



FCC / ISED Test Report

For:
Geoforce Inc.

Model Name:
OWA1C00

Product Description:
Battery Powered Asset Logistics Device

FCC ID: OWA00GT1C
ISED: 10540A-00GT1C

Applied Rules and Standards:
47 CFR Part 15.247 (DTS)
RSS-247 Issue 4 (DTS) & RSS-Gen Issue 5

REPORT #: EMC_GEOFO_051_25001_15_247_BTLE_DTS

DATE: 2025-08-26



A2LA Accredited

IC recognized #
3462B

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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

No deviations were ascertained.

Company Name	Product Description	Model No.
Geoforce Inc.	Battery Powered Asset Logistics Device	OWA1C00

Report Reviewer:

Alvin, Ilarina

2025-08-26 Compliance (Senior Manager Regulatory Services)

Date	Section	Name	Signature
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Responsible for the Report:

Art Thammanavarat

2025-08-26 Compliance (Senior EMC Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Section 3.
CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Alvin, Ilarina
Responsible Project Leader:	Jayalakshmi, Sekar

2.2 Identification of the Client

Client Firm/Name:	Geoforce Inc.
Street Address:	5830 Granite Parkway, Suite 1200
City/Zip Code	Plano, TX 75024
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Product Description:	Battery Powered Asset Logistics Device
Model Name:	OWA1C00
HW Version:	R1
SW Version:	1.X.X
FCC ID:	OWA00GT1C
ISED:	10540A-00GT1C
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz Center to center: 2402 MHz (ch 0) – 2480 MHz (ch 39), 40 channels
Bands/Modes Supported	<u>Bluetooth Modules</u> Model Name: Nordic Model Number: NRF52840 <u>Wireless Technologies</u> Bluetooth LE
Mode Of Operations	GFSK
Antenna Information as declared:	Manufacturer: Molex Part Number: 0479480001 Type: Surface Mount Device Antenna Peak Gain: 3.3dBi @2.4 GHz.
Other Radios included in the device:	Cellular LTE, GNSS
Max. Peak Output Power:	Conducted Power -2 dBm
Power Supply/ Rated Operating Voltage Range	3.45VDC - 3.65VDC
Operating Temperature Range	-40C to +85C
Sample Revision	☐ Production ☒ Pre-Production
EUT Dimensions	71mm x 71mm x 32mm
EUT Diameter	☒ < 60 cm ☐ Other _____

Note: The information of the EUT specifications in the table above is provided by the client.

3.2 EUT Sample details

EUT #	Model Number	Serial Number	HW Version	SW Version	Comments
1	OWA1C00	00095053	R1	1.X.X	Radiated Emission
2	OWA1C00	00095051	R1	1.X.X	Conducted Emission

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number	Comments
1	Laptop	P51s	LENOVO	10366	Support laptop provided by client to exercise device.

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1 + AE# 1	The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using software that is not available to the end user. The internal antenna was connected. The EUT was connected to the 3.6Vdc power supply.
2	EUT#2 + AE# 1	The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using software that is not available to the end user. The measurement equipment was connected to the 50-ohm RF port of the EUT. The EUT was connected to the 3.6Vdc power supply.

3.5 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on low, mid and high channels, and highest possible duty cycle of 100%. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada.

5 Summary of the worst-case results

Test Specification	Test Case	Measurement	Limited	Result
§15.247(a) RSS-247 5.2(a)	Emission Bandwidth	1.27 MHz	>500kHz	PASS
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	-12.024 dBm / 3kHz	8dBm / 3kHz	PASS
§15.247(b) RSS-247 5.4(d)	Maximum Conducted Output Power	Peak: -2.00 dBm Peak: 0.00063 Watts	1 Watt (30 dBm)	PASS
	Maximum Conducted Output Power (EIRP)	EIRP: 1.30 dBm EIRP: 0.0013 Watts	4 Watt (36 dBm)	PASS
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	-37.80 dBm	Peak <20dBc	PASS
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Peak: 56.43 dBμV/m AVG: 41.05 dBμV/m	*PEAK LIMIT= 74 dBμV/m @3m = -21.23 dBm *AVG. LIMIT= 54 dBμV/m @3m = -41.23 dBm	PASS
'Test Specification	Test Case	Lowest Margin Emission		Result
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious Emissions-Radiated	43.13 dBμV/m		PASS
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	N/A		NP Note 1

Note: Pass=Complies, NA=Not Applicable, NP=Not Performed

Note 1: This device does not connect to the main network.

6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor $k=2$.

Radiated measurement

Measurement System		EMC Lab 1	EMC Lab 2
Conducted emissions (mains port)	150 kHz – 30 MHz	2.47 dB	N/A
Radiated emissions	9 kHz – 30 MHz	2.68 dB	2.53 dB
	30 – 100 MHz	4.39 dB	3.85 dB
	100 MHz – 1 GHz	5.65 dB	5.24 dB
	1 – 6 GHz	5.0 dB	4.88 dB
	6 – 18 GHz	4.76 dB	4.58 dB
	18 – 40 GHz	4.65 dB	4.61 dB

RF conducted measurement ± 0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: <http://physics.nist.gov/cuu/Uncertainty/typeb.html>. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3dB to the limit.

6.1 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

6.2 Dates of Testing:

2025-08-13 – 2025-08-20

6.3 Decision Rule:

Cetecom Inc. follows ILAC G8:09/2019 chapter 4.2.1 (Simple Acceptance Rule).

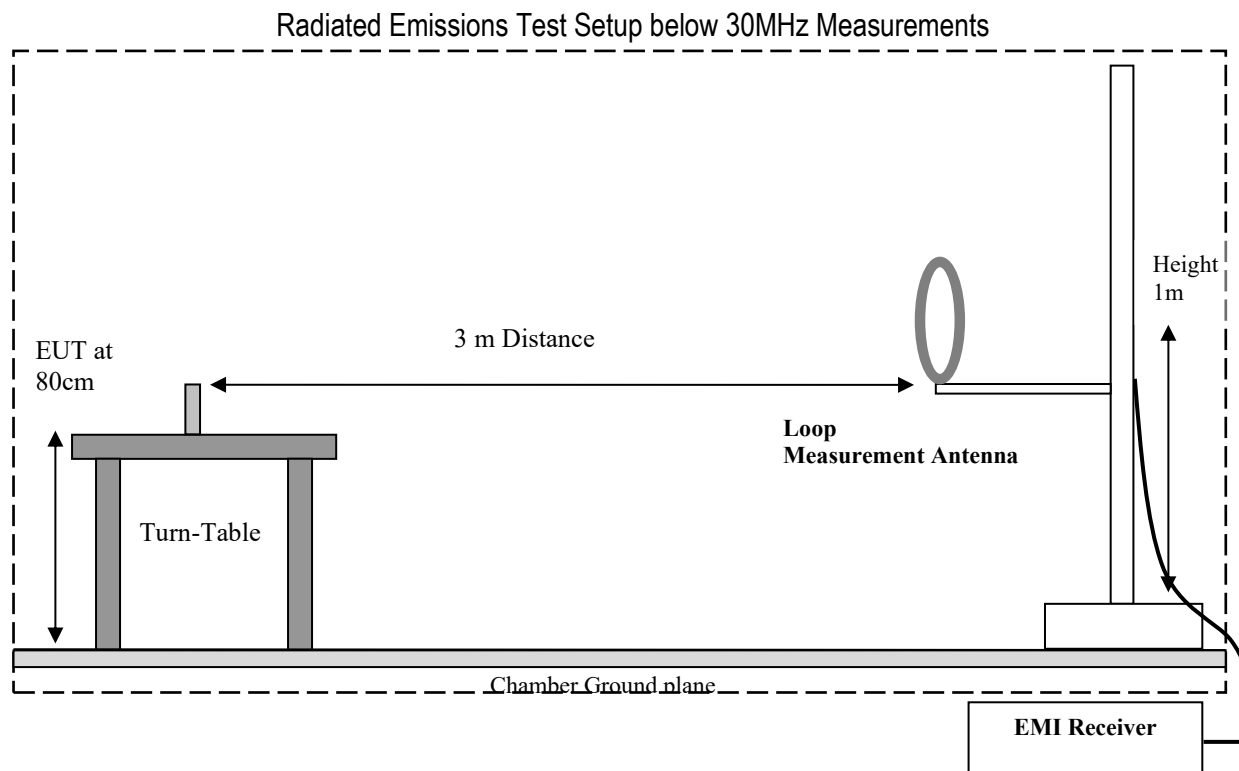
Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

7 Measurement Procedures

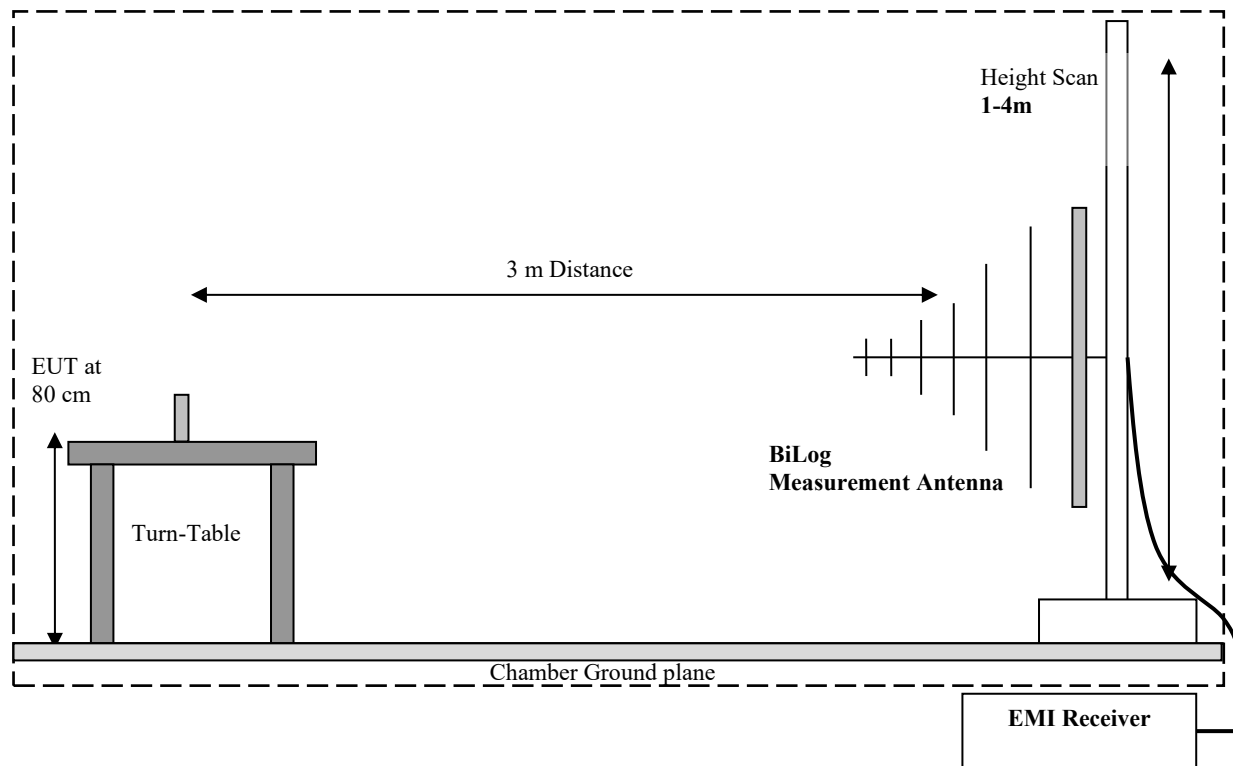
7.1 Radiated Measurement

The radiated measurement is performed according to ANSI C63.10 (2020)

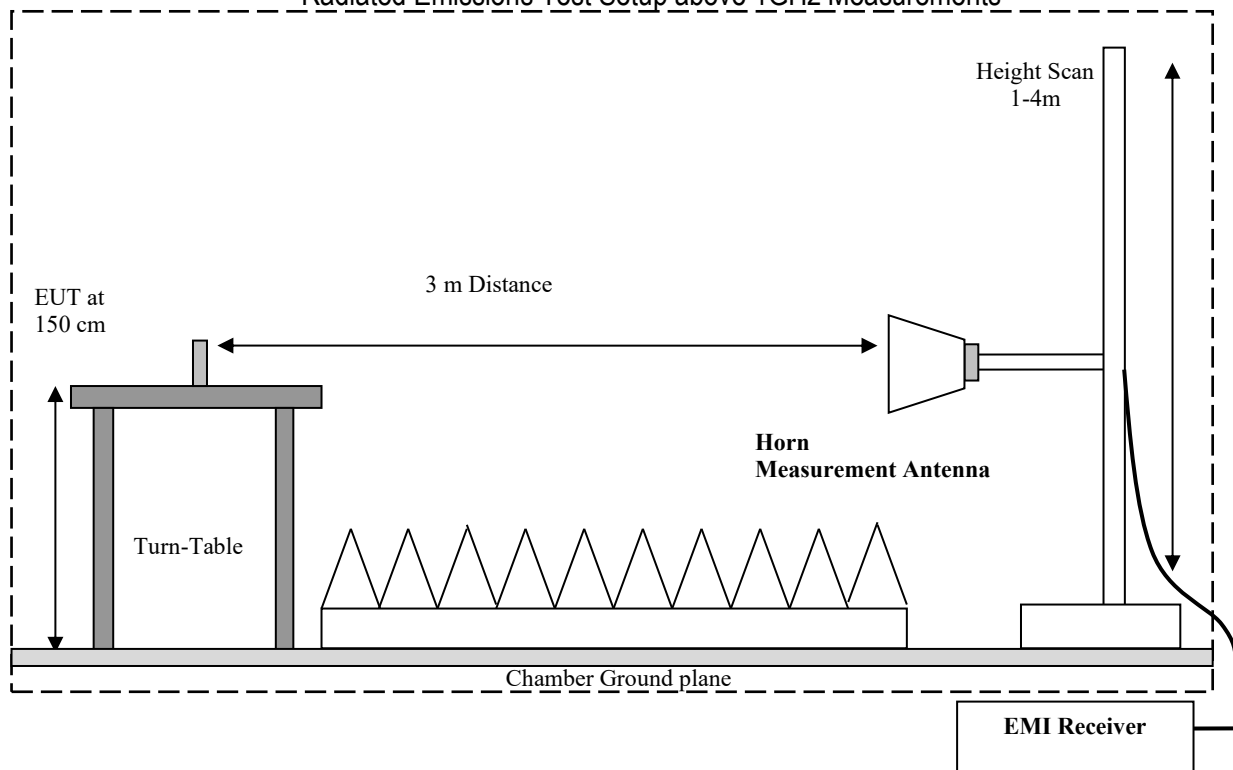
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dB μ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

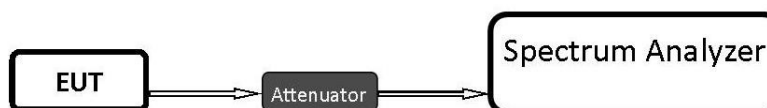
Frequency (MHz)	Measured SA (dB μ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB μ V/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to: ANSI C63.4 (2014)

7.3 RF Conducted Measurement Procedure

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – “GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES” - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.



- Connect the equipment as shown in the above diagram.
- Adjust the settings of the SA (Rohde-Schwarz Spectrum Analyzer) to connect the EUT at the required mode of test.
- Measurements are to be performed with the EUT set to the low, middle and high channels and for worst case modulation schemes.

8 Test Result Data

8.1 Maximum Peak Conducted Output Power

8.1.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02, and ANSI C63.10 Clause 11.

