FCC &ISED Radio Test Report

FCC ID: 2AC23-WCT5K
IC:12290A-WCT5K

The report concerns: Original Grant

Report Reference No.....:	19EFAS11026 3361
Date Sample(s) Received.....:	2019-10-30
Date of Tested.....:	2019-10-31 to 2019-11-12
Date of issue.....:	2019-11-13
Testing Laboratory .....:	DongGuan ShuoXin Electronic Technology Co., Ltd.
Address .....:	Zone A, 1F, No. 6, XinGang Road YuanGang Street, XinAn District, ChangAn Town, DongGuan City, GuangDong, China
Applicant's name .....:	Hui Zhou Gaoshengda Technology Co., LTD
Address .....:	NO.75 Zhongkai Development Area, Huizhou, Guangdong
Manufacturer.....:	Hui Zhou Gaoshengda Technology Co., LTD
Equipment.....:	WIFI+BT Module
Trade Mark .....:	GSD
Model .....:	WCT5KM2301
Ratings .....:	I/P: DC 3.3V

Responsible Engineer : Smile Wang

Smile Wang

Authorized Signatory: King Wang

King Wang

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1. TEST REPORT DECLARE

Applicant	Hui Zhou Gaoshengda Technology Co., LTD
Address	NO.75 Zhongkai Development Area, Huizhou, Guangdong
Manufacturer	Hui Zhou Gaoshengda Technology Co., LTD
Address	NO.75 Zhongkai Development Area, Huizhou, Guangdong
Factory	Hui Zhou Gaoshengda Technology Co., LTD
Address	NO.75 Zhongkai Development Area, Huizhou, Guangdong
Equipment	WIFI+BT Module
Model No.	WCT5KM2301
Trade Mark	GSD
Standard	FCC Part15, Subpart C (15.247) RSS-247 Issue 2, Feb. 2017 RSS-Gen Issue 5, Apr. 2018 ANSI C63.10-2013

We Declare:

The equipment described above is tested by DongGuan ShuoXin Electronic Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and DongGuan ShuoXin Electronic Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

2. SUMMARY OF TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

Standard(s) Section		Test Item	Judgment	Remark
FCC	ISED			
15.207	RSS-Gen8.8	AC Power Line Conducted Emissions	PASS	------
15.247(d) 15.205(a) 15.209(a)	RSS-247 5.5 RSS-Gen8.9 RSS-Gen8.10	Radiated Emissions	PASS	------
15.247(a)(2)	RSS-247 5.2 (a) RSS-Gen6.7	Bandwidth	PASS	------
15.247(b)(3)	RSS-247 5.4 (d)	Maximum Output Power	PASS	------
15.247(d)	RSS-247 5.5	Conducted Spurious Emission	PASS	------
15.247(e)	RSS-247 5.2 (b)	Power Spectral Density	PASS	------
	RSS-Gen 6.11	Frequency Stability	PASS	------
15.203	-	Antenna Requirement	PASS	Note(2)

Note:

(1) “N/A” denotes test is not applicable in this test report.

(2) The device what use a permanently attached antenna were considered sufficient tocomply with the provisions of 15.203.

2.1 MEASUREMENT UNCERTAINTY

Test Item	Uncertainty
Uncertainty for Conduction emission test (9kHz-150kHz)	3.7 dB
Uncertainty for Conduction emission test (150kHz-30MHz)	3.3 dB
Uncertainty for Radiation Emission test (30MHz-200MHz)	4.60 dB (Polarize: V)
	4.60 dB (Polarize: H)
Uncertainty for Radiation Emission test (200MHz-1GHz)	6.10 dB (Polarize: V)
	5.08 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz-6GHz)	5.01 dB (Polarize: V)
	5.01 dB (Polarize: H)
Uncertainty for Radiation Emission test (6GHz-18GHz)	5.26 dB (Polarize: V)
	5.26 dB (Polarize: H)
Uncertainty for Radiation Emission test (18GHz-40GHz)	5.06 dB (Polarize: V)
	5.06 dB (Polarize: H)
Uncertainty for radio frequency	±0.048kHz
Uncertainty for conducted RF Power	±0.32dB

Note:

This uncertainty represents an expanded uncertainty expressed at approximately the 95%confidence level using a coverage factor of k=2.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	WIFI+BT Module	
Brand Name	GSD	
Test Model	WCT5KM2301	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	V1.0	
Software Version	V1.0	
PowerSource	Supplied from USB.	
Power Rating	DC 3.3V	
Operation Frequency	2412 MHz~ 2462 MHz	
Modulation Technology	IEEE 802.11b:DSSS IEEE 802.11g:OFDM IEEE 802.11n:OFDM	
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps	
Operating Mode	IEEE 802.11b:1TX(Ant 1 or Ant 2) IEEE 802.11g:1TX(Ant 1 or Ant 2) IEEE 802.11n (HT20):2TX(Ant 1+Ant 2) IEEE 802.11n (HT40):2TX(Ant 1+Ant 2)	
Antenna Information	Antenna Type:PCB	Maximum Peak Gain: 2dBi(Ant 1) 2dBi(Ant 2
Max. Output Power	IEEE 802.11b: 20.48dBm(0.1117W) IEEE 802.11g: 23.45dBm(0.2213W) IEEE 802.11n (HT20):25.21dBm(0.3321W) IEEE 802.11n (HT40):24.56dBm(0.2857W)	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

CH01 - CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n (HT20) CH03-CH09 for IEEE 802.11n (HT40)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel03/06/09
Mode 5	TX N-20 MHz Mode Channel 11

Following mode(s) as (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test	
Final Test Mode	Description
Mode 5	TX N-20 MHz Mode Channel 11

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 5	TX N-20 MHz Mode Channel 11

Radiated emissions test- Above 1GHz	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel03/06/09

Conducted test	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel03/06/09

NOTE:

(1) The measurements are performed at the high, middle, low available channels.

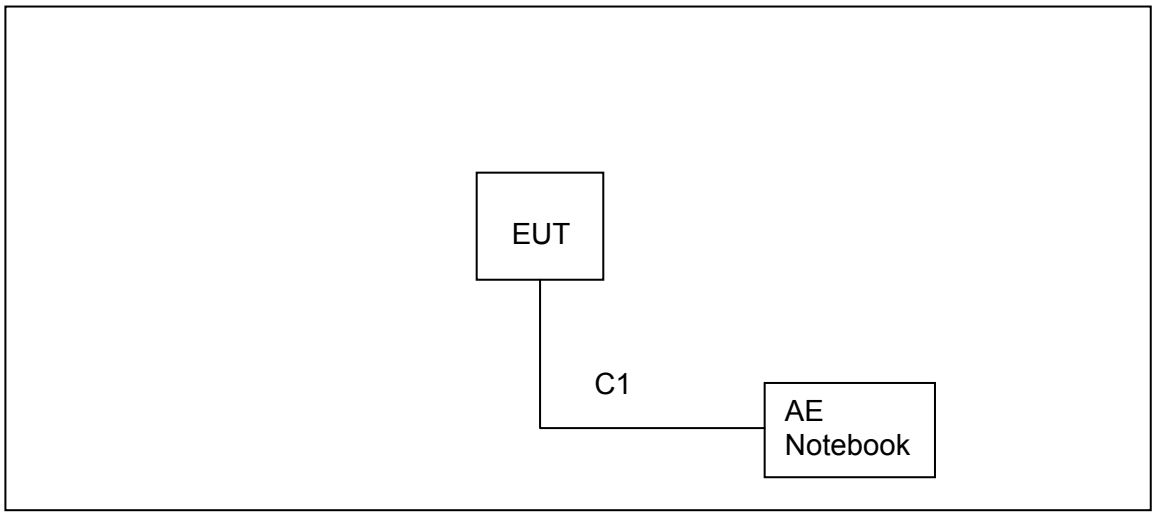
(2) 802.11b mode: DBPSK (1Mbps)
802.11g mode: OFDM (6Mbps)
802.11n HT20 mode : BPSK (13Mbps)
802.11n HT40mode : BPSK (27Mbps)
For radiated emission tests, the highest output powers were set for final test.

(3)For radiated emission below 1GHzand AC power line conducted emissions test, the IEEE 802.11n20 channel 11is found to be the worst case and recorded.

3.3 PARAMETERS OF TEST SOFTWARE

Test Software	MT7668 QA 0.0.1.92		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	1B	1B	1B
IEEE 802.11g	1B	1B	1B
IEEE 802.11n (HT20)	1B	1B	1B
Test Frequency (MHz)	2422	2437	2452
IEEE 802.11n (HT40)	16	1B	18

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
AE	Notebook	ACER	MS2367	32807810766

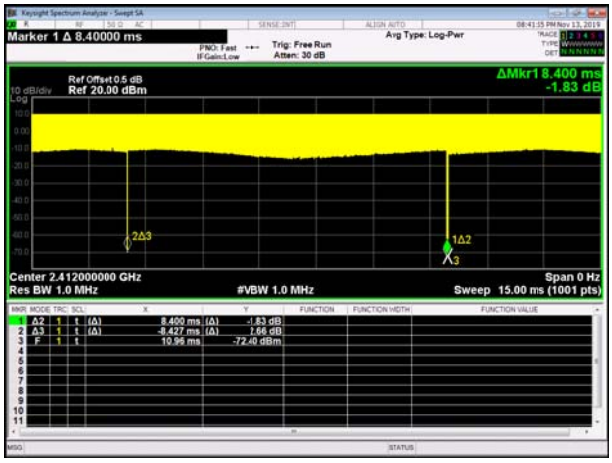
Item	Cable Type	Shielded Type	Ferrite Core	Length
C1	DC Cable	NO	NO	0.8m

3.6 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage
AC Power Line Conducted Emissions	25°C	53%	DC 5V
Radiated Emissions-9K-30MHz	25°C	60%	DC 5V
Radiated Emissions-30 MHz to 1GHz	24°C	68%	DC 5V
Radiated Emissions-Above 1000 MHz	24°C	68%	DC 5V
Bandwidth	24.8°C	40.9%	DC 5V
Maximum Output Power	24.8°C	40.9%	DC 5V
Conducted Spurious Emission	24.8°C	40.9%	DC 5V
Power Spectral Density	24.8°C	40.9%	DC 5V

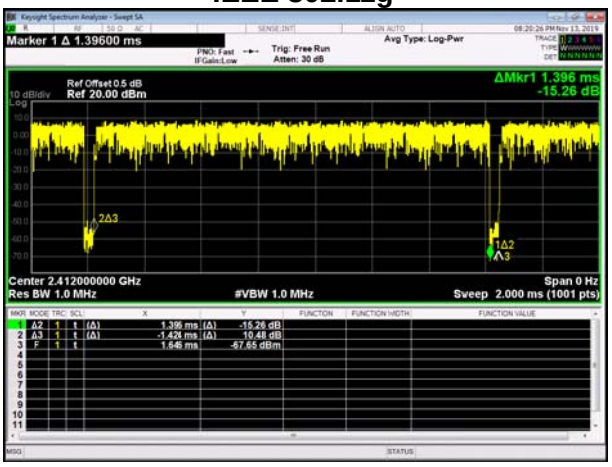
3.7 DUTY CYCLE

IEEE 802.11b



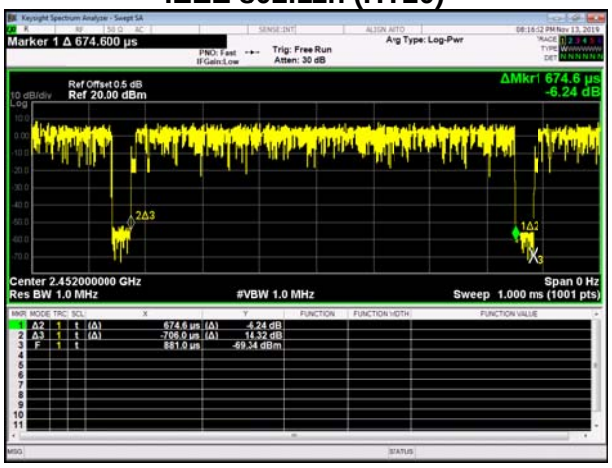
Duty cycle = 8.400ms / 8.427ms = 99.680%
Duty Factor = 10 log(1 / Duty cycle) = 0.00

IEEE 802.11g



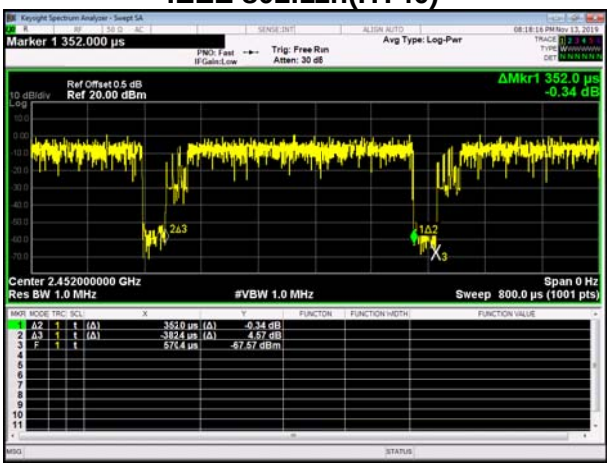
Duty cycle = 1.396ms / 1.424ms = 98.034%
Duty Factor = 10 log(1 / Duty cycle) = 0.00

IEEE 802.11n (HT20)



Duty cycle = 0.675ms / 0.706ms = 95.609%
Duty Factor = 10 log(1 / Duty cycle) = 0.20

IEEE 802.11n(HT40)



Duty cycle = 0.352ms / 0.382ms = 92.147%
Duty Factor = 10 log(1 / Duty cycle) = 0.36

If duty cycle is ≥ 98 %, duty factor is not required.
If duty cycle is < 98 %, duty factor shall be considered, the Duty Factor =10 log(1/Duty cycle), the output power= measured power + duty factor, the result of duty factor as below table:

IEEE 802.11b	IEEE 802.11g	IEEE 802.11n (HT20)	IEEE 802.11n (HT40)
0.00	0.00	0.20	0.36

NOTE:
For IEEE 802.11a,IEEE 802.11n (HT20)
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).
For IEEE 802.11n (HT40)
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz (Duty cycle < 98%).

4. AC POWER LINE CONDUCTED EMISSIONS TEST

4.1 LIMIT

Frequency of Emission (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 -0.50	66to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

NOTE:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

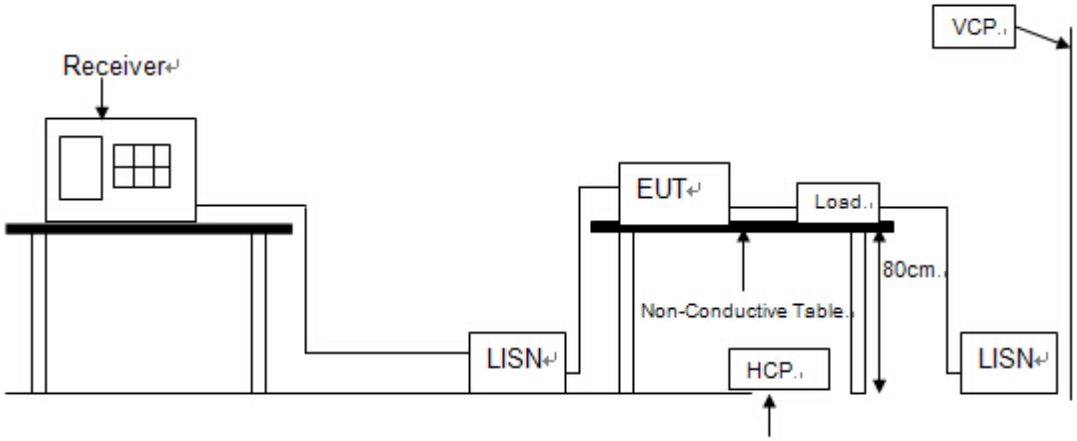
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

d. LISN at least 80 cm from nearest part of EUT chassis.

4.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pulse Limiter	MTS-system technik	MTS-IMP-136	261115-010-0024	12/16/2019
2	EMI Test Receiver	R&S	ESCI	101308	12/16/2019
3	LISN	AFJ	LS16	16011103219	12/16/2019
4	LISN	Schwarzbeck	NSLK 8127	8127-432	12/16/2019
5	Measurement Software	Farad	EZ-EMC (Ver.ATT-03A)	N/A	N/A

4.4 TESTSETUP



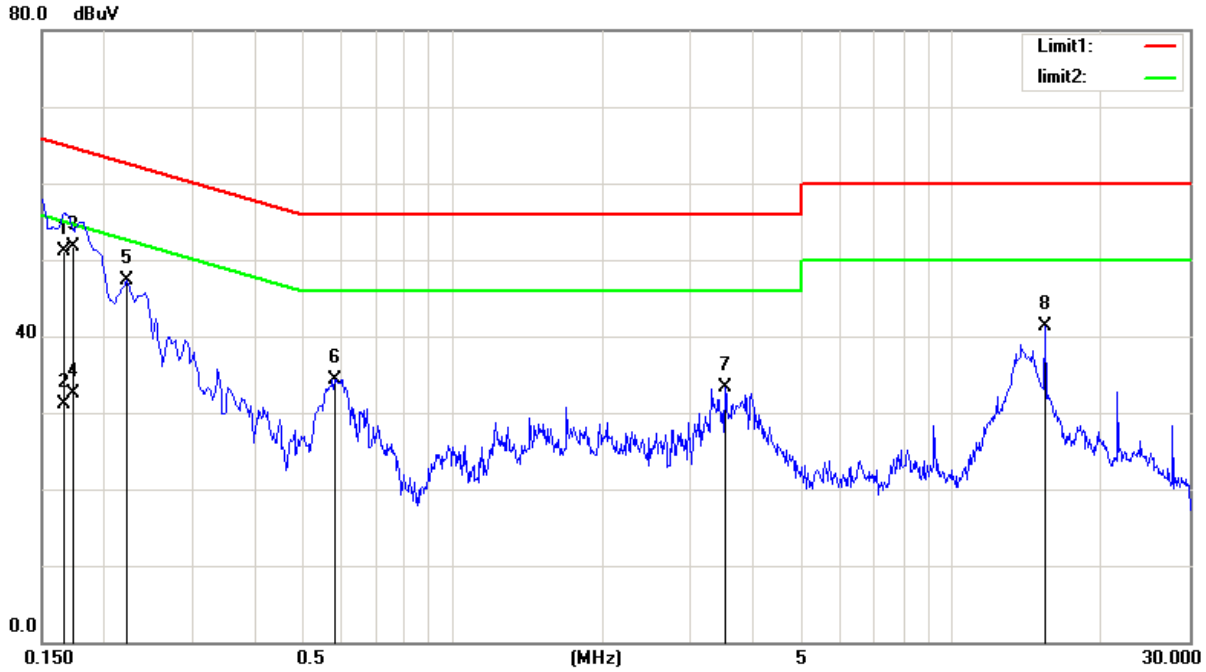
4.5 EUT OPERATION CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it).The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.6 TEST RESULTS

Test Mode:	TX N-20 MHz Mode Channel 11

Line

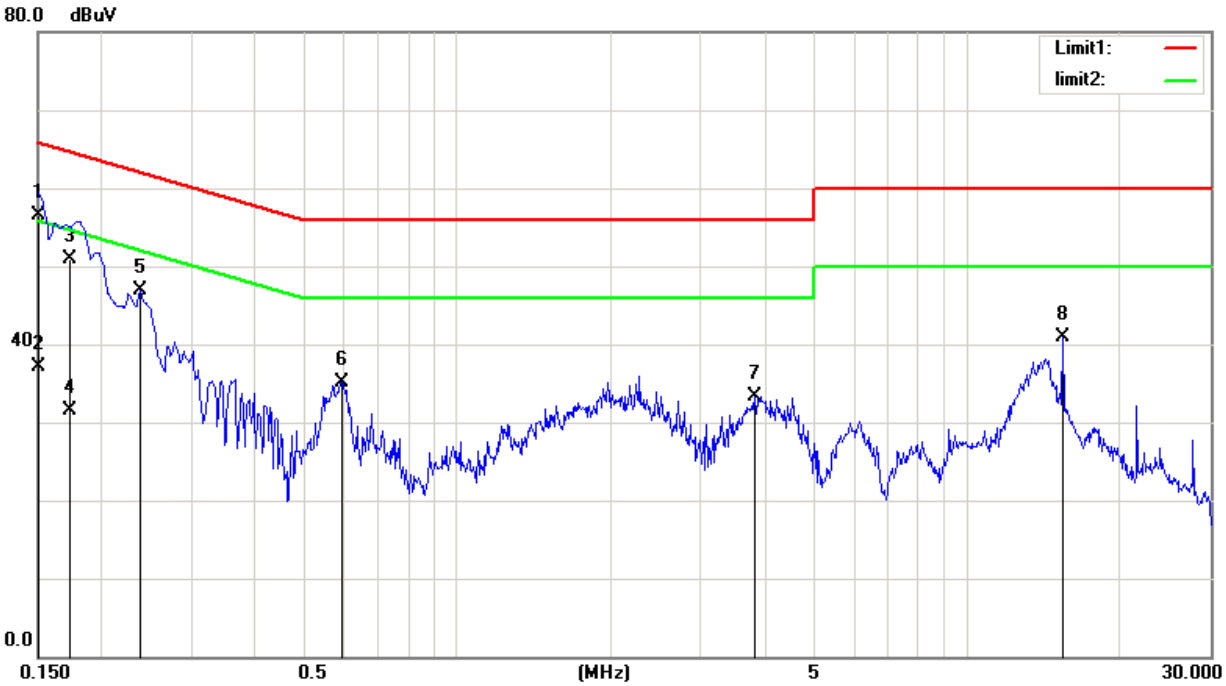


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1651	39.80	11.37	51.17	65.20	-14.03	QP
2	0.1651	19.64	11.37	31.01	55.20	-24.19	AVG
3	0.1735	40.40	11.31	51.71	64.79	-13.08	QP
4	0.1735	21.24	11.31	32.55	54.79	-22.24	AVG
5	0.2220	36.43	10.97	47.40	62.74	-15.34	peak
6	0.5820	24.24	10.16	34.40	56.00	-21.60	peak
7	3.5100	23.10	10.14	33.24	56.00	-22.76	peak
8	15.4060	31.06	10.17	41.23	60.00	-18.77	peak

Remarks:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode:	TX N-20 MHz Mode Channel 11

Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1504	45.09	11.47	56.56	65.97	-9.41	QP
2	0.1504	25.61	11.47	37.08	55.97	-18.89	AVG
3	0.1737	39.58	11.31	50.89	64.78	-13.89	QP
4	0.1737	20.25	11.31	31.56	54.78	-23.22	AVG
5	0.2380	36.00	10.86	46.86	62.16	-15.30	peak
6	0.5940	24.93	10.15	35.08	56.00	-20.92	peak
7	3.8340	23.22	10.15	33.37	56.00	-22.63	peak
8	15.4060	30.64	10.17	40.81	60.00	-19.19	peak

Remarks:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

5. RADIATED EMISSIONSTEST

5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a) and RSS-Gen 8.10, then the 15.209(a) and RSS-Gen 8.9limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000MHz)

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

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-30 MHz)

Frequency (MHz)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (meters)
0.009-0.490	6.37/F(kHz)	300
0.490-1.705	6.37/F(kHz)	30
1.705-30.0	0.08	30

LIMITS OF RADIATED EMISSION MEASUREMENT (30 MHz-1000MHz)

Frequency (MHz)	Field Strength (μV/m at 3m)
30-88	100
88-216	150
216-960	200
Above 960	500

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m at 3 m)	
	Peak	Average
Above 1000	74	54

NOTE:
(1) The limit for radiated test was performed according to FCC PART 15C and RSS-247.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

5.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)
i. The test result is calculated as the following:
(1) Result = Reading + Correct Factor
(2) Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain + Attenuator
(3) Margin = Result - Limit

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

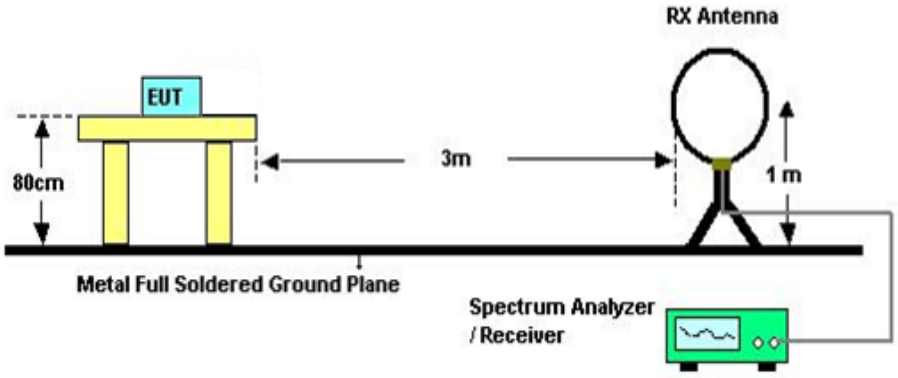
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

