EMC Test Report

Project Number: 4222155

Report Number: 4222155EMC05 **Revision Level:** 0

Client: Tyco Safety Products/Sensormatic

Equipment Under Test: Business Intelligence Accessory

Model: BIX1000

FCC ID: BVCBIX1000

IC ID: 3506A-BIX1000

Applicable Standards: ANSI C63.10: 2013 (FCC Part 15 Subpart C, § 15.247)

RSS-247, Issue 2

RSS-GEN Issue 4

Report issued on: 22 February 2018

Test Result: Compliant

Tested by: _____
Shawn McGuinness, EMC Engineering Leader

Reviewed by: _____
David Schramm, Operations Manager

Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Table of Contents

1 Summary of Test Results

Test Description	Test Specification		Test Result
Bandwidth	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant (1)
Transmitter Output Power	15.247(b)(3)	RSS-247 S5.4 (4)	Compliant (1)
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant (1)
Conducted Spurious Emissions / Band edge	15.247(d)	RSS-247 S5.5	Compliant (1)
Radiated Spurious Emissions / Restricted Bands	15.35(b),15.209	RSS-GEN S6.13 RSS-GEN S8.10	Compliant (1)
AC Powerline Conducted Emission	15.107, 15.207	RSS-GEN S8.8	Not Applicable (3)
Antenna Requirement	15.203	RSS-GEN S8.3	Compliant (2)

(1) The BIX1000 utilizes the exact RF components and RF layout to the antenna port(s) of the certified BIM1000 (FCC ID: BVCBIM1000 and IC: 3506A-BIM1000); therefore, the antenna port conducted results and the spurious emissions with the 3.8dBi monopole from the BIM1000 evaluation were leveraged. The results are included in this test report.
(2) The module can utilize a 2.05dBi Chip antenna or it can be fitted with a Reverse Polarity SMA connector.
(3) The EUT is powered over Ethernet.

1.1 *Modifications Required for Compliance*

Hardware – None
(1) EUT Settings at Ch 25, 2475MHz reduced to 16dBm for restricted band edge compliance.

2 General Information

2.1 *Client Information*

Name:	Tyco Safety Products/Sensormatic
Address:	6600 Congress Avenue
City, State, Zip, Country:	Boca Raton, FL 33487, USA

2.2 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country:	Suwanee, GA 30024, USA
Accrediting Body:	A2LA
Type of lab:	Testing Laboratory
Certificate Number:	3212.01

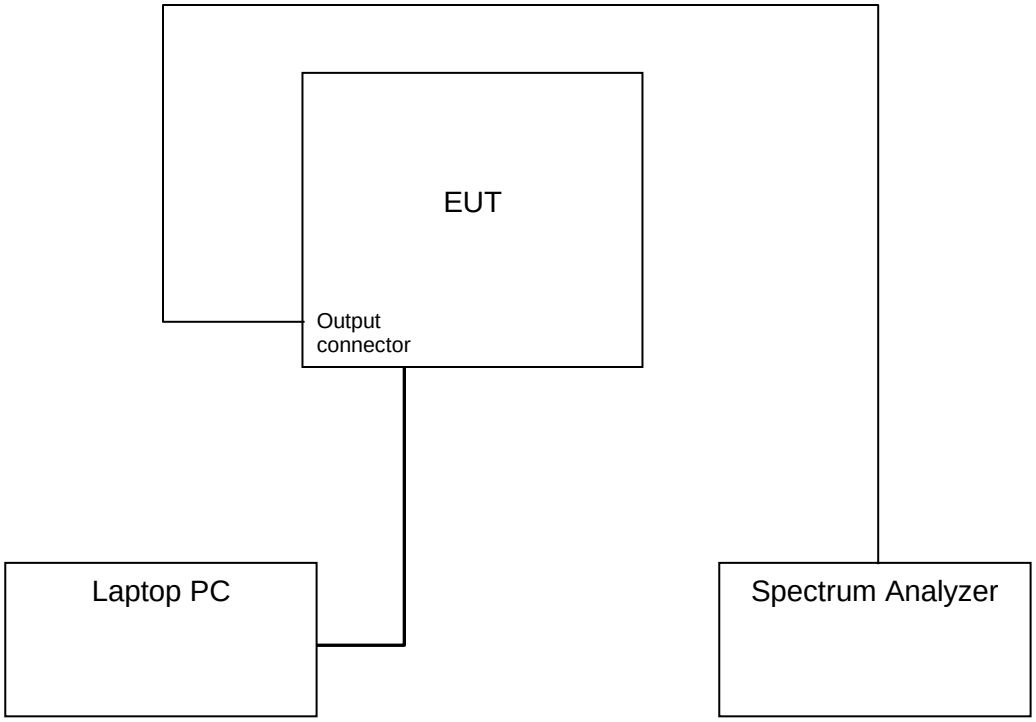
2.3 *General Information of EUT*

Type of Product:	Business Intelligence Accessory
Model Number:	BIX1000
Serial Number:	Not Labeled
Frequency Range:	2405-2475MHz
Modulation:	802.15.4
Antenna:	Weii 2.4Ghz Chip Antenna 2.05 dBi Gain (Optional antennas identified in the user manual)
Rated Voltage:	P.O.E.
Test Voltage:	P.O.E
Sample Received Date:	20 October 2017
Dates of testing:	23 October to 21 February 2018

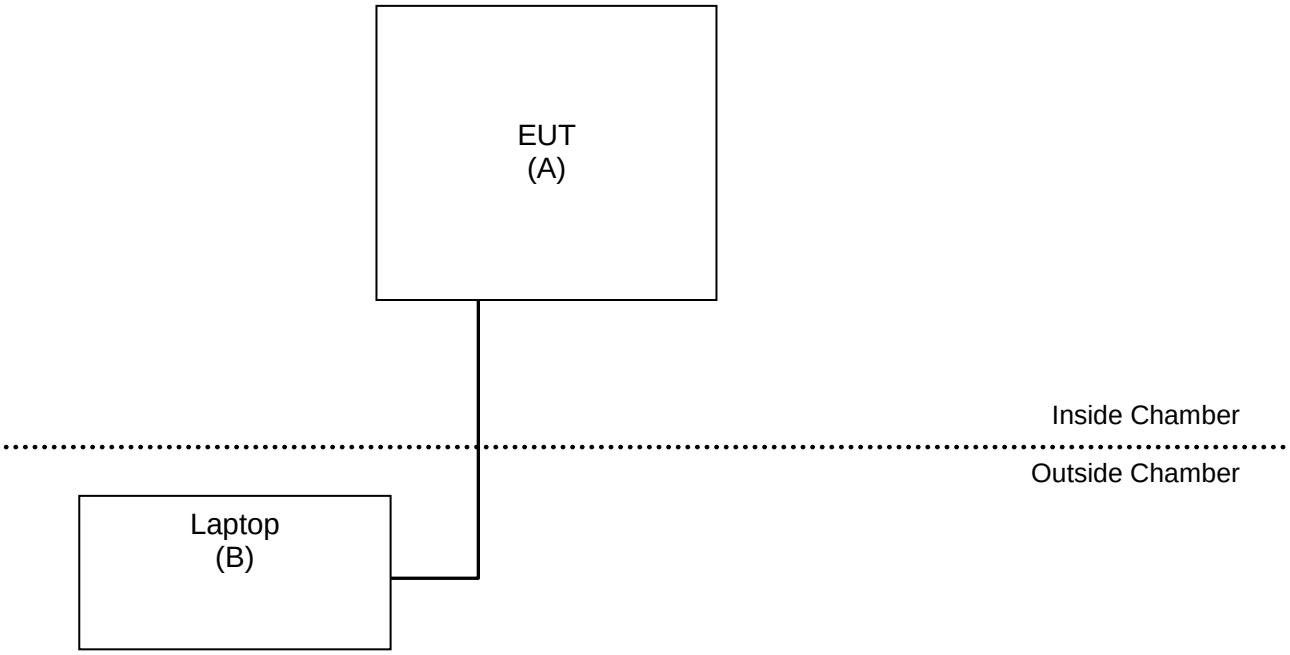
2.4 *Operating Modes and Conditions*

Continuous traffic was generated using test commands. The device was programmed to transmit at 100% duty cycle at low, middle, and high channels.
Channel 11, 2405MHz
Channel 18, 2440MHz
Channel 25, 2475MHz

2.5 *EUT Connection Block Diagram – Conducted Measurements*



2.6 *EUT Connection Block Diagram – Radiated Measurements*



2.7 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Tyco / Sensormatic	Business Intelligence Accessory	BIX1000	Not Labeled
		Business Intelligence Module	BIM1000(1)	Not Labeled
B	H/P	Laptop PC(Client)	15-21233wm	5CD6415H9V

(1) BIM1000 antenna port conducted measurements and 3.8dBi antenna radiated measurements included as representative of the BIX1000 due to RF circuitry being the same.

3 Bandwidth

3.1 *Test Result*

Test Description	Test Specification		Test Result
6 dB bandwidth / 99% OBW	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant

3.2 *Test Method*

The procedures from ANSI C63.10: 2013 clause 11.8 and 558074 D01 DTS Measurement Guidance v04 were used to determine the 6 dB bandwidth and 99% OBW.

3.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.2 °C
Relative Humidity: 47.5 %

3.4 *Test Equipment*

Test End Date: 24-Oct-2017 Tester: SKM

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522I	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

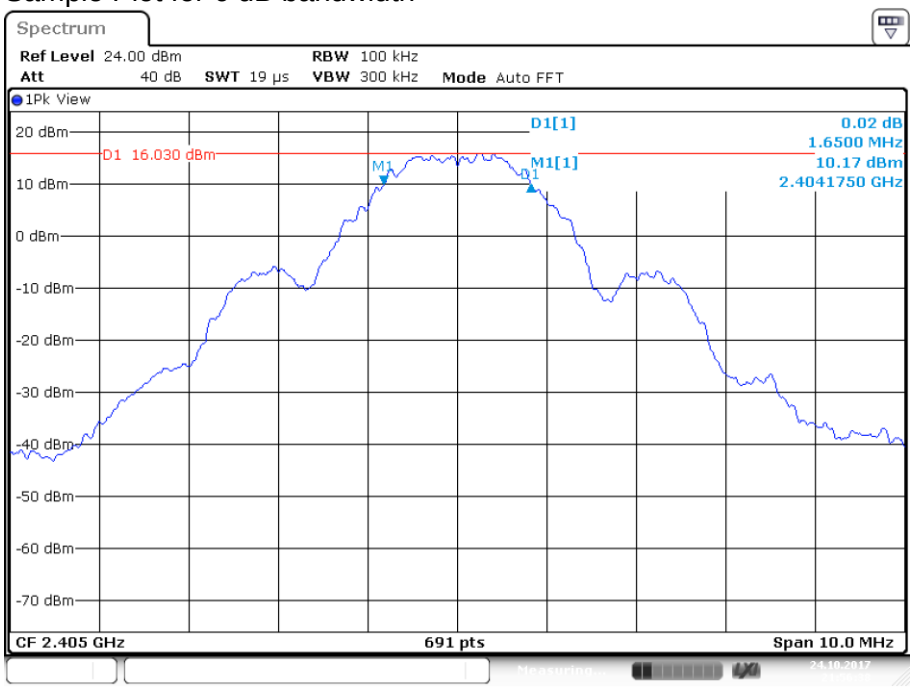
Note: The equipment calibration period is 1 year except for the FSV which is on a 2-year calibration cycle.

3.5 *Test Data*

Channel	6dB Bandwidth (MHz)	Occupied Bandwidth (99%) (MHz)
11	1.65	2.691
18	1.635	2.677
25	1.621	2.677

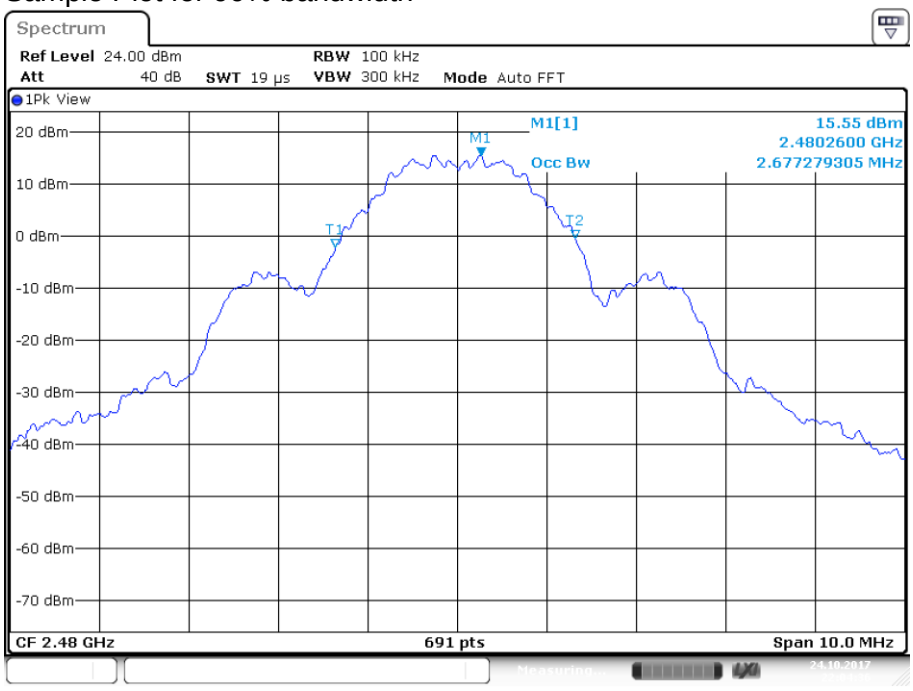
Measurements recorded using the BIM1000.

Sample Plot for 6 dB bandwidth



Date: 24.OCT.2017 21:56:39

Sample Plot for 99% bandwidth



Date: 24.OCT.2017 22:04:36

4 Output Power

4.1 *Test Result*

Test Description	Test Specification		Test Result
Peak Output Power	15.247(b) (3)	RSS-247 S5.4 (4)	Compliant

4.2 *Test Method*

Fundamental power measurements were recorded using the peak power procedures from ANSI C63.10: 2013 clause 11.9 and KDB 558074 D01 Measurement Guidance v04.

Limit
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. For using antennas with greater than 6dBi of gain, the limit is reduced in dB by the amount the gain exceeds 6dBi

4.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.2 °C
Relative Humidity: 47.5 %

4.4 *Test Equipment*

Test End Date: 24-Oct-2017 Tester: SKM

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522l l	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2-year calibration cycle.

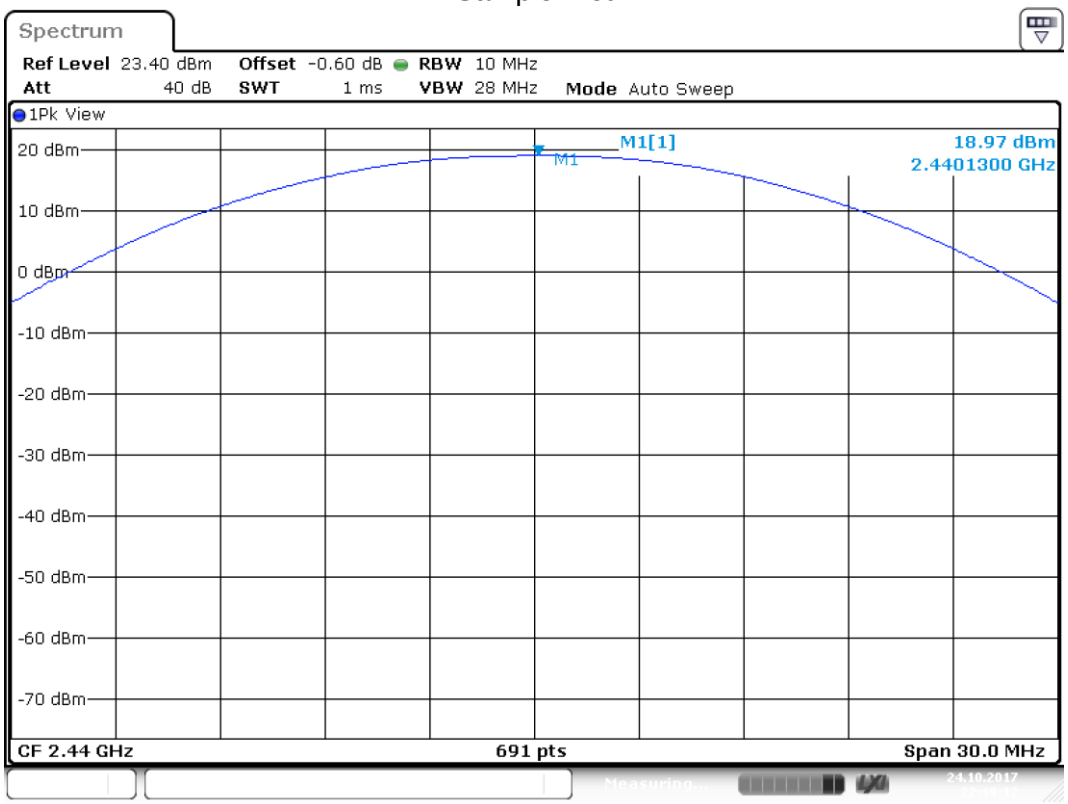
Because the measured RF output power at nominal temperature and volatge was less than 10dBm EIRP, it was not necessary to perform power spectral density measurements.

4.5 *Test Data*

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (30dBm)	Margin (dB)
11	2405	19.43	30	-10.57
18	2440	18.97	30	-11.03
25	2475	18.43	30	-11.57

Measurements recorded using the BIM1000.

Sample Plot



Date: 24.OCT.2017 22:19:13

5 Power Spectral Density

5.1 *Test Result*

Test Description	Test Specification		Test Result
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant

5.2 *Test Method*

Power spectral density measurements were recorded using the peak PSD procedures from ANSI C63.10: 2013 clause 11.10 and KDB 558074 D01 Measurement Guidance v04.

Limit
The limit is 8 dBm.

5.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.2 °C
Relative Humidity: 51.5 %

5.4 *Test Equipment*

Test End Date: 24-Oct-2017 Tester: SKM

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522I	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

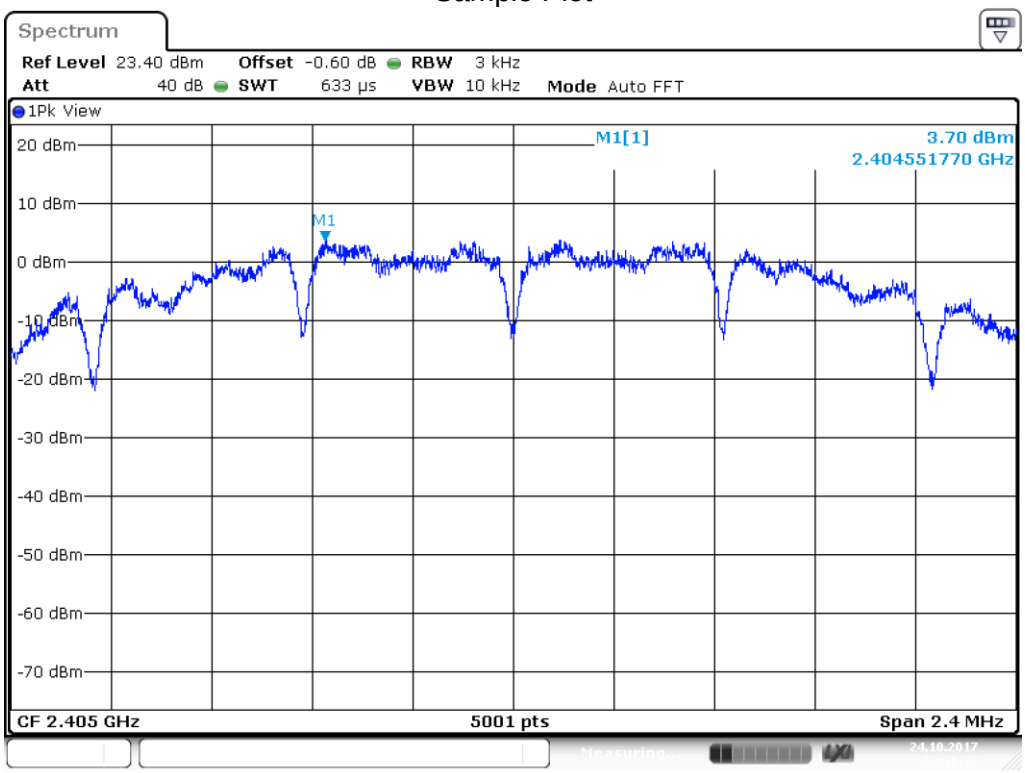
Note: The equipment calibration period is 1 year except for the FSV which is on a 2-year calibration cycle.