Spectrum Analyzer settings:

- RBW $\geq$ DTS bandwidth
- VBW $\geq 3 \times$ RBW
- Span $\geq 3 \times$ RBW
- Sweep = Auto couple
- Detector function = Peak
- Trace = Max hold
- Use peak marker function to determine the peak amplitude level

8.1.2 Limits:

Maximum Peak Output Power:

- FCC §15.247 (b): 1 W
- IC RSS-247: 1 W

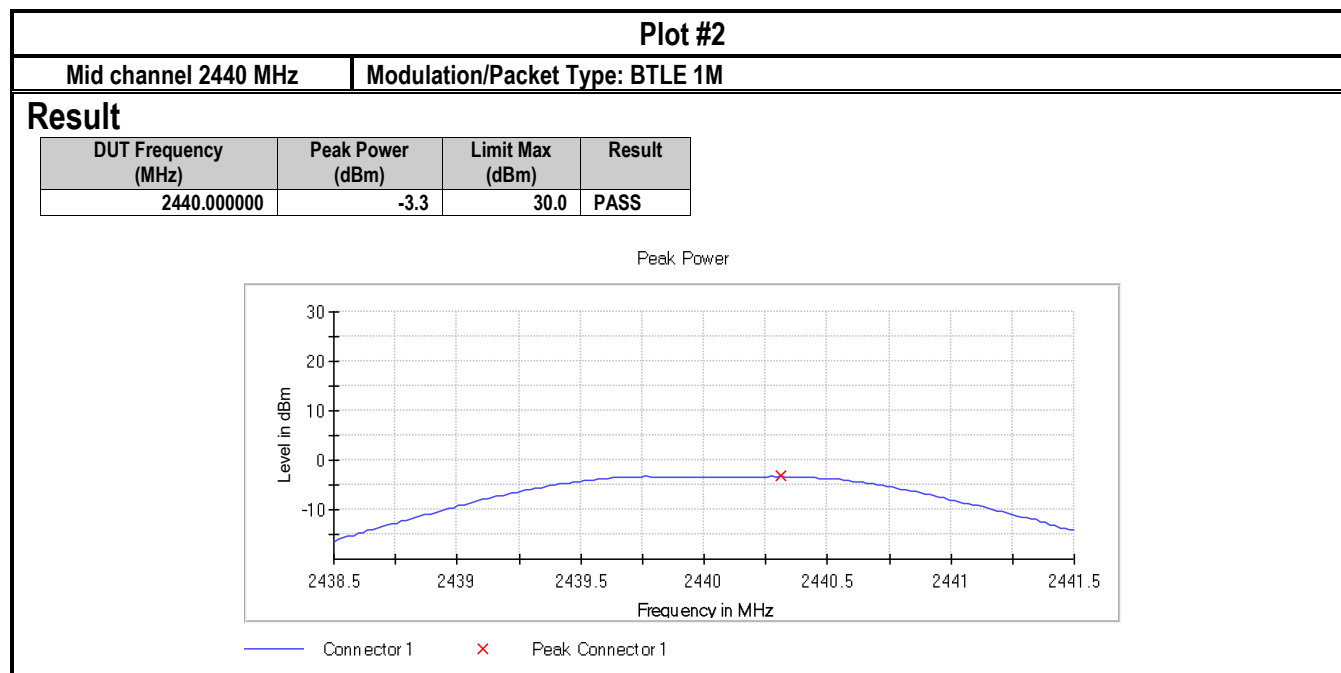
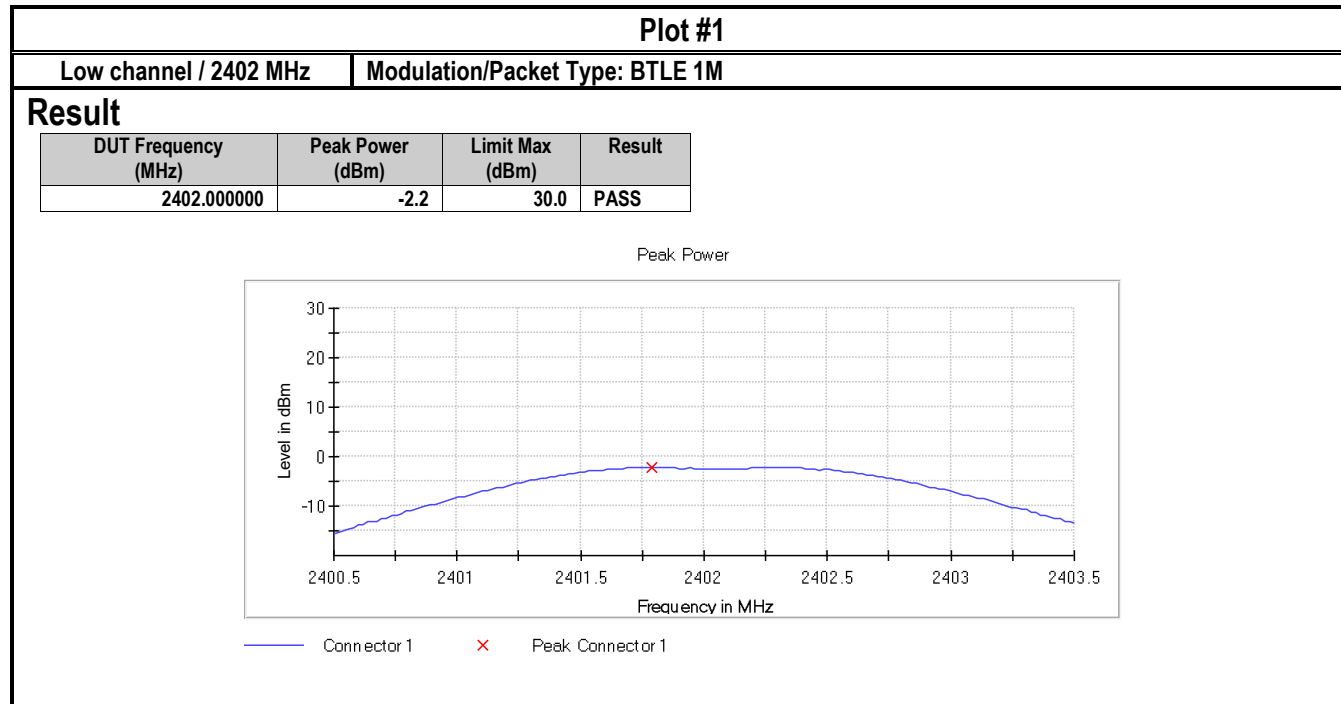
8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	2	2	3.6 VDC	3.3 dBi

8.1.4 Measurement result:

Plot #	Frequency (MHz)	Data Rate	Maximum Peak Conducted Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2402	1M	-2.20	1.10	30 (Pk) / 36 (EIRP)	Pass
2	2440		-3.30	0.00	30 (Pk) / 36 (EIRP)	Pass
3	2480		-3.30	0.00	30 (Pk) / 36 (EIRP)	Pass
4	2402	2M	-2.00	1.30	30 (Pk) / 36 (EIRP)	Pass
5	2440		-3.00	0.30	30 (Pk) / 36 (EIRP)	Pass
6	2480		-3.10	0.20	30 (Pk) / 36 (EIRP)	Pass

8.1.5 Measurement Plots:

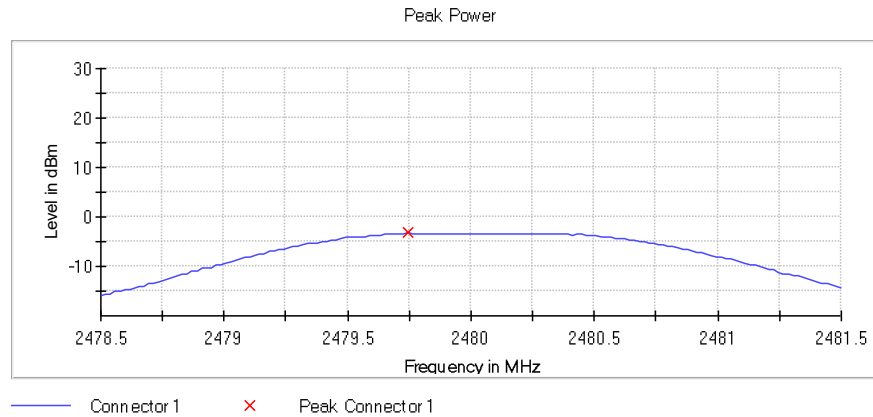


Plot #3

High channel 2480 MHz | Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	-3.3	30.0	PASS

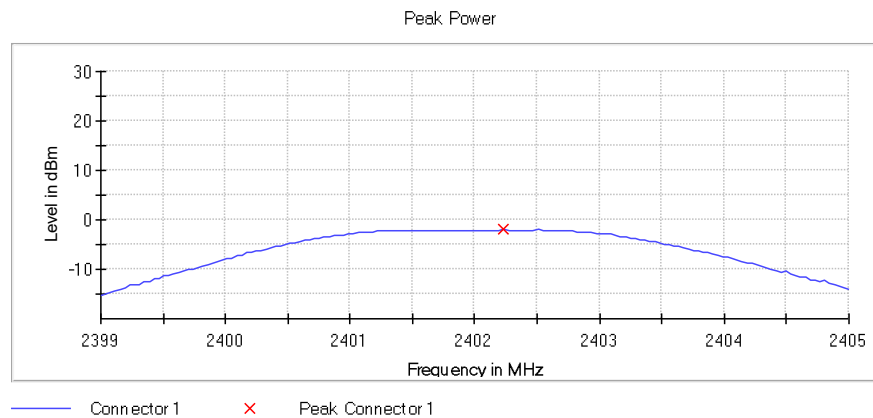


Plot #4

Low channel / 2402 MHz | Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	-2.0	30.0	PASS



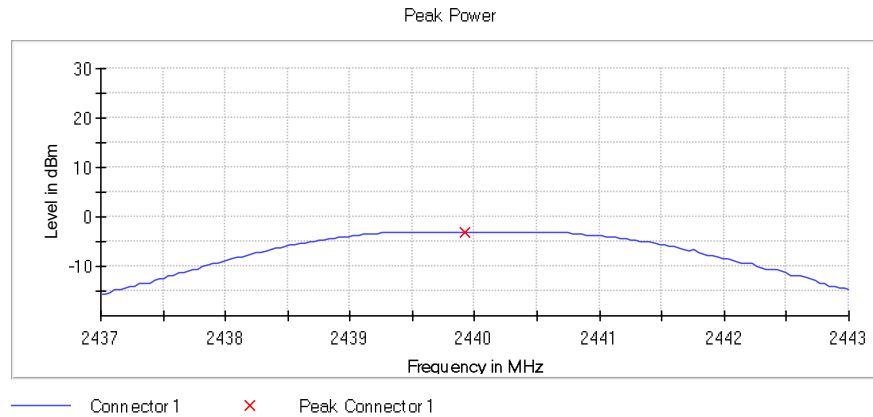
Plot #5

Mid channel 2440 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2440.000000	-3.0	30.0	PASS



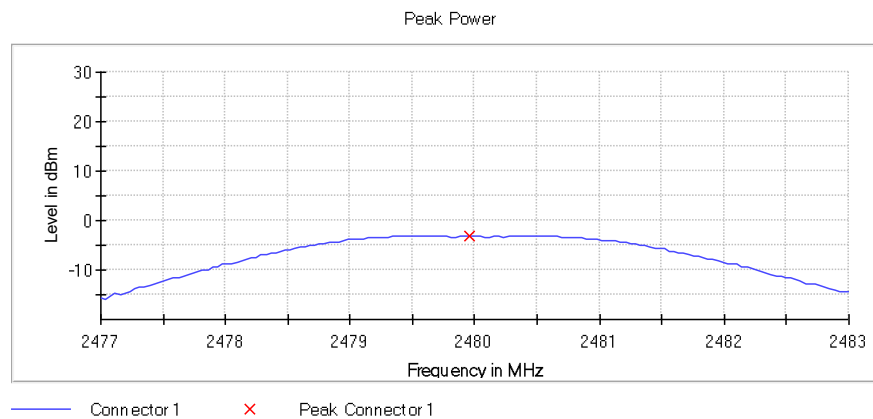
Plot #6

High channel 2480 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	-3.1	30.0	PASS



8.2 Power Spectral Density

8.2.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02, and ANSI C63.10 Clause 11.

Spectrum Analyzer settings for Peak PSD method:

- Set analyzer center frequency to DTS channel center frequency
- Set the span to 1.5 x DTS bandwidth
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
- Set the VBW $\geq 3 \times \text{RBW}$
- Detector = Peak
- Sweep time = Auto couple
- Trace mode = Max hold
- Allow trace to fully stabilize
- Use the peak marker function to determine the maximum amplitude level within the RBW
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat

8.2.2 Limits:

FCC§15.247(e) & RSS-247 5.2(b)

- For digitally modulated systems, the peak 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.

8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	2	2	3.6 VDC	3.3 dBi

8.2.4 Measurement result:

Plot #	Frequency (MHz)	Maximum Power Spectral Density (dBm/3 kHz)	Limit (dBm / 3 kHz)	Result
1	2402	-12.024	8	Pass
2	2440	-13.066	8	Pass
3	2480	-13.177	8	Pass
4	2402	-14.395	8	Pass
5	2440	-15.389	8	Pass
6	2480	-15.543	8	Pass

8.2.5 Measurement Plots:

Plot #1

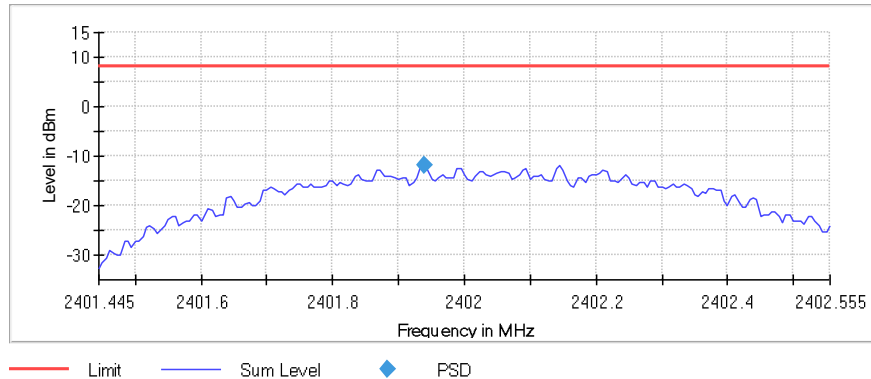
Low channel / 2402 MHz

Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2401.938929	-12.024	8.0	PASS

Peak Power Spectral Density



Plot #2

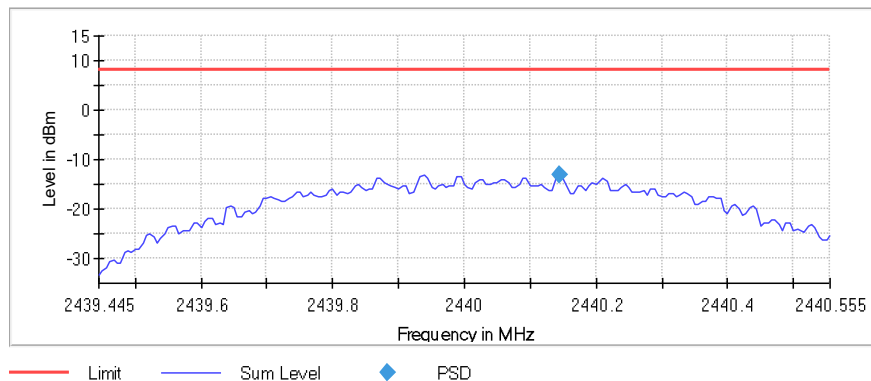
Mid channel 2440 MHz

Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2440.000000	2440.144351	-13.066	8.0	PASS

Peak Power Spectral Density



Plot #3

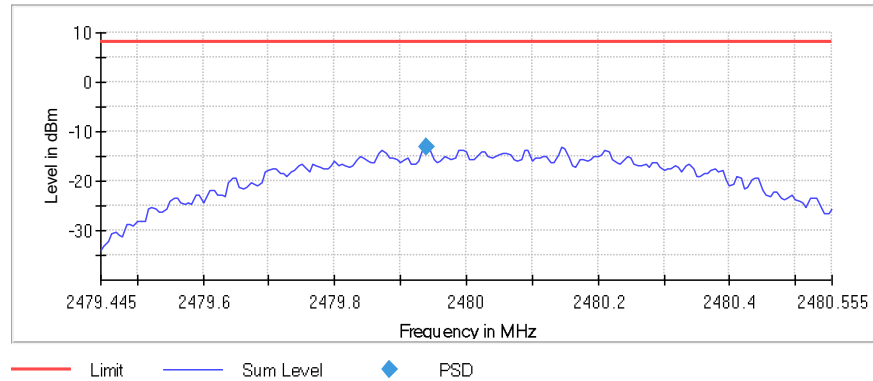
High channel 2480 MHz

Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2479.938929	-13.177	8.0	PASS

Peak Power Spectral Density



Plot #4

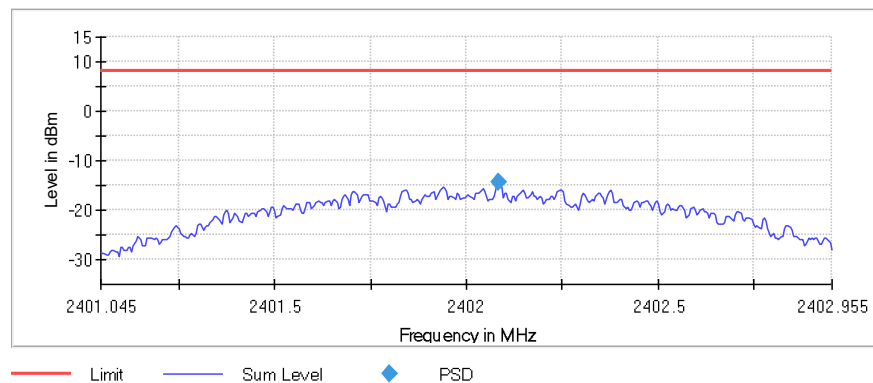
Low channel / 2402 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2402.085909	-14.395	8.0	PASS

