



FCC / ISED Test Report

FOR: ChargePoint Inc.

Marketing name: CPNK

Model Name: CPNK500

Product Description: CPNK500 is to provide communication between the Chargepoint network and the charging station.

FCC ID: W38-28010106

IC ID: 8854A-28010106

Applied Rules and Standards:

47 CFR Part 15.247 (DTS)

RSS-247 Issue 2 (DTSS) & RSS-Gen Issue 5

REPORT #: EMC_CHARG_017_18501_FCC_15.247_ISED_BLE_DTS

DATE: 11/09/2018



A2LA Accredited

IC recognized #
3462B-2

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1 Assessment

The following device as further described in section 3 of this report was evaluated for radiated spurious emissions of unlicensed radio according to criteria specified in FCC rules 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-GEN and RSS-247.

No deviations were ascertained.

Company	Description	Model #
ChargePoint Inc.	CPNK500 is to provide communication between the Chargepoint network and the charging station.	CPNK500

Responsible for Testing Laboratory:

11/09/2018	Compliance	Cindy Li (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

11/09/2018	Compliance	Issa Ghanma (EMC Engineer)	
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
Lab Manager:	Cindy Li
Responsible Project Leader:	Cathy Palacios

2.2 Identification of the Client

Applicant's Name:	ChargePoint Inc.
Street Address:	254 E. Hacienda Ave.
City/Zip Code	Campbell, CA 95008-6617
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

Model No:	CPNK500
FWIN:	7.0.3
HVIN:	27-010106
PMN:	CPNK500, CPNK
Module Information	
Module Name:	Redpine TS9113
FCC ID:	XF6-RS9113DB
IC ID:	8407ARS9113DB
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
Type(s) of Modulation:	Bluetooth low energy GFSK modulation.
Modes of Operation:	Bluetooth LE in both advertising and connected mode of operation
Max. declared output Powers form modular grant:	0.02904 Watts
Antenna Information as declared:	Embedded 2.4GHZ,WLAN Peak gain: 1.5 – 2.5dBi Manufacturer item number: 1000146
Power Supply/ Rated Operating Voltage Range:	Low 23 VDC, Nominal 24 VDC, High 25 VDC
Operating Temperature Range:	Low -30° C, Nominal 25° C, High 50° C

Other Radios included in the device:	Cellular Module: LTE module will operate on band 2, 4, 5, 13 and 17 with a fall back 3G band 2, 4, 5. FCC ID: QIPPLS8-X / IC ID: 7830A-PLS8X Redpine Module: Radios: • Bluetooth Classic 4.0 / Modulation: GFSK, DQPSK, 8DPSK • 2.4GHz operate on b/g/n modulation on channel 1-11 • 5GHz operate a/n modulation on Band 1 and Band 3 channel 36-48 and 149-165 FCC ID: XF6-RS9113DB / IC: 8407ARS9113DB
Sample Revision	☐ Prototype Unit; ☒ Production Unit; ☐ Pre-Production
EUT Dimensions(mm):	190x180x20
Weight(grams):	229
EUT Diameter	☒ < 60 cm ☐ Other _____

3.2 EUT Sample details

EUT #	Unit number	HW Version	SW Version	Notes/Comments
1	Unit #3	27-01016	7.0.3	Radiated Emissions

3.3 Accessory Equipment (AE) details

AE #	Comments
-	NA

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
-	-	NA

3.5 Mode of Operation details

Mode of Operation	Description of Operating modes	Additional Information
Op. 1	BLE GFSK	The customer provided special commands that is not available to the end user to configure the EUT to: • Low, Mid, High channel. • Maximum power. • Maximum duty cycle. Configuration commands will not be available for the end user. Putty Terminal tool used for configuration. The internal antenna was connected.

3.6 Justification for Worst Case Mode of Operation

During the testing process the EUT was tested with transmitter sets on low, mid and high channels, the highest duty cycle and maximum output power.

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 transmitter spurious emission 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 Issue 2 and RSS-GEN Issue 5 of ISED Canada.

This test report is to support a request for new equipment authorization under the:

- FCC ID: W38-28010106
- IC ID: 8854A-28010106

The conducted module test data can be obtained under the FCC ID: XF6-RS9113DB / IC: 8407ARS9113DB

Testing procedures are based on 558074 D01 DTS Meas Guidance v04 – “GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247” - April 5, 2017, 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)(2) RSS-247 5.2(a)	Emission Bandwidth	Nominal		☐	☐	☒	Note 1 Note 3 Complies
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal		☐	☐	☒	Note 1 Note 3 Complies
§15.247(b)(3) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal		☐	☐	☒	Note 1 Note 3 Complies
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	-	☐	☐	☒	Note 1 Note 3 Complies
§15.247; 15.209; 15.205 RSS-247 5.5; Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	-	☐	☐	☒	Complies
§15.247; §15.209 RSS-Gen 6.13	TX Spurious emissions- Radiated	Nominal	BT LE	☒	☐	☐	Note 1 Note 2 Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	-	-	☐	☒	☐	Note 1 Note 2

Note1: NA= Not Applicable; NP= Not Performed.

Note2: Device does not connect to AC main power.

Note3: Leveraged from module certification FCC ID: XF6-RS9113DB / IC: 8407ARS9113DB

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 $k=1$.

Radiated measurement

9 kHz to 30 MHz	± 2.5 dB (Magnetic Loop Antenna)
30 MHz to 1000 MHz	± 2.0 dB (Biconilog Antenna)
1 GHz to 40 GHz	± 2.3 dB (Horn Antenna)

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 3 dB 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:

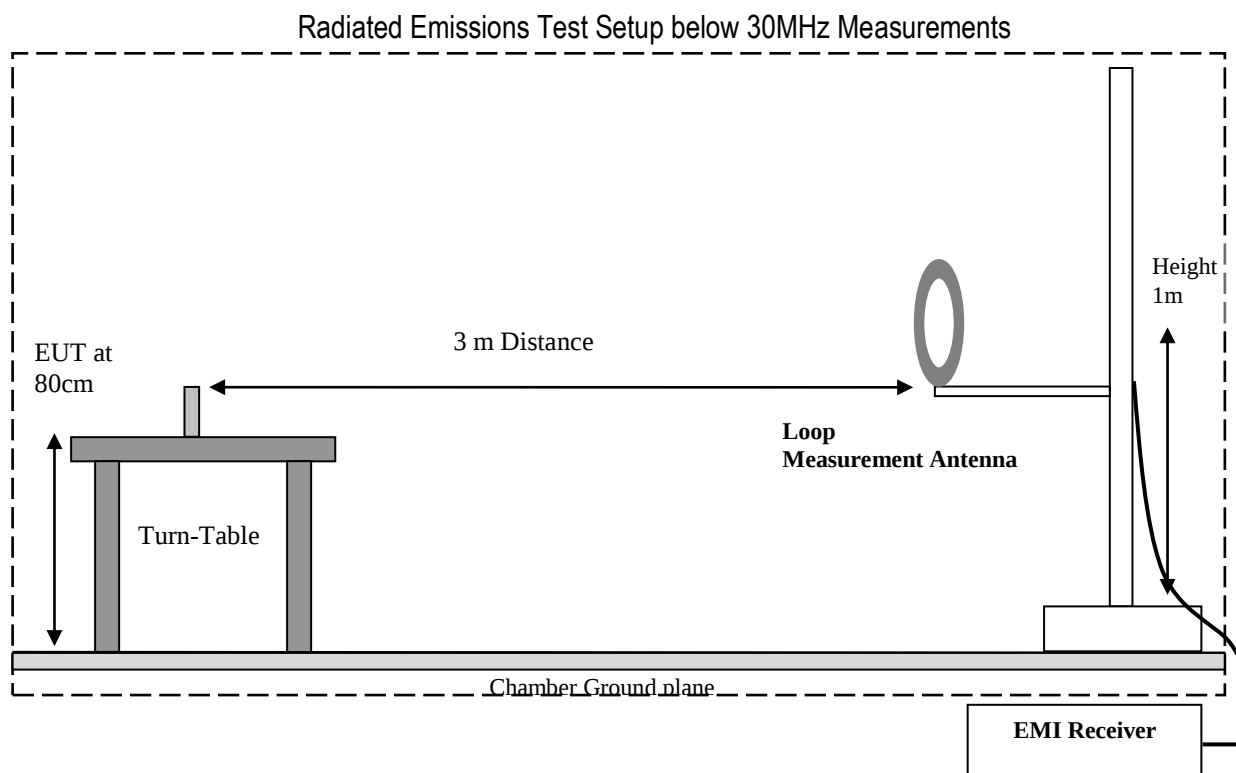
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7 Measurement Procedures