5.3 MEASUREMENT INSTRUMENTS LIST

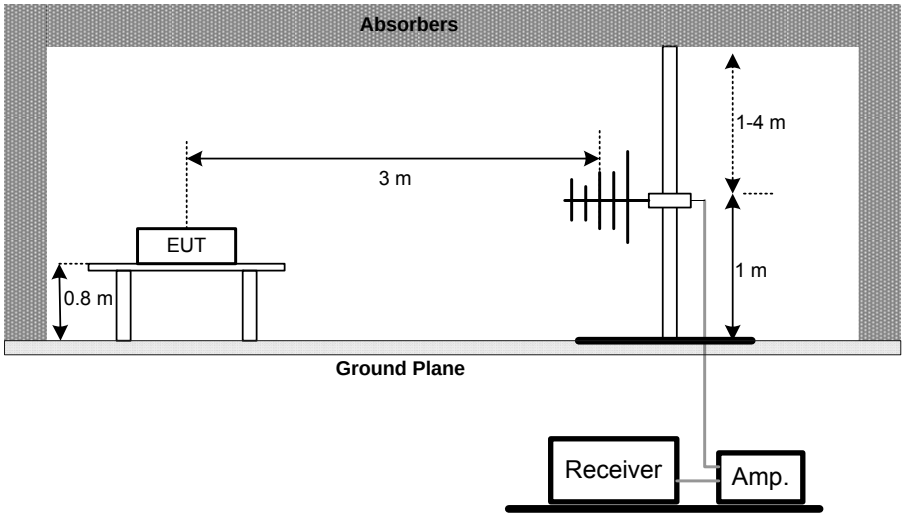
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	101307	2019/12/16
2	Spectrum Analyzer	Agilent	E4407B	US40240708	2019/11/20
3	Spectrum analyzer	R&S	FSU	1166.1660.26	2019/12/16
4	Loop antenna	TESEQ	HLA6120	20129	2019/12/16
5	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2019/12/16
6	Double Ridged Horn Antenna	Schwarzbeck	BBHA9120D	9120D 1065	2019/12/16
7	Horn Antenna	Schwarzbeck	BBHA 9170	9170 1248	2019/12/16
8	Pre-amplifier	A.H.	PAM-1840VH	562	2019/12/16
9	Pre-amplifier	R&S	AFS33-18002 650-30-8P-44	SEL0080	2019/12/16
10	Pre-Amplifier	HP	8449B	3274A06298	2019/12/16
11	RF Cable	R&S	R01	10403	2019/12/16
12	RF Cable	R&S	R02	10512	2019/12/16

5.4 TESTSETUP

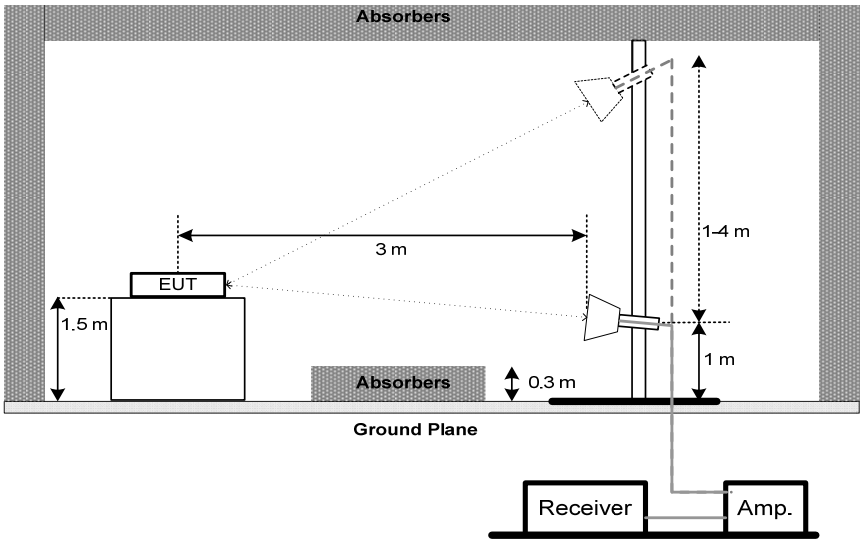
9 kHz-30 MHz



30 MHz to 1 GHz



Above 1 GHz



5.5 EUT OPERATIONCONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS - 9kHz TO 30MHz

Test Mode:	TX N-20 MHz Mode Channel 11

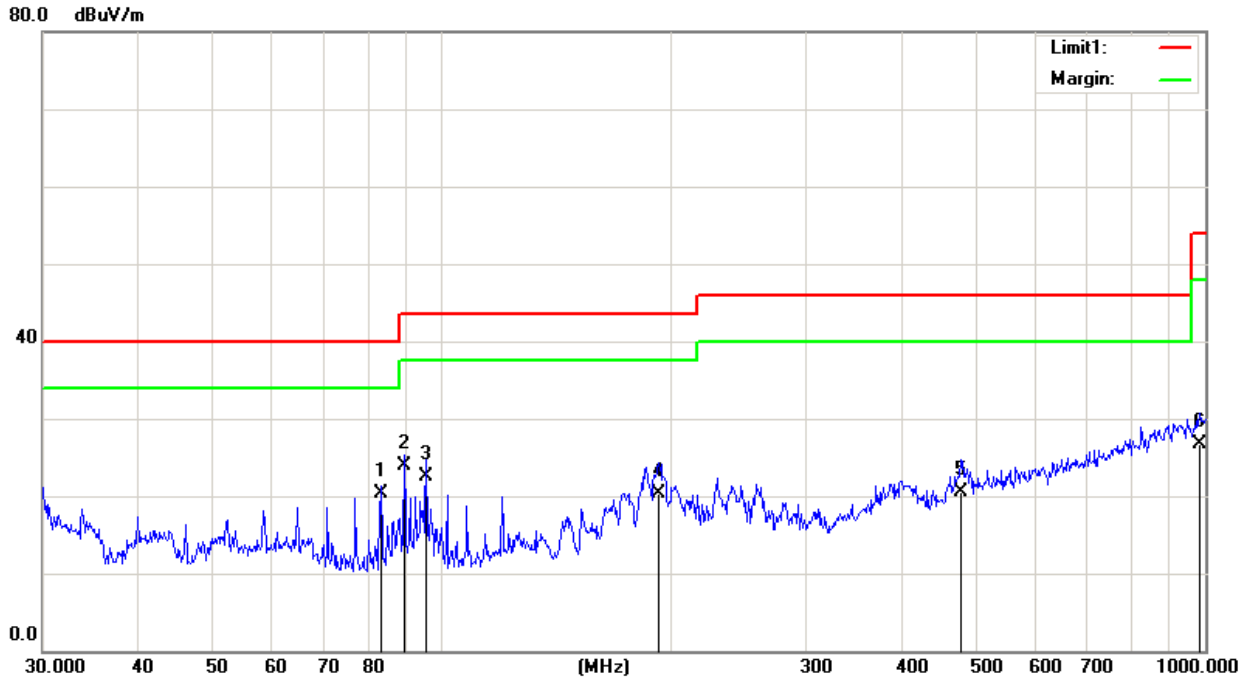
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor

5.7 TEST RESULTS - 30MHzTO 1000MHz

Test Mode :	TX N-20 MHz Mode Channel 11

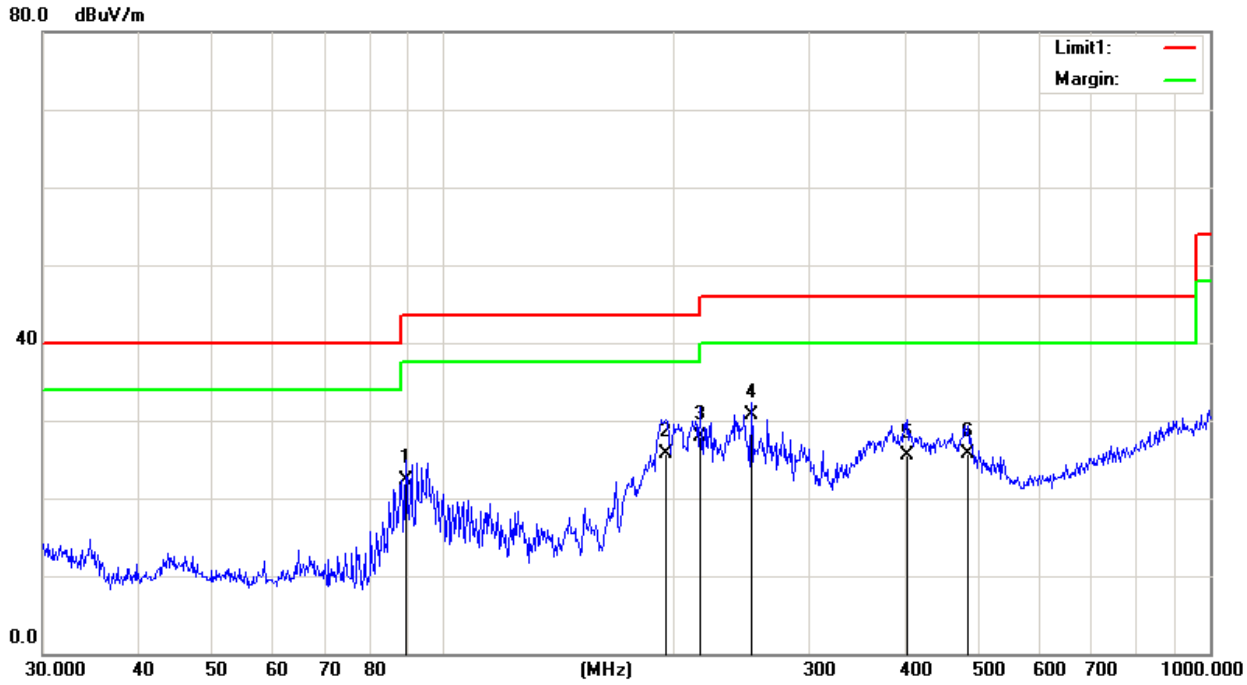
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	83.2298	35.74	-15.42	20.32	40.00	-19.68	QP
2	89.2764	39.13	-15.17	23.96	43.50	-19.54	QP
3	95.4270	37.19	-14.77	22.42	43.50	-21.08	QP
4	192.4186	31.84	-11.53	20.31	43.50	-23.19	QP
5	478.8456	26.13	-5.61	20.52	46.00	-25.48	QP
6	982.6200	22.32	4.36	26.68	54.00	-27.32	QP

Test Mode :	TX N-20 MHz Mode Channel 11

Horizontal

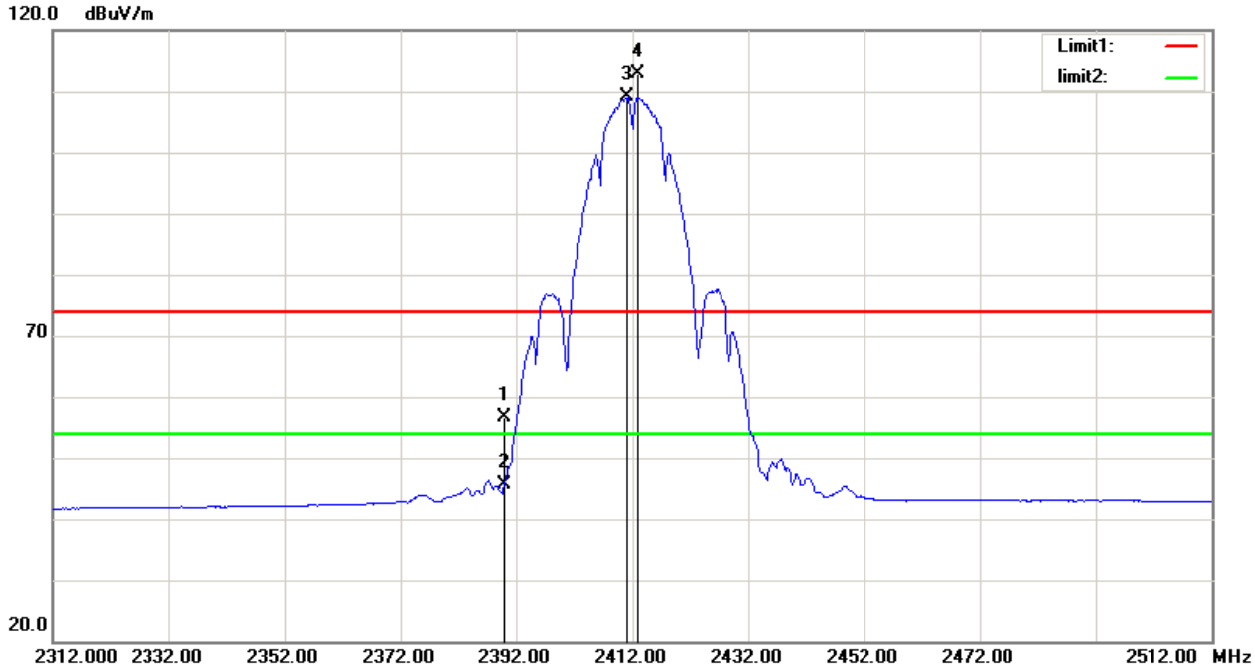


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	89.2764	39.49	-17.17	22.32	43.50	-21.18	QP
2	195.1365	35.34	-9.69	25.65	43.50	-17.85	QP
3	216.0240	37.27	-9.38	27.89	46.00	-18.11	QP
4	252.0627	36.64	-6.03	30.61	46.00	-15.39	QP
5	403.2500	32.71	-7.28	25.43	46.00	-20.57	QP
6	483.9094	31.64	-6.02	25.62	46.00	-20.38	QP

5.8 TEST RESULTS- ABOVE 1000MHz(BAND EDGE)

Orthogonal Axis	X
Test Mode:	TX B Mode2412 MHz

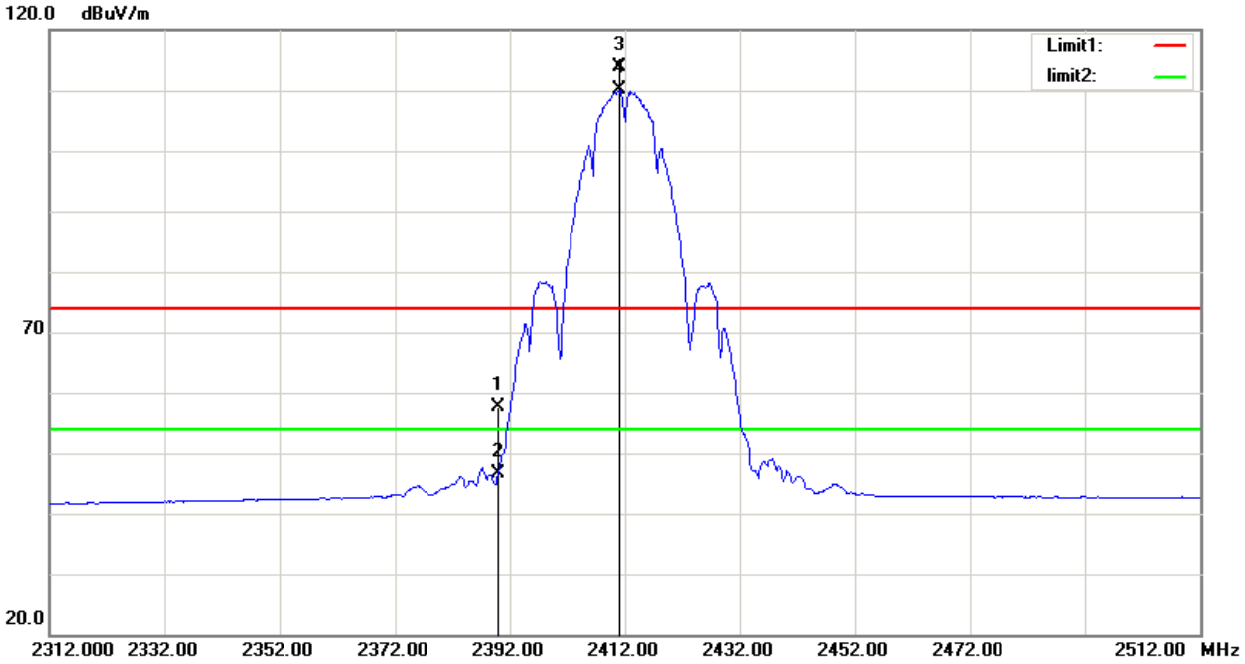
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	24.90	31.62	56.52	74.00	-17.48	peak
2	2390.000	14.04	31.62	45.66	54.00	-8.34	AVG
3	2411.200	77.39	31.68	109.07	/	/	AVG
4	2413.000	81.12	31.68	112.80	/	/	peak

Orthogonal Axis	X
Test Mode:	TX B Mode2412 MHz

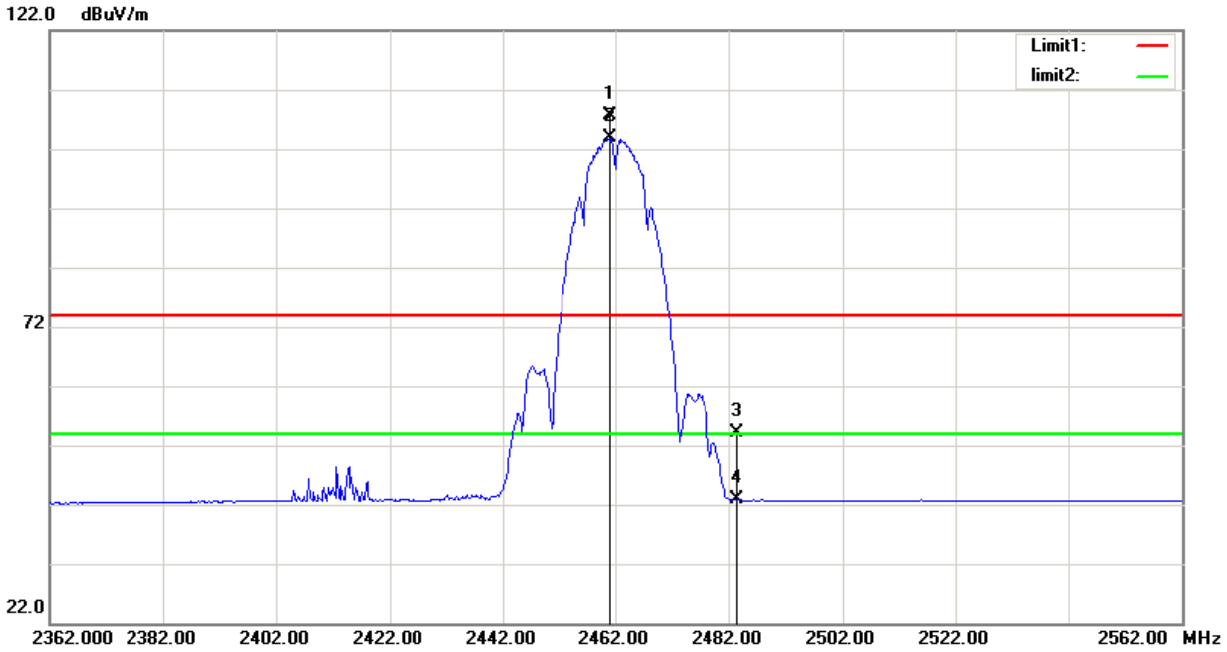
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.12	31.62	57.74	74.00	-16.26	peak
2	2390.000	15.07	31.62	46.69	54.00	-7.31	AVG
3	2411.200	82.17	31.68	113.85	/	/	peak
4	2411.200	78.43	31.68	110.11	/	/	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2462 MHz

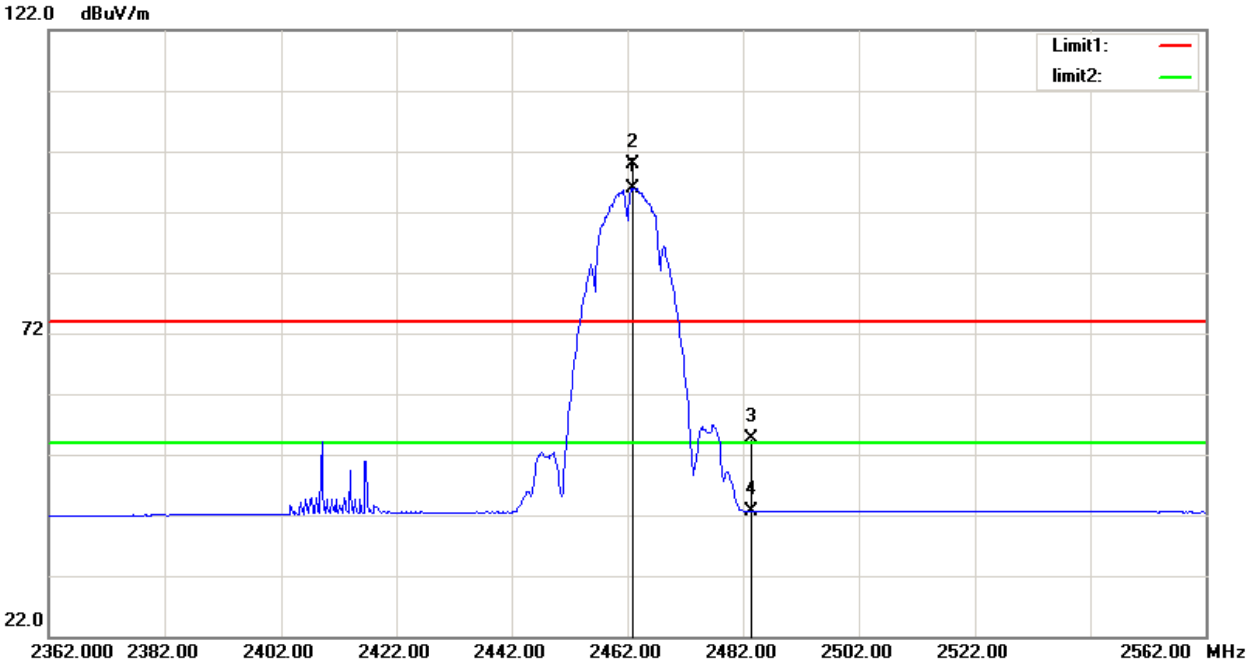
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.000	75.76	31.83	107.59	/	/	peak
2	2461.200	72.08	31.83	103.91	/	/	AVG
3	2483.500	22.23	31.89	54.12	74.00	-19.88	peak
4	2483.500	10.98	31.89	42.87	54.00	-11.13	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2462 MHz

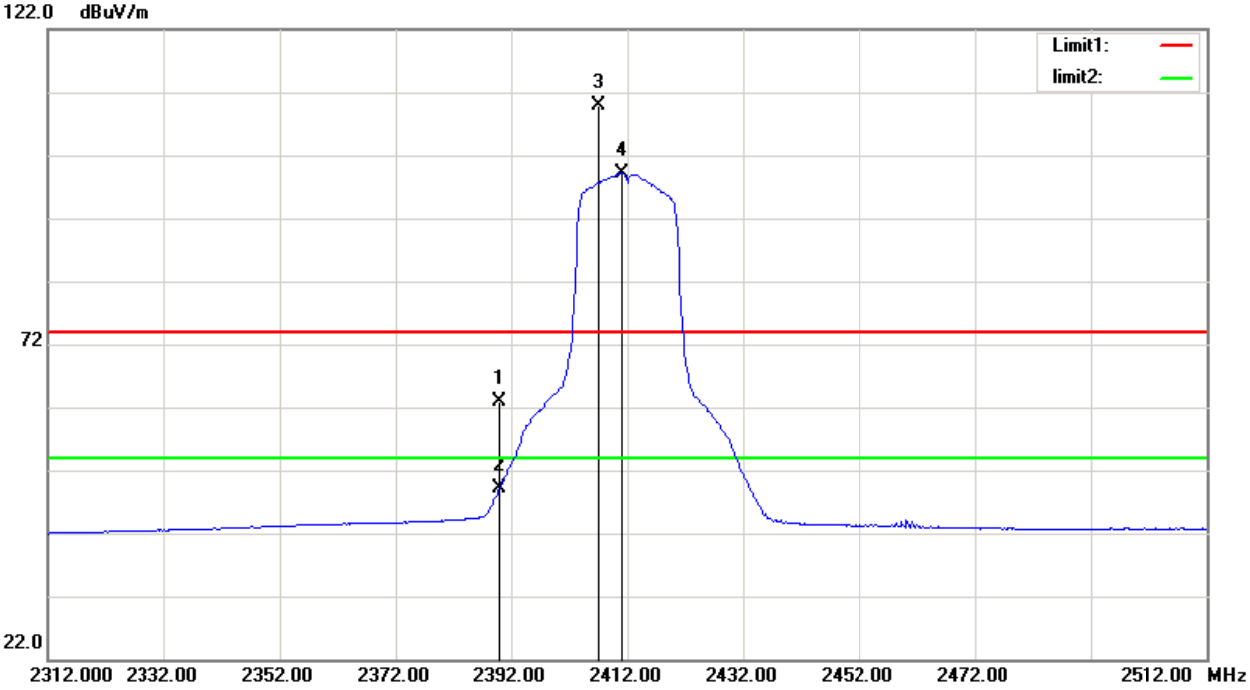
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.800	64.06	31.83	95.89	/	/	AVG
2	2463.000	68.03	31.83	99.86	/	/	peak
3	2483.500	22.83	31.89	54.72	74.00	-19.28	peak
4	2483.500	10.77	31.89	42.66	54.00	-11.34	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2412 MHz

