

TEST REPORT

Report Number: 104293906MPK-020

Project Number: G104293906

October 05, 2020

**Testing performed on
NRU 1C™
Model Tested: NRU 1C™**

to

**FCC Part 15 Subpart C (15.247)
Industry Canada RSS-247 Issue 2**

For

Geophysical Technology, Inc.

Test Performed by:

Intertek
1365 Adams Court
Menlo Park, CA 94025 USA

Test Authorized by:

Geophysical Technology, Inc.
800 Mulberry Ln
Bellaire, TX 77401 USA

Prepared by:



Minh Ly

Date: October 05, 2020

Reviewed by:




Krishna K Vemuri

Date: October 05, 2020


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Report No. 104293906MPK-020	
Equipment Under Test:	NRU 1C™
Trade Name:	Geophysical Technology, Inc.
Model Tested Number:	NRU 1C™
Applicant:	Geophysical Technology, Inc.
Contact:	Ryan Khan
Address:	Geophysical Technology, Inc. 800 Mulberry Ln Bellaire, TX 77401
Country:	USA
Tel. Number:	(713) 893-5655
Email:	Ryan.khan@geophysicaltechnology.com
Applicable Regulation:	FCC Part 15 Subpart C (15.247) Industry Canada RSS-247 Issue 2
Date of Test:	May 18, 2020 – June 17, 2020 & October 02, 2020

We attest to the accuracy of this report:



Mih Ly
Project Engineer



Krishna K Vemuri
EMC Manager

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1.0 Summary of Tests

Test	Reference FCC	Reference Industry Canada	Result
RF Output Power	15.247(b)(3)	RSS-247, 5.4.d)	Complies
6 dB Bandwidth	15.247(a)(2)	RSS-247, 5.2.a)	Complies
Power Density	15.247(e)	RSS-247, 5.2.b)	Complies
Out of Band Antenna Conducted Emission	15.247(d)	RSS-247, 5.5	Complies
Transmitter Radiated Emissions	15.247(d), 15.209, 15.205	RSS-247, 5.5	Complies
AC Line Conducted Emission	15.207	RSS-GEN	Complies ¹
Antenna Requirement	15.203	RSS-GEN	Complies (Internal Antenna)

¹ The EUT is battery operated and uses charging batteries. Test was performed with representative charger.

EUT receive date: May 18, 2020

EUT receive condition: The pre-production version of the EUT was received in good condition with no apparent damage. As declared by the Applicant, it is identical to the production units.

Test start date: May 18, 2020

Test completion date: October 02, 2020

The test results in this report pertain only to the item tested.

2.0 General Information

2.1 Product Description

The NRU 1C™ is a self-contained nodal seismic recording unit with 1 channel of 24-bit digitization, internal and/or external battery, internal or external geophone, integrated high sensitivity GNSS/GPS, BLE connectivity for status/health, and high-speed USB data download. The unit is enclosed within a robust two-part, water-tight plastic assembly, held together with aluminum locking rings, with stainless steel MIM protrusions for charging the battery.

The equipment under test is a remote control containing a Bluetooth Low Energy transmitter operating at 2.4 GHz.

For more information, refer to the following product specification, declared by the manufacturer.

Information about the 2.4 GHz radio is presented below:

Applicant	Geophysical Technology, Inc.
Model Tested No.	NRU 1C™
Type of transmission	Digital Transmission System (DTS)
Rated RF Output	-0.29 dBm
Antenna(s) & Gain	Internal Antenna, Peak Gain: 2.1 dBi*
Frequency Range	2402 – 2480 MHz
Type of modulation/data rate	GFSK 1MB/s
Number of Channel(s)	40, Channel 0-39
Applicant Name & Address	Geophysical Technology, Inc. 800 Mulberry Ln Bellaire, TX 77401 USA

* Antenna type(s) and gain(s) were provided by Geophysical Technology, Inc. Intertek takes no responsibility for the accuracy of the information

2.2 Related Submittal(s) Grants

None.

2.3 Test Facility

The test site used to collect the radiated data is site 1 (10-m semi-anechoic chamber). This test facility and site measurement data have been fully placed on file with the FCC, IC and A2LA accredited.

2.4 Test Methodology

Antenna conducted measurements were performed according to the FCC documents “Guidance for Performing Compliance Measurement on Digital Transmission Systems (DTS) Operating under §15.247” (KDB 558074 D01 DTS Meas Guidance v05r02), and RSS-247 Issue 2, RSS-GEN Issue 5.

Radiated emissions and AC mains conducted emissions measurements were performed according to the procedures in ANSI C63.10: 2013. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Data Sheet" of this report.

2.5 Measurement Uncertainty

Compliance with the limits was based on the results of the measurements and doesn't take into account the measurement uncertainty.

Estimated Measurement Uncertainty

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 1 GHz	1 GHz – 2.5 GHz	> 2.5 GHz
RF Power and Power Density – antenna conducted	-	0.7 dB	-
Unwanted emissions - antenna conducted	1.1 dB	1.3 dB	1.9 dB
Bandwidth – antenna conducted	-	30 Hz	-

Measurement	Expanded Uncertainty (k=2)			
	0.15 MHz – 30MHz	30 – 200 MHz	200 MHz – 1 GHz	1 GHz – 18 GHz
Radiated emissions	-	4.7	4.6	5.1 dB
AC mains conducted emissions	2.1 dB	-	-	-

3.0 System Test Configuration

3.1 Support Equipment

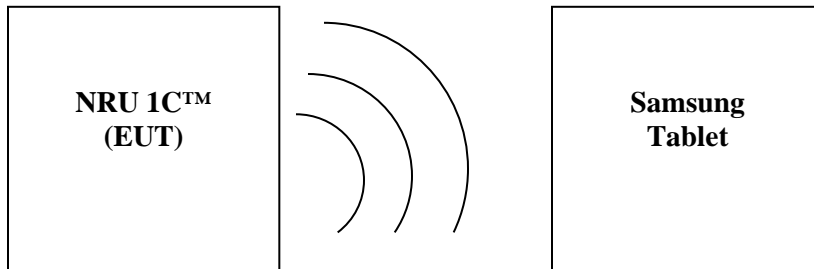
Support Equipment		
Description	Manufacturer	Model Tested Number
Tablet	Samsung	SM-T713
Charger	Geophysical Technology, Inc.	TL000007

3.2 Block Diagram of Test Setup

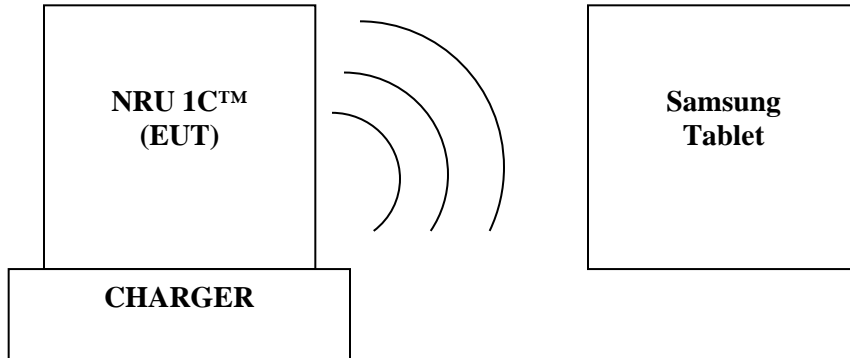
Equipment Under Test			
Description	Manufacturer	Model	Serial Number
Radiated Sample	Geophysical Technology, Inc.	NRU 1C™	210007330
Conducted Sample	Geophysical Technology, Inc.	NRU 1C™	210006843

NORMAL MODE

Antenna was removed from EUT and fitted with an RF port to perform conducted RF Testing



CHARGING MODE



S = Shielded U = Unshielded	F = With Ferrite m = Length in Meters
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3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT was configured to continuously transmit. The highest clock frequency used in the EUT is less than 2.5 GHz.

EUT was tested in charger mode to ensure compliance for Transmitter Radiated Emission and AC Line conducted emission only.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was provided by Geophysical Technology, Inc.

3.5 Mode of Operation during Test

Mode of operation during the tests was setup using a tablet which allows controlling the radio by test software. During the transmitter tests, the transmitter was setup to transmit maximum communication and RF power levels.

EUT was placed into transmit mode at the lowest (2402MHz) middle (2440MHz), and highest (2480MHz) channels.

3.6 Modifications Required for Compliance

No modifications were made by the manufacturer or Intertek to the EUT in order to bring the EUT into compliance.

3.7 Additions, Deviations and Exclusions from Standards

No additions, deviations or exclusions from the standard were made.

4.0 Measurement Results

4.1 6-dB Bandwidth and 99% Occupied Bandwidth
FCC Rule: 15.247(a)(2); RSS-247, 5.2.a) and RSS-GEN;

4.1.1 Requirement

The minimum 6-dB bandwidth shall be at least 500 kHz

4.1.2 Procedure

A spectrum analyzer was connected to the antenna port of the transmitter.

For FCC 6dB Channel Bandwidth the Procedure described in the FCC Publication KDB 558074 D01 Meas Guidance v05r02 was used to determine the DTS occupied bandwidth. Section 11.8.1 Option 1 of ANSI 63.10 was used.

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

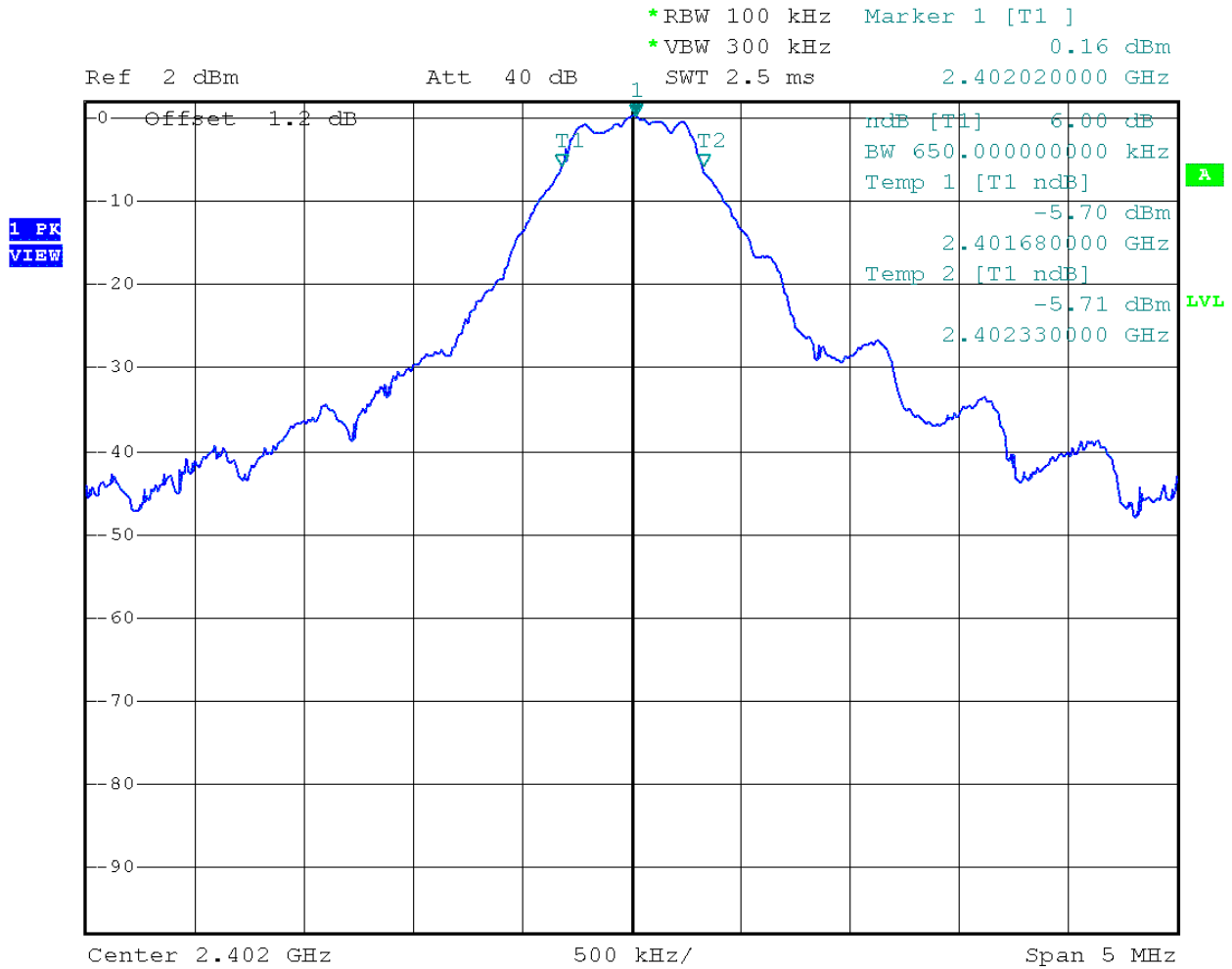
For 99% power bandwidth measurement, the bandwidth was determined by using the built-in 99% occupied bandwidth function of the spectrum analyzer. The resolution bandwidth is set to 1% of the selected span as is without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth.

4.1.3 Test Result

Frequency (MHz)	6-dB bandwidth FCC 15.247 & RSS-GEN	Occupied bandwidth, RSS-GEN	Plot
MHz	MHz	MHz	
2402	0.650	--	1.1
	--	1.040	1.4
2440	0.650	--	1.2
	--	1.010	1.5
2480	0.650	--	1.3
	--	1.010	1.6

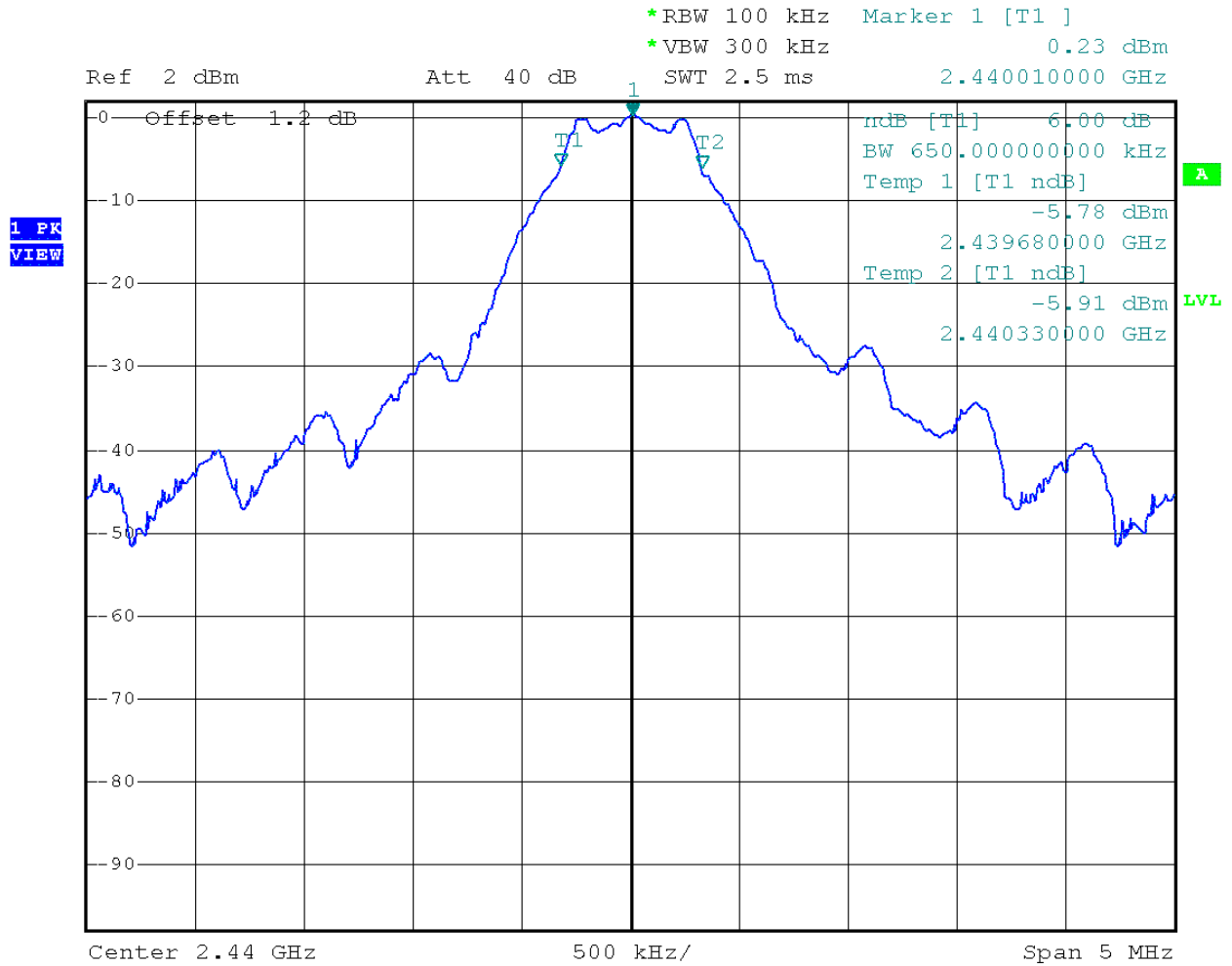
Tested By	Test Date
Minh Ly	May 07, 2020