5.5 *Test Data*

Channel	Frequency (MHz)	Peak PSD (dBm)	Limit (8dBm)	Margin (dB)
11	2405	3.7	8	-4.3
18	2440	3.42	8	-4.58
25	2475	3.56	8	-4.44

Measurements recorded using the BIM1000.

Sample Plot



Date: 24.OCT.2017 22:31:37

6 Conducted Spurious Emissions

6.1 *Test Result*

Test Description	Test Specification		Test Result
Conducted Spurious Emissions	15.247(d)	RSS-247 S5.5	Compliant

6.2 *Test Method*

Spurious emissions in non-restricted frequency bands were recorded using the methods defined in ANSI C63.10: 2013 clause 11.11 and KDB 558074 D01 Measurement Guidance v04.

Lowest, middle, and highest channels were investigated. Only the worst-case (lowest data rate) for each modulation was reported. Antenna Port 2 yielded the higher output power levels and was used for conducted spurious measurements. The maximum target power was used (20dBm).

Because the maximum conducted peak output power was used to determine compliance with the output power limits, the limit is 20 dB below the maximum in-band peak PSD level in 100 kHz.

6.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.2 °C
Relative Humidity: 47.5 %

6.4 *Test Equipment*

Test End Date: 24-Oct-2017 Tester: SKM

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522I	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

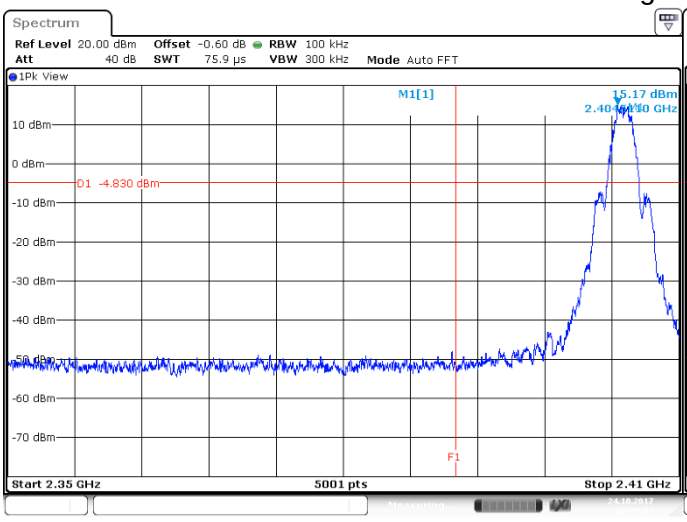
Test End Date: 26-Oct-2017 Tester: SKM

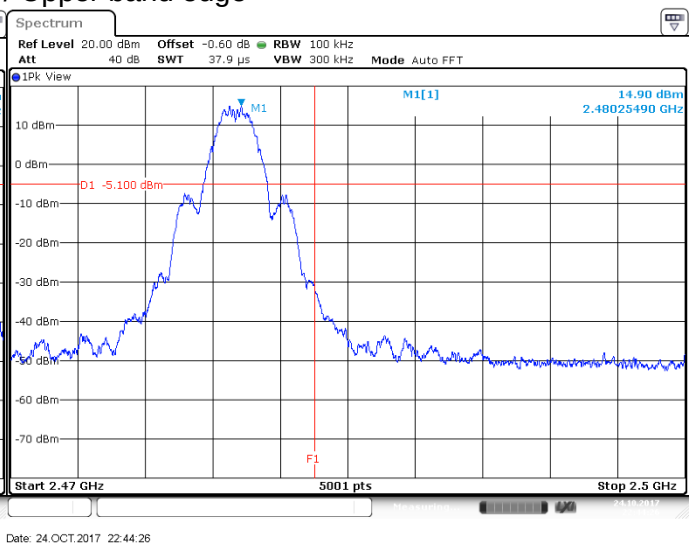
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522I	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2-year calibration cycle.

6.5 *Test Data – DTS Bandedge*

Lower band edge / Upper band edge

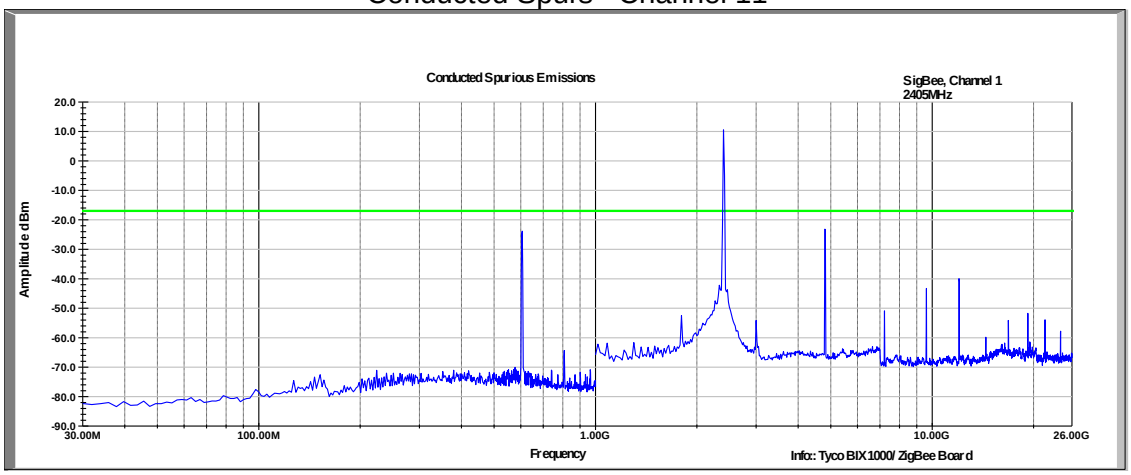




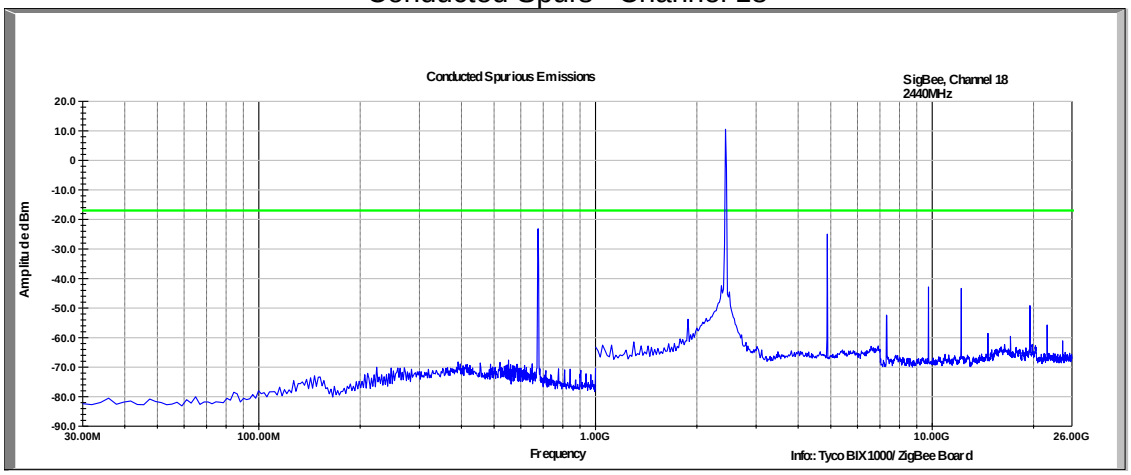
Measurements recorded using the BIM1000.

6.6 *Test Data – Conducted Spurious Emissions*

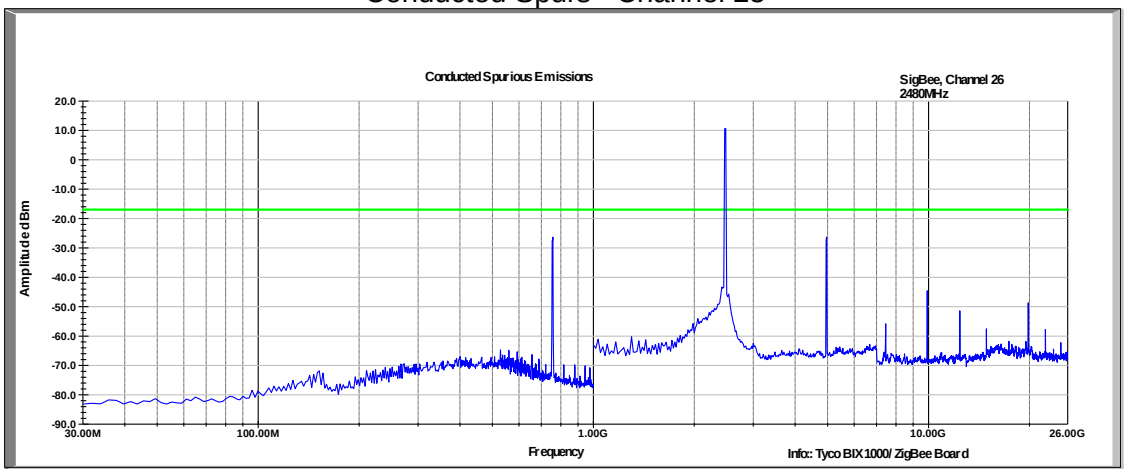
Conducted Spurs –Channel 11



Conducted Spurs –Channel 18



Conducted Spurs –Channel 25



Measurements recorded using the BIM1000.

7 Field Strength of Spurious Radiation

7.1 *Test Result*

Test Description	Test Specification		Test Result
Spurious Emissions	15.247 (d) and 15.209	RSS-247 S5.5	Compliant

7.2 *Test Method*

Radiated emission measurements were performed with the chip antennas installed as intended. The measurement methods defined in ANSI C63.4: 2014 were used.

Lowest, middle, and highest channels were investigated.

Test distance:

9k to 30 MHz – Near field pre-scan to determine if there were any emissions
30 to 1000 MHz - The EUT to measurement antenna distance was 3 meters
1 to 18 GHz - The EUT to measurement antenna distance was 3 meters
18 to 26 GHz - The EUT to measurement antenna distance was 1 meter

Limits within restricted bands of operation:

Frequency	Limits(1)		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (2)	--
88 - 216 MHz	150	43.5 (2)	--
216 - 960 MHz	200	46 (2)	--
960 - 1000 MHz	500	54 (2)	--
1 - 40 GHz	500	54 (3)	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.
(2) Quasi-peak limit
(3) Average limit

7.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 °C
Relative Humidity: 49.5 %

7.4 *Test Equipment*

Test Date: 21-Feb-2017 Tester: SKM

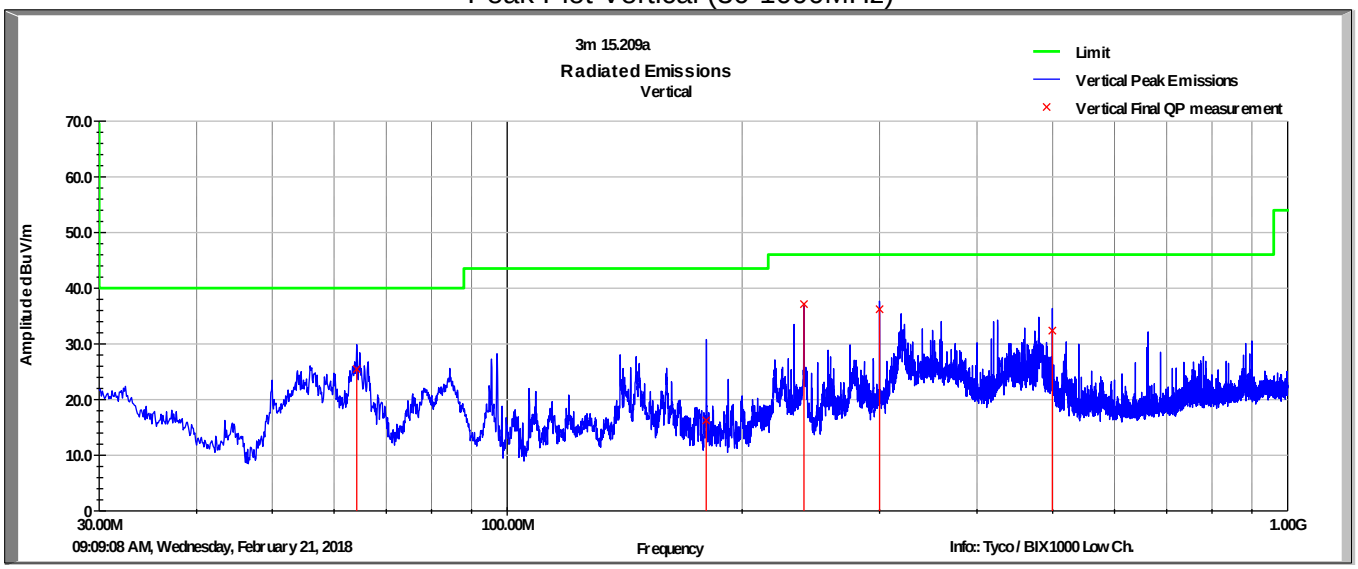
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	20-Jun-2017
FILTER, HIGH PASS	HPM50110	MICRO-TRONICS	B079792	28-Jul-2017
ANTENNA, BILOG	JB6	SUNOL	B079690	28-Nov-2018
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	15003	28-Jul-2018
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	29-Jul-2017
ANTENNA DRG HORN	3117	ETS LINDGREN	B079691	27-Jul-2017
ANTENNA DRG HORN	LB-180400-20-C-KF	A-INFO	15007	29-Mar-2017
RF CABLE	SF102	HUBER & SUHNER	B079822	27-Jul-2017
RF CABLE	SF102	HUBER & SUHNER	B079824	27-Jul-2017
RF CABLE	SUCOFLEX 100	HUBER & SUHNER	B108523	4-Aug-2017
RF CABLE	SF106	HUBER & SUHNER	B079716	27-Jul-2017
RF CABLE	SF106	HUBER & SUHNER	B079661	25-Jul-2018
RF CABLE	141	HUBER & SUHNER	B095590	26-Jul-2017
RF CABLE	141	HUBER & SUHNER	B095589	26-Jul-2017

Note: The equipment calibration period is 1 year.

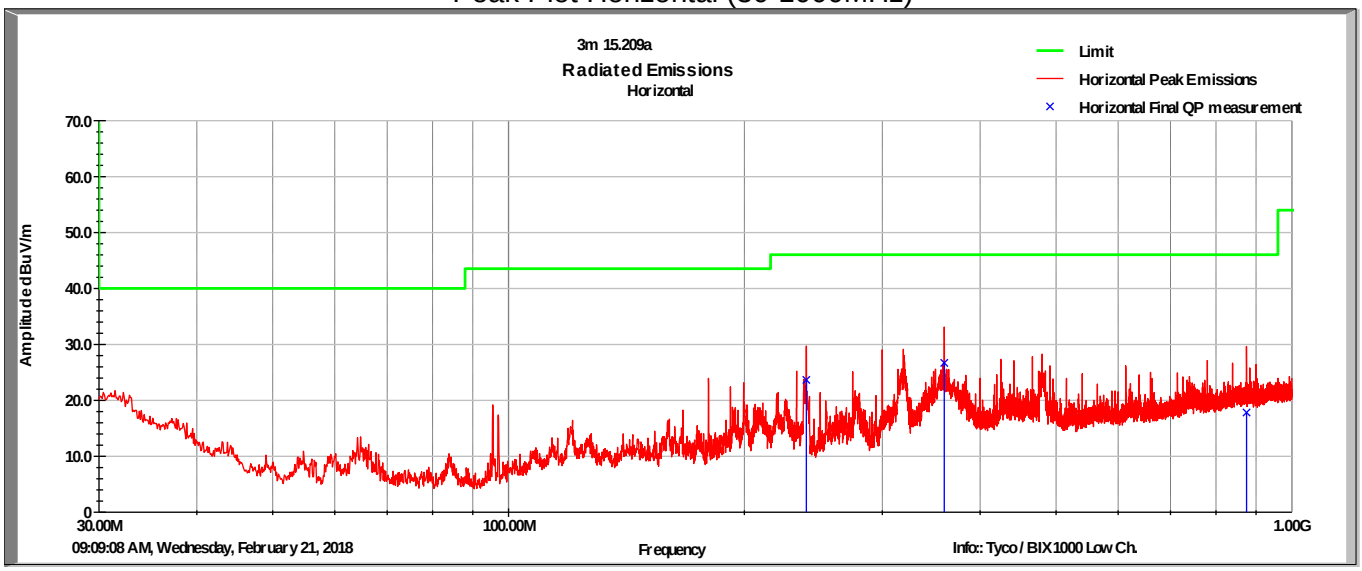
7.5 *Test Data – Peak Plots (2.05dBi chip antenna, BIX1000)*

No emissions detected below 30MHz

Low Channel (11, 2405MHz)
Peak Plot Vertical (30-1000MHz)



Low Channel (Channel (11, 2405MHz)
Peak Plot Horizontal (30-1000MHz)

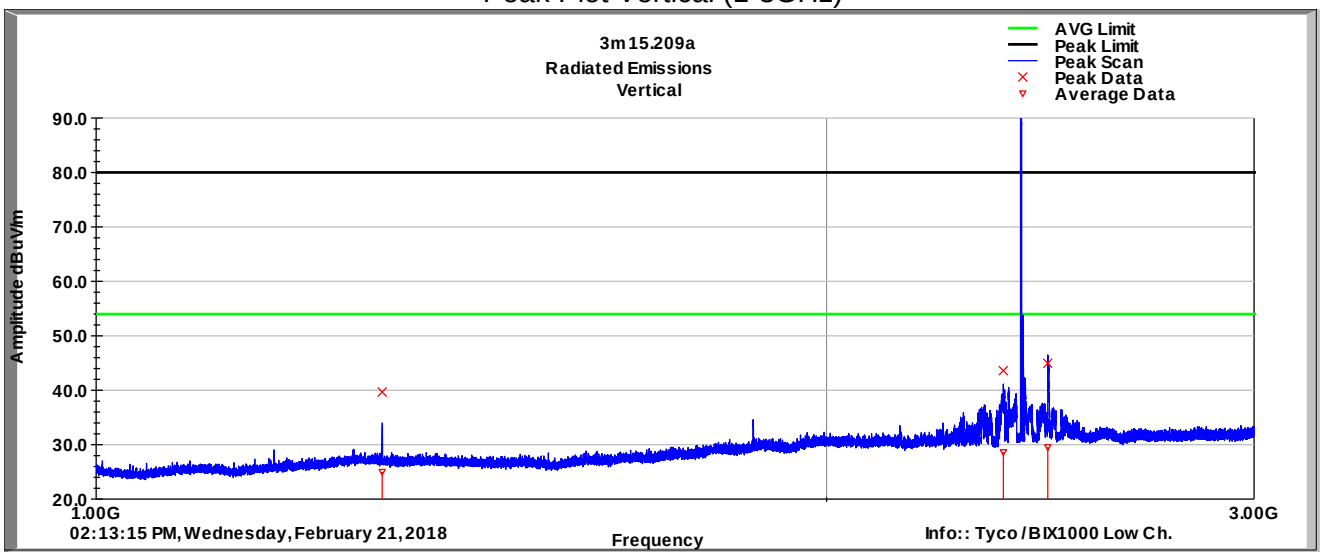


Tabulated Data 30-1000MHz

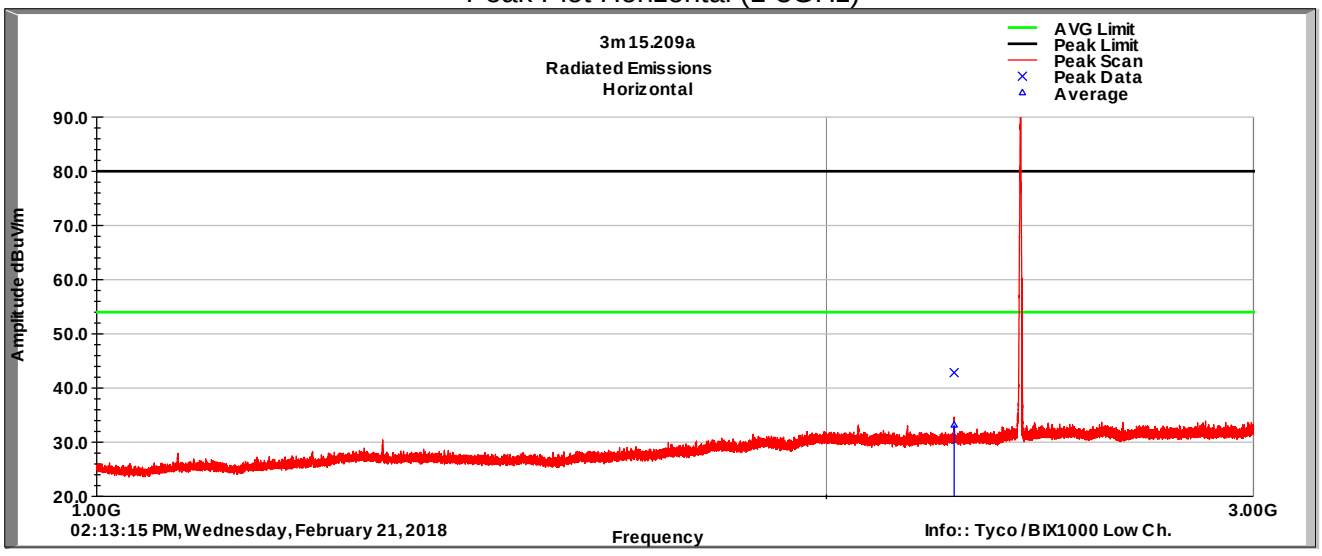
Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
64.14	50.0	V	204.0	100.0	7.7	0.9	33.1	25.5	40.0	-14.5
179.90	37.5	V	207.0	117.0	10.9	1.6	33.7	16.3	43.5	-27.3
240.00	57.3	V	189.0	100.0	11.7	1.9	33.7	37.1	46.0	-8.9
300.01	54.0	V	218.0	116.0	13.7	2.1	33.6	36.2	46.0	-9.8
499.58	45.2	V	6.0	136.0	17.9	2.7	33.4	32.4	46.0	-13.7
= Level + AF + CL - Amp										
Margin = QP Value - Limit										

