



FCC TEST REPORT

Report No:STS2012216W01

Issued for

Zhizhen Audio Tech(Dongguan)Co.,Ltd

2F, No.45, Guanlong Rd, Baizhoubian Community, Dongcheng
St, Dongguan China

Product Name:	Wireless Microphone
Brand Name:	N/A
Model Name:	X200TX
Series Model:	X200,X200S,X100,X100T,X100S
FCC ID:	2AX6OX200TX
Test Standard:	FCC Part 74 Rules

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TEST RESULT CERTIFICATION

Applicant's Name: Zhizhen Audio Tech(Dongguan)Co.,Ltd
Address.....: 2F, No.45, Guanlong Rd, Baizhoubian Community, Dongcheng St, Dongguan China
Manufacturer's Name: Zhizhen Audio Tech(Dongguan)Co.,Ltd
Address.....: 2F, No.45, Guanlong Rd, Baizhoubian Community, Dongcheng St, Dongguan China

Product Description

Product Name: Wireless Microphone
Brand Name: N/A
Model Name.....: X200TX
Series Model: X200,X200S,X100,X100T,X100S

Test Standards: FCC Part 74 Rules

Test Procedure.....: ANSI C63.10-2013; C63.26-2015

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test:
Date of receipt of test item: 29 Dec. 2020
Date of performance of tests.....: 29 Dec. 2020 ~ 19 Jan. 2021
Date of Issue: 19 Jan. 2021
Test Result.....: Pass

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	19 Jan. 2021	STS2012216W01	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

The EUT has been tested according to FCC CFR 47:

Part 2: Frequency Allocations and Radio Treaty Matters: General Rules and Regulations (10-1-05 Edition)

Part 74: Experimental Radio, Auxiliary, Special Broadcast and other program distributional services

Emission			
Standard	Item	Limit	Result
FCC 2.1053; 74.861(e)(6)	Radiated Spurious Emission	Refer to 74.861e(6)	PASS
FCC 2.1046 (a), 74.861(e)(1)	RF Output Power	250 mW	PASS
FCC 2.1047 (b), 74.861(e)(3)	Modulation Deviation	Refer to 74.861e(2)	PASS
FCC 2.1047 (a)	Audio Frequency Response	Refer to 2.1047(a)	PASS
FCC 74.861 (e)(5)	Occupied Bandwidth	< 200 KHz	PASS
FCC 74.861 (e)(6)(i) (ii); FCC 2.1049	Emission Mask	Refer to 74.861e(6)	PASS
2.1055(b); 74.861 e(4)	Frequency Stability vs. Temperature	Refer to 74.861e(4)	PASS
2.1055(a)(1); 74.861 e(4)	Frequency Stability vs. Voltage	Refer to 74.861e(4)	PASS
FCC 15.207	Line Conducted Emissions	Refer to 15.207	PASS

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 4.39\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 5.10\text{dB}$
5	All emissions, radiated >6G	$\pm 5.48\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 2.79\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 2.80\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Wireless Microphone
Brand Name:	N/A
Model Name:	X200TX
Series Model :	X200,X200S,X100,X100T,X100S
Model Difference description:	Only difference in model name.
Emission Bandwidth:	126.13KHz
Battery:	Rated Voltage: 3.7V Charge Limit Voltage: 4.2V Capacity: 700mAh
Operation Frequency Range	Band A: 550.125 MHz- 564.825 MHz Band B: 572.125 MHz- 586.825 MHz
Maximum Transmitter Power:	0.531 mW(-2.75dBm)
Modulation mode / type:	FM
Frequency Tolerance	0.000434%
Temperature Range:	-30℃-50℃
Test frequency list:	See Note 4.
Software version number:	N/A
Hardware version number:	N/A

Note:

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



2.

Channel List For Band A							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	550.125	14	554.025	27	557.925	40	561.825
2	550.425	15	554.325	28	558.225	41	562.125
3	550.725	16	554.625	29	558.525	42	562.425
4	551.025	17	554.925	30	558.825	43	562.725
5	551.325	18	555.225	31	559.125	44	563.025
6	551.625	19	555.525	32	559.425	45	563.325
7	551.925	20	555.825	33	559.725	46	563.625
8	552.225	21	556.125	34	560.025	47	563.925
9	552.525	22	556.425	35	560.325	48	564.225
10	552.825	23	556.725	36	560.625	49	564.525
11	553.125	24	557.025	37	560.925	50	564.825
12	553.425	25	557.325	38	561.225		
13	553.725	26	557.625	39	561.525		

Channel List For Band B							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	572.125	14	576.025	27	579.925	40	583.825
2	572.425	15	576.325	28	580.225	41	584.125
3	572.725	16	576.625	29	580.525	42	584.425
4	573.025	17	576.925	30	580.825	43	584.725
5	573.325	18	577.225	31	581.125	44	585.025
6	573.625	19	577.525	32	581.425	45	585.325
7	573.925	20	577.825	33	581.725	46	585.625
8	574.225	21	578.125	34	582.025	47	585.925
9	574.525	22	578.425	35	582.325	48	586.225
10	574.825	23	578.725	36	582.625	49	586.525
11	575.125	24	579.025	37	582.925	50	586.825
12	575.425	25	579.325	38	583.225		
13	575.725	26	579.625	39	583.525		

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	X200TX	Internal	NA	1	Antenna

The EUT antenna is Internal Antenna. no antenna other than that furnished by the responsible party shall be used with the device.



4. Test frequency list

Test Channel List For Band A		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	550.125
middle	CH24	557.025
highest	CH50	564.825

Test Channel List For Band B		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	572.125
middle	CH24	579.025
highest	CH50	586.825

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above listed frequency for testing.



2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Low Channel
Mode 2	Middle Channel
Mode 3	High Channel
Mode 4	Link Mode

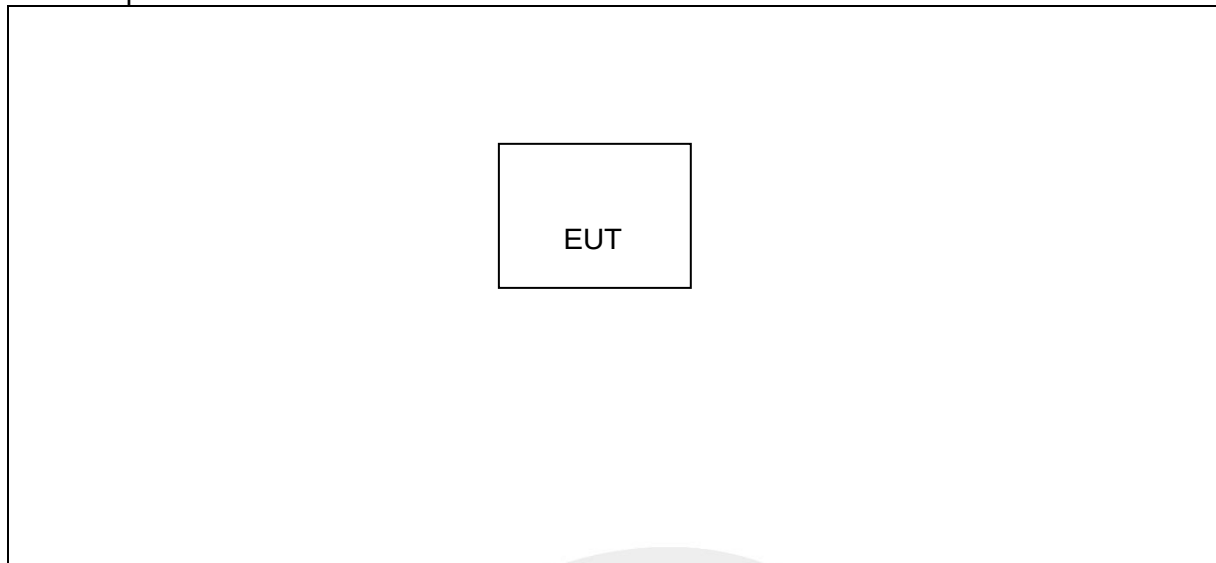
For Radiated Emission/Conducted Emission	
Final Test Mode	Description
Mode 1	Low Channel
Mode 2	Middle Channel
Mode 3	High Channel

Note:

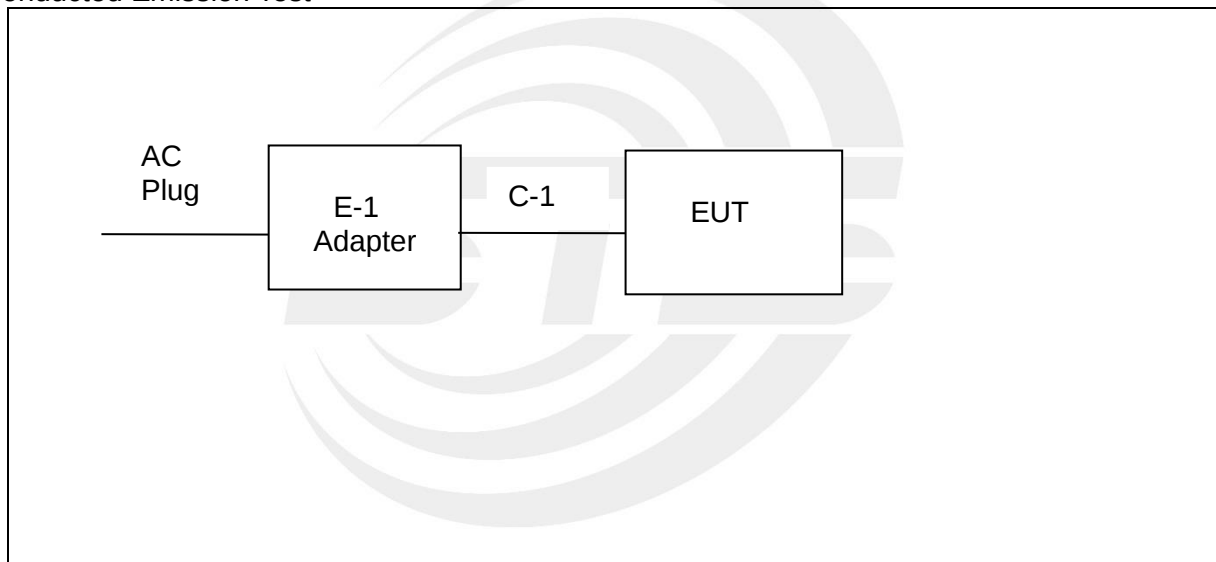
(1) Due to the different configuration and test, in this list only some worse mode. The worst test data of the worse mode is reported by this report.

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test





2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
C-1	USB Cable	N/A	N/A	150cm	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-1	Adapter	HUAWEI	HW-0580450C00	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



2.5 TEST EQUIPMENT

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2021.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2019.10.15	2021.10.14
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2020.10.12	2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2020.10.12	2021.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2020.10.10	2021.10.09
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N.C.R	N.C.R
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

RF Connected Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Generator	Agilent	N5182A	MY46240556	2020.10.10	2021.10.09
Signal Analyzer	Agilent	N9020A	MY51110105	2020.03.05	2021.03.04
Universal Radio communication tester	R&S	CMU200	119907	2020.10.12	2021.10.11
Audio analyzer	R&S	UPL	N/A	2020.03.05	2021.03.04
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2020.03.05	2021.03.04
Programmable power supply	Agilent	E3642A	MY40002025	2020.10.12	2021.10.11
Attenuator	HP	8494B	DC-18G	2020.04.30	2021.04.29
AC Power Source	APC	KDF-11010G	F214050035	N.C.R	N.C.R
Test SW	FARAD	LZ-RF /LzRf-3A3			



3. TEST METHODOLOGY

3.1 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirement in Section 13.1.4.1 of ANSI C63.4:2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Not Applicable (Since the EUT is powered by battery)

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4:2003.

3.2 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



4. FCC PART 74 REQUIREMENTS

4.1 RADIATED SPURIOUS EMISSION

TEST LIMITS

According to CFR 47 section 74.861 e (6)(iii), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(\text{dBW}) - [43 + 10\log(P)] (\text{dB})$$

$$= [30 + 10\log(P)] (\text{dBm}) - [43 + 10\log(P)] (\text{dB})$$

$$= -13\text{dBm}.$$

According to CFR 47 section 74.861 e (7), Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08).

4.2 EMISSION MASK I

TEST LIMITS

- According to CFR 47 section 74.861 e (6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (1) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- a. (2) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log 10 \cdot (\text{mean output power in watts})$ dB;

4.3 EMISSION MASK II

TEST LIMITS

- According to ETSI EN 300 422-1 V1.5.1 Clause 8.3.1.2,

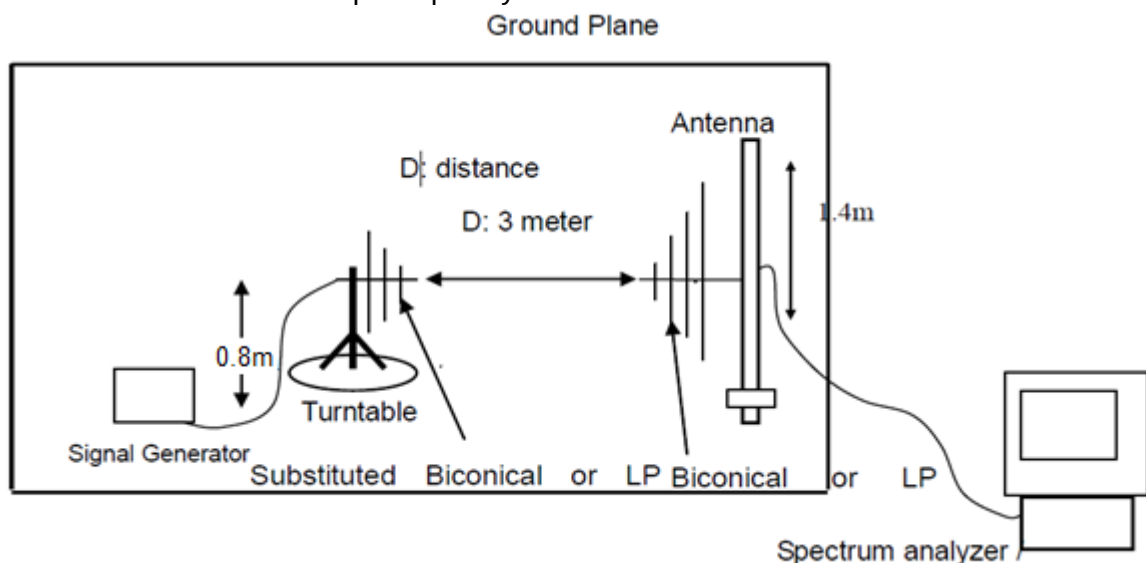
- a. The transmitter output spectrum shall be within the mask defined in figure 3 where B is the declared channel bandwidth

TEST PROCEDURE

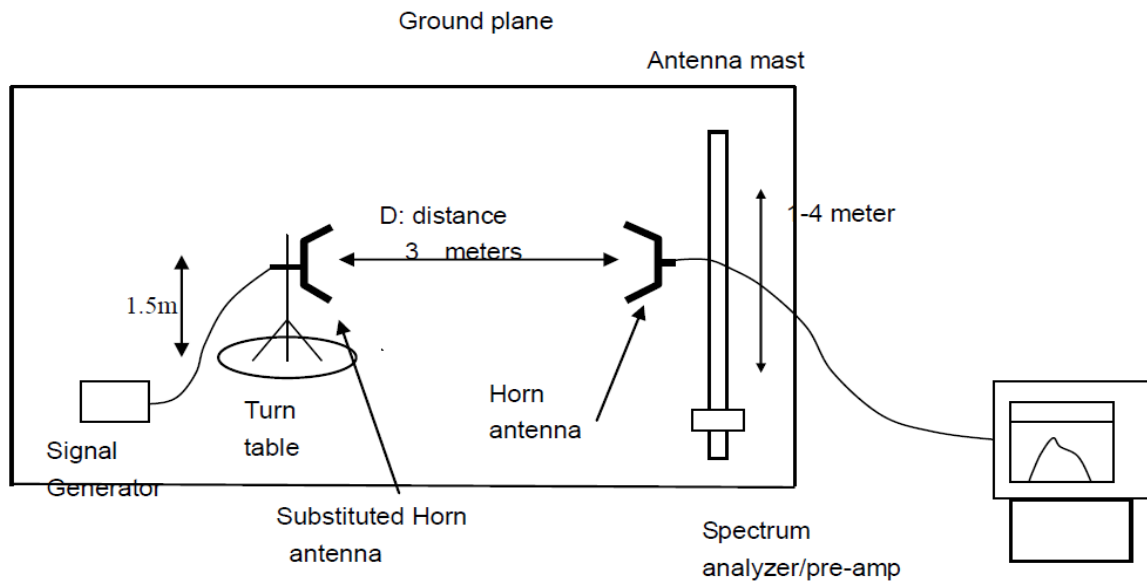
- a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- c. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- d. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The measurement shall be repeated with the test antenna set to horizontal polarization.
- j. Replace the antenna with a proper Antenna (substitution antenna).
- k. The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- l. The substitution antenna shall be connected to a calibrated signal generator.
- m. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- n. The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- o. The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- p. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- q. The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

TEST CONFIGURATION

(A) Radiated Emission Test-Up Frequency Above 30MHz



(B) Radiated Emission Test-Up Frequency Above 1GHz

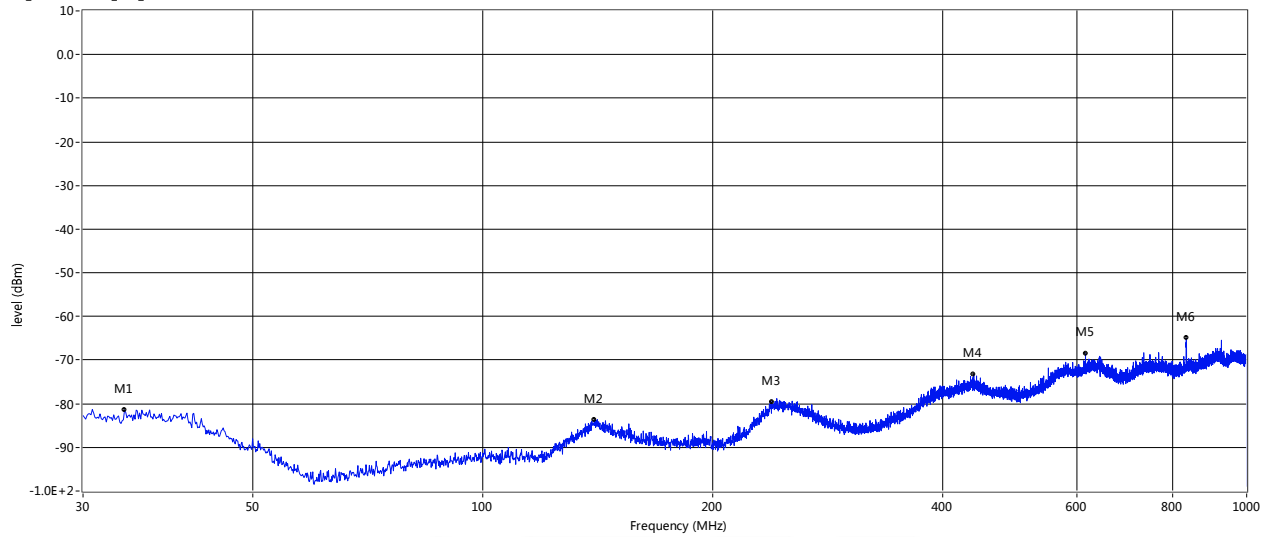




TEST RESULTS

Below 1GHz:
Band A
Low channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

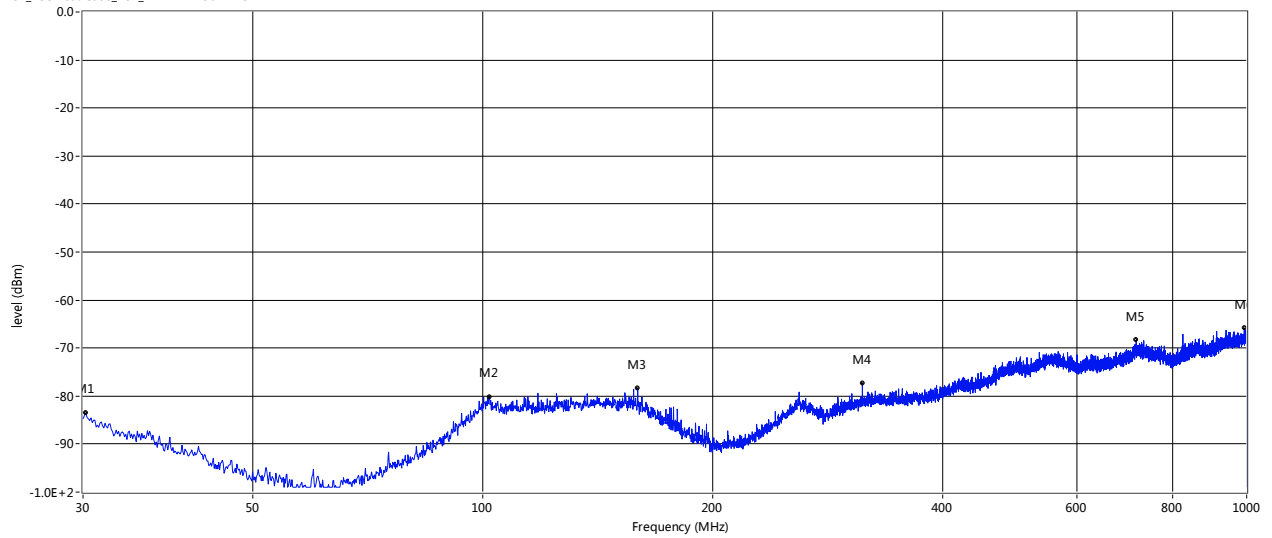


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
34.001	-81.41	-4.33	-13.0	-68.41	99.80	Horizontal	Vertical	Pass
139.974	-83.74	-6.21	-13.0	-70.74	84.40	Horizontal	Vertical	Pass
238.914	-79.57	-2.32	-13.0	-66.57	217.80	Horizontal	Vertical	Pass
439.340	-73.32	3.39	-13.0	-60.32	169.60	Horizontal	Vertical	Pass
615.274	-68.56	6.98	-13.0	-55.56	358.30	Horizontal	Vertical	Pass
833.524	-64.99	6.99	-13.0	-51.99	245.60	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-1G

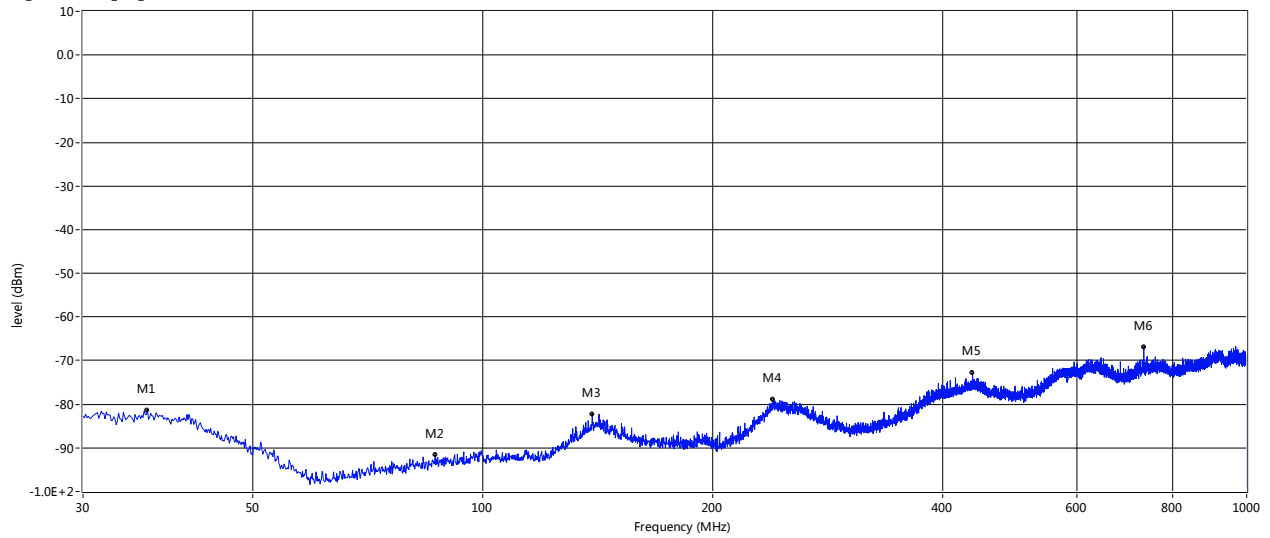


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
30.121	-84.08	-6.23	-13.0	-71.08	224.40	Vertical	Vertical	Pass
102.144	-80.17	-4.80	-13.0	-67.17	203.00	Vertical	Vertical	Pass
159.616	-78.39	-3.72	-13.0	-65.39	230.20	Vertical	Vertical	Pass
314.089	-77.35	-2.69	-13.0	-64.35	43.10	Vertical	Vertical	Pass
716.760	-68.35	8.02	-13.0	-55.35	12.50	Vertical	Vertical	Pass
992.725	-65.89	10.56	-13.0	-52.89	318.20	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

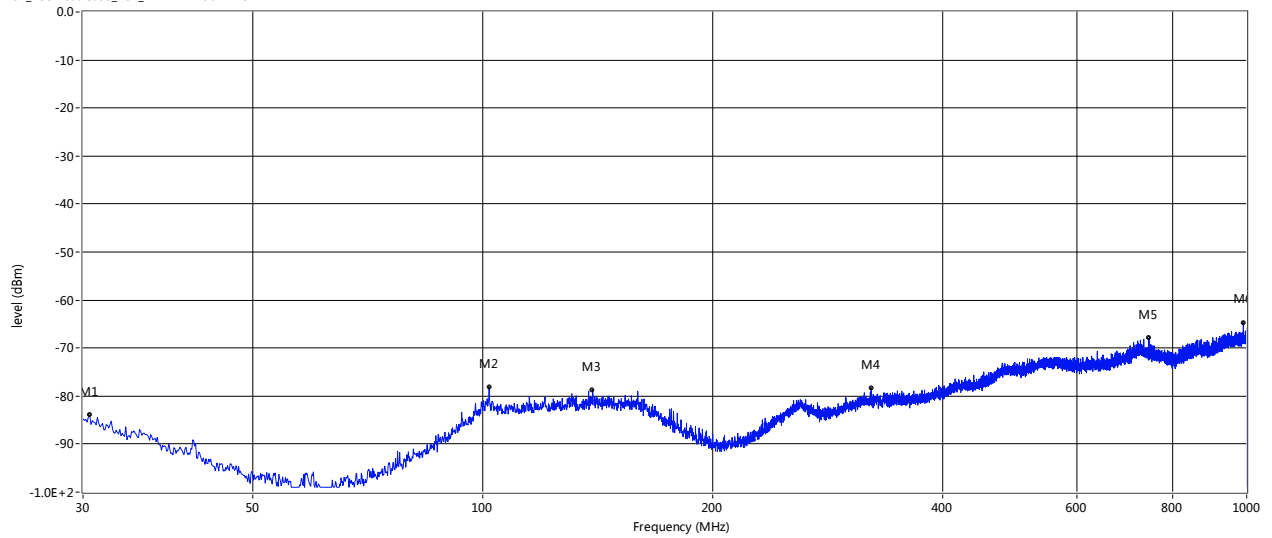


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
36.426	-81.43	-4.29	-13.0	-68.43	80.40	Horizontal	Vertical	Pass
86.745	-91.70	-15.06	-13.0	-78.70	37.70	Horizontal	Vertical	Pass
139.125	-82.29	-6.53	-13.0	-69.29	119.30	Horizontal	Vertical	Pass
240.126	-79.03	-1.95	-13.0	-66.03	236.00	Horizontal	Vertical	Pass
437.885	-72.83	3.30	-13.0	-59.83	50.10	Horizontal	Vertical	Pass
733.371	-66.87	6.79	-13.0	-53.87	332.70	Horizontal	Vertical	Pass