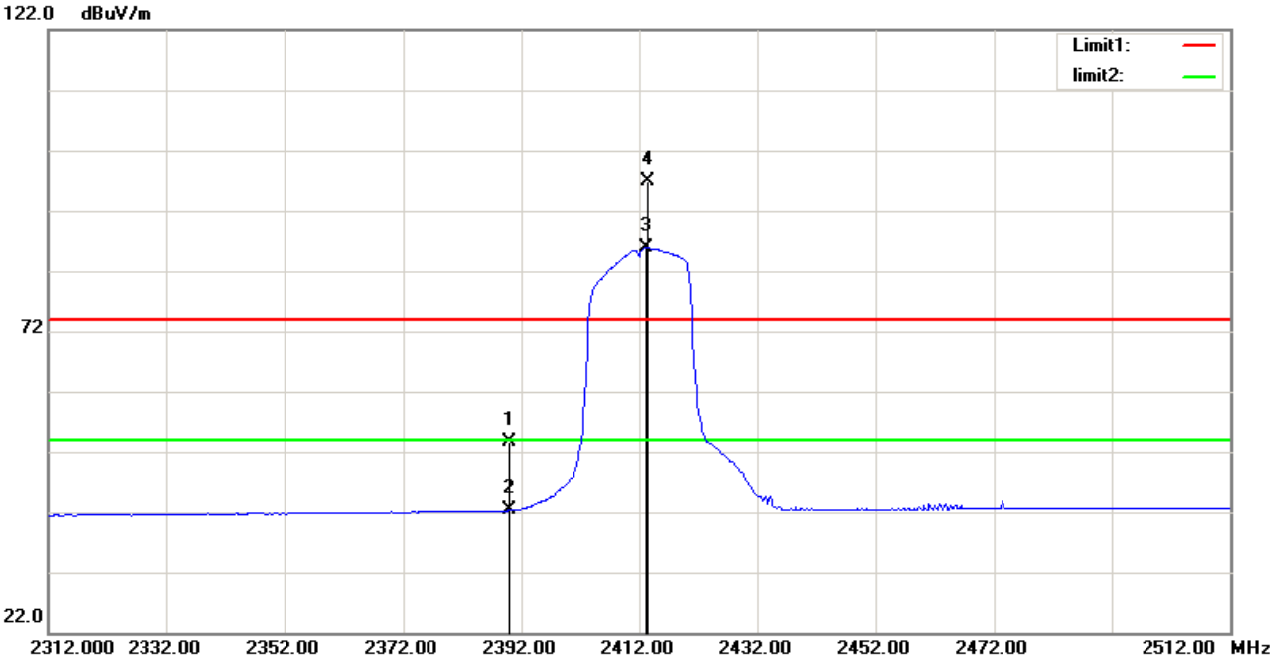
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	31.21	31.62	62.83	74.00	-11.17	peak
2	2390.000	17.40	31.62	49.02	54.00	-4.98	AVG
3	2407.200	78.33	31.67	110.00	/	/	peak
4	2411.000	67.50	31.68	99.18	/	/	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2412 MHz

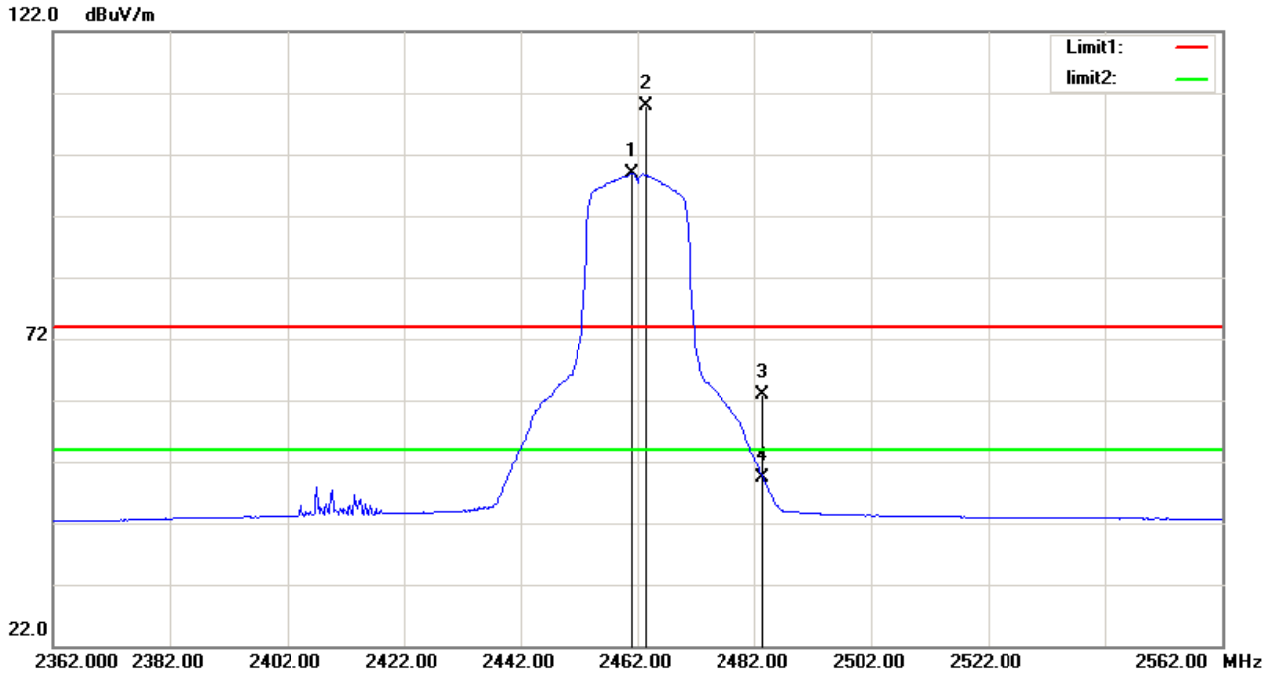
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	22.02	31.62	53.64	74.00	-20.36	peak
2	2390.000	10.69	31.62	42.31	54.00	-11.69	AVG
3	2413.200	54.21	31.68	85.89	/	/	AVG
4	2413.400	65.09	31.68	96.77	/	/	peak

Orthogonal Axis	X
Test Mode:	TX G Mode2462 MHz

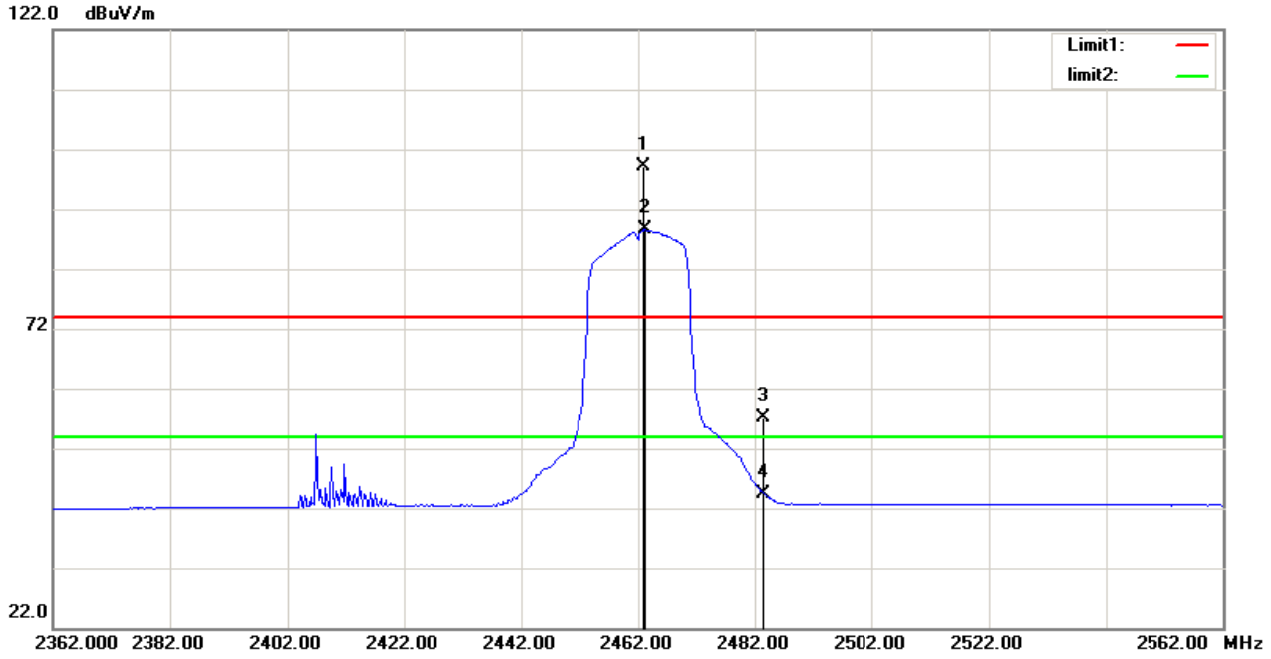
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.000	67.06	31.83	98.89	/	/	AVG
2	2463.400	77.98	31.83	109.81	/	/	peak
3	2483.500	31.06	31.89	62.95	74.00	-11.05	peak
4	2483.500	17.53	31.89	49.42	54.00	-4.58	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2462 MHz

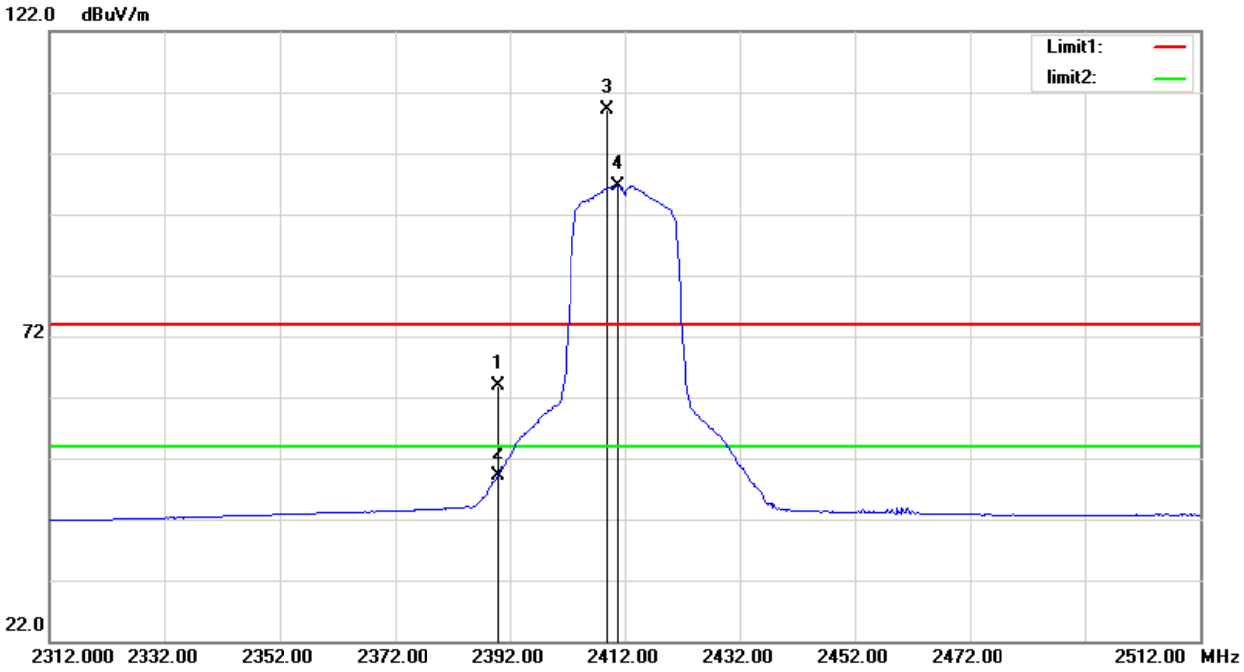
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.000	67.25	31.83	99.08	/	/	peak
2	2463.200	56.73	31.83	88.56	/	/	AVG
3	2483.500	25.26	31.89	57.15	74.00	-16.85	peak
4	2483.500	12.58	31.89	44.47	54.00	-9.53	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2412 MHz

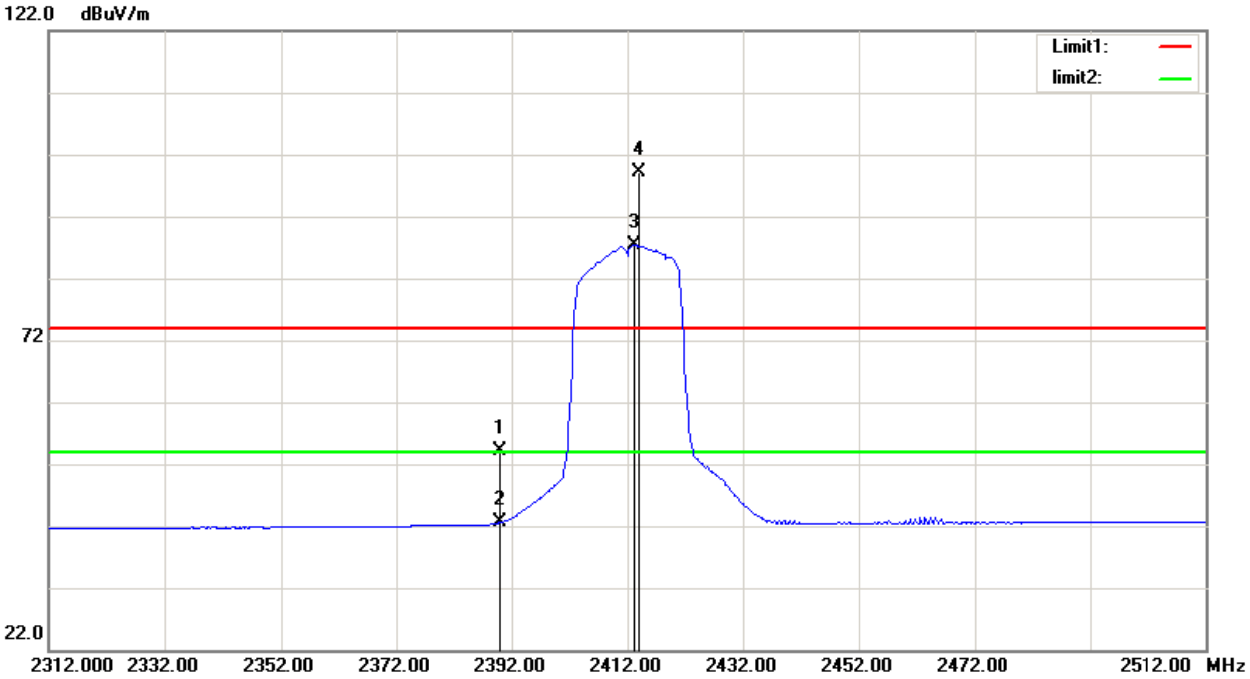
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	32.27	31.62	63.89	74.00	-10.11	peak
2	2390.000	17.50	31.62	49.12	54.00	-4.88	AVG
3	2409.000	77.58	31.67	109.25	/	/	peak
4	2410.800	64.99	31.68	96.67	/	/	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2412 MHz

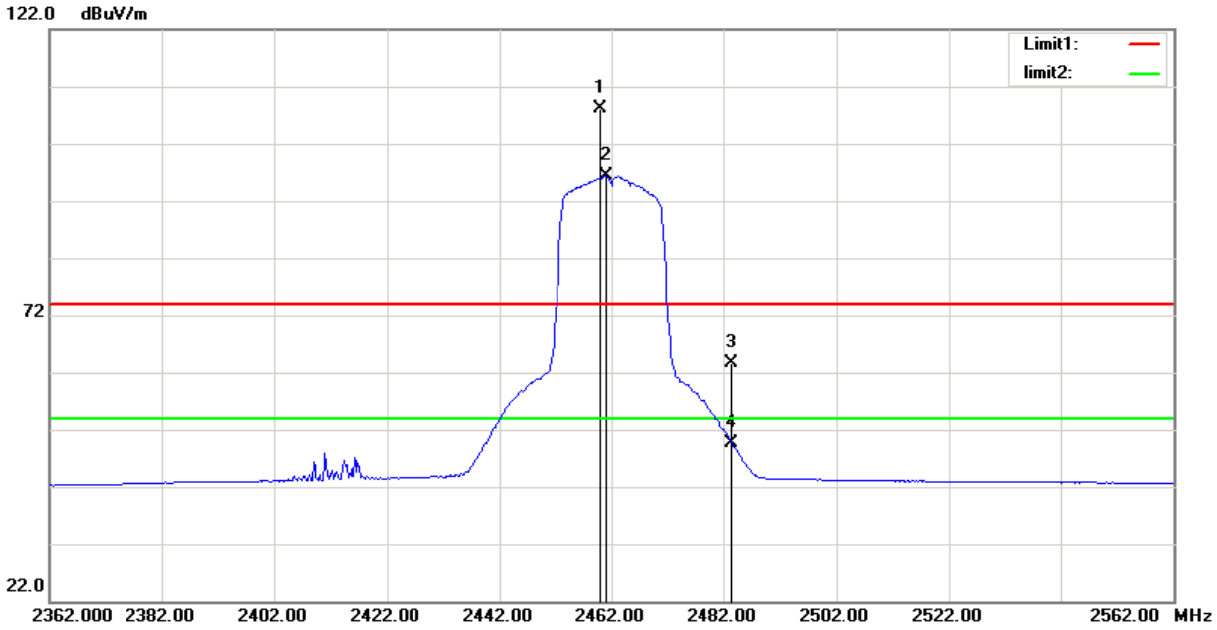
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	22.50	31.62	54.12	74.00	-19.88	peak
2	2390.000	10.96	31.62	42.58	54.00	-11.42	AVG
3	2413.200	55.82	31.68	87.50	/	/	AVG
4	2414.000	67.41	31.68	99.09	/	/	peak

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2462 MHz

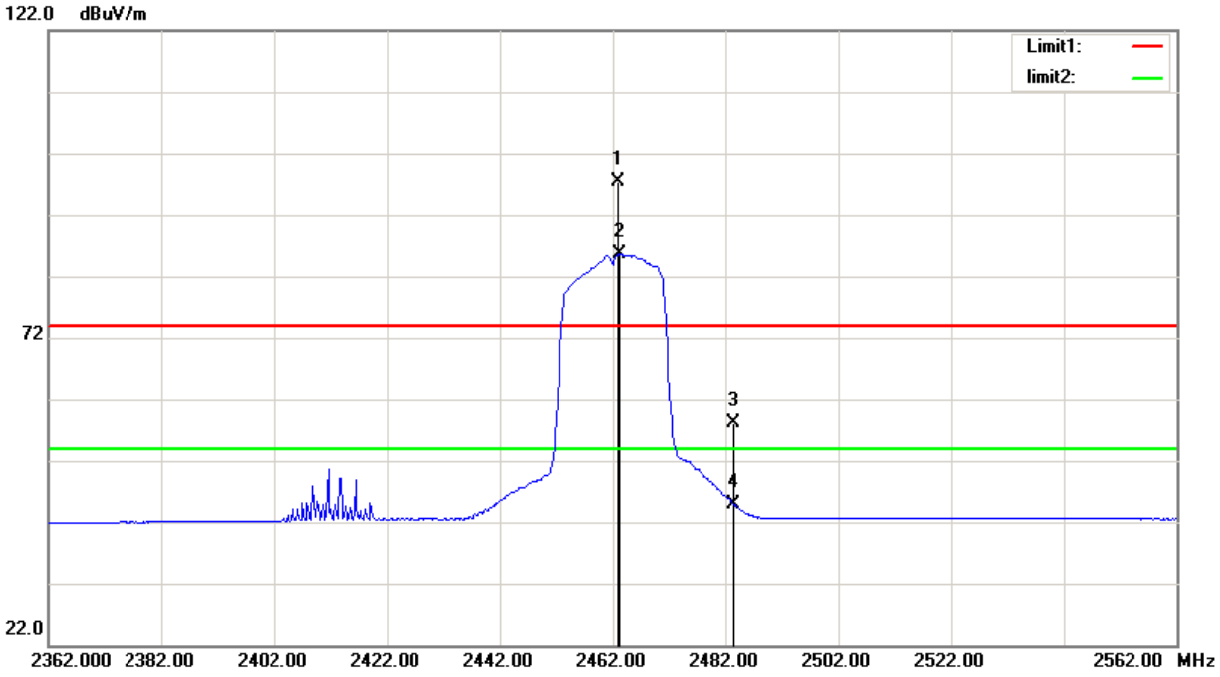
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.000	76.34	31.82	108.16	/	/	peak
2	2461.000	64.51	31.83	96.34	/	/	AVG
3	2483.500	31.77	31.89	63.66	74.00	-10.34	peak
4	2483.500	17.81	31.89	49.70	54.00	-4.30	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2462 MHz

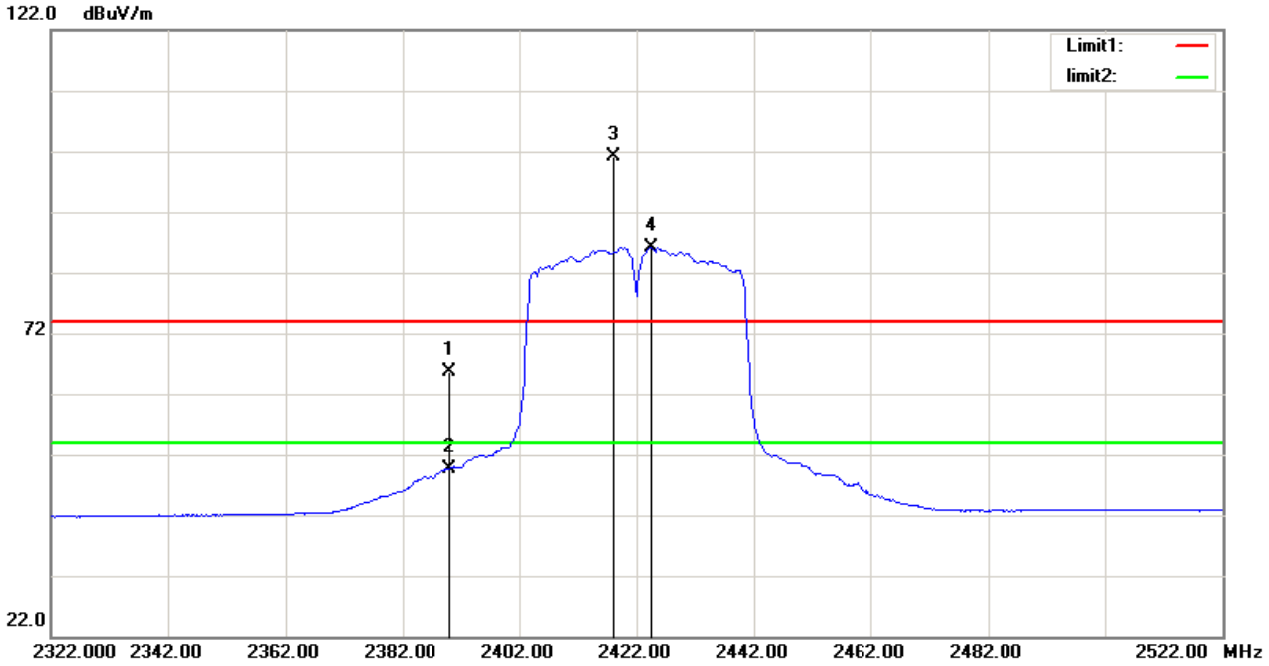
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.000	65.66	31.83	97.49	/	/	peak
2	2463.200	53.81	31.83	85.64	/	/	AVG
3	2483.500	26.13	31.89	58.02	74.00	-15.98	peak
4	2483.500	12.96	31.89	44.85	54.00	-9.15	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode 2422MHz