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
239.96	43.8	H	257.0	157.0	11.7	1.9	33.7	23.7	46.0	-22.4
359.99	43.2	H	90.0	400.0	14.8	2.3	33.6	26.7	46.0	-19.3
875.28	25.6	H	124.0	100.0	22.1	3.6	33.5	17.8	46.0	-28.2
= Level + AF + CL - Amp										
n = QP Value - Limit										

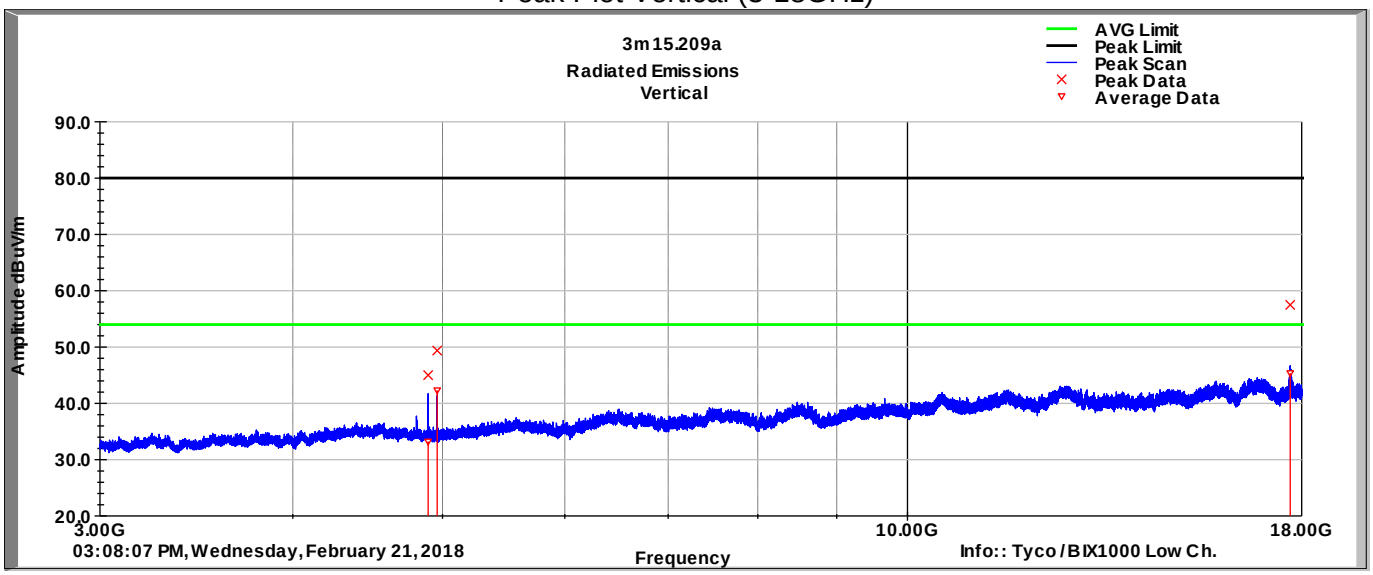
Low Channel
Peak Plot Vertical (1-3GHz)



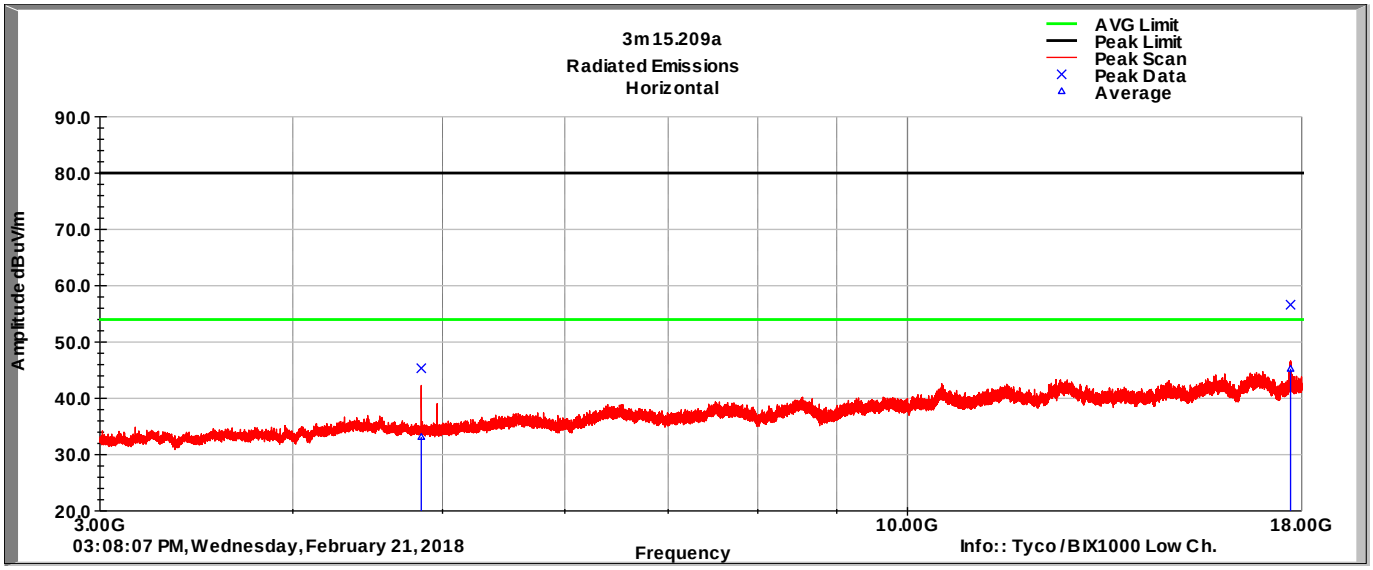
Low Channel
Peak Plot Horizontal (1-3GHz)



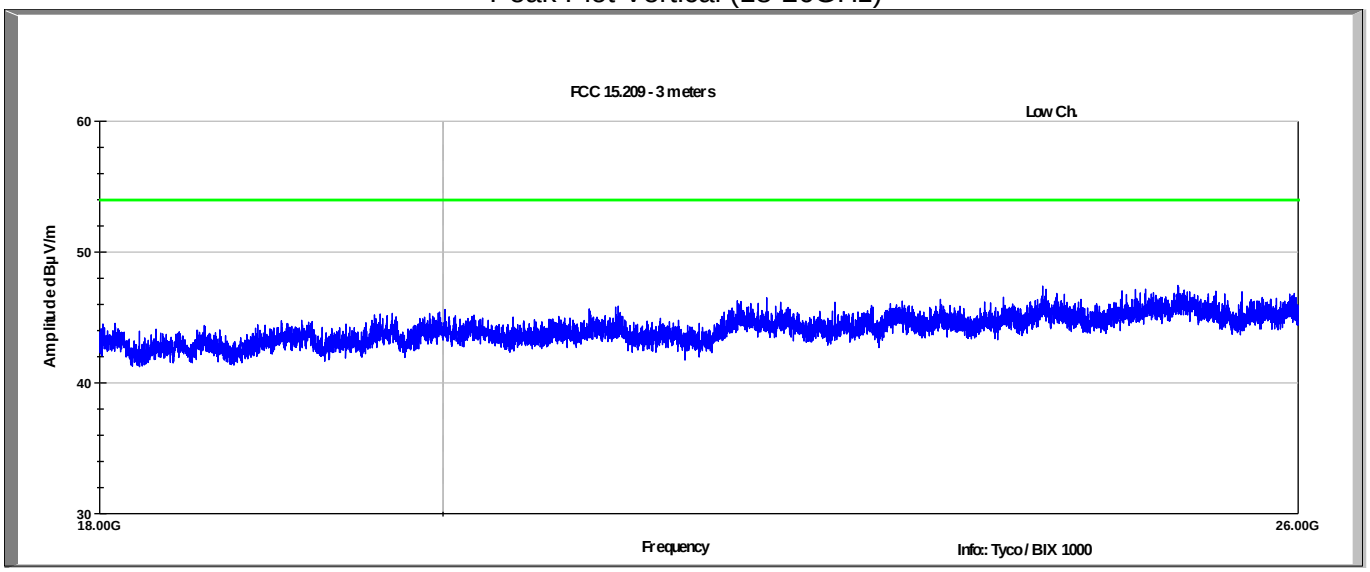
Low Channel
Peak Plot Vertical (3-18GHz)



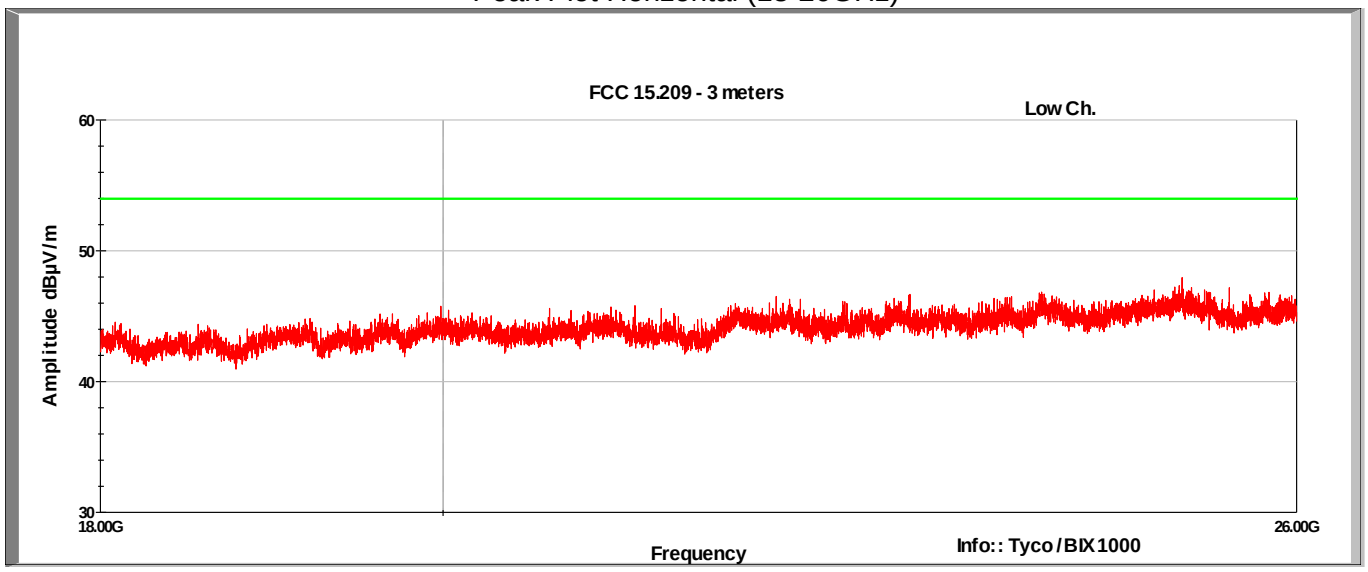
Low Channel
Peak Plot Horizontal (3-18GHz)



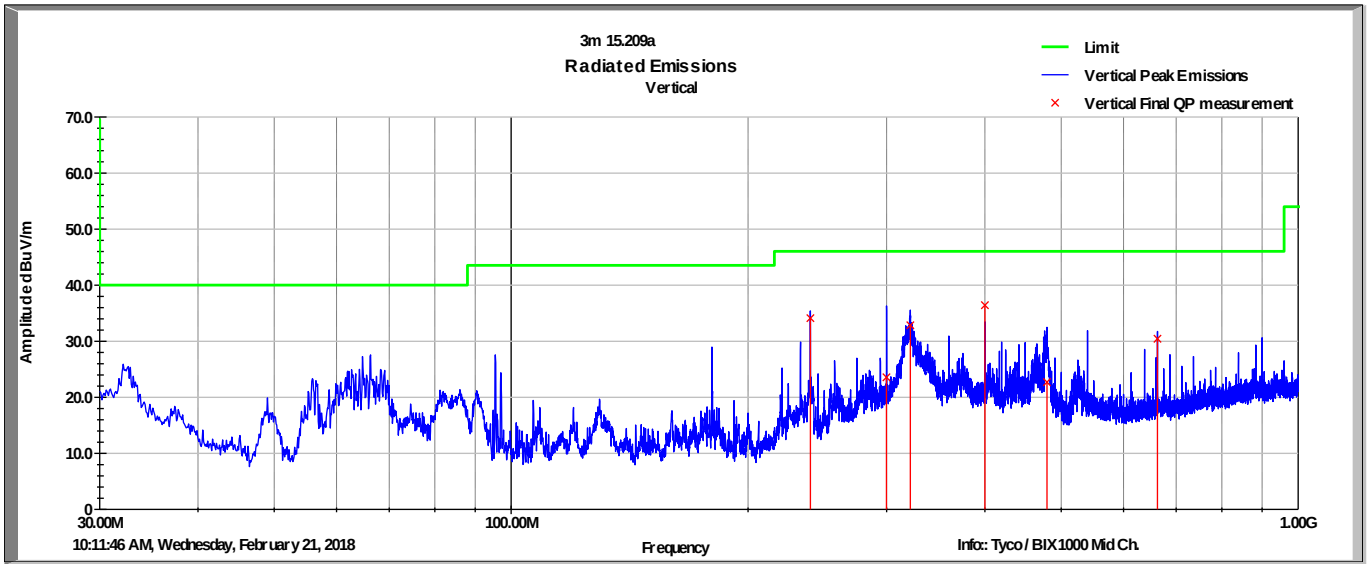
Low Channel
Peak Plot Vertical (18-26GHz)



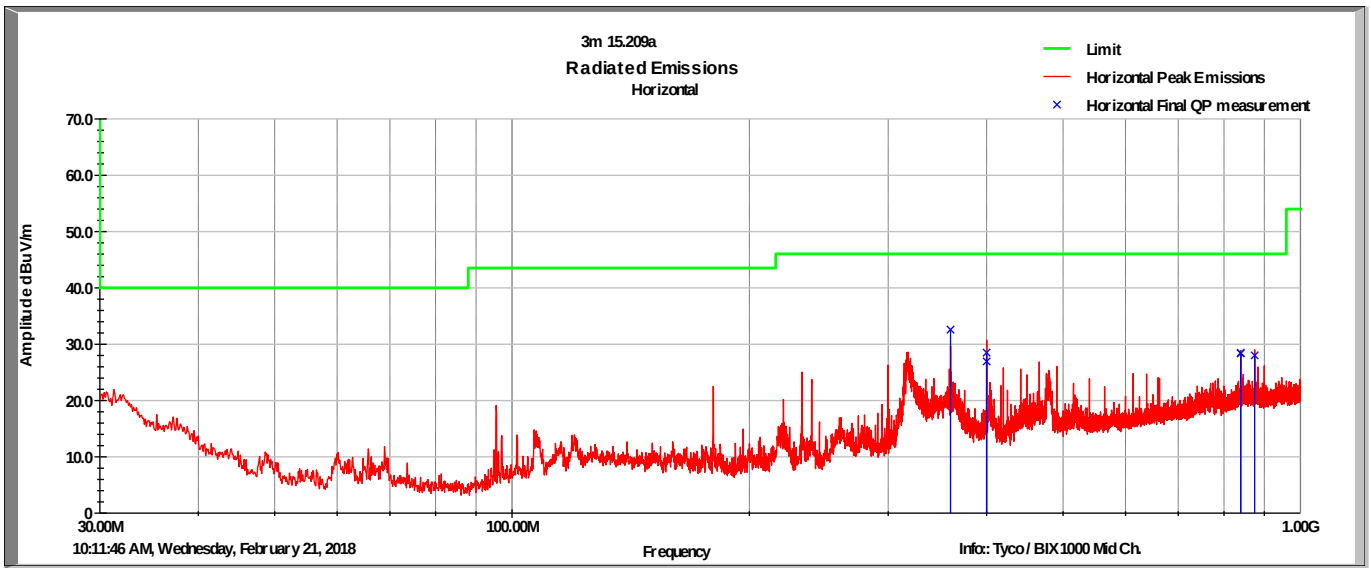
Low Channel
Peak Plot Horizontal (18-26GHz)



Mid Channel (18, 2440MHz)
Peak Plot Vertical (30-1000MHz)



Mid Channel (Channel 18, 2440MHz)
Peak Plot Horizontal (30-1000MHz)

