



FCC / ISED Test Report

For:
Telular Corporation

Model Name:
SHB6500

Product Description:
Wireless Telematics Hub LTE-M/5G Tether

FCC ID: MTFSHB6500
ISED: 2175D-SHB6500

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

REPORT #: EMC_TELUL_234_25001_15_247_BTLE_DTS_Rev1

DATE: 2025-10-21



A2LA Accredited

IC recognized #
3462B

CETECOM Inc.

411 Dixon Landing Road ♦ Milpitas, CA 95035 ♦ U.S.A.

Phone: + 1 (408) 586 6200 ♦ Fax: + 1 (408) 586 6299 ♦ E-mail: info@cetecom.com ♦ <http://www.cetecom.com>

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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.
Telular Corporation	Wireless Telematics Hub LTE-M/5G Tether	SHB6500

Report Authorized by:

Responsible for testing Laboratory:

Alvin, Ilarina (Director of EMC Services)			
2025-10-21	Compliance		
Date	Section	Name	Signature

Responsible for the Report:

Art Thammanavarat (Lead Engineer)			
2025-10-21	Compliance		
Date	Section	Name	Signature

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:	Ruby, Hall

2.2 Identification of the Client

Applicant's Name:	Telular Corporation
Street Address:	3225 Cumberland Blvd., Suite 300
City/Zip Code	Atlanta, GA 30339
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:	Wireless Telematics Hub LTE-M/5G Tether
Marketing Name:	Kinnect-M Tethered
Model Name:	SHB6500
HW Version:	B
SW Version:	EM.00.03.1034,BM.00.01.0140
FCC-ID:	MTFSHB6500
ISED:	2175D-SHB6500
HVIN	SHB6500
PMN	Kinnect-M Tethered
FVIN	SHB6500.2.
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	Bluetooth Modules Model Name : Laird Model Number : BL654 FCC : SQGBL654 ISED : 5131A-ME910G1W1 Wireless Technologies Bluetooth LE
Modes of Operation:	GFSK
Antenna Information as declared:	Bluetooth LE: Laird BL654 - Type: PCB Trace - Peak Gain: 0 dBi
Max. Peak Output Power:	7.55 dBm
Other Radios included in the device	Cellular.
Power Supply/ Rated Operating Voltage Range	11VDC/12VDC/30VDC
Operating Temperature Range	Low : 40 °C - High 70 °C
Sample Revision	☒ Production ☐ Pre-Production
EUT Dimensions	953mm x 476.3mm x 38.1mm
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	+8dBm	+8dBm
Mid	+8dBm	+8dBm
High	+8dBm	+8dBm

Note: The software used for testing is BleDtmRfTool.

3.3 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	SHB81JBL232205340	B	EM.00.03.1034,BM.00.01.0140	Radiated Emissions

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.

3.5 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1 + AE#1	- The BLE 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 14DC Power Supply.

3.6 Justification for Worst Case Mode of Operation

During the testing process the BLE radio was tested with transmitter sets to low, mid and high channel at the maximum power with the highest output power, representing the worst-case mode of operation. 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.

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	BTLE	☐	☒	☐	NA See Note 2
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	BTLE	☐	☒	☐	NA See Note 3
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	BTLE	☐	☒	☐	NA See Note 4
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	BTLE	☐	☒	☐	NA See Note 5
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	BTLE	☐	☒	☐	NA See Note 5
§15.247(d); §15.209 RSS-Gen 6.13	TX Radiated Spurious Emissions	Nominal	BTLE	☒	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	BTLE	☐	☒	☐	NA See Note 1

Note 1: This device does not connect to AC mains network

Note 2: Leveraged from report # FR813002, Section 3.2 (FCC ID: SQGBL654)

Note 3: Leveraged from report # FR813002, Section 3.4 (FCC ID: SQGBL654)

Note 4: Leveraged from report # FR813002, Section 3.3 (FCC ID: SQGBL654)

Note 5: Leveraged from report # FR813002, Section 3.5 (FCC ID: SQGBL654)

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:

2025-09-18 – 2025-10-20

6.3 Decision Rule:

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

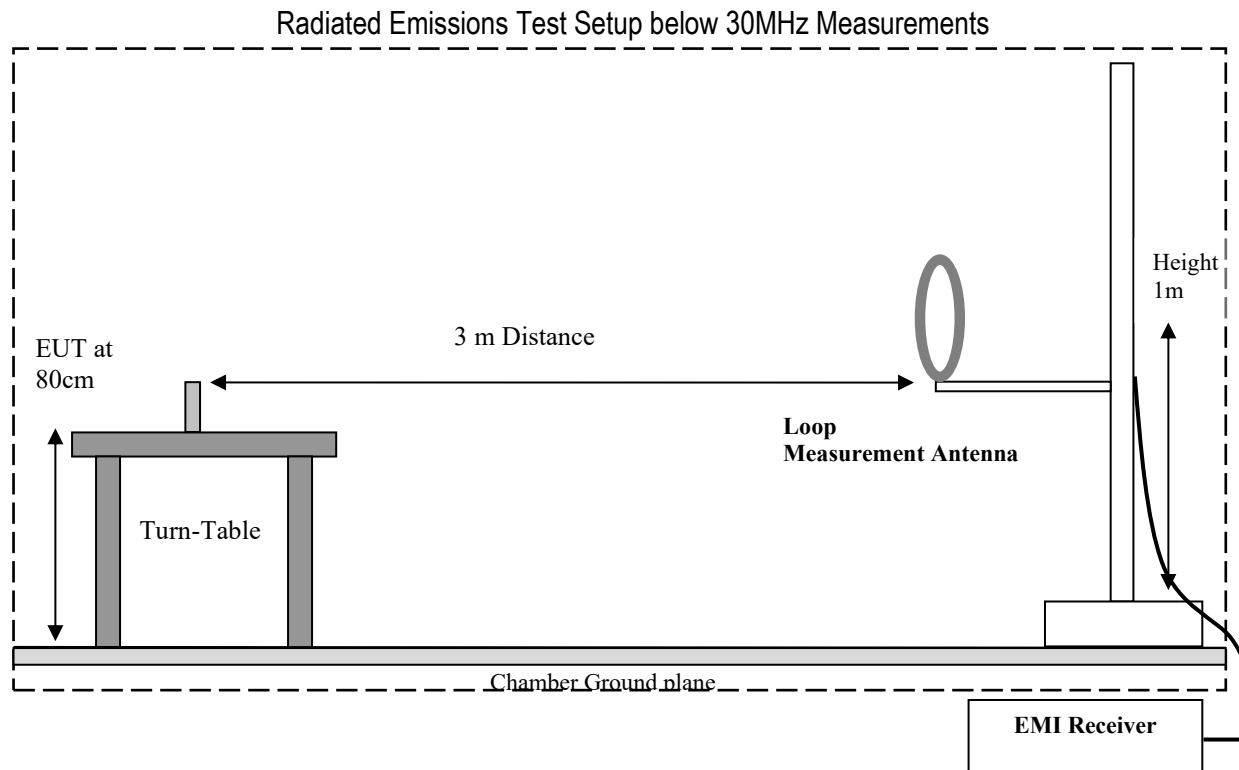
Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither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

