

BAND EDGE COMPLIANCE

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge. The analyzer screen captures for this test show an example of the emission mask for the test mode also used during the radiated spurious emissions at the restricted band edges test.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	2025-02-13	2028-02-13
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2025-02-03	2026-02-03

BAND EDGE COMPLIANCE

EUT:	Sprinkler 3 (Model No. 400304)	Work Order:	IRRI0027
Serial Number:	250300220	Date:	2025-04-03
Customer:	IrriGreen, Inc.	Temperature:	21.8°C
Attendees:	Sawyer Hamond	Relative Humidity:	30.1%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	5VDC via USB	Configuration:	IRRI0027-3

COMMENTS

Reference level offset includes measurement cable, attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

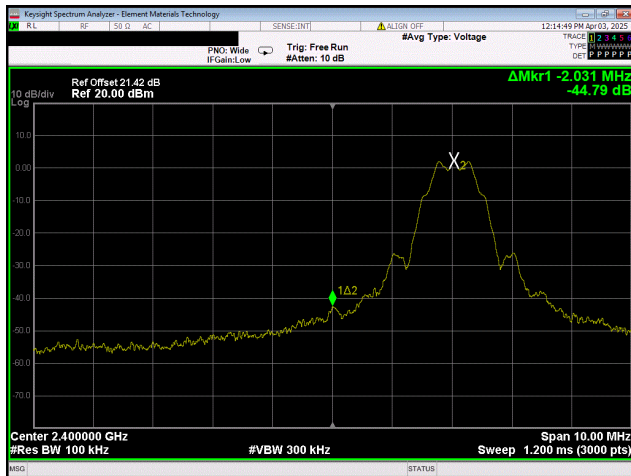


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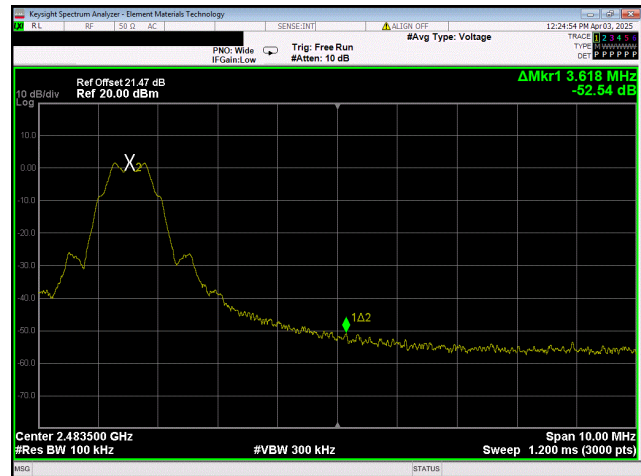
TEST RESULTS

		Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 125 kbps				
	Low Channel, 2402 MHz	-44.79	-20	Pass
	High Channel, 2480 MHz	-52.54	-20	Pass
BLE/GFSK 500 kbps				
	Low Channel, 2402 MHz	-49.06	-20	Pass
	High Channel, 2480 MHz	-55.99	-20	Pass
BLE/GFSK 1 Mbps				
	Low Channel, 2402 MHz	-48.75	-20	Pass
	High Channel, 2480 MHz	-55.6	-20	Pass
BLE/GFSK 2 Mbps				
	Low Channel, 2402 MHz	-31.48	-20	Pass
	High Channel, 2480 MHz	-52.72	-20	Pass

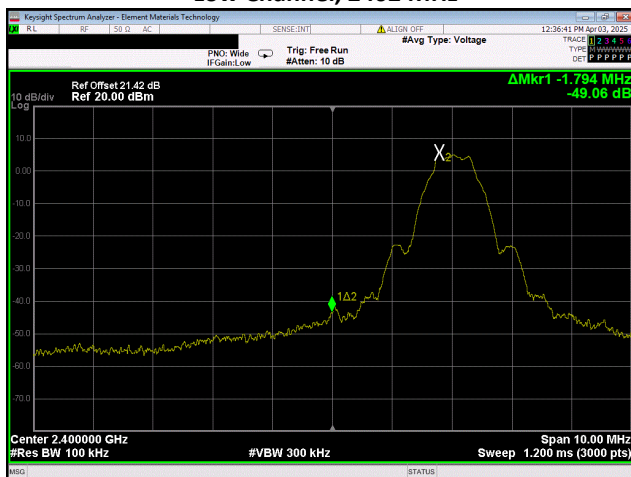
BAND EDGE COMPLIANCE



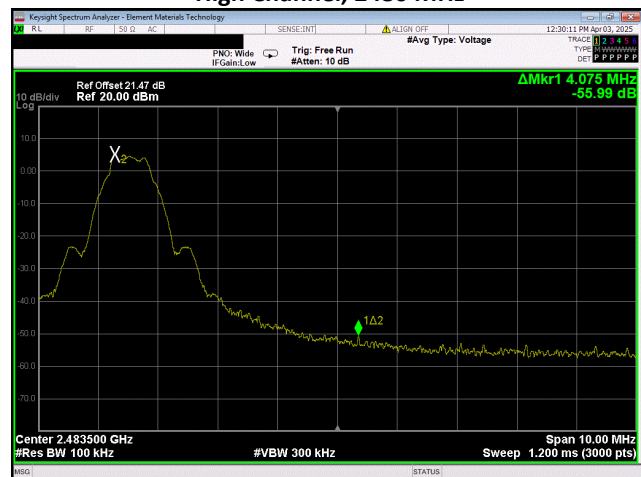
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



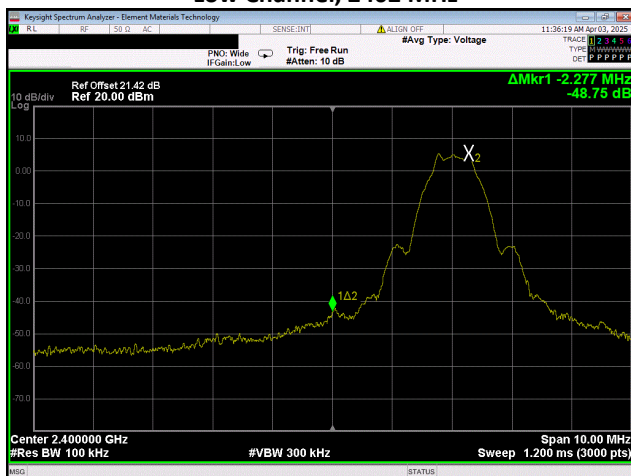
BLE/GFSK 125 kbps
High Channel, 2480 MHz



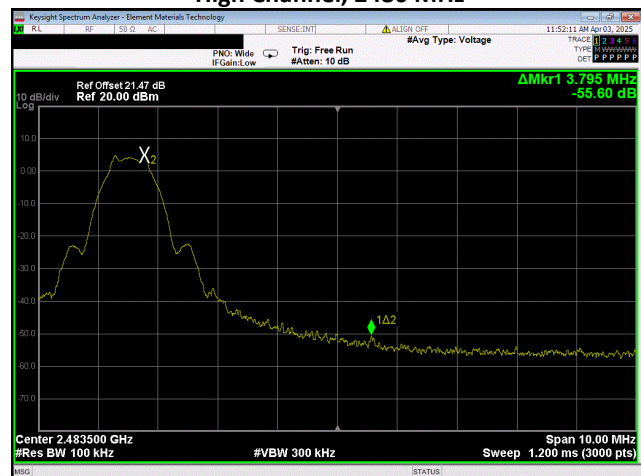
BLE/GFSK 500 kbps
Low Channel, 2402 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz

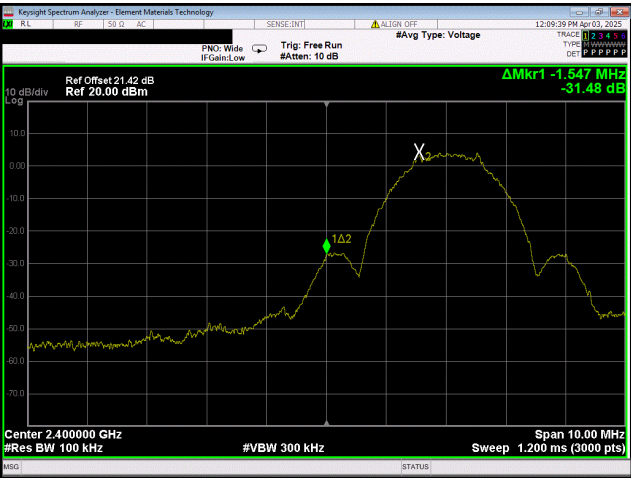


BLE/GFSK 1 Mbps
Low Channel, 2402 MHz

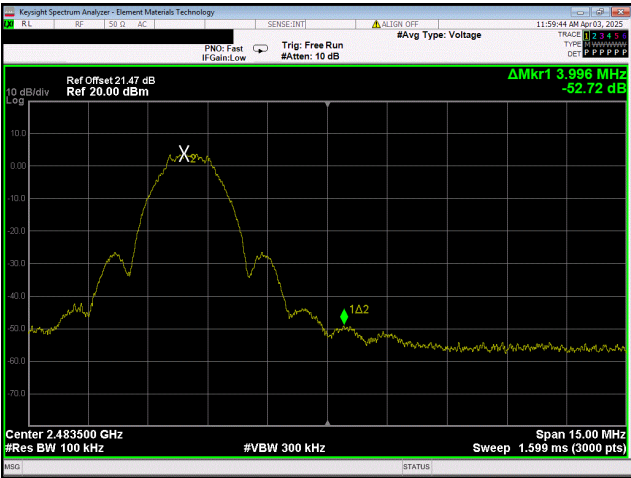


BLE/GFSK 1 Mbps
High Channel, 2480 MHz

BAND EDGE COMPLIANCE



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = "Internal" cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5183A	TIK	2025-02-13	2028-02-13
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2025-02-03	2026-02-03

SPURIOUS CONDUCTED EMISSIONS



EUT:	Sprinkler 3 (Model No. 400304)	Work Order:	IRRI0027
Serial Number:	250300220	Date:	2025-04-03
Customer:	IrriGreen, Inc.	Temperature:	21.8°C
Attendees:	Sawyer Hamond	Relative Humidity:	30.1%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	5VDC via USB	Configuration:	IRRI0027-3

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

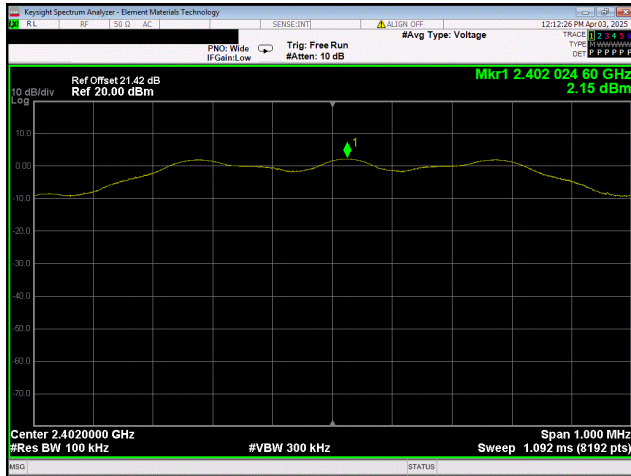
	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 125 kbps					
Low Channel, 2402 MHz	Fundamental	2402.02	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.25	-50.46	-20	Pass
	12.5 GHz - 25 GHz	24911.49	-39.08	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2442.03	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12178.77	-51.6	-20	Pass
	12.5 GHz - 25 GHz	24926.75	-39.14	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.03	N/A	N/A	N/A
	30 MHz - 12.5 GHz	11912.35	-50.89	-20	Pass
	12.5 GHz - 25 GHz	24867.23	-38.33	-20	Pass
BLE/GFSK 500 kbps					
Low Channel, 2402 MHz	Fundamental	2401.77	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.25	-53.31	-20	Pass
	12.5 GHz - 25 GHz	24978.64	-41.58	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2441.78	N/A	N/A	N/A
	30 MHz - 12.5 GHz	7061.98	-54.36	-20	Pass
	12.5 GHz - 25 GHz	24981.69	-42.54	-20	Pass
High Channel, 2480 MHz	Fundamental	2479.78	N/A	N/A	N/A
	30 MHz - 12.5 GHz	5573.07	-53.74	-20	Pass
	12.5 GHz - 25 GHz	24952.69	-42.2	-20	Pass
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	Fundamental	2402.27	N/A	N/A	N/A
	30 MHz - 12.5 GHz	4804.25	-52.26	-20	Pass
	12.5 GHz - 25 GHz	24896.23	-42.23	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2442.27	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12253.37	-54.35	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

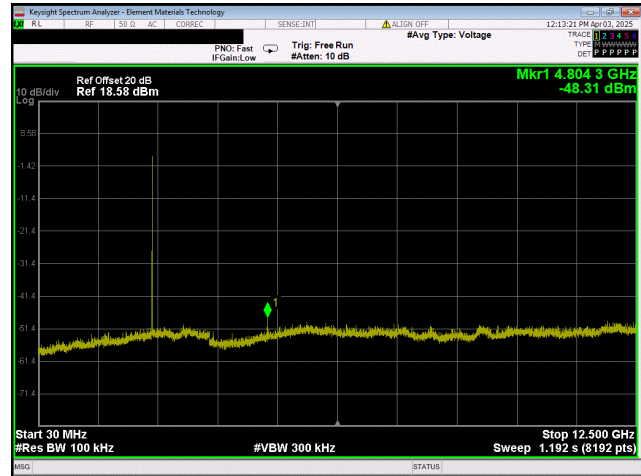


Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
High Channel, 2480 MHz	12.5 GHz - 25 GHz	24781.77	-41.69	-20	Pass
	Fundamental	2479.78	N/A	N/A	N/A
	30 MHz - 12.5 GHz	5626.35	-54.04	-20	Pass
	12.5 GHz - 25 GHz	24887.07	-42.1	-20	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	Fundamental	2402.04	N/A	N/A	N/A
	30 MHz - 12.5 GHz	5390.38	-52.81	-20	Pass
	12.5 GHz - 25 GHz	24925.22	-41.16	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2441.51	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12102.65	-53.86	-20	Pass
	12.5 GHz - 25 GHz	24842.82	-42.07	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.07	N/A	N/A	N/A
	30 MHz - 12.5 GHz	11725.1	-52.7	-20	Pass
	12.5 GHz - 25 GHz	24938.96	-40.77	-20	Pass

