



FCC / ISED Test Report

For:
Lennox Industries Inc.

Model Name:
30L26

Product Description:
Smart thermostat to control residential HVAC system

FCC ID: 2A6F9-E4025A
IC: 28687-E4025A

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

REPORT #: EMC_LENNX_032_26001_15_247_BTLE_DTS

DATE: 2026-03-11



IC recognized #
3462B

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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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.

There were no additions, deviations, or exclusions made from the test method.

Company Name	Product Description	Model No.
Lennox Industries Inc.	Smart thermostat to control residential HVAC system	30L26

Report Authorized by:

Responsible for testing Laboratory:

2026-03-11	Compliance	Alvin, Ilarina (Director of EMC Services)	Alvin ILARINA Digitally signed by Alvin ILARINA Date: 2026.03.11 15:26:13 -07'00'
Date	Section	Name	Signature

Responsible for the Report:

2026-03-11	Compliance	Cheng Song (EMC Engineer)	Cheng Song CN = Cheng Song email = cheng.song@cetecom.com C = US O = CETECOM INC. 2026.03.11 11:28:49 -07'00'
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section3.

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:	Ruby, Hall

2.2 Identification of the Client

Applicant's Name:	Lennox Industries Inc.
Street Address:	1600 Metrocrest Dr
City/Zip Code	Carrollton, TX 75006
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:	Smart thermostat to control residential HVAC system
Model Name :	30L26
HW Version:	108878
SW Version:	04.60.0156
FCC-ID:	2A6F9-E4025A
IC:	28687-E4025A
Marketing Name:	Lennox E40 Smart Thermostat
FVIN:	04.60.0156
HVIN:	108878-01
PMN:	Lennox E40 Smart Thermostat
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 Module</u> Model Name: SiliconLabs Model Number: BGM210PA32JIA2 <u>Wireless Technologies</u> Bluetooth LE
Max. declared antenna gain	Brand Name: Runshun Part No: B43X.W0.1.334 Type: WIFI Antenna With RG1.13 Cable MHF1 Connector Location: Internal Peak Gain: 2.5 dBi
Other Radios included in the device	Wi-Fi 2.4 GHz & Wi-Fi 5GHz
Power Supply/ Rated Operating Voltage Range	Vmin: 18 Vac / Vnom: 24 Vac / Vmax: 30 Vac
Operating Temperature Range	Low: 0 °C / High 40 °C
Sample Revision	☐ Production ☒ Pre-Production
EUT Dimensions	136mm x 86mm x 25mm
EUT Diameter	☒ < 60 cm ☐ Other _____
Note: The information of the EUT specifications in the table above is provided by the client.	

3.2 EUT Power Setting

Channel Number	2400 – 2483.5 MHz	
	1Mbit/s	2Mbit/s
Low	17	17
Mid	17	17
High	17	17

Note: The device configures its power settings through Python and shell scripts

3.3 EUT Sample details

EUT #	Model Number	HW Version	SW Version	Notes/Comments
1	30L26	108878	04.60.0156	Radiated & Conducted Emission

3.4 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number	Comments
1	Laptop	P135G	Dell	12243628947	Support laptop provided by Cetecom to exercise device.
2	USB				The debug adapter (USB-UART)
3	Transformer	MGT2450	MG Electronics	69NOE197643	120Vac to 24Vac

3.5 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#2+AE1,2,3	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 external antenna was connected. The client provides a USB cable to communicate with the device and send commands for configuring the Wi-Fi radios into a specific test mode. This test mode configuration, designed for worst-case scenarios, is not intended for end-user application and is outlined as follows: • BLE: continuous modulated transmission at the maximum power settings, highest duty cycle. • EUT power by 24VAC • Radiated RF measurements were performed with EUT configured via customer provided Python script and instructions • The EUT connected to support laptop to exercise device

3.6 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	BT LE	Bluetooth LE radio was configured to a fixed channel transmission with highest possible duty cycle using confidential test software and scripts provided by the applicant.

3.7 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. For radiated measurements, all data in this report show 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.

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.

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.247(a)(1) RSS-247 5.2(a)	Emission Bandwidth	Nominal	LE 1M LE 2M	☒	☐	☐	Complies
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	LE 1M LE 2M	☒	☐	☐	Complies
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	LE 1M LE 2M	☒	☐	☐	Complies
§15.247(d) RSS-247 5.5	Band edge compliance Non-restricted Band Edges	Nominal	LE 1M LE 2M	☒	☐	☐	Complies
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	LE 1M LE 2M	☒	☐	☐	Complies
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious Emissions- Radiated	Nominal	LE 2M	☒	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	LE 2M	☒	☐	☐	Complies

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

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:

2025-10-24 – 2026-03-02

6.3 Decision Rule:

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

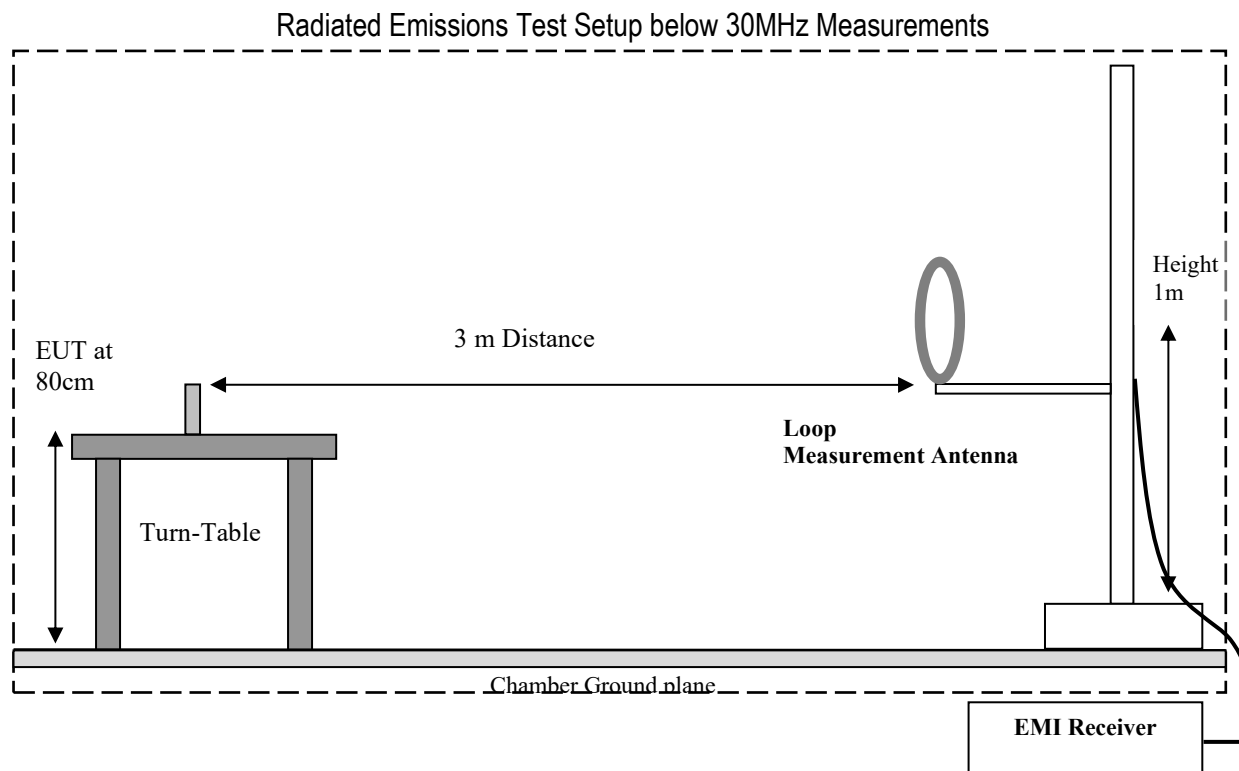
Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither 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

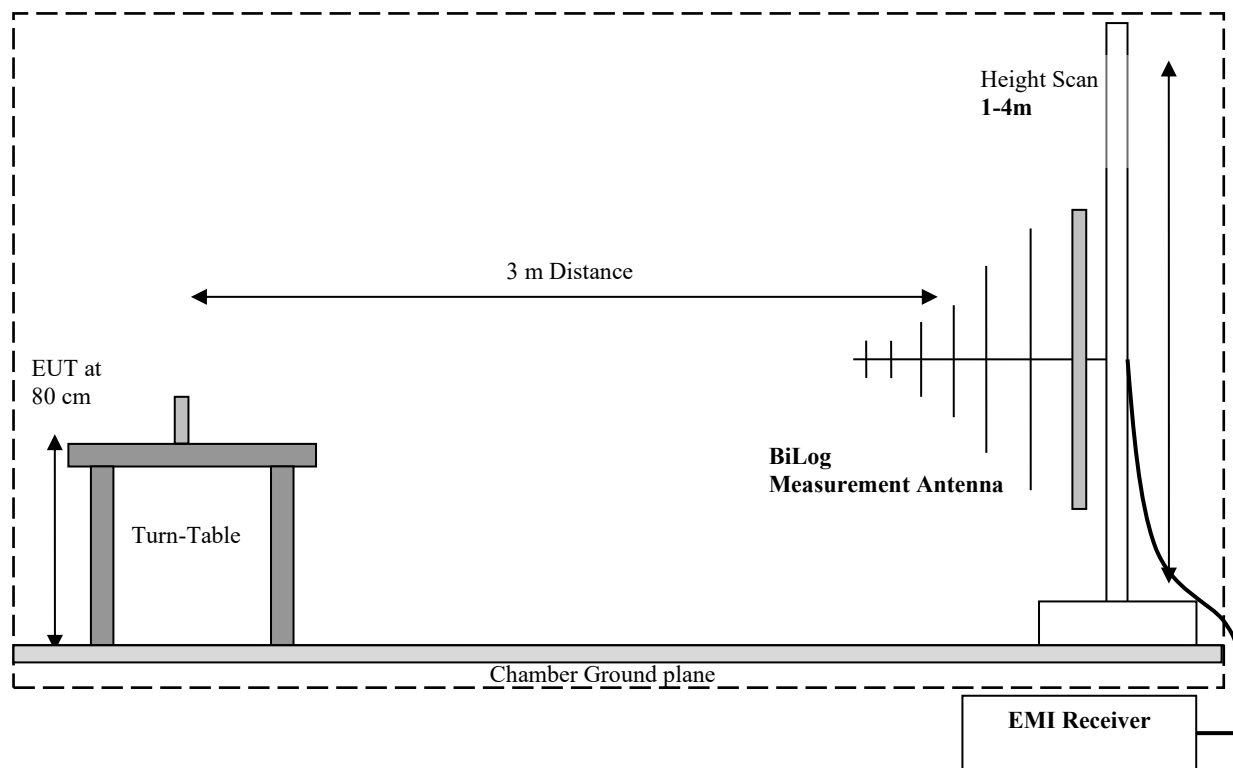
7.1 Radiated Measurement

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

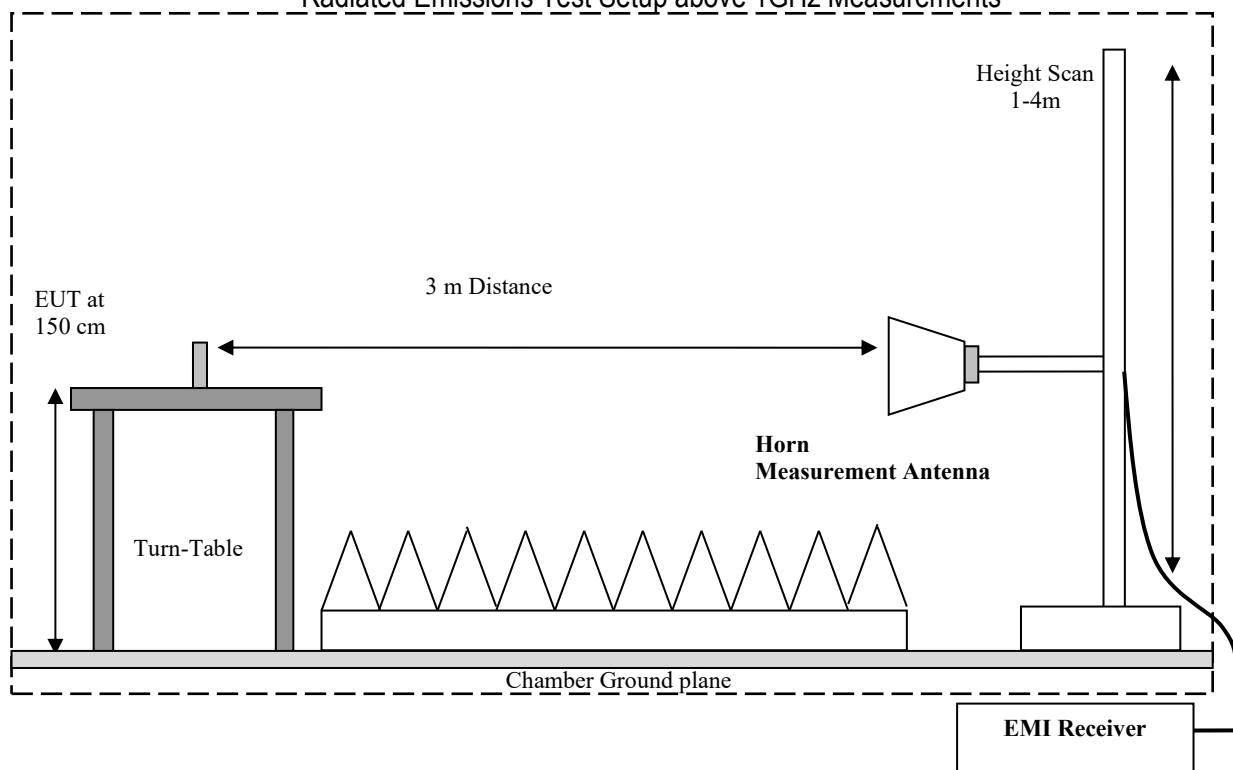
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to 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.

