

9. TEST RESULTS

9.1. 20 dB & 99% Bandwidth

Conducted Test Conditions for 20 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	20 dB and 99 % Bandwidth	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)(1)(i)/(ii)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for 20 dB and 99% Bandwidth Measurement

The bandwidth at 20 dB and 99 % was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Limits for 20 dB and 99% Bandwidth

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(ii) Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

Equipment Configuration for 20 dB 99% Bandwidth

Variant:	FSK-10k-HP	Duty Cycle (%):	100
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
902.4	0.265	--	--	--	0.265	0.265	≤ 500	-0.235
914.8	0.265	--	--	--	0.265	0.265	≤ 500	-0.235
927.6	0.265	--	--	--	0.265	0.265	≤ 500	-0.235

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c			
902.4	0.283	--	--	--	0.283		
914.8	0.283	--	--	--	0.283		
927.6	0.283	--	--	--	0.283		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 20 dB 99% Bandwidth

Variant:	FSK-200k-HP	Duty Cycle (%):	100
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
902.4	0.347	--	--	--	0.347	0.347	≤ 500	-0.153
914.8	0.347	--	--	--	0.347	0.347	≤ 500	-0.153
927.6	0.347	--	--	--	0.347	0.347	≤ 500	-0.153

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c		d	
902.4	0.337	--	--	--	0.337		
914.8	0.337	--	--	--	0.337		
927.6	0.341	--	--	--	0.341		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 20 dB 99% Bandwidth

Variant:	FSK-10k-XR	Duty Cycle (%):	100
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
902.5	0.100	--	--	--	0.100	0.100	≤ 500	-0.400
915.0	0.100	--	--	--	0.100	0.100	≤ 500	-0.400
927.5	0.133	--	--	--	0.133	0.133	≤ 500	-0.367

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c			
902.5	0.091	--	--	--	0.091		
915.0	0.091	--	--	--	0.091		
927.5	0.111	--	--	--	0.111		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 20 dB 99% Bandwidth

Variant:	FSK-110k-XR	Duty Cycle (%):	100
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
902.5	0.228	--	--	--	0.228	0.228	≤ 500	-0.272
915.0	0.228	--	--	--	0.228	0.228	≤ 500	-0.272
927.5	0.228	--	--	--	0.228	0.228	≤ 500	-0.272

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c		d	
902.5	0.208	--	--	--	0.208		
915.0	0.208	--	--	--	0.208		
927.5	0.210	--	--	--	0.210		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 20 dB 99% Bandwidth

Variant:	FSK-250k-XR	Duty Cycle (%):	100
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
902.8	0.301	--	--	--	0.301	0.301	≤ 500	-0.199
915.3	0.301	--	--	--	0.301	0.301	≤ 500	-0.199
927.3	0.301	--	--	--	0.301	0.301	≤ 500	-0.199

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c			
902.8	0.287	--	--	--	0.287		
915.3	0.285	--	--	--	0.285		
927.3	0.287	--	--	--	0.287		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.2. Frequency Hopping Tests

Conducted Test Conditions for Frequency Hopping Measurements			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Frequency Hopping Tests	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)(1)(i)/(ii)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References, FCC Public Notice DA 00-705		

Test Procedure for Frequency Hopping Measurements

These tests cover the following measurements:

- i) channel separation
- ii) channel occupancy
- iii) dwell time
- iv) number of hopping frequencies

Frequency hopping testing was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency or hopping mode.

Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Limits for Frequency Hopping Measurements

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(ii) Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

9.2.1. Number of Hopping Channels

Equipment Configuration for Number of Hopping Channels
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Variant:	FSK-10k-HP	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	19	...	...
910.0-920.0	26	...	...
920.0-928.0	19	...	...
Total number of Hops	64	25	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Number of Hopping Channels

Variant:	FSK-200k-HP	Antenna:	Not Applicable
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	19	--	--
910.0-920.0	25	--	--
920.0-928.0	20	--	--
Total number of Hops	64	25	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Number of Hopping Channels

Variant:	FSK-10k-XR	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	15	--	--
910.0-920.0	20	--	--
920.0-928.0	15	--	--
Total number of Hops	50	50	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Number of Hopping Channels

Variant:	FSK-110k-XR	Antenna:	Not Applicable
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	15	--	--
910.0-920.0	20	--	--
920.0-928.0	15	--	--
Total number of Hops	50	50	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Number of Hopping Channels

Variant:	FSK-250k-XR	Antenna:	Not Applicable
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	15	--	--
910.0-920.0	20	--	--
920.0-928.0	15	--	--
Total number of Hops	50	50	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.2.2. Channel Separation

Equipment Configuration for Channel Separation
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Variant:	FSK-10k-HP	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
914.8	0.397	0.288	Pass

Traceability to Industry Recognized Test Methodologies
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Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Separation

Variant:	FSK-200k-HP	Antenna:	Not Applicable
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
914.8	0.410	0.380	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Separation

Variant:	FSK-10k-XR	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.0	0.500	0.133	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Separation

Variant:	FSK-110k-XR	Antenna:	Not Applicable
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.0	0.500	0.228	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Separation

Variant:	FSK-250k-XR	Antenna:	Not Applicable
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.3	0.500	0.315	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.2.3. Dwell Time

Variant:	FSK-10k-HP	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
914.8	0.150	150.00	10	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Variant:	FSK-200k-HP	Antenna:	Not Applicable
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
914.8	0.015	262.32	10.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Variant:	FSK-10k-XR	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.0	0.198	396.00	20.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Variant:	FSK-110k-XR	Antenna:	Not Applicable
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.0	0.030	300.00	20.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Variant:	FSK-250k-XR	Antenna:	Not Applicable
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.25	0.016	120.00	10.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.2.4. Channel Occupancy

Equipment Configuration for Channel Occupancy

Variant:	FSK-10k-HP	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
914.80	0.150	150.000	10.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Occupancy

Variant:	FSK-200k-HP	Antenna:	Not Applicable
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
914.80	0.015	262.320	10.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Occupancy

Variant:	FSK-10k-XR	Antenna:	Not Applicable
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.00	0.198	396.000	20.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Occupancy

Variant:	FSK-110k-XR	Antenna:	Not Applicable
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.00	0.030	300.000	20.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Channel Occupancy

Variant:	FSK-250k-XR	Antenna:	Not Applicable
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
Duty Cycle (%):	100.0	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency (MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.30	0.016	120.000	10.00	400.000	Pass

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.3. Output Power

Conducted Test Conditions for Fundamental Emission Output Power			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Output Power	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)(1), (b)(1)/(2)/(3)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Fundamental Emission Output Power Measurement

In the case of average power measurements an average power sensor was utilized.

For peak power measurements the spectrum analyzer built-in power function was used to integrate peak power over the 20 dB bandwidth.

Testing was performed under ambient conditions, nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured, summed (Σ) and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Supporting Information

Calculated Power = $A + G + Y + 10 \log (1/x)$ dBm

A = Total Power [$10 \cdot \log_{10} (10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})$]

G = Antenna Gain

Y = Beamforming Gain

x = Duty Cycle (average power measurements only)

Limits for Fundamental Emission Output Power

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following for frequency hopping systems:

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power

control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Equipment Configuration for Output Power Peak

Variant:	FSK-10k-HP	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	1.00
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.4	23.70	--	--	--	23.70	30.00	-6.30	PL4
914.8	23.87	--	--	--	23.87	30.00	-6.13	PL4
927.6	23.87	--	--	--	23.87	30.00	-6.13	PL4

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

Equipment Configuration for Output Power Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100.0
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	1.00
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.4	23.78	--	--	--	23.78	30.00	-6.22	PL4
914.8	23.88	--	--	--	23.88	30.00	-6.12	PL4
927.6	23.72	--	--	--	23.72	30.00	-6.28	PL4

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

Equipment Configuration for Output Power Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	1.00
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.5	23.63	--	--	--	23.63	30.00	-6.37	PL4
915.0	23.75	--	--	--	23.75	30.00	-6.25	PL4
927.5	23.70	--	--	--	23.70	30.00	-6.30	PL4

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

Equipment Configuration for Output Power Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100.0
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	1.00
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.5	23.67	--	--	--	23.67	30.00	-6.33	PL4
915.0	23.75	--	--	--	23.75	30.00	-6.25	PL4
927.5	23.70	--	--	--	23.70	30.00	-6.30	PL4

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

Equipment Configuration for Output Power Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100.0
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	1.00
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.8	23.70	--	--	--	23.70	30.00	-6.30	PL4
915.3	23.80	--	--	--	23.80	30.00	-6.20	PL4
927.3	23.71	--	--	--	23.71	30.00	-6.29	PL4

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

9.4. Emissions

9.4.1. Conducted Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Transmitter Conducted Spurious and Band-Edge Emissions	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (d)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement

Transmitter Conducted Spurious and Band-Edge emissions were measured at a limit of 30 dBc (average detector) or 20 dBc (peak detector) below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Measurements were made while EUT was operating in transmit mode of operation at the appropriate centre frequency closest to the band-edge. Emissions were maximized during the measurement and limits derived from the peak spectral power and drawn on each plot.

Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured separately. Testing was performed under ambient conditions at nominal voltage only.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Limits Transmitter Conducted Spurious and Band-Edge Emissions

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

9.4.1.1. Conducted Unwanted Spurious Emissions

Equipment Configuration for Unwanted Emissions Peak			
Variant:	FSK-10k-HP	Duty Cycle (%):	100
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.4	30.0 - 26000.0	-29.357	3.19	--	--	--	--	--	--
914.8	30.0 - 26000.0	-32.507	3.16	--	--	--	--	--	--
927.6	30.0 - 26000.0	-33.801	2.98	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Unwanted Emissions Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.4	30.0 - 26000.0	-29.607	3.19	--	--	--	--	--	--
914.8	30.0 - 26000.0	-32.658	3.05	--	--	--	--	--	--
927.6	30.0 - 26000.0	-34.030	2.98	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Unwanted Emissions Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.5	30.0 - 26000.0	-29.159	3.08	--	--	--	--	--	--
915.0	30.0 - 26000.0	-32.779	2.94	--	--	--	--	--	--
927.5	30.0 - 26000.0	-33.409	2.72	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Unwanted Emissions Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.5	30.0 - 26000.0	-29.285	3.12	--	--	--	--	--	--
915.0	30.0 - 26000.0	-31.994	2.95	--	--	--	--	--	--
927.5	30.0 - 26000.0	-33.250	2.73	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Unwanted Emissions Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.8	30.0 - 26000.0	-29.114	3.14	--	--	--	--	--	--
915.3	30.0 - 26000.0	-32.074	2.95	--	--	--	--	--	--
927.3	30.0 - 26000.0	-33.504	2.74	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.4.1.2. Conducted Band-Edge Emissions

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak							
Variant:		FSK-10k-HP		Duty Cycle (%):		100.0	
Data Rate:		10.00 KBit/s		Antenna Gain (dBi):		Not Applicable	
Modulation:		FSK		Beam Forming Gain (Y)(dB):		Not Applicable	
TPC:		Not Applicable		Tested By:		CC	
Engineering Test Notes:							
Test Measurement Results							
Channel Frequency:		902.4 MHz					
Band-Edge Frequency:		902.0 MHz					
Test Frequency Range:		875.0 - 905.0 MHz					
Port(s)		Band-Edge Markers and Limit			Revised Limit		Margin
		M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a		-2.69	2.88	902.10	--	--	-0.100
Traceability to Industry Recognized Test Methodologies							
Work Instruction:				WI-05 MEASUREMENT OF SPURIOUS EMISSIONS			
Measurement Uncertainty:				<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB			

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100.0
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.4 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-16.65	2.94	902.10	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-33.80	2.78	902.30	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100.0
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-33.04	3.11	902.30	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100.0
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.8 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-33.87	2.83	902.50	--	--	-0.500

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FSK-10k-HP	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.4 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-3.34	2.74	902.10	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100.0
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.4 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-18.77	2.76	902.10	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-34.98	2.53	902.30	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100.0
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-32.40	2.68	902.30	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100.0
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.8 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-31.51	2.72	902.50	--	--	-0.500

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Hopping) Peak

Variant:	FSK-10k-HP	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.6 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-3.07	2.95	927.90	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Hopping) Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100.0
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.6 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-16.92	3.06	927.90	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Hopping) Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-41.83	2.88	927.20	--	--	-0.800

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Hopping) Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100.0
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-40.69	3.07	927.20	--	--	-0.800

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Hopping) Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100.0
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.3 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-34.33	2.84	927.50	--	--	-0.500

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-10k-HP	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.6 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-3.80	2.74	927.90	--	--	-0.100

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-200k-HP	Duty Cycle (%):	100.0
Data Rate:	200.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.6 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-18.95	2.71	927.80	--	--	-0.200

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-10k-XR	Duty Cycle (%):	100.0
Data Rate:	10.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-10	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-34.81	2.69	927.70	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-110k-XR	Duty Cycle (%):	100.0
Data Rate:	110.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-110	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-32.89	2.69	927.70	--	--	-0.300

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-250k-XR	Duty Cycle (%):	100.0
Data Rate:	250.00 KBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	FSK-250	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.3 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 MHz					
Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-31.27	2.69	927.50	--	--	-0.500

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.4.2. Radiated Emissions

Frequency Band			
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

- (1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.
- (2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.
- (3) Cable locating equipment operated pursuant to §15.213.
- (4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.
- (5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.
- (6) Transmitters operating under the provisions of subparts D or F of this part.
- (7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.

(8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).

(9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).

9.4.2.1. TX Spurious & Restricted Band Emissions (30 MHz -1 GHz)

9.4.2.1.1. Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.25	53.59	4.12	-17.75	39.96	MaxQP	Vertical	100	89	40.0	-0.04	Pass
#2	168.07	40.02	4.63	-13.92	30.73	MaxQP	Horizontal	199	151	43.5	-12.8	Pass
#3	240.00	41.78	4.94	-13.73	32.99	MaxQP	Horizontal	193	235	46.0	-13.0	Pass
#4	280.01	46.85	5.11	-11.91	40.04	MaxQP	Horizontal	104	237	46.0	-6.0	Pass
#5	341.67	46.71	5.32	-11.21	40.81	MaxQP	Vertical	110	207	46.0	-5.2	Pass
#6	599.98	40.75	6.24	-6.45	40.55	MaxQP	Horizontal	135	150	46.0	-5.5	Pass
#7	680.00	44.67	6.58	-5.21	46.04	NRB	Vertical	96	265	--	--	Pass
#8	742.38	39.46	6.80	-4.18	42.08	MaxQP	Horizontal	100	235	46.0	-3.9	Pass
#9	882.46	29.70	7.33	-2.84	34.20	MaxQP	Vertical	108	151	46.0	-11.8	Pass
#10	903.00	61.47	7.42	-2.45	66.44	Fundamental	Vertical	199	179	--	--	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.24	53.08	4.12	-17.75	39.46	MaxQP	Vertical	98	24	40.0	-0.5	Pass
#2	167.68	36.87	4.64	-13.90	27.61	MaxQP	Horizontal	180	120	43.5	-15.9	Pass
#3	272.97	45.57	5.06	-11.96	38.67	MaxQP	Horizontal	111	113	46.0	-7.3	Pass
#4	339.25	47.04	5.33	-11.28	41.09	MaxQP	Vertical	100	175	46.0	-4.9	Pass
#5	599.97	40.62	6.24	-6.45	40.41	MaxQP	Horizontal	130	225	46.0	-5.6	Pass
#6	695.08	38.22	6.63	-4.83	40.02	MaxQP	Vertical	155	238	46.0	-6.0	Pass
#7	757.36	32.37	6.88	-4.29	34.95	MaxQP	Horizontal	96	234	46.0	-11.0	Pass
#8	881.04	29.05	7.33	-2.80	33.58	MaxQP	Vertical	111	169	46.0	-12.4	Pass
#9	915.61	57.60	7.46	-2.30	62.76	Fundamental	Vertical	100	89	--	--	Pass
#10	994.83	30.48	7.56	-1.44	36.60	MaxQP	Vertical	108	34	54.0	-17.4	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.23	52.57	4.12	-17.75	38.95	MaxQP	Vertical	98	239	40.0	-1.1	Pass
#2	167.63	38.56	4.64	-13.90	29.31	MaxQP	Horizontal	152	308	43.5	-14.2	Pass
#3	277.87	46.89	5.08	-11.90	40.07	MaxQP	Horizontal	106	105	46.0	-5.9	Pass
#4	346.38	48.14	5.35	-11.03	42.46	MaxQP	Horizontal	102	253	46.0	-3.5	Pass
#5	600.05	40.96	6.24	-6.45	40.75	MaxQP	Horizontal	150	239	46.0	-5.3	Pass
#6	687.60	43.10	6.56	-5.04	44.62	MaxQP	Vertical	152	120	46.0	-1.4	Pass
#7	880.01	33.22	7.36	-2.78	37.80	MaxQP	Vertical	102	182	46.0	-8.2	Pass
#8	928.22	57.59	7.51	-2.06	63.04	Fundamental	Vertical	101	149	--	--	Pass
#9	967.61	32.69	7.53	-1.67	38.55	MaxQP	Vertical	99	89	54.0	-15.5	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.2. Dipole Mpdevice Antenna (A09-HASM-675 / ACE-915NF) [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.24	53.57	4.12	-17.75	39.94	MaxQP	Vertical	100	90	40.0	-0.06	Pass
#2	168.00	41.14	4.64	-13.92	31.85	MaxQP	Horizontal	157	125	43.5	-11.6	Pass
#3	240.02	45.86	4.94	-13.73	37.07	MaxQP	Horizontal	132	266	46.0	-8.9	Pass
#4	275.69	46.55	5.07	-11.90	39.71	MaxQP	Horizontal	98	101	46.0	-6.3	Pass
#5	342.64	46.19	5.34	-11.18	40.36	MaxQP	Vertical	103	201	46.0	-5.6	Pass
#6	582.51	42.26	6.19	-6.54	41.91	MaxQP	Horizontal	135	132	46.0	-4.1	Pass
#7	679.99	45.39	6.58	-5.21	46.76	NRB	Horizontal	124	245	--	--	Pass
#8	742.52	37.78	6.81	-4.18	40.41	MaxQP	Vertical	166	260	46.0	-5.6	Pass
#9	862.51	37.00	7.25	-2.84	41.41	MaxQP	Vertical	100	166	46.0	-4.6	Pass
#10	903.00	61.85	7.42	-2.45	66.81	Fundamental	Vertical	100	89	46.0	20.8	Pass
#11	982.50	33.80	7.55	-1.66	39.69	MaxQP	Vertical	104	216	54.0	-14.3	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.24	52.56	4.12	-17.75	38.93	MaxQP	Vertical	107	109	40.0	-1.1	Pass
#2	165.00	40.20	4.63	-13.75	31.08	MaxQP	Horizontal	187	141	43.5	-12.4	Pass
#3	277.81	47.84	5.08	-11.90	41.02	MaxQP	Horizontal	104	110	46.0	-5.0	Pass
#4	346.43	49.01	5.35	-11.03	43.33	MaxQP	Vertical	100	194	46.0	-2.7	Pass
#5	592.54	35.24	6.20	-6.41	35.03	MaxQP	Horizontal	129	141	46.0	-11.0	Pass
#6	675.01	45.66	6.60	-5.34	46.92	NRB	Vertical	98	261	46.0	0.9	Pass
#7	749.99	36.15	6.81	-4.14	38.81	MaxQP	Horizontal	106	248	46.0	-7.2	Pass
#8	874.99	33.93	7.34	-2.78	38.49	MaxQP	Vertical	111	213	46.0	-7.5	Pass
#9	915.61	57.83	7.46	-2.30	62.99	Fundamental	Vertical	98	89	46.0	17.0	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.20	52.47	4.12	-17.74	38.85	MaxQP	Vertical	98	330	40.0	-1.2	Pass
#2	167.53	39.10	4.63	-13.89	29.84	MaxQP	Horizontal	144	150	43.5	-13.7	Pass
#3	277.45	46.52	5.08	-11.90	39.70	MaxQP	Horizontal	101	105	46.0	-6.3	Pass
#4	339.45	48.46	5.33	-11.27	42.52	MaxQP	Vertical	111	195	46.0	-3.5	Pass
#5	606.32	36.96	6.25	-6.30	36.91	MaxQP	Horizontal	155	240	46.0	-9.1	Pass
#6	687.50	48.32	6.56	-5.04	49.83	NRB	Horizontal	125	240	--	--	Pass
#7	760.00	33.63	6.93	-4.33	36.24	MaxQP	Horizontal	102	242	46.0	-9.8	Pass
#8	879.97	32.60	7.36	-2.78	37.17	MaxQP	Vertical	99	178	46.0	-8.8	Pass
#9	928.22	57.67	7.51	-2.06	63.12	Fundamental	Vertical	100	89	--	--	Pass
#10	967.52	31.28	7.53	-1.67	37.14	MaxQP	Vertical	101	273	54.0	-16.9	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.3. Dome / Laird Antenna (A09-D3NF /TRA8903) [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	73.61	46.30	4.21	-17.38	33.13	MaxQP	Vertical	98	160	40.0	-6.9	Pass
#2	199.22	39.53	4.77	-12.82	31.48	MaxQP	Horizontal	146	230	43.5	-12.0	Pass
#3	275.42	46.50	5.06	-11.90	39.66	MaxQP	Horizontal	100	220	46.0	-6.3	Pass
#4	329.69	48.23	5.31	-11.39	42.15	MaxQP	Horizontal	100	221	46.0	-3.9	Pass
#5	384.93	41.95	5.46	-10.21	37.19	MaxQP	Vertical	198	299	46.0	-8.8	Pass
#6	645.65	38.53	6.43	-5.18	39.78	MaxQP	Vertical	128	154	46.0	-6.2	Pass
#7	703.32	36.59	6.69	-4.70	38.58	MaxQP	Vertical	146	103	46.0	-7.4	Pass
#8	764.74	34.09	6.90	-4.30	36.68	MaxQP	Vertical	98	29	46.0	-9.3	Pass
#9	862.41	36.68	7.25	-2.84	41.09	MaxQP	Vertical	155	179	46.0	-4.9	Pass
#10	903.00	51.89	7.42	-2.45	56.86	Fundamental	Vertical	199	179	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	75.97	46.80	4.26	-17.47	33.58	MaxQP	Vertical	98	171	40.0	-6.4	Pass
#2	199.42	40.75	4.76	-12.81	32.70	MaxQP	Horizontal	104	240	43.5	-10.8	Pass
#3	281.96	43.48	5.09	-11.91	36.66	MaxQP	Horizontal	101	227	46.0	-9.3	Pass
#4	322.62	48.55	5.27	-11.42	42.40	MaxQP	Horizontal	100	222	46.0	-3.6	Pass
#5	401.25	41.25	5.53	-9.67	37.11	MaxQP	Vertical	199	282	46.0	-8.9	Pass
#6	649.91	42.78	6.41	-5.10	44.09	MaxQP	Vertical	154	102	46.0	-1.9	Pass
#7	767.62	32.63	6.94	-4.27	35.30	MaxQP	Vertical	100	0	46.0	-10.7	Pass
#8	869.59	32.79	7.30	-2.74	37.35	MaxQP	Vertical	158	138	46.0	-8.6	Pass
#9	915.61	47.73	7.46	-2.30	52.89	Fundamental	Vertical	199	179	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	76.04	48.57	4.26	-17.47	35.36	MaxQP	Vertical	110	174	40.0	-4.6	Pass
#2	201.84	41.27	4.78	-13.30	32.76	MaxQP	Horizontal	159	231	43.5	-10.7	Pass
#3	280.08	44.15	5.11	-11.91	37.35	MaxQP	Horizontal	102	220	46.0	-8.7	Pass
#4	334.85	46.91	5.30	-11.34	40.86	MaxQP	Horizontal	98	227	46.0	-5.1	Pass
#5	382.73	41.42	5.46	-10.24	36.64	MaxQP	Vertical	196	291	46.0	-9.4	Pass
#6	601.64	31.00	6.28	-6.42	30.86	MaxQP	Vertical	154	0	46.0	-15.1	Pass
#7	650.92	41.67	6.44	-5.10	43.01	MaxQP	Vertical	136	150	46.0	-3.0	Pass
#8	767.62	39.58	6.94	-4.27	42.25	MaxQP	Vertical	98	277	46.0	-3.7	Pass
#9	880.01	31.48	7.36	-2.78	36.05	MaxQP	Vertical	144	178	46.0	-10.0	Pass
#10	928.22	53.85	7.51	-2.06	59.30	Fundamental	Vertical	149	179	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.4. Dome / Laird Antenna (A09-D3NF /TRA8903) [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	73.66	45.89	4.21	-17.38	32.72	MaxQP	Vertical	98	139	40.0	-7.3	Pass
#2	199.47	32.85	4.76	-12.81	24.80	MaxQP	Vertical	145	268	43.5	-18.7	Pass
#3	275.30	35.03	5.06	-11.91	28.19	MaxQP	Vertical	102	251	46.0	-17.8	Pass
#4	318.13	46.50	5.25	-11.51	40.24	MaxQP	Horizontal	99	231	46.0	-5.8	Pass
#5	351.52	44.56	5.38	-10.74	39.20	MaxQP	Horizontal	99	29	46.0	-6.8	Pass
#6	399.01	40.05	5.51	-9.75	35.81	MaxQP	Vertical	125	119	46.0	-10.2	Pass
#7	645.01	44.16	6.42	-5.21	45.37	MaxQP	Vertical	137	21	46.0	-0.6	Pass
#8	702.49	39.79	6.70	-4.71	41.78	MaxQP	Vertical	131	207	46.0	-4.2	Pass
#9	764.97	35.50	6.91	-4.30	38.11	MaxQP	Vertical	171	0	46.0	-7.9	Pass
#10	822.52	38.01	7.11	-3.28	41.84	MaxQP	Vertical	172	70	46.0	-4.2	Pass
#11	862.51	38.83	7.25	-2.84	43.24	MaxQP	Vertical	169	174	46.0	-2.8	Pass
#12	903.00	51.14	7.42	-2.45	56.11	Fundamental	Vertical	199	89	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	73.64	46.65	4.21	-17.38	33.48	MaxQP	Vertical	100	181	40.0	-6.5	Pass
#2	199.56	40.31	4.76	-12.81	32.27	MaxQP	Horizontal	193	237	43.5	-11.2	Pass
#3	320.57	48.06	5.24	-11.47	41.83	MaxQP	Horizontal	101	225	46.0	-4.2	Pass
#4	394.37	44.52	5.50	-9.92	40.10	MaxQP	Horizontal	99	32	46.0	-5.9	Pass
#5	650.09	46.52	6.42	-5.10	47.83	NRB	Vertical	150	170	--	--	Pass
#6	674.99	40.35	6.60	-5.34	41.61	MaxQP	Vertical	159	160	46.0	-4.4	Pass
#7	701.94	36.45	6.69	-4.71	38.43	MaxQP	Vertical	130	81	46.0	-7.6	Pass
#8	834.99	35.17	7.19	-3.12	39.23	MaxQP	Vertical	101	286	46.0	-6.8	Pass
#9	915.61	46.84	7.46	-2.30	52.00	Fundamental	Vertical	100	0	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	75.98	48.61	4.26	-17.47	35.40	MaxQP	Vertical	98	179	40.0	-4.6	Pass
#2	201.91	41.09	4.78	-13.32	32.56	MaxQP	Horizontal	184	240	43.5	-10.9	Pass
#3	280.27	45.13	5.11	-11.92	38.33	MaxQP	Horizontal	101	220	46.0	-7.7	Pass
#4	325.51	48.72	5.28	-11.39	42.61	MaxQP	Horizontal	101	222	46.0	-3.4	Pass
#5	389.61	37.88	5.49	-10.09	33.28	MaxQP	Vertical	102	336	46.0	-12.7	Pass
#6	651.39	42.27	6.45	-5.10	43.62	MaxQP	Vertical	151	138	46.0	-2.4	Pass
#7	767.52	38.59	6.95	-4.27	41.26	MaxQP	Vertical	199	215	46.0	-4.7	Pass
#8	879.96	31.46	7.36	-2.78	36.03	MaxQP	Vertical	102	30	46.0	-10.0	Pass
#9	928.22	54.35	7.51	-2.06	59.80	Fundamental	Vertical	100	119	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.5. Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	59.29	53.73	4.15	-18.12	39.76	MaxQP	Vertical	100	207	40.0	-0.2	Pass
#2	173.68	29.19	4.66	-14.28	19.57	MaxQP	Vertical	170	176	43.5	-23.9	Pass
#3	312.95	40.20	5.22	-11.61	33.82	MaxQP	Horizontal	97	240	46.0	-12.2	Pass
#4	428.68	37.36	5.63	-8.71	34.28	MaxQP	Horizontal	107	273	46.0	-11.7	Pass
#5	881.49	29.27	7.33	-2.82	33.78	MaxQP	Horizontal	169	230	46.0	-12.2	Pass
#6	903.00	58.75	7.42	-2.45	63.72	Fundamental	Vertical	149	299	--	--	Pass
#7	959.96	28.30	7.58	-1.68	34.19	MaxQP	Horizontal	137	230	46.0	-11.8	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.91	53.85	4.13	-18.19	39.79	MaxQP	Vertical	120	184	40.0	-0.2	Pass
#2	177.44	32.73	4.69	-14.42	22.99	MaxQP	Vertical	179	164	43.5	-20.5	Pass
#3	317.75	40.47	5.26	-11.51	34.22	MaxQP	Horizontal	108	240	46.0	-11.8	Pass
#4	434.14	40.44	5.66	-8.74	37.36	MaxQP	Horizontal	103	68	46.0	-8.6	Pass
#5	501.04	30.17	5.86	-7.64	28.39	MaxQP	Vertical	99	32	46.0	-17.6	Pass
#6	879.96	30.09	7.36	-2.78	34.66	MaxQP	Horizontal	166	235	46.0	-11.3	Pass
#7	915.61	52.28	7.46	-2.30	57.44	Fundamental	Vertical	149	299	--	--	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.91	53.98	4.13	-18.19	39.92	MaxQP	Vertical	103	89	40.0	-0.08	Pass
#2	175.67	34.65	4.67	-14.36	24.97	MaxQP	Vertical	197	183	43.5	-18.5	Pass
#3	313.11	41.77	5.22	-11.60	35.38	MaxQP	Horizontal	100	238	46.0	-10.6	Pass
#4	429.79	39.35	5.63	-8.66	36.31	MaxQP	Horizontal	103	270	46.0	-9.7	Pass
#5	879.97	29.69	7.36	-2.78	34.26	MaxQP	Horizontal	101	101	46.0	-11.7	Pass
#6	928.22	54.43	7.51	-2.06	59.88	Fundamental	Horizontal	149	240	--	--	Pass
#7	967.58	32.32	7.53	-1.67	38.19	MaxQP	Horizontal	142	247	54.0	-15.8	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.6. Flexible Printed Circuit (FPC) Molex 211140-0100 [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	59.10	53.54	4.15	-18.13	39.56	MaxP	Vertical	101	210	40.0	-0.4	Pass
#2	59.34	53.75	4.15	-18.12	39.08	MaxQP	Vertical	100	180	40.0	-0.9	Pass
#3	180.35	36.36	4.68	-14.44	26.59	MaxP	Vertical	199	179	43.5	-16.9	Pass
#4	313.24	43.10	5.22	-11.60	36.72	MaxP	Horizontal	101	240	46.0	-9.3	Pass
#5	427.70	42.64	5.63	-8.73	39.54	MaxP	Horizontal	101	60	46.0	-6.5	Pass
#6	504.33	36.24	5.90	-7.63	34.51	MaxP	Vertical	101	29	46.0	-11.5	Pass
#7	879.72	34.22	7.37	-2.78	38.80	MaxP	Horizontal	101	240	46.0	-7.2	Pass
#8	903.00	55.14	7.42	-2.45	60.11	Fundamental	Vertical	149	299	--	--	Pass
#9	965.08	32.64	7.57	-1.66	38.54	MaxP	Vertical	101	270	54.0	-15.5	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.19	53.79	4.12	-18.18	39.73	MaxP	Vertical	100	0	40.0	-0.3	Pass
#2	56.97	53.54	4.13	-18.19	39.48	MaxQP	Vertical	104	30	40.0	-0.5	Pass
#3	177.44	37.56	4.69	-14.42	27.82	MaxP	Vertical	199	149	43.5	-15.7	Pass
#4	315.18	42.96	5.24	-11.55	36.65	MaxP	Horizontal	99	240	46.0	-9.4	Pass
#5	426.73	45.09	5.62	-8.72	41.99	MaxP	Horizontal	99	90	46.0	-4.0	Pass
#6	427.27	40.40	5.62	-8.72	37.30	MaxQP	Horizontal	106	69	46.0	-8.7	Pass
#7	495.60	35.08	5.86	-7.66	33.28	MaxP	Vertical	99	59	46.0	-12.7	Pass
#8	875.84	33.14	7.35	-2.79	37.69	MaxP	Horizontal	99	240	46.0	-8.3	Pass
#9	915.61	48.35	7.46	-2.30	53.51	Fundamental	Horizontal	99	300	--	--	Pass
#10	967.99	33.63	7.54	-1.67	39.50	MaxP	Horizontal	149	240	54.0	-14.5	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.94	53.94	4.13	-18.19	39.88	MaxQP	Vertical	101	210	40.0	-0.1	Pass
#2	169.68	38.01	4.64	-14.03	28.62	MaxP	Vertical	149	179	43.5	-14.9	Pass
#3	320.03	44.63	5.24	-11.48	38.38	MaxP	Horizontal	99	210	46.0	-7.6	Pass
#4	431.58	43.48	5.65	-8.69	40.44	MaxP	Vertical	99	179	46.0	-5.6	Pass
#5	431.95	38.75	5.65	-8.70	35.70	MaxQP	Vertical	112	201	46.0	-10.3	Pass
#6	443.22	42.96	5.69	-8.63	40.02	MaxP	Horizontal	99	90	46.0	-6.0	Pass
#7	496.57	35.48	5.87	-7.66	33.69	MaxP	Vertical	99	29	46.0	-12.3	Pass
#8	928.22	55.22	7.51	-2.06	60.66	Fundamental	Horizontal	149	238	--	--	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.7. Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.20	50.07	4.12	-17.74	36.45	MaxQP	Vertical	100	0	40.0	-3.5	Pass
#2	227.21	48.54	4.88	-14.06	39.35	MaxQP	Horizontal	115	84	46.0	-6.6	Pass
#3	306.05	40.42	5.20	-11.78	33.84	MaxQP	Horizontal	119	268	46.0	-12.2	Pass
#4	404.74	43.58	5.55	-9.58	39.56	MaxQP	Horizontal	100	247	46.0	-6.4	Pass
#5	662.40	45.50	6.47	-5.27	46.71	NRB	Horizontal	130	272	--	--	Pass
#6	736.46	36.96	6.78	-4.29	39.45	MaxQP	Horizontal	113	120	46.0	-6.6	Pass
#7	862.42	37.74	7.25	-2.84	42.15	MaxQP	Horizontal	98	236	46.0	-3.9	Pass
#8	903.00	55.51	7.42	-2.45	60.48	Fundamental	Horizontal	99	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.81	51.68	4.13	-18.19	37.63	MaxQP	Vertical	97	0	40.0	-2.4	Pass
#2	165.61	30.65	4.64	-13.77	21.52	MaxQP	Vertical	165	319	43.5	-22.0	Pass
#3	227.37	48.57	4.87	-14.06	39.39	MaxQP	Horizontal	140	80	46.0	-6.6	Pass
#4	324.26	40.36	5.28	-11.40	34.25	MaxQP	Vertical	101	179	46.0	-11.8	Pass
#5	412.50	43.58	5.55	-9.20	39.93	MaxQP	Horizontal	100	97	46.0	-6.1	Pass
#6	600.01	42.45	6.24	-6.45	42.24	MaxQP	Horizontal	134	127	46.0	-3.8	Pass
#7	680.01	45.23	6.58	-5.21	46.60	NRB	Horizontal	129	242	--	--	Pass
#8	834.77	34.32	7.19	-3.13	38.39	MaxQP	Horizontal	97	327	46.0	-7.6	Pass
#9	915.61	45.98	7.46	-2.30	51.14	Fundamental	Horizontal	149	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB A to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.81	52.10	4.13	-18.19	38.04	MaxQP	Vertical	98	0	40.0	-2.0	Pass
#2	168.08	35.53	4.63	-13.92	26.24	MaxQP	Horizontal	171	303	43.5	-17.3	Pass
#3	227.44	46.78	4.87	-14.06	37.60	MaxQP	Horizontal	151	85	46.0	-8.4	Pass
#4	331.43	40.19	5.32	-11.41	34.10	MaxQP	Vertical	101	191	46.0	-11.9	Pass
#5	409.47	45.85	5.55	-9.33	42.06	MaxQP	Horizontal	100	77	46.0	-3.9	Pass
#6	605.16	42.62	6.26	-6.33	42.55	MaxQP	Horizontal	141	122	46.0	-3.4	Pass
#7	687.59	45.85	6.56	-5.04	47.37	NRB	Horizontal	124	121	--	--	Pass
#8	807.61	36.18	7.05	-3.55	39.68	MaxQP	Horizontal	102	255	46.0	-6.3	Pass
#9	868.74	28.87	7.30	-2.75	33.42	MaxQP	Horizontal	101	229	46.0	-12.6	Pass
#10	928.22	56.93	7.51	-2.06	62.37	Fundamental	Horizontal	149	180	-	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.8. Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	52.21	50.14	4.12	-17.74	36.52	MaxQP	Vertical	120	72	40.0	-3.5	Pass
#2	227.28	50.15	4.87	-14.06	40.97	MaxQP	Horizontal	154	72	46.0	-5.0	Pass
#3	322.57	41.35	5.27	-11.42	35.20	MaxQP	Vertical	107	203	46.0	-10.8	Pass
#4	407.82	45.74	5.54	-9.41	41.87	MaxQP	Horizontal	101	85	46.0	-4.1	Pass
#5	582.54	37.82	6.19	-6.54	37.47	MaxQP	Horizontal	156	125	46.0	-8.5	Pass
#6	662.50	47.05	6.47	-5.27	48.26	NRB	Horizontal	111	140	--	--	Pass
#7	742.50	42.05	6.81	-4.18	44.68	MaxQP	Horizontal	116	120	46.0	-1.3	Pass
#8	862.51	40.70	7.25	-2.84	45.12	MaxQP	Horizontal	101	112	46.0	-0.9	Pass
#9	903.00	53.65	7.42	-2.45	58.62	MaxP	Horizontal	98	300	--	--	Pass

Test Notes: Flex Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.92	51.67	4.13	-18.19	37.61	MaxQP	Vertical	104	30	40.0	-2.4	Pass
#2	227.86	49.81	4.88	-14.04	40.65	MaxQP	Horizontal	139	236	46.0	-5.4	Pass
#3	314.99	41.24	5.24	-11.55	34.93	MaxQP	Horizontal	100	240	46.0	-11.1	Pass
#4	405.13	45.04	5.56	-9.56	41.04	MaxQP	Horizontal	102	98	46.0	-5.0	Pass
#5	601.89	36.27	6.28	-6.41	36.14	MaxQP	Horizontal	145	235	46.0	-9.9	Pass
#6	675.01	46.86	6.60	-5.34	48.12	NRB	Horizontal	125	300	--	--	Pass
#7	754.97	38.51	6.87	-4.22	41.16	MaxQP	Horizontal	102	142	46.0	-4.8	Pass
#8	915.61	47.20	7.46	-2.30	52.36	Fundamental	Horizontal	100	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.80	51.94	4.13	-18.19	37.88	MaxQP	Vertical	104	0	40.0	-2.1	Pass
#2	168.27	35.12	4.63	-13.93	25.82	MaxQP	Horizontal	196	290	43.5	-17.7	Pass
#3	227.47	47.55	4.87	-14.05	38.37	MaxQP	Horizontal	101	90	46.0	-7.6	Pass
#4	317.40	42.95	5.25	-11.51	36.69	MaxQP	Horizontal	100	243	46.0	-9.3	Pass
#5	402.89	45.61	5.54	-9.64	41.52	MaxQP	Horizontal	102	91	46.0	-4.5	Pass
#6	605.92	40.09	6.25	-6.31	40.03	MaxQP	Horizontal	152	236	46.0	-6.0	Pass
#7	687.51	49.17	6.56	-5.04	50.69	NRB	Horizontal	119	251	--	-	Pass
#8	876.80	29.82	7.37	-2.81	34.39	MaxQP	Horizontal	157	181	46.0	-11.6	Pass
#9	928.22	56.29	7.51	-2.06	61.74	Fundamental	Horizontal	149	180	--	---	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB A to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.9. Omni / Laird Antenna (A09-F8NF/ FG9026) [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	57.00	48.54	4.13	-18.19	34.49	MaxQP	Vertical	116	209	40.0	-5.5	Pass
#2	87.87	46.37	4.29	-17.92	32.74	MaxQP	Vertical	103	266	40.0	-7.3	Pass
#3	199.38	40.10	4.77	-12.81	32.05	MaxQP	Horizontal	145	253	43.5	-11.5	Pass
#4	222.40	45.52	4.85	-14.20	36.17	MaxQP	Horizontal	145	0	46.0	-9.8	Pass
#5	320.51	49.31	5.24	-11.47	43.09	MaxQP	Horizontal	98	197	46.0	-2.9	Pass
#6	629.23	35.90	6.36	-5.66	36.60	MaxQP	Vertical	149	119	46.0	-9.4	Pass
#7	665.94	40.17	6.53	-5.33	41.36	MaxQP	Vertical	199	276	46.0	-4.6	Pass
#8	719.96	42.67	6.72	-4.54	44.84	MaxQP	Vertical	107	275	46.0	-1.2	Pass
#9	862.42	42.11	7.25	-2.84	46.51	NRB	Vertical	100	259	--	--	Pass
#10	903.00	56.04	7.42	-2.45	61.01	Fundamental	Vertical	149	59	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.91	48.35	4.13	-18.19	34.30	MaxQP	Vertical	101	209	40.0	-5.7	Pass
#2	90.21	47.44	4.24	-17.64	34.04	MaxQP	Vertical	98	268	43.5	-9.5	Pass
#3	199.46	39.93	4.76	-12.81	31.88	MaxQP	Horizontal	106	252	43.5	-11.6	Pass
#4	273.08	42.25	5.06	-11.96	35.35	MaxQP	Horizontal	102	203	46.0	-10.6	Pass
#5	322.83	48.93	5.27	-11.41	42.79	MaxQP	Horizontal	101	188	46.0	-3.2	Pass
#6	622.16	40.71	6.31	-5.92	41.11	MaxQP	Vertical	146	287	46.0	-4.9	Pass
#7	668.19	42.53	6.54	-5.36	43.71	MaxQP	Vertical	198	267	46.0	-2.3	Pass
#8	720.01	43.96	6.72	-4.54	46.13	NRB	Vertical	107	259	--	--	Pass
#9	869.60	37.19	7.30	-2.74	41.75	MaxQP	Vertical	124	121	46.0	-4.2	Pass
#10	915.61	51.82	7.46	-2.30	56.98	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.96	35.60	4.13	-18.19	21.54	MaxQP	Vertical	143	185	40.0	-18.5	Pass
#2	90.16	47.20	4.24	-17.65	33.78	MaxQP	Vertical	101	269	43.5	-9.7	Pass
#3	199.35	40.39	4.77	-12.82	32.34	MaxQP	Horizontal	100	271	43.5	-11.2	Pass
#4	223.30	40.91	4.86	-14.17	31.59	MaxQP	Horizontal	121	243	46.0	-14.4	Pass
#5	313.06	46.94	5.22	-11.61	40.55	MaxQP	Horizontal	102	203	46.0	-5.4	Pass
#6	398.40	37.47	5.50	-9.78	33.19	MaxQP	Vertical	107	0	46.0	-12.8	Pass
#7	617.21	41.09	6.29	-5.95	41.43	MaxQP	Vertical	128	209	46.0	-4.6	Pass
#8	629.39	41.77	6.36	-5.65	42.48	MaxQP	Vertical	98	251	46.0	-3.5	Pass
#9	671.14	39.65	6.51	-5.39	40.77	MaxQP	Vertical	196	274	46.0	-5.2	Pass
#10	847.59	24.64	7.26	-3.02	28.88	MaxQP	Vertical	98	161	46.0	-17.1	Pass
#11	928.22	60.02	7.51	-2.06	65.47	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.10. Omni / Laird Antenna (A09-F8NF/ FG9026) [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Omni FG9026	Variant:	FSK-10k-XR
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.97	47.95	4.13	-18.19	33.89	MaxQP	Vertical	123	27	40.0	-6.1	Pass
#2	87.78	46.17	4.29	-17.92	32.54	MaxQP	Vertical	111	138	40.0	-7.5	Pass
#3	223.05	43.51	4.86	-14.18	34.19	MaxQP	Horizontal	139	220	46.0	-11.8	Pass
#4	327.14	48.02	5.27	-11.38	41.91	MaxQP	Horizontal	102	183	46.0	-4.1	Pass
#5	629.99	36.74	6.35	-5.62	37.47	MaxQP	Horizontal	124	211	46.0	-8.5	Pass
#6	662.52	47.56	6.47	-5.27	48.76	NRB	Horizontal	114	173	--	--	Pass
#7	711.61	36.96	6.68	-4.66	38.98	MaxQP	Vertical	115	274	46.0	-7.0	Pass
#8	822.49	38.76	7.11	-3.28	42.59	MaxQP	Vertical	101	258	46.0	-3.4	Pass
#9	862.49	43.13	7.25	-2.84	47.54	NRB	Vertical	132	241	--	--	Pass
#10	903.00	55.31	7.42	-2.45	60.27	Fundamental	Vertical	149	59	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Omni FG9026	Variant:	FSK-10k-XR
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	57.01	48.13	4.13	-18.18	34.07	MaxQP	Vertical	101	198	40.0	-5.9	Pass
#2	90.24	47.21	4.24	-17.64	33.81	MaxQP	Vertical	99	275	43.5	-9.7	Pass
#3	315.91	48.27	5.24	-11.55	41.96	MaxQP	Horizontal	100	202	46.0	-4.0	Pass
#4	555.00	42.16	6.05	-6.89	41.32	MaxQP	Vertical	163	297	46.0	-4.7	Pass
#5	624.61	38.17	6.33	-5.86	38.64	MaxQP	Vertical	101	182	46.0	-7.4	Pass
#6	670.04	44.58	6.51	-5.40	45.69	MaxQP	Vertical	198	271	46.0	-0.3	Pass
#7	720.02	38.41	6.72	-4.54	40.58	MaxQP	Vertical	107	11	46.0	-5.4	Pass
#8	875.02	38.44	7.34	-2.78	43.00	MaxQP	Vertical	131	122	46.0	-3.0	Pass
#9	915.61	50.84	7.46	-2.30	56.00	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Omni FG9026	Variant:	FSK-10k-XR
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.86	49.04	4.13	-18.19	34.98	MaxQP	Vertical	105	199	40.0	-5.0	Pass
#2	87.77	45.85	4.29	-17.92	32.22	MaxQP	Vertical	113	279	40.0	-7.8	Pass
#3	222.98	40.20	4.86	-14.18	30.87	MaxQP	Horizontal	130	3	46.0	-15.1	Pass
#4	313.42	47.04	5.22	-11.59	40.66	MaxQP	Horizontal	100	193	46.0	-5.3	Pass
#5	567.52	41.16	6.10	-6.68	40.59	MaxQP	Vertical	101	180	46.0	-5.4	Pass
#6	620.31	42.93	6.30	-5.96	43.27	MaxQP	Vertical	151	21	46.0	-2.7	Pass
#7	673.42	40.58	6.56	-5.35	41.80	MaxQP	Horizontal	198	223	46.0	-4.2	Pass
#8	725.73	36.90	6.77	-4.52	39.15	MaxQP	Vertical	105	270	46.0	-6.8	Pass
#9	879.99	35.16	7.36	-2.78	39.73	MaxQP	Vertical	132	177	46.0	-6.3	Pass
#10	928.22	59.69	7.51	-2.06	65.14	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.11. Yagi / Laird-TE Connectivity Antenna (PC9013N) [HPX]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.91	51.30	4.13	-18.19	37.24	MaxQP	Vertical	100	156	40.0	-2.8	Pass
#2	213.21	45.00	4.84	-14.37	35.47	MaxQP	Horizontal	143	130	43.5	-8.0	Pass
#3	647.36	53.28	6.41	-5.13	54.56	NRB	Horizontal	109	104	--	--	Pass
#4	696.34	43.56	6.60	-4.83	45.34	MaxQP	Horizontal	98	115	46.0	-0.7	Pass
#5	799.97	44.33	7.04	-3.76	47.61	NRB	Horizontal	111	271	--	--	Pass
#6	862.38	46.72	7.25	-2.84	51.12	NRB	Horizontal	117	271	--	--	Pass
#7	903.00	66.25	7.42	-2.45	71.22	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.83	50.92	4.13	-18.19	36.86	MaxQP	Vertical	100	86	40.0	-3.1	Pass
#2	215.65	46.95	4.83	-14.33	37.45	MaxQP	Horizontal	99	132	43.5	-6.1	Pass
#3	644.93	45.11	6.41	-5.21	46.31	NRB	Horizontal	114	94	--	--	Pass
#4	749.61	41.39	6.80	-4.15	44.04	MaxQP	Horizontal	100	101	46.0	-2.0	Pass
#5	810.03	39.23	7.07	-3.49	42.81	MaxQP	Horizontal	124	262	46.0	-3.2	Pass
#6	834.81	43.26	7.19	-3.13	47.33	NRB	Horizontal	100	274	--	--	Pass
#7	878.44	40.09	7.39	-2.78	44.70	MaxQP	Horizontal	126	271	46.0	-1.3	Pass
#8	915.61	59.91	7.46	-2.30	65.07	Fundamental	Horizontal	100	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.88	51.20	4.13	-18.19	37.15	MaxQP	Vertical	100	119	40.0	-2.9	Pass
#2	215.64	46.82	4.83	-14.33	37.32	MaxQP	Horizontal	130	131	43.5	-6.2	Pass
#3	652.25	43.09	6.47	-5.12	44.44	MaxQP	Horizontal	100	114	46.0	-1.6	Pass
#4	678.22	43.26	6.53	-5.26	44.53	MaxQP	Horizontal	98	115	46.0	-1.5	Pass
#5	800.05	43.34	7.04	-3.76	46.62	NRB	Horizontal	123	265	--	--	Pass
#6	834.60	38.35	7.19	-3.13	42.41	MaxQP	Horizontal	107	265	46.0	-3.6	Pass
#7	870.09	39.32	7.30	-2.74	43.88	MaxQP	Horizontal	102	267	46.0	-2.1	Pass
#8	928.22	69.71	7.51	-2.06	75.16	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.1.12. Yagi / Laird-TE Connectivity Antenna (PC9013N) [XR]

Equipment Configuration for 30 MHz TO 1 GHz [Low]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.91	50.88	4.13	-18.19	36.82	MaxQP	Vertical	100	85	40.0	-3.2	Pass
#2	255.92	52.64	5.00	-13.62	44.02	MaxQP	Horizontal	101	128	46.0	-2.0	Pass
#3	646.57	54.70	6.42	-5.15	55.98	NRB	Horizontal	109	100	--	--	Pass
#4	662.49	48.76	6.47	-5.27	49.96	NRB	Horizontal	104	111	--	--	Pass
#5	662.50	48.68	6.47	-5.27	49.88	NRB	Horizontal	105	117	--	--	Pass
#6	695.05	43.31	6.63	-4.83	45.10	MaxQP	Horizontal	99	116	46.0	-0.9	Pass
#7	800.00	44.25	7.04	-3.76	47.53	NRB	Horizontal	100	270	--	--	Pass
#8	822.49	42.18	7.11	-3.28	46.01	NRB	Horizontal	100	260	--	--	Pass
#9	834.02	39.26	7.19	-3.15	43.30	MaxQP	Horizontal	100	271	46.0	-2.7	Pass
#10	840.54	37.56	7.25	-3.05	41.75	MaxQP	Horizontal	130	258	46.0	-4.2	Pass
#11	862.50	49.55	7.25	-2.84	53.96	NRB	Horizontal	100	273	--	--	Pass
#12	903.00	66.42	7.42	-2.45	71.38	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [Mid]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.93	50.32	4.13	-18.19	36.26	MaxQP	Vertical	98	103	40.0	-3.7	Pass
#2	348.83	44.11	5.35	-10.90	38.56	MaxQP	Horizontal	102	73	46.0	-7.4	Pass
#3	647.94	44.83	6.41	-5.12	46.12	NRB	Horizontal	100	96	--	--	Pass
#4	670.02	44.13	6.51	-5.40	45.24	MaxQP	Horizontal	100	115	46.0	-0.8	Pass
#5	670.20	44.77	6.51	-5.40	45.88	MaxP	Horizontal	98	90	46.0	-0.1	Pass
#6	694.15	40.79	6.61	-4.86	42.54	MaxQP	Horizontal	103	108	46.0	-3.5	Pass
#7	800.00	45.03	7.04	-3.76	48.32	NRB	Horizontal	101	266	--	--	Pass
#8	837.80	38.81	7.20	-3.08	42.93	MaxQP	Horizontal	98	269	46.0	-3.1	Pass
#9	878.03	40.08	7.39	-2.78	44.69	MaxQP	Horizontal	116	273	46.0	-1.3	Pass
#10	915.61	60.90	7.46	-2.30	66.06	Fundamental	Horizontal	98	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for 30 MHz TO 1 GHz [High]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	56.93	50.02	4.13	-18.19	35.97	MaxQP	Vertical	105	88	40.0	-4.0	Pass
#2	215.97	46.51	4.83	-14.32	37.01	MaxQP	Horizontal	100	139	43.5	-6.5	Pass
#3	617.40	40.46	6.29	-5.95	40.79	MaxQP	Horizontal	114	115	46.0	-5.2	Pass
#4	672.81	41.50	6.55	-5.35	42.70	MaxQP	Horizontal	104	97	46.0	-3.3	Pass
#5	801.60	40.61	7.07	-3.71	43.97	MaxQP	Horizontal	113	262	46.0	-2.0	Pass
#6	836.42	38.96	7.20	-3.09	43.07	MaxQP	Horizontal	100	271	46.0	-2.9	Pass
#7	877.54	40.48	7.38	-2.79	45.07	MaxQP	Horizontal	100	272	46.0	-0.9	Pass
#8	928.22	69.25	7.51	-2.06	74.70	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2 TX Spurious & Restricted Band Emissions (1 GHz-18 GHz)

9.4.2.2.1 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	52.79	2.27	-16.34	38.72	MaxP	Vertical	199	209	74.0	-35.3	Pass
#2	1799.00	73.07	2.65	-14.67	61.05	MaxP	Horizontal	150	210	74.0	-12.9	Pass
#3	1799.00	53.59	2.65	-14.67	41.57	AVG	Horizontal	150	210	54.0	-12.4	Pass
#4	2700.00	59.70	3.22	-11.74	51.17	MaxP	Horizontal	199	240	74.0	-22.8	Pass
#5	2700.00	43.45	3.22	-11.74	34.93	AVG	Horizontal	199	240	54.0	-19.1	Pass
#6	8021.00	51.02	4.78	-7.83	47.97	MaxP	Vertical	199	59	74.0	-26.0	Pass
#7	12713.00	54.29	6.14	-7.84	52.59	MaxP	Vertical	151	0	74.0	-21.4	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1255.00	52.48	2.28	-16.16	38.60	MaxP	Horizontal	199	60	74.0	-35.4	Pass
#2	1816.00	71.89	2.66	-14.49	60.06	MaxP	Vertical	149	59	74.0	-13.9	Pass
#3	1816.00	52.41	2.66	-14.49	40.57	AVG	Vertical	149	59	54.0	-13.4	Pass
#4	2734.00	60.90	3.24	-11.54	52.59	MaxP	Horizontal	149	240	74.0	-21.4	Pass
#5	2734.00	43.92	3.24	-11.54	35.61	AVG	Horizontal	149	240	54.0	-18.4	Pass
#6	8038.00	51.98	4.97	-7.83	49.13	MaxP	Vertical	199	0	74.0	-24.9	Pass
#7	16861.00	49.20	7.01	0.18	56.39	MaxP	Horizontal	199	90	74.0	-17.6	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Mid Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.82	2.28	-16.58	38.52	MaxP	Vertical	149	269	74.0	-35.5	Pass
#2	1850.00	69.41	2.66	-14.40	57.67	MaxP	Horizontal	149	90	74.0	-16.3	Pass
#3	1850.00	50.38	2.66	-14.40	38.64	AVG	Horizontal	149	90	54.0	-15.4	Pass
#4	2768.00	60.91	3.21	-11.48	52.64	MaxP	Horizontal	149	240	74.0	-21.4	Pass
#5	2768.00	43.64	3.21	-11.48	35.37	AVG	Horizontal	149	240	54.0	-18.6	Pass
#6	4604.00	54.52	3.73	-12.01	46.24	MaxP	Vertical	199	89	74.0	-27.8	Pass
#7	16215.00	49.23	6.71	-0.95	54.99	MaxP	Vertical	149	59	74.0	-19.0	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.2 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) [XR]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	51.91	2.27	-16.34	37.83	MaxP	Horizontal	148	120	74.0	-36.2	Pass
#2	1799.00	72.38	2.65	-14.67	60.36	MaxP	Horizontal	148	210	74.0	-13.6	Pass
#3	1799.00	52.63	2.65	-14.67	40.61	AVG	Horizontal	148	210	54.0	-13.4	Pass
#4	2700.00	55.92	3.22	-11.74	47.40	MaxP	Horizontal	199	240	74.0	-26.6	Pass
#5	2700.00	41.22	3.22	-11.74	32.70	AVG	Vertical	148	29	54.0	-21.3	Pass
#6	5403.00	52.50	4.29	-11.35	45.44	MaxP	Vertical	199	179	74.0	-28.6	Pass
#7	15076.00	50.45	6.61	-3.48	53.57	MaxP	Vertical	199	89	74.0	-20.4	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.16	2.28	-16.58	37.86	MaxP	Vertical	148	209	74.0	-36.1	Pass
#2	1816.00	70.09	2.66	-14.49	58.25	MaxP	Vertical	148	59	74.0	-15.7	Pass
#3	1816.00	50.70	2.66	-14.49	38.86	AVG	Vertical	148	59	54.0	-15.1	Pass
#4	2734.00	57.47	3.24	-11.54	49.16	MaxP	Horizontal	199	270	74.0	-24.8	Pass
#5	2734.00	41.60	3.24	-11.54	33.29	AVG	Vertical	148	29	54.0	-20.7	Pass
#6	8922.00	51.36	5.25	-7.48	49.12	MaxP	Vertical	148	89	74.0	-24.9	Pass
#7	16623.00	48.20	6.73	0.24	55.16	MaxP	Vertical	148	119	74.0	-18.8	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Mid Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Dipole A09-HASM-675	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2.1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	51.61	2.28	-16.58	37.31	MaxP	Horizontal	148	210	74.0	-36.7	Pass
#2	1850.00	67.99	2.66	-14.40	56.26	MaxP	Horizontal	148	210	74.0	-17.7	Pass
#3	1850.00	49.17	2.66	-14.40	37.43	AVG	Horizontal	148	210	54.0	-16.6	Pass
#4	2768.00	58.37	3.21	-11.48	50.10	MaxP	Horizontal	148	270	74.0	-23.9	Pass
#5	2768.00	42.41	3.21	-11.48	34.14	AVG	Horizontal	148	270	54.0	-19.9	Pass
#6	8718.00	50.53	5.50	-8.33	47.70	MaxP	Vertical	148	119	74.0	-26.3	Pass
#7	15824.00	48.81	6.73	-1.26	54.29	MaxP	Vertical	148	270	74.0	-19.7	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 High Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.3 Dome /Laird Antenna (A09-D3NF /TRA8903) [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	51.21	2.27	-16.34	37.13	MaxP	Horizontal	199	240	74.0	-36.9	Pass
#2	1799.00	78.49	2.65	-14.67	66.47	MaxP	Vertical	199	89	74.0	-7.5	Pass
#3	1799.00	58.21	2.65	-14.67	46.19	AVG	Vertical	199	89	54.0	-7.8	Pass
#4	2700.00	54.67	3.22	-11.74	46.15	MaxP	Horizontal	199	300	74.0	-27.9	Pass
#5	2700.00	40.76	3.22	-11.74	32.24	AVG	Vertical	199	269	54.0	-21.8	Pass
#6	5845.00	51.68	4.27	-10.07	45.88	MaxP	Horizontal	148	300	74.0	-28.1	Pass
#7	11965.00	50.89	5.81	-5.64	51.07	MaxP	Vertical	148	119	74.0	-22.9	Pass
#8	17932.00	47.77	8.07	1.02	56.86	MaxP	Horizontal	148	210	74.0	-17.1	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.02	2.28	-16.58	37.72	MaxP	Vertical	151	0	74.0	-36.3	Pass
#2	1816.00	76.17	2.66	-14.49	64.33	MaxP	Vertical	199	269	74.0	-9.7	Pass
#3	1816.00	56.31	2.66	-14.49	44.47	AVG	Vertical	199	269	54.0	-9.5	Pass
#4	2734.00	56.64	3.24	-11.54	48.33	MaxP	Vertical	199	239	74.0	-25.7	Pass
#5	2734.00	42.43	3.24	-11.54	34.12	AVG	Vertical	199	239	54.0	-19.9	Pass
#6	6032.00	51.73	4.28	-9.67	46.33	MaxP	Horizontal	199	150	74.0	-27.7	Pass
#7	12526.00	51.82	6.20	-6.56	51.45	MaxP	Vertical	150	59	74.0	-22.5	Pass
#8	17626.00	49.27	7.48	-0.37	56.38	MaxP	Horizontal	150	150	74.0	-17.6	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-HP
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	52.63	2.26	-16.72	38.17	MaxP	Vertical	150	270	74.0	-35.8	Pass
#2	1850.00	71.61	2.66	-14.40	59.87	MaxP	Vertical	199	270	74.0	-14.1	Pass
#3	1850.00	52.08	2.66	-14.40	40.34	AVG	Vertical	199	270	54.0	-13.7	Pass
#4	2768.00	57.35	3.21	-11.48	49.08	MaxP	Horizontal	150	60	74.0	-24.9	Pass
#5	2768.00	41.35	3.21	-11.48	33.08	AVG	Horizontal	199	300	54.0	-20.9	Pass
#6	5352.00	51.42	4.20	-11.27	44.35	MaxP	Vertical	199	0	74.0	-29.7	Pass
#7	13971.00	54.03	6.58	-7.49	53.13	MaxP	Vertical	150	239	74.0	-20.9	Pass
#8	17592.00	50.40	7.37	-0.38	57.40	MaxP	Vertical	150	29	74.0	-16.6	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.4 Dome /Laird Antenna (A09-D3NF /TRA8903) [XR]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	51.49	2.27	-16.34	37.42	MaxP	Vertical	149	89	74.0	-36.6	Pass
#2	1799.00	78.42	2.65	-14.67	66.40	MaxP	Vertical	199	89	74.0	-7.6	Pass
#3	1799.00	58.17	2.65	-14.67	46.15	AVG	Vertical	199	89	54.0	-7.9	Pass
#4	2700.00	54.41	3.22	-11.74	45.89	MaxP	Horizontal	149	270	74.0	-28.1	Pass
#5	2700.00	40.69	3.22	-11.74	32.17	AVG	Vertical	199	270	54.0	-21.8	Pass
#6	4655.00	53.00	3.80	-12.15	44.65	MaxP	Horizontal	199	30	74.0	-29.3	Pass
#7	16385.00	48.99	6.89	-0.61	55.26	MaxP	Vertical	149	149	74.0	-18.7	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	52.18	2.27	-16.34	38.10	MaxP	Horizontal	148	30	74.0	-35.9	Pass
#2	1816.00	75.87	2.66	-14.49	64.04	MaxP	Vertical	199	269	74.0	-10.0	Pass
#3	1816.00	55.82	2.66	-14.49	43.99	AVG	Vertical	199	269	54.0	-10.0	Pass
#4	2734.00	57.48	3.24	-11.54	49.17	MaxP	Horizontal	199	270	74.0	-24.8	Pass
#5	2734.00	42.19	3.24	-11.54	33.89	AVG	Vertical	199	269	54.0	-20.1	Pass
#6	10367.00	49.05	5.63	-4.88	49.80	MaxP	Vertical	199	89	74.0	-24.2	Pass
#7	17881.00	47.11	8.07	1.46	56.64	MaxP	Vertical	148	89	74.0	-17.4	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Dome Laird TRA8903	Variant:	FSK-10k-XR
Antenna Gain (dBi):	3	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1255.00	52.28	2.28	-16.16	38.40	MaxP	Vertical	148	59	74.0	-35.6	Pass
#2	1850.00	71.53	2.66	-14.40	59.79	MaxP	Vertical	199	270	74.0	-14.2	Pass
#3	1850.00	51.80	2.66	-14.40	40.06	AVG	Vertical	148	89	54.0	-13.9	Pass
#4	2768.00	59.82	3.21	-11.48	51.55	MaxP	Vertical	199	270	74.0	-22.4	Pass
#5	2768.00	43.12	3.21	-11.48	34.85	AVG	Vertical	199	270	54.0	-19.2	Pass
#6	11965.00	50.86	5.81	-5.64	51.03	MaxP	Horizontal	148	60	74.0	-23.0	Pass
#7	17575.00	49.70	7.50	-0.45	56.74	MaxP	Vertical	148	29	74.0	-17.3	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.5 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.20	2.28	-16.58	37.89	MaxP	Vertical	148	89	74.0	-36.1	Pass
#2	1799.00	68.31	2.65	-14.67	56.29	MaxP	Horizontal	148	210	74.0	-17.7	Pass
#3	1799.00	49.61	2.65	-14.67	37.59	AVG	Horizontal	148	240	54.0	-16.4	Pass
#4	2700.00	59.45	3.22	-11.74	50.93	MaxP	Horizontal	148	240	74.0	-23.1	Pass
#5	2700.00	43.58	3.22	-11.74	35.05	AVG	Horizontal	148	240	54.0	-18.9	Pass
#6	9024.00	52.15	5.25	-7.33	50.08	MaxP	Horizontal	148	300	74.0	-23.9	Pass
#7	16861.00	48.33	7.01	0.18	55.52	MaxP	Vertical	199	0	74.0	-18.5	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	52.70	2.27	-16.34	38.62	MaxP	Horizontal	148	90	74.0	-35.4	Pass
#2	1816.00	64.93	2.66	-14.49	53.10	MaxP	Horizontal	199	210	74.0	-20.9	Pass
#3	1816.00	46.82	2.66	-14.49	34.98	AVG	Horizontal	199	210	54.0	-19.0	Pass
#4	2734.00	59.42	3.24	-11.54	51.11	MaxP	Horizontal	148	240	74.0	-22.9	Pass
#5	2734.00	43.27	3.24	-11.54	34.96	AVG	Horizontal	199	240	54.0	-19.0	Pass
#6	4281.00	53.02	3.66	-12.19	44.49	MaxP	Vertical	148	299	74.0	-29.5	Pass
#7	9143.00	51.86	5.14	-7.06	49.95	MaxP	Vertical	148	0	74.0	-24.1	Pass
#8	17099.00	49.46	7.09	0.01	56.56	MaxP	Vertical	199	89	74.0	-17.4	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Mid Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-HP
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.04	2.28	-16.58	37.73	MaxP	Horizontal	148	210	74.0	-36.3	Pass
#2	1850.00	64.06	2.66	-14.40	52.32	MaxP	Horizontal	148	240	74.0	-21.7	Pass
#3	1850.00	45.83	2.66	-14.40	34.09	AVG	Horizontal	148	240	54.0	-19.9	Pass
#4	2768.00	55.47	3.21	-11.48	47.19	MaxP	Horizontal	148	240	74.0	-26.8	Pass
#5	2768.00	41.14	3.21	-11.48	32.87	AVG	Horizontal	148	240	54.0	-21.1	Pass
#6	11846.00	51.63	6.13	-5.68	52.08	MaxP	Vertical	148	209	74.0	-21.9	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.6 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR]