Plot 1.1



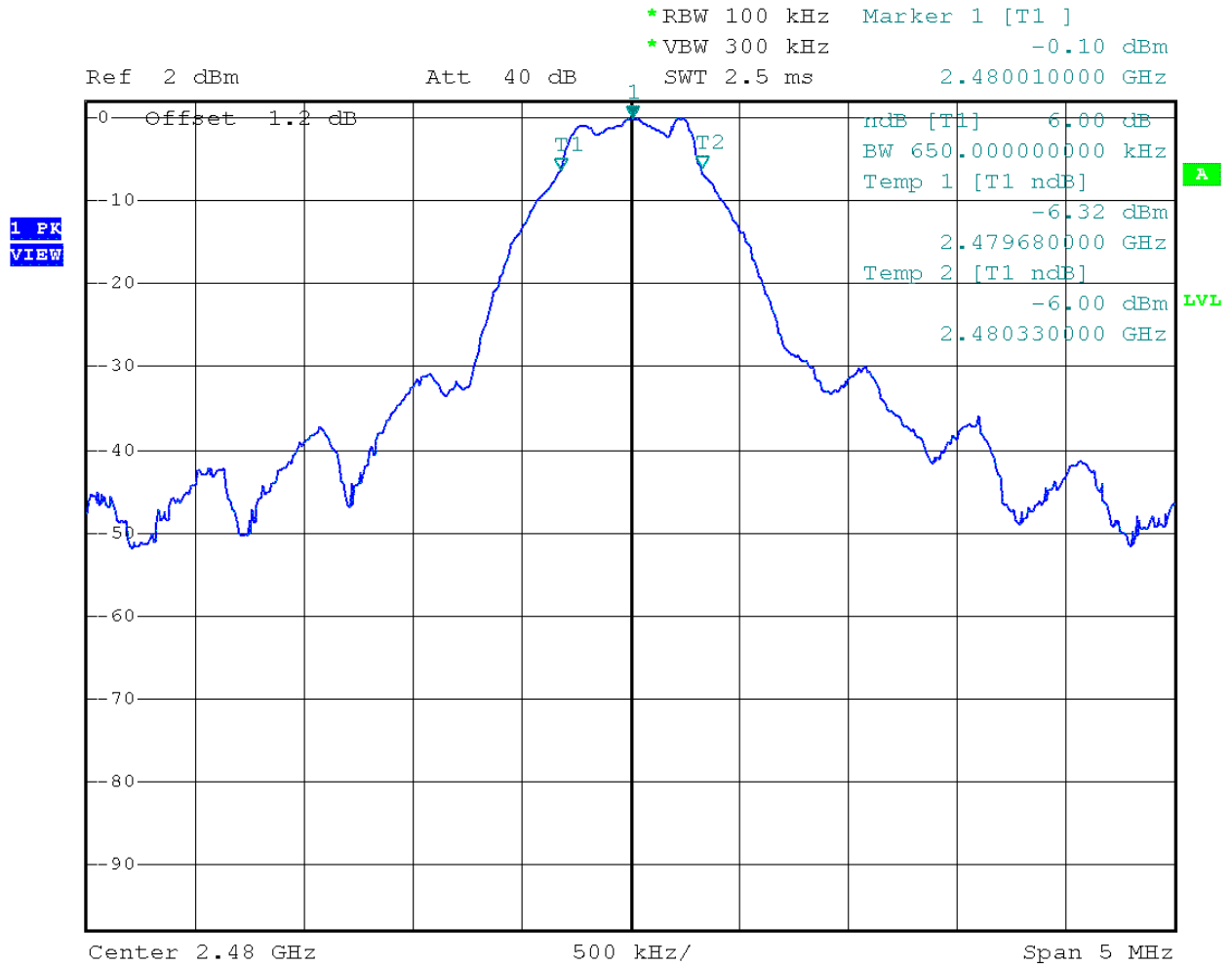
Date: 7.MAY.2020 18:13:53

Plot 1.2



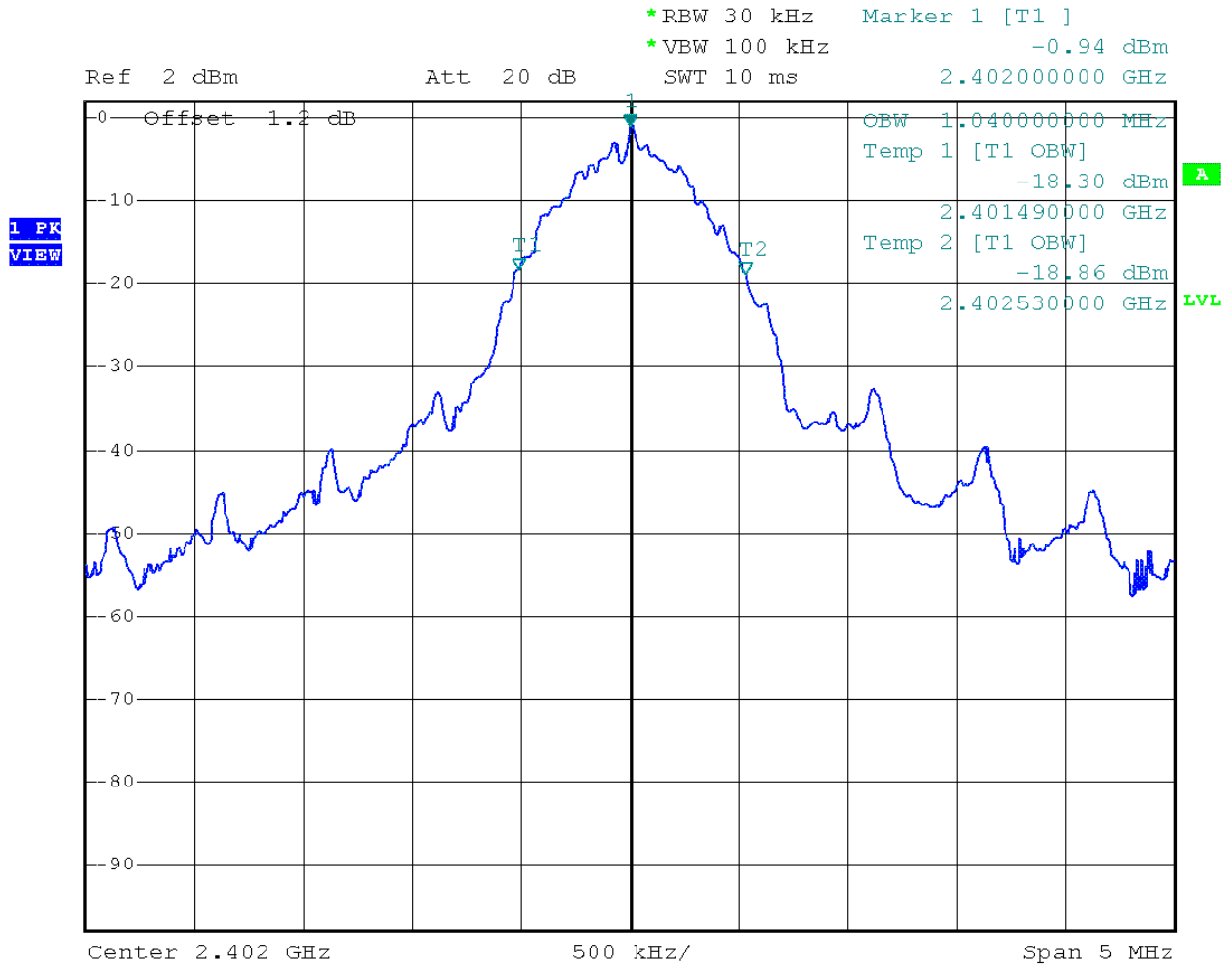
Date: 7.MAY.2020 18:54:56

Plot 1.3



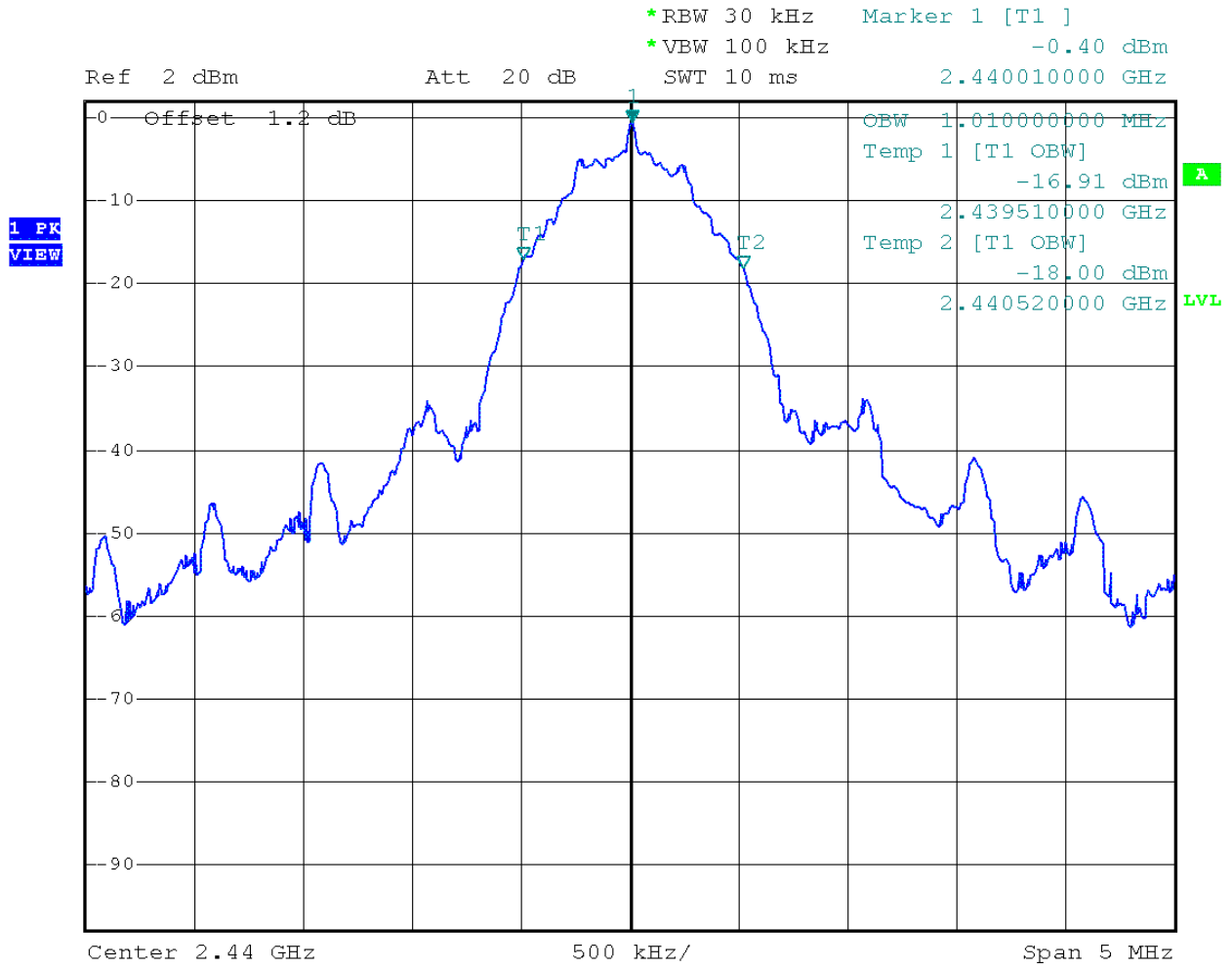
Date: 7.MAY.2020 19:14:43

Plot 1.4



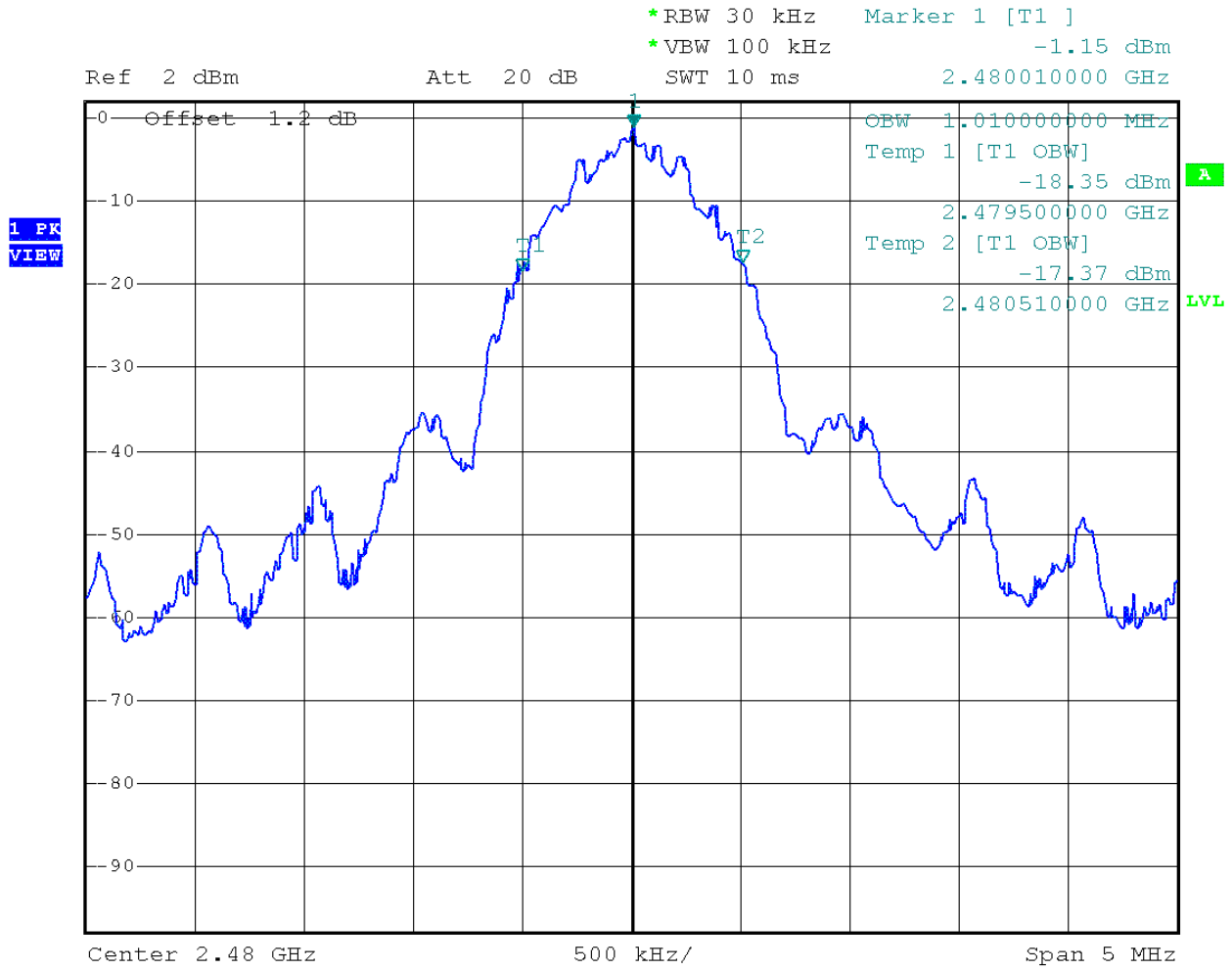
Date: 7.MAY.2020 18:15:58

Plot 1.5



Date: 7.MAY.2020 18:55:45

Plot 1.6



Date: 7.MAY.2020 19:15:40

4.2 Maximum Peak Conducted Output Power at Antenna Terminals
FCC Rule: 15.247(b)(3); RSS-247, 5.4.d);

4.2.1 Requirement

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt or 30 dBm. For antennas with gains greater than 6 dBi, transmitter output level must be decreased appropriately, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2.2 Procedure

The procedure described in FCC Publication KDB 558074 D01 Meas Guidance v05r02 was used. Specifically, section 11.9.1.1 $RBW \geq DTS$ bandwidth in ANSI 63.10.

1. Set the $RBW \geq DTS$ Bandwidth
2. Set the $VBW \geq 3 \times RBW$
3. Set the span $\geq 3 \times RBW$
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max Hold
7. Allow trace to fully stabilize
8. Use peak marker function to determine the peak amplitude level.

A spectrum analyzer was connected to the antenna port of the transmitter.

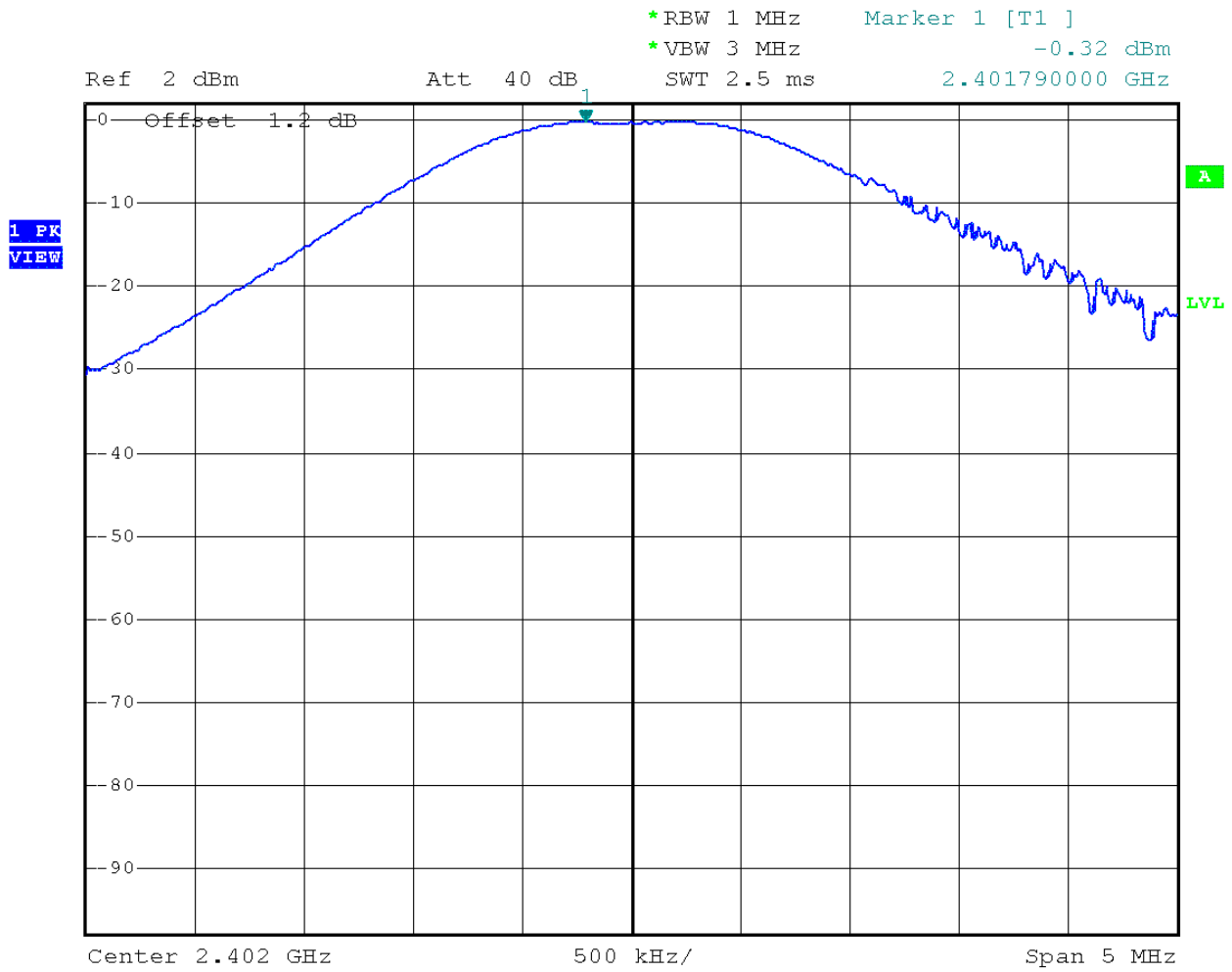
4.2.3 Test Result

Refer to the following plots 2.1 – 2.3 for the test details.

Frequency	Conducted Power (peak)		Plot
	MHz	dBm	
2402	-0.32	0.93	2.1
2440	-0.29	0.94	2.2
2480	-0.56	0.88	2.3

Tested By	Test Date
Minh Ly	May 07, 2020

Plot 2. 1



Date: 7.MAY.2020 18:16:52

4.3 Maximum Power Spectral Density
FCC: 15.247 (e); RSS-247, 5.2.b);

4.3.1 Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna should not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2 Procedure

A spectrum analyzer was connected to the antenna port of the transmitter.