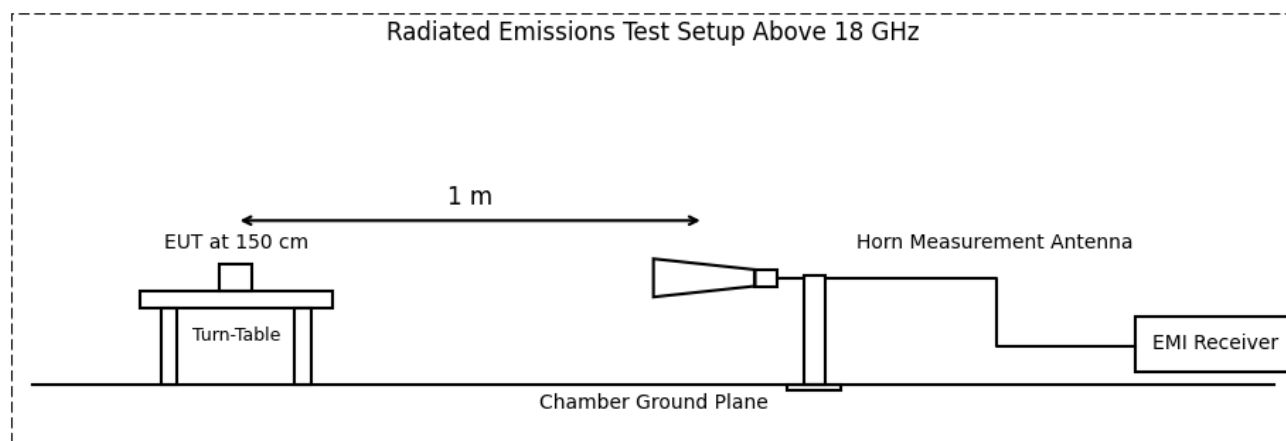


Radiated Emissions Test Setup 30MHz-1GHz Measurements



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

For measurements performed above 18 GHz, the radiated spurious emissions were investigated at a measurement distance of 1 m. Since the applicable FCC limit is referenced to 3 m, the measured result is extrapolated to an equivalent 3 m field strength using the inverse distance relationship:

$$\text{Distance Correction} = 20 \log (d_{\text{meas}} / d_{\text{ref}})$$

To convert a measurement at 1 m to an equivalent 3 m field strength

$$FS_{3m} = FS_{1m} - 9.54 \text{ dB}$$

Alternatively, the regulatory limit may be adjusted to the measurement distance

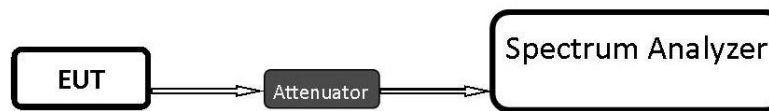
$$\text{Limit}_{1m} = \text{Limit}_{3m} + 9.54 \text{ dB}$$

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	1	LE 1M PHY LE 2M PHY	120Vac to 24Vac	2.5 dBi

8.1.4 Measurement result:

Plot #	Frequency (MHz)	PHY	Maximum Peak Conducted Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2402	LE 1M	17.7	20.2	30 (Pk) / 36 (EIRP)	Pass
2	2440		17.3	19.8	30 (Pk) / 36 (EIRP)	Pass
3	2480		17.3	19.8	30 (Pk) / 36 (EIRP)	Pass
4	2402	LE 2M	17.8	20.3	30 (Pk) / 36 (EIRP)	Pass
5	2440		17.4	19.9	30 (Pk) / 36 (EIRP)	Pass
6	2480		17.4	19.9	30 (Pk) / 36 (EIRP)	Pass

Note: For certain test cases where the measurement plots were determined to be similar, only the plot corresponding to the worst-case configuration is presented in the following section.

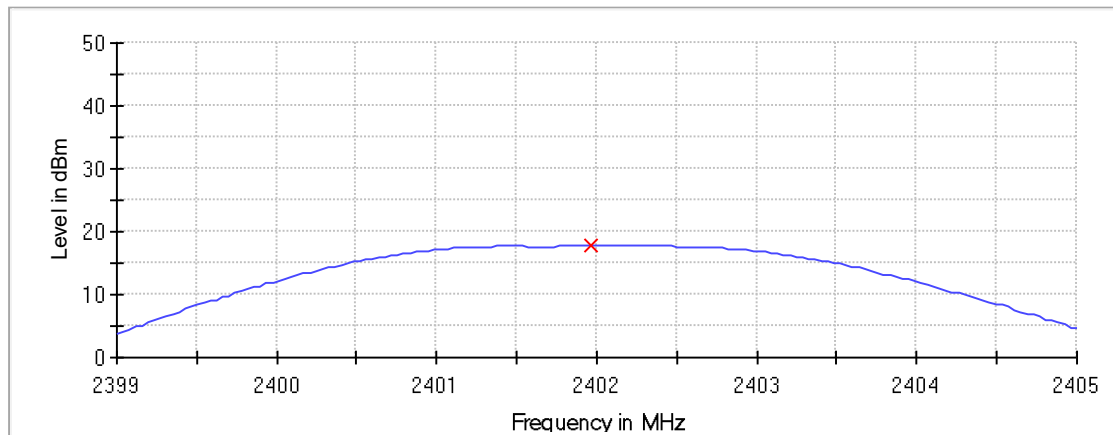
8.1.5 Measurement Plots:

Peak output power (Sweep) (2402 MHz; 10.000 dBm; 1 MHz)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	17.8	30.0	PASS

Peak Power



— Connector 1 × Peak Connector 1

Peak Power 1

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39900 GHz	2.39900 GHz
Stop Frequency	2.40500 GHz	2.40500 GHz
Span	6.000 MHz	6.000 MHz
RBW	2.000 MHz	≥ 1.130 MHz
VBW	10.000 MHz	≥ 6.000 MHz
SweepPoints	155	~ 101
SweepTime	2.500 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

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	1	LE 1M PHY LE 2M PHY	120Vac to 24Vac	2.5 dBi

8.2.4 Measurement result:

Plot #	PHY	Frequency (MHz)	Maximum Power Spectral Density (dBm/3 kHz)	Limit (dBm / 3 kHz)	Result
1	LE 1M	2402	2.756	8	Pass
2		2440	2.447	8	Pass
3		2480	2.421	8	Pass
4	LE 2M	2402	2.184	8	Pass
5		2440	1.818	8	Pass
6		2480	1.765	8	Pass

Note: For certain test cases where the measurement plots were determined to be similar, only the plot corresponding to the worst-case configuration is presented in the following section.

8.2.5 Measurement Plots:

Peak Power Spectral Density (2402 MHz; 10.000 dBm; 1 MHz)

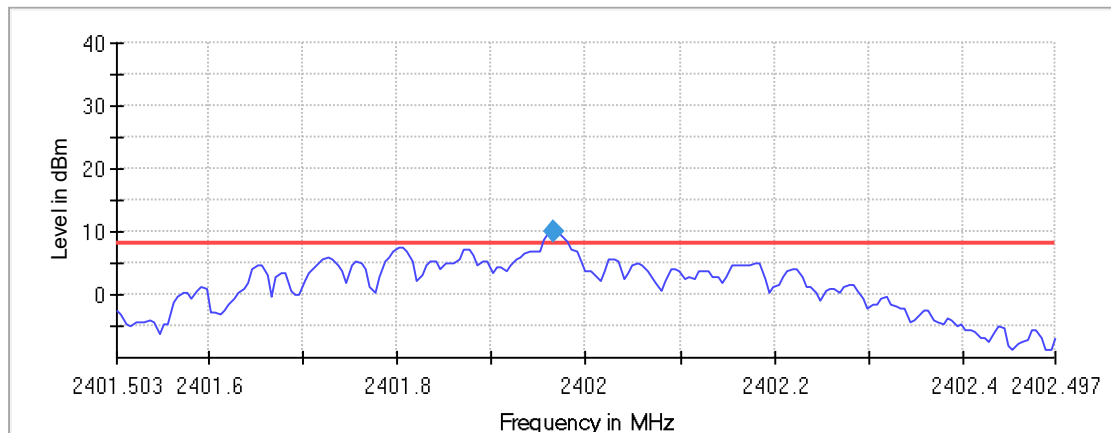
Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2401.948669	2.756	8.0	PASS

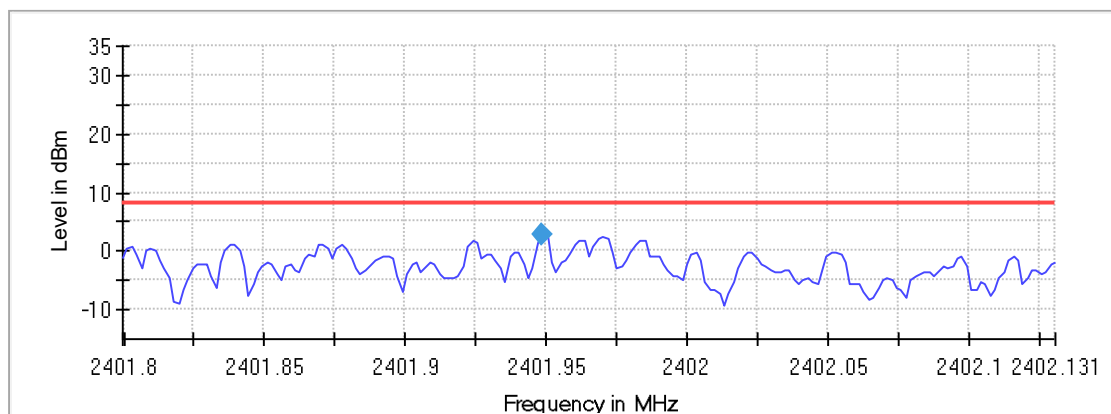
Ports

Port	State
1	used

Peak Power Spectral Density



Peak Power Spectral Density 2nd



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40150 GHz	2.40150 GHz
Stop Frequency	2.40250 GHz	2.40250 GHz
Span	993.506 kHz	993.506 kHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	201	~ 199
SweepTime	40.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	3 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.07 dB	0.50 dB

2nd Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40180 GHz	2.40180 GHz
Stop Frequency	2.40213 GHz	2.40213 GHz
Span	331.169 kHz	331.169 kHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	201	~ 221
SweepTime	40.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	10	10
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	2 / max. 150	max. 150
Stable	1 / 1	1
Max Stable Difference	0.00 dB	0.50 dB

8.3 Band Edge Compliance

8.3.1 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

8.3.2 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

8.3.3 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			

8.3.4 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
22° C	1	LE 1M PHY LE 2M PHY	120Vac to 24Vac	2.5 dBi

8.3.5 Measurement result:

Test #	Frequency	PHY	Band Edge	In band Peak Level	Level	Margin	Limit	Result
	(MHz)			(dBm)	(dBm)	(dBm)	(dBm)	
1	2402	LE 1M	Lower, Non-restricted (conducted)	20	-26.6	26.6	0	Pass
2	2402	LE 2M	Lower, Non-restricted (conducted)	20.1	-12.3	12.3	0.1	Pass
3	2480	LE 1M	Upper, Non-restricted (conducted)	19.6	-33	32.6	-0.4	Pass
4	2480	LE 2M	Upper, Non-restricted (conducted)	19.7	-32	31.7	-0.3	Pass

Note 1: An antenna gain correction of 2.5 dBi was applied by the measurement system to the measured power values. The corrected results are reflected in the "Measurement Plots" section below.

