

	  
<p>MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn. Bhd. Plot 2A Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia.</p>	<p>FCC / ISED TEST REPORT Report Revision : Rev.C</p>
<p>Date/s Tested : 15-January-2025 - 07-April-2025 Report Issue Date : 21-April-2025 Manufacturer/Location : Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D 11900 Bayan Lepas, Penang, Malaysia Requestor : Yeap Tee Khoon Product Type : Body Worn Camera Product Marketing Name (PMN) : SVX Hardware Version Identification Number (HVIN) : VX650 Frequency Band : 2.402 - 2.480 GHz Max RF Output Power : 39.81 mWatts Applicant Name : Motorola Solutions Inc Applicant Address : Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D.11900 Bayan Lepas, Penang, Malaysia FCC Registrations : 461337 ISED Registrations : MY0001 Firmware Version Identification Number (FVIN) : BL: D01.00.10; HOST: D01.00.54 The equipment was tested accordance to the requirement listed below: (2.4GHz BT LE) PASS 47 CFR Part 15C ISED RSS 247 Issue 3 August 2023</p>	
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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	24-February-2025	NUR ALIEYA
Rev. B	Update Antenna Type	12-March-2025	NUR ALIEYA
Rev. C	Change Product Marketing Name (PMN) from "VX650" to "SVX"	14-April-2025	NUR ALIEYA

1.0 General Information

EUT Description:

Technologies	2.4GHz BT LE
TX Frequency range	2402MHz – 2480MHz
Modulation Type	GFSK
Connector type	PROGRAMMING, TEST & ALIGNMENT CABLE
Antenna type	PIFA

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
BATTERY PACK,BATT LIION UL DIV2 IP68 4300T	MOTOROLA	PMNN4893A

Channel number and frequency information:

40 channels are provided to this EUT:

Channel	Freq. (MHz)						
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

FCC 47 CFR Part 15 Subpart C
 KDB 558074 D01 15.247 Meas Guidance v05
 ANSI C63.10-2013

Deviation from standard

Not applicable as no deviation from standard test method

Modifications to EUT

For RF conducted measurements a pigtail was soldered out of the board while for radiated measurements there were no modifications to the device

2.0 Summary of Test Results

FCC Clause	ISED Clause	Test Item	Result	Remark	Serial number tested	Tested by
15.247 (a)(2)	RSS 247 5.2 (a)	DTS & 99% Channel Bandwidth	Pass	Highest 99% OCB: BT 4.0 - 1.05 MHz (1M05F1D) BT 5.0 - 2.06 MHz (2M06F1D)	9903EBA0063	Alieya
15.247 (b)(3)	RSS 247 5.4 (d)	Conducted RF Output Power (Peak)	Pass	Highest output power: BT 4.0 - 15.329 dBm (34.11mW) BT 5.0 - 15.341 dBm (34.21mW)	9903EBA0063	Alieya
15.247(e)	RSS 247 5.2 (b)	Maximum Peak Power Spectral Density	Pass	Meet the limit requirement.	9903EBA0063	Alieya
15.247 (d)	RSS-247 5.5	Band-Edge Conducted Spurious Emission	Pass	Worst case emission: -44.14 dBm	9903EBA0063	Alieya
15.247 (b)	RSS-247 5.5	Conducted Spurious Emission	Pass	Worst case emission: -38.43 dBm	9903EBA0063	Alieya
15.205, 15.209, 15.247 (d)	RSS247 5.5	Radiated Emission within Restricted Bands	Pass	Worst case emission: RBE: 46.8573dBuV/m (Margin: 7.1427dB) RSE: 25.8858dBuV/m (Margin: 20.1142dB)	9903EBA0048	Haniff
15.207	RSS-Gen 8.8	AC Power Line Conducted Spurious Emission	Pass	Meet the limit requirement.	9903EBA0048	Shidee
15.203	-	Antenna Requirement	NA	Internal antenna is not accessible to the end-user	NA	NA

3.0. Measurement Uncertainty

The measurement uncertainties below were calculated using approach describe in ETSI TR 100 028, ETSI TR 100 028-2 (using a coverage factor of $k = 1.96$) & CISPR 16-4-2 (using a coverage factor of $k=2$), which gives a level of confidence of approximately 95%.

According to CISPR 16-4-2, the levels were found to be below levels of U_{CISPR} and therefore no adjustment of the data for measurement uncertainty is required.

ETSI TR 100 028 & ETSI TR 100 028-2:

MEASUREMENT TYPE	FREQUENCY RANGE	EXPANDED UNCERTAINTY
Conducted Spurious Output Power	9kHz-12750MHz	± 2.82 dB

CISPR 16-4-2:

MEASUREMENT TYPE	FREQUENCY RANGE	EXPANDED UNCERTAINTY
AC Power-line Conducted Emissions	150kHz-30MHz	± 3.44 dB
Radiated Emissions	30MHz-1000MHz	± 6.00 dB
Radiated Emissions	1000MHz-18000MHz	± 5.14 dB
Radiated Emissions	18000MHz-40000MHz	± 5.36 dB

4.0 Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.12_R1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SPECTRUM ANALYZER	E4440A	MY46186938	29-Oct-24	29-Oct-25
POWER SUPPLY	6652A	3541A02371	11-Sep-24	11-Sep-25
CHAMBER	SH-641	92003820	04-Jul-24	04-Jul-25

Radiated Emission Station (SW Version: EMC FCC RE v1.6.5)

Description	Model #	Serial Number	Calibration Date	Calibration Due Date
EMI TEST RECEIVER	ESIB40	100307	23-Oct-24	23-Oct-25
3m Semi-anechoic Chamber	NA	888032	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	T-200-S	N/A	Not Required	Not Required
PROGRAMMING CONTROLLER	MF-7802BS	N/A	Not Required	Not Required
POWER SUPPLY	6674A	3126A00133	13-Mar-24	13-Mar-25
SIGNAL ANALYZER	FSV40	101432	09-Aug-24	08-Aug-25
DATA LOGGER	SDL500	A.016800	26-Jun-24	26-Jun-25
BILOG ANTENNA	CBL6112D	55546	05-Jun-24	05-Jun-25
BILOG ANTENNA	CBL 6112B	2964	08-Oct-24	08-Oct-25
DRG HORN FREQ.	SAS-571	1027	01-Jul-24	01-Jul-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
PREAMPLIFIER	PAM-0118	427	15-Nov-24	15-Nov-25
SIGNAL GENERATOR	SMB100A	181117	06-Dec-21	06-May-25
LOOP ANTENNA	6502	00203479	06-Mar-24	06-Mar-25
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	13-Mar-24	13-Mar-25

AC Powerline Station (SW Version: EMC Ver.10.60.10)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DATA LOGGER	DSB	16344143	05-Jul-24	05-Jul-25
V-NETWORK 2-LINE	ENV216V	101268	12-Jun-24	12-Jun-25
EMI TEST RECEIVER	ESCI	100225	08-May-24	08-May-25
PROGRAMMABLE AC SOURCE	61604	ABR000000926	05-Aug-24	05-Aug-25

5.0 Test Mode Applicability and Test Channel Detail

Radiated Emission Test (Above 1GHz)

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Environmental Conditions
Test Mode	0 to 39	0,19,39	GFSK	22.5°C, 6.31%RH

Radiated Emission Test (Below 1GHz)

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Environmental Conditions
Test Mode	0 to 39	0,19,39	GFSK	22.5°C, 63.1%RH

Power Line Conducted Emission Test

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Environmental Conditions
Application Mode	0 to 39	AUTO	AUTO	NA

Antenna Port Conducted Measurement:

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

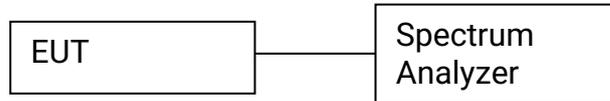
Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Environmental Conditions
Test Mode	0 to 39	0,19,39	GFSK	25°C, 54.8%RH

6.0 Transmitter Test Parameters

6.1 6dB Channel Bandwidth

6.1.1 Test Setup



- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max hold
 - e. Sweep = auto
- 5) Measure the freq different of two frequencies that were attenuated 6dB from peak of the emission & record the frequency difference as the emission bandwidth.

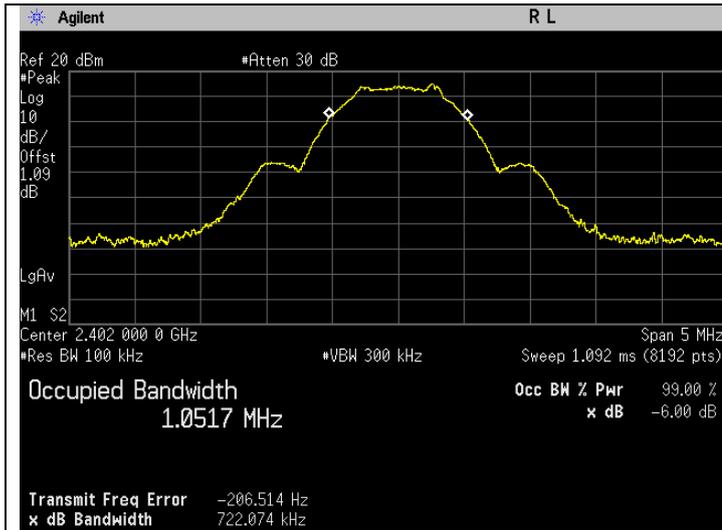
6.1.2 Test Limits:

Normal Condition (25 ° C)
≥500 kHz

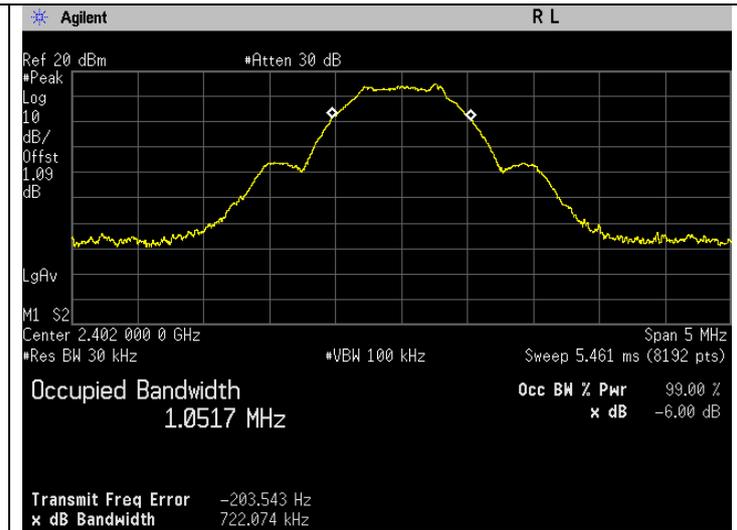
6.1.3 Test Data:

BTLE 1M

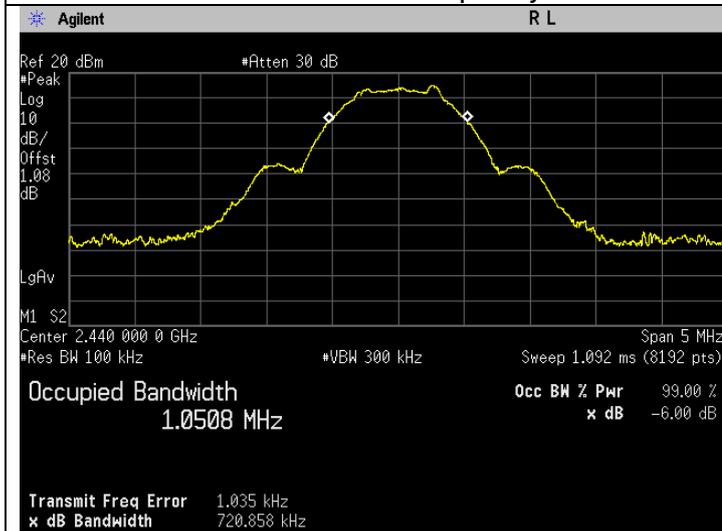
Test Conditions		Test Frequency	Results		
Standard	Data Rate	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
Bluetooth LE	1	2402	0.72	1.05	Pass
Bluetooth LE	1	2440	0.72	1.05	Pass
Bluetooth LE	1	2480	0.72	1.05	Pass



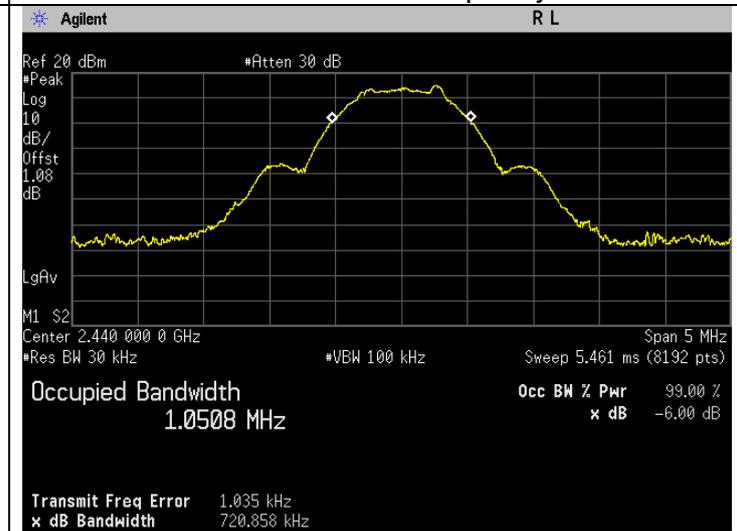
6dB Bandwidth. Bluetooth LE Frequency 2402 MHz



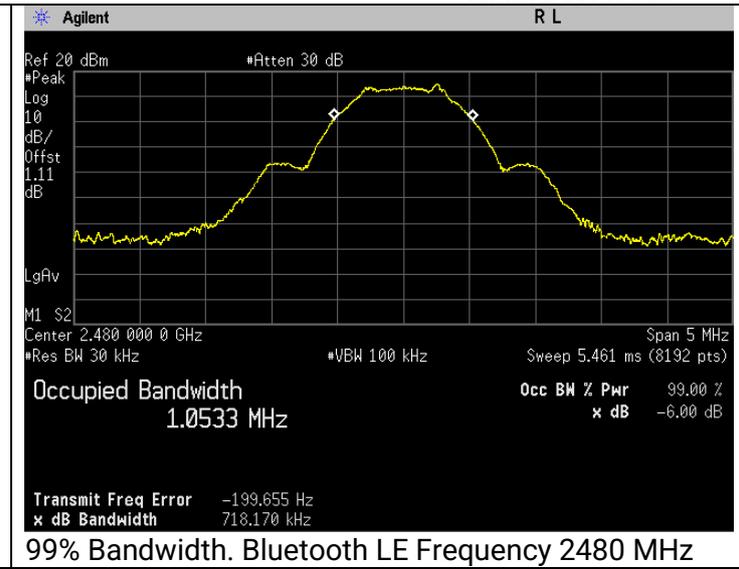
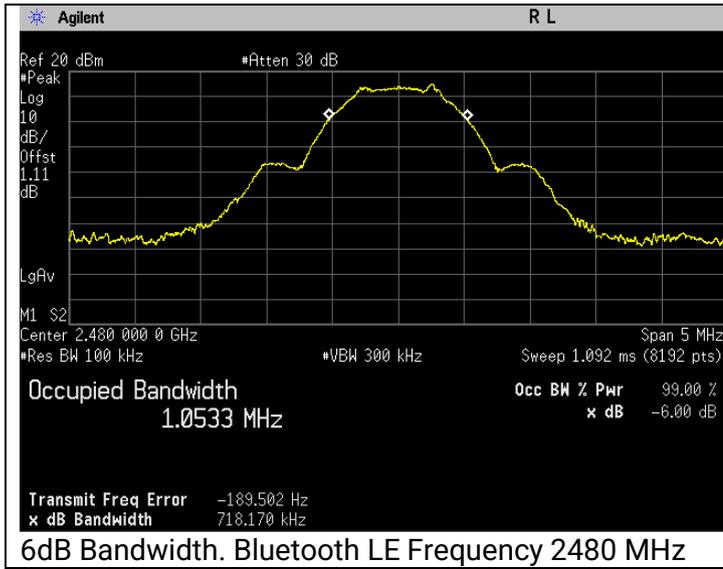
99% Bandwidth. Bluetooth LE Frequency 2402 MHz

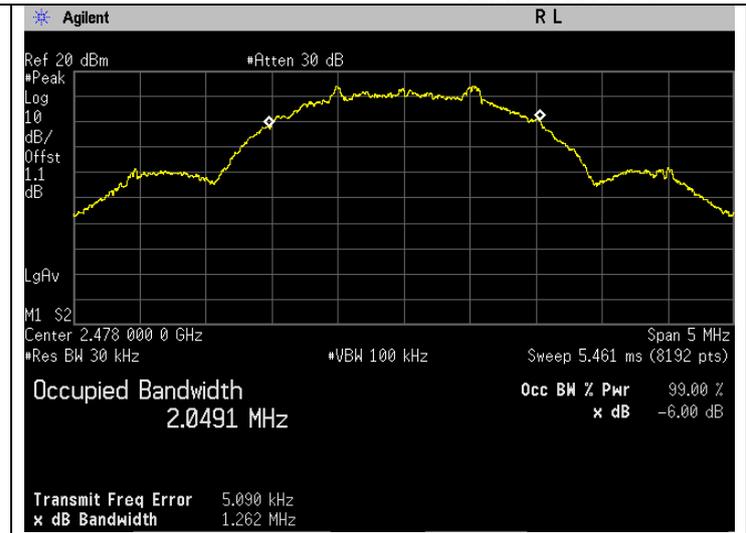
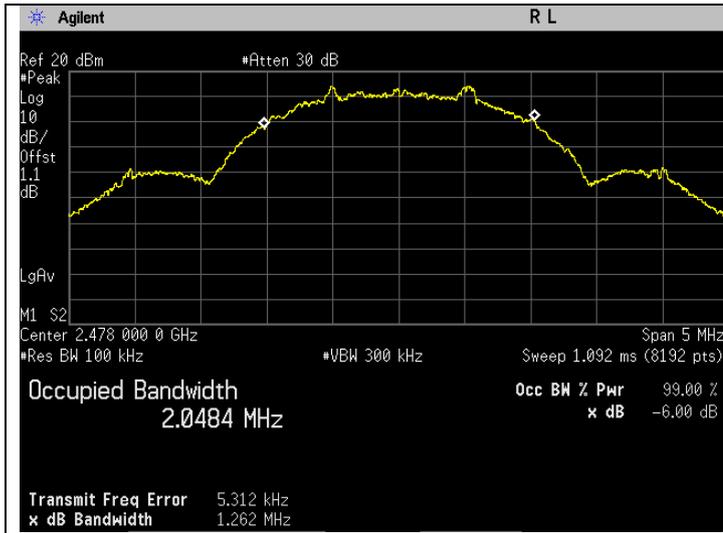


6dB Bandwidth. Bluetooth LE Frequency 2440 MHz



99% Bandwidth. Bluetooth LE Frequency 2440 MHz



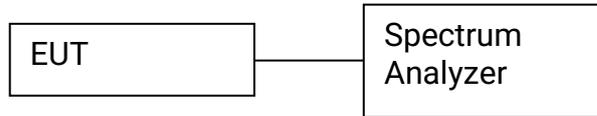


6dB Bandwidth. Bluetooth LE Frequency 2478 MHz

99% Bandwidth. Bluetooth LE Frequency 2478 MHz

6.2 Conducted RF Output Power

6.2.1 Test Setup



Peak

- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Measure the duty cycle of transmitter output signal.
- 4) Setting of Spectrum analyzer :
 - a. Set the RBW = 3 MHz.
 - b. Set the VBW = 50 MHz.
 - c. Set the span $\geq [1.5 \times \text{OBW bandwidth}]$.
 - d. Detector = Peak
 - e. Sweep time = auto couple.
 - f. Trace mode = max hold.
 - g. Allow trace to fully stabilize.

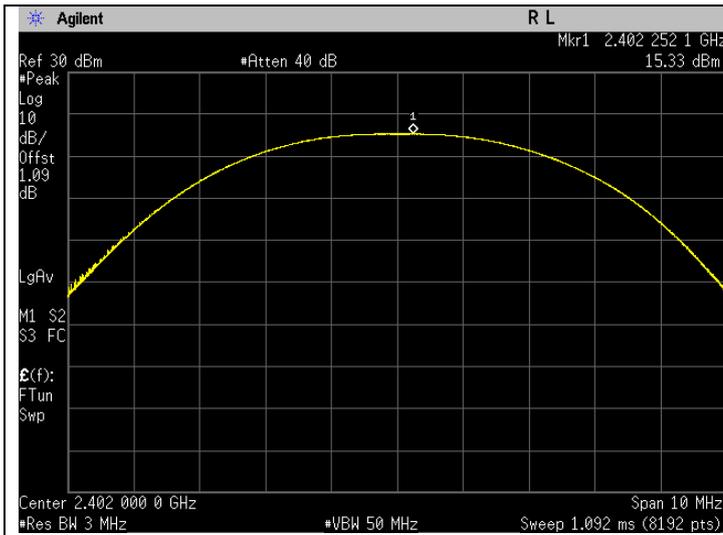
6.2.2 Test Limits:

Normal Condition (25 ° C)
$\leq 1 \text{ Watt}(30 \text{ dBm})$

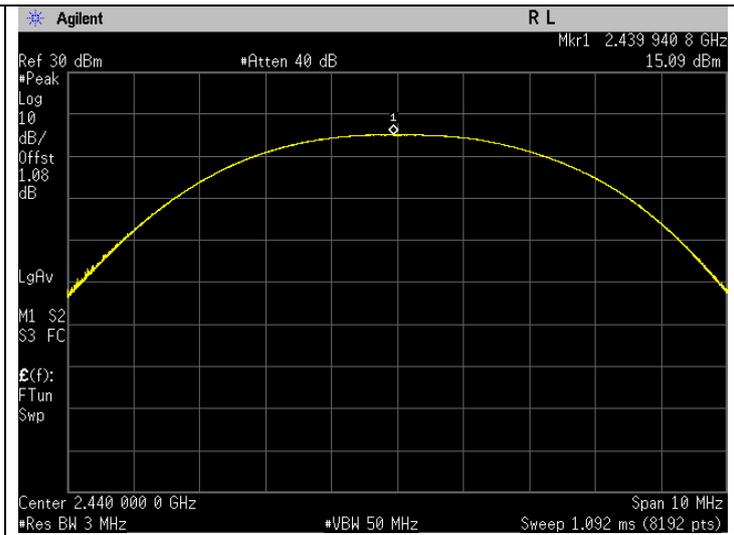
6.2.3 Test Data:

BTLE 1M

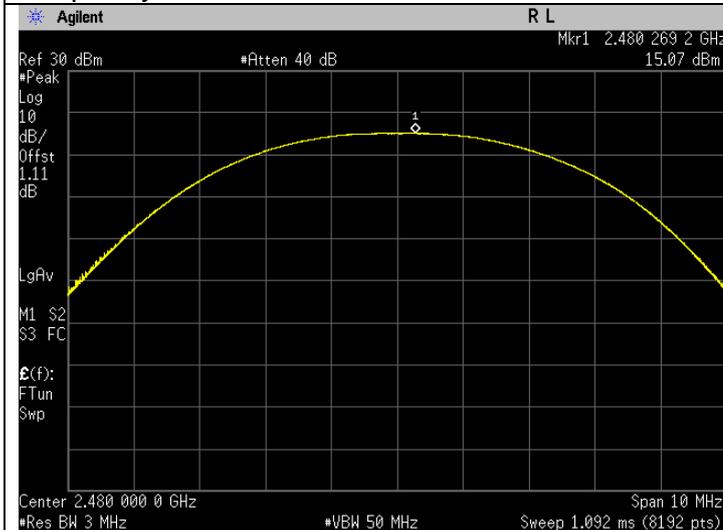
Test Conditions		Test Frequency	Results	
Standard	Data Rate	Tx (MHz)	Output Power (dBm)	Status
Bluetooth LE	1	2402	15.329	Pass
Bluetooth LE	1	2440	15.090	Pass
Bluetooth LE	1	2480	15.073	Pass



Frequency 2402 MHz



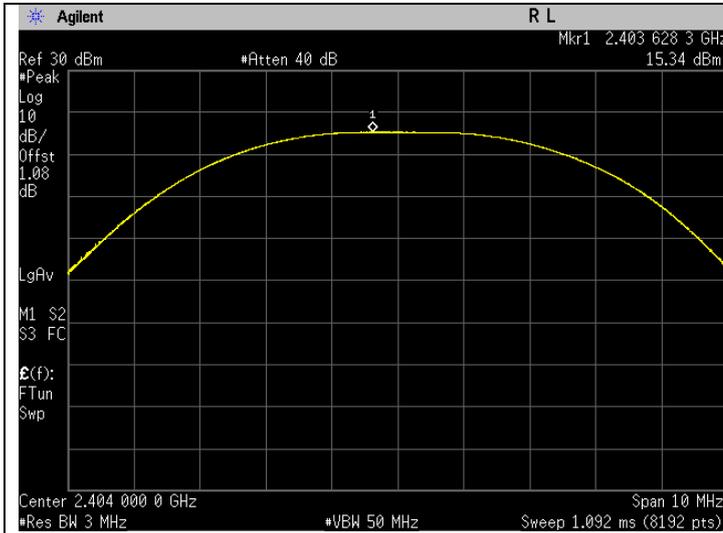
Frequency 2440 MHz



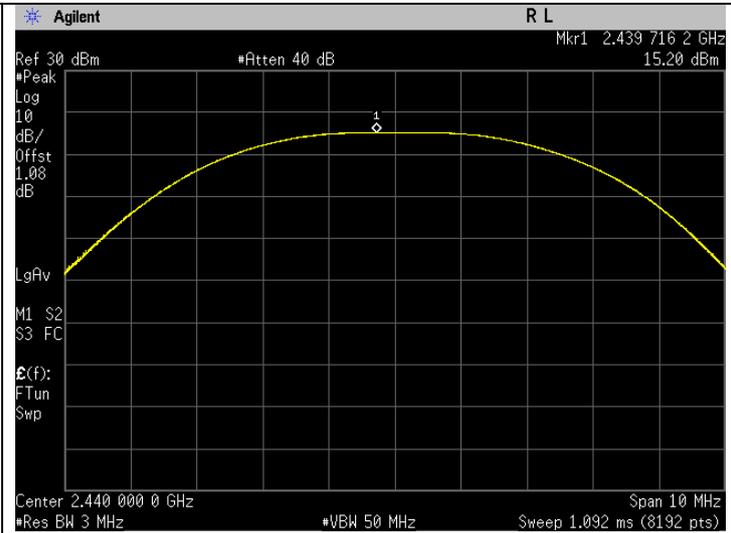
Frequency 2480 MHz

BTLE 2M

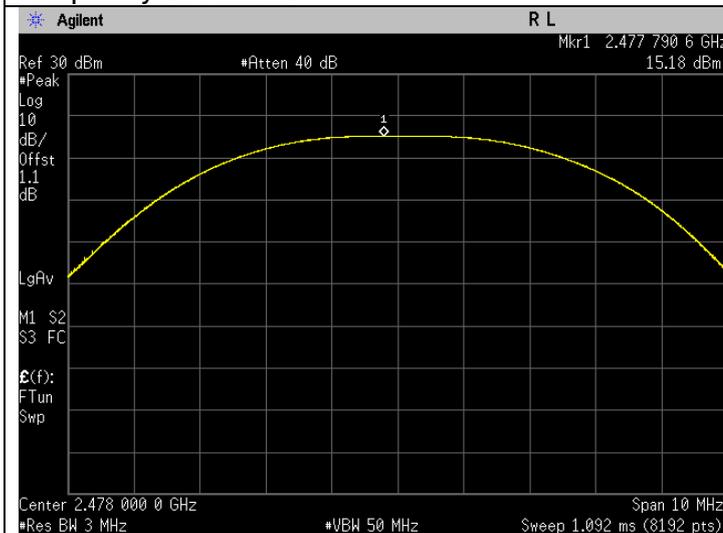
Test Conditions		Test Frequency	Results	
Standard	Data Rate	Tx (MHz)	Output Power (dBm)	Status
Bluetooth LE	2	2404	15.341	Pass
Bluetooth LE	2	2440	15.204	Pass
Bluetooth LE	2	2478	15.182	Pass