The procedure described in FCC Publication KDB 558074 D01 Meas Guidance v05r02, specifically section 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the *DTS bandwidth*.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

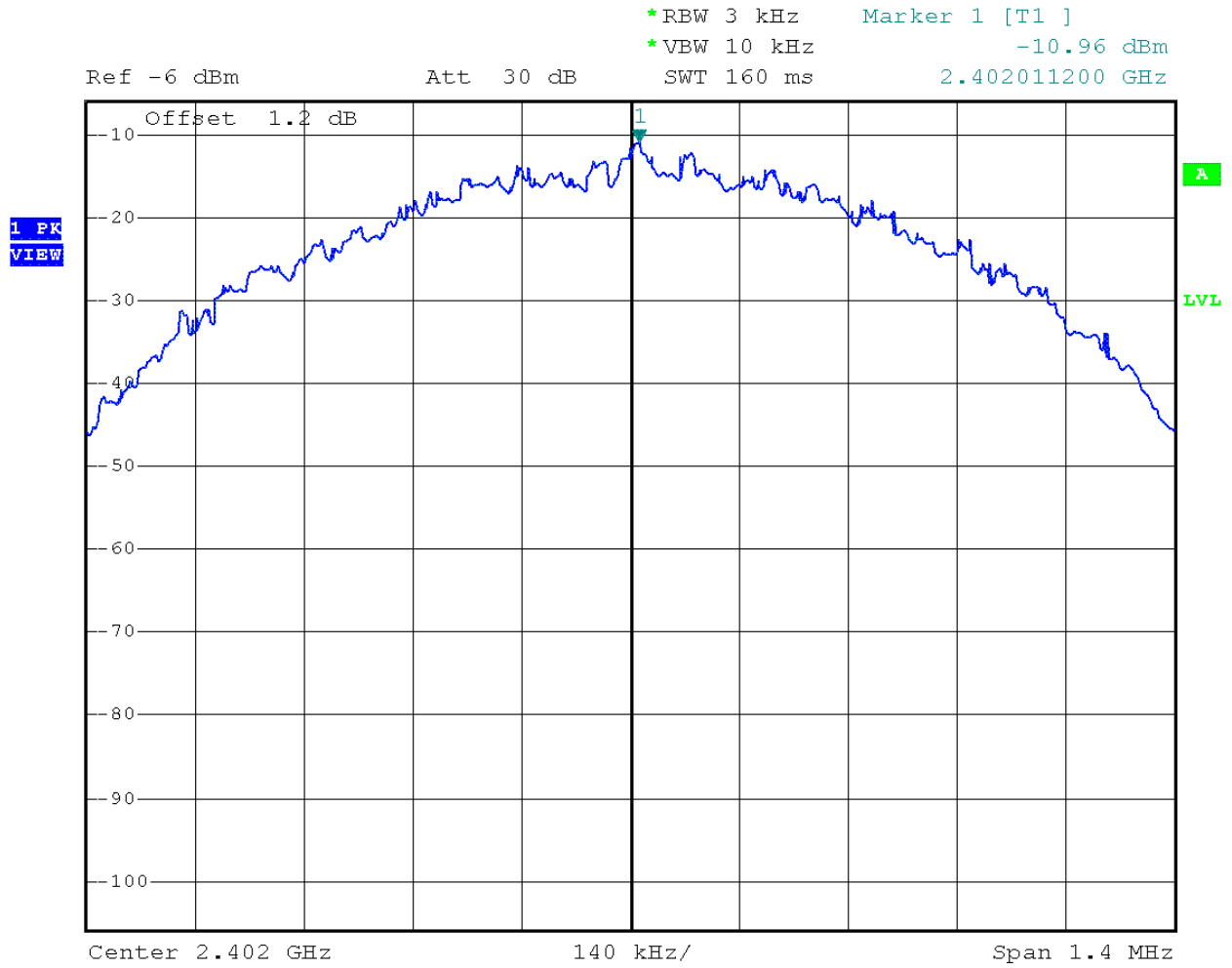
4.3.3 Test Result

Refer to the following plots for the test result

Frequency, MHz	Maximum Power Spectral Density dBm	Maximum Power Spectral Density Limit dBm	Margin dB	Plot
2402	-10.96	8.00	-18.96	3.1
2440	-11.76	8.00	-19.76	3.2
2480	-11.29	8.00	-19.29	3.3

Tested By	Test Date
Minh Ly	May 07, 2020

Plot 3.1



Date: 7.MAY.2020 18:19:23

4.4 Out of Band Antenna Conducted Emission
FCC: 15.247(d); RSS-247, 5.5;

4.4.1 Requirement

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be below the maximum in-band 100 kHz emissions by at least 20 dB (if peak power of in-band emission is measured) or 30 dB (if average power of in-band emission is measured).

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)

4.4.2 Procedure

The procedure described in FCC Publication KDB 558074 D01 Meas Guidance v05r02, specifically section 11.11 DTS Emissions in non-restricted frequency bands of ANSI 63.10.

A spectrum analyzer was connected to the antenna port of the transmitter.

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq 3 \times$ RBW.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

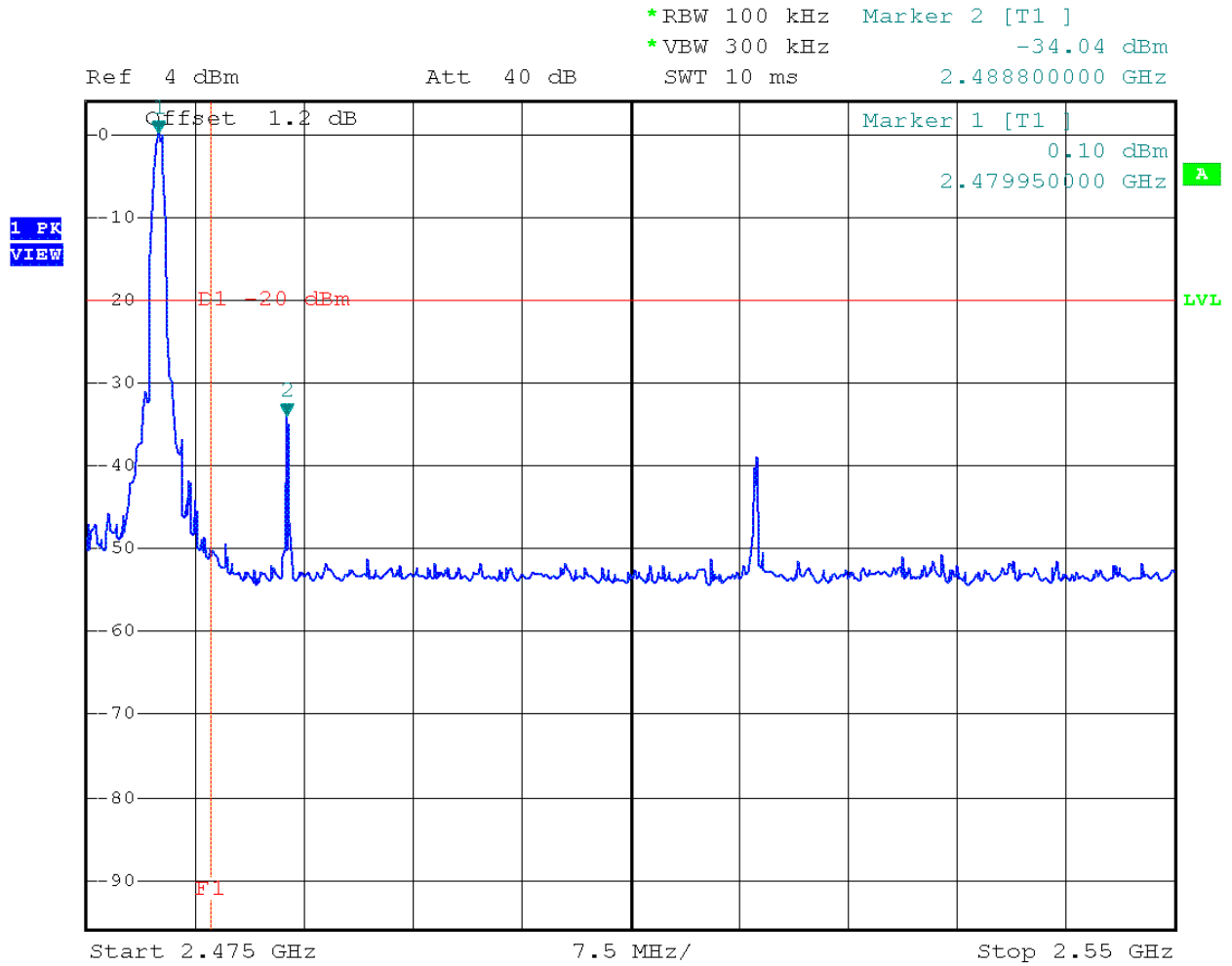
The unwanted emissions were measured from 30 MHz to 25 GHz. Plots below are corrected for cable loss and then compared to the limits.

4.4.3 Test Result

Refer to the following plots 4.1 – 4.5 for unwanted conducted emissions. The plot shows -20dB attenuation limit line.

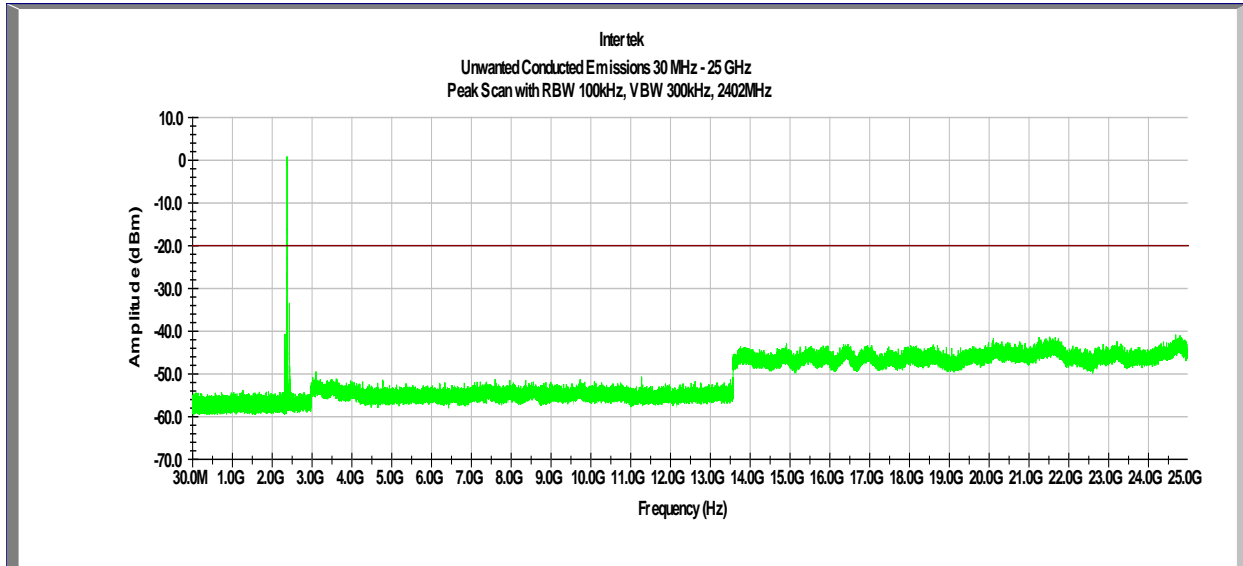
Tested By	Test Date
Minh Ly	May 14, 2020

Tx @ Low Channel, 2483.5 MHz Band Edge
Plot 4.2

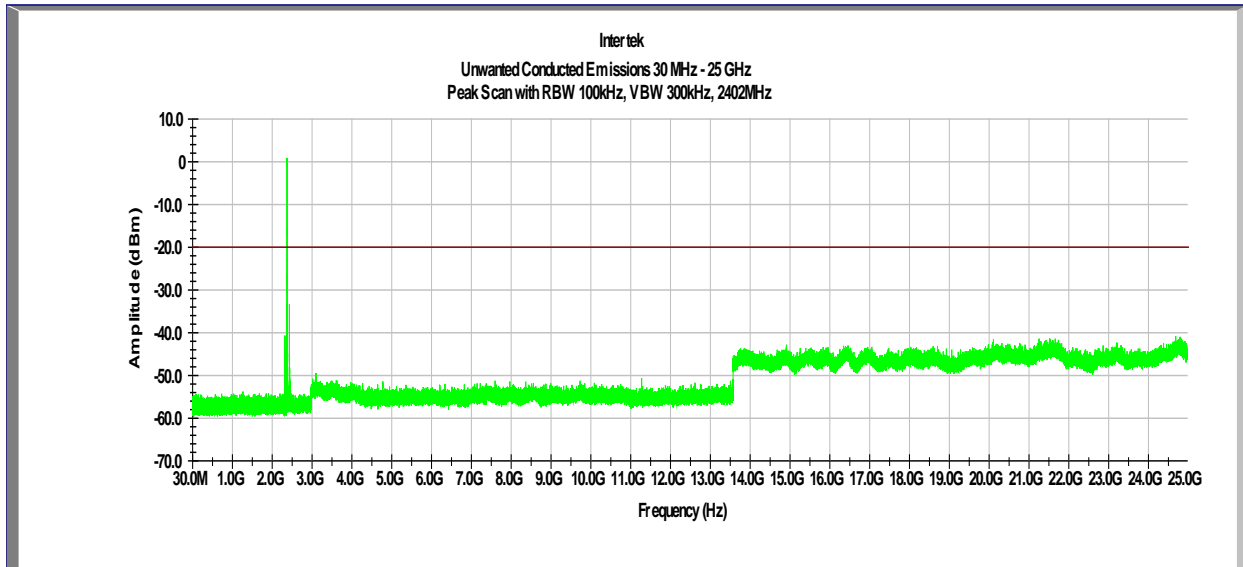


Date: 7.MAY.2020 19:25:12

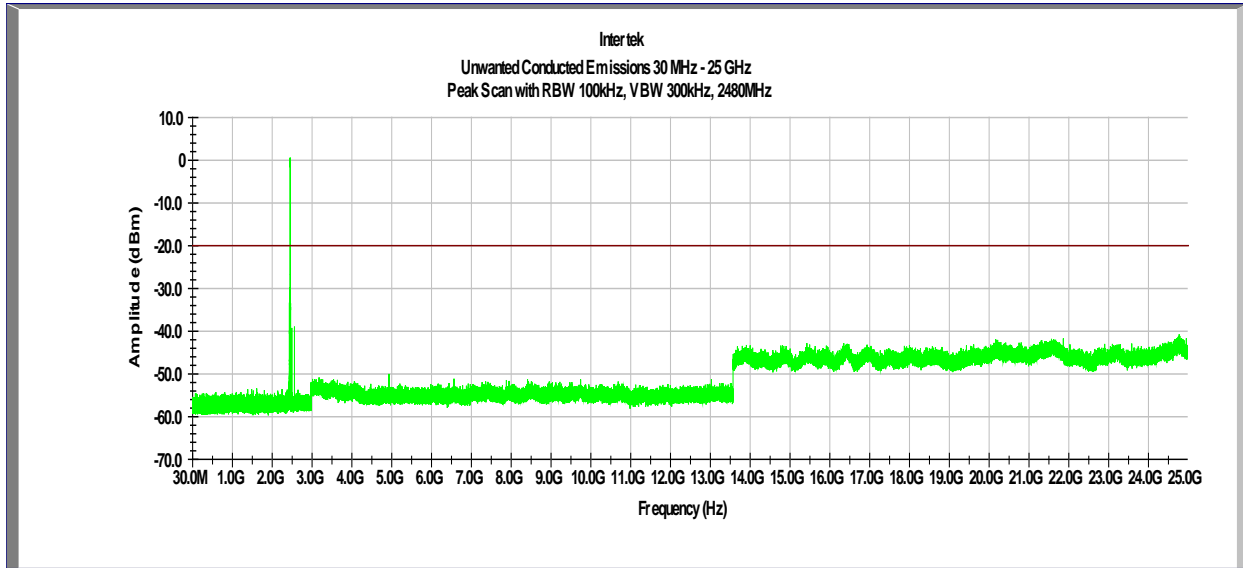
Tx @ Low Channel, 2402 MHz
30MHz -25GHz Conducted Spurious
Plot 4.3



Tx @ Mid Channel, 2440 MHz
30MHz -25GHz Conducted Spurious
Plot 4.4



Tx @ High Channel, 2480 MHz
30MHz -25GHz Conducted Spurious
Plot 4.5



4.5 Transmitter Radiated Emissions
FCC Rules: 15.247(d), 15.209, 15.205; RSS-247, 5.5;

4.5.1 Requirement

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)).

For out of band radiated emissions (except for frequencies in restricted bands), in any 100 kHz bandwidths outside the EUT pass-band, the RF power shall be at least 20dB (peak) or 30 dB (average) below that of the maximum in-band 100 kHz emissions.

4.5.2 Procedure

Radiated emission measurements were performed from 9 kHz to 25 GHz according to the procedure described in ANSI C63.10: 2013. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz for frequencies above 1000 MHz. Above 1000 MHz Peak and Average measurements were performed.

The EUT is placed on a plastic turntable that is 80 cm in height for below 1000MHz and 1.5m in height for above 1GHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters for frequencies above 1 GHz and at 10 meters for frequencies below 1 GHz.

Measurements made from 1 GHz to 18GHz had a 2.4-2.5GHz notch filter in place. A preamp was used from 30MHz to 26GHz.

All measurements were made with a Peak Detector and compared to QP limits for 30MHz – 1GHz and Average limits for 1GHz – 26GHz.

Radiated measurements were performed on X, Y, Z orientations of the EUT. Data is presented with the worst-case configuration (the configuration which resulted in the highest emission levels).

Correlation measurements were performed below 30MHz between 10m ALSE and Open Field site according to FCC KDB 414788 D01 Radiated Test Site v01r01 section 2. All readings were within the acceptable tolerance.

4.5.3 Field Strength Calculation

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$FS = RA + AF + CF - AG$; if measurement is performed at a distance other than specified in the rule, a Distance Correction Factor (DCF) shall be added.

Where FS = Field Strength in dB(μ V/m)

RA = Receiver Amplitude (including preamplifier) in dB(μ V); AF = Antenna Factor in dB(1/m)

CF = Cable Attenuation Factor in dB; AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μ V) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μ V/m). This value in dB(μ V/m) was converted to its corresponding level in μ V/m.

RA = 52.0 dB(μ V)

AF = 7.4 dB(1/m)

CF = 1.6 dB

AG = 29.0 dB

$FS = 52.0 + 7.4 + 1.6 - 29.0 = 32$ dB(μ V/m).

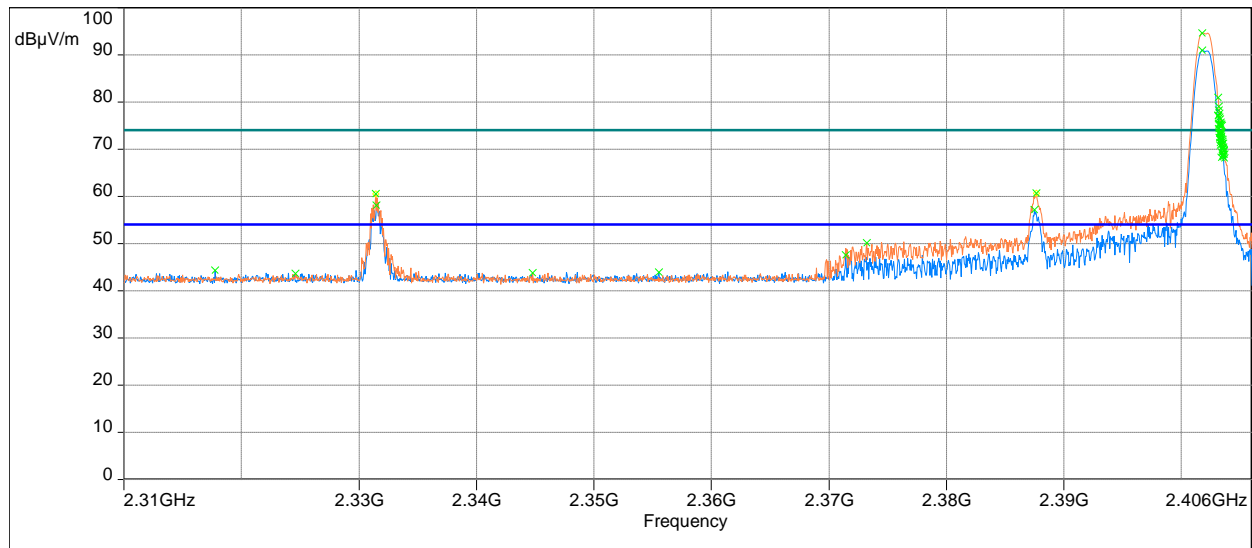
Level in μ V/m = Common Antilogarithm [(32 dB μ V/m)/20] = 39.8 μ V/m.

