



Radio Test Report

Report No.: STS2505036W05

Issued for

Sound Devices, LLC

E7556 State Road 23 and 33, Reedsburg, WI 53959, United
States Of America

Product Name: Professional Handheld Wireless
Microphone

Brand Name: N/A

Model Name: ASTRAL HH

Series Model(s): N/A

FCC ID: 2AKLX-28297

Test Standards: FCC Part 74 Rules

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**TEST REPORT**

Applicant's Name: Sound Devices, LLC
Address.....: E7556 State Road 23 and 33, Reedsburg, WI 53959, United States Of America
Manufacturer's Name: Sound Devices, LLC
Address.....: E7556 State Road 23 and 33, Reedsburg, WI 53959, United States Of America

Product Description

Product Name: Professional Handheld Wireless Microphone
Brand Name: N/A
Model Name.....: ASTRAL HH
Series Model: N/A

Test Standards: FCC Part 74 Rules

Test Procedure.....: ANSI C63.10-2020; 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: 09 May 2025
Date of performance of tests.....: 09 May 2025~17 Sept. 2025
Date of Issue: 17 Sept. 2025
Test Result.....: Pass

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Skylar Li

(Skylar Li)

Authorized Signatory :

Bovey Yang

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	17 Sept. 2025	STS2505036W05	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)	N/A
FCC 2.1047 (a)	Audio Frequency Response	Refer to 2.1047(a)	N/A
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. :101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai 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 expended 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	$\pm 0.755\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.874\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.18\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.90\text{dB}$
6	All emissions, radiated >6G	$\pm 5.24\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.19\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.53\text{dB}$
9	Occupied Channel Bandwidth	$\pm 3.5\%$
10	Duty Cycle	$\pm 3.2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Professional Handheld Wireless Microphone
Brand Name:	N/A
Model Name:	ASTRAL HH
Series Model :	N/A
Model Difference description:	N/A
Operation Frequency Range	653MHz - 657MHz
Modulation mode / type:	Digital modulation
Temperature Range:	-10 °C ~ +40 °C
Test frequency list:	See Note 4.
Power Rating	N/A
Adapter	N/A
Battery	Rated Voltage: DC 3.7V Charge Limit Voltage: DC 4.2V Capacity: 4000mAh
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. 653 MHz - 657MHz

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	653.100	2	653.125	3	653.15	4	653.175
.....		77	655				
150	656.825	151	656.850	152	656.875	153	656.900



3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	Sound Devices	ASTRAL HH	Integrated Antenna	N/A	0.28	Antenna

The EUT antenna is Integrated 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 653MHz - 657MHz		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	653.1
middle	CH77	655
highest	CH153	656.9

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 generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

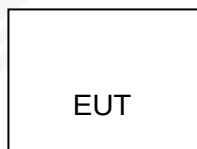
Pretest Mode	Description
Mode 1	Low Channel
Mode 2	Middle Channel
Mode 3	High Channel
Mode 4	AC Charging
Mode 5	2.4G + Microphone
Mode 6	BLE + Microphone

Note:

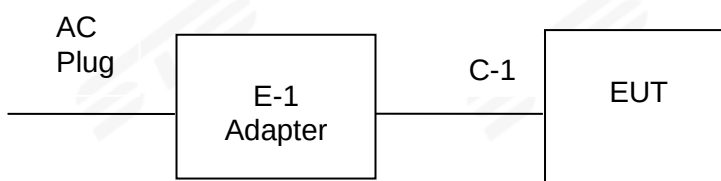
(1) Due to the different configuration and test, in this list only some worse mode. The worst test data of the worse modeis reported by this report.

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



AC Conducted Emission Test



RF 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.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Adapter	ZTC	NB-A515A	N/A
C-1	USB Cable	N/A	TTL-232R-3V3	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Shielded	NO	100cm	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

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Wireless Communications Test Set	R&S	CMW 500	117239	2024.09.23	2025.09.22
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2024.09.23	2025.09.22
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2025.02.22	2026.02.21
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.23	2025.09.22
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Video Controller	SKET	FCS C-3	N/A	N/A	N/A
Bilog Antenna	TESEQ	CBL6111D	34678	2024.09.30	2025.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2024.09.25	2025.09.24
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2023.10.10	2025.10.09
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	N/A	N/A	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC Power Supply	Zhaoxin	RXN 605D	20R605D11010081	N/A	N/A
Test SW	EMC Test Software	15.2.0.339			
AC Connected Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Test Receiver	R&S	ESCI	101427	2024.09.24	2025.09.23
Limtter	CYBERTEK	EM5010	N/A	2024.09.24	2025.09.23
LISN	R&S	ENV216	101242	2024.09.24	2025.09.23
LISN	EMCO	3810/2NM	23625	2024.09.24	2025.09.23
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Test SW	EZ-EMC	Ver.STSLAB-03A1 CE			
RF Connected Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Universal Radio communication tester	R&S	CMU200	119907	2025.02.22	2026.02.21
Signal Generator	Agilent	N5182A	MY46240556	2024.09.23	2025.09.22
Signal Analyzer	Agilent	N9020A	MY52440124	2025.02.22	2026.02.21
Temperature & Humidity Test Chamber	Safety test	AG80L	171200018	2025.02.22	2026.02.21
Programmable Power Supply	Agilent	E3642A	MY40002025	2024.09.23	2025.09.22
Attenuator	HP	8494B	DC-18G	2025.02.25	2026.02.24
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A



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 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 Emission limit (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.

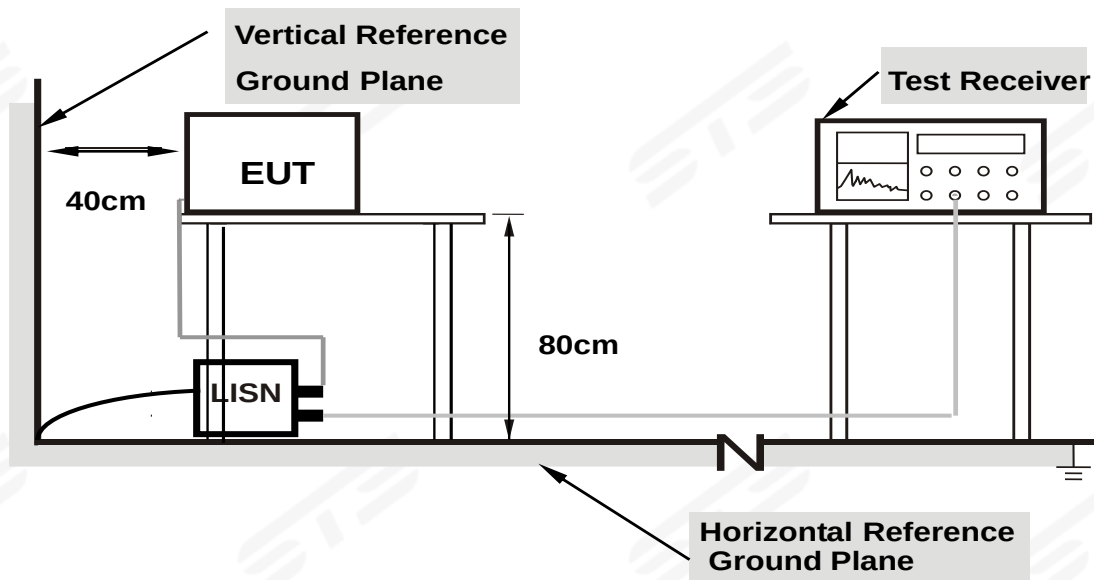
The following table is the setting of the receiver

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

4.1.1 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.

4.1.2 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.

4.1.3 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.



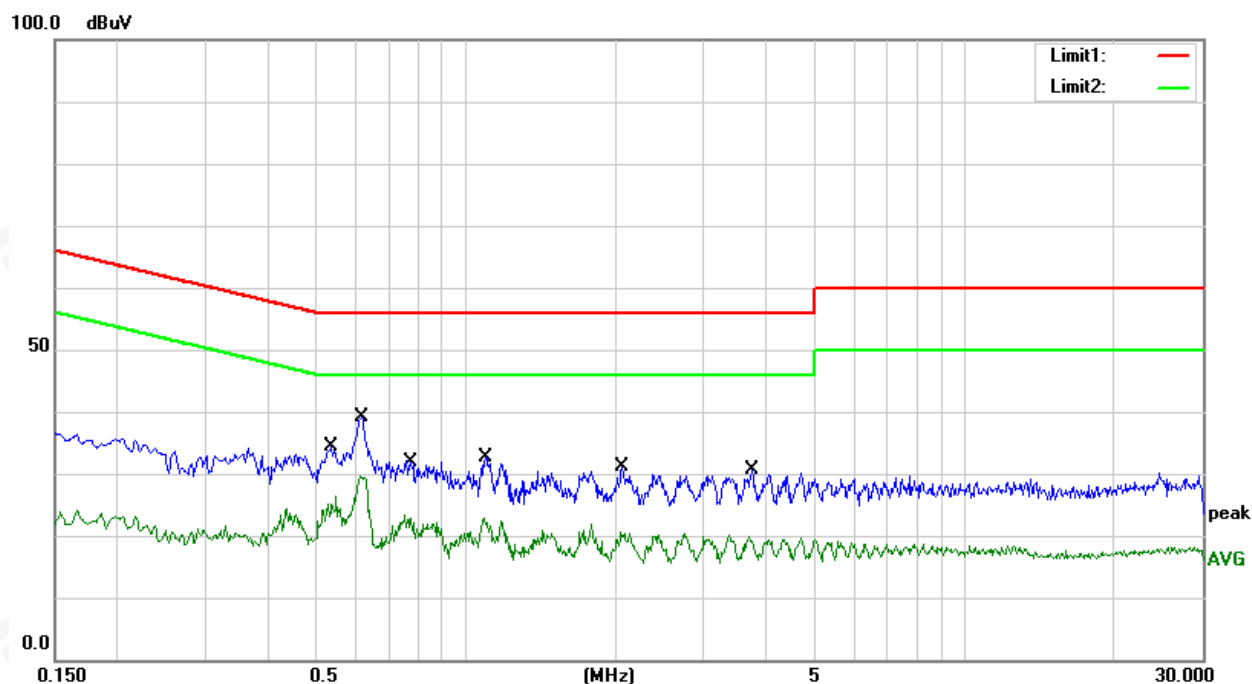
4.1.4 TEST RESULT

Temperature:	25.1°C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5380	14.34	19.97	34.31	56.00	-21.69	QP
2	0.5380	5.23	19.97	25.20	46.00	-20.80	AVG
3	0.6180	19.19	19.90	39.09	56.00	-16.91	QP
4	0.6180	9.80	19.90	29.70	46.00	-16.30	AVG
5	0.7780	12.10	19.81	31.91	56.00	-24.09	QP
6	0.7780	3.55	19.81	23.36	46.00	-22.64	AVG
7	1.0980	12.82	19.77	32.59	56.00	-23.41	QP
8	1.0980	3.09	19.77	22.86	46.00	-23.14	AVG
9	2.0580	11.46	19.79	31.25	56.00	-24.75	QP
10	2.0580	2.14	19.79	21.93	46.00	-24.07	AVG
11	3.7500	10.73	19.84	30.57	56.00	-25.43	QP
12	3.7500	0.21	19.84	20.05	46.00	-25.95	AVG

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)





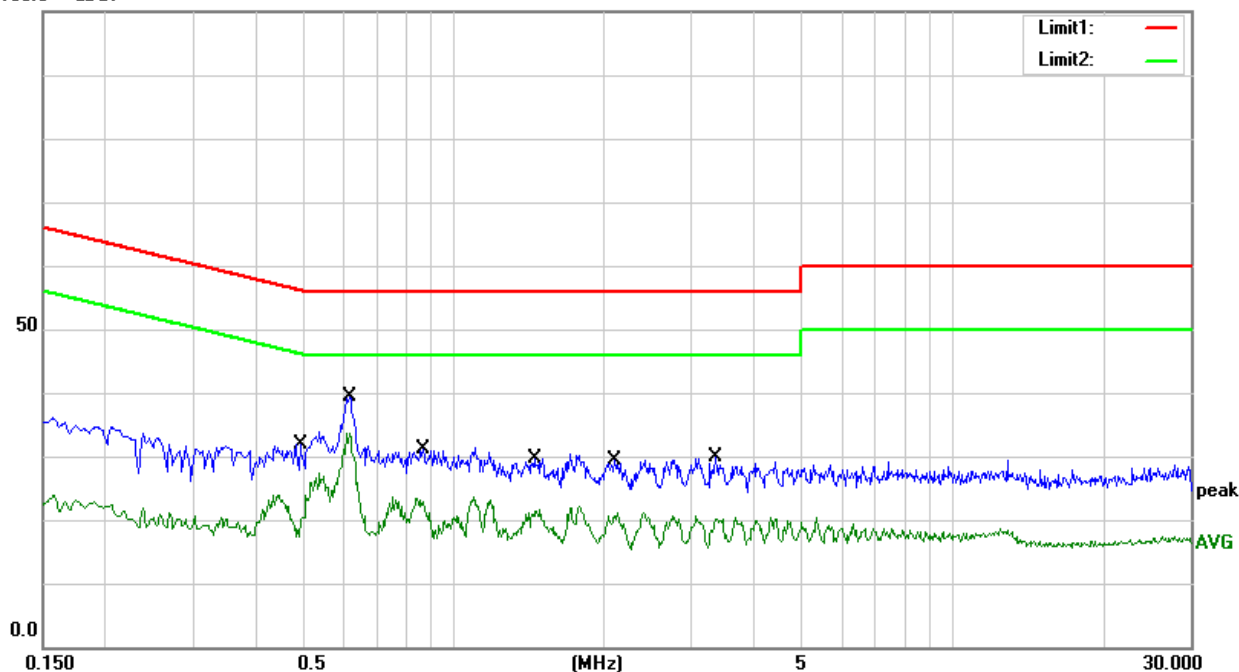
Temperature:	25.1°C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4940	11.86	19.96	31.82	56.10	-24.28	QP
2	0.4940	7.30	19.96	27.26	46.10	-18.84	AVG
3	0.6180	19.59	19.89	39.48	56.00	-16.52	QP
4	0.6180	13.64	19.89	33.53	46.00	-12.47	AVG
5	0.8700	11.45	19.80	31.25	56.00	-24.75	QP
6	0.8700	3.51	19.80	23.31	46.00	-22.69	AVG
7	1.4500	9.91	19.82	29.73	56.00	-26.27	QP
8	1.4500	3.27	19.82	23.09	46.00	-22.91	AVG
9	2.1100	9.40	19.88	29.28	56.00	-26.72	QP
10	2.1100	2.32	19.88	22.20	46.00	-23.80	AVG
11	3.3580	10.01	19.94	29.95	56.00	-26.05	QP
12	3.3580	0.80	19.94	20.74	46.00	-25.26	AVG

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)

100.0 dBuV



4.2 RADIATED SPURIOUS EMISSION

4.2.1 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)

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

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

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

4.3 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;

4.4 EMISSION MASK II

TEST LIMITS

- According to ETSI EN 300 422-1 V2.2.1 Clause 4.2.4,
The transmitter output spectrum shall be within the mask defined in figure 2 where B is the declared channel bandwidth

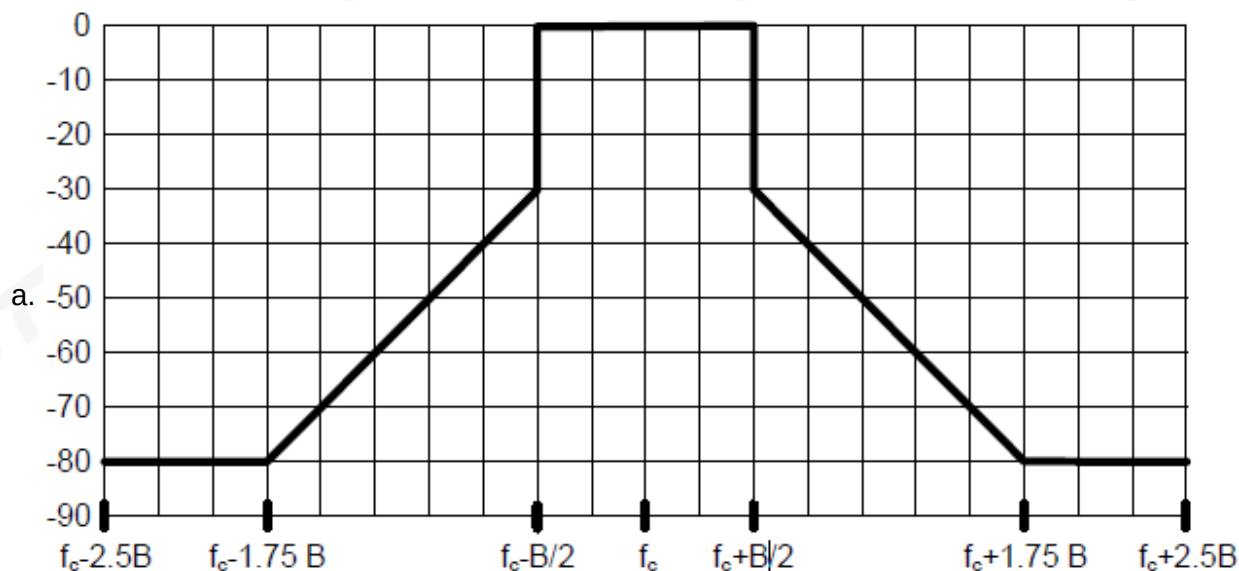


Figure 2: Transmit spectral power mask for equipment employing digital modulation, except WMA5, RBW = 1 kHz