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ [Low]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	52.49	2.26	-16.72	38.02	MaxP	Vertical	149	0	74.0	-36.0	Pass
#2	1799.00	68.91	2.65	-14.67	56.89	MaxP	Horizontal	149	240	74.0	-17.1	Pass
#3	1799.00	50.04	2.65	-14.67	38.02	AVG	Horizontal	149	240	54.0	-16.0	Pass
#4	2700.00	59.05	3.22	-11.74	50.53	MaxP	Horizontal	199	240	74.0	-23.5	Pass
#5	2700.00	43.74	3.22	-11.74	35.22	AVG	Horizontal	199	240	54.0	-18.8	Pass
#6	8582.00	51.29	5.16	-7.85	48.59	MaxP	Vertical	149	119	74.0	-25.4	Pass
#7	16113.00	49.22	6.60	-0.48	55.34	MaxP	Vertical	149	239	74.0	-18.7	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1085.00	50.86	2.19	-17.56	35.50	MaxP	Vertical	199	149	74.0	-38.5	Pass
#2	1816.00	65.45	2.66	-14.49	53.61	MaxP	Horizontal	151	210	74.0	-20.4	Pass
#3	1816.00	47.31	2.66	-14.49	35.48	AVG	Vertical	151	239	54.0	-18.5	Pass
#4	2734.00	59.45	3.24	-11.54	51.14	MaxP	Horizontal	199	240	74.0	-22.9	Pass
#5	2734.00	43.41	3.24	-11.54	35.11	AVG	Vertical	151	239	54.0	-18.9	Pass
#6	9126.00	51.41	5.21	-6.98	49.64	MaxP	Vertical	199	89	74.0	-24.4	Pass
#7	15042.00	52.11	6.66	-3.68	55.09	MaxP	Horizontal	199	90	74.0	-18.9	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Mid Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Flex Molex 211140-0100	Variant:	FSK-10k-XR
Antenna Gain (dBi):	1	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	51.95	2.28	-16.58	37.65	MaxP	Vertical	199	0	74.0	-36.4	Pass
#2	1850.00	63.42	2.66	-14.40	51.68	MaxP	Horizontal	148	210	74.0	-22.3	Pass
#3	1850.00	45.83	2.66	-14.40	34.10	AVG	Horizontal	148	240	54.0	-19.9	Pass
#4	2768.00	57.14	3.21	-11.48	48.87	MaxP	Vertical	199	89	74.0	-25.1	Pass
#5	2768.00	41.96	3.21	-11.48	33.69	AVG	Horizontal	148	240	54.0	-20.3	Pass
#6	9449.00	49.61	5.49	-6.34	48.77	MaxP	Vertical	148	89	74.0	-25.2	Pass
#7	15076.00	51.07	6.61	-3.48	54.19	MaxP	Vertical	199	330	74.0	-19.8	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 High Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.7 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	52.80	2.27	-16.34	38.73	MaxP	Vertical	199	149	74.0	-35.3	Pass
#2	1799.00	77.96	2.65	-14.67	65.94	MaxP	Horizontal	199	180	74.0	-8.1	Pass
#3	2700.00	57.35	3.22	-11.74	48.83	MaxP	Vertical	199	59	74.0	-25.2	Pass
#4	5386.00	54.03	4.21	-11.30	46.93	MaxP	Vertical	199	299	74.0	-27.1	Pass
#5	13546.00	53.73	6.02	-7.00	52.75	MaxP	Vertical	151	0	74.0	-21.3	Pass
#6	17099.00	49.67	7.09	0.01	56.76	MaxP	Horizontal	199	270	74.0	-17.2	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHz [Mid]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	51.98	2.26	-16.72	37.52	MaxP	Horizontal	199	240	74.0	-36.5	Pass
#2	1816.00	75.81	2.66	-14.49	63.98	MaxP	Horizontal	150	210	74.0	-10.0	Pass
#3	2734.00	55.09	3.24	-11.54	46.78	MaxP	Horizontal	199	240	74.0	-27.2	Pass
#4	9432.00	51.03	5.50	-6.50	50.04	MaxP	Vertical	199	299	74.0	-24.0	Pass
#5	13206.00	54.67	6.06	-7.45	53.29	MaxP	Horizontal	150	270	74.0	-20.7	Pass
#6	17915.00	49.57	7.75	1.20	58.53	MaxP	Vertical	199	270	74.0	-15.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-HP
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.20	2.28	-16.58	37.90	MaxP	Horizontal	150	270	74.0	-36.1	Pass
#2	1850.00	72.11	2.66	-14.40	60.37	MaxP	Horizontal	150	210	74.0	-13.6	Pass
#3	2768.00	55.03	3.21	-11.48	46.76	MaxP	Horizontal	150	270	74.0	-27.2	Pass
#4	8463.00	50.97	5.15	-7.87	48.25	MaxP	Vertical	150	330	74.0	-25.7	Pass
#5	11438.00	50.87	5.86	-5.29	51.44	MaxP	Vertical	199	89	74.0	-22.6	Pass
#6	15739.00	50.09	6.63	-1.26	55.46	MaxP	Vertical	150	29	74.0	-18.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.8 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	53.69	2.26	-16.72	39.23	MaxP	Horizontal	199	300	74.0	-34.8	Pass
#2	1799.00	79.35	2.65	-14.67	67.33	MaxP	Horizontal	199	180	74.0	-6.7	Pass
#3	2700.00	56.07	3.22	-11.74	47.55	MaxP	Horizontal	149	240	74.0	-26.5	Pass
#4	6695.00	50.68	4.34	-7.91	47.11	MaxP	Vertical	199	330	74.0	-26.9	Pass
#5	9024.00	52.45	5.25	-7.33	50.37	MaxP	Horizontal	149	300	74.0	-23.6	Pass
#6	15535.00	50.54	6.91	-1.90	55.55	MaxP	Vertical	149	149	74.0	-18.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1272.00	51.99	2.31	-16.17	38.13	MaxP	Vertical	151	209	74.0	-35.9	Pass
#2	1816.00	76.94	2.66	-14.49	65.10	MaxP	Horizontal	151	210	74.0	-8.9	Pass
#3	2734.00	56.02	3.24	-11.54	47.71	MaxP	Horizontal	199	30	74.0	-26.3	Pass
#4	9143.00	51.45	5.14	-7.06	49.54	MaxP	Vertical	151	270	74.0	-24.5	Pass
#5	12747.00	54.75	6.16	-8.04	52.87	MaxP	Horizontal	199	0	74.0	-21.1	Pass
#6	17677.00	50.19	7.43	0.14	57.77	MaxP	Vertical	199	330	74.0	-16.2	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Flex Taoglas FXUB65	Variant:	FSK-10k-XR
Antenna Gain (dBi):	2	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	51.93	2.27	-16.34	37.86	MaxP	Vertical	199	149	74.0	-36.1	Pass
#2	1850.00	72.79	2.66	-14.40	61.05	MaxP	Horizontal	150	210	74.0	-12.9	Pass
#3	2768.00	58.29	3.21	-11.48	50.02	MaxP	Horizontal	150	30	74.0	-24.0	Pass
#4	9483.00	50.63	5.32	-6.24	49.71	MaxP	Vertical	199	89	74.0	-24.3	Pass
#5	11064.00	50.59	6.12	-5.09	51.63	MaxP	Vertical	150	0	74.0	-22.4	Pass
#6	17898.00	48.76	7.94	1.36	58.06	MaxP	Vertical	199	239	74.0	-15.9	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.9 Omni / Laird Antenna (A09-F8NF/ FG9026) [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.46	2.28	-16.58	38.15	MaxP	Vertical	151	209	74.0	-35.8	Pass
#2	1799.00	83.30	2.65	-14.67	71.28	MaxP	Vertical	199	29	74.0	-2.7	Pass
#3	1799.00	62.72	2.65	-14.67	50.70	AVG	Vertical	199	29	54.0	-3.3	Pass
#4	2700.00	55.68	3.22	-11.74	47.16	MaxP	Vertical	151	330	74.0	-26.8	Pass
#5	2700.00	41.20	3.22	-11.74	32.68	AVG	Horizontal	151	330	54.0	-21.3	Pass
#6	9211.00	51.43	5.29	-7.15	49.57	MaxP	Vertical	199	270	74.0	-24.4	Pass
#7	17082.00	48.60	7.16	0.00	55.75	MaxP	Horizontal	151	120	74.0	-18.3	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1272.00	51.29	2.31	-16.17	37.43	MaxP	Vertical	148	270	74.0	-36.6	Pass
#2	1816.00	73.12	2.66	-14.49	61.29	MaxP	Vertical	199	59	74.0	-12.7	Pass
#3	1816.00	53.25	2.66	-14.49	41.42	AVG	Vertical	199	59	54.0	-12.6	Pass
#4	2734.00	57.15	3.24	-11.54	48.85	MaxP	Horizontal	148	330	74.0	-25.2	Pass
#5	2734.00	42.15	3.24	-11.54	33.84	AVG	Horizontal	148	330	54.0	-20.2	Pass
#6	10401.00	49.55	5.61	-4.76	50.41	MaxP	Vertical	199	239	74.0	-23.6	Pass
#7	14617.00	53.55	6.66	-5.44	54.77	MaxP	Vertical	148	179	74.0	-19.2	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	51.81	2.28	-16.58	37.50	MaxP	Vertical	199	299	74.0	-36.5	Pass
#2	1850.00	70.63	2.66	-14.40	58.89	MaxP	Vertical	199	59	74.0	-15.1	Pass
#3	1850.00	51.37	2.66	-14.40	39.63	AVG	Vertical	199	59	54.0	-14.4	Pass
#4	2768.00	56.99	3.21	-11.48	48.72	MaxP	Horizontal	199	330	74.0	-25.3	Pass
#5	2768.00	41.50	3.21	-11.48	33.23	AVG	Vertical	199	330	54.0	-20.8	Pass
#6	10843.00	50.43	6.12	-5.88	50.66	MaxP	Vertical	199	59	74.0	-23.3	Pass
#7	16861.00	48.17	7.01	0.18	55.36	MaxP	Vertical	148	0	74.0	-18.6	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.10 Omni / Laird Antenna (A09-F8NF/ FG9026) [XR]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1187.00	53.32	2.25	-16.95	38.62	MaxP	Vertical	199	149	74.0	-35.4	Pass
#2	1799.00	83.52	2.65	-14.67	71.50	MaxP	Vertical	199	29	74.0	-2.5	Pass
#3	1799.00	62.93	2.65	-14.67	50.91	AVG	Vertical	199	29	54.0	-3.1	Pass
#4	2700.00	56.20	3.22	-11.74	47.68	MaxP	Vertical	150	330	74.0	-26.3	Pass
#5	6865.00	51.02	4.36	-8.02	47.36	MaxP	Horizontal	199	210	74.0	-26.6	Pass
#6	13223.00	53.96	6.29	-7.36	52.89	MaxP	Horizontal	150	300	74.0	-21.1	Pass
#7	17592.00	50.94	7.37	-0.38	57.93	MaxP	Vertical	150	59	74.0	-16.1	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.31	2.28	-16.58	38.01	MaxP	Vertical	199	90	74.0	-36.0	Pass
#2	1816.00	73.21	2.66	-14.49	61.38	MaxP	Vertical	199	59	74.0	-12.6	Pass
#3	1816.00	53.46	2.66	-14.49	41.62	AVG	Vertical	199	59	54.0	-12.4	Pass
#4	2734.00	58.55	3.24	-11.54	50.25	MaxP	Vertical	151	330	74.0	-23.8	Pass
#5	2734.00	42.81	3.24	-11.54	34.51	AVG	Vertical	151	330	54.0	-19.5	Pass
#6	10622.00	50.29	5.77	-4.61	51.46	MaxP	Horizontal	199	180	74.0	-22.5	Pass
#7	17609.00	49.57	7.35	-0.27	56.65	MaxP	Horizontal	151	150	74.0	-17.3	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB A to USB C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Omni FG9026	Variant:	FSK-10k-HP
Antenna Gain (dBi):	8	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1238.00	52.99	2.27	-16.34	38.91	MaxP	Horizontal	151	90	74.0	-35.1	Pass
#2	1850.00	70.81	2.66	-14.40	59.07	MaxP	Vertical	199	59	74.0	-14.9	Pass
#3	1850.00	51.49	2.66	-14.40	39.75	AVG	Vertical	199	59	54.0	-14.3	Pass
#4	2768.00	58.65	3.21	-11.48	50.38	MaxP	Horizontal	199	330	74.0	-23.6	Pass
#5	2768.00	42.90	3.21	-11.48	34.62	AVG	Horizontal	199	330	54.0	-19.4	Pass
#6	12781.00	54.15	6.74	-8.26	52.63	MaxP	Vertical	151	210	74.0	-21.4	Pass
#7	16776.00	49.50	6.96	0.07	56.54	MaxP	Horizontal	151	240	74.0	-17.5	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.11 Yagi / Laird-TE Connectivity Antenna (PC9013N) [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.4	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	52.34	2.28	-16.58	38.04	MaxP	Vertical	199	299	74.0	-36.0	Pass
#2	1799.00	75.45	2.65	-14.67	63.43	MaxP	Horizontal	148	300	74.0	-10.6	Pass
#3	7171.00	50.18	4.52	-7.48	47.22	MaxP	Horizontal	148	180	74.0	-26.8	Pass
#4	12050.00	51.66	5.59	-5.57	51.69	MaxP	Vertical	199	0	74.0	-22.3	Pass
#5	16164.00	49.94	6.77	-0.93	55.78	MaxP	Horizontal	148	240	74.0	-18.2	Pass
#6	17864.00	48.05	7.77	1.31	57.14	MaxP	Vertical	148	29	74.0	-16.9	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	914.8	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1255.00	52.05	2.28	-16.16	38.17	MaxP	Horizontal	199	180	74.0	-35.8	Pass
#2	1595.00	55.32	2.49	-16.48	41.34	MaxP	Horizontal	199	300	74.0	-32.7	Pass
#3	1816.00	74.99	2.66	-14.49	63.15	MaxP	Horizontal	150	300	74.0	-10.9	Pass
#4	2734.00	60.26	3.24	-11.54	51.95	MaxP	Vertical	199	89	74.0	-22.1	Pass
#5	14226.00	54.39	6.62	-6.90	54.11	MaxP	Horizontal	150	270	74.0	-19.9	Pass
#6	16844.00	49.03	7.28	0.12	56.42	MaxP	Horizontal	199	210	74.0	-17.6	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [High]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-HP
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.6	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	52.14	2.26	-16.72	37.68	MaxP	Horizontal	148	300	74.0	-36.3	Pass
#2	1850.00	67.95	2.66	-14.40	56.21	MaxP	Horizontal	148	300	74.0	-17.8	Pass
#3	2768.00	52.58	3.21	-11.48	44.31	MaxP	Vertical	199	89	74.0	-29.7	Pass
#4	9109.00	49.89	5.41	-7.10	48.20	MaxP	Vertical	148	300	74.0	-25.8	Pass
#5	11965.00	51.09	5.81	-5.64	51.26	MaxP	Vertical	148	300	74.0	-22.7	Pass
#6	16827.00	48.67	7.13	0.02	55.82	MaxP	Vertical	199	330	74.0	-18.2	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

9.4.2.2.12 Yagi / Laird-TE Connectivity Antenna (PC9013N) [HPX]

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Low]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	902.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	52.34	2.26	-16.72	37.88	MaxP	Vertical	149	89	74.0	-36.1	Pass
#2	1799.00	76.63	2.65	-14.67	64.61	MaxP	Horizontal	149	300	74.0	-9.4	Pass
#3	2700.00	53.99	3.22	-11.74	45.46	MaxP	Vertical	199	89	74.0	-28.5	Pass
#4	5896.00	51.77	4.26	-9.89	46.14	MaxP	Vertical	149	209	74.0	-27.9	Pass
#5	11387.00	50.31	6.06	-5.71	50.66	MaxP	Vertical	199	269	74.0	-23.3	Pass
#6	17949.00	48.45	8.05	0.80	57.31	MaxP	Horizontal	149	180	74.0	-16.7	Pass

Test Notes: Yagi TE Connectivity PC9013N , XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz [Mid]

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	915	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1204.00	52.17	2.26	-16.72	37.71	MaxP	Vertical	150	0	74.0	-36.3	Pass
#2	1816.00	76.11	2.66	-14.49	64.28	MaxP	Horizontal	150	300	74.0	-9.7	Pass
#3	2734.00	61.08	3.24	-11.54	52.77	MaxP	Vertical	199	90	74.0	-21.2	Pass
#4	6321.00	51.38	4.22	-8.59	47.01	MaxP	Horizontal	199	30	74.0	-27.0	Pass
#5	11336.00	50.51	6.24	-5.70	51.05	MaxP	Vertical	199	270	74.0	-23.0	Pass
#6	16657.00	49.43	6.81	0.11	56.36	MaxP	Vertical	150	0	74.0	-17.6	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz

Antenna:	Yagi PC9013N	Variant:	FSK-10k-XR
Antenna Gain (dBi):	15	Modulation:	FSK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	100.0
Channel Frequency (MHz):	927.5	Data Rate:	10 kbps
Power Setting:	PL4	Tested By:	CC

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	1221.00	51.77	2.28	-16.58	37.46	MaxP	Vertical	151	239	74.0	-36.5	Pass
#2	1850.00	68.12	2.66	-14.40	56.38	MaxP	Horizontal	199	300	74.0	-17.6	Pass
#3	2768.00	54.59	3.21	-11.48	46.32	MaxP	Vertical	151	89	74.0	-27.7	Pass
#4	6270.00	50.98	4.26	-8.91	46.33	MaxP	Vertical	151	89	74.0	-27.7	Pass
#5	12781.00	54.21	6.74	-8.26	52.70	MaxP	Horizontal	199	240	74.0	-21.3	Pass
#6	16623.00	48.67	6.73	0.24	55.63	MaxP	Vertical	199	209	74.0	-18.4	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS;
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB;

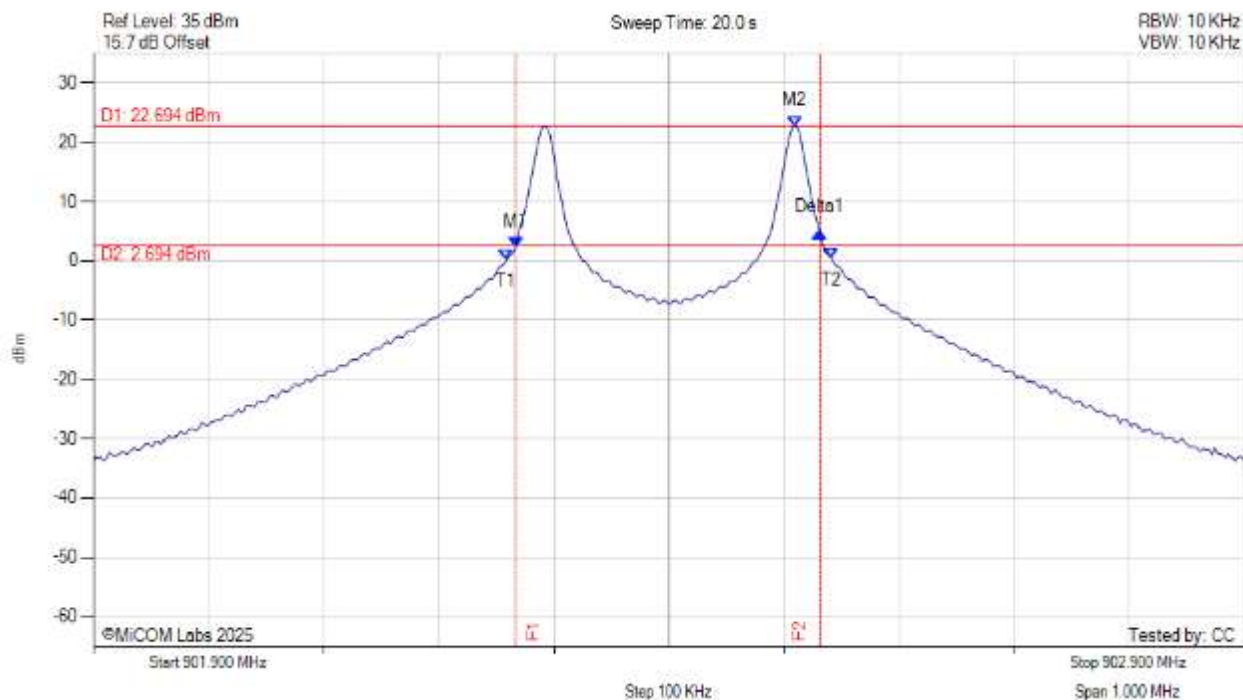
A. APPENDIX - GRAPHICAL IMAGES

A.1. 20 dB & 99% Bandwidth

20 dB 99% BANDWIDTH



Variant: FSK-10k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



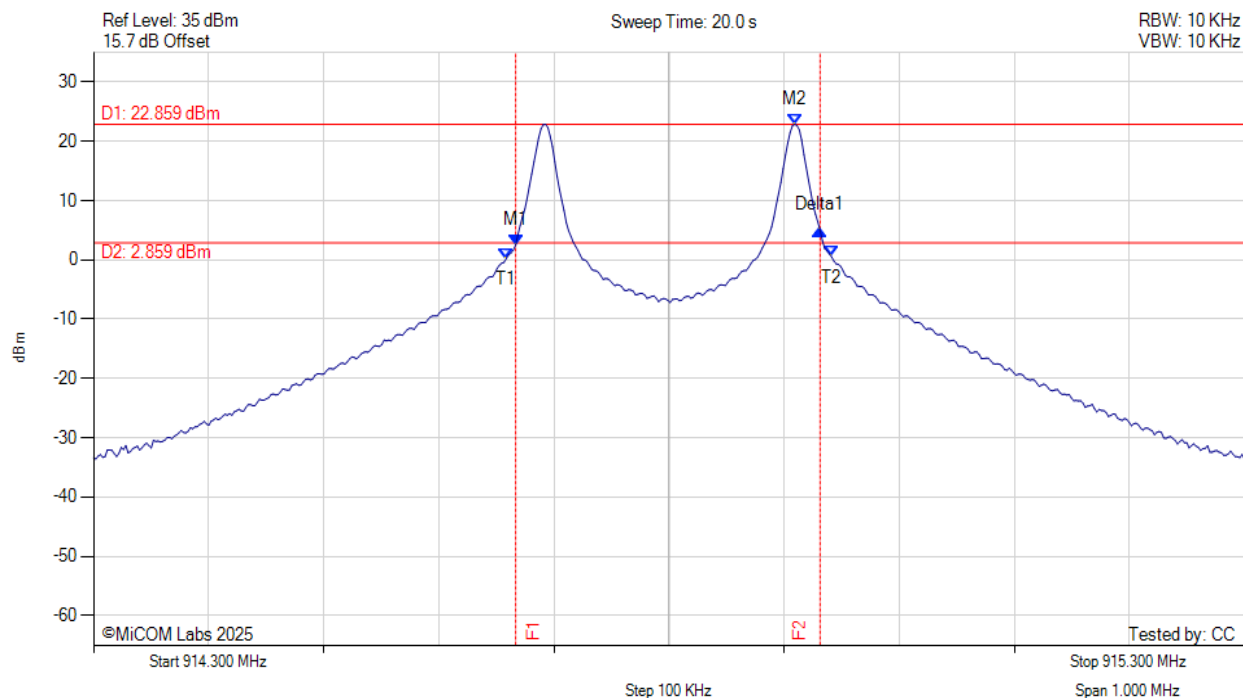
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.267 MHz : 2.310 dBm M2 : 902.509 MHz : 22.694 dBm Delta1 : 265 KHz : 2.516 dB T1 : 902.259 MHz : 0.089 dBm T2 : 902.541 MHz : 0.416 dBm OBW : 283 KHz	Channel Frequency: 902.40 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



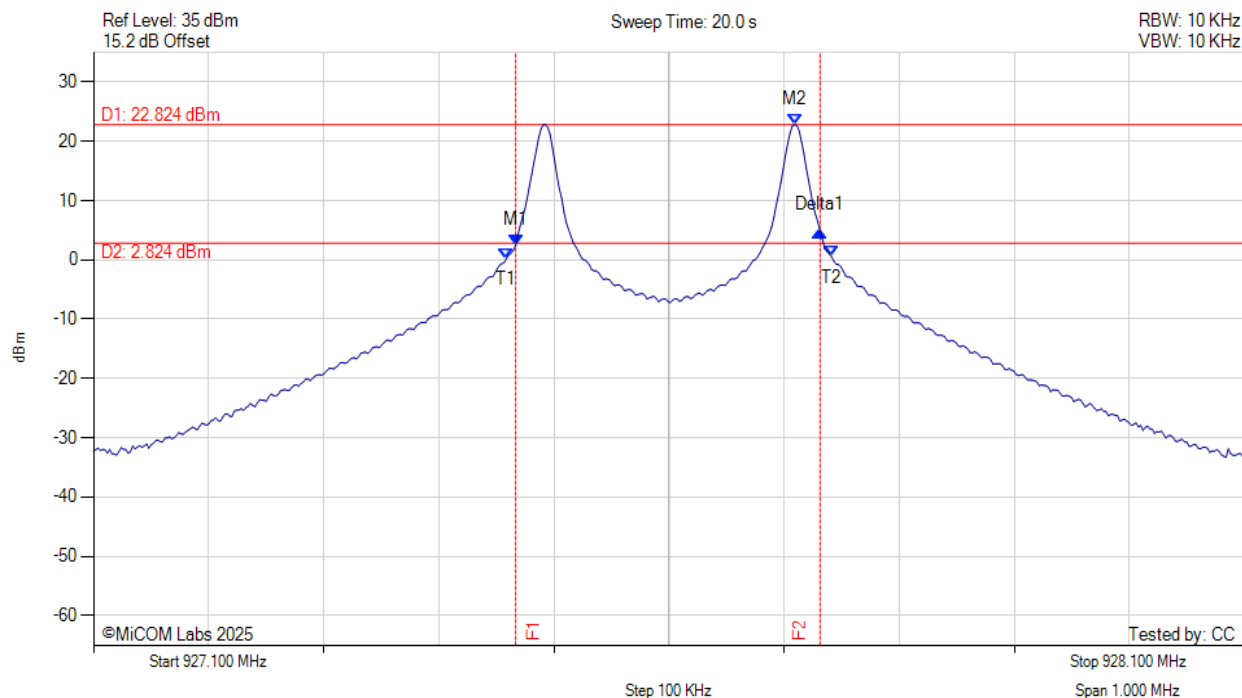
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.667 MHz : 2.507 dBm M2 : 914.909 MHz : 22.859 dBm Delta1 : 265 KHz : 2.467 dB T1 : 914.659 MHz : 0.270 dBm T2 : 914.941 MHz : 0.516 dBm OBW : 283 KHz	Channel Frequency: 914.80 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-10k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.467 MHz : 2.462 dBm M2 : 927.709 MHz : 22.824 dBm Delta1 : 265 KHz : 2.487 dB T1 : 927.459 MHz : 0.251 dBm T2 : 927.741 MHz : 0.524 dBm OBW : 283 KHz	Channel Frequency: 927.60 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-200k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.227 MHz : -0.361 dBm M2 : 902.307 MHz : 20.386 dBm Delta1 : 347 KHz : 1.794 dB T1 : 902.233 MHz : 2.415 dBm T2 : 902.569 MHz : 1.722 dBm OBW : 337 KHz	Channel Frequency: 902.40 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.627 MHz : -0.296 dBm M2 : 914.707 MHz : 20.532 dBm Delta1 : 347 KHz : 1.810 dB T1 : 914.633 MHz : 2.482 dBm T2 : 914.969 MHz : 1.830 dBm OBW : 337 KHz	Channel Frequency: 914.80 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-200k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



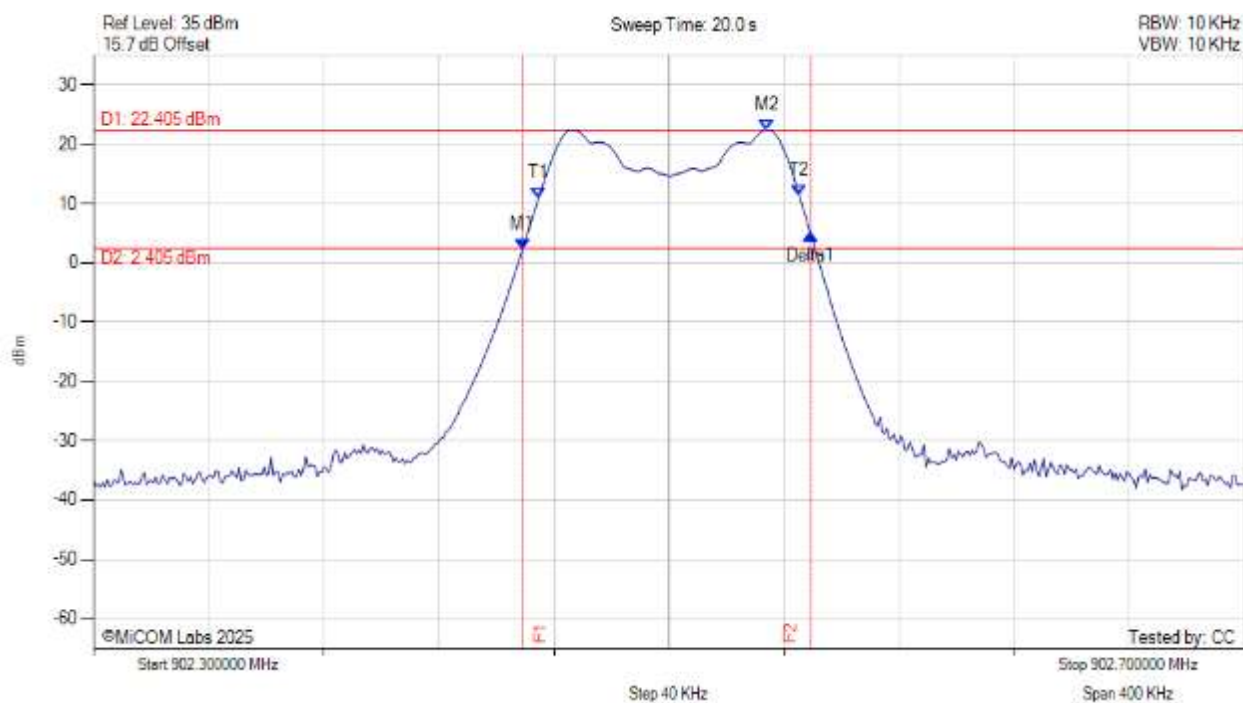
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.427 MHz : 0.064 dBm M2 : 927.507 MHz : 20.550 dBm Delta1 : 347 KHz : 1.694 dB T1 : 927.431 MHz : 1.992 dBm T2 : 927.771 MHz : 2.055 dBm OBW : 341 KHz	Channel Frequency: 927.60 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-10k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



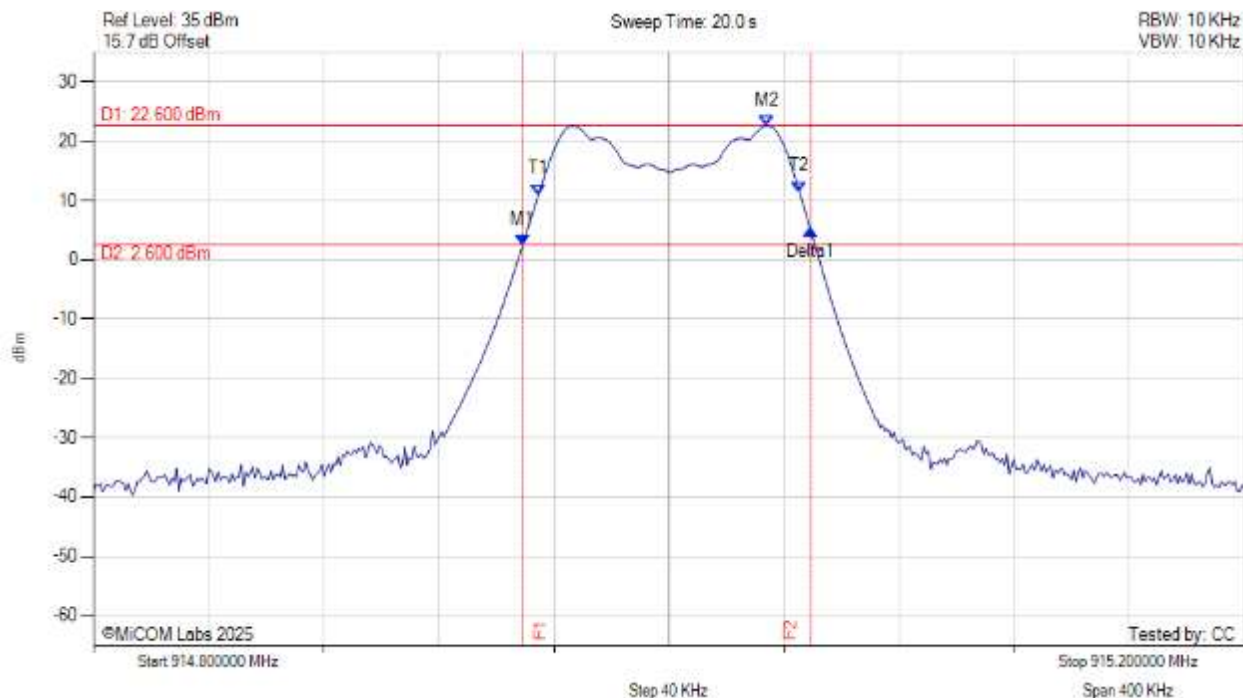
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.449 MHz : 2.263 dBm M2 : 902.534 MHz : 22.405 dBm Delta1 : 100 KHz : 2.516 dB T1 : 902.455 MHz : 10.949 dBm T2 : 902.545 MHz : 11.280 dBm OBW : 91 KHz	Channel Frequency: 902.50 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



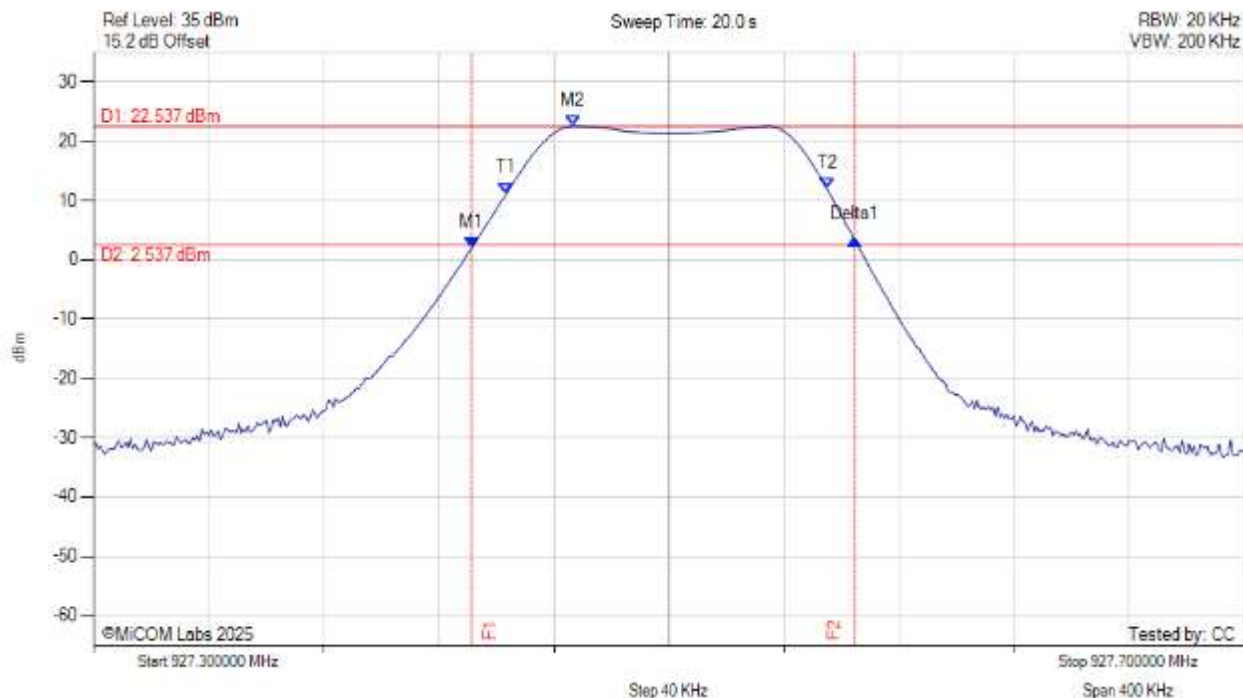
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.949 MHz : 2.448 dBm M2 : 915.034 MHz : 22.600 dBm Delta1 : 100 KHz : 2.544 dB T1 : 914.955 MHz : 11.026 dBm T2 : 915.045 MHz : 11.486 dBm OBW : 91 KHz	Channel Frequency: 915.00 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-10k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



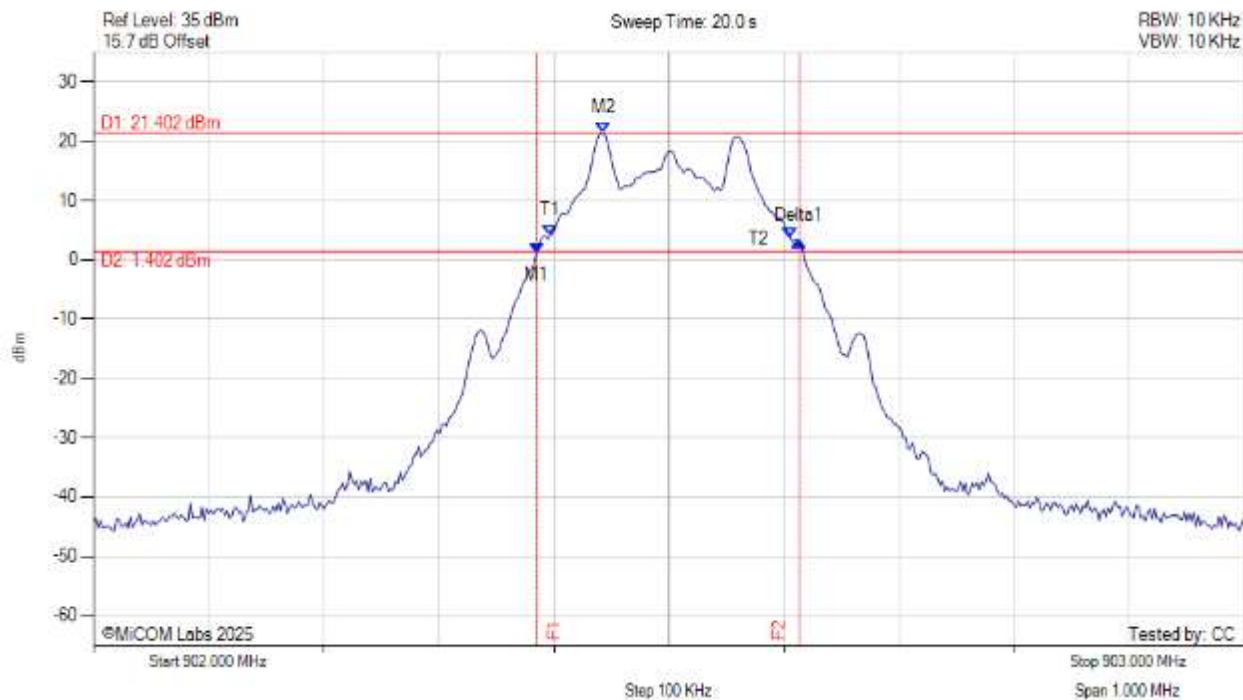
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.431 MHz : 1.986 dBm M2 : 927.467 MHz : 22.537 dBm Delta1 : 133 KHz : 1.393 dB T1 : 927.443 MHz : 11.236 dBm T2 : 927.555 MHz : 11.984 dBm OBW : 111 KHz	Channel Frequency: 927.50 MHz

[back to matrix](#)

20 dB 99% BANDWIDTH



Variant: FSK-110k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



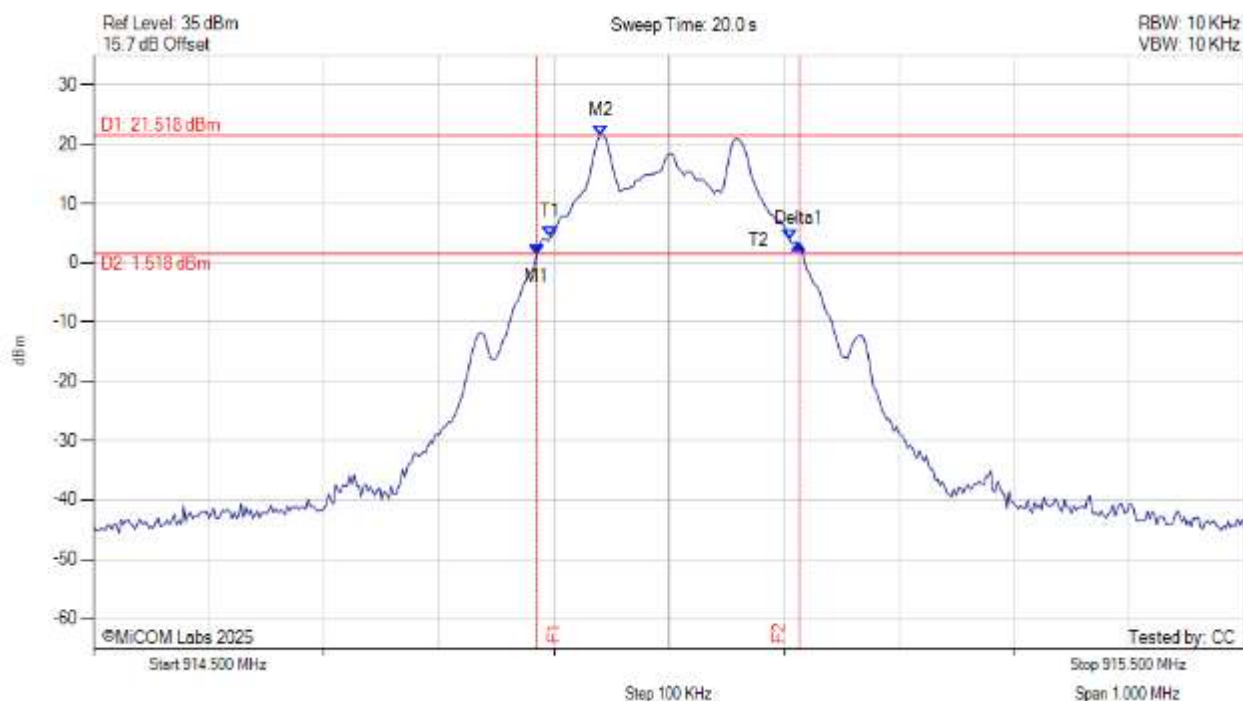
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.385 MHz : 1.099 dBm M2 : 902.443 MHz : 21.402 dBm Delta1 : 228 KHz : 2.013 dB T1 : 902.397 MHz : 4.219 dBm T2 : 902.605 MHz : 3.682 dBm OBW : 208 KHz	Channel Frequency: 902.50 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



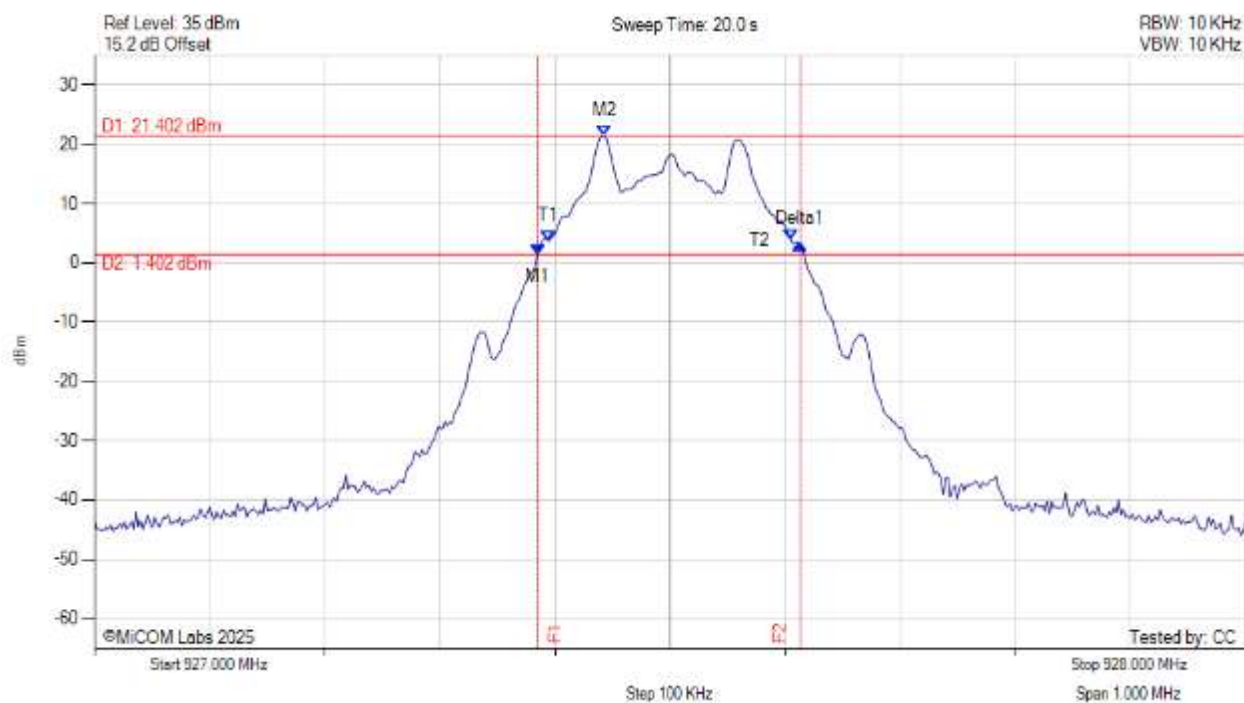
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.885 MHz : 1.222 dBm M2 : 914.941 MHz : 21.518 dBm Delta1 : 228 KHz : 1.975 dB T1 : 914.897 MHz : 4.329 dBm T2 : 915.105 MHz : 3.815 dBm OBW : 208 KHz	Channel Frequency: 915.00 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-110k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



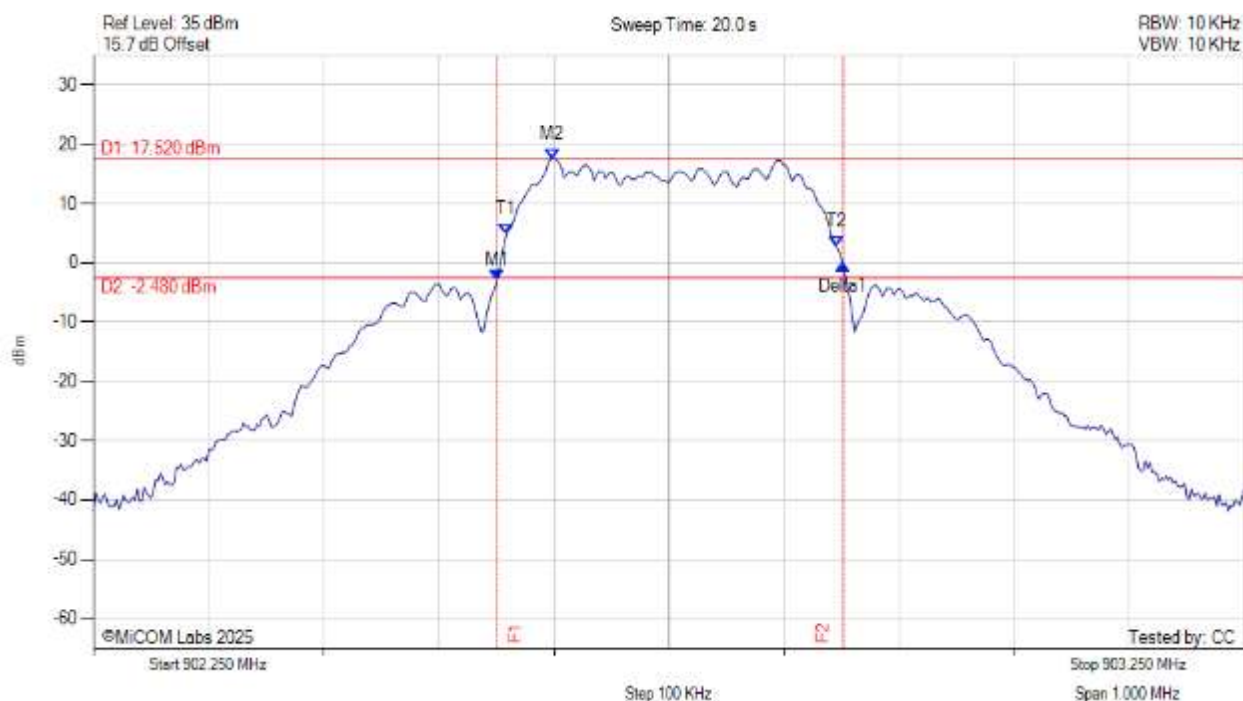
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.385 MHz : 1.232 dBm M2 : 927.443 MHz : 21.402 dBm Delta1 : 228 KHz : 1.969 dB T1 : 927.395 MHz : 3.613 dBm T2 : 927.605 MHz : 3.839 dBm OBW : 210 KHz	Channel Frequency: 927.50 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-250k-XR, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



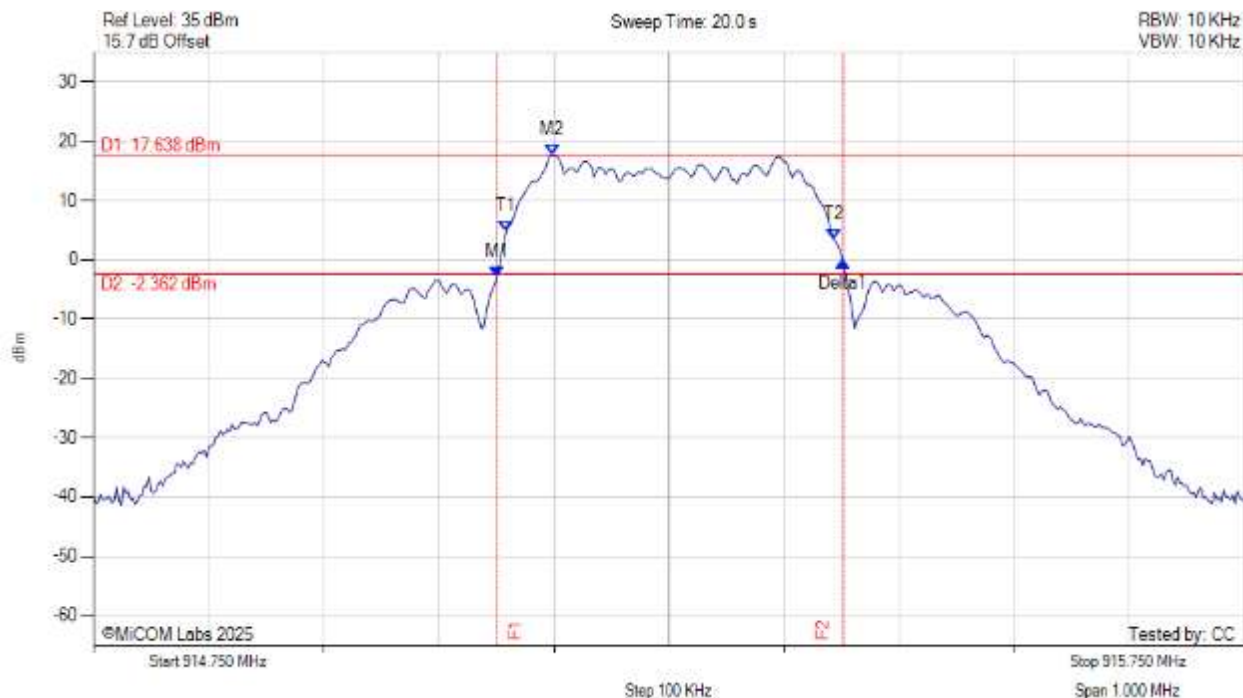
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.601 MHz : -2.885 dBm M2 : 902.649 MHz : 17.520 dBm Delta1 : 301 KHz : 2.504 dB T1 : 902.609 MHz : 4.766 dBm T2 : 902.895 MHz : 2.796 dBm OBW : 287 KHz	Channel Frequency: 902.75 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



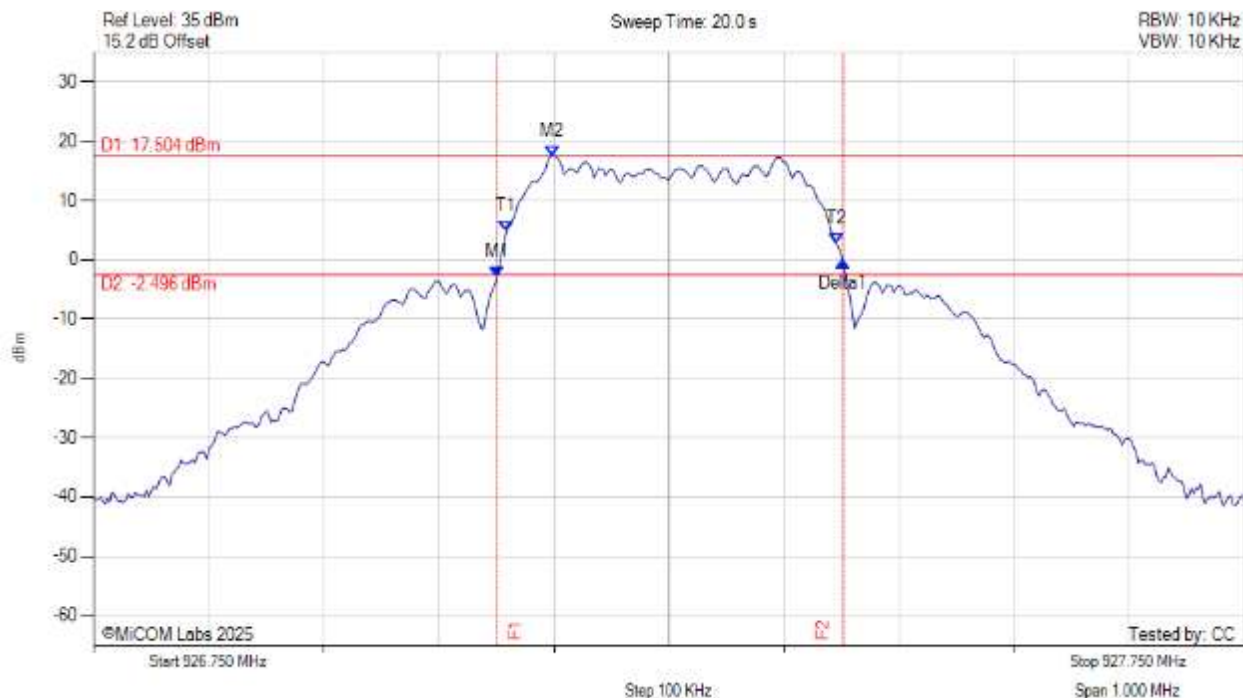
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 915.101 MHz : -2.805 dBm M2 : 915.149 MHz : 17.638 dBm Delta1 : 301 KHz : 2.516 dB T1 : 915.109 MHz : 4.878 dBm T2 : 915.393 MHz : 3.461 dBm OBW : 285 KHz	Channel Frequency: 915.25 MHz

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20 dB 99% BANDWIDTH



Variant: FSK-250k-XR, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

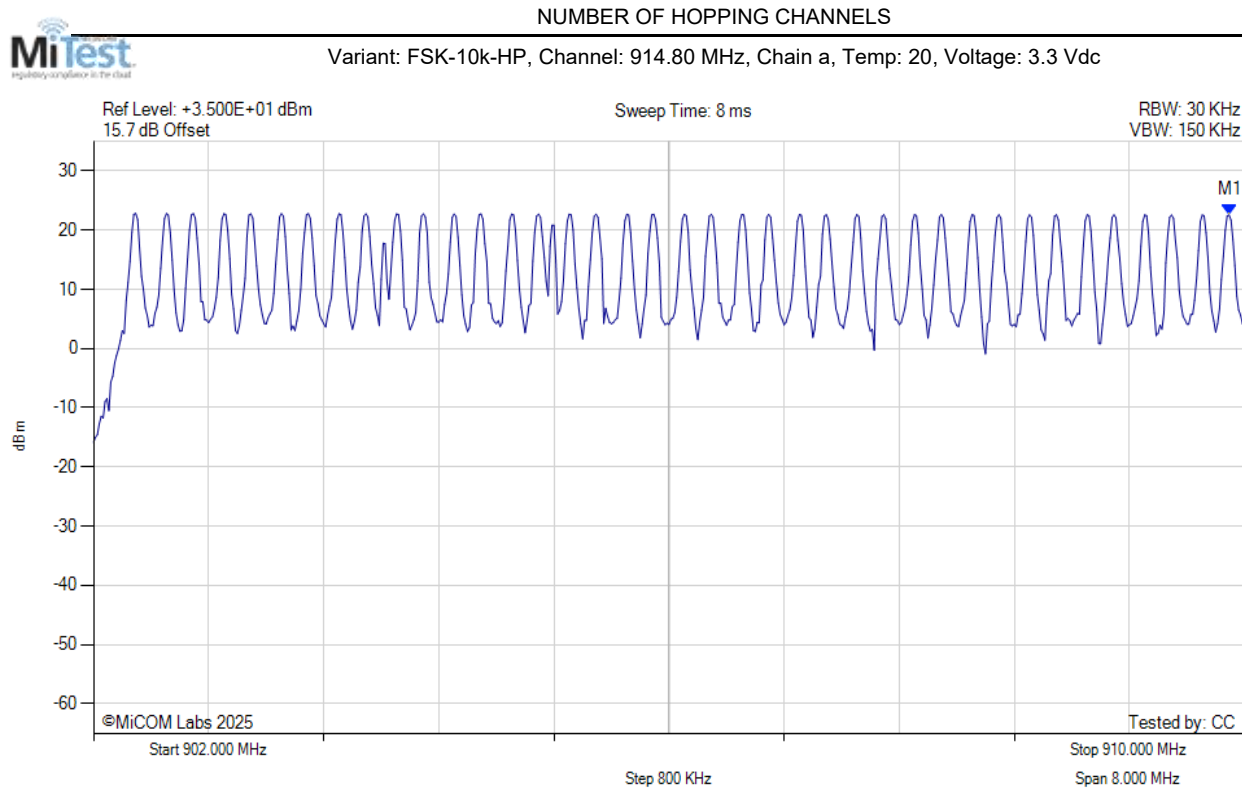


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.101 MHz : -2.866 dBm M2 : 927.149 MHz : 17.504 dBm Delta1 : 301 KHz : 2.463 dB T1 : 927.109 MHz : 4.805 dBm T2 : 927.395 MHz : 2.804 dBm OBW : 287 KHz	Channel Frequency: 927.25 MHz

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A.2. Frequency Hopping Tests

A.2.1. Number of Hopping Channels



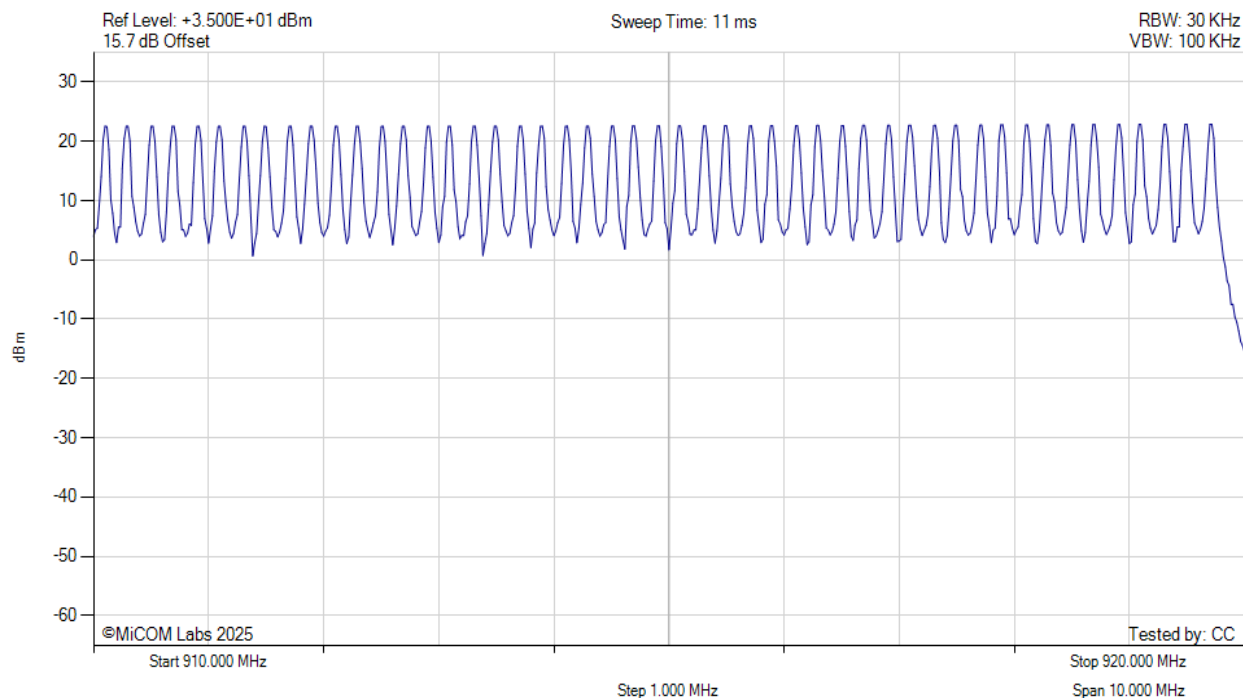
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.900 MHz : 22.555 dBm	Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



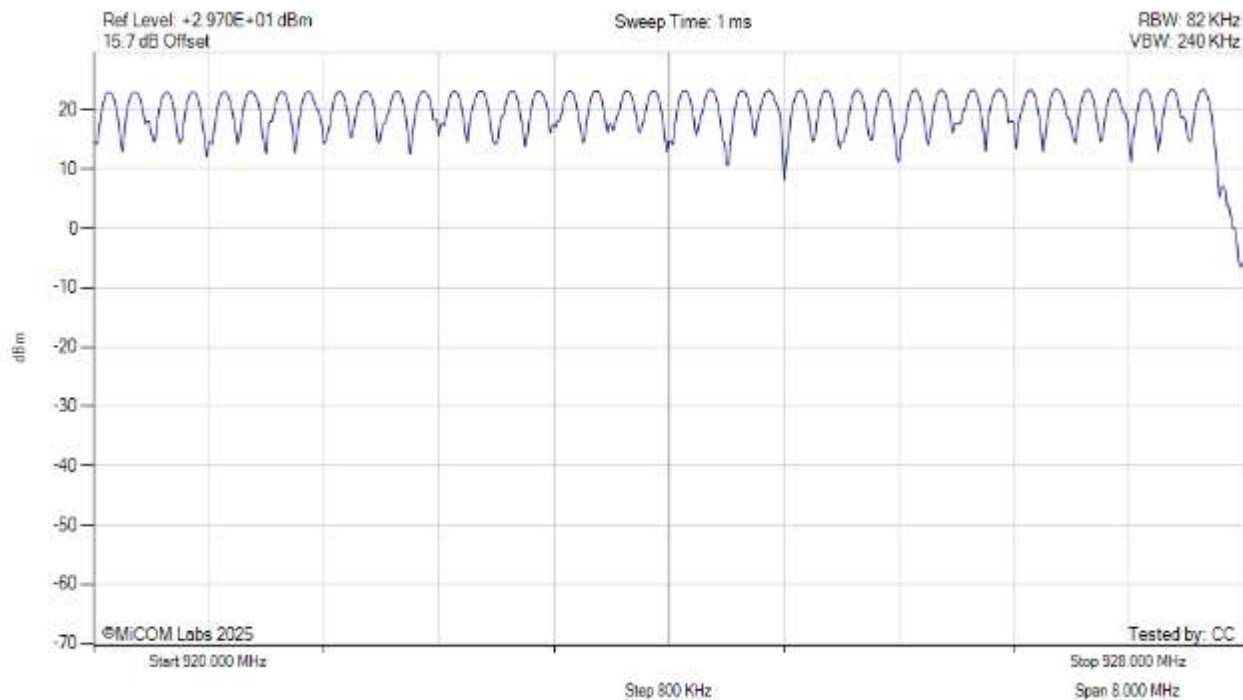
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



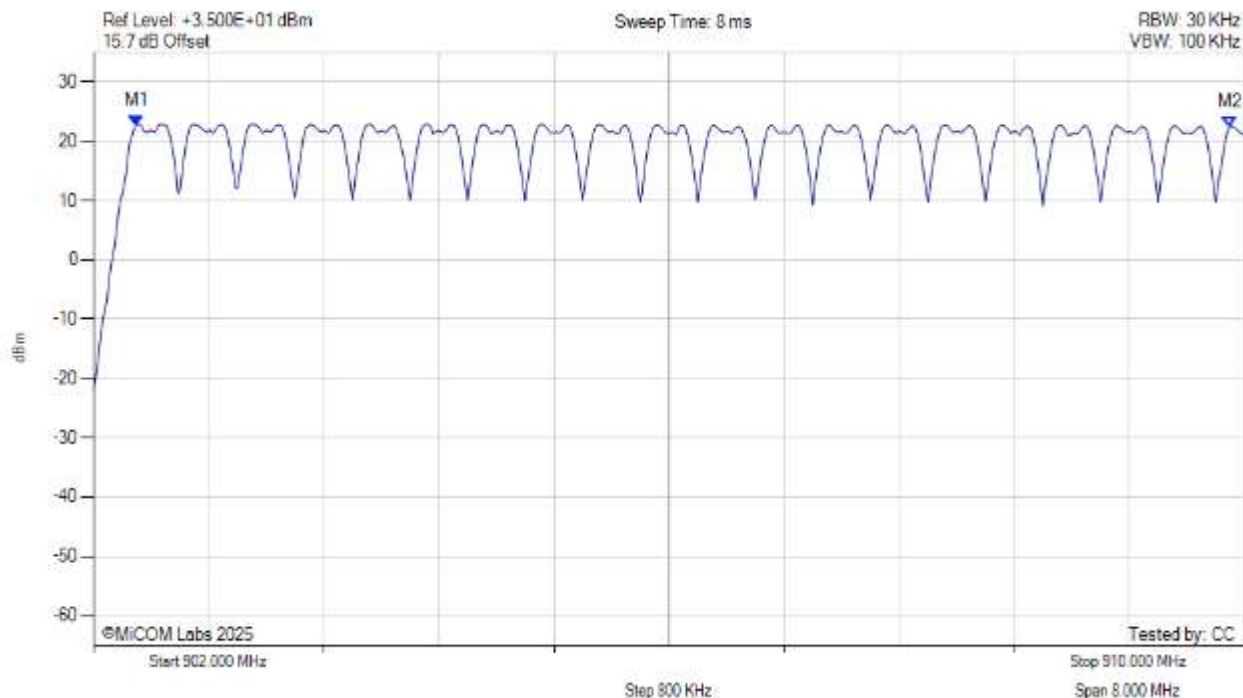
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



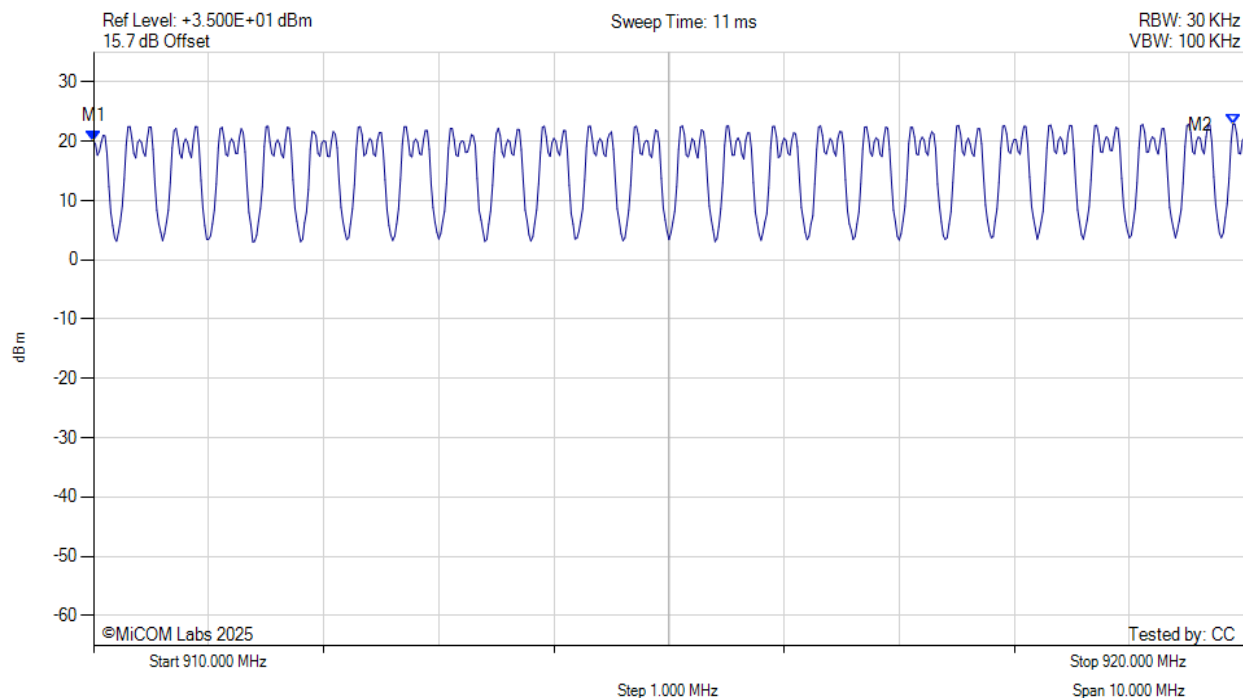
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.300 MHz : 22.591 dBm M2 : 909.900 MHz : 22.295 dBm	Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



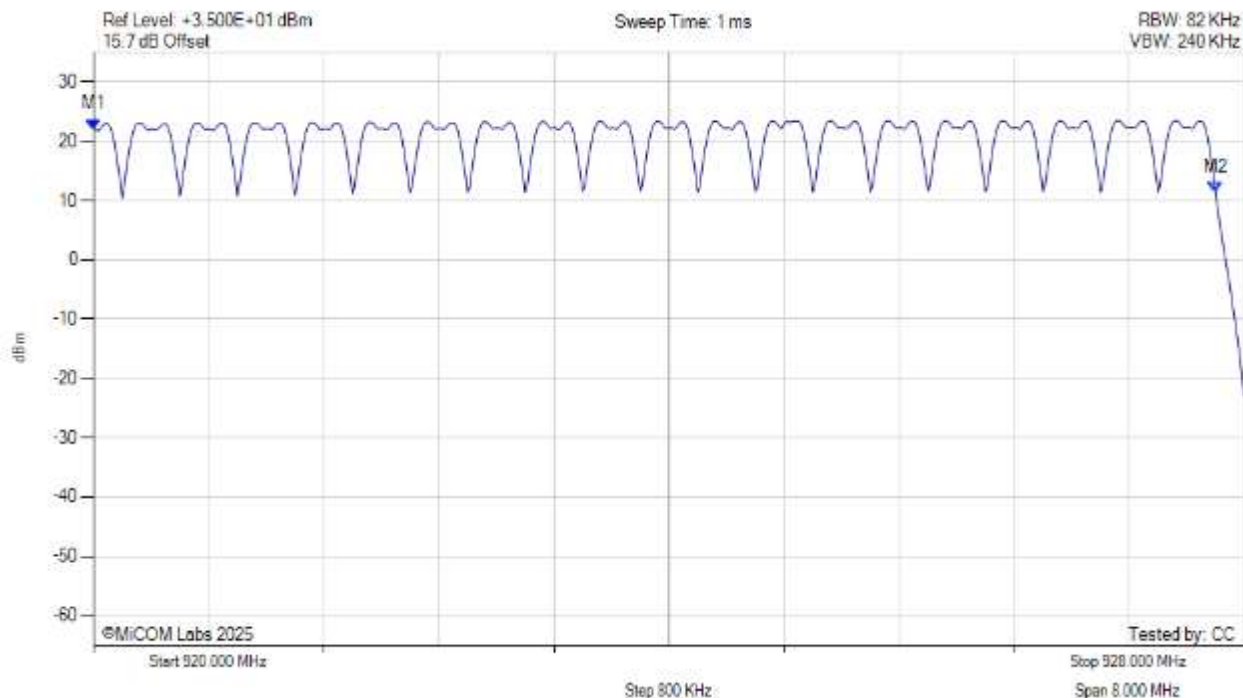
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 910.000 MHz : 20.096 dBm M2 : 919.900 MHz : 22.860 dBm	Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



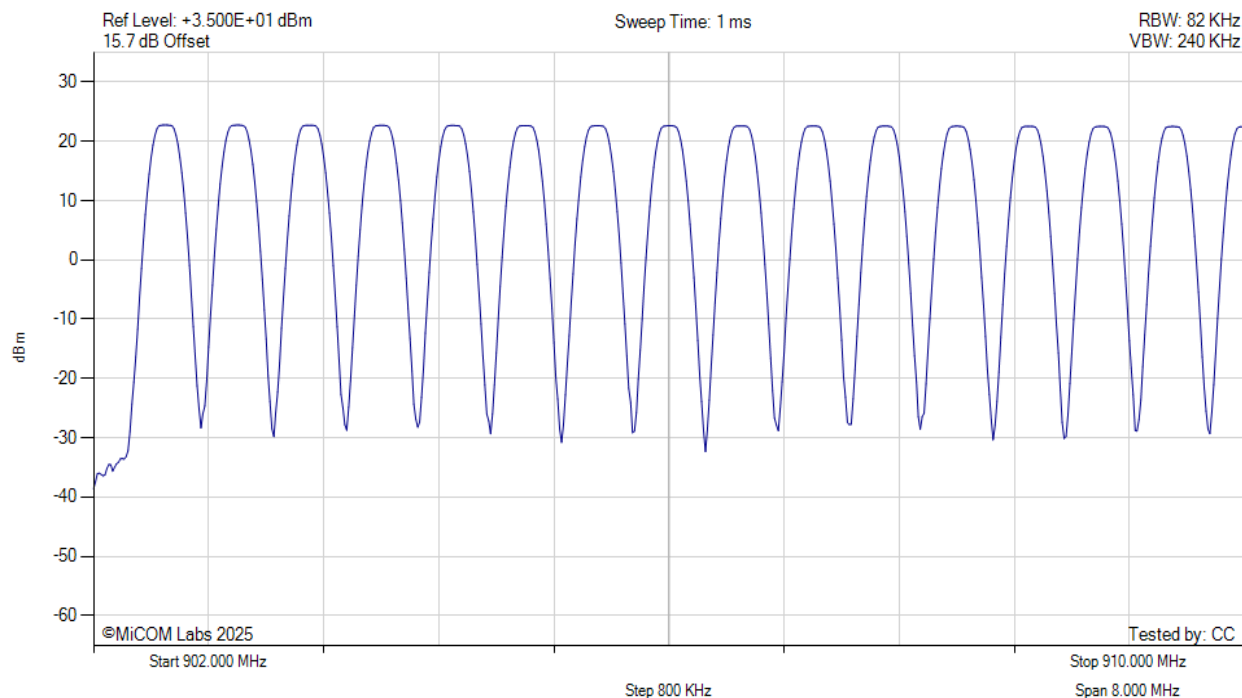
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 920.000 MHz : 21.988 dBm M2 : 927.800 MHz : 11.286 dBm	Channel Frequency: 914.80 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



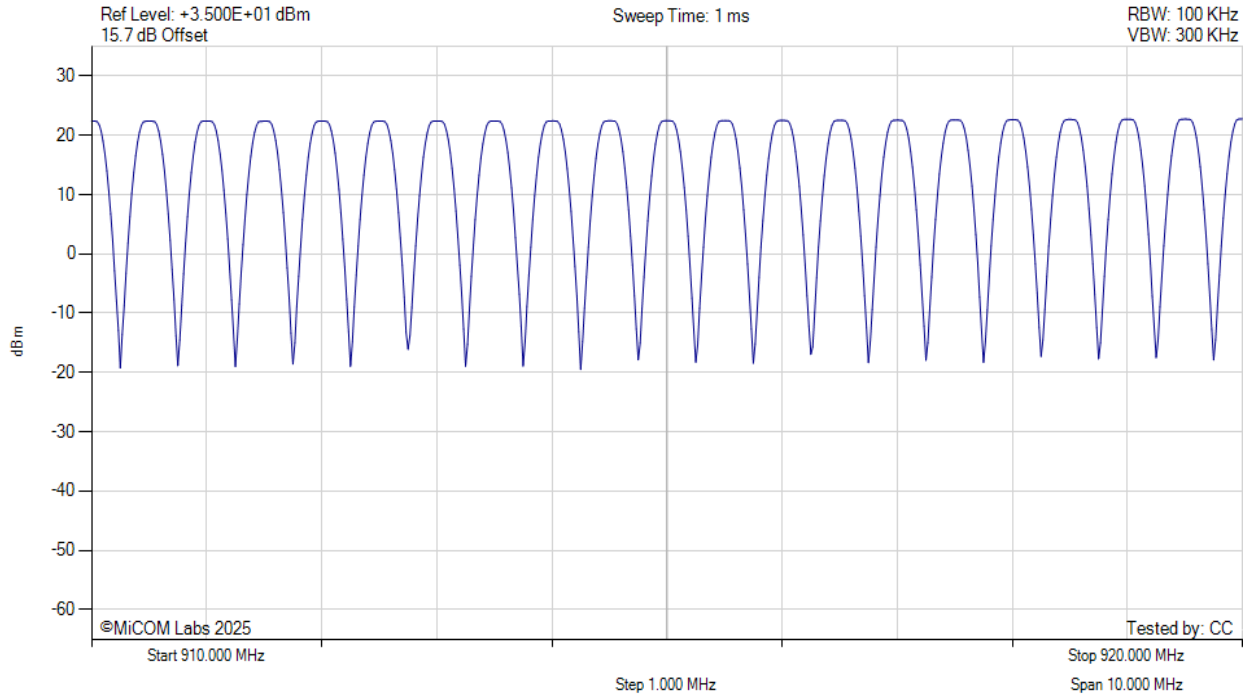
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