4.5.4 Test Results

Tested By	Test Date
Minh Ly	May 08 – June 17, 2020 & October 02, 2020

**Out-of-Band Radiated spurious emissions at the Band-edge @3m distance
2310–2390 MHz, Peak Scan
EUT in Horizontal Position**

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- ◇ Level (Manual suspects) (Horizontal)
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)



Model: ; Client: ; Comments: ; Test Date: 05/15/2020 15:21

Frequency (MHz)	Peak (dBuV/m)	Pk Limit (dBuV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2331.4	60.5	74.0	-13.5	291.3	2.5	Horizontal	55.5	5.0
2387.6	60.7	74.0	-13.3	283.5	3.5	Horizontal	55.6	5.1
2390.0	50.7	74.0	-23.3	298.25	1.52	Horizontal	45.6	5.1

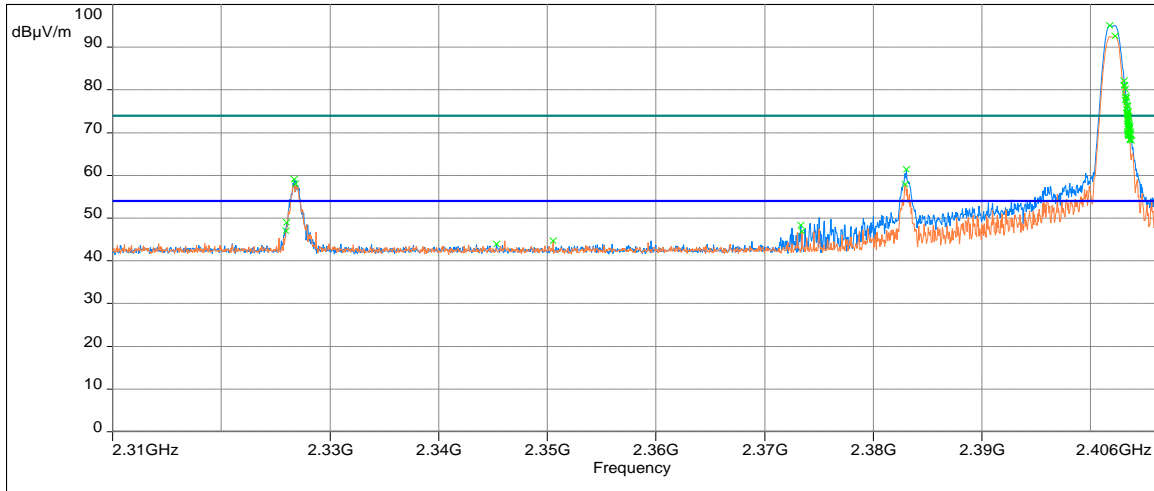
Frequency (MHz)	Peak (dBuV/m)	Ave Limit (dBuV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2390.0	50.7	54	-3.3	298.25	1.52	Horizontal	45.6	5.1

Frequency (MHz)	Average (dBuV/m)	Ave Limit (dBuV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2331.4	32.1	54.0	-21.9	291.0	2.5	Horizontal	27.1	5.0
2387.5	32.4	54.0	-21.6	283.0	3.5	Horizontal	27.3	5.1

For average measurements, section 11.12.2.5.1 “Trace averaging with continuous EUT transmission at full power” of ANSI 63.10 was utilized per 558074 D01 15.247 Meas Guidance v05r02.

**Out-of-Band Radiated spurious emissions at the Band-edge @3m distance
2310–2390 MHz, Peak Scan
EUT in Upright Position**

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)



Model: ; Client: ; Comments: ; Test Date: 05/08/2020 20:51

Frequency (MHz)	Peak (dBµV/m)	Pk Limit (dBµV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2331.5	60.2	74.0	-13.8	30.3	2.5	Vertical	55.2	5.0
2387.6	58.5	74.0	-15.5	90.8	3.5	Vertical	53.4	5.1
2390.0	49.5	74.0	-24.5	272	2.49	Vertical	44.4	5.1

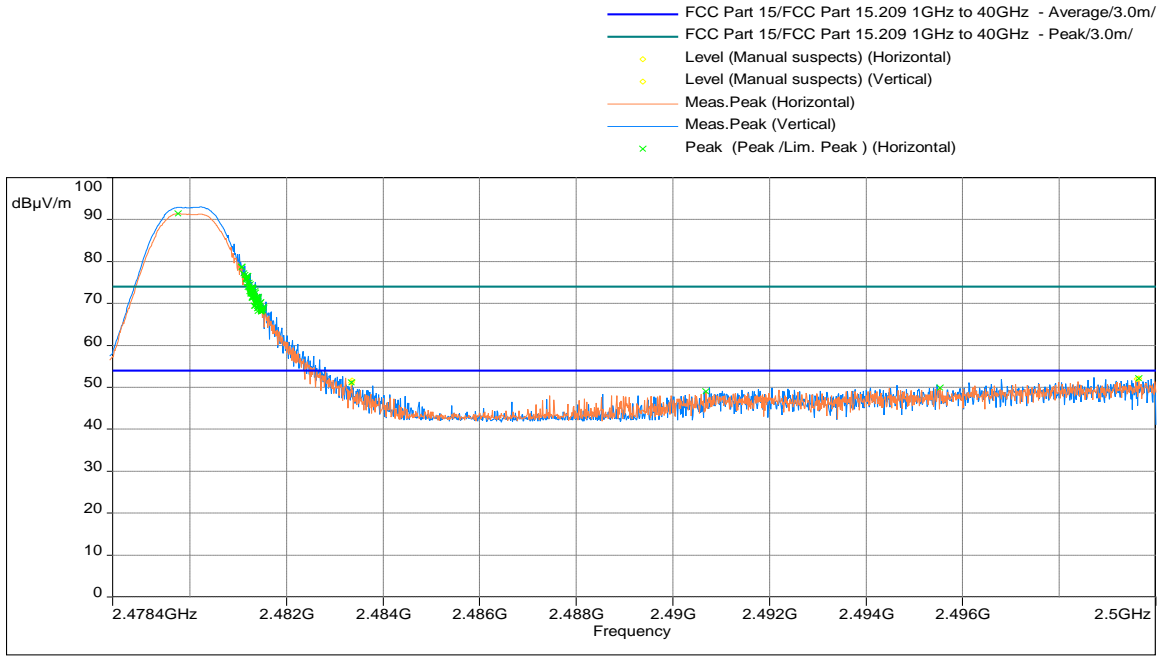
Frequency (MHz)	Peak (dBµV/m)	Ave Limit (dBµV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2390.0	49.5	54	-4.5	272	2.49	Vertical	44.4	5.1

Frequency (MHz)	Average (dBµV/m)	Ave Limit (dBµV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2331.5	31.6	54.0	-22.4	291.0	2.5	Vertical	26.6	5.0
2387.6	32.3	54.0	-21.7	283.0	3.5	Vertical	27.2	5.1

For average measurements, section 11.12.2.5.1 “Trace averaging with continuous EUT transmission at full power” of ANSI 63.10 was utilized per 558074 D01 15.247 Meas Guidance v05r02.

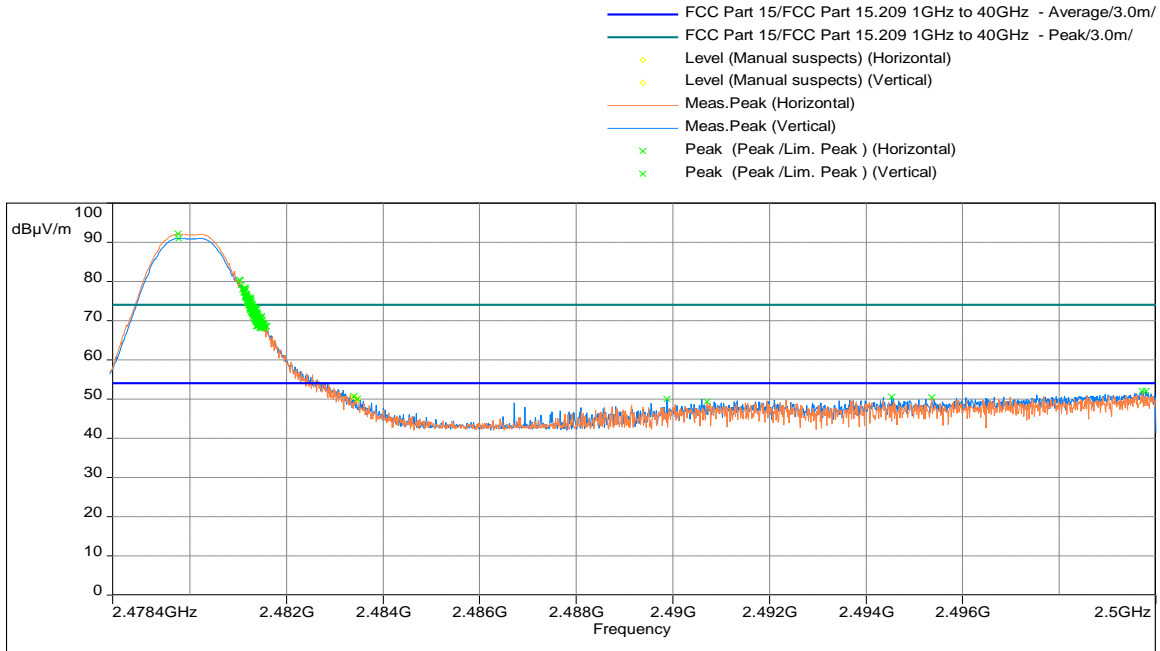
Note: Both normal mode and charging mode are investigated. Data is presented with the worst-case configuration.

**Out-of-Band Radiated spurious emissions at the Band-edge @3m distance
2483.5–2500 MHz, Peak Scan with Average Limit
EUT in Horizontal Position**



Frequency (MHz)	Peak (dBµV/m)	Ave Limit (dBµV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2483.5	51.1	54.0	-2.9	223.8	1.6	Horizontal	45.9	5.2
2499.5	52.1	54.0	-1.9	284.8	2.1	Horizontal	46.9	5.2
2483.3	51.6	54.0	-2.4	284.3	1.5	Vertical	46.4	5.2
2499.6	52.0	54.0	-2.0	315.5	1.8	Vertical	46.8	5.2

**Out-of-Band Radiated spurious emissions at the Band-edge @3m distance
2483.5–2500 MHz, Peak Scan with Average Limit
EUT in Upright Position**



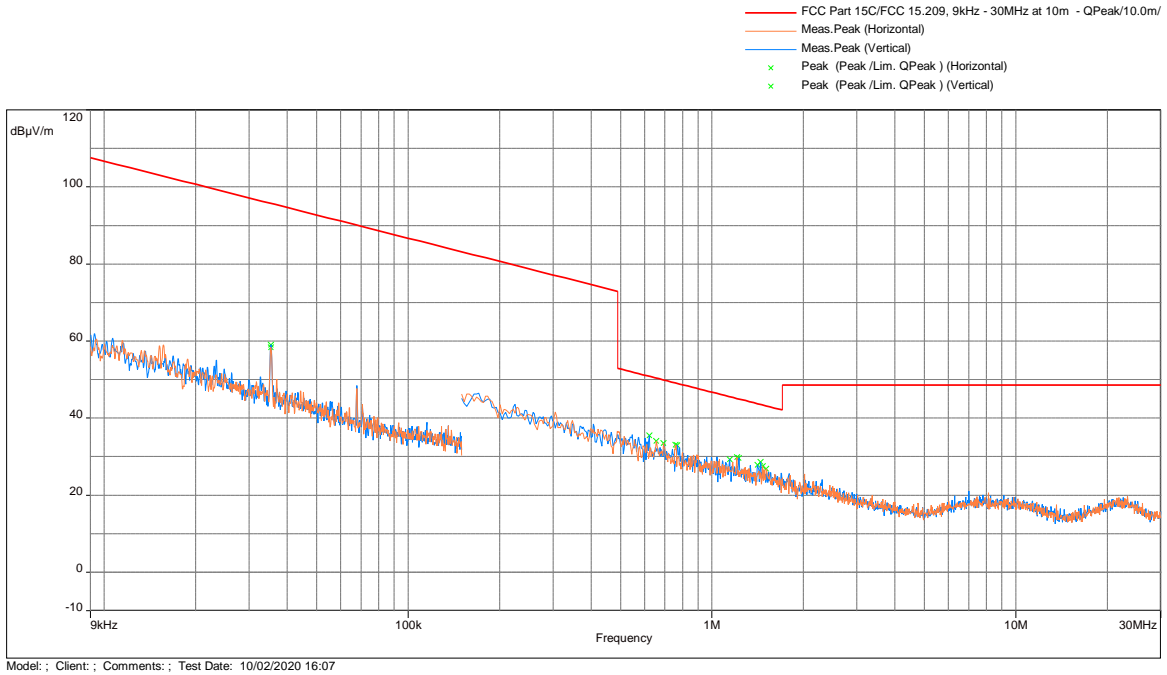
Frequency (MHz)	Peak (dBµV/m)	Ave Limit (dBµV/m)	Margin (dB)	Angle (°)	Height (m)	Polarity	Raw (dBuV)	Correction (dB)
2483.5	50.1	54.0	-3.9	191.5	3.5	Horizontal	44.9	5.2
2483.5	50.7	54.0	-3.3	24.5	3.5	Vertical	45.5	5.2
2499.7	52.1	54.0	-1.9	236.0	2.5	Horizontal	46.9	5.2
2499.6	52.1	54.0	-1.9	260.5	3.5	Vertical	46.9	5.2

Note: Both normal mode and charging mode are investigated. Data is presented with the worst-case configuration.

Out-of-Band Radiated Spurious Emissions

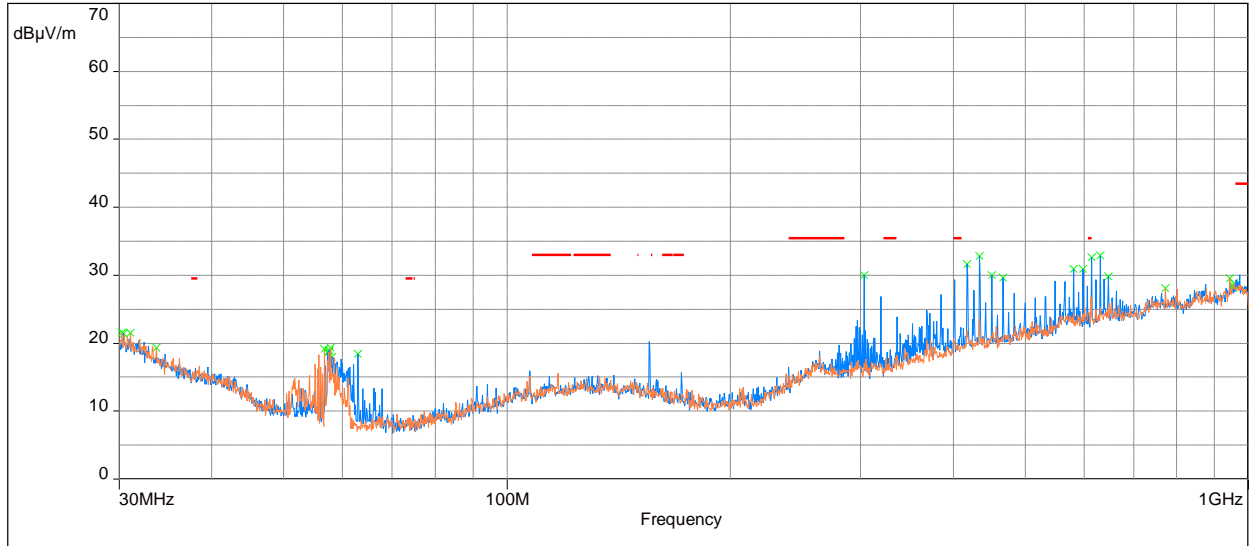
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz
Normal Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)



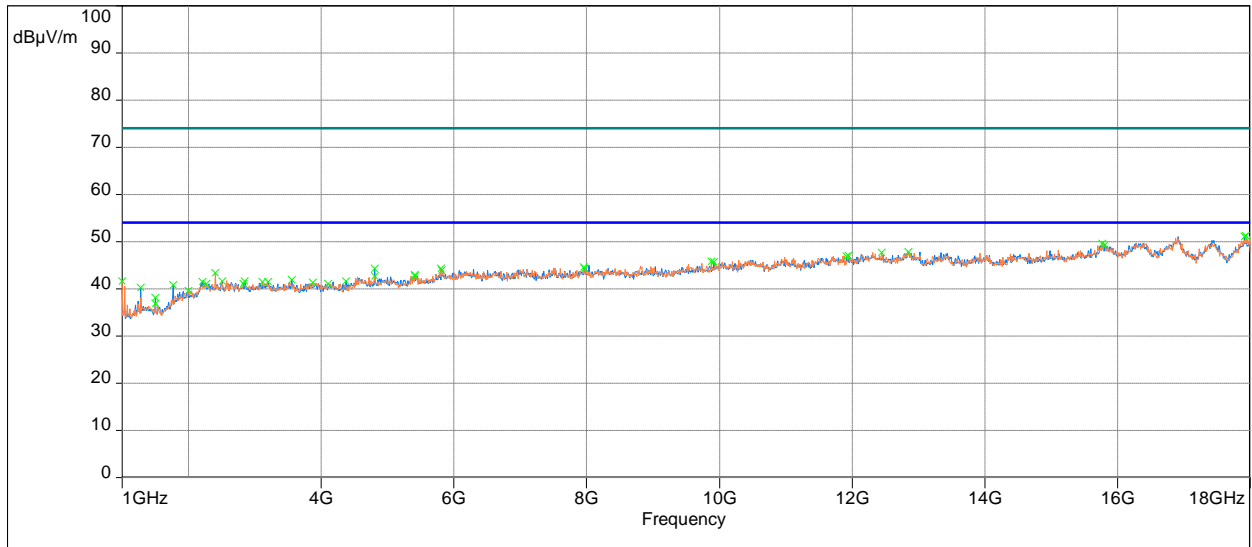
Model: ; Client: ; Comments: ; Test Date: 05/08/2020 15:43

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
117.2	15.6	33.0	-17.5	77.3	4.0	Horizontal	28.9	-13.3
123.4	15.0	33.0	-18.0	127.0	2.1	Vertical	28.0	-13.1
263.9	18.2	35.5	-17.3	351.0	1.2	Horizontal	27.5	-9.4
401.4	29.4	35.5	-6.1	226.3	3.9	Vertical	36.1	-6.7
613.8	26.8	35.5	-8.7	301.0	2.0	Horizontal	29.4	-2.6
614.4	32.6	35.5	-2.9	200.3	2.0	Vertical	35.3	-2.6

Note: FS@10m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Normal Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)

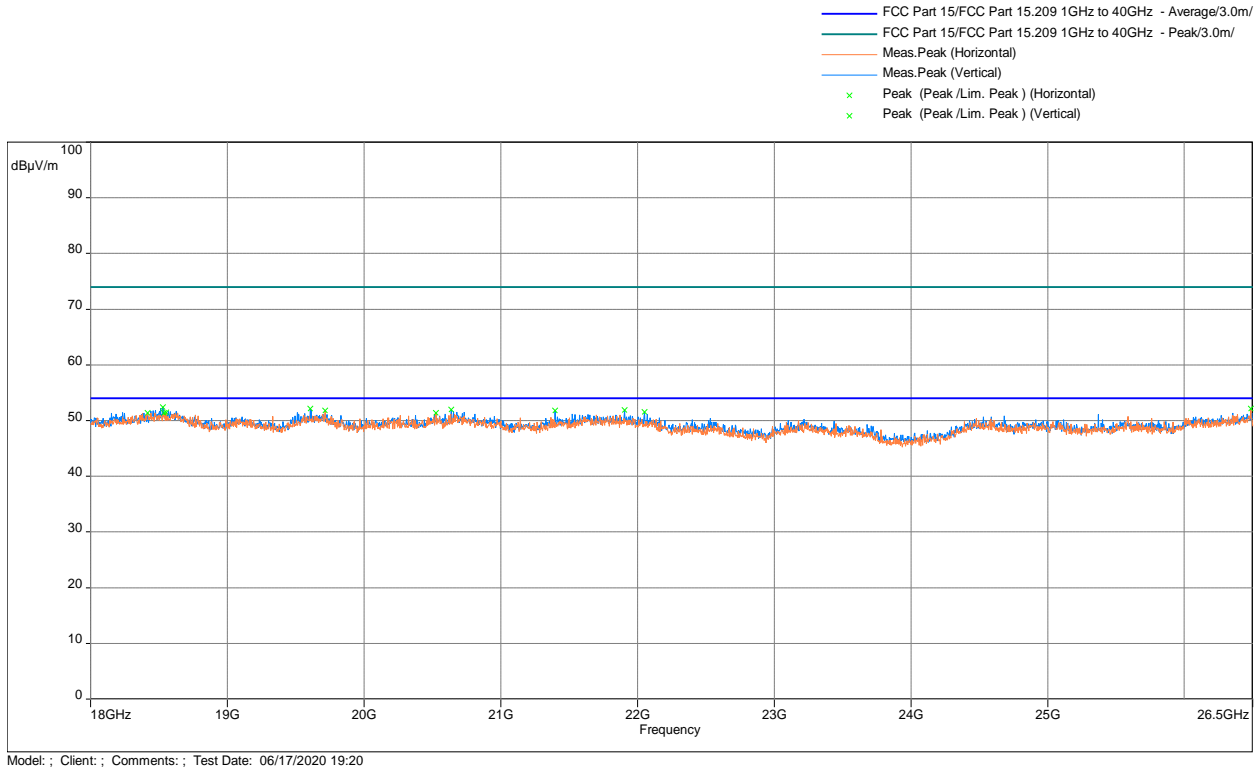


Model: ; Client: ; Comments: ; Test Date: 05/15/2020 16:24

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1000.01	41.6	54.0	-12.4	101.0	2.3	Horizontal	60.4	-18.8
1279.93	40.3	54.0	-13.8	214.8	1.5	Vertical	58.5	-18.3