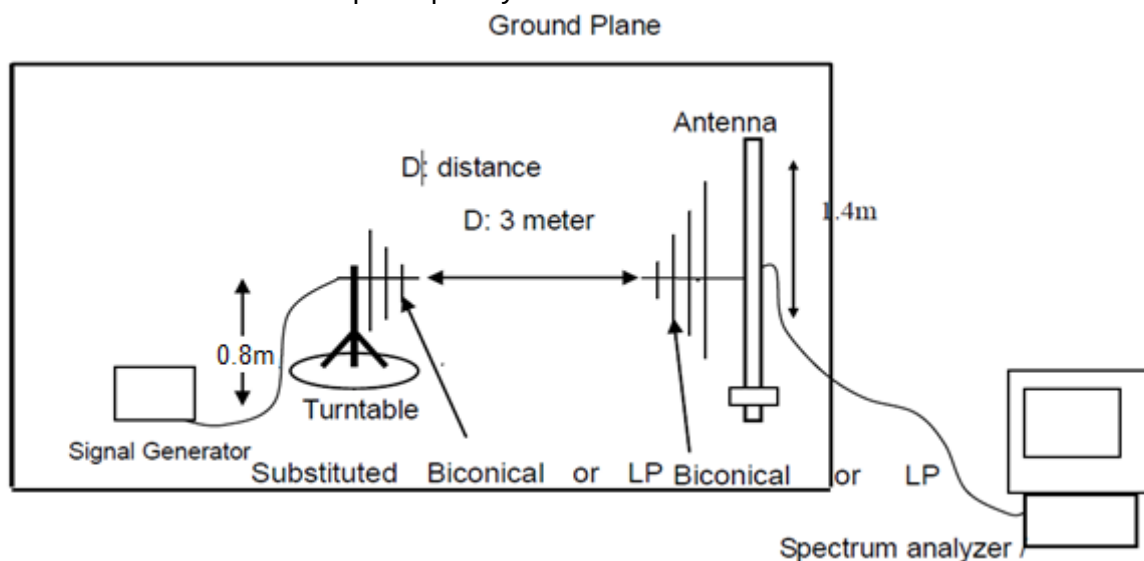


TEST PROCEDURE

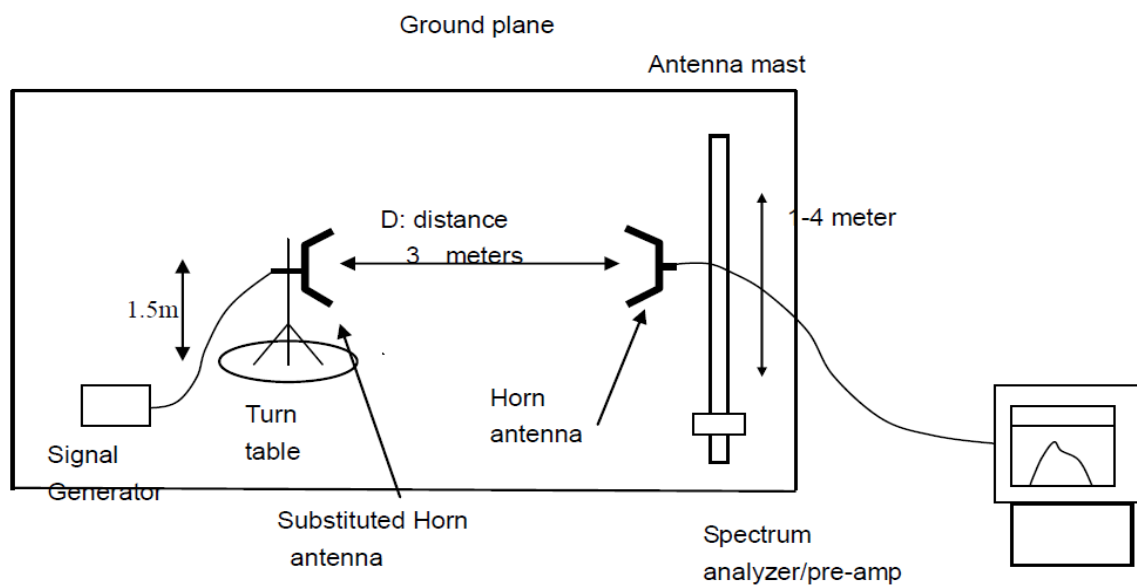
- a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- c. The output of the antenna shall 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



(C) Conducted Emission Test Set-Up

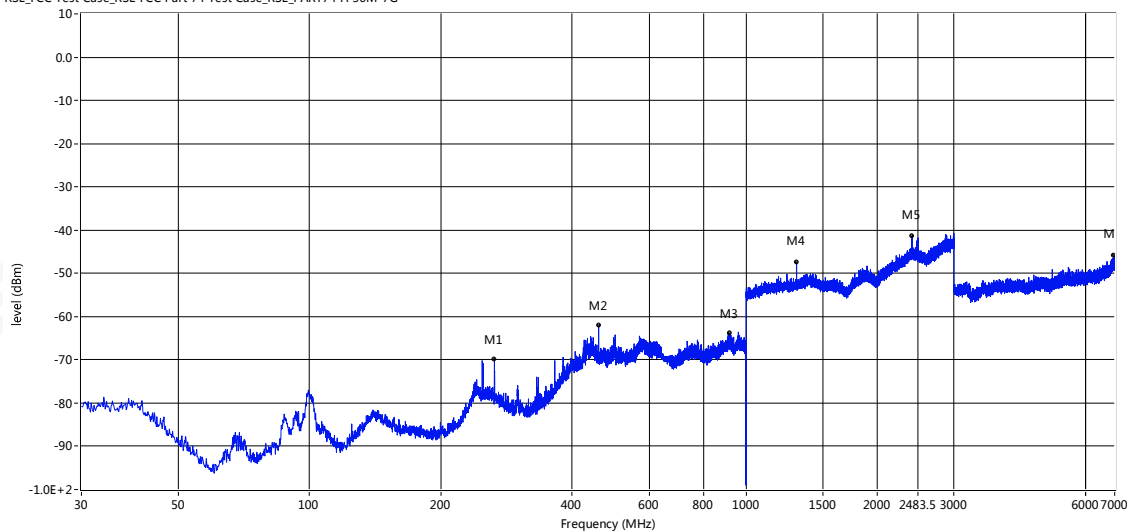




TEST RESULTS

Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 1		

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 H 30M-7G

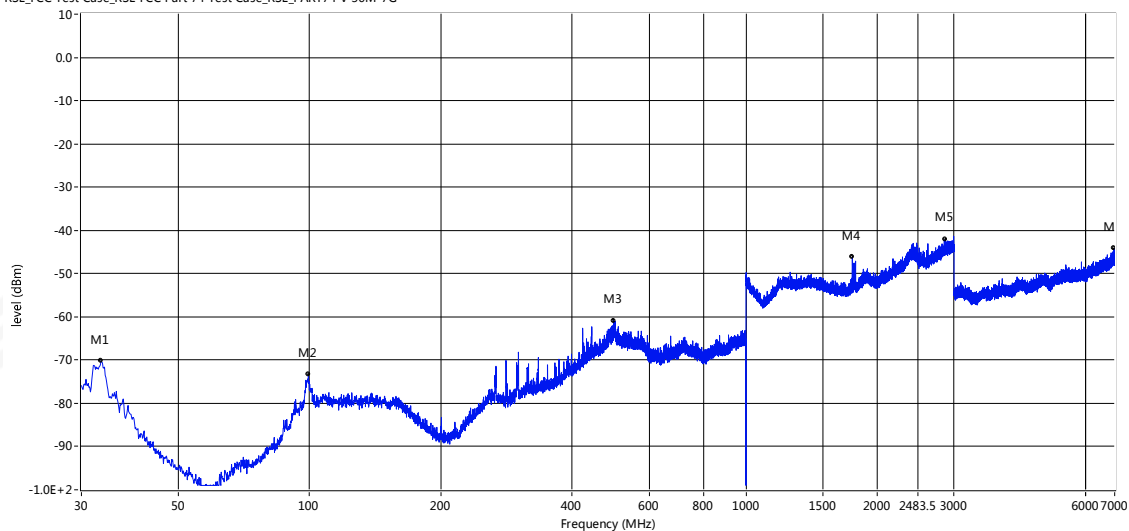


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
265.225	-69.92	-3.40	-13.0	-56.92	81.40	Horizontal	Vertical	Pass
459.710	-62.15	1.58	-13.0	-49.15	265.50	Horizontal	Vertical	Pass
917.186	-63.87	9.49	-13.0	-50.87	45.30	Horizontal	Vertical	Pass
1306.750	-47.44	12.90	-13.0	-34.44	82.40	Horizontal	Vertical	Pass
2402.000	-41.37	19.75	-13.0	-28.37	247.60	Horizontal	Vertical	Pass
6965.000	-45.96	10.15	-13.0	-32.96	315.10	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 1		

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 V 30M-7G

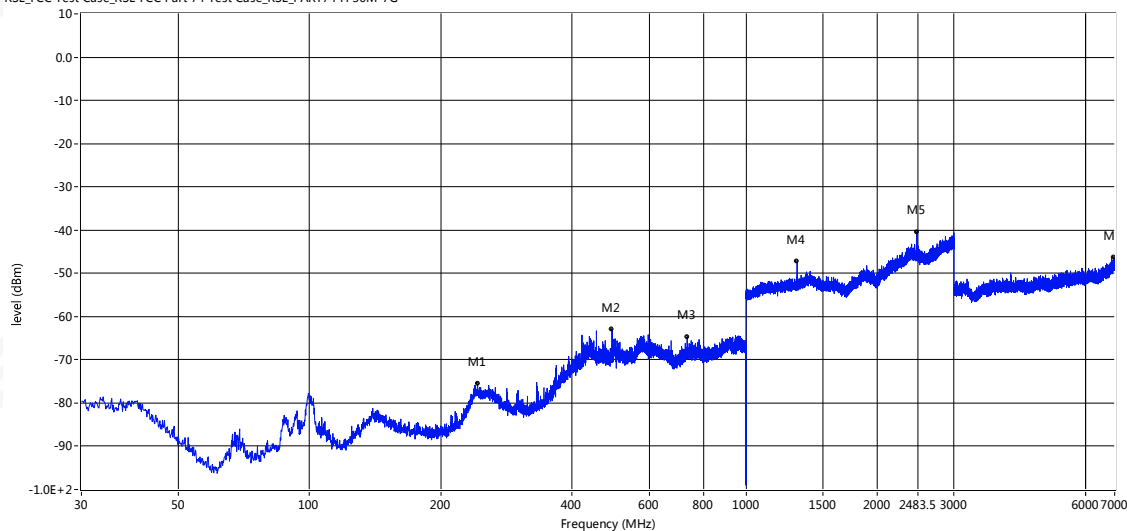


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
33.274	-70.19	-8.23	-13.0	-57.19	357.00	Vertical	Vertical	Pass
99.355	-73.25	-5.24	-13.0	-60.25	84.20	Vertical	Vertical	Pass
497.176	-60.85	4.54	-13.0	-47.85	186.60	Vertical	Vertical	Pass
1753.250	-46.20	12.26	-13.0	-33.20	335.90	Vertical	Vertical	Pass
2865.750	-42.00	20.10	-13.0	-29.00	147.10	Vertical	Vertical	Pass
6972.500	-44.17	11.50	-13.0	-31.17	28.10	Vertical	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 2		

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 H 30M-7G

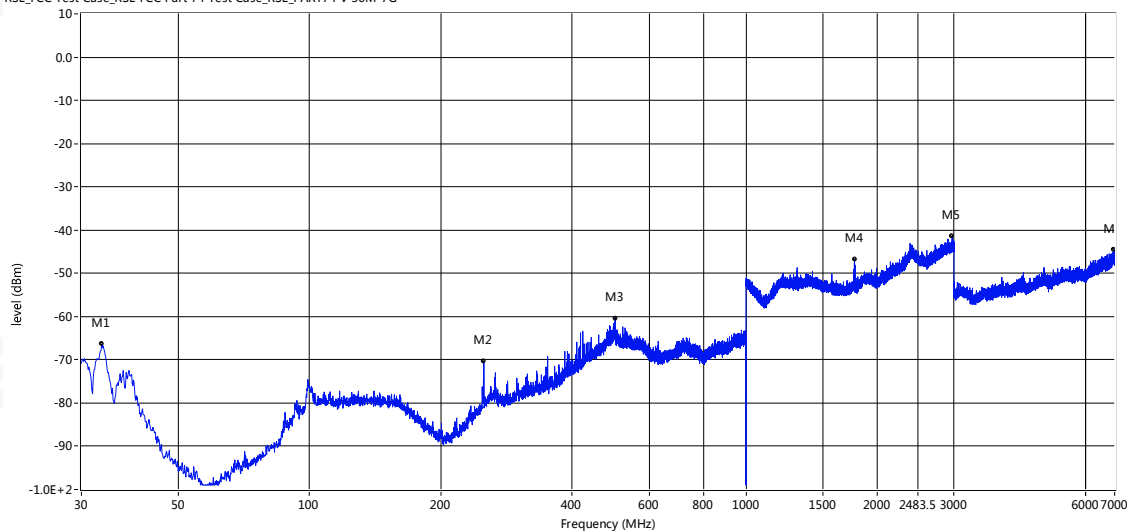


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
242.672	-75.58	-2.04	-13.0	-62.58	156.50	Horizontal	Vertical	Pass
493.296	-62.98	0.94	-13.0	-49.98	232.30	Horizontal	Vertical	Pass
733.492	-64.74	6.79	-13.0	-51.74	56.00	Horizontal	Vertical	Pass
1310.250	-47.29	12.95	-13.0	-34.29	68.50	Horizontal	Vertical	Pass
2464.250	-40.43	19.19	-13.0	-27.43	252.20	Horizontal	Vertical	Pass
6957.000	-46.30	10.10	-13.0	-33.30	46.30	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%	
Test Voltage:	DC 3.7V	Phase:	Vertical	
Test Mode:	Mode 2			

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 V 30M-7G

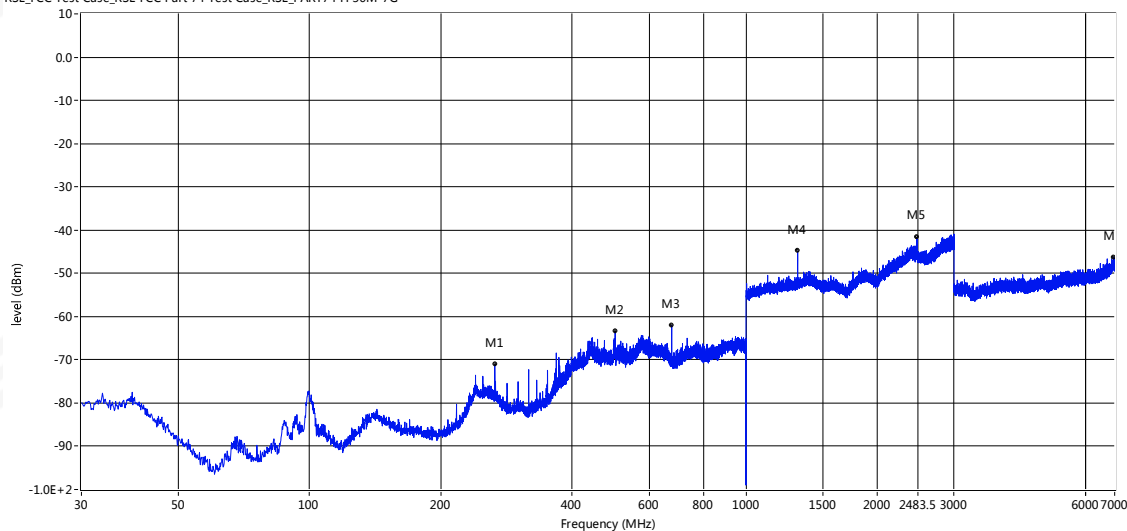


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
33.395	-66.38	-8.31	-13.0	-53.38	2.40	Vertical	Vertical	Pass
250.796	-70.42	-5.11	-13.0	-57.42	80.80	Vertical	Vertical	Pass
501.662	-60.41	4.60	-13.0	-47.41	245.50	Vertical	Vertical	Pass
1774.000	-46.78	12.22	-13.0	-33.78	359.20	Vertical	Vertical	Pass
2969.500	-41.49	20.36	-13.0	-28.49	357.30	Vertical	Vertical	Pass
6971.500	-44.65	11.50	-13.0	-31.65	141.10	Vertical	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 3		

