TEST REPORT

Report Number: 104106572MPK-002
Project Number: G104106572

Report Issue Date: April 19, 2020
Revision Issue Date: November 11, 2021

Testing performed on
Implant Charger
Model: 31102
Part Number: PD-00035-002

FCC ID: 2AVN4-31102
IC: 26010-31102

to

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

For

Galvani Bioelectronics

Test Performed by:	Test Authorized by:
Intertek	Galvani Bioelectronics
1365 Adams Court	269 E Grand Ave
Menlo Park, CA 94025 USA	South San Francisco, CA 94080 USA

Prepared by: Aaron Chang **Date:** April 19, 2020

Aaron Chang

Reviewed by: **Date:** April 19, 2020

Krishna K Vemuri

Report No. 104106572MPK-002	
Equipment Under Test:	Implant Charger
Trade Name:	Galvani Bioelectronics
Model Number:	31102
Part Number:	PD-00035-002
Applicant:	Galvani Bioelectronics
Contact:	Rizwan Bashirullah
Address:	Galvani Bioelectronics 269 E Grand Ave South San Francisco, CA 94080
Country:	USA
Tel. Number:	(919) 696-1039
Email:	rizwan.x.bashirullah@galvani.bio
Applicable Regulation:	FCC Part 15 Subpart C (15.247) Industry Canada RSS-247 Issue 2
Date of Test:	January 13 to April 05, 2020

We attest to the accuracy of this report:

Aaron Chang
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	Not Applicable – EUT is battery operated
Antenna Requirement	15.203	RSS-GEN	Complies (Internal Antenna)

EUT receive date: January 13, 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: January 13, 2020

Test completion date: April 05, 2020

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

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2.0 General Information

2.1 Product Description

Galvani Bioelectronics supplied the following description of the EUT:

The Implant Charger is a wireless charger to charge the Implantable Pulse Generator (IPG). It only wirelessly charges in battery mode.

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

Information about the 2.4 GHz radio is presented below:

Applicant	Galvani Bioelectronics
Model No.	31102
FCC Identifier	2AVN4-31102
IC Identifier	26010-31102
Type of transmission	Digital Transmission System (DTS)
Rated RF Output	-2.87 dBm
Antenna(s) & Gain	Internal Antenna, Peak Gain: 1.1 dBi
Frequency Range	2402 – 2480 MHz
Type of modulation/data rate	GFSK / 1Mbit/s
Number of Channel(s)	40
Applicant Name & Address	Galvani Bioelectronics 269 E Grand Ave South San Francisco, CA 94080 USA

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	-	-	-

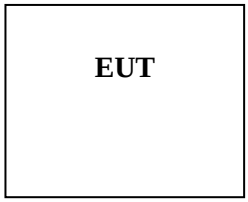
3.0 System Test Configuration

3.1 Support Equipment

No Support Equipment was used.

3.2 Block Diagram of Test Setup

Equipment Under Test			
Description	**Manufacturer**	**Part Number**	**Serial Number**
Radiated Sample of Implant Charger	Galvani Bioelectronics	PD-00035-002	00000117



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

3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table.

The Implant Charger has the same BLE circuitry of the IPG. The conducted measurements were taken from the IPG. See report 104106572MPK-001 for details.

3.4 Software Exercise Program

The test mode firmware version 01.13.30 was used during testing. This information was provided by Galvani Bioelectronics.

3.5 Mode of Operation during Test

As instructed by the manufacturer, the EUT's power setting was set to 0 dBm on the low, middle and high frequencies/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) ≥ 3 x 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.

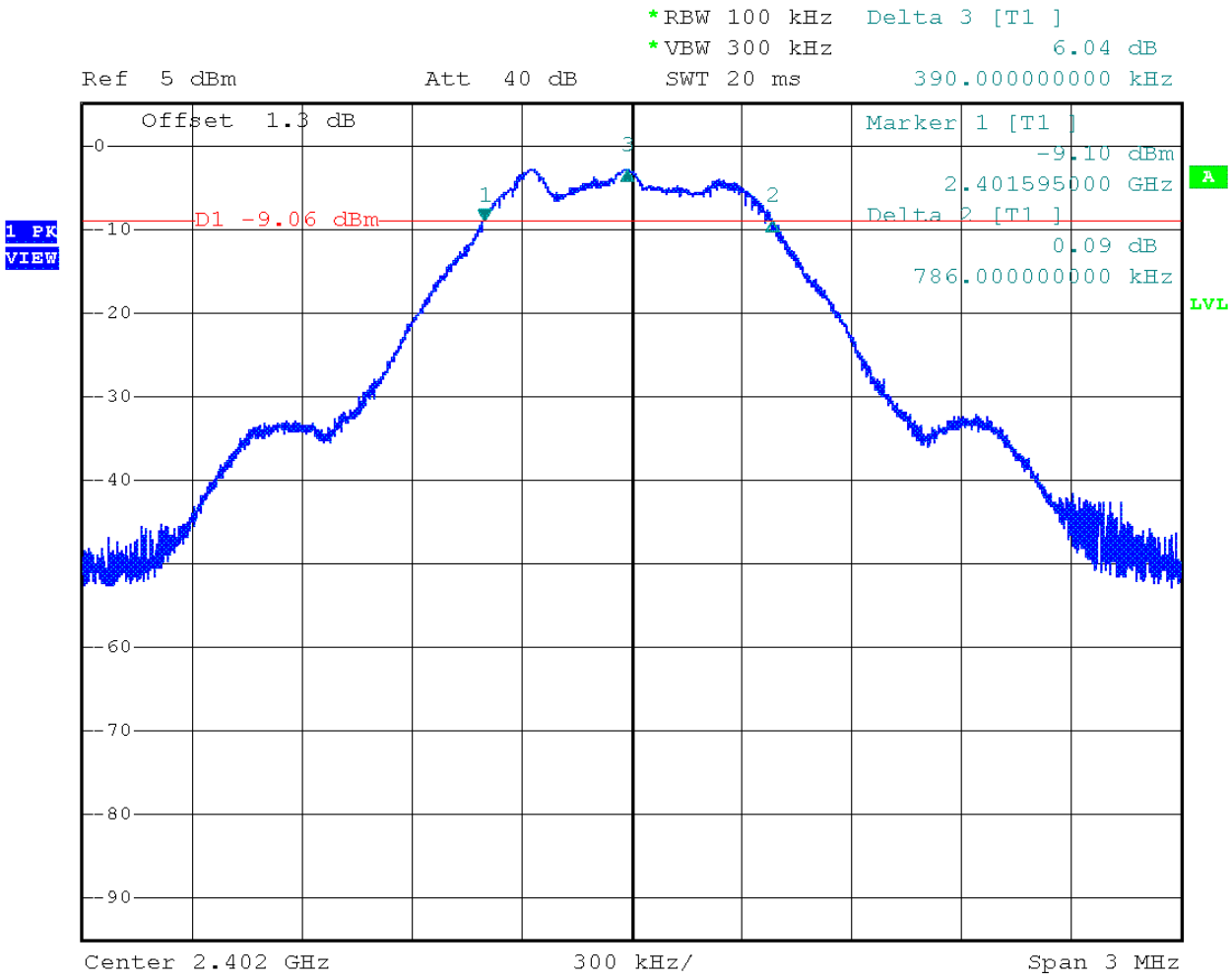
For 99% power bandwidth measurement, the bandwidth was determined by using the built-in 99% occupied bandwidth function of the spectrum analyzer. The resolution bandwidth is set to 1% of the selected span as is without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth.

4.1.3 Test Result

Frequency (MHz)	**6-dB bandwidth FCC 15.247 & RSS-GEN**	**Occupied bandwidth, RSS-GEN**	**Plot**
MHz	kHz	MHz	
2402	786.000	--	1.1
	--	1.024	1.4
2440	792.000	--	1.2
	--	1.026	1.5
2480	774.000	--	1.3
	--	1.032	1.6

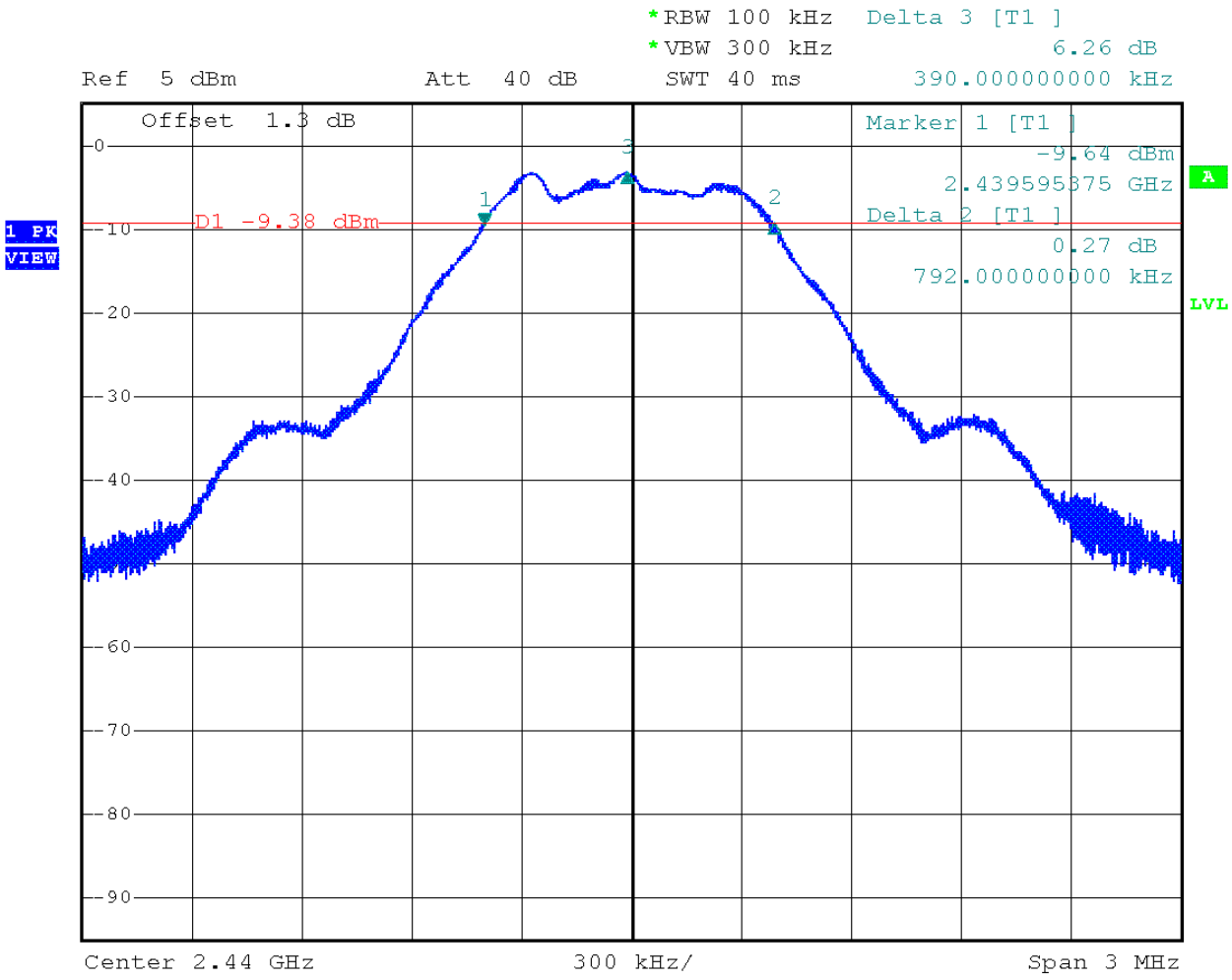
Tested By	**Test Date**
Aaron Chang	January 14, 2020

