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RADIO TEST REPORT

Report No:STS2007355W09

Issued for

K-MOBILE TECHNOLOGY CO., LTD

NO 1109-1110, C1 Block, bantian international center, NO 5
huancheng south road, longgang district, Shenzhen, China.

Product Name:	Multi Mode 4G Android PTT Phone
Brand Name:	Estalky
Model Name:	E966
Series Model:	E966P
FCC ID:	2AVAF-E966
IC:	26705-E966
Test Standard:	FCC Part 90 Rules RSS-119 Issue 12 May 2015

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TEST RESULT CERTIFICATION

Applicant's Name : K-MOBILE TECHNOLOGY CO., LTD
Address : NO 1109-1110, C1 Block, bantian international center, NO 5
huancheng south road, longgang district, Shenzhen, China.
Manufacturer's Name : K-MOBILE TECHNOLOGY CO., LTD
Address : NO 1109-1110, C1 Block, bantian international center, NO 5
huancheng south road, longgang district, Shenzhen, China.

Product Description

Product Name : Multi Mode 4G Android PTT Phone
Brand Name : Estalky
Model Name : E966
Series Model : E966P

Test Standards : FCC Part 90 Rules
RSS-119 Issue 12 May 2015

Test Procedure : 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/IC 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 : 21 Sept. 2020

Date of performance of tests ... : 21 Sept. 2020 ~ 03 Nov. 2020

Date of Issue : 03 Nov. 2020

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	03 Nov. 2020	STS2007355W09	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 90 Rules RSS-119 Issue 12 May 2015			
Standard	Item	Result	Remarks
FCC Part 90.205 RSS-119 5.4	Maximum Effective Radiated Power	PASS	
FCC Part 90.209 RSS-Gen 4.6.1, 4.6.3	Occupied Bandwidth	PASS	
FCC Part 90.210 RSS-119 5.8.3	Emission Mask	PASS	
FCC Part 90.210 RSS-119 5.8.3	Transmitter Radiated Spurious Emssion	PASS	
FCC Part 90.210 RSS-119 5.8.3	Spurious Emssion on Antenna Port	PASS	
FCC Part 90.213 RSS-119 5.3	Frequency Stability Test	PASS	
FCC Part 90.210 RSS-119 5.9	Transmitter Frequency Behavior	PASS	
FCC Part 2.1047	Modulation Characteristic	PASS	

NOTE:

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



1.1 TEST FACILITY

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	$\pm 6.7\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 5.5\text{dB}$
5	All emissions, radiated >6G	$\pm 5.8\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 4.43\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 5\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Multi Mode 4G Android PTT Phone
Brand Name:	Estalky
Model Name:	E966
Series Model:	E966P
Model Difference description:	Only different in model name
Operation Frequency Range	Frequency Range: 450.0125MHz ~ 469.9875MHz
Maximum Transmitter Power:	33.31dBm
Modulation type:	Analogue mode: FM Digital mode: 4FSK
Adapter:	Input: AC 100-240V, 50/60Hz, 0.5A Output: 5V, 3A
Battery :	Rated Voltage: 3.8V Charge Limit: 4.35V Capacity: 4500mAh
Temperature Range:	0℃-40℃
Test frequency list:	See Note 3
Software version number:	Y6128A-V2.0
Hardware version number:	Y6128A_E966_DMR_D01_2020081114

Note:

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

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Estalky	E966	External	N/A	1.8dBi	Antenna

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



3. Test frequency list

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	450.0125	...	...	...	...
02	450.0250	...	...	...	...
03	450.0375	...	...	...	...
...	...	799	459.9875	...	...
...	...	800	460.0000	...	...
...	...	801	460.0125	1597	469.9625
...	...	...	...	1598	469.9750
...	...	...	...	1599	469.9875

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 EUT OPERATION MODE

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

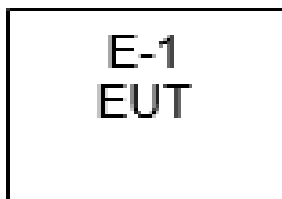
2.3 DESCRIPTION OF TEST MODES

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.

Test Mode	Power level	Modulation Type	Channel Separation	Frenquency
Mode1	Low power	FM	12.5kHz	Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)
Mode2	High power			Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)
Mode3	Low power	FM	25kHz	Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)
Mode4	High power			Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)
Mode5	Low power	4FSK	12.5kHz	Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)
Mode6	High power			Low channel(450.0125MHz)
				Mid channel(460.0000MHz)
				High channel(469.9875MHz)



2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 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
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.7 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
Intercom comprehensive tester	HP	8920A	348A05658	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. MAXIMUM EFFECTIVE RADIATED POWER

3.1 LIMITS

Per FCC Part 2.1046 and Part 90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

The output power shall not exceed by more than 20 percent either the output power shown in the Radio Equipment List [available in accordance with §90.203(a)(1)] for transmitters included in this list or when not so listed, the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

RSS 199: The output power shall be within ± 1 dB of the manufacturer's rated power listed in the equipment specifications.

The transmitter output power limits set forth in Table 2 will come into force upon the publication of Issue 12 of this standard and will apply to newly certified equipment.

Frequency Bands (MHz)	Transmitter Output Power (W)	
	Base/Fixed Equipment	Mobile Equipment
406.1-430 and 450-470	110	60

3.2 TEST PROCEDURE

The procedure of conducted power is as follows:

Measurements shall be made to establish the radio frequency power delivered by the transmitter the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted below: If the power output is adjustable, measurements shall be made for the highest and lowest power levels. The EUT connect to the Spectrum Analyzer through 30 dB attenuator.

The procedure of effective radiated power is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, $RSE = Rx \text{ (dBuV)} + CL \text{ (dB)} + SA \text{ (dB)} + Gain \text{ (dBi)} - 107 \text{ (dBuV to dBm)}$ The SA is calibrated using following setup.

b) EUT was placed on a 1.5m non-conductive stand at a 3 m test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 m from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic measured with peak detector and 1MHz bandwidth.

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power = P_{Mea} + AR_{pl}$

3.3 DEVIATION FROM TEST STANDARD

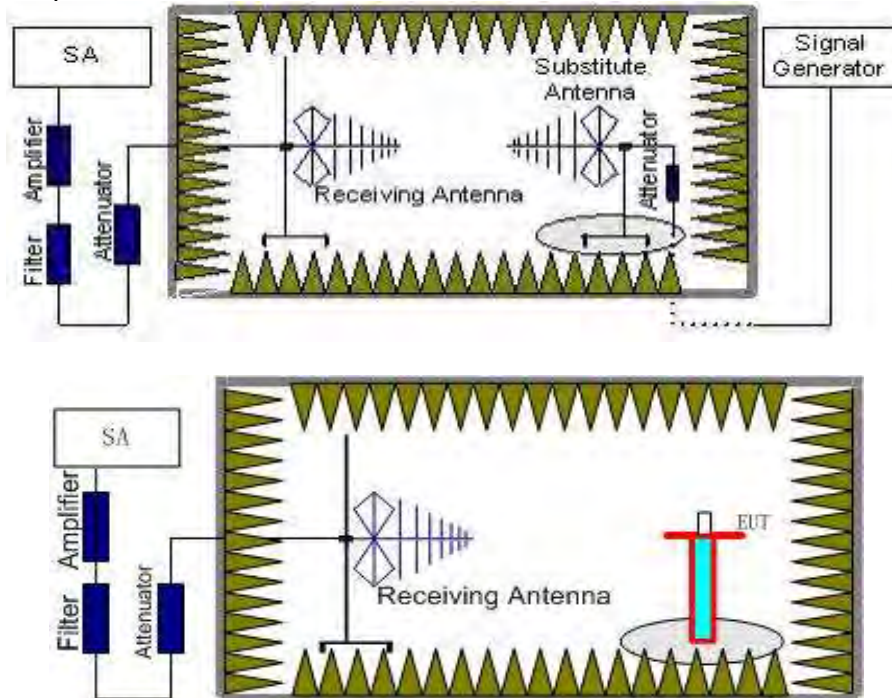
No deviation

3.4 TEST SETUP BLOCK DIAGRAM

Conducted power:



Effective radiated power:





3.5 TEST RESULT

Conducted Power:

FCC:

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Test Results (W)	Limit (W)
FM	12.5KHz	Low Power	CH1	450.0125	27.078	0.51	0.4-0.6
			CH800	460.0000	27.088	0.51	
			CH1599	469.9875	27.057	0.51	
		High Power	CH1	450.0125	33.508	2.24	1.6-2.4
			CH800	460.0000	33.162	2.07	
			CH1599	469.9875	32.642	1.84	

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Test Results (W)	Limit (W)
FM	25KHz	Low Power	CH1	450.0125	27.463	0.56	0.4-0.6
			CH800	460.0000	27.056	0.51	
			CH1599	469.9875	27.029	0.50	
		High Power	CH1	450.0125	33.625	2.30	1.6-2.4
			CH800	460.0000	33.227	2.10	
			CH1599	469.9875	32.721	1.87	

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Test Results (W)	Limit (W)
4FSK	12.5KHz	Low Power	CH1	450.0125	27.571	0.57	0.4-0.6
			CH800	460.0000	27.568	0.57	
			CH1599	469.9875	27.717	0.59	
		High Power	CH1	450.0125	33.709	2.35	1.6-2.4
			CH800	460.0000	33.425	2.20	
			CH1599	469.9875	32.951	1.97	



IC:

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Limit (W)
FM	12.5KHz	Low Power	CH1	450.0125	27.078	25.99-27.99
			CH800	460.0000	27.088	
			CH1599	469.9875	27.057	
		High Power	CH1	450.0125	33.508	32.01-34.01
			CH800	460.0000	33.162	
			CH1599	469.9875	32.642	

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Limit (W)
FM	25KHz	Low Power	CH1	450.0125	27.463	25.99-27.99
			CH800	460.0000	27.056	
			CH1599	469.9875	27.029	
		High Power	CH1	450.0125	33.625	32.01-34.01
			CH800	460.0000	33.227	
			CH1599	469.9875	32.721	

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)	Limit (W)
4FSK	12.5KHz	Low Power	CH1	450.0125	27.571	25.99-27.99
			CH800	460.0000	27.568	
			CH1599	469.9875	27.717	
		High Power	CH1	450.0125	33.709	32.01-34.01
			CH800	460.0000	33.425	
			CH1599	469.9875	32.951	



Effective radiated power:

FCC:

Channel Separation: 12.5KHz

Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	25.05	1.43	6.20	27.67	26.02-27.78
			H	24.92	1.43	6.20	27.54	26.02-27.78
	460.0000	CH800	V	24.95	1.49	6.00	27.31	26.02-27.78
			H	25.04	1.49	6.00	27.40	26.02-27.78
	469.9875	CH1599	V	25.27	1.51	6.00	27.61	26.02-27.78
			H	25.04	1.51	6.00	27.38	26.02-27.78

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	29.99	1.43	6.20	32.61	32.04-33.80
			H	30.12	1.43	6.20	32.74	32.04-33.80
	460.0000	CH800	V	30.00	1.49	6.00	32.36	32.04-33.80
			H	30.04	1.49	6.00	32.40	32.04-33.80
	469.9875	CH1599	V	30.50	1.51	6.00	32.84	32.04-33.80
			H	30.25	1.51	6.00	32.59	32.04-33.80

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15



Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
4FSK	450.0125	CH1	V	24.90	1.43	6.20	27.52	26.02-27.78
			H	24.72	1.43	6.20	27.34	26.02-27.78
	460.0000	CH800	V	24.90	1.49	6.00	27.26	26.02-27.78
			H	24.72	1.49	6.00	27.08	26.02-27.78
	469.9875	CH1599	V	25.07	1.51	6.00	27.41	26.02-27.78
			H	24.99	1.51	6.00	27.33	26.02-27.78

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
4FSK	450.0125	CH1	V	30.69	1.43	6.20	33.31	32.04-33.80
			H	30.46	1.43	6.20	33.08	32.04-33.80
	460.0000	CH800	V	30.49	1.49	6.00	32.85	32.04-33.80
			H	30.33	1.49	6.00	32.69	32.04-33.80
	469.9875	CH1599	V	30.57	1.51	6.00	32.91	32.04-33.80
			H	30.41	1.51	6.00	32.75	32.04-33.80

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15



Channel Separation: 25KHz

Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	24.76	1.43	6.20	27.38	26.02-27.78
			H	24.89	1.43	6.20	27.51	26.02-27.78
	460.0000	CH800	V	24.88	1.49	6.00	27.24	26.02-27.78
			H	25.05	1.49	6.00	27.41	26.02-27.78
	469.9875	CH1599	V	25.04	1.51	6.00	27.38	26.02-27.78
			H	25.20	1.51	6.00	27.54	26.02-27.78

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	30.06	1.43	6.20	32.68	32.04-33.80
			H	30.09	1.43	6.20	32.71	32.04-33.80
	460.0000	CH800	V	30.06	1.49	6.00	32.42	32.04-33.80
			H	29.93	1.49	6.00	32.29	32.04-33.80
	469.9875	CH1599	V	30.33	1.51	6.00	32.67	32.04-33.80
			H	30.24	1.51	6.00	32.58	32.04-33.80

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

Note: The rated low power is 0.5W, the power limits is 0.4W~0.6W.

The rated high power is 2W, the power limits is 1.6W~2.4W.



IC:

Channel Sparation: 12.5KHz

Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	25.05	1.43	6.20	27.67	25.99-27.99
			H	24.92	1.43	6.20	27.54	25.99-27.99
	460.0000	CH800	V	24.95	1.49	6.00	27.31	25.99-27.99
			H	25.04	1.49	6.00	27.40	25.99-27.99
	469.9875	CH1599	V	25.27	1.51	6.00	27.61	25.99-27.99
			H	25.04	1.51	6.00	27.38	25.99-27.99

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	29.99	1.43	6.20	32.61	32.01-34.01
			H	30.12	1.43	6.20	32.74	32.01-34.01
	460.0000	CH800	V	30.00	1.49	6.00	32.36	32.01-34.01
			H	30.04	1.49	6.00	32.40	32.01-34.01
	469.9875	CH1599	V	30.50	1.51	6.00	32.84	32.01-34.01
			H	30.25	1.51	6.00	32.59	32.01-34.01

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15



Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
4FSK	450.0125	CH1	V	24.76	1.43	6.20	27.38	25.99-27.99
			H	24.89	1.43	6.20	27.51	25.99-27.99
	460.0000	CH800	V	24.88	1.49	6.00	27.24	25.99-27.99
			H	25.05	1.49	6.00	27.41	25.99-27.99
	469.9875	CH1599	V	25.04	1.51	6.00	27.38	25.99-27.99
			H	25.20	1.51	6.00	27.54	25.99-27.99

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
4FSK	450.0125	CH1	V	30.06	1.43	6.20	32.68	32.01-34.01
			H	30.09	1.43	6.20	32.71	32.01-34.01
	460.0000	CH800	V	30.06	1.49	6.00	32.42	32.01-34.01
			H	29.93	1.49	6.00	32.29	32.01-34.01
	469.9875	CH1599	V	30.33	1.51	6.00	32.67	32.01-34.01
			H	30.24	1.51	6.00	32.58	32.01-34.01

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15



Channel Separation: 25KHz

Low Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	24.90	1.43	6.20	27.52	25.99-27.99
			H	24.72	1.43	6.20	27.34	25.99-27.99
	460.0000	CH800	V	24.90	1.49	6.00	27.26	25.99-27.99
			H	24.72	1.49	6.00	27.08	25.99-27.99
	469.9875	CH1599	V	25.07	1.51	6.00	27.41	25.99-27.99
			H	24.99	1.51	6.00	27.33	25.99-27.99

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

High Power

Operation Mode	Freq (MHz)	Channel	Antenna	Reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FM	450.0125	CH1	V	30.69	1.43	6.20	33.31	32.01-34.01
			H	30.46	1.43	6.20	33.08	32.01-34.01
	460.0000	CH800	V	30.49	1.49	6.00	32.85	32.01-34.01
			H	30.33	1.49	6.00	32.69	32.01-34.01
	469.9875	CH1599	V	30.57	1.51	6.00	32.91	32.01-34.01
			H	30.41	1.51	6.00	32.75	32.01-34.01

Note:ERP=Reading - Cable loss + Antenna Gain - 2.15

Note: The rated low power is 0.5W=26.99dBm, the power limits is 25.99dBm~27.99dBm.
The rated high power is 2W=33.01dBm, the power limits is 32.01dBm~34.01dBm.



4. OCCUPIED BANDWIDTH

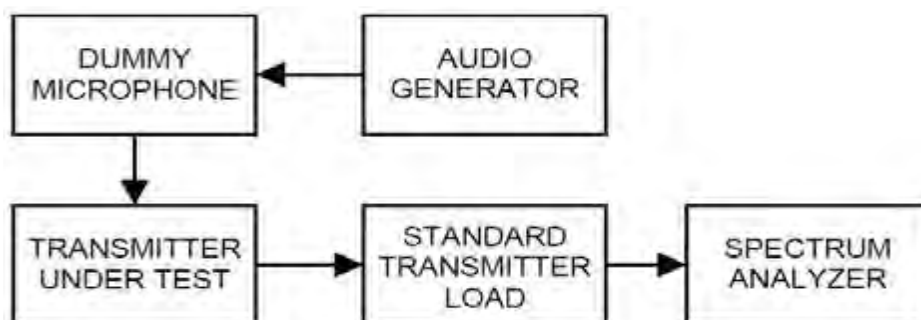
4.1 LIMIT

Occupied Bandwidth: The EUT was connected to the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer. The maximum authorized bandwidth shall not be more than that normally authorized for digital data mode.

4.2 MEASUREMENT PROCEDURE

- The EUT was connected to the spectrum analyzer through sufficient attenuation.
- Set EUT as digital data mode.
- Set SPA Center Frequency=fundamental frequency, RBW=300Hz, VBW=3KHz, span =15KHz or 30KHz.
- Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth.

4.3 TEST SETUP BLOCK DIAGRAM



4.4 TEST RESULT

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Occupied Bandwidth (KHz)	
					99%	26dB
FM	12.5KHz	Low Power	CH1	450.0125	6.522	9.891
			CH800	460.0000	6.290	10.030
			CH1599	469.9875	6.411	10.090
		High Power	CH1	450.0125	6.265	10.130
			CH800	460.0000	6.260	9.953
			CH1599	469.9875	6.249	10.220

Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Occupied Bandwidth (KHz)	
					99%	26dB
FM	25KHz	Low Power	CH1	450.0125	9.788	14.48
			CH800	460.0000	9.697	14.30
			CH1599	469.9875	9.677	14.41
		High Power	CH1	450.0125	9.857	14.41
			CH800	460.0000	9.761	14.44
			CH1599	469.9875	10.061	14.48

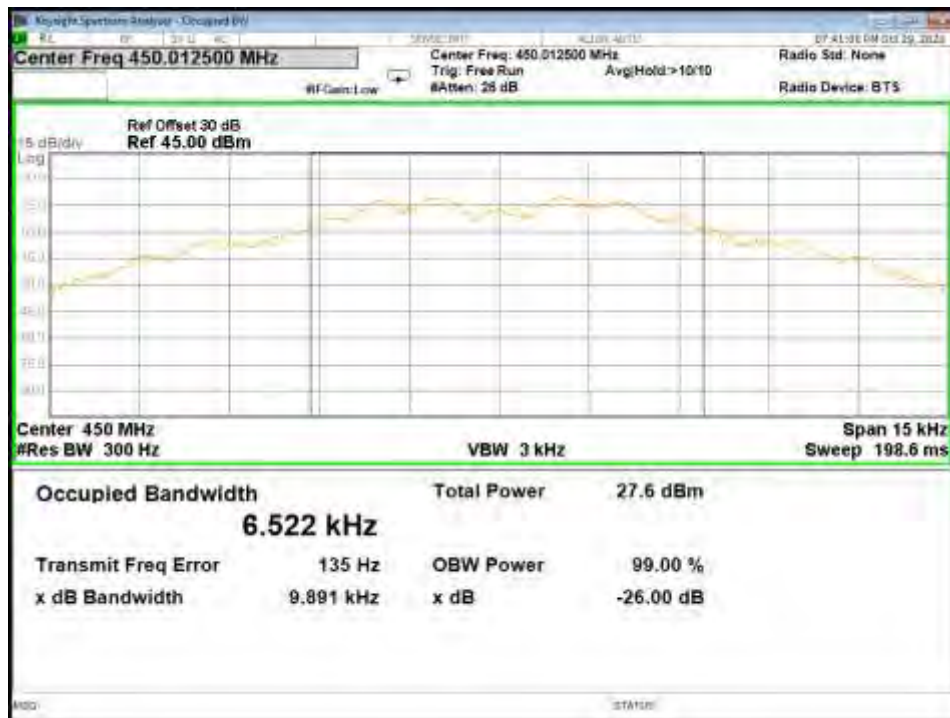


Modulation Type	Channel Sparation	Operation Mode	Test Channel	Test Frequency (MHz)	Occupied Bandwidth (KHz)	
					99%	26dB
4FSK	12.5KHz	Low Power	CH1	450.0125	7.977	9.779
			CH800	460.0000	7.944	9.985
			CH1599	469.9875	7.871	10.730
		High Power	CH1	450.0125	7.609	9.847
			CH800	460.0000	7.849	9.961
			CH1599	469.9875	8.128	10.120