Peak Power Spectral Density



Plot #5

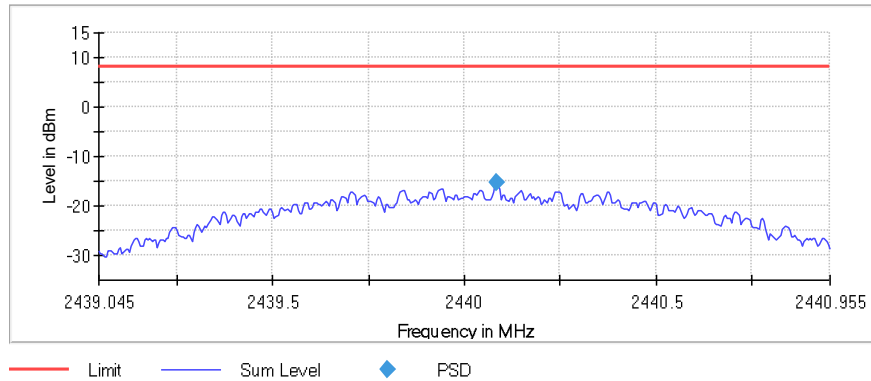
Mid channel 2440 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2440.000000	2440.085909	-15.389	8.0	PASS

Peak Power Spectral Density



Plot #6

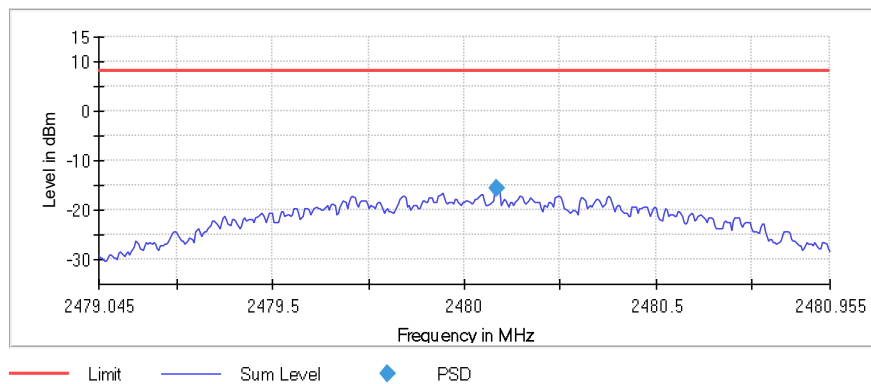
High channel 2480 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2480.085909	-15.543	8.0	PASS

Peak Power Spectral Density



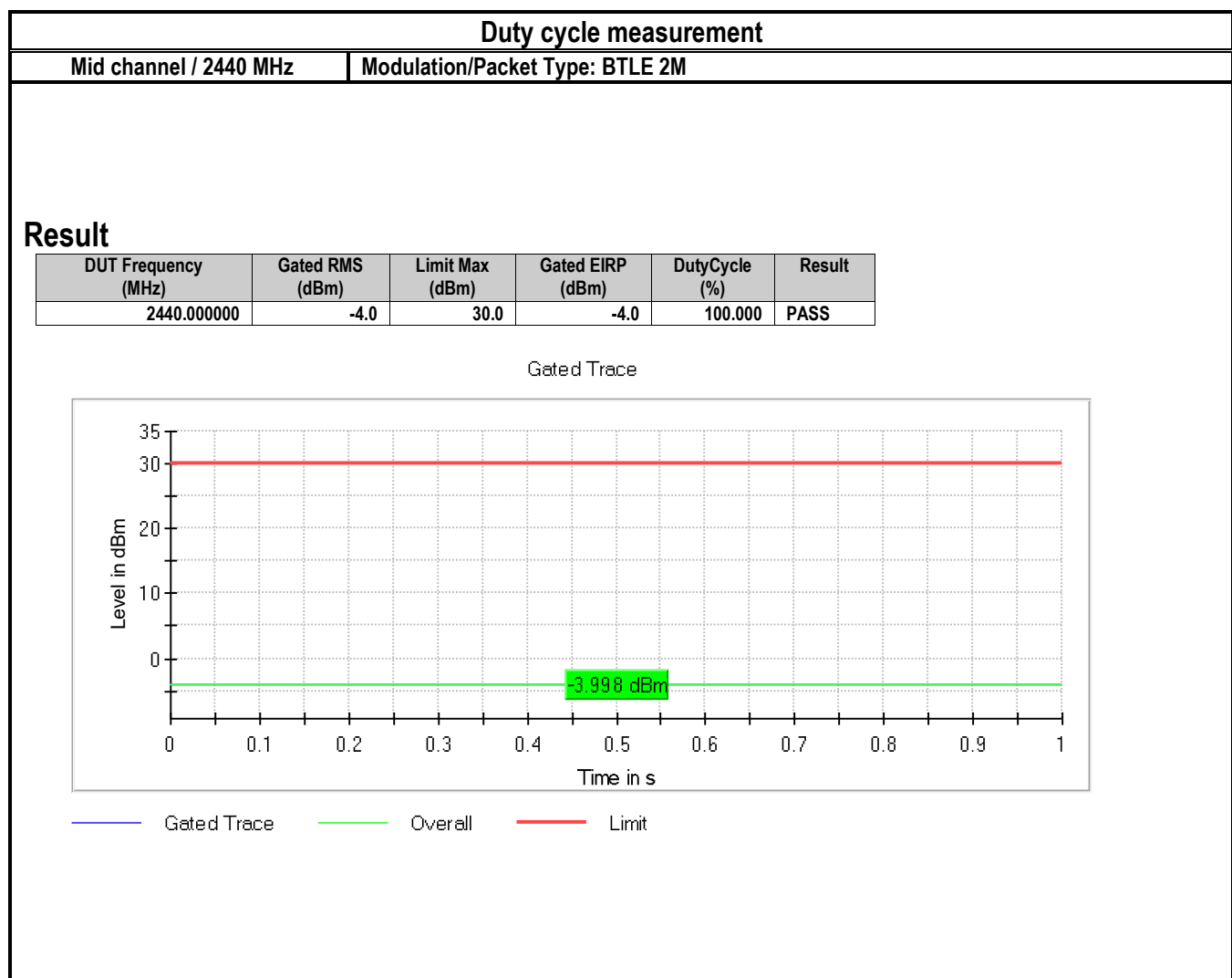
8.3 Duty cycle

8.3.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02, and ANSI C63.10 Clause 11.

Spectrum Analyzer settings:

- Set the center frequency and of the instrument to the center frequency of the transmission
- Zero span
- Set RBW $\geq$ OBW if possible; otherwise, set RBW to the largest available value
- Detector = Peak or average

8.3.2 Measurement result



Duty cycle = 100%

Duty cycle correction factor = $10 \cdot \log(1/1) = 0.00$ dB

Duty cycle measurement

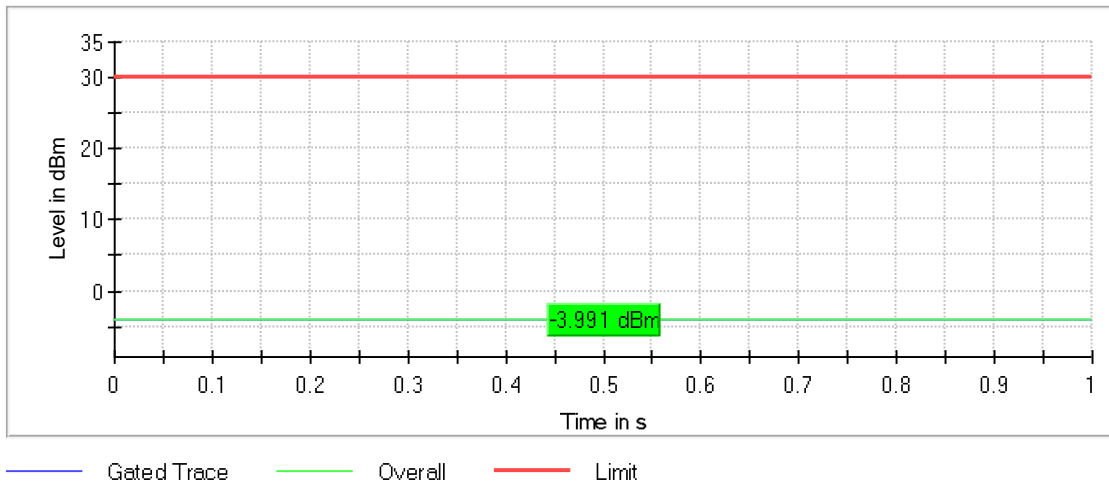
Mid channel / 2440 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2440.000000	-4.0	30.0	-4.0	100.000	PASS

Gated Trace



Duty cycle = 100%

Duty cycle correction factor = $10 \cdot \log(1/1) = 0.00$ Db

8.4 Band Edge Compliance

8.4.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02, and ANSI C63.10 Clause 11.

Spectrum Analyzer settings for band edge:

- Set the center frequency and span to encompass frequency range to be measured
- RBW = 100 kHz
- VBW $\geq 3 \times$ RBW
- Sweep Time: Auto couple
- Detector = Peak
- Trace = Max hold
- Allow trace to fully stabilize
- Use the peak marker function to determine the maximum amplitude level
- Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge

8.4.2 Limits non restricted band:

FCC§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. 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)).

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- 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 30dB instead of 20dB.

Spectrum Analyzer settings for restricted band:

- Peak measurements are made using a peak detector and RBW=1 MHz

8.4.3 Limits restricted band §15.247/15.209/15.205 and RSS-Gen 8.9/8.10

- *PEAK LIMIT= 74 dB μ V/m @3m =-21.23 dBm
- *AVG. LIMIT= 54 dB μ V/m @3m =-41.23 dBm
- Start frequency & stop frequency according to frequency range specified in the restricted band table in FCC section 15.205 & RSS-Gen 8.10
- Measurements with a peak detector were used to show compliance to average limits, thus showing compliance to both peak and average limits.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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			

8.4.4 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	2	2	3.6 VDC	3.3 dBi

8.4.5 Measurement result:

Test #	Frequency	Data Rate	Band Edge	In band Peak Level	Level	Margin	Limit	Result
	(MHz)			(dBm)	(dBm)	(dBm)	(dBm)	
1	2402	LE 1M	Lower, Non-restricted (conducted)	-3.00	-56.30	33.20	-23.00	Pass
2	2402	LE 2M	Lower, Non-restricted (conducted)	-4.00	-37.80	13.80	-24.00	Pass
3	2480	LE 1M	Higher, Non-restricted (conducted)	-4.20	-59.10	34.90	-24.20	Pass
4	2480	LE 2M	Higher, Non-restricted (conducted)	-5.10	-56.20	31.10	-25.10	Pass

Note 1: The test results and plots are generated by the R&S WMS32 software, which automatically performs the measurements.

Plot #	Frequency	Band Edge	Measured Value	Limit	Result
	(MHz)		(dB μ V/m)	(dB μ V/m)	
6	2480	Upper Restricted Peak	56.43	74 Peak	Pass
		Upper Restricted AVG	41.05	54 AVG	Pass

8.4.6 Measurement Plots:

Plot #1

Low channel / 2402 MHz

Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Result
2402.000000	PASS

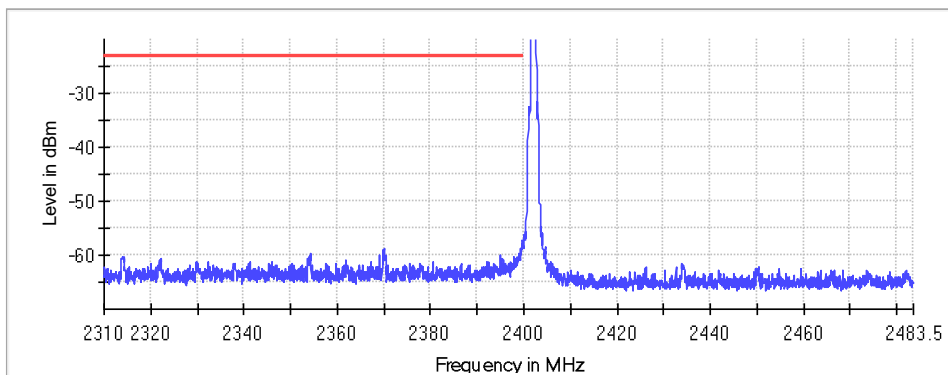
Inband Peak

Frequency (MHz)	Level (dBm)
2401.768235	-3.0

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.950000	-56.3	33.2	-23.0	PASS
2399.800000	-57.3	34.2	-23.0	PASS
2399.700000	-57.5	34.5	-23.0	PASS
2399.750000	-57.6	34.5	-23.0	PASS
2399.600000	-57.9	34.9	-23.0	PASS
2399.900000	-58.1	35.1	-23.0	PASS
2399.450000	-58.5	35.5	-23.0	PASS
2399.850000	-58.7	35.7	-23.0	PASS
2399.650000	-58.7	35.7	-23.0	PASS
2399.500000	-58.8	35.7	-23.0	PASS
2399.200000	-58.8	35.8	-23.0	PASS
2399.550000	-58.9	35.9	-23.0	PASS
2369.950000	-58.9	35.9	-23.0	PASS
2369.750000	-59.2	36.2	-23.0	PASS
2399.250000	-59.6	36.6	-23.0	PASS

Band Edge



— Limit — Sum Level × Fail

Plot #2

Low channel / 2402 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Result
2402.000000	PASS

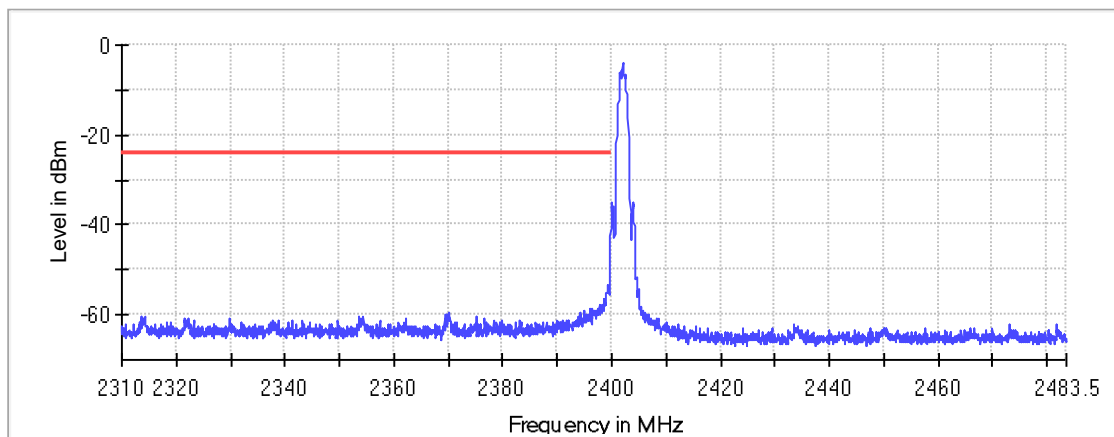
Inband Peak

Frequency (MHz)	Level (dBm)
2402.013824	-4.0

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.950000	-37.8	13.8	-24.0	PASS
2399.900000	-38.0	14.1	-24.0	PASS
2399.850000	-40.8	16.8	-24.0	PASS
2399.800000	-42.6	18.6	-24.0	PASS
2399.750000	-44.6	20.6	-24.0	PASS
2399.700000	-46.5	22.5	-24.0	PASS
2399.650000	-48.1	24.1	-24.0	PASS
2399.600000	-50.2	26.2	-24.0	PASS
2399.550000	-50.4	26.4	-24.0	PASS
2399.500000	-50.8	26.8	-24.0	PASS
2399.250000	-53.4	29.4	-24.0	PASS
2399.300000	-54.2	30.2	-24.0	PASS
2399.200000	-54.5	30.6	-24.0	PASS
2399.400000	-54.6	30.6	-24.0	PASS
2399.150000	-54.9	30.9	-24.0	PASS