Plot 1. 1



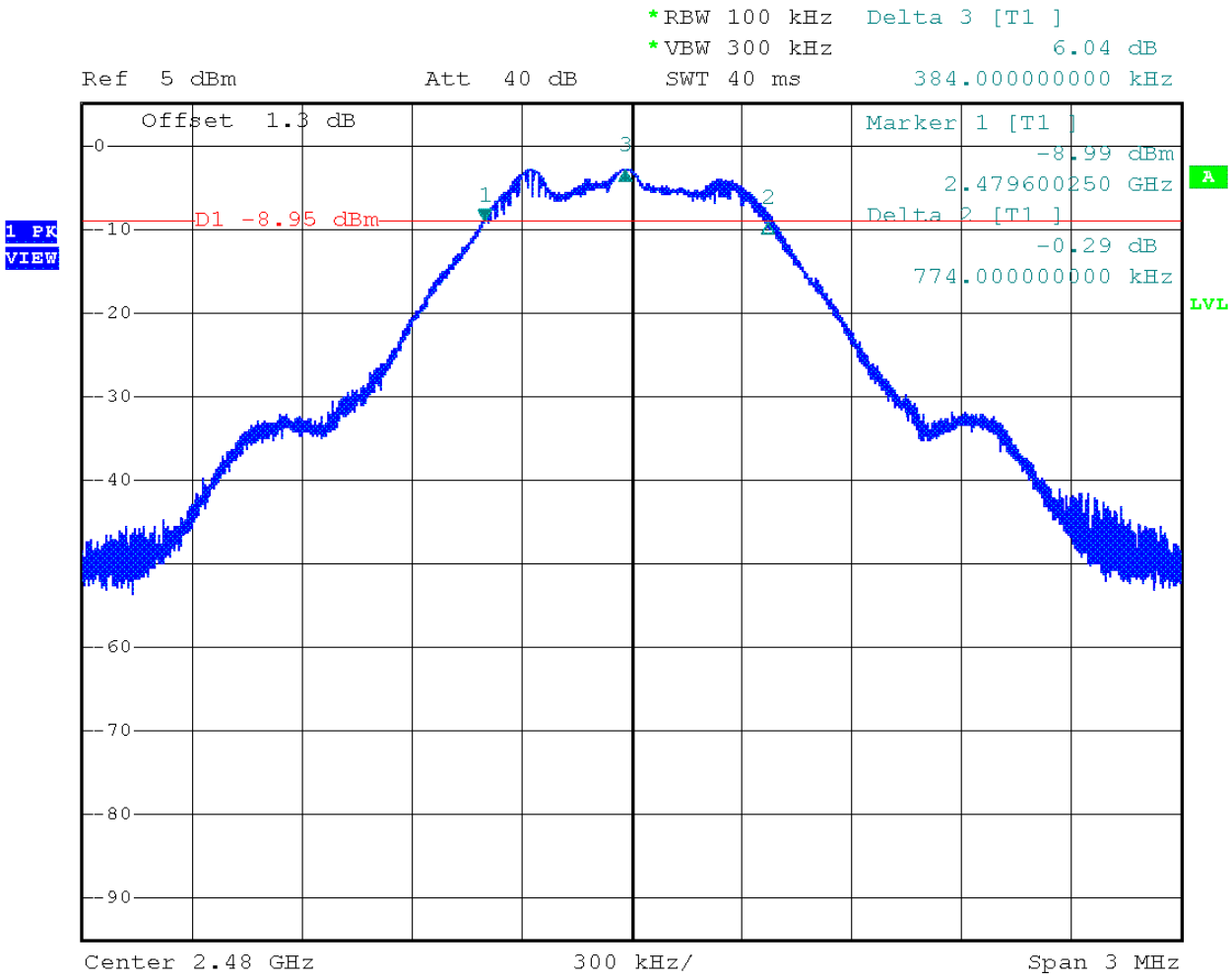
Date: 14.JAN.2020 01:10:32

Plot 1. 2



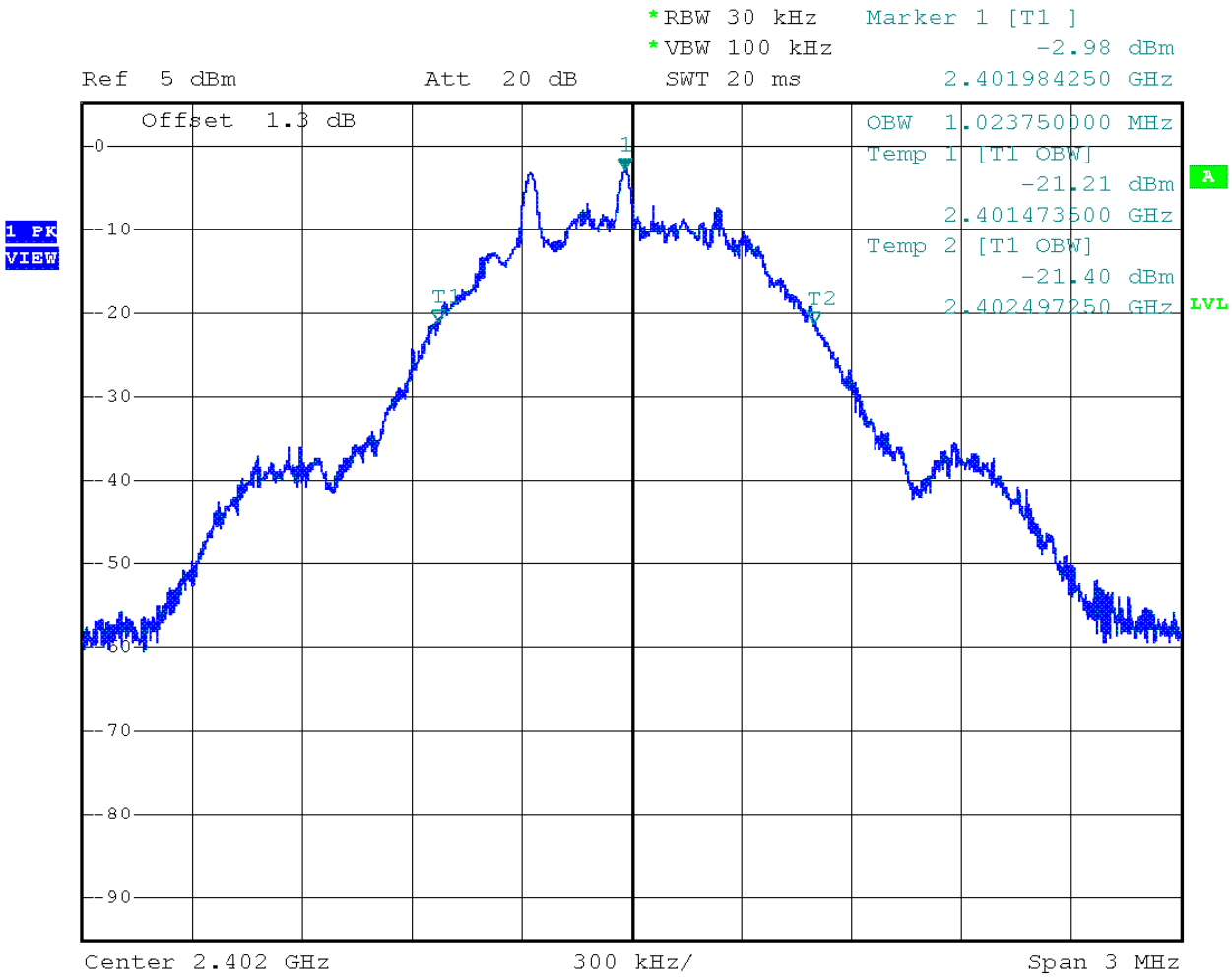
Date: 14.JAN.2020 02:41:15

Plot 1. 3



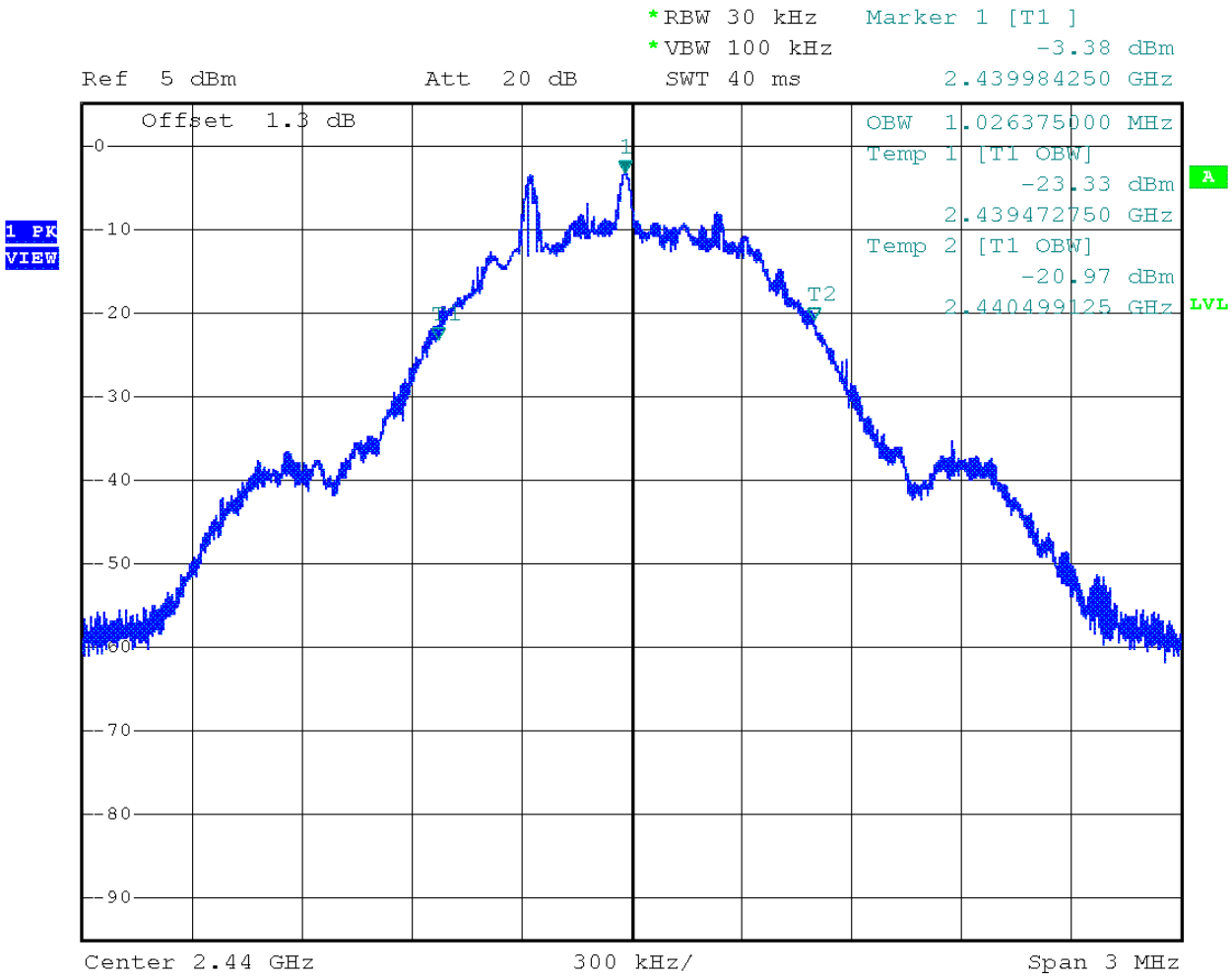
Date: 14.JAN.2020 02:20:16

Plot 1. 4



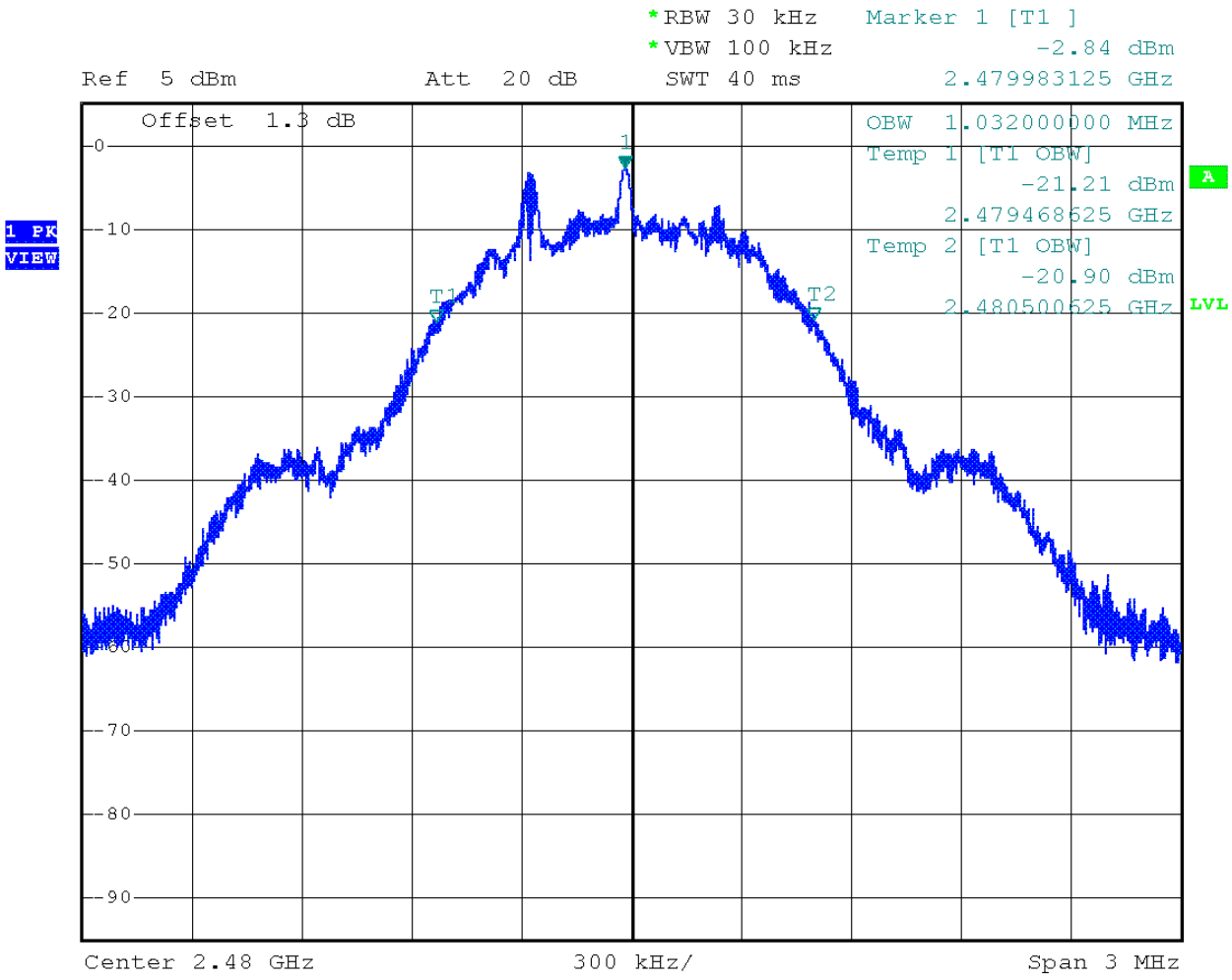
Date: 14.JAN.2020 01:12:33

Plot 1.5



Date: 14.JAN.2020 02:28:51

Plot 1.6



Date: 14.JAN.2020 02:25:42

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 ≥ DTS bandwidth in ANSI 63.10.