Note 2: For certain test cases where the measurement plots were determined to be similar, only the plot corresponding to the worst-case configuration is presented in the following section.

8.3.6 Measurement Plots:

Band Edge low (2402 MHz; 10.000 dBm; 1 MHz)

Result

DUT Frequency (MHz)	Result
2402.000000	PASS

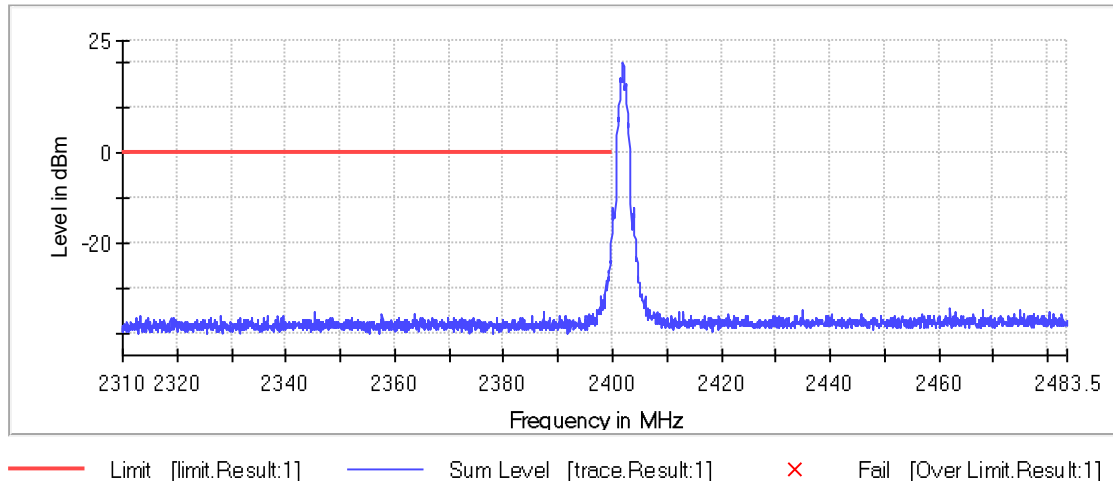
Inband Peak

Frequency (MHz)	Level (dBm)
2401.964706	20.1

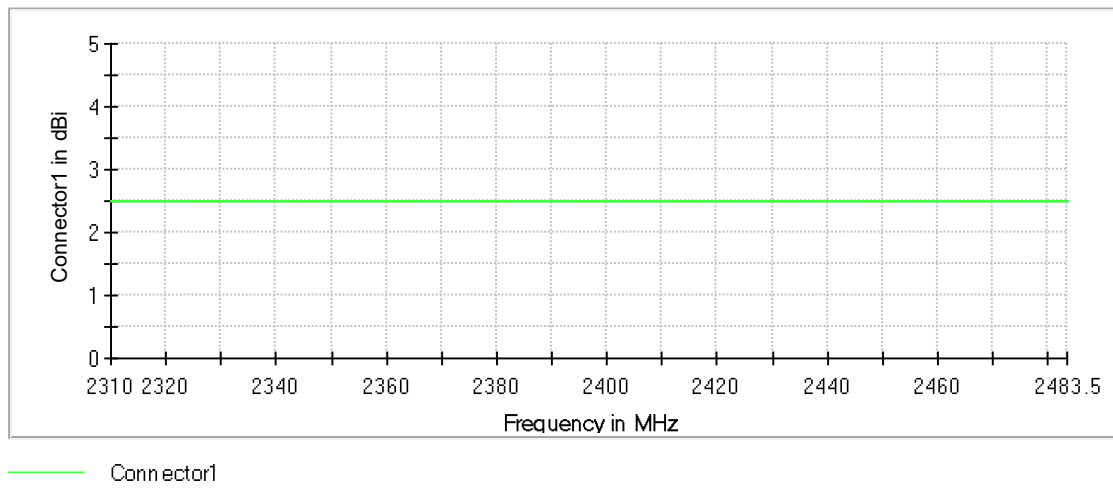
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.950000	-12.3	12.3	0.1	PASS
2400.000000	-12.7	12.7	0.1	PASS
2399.900000	-14.4	14.5	0.1	PASS
2399.850000	-17.9	17.9	0.1	PASS
2399.800000	-20.2	20.3	0.1	PASS
2399.750000	-21.2	21.3	0.1	PASS
2399.700000	-21.9	22.0	0.1	PASS
2399.650000	-23.0	23.1	0.1	PASS
2399.500000	-23.9	24.0	0.1	PASS
2399.550000	-24.0	24.1	0.1	PASS
2399.600000	-24.4	24.5	0.1	PASS
2399.450000	-24.7	24.8	0.1	PASS
2399.250000	-26.2	26.3	0.1	PASS
2399.300000	-26.5	26.6	0.1	PASS
2399.400000	-26.7	26.8	0.1	PASS

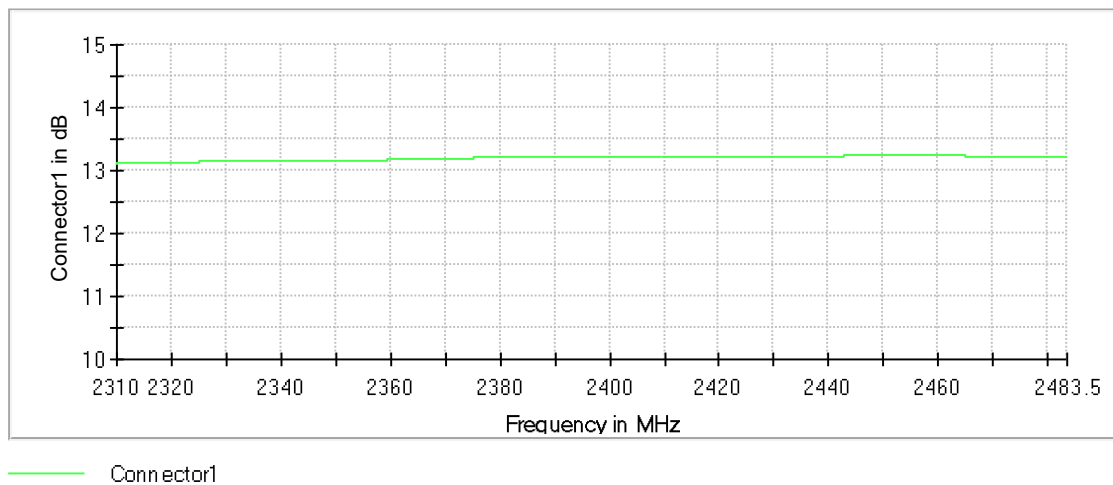
Band Edge



Gain



Attenuation



Measurement 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1801	~ 1800
Sweeptime	10.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1701	~ 1670
Sweeptime	10.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.11 dB	0.50 dB

8.4 Emission Bandwidth 6dB and 99% Occupied Bandwidth

8.4.1 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.

8.4.2 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.

8.4.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	LE 1M PHY LE 2M PHY	120Vac to 24Vac

8.4.4 Measurement result:

Plot #	PHY	Frequency	6dB Emissions Bandwidth	Limit	Result
		(MHz)	(MHz)	(MHz)	
1	LE 1M	2402	0.662337	> 0.5	Pass
2		2440	0.662337	> 0.5	Pass
3		2480	0.662337	> 0.5	Pass
4	LE 2M	2402	1.129871	> 0.5	Pass
5		2440	1.129871	> 0.5	Pass
6		2480	1.129871	> 0.5	Pass

Plot #	PHY	Frequency	99% Occupied Bandwidth	Limit	Result
		(MHz)	(MHz)	(MHz)	
7	LE 1M	2402	1.035000	N/A	Pass
8		2440	1.025000	N/A	Pass
9		2480	1.035000	N/A	Pass
10	LE 2M	2402	1.860000	N/A	Pass
11		2440	1.860000	N/A	Pass
12		2480	1.865000	N/A	Pass

Note: For certain test cases where the measurement plots were determined to be similar, only the plot corresponding to the worst-case configuration is presented in the following section.

8.4.5 Measurement Plots:

Minimum Emission Bandwidth 6 dB (2440 MHz; 10.000 dBm; 1 MHz)

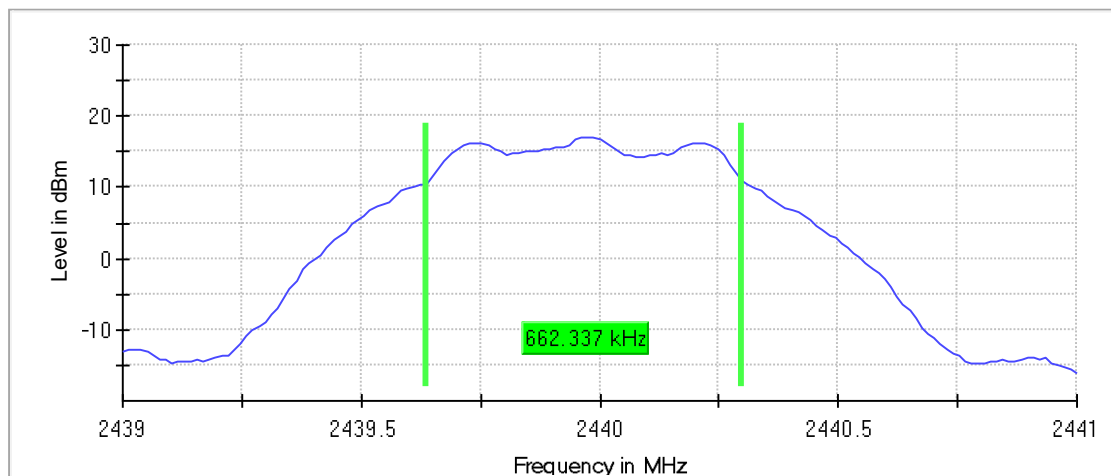
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.662337	0.500000	---	2439.636364	2440.298701

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	17.1	PASS

6 dB Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	155	~ 40
SweepTime	2.500 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.10 dB	0.50 dB

Occupied Channel Bandwidth 99% (2440 MHz; 10.000 dBm; 1 MHz)

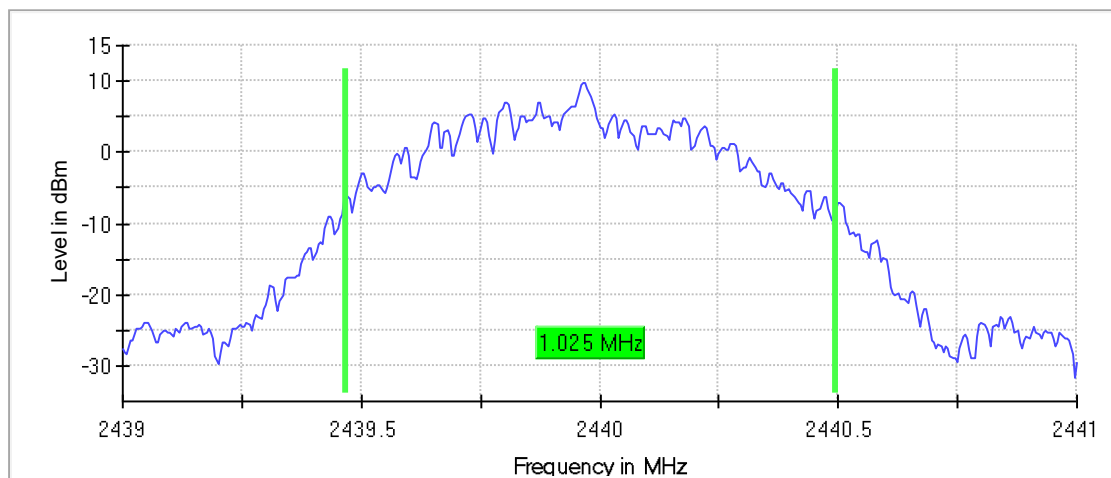
99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.025000	---	---	2439.470000	2440.495000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS

99 % Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	401	~ 400
SweepTime	80.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.07 dB	0.30 dB

8.5 Radiated Transmitter Spurious Emissions and Restricted Bands

8.5.1 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.

8.5.2 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

8.5.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	LE 2M PHY	120VAC to 24VAC

8.5.4 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
16	Restricted Band Edge Low	2360 – 2412 MHz	See section 8.5.2	Pass
17	Restricted Band Edge High	2462 – 2500 MHz	See section 8.5.2	Pass

Note: BLE LE 2M PHY was selected for Radiated Transmitter Spurious Emissions testing because it exhibited the highest measured Maximum Peak Conducted Output Power and EIRP (worst-case). Radiated spurious measurements were therefore performed with the EUT configured to BLE LE 2M at maximum power on Low/Mid/High channels (2402/2440/2480 MHz) to represent worst-case operation.