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 H 30M-7G

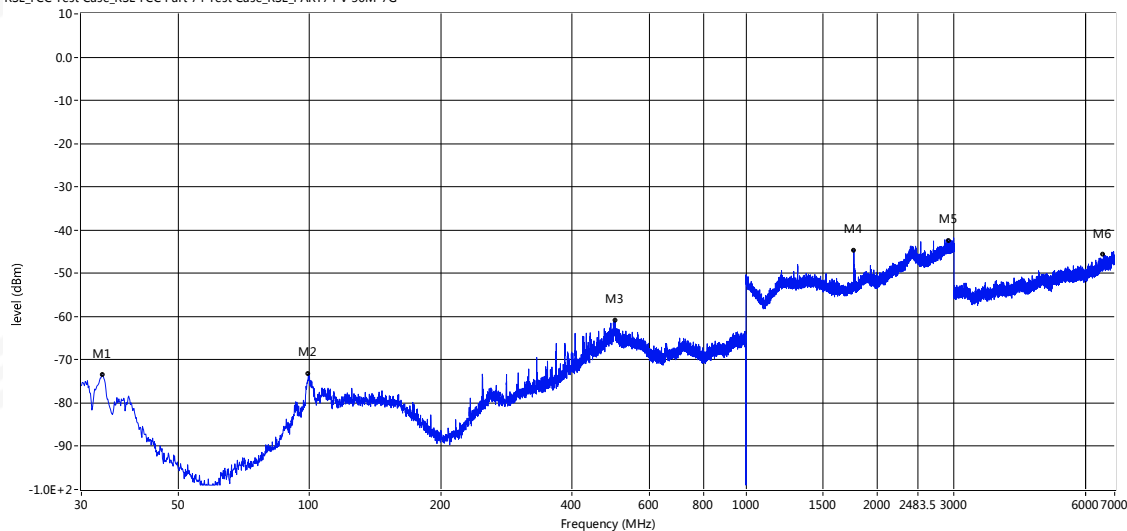


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
265.831	-71.12	-3.49	-13.0	-58.12	80.40	Horizontal	Vertical	Pass
501.662	-63.37	0.87	-13.0	-50.37	264.00	Horizontal	Vertical	Pass
676.020	-62.07	4.99	-13.0	-49.07	270.70	Horizontal	Vertical	Pass
1314.250	-44.83	13.00	-13.0	-31.83	62.30	Horizontal	Vertical	Pass
2465.000	-41.63	19.18	-13.0	-28.63	22.50	Horizontal	Vertical	Pass
6967.000	-46.24	10.16	-13.0	-33.24	324.50	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 3		

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 V 30M-7G



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
33.516	-73.52	-8.38	-13.0	-60.52	19.90	Vertical	Vertical	Pass
99.355	-73.18	-5.24	-13.0	-60.18	63.00	Vertical	Vertical	Pass
501.662	-61.00	4.60	-13.0	-48.00	259.10	Vertical	Vertical	Pass
1767.750	-44.69	12.23	-13.0	-31.69	101.70	Vertical	Vertical	Pass
2915.250	-42.47	20.27	-13.0	-29.47	336.30	Vertical	Vertical	Pass
6598.000	-45.73	10.23	-13.0	-32.73	86.50	Vertical	Vertical	Pass



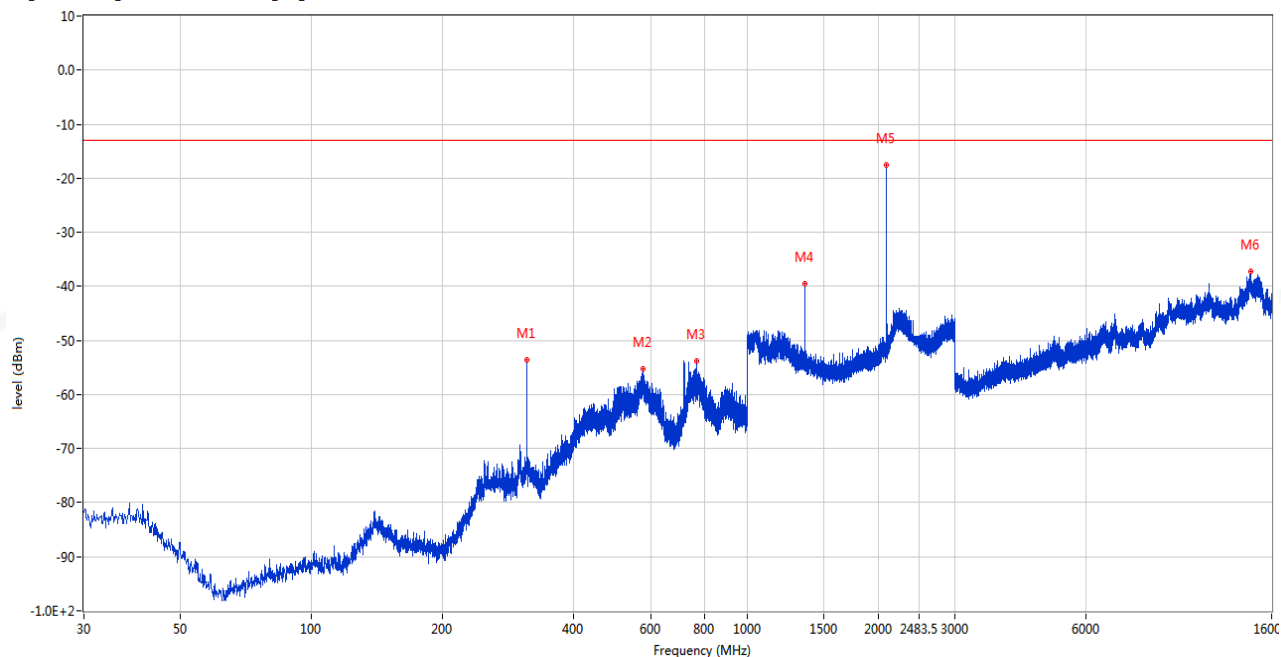
Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 5		

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
312.027	-53.53	-7.19	-13.0	40.53	86.90	Horizontal	Vertical	Pass
575.140	-55.20	6.31	-13.0	42.20	275.50	Horizontal	Vertical	Pass
766.594	-53.82	7.17	-13.0	40.82	286.70	Horizontal	Vertical	Pass
1357.250	-39.58	12.36	-13.0	26.58	319.60	Horizontal	Vertical	Pass
2090.250	-17.58	15.00	-13.0	4.58	327.40	Horizontal	Vertical	Pass
14321.500	-37.19	19.44	-13.0	24.19	218.40	Horizontal	Vertical	Pass

Remark:

1. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$
2. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor} (\text{cable loss}) - \text{Amplifier gain}$

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 H 30M-16G



Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



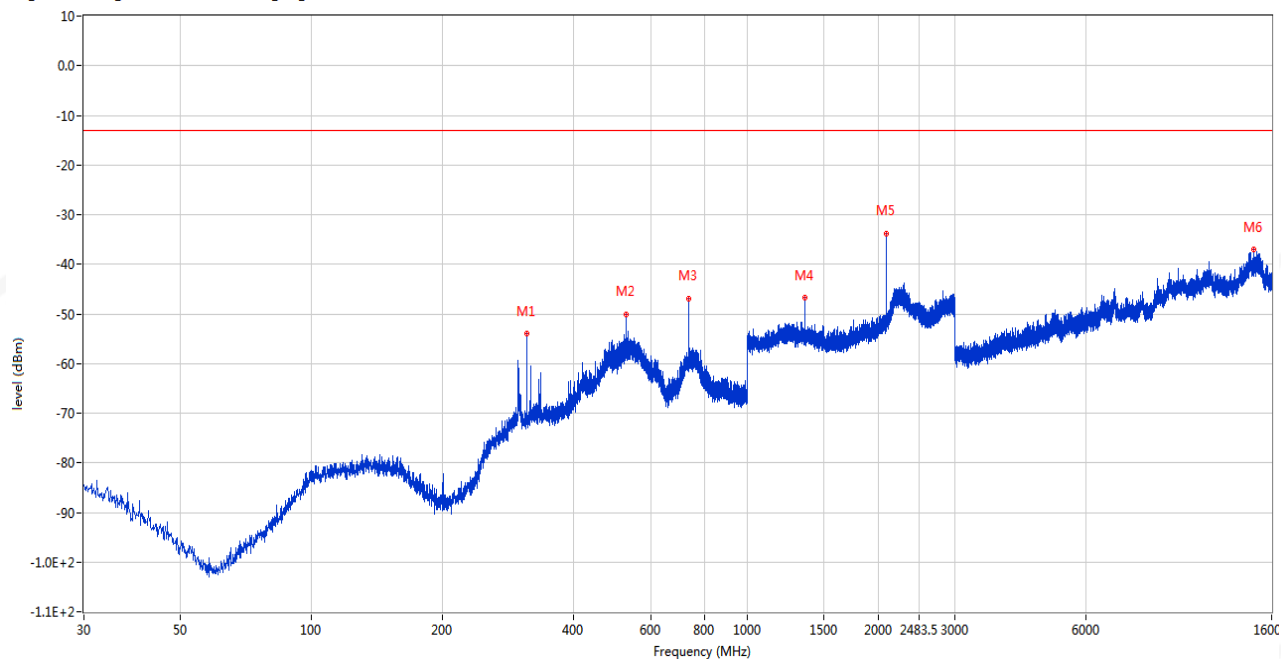
Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 5		

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
311.664	-53.93	-2.83	-13.0	40.93	23.60	Vertical	Vertical	Pass
527.004	-50.18	5.03	-13.0	37.18	69.00	Vertical	Vertical	Pass
733.371	-47.05	7.88	-13.0	34.05	161.60	Vertical	Vertical	Pass
1357.000	-46.62	12.36	-13.0	33.62	332.70	Vertical	Vertical	Pass
2090.500	-33.80	15.01	-13.0	20.80	165.60	Vertical	Vertical	Pass
14576.874	-37.06	18.02	-13.0	24.06	53.20	Vertical	Vertical	Pass

Remark:

- Margin = Result (Result = Reading + Factor) – Limit
- Factor = Antenna factor + Cable attenuation factor (cable loss) – Amplifier gain

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 V 30M-16G



Note:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
- The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 6		

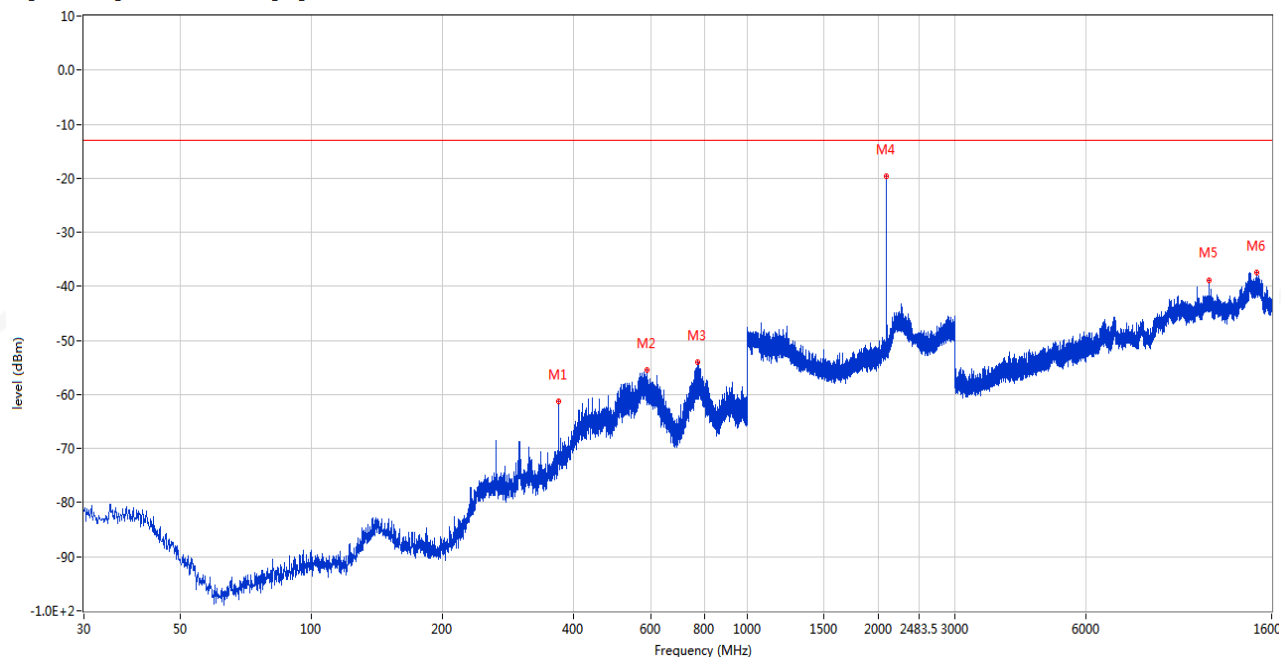
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
368.409	-61.36	-2.41	-13.0	48.36	67.90	Horizontal	Vertical	Pass
589.811	-55.54	6.37	-13.0	42.54	261.80	Horizontal	Vertical	Pass
770.110	-54.09	7.12	-13.0	41.09	45.20	Horizontal	Vertical	Pass
2090.250	-19.61	15.00	-13.0	6.61	67.00	Horizontal	Vertical	Pass
11495.500	-38.85	15.43	-13.0	25.85	206.20	Horizontal	Vertical	Pass
14798.500	-37.40	19.20	-13.0	24.40	21.60	Horizontal	Vertical	Pass

Remark:

5. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$

6. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor} (\text{cable loss}) - \text{Amplifier gain}$

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 H 30M-16G



Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 6		

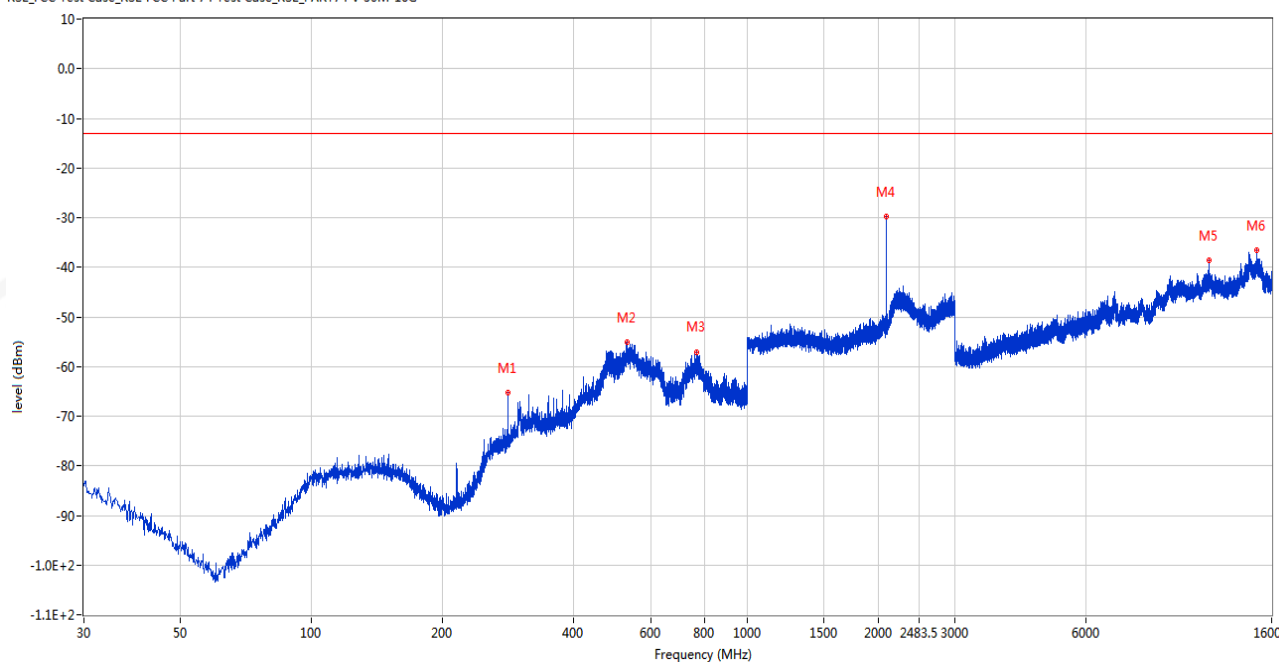
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
281.715	-65.36	-5.36	-13.0	52.36	26.60	Vertical	Vertical	Pass
529.671	-55.07	5.22	-13.0	42.07	177.30	Vertical	Vertical	Pass
764.290	-57.01	7.06	-13.0	44.01	349.60	Vertical	Vertical	Pass
2090.500	-29.75	15.01	-13.0	16.75	57.00	Vertical	Vertical	Pass
11496.625	-38.58	15.44	-13.0	25.58	54.70	Vertical	Vertical	Pass
14819.875	-36.58	18.99	-13.0	23.58	225.90	Vertical	Vertical	Pass