1. Set the RBW ≥ DTS Bandwidth
2. Set the VBW ≥ 3 x RBW
3. Set the span ≥ 3 x 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.

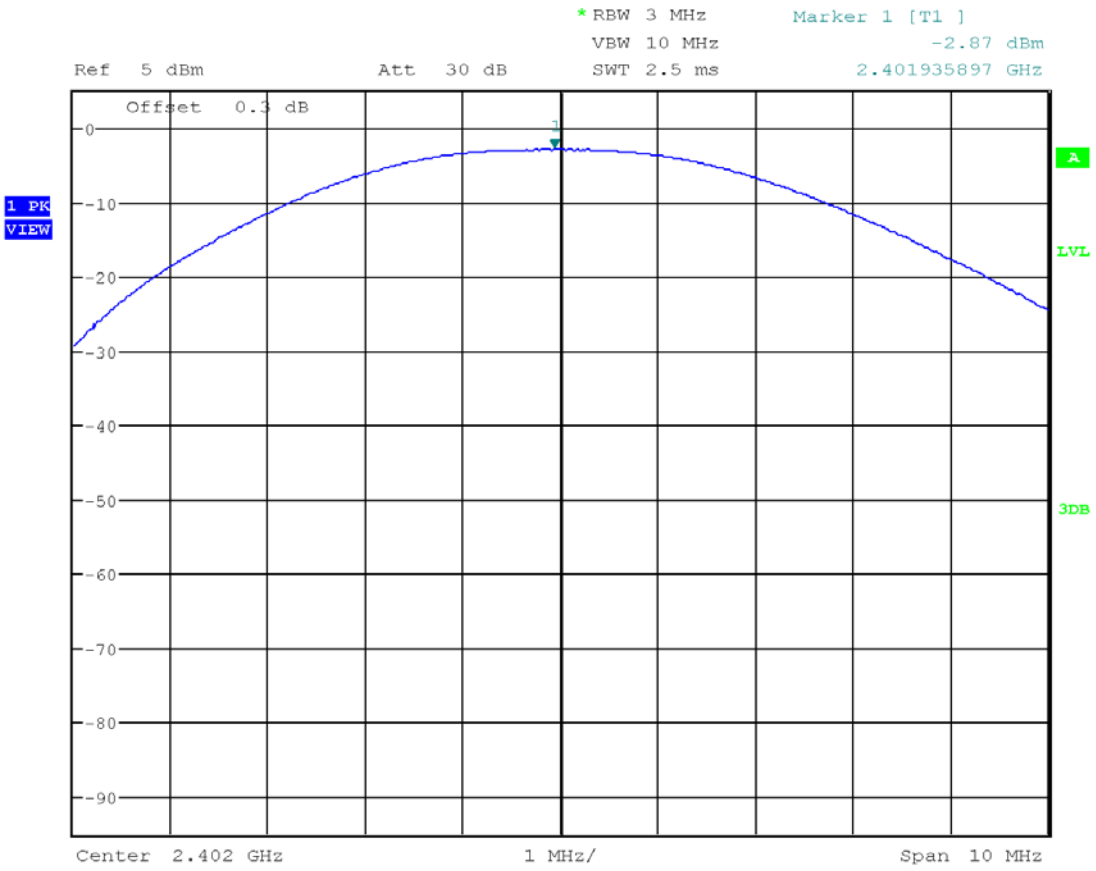
4.2.3 Test Result

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

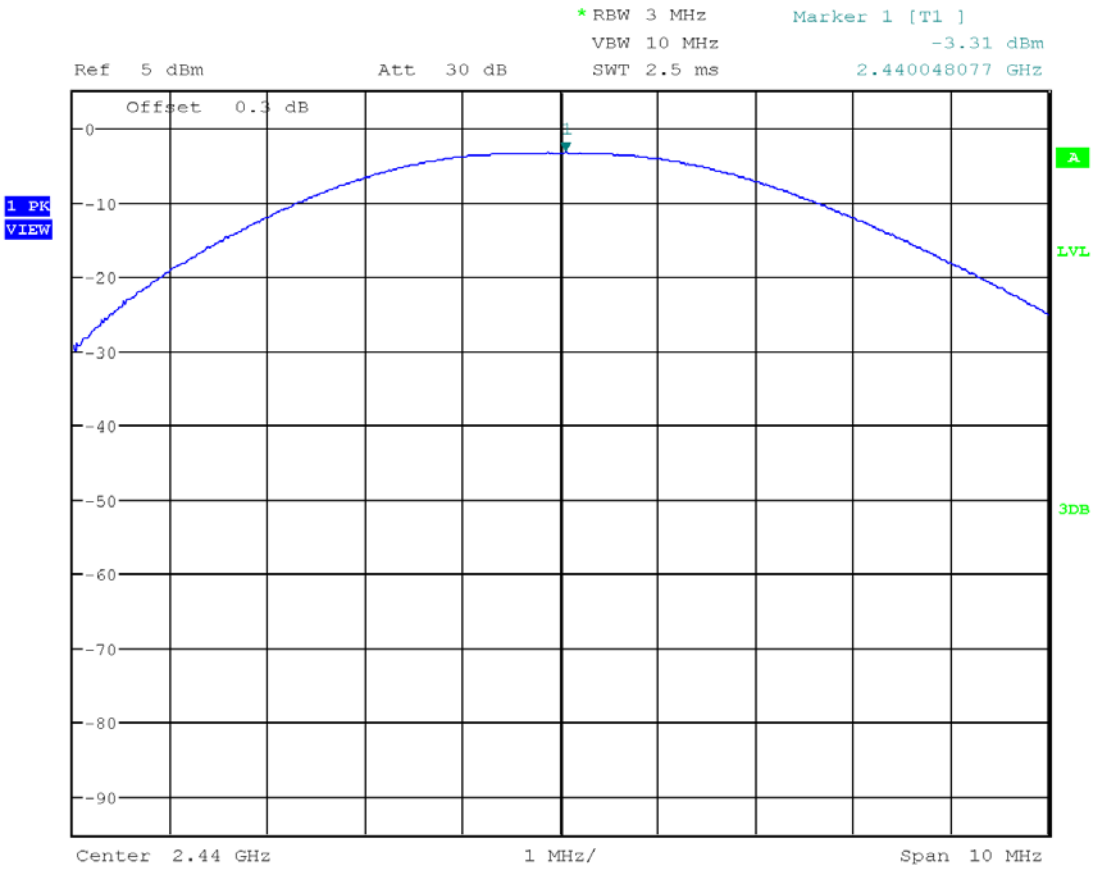
Frequency	**Conducted Power (peak)**		**Plot**
MHz	dBm	mW	
2402	-2.87	0.516	2.1
2440	-3.31	0.467	2.2
2480	-3.22	0.476	2.3

Tested By	**Test Date**
Aaron Chang	January 14, 2020

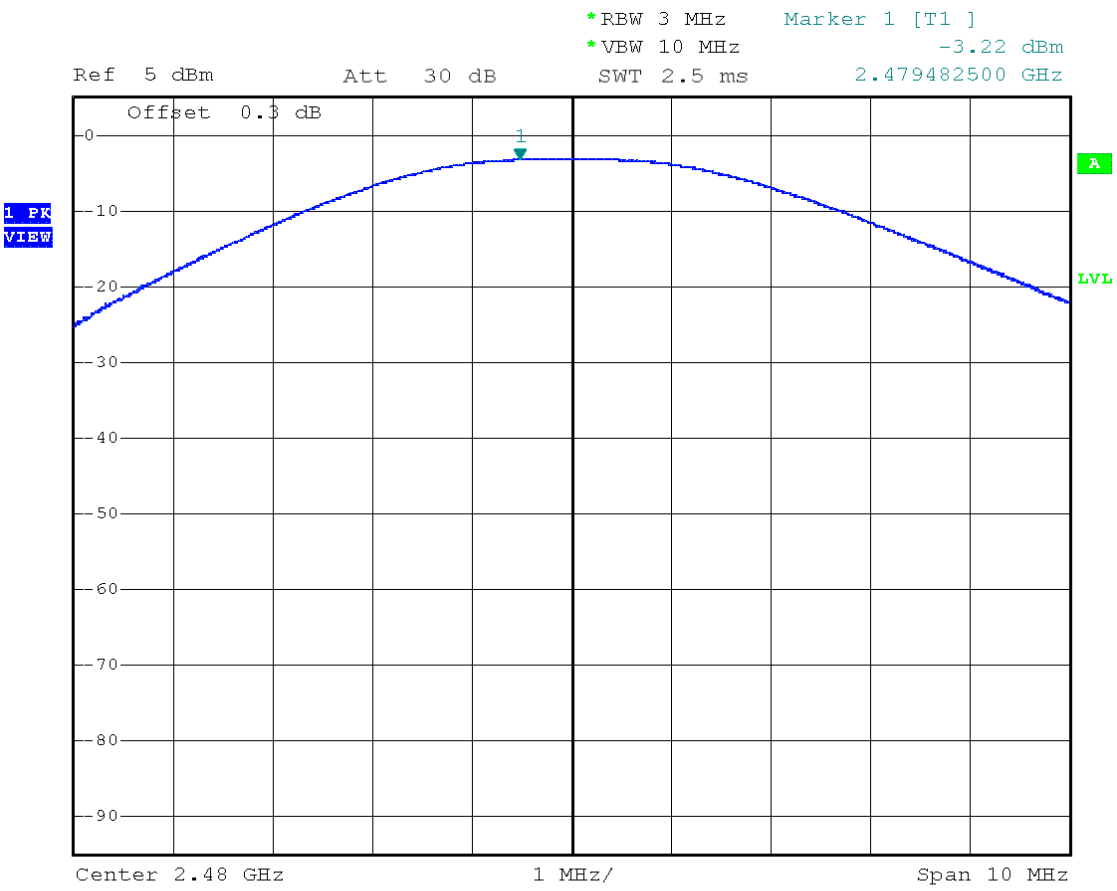
Plot 2. 1


*RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-2.87 dBm
2.401935897 GHz
Ref 5 dBm
Att 30 dB
Offset 0.3 dB
1 PK
VIEW
A
LVL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
1 MHz/
Span 10 MHz

Plot 2. 2


* RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-3.31 dBm
2.440048077 GHz
Ref 5 dBm
Att 30 dB
Offset 0.3 dB
1 PK
VIEW
A
LVL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.44 GHz
1 MHz/
Span 10 MHz

Plot 2. 3


*RBW 3 MHz
*VBW 10 MHz
Marker 1 [T1]
-3.22 dBm
2.479482500 GHz
Ref 5 dBm
Att 30 dB
SWT 2.5 ms
Offset 0.3 dB
1 PK
VIEW
A
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
1 MHz/
Span 10 MHz

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 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x 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.

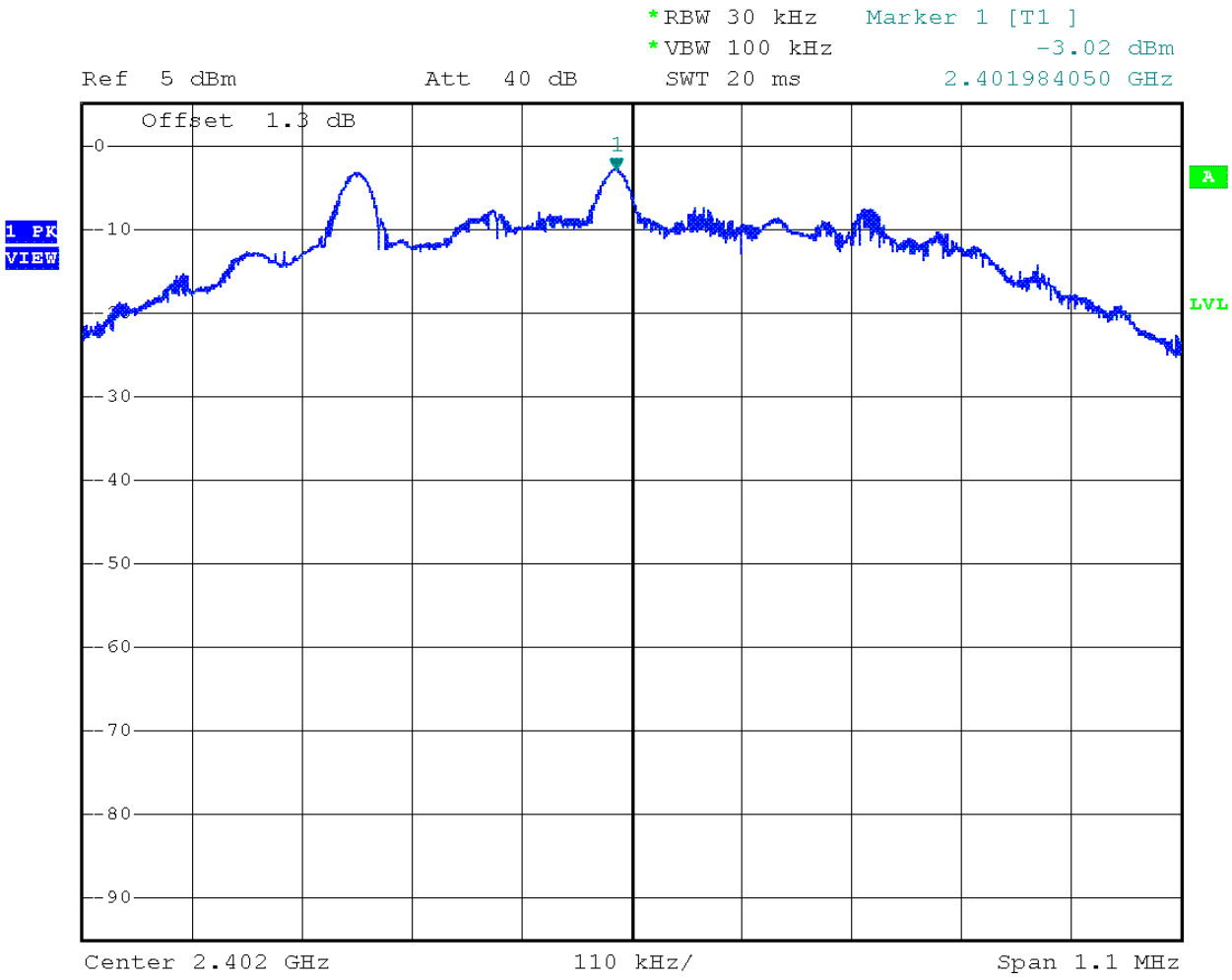
4.3.3 Test Result

Refer to the following plots for the test result

Frequency,	Maximum Power Spectral Density	Maximum Power Spectral Density Limit	Margin	Plot
MHz	dBm	dBm	dB	
2402	-3.02	8.0	-11.02	3.1
2440	-3.34	8.0	-11.34	3.2
2480	-3.96	8.0	-11.96	3.3