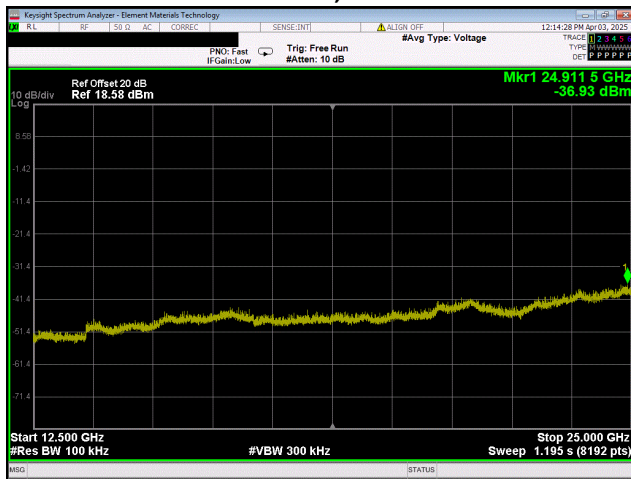
SPURIOUS CONDUCTED EMISSIONS



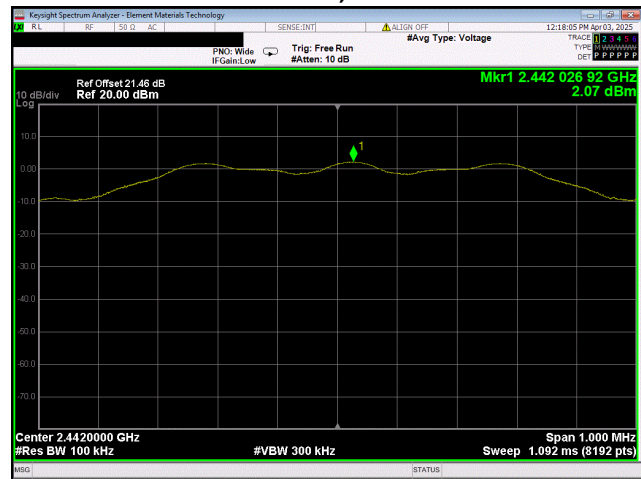
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



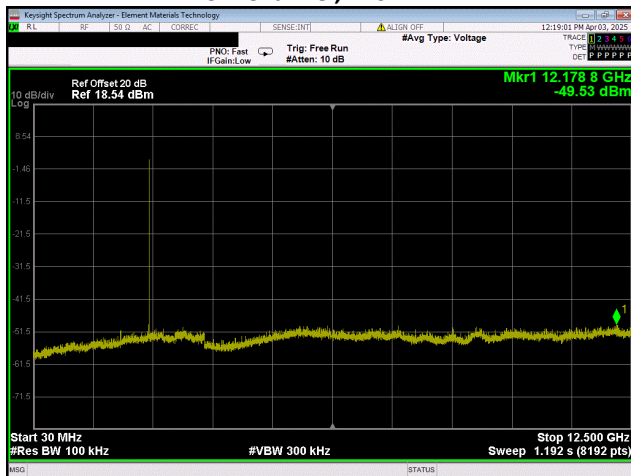
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Low Channel, 2402 MHz



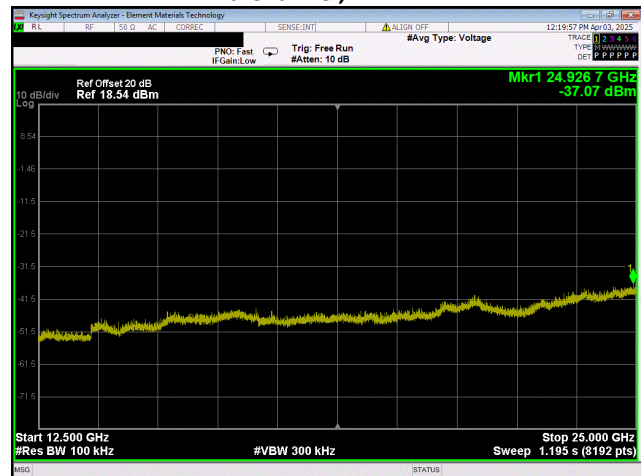
BLE/GFSK 125 kbps
Low Channel, 2402 MHz



BLE/GFSK 125 kbps
Mid Channel, 2442 MHz

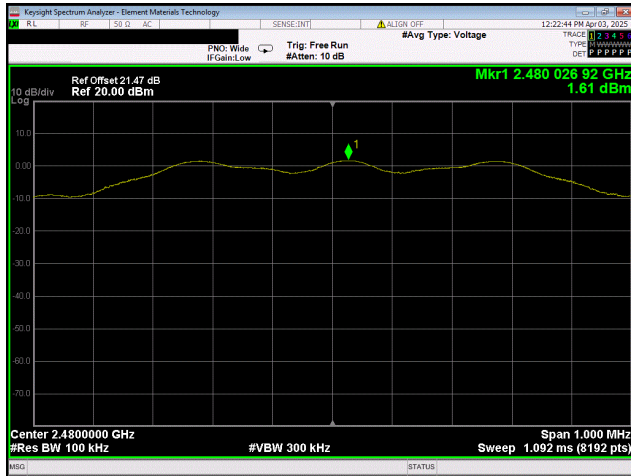


BLE/GFSK 125 kbps
Mid Channel, 2442 MHz

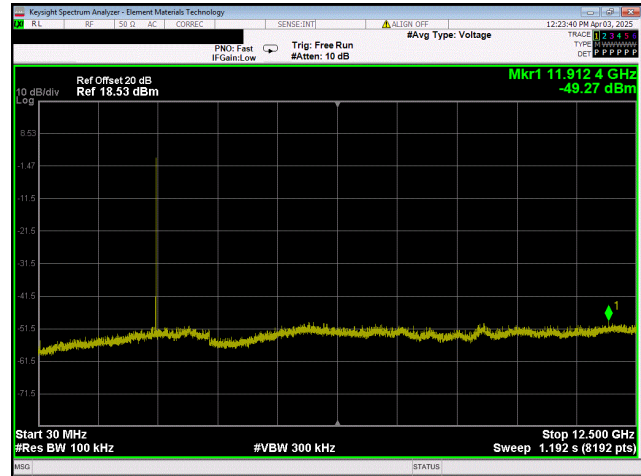


BLE/GFSK 125 kbps
Mid Channel, 2442 MHz

SPURIOUS CONDUCTED EMISSIONS



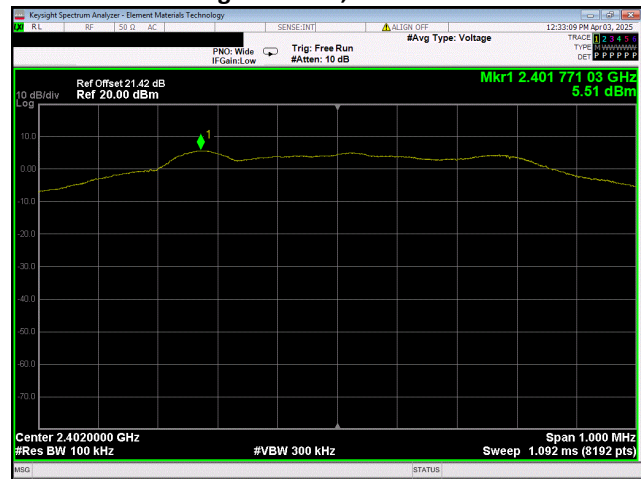
BLE/GFSK 125 kbps
High Channel, 2480 MHz



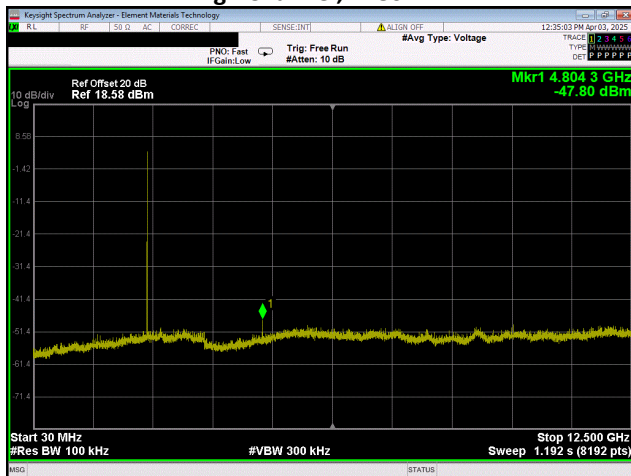
BLE/GFSK 125 kbps
High Channel, 2480 MHz



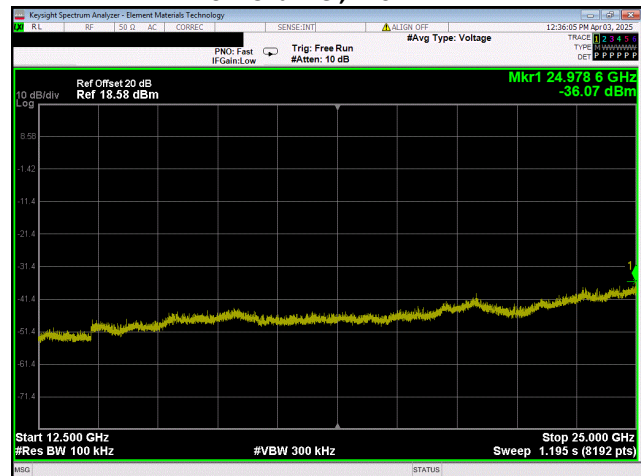
BLE/GFSK 125 kbps
High Channel, 2480 MHz