Remark:

7. Margin = Result (Result = Reading + Factor) – Limit

8. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

RSE_FCC Test Case_RSE FCC Part 74 Test Case_RSE_PART74 V 30M-16G

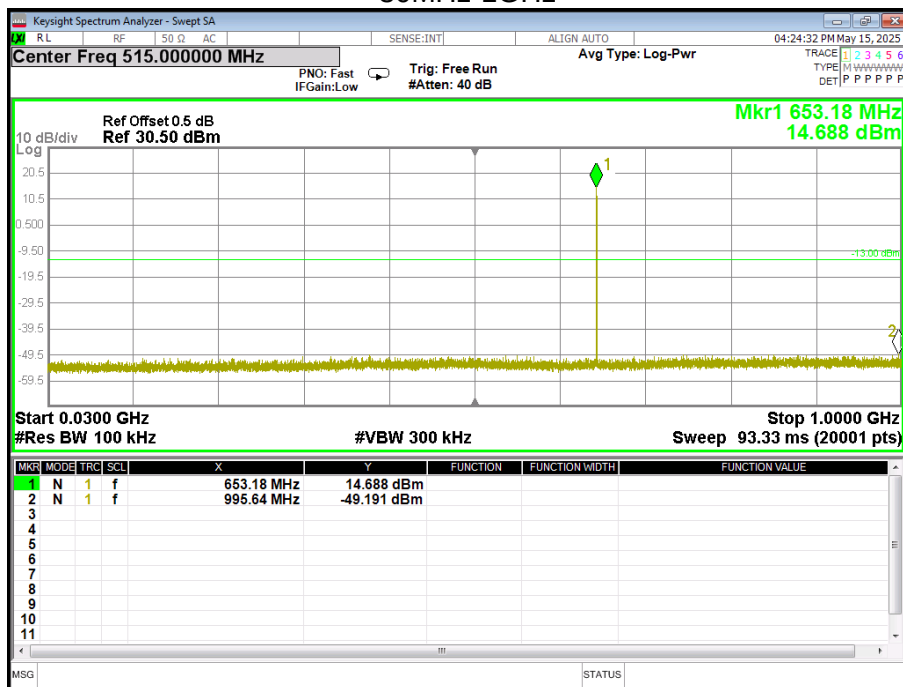


Note:

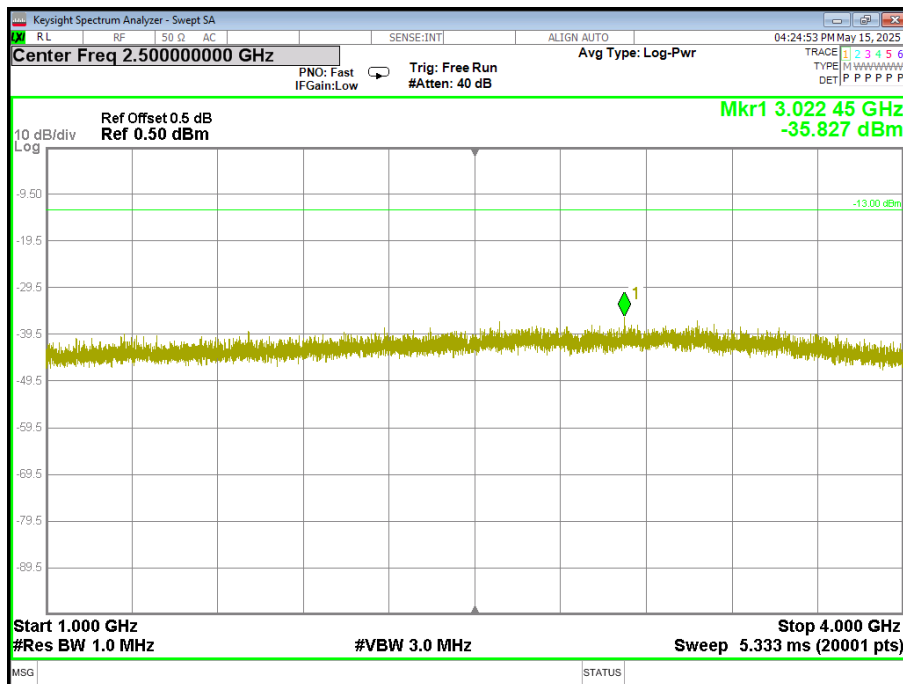
- 1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



TEST RESULT

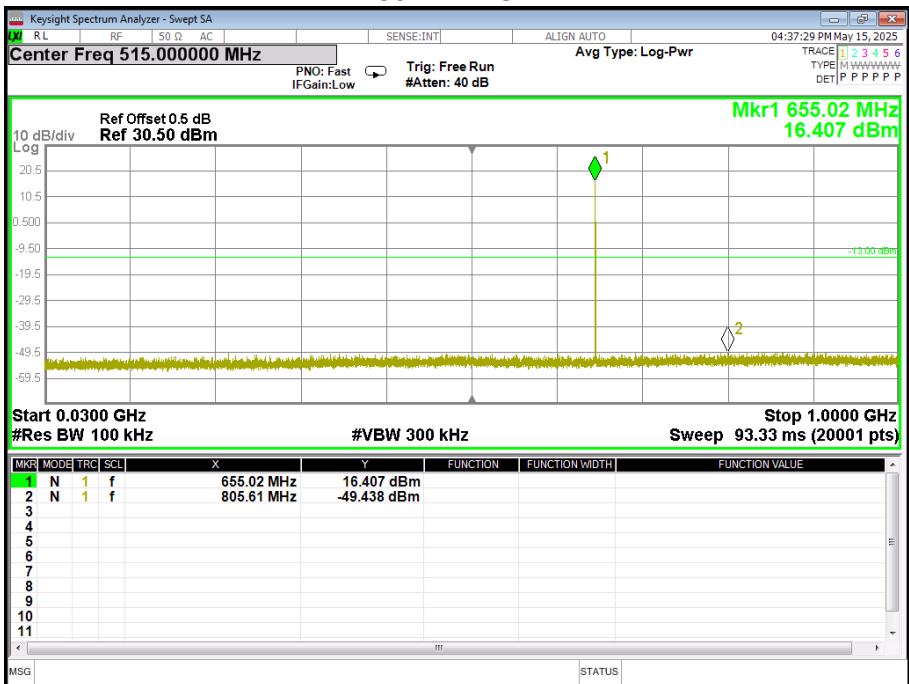
Mode 1
30MHz-1GHz

1GHz-4GHz

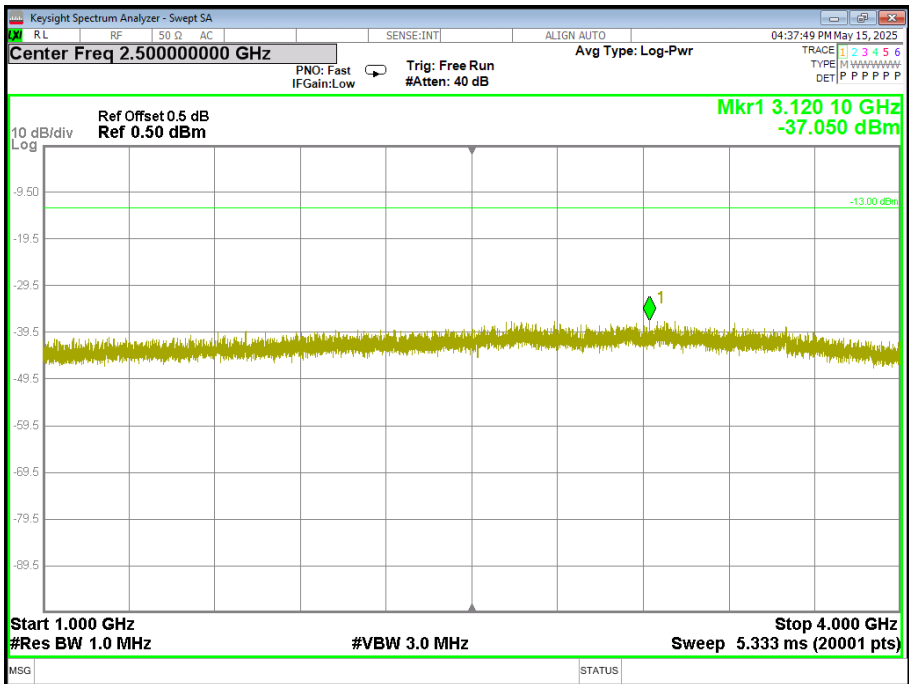




Mode 2
30MHz-1GHz

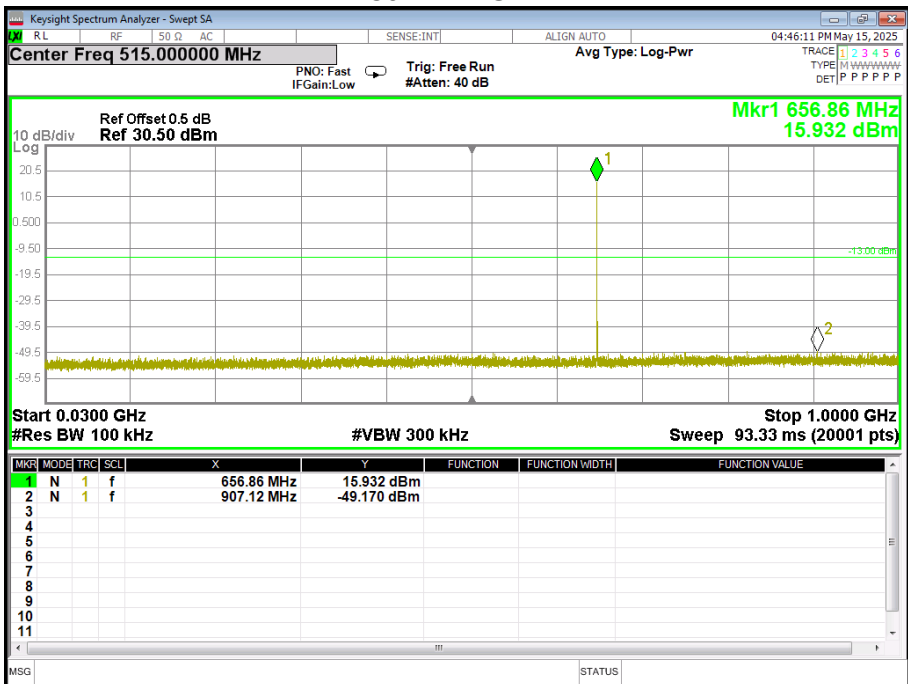


1GHz-4GHz

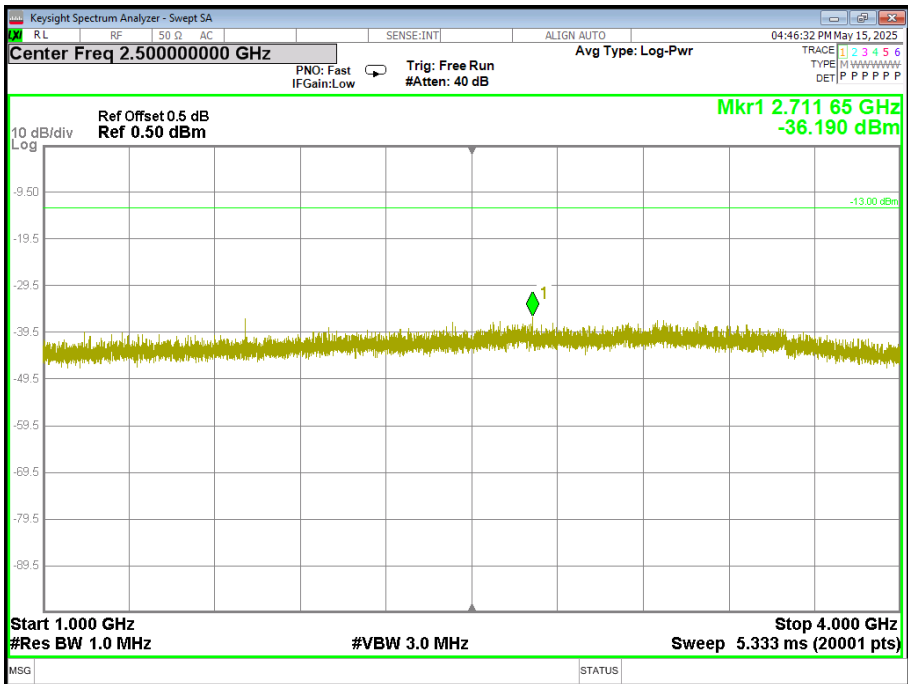




Mode 3
30MHz-1GHz



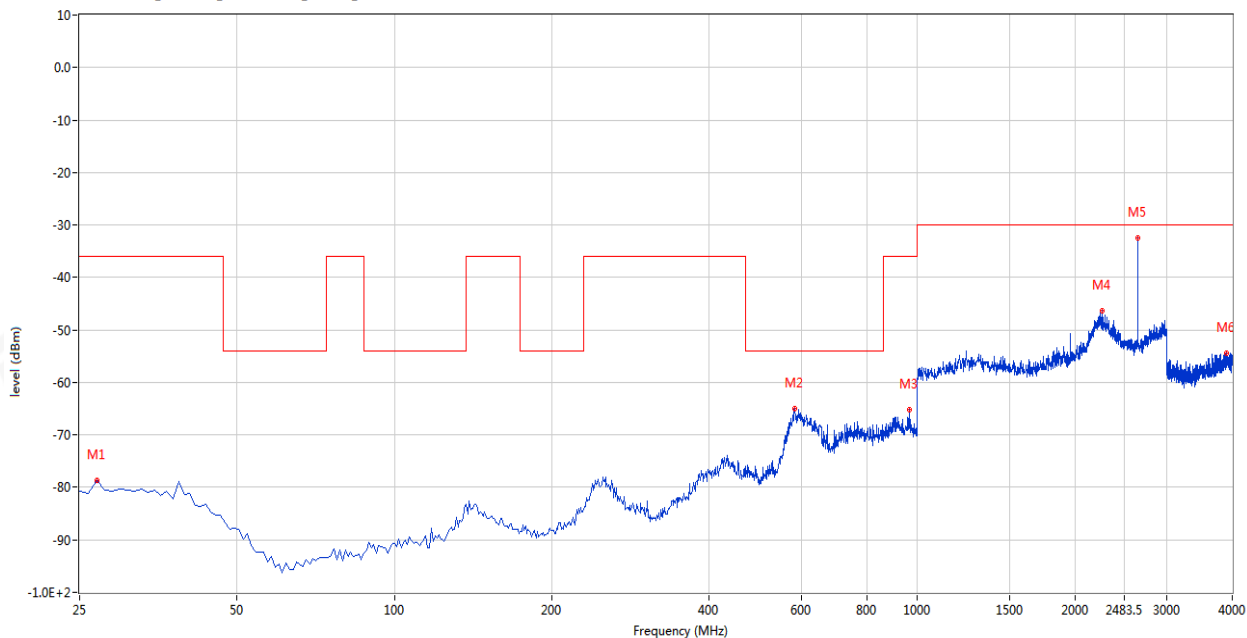
1GHz-4GHz





Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 1		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_H