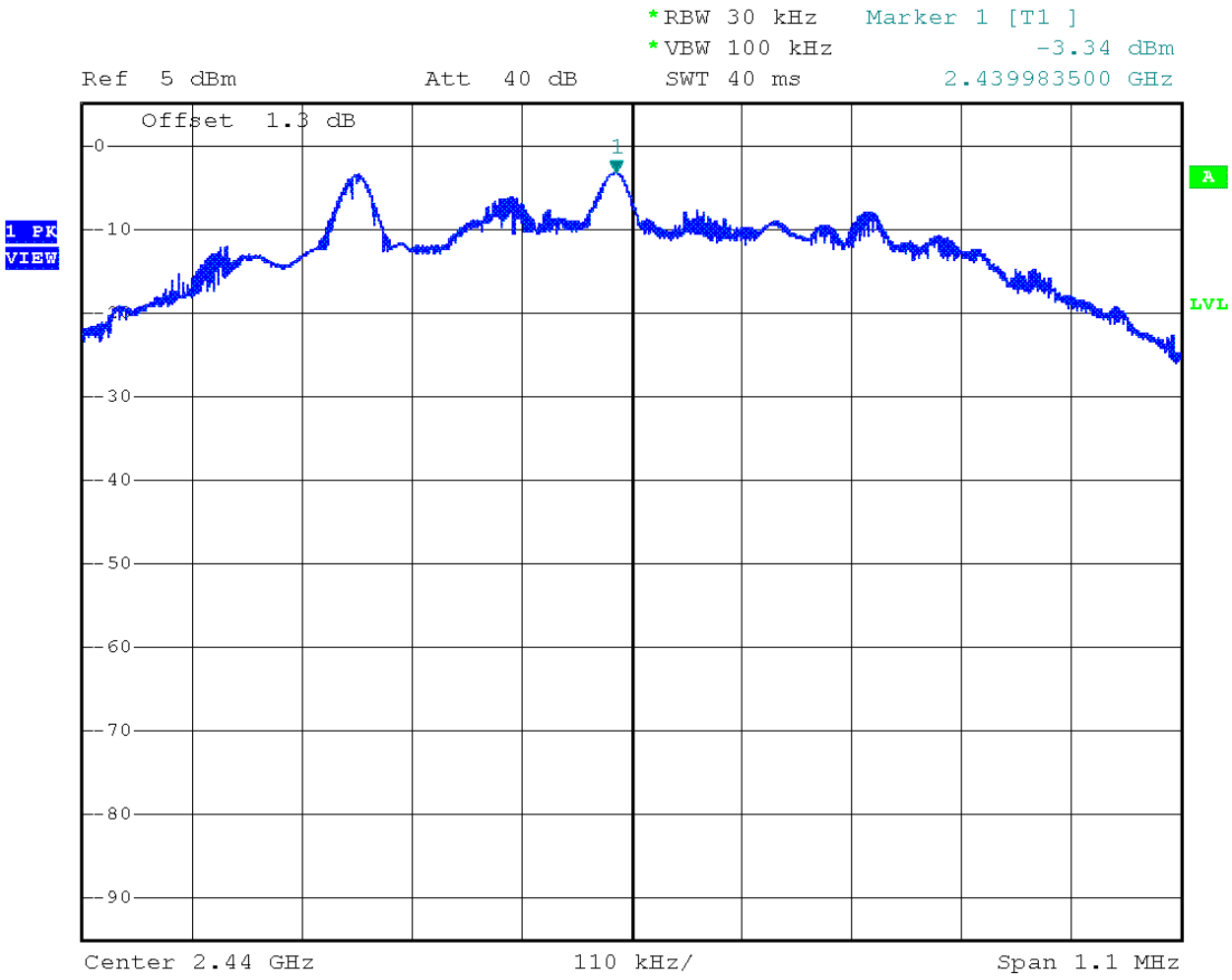
Tested By	Test Date
Aaron Chang	January 14, 2020

Plot 3. 1



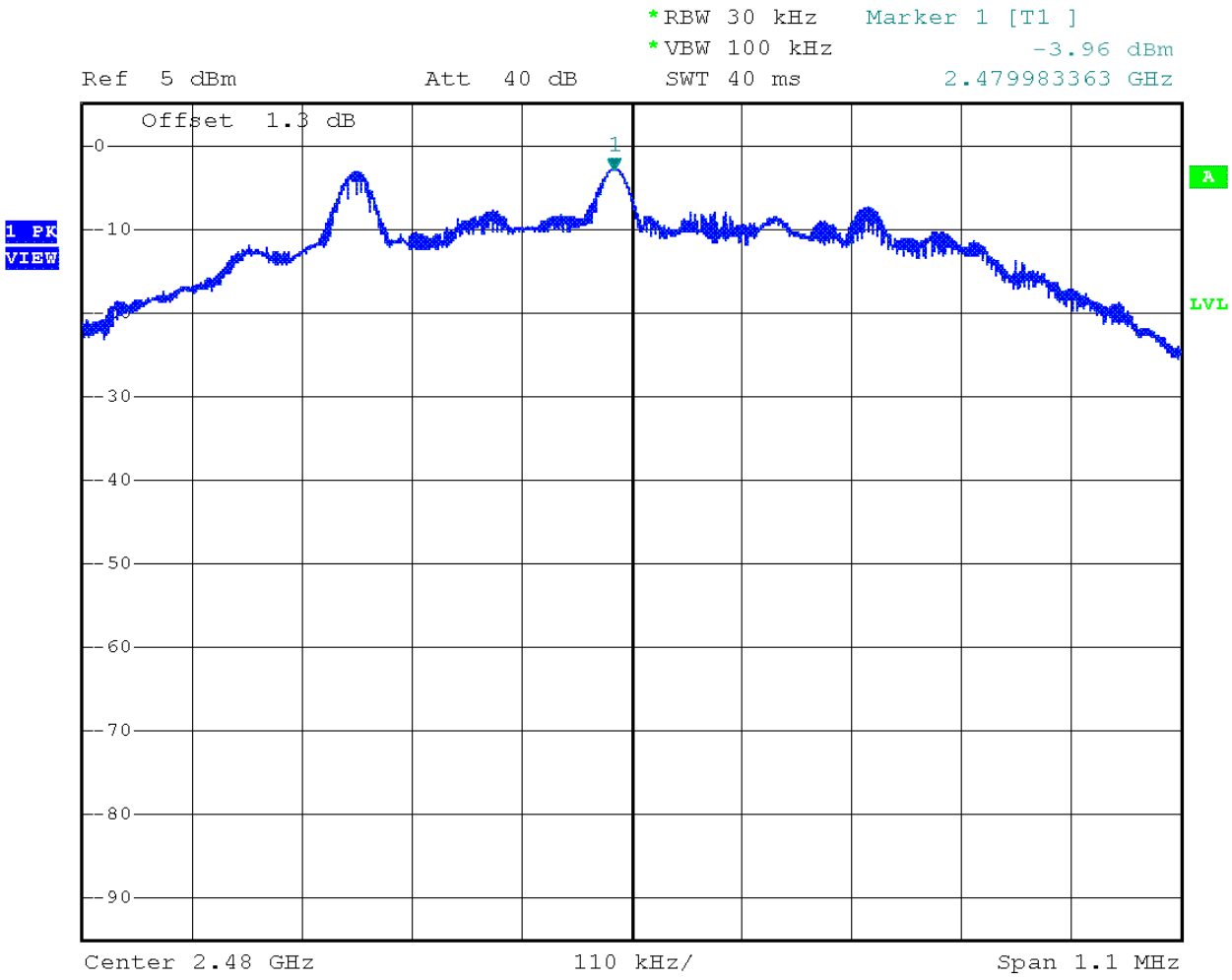
Date: 14.JAN.2020 01:08:46

Plot 3. 2



Date: 14.JAN.2020 02:31:03

Plot 3. 3



Date: 14.JAN.2020 02:24:23

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 ≥ 3 x 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.

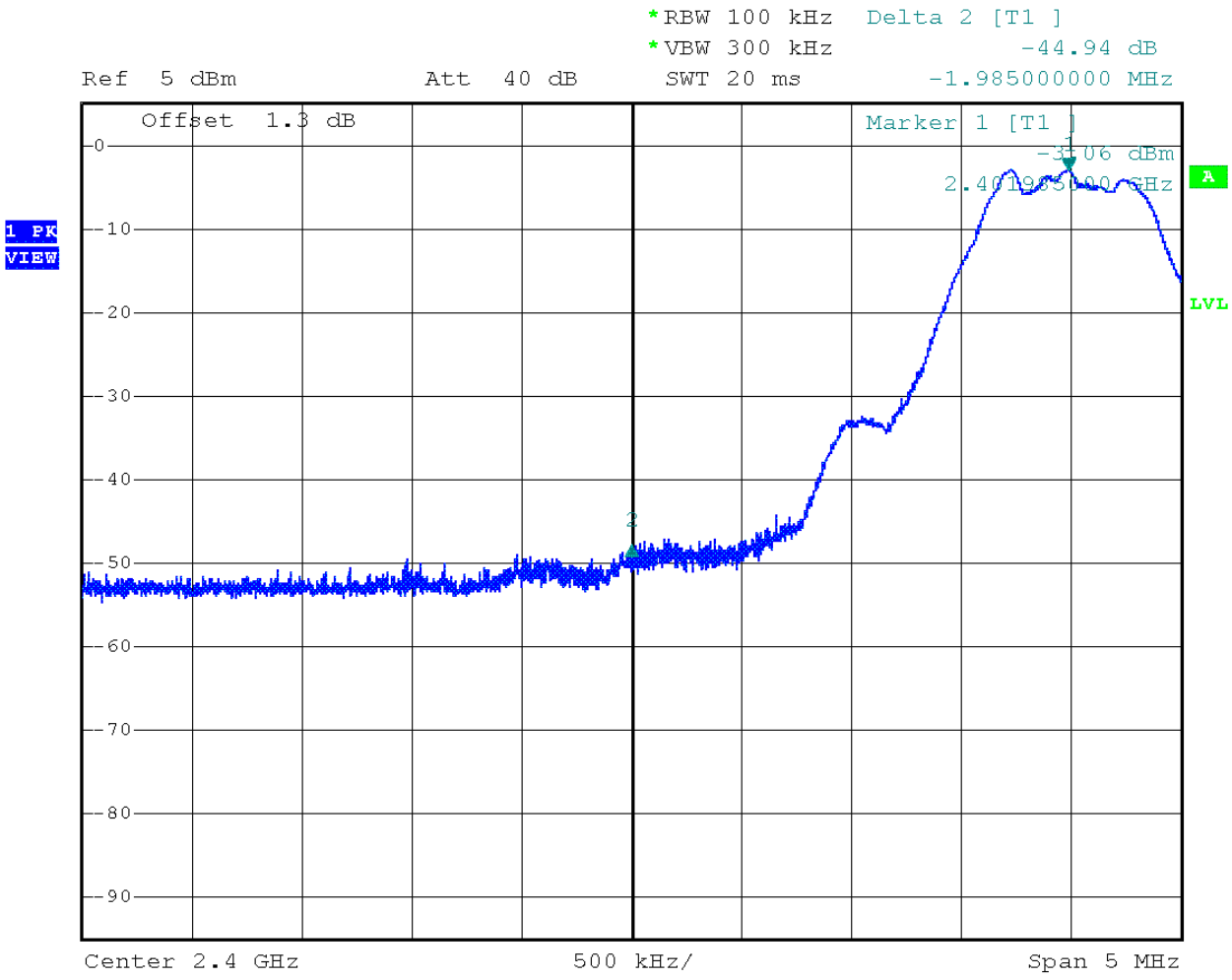
The unwanted emissions were measured from 30 MHz to 25 GHz. Plots below are corrected for cable loss and then compared to the limits.