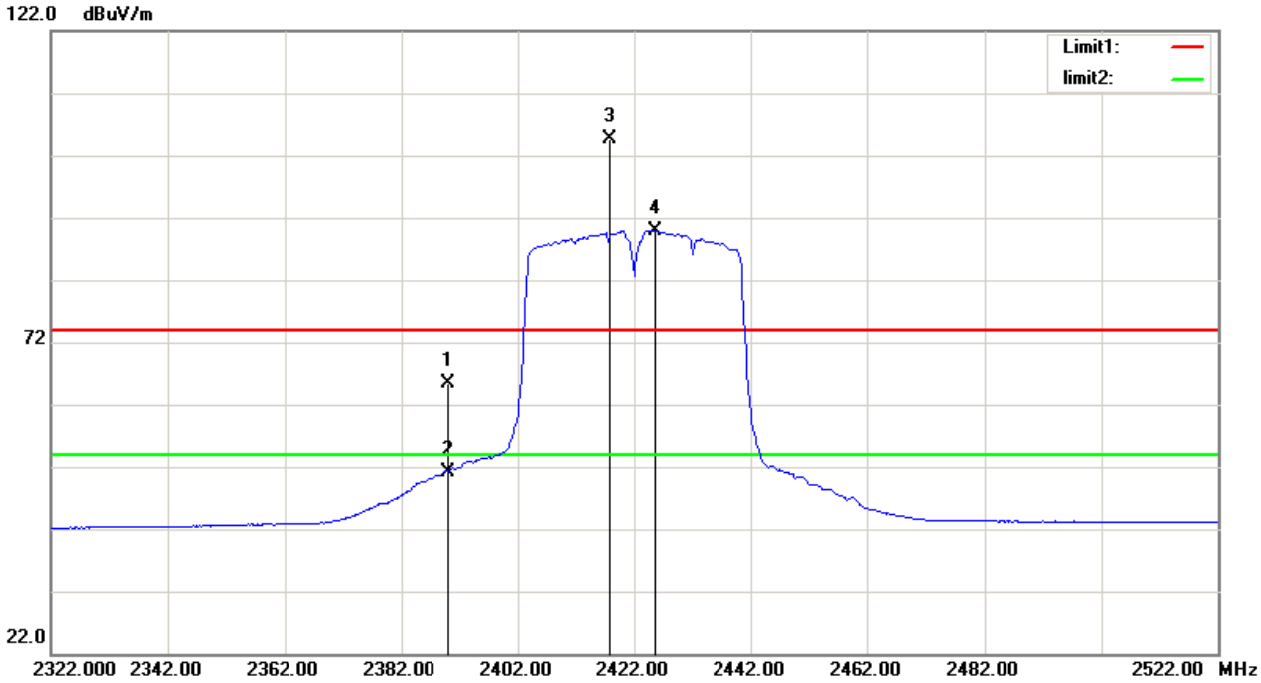
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	34.04	31.62	65.66	74.00	-8.34	peak
2	2390.000	17.95	31.62	49.57	54.00	-4.43	AVG
3	2418.000	69.56	31.69	101.25	/	/	peak
4	2424.400	54.38	31.72	86.10	/	/	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode 2422MHz

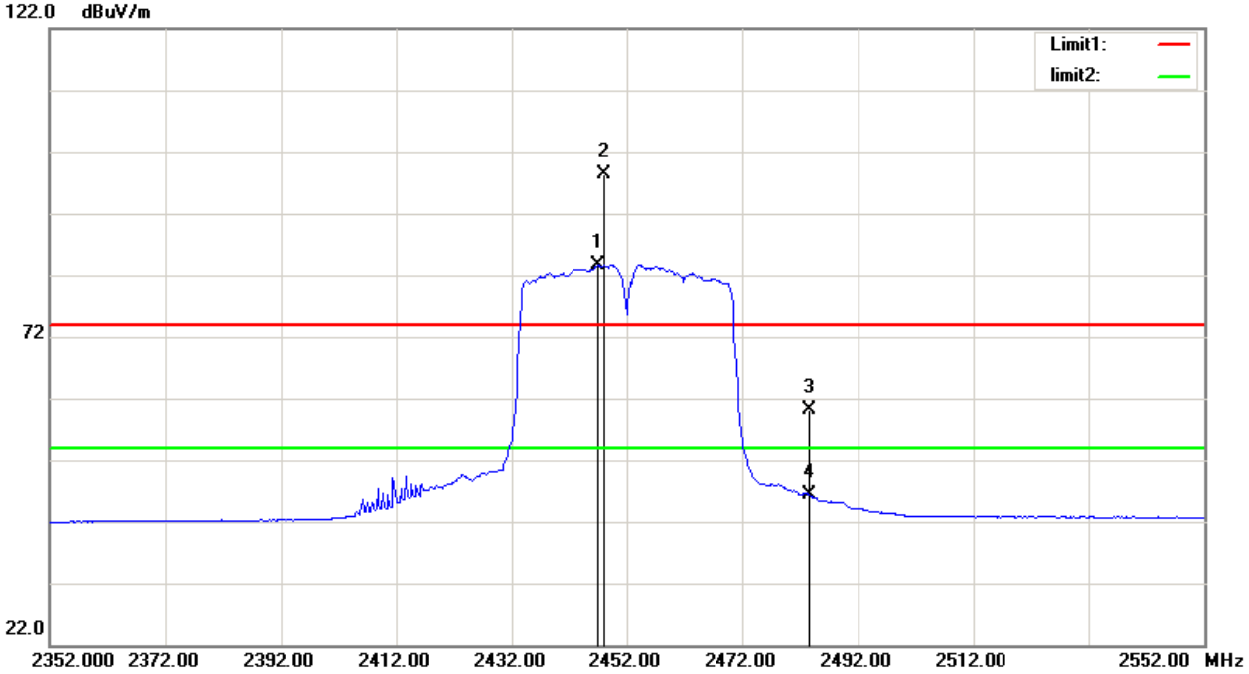
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	33.88	31.62	65.50	74.00	-8.50	peak
2	2390.000	19.57	31.62	51.19	54.00	-2.81	AVG
3	2417.800	72.99	31.69	104.68	/	/	peak
4	2425.600	58.28	31.72	90.00	/	/	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2452 MHz

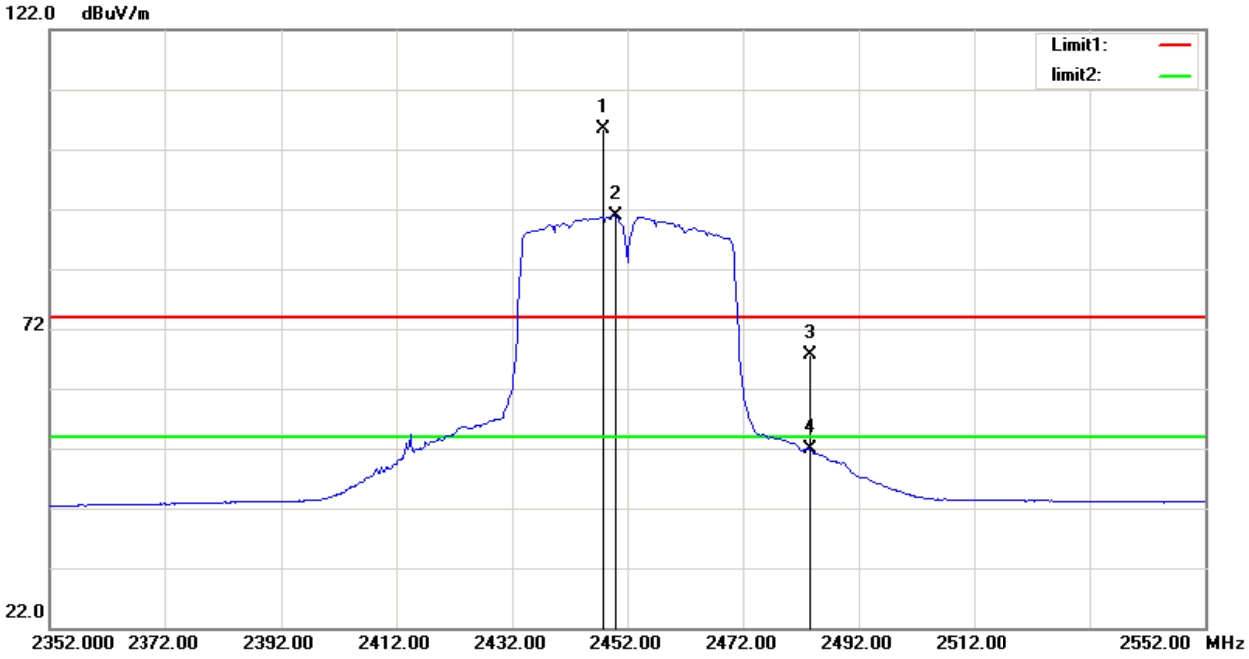
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.000	51.87	31.78	83.65	/	/	AVG
2	2448.000	66.69	31.78	98.47	/	/	peak
3	2483.500	28.25	31.89	60.14	74.00	-13.86	peak
4	2483.500	14.47	31.89	46.36	54.00	-7.64	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2452 MHz

Horizontal

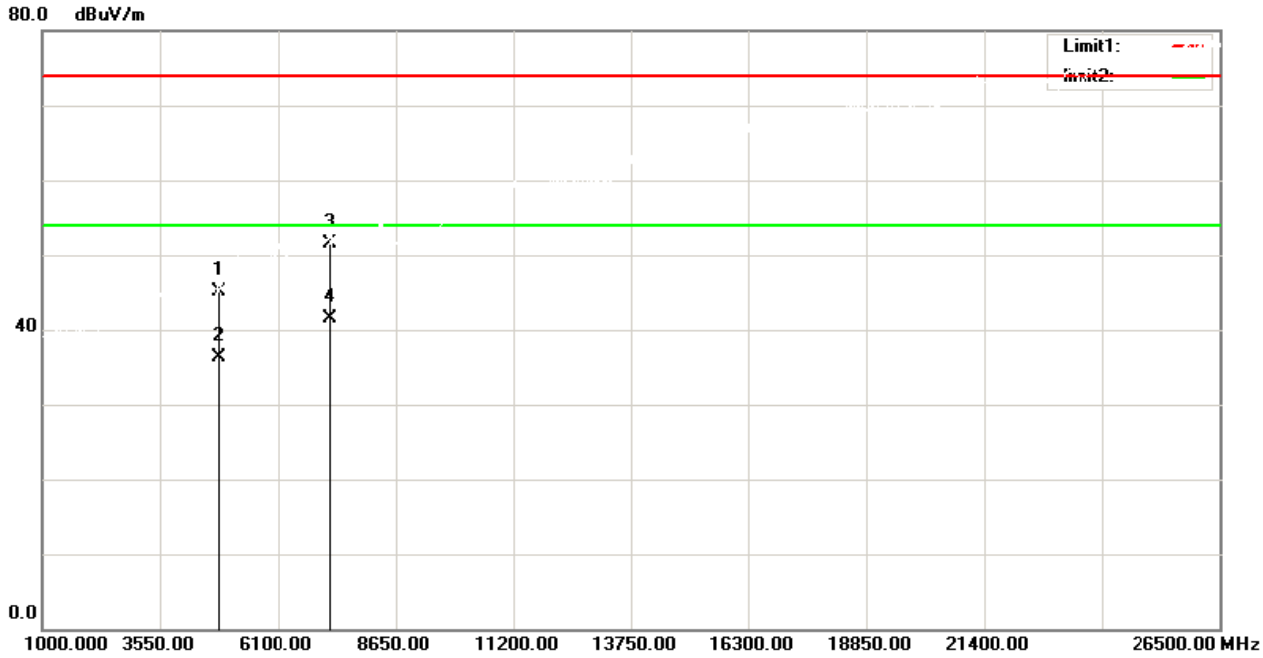


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.800	73.58	31.78	105.36	/	/	peak
2	2450.000	59.08	31.79	90.87	/	/	AVG
3	2483.500	35.82	31.89	67.71	74.00	-6.29	peak
4	2483.500	19.94	31.89	51.83	54.00	-2.17	AVG

5.9 TEST RESULTS- ABOVE 1000MHz(HARMONIC)

Orthogonal Axis	X
Test Mode:	TX B Mode2412 MHz

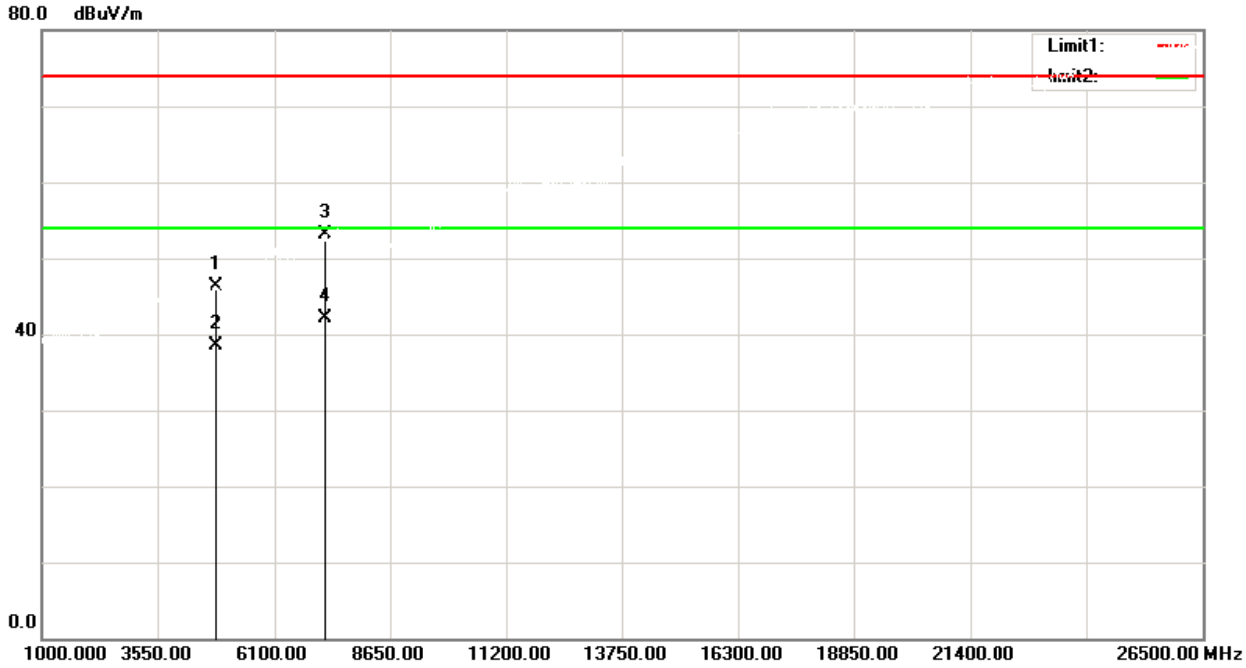
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.000	48.37	-3.24	45.13	74.00	-28.87	peak
2	4824.000	39.50	-3.24	36.26	54.00	-17.74	AVG
3	7236.000	45.90	5.68	51.58	74.00	-22.42	peak
4	7236.000	35.88	5.68	41.56	54.00	-12.44	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2412 MHz

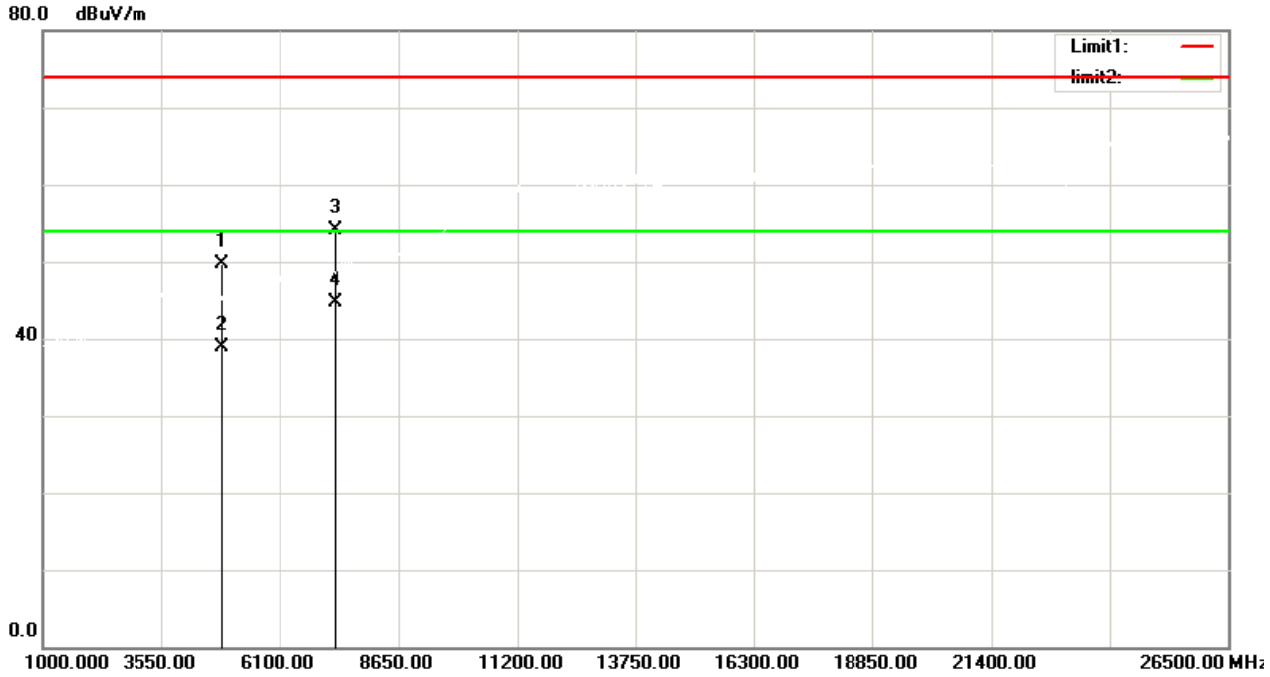
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.000	49.62	-3.24	46.38	74.00	-27.62	peak
2	4824.000	41.72	-3.24	38.48	54.00	-15.52	AVG
3	7236.000	47.38	5.68	53.06	74.00	-20.94	peak
4	7236.000	36.47	5.68	42.15	54.00	-11.85	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2437 MHz

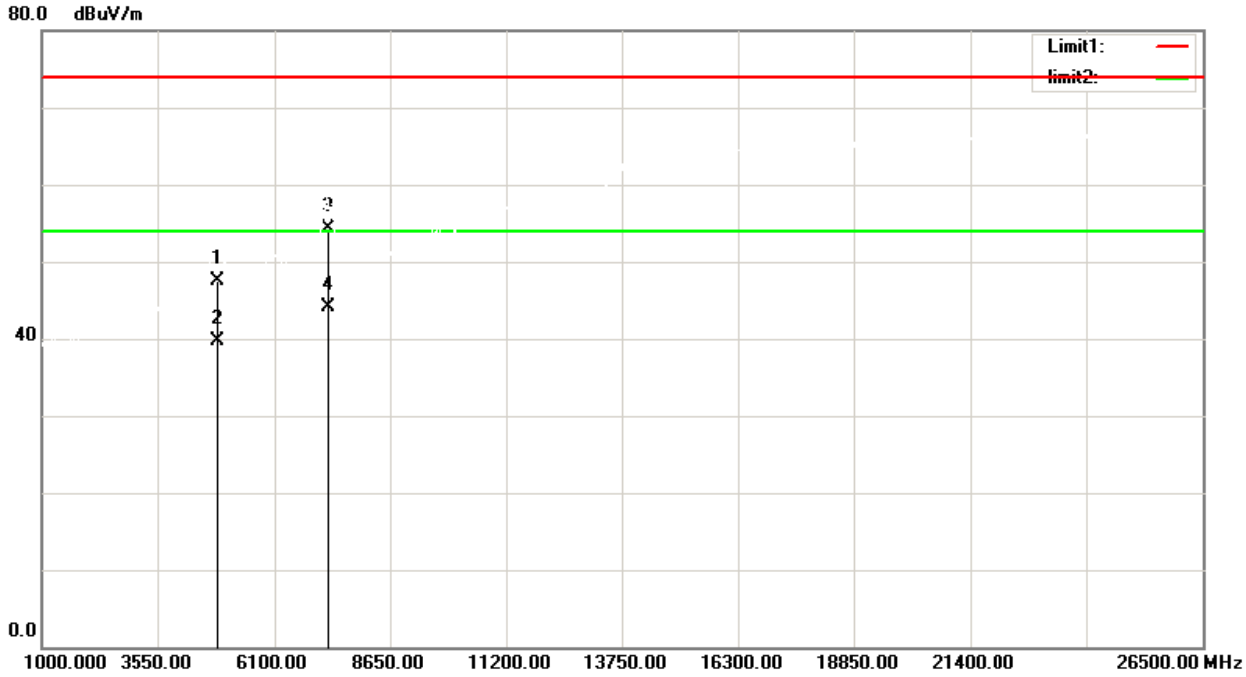
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.050	52.69	-3.06	49.63	74.00	-24.37	peak
2	4874.050	41.97	-3.06	38.91	54.00	-15.09	AVG
3	7311.100	48.26	5.87	54.13	74.00	-19.87	peak
4	7311.100	38.74	5.87	44.61	54.00	-9.39	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2437 MHz

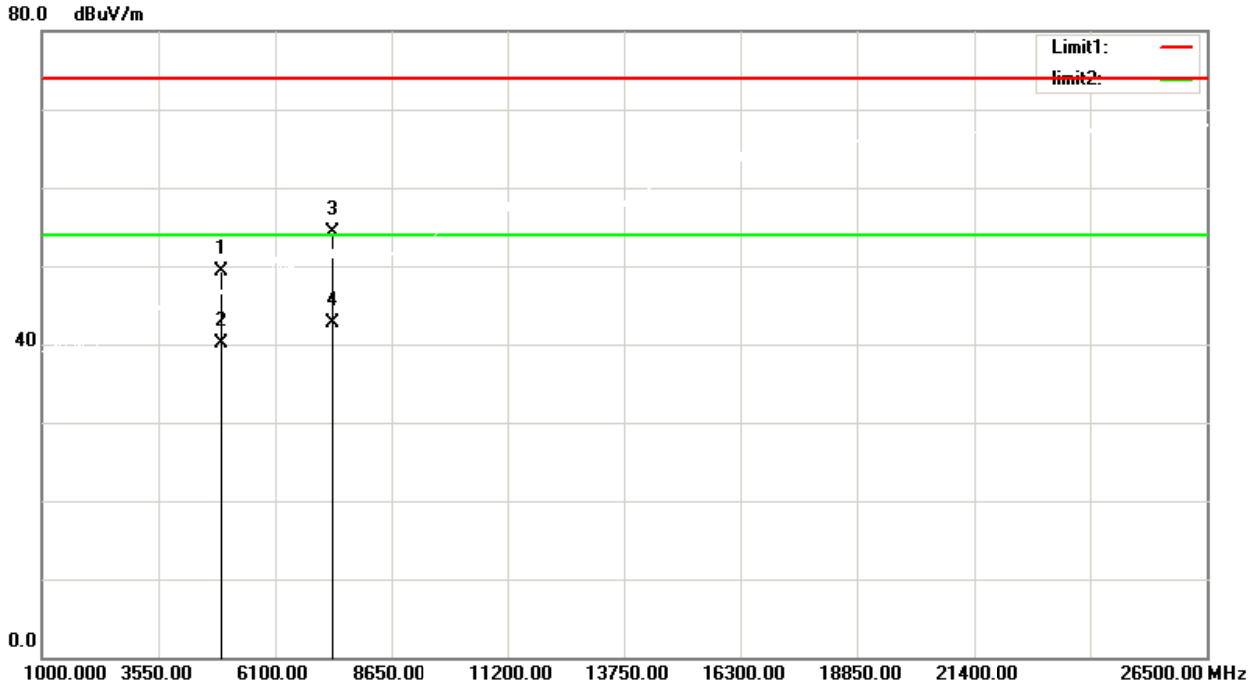
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.000	50.66	-3.06	47.60	74.00	-26.40	peak
2	4874.000	42.70	-3.06	39.64	54.00	-14.36	AVG
3	7311.000	48.43	5.87	54.30	74.00	-19.70	peak
4	7311.000	38.26	5.87	44.13	54.00	-9.87	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2462 MHz

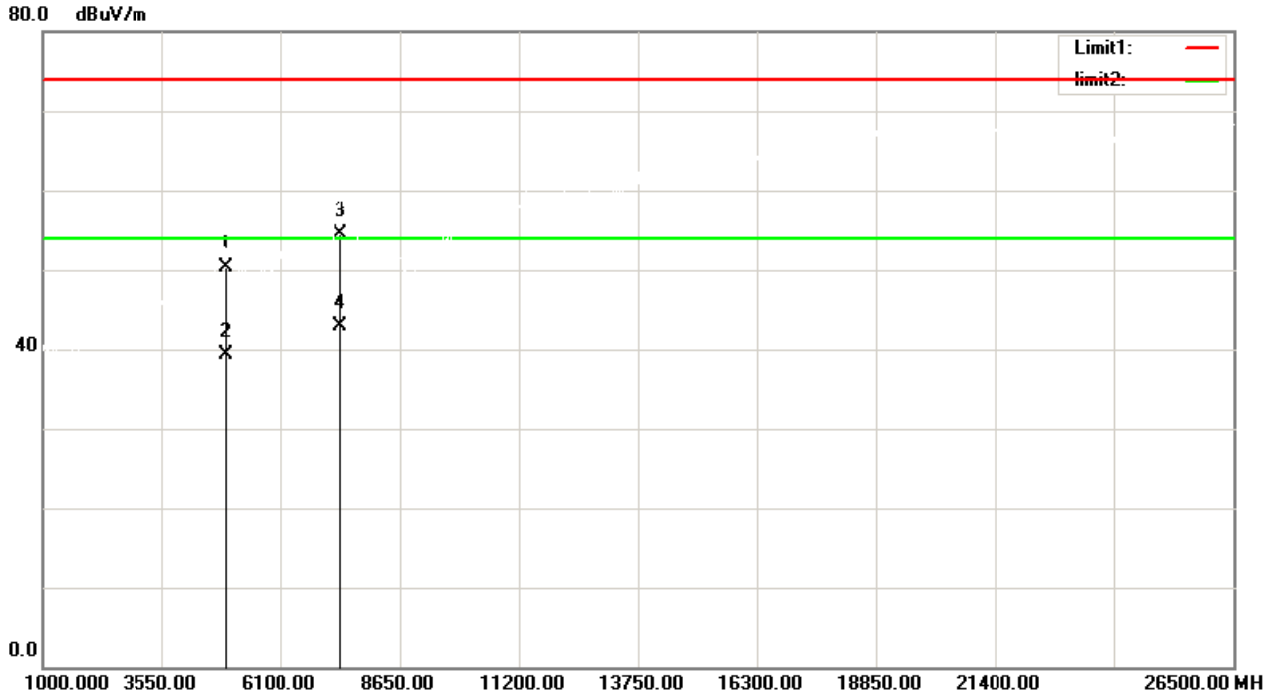
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.000	52.17	-2.87	49.30	74.00	-24.70	peak
2	4924.000	42.99	-2.87	40.12	54.00	-13.88	AVG
3	7386.000	48.29	6.06	54.35	74.00	-19.65	peak
4	7386.000	36.55	6.06	42.61	54.00	-11.39	AVG