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

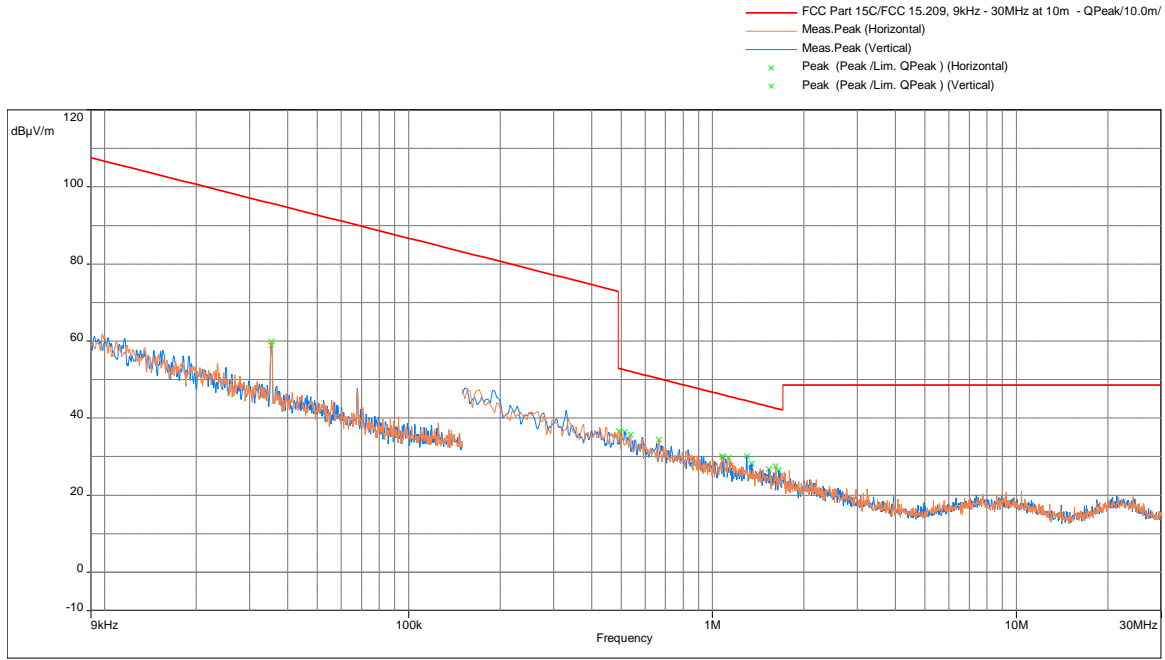
Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Normal Mode



Note: Measurements were performed in horizontal and upright position of the EUT and worst cast data was presented.

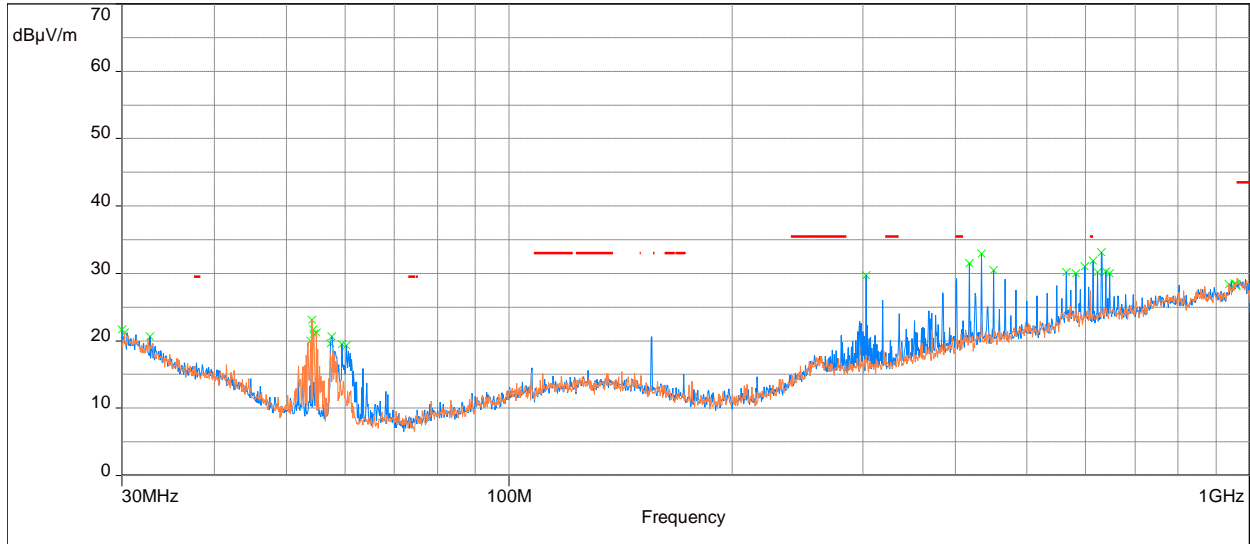
Test Results: 15.209 Radiated Spurious Emissions Mid Channel, Tx at 2440MHz
Normal Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)



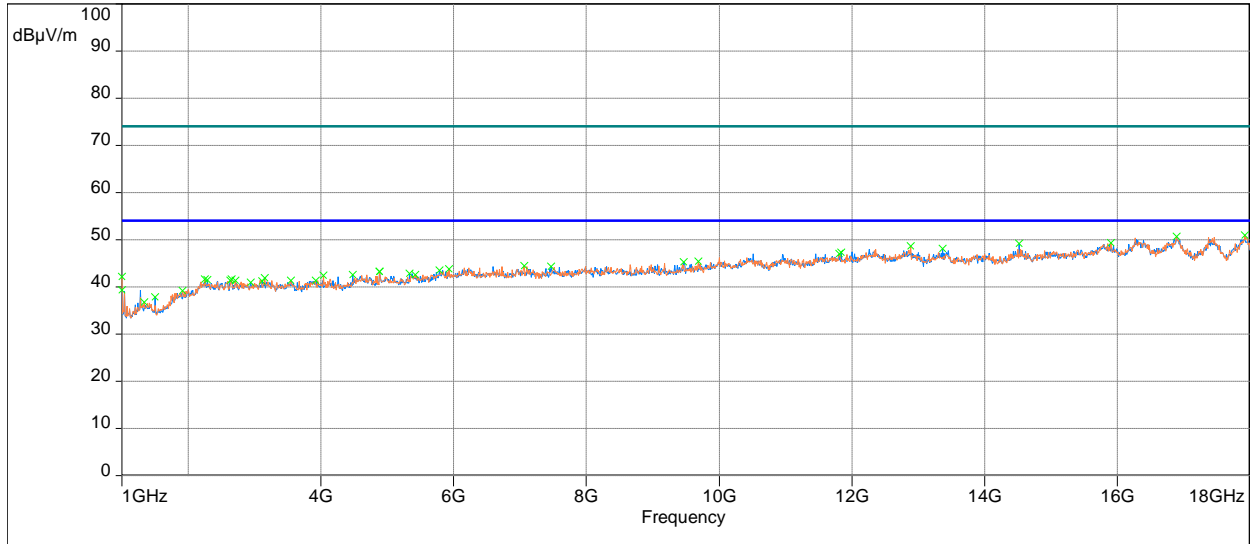
Model: ; Client: ; Comments: ; Test Date: 05/08/2020 16:03

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
117.6	14.8	33.0	-18.2	279.3	2.2	Horizontal	28.1	-13.3
127.8	15.6	33.0	-17.4	205.3	3.4	Vertical	28.6	-13.0
327.0	20.0	35.5	-15.5	255.8	3.8	Vertical	29.3	-9.3
401.4	29.3	35.5	-6.3	154.5	3.9	Vertical	35.9	-6.7
608.8	27.5	35.5	-8.0	189.0	2.4	Horizontal	30.0	-2.5
614.4	31.9	35.5	-3.6	227.5	2.1	Vertical	34.5	-2.6

Note: FS@10m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Normal Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)

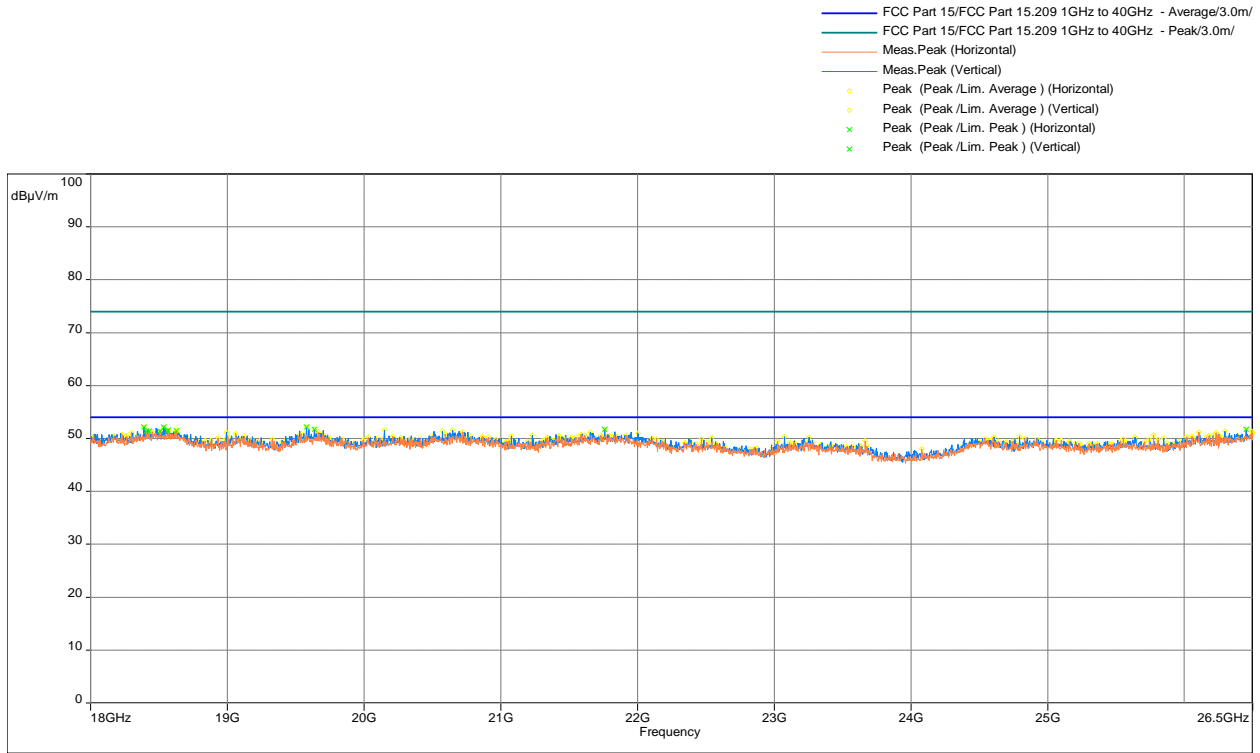


Model: ; Client: ; Comments: ; Test Date: 05/15/2020 16:31

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(μV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1000.05	42.2	54.0	-11.8	316.5	2.1	Horizontal	61.0	-18.8
1000.11	39.3	54.0	-14.7	0.3	2.5	Vertical	58.1	-18.8

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

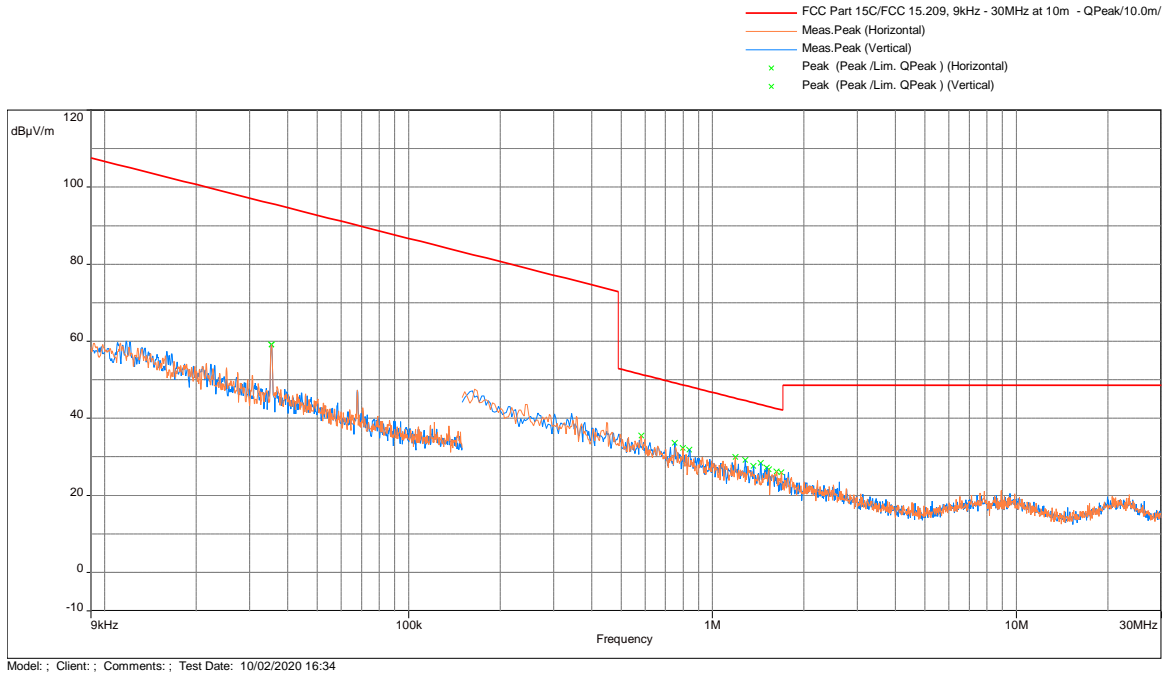
Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Normal Mode



Note: Measurements were performed in horizontal and upright position of the EUT and worst cast data was presented.

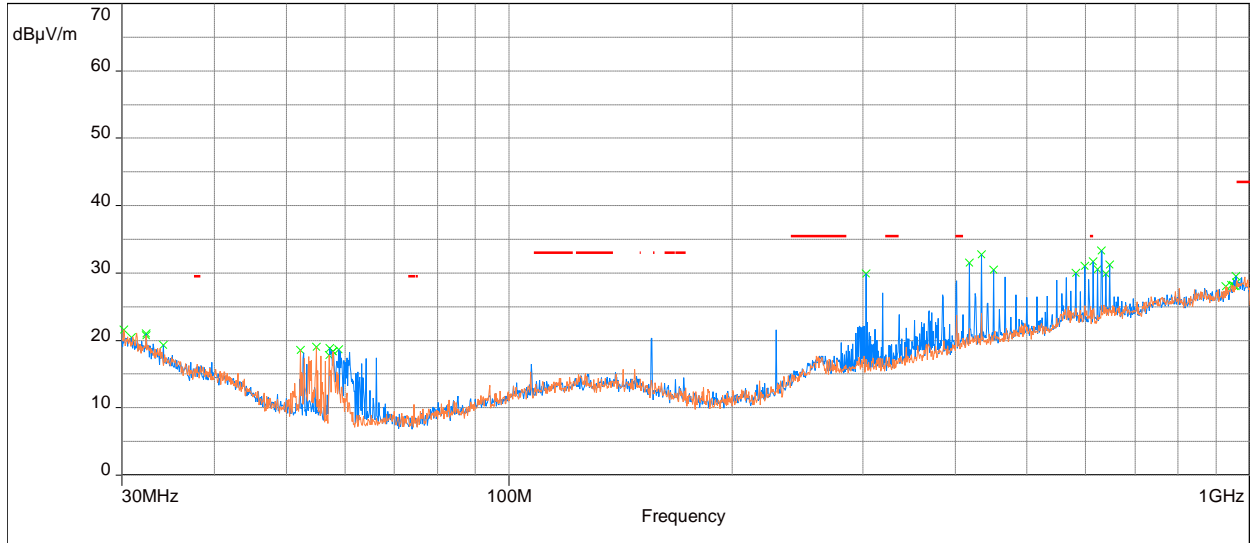
Test Results: 15.209 Radiated Spurious Emissions High Channel, Tx at 2480MHz
Normal Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)



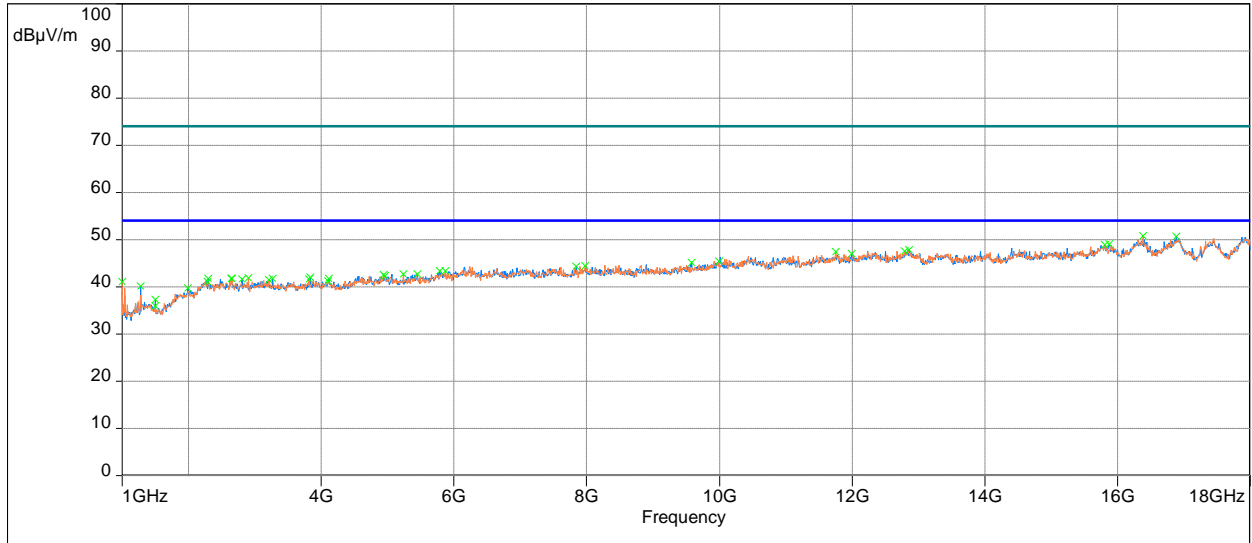
Model: ; Client: ; Comments: ; Test Date: 05/08/2020 16:04

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
127.5	14.9	33.0	-18.1	29.3	1.3	Vertical	27.9	-13.0
401.4	28.3	35.5	-7.2	158.8	4.0	Vertical	35.0	-6.7
401.4	23.8	35.5	-11.7	82.3	3.7	Horizontal	30.5	-6.7
409.6	23.8	35.5	-11.7	118.0	1.2	Vertical	30.2	-6.4
609.1	25.1	35.5	-10.4	23.0	3.7	Horizontal	27.6	-2.5
614.4	31.7	35.5	-3.8	224.5	2.2	Vertical	34.3	-2.6

Note: FS@10m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Normal Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)