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.

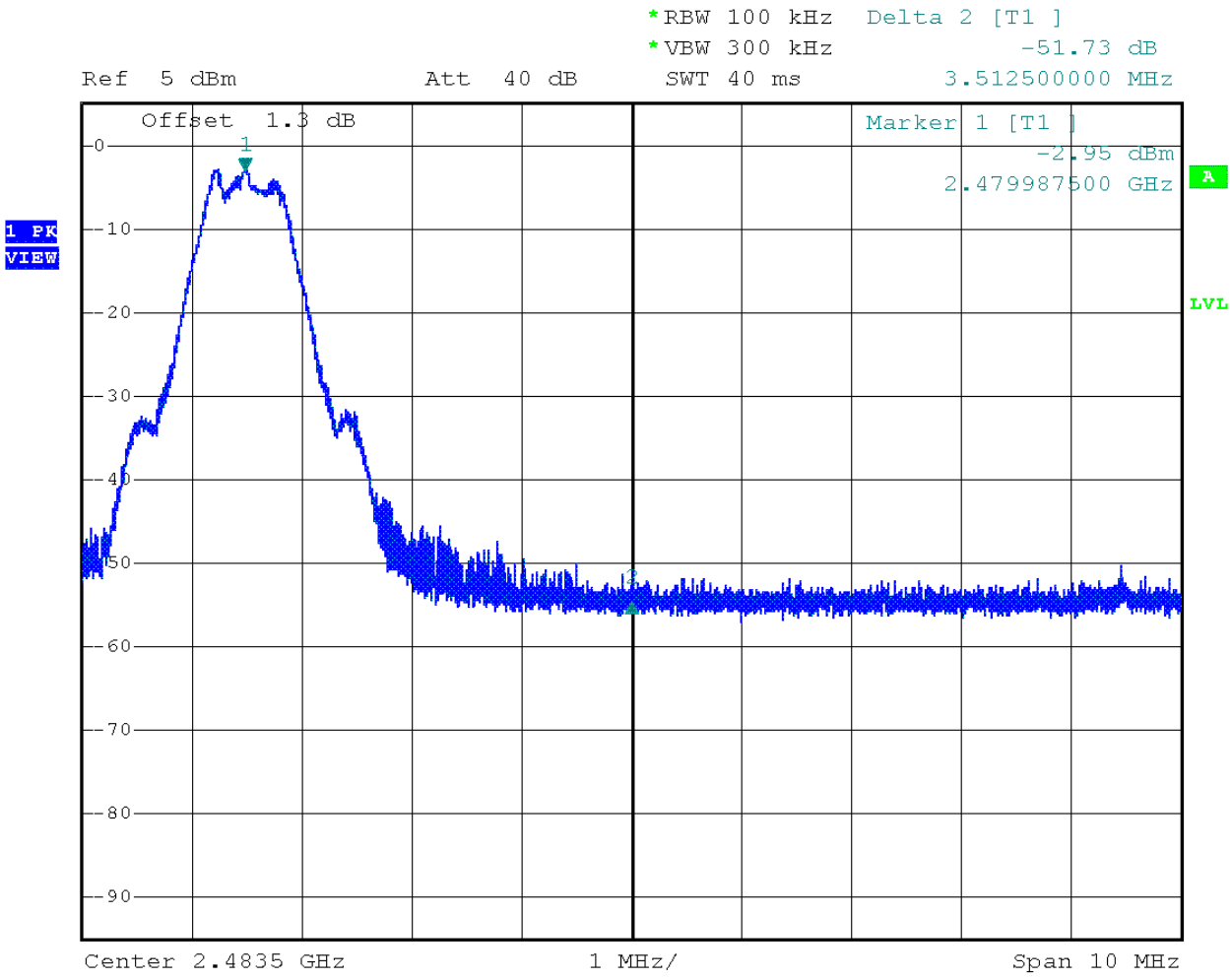
Tested By	Test Date
Aaron Chang	January 14, 2020

Tx @ Low Channel, 2400 MHz Band Edge
Plot 4.1



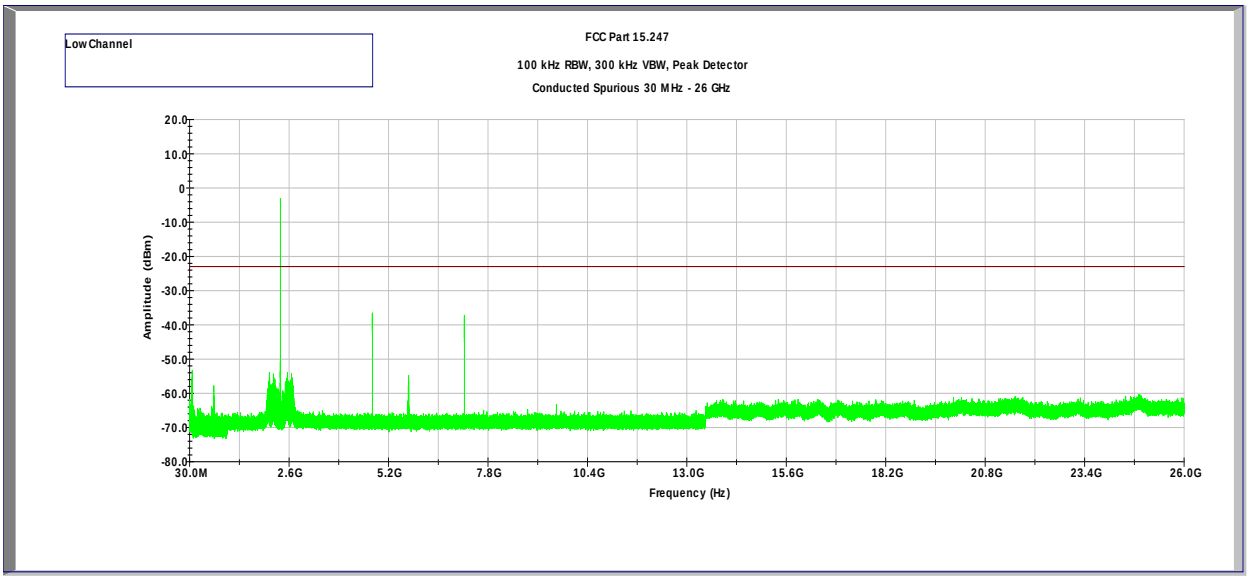
Date: 14.JAN.2020 01:22:25

Tx @ Low Channel, 2483.5 MHz Band Edge
Plot 4.2

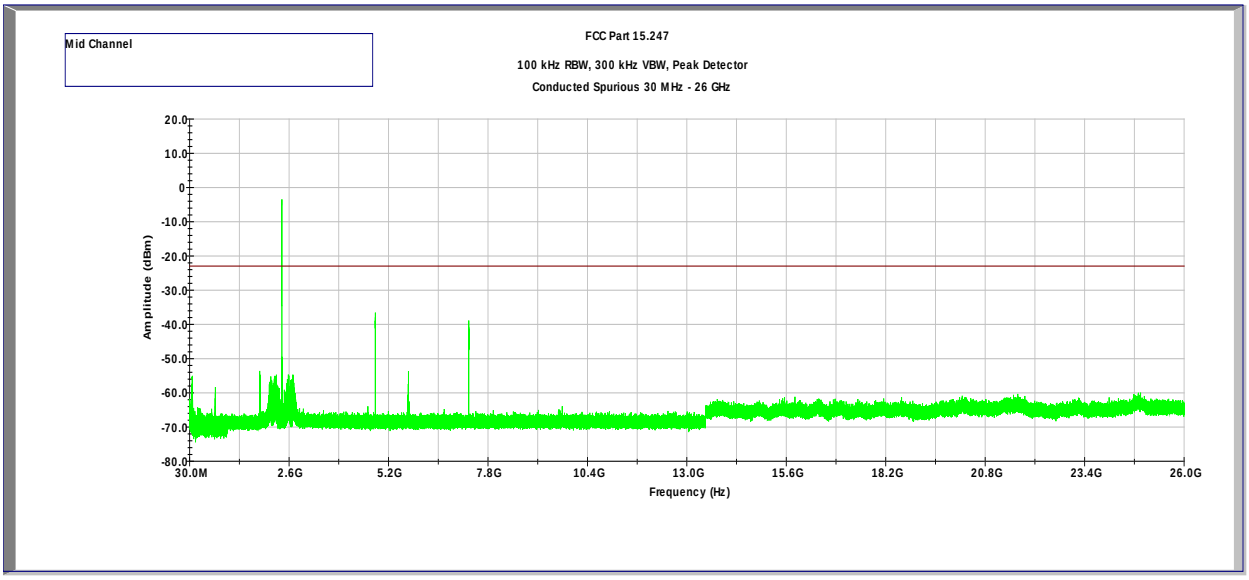


Date: 14.JAN.2020 02:22:06

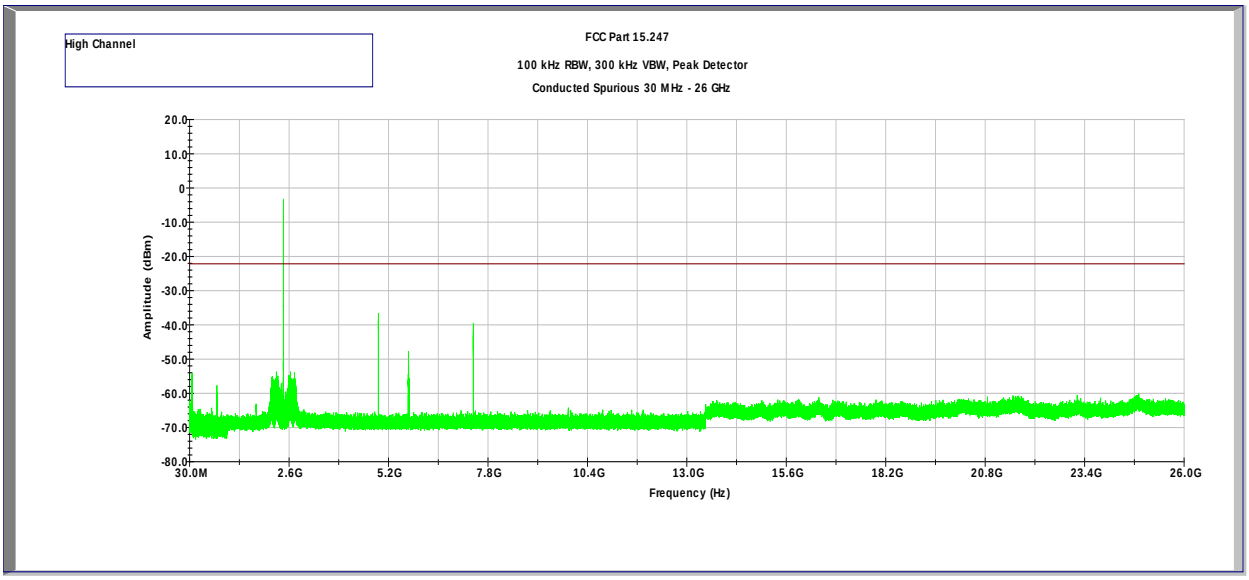
Tx @ Low Channel, 2402 MHz
30MHz -26GHz Conducted Spurious
Plot 4.3



Tx @ Mid Channel, 2440 MHz
30MHz -26GHz Conducted Spurious
Plot 4.4



Tx @ High Channel, 2480 MHz
30MHz -26GHz 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 30 MHz 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 the X, Y and Z orientation of the EUT. Data is presented with the worst-case configuration (the configuration which resulted in the highest emission levels).

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(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV); 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(μV) 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(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.
RA = 52.0 dB(μV)
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(μV/m).
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m.

4.5.4 Antenna-port conducted measurements

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

4.5.5 General Procedure for conducted measurements in restricted bands

a) Measure the conducted output power (in dBm) using the detector specified for determining quasi-peak, peak, and average conducted output power, respectively.

b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)

c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).

d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (*e.g.*, Watts, mW).

e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:
E = EIRP – 20log D + 104.8+DCF (DCF for Average measurements)
where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.
DCF = Duty Cycle Correction Factor
f) Compare the resultant electric field strength level to the applicable limit.
g) Perform radiated spurious emission test

4.5.6 Test Results

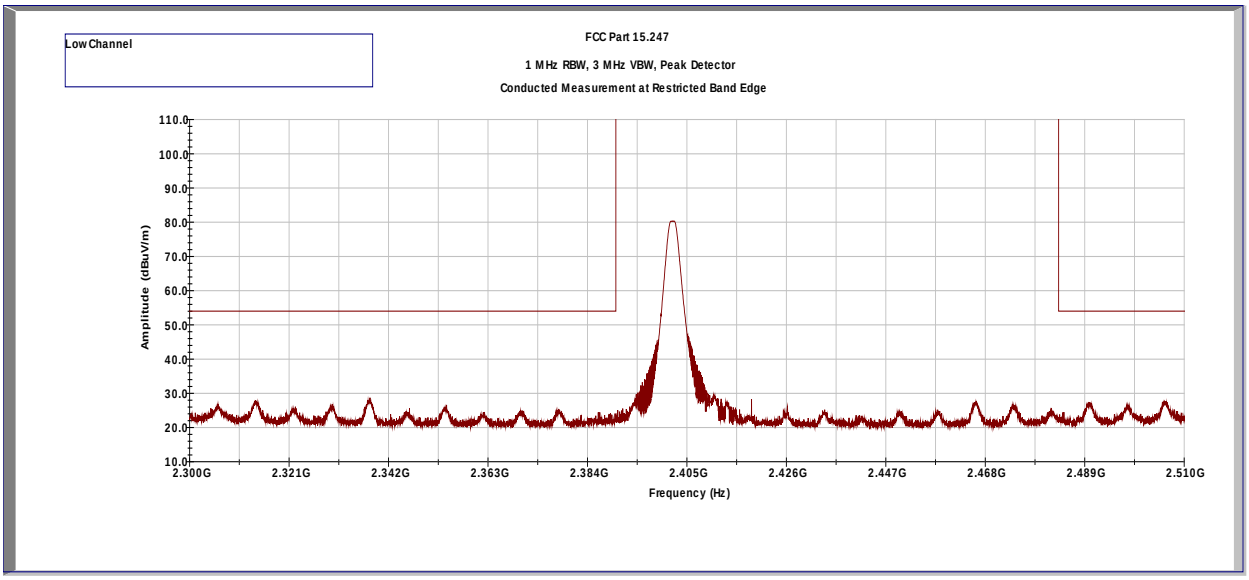
All testing in this section were performed by radiated measurements.