8.5.5 Measurement Plots:

Plot # 1 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2402 MHz

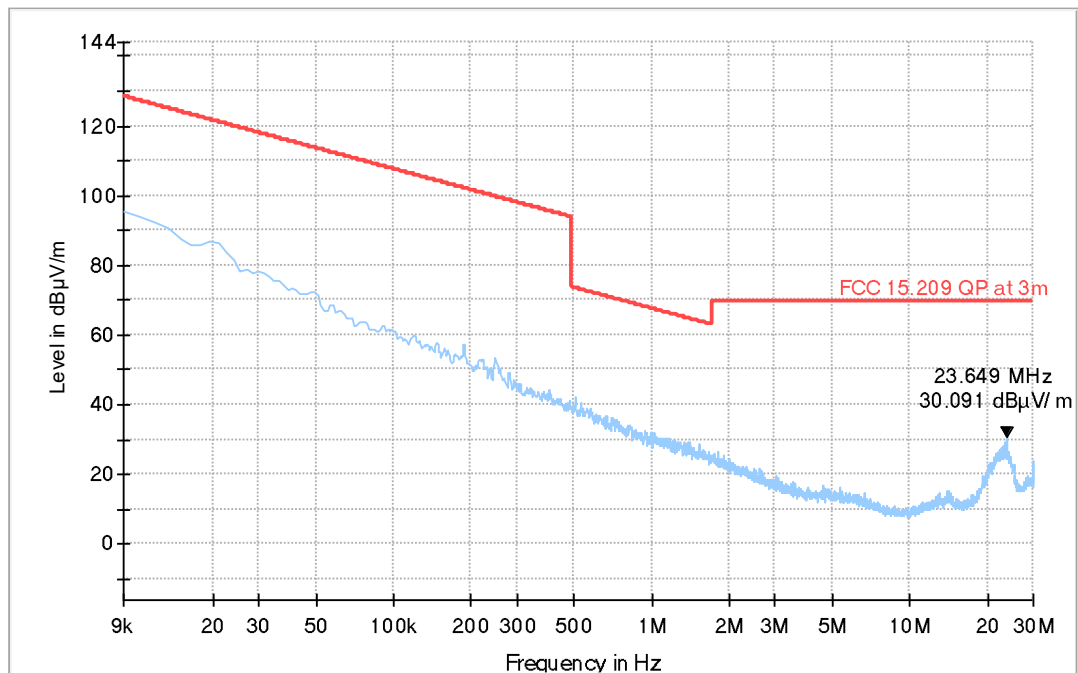
Modulation: 2m

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preampl (dB)	Trd Corr. (dB/m)
---	---	---	---	---	---	---	---	---	---	---	---	---	---

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBµV)
---	---



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

Plot # 2 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2402 MHz

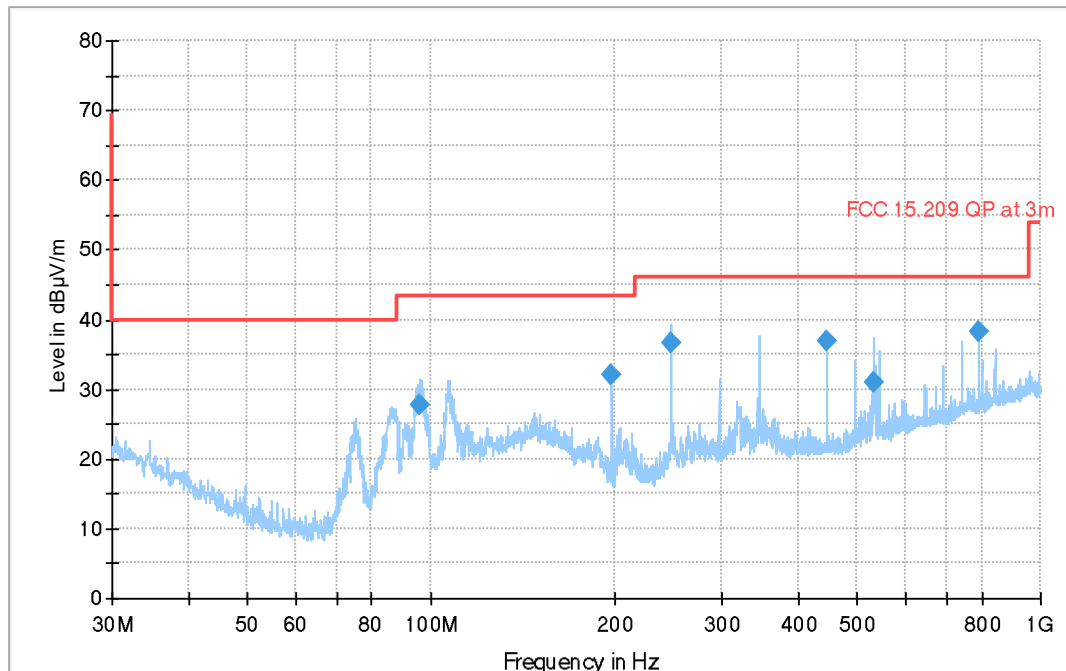
Modulation: 2m

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
96.202	27.757	---	43.50	15.74	500.0	120.0	225.0	H	15.0	-15.3	-34.6	0.0	19.4
198.003	31.929	---	43.50	11.57	500.0	120.0	226.0	H	298.0	-16.2	-34.2	0.0	18.0
247.509	36.681	---	46.02	9.34	500.0	120.0	197.0	H	350.0	-11.3	-34.0	0.0	22.7
445.501	36.819	---	46.02	9.20	500.0	120.0	118.0	V	20.0	-10.6	-33.3	0.0	22.7
533.610	30.941	---	46.02	15.08	500.0	120.0	209.0	H	114.0	-8.7	-33.0	0.0	24.3
791.994	38.380	---	46.02	7.64	500.0	120.0	125.0	H	171.0	-4.3	-32.4	0.0	28.1

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
96.202	43.0
198.003	48.1
247.509	48.0
445.501	47.4
533.610	39.6
791.994	42.7



Preview Result 1-PK+ Final_Result QPK

FCC 15.209 QP at 3m Final_Result PK+

Plot # 3 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2402 MHz

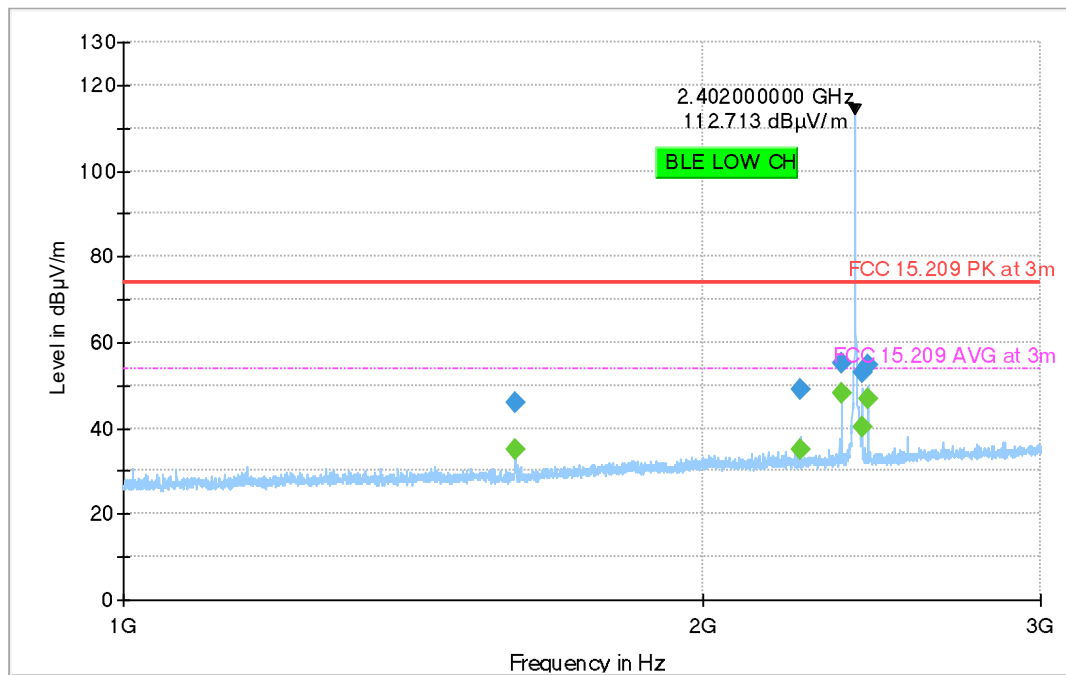
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
1598.950	45.795	---	73.98	28.18	500.0	1000.0	145.0	V	66.0	2.5	-22.9	0.0	25.4
1598.950	---	35.200	53.98	18.78	500.0	1000.0	145.0	V	66.0	2.5	-22.9	0.0	25.4
2248.362	---	35.007	53.98	18.97	500.0	1000.0	144.0	V	161.0	5.4	-22.3	0.0	27.7
2248.362	49.146	---	73.98	24.83	500.0	1000.0	144.0	V	161.0	5.4	-22.3	0.0	27.7
2363.587	55.310	---	73.98	18.67	500.0	1000.0	100.0	V	157.0	6.0	-22.2	0.0	28.2
2363.587	---	48.056	53.98	5.92	500.0	1000.0	100.0	V	157.0	6.0	-22.2	0.0	28.2
2420.805	53.041	---	73.98	20.94	500.0	1000.0	160.0	V	146.0	6.0	-22.2	0.0	28.2
2420.805	---	40.160	53.98	13.82	500.0	1000.0	160.0	V	146.0	6.0	-22.2	0.0	28.2
2440.358	54.514	---	73.98	19.47	500.0	1000.0	144.0	V	154.0	6.0	-22.2	0.0	28.2
2440.358	---	47.027	53.98	6.95	500.0	1000.0	144.0	V	154.0	6.0	-22.2	0.0	28.2

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
1598.950	43.3
1598.950	32.7
2248.362	29.7
2248.362	43.8
2363.587	49.3
2363.587	42.1
2420.805	47.1
2420.805	34.2
2440.358	48.5
2440.358	41.0



◆ Preview Result 1 -PK+ Final_Result PK+ ◆ FCC 15.209 PK at 3m Final_Result AVG - - - - - FCC 15.209 AVG at 3m

Plot # 4 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2402 MHz

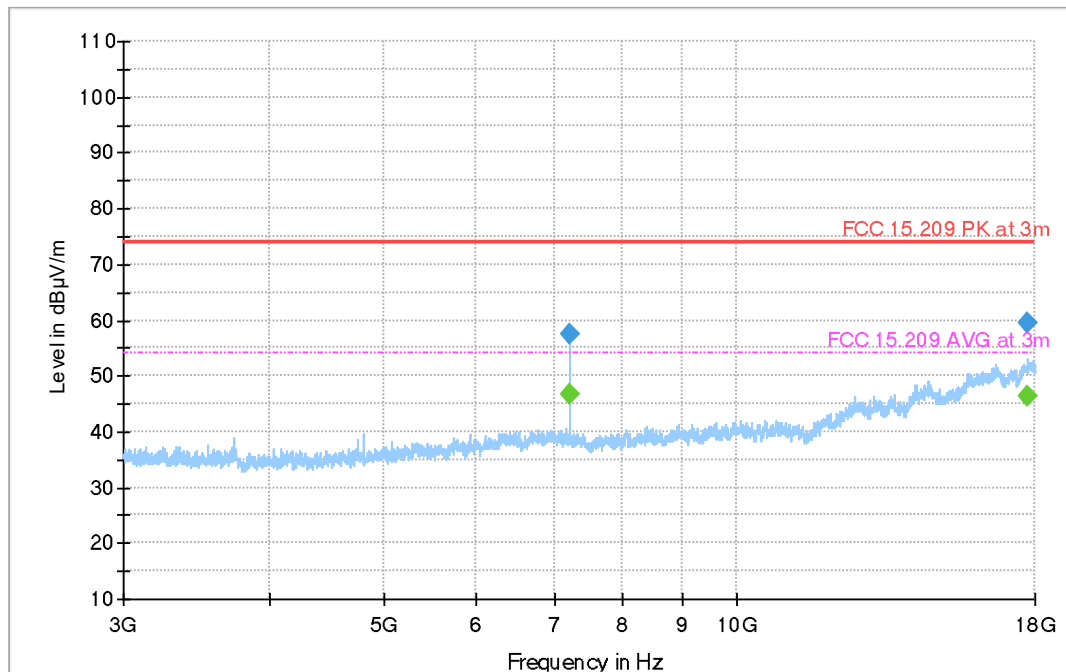
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
7205.169	---	46.730	53.98	7.25	500.0	1000.0	100.0	H	73.0	-1.9	9.0	-46.8	35.9
7205.169	57.352	---	73.98	16.63	500.0	1000.0	100.0	H	73.0	-1.9	9.0	-46.8	35.9
17713.049	---	46.498	53.98	7.48	500.0	1000.0	144.0	H	197.0	14.3	15.5	-42.7	41.6
17713.049	59.327	---	73.98	14.65	500.0	1000.0	144.0	H	197.0	14.3	15.5	-42.7	41.6