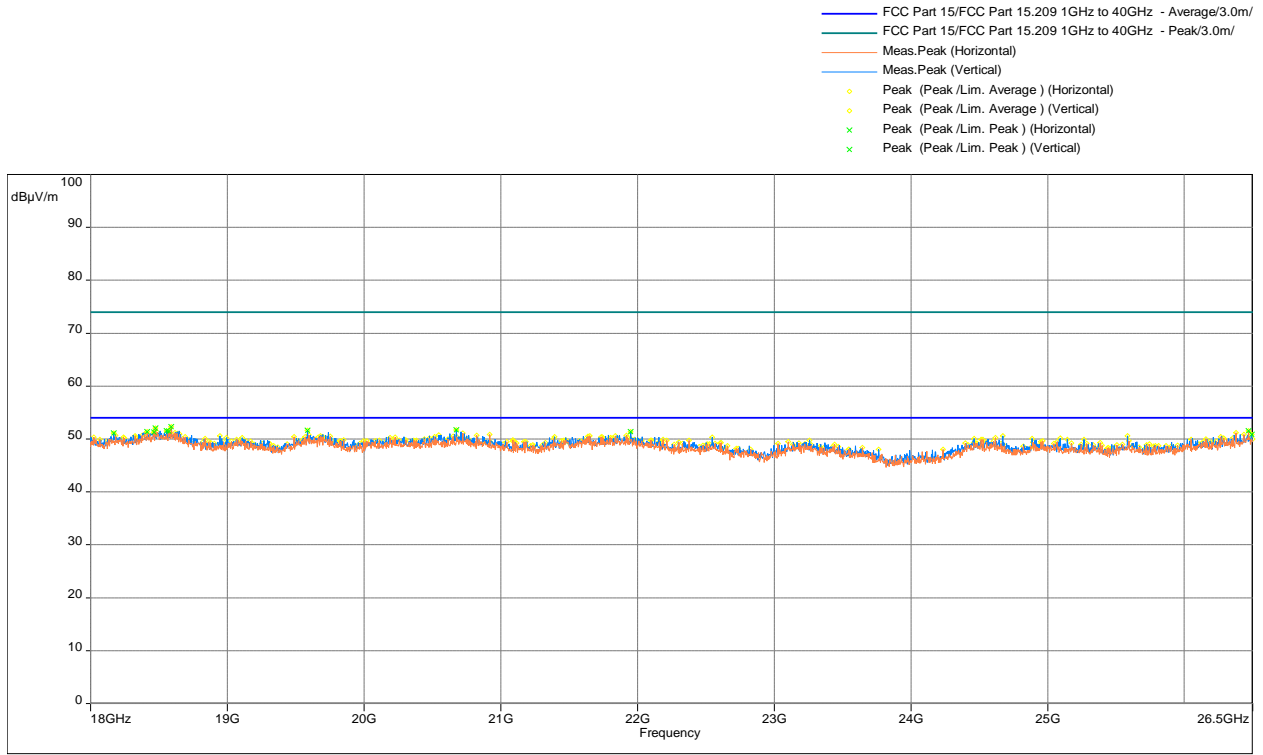


Model: ; Client: ; Comments: ; Test Date: 05/15/2020 16:42

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1000.05	41.1	54.0	-12.9	74.0	2.5	Horizontal	59.9	-18.8
1279.93	40.2	54.0	-13.8	36.0	1.7	Vertical	58.5	-18.3

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

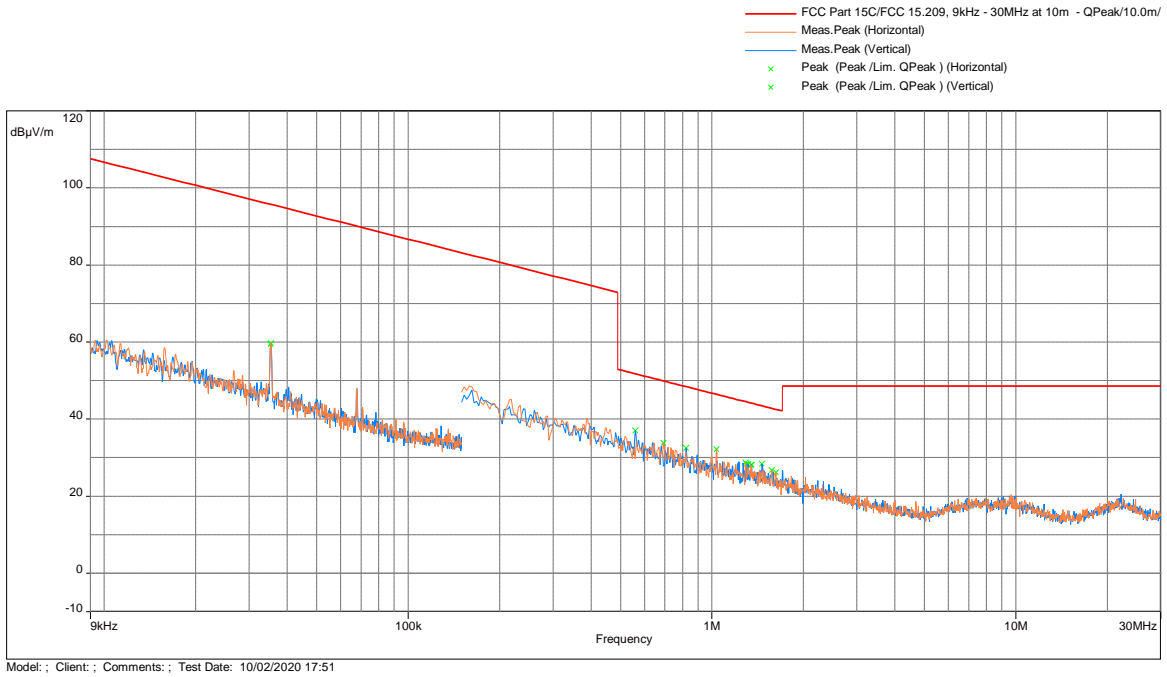
Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Normal Mode



Note: Measurements were performed in horizontal and upright position of the EUT and worst cast data was presented.

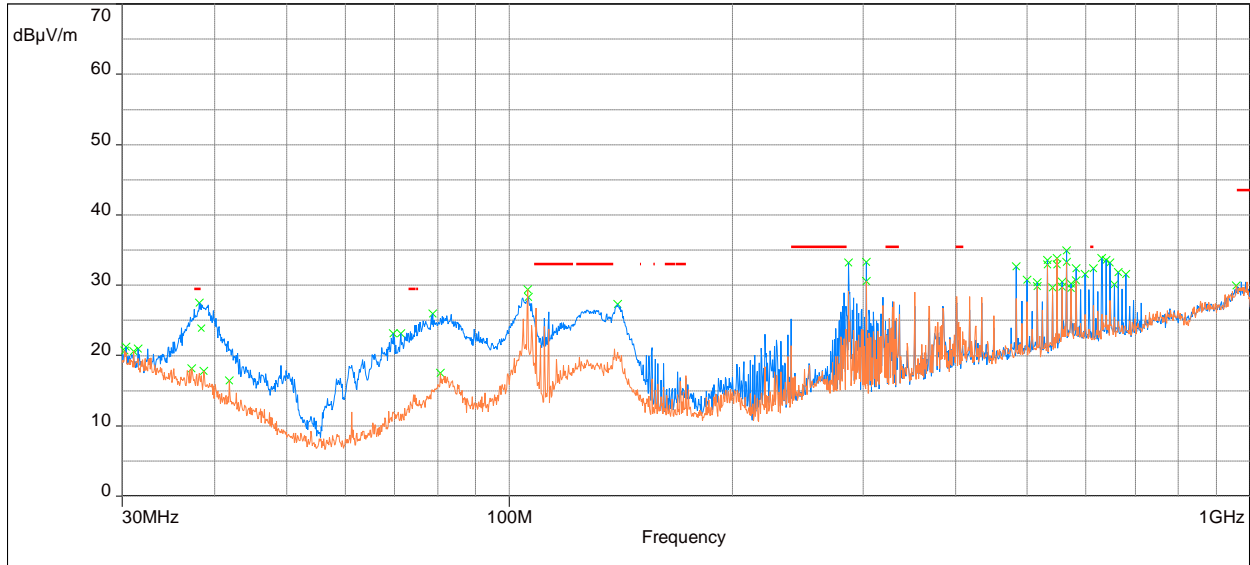
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz
Charging Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)
- × FS (Final QP) (Vertical)



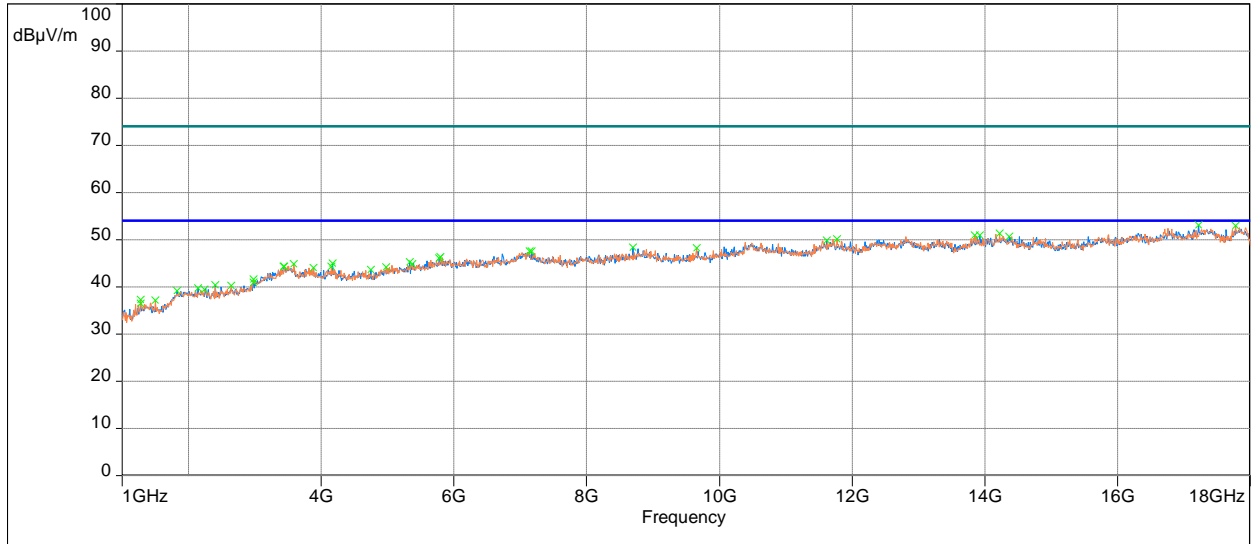
Model: ; Client: ; Comments: ; Test Date: 05/21/2020 19:48

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
38.1	27.5	33.0	-5.5	215.3	1.2	Vertical	39.3	-11.8
108.6	26.7	33.0	-6.3	196.3	3.3	Horizontal	41.5	-14.8
111.5	24.1	33.0	-8.9	6.8	4.0	Horizontal	38.6	-14.5
130.2	26.5	33.0	-6.5	347.0	1.5	Vertical	40.2	-13.7
401.4	27.5	35.5	-8.0	140.8	4.0	Vertical	35.0	-7.5
614.4	32.3	35.5	-3.3	219.8	3.9	Vertical	35.8	-3.6

Note: FS@10m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Charging Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- x Peak (Peak /Lim. Peak) (Horizontal)
- x Peak (Peak /Lim. Peak) (Vertical)



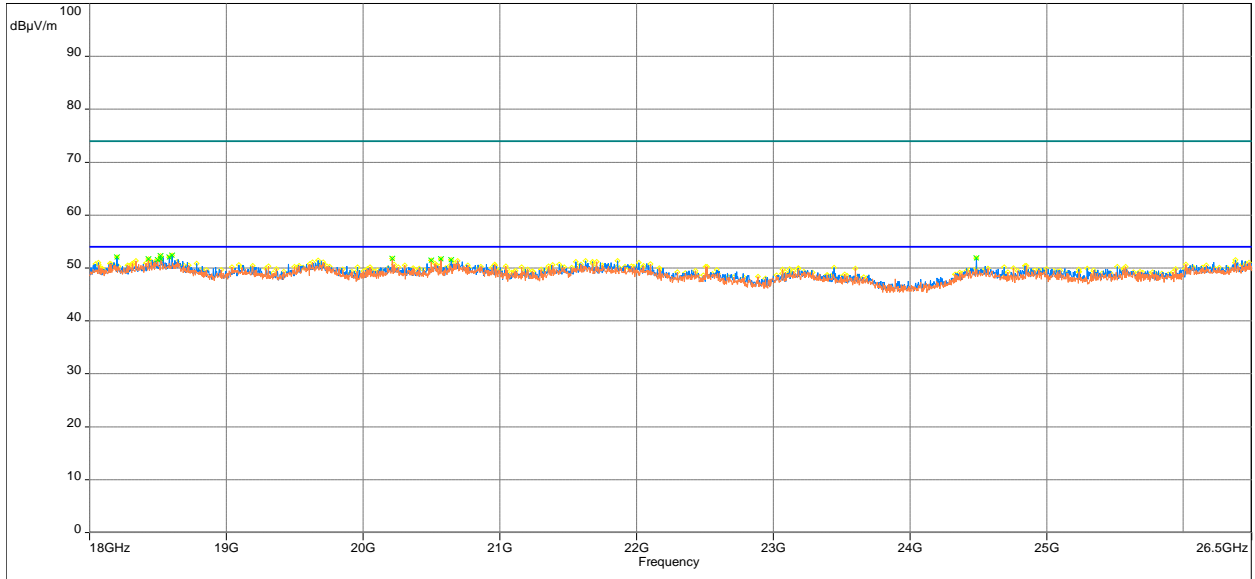
Model: ; Client: ; Comments: ; Test Date: 05/21/2020 18:03

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1279.93	37.4	54.0	-16.6	295.3	1.7	Horizontal	55.9	-18.5
1279.93	36.5	54.0	-17.5	0.0	1.5	Vertical	55.0	-18.5

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Charging Mode

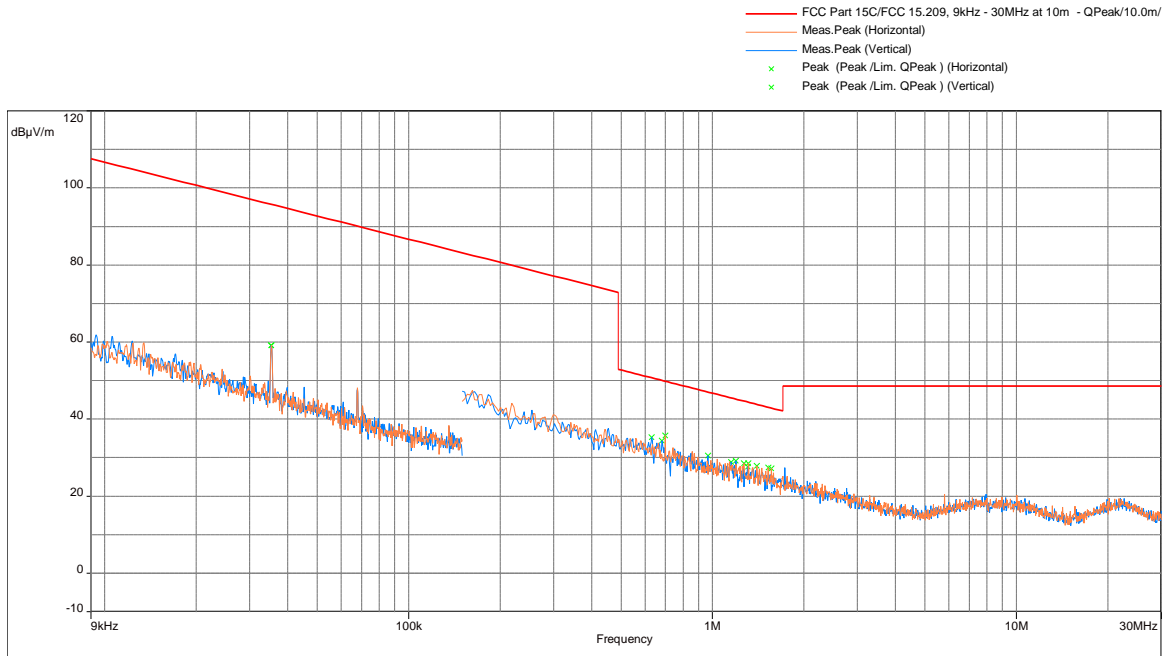
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- ◇ Peak (Peak /Lim. Average) (Horizontal)
- ◇ Peak (Peak /Lim. Average) (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)



Model: ; Client: ; Comments: ; Test Date: 06/25/2020 19:48

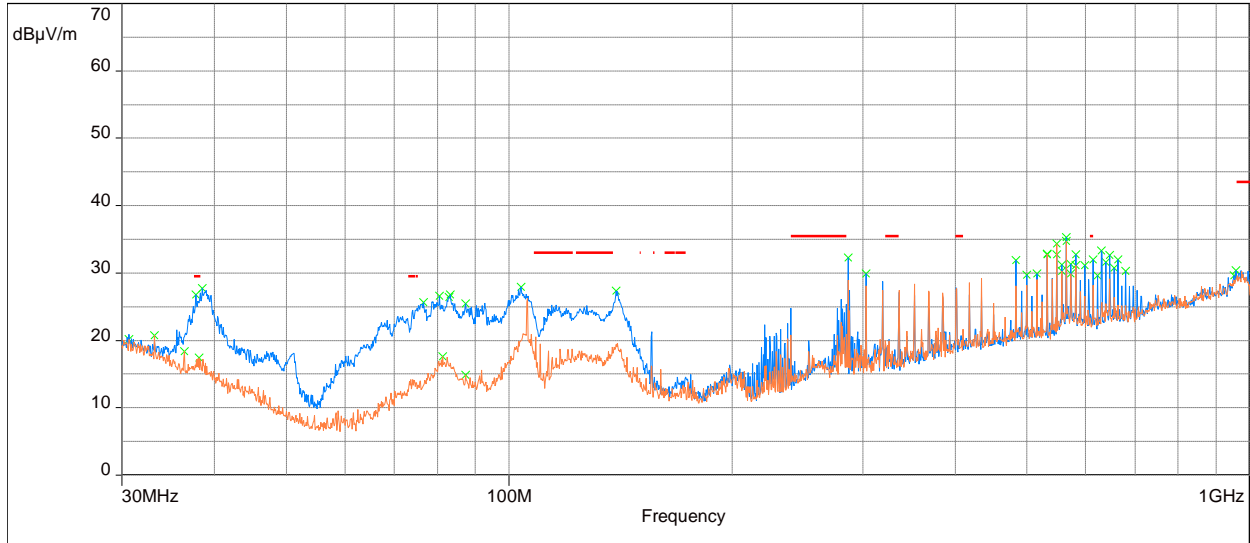
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2440MHz
Charging Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)



