

Test Report

Report No.: MTi230615006-05E3

Date of issue: 2023-08-04

Applicant: Shenzhen Teneth Technology Co., Ltd

Product: Cutting Plotter

Model(s): MINI140 PRO, MINI140

FCC ID: 2A33R-MINI140

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Table of contents

1	General Description	5
1.1	Description of the EUT	5
1.2	Description of test modes	5
1.3	Environmental Conditions	7
1.4	Description of support units	7
1.5	Measurement uncertainty	7
2	Summary of Test Result	8
3	Test Facilities and accreditations	9
3.1	Test laboratory	9
4	List of test equipment.....	10
5	Evaluation Results (Evaluation).....	13
5.1	Antenna requirement	13
6	Radio Spectrum Matter Test Results (RF)	13
6.1	Conducted Emission at AC power line	13
6.2	Occupied Bandwidth	18
6.3	Maximum Conducted Output Power.....	19
6.4	Power Spectral Density	20
6.5	Emissions in non-restricted frequency bands.....	21
6.6	Band edge emissions (Radiated)	22
6.7	Emissions in restricted frequency bands (below 1GHz).....	25
6.8	Emissions in restricted frequency bands (above 1GHz)	29
	Photographs of the test setup	36
	Photographs of the EUT.....	38
	Appendix A: DTS Bandwidth	40
	Appendix B: Maximum conducted output power.....	45
	Appendix C: Maximum power spectral density.....	46
	Appendix D: Band edge measurements	51
	Appendix E: Conducted Spurious Emission	54
	Appendix F: Duty Cycle	66

Test Result Certification	
Applicant:	Shenzhen Teneth Technology Co., Ltd
Address:	No.161, Pinghu street, Pinghu town, Longgang District, Shenzhen City, Guangdong Province, China
Manufacturer:	Shenzhen Teneth Technology Co., Ltd
Address:	No.161, Pinghu street, Pinghu town, Longgang District, Shenzhen City, Guangdong Province, China
Product description	
Product name:	Cutting Plotter
Trademark:	TENETH
Model name:	MINI140 PRO
Series Model:	MINI140
Standards:	47 CFR Part 15.247
Test Method:	ANSI C63.10 KDB 558074 D01 D15.247 Meas Guidance v05r02
Date of Test	
Date of test:	2023-07-19 to 2023-08-01
Test result:	Pass

Test Engineer	:	<i>Yanice Xie</i>
		(Yanice.Xie)
Reviewed By	:	<i>Leon Chen</i>
		(Leon Chen)
Approved By	:	<i>Tom Xue</i>
		(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Cutting Plotter
Model name:	MINI140 PRO
Series Model:	MINI140
Model difference:	All the models are the same circuit and module, except the model name, screen and RF function. MINI140 PRO is with screen and WIFI, MINI140 is without screen and WIFI.
Electrical rating:	Input:DC24V 1.75A
Accessories:	Adaptor: Model: GM42-240175-D INPUT: AC 100-240V 50/60Hz 1.5A OUTPUT: DC 24V 1.75A
Hardware version:	3.0
Software version:	2.6
Test sample(s) number:	MTi230615006-05S1001
RF specification	
Operating frequency range:	802.11b/g/n20:2412~2462 MHz 802.11n40:2422~2452 MHz
Channel number:	11
Modulation type:	IEEE 802.11b : DSSS (DBPSK, DQPSK, CCK) IEEE 802.11g/n (HT20/HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna(s) type:	FPC Antenna
Antenna(s) gain:	3.06dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX -802.11b mode(CH01/CH06/CH11)
Mode2	TX -802.11g mode(CH01/CH06/CH11)
Mode3	TX -802.11n(HT20) mode(CH01/CH06/CH11)
Mode4	TX -802.11n(HT40) mode(CH03/CH06/CH09)

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software:

For power setting, refer to below table.

Test Software:		RF Engineering Setting Test	
802.11b		802.11g	
Channel	Power setting	Channel	Power setting
1	44	1	44
6	44	6	44
11	44	11	44
802.11n (HT20)		802.11n (HT40)	
Channel	Power setting	Channel	Power setting
1	44	3	44
6	44	6	44
11	44	9	44

1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
Radiated spurious emissions (1GHz~25GHz)	5.3dB
Radiated spurious emissions (9kHz~30MHz)	4.3dB
Radiated spurious emissions (30MHz~1GHz)	4.7dB
Temperature	±1 °C
Humidity	± 5 %

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15.247	47 CFR 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	Init
3	Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.247(a)(2)	Pass
4	Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(3)	Pass
5	Power Spectral Density	47 CFR Part 15.247	47 CFR 15.247(e)	Pass
6	Emissions in non-restricted frequency bands	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
7	Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
8	Emissions in restricted frequency bands (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
9	Emissions in restricted frequency bands (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

4 List of test equipment

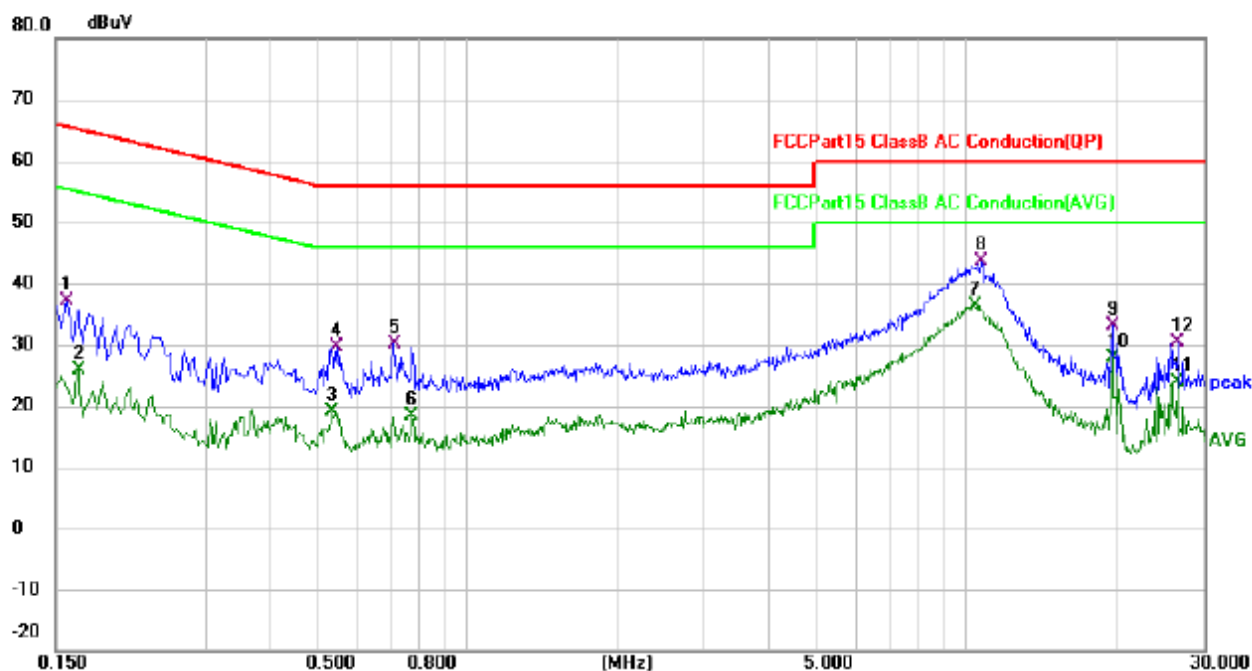
No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2023-04-26	2024-04-25
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2023-05-05	2024-05-04
3	Artificial Mains Network	Schwarzbeck	NSLK 8127	1001	2023-05-06	2024-05-05
Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Maximum Conducted Output Power						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Power Spectral Density						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Emissions in non-restricted frequency bands						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Band edge emissions (Radiated)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04
Emissions in restricted frequency bands (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-26	2024-04-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
Emissions in restricted frequency bands (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04