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
7205.169	48.7
7205.169	59.3
17713.049	32.2
17713.049	45.0



Preview Result 1 -PK+ Final_Result PK+ FCC 15.209 PK at 3m Final_Result PK+ FCC 15.209 AVG at 3m Final_Result AVG

Plot # 5 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2402 MHz

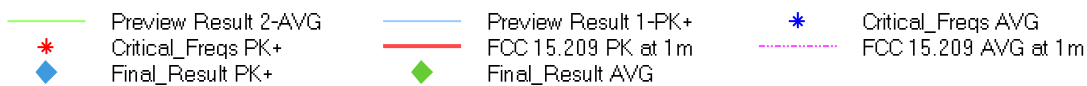
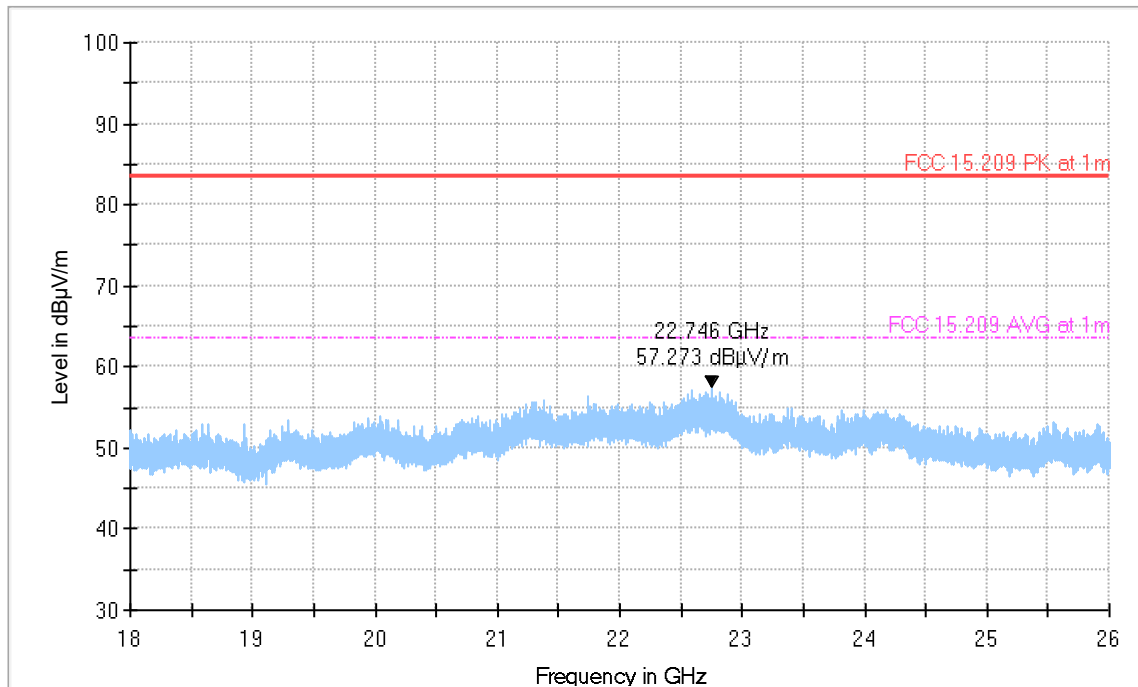
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
---	---	---	---	---	---	---	---	---	---	---	---	---	---

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
---	---



Plot # 6 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2440 MHz

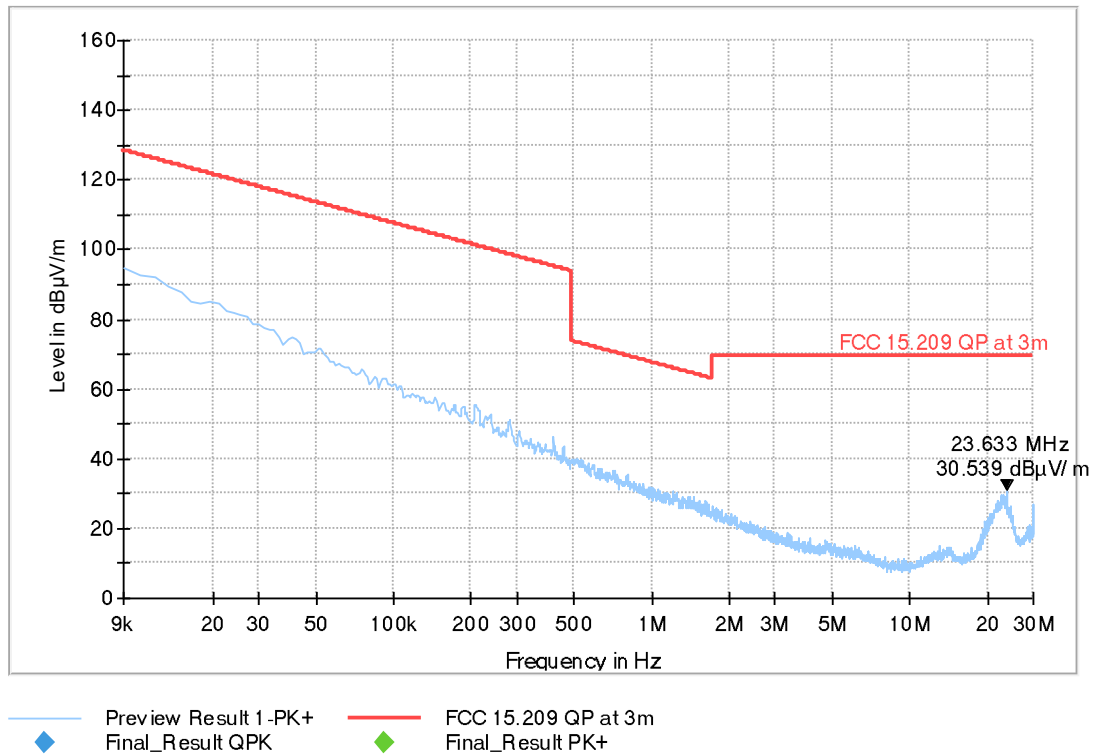
Modulation: 2m

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
---	---	---	---	---	---	---	---	---	---	---	---	---	---

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBµV)
---	---



Plot # 7 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2440 MHz

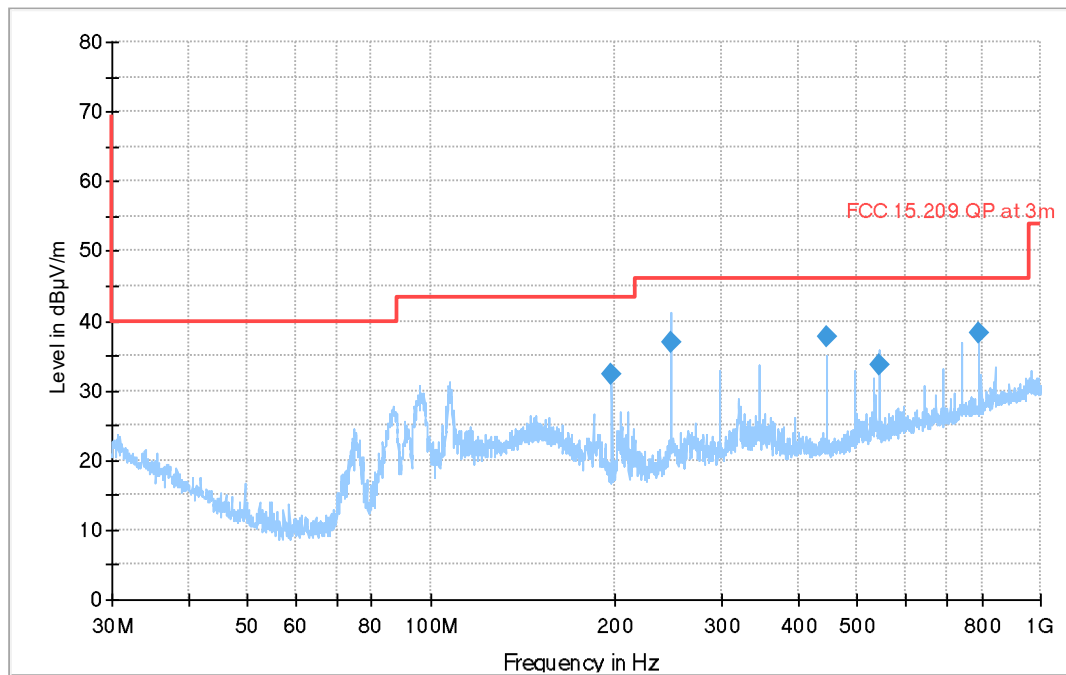
Modulation: 2m

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
197.984	32.267	---	43.50	11.23	500.0	120.0	183.0	H	309.0	-16.2	-34.2	0.0	18.0
247.497	36.991	---	46.02	9.03	500.0	120.0	107.0	H	290.0	-11.3	-34.0	0.0	22.7
445.473	37.629	---	46.02	8.39	500.0	120.0	257.0	H	135.0	-10.2	-33.3	0.0	23.1
544.492	33.588	---	46.02	12.43	500.0	120.0	257.0	H	108.0	-8.6	-32.9	0.0	24.3
792.004	38.269	---	46.02	7.75	500.0	120.0	107.0	H	133.0	-4.3	-32.4	0.0	28.1

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBµV)
197.984	48.4
247.497	48.3
445.473	47.8
544.492	42.2
792.004	42.5



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

Plot # 8 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2440 MHz

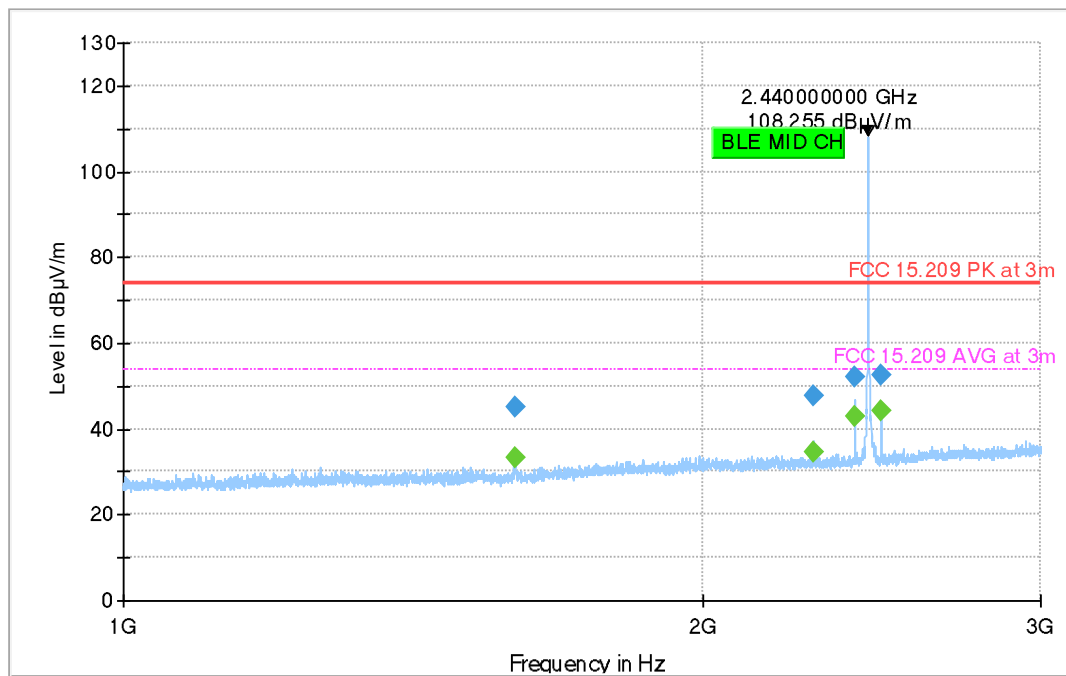
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
1598.906	44.874	---	73.98	29.11	500.0	1000.0	127.0	H	11.0	2.5	-22.9	0.0	25.4
1598.906	---	33.232	53.98	20.75	500.0	1000.0	127.0	H	11.0	2.5	-22.9	0.0	25.4
2286.379	47.852	---	73.98	26.13	500.0	1000.0	400.0	H	164.0	5.4	-22.5	0.0	27.9
2286.379	---	34.659	53.98	19.32	500.0	1000.0	400.0	H	164.0	5.4	-22.5	0.0	27.9
2401.575	---	43.095	53.98	10.88	500.0	1000.0	245.0	H	155.0	5.9	-22.3	0.0	28.2
2401.575	52.135	---	73.98	21.84	500.0	1000.0	245.0	H	155.0	5.9	-22.3	0.0	28.2
2478.362	---	44.382	53.98	9.60	500.0	1000.0	311.0	V	142.0	6.0	-22.3	0.0	28.3
2478.362	52.713	---	73.98	21.27	500.0	1000.0	311.0	V	142.0	6.0	-22.3	0.0	28.3