Vertical

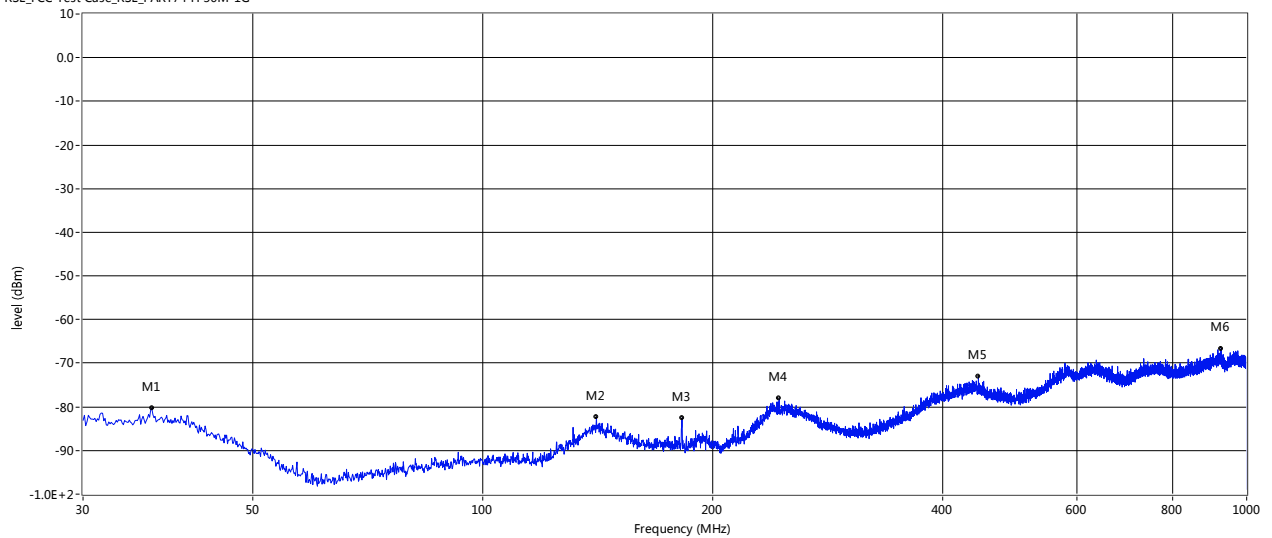
RSE_FCC Test Case_RSE_PART74 V 30M-1G



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
30.606	-83.99	-6.53	-13.0	-70.99	302.60	Vertical	Vertical	Pass
102.022	-78.27	-4.81	-13.0	-65.27	184.30	Vertical	Vertical	Pass
139.367	-78.77	-2.98	-13.0	-65.77	196.70	Vertical	Vertical	Pass
322.576	-78.43	-2.35	-13.0	-65.43	247.90	Vertical	Vertical	Pass
745.011	-67.89	7.55	-13.0	-54.89	126.60	Vertical	Vertical	Pass
989.815	-64.74	10.53	-13.0	-51.74	9.10	Vertical	Vertical	Pass

High channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

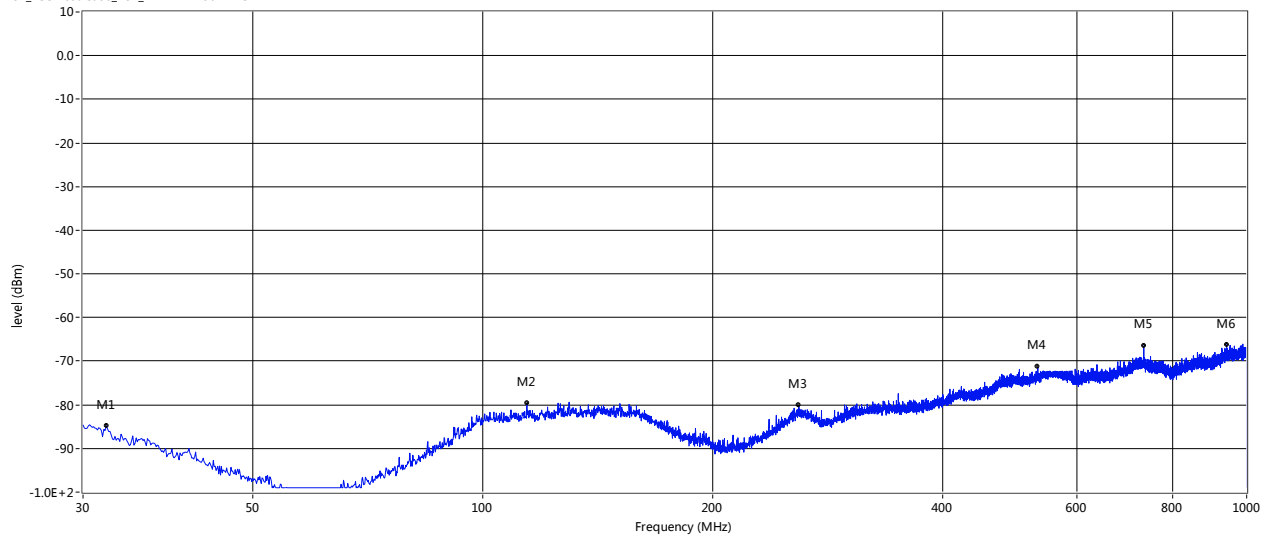


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
36.911	-80.41	-4.29	-13.0	-67.41	212.70	Horizontal	Vertical	Pass
140.944	-82.30	-6.38	-13.0	-69.30	21.70	Horizontal	Vertical	Pass
182.411	-82.55	-10.77	-13.0	-69.55	124.50	Horizontal	Vertical	Pass
244.491	-78.14	-2.10	-13.0	-65.14	288.90	Horizontal	Vertical	Pass
445.524	-73.09	2.91	-13.0	-60.09	48.80	Horizontal	Vertical	Pass
925.795	-66.62	9.19	-13.0	-53.62	212.70	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-1G

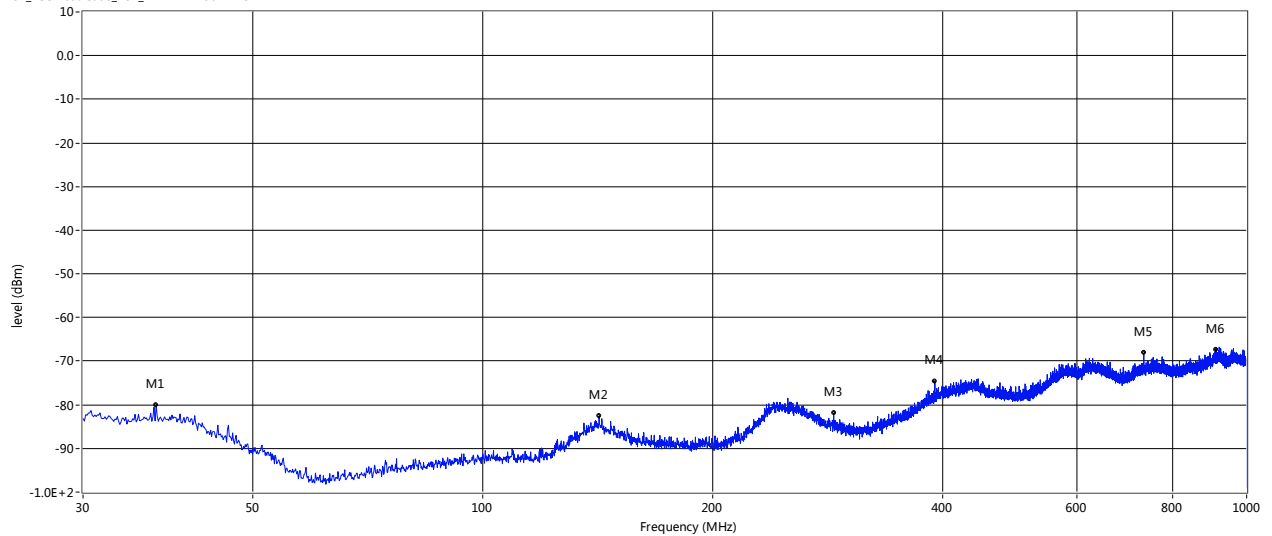


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
32.182	-84.79	-7.54	-13.0	-71.79	229.60	Horizontal	Vertical	Pass
114.269	-79.63	-4.12	-13.0	-66.63	148.30	Horizontal	Vertical	Pass
259.405	-80.12	-3.37	-13.0	-67.12	33.40	Horizontal	Vertical	Pass
538.886	-70.12	5.87	-13.0	-57.12	299.30	Horizontal	Vertical	Pass
733.371	-66.51	7.88	-13.0	-53.51	344.70	Horizontal	Vertical	Pass
941.194	-66.25	10.16	-13.0	-53.25	160.40	Horizontal	Vertical	Pass



Band B
Low channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

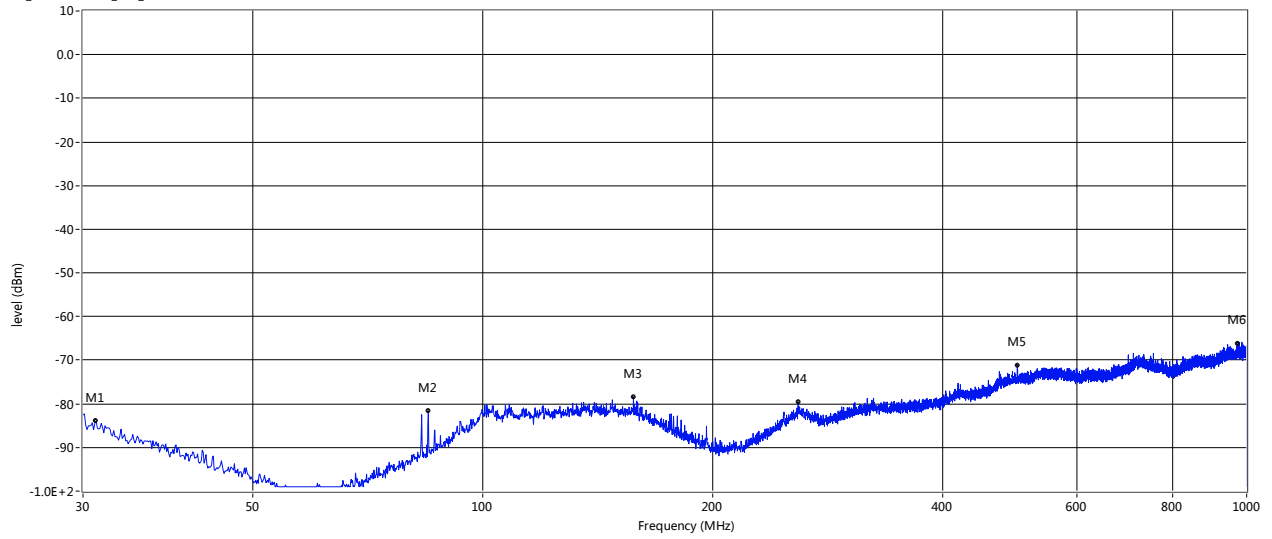


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
37.396	-80.17	-4.28	-13.0	-67.17	233.30	Horizontal	Vertical	Pass
142.035	-82.64	-6.58	-13.0	-69.64	197.20	Horizontal	Vertical	Pass
288.141	-81.87	-6.21	-13.0	-68.87	353.50	Horizontal	Vertical	Pass
390.840	-74.61	0.37	-13.0	-61.61	166.90	Horizontal	Vertical	Pass
733.371	-68.13	6.79	-13.0	-55.13	360.00	Horizontal	Vertical	Pass
910.639	-67.33	9.23	-13.0	-54.33	75.90	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-1G

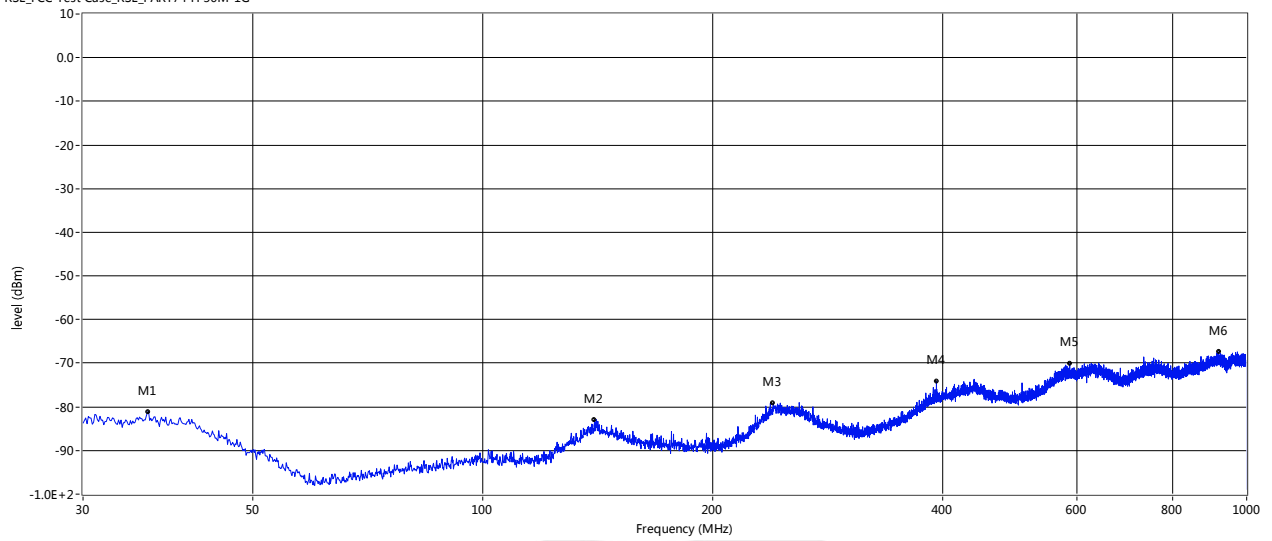


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
31.212	-84.02	-6.92	-13.0	-71.02	309.60	Vertical	Vertical	Pass
84.926	-81.74	-12.46	-13.0	-68.74	233.10	Vertical	Vertical	Pass
157.555	-78.46	-3.63	-13.0	-65.46	106.30	Vertical	Vertical	Pass
258.920	-79.70	-3.47	-13.0	-66.70	209.40	Vertical	Vertical	Pass
500.935	-71.22	4.61	-13.0	-58.22	21.40	Vertical	Vertical	Pass
974.416	-66.18	10.30	-13.0	-53.18	291.40	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

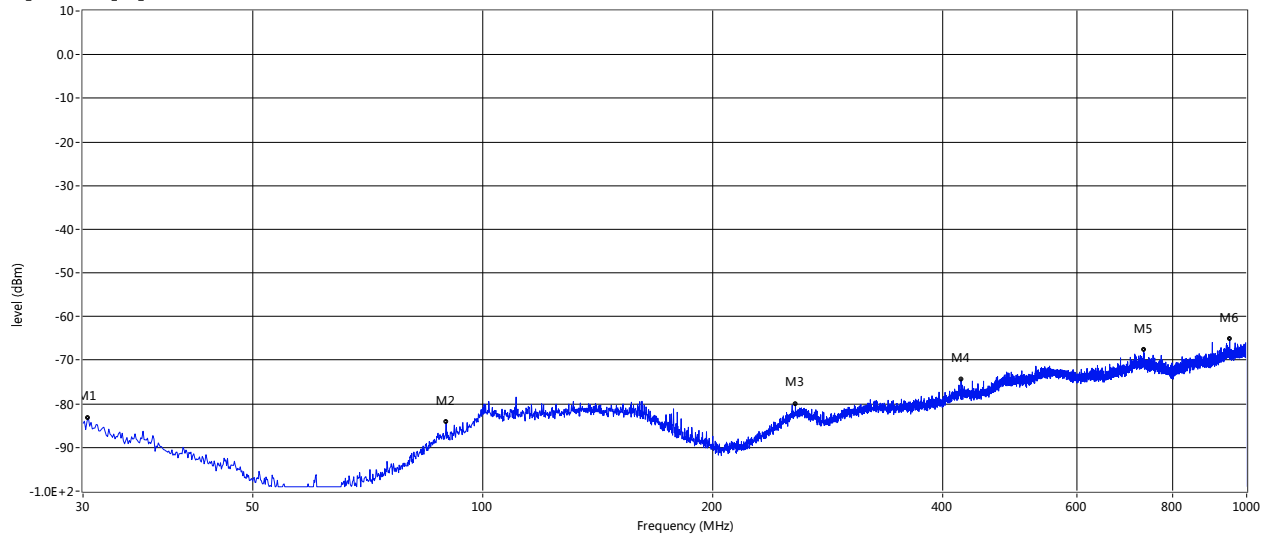


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
36.547	-81.12	-4.29	-13.0	-68.12	174.80	Horizontal	Vertical	Pass
140.095	-82.94	-6.22	-13.0	-69.94	84.40	Horizontal	Vertical	Pass
240.126	-79.18	-1.95	-13.0	-66.18	177.90	Horizontal	Vertical	Pass
392.659	-74.14	0.52	-13.0	-61.14	277.90	Horizontal	Vertical	Pass
579.020	-16.78	6.63	-13.0	-3.78	90.60	Horizontal	Vertical	Pass
919.247	-67.39	9.57	-13.0	-54.39	275.10	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-1G

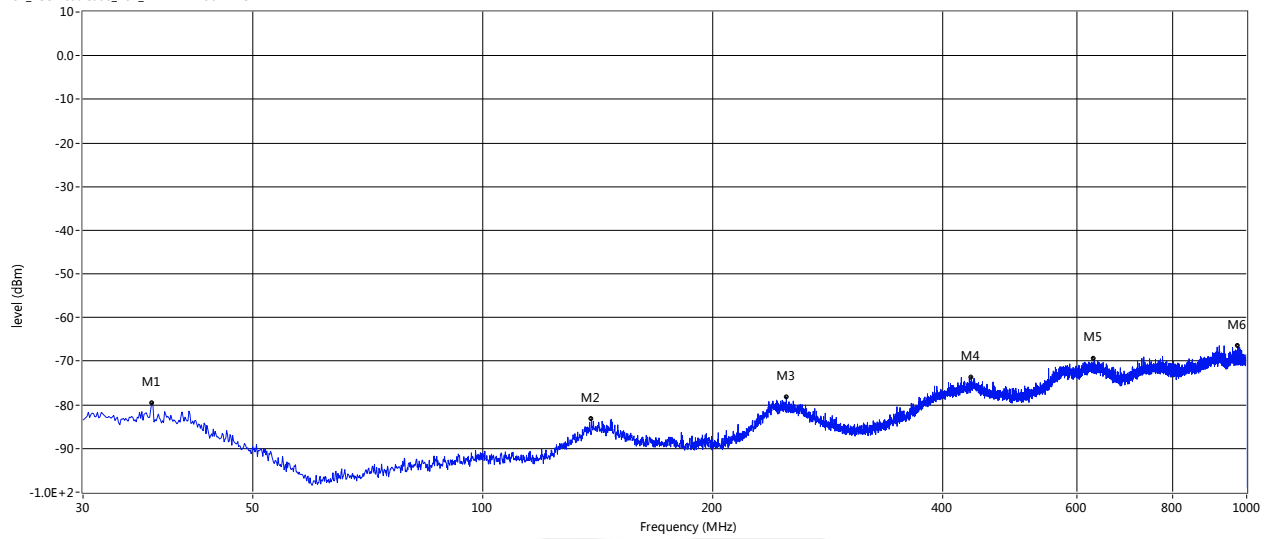


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
30.364	-83.95	-6.38	-13.0	-70.95	133.40	Vertical	Vertical	Pass
89.655	-84.21	-10.10	-13.0	-71.21	266.20	Vertical	Vertical	Pass
256.737	-79.98	-3.91	-13.0	-66.98	85.00	Vertical	Vertical	Pass
422.850	-74.48	1.23	-13.0	-61.48	272.40	Vertical	Vertical	Pass
733.371	-67.74	7.88	-13.0	-54.74	27.50	Vertical	Vertical	Pass
950.045	-65.14	10.09	-13.0	-52.14	263.20	Vertical	Vertical	Pass



High channel Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-1G

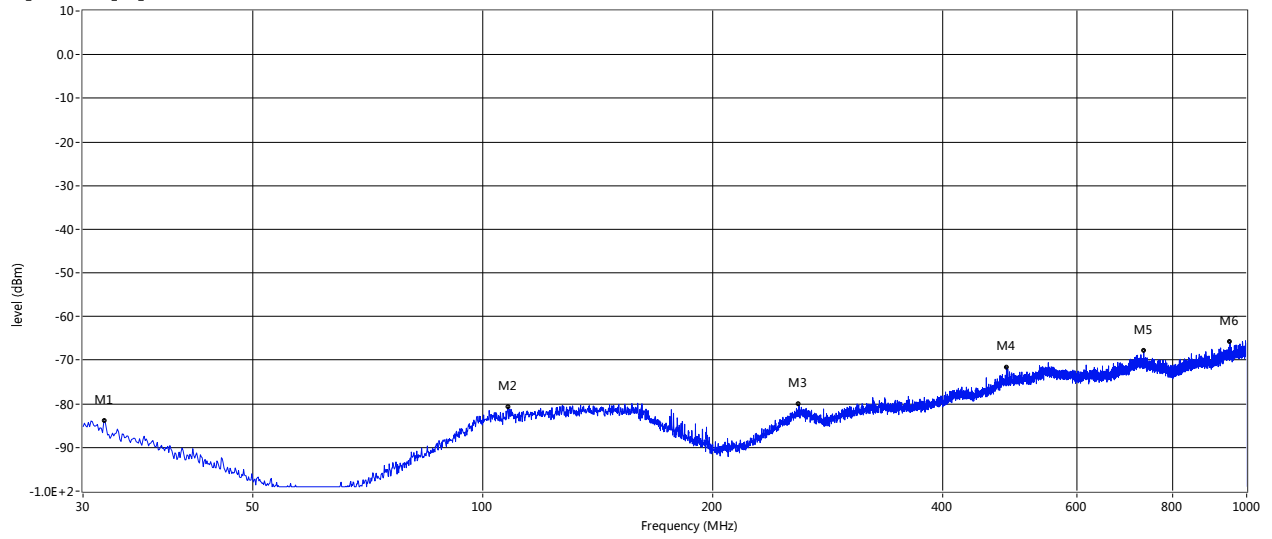


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
36.911	-79.56	-4.29	-13.0	-66.56	181.10	Horizontal	Vertical	Pass
138.761	-83.29	-6.66	-13.0	-70.29	0.10	Horizontal	Vertical	Pass
249.826	-78.33	-2.29	-13.0	-65.33	105.40	Horizontal	Vertical	Pass
436.066	-73.68	3.19	-13.0	-60.68	99.50	Horizontal	Vertical	Pass
631.521	-69.47	7.26	-13.0	-56.47	353.70	Horizontal	Vertical	Pass
974.052	-66.54	9.20	-13.0	-53.54	329.60	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-1G

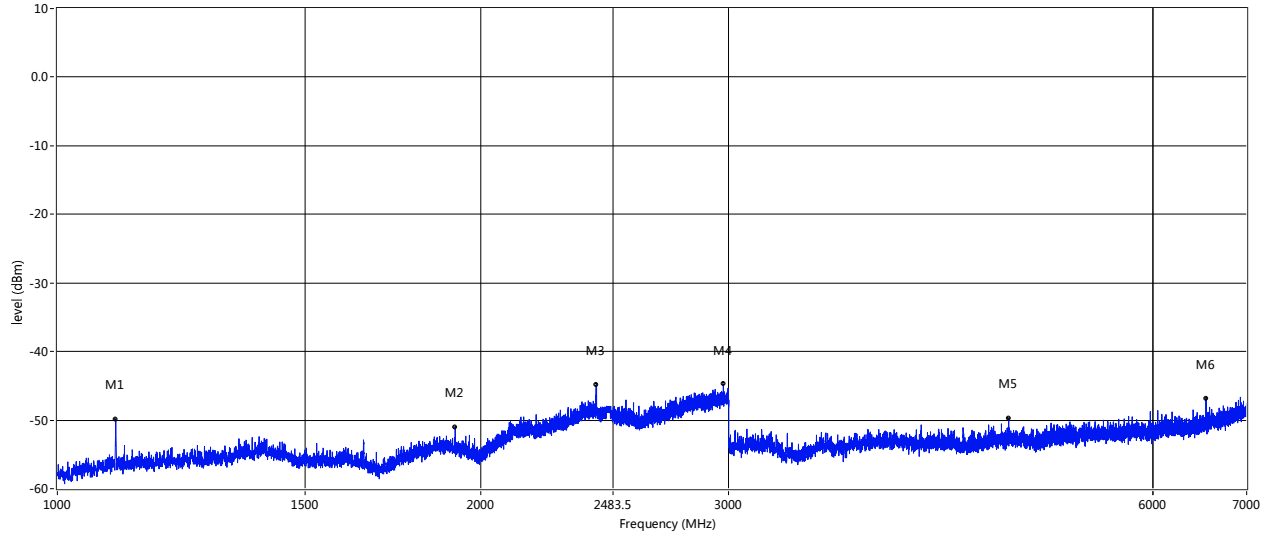


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
32.061	-83.93	-7.46	-13.0	-70.93	294.80	Vertical	Vertical	Pass
107.964	-80.82	-4.47	-13.0	-67.82	194.20	Vertical	Vertical	Pass
259.526	-80.15	-3.35	-13.0	-67.15	282.80	Vertical	Vertical	Pass
484.809	-71.69	4.25	-13.0	-58.69	181.90	Vertical	Vertical	Pass
733.371	-67.95	7.88	-13.0	-54.95	235.90	Vertical	Vertical	Pass
951.136	-65.73	10.09	-13.0	-52.73	169.50	Vertical	Vertical	Pass



Above 1GHz:
Band A
Low channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