Orthogonal Axis	X
Test Mode:	TX B Mode2462 MHz

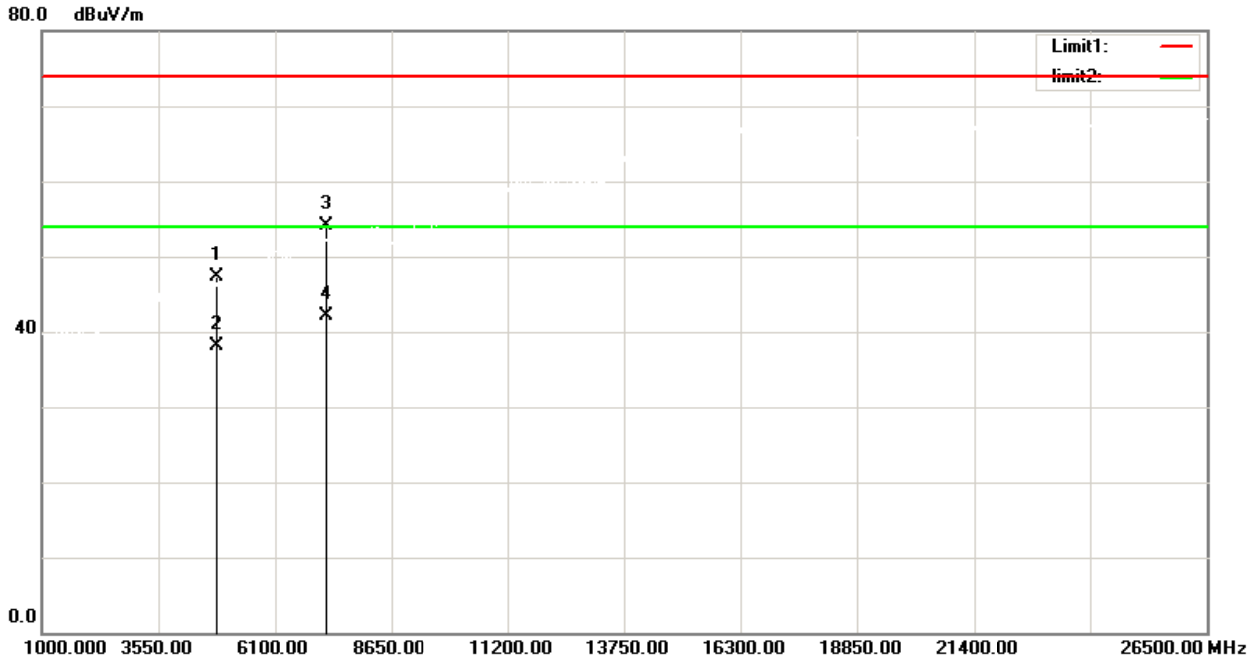
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.000	53.17	-2.87	50.30	74.00	-23.70	peak
2	4924.000	42.10	-2.87	39.23	54.00	-14.77	AVG
3	7386.000	48.46	6.06	54.52	74.00	-19.48	peak
4	7386.000	36.89	6.06	42.95	54.00	-11.05	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2412 MHz

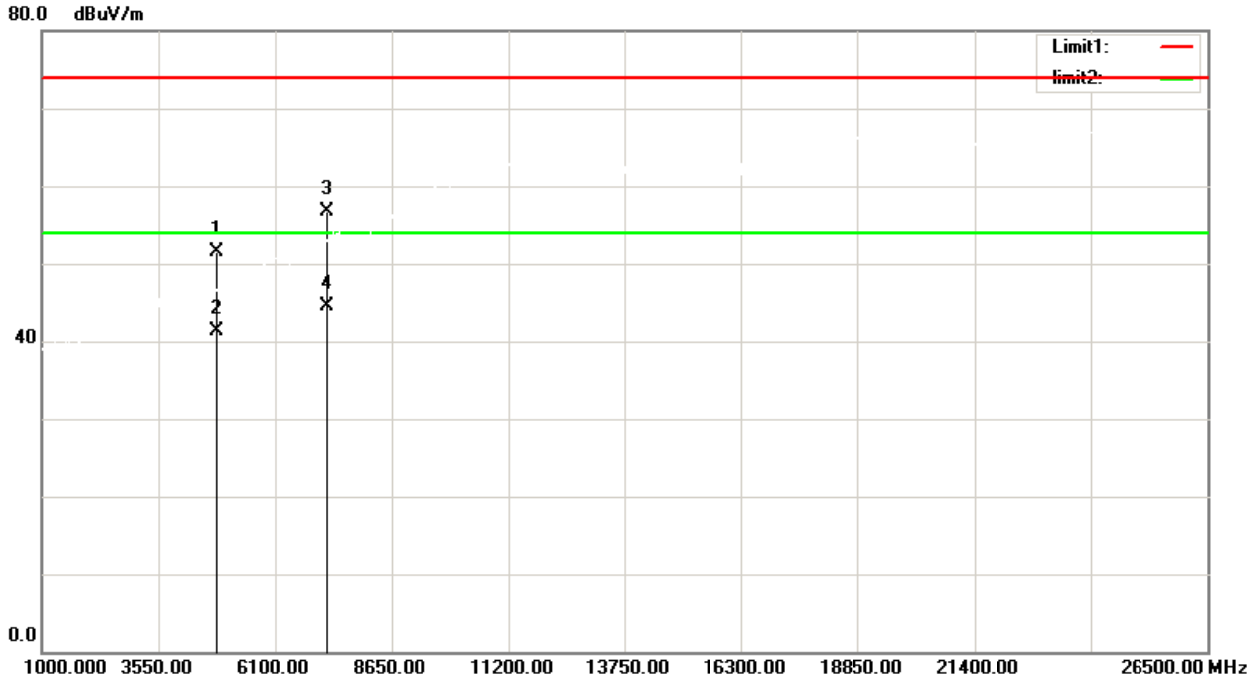
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.150	50.49	-3.24	47.25	74.00	-26.75	peak
2	4824.150	41.35	-3.24	38.11	54.00	-15.89	AVG
3	7236.000	48.43	5.68	54.11	74.00	-19.89	peak
4	7236.000	36.35	5.68	42.03	54.00	-11.97	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2412 MHz

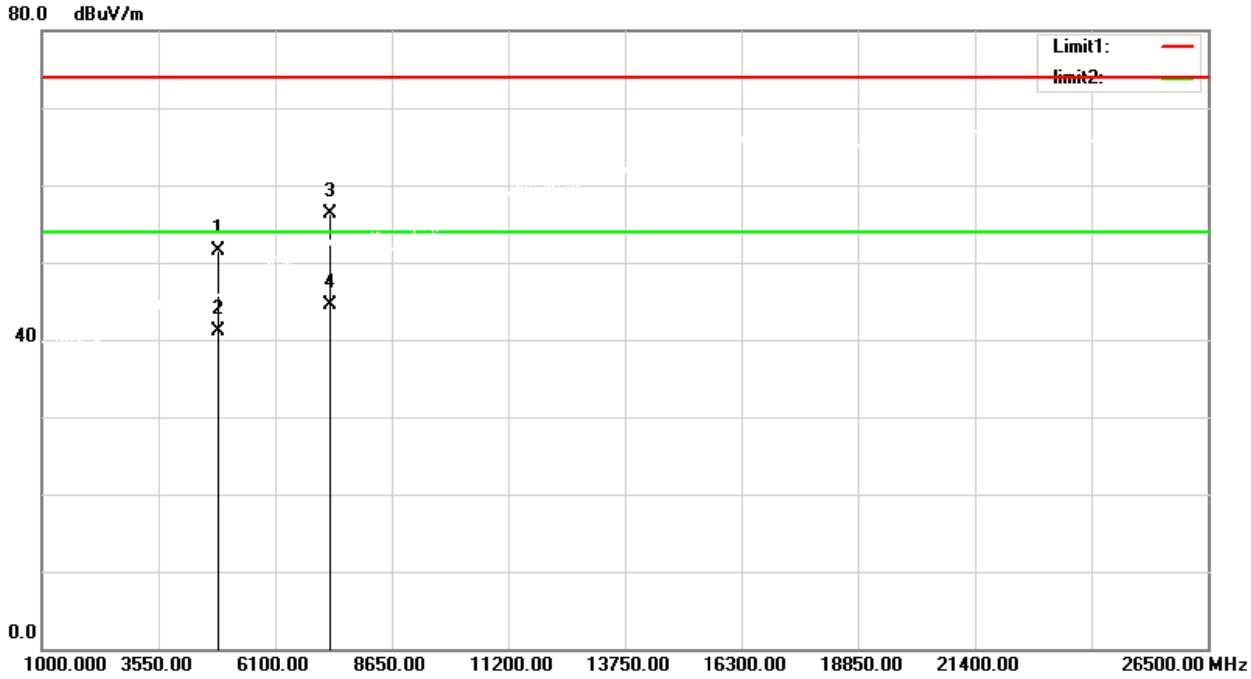
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.000	54.78	-3.24	51.54	74.00	-22.46	peak
2	4824.000	44.47	-3.24	41.23	54.00	-12.77	AVG
3	7236.000	50.94	5.68	56.62	74.00	-17.38	peak
4	7236.000	38.90	5.68	44.58	54.00	-9.42	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2437 MHz

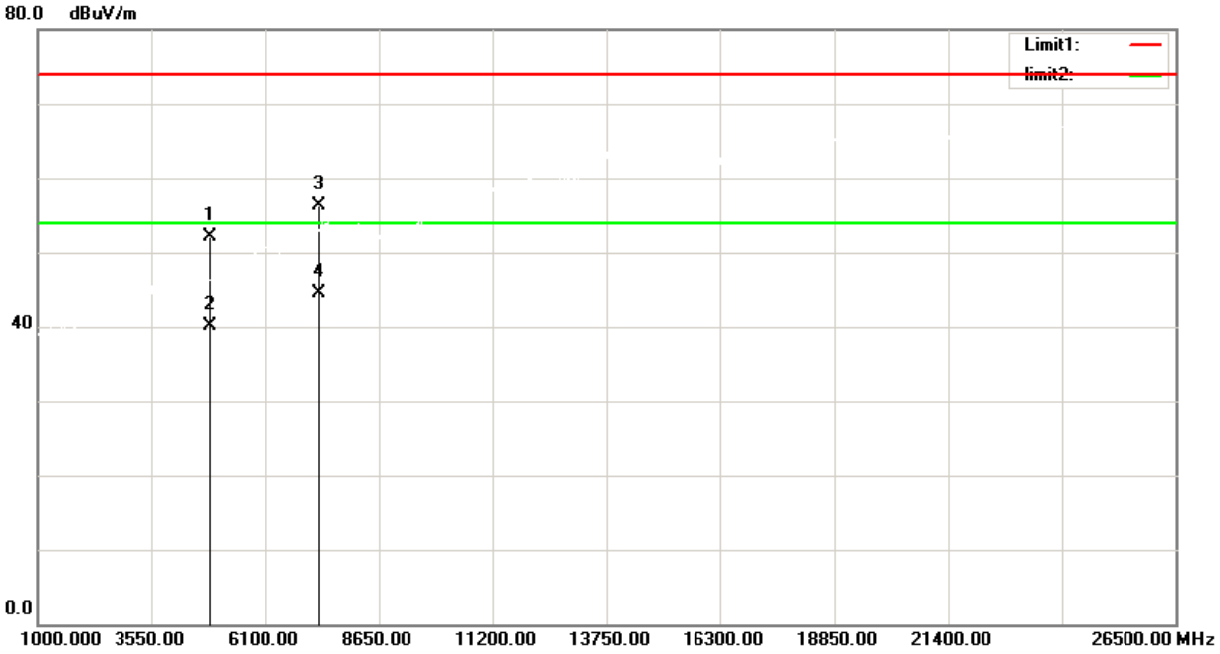
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.000	54.60	-3.06	51.54	74.00	-22.46	peak
2	4874.000	44.07	-3.06	41.01	54.00	-12.99	AVG
3	7311.000	50.47	5.87	56.34	74.00	-17.66	peak
4	7311.000	38.58	5.87	44.45	54.00	-9.55	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2437 MHz

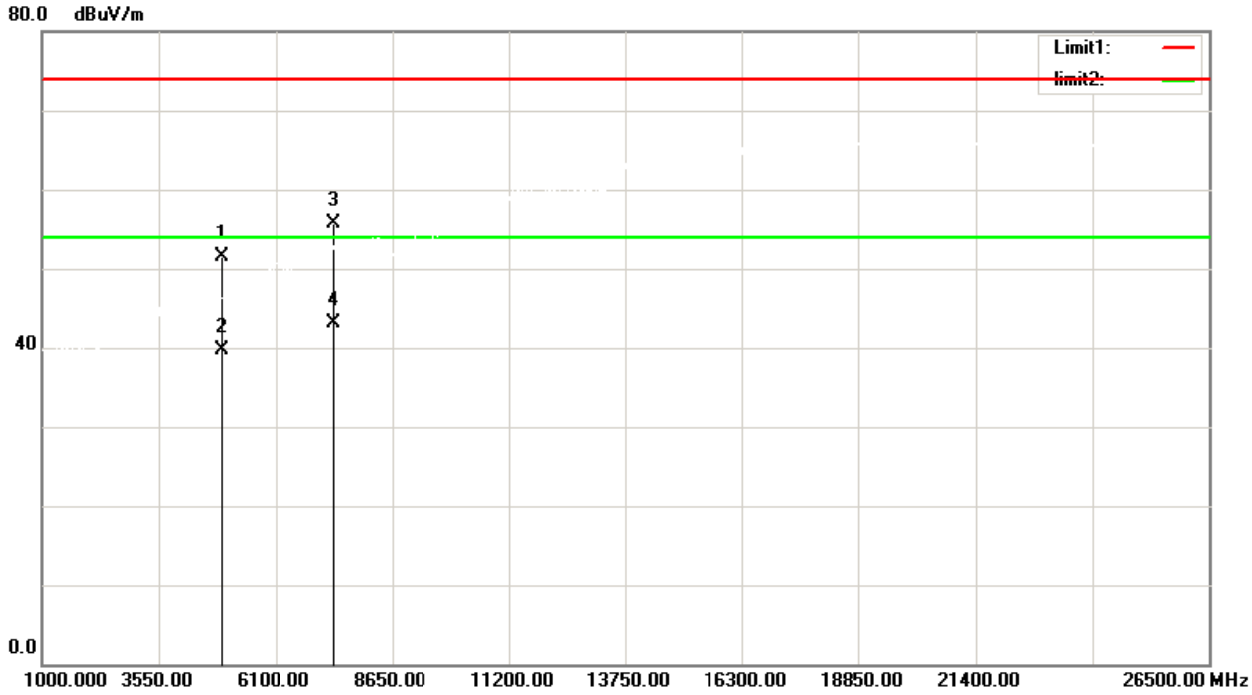
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.000	55.08	-3.06	52.02	74.00	-21.98	peak
2	4874.000	43.18	-3.06	40.12	54.00	-13.88	AVG
3	7311.000	50.45	5.87	56.32	74.00	-17.68	peak
4	7311.000	38.54	5.87	44.41	54.00	-9.59	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2462 MHz

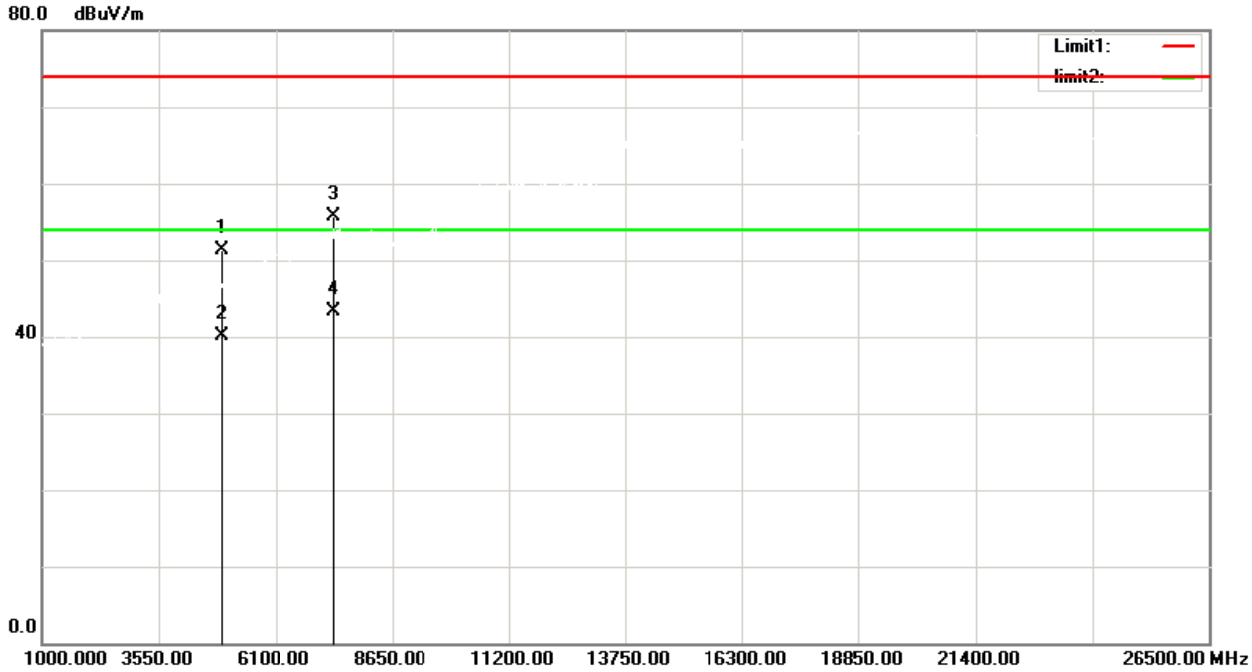
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.492	54.38	-2.87	51.51	74.00	-22.49	peak
2	4924.492	42.66	-2.87	39.79	54.00	-14.21	AVG
3	7386.000	49.69	6.06	55.75	74.00	-18.25	peak
4	7386.000	37.13	6.06	43.19	54.00	-10.81	AVG

Orthogonal Axis	X
Test Mode:	TX G Mode2462 MHz

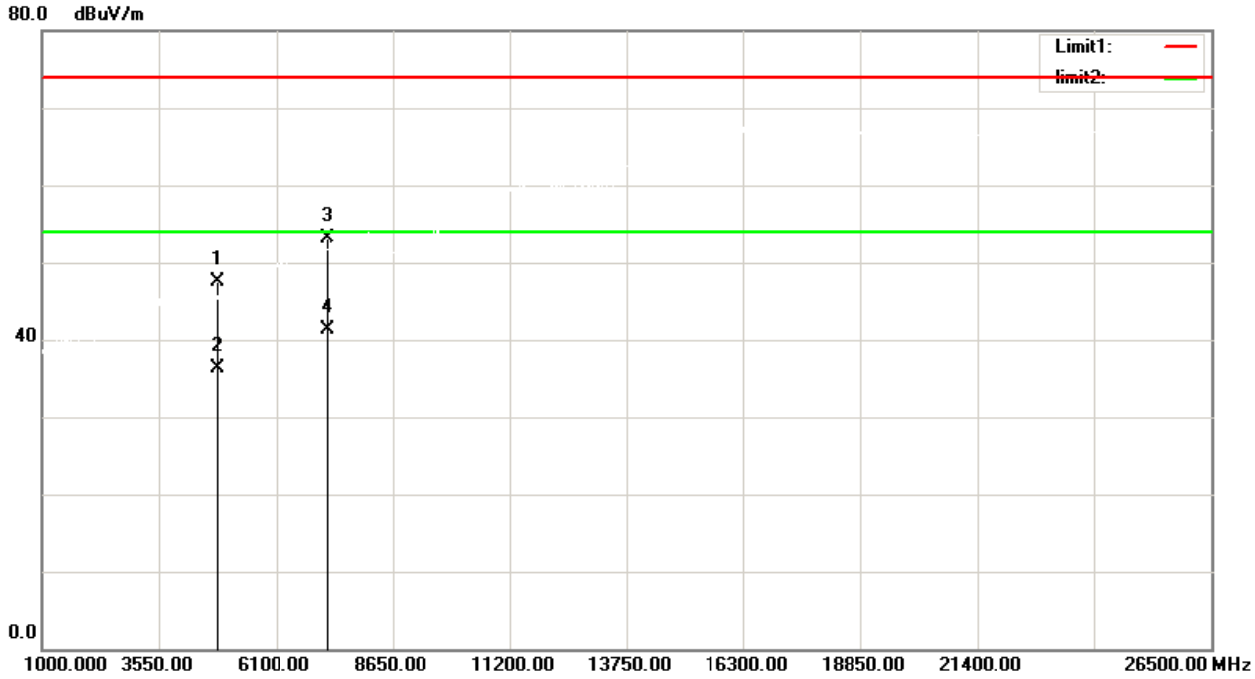
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.000	54.08	-2.87	51.21	74.00	-22.79	peak
2	4924.000	42.97	-2.87	40.10	54.00	-13.90	AVG
3	7386.000	49.59	6.06	55.65	74.00	-18.35	peak
4	7386.000	37.33	6.06	43.39	54.00	-10.61	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2412 MHz

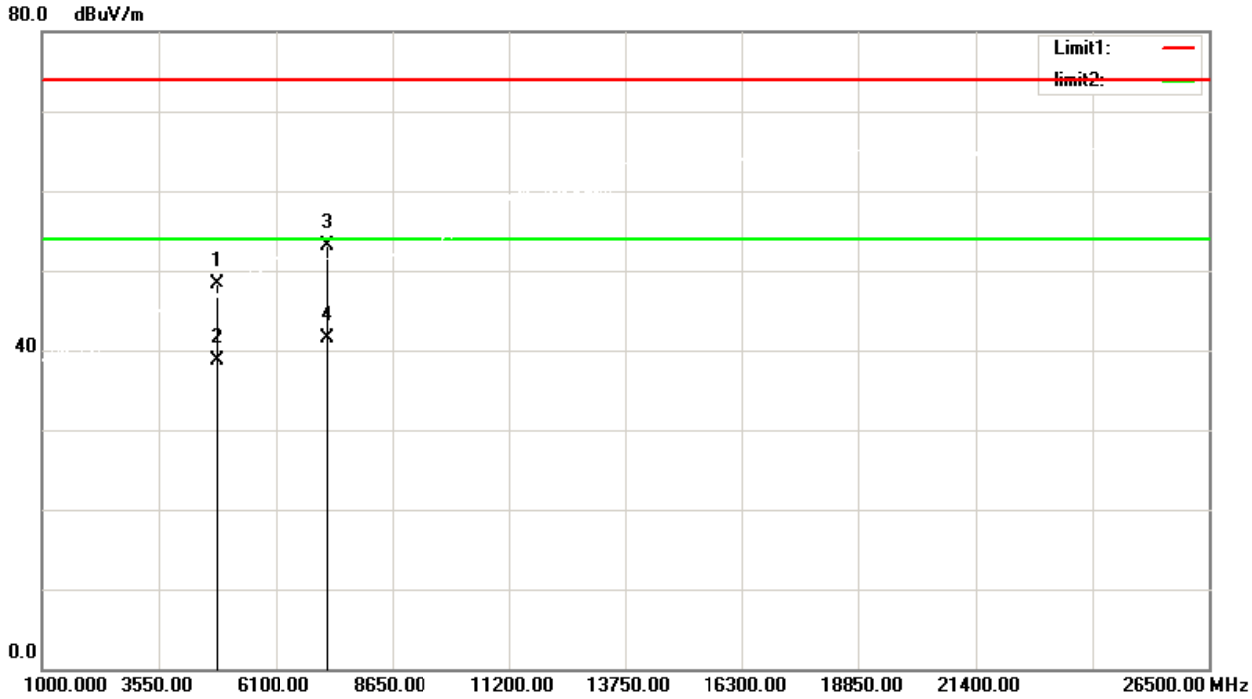
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.100	50.80	-3.24	47.56	74.00	-26.44	peak
2	4824.100	39.47	-3.24	36.23	54.00	-17.77	AVG
3	7236.050	47.34	5.68	53.02	74.00	-20.98	peak
4	7236.050	35.69	5.68	41.37	54.00	-12.63	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2412 MHz