CH 1

Model 1



CH 800

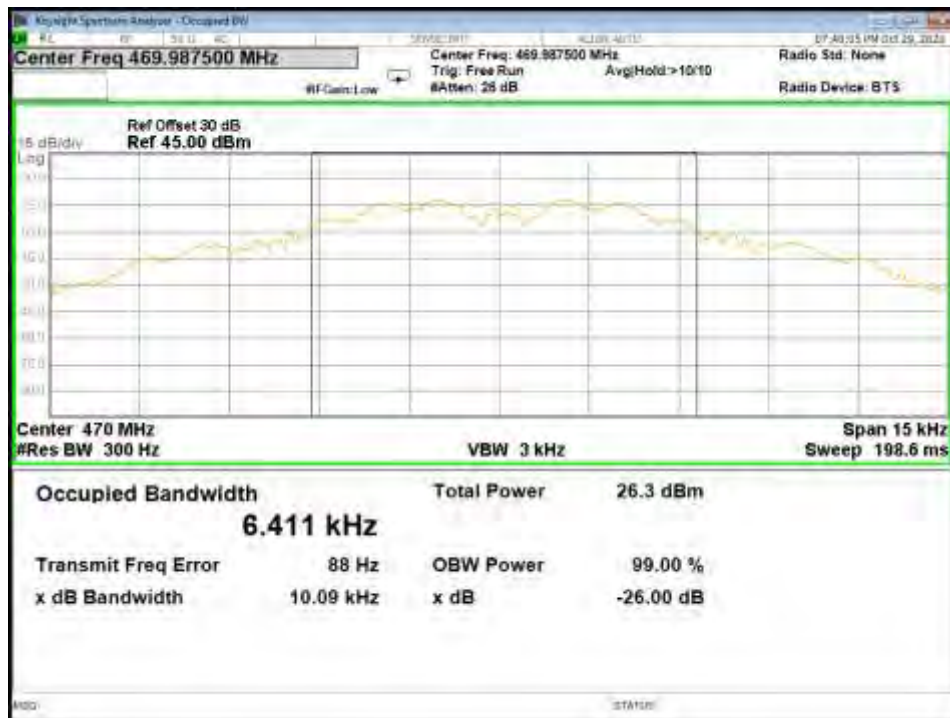
Model 1





CH 1599

Model 1



CH 1

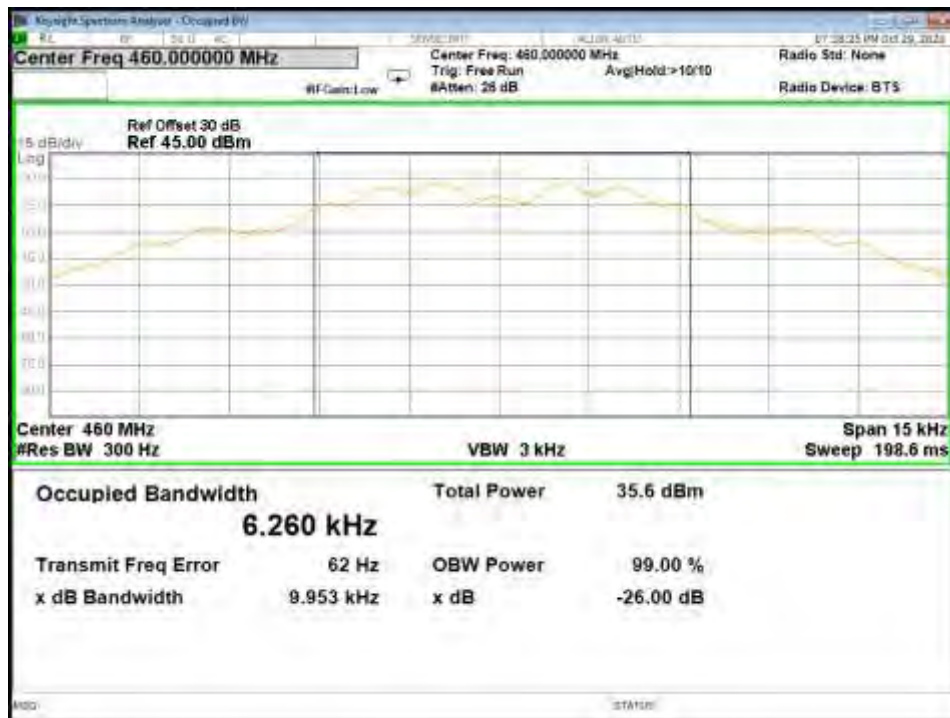
Model 2





CH 800

Model 2



CH 1599

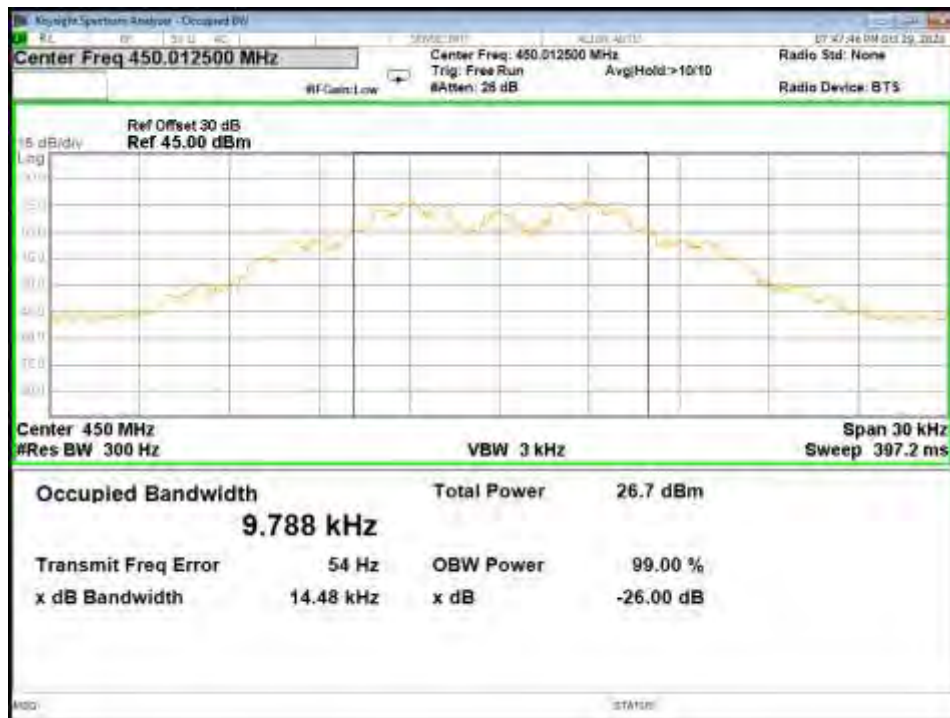
Model 2





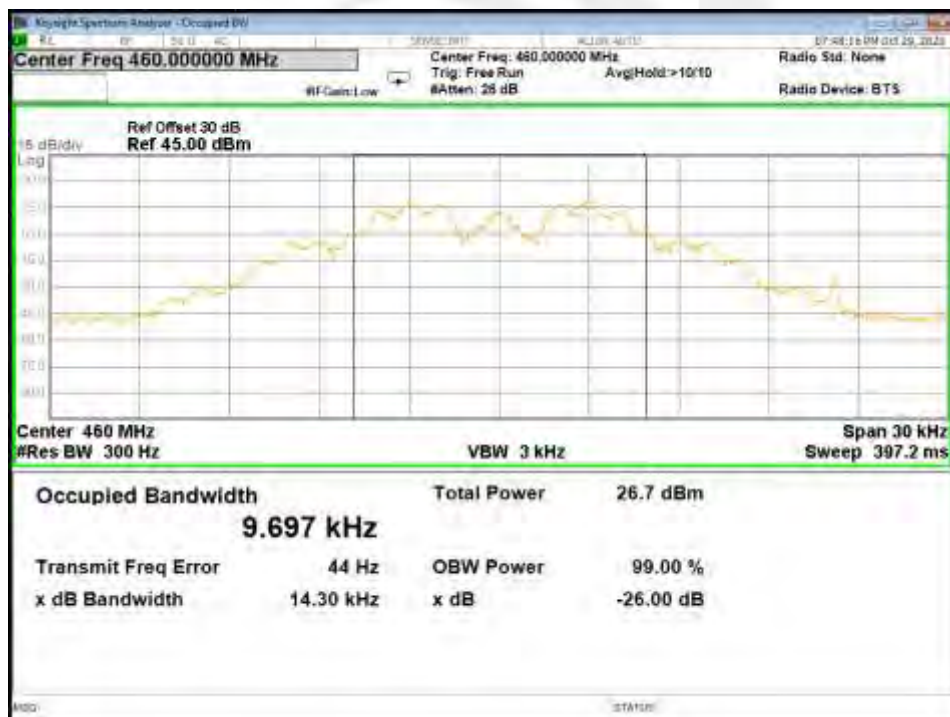
CH 1

Model 3



CH 800

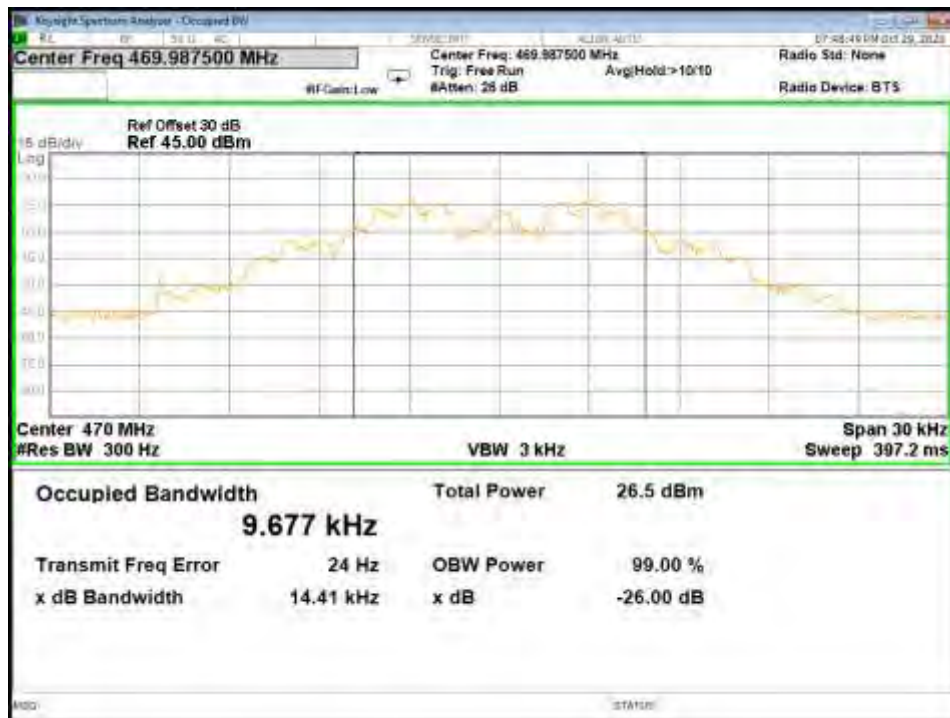
Model 3





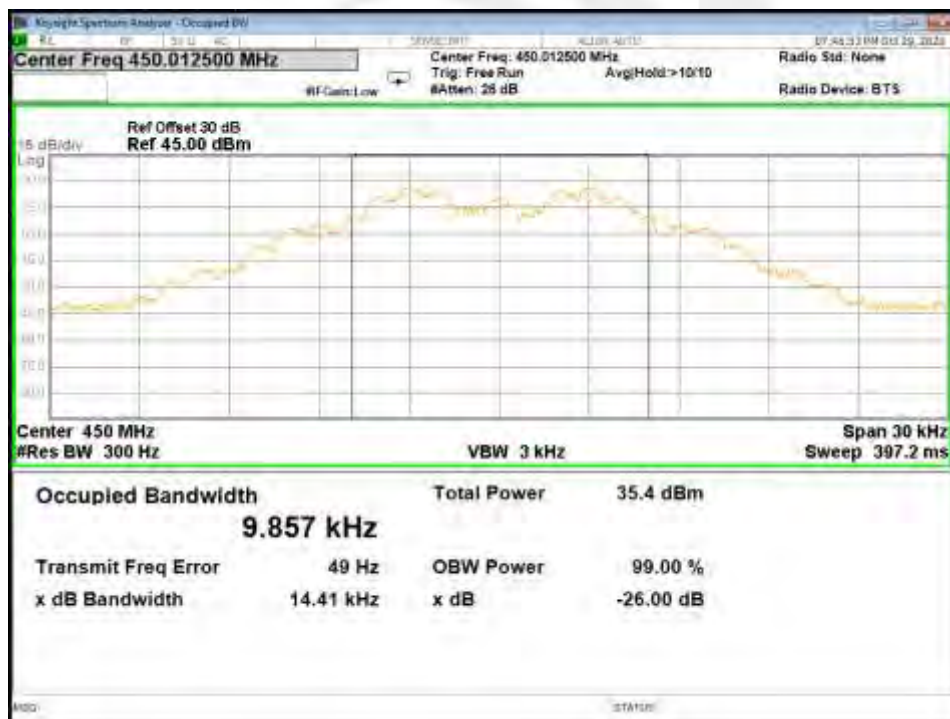
CH 1599

Model 3



CH 1

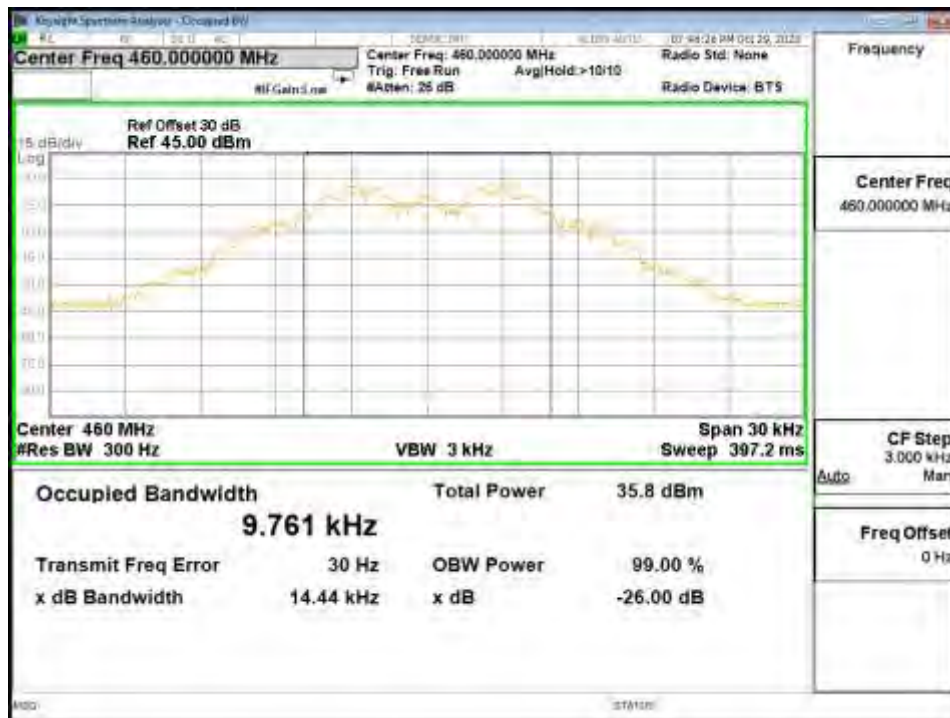
Model 4





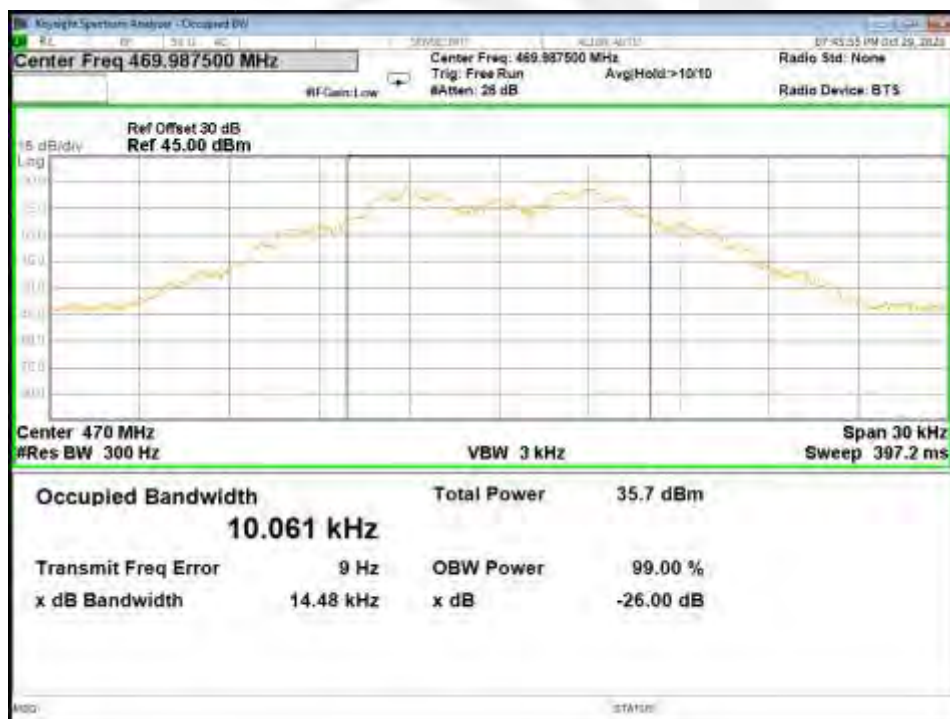
CH 800

Model 4



CH 1599

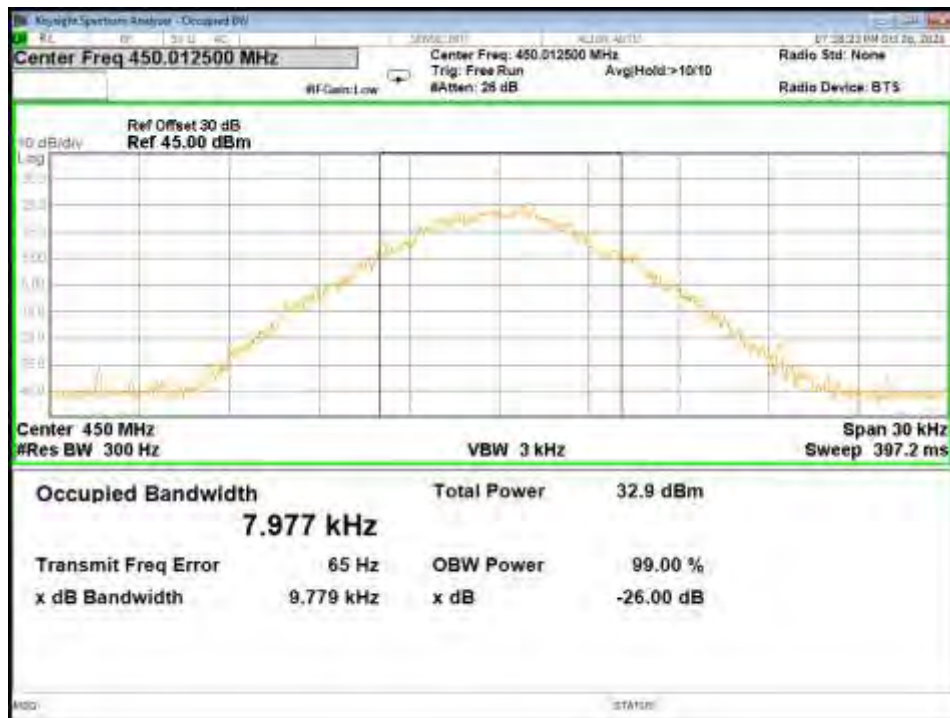
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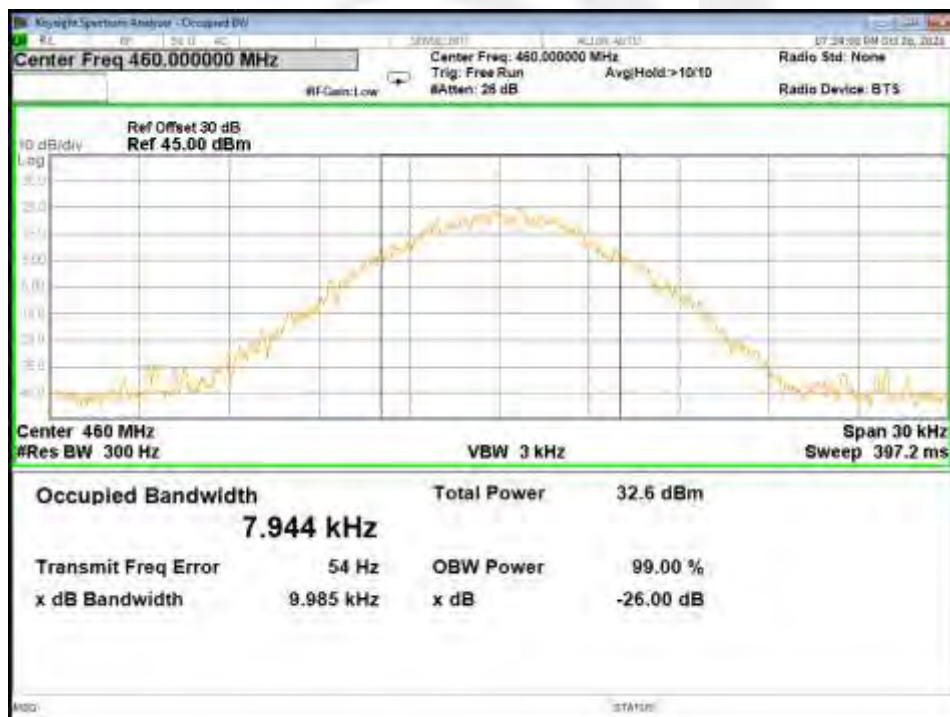
CH 1

Model 5



CH 800

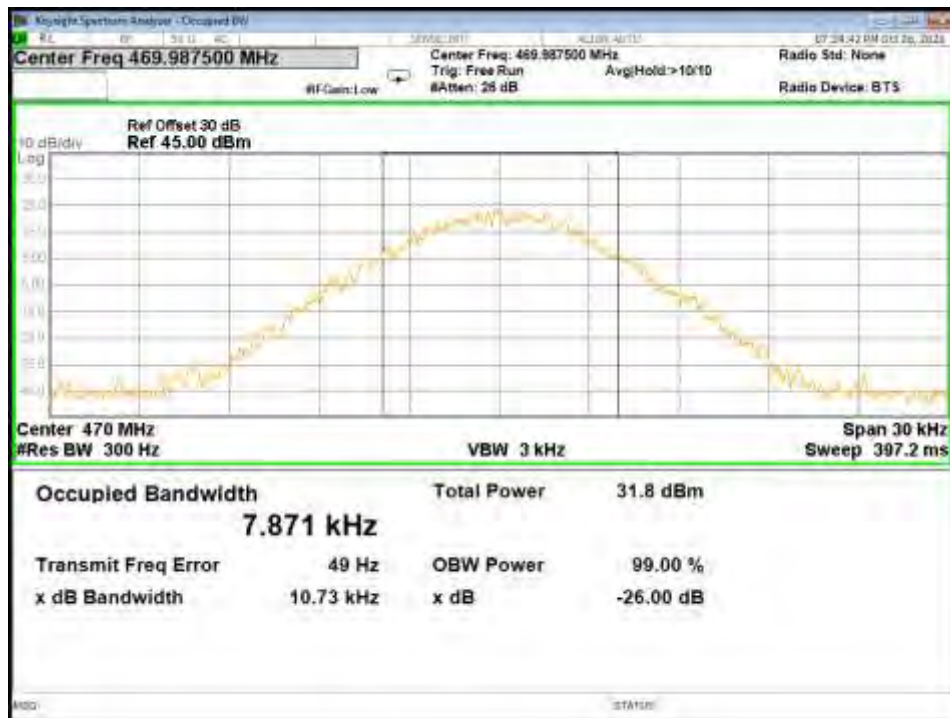
Model 5





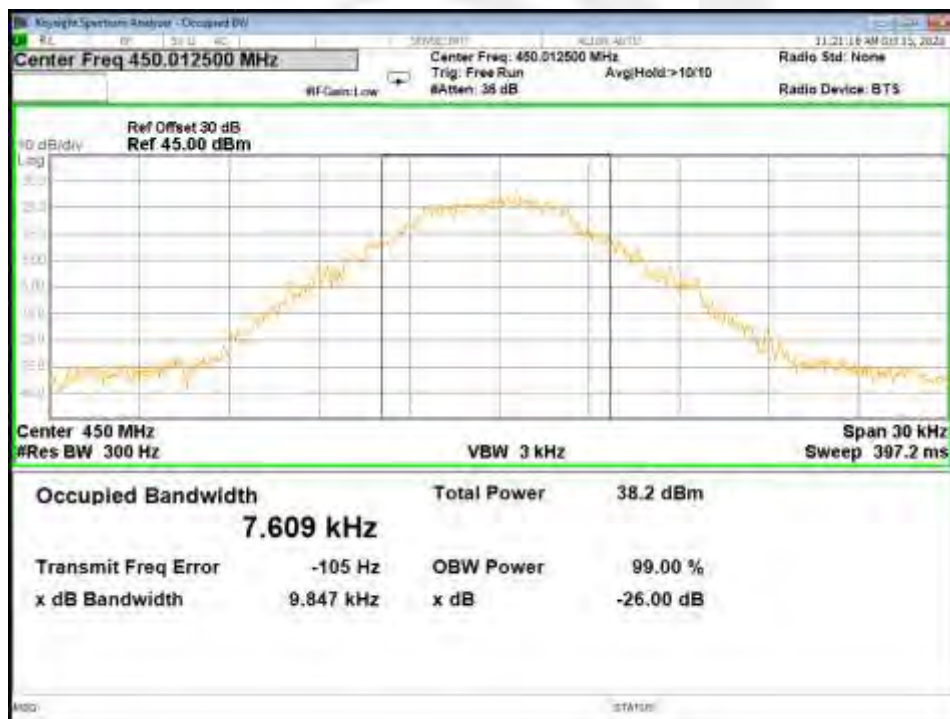
CH 1599

Model 5



CH 1

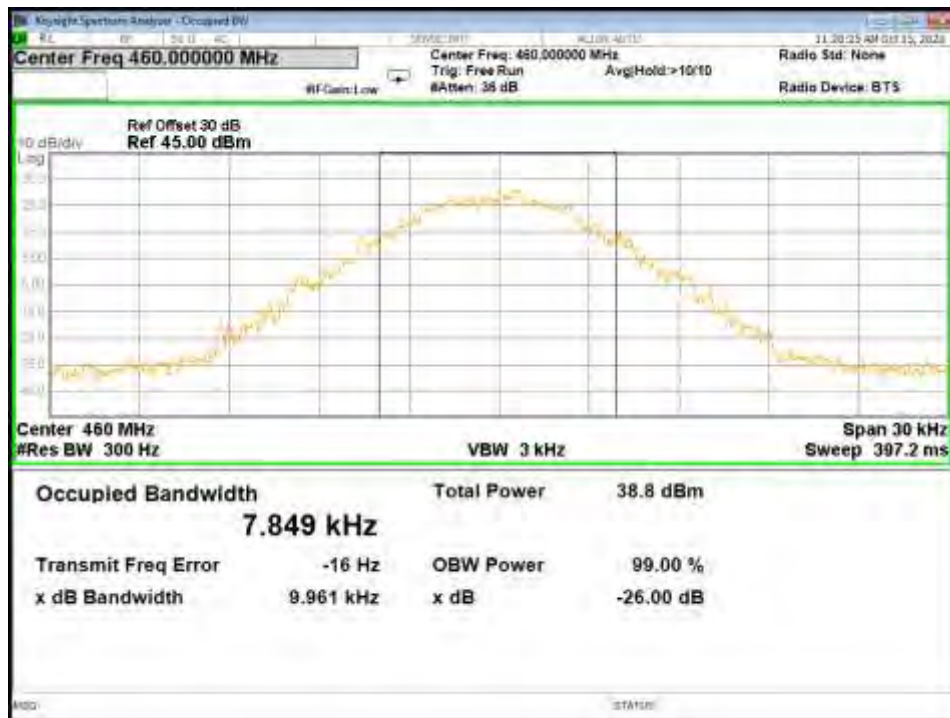
Model 6





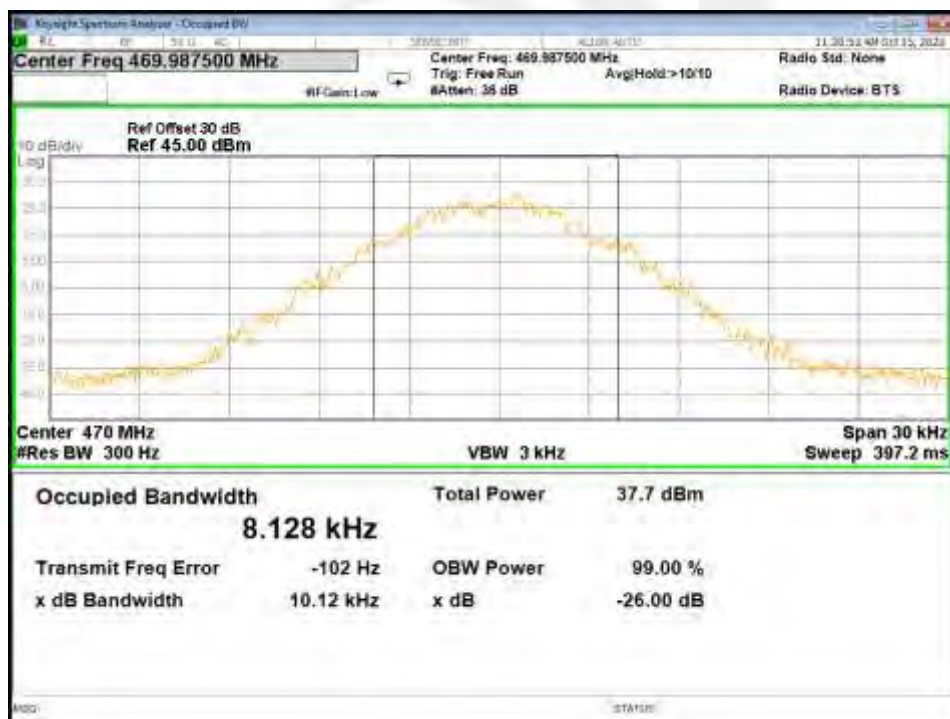
CH 800

Model 6



CH 1599

Model 6





5. EMISSION MASK

5.1 PROVISIONS APPLICABLE

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

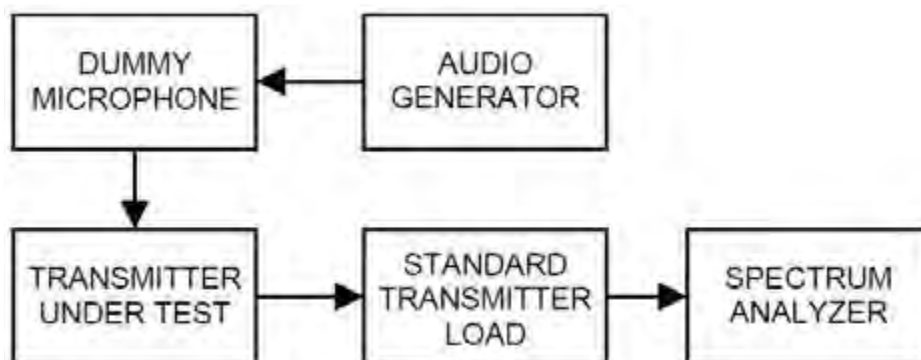
Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

5.2 MEASUREMENT PROCEDURE

- a. The EUT was connected to the spectrum analyzer through sufficient attenuation.
- b. Set EUT as digital data mode.
- c. Set SPA Center Frequency=fundamental frequency, RBW=300Hz, VBW=3KHz, span =120KHz.