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
1598.906	42.3
1598.906	30.7
2286.379	42.5
2286.379	29.3
2401.575	37.2
2401.575	46.2
2478.362	38.4
2478.362	46.7



◆ Preview Result 1-PK+ Final_Result PK+ ◆ FCC 15.209 PK at 3m Final_Result AVG - - - - - FCC 15.209 AVG at 3m

Plot # 9 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2440 MHz

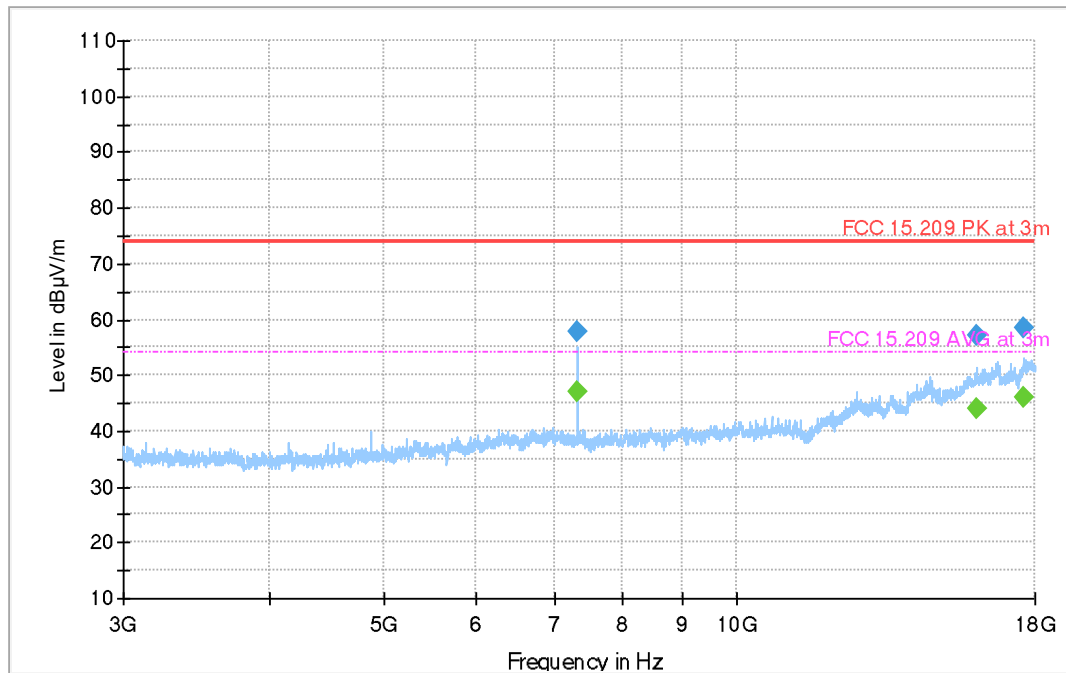
Modulation: 2m

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
7319.940	57.669	---	73.98	16.31	500.0	1000.0	245.0	H	100.0	-1.7	9.0	-46.5	35.8
7319.940	---	47.172	53.98	6.81	500.0	1000.0	245.0	H	100.0	-1.7	9.0	-46.5	35.8
16049.571	57.184	---	73.98	16.80	500.0	1000.0	296.0	V	189.0	12.6	14.2	-42.6	41.0
16049.571	---	44.081	53.98	9.90	500.0	1000.0	296.0	V	189.0	12.6	14.2	-42.6	41.0
17626.079	---	46.138	53.98	7.84	500.0	1000.0	297.0	H	275.0	14.1	15.3	-42.8	41.6
17626.079	58.586	---	73.98	15.39	500.0	1000.0	297.0	H	275.0	14.1	15.3	-42.8	41.6

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
7319.940	59.3
7319.940	48.8
16049.571	44.6
16049.571	31.5
17626.079	32.1
17626.079	44.5



Plot # 10 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2440 MHz

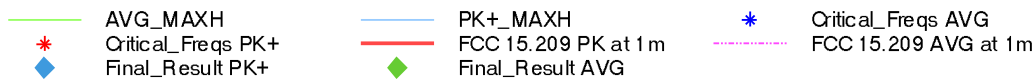
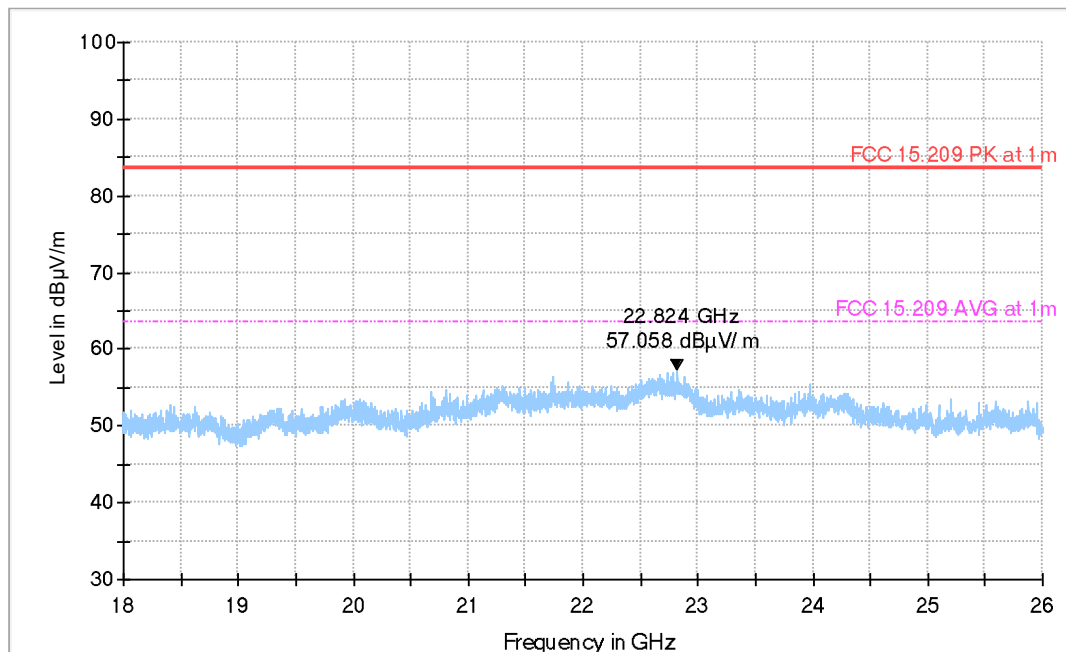
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
----	----	----	----	----	----	----	----	----	----	----	----	----	----

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBµV)
----	----



Plot # 11 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2480 MHz

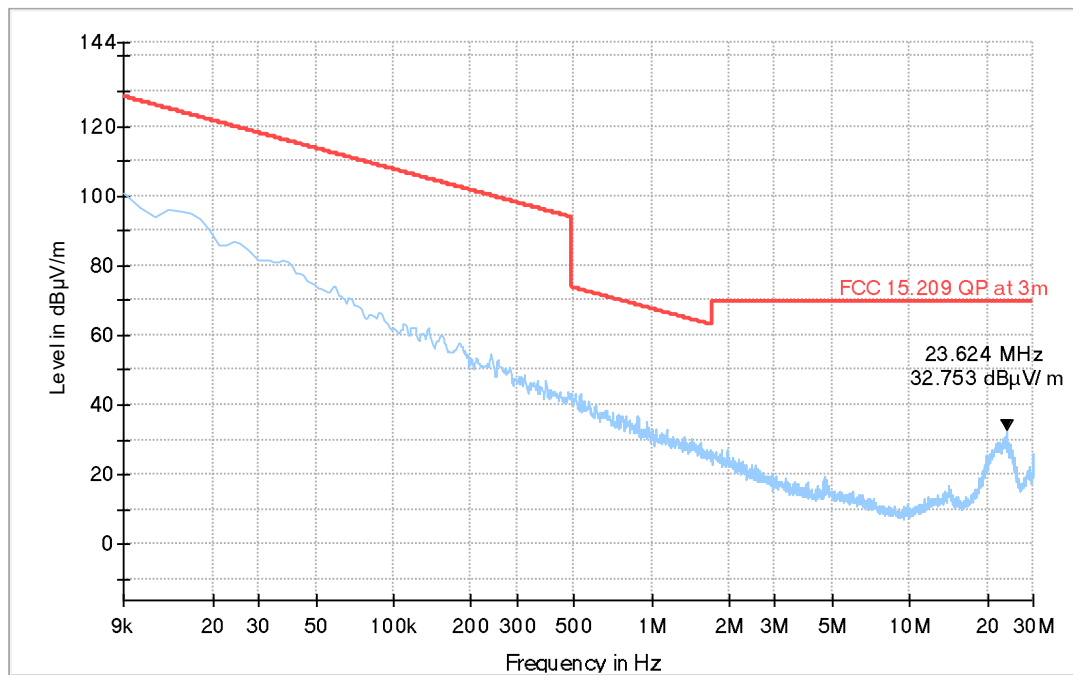
Modulation: 2m

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
---	---	---	---	---	---	---	---	---	---	---	---	---	---

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBµV)
---	---



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

Plot # 12 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2480 MHz

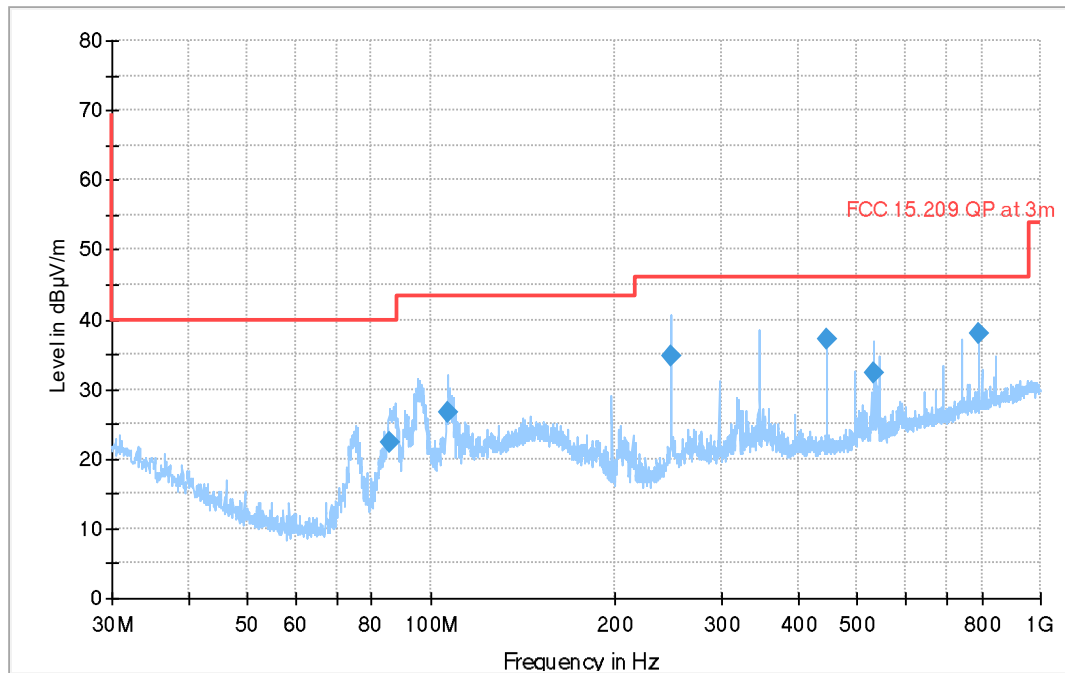
Modulation: 2m

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
85.774	22.444	---	40.00	17.56	500.0	120.0	116.0	V	202.0	-17.4	-34.7	0.0	17.3
106.857	26.662	---	43.50	16.84	500.0	120.0	202.0	H	32.0	-13.0	-34.6	0.0	21.6
247.499	34.628	---	46.02	11.39	500.0	120.0	188.0	H	14.0	-11.3	-34.0	0.0	22.7
445.500	37.231	---	46.02	8.79	500.0	120.0	318.0	H	341.0	-10.2	-33.3	0.0	23.1
533.052	32.261	---	46.02	13.76	500.0	120.0	169.0	H	128.0	-8.7	-33.0	0.0	24.3
792.002	38.023	---	46.02	8.00	500.0	120.0	100.0	H	136.0	-4.3	-32.4	0.0	28.1