Tested By	Test Date
Aaron Chang	January 13 to April 05, 2020

Conducted Out-of-Band Spurious Emissions at the Band Edge were made with the consideration of cable loss and the addition of a 2dBi Antenna.

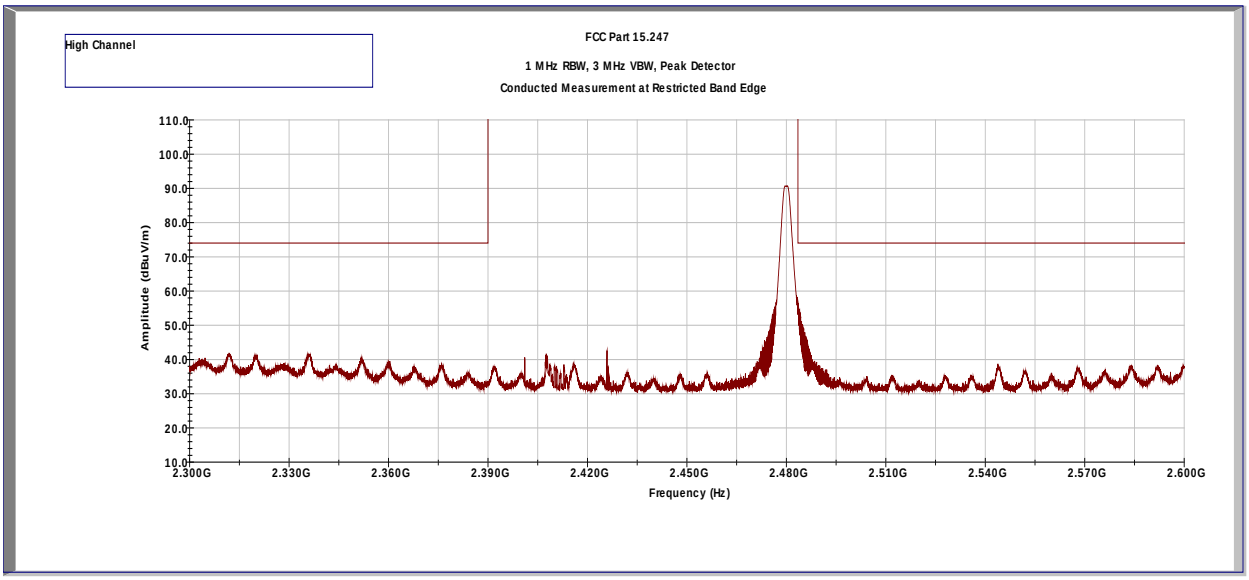
Test Results: 15.209/15.205 Radiated Restricted Band Emissions

Conducted Out-of-Band Spurious Emissions at the Band Edge – Tx @ 2402 MHz, Peak vs Avg Limits



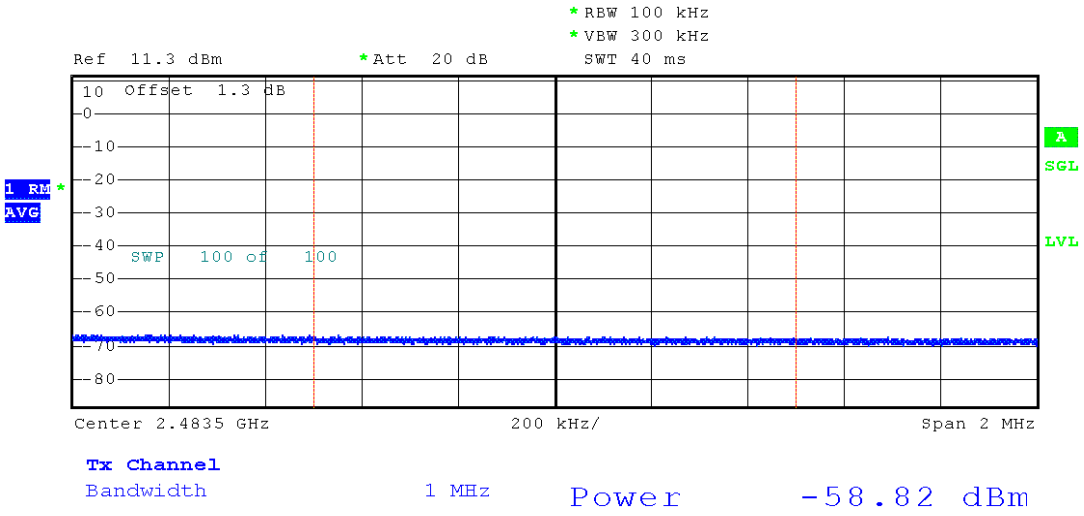
Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dB(µV/m)	dB(µV/m)	dB		
2.390	25.0	54	-29.0	Peak	Pass

Conducted Out-of-Band Spurious Emissions at the Band Edge – Tx @ 2480 MHz, Peak



Frequency	Corrected Amplitude	Peak Limit	Margin	Detector	Results
GHz	dB(µV/m)	dB(µV/m)	dB		
2.4835	56.5	74	-17.5	Peak	Pass

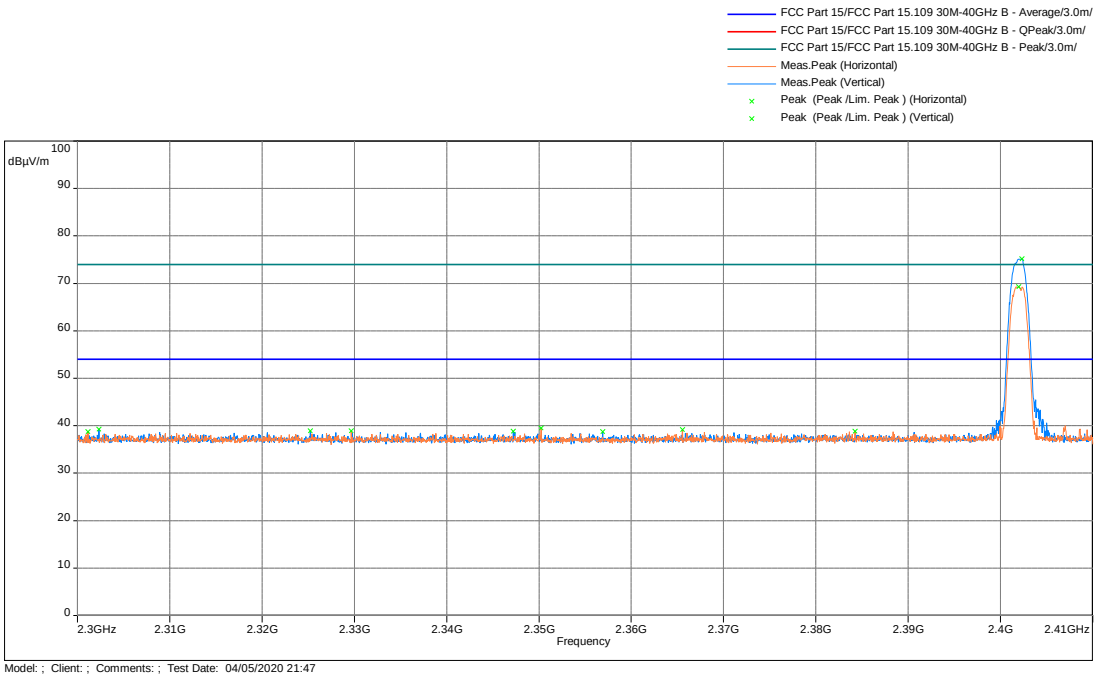
Conducted Out-of-Band Spurious Emissions at the Band Edge – Tx @ 2480 MHz, Average



Frequency	Corrected Amplitude	Avg Limit	Margin	Detector	Results
GHz	dB(µV/m)	dB(µV/m)	dB		
2.4835	36.44	54.00	-17.56	RMS	Pass

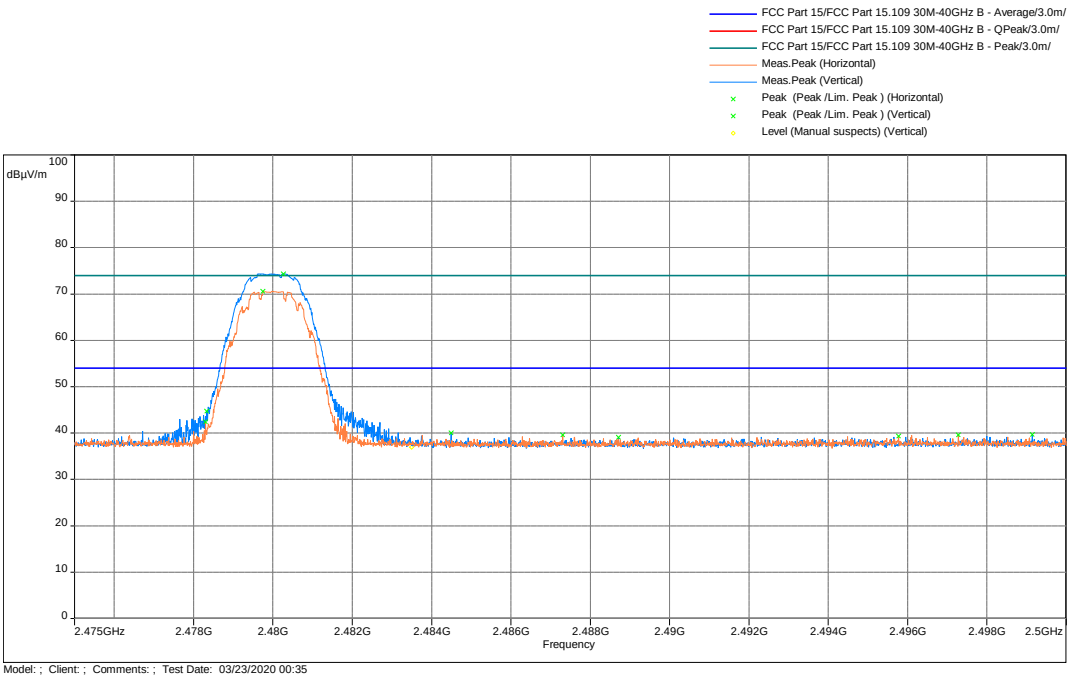
E_0 = EIRP – 20log(D) + 104.8, where D = 3 meters
E_0 = -58.82 – 9.54 + 104.8
E_0 = 36.44

Radiated Out-of-Band Spurious Emissions at the Band Edge, Cabinet Emissions
Tx @ 2402 MHz, Peak Detector vs Avg Limits



Freq. MHz	Peak@3m dB(uV/m)	Avg Limit dB(µV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2390	37.23	54	-16.77	3.00	65.75	Vertical	5.1

Radiated Out-of-Band Spurious Emissions at the Band Edge, Cabinet Emissions
Tx @ 2480 MHz, Peak Detector vs Avg Limits

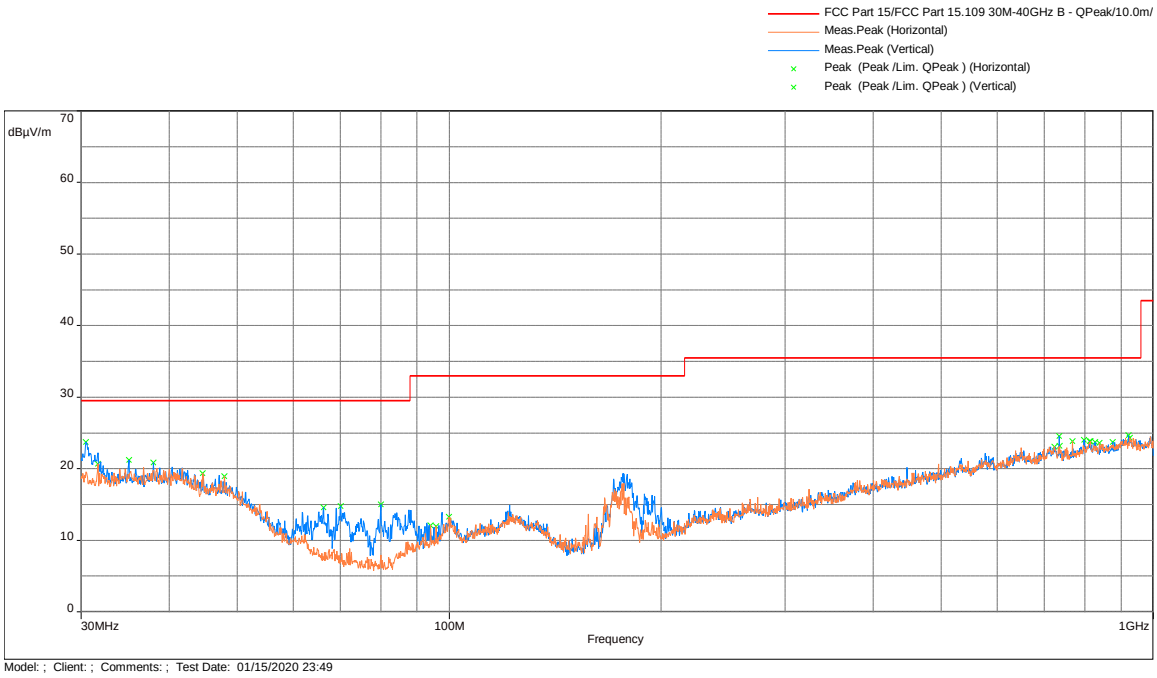


Freq. MHz	Peak@3m dB(uV/m)	Avg Limit dB(µV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	36.99	54	-17.01	3.99	356.5	Vertical	5.2