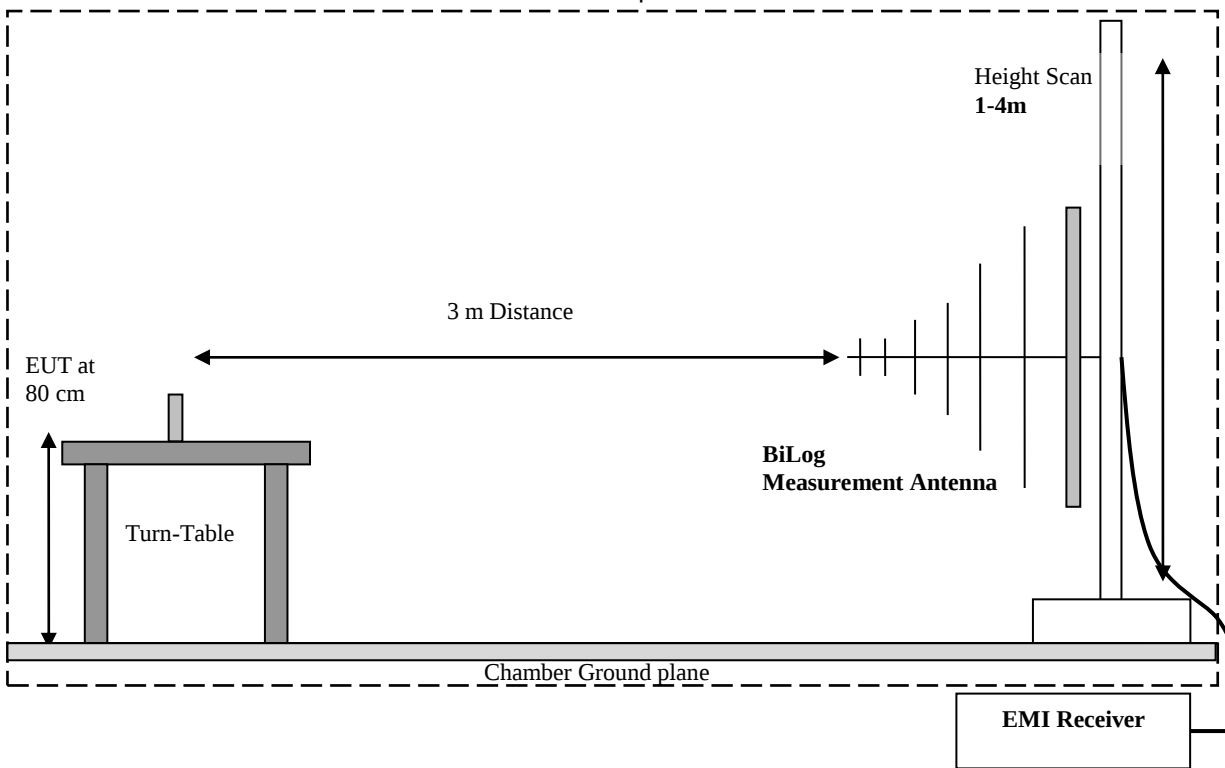
7.1 Radiated Measurement

The radiated measurement is performed according to ANSI C63.10 (2013)

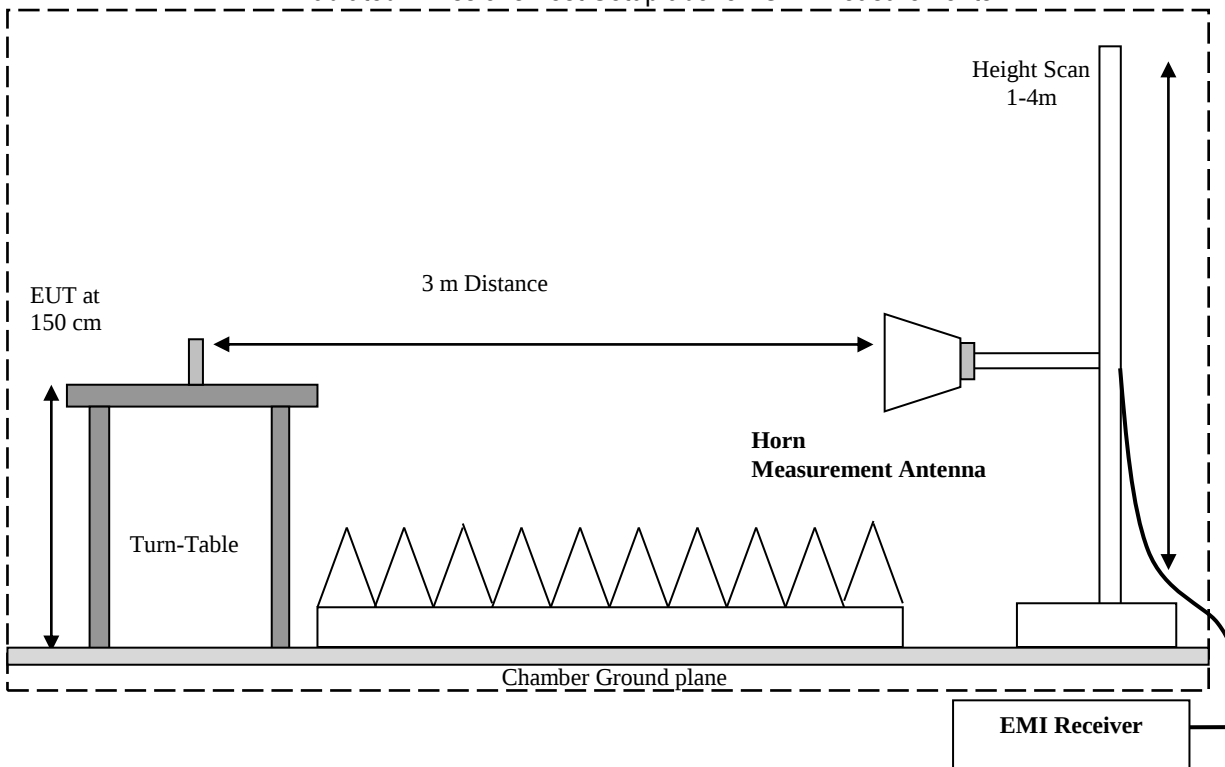
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to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

8 Test Result Data

8.1 Radiated Transmitter Spurious Emissions and Restricted Bands

8.1.1 Measurement according to ANSI C63.10 (2013)

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 at distance other than the specified in the standard, the limit conversion is calculated by using 40 dB/decade extrapolation factor as follow: Conversion factor (CF) = $40 \log (D/d) = 40 \log (300m / 3m) = 80dB$

8.1.2 Limits:

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)).