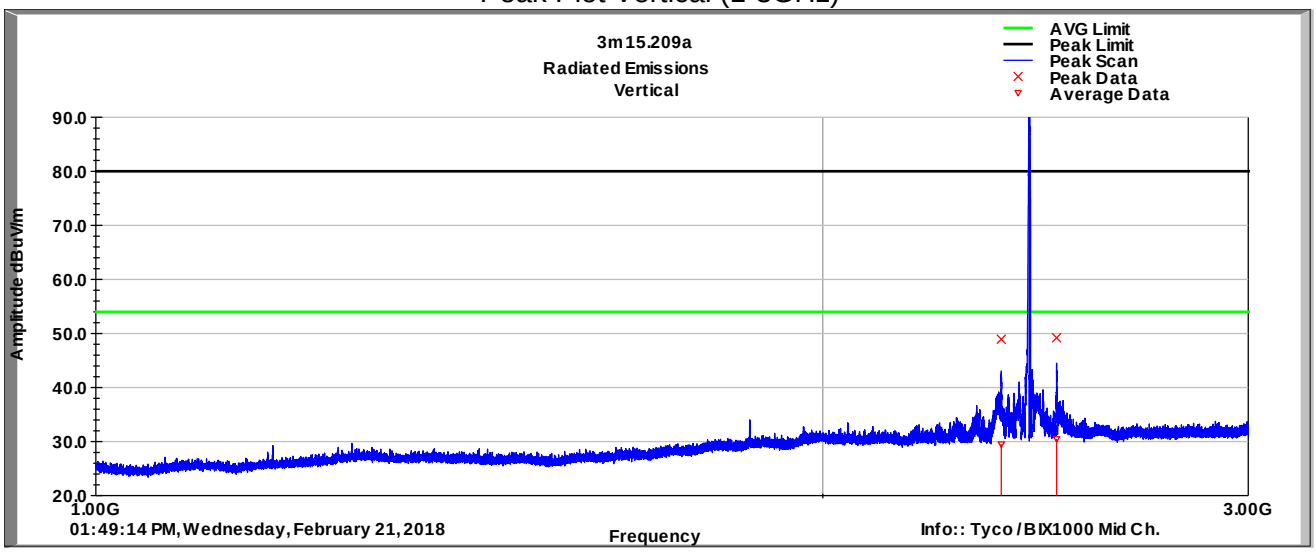


Tabulated Data 30-1000MHz

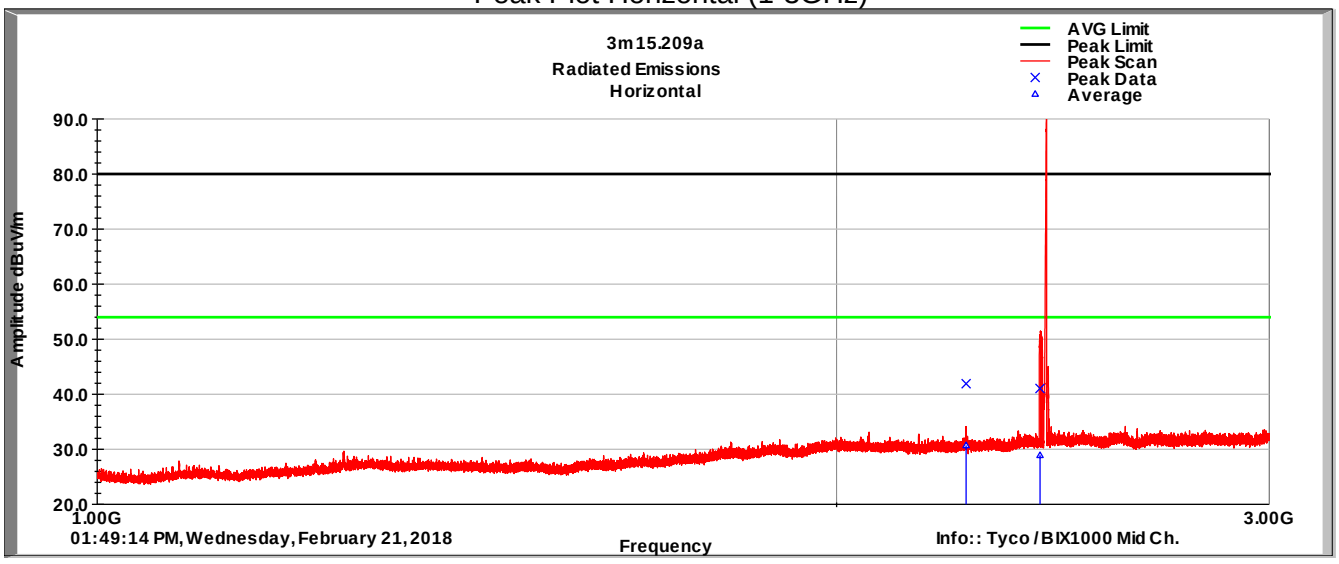
Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
240.00	54.2	V	351.0	135.0	11.7	1.9	33.7	34.1	46.0	-11.9
299.89	41.4	V	291.0	107.0	13.7	2.1	33.6	23.6	46.0	-22.5
321.52	50.2	V	249.0	100.0	14.1	2.2	33.6	32.8	46.0	-13.2
399.99	51.8	V	169.0	100.0	15.7	2.4	33.5	36.4	46.0	-9.6
479.60	35.8	V	193.0	106.0	17.7	2.6	33.5	22.7	46.0	-23.3
662.71	40.7	V	105.0	250.0	20.0	3.1	33.4	30.4	46.0	-15.6
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
359.99	49.1	H	63.0	118.0	14.8	2.3	33.6	32.6	46.0	-13.4
399.99	42.4	H	199.0	400.0	15.7	2.4	33.5	26.9	46.0	-19.1
839.99	36.3	H	200.0	158.0	22.0	3.5	33.5	28.4	46.0	-17.6
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

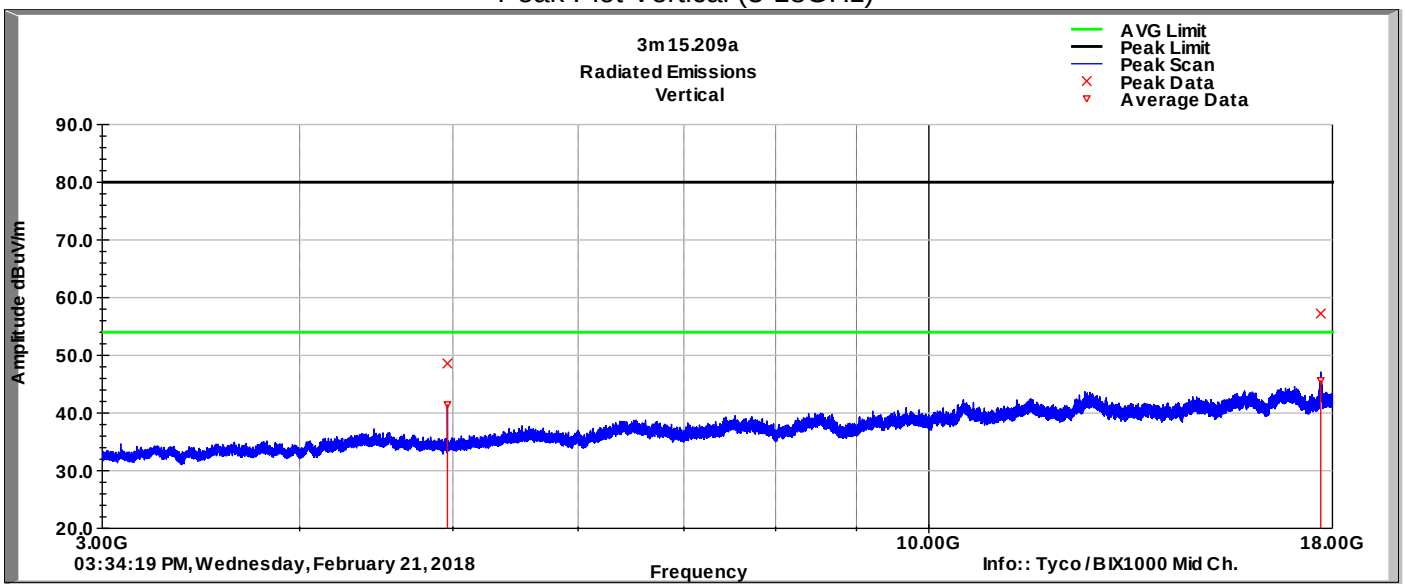
Mid Channel
Peak Plot Vertical (1-3GHz)



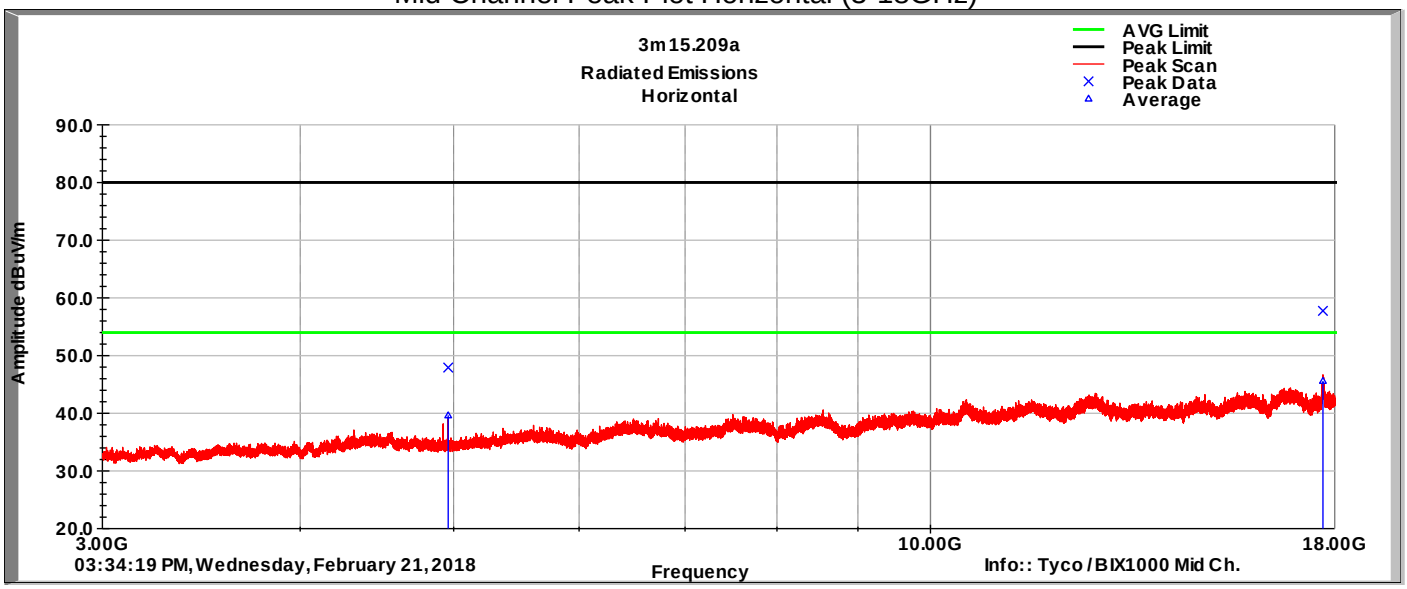
Mid Channel
Peak Plot Horizontal (1-3GHz)



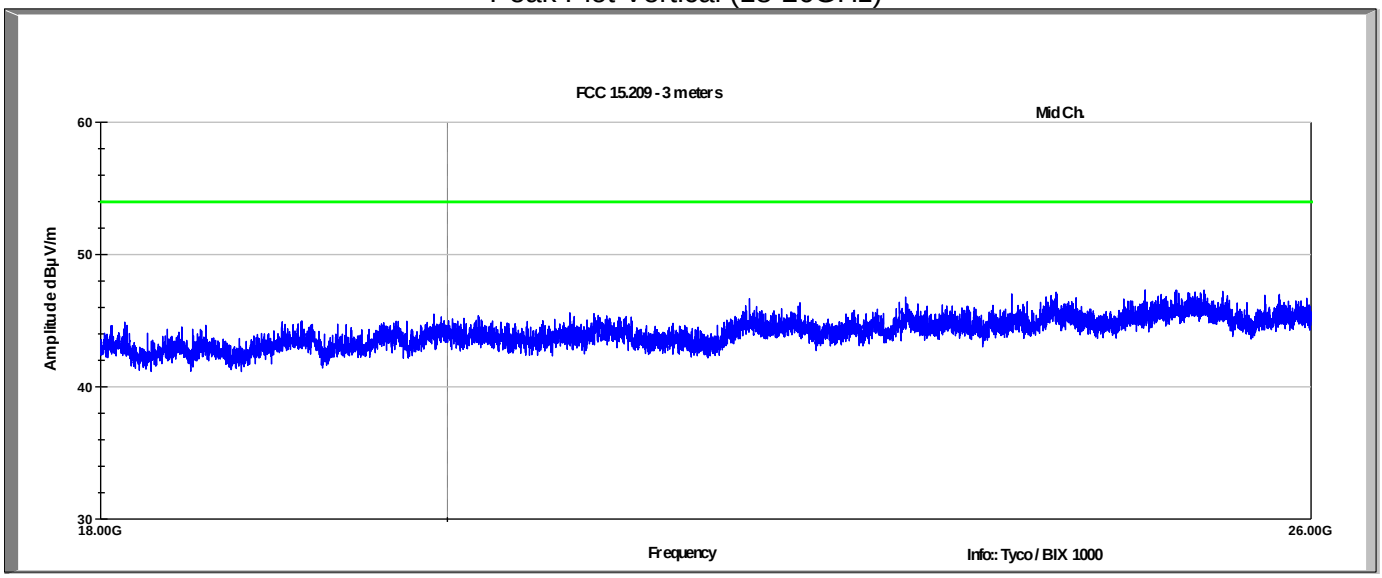
Mid Channel
Peak Plot Vertical (3-18GHz)



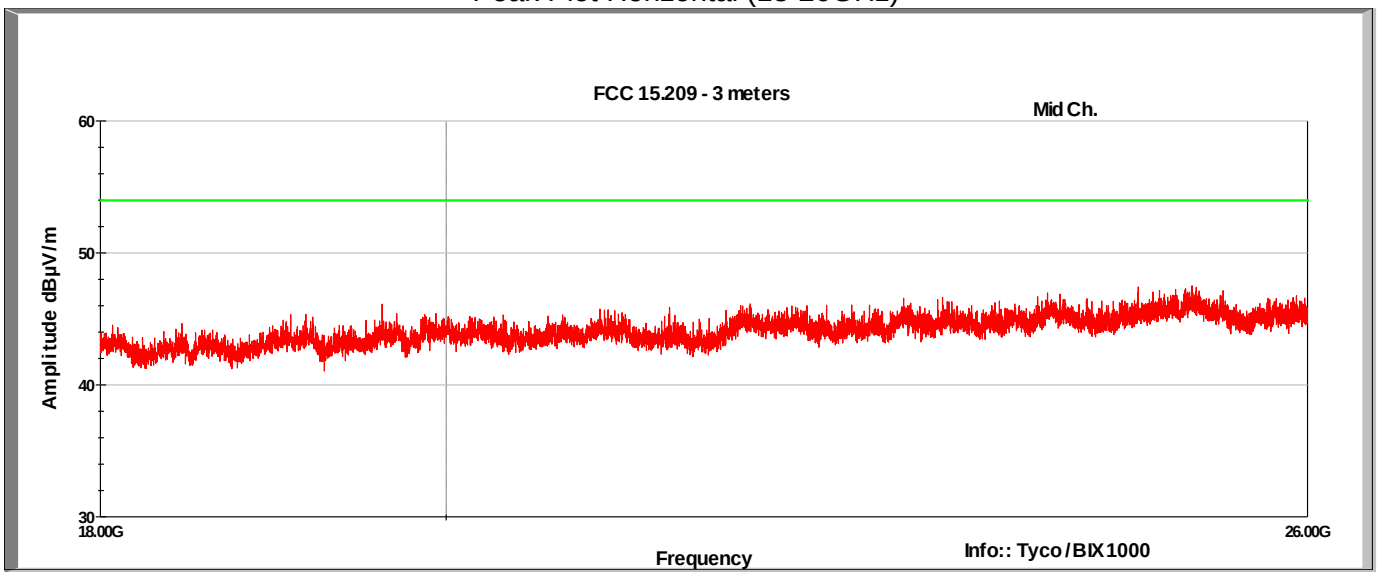
Mid Channel Peak Plot Horizontal (3-18GHz)



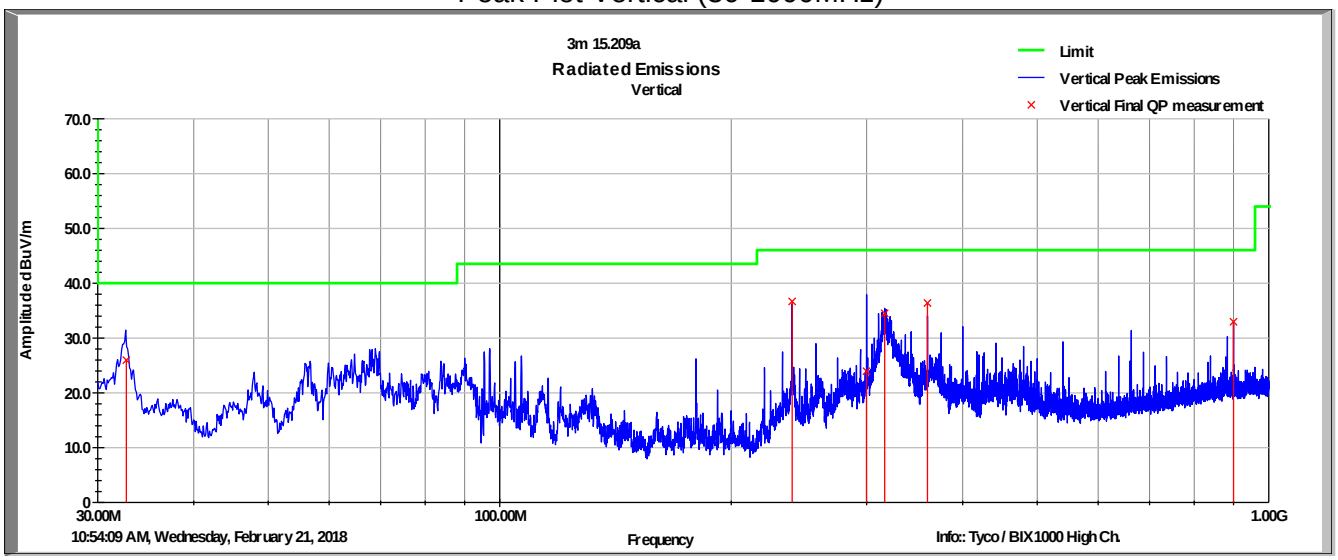
Mid Channel
Peak Plot Vertical (18-26GHz)



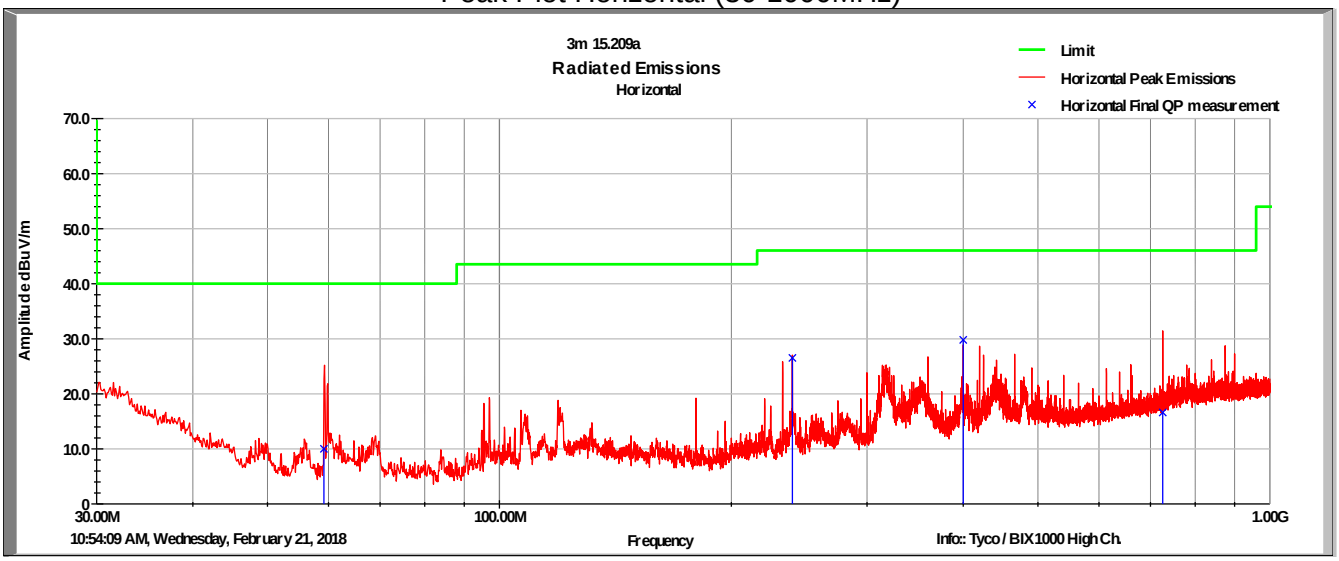
Mid Channel
Peak Plot Horizontal (18-26GHz)



High Channel (Channel 25, 2475MHz))
Peak Plot Vertical (30-1000MHz)