Band Edge



— Limit — Sum Level × Fail

Plot #3

High channel / 2480 MHz

Modulation/Packet Type: BTLE 1M

Result

DUT Frequency (MHz)	Result
2480.000000	PASS

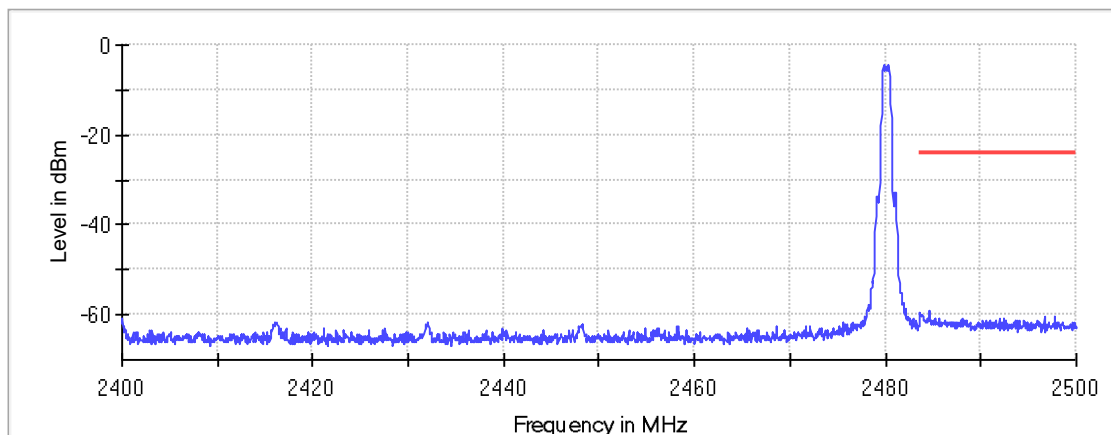
Inband Peak

Frequency (MHz)	Level (dBm)
2479.816176	-4.2

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2484.557692	-59.1	34.9	-24.2	PASS
2483.605769	-59.3	35.1	-24.2	PASS
2483.658654	-59.8	35.6	-24.2	PASS
2483.817308	-60.1	35.9	-24.2	PASS
2483.870192	-60.1	35.9	-24.2	PASS
2483.764423	-60.2	36.0	-24.2	PASS
2497.778846	-60.2	36.0	-24.2	PASS
2484.610577	-60.2	36.1	-24.2	PASS
2483.711538	-60.4	36.2	-24.2	PASS
2483.923077	-60.5	36.3	-24.2	PASS
2496.615385	-60.6	36.4	-24.2	PASS
2483.975962	-60.6	36.4	-24.2	PASS
2492.384615	-60.7	36.5	-24.2	PASS
2485.668269	-60.7	36.5	-24.2	PASS
2491.908654	-60.7	36.5	-24.2	PASS

Band Edge



— Limit — Sum Level × Fail

Plot #4

High channel / 2480 MHz

Modulation/Packet Type: BTLE 2M

Result

DUT Frequency (MHz)	Result
2480.000000	PASS

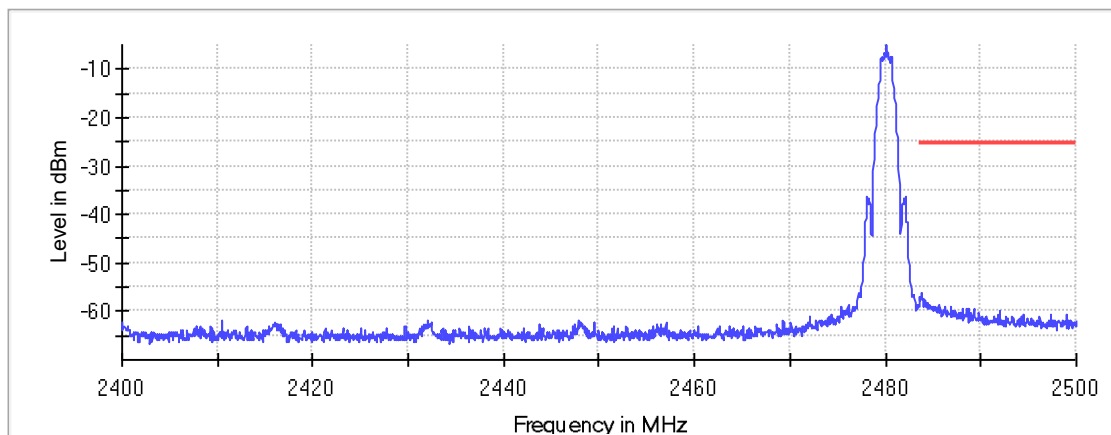
Inband Peak

Frequency (MHz)	Level (dBm)
2480.110882	-5.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.764423	-56.2	31.1	-25.1	PASS
2483.870192	-57.1	32.0	-25.1	PASS
2483.605769	-57.2	32.0	-25.1	PASS
2483.552885	-57.3	32.2	-25.1	PASS
2484.081731	-57.5	32.3	-25.1	PASS
2483.817308	-57.5	32.4	-25.1	PASS
2483.711538	-57.6	32.5	-25.1	PASS
2483.658654	-57.8	32.6	-25.1	PASS
2483.923077	-57.8	32.6	-25.1	PASS
2484.187500	-57.9	32.8	-25.1	PASS
2484.134615	-58.0	32.8	-25.1	PASS
2484.399038	-58.2	33.1	-25.1	PASS
2484.028846	-58.2	33.1	-25.1	PASS
2484.663462	-58.5	33.4	-25.1	PASS
2484.610577	-58.5	33.4	-25.1	PASS

Band Edge



— Limit — Sum Level × Fail

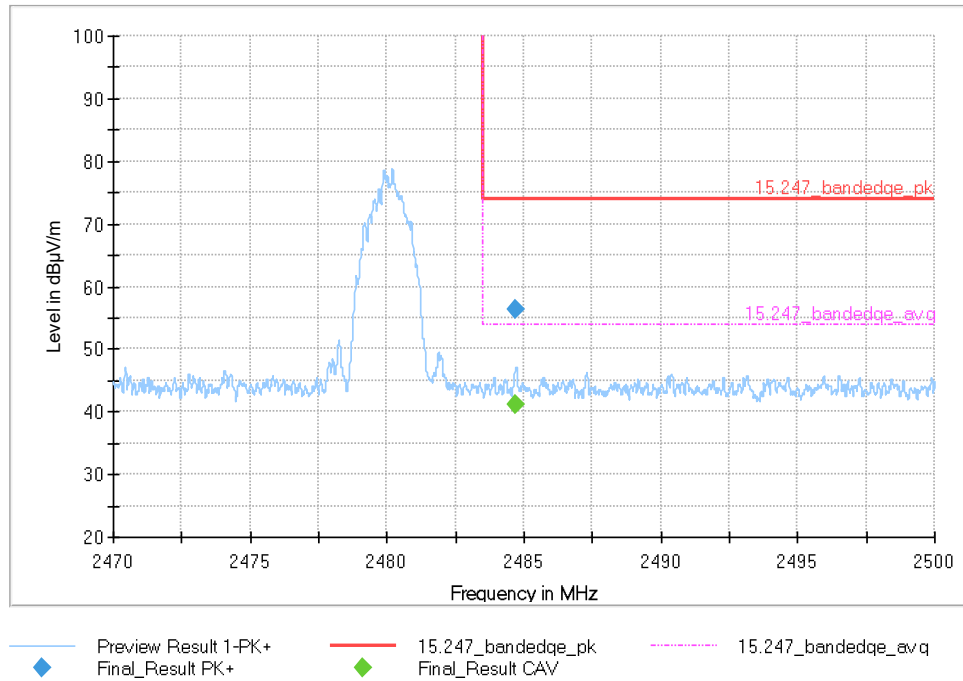
Plot #5

High channel 2480 MHz

Modulation/Packet Type: BTLE 2M

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2484.705	56.43	---	74.00	17.57	500.0	1000.0	282.0	H	344.0	33.9	
2484.705	---	41.05	54.00	12.95	500.0	1000.0	282.0	H	344.0	33.9	



8.5 Emission Bandwidth 6dB and 99% Occupied Bandwidth

8.5.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02, and ANSI C63.10 Clause 11.

Spectrum Analyzer settings:

6dB (DTS) Bandwidth:

- Set RBW = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep = Auto couple
- Allow the trace to stabilize
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

99% Occupied Bandwidth:

- Set frequency = nominal EUT channel center frequency
- Set Span = 1.5 x to 5.0 x OBW
- Set RBW = 1% to 5% of OBW
- Set the video bandwidth (VBW) $\approx 3 \times$ RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep = Auto couple
- Allow the trace to stabilize
- Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth
- If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

8.5.2 Limits:

FCC §15.247(a)(2) and RSS-247 5.2(a)

- Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.5.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	2	2	3.6 VDC

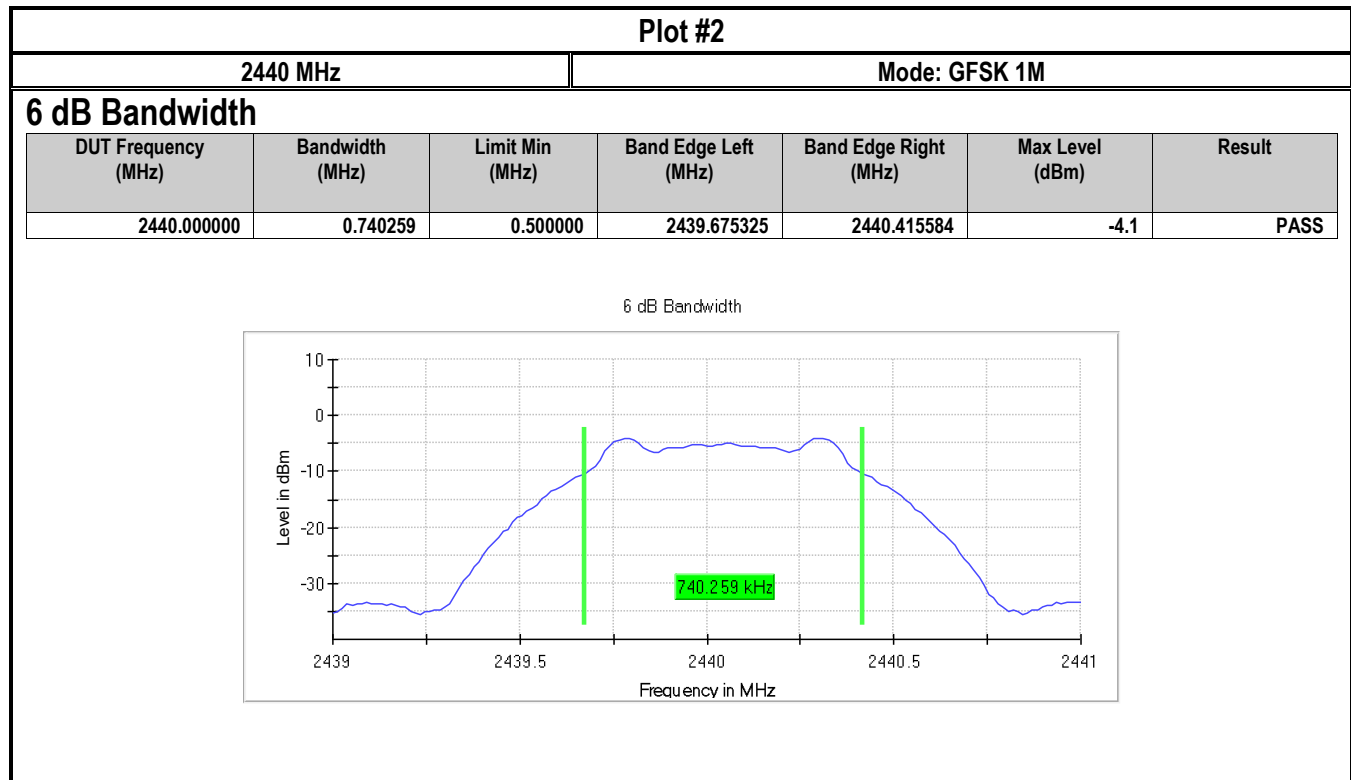
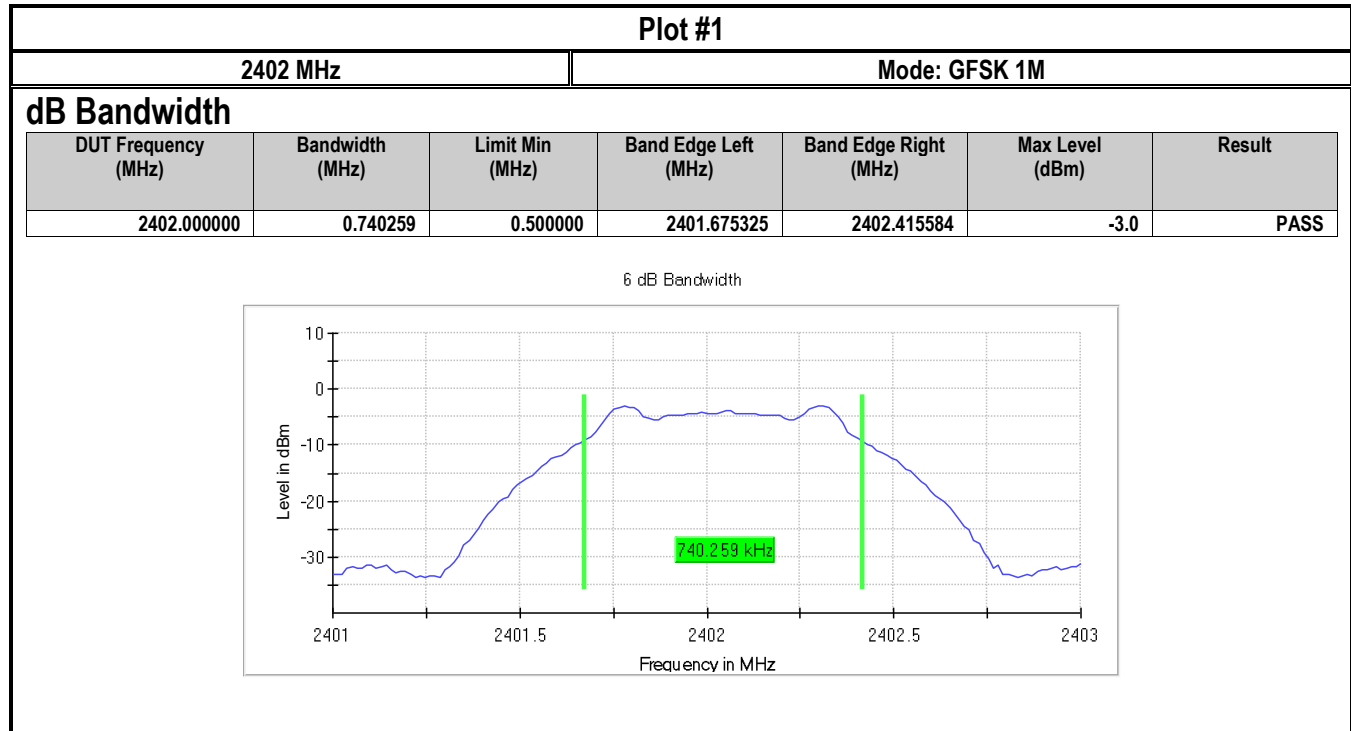
8.5.4 Measurement result:

Plot #	Data Rate	Frequency	6dB Emissions Bandwidth	Limit	Result
		(MHz)	(MHz)	(MHz)	
1	1	2402	0.74	> 0.5	Pass
2		2440	0.74	> 0.5	Pass
3		2480	0.74	> 0.5	Pass
4	2	2402	1.27	> 0.5	Pass
5		2440	1.27	> 0.5	Pass
6		2480	1.27	> 0.5	Pass

Plot #	Data Rate	Frequency	99% Occupied Bandwidth	Limit	Result
		(MHz)	(MHz)	(MHz)	
7	1	2402	1.06	N/A	Pass
8		2440	1.06	N/A	Pass
9		2480	1.06	N/A	Pass
10	2	2402	2.07	N/A	Pass
11		2440	2.08	N/A	Pass
12		2480	2.08	N/A	Pass

8.5.5 Measurement Plots:

6 dB Emission Bandwidth



Plot #3

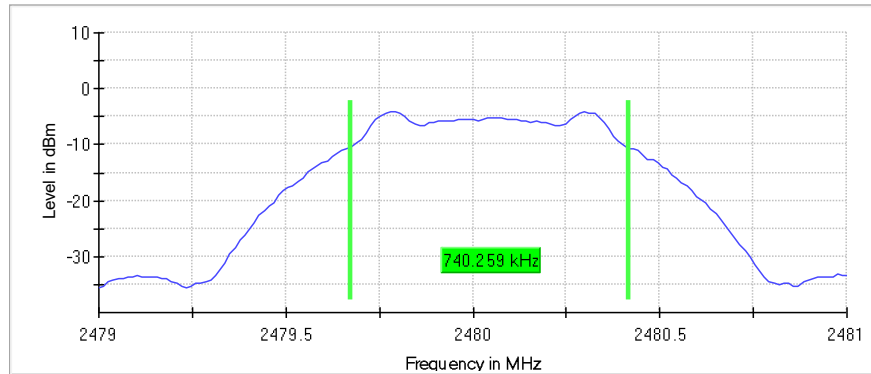
2480 MHz

Mode: GFSK 1M

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2480.000000	0.740259	0.500000	2479.675325	2480.415584	-4.2	PASS