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

8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
23° C	1	Op.1	24V DC

8.1.4 Measurement result:

Plot #	Channel #	Scan Frequency	Frequency of highest emission in MHz	Highest emission in dB	Limit	Result
1 – 3	Low	30 MHz – 18 GHz	2482	55.52	See section 8.1.2	Pass
4 – 8	Mid	9 kHz – 26 GHz	2519	56.10	See section 8.1.2	Pass
9 – 11	High	30 MHz – 18 GHz	2499	58.14	See section 8.1.2	Pass

8.1.5 Measurement Plots:

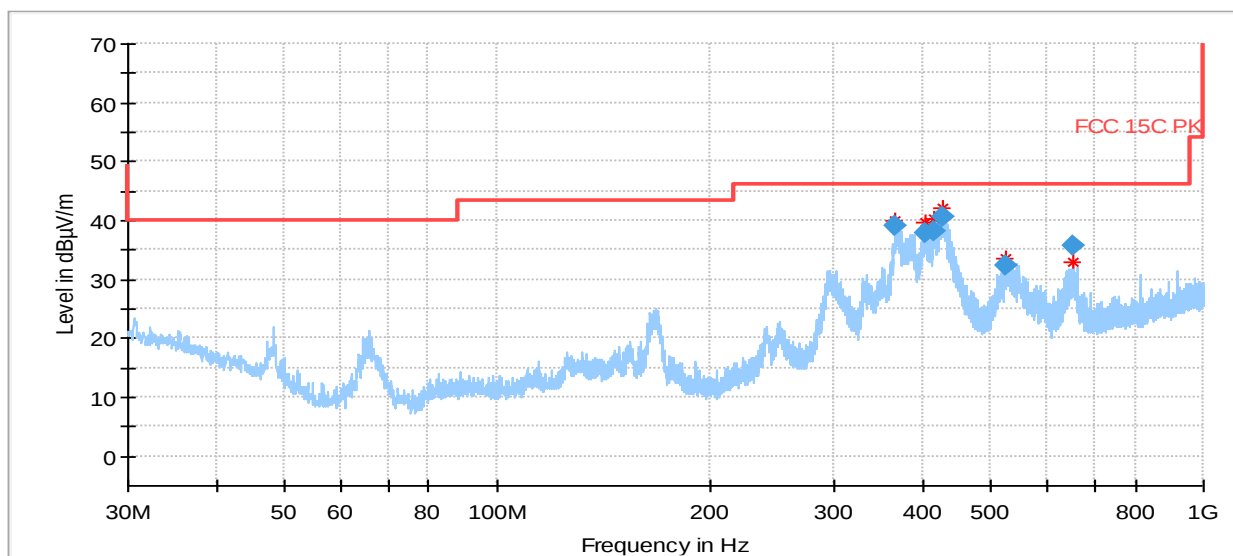
Plot #1 Radiated Emissions: 30MHz – 1GHz

Modulation: BT LE

Channel: Low

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
366.536750	39.04	46.00	6.96	500.0	100.000	100.0	H	98.0	-15.3
404.821100	37.83	46.00	8.17	500.0	100.000	107.0	H	98.0	-14.5
416.438800	38.08	46.00	7.92	500.0	100.000	107.0	H	109.0	-13.6
426.034450	40.51	46.00	5.49	500.0	100.000	116.0	V	162.0	-15.0
524.326200	32.28	46.00	13.72	500.0	100.000	100.0	H	113.0	-12.4
655.293800	35.65	46.00	10.35	500.0	100.000	157.0	H	97.0	-9.0



Preview Result 1-PK+
FCC 15C PK

* Critical_Freqs PK+
◆ Final_Result QPK

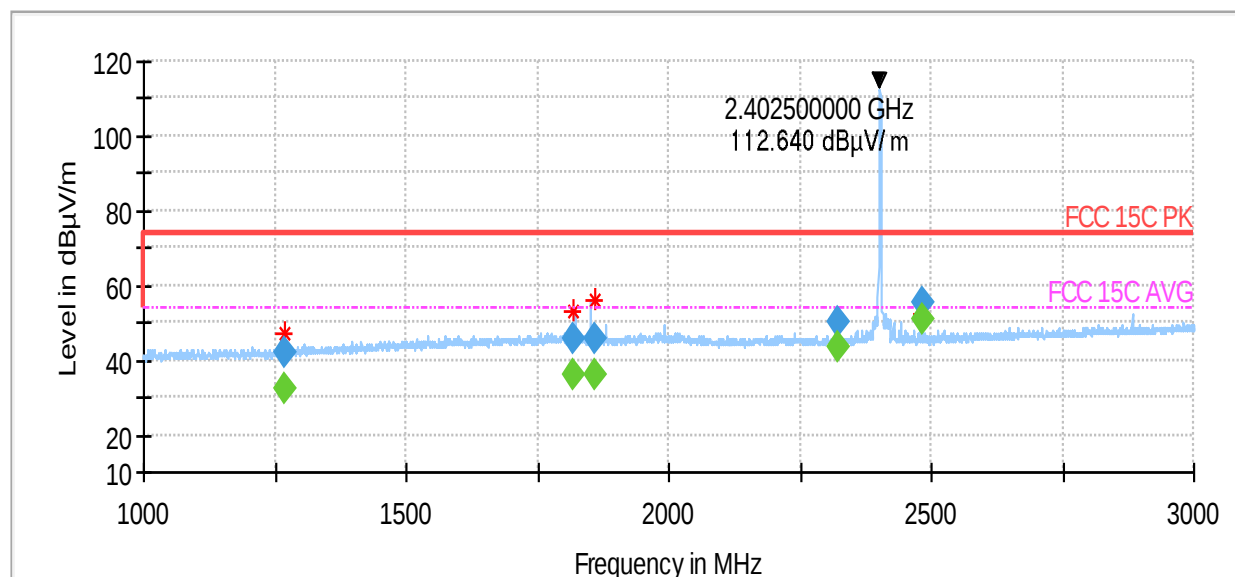
Plot # 2 Radiated Emissions: 1 – 3GHz

Modulation: BT LE

Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1268.90500	42.21	---	74.00	31.79	10.0	1000.000	177.0	V	154.0	5.5
1268.90500	---	32.33	53.98	21.65	10.0	1000.000	177.0	V	154.0	5.5
1816.37500	---	36.20	53.98	17.77	10.0	1000.000	136.0	V	138.0	8.4
1816.37500	45.59	---	74.00	28.41	10.0	1000.000	136.0	V	138.0	8.4
1860.51500	---	36.00	53.98	17.98	10.0	1000.000	116.0	V	87.0	8.6
1860.51500	45.62	---	74.00	28.38	10.0	1000.000	116.0	V	87.0	8.6
2321.87000	---	43.72	53.98	10.26	10.0	1000.000	139.0	H	218.0	8.2
2321.87000	50.13	---	73.99	23.86	10.0	1000.000	139.0	H	218.0	8.2
2482.18500	55.52	---	73.99	18.47	10.0	1000.000	177.0	H	229.0	8.1
2482.18500	---	50.85	53.98	3.13	10.0	1000.000	177.0	H	229.0	8.1