5.3 TEST SETUP BLOCK DIAGRAM

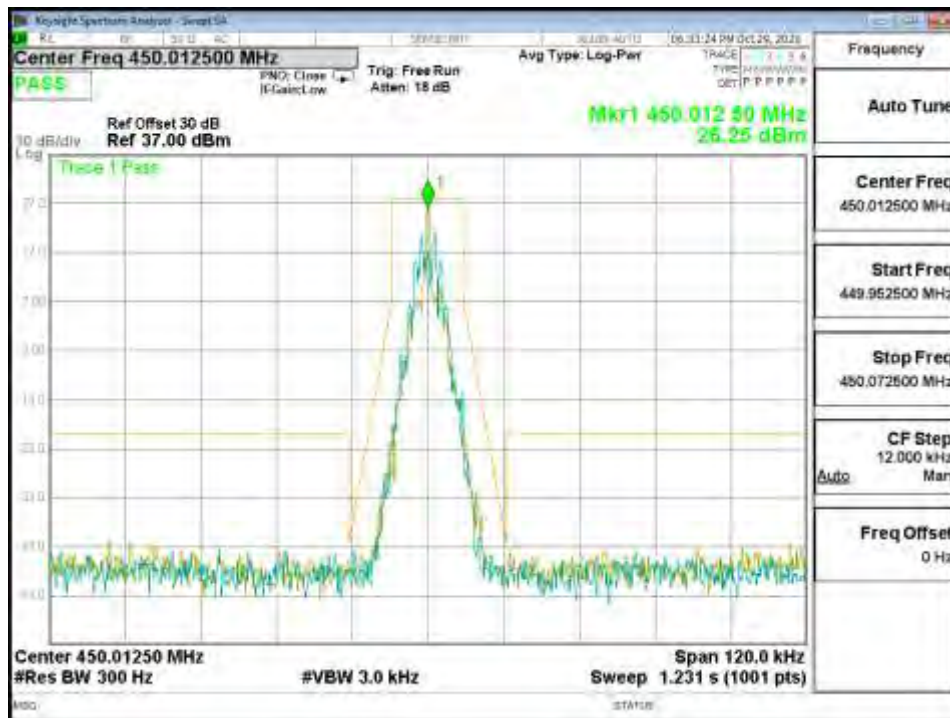




5.4 MEASUREMENT RESULT

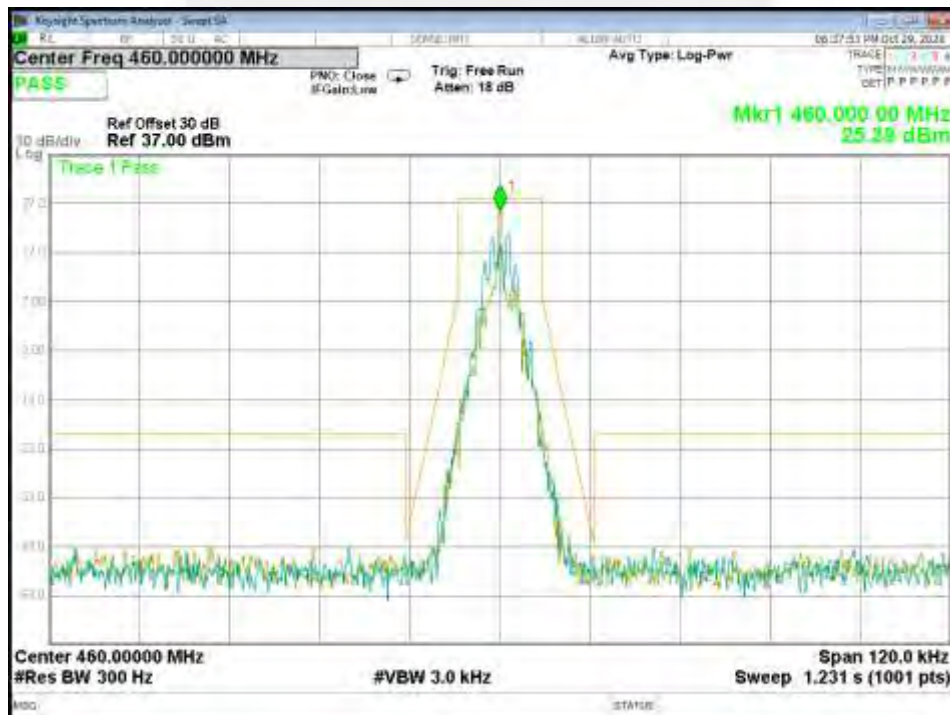
CH 1

Model 1



CH 800

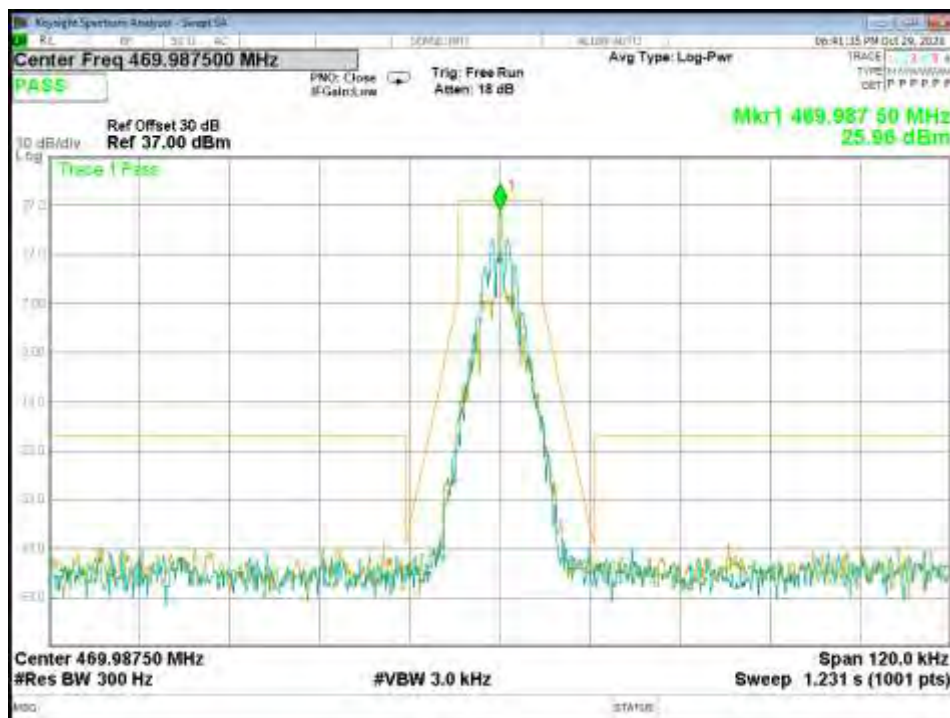
Model 1





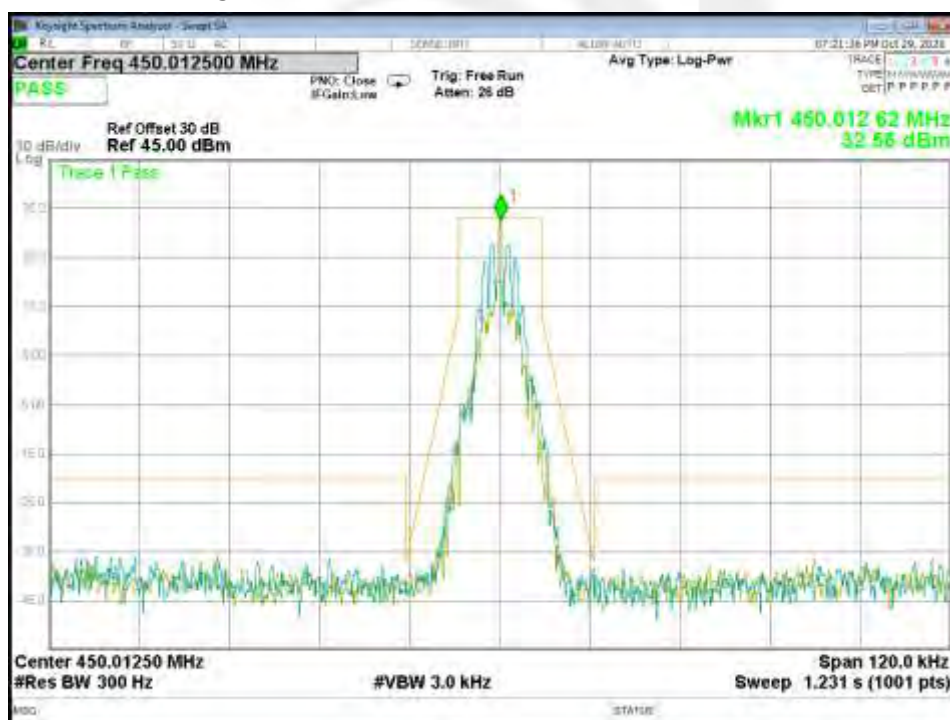
CH 1599

Model 1



CH 1

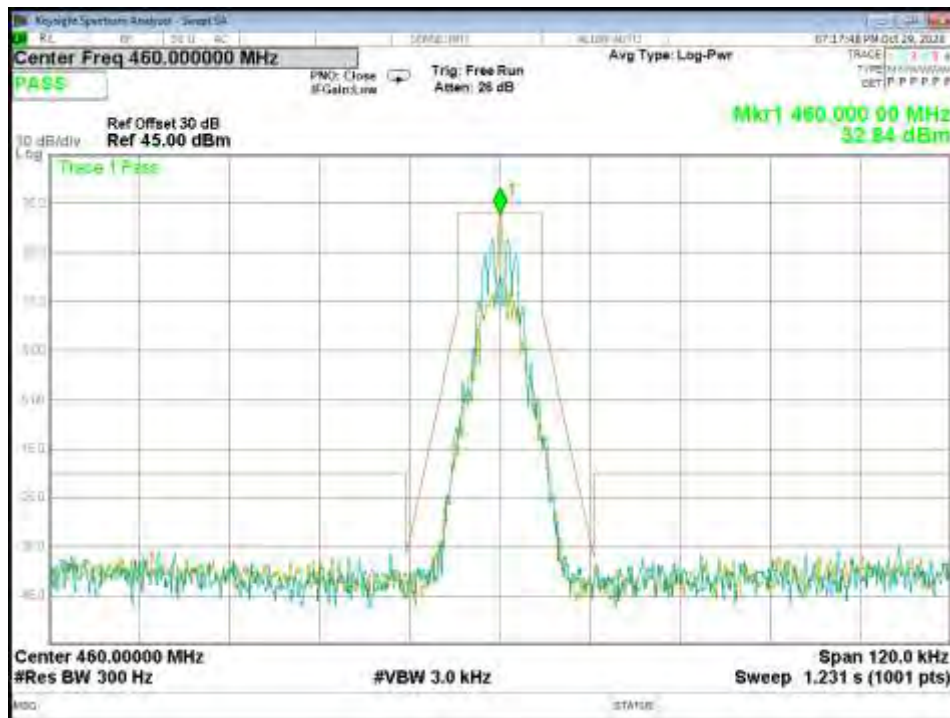
Model 2





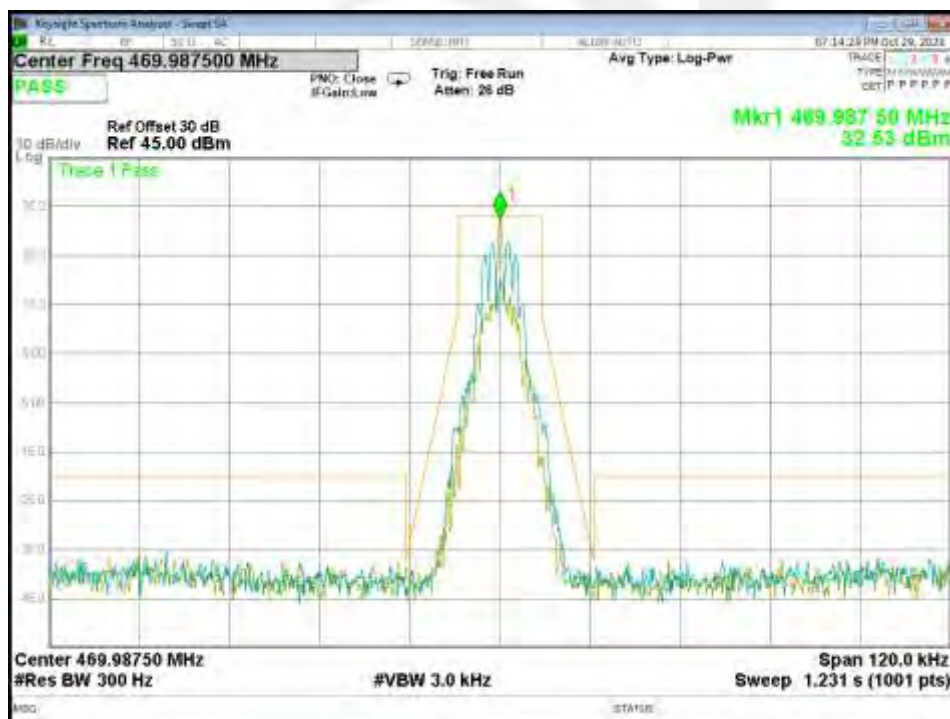
CH 800

Model 2



CH 1599

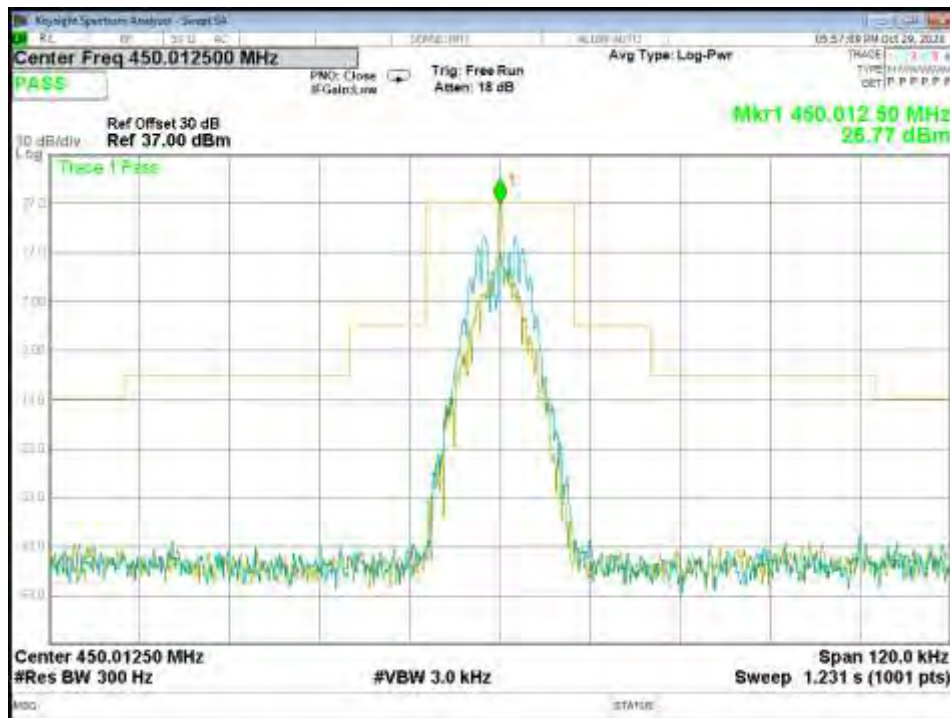
Model 2





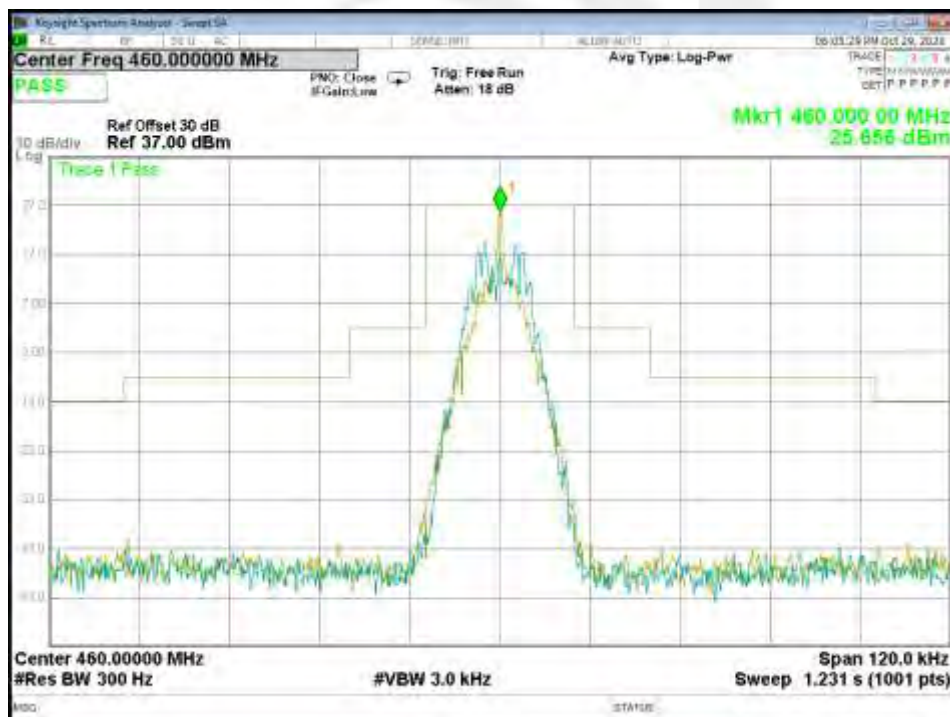
CH 1

Model 3



CH 800

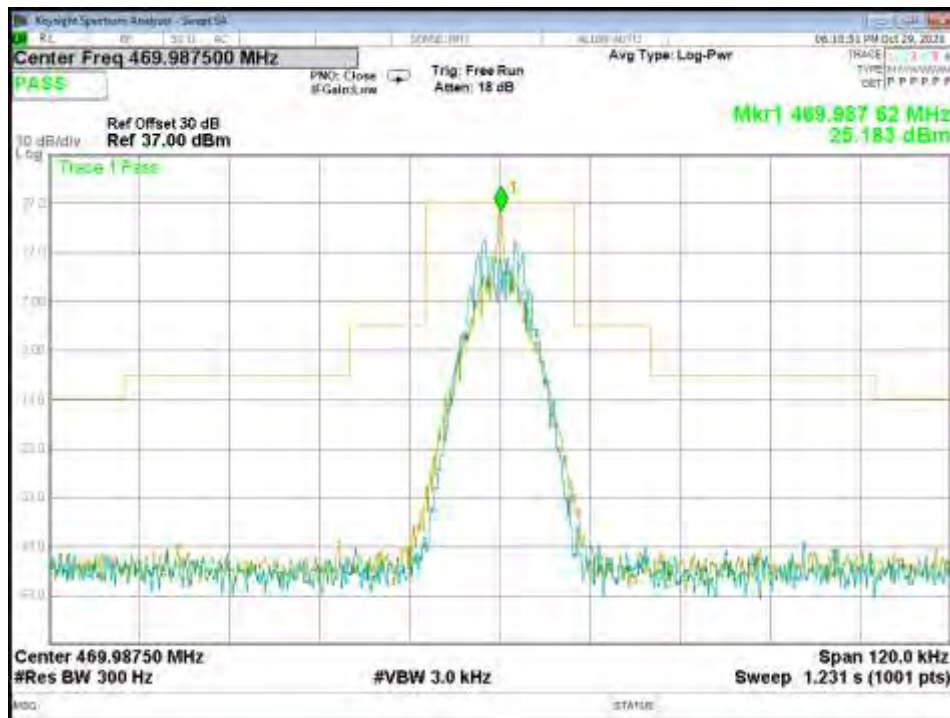
Model 3





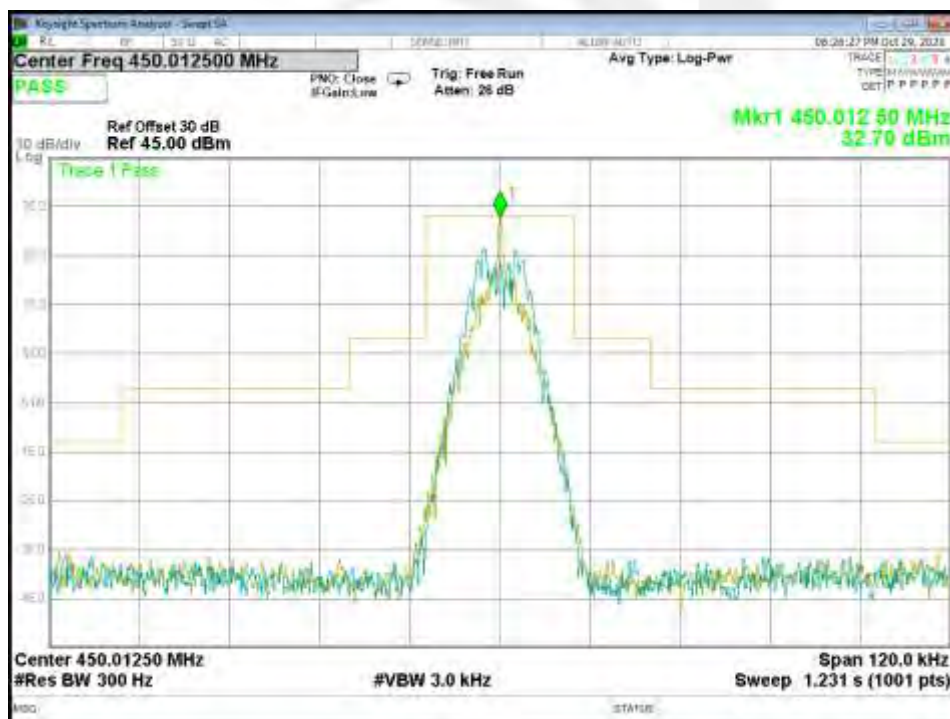
CH 1599

Model 3



CH 1

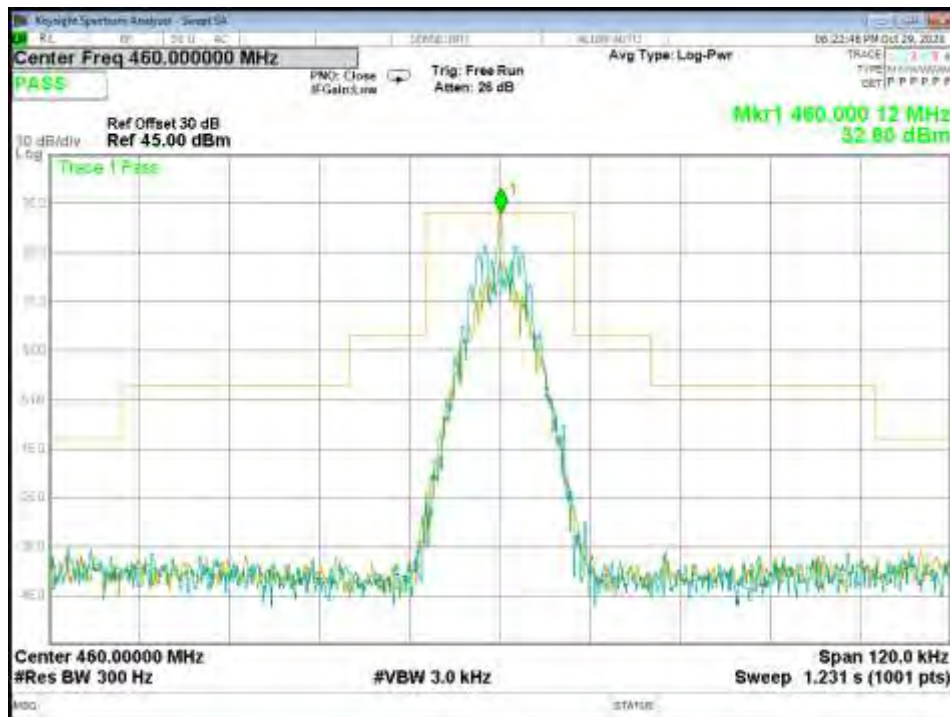
Model 4





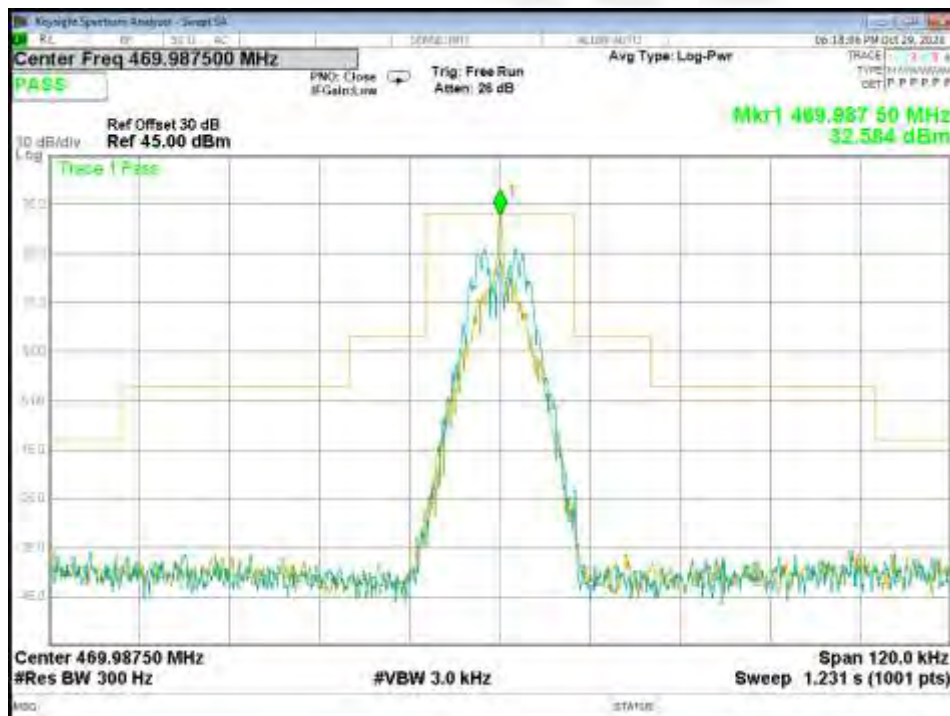
CH 800

Model 4



CH 1599

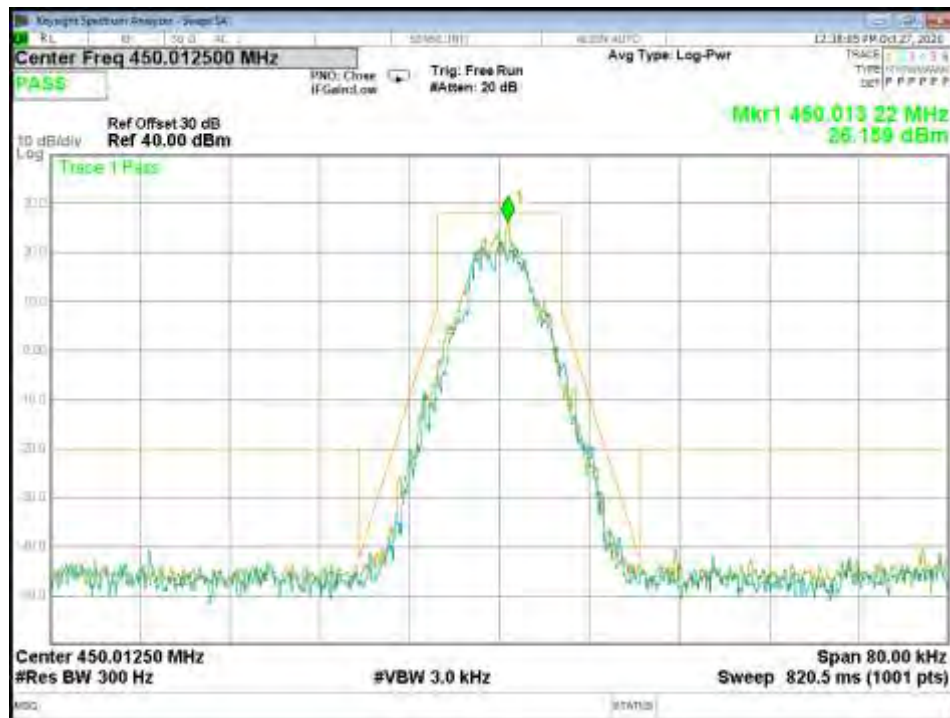
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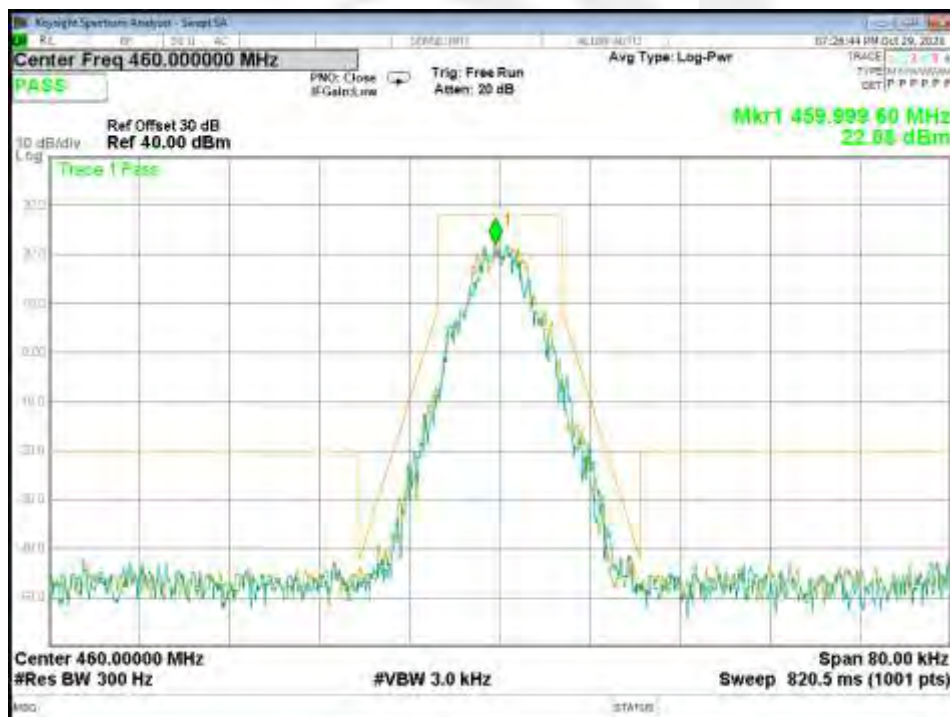
CH 1

Model 5



CH 800

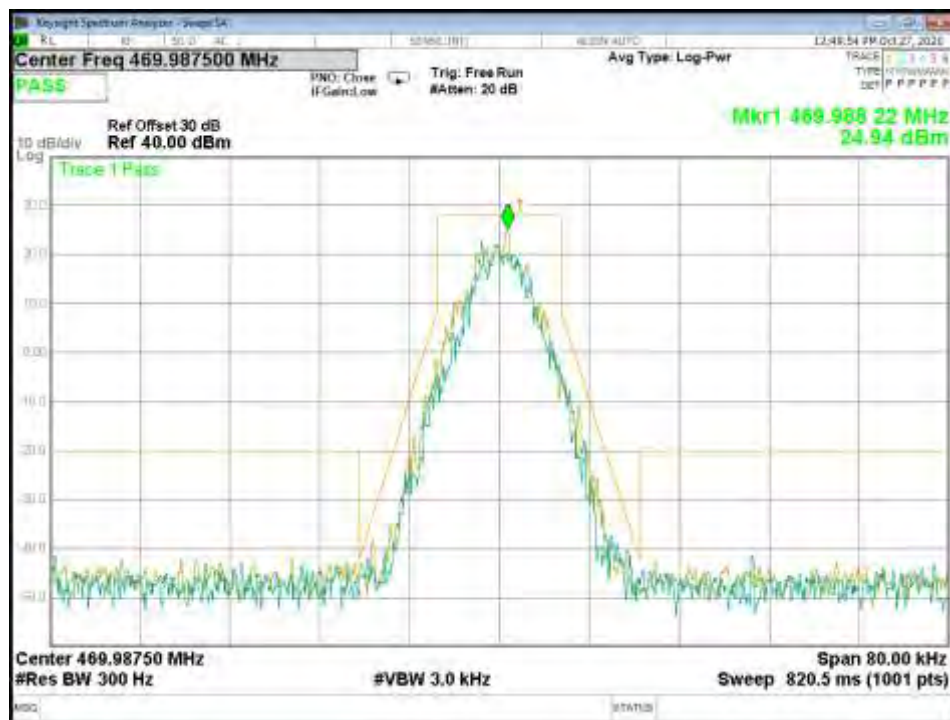
Model 5





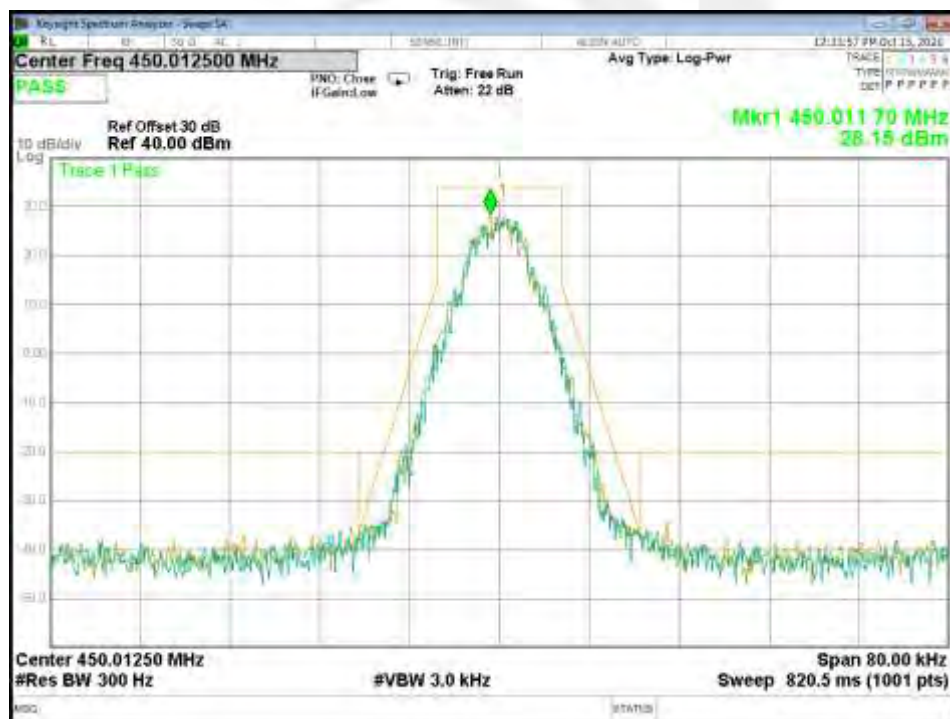
CH 1599

Model 5



CH 1

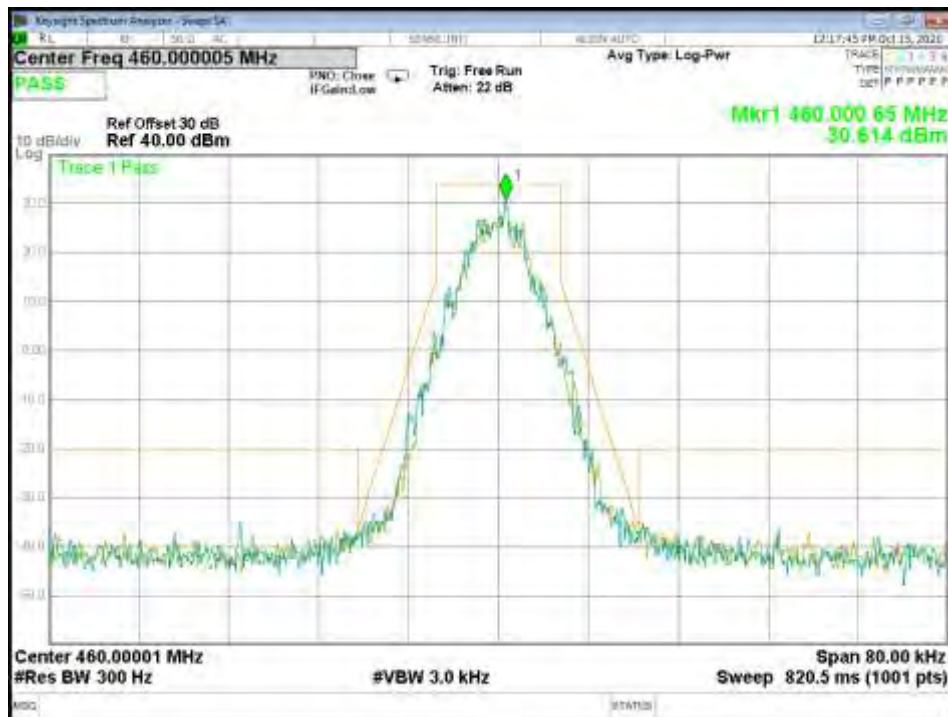
Model 6





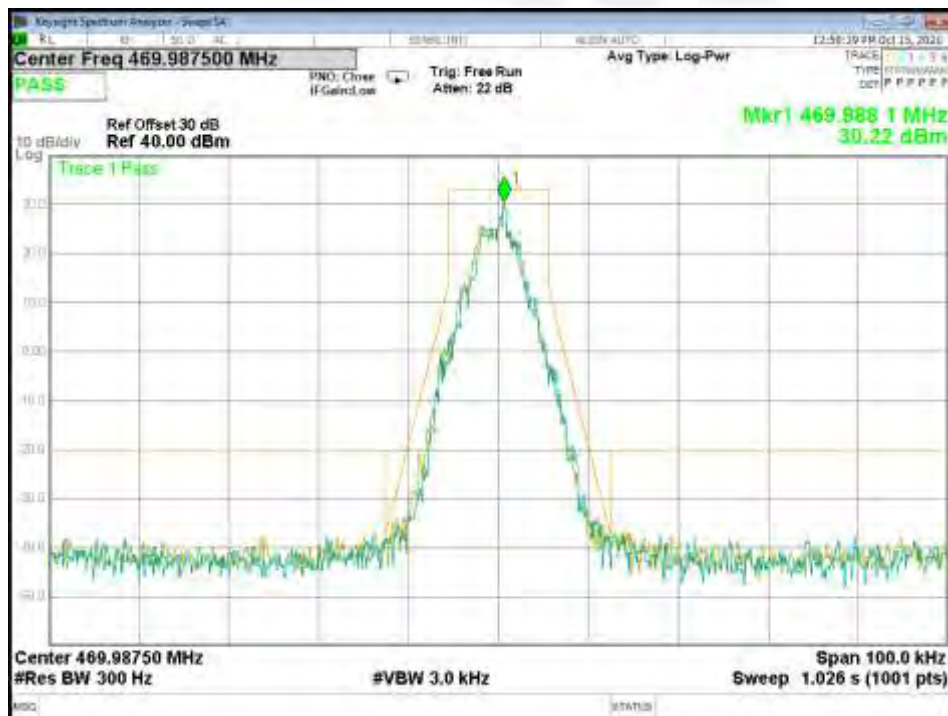
CH 800

Model 6



CH 1599

Model 6





6. TRANSMITTER RADIATED SPURIOUS EMISSION

6.1 PROVISIONS APPLICABLE

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

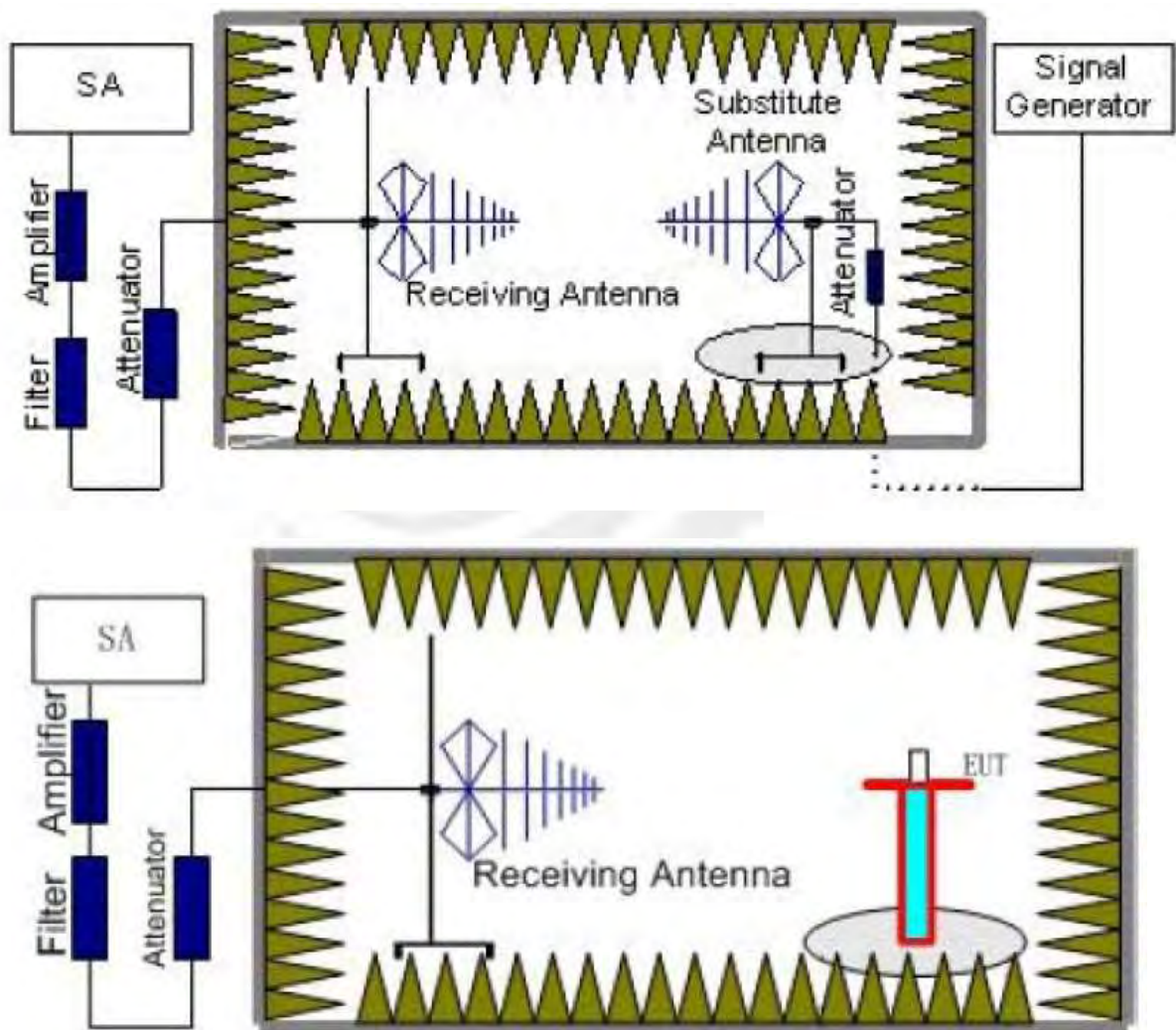
- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88)$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

6.2 TEST PROCEDURE

- a. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in six channels were measured with peak detector.
- b. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- c. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100KHz, VBW=300KHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (P_r).