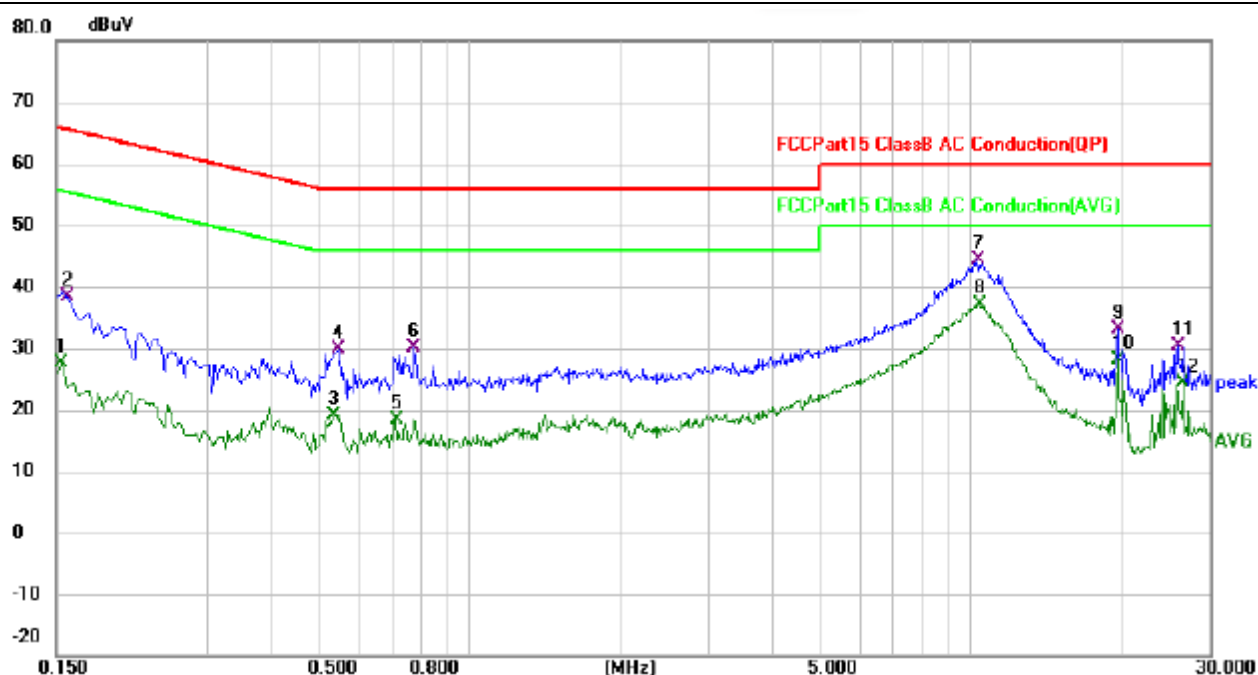
6.1.3 Test Data:

Mode1(AC120V/60Hz) / Line: Line / Band: 2.4G / BW: 20 / CH11



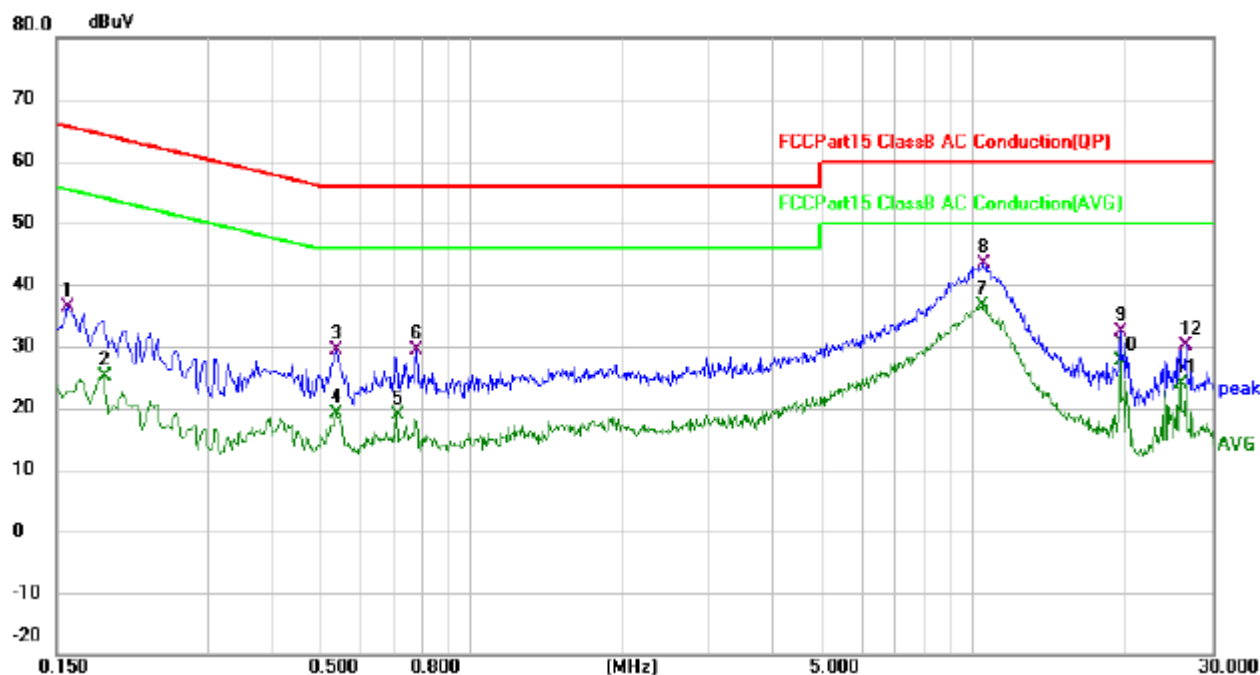
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1580	26.94	10.18	37.12	65.57	-28.45	QP	
2		0.1660	15.78	10.18	25.96	55.16	-29.20	AVG	
3		0.5340	8.82	10.23	19.05	46.00	-26.95	AVG	
4		0.5460	19.48	10.23	29.71	56.00	-26.29	QP	
5		0.7140	19.97	10.16	30.13	56.00	-25.87	QP	
6		0.7780	8.36	10.14	18.50	46.00	-27.50	AVG	
7	*	10.3820	25.63	10.75	36.38	50.00	-13.62	AVG	
8		10.7500	32.94	10.74	43.68	60.00	-16.32	QP	
9		19.7099	22.50	10.59	33.09	60.00	-26.91	QP	
10		19.7099	17.25	10.59	27.84	50.00	-22.16	AVG	
11		26.4860	13.13	10.71	23.84	50.00	-26.16	AVG	
12		26.6100	19.60	10.71	30.31	60.00	-29.69	QP	

Mode1(AC120V/60Hz) / Line: Neutral / Band: 2.4G / BW: 20 / CH11



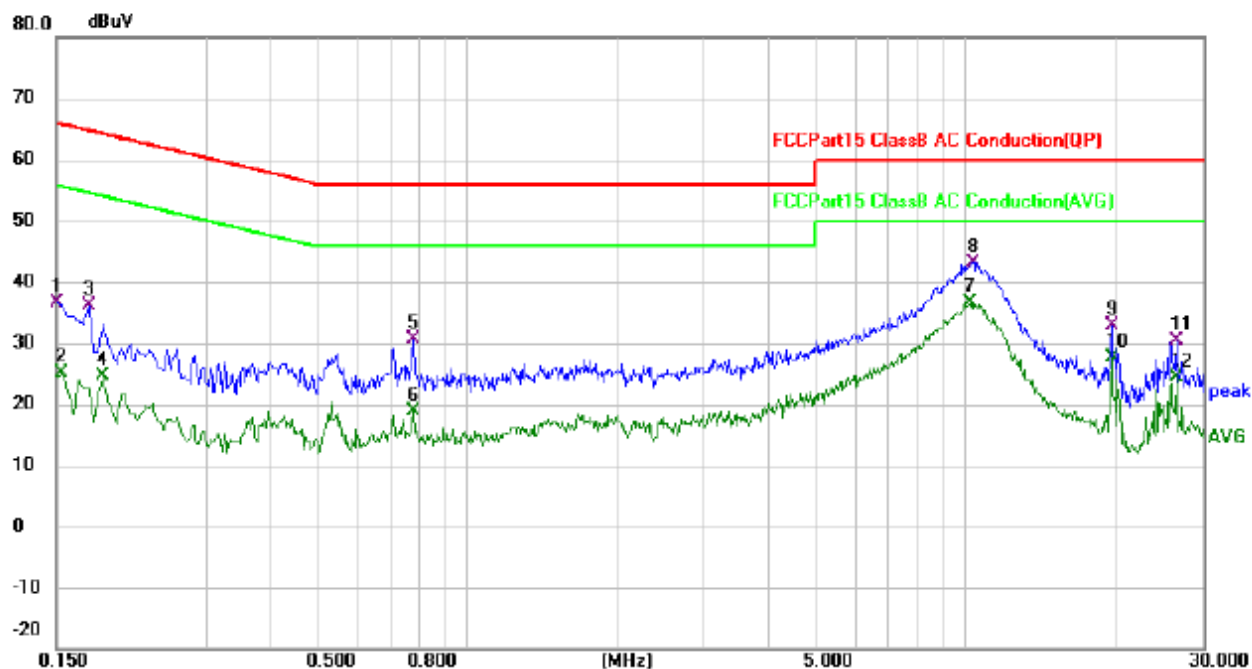
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
1		0.1539	17.37	10.14	27.51	55.79	-28.28	AVG	
2		0.1580	28.19	10.13	38.32	65.57	-27.25	QP	
3		0.5380	9.17	10.07	19.24	46.00	-26.76	AVG	
4		0.5460	19.74	10.07	29.81	56.00	-26.19	QP	
5		0.7140	8.23	10.13	18.36	46.00	-27.64	AVG	
6		0.7780	19.94	10.11	30.05	56.00	-25.95	QP	
7		10.3340	33.65	10.72	44.37	60.00	-15.63	QP	
8	*	10.3940	26.41	10.72	37.13	50.00	-12.87	AVG	
9		19.7099	22.48	10.58	33.06	60.00	-26.94	QP	
10		19.7099	17.54	10.58	28.12	50.00	-21.88	AVG	
11		25.8779	19.73	10.68	30.41	60.00	-29.59	QP	
12		26.4860	13.80	10.69	24.49	50.00	-25.51	AVG	