BLE/GFSK 500 kbps
Low Channel, 2402 MHz

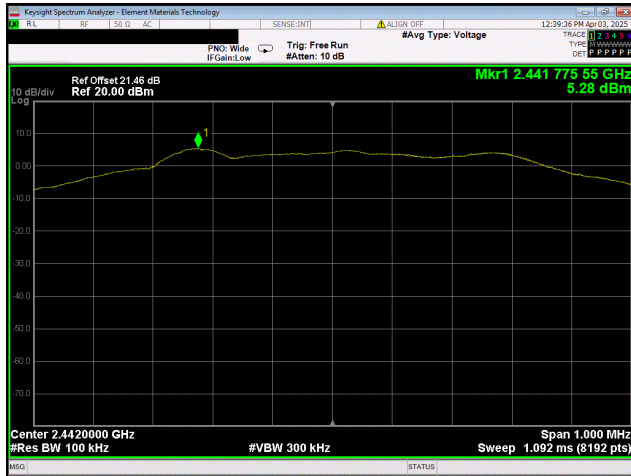


BLE/GFSK 500 kbps
Low Channel, 2402 MHz

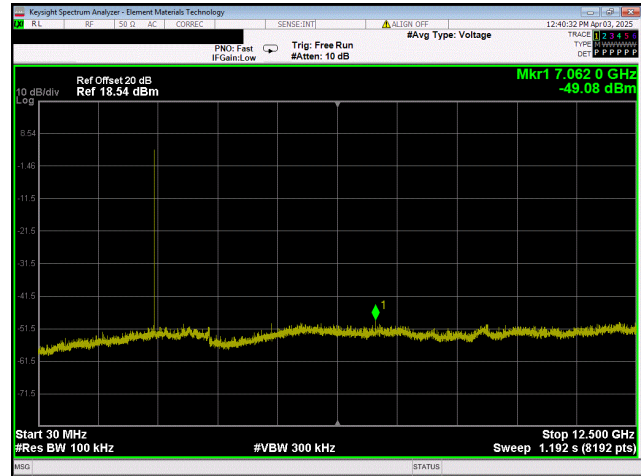


BLE/GFSK 500 kbps
Low Channel, 2402 MHz

SPURIOUS CONDUCTED EMISSIONS



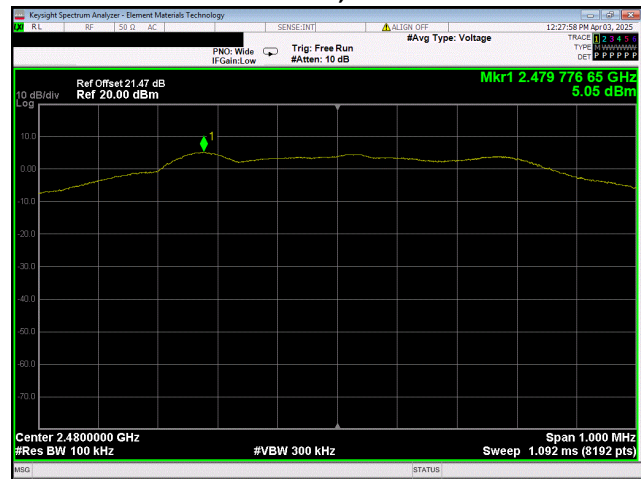
BLE/GFSK 500 kbps
Mid Channel, 2442 MHz



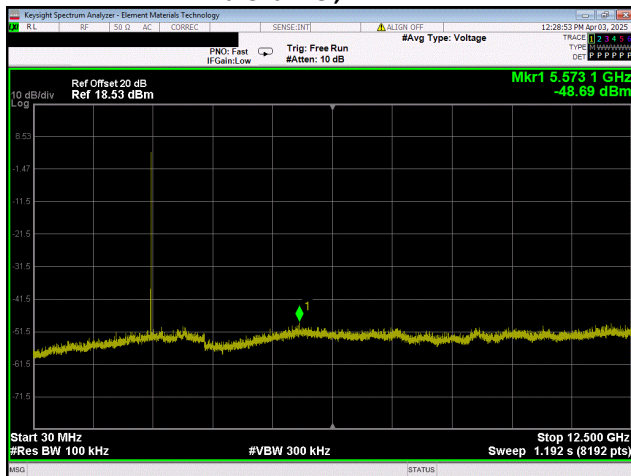
BLE/GFSK 500 kbps
Mid Channel, 2442 MHz



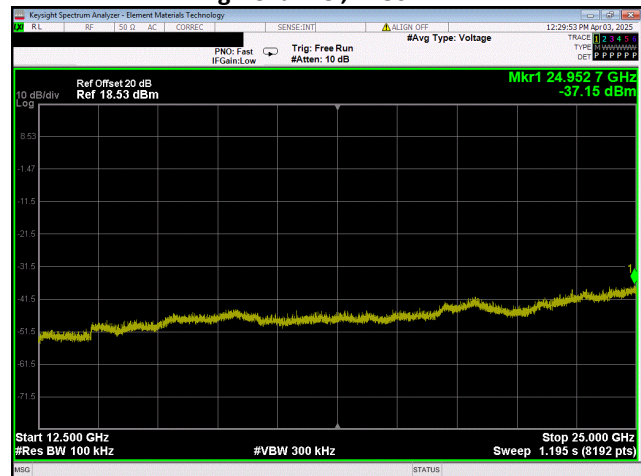
BLE/GFSK 500 kbps
Mid Channel, 2442 MHz



BLE/GFSK 500 kbps
High Channel, 2480 MHz

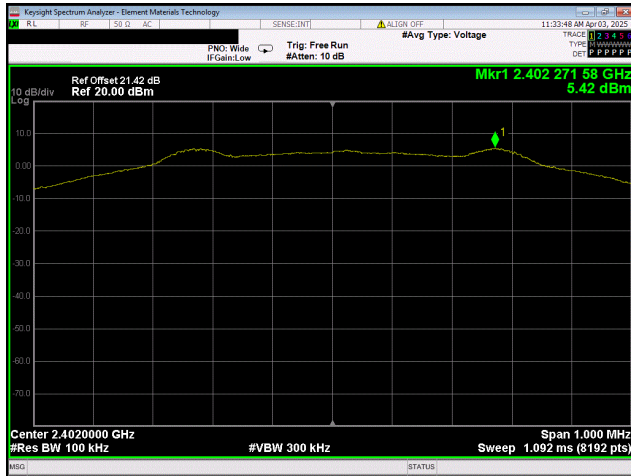


BLE/GFSK 500 kbps
High Channel, 2480 MHz

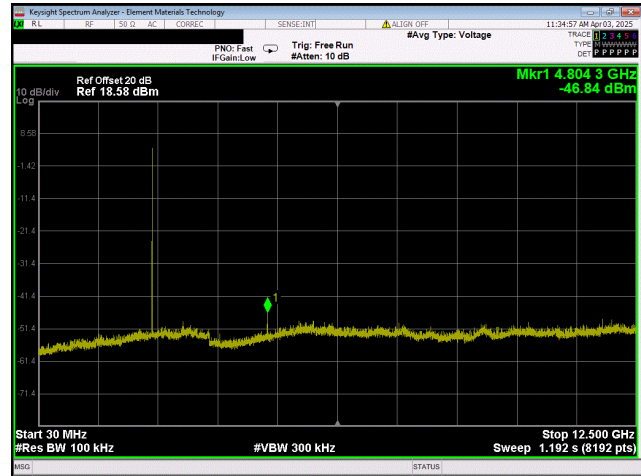


BLE/GFSK 500 kbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS



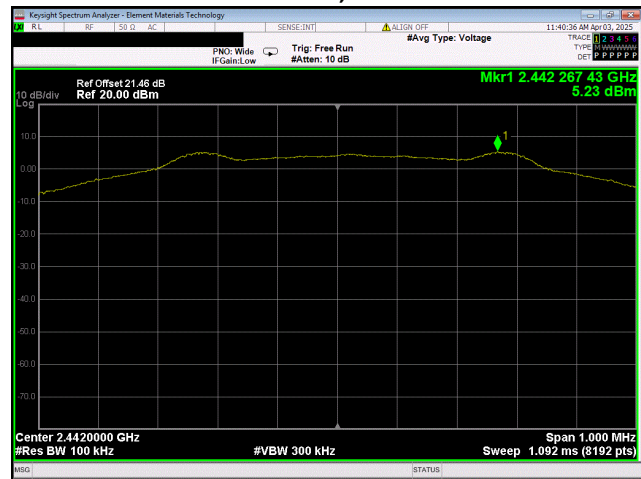
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



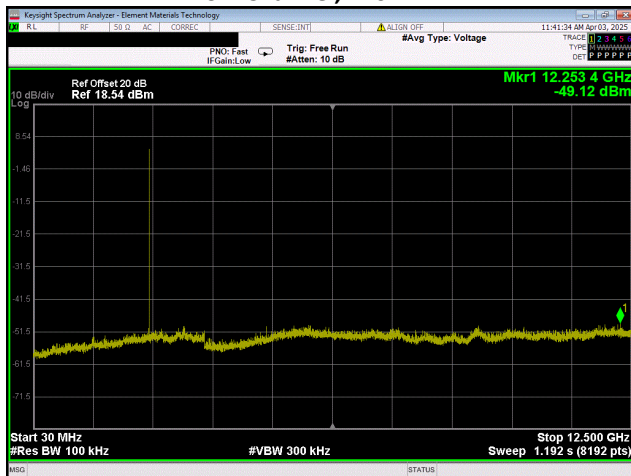
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



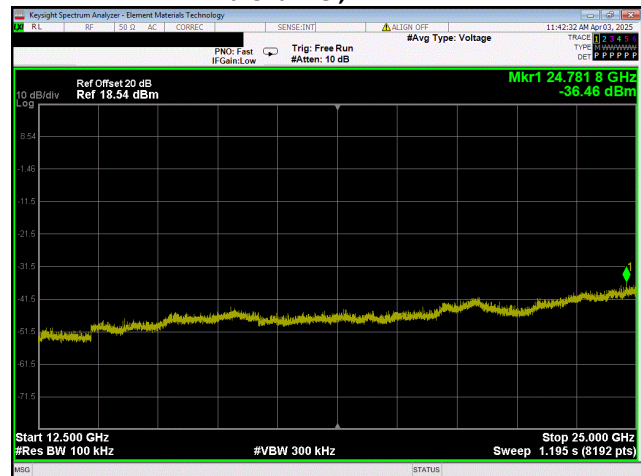
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

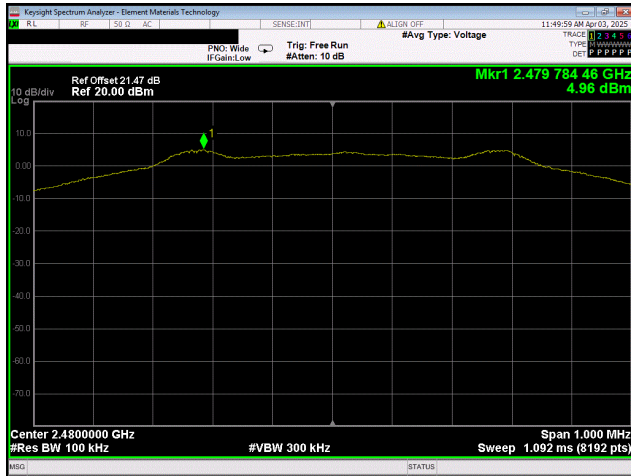


BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

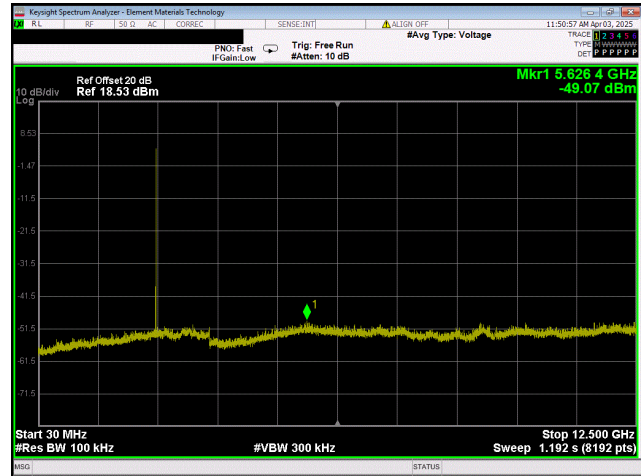


BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

SPURIOUS CONDUCTED EMISSIONS



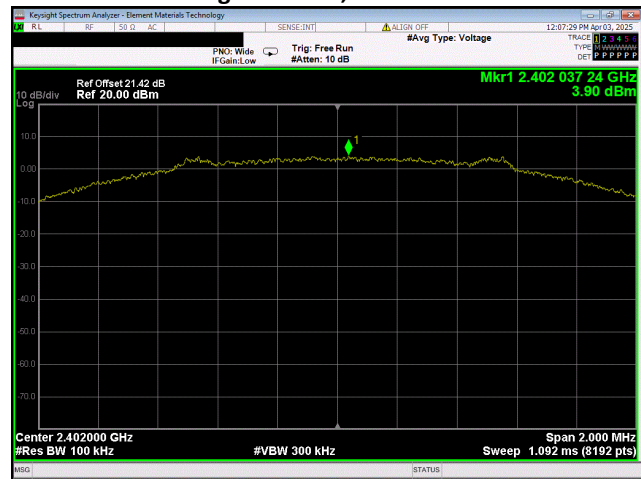
BLE/GFSK 1 Mbps
Low Channel, 2480 MHz



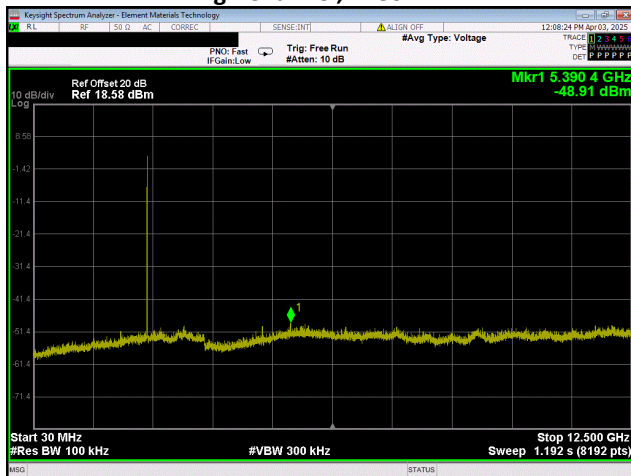
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



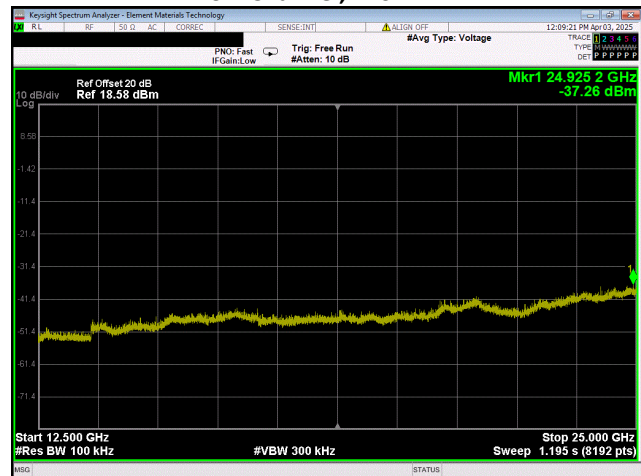
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

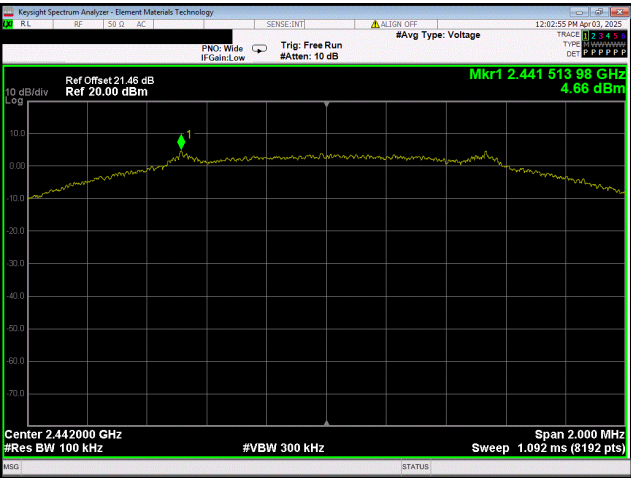


BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

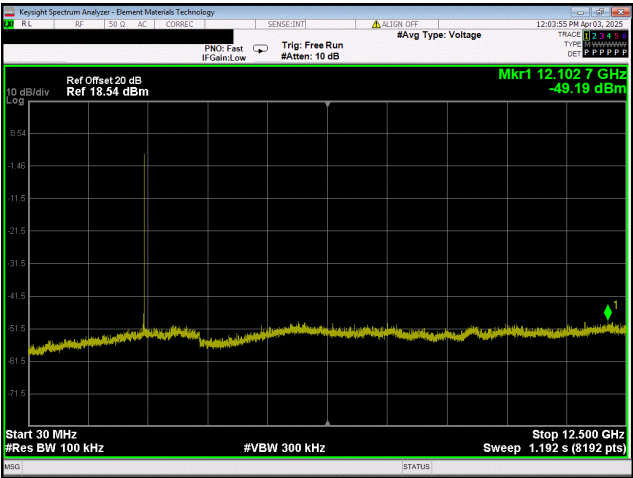


BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

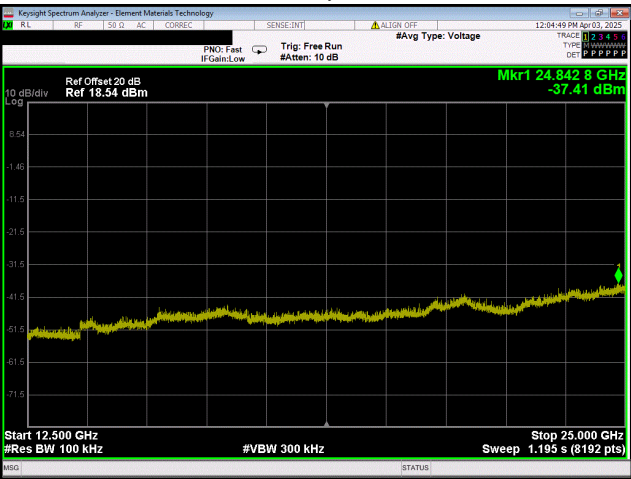
SPURIOUS CONDUCTED EMISSIONS



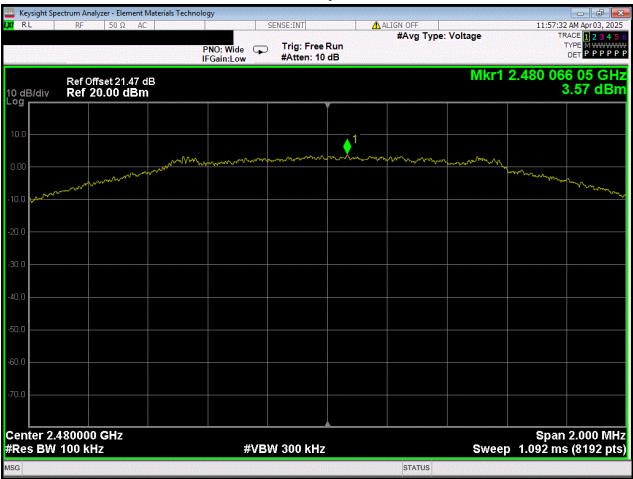
BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz

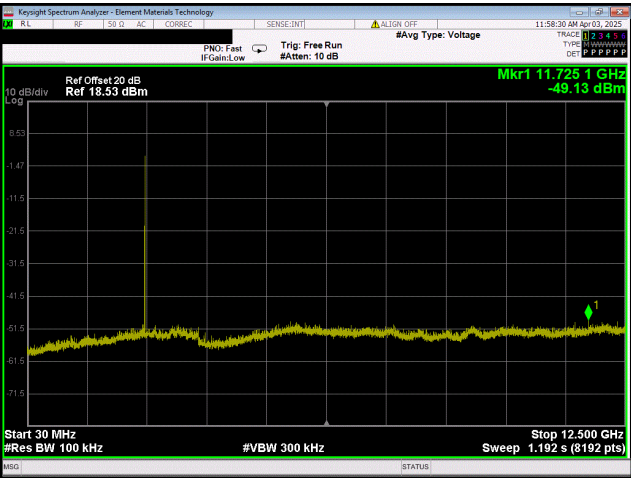


BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz

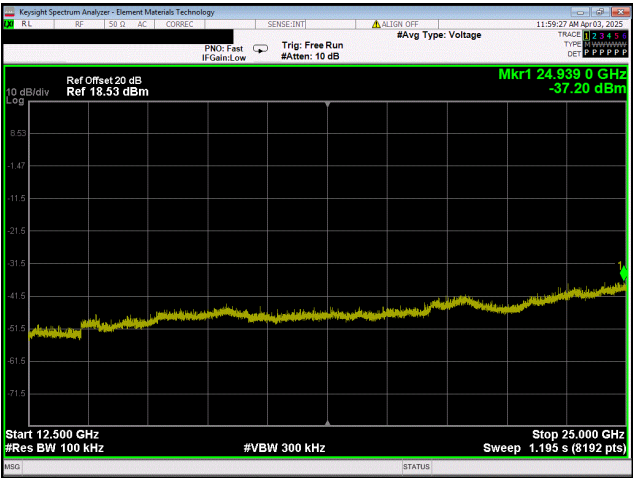


BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS



BLE/GFSK 2 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

RADIATED BAND EDGE EMISSIONS

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

The emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and attenuation were used (if needed) for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

PK = Peak Detector
AV = RMS Detector

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Double Ridge	ETS Lindgren	3115	AJA	2023-09-06	2025-09-06
Cable	Element	Double Ridge Guide Horn Cables	MNV	2024-09-10	2025-09-10
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2024-05-31	2025-05-31
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2025-02-01	2026-02-01

RADIATED BAND EDGE EMISSIONS



EUT:	Sprinkler 3 (Model No. 400304)	Work Order:	IRRI0027
Serial Number:	30725692	Date:	2025-05-12
Customer:	IrriGreen, Inc.	Temperature:	23°C
Attendees:	Sawyer Hamond	Relative Humidity:	36.7%
Customer Project:	None	Bar. Pressure (PMSL):	1012 mbar
Tested By:	Arnauld Dedry, William Hoffa	Job Site:	MN09
Power:	110VAC/60Hz	Configuration:	IRRI0027-2

COMMENTS

See Block diagrams for overall test setup.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

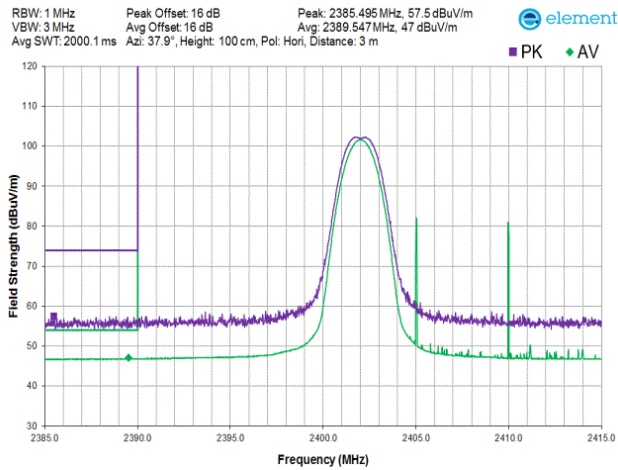
Tested By

TEST RESULTS

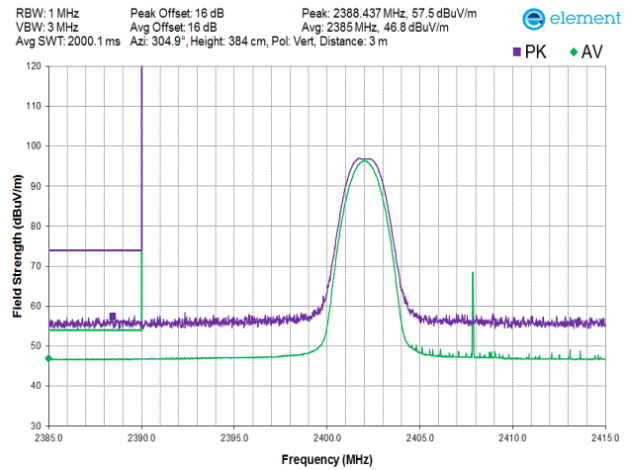
	Frequency (MHz)	PK (dBuV/m) AV (dBuV/m)	PK Lim (dBuV/m) AV Lim (dBuV/m)	Worst Margin (dB)	Pol. (H/V)	EUT Orientation	Results
BLE/GFSK 1 Mbps							
Low Channel, 2402 MHz	2385.510	58.9	74.0	-6.3	H	on Side	Pass
	2388.557	47.7	54.0				
High Channel, 2480 MHz	2387.566	60.3	74.0	-6.4	V	on Side	Pass
	2385.165	47.6	54.0				
	2484.498	59.1	74.0	-6.1	H	Horizontal	Pass
	2483.513	47.9	54.0				
	2484.743	58.8	74.0	-6.2	V	Horizontal	Pass
	2483.778	47.8	54.0				
	2484.703	59.0	74.0	-5.8	V	Vertical	Pass
	2483.768	48.2	54.0				
	2485.634	59.0	74.0	-6.3	H	Vertical	Pass
	2483.518	47.7	54.0				
	2484.218	59.4	74.0	-6.0	H	on Side	Pass
	2483.548	48.0	54.0				
2484.093	58.9	74.0	-6.1	V	on Side	Pass	
2483.623	47.9	54.0					
BLE/GFSK 125 kbps							
Low Channel, 2402 MHz	2385.495	57.5	74.0	-7.0	H	on Side	Pass
	2389.547	47.0	54.0				
High Channel, 2480 MHz	2388.437	57.5	74.0	-7.2	V	on Side	Pass
	2385.000	46.8	54.0				
	2486.299	58.9	74.0	-5.7	V	on Side	Pass
	2483.503	48.3	54.0				
	2483.513	60.1	74.0	-4.5	H	on Side	Pass
	2483.508	49.5	54.0				
BLE/GFSK 500 kbps							
Low Channel, 2402 MHz	2386.216	57.4	74.0	-7.1	V	on Side	Pass
	2388.917	46.9	54.0				
	2387.791	57.9	74.0	-7.0	H	on Side	Pass
	2389.232	47.0	54.0				
High Channel, 2480 MHz	2483.593	60.2	74.0	-4.5	H	on Side	Pass
	2483.503	49.5	54.0				

RADIATED BAND EDGE EMISSIONS

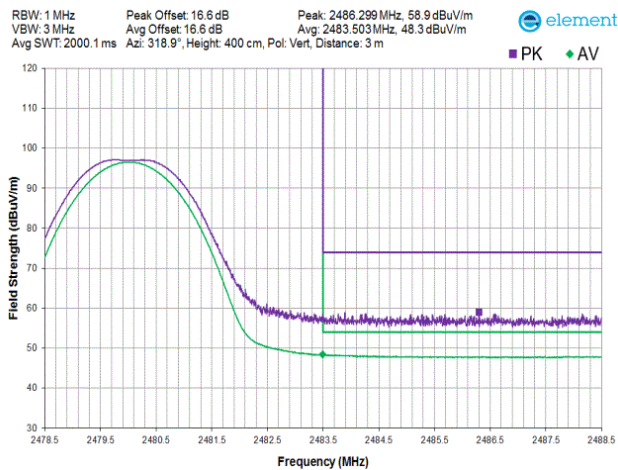
	Frequency (MHz)	PK (dBuV/m) AV (dBuV/m)	PK Lim (dBuV/m) AV Lim (dBuV/m)	Worst Margin (dB)	Pol. (H/V)	EUT Orientation	Results
	2483.623	59.0	74.0	-5.5	V	on Side	Pass
	2483.508	48.5	54.0				
BLE/GFSK 2 Mbps							
Low Channel, 2402 MHz	2389.337	59.3	74.0	-7.0	H	on Side	Pass
	2389.142	47.0	54.0				
	2388.602	57.5	74.0	-7.0	V	on Side	Pass
	2389.037	47.0	54.0				
High Channel, 2480 MHz	2483.613	60.6	74.0	-4.7	V	on Side	Pass
	2483.503	49.3	54.0				
	2483.528	61.0	74.0	-2.9	H	on Side	Pass
	2483.503	51.1	54.0				



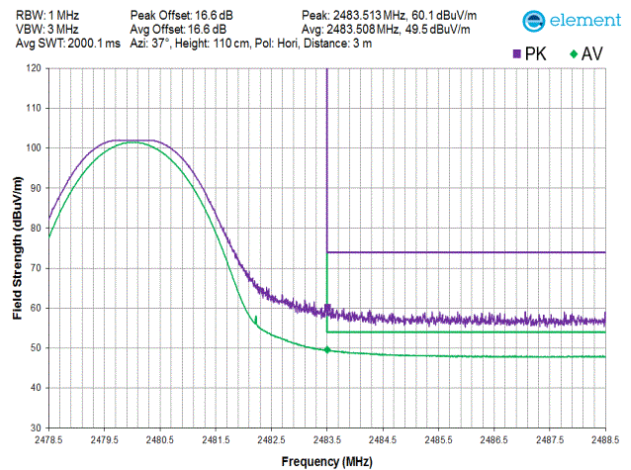
**BLE/GFSK 125 kbps
Low Channel, 2402 MHz**



**BLE/GFSK 125 kbps
Low Channel, 2402 MHz**

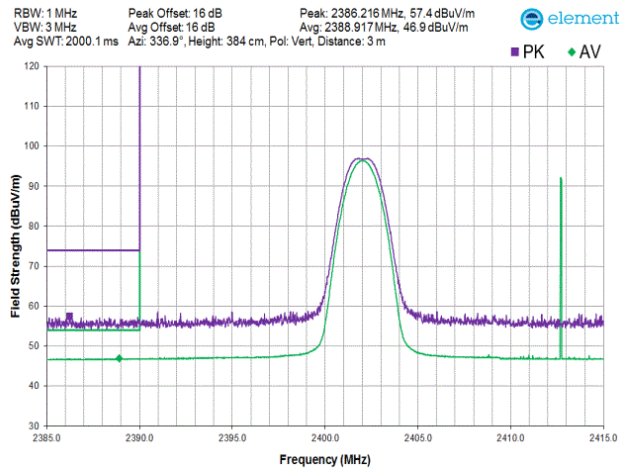


**BLE/GFSK 125 kbps
High Channel, 2480 MHz**

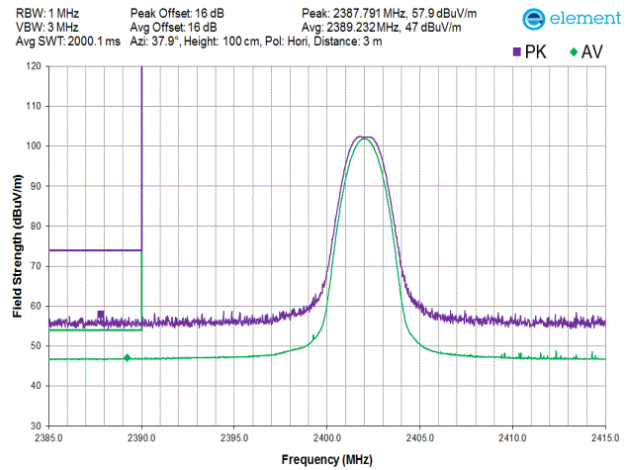


**BLE/GFSK 125 kbps
High Channel, 2480 MHz**

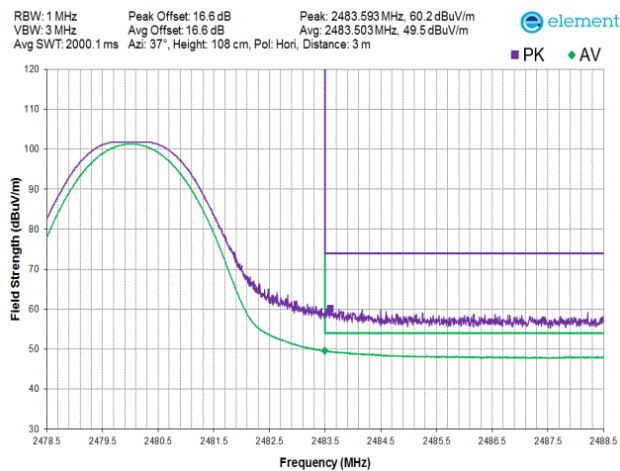
RADIATED BAND EDGE EMISSIONS



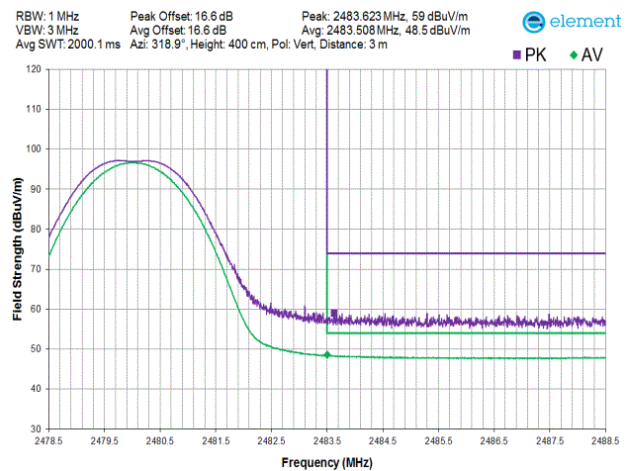
**BLE/GFSK 500 kbps
Low Channel, 2402 MHz**