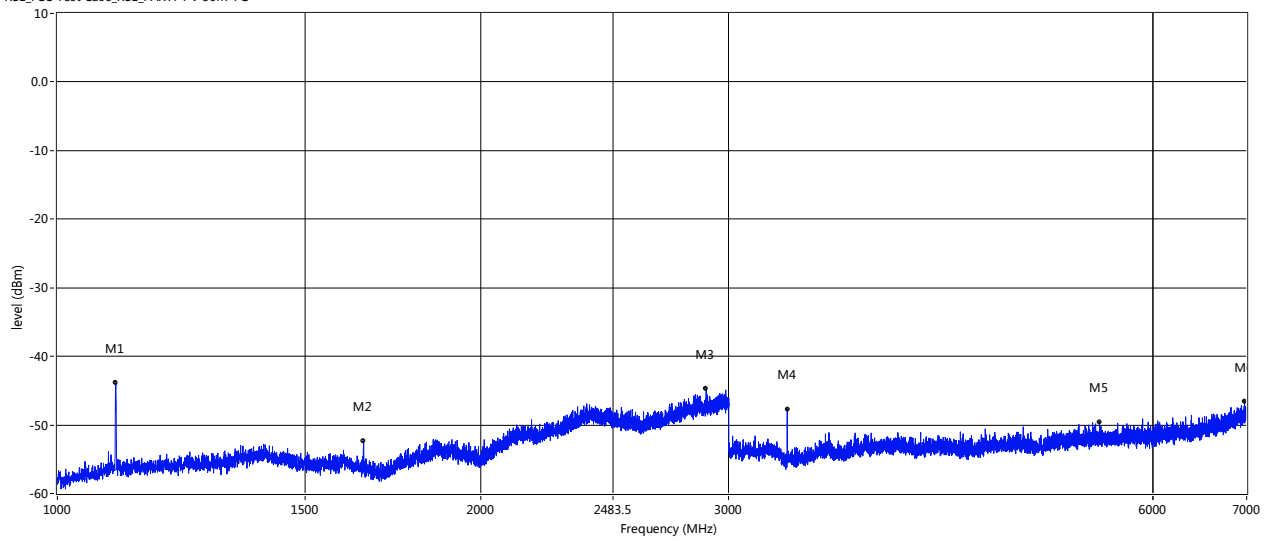


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1100.250	-49.90	12.19	-13.0	-36.90	224.70	Horizontal	Vertical	Pass
1917.250	-51.01	14.21	-13.0	-38.01	212.40	Horizontal	Vertical	Pass
2416.250	-44.88	19.64	-13.0	-31.88	109.40	Horizontal	Vertical	Pass
2973.000	-44.75	21.11	-13.0	-31.75	285.20	Horizontal	Vertical	Pass
4742.500	-49.74	4.68	-13.0	-36.74	224.90	Horizontal	Vertical	Pass
6549.000	-46.83	8.17	-13.0	-33.83	206.70	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

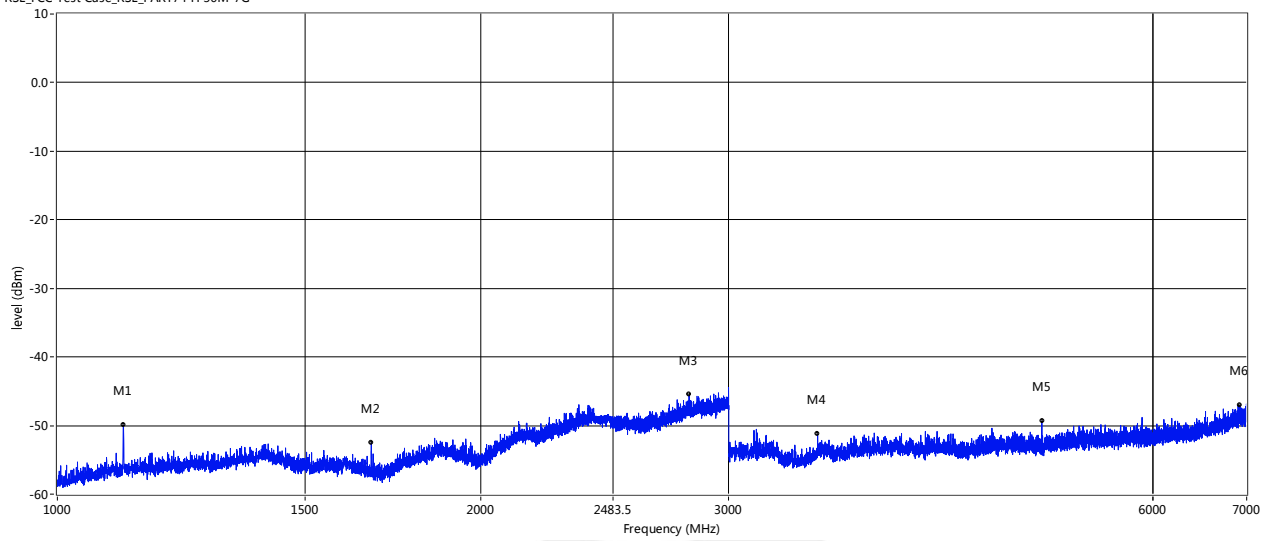


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1100.500	-43.89	12.19	-13.0	-30.89	300.60	Vertical	Vertical	Pass
1650.500	-52.36	12.10	-13.0	-39.36	172.50	Vertical	Vertical	Pass
2891.000	-44.66	20.66	-13.0	-31.66	359.00	Vertical	Vertical	Pass
3301.000	-47.69	2.01	-13.0	-34.69	187.90	Vertical	Vertical	Pass
5502.000	-49.59	5.79	-13.0	-36.59	197.10	Vertical	Vertical	Pass
6976.000	-46.61	10.21	-13.0	-33.61	338.60	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

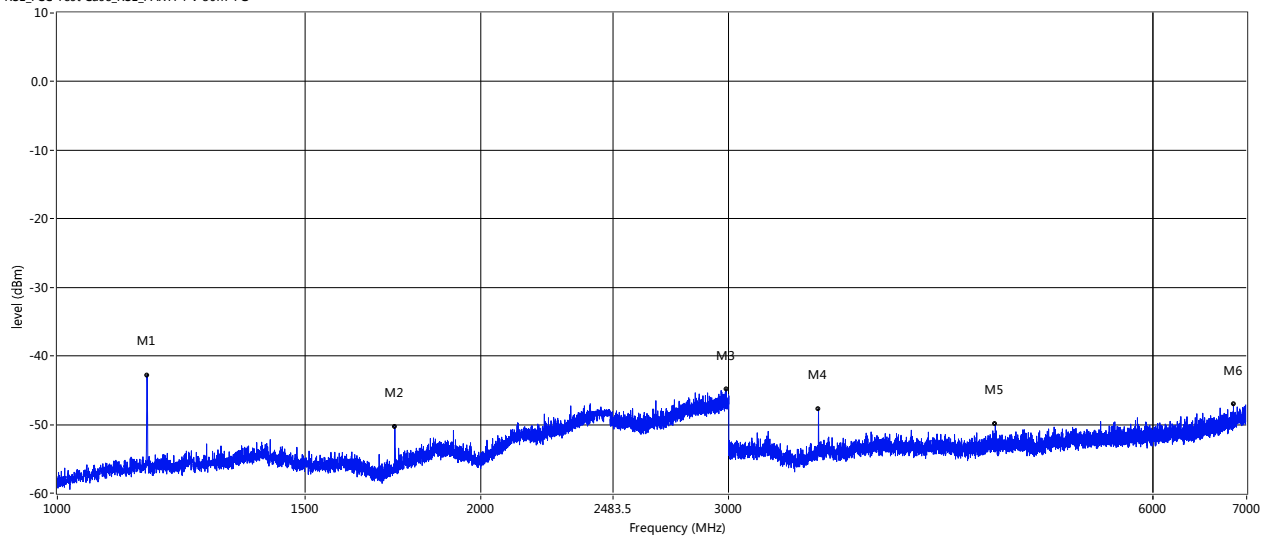


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1114.250	-49.91	12.25	-13.0	-36.91	246.70	Horizontal	Vertical	Pass
1671.500	-52.51	11.72	-13.0	-39.51	352.70	Horizontal	Vertical	Pass
2811.000	-45.52	20.46	-13.0	-32.52	234.60	Horizontal	Vertical	Pass
3469.000	-51.25	3.33	-13.0	-38.25	359.10	Horizontal	Vertical	Pass
5007.000	-49.33	4.88	-13.0	-36.33	173.90	Horizontal	Vertical	Pass
6922.000	-47.01	9.88	-13.0	-34.01	311.10	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

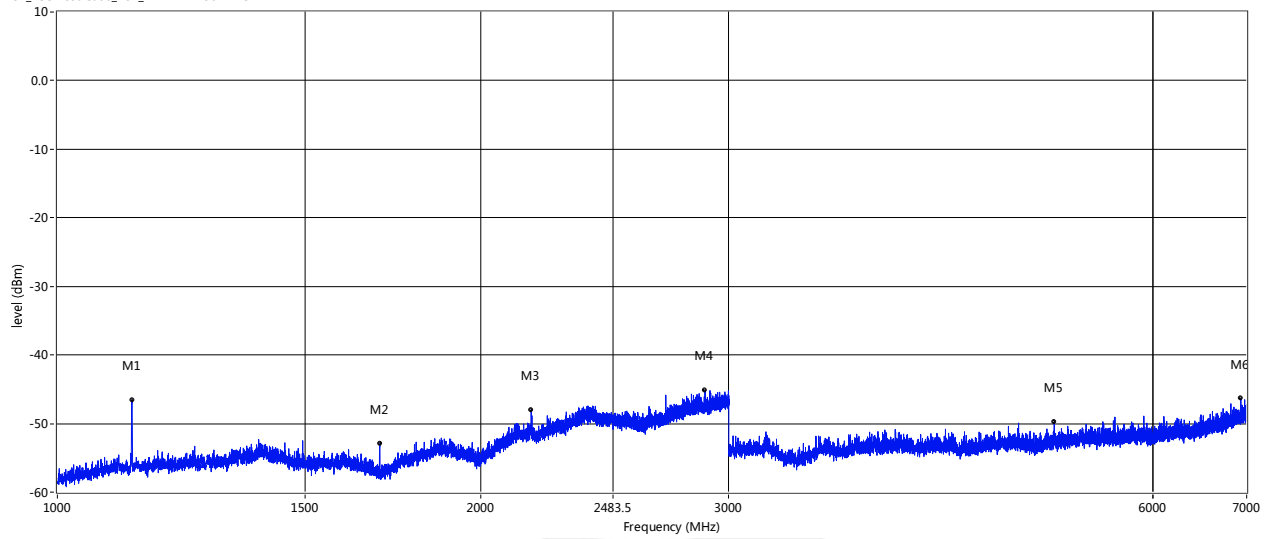


Frequenc y (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1158.000	-42.86	12.44	-13.0	-29.86	168.50	Vertical	Vertical	Pass
1737.000	-50.31	12.33	-13.0	-37.31	76.10	Vertical	Vertical	Pass
2986.500	-44.91	21.18	-13.0	-31.91	209.90	Vertical	Vertical	Pass
3474.500	-47.71	3.41	-13.0	-34.71	18.90	Vertical	Vertical	Pass
4639.500	-49.92	4.65	-13.0	-36.92	208.40	Vertical	Vertical	Pass
6850.500	-47.11	9.54	-13.0	-34.11	266.50	Vertical	Vertical	Pass



High channel Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

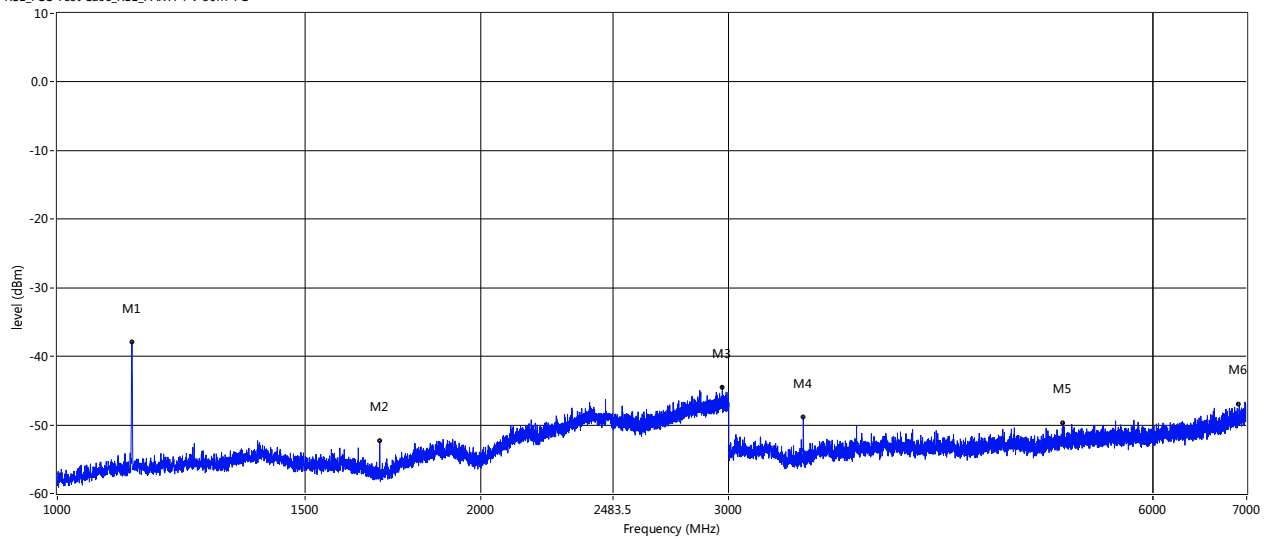


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1130.000	-46.55	12.31	-13.0	-33.55	252.30	Horizontal	Vertical	Pass
1694.750	-52.92	11.30	-13.0	-39.92	359.10	Horizontal	Vertical	Pass
2171.000	-48.00	16.50	-13.0	-35.00	1.70	Horizontal	Vertical	Pass
2885.500	-45.16	20.66	-13.0	-32.16	121.10	Horizontal	Vertical	Pass
5109.000	-49.72	5.39	-13.0	-36.72	351.30	Horizontal	Vertical	Pass
6933.500	-46.36	9.95	-13.0	-33.36	63.50	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

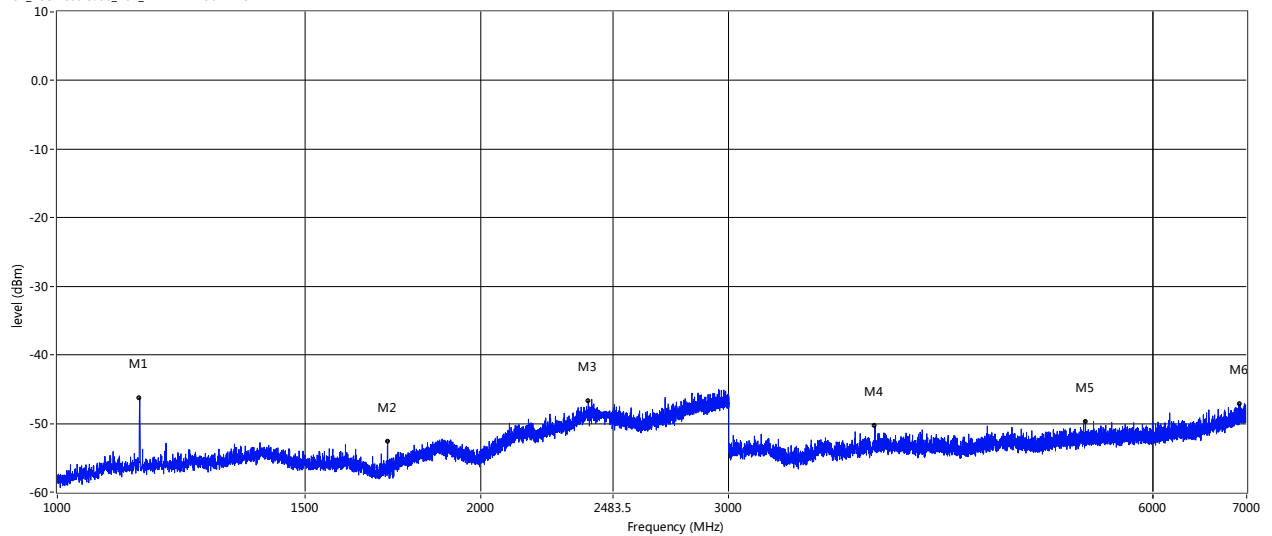


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1129.750	-38.02	12.31	-13.0	-25.02	145.20	Vertical	Vertical	Pass
1694.500	-52.39	11.31	-13.0	-39.39	57.50	Vertical	Vertical	Pass
2968.250	-44.55	21.08	-13.0	-31.55	108.80	Vertical	Vertical	Pass
3389.000	-48.96	2.29	-13.0	-35.96	10.60	Vertical	Vertical	Pass
5183.500	-49.73	5.71	-13.0	-36.73	327.10	Vertical	Vertical	Pass
6915.500	-47.07	9.84	-13.0	-34.07	161.60	Vertical	Vertical	Pass



Band B
Low channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

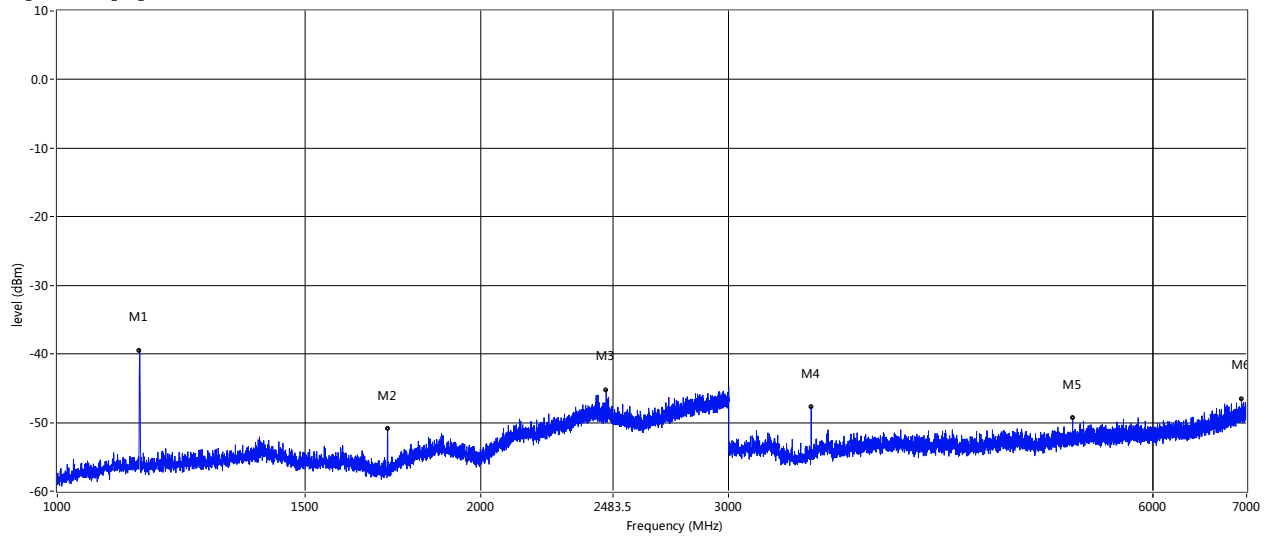


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1144.250	-46.25	12.37	-13.0	-33.25	221.00	Vertical	Vertical	Pass
1716.500	-52.68	11.71	-13.0	-39.68	21.30	Vertical	Vertical	Pass
2383.750	-46.76	19.48	-13.0	-33.76	67.00	Vertical	Vertical	Pass
3810.500	-50.35	3.87	-13.0	-37.35	0.70	Vertical	Vertical	Pass
5377.500	-49.74	5.83	-13.0	-36.74	353.90	Vertical	Vertical	Pass
6922.000	-47.15	9.88	-13.0	-34.15	151.70	Vertical	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

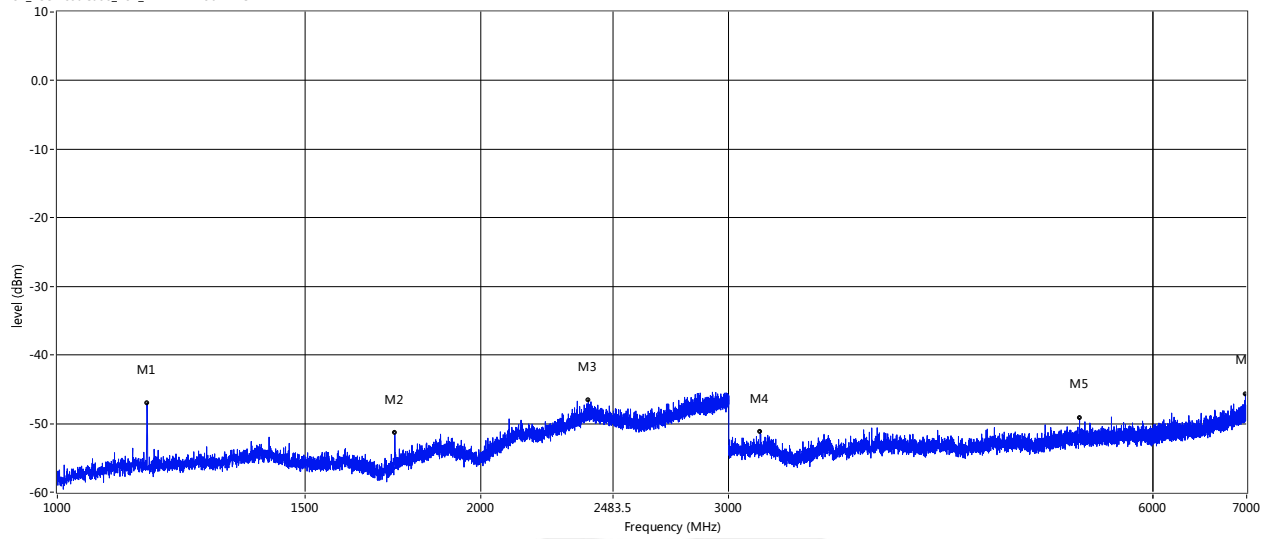


Frequenc y (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1144.250	-39.49	12.37	-13.0	-26.49	229.20	Vertical	Vertical	Pass
1716.500	-50.98	11.71	-13.0	-37.98	145.50	Vertical	Vertical	Pass
2454.750	-45.33	19.31	-13.0	-32.33	187.20	Vertical	Vertical	Pass
3433.000	-47.82	2.81	-13.0	-34.82	30.90	Vertical	Vertical	Pass
5265.500	-49.38	5.88	-13.0	-36.38	164.00	Vertical	Vertical	Pass
6941.000	-46.65	10.00	-13.0	-33.65	236.80	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

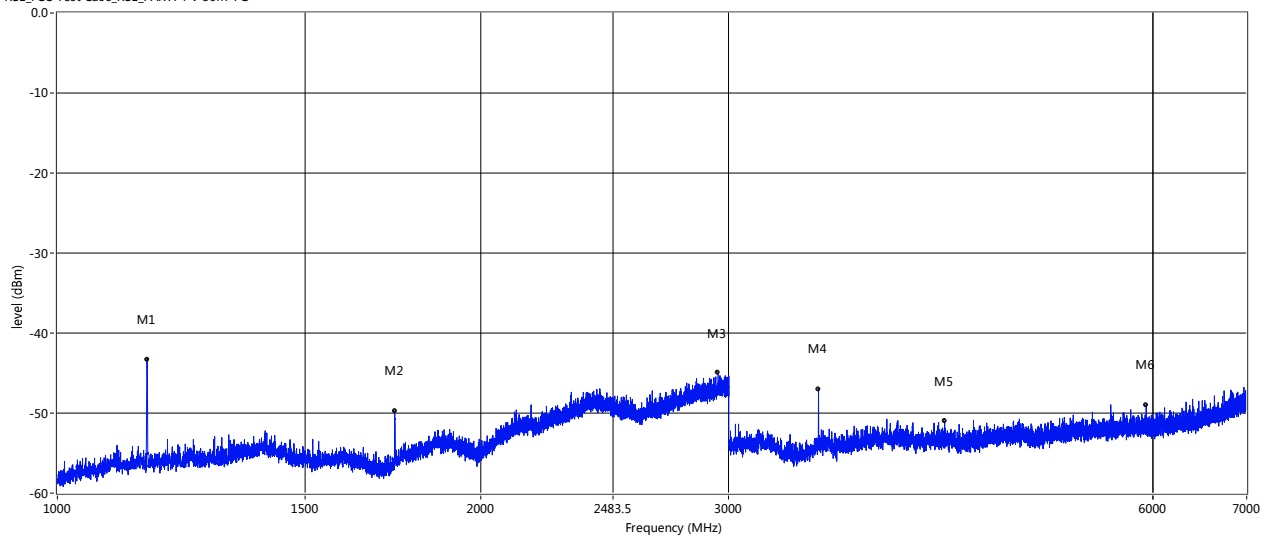


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1158.000	-47.10	12.44	-13.0	-34.10	68.00	Horizontal	Vertical	Pass
1737.000	-51.40	12.33	-13.0	-38.40	201.70	Horizontal	Vertical	Pass
2384.000	-46.66	19.49	-13.0	-33.66	177.30	Horizontal	Vertical	Pass
3158.000	-51.26	3.23	-13.0	-38.26	6.50	Horizontal	Vertical	Pass
5325.500	-49.22	5.89	-13.0	-36.22	24.10	Horizontal	Vertical	Pass
6985.500	-45.71	10.27	-13.0	-32.71	138.30	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

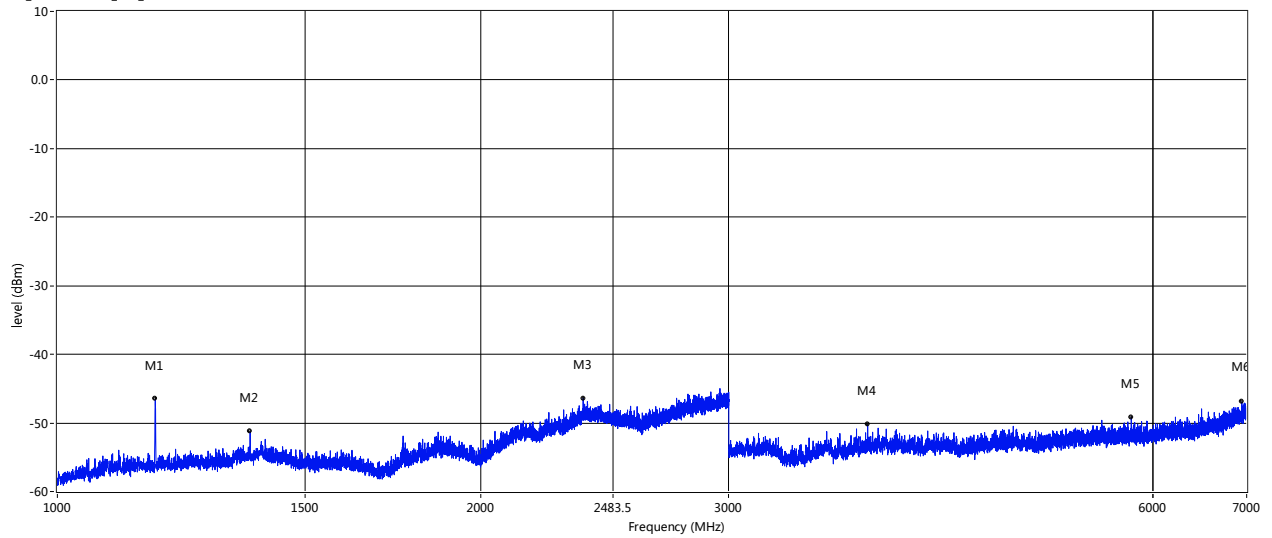


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1158.000	-43.28	12.44	-13.0	-30.28	190.90	Vertical	Vertical	Pass
1736.750	-49.75	12.32	-13.0	-36.75	160.90	Vertical	Vertical	Pass
2947.750	-44.97	20.97	-13.0	-31.97	281.20	Vertical	Vertical	Pass
3474.000	-47.00	3.40	-13.0	-34.00	27.90	Vertical	Vertical	Pass
4270.500	-51.04	4.38	-13.0	-38.04	12.40	Vertical	Vertical	Pass
5938.500	-49.01	6.62	-13.0	-36.01	33.80	Vertical	Vertical	Pass