- d. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- e. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test. The measurement results are obtained as described below:
Amplifier for substitution test; The measurement results are amend as described below:
Power(EIRP)= $P_{Mea} - P_{cl} + G_a$

6.3 TEST CONFIGURATION

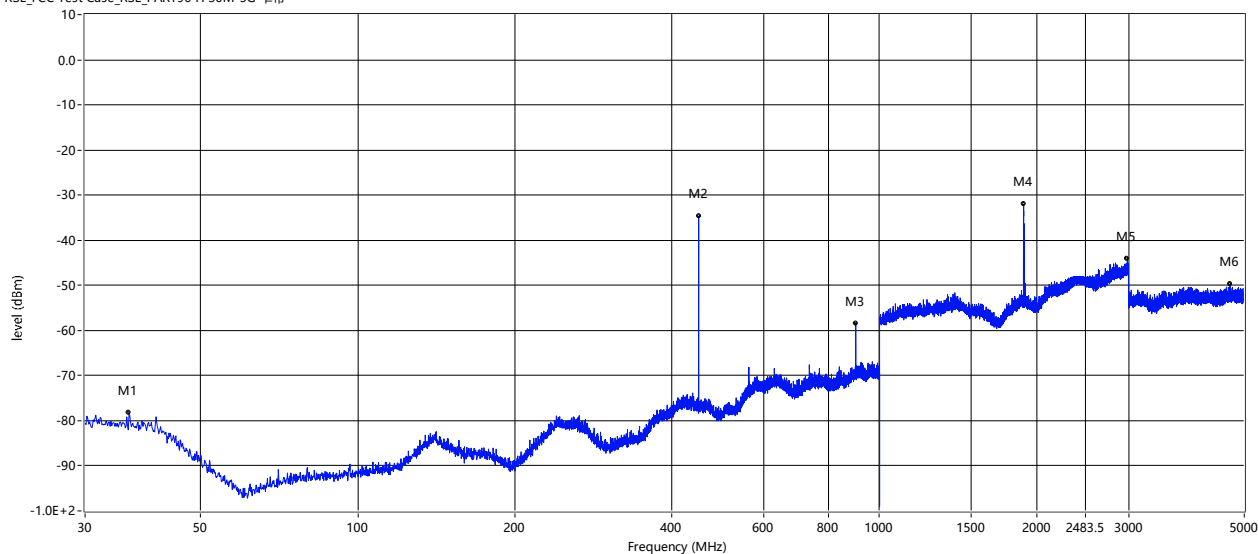




6.4 TEST RESULT

Model 1 CH 1
Horizontal

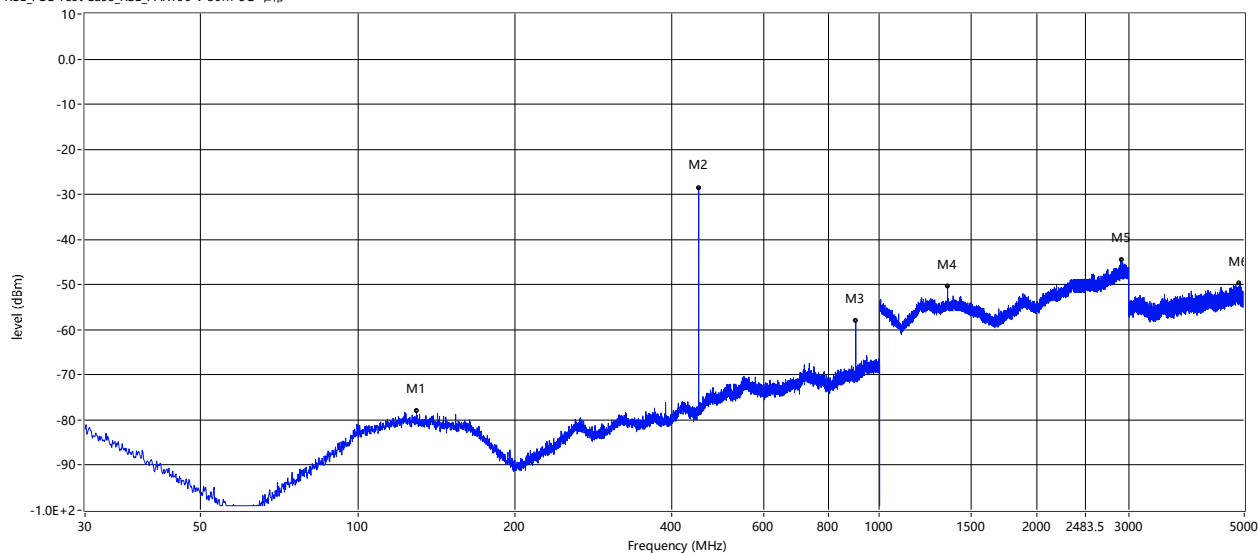
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
36.426	-78.24	-20.0	-58.24	Horizontal	Pass
450.010	-34.75	-20.0	-14.75	Horizontal	Pass
900.090	-58.49	-20.0	-38.49	Horizontal	Pass
1888.750	-32.05	-20.0	-12.05	Horizontal	Pass
2984.000	-44.09	-20.0	-24.09	Horizontal	Pass
4694.250	-49.72	-20.0	-29.72	Horizontal	Pass

Vertical

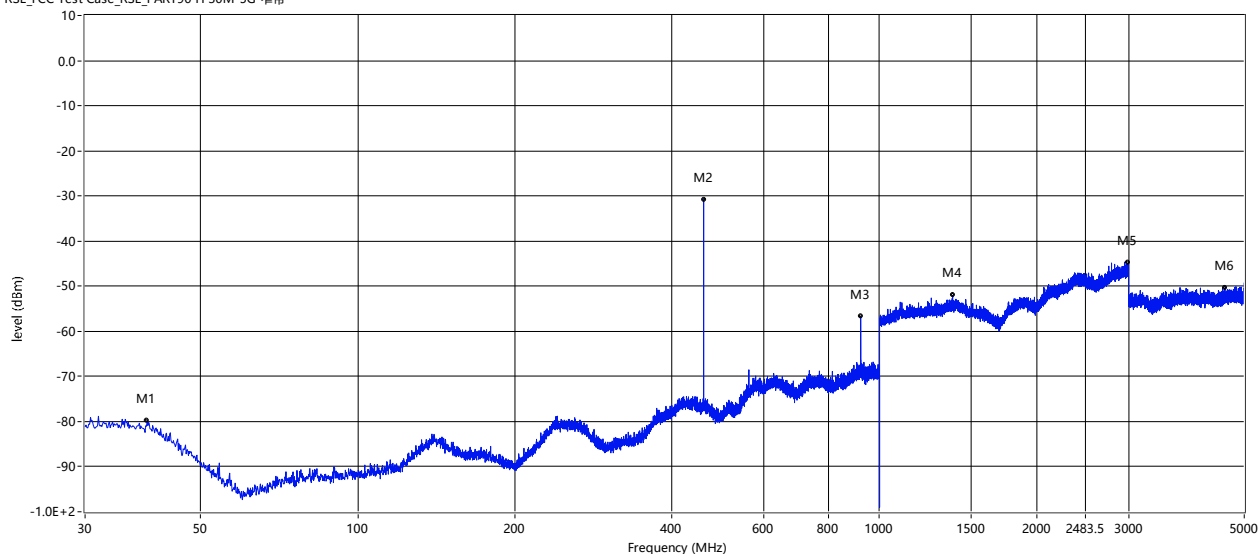
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
129.546	-78.05	-20.0	-58.05	Vertical	Pass
450.010	-28.52	-20.0	-8.52	Vertical	Pass
900.090	-58.08	-20.0	-38.08	Vertical	Pass
1350.000	-50.36	-20.0	-30.36	Vertical	Pass
2907.000	-44.58	-20.0	-24.58	Vertical	Pass
4898.750	-49.74	-20.0	-29.74	Vertical	Pass

Model 1 CH 800
Horizontal

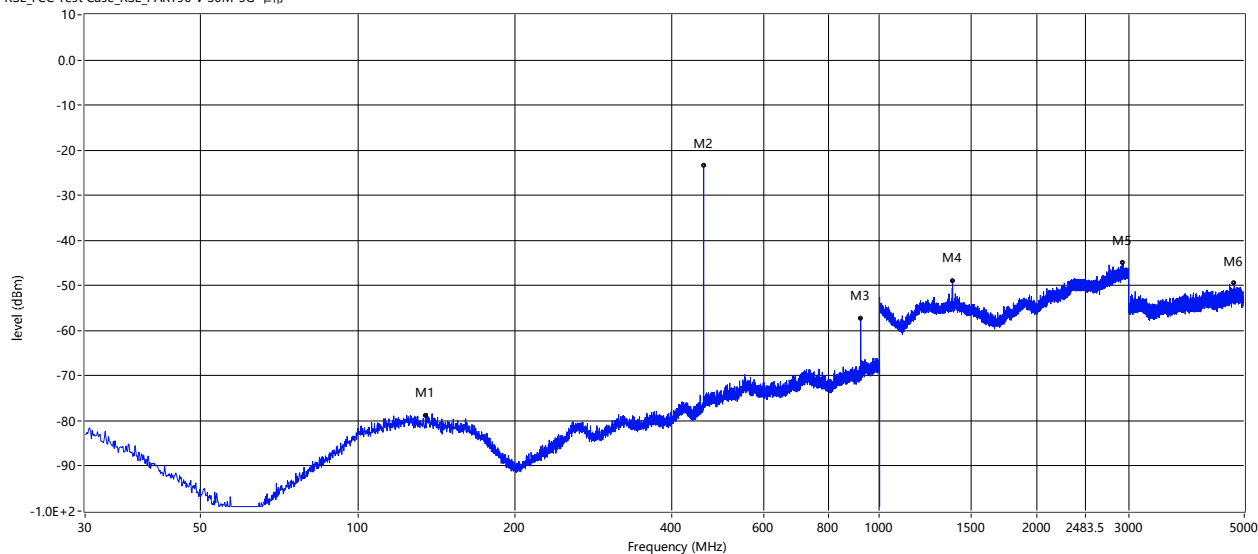
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
39.458	-79.83	-20.0	-59.83	Horizontal	Pass
459.953	-30.82	-20.0	-10.82	Horizontal	Pass
920.096	-56.74	-20.0	-36.74	Horizontal	Pass
1380.750	-52.00	-20.0	-32.00	Horizontal	Pass
2998.000	-44.87	-20.0	-24.87	Horizontal	Pass
4591.000	-50.35	-20.0	-30.35	Horizontal	Pass

Vertical

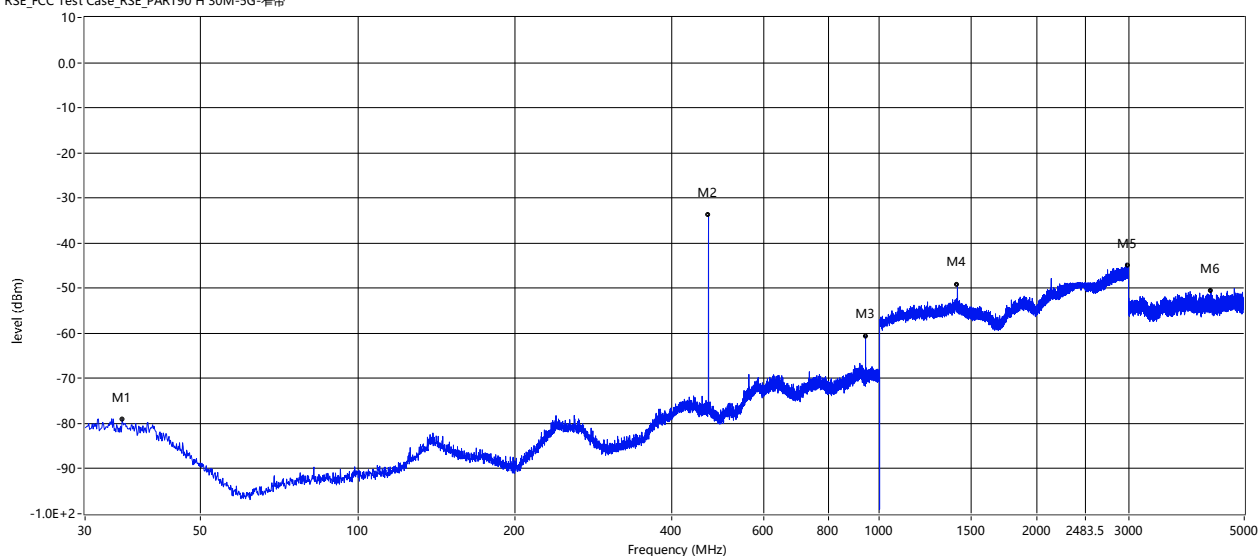
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
134.760	-78.84	-20.0	-58.84	Vertical	Pass
459.953	-23.52	-20.0	-3.52	Vertical	Pass
920.096	-57.24	-20.0	-37.24	Vertical	Pass
1380.000	-48.95	-20.0	-28.95	Vertical	Pass
2931.250	-44.91	-20.0	-24.91	Vertical	Pass
4783.750	-49.50	-20.0	-29.50	Vertical	Pass

Model 1 CH 1599
Horizontal

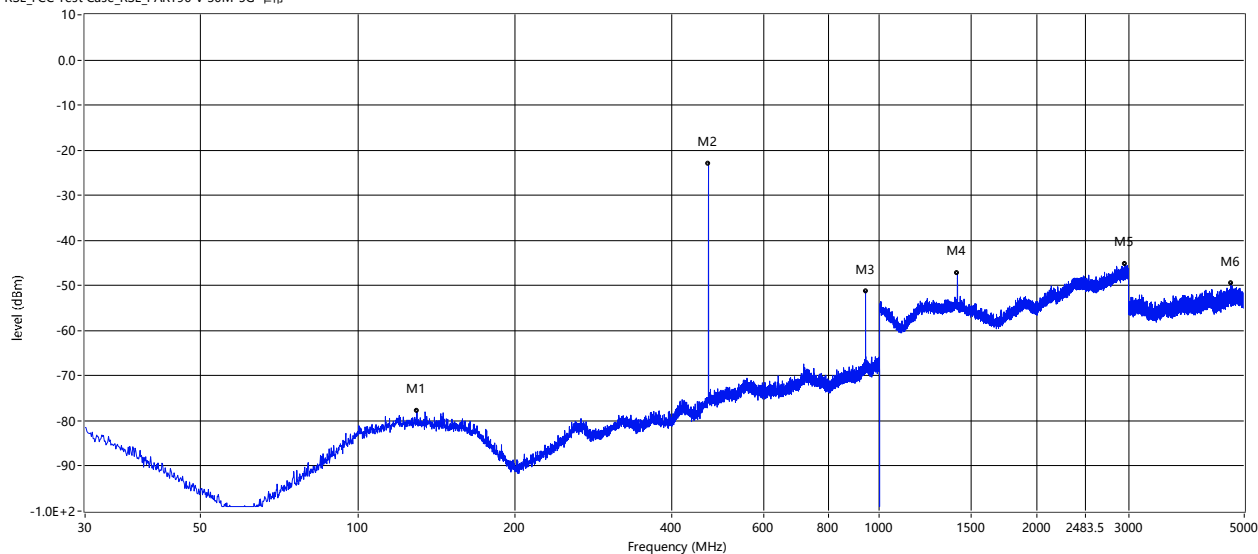
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
35.335	-79.17	-20.0	-59.17	Horizontal	Pass
470.016	-33.78	-20.0	-13.78	Horizontal	Pass
940.102	-60.61	-20.0	-40.61	Horizontal	Pass
1409.750	-49.33	-20.0	-29.33	Horizontal	Pass
2998.500	-45.09	-20.0	-25.09	Horizontal	Pass
4316.750	-50.50	-20.0	-30.50	Horizontal	Pass

Vertical

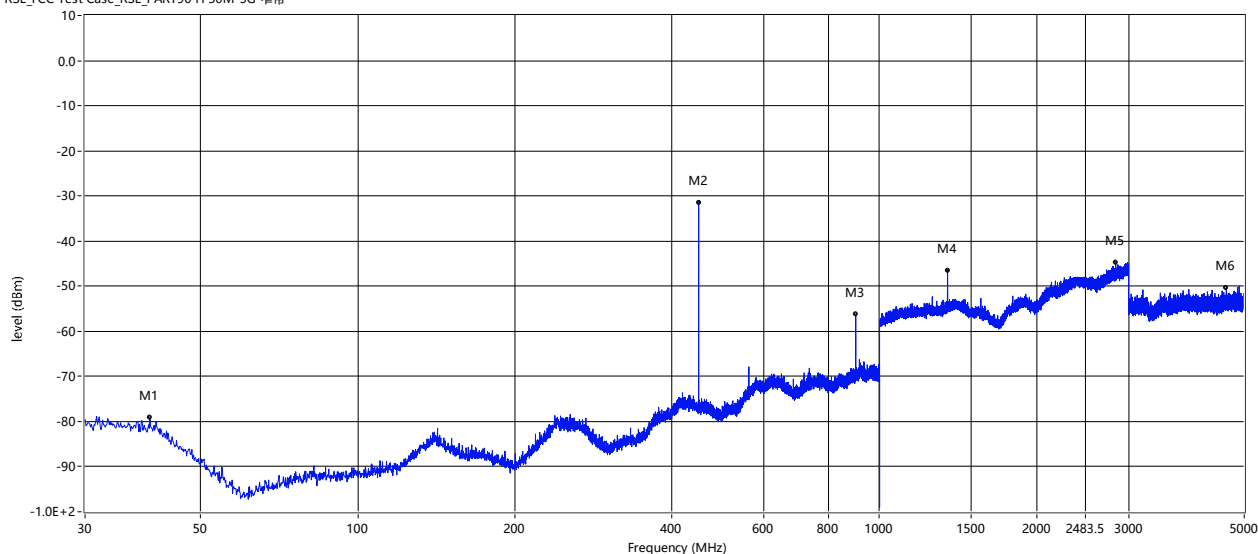
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
129.789	-77.87	-20.0	-57.87	Vertical	Pass
470.016	-23.05	-20.0	-3.05	Vertical	Pass
940.102	-51.29	-20.0	-31.29	Vertical	Pass
1410.000	-47.23	-20.0	-27.23	Vertical	Pass
2954.500	-45.29	-20.0	-25.29	Vertical	Pass
4716.750	-49.49	-20.0	-29.49	Vertical	Pass

Model 2 CH 1
Horizontal

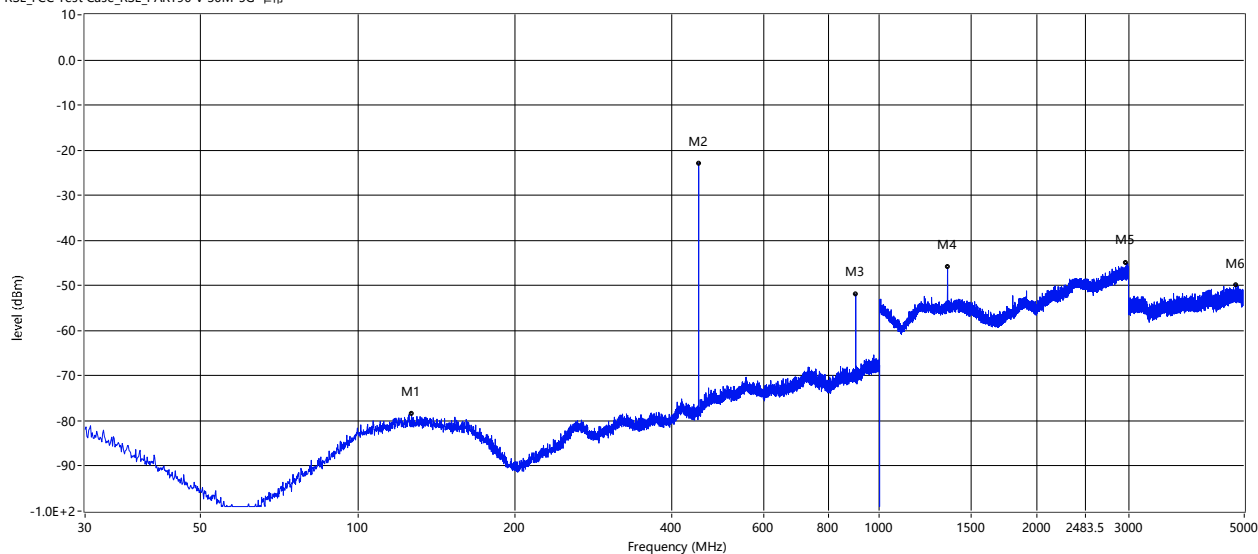
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
39.943	-79.21	-20.0	-59.21	Horizontal	Pass
450.010	-31.49	-20.0	-11.49	Horizontal	Pass
900.090	-56.30	-20.0	-36.30	Horizontal	Pass
1350.000	-46.58	-20.0	-26.58	Horizontal	Pass
2835.500	-44.82	-20.0	-24.82	Horizontal	Pass
4619.750	-50.49	-20.0	-30.49	Horizontal	Pass

Vertical

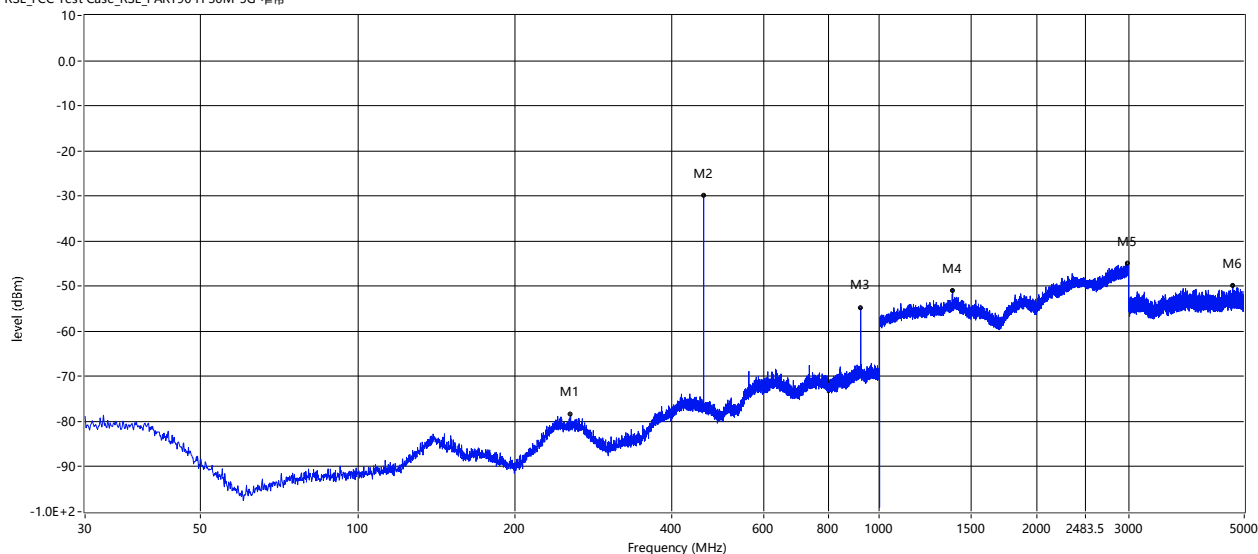
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
126.757	-78.51	-20.0	-58.51	Vertical	Pass
450.010	-22.97	-20.0	-2.97	Vertical	Pass
900.090	-52.34	-20.0	-32.34	Vertical	Pass
1350.000	-45.97	-20.0	-25.97	Vertical	Pass
2971.500	-44.96	-20.0	-24.96	Vertical	Pass
4819.000	-49.84	-20.0	-29.84	Vertical	Pass

Model 2 CH 800
Horizontal

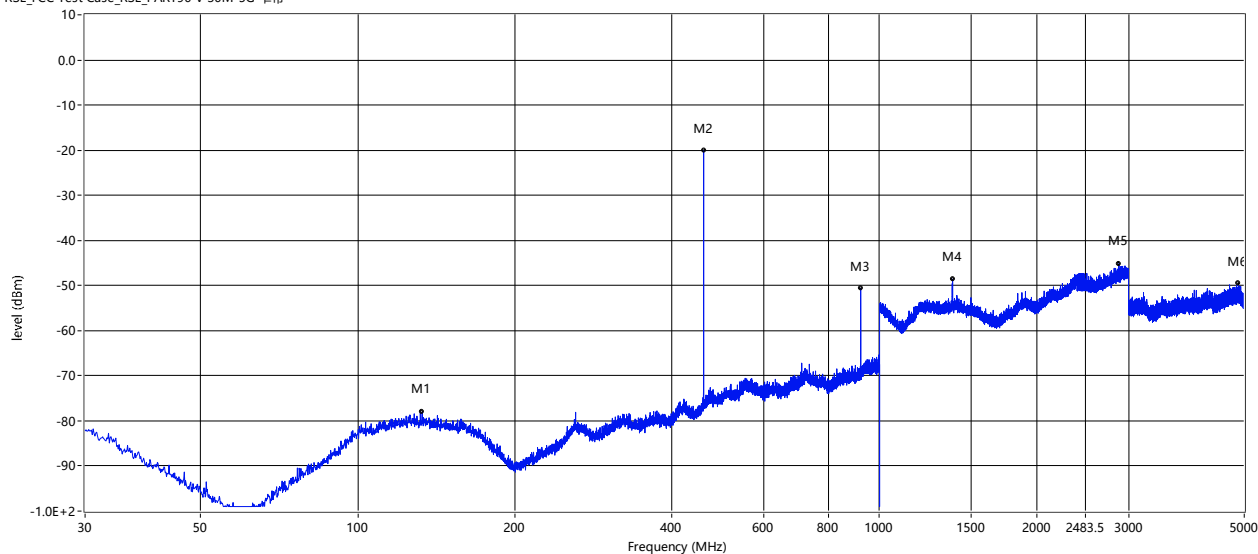
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
255.768	-78.56	-20.0	-58.56	Horizontal	Pass
459.953	-30.05	-20.0	-10.05	Horizontal	Pass
920.096	-54.79	-20.0	-34.79	Horizontal	Pass
1380.000	-51.15	-20.0	-31.15	Horizontal	Pass
2999.000	-45.03	-20.0	-25.03	Horizontal	Pass
4753.750	-50.00	-20.0	-30.00	Horizontal	Pass