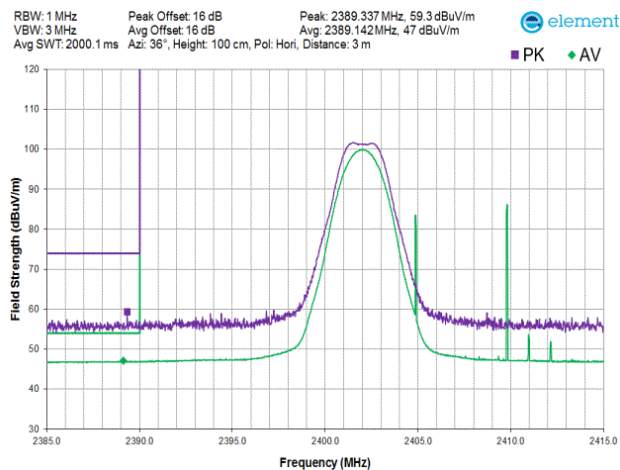
**BLE/GFSK 500 kbps
Low Channel, 2402 MHz**



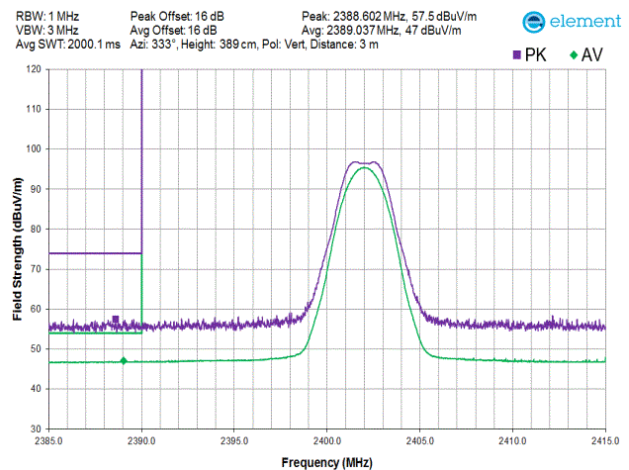
**BLE/GFSK 500 kbps
High Channel, 2480 MHz**



**BLE/GFSK 500 kbps
High Channel, 2480 MHz**

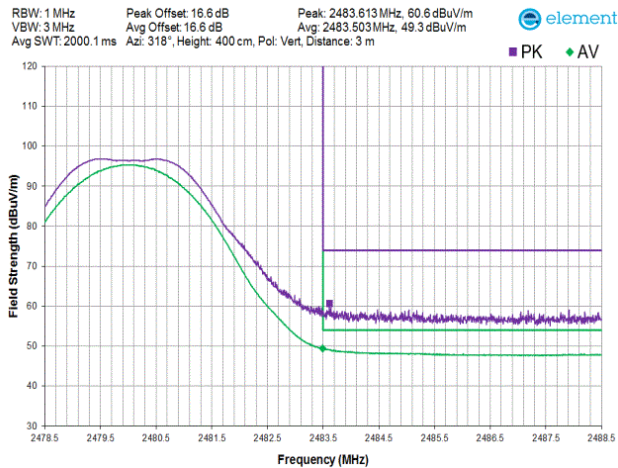


**BLE/GFSK 2 Mbps
Low Channel, 2402 MHz**

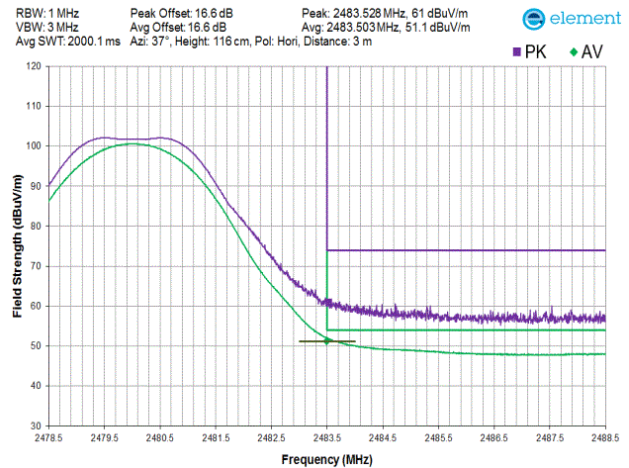


**BLE/GFSK 2 Mbps
Low Channel, 2402 MHz**

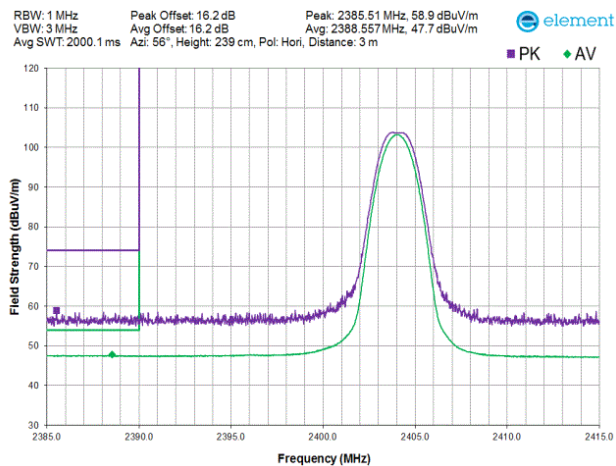
RADIATED BAND EDGE EMISSIONS



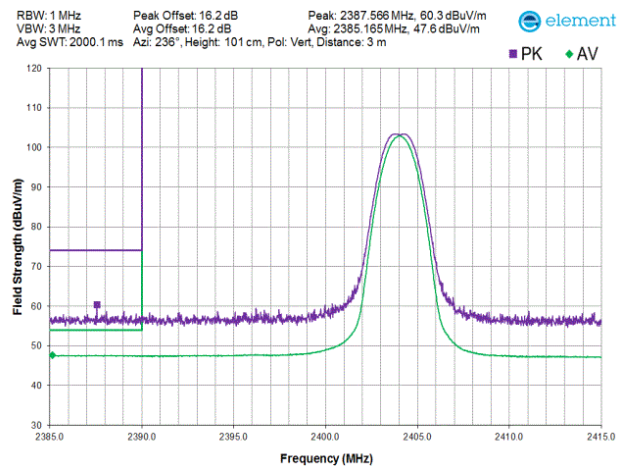
**BLE/GFSK 2 Mbps
High Channel, 2480 MHz**



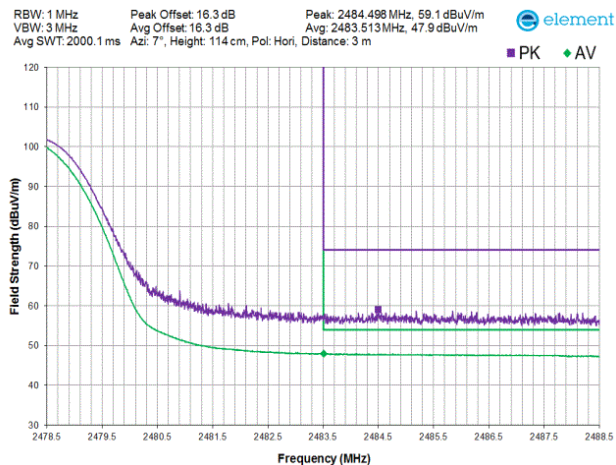
**BLE/GFSK 2 Mbps
High Channel, 2480 MHz**



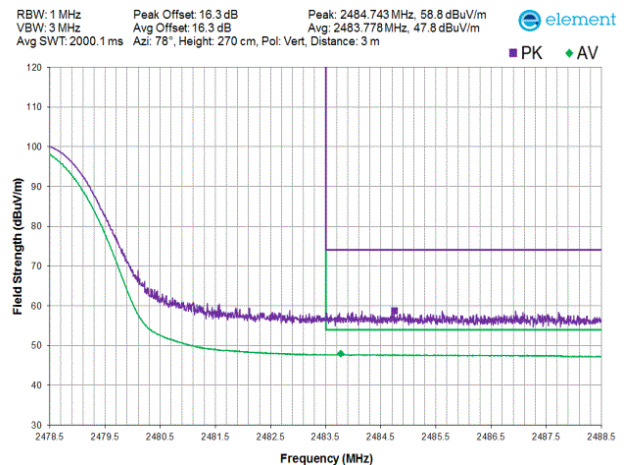
**BLE/GFSK 1 Mbps
Low Channel, 2402 MHz**



**BLE/GFSK 1 Mbps
Low Channel, 2402 MHz**

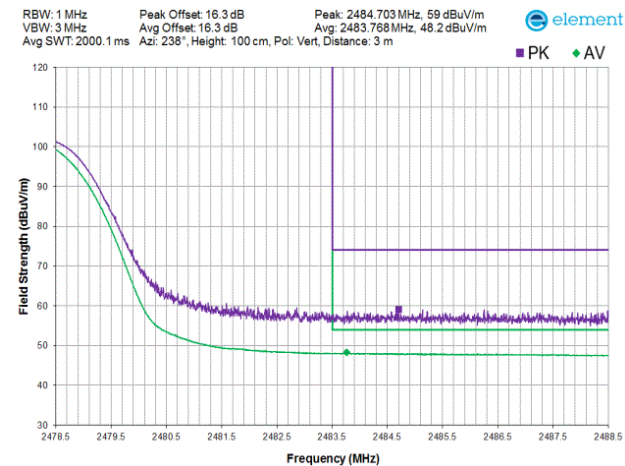


**BLE/GFSK 1 Mbps
High Channel, 2480 MHz**

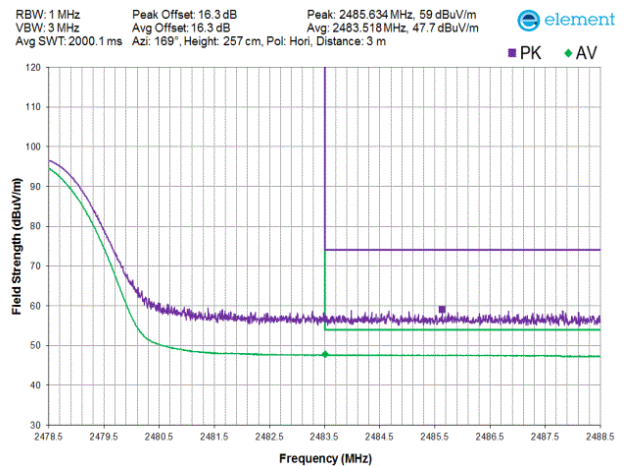


**BLE/GFSK 1 Mbps
High Channel, 2480 MHz**

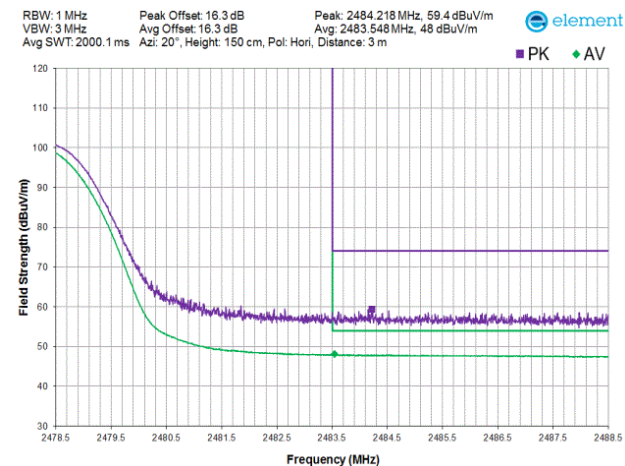
RADIATED BAND EDGE EMISSIONS



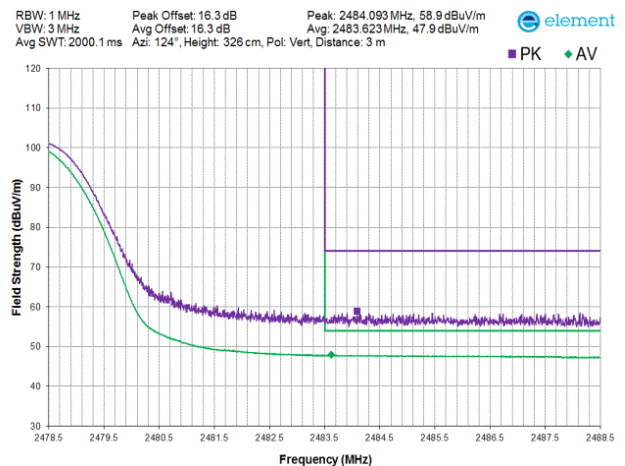
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz

SPURIOUS RADIATED EMISSIONS

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2024-03-18	2026-03-18
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2024-05-31	2025-05-31
Attenuator	Coaxicom	3910-20	AXY	2024-09-10	2025-09-10
Antenna - Double Ridge	ETS Lindgren	3115	AJA	2023-09-06	2025-09-06
Cable	Element	Double Ridge Guide Horn Cables	MNV	2024-09-10	2025-09-10
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2025-02-01	2026-02-01
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2024-09-10	2025-09-10
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	2025-02-04	2026-02-04
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2025-02-01	2026-02-01
Antenna - Standard Gain	ETS-Lindgren	3160-08	AJP	2025-02-04	2026-02-04
Amplifier - Pre-Amplifier	L-3 Narda-Miteq	AMF-6F-12001800-30-10P	PAP	2025-02-01	2026-02-01
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	2025-02-04	2026-02-04
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNP	2024-09-05	2025-09-05
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	2024-09-05	2025-09-05
Antenna - Loop	ETS Lindgren	6502	AOB	2023-06-12	2025-06-12