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
85.774	39.8
106.857	39.7
247.499	45.9
445.500	47.4
533.052	41.0
792.002	42.3



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

Plot # 13 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2480 MHz

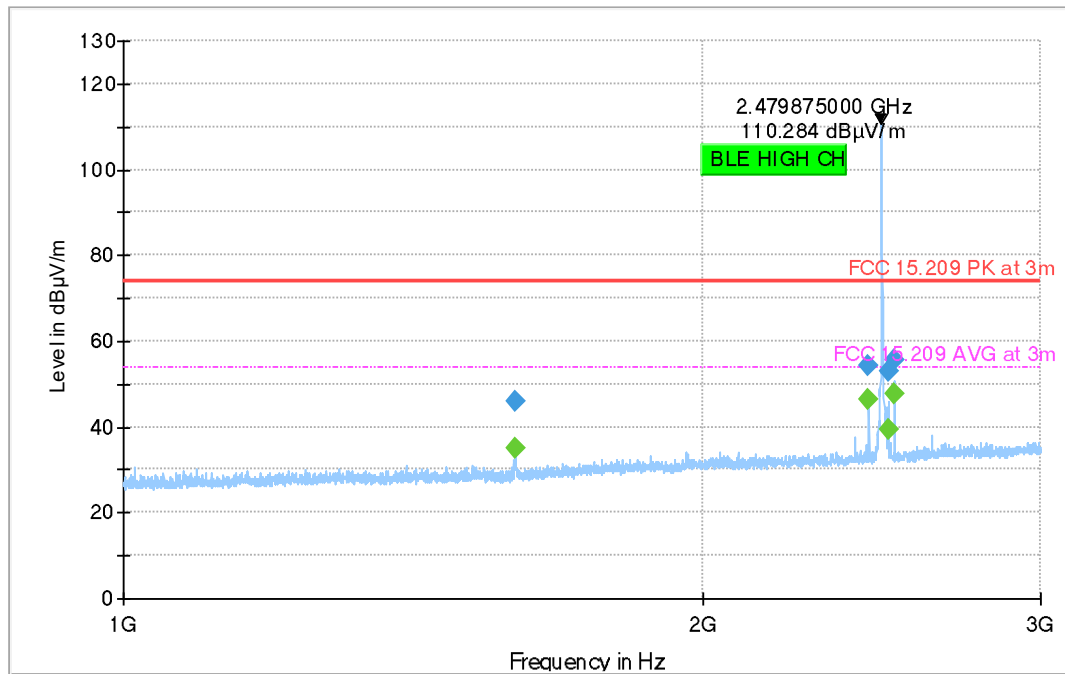
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
1599.020	46.073	---	73.98	27.91	500.0	1000.0	313.0	H	247.0	2.5	-22.9	0.0	25.4
1599.020	---	34.807	53.98	19.17	500.0	1000.0	313.0	H	247.0	2.5	-22.9	0.0	25.4
2441.563	54.136	---	73.98	19.84	500.0	1000.0	100.0	V	220.0	6.0	-22.2	0.0	28.2
2441.563	---	46.559	53.98	7.42	500.0	1000.0	100.0	V	220.0	6.0	-22.2	0.0	28.2
2498.854	53.158	---	73.98	20.82	500.0	1000.0	144.0	V	186.0	6.0	-22.4	0.0	28.4
2498.854	---	39.512	53.98	14.47	500.0	1000.0	144.0	V	186.0	6.0	-22.4	0.0	28.4
2518.360	55.460	---	73.98	18.52	500.0	1000.0	144.0	V	195.0	6.1	-22.3	0.0	28.4
2518.360	---	47.927	53.98	6.05	500.0	1000.0	144.0	V	195.0	6.1	-22.3	0.0	28.4

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
1599.020	43.5
1599.020	32.3
2441.563	48.1
2441.563	40.6
2498.854	47.2
2498.854	33.5
2518.360	49.4
2518.360	41.8



◆ Preview Result 1-PK+ Final_Result PK+ ◆ FCC 15.209 PK at 3m Final_Result AVG - - - - - FCC 15.209 AVG at 3m

Plot # 14 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2480 MHz

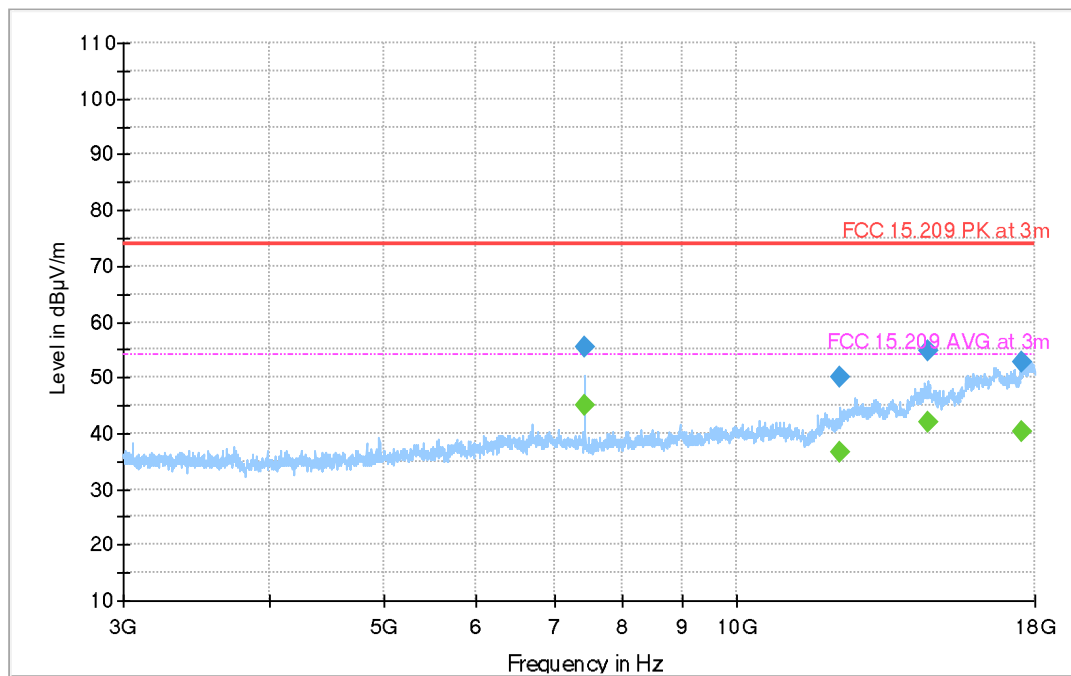
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
7439.915	55.481	---	73.98	18.50	500.0	1000.0	214.0	V	116.0	-1.6	9.2	-46.7	35.9
7439.915	---	45.046	53.98	8.93	500.0	1000.0	214.0	V	116.0	-1.6	9.2	-46.7	35.9
12277.843	---	36.760	53.98	17.22	500.0	1000.0	363.0	V	79.0	5.2	11.9	-45.3	38.6
12277.843	50.175	---	73.98	23.80	500.0	1000.0	363.0	V	79.0	5.2	11.9	-45.3	38.6
14601.079	---	41.878	53.98	12.10	500.0	1000.0	400.0	H	33.0	9.7	13.5	-44.9	41.2
14601.079	54.886	---	73.98	19.09	500.0	1000.0	400.0	H	33.0	9.7	13.5	-44.9	41.2
17551.197	52.638	---	73.98	21.34	500.0	1000.0	263.0	H	300.0	13.7	15.1	-42.9	41.5
17551.197	---	40.417	53.98	13.56	500.0	1000.0	263.0	H	300.0	13.7	15.1	-42.9	41.5

(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
7439.915	57.1
7439.915	46.7
12277.843	31.6
12277.843	45.0
14601.079	32.2
14601.079	45.2
17551.197	38.9
17551.197	26.7



Preview Result 1-PK+ Final_Result PK+ FCC 15.209 PK at 3m Final_Result AVG FCC 15.209 AVG at 3m

Plot # 15 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2480 MHz

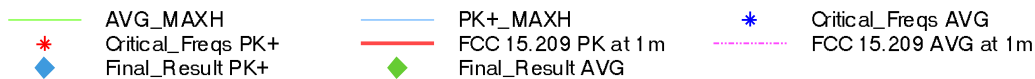
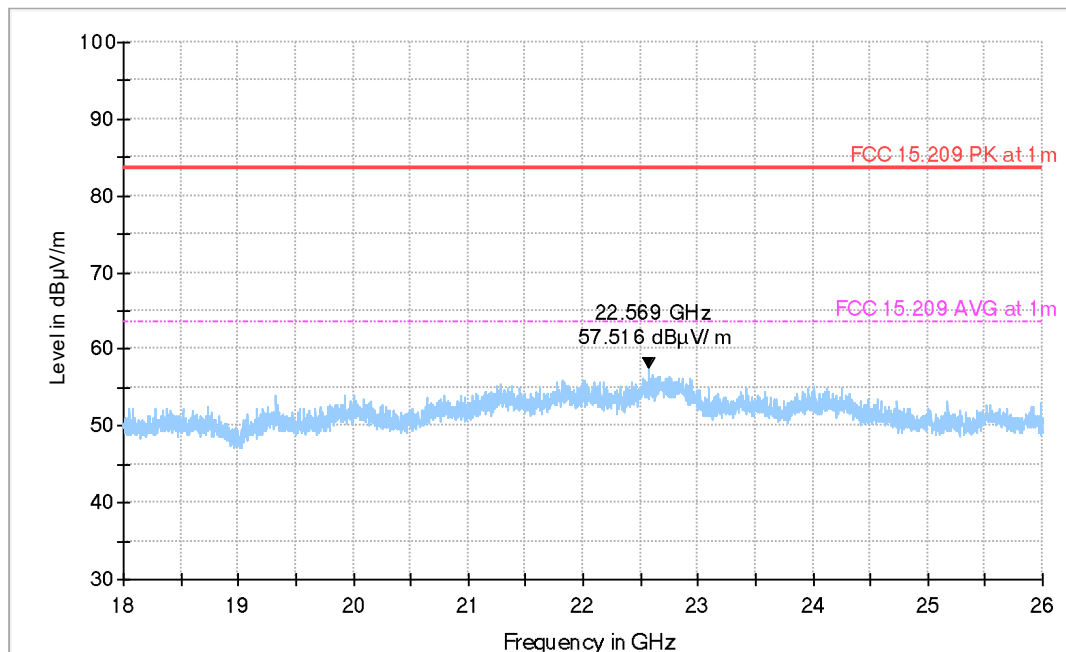
Modulation: 2m

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/)	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)
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(continuation of the "Final_Result" table from column 19 ...)

Frequency (MHz)	Raw Rec (dBμV)
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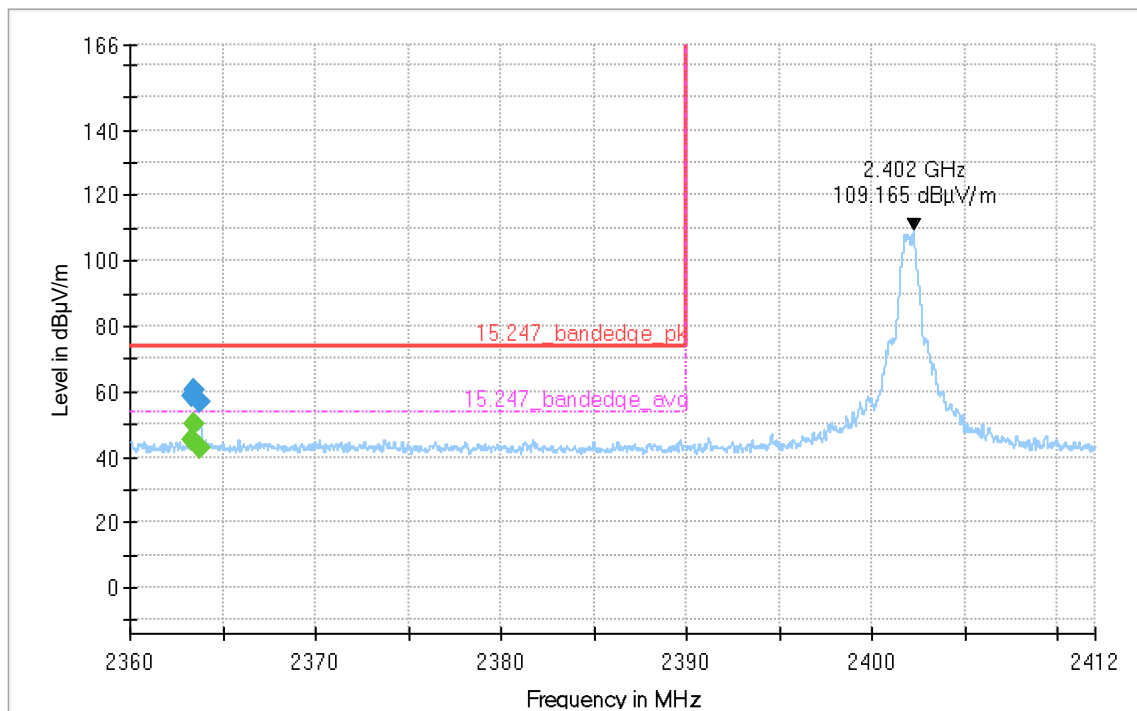
Plot # 16 Restricted Bandedge Low Channel