High channel Horizontal

RSE_FCC Test Case_RSE_PART74 H 30M-7G

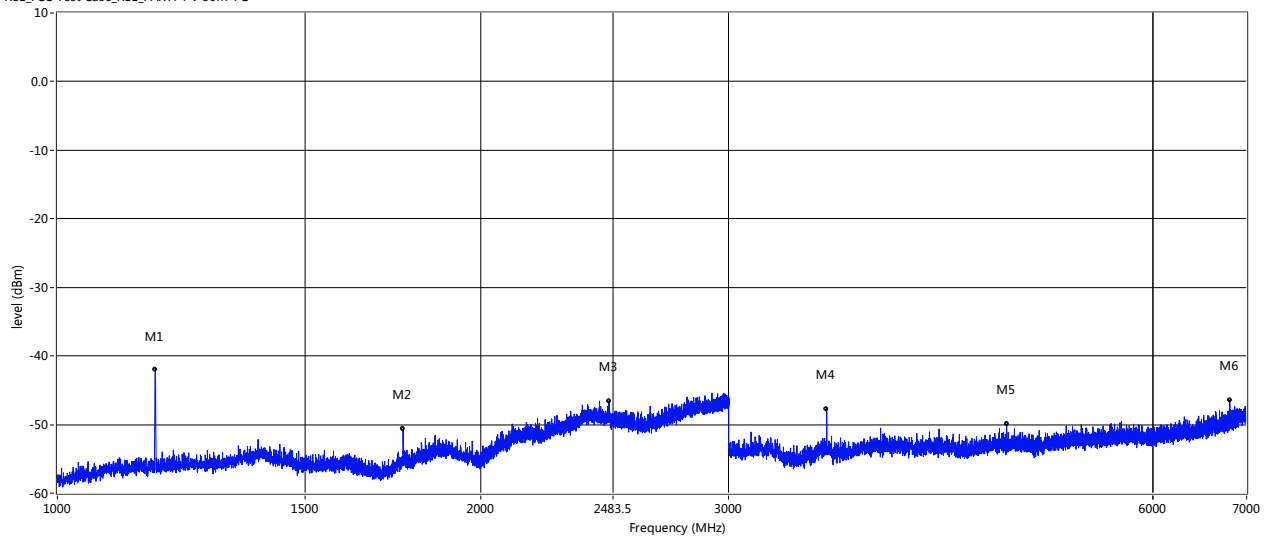


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1173.750	-46.51	12.53	-13.0	-33.51	54.70	Horizontal	Vertical	Pass
1370.750	-51.28	13.77	-13.0	-38.28	21.40	Horizontal	Vertical	Pass
2364.000	-46.39	19.13	-13.0	-33.39	327.50	Horizontal	Vertical	Pass
3765.500	-50.26	3.78	-13.0	-37.26	342.90	Horizontal	Vertical	Pass
5795.000	-49.15	6.50	-13.0	-36.15	43.30	Horizontal	Vertical	Pass
6944.500	-46.92	10.02	-13.0	-33.92	331.20	Horizontal	Vertical	Pass



Vertical

RSE_FCC Test Case_RSE_PART74 V 30M-7G

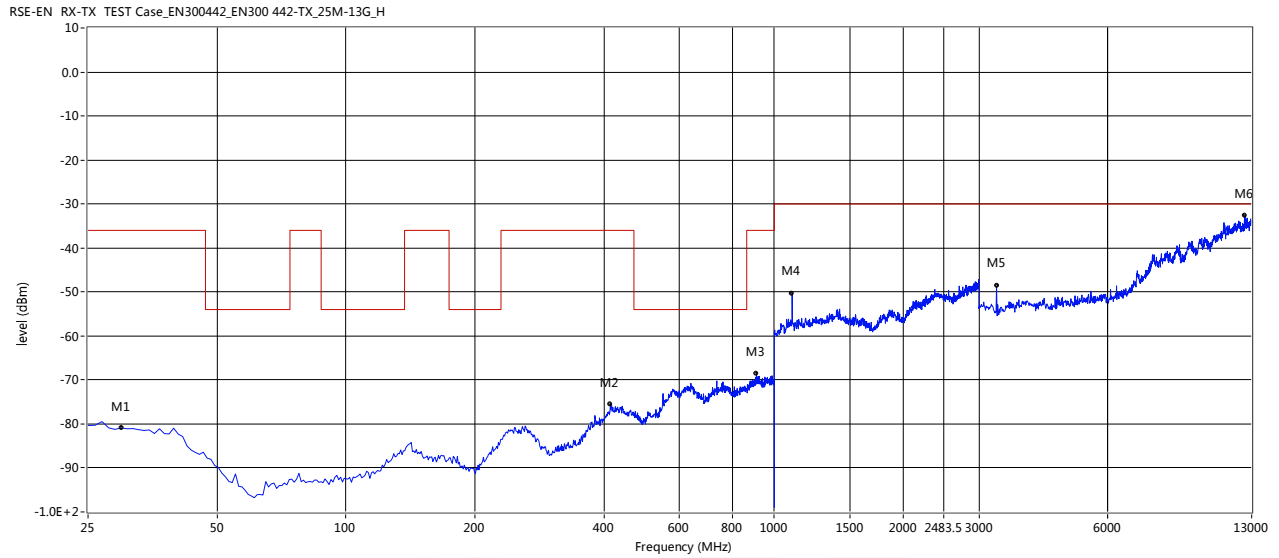


Frequenc y (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
1173.750	-42.07	12.53	-13.0	-29.07	0.00	Vertical	Vertical	Pass
1760.750	-50.64	12.90	-13.0	-37.64	39.00	Vertical	Vertical	Pass
2466.000	-41.59	19.16	-13.0	-28.59	48.30	Vertical	Vertical	Pass
3521.000	-47.69	3.62	-13.0	-34.69	22.90	Vertical	Vertical	Pass
4726.500	-49.96	4.66	-13.0	-36.96	289.00	Vertical	Vertical	Pass
6809.500	-46.45	9.37	-13.0	-33.45	65.20	Vertical	Vertical	Pass



ETSI EN 300 422-1 Clause 8.4 Spurious emissions:

Band A
Low channel
Horizontal

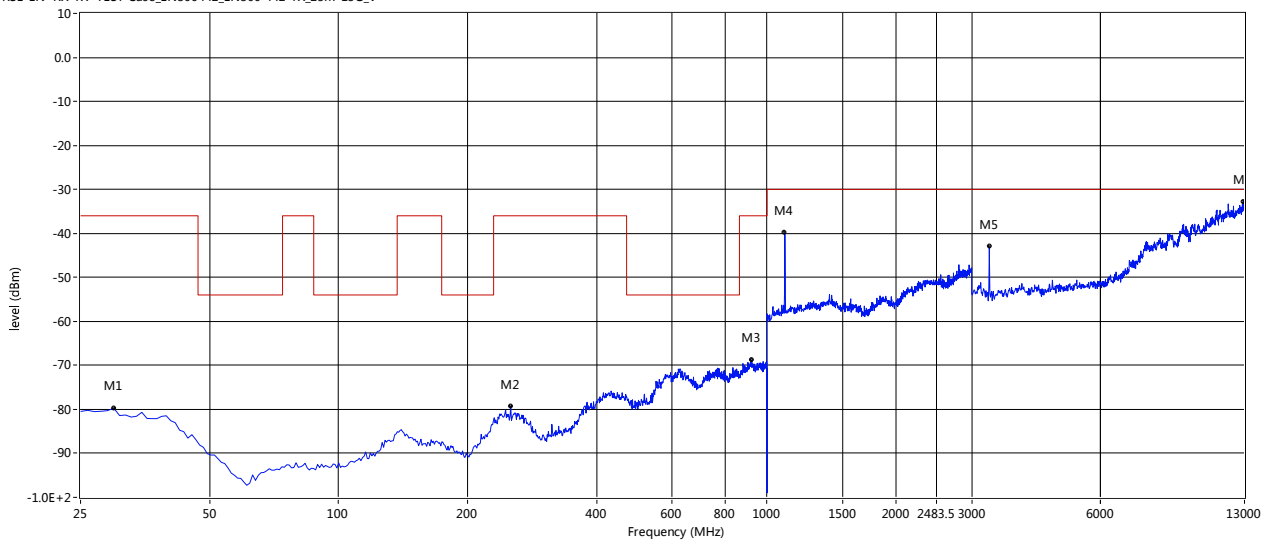


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
29.875	-80.89	-1.92	-36.0	-44.89	9.40	Horizontal	Vertical	Pass
414.025	-75.63	2.47	-36.0	-39.63	199.70	Horizontal	Vertical	Pass
908.350	-68.65	9.15	-36.0	-32.65	143.30	Horizontal	Vertical	Pass
1100.000	-50.29	12.19	-30.0	-20.29	26.30	Horizontal	Vertical	Pass
3300.000	-48.67	2.01	-30.0	-18.67	64.80	Horizontal	Vertical	Pass
12540.000	-32.61	22.43	-30.0	-2.61	137.90	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V

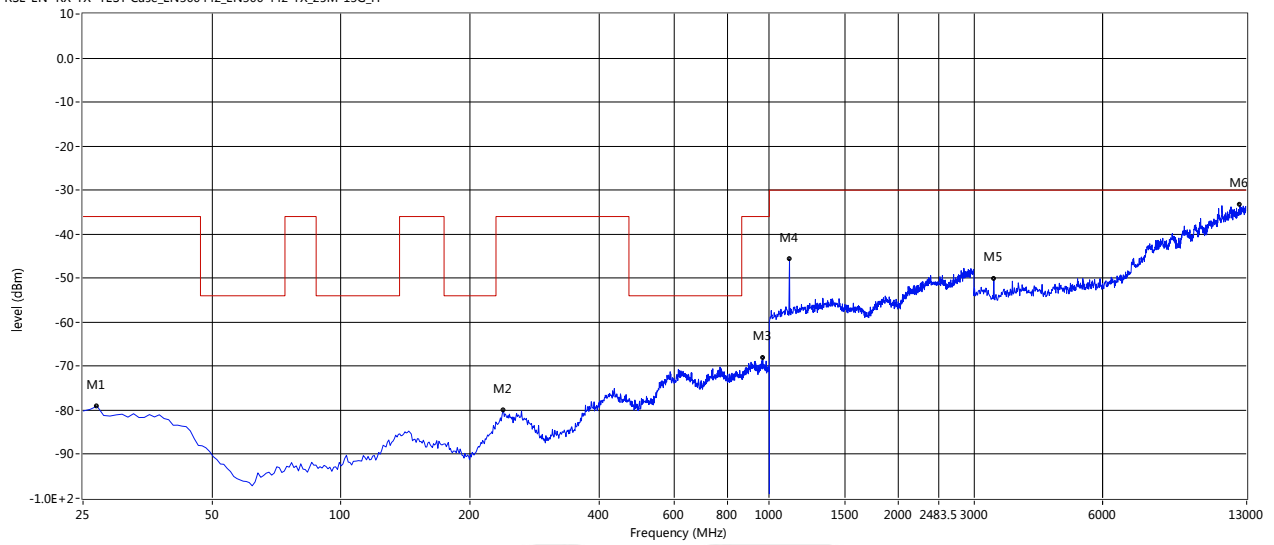


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
29.875	-79.72	-1.92	-36.0	-43.72	359.30	Vertical	Vertical	Pass
252.175	-79.32	-1.23	-36.0	-43.32	208.60	Vertical	Vertical	Pass
921.025	-68.73	9.53	-36.0	-32.73	58.50	Vertical	Vertical	Pass
1100.000	-39.87	12.19	-30.0	-9.87	157.50	Vertical	Vertical	Pass
3300.000	-43.04	2.01	-30.0	-13.04	27.30	Vertical	Vertical	Pass
12940.000	-32.78	23.98	-30.0	-2.78	75.80	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_H

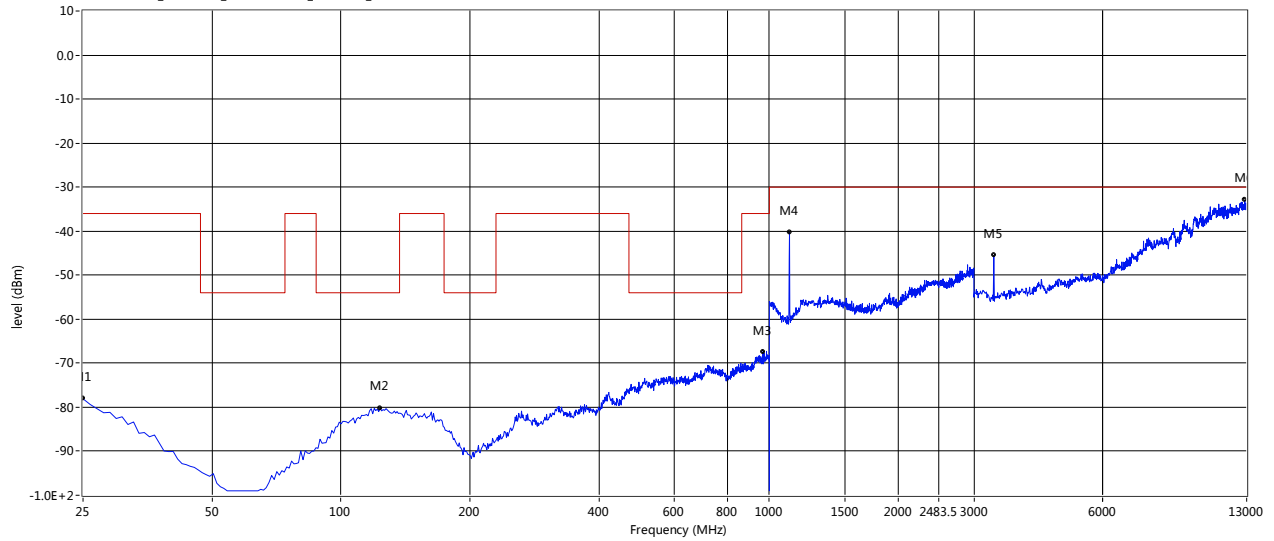


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
26.950	-79.07	-1.94	-36.0	-43.07	340.40	Horizontal	Vertical	Pass
239.500	-80.08	-0.93	-36.0	-44.08	18.90	Horizontal	Vertical	Pass
964.900	-68.11	9.49	-36.0	-32.11	104.50	Horizontal	Vertical	Pass
1114.000	-45.64	12.25	-30.0	-15.64	58.90	Horizontal	Vertical	Pass
3340.000	-50.27	2.14	-30.0	-20.27	261.70	Horizontal	Vertical	Pass
12540.000	-33.37	22.43	-30.0	-3.37	275.30	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V

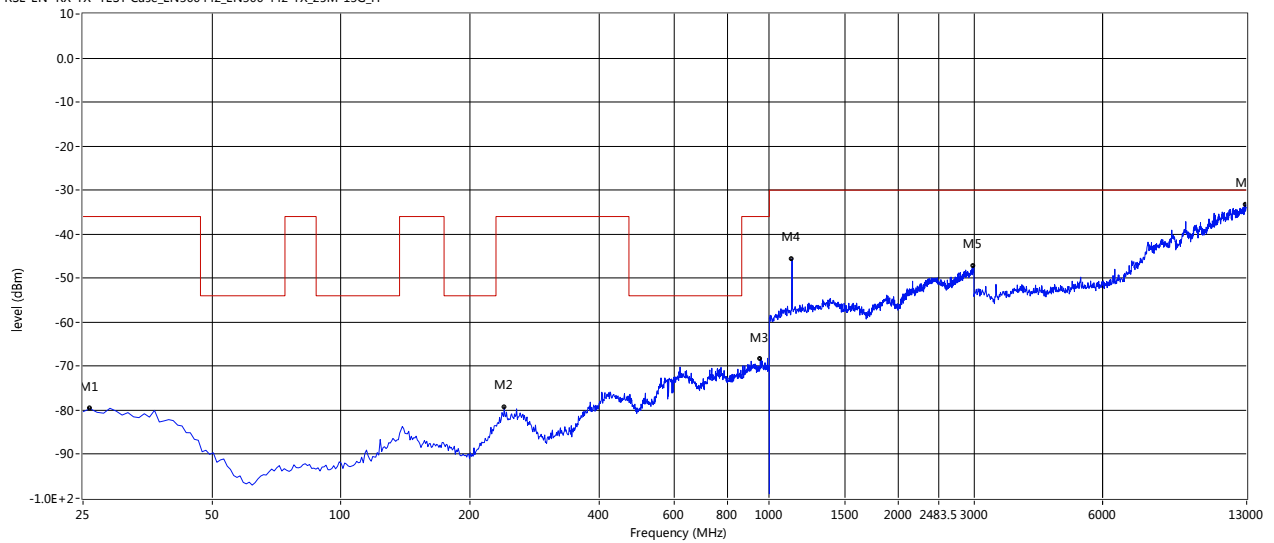


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-78.08	-0.46	-36.0	-42.08	137.90	Vertical	Vertical	Pass
123.475	-80.18	-1.77	-54.0	-26.18	284.80	Vertical	Vertical	Pass
965.875	-67.37	10.13	-36.0	-31.37	186.10	Vertical	Vertical	Pass
1114.000	-40.31	9.30	-30.0	-10.31	180.70	Vertical	Vertical	Pass
3340.000	-45.56	1.38	-30.0	-15.56	0.80	Vertical	Vertical	Pass
12870.000	-32.99	23.72	-30.0	-2.99	310.90	Vertical	Vertical	Pass



High channel Horizontal

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_H

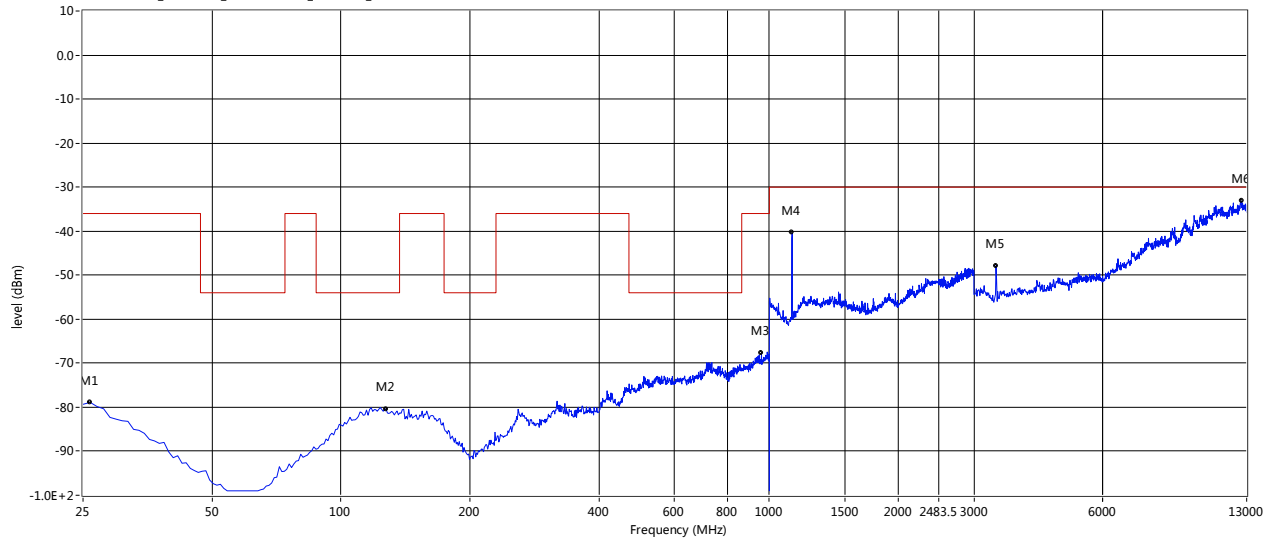


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.975	-79.63	-1.95	-36.0	-43.63	163.70	Horizontal	Vertical	Pass
240.475	-79.42	-0.79	-36.0	-43.42	282.50	Horizontal	Vertical	Pass
952.225	-68.30	9.08	-36.0	-32.30	98.90	Horizontal	Vertical	Pass
1130.000	-45.57	12.31	-30.0	-15.57	69.30	Horizontal	Vertical	Pass
2998.000	-47.19	21.24	-30.0	-17.19	0.00	Horizontal	Vertical	Pass
12920.001	-33.24	23.95	-30.0	-3.24	201.60	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V

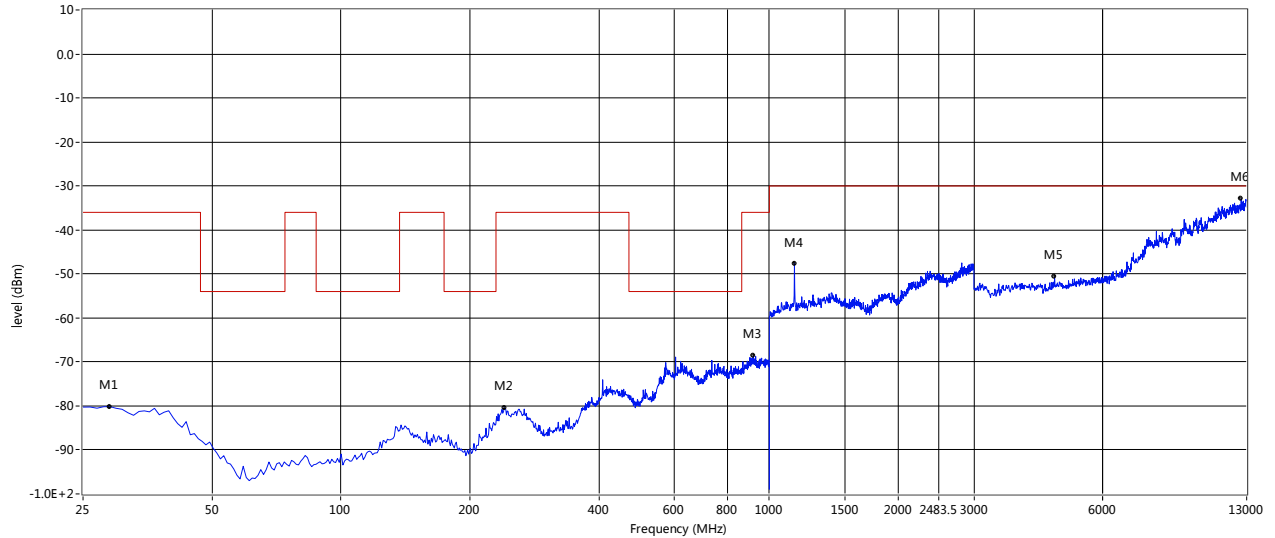


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.975	-78.91	-1.09	-36.0	-42.91	176.70	Vertical	Vertical	Pass
127.375	-80.37	-1.62	-54.0	-26.37	337.00	Vertical	Vertical	Pass
958.075	-67.76	10.03	-36.0	-31.76	107.30	Vertical	Vertical	Pass
1130.000	-40.39	10.09	-30.0	-10.39	126.70	Vertical	Vertical	Pass
3380.000	-47.86	1.50	-30.0	-17.86	29.40	Vertical	Vertical	Pass
12660.000	-33.16	23.38	-30.0	-3.16	93.70	Vertical	Vertical	Pass



Band B
Low channel
Horizontal

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_H

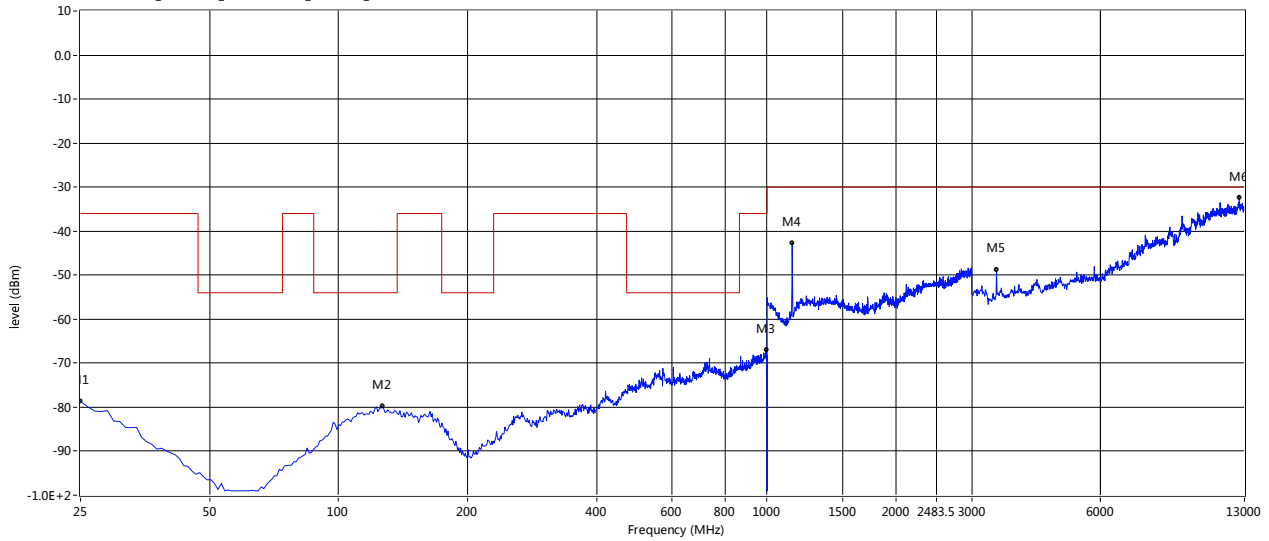


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
28.900	-80.16	-1.92	-36.0	-44.16	27.70	Horizontal	Vertical	Pass
240.475	-80.40	-0.79	-36.0	-44.40	162.00	Horizontal	Vertical	Pass
917.125	-68.68	9.49	-36.0	-32.68	129.90	Horizontal	Vertical	Pass
1144.000	-47.64	12.37	-30.0	-17.64	84.00	Horizontal	Vertical	Pass
4630.000	-50.69	4.65	-30.0	-20.69	352.40	Horizontal	Vertical	Pass
12620.000	-32.92	22.59	-30.0	-2.92	44.20	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V

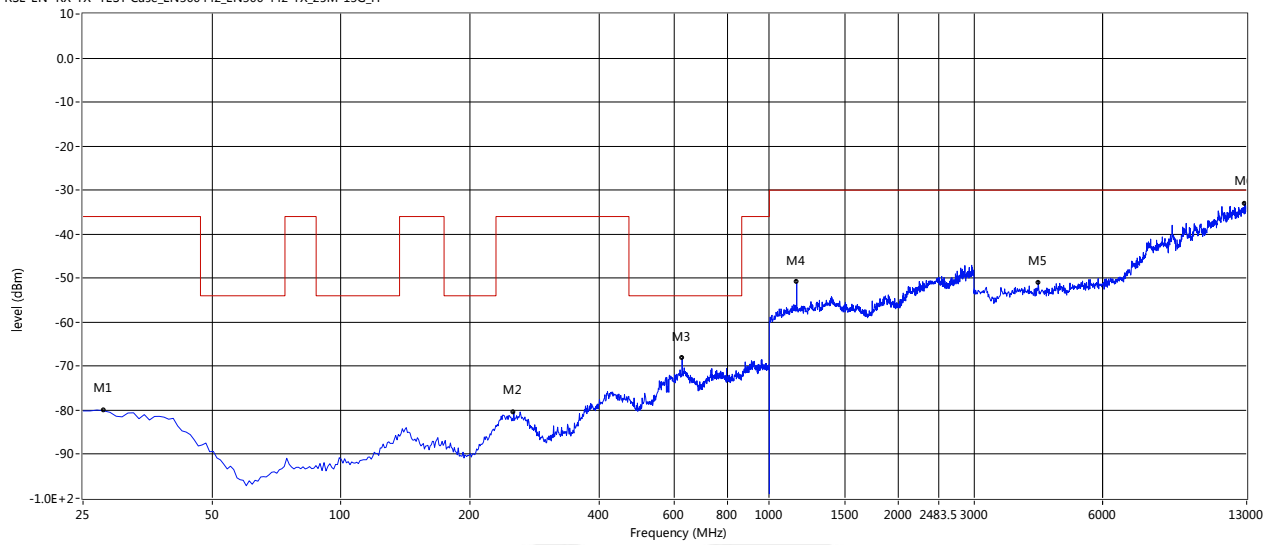


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-78.73	-0.46	-36.0	-42.73	195.70	Vertical	Vertical	Pass
126.400	-79.86	-1.66	-54.0	-25.86	209.00	Vertical	Vertical	Pass
995.125	-67.04	10.59	-36.0	-31.04	47.30	Vertical	Vertical	Pass
1144.000	-42.82	10.79	-30.0	-12.82	291.00	Vertical	Vertical	Pass
3430.000	-48.88	1.94	-30.0	-18.88	284.30	Vertical	Vertical	Pass
12640.000	-32.48	23.37	-30.0	-2.48	115.50	Vertical	Vertical	Pass