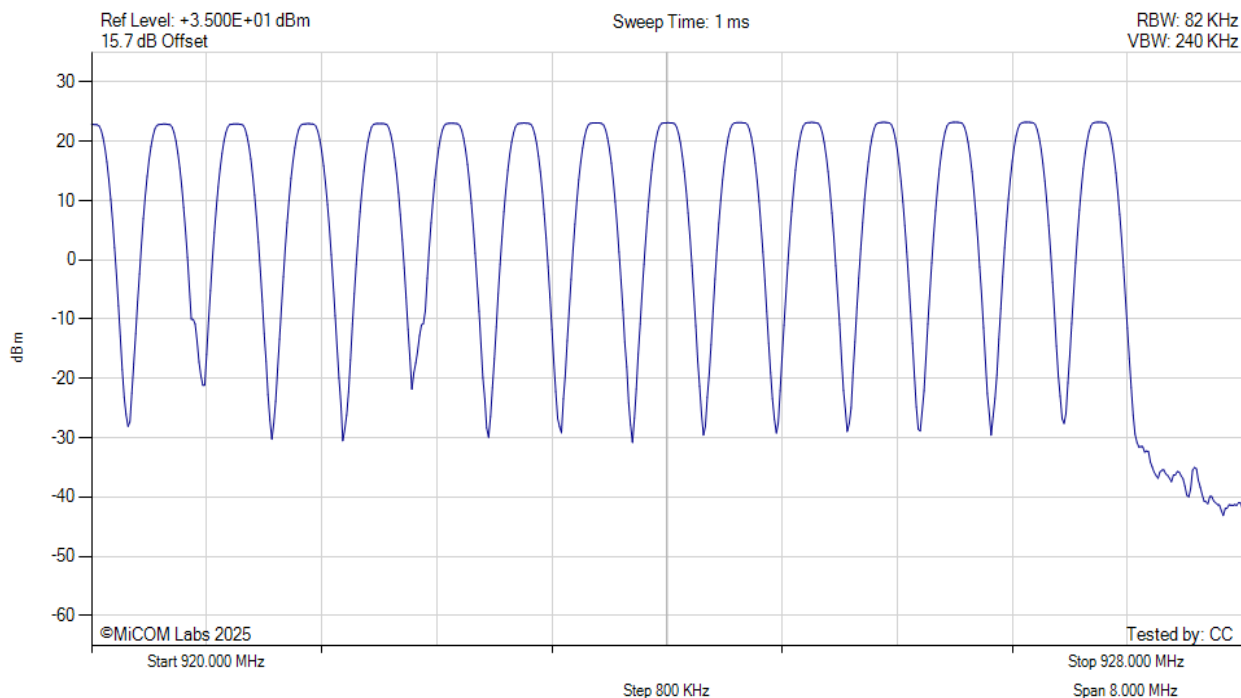
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



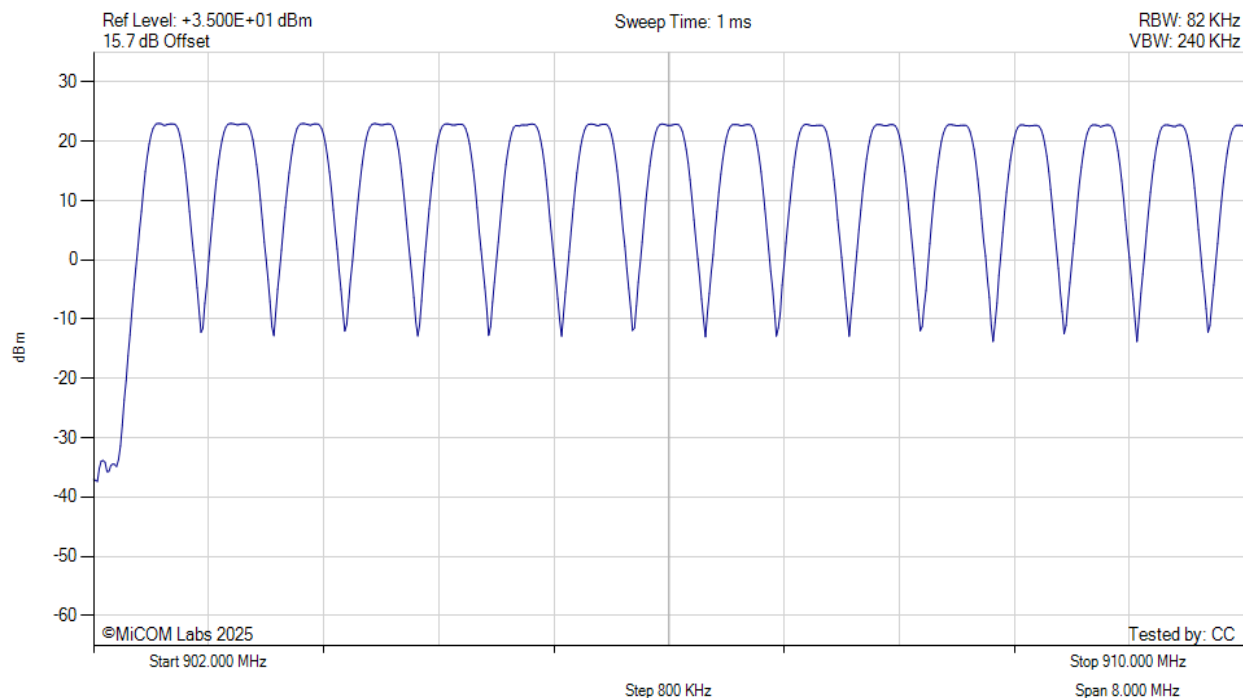
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



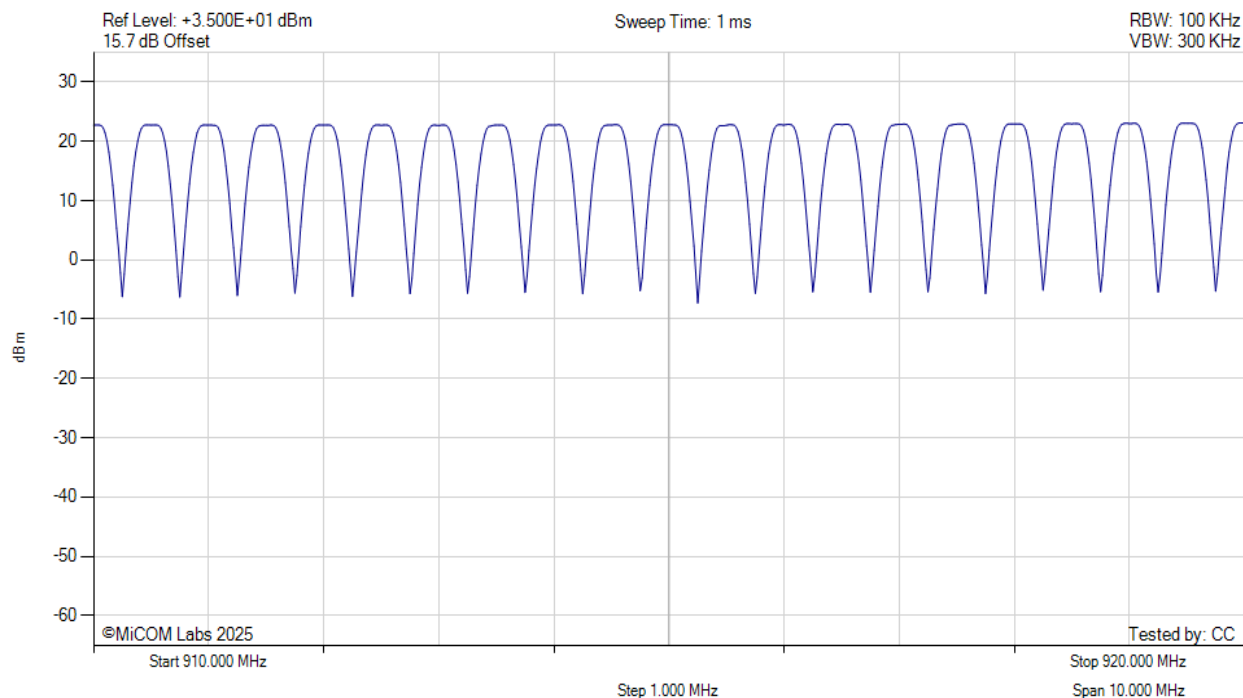
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



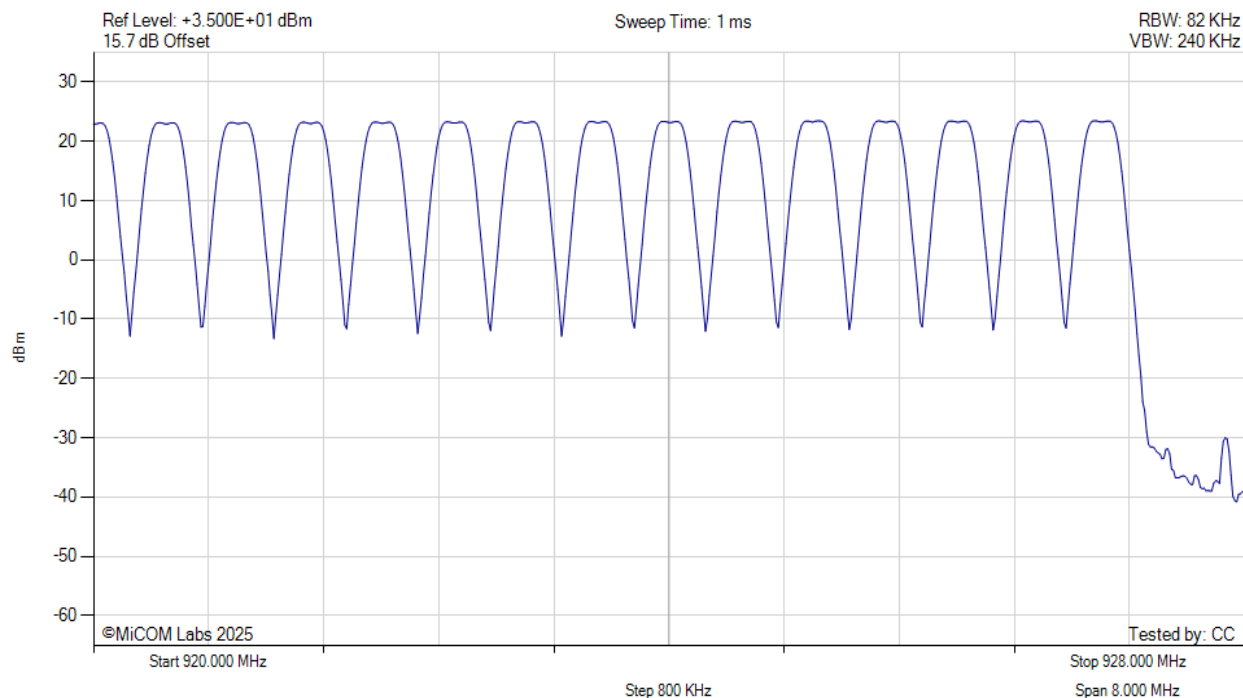
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



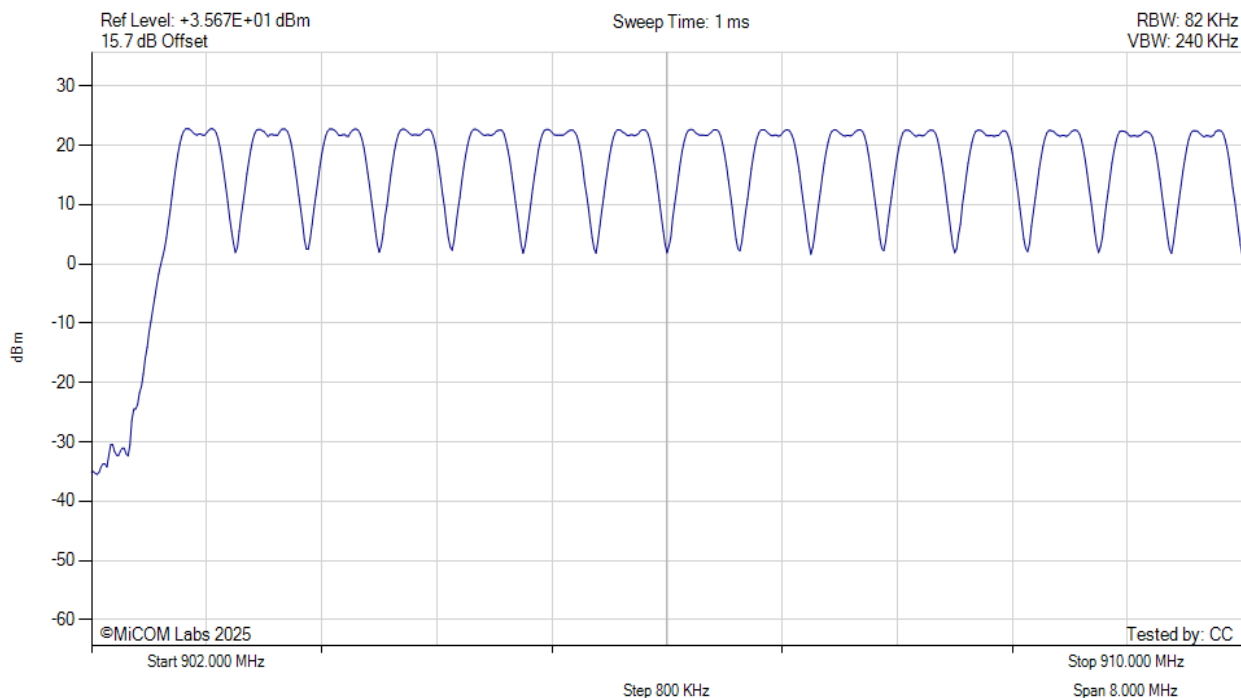
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



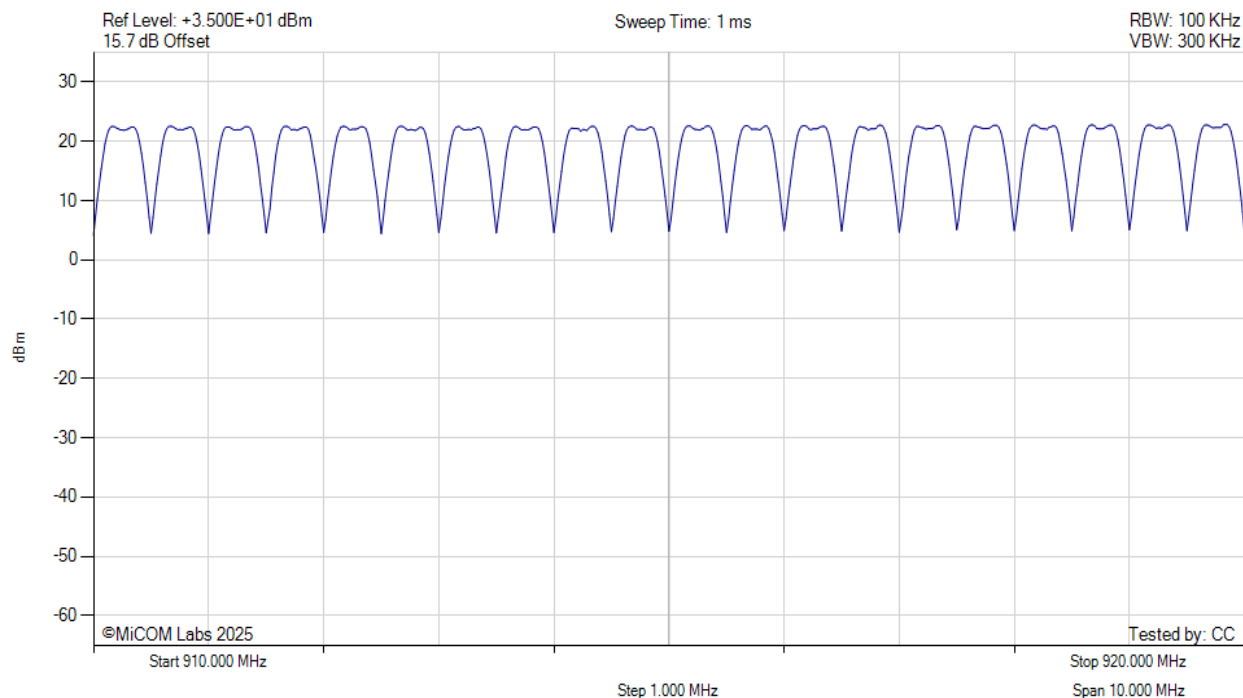
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



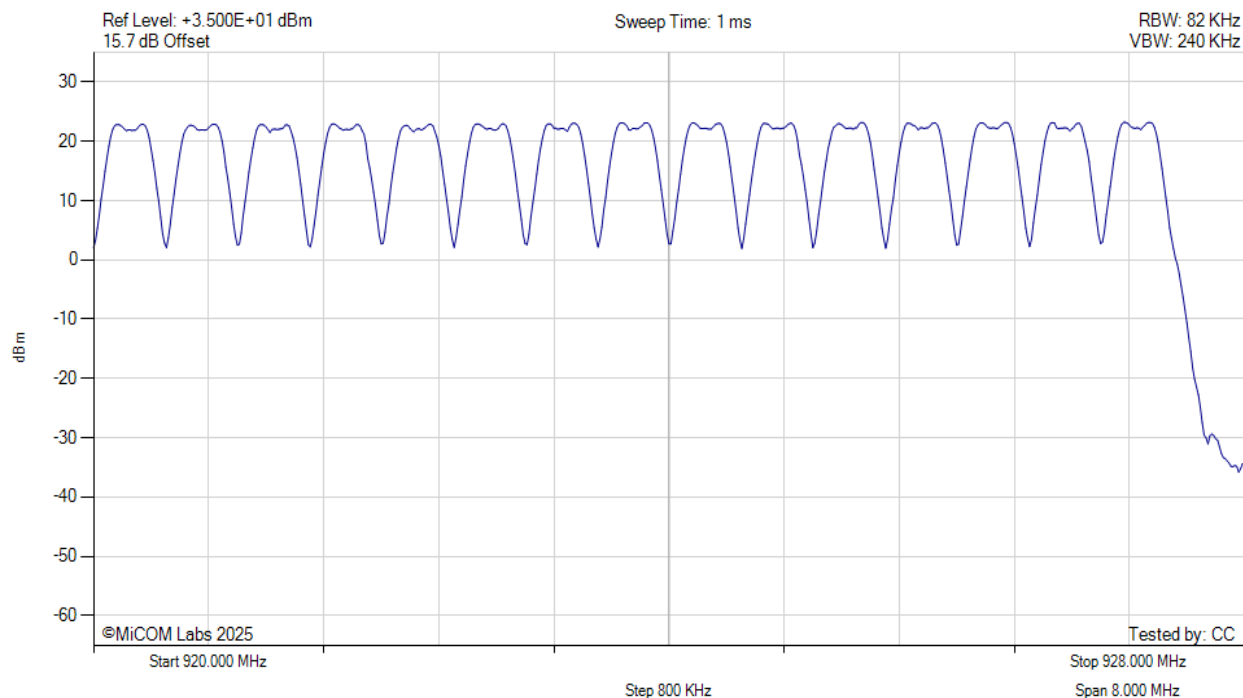
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

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NUMBER OF HOPPING CHANNELS



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

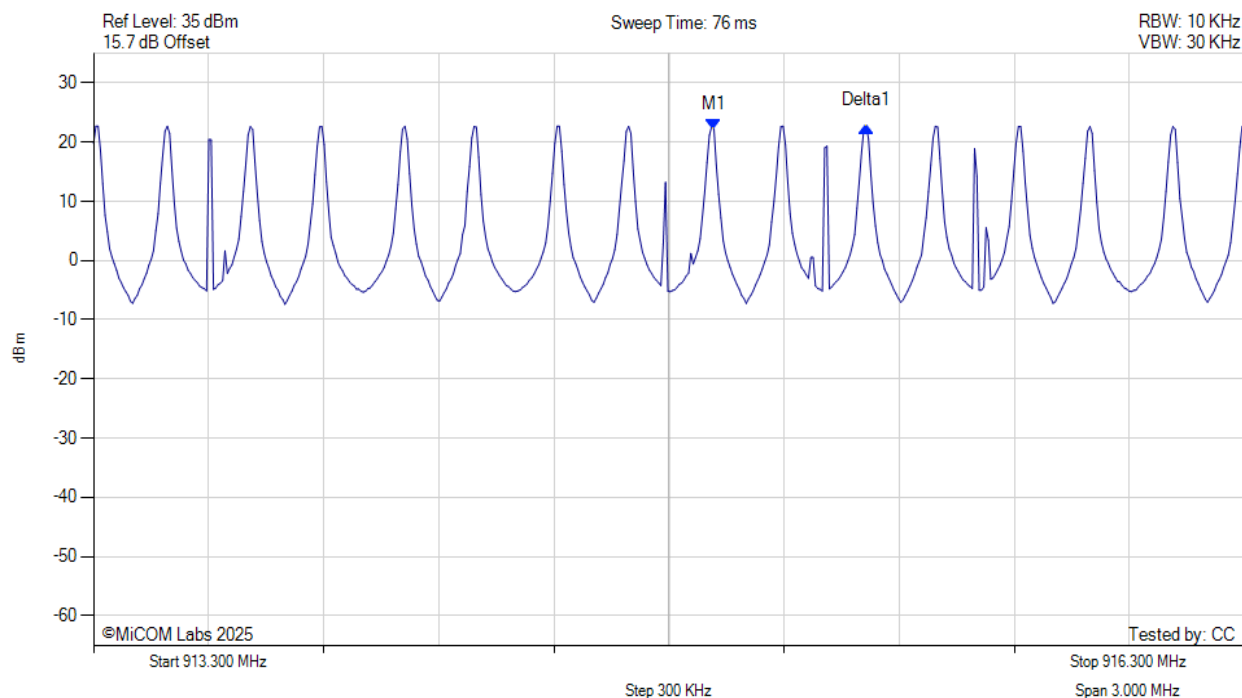
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A.2.2. Channel Separation



CHANNEL SEPARATION

Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



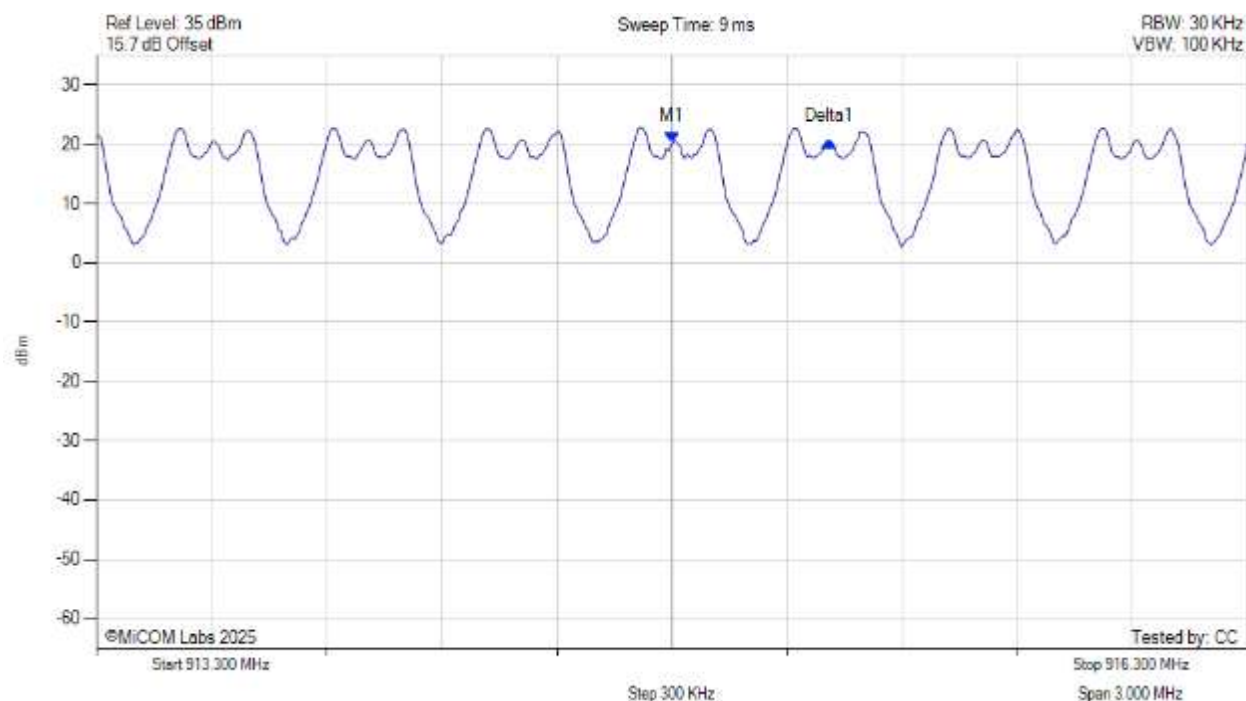
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.917 MHz : 22.151 dBm Delta1 : 397 KHz : 0.547 dB	Channel Frequency: 914.80 MHz

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CHANNEL SEPARATION



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



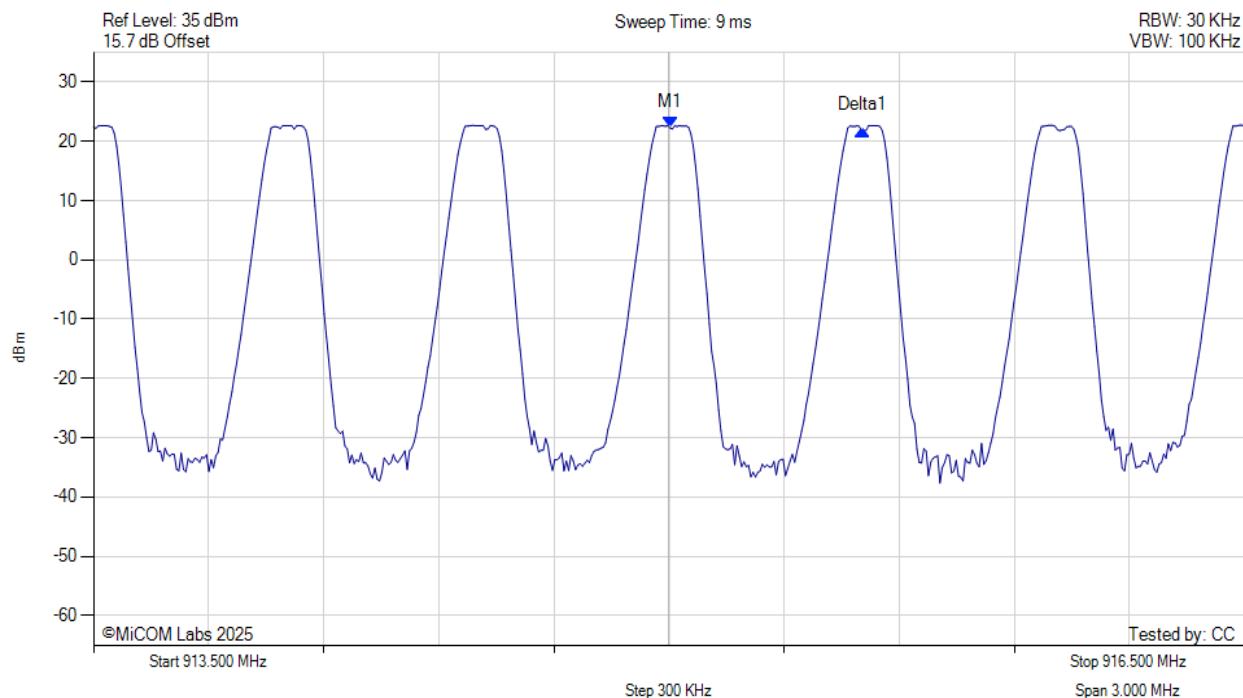
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.800 MHz : 20.373 dBm Delta1 : 410 KHz : 0.130 dB	Channel Frequency: 914.80 MHz

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CHANNEL SEPARATION



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



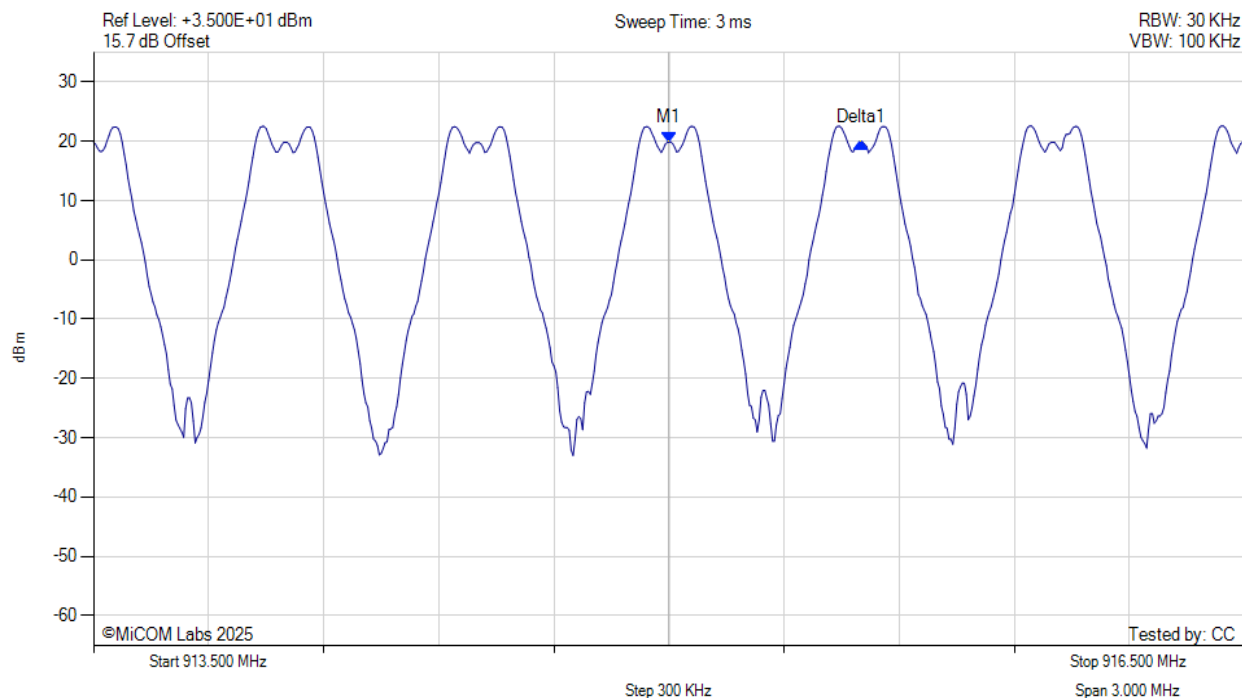
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.003 MHz : 22.259 dBm Delta1 : 500 KHz : -0.451 dB	Channel Frequency: 915.00 MHz

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CHANNEL SEPARATION



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



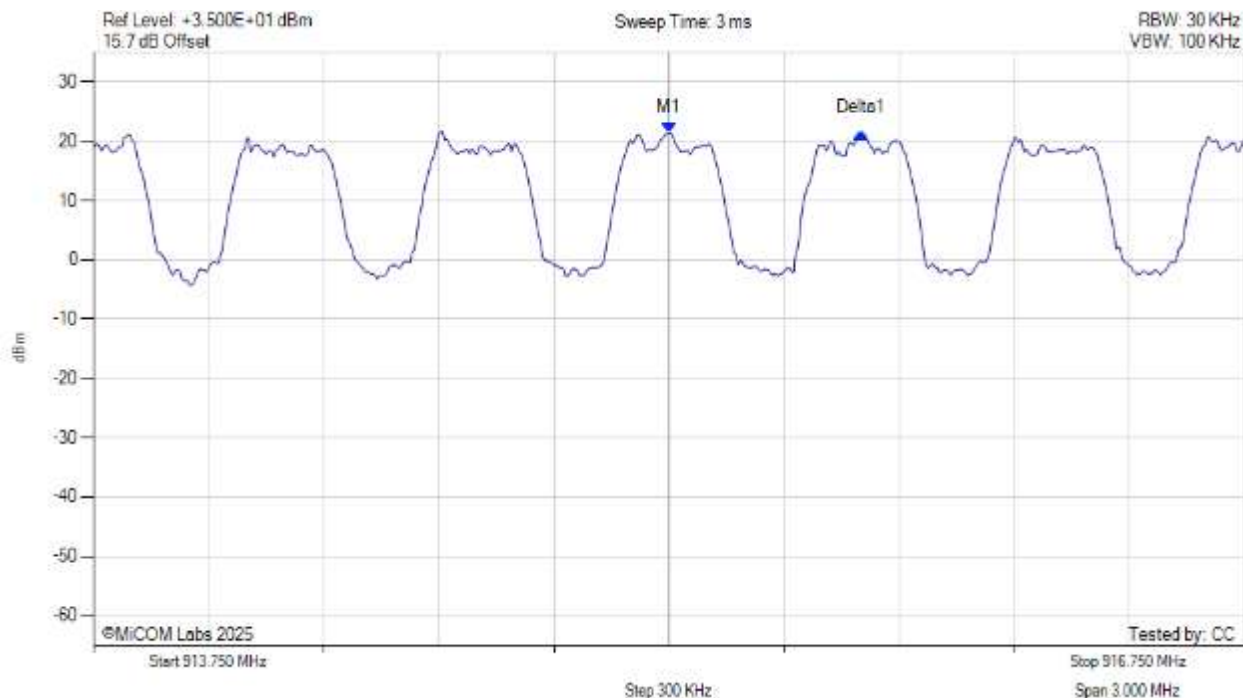
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.000 MHz : 19.857 dBm Delta1 : 500 KHz : -0.002 dB	Channel Frequency: 915.00 MHz

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CHANNEL SEPARATION



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.250 MHz : 21.350 dBm Delta1 : 500 KHz : 0.029 dB	Channel Frequency: 915.25 MHz

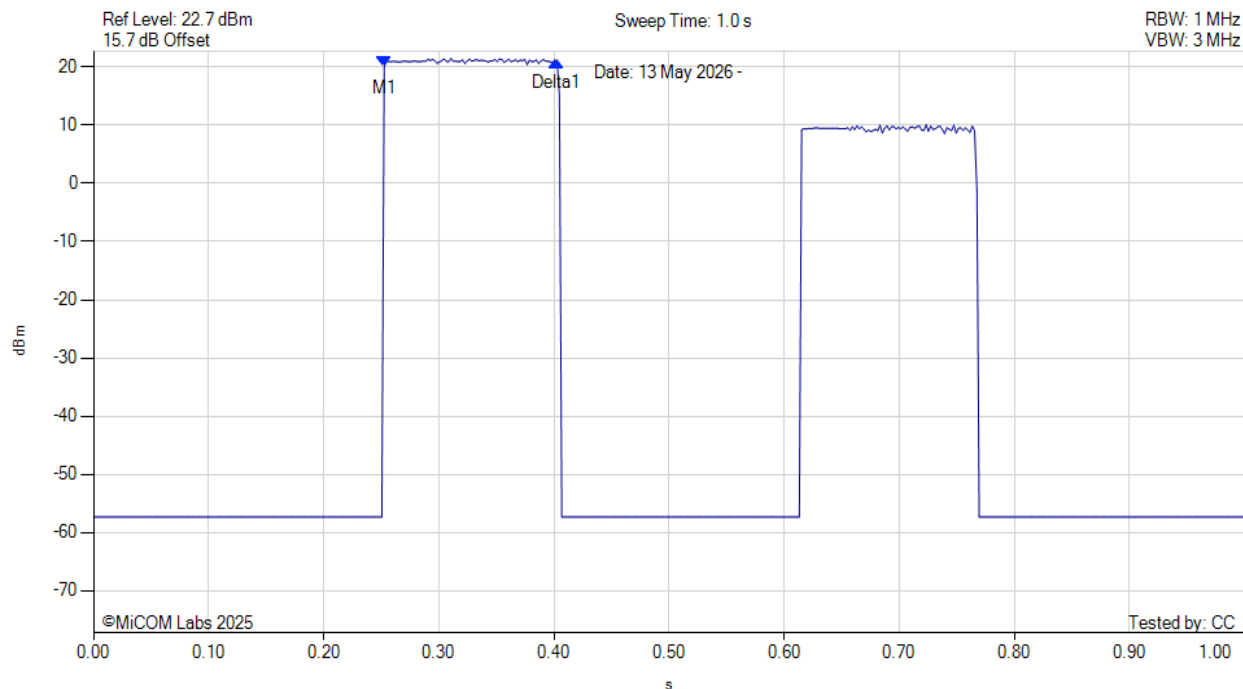
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A.2.3. Dwell Time



DWELL TIME

Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



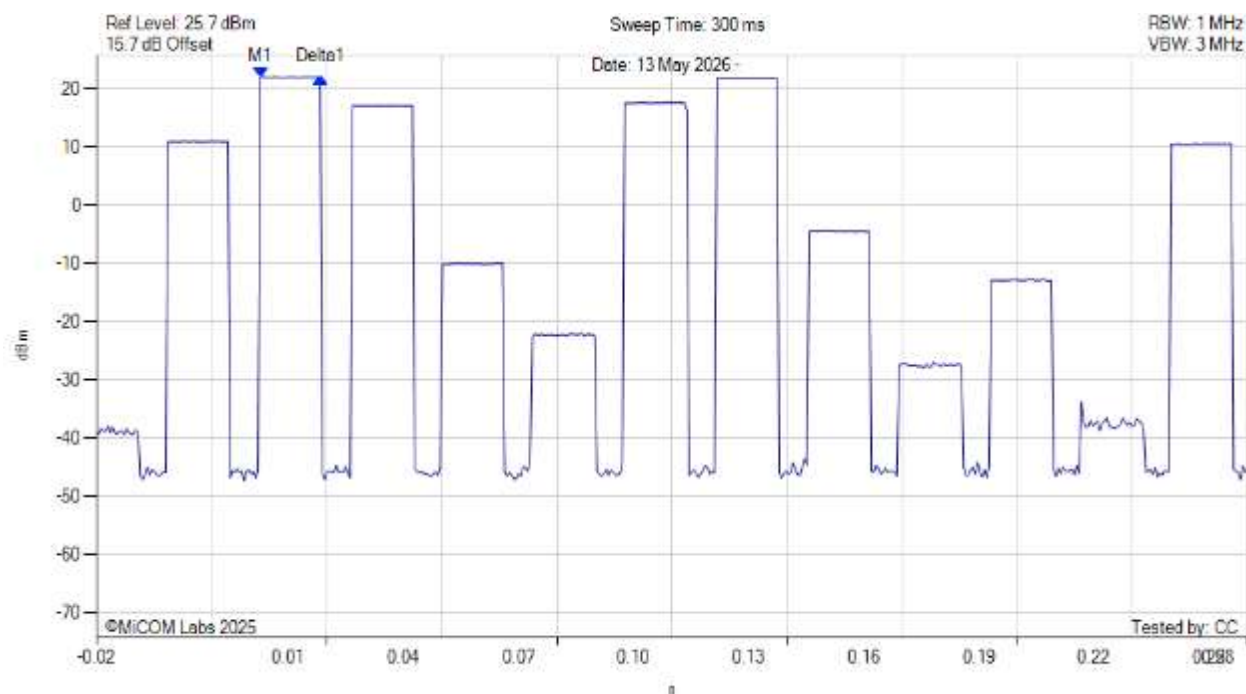
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(914.80 MHz) : 0.253 s : 20.029 dBm Delta1(914.80 MHz) : 0.150 s : 0.893 dB	Channel Frequency: 914.80 MHz

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DWELL TIME



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



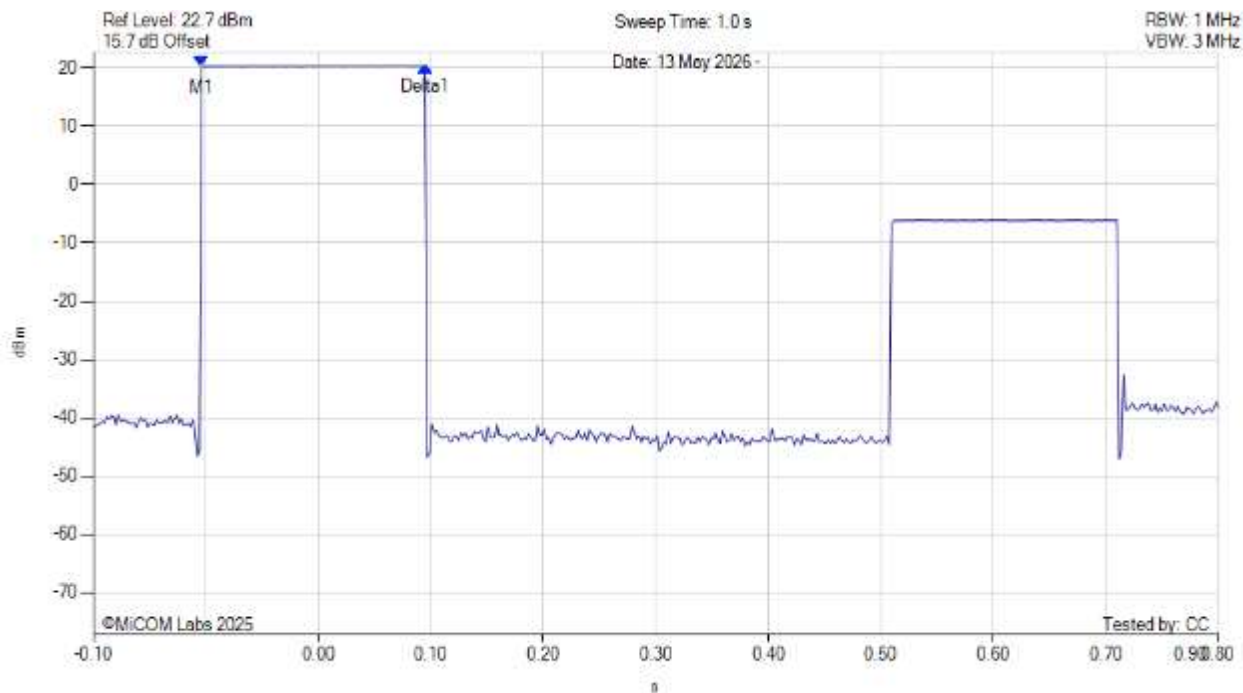
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1(914.80 MHz) : 0.023 s : 21.948 dBm Delta1(914.80 MHz) : 0.015 s : 0.000 dB	Channel Frequency: 914.80 MHz

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DWELL TIME



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.00 MHz) : -0.004 s : 20.288 dBm Delta1(915.00 MHz) : 0.198 s : 0.045 dB	Channel Frequency: 915.00 MHz

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DWELL TIME



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



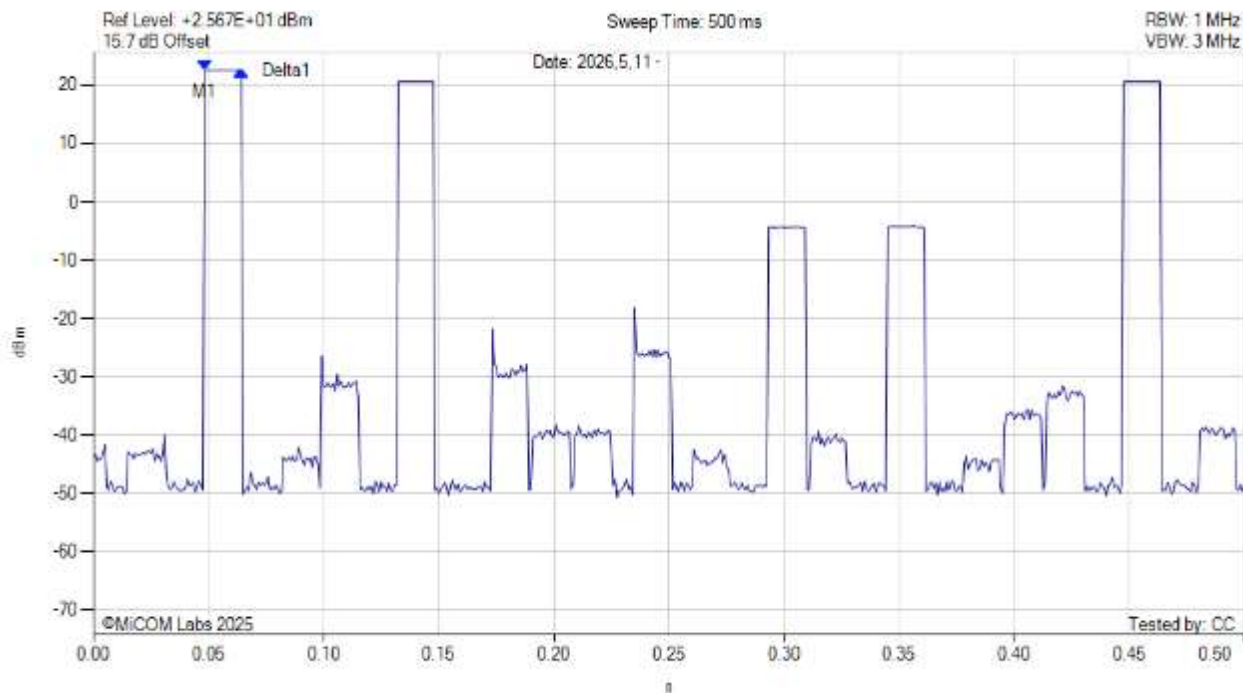
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.00 MHz) : 0.048 s : 22.582 dBm Delta1(915.00 MHz) : 0.030 s : 0.000 dB	Channel Frequency: 915.00 MHz

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DWELL TIME



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.25 MHz) : 0.048 s : 22.580 dBm Delta1(915.25 MHz) : 0.016 s : 0.000 dB	Channel Frequency: 915.25 MHz

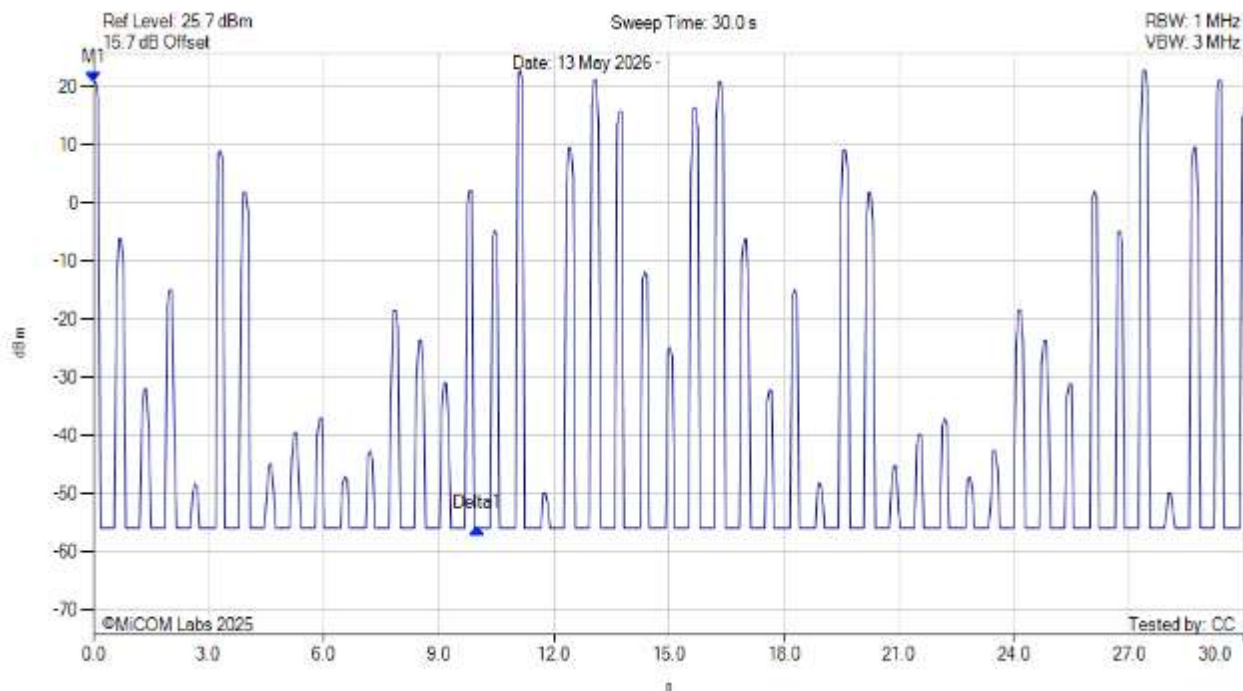
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A.2.4. Channel Occupancy



CHANNEL OCCUPANCY

Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



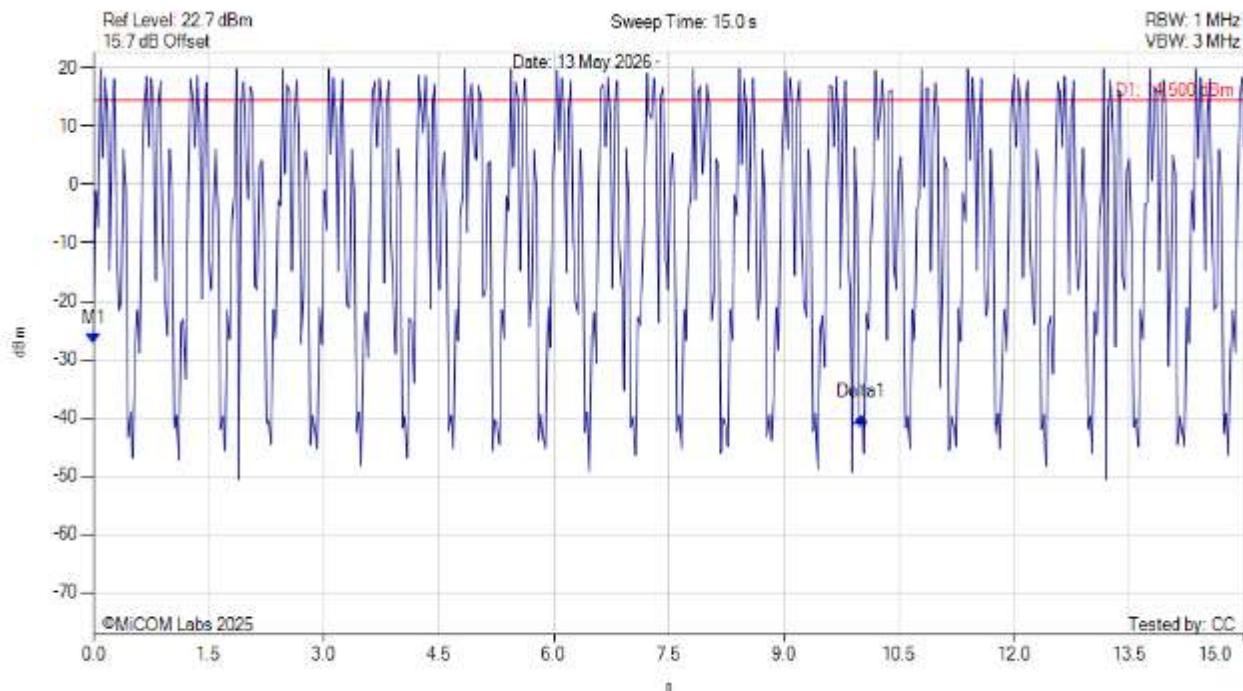
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(914.80 MHz) : 0.000 s : 20.709 dBm Delta1(914.80 MHz) : 10.000 s : -76.595 dB	Channel Frequency: 914.80 MHz

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CHANNEL OCCUPANCY



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



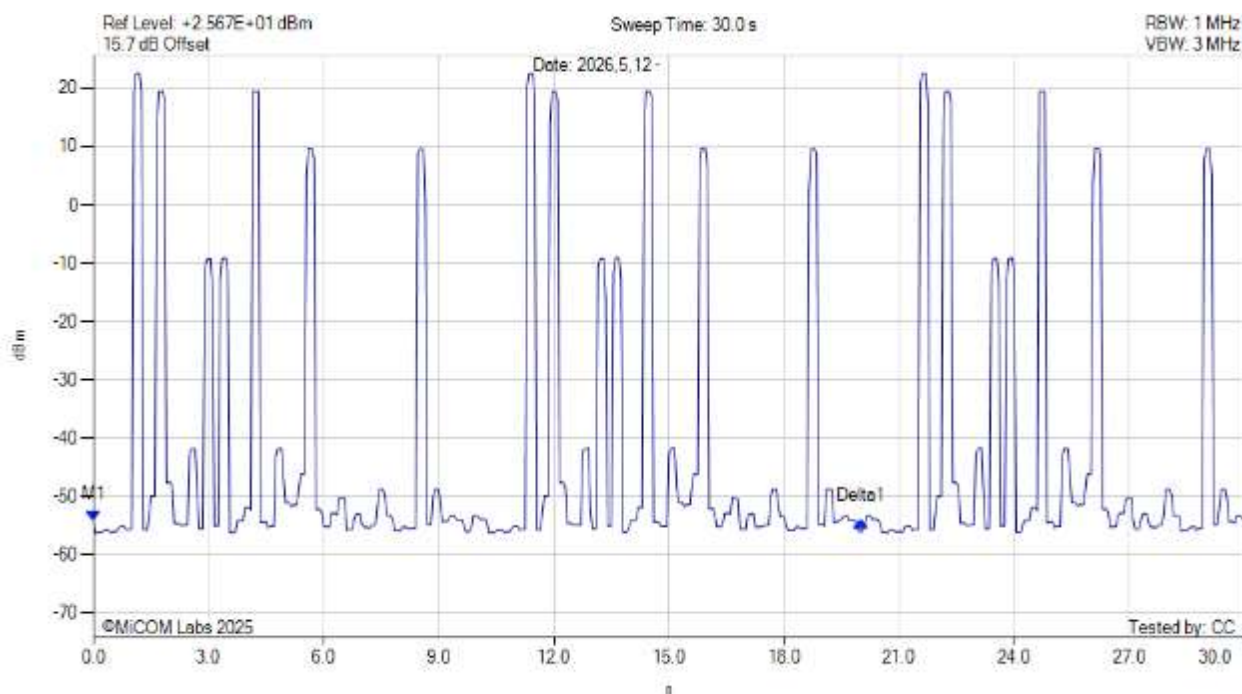
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(914.80 MHz) : 0.000 s : -27.199 dBm Delta1(914.80 MHz) : 10.000 s : -12.602 dB	Channel Frequency: 914.80 MHz

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CHANNEL OCCUPANCY



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



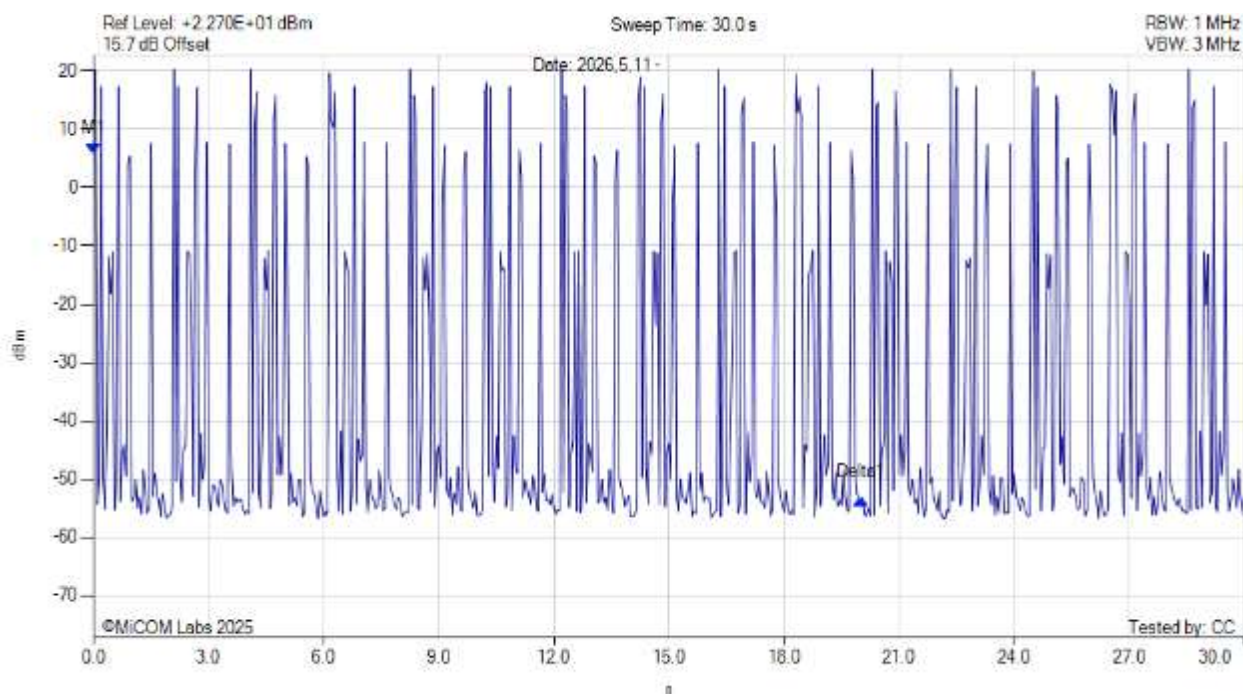
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = AVER Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.00 MHz) : 0.000 s : -54.130 dBm Delta1(915.00 MHz) : 20.000 s : -0.184 dBm	Channel Frequency: 915.00 MHz

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CHANNEL OCCUPANCY



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



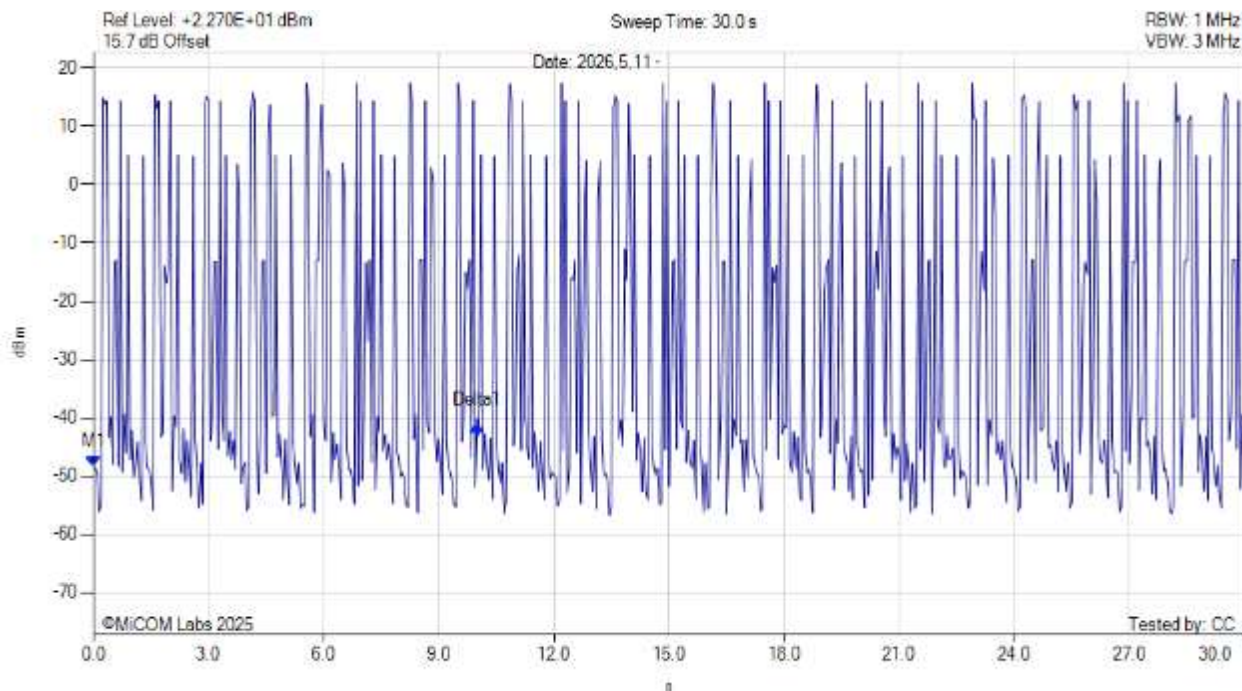
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = AVER Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.00 MHz) : 0.000 s : 5.768 dBm Delta1(915.00 MHz) : 20.000 s : -59.080 dB	Channel Frequency: 915.00 MHz

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CHANNEL OCCUPANCY



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



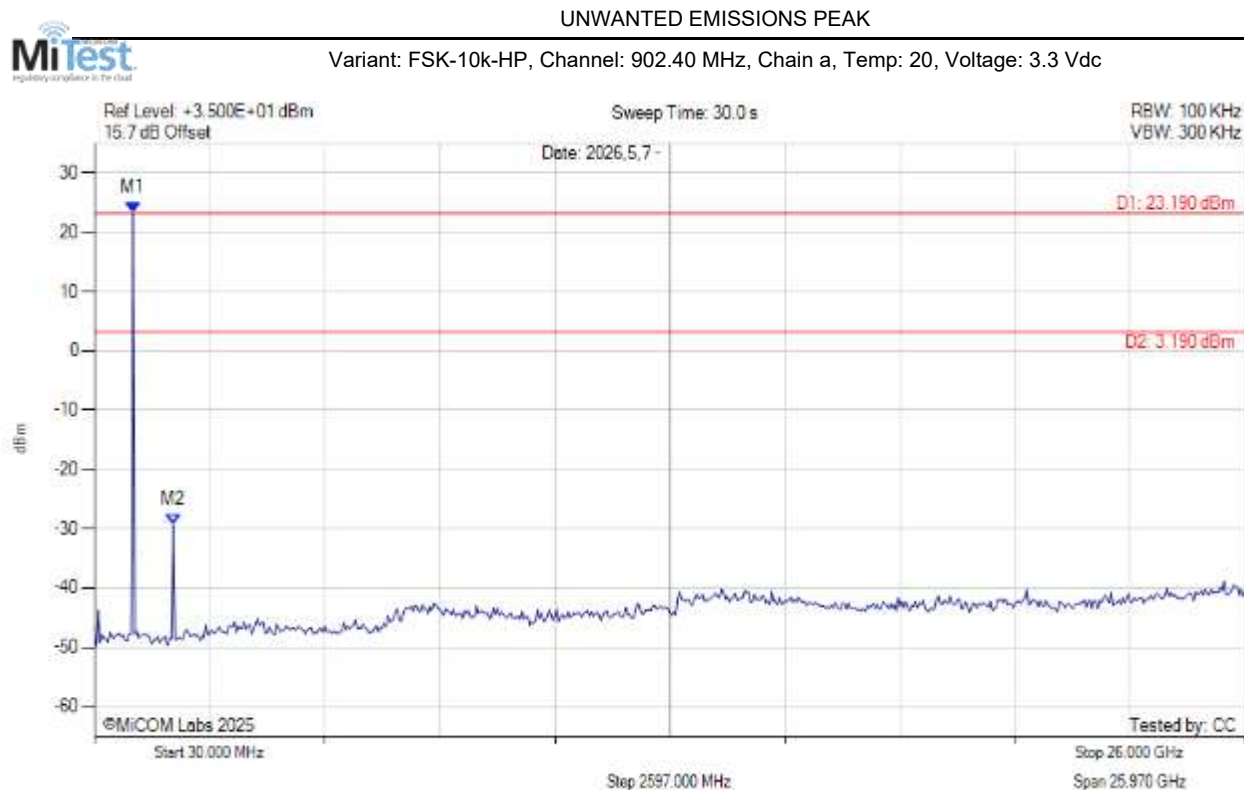
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = AVER Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1(915.25 MHz) : 0.000 s : -48.332 dBm Delta1(915.25 MHz) : 10.000 s : 7.107 dB	Channel Frequency: 915.25 MHz

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A.3. Emissions

A.3.1. Conducted Emissions

A.3.1.1. Conducted Unwanted Spurious Emissions



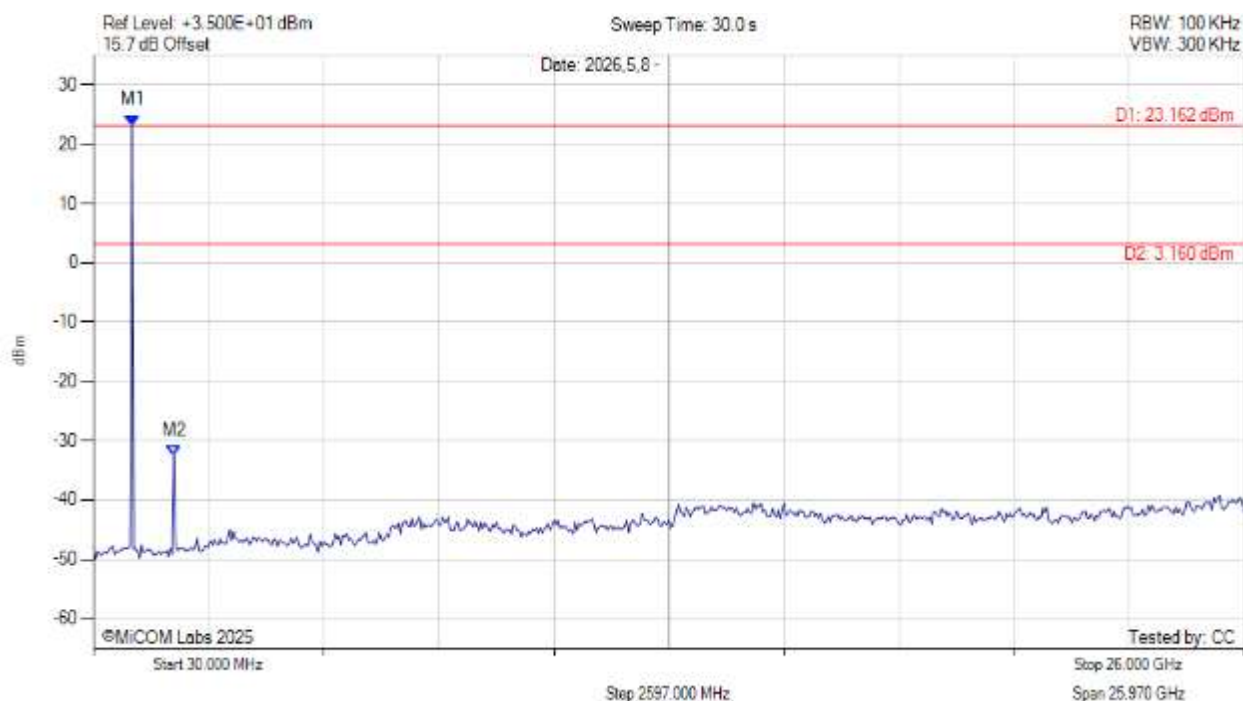
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.190 dBm M2 : 1800.000 MHz : -29.357 dBm	Channel Frequency: 902.40 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-10k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



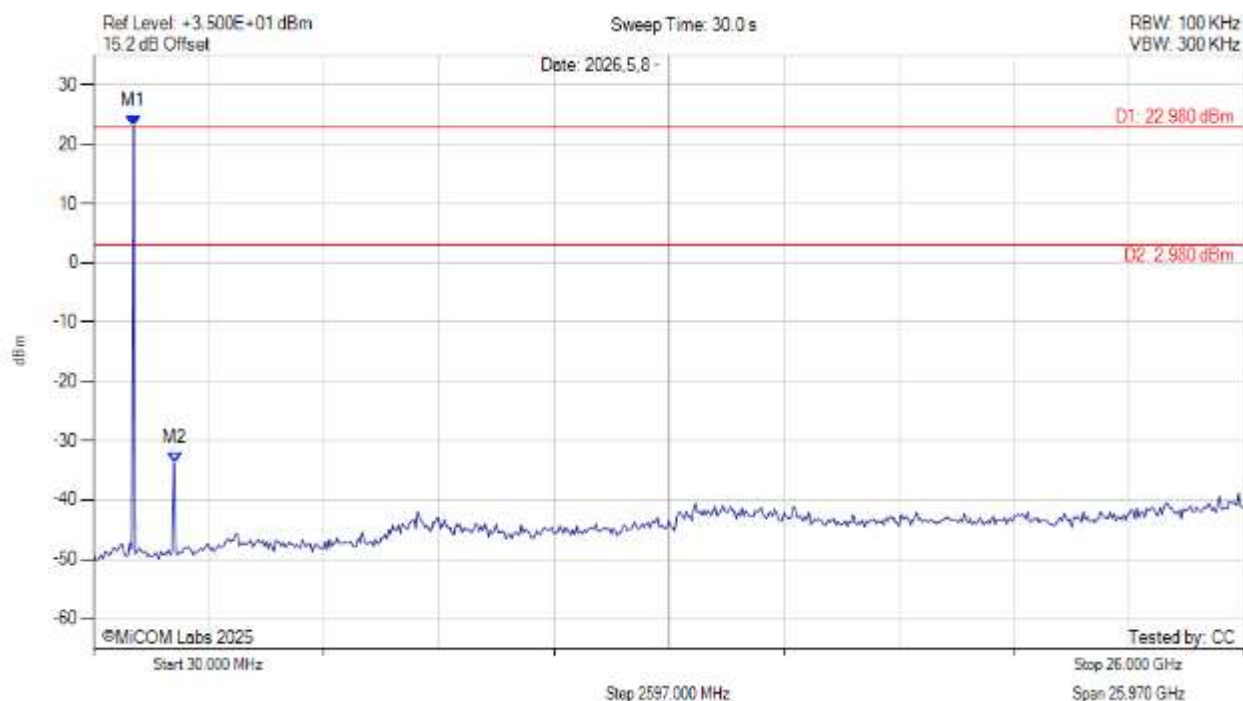
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 910.000 MHz : 23.162 dBm M2 : 1850.000 MHz : -32.507 dBm	Channel Frequency: 914.80 MHz

[back to matrix](#)

UNWANTED EMISSIONS PEAK



Variant: FSK-10k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



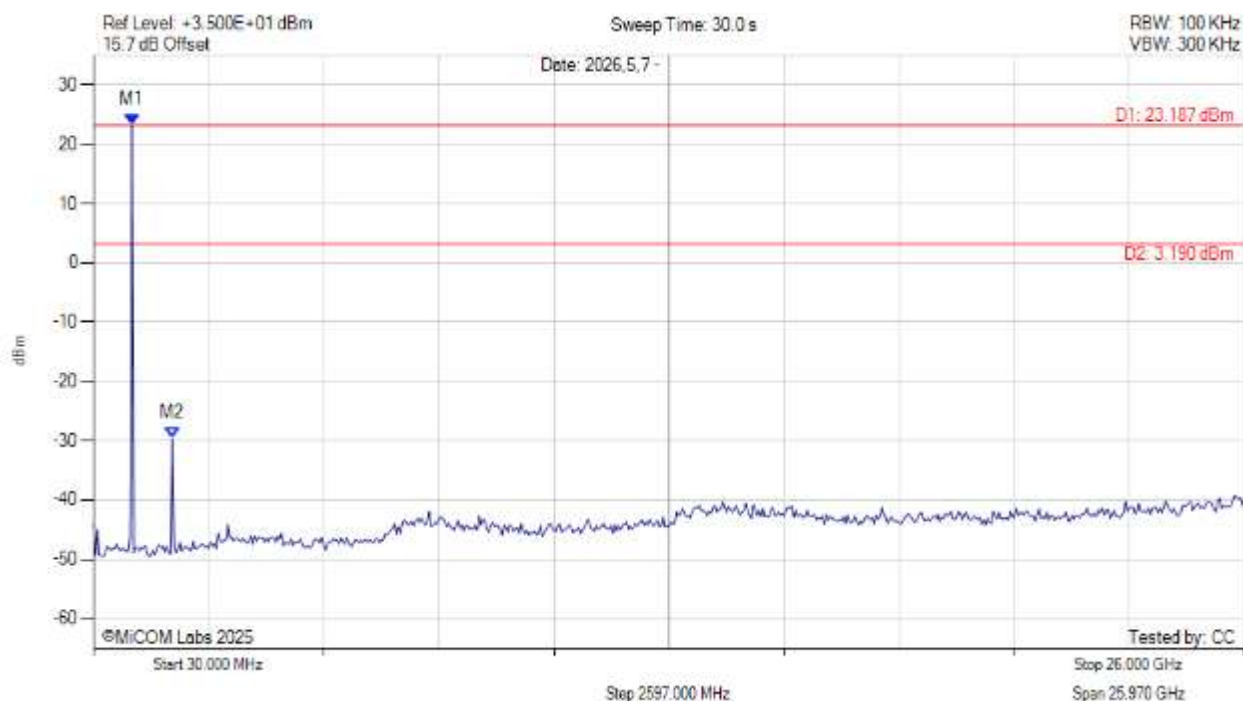
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 930.000 MHz : 22.980 dBm M2 : 1860.000 MHz : -33.801 dBm	Channel Frequency: 927.60 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-200k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