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

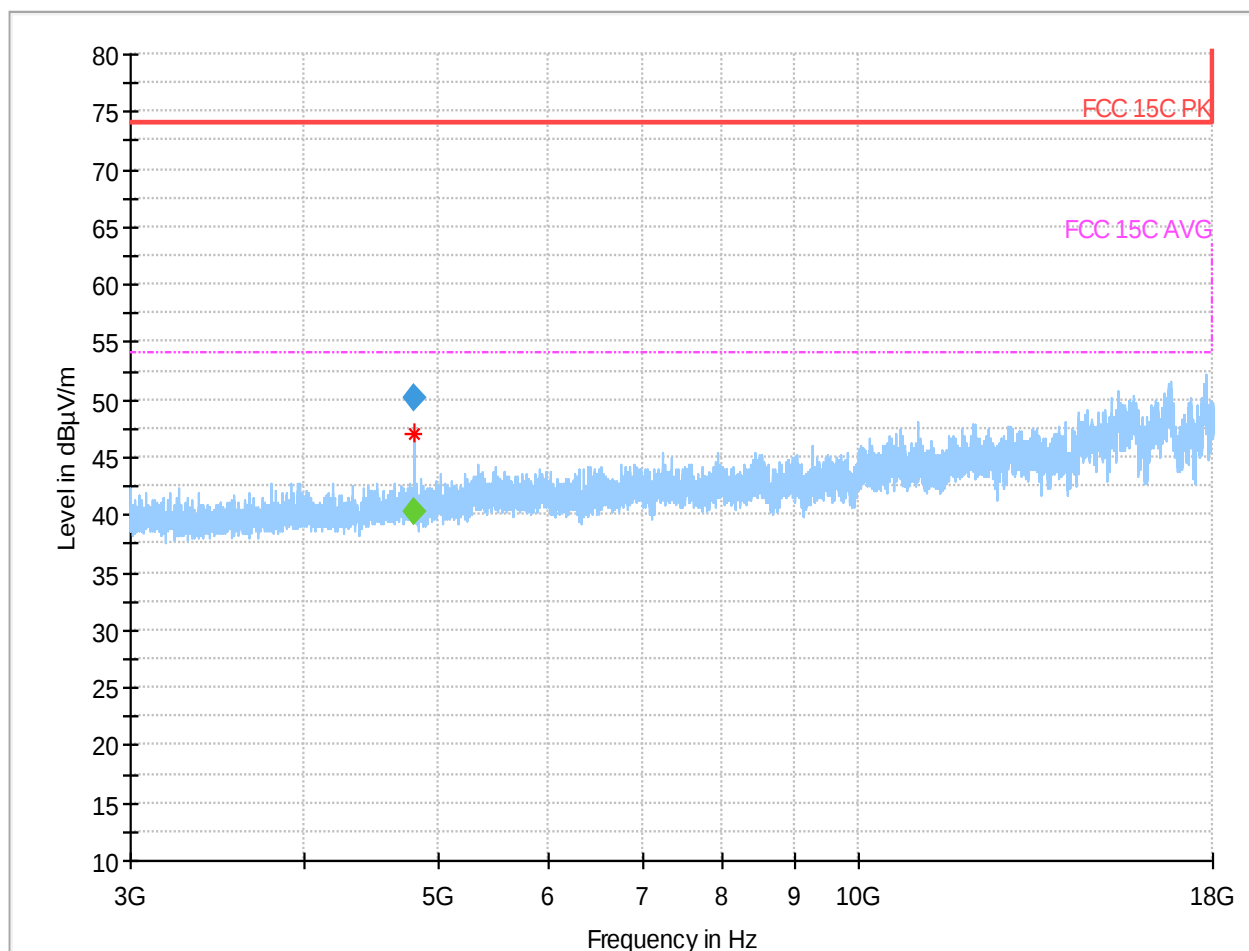
Plot # 3 Radiated Emissions: 3 – 18GHz

Modulation: BT LE

Channel: Low

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
4804.30926	---	40.22	53.98	13.76	200.0	1000.000	108.0	H	202.0	-33.5
4804.30926	50.06	---	73.99	23.93	200.0	1000.000	108.0	H	202.0	-33.5



Preview Result 1-PK+
FCC 15C AVG

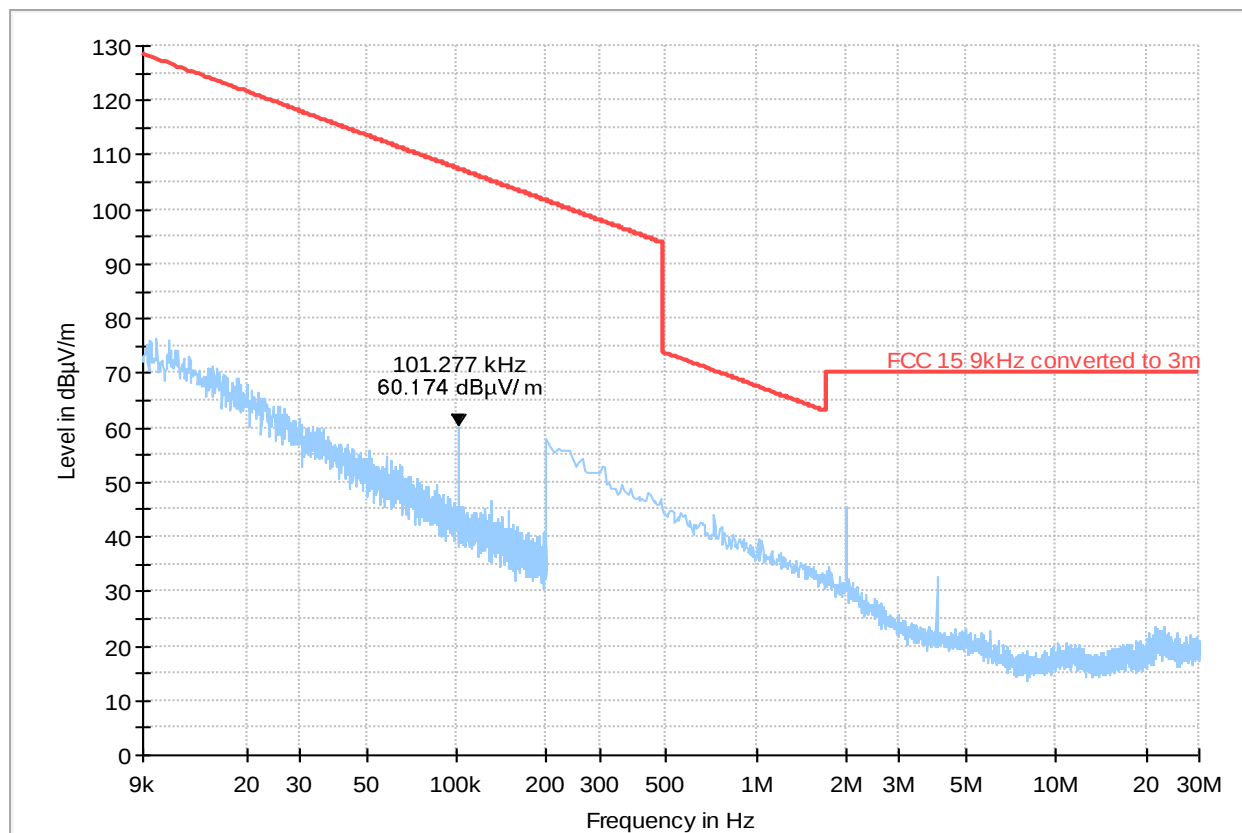
* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