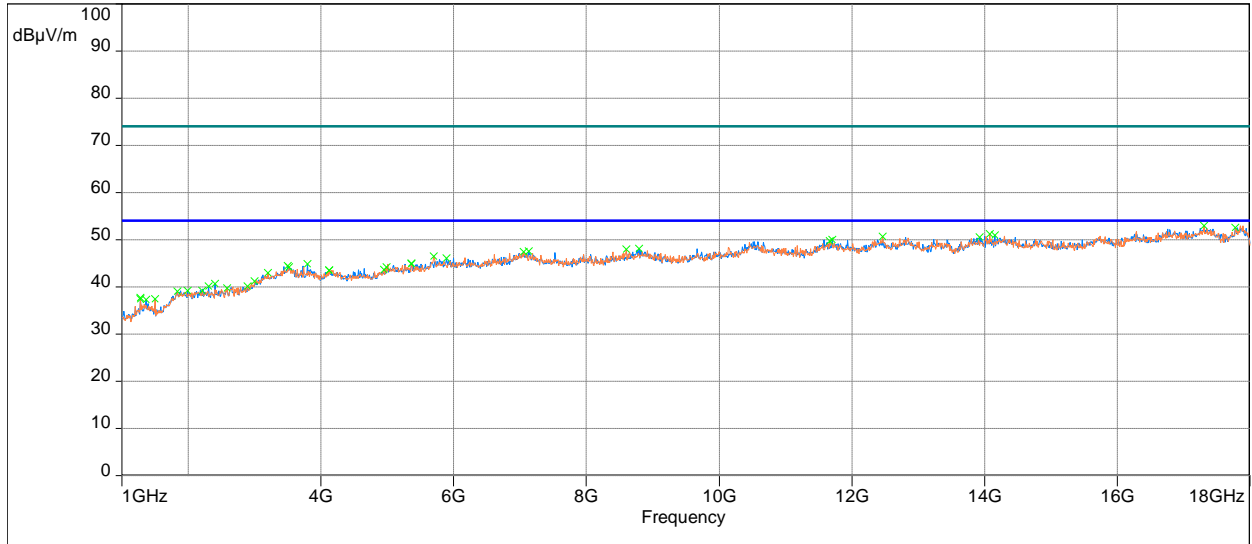
Model: ; Client: ; Comments: ; Test Date: 05/21/2020 20:12

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
37.8	26.2	33.0	-6.8	266.0	4.0	Vertical	37.8	-11.6
74.0	24.5	33.0	-8.5	270.5	4.0	Vertical	43.7	-19.2
280.5	26.1	35.5	-9.4	144.5	1.6	Vertical	37.3	-11.3
401.4	27.7	35.5	-7.8	154.8	2.2	Horizontal	35.3	-7.5
614.4	27.9	35.5	-7.6	64.0	1.1	Horizontal	31.5	-3.6
614.4	32.0	35.5	-3.5	205.3	3.2	Vertical	35.6	-3.6

Note: FS@10m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Charging Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- x Peak (Peak /Lim. Peak) (Horizontal)
- x Peak (Peak /Lim. Peak) (Vertical)



Model: ; Client: ; Comments: ; Test Date: 05/21/2020 18:28

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(μV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1279.93	37.7	54.0	-16.3	339.0	1.5	Horizontal	56.2	-18.5
14076.40	51.2	54.0	-2.8	63.0	2.5	Horizontal	47.7	3.5
1278.80	37.4	54.0	-16.6	342.0	2.5	Vertical	55.9	-18.5
17782.40	52.6	54.0	-1.4	74.3	1.5	Vertical	43.3	9.4

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Charging Mode

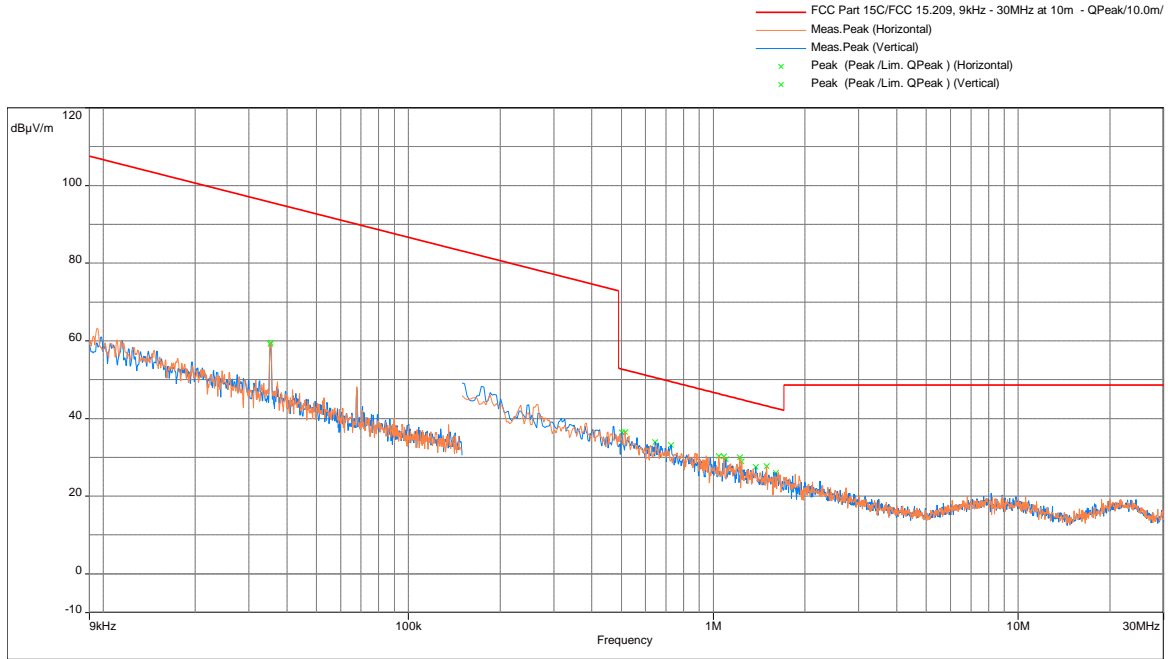
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- ◇ Peak (Peak /Lim. Average) (Horizontal)
- ◇ Peak (Peak /Lim. Average) (Vertical)
- × Peak (Peak /Lim. Peak) (Horizontal)
- × Peak (Peak /Lim. Peak) (Vertical)



Model: ; Client: ; Comments: ; Test Date: 06/25/2020 19:54

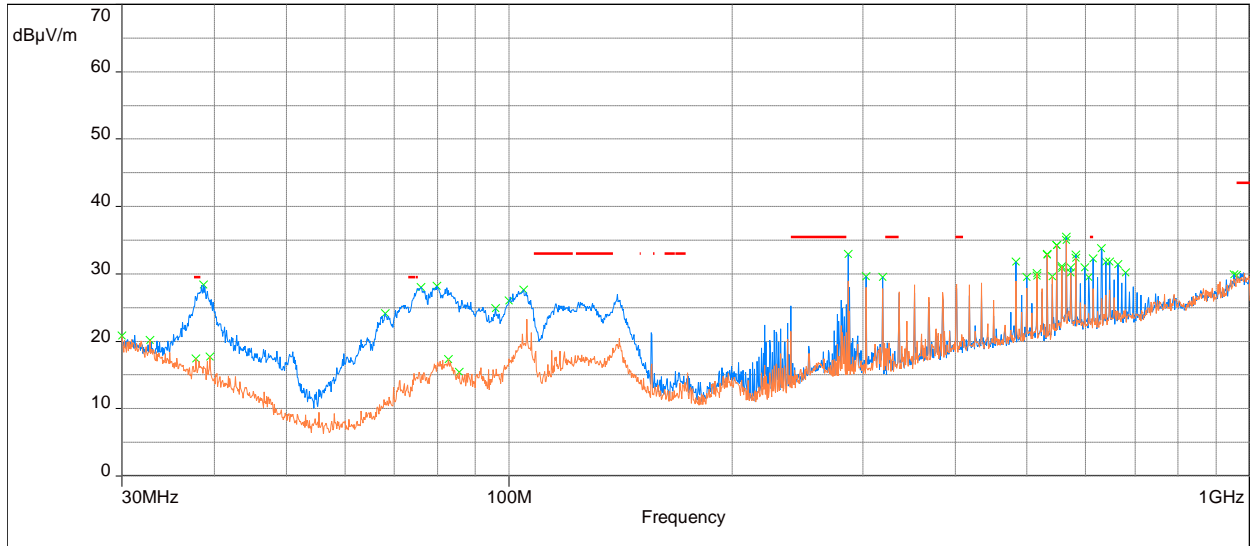
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2480MHz
Charging Mode

Radiated Spurious Emissions 9kHz - 30 MHz



Radiated Spurious Emissions 30 MHz - 1000 MHz

- FCC Part 15/FCC Part 15.205/15.209, 30MHz-1GHz - QPeak/10.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- × Peak (Peak /Lim. QPeak) (Horizontal)
- × Peak (Peak /Lim. QPeak) (Vertical)



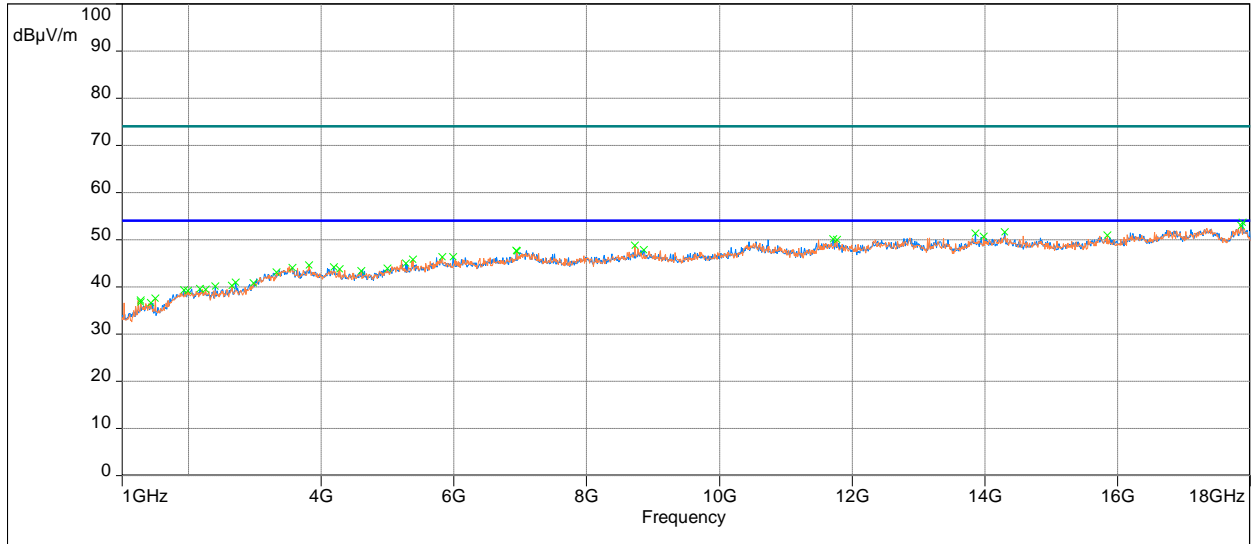
Model: ; Client: ; Comments: ; Test Date: 05/21/2020 20:24

Frequency (MHz)	FS @10m dB(µV/m)	Limit @10m dB(µV/m)	Margin (dB)	Azimuth (deg)	Height (m)	Polarity	RA (dBµV)	Correction (dB)
38.0	27.1	33.0	-5.9	126.5	2.6	Vertical	38.9	-11.8
74.6	27.1	33.0	-5.9	250.5	2.3	Vertical	46.2	-19.1
124.1	25.8	33.0	-7.2	319.3	1.1	Vertical	39.6	-13.7
280.5	26.1	35.5	-9.4	355.5	1.3	Vertical	37.3	-11.3
614.4	27.8	35.5	-7.7	77.3	2.1	Horizontal	31.4	-3.6
614.4	32.3	35.5	-3.3	205.3	3.6	Vertical	35.8	-3.6

Note: FS@10m = RA + Correction
Correction = AF + CF - Preamp

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Avg & Peak Limit, Charging Mode

- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Average/3.0m/
- FCC Part 15/FCC Part 15.209 1GHz to 40GHz - Peak/3.0m/
- Meas.Peak (Horizontal)
- Meas.Peak (Vertical)
- x Peak (Peak /Lim. Peak) (Horizontal)
- x Peak (Peak /Lim. Peak) (Vertical)

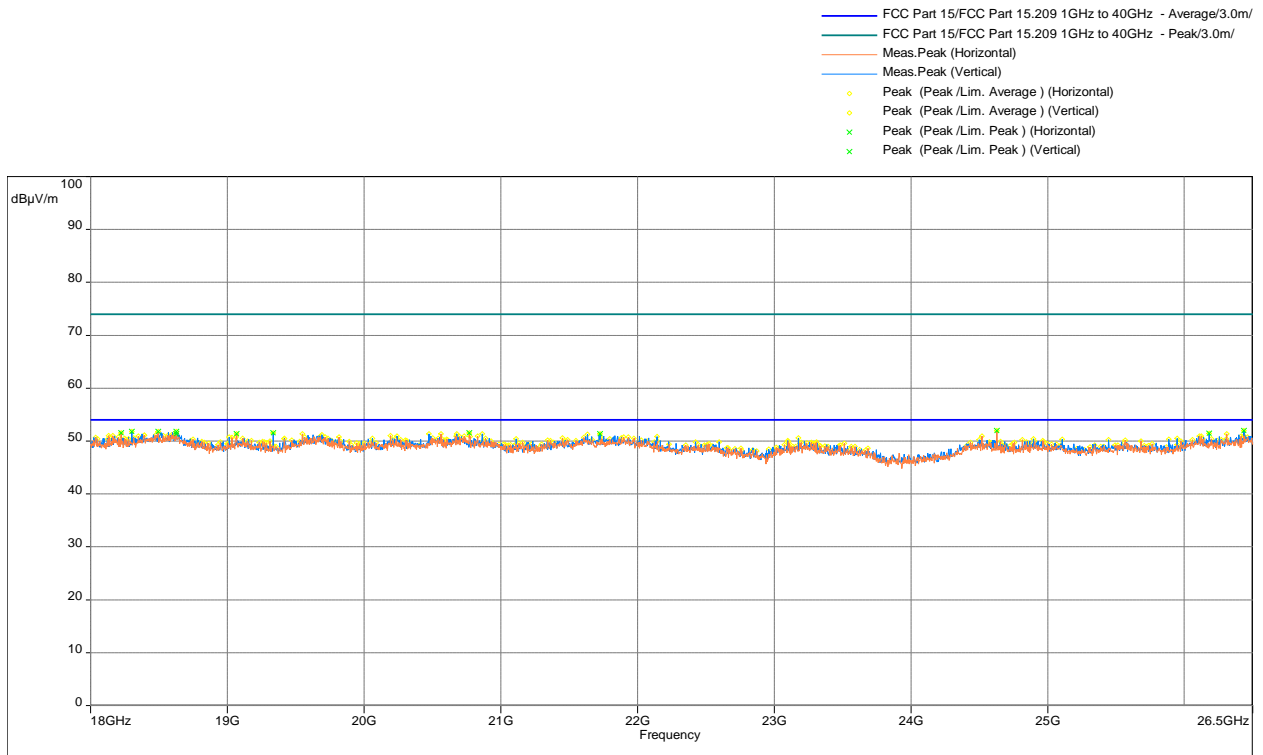


Model: ; Client: ; Comments: ; Test Date: 05/21/2020 18:32

Freq. MHz	Peak @3m dB(uV/m)	Ave Limit@3m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Raw (dBuV)	Correction dB
1279.93	37.2	54.0	-16.8	321.8	1.6	Horizontal	55.7	-18.5
15844.96	51.0	54.0	-3.1	205.5	1.4	Horizontal	45.7	5.2
1934.43	39.4	54.0	-14.7	316.0	1.7	Vertical	54.7	-15.3
2169.03	39.7	54.0	-14.3	207.8	2.2	Vertical	54.8	-15.1
14302.50	51.6	54.0	-2.4	199.3	1.5	Vertical	46.8	4.9

Note: FS@3m = RA + Correction
Correction = AF + CF – Preamp

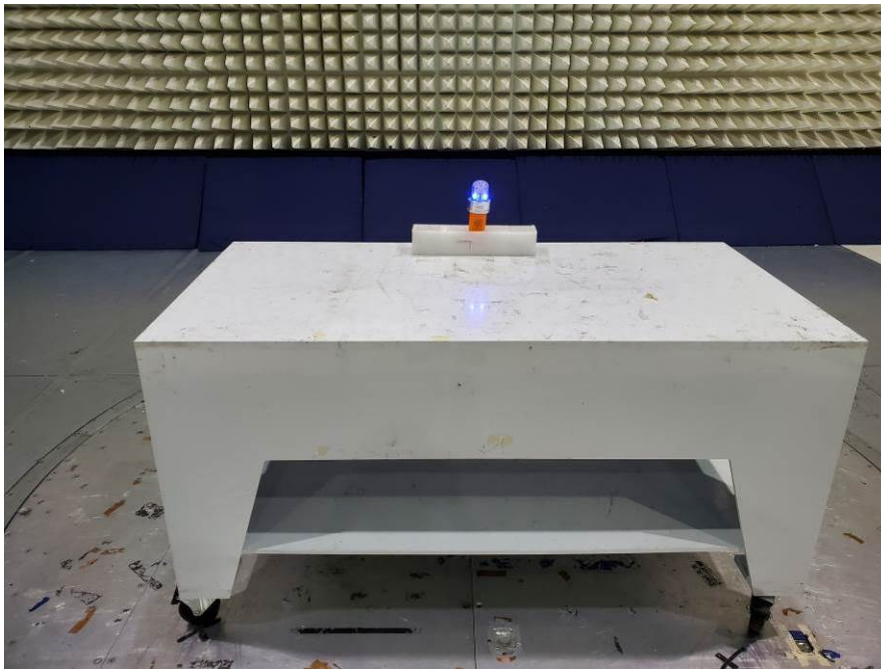
Radiated Spurious Emissions 18GHz – 26.5GHz, Peak Scan vs Avg & Peak Limit, Charging Mode



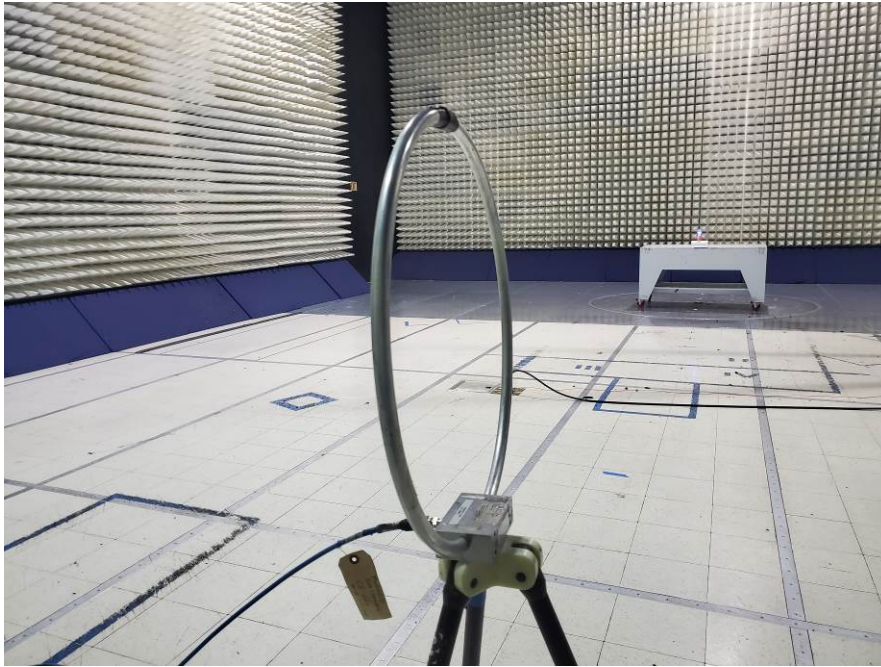
Results **Complies by 1.9 dB**

4.5.5 Test Setup Configuration

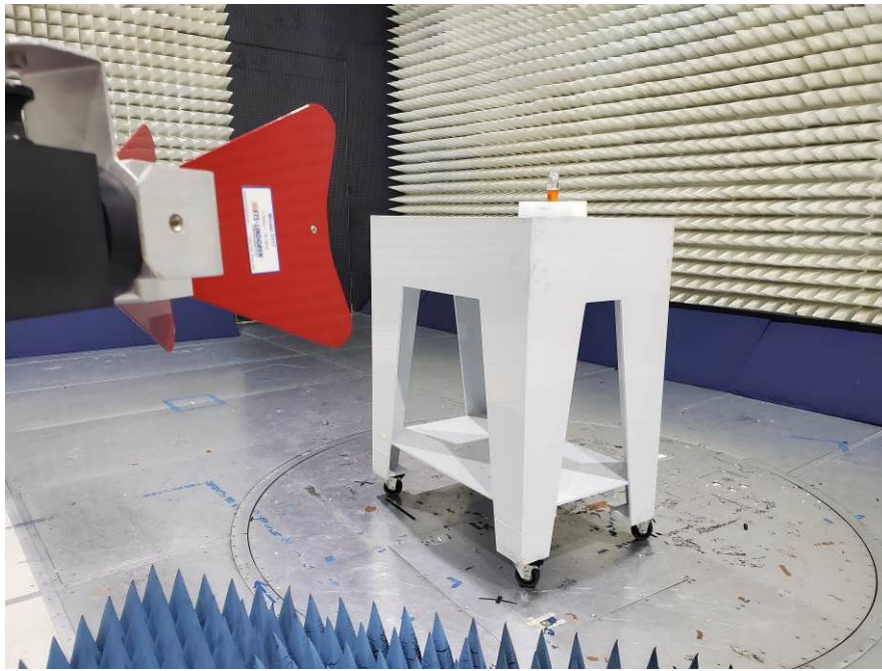
The following photographs show the testing configurations used.