Mode1(AC240V/60Hz) / Line: Line / Band: 2.4G / BW: 20 / CH11



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1580	26.09	10.18	36.27	65.57	-29.30	QP	
2		0.1860	14.98	10.17	25.15	54.21	-29.06	AVG	
3		0.5420	19.08	10.23	29.31	56.00	-26.69	QP	
4		0.5420	8.99	10.23	19.22	46.00	-26.78	AVG	
5		0.7140	8.83	10.16	18.99	46.00	-27.01	AVG	
6		0.7820	19.32	10.14	29.46	56.00	-26.54	QP	
7	*	10.4180	25.83	10.75	36.58	50.00	-13.42	AVG	
8		10.4980	32.70	10.75	43.45	60.00	-16.55	QP	
9		19.7099	21.79	10.59	32.38	60.00	-27.62	QP	
10		19.7099	17.08	10.59	27.67	50.00	-22.33	AVG	
11		25.8779	13.17	10.70	23.87	50.00	-26.13	AVG	
12		26.6100	19.52	10.71	30.23	60.00	-29.77	QP	

Mode1(AC240V/60Hz) / Line: Neutral / Band: 2.4G / BW: 20 / CH11



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	26.58	10.14	36.72	66.00	-29.28	QP	
2		0.1539	14.98	10.14	25.12	55.79	-30.67	AVG	
3		0.1740	25.91	10.11	36.02	64.77	-28.75	QP	
4		0.1860	14.45	10.10	24.55	54.21	-29.66	AVG	
5		0.7820	20.45	10.11	30.56	56.00	-25.44	QP	
6		0.7820	8.69	10.11	18.80	46.00	-27.20	AVG	
7	*	10.2220	25.92	10.72	36.64	50.00	-13.36	AVG	
8		10.3180	32.53	10.72	43.25	60.00	-16.75	QP	
9		19.7099	22.36	10.58	32.94	60.00	-27.06	QP	
10		19.7099	17.12	10.58	27.70	50.00	-22.30	AVG	
11		26.4860	19.66	10.70	30.36	60.00	-29.64	QP	
12		26.4860	13.80	10.70	24.50	50.00	-25.50	AVG	

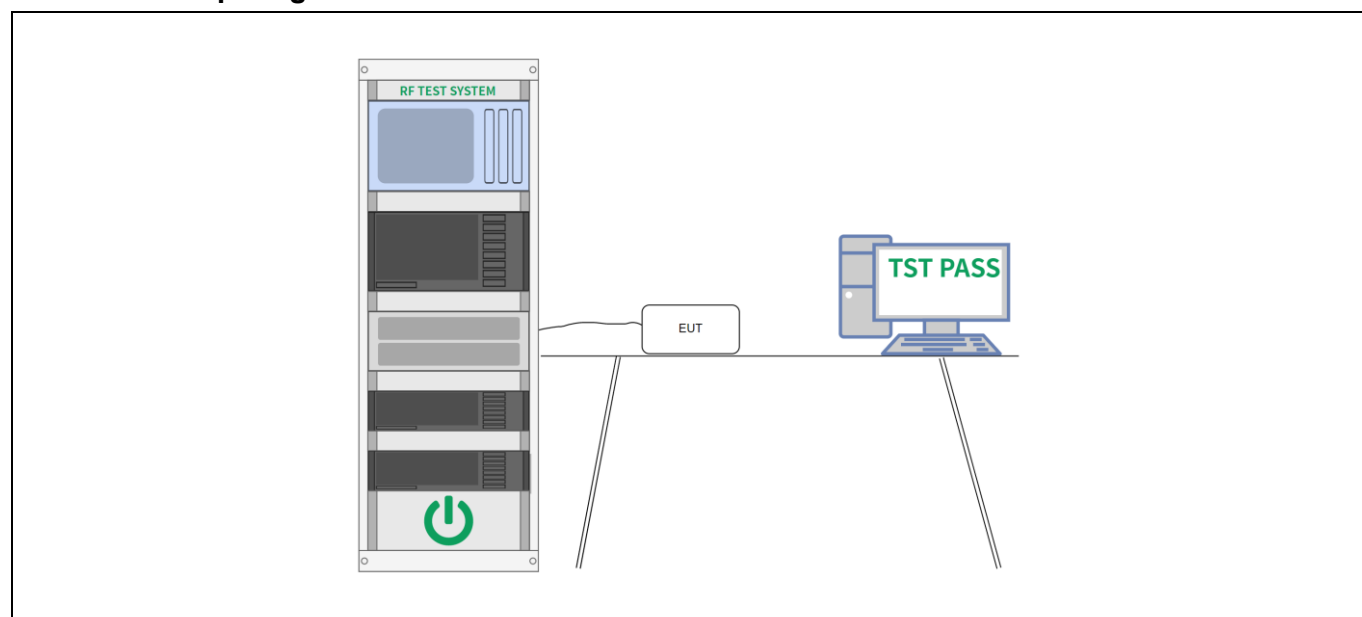
6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

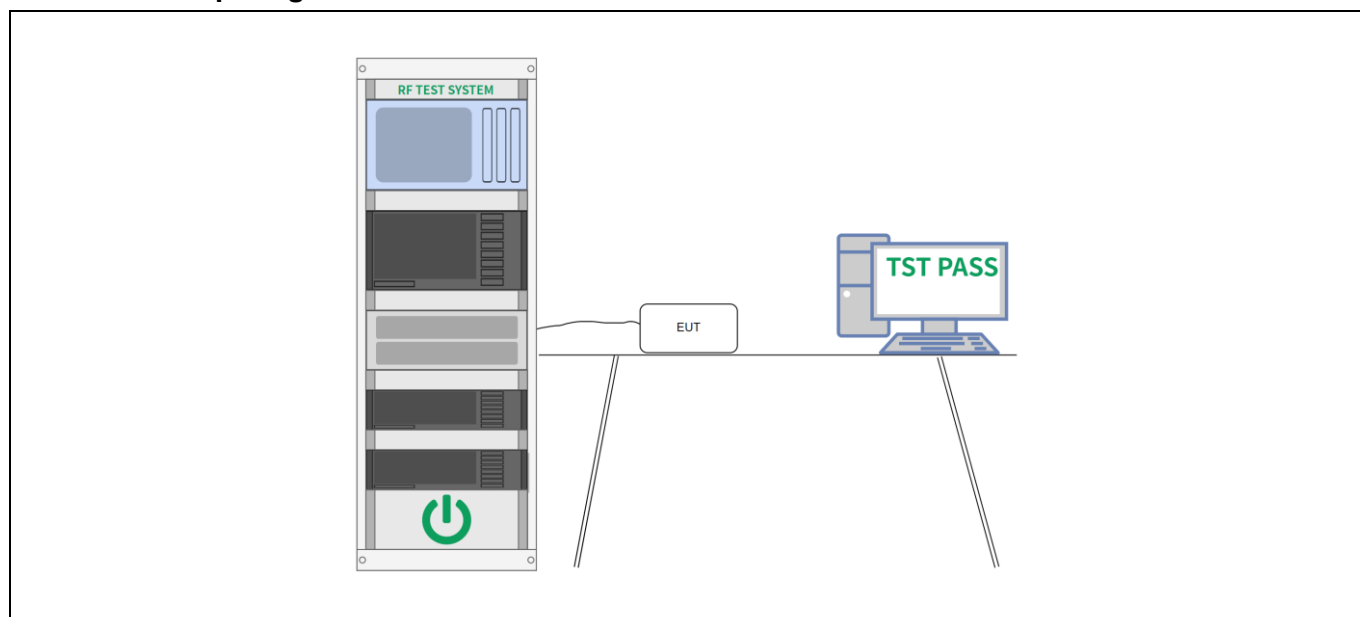
6.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(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.
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