6 dB Bandwidth



Plot #4

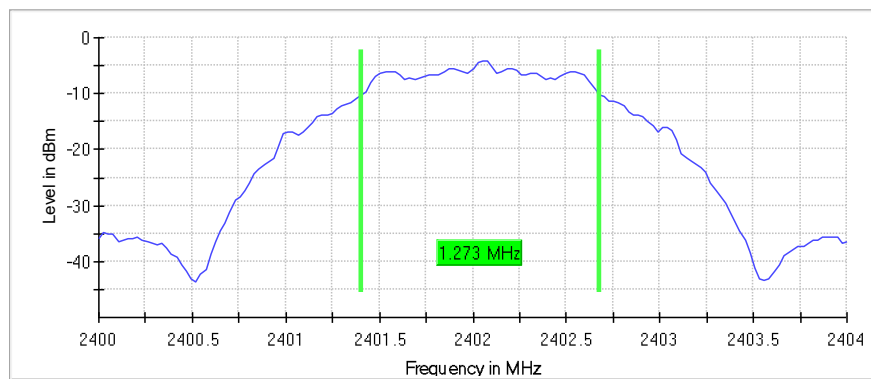
2402 MHz

Mode: GFSK 2M

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2402.000000	1.272728	0.500000	2401.402597	2402.675325	-4.1	PASS

6 dB Bandwidth



Plot #5

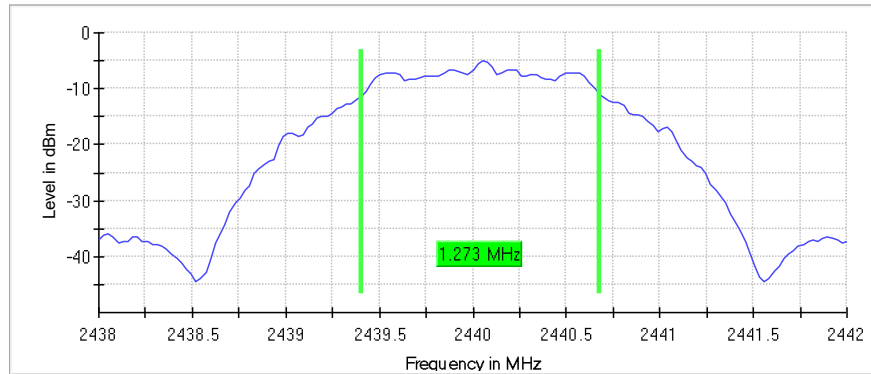
2440 MHz

Mode: GFSK 2M

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2440.000000	1.272728	0.500000	2439.402597	2440.675325	-5.1	PASS

6 dB Bandwidth



Plot #6

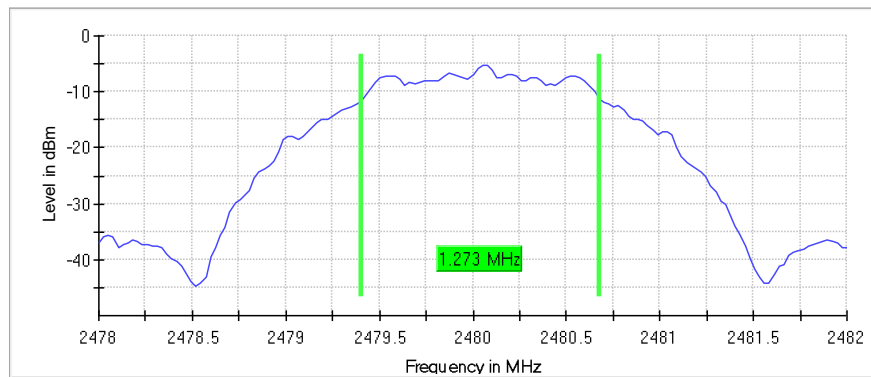
2480 MHz

Mode: GFSK 2M

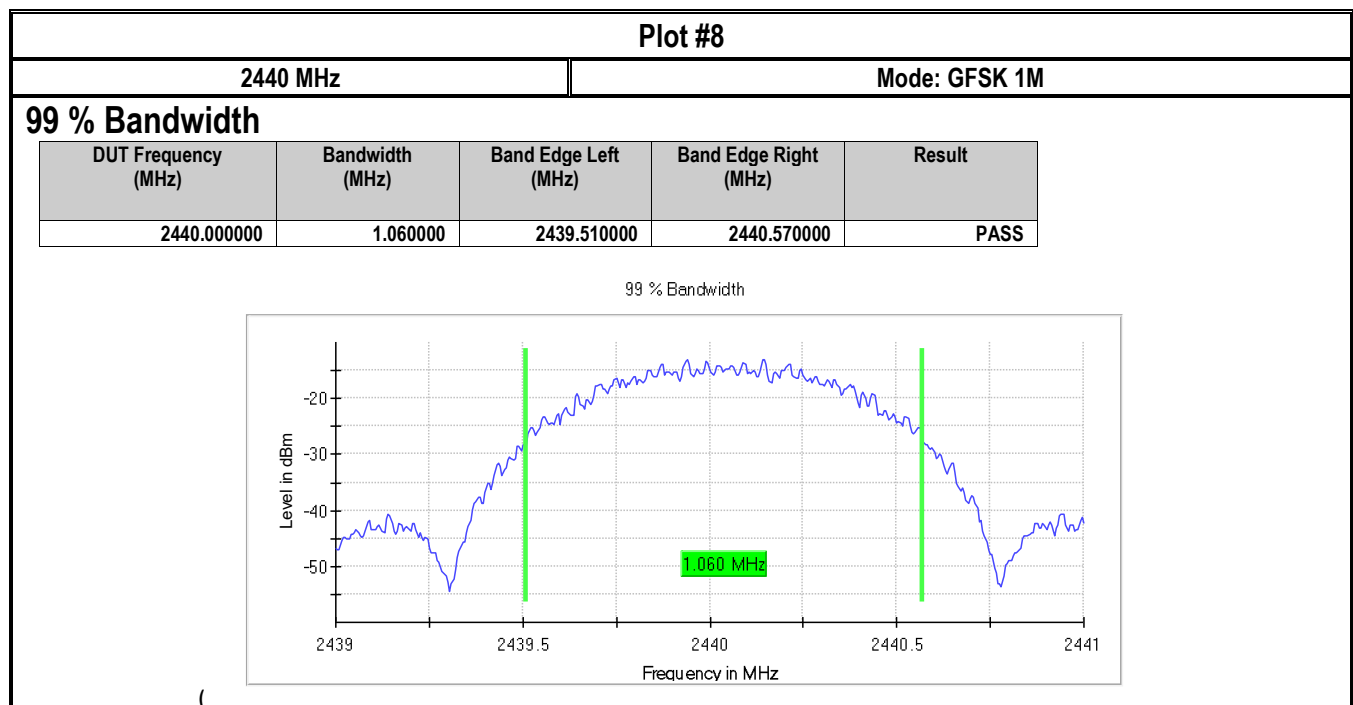
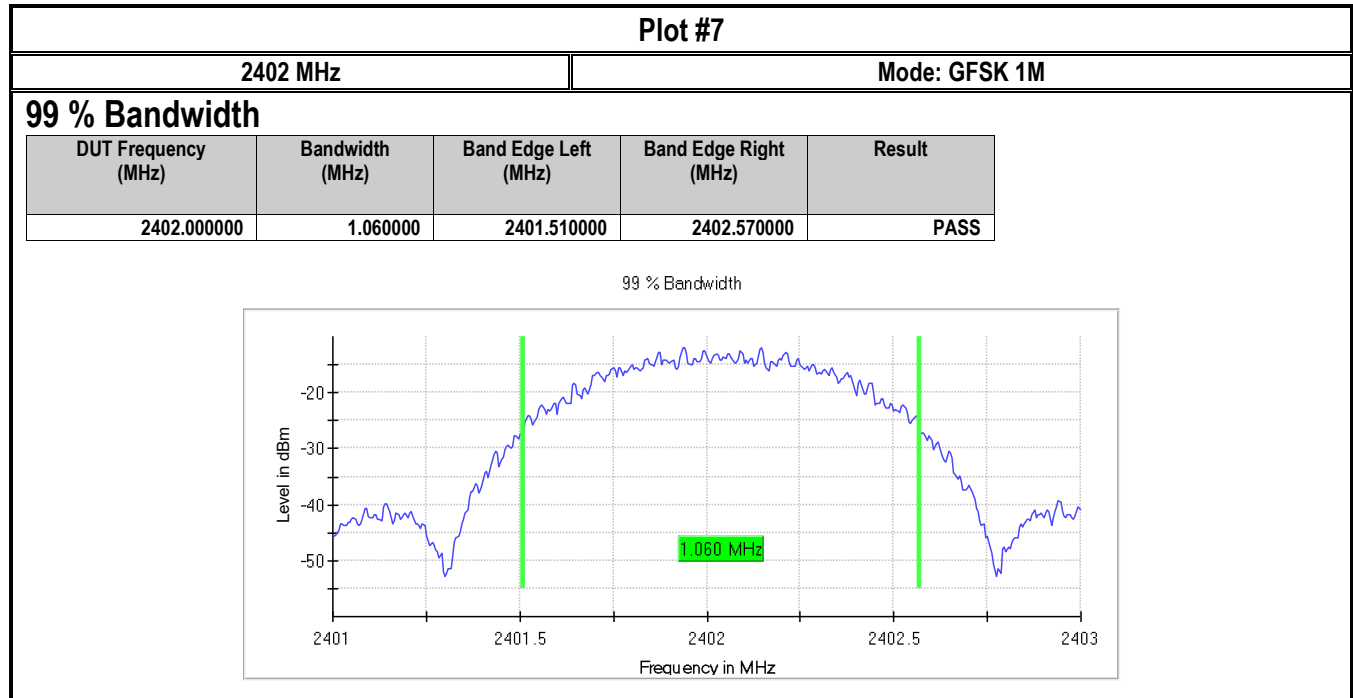
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2480.000000	1.272728	0.500000	---	2479.402597	2480.675325	-5.3	PASS

6 dB Bandwidth



99% Occupied Bandwidth



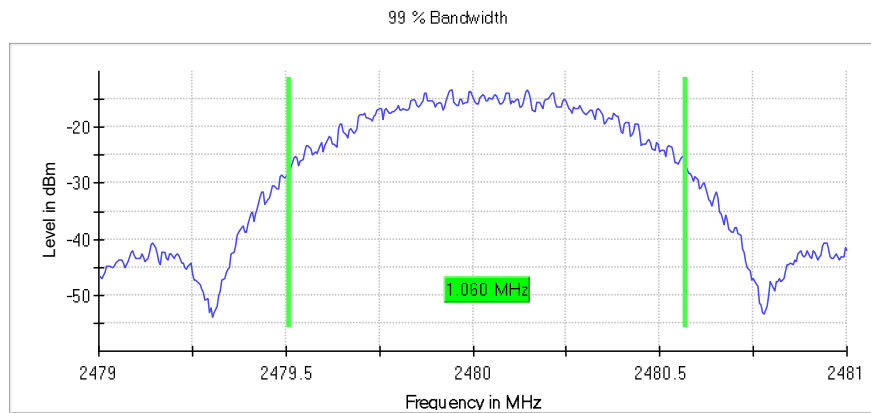
Plot #9

2480 MHz

Mode: GFSK 1M

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	1.060000	2479.510000	2480.570000	PASS



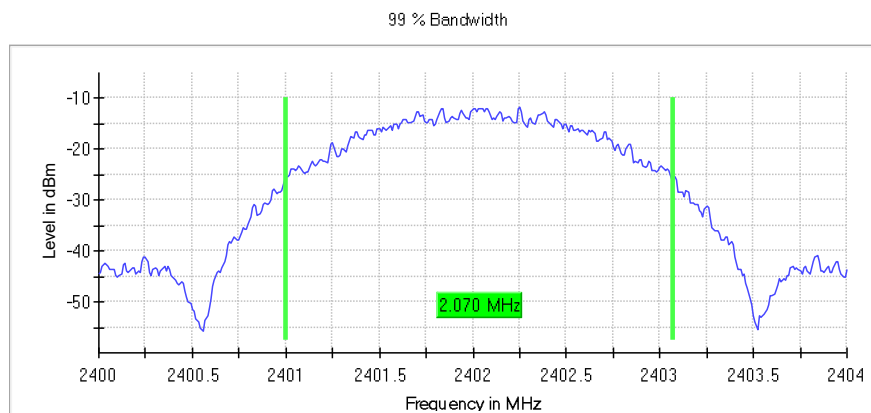
Plot #10

2402 MHz

Mode: GFSK 2M

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	2.070000	2401.000000	2403.070000	PASS



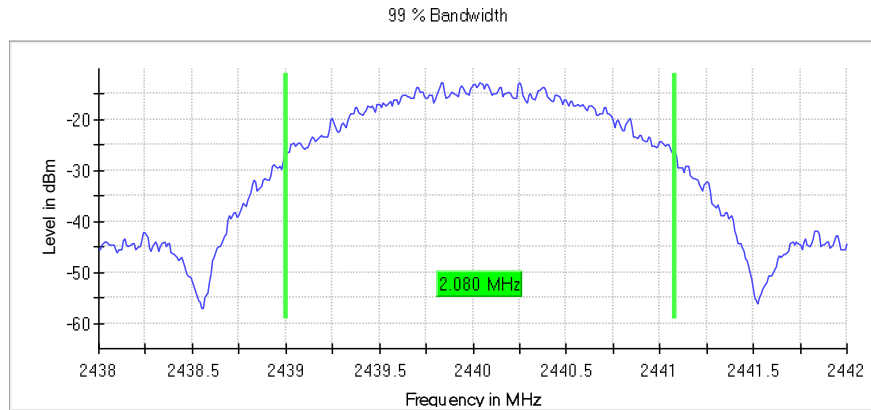
Plot #11

2440 MHz

Mode: GFSK 2M

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2440.000000	2.080000	2439.000000	2441.080000	PASS



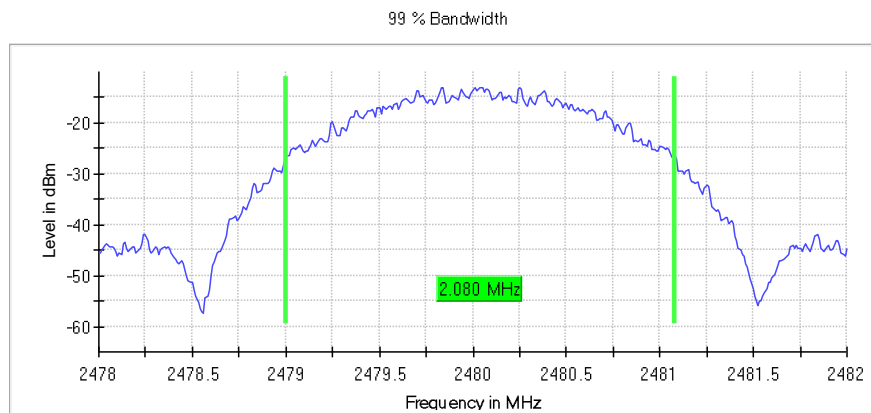
Plot #12

2480 MHz

Mode: GFSK 2M

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	2.080000	2479.000000	2481.080000	PASS



8.6 Radiated Transmitter Spurious Emissions and Restricted Bands

8.6.1 Measurement according to ANSI C63.10 (2020)

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing frequencies below 30 MHz at distance other than the specified in the standard, the limit conversion is calculated by using the FCC materials for the ANSI 63 committee issued on January, 27 1991.

8.6.2 Limits:

FCC §15.247

- 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)).

FCC §15.209 & RSS-Gen 8.9

- Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field strength (μV/m)	Measurement Distance (m)	Field strength @ 3m (dBμV/m)
0.009–0.490	2400/F(kHz) / -----	300	-
0.490–1.705	24000/F(kHz) / -----	30	-
1.705–30.0	30 / (29.5)	30	-
30–88	100	3	40 dBμV/m
88–216	150	3	43.5 dBμV/m
216–960	200	3	46 dBμV/m
Above 960	500	3	54 dBμV/m

FCC §15.205 & RSS-Gen 8.10

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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			

- 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)).