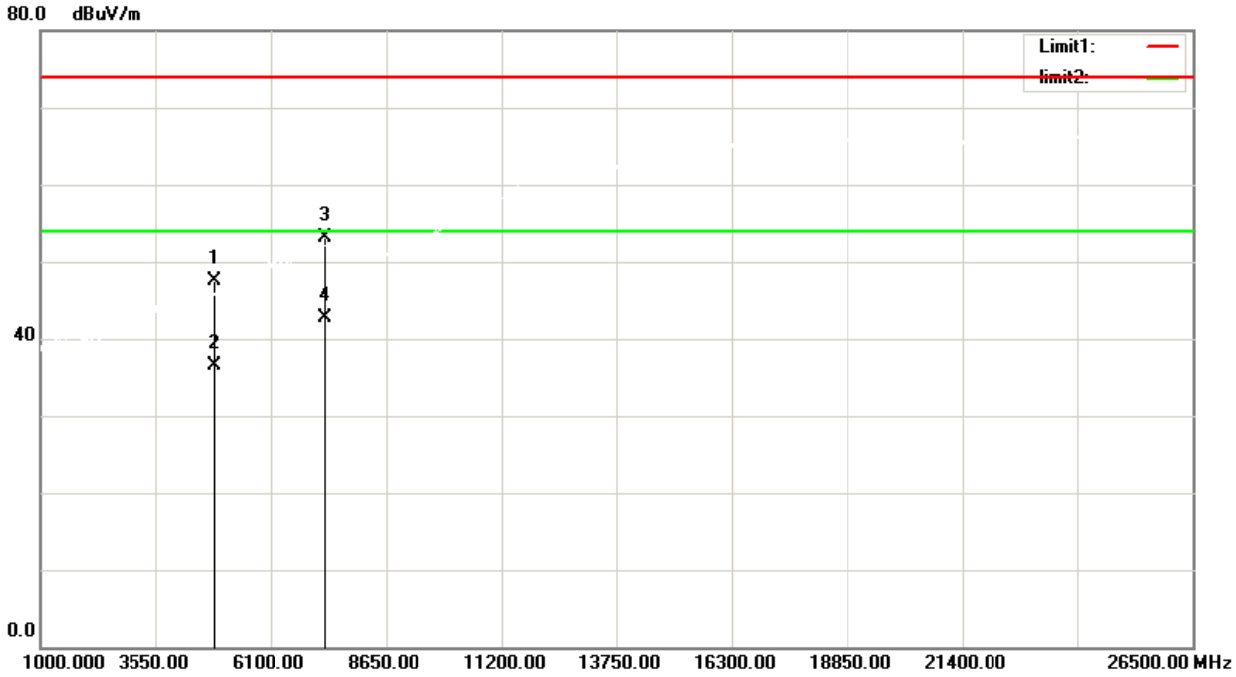
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4824.000	51.59	-3.24	48.35	74.00	-25.65	peak
2	4824.000	41.85	-3.24	38.61	54.00	-15.39	AVG
3	7235.950	47.46	5.68	53.14	74.00	-20.86	peak
4	7235.950	35.79	5.68	41.47	54.00	-12.53	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2437 MHz

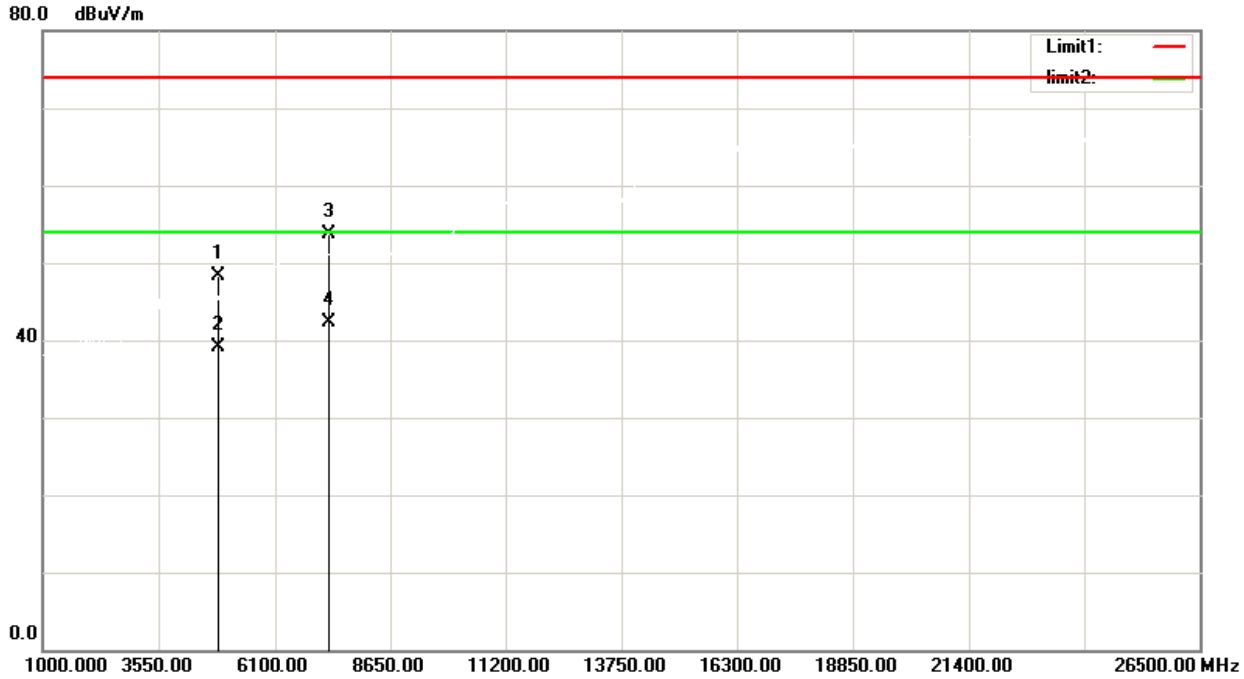
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.000	50.51	-3.06	47.45	74.00	-26.55	peak
2	4874.000	39.49	-3.06	36.43	54.00	-17.57	AVG
3	7311.150	47.18	5.87	53.05	74.00	-20.95	peak
4	7311.150	36.92	5.87	42.79	54.00	-11.21	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2437 MHz

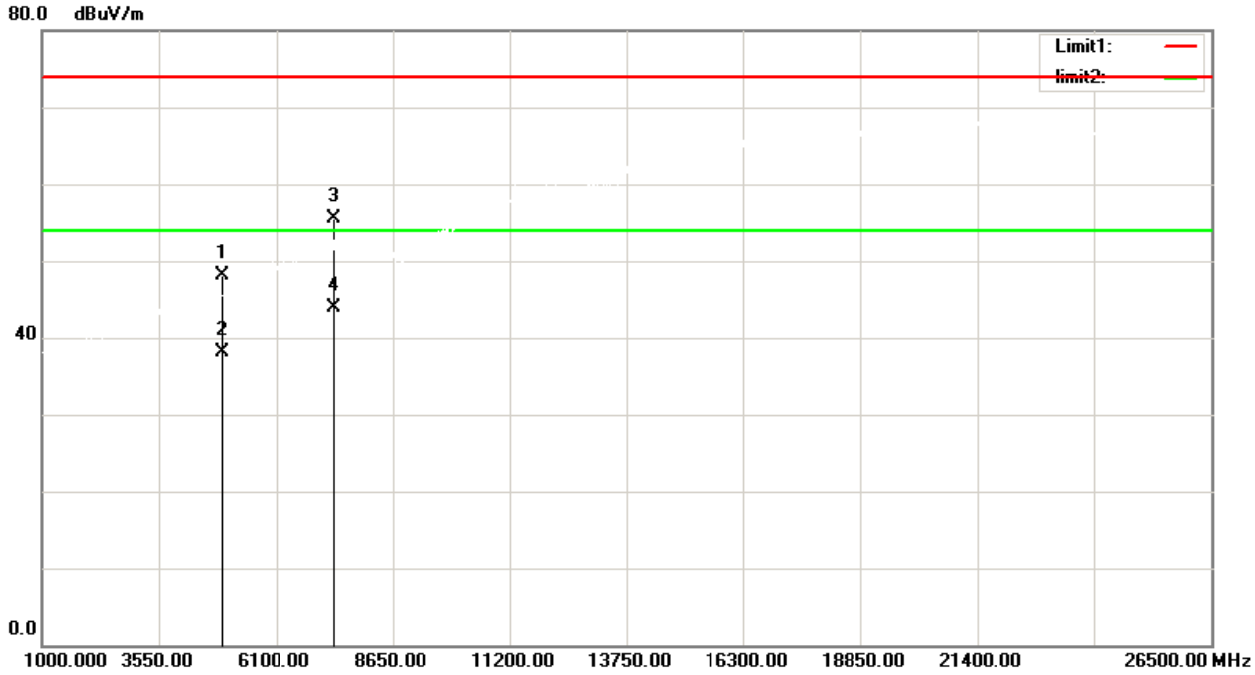
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4873.990	51.34	-3.06	48.28	74.00	-25.72	peak
2	4873.990	42.08	-3.06	39.02	54.00	-14.98	AVG
3	7311.250	47.78	5.87	53.65	74.00	-20.35	peak
4	7311.250	36.47	5.87	42.34	54.00	-11.66	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2462 MHz

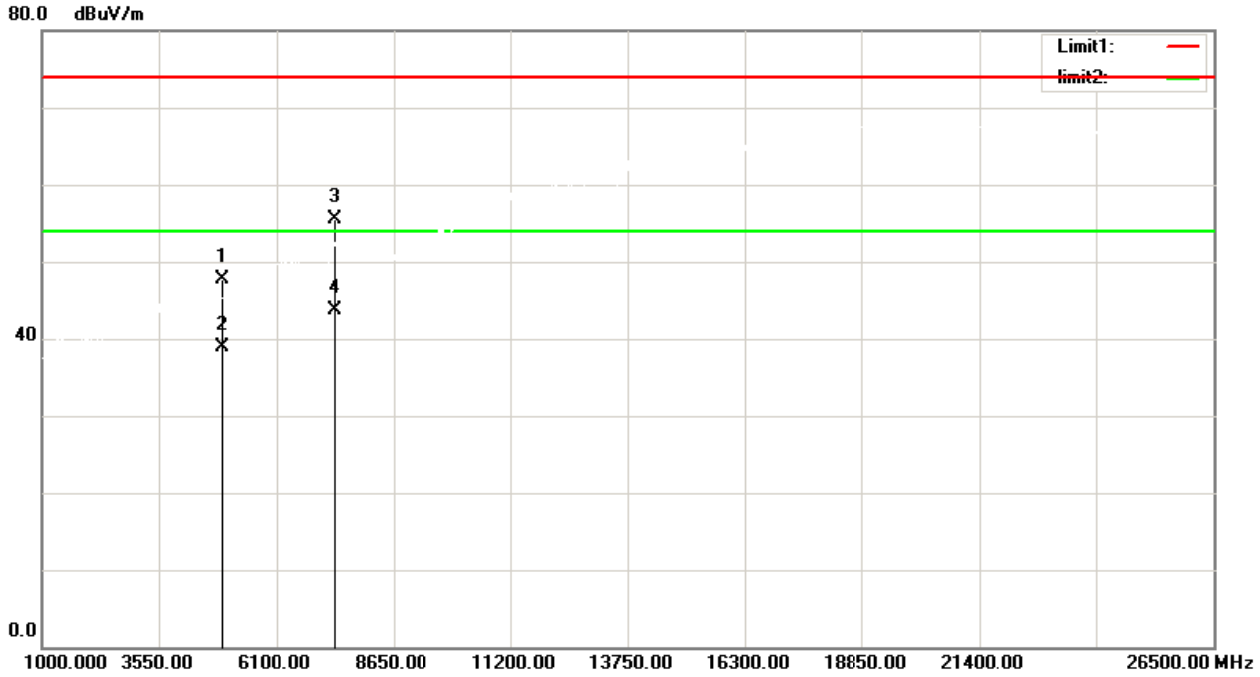
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.100	50.89	-2.87	48.02	74.00	-25.98	peak
2	4924.100	40.97	-2.87	38.10	54.00	-15.90	AVG
3	7386.000	49.39	6.06	55.45	74.00	-18.55	peak
4	7386.000	37.86	6.06	43.92	54.00	-10.08	AVG

Orthogonal Axis	X
Test Mode:	TX N-20M Mode2462 MHz

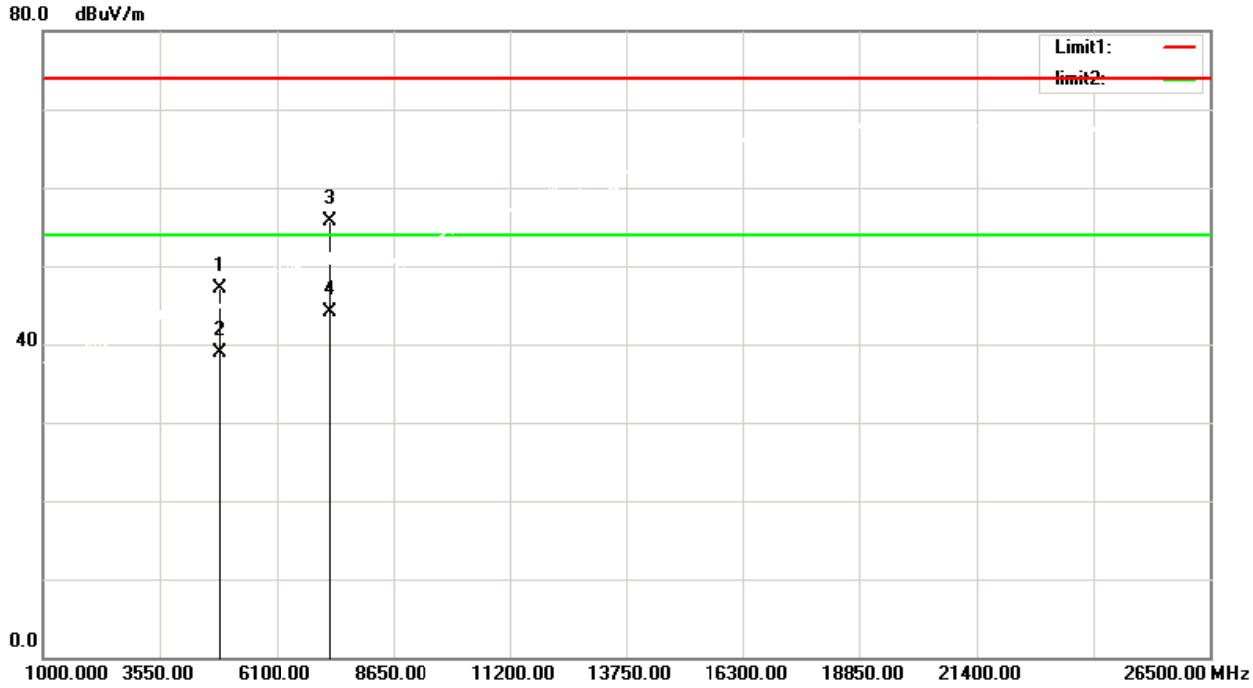
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4924.050	50.61	-2.87	47.74	74.00	-26.26	peak
2	4924.050	41.81	-2.87	38.94	54.00	-15.06	AVG
3	7386.150	49.48	6.06	55.54	74.00	-18.46	peak
4	7386.150	37.55	6.06	43.61	54.00	-10.39	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode 2422MHz

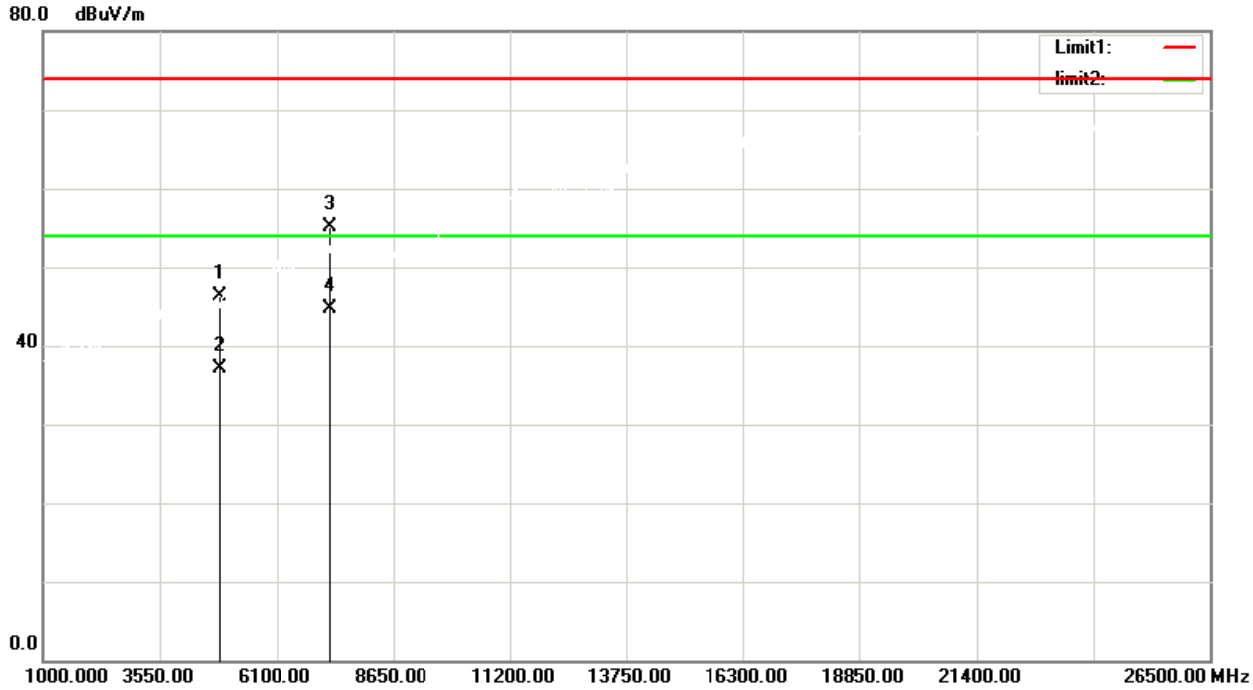
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4844.100	50.19	-3.17	47.02	74.00	-26.98	peak
2	4844.100	41.98	-3.17	38.81	54.00	-15.19	AVG
3	7266.500	49.89	5.76	55.65	74.00	-18.35	peak
4	7266.500	38.31	5.76	44.07	54.00	-9.93	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode 2422MHz

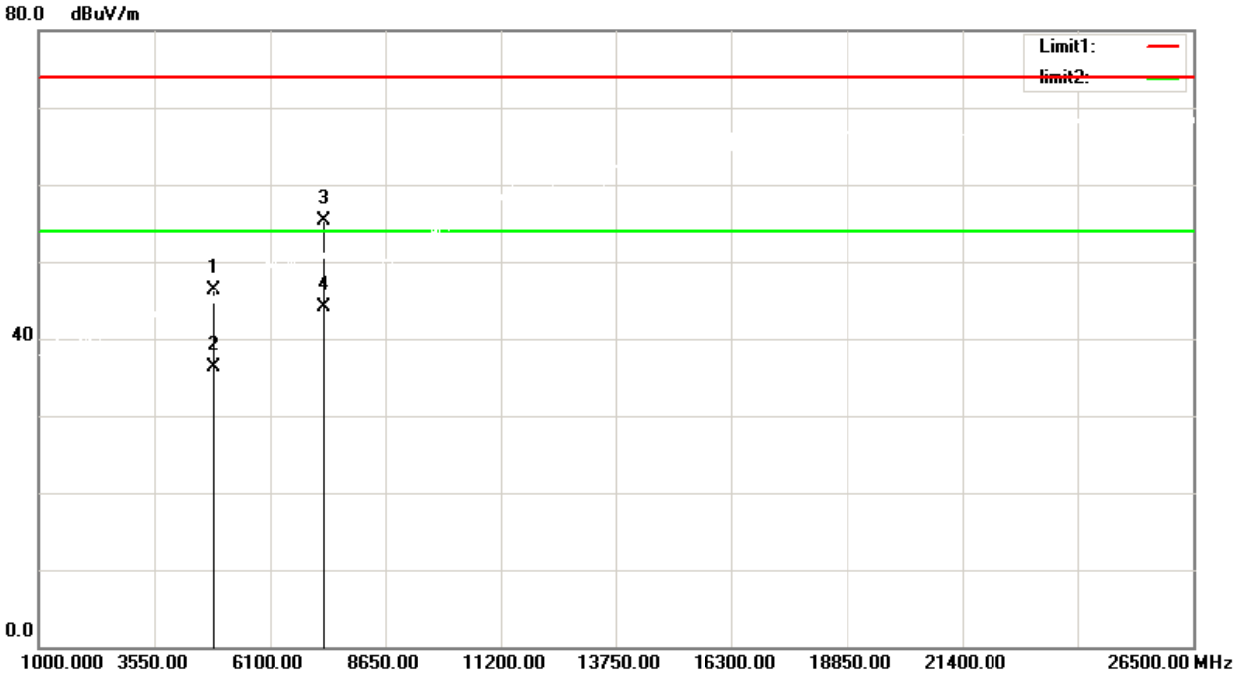
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4844.050	49.51	-3.17	46.34	74.00	-27.66	peak
2	4844.050	40.32	-3.17	37.15	54.00	-16.85	AVG
3	7266.150	49.34	5.76	55.10	74.00	-18.90	peak
4	7266.150	38.88	5.76	44.64	54.00	-9.36	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2437 MHz

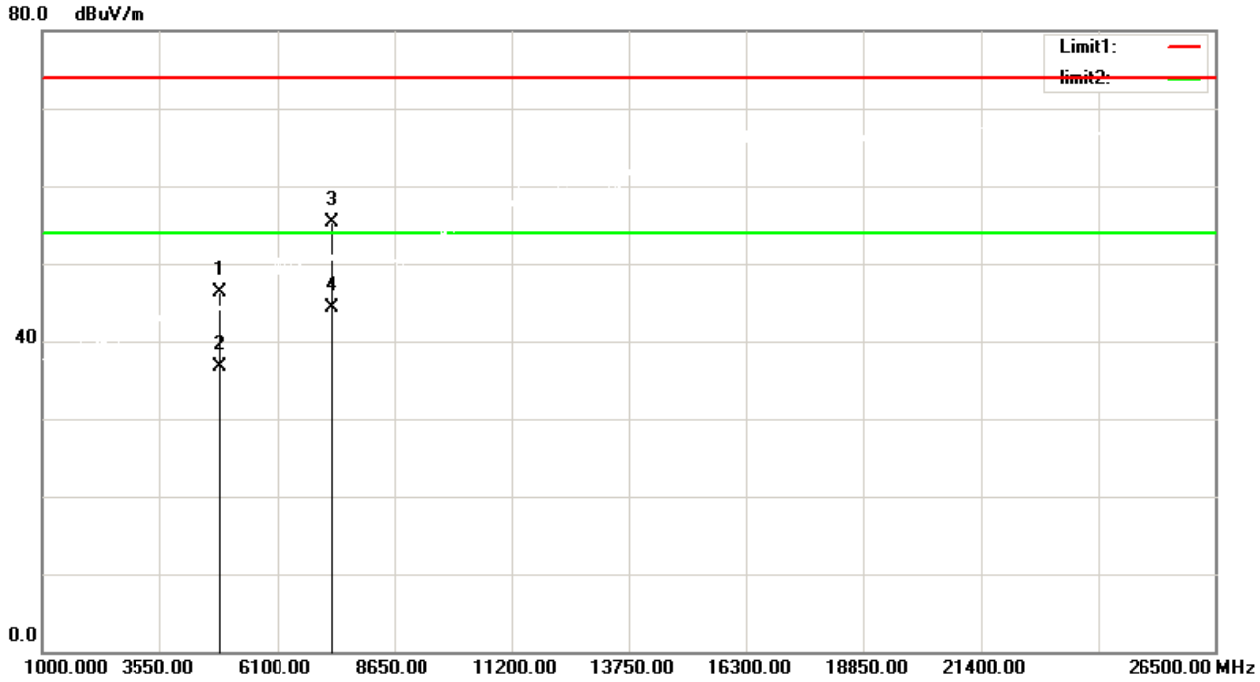
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.000	49.44	-3.06	46.38	74.00	-27.62	peak
2	4874.000	39.32	-3.06	36.26	54.00	-17.74	AVG
3	7311.000	49.43	5.87	55.30	74.00	-18.70	peak
4	7311.000	38.25	5.87	44.12	54.00	-9.88	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2437 MHz