Frequency 2404 MHz



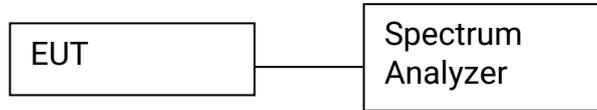
Frequency 2440 MHz



Frequency 2478 MHz

6.3 Maximum Peak Power Spectral Density

6.3.1 Test Setup



Maximum Peak

- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. Set analyzer center frequency to DTS channel center frequency.
 - b. Set the span to 1.5 times the DTS bandwidth.
 - c. Set the RBW to 3 kHz.
 - d. Set the VBW $\geq [3 \times \text{RBW}]$.
 - e. Detector = peak.
 - f. Sweep time = auto couple.
 - g. Trace mode = max hold.
 - h. Allow trace to fully stabilize.
 - i. Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

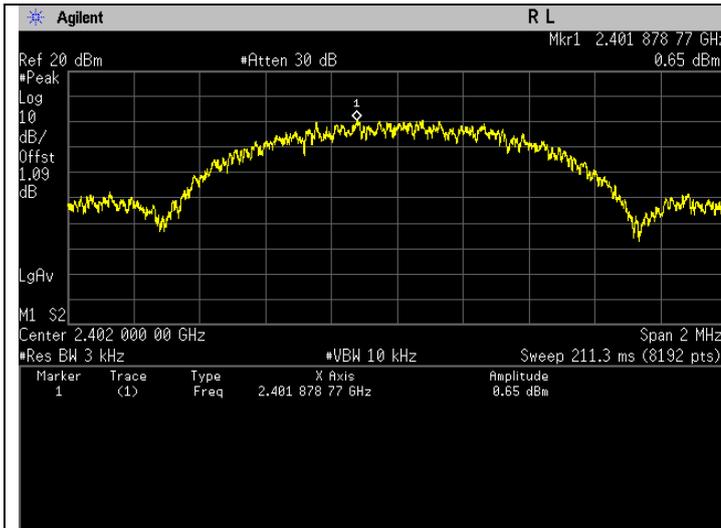
6.3.2 Test Limits:

Normal Condition (25 ° C)
$\leq 8 \text{ dBm/3kHz}$

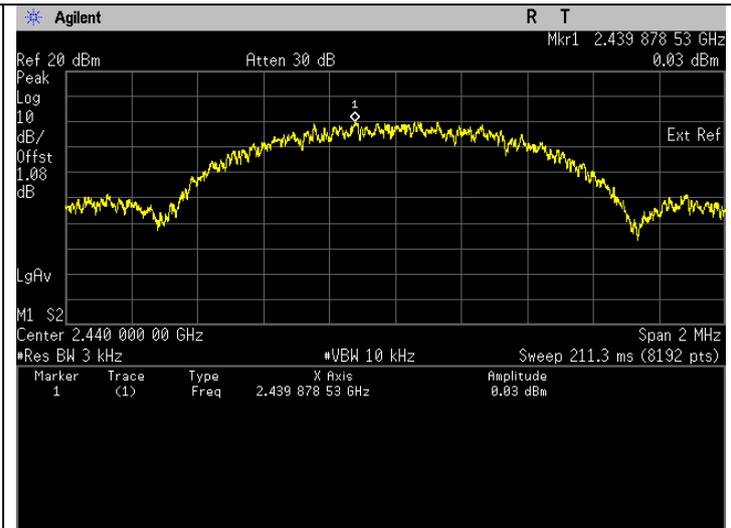
6.3.3 Test Result

BTLE 1M

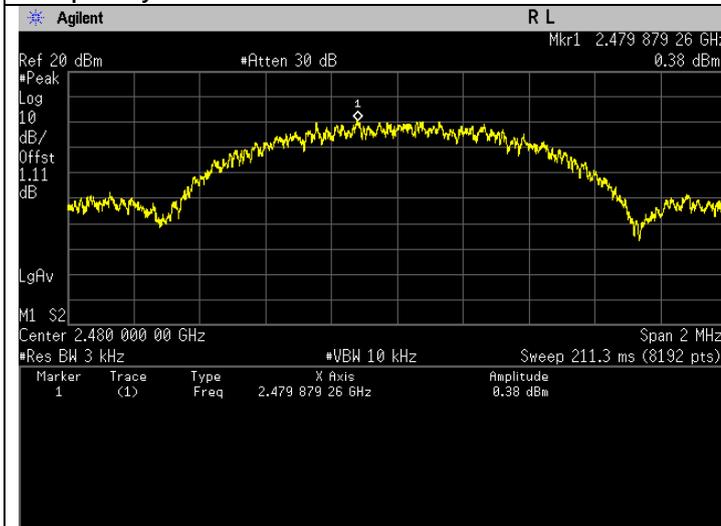
Test Conditions		Test Frequency	Results	
Standard	Data Rate	Tx (MHz)	Power (dBm/3kHz)	Status
Bluetooth LE	1	2402	0.65	Pass
Bluetooth LE	1	2440	0.03	Pass
Bluetooth LE	1	2480	0.38	Pass



Maximum Power Spectral Density. Bluetooth LE
 Frequency 2402 MHz



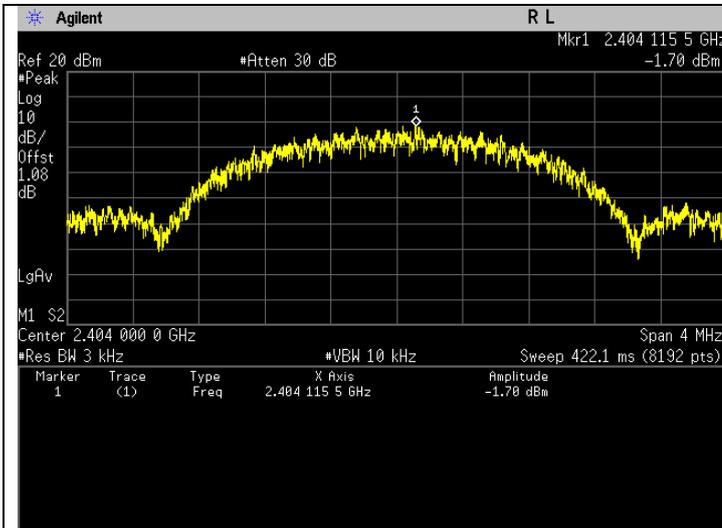
Maximum Power Spectral Density. Bluetooth LE
 Frequency 2440 MHz



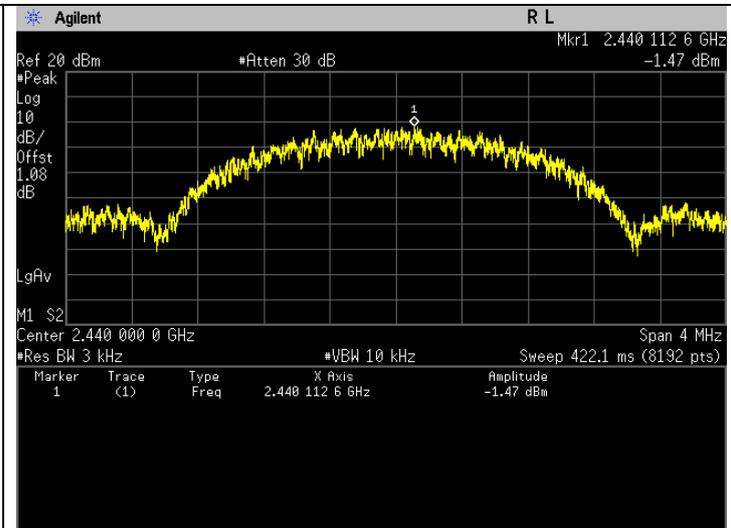
Maximum Power Spectral Density. Bluetooth LE
 Frequency 2480 MHz

BTLE 2M

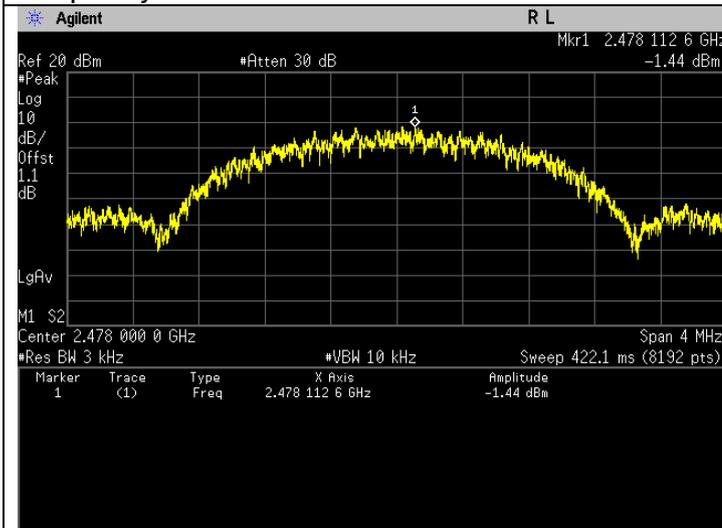
Test Conditions		Test Frequency	Results	
Standard	Data Rate	Tx (MHz)	Power (dBm/3kHz)	Status
Bluetooth LE	2	2404	-1.70	Pass
Bluetooth LE	2	2440	-1.47	Pass
Bluetooth LE	2	2478	-1.44	Pass



Maximum Power Spectral Density. Bluetooth LE Frequency 2404 MHz



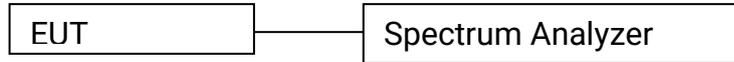
Maximum Power Spectral Density. Bluetooth LE Frequency 2440 MHz



Maximum Power Spectral Density. Bluetooth LE Frequency 2478 MHz

6.4 Conducted Spurious Emission

6.4.1 Test Setup



- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- 5) Use the peak marker function to measure highest emission and scan up to 10th harmonic.

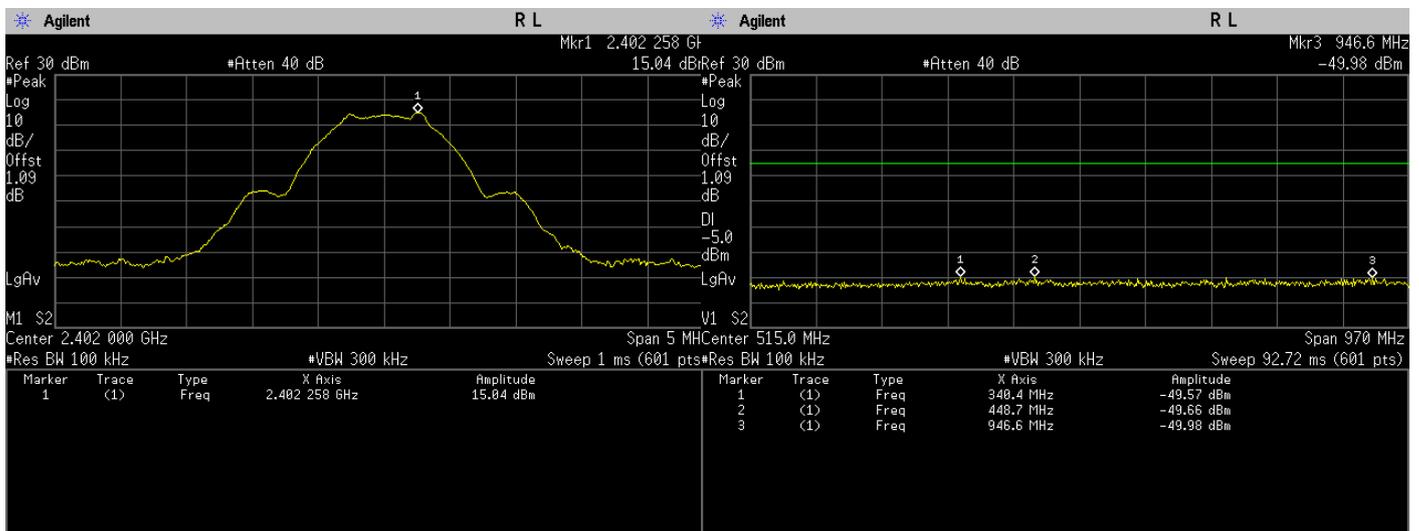
6.4.2 Test Limits:

Normal Condition (25 ° C)
Shall be at least 20 dB below max power. (Peak detector)

6.4.3 Test Result

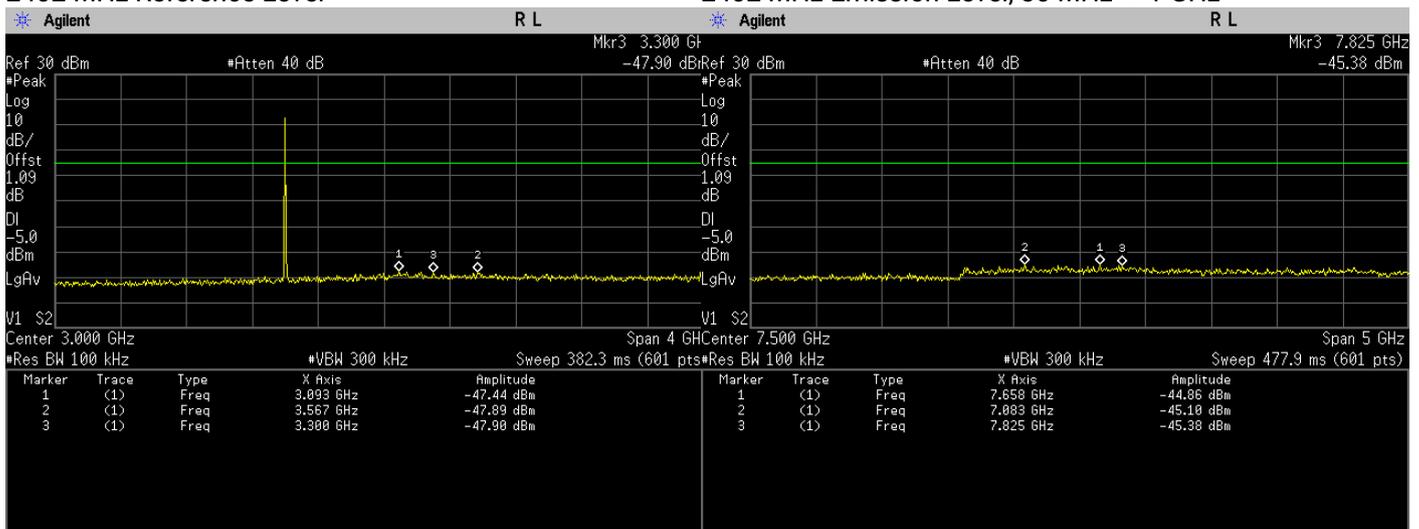
BTLE 1M

Test Conditions		Test Frequency	Results		
Standard	Data Rate	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
Bluetooth LE	1	2402	24867.00	-41.85	Pass
			24908.00	-42.03	Pass
			24808.00	-42.07	Pass
Bluetooth LE	1	2440	24308.00	-38.43	Pass
			24817.00	-39.56	Pass
			24983.00	-39.63	Pass
Bluetooth LE	1	2480	24908.00	-41.37	Pass
			24800.00	-41.85	Pass
			24775.00	-41.92	Pass



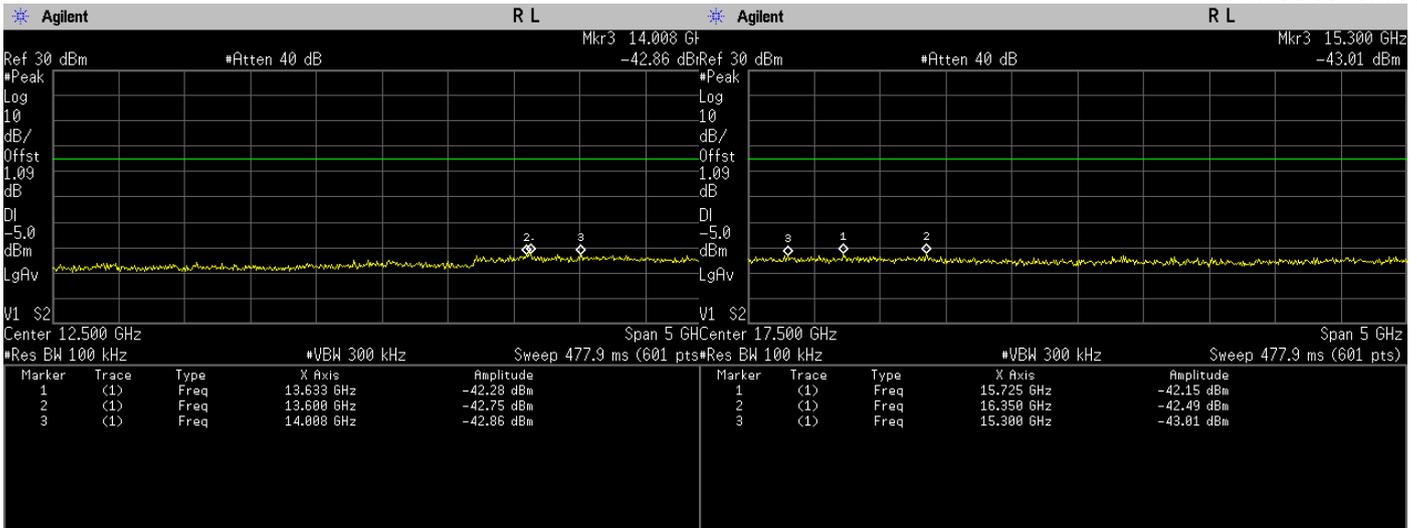
Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Emission Level, 30 MHz -> 1 GHz



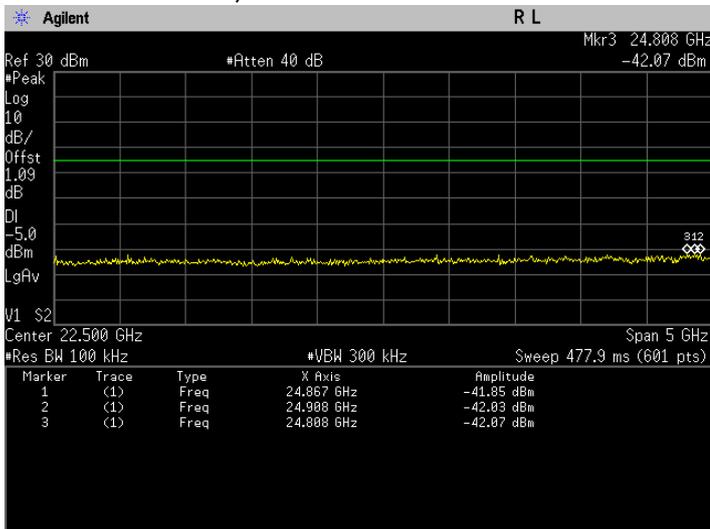
Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Emission Level, 5 GHz -> 10 GHz

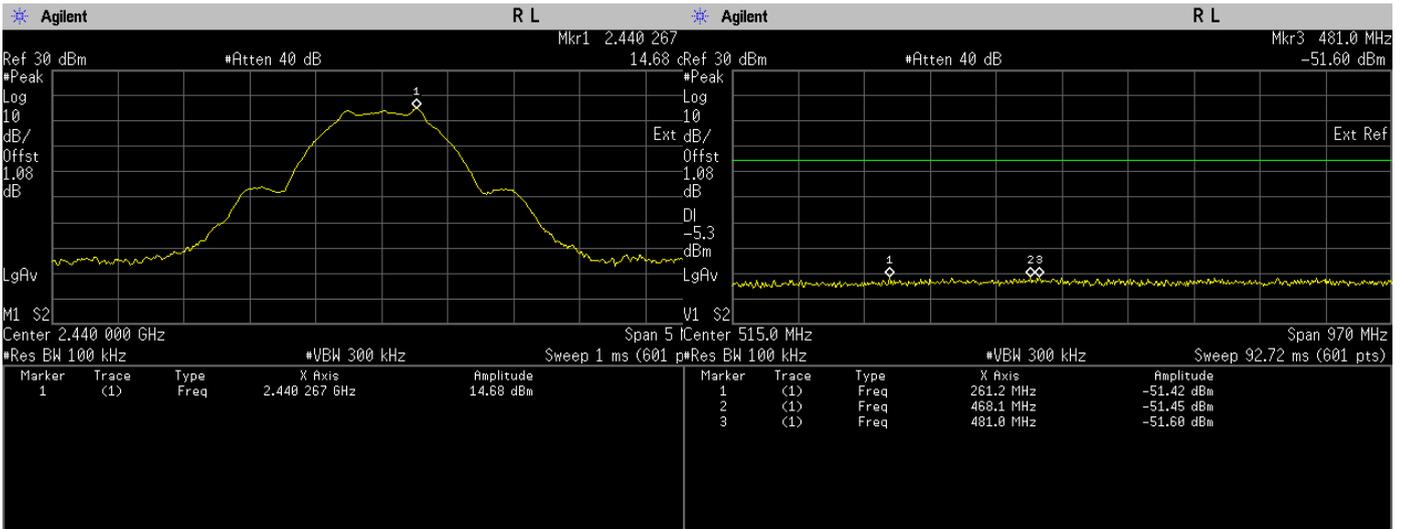


Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 Emission Level, 10 GHz -> 15 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Emission Level, 15 GHz -> 20 GHz

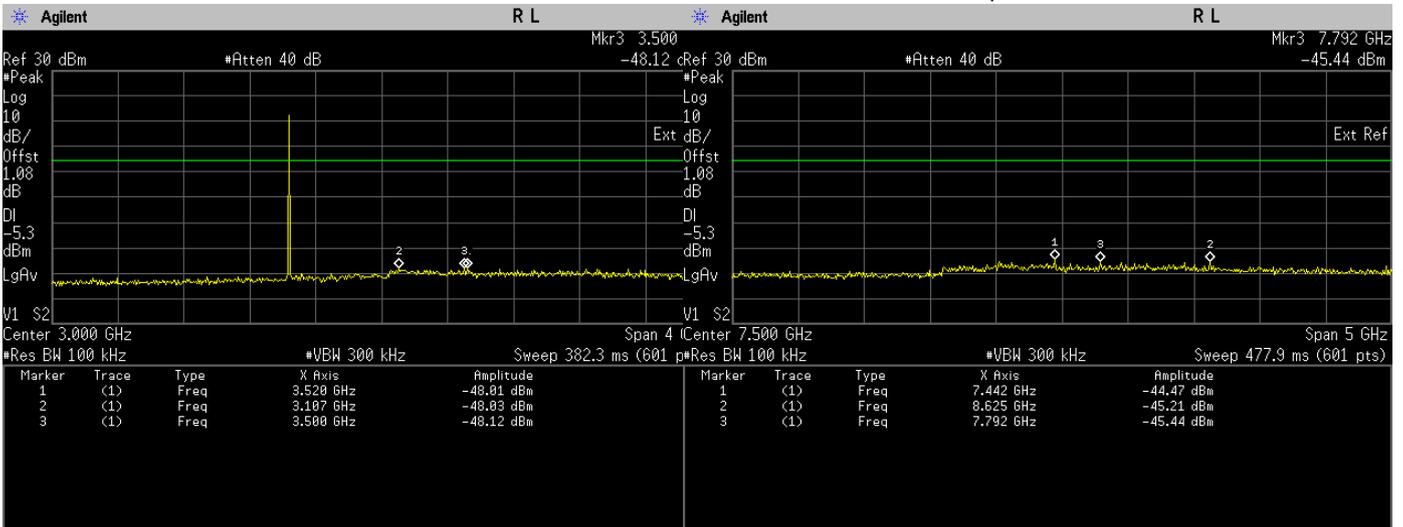


Conducted Emissions(Peak). Bluetooth LE, Frequency 2402 MHz Emission Level, 20 GHz -> 25 GHz