Plot # 4 Radiated Emissions: 9KHz – 30MHz

Modulation: BT LE

Channel: Mid



— Preview Result 1-PK+
— FCC 15 9kHz converted to 3m
◆ Final Result RMS

* Critical_Freqs PK+
◆ Final_Result PK+

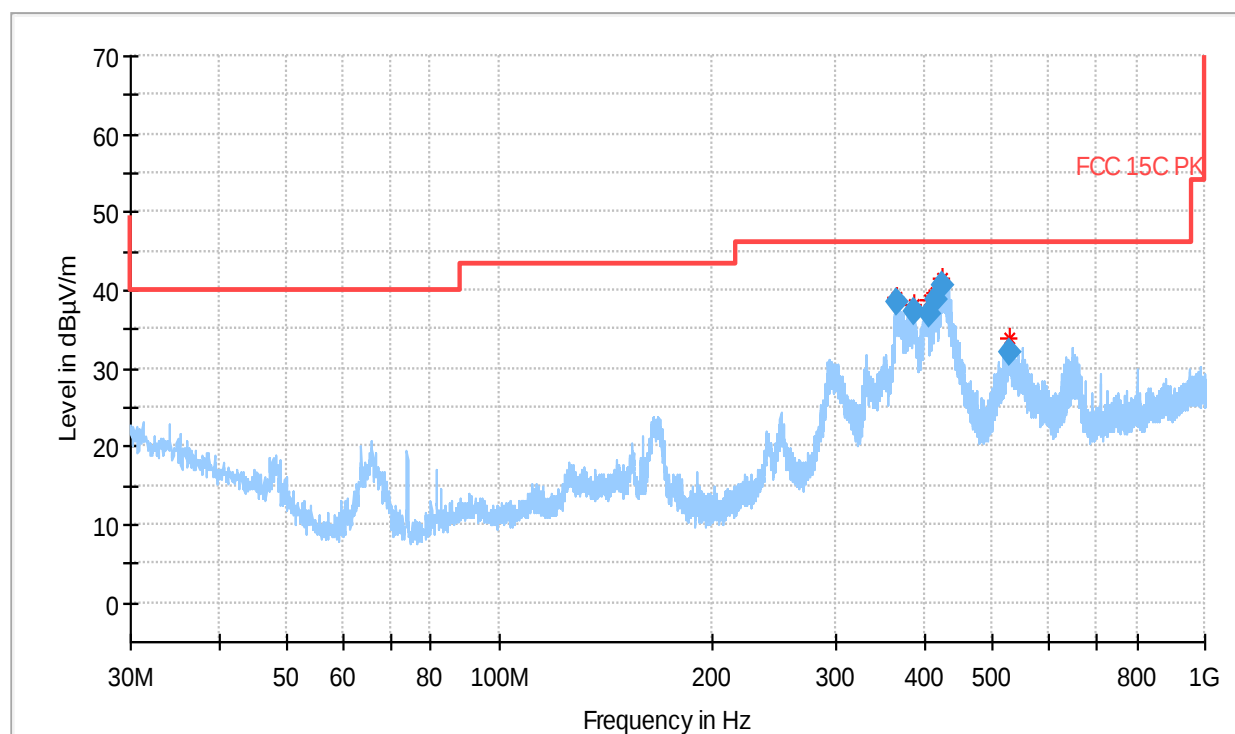
Plot #5 Radiated Emissions: 30MHz – 1GHz

Modulation: BT LE

Channel: Mid

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
366.172850	38.43	46.00	7.57	500.0	100.000	100.0	H	98.0	-15.3
387.151600	37.35	46.00	8.65	500.0	100.000	100.0	H	94.0	-15.1
405.272950	36.99	46.00	9.01	500.0	100.000	107.0	H	97.0	-14.4
415.766100	38.80	46.00	7.20	500.0	100.000	100.0	H	112.0	-13.6
425.557350	40.67	46.00	5.33	500.0	100.000	100.0	V	159.0	-14.9
530.394600	32.04	46.00	13.96	500.0	100.000	100.0	H	116.0	-12.2



— Preview Result 1-PK+ * Critical_Freqs PK+
— FCC 15C PK ♦ Final_Result QPK

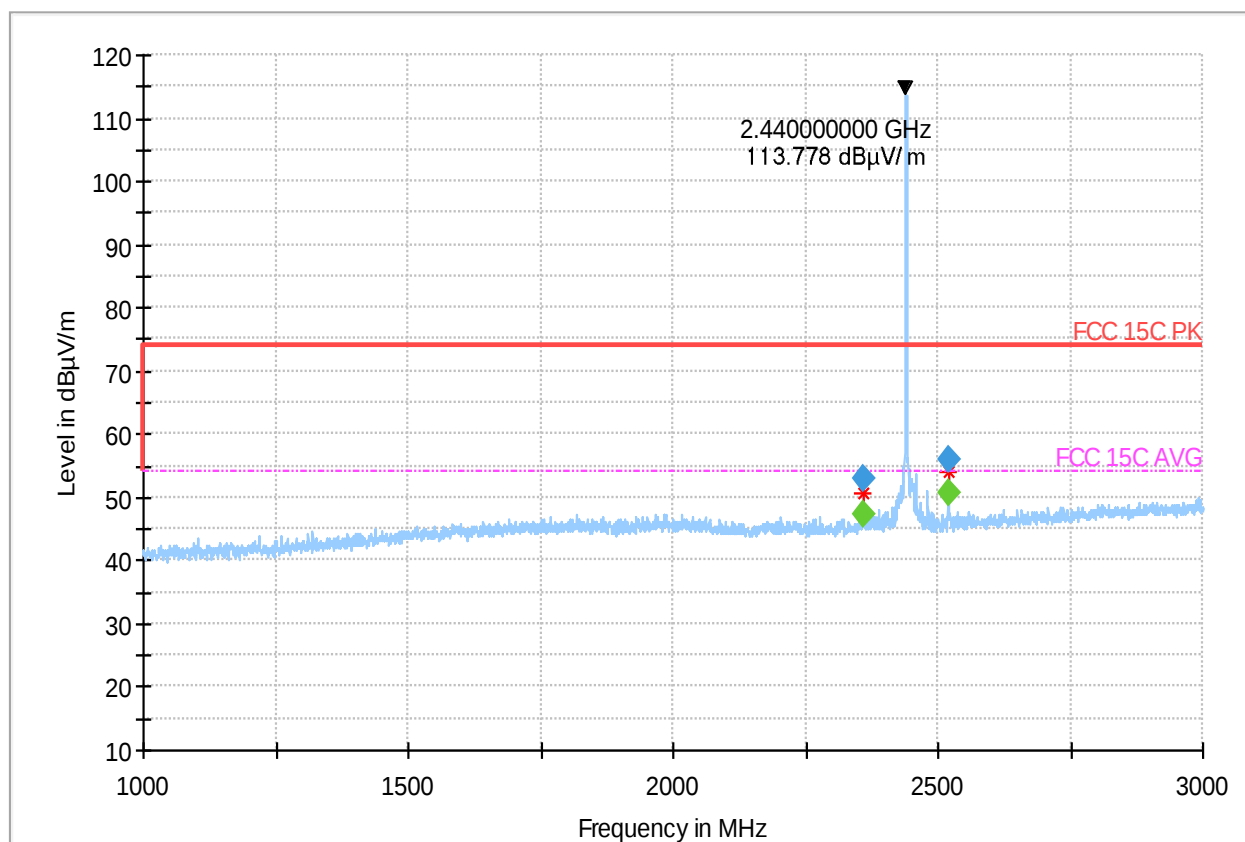
Plot #6 Radiated Emissions: 1 – 3GHz

Modulation: BT LE

Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2359.87500	53.13	---	73.99	20.87	10.0	1000.000	116.0	H	227.0	8.4
2359.87500	---	47.26	53.98	6.72	10.0	1000.000	116.0	H	227.0	8.4
2519.67000	56.10	---	73.99	17.89	10.0	1000.000	189.0	H	223.0	8.1
2519.67000	---	50.69	53.98	3.29	10.0	1000.000	189.0	H	223.0	8.1



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

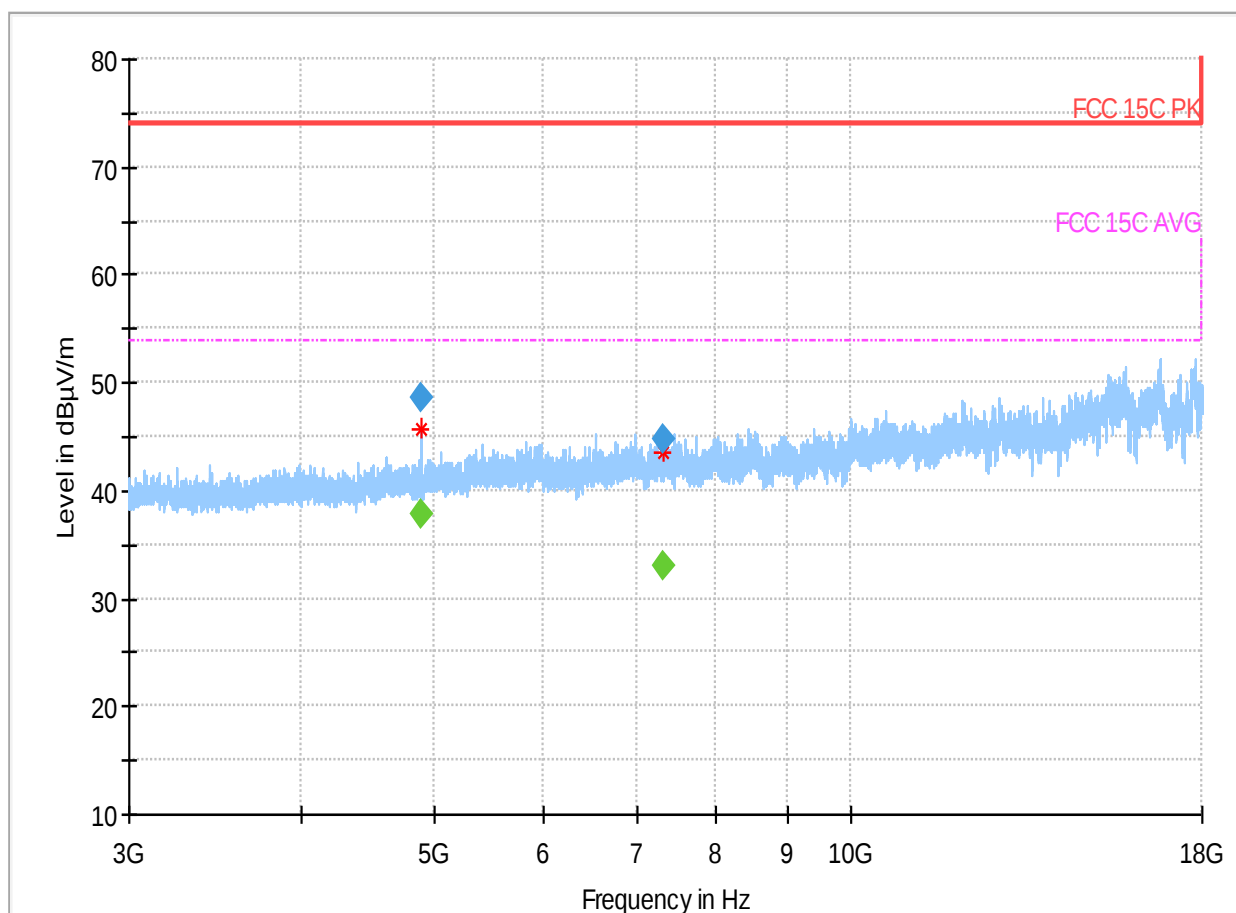
Plot #7 Radiated Emissions: 3 – 18GHz

Modulation: BT LE

Channel: Mid

Final Result

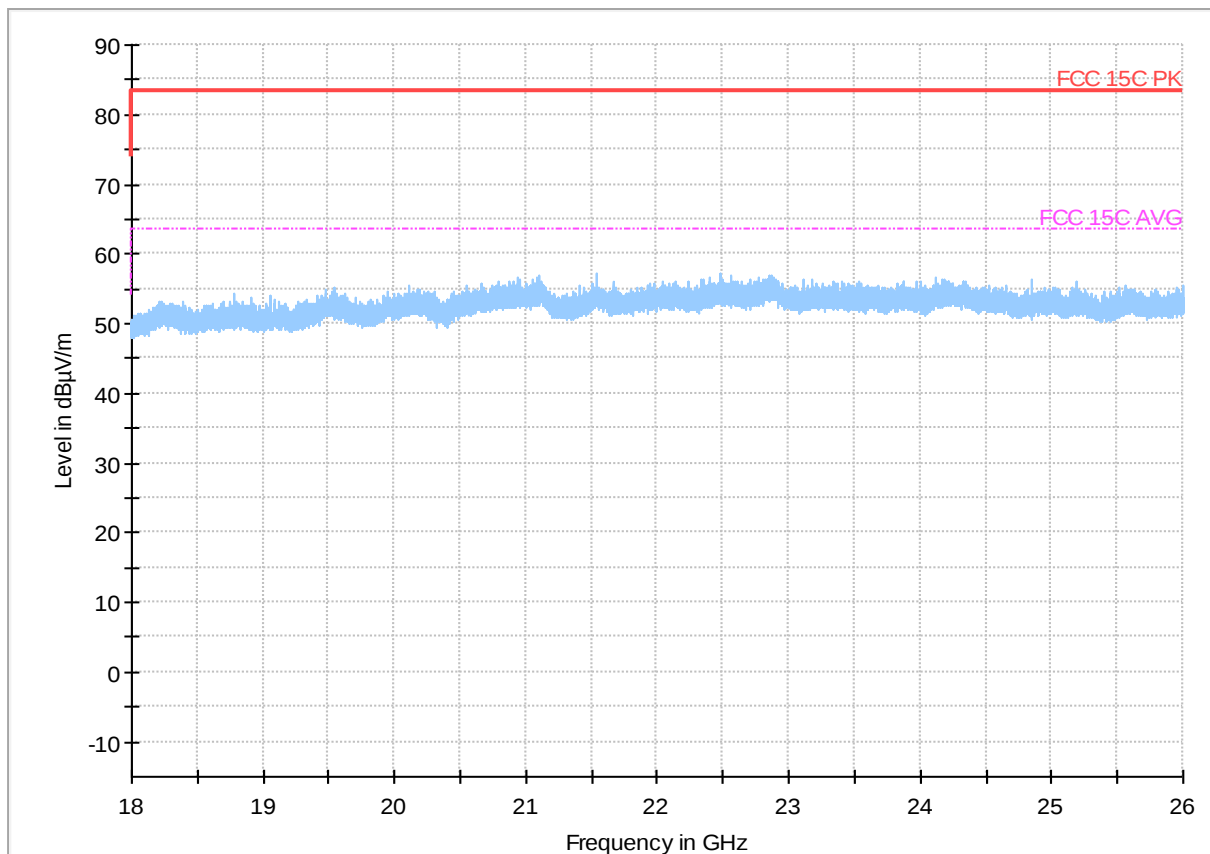
Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
4880.50876	---	37.75	53.98	16.23	200.0	1000.000	292.0	H	225.0	-33.4
4880.50876	48.64	---	73.99	25.34	200.0	1000.000	292.0	H	225.0	-33.4
7317.72690	---	33.08	53.98	20.90	200.0	1000.000	227.0	V	23.0	-29.9
7317.72690	44.70	---	73.99	29.29	200.0	1000.000	227.0	V	23.0	-29.9



Plot #8 Radiated Emissions: 18 – 26GHz

Modulation: BT LE

Channel: Mid



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

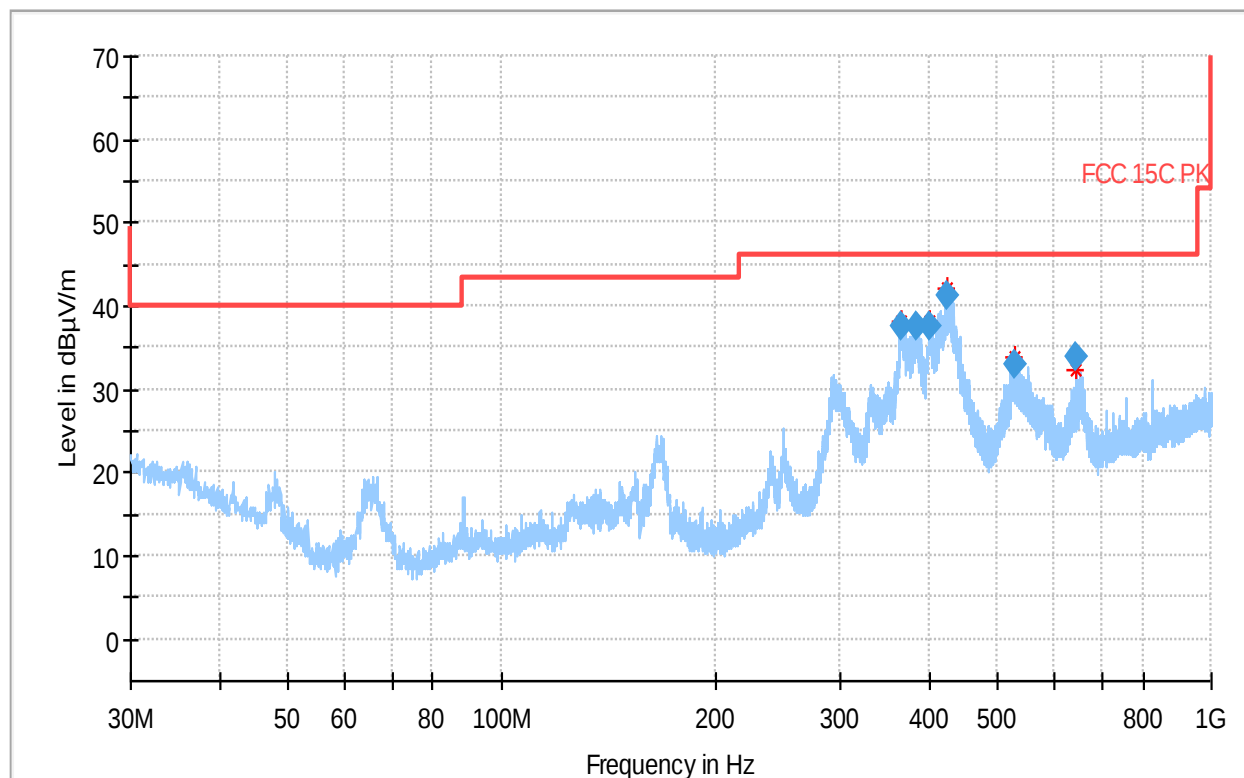
Plot #9 Radiated Emissions: 30MHz – 1GHz

Modulation: BT LE

Channel: High

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
366.015450	37.70	46.00	8.30	500.0	100.000	100.0	H	102.0	-15.4
383.095450	37.54	46.00	8.46	500.0	100.000	149.0	V	234.0	-15.5
400.335800	37.49	46.00	8.51	500.0	100.000	100.0	H	101.0	-15.0
425.295300	41.09	46.00	4.91	500.0	100.000	107.0	V	166.0	-14.9
529.527150	32.98	46.00	13.02	500.0	100.000	116.0	V	115.0	-12.6
644.497600	33.80	46.00	12.20	500.0	100.000	150.0	H	97.0	-9.9



Preview Result 1-PK+
FCC 15C PK

* Critical_Freqs PK+
◆ Final_Result QPK

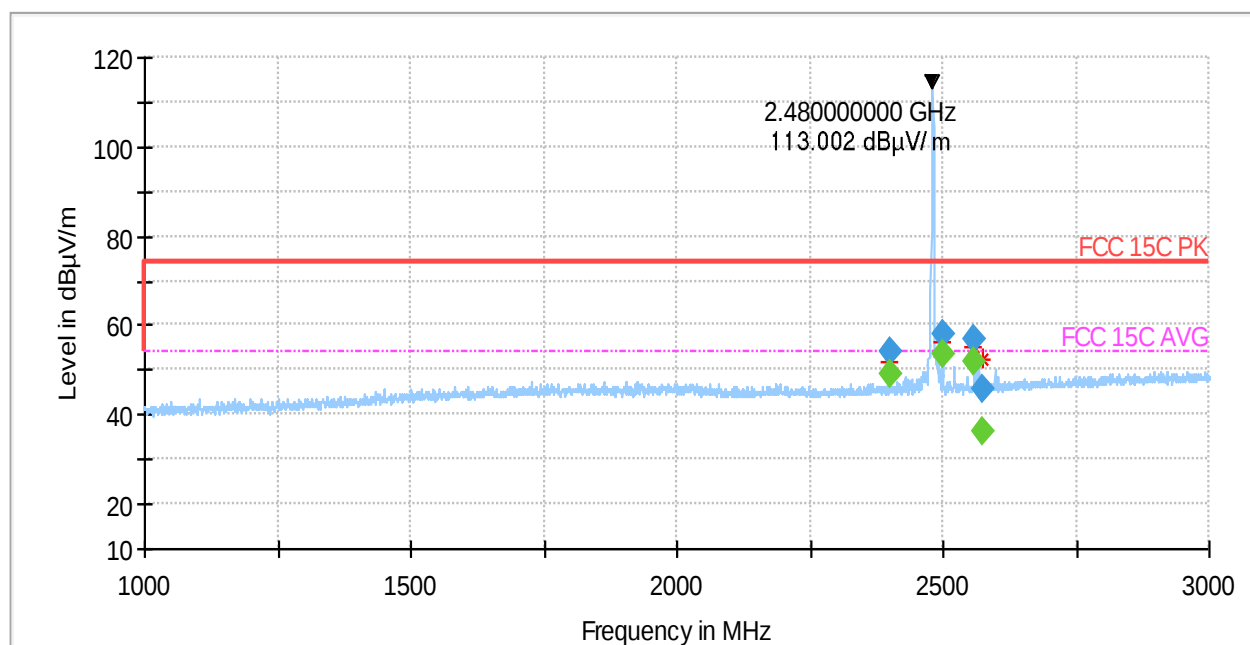
Plot # 10 Radiated Emissions: 1 – 3GHz

Modulation: BT LE

Channel: High

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2399.88500	---	48.98	53.98	5.00	10.0	1000.000	177.0	H	213.0	8.4
2399.88500	53.96	---	73.99	20.03	10.0	1000.000	177.0	H	213.0	8.4
2499.17500	---	53.36	53.98	0.62	10.0	1000.000	195.0	H	219.0	8.1
2499.17500	58.14	---	73.99	15.86	10.0	1000.000	195.0	H	219.0	8.1
2559.87000	56.99	---	73.99	17.01	10.0	1000.000	151.0	H	224.0	8.4
2559.87000	---	51.99	53.98	1.99	10.0	1000.000	151.0	H	224.0	8.4
2574.46000	45.68	---	73.99	28.31	10.0	1000.000	153.0	V	208.0	8.5
2574.46000	---	36.41	53.98	17.57	10.0	1000.000	153.0	V	208.0	8.5



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

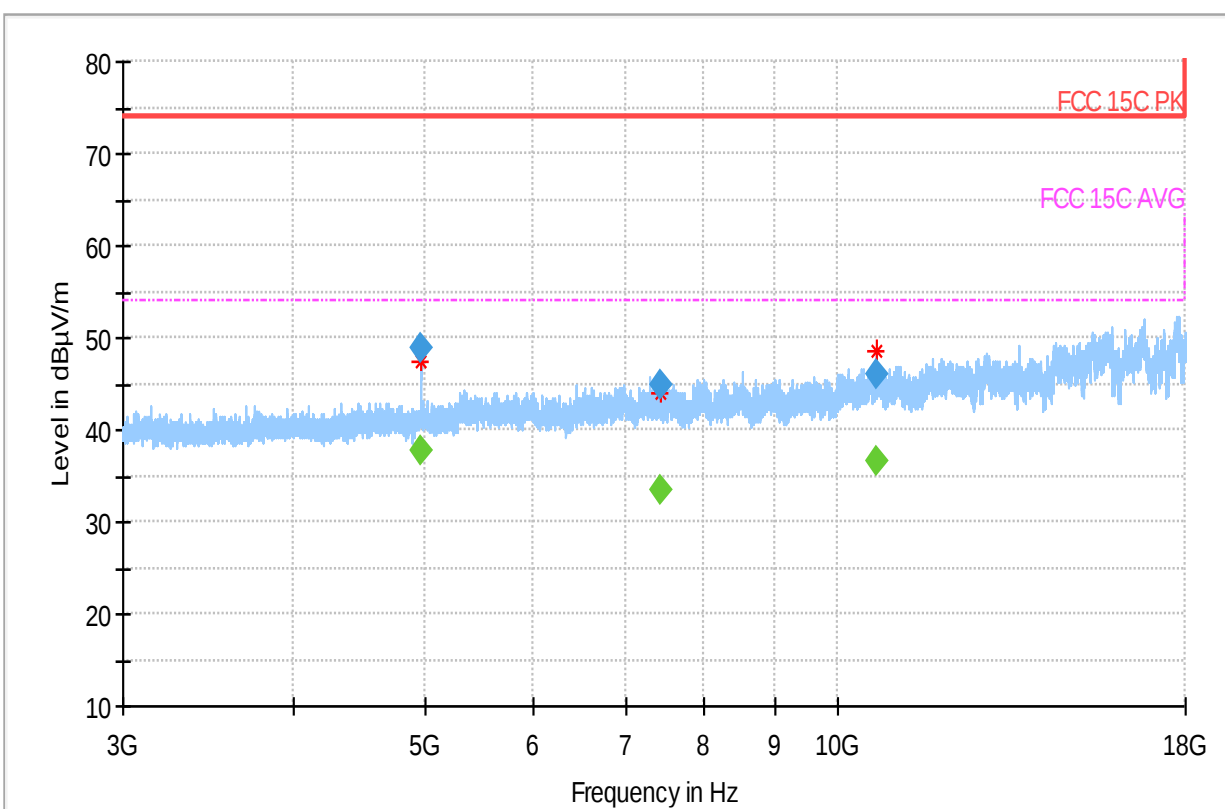
Plot #11 Radiated Emissions: 3 – 18GHz

Modulation: BT LE

Channel: High

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	RMS (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
4960.674800	48.90	---	73.99	25.09	200.0	1000.000	213.0	H	212.0	-33.1
4960.674800	---	37.73	53.98	16.25	200.0	1000.000	213.0	H	212.0	-33.1
7440.241800	44.95	---	73.99	29.04	200.0	1000.000	281.0	V	10.0	-29.4
7440.241800	---	33.29	53.98	20.69	200.0	1000.000	281.0	V	10.0	-29.4
10679.135667	---	36.67	53.98	17.31	10.0	1000.000	275.0	H	16.0	-22.8
10679.135667	45.97	---	73.98	28.01	10.0	1000.000	275.0	H	16.0	-22.8



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

* FCC 15C PK
◆ Final_Result RMS

9 Test setup photos

Setup photos are included in supporting file name: "EMC_CHARG_017_18501_FCC_ISED_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	00164698	3 YEARS	08/08/2017
BILOG ANTENNA	TESEO	CBL 6141B	41106	3 YEARS	11/01/2017
HORN ANTENNA	ETS LINDGREN	3115	00035111	3 YEARS	11/17/2015
HORN ANTENNA	ETS LINDGREN	3117	00167061	3 YEARS	08/08/2017
SPECTRUM ANALYZER	R&S	FSV40	101022	3 YEARS	7/5/2017
COMPACT DIGITAL BAROMETER	CONTROL COMPANY	35519-055	91119547	2 YEARS	6/20/2017
THRMOMETER HUMIDIY	DICKSON	TM320	16253639	3 YEARS	11/02/2017

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 Revision History

Date	Report Name	Changes to report	Report prepared by
11/09/2018	EMC_CHARG_017_18501_FCC_15.247_ISED_BLE_DTS	Initial Version	Issa Ghanma