Vertical

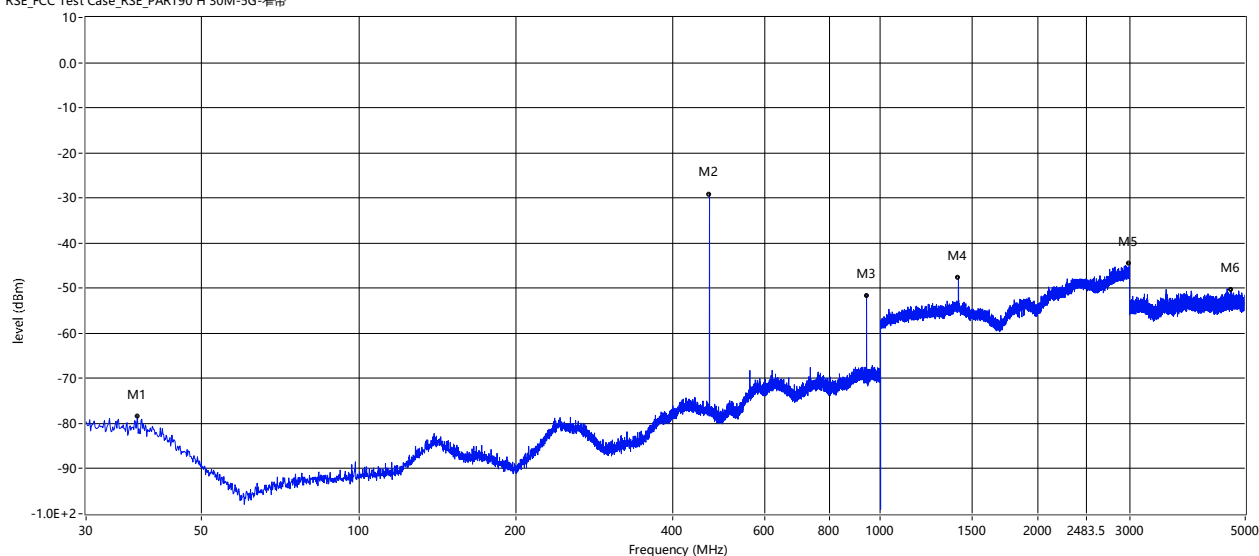
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
132.820	-78.01	-20.0	-58.01	Vertical	Pass
459.953	-20.09	-20.0	-0.09	Vertical	Pass
920.096	-50.61	-20.0	-30.61	Vertical	Pass
1380.000	-48.56	-20.0	-28.56	Vertical	Pass
2876.250	-45.14	-20.0	-25.14	Vertical	Pass
4871.750	-49.51	-20.0	-29.51	Vertical	Pass

Model 2 CH 1599
Horizontal

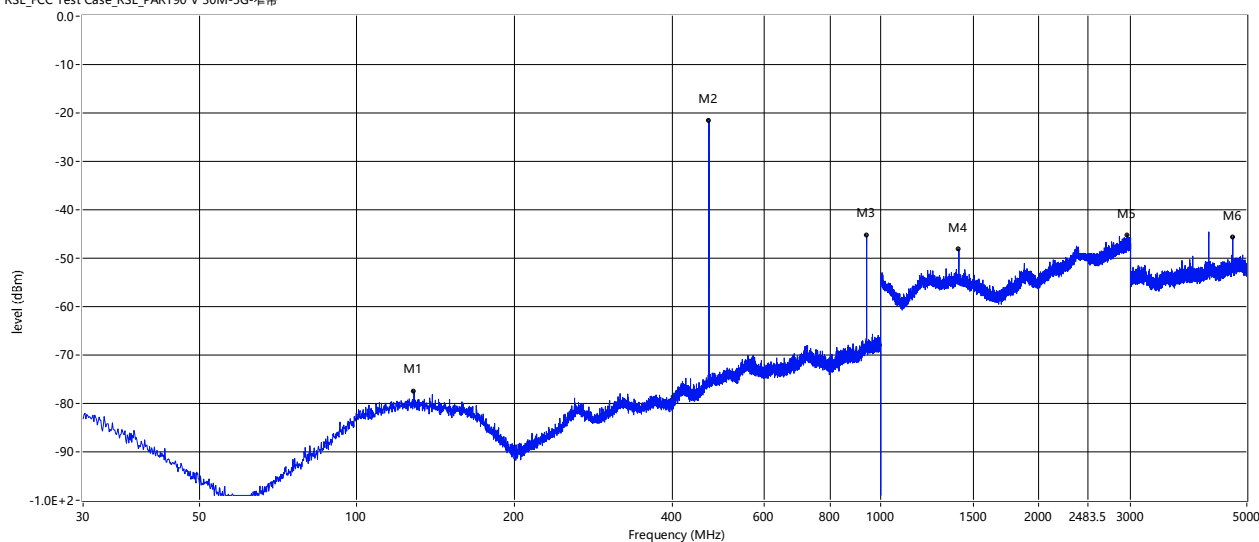
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
37.639	-78.52	-20.0	-58.52	Horizontal	Pass
470.016	-29.23	-20.0	-9.23	Horizontal	Pass
940.102	-51.67	-20.0	-31.67	Horizontal	Pass
1410.000	-47.72	-20.0	-27.72	Horizontal	Pass
2998.000	-44.55	-20.0	-24.55	Horizontal	Pass
4694.000	-50.44	-20.0	-30.44	Horizontal	Pass

Vertical

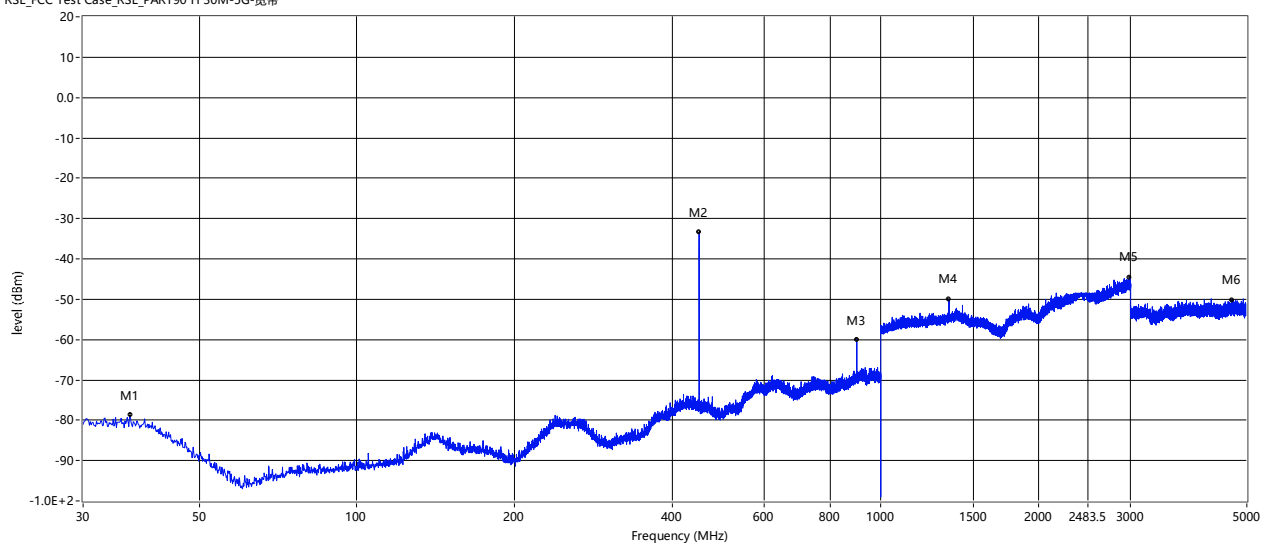
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
128.455	-77.49	-20.0	-57.49	Vertical	Pass
470.016	-22.03	-20.0	-2.03	Vertical	Pass
940.102	-45.39	-20.0	-25.39	Vertical	Pass
1410.000	-48.12	-20.0	-28.12	Vertical	Pass
2953.500	-45.28	-20.0	-25.28	Vertical	Pass
4700.250	-45.76	-20.0	-25.76	Vertical	Pass

Model 3 CH 1
Horizontal

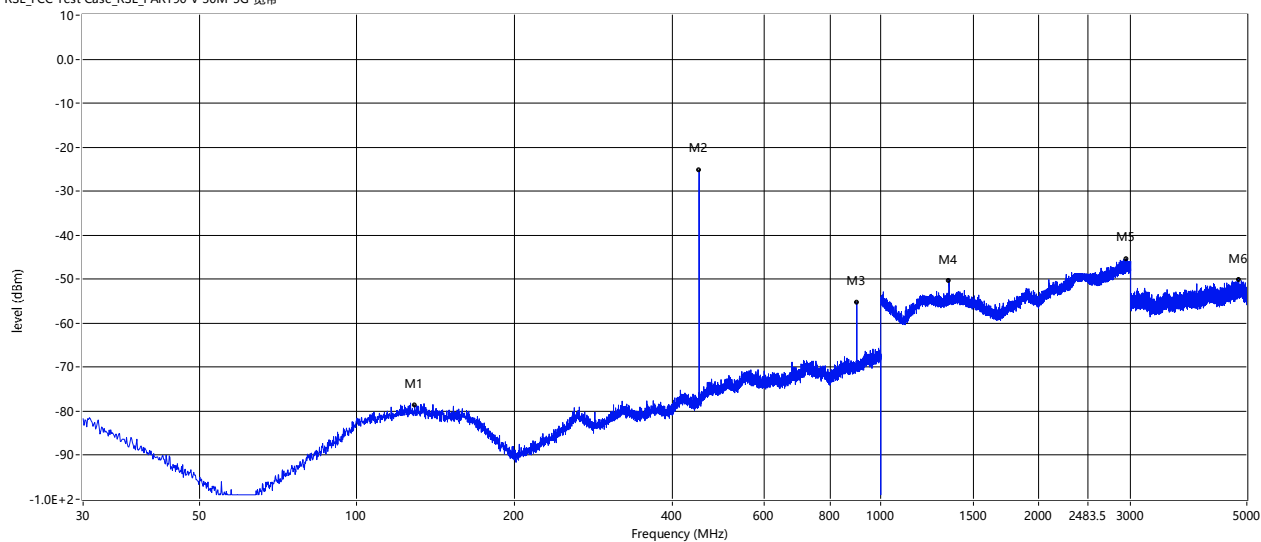
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
36.911	-78.81	-13.0	-65.81	Horizontal	Pass
450.010	-33.33	-13.0	-20.33	Horizontal	Pass
900.090	-60.02	-13.0	-47.02	Horizontal	Pass
1350.000	-49.99	-13.0	-36.99	Horizontal	Pass
2983.500	-44.56	-13.0	-31.56	Horizontal	Pass
4681.000	-50.22	-13.0	-37.22	Horizontal	Pass

Vertical

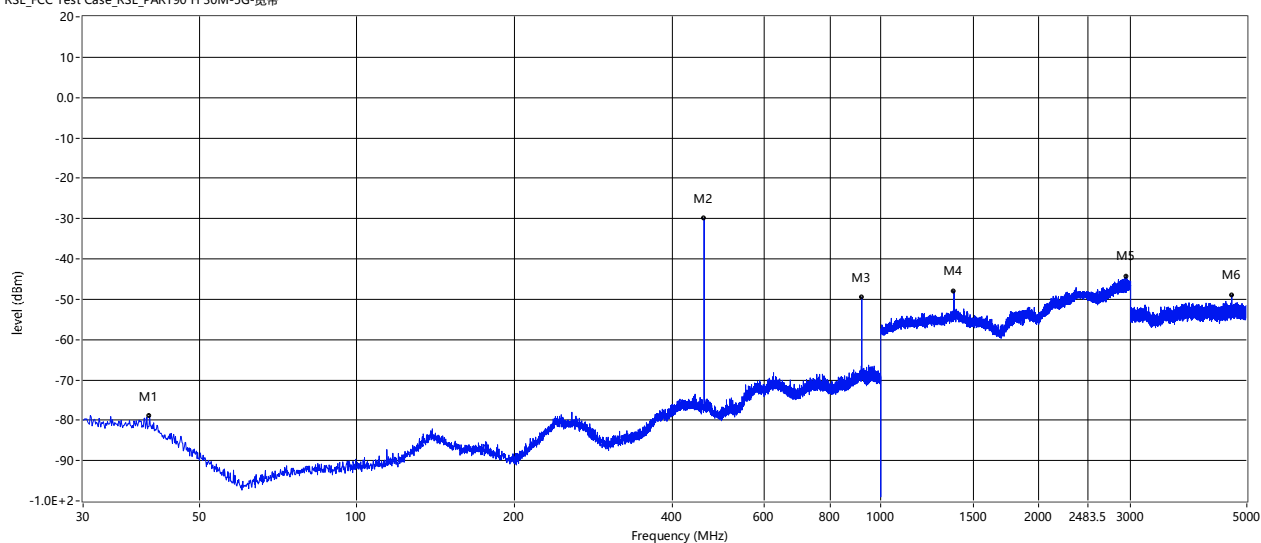
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
128.940	-78.69	-13.0	-65.69	Vertical	Pass
450.010	-25.22	-13.0	-12.22	Vertical	Pass
900.090	-55.31	-13.0	-42.31	Vertical	Pass
1349.750	-50.45	-13.0	-37.45	Vertical	Pass
2948.000	-45.35	-13.0	-32.35	Vertical	Pass
4822.750	-50.09	-13.0	-37.09	Vertical	Pass

Model 3 CH 800
Horizontal

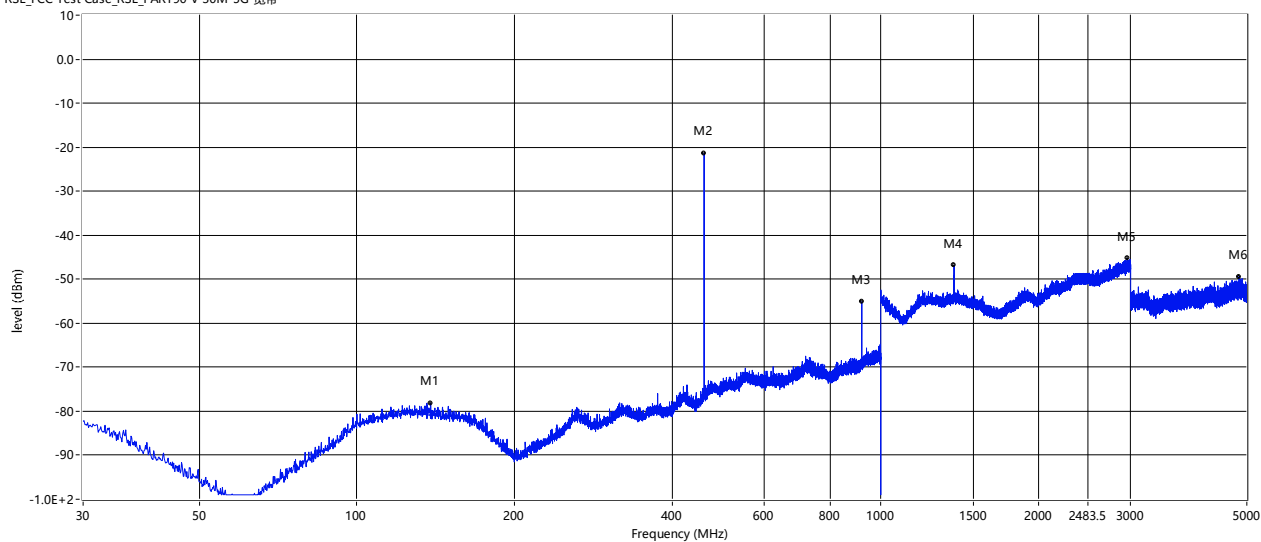
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
40.185	-78.95	-13.0	-65.95	Horizontal	Pass
459.953	-29.95	-13.0	-16.95	Horizontal	Pass
920.096	-49.64	-13.0	-36.64	Horizontal	Pass
1380.500	-48.00	-13.0	-35.00	Horizontal	Pass
2944.500	-44.29	-13.0	-31.29	Horizontal	Pass
4679.750	-49.03	-13.0	-36.03	Horizontal	Pass

Vertical

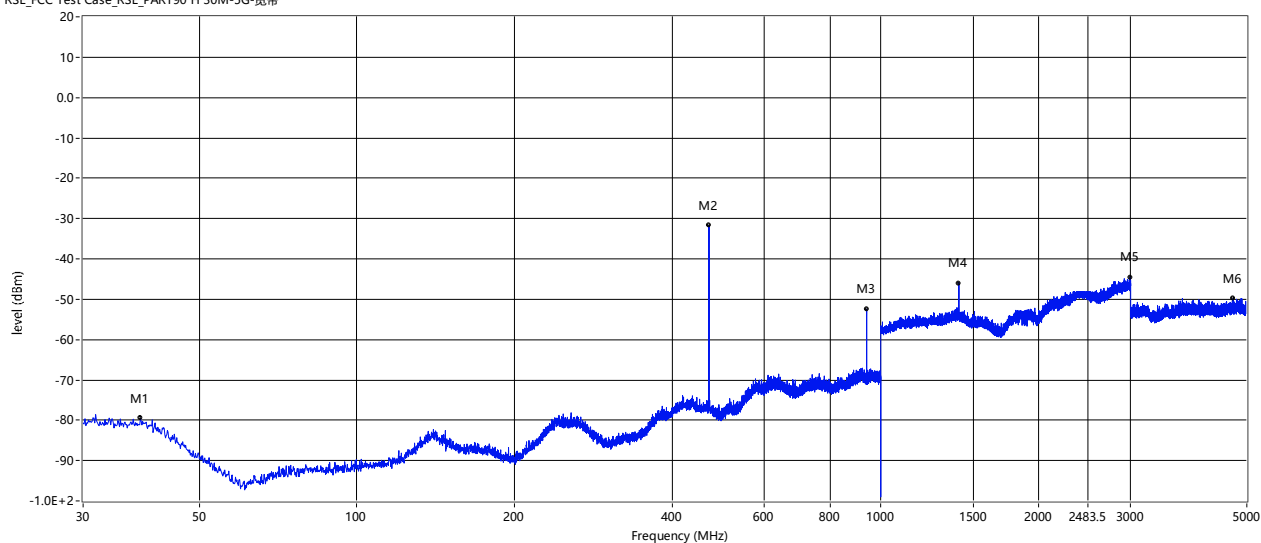
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
138.276	-78.13	-13.0	-65.13	Vertical	Pass
459.953	-21.37	-13.0	-8.37	Vertical	Pass
920.096	-55.15	-13.0	-42.15	Vertical	Pass
1380.250	-46.79	-13.0	-33.79	Vertical	Pass
2954.750	-45.24	-13.0	-32.24	Vertical	Pass
4831.250	-49.38	-13.0	-36.38	Vertical	Pass

Model 3 CH 1599
Horizontal

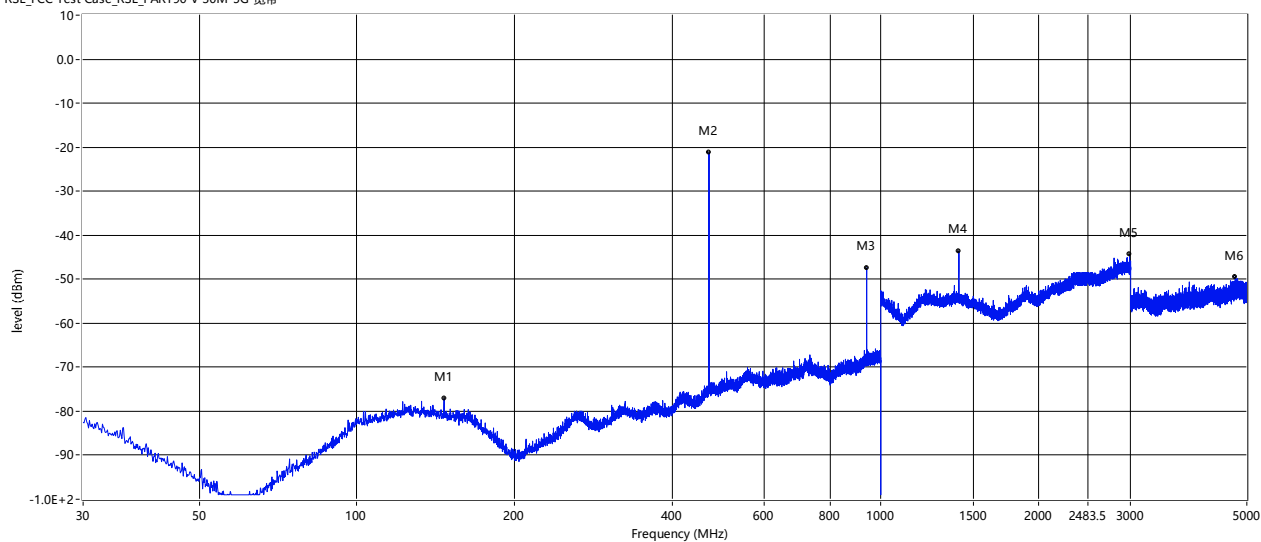
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
38.609	-79.42	-13.0	-66.42	Horizontal	Pass
470.016	-31.68	-13.0	-18.68	Horizontal	Pass
940.102	-52.45	-13.0	-39.45	Horizontal	Pass
1410.250	-46.05	-13.0	-33.05	Horizontal	Pass
2992.500	-44.54	-13.0	-31.54	Horizontal	Pass
4709.000	-49.79	-13.0	-36.79	Horizontal	Pass

Vertical

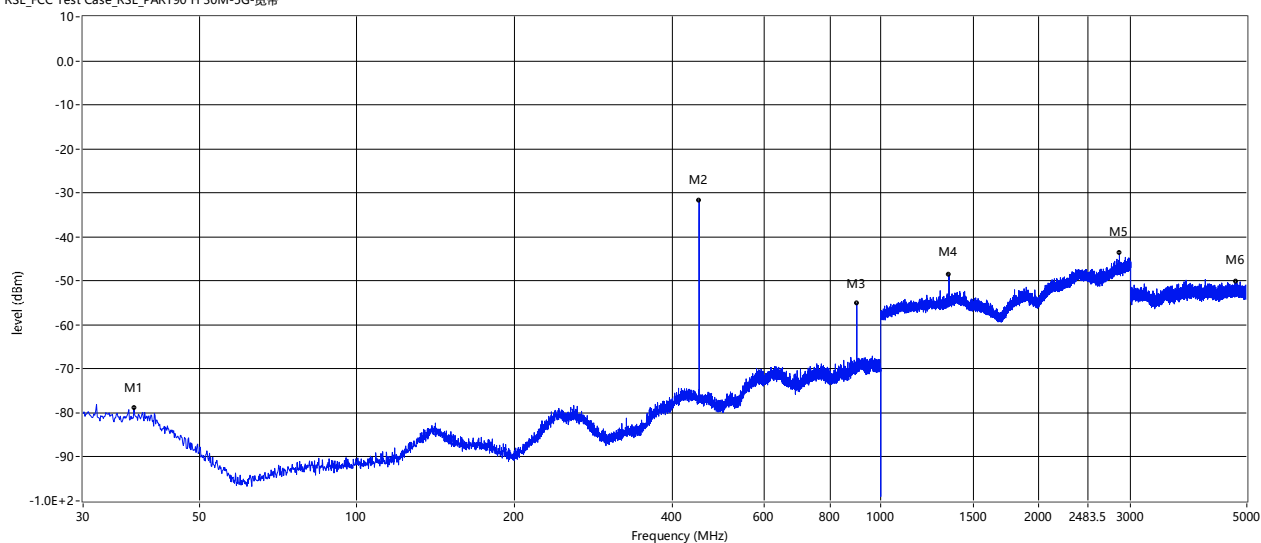
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
146.642	-77.18	-13.0	-64.18	Vertical	Pass
470.016	-21.21	-13.0	-8.21	Vertical	Pass
940.102	-47.39	-13.0	-34.39	Vertical	Pass
1410.250	-43.59	-13.0	-30.59	Vertical	Pass
2985.000	-44.38	-13.0	-31.38	Vertical	Pass
4750.000	-49.42	-13.0	-36.42	Vertical	Pass

Model 4 CH 1
Horizontal

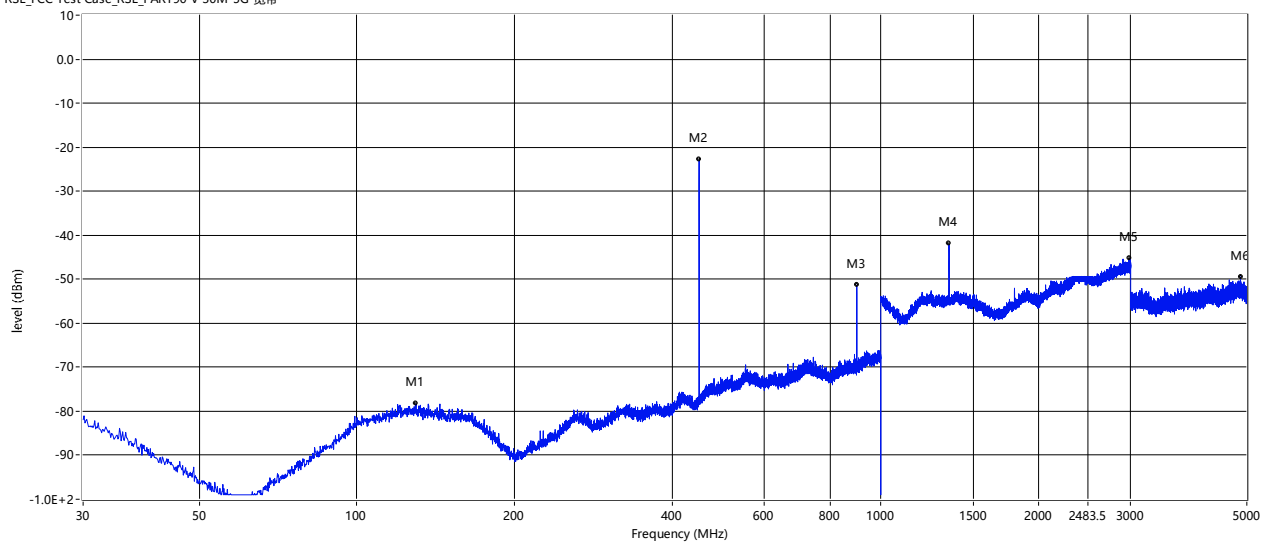
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
37.517	-78.92	-13.0	-65.92	Horizontal	Pass
450.010	-31.65	-13.0	-18.65	Horizontal	Pass
900.090	-55.18	-13.0	-42.18	Horizontal	Pass
1350.000	-48.53	-13.0	-35.53	Horizontal	Pass
2855.500	-43.75	-13.0	-30.75	Horizontal	Pass
4775.750	-50.14	-13.0	-37.14	Horizontal	Pass

Vertical

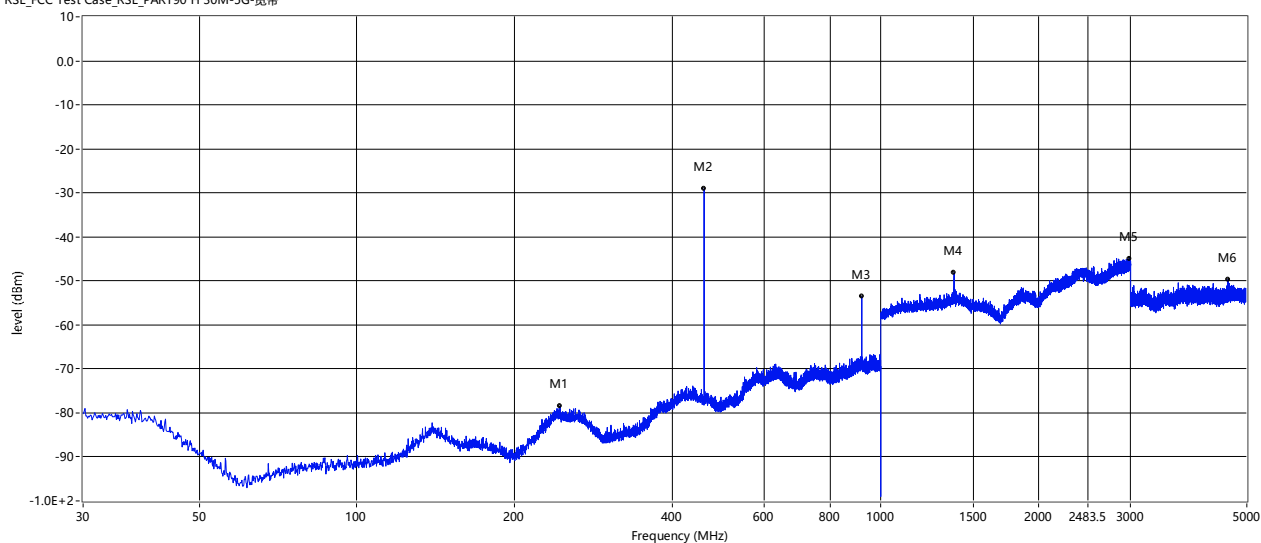
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
129.667	-78.34	-13.0	-65.34	Vertical	Pass
450.010	-22.88	-13.0	-9.88	Vertical	Pass
900.090	-51.32	-13.0	-38.32	Vertical	Pass
1350.000	-41.96	-13.0	-28.96	Vertical	Pass
2989.000	-45.33	-13.0	-32.33	Vertical	Pass
4862.000	-49.47	-13.0	-36.47	Vertical	Pass

Model 4 CH 800
Horizontal

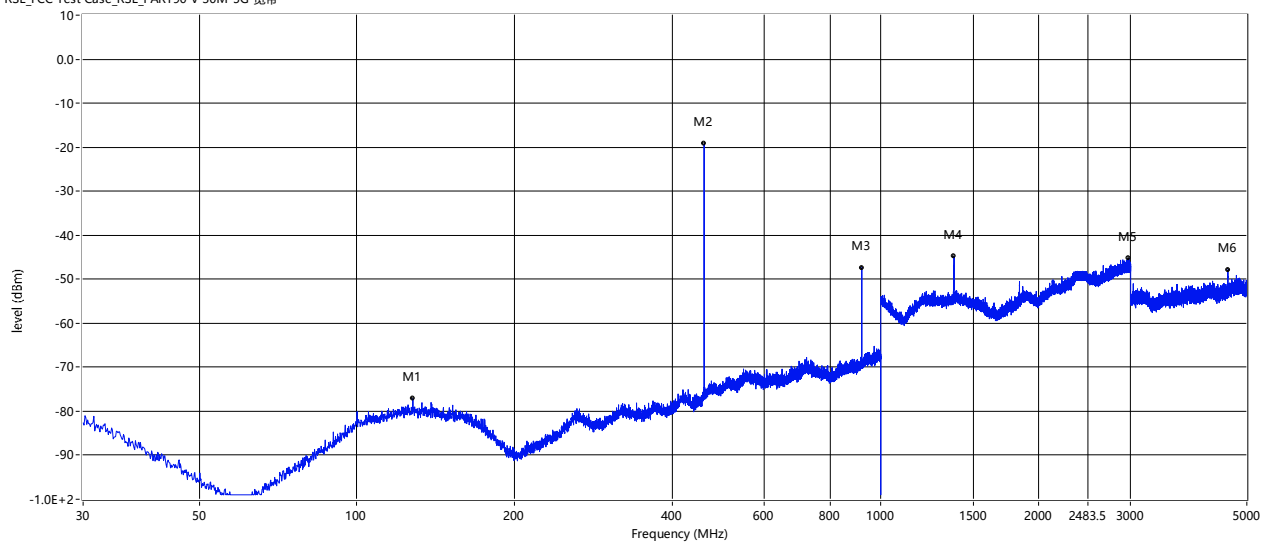
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
244.128	-78.37	-13.0	-65.37	Horizontal	Pass
459.953	-29.06	-13.0	-16.06	Horizontal	Pass
920.096	-53.61	-13.0	-40.61	Horizontal	Pass
1380.250	-48.12	-13.0	-35.12	Horizontal	Pass
2986.500	-44.92	-13.0	-31.92	Horizontal	Pass
4599.750	-49.73	-13.0	-36.73	Horizontal	Pass