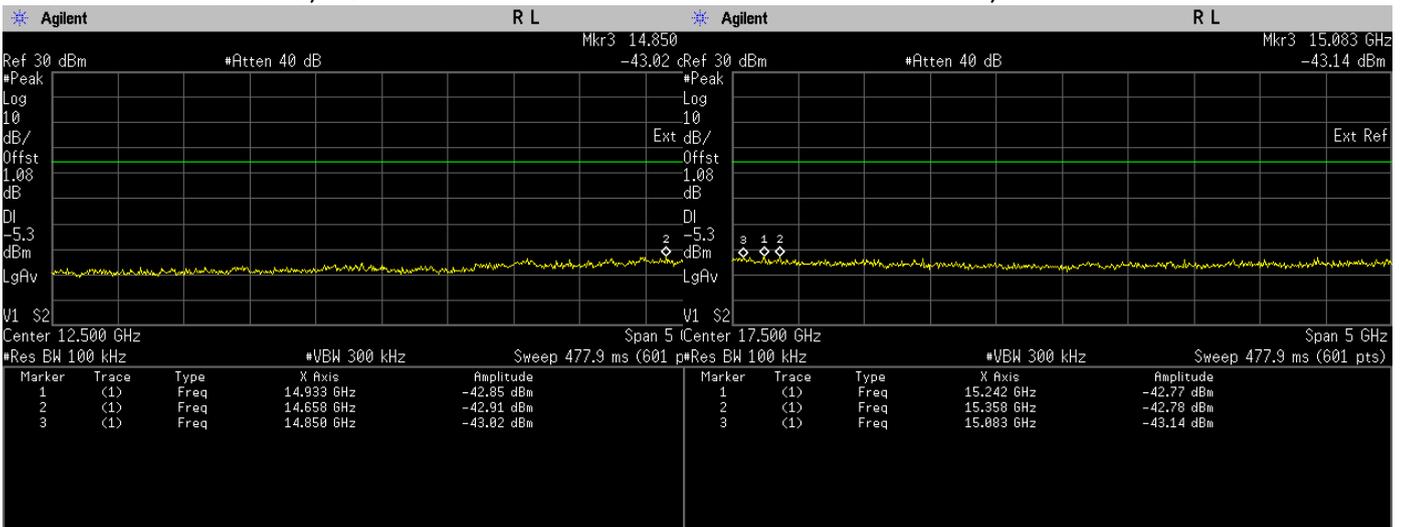
Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 30 MHz -> 1 GHz



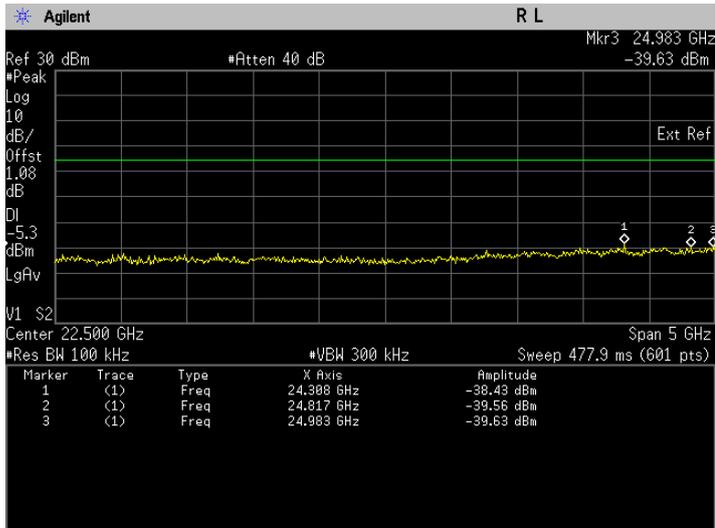
Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 5 GHz -> 10 GHz

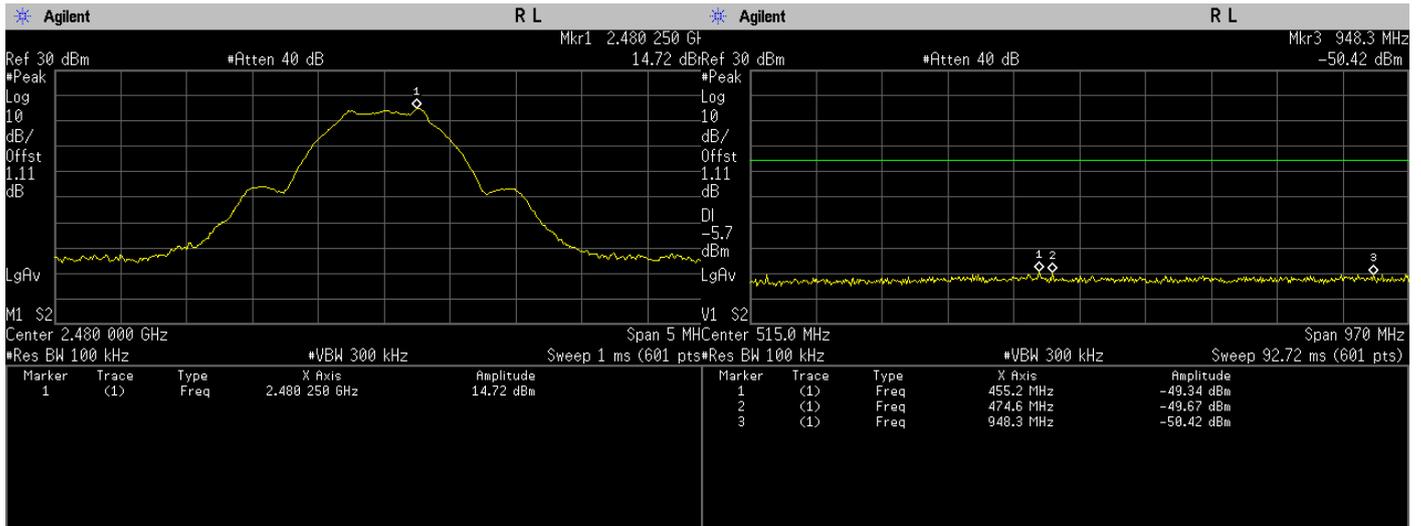


Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 10 GHz -> 15 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 15 GHz -> 20 GHz

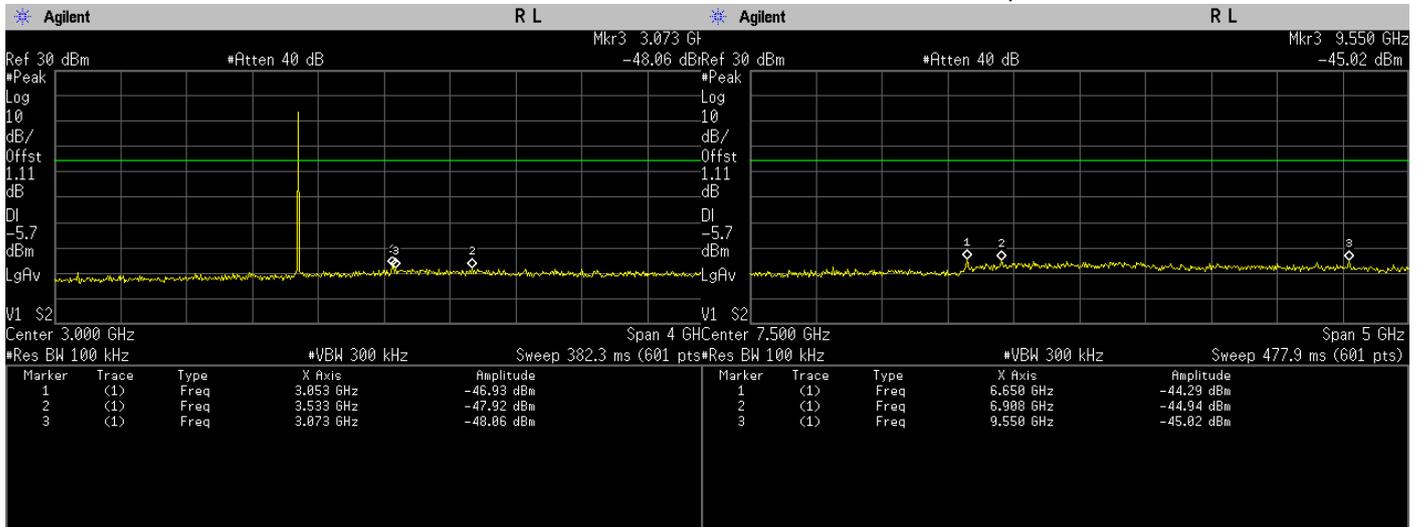


Conducted Emissions(Peak). Bluetooth LE,
Frequency 2440 MHz Emission Level, 20 GHz -> 25
GHz



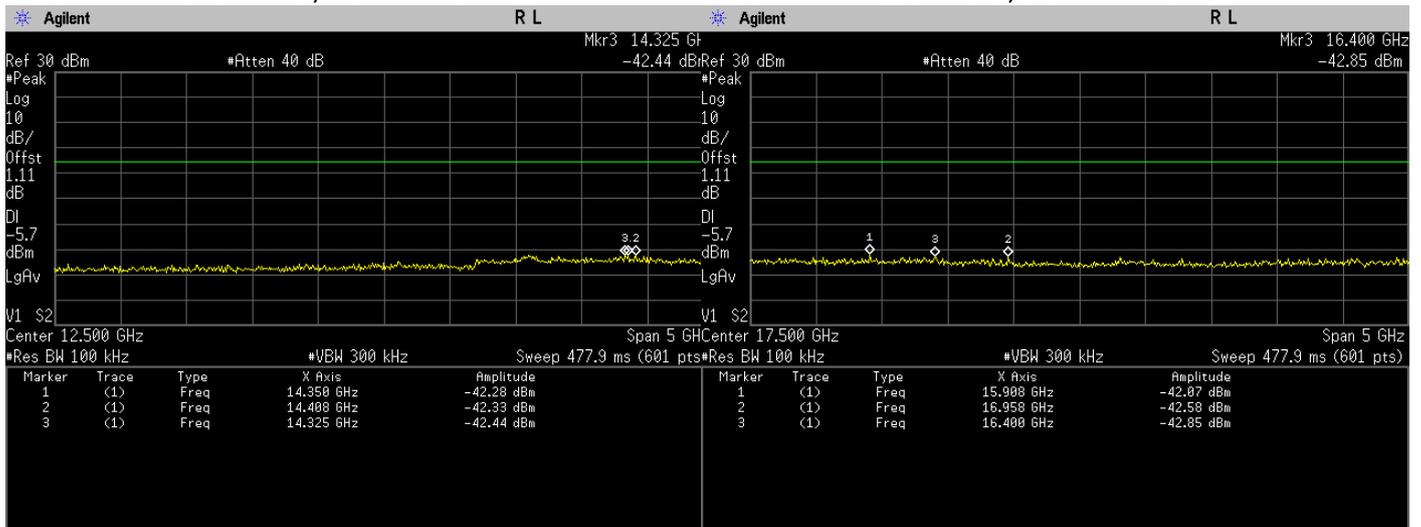
Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 MHz Emission Level, 30 MHz -> 1 GHz



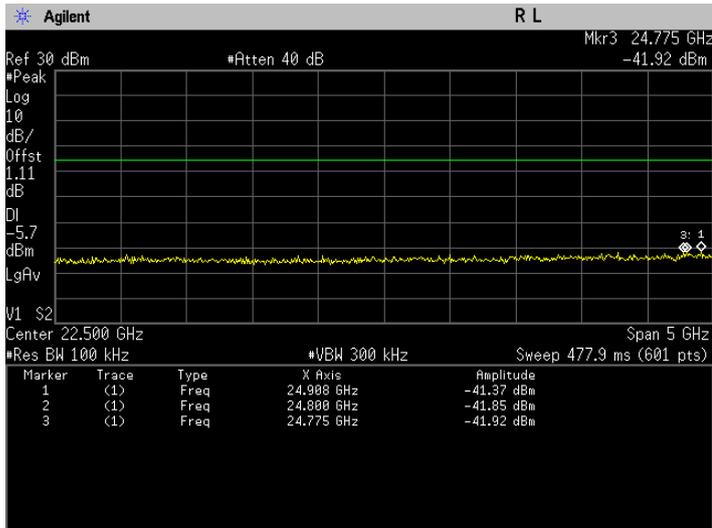
Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 Emission Level, 10 GHz -> 15 GHz

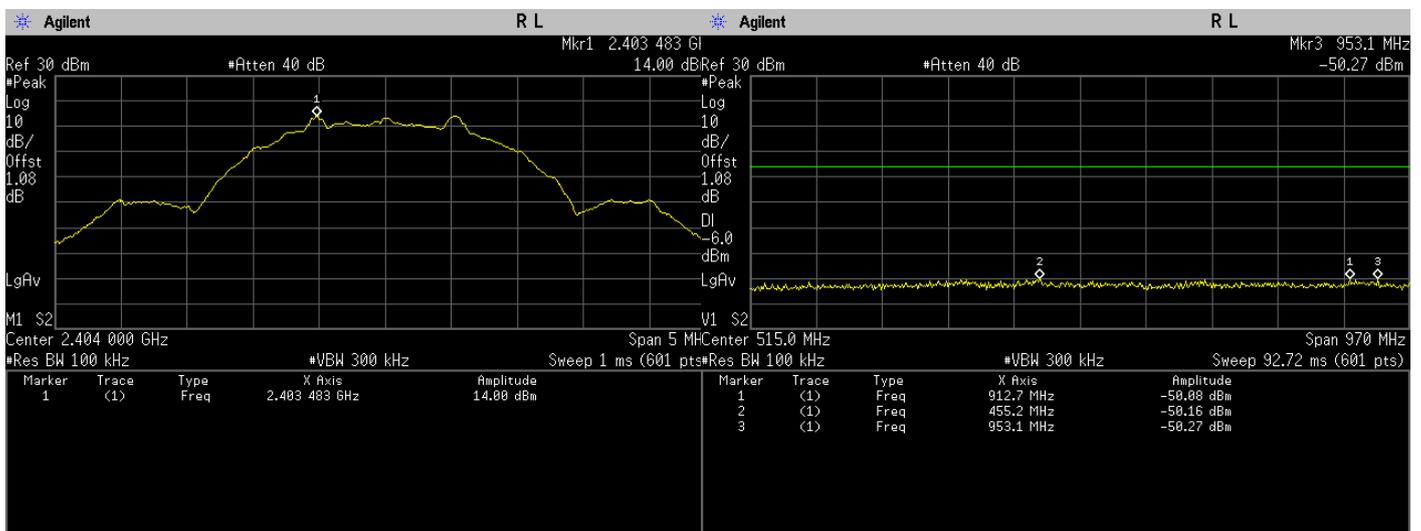
Conducted Emissions(Peak). Bluetooth LE, Frequency 2480 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Peak). Bluetooth LE, Frequency
 2480 MHz Emission Level, 20 GHz -> 25 GHz

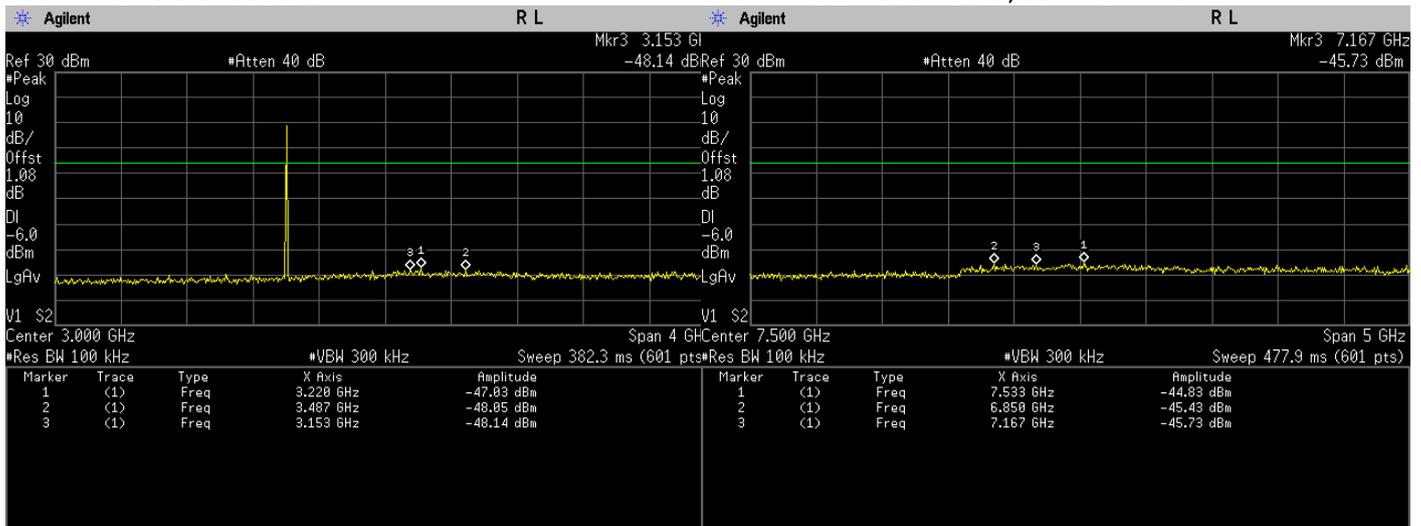
BTLE 2M

Test Conditions		Test Frequency	Results		
Standard	Data Rate	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
Bluetooth LE	2	2404	13600.00	-41.39	Pass
			24833.00	-41.90	Pass
			13842.00	-42.08	Pass
Bluetooth LE	2	2440	14733.00	-41.71	Pass
			13575.00	-41.91	Pass
			14283.00	-41.93	Pass
Bluetooth LE	2	2478	24825.00	-41.41	Pass
			24767.00	-42.15	Pass
			24808.00	-42.18	Pass



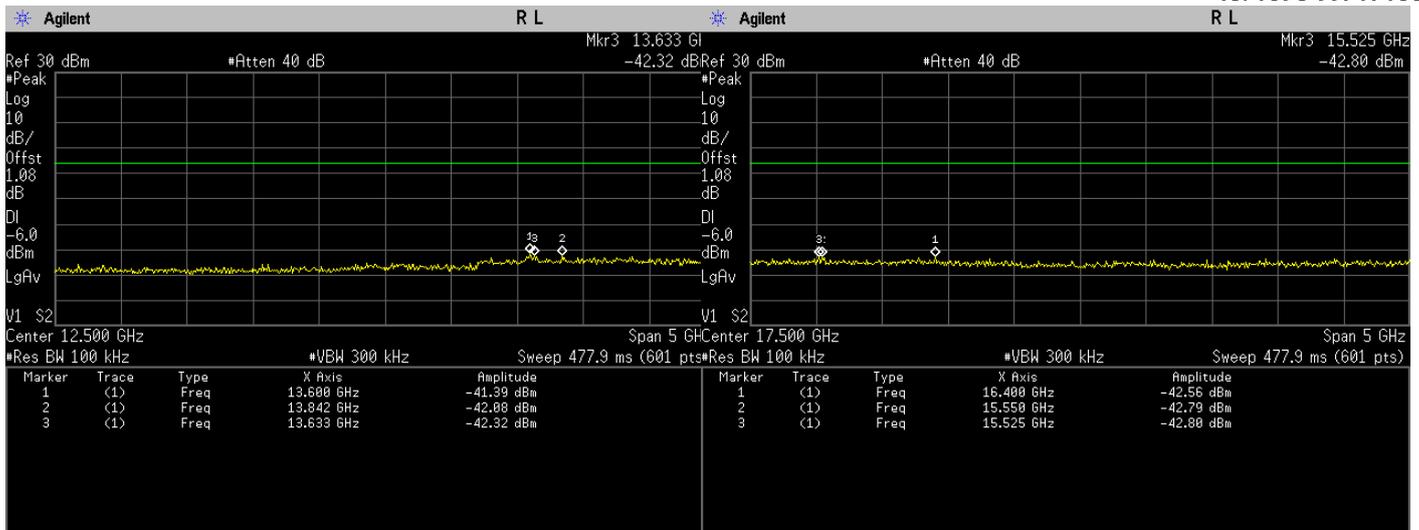
Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Emission Level, 30 MHz -> 1 GHz



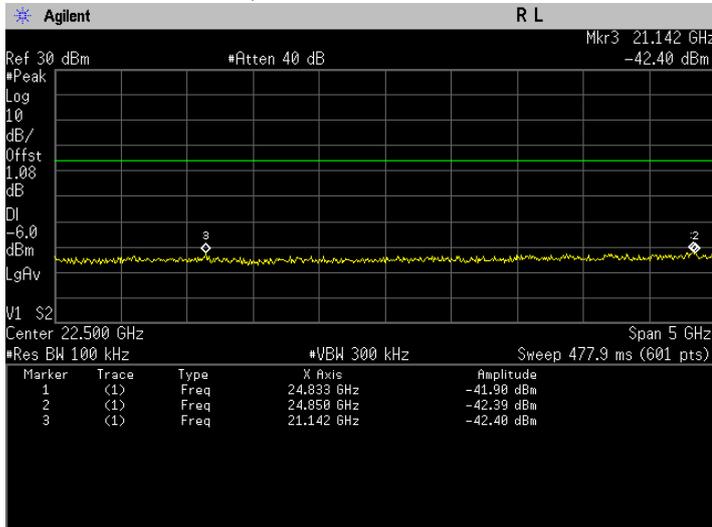
Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Emission Level, 5 GHz -> 10 GHz

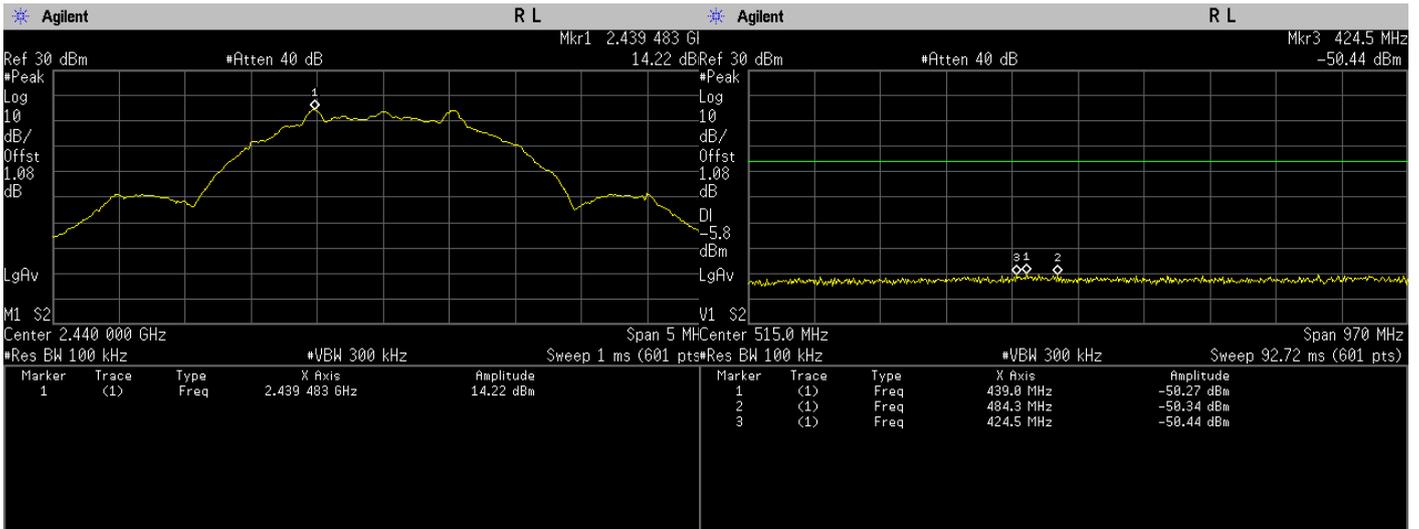


Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 Emission Level, 10 GHz -> 15 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Emission Level, 15 GHz -> 20 GHz

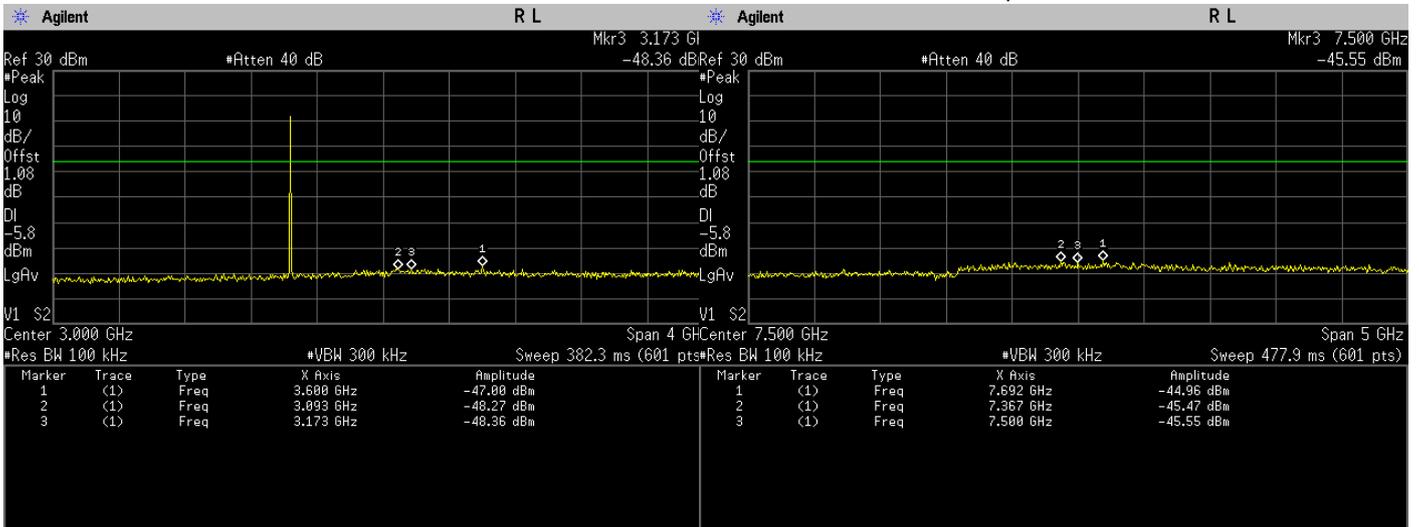


Conducted Emissions(Peak). Bluetooth LE, Frequency 2404 MHz Emission Level, 20 GHz -> 25 GHz



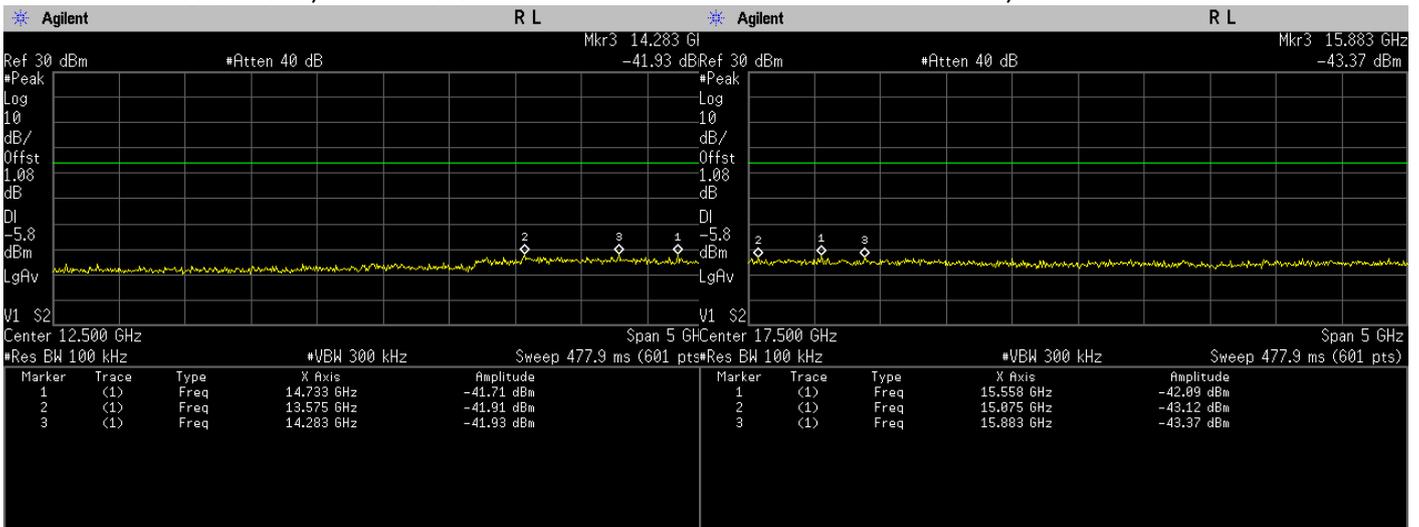
Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 30 MHz -> 1 GHz