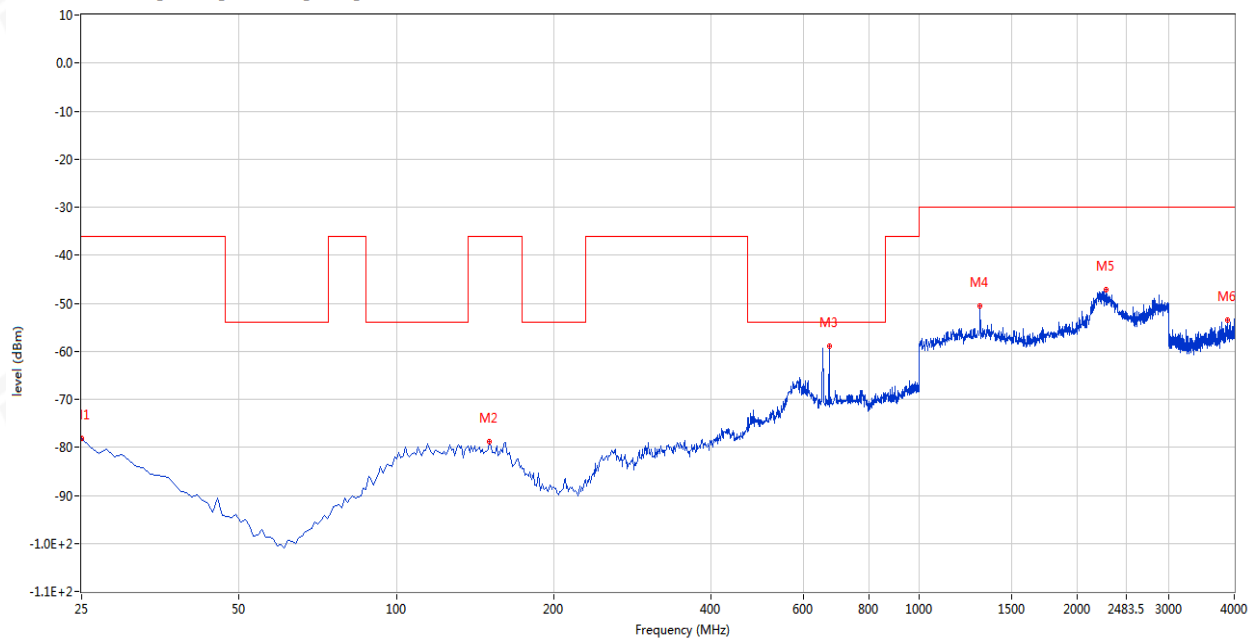


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
26.950	-78.64	-1.94	-36.0	42.64	332.80	Horizontal	Vertical	Pass
581.725	-64.92	6.65	-54.0	10.92	86.30	Horizontal	Vertical	Pass
966.850	-65.23	9.43	-36.0	29.23	69.90	Horizontal	Vertical	Pass
2252.000	-46.30	19.66	-30.0	16.30	146.40	Horizontal	Vertical	Pass
2636.000	-32.46	15.67	-30.0	2.46	149.70	Horizontal	Vertical	Pass
3893.000	-54.37	2.81	-30.0	24.37	319.60	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 1		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_V

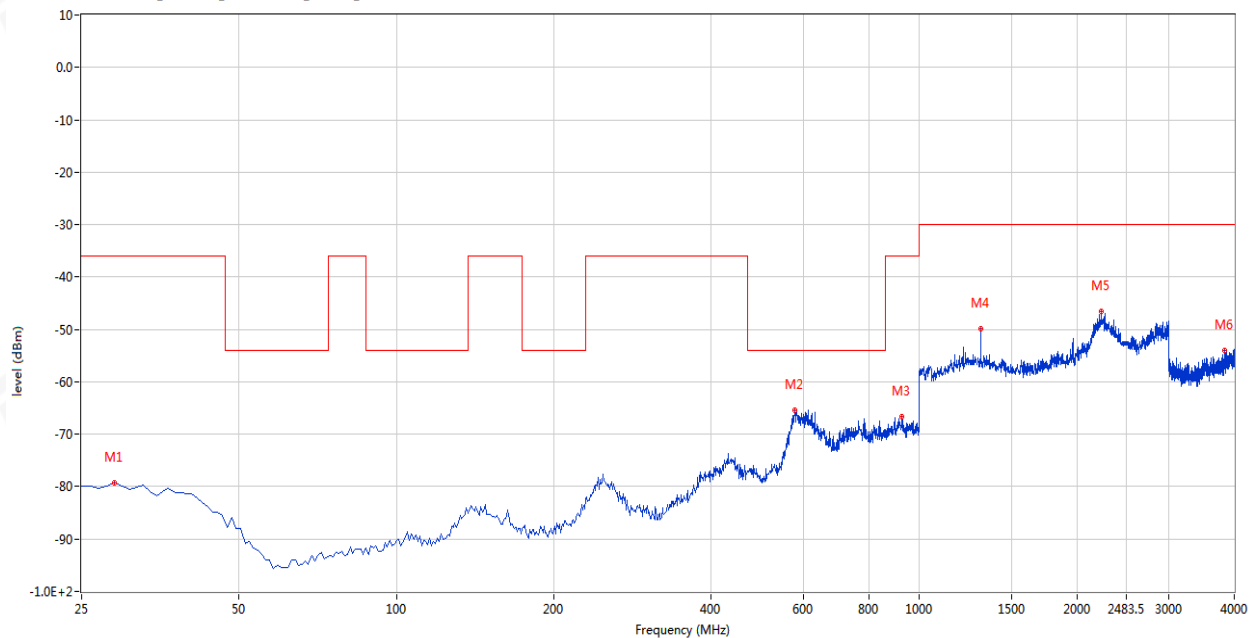


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-78.25	-0.46	-36.0	42.25	359.30	Vertical	Vertical	Pass
150.775	-78.87	-1.62	-36.0	42.87	49.70	Vertical	Vertical	Pass
672.400	-58.85	5.97	-54.0	4.85	127.10	Vertical	Vertical	Pass
1306.000	-50.65	12.48	-30.0	20.65	269.30	Vertical	Vertical	Pass
2278.000	-47.14	19.39	-30.0	17.14	109.70	Vertical	Vertical	Pass
3889.000	-53.49	2.78	-30.0	23.49	76.80	Vertical	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 2		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_H

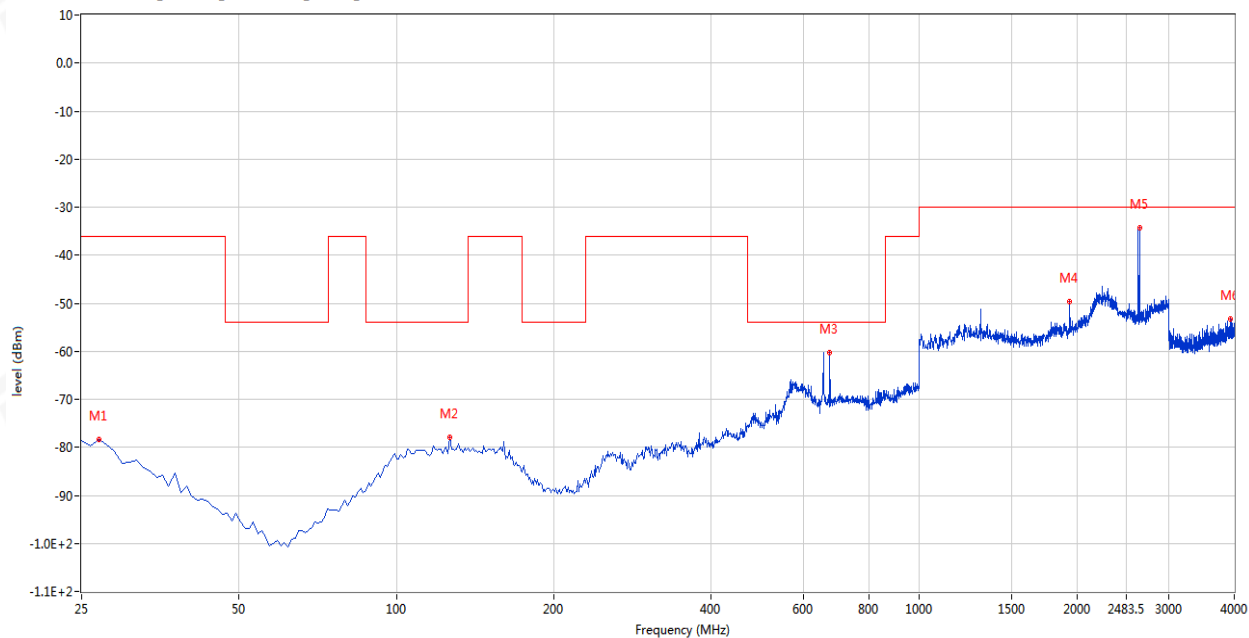


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
28.900	-79.37	-1.92	-36.0	43.37	6.10	Horizontal	Vertical	Pass
578.800	-65.37	6.61	-54.0	11.37	58.20	Horizontal	Vertical	Pass
926.875	-66.73	9.12	-36.0	30.73	128.90	Horizontal	Vertical	Pass
1310.000	-49.94	12.47	-30.0	19.94	90.80	Horizontal	Vertical	Pass
2226.000	-46.66	19.65	-30.0	16.66	30.50	Horizontal	Vertical	Pass
3840.000	-53.97	2.36	-30.0	23.97	168.40	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 2		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_V

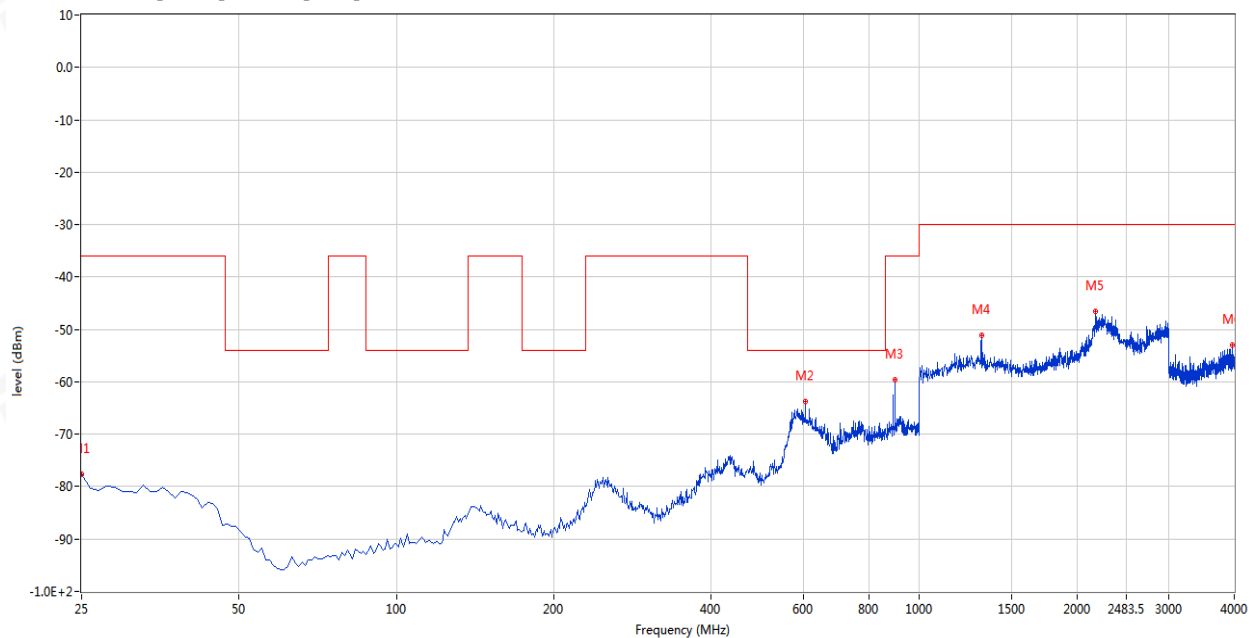


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
26.950	-78.42	-1.72	-36.0	42.42	226.30	Vertical	Vertical	Pass
126.400	-78.02	-1.66	-54.0	24.02	303.30	Vertical	Vertical	Pass
674.350	-60.21	6.06	-54.0	6.21	199.90	Vertical	Vertical	Pass
1940.000	-49.57	12.94	-30.0	19.57	185.50	Vertical	Vertical	Pass
2636.000	-34.24	15.67	-30.0	4.24	3.70	Vertical	Vertical	Pass
3927.000	-53.35	2.82	-30.0	23.35	236.80	Vertical	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 3		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_H

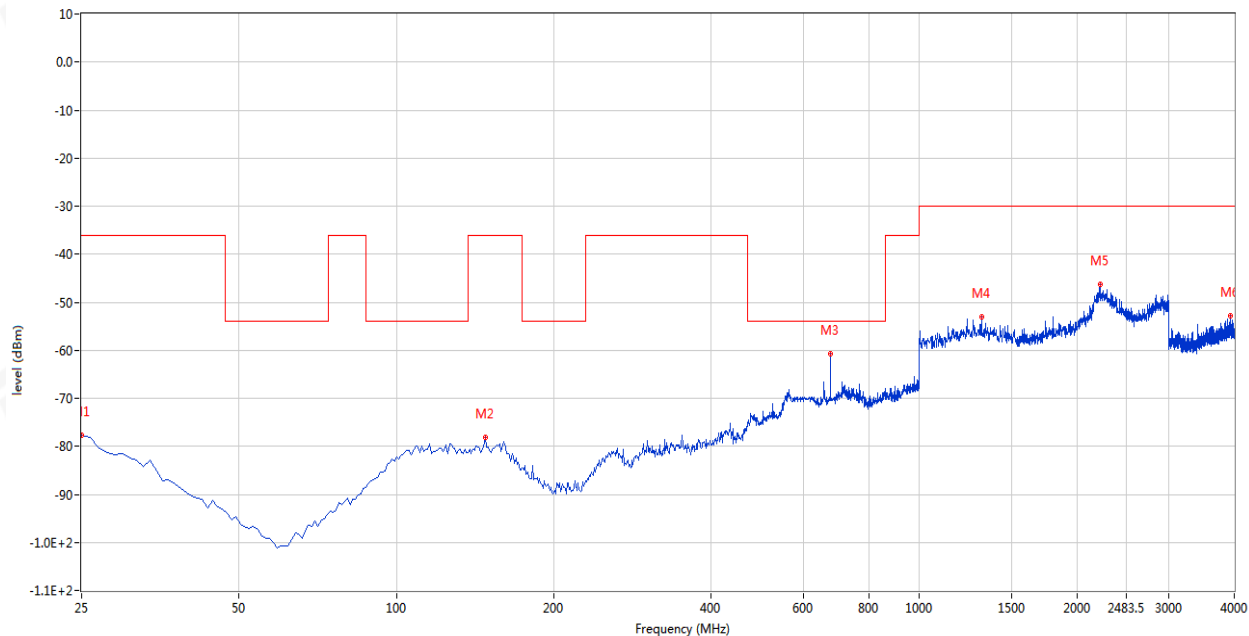


Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-77.68	-1.95	-36.0	41.68	200.40	Horizontal	Vertical	Pass
605.125	-63.78	6.34	-54.0	9.78	277.40	Horizontal	Vertical	Pass
898.600	-59.64	8.77	-36.0	23.64	0.40	Horizontal	Vertical	Pass
1314.000	-51.09	12.46	-30.0	21.09	66.10	Horizontal	Vertical	Pass
2170.000	-46.56	18.69	-30.0	16.56	0.00	Horizontal	Vertical	Pass
3973.000	-53.06	2.74	-30.0	23.06	159.00	Horizontal	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 3		

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-4G_V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
25.000	-77.69	-0.46	-36.0	41.69	170.20	Vertical	Vertical	Pass
147.850	-78.13	-1.49	-36.0	42.13	90.20	Vertical	Vertical	Pass
676.300	-60.80	6.15	-54.0	6.80	280.40	Vertical	Vertical	Pass
1314.000	-53.14	12.46	-30.0	23.14	282.80	Vertical	Vertical	Pass
2220.000	-46.26	19.64	-30.0	16.26	282.80	Vertical	Vertical	Pass
3931.000	-52.77	2.81	-30.0	22.77	72.70	Vertical	Vertical	Pass



Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 5		

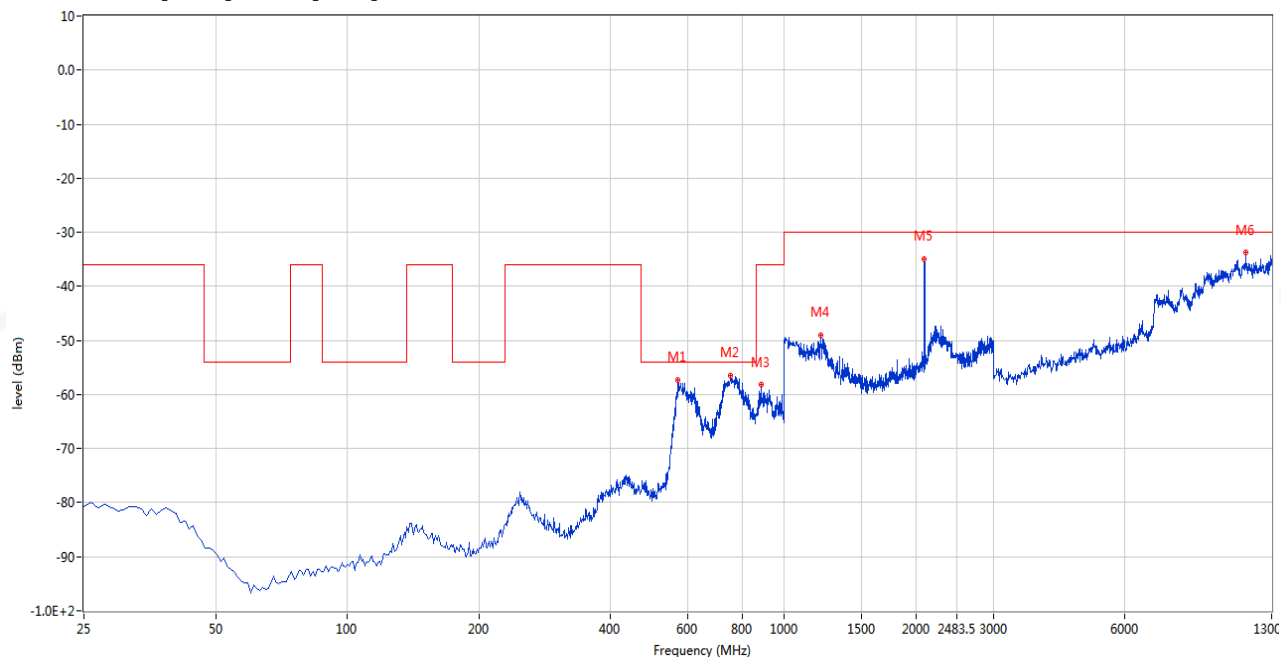
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
571.000	-57.36	5.96	-54.0	3.36	267.50	Horizontal	Vertical	Pass
753.325	-56.40	7.20	-54.0	2.40	291.70	Horizontal	Vertical	Pass
884.950	-58.16	8.27	-36.0	22.16	308.50	Horizontal	Vertical	Pass
1212.000	-48.94	12.64	-30.0	18.94	325.00	Horizontal	Vertical	Pass
2090.000	-34.97	15.00	-30.0	4.97	328.30	Horizontal	Vertical	Pass
11360.000	-33.71	20.03	-30.0	3.71	69.60	Horizontal	Vertical	Pass

Remark:

9. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$

10. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor} (\text{cable loss}) - \text{Amplifier gain}$

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-13G_H



Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



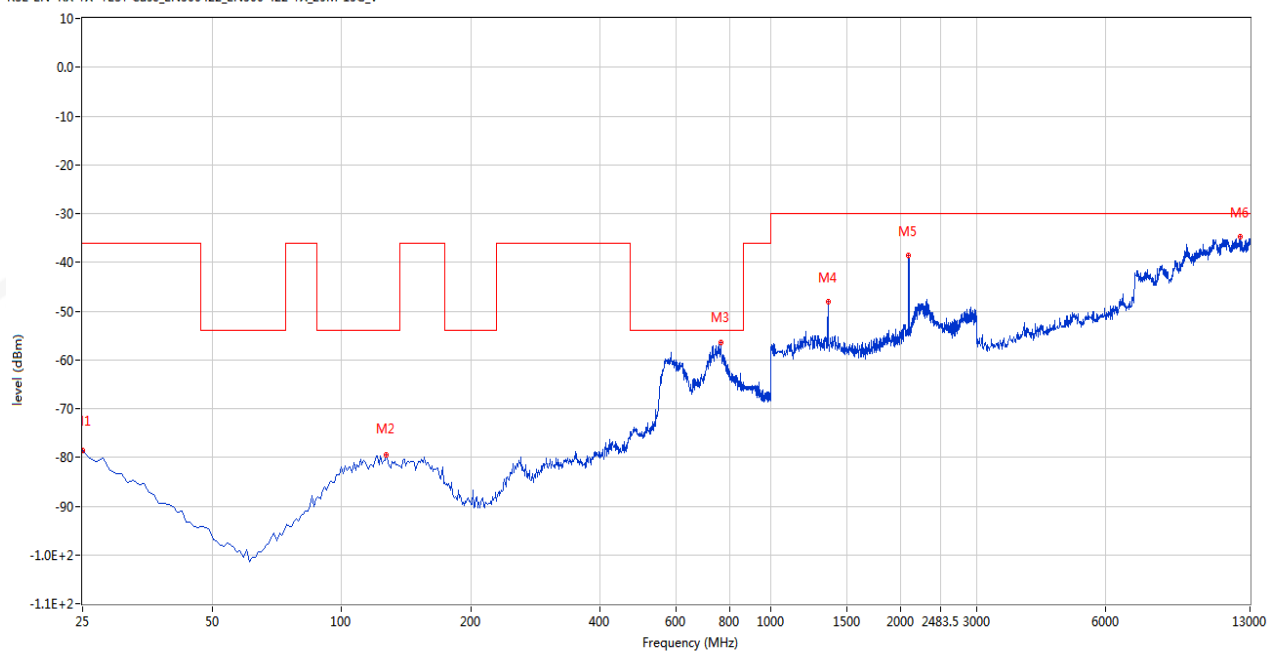
Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 5		

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
25.000	-78.53	-0.46	-36.0	42.53	354.60	Vertical	Vertical	Pass
127.375	-79.40	-1.62	-54.0	25.40	169.30	Vertical	Vertical	Pass
765.025	-56.43	7.05	-54.0	2.43	145.80	Vertical	Vertical	Pass
1356.000	-48.14	12.37	-30.0	18.14	291.10	Vertical	Vertical	Pass
2090.000	-38.67	15.00	-30.0	8.67	242.80	Vertical	Vertical	Pass
12310.000	-34.84	19.73	-30.0	4.84	163.40	Vertical	Vertical	Pass

Remark:

11. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$ 12. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor (cable loss)} - \text{Amplifier gain}$

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-13G_V



Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$.
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



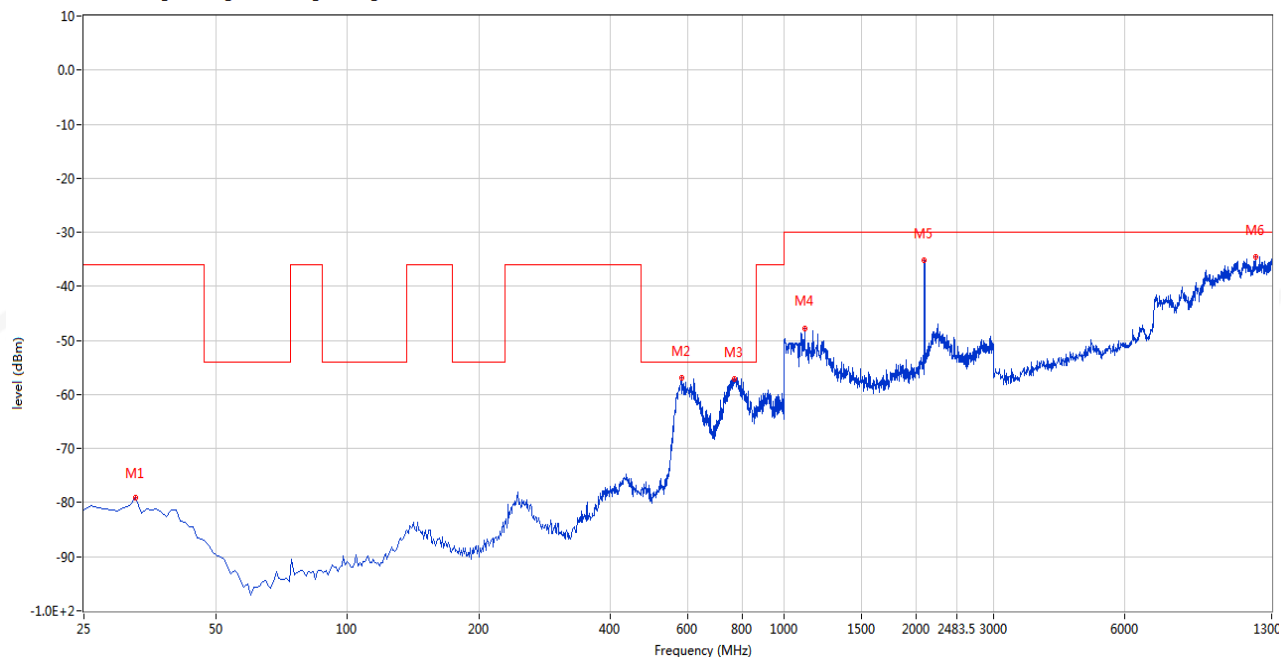
Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 6		

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
32.800	-79.14	-1.89	-36.0	43.14	0.30	Horizontal	Vertical	Pass
581.725	-56.83	6.65	-54.0	2.83	278.20	Horizontal	Vertical	Pass
767.950	-56.34	7.15	-54.0	2.34	48.60	Horizontal	Vertical	Pass
1114.000	-47.70	11.24	-30.0	17.70	322.60	Horizontal	Vertical	Pass
2090.000	-35.25	15.00	-30.0	5.25	70.30	Horizontal	Vertical	Pass
11940.000	-34.55	19.53	-30.0	4.55	213.00	Horizontal	Vertical	Pass

Remark:

13. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$ 14. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor} (\text{cable loss}) - \text{Amplifier gain}$

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-13G_H



Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$.
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



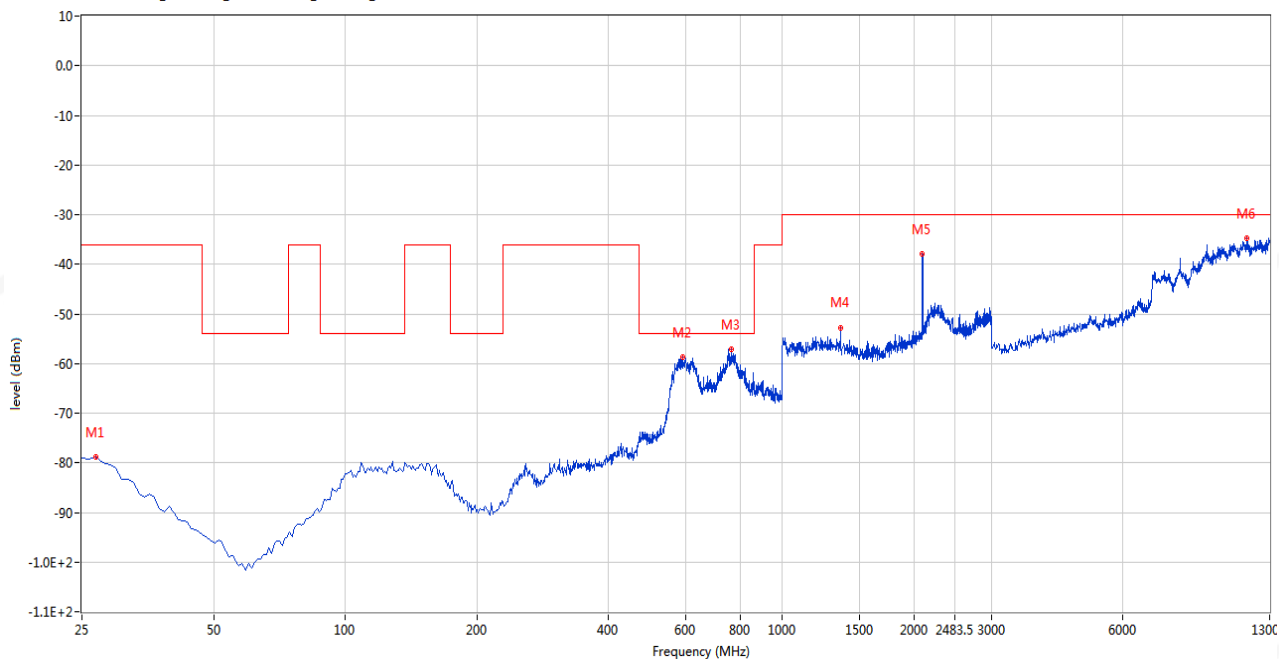
Temperature:	23.4°C	Relative Humidity:	60%
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 6		

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
26.950	-78.77	-1.72	-36.0	42.77	48.40	Vertical	Vertical	Pass
591.475	-58.67	5.06	-54.0	4.67	360.00	Vertical	Vertical	Pass
762.100	-57.06	7.10	-54.0	3.06	338.30	Vertical	Vertical	Pass
1358.000	-52.72	12.36	-30.0	22.72	329.50	Vertical	Vertical	Pass
2090.000	-37.91	15.00	-30.0	7.91	44.80	Vertical	Vertical	Pass
11550.000	-34.79	20.63	-30.0	4.79	141.10	Vertical	Vertical	Pass

Remark:

15. $\text{Margin} = \text{Result} (\text{Result} = \text{Reading} + \text{Factor}) - \text{Limit}$ 16. $\text{Factor} = \text{Antenna factor} + \text{Cable attenuation factor (cable loss)} - \text{Amplifier gain}$

RSE-EN RX-TX TEST Case_EN300422_EN300 422-TX_25M-13G_V



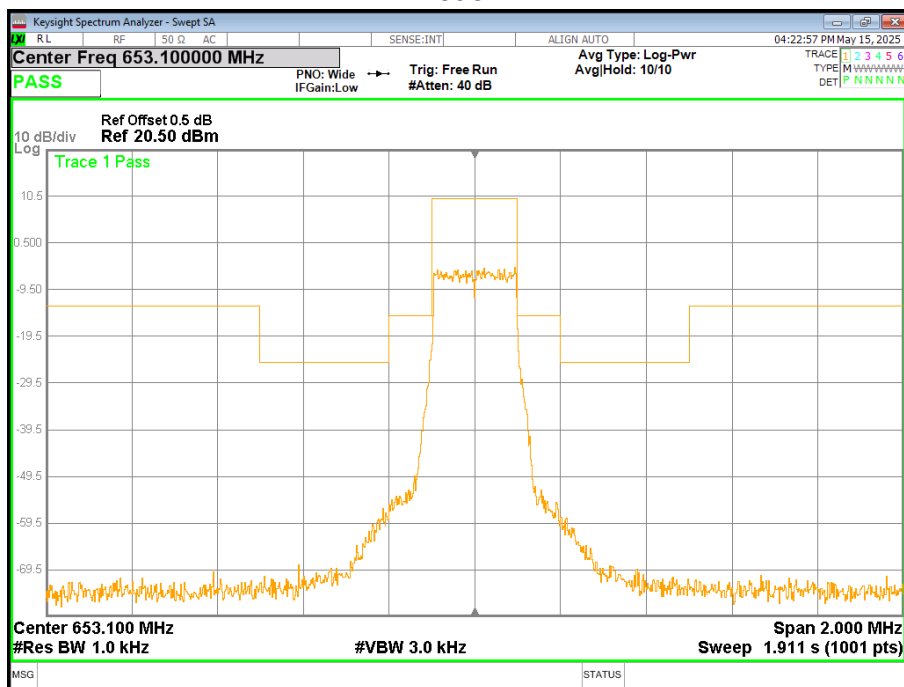
Note:

- 1) $\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier}$
 $\text{Emission Level} = \text{Reading} + \text{Factor}$
- 2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