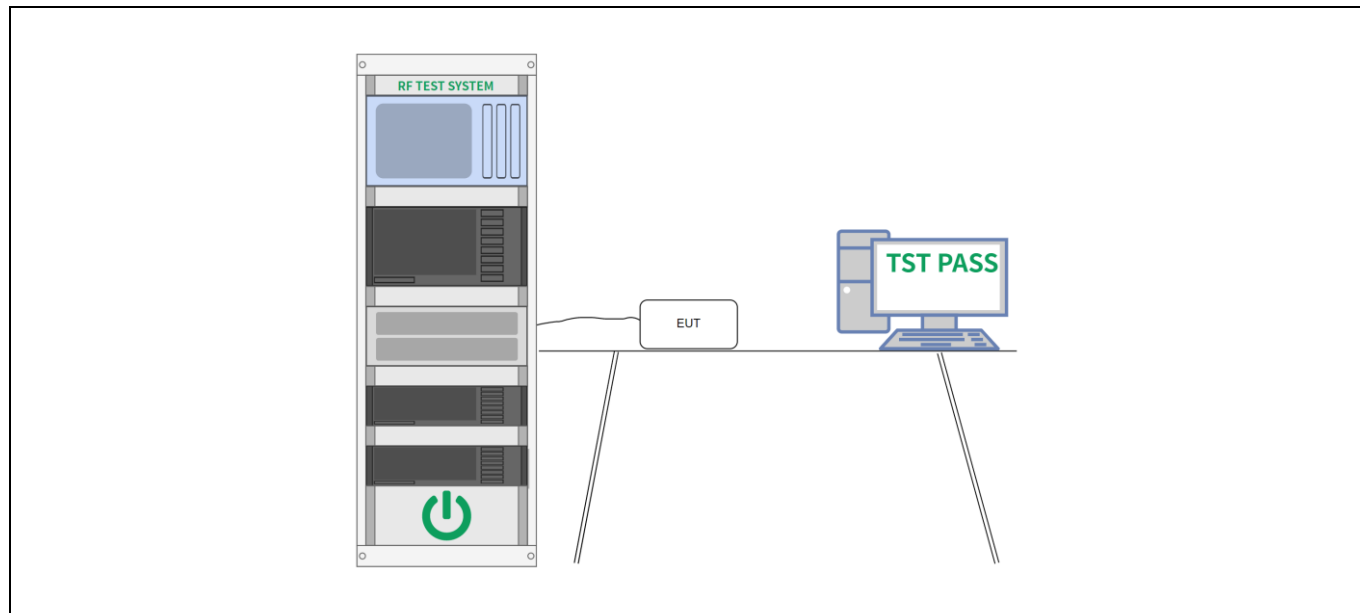
6.4 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Test mode:		Mode1, Mode2, Mode3, Mode4			

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

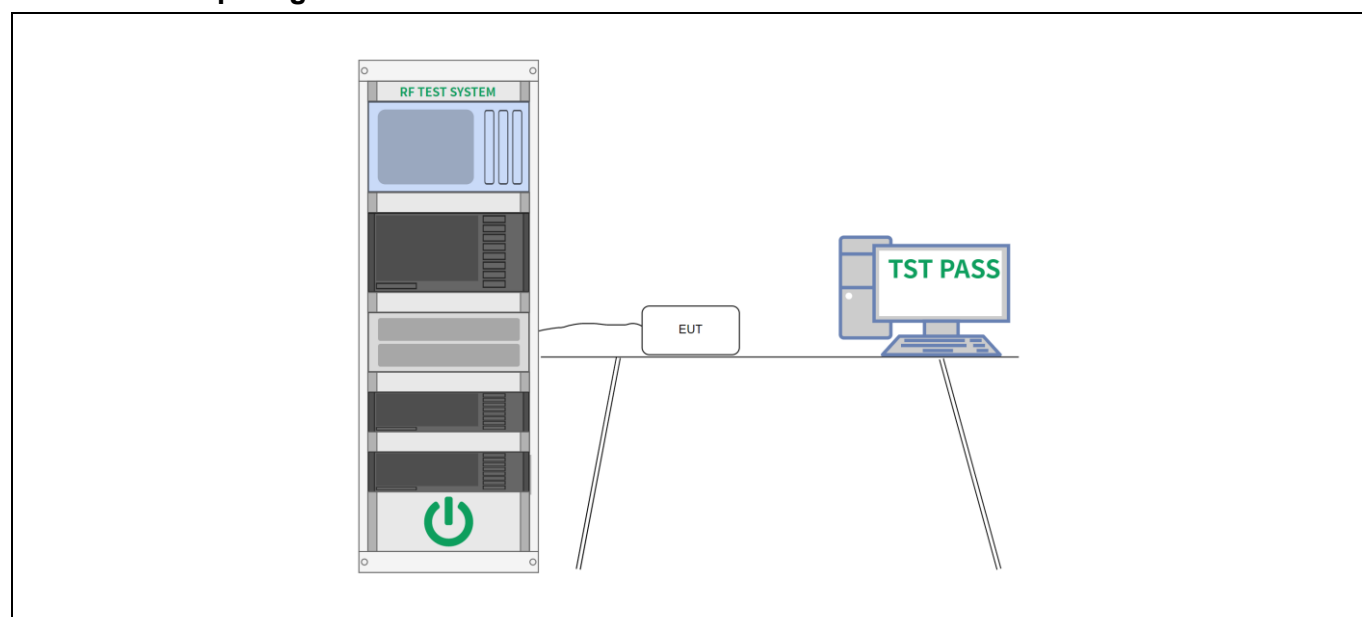
6.5 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d)
Test Limit:	Refer to 47 CFR 15.247(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.
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4				

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Please Refer to Appendix for Details.

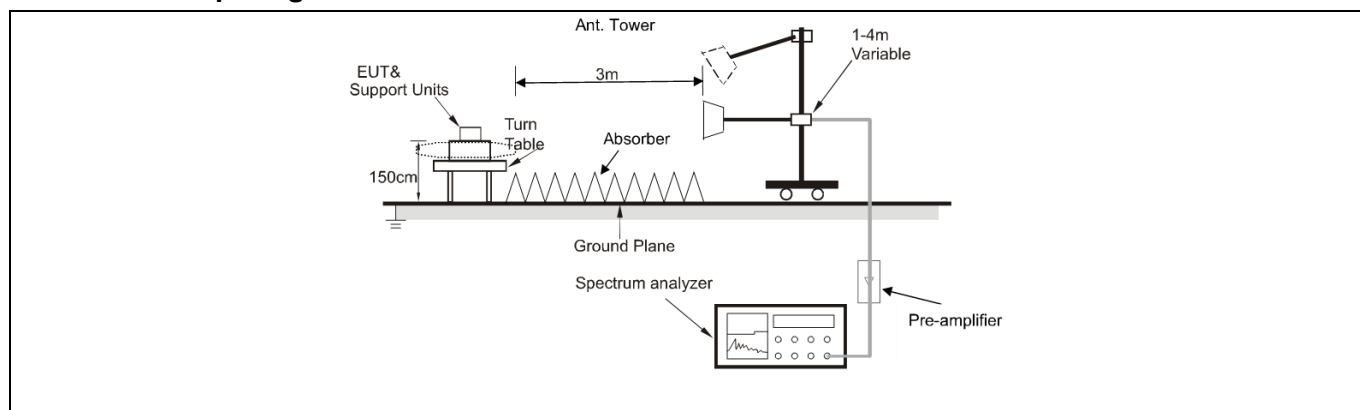
6.6 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.			
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02		

6.6.1 E.U.T. Operation:

Operating Environment:			
Temperature:	21.9 °C	Humidity:	61.9 %
		Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report		
Note:	All other emissions are attenuated 20dB below the limit, so does not recorded.		

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH01

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	47.21	-8.08	39.13	74.00	-34.87	peak
2		2310.000	38.25	-8.08	30.17	54.00	-23.83	AVG
3		2390.000	54.51	-7.71	46.80	74.00	-27.20	peak
4	*	2390.000	46.09	-7.71	38.38	54.00	-15.62	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH01

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	42.77	-8.08	34.69	74.00	-39.31	peak
2		2310.000	33.01	-8.08	24.93	54.00	-29.07	AVG
3		2390.000	44.32	-7.71	36.61	74.00	-37.39	peak
4	*	2390.000	35.52	-7.71	27.81	54.00	-26.19	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH11

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	54.09	-7.24	46.85	74.00	-27.15	peak
2	*	2483.500	44.73	-7.24	37.49	54.00	-16.51	AVG
3		2500.000	49.53	-7.17	42.36	74.00	-31.64	peak
4		2500.000	40.91	-7.17	33.74	54.00	-20.26	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH11

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	48.79	-7.24	41.55	74.00	-32.45	peak
2	*	2483.500	39.29	-7.24	32.05	54.00	-21.95	AVG
3		2500.000	48.27	-7.17	41.10	74.00	-32.90	peak
4		2500.000	38.45	-7.17	31.28	54.00	-22.72	AVG