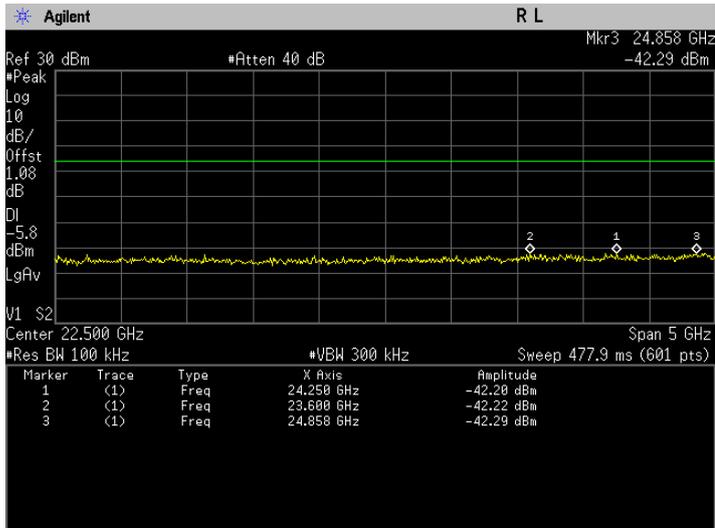
Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 5 GHz -> 10 GHz

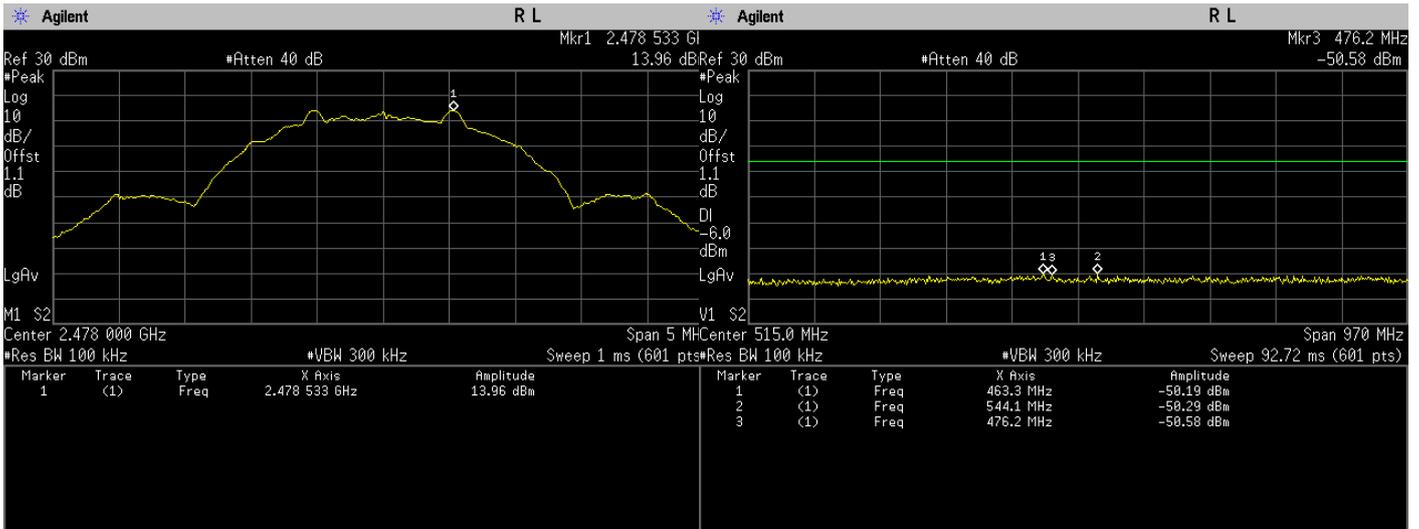


Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 Emission Level, 10 GHz -> 15 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 15 GHz -> 20 GHz

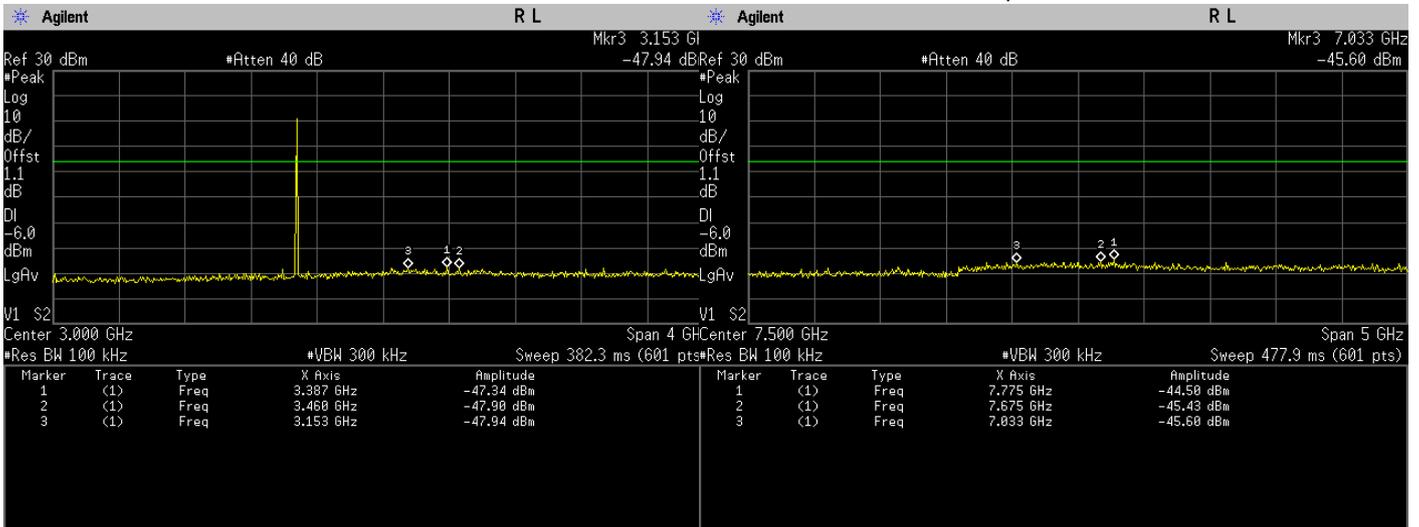


Conducted Emissions(Peak). Bluetooth LE, Frequency 2440 MHz Emission Level, 20 GHz -> 25 GHz



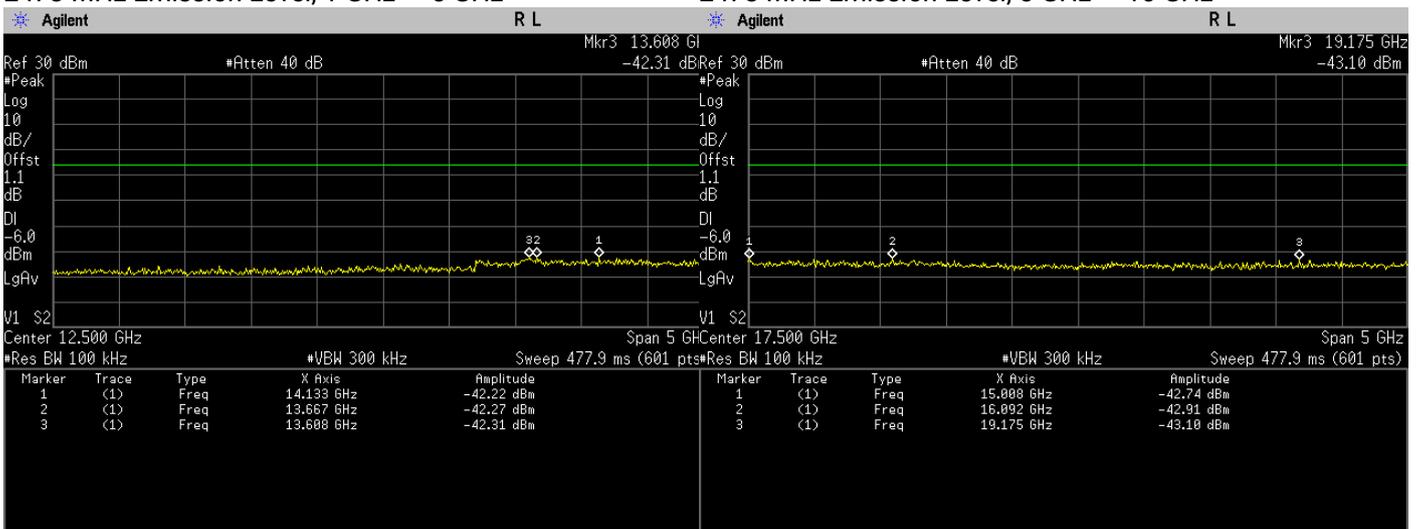
Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Reference Level

Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Emission Level, 30 MHz -> 1 GHz



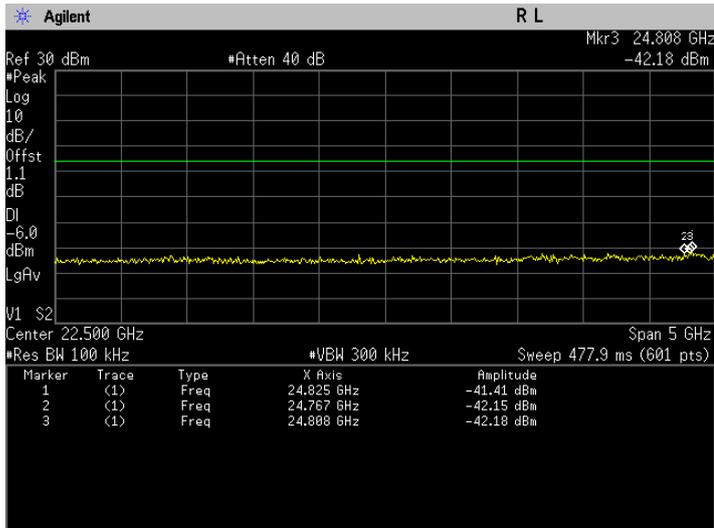
Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Emission Level, 10 GHz -> 15 GHz

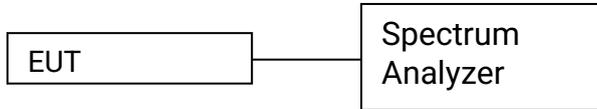
Conducted Emissions(Peak). Bluetooth LE, Frequency 2478 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Peak). Bluetooth LE, Frequency
 2478 MHz Emission Level, 20 GHz -> 25 GHz

6.5 Band edge Conducted Spurious Emission

6.5.1 Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- e) Use the peak marker function to measure highest emission.

6.5.2 Test Limits:

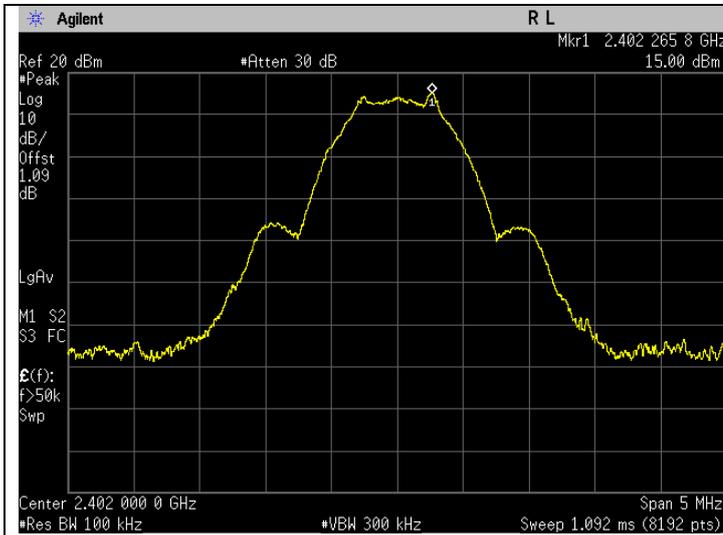
Normal Condition (25 ° C)

Shall be at least 20 dB below max power. (Peak detector)

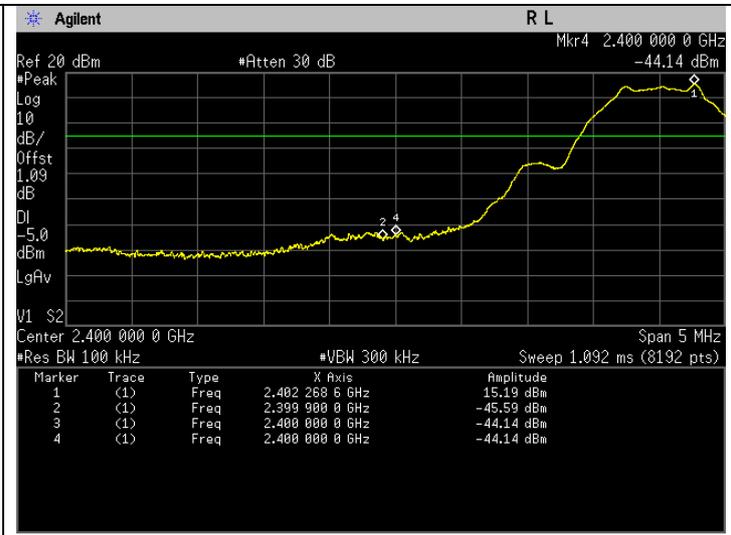
6.5.3 Test Result

BTLE 1M

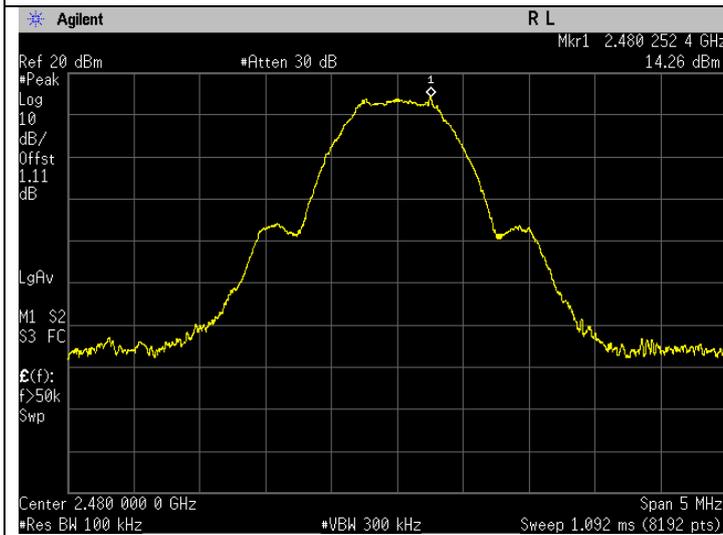
Test Conditions		Test Frequency	Results		
Standard	Data Rate	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
Bluetooth LE	1	2402	2400.00	-44.14	Pass
Bluetooth LE	1	2480	2483.50	-49.97	Pass



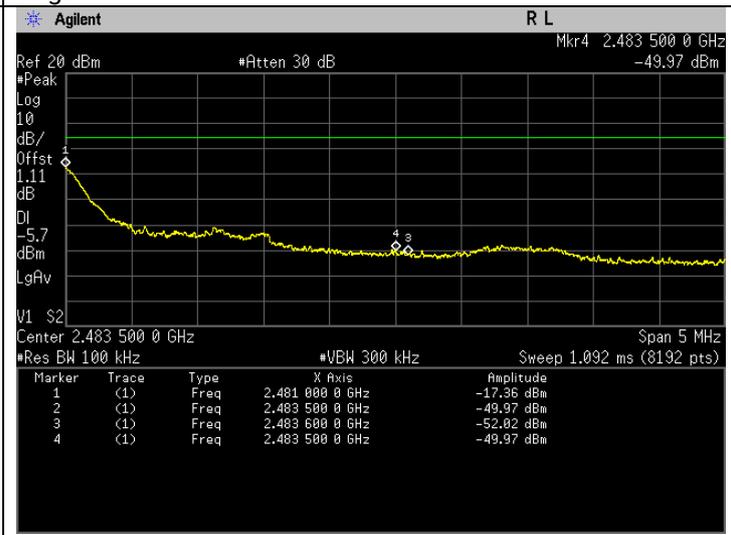
Band Edge(Peak). Bluetooth LE Frequency 2402 MHz Reference Level



Band Edge(Peak). Bluetooth LE Frequency 2402 MHz Band Edge



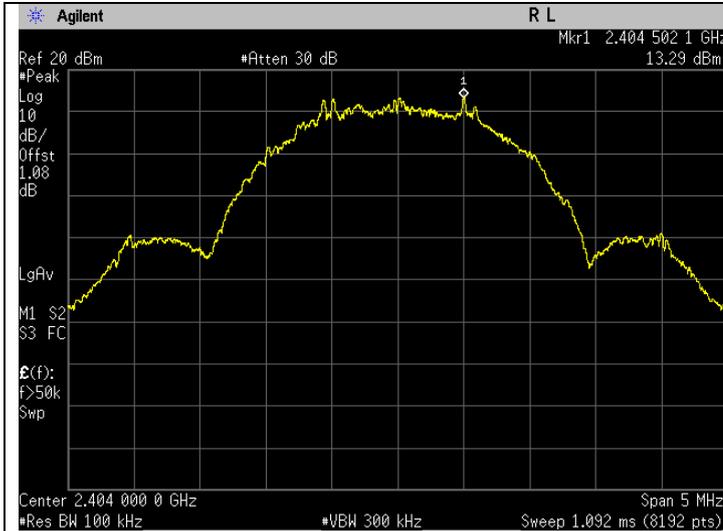
Band Edge(Peak). Bluetooth LE Frequency 2480 MHz Reference Level



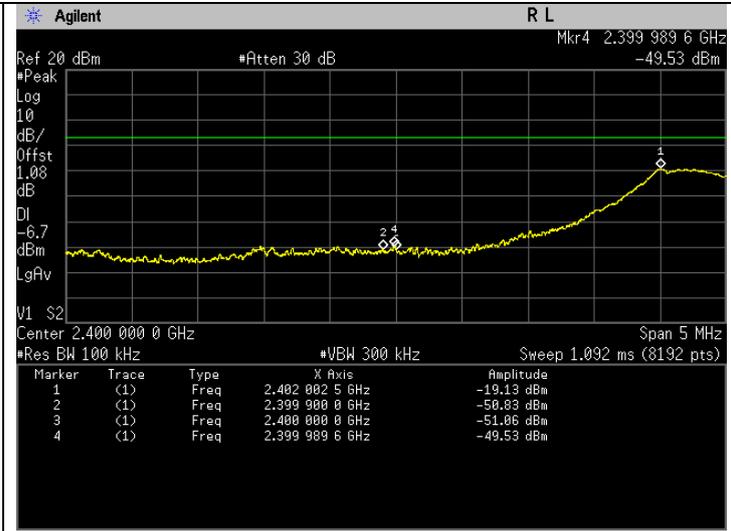
Band Edge(Peak). Bluetooth LE Frequency 2480 MHz Band Edge

BTLE 2M

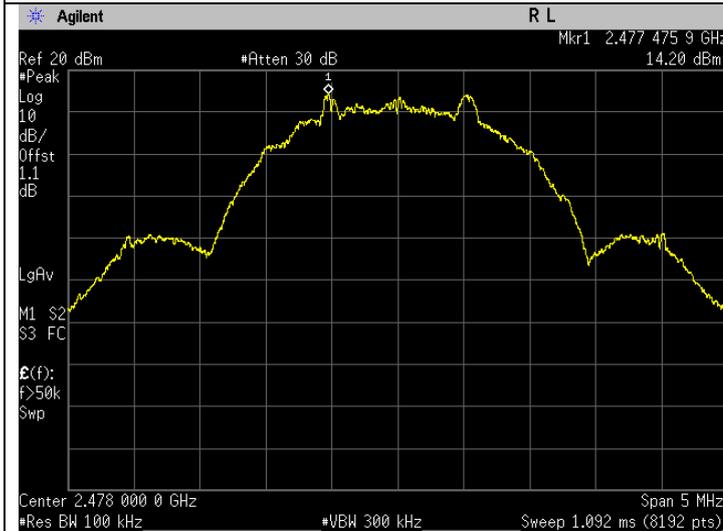
Test Conditions		Test Frequency	Results		
Standard	Data Rate	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
Bluetooth LE	2	2404	2399.99	-49.53	Pass
Bluetooth LE	2	2478	2483.59	-53.19	Pass



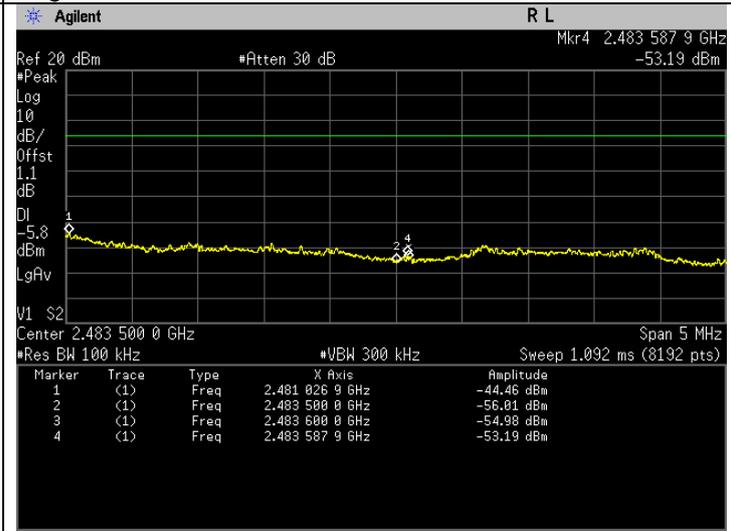
Band Edge(Peak). Bluetooth LE Frequency 2404 MHz Reference Level



Band Edge(Peak). Bluetooth LE Frequency 2404 MHz Band Edge



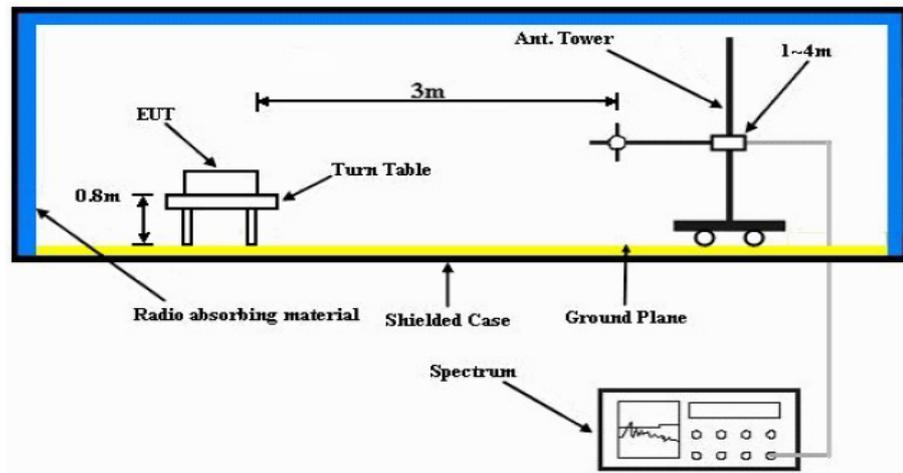
Band Edge(Peak). Bluetooth LE Frequency 2478 MHz Reference Level



Band Edge(Peak). Bluetooth LE Frequency 2478 MHz Band Edge

6.6 Radiated Emission within Restricted Bands

6.6.1 Test Setup



- The EUT is placed on the top of a rotating table 0.8m (<1GHz) or 1.5m (>1GHz) above the ground at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
- The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
- The antenna is Bilog/Horn antenna depend on which frequency range uses, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

6.6.2 Test Limits:

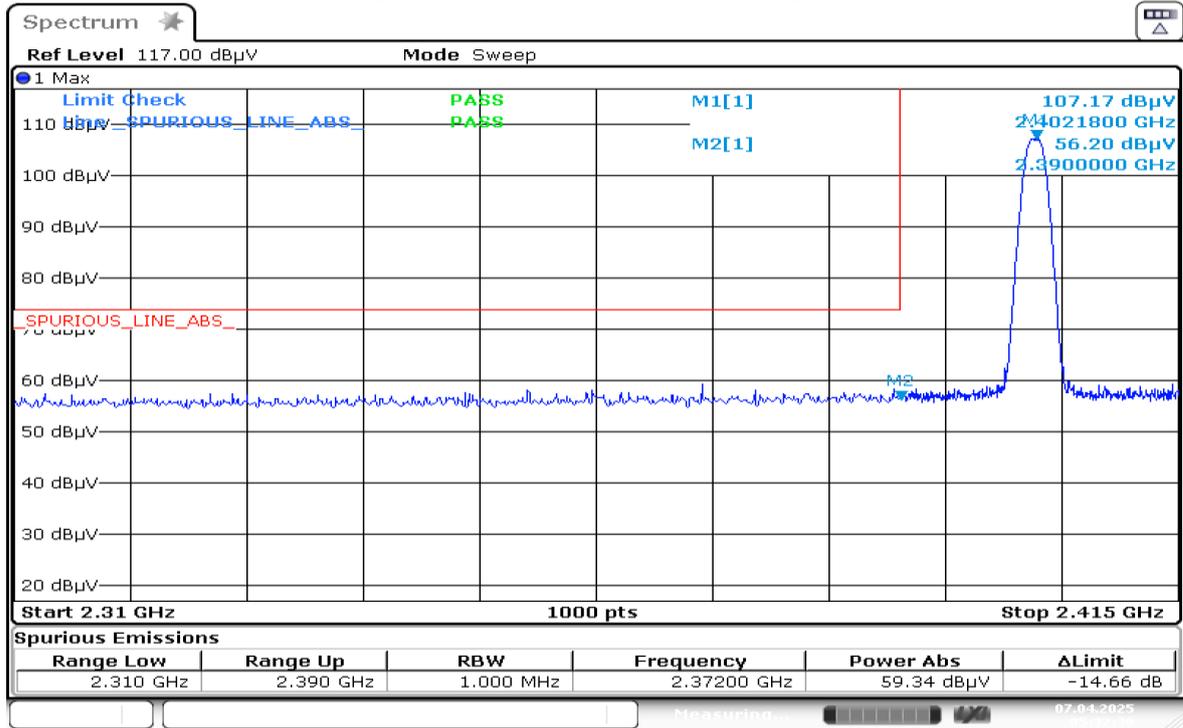
Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