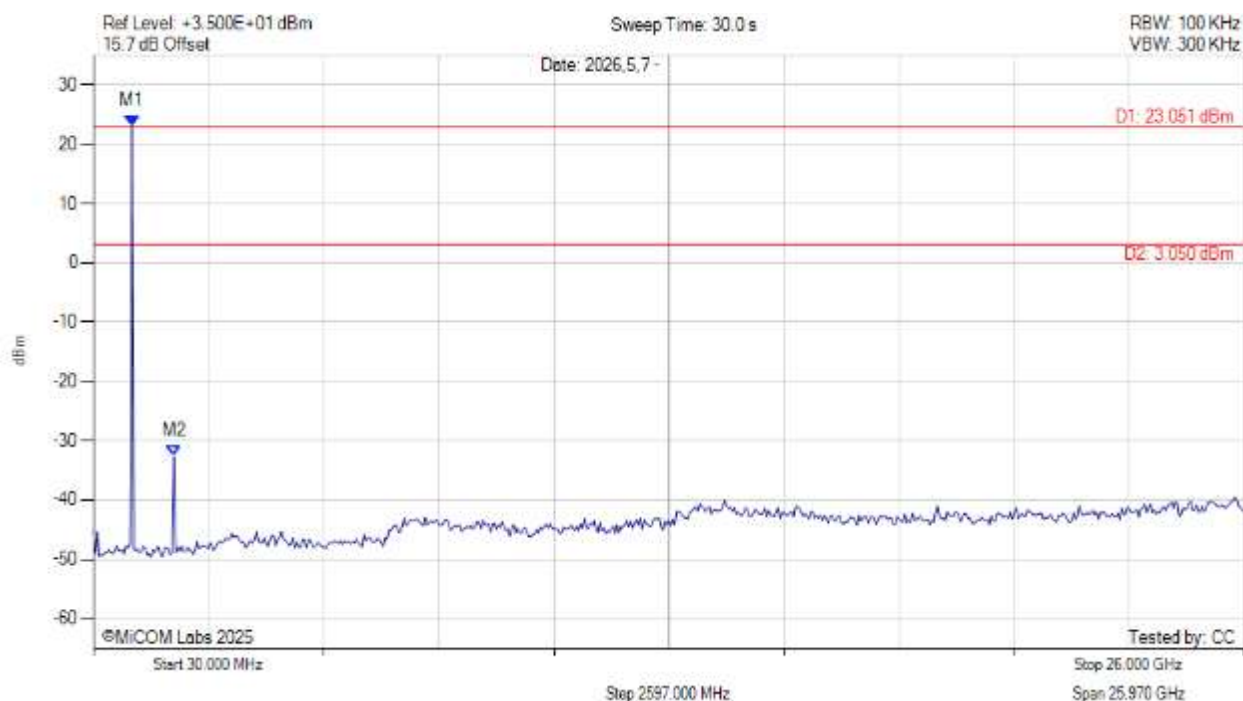
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.187 dBm M2 : 1800.000 MHz : -29.607 dBm	Channel Frequency: 902.40 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-200k-HP, Channel: 914.80 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



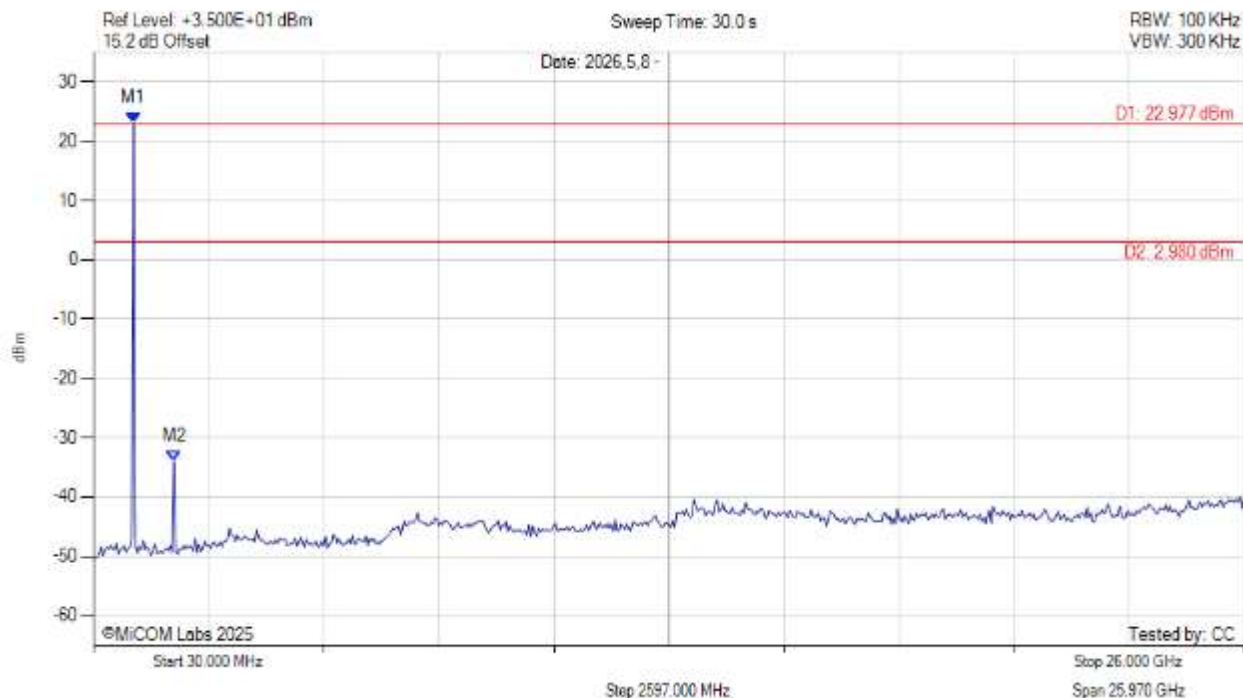
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.051 dBm M2 : 1850.000 MHz : -32.658 dBm	Channel Frequency: 914.80 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-200k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



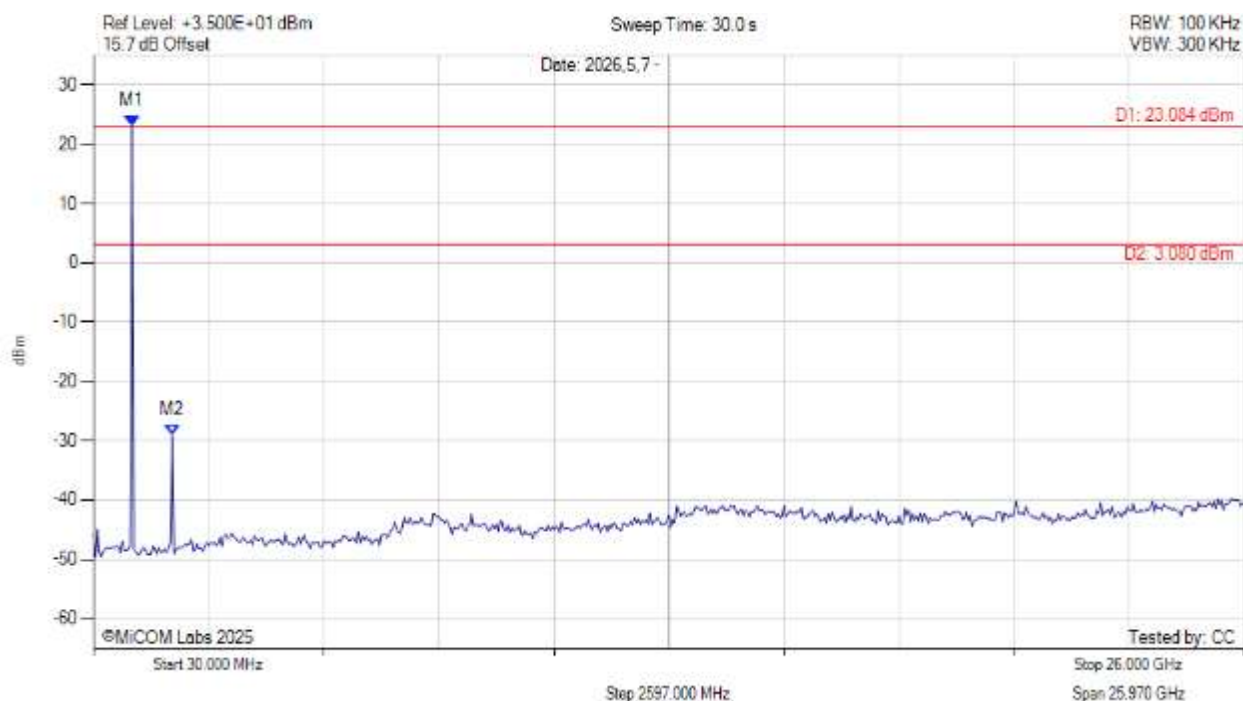
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 930.000 MHz : 22.977 dBm M2 : 1850.000 MHz : -34.030 dBm	Channel Frequency: 927.60 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-10k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



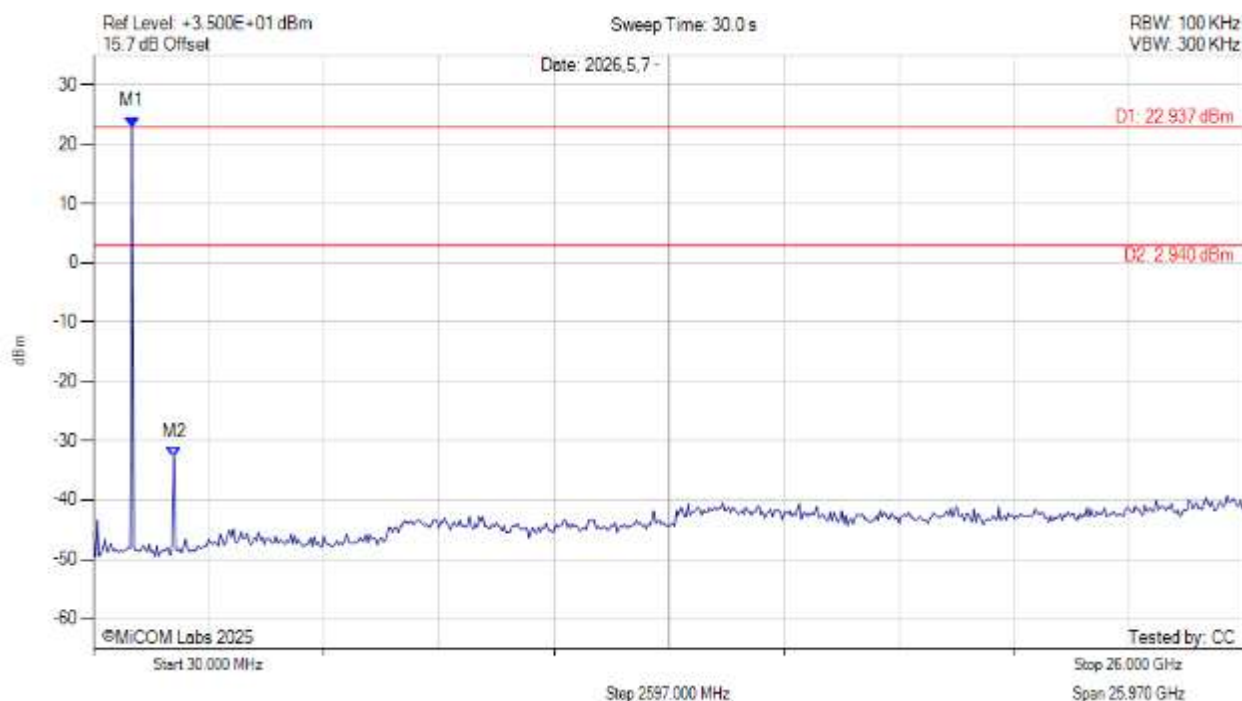
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.084 dBm M2 : 1800.000 MHz : -29.159 dBm	Channel Frequency: 902.50 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-10k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



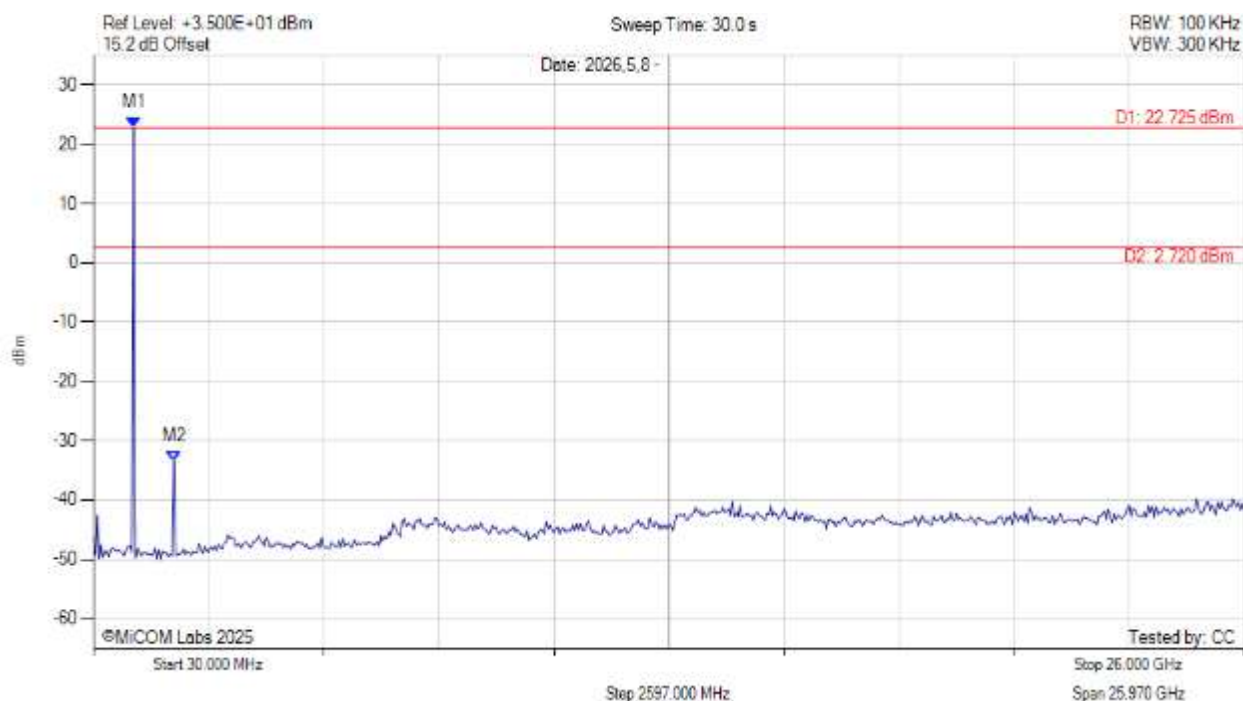
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 22.937 dBm M2 : 1850.000 MHz : -32.779 dBm	Channel Frequency: 915.00 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-10k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



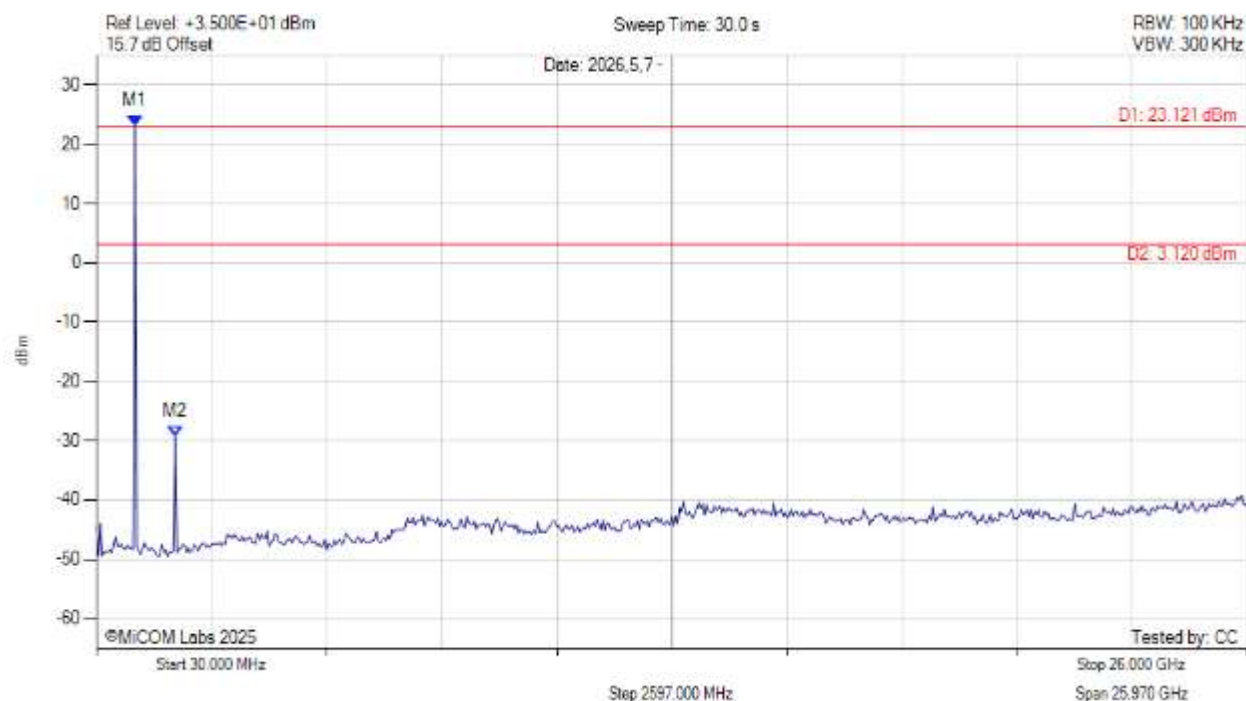
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 940.000 MHz : 22.725 dBm M2 : 1850.000 MHz : -33.409 dBm	Channel Frequency: 927.50 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-110k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



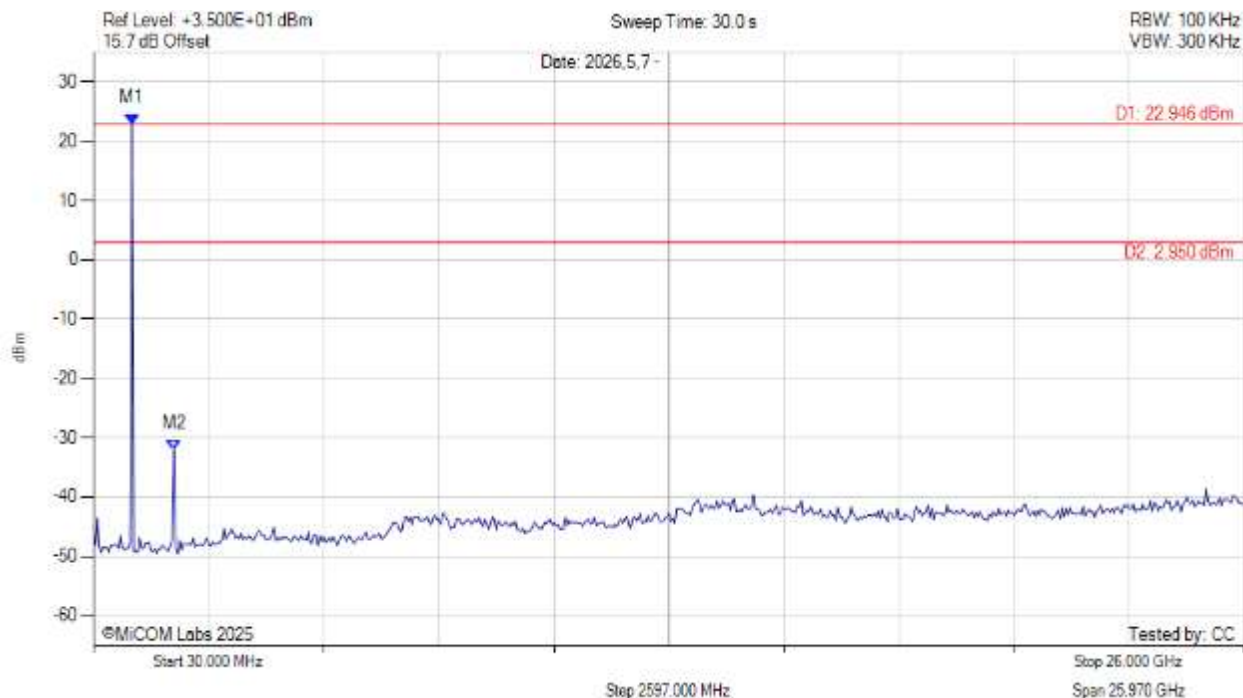
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.121 dBm M2 : 1800.000 MHz : -29.285 dBm	Channel Frequency: 902.50 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-110k-XR, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



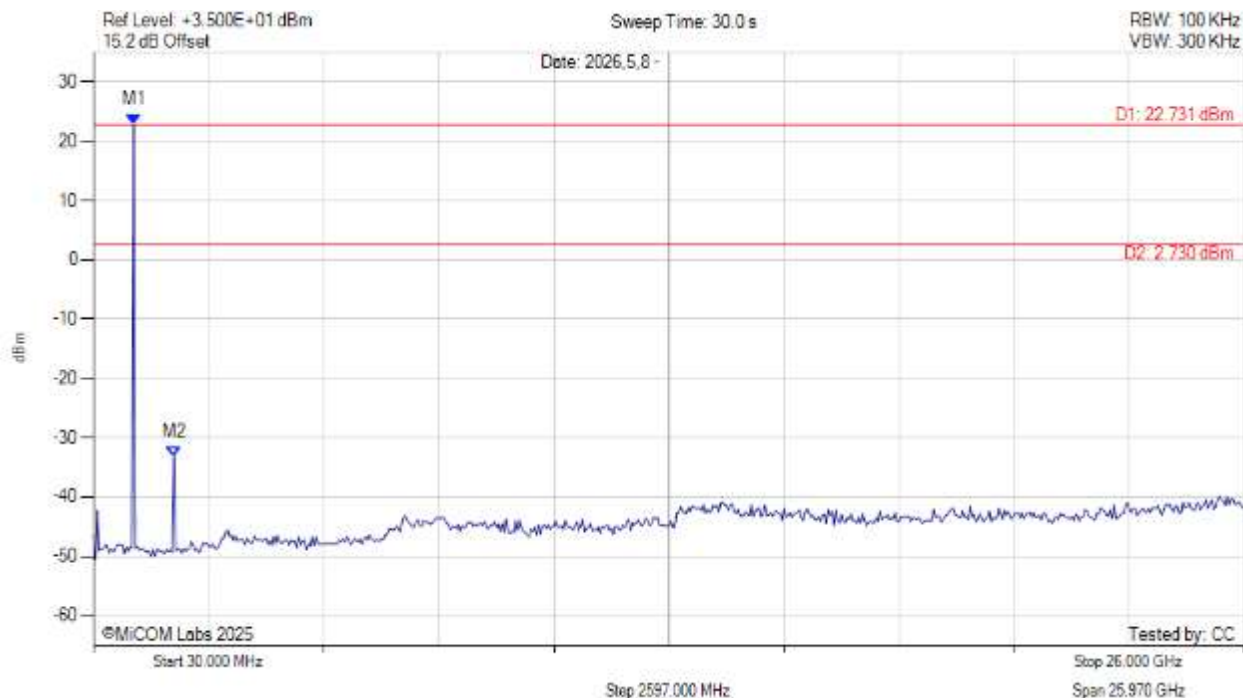
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 22.946 dBm M2 : 1850.000 MHz : -31.994 dBm	Channel Frequency: 915.00 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-110k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



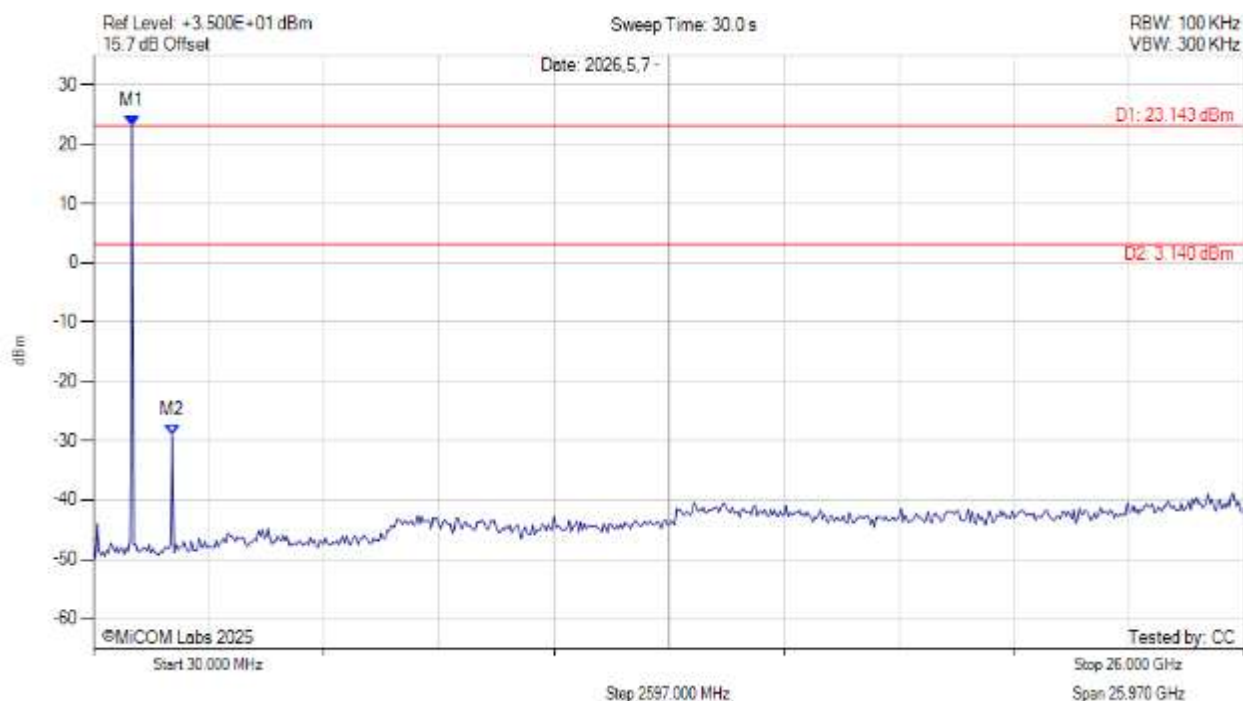
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 940.000 MHz : 22.731 dBm M2 : 1850.000 MHz : -33.250 dBm	Channel Frequency: 927.50 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-250k-XR, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



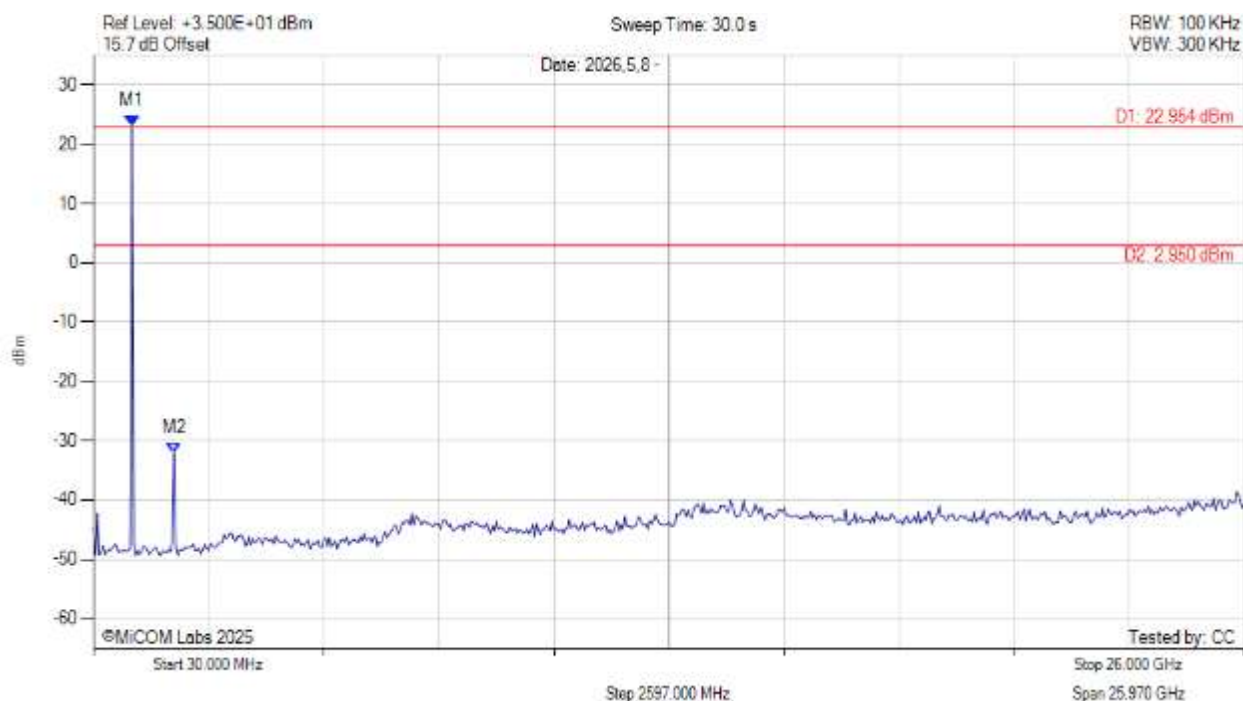
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 23.143 dBm M2 : 1800.000 MHz : -29.114 dBm	Channel Frequency: 902.75 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-250k-XR, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



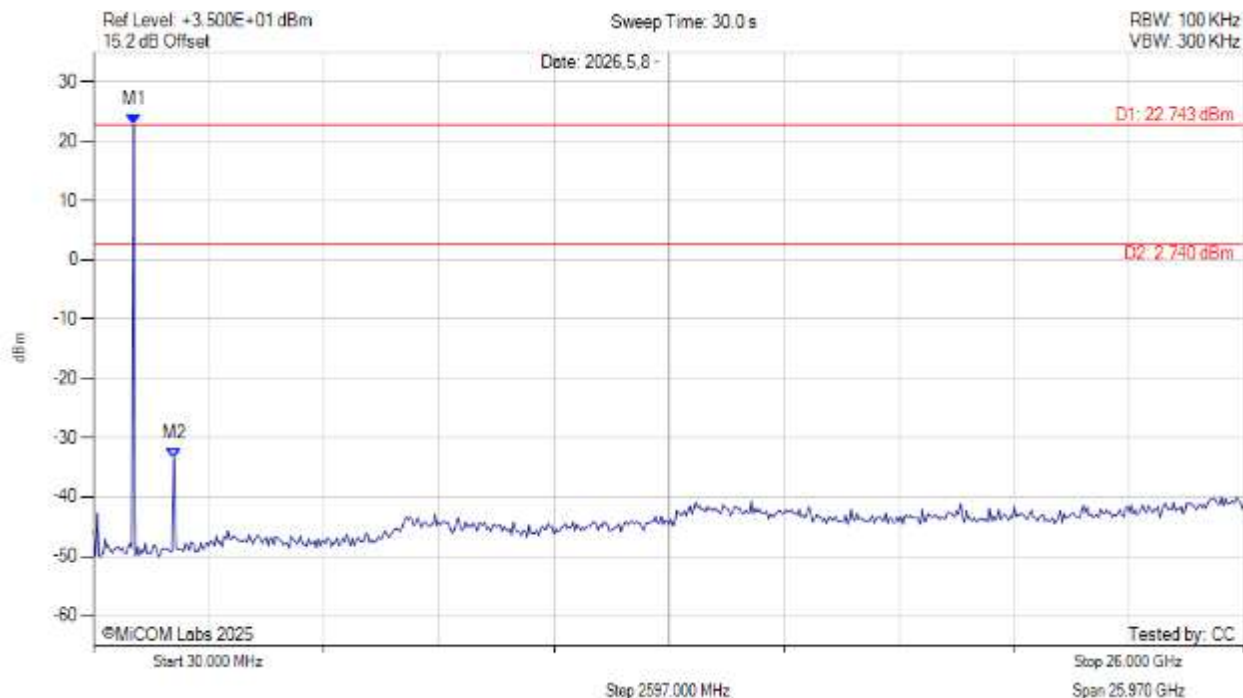
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 900.000 MHz : 22.954 dBm M2 : 1850.000 MHz : -32.074 dBm	Channel Frequency: 915.25 MHz

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UNWANTED EMISSIONS PEAK



Variant: FSK-250k-XR, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 940.000 MHz : 22.743 dBm M2 : 1850.000 MHz : -33.504 dBm	Channel Frequency: 927.25 MHz

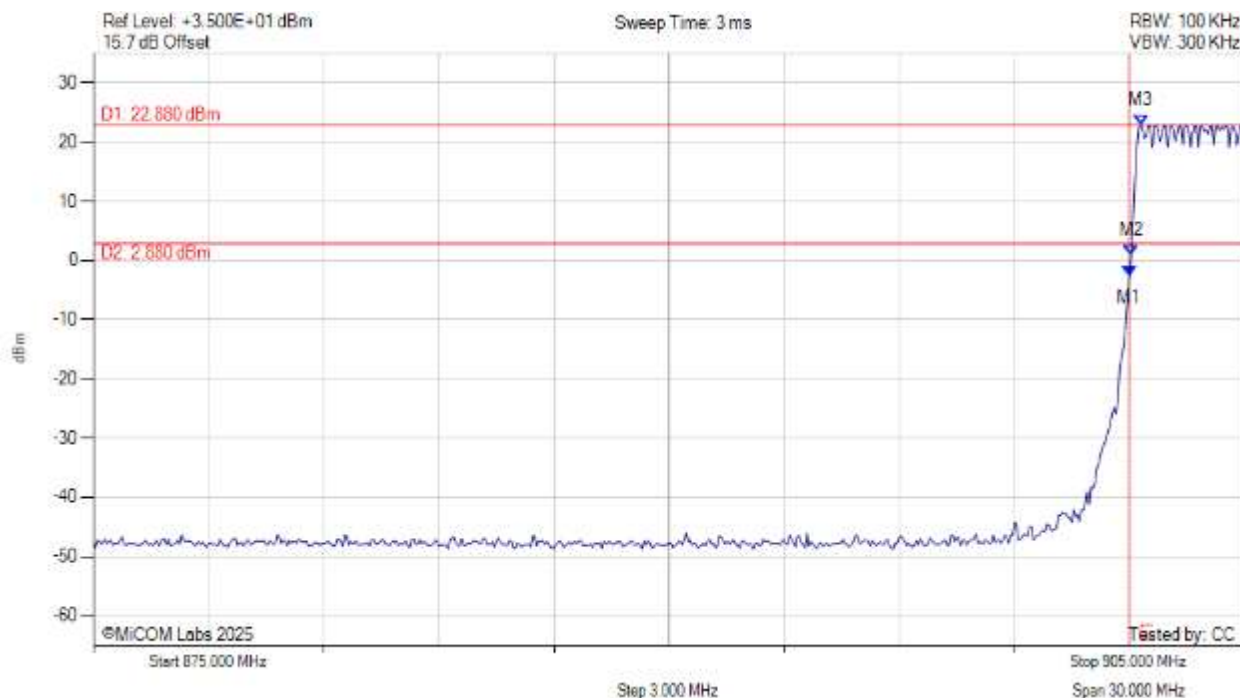
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A.3.1.2. Conducted Band-Edge Emissions

CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-10k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



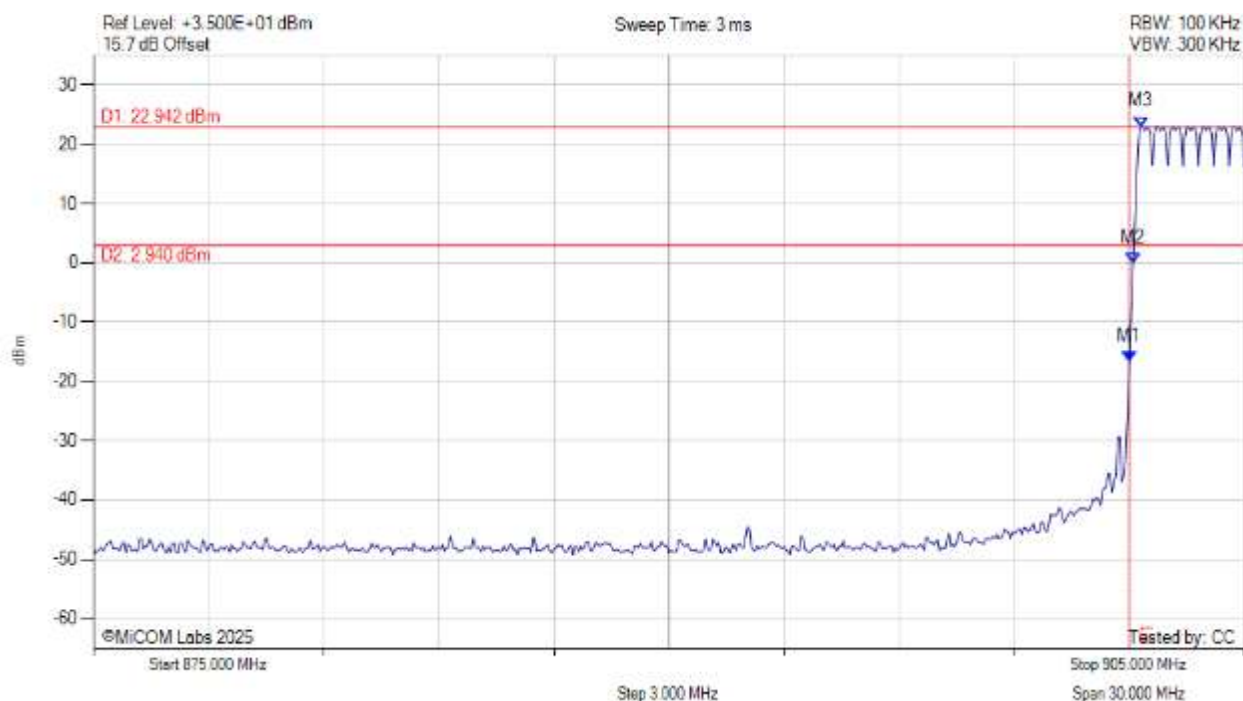
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -2.690 dBm M2 : 902.050 MHz : 0.924 dBm M3 : 902.300 MHz : 22.880 dBm	Channel Frequency: 902.40 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-200k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



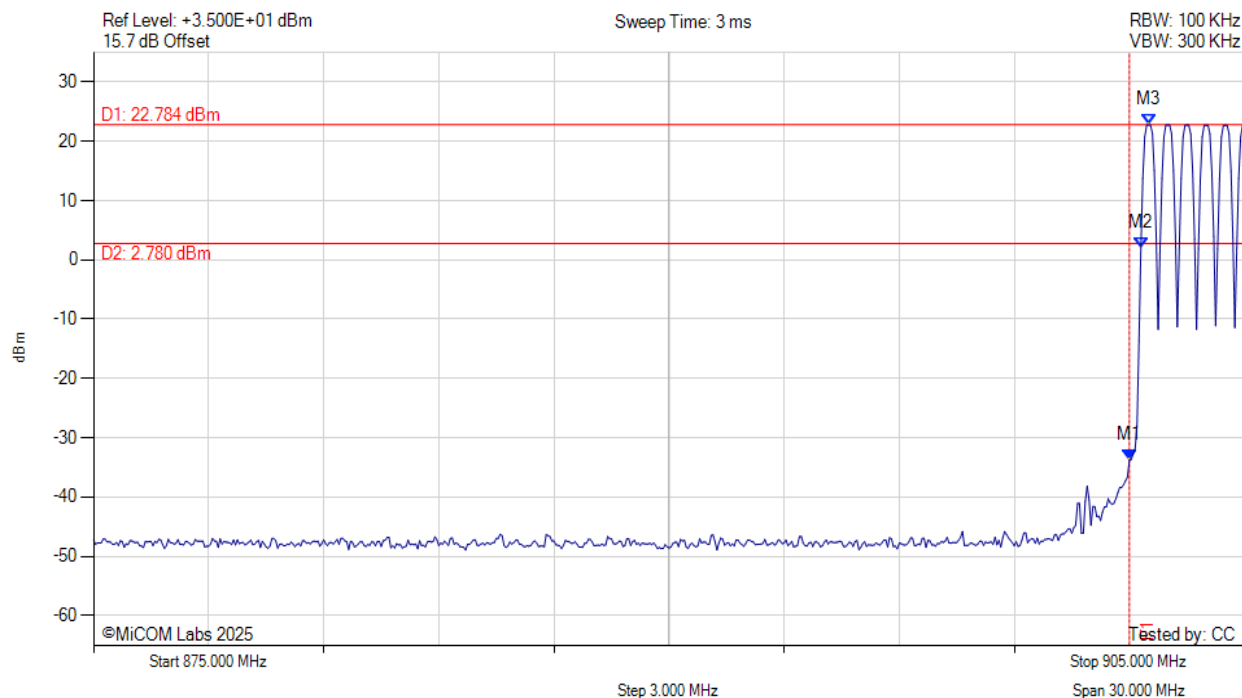
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -16.653 dBm M2 : 902.100 MHz : -0.134 dBm M3 : 902.300 MHz : 22.942 dBm	Channel Frequency: 902.40 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-10k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



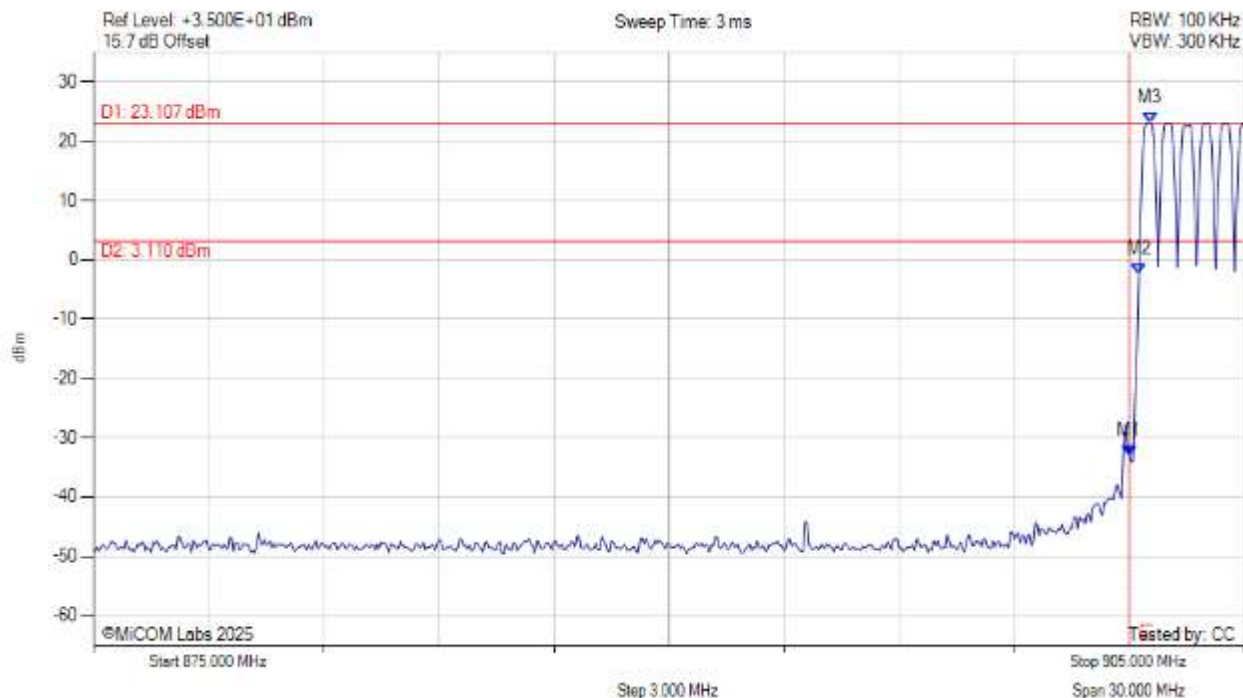
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -33.804 dBm M2 : 902.300 MHz : 2.050 dBm M3 : 902.500 MHz : 22.784 dBm	Channel Frequency: 902.50 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-110k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



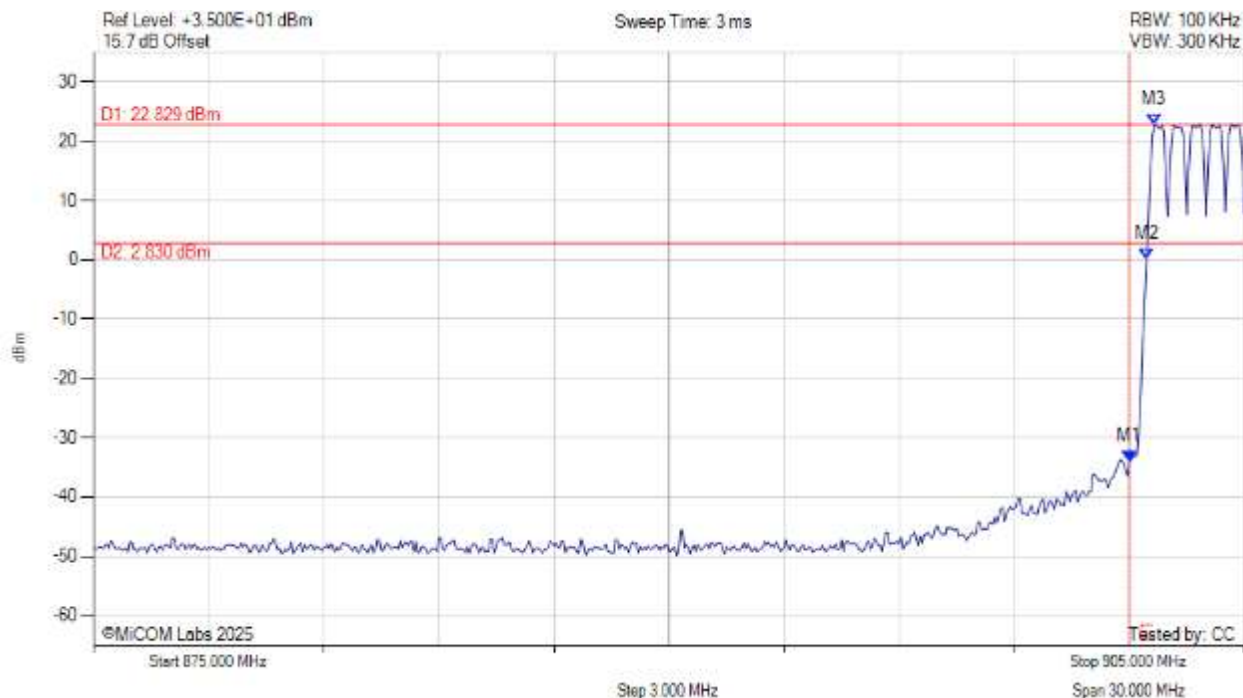
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -33.036 dBm M2 : 902.250 MHz : -2.447 dBm M3 : 902.550 MHz : 23.107 dBm	Channel Frequency: 902.50 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-250k-XR, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



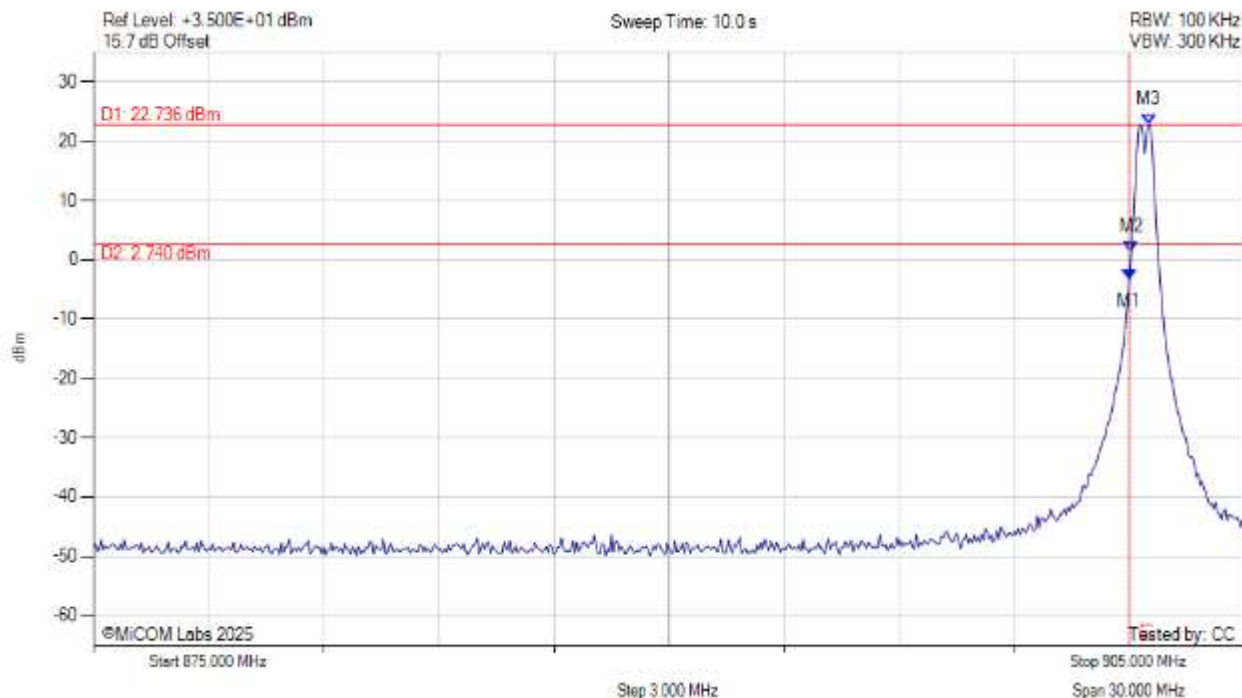
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -33.870 dBm M2 : 902.450 MHz : 0.123 dBm M3 : 902.650 MHz : 22.829 dBm	Channel Frequency: 902.75 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-10k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



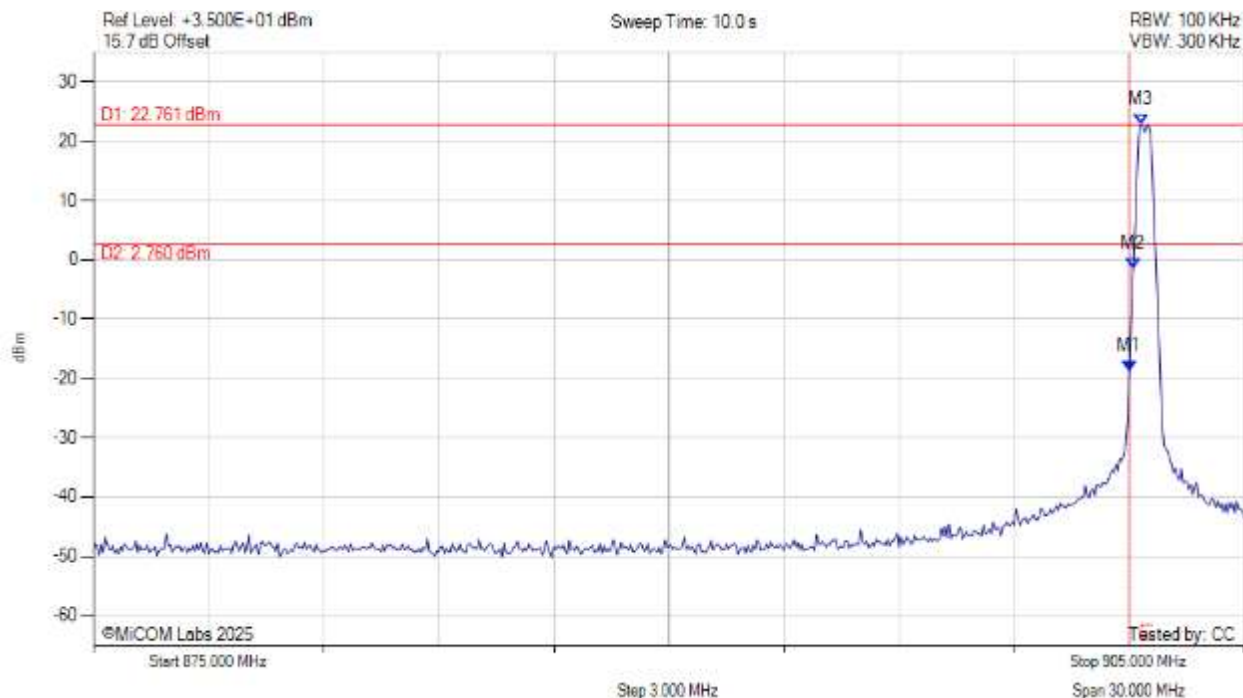
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -3.338 dBm M2 : 902.050 MHz : 1.272 dBm M3 : 902.500 MHz : 22.781 dBm	Channel Frequency: 902.40 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-200k-HP, Channel: 902.40 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



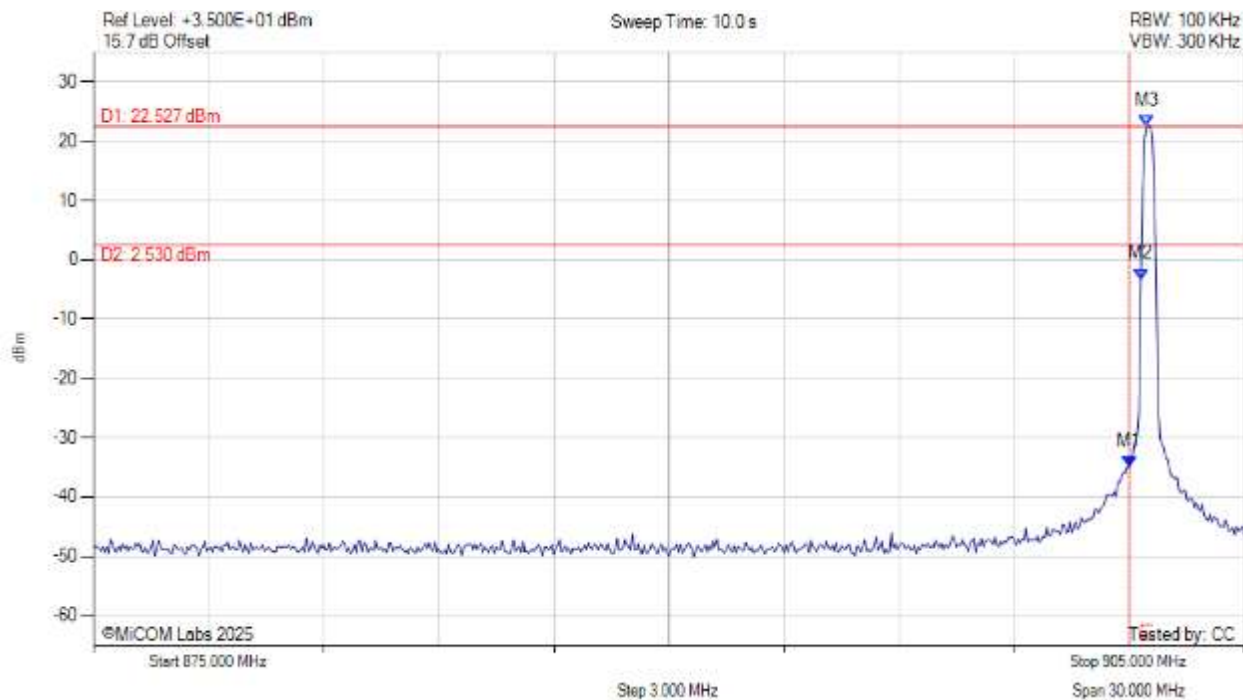
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -18.774 dBm M2 : 902.100 MHz : -1.547 dBm M3 : 902.300 MHz : 22.761 dBm	Channel Frequency: 902.40 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-10k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



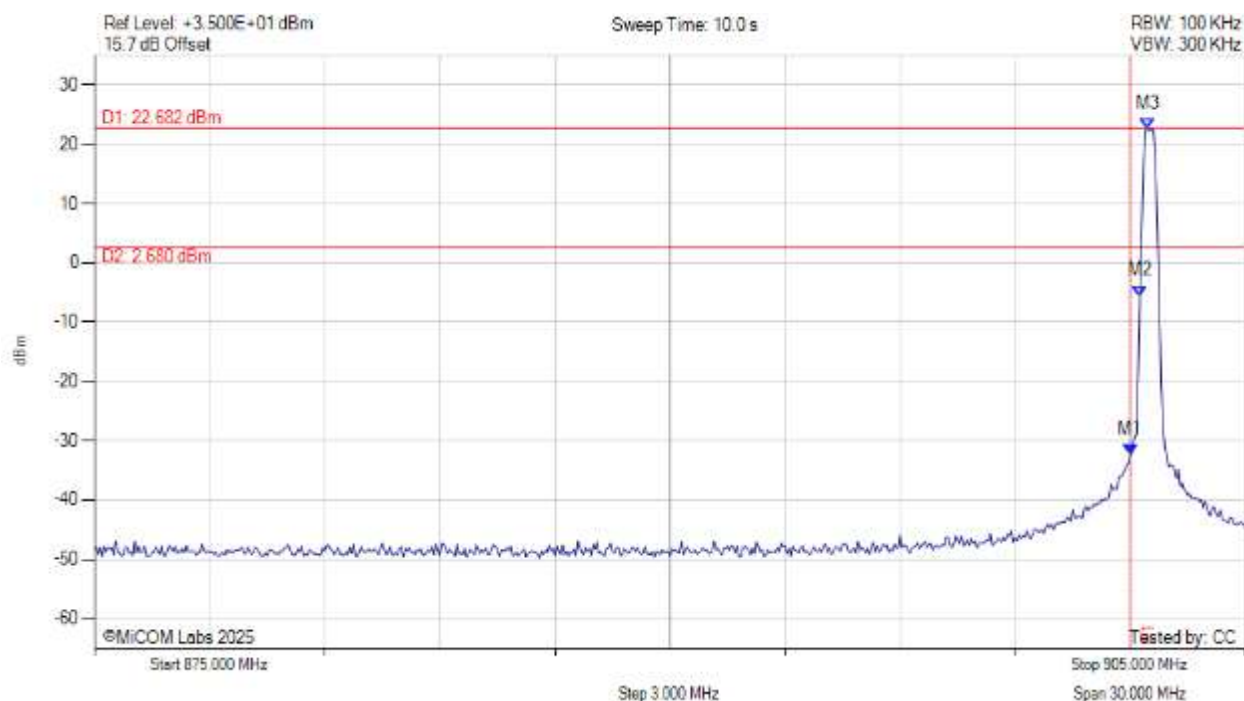
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -34.983 dBm M2 : 902.300 MHz : -3.240 dBm M3 : 902.450 MHz : 22.527 dBm	Channel Frequency: 902.50 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-110k-XR, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



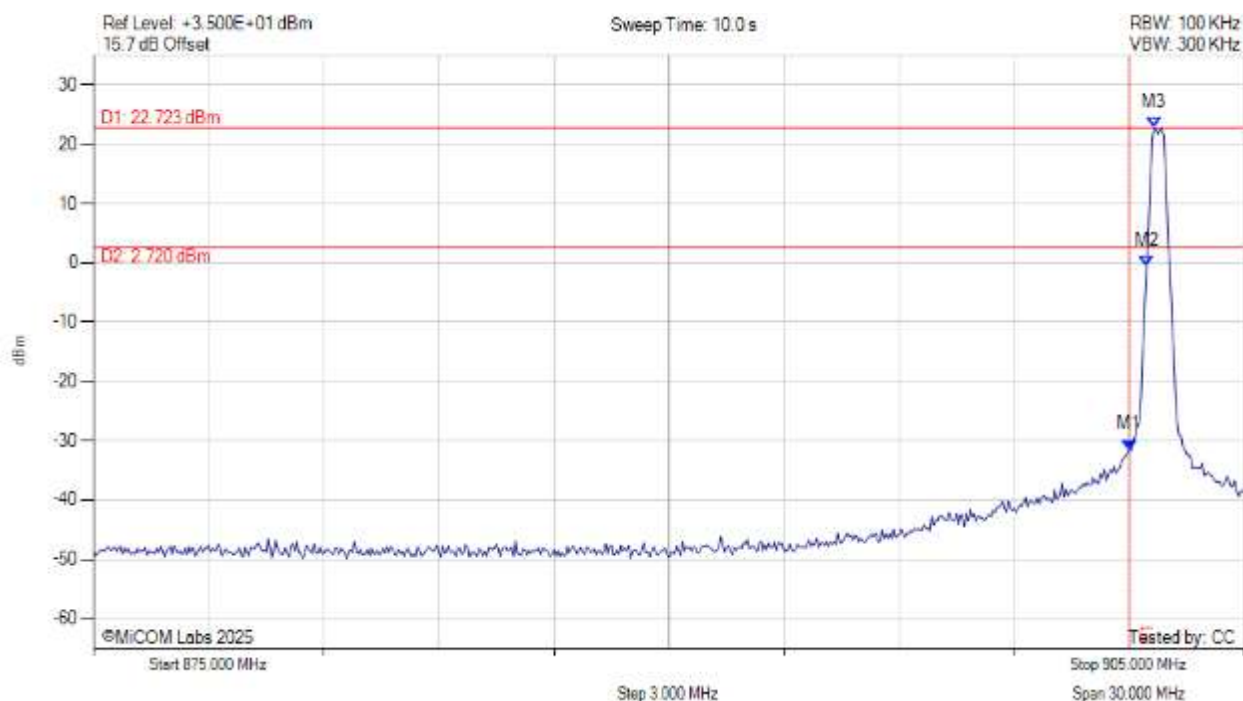
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -32.400 dBm M2 : 902.250 MHz : -5.564 dBm M3 : 902.450 MHz : 22.682 dBm	Channel Frequency: 902.50 MHz

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CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-250k-XR, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



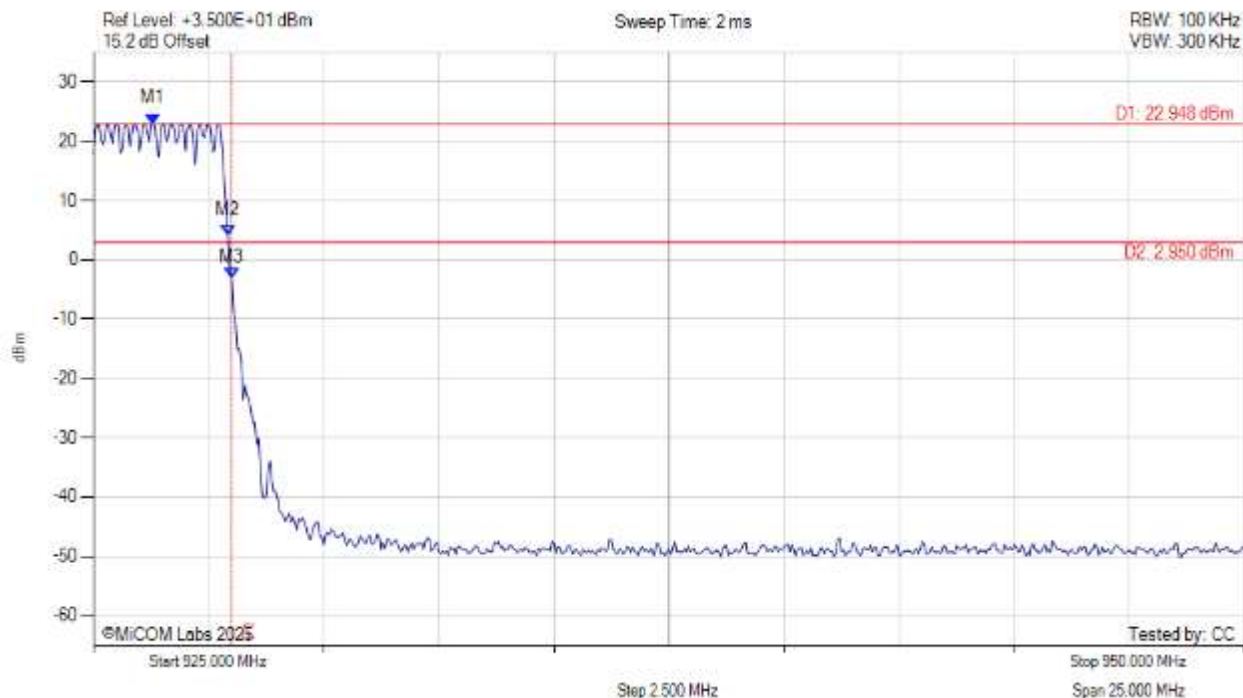
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -31.511 dBm M2 : 902.450 MHz : -0.578 dBm M3 : 902.650 MHz : 22.723 dBm	Channel Frequency: 902.75 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-10k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



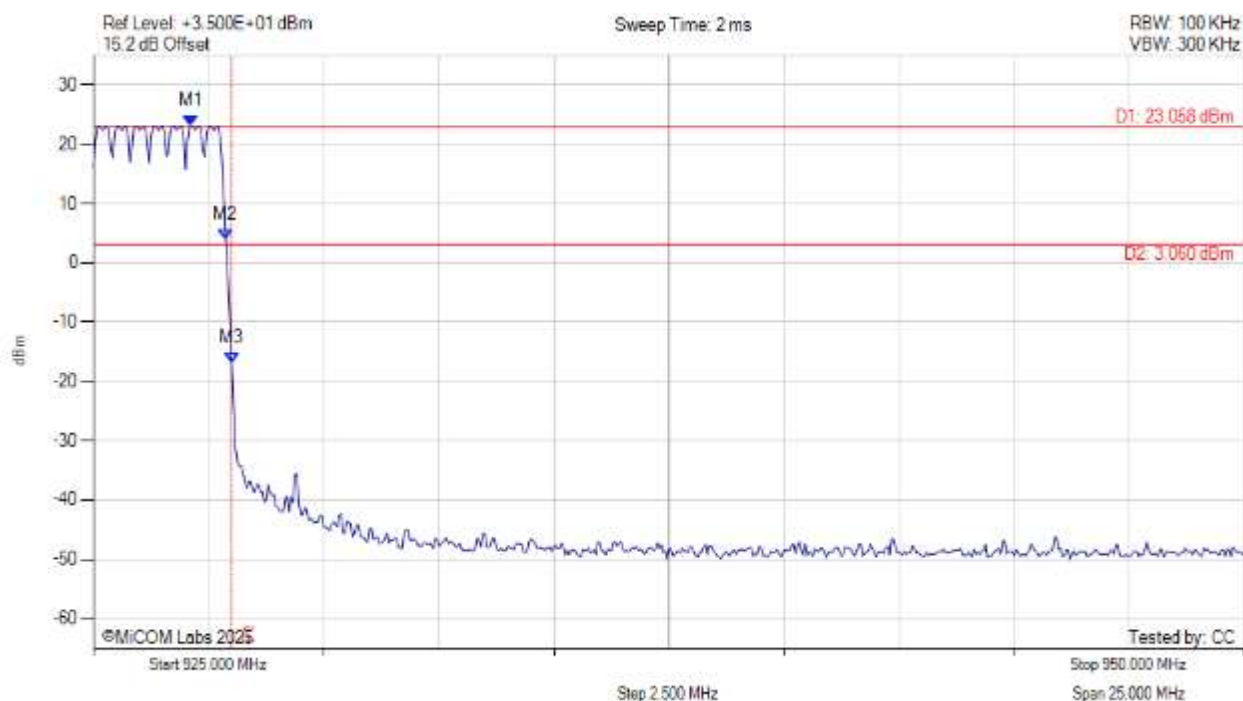
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 926.290 MHz : 22.948 dBm M2 : 927.920 MHz : 4.023 dBm M3 : 928.000 MHz : -3.070 dBm	Channel Frequency: 927.60 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-200k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



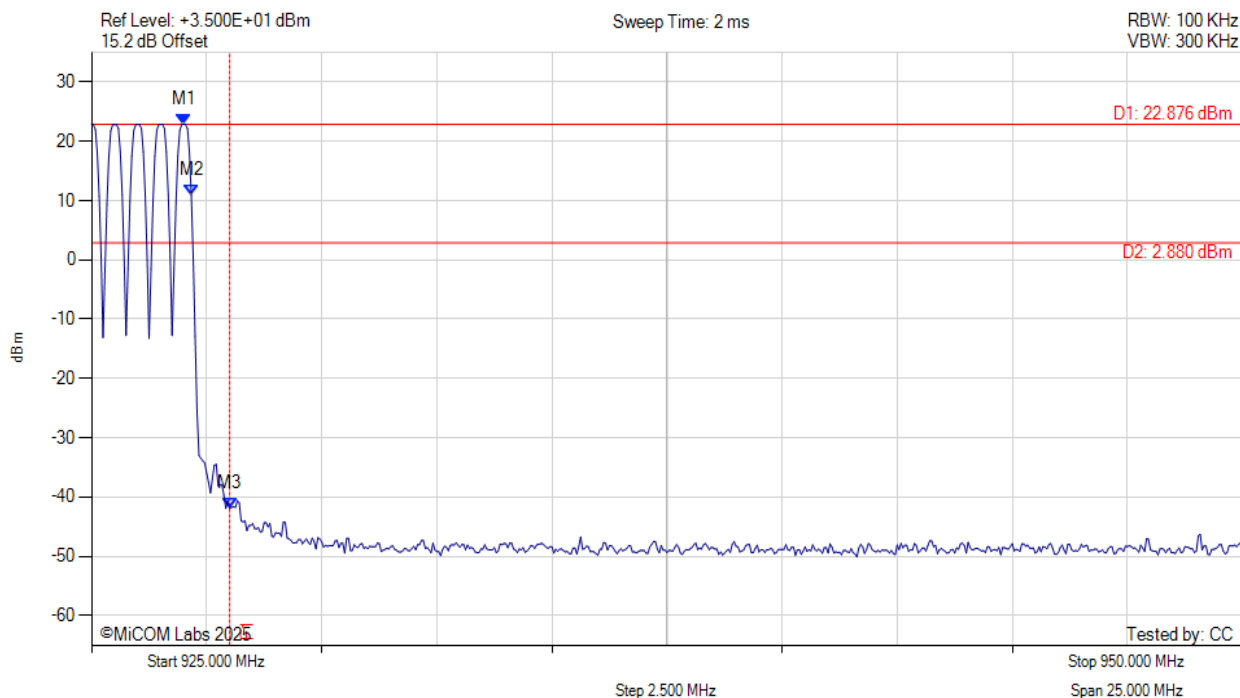
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.120 MHz : 23.058 dBm M2 : 927.870 MHz : 3.794 dBm M3 : 928.000 MHz : -16.921 dBm	Channel Frequency: 927.60 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-10k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