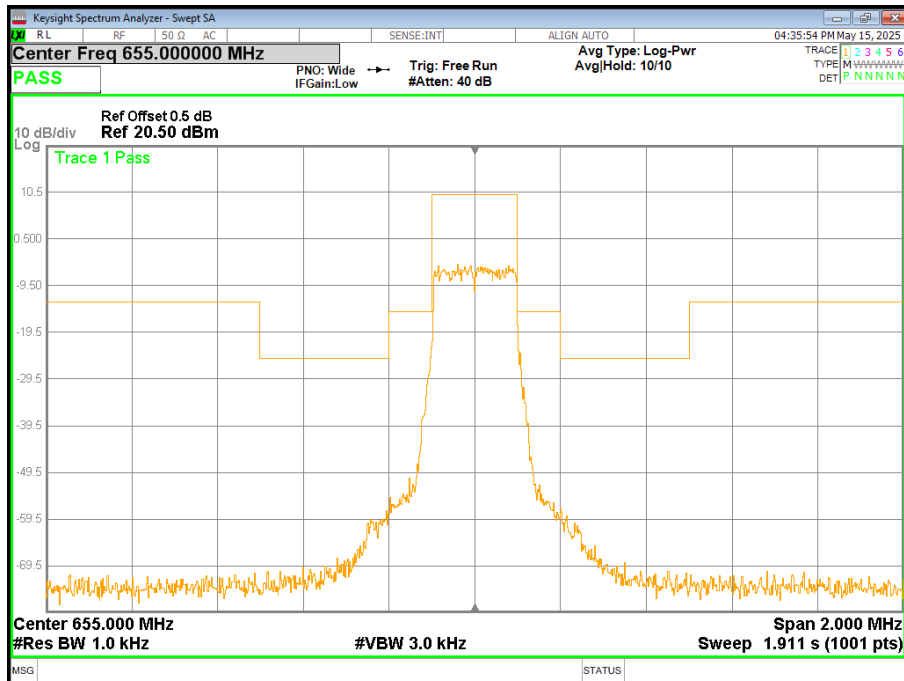
Emission Mask I

Mode 1

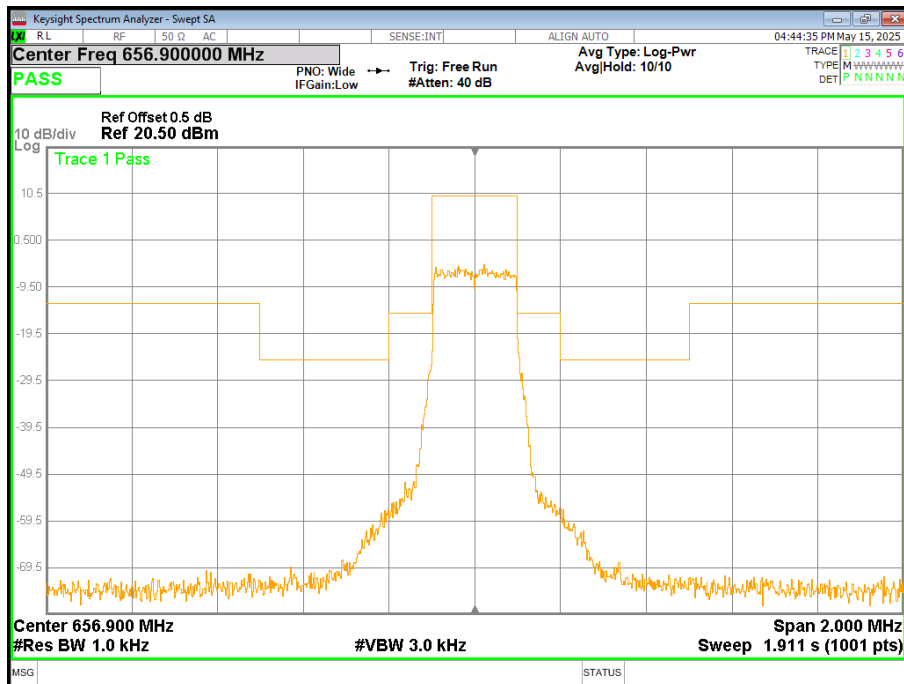




Mode 2



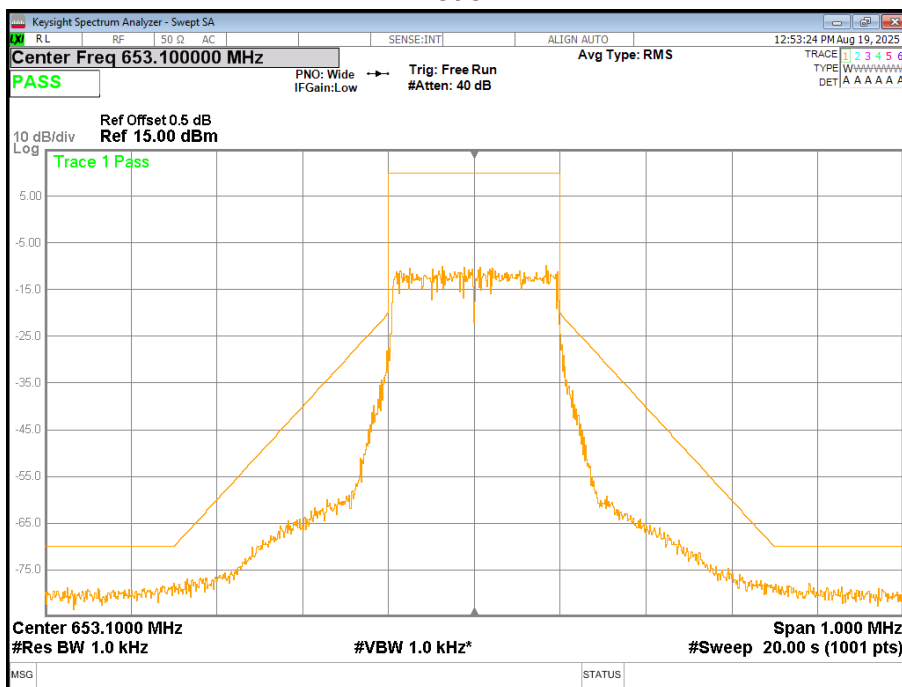
Mode 3





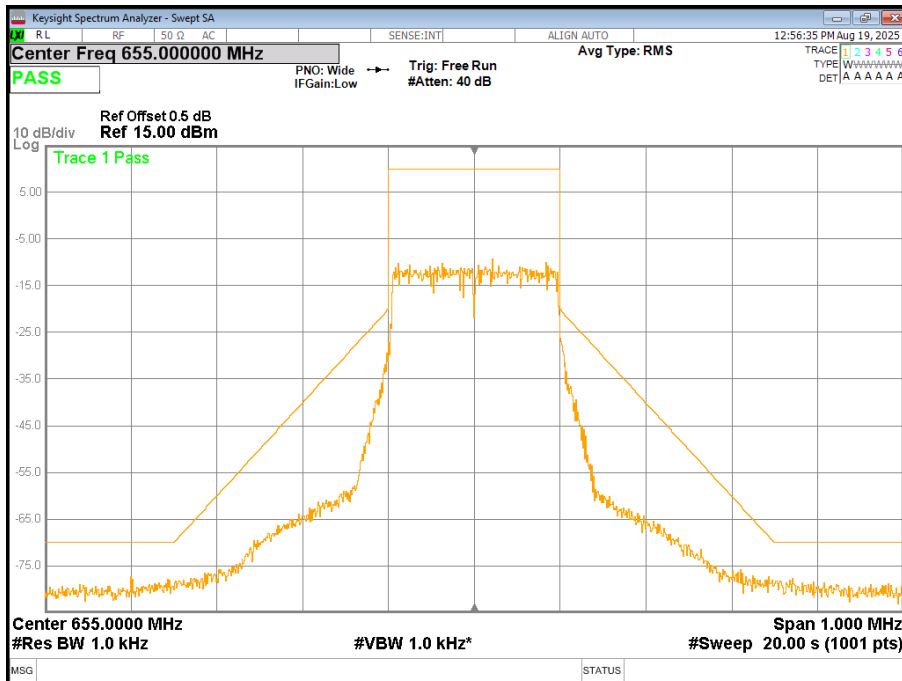
Emission Mask II

Mode 1

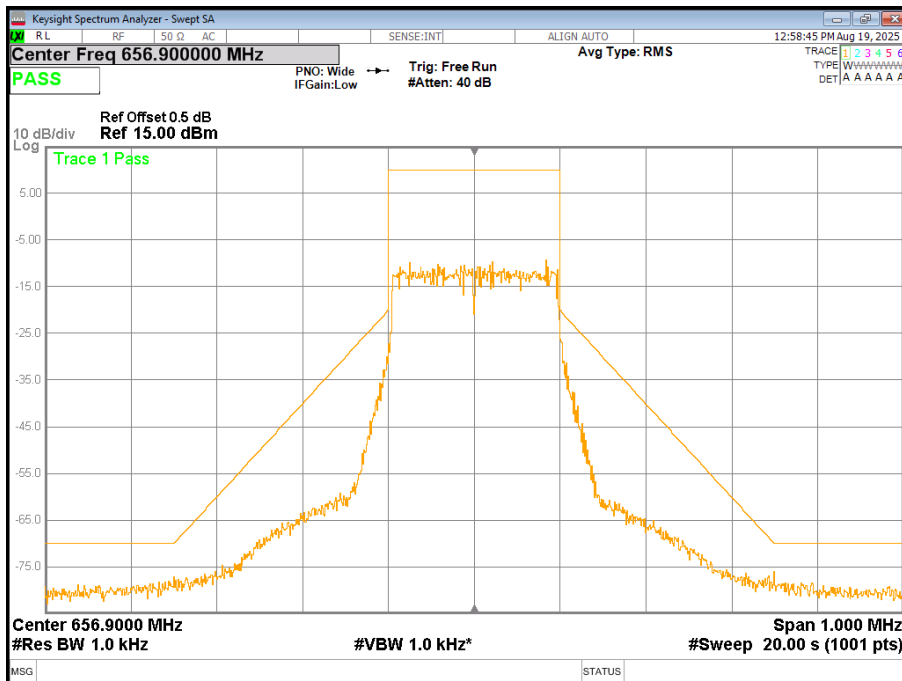




Mode 2



Mode 3

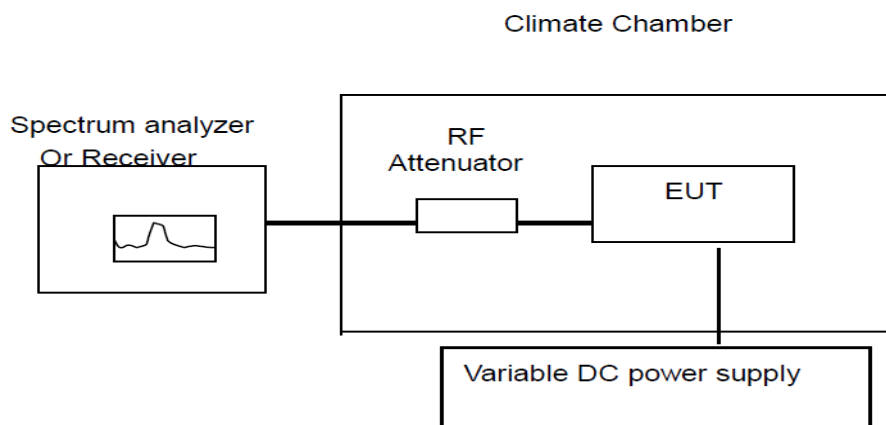


4.5 FREQUENCY STABILITY VS. TEMPERATURE & VOLTAGE

4.5.1 TEST LIMIT

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

TEST CONFIGURATION



4.5.2 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 a 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 form 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.



4.5.3 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)

653MHz - 657MHz

Environment		Frequency Deviation measured with time Elapse(30 minutes)					
Temperature (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	Normal Voltage	653.1000	653.1013	1300	0.0002	0.0050	PASS
40		653.1000	653.0978	-2200	-0.0003		
30		653.1000	653.1027	2700	0.0004		
20		653.1000	653.1018	1800	0.0003		
10		653.1000	653.0971	-2900	-0.0004		
0		653.1000	653.0999	-100	0.0000		
-10		653.1000	653.0983	-1700	-0.0003		
-20		653.1000	653.1029	2900	0.0004		
-30		653.1000	653.1010	1000	0.0002		
20	Maximum Voltage	653.1000	653.1010	1000	0.0002		
-30	BEP	653.1000	653.0976	-2400	-0.0004		

Environment		Frequency Deviation measured with time Elapse(30 minutes)					
Temperature (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	Normal Voltage	655.0000	654.9953	-4700	-0.0007	0.0050	PASS
40		655.0000	654.9995	-500	-0.0001		
30		655.0000	655.0010	1000	0.0002		
20		655.0000	655.0030	3000	0.0005		
10		655.0000	655.0005	500	0.0001		
0		655.0000	655.0029	2900	0.0004		
-10		655.0000	655.0025	2500	0.0004		
-20		655.0000	655.0023	2300	0.0004		
-30		655.0000	655.0021	2100	0.0003		
20	Maximum Voltage	655.0000	654.9971	-2900	-0.0004		
-30	BEP	655.0000	655.0004	400	0.0001		

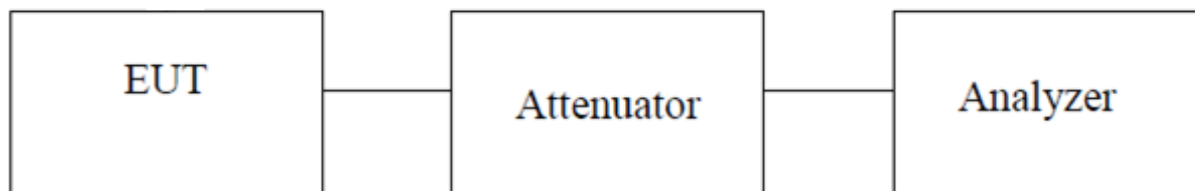
Environment		Frequency Deviation measured with time Elapse(30 minutes)					
Temperature (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	Normal Voltage	656.9000	656.9004	400	0.0001	0.0050	PASS
40		656.9000	656.8997	-300	0.0000		
30		656.9000	656.8998	-200	0.0000		
20		656.9000	656.9013	1300	0.0002		
10		656.9000	656.8977	-2300	-0.0004		
0		656.9000	656.8973	-2700	-0.0004		
-10		656.9000	656.9002	200	0.0000		
-20		656.9000	656.9017	1700	0.0003		
-30		656.9000	656.8967	-3300	-0.0005		
20	Maximum Voltage	656.9000	656.8992	-800	-0.0001		
-30	BEP	656.9000	656.9037	3700	0.0006		

4.6 OCCUPIED BANDWIDTH

4.6.1 TEST LIMIT

According to CFR 47 section 74.861 e (5), the operating bandwidth shall not exceed 200 KHz. Near the carrier an emission mask is defined by the standard.

TEST CONFIGURATION



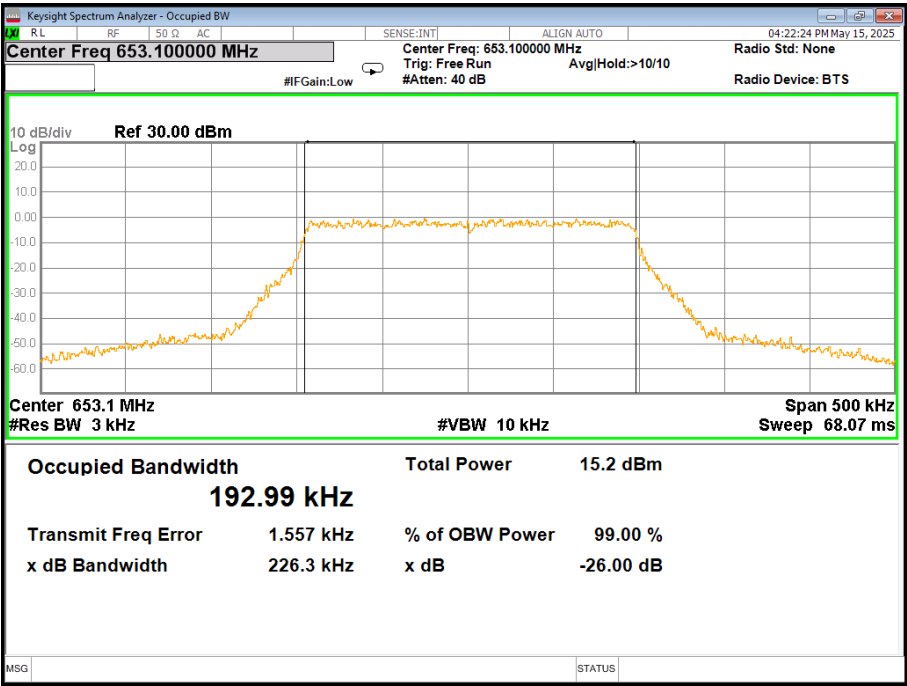
4.6.2 TEST PROCEDURE

- 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%.