*PEAK LIMIT= 74 dBμV/m

*AVG. LIMIT= 54 dBμV/m

8.6.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	12	3.6 VDC

8.6.4 Measurement result:

Plot #	Channel #	Scan Frequency	Limit	Result
1-5	Low	9 kHz – 26 GHz	See section 8.5.2	Pass
6-10	Mid	9 kHz – 26 GHz	See section 8.5.2	Pass
11-15	High	9 kHz – 26 GHz	See section 8.5.2	Pass

8.6.5 Measurement Plots:

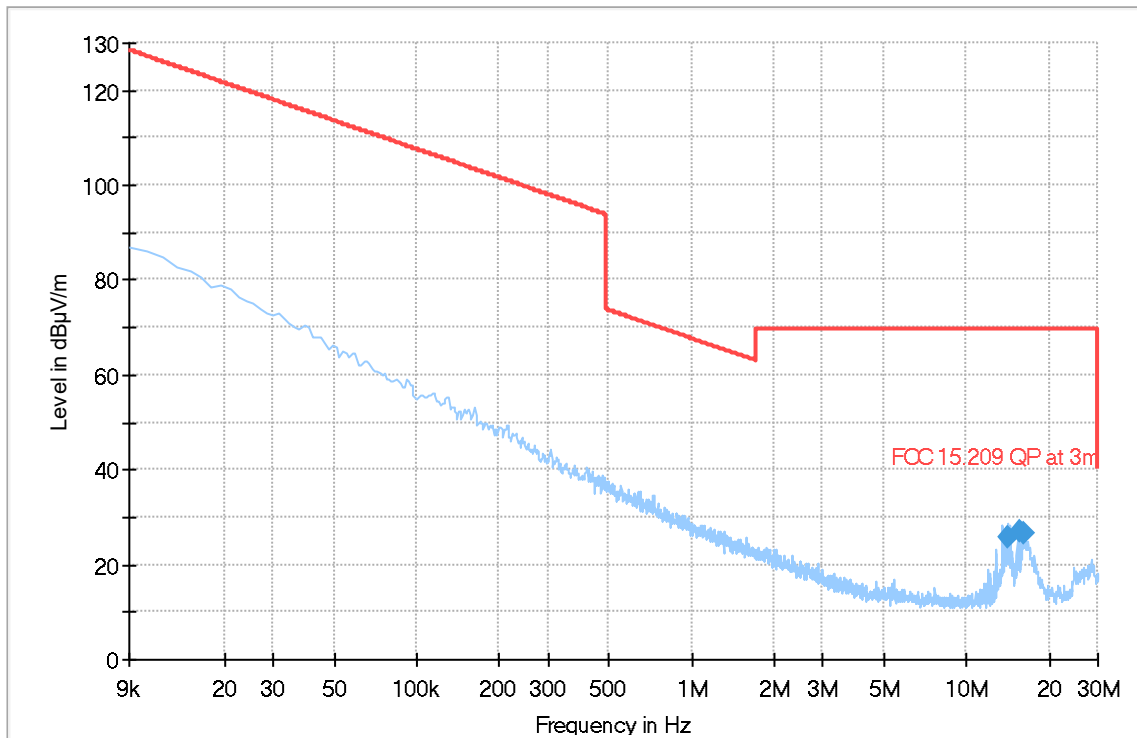
Plot # 1 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2402 MHz

Modulation: 2M

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	DET 2 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
14.028	25.80	---	69.50	43.70	500.0	9.0	120.0	V	301.0	5.4	
15.616	27.08	---	69.50	42.42	500.0	9.0	120.0	V	87.0	5.2	
16.228	26.63	---	69.50	42.87	500.0	9.0	120.0	H	176.0	5.1	



— Preview Result 1-PK+

— FCC 15.209 QP at 3m

◆ Final_Result QPK

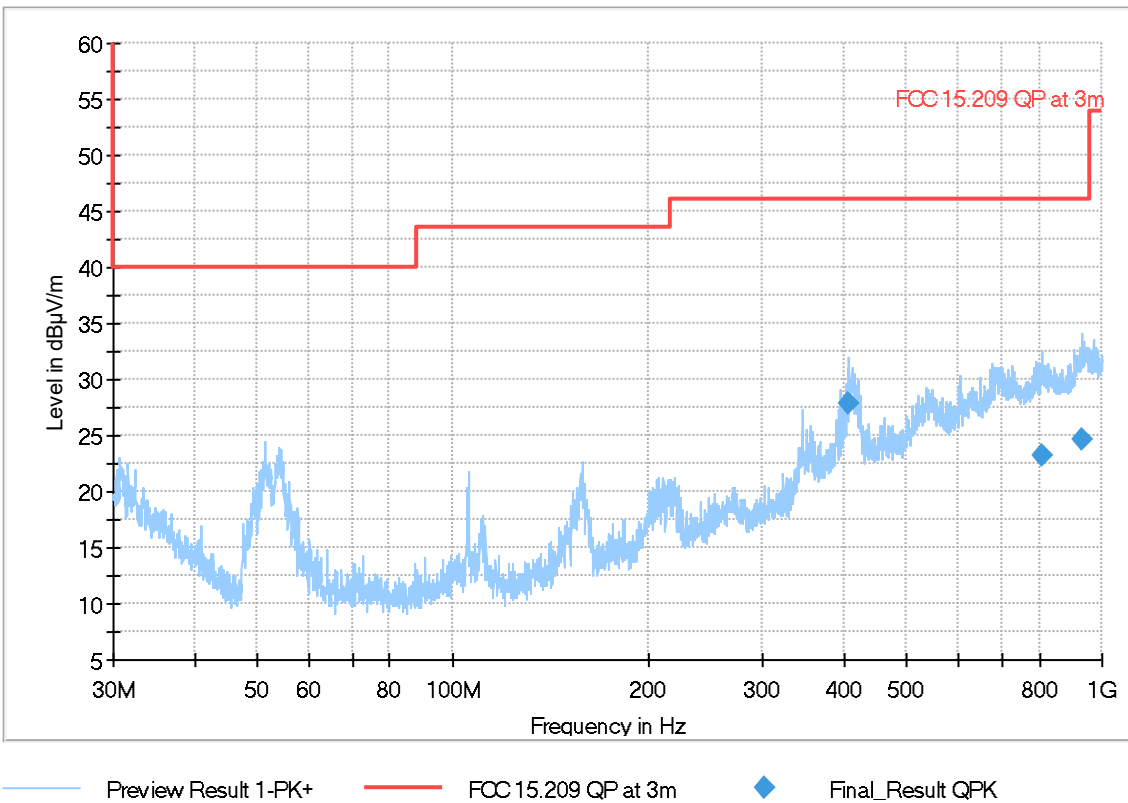
Plot # 2 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2402 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	DET 2 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
407.791	27.80	---	46.02	18.22	500.0	120.0	112.0	H	23.0	-8.5	
810.244	23.26	---	46.02	22.76	500.0	120.0	312.0	H	260.0	-2.2	
933.143	24.61	---	46.02	21.41	500.0	120.0	216.0	H	18.0	-0.6	



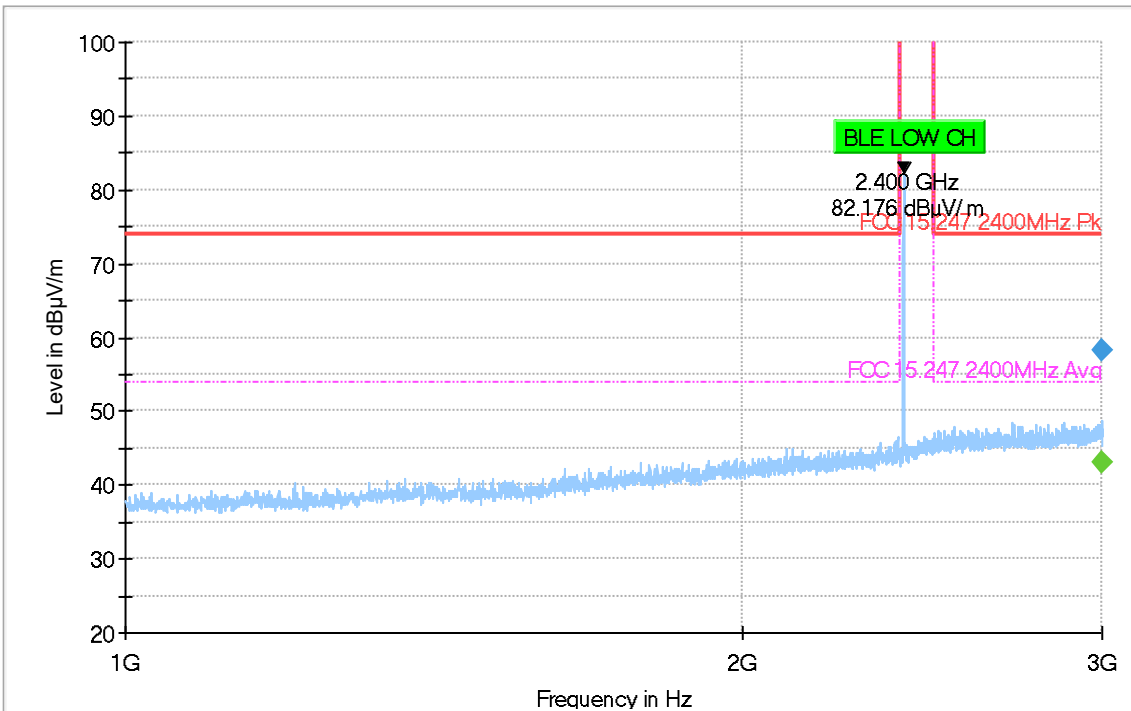
Plot # 3 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2402 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
2998.000	---	43.13	54.00	10.87	500.0	1000.0	236.0	V	160.0	36.2	
2998.000	58.12	---	74.00	15.88	500.0	1000.0	236.0	V	160.0	36.2	

 Preview Result 1-PK+
Final_Result PK+ FCC 15.247 2400MHz Pk
Final_Result CAV FCC 15.247 2400MHz Avg

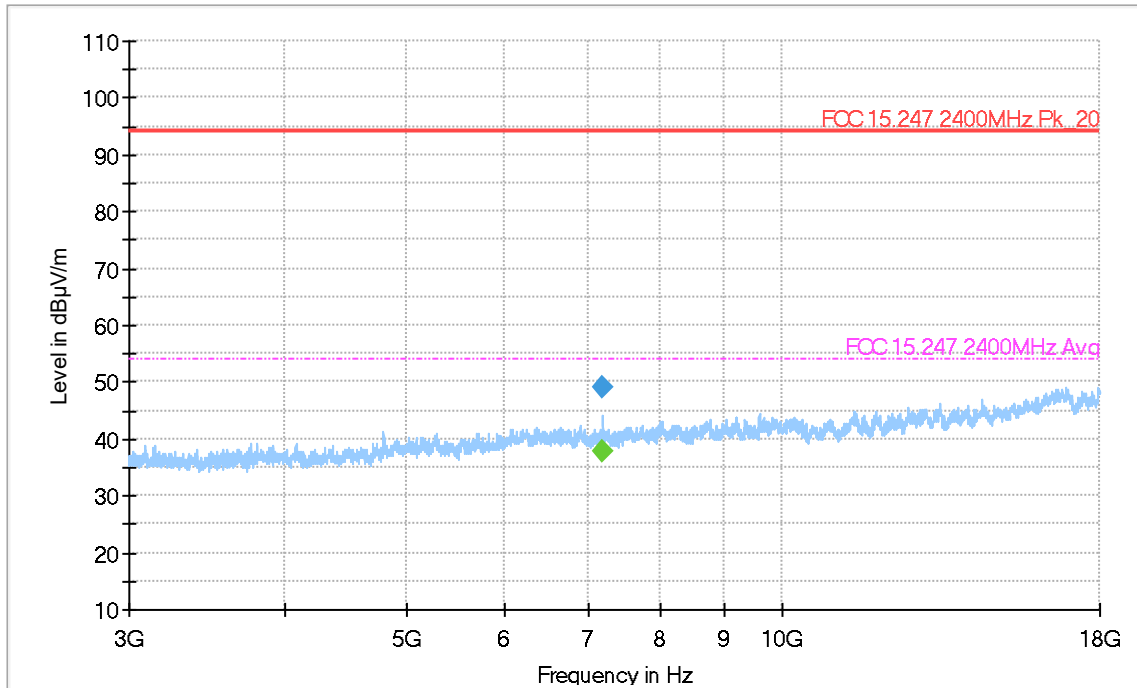
Plot # 4 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2402 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
7198.500	---	37.92	54.00	16.08	500.0	1000.0	118.0	V	192.0	1.9	
7198.500	49.08	---	94.00	44.92	500.0	1000.0	118.0	V	192.0	1.9	



Preview Result 1-PK+
 FCC 15.247 2400MHz Avg
 Final_Result CAV

FCC 15.247 2400MHz Pk_20
 Final_Result PK+

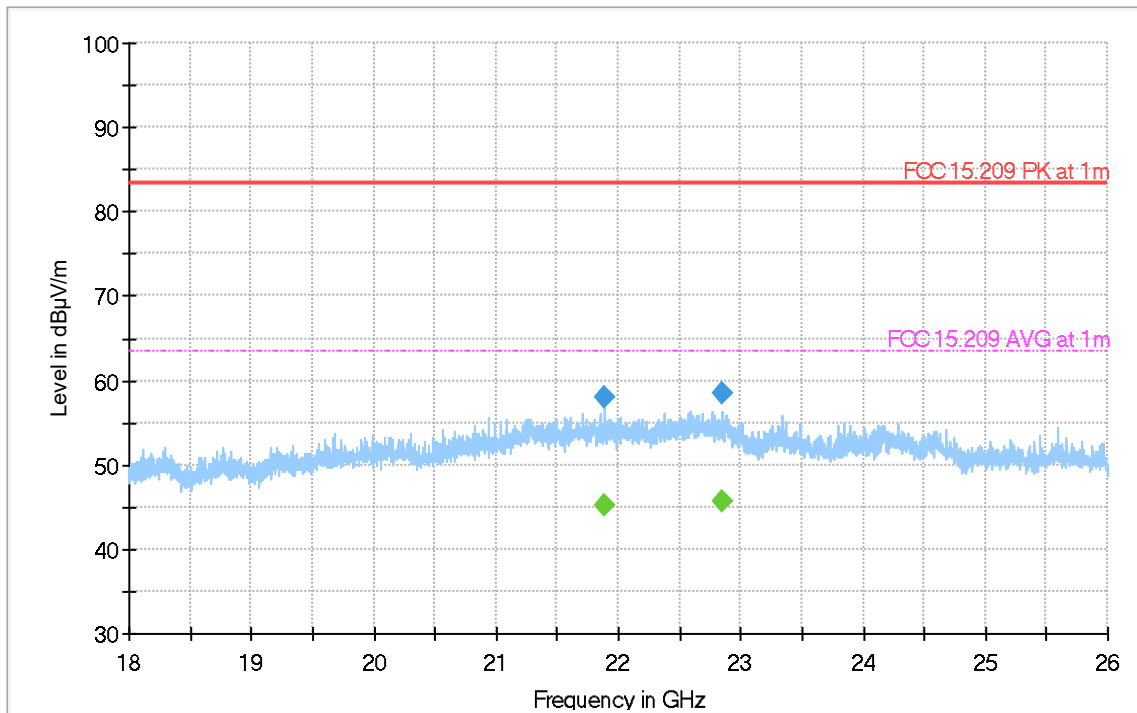
Plot # 5 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2402 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
21884.750	---	45.21	63.50	18.29	500.0	1000.0	140.0	H	88.0	18.8	
21884.750	57.94	---	83.50	25.56	500.0	1000.0	140.0	H	88.0	18.8	
22855.500	---	45.70	63.50	17.80	500.0	1000.0	140.0	V	15.0	19.7	
22855.500	58.43	---	83.50	25.07	500.0	1000.0	140.0	V	15.0	19.7	



◆ Preview Result 1-PK+ Final_Result PK+
 ◆ FCC 15.209 PK at 1m Final_Result CAV
 --- FCC 15.209 AVG at 1m