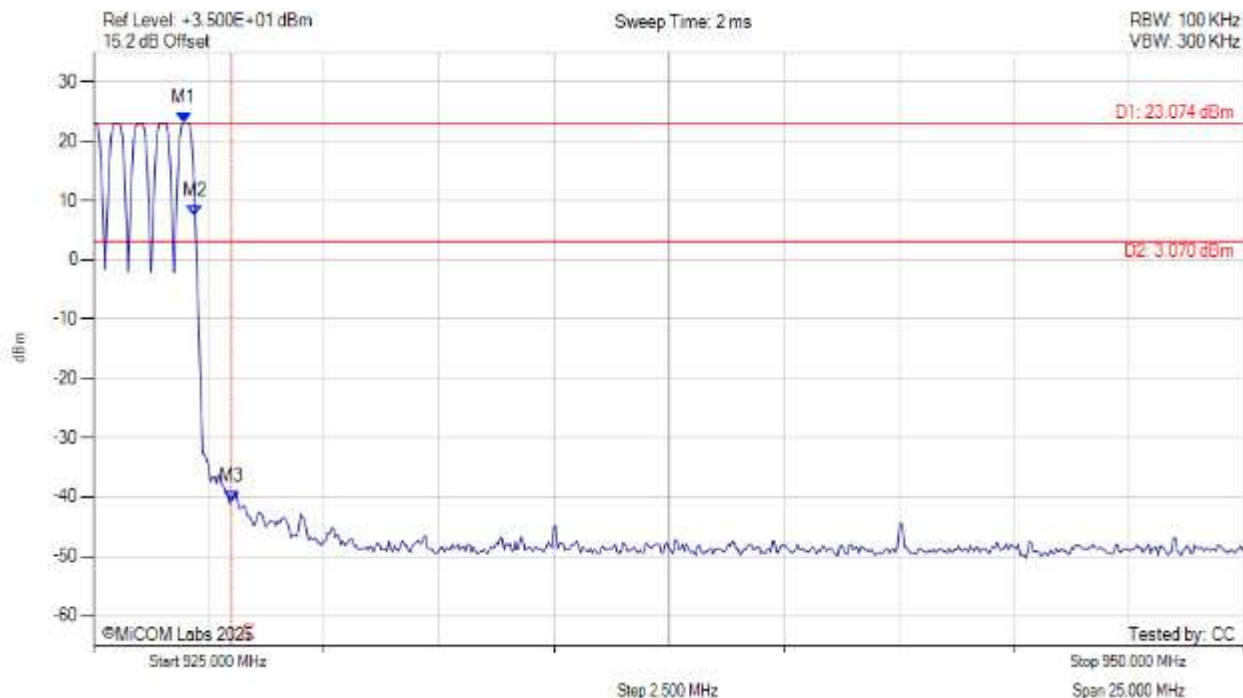
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.000 MHz : 22.876 dBm M2 : 927.170 MHz : 10.859 dBm M3 : 928.000 MHz : -41.830 dBm	Channel Frequency: 927.50 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-110k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



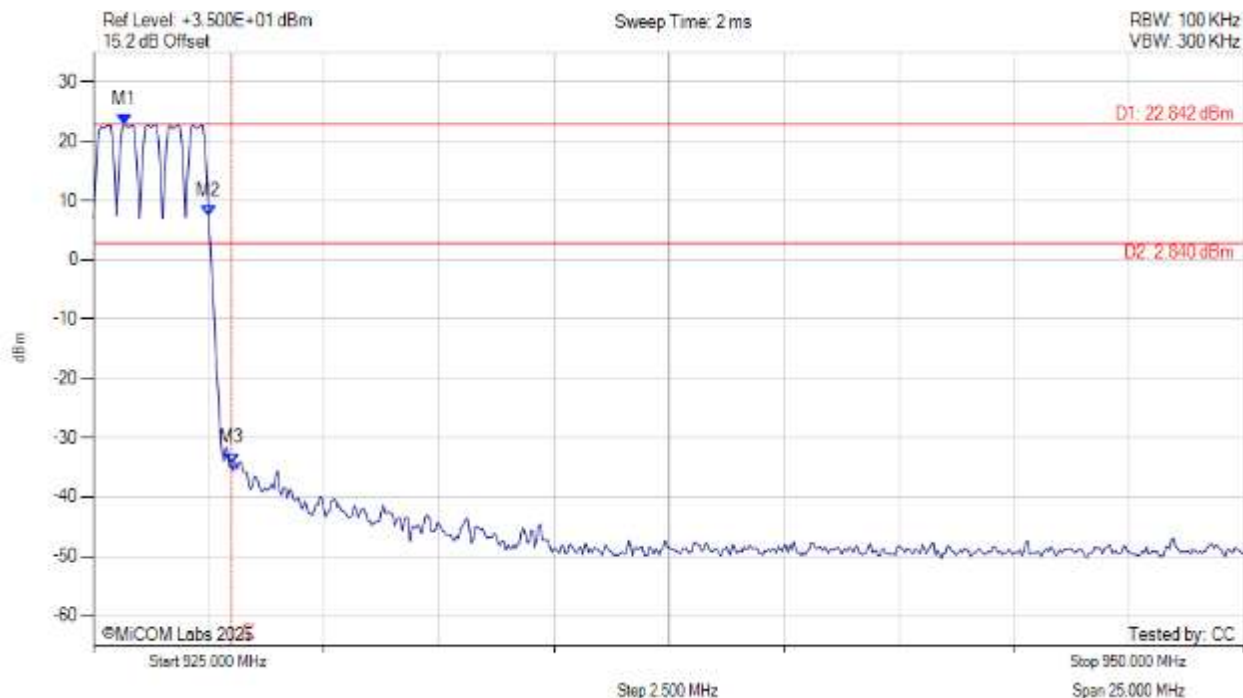
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 926.960 MHz : 23.074 dBm M2 : 927.210 MHz : 7.292 dBm M3 : 928.000 MHz : -40.688 dBm	Channel Frequency: 927.50 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK



Variant: FSK-250k-XR, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



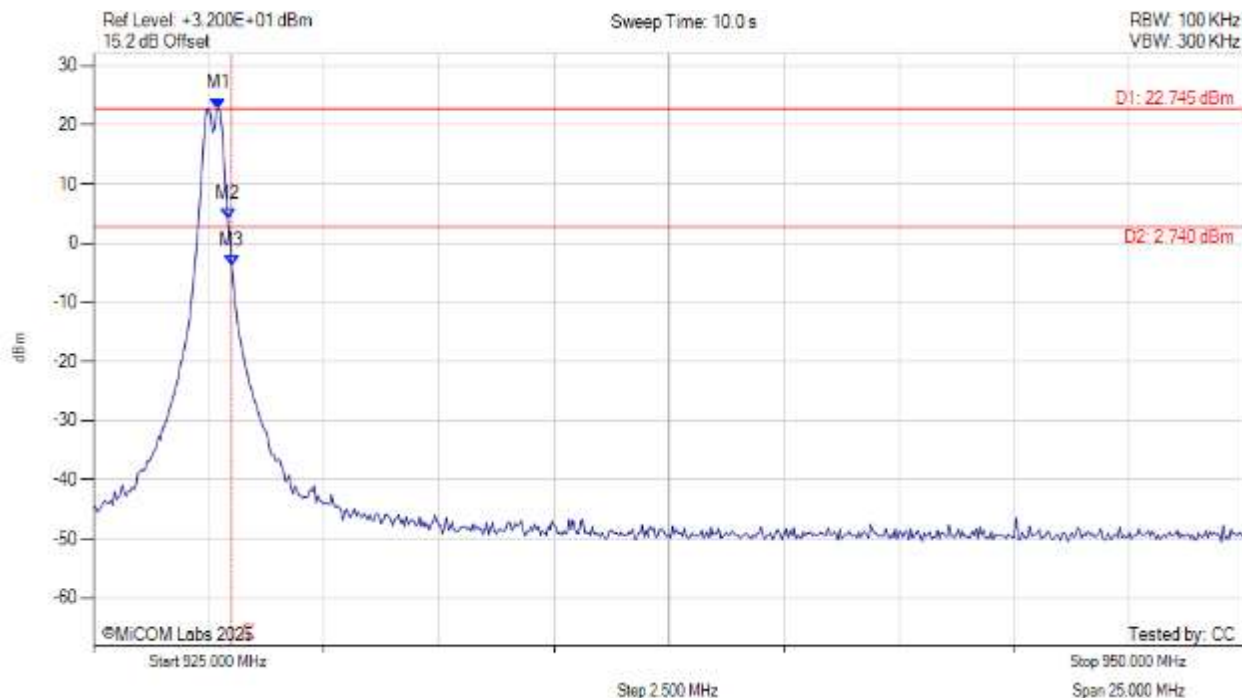
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 925.670 MHz : 22.842 dBm M2 : 927.500 MHz : 7.356 dBm M3 : 928.000 MHz : -34.327 dBm	Channel Frequency: 927.25 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-10k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



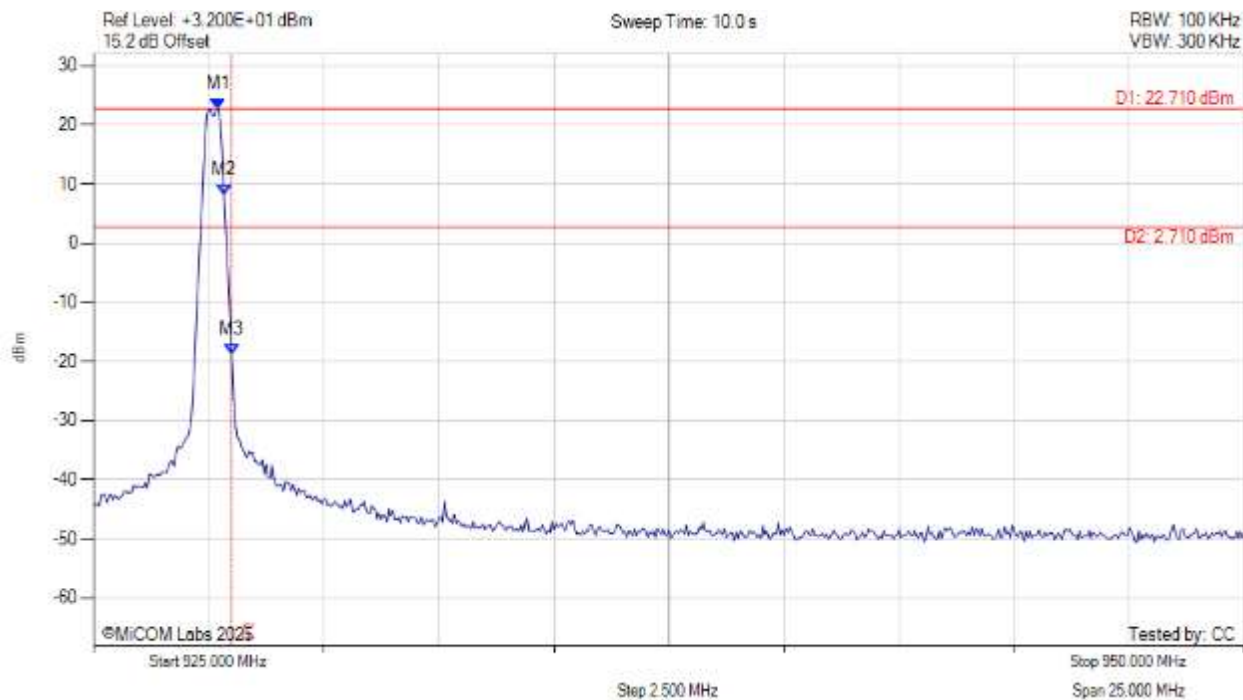
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.710 MHz : 22.745 dBm M2 : 927.920 MHz : 4.166 dBm M3 : 928.000 MHz : -3.798 dBm	Channel Frequency: 927.60 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-200k-HP, Channel: 927.60 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



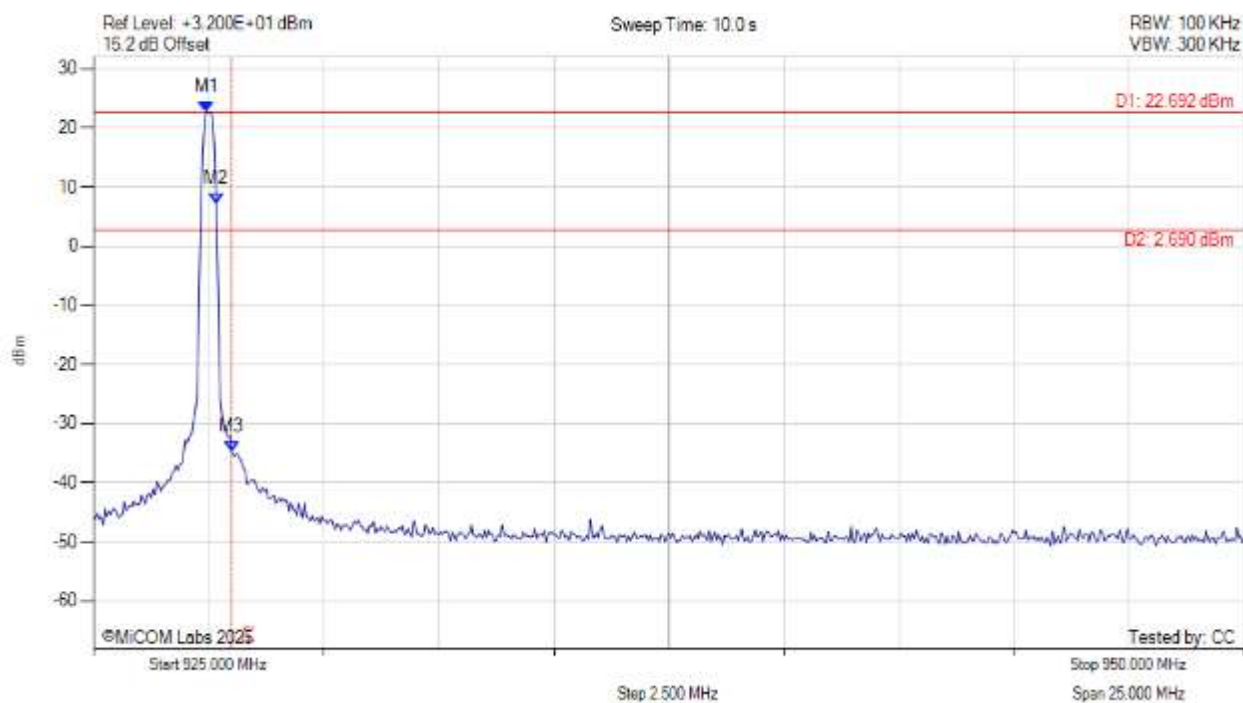
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.710 MHz : 22.710 dBm M2 : 927.830 MHz : 7.993 dBm M3 : 928.000 MHz : -18.952 dBm	Channel Frequency: 927.60 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-10k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



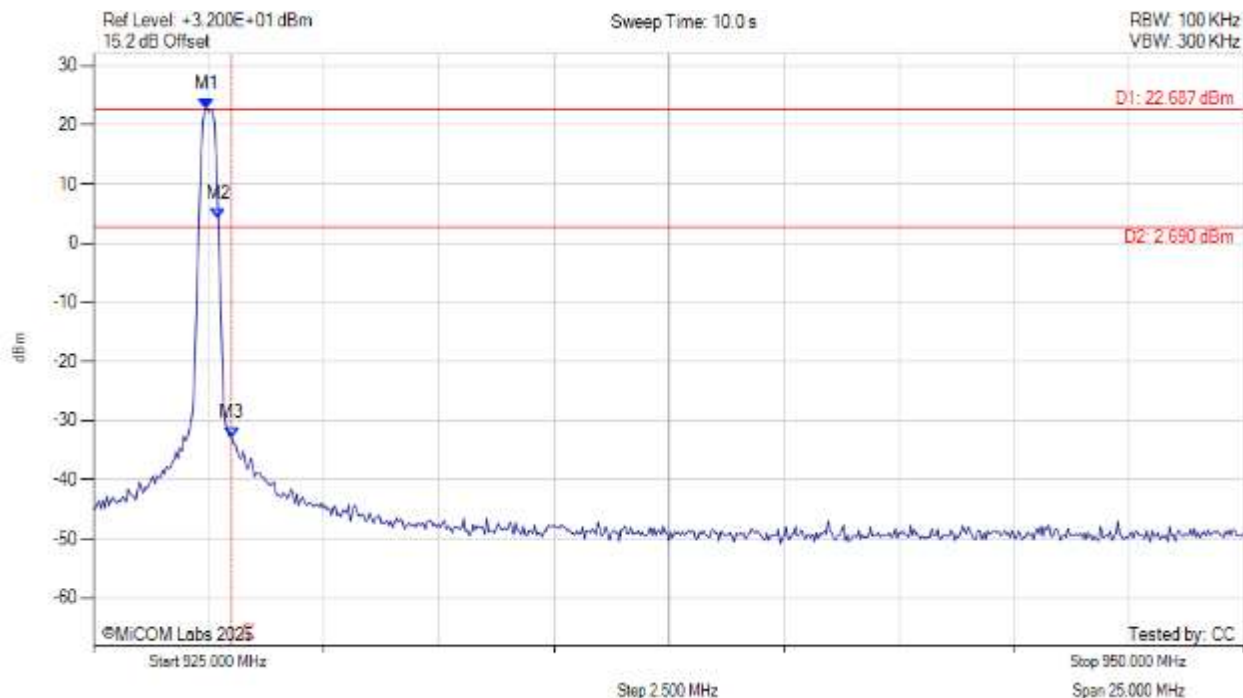
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.460 MHz : 22.692 dBm M2 : 927.670 MHz : 7.061 dBm M3 : 928.000 MHz : -34.806 dBm	Channel Frequency: 927.50 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-110k-XR, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



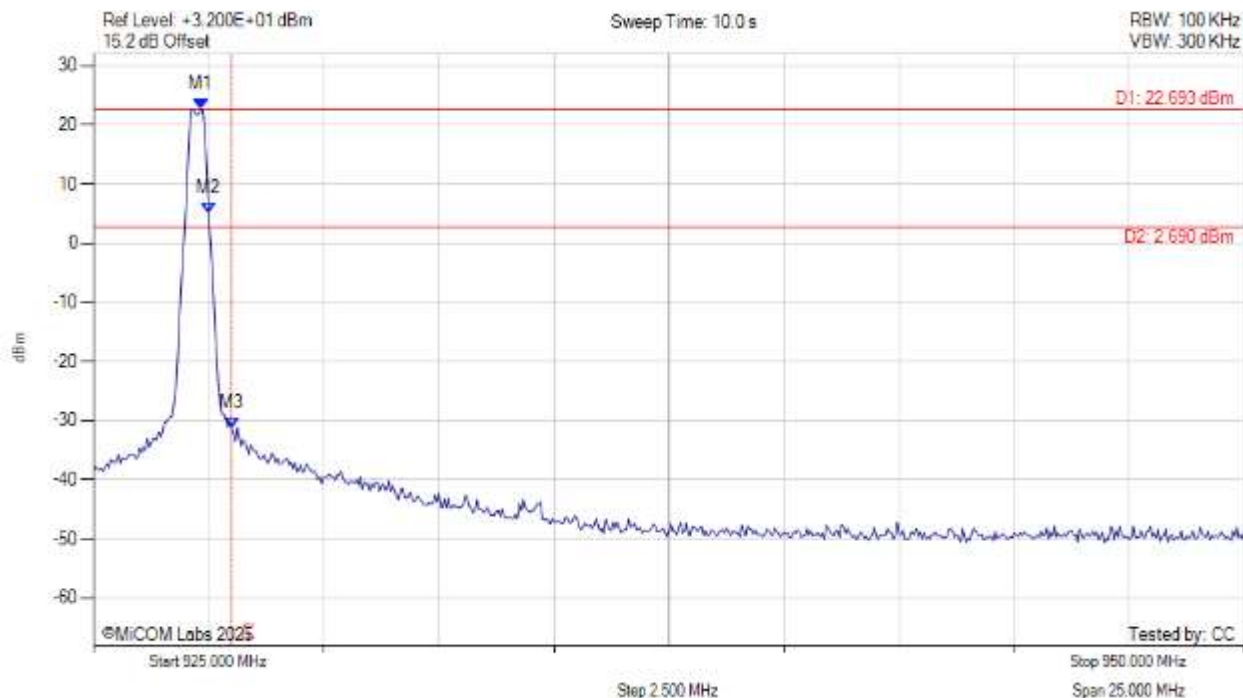
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.460 MHz : 22.687 dBm M2 : 927.710 MHz : 4.088 dBm M3 : 928.000 MHz : -32.889 dBm	Channel Frequency: 927.50 MHz

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CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK



Variant: FSK-250k-XR, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.330 MHz : 22.693 dBm M2 : 927.500 MHz : 5.139 dBm M3 : 928.000 MHz : -31.271 dBm	Channel Frequency: 927.25 MHz

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A.3.2. Radiated Emissions

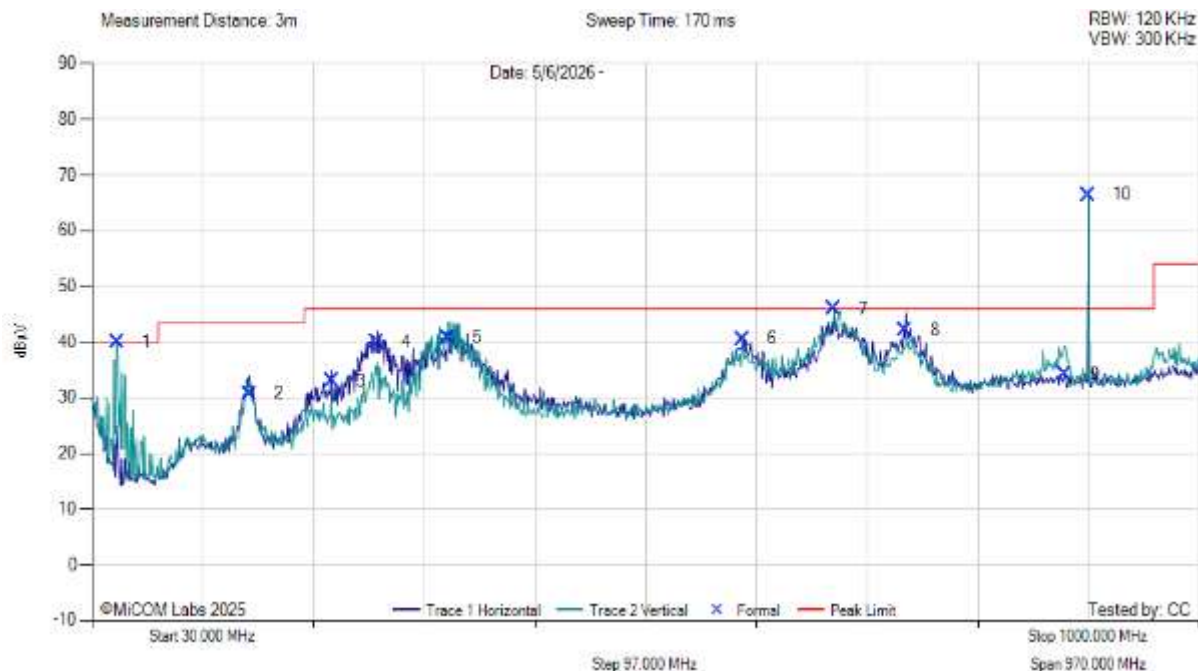
A.3.2.1. TX Spurious & Restricted Band Emissions (30MHz – 1 GHz)

A.4.2.1.1 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX Low)



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Dipole A09-HASM-675



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.25	53.59	4.12	-17.75	39.96	MaxQP	Vertical	100	89	40.0	-0.04	Pass
2	168.07	40.02	4.63	-13.92	30.73	MaxQP	Horizontal	199	151	43.5	-12.8	Pass
3	240.00	41.78	4.94	-13.73	32.99	MaxQP	Horizontal	193	235	46.0	-13.0	Pass
4	280.01	46.85	5.11	-11.91	40.04	MaxQP	Horizontal	104	237	46.0	-6.0	Pass
5	341.67	46.71	5.32	-11.21	40.81	MaxQP	Vertical	110	207	46.0	-5.2	Pass
6	599.98	40.75	6.24	-6.45	40.55	MaxQP	Horizontal	135	150	46.0	-5.5	Pass
7	680.00	44.67	6.58	-5.21	46.04	NRB	Vertical	96	265	--	--	Pass
8	742.38	39.46	6.80	-4.18	42.08	MaxQP	Horizontal	100	235	46.0	-3.9	Pass
9	882.46	29.70	7.33	-2.84	34.20	MaxQP	Vertical	108	151	46.0	-11.8	Pass
10	903.00	61.47	7.42	-2.45	66.44	Fundamental	Vertical	199	179	--	--	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant (XBP-HPX-UT-001), Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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A.4.2.1.2 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX Mid)



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.80 MHz, Antenna: Dipole A09-HASM-675



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.24	53.08	4.12	-17.75	39.46	MaxQP	Vertical	98	24	40.0	-0.5	Pass
2	167.68	36.87	4.64	-13.90	27.61	MaxQP	Horizontal	180	120	43.5	-15.9	Pass
3	272.97	45.57	5.06	-11.96	38.67	MaxQP	Horizontal	111	113	46.0	-7.3	Pass
4	339.25	47.04	5.33	-11.28	41.09	MaxQP	Vertical	100	175	46.0	-4.9	Pass
5	599.97	40.62	6.24	-6.45	40.41	MaxQP	Horizontal	130	225	46.0	-5.6	Pass
6	695.08	38.22	6.63	-4.83	40.02	MaxQP	Vertical	155	238	46.0	-6.0	Pass
7	757.36	32.37	6.88	-4.29	34.95	MaxQP	Horizontal	96	234	46.0	-11.0	Pass
8	881.04	29.05	7.33	-2.80	33.58	MaxQP	Vertical	111	169	46.0	-12.4	Pass
9	915.61	57.60	7.46	-2.30	62.76	Fundamental	Vertical	100	89	--	--	Pass
10	994.83	30.48	7.56	-1.44	36.60	MaxQP	Vertical	108	34	54.0	-17.4	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

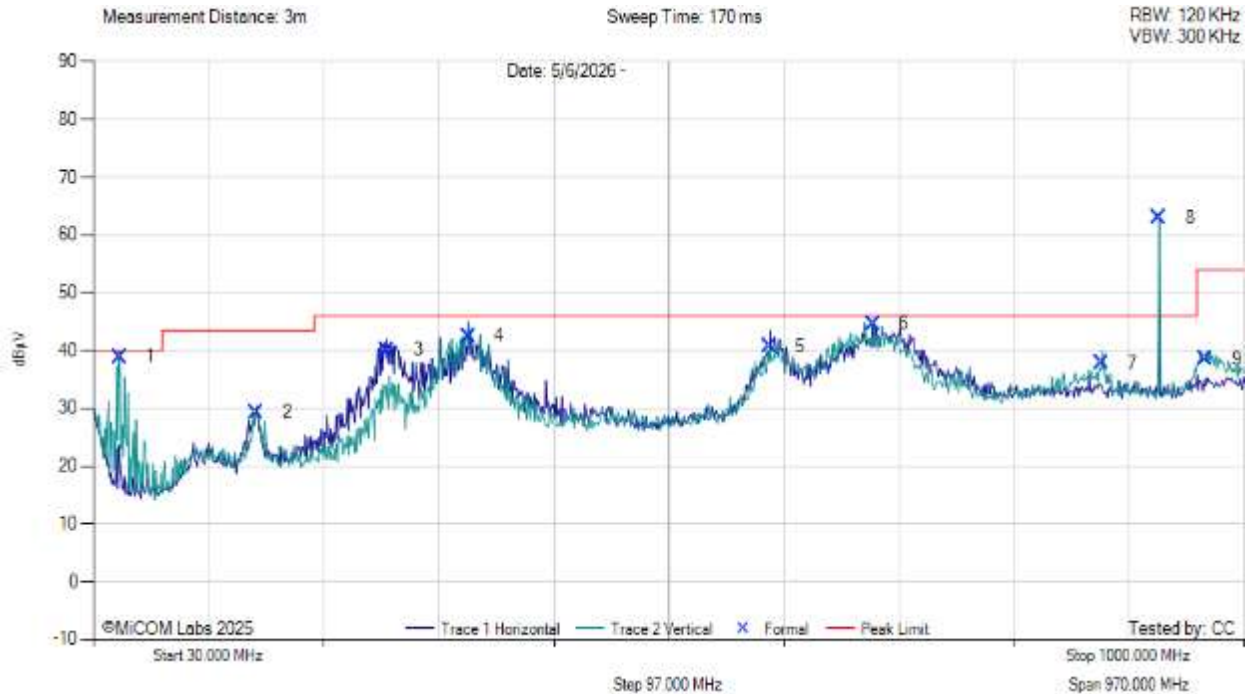
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A.4.2.1.3 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX High)



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.60 MHz, Antenna: Dipole A09-HASM-675

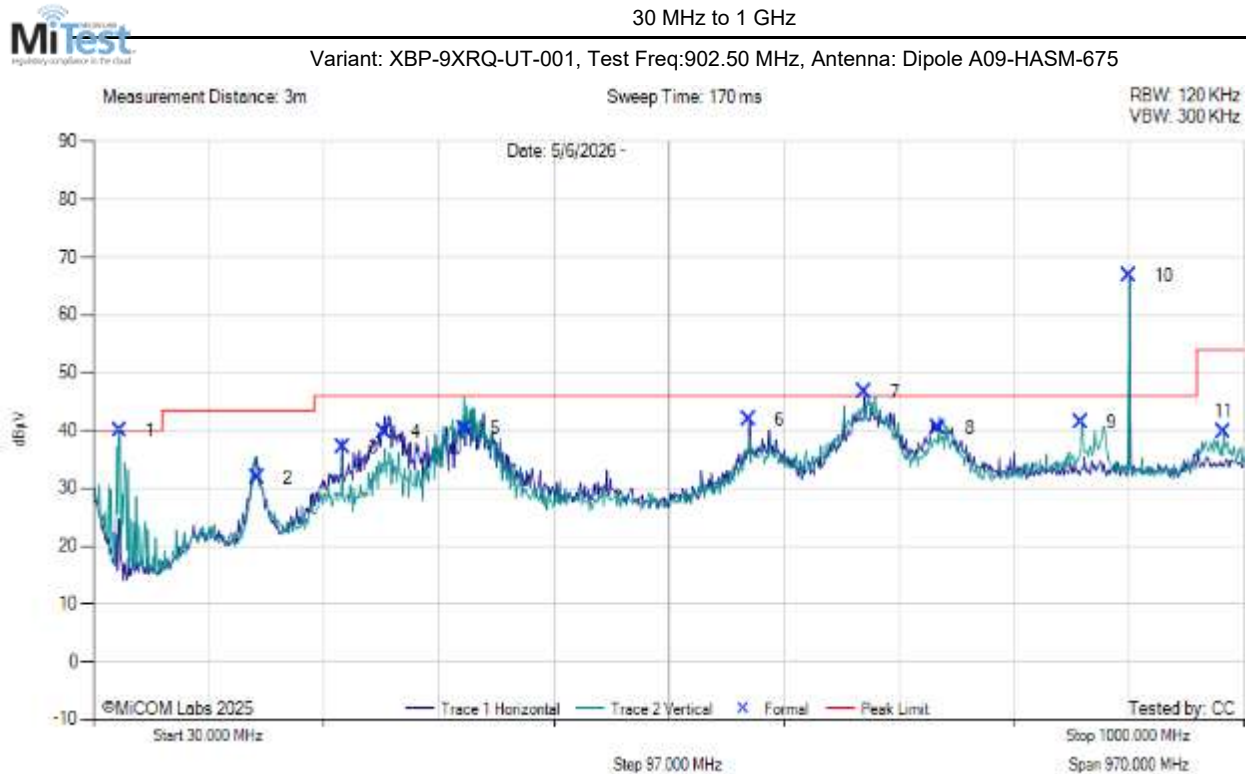


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.23	52.57	4.12	-17.75	38.95	MaxQP	Vertical	98	239	40.0	-1.1	Pass
2	167.63	38.56	4.64	-13.90	29.31	MaxQP	Horizontal	152	308	43.5	-14.2	Pass
3	277.87	46.89	5.08	-11.90	40.07	MaxQP	Horizontal	106	105	46.0	-5.9	Pass
4	346.38	48.14	5.35	-11.03	42.46	MaxQP	Horizontal	102	253	46.0	-3.5	Pass
5	600.05	40.96	6.24	-6.45	40.75	MaxQP	Horizontal	150	239	46.0	-5.3	Pass
6	687.60	43.10	6.56	-5.04	44.62	MaxQP	Vertical	152	120	46.0	-1.4	Pass
7	880.01	33.22	7.36	-2.78	37.80	MaxQP	Vertical	102	182	46.0	-8.2	Pass
8	928.22	57.59	7.51	-2.06	63.04	Fundamental	Vertical	101	149	--	--	Pass
9	967.61	32.69	7.53	-1.67	38.55	MaxQP	Vertical	99	89	54.0	-15.5	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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A.4.2.1.4 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR Low)

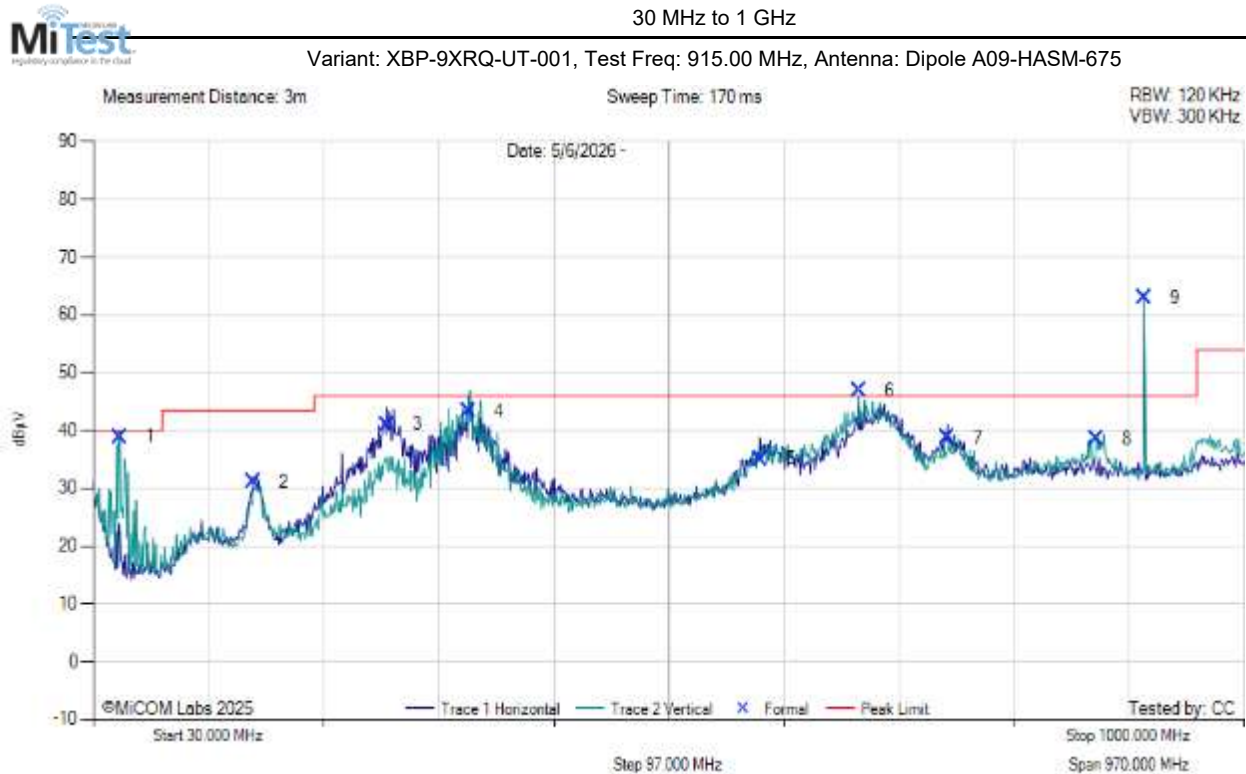


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.24	53.57	4.12	-17.75	39.94	MaxQP	Vertical	100	90	40.0	-0.06	Pass
2	168.00	41.14	4.64	-13.92	31.85	MaxQP	Horizontal	157	125	43.5	-11.6	Pass
3	240.02	45.86	4.94	-13.73	37.07	MaxQP	Horizontal	132	266	46.0	-8.9	Pass
4	275.69	46.55	5.07	-11.90	39.71	MaxQP	Horizontal	98	101	46.0	-6.3	Pass
5	342.64	46.19	5.34	-11.18	40.36	MaxQP	Vertical	103	201	46.0	-5.6	Pass
6	582.51	42.26	6.19	-6.54	41.91	MaxQP	Horizontal	135	132	46.0	-4.1	Pass
7	679.99	45.39	6.58	-5.21	46.76	NRB	Horizontal	124	245	--	--	Pass
8	742.52	37.78	6.81	-4.18	40.41	MaxQP	Vertical	166	260	46.0	-5.6	Pass
9	862.51	37.00	7.25	-2.84	41.41	MaxQP	Vertical	100	166	46.0	-4.6	Pass
10	903.00	61.85	7.42	-2.45	66.81	Fundamental	Vertical	100	89	--	--	Pass
11	982.50	33.80	7.55	-1.66	39.69	MaxQP	Vertical	104	216	54.0	-14.3	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB to USBC from laptop.

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A.4.2.1.5 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR Mid)



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.24	52.56	4.12	-17.75	38.93	MaxQP	Vertical	107	109	40.0	-1.1	Pass
2	165.00	40.20	4.63	-13.75	31.08	MaxQP	Horizontal	187	141	43.5	-12.4	Pass
3	277.81	47.84	5.08	-11.90	41.02	MaxQP	Horizontal	104	110	46.0	-5.0	Pass
4	346.43	49.01	5.35	-11.03	43.33	MaxQP	Vertical	100	194	46.0	-2.7	Pass
5	592.54	35.24	6.20	-6.41	35.03	MaxQP	Horizontal	129	141	46.0	-11.0	Pass
6	675.01	45.66	6.60	-5.34	46.92	NRB	Vertical	98	261	--	--	Pass
7	749.99	36.15	6.81	-4.14	38.81	MaxQP	Horizontal	106	248	46.0	-7.2	Pass
8	874.99	33.93	7.34	-2.78	38.49	MaxQP	Vertical	111	213	46.0	-7.5	Pass
9	915.61	57.83	7.46	-2.30	62.99	Fundamental	Vertical	98	89	--	--	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

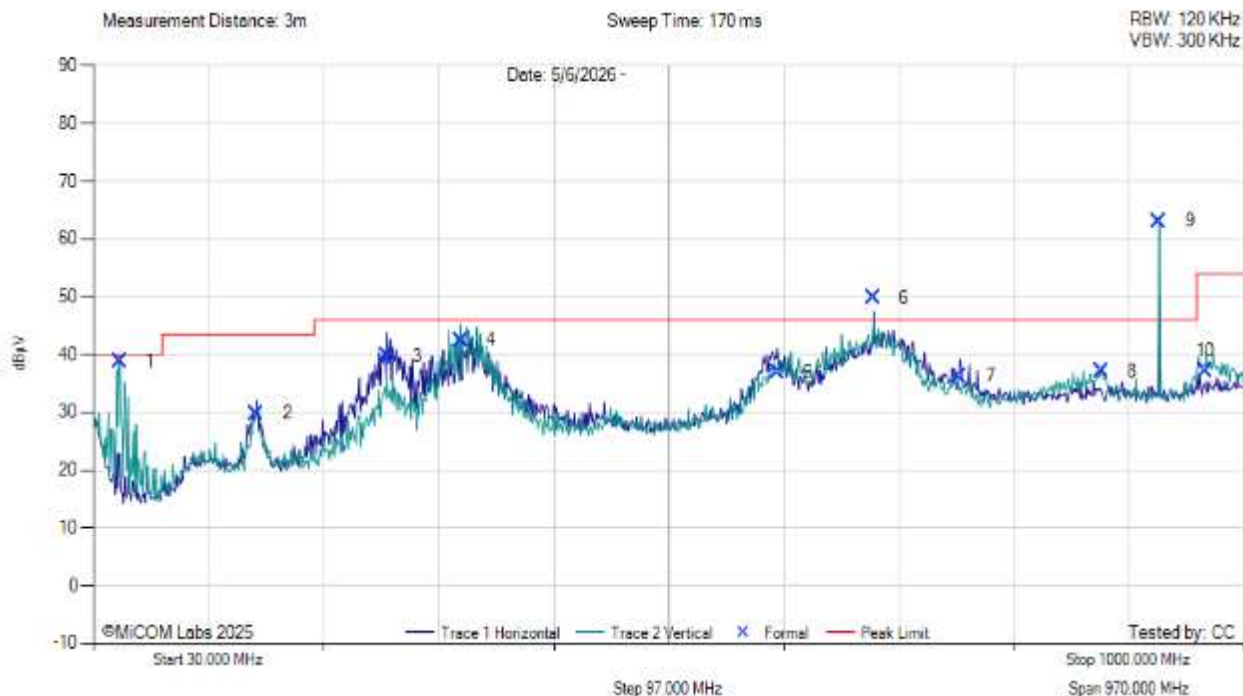
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A.4.2.1.6 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR High)



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001 , Test Freq: 927.50 MHz, Antenna: Dipole A09-HASM-675



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.20	52.47	4.12	-17.74	38.85	MaxQP	Vertical	98	330	40.0	-1.2	Pass
2	167.53	39.10	4.63	-13.89	29.84	MaxQP	Horizontal	144	150	43.5	-13.7	Pass
3	277.45	46.52	5.08	-11.90	39.70	MaxQP	Horizontal	101	105	46.0	-6.3	Pass
4	339.45	48.46	5.33	-11.27	42.52	MaxQP	Vertical	111	195	46.0	-3.5	Pass
5	606.32	36.96	6.25	-6.30	36.91	MaxQP	Horizontal	155	240	46.0	-9.1	Pass
6	687.50	48.32	6.56	-5.04	49.83	NRB	Horizontal	125	240	--	--	Pass
7	760.00	33.63	6.93	-4.33	36.24	MaxQP	Horizontal	102	242	46.0	-9.8	Pass
8	879.97	32.60	7.36	-2.78	37.17	MaxQP	Vertical	99	178	46.0	-8.8	Pass
9	928.22	57.67	7.51	-2.06	63.12	Fundamental	Vertical	100	89	--	--	Pass
10	967.52	31.28	7.53	-1.67	37.14	MaxQP	Vertical	101	273	54.0	-16.9	Pass

Test Notes: Dipole A09-HASM-675 MPD SATAC-915NF Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

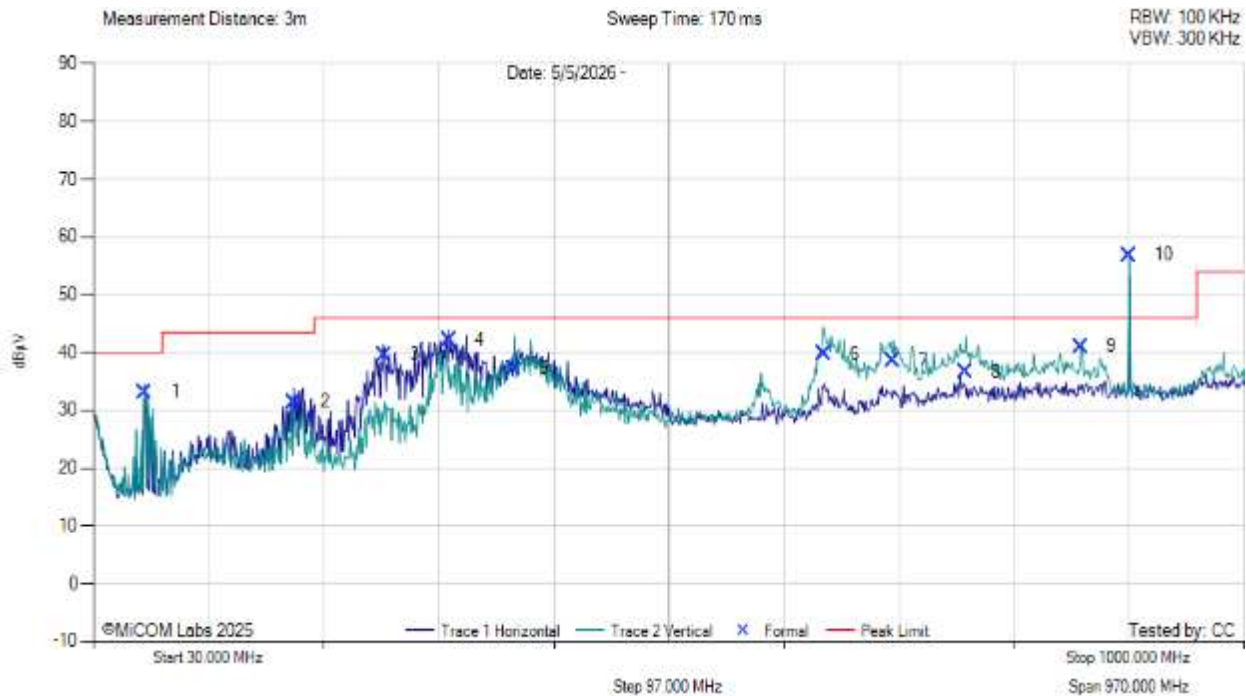
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A.4.2.1.7 Dome Laird Antenna (A09-D3NF /TRA8903) [HPX Low]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.40 MHz, Antenna: Dome Laird TRA8903



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	73.61	46.30	4.21	-17.38	33.13	MaxQP	Vertical	98	160	40.0	-6.9	Pass
2	199.22	39.53	4.77	-12.82	31.48	MaxQP	Horizontal	146	230	43.5	-12.0	Pass
3	275.42	46.50	5.06	-11.90	39.66	MaxQP	Horizontal	100	220	46.0	-6.3	Pass
4	329.69	48.23	5.31	-11.39	42.15	MaxQP	Horizontal	100	221	46.0	-3.9	Pass
5	384.93	41.95	5.46	-10.21	37.19	MaxQP	Vertical	198	299	46.0	-8.8	Pass
6	645.65	38.53	6.43	-5.18	39.78	MaxQP	Vertical	128	154	46.0	-6.2	Pass
7	703.32	36.59	6.69	-4.70	38.58	MaxQP	Vertical	146	103	46.0	-7.4	Pass
8	764.74	34.09	6.90	-4.30	36.68	MaxQP	Vertical	98	29	46.0	-9.3	Pass
9	862.41	36.68	7.25	-2.84	41.09	MaxQP	Vertical	155	179	46.0	-4.9	Pass
10	903.00	51.89	7.42	-2.45	56.86	Fundamental	Vertical	199	179	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

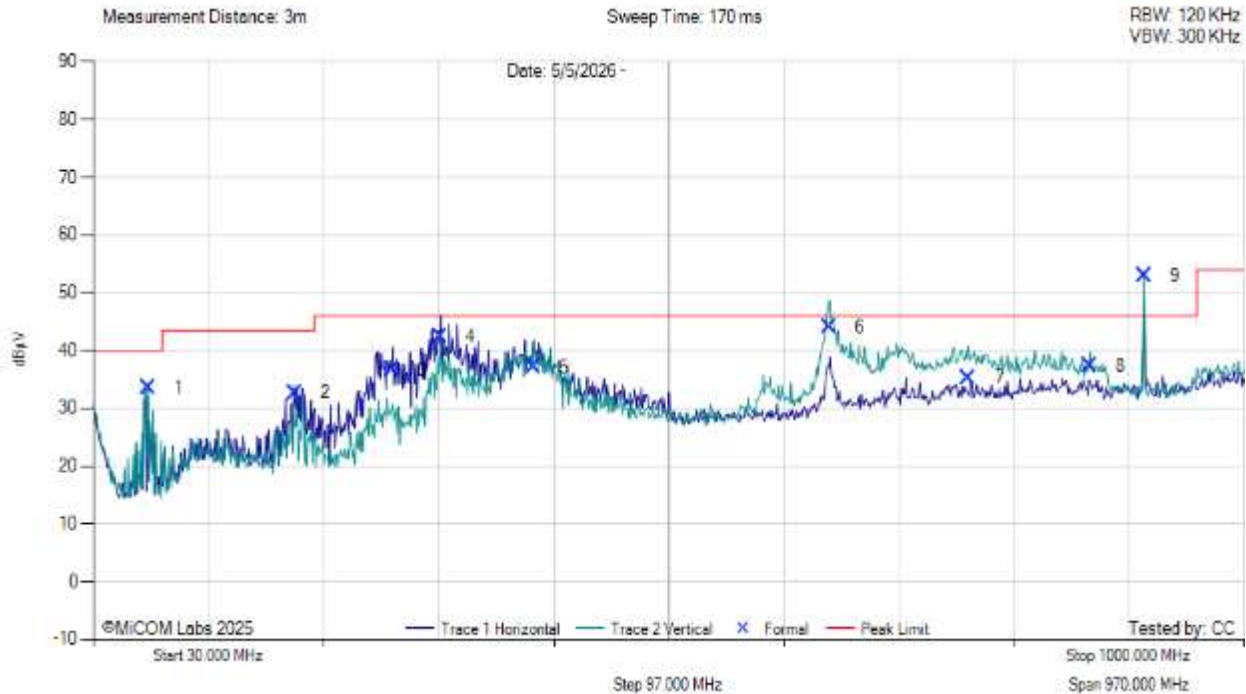
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A.4.2.1.8 Dome Laird Antenna (A09-D3NF /TRA8903) [HPX Mid]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 915.00 MHz, Antenna: Dome Laird TRA8903



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	75.97	46.80	4.26	-17.47	33.58	MaxQP	Vertical	98	171	40.0	-6.4	Pass
2	199.42	40.75	4.76	-12.81	32.70	MaxQP	Horizontal	104	240	43.5	-10.8	Pass
3	281.96	43.48	5.09	-11.91	36.66	MaxQP	Horizontal	101	227	46.0	-9.3	Pass
4	322.62	48.55	5.27	-11.42	42.40	MaxQP	Horizontal	100	222	46.0	-3.6	Pass
5	401.25	41.25	5.53	-9.67	37.11	MaxQP	Vertical	199	282	46.0	-8.9	Pass
6	649.91	42.78	6.41	-5.10	44.09	MaxQP	Vertical	154	102	46.0	-1.9	Pass
7	767.62	32.63	6.94	-4.27	35.30	MaxQP	Vertical	100	0	46.0	-10.7	Pass
8	869.59	32.79	7.30	-2.74	37.35	MaxQP	Vertical	158	138	46.0	-8.6	Pass
9	915.61	47.73	7.46	-2.30	52.89	Fundamental	Vertical	199	179	46.0	6.9	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

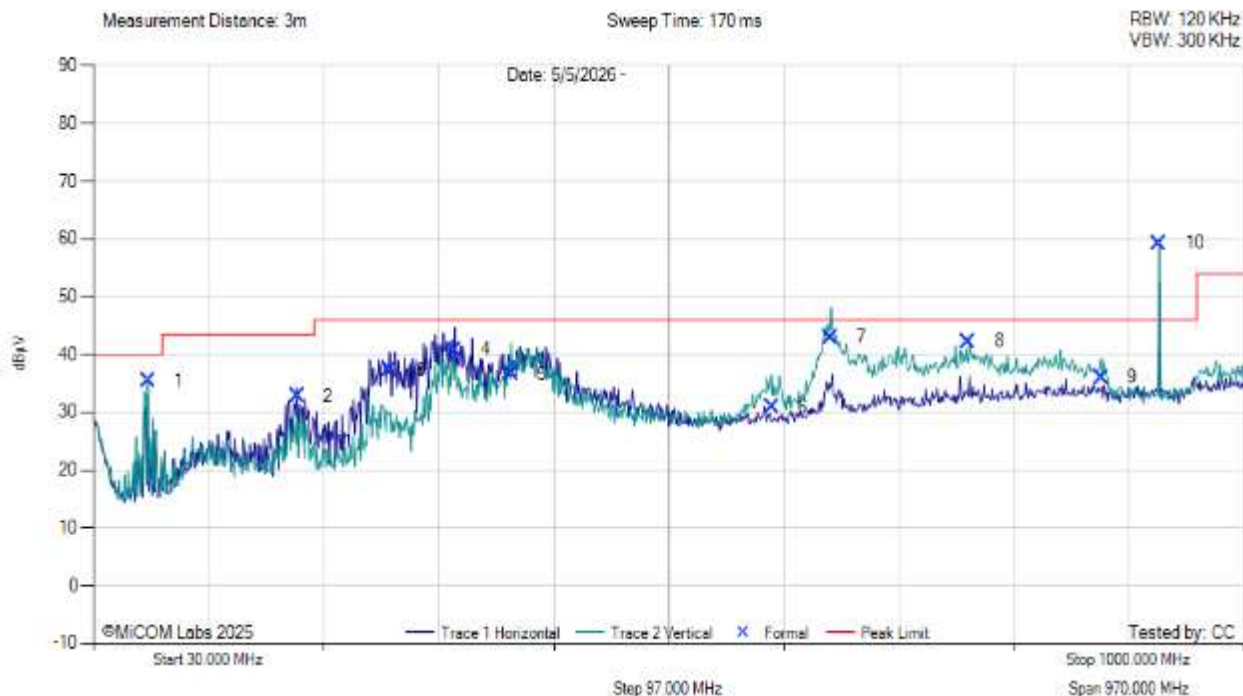
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A.4.2.1.9 Dome Laird Antenna (A09-D3NF /TRA8903) [HPX High]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.60 MHz, Antenna: Dome Laird TRA8903



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	76.04	48.57	4.26	-17.47	35.36	MaxQP	Vertical	110	174	40.0	-4.6	Pass
2	201.84	41.27	4.78	-13.30	32.76	MaxQP	Horizontal	159	231	43.5	-10.7	Pass
3	280.08	44.15	5.11	-11.91	37.35	MaxQP	Horizontal	102	220	46.0	-8.7	Pass
4	334.85	46.91	5.30	-11.34	40.86	MaxQP	Horizontal	98	227	46.0	-5.1	Pass
5	382.73	41.42	5.46	-10.24	36.64	MaxQP	Vertical	196	291	46.0	-9.4	Pass
6	601.64	31.00	6.28	-6.42	30.86	MaxQP	Vertical	154	0	46.0	-15.1	Pass
7	650.92	41.67	6.44	-5.10	43.01	MaxQP	Vertical	136	150	46.0	-3.0	Pass
8	767.62	39.58	6.94	-4.27	42.25	MaxQP	Vertical	98	277	46.0	-3.7	Pass
9	880.01	31.48	7.36	-2.78	36.05	MaxQP	Vertical	144	178	46.0	-10.0	Pass
10	928.22	53.85	7.51	-2.06	59.30	Fundamental	Vertical	149	179	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

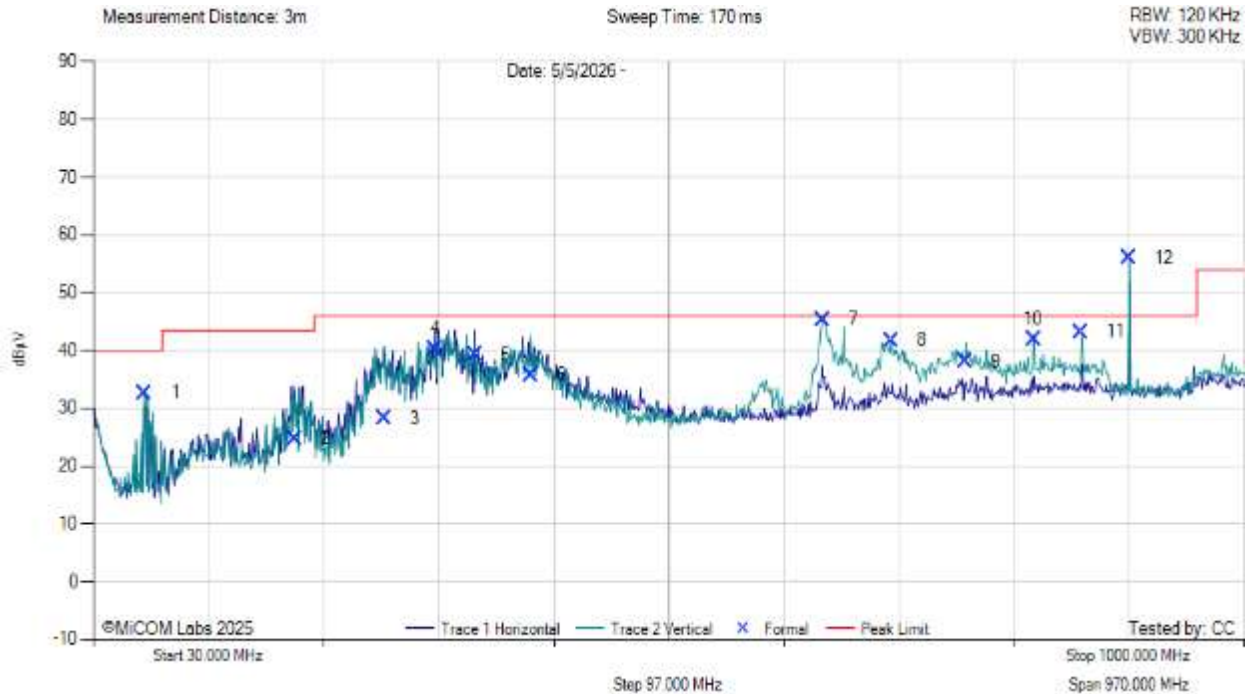
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A.4.2.1.10 Dome Laird Antenna (A09-D3NF /TRA8903) [XR Low]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.40 MHz, Antenna: Dome Laird TRA8903

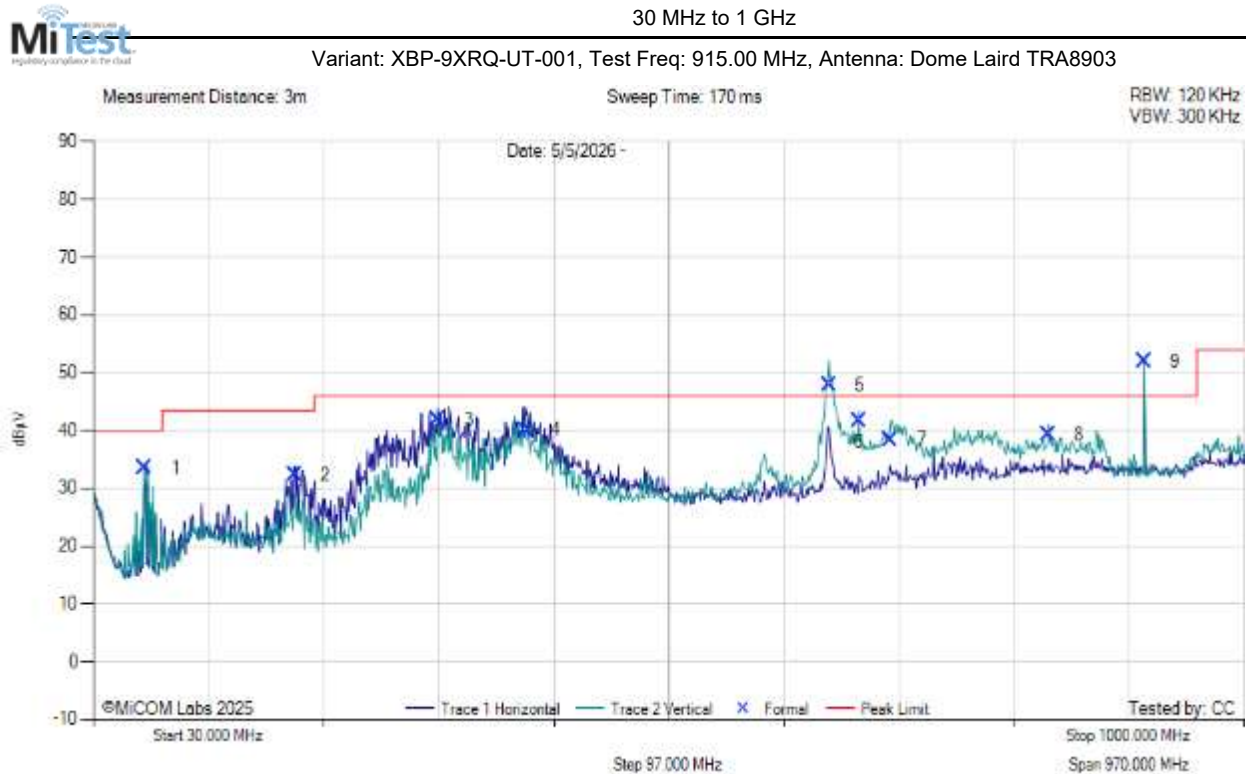


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	73.66	45.89	4.21	-17.38	32.72	MaxQP	Vertical	98	139	40.0	-7.3	Pass
2	199.47	32.85	4.76	-12.81	24.80	MaxQP	Vertical	145	268	43.5	-18.7	Pass
3	275.30	35.03	5.06	-11.91	28.19	MaxQP	Vertical	102	251	46.0	-17.8	Pass
4	318.13	46.50	5.25	-11.51	40.24	MaxQP	Horizontal	99	231	46.0	-5.8	Pass
5	351.52	44.56	5.38	-10.74	39.20	MaxQP	Horizontal	99	29	46.0	-6.8	Pass
6	399.01	40.05	5.51	-9.75	35.81	MaxQP	Vertical	125	119	46.0	-10.2	Pass
7	645.01	44.16	6.42	-5.21	45.37	MaxQP	Vertical	137	21	46.0	-0.6	Pass
8	702.49	39.79	6.70	-4.71	41.78	MaxQP	Vertical	131	207	46.0	-4.2	Pass
9	764.97	35.50	6.91	-4.30	38.11	MaxQP	Vertical	171	0	46.0	-7.9	Pass
10	822.52	38.01	7.11	-3.28	41.84	MaxQP	Vertical	172	70	46.0	-4.2	Pass
11	862.51	38.83	7.25	-2.84	43.24	MaxQP	Vertical	169	174	46.0	-2.8	Pass
12	903.00	51.14	7.42	-2.45	56.11	Fundamental	Vertical	199	89	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USBA to USBC from laptop.

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A.4.2.1.11 Dome Laird Antenna (A09-D3NF /TRA8903) [XR Mid]



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	73.64	46.65	4.21	-17.38	33.48	MaxQP	Vertical	100	181	40.0	-6.5	Pass
2	199.56	40.31	4.76	-12.81	32.27	MaxQP	Horizontal	193	237	43.5	-11.2	Pass
3	320.57	48.06	5.24	-11.47	41.83	MaxQP	Horizontal	101	225	46.0	-4.2	Pass
4	394.37	44.52	5.50	-9.92	40.10	MaxQP	Horizontal	99	32	46.0	-5.9	Pass
5	650.09	46.52	6.42	-5.10	47.83	NRB	Vertical	150	170	--	--	Pass
6	674.99	40.35	6.60	-5.34	41.61	MaxQP	Vertical	159	160	46.0	-4.4	Pass
7	701.94	36.45	6.69	-4.71	38.43	MaxQP	Vertical	130	81	46.0	-7.6	Pass
8	834.99	35.17	7.19	-3.12	39.23	MaxQP	Vertical	101	286	46.0	-6.8	Pass
9	915.61	46.84	7.46	-2.30	52.00	Fundamental	Vertical	100	0	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

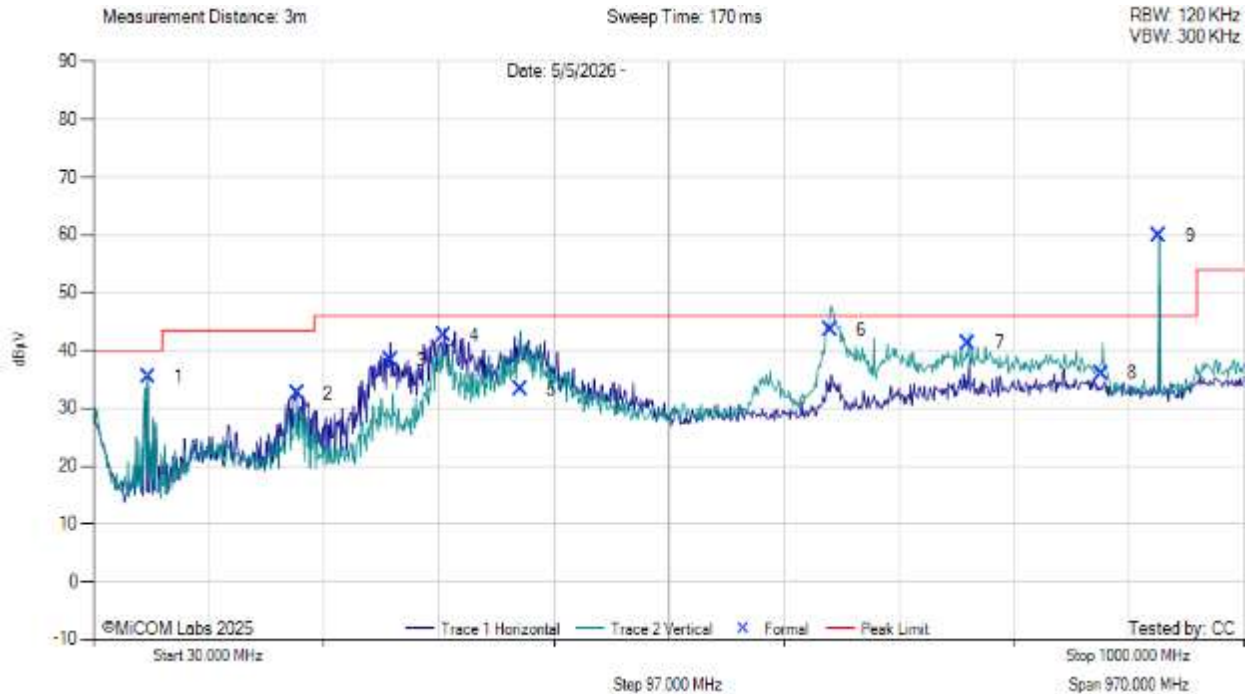
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A.4.2.1.12 Dome Laird Antenna (A09-D3NF /TRA8903) [XR High]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Dome Laird TRA8903



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	75.98	48.61	4.26	-17.47	35.40	MaxQP	Vertical	98	179	40.0	-4.6	Pass
2	201.91	41.09	4.78	-13.32	32.56	MaxQP	Horizontal	184	240	43.5	-10.9	Pass
3	280.27	45.13	5.11	-11.92	38.33	MaxQP	Horizontal	101	220	46.0	-7.7	Pass
4	325.51	48.72	5.28	-11.39	42.61	MaxQP	Horizontal	101	222	46.0	-3.4	Pass
5	389.61	37.88	5.49	-10.09	33.28	MaxQP	Vertical	102	336	46.0	-12.7	Pass
6	651.39	42.27	6.45	-5.10	43.62	MaxQP	Vertical	151	138	46.0	-2.4	Pass
7	767.52	38.59	6.95	-4.27	41.26	MaxQP	Vertical	199	215	46.0	-4.7	Pass
8	879.96	31.46	7.36	-2.78	36.03	MaxQP	Vertical	102	30	46.0	-10.0	Pass
9	928.22	54.35	7.51	-2.06	59.80	Fundamental	Vertical	100	119	--	--	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

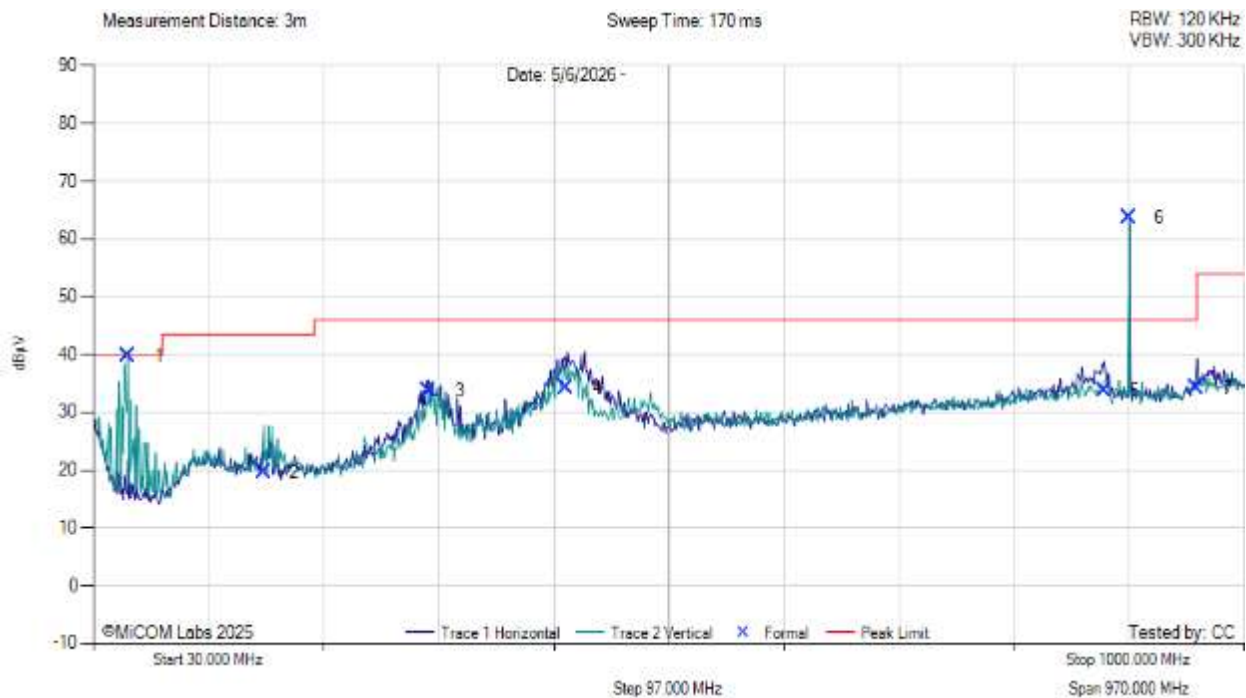
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A.4.2.1.13 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX Low]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.40 MHz, Antenna: Flex Molex 211140-0100



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	59.29	53.73	4.15	-18.12	39.76	MaxQP	Vertical	100	207	40.0	-0.2	Pass
2	173.68	29.19	4.66	-14.28	19.57	MaxQP	Vertical	170	176	43.5	-23.9	Pass
3	312.95	40.20	5.22	-11.61	33.82	MaxQP	Horizontal	97	240	46.0	-12.2	Pass
4	428.68	37.36	5.63	-8.71	34.28	MaxQP	Horizontal	107	273	46.0	-11.7	Pass
5	881.49	29.27	7.33	-2.82	33.78	MaxQP	Horizontal	169	230	46.0	-12.2	Pass
6	903.00	58.75	7.42	-2.45	63.72	Fundamental	Vertical	149	299	--	--	Pass
7	959.96	28.30	7.58	-1.68	34.19	MaxQP	Horizontal	137	230	46.0	-11.8	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

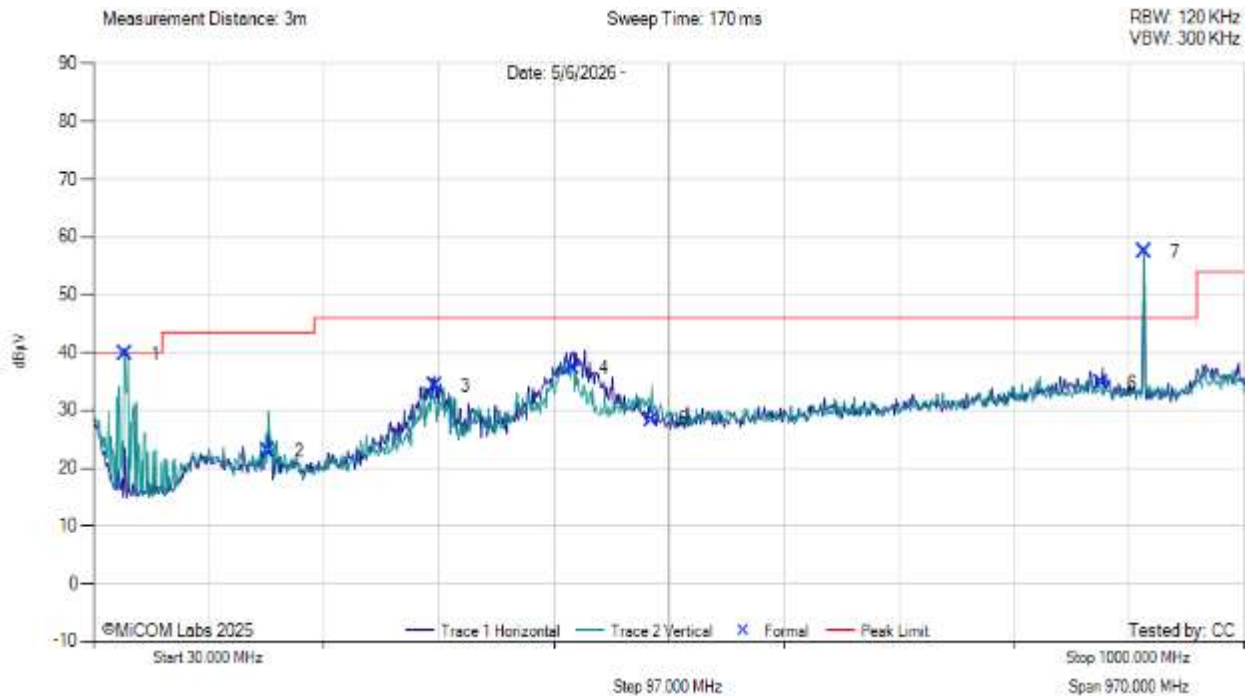
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A.4.2.1.14 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX Mid]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Flex Molex 211140-0100