Tx Frequency: 2402 MHz

Modulation: 2m

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2363.38	---	45.31978697	54.00	8.68	500.0	1000.0	141.0	H	84.0	33.6	
2363.38	58.33493895	---	74.00	15.67	500.0	1000.0	141.0	H	84.0	33.6	
2363.41	---	49.99387572	54.00	4.01	500.0	1000.0	100.0	H	129.0	33.6	
2363.41	60.55607817	---	74.00	13.44	500.0	1000.0	100.0	H	129.0	33.6	
2363.78	---	42.49309232	54.00	11.51	500.0	1000.0	144.0	H	244.0	33.6	
2363.78	56.61502531	---	74.00	17.38	500.0	1000.0	144.0	H	244.0	33.6	



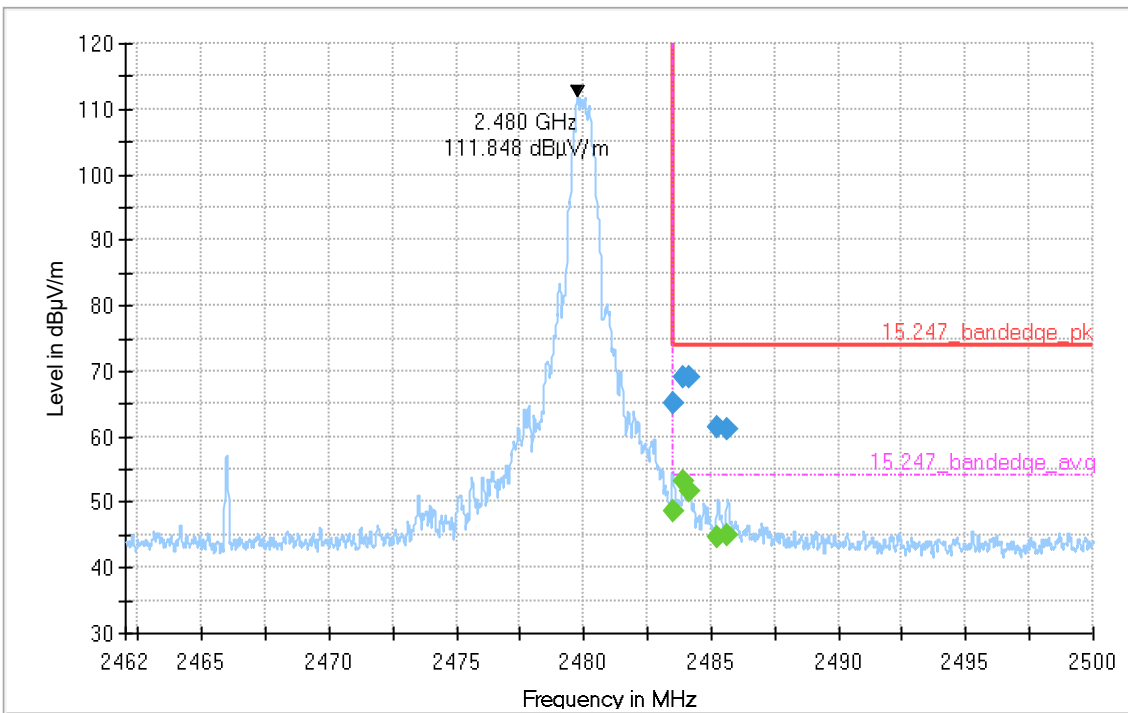
Preview Result 1-PK+ Final_Result PK+ 15.247_bandedge_pk Final_Result CAV 15.247_bandedge_avg

Plot # 17 Restricted Bandedge High Channel

Tx Frequency: 2480 MHz

Modulation: 2m

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.51	---	48.51872110	54.00	5.48	500.0	1000.0	118.0	H	71.0	34.0	
2483.51	65.16298532	---	74.00	8.84	500.0	1000.0	118.0	H	71.0	34.0	
2483.93	69.03983970	---	74.00	4.96	500.0	1000.0	107.0	H	76.0	34.0	
2483.93	---	53.13696952	54.00	0.86	500.0	1000.0	107.0	H	76.0	34.0	
2484.12	68.99218323	---	74.00	5.01	500.0	1000.0	153.0	H	73.0	34.0	
2484.12	---	51.79261352	54.00	2.21	500.0	1000.0	153.0	H	73.0	34.0	
2485.28	61.36302427	---	74.00	12.64	500.0	1000.0	179.0	H	70.0	34.0	
2485.28	---	44.71319059	54.00	9.29	500.0	1000.0	179.0	H	70.0	34.0	
2485.64	---	44.90968322	54.00	9.09	500.0	1000.0	142.0	H	74.0	34.0	
2485.64	60.97806548	---	74.00	13.02	500.0	1000.0	142.0	H	74.0	34.0	



Preview Result 1-PK+
Final_Result PK+

15.247_bandedge_pk
Final_Result CAV

15.247_bandedge_avg

8.6 AC Power Line Conducted Emissions

8.6.1 Measurement according to ANSI C63.4

Analyzer Settings:

- RBW = 9 KHz (CISPR Bandwidth)
- Detector: Peak / Average for Pre-scan
- Quasi-Peak/Average for Final Measurements

8.6.2 Limits: §15.207 & RSS-Gen 8.8

FCC §15.207(a) & RSS-Gen 8.8

- Except as shown in paragraphs (b) and (c) of this section of the CFR, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table (1), as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

8.6.3 Test conditions and setup:

Ambient Temperature $^{\circ}$ C	EUT Set-Up #	EUT operating mode	Power line (L1, L2, L3, N)	Power Input
22 $^{\circ}$ C	1	LE 2M PHY	Line & Neutral	120VAC to 24VAC

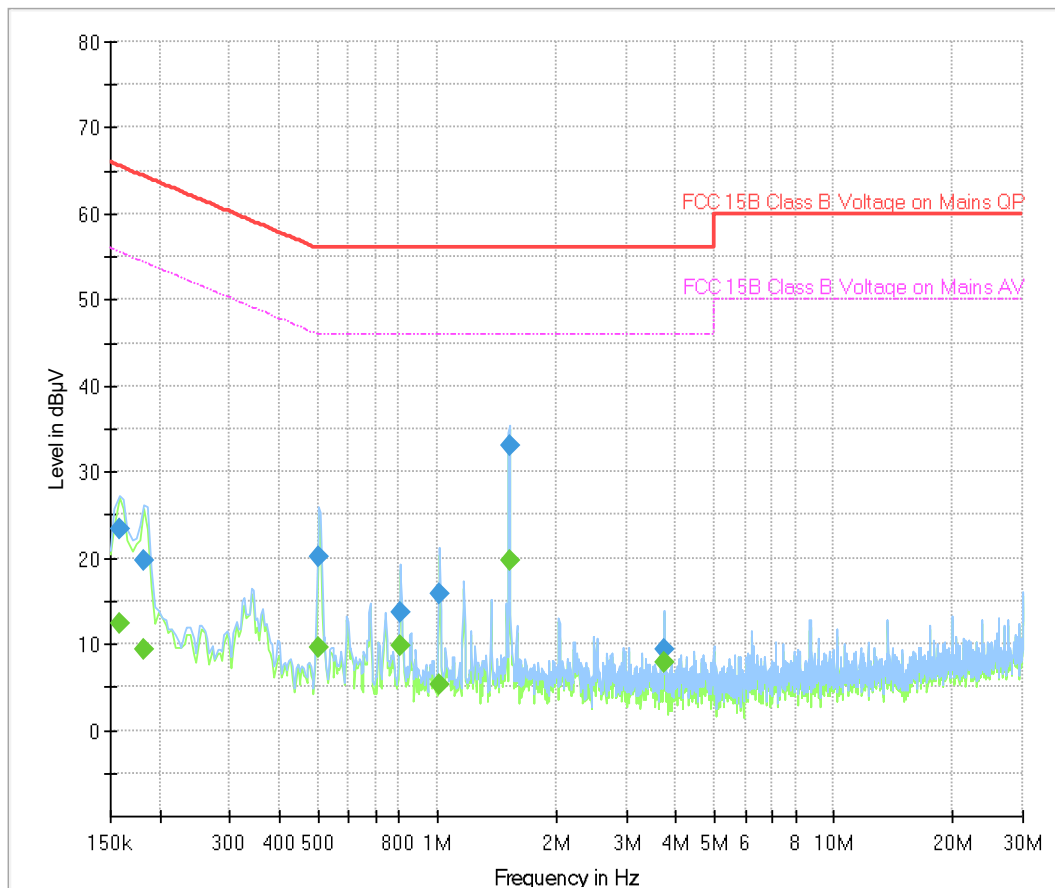
8.6.4 Measurement Result:

Plot #	Port	EUT Set-Up #:	EUT operating mode	Scan Frequency	Limit	Result
1	AC Mains	1	LE 2M PHY	150 kHz – 30 MHz	See section 8.6.2	Pass

8.6.5 Measurement Plots:

Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.16	---	12.47553413	55.57	43.09	1000.0	9.0	L1	GND	10.1
0.16	23.42509620	---	65.57	42.14	1000.0	9.0	L1	GND	10.1
0.18	19.63718866	---	64.38	44.74	1000.0	9.0	N	GND	10.1
0.18	---	9.34177087	54.38	45.04	1000.0	9.0	N	GND	10.1
0.50	---	9.62765120	46.00	36.37	1000.0	9.0	N	GND	9.9
0.50	20.18720625	---	56.00	35.81	1000.0	9.0	N	GND	9.9
0.81	---	9.80743291	46.00	36.19	1000.0	9.0	L1	GND	9.9
0.81	13.61498907	---	56.00	42.39	1000.0	9.0	L1	GND	9.9
1.01	---	5.29062286	46.00	40.71	1000.0	9.0	L1	GND	9.9
1.01	15.81064240	---	56.00	40.19	1000.0	9.0	L1	GND	9.9
1.52	---	19.69936005	46.00	26.30	1000.0	9.0	N	GND	9.9
1.52	33.15090576	---	56.00	22.85	1000.0	9.0	N	GND	9.9
3.74	9.43730560	---	56.00	46.56	1000.0	9.0	L1	GND	9.9
3.74	---	7.81655518	46.00	38.18	1000.0	9.0	L1	GND	9.9



AVG_MAXH
FCC 15B Class B Voltage on Mains QP
Final_Result QPK
PK+_MAXH
FCC 15B Class B Voltage on Mains AV
Final_Result CAV

9 Test setup photos

Setup photos are included in supporting file name: "EMC_LEN NX_032_26001_FCC_Setup_Photos.pdf"

10 Test Equipment and Ancillaries Used for Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
PASSIVE LOOP ANTENNA	ETS LINDGREN	6512	000164698	3 Years	09/05/2025
BILOG ANTENNA	A.H. SYSTEMS	BiLA2G	569	3 Years	09/08/2025
HORN ANTENNA	EMCO	3115	00035111	3 Years	09/04/2025
HORN ANTENNA	ETS LINDGREN	3117-PA	00167061	3 Years	09/04/2025
HORN ANTENNA	ETS LINDGREN	3116C-PA	00166821	3 Years	09/04/2025
ESW.EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	101715	3 Years	12/09/2025
DIGITAL THERMOMETER	Control Company	4410,90080-03	230712972	3 Years	10/18/2023
Signal Analyzer	R&S	FSV40	101022	3 Years	09/30/2025
Multimeter	Fluke	115	56090717MV	3 Years	09/25/2025
Software	EMC32	Version 10.50.40	-	-	-
TEST RECEIVER	R&S	ESW44	103143	2 Years	09/12/2024
PULSE LIMITER	R&S	ESH3-Z2	102473	3 Years	09/08/2025
LISN	FCC	FCC-LISN-50-25-2-08	08014	2 Years	09/08/2025
Multimeter	Fluke	115	56090717MV	3 Years	09/25/2025
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
2026-03-11	EMC_LENNX_032_26001_15_247_BTLE_DTS	Initial Version	Cheng Song

<<< The End >>>