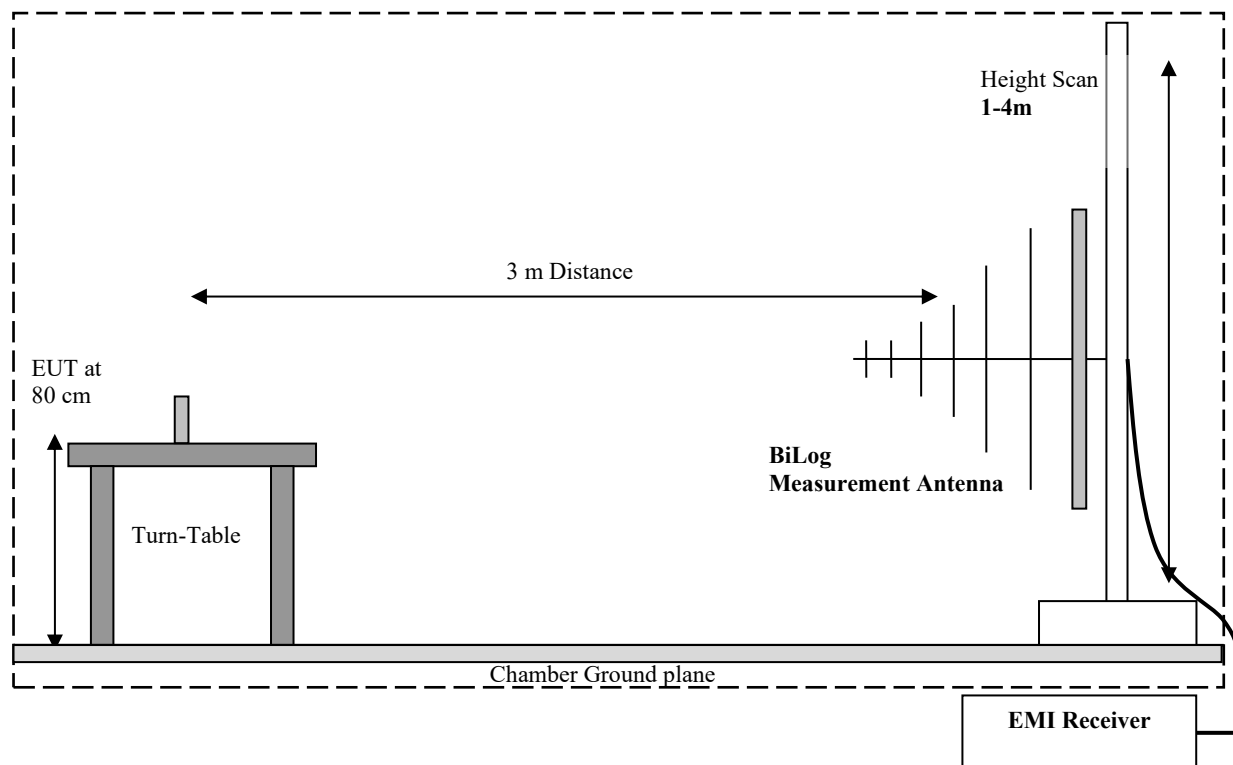
7.1 Radiated Measurement

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

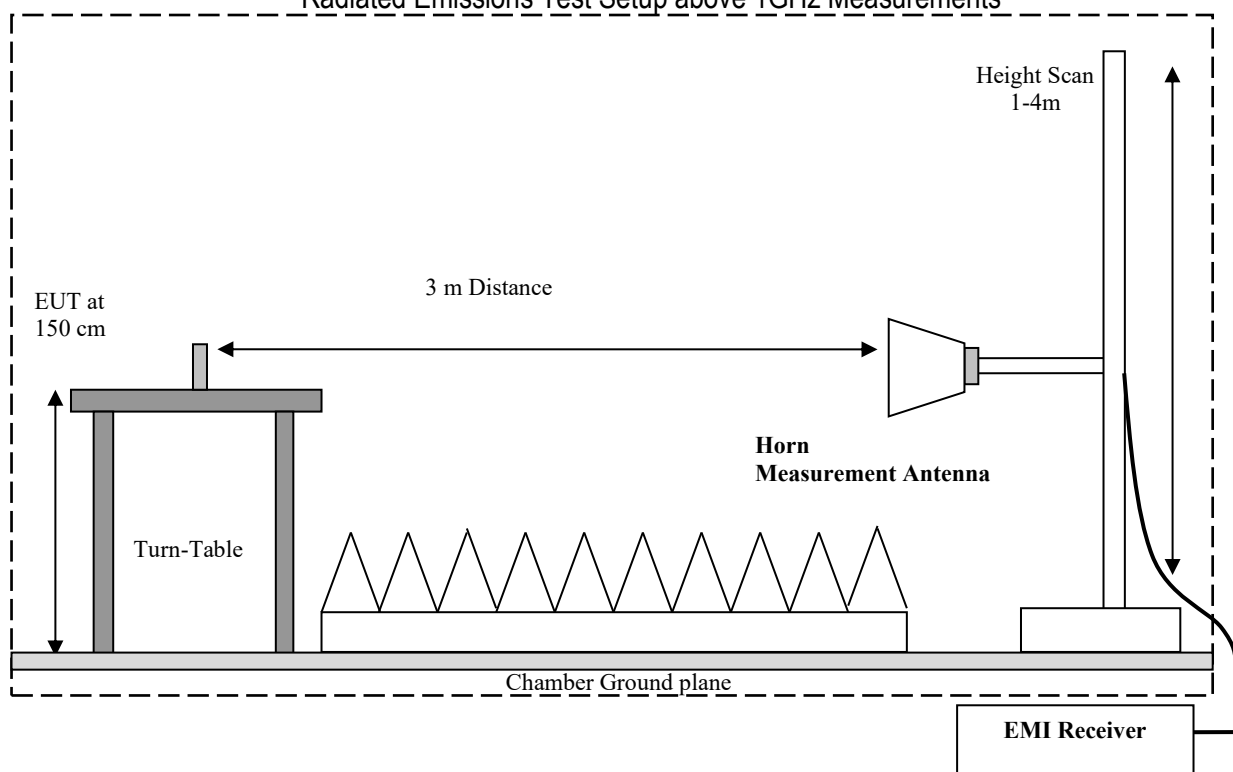
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to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

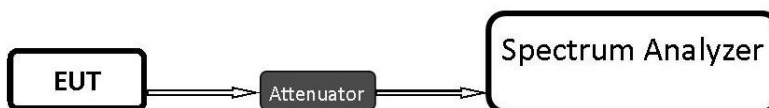
Frequency (MHz)	Measured SA (dB μ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB μ V/m)
1000	80.5	3.5	14	98.0

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 ERP/EIRP

Radio	Data Rate	Mode	Peak Output Power		Ant-Gain	EIRP	Limit EIRP
			(dBm)	(W)			
BT	1M	BLE	7.55	0.0057	0.00	0.0057	4
	2M	BLE	7.54	0.0057	0.00	0.0057	4

Note 1: Power Conducted (dBm) leveraged from test report "FR813002, Section 3.2" prepared by International Certification Corp. Module No. BL654 (FCC ID: SQGBL654)).

Note 2: ERP/EIRP are based on calculations from Power Conducted by adding the declared maximum gain of the utilized antenna per operational description.

8.2 Radiated Transmitter Spurious Emissions and Restricted Bands

8.2.1 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.

8.2.2 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

8.2.3 Test conditions and setup:

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

8.2.4 Measurement result:

Plot #	Channel #	Scan Frequency	Limit	Result
1-2	Low	9 kHz – 26 GHz	See section 8.2.2	Pass
3-6	Mid	9 kHz – 26 GHz	See section 8.2.2	Pass
7-8	High	9 kHz – 26 GHz	See section 8.2.2	Pass