Vertical

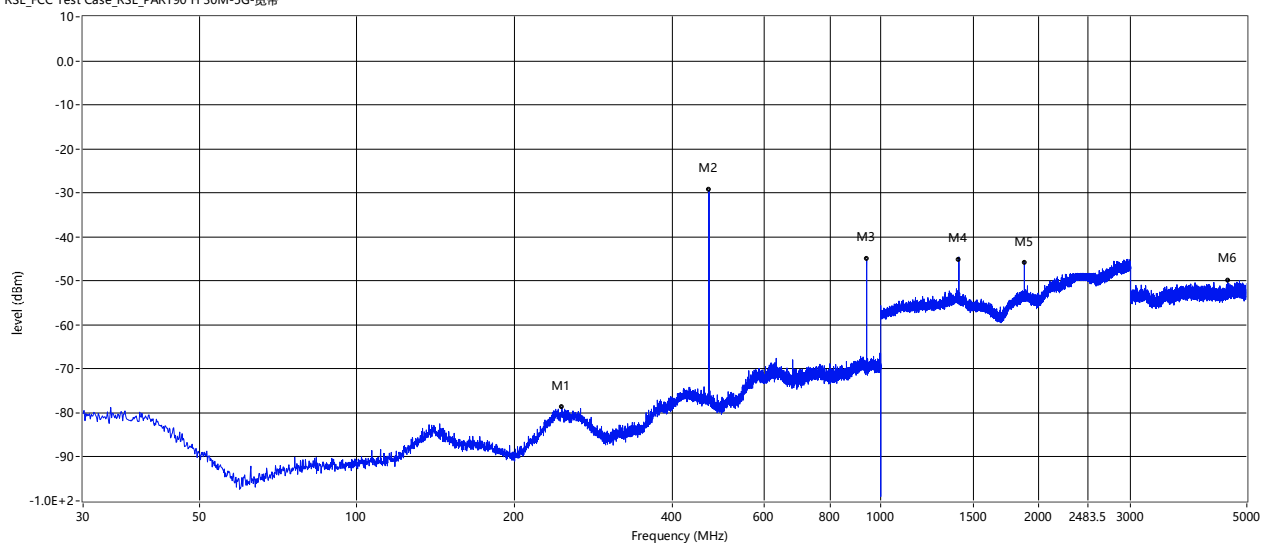
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
127.849	-77.13	-13.0	-64.13	Vertical	Pass
459.953	-19.28	-13.0	-6.28	Vertical	Pass
920.096	-47.40	-13.0	-34.40	Vertical	Pass
1380.000	-44.83	-13.0	-31.83	Vertical	Pass
2972.750	-45.23	-13.0	-32.23	Vertical	Pass
4600.000	-47.89	-13.0	-34.89	Vertical	Pass

Model 4 CH 1599
Horizontal

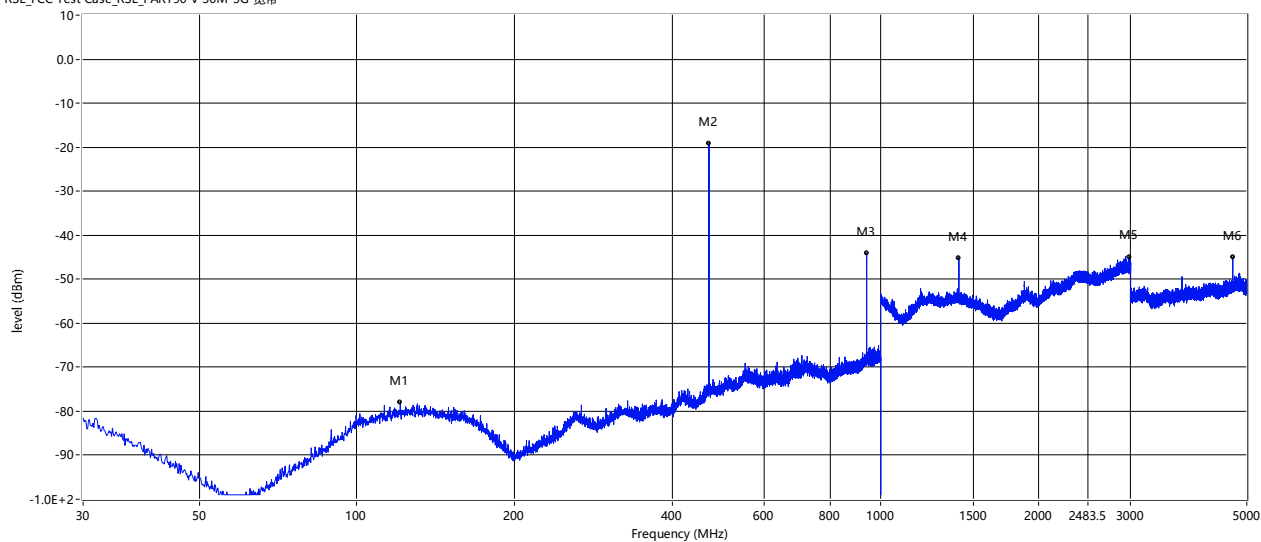
RSE_FCC Test Case_RSE_PART90 H 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
246.189	-78.64	-13.0	-65.64	Horizontal	Pass
470.016	-29.38	-13.0	-16.38	Horizontal	Pass
940.102	-45.09	-13.0	-32.09	Horizontal	Pass
1410.000	-45.28	-13.0	-32.28	Horizontal	Pass
1880.000	-45.97	-13.0	-32.97	Horizontal	Pass
4594.750	-49.98	-13.0	-36.98	Horizontal	Pass

Vertical

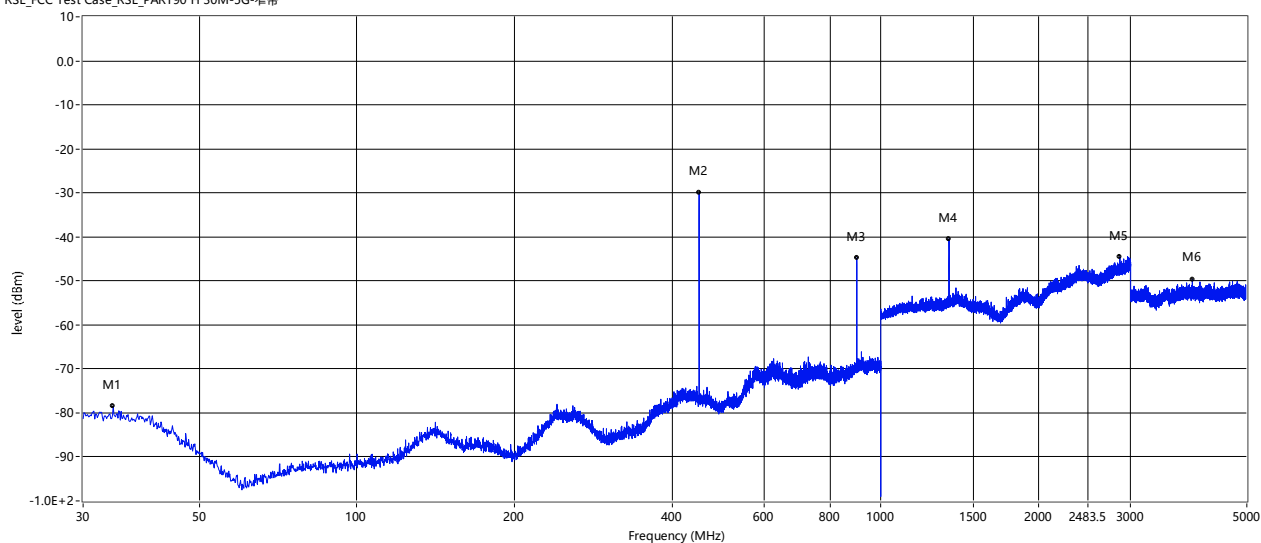
RSE_FCC Test Case_RSE_PART90 V 30M-5G-宽带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
120.938	-78.07	-13.0	-65.07	Vertical	Pass
470.016	-19.22	-13.0	-6.22	Vertical	Pass
940.102	-44.19	-13.0	-31.19	Vertical	Pass
1409.750	-45.12	-13.0	-32.12	Vertical	Pass
2986.250	-44.91	-13.0	-31.91	Vertical	Pass
4700.000	-45.06	-13.0	-32.06	Vertical	Pass

Model 5 CH 1
Horizontal

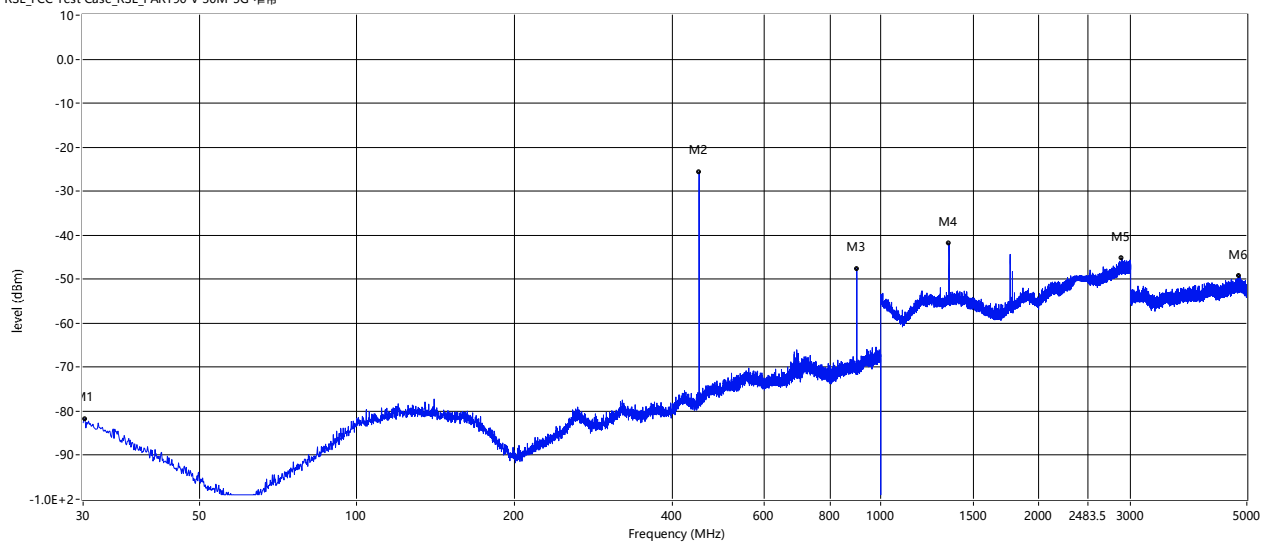
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
34.244	-78.45	-20.0	-58.45	Horizontal	Pass
450.010	-30.02	-20.0	-10.02	Horizontal	Pass
900.090	-44.77	-20.0	-24.77	Horizontal	Pass
1350.000	-40.43	-20.0	-20.43	Horizontal	Pass
2861.500	-44.53	-20.0	-24.53	Horizontal	Pass
3936.000	-49.63	-20.0	-29.63	Horizontal	Pass

Vertical

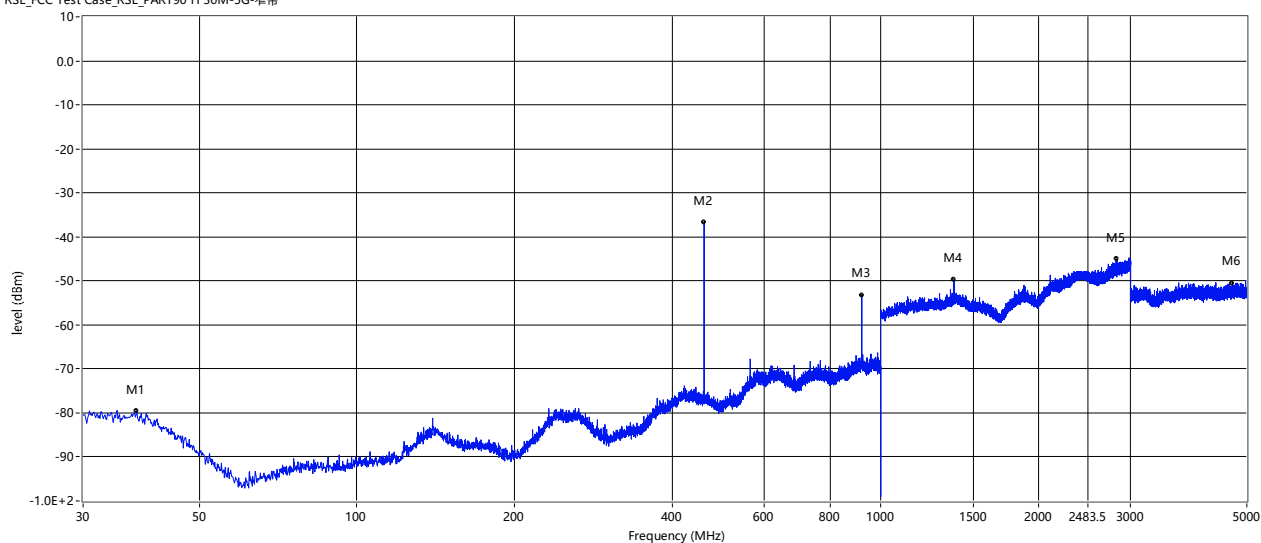
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
30.242	-81.73	-20.0	-61.73	Vertical	Pass
450.010	-25.61	-20.0	-5.61	Vertical	Pass
900.090	-47.60	-20.0	-27.60	Vertical	Pass
1350.000	-41.82	-20.0	-21.82	Vertical	Pass
2887.750	-45.33	-20.0	-25.33	Vertical	Pass
4823.000	-49.23	-20.0	-29.23	Vertical	Pass

Model 5 CH 800
Horizontal

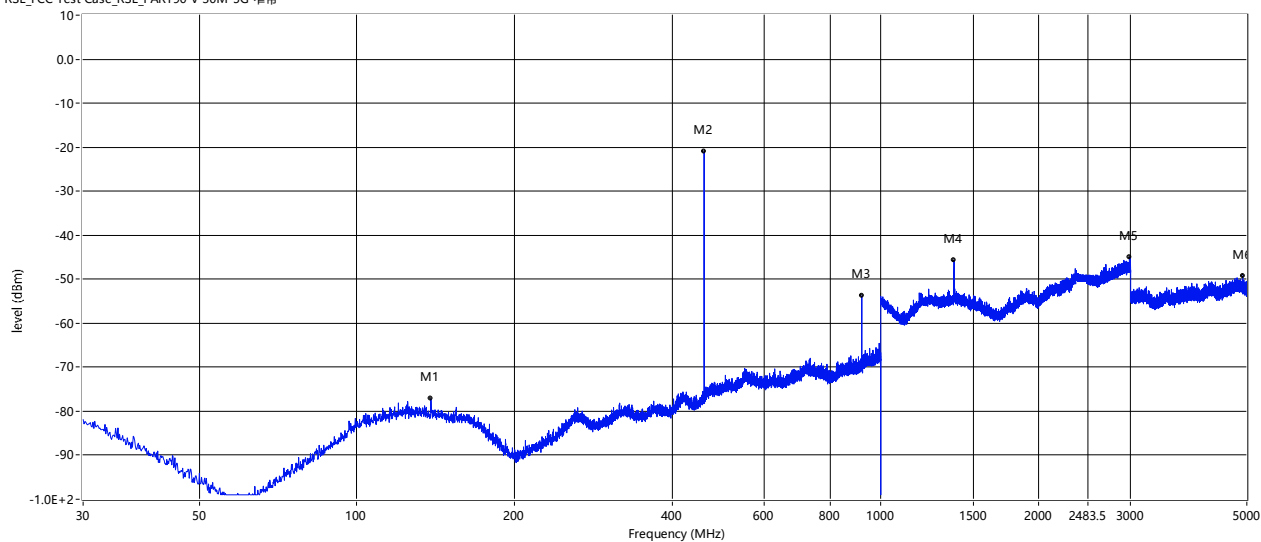
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
38.002	-79.60	-20.0	-59.60	Horizontal	Pass
459.953	-36.68	-20.0	-16.68	Horizontal	Pass
920.096	-53.23	-20.0	-33.23	Horizontal	Pass
1380.250	-49.78	-20.0	-29.78	Horizontal	Pass
2825.000	-45.09	-20.0	-25.09	Horizontal	Pass
4693.000	-50.64	-20.0	-30.64	Horizontal	Pass

Vertical

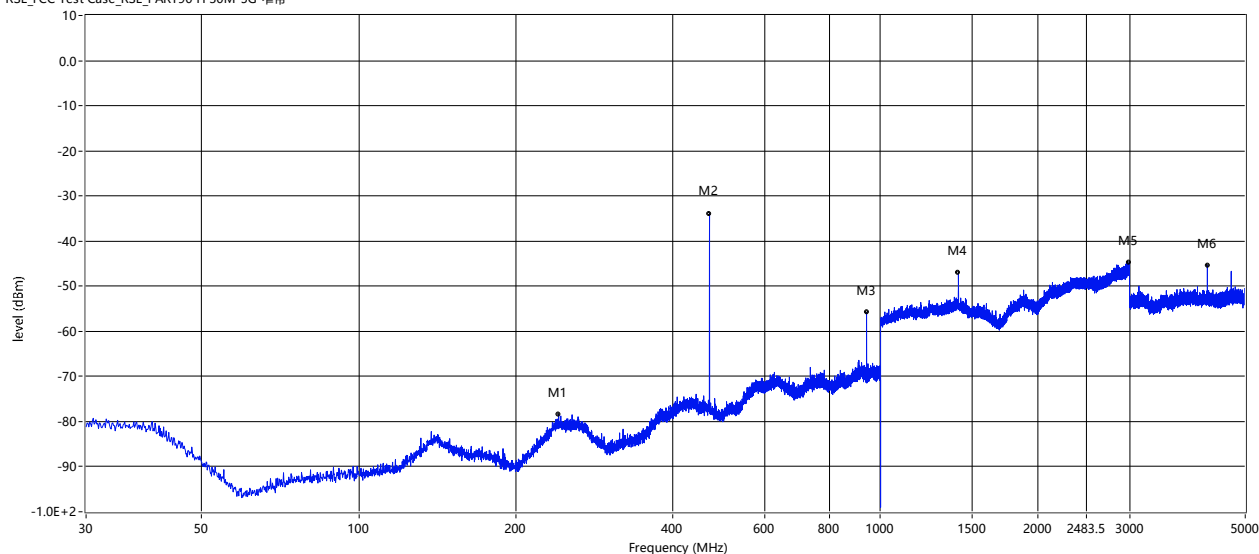
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
138.398	-77.18	-20.0	-57.18	Vertical	Pass
459.953	-20.98	-20.0	-0.98	Vertical	Pass
920.096	-53.81	-20.0	-33.81	Vertical	Pass
1380.250	-45.64	-20.0	-25.64	Vertical	Pass
2983.250	-44.96	-20.0	-24.96	Vertical	Pass
4910.000	-49.26	-20.0	-29.26	Vertical	Pass

Model 5 CH 1599
Horizontal

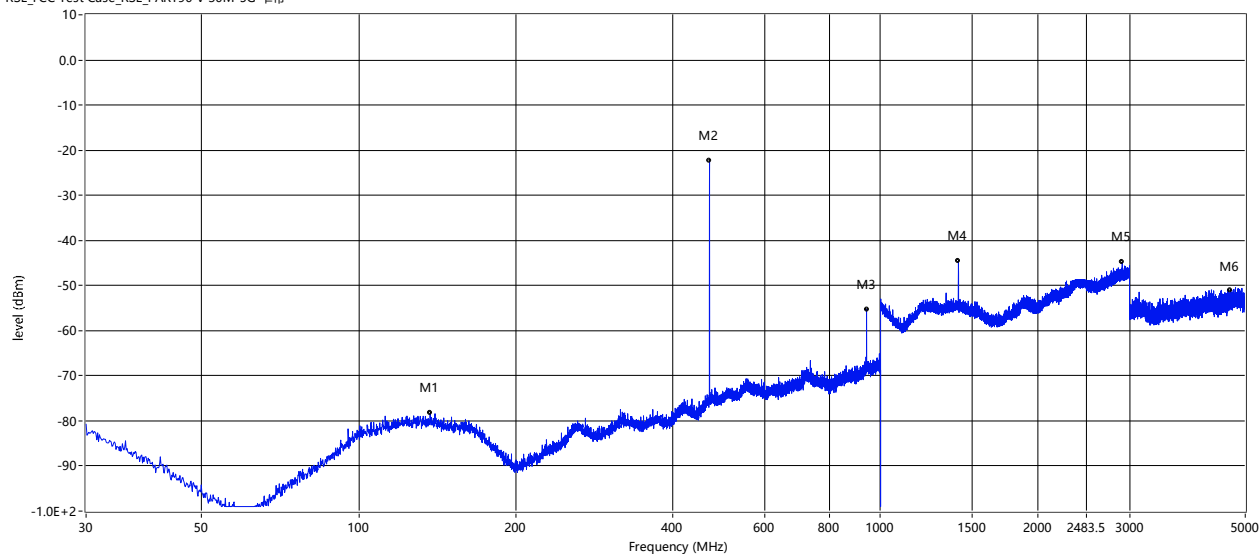
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
241.581	-78.53	-20.0	-58.53	Horizontal	Pass
470.016	-33.90	-20.0	-13.90	Horizontal	Pass
940.102	-55.82	-20.0	-35.82	Horizontal	Pass
1410.000	-49.28	-20.0	-29.28	Horizontal	Pass
2993.000	-44.77	-20.0	-24.77	Horizontal	Pass
4229.750	-45.44	-20.0	-25.44	Horizontal	Pass

Vertical

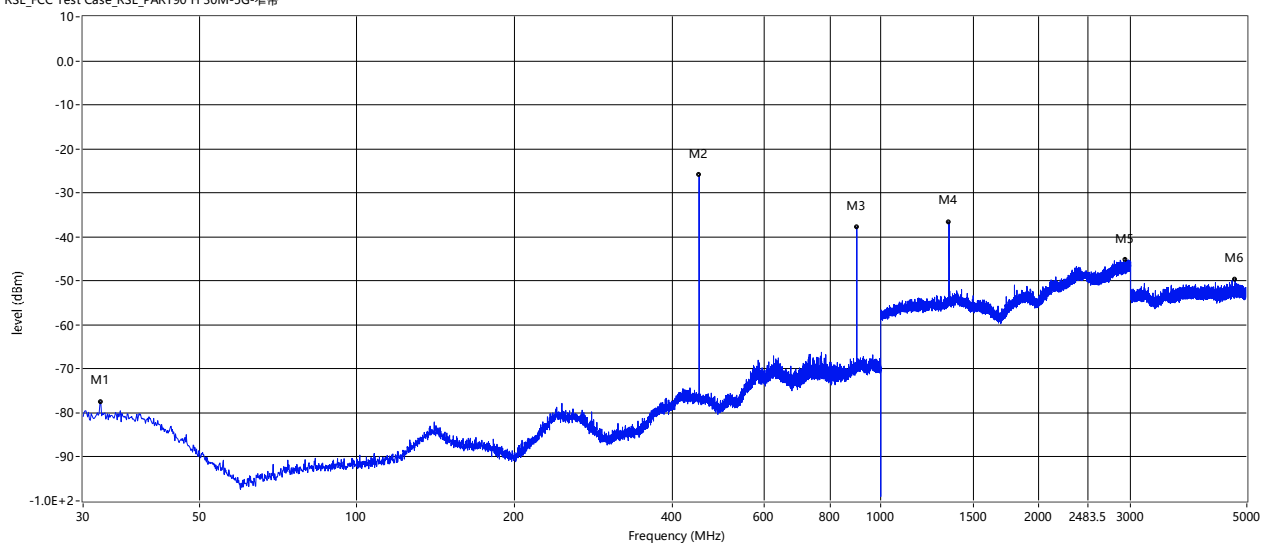
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
136.943	-78.30	-20.0	-58.30	Vertical	Pass
470.016	-22.40	-20.0	-2.40	Vertical	Pass
940.102	-55.27	-20.0	-35.27	Vertical	Pass
1409.750	-44.62	-20.0	-24.62	Vertical	Pass
2905.000	-44.88	-20.0	-24.88	Vertical	Pass
4683.250	-51.06	-20.0	-31.06	Vertical	Pass

Model 6 CH 1
Horizontal

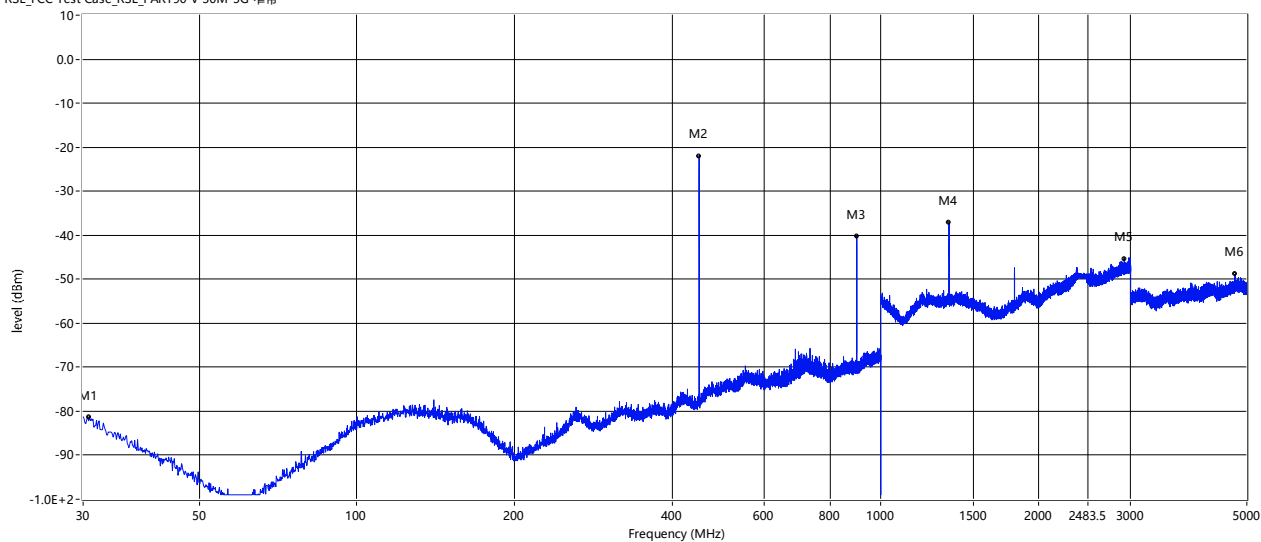
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
32.425	-77.48	-20.0	-57.48	Horizontal	Pass
450.010	-25.94	-20.0	-5.94	Horizontal	Pass
900.090	-37.77	-20.0	-17.77	Horizontal	Pass
1350.250	-36.59	-20.0	-16.59	Horizontal	Pass
2935.250	-45.18	-20.0	-25.18	Horizontal	Pass
4748.500	-49.76	-20.0	-29.76	Horizontal	Pass

Vertical

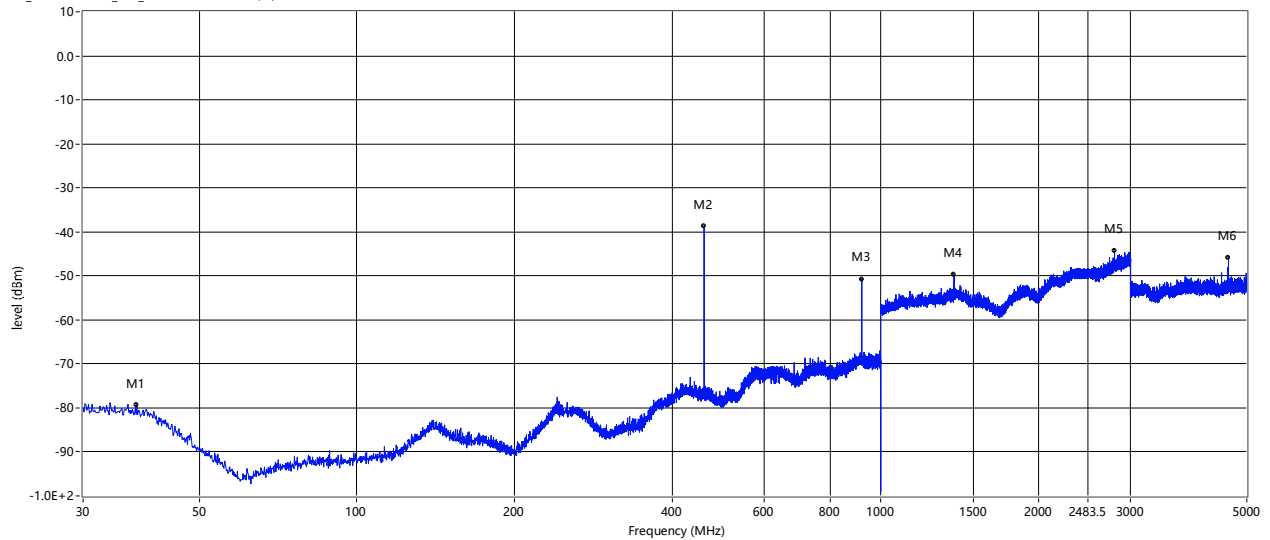
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
30.849	-81.44	-20.0	-61.44	Vertical	Pass
450.010	-22.07	-20.0	-2.07	Vertical	Pass
900.090	-40.28	-20.0	-20.28	Vertical	Pass
1350.250	-37.14	-20.0	-17.14	Vertical	Pass
2917.000	-45.34	-20.0	-25.34	Vertical	Pass
4746.500	-48.89	-20.0	-28.89	Vertical	Pass