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.91	53.85	4.13	-18.19	39.79	MaxQP	Vertical	120	184	40.0	-0.2	Pass
2	177.44	32.73	4.69	-14.42	22.99	MaxQP	Vertical	179	164	43.5	-20.5	Pass
3	317.75	40.47	5.26	-11.51	34.22	MaxQP	Horizontal	108	240	46.0	-11.8	Pass
4	434.14	40.44	5.66	-8.74	37.36	MaxQP	Horizontal	103	68	46.0	-8.6	Pass
5	501.04	30.17	5.86	-7.64	28.39	MaxQP	Vertical	99	32	46.0	-17.6	Pass
6	879.96	30.09	7.36	-2.78	34.66	MaxQP	Horizontal	166	235	46.0	-11.3	Pass
7	915.61	52.28	7.46	-2.30	57.44	Fundamental	Vertical	149	299	--	--	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

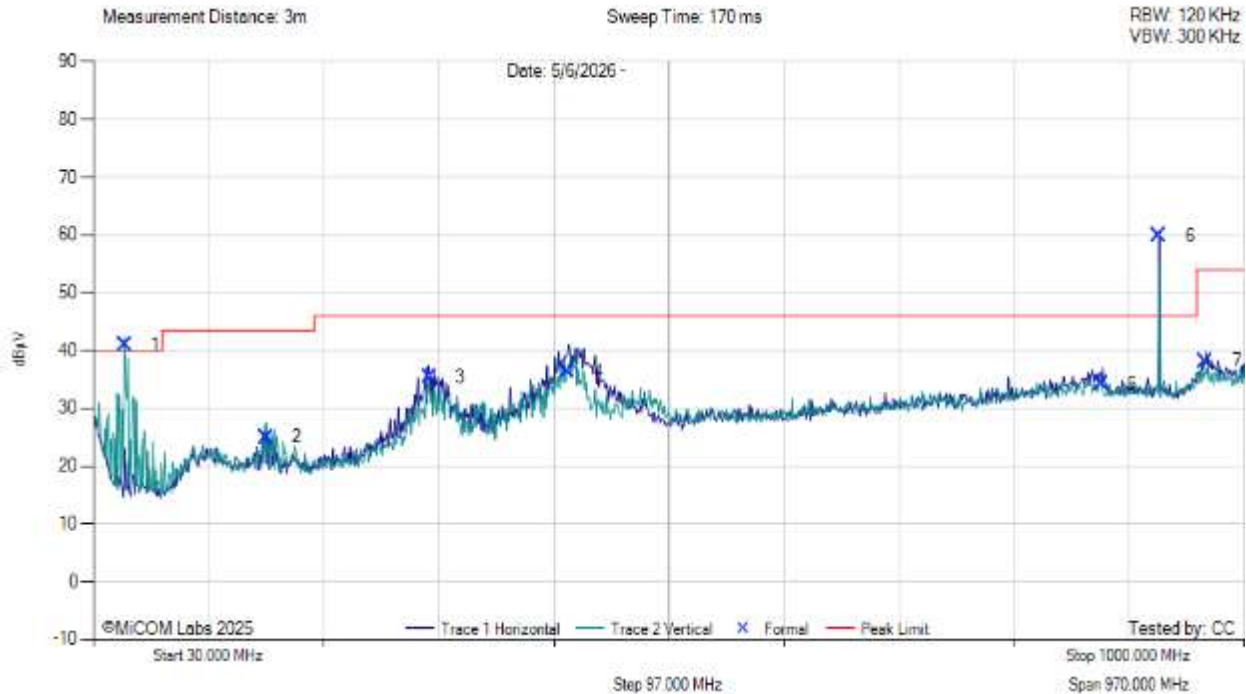
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A.4.2.1.15 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX High]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Flex Molex 211140-0100



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.91	53.98	4.13	-18.19	39.92	MaxQP	Vertical	103	89	40.0	-0.08	Pass
2	175.67	34.65	4.67	-14.36	24.97	MaxQP	Vertical	197	183	43.5	-18.5	Pass
3	313.11	41.77	5.22	-11.60	35.38	MaxQP	Horizontal	100	238	46.0	-10.6	Pass
4	429.79	39.35	5.63	-8.66	36.31	MaxQP	Horizontal	103	270	46.0	-9.7	Pass
5	879.97	29.69	7.36	-2.78	34.26	MaxQP	Horizontal	101	101	46.0	-11.7	Pass
6	928.22	54.43	7.51	-2.06	59.88	Fundamental	Horizontal	149	240	--	--	Pass
7	967.58	32.32	7.53	-1.67	38.19	MaxQP	Horizontal	142	247	54.0	-15.8	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

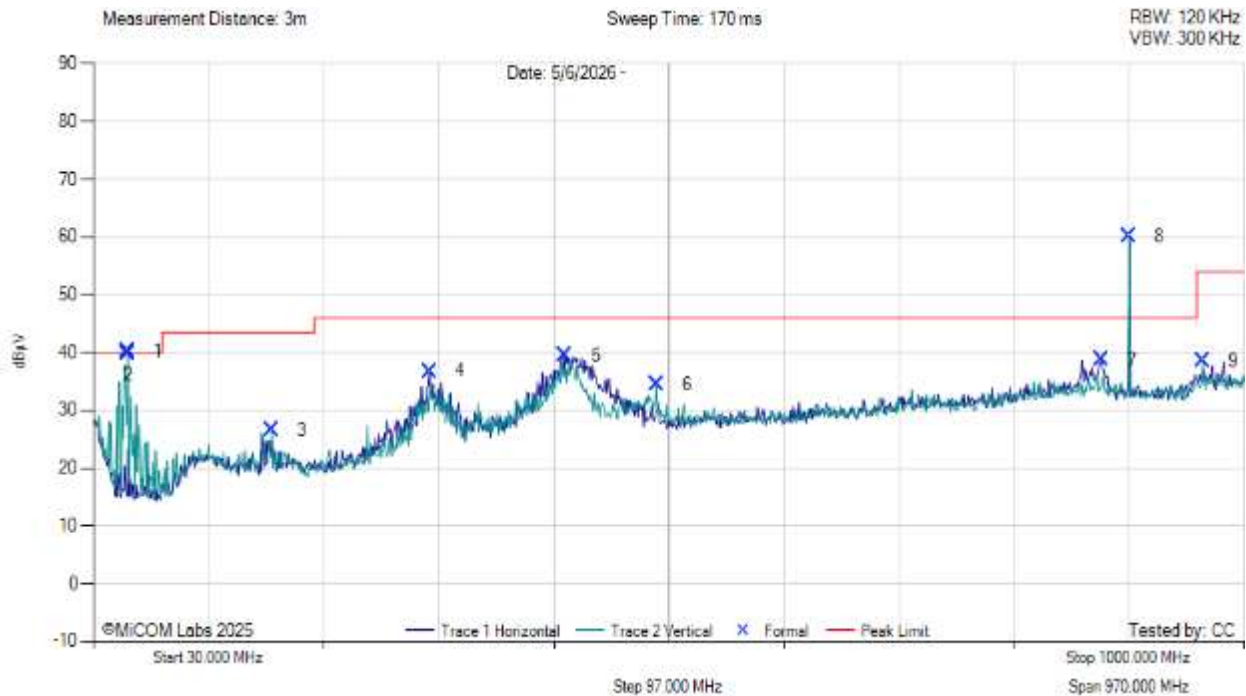
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A.4.2.1.16 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR Low]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.50 MHz, Antenna: Flex Molex 211140-0100



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	59.10	53.54	4.15	-18.13	39.56	MaxP	Vertical	101	210	40.0	-0.4	Pass
2	59.34	53.75	4.15	-18.12	39.08	MaxQP	Vertical	100	180	40.0	-0.9	Pass
3	180.35	36.36	4.68	-14.44	26.59	MaxP	Vertical	199	179	43.5	-16.9	Pass
4	313.24	43.10	5.22	-11.60	36.72	MaxP	Horizontal	101	240	46.0	-9.3	Pass
5	427.70	42.64	5.63	-8.73	39.54	MaxP	Horizontal	101	60	46.0	-6.5	Pass
6	504.33	36.24	5.90	-7.63	34.51	MaxP	Vertical	101	29	46.0	-11.5	Pass
7	879.72	34.22	7.37	-2.78	38.80	MaxP	Horizontal	101	240	46.0	-7.2	Pass
8	903.00	55.14	7.42	-2.45	60.11	Fundamental	Vertical	149	299	--	--	Pass
9	965.08	32.64	7.57	-1.66	38.54	MaxP	Vertical	101	270	54.0	-15.5	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

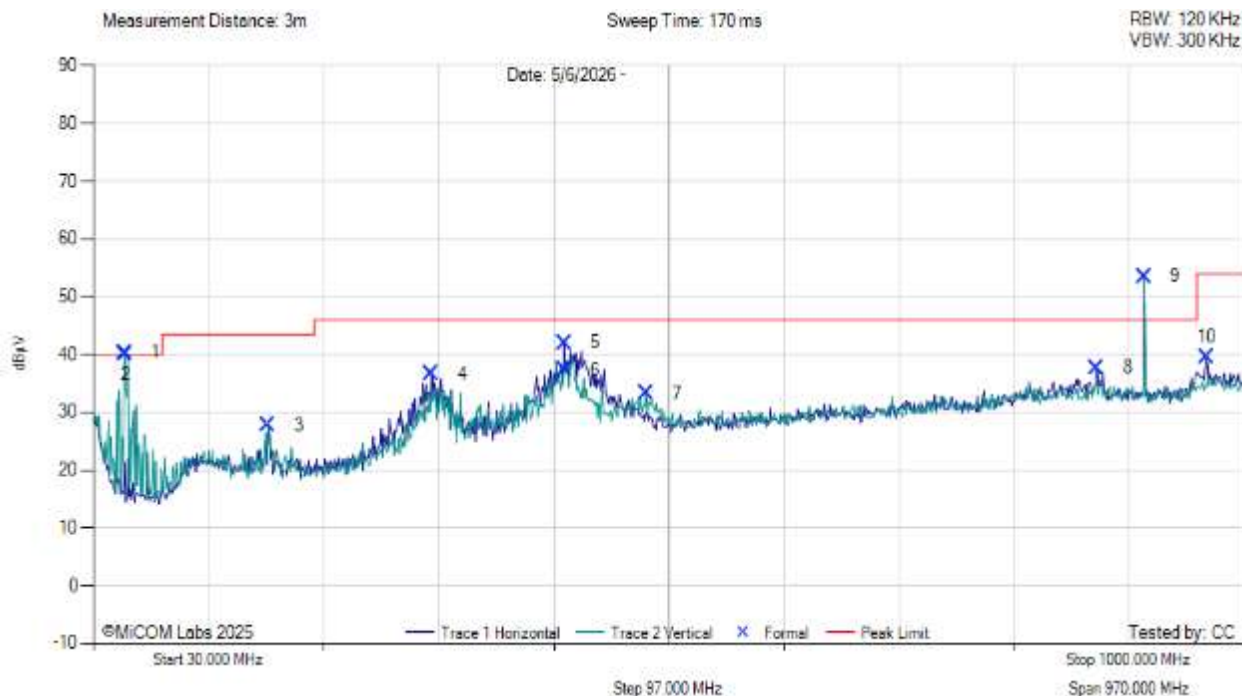
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A.4.2.1.17 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR Mid]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Flex Molex 211140-0100



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.19	54.39	4.12	-18.18	39.73	MaxP	Vertical	100	0	40.0	-0.3	Pass
2	56.97	54.14	4.13	-18.19	39.48	MaxQP	Vertical	104	30	40.0	-0.5	Pass
3	177.44	37.56	4.69	-14.42	27.82	MaxP	Vertical	199	149	43.5	-15.7	Pass
4	315.18	42.96	5.24	-11.55	36.65	MaxP	Horizontal	99	240	46.0	-9.4	Pass
5	426.73	45.09	5.62	-8.72	41.99	MaxP	Horizontal	99	90	46.0	-4.0	Pass
6	427.27	40.40	5.62	-8.72	37.30	MaxQP	Horizontal	106	69	46.0	-8.7	Pass
7	495.60	35.08	5.86	-7.66	33.28	MaxP	Vertical	99	59	46.0	-12.7	Pass
8	875.84	33.14	7.35	-2.79	37.69	MaxP	Horizontal	99	240	46.0	-8.3	Pass
9	915.61	48.35	7.46	-2.30	53.51	Fundamental	Horizontal	99	300	--	--	Pass
10	967.99	33.63	7.54	-1.67	39.50	MaxP	Horizontal	149	240	54.0	-14.5	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

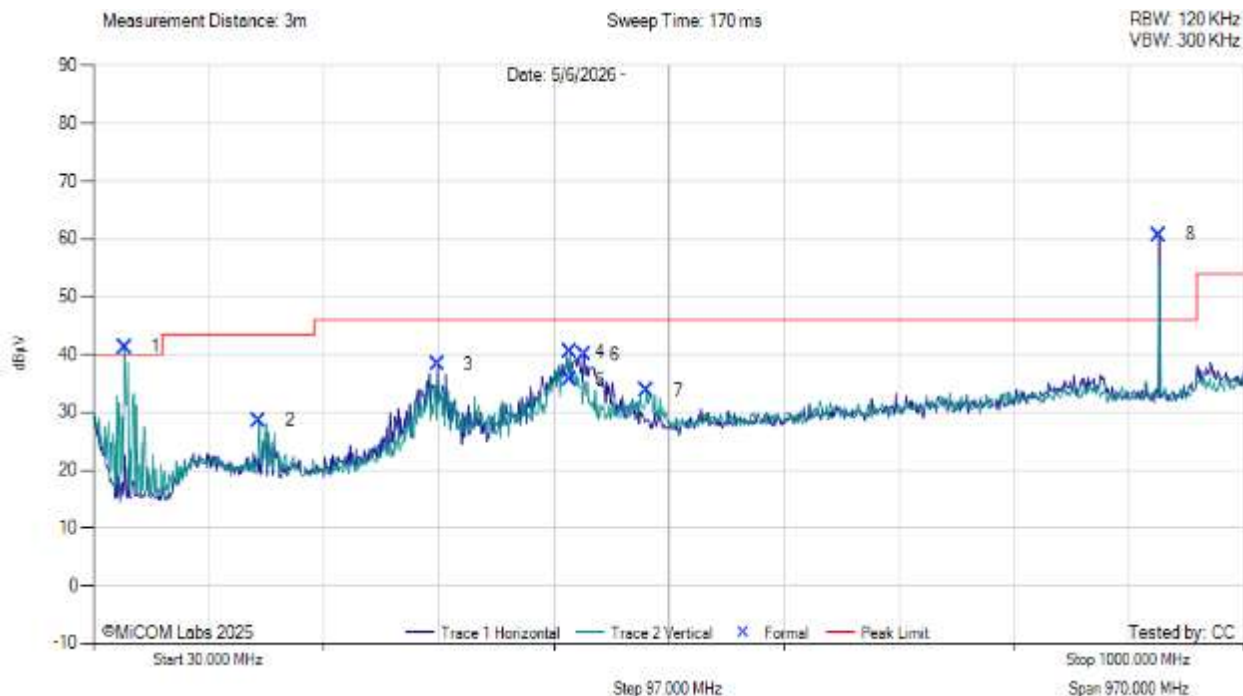
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A.4.2.1.18 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR High]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Flex Molex 211140-0100

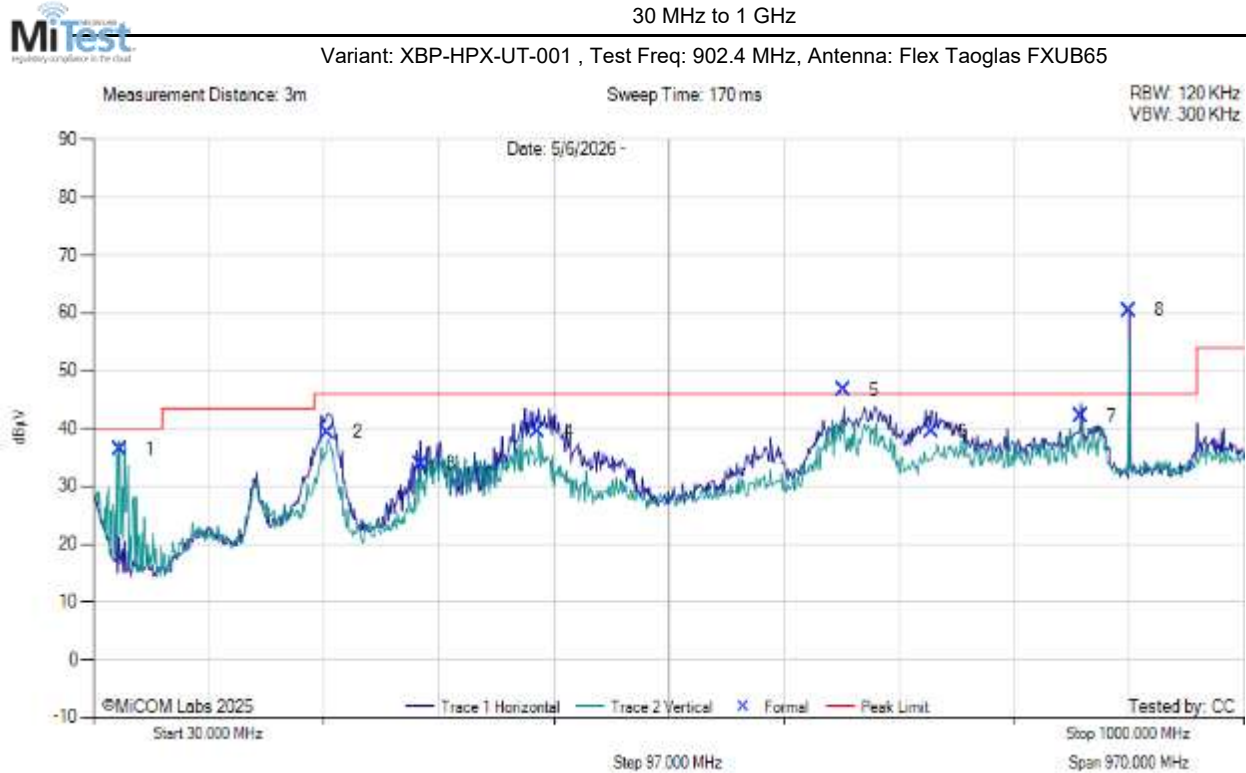


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.94	53.94	4.13	-18.19	39.88	MaxQP	Vertical	101	210	40.0	-0.1	Pass
2	169.68	38.01	4.64	-14.03	28.62	MaxP	Vertical	149	179	43.5	-14.9	Pass
3	320.03	44.63	5.24	-11.48	38.38	MaxP	Horizontal	99	210	46.0	-7.6	Pass
4	431.58	43.48	5.65	-8.69	40.44	MaxP	Vertical	99	179	46.0	-5.6	Pass
5	431.95	38.75	5.65	-8.70	35.70	MaxQP	Vertical	112	201	46.0	-10.3	Pass
6	443.22	42.96	5.69	-8.63	40.02	MaxP	Horizontal	99	90	46.0	-6.0	Pass
7	496.57	35.48	5.87	-7.66	33.69	MaxP	Vertical	99	29	46.0	-12.3	Pass
8	928.22	55.22	7.51	-2.06	60.66	Fundamental	Horizontal	149	238	--	--	Pass

Test Notes: Flex Molex 211140-0100 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB A to USB C from laptop.

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A.4.2.1.19 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX Low]

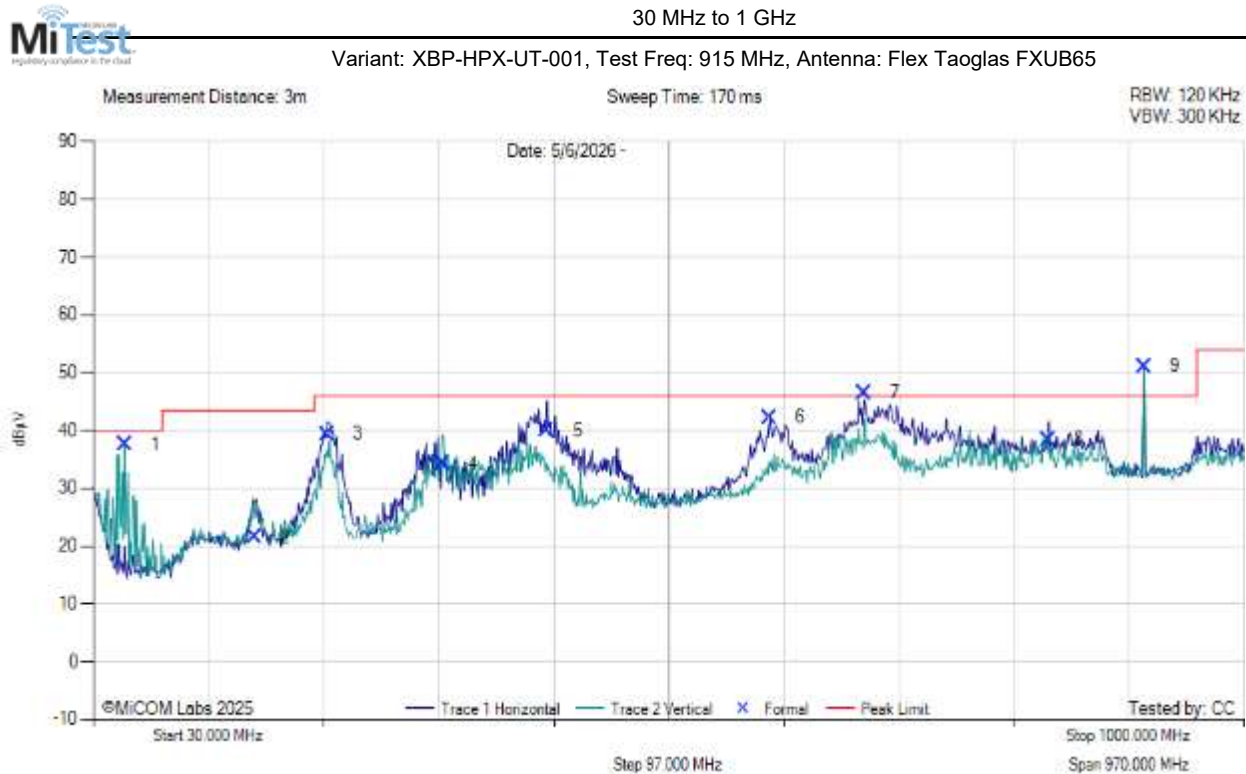


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.20	50.07	4.12	-17.74	36.45	MaxQP	Vertical	100	0	40.0	-3.5	Pass
2	227.21	48.54	4.88	-14.06	39.35	MaxQP	Horizontal	115	84	46.0	-6.6	Pass
3	306.05	40.42	5.20	-11.78	33.84	MaxQP	Horizontal	119	268	46.0	-12.2	Pass
4	404.74	43.58	5.55	-9.58	39.56	MaxQP	Horizontal	100	247	46.0	-6.4	Pass
5	662.40	45.50	6.47	-5.27	46.71	NRB	Horizontal	130	272	--	--	Pass
6	736.46	36.96	6.78	-4.29	39.45	MaxQP	Horizontal	113	120	46.0	-6.6	Pass
7	862.42	37.74	7.25	-2.84	42.15	MaxQP	Horizontal	98	236	46.0	-3.9	Pass
8	903.00	55.51	7.42	-2.45	60.48	Fundamental	Horizontal	99	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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A.4.2.1.20 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX Mid]



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.81	51.68	4.13	-18.19	37.63	MaxQP	Vertical	97	0	40.0	-2.4	Pass
2	165.61	30.65	4.64	-13.77	21.52	MaxQP	Vertical	165	319	43.5	-22.0	Pass
3	227.37	48.57	4.87	-14.06	39.39	MaxQP	Horizontal	140	80	46.0	-6.6	Pass
4	324.26	40.36	5.28	-11.40	34.25	MaxQP	Vertical	101	179	46.0	-11.8	Pass
5	412.50	43.58	5.55	-9.20	39.93	MaxQP	Horizontal	100	97	46.0	-6.1	Pass
6	600.01	42.45	6.24	-6.45	42.24	MaxQP	Horizontal	134	127	46.0	-3.8	Pass
7	680.01	45.23	6.58	-5.21	46.60	NRB	Horizontal	129	242	--	--	Pass
8	834.77	34.32	7.19	-3.13	38.39	MaxQP	Horizontal	97	327	46.0	-7.6	Pass
9	915.61	45.98	7.46	-2.30	51.14	Fundamental	Horizontal	149	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

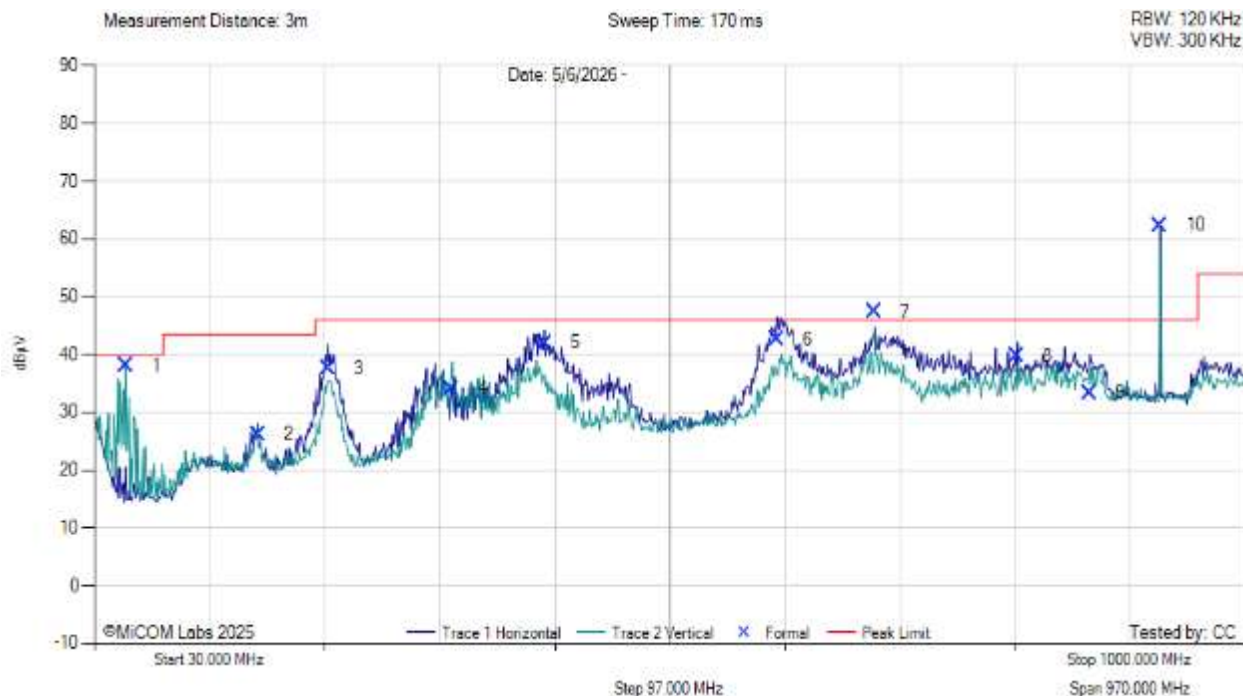
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A.4.2.1.21 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX High]



30 MHz to 1 GHz

Variant XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Flex Taoglas FXUB65

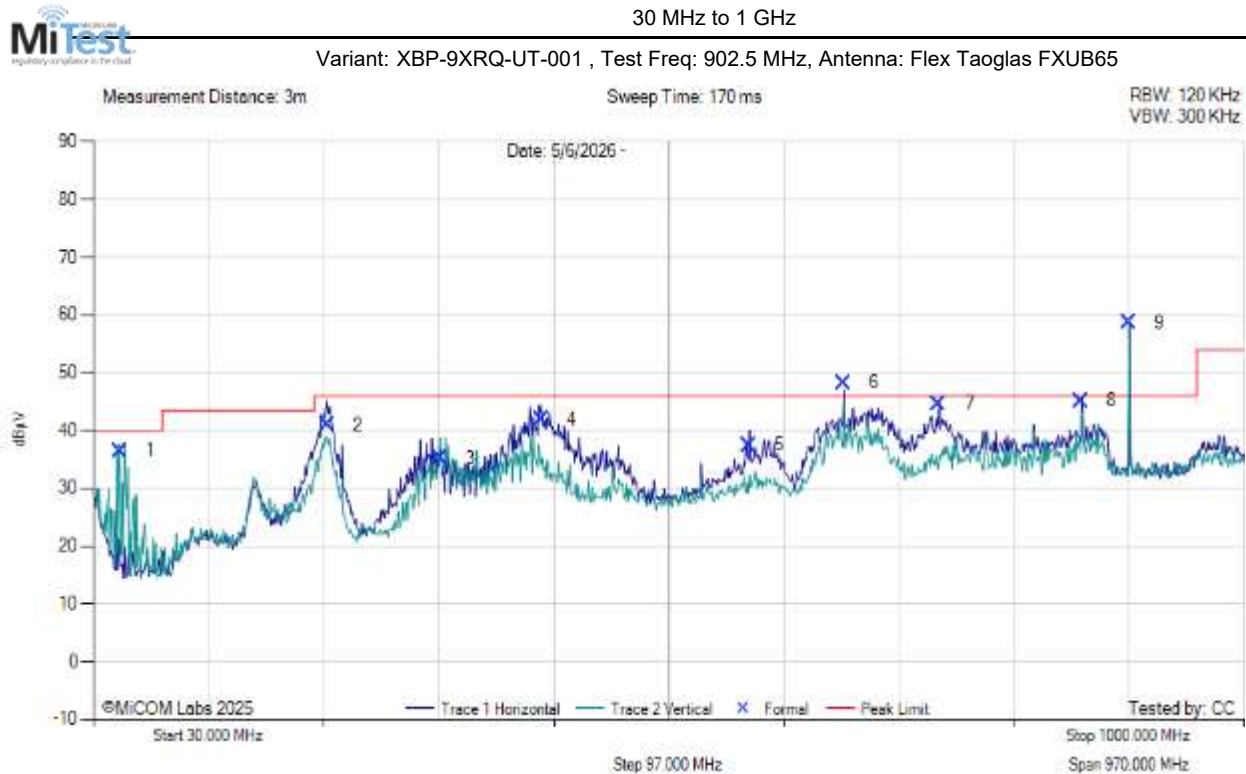


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.81	52.10	4.13	-18.19	38.04	MaxQP	Vertical	98	0	40.0	-2.0	Pass
2	168.08	35.53	4.63	-13.92	26.24	MaxQP	Horizontal	171	303	43.5	-17.3	Pass
3	227.44	46.78	4.87	-14.06	37.60	MaxQP	Horizontal	151	85	46.0	-8.4	Pass
4	331.43	40.19	5.32	-11.41	34.10	MaxQP	Vertical	101	191	46.0	-11.9	Pass
5	409.47	45.85	5.55	-9.33	42.06	MaxQP	Horizontal	100	77	46.0	-3.9	Pass
6	605.16	42.62	6.26	-6.33	42.55	MaxQP	Horizontal	141	122	46.0	-3.4	Pass
7	687.59	45.85	6.56	-5.04	47.37	NRB	Horizontal	124	121	--	--	Pass
8	807.61	36.18	7.05	-3.55	39.68	MaxQP	Horizontal	102	255	46.0	-6.3	Pass
9	868.74	28.87	7.30	-2.75	33.42	MaxQP	Horizontal	101	229	46.0	-12.6	Pass
10	928.22	56.93	7.51	-2.06	62.37	Fundamental	Horizontal	149	180	-	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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A.4.2.1.22 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR Low]



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	52.21	50.14	4.12	-17.74	36.52	MaxQP	Vertical	120	72	40.0	-3.5	Pass
2	227.28	50.15	4.87	-14.06	40.97	MaxQP	Horizontal	154	72	46.0	-5.0	Pass
3	322.57	41.35	5.27	-11.42	35.20	MaxQP	Vertical	107	203	46.0	-10.8	Pass
4	407.82	45.74	5.54	-9.41	41.87	MaxQP	Horizontal	101	85	46.0	-4.1	Pass
5	582.54	37.82	6.19	-6.54	37.47	MaxQP	Horizontal	156	125	46.0	-8.5	Pass
6	662.50	47.05	6.47	-5.27	48.26	NRB	Horizontal	111	140	--	--	Pass
7	742.50	42.05	6.81	-4.18	44.68	MaxQP	Horizontal	116	120	46.0	-1.3	Pass
8	862.51	40.70	7.25	-2.84	45.12	MaxQP	Horizontal	101	112	46.0	-0.9	Pass
9	903.00	53.65	7.42	-2.45	58.62	MaxP	Horizontal	98	300	--	--	Pass

Test Notes: Flex Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

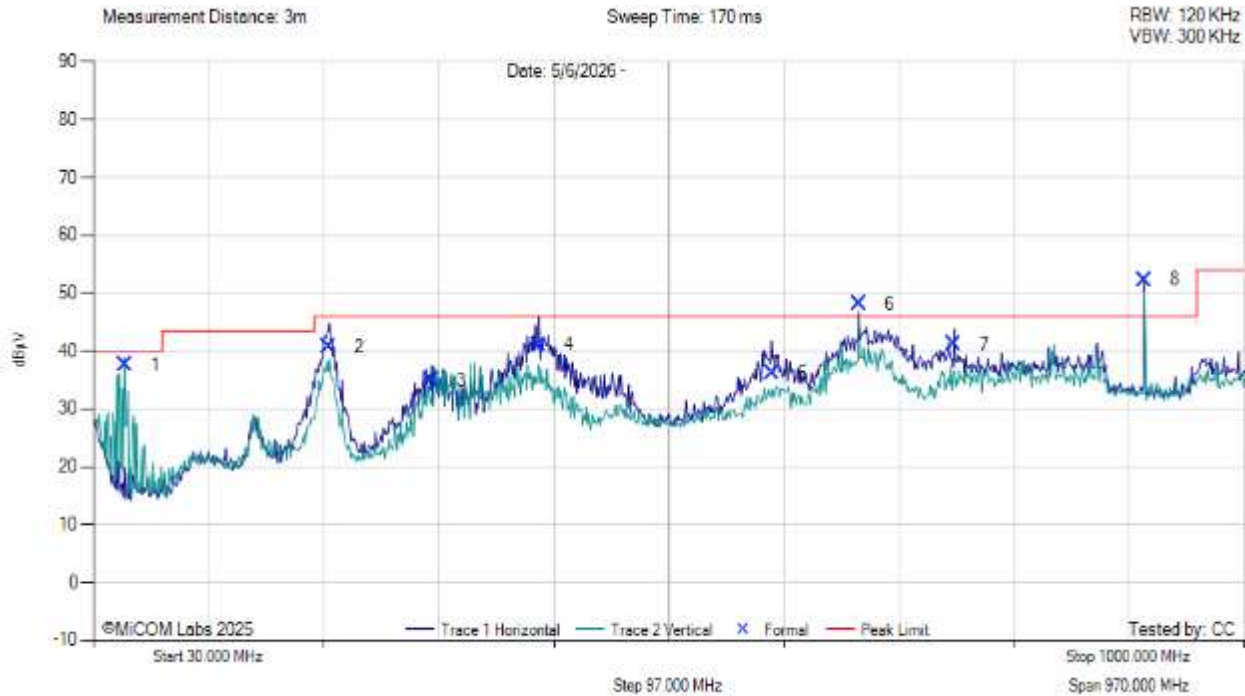
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A.4.2.1.23 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR Mid]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Flex Taoglas FXUB65

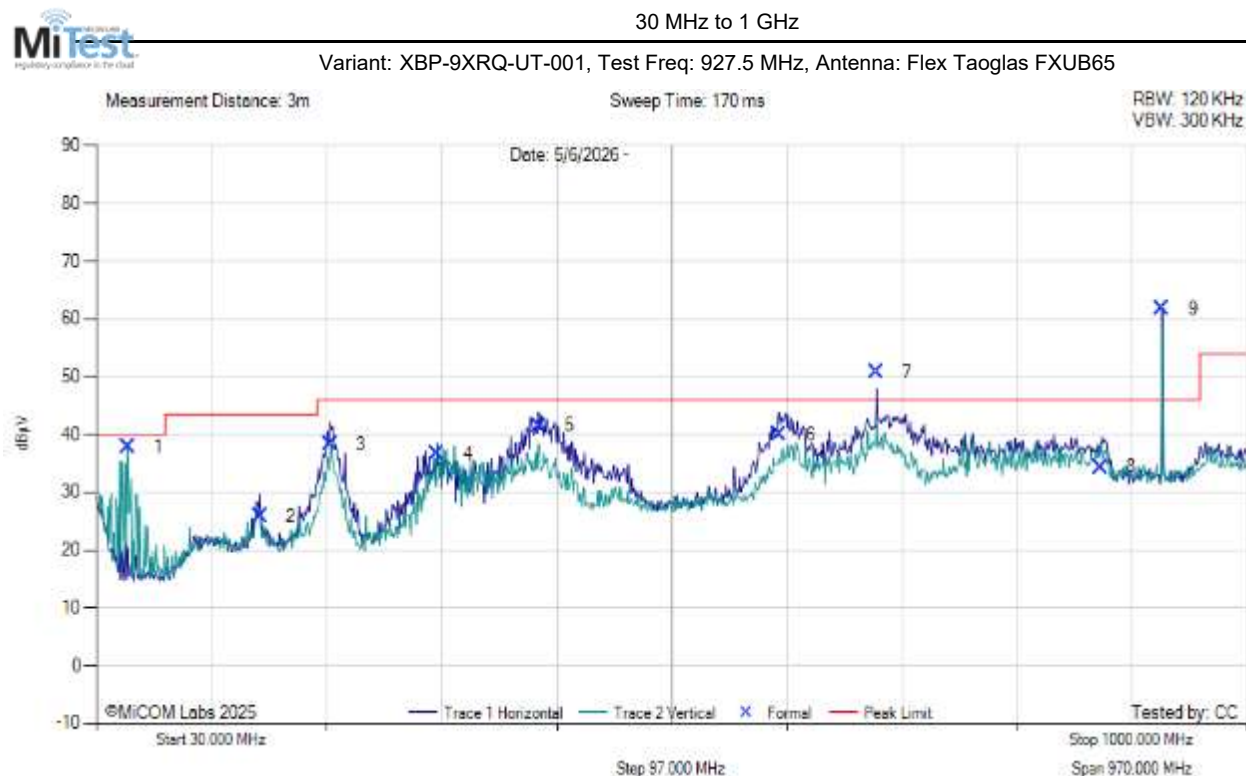


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.92	51.67	4.13	-18.19	37.61	MaxQP	Vertical	104	30	40.0	-2.4	Pass
2	227.86	49.81	4.88	-14.04	40.65	MaxQP	Horizontal	139	236	46.0	-5.4	Pass
3	314.99	41.24	5.24	-11.55	34.93	MaxQP	Horizontal	100	240	46.0	-11.1	Pass
4	405.13	45.04	5.56	-9.56	41.04	MaxQP	Horizontal	102	98	46.0	-5.0	Pass
5	601.89	36.27	6.28	-6.41	36.14	MaxQP	Horizontal	145	235	46.0	-9.9	Pass
6	675.01	46.86	6.60	-5.34	48.12	NRB	Horizontal	125	300	--	--	Pass
7	754.97	38.51	6.87	-4.22	41.16	MaxQP	Horizontal	102	142	46.0	-4.8	Pass
8	915.61	47.20	7.46	-2.30	52.36	Fundamental	Horizontal	100	300	--	--	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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A.4.2.1.24 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR High]



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.80	51.94	4.13	-18.19	37.88	MaxQP	Vertical	104	0	40.0	-2.1	Pass
2	168.27	35.12	4.63	-13.93	25.82	MaxQP	Horizontal	196	290	43.5	-17.7	Pass
3	227.47	47.55	4.87	-14.05	38.37	MaxQP	Horizontal	101	90	46.0	-7.6	Pass
4	317.40	42.95	5.25	-11.51	36.69	MaxQP	Horizontal	100	243	46.0	-9.3	Pass
5	402.89	45.61	5.54	-9.64	41.52	MaxQP	Horizontal	102	91	46.0	-4.5	Pass
6	605.92	40.09	6.25	-6.31	40.03	MaxQP	Horizontal	152	236	46.0	-6.0	Pass
7	687.51	49.17	6.56	-5.04	50.69	NRB	Horizontal	119	251	--	-	Pass
8	876.80	29.82	7.37	-2.81	34.39	MaxQP	Horizontal	157	181	46.0	-11.6	Pass
9	928.22	56.29	7.51	-2.06	61.74	Fundamental	Horizontal	149	180	--	---	Pass

Test Notes: Flex Taoglas FXUB65.07.0180C Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

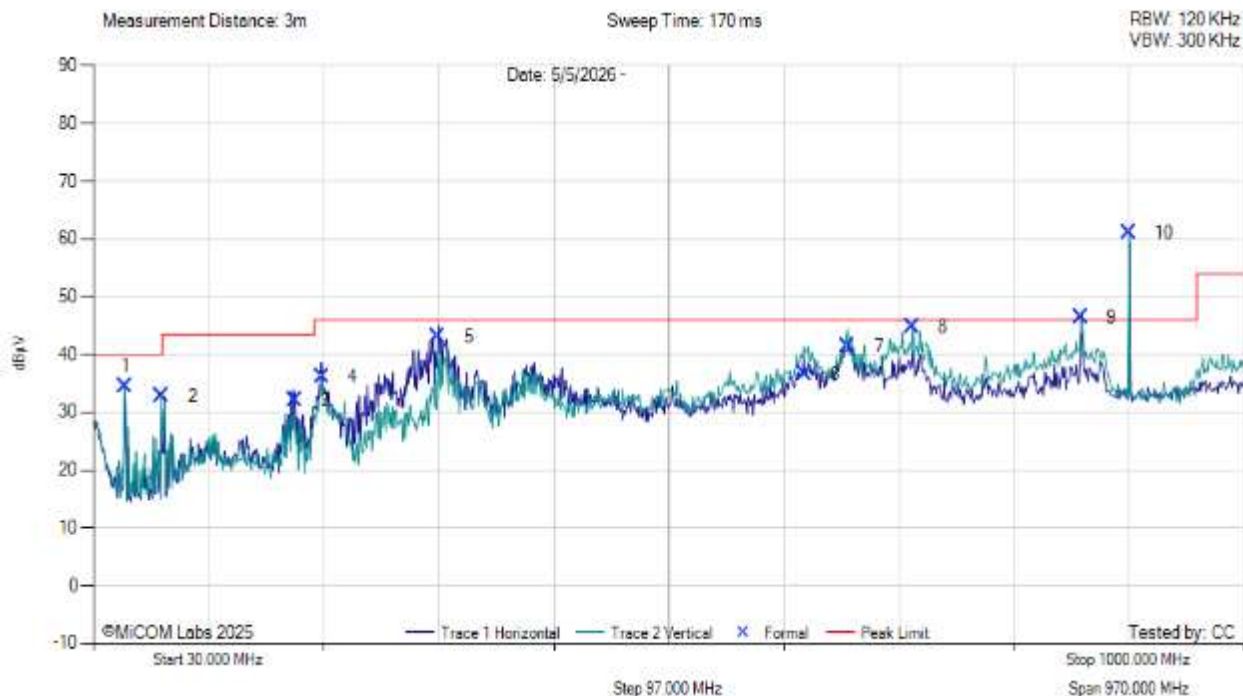
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A.4.2.1.25 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX Low]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	57.00	48.54	4.13	-18.19	34.49	MaxQP	Vertical	116	209	40.0	-5.5	Pass
2	87.87	46.37	4.29	-17.92	32.74	MaxQP	Vertical	103	266	40.0	-7.3	Pass
3	199.38	40.10	4.77	-12.81	32.05	MaxQP	Horizontal	145	253	43.5	-11.5	Pass
4	222.40	45.52	4.85	-14.20	36.17	MaxQP	Horizontal	145	0	46.0	-9.8	Pass
5	320.51	49.31	5.24	-11.47	43.09	MaxQP	Horizontal	98	197	46.0	-2.9	Pass
6	629.23	35.90	6.36	-5.66	36.60	MaxQP	Vertical	149	119	46.0	-9.4	Pass
7	665.94	40.17	6.53	-5.33	41.36	MaxQP	Vertical	199	276	46.0	-4.6	Pass
8	719.96	42.67	6.72	-4.54	44.84	MaxQP	Vertical	107	275	46.0	-1.2	Pass
9	862.42	42.11	7.25	-2.84	46.51	NRB	Vertical	100	259	--	--	Pass
10	903.00	56.04	7.42	-2.45	61.01	Fundamental	Vertical	149	59	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

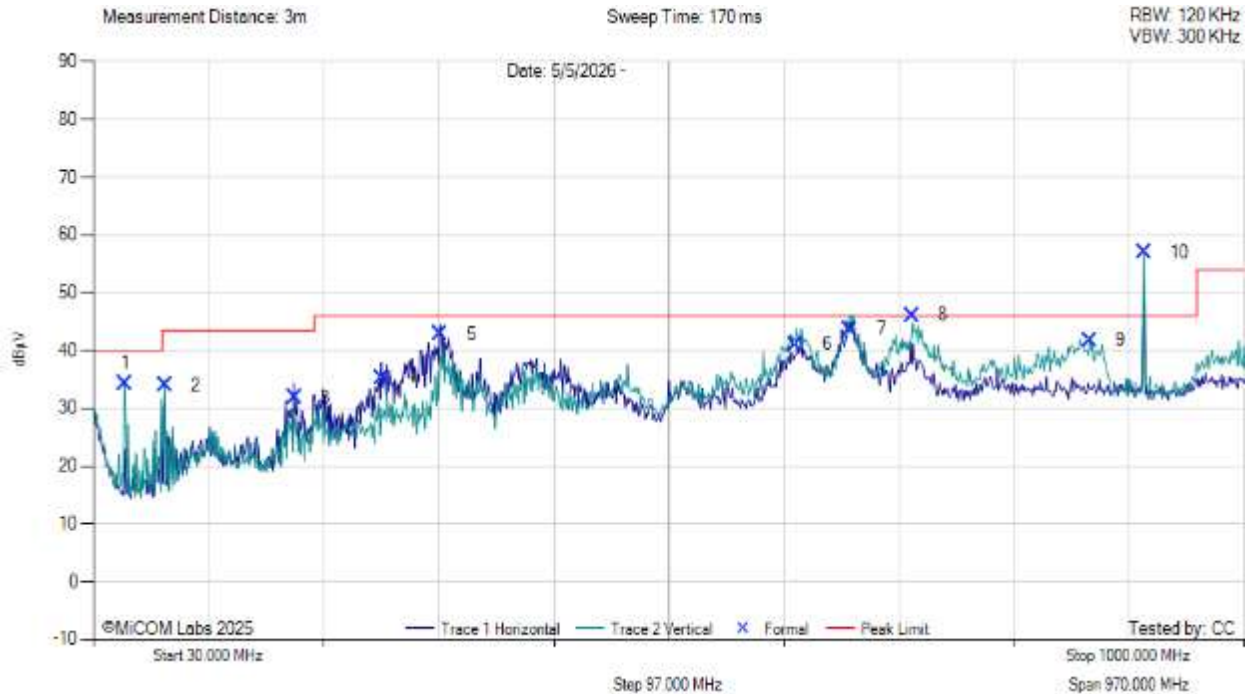
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A.4.2.1.26 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX Mid]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.91	48.35	4.13	-18.19	34.30	MaxQP	Vertical	101	209	40.0	-5.7	Pass
2	90.21	47.44	4.24	-17.64	34.04	MaxQP	Vertical	98	268	43.5	-9.5	Pass
3	199.46	39.93	4.76	-12.81	31.88	MaxQP	Horizontal	106	252	43.5	-11.6	Pass
4	273.08	42.25	5.06	-11.96	35.35	MaxQP	Horizontal	102	203	46.0	-10.6	Pass
5	322.83	48.93	5.27	-11.41	42.79	MaxQP	Horizontal	101	188	46.0	-3.2	Pass
6	622.16	40.71	6.31	-5.92	41.11	MaxQP	Vertical	146	287	46.0	-4.9	Pass
7	668.19	42.53	6.54	-5.36	43.71	MaxQP	Vertical	198	267	46.0	-2.3	Pass
8	720.01	43.96	6.72	-4.54	46.13	NRB	Vertical	107	259	--	--	Pass
9	869.60	37.19	7.30	-2.74	41.75	MaxQP	Vertical	124	121	46.0	-4.2	Pass
10	915.61	51.82	7.46	-2.30	56.98	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

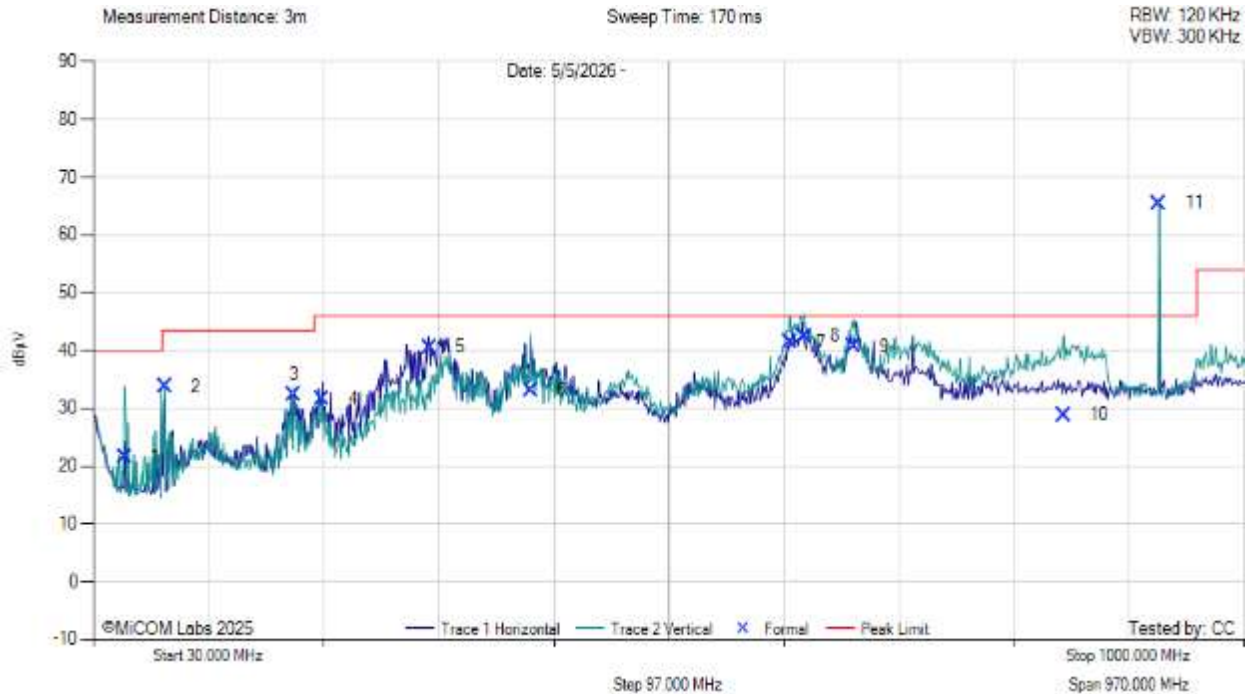
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A.4.2.1.27 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX High]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.96	35.60	4.13	-18.19	21.54	MaxQP	Vertical	143	185	40.0	-18.5	Pass
2	90.16	47.20	4.24	-17.65	33.78	MaxQP	Vertical	101	269	43.5	-9.7	Pass
3	199.35	40.39	4.77	-12.82	32.34	MaxQP	Horizontal	100	271	43.5	-11.2	Pass
4	223.30	40.91	4.86	-14.17	31.59	MaxQP	Horizontal	121	243	46.0	-14.4	Pass
5	313.06	46.94	5.22	-11.61	40.55	MaxQP	Horizontal	102	203	46.0	-5.4	Pass
6	398.40	37.47	5.50	-9.78	33.19	MaxQP	Vertical	107	0	46.0	-12.8	Pass
7	617.21	41.09	6.29	-5.95	41.43	MaxQP	Vertical	128	209	46.0	-4.6	Pass
8	629.39	41.77	6.36	-5.65	42.48	MaxQP	Vertical	98	251	46.0	-3.5	Pass
9	671.14	39.65	6.51	-5.39	40.77	MaxQP	Vertical	196	274	46.0	-5.2	Pass
10	847.59	24.64	7.26	-3.02	28.88	MaxQP	Vertical	98	161	46.0	-17.1	Pass
11	928.22	60.02	7.51	-2.06	65.47	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USBA to USBC from laptop.

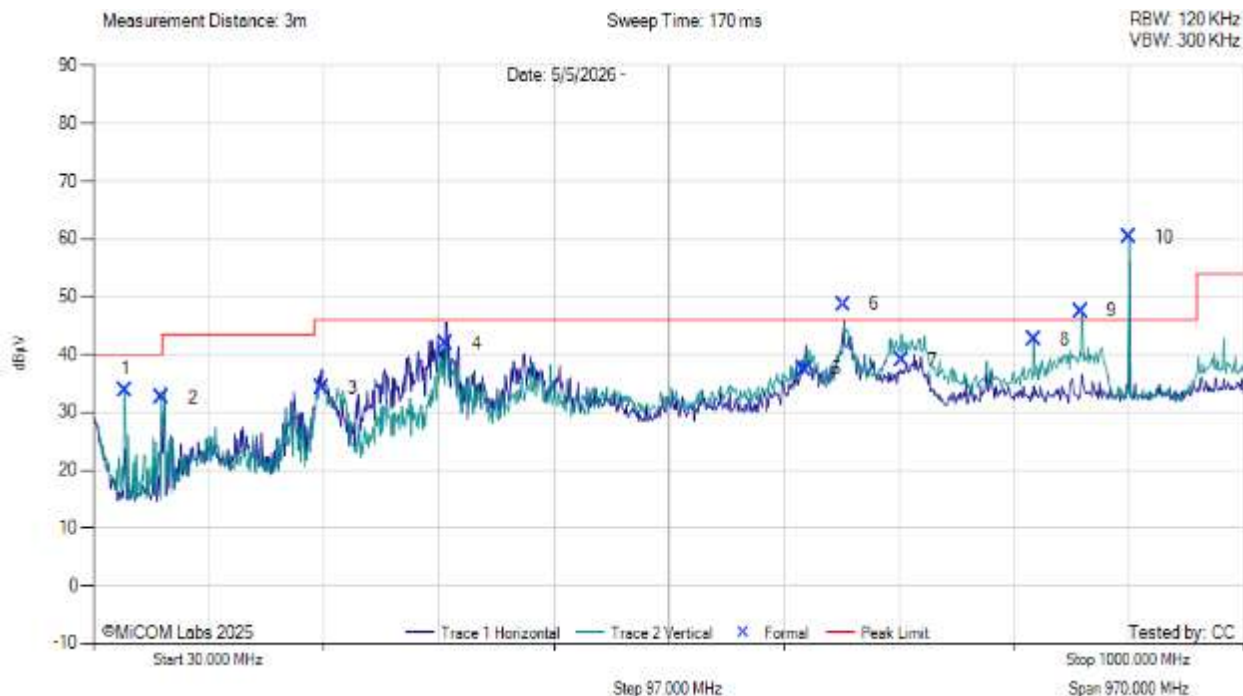
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A.4.2.1.28 Omni Laird Antenna (A09-F8NF/ FG9026) [XR Low]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.97	47.95	4.13	-18.19	33.89	MaxQP	Vertical	123	27	40.0	-6.1	Pass
2	87.78	46.17	4.29	-17.92	32.54	MaxQP	Vertical	111	138	40.0	-7.5	Pass
3	223.05	43.51	4.86	-14.18	34.19	MaxQP	Horizontal	139	220	46.0	-11.8	Pass
4	327.14	48.02	5.27	-11.38	41.91	MaxQP	Horizontal	102	183	46.0	-4.1	Pass
5	629.99	36.74	6.35	-5.62	37.47	MaxQP	Horizontal	124	211	46.0	-8.5	Pass
6	662.52	47.56	6.47	-5.27	48.76	NRB	Horizontal	114	173	--	--	Pass
7	711.61	36.96	6.68	-4.66	38.98	MaxQP	Vertical	115	274	46.0	-7.0	Pass
8	822.49	38.76	7.11	-3.28	42.59	MaxQP	Vertical	101	258	46.0	-3.4	Pass
9	862.49	43.13	7.25	-2.84	47.54	NRB	Vertical	132	241	--	--	Pass
10	903.00	55.31	7.42	-2.45	60.27	Fundamental	Vertical	149	59	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

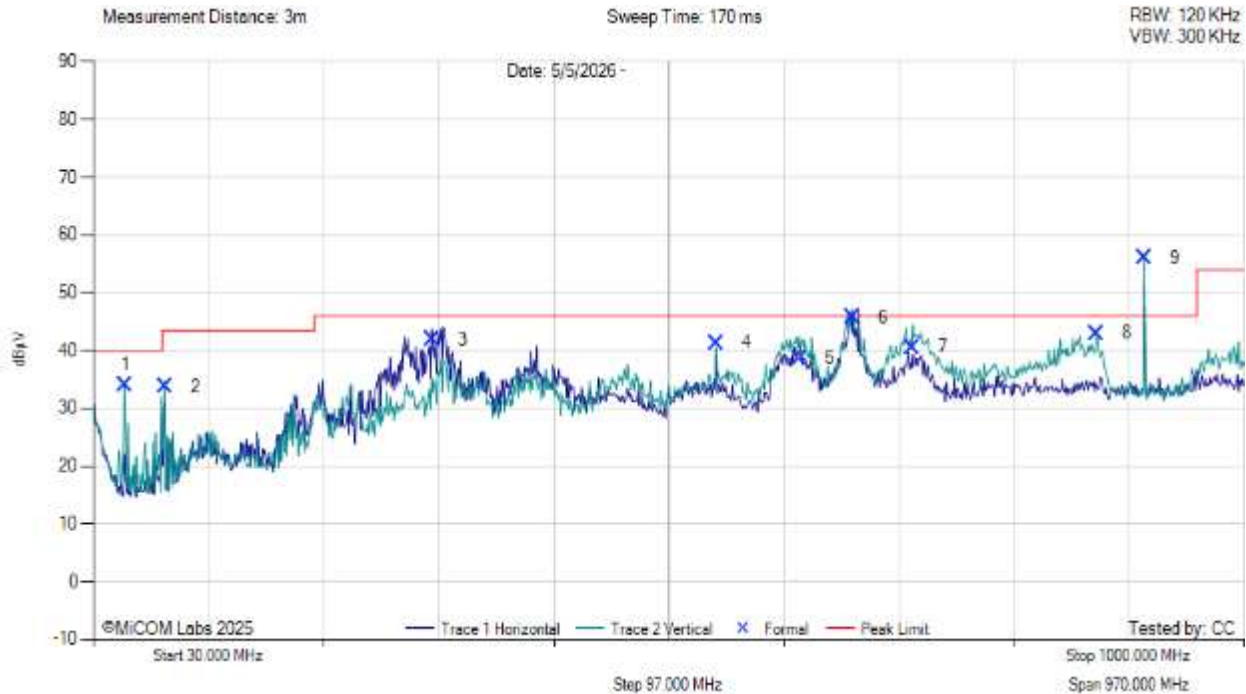
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A.4.2.1.29 Omni Laird Antenna (A09-F8NF/ FG9026) [XR Mid]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	57.01	48.13	4.13	-18.18	34.07	MaxQP	Vertical	101	198	40.0	-5.9	Pass
2	90.24	47.21	4.24	-17.64	33.81	MaxQP	Vertical	99	275	43.5	-9.7	Pass
3	315.91	48.27	5.24	-11.55	41.96	MaxQP	Horizontal	100	202	46.0	-4.0	Pass
4	555.00	42.16	6.05	-6.89	41.32	MaxQP	Vertical	163	297	46.0	-4.7	Pass
5	624.61	38.17	6.33	-5.86	38.64	MaxQP	Vertical	101	182	46.0	-7.4	Pass
6	670.04	44.58	6.51	-5.40	45.69	MaxQP	Vertical	198	271	46.0	-0.3	Pass
7	720.02	38.41	6.72	-4.54	40.58	MaxQP	Vertical	107	11	46.0	-5.4	Pass
8	875.02	38.44	7.34	-2.78	43.00	MaxQP	Vertical	131	122	46.0	-3.0	Pass
9	915.61	50.84	7.46	-2.30	56.00	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

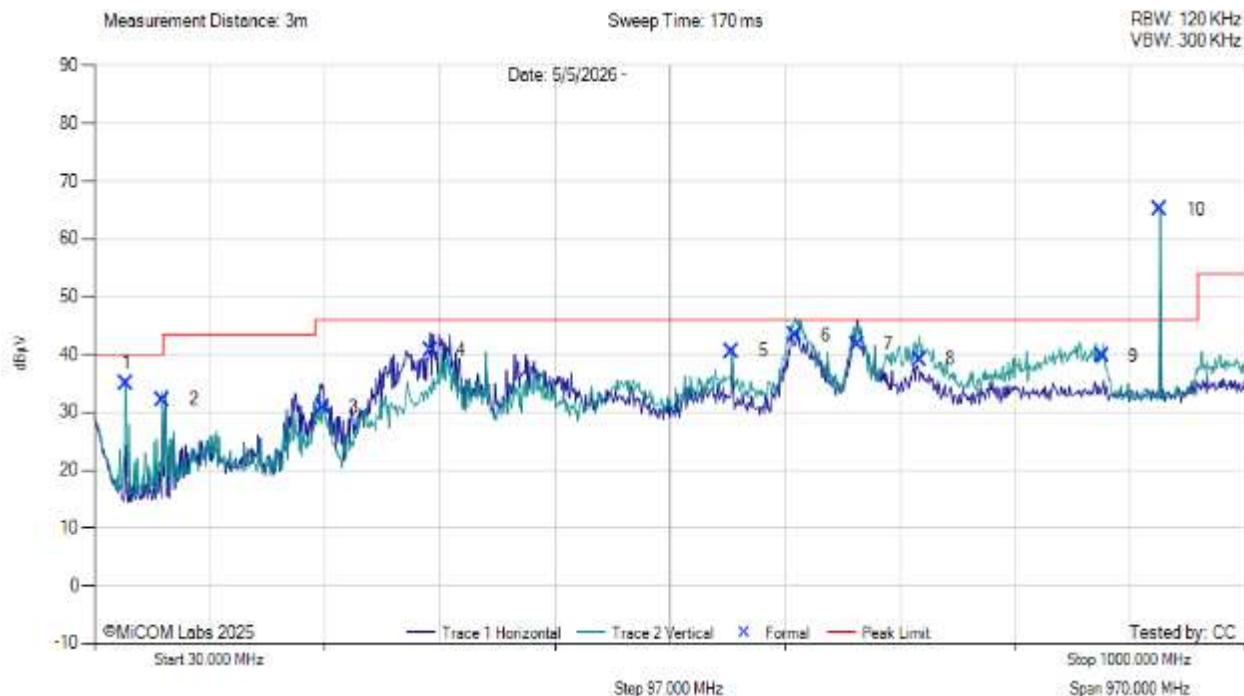
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A.4.2.1.30 Omni Laird Antenna (A09-F8NF/ FG9026) [XR High]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Omni FG9026



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.86	49.04	4.13	-18.19	34.98	MaxQP	Vertical	105	199	40.0	-5.0	Pass
2	87.77	45.85	4.29	-17.92	32.22	MaxQP	Vertical	113	279	40.0	-7.8	Pass
3	222.98	40.20	4.86	-14.18	30.87	MaxQP	Horizontal	130	3	46.0	-15.1	Pass
4	313.42	47.04	5.22	-11.59	40.66	MaxQP	Horizontal	100	193	46.0	-5.3	Pass
5	567.52	41.16	6.10	-6.68	40.59	MaxQP	Vertical	101	180	46.0	-5.4	Pass
6	620.31	42.93	6.30	-5.96	43.27	MaxQP	Vertical	151	21	46.0	-2.7	Pass
7	673.42	40.58	6.56	-5.35	41.80	MaxQP	Horizontal	198	223	46.0	-4.2	Pass
8	725.73	36.90	6.77	-4.52	39.15	MaxQP	Vertical	105	270	46.0	-6.8	Pass
9	879.99	35.16	7.36	-2.78	39.73	MaxQP	Vertical	132	177	46.0	-6.3	Pass
10	928.22	59.69	7.51	-2.06	65.14	Fundamental	Vertical	149	209	--	--	Pass

Test Notes: Omni Laird/TE Connectivity FG9026 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

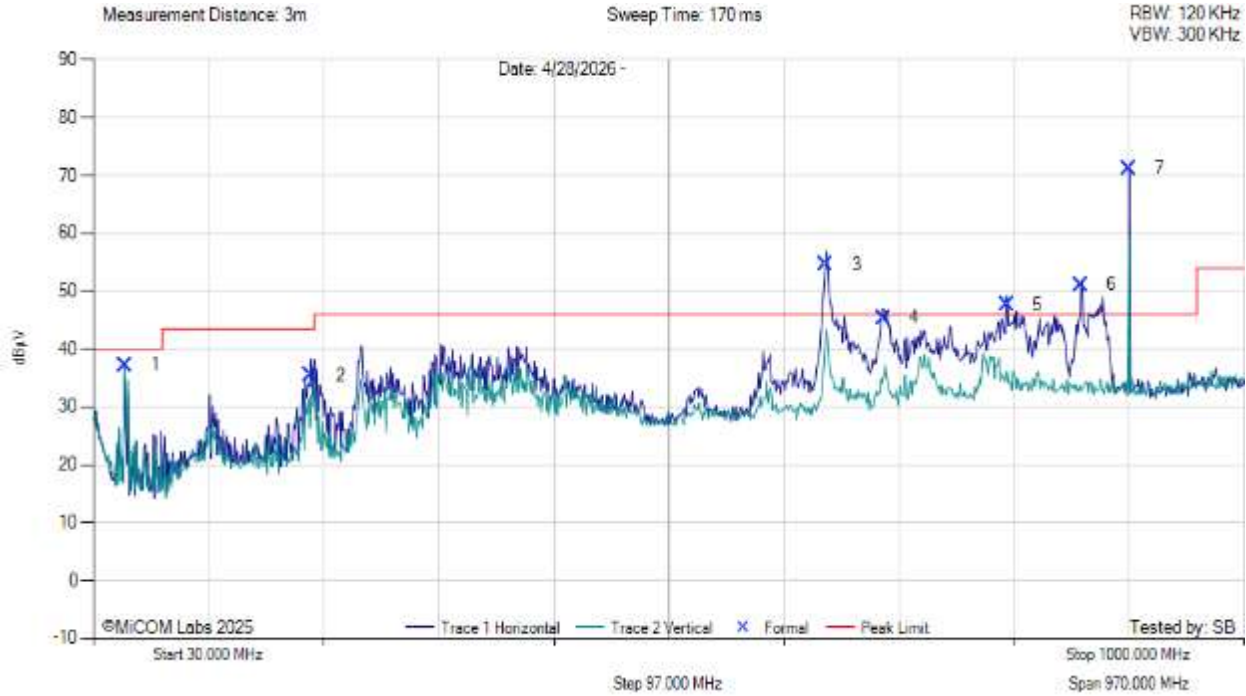
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A.4.2.1.31 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX Low]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001 , Test Freq: 902.4 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.91	51.30	4.13	-18.19	37.24	MaxQP	Vertical	100	156	40.0	-2.8	Pass
2	213.21	45.00	4.84	-14.37	35.47	MaxQP	Horizontal	143	130	43.5	-8.0	Pass
3	647.36	53.28	6.41	-5.13	54.56	NRB	Horizontal	109	104	--	--	Pass
4	696.34	43.56	6.60	-4.83	45.34	MaxQP	Horizontal	98	115	46.0	-0.7	Pass
5	799.97	44.33	7.04	-3.76	47.61	NRB	Horizontal	111	271	--	--	Pass
6	862.38	46.72	7.25	-2.84	51.12	NRB	Horizontal	117	271	--	--	Pass
7	903.00	66.25	7.42	-2.45	71.22	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

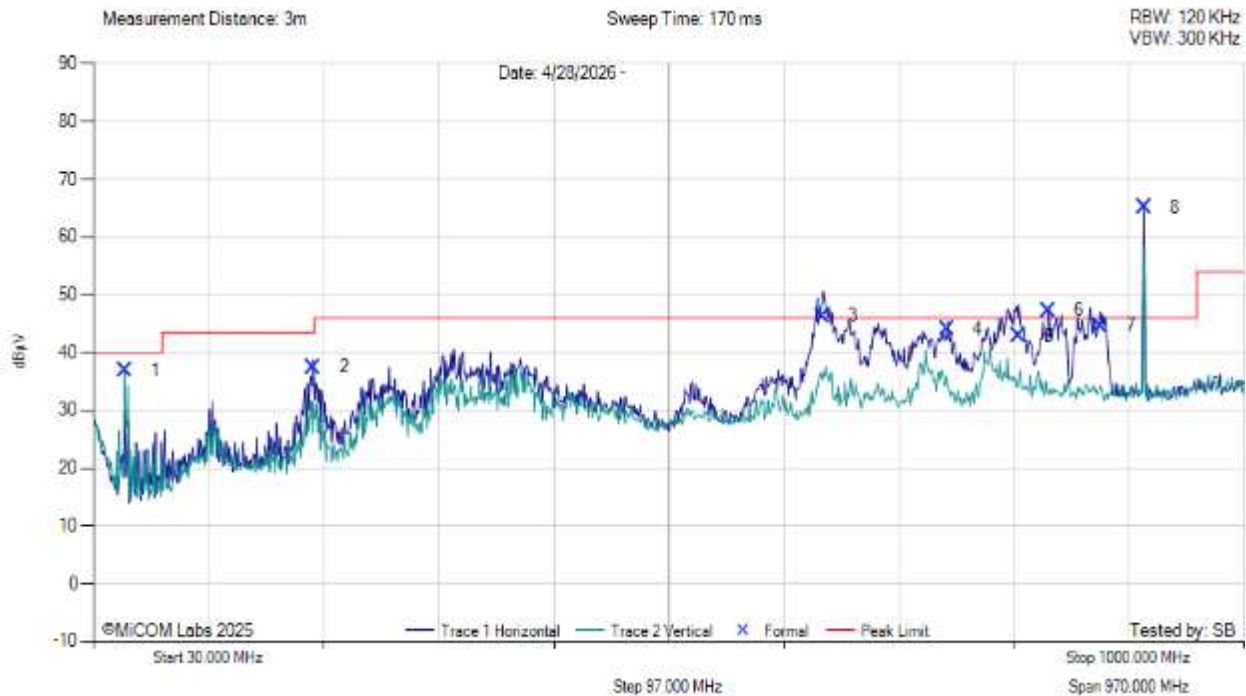
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A.4.2.1.32 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX Mid]



30 MHz to 1 GHz

Variant: XBP-HPX-UT-001 , Test Freq: 914.8 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.83	50.92	4.13	-18.19	36.86	MaxQP	Vertical	100	86	40.0	-3.1	Pass
2	215.65	46.95	4.83	-14.33	37.45	MaxQP	Horizontal	99	132	43.5	-6.1	Pass
3	644.93	45.11	6.41	-5.21	46.31	NRB	Horizontal	114	94	--	--	Pass
4	749.61	41.39	6.80	-4.15	44.04	MaxQP	Horizontal	100	101	46.0	-2.0	Pass
5	810.03	39.23	7.07	-3.49	42.81	MaxQP	Horizontal	124	262	46.0	-3.2	Pass
6	834.81	43.26	7.19	-3.13	47.33	NRB	Horizontal	100	274	--	--	Pass
7	878.44	40.09	7.39	-2.78	44.70	MaxQP	Horizontal	126	271	46.0	-1.3	Pass
8	915.61	59.91	7.46	-2.30	65.07	Fundamental	Horizontal	100	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