8.2.5 Measurement Plots:

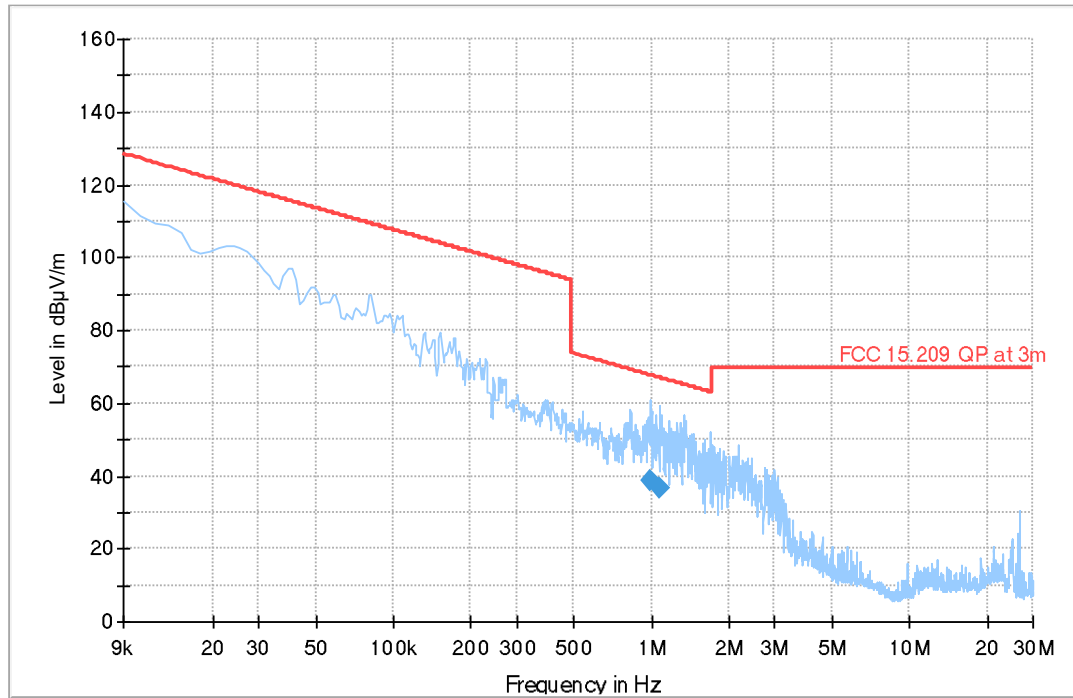
Plot # 1 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2402 MHz

Modulation: 1M

Final Result

Frequency (MHz)	QuasiPeak (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)	Raw Rec (dBμV)
0.987	38.556	67.74	29.18	500.0	9.0	100.0	H	201.0	18.0	0.2	-28.7	46.5	20.5
1.077	36.675	66.98	30.30	500.0	9.0	100.0	H	241.0	17.5	0.2	-28.7	46.0	19.2



— AVG_MAXH — PK+_MAXH — FCC 15.209 QP at 3m ◆ Final_Result QPK

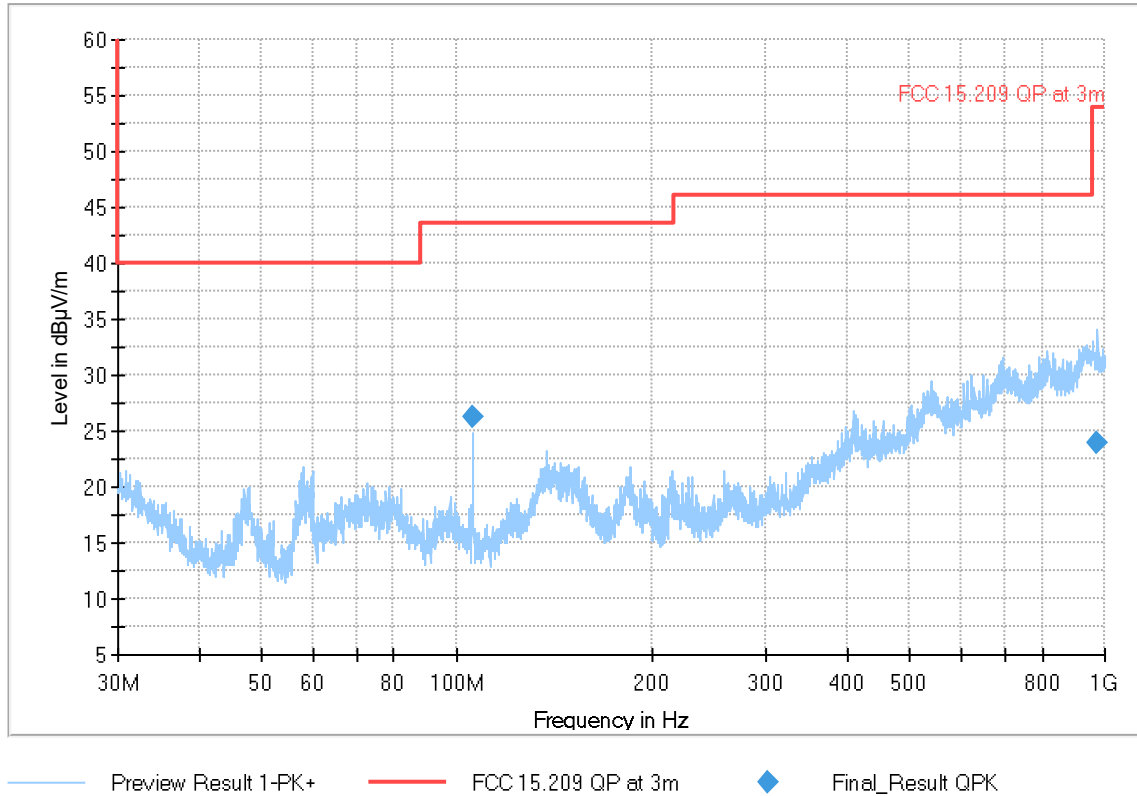
Plot # 2 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2402 MHz

Modulation: 1M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
105.709	26.19	43.50	17.31	500.0	120.0	152.0	H	-38.0	-19.6	
974.732	23.88	53.98	30.10	500.0	120.0	150.0	V	220.0	-1.2	



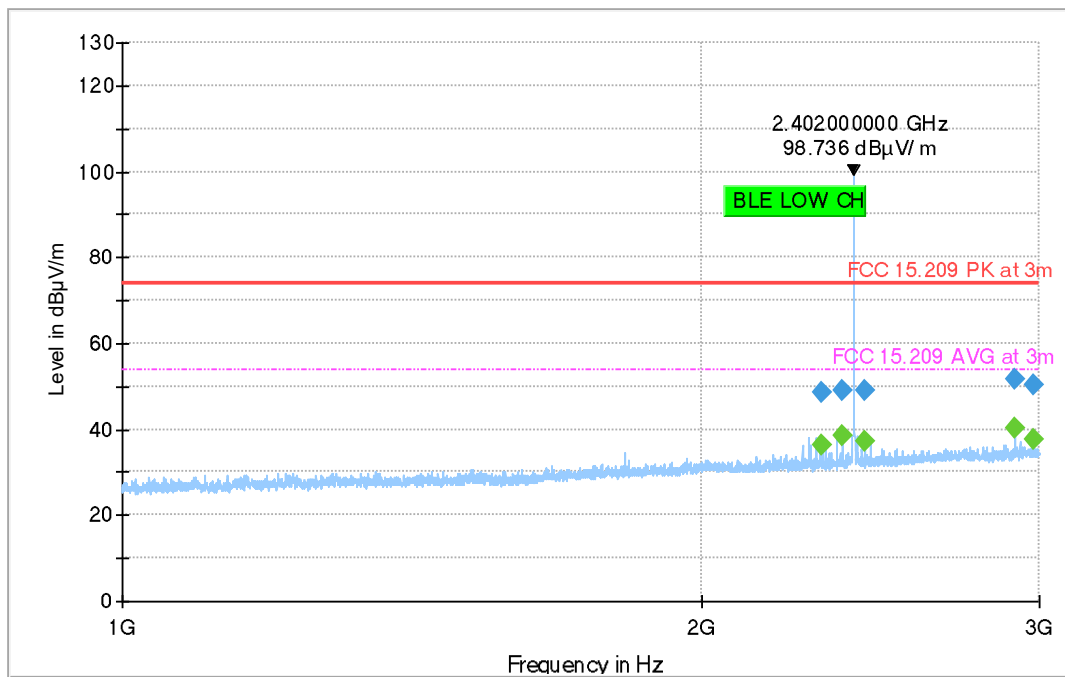
Plot # 3 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2402 MHz