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

NOTE:

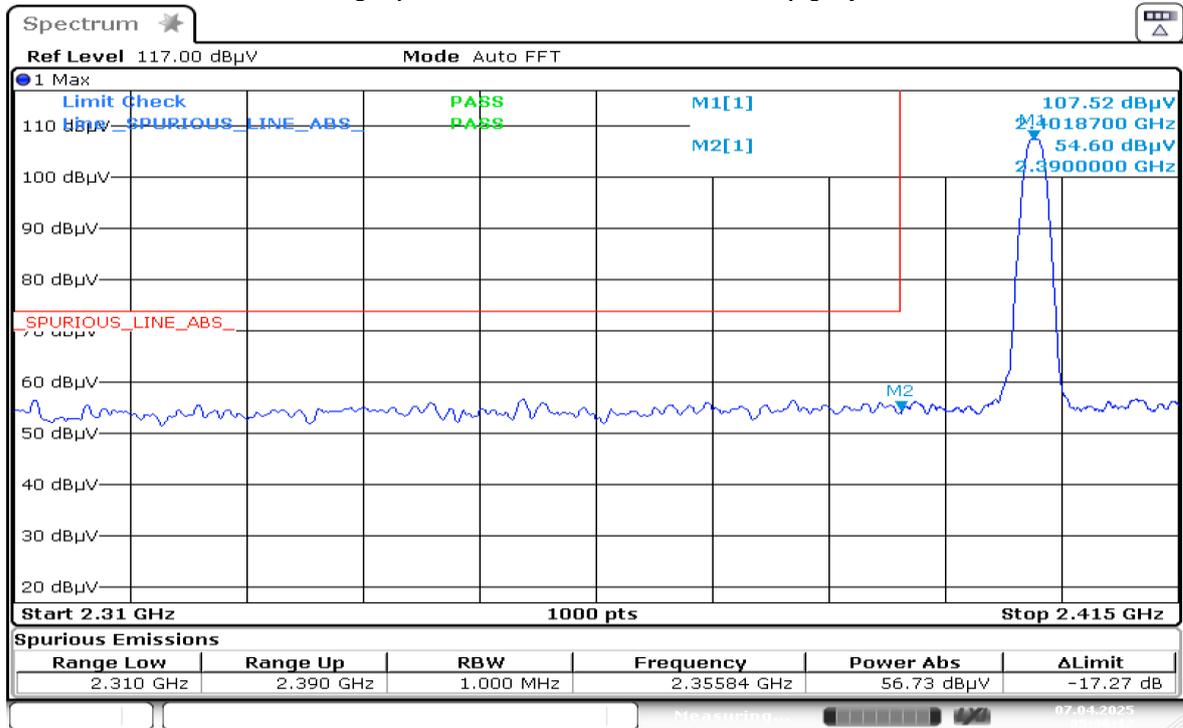
- 1) The lower limit shall apply at the transition frequencies.
- 2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3) For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



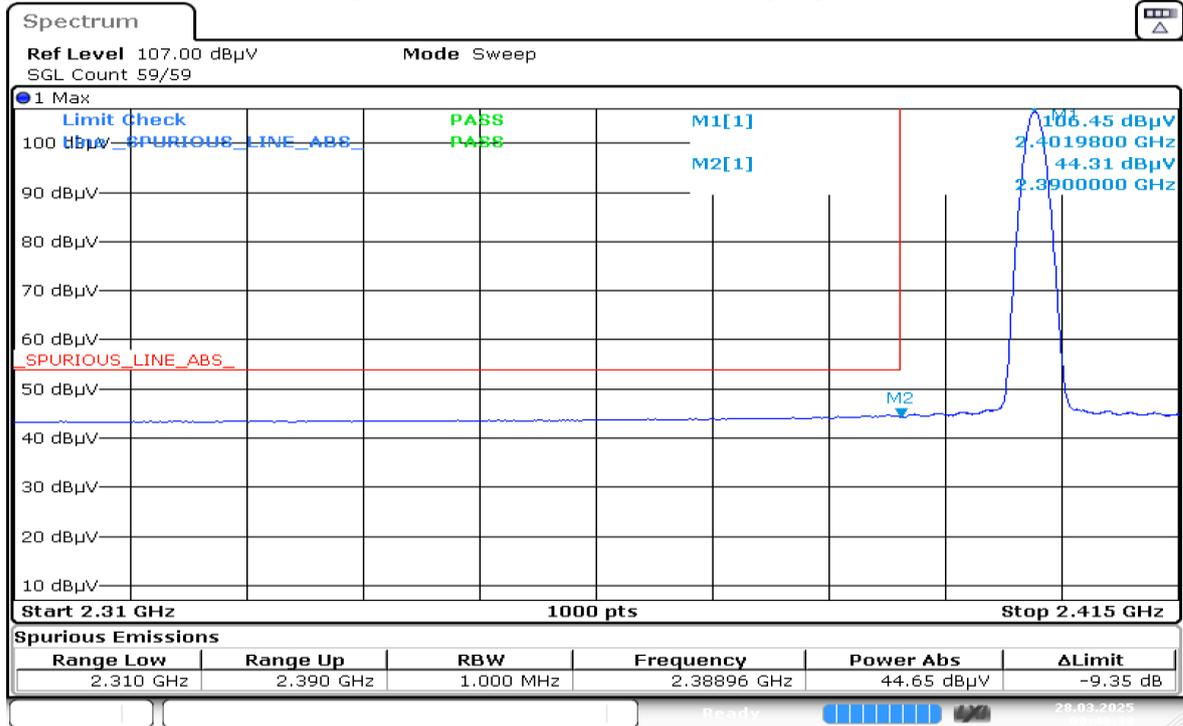
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Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



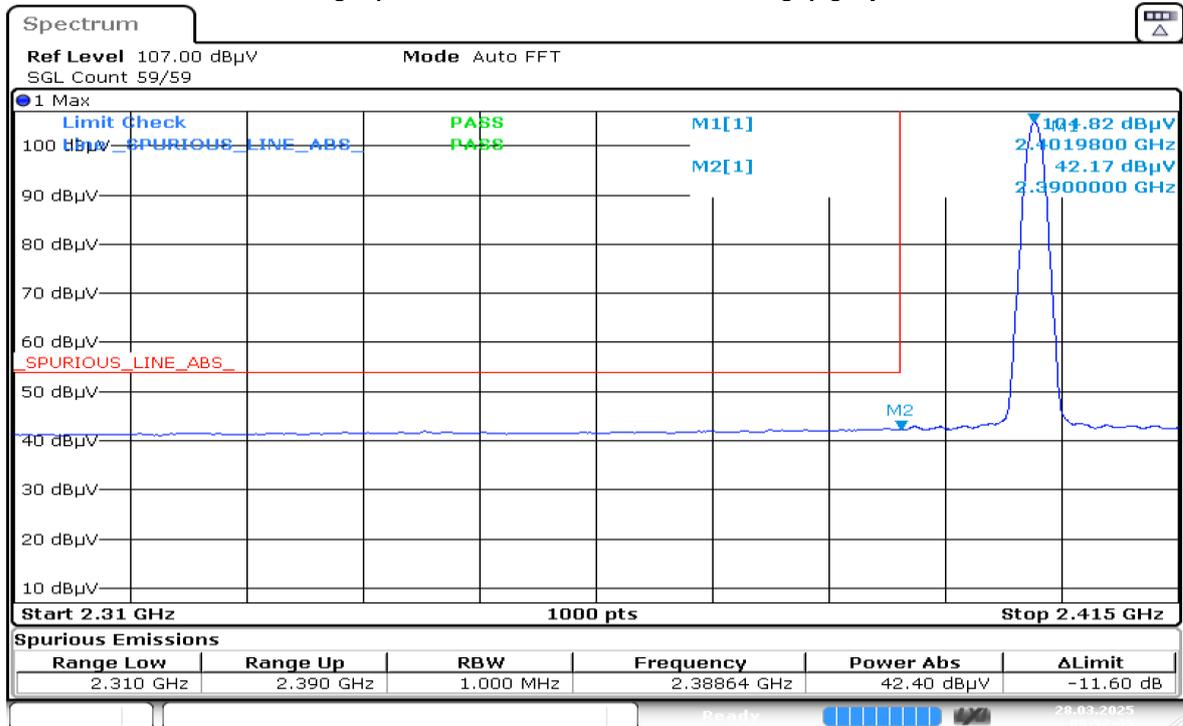
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Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



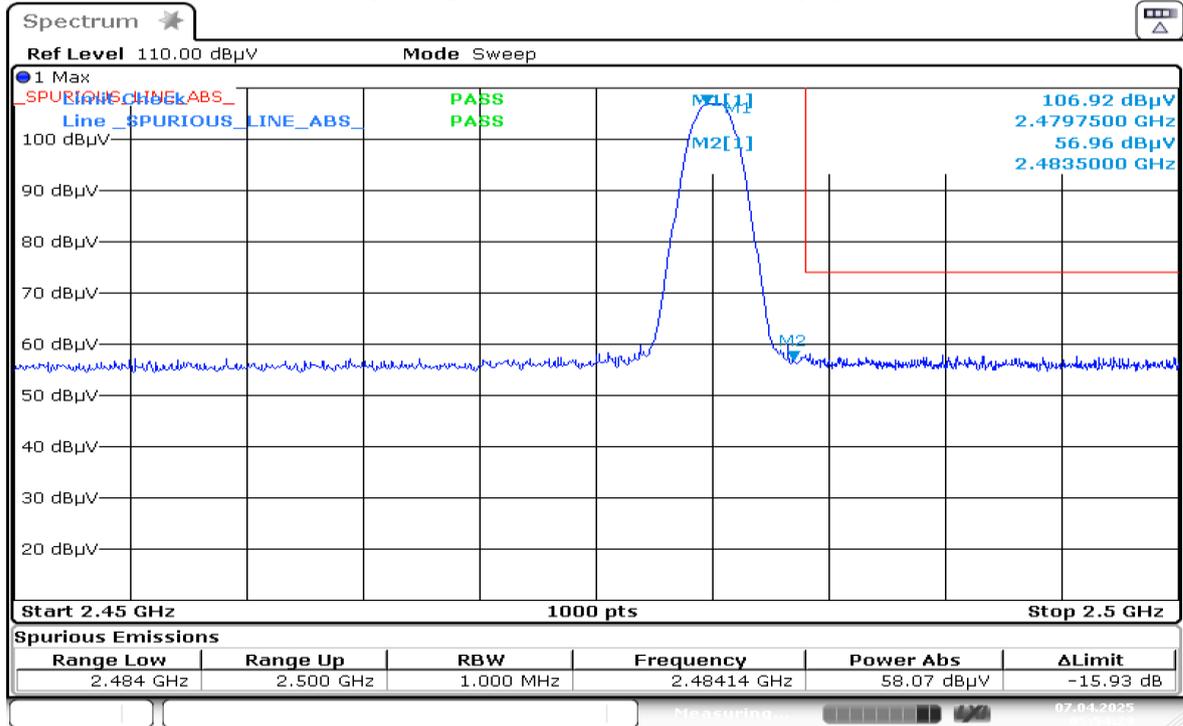
Date: 28.MAR.2025 09:48:38

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



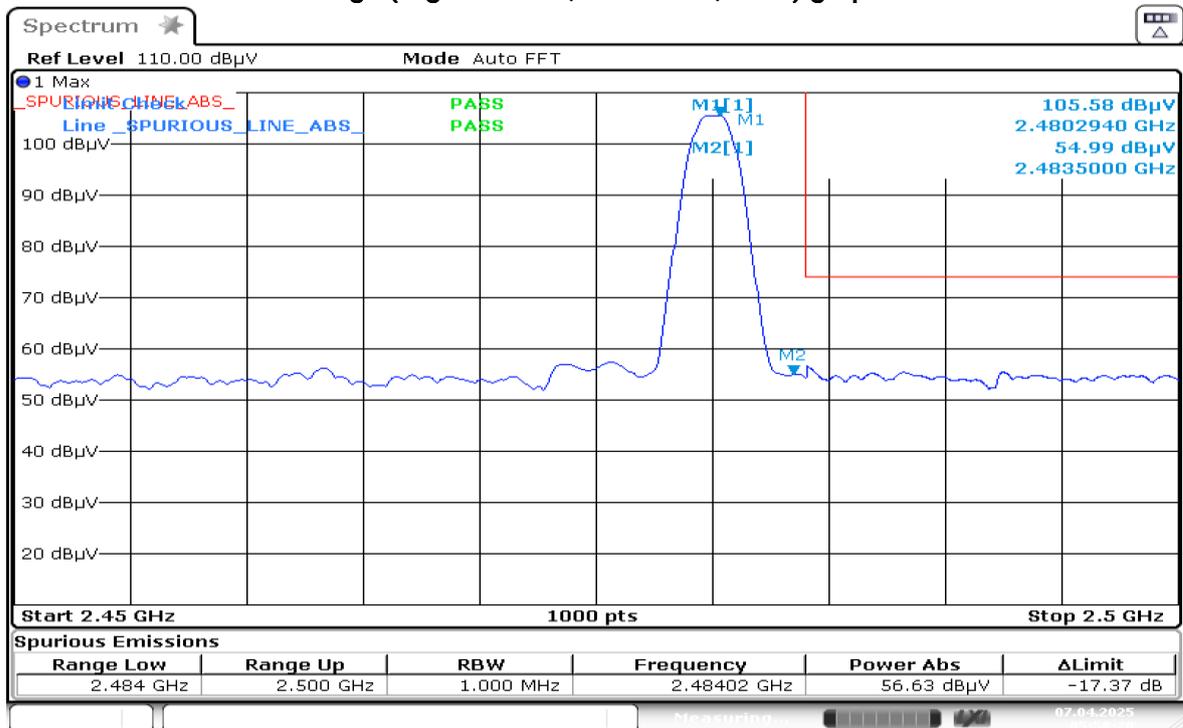
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Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



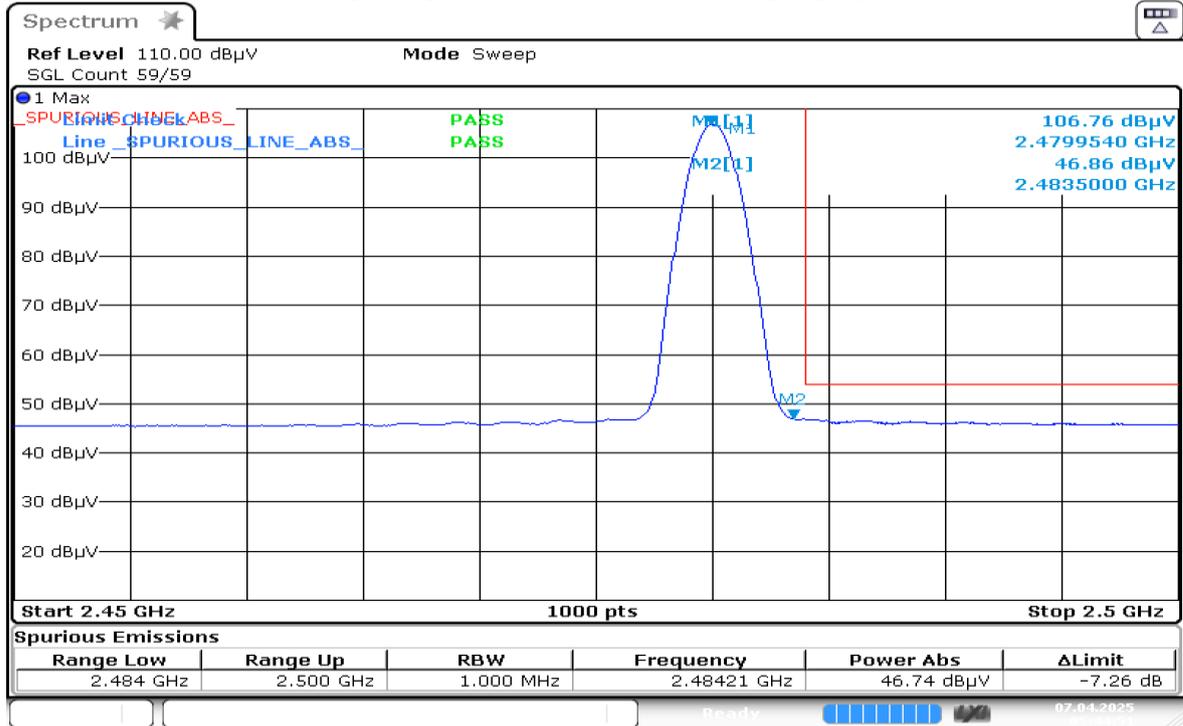
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Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot

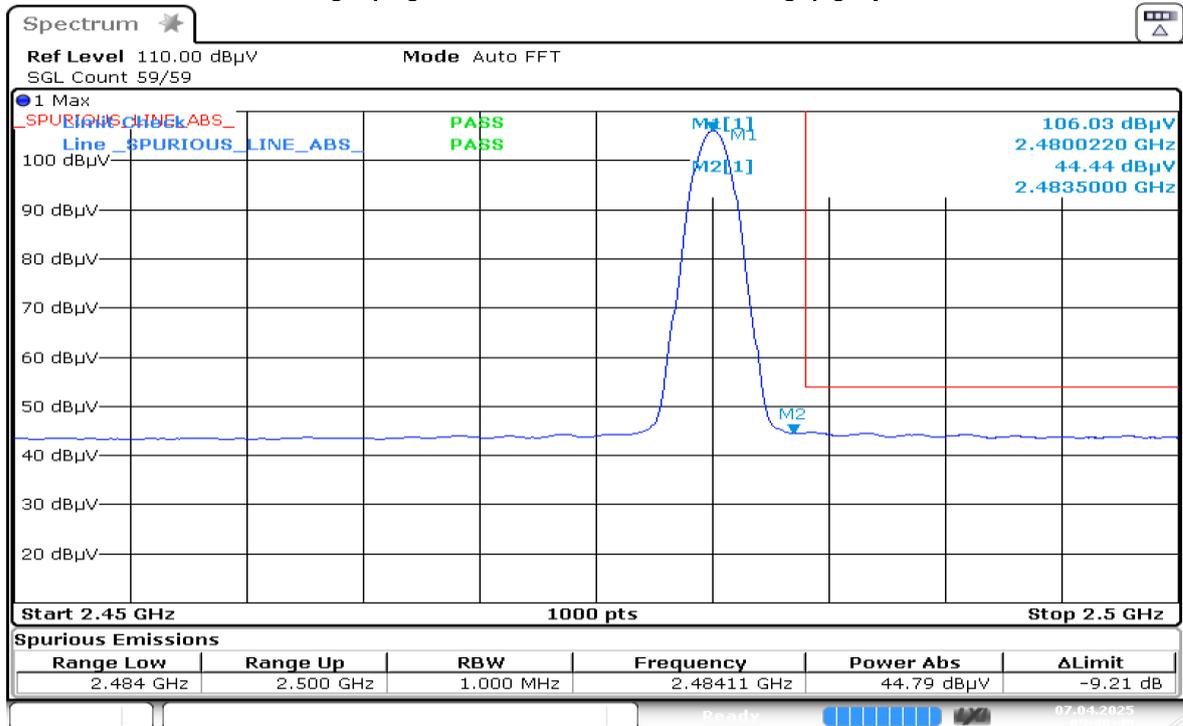


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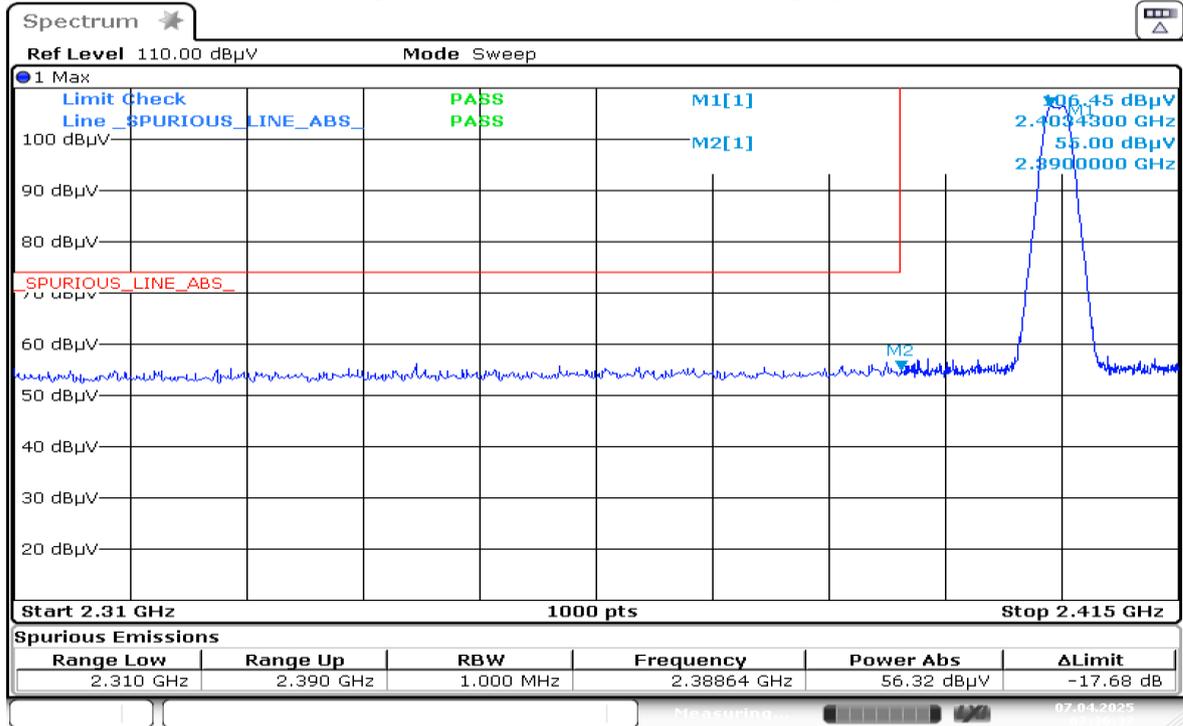
Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



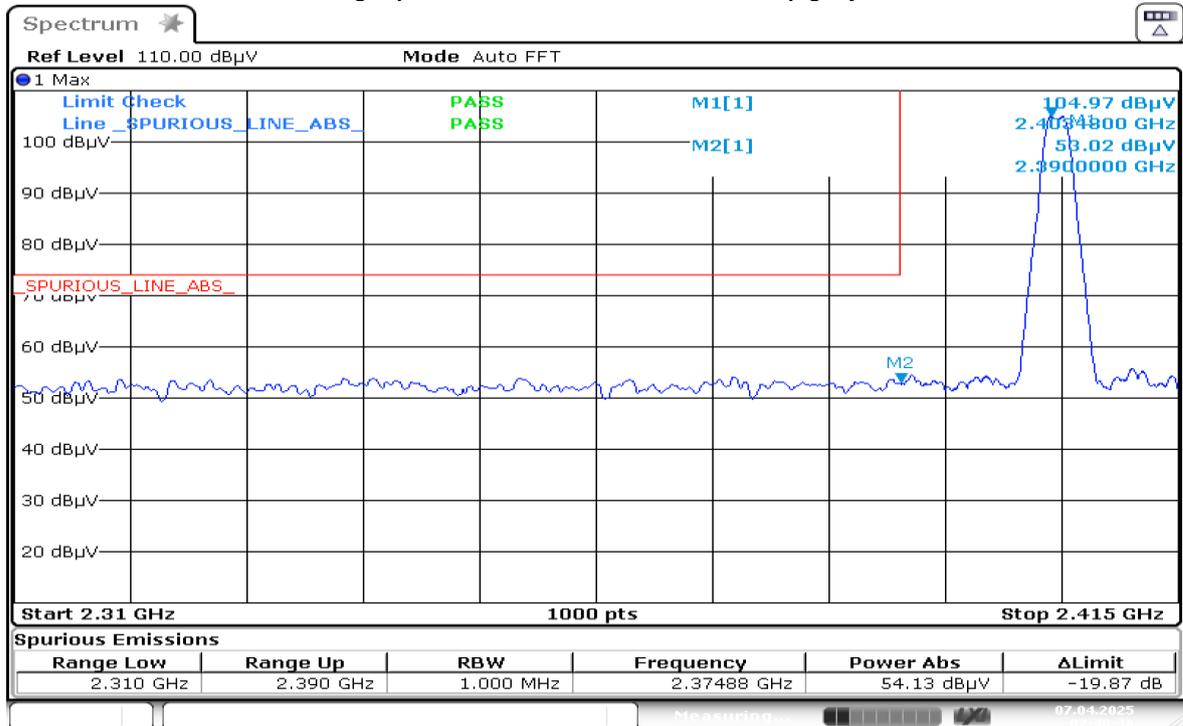
Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



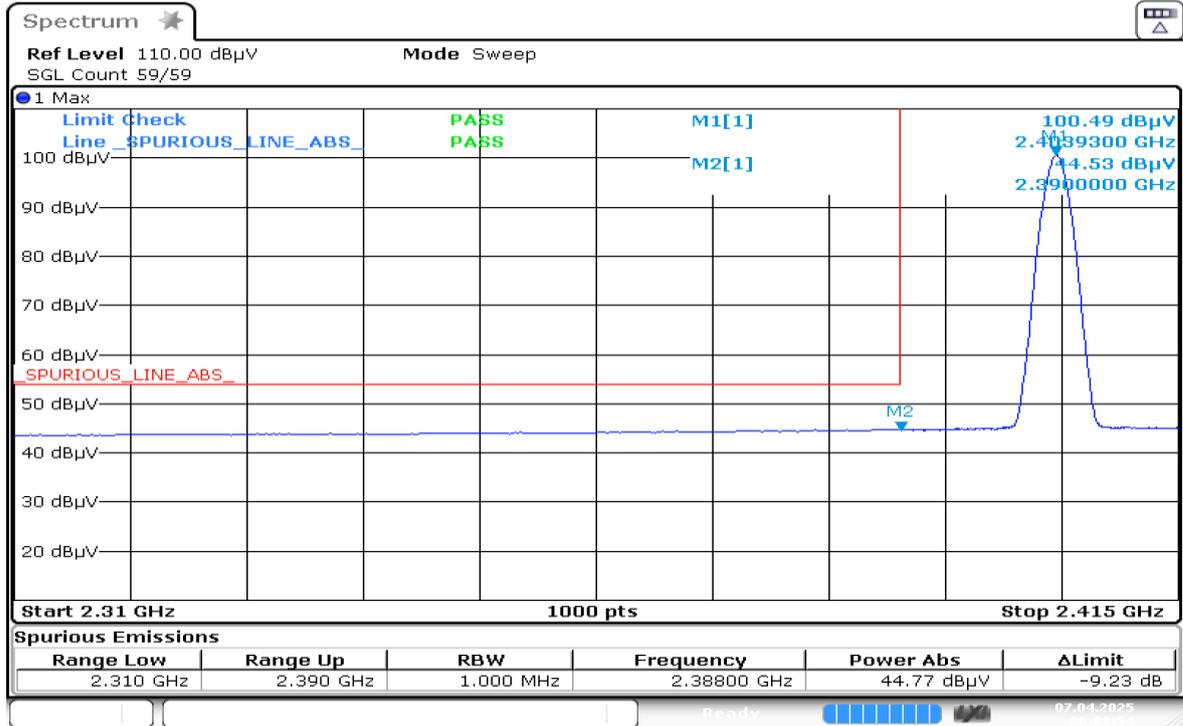
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot

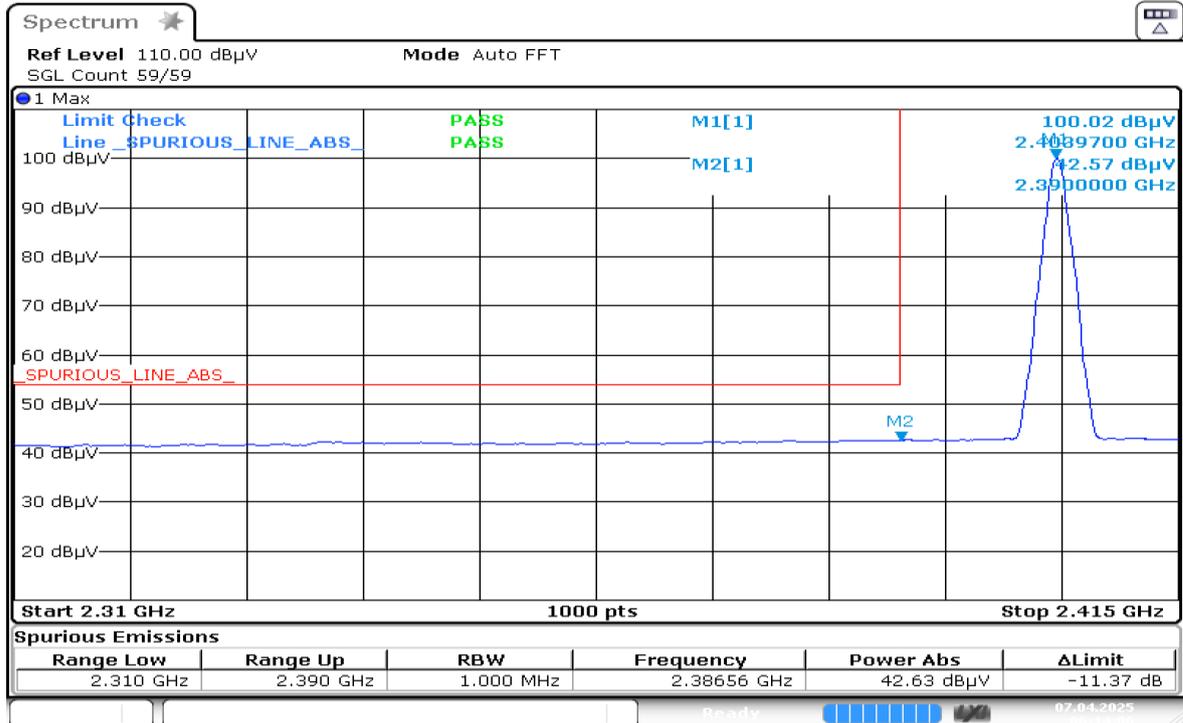


Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



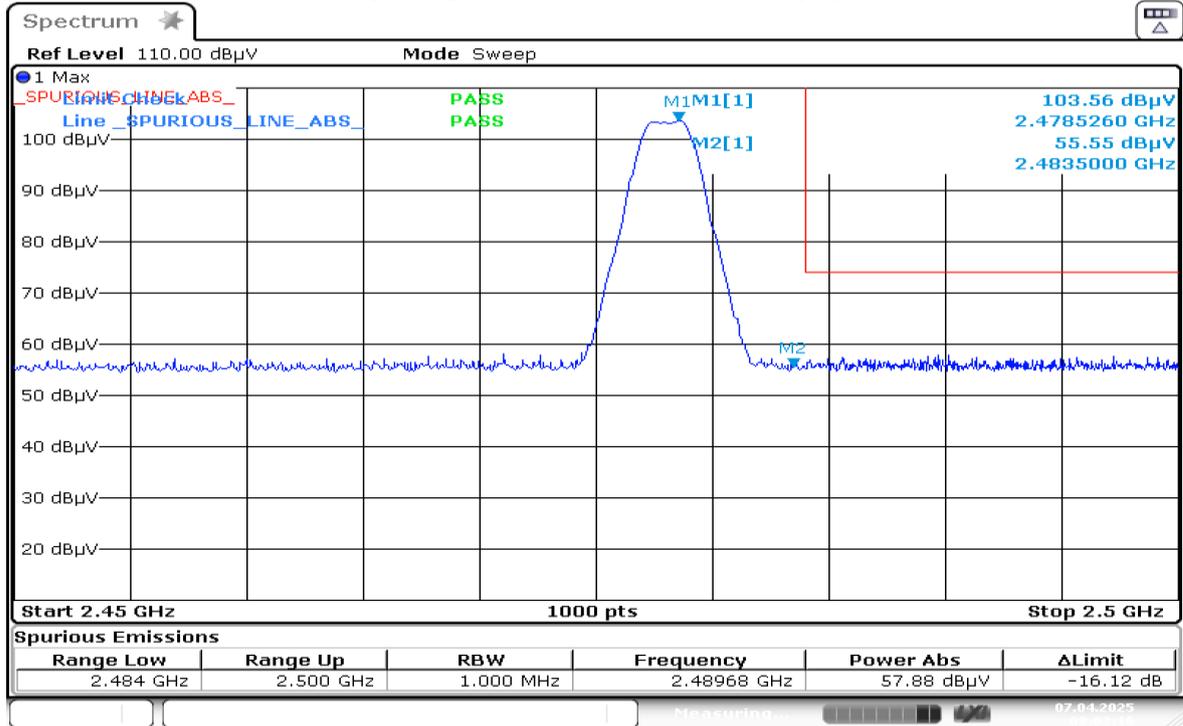
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Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



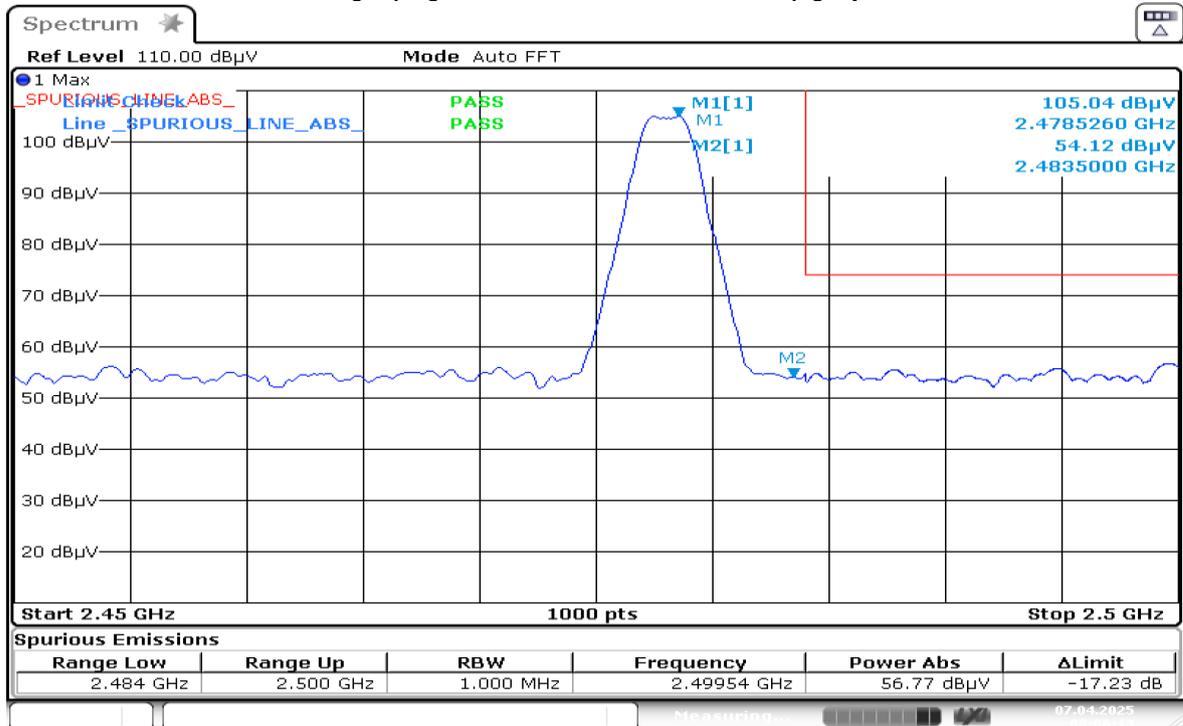
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Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



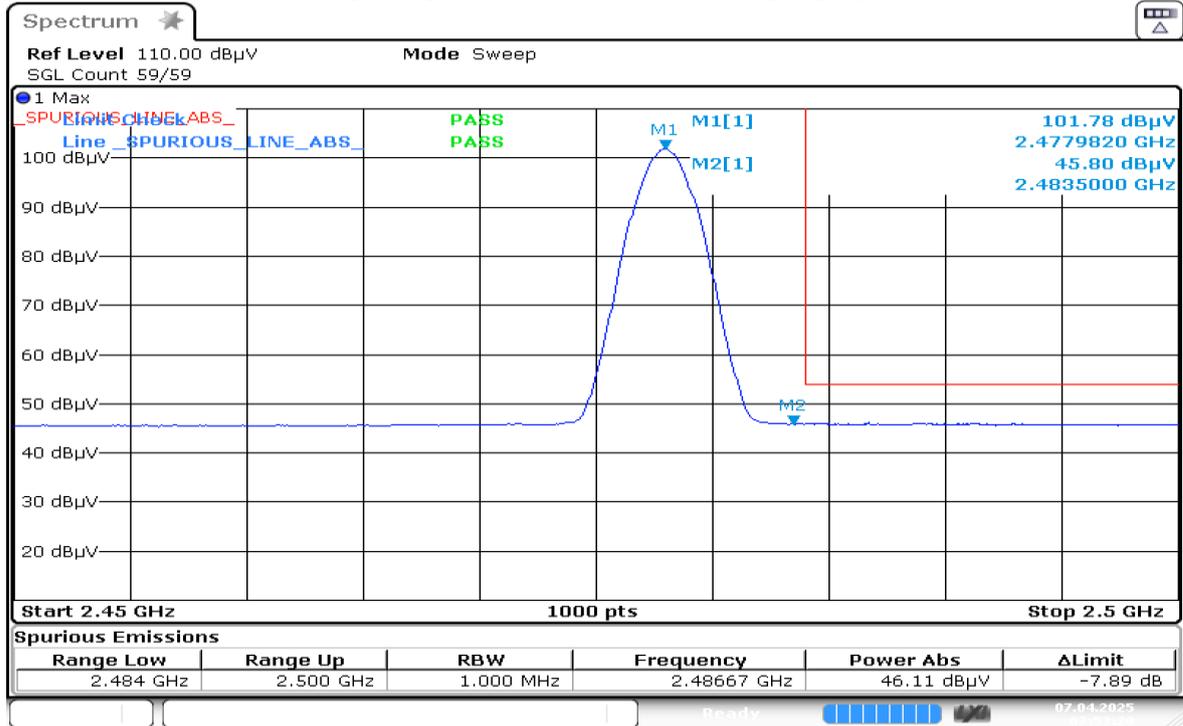
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Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



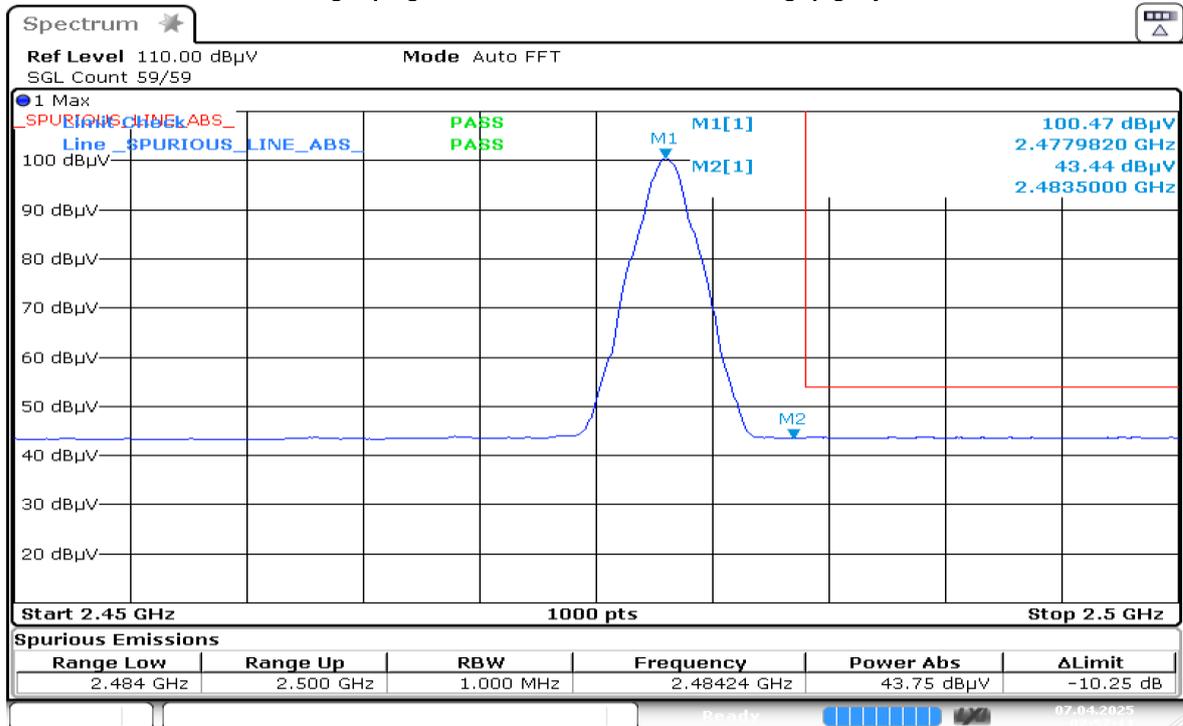
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Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



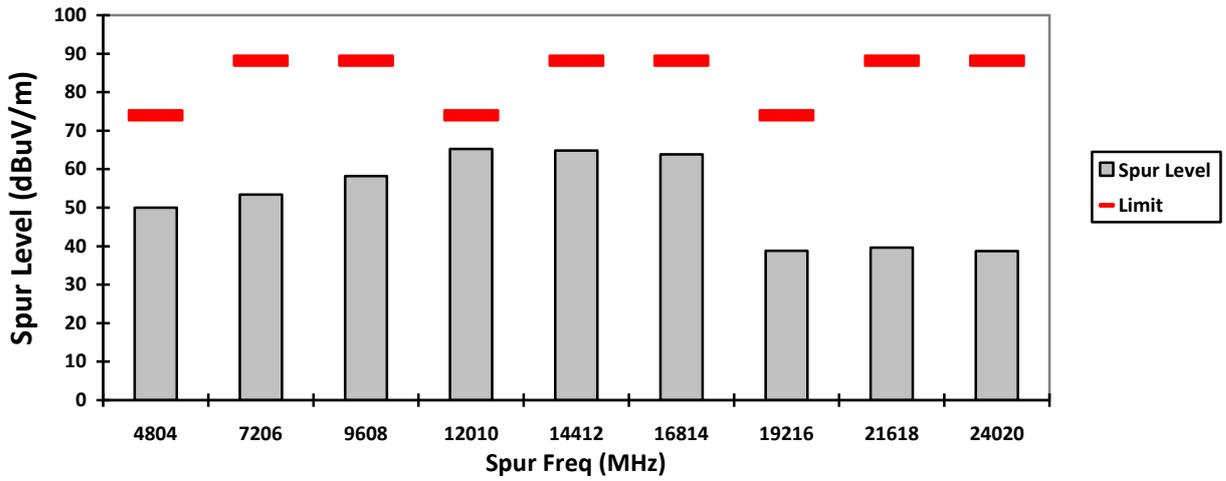
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Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot

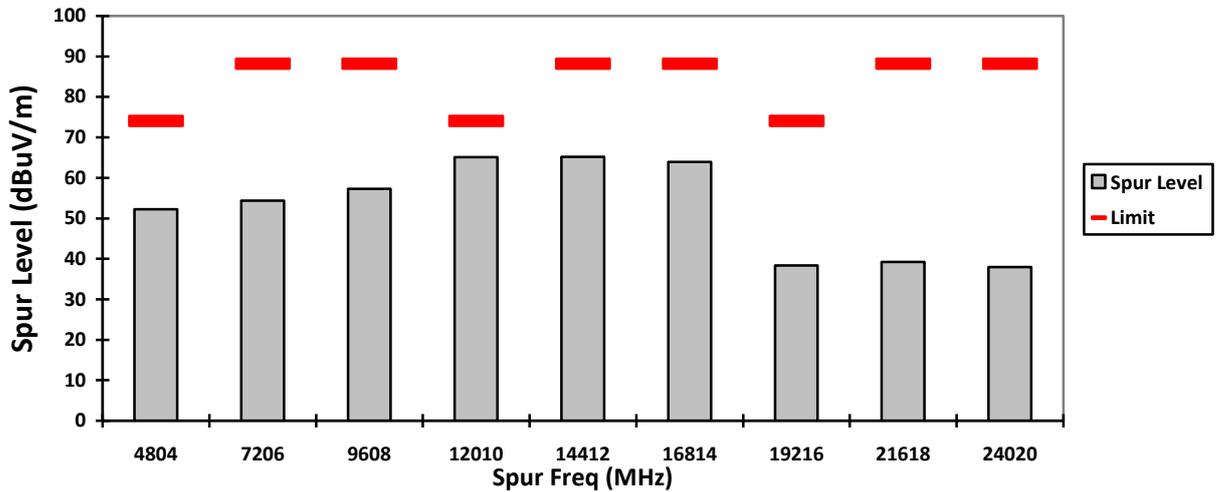


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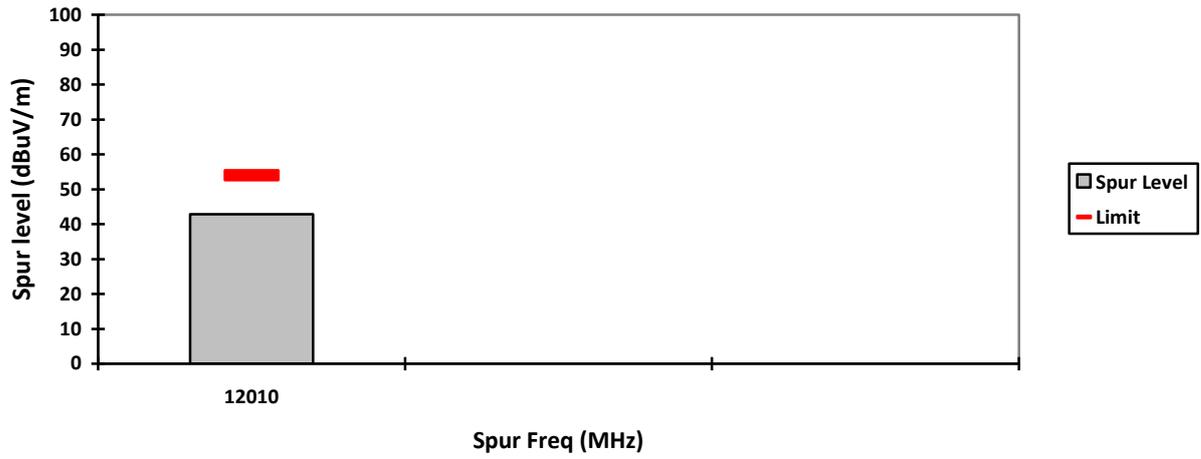
VERTICAL, PK