4.5.5 Test Setup Configuration (Continued)



4.5.5 Test Setup Configuration (Continued)



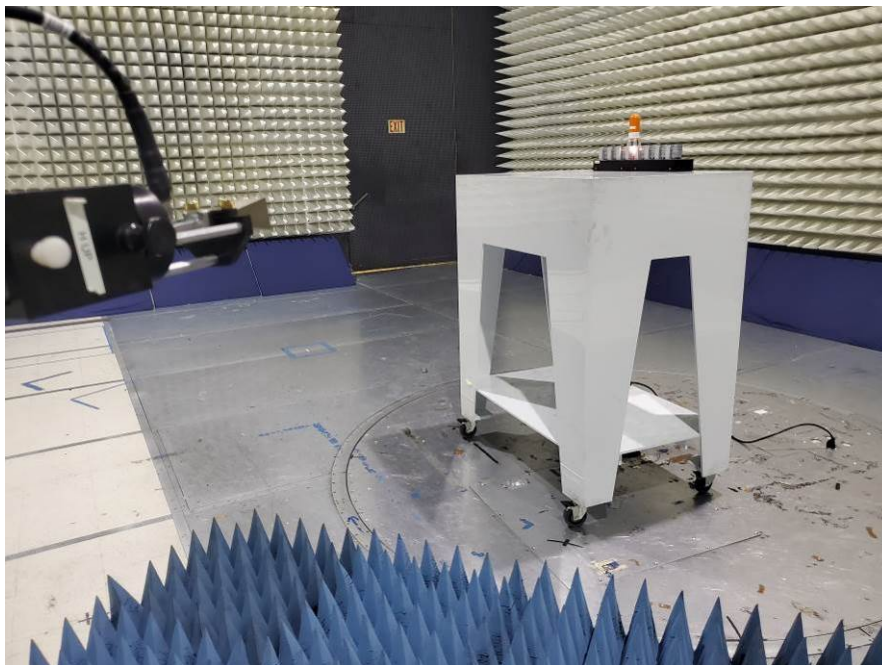
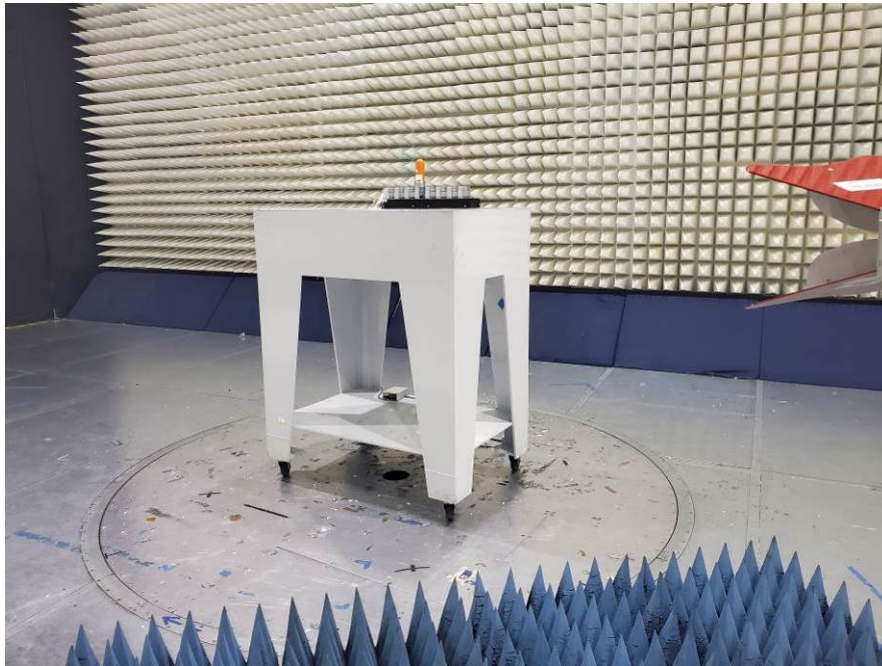
4.5.5 Test Setup Configuration (Continued)



4.5.5 Test Setup Configuration (Continued)



4.5.5 Test Setup Configuration (Continued)



4.6 AC Line Conducted Emission
FCC Rule 15.207; RSS-GEN

4.6.1 Requirement

Frequency Band MHz	FCC Part 15.207 Limits	
	Quasi-Peak	Average
0.15-0.50	66 to 56 *	56 to 46 *
0.50-5.00	56	46
5.00-30.00	60	50

Note: *Decreases linearly with the logarithm of the frequency. At the transition frequency the lower limit applies.

4.6.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.10:2014.

Tested By	Test Date
Minh Ly	May 08 – May 21, 2020

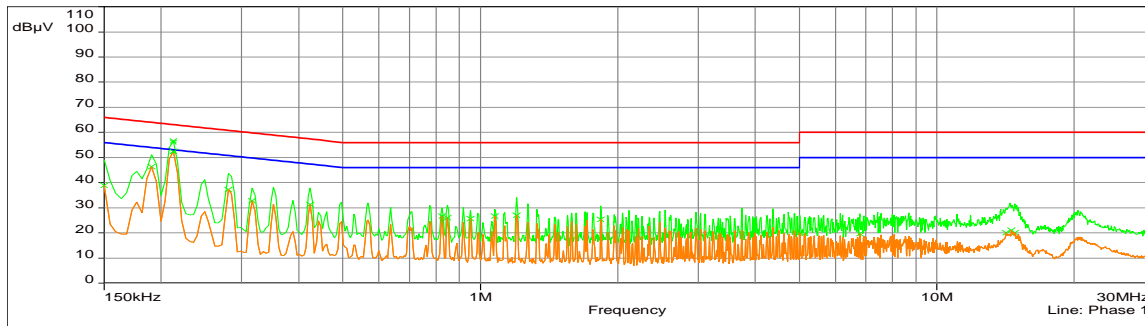
4.6.3 Test Results

15.207: Conducted Emissions 120VAC 60Hz

Phase 1

- FCC Part 15/FCC Part 15.107 B - Average/
- FCC Part 15/FCC Part 15.107 B - QPeak/
- × Level (Manual finals) (Phase 1)
- Meas.Peak (Phase 1)
- Meas.Avg (Phase 1)
- × Average (Average /Lim. Average) (Phase 1)
- × Ave Level (dBuV) (Final QP and Ave) (Phase 1)
- × QP Level (dBuV) (Final QP and Ave) (Phase 1)

Sub-range 1
Frequencies: 150 kHz - 30 MHz (Mode: Lin - Step: 4.5 kHz)
Settings: BBW: 9kHz, VBW: 30kHz, Sweep time: 2e+03 ms/MHz, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: On
Line:Phase 1

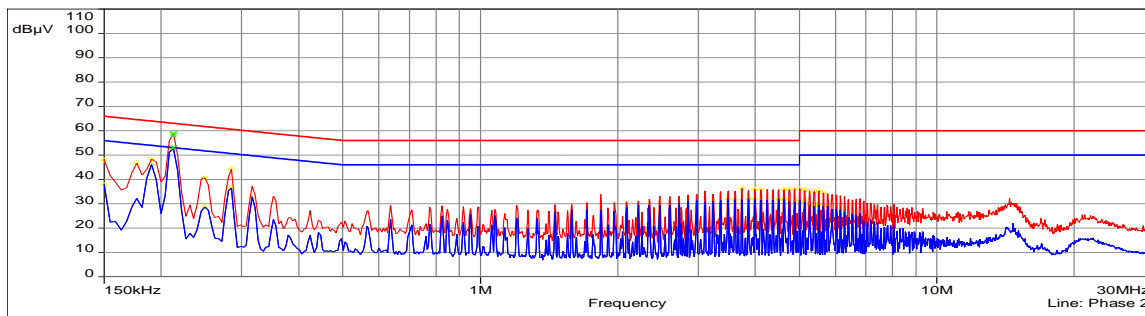


Model: ; Client: ; Comments: ; Test Date: 05/21/2020 20:50

Phase 2

- FCC Part 15/FCC Part 15.107 B - Average/
- FCC Part 15/FCC Part 15.107 B - QPeak/
- × Level (Manual finals) (Phase 2)
- Meas.Peak (Phase 2)
- Meas.Avg (Phase 2)
- ◇ Peak (Peak /Lim. QPeak) (Phase 2)
- ◇ Average (Average /Lim. Average) (Phase 2)
- × Ave Level (dBuV) (Final QP and Ave) (Phase 2)
- × QP Level (dBuV) (Final QP and Ave) (Phase 2)

Sub-range 2
Frequencies: 150 kHz - 30 MHz (Mode: Lin - Step: 4.5 kHz)
Settings: BBW: 9kHz, VBW: 30kHz, Sweep time: 2e+03 ms/MHz, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: On
Line:Phase 2



Model: ; Client: ; Comments: ; Test Date: 05/21/2020 20:50

4.4.3 Test Results (Continued)

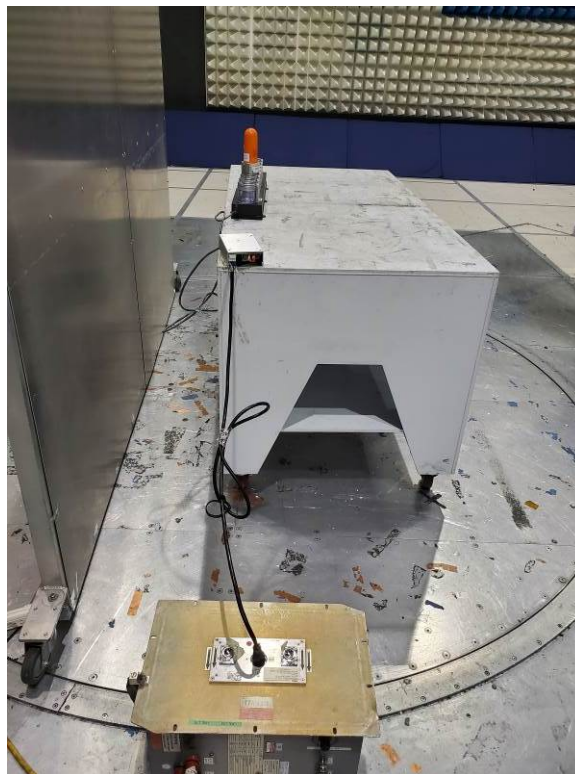
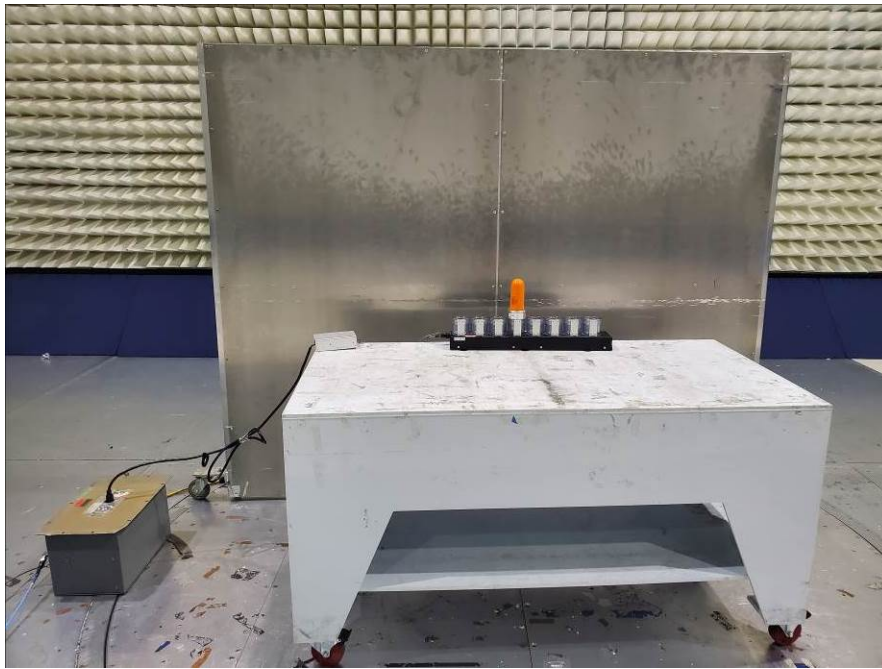
Quasi Peak Table					
Frequency (MHz)	QPeak (dBμV)	Lim. QPeak (dBμV)	QPeak-Lim (dB)	Phase	Correction (dB)
0.150	49.1	66.0	-16.9	Phase 1	10.2
0.150	48.1	66.0	-17.9	Phase 2	10.2
0.177	46.6	64.6	-18.0	Phase 2	10.2
0.191	48.3	64.0	-15.7	Phase 2	10.2
0.191	51.2	64.0	-12.9	Phase 1	10.2
0.213	56.6	63.1	-6.5	Phase 1	10.2
0.213	58.9	63.1	-4.2	Phase 2	10.2
0.249	40.6	61.8	-21.2	Phase 2	10.1
0.249	41.2	61.8	-20.6	Phase 1	10.1
0.281	43.7	60.8	-17.1	Phase 1	10.1
0.285	44.4	60.7	-16.3	Phase 2	10.1
0.425	37.8	57.4	-19.5	Phase 1	10.1
0.569	31.9	56.0	-24.1	Phase 1	10.1
0.776	31.0	56.0	-25.0	Phase 1	10.1
0.848	31.2	56.0	-24.8	Phase 1	10.1
1.203	34.1	56.0	-21.9	Phase 1	10.2
1.271	31.6	56.0	-24.4	Phase 1	10.2
1.838	30.7	56.0	-25.3	Phase 1	10.2
3.746	36.4	56.0	-19.6	Phase 2	10.3
3.993	35.9	56.0	-20.1	Phase 2	10.3
4.128	35.9	56.0	-20.1	Phase 2	10.3
4.632	35.9	56.0	-20.1	Phase 2	10.4
4.754	36.0	56.0	-20.0	Phase 2	10.4
4.889	36.1	56.0	-19.9	Phase 2	10.4
5.010	36.1	60.0	-23.9	Phase 2	10.4
5.136	35.6	60.0	-24.4	Phase 2	10.4
5.271	35.4	60.0	-24.6	Phase 2	10.4
5.393	35.0	60.0	-25.0	Phase 2	10.4
5.519	35.3	60.0	-24.7	Phase 2	10.4
5.640	34.6	60.0	-25.4	Phase 2	10.4
14.402	30.5	60.0	-29.5	Phase 1	10.7
14.469	32.0	60.0	-28.0	Phase 1	10.7
14.600	31.0	60.0	-29.0	Phase 1	10.7

4.4.3 Test Results (Continued)

Average Table					
Frequency (MHz)	AVG (dB μ V)	Lim. Average (dB μ V)	AVG-Lim (dB)	Phase	Correction (dB)
0.150	38.9	56.0	-17.1	Phase 1	10.2
0.150	37.8	56.0	-18.2	Phase 2	10.2
0.191	46.3	54.0	-7.8	Phase 1	10.2
0.191	46.2	54.0	-7.8	Phase 2	10.2
0.213	52.4	53.1	-0.7	Phase 1	10.2
0.213	52.6	53.1	-0.5	Phase 2	10.2
0.249	28.7	51.8	-23.1	Phase 2	10.1
0.281	37.3	50.8	-13.5	Phase 1	10.1
0.285	36.6	50.7	-14.1	Phase 2	10.1
0.317	32.8	49.8	-17.0	Phase 1	10.1
0.317	32.8	49.8	-17.0	Phase 2	10.1
0.425	31.3	47.4	-16.1	Phase 1	10.1
0.825	26.6	46.0	-19.4	Phase 1	10.1
0.951	25.7	46.0	-20.3	Phase 1	10.1
1.077	26.7	46.0	-19.3	Phase 1	10.1
1.203	27.0	46.0	-19.0	Phase 1	10.2
3.489	31.9	46.0	-14.1	Phase 2	10.3
3.615	31.7	46.0	-14.3	Phase 2	10.3
3.872	32.1	46.0	-13.9	Phase 2	10.3
3.998	31.8	46.0	-14.2	Phase 2	10.3
4.502	31.9	46.0	-14.1	Phase 2	10.3
4.628	31.8	46.0	-14.2	Phase 2	10.4
5.010	31.3	50.0	-18.7	Phase 2	10.4
5.136	30.6	50.0	-19.4	Phase 2	10.4
5.262	29.4	50.0	-20.6	Phase 2	10.4
5.393	29.1	50.0	-20.9	Phase 2	10.4
5.523	29.6	50.0	-20.4	Phase 2	10.4
6.783	19.7	50.0	-30.4	Phase 1	10.4
14.199	20.0	50.0	-30.0	Phase 1	10.7
14.577	21.0	50.0	-29.0	Phase 1	10.7
14.838	20.1	50.0	-29.9	Phase 1	10.7

Results: Complies by 0.5 dB

4.6.4 Test Setup Configuration



5.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model Tested/Type	Asset #	Cal Int	Cal Due
BI-Log Antenna	Teseq	CBL 6111D	ITS 01650	12	07/23/20
Preamp	Sonoma Preamp	310N	ITS 01714	12	11/11/20
EMI Receiver	Rohde & Schwarz	ESR7	ITS 01607	12	10/23/20
EMI Receiver	Rohde & Schwarz	ESU40	ITS 00961	12	11/07/20
Spectrum Analyzer	Rohde and Schwarz	FSU	ITS 00913	12	05/11/21
Pre-Amplifier	Miteq	TTA1840-35-S-M	ITS 01393	12	03/02/21
Active Horn Antenna	ETS Lindgren	3117PA	ITS 01636	12	02/24/21
Horn Antenna	EMCO	3160-09	ITS00571	12	#
Passive Loop Antenna	EMCO	6512	ITS 001598	12	10/22/20
RE Cable	TRU Corporation	TRU CORE 300	ITS 01462	12	08/27/20
RE Cable	TRU Corporation	TRU CORE 300	ITS 01465	12	08/27/20
RE Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	08/27/20
RF Cable	TRU Corporation	TRU CORE 300	ITS 01342	12	10/07/20
Notch Filter	MICRO-TRONICS	BRM50702	ITS 01166	12	06/11/21
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01537	12	04/17/21
10 dB Attenuator	Mini Circuits	BW-S10W5+	ITS 01582	12	10/07/20
RF Cable	Mega Phase	TM40-K1K1-59	ITS 01655	12	07/29/20
LISN	Fischer Custom	FCC-LISN-50-50-	ITS 00551	12	11/13/20
10m chamber	Panashield	10m Semi-	ITS 00984	36	09/11/21

No Calibration required

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
Tile	Quantum Change	3.4.K.22	Conducted Spurious_30M-26GHz
BAT-EMC	Nexio	3.19.0.19	Philips, ML_07-2019.bpp
RS Commander	Rohde Schwarz	1.9.3	Not Applicable (Screen grabber)

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewers Initials	Date	Change
1.0 / G104293906	ML	KV	June 26, 2020	Original document
2.0 / G104293906	ML	KV	October 05, 2020	Added Radiated Spurious Emission 9kHz – 30MHz.