Modulation: 1M

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)	Raw Rec (dBμV)
2313.971	48.781	---	73.98	25.20	500.0	1000.0	231.0	H	150.0	5.6	-22.3	0.0	27.9	43.2
2313.971	---	36.243	53.98	17.74	500.0	1000.0	231.0	H	150.0	5.6	-22.3	0.0	27.9	30.7
2369.997	48.850	---	73.98	25.13	500.0	1000.0	177.0	H	259.0	5.9	-22.2	0.0	28.1	43.0
2369.997	---	38.323	53.98	15.66	500.0	1000.0	177.0	H	259.0	5.9	-22.2	0.0	28.1	32.5
2434.009	48.820	---	73.98	25.16	500.0	1000.0	230.0	H	85.0	6.0	-22.2	0.0	28.2	42.8
2434.009	---	37.373	53.98	16.61	500.0	1000.0	230.0	H	85.0	6.0	-22.2	0.0	28.2	31.4
2913.983	51.535	---	73.98	22.44	500.0	1000.0	109.0	H	255.0	7.7	-21.9	0.0	29.5	43.9
2913.983	---	40.330	53.98	13.65	500.0	1000.0	109.0	H	255.0	7.7	-21.9	0.0	29.5	32.7
2978.019	---	---	53.98	16.25	500.0	1000.0	394.0	H	88.0	8.1	-21.8	0.0	29.9	29.6
2978.019	50.519	---	73.98	23.46	500.0	1000.0	394.0	H	88.0	8.1	-21.8	0.0	29.9	42.4



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

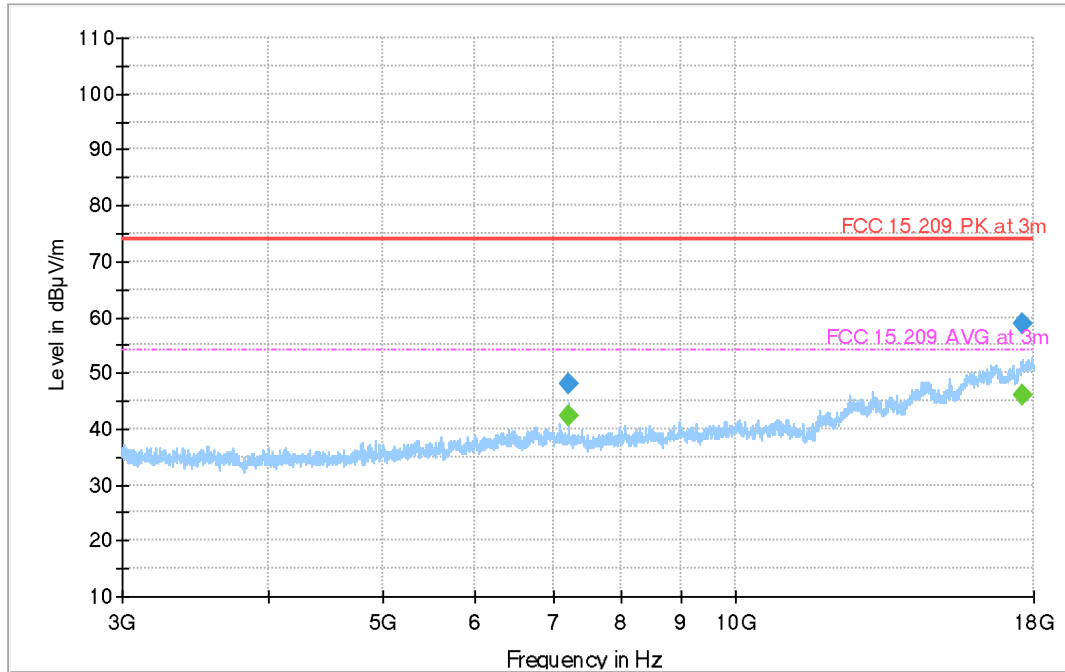
Plot # 4 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2402 MHz

Modulation: 1M

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)	Raw Rec (dBμV)
7205.963	---	42.353	53.98	11.63	500.0	1000.0	109.0	H	256.0	-2.0	9.0	-46.8	35.9	44.3
7205.963	48.021	---	73.98	25.96	500.0	1000.0	109.0	H	256.0	-2.0	9.0	-46.8	35.9	50.0
17606.564	---	45.948	53.98	8.03	500.0	1000.0	264.0	H	222.0	14.0	15.2	-42.8	41.6	31.9
17606.564	58.814	---	73.98	15.16	500.0	1000.0	264.0	H	222.0	14.0	15.2	-42.8	41.6	44.8



◆ 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

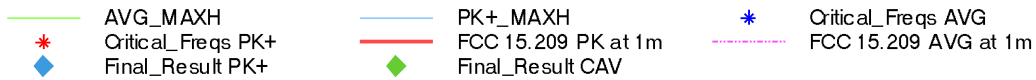
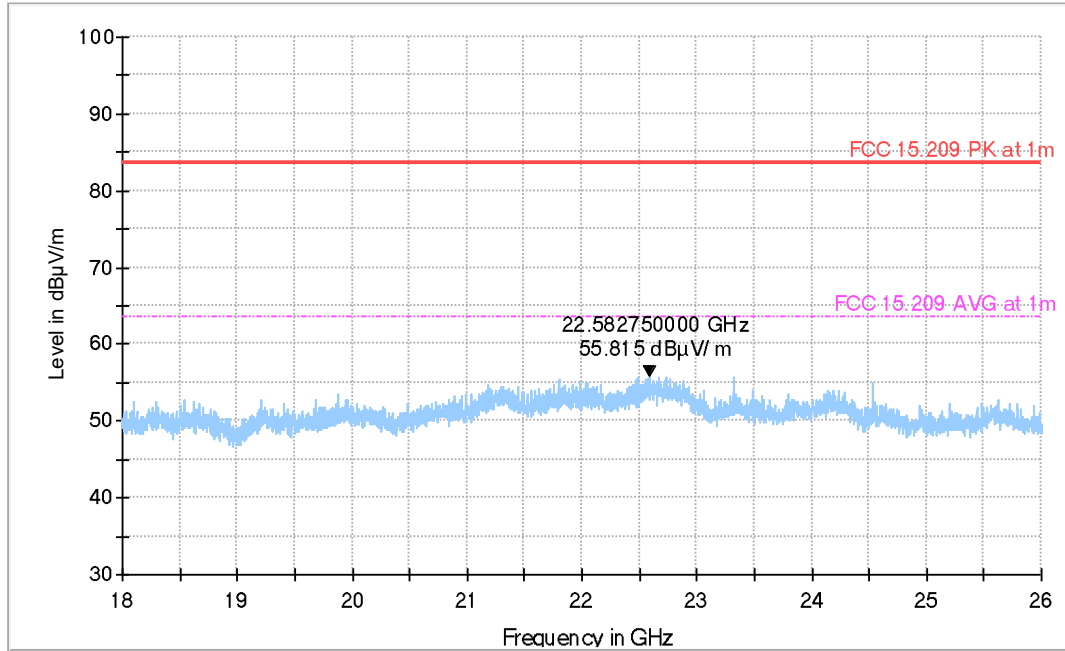
Plot # 5 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2402 MHz

Modulation: 1M

Final Result

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



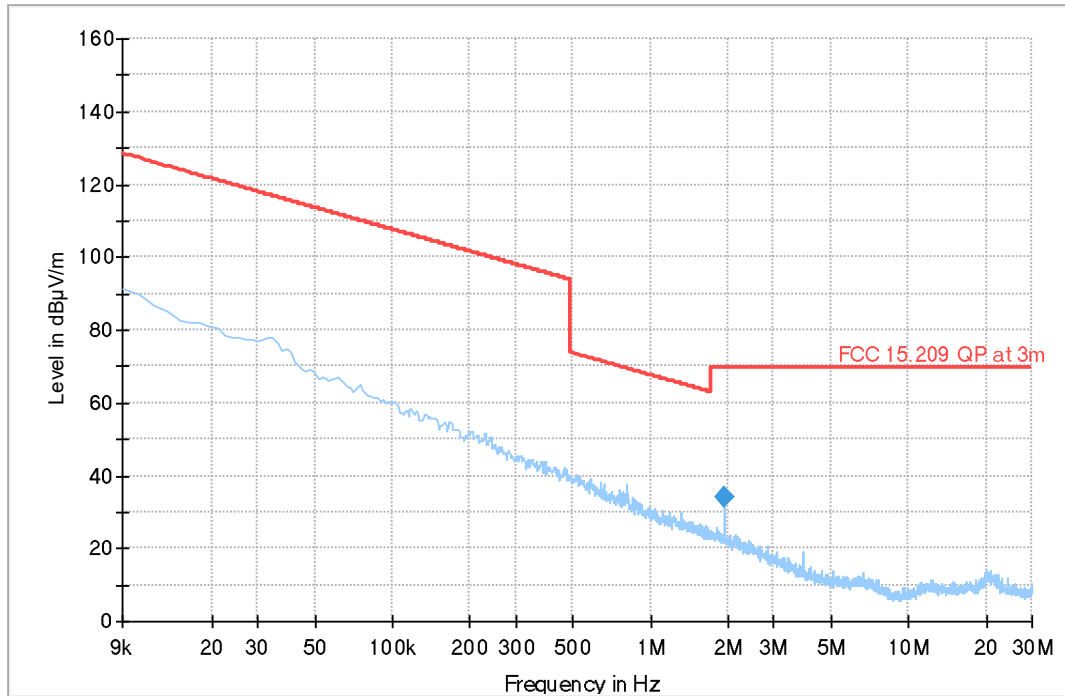
Plot # 6 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2440 MHz