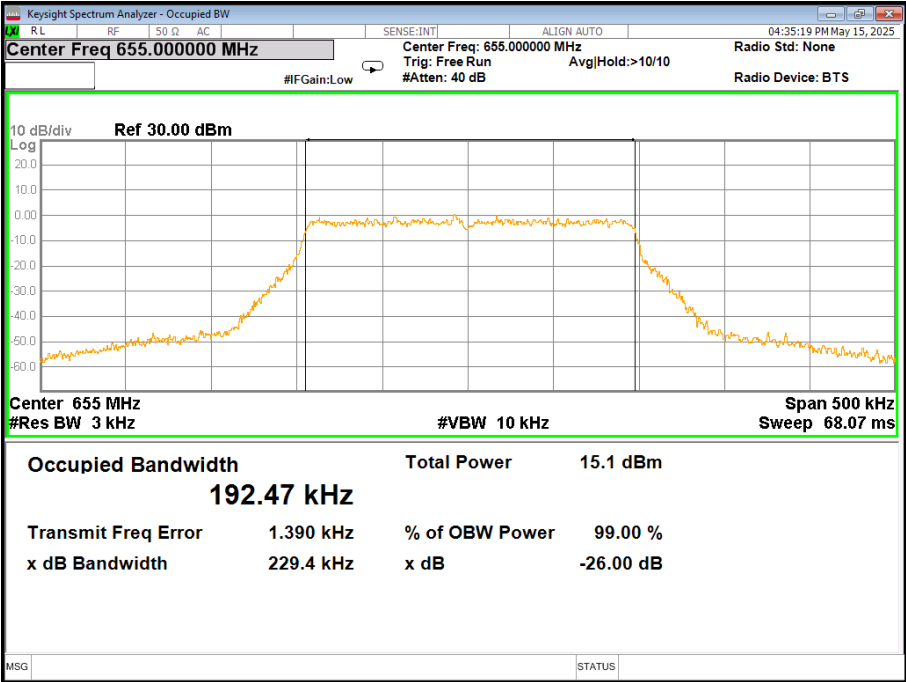
4.6.3 TEST RESULT

Mode 1

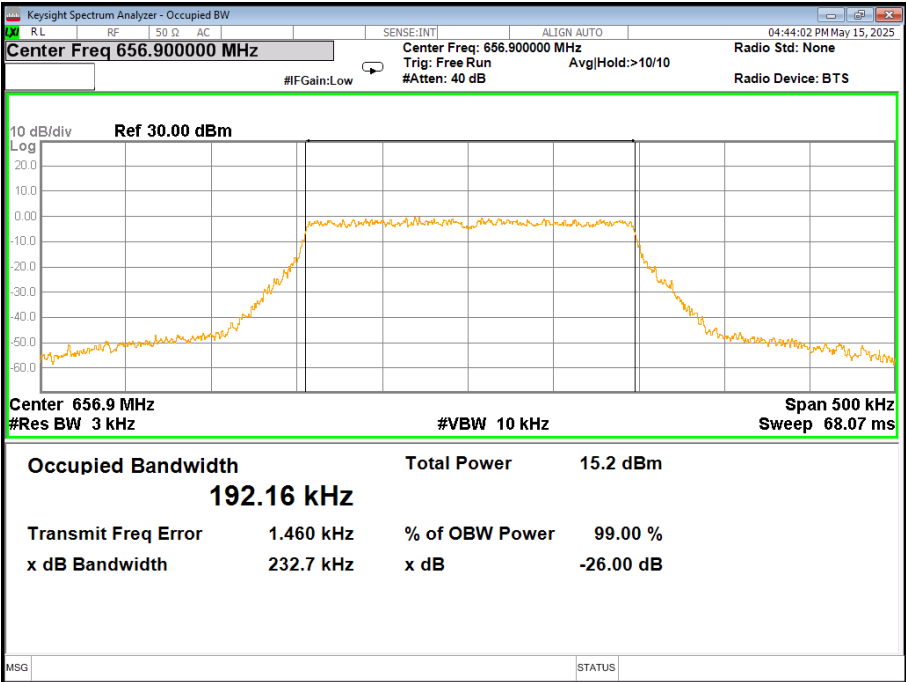




Mode 2



Mode 3



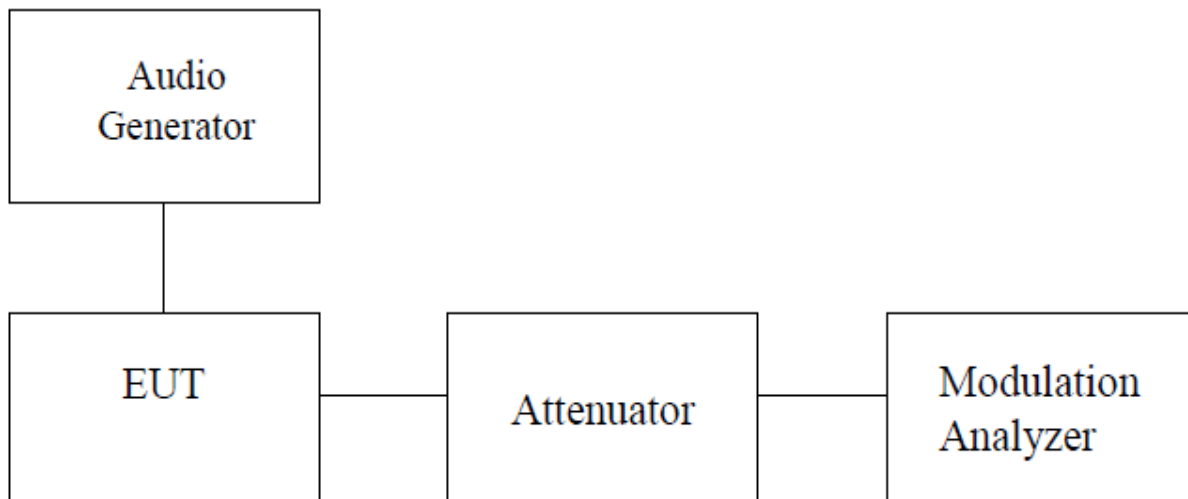
4.7 AUDIO FREQUENCY RESPONSE

4.7.1 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.

4.7.2 TEST CONFIGURATION



4.7.3 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:
$$\text{Audio Frequency Response} = 20 \log (\text{DEV freq} / \text{Dev ref})$$

4.7.4 TEST RESULT

Note: The EUT is digital modulation, not applicable.

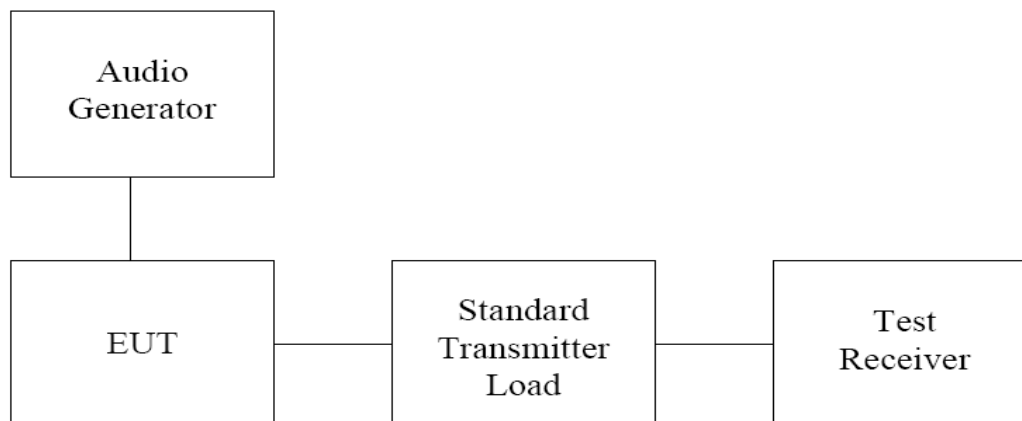
4.8 MODULATION DEVIATION

4.8.1 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.

4.8.2 TEST CONFIGURATION



4.8.3 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.

4.8.4 TEST RESULT

Note: The EUT is digital modulation, not applicable.

4.9 RF OUTPUT POWER

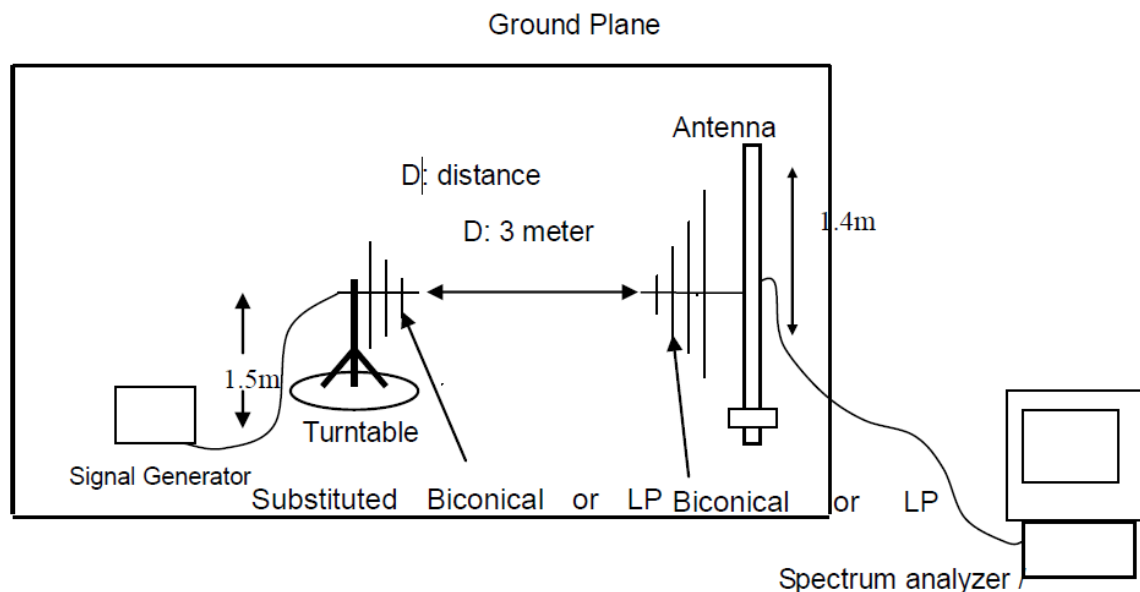
4.9.1 TEST LIMIT

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:

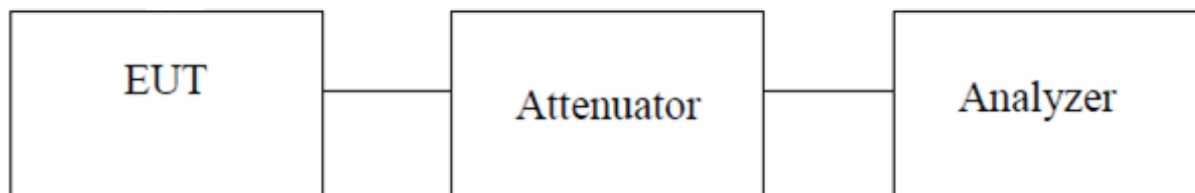
- (i) 54-72, 76-88, and 174-216 MHz bands: 50 mW EIRP
- (ii) 470-608 and 614-698: 250 mW conducted power
- (iii) 600 MHz duplex gap: 20 mW EIRP

4.9.2 TEST CONFIGURATION

Radiation



Conduction



4.9.3 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)

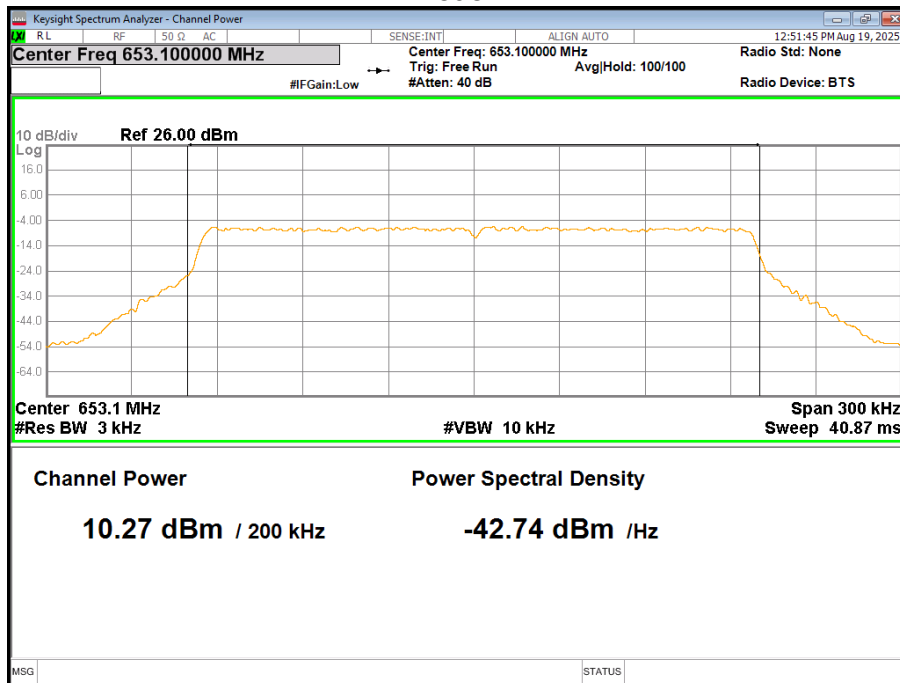
- a. The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.
- b. Set the RBW $>20\text{BW}$, VBW $>3\text{RBW}$.
- c. Detector = peak.
- d. Sweep time = auto couple.
- e. Trace mode = max hold.
- f. Allow trace to fully stabilize.
- g. Use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



4.9.4 TEST RESULT

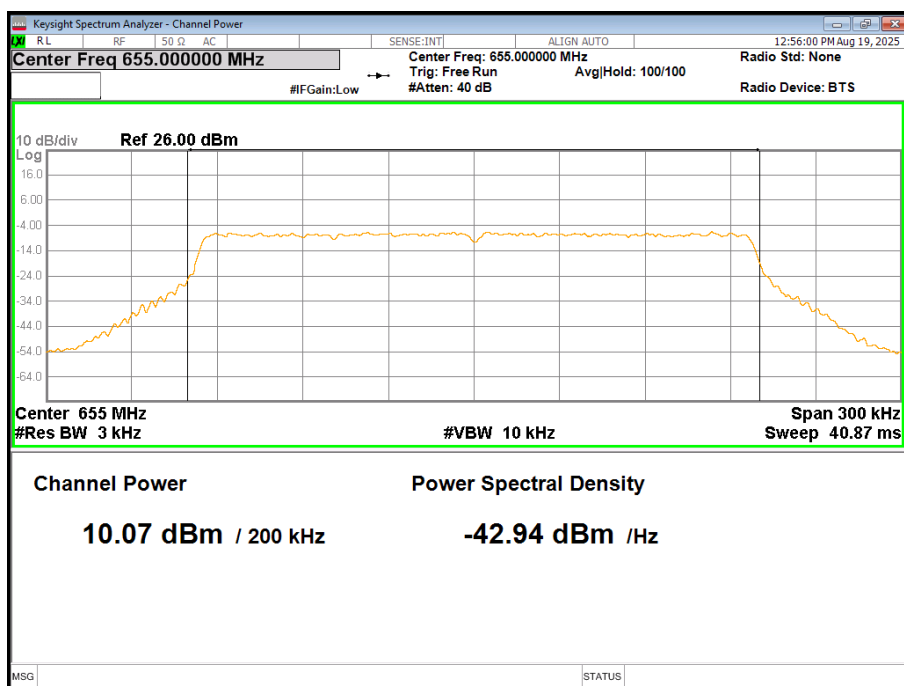
Frequency Channel (MHz)	Conducted Output Power (dBm)	Ant Gain (dBd)	EIRP (dBm)	EIRP (mW)	Limits (mW)
653.100	10.27	-1.87	10.55	11.350	20
655.000	10.07	-1.87	10.35	10.839	20
656.900	10.12	-1.87	10.4	10.965	20

Mode 1

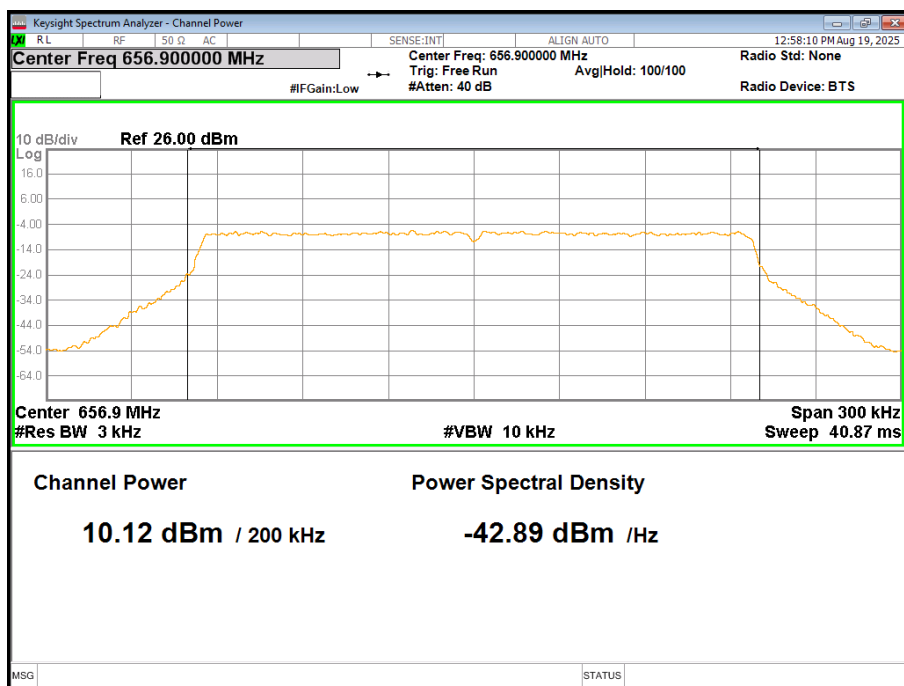




Mode 2



Mode 3





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※※※※※