Model 6 CH 800
Horizontal

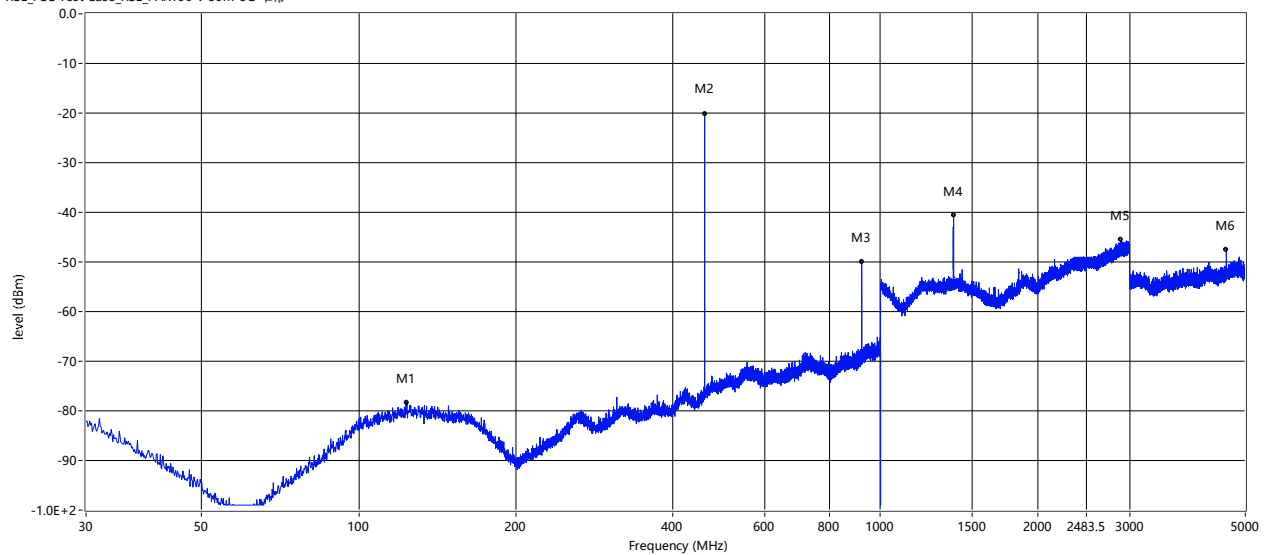
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
38.002	-79.32	-20.0	-59.32	Horizontal	Pass
459.953	-33.75	-20.0	-13.75	Horizontal	Pass
920.096	-50.89	-20.0	-30.89	Horizontal	Pass
1380.250	-49.73	-20.0	-29.73	Horizontal	Pass
2795.250	-44.42	-20.0	-24.42	Horizontal	Pass
4612.250	-45.92	-20.0	-25.92	Horizontal	Pass

Vertical

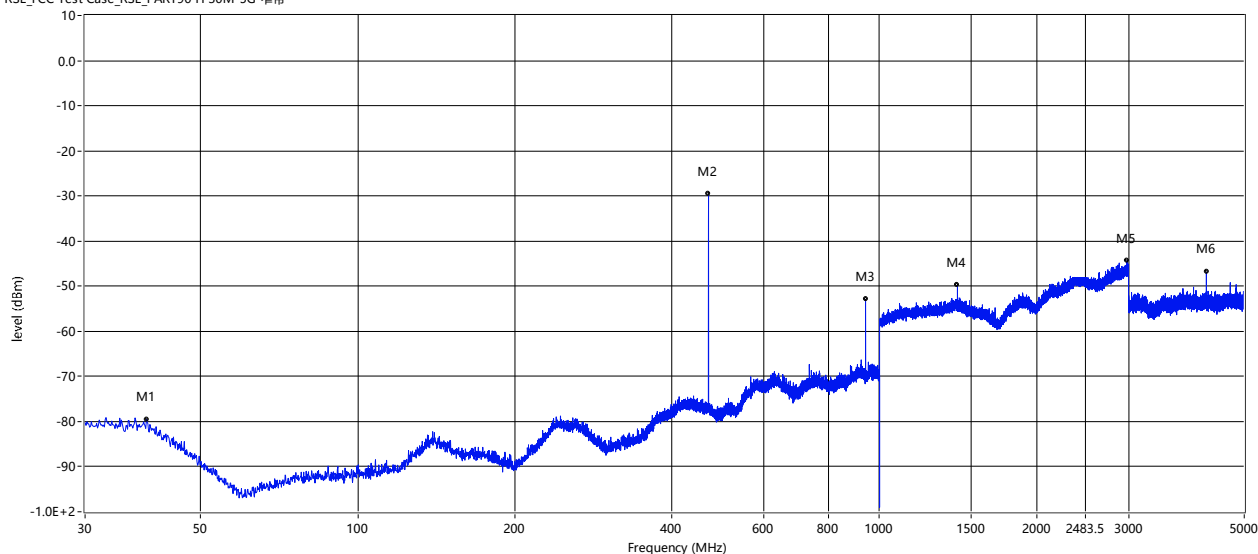
RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
123.605	-78.44	-20.0	-58.44	Vertical	Pass
459.953	-20.13	-20.0	-0.13	Vertical	Pass
920.096	-50.05	-20.0	-30.05	Vertical	Pass
1380.250	-40.62	-20.0	-20.62	Vertical	Pass
2892.000	-45.59	-20.0	-25.59	Vertical	Pass
4600.250	-47.47	-20.0	-27.47	Vertical	Pass

Model 6 CH 1599
Horizontal

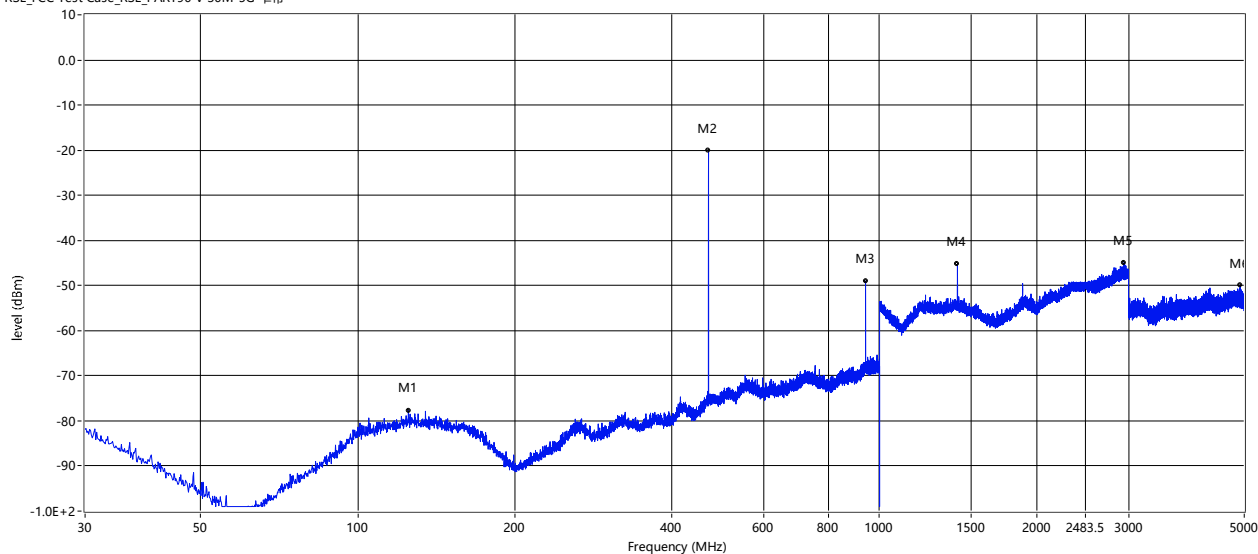
RSE_FCC Test Case_RSE_PART90 H 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
39.336	-79.48	-20.0	-59.48	Horizontal	Pass
470.016	-29.58	-20.0	-9.58	Horizontal	Pass
940.102	-52.90	-20.0	-32.90	Horizontal	Pass
1410.250	-49.79	-20.0	-29.79	Horizontal	Pass
2982.000	-44.36	-20.0	-24.36	Horizontal	Pass
4230.000	-46.90	-20.0	-26.90	Horizontal	Pass

Vertical

RSE_FCC Test Case_RSE_PART90 V 30M-5G-窄带



Frequency (MHz)	Result (dBm)	Limit (dBm)	Over Limit (dB)	ANT	Verdict
124.939	-77.71	-20.0	-57.71	Vertical	Pass
470.016	-20.04	-20.0	-0.04	Vertical	Pass
940.102	-49.00	-20.0	-29.00	Vertical	Pass
1410.000	-45.33	-20.0	-25.33	Vertical	Pass
2942.000	-44.92	-20.0	-24.92	Vertical	Pass
4909.750	-49.91	-20.0	-29.91	Vertical	Pass



7. SPURIOUS EMISSION ON ANTENNA PORT

7.1 PROVISIONS APPLICABLE

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88)$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

7.2 MEASUREMENT PROCEDURE

- a. The EUT was connected to the spectrum analyzer through sufficient attenuation.
- b. Sufficient scans were taken to show any out of band emission up to 10th. Harmonic for the lower and the highest frequency range.
- c. Set EUT as digital data mode.
- d. Set RBW 100kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz, while set RBW=1MHz. VBW=3MHz from the 1GHz to 10th Harmonic.