Modulation: 1M

Final_Result

Frequency (MHz)	QuasiPeak (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)	Raw Rec (dBμV)
1.946	34.274	69.50	35.23	500.0	9.0	100.0	V	80.0	13.0	0.3	-28.7	41.5	21.3



— AVG_MAXH — PK+_MAXH — FCC 15.209 QP at 3m ◆ Final_Result QPK

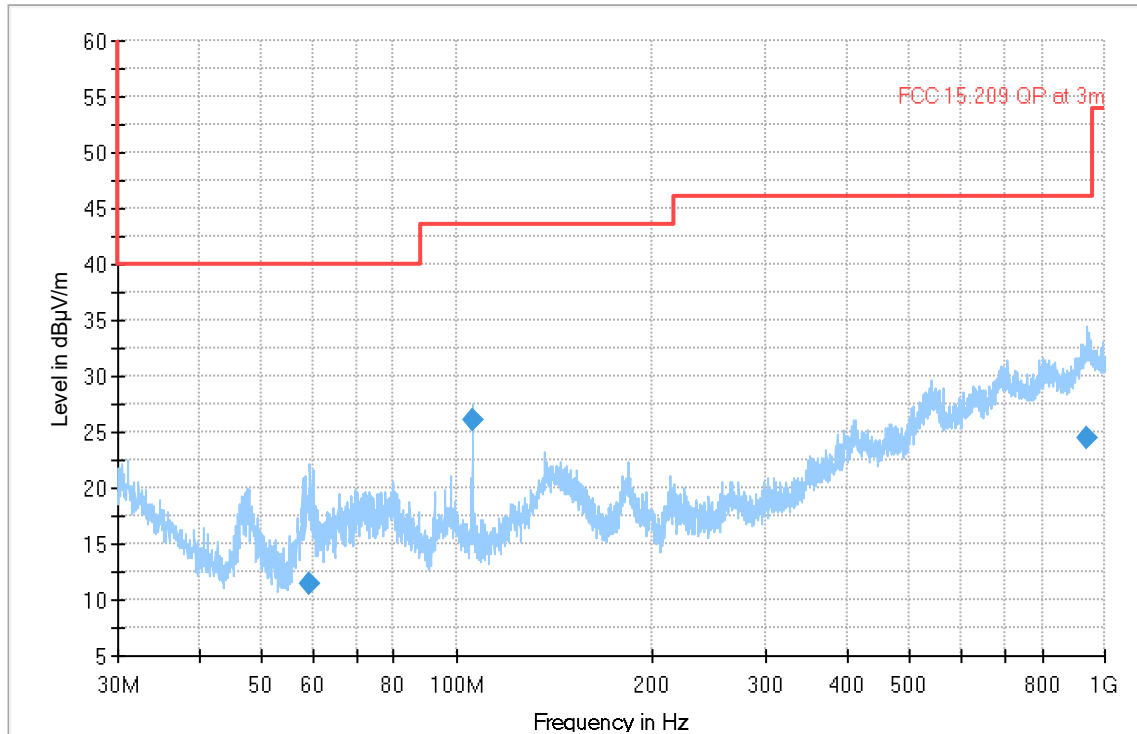
Plot # 7 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2440 MHz

Modulation: 1M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
59.391	11.47	40.00	28.53	500.0	120.0	112.0	H	190.0	-21.6	
105.757	26.16	43.50	17.34	500.0	120.0	150.0	H	-9.0	-19.6	
939.666	24.46	46.02	21.56	500.0	120.0	117.0	V	26.0	-0.5	



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

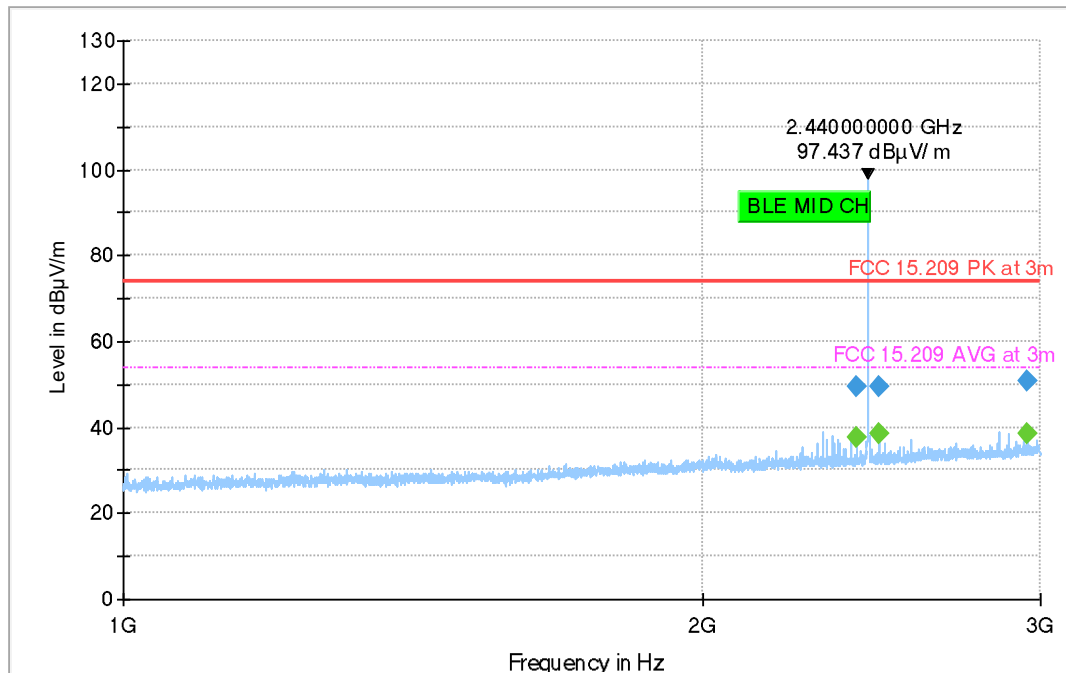
Plot # 8 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2440 MHz

Modulation: 1M

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)	Preampl (dB)	Trd Corr. (dB/m)	Raw Rec (dBμV)
2408.005	49.271	---	73.98	24.71	500.0	1000.0	245.0	H	130.0	5.9	-22.2	0.0	28.2	43.4
2408.005	---	37.565	53.98	16.41	500.0	1000.0	245.0	H	130.0	5.9	-22.2	0.0	28.2	31.6
2472.014	---	38.376	53.98	15.60	500.0	1000.0	109.0	H	85.0	6.0	-22.3	0.0	28.3	32.3
2472.014	49.301	---	73.98	24.68	500.0	1000.0	109.0	H	85.0	6.0	-22.3	0.0	28.3	43.3
2952.019	50.657	---	73.98	23.32	500.0	1000.0	109.0	H	70.0	7.9	-21.8	0.0	29.8	42.7
2952.019	---	38.619	53.98	15.36	500.0	1000.0	109.0	H	70.0	7.9	-21.8	0.0	29.8	30.7