FREQUENCY RANGE INVESTIGATED

9 kHz TO 26000 MHz

SPURIOUS RADIATED EMISSIONS



POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

IRRI0027-2

MODES INVESTIGATED

BLE Radio Transmitting, Low Ch 2402 MHz, Mid Ch 2440 MHz and High Ch 2480 MHz, Modulated, 1 & 2Mbps
BLE Radio Transmitting, Low Ch 2402 MHz, Modulated, 1 & 2Mbps, 5dBm

SPURIOUS RADIATED EMISSIONS

EUT:	Sprinkler 3 (Model No. 400304)	Work Order:	IRRI0027
Serial Number:	30725692	Date:	2025-04-02
Customer:	Irrigreen, Inc.	Temperature:	22.4°C
Attendees:	Sawyer Hamond	Relative Humidity:	28.5%
Customer Project:	None	Bar. Pressure (PMSL):	997 mb
Tested By:	Arnauld Dedry, William Hoffa	Job Site:	MN09
Power:	110VAC/60Hz	Configuration:	IRRI0027-2

TEST PARAMETERS

Run #:	890	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

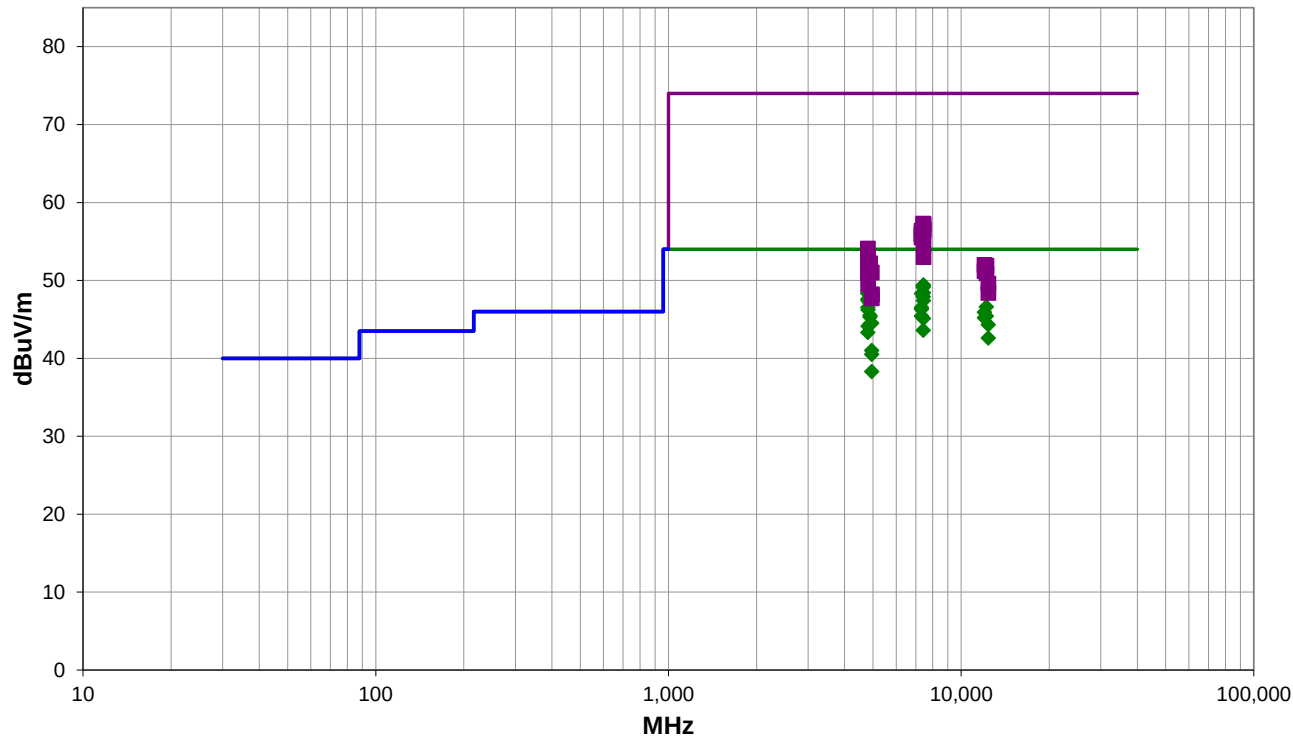
Tested at 100% Duty Cycle as determined using the spectrum analyzer. No DCCF was applied. See Block diagrams for overall test setup. Below 1 GHz an 80 cm table was used with no absorber on the ground plane.

EUT OPERATING MODES

BLE Radio Transmitting, Low Ch 2402 MHz, Mid Ch 2440 MHz and High Ch 2480 MHz, Modulated. 1 and 2 Mbps, 125 and 500 kbps.

DEVIATIONS FROM TEST STANDARD

None



Run #: 888

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #888

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.375	35.7	13.7	3.1	101.0	3.0	0.0	Horz	AV	0.0	49.4	54.0	-4.6	Eut Vert, High Ch, 125 kbps
7432.625	35.3	14.0	2.0	86.0	3.0	0.0	Horz	AV	0.0	49.3	54.0	-4.7	EUT Vert, High Ch, 2 Mbps
7433.350	35.1	14.0	1.9	93.0	3.0	0.0	Horz	AV	0.0	49.1	54.0	-4.9	EUT Vert, High Ch, 1 Mbps
7440.658	34.7	13.7	3.4	37.0	3.0	0.0	Vert	AV	0.0	48.4	54.0	-5.6	Eut Vert, High Ch, 500 kbps
4808.250	43.3	5.1	1.7	273.0	3.0	0.0	Horz	AV	0.0	48.4	54.0	-5.6	EUT Vert, Low Ch, 1 Mbps
4808.008	43.2	5.1	3.0	254.0	3.0	0.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT On Side, Low Ch, 1 Mbps
7326.650	35.1	13.2	1.9	85.0	3.0	0.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT Vert, Mid Ch, 1 Mbps
7433.442	33.9	14.0	2.0	136.0	3.0	0.0	Vert	AV	0.0	47.9	54.0	-6.1	EUT Vert, High Ch, 1 Mbps
4807.300	42.6	5.0	1.8	271.0	3.0	0.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Vert, Low Ch, 2 Mbps
7440.750	33.7	13.7	2.7	26.0	3.0	0.0	Vert	AV	0.0	47.4	54.0	-6.6	Eut Vert, High Ch, 125 kbps
4808.083	42.3	5.1	2.4	187.0	3.0	0.0	Vert	AV	0.0	47.4	54.0	-6.6	EUT Vert, Low Ch, 1 Mbps
4883.883	42.3	4.8	1.2	272.0	3.0	0.0	Horz	AV	0.0	47.1	54.0	-6.9	EUT Vert, Mid Ch, 1 Mbps
12209.010	47.4	-0.8	2.5	215.0	3.0	0.0	Vert	AV	0.0	46.6	54.0	-7.4	EUT Vert, Mid Ch, 1 Mbps
4808.008	41.4	5.1	3.8	91.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	EUT Horz, Low Ch, 1 Mbps
7327.408	33.3	13.2	2.0	93.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	EUT Vert, Mid Ch, 2 Mbps
7326.583	33.1	13.2	1.9	131.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	EUT Vert, Mid Ch, 1 Mbps
4808.150	41.1	5.1	2.4	344.0	3.0	0.0	Vert	AV	0.0	46.2	54.0	-7.8	EUT Horz, Low Ch, 1 Mbps
12022.450	47.4	-1.5	3.7	201.0	3.0	0.0	Vert	AV	0.0	45.9	54.0	-8.1	EUT Vert, Low Ch, 2 Mbps
4883.150	40.7	4.8	1.1	309.0	3.0	0.0	Vert	AV	0.0	45.5	54.0	-8.5	EUT Vert, Mid Ch, 2 Mbps
7327.350	32.2	13.2	2.1	128.0	3.0	0.0	Vert	AV	0.0	45.4	54.0	-8.6	EUT Vert, Mid Ch, 2 Mbps
12211.290	46.2	-0.8	2.2	212.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT Vert, Mid Ch, 1 Mbps
4884.100	40.5	4.8	1.1	186.0	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	EUT Vert, Mid Ch, 1 Mbps
12022.470	46.7	-1.5	1.5	231.0	3.0	0.0	Horz	AV	0.0	45.2	54.0	-8.8	EUT Vert, Low Ch, 2 Mbps
7439.417	31.4	13.7	1.5	225.9	3.0	0.0	Horz	AV	0.0	45.1	54.0	-8.9	Eut Vert, High Ch, 500 kbps
4955.925	39.9	4.6	1.6	257.0	3.0	0.0	Horz	AV	0.0	44.5	54.0	-9.5	EUT Vert, High Ch, 1 Mbps
4884.883	39.6	4.8	1.7	265.0	3.0	0.0	Horz	AV	0.0	44.4	54.0	-9.6	EUT Vert, Mid Ch, 2 Mbps
12391.340	44.4	-0.1	1.5	265.0	3.0	0.0	Horz	AV	0.0	44.3	54.0	-9.7	EUT Vert, High Ch, 1 Mbps
4808.892	39.0	5.1	1.3	184.0	3.0	0.0	Vert	AV	0.0	44.1	54.0	-9.9	EUT Vert, Low Ch, 2 Mbps
7432.833	29.6	14.0	1.5	272.0	3.0	0.0	Vert	AV	0.0	43.6	54.0	-10.4	EUT Vert, High Ch, 2 Mbps
4808.033	38.2	5.1	1.5	180.0	3.0	0.0	Vert	AV	0.0	43.3	54.0	-10.7	EUT On Side, Low Ch, 1 Mbps
12391.310	42.7	-0.1	1.5	301.0	3.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	EUT Vert, High Ch, 1 Mbps
4956.192	36.4	4.6	1.2	185.0	3.0	0.0	Vert	AV	0.0	41.0	54.0	-13.0	EUT Vert, High Ch, 1 Mbps
4955.167	35.9	4.6	1.5	262.0	3.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	EUT Vert, High Ch, 2 Mbps
4955.383	33.7	4.6	2.1	56.0	3.0	0.0	Vert	AV	0.0	38.3	54.0	-15.7	EUT Vert, High Ch, 2 Mbps
7432.508	43.3	14.0	2.0	86.0	3.0	0.0	Horz	PK	0.0	57.3	74.0	-16.7	EUT Vert, High Ch, 2 Mbps
7440.717	43.5	13.7	3.1	101.0	3.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	Eut Vert, High Ch, 125 kbps
7433.317	43.2	14.0	1.9	93.0	3.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	EUT Vert, High Ch, 1 Mbps
7440.825	43.0	13.7	3.4	37.0	3.0	0.0	Vert	PK	0.0	56.7	74.0	-17.3	Eut Vert, High Ch, 500 kbps
7440.958	42.8	13.7	2.7	26.0	3.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	Eut Vert, High Ch, 125 kbps
7325.700	43.2	13.2	1.9	85.0	3.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	EUT Vert, Mid Ch, 1 Mbps

SPURIOUS RADIATED EMISSIONS

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7434.408	42.3	14.0	2.0	136.0	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT Vert, High Ch, 1 Mbps
7327.408	42.8	13.2	2.0	93.0	3.0	0.0	Horz	PK	0.0	56.0	74.0	-18.0	EUT Vert, Mid Ch, 2 Mbps
7324.625	42.7	13.2	2.1	128.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	EUT Vert, Mid Ch, 2 Mbps
7325.100	42.3	13.2	1.9	131.0	3.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT Vert, Mid Ch, 1 Mbps
7440.192	40.9	13.7	1.5	225.9	3.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	Eut Vert, High Ch, 500 kbps
4807.033	49.1	5.0	1.8	271.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	EUT Vert, Low Ch, 2 Mbps
4807.425	48.0	5.0	1.7	273.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT Vert, Low Ch, 1 Mbps
7433.600	39.0	14.0	1.5	272.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	EUT Vert, High Ch, 2 Mbps
4808.358	47.5	5.1	3.0	254.0	3.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	EUT On Side, Low Ch, 1 Mbps
4808.558	47.2	5.1	2.4	187.0	3.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	EUT Vert, Low Ch, 1 Mbps
4885.058	47.4	4.8	1.1	309.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	EUT Vert, Mid Ch, 2 Mbps
4883.725	47.3	4.8	1.2	272.0	3.0	0.0	Horz	PK	0.0	52.1	74.0	-21.9	EUT Vert, Mid Ch, 1 Mbps
12017.690	53.5	-1.5	3.7	201.0	3.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	EUT Vert, Low Ch, 2 Mbps
12208.900	52.7	-0.8	2.5	215.0	3.0	0.0	Vert	PK	0.0	51.9	74.0	-22.1	EUT Vert, Mid Ch, 1 Mbps
4883.567	46.5	4.8	1.1	186.0	3.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	EUT Vert, Mid Ch, 1 Mbps
4885.075	46.5	4.8	1.7	265.0	3.0	0.0	Horz	PK	0.0	51.3	74.0	-22.7	EUT Vert, Mid Ch, 2 Mbps
4807.783	46.1	5.1	2.4	344.0	3.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	EUT Horz, Low Ch, 1 Mbps
12017.610	52.7	-1.5	1.5	231.0	3.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	EUT Vert, Low Ch, 2 Mbps
4807.508	46.1	5.0	3.8	91.0	3.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	EUT Horz, Low Ch, 1 Mbps
4955.717	46.4	4.6	1.6	257.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	EUT Vert, High Ch, 1 Mbps
4807.142	45.9	5.0	1.3	184.0	3.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	EUT Vert, Low Ch, 2 Mbps
12211.540	51.7	-0.8	2.2	212.0	3.0	0.0	Horz	PK	0.0	50.9	74.0	-23.1	EUT Vert, Mid Ch, 1 Mbps
12388.880	49.7	-0.1	1.5	265.0	3.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	EUT Vert, High Ch, 1 Mbps
4808.600	44.4	5.1	1.5	180.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	EUT On Side, Low Ch, 1 Mbps
12391.270	48.5	-0.1	1.5	301.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	EUT Vert, High Ch, 1 Mbps
4956.117	43.6	4.6	1.2	185.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT Vert, High Ch, 1 Mbps
4955.192	43.6	4.6	1.5	262.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	EUT Vert, High Ch, 2 Mbps
4956.542	43.1	4.6	2.1	56.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	EUT Vert, High Ch, 2 Mbps