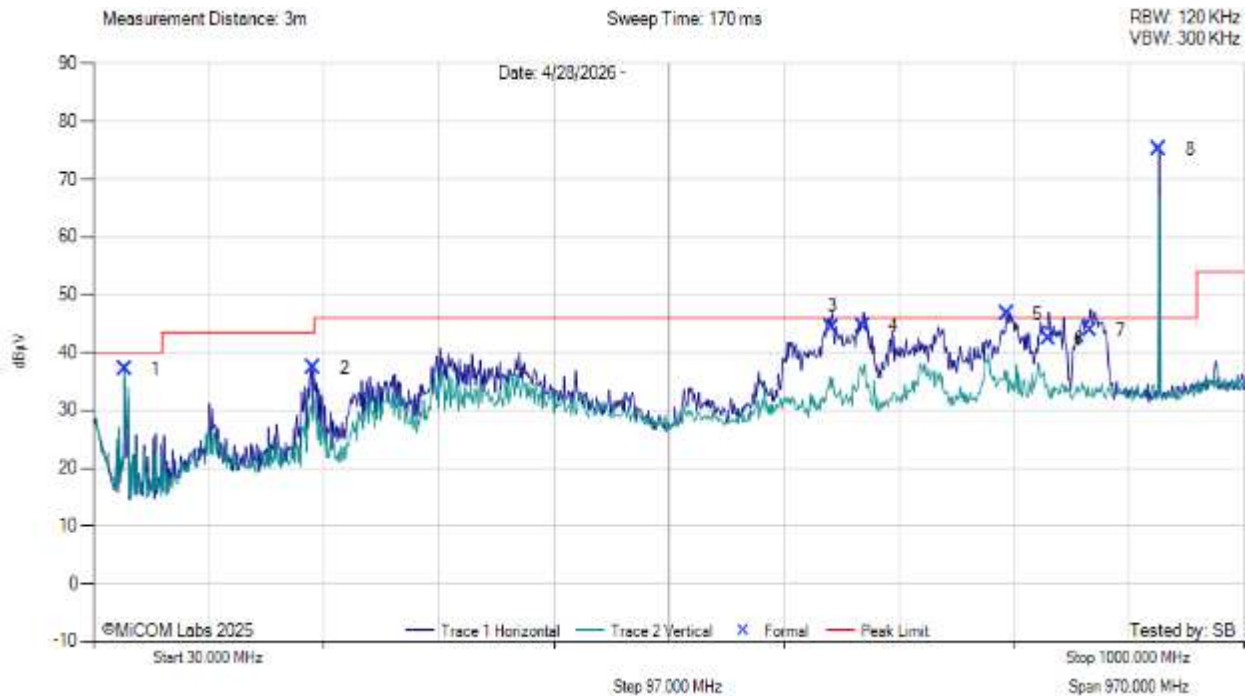
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A.4.2.1.33 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX High]



30 MHz to 1 GHz

Variant: , Test Freq: 927.6 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.88	51.20	4.13	-18.19	37.15	MaxQP	Vertical	100	119	40.0	-2.9	Pass
2	215.64	46.82	4.83	-14.33	37.32	MaxQP	Horizontal	130	131	43.5	-6.2	Pass
3	652.25	43.09	6.47	-5.12	44.44	MaxQP	Horizontal	100	114	46.0	-1.6	Pass
4	678.22	43.26	6.53	-5.26	44.53	MaxQP	Horizontal	98	115	46.0	-1.5	Pass
5	800.05	43.34	7.04	-3.76	46.62	NRB	Horizontal	123	265	--	--	Pass
6	834.60	38.35	7.19	-3.13	42.41	MaxQP	Horizontal	107	265	46.0	-3.6	Pass
7	870.09	39.32	7.30	-2.74	43.88	MaxQP	Horizontal	102	267	46.0	-2.1	Pass
8	928.22	69.71	7.51	-2.06	75.16	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

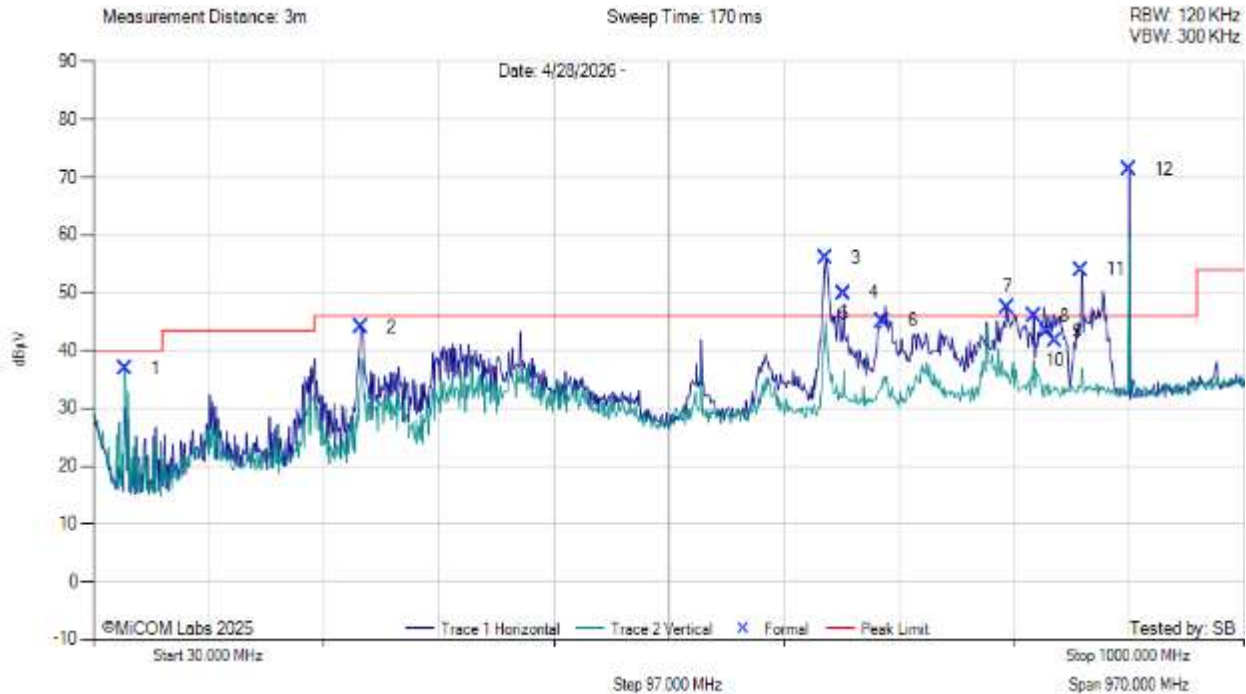
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A.4.2.1.34 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR Low]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.91	50.88	4.13	-18.19	36.82	MaxQP	Vertical	100	85	40.0	-3.2	Pass
2	255.92	52.64	5.00	-13.62	44.02	MaxQP	Horizontal	101	128	46.0	-2.0	Pass
3	646.57	54.70	6.42	-5.15	55.98	NRB	Horizontal	109	100	--	--	Pass
4	662.49	48.76	6.47	-5.27	49.96	NRB	Horizontal	104	111	--	--	Pass
5	662.50	48.68	6.47	-5.27	49.88	NRB	Horizontal	105	117	--	--	Pass
6	695.05	43.31	6.63	-4.83	45.10	MaxQP	Horizontal	99	116	46.0	-0.9	Pass
7	800.00	44.25	7.04	-3.76	47.53	NRB	Horizontal	100	270	--	--	Pass
8	822.49	42.18	7.11	-3.28	46.01	NRB	Horizontal	100	260	--	--	Pass
9	834.02	39.26	7.19	-3.15	43.30	MaxQP	Horizontal	100	271	46.0	-2.7	Pass
10	840.54	37.56	7.25	-3.05	41.75	MaxQP	Horizontal	130	258	46.0	-4.2	Pass
11	862.50	49.55	7.25	-2.84	53.96	NRB	Horizontal	100	273	--	--	Pass
12	903.00	66.42	7.42	-2.45	71.38	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

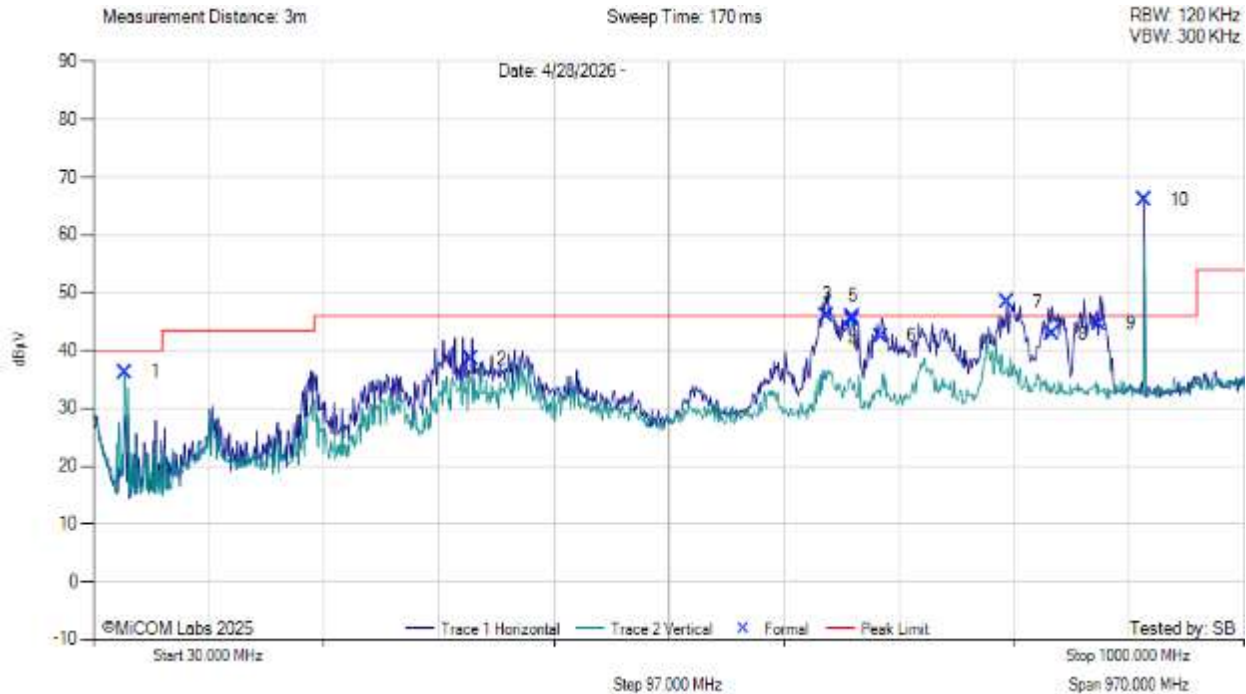
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A.4.2.1.35 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR Mid]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915.0 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.93	50.32	4.13	-18.19	36.26	MaxQP	Vertical	98	103	40.0	-3.7	Pass
2	348.83	44.11	5.35	-10.90	38.56	MaxQP	Horizontal	102	73	46.0	-7.4	Pass
3	647.94	44.83	6.41	-5.12	46.12	NRB	Horizontal	100	96	--	--	Pass
4	670.02	44.13	6.51	-5.40	45.24	MaxQP	Horizontal	100	115	46.0	-0.8	Pass
5	670.20	44.77	6.51	-5.40	45.88	MaxP	Horizontal	98	90	46.0	-0.1	Pass
6	694.15	40.79	6.61	-4.86	42.54	MaxQP	Horizontal	103	108	46.0	-3.5	Pass
7	800.00	45.03	7.04	-3.76	48.32	NRB	Horizontal	101	266	--	--	Pass
8	837.80	38.81	7.20	-3.08	42.93	MaxQP	Horizontal	98	269	46.0	-3.1	Pass
9	878.03	40.08	7.39	-2.78	44.69	MaxQP	Horizontal	116	273	46.0	-1.3	Pass
10	915.61	60.90	7.46	-2.30	66.06	Fundamental	Horizontal	98	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

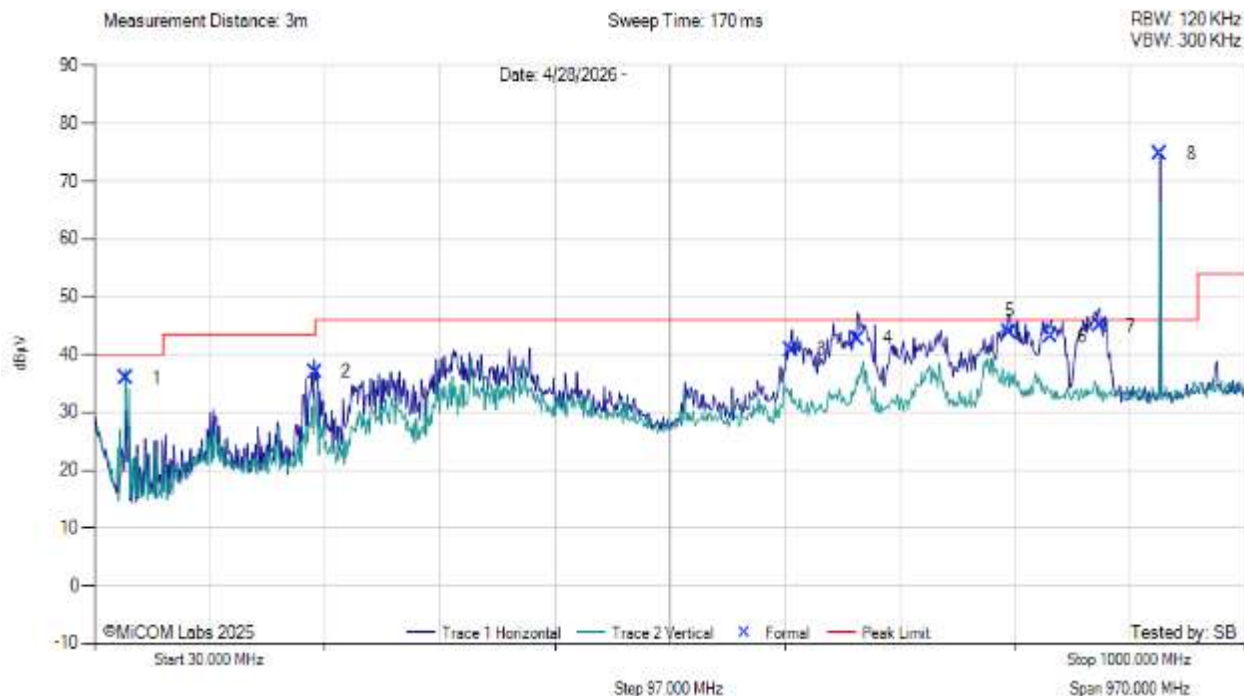
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A.4.2.1.36 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR High]



30 MHz to 1 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Yagi



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	56.93	50.02	4.13	-18.19	35.97	MaxQP	Vertical	105	88	40.0	-4.0	Pass
2	215.97	46.51	4.83	-14.32	37.01	MaxQP	Horizontal	100	139	43.5	-6.5	Pass
3	617.40	40.46	6.29	-5.95	40.79	MaxQP	Horizontal	114	115	46.0	-5.2	Pass
4	672.81	41.50	6.55	-5.35	42.70	MaxQP	Horizontal	104	97	46.0	-3.3	Pass
5	801.60	40.61	7.07	-3.71	43.97	MaxQP	Horizontal	113	262	46.0	-2.0	Pass
6	836.42	38.96	7.20	-3.09	43.07	MaxQP	Horizontal	100	271	46.0	-2.9	Pass
7	877.54	40.48	7.38	-2.79	45.07	MaxQP	Horizontal	100	272	46.0	-0.9	Pass
8	928.22	69.25	7.51	-2.06	74.70	Fundamental	Horizontal	149	270	--	--	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

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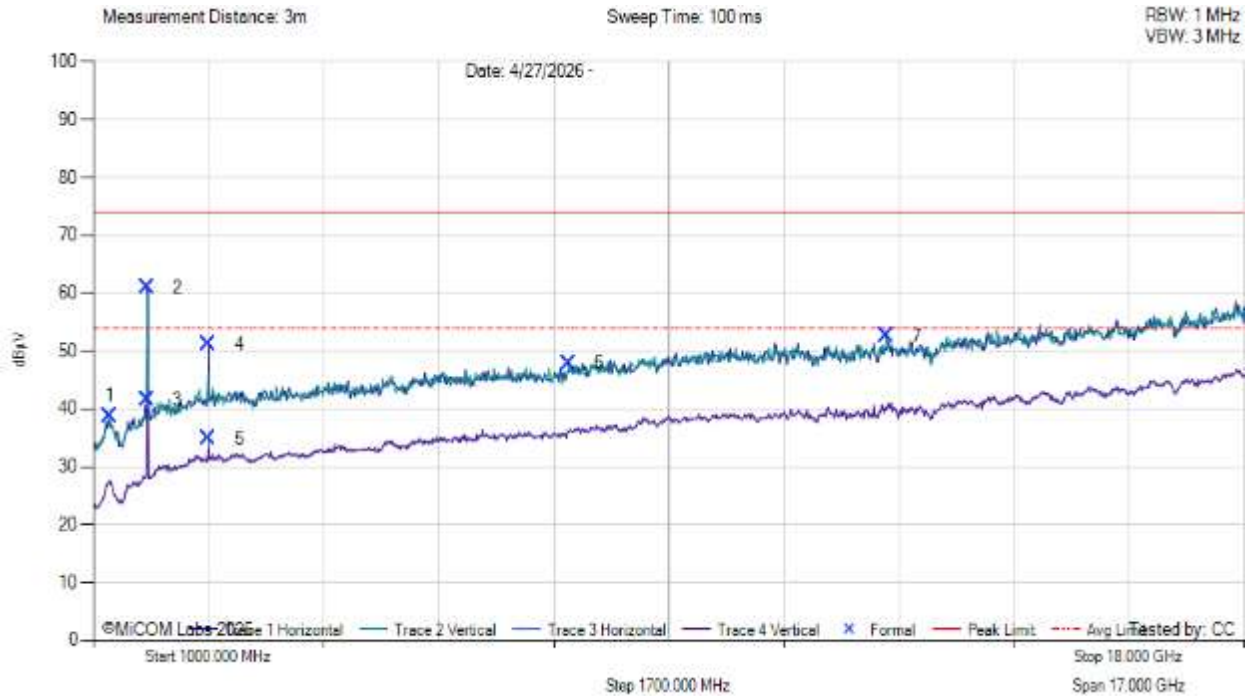
A.3.2.2. TX Spurious & Restricted Band Emissions (1GHz - 18 GHz)

A.4.2.2.1 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX Low)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	52.79	2.27	-16.34	38.72	MaxP	Vertical	199	209	74.0	-35.3	Pass
2	1799.00	73.07	2.65	-14.67	61.05	MaxP	Horizontal	150	210	74.0	-12.9	Pass
3	1799.00	53.59	2.65	-14.67	41.57	AVG	Horizontal	150	210	54.0	-12.4	Pass
4	2700.00	59.70	3.22	-11.74	51.17	MaxP	Horizontal	199	240	74.0	-22.8	Pass
5	2700.00	43.45	3.22	-11.74	34.93	AVG	Horizontal	199	240	54.0	-19.1	Pass
6	8021.00	51.02	4.78	-7.83	47.97	MaxP	Vertical	199	59	74.0	-26.0	Pass
7	12713.00	54.29	6.14	-7.84	52.59	MaxP	Vertical	151	0	74.0	-21.4	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

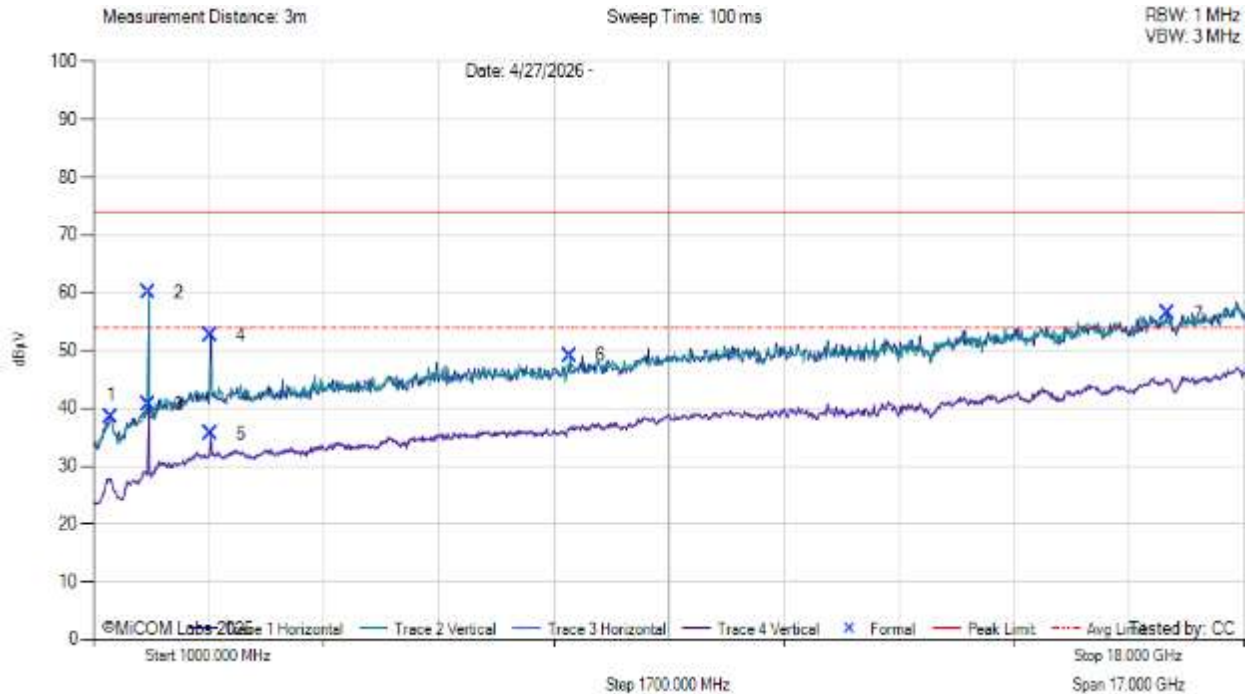
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A.4.2.2.2 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX Mid)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 915 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1255.00	52.48	2.28	-16.16	38.60	MaxP	Horizontal	199	60	74.0	-35.4	Pass
2	1816.00	71.89	2.66	-14.49	60.06	MaxP	Vertical	149	59	74.0	-13.9	Pass
3	1816.00	52.41	2.66	-14.49	40.57	AVG	Vertical	149	59	54.0	-13.4	Pass
4	2734.00	60.90	3.24	-11.54	52.59	MaxP	Horizontal	149	240	74.0	-21.4	Pass
5	2734.00	43.92	3.24	-11.54	35.61	AVG	Horizontal	149	240	54.0	-18.4	Pass
6	8038.00	51.98	4.97	-7.83	49.13	MaxP	Vertical	199	0	74.0	-24.9	Pass
7	16861.00	49.20	7.01	0.18	56.39	MaxP	Horizontal	199	90	74.0	-17.6	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

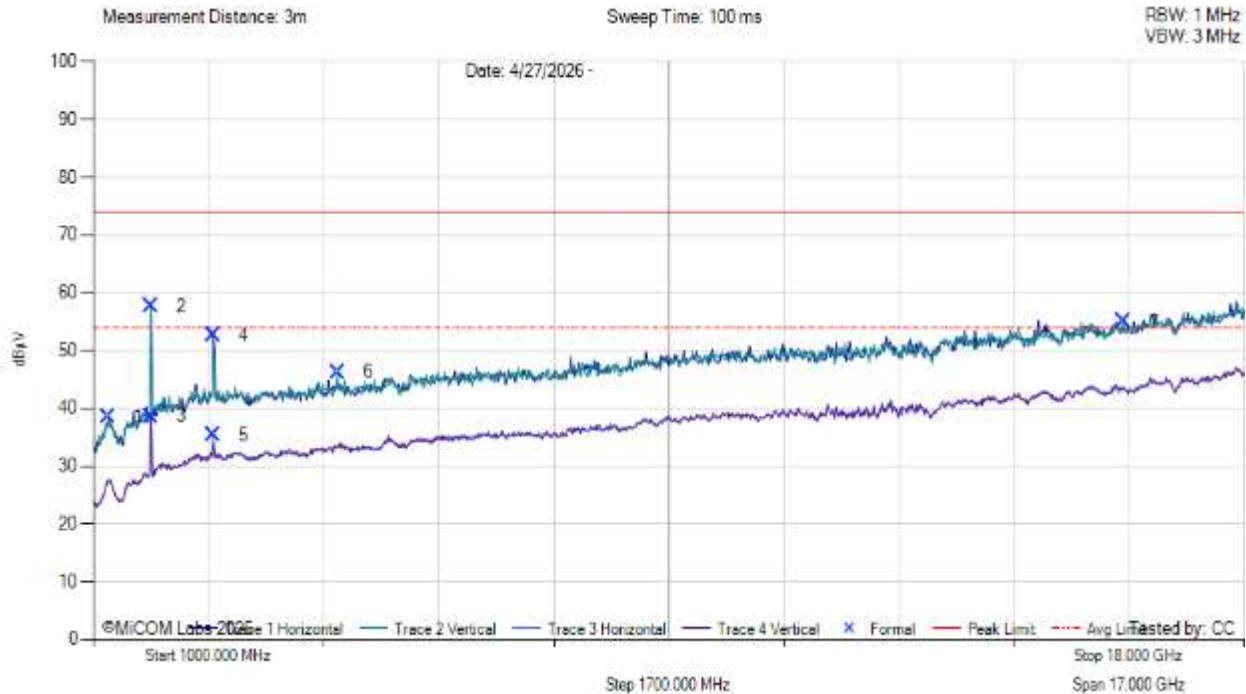
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A.4.2.2.3 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (HPX High)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.5 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.82	2.28	-16.58	38.52	MaxP	Vertical	149	269	74.0	-35.5	Pass
2	1850.00	69.41	2.66	-14.40	57.67	MaxP	Horizontal	149	90	74.0	-16.3	Pass
3	1850.00	50.38	2.66	-14.40	38.64	AVG	Horizontal	149	90	54.0	-15.4	Pass
4	2768.00	60.91	3.21	-11.48	52.64	MaxP	Horizontal	149	240	74.0	-21.4	Pass
5	2768.00	43.64	3.21	-11.48	35.37	AVG	Horizontal	149	240	54.0	-18.6	Pass
6	4604.00	54.52	3.73	-12.01	46.24	MaxP	Vertical	199	89	74.0	-27.8	Pass
7	16215.00	49.23	6.71	-0.95	54.99	MaxP	Vertical	149	59	74.0	-19.0	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

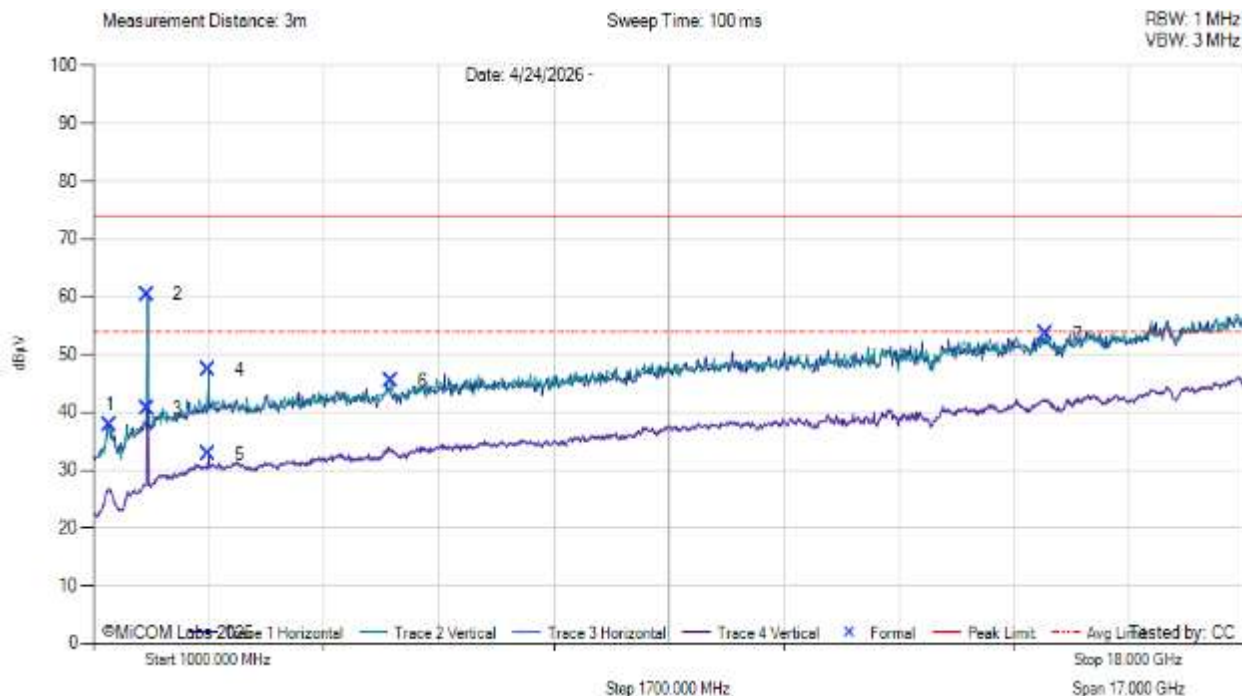
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A.4.2.2.4 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR Low)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	51.91	2.27	-16.34	37.83	MaxP	Horizontal	148	120	74.0	-36.2	Pass
2	1799.00	72.38	2.65	-14.67	60.36	MaxP	Horizontal	148	210	74.0	-13.6	Pass
3	1799.00	52.63	2.65	-14.67	40.61	AVG	Horizontal	148	210	54.0	-13.4	Pass
4	2700.00	55.92	3.22	-11.74	47.40	MaxP	Horizontal	199	240	74.0	-26.6	Pass
5	2700.00	41.22	3.22	-11.74	32.70	AVG	Vertical	148	29	54.0	-21.3	Pass
6	5403.00	52.50	4.29	-11.35	45.44	MaxP	Vertical	199	179	74.0	-28.6	Pass
7	15076.00	50.45	6.61	-3.48	53.57	MaxP	Vertical	199	89	74.0	-20.4	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

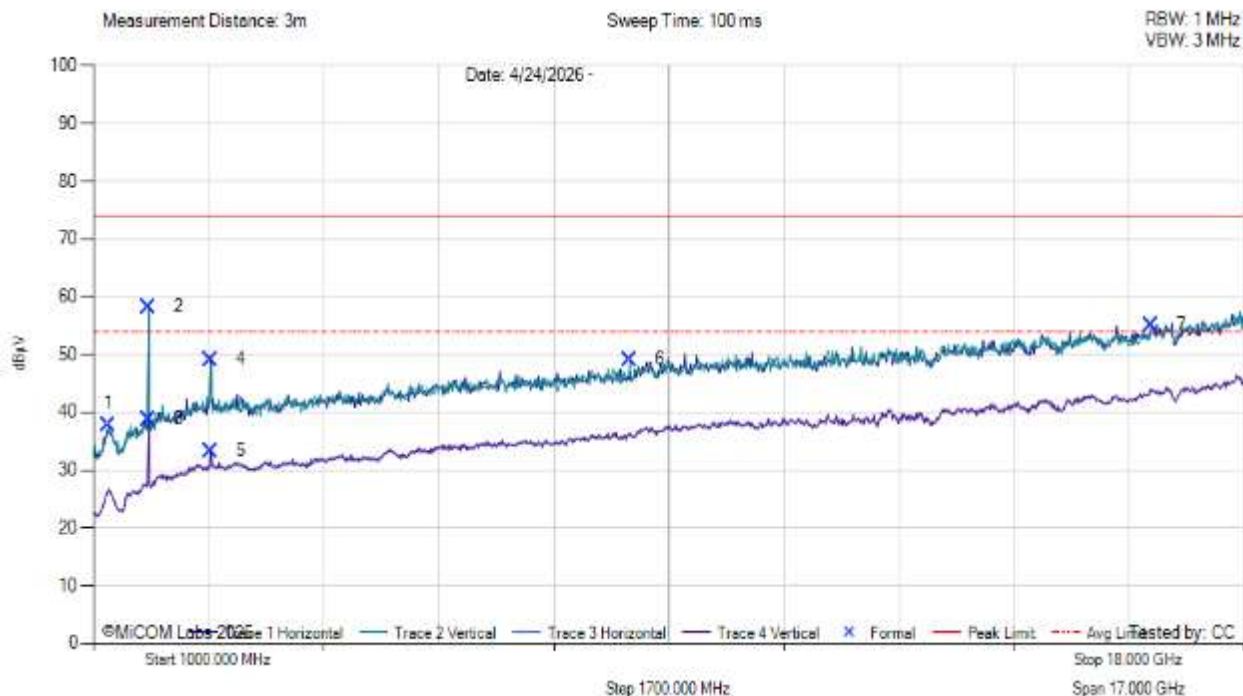
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A.4.2.2.5 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR Mid)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.16	2.28	-16.58	37.86	MaxP	Vertical	148	209	74.0	-36.1	Pass
2	1816.00	70.09	2.66	-14.49	58.25	MaxP	Vertical	148	59	74.0	-15.7	Pass
3	1816.00	50.70	2.66	-14.49	38.86	AVG	Vertical	148	59	54.0	-15.1	Pass
4	2734.00	57.47	3.24	-11.54	49.16	MaxP	Horizontal	199	270	74.0	-24.8	Pass
5	2734.00	41.60	3.24	-11.54	33.29	AVG	Vertical	148	29	54.0	-20.7	Pass
6	8922.00	51.36	5.25	-7.48	49.12	MaxP	Vertical	148	89	74.0	-24.9	Pass
7	16623.00	48.20	6.73	0.24	55.16	MaxP	Vertical	148	119	74.0	-18.8	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

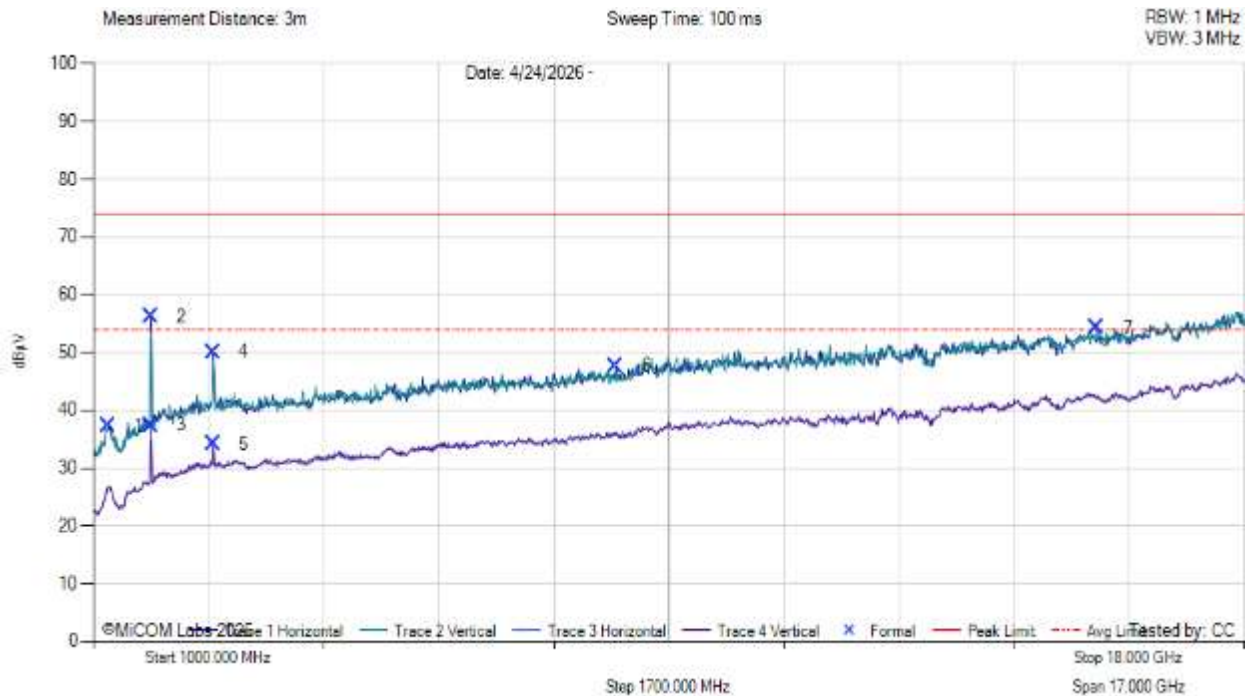
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A.4.2.2.6 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF) (XR High)



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Dipole A09-HASM-675



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	51.61	2.28	-16.58	37.31	MaxP	Horizontal	148	210	74.0	-36.7	Pass
2	1850.00	67.99	2.66	-14.40	56.26	MaxP	Horizontal	148	210	74.0	-17.7	Pass
3	1850.00	49.17	2.66	-14.40	37.43	AVG	Horizontal	148	210	54.0	-16.6	Pass
4	2768.00	58.37	3.21	-11.48	50.10	MaxP	Horizontal	148	270	74.0	-23.9	Pass
5	2768.00	42.41	3.21	-11.48	34.14	AVG	Horizontal	148	270	54.0	-19.9	Pass
6	8718.00	50.53	5.50	-8.33	47.70	MaxP	Vertical	148	119	74.0	-26.3	Pass
7	15824.00	48.81	6.73	-1.26	54.29	MaxP	Vertical	148	270	74.0	-19.7	Pass

Test Notes: Dipole A09-HASM-675, Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

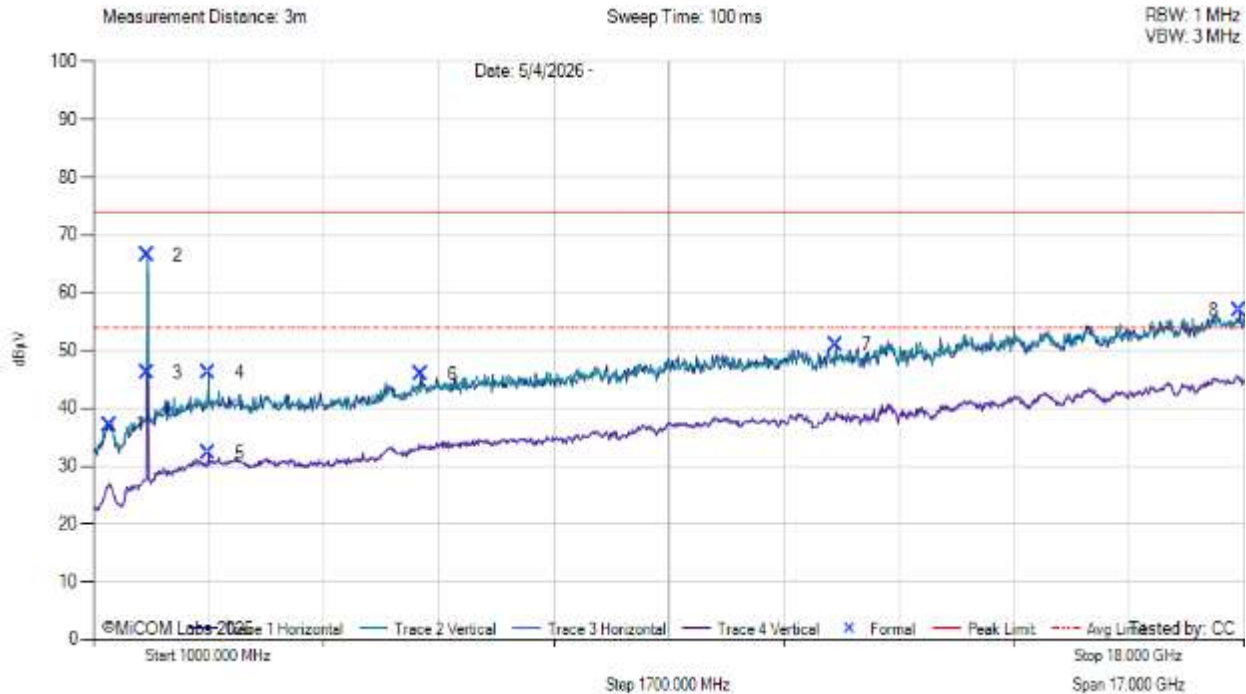
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A.4.2.2.7 Dome / Laird Antenna (A09-D3NF /TRA8903) [HPX Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	51.21	2.27	-16.34	37.13	MaxP	Horizontal	199	240	74.0	-36.9	Pass
2	1799.00	78.49	2.65	-14.67	66.47	MaxP	Vertical	199	89	74.0	-7.5	Pass
3	1799.00	58.21	2.65	-14.67	46.19	AVG	Vertical	199	89	54.0	-7.8	Pass
4	2700.00	54.67	3.22	-11.74	46.15	MaxP	Horizontal	199	300	74.0	-27.9	Pass
5	2700.00	40.76	3.22	-11.74	32.24	AVG	Vertical	199	269	54.0	-21.8	Pass
6	5845.00	51.68	4.27	-10.07	45.88	MaxP	Horizontal	148	300	74.0	-28.1	Pass
7	11965.00	50.89	5.81	-5.64	51.07	MaxP	Vertical	148	119	74.0	-22.9	Pass
8	17932.00	47.77	8.07	1.02	56.86	MaxP	Horizontal	148	210	74.0	-17.1	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

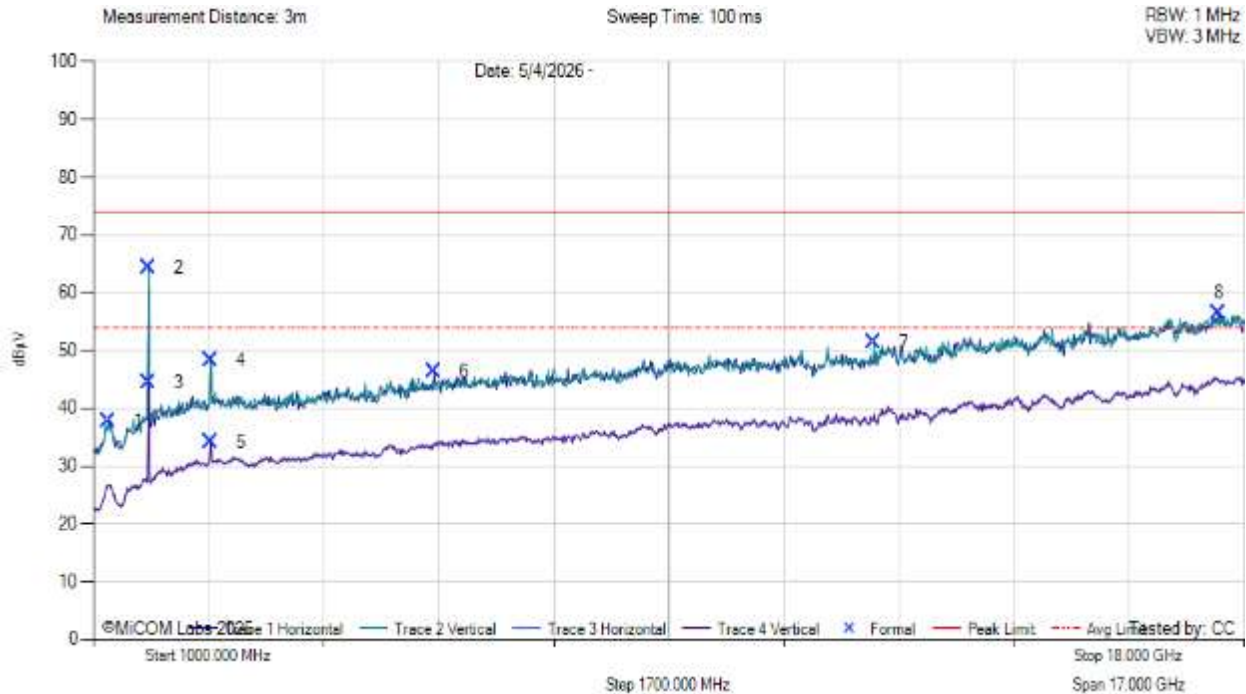
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A.4.2.2.8 Dome / Laird Antenna (A09-D3NF /TRA8903) [HPX Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.02	2.28	-16.58	37.72	MaxP	Vertical	151	0	74.0	-36.3	Pass
2	1816.00	76.17	2.66	-14.49	64.33	MaxP	Vertical	199	269	74.0	-9.7	Pass
3	1816.00	56.31	2.66	-14.49	44.47	AVG	Vertical	199	269	54.0	-9.5	Pass
4	2734.00	56.64	3.24	-11.54	48.33	MaxP	Vertical	199	239	74.0	-25.7	Pass
5	2734.00	42.43	3.24	-11.54	34.12	AVG	Vertical	199	239	54.0	-19.9	Pass
6	6032.00	51.73	4.28	-9.67	46.33	MaxP	Horizontal	199	150	74.0	-27.7	Pass
7	12526.00	51.82	6.20	-6.56	51.45	MaxP	Vertical	150	59	74.0	-22.5	Pass
8	17626.00	49.27	7.48	-0.37	56.38	MaxP	Horizontal	150	150	74.0	-17.6	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

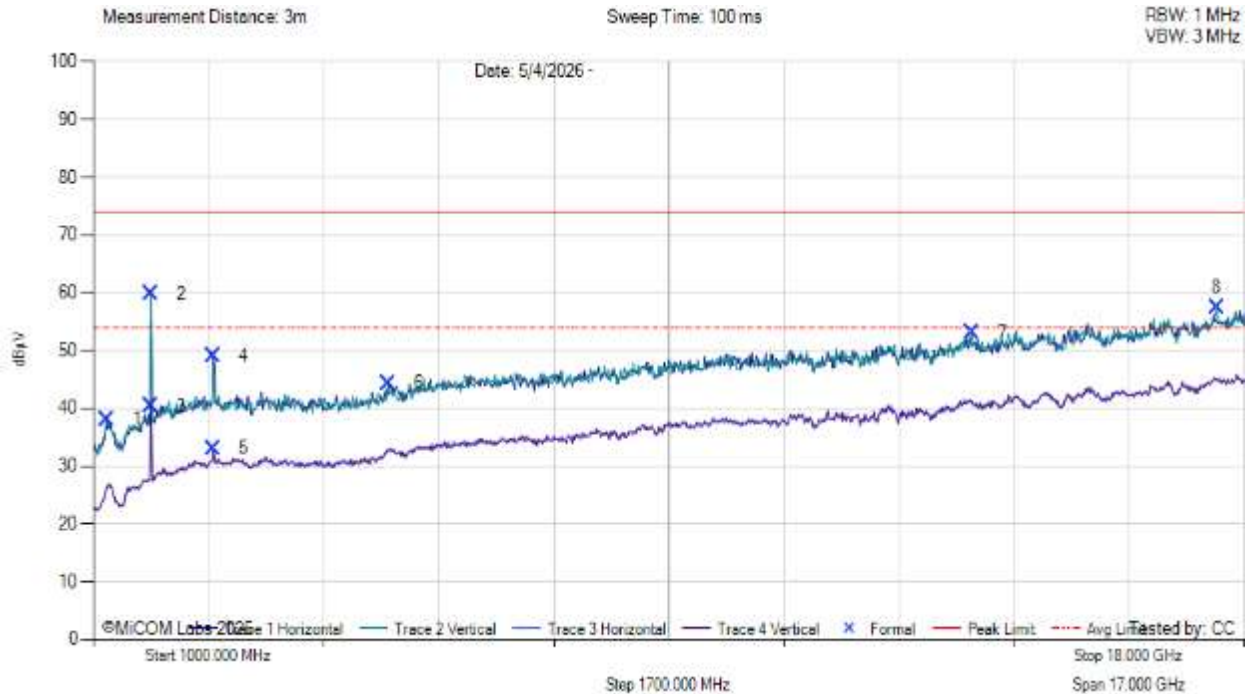
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A.4.2.2.9 Dome / Laird Antenna (A09-D3NF /TRA8903) [HPX High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	52.63	2.26	-16.72	38.17	MaxP	Vertical	150	270	74.0	-35.8	Pass
2	1850.00	71.61	2.66	-14.40	59.87	MaxP	Vertical	199	270	74.0	-14.1	Pass
3	1850.00	52.08	2.66	-14.40	40.34	AVG	Vertical	199	270	54.0	-13.7	Pass
4	2768.00	57.35	3.21	-11.48	49.08	MaxP	Horizontal	150	60	74.0	-24.9	Pass
5	2768.00	41.35	3.21	-11.48	33.08	AVG	Horizontal	199	300	54.0	-20.9	Pass
6	5352.00	51.42	4.20	-11.27	44.35	MaxP	Vertical	199	0	74.0	-29.7	Pass
7	13971.00	54.03	6.58	-7.49	53.13	MaxP	Vertical	150	239	74.0	-20.9	Pass
8	17592.00	50.40	7.37	-0.38	57.40	MaxP	Vertical	150	29	74.0	-16.6	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

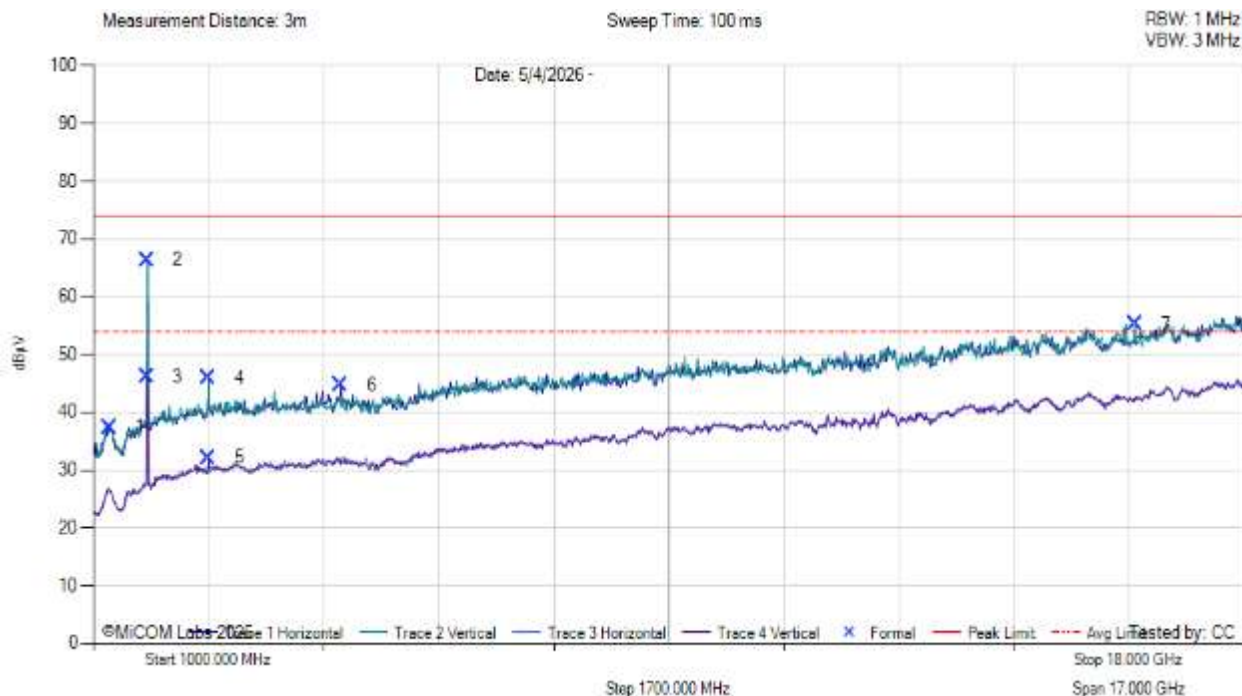
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A.4.2.2.10 Dome / Laird Antenna (A09-D3NF /TRA8903) [XR Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	51.49	2.27	-16.34	37.42	MaxP	Vertical	149	89	74.0	-36.6	Pass
2	1799.00	78.42	2.65	-14.67	66.40	MaxP	Vertical	199	89	74.0	-7.6	Pass
3	1799.00	58.17	2.65	-14.67	46.15	AVG	Vertical	199	89	54.0	-7.9	Pass
4	2700.00	54.41	3.22	-11.74	45.89	MaxP	Horizontal	149	270	74.0	-28.1	Pass
5	2700.00	40.69	3.22	-11.74	32.17	AVG	Vertical	199	270	54.0	-21.8	Pass
6	4655.00	53.00	3.80	-12.15	44.65	MaxP	Horizontal	199	30	74.0	-29.3	Pass
7	16385.00	48.99	6.89	-0.61	55.26	MaxP	Vertical	149	149	74.0	-18.7	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

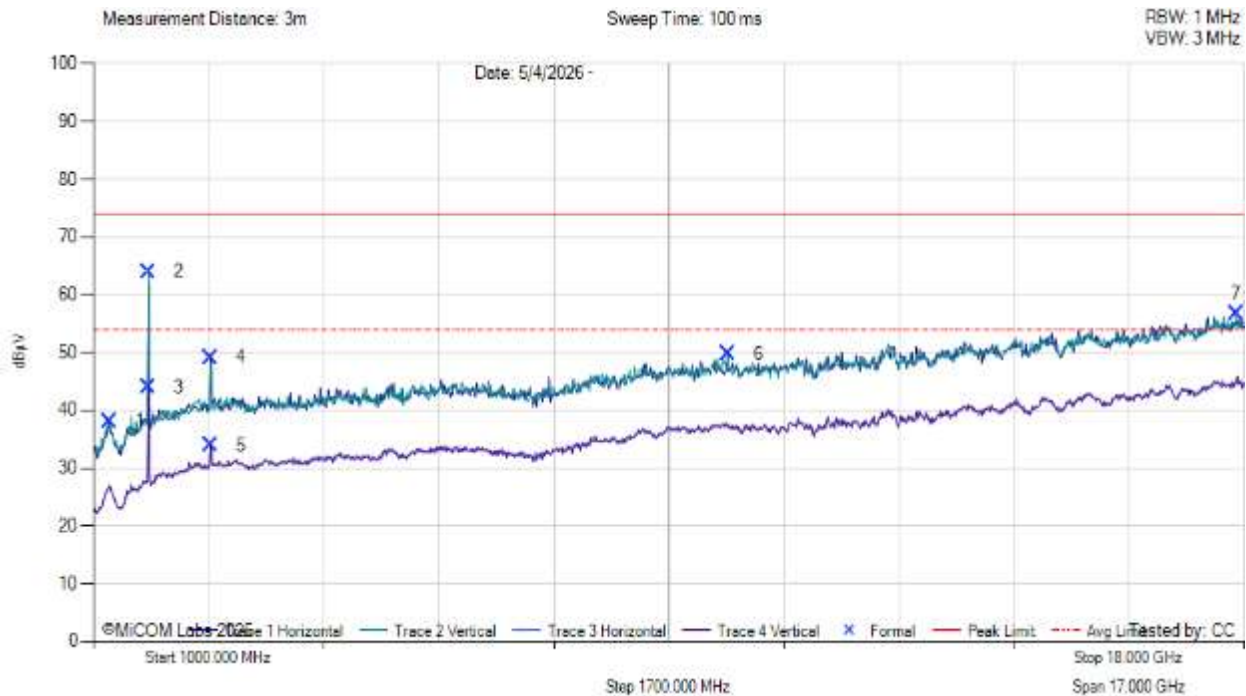
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A.4.2.2.11 Dome / Laird Antenna (A09-D3NF /TRA8903) [XR Mid]



FCC Spurious 1 GHz -18 GHz

Variant: , Test Freq: 914.8 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	52.18	2.27	-16.34	38.10	MaxP	Horizontal	148	30	74.0	-35.9	Pass
2	1816.00	75.87	2.66	-14.49	64.04	MaxP	Vertical	199	269	74.0	-10.0	Pass
3	1816.00	55.82	2.66	-14.49	43.99	AVG	Vertical	199	269	54.0	-10.0	Pass
4	2734.00	57.48	3.24	-11.54	49.17	MaxP	Horizontal	199	270	74.0	-24.8	Pass
5	2734.00	42.19	3.24	-11.54	33.89	AVG	Vertical	199	269	54.0	-20.1	Pass
6	10367.00	49.05	5.63	-4.88	49.80	MaxP	Vertical	199	89	74.0	-24.2	Pass
7	17881.00	47.11	8.07	1.46	56.64	MaxP	Vertical	148	89	74.0	-17.4	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

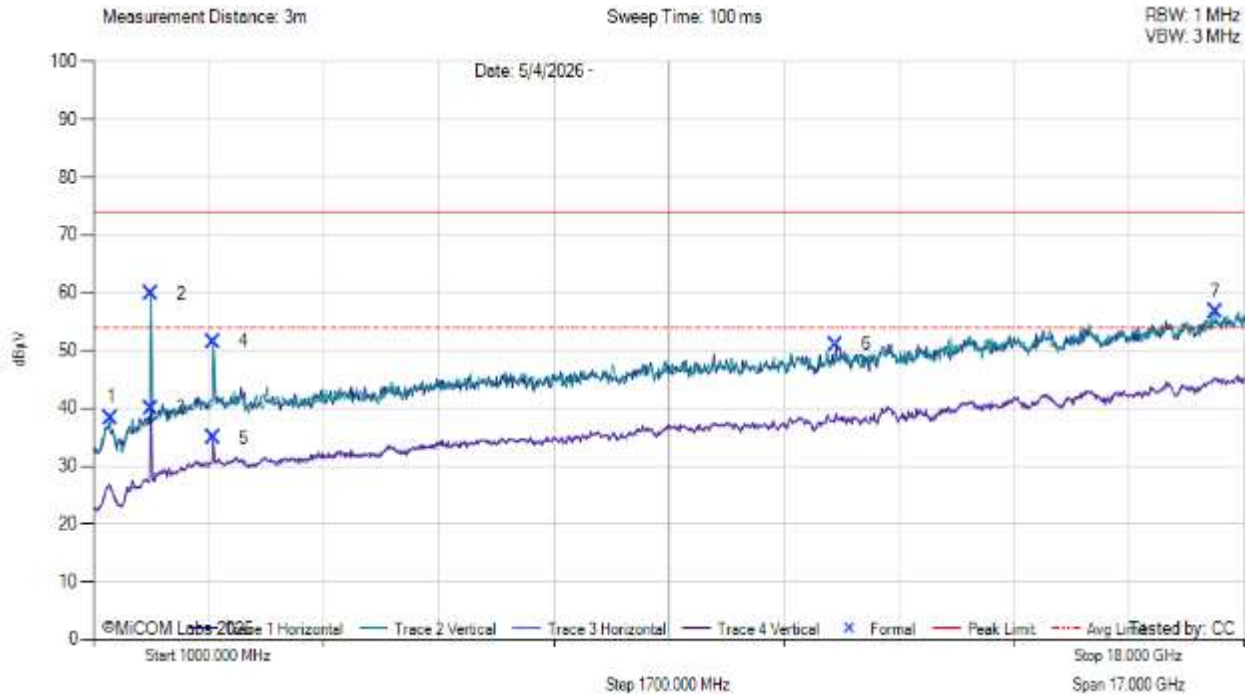
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A.4.2.2.12 Dome / Laird Antenna (A09-D3NF /TRA8903) [XR High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Dome Laird TRA8903



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1255.00	52.28	2.28	-16.16	38.40	MaxP	Vertical	148	59	74.0	-35.6	Pass
2	1850.00	71.53	2.66	-14.40	59.79	MaxP	Vertical	199	270	74.0	-14.2	Pass
3	1850.00	51.80	2.66	-14.40	40.06	AVG	Vertical	148	89	54.0	-13.9	Pass
4	2768.00	59.82	3.21	-11.48	51.55	MaxP	Vertical	199	270	74.0	-22.4	Pass
5	2768.00	43.12	3.21	-11.48	34.85	AVG	Vertical	199	270	54.0	-19.2	Pass
6	11965.00	50.86	5.81	-5.64	51.03	MaxP	Horizontal	148	60	74.0	-23.0	Pass
7	17575.00	49.70	7.50	-0.45	56.74	MaxP	Vertical	148	29	74.0	-17.3	Pass

Test Notes: Dome Laird TRA8903 Antenna tested with XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

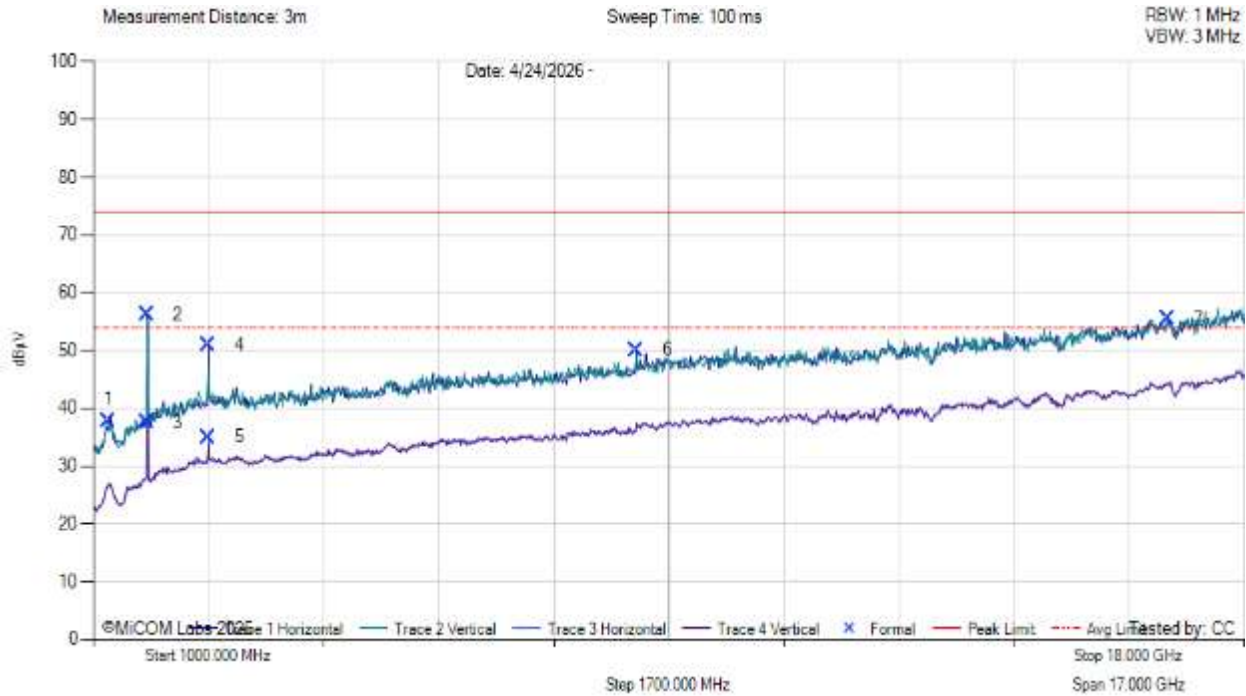
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A.4.2.2.13 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.20	2.28	-16.58	37.89	MaxP	Vertical	148	89	74.0	-36.1	Pass
2	1799.00	68.31	2.65	-14.67	56.29	MaxP	Horizontal	148	210	74.0	-17.7	Pass
3	1799.00	49.61	2.65	-14.67	37.59	AVG	Horizontal	148	240	54.0	-16.4	Pass
4	2700.00	59.45	3.22	-11.74	50.93	MaxP	Horizontal	148	240	74.0	-23.1	Pass
5	2700.00	43.58	3.22	-11.74	35.05	AVG	Horizontal	148	240	54.0	-18.9	Pass
6	9024.00	52.15	5.25	-7.33	50.08	MaxP	Horizontal	148	300	74.0	-23.9	Pass
7	16861.00	48.33	7.01	0.18	55.52	MaxP	Vertical	199	0	74.0	-18.5	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

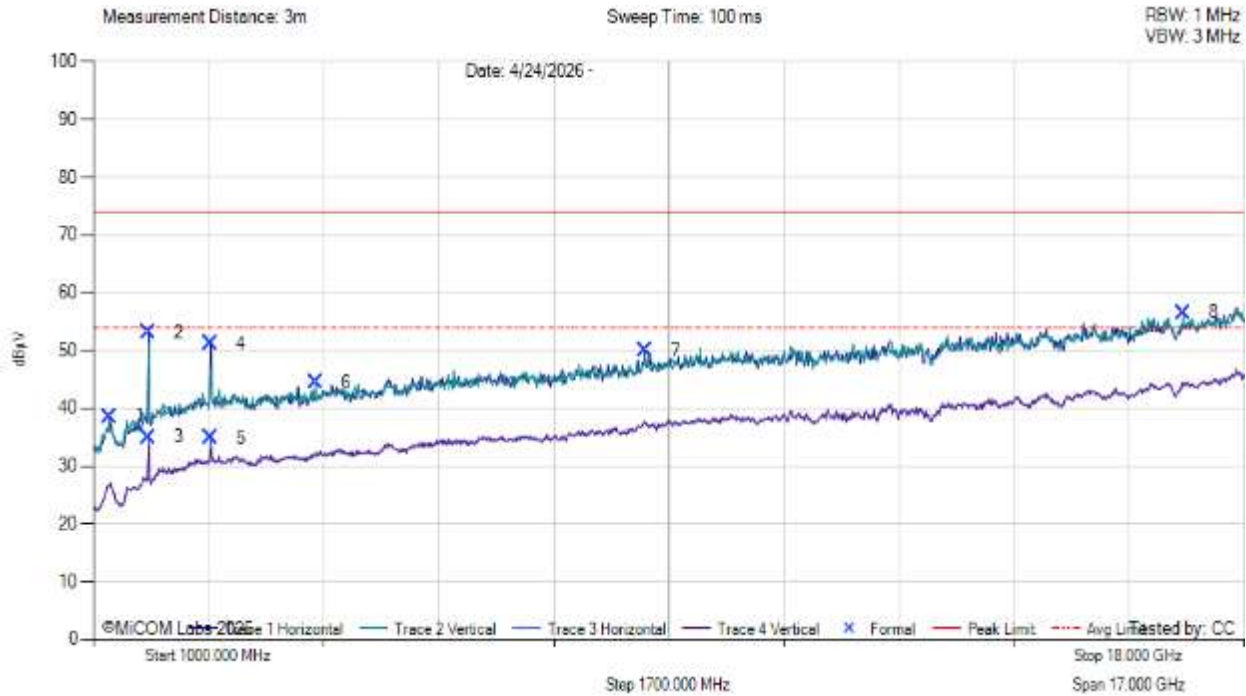
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A.4.2.2.14 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	52.70	2.27	-16.34	38.62	MaxP	Horizontal	148	90	74.0	-35.4	Pass
2	1816.00	64.93	2.66	-14.49	53.10	MaxP	Horizontal	199	210	74.0	-20.9	Pass
3	1816.00	46.82	2.66	-14.49	34.98	AVG	Horizontal	199	210	54.0	-19.0	Pass
4	2734.00	59.42	3.24	-11.54	51.11	MaxP	Horizontal	148	240	74.0	-22.9	Pass
5	2734.00	43.27	3.24	-11.54	34.96	AVG	Horizontal	199	240	54.0	-19.0	Pass
6	4281.00	53.02	3.66	-12.19	44.49	MaxP	Vertical	148	299	74.0	-29.5	Pass
7	9143.00	51.86	5.14	-7.06	49.95	MaxP	Vertical	148	0	74.0	-24.1	Pass
8	17099.00	49.46	7.09	0.01	56.56	MaxP	Vertical	199	89	74.0	-17.4	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

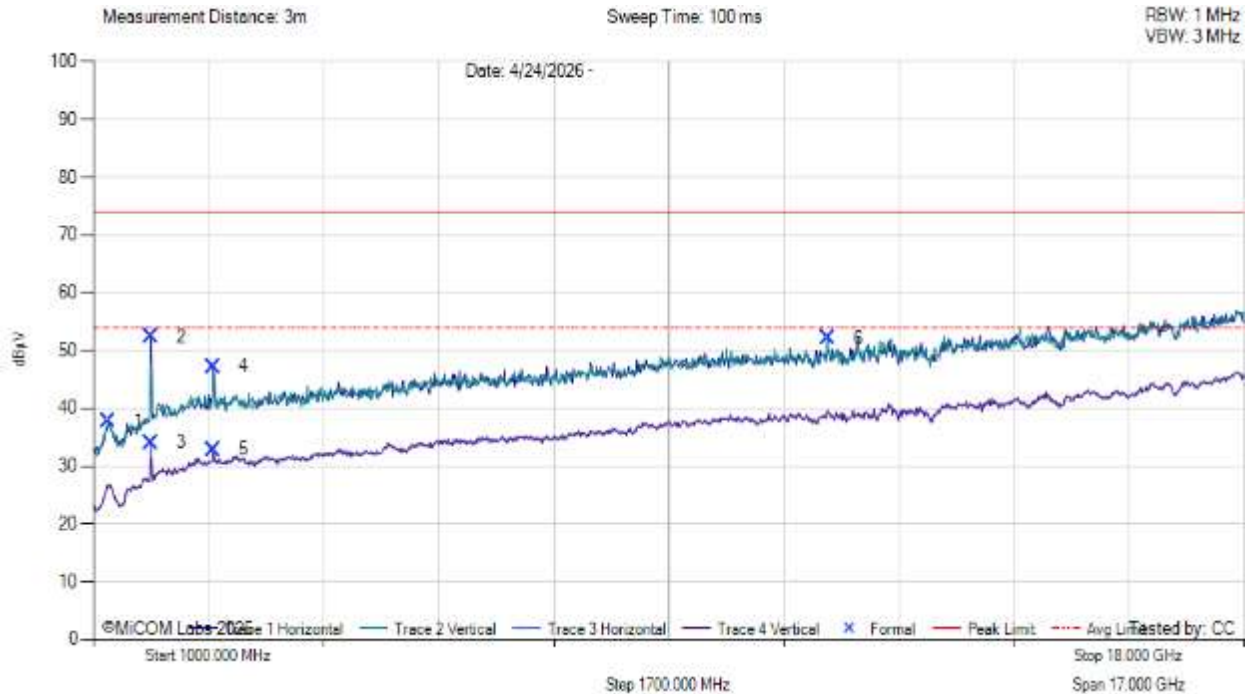
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A.4.2.2.15 Flexible Printed Circuit (FPC) Molex 211140-0100 [HPX High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.5 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.04	2.28	-16.58	37.73	MaxP	Horizontal	148	210	74.0	-36.3	Pass
2	1850.00	64.06	2.66	-14.40	52.32	MaxP	Horizontal	148	240	74.0	-21.7	Pass
3	1850.00	45.83	2.66	-14.40	34.09	AVG	Horizontal	148	240	54.0	-19.9	Pass
4	2768.00	55.47	3.21	-11.48	47.19	MaxP	Horizontal	148	240	74.0	-26.8	Pass
5	2768.00	41.14	3.21	-11.48	32.87	AVG	Horizontal	148	240	54.0	-21.1	Pass
6	11846.00	51.63	6.13	-5.68	52.08	MaxP	Vertical	148	209	74.0	-21.9	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

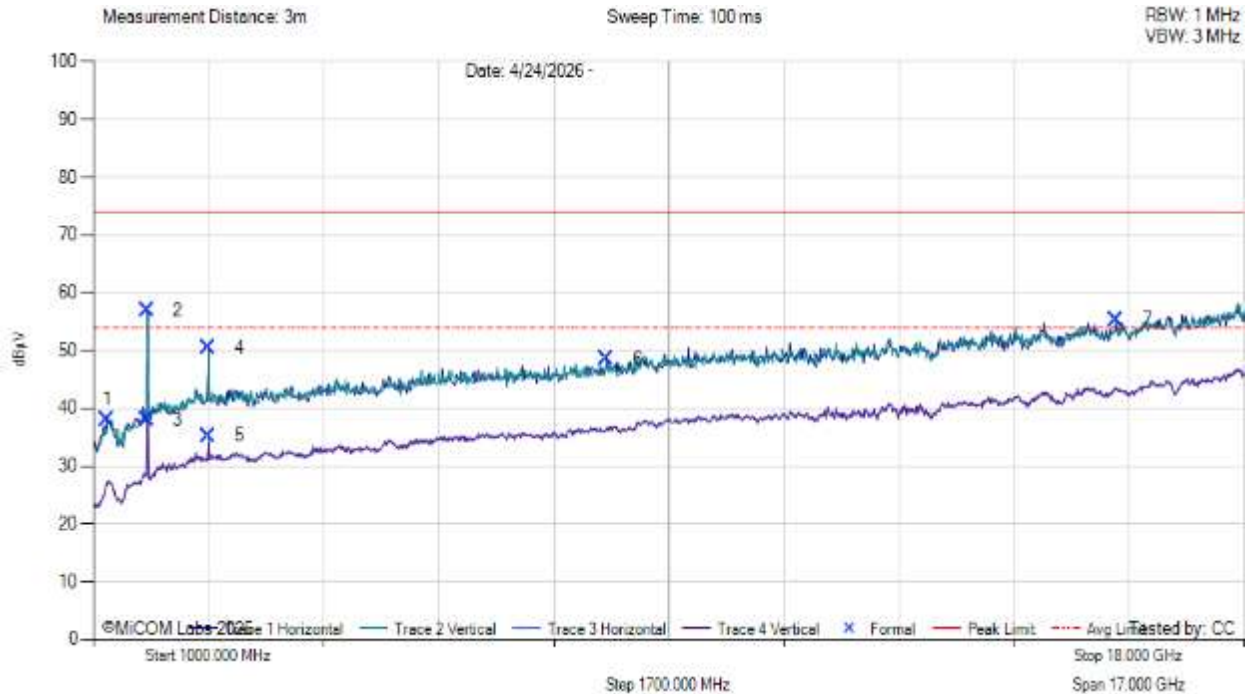
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A.4.2.2.16 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	52.49	2.26	-16.72	38.02	MaxP	Vertical	149	0	74.0	-36.0	Pass
2	1799.00	68.91	2.65	-14.67	56.89	MaxP	Horizontal	149	240	74.0	-17.1	Pass
3	1799.00	50.04	2.65	-14.67	38.02	AVG	Horizontal	149	240	54.0	-16.0	Pass
4	2700.00	59.05	3.22	-11.74	50.53	MaxP	Horizontal	199	240	74.0	-23.5	Pass
5	2700.00	43.74	3.22	-11.74	35.22	AVG	Horizontal	199	240	54.0	-18.8	Pass
6	8582.00	51.29	5.16	-7.85	48.59	MaxP	Vertical	149	119	74.0	-25.4	Pass
7	16113.00	49.22	6.60	-0.48	55.34	MaxP	Vertical	149	239	74.0	-18.7	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