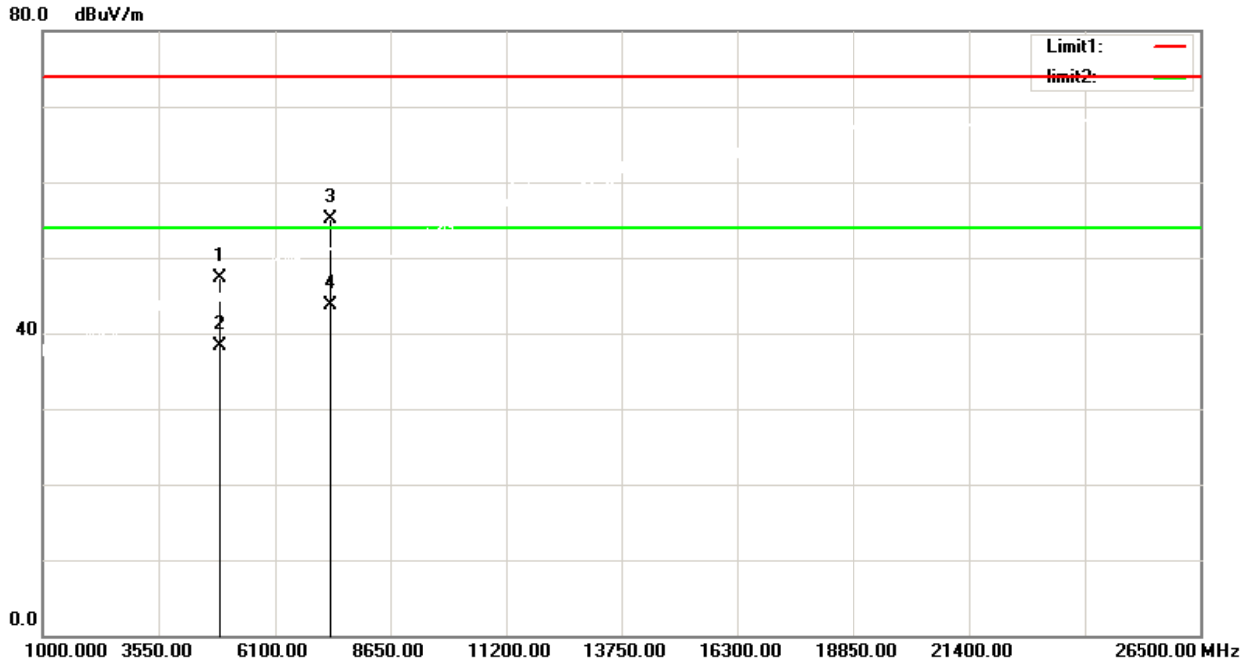
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4874.500	49.43	-3.06	46.37	74.00	-27.63	peak
2	4874.500	39.74	-3.06	36.68	54.00	-17.32	AVG
3	7311.100	49.44	5.87	55.31	74.00	-18.69	peak
4	7311.100	38.37	5.87	44.24	54.00	-9.76	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2452 MHz

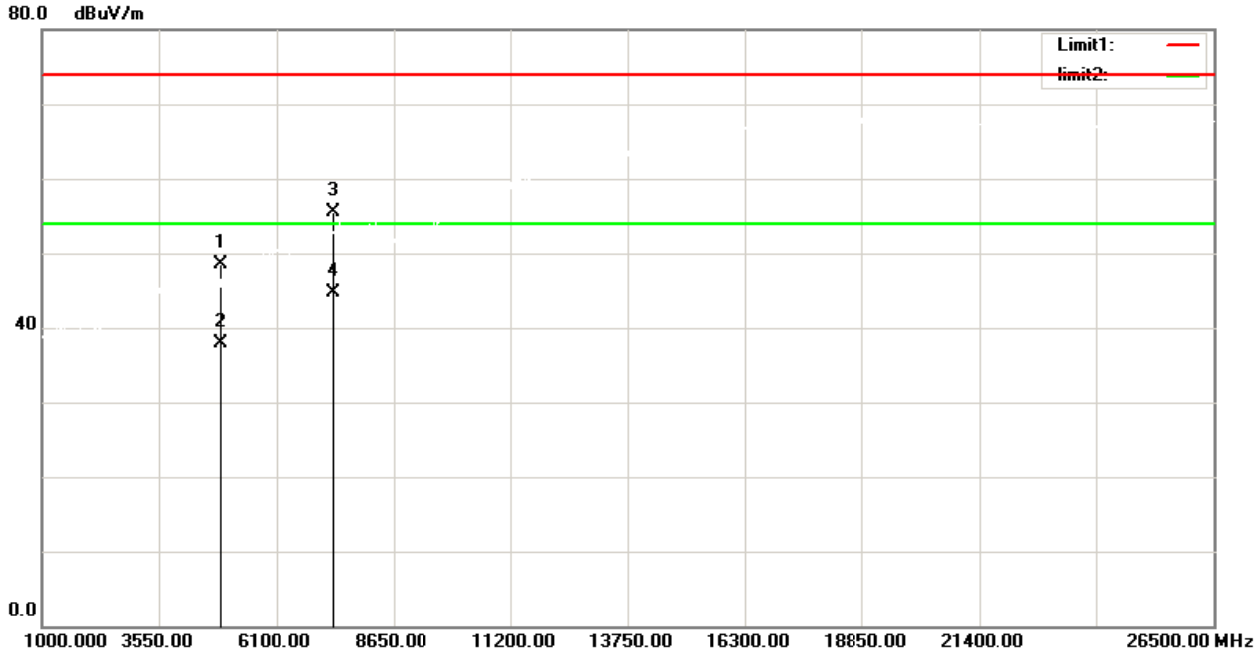
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4904.100	50.35	-2.95	47.40	74.00	-26.60	peak
2	4904.100	41.17	-2.95	38.22	54.00	-15.78	AVG
3	7356.050	49.17	5.99	55.16	74.00	-18.84	peak
4	7356.050	37.66	5.99	43.65	54.00	-10.35	AVG

Orthogonal Axis	X
Test Mode:	TX N-40M Mode2452 MHz

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4903.950	51.43	-2.95	48.48	74.00	-25.52	peak
2	4903.950	40.86	-2.95	37.91	54.00	-16.09	AVG
3	7356.150	49.55	5.99	55.54	74.00	-18.46	peak
4	7356.150	38.74	5.99	44.73	54.00	-9.27	AVG

6. BANDWIDTH TEST

6.1 LIMIT

FCC Part15, Subpart C (15.247)&RSS-Gen and RSS-247		
Section	Test Item	Limit
15.247(a)(2) RSS-Gen6.7 RSS-247 5.2 (a)	6dB Bandwidth	Minimum 500 kHz
	99% Emission Bandwidth	-

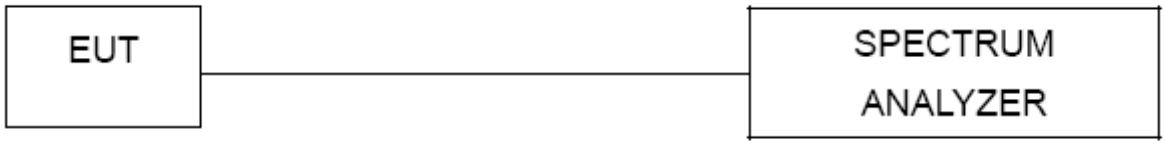
6.2 TEST PROCEDURE AND SETTING

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. For 6dB Bandwidth Spectrum setting:RBW= 100KHz, VBW=300KHz, Sweep time = 2.5ms.
For 99% OBW Spectrum Setting: RBW= 300KHz, VBW=1MHz,Sweep time = 2.5ms.
c. The bandwidth was performed in accordance with method 11.8.1 of ANSI C63.10-2013.

6.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/27
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/16
3	RF Cable	Mi-cable	C10-01-01-1	100309	2019/12/16

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

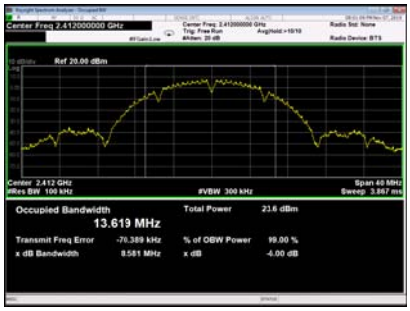
The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TESTRESULTS

TX B Mode					
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Emission Bandwidth(MHz)	6dB Bandwidth Min. Limit(kHz)	Result
01	2412	8.581	13.680	500	PASS
06	2437	8.132	13.769	500	PASS
11	2462	8.632	13.824	500	PASS

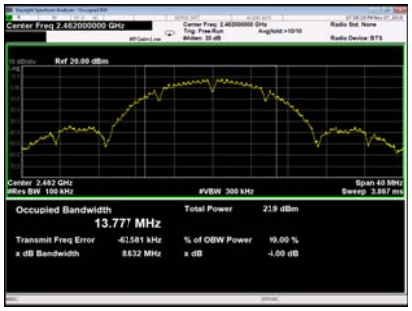
6dB

CH01



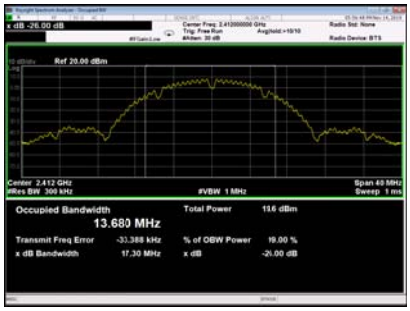
CH06

CH11

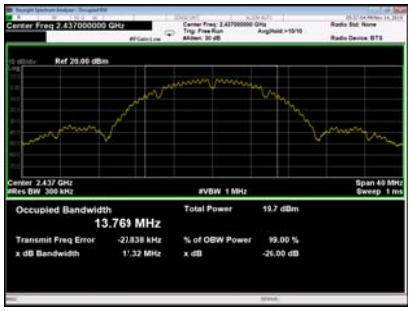


99%

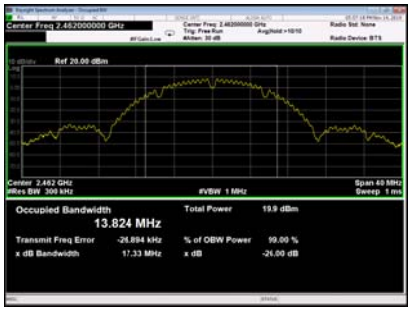
CH01



CH06



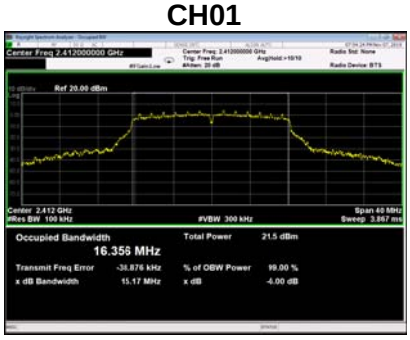
CH11



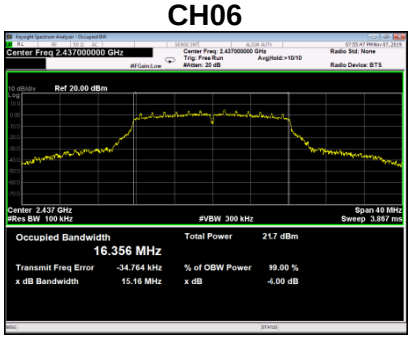
TX G Mode					
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Emission Bandwidth(MHz)	6dB Bandwidth Min. Limit(kHz)	Result
01	2412	15.17	16.669	500	PASS
06	2437	15.16	16.673	500	PASS
11	2462	15.16	16.690	500	PASS

6dB

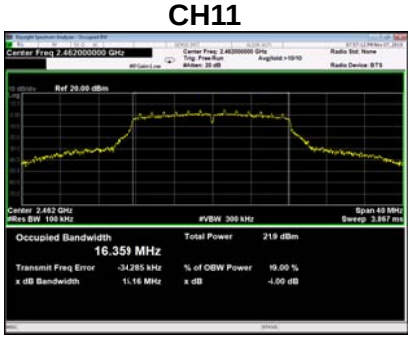
CH01



CH06

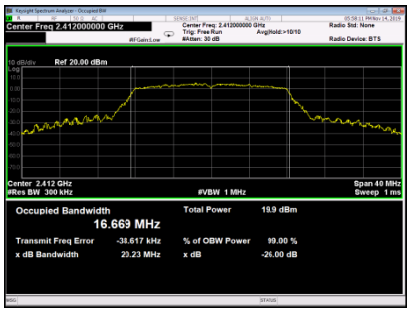


CH11

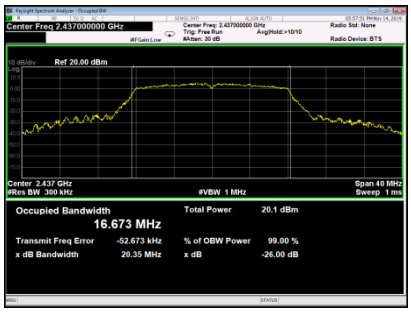


99%

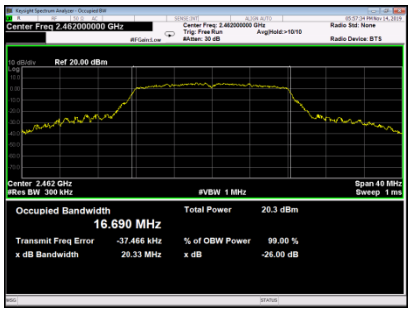
CH01



CH06



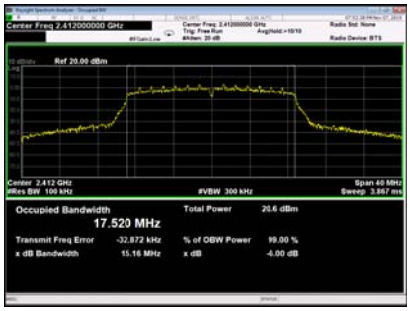
CH11



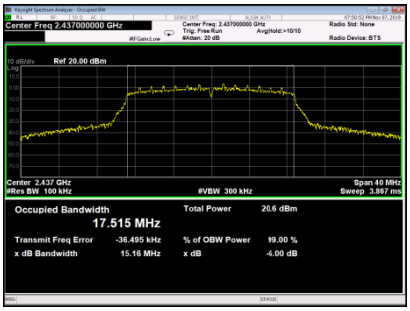
TX N (HT20) Mode					
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Emission Bandwidth(MHz)	6dB Bandwidth Min. Limit(kHz)	Result
01	2412	15.16	17.629	500	PASS
06	2437	15.16	17.638	500	PASS
11	2462	15.16	17.647	500	PASS

6dB

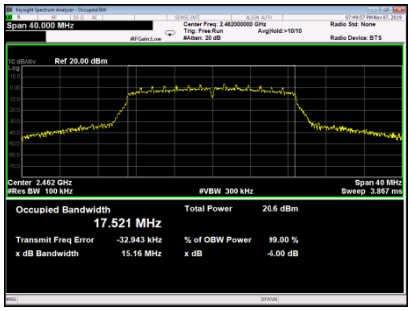
CH01



CH06

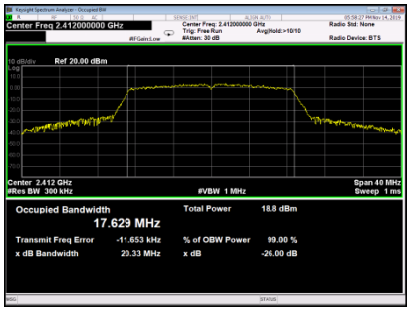


CH11



99%

CH01



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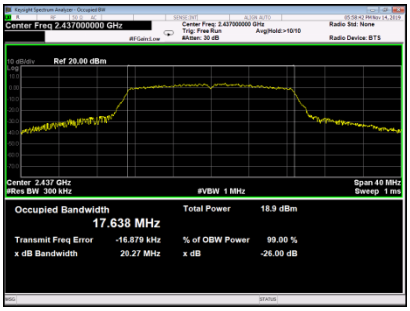
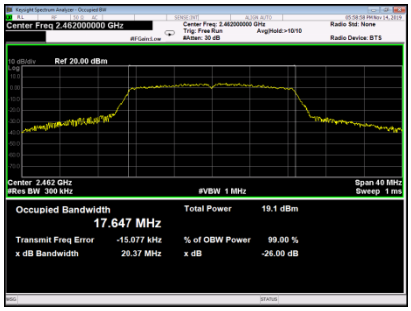


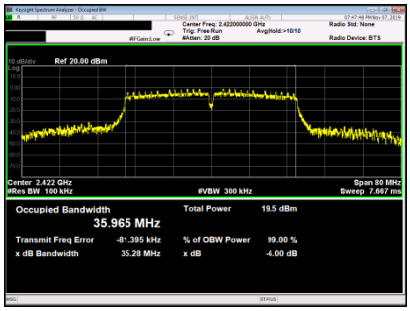
CH11



TX N (HT40) Mode					
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Emission Bandwidth(MHz)	6dB Bandwidth Min. Limit(kHz)	Result
03	2422	35.28	36.472	500	PASS
06	2437	35.29	36.483	500	PASS
09	2452	35.10	36.539	500	PASS

6dB

CH03



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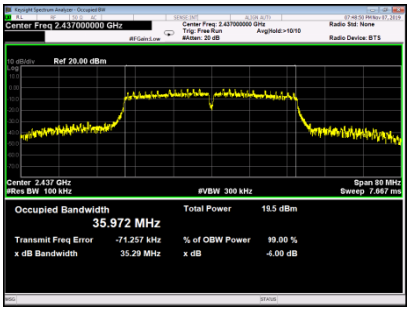
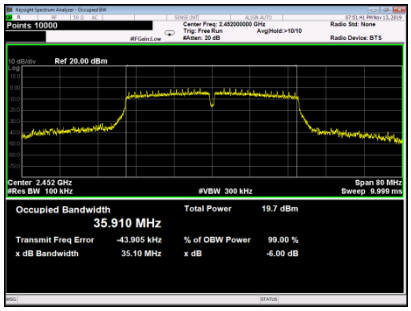
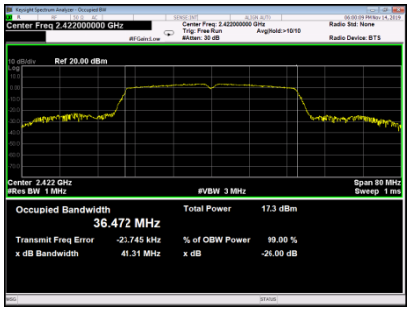


CH09

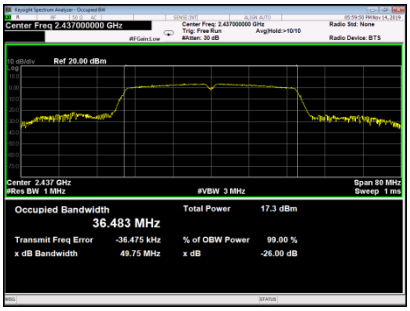


99%

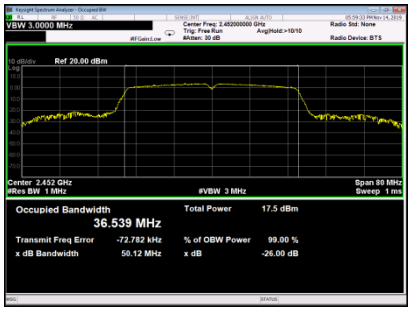
CH03



CH06



CH9



7. MAXIMUM OUTPUT POWER TEST

7.1 LIMIT

FCC Part15, Subpart C (15.247)&RSS-247		
Section	Test Item	Limit
15.247(b)(3) RSS-2475.4 (d)	Maximum Output Power	1 Watt or 30dBm

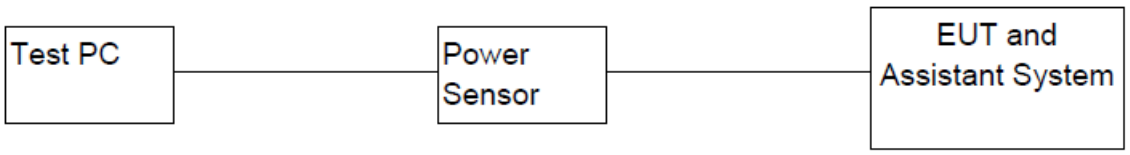
7.2 TEST PROCEDURE AND SETTING

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
b. The maximum conducted output power was performed in accordance with method 11.9.1.3 of ANSI C63.10-2013.and FCC KDB 662911 D01 v02r01 Multiple Transmitter Output.

7.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power Sensor	KEYSIGHT	U2021XA	MY55240009	05/27/2020
2	Attenuator	Mini-Circuits	BW-S10W2	101109	12/16/2019
3	RF Cable	Micable	C10-01-01-1	100309	12/16/2019
4	Test Software	KEYSIGHT	Power Panel	V3.11	N/A

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TESTRESULTS

TX B Mode_Ant 1				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	20.38	0.1091	PASS
06	2437	20.29	0.1069	PASS
11	2462	20.48	0.1117	PASS
Limit	30dBm / 1W			

TX B Mode_Ant 2				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	19.65	0.0923	PASS
06	2437	19.21	0.0834	PASS
11	2462	19.26	0.0843	PASS
Limit	30dBm / 1W			

TX G Mode_Ant 1				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	23.45	0.2213	PASS
06	2437	23.25	0.2114	PASS
11	2462	23.12	0.2051	PASS
Limit	30dBm / 1W			

TX G Mode_Ant 2				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	22.88	0.1941	PASS
06	2437	23.02	0.2005	PASS
11	2462	22.98	0.1986	PASS
Limit	30dBm / 1W			

TX N (HT20) _Ant 1				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	22.01	0.1589	PASS
06	2437	22.15	0.1641	PASS
11	2462	22.35	0.1718	PASS
Limit	30dBm / 1W			

TX N (HT20) _Ant 2				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	21.91	0.1552	PASS
06	2437	21.94	0.1563	PASS
11	2462	22.02	0.1603	PASS
Limit	30dBm / 1W			

TX N (HT20) _Total				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
01	2412	24.97	0.3141	PASS
06	2437	25.06	0.3204	PASS
11	2462	25.21	0.3321	PASS
Limit	30dBm / 1W			

TX N (HT40) _Ant 1				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
03	2422	18.84	0.0766	PASS
06	2437	21.37	0.1371	PASS
09	2452	18.37	0.0687	PASS
Limit	30dBm / 1W			

TX N (HT40) _Ant 2				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
03	2422	18.42	0.0695	PASS
06	2437	21.72	0.1486	PASS
09	2452	18.74	0.0748	PASS
Limit	30dBm / 1W			

TX N (HT40) _Total				
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
03	2422	21.65	0.1461	PASS
06	2437	24.56	0.2857	PASS
09	2452	21.57	0.1435	PASS
Limit	30dBm / 1W			

8. CONDUCTED SPURIOUS EMISSIONS

8.1 LIMIT

For FCC

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

For ISED

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

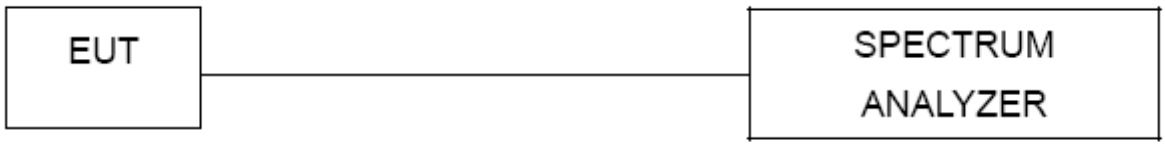
8.2 TEST PROCEDURE AND SETTING

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = Auto.