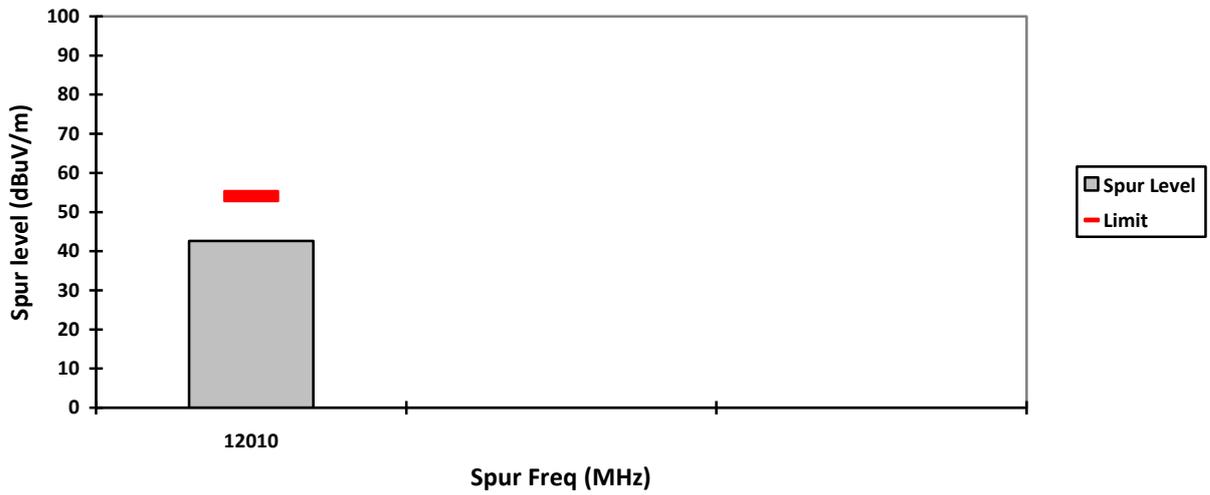
HORIZONTAL, PK



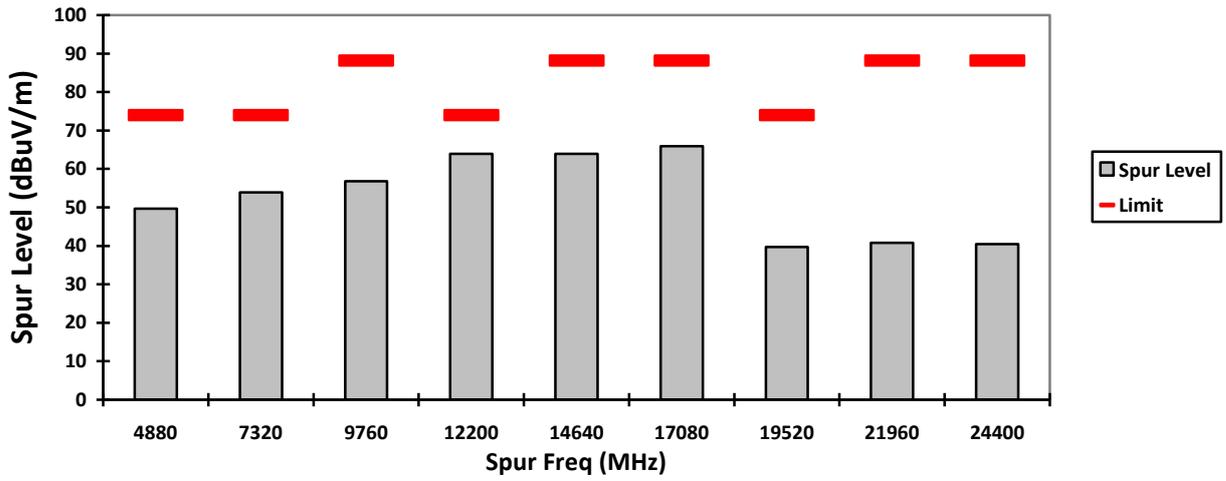
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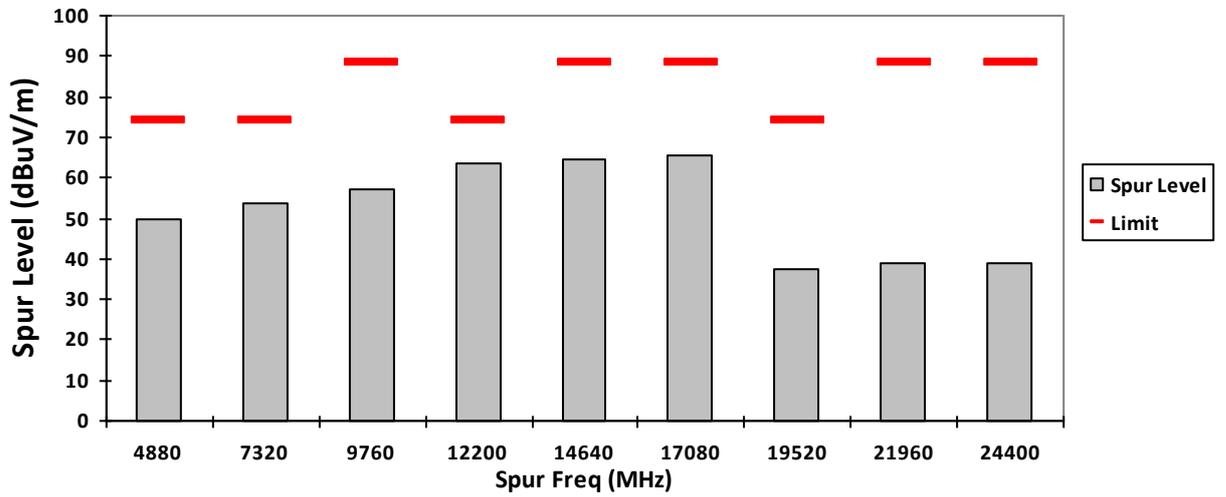
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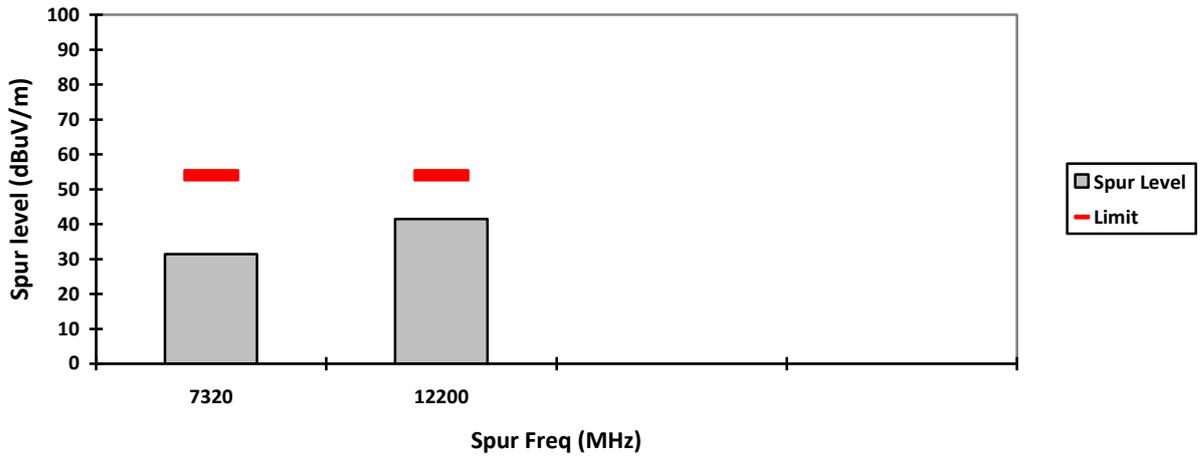
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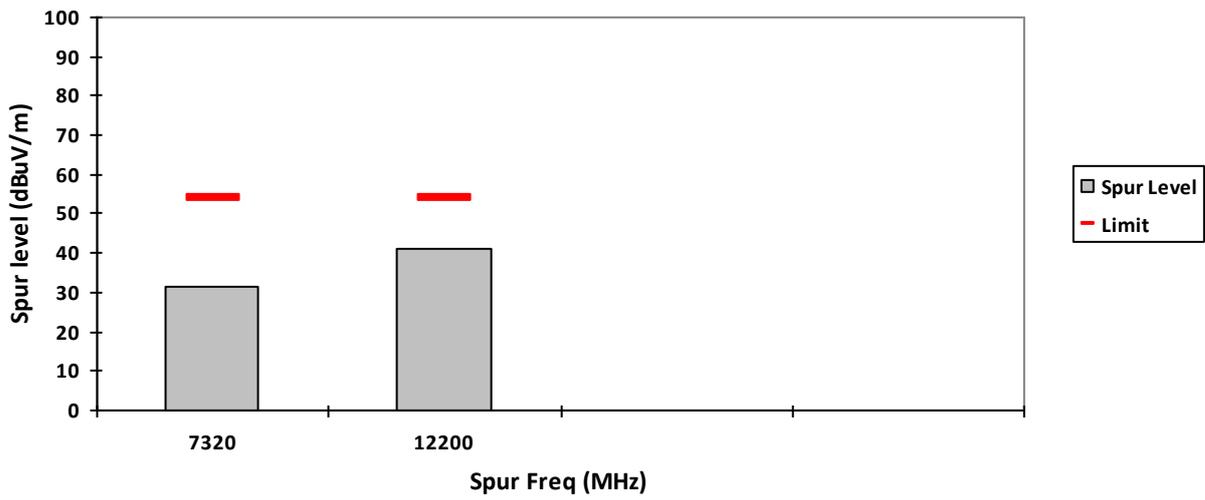
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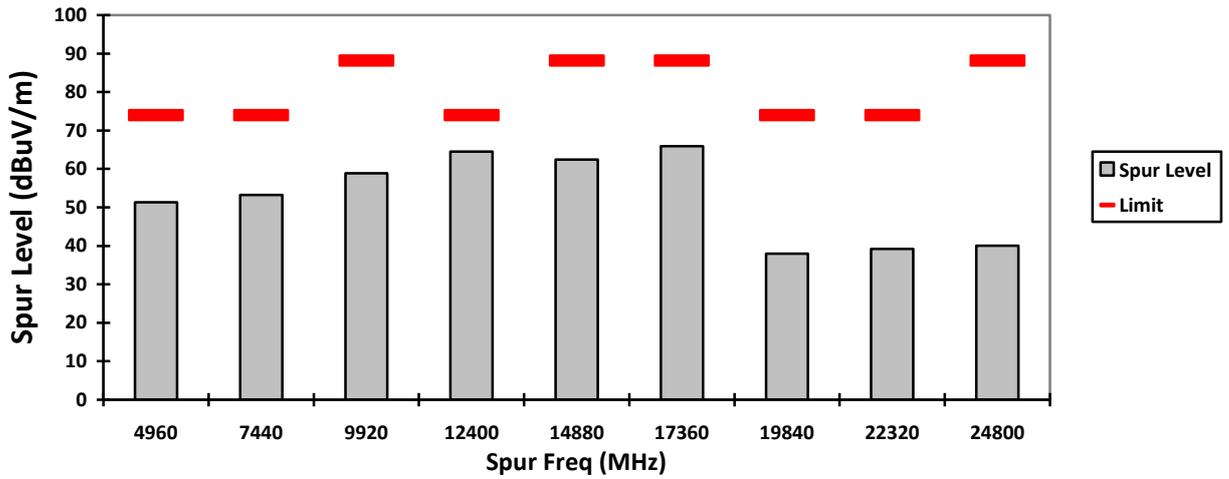
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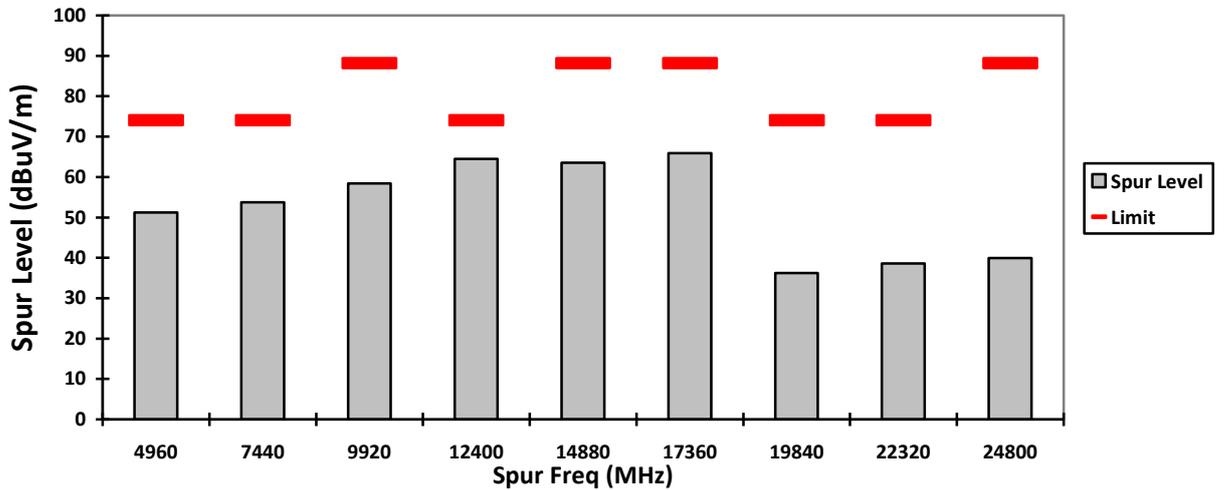
HORIZONTAL, AV



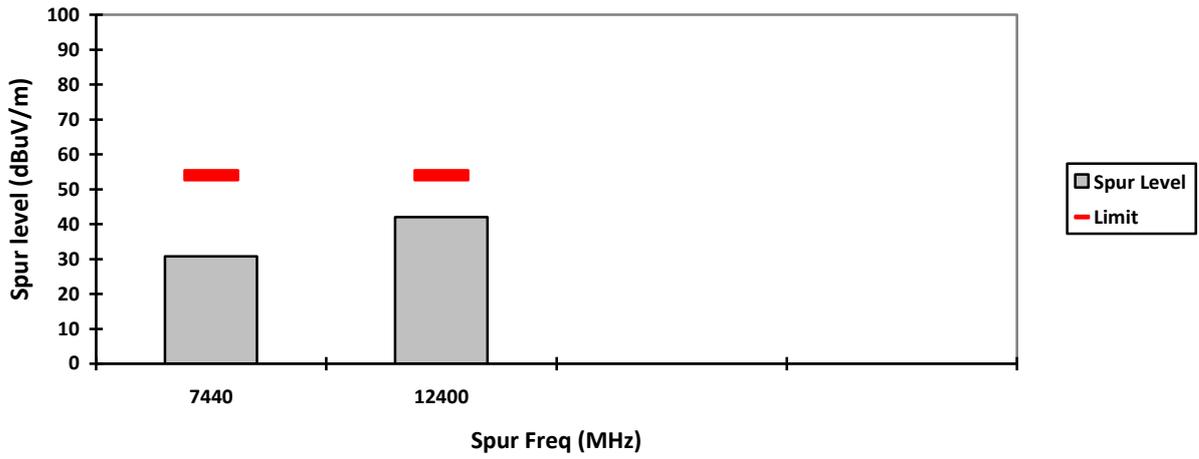
VERTICAL, PK



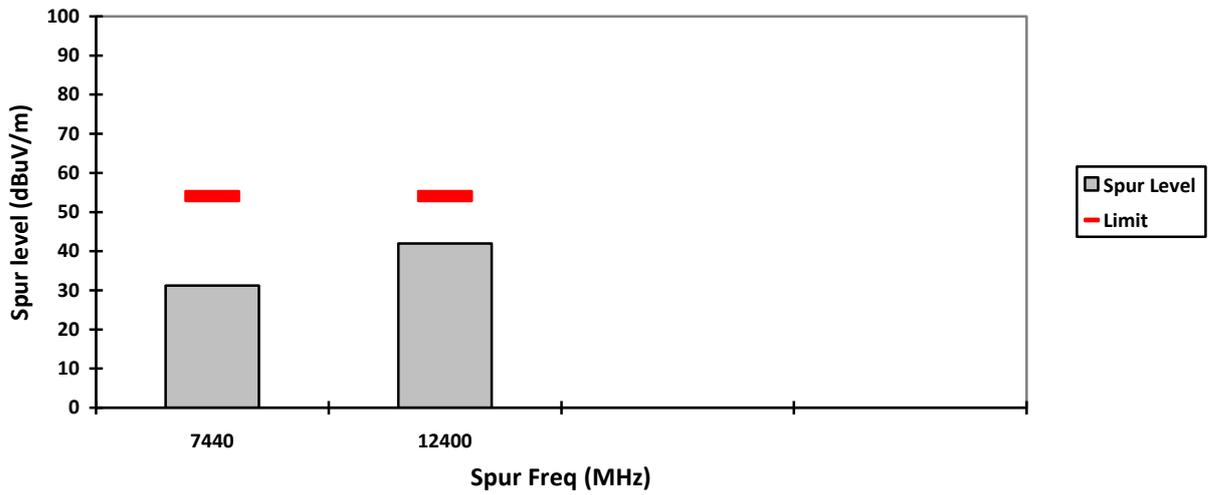
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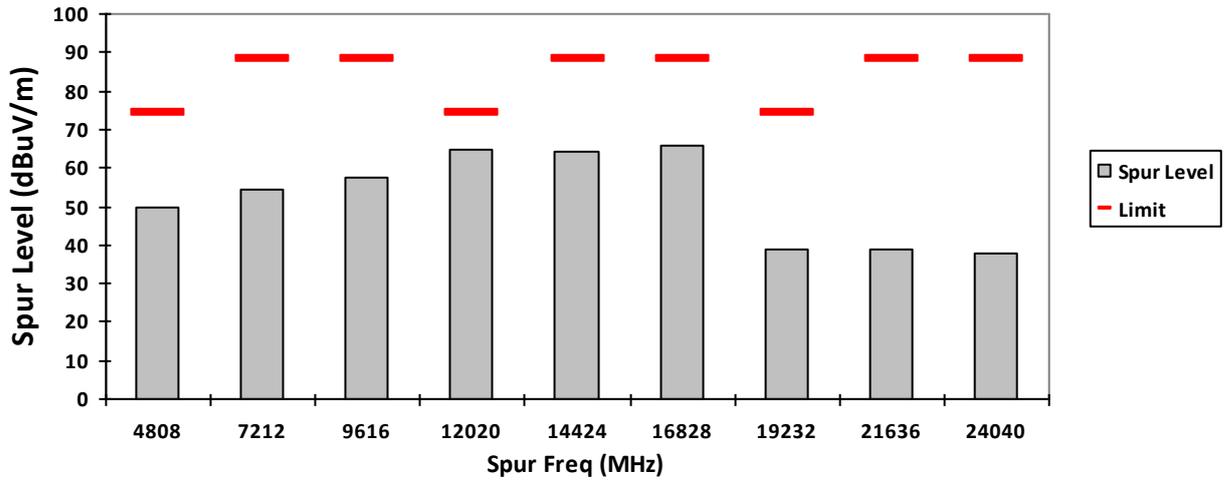
VERTICAL, AV



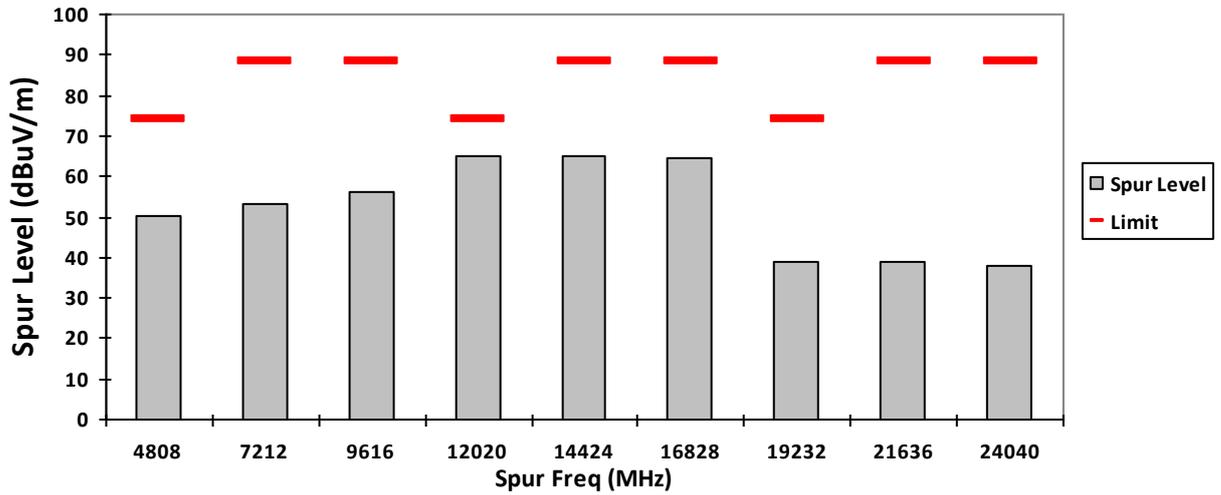
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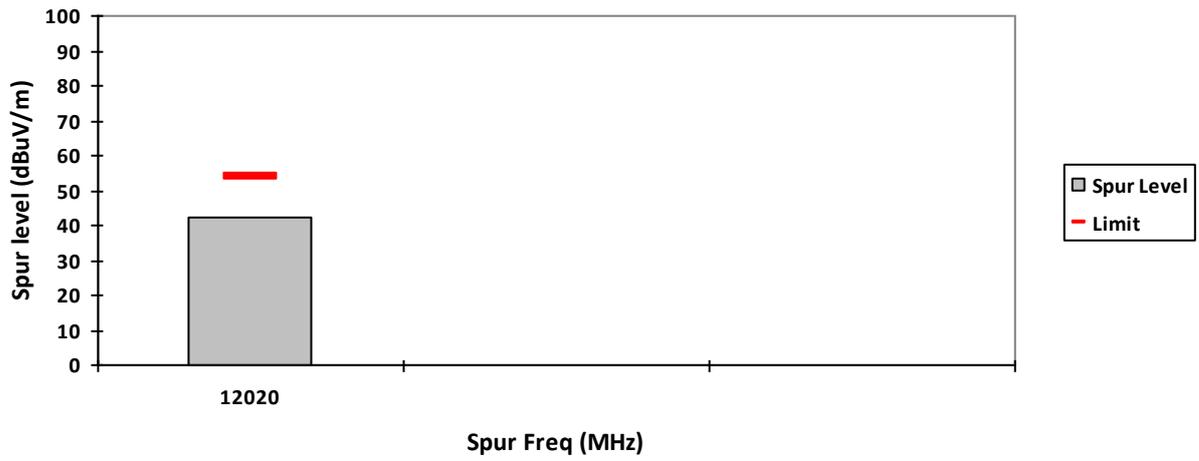
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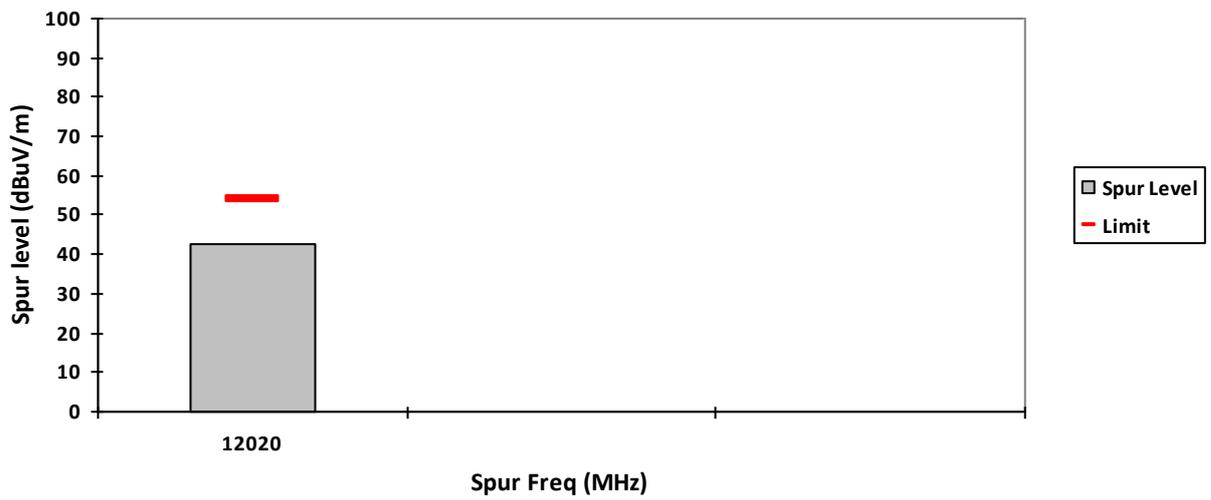
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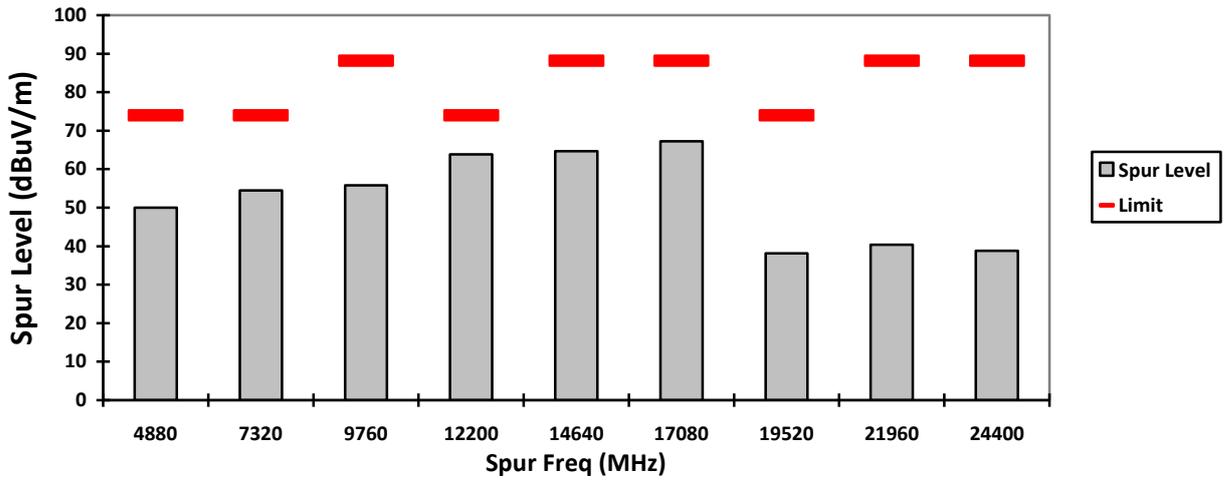
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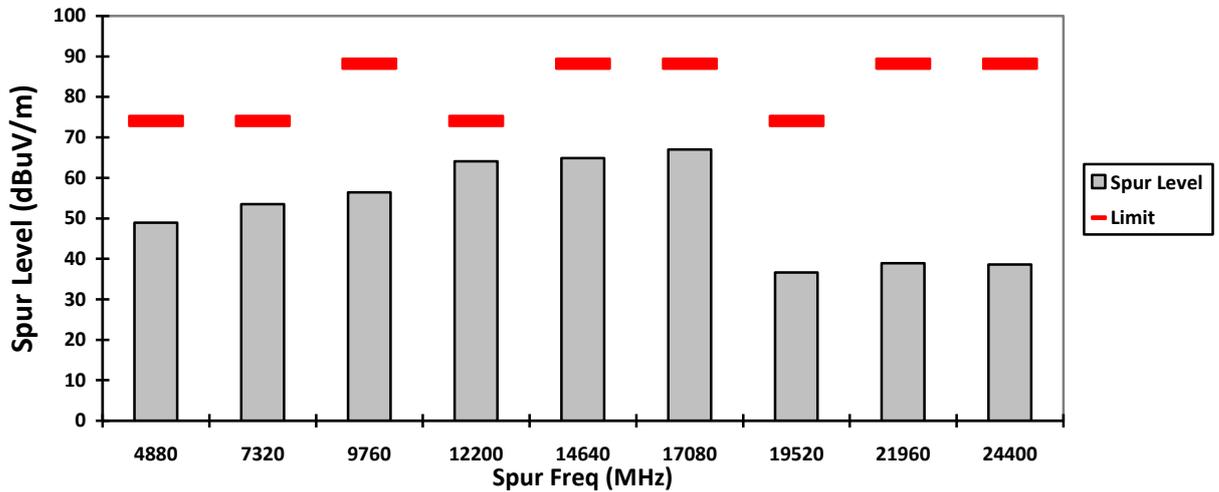
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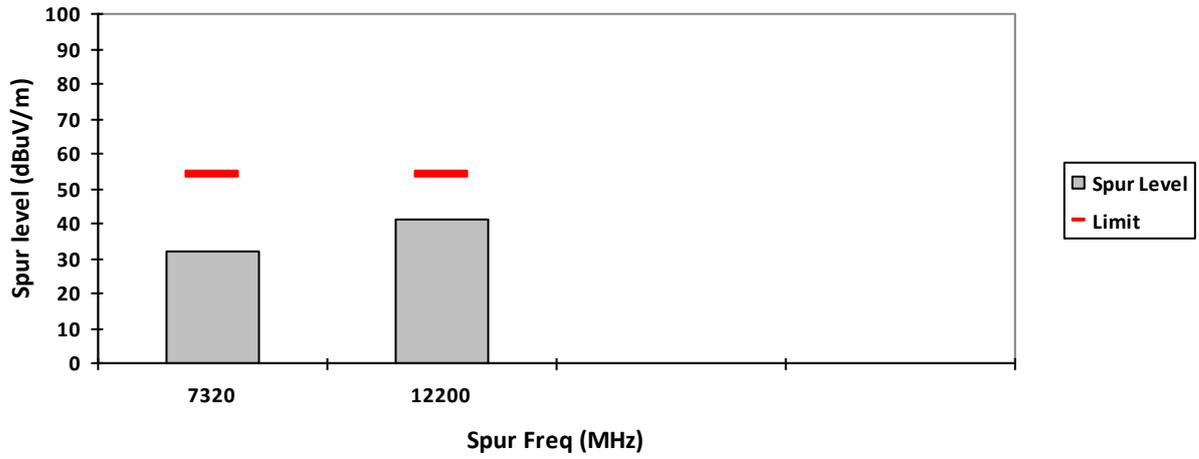
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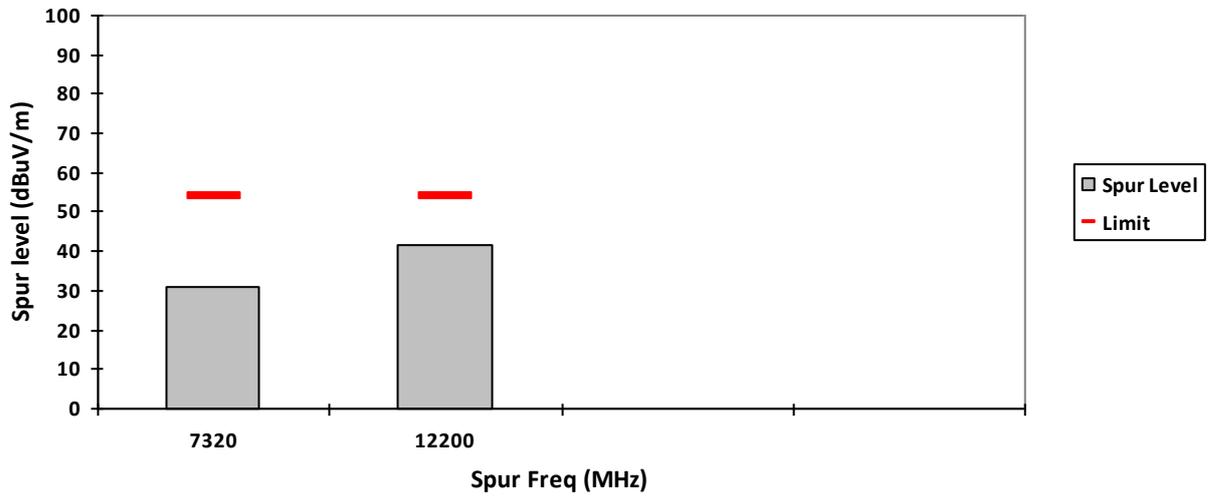
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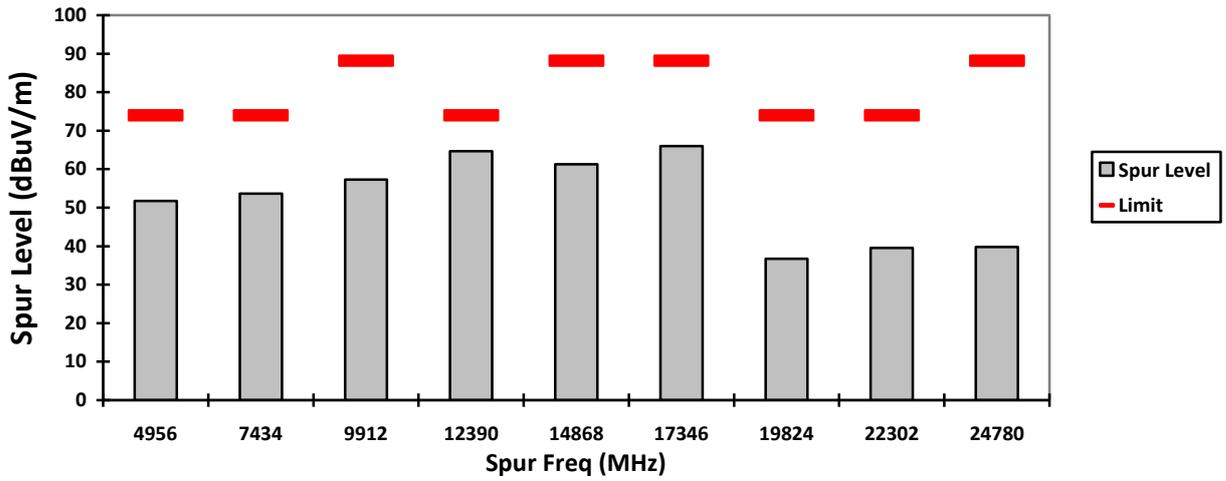
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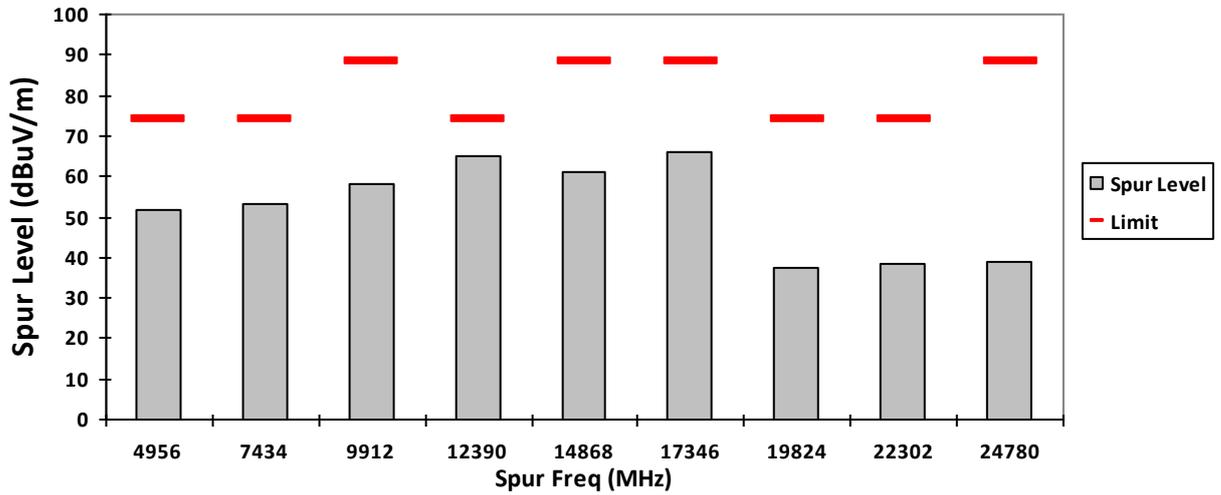
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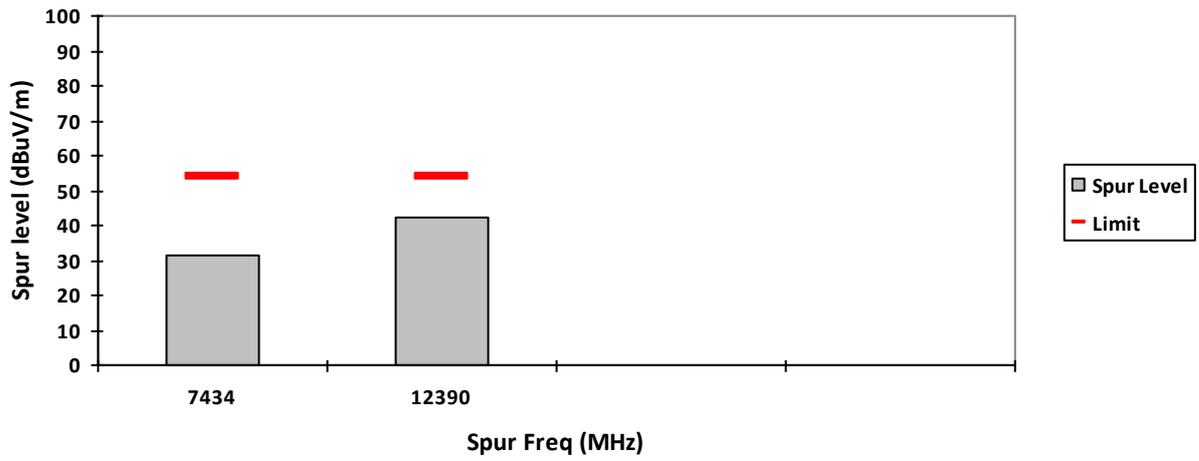
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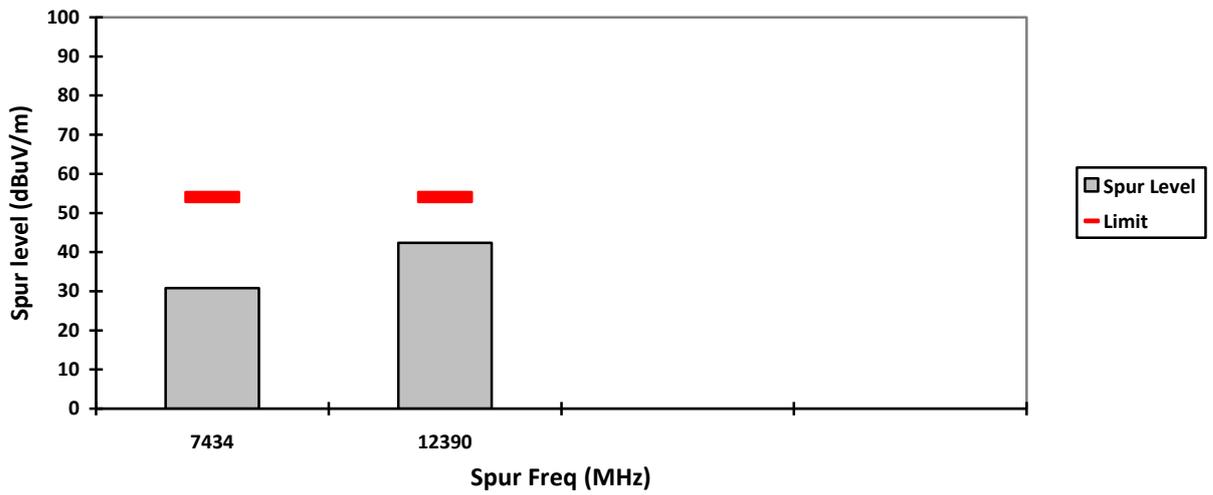
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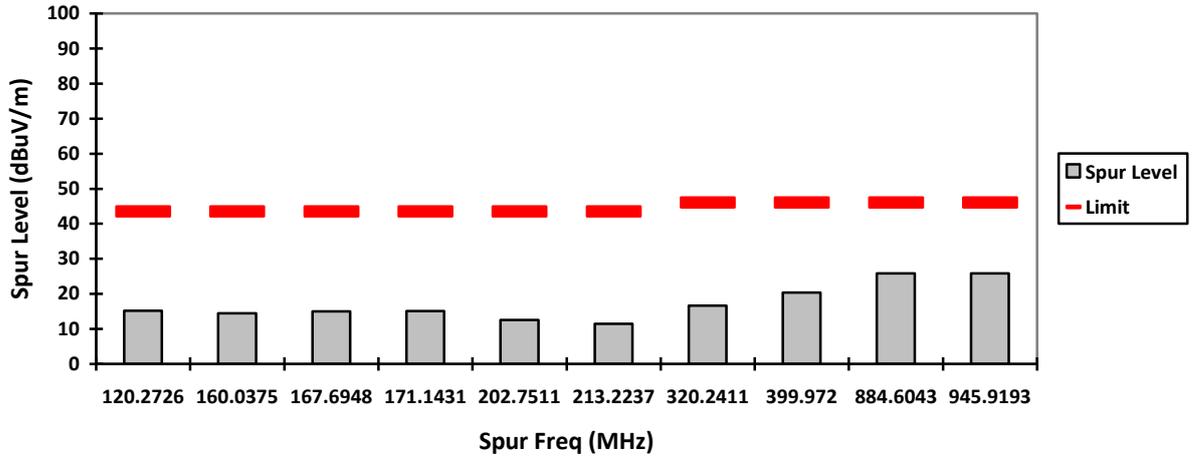
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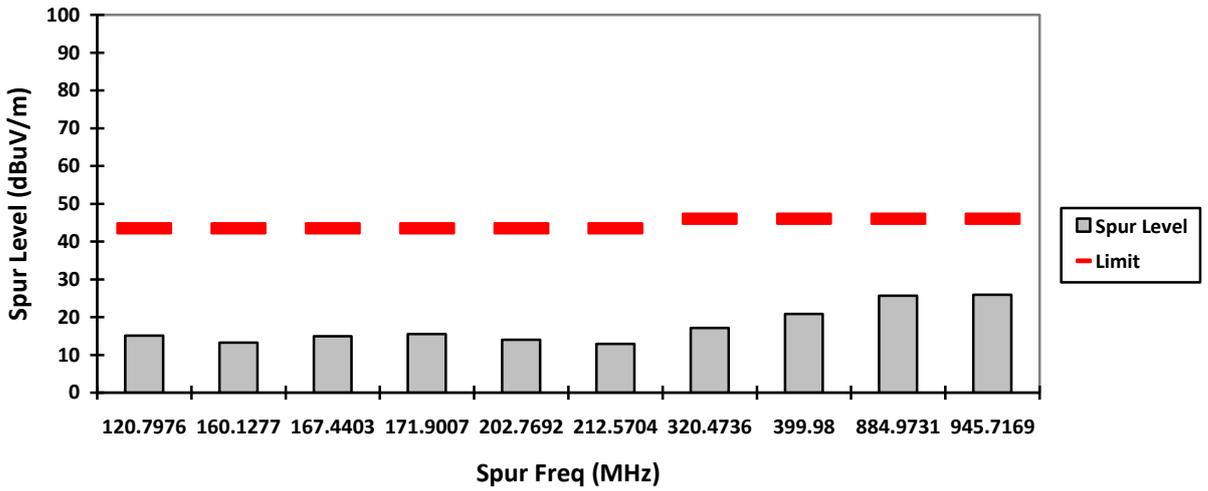
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VERTICAL, QPK