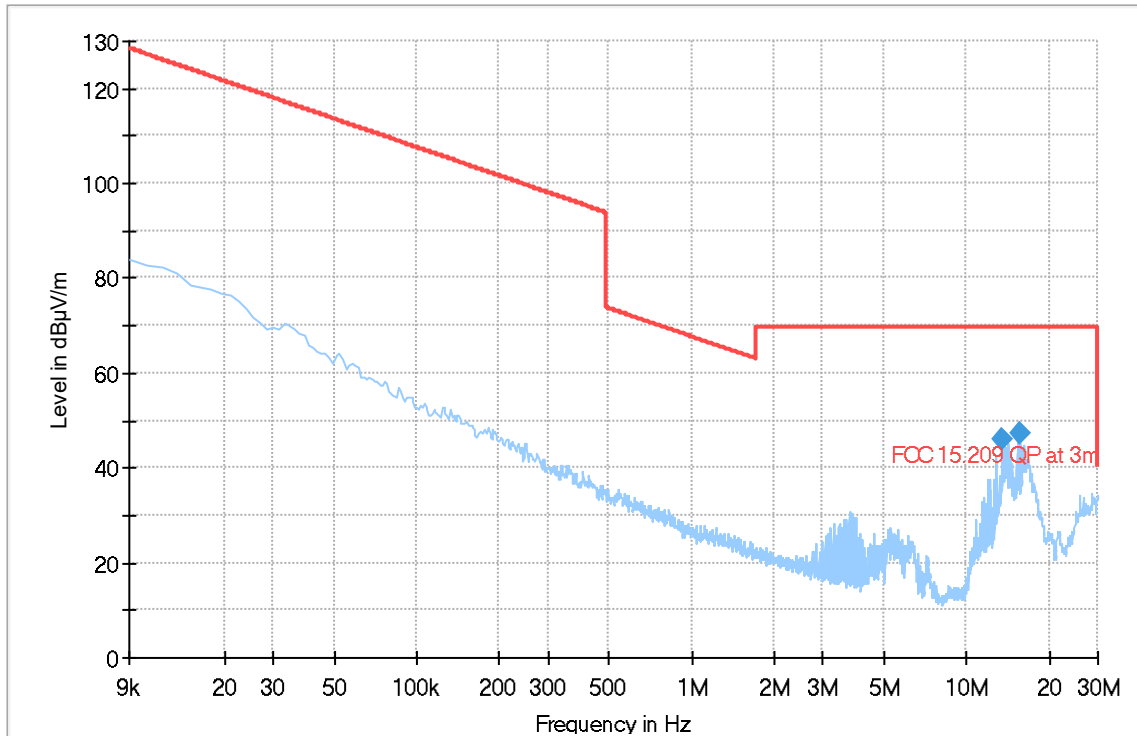
Plot # 6 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2440 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	DET 2 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
13.418	45.83	---	69.50	23.67	500.0	9.0	120.0	H	244.0	5.5	
15.616	47.40	---	69.50	22.10	500.0	9.0	120.0	H	302.0	5.2	



— Preview Result 1-PK+ — FCC 15.209 QP at 3m ◆ Final_Result QPK

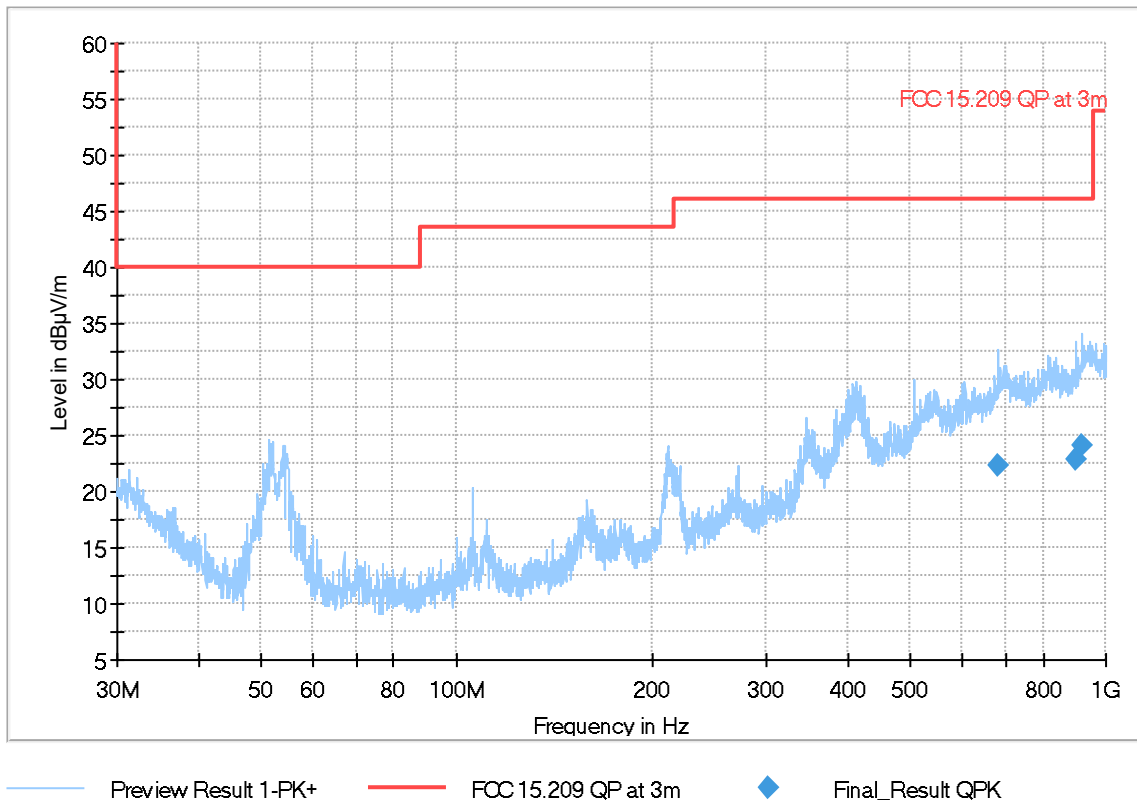
Plot # 7 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2440 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	DET 2 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
681.258	22.27	---	46.02	23.75	500.0	120.0	150.0	H	-27.0	-3.0	
900.114	22.79	---	46.02	23.23	500.0	120.0	100.0	V	37.0	-2.3	
918.569	24.08	---	46.02	21.94	500.0	120.0	150.0	V	0.0	-1.3	



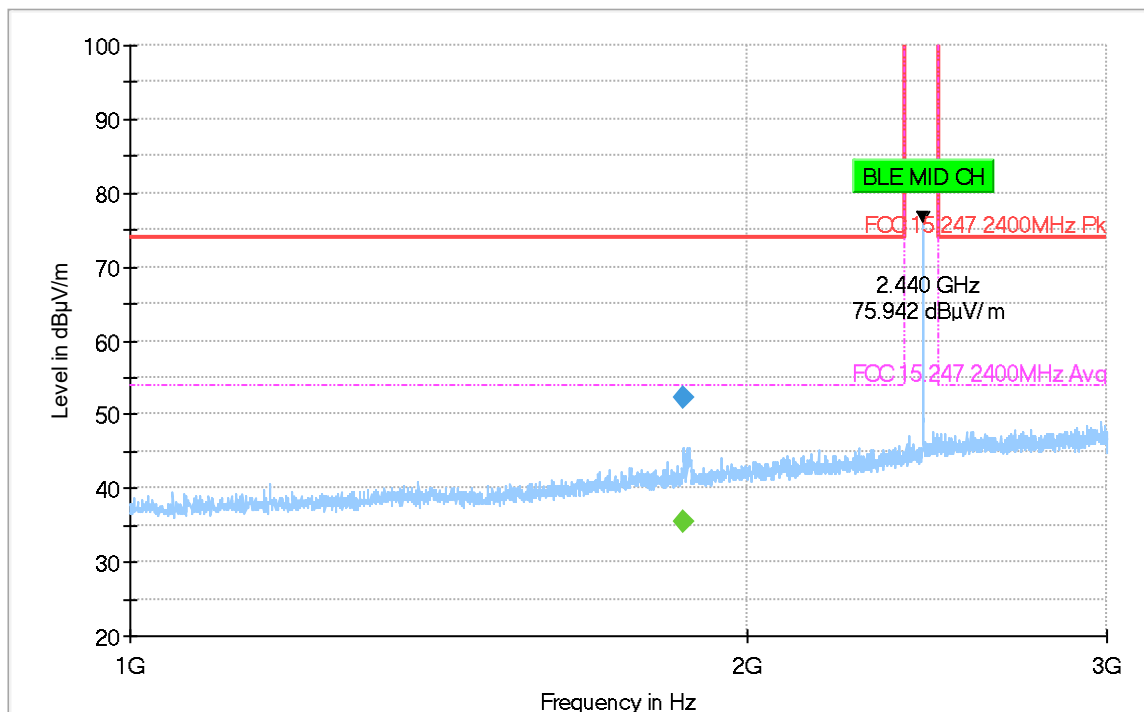
Plot # 8 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2440 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth (Hz)	Height	Pol	Azimuth	Corr. (dB/m)	Comment
1863.000	---	35.39	54.00	18.61	500.0	1000.0	325.0	H	356.0	31.5	
1863.000	52.40	---	74.00	21.60	500.0	1000.0	325.0	H	356.0	31.5	

Preview Result 1-PK+
Final_Result PK+FCC 15.247.2400MHz Pk
Final_Result CAV

FCC 15.247.2400MHz Avg

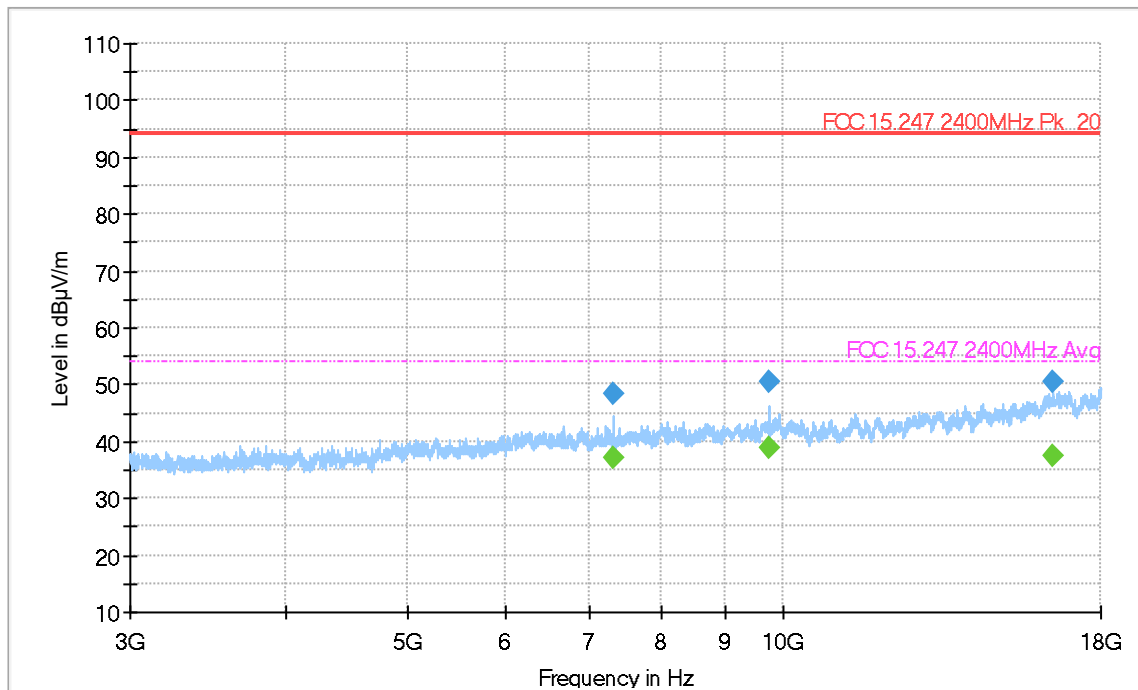
Plot # 9 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2440 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
7318.500	---	37.29	54.00	16.71	500.0	1000.0	100.0	V	193.0	1.1	
7318.500	48.31	---	94.00	45.69	500.0	1000.0	100.0	V	193.0	1.1	
9762.000	---	38.79	54.00	15.21	500.0	1000.0	177.0	V	139.0	3.9	
9762.000	50.55	---	94.00	43.45	500.0	1000.0	177.0	V	139.0	3.9	
16460.750	---	37.59	54.00	16.41	500.0	1000.0	352.0	V	192.0	14.2	
16460.750	50.33	---	94.00	43.67	500.0	1000.0	352.0	V	192.0	14.2	



Preview Result 1-PK+
FCC 15.247 2400MHz Avg
Final_Result CAV

FCC 15.247 2400MHz Pk_20
Final_Result PK+

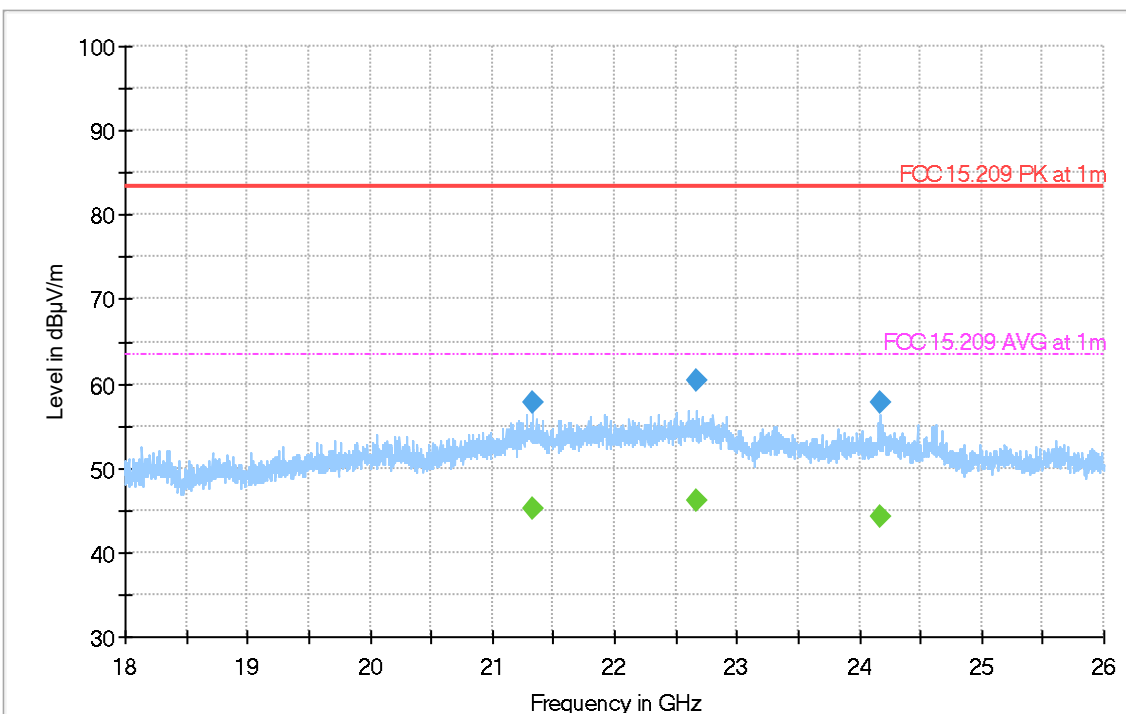
Plot # 10 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2440 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
21331.750	---	45.11	63.50	18.39	500.0	1000.0	140.0	H	230.0	18.2	
21331.750	57.82	---	83.50	25.68	500.0	1000.0	140.0	H	230.0	18.2	
22664.500	60.45	---	83.50	23.05	500.0	1000.0	140.0	H	127.0	19.9	
22664.500	---	46.05	63.50	17.45	500.0	1000.0	140.0	H	127.0	19.9	
24174.000	57.84	---	83.50	25.66	500.0	1000.0	140.0	H	297.0	18.3	
24174.000	---	44.13	63.50	19.37	500.0	1000.0	140.0	H	297.0	18.3	