Mid channel
Horizontal

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_H

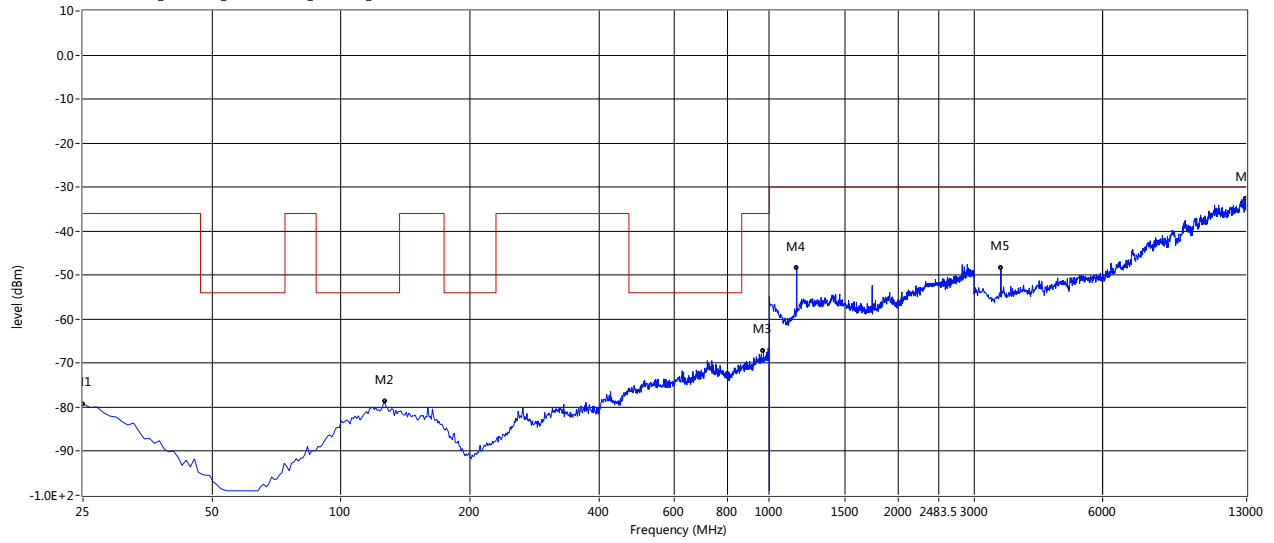


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
27.925	-80.12	-1.93	-36.0	-44.12	127.00	Horizontal	Vertical	Pass
253.150	-80.50	-1.27	-36.0	-44.50	288.40	Horizontal	Vertical	Pass
625.600	-68.16	7.27	-54.0	-14.16	57.20	Horizontal	Vertical	Pass
1158.000	-50.90	12.44	-30.0	-20.90	73.60	Horizontal	Vertical	Pass
4240.000	-51.00	4.37	-30.0	-21.00	259.60	Horizontal	Vertical	Pass
12890.000	-33.01	23.89	-30.0	-3.01	14.60	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V

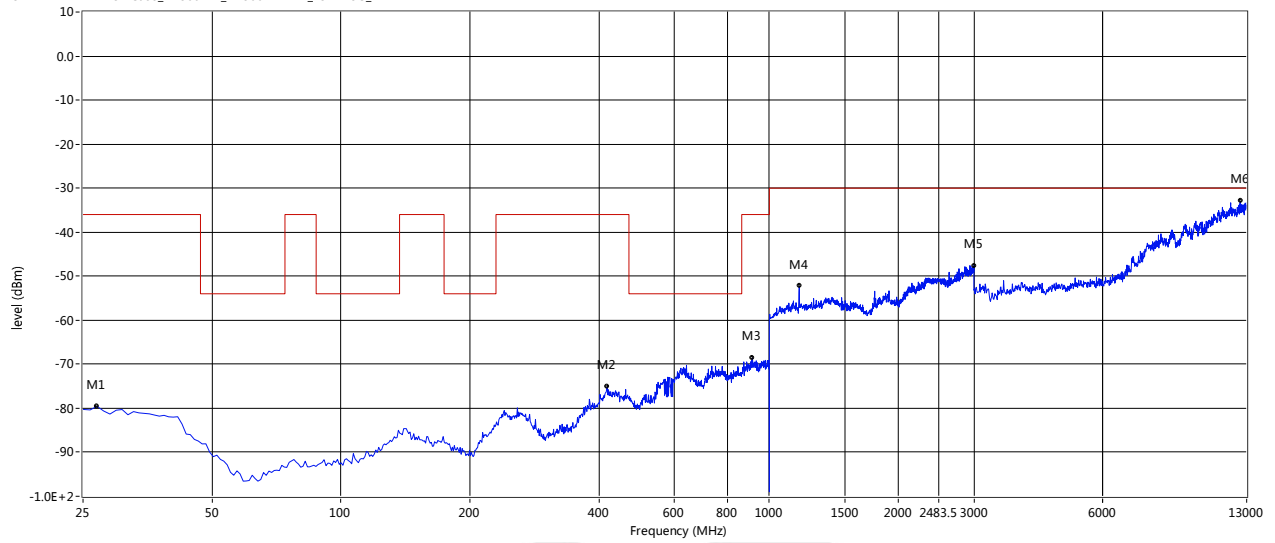


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-79.25	-0.46	-36.0	-43.25	130.00	Vertical	Vertical	Pass
126.400	-78.77	-1.66	-54.0	-24.77	175.40	Vertical	Vertical	Pass
968.800	-67.32	10.19	-36.0	-31.32	288.50	Vertical	Vertical	Pass
1158.000	-48.34	11.49	-30.0	-18.34	359.20	Vertical	Vertical	Pass
3470.000	-48.39	2.45	-30.0	-18.39	312.60	Vertical	Vertical	Pass
12900.000	-32.76	23.63	-30.0	-2.76	263.50	Vertical	Vertical	Pass



High channel Horizontal

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_H

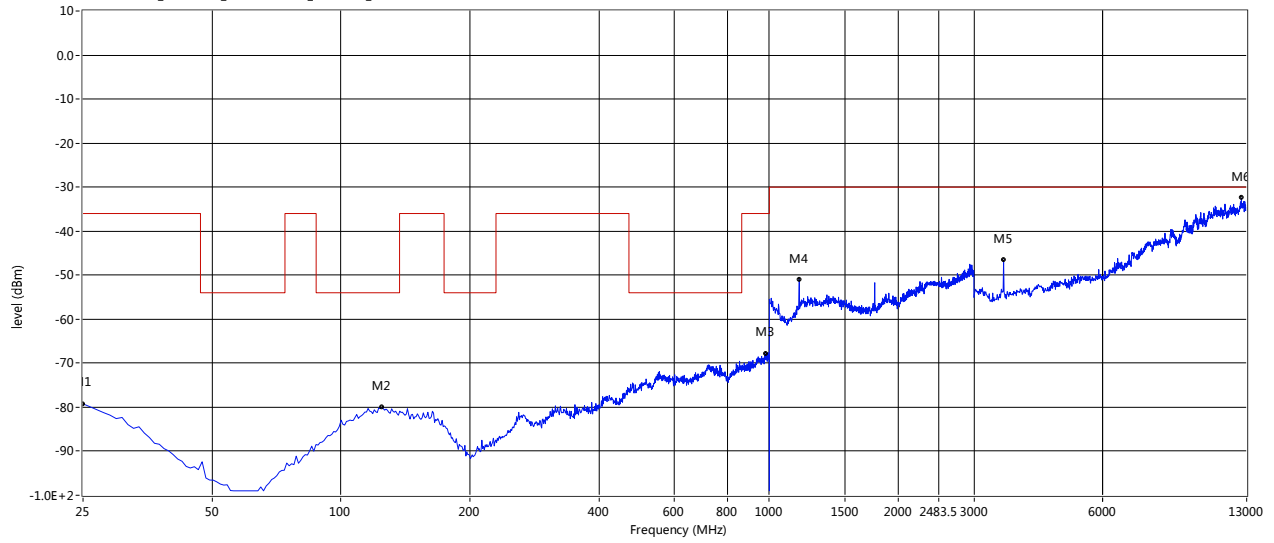


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
26.950	-79.55	-1.94	-36.0	-43.55	288.50	Horizontal	Vertical	Pass
417.925	-75.15	2.64	-36.0	-39.15	181.10	Horizontal	Vertical	Pass
913.225	-68.57	9.34	-36.0	-32.57	130.10	Horizontal	Vertical	Pass
1174.000	-52.23	12.53	-30.0	-22.23	21.60	Horizontal	Vertical	Pass
3000.000	-47.60	21.25	-30.0	-17.60	304.50	Horizontal	Vertical	Pass
12560.000	-32.99	22.45	-30.0	-2.99	157.00	Horizontal	Vertical	Pass



Vertical

RSE-EN RX-TX TEST Case_EN300442_EN300 442-TX_25M-13G_V



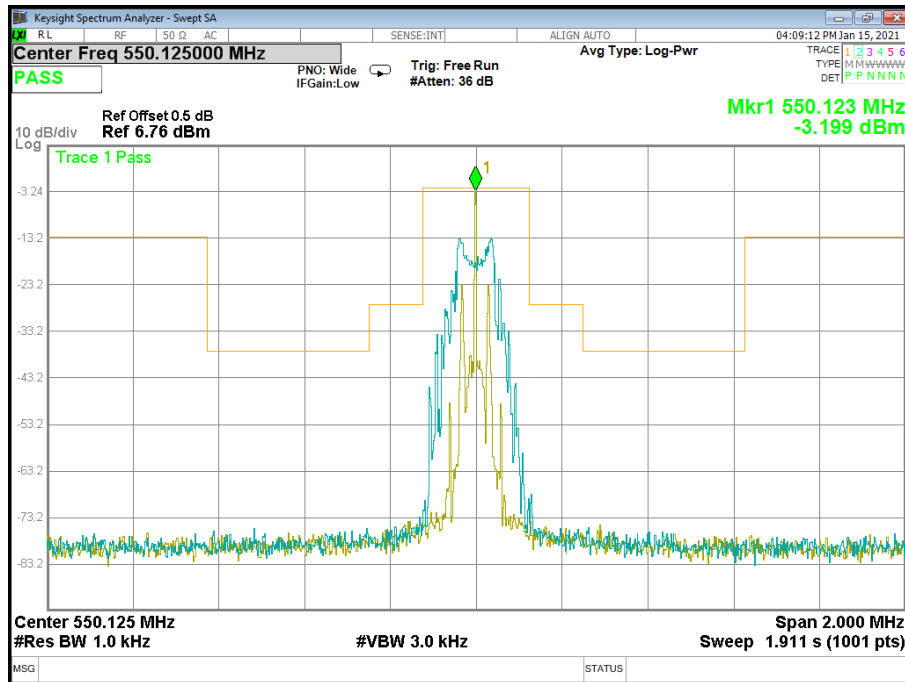
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-79.24	-0.46	-36.0	-43.24	55.50	Vertical	Vertical	Pass
124.450	-80.08	-1.73	-54.0	-26.08	25.90	Vertical	Vertical	Pass
981.475	-67.80	10.43	-36.0	-31.80	203.00	Vertical	Vertical	Pass
1174.000	-51.02	12.31	-30.0	-21.02	190.60	Vertical	Vertical	Pass
3520.000	-46.57	2.70	-30.0	-16.57	35.80	Vertical	Vertical	Pass
12630.000	-32.52	23.37	-30.0	-2.52	250.60	Vertical	Vertical	Pass



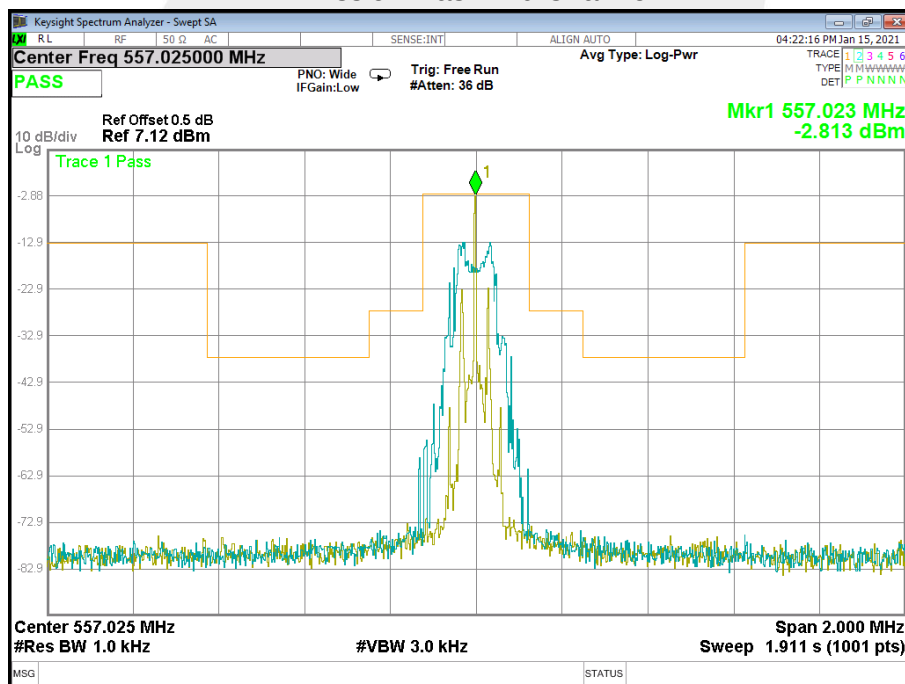
Emission Mask I

Band A

Emission Mask Low Channel

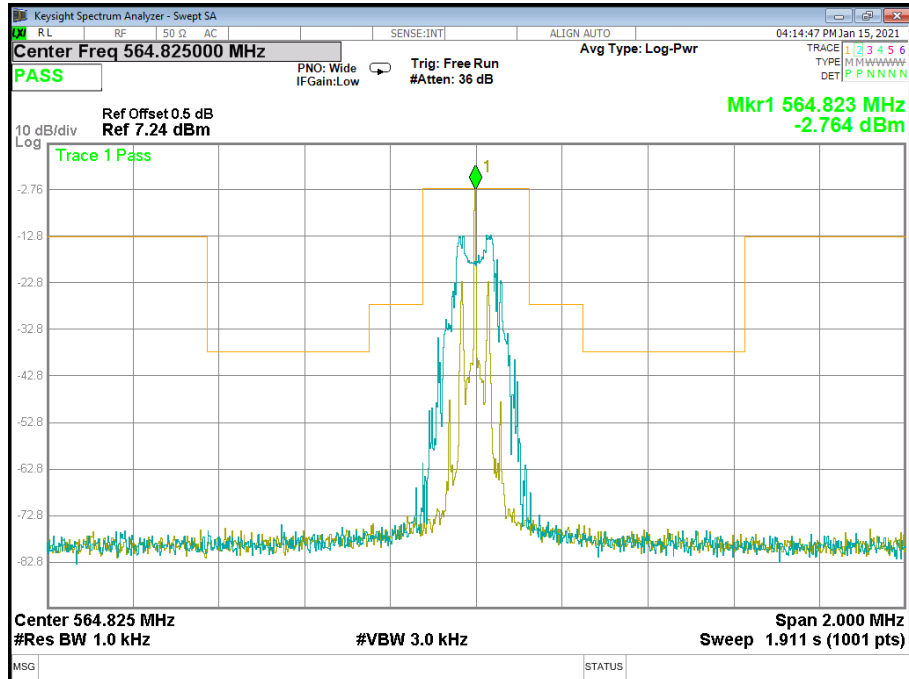


Emission Mask Mid Channel





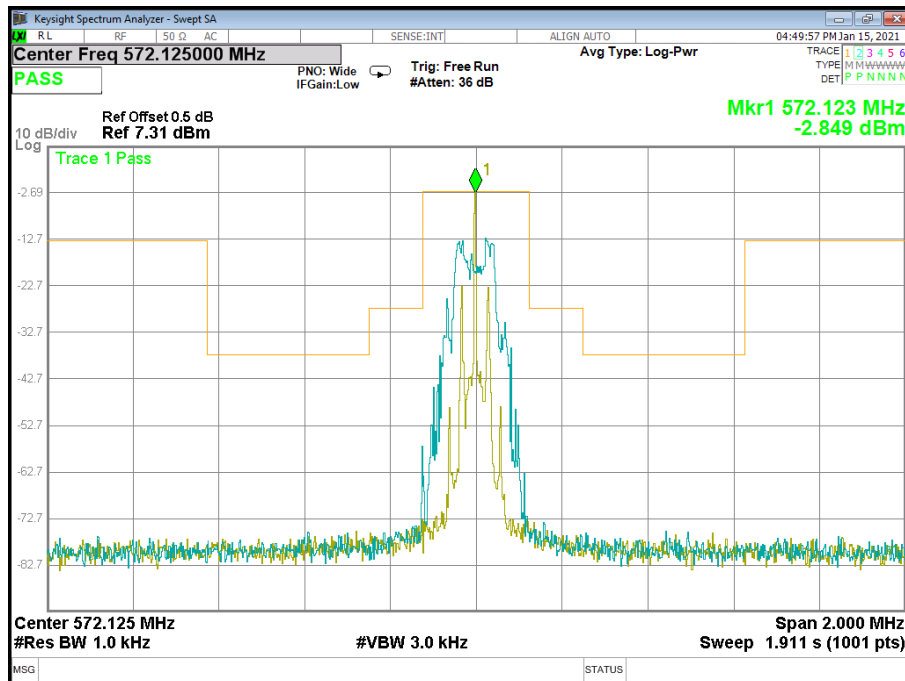
Emission Mask High Channel



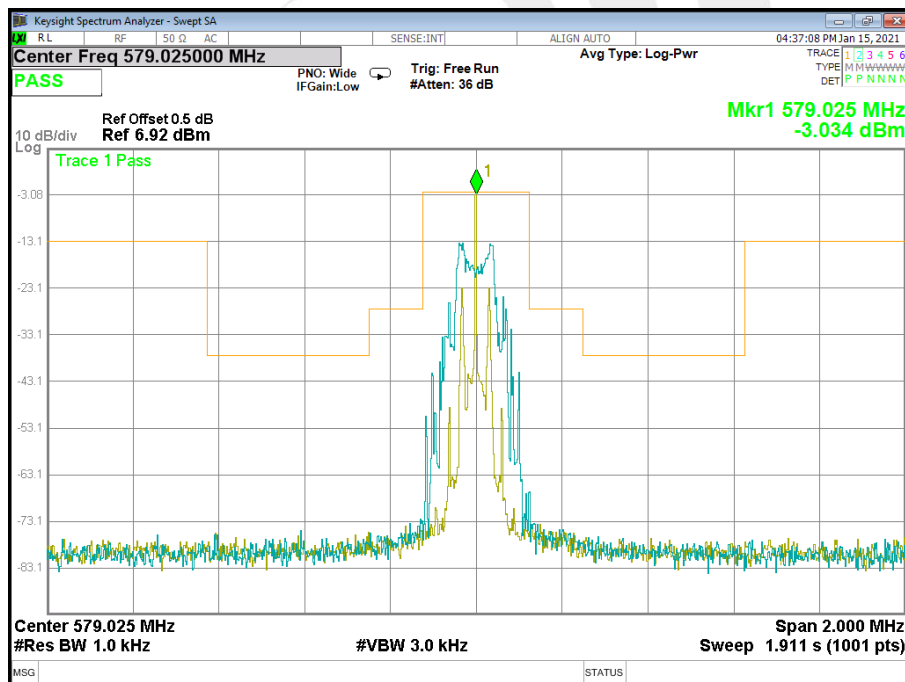


Band B

Emission Mask Low Channel

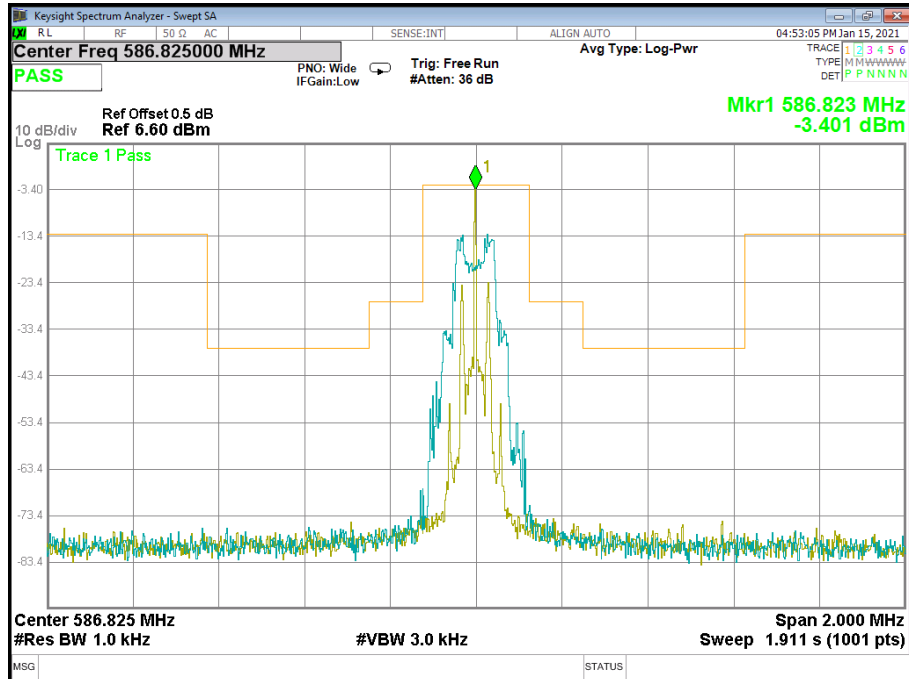


Emission Mask Mid Channel





Emission Mask High Channel

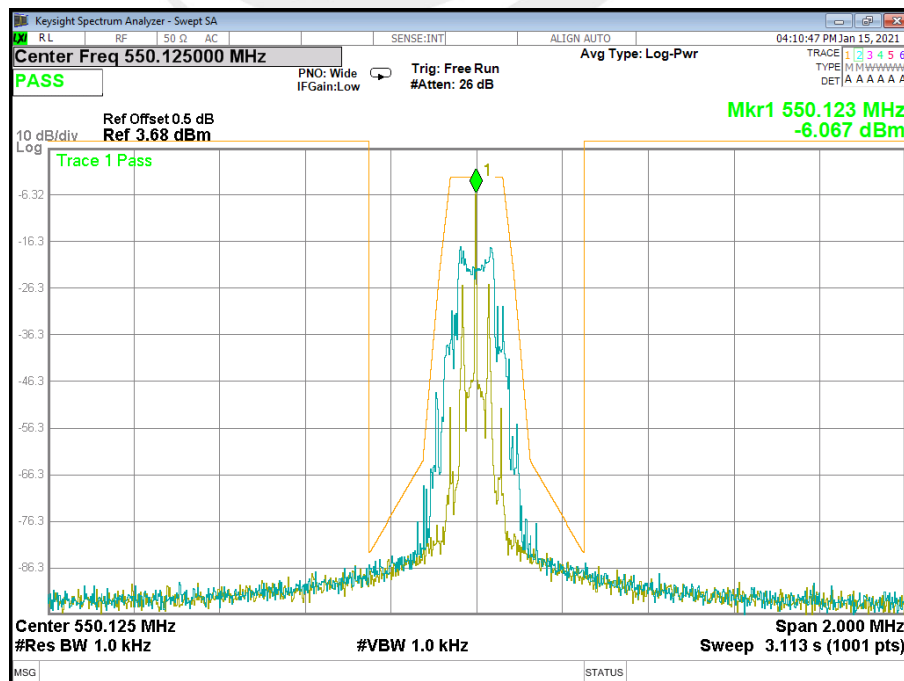
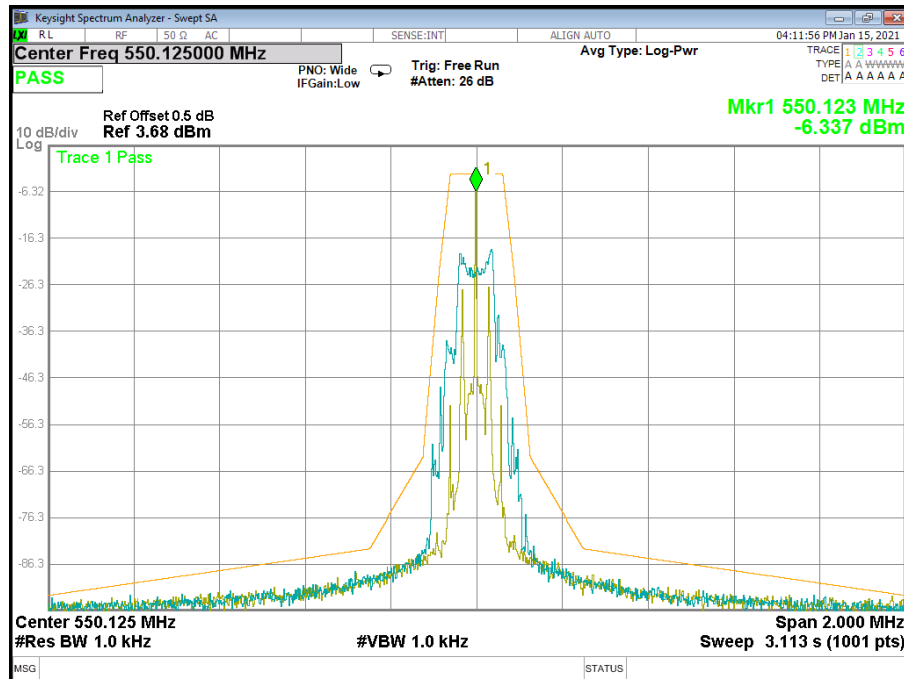


**Emission Mask II**

ETSI EN 300 422-1 V1.5.1 Clause 8.3.1.2 The Maximum Measurement of Necessary Bandwidth
Test Plot:

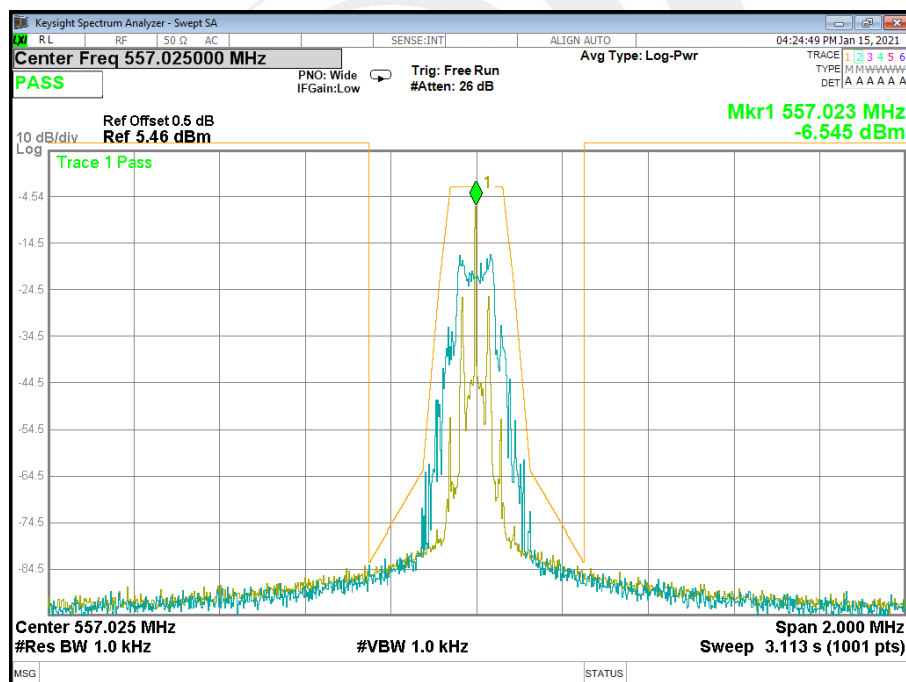
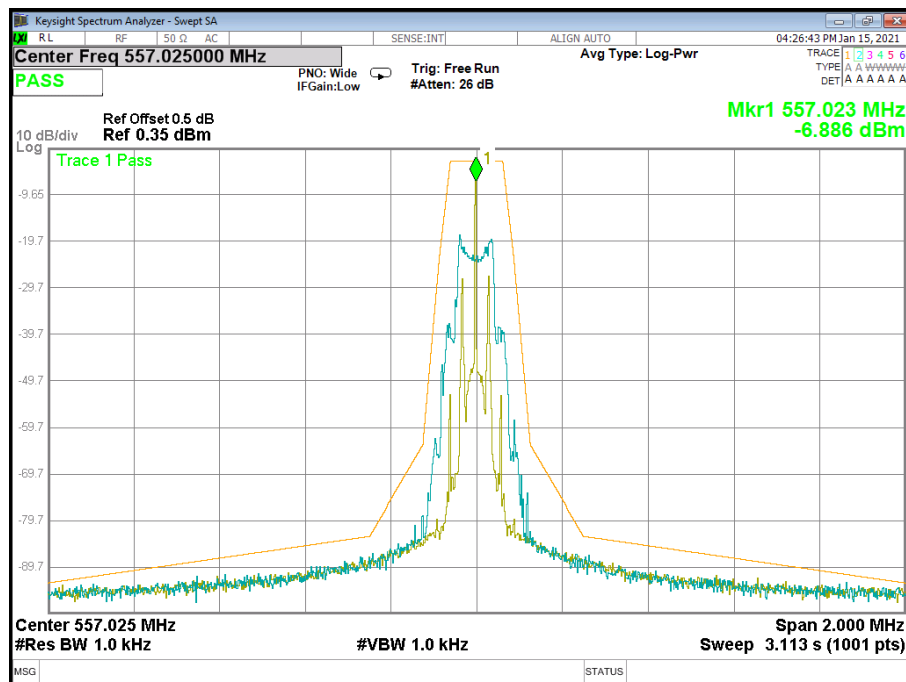
Band A

Frequency	Declared Bandwidth	B/2	0.35B
550.125 MHz	150K	75K	52.5K
557.025 MHz	150K	75K	52.5K
564.825 MHz	150K	75K	52.5K

Low CH

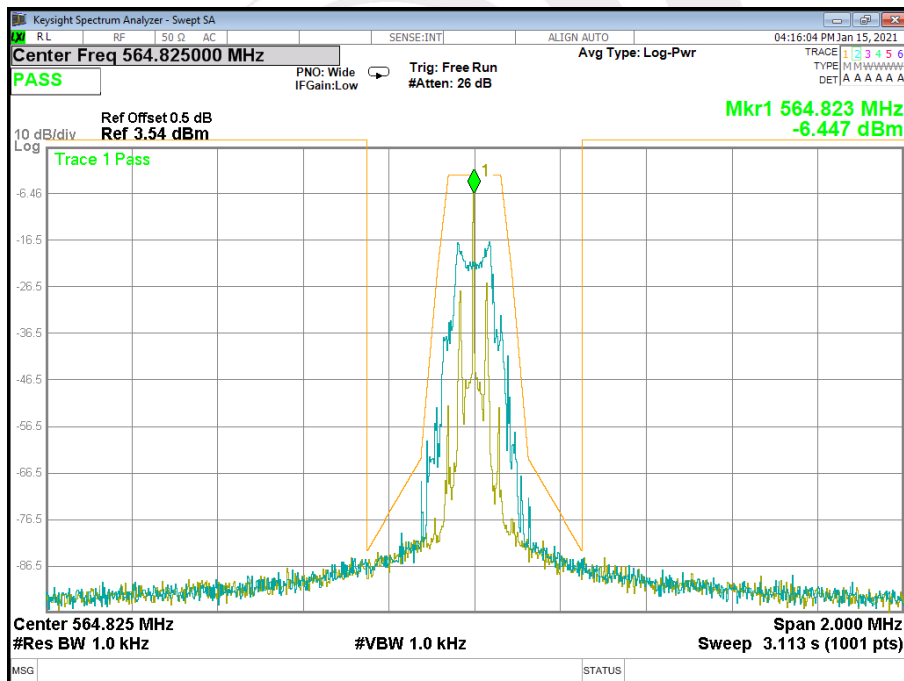
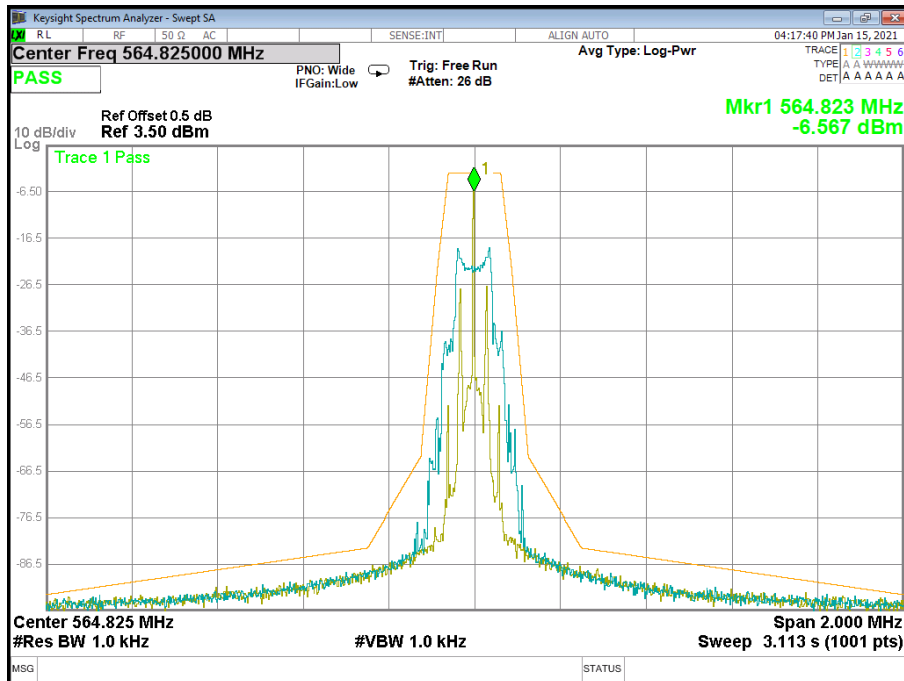


Mid CH





High CH

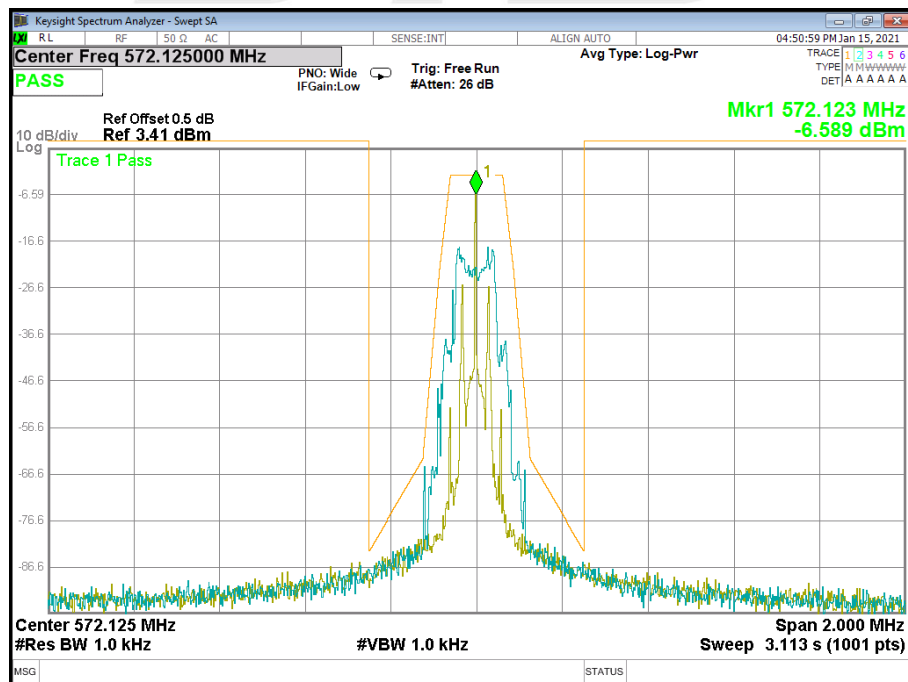
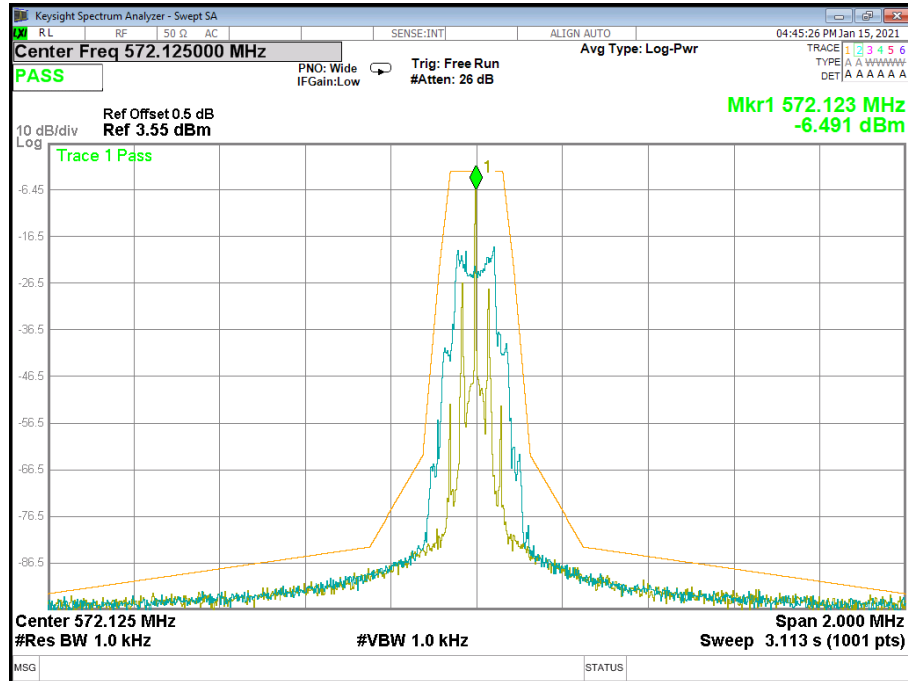




Band B

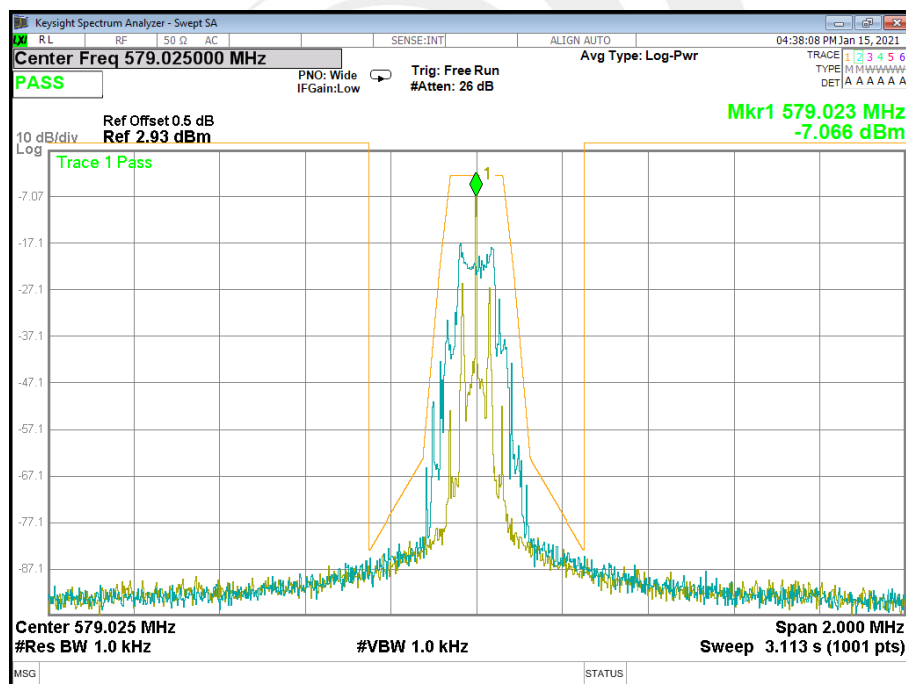
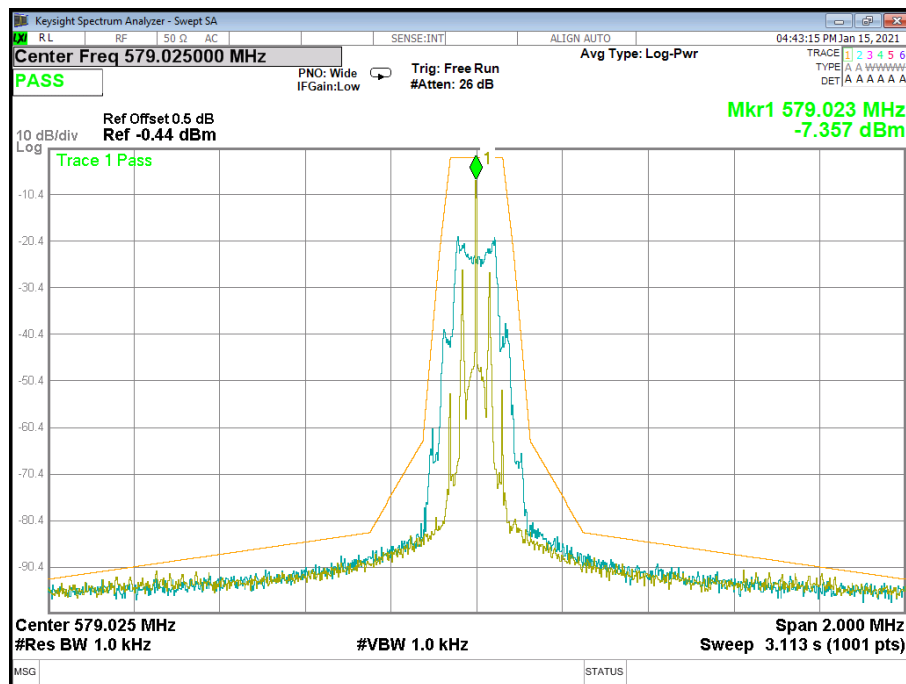
Frequency	Declared Bandwidth	B/2	0.35B
572.125 MHz	150K	75K	52.5K
579.025 MHz	150K	75K	52.5K
586.825 MHz	150K	75K	52.5K

Low CH



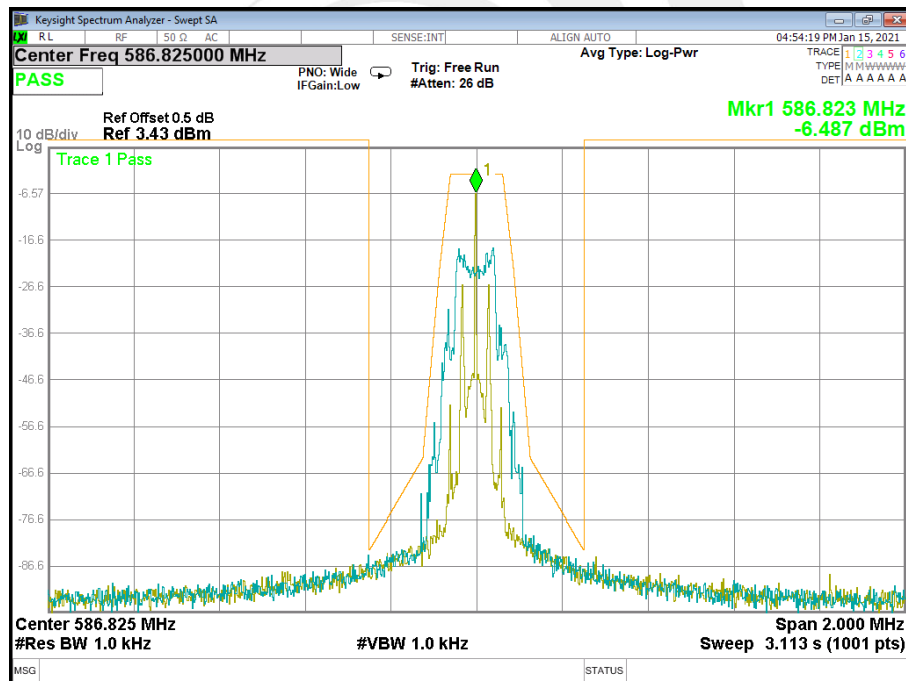
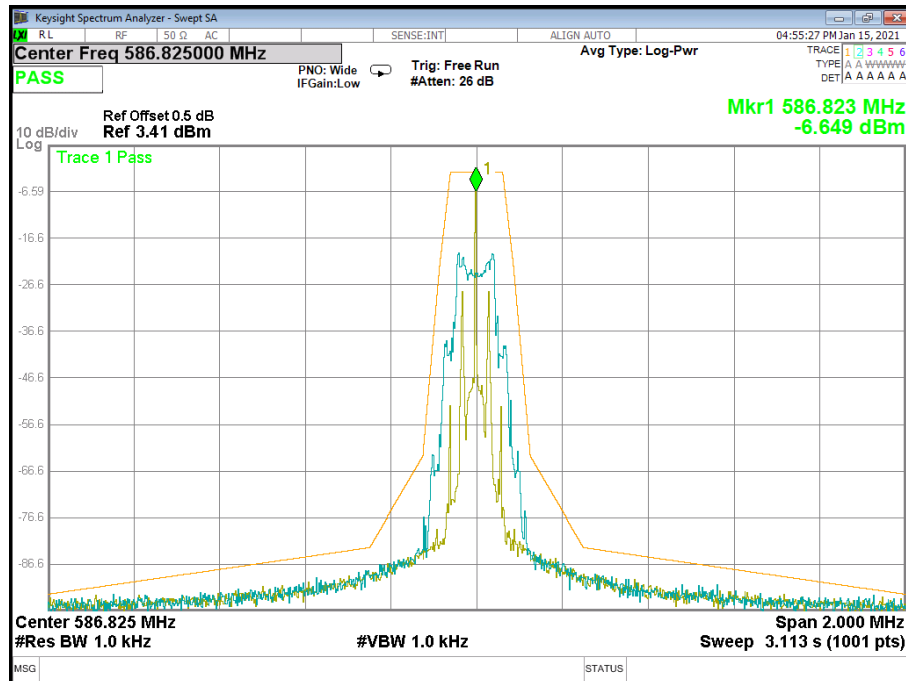


Mid CH





High CH

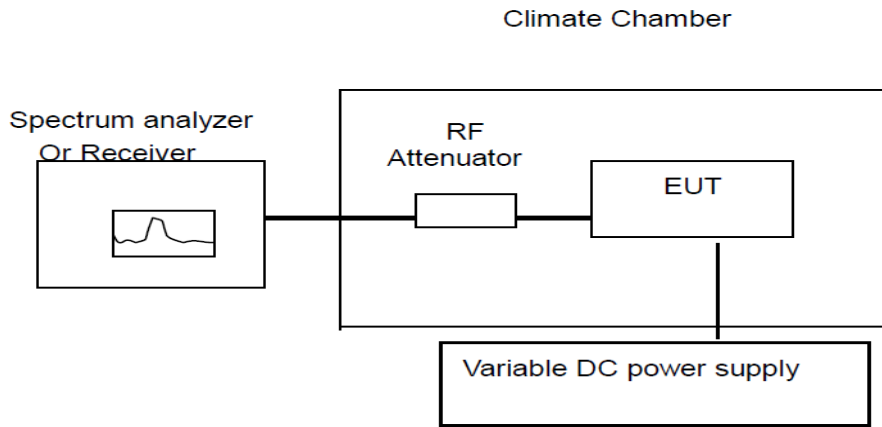


4.4 FREQUENCY STABILITY VS. TEMPERATURE & VOLTAGE

TEST LIMIT

According to CFR 47 section 74.861 e (4), the frequency tolerance of the transmitter shall be 0.005 percent.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. The DC leads and the RF output cable, exited the chamber through an opening made for that purpose.

After the temperature stabilized the frequency output was recorded from the counter.

An external variable DC power supply was connected to the battery terminals of the equipment under test.

- b. For hand carried, battery powered equipment primary supply voltage was reduced to the battery operating end point as specified by the manufacturer. The output frequency was recorded for each battery voltage.

**TEST RESULTS**

- (1) Frequency stability versus input voltage (Supply Nominal voltage is DC 3.7V)
- (2) Frequency stability versus input voltage (Supply battery operating end point which shall be specified by the manufacturer DC 4.07V)

Band A

Reference Frequency: 550.125MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	1228	0.000223
3.70V, DC	20	1229	0.000223
4.07V, DC	20	1227	0.000223
BEP	20	1227	0.000223

Reference Frequency: 550.125MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	1229	0.000223	0.00500	PASS
40	1226	0.000223		
30	1226	0.000223		
20	1228	0.000223		
10	1227	0.000223		
0	1228	0.000223		
-10	1230	0.000224		
-20	1227	0.000223		
-30	1230	0.000224		



Reference Frequency: 557.025MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	2417	0.000434
3.70V, DC	20	2415	0.000434
4.07V, DC	20	2417	0.000434
BEP	20	2416	0.000434

Reference Frequency: 557.025MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	2414	0.000433	0.00500	PASS
40	2415	0.000434		
30	2414	0.000433		
20	2414	0.000433		
10	2416	0.000434		
0	2413	0.000433		
-10	2414	0.000433		
-20	2414	0.000433		
-30	2416	0.000434		



Reference Frequency: 564.825MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	2260	0.000400
3.70V, DC	20	2257	0.000400
4.07V, DC	20	2258	0.000400
BEP	20	2258	0.000400

Reference Frequency: 564.825MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	2259	0.000400	0.00500	PASS
40	2258	0.000400		
30	2260	0.000400		
20	2257	0.000400		
10	2257	0.000400		
0	2256	0.000399		
-10	2258	0.000400		
-20	2258	0.000400		
-30	2257	0.000400		

**Band B**

Reference Frequency: 572.125MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	2228	0.000389
3.70V, DC	20	2227	0.000389
4.07V, DC	20	2226	0.000389
BEP	20	2225	0.000389

Reference Frequency: 572.125MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	2228	0.000389	0.00500	PASS
40	2225	0.000389		
30	2225	0.000389		
20	2227	0.000389		
10	2227	0.000389		
0	2226	0.000389		
-10	2226	0.000389		
-20	2225	0.000389		
-30	2224	0.000389		



Reference Frequency: 579.025MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	1083	0.000187
3.70V, DC	20	1082	0.000187
4.07V, DC	20	1084	0.000187
BEP	20	1082	0.000187

Reference Frequency: 579.025MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	1082	0.000187	0.00500	PASS
40	1080	0.000187		
30	1082	0.000187		
20	1083	0.000187		
10	1084	0.000187		
0	1082	0.000187		
-10	1081	0.000187		
-20	1083	0.000187		
-30	1082	0.000187		



Reference Frequency: 586.825MHz			
Power Supply	Environment Temperature (°C)	Frequency Error (Hz)	Frequency Error (%)
3.33V, DC	20	2240	0.000382
3.70V, DC	20	2241	0.000382
4.07V, DC	20	2241	0.000382
BEP	20	2240	0.000382

Reference Frequency: 586.825MHz				
Environment Temperature(°C)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	2241	0.000382	0.00500	PASS
40	2243	0.000382		
30	2239	0.000382		
20	2242	0.000382		
10	2242	0.000382		
0	2242	0.000382		
-10	2242	0.000382		
-20	2243	0.000382		
-30	2242	0.000382		



4.5 OCCUPIED BANDWIDTH

TEST LIMIT

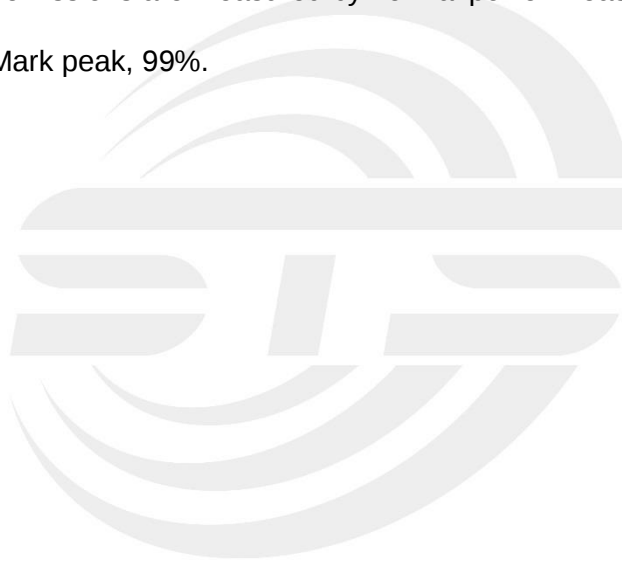
According to CFR 47 section 74.861 e (5), the operating bandwidth shall no exceed 200 KHz.
Near the carrier an emission mask is defined by the standard.

TEST CONFIGURATION



TEST PROCEDURE

- a. The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.
Set Occupied Bandwidth was measured with a occupied bandwidth function of the analyzer.
- b. The near the carrier emissions are measured by normal power measurement function of the analyzer.
- c. Set SPA Max hold. Mark peak, 99%.