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS

EUT:	Sprinkler 3 (Model No. 400304)	Work Order:	IRRI0027
Serial Number:	30725692	Date:	2025-04-02
Customer:	IrriGreen, Inc.	Temperature:	22.6°C
Attendees:	Sawyer Hamond	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure (PMSL):	987 mb
Tested By:	Arnauld Dedry, William Hoffa	Job Site:	MN09
Power:	110VAC/60Hz	Configuration:	IRRI0027-2

TEST PARAMETERS

Run #:	900	Test Distance (m):	1.5	Ant. Height(s) (m):	1 to 1.25(m)
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COMMENTS

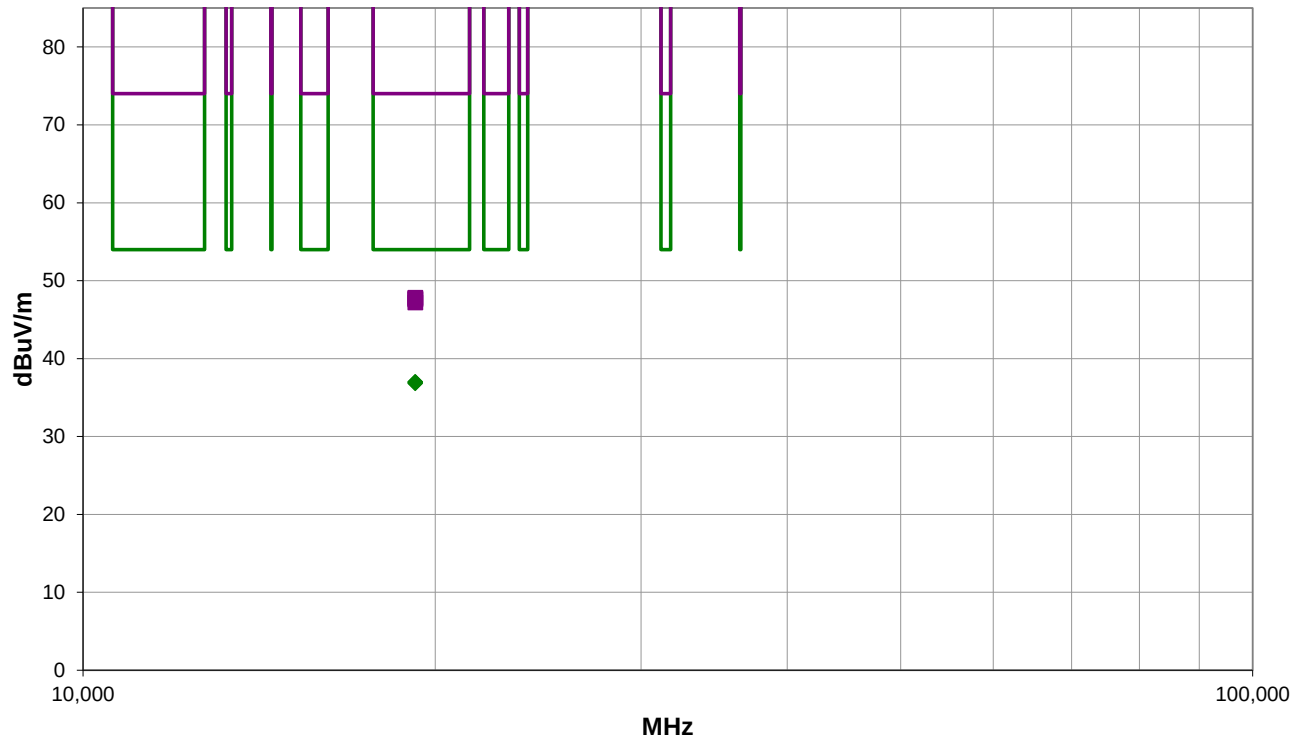
Tested at 100% Duty Cycle as determined using the spectrum analyzer. No DCCF was applied. See Block diagrams for overall test setup. Below 1 GHz an 80 cm table was used with no absorber on the ground plane.

EUT OPERATING MODES

BLE Radio Transmitting, Low Ch 2402 MHz, Modulated, 1 & 2Mbps, 5dBm

DEVIATIONS FROM TEST STANDARD

None



Run #: 900

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #900

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
19230.340	26.5	16.5	1.6	221.0	1.5	0.0	Horz	AV	-6.0	37.0	54.0	-17.0	EUT Vert, Low Ch, 1 Mbps
19233.740	26.5	16.5	1.5	296.0	1.5	0.0	Vert	AV	-6.0	37.0	54.0	-17.0	EUT Vert, Low Ch, 1 Mbps
19233.580	26.4	16.5	1.63	81.0	1.5	0.0	Vert	AV	-6.0	36.9	54.0	-17.1	EUT Vert, Low Ch, 2 Mbps
19233.820	26.3	16.5	1.65	75.0	1.5	0.0	Horz	AV	-6.0	36.8	54.0	-17.2	EUT Vert, Low Ch, 2 Mbps
19231.820	37.3	16.5	1.65	75.0	1.5	0.0	Horz	PK	-6.0	47.8	74.0	-26.2	EUT Vert, Low Ch, 2 Mbps
19232.610	37.2	16.5	1.63	81.0	1.5	0.0	Vert	PK	-6.0	47.7	74.0	-26.3	EUT Vert, Low Ch, 2 Mbps
19233.280	37.1	16.5	1.5	296.0	1.5	0.0	Vert	PK	-6.0	47.6	74.0	-26.4	EUT Vert, Low Ch, 1 Mbps
19233.830	36.7	16.5	1.6	221.0	1.5	0.0	Horz	PK	-6.0	47.2	74.0	-26.8	EUT Vert, Low Ch, 1 Mbps

CONCLUSION

Pass

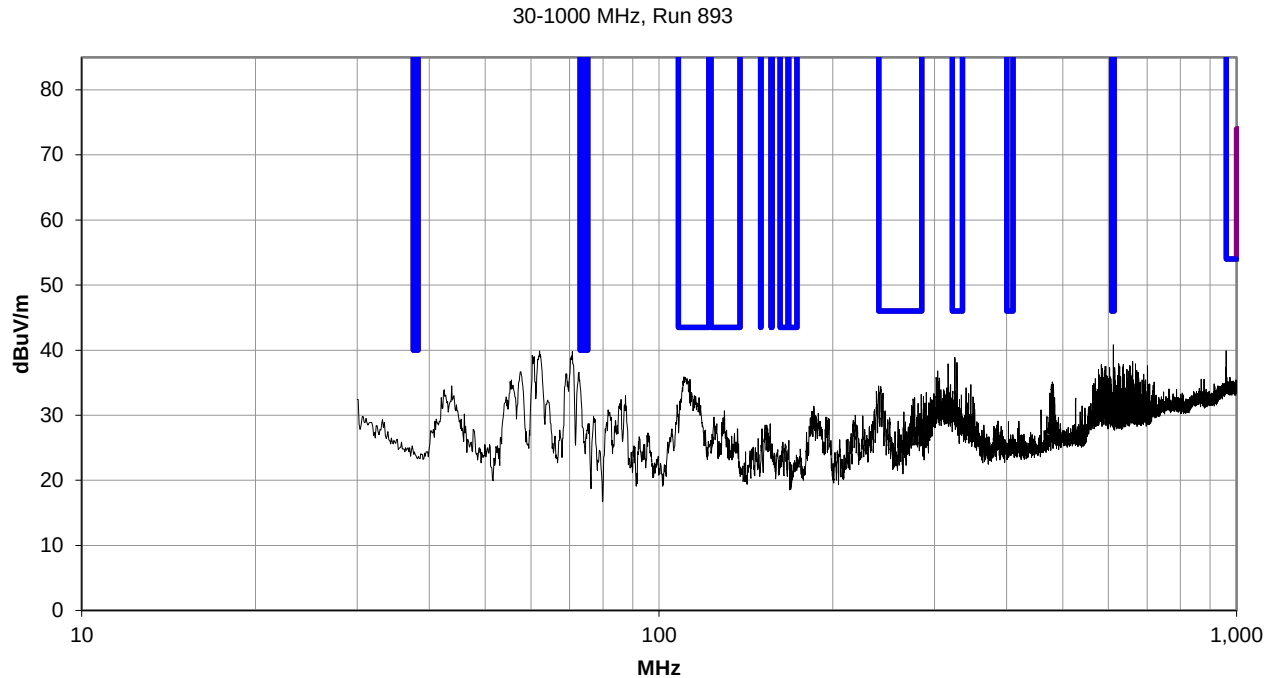


Tested By

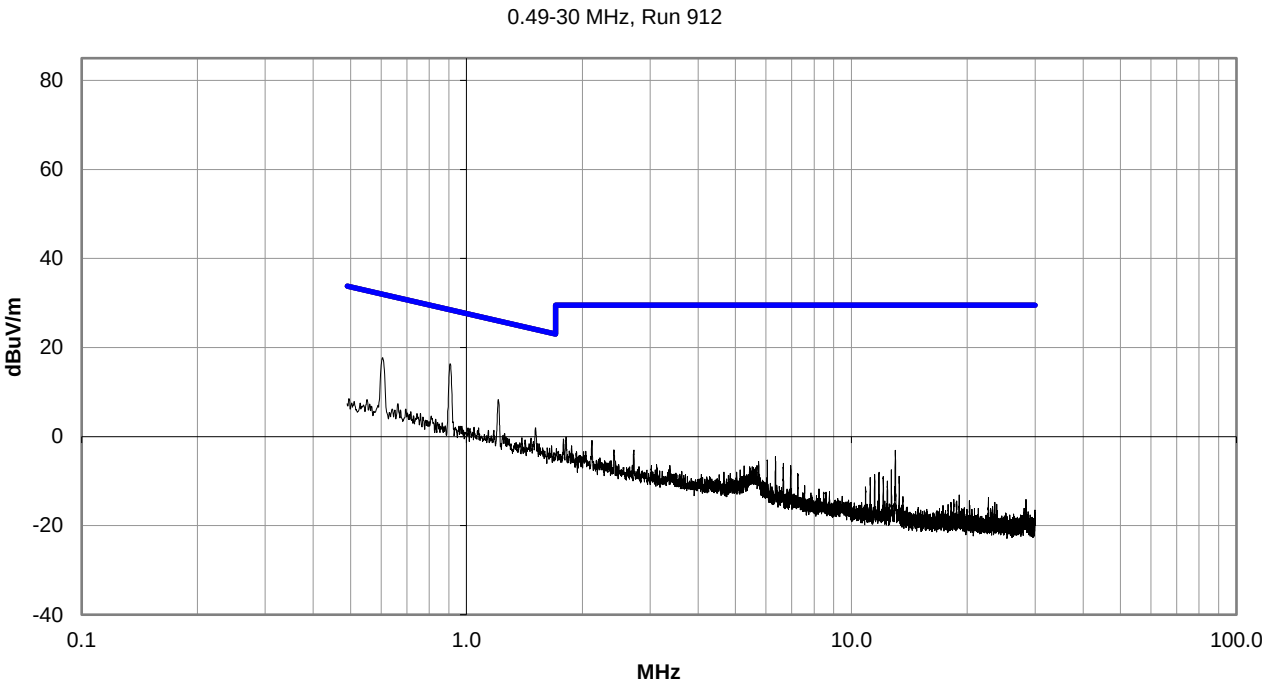
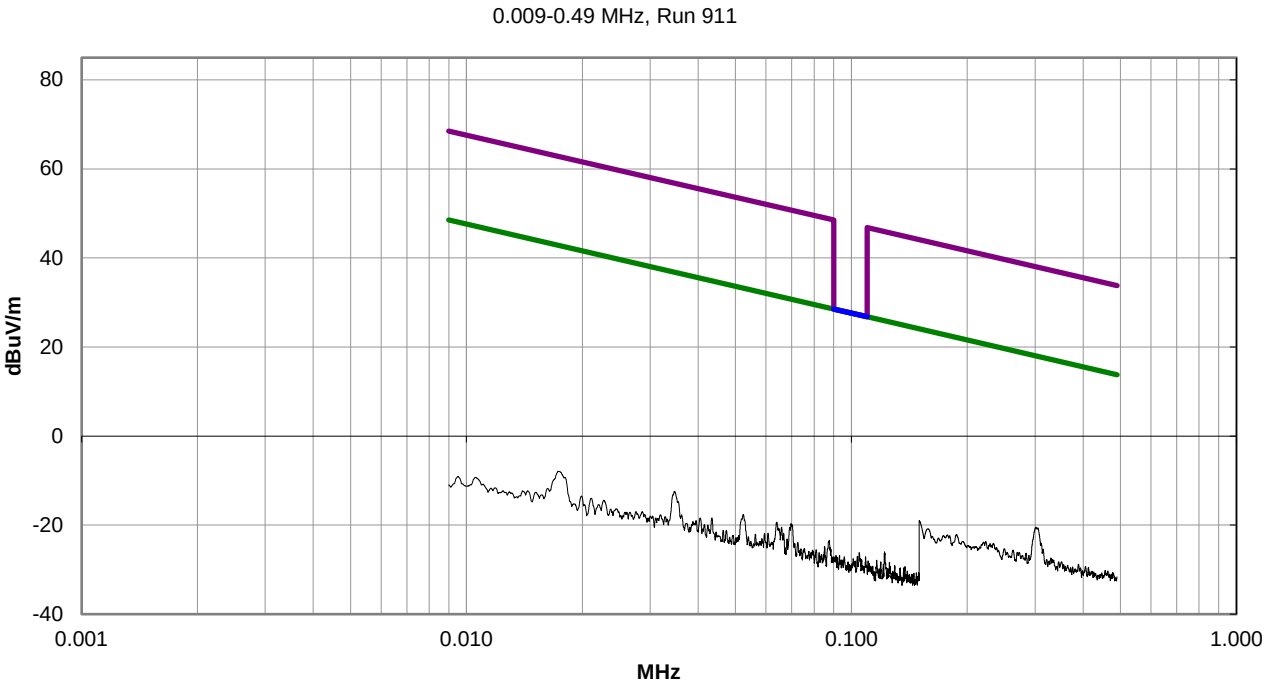
SPURIOUS RADIATED EMISSIONS