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

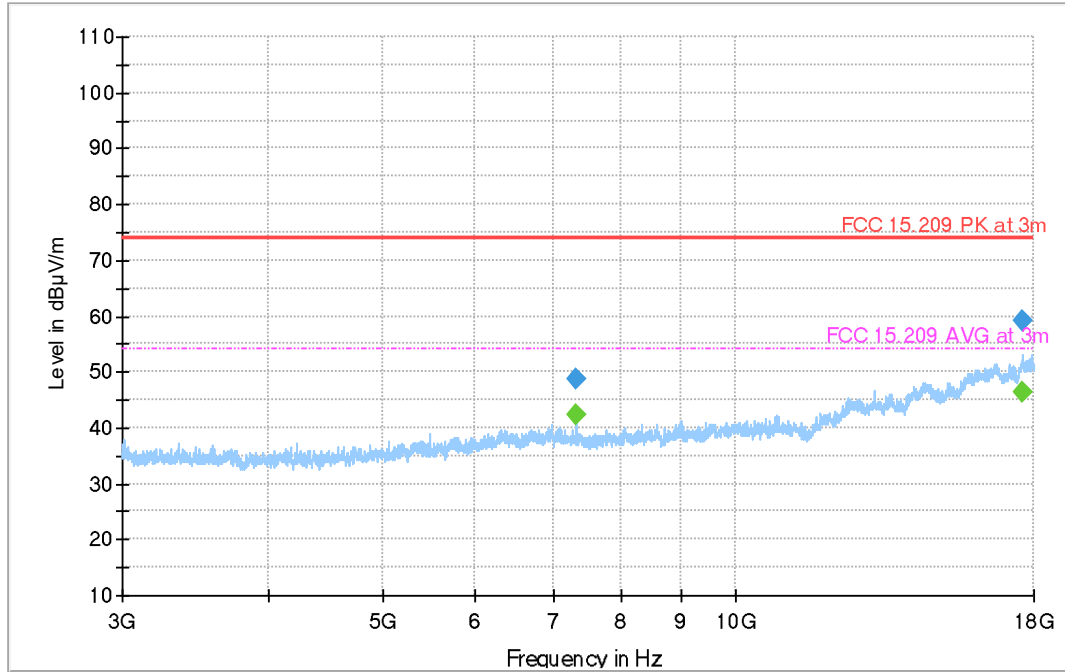
Plot # 9 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2440 MHz

Modulation: 1M

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)	Raw Rec (dBμV)
7319.989	48.598	---	73.98	25.38	500.0	1000.0	177.0	V	279.0	-1.7	9.0	-46.5	35.8	50.3
7319.989	---	42.245	53.98	11.73	500.0	1000.0	177.0	V	279.0	-1.7	9.0	-46.5	35.8	43.9
17588.384	59.053	---	73.98	14.93	500.0	1000.0	229.0	V	22.0	13.9	15.2	-42.8	41.6	45.1
17588.384	---	46.208	53.98	7.77	500.0	1000.0	229.0	V	22.0	13.9	15.2	-42.8	41.6	32.3



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

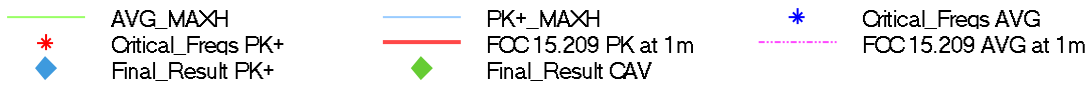
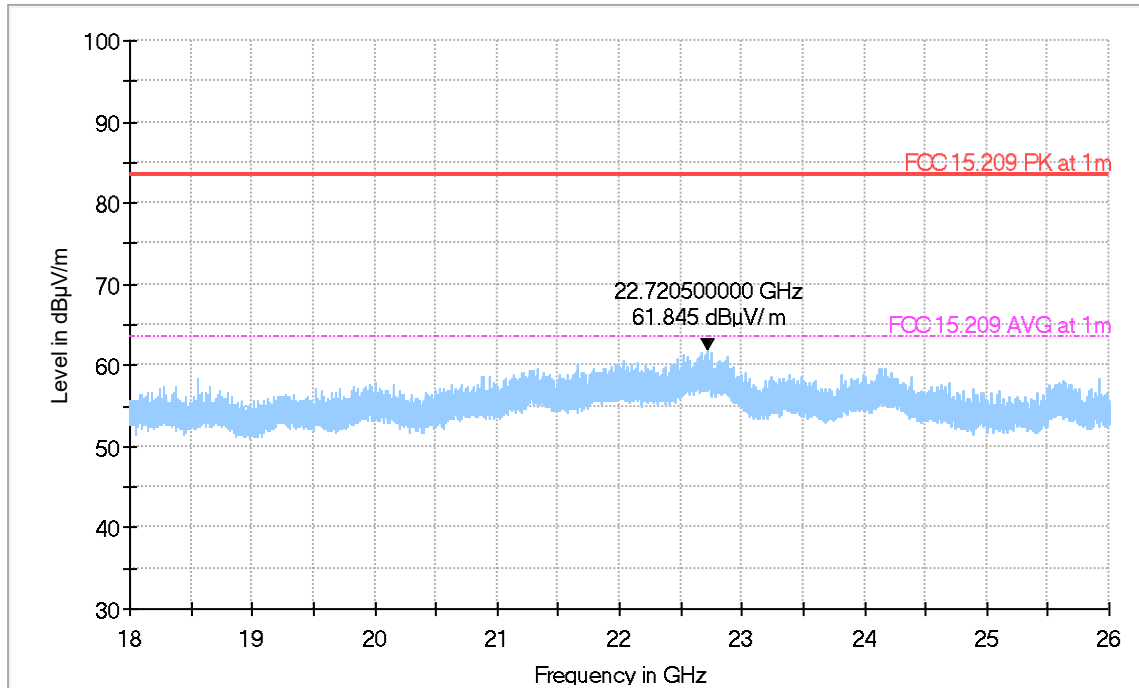
Plot # 10 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2440 MHz

Modulation: 1M

Final Result

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



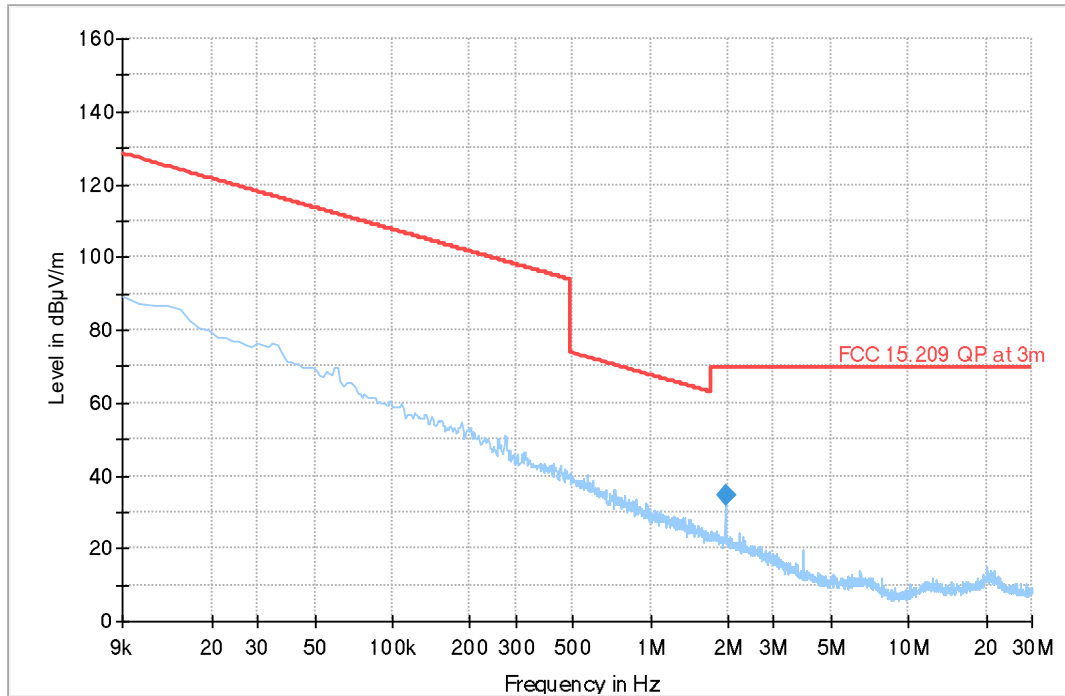
Plot # 11 Radiated Emissions: 9 KHz – 30 MHz