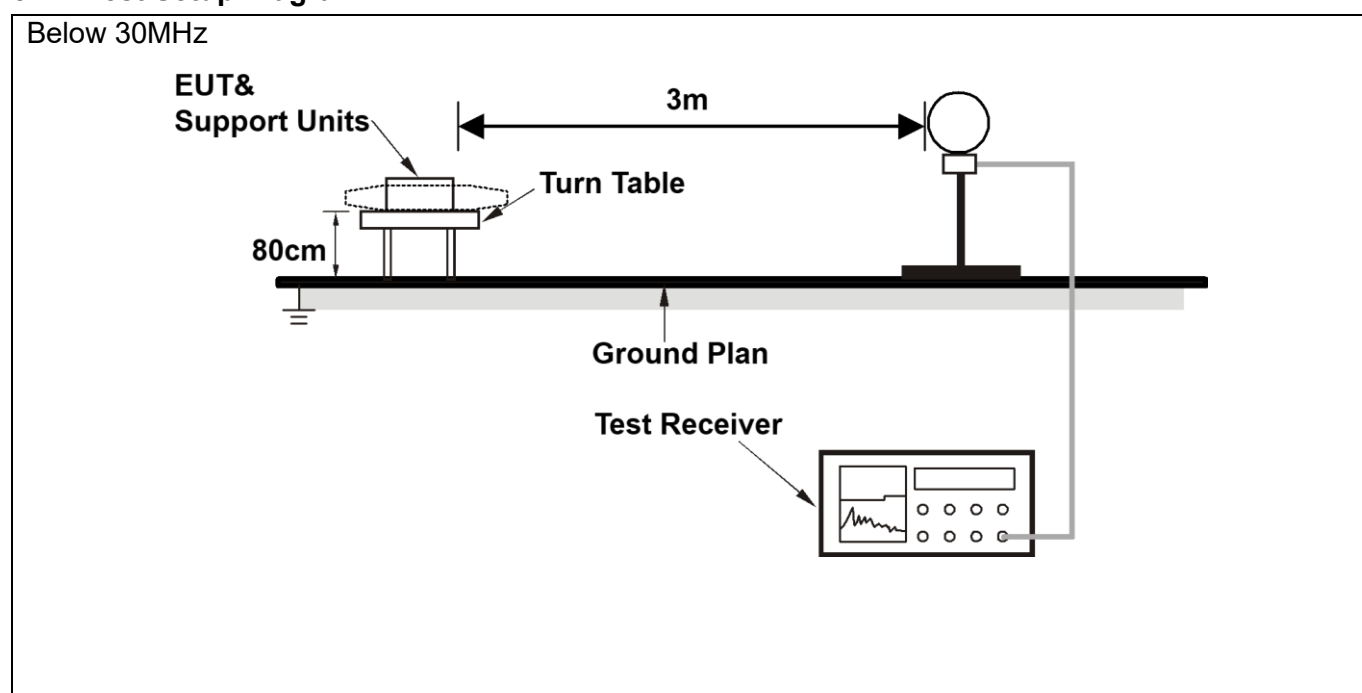
6.7 Emissions in restricted frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.			
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02		

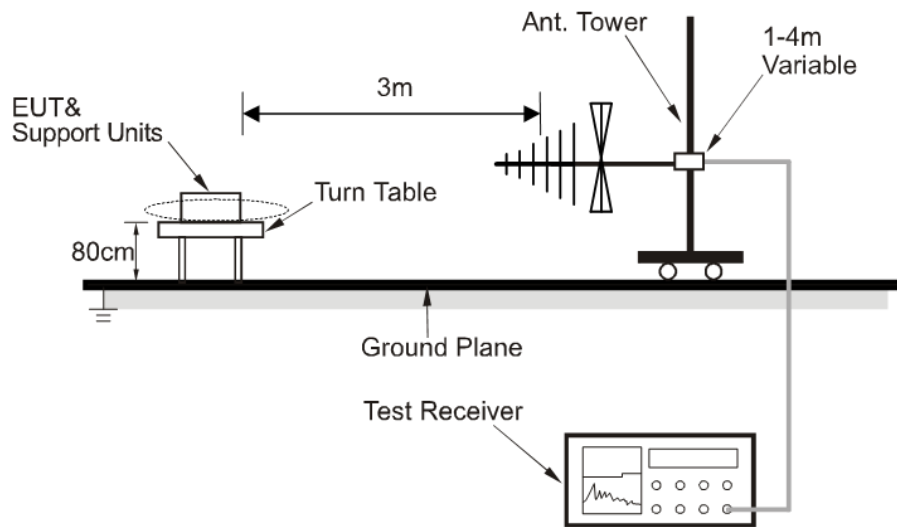
6.7.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				
Note: The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported. All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.					

6.7.2 Test Setup Diagram:

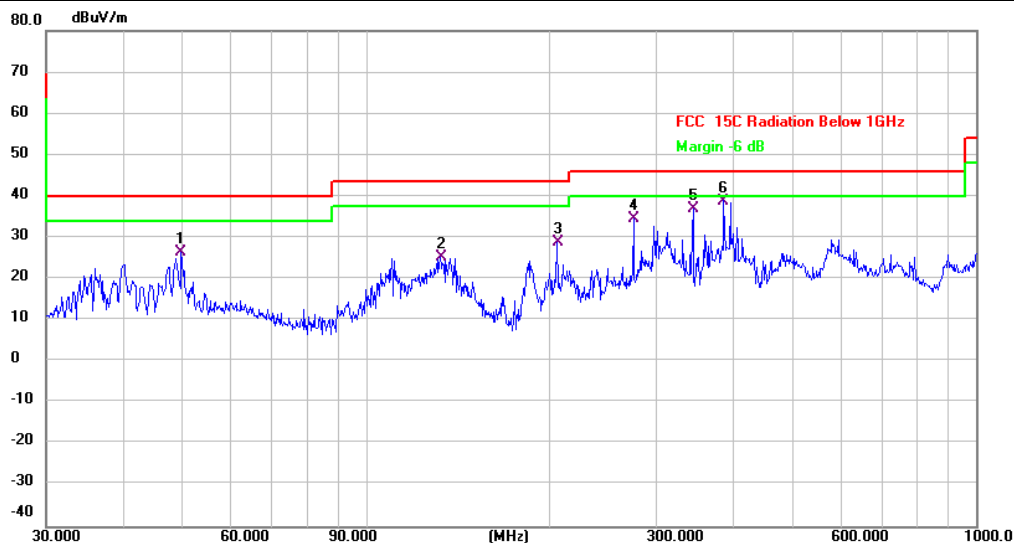


30MHz~1GHz



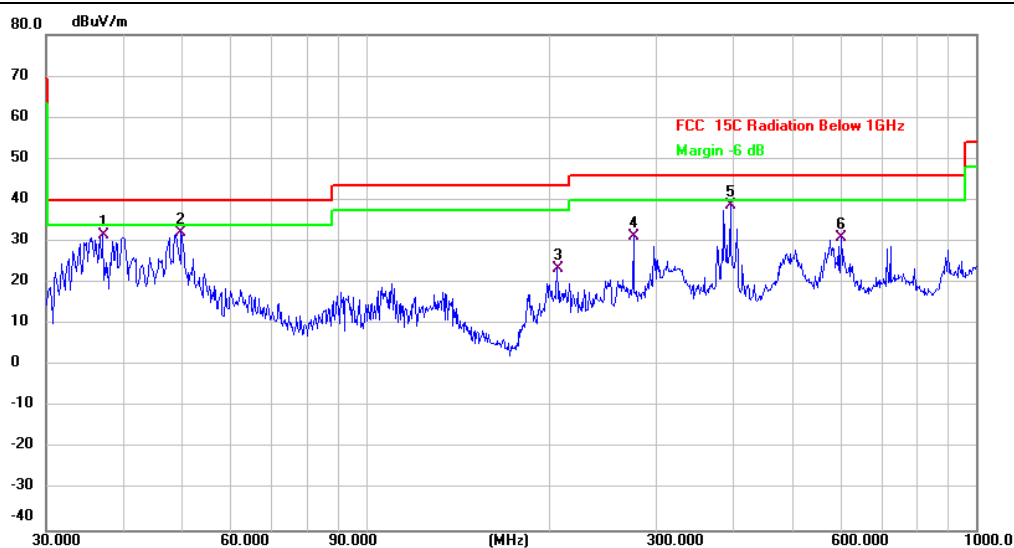
6.7.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH11



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	49.8814	39.72	-13.28	26.44	40.00	-13.56	QP	
2	132.2206	41.10	-15.99	25.11	43.50	-18.39	QP	
3	206.3976	47.37	-18.61	28.76	43.50	-14.74	QP	
4	275.1570	49.17	-14.69	34.48	46.00	-11.52	QP	
5	344.3855	50.79	-13.73	37.06	46.00	-8.94	QP	
6 *	386.6338	51.95	-13.05	38.90	46.00	-7.10	QP	

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH11



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		37.1550	44.64	-12.96	31.68	40.00	-8.32	QP	
2		49.8814	45.58	-13.28	32.30	40.00	-7.70	QP	
3		206.3976	42.06	-18.61	23.45	43.50	-20.05	QP	
4		275.1570	46.04	-14.69	31.35	46.00	-14.65	QP	
5	*	396.2415	50.52	-11.84	38.68	46.00	-7.32	QP	
6		601.4265	36.81	-5.84	30.97	46.00	-15.03	QP	

Note: MINI140 is not equipped with the appropriate hardware and does not support the WIFI features.