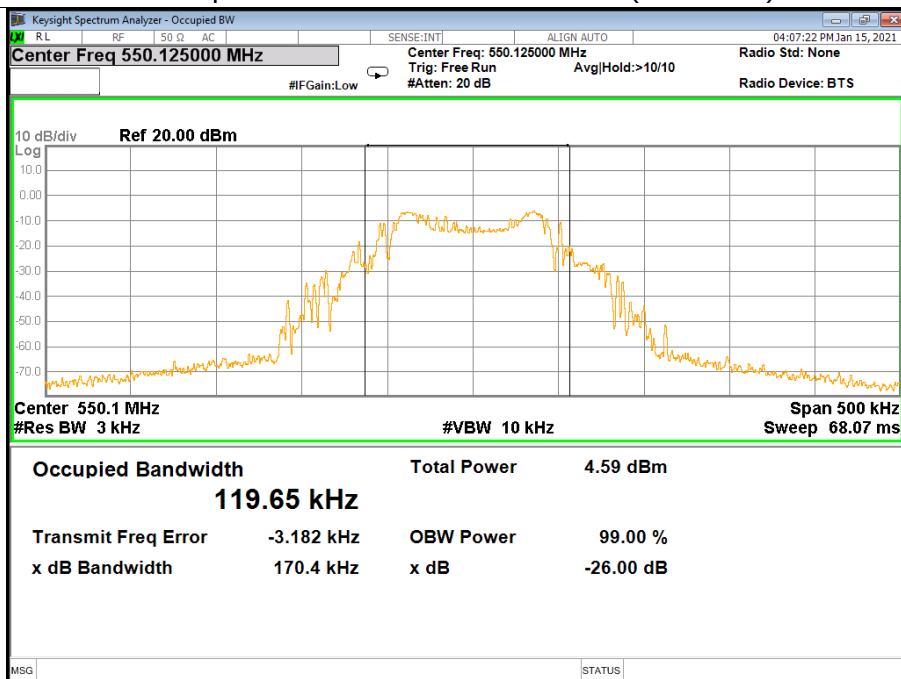


TEST RESULT

Band A

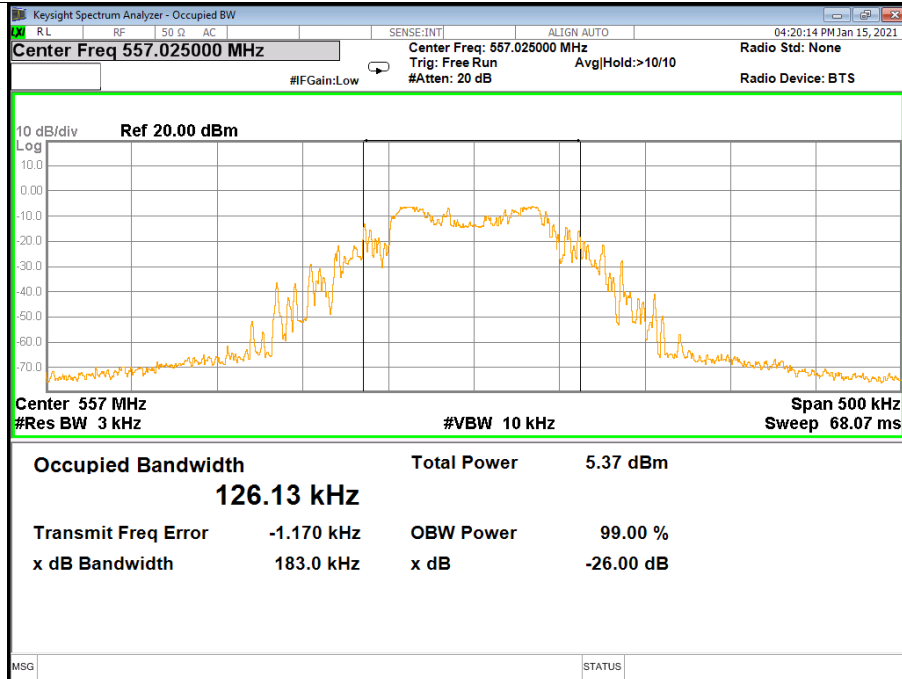
Frequency(MHz)	Occupied Bandwidth(KHz)	Limit(KHz)
550.125	119.65	200
557.025	126.13	200
564.825	125.83	200

Occupied bandwidth of Low Channel (Maximum)

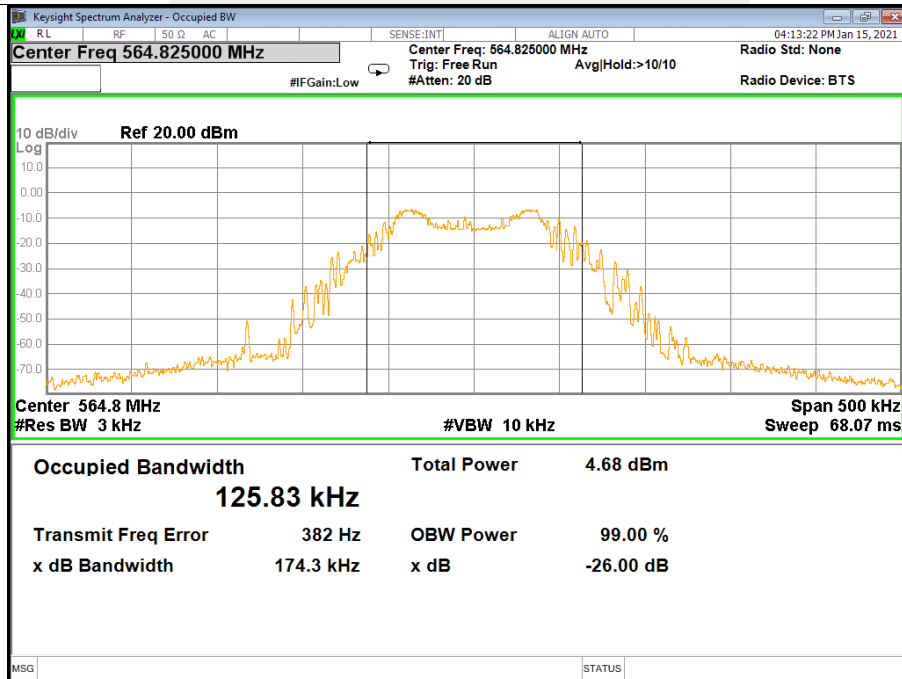




Occupied bandwidth of Mid Channel (Maximum)



Occupied bandwidth of High Channel (Maximum)

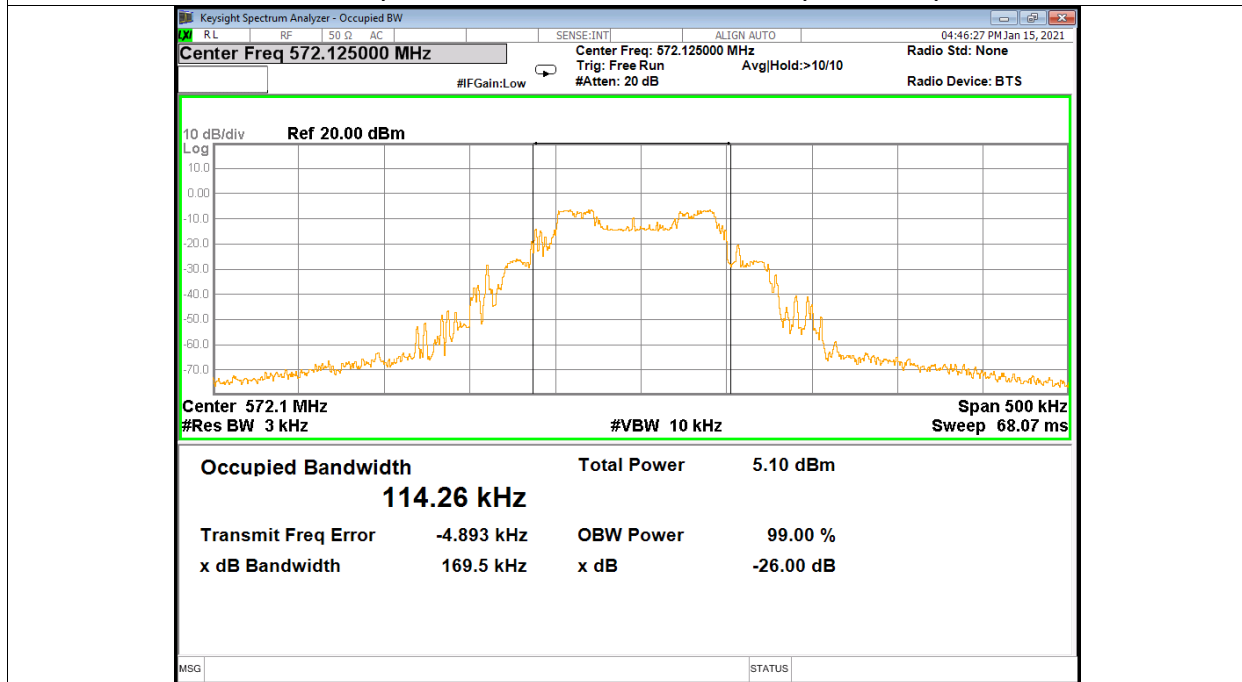




Band B

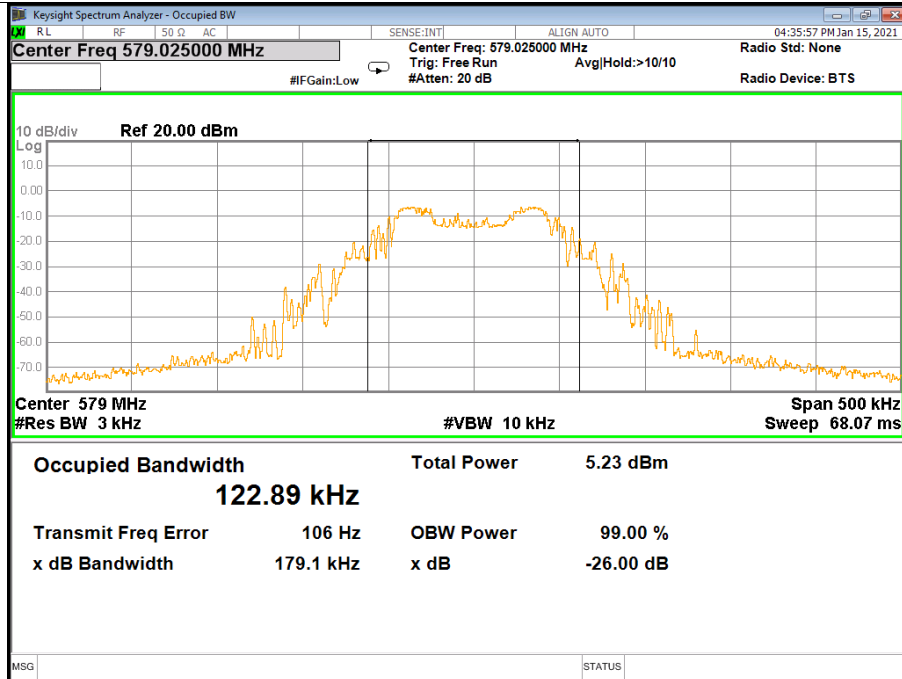
Frequency(MHz)	Occupied Bandwidth(KHz)	Limit(KHz)
572.125	114.26	200
579.025	122.89	200
586.825	122.14	200

Occupied bandwidth of Low Channel (Maximum)

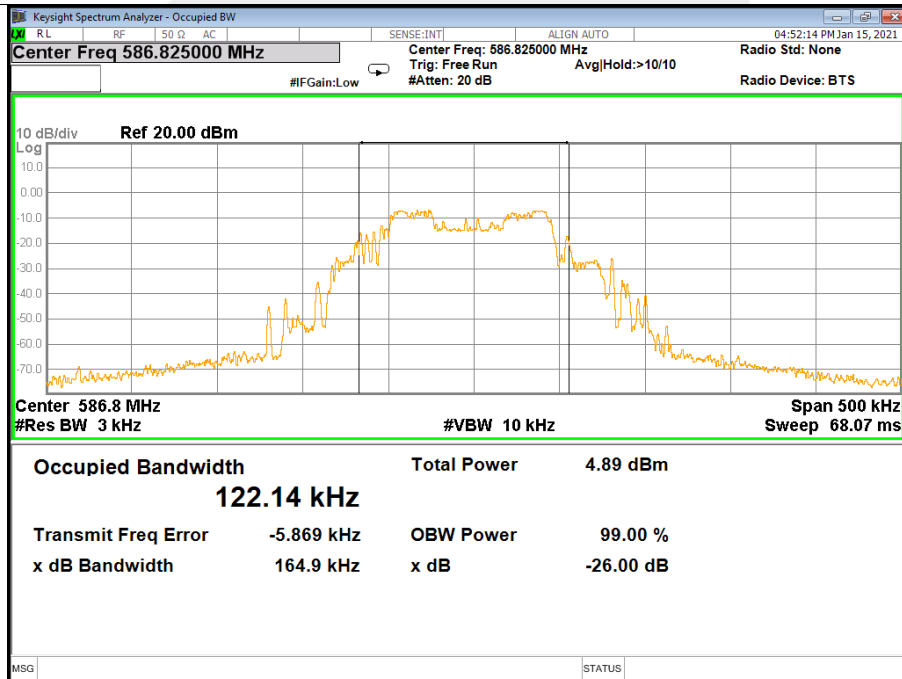




Occupied bandwidth of Mid Channel (Maximum)



Occupied bandwidth of High Channel (Maximum)



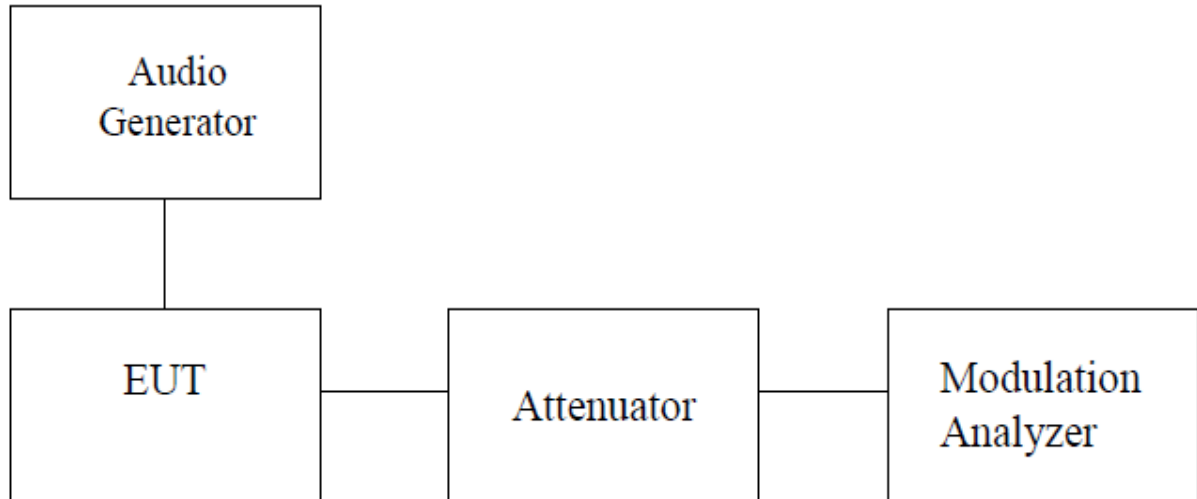
4.6 AUDIO FREQUENCY RESPONSE

TEST LIMIT

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic. The frequency response of the audio modulation part is measured over a frequency range of 100 Hz to 5000 Hz.

According to CFR 47 section 74.861 e (1), any form of modulation may be used. A maximum deviation of ± 75 KHz is permitted when frequency modulation is employed.

TEST CONFIGURATION



TEST PROCEDURE

- The audio frequency response is the degree of the closeness to which the frequency deviation of the transmitter follows prescribed characteristics.
- The frequency response of the audio modulation part is measured over a frequency range of 100Hz to 5000 Hz.
- For 1000 Hz tone reference signal the audio generator level is adjusted to get 20% of the rated system deviation.
The deviations obtained over the frequency range from 100 HZ to 5000 Hz are recorded and
- compared with the reference deviation as follows:
$$\text{Audio Frequency Response} = 20 \log (\text{DEV freq} / \text{Dev ref})$$

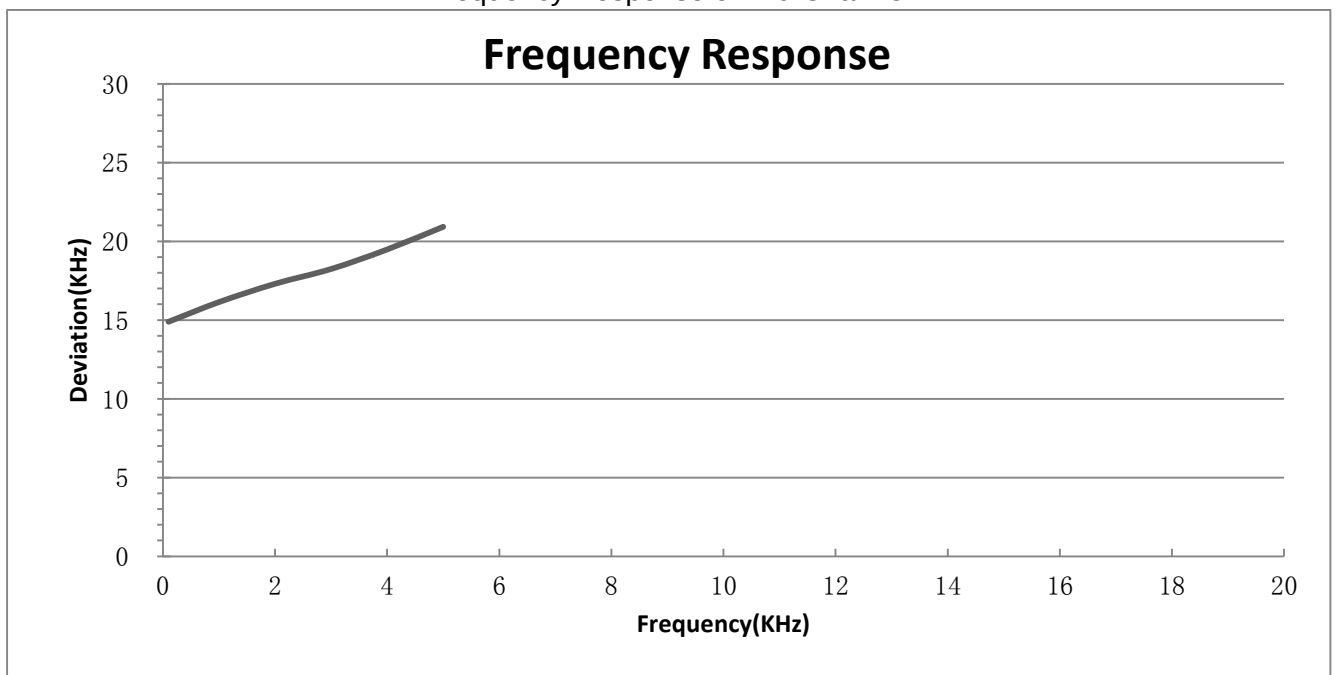
**TEST RESULT**

Audio Frequency Response:

Band A

Frequency(KHz)	Deviation(KHz)
0.01	14.89
1	16.14
2	17.30
3	18.24
4	19.48
5	20.92

Frequency Response of Mid Channel

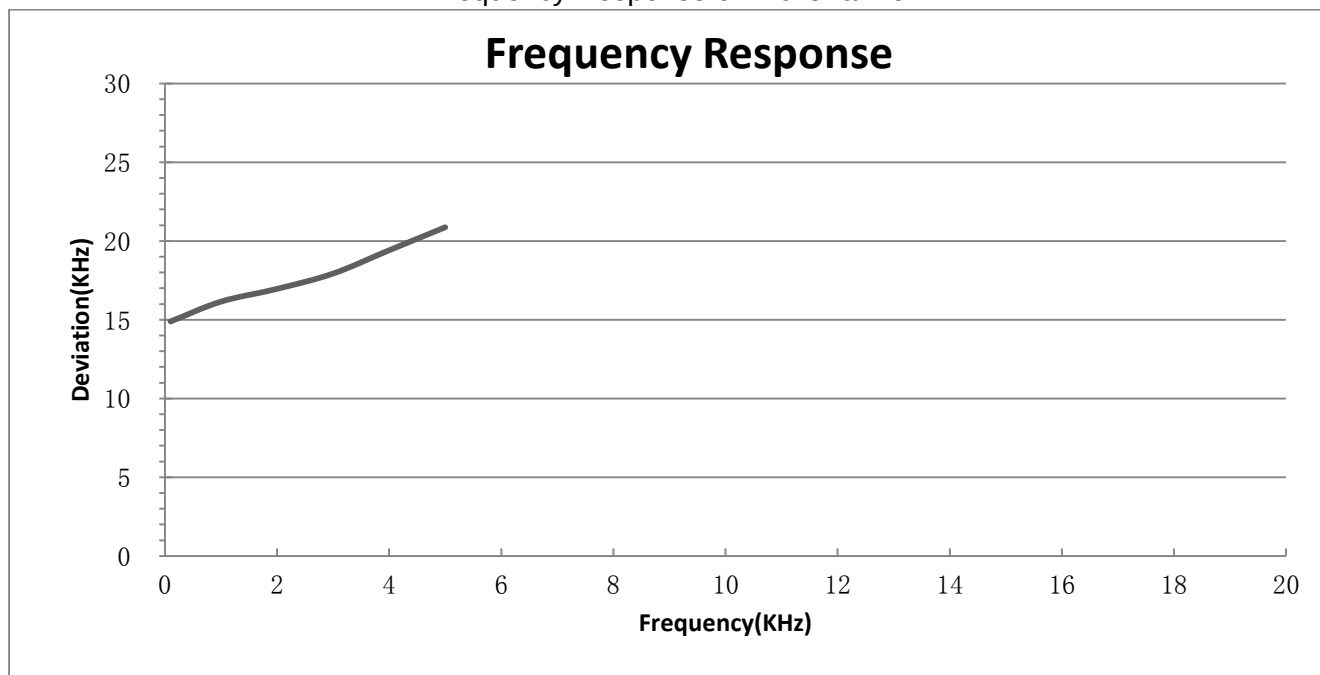




Band B

Frequency(KHz)	Deviation(KHz)
0.01	14.89
1	16.15
2	16.96
3	17.93
4	19.41
5	20.87

Frequency Response of Mid Channel



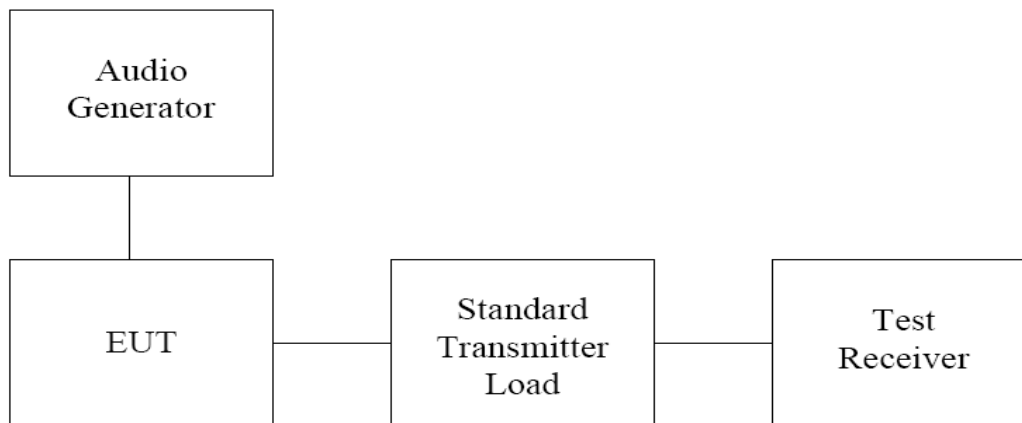
4.7 MODULATION DEVIATION

TEST LIMIT

According to CFR 47 section 2.1047 a, for Voice modulation communication equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000 Hz shall be measured.

According to CFR 47 section 74.861 e (3), any form of modulation may be used. A maximum deviation of ± 75 KHz is permitted when frequency modulation is employed.

TEST CONFIGURATION



TEST PROCEDURE

- Modulation limits is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of rated system deviation.
- The audio signal generator is connected to the audio input of the EUT with its full rating.
- The modulation response is measured at certain modulation frequencies, related to 1000 Hz reference signal.
- Tests are performed for positive and negative modulation.