Out-of-Band Radiated Spurious Emissions

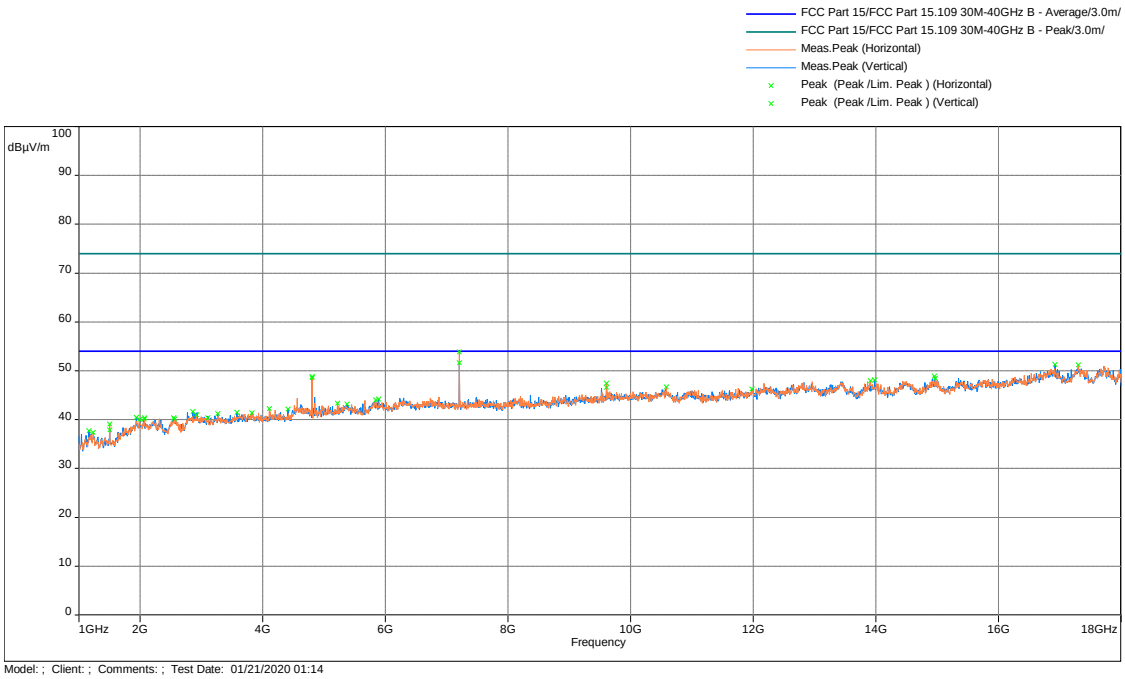
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



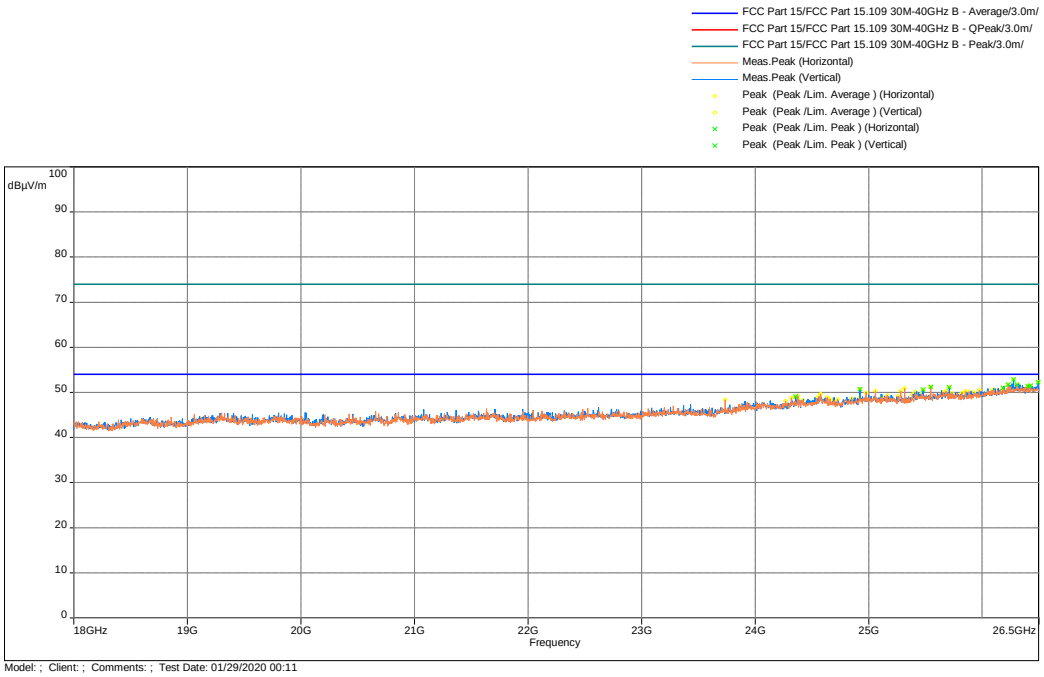
Model: ; Client: ; Comments: ; Test Date: 01/15/2020 23:49

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Average Limit



Model: ; Client: ; Comments: ; Test Date: 01/21/2020 01:14

Radiated Spurious Emissions 18 - 26 GHz, Peak Scan vs Peak & Average Limit



Freq. MHz	FS @ 10m QP dB(uV/m)	Limit @ 10m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
30.485	23.72	29.50	-5.78	131.00	4.00	Vertical	-6.75

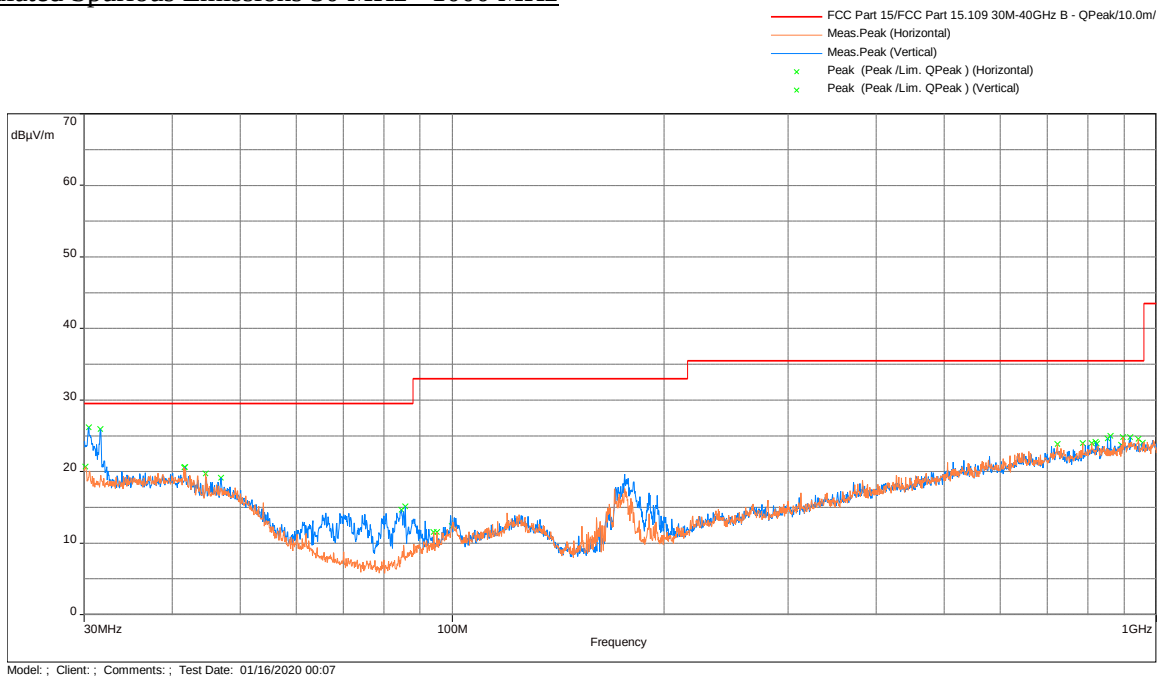
Freq. MHz	FS @ 3m Peak dB(uV/m)	FS @ 3m Avg dB(uV/m)	Limit @ 3m Peak/Avg dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
1878.333	50.63	--	54.00	-3.37	96.00	4.00	Vertical	-13.16
4804.033	49.12	--	54.00	-4.88	5.75	4.00	Vertical	-8.52
9607.667	48.31	--	54.00	-5.69	195.50	2.50	Vertical	-3.35
4804.600	48.09	--	54.00	-5.91	120.00	2.50	Horizontal	-8.52
7206.000	--	52.08	54.00	-1.92	204.50	1.15	Horizontal	-5.26
7206.000	53.68	--	74.00	-20.32	204.50	1.15	Horizontal	-5.26

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

Results	**Complies**

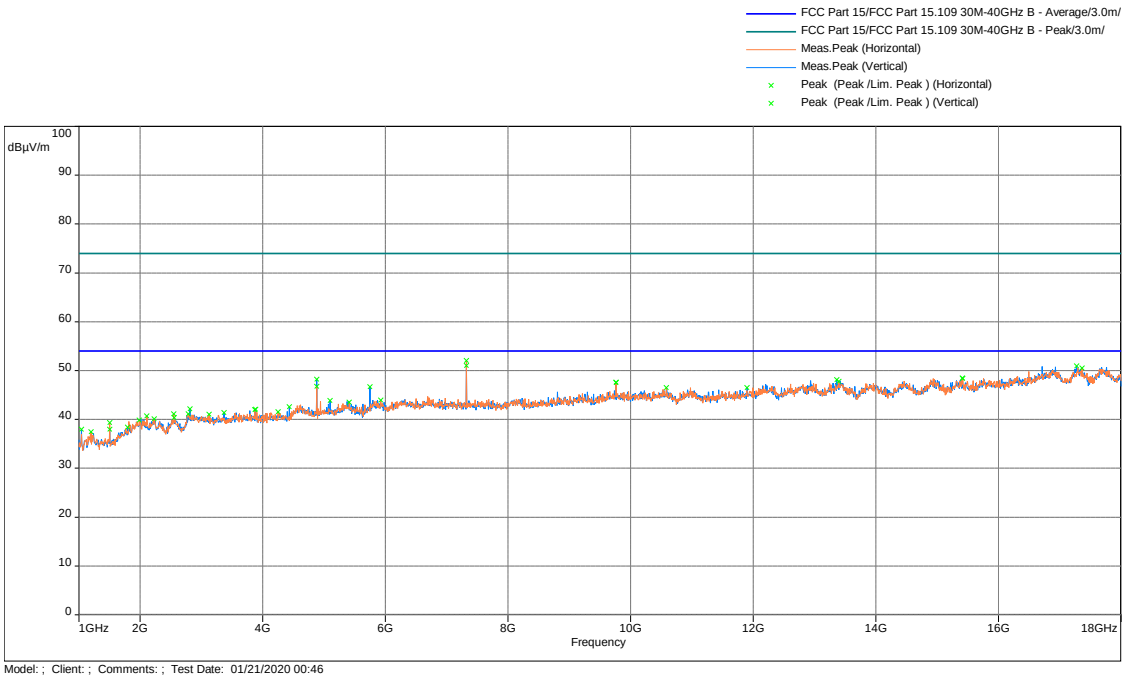
Test Results: 15.209 Radiated Spurious Emissions Mid Channel, Tx at 2440MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