High Channel (Channel 25, 2475MHz)
Peak Plot Horizontal (30-1000MHz)

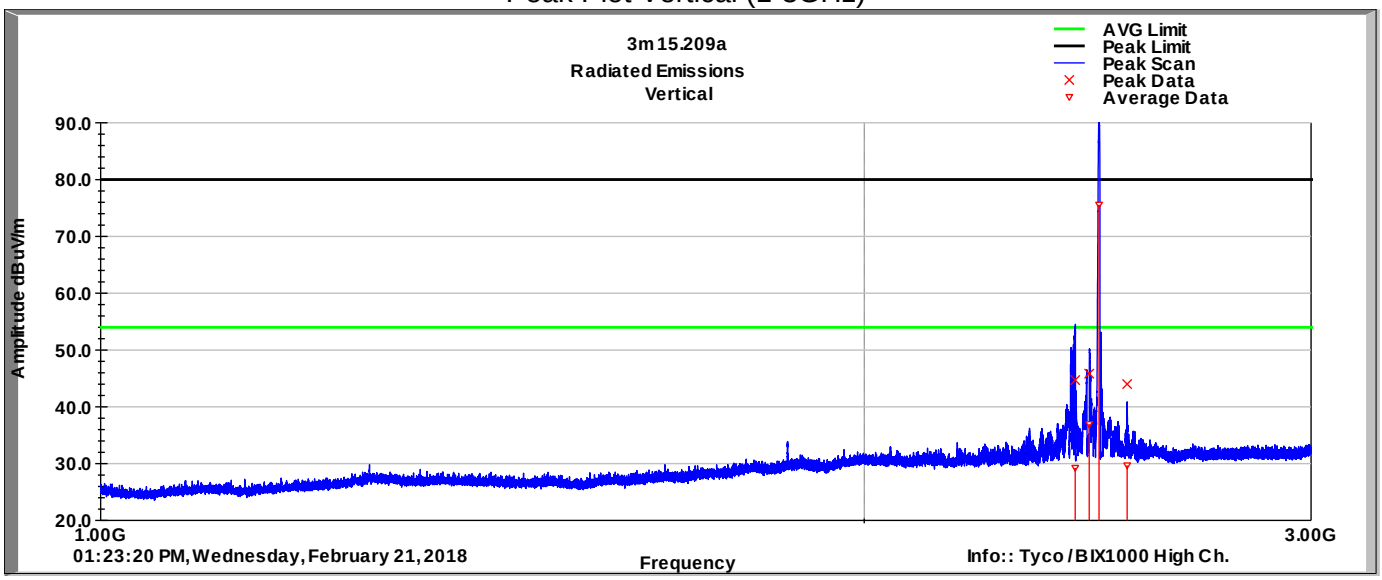


Tabulated Data 30-1000MHz

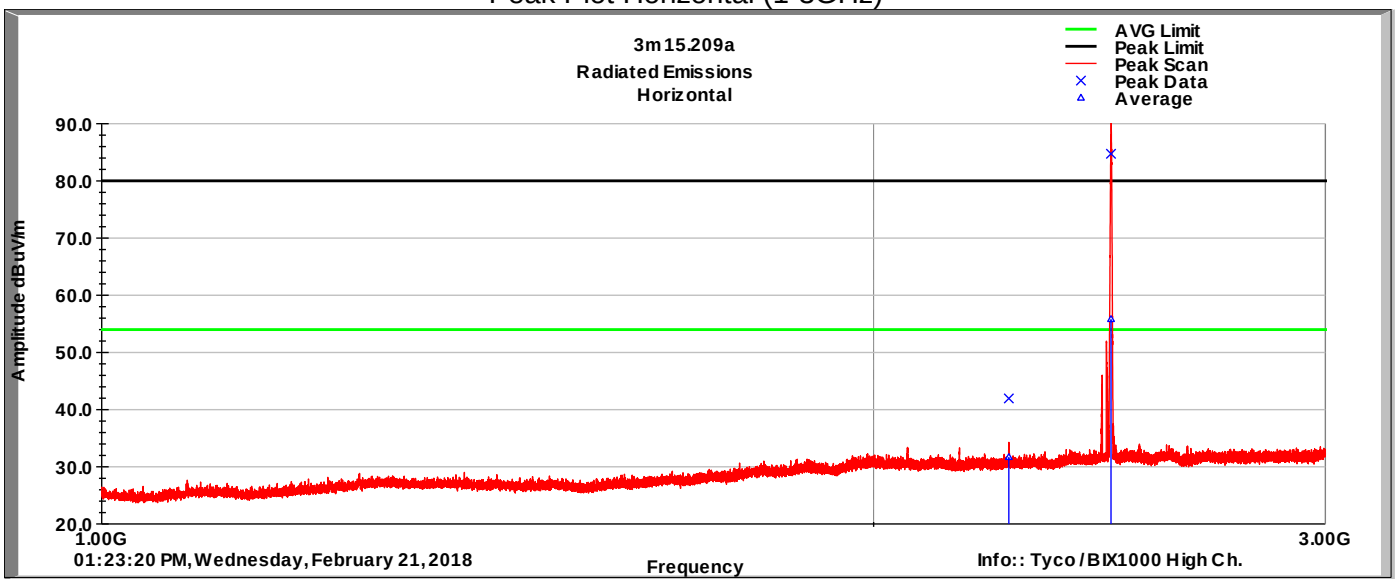
MHz	(dBuV)	(V/H)	(degrees)	(cm)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
32.68	37.0	V	359.0	137.0	19.6	0.6	31.3	26.0	40.0	-14.0
240.00	56.8	V	297.0	117.0	11.7	1.9	33.7	36.7	46.0	-9.4
299.89	41.8	V	303.0	100.0	13.7	2.1	33.6	23.9	46.0	-22.1
316.64	52.0	V	237.0	100.0	14.0	2.1	33.6	34.5	46.0	-11.5
359.99	52.9	V	260.0	100.0	14.8	2.3	33.6	36.4	46.0	-9.6
899.99	40.5	V	141.0	100.0	22.3	3.7	33.5	33.0	46.0	-13.1
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
59.17	34.7	H	190.0	100.0	7.3	0.9	33.0	10.0	40.0	-30.0
240.01	46.6	H	244.0	167.0	11.7	1.9	33.7	26.5	46.0	-19.5
400.00	45.2	H	136.0	308.0	15.7	2.4	33.5	29.8	46.0	-16.2
726.13	26.1	H	153.0	288.0	20.7	3.3	33.4	16.6	46.0	-29.4
QP Value = Level + AF + CL - Amp										

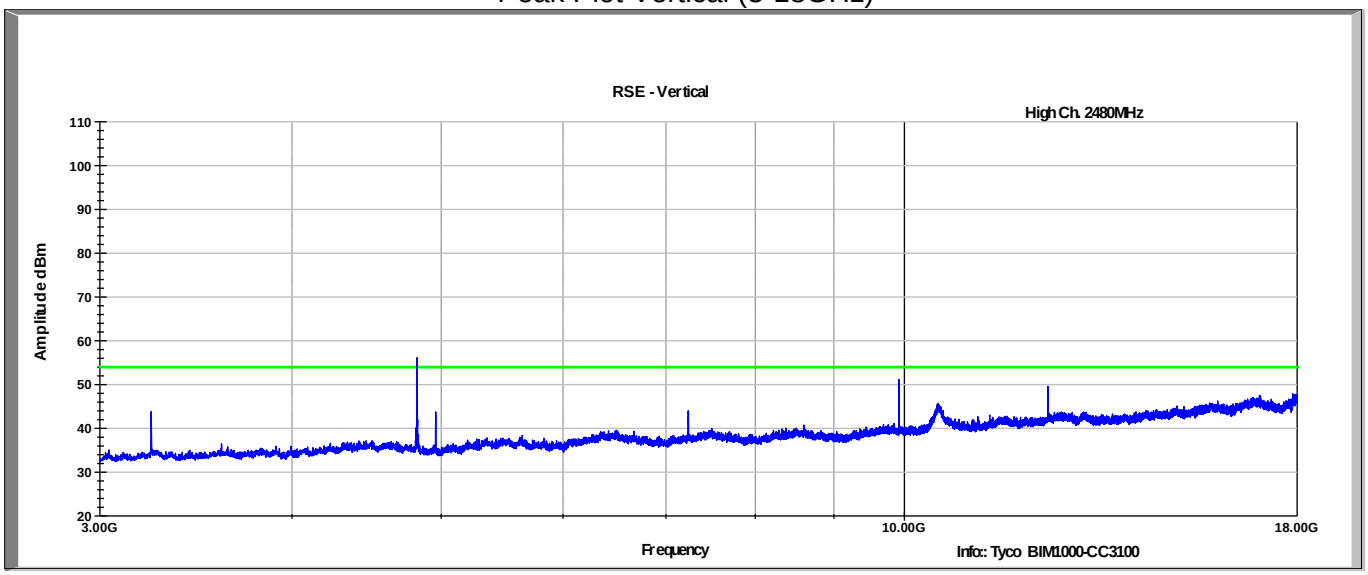
High Channel
Peak Plot Vertical (1-3GHz)



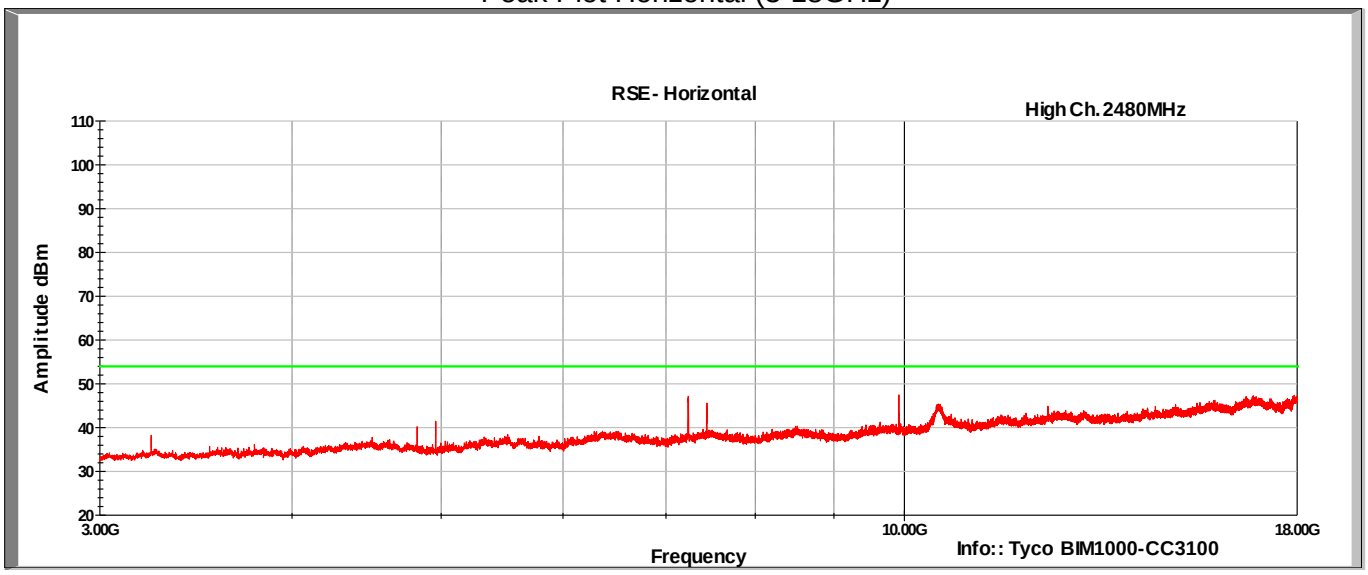
High Channel
Peak Plot Horizontal (1-3GHz)



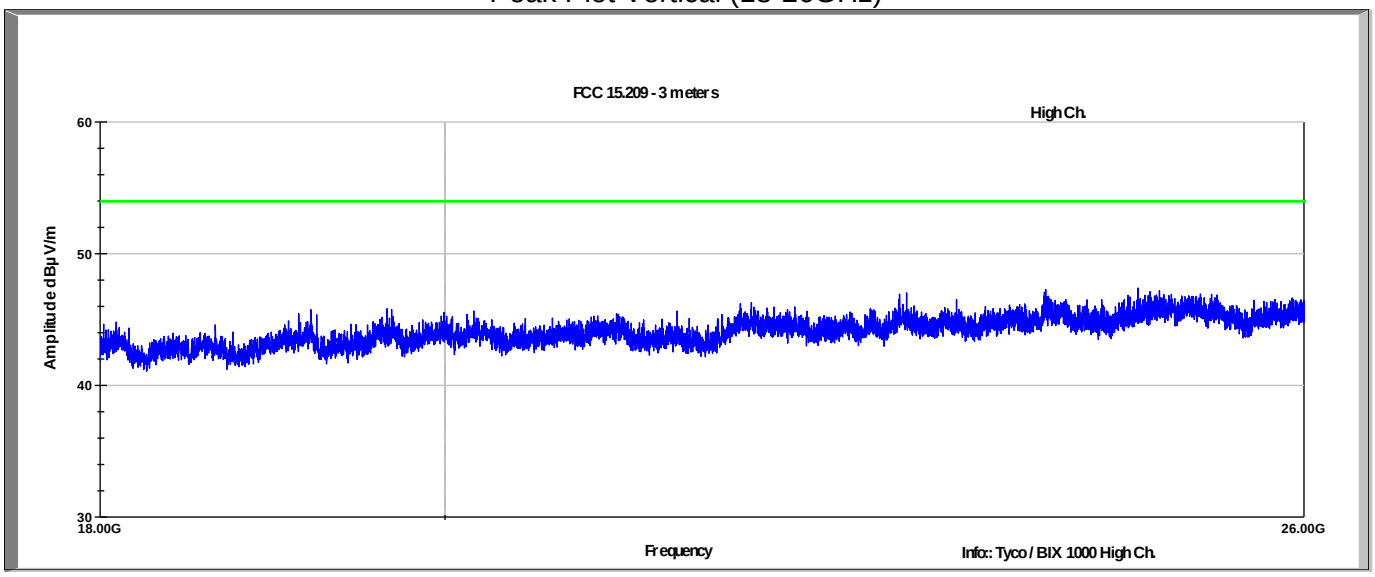
High Channel
Peak Plot Vertical (3-18GHz)



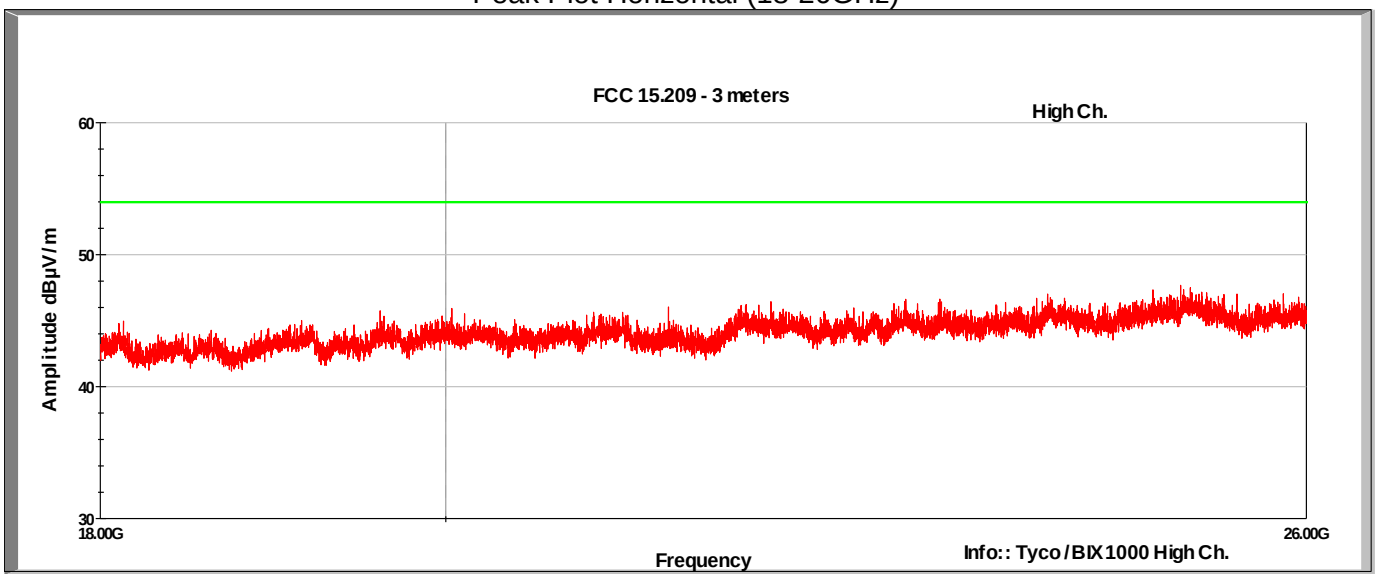
High Channel
Peak Plot Horizontal (3-18GHz)



High Channel
Peak Plot Vertical (18-26GHz)



High Channel
Peak Plot Horizontal (18-26GHz)



7.6 *Test Data – Tabular Data (2.05dBi chip antenna, BIX1000)*

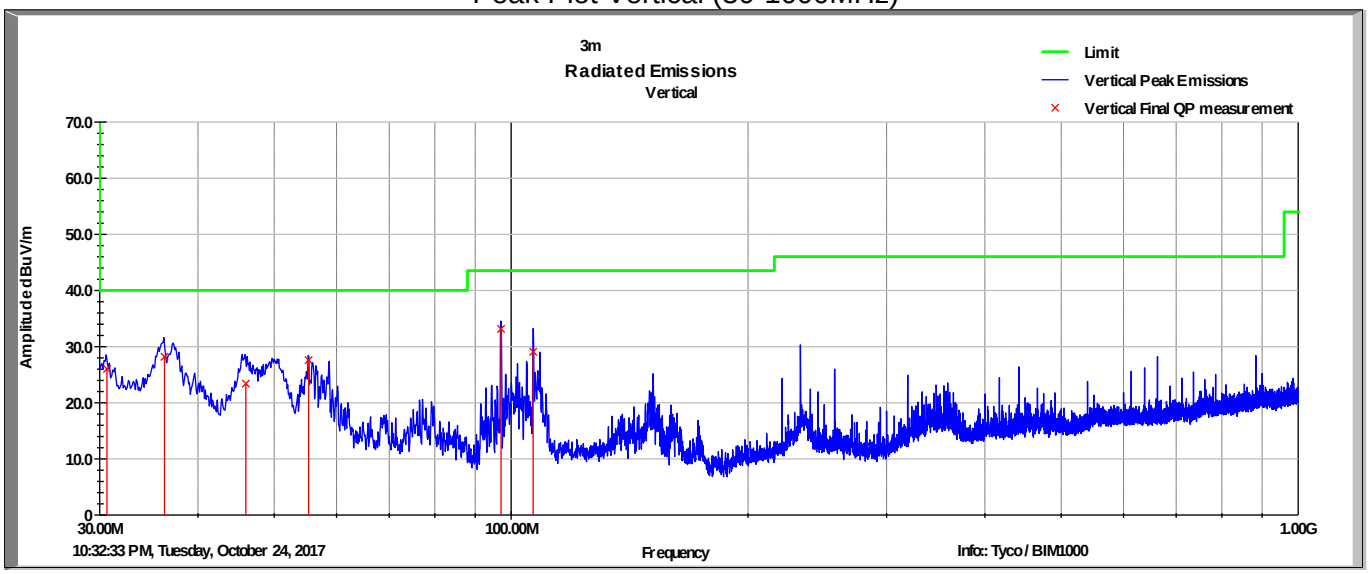
Frequency	Raw Avg	Polarity	AF	CL	Amp	Avg Value	Limit	Margin	Detector
MHz	dBuV	(V/H)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	RBW/VBW
Low Channel									
1311.90	28.2	V	28.9	1.0	33.2	25.0	54.0	-28.9	Avg 1M/3M
2365.00	28.3	V	32.0	1.5	33.4	28.6	54.0	-25.3	Avg 1M/3M
2257.90	33.2	H	31.6	1.4	33.3	33.2	54.0	-20.8	Avg 1M/3M
4894.00	30.0	V	34.1	2.2	33.4	33.2	54.0	-20.8	Avg 1M/3M
4960.00	39.0	V	34.1	2.2	33.3	42.3	54.0	-11.7	Avg 1M/3M
4844.00	29.8	H	34.2	2.2	33.4	33.1	54.0	-20.9	Avg 1M/3M
17704.00	29.1	H	40.9	8.2	33.8	45.2	54.0	-8.7	Avg 1M/3M
Mid Channel									
2258.00	30.7	H	31.6	1.4	33.3	30.7	54.0	-23.3	Avg 1M/3M
2370.80	29.2	V	32.0	1.5	33.4	29.5	54.0	-24.5	Avg 1M/3M
2499.20	29.2	V	32.9	1.5	33.4	30.5	54.0	-23.5	Avg 1M/3M
4960.00	36.4	H	34.1	2.2	33.3	39.6	54.0	-14.3	Avg 1M/3M
4960.00	38.2	V	34.1	2.2	33.3	41.5	54.0	-12.5	Avg 1M/3M
17700.00	29.2	V	40.9	8.6	33.8	45.7	54.0	-8.3	Avg 1M/3M
2258.00	30.7	H	31.6	1.4	33.3	30.7	54.0	-23.3	Avg 1M/3M
2370.80	29.2	V	32.0	1.5	33.4	29.5	54.0	-24.5	Avg 1M/3M
2499.20	29.2	V	32.9	1.5	33.4	30.5	54.0	-23.5	Avg 1M/3M
High Channel									
2258.00	31.7	H	31.6	1.4	33.3	31.7	54.0	-22.3	Avg 1M/3M
2539.00	28.5	V	32.7	1.5	33.3	29.7	54.0	-24.3	Avg 1M/3M
4959.70	34.9	H	34.1	2.2	33.3	38.2	54.0	-15.8	Avg 1M/3M
4960.00	38.8	V	34.1	2.2	33.3	42.1	54.0	-11.9	Avg 1M/3M

- No other measurable harmonics were in a restricted band.