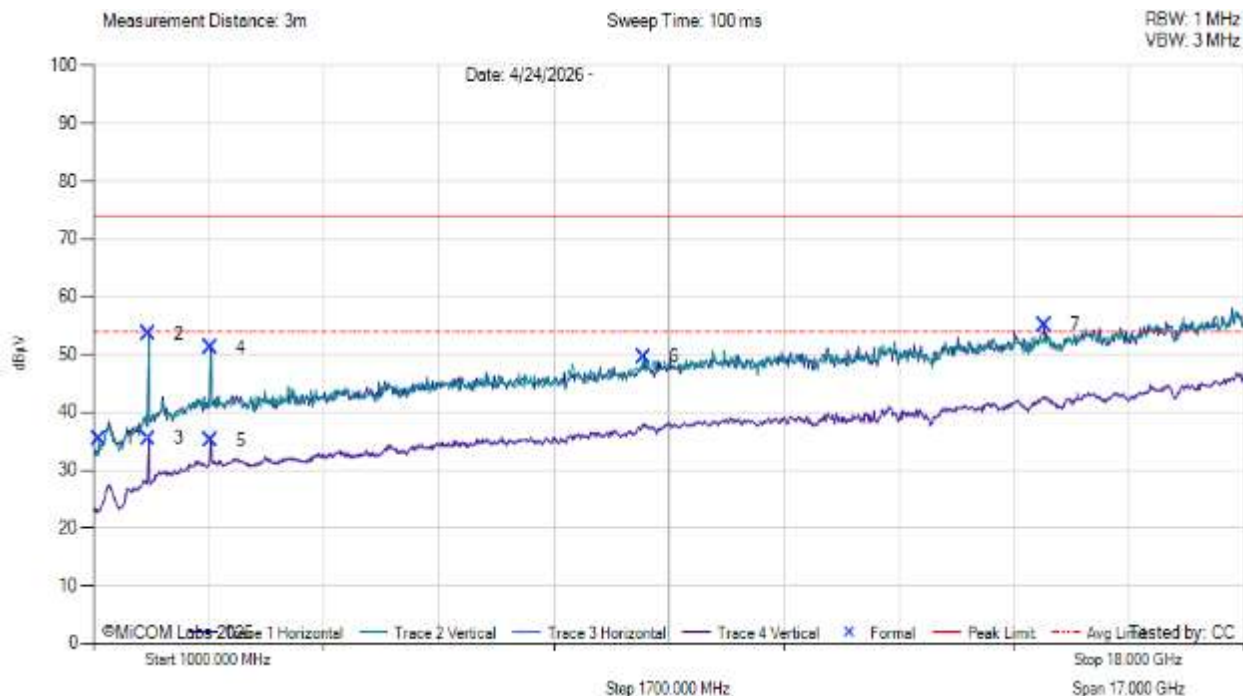
[back to matrix](#)

A.4.2.2.17 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1085.00	50.86	2.19	-17.56	35.50	MaxP	Vertical	199	149	74.0	-38.5	Pass
2	1816.00	65.45	2.66	-14.49	53.61	MaxP	Horizontal	151	210	74.0	-20.4	Pass
3	1816.00	47.31	2.66	-14.49	35.48	AVG	Vertical	151	239	54.0	-18.5	Pass
4	2734.00	59.45	3.24	-11.54	51.14	MaxP	Horizontal	199	240	74.0	-22.9	Pass
5	2734.00	43.41	3.24	-11.54	35.11	AVG	Vertical	151	239	54.0	-18.9	Pass
6	9126.00	51.41	5.21	-6.98	49.64	MaxP	Vertical	199	89	74.0	-24.4	Pass
7	15042.00	52.11	6.66	-3.68	55.09	MaxP	Horizontal	199	90	74.0	-18.9	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

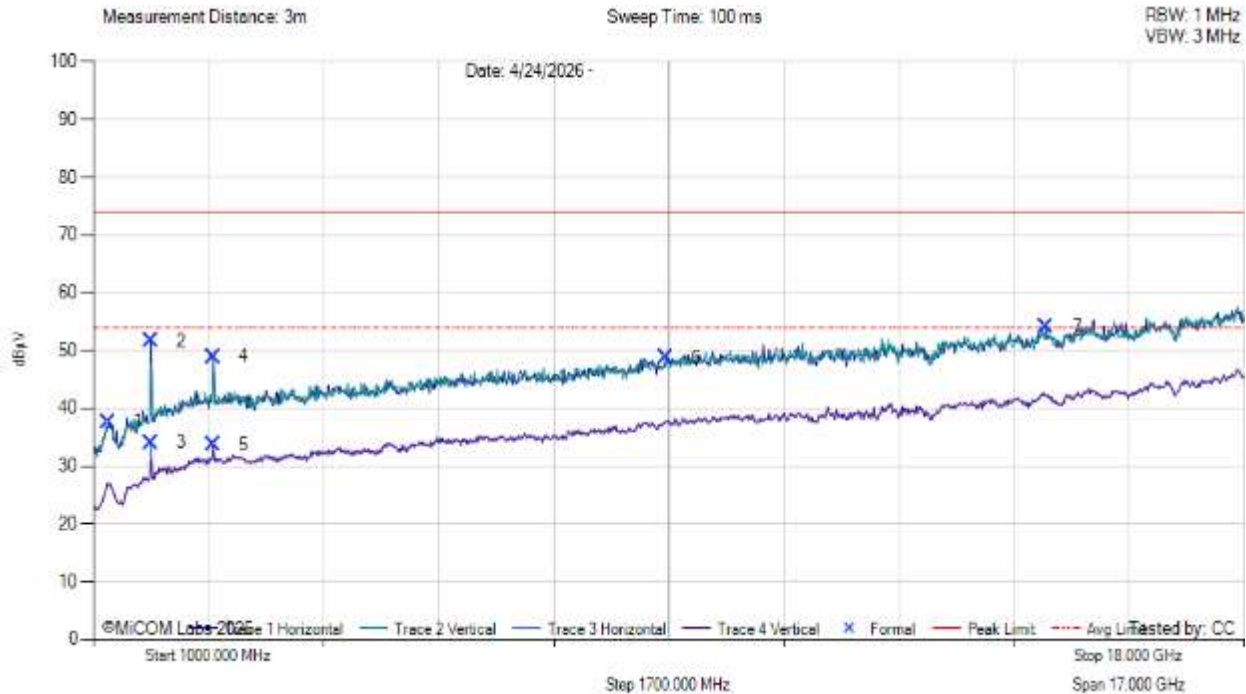
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A.4.2.2.18 Flexible Printed Circuit (FPC) Molex 211140-0100 [XR High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Molex 211140



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	51.95	2.28	-16.58	37.65	MaxP	Vertical	199	0	74.0	-36.4	Pass
2	1850.00	63.42	2.66	-14.40	51.68	MaxP	Horizontal	148	210	74.0	-22.3	Pass
3	1850.00	45.83	2.66	-14.40	34.10	AVG	Horizontal	148	240	54.0	-19.9	Pass
4	2768.00	57.14	3.21	-11.48	48.87	MaxP	Vertical	199	89	74.0	-25.1	Pass
5	2768.00	41.96	3.21	-11.48	33.69	AVG	Horizontal	148	240	54.0	-20.3	Pass
6	9449.00	49.61	5.49	-6.34	48.77	MaxP	Vertical	148	89	74.0	-25.2	Pass
7	15076.00	51.07	6.61	-3.48	54.19	MaxP	Vertical	199	330	74.0	-19.8	Pass

Test Notes: Flex Molex 211140 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001 High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

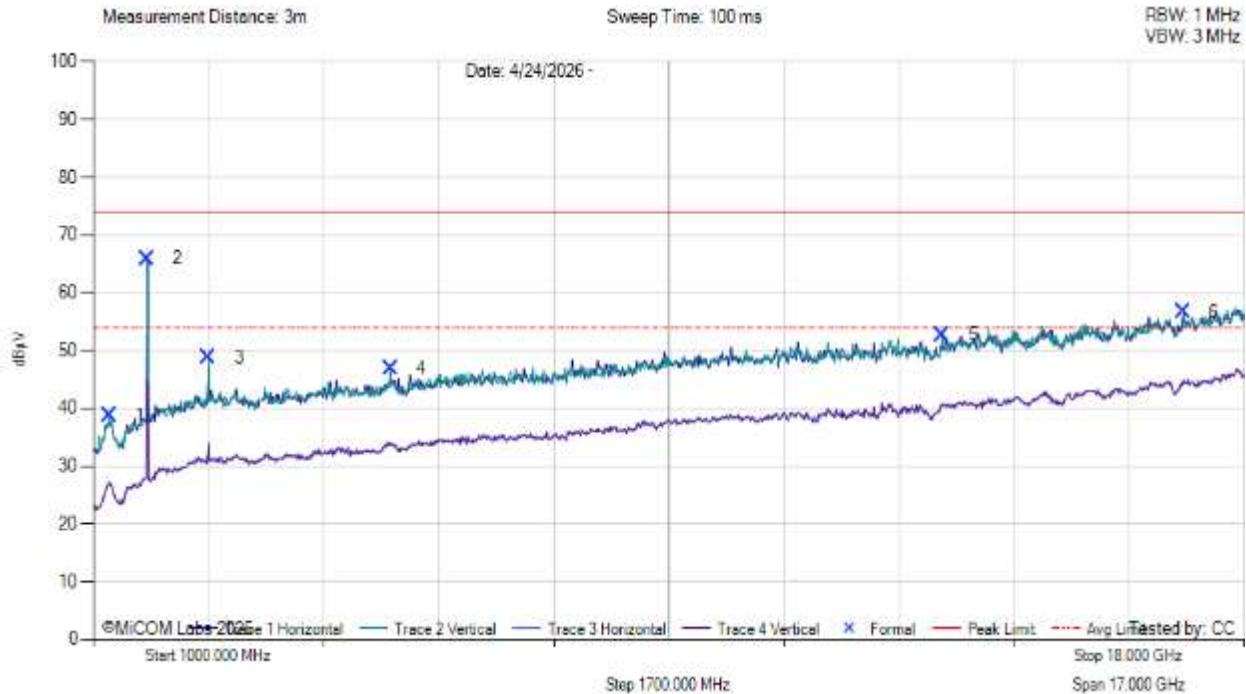
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A.4.2.2.19 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	52.80	2.27	-16.34	38.73	MaxP	Vertical	199	149	74.0	-35.3	Pass
2	1799.00	77.96	2.65	-14.67	65.94	MaxP	Horizontal	199	180	74.0	-8.1	Pass
3	2700.00	57.35	3.22	-11.74	48.83	MaxP	Vertical	199	59	74.0	-25.2	Pass
4	5386.00	54.03	4.21	-11.30	46.93	MaxP	Vertical	199	299	74.0	-27.1	Pass
5	13546.00	53.73	6.02	-7.00	52.75	MaxP	Vertical	151	0	74.0	-21.3	Pass
6	17099.00	49.67	7.09	0.01	56.76	MaxP	Horizontal	199	270	74.0	-17.2	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

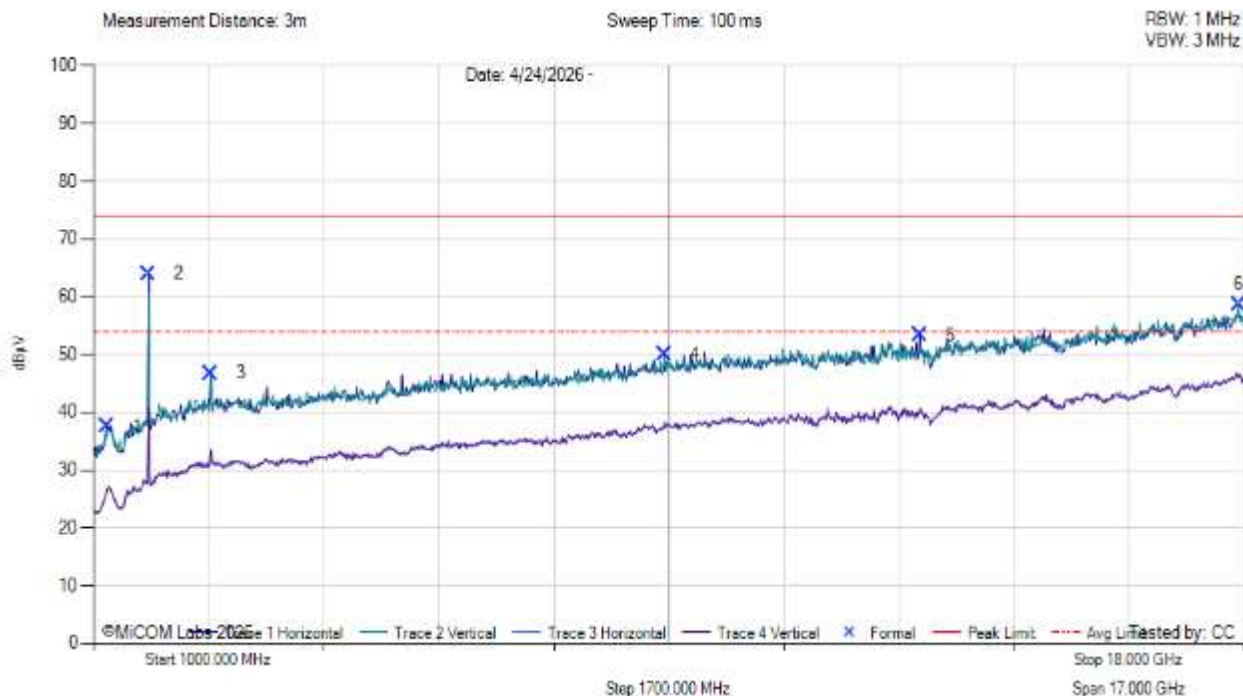
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A.4.2.2.20 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	51.98	2.26	-16.72	37.52	MaxP	Horizontal	199	240	74.0	-36.5	Pass
2	1816.00	75.81	2.66	-14.49	63.98	MaxP	Horizontal	150	210	74.0	-10.0	Pass
3	2734.00	55.09	3.24	-11.54	46.78	MaxP	Horizontal	199	240	74.0	-27.2	Pass
4	9432.00	51.03	5.50	-6.50	50.04	MaxP	Vertical	199	299	74.0	-24.0	Pass
5	13206.00	54.67	6.06	-7.45	53.29	MaxP	Horizontal	150	270	74.0	-20.7	Pass
6	17915.00	49.57	7.75	1.20	58.53	MaxP	Vertical	199	270	74.0	-15.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

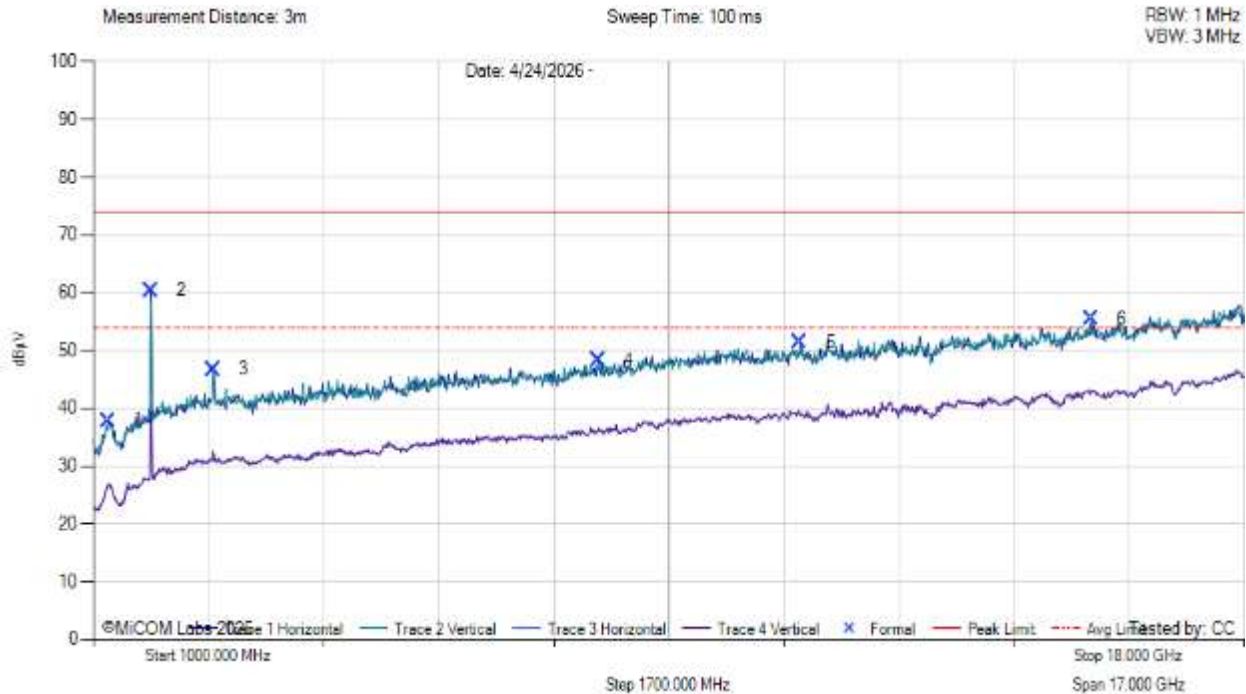
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A.4.2.2.21 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [HPX High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.20	2.28	-16.58	37.90	MaxP	Horizontal	150	270	74.0	-36.1	Pass
2	1850.00	72.11	2.66	-14.40	60.37	MaxP	Horizontal	150	210	74.0	-13.6	Pass
3	2768.00	55.03	3.21	-11.48	46.76	MaxP	Horizontal	150	270	74.0	-27.2	Pass
4	8463.00	50.97	5.15	-7.87	48.25	MaxP	Vertical	150	330	74.0	-25.7	Pass
5	11438.00	50.87	5.86	-5.29	51.44	MaxP	Vertical	199	89	74.0	-22.6	Pass
6	15739.00	50.09	6.63	-1.26	55.46	MaxP	Vertical	150	29	74.0	-18.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

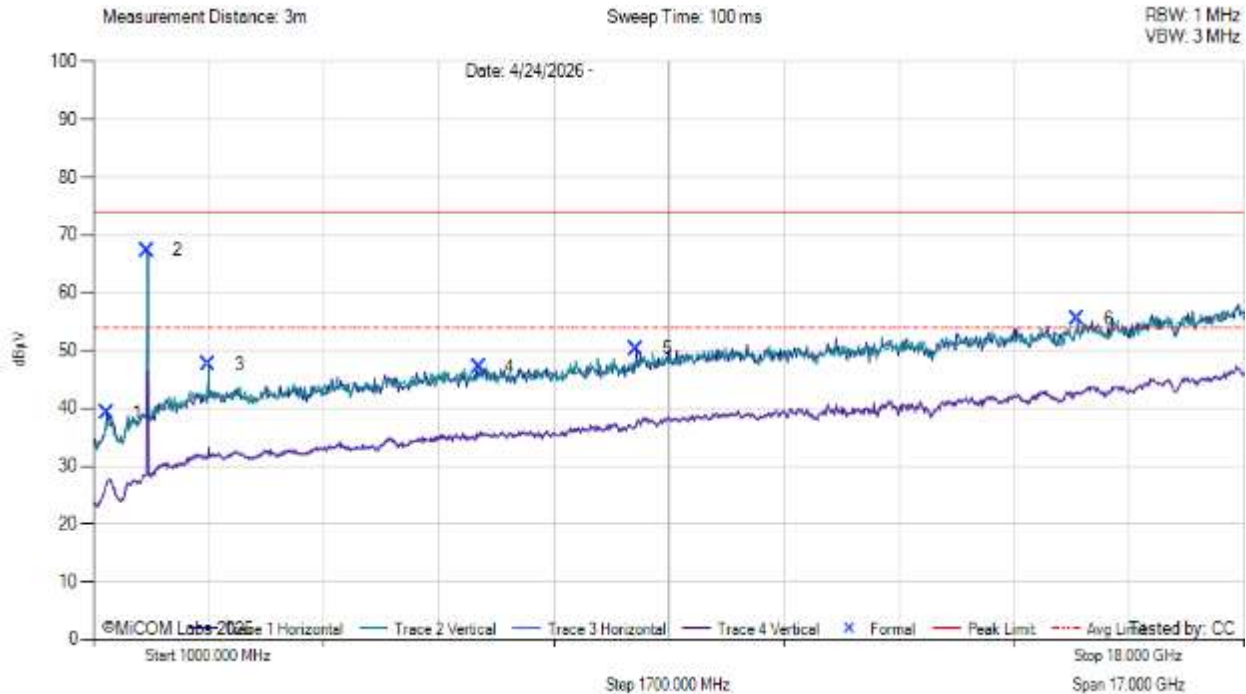
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A.4.2.2.22 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	53.69	2.26	-16.72	39.23	MaxP	Horizontal	199	300	74.0	-34.8	Pass
2	1799.00	79.35	2.65	-14.67	67.33	MaxP	Horizontal	199	180	74.0	-6.7	Pass
3	2700.00	56.07	3.22	-11.74	47.55	MaxP	Horizontal	149	240	74.0	-26.5	Pass
4	6695.00	50.68	4.34	-7.91	47.11	MaxP	Vertical	199	330	74.0	-26.9	Pass
5	9024.00	52.45	5.25	-7.33	50.37	MaxP	Horizontal	149	300	74.0	-23.6	Pass
6	15535.00	50.54	6.91	-1.90	55.55	MaxP	Vertical	149	149	74.0	-18.5	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

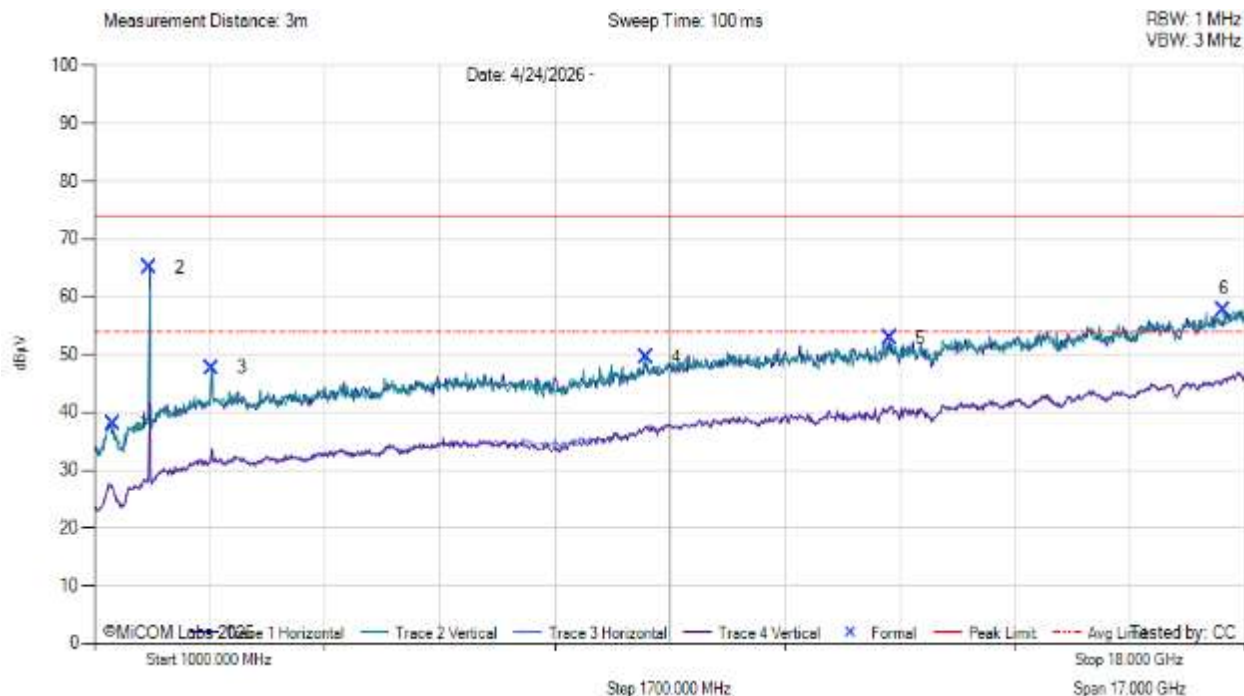
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A.4.2.2.23 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1272.00	51.99	2.31	-16.17	38.13	MaxP	Vertical	151	209	74.0	-35.9	Pass
2	1816.00	76.94	2.66	-14.49	65.10	MaxP	Horizontal	151	210	74.0	-8.9	Pass
3	2734.00	56.02	3.24	-11.54	47.71	MaxP	Horizontal	199	30	74.0	-26.3	Pass
4	9143.00	51.45	5.14	-7.06	49.54	MaxP	Vertical	151	270	74.0	-24.5	Pass
5	12747.00	54.75	6.16	-8.04	52.87	MaxP	Horizontal	199	0	74.0	-21.1	Pass
6	17677.00	50.19	7.43	0.14	57.77	MaxP	Vertical	199	330	74.0	-16.2	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

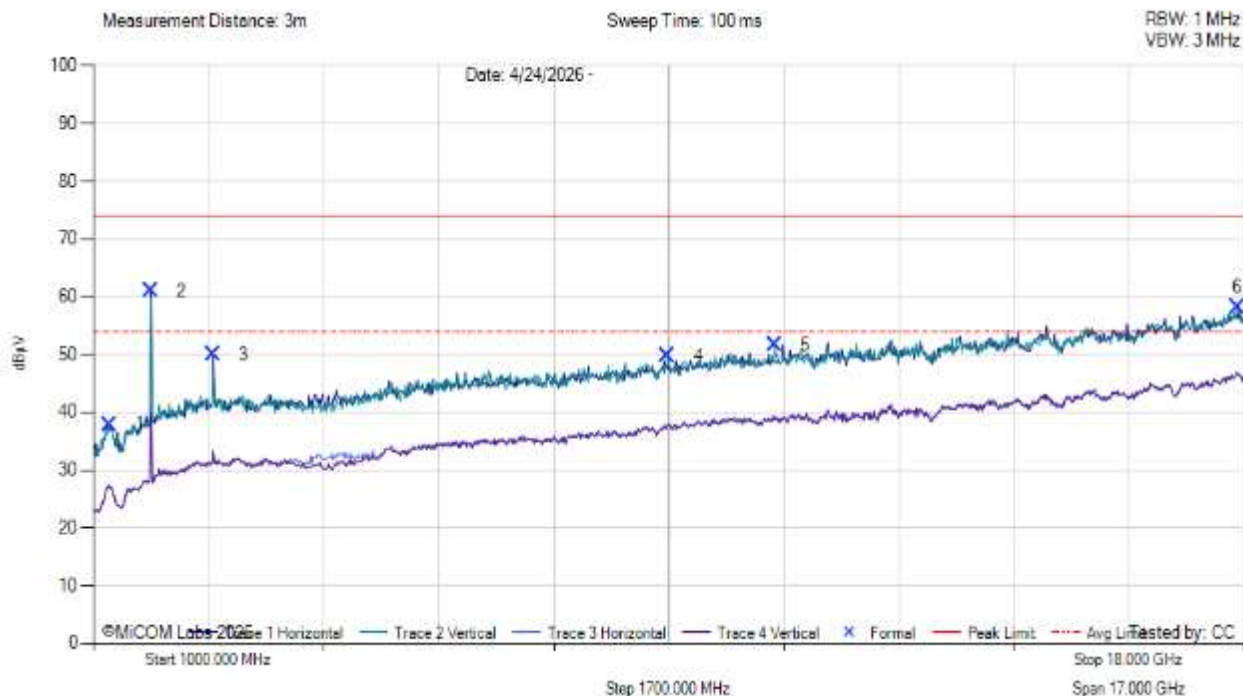
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A.4.2.2.24 Flexible Printed Circuit (FPC) Taoglas FXUB65.07.0180C [XR High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001 , Test Freq: 927.5 MHz, Antenna: Taoglas FXUB65



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	51.93	2.27	-16.34	37.86	MaxP	Vertical	199	149	74.0	-36.1	Pass
2	1850.00	72.79	2.66	-14.40	61.05	MaxP	Horizontal	150	210	74.0	-12.9	Pass
3	2768.00	58.29	3.21	-11.48	50.02	MaxP	Horizontal	150	30	74.0	-24.0	Pass
4	9483.00	50.63	5.32	-6.24	49.71	MaxP	Vertical	199	89	74.0	-24.3	Pass
5	11064.00	50.59	6.12	-5.09	51.63	MaxP	Vertical	150	0	74.0	-22.4	Pass
6	17898.00	48.76	7.94	1.36	58.06	MaxP	Vertical	199	239	74.0	-15.9	Pass

Test Notes: Taoglas FXUB65 Antenna, XBIB-CU-TH Dev Board with Variant UFL XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

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A.4.2.2.25 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.46	2.28	-16.58	38.15	MaxP	Vertical	151	209	74.0	-35.8	Pass
2	1799.00	83.30	2.65	-14.67	71.28	MaxP	Vertical	199	29	74.0	-2.7	Pass
3	1799.00	62.72	2.65	-14.67	50.70	AVG	Vertical	199	29	54.0	-3.3	Pass
4	2700.00	55.68	3.22	-11.74	47.16	MaxP	Vertical	151	330	74.0	-26.8	Pass
5	2700.00	41.20	3.22	-11.74	32.68	AVG	Horizontal	151	330	54.0	-21.3	Pass
6	9211.00	51.43	5.29	-7.15	49.57	MaxP	Vertical	199	270	74.0	-24.4	Pass
7	17082.00	48.60	7.16	0.00	55.75	MaxP	Horizontal	151	120	74.0	-18.3	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

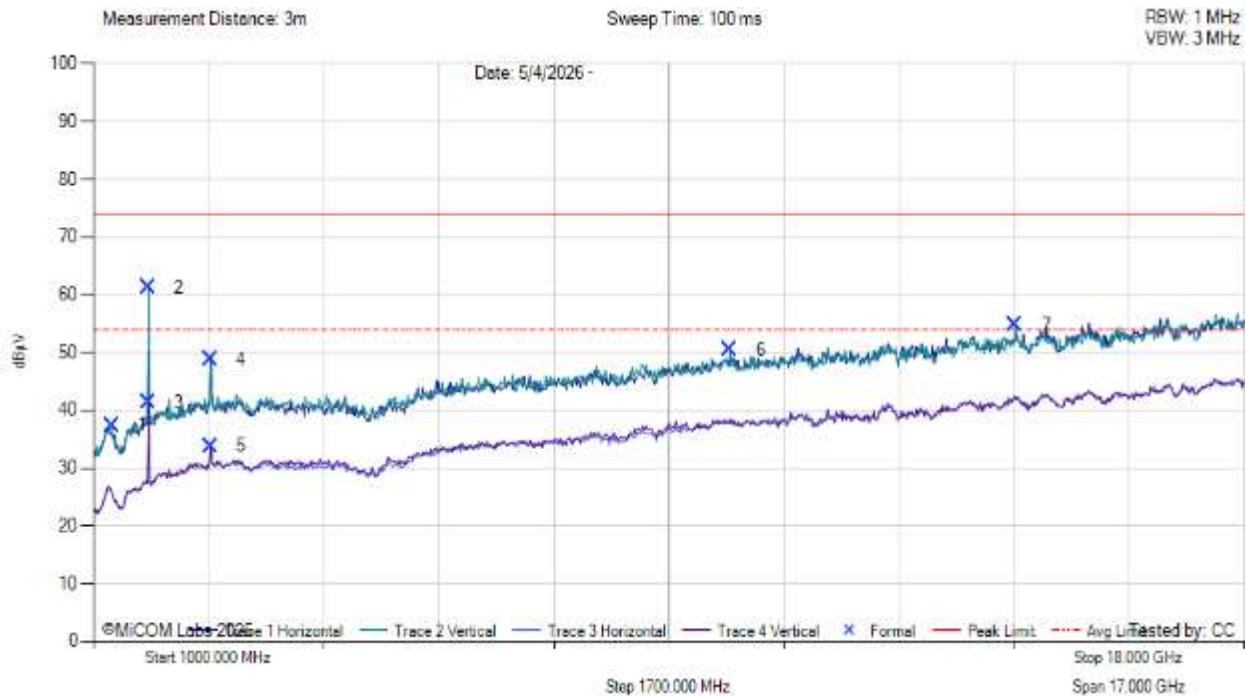
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A.4.2.2.26 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 914.8 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1272.00	51.29	2.31	-16.17	37.43	MaxP	Vertical	148	270	74.0	-36.6	Pass
2	1816.00	73.12	2.66	-14.49	61.29	MaxP	Vertical	199	59	74.0	-12.7	Pass
3	1816.00	53.25	2.66	-14.49	41.42	AVG	Vertical	199	59	54.0	-12.6	Pass
4	2734.00	57.15	3.24	-11.54	48.85	MaxP	Horizontal	148	330	74.0	-25.2	Pass
5	2734.00	42.15	3.24	-11.54	33.84	AVG	Horizontal	148	330	54.0	-20.2	Pass
6	10401.00	49.55	5.61	-4.76	50.41	MaxP	Vertical	199	239	74.0	-23.6	Pass
7	14617.00	53.55	6.66	-5.44	54.77	MaxP	Vertical	148	179	74.0	-19.2	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

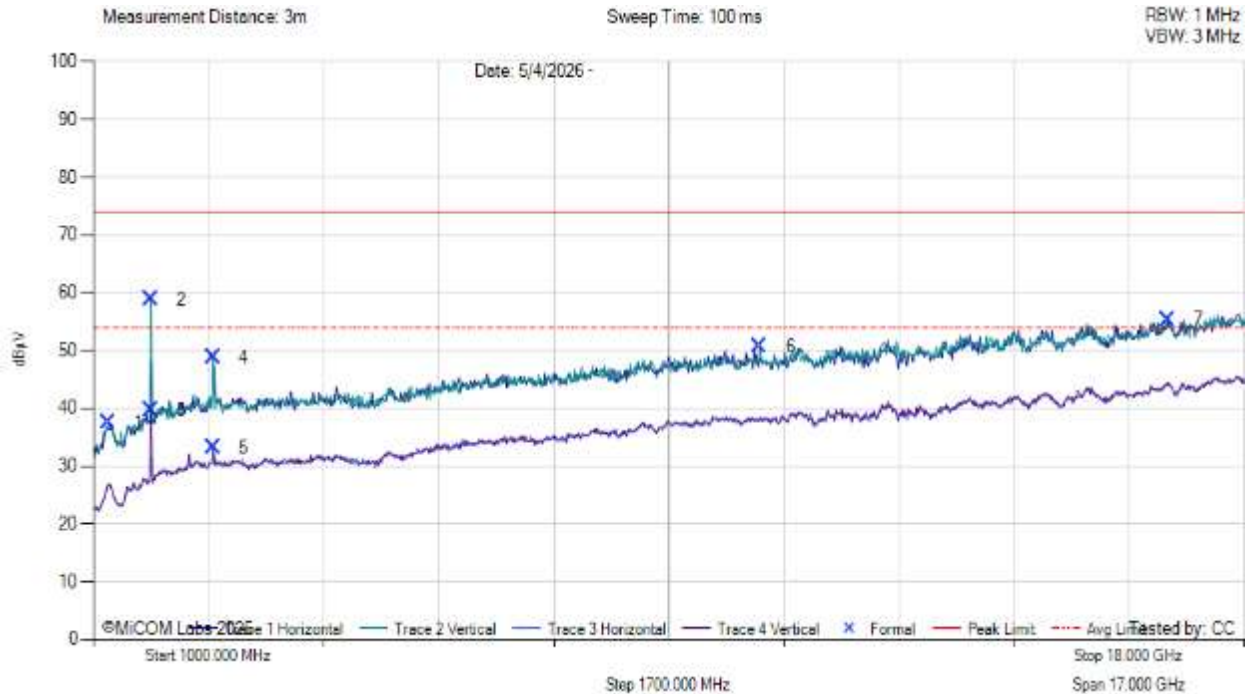
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A.4.2.2.27 Omni Laird Antenna (A09-F8NF/ FG9026) [HPX High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	51.81	2.28	-16.58	37.50	MaxP	Vertical	199	299	74.0	-36.5	Pass
2	1850.00	70.63	2.66	-14.40	58.89	MaxP	Vertical	199	59	74.0	-15.1	Pass
3	1850.00	51.37	2.66	-14.40	39.63	AVG	Vertical	199	59	54.0	-14.4	Pass
4	2768.00	56.99	3.21	-11.48	48.72	MaxP	Horizontal	199	330	74.0	-25.3	Pass
5	2768.00	41.50	3.21	-11.48	33.23	AVG	Vertical	199	330	54.0	-20.8	Pass
6	10843.00	50.43	6.12	-5.88	50.66	MaxP	Vertical	199	59	74.0	-23.3	Pass
7	16861.00	48.17	7.01	0.18	55.36	MaxP	Vertical	148	0	74.0	-18.6	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

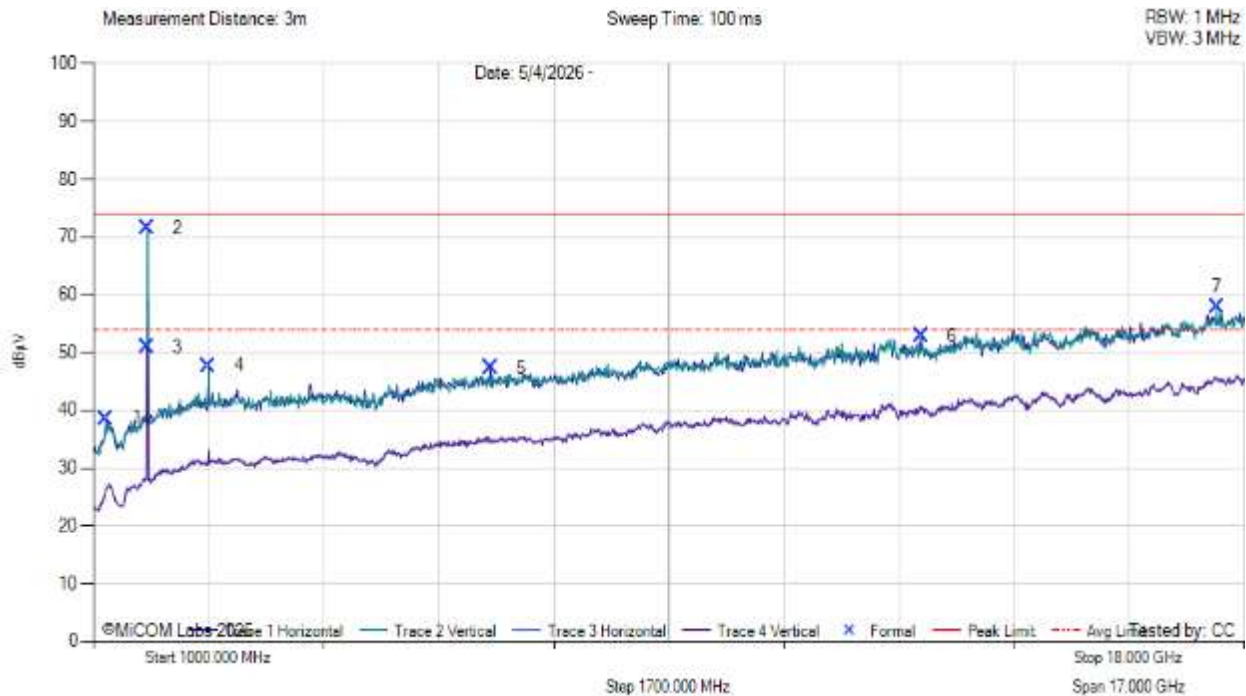
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A.4.2.2.28 Omni Laird Antenna (A09-F8NF/ FG9026) [XR Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 902.5 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1187.00	53.32	2.25	-16.95	38.62	MaxP	Vertical	199	149	74.0	-35.4	Pass
2	1799.00	83.52	2.65	-14.67	71.50	MaxP	Vertical	199	29	74.0	-2.5	Pass
3	1799.00	62.93	2.65	-14.67	50.91	AVG	Vertical	199	29	54.0	-3.1	Pass
4	2700.00	56.20	3.22	-11.74	47.68	MaxP	Vertical	150	330	74.0	-26.3	Pass
5	6865.00	51.02	4.36	-8.02	47.36	MaxP	Horizontal	199	210	74.0	-26.6	Pass
6	13223.00	53.96	6.29	-7.36	52.89	MaxP	Horizontal	150	300	74.0	-21.1	Pass
7	17592.00	50.94	7.37	-0.38	57.93	MaxP	Vertical	150	59	74.0	-16.1	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

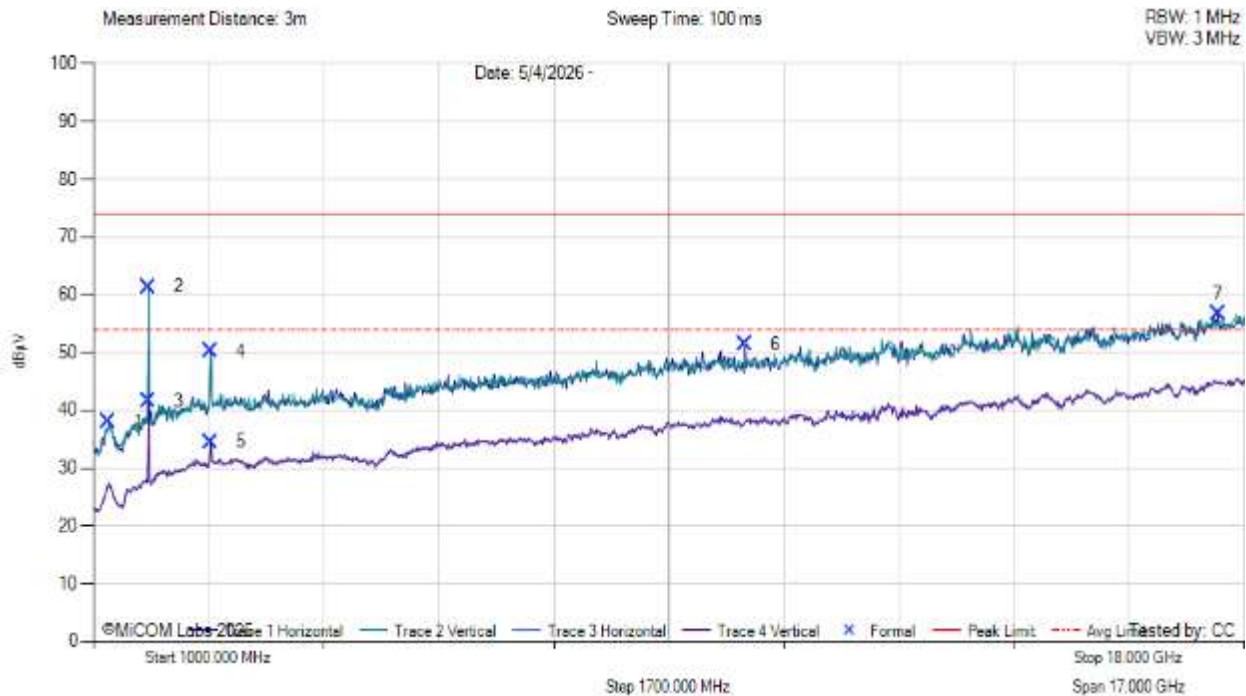
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A.4.2.2.29 Omni Laird Antenna (A09-F8NF/ FG9026) [XR Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001 , Test Freq: 915 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.31	2.28	-16.58	38.01	MaxP	Vertical	199	90	74.0	-36.0	Pass
2	1816.00	73.21	2.66	-14.49	61.38	MaxP	Vertical	199	59	74.0	-12.6	Pass
3	1816.00	53.46	2.66	-14.49	41.62	AVG	Vertical	199	59	54.0	-12.4	Pass
4	2734.00	58.55	3.24	-11.54	50.25	MaxP	Vertical	151	330	74.0	-23.8	Pass
5	2734.00	42.81	3.24	-11.54	34.51	AVG	Vertical	151	330	54.0	-19.5	Pass
6	10622.00	50.29	5.77	-4.61	51.46	MaxP	Horizontal	199	180	74.0	-22.5	Pass
7	17609.00	49.57	7.35	-0.27	56.65	MaxP	Horizontal	151	150	74.0	-17.3	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

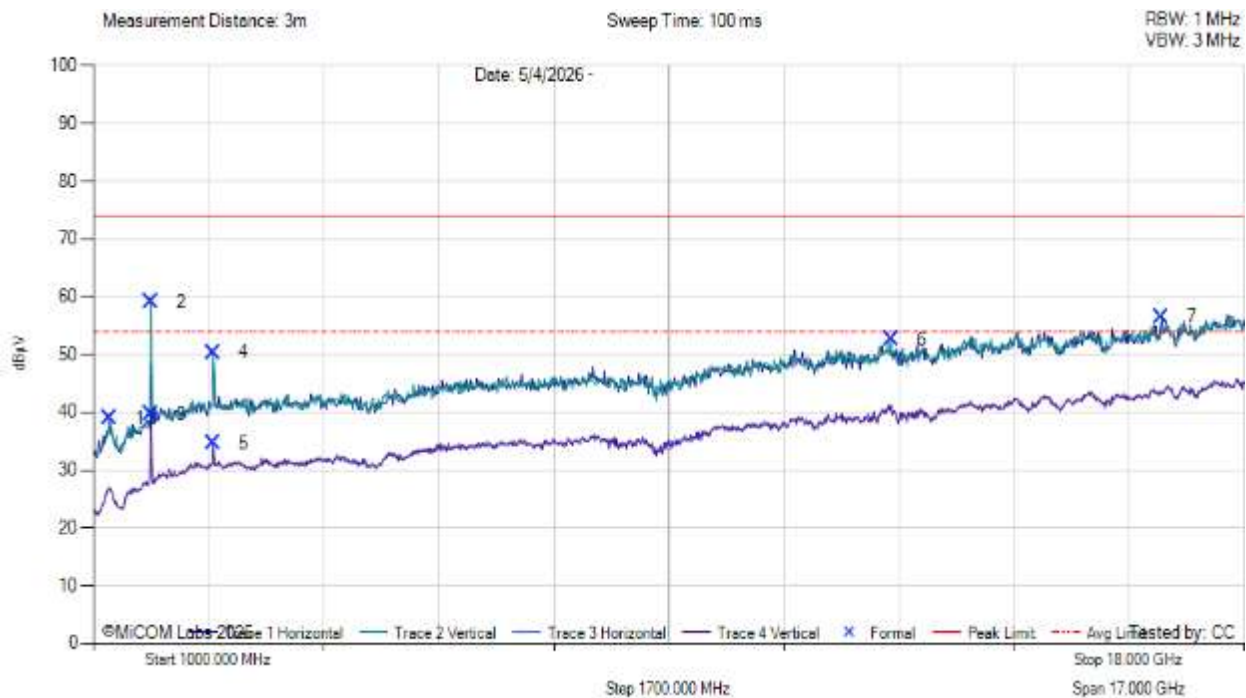
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A.4.2.2.30 Omni Laird Antenna (A09-F8NF/ FG9026) [XR High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001 , Test Freq: 927.5 MHz, Antenna: Omni FG9026



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1238.00	52.99	2.27	-16.34	38.91	MaxP	Horizontal	151	90	74.0	-35.1	Pass
2	1850.00	70.81	2.66	-14.40	59.07	MaxP	Vertical	199	59	74.0	-14.9	Pass
3	1850.00	51.49	2.66	-14.40	39.75	AVG	Vertical	199	59	54.0	-14.3	Pass
4	2768.00	58.65	3.21	-11.48	50.38	MaxP	Horizontal	199	330	74.0	-23.6	Pass
5	2768.00	42.90	3.21	-11.48	34.62	AVG	Horizontal	199	330	54.0	-19.4	Pass
6	12781.00	54.15	6.74	-8.26	52.63	MaxP	Vertical	151	210	74.0	-21.4	Pass
7	16776.00	49.50	6.96	0.07	56.54	MaxP	Horizontal	151	240	74.0	-17.5	Pass

Test Notes: Omni TE Connectivity FG9026 XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop.

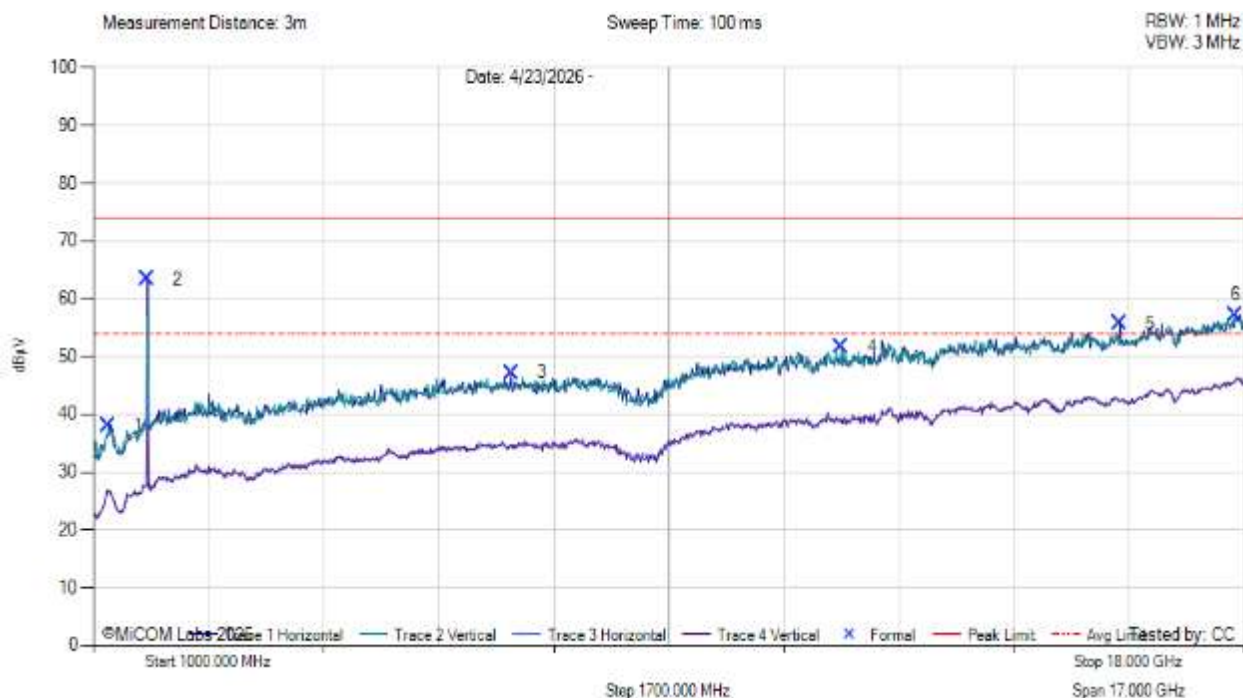
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A.4.2.2.31 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 902.4 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	52.34	2.28	-16.58	38.04	MaxP	Vertical	199	299	74.0	-36.0	Pass
2	1799.00	75.45	2.65	-14.67	63.43	MaxP	Horizontal	148	300	74.0	-10.6	Pass
3	7171.00	50.18	4.52	-7.48	47.22	MaxP	Horizontal	148	180	74.0	-26.8	Pass
4	12050.00	51.66	5.59	-5.57	51.69	MaxP	Vertical	199	0	74.0	-22.3	Pass
5	16164.00	49.94	6.77	-0.93	55.78	MaxP	Horizontal	148	240	74.0	-18.2	Pass
6	17864.00	48.05	7.77	1.31	57.14	MaxP	Vertical	148	29	74.0	-16.9	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

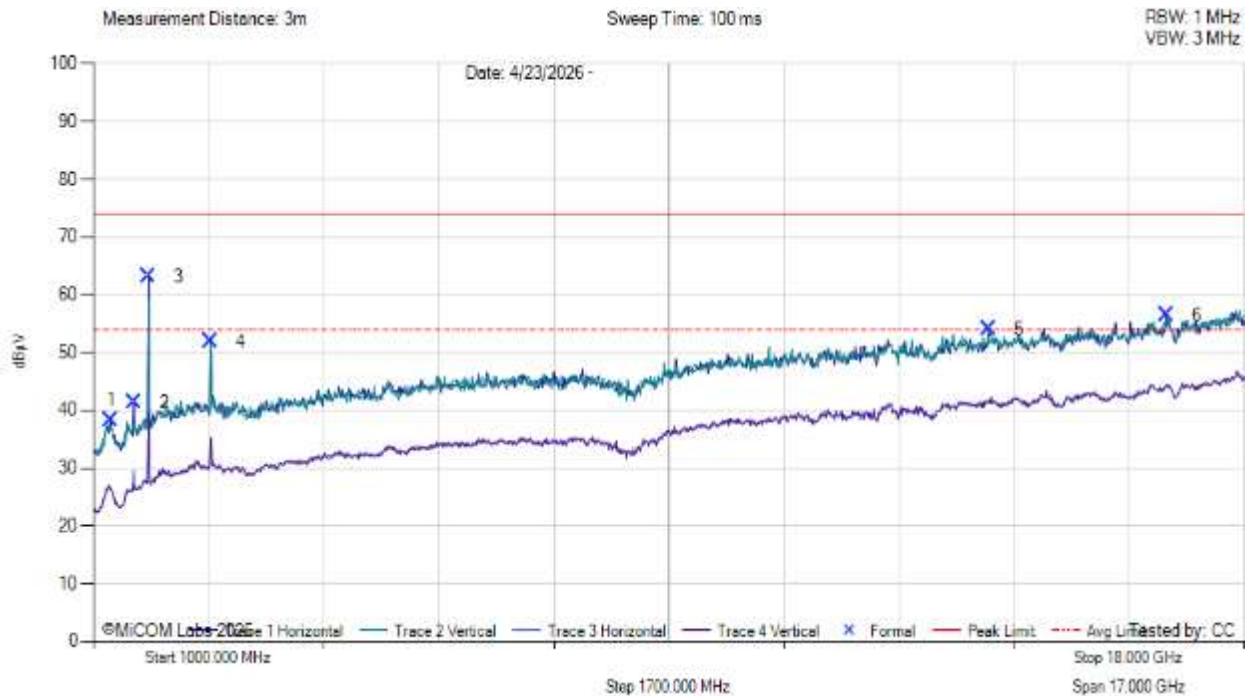
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A.4.2.2.32 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001 , Test Freq: 914.8 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1255.00	52.05	2.28	-16.16	38.17	MaxP	Horizontal	199	180	74.0	-35.8	Pass
2	1595.00	55.32	2.49	-16.48	41.34	MaxP	Horizontal	199	300	74.0	-32.7	Pass
3	1816.00	74.99	2.66	-14.49	63.15	MaxP	Horizontal	150	300	74.0	-10.9	Pass
4	2734.00	60.26	3.24	-11.54	51.95	MaxP	Vertical	199	89	74.0	-22.1	Pass
5	14226.00	54.39	6.62	-6.90	54.11	MaxP	Horizontal	150	270	74.0	-19.9	Pass
6	16844.00	49.03	7.28	0.12	56.42	MaxP	Horizontal	199	210	74.0	-17.6	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

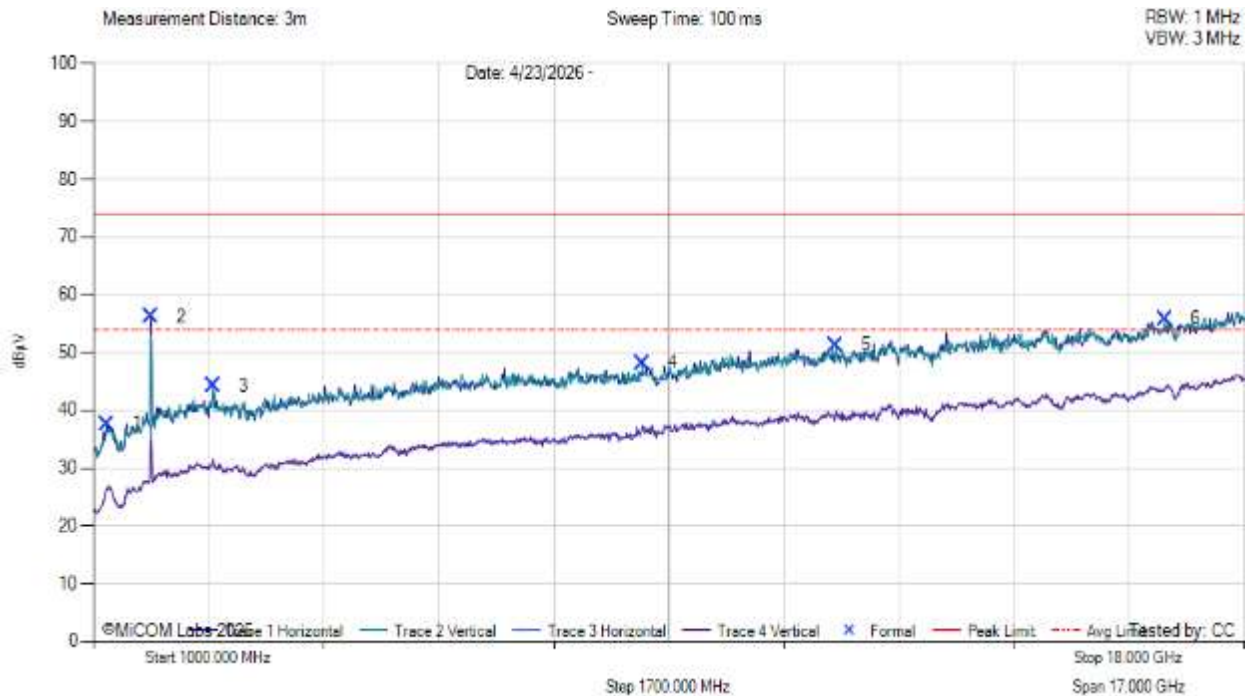
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A.4.2.2.33 Yagi Laird/ TE Connectivity Antenna (PC9013N) [HPX High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-HPX-UT-001, Test Freq: 927.6 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	52.14	2.26	-16.72	37.68	MaxP	Horizontal	148	300	74.0	-36.3	Pass
2	1850.00	67.95	2.66	-14.40	56.21	MaxP	Horizontal	148	300	74.0	-17.8	Pass
3	2768.00	52.58	3.21	-11.48	44.31	MaxP	Vertical	199	89	74.0	-29.7	Pass
4	9109.00	49.89	5.41	-7.10	48.20	MaxP	Vertical	148	300	74.0	-25.8	Pass
5	11965.00	51.09	5.81	-5.64	51.26	MaxP	Vertical	148	300	74.0	-22.7	Pass
6	16827.00	48.67	7.13	0.02	55.82	MaxP	Vertical	199	330	74.0	-18.2	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-HPX-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

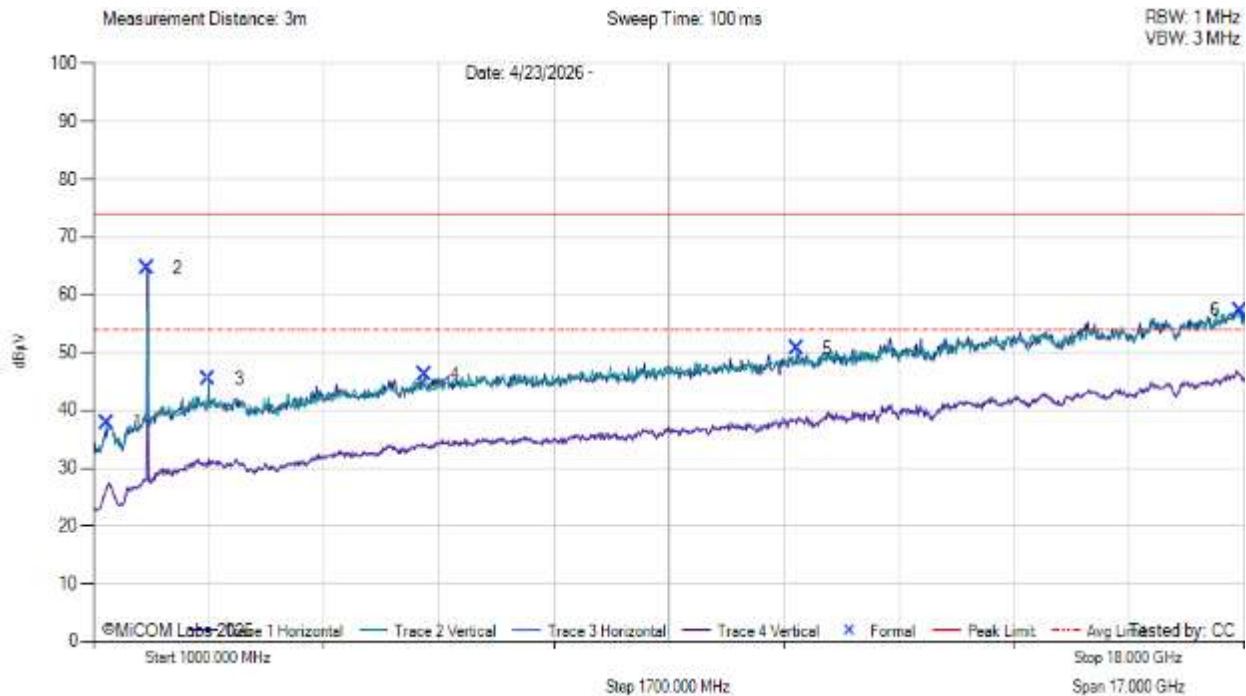
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A.4.2.2.34 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR Low]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001 , Test Freq: 902.5 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	52.34	2.26	-16.72	37.88	MaxP	Vertical	149	89	74.0	-36.1	Pass
2	1799.00	76.63	2.65	-14.67	64.61	MaxP	Horizontal	149	300	74.0	-9.4	Pass
3	2700.00	53.99	3.22	-11.74	45.46	MaxP	Vertical	199	89	74.0	-28.5	Pass
4	5896.00	51.77	4.26	-9.89	46.14	MaxP	Vertical	149	209	74.0	-27.9	Pass
5	11387.00	50.31	6.06	-5.71	50.66	MaxP	Vertical	199	269	74.0	-23.3	Pass
6	17949.00	48.45	8.05	0.80	57.31	MaxP	Horizontal	149	180	74.0	-16.7	Pass

Test Notes: Yagi TE Connectivity PC9013N , XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Low Ch, 10k data rate, Powered via USB-A to USB-C from laptop

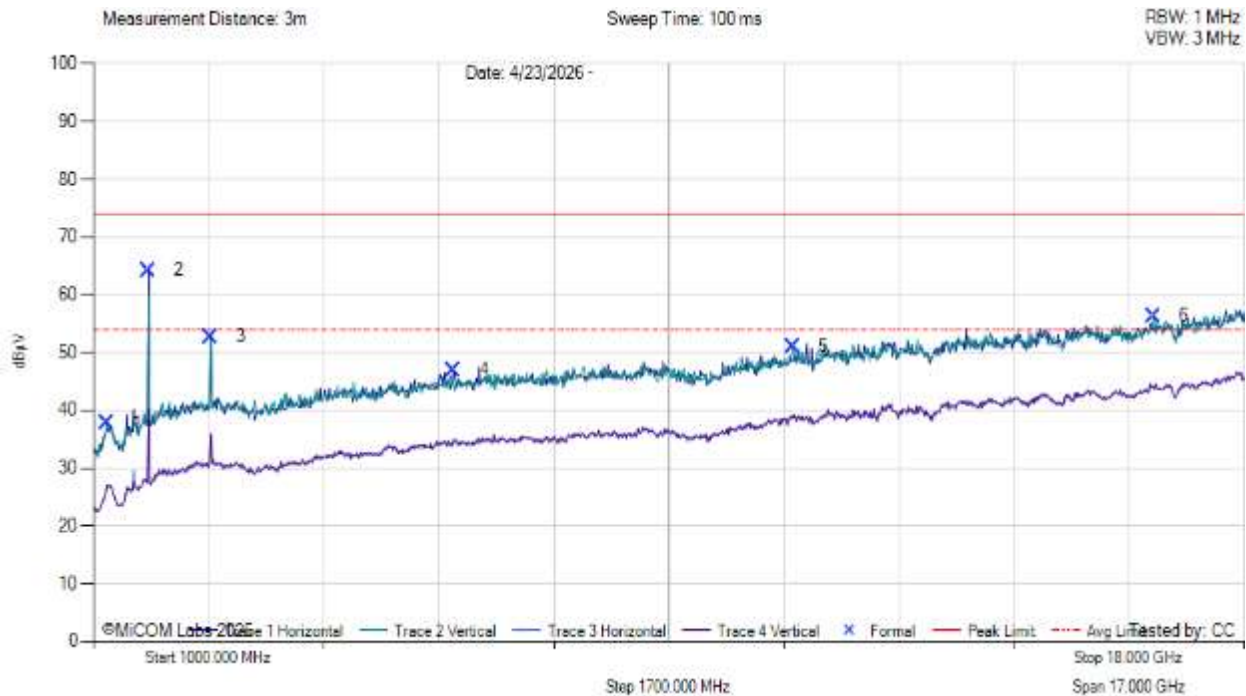
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A.4.2.2.35 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR Mid]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 915 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1204.00	52.17	2.26	-16.72	37.71	MaxP	Vertical	150	0	74.0	-36.3	Pass
2	1816.00	76.11	2.66	-14.49	64.28	MaxP	Horizontal	150	300	74.0	-9.7	Pass
3	2734.00	61.08	3.24	-11.54	52.77	MaxP	Vertical	199	90	74.0	-21.2	Pass
4	6321.00	51.38	4.22	-8.59	47.01	MaxP	Horizontal	199	30	74.0	-27.0	Pass
5	11336.00	50.51	6.24	-5.70	51.05	MaxP	Vertical	199	270	74.0	-23.0	Pass
6	16657.00	49.43	6.81	0.11	56.36	MaxP	Vertical	150	0	74.0	-17.6	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, Mid Ch, 10k data rate, Powered via USB-A to USB-C from laptop

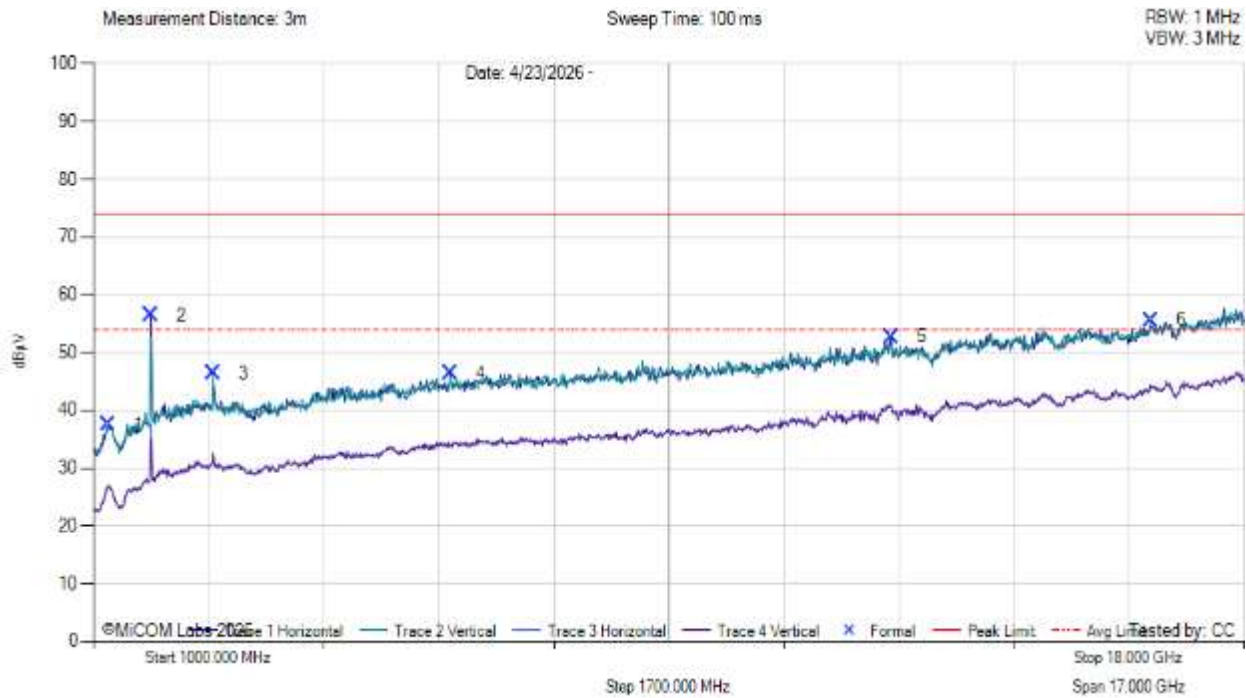
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A.4.2.2.36 Yagi Laird/ TE Connectivity Antenna (PC9013N) [XR High]



FCC Spurious 1 GHz -18 GHz

Variant: XBP-9XRQ-UT-001, Test Freq: 927.5 MHz, Antenna: Yagi TE Connectivity PC9013N



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB/m	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	1221.00	51.77	2.28	-16.58	37.46	MaxP	Vertical	151	239	74.0	-36.5	Pass
2	1850.00	68.12	2.66	-14.40	56.38	MaxP	Horizontal	199	300	74.0	-17.6	Pass
3	2768.00	54.59	3.21	-11.48	46.32	MaxP	Vertical	151	89	74.0	-27.7	Pass
4	6270.00	50.98	4.26	-8.91	46.33	MaxP	Vertical	151	89	74.0	-27.7	Pass
5	12781.00	54.21	6.74	-8.26	52.70	MaxP	Horizontal	199	240	74.0	-21.3	Pass
6	16623.00	48.67	6.73	0.24	55.63	MaxP	Vertical	199	209	74.0	-18.4	Pass

Test Notes: Yagi TE Connectivity PC9013N, XBIB-CU-TH Dev Board with UFL Variant XBP-9XRQ-UT-001, High Ch, 10k data rate, Powered via USB-A to USB-C from laptop

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APPENDIX A – DECLARATION OF SIMILARITIES



DIGI INTERNATIONAL
 9250 Excelsior Blvd, Suite 700
 Hopkins, MN 55343
 952-912-3444 / 877-912-3444
www.digi.com

Date: 2 June 2026

Letter of Similarity

IC: 1846A-XBHXR

FCC: MCQ-XBHXR

HVINS: XBP-HPX-UT-001, XBP-HPX-ST-001, XBP-9XRQ-UT-001, XBP-9XRQ-ST-001

To whom it may concern,

The above-mentioned model number variants all have the same hardware and are electrically identical in terms of RF parameters, save for the differences shown in the table below:

Similarities of Radio Frequency Modules.		Firmware (First digit delineates firmware type)	
		8000A0 (HPX)	9001A0 (9XRQ)
Radio Frequency Port Connector	U.FL Receptacle, 0Ω Resistor Population, HW: 55002235-01	XBP-HPX-UT-001	XBP-9XRQ-UT-001
	RPSMA Connector, 0Ω Resistor Population, HW: 55002235-02	XBP-HPX-ST-001	XBP-9XRQ-ST-001

The 8000A0 (HPX) firmware modulates at 902.4 MHz ± 400 kHz.

The 9001A0 (9XRQ) firmware modulates at 902.5 MHz ± 250 kHz or 902.75 ± 500 kHz (250 kbps data rate).

The Radio Frequency Port options have identical hardware and RF matching networks, with the only difference being the connector population option and a zero-ohm jumper delineating the RF path direction to the populated RF connector.

Sincerely,



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