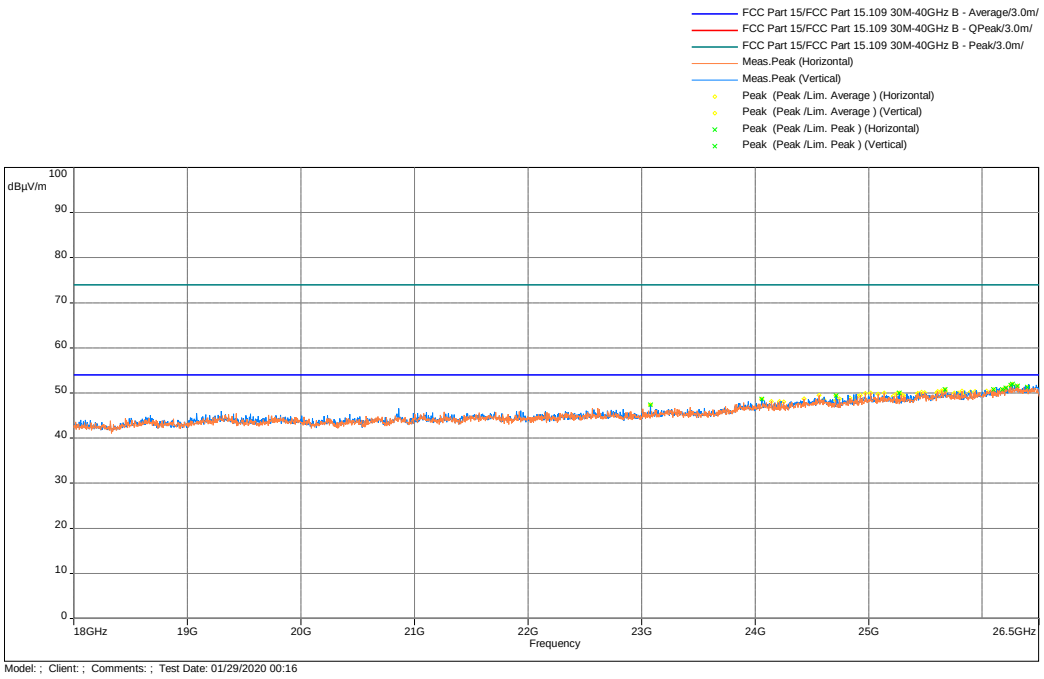
Model: ; Client: ; Comments: ; Test Date: 01/16/2020 00:07

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Average Limit



Model: ; Client: ; Comments: ; Test Date: 01/21/2020 00:46

Radiated Spurious Emissions 18 - 26 GHz, Peak Scan vs Peak & Average Limit



Freq. MHz	FS @ 10m QP dB(uV/m)	Limit @ 10m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
30.452	26.16	29.50	-3.34	201.50	1.00	Vertical	-6.75

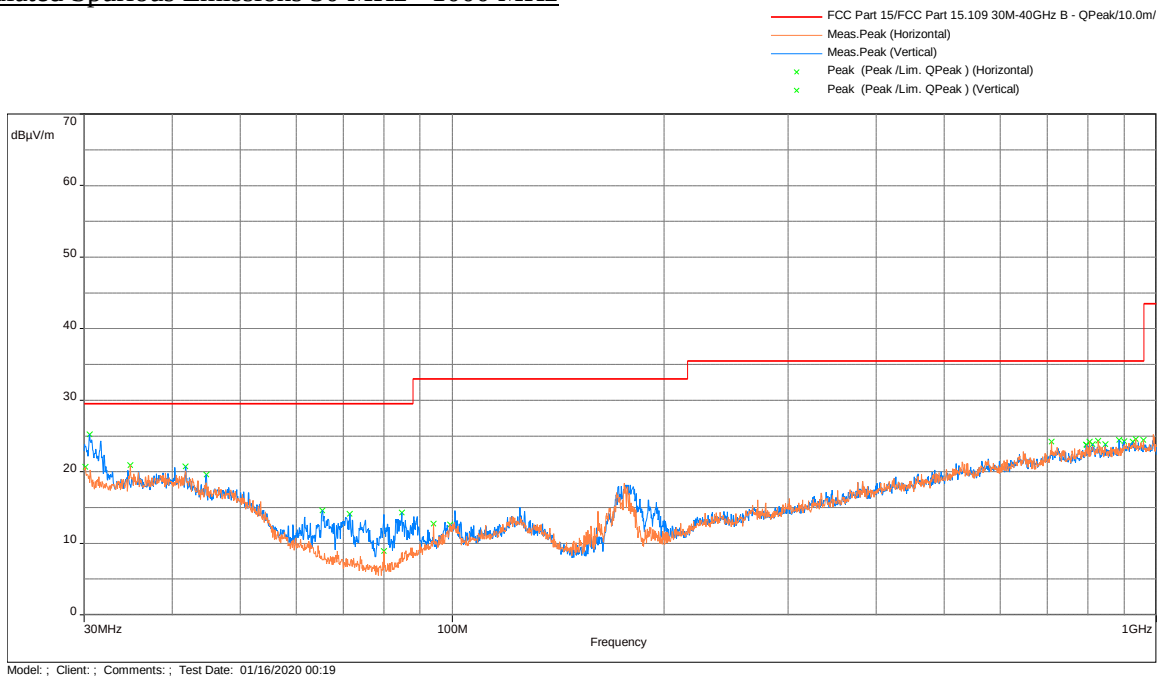
Freq. MHz	FS @ 3m Peak dB(uV/m)	Limit @ 3m Avg dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
4879.967	48.22	54.00	-5.78	93.50	4.00	Vertical	-8.67
9760.100	47.60	54.00	-6.40	296.75	2.50	Vertical	-2.67
5748.100	46.65	54.00	-7.35	13.25	2.50	Vertical	-6.92
5923.200	43.98	54.00	-10.02	311.50	4.00	Horizontal	-5.90
7320.000	52.03	54.00	-1.97	107.75	2.48	Horizontal	-5.37

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

Results	**Complies**

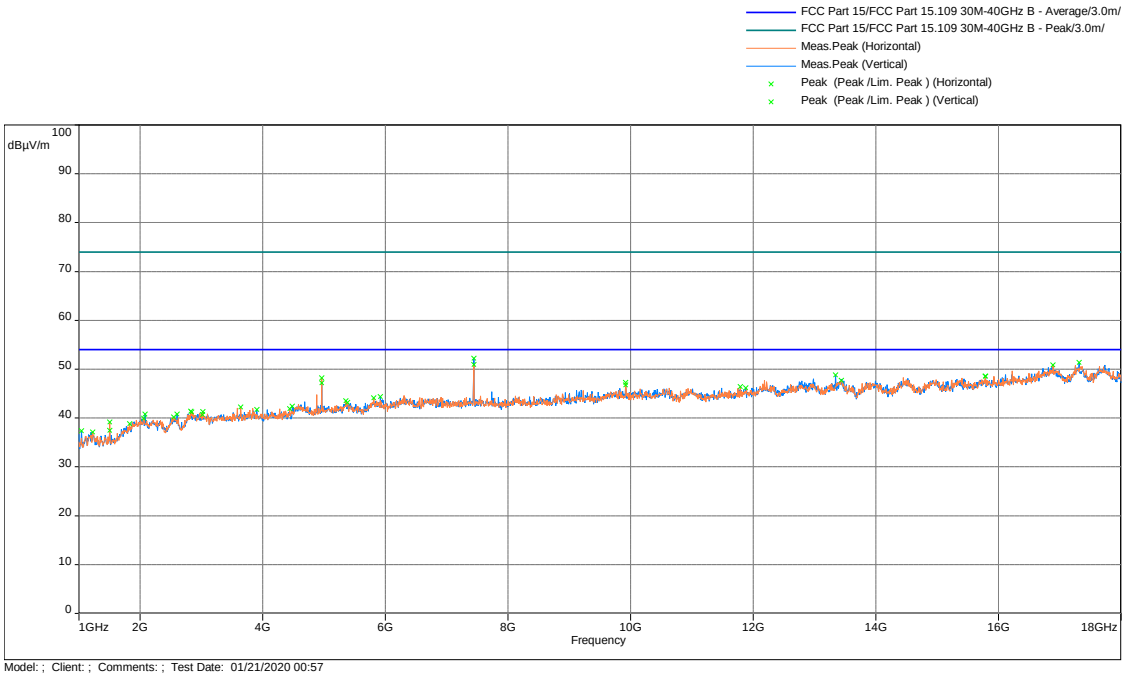
Test Results: 15.209 Radiated Spurious Emissions High Channel, Tx at 2480MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



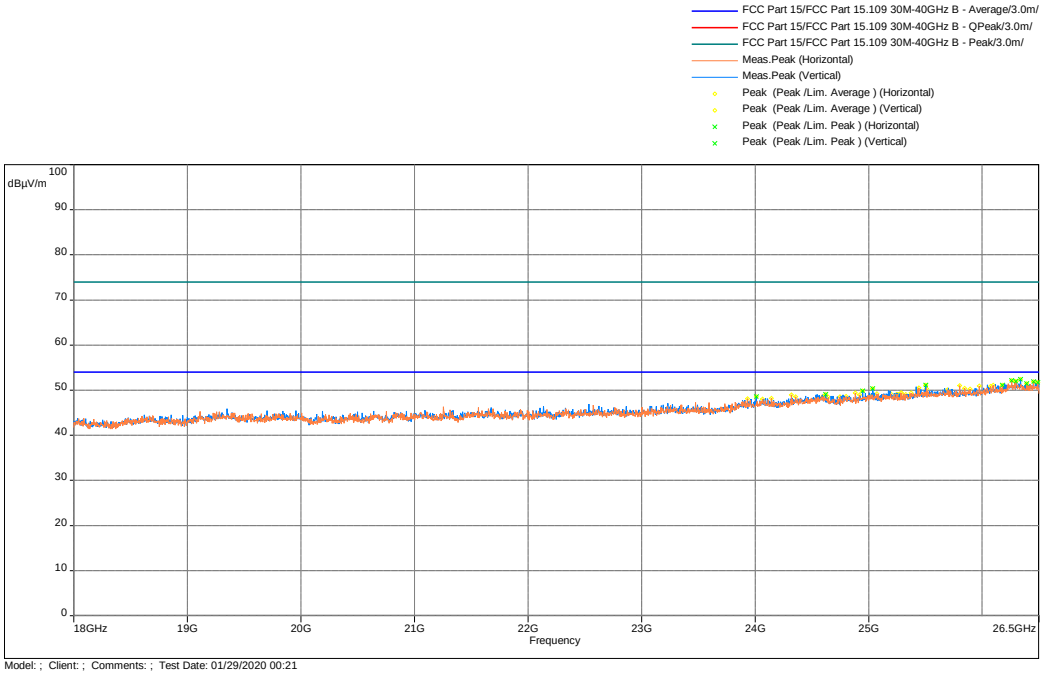
Model: ; Client: ; Comments: ; Test Date: 01/16/2020 00:19

Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Average Limit



Model: ; Client: ; Comments: ; Test Date: 01/21/2020 00:57

Radiated Spurious Emissions 18 - 26 GHz, Peak Scan vs Peak & Average Limit



Freq. MHz	FS @ 10m QP dB(uV/m)	Limit @ 10m dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
30.550	25.24	29.50	-4.26	188.75	1.00	Vertical	-6.75

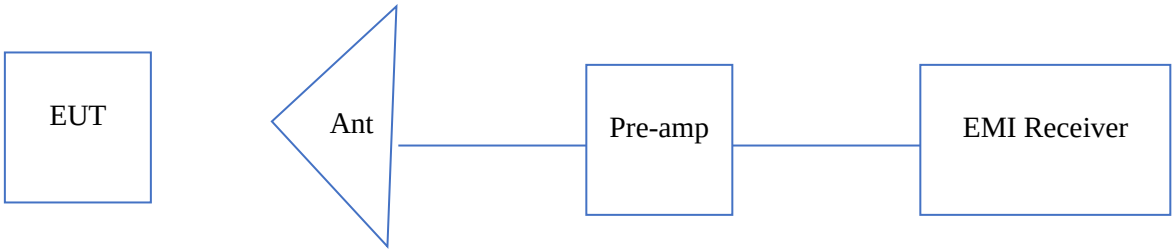
Freq. MHz	FS @ 3m Peak dB(uV/m)	Limit @ 3m Avg dB(µV/m)	Margin dB	Azimuth deg	Height m	Polarity	Correction dB
4959.867	48.22	54.00	-5.78	169.50	2.52	Horizontal	-8.60
9919.900	47.28	54.00	-6.72	328.75	2.52	Horizontal	-2.99
5914.700	44.39	54.00	-9.61	0.00	1.00	Vertical	-5.88
5809.867	44.15	54.00	-9.85	302.00	1.00	Horizontal	-6.23
7440.000	52.21	54.00	-1.79	58.00	2.51	Vertical	-5.34

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

Results	**Complies**

4.5.7 Test Setup Configuration

The following photographs show the testing configurations used.



5.0 List of Test Equipment

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

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
Spectrum Analyzer	Rohde and Schwarz	FSU	ITS 00913	12	03/26/20
EMI Receiver	Rohde and Schwarz	ESR7	ITS 01607	12	10/23/20
EMI Receiver	Rohde and Schwarz	ESU40	ITS 00961	12	11/07/20
Pre-Amplifier (18-40GHz)	Miteq	TTA1840-35-S-M	ITS 01393	12	02/08/20
Active Horn Antenna	ETS-Lindgren	3117-PA	ITS 01365	12	07/08/20
Horn Antenna (10-40 GHz)	ETS-Lindgren1376	3116C	ITS 01376	12	04/15/20
Bi-Log Antenna	Antenna Research	LPB-2513	ITS 00355	12	04/24/20
Pre-Amplifier	Sonoma Instrument	310N	ITS 00415	12	04/17/20
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	05/14/20
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01537	12	02/20/20
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01543	12	11/11/20

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	3.17.0.10	Galvani_1-14-2020.bpp
RS Commander	Rohde Schwarz	1.6.4	Not Applicable (Screen grabber)

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewers Initials	Date	Change
1.0 / G104106572	AC	KV	April 19, 2020	Original document
2.0 / G104106572	AC	KV	November 11, 2021	Updated report with test mode firmware version.