Preview Result 1-PK+
Final_Result PK+

Final_Result CAV

FCC 15.209 PK at 1m

FCC 15.209 AVG at 1m

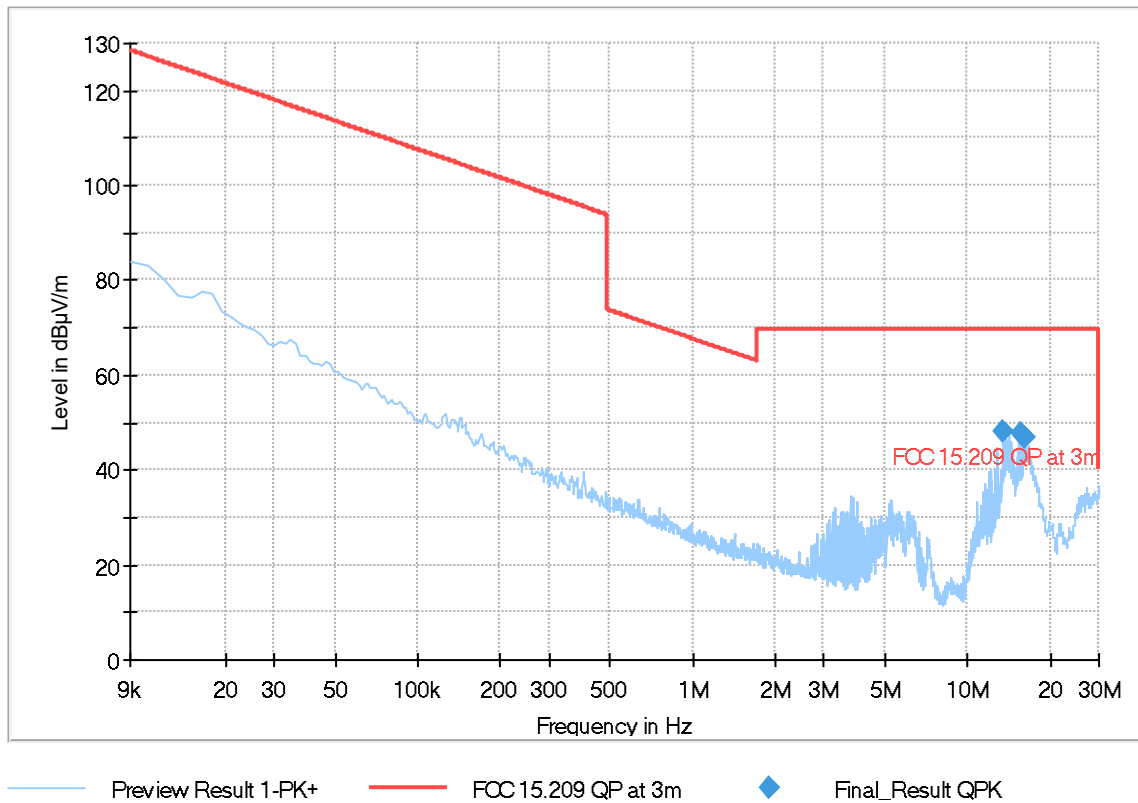
Plot # 11 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2480 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	DET 2 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
13.418	48.13	---	69.50	21.37	500.0	9.0	120.0	V	297.0	5.5	
15.616	47.87	---	69.50	21.63	500.0	9.0	120.0	H	46.0	5.2	
16.167	46.84	---	69.50	22.66	500.0	9.0	120.0	V	354.0	5.2	



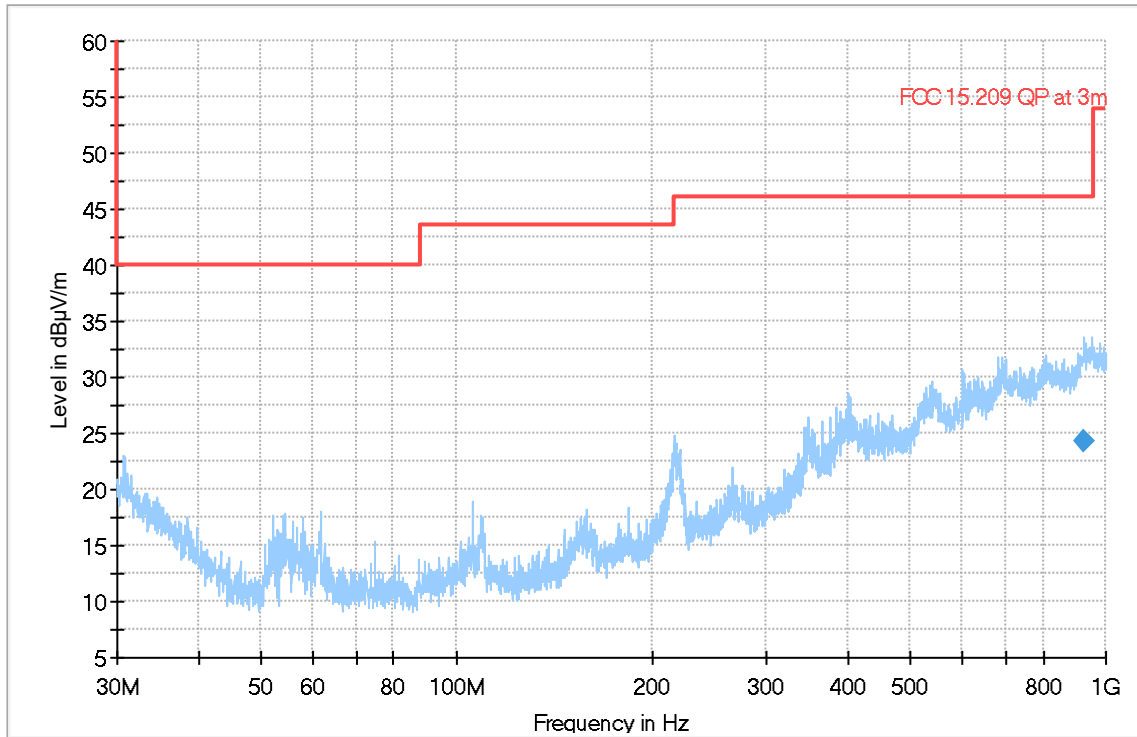
Plot # 12 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2480 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	DET 2 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
924.777	24.25	---	46.02	21.77	500.0	120.0	100.0	H	116.0	-0.9	



— Preview Result 1-PK+ — FCC 15.209 QP at 3m ◆ Final_Result QPK

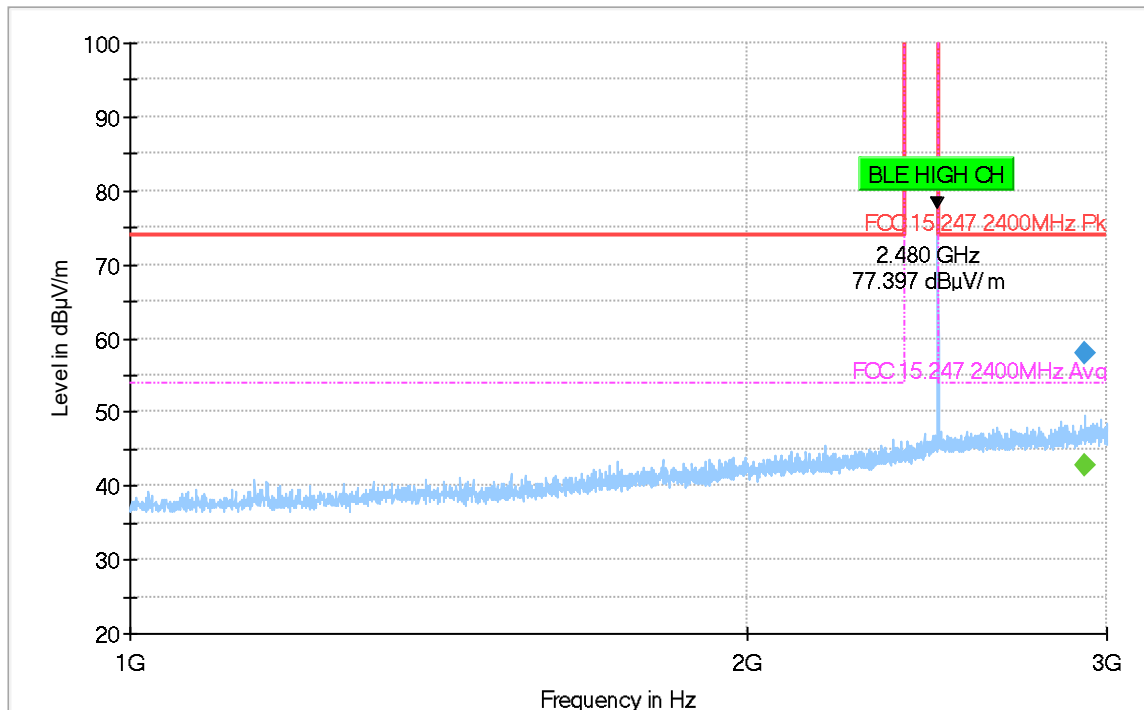
Plot # 13 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2480 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
2926.500	---	42.88	54.00	11.12	500.0	1000.0	200.0	V	16.0	35.9	
2926.500	57.94	---	74.00	16.06	500.0	1000.0	200.0	V	16.0	35.9	



Preview Result 1-PK+
Final_Result PK+

FCC 15.247 2400MHz Pk
Final_Result CAV

FCC 15.247 2400MHz Avg

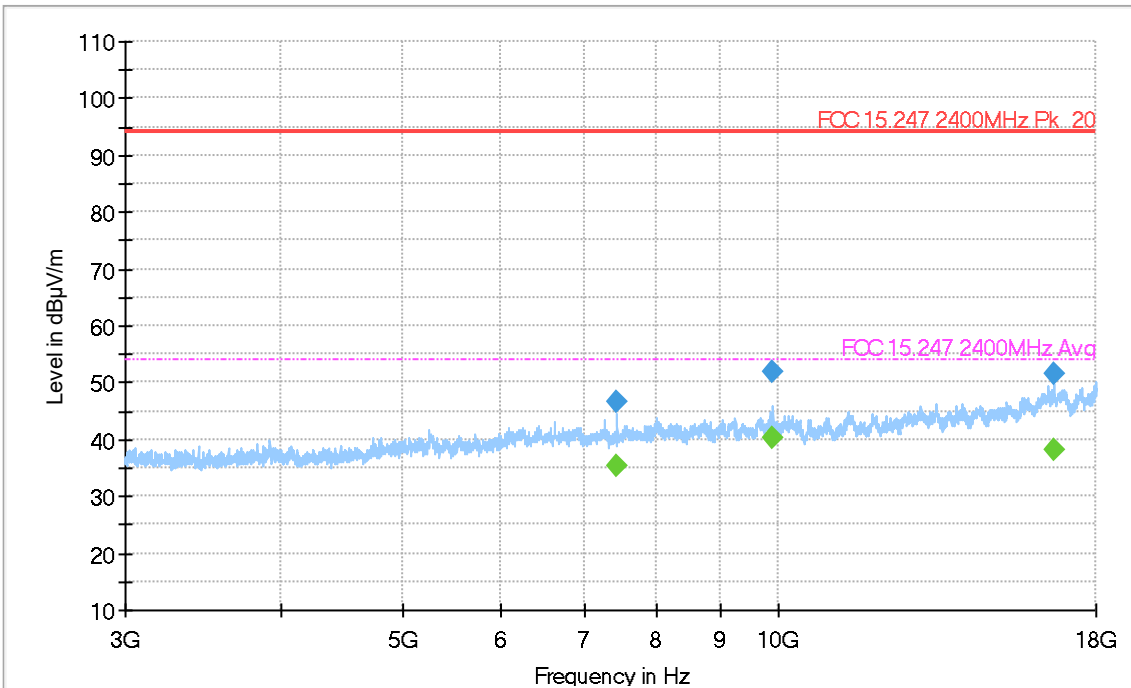
Plot # 14 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2480 MHz

Modulation: 2M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
7438.750	---	35.51	54.00	18.49	500.0	1000.0	107.0	H	110.0	1.5	
7438.750	46.74	---	94.00	47.26	500.0	1000.0	107.0	H	110.0	1.5	
9922.250	51.79	---	94.00	42.21	500.0	1000.0	192.0	V	141.0	5.7	
9922.250	---	40.31	54.00	13.69	500.0	1000.0	192.0	V	141.0	5.7	
16641.250	51.43	---	94.00	42.57	500.0	1000.0	398.0	H	184.0	14.6	
16641.250	---	38.29	54.00	15.71	500.0	1000.0	398.0	H	184.0	14.6	



Preview Result 1-PK+
FCC 15.247 2400MHz Avg
Final Result CAV

FCC 15.247 2400MHz Pk_20
Final Result PK+

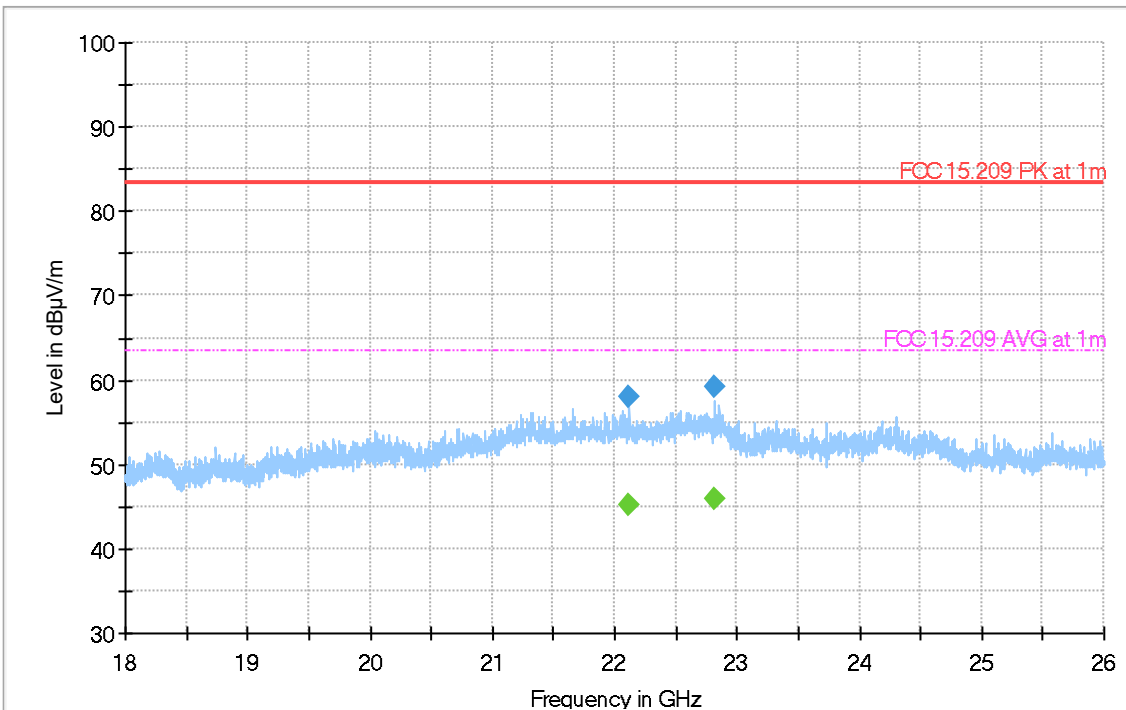
Plot # 15 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2480 MHz

Modulation: 2M

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m)	Comment
22122.000	57.99	---	83.50	25.51	500.0	1000.0	140.0	H	65.0	18.8	
22122.000	---	45.20	63.50	18.30	500.0	1000.0	140.0	H	65.0	18.8	
22812.750	59.19	---	83.50	24.31	500.0	1000.0	140.0	H	76.0	19.8	
22812.750	---	45.86	63.50	17.64	500.0	1000.0	140.0	H	76.0	19.8	



Preview Result 1-PK+
 Final_Result PK+

FCC 15.209 PK at 1m
 Final_Result CAV

FCC 15.209 AVG at 1m

9 Test setup photos

Setup photos are included in supporting file name: "EMC_GEOFO_051_25001_15.247_BTLE_DTS_Setup_Photos.pdf"

10 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
Active Monopole	Com-Power Corp.	AM-741R	10200112	3 Years	11/09/2023
PASSIVE LOOP ANTENNA	ETS LINDGREN	6512	00049838	3 Years	09/06/2023
AVTIVE LOOP ANTENNA (	ETS LINDGREN	6507	00161344	3 Years	08/13/2024
BILOG ANTENNA	ETS.LINDGREN	3142E	00166067	3 Years	08/01/2024
HORN ANTENNA	EMCO	3115	00035114	3 Years	09/13/2023
HORN ANTENNA	ETS.LINDGREN	3117	00215984	3 Years	10/26/2023
HORN ANTENNA	ETS LINDGREN	3116C-PA	00166821	3 Years	10/26/2023
TEST RECEIVER	R&S	ESW44	103143	2 Years	09/12/2024
DIGITAL THERMOMETER	CONTROL COMPANY	4410,90080-03	230713059	3 Years	10/18/2023
PULSE LIMITER	R&S	ESH3-Z2	102473	3 Years	11/02/2023
LISN	FCC	FCC-LISN-50-25-2-08	08014	2 Years	10/06/2023
V-Network LISN	R&S	ESH3-Z6	836154/011	3 Years	10/06/2023
Multimeter	Fluke	115	56090717MV	3 Years	09/26/2023
Software	EMC32	Version 11.40.00	-	-	-

Note: Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels. Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

11 History

Date	Report Name	Changes to report	Prepared by
2025-08-26	EMC_GEOFO_051_25001_FCC_15_247_BTLE_DTS	Initial Version	Art Thammanavarat

<<< The End >>>