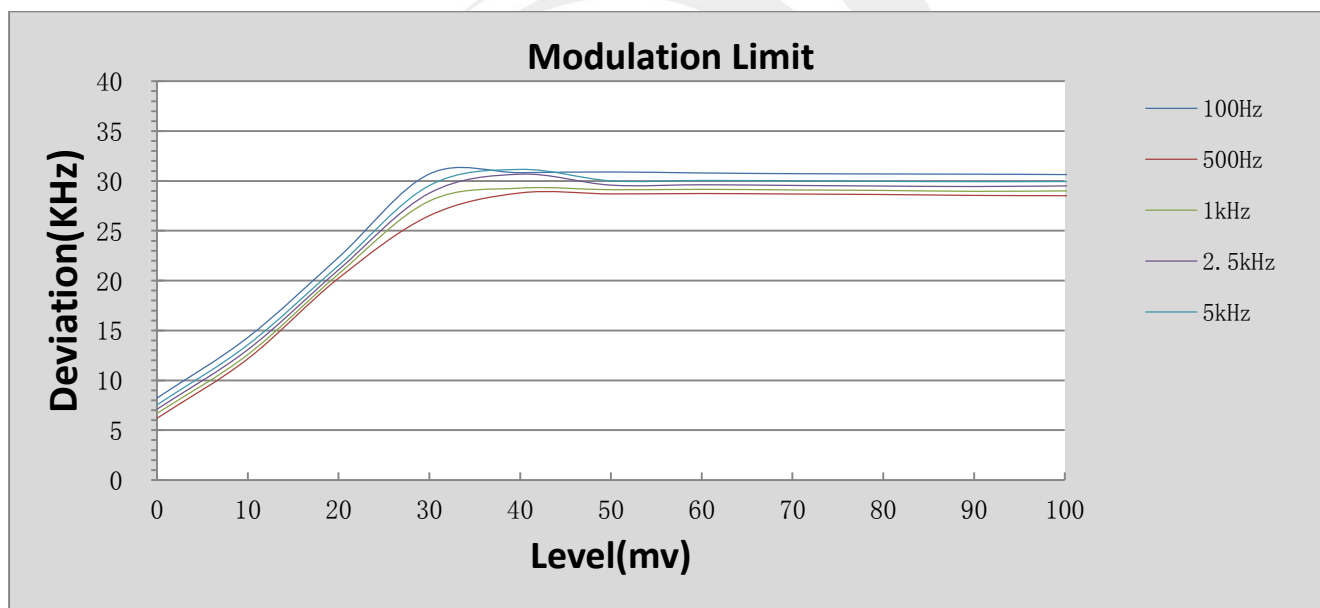
**TEST RESULT**

Modulation Deviation

Band A

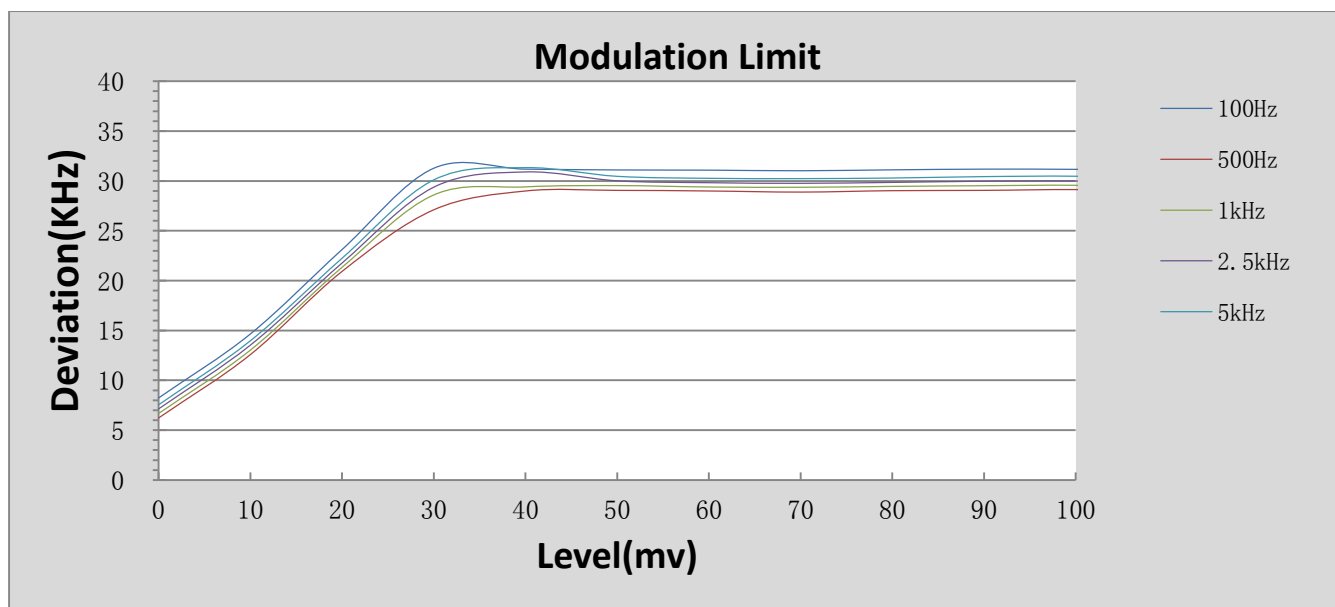
Level(mv)	100Hz	500Hz	1kHz	2.5kHz	5kHz
0	8.23	6.20	6.69	7.11	7.55
10	14.31	12.16	12.59	13.08	13.57
20	22.34	20.25	20.68	21.09	21.53
30	30.70	26.52	27.99	28.78	29.54
40	30.83	28.80	29.28	30.68	31.16
50	30.90	28.70	29.12	29.58	30.01
60	30.80	28.74	29.16	29.62	30.05
70	30.73	28.69	29.10	29.55	30.01
80	30.70	28.64	29.05	29.49	29.96
90	30.68	28.55	28.96	29.44	29.93
100	30.64	28.52	29.00	29.50	29.94
110	30.56	28.50	29.00	29.48	29.97

Modulation Deviation of Mid Channel



**Band B**

Level(mv)	100Hz	500Hz	1kHz	2.5kHz	5kHz
0	8.23	6.22	6.67	7.13	7.54
10	14.64	12.57	13.02	13.52	13.96
20	23.11	20.92	21.33	21.76	22.24
30	31.27	27.10	28.59	29.37	30.10
40	31.18	28.99	29.40	30.90	31.33
50	31.10	29.05	29.53	30.01	30.46
60	31.08	28.99	29.39	29.82	30.26
70	31.02	28.88	29.36	29.76	30.23
80	31.11	29.02	29.45	29.85	30.29
90	31.18	29.05	29.52	29.97	30.43
100	31.16	29.13	29.56	29.99	30.47
110	31.06	28.93	29.34	29.76	30.21

Modulation Deviation of Mid Channel

4.8 RF OUTPUT POWER

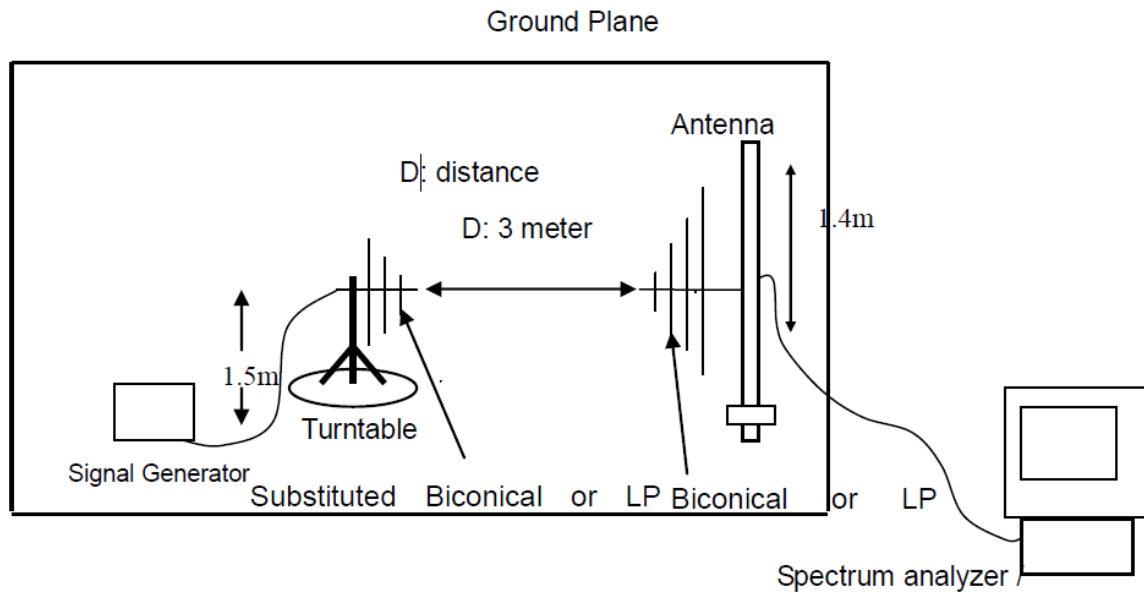
TEST LIMIT

According to CFR 47 section 74.861 e (1), the power of the measured unmodulated carrier power at the output of the transmitter power amplifier (antenna input power) may not exceed the following:

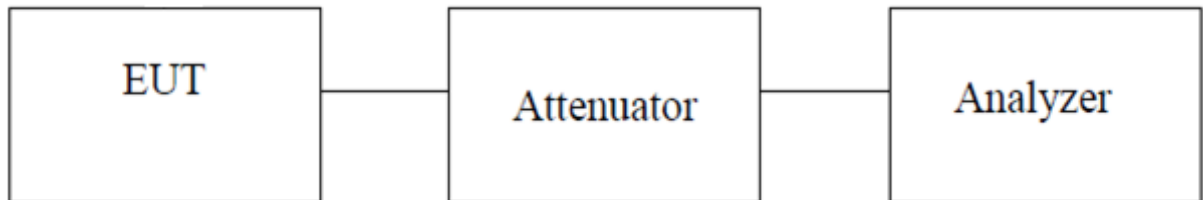
- (i) 54-72, 76-88, and 174-216 MHz bands: 50 mW EIRP
- (ii) 470-608 and 614-698: 250 mW conducted power
- (iii) 600 MHz duplex gap: 20 mW EIRP

TEST CONFIGURATION

Radiation



Conduction



TEST PROCEDURE(Radiation)

- a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- c. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- d. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.



- h The maximum signal level detected by the measuring receiver shall be noted.
- i The measurement shall be repeated with the test antenna set to horizontal polarization.
- j Replace the antenna with a proper Antenna (substitution antenna).
- k The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- l The substitution antenna shall be connected to a calibrated signal generator.
- m If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- n The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- o The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- p The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- q The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

TEST PROCEDURE (Conduction)

- a. The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.
- b. Set the RBW >20BW, VBW>3xRBW.
- c. Detector = peak.
- d. Sweep time = auto couple.
- e. Trace mode = max hold.
- f. Allow trace to fully stabilize.
- g. Use the peak marker function to determine the maximum amplitude level.

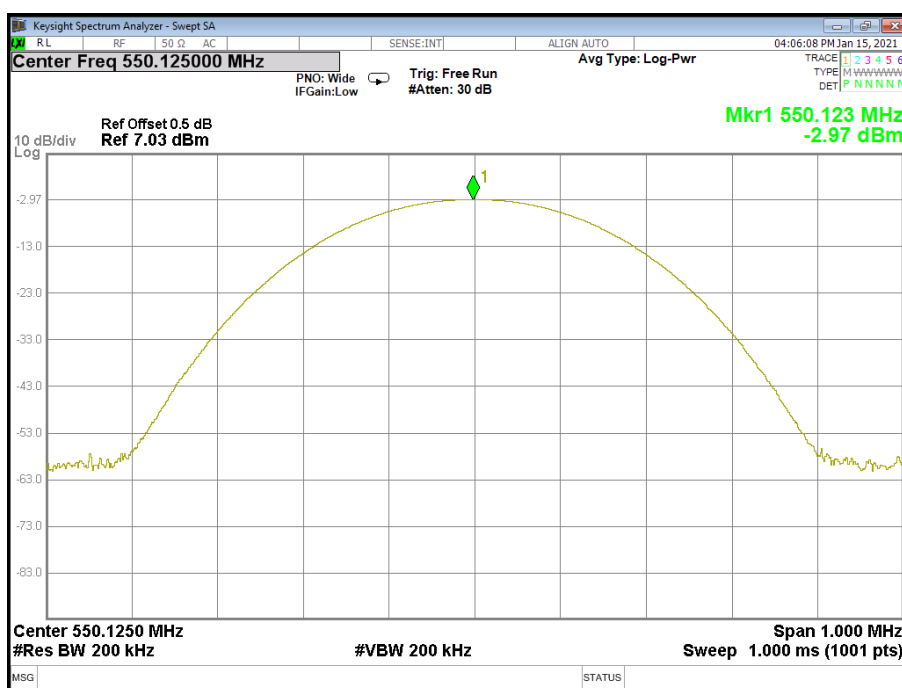


TEST RESULT

Band A

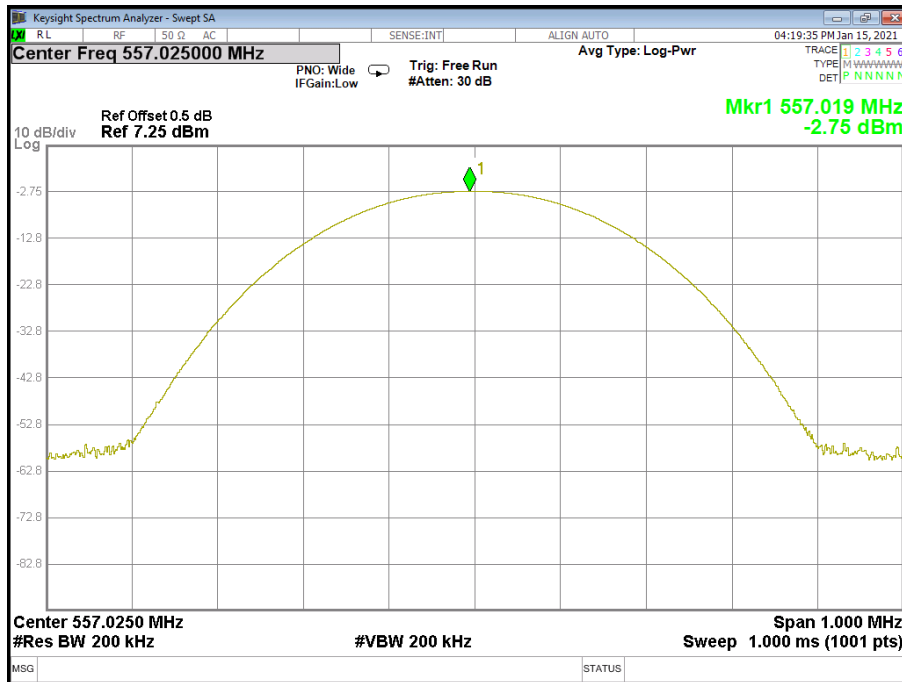
Frequency Channel (MHz)	Peak Output Power (dBm)	Transmitter Power (mW)	Limits (mW)
550.125	-2.97	0.505	250
557.025	-2.75	0.531	250
564.825	-3.21	0.478	250

Low Channel

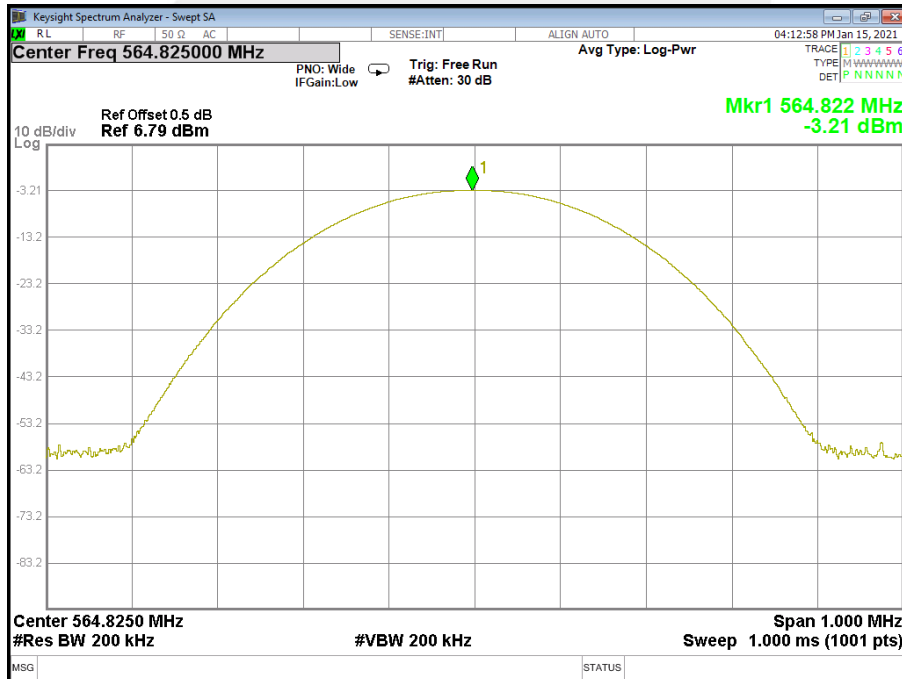




Mid Channel



High Channel





Band B

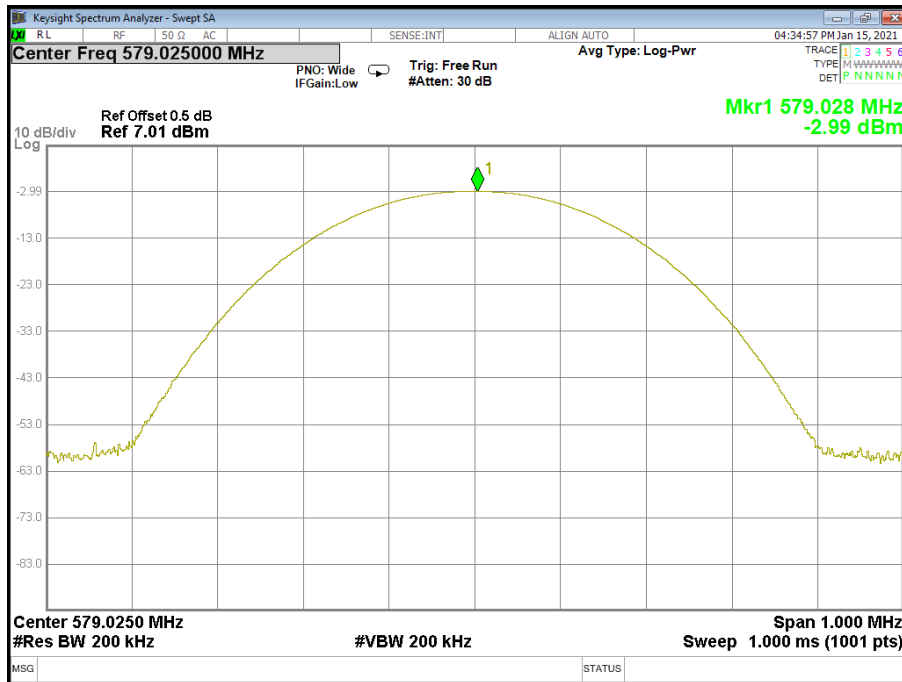
Frequency Channel (MHz)	Peak Output Power (dBm)	Transmitter Power (mW)	Limits (mW)
572.125	-2.81	0.524	250
579.025	-2.99	0.502	250
586.825	-3.34	0.463	250

Low Channel

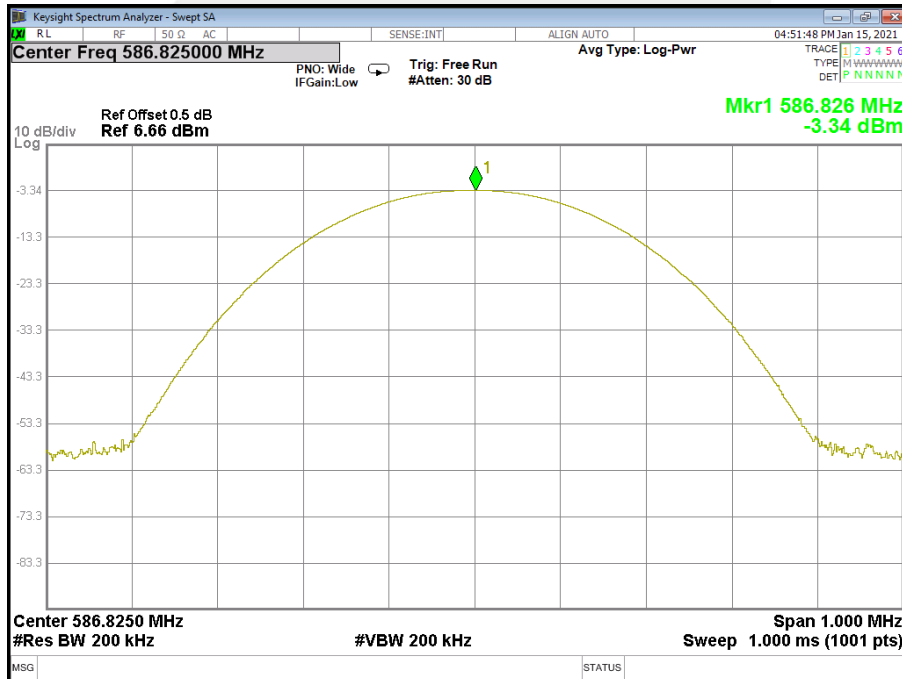




Mid Channel



High Channel





4.9 CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Conducted Emissionlimit (dBUV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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.

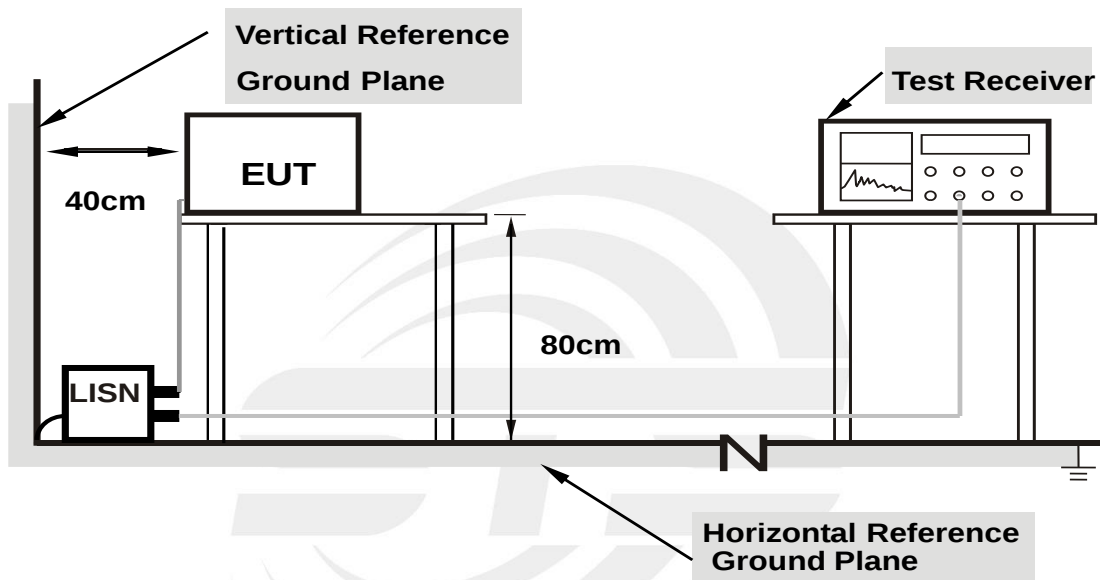
The following table is the setting of the receiver

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

TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- 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.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



Note: 1. Support units were connected to second LISN.

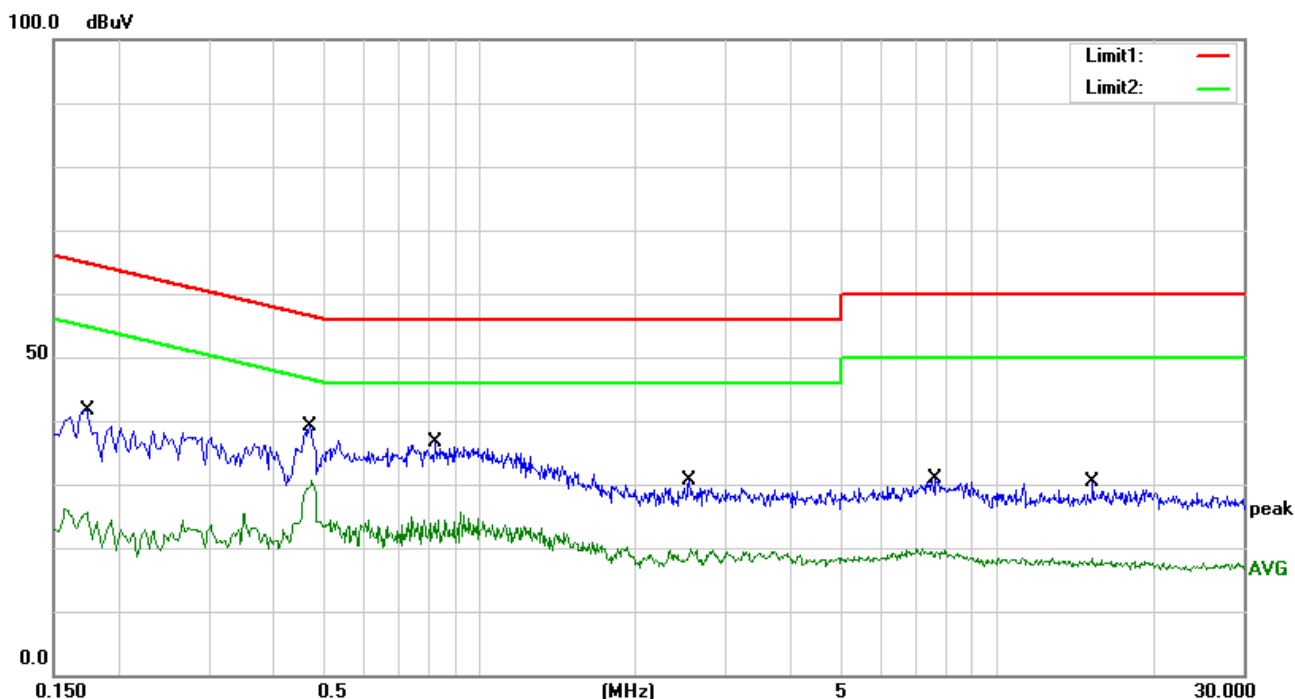
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

EUT OPERATING 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.

**TEST RESULT**

Temperature:	24.5°C	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 1/2/3(Mode 2 worst mode)		



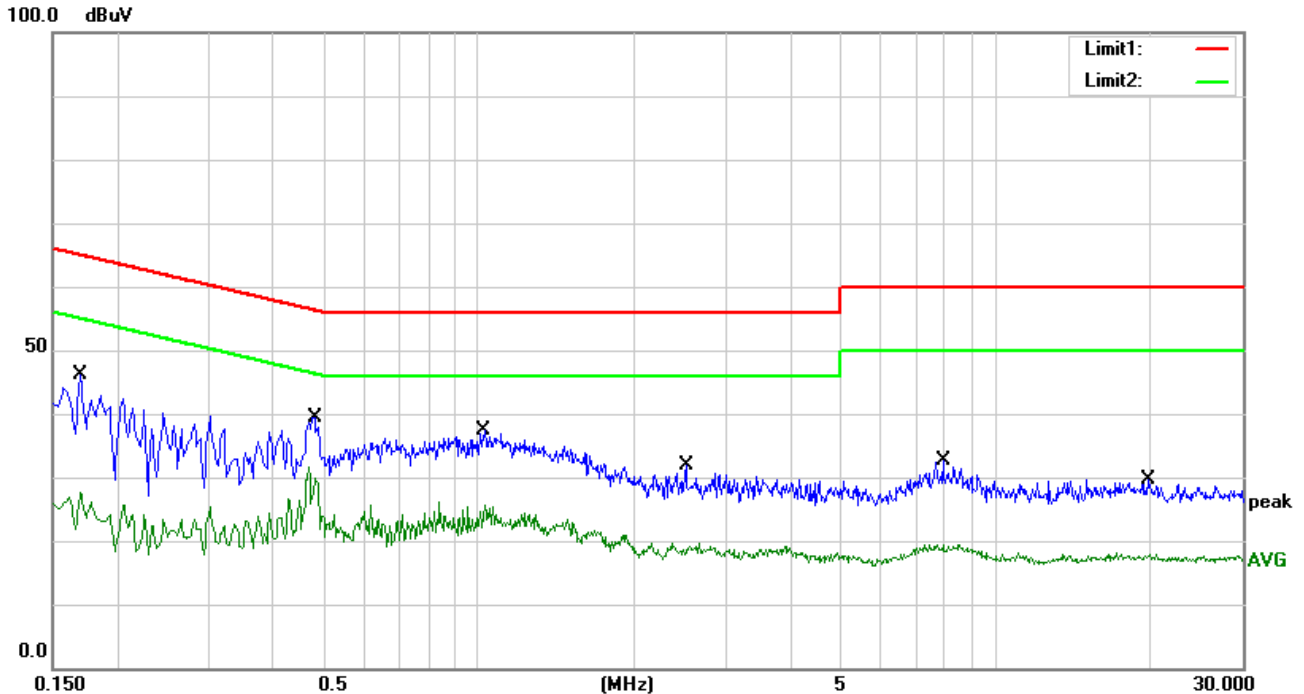
Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) - Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1740	21.41	20.26	41.67	64.77	-23.10	QP
2	0.1740	5.22	20.26	25.48	54.77	-29.29	AVG
3	0.4700	18.66	20.45	39.11	56.51	-17.40	QP
4	0.4700	10.15	20.45	30.60	46.51	-15.91	AVG
5	0.8220	16.36	20.23	36.59	56.00	-19.41	QP
6	0.8220	3.73	20.23	23.96	46.00	-22.04	AVG
7	2.5420	10.50	20.12	30.62	56.00	-25.38	QP
8	2.5420	-0.26	20.12	19.86	46.00	-26.14	AVG
9	7.6460	11.11	19.89	31.00	60.00	-29.00	QP
10	7.6460	-0.19	19.89	19.70	50.00	-30.30	AVG
11	15.3380	10.35	20.10	30.45	60.00	-29.55	QP
12	15.3380	-2.07	20.10	18.03	50.00	-31.97	AVG



Temperature:	24.5°C	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 1/2/3(Mode 2 worst mode)		



Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1700	25.91	20.24	46.15	64.96	-18.81	QP
2	0.1700	7.40	20.24	27.64	54.96	-27.32	AVG
3	0.4820	19.00	20.44	39.44	56.30	-16.86	QP
4	0.4820	9.49	20.44	29.93	46.30	-16.37	AVG
5	1.0300	17.15	20.16	37.31	56.00	-18.69	QP
6	1.0300	5.44	20.16	25.60	46.00	-20.40	AVG
7	2.5220	11.79	20.12	31.91	56.00	-24.09	QP
8	2.5220	-1.03	20.12	19.09	46.00	-26.91	AVG
9	7.9300	12.65	19.88	32.53	60.00	-27.47	QP
10	7.9300	-0.76	19.88	19.12	50.00	-30.88	AVG
11	19.7140	9.09	20.62	29.71	60.00	-30.29	QP
12	19.7140	-2.76	20.62	17.86	50.00	-32.14	AVG



PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