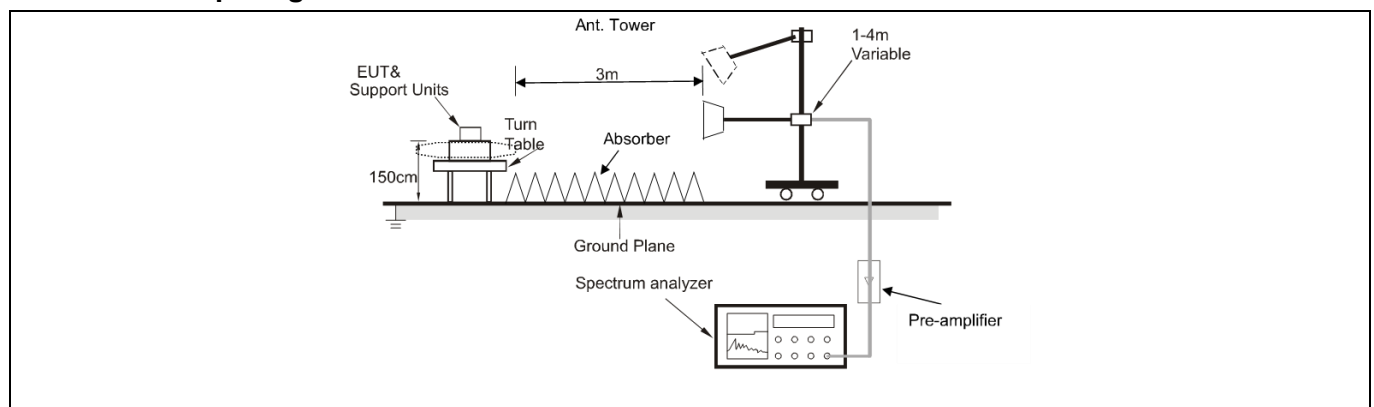
6.8 Emissions in restricted frequency bands (above 1GHz)

Test Requirement:	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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.			
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02		

6.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.9 °C	Humidity:	61.9 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				
Note: Test frequency are from 1GHz to 25GHz, the amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported. All modes of operation of the EUT were investigated, and only the worst-case results are reported.					

6.8.2 Test Setup Diagram:



6.8.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH01

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4824.000	52.27	0.82	53.09	74.00	-20.91	peak
2	*	4824.000	49.44	0.82	50.26	54.00	-3.74	AVG
3		7236.000	42.15	6.00	48.15	74.00	-25.85	peak
4		7236.000	36.11	6.00	42.11	54.00	-11.89	AVG
5		9648.000	40.93	6.17	47.10	74.00	-26.90	peak
6		9648.000	34.89	6.17	41.06	54.00	-12.94	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH01

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4824.000	46.52	0.82	47.34	74.00	-26.66	peak
2	*	4824.000	44.38	0.82	45.20	54.00	-8.80	AVG
3		7236.000	40.24	6.00	46.24	74.00	-27.76	peak
4		7236.000	34.18	6.00	40.18	54.00	-13.82	AVG
5		9648.000	43.78	6.17	49.95	74.00	-24.05	peak
6		9648.000	37.22	6.17	43.39	54.00	-10.61	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH06

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4874.000	50.30	1.01	51.31	74.00	-22.69	peak
2	*	4874.000	48.14	1.01	49.15	54.00	-4.85	AVG
3		7311.000	39.61	5.94	45.55	74.00	-28.45	peak
4		7311.000	33.29	5.94	39.23	54.00	-14.77	AVG
5		9748.000	42.76	6.54	49.30	74.00	-24.70	peak
6		9748.000	37.58	6.54	44.12	54.00	-9.88	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH06

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4874.000	43.50	1.01	44.51	74.00	-29.49	peak
2		4874.000	41.22	1.01	42.23	54.00	-11.77	AVG
3		7311.000	40.32	5.94	46.26	74.00	-27.74	peak
4		7311.000	34.21	5.94	40.15	54.00	-13.85	AVG
5		9748.000	44.25	6.54	50.79	74.00	-23.21	peak
6	*	9748.000	38.75	6.54	45.29	54.00	-8.71	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH11

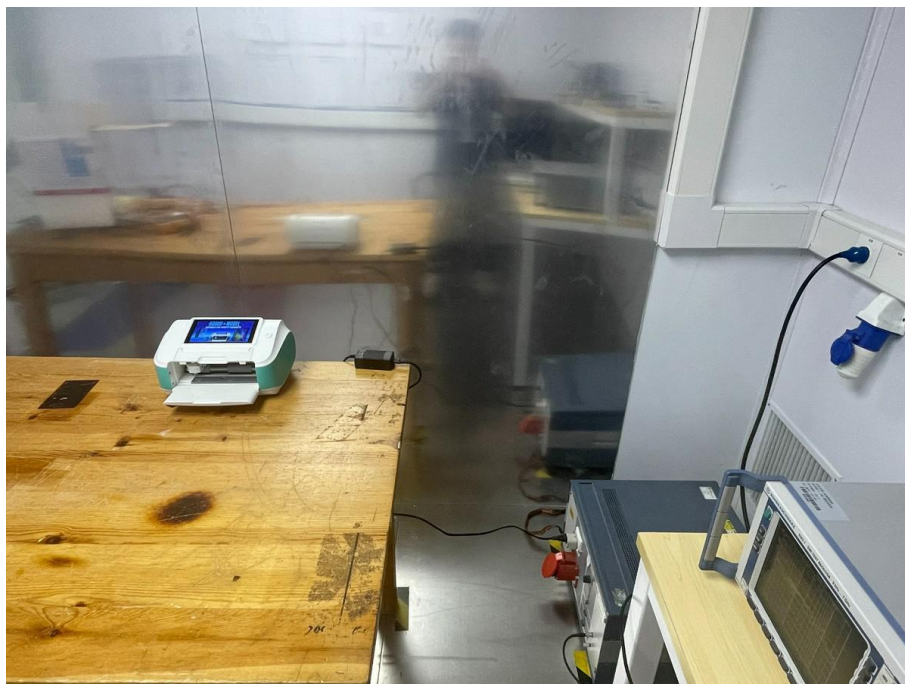
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	50.45	1.27	51.72	74.00	-22.28	peak
2	*	4924.000	47.94	1.27	49.21	54.00	-4.79	AVG
3		7386.000	42.94	5.86	48.80	74.00	-25.20	peak
4		7386.000	36.39	5.86	42.25	54.00	-11.75	AVG
5		9848.000	40.92	6.31	47.23	74.00	-26.77	peak
6		9848.000	34.81	6.31	41.12	54.00	-12.88	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH11

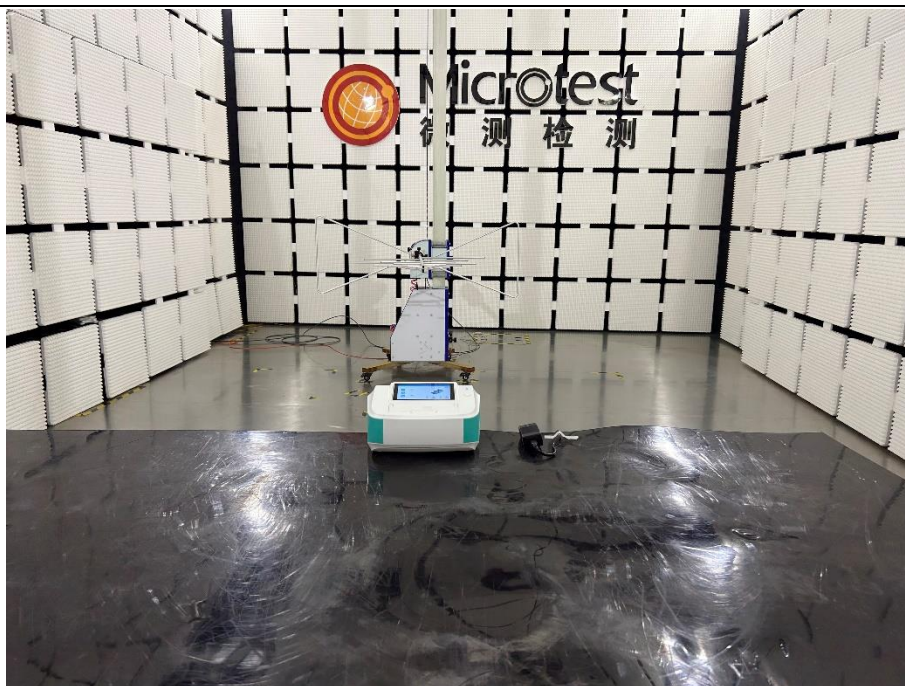
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4924.000	47.07	1.27	48.34	74.00	-25.66	peak
2	*	4924.000	44.96	1.27	46.23	54.00	-7.77	AVG
3		7386.000	44.44	5.86	50.30	74.00	-23.70	peak
4		7386.000	39.29	5.86	45.15	54.00	-8.85	AVG
5		9848.000	45.63	6.31	51.94	74.00	-22.06	peak
6		9848.000	39.89	6.31	46.20	54.00	-7.80	AVG

Photographs of the test setup

Conducted Emission at AC power line



Receiver spurious emissions (30MHz to 1GHz)



Receiver spurious emissions (above 1GHz)