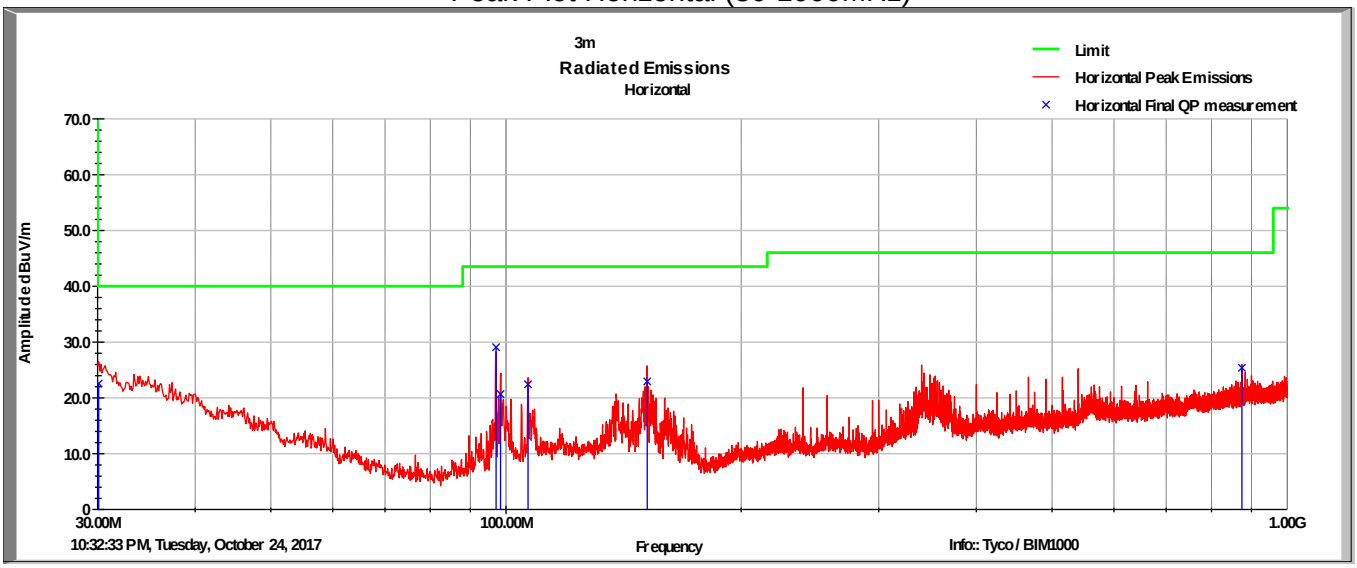
7.7 *Test Data – Peak Plots (3.8dBi Monopole, BIM1000)*

No emissions detected below 30MHz

Low Channel)
Peak Plot Vertical (30-1000MHz)

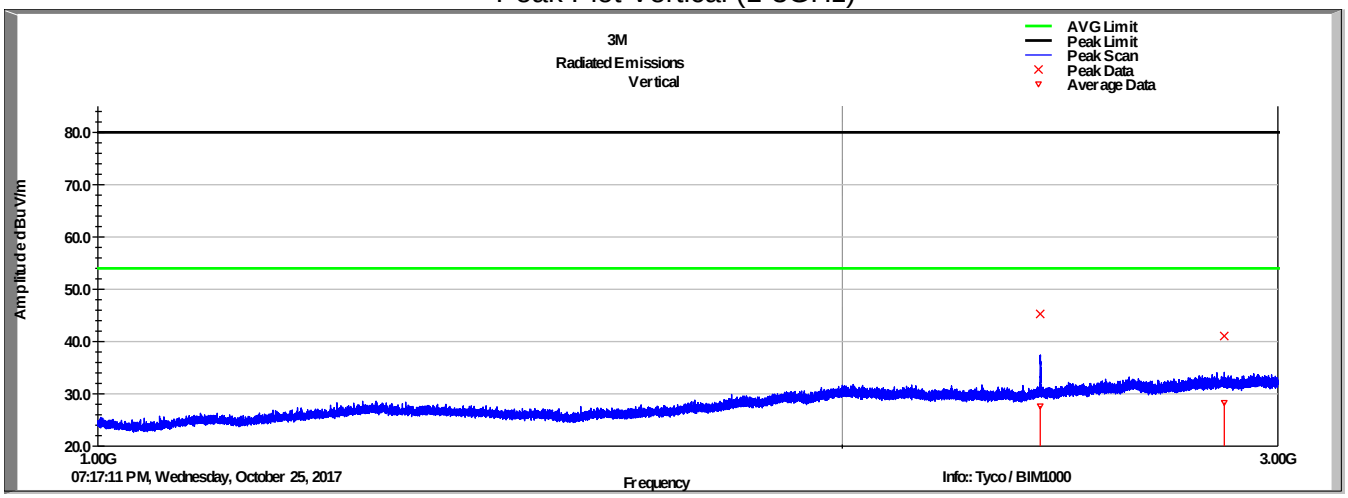


Low Channel (Channel 11, 2405MHz)
Peak Plot Horizontal (30-1000MHz)



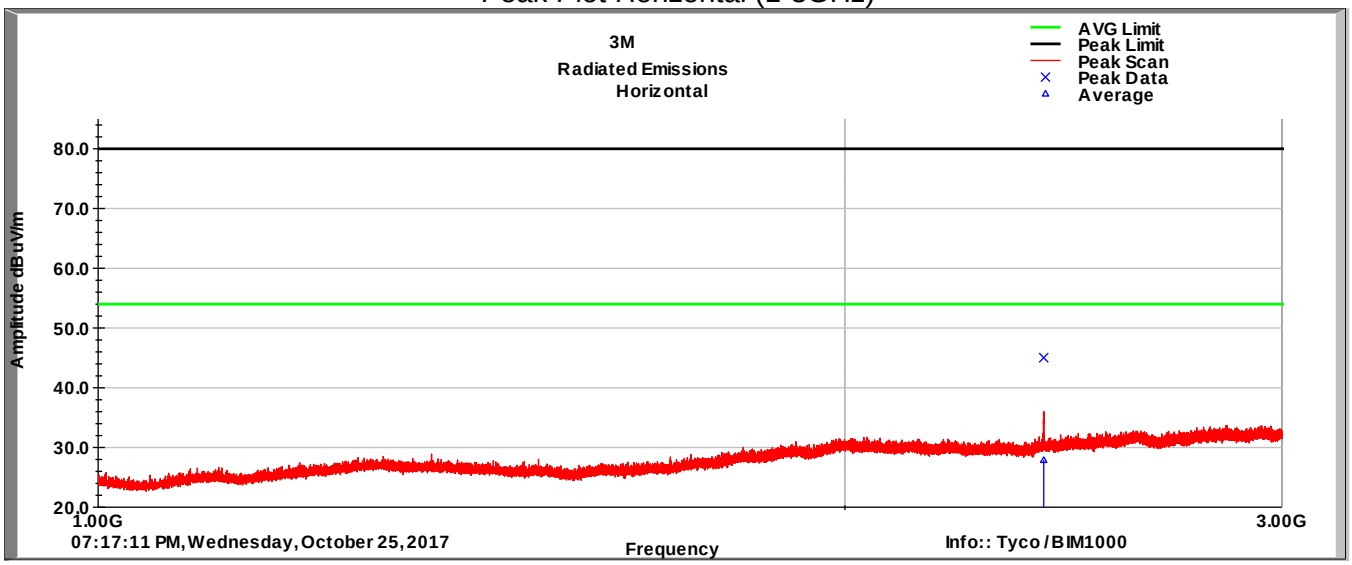
Note: There was no change in the emission profile below 1GHz when switching among Channels 11, 18, and 25.

Low Channel
Peak Plot Vertical (1-3GHz)



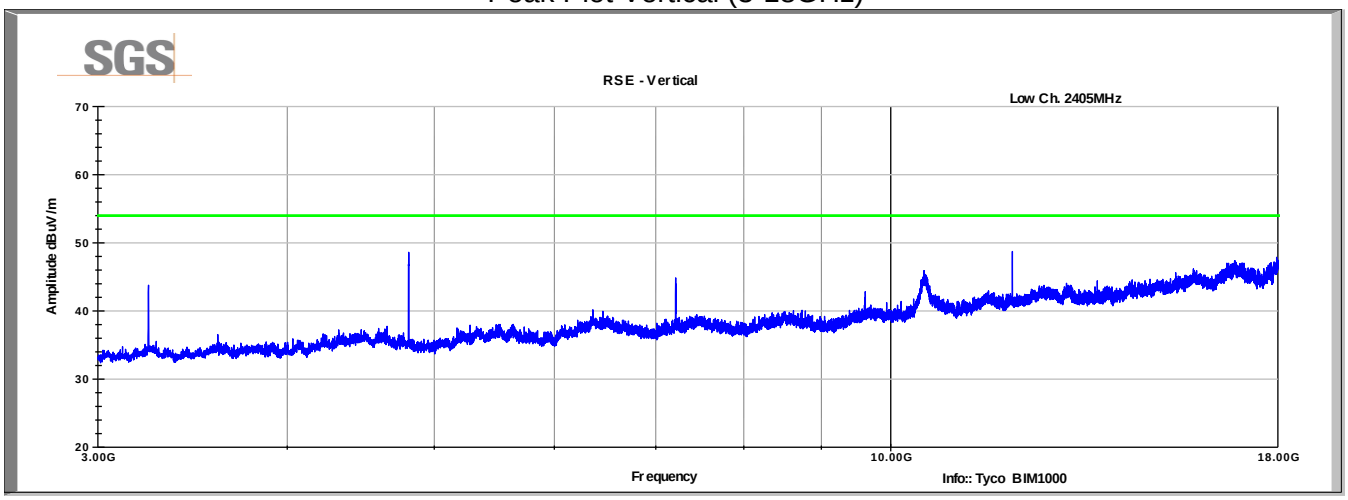
Note: 2.4GHz Band Reject filter in place

Low Channel
Peak Plot Horizontal (1-3GHz)

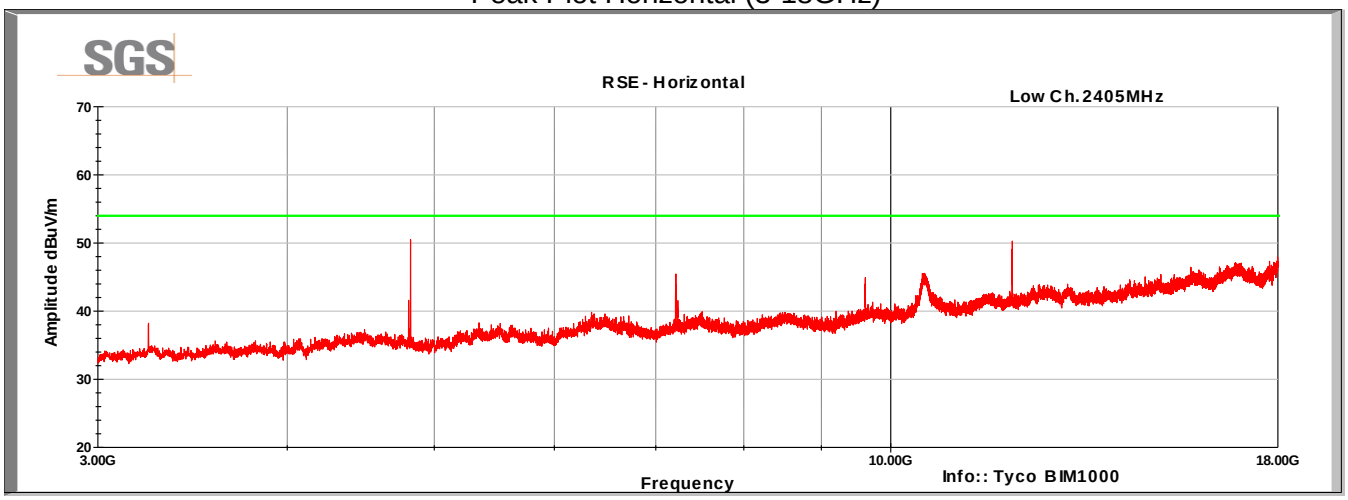


Note: 2.4GHz Band Reject filter in place

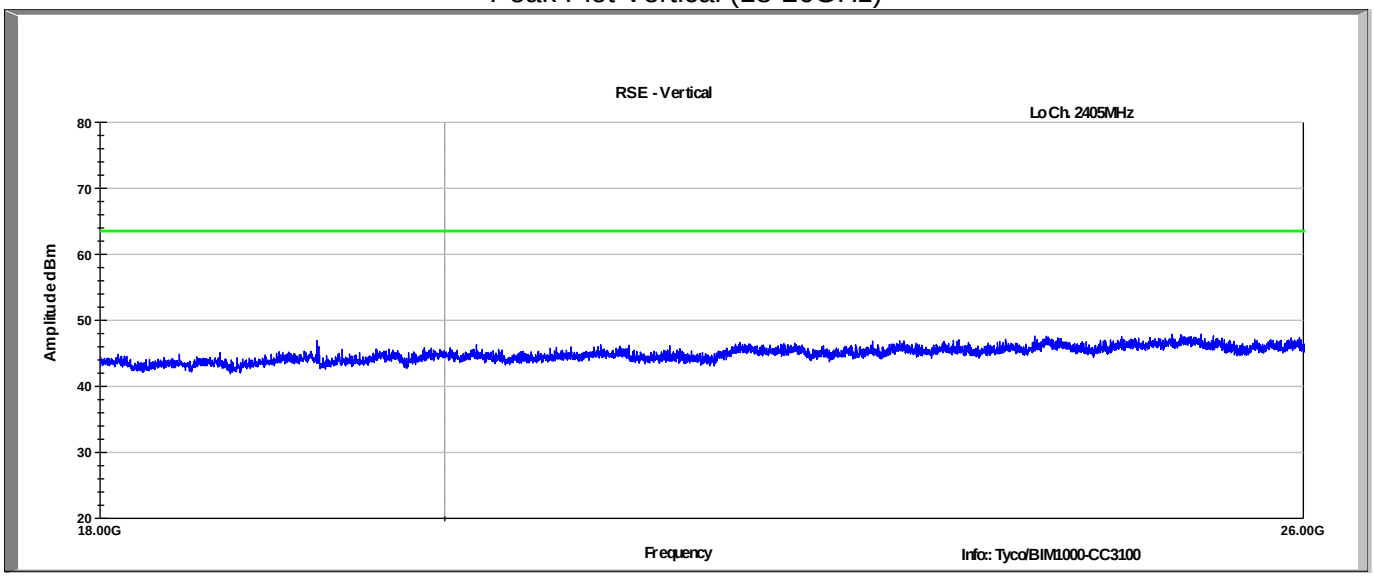
Low Channel (Channel 11, 2405MHz)
Peak Plot Vertical (3-18GHz)



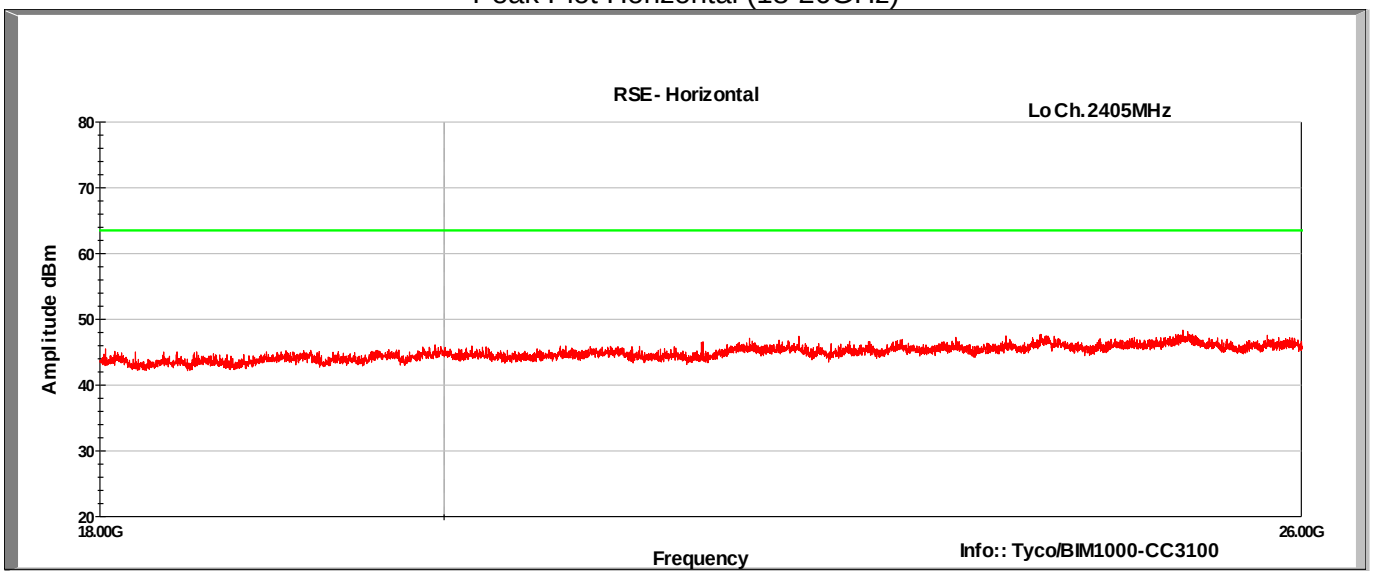
Low Channel (Channel 11, 2405MHz)
Peak Plot Horizontal (3-18GHz)