PRESCAN DATA

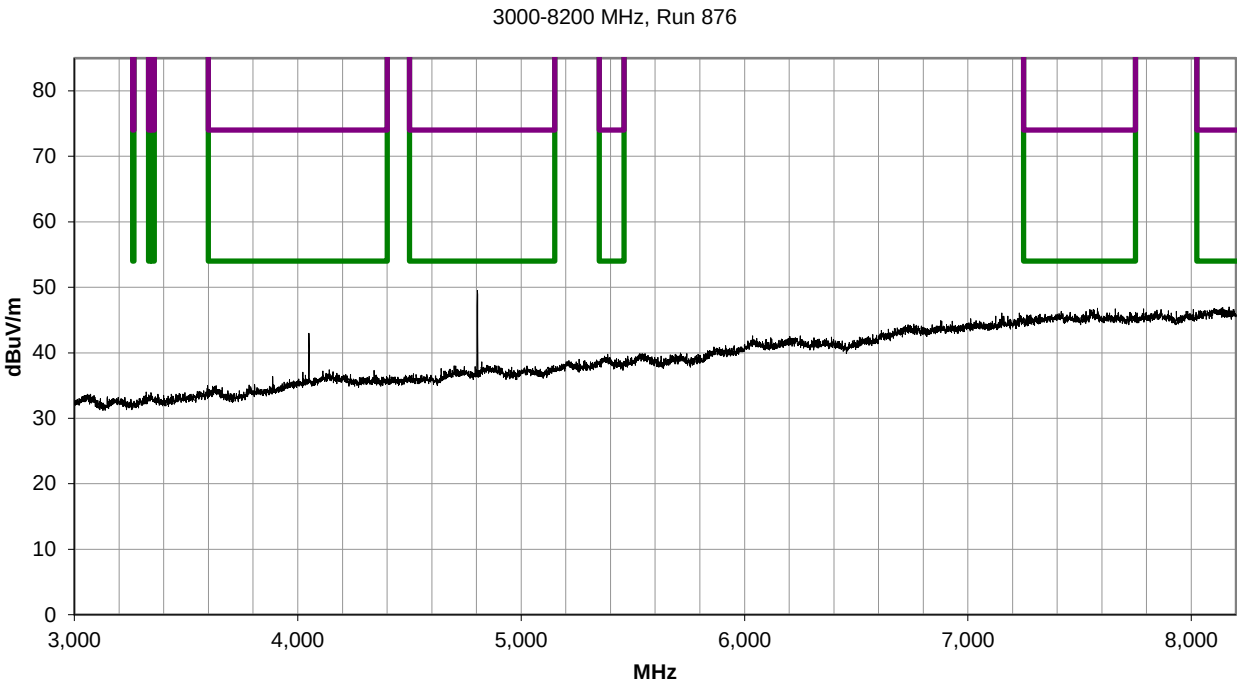
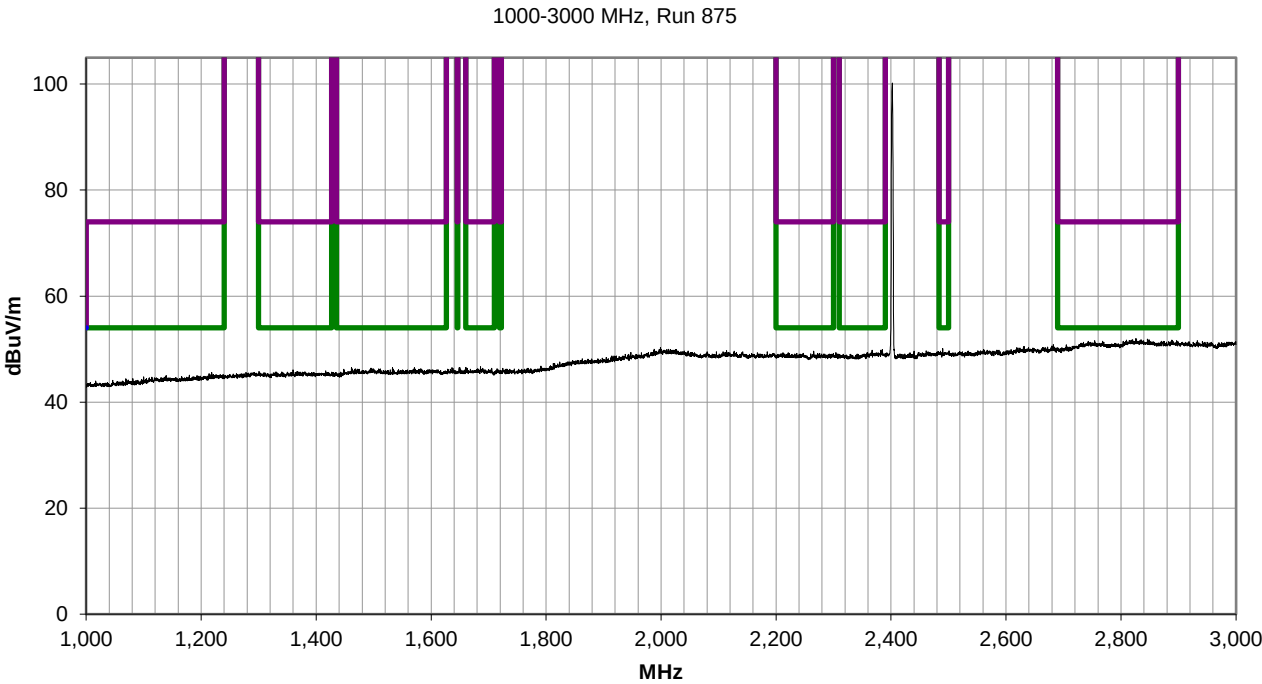
Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.



SPURIOUS RADIATED EMISSIONS

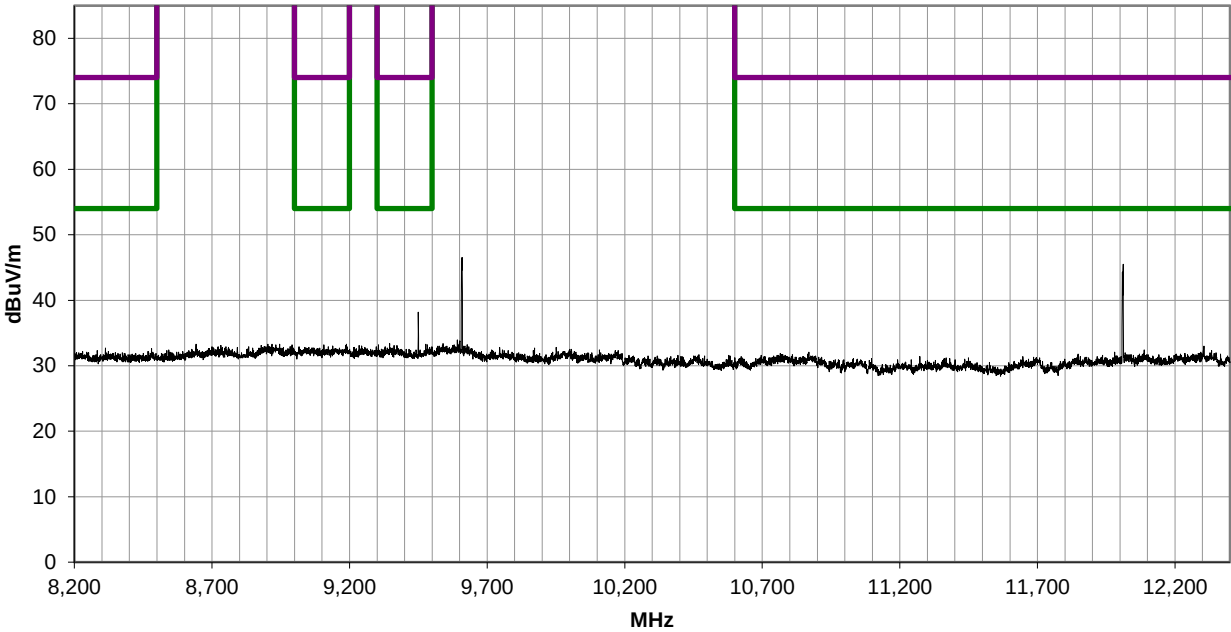


SPURIOUS RADIATED EMISSIONS

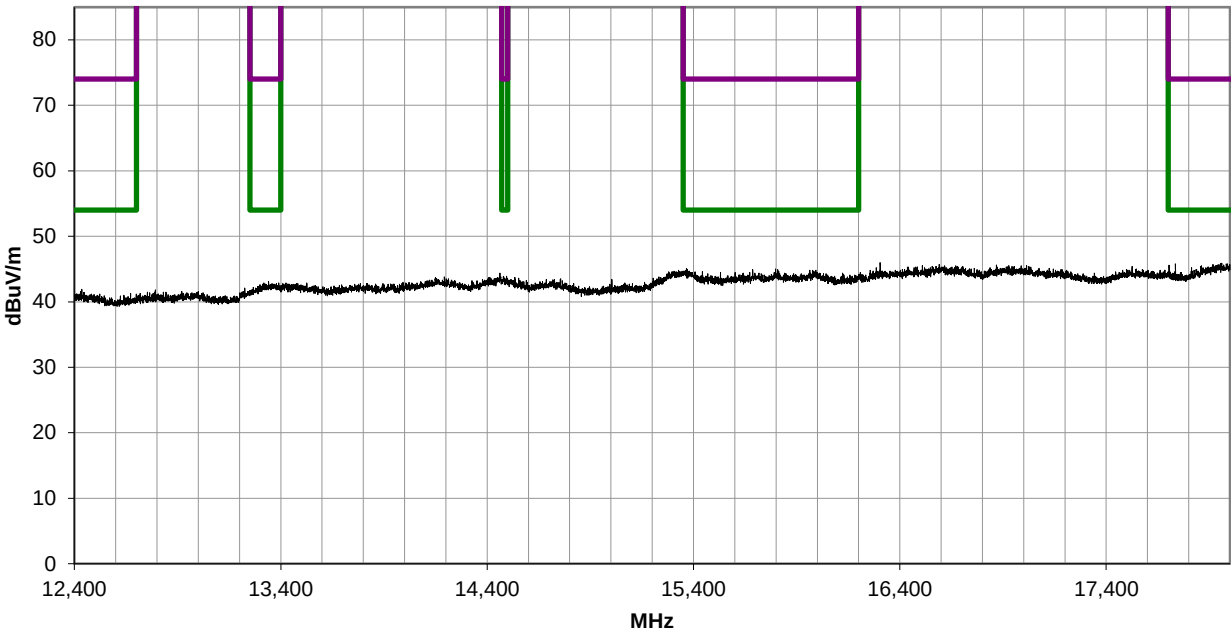


SPURIOUS RADIATED EMISSIONS

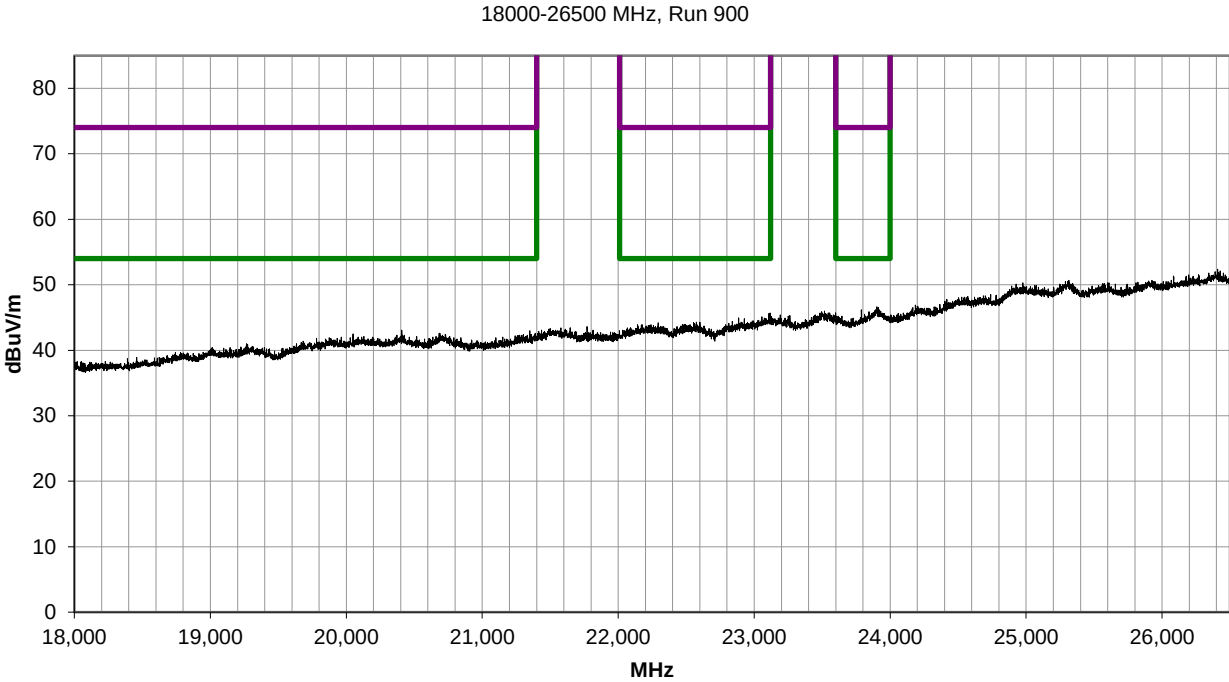
8200-12400 MHz, Run 877



12400-18000 MHz, Run 878



SPURIOUS RADIATED EMISSIONS



End of Test Report