Photographs of the EUT

Refer to Appendix - EUT Photos

Appendix

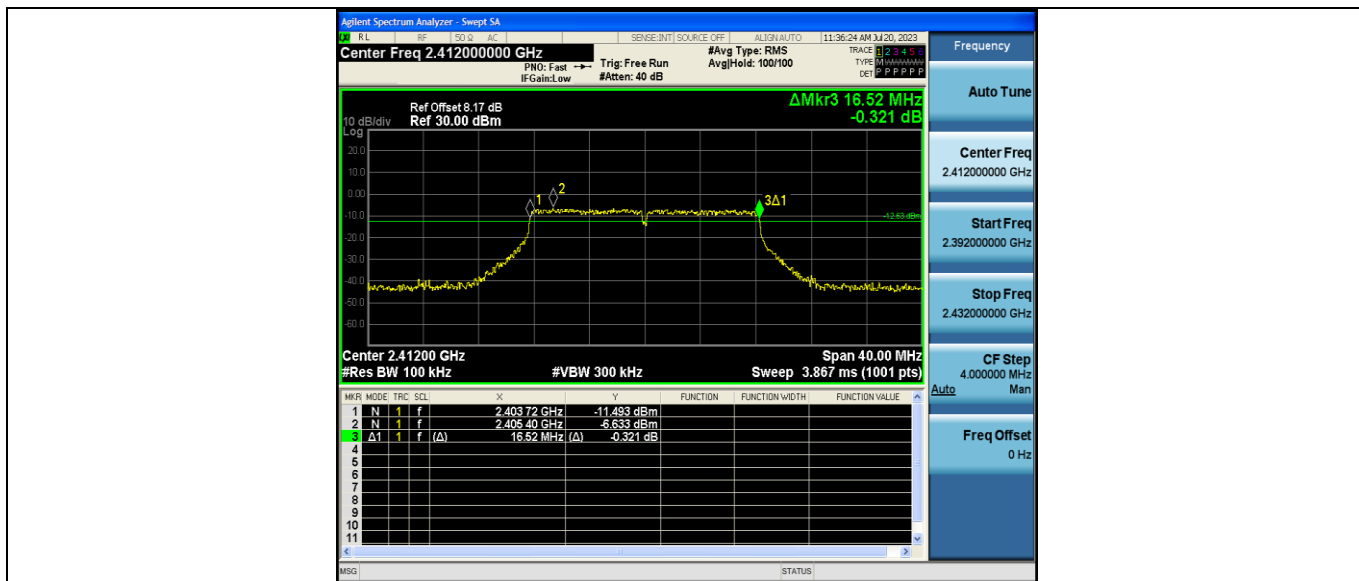
Appendix A: DTS Bandwidth

Test Result

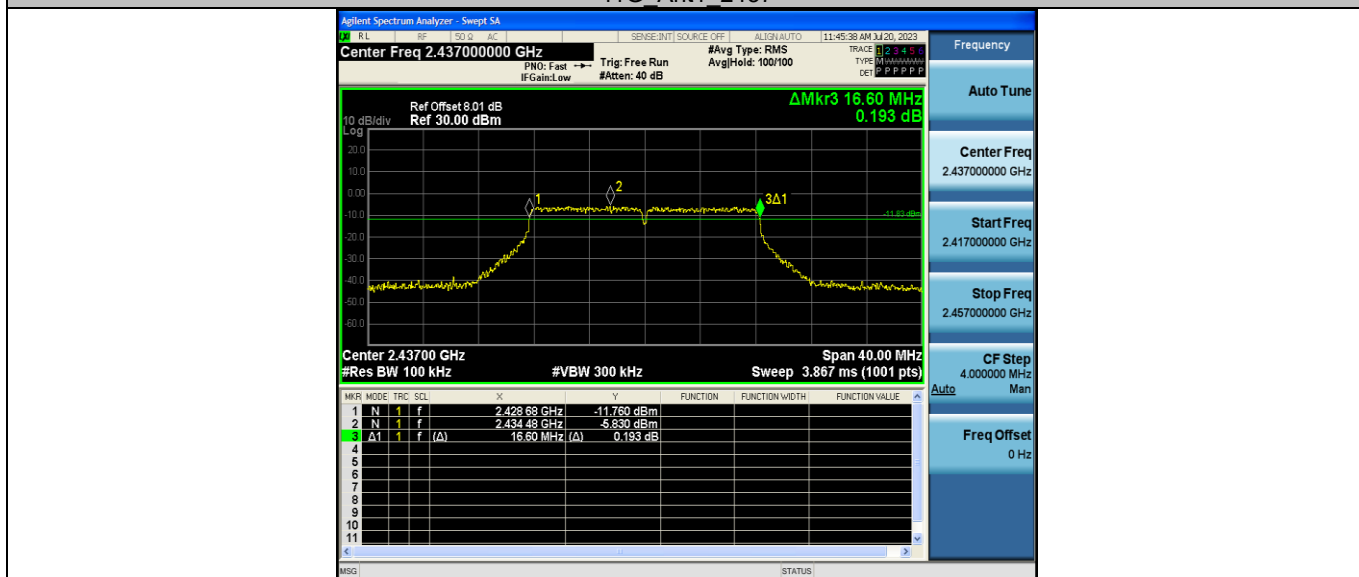
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	9.000	0.5	PASS
		2437	8.600	0.5	PASS
		2462	8.560	0.5	PASS
11G	Ant1	2412	16.520	0.5	PASS
		2437	16.600	0.5	PASS
		2462	16.520	0.5	PASS
11N20SISO	Ant1	2412	17.800	0.5	PASS
		2437	17.800	0.5	PASS
		2462	17.720	0.5	PASS
11N40SISO	Ant1	2422	36.400	0.5	PASS
		2437	36.480	0.5	PASS
		2452	36.400	0.5	PASS