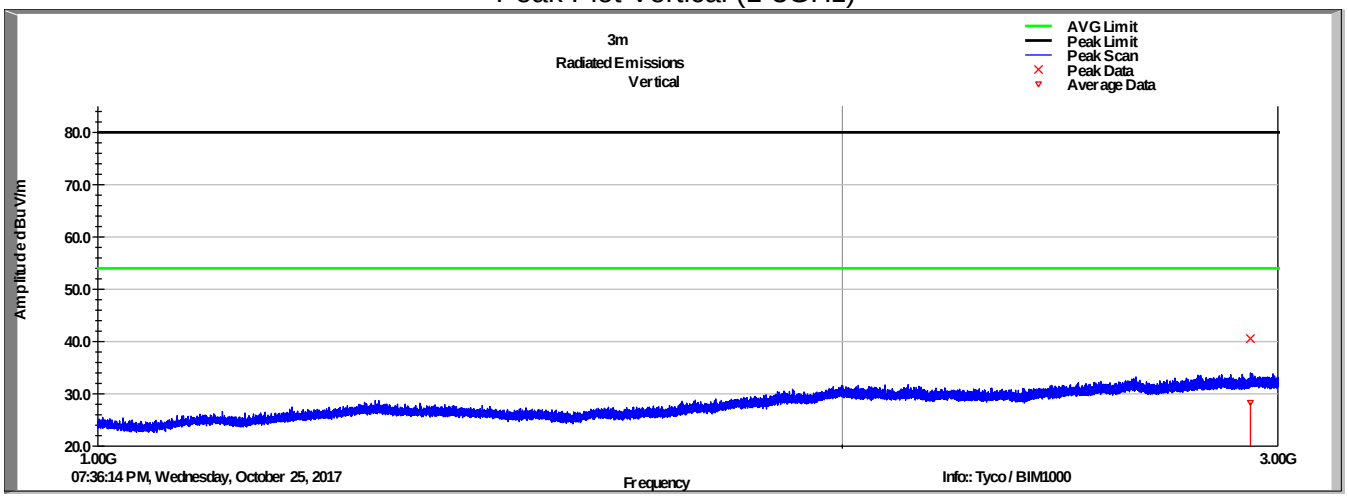
Low Channel
Peak Plot Vertical (18-26GHz)



Low Channel
Peak Plot Horizontal (18-26GHz)

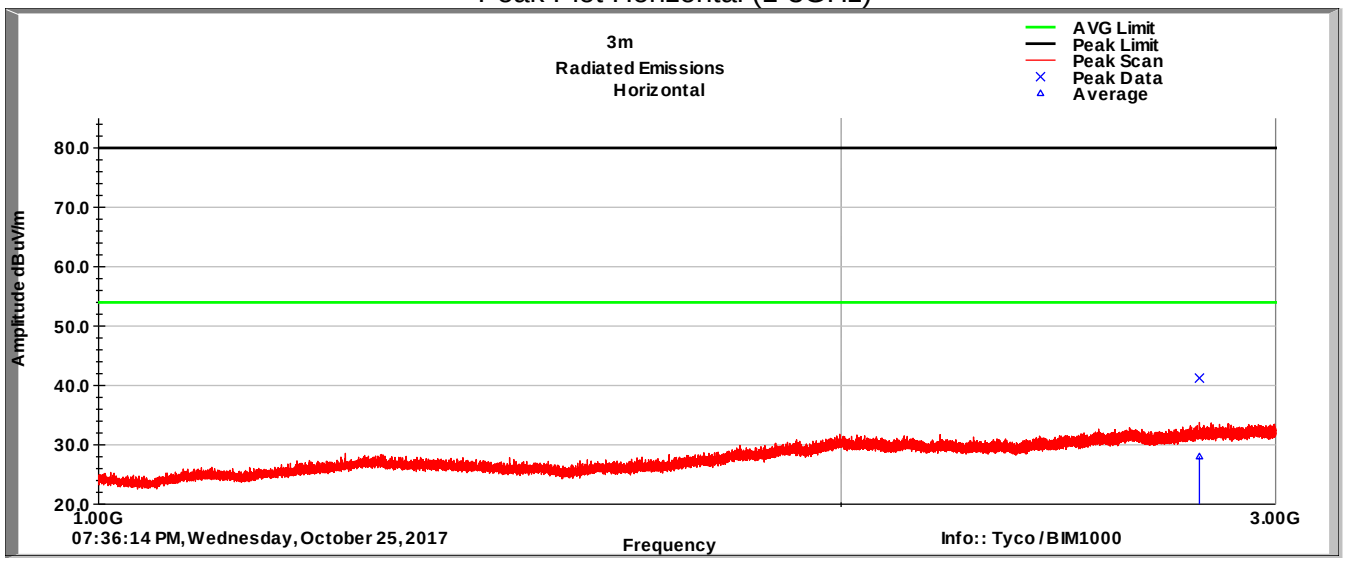


Mid Channel
Peak Plot Vertical (1-3GHz)

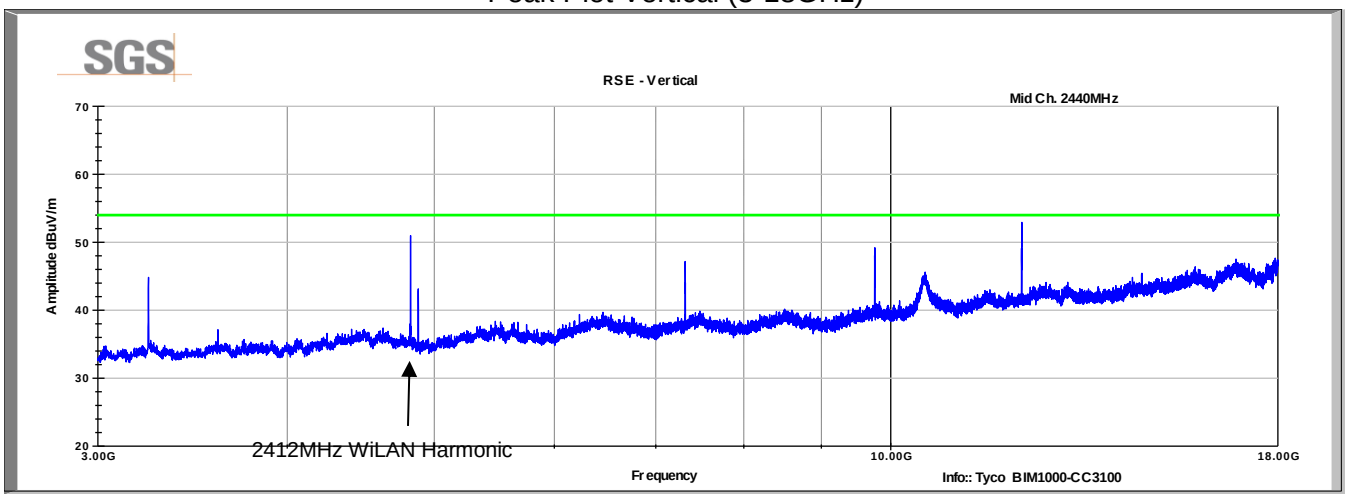


Note: 2.4GHz Band Reject filter in place

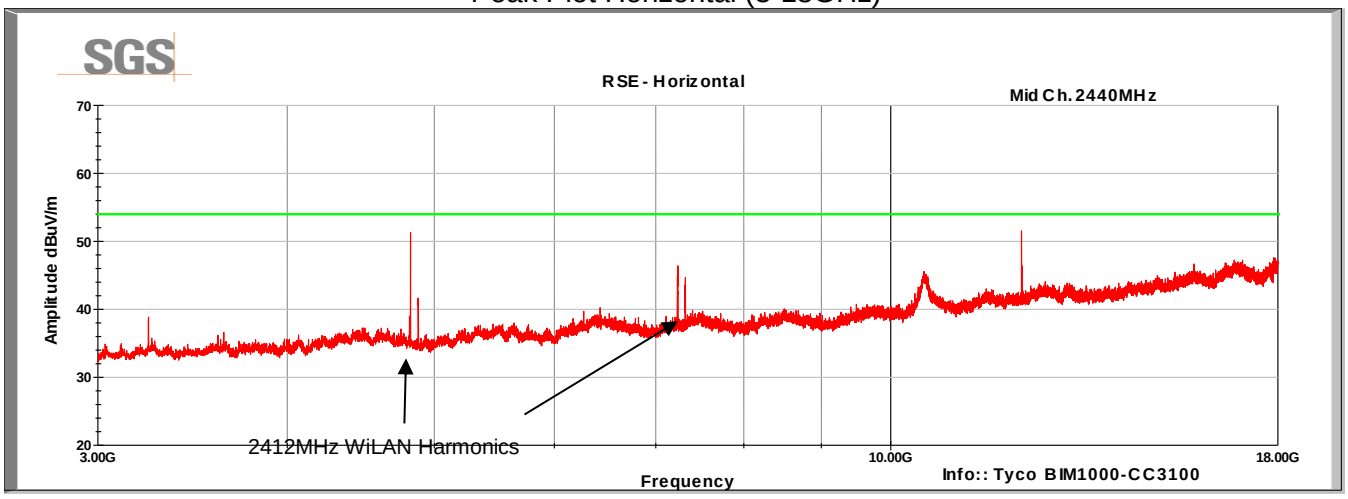
Mid Channel
Peak Plot Horizontal (1-3GHz)



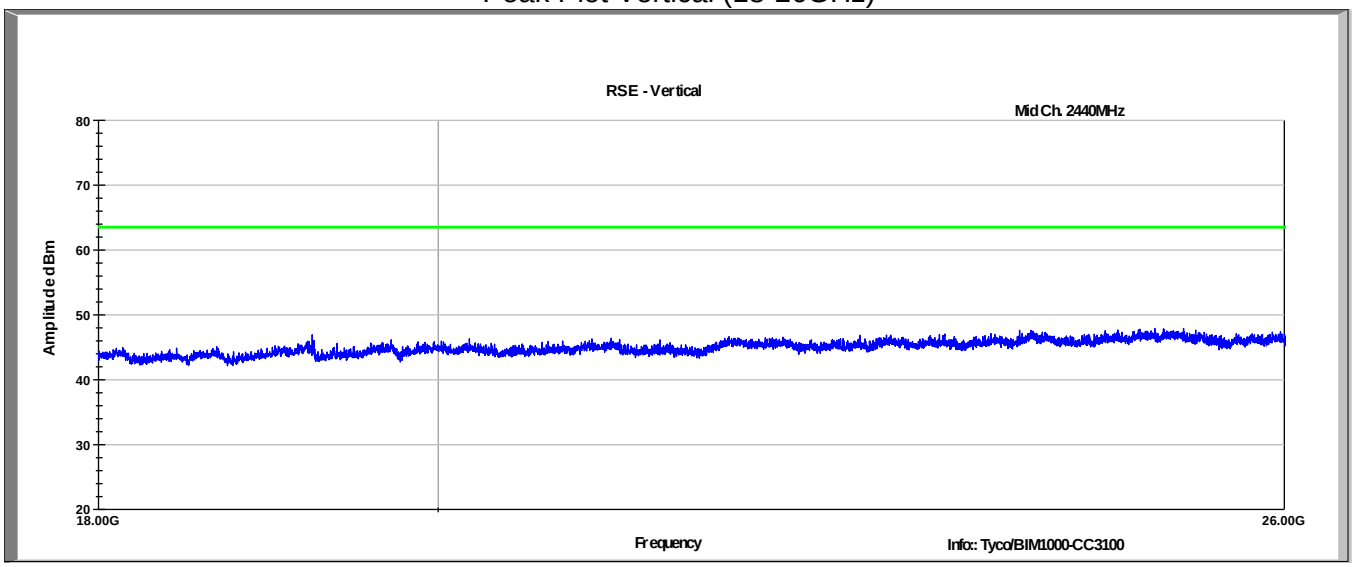
Mid Channel (Channel 18, 2440MHz)
Peak Plot Vertical (3-18GHz)



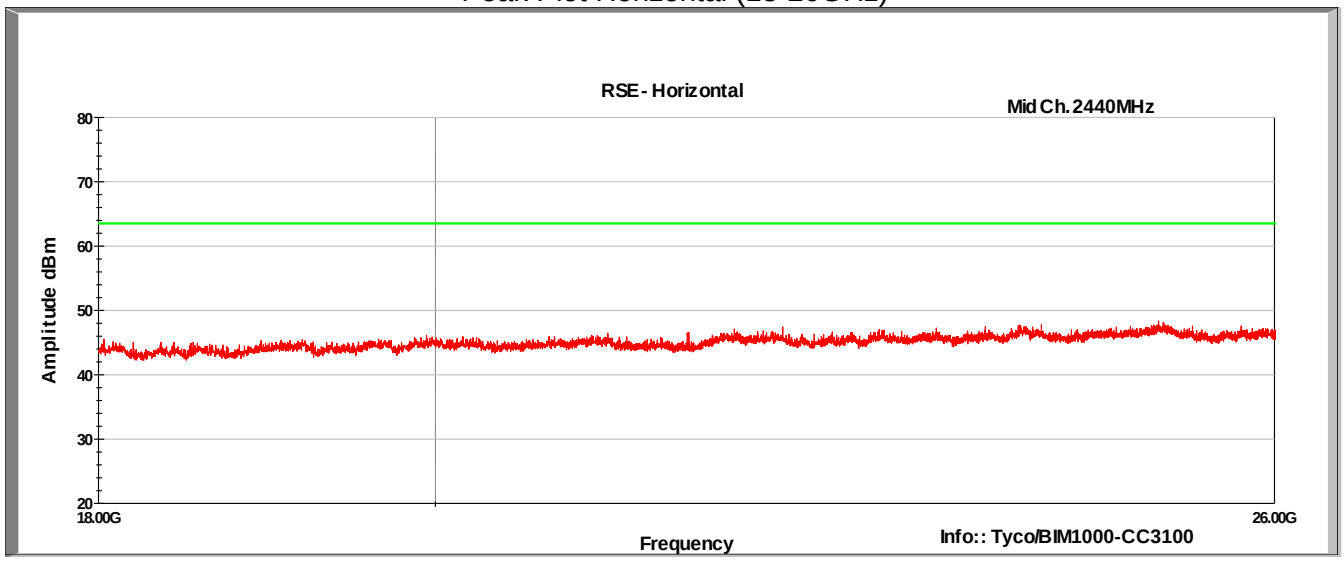
Mid Channel (Channel 18, 2440MHz)
Peak Plot Horizontal (3-18GHz)



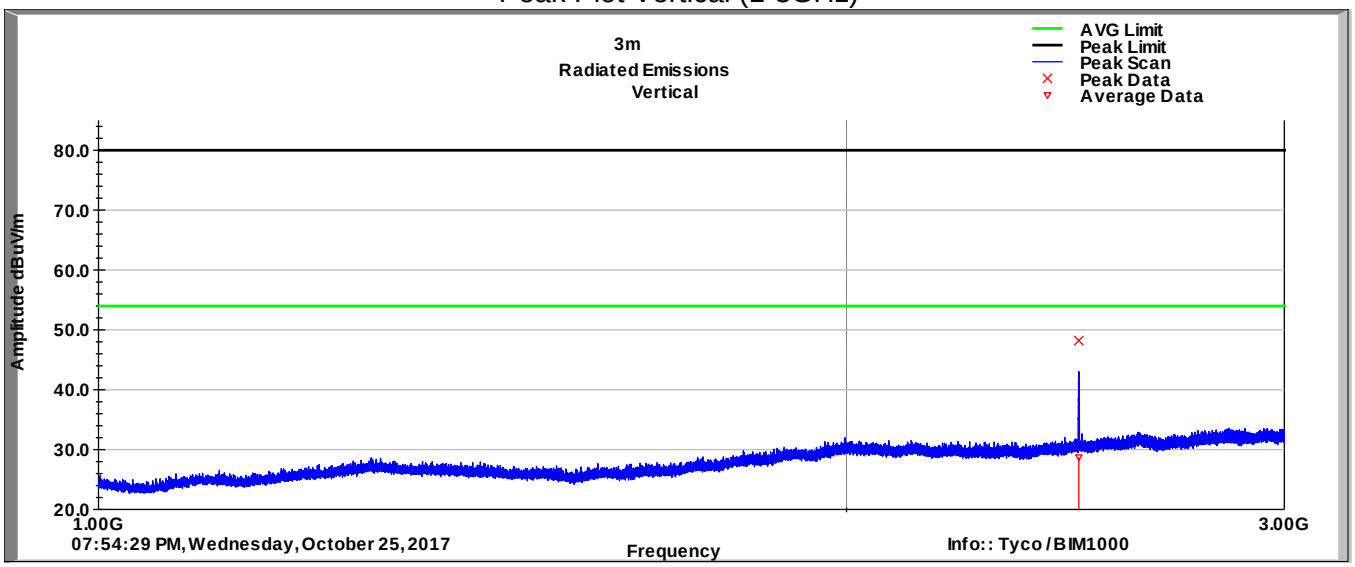
Mid Channel
Peak Plot Vertical (18-26GHz)



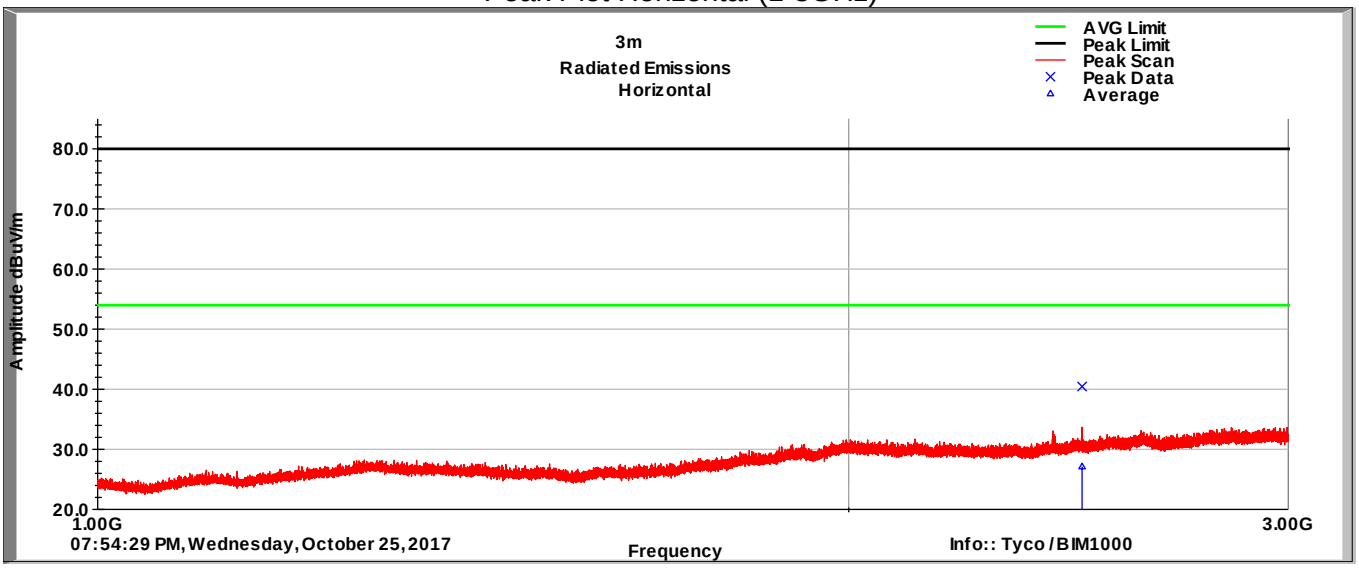
Mid Channel
Peak Plot Horizontal (18-26GHz)



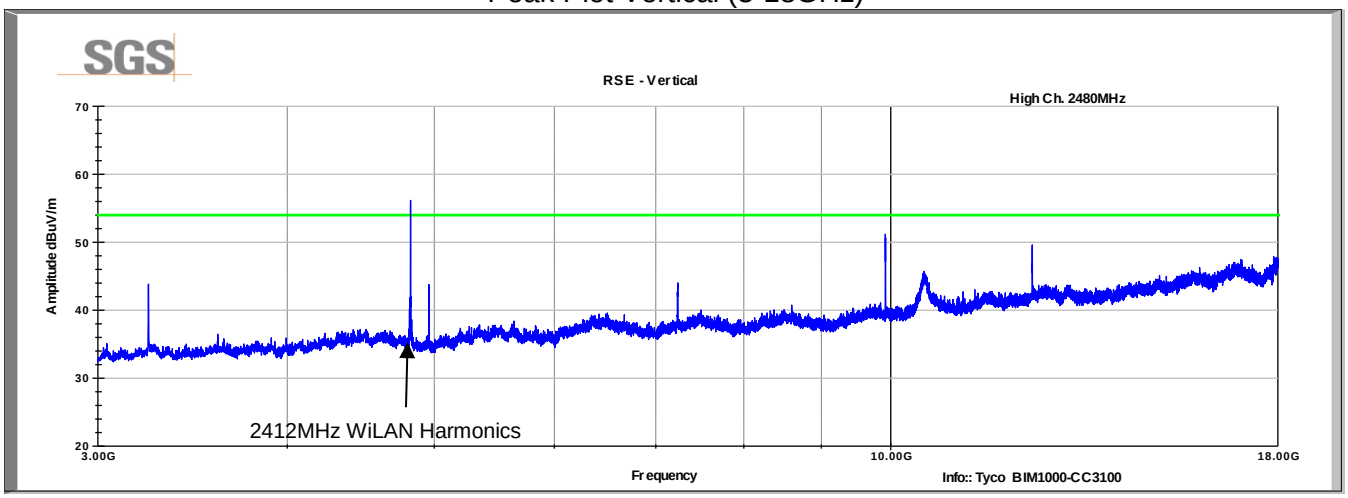
High Channel
Peak Plot Vertical (1-3GHz)