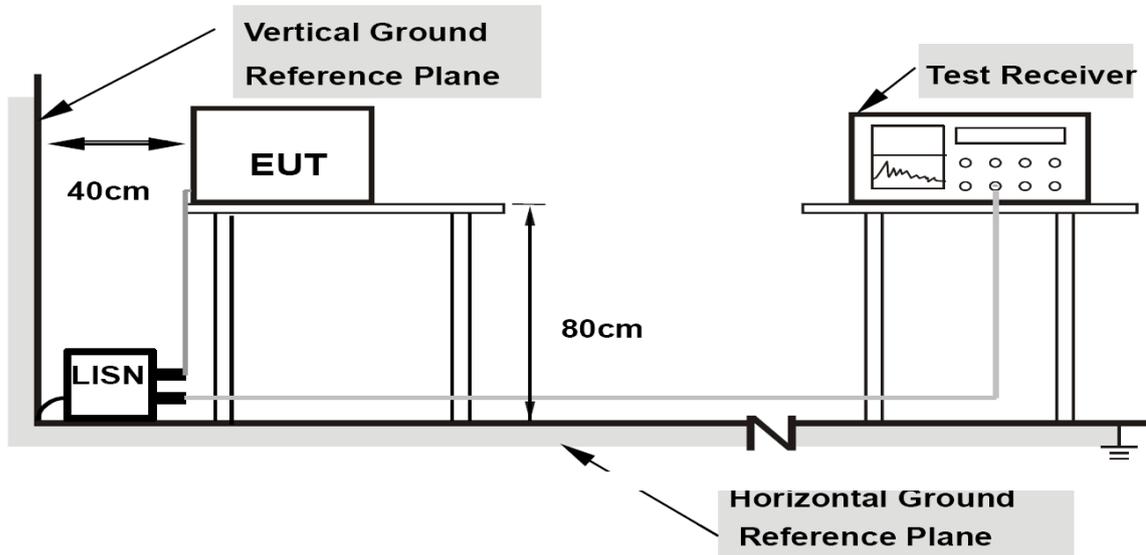


HORIZONTAL, QPK



6.7 AC Powerline Conducted Emission

6.7.1 Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.7.2 Test Limits:

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports
of class A ITE

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
of class B ITE**

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE 1 The lower limit shall apply at the transition frequencies.
NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

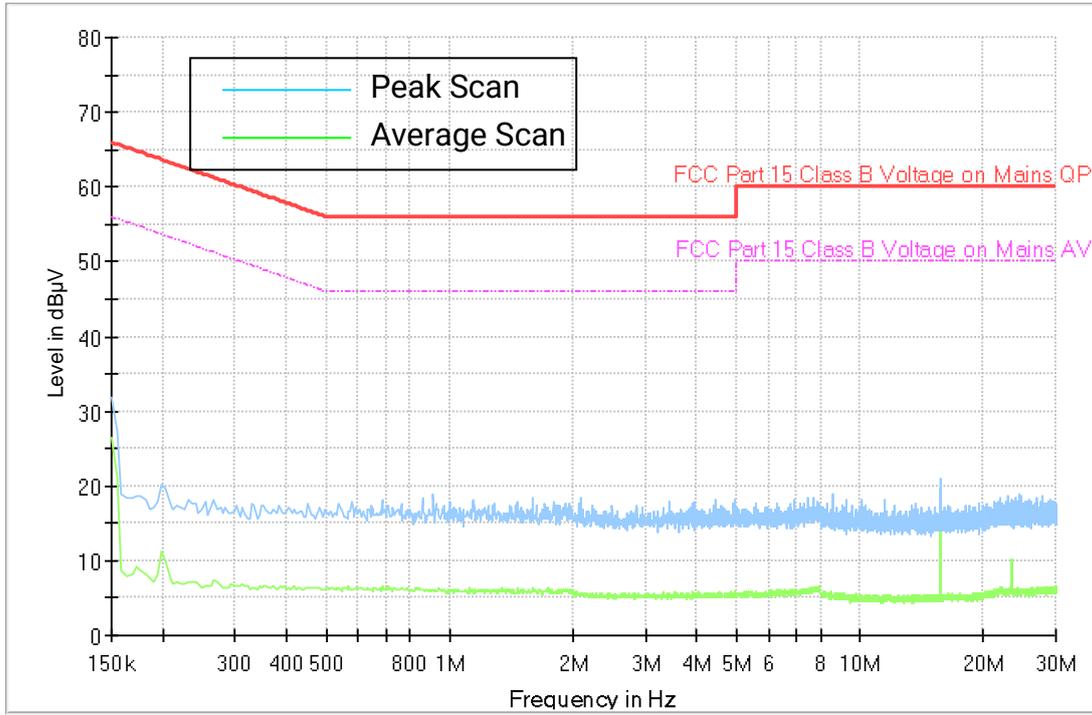
Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

6.7.3 Test Result

120 VAC, 60Hz

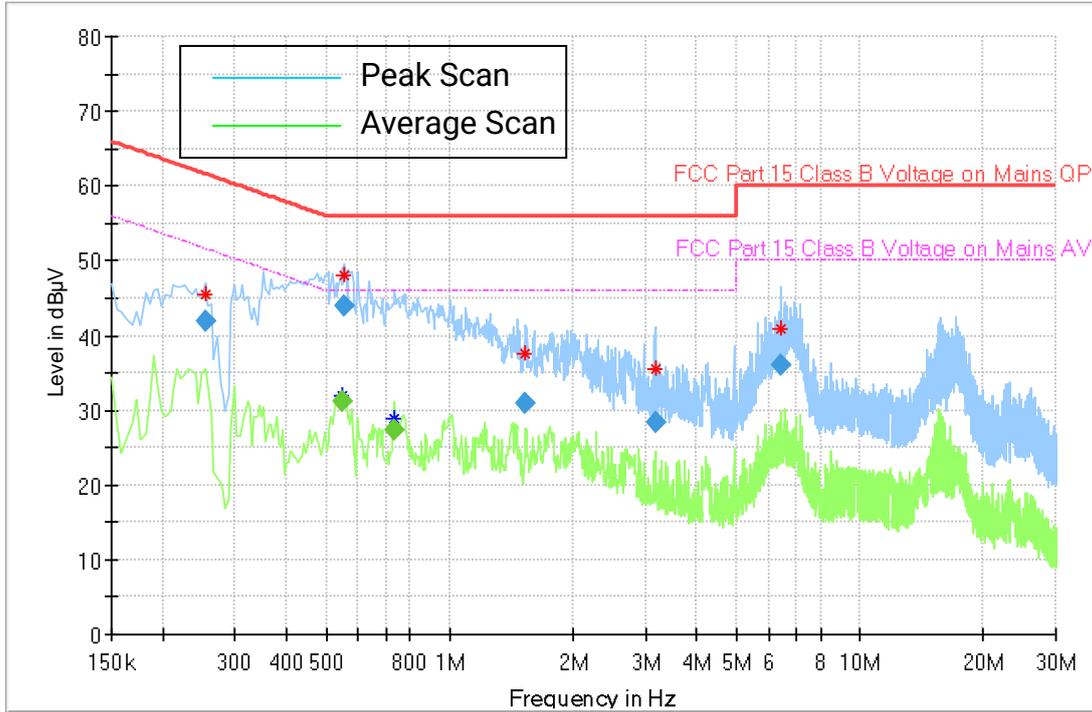
1) Ambient

Full Spectrum



2) Ambient Laptop

Full Spectrum

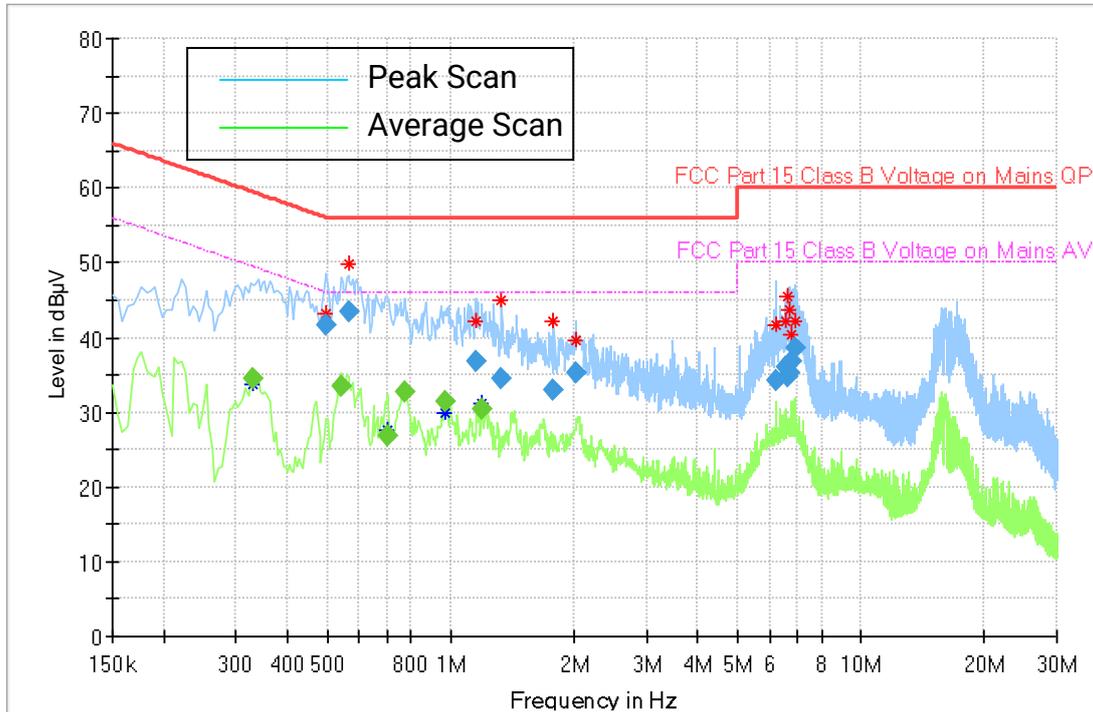


QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.253500	42.01	—	61.64	19.63	N	ON	10.2
0.550500	—	31.27	46.00	14.73	N	ON	10.6
0.555000	44.04	—	56.00	11.96	N	ON	10.6
0.735000	—	27.45	46.00	18.55	N	ON	10.5
1.531500	30.99	—	56.00	25.01	L1	ON	10.3
3.165000	28.30	—	56.00	27.70	L1	ON	10.3
6.418500	35.99	—	60.00	24.01	N	ON	10.4

3) Laptop + VRSM Standby

Full Spectrum

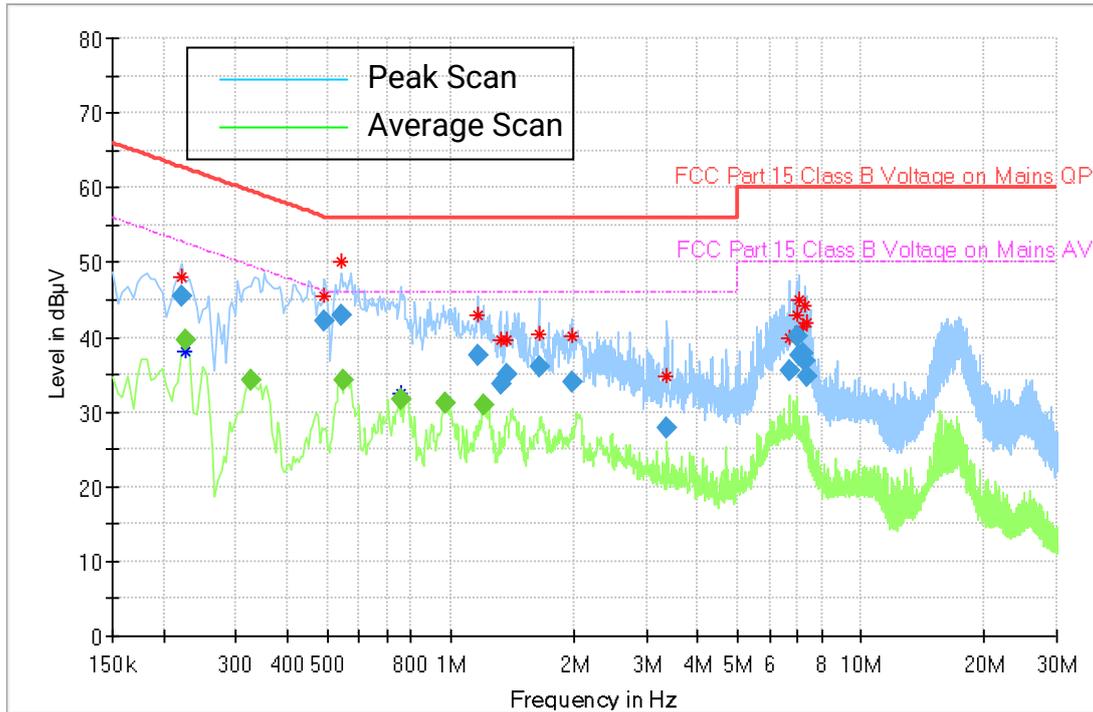


QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.330000	—	34.44	49.45	15.01	N	ON	10.5
0.496500	41.59	—	56.06	14.46	N	ON	10.6
0.541500	—	33.55	46.00	12.45	L1	ON	10.6
0.564000	43.49	—	56.00	12.51	N	ON	10.6
0.703500	—	26.73	46.00	19.27	L1	ON	10.5
0.771000	—	32.80	46.00	13.20	N	ON	10.5
0.973500	—	31.47	46.00	14.53	N	ON	10.4
1.149000	36.86	—	56.00	19.14	N	ON	10.4
1.194000	—	30.31	46.00	15.69	L1	ON	10.4
1.333500	34.61	—	56.00	21.39	N	ON	10.3
1.783500	33.00	—	56.00	23.00	L1	ON	10.3
2.017500	35.15	—	56.00	20.85	L1	ON	10.3
6.180000	34.30	—	60.00	25.70	N	ON	10.4
6.571500	36.13	—	60.00	23.87	L1	ON	10.4
6.616500	34.87	—	60.00	25.13	N	ON	10.4
6.706500	35.31	—	60.00	24.69	N	ON	10.4
6.778500	36.85	—	60.00	23.15	L1	ON	10.4
6.882000	38.58	—	60.00	21.42	L1	ON	10.4

4) Laptop + VRSM TX BTLE 2M

Full Spectrum



QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.222000	45.48	—	62.74	17.27	N	ON	10.4
0.226500	—	39.66	52.58	12.91	L1	ON	10.3
0.325500	—	34.33	49.57	15.23	L1	ON	10.5
0.492000	42.05	—	56.13	14.08	N	ON	10.6
0.541500	42.91	—	56.00	13.09	N	ON	10.6
0.550500	—	34.20	46.00	11.80	N	ON	10.6
0.757500	—	31.79	46.00	14.21	N	ON	10.5
0.973500	—	31.26	46.00	14.74	N	ON	10.4
1.167000	37.61	—	56.00	18.39	N	ON	10.4
1.203000	—	30.81	46.00	15.19	L1	ON	10.4
1.320000	33.73	—	56.00	22.27	N	ON	10.3
1.374000	35.12	—	56.00	20.88	L1	ON	10.3
1.644000	36.12	—	56.00	19.88	L1	ON	10.3
1.981500	34.11	—	56.00	21.89	L1	ON	10.3
3.372000	27.91	—	56.00	28.09	N	ON	10.3
6.702000	35.49	—	60.00	24.51	N	ON	10.4
6.954000	40.23	—	60.00	19.77	L1	ON	10.4
7.089000	37.52	—	60.00	22.48	L1	ON	10.4
7.197000	37.76	—	60.00	22.24	L1	ON	10.4
7.269000	36.79	—	60.00	23.21	L1	ON	10.4
7.363500	34.74	—	60.00	25.26	L1	ON	10.4

END OF TEST REPORT