Test Graphs

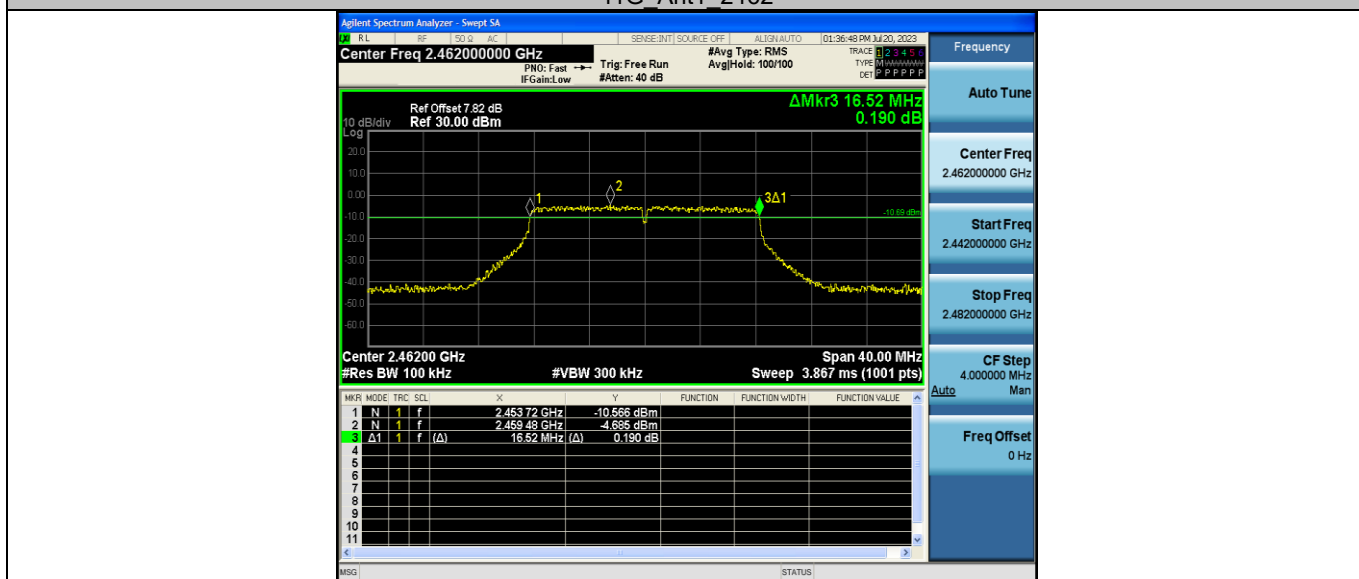




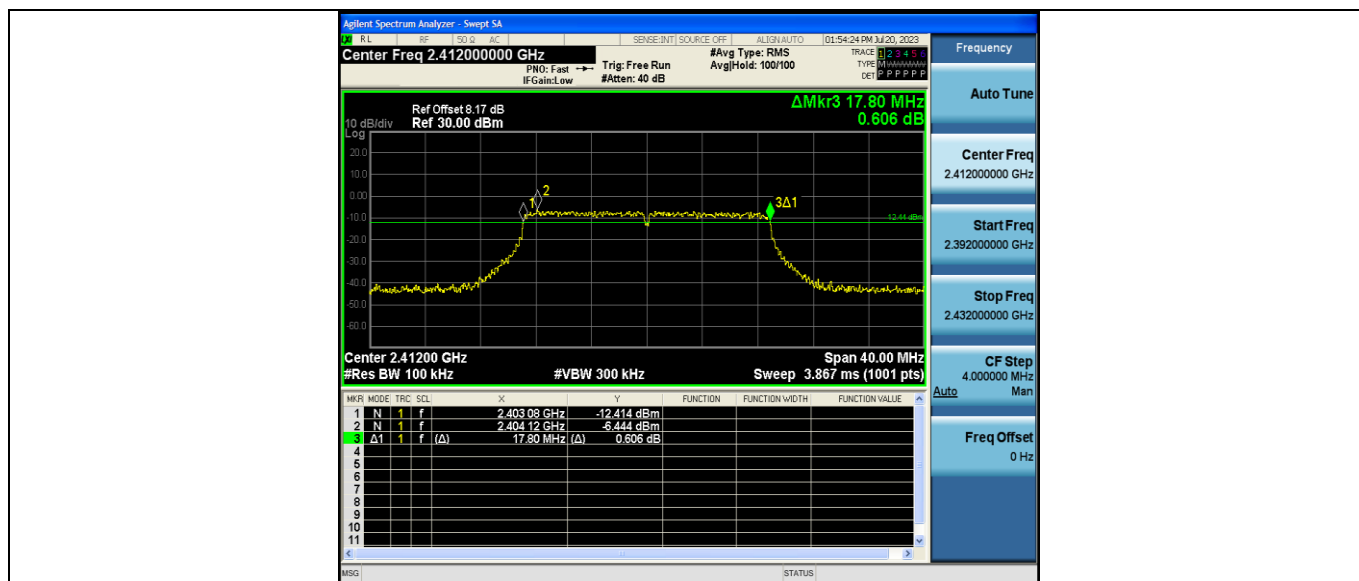
11G Ant1 2437



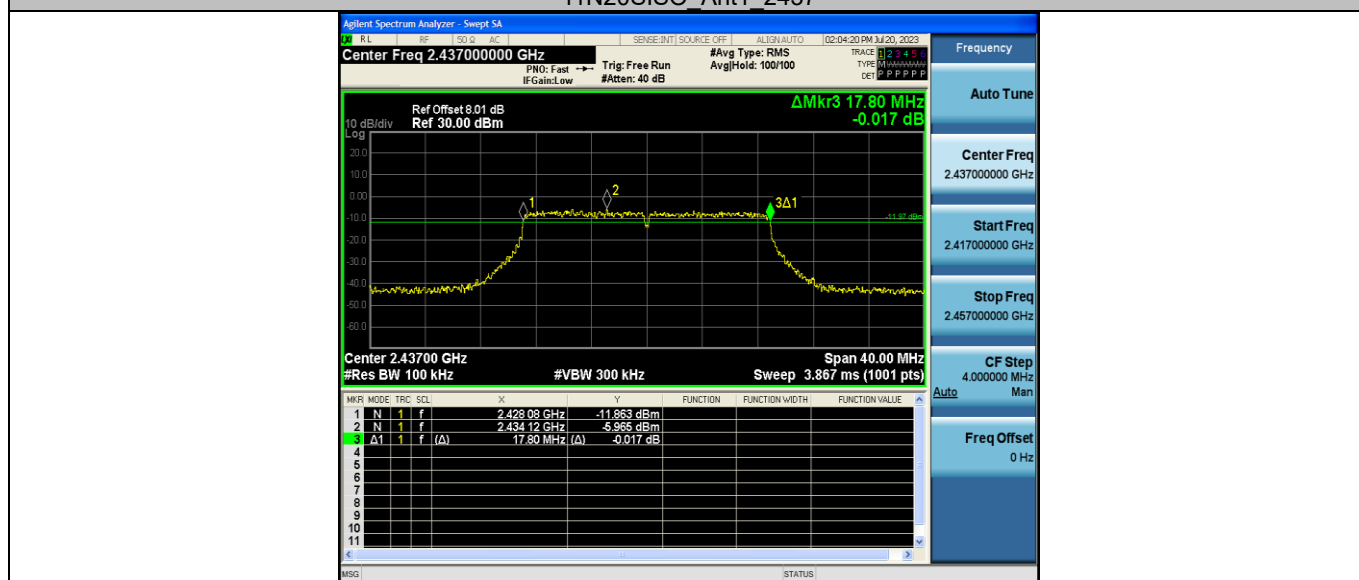
11G Ant1 2462



11N20SISO Ant1 2412



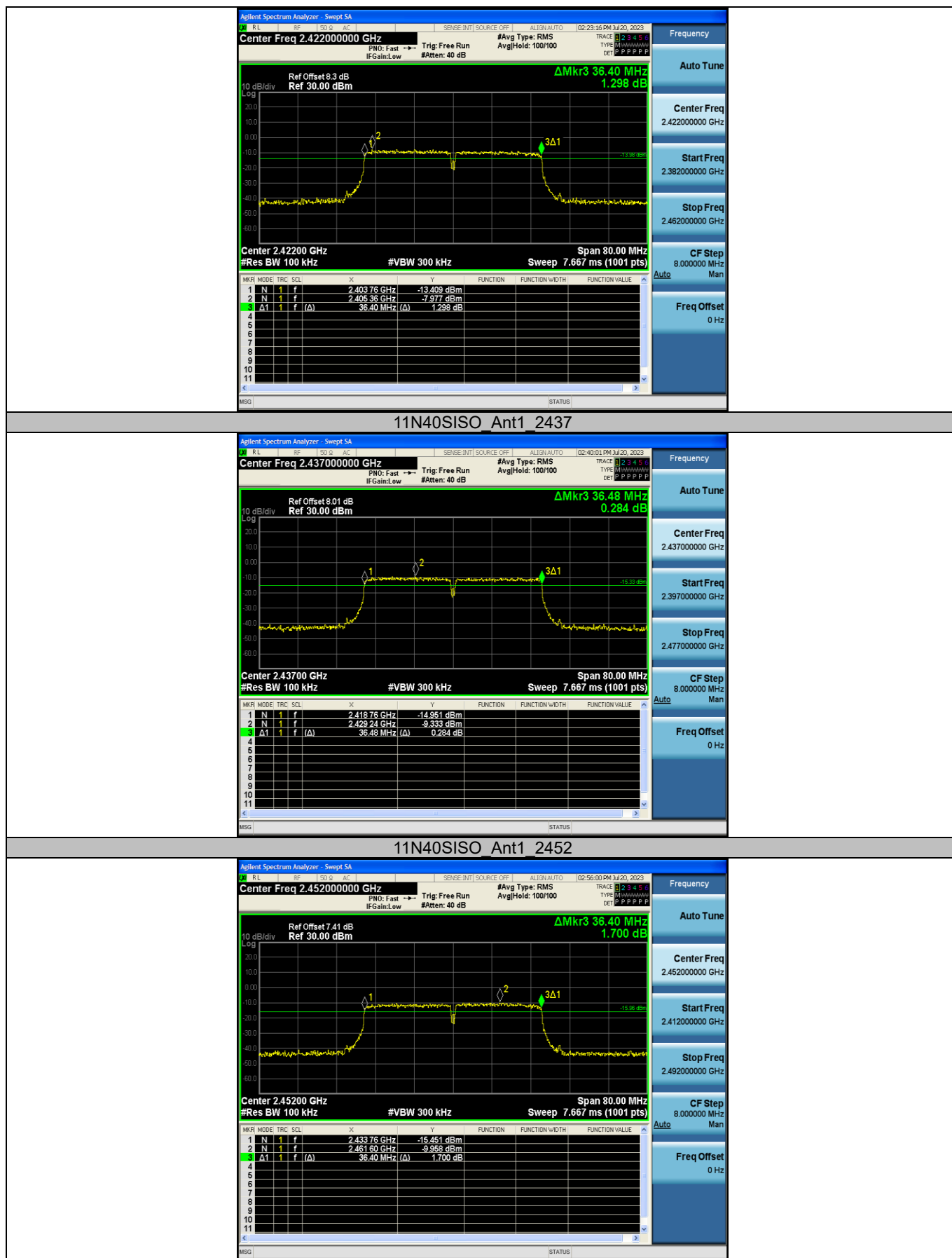
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



Appendix B: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency [MHz]	Peak Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	16.04	≤30.00	PASS
		2437	16.25	≤30.00	PASS
		2462	16.53	≤30.00	PASS
11G	Ant1	2412	14.74	≤30.00	PASS
		2437	15.53	≤30.00	PASS
		2462	15.63	≤30.00	PASS
11N20SISO	Ant1	2412	15.30	≤30.00	PASS
		2437	15.36	≤30.00	PASS
		2462	15.06	≤30.00	PASS
11N40SISO	Ant1	2422	15.75	≤30.00	PASS
		2437	15.10	≤30.00	PASS
		2452	14.47	≤30.00	PASS

Appendix C: Maximum power spectral density

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-16.02	≤8.00	PASS
		2437	-15.76	≤8.00	PASS
		2462	-15.37	≤8.00	PASS
11G	Ant1	2412	-18.55	≤8.00	PASS
		2437	-19.77	≤8.00	PASS
		2462	-18.92	≤8.00	PASS
11N20SISO	Ant1	2412	-18.41	≤8.00	PASS
		2437	-19.34	≤8.00	PASS
		2462	-19.36	≤8.00	PASS
11N40SISO	Ant1	2422	-18.73	≤8.00	PASS
		2437	-19.69	≤8.00	PASS
		2452	-20.15	≤8.00	PASS

Test Graphs