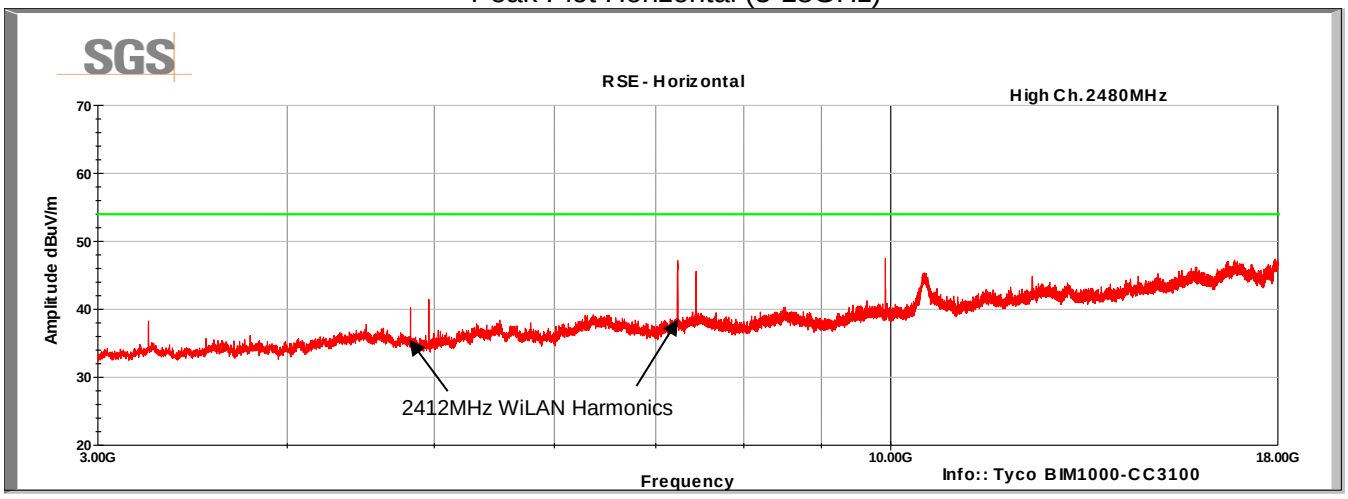
High Channel
Peak Plot Horizontal (1-3GHz)



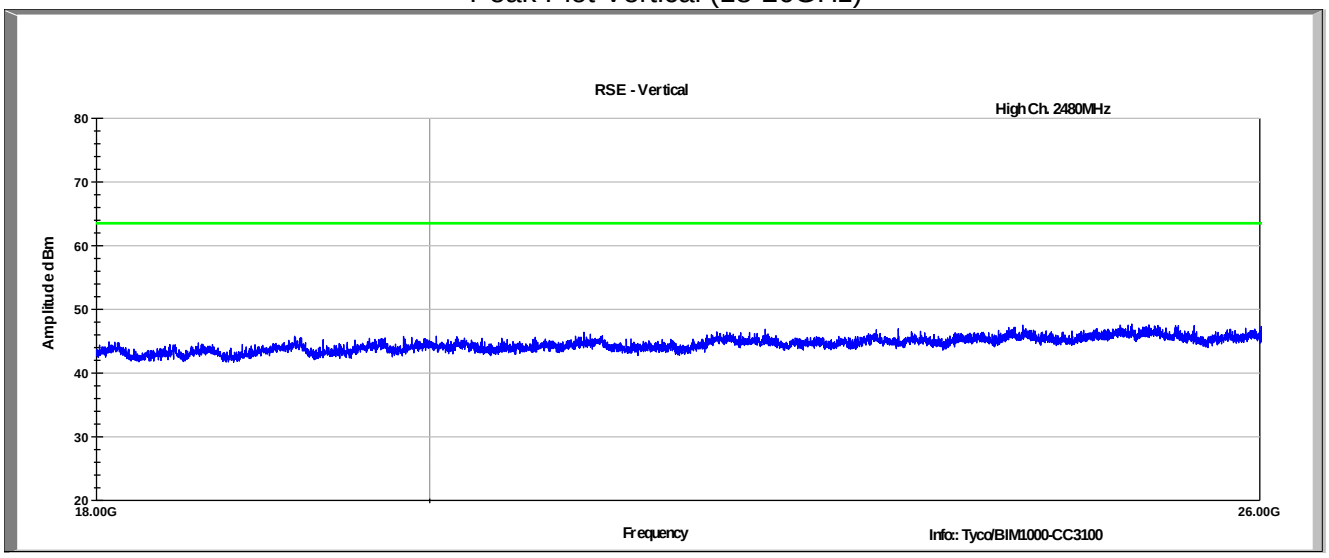
High Channel (Channel 25, 2475MHz)
Peak Plot Vertical (3-18GHz)



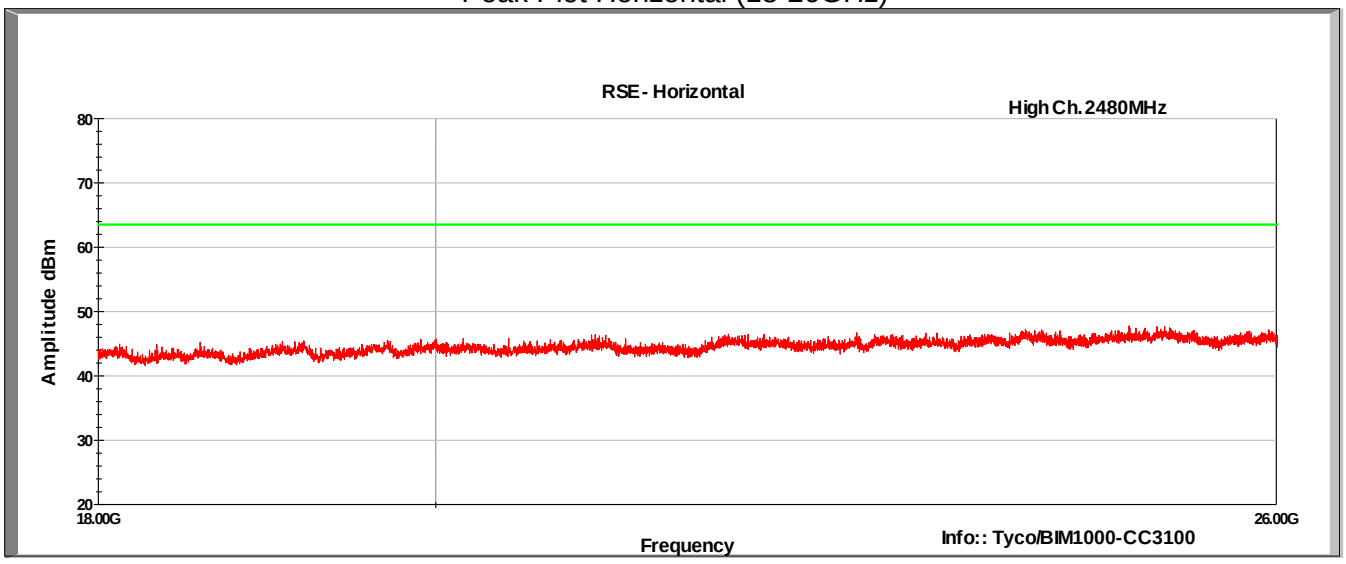
High Channel (Channel 25, 2475MHz)
Peak Plot Horizontal (3-18GHz)



High Channel
Peak Plot Vertical (18-26GHz)



High Channel
Peak Plot Horizontal (18-26GHz)



7.8 *Test Data – Tabular Data (3.8dBi Monopole, BIM1000)*

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QPValue (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.64	33.2	V	325.0	137.0	23.9	0.6	31.7	26.0	40.0	-14.0
36.26	38.6	V	7.0	119.0	20.9	0.7	32.0	28.2	40.0	-11.8
46.01	39.1	V	225.0	120.0	16.1	0.8	32.6	23.4	40.0	-16.6
55.28	47.1	V	109.0	241.0	12.5	0.9	32.9	27.6	40.0	-12.4
97.09	55.3	V	233.0	346.0	10.3	1.2	33.6	33.1	43.5	-10.4
106.63	49.5	V	51.0	157.0	12.1	1.2	33.7	29.1	43.5	-14.5
QPValue = Level + AF + CL - Amp										
Margin = QPValue - Limit										

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QPValue (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.10	29.5	H	156.0	249.0	24.2	0.6	31.7	22.6	40.0	-17.4
97.12	51.2	H	260.0	335.0	10.3	1.2	33.6	29.1	43.5	-14.4
98.39	42.5	H	83.0	363.0	10.6	1.2	33.6	20.7	43.5	-22.9
106.69	42.8	H	280.0	400.0	12.1	1.2	33.7	22.4	43.5	-21.1
151.61	42.7	H	83.0	373.0	12.4	1.5	33.6	22.9	43.5	-20.6
875.09	33.7	H	134.0	178.0	21.4	3.6	33.2	25.4	46.0	-20.6
QPValue = Level + AF + CL - Amp										
Margin = QPValue - Limit										

Note: There was no change in the emission profile below 1GHz when switching among Channels 11, 18, and 25.

Frequency MHz	Raw Meas (dBuV)	Polarity (V/H)	Correction (dB/m)	Corr Value dBuV/m	Limit (dBuV/m)	Margin (dB)	Detector
Channel 11 (2405MHz)							
4810.00	44.7	V	3.9	48.6	54.0	-5.4	Peak
12025.00	38.0	V	10.7	48.7	54.0	-5.3	Peak
4810.00	46.6	H	3.9	50.5	54.0	-3.5	Peak
12025.00	39.5	H	10.7	50.2	54.0	-3.8	Peak
Channel 18 (2440MHz)							
4880.00	39.3	V	3.8	43.1	54.0	-10.9	Peak
7320.00	41.3	V	5.9	47.2	54.0	-6.8	Peak
9760.00	40.9	V	8.3	49.2	NA	NA	Peak
12200.00	42.1	V	10.8	52.9	54.0	-1.1	Peak
4880.00	37.8	V	3.8	41.6	54.0	-12.4	Peak
7320.00	38.7	V	5.9	44.6	54.0	-9.4	Peak
12200.00	39.7	V	10.8	50.5	54.0	-3.5	Peak
Channel 25 (2475MHz)							
4950.00	40.0	V	3.8	43.8	54.0	-10.2	Peak
7425.00	37.9	V	6.1	44.0	54.0	-10.0	Peak
9900.00	42.6	H	8.6	51.2	NA	NA	Peak
12375.00	38.8	H	10.8	49.6	54.0	-4.4	Peak
4950.00	37.6	V	3.8	41.4	54.0	-12.6	Peak
7425.00	39.5	V	6.1	45.6	NA	NA	Peak
9900.00	38.7	H	8.6	47.3	54.0	-6.7	Peak

* These emissions did not fall into restricted bands.

Note: Peak data compared to avaerage limits.

8 Radiated Emissions at Band Edge / Restricted Band

8.1 *Test Result*

Test Description	Test Specification		Test Result
Spurious Emissions	15.205 / 15.209	RSS-GEN S8.9 / 8.10	Compliant

8.2 *Test Method*

Peak and average field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz.Measurements were made using the conducted methods defined in FCC KDB publication 558074 D01 DTS Meas Guidance v04.

8.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions
Temperature: 23.2 °C
Relative Humidity: 51.5 %

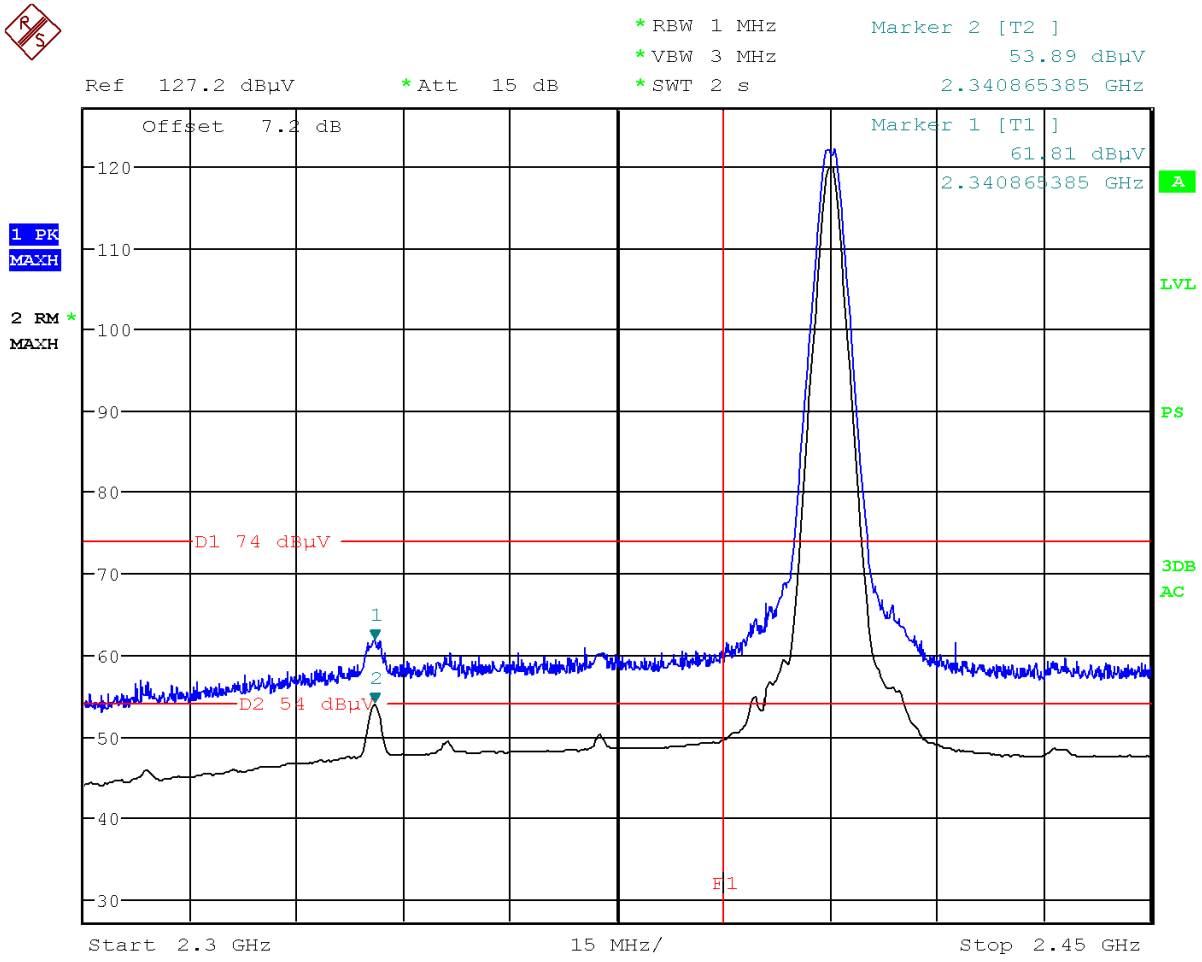
8.4 *Test Equipment*

Test End Date: 26-Oct-2017 Tester: SKM

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Signal Analyzer	FSV-30	Rohde & Schwarz	1608522I	28-Sep-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2-year calibration cycle.

Test Data

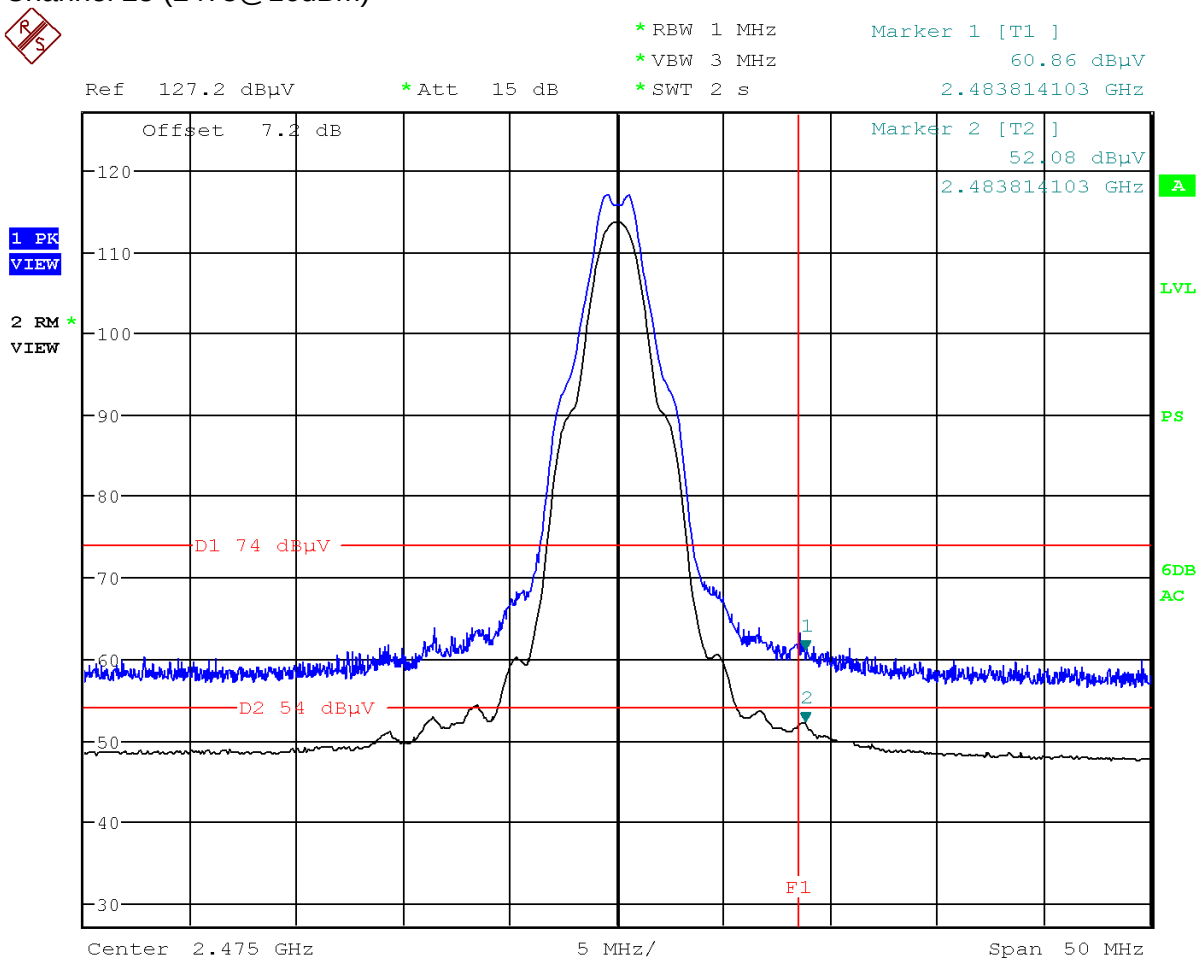


Date: 31.OCT.2017 13:30:47

Channel 11

Channel	Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measuremnt Detector
11	2340.8	61.81	74	-12.19	Peak
11	2340.8	53.89	54	-0.11	RMS

Channel 25 (2475@16dBm)



Date: 31.OCT.2017 13:45:51

Channel	Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measuremnt Detector
25	2483.8	60.86	74	-13.14	Peak
25	2483.8	52.08	54	-1.92	RMS

9 Conducted Emissions

Not applicable: EUT is Power over Ethernet

10 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	22 February, 2018