Tx Frequency: 2480 MHz

Modulation: 1M

Final_Result

Frequency (MHz)	QuasiPeak (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)	Raw Rec (dBμV)
1.956	34.330	69.50	35.17	500.0	9.0	100.0	H	260.0	13.0	0.3	-28.7	41.4	21.4



— AVG_MAXH — PK+_MAXH — FCC 15.209 QP at 3m ◆ Final_Result QPK

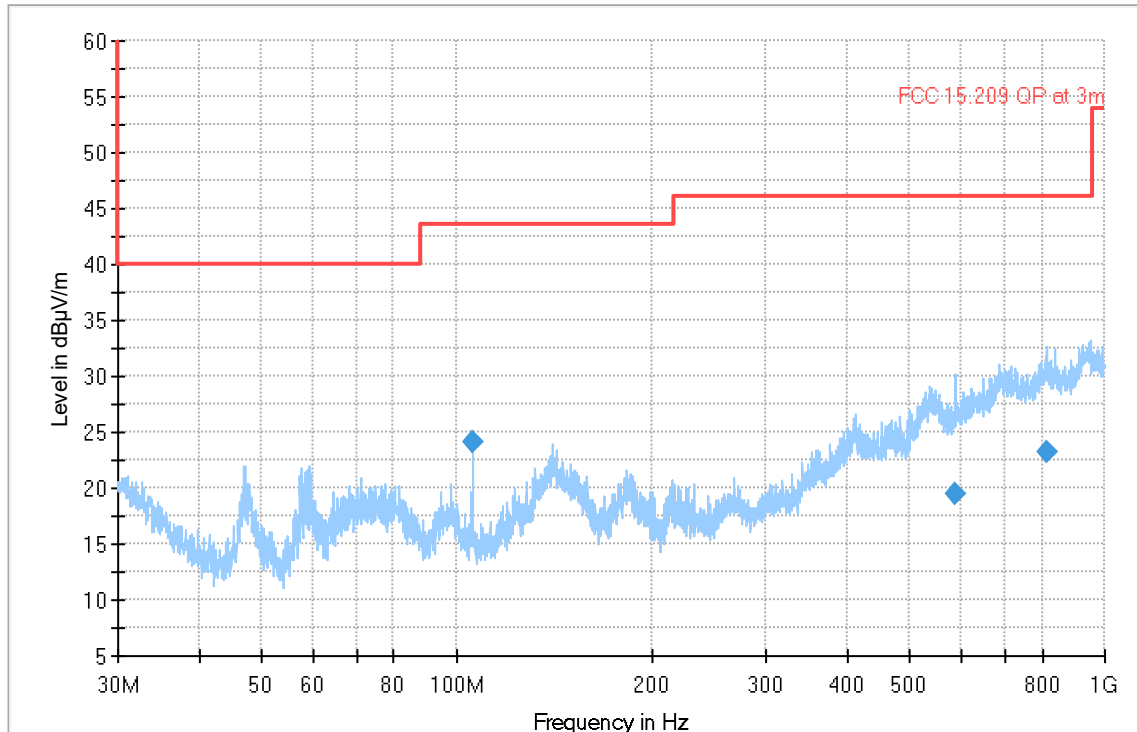
Plot # 12 Radiated Emissions: 30 – 1000MHz

Tx Frequency: 2480 MHz

Modulation: 1M

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
105.660	24.05	43.50	19.45	500.0	120.0	156.0	H	86.0	-19.6	
588.332	19.46	46.02	26.56	500.0	120.0	264.0	V	135.0	-5.8	
811.553	23.17	46.02	22.85	500.0	120.0	192.0	V	49.0	-2.1	



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

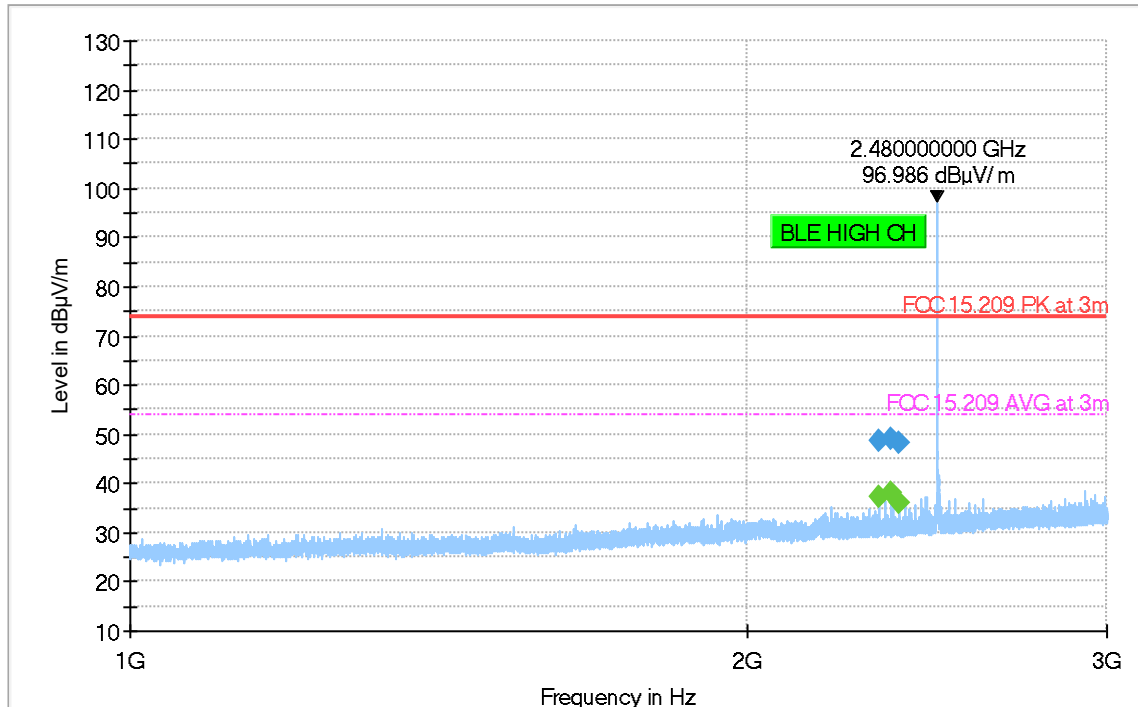
Plot # 13 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2480 MHz

Modulation: 1M

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)	Raw Rec (dBμV)
2320.012	48.668	---	73.98	25.31	500.0	1000.0	100.0	H	252.0	5.6	-22.3	0.0	28.0	43.0
2320.012	---	37.428	53.98	16.55	500.0	1000.0	100.0	H	252.0	5.6	-22.3	0.0	28.0	31.8
2352.001	49.086	---	73.98	24.89	500.0	1000.0	143.0	H	170.0	5.9	-22.1	0.0	28.0	43.1
2352.001	---	37.930	53.98	16.05	500.0	1000.0	143.0	H	170.0	5.9	-22.1	0.0	28.0	32.0
2376.016	---	36.115	53.98	17.86	500.0	1000.0	245.0	H	125.0	5.8	-22.3	0.0	28.1	30.3
2376.016	48.108	---	73.98	25.87	500.0	1000.0	245.0	H	125.0	5.8	-22.3	0.0	28.1	42.3



◆ PK+_MAXH Final_Result PK+
 ◆ FCC 15.209 PK at 3m Final_Result AVG
 ----- FCC 15.209 AVG at 3m