7.3 TEST SETUP BLOCK DIAGRAM

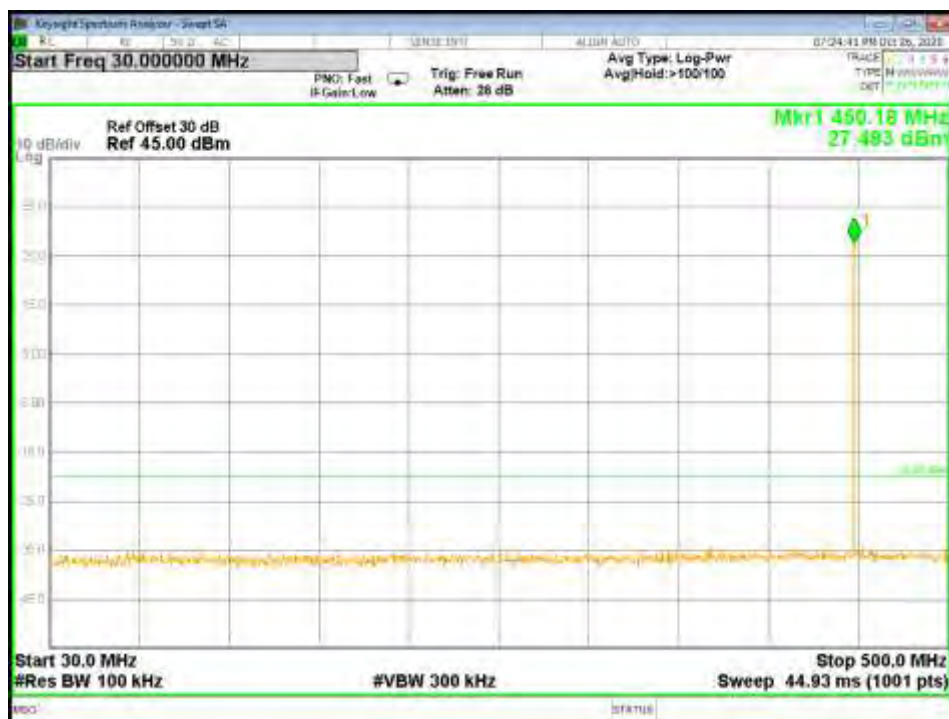




7.4 TEST RESULT

CH 1

Model 1



30M-500M

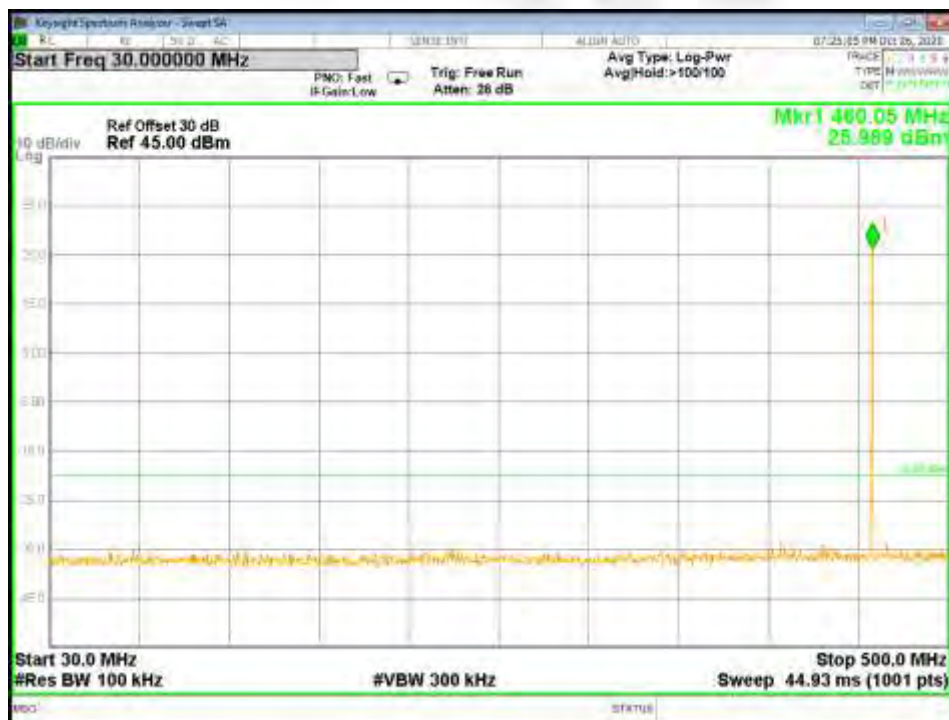


500M-1G



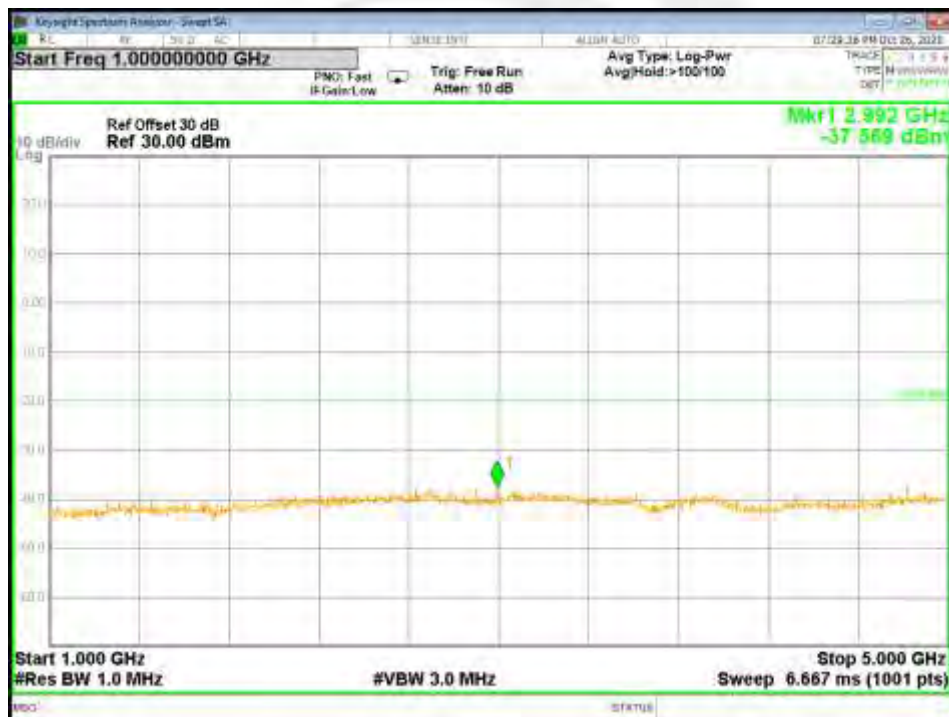
CH 800

Model 1





500M-1G



1G-5G

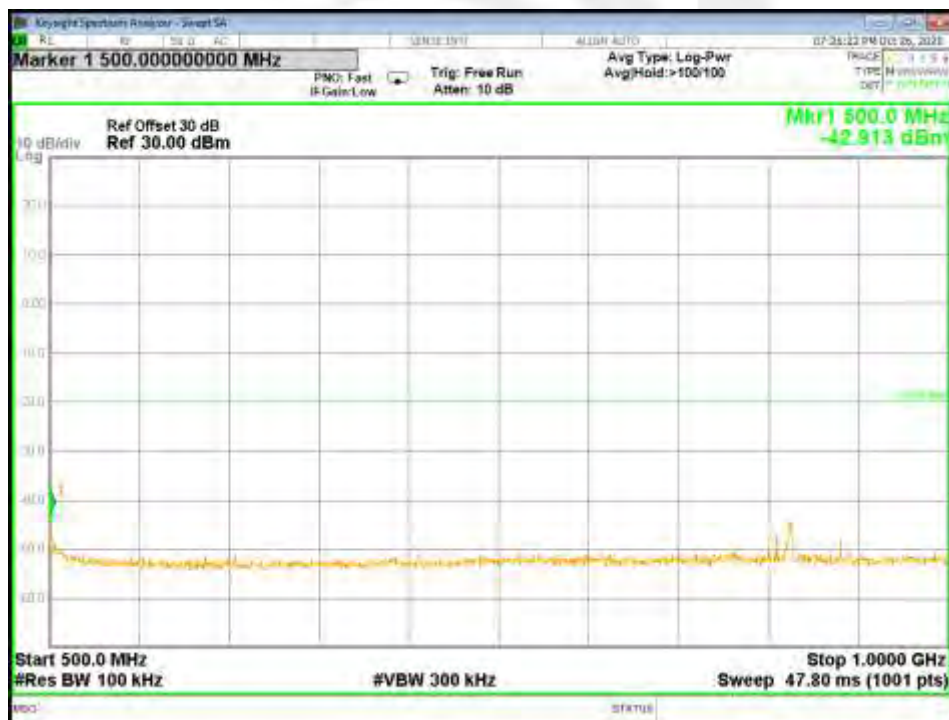


CH 1599

Model 1



30M-500M



500M-1G



500M-1G

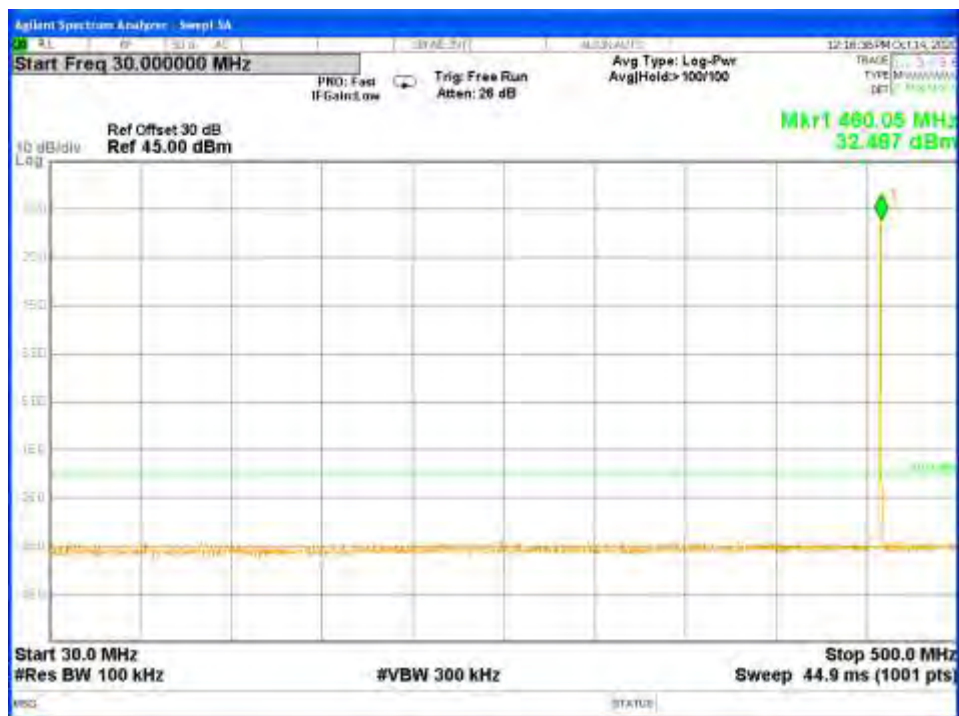


1G-5G

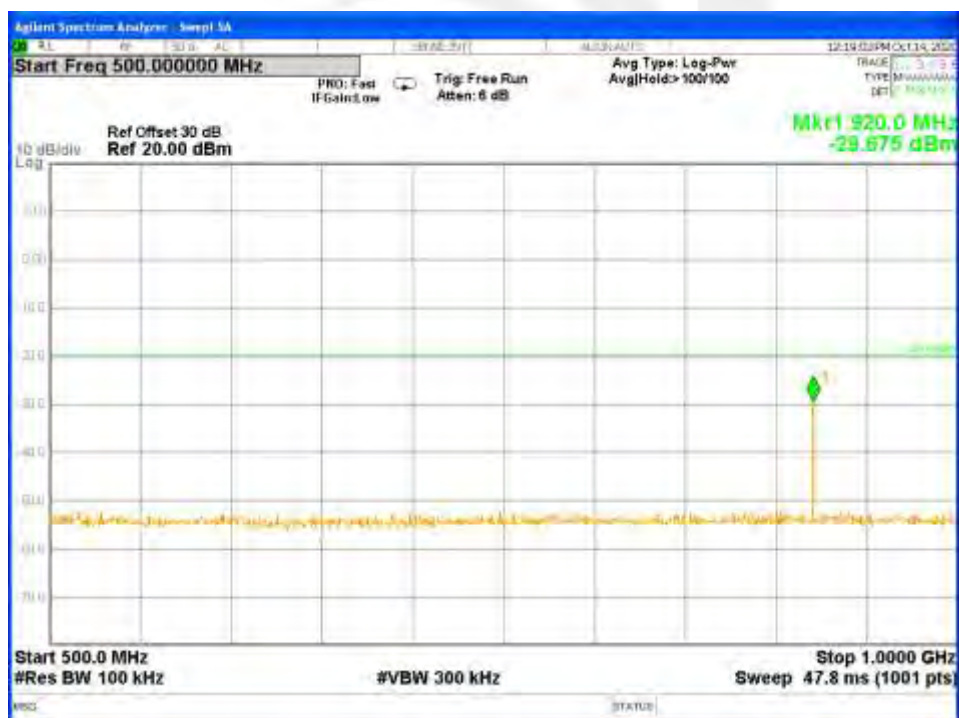


CH 800

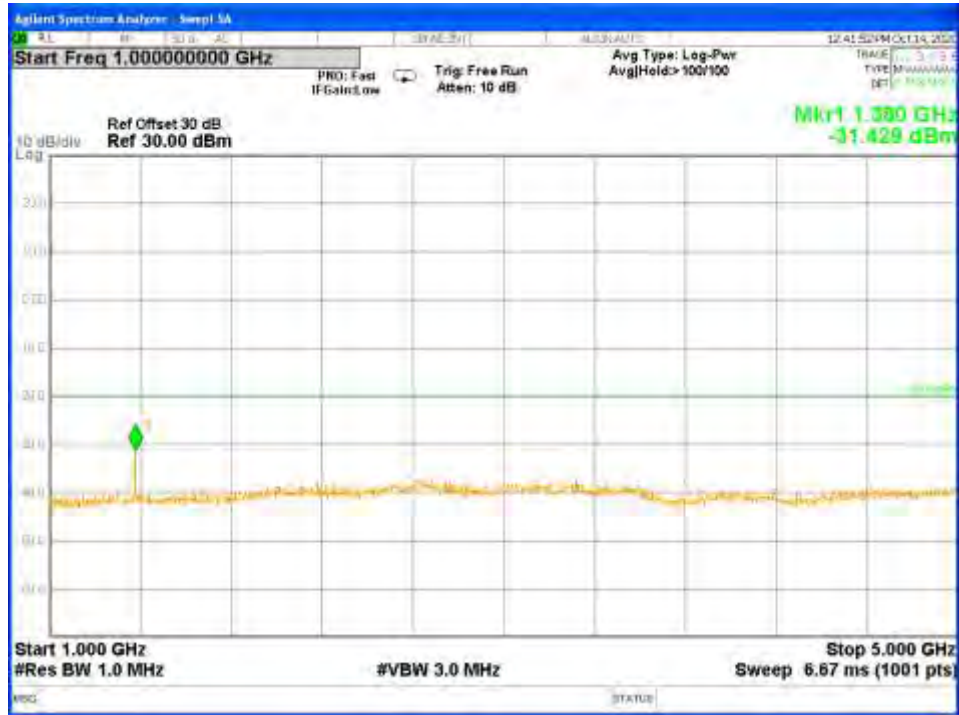
Model 2



30M-500M



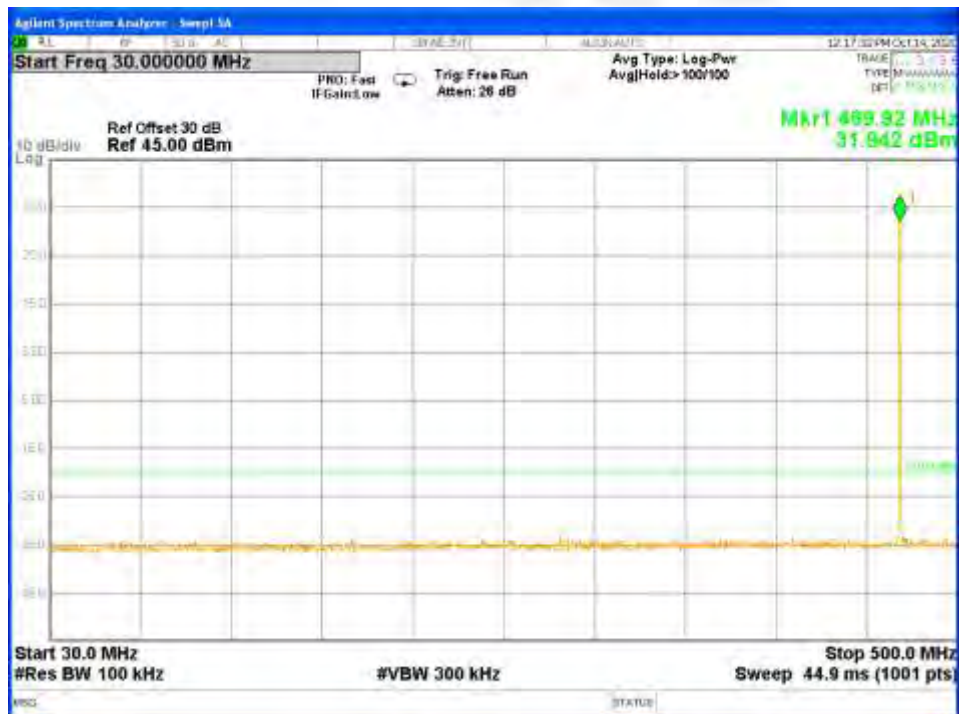
500M-1G



1G-5G

CH 1599

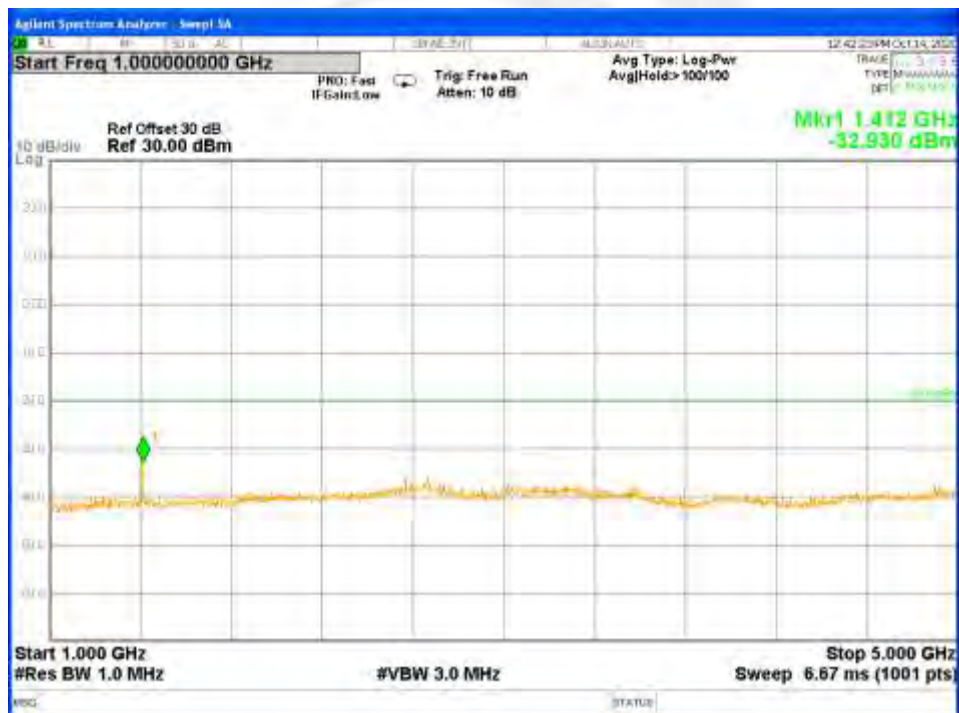
Model 2



30M-500M



500M-1G

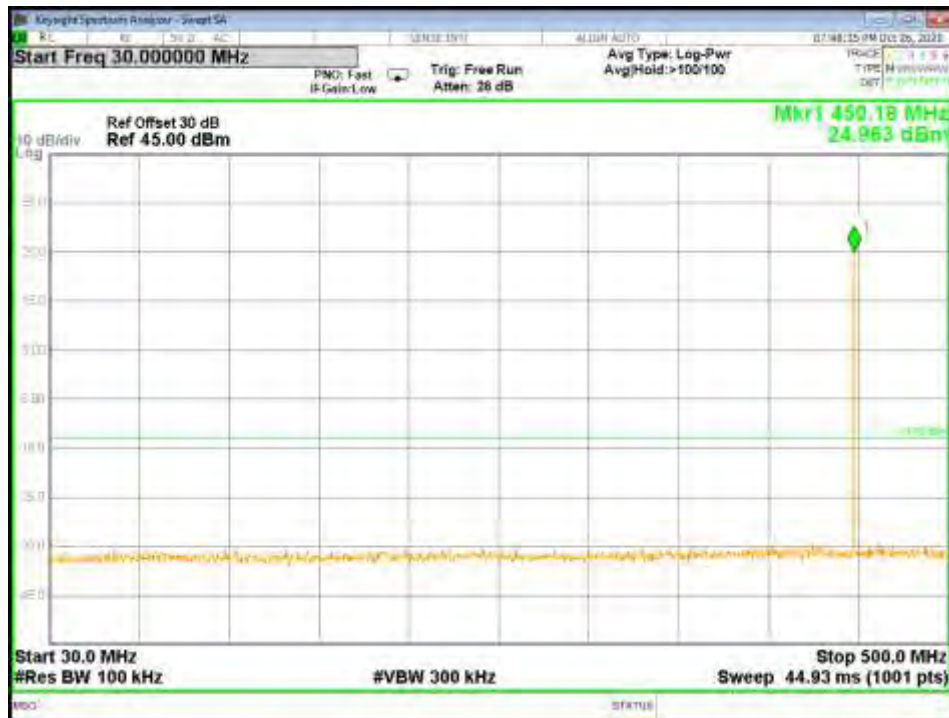


1G-5G



CH 1

Model 3



30M-500M



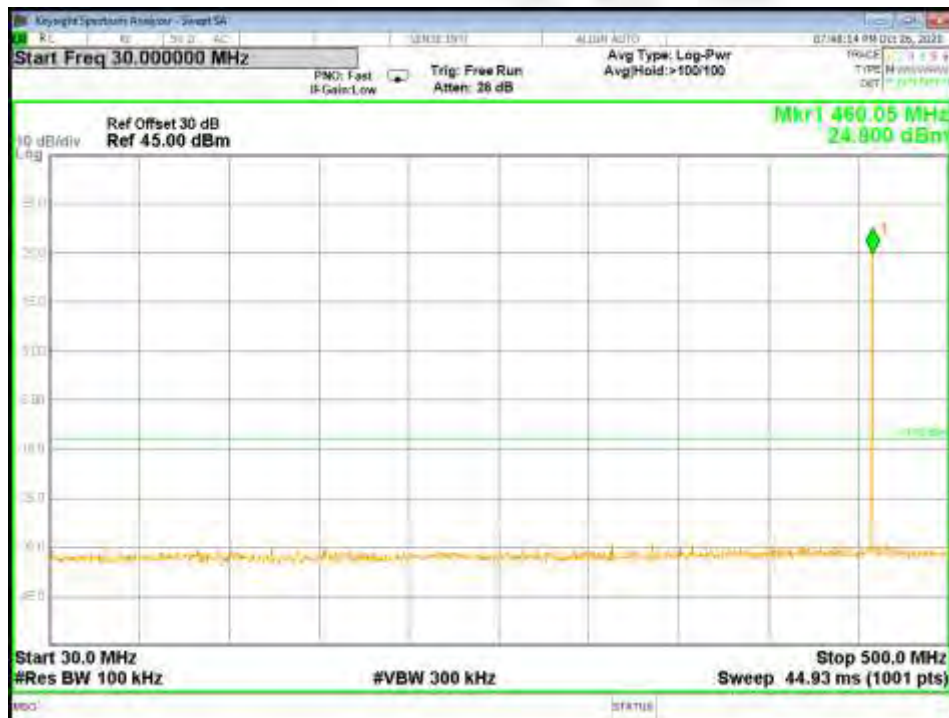
500M-1G



1G-5G

CH 800

Model 3



30M-500M



500M-1G

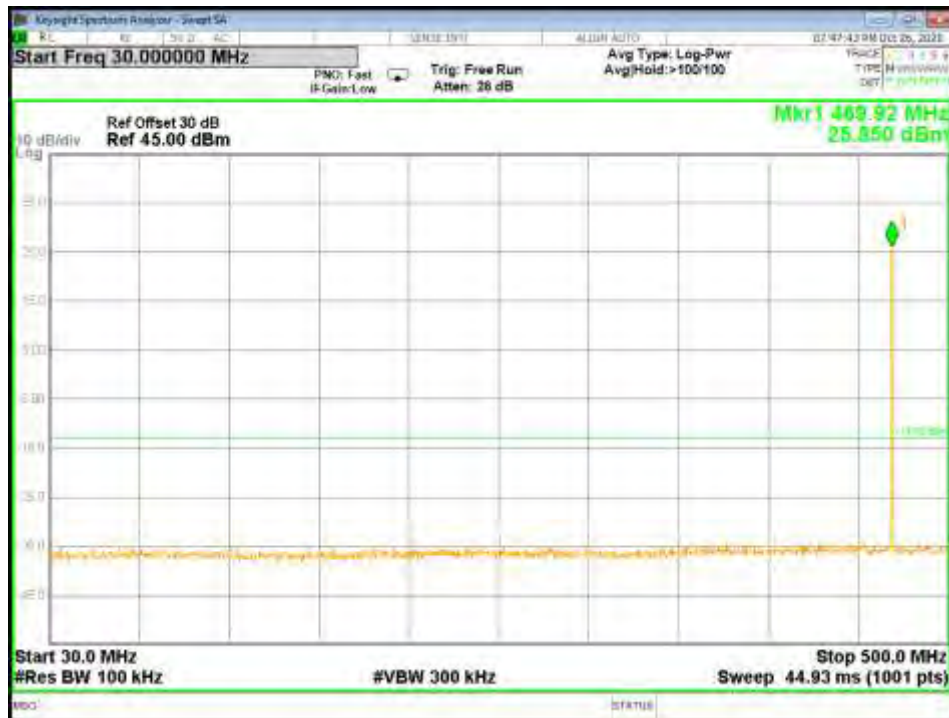


1G-5G



CH 1599

Model 3



30M-500M



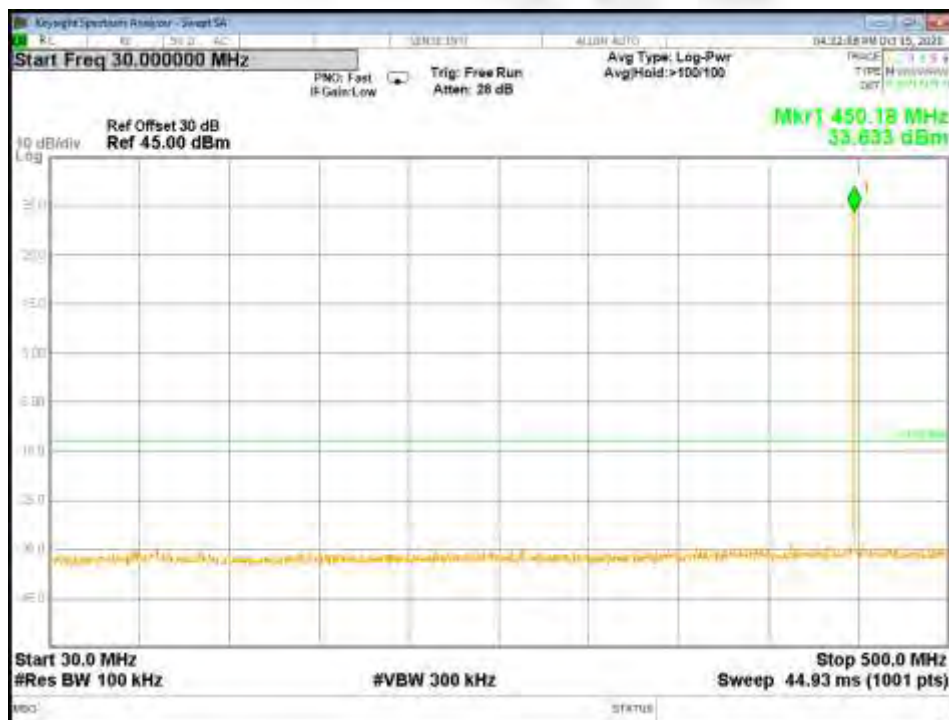
500M-1G



1G-5G

CH 1

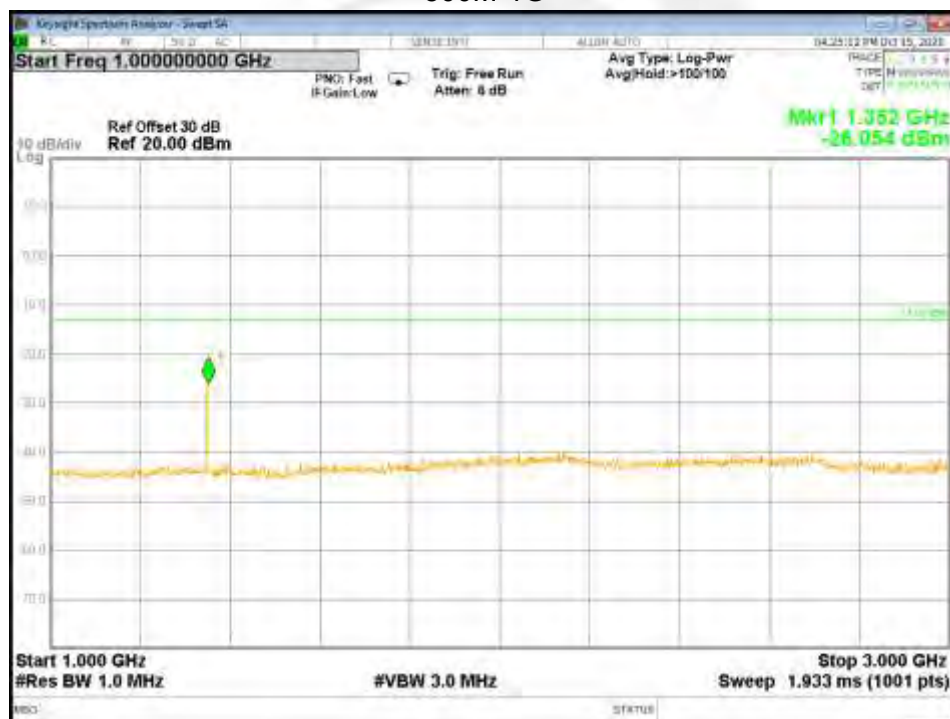
Model 4



30M-500M



500M-1G

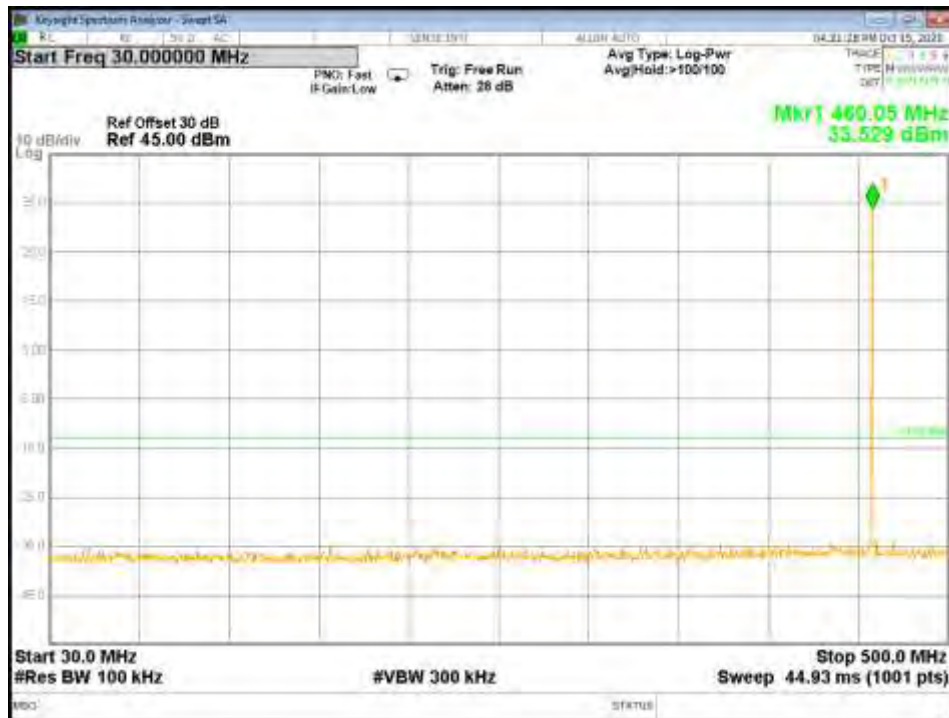


1G-3G

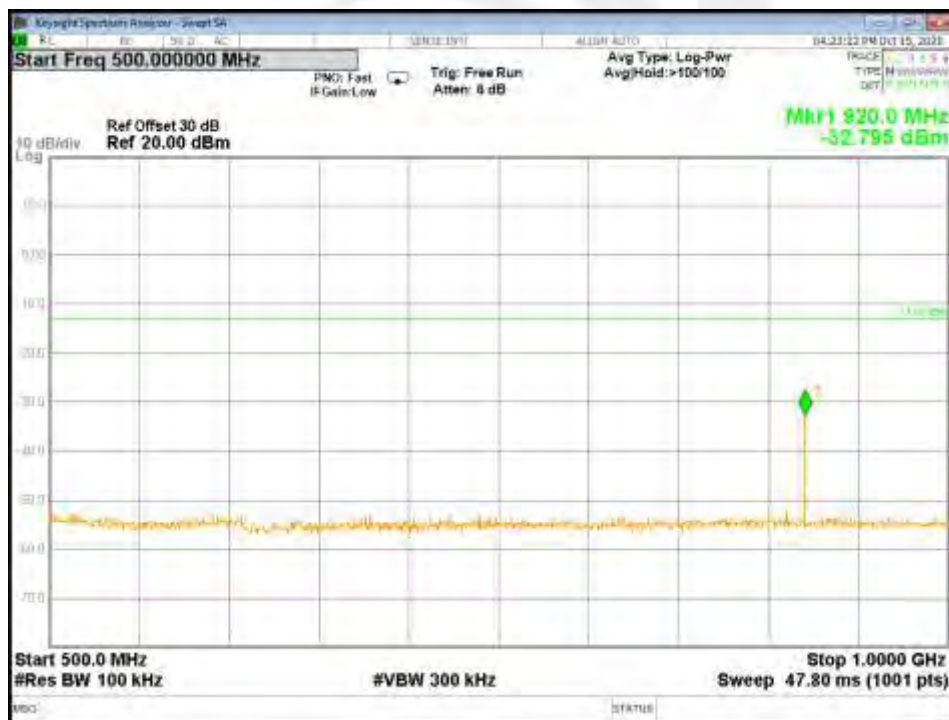


CH 800

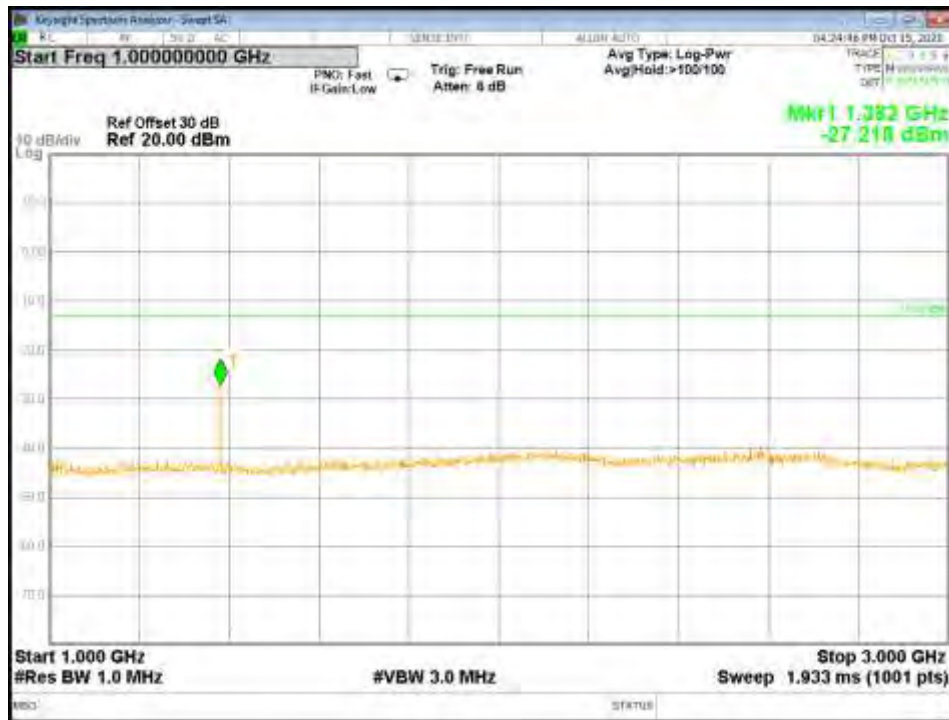
Model 4



30M-500M



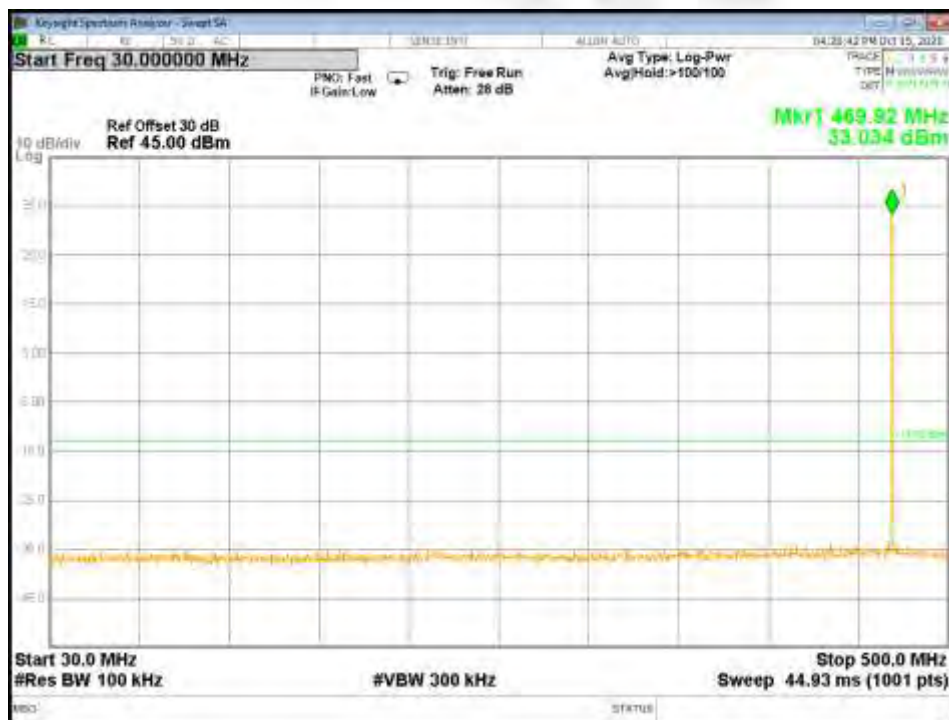
500M-1G



1G-3G

CH 1599

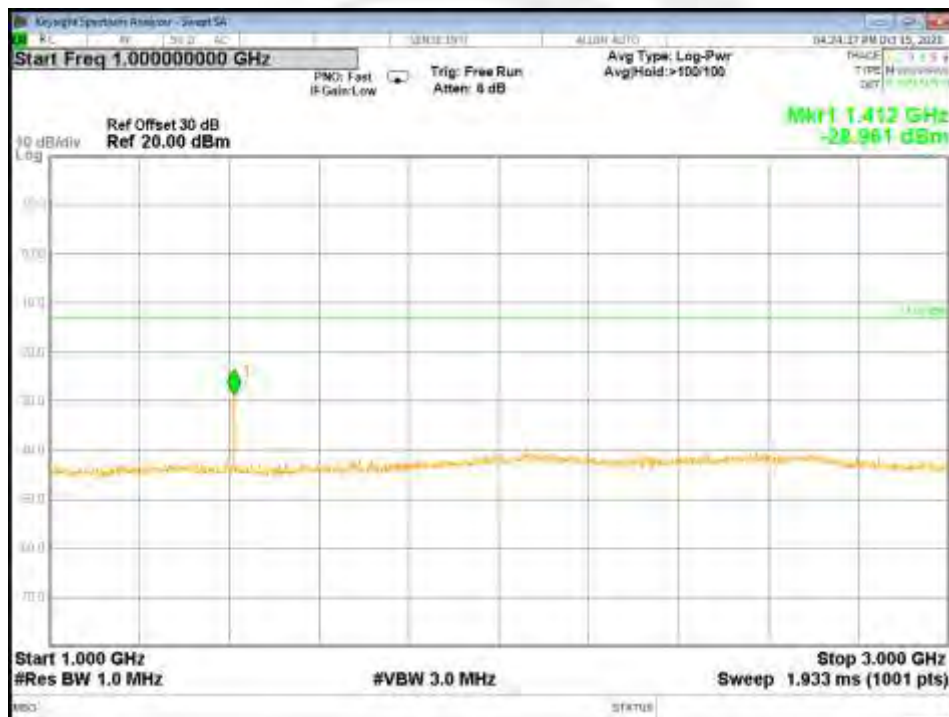
Model 4



30M-500M



500M-1G

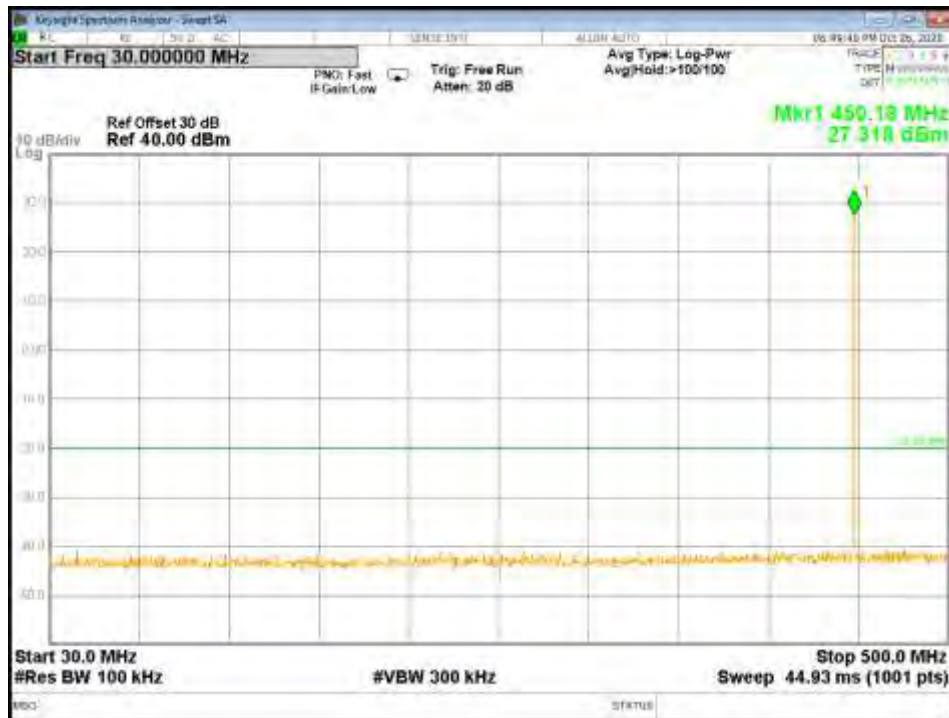


1G-3G

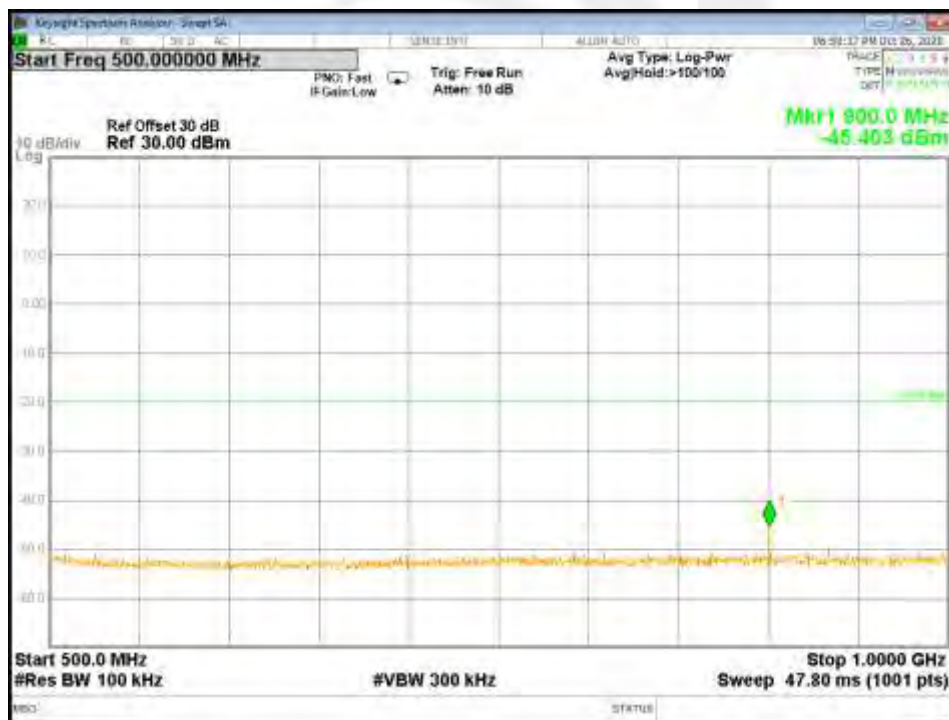


CH 1

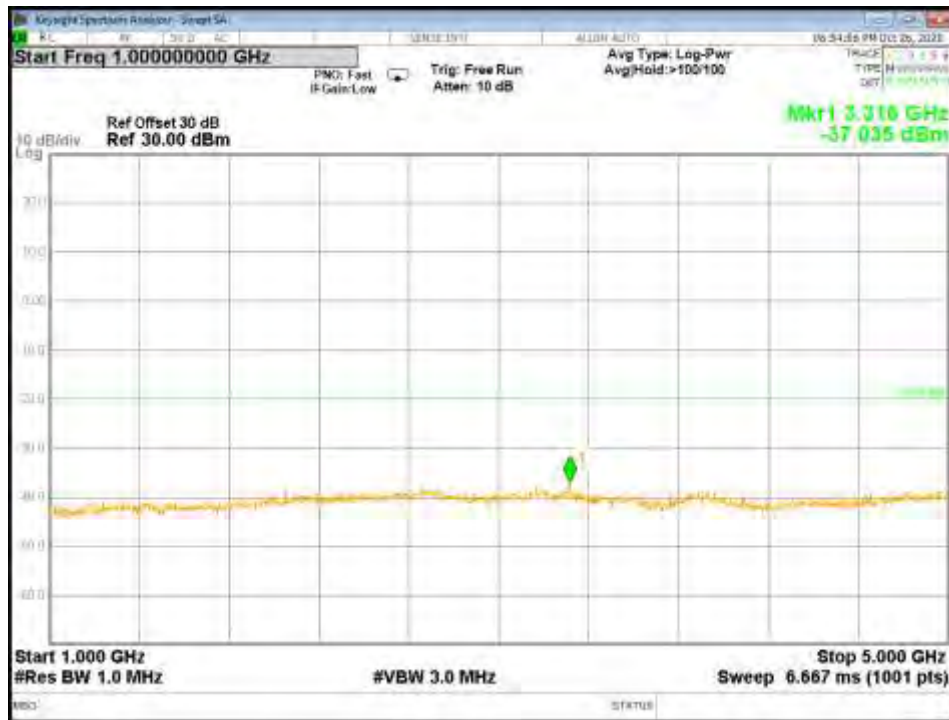
Model 5



30M-500M



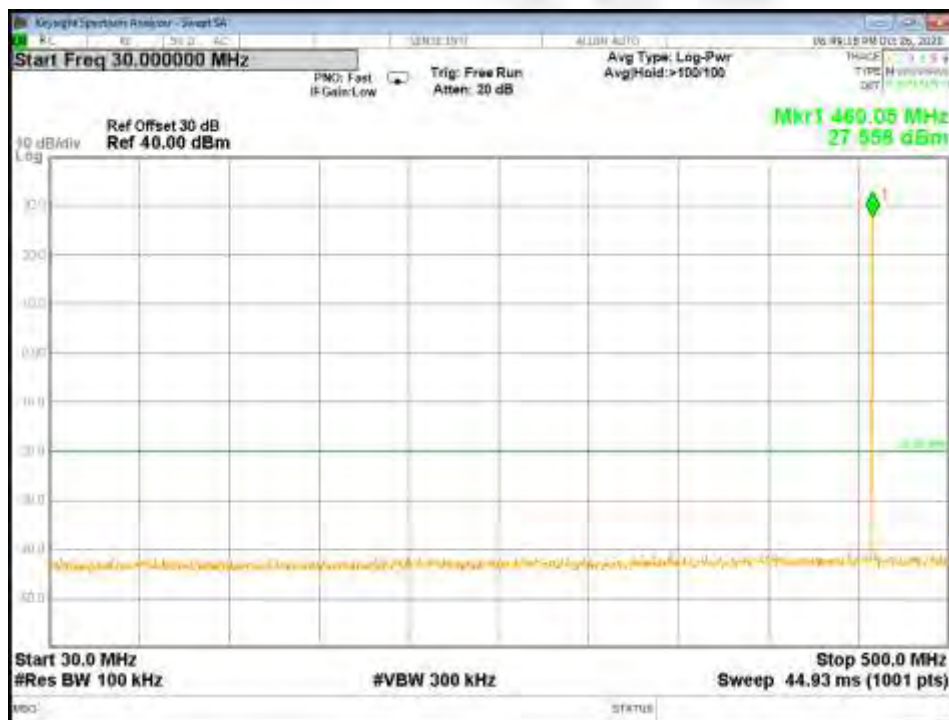
500M-1G



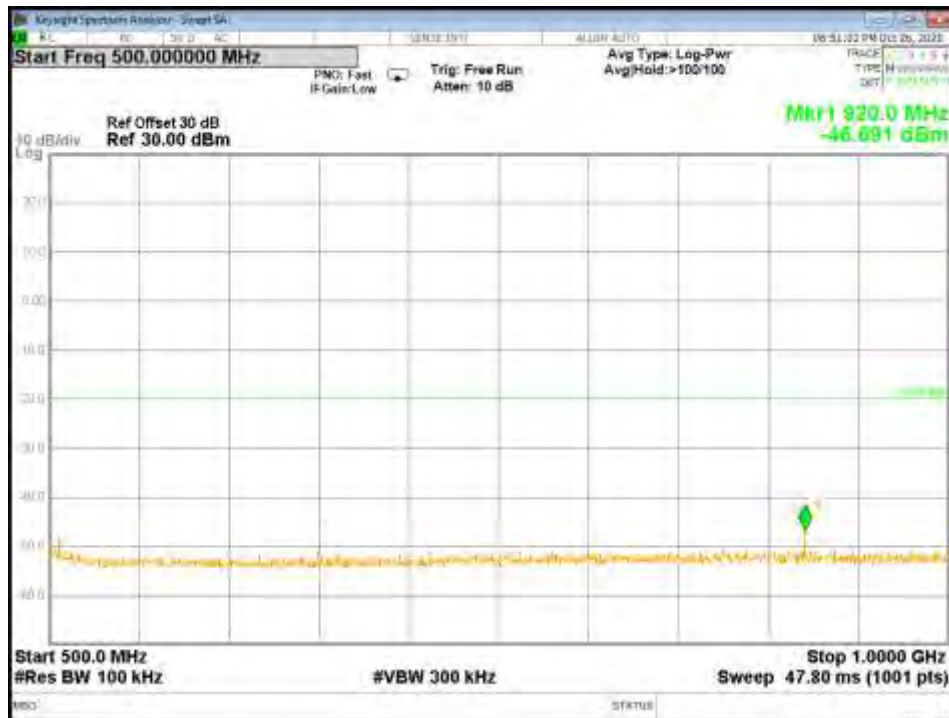
1G-5G

CH 800