8.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/27
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/16
3	RF Cable	Mi-cable	C10-01-01-1	100309	2019/12/16

8.4 TEST SETUP



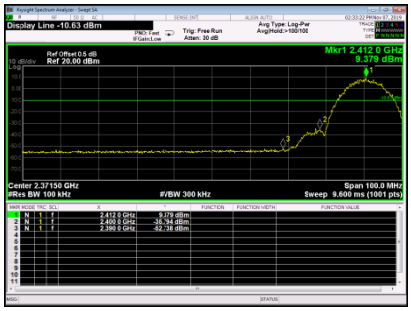
8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TESTRESULTS

TX B Mode_Ant 1

Bandedge-CH01



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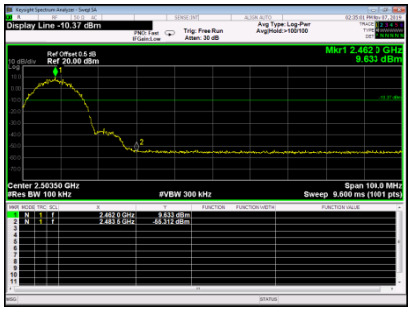
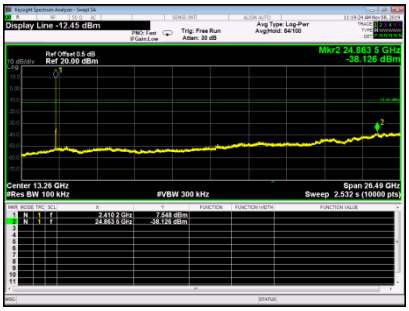
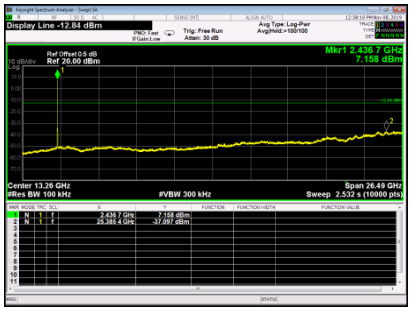


10th Harmonic of the fundamental frequency

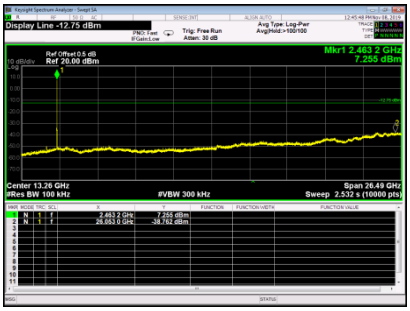
CH01



CH06

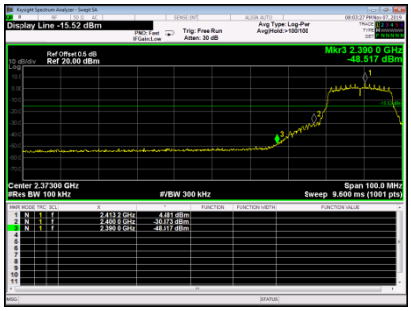


CH11



TX G Mode_Ant 1

Bandedge-CH01



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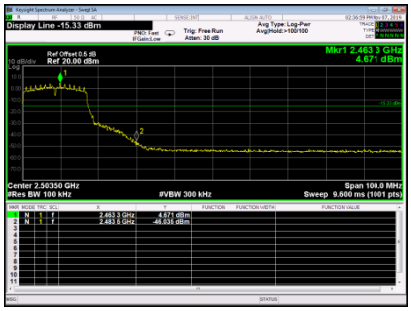
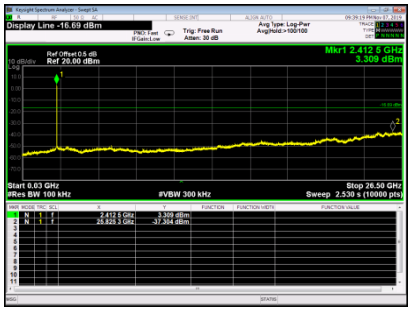


10th Harmonic of the fundamental frequency

CH01



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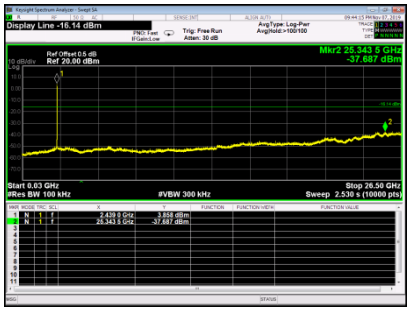

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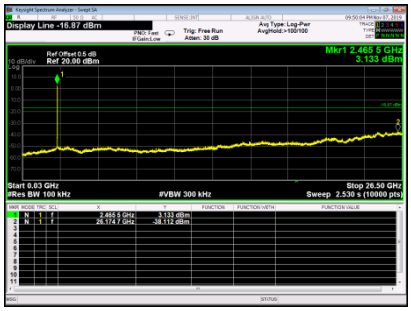
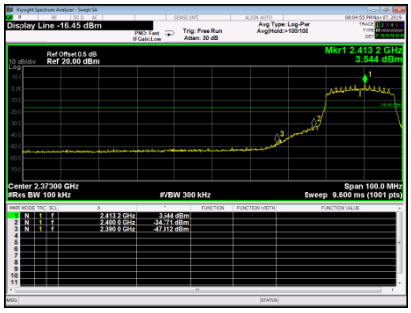


TX N (HT20) Mode _Ant 1

Bandedge-CH01



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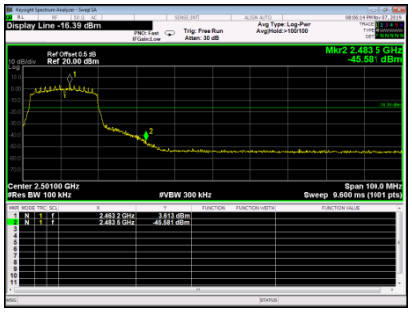
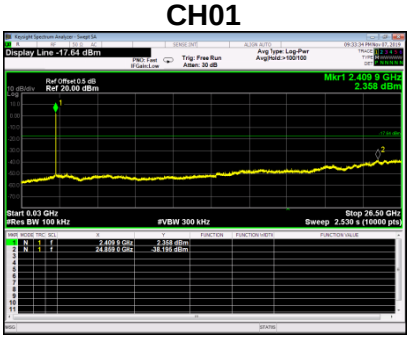


10th Harmonic of the fundamental frequency

CH01



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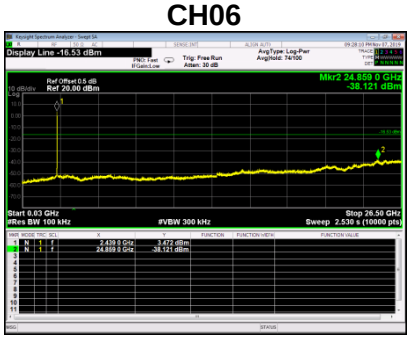

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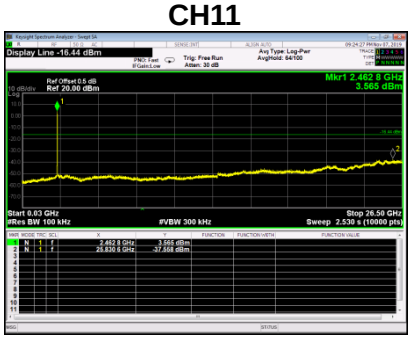

TX N (HT20) Mode _Ant 2

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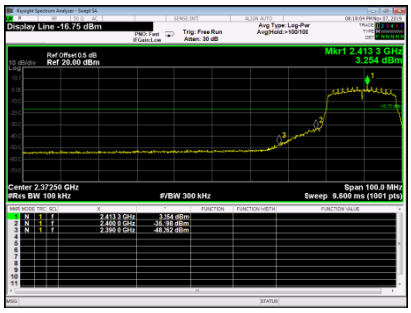
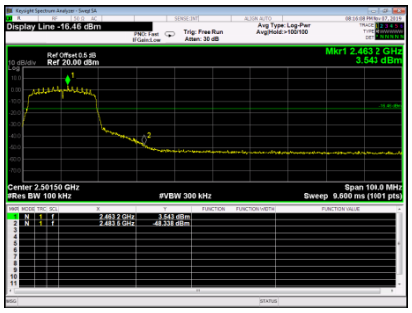
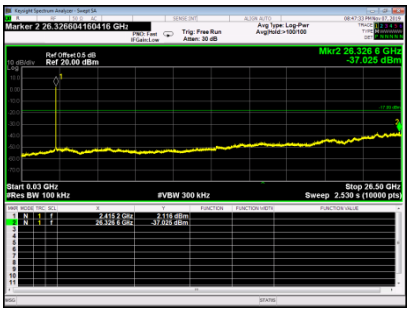


Bandedge-CH11

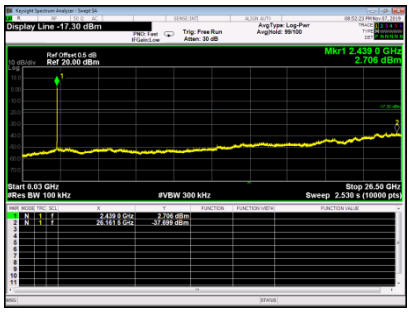


10th Harmonic of the fundamental frequency

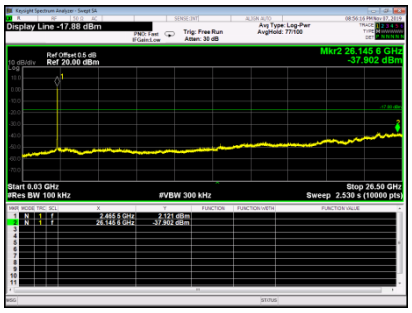
CH01



CH06

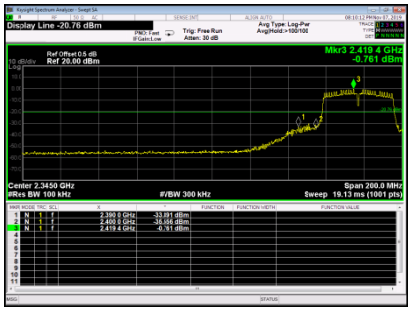


CH11

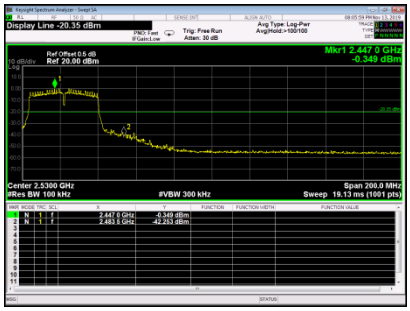


TX N (HT40) Mode _Ant 1

Bandedge-CH03

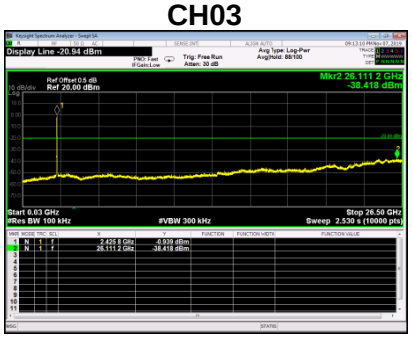


Bandedge-CH09

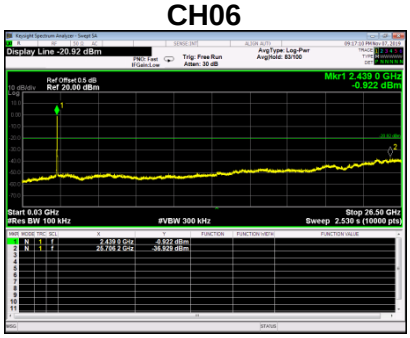


10th Harmonic of the fundamental frequency

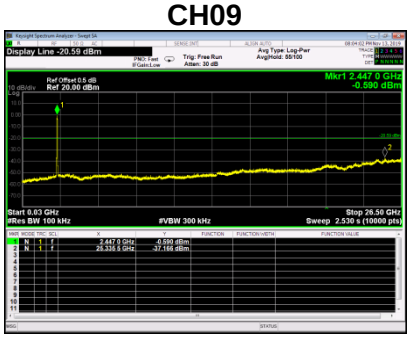
CH03



CH06



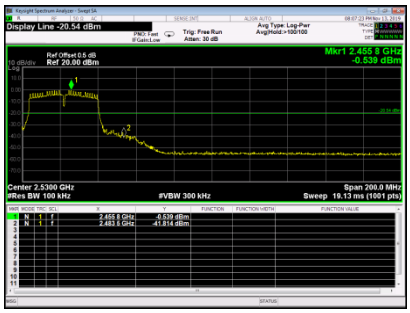
CH09



TX N (HT40) Mode _Ant 2

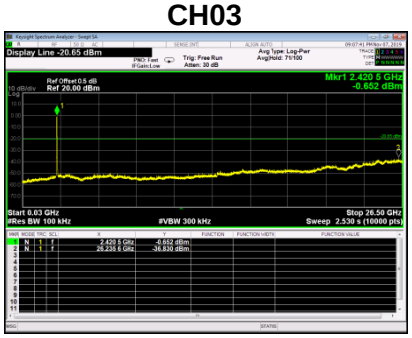
Bandedge-CH03

Bandedge-CH09

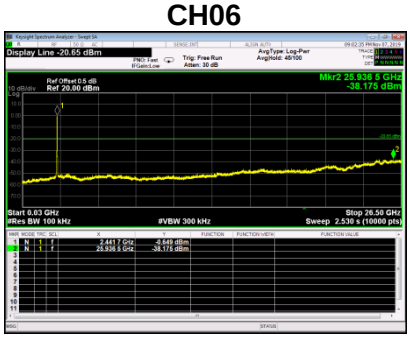


10th Harmonic of the fundamental frequency

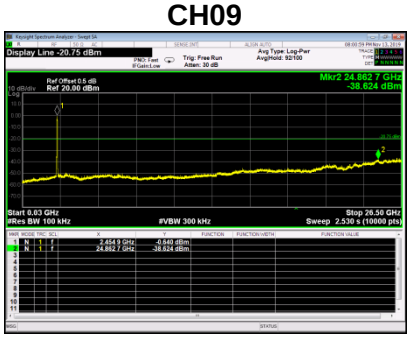
CH03



CH06



CH09



9. POWER SPECTRAL DENSITY TEST

9.1 LIMIT

FCC Part15, Subpart C (15.247)&RSS-247		
Section	Test Item	Limit
15.247(e) RSS-2475.2 (b)	Power Spectral Density	8 dBm (in any 3 kHz)

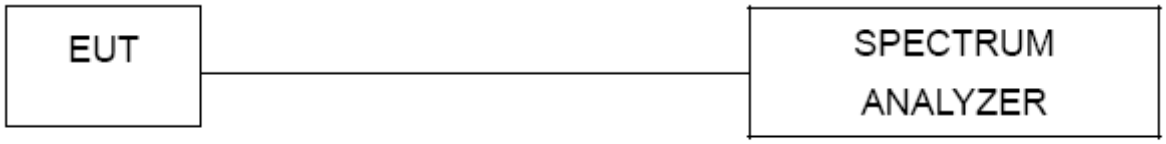
9.2 TEST PROCEDURE AND SETTING

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW=3 kHz, VBW=10 kHz, Sweep time = Auto.
c. The Power Spectral Density was performed in accordance with method11.10.2 of ANSI C63.10-2013.

9.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/27
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/16
3	RF Cable	Mi-cable	C10-01-01-1	100309	2019/12/16

9.4 TEST SETUP



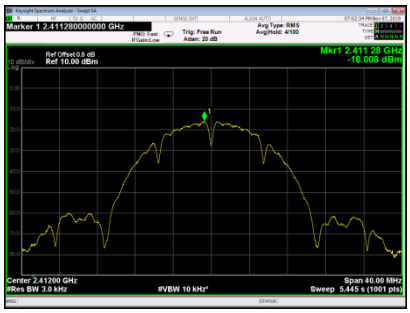
9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

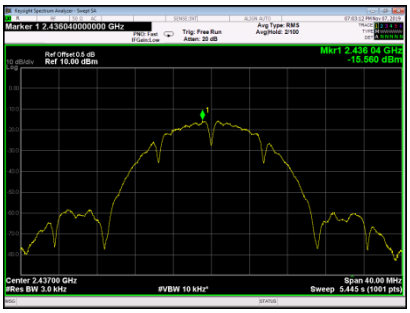
9.6 TESTRESULTS

TX B Mode_Ant 1				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
01	2412	-16.008	8	PASS
06	2437	-15.560	8	PASS
11	2462	-15.234	8	PASS

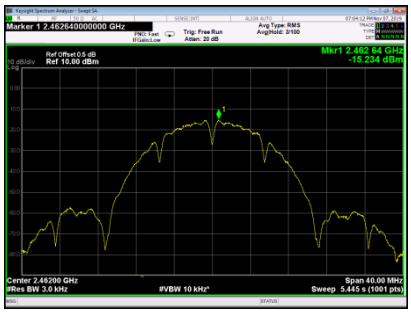
CH01



CH06

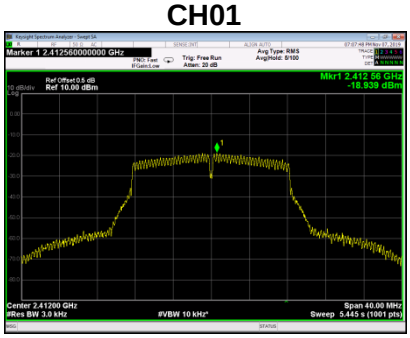


CH11

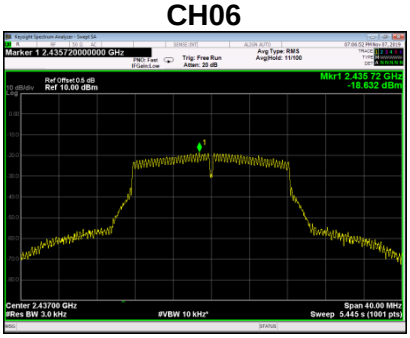


TX G Mode_Ant 1				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
01	2412	-18.939	8	PASS
06	2437	-18.632	8	PASS
11	2462	-18.451	8	PASS

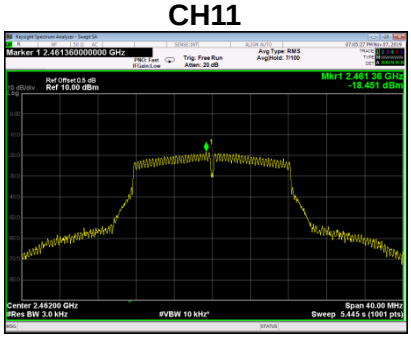
CH01



CH06

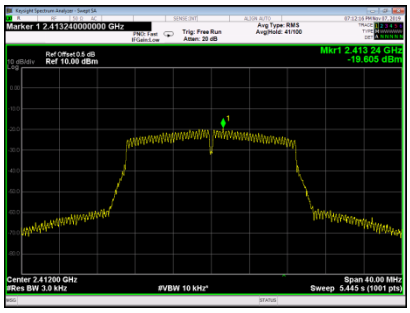


CH11

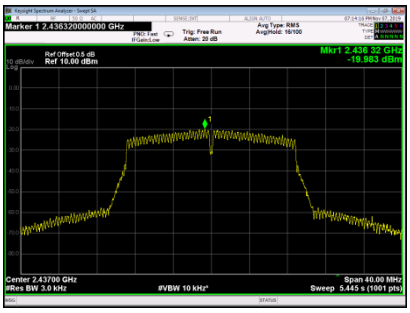


TX N (HT20) Mode_Ant 1				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
01	2412	-19.605	8	PASS
06	2437	-19.983	8	PASS
11	2462	-19.706	8	PASS

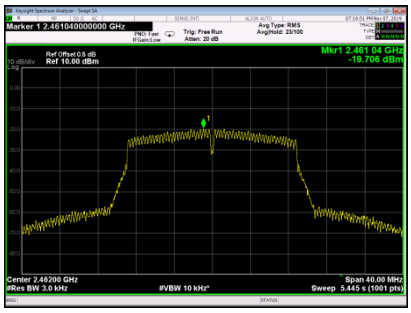
CH01



CH06

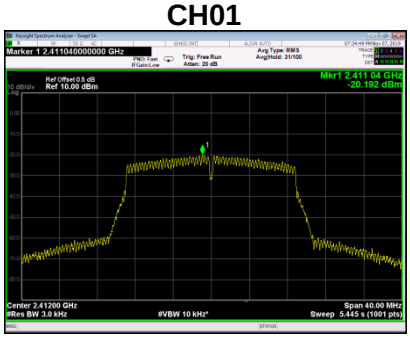


CH11

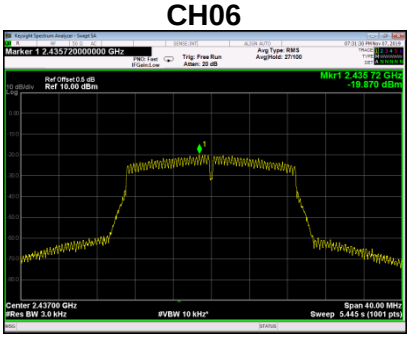


TX N (HT20) Mode_Ant 2				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
01	2412	-20.192	8	PASS
06	2437	-19.870	8	PASS
11	2462	-19.960	8	PASS

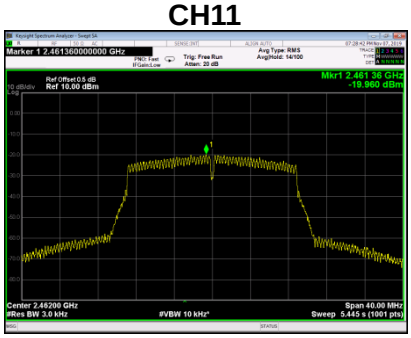
CH01



CH06



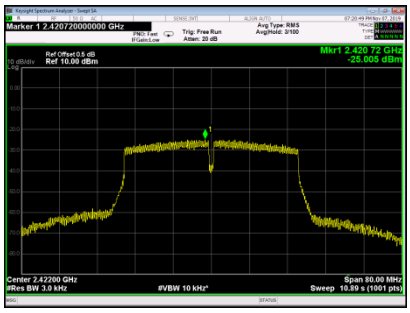
CH11



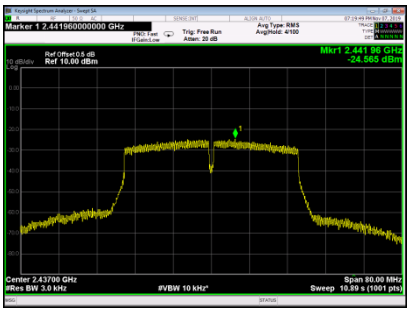
TX N (HT20) Mode_Total				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
01	2412	-16.878	8	PASS
06	2437	-16.916	8	PASS
11	2462	-16.821	8	PASS

TX N (HT40) Mode_Ant 1				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
03	2412	-25.005	8	PASS
06	2437	-24.565	8	PASS
09	2452	-23.345	8	PASS

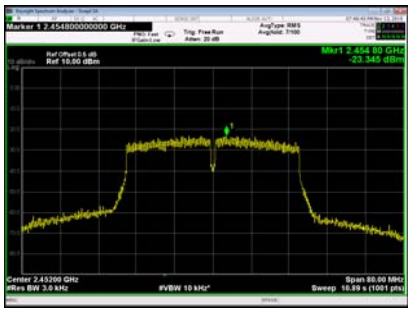
CH03



CH06

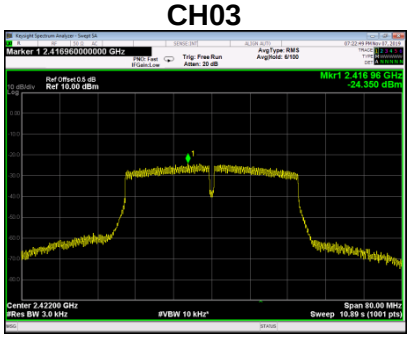


CH09

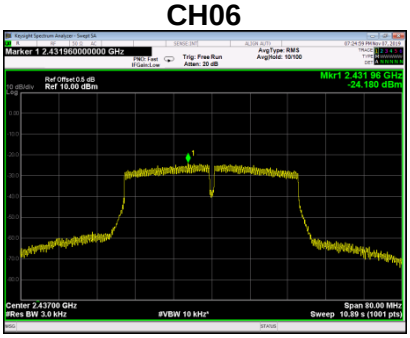


TX N (HT40) Mode_Ant 2				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
03	2412	-24.350	8	PASS
06	2437	-24.180	8	PASS
09	2452	-24.570	8	PASS

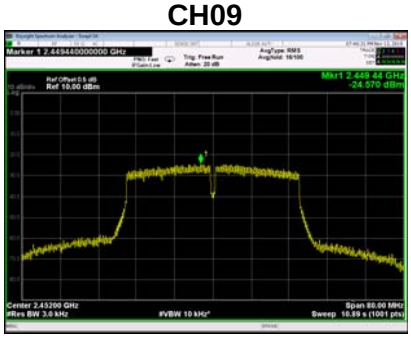
CH03



CH06



CH09



TX N (HT40) Mode_Total				
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit: <dBm/3KHz	Result
03	2412	-21.655	8	PASS
06	2437	-21.358	8	PASS
09	2452	-20.904	8	PASS

10. FREQUENCY STABILITY MEASUREMENT

10.1 LIMIT

RSS-Gen			
Section	Test Item	Limit	Frequency Range (MHz)
RSS-Gen 6.11	Frequency Stability	Specified in the user's manual	2412-2462

10.2 TEST PROCEDURE AND SETTING

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

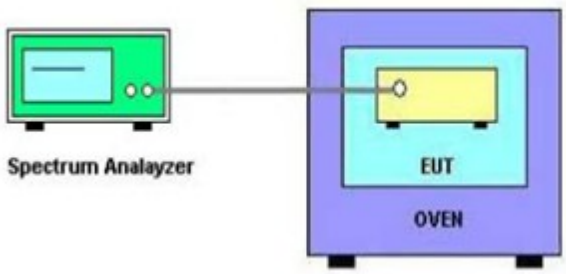
b. Spectrum Setting:

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10kHz
Sweep Time	Auto

10.3 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	2020/05/27
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/12/16
3	RF Cable	Mi-cable	C10-01-01-1	100309	2019/12/16
4	Temperature conditioning	Guan Jian.HTH1000	-20-130℃	GJ1000-10D001	2019/12/16
5	DC Power Supply	G.KE	IPR-10010D	010931954	2019/12/16

10.4 TEST SETUP



10.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULTS

	Temperature vs. Frequency Stability	
Voltage	Temperature	Measurement Frequency (MHz)
5V	(℃)	2412
	-20	2411.93
	25	2411.96
	50	2411.89
2.5V	25	2412.05
Max. Deviation (MHz)		-0.11
Max. Deviation (ppm)		-45.61

Note: 2.5V is the end point voltage, and products below 2.5V will cease working.

END OF TEST REPORT