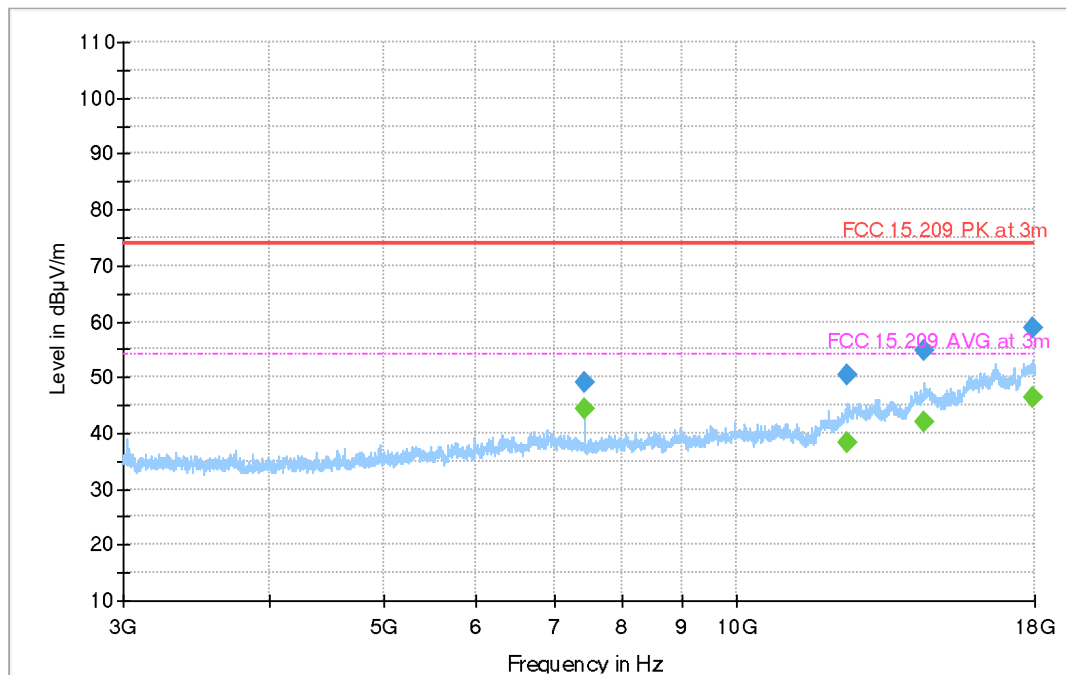
Plot # 14 Radiated Emissions: 3 - 18 GHz

Tx Frequency: 2480 MHz

Modulation: 1M

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)	Raw Rec (dBμV)
7440.031	48.998	---	73.98	24.98	500.0	1000.0	109.0	H	255.0	-1.6	9.2	-46.7	35.9	50.6
7440.031	---	44.383	53.98	9.60	500.0	1000.0	109.0	H	255.0	-1.6	9.2	-46.7	35.9	46.0
12466.337	50.364	---	73.98	23.61	500.0	1000.0	227.0	V	338.0	6.5	12.2	-44.3	38.5	43.9
12466.337	---	38.121	53.98	15.86	500.0	1000.0	227.0	V	338.0	6.5	12.2	-44.3	38.5	31.7
14487.906	---	42.096	53.98	11.88	500.0	1000.0	213.0	H	80.0	9.3	13.5	-44.9	40.7	32.8
14487.906	54.725	---	73.98	19.25	500.0	1000.0	213.0	H	80.0	9.3	13.5	-44.9	40.7	45.4
17940.315	---	46.384	53.98	7.60	500.0	1000.0	100.0	V	134.0	14.8	15.5	-42.3	41.6	31.6
17940.315	58.798	---	73.98	15.18	500.0	1000.0	100.0	V	134.0	14.8	15.5	-42.3	41.6	44.0



◆ 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

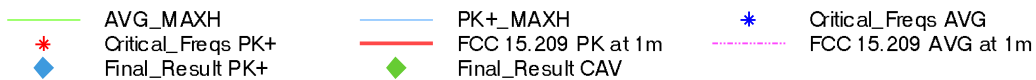
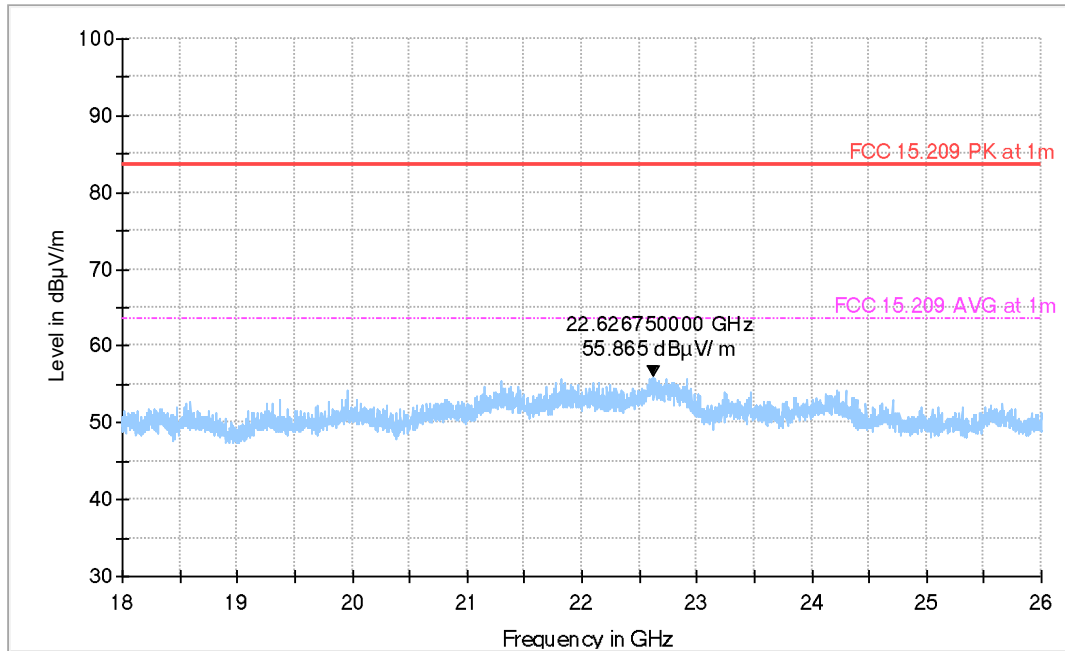
Plot # 15 Radiated Emissions: 18 - 26GHz

Tx Frequency: 2480 MHz

Modulation: 1M

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path (dB)	Preampl (dB)	Trd Corr. (dB/m)	Raw Rec (dBμV)
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9 Test setup photos

Setup photos are included in supporting file name:
"EMC_TELUL_234_15_247_BTLE_DTS_Setup_Photos_Rev1.pdf"

10 Test Equipment And Ancillaries Used For Testing

EMC Lab 1 Emission

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
BILOG ANTENNA	ETS.LINDGREN	3142E	00166067	3 Years	08/01/2024
TEST RECEIVER	R&S	ESW44	103143	2 Years	09/12/2024
DIGITAL THERMOMETER	CONTROL COMPANY	4410,90080-03	230713059	3 Years	10/18/2023
Multimeter	Fluke	115	56090717MV	3 Years	09/26/2023
Software	EMC32	Version 11.40.00	-	-	-

EMC Lab 2 Emission

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	04/17/2024
DIGITAL THERMOMETER	Control Company	4410,90080-03	230712972	3 Years	10/18/2023
Signal Analyzer	R&S	FSV40	101022	3 Years	09/25/2023
Multimeter	Fluke	115	56090717MV	3 Years	09/26/2023
Software	EMC32	Version 10.50.40	-	-	-

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
2025-10-03	EMC_TELUL_234_25001_FCC_15_247_BTLE_DTS	Initial Version	Art Thammanavarat
2025-10-21	EMC_TELUL_234_25001_FCC_15_247_BTLE_DTS_Rev1	Report revised 1. Section 3.1: Updated table. 2. Section 8.2.5: Updated plots 3. Updated Setup Photos	Art Thammanavarat

<<< The End >>>