



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 (DSS)
RSS-247 Issue 2 (FHSs) & RSS-Gen Issue 5

REPORT #: EMC_CHARG_017_18501_FCC_15.247_ISED_BT_DSS

DATE: 11/26/2018



A2LA Accredited

IC recognized #
3462B-2

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TABLE OF CONTENTS

1	ASSESSMENT	3
2	ADMINISTRATIVE DATA	4
2.1	IDENTIFICATION OF THE TESTING LABORATORY ISSUING THE EMC TEST REPORT	4
2.2	IDENTIFICATION OF THE CLIENT	4
2.3	IDENTIFICATION OF THE MANUFACTURER.....	4
3	EQUIPMENT UNDER TEST (EUT)	5
3.1	EUT SPECIFICATIONS	5
3.2	EUT SAMPLE DETAILS	6
3.3	ACCESSORY EQUIPMENT (AE) DETAILS.....	6
3.4	TEST SAMPLE CONFIGURATION	6
3.5	MODE OF OPERATION DETAILS	7
3.6	JUSTIFICATION FOR WORST CASE MODE OF OPERATION.....	7
4	SUBJECT OF INVESTIGATION	8
5	MEASUREMENT RESULTS SUMMARY	8
6	MEASUREMENTS	9
6.1	MEASUREMENT UNCERTAINTY	9
6.2	ENVIRONMENTAL CONDITIONS DURING TESTING:.....	9
6.3	DATES OF TESTING:	9
7	MEASUREMENT PROCEDURES	10
7.1	RADIATED MEASUREMENT.....	10
8	TEST RESULT DATA	14
8.1	TRANSMITTER SPURIOUS EMISSIONS AND RESTRICTED BANDS	14
9	TEST SETUP PHOTOS	27
10	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTING	27
11	REVISION HISTORY	27

1 Assessment

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

No deviations were ascertained.

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

Responsible for Testing Laboratory:

11/26/2018	Compliance	Cindy Li (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

11/26/2018	Compliance	Issa Ghanma (EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in 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
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 / Number:	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 78), 79 Channels
Type(s) of Modulation:	Bluetooth Basic/EDR: GFSK, $\pi/4$ DQPSK, 8DPSK
Modes of Operation:	Hopping
Antenna Information as declared:	Embedded 2.4GHZ,WLAN Peak gain: 1.5 – 2.5dBi Manufacturer item number: 1000146
Max. declared output Powers form modular grant:	Conducted Power 0.05188 Watts
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: <ul style="list-style-type: none"> • Bluetooth low energy GFSK modulation 2402 MHz (ch 0) – 2480 MHz (ch 39), 40 channels • 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	<input type="checkbox"/> Prototype Unit; <input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production
EUT Dimensions	190x180x20
Weight	229
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____

3.2 EUT Sample details

EUT #	Unit number	HW Version	SW Version	Notes/Comments
1	#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	Comments
Op.1	Bluetooth P/4 DQPSK	The customer provided special commands to configure the EUT to: <ul style="list-style-type: none">• Low, Mid, High channel.• Maximum power.• Maximum duty cycle.• GFSK, P/4 DQPSK, 8DPSK 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, maximum output power and the worst case of the modulations supported base on the maximum conducted output power from the modular grant and reports.

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 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

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.247(b)(1) RSS-247 5.4(b)	Maximum Peak Conducted Output Power	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(d) RSS-247 5.5 RSS-Gen 8.10	Band Edge Compliance	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(a)(1) RSS-247 5.1(b)	Spectrum Bandwidth	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(a)(1) RSS-247 5.1(b)	Carrier Frequency Separation	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(a)(1) RSS-247 5.1(d)	Number of Hopping Channels	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(a)(1)(iii) RSS-247 5.1(d)	Time of occupancy	Nominal	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Note 1 Note 3 Complies
§15.247(d) §15.209 (a) RSS-Gen 6.13	TX Spurious emissions- Radiated	Nominal	P/4 DQPSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complies
§15.207(a) RSS-Gen 8.8	AC Conducted Emissions	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Note 2 Complies

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 Measurements

6.1 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 30MHz	±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)

6.2 Environmental Conditions During Testing:

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

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

6.3 Dates of Testing:

10/01/2018 – 11/02/2018

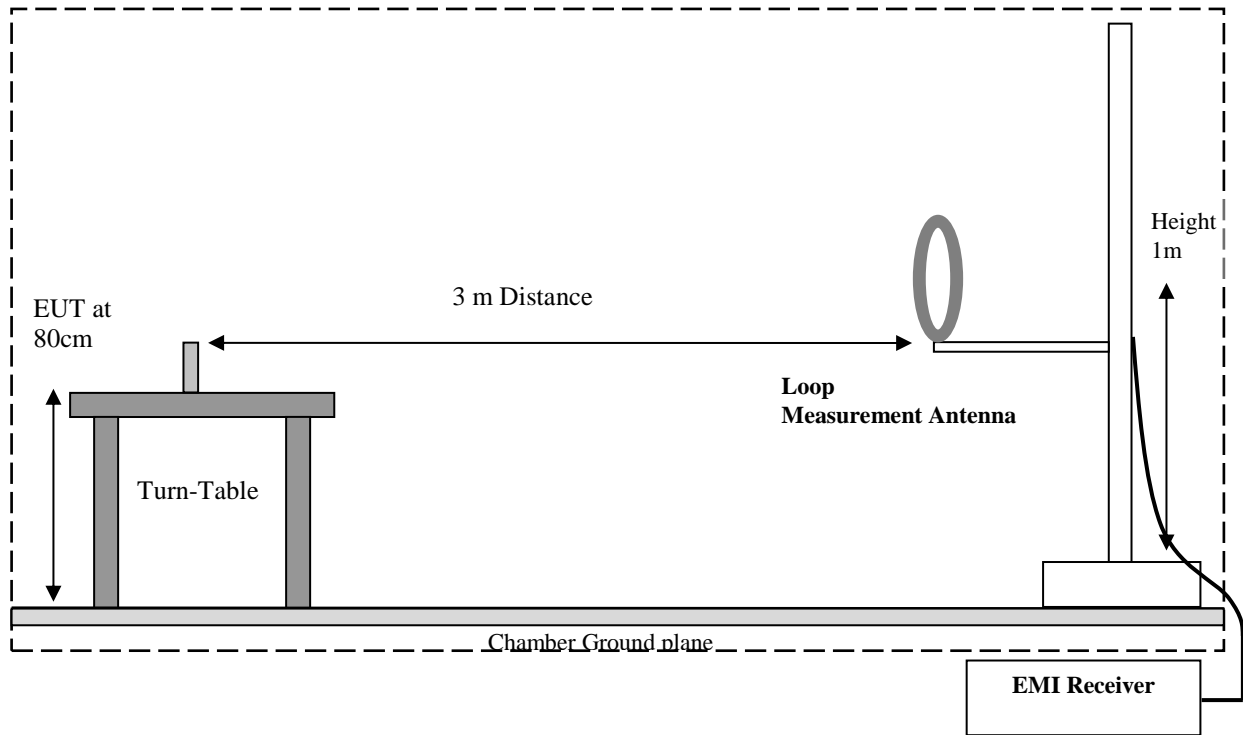
7 Measurement Procedures

7.1 Radiated Measurement

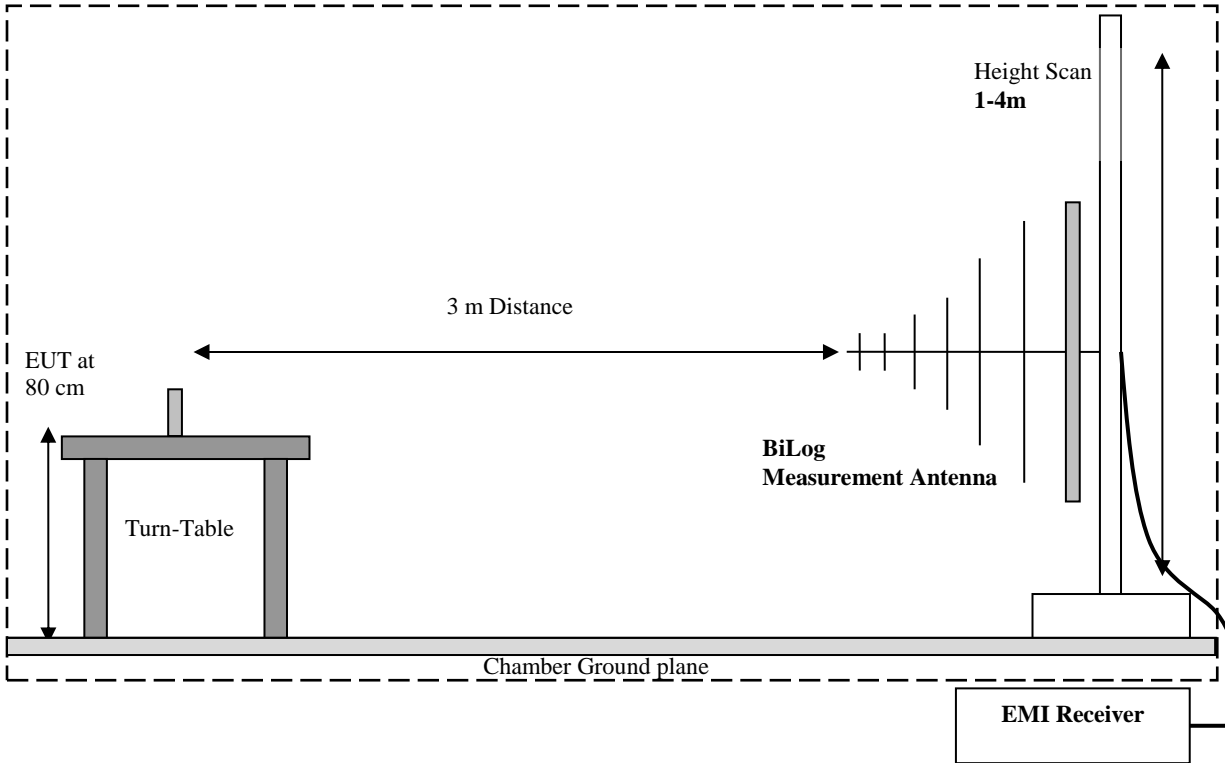
The radiated measurement is performed according to: ANSI C63.10 (2013)

- 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.

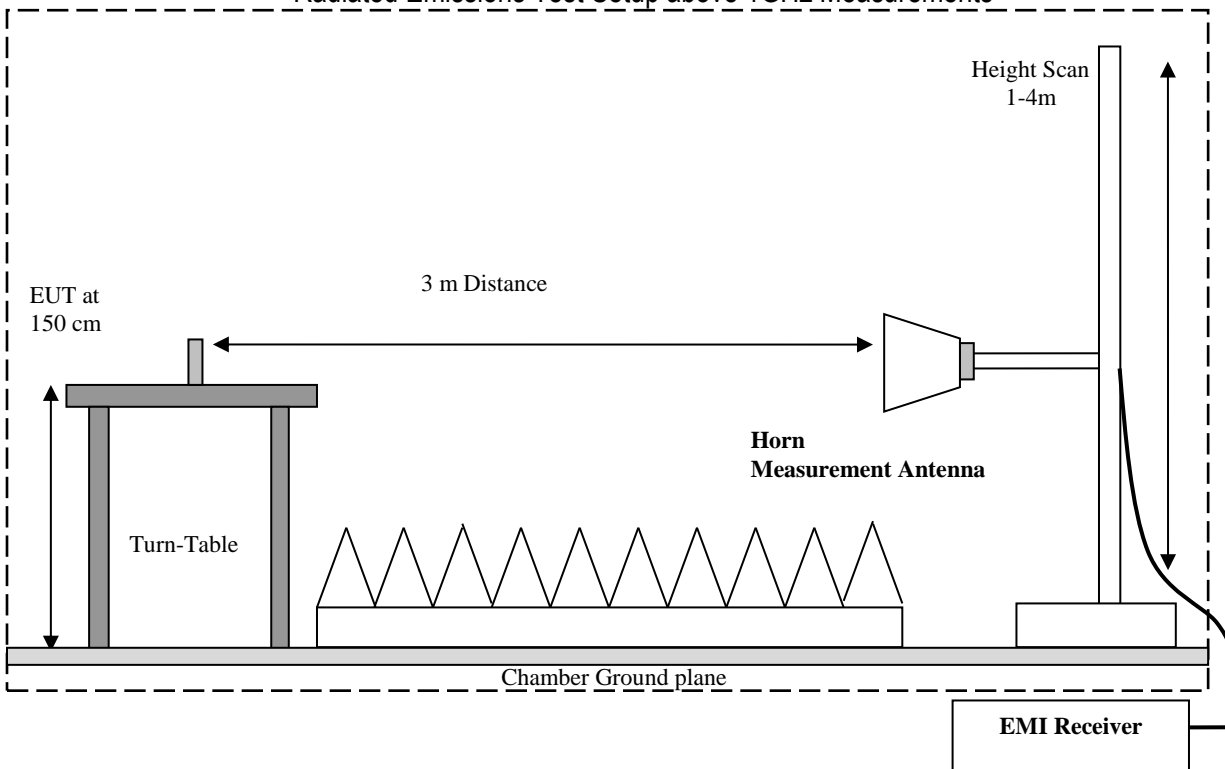
Radiated Emissions Test Setup below 30MHz Measurements



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 Transmitter Spurious Emissions and Restricted Bands

8.1.1 Measurement according to ANSI C63.10

Analyzer Settings:

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

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

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

Plots reported here represent the worst case emissions for horizontal and vertical antenna polarizations and for three orientations of the EUT. Unless mentioned otherwise, the emissions outside the limit lines in the plots are from the transmit signal.

8.1.2 Limits: FCC 15.247(d)/15.209(a) /RSS-Gen 6.13

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	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= 74dB µV/m
- AVG. LIMIT= 54dB µV/m
- Except as shown in CFR 47 Part 15.205 paragraph (d), only spurious emissions are permitted in any of the frequency bands listed below

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

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 described in 5.4. 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 as follow:

$$\text{Conversion factor (CF)} = 40 \log (D/d) = 40 \log (300 \text{ m} / 3 \text{ m}) = 80 \text{ dB}$$

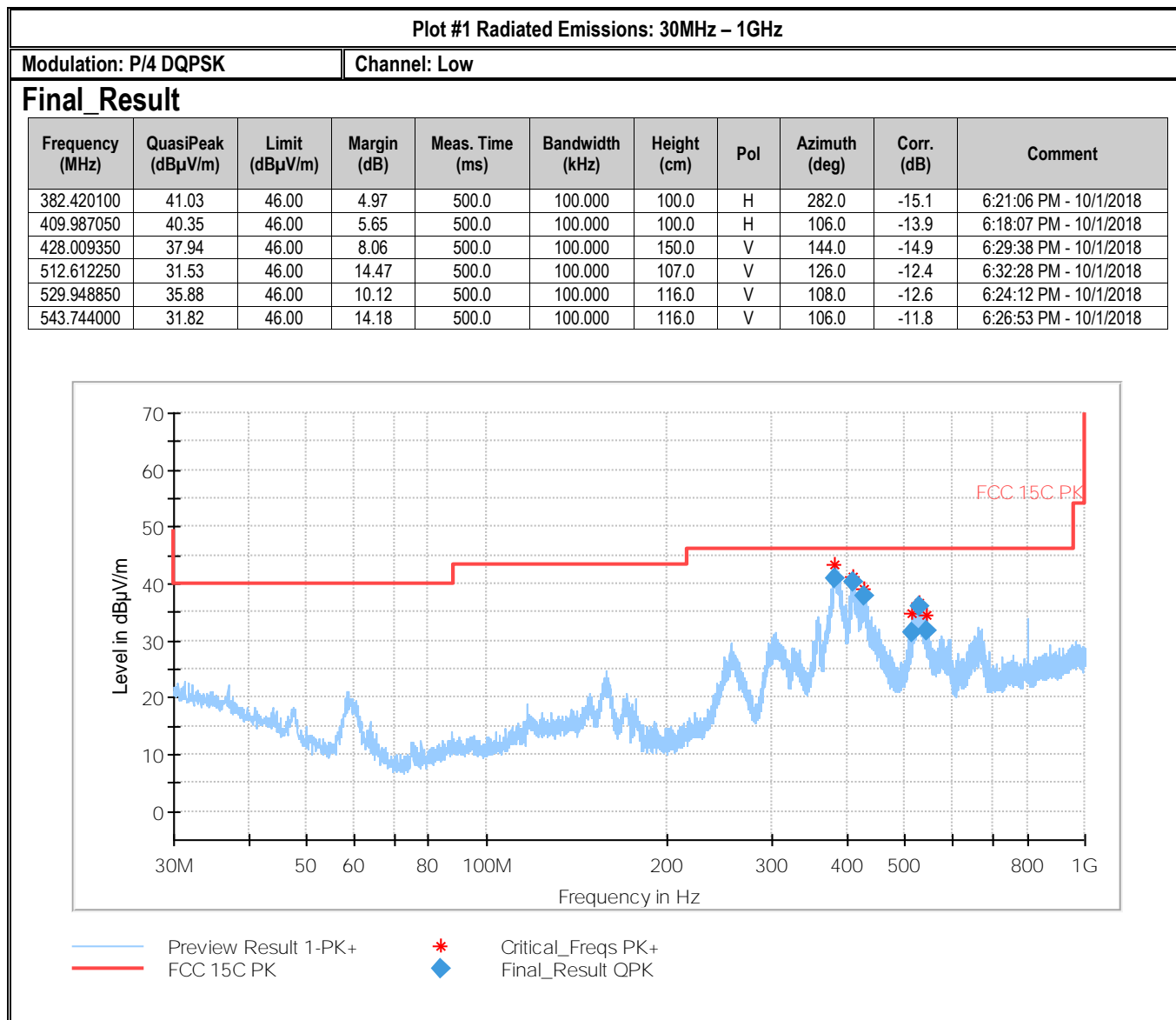
8.1.3 Test conditions and setup:

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 [MHz]	Highest emission [dB]	Limit	Result
1 – 3	Low	30 MHz – 18 GHz	2481.675000	53.55	See section 8.1.2	Pass
4 – 8	Mid	9 kHz – 40 GHz	0.101	60.41	See section 8.1.2	Pass
9 – 11	High	30 MHz – 18 GHz	2559.730000	53.83	See section 8.1.2	Pass

8.1.5 Measurement Plots:



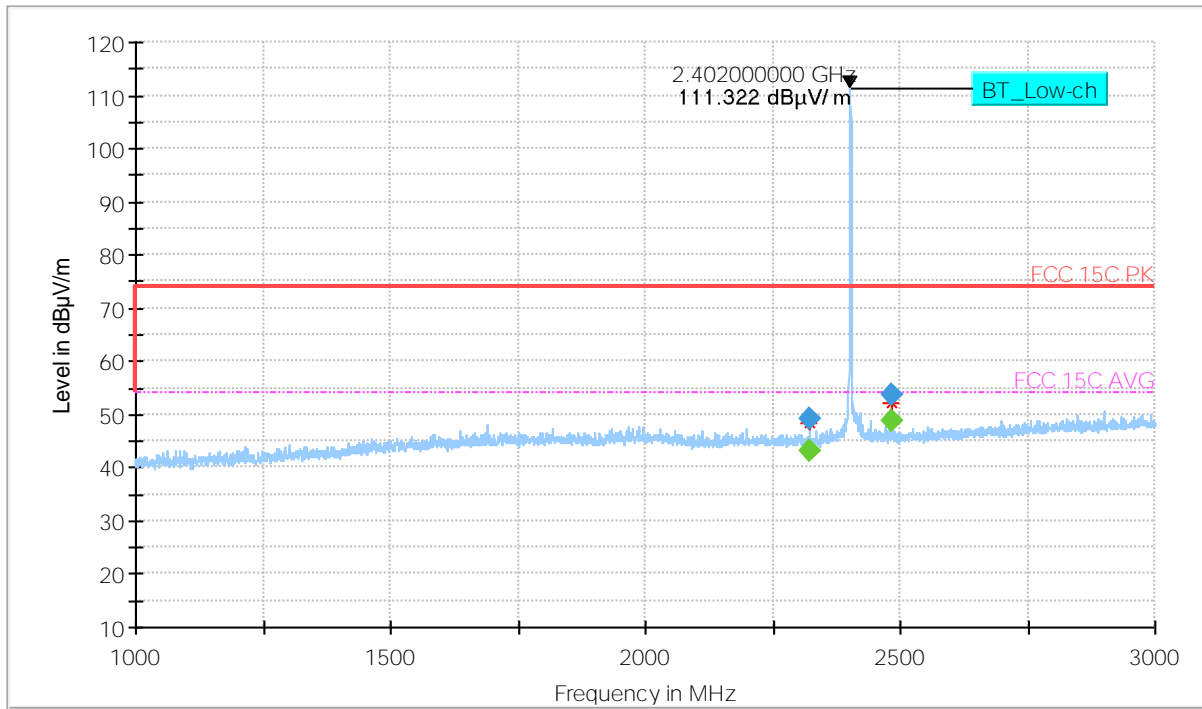
Plot # 2 Radiated Emissions: 1 – 3GHz

Modulation: P/4 DQPSK

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)	Comment
2321.595000	49.13	---	73.99	24.86	10.0	1000.000	183.0	H	214.0	8.2	12:46:11 PM - 10/1/2018
2321.595000	---	43.33	53.98	10.65	10.0	1000.000	183.0	H	214.0	8.2	12:46:11 PM - 10/1/2018
2481.675000	53.55	---	73.99	20.44	10.0	1000.000	199.0	H	223.0	8.1	12:44:16 PM - 10/1/2018
2481.675000	---	48.66	53.98	5.31	10.0	1000.000	199.0	H	223.0	8.1	12:44:16 PM - 10/1/2018



- Preview Result 1-PK+
- - - FCC 15C AVG
- * Critical_Freqs PK+
- ◆ Final_Result PK+
- FCC 15C PK
- ◆ Final_Result RMS

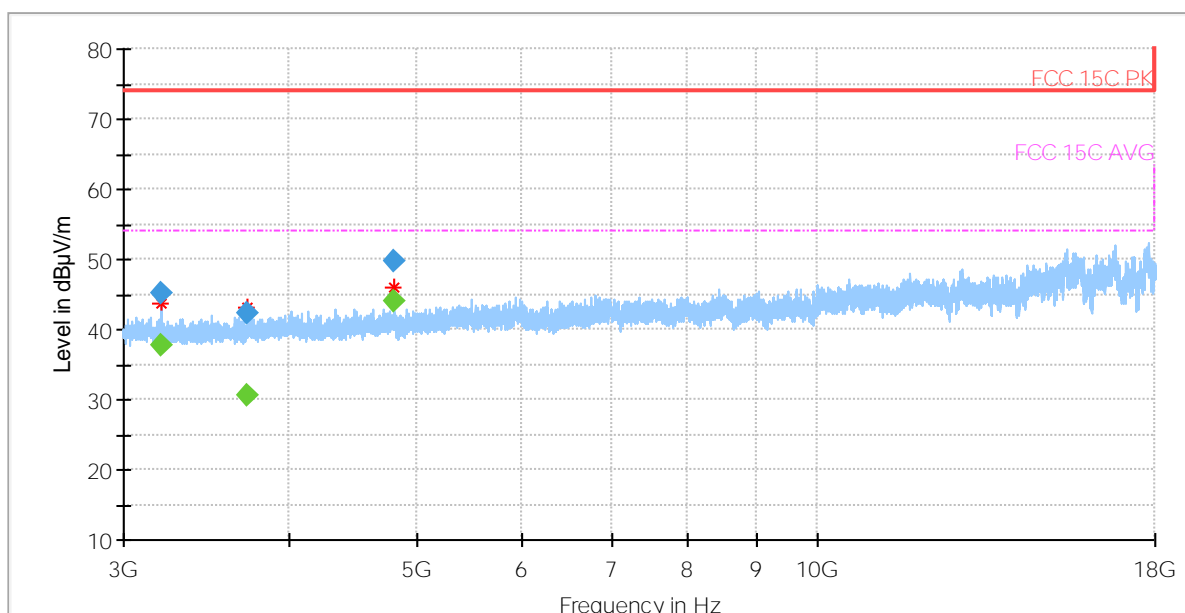
Plot # 3 Radiated Emissions: 3 – 18GHz

Modulation: P/4 DQPSK

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)	Comment
3202.453333	---	37.66	53.98	16.32	200.0	1000.000	276.0	H	243.0	-36.9	4:06:19 PM - 10/1/2018
3202.453333	45.14	---	73.99	28.85	200.0	1000.000	276.0	H	243.0	-36.9	4:06:19 PM - 10/1/2018
3725.573467	42.18	---	73.99	31.81	200.0	1000.000	271.0	H	-11.0	-35.4	3:59:31 PM - 10/1/2018
3725.573467	---	30.65	53.98	23.33	200.0	1000.000	271.0	H	-11.0	-35.4	3:59:32 PM - 10/1/2018
4803.377133	49.65	---	73.99	24.34	200.0	1000.000	133.0	H	198.0	-33.5	4:03:11 PM - 10/1/2018
4803.377133	---	44.05	53.98	9.93	200.0	1000.000	133.0	H	198.0	-33.5	4:03:11 PM - 10/1/2018

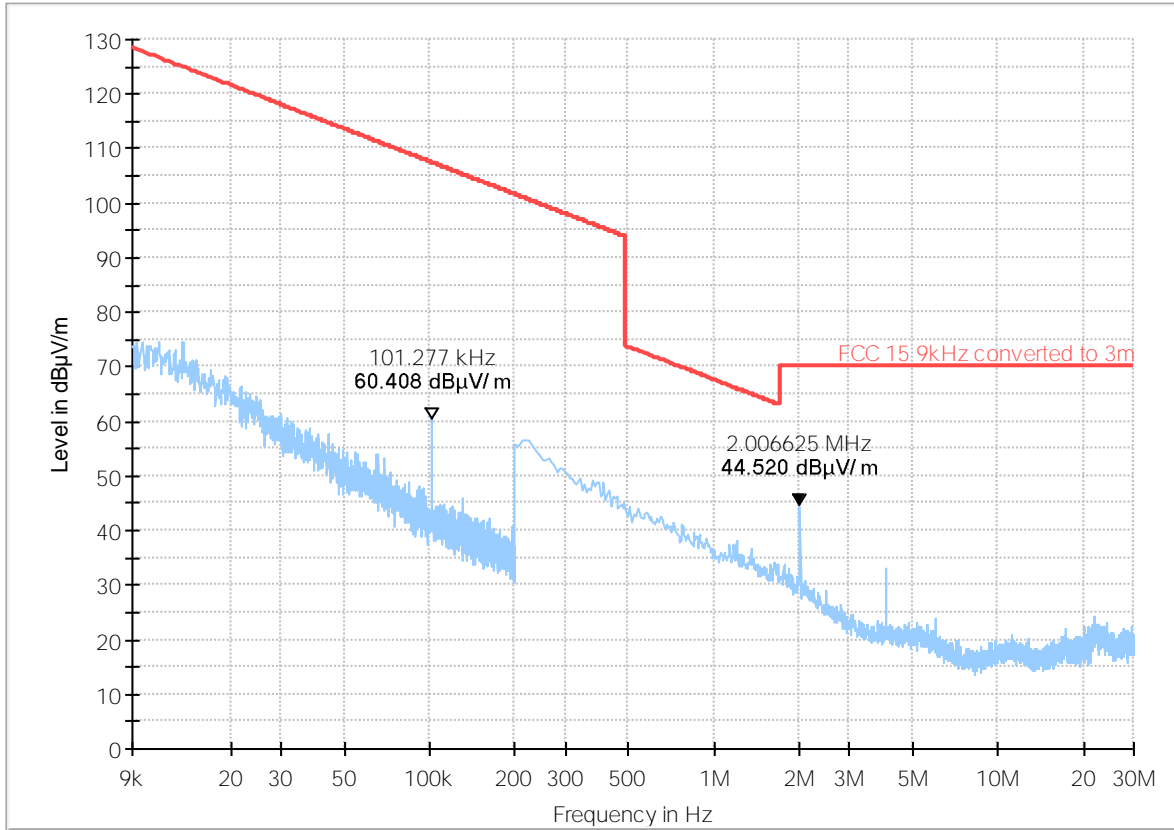


— Preview Result 1-PK+
 * Critical_Freqs PK+
 — FCC 15C PK
- - - FCC 15C AVG
 ◆ Final_Result PK+
 ◆ Final_Result RMS

Plot # 4 Radiated Emissions: 9KHz – 30MHz

Modulation: P/4 DQPSK

Channel: Mid



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

* Critical_Freqs PK+
 ◆ Final_Result PK+

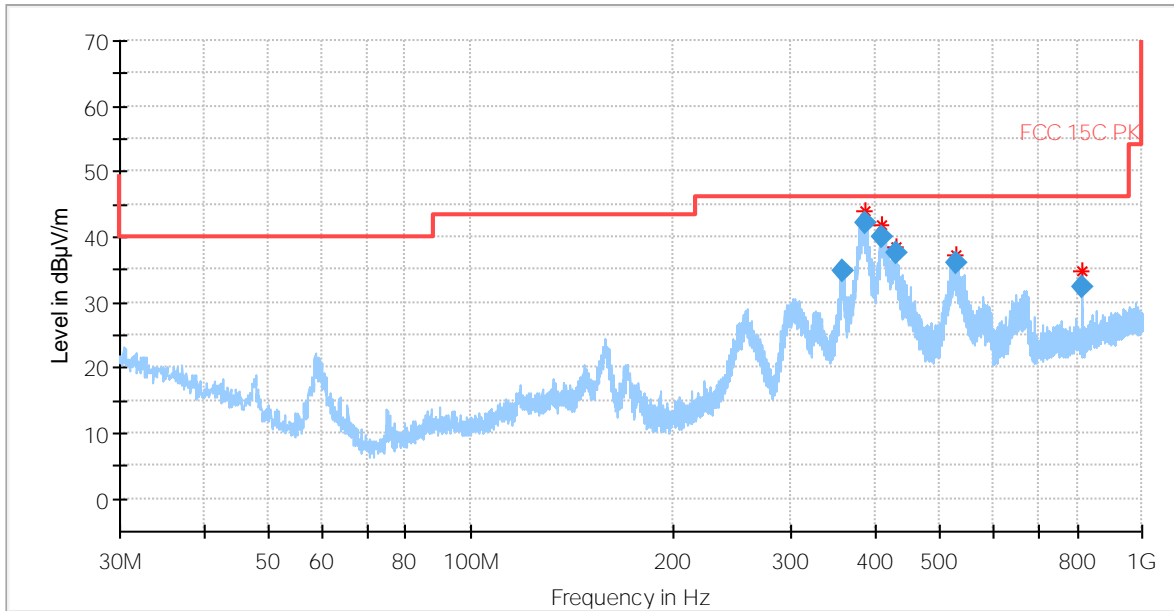
Plot #5 Radiated Emissions: 30MHz – 1GHz

Modulation: P/4 DQPSK

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)	Comment
356.768400	34.83	46.00	11.17	500.0	100.000	107.0	H	114.0	-16.0	5:34:18 PM - 10/1/2018
385.846100	42.19	46.00	3.81	500.0	100.000	100.0	H	114.0	-15.1	5:39:52 PM - 10/1/2018
409.353800	40.13	46.00	5.87	500.0	100.000	100.0	H	107.0	-13.9	5:37:06 PM - 10/1/2018
429.214500	37.70	46.00	8.30	500.0	100.000	149.0	V	147.0	-14.8	5:48:46 PM - 10/1/2018
527.265150	35.93	46.00	10.07	500.0	100.000	120.0	V	110.0	-12.6	5:45:56 PM - 10/1/2018
814.029100	32.32	46.00	13.68	500.0	100.000	116.0	H	282.0	-7.6	5:42:47 PM - 10/1/2018



— Preview Result 1-PK+ * Critical_Freqs PK+
— FCC 15C PK ◆ Final_Result OPK

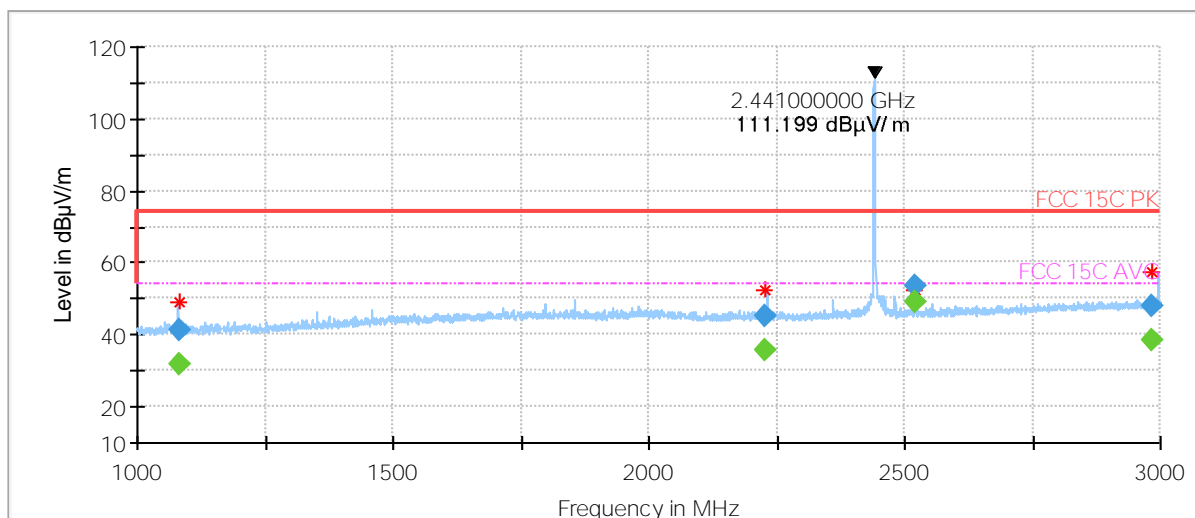
Plot #6 Radiated Emissions: 1 – 3GHz

Modulation: P/4 DQPSK

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)	Comment
1083.645000	41.52	---	74.00	32.48	10.0	1000.000	162.0	H	334.0	4.4	1:34:53 PM - 10/1/2018
1083.645000	---	31.59	53.98	22.39	10.0	1000.000	162.0	H	334.0	4.4	1:34:54 PM - 10/1/2018
2227.100000	---	35.42	53.98	18.56	10.0	1000.000	115.0	H	276.0	7.9	1:33:01 PM - 10/1/2018
2227.100000	45.36	---	73.99	28.63	10.0	1000.000	115.0	H	276.0	7.9	1:33:01 PM - 10/1/2018
2520.920000	53.39	---	73.99	20.61	10.0	1000.000	195.0	H	224.0	8.1	1:30:52 PM - 10/1/2018
2520.920000	---	49.20	53.98	4.78	10.0	1000.000	195.0	H	224.0	8.1	1:30:53 PM - 10/1/2018
2984.798375	---	38.73	53.98	15.25	10.0	1000.000	128.0	H	324.0	11.1	1:36:48 PM - 10/1/2018
2984.798375	47.99	---	73.99	26.00	10.0	1000.000	128.0	H	324.0	11.1	1:36:48 PM - 10/1/2018



—◆ Preview Result 1-PK+
 * Critical_Freqs PK+
 — FCC 15C PK
- - - FCC 15C AVG
 ◆ Final_Result PK+
 ◆ Final_Result RMS

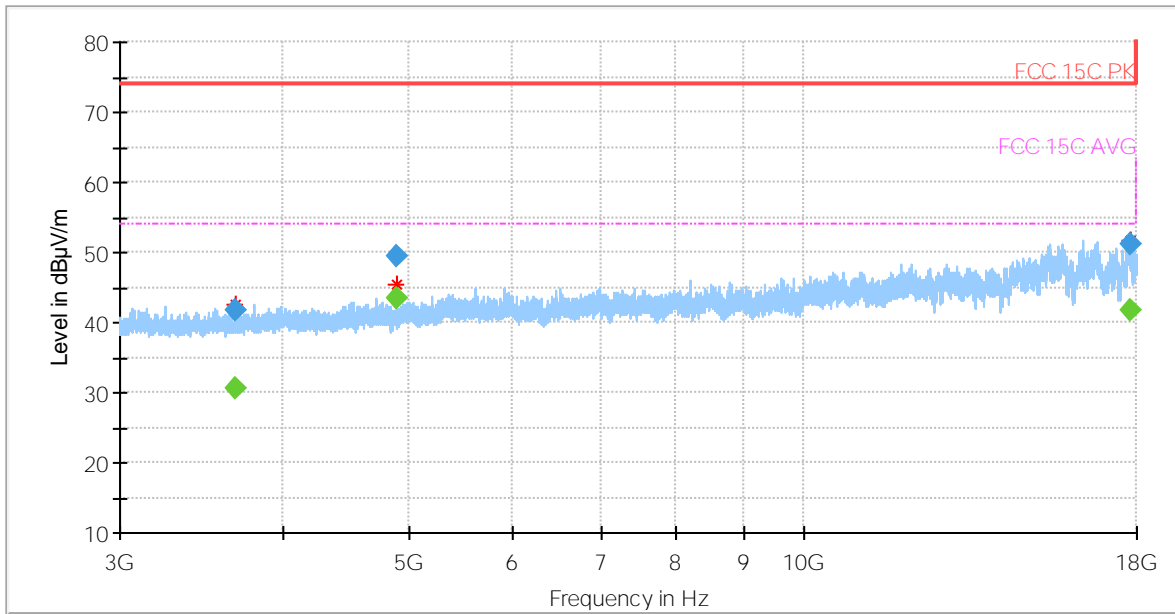
Plot #7 Radiated Emissions: 3 – 18GHz

Modulation: P/4 DQPSK

Channel: Mid

Final Result

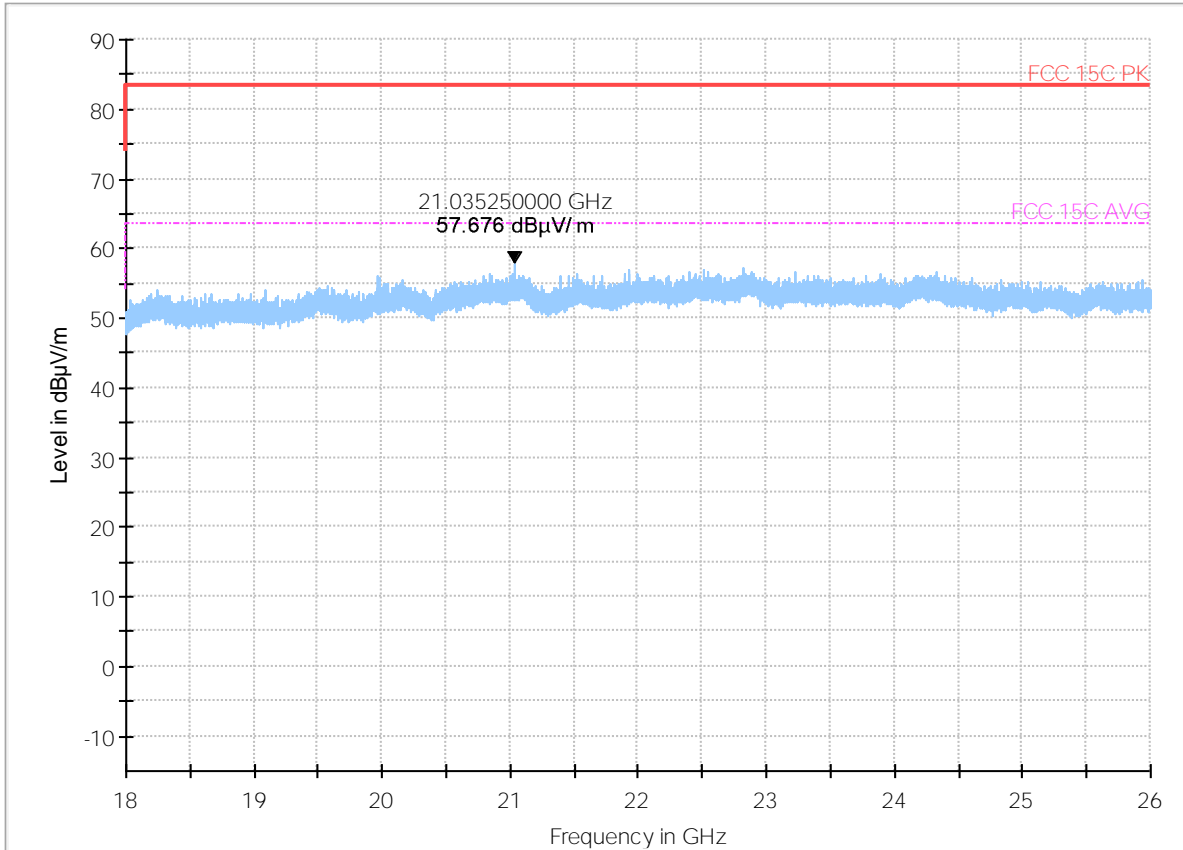
Frequency (MHz)	MaxPeak (dBµV/m)	RMS (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Comment
3675.911167	---	30.57	53.98	23.41	200.0	1000.000	300.0	V	58.0	-35.6	4:22:53 PM - 10/1/2018
3675.911167	41.72	---	73.99	32.27	200.0	1000.000	300.0	V	58.0	-35.6	4:22:53 PM - 10/1/2018
4881.321500	49.33	---	73.99	24.66	200.0	1000.000	273.0	H	201.0	-33.4	4:29:41 PM - 10/1/2018
4881.321500	---	43.30	53.98	10.68	200.0	1000.000	273.0	H	201.0	-33.4	4:29:41 PM - 10/1/2018
17799.17350	51.09	---	73.98	22.89	10.0	1000.000	261.0	V	242.0	-12.7	4:26:15 PM - 10/1/2018
17799.17350	---	41.61	53.98	12.37	10.0	1000.000	261.0	V	242.0	-12.7	4:26:15 PM - 10/1/2018



Plot #8 Radiated Emissions: 18 – 40GHz

Modulation: P/4 DQPSK

Channel: Mid



Preview Result 1-PK+
FCC 15C AVG

* Critical_Freqs PK+
◆ Final_Result PK+

— FCC 15C PK
◆ Final_Result RMS

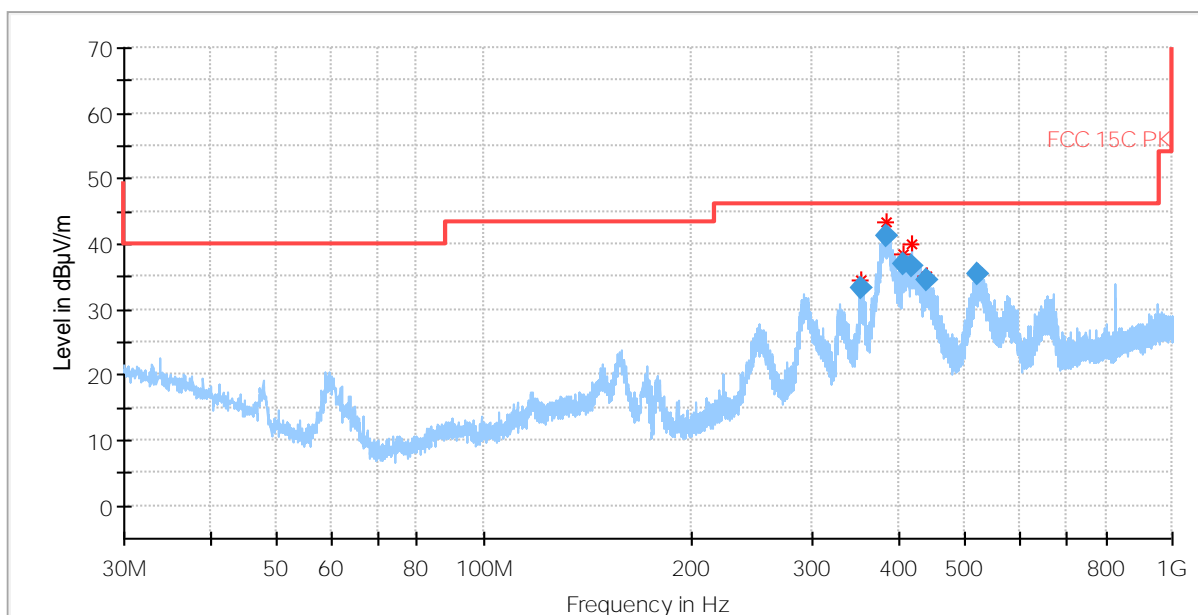
Plot #9 Radiated Emissions: 30MHz – 1GHz

Modulation: P/4 DQPSK

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)	Comment
353.603400	33.14	46.00	12.86	500.0	100.000	107.0	H	116.0	-16.1	5:10:16 PM - 10/1/2018
383.700750	41.28	46.00	4.72	500.0	100.000	100.0	H	111.0	-15.0	5:13:01 PM - 10/1/2018
407.475900	36.94	46.00	9.06	500.0	100.000	107.0	H	118.0	-14.1	5:15:43 PM - 10/1/2018
417.668300	36.67	46.00	9.33	500.0	100.000	100.0	H	124.0	-13.7	5:18:28 PM - 10/1/2018
440.278050	34.38	46.00	11.62	500.0	100.000	124.0	V	159.0	-14.6	5:24:01 PM - 10/1/2018
522.391950	35.27	46.00	10.73	500.0	100.000	100.0	V	122.0	-12.6	5:21:18 PM - 10/1/2018



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

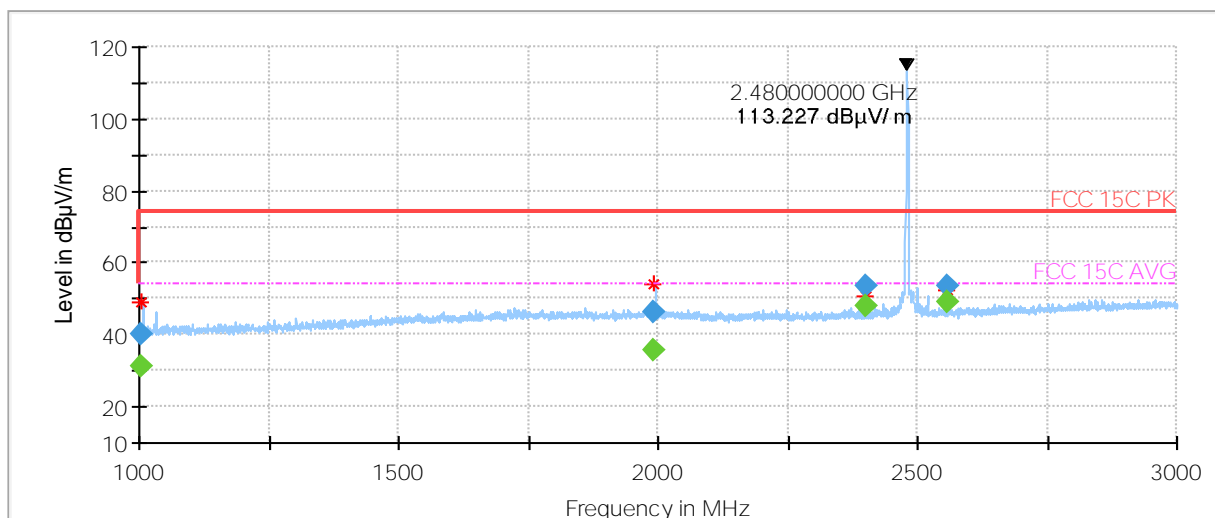
Plot # 10 Radiated Emissions: 1 – 3GHz

Modulation: P/4 DQPSK

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)	Comment
1005.945750	---	31.11	53.98	22.87	10.0	1000.000	183.0	V	249.0	4.2	1:52:30 PM - 10/1/2018
1005.945750	39.89	---	74.00	34.11	10.0	1000.000	183.0	V	249.0	4.2	1:52:30 PM - 10/1/2018
1990.525000	46.14	---	74.00	27.85	10.0	1000.000	210.0	V	74.0	8.9	1:46:45 PM - 10/1/2018
1990.525000	---	35.61	53.98	18.37	10.0	1000.000	210.0	V	74.0	8.9	1:46:45 PM - 10/1/2018
2399.545000	---	48.07	53.98	5.90	10.0	1000.000	181.0	H	226.0	8.4	1:49:00 PM - 10/1/2018
2399.545000	53.49	---	73.99	20.51	10.0	1000.000	181.0	H	226.0	8.4	1:49:00 PM - 10/1/2018
2559.730000	53.83	---	73.99	20.17	10.0	1000.000	150.0	H	229.0	8.4	1:50:46 PM - 10/1/2018
2559.730000	---	49.28	53.98	4.70	10.0	1000.000	150.0	H	229.0	8.4	1:50:46 PM - 10/1/2018



— Preview Result 1-PK+
 * Critical_Freqs PK+
 — FCC 15C PK
- - - FCC 15C AVG
 ◆ Final_Result PK+
 ◆ Final_Result RMS

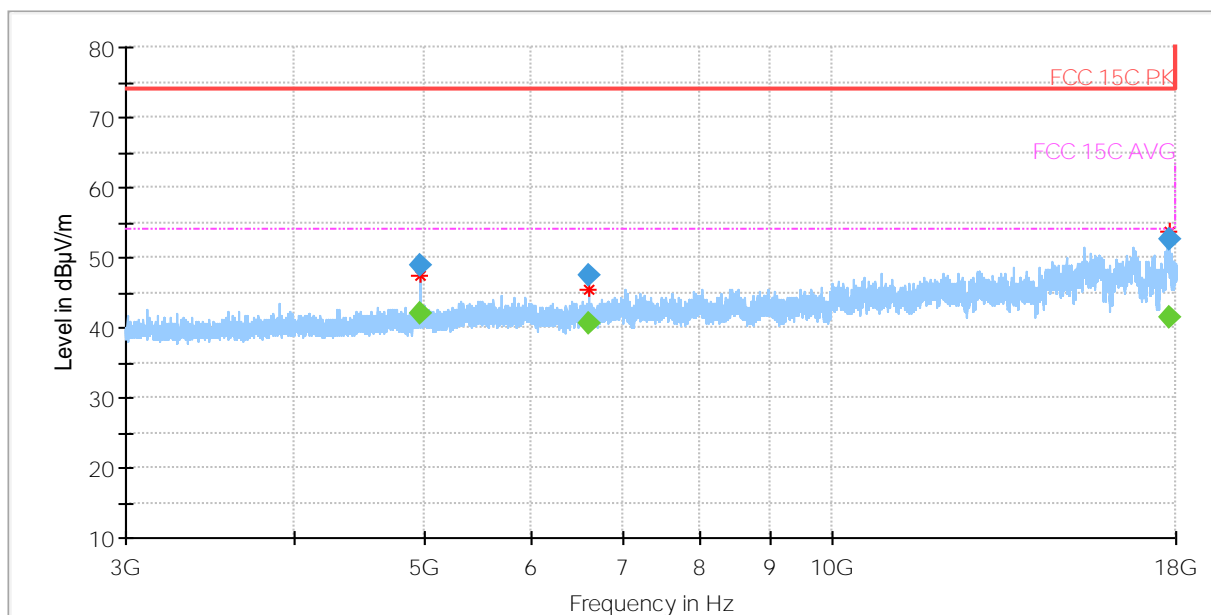
Plot #11 Radiated Emissions: 3 – 18GHz

Modulation: P/4 DQPSK

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)	Comment
4959.618567	48.91	---	73.99	25.08	200.0	1000.000	225.0	H	198.0	-33.1	4:47:43 PM - 10/1/2018
4959.618567	---	41.97	53.98	12.01	200.0	1000.000	225.0	H	198.0	-33.1	4:47:43 PM - 10/1/2018
6613.512200	47.49	---	73.99	26.50	200.0	1000.000	228.0	V	6.0	-30.2	4:44:04 PM - 10/1/2018
6613.512200	---	40.66	53.98	13.32	200.0	1000.000	228.0	V	6.0	-30.2	4:44:04 PM - 10/1/2018
17776.99590	---	41.34	53.98	12.64	10.0	1000.000	300.0	H	350.0	-12.9	4:50:39 PM - 10/1/2018
17776.99590	52.61	---	73.99	21.37	10.0	1000.000	300.0	H	350.0	-12.9	4:50:39 PM - 10/1/2018



— Preview Result 1-PK+
 * Critical_Freqs PK+
 — FCC 15C PK
- - - FCC 15C AVG
 ◆ Final_Result 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
THRMMOMETER HUMIDIY	DICKSON	TM320	16253639	3 YEARS	11/02/2017

Note:

1. 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
11/26/2018	EMC_CHARG_017_18501_FCC_15.247_ISED_BT_DSS	Initial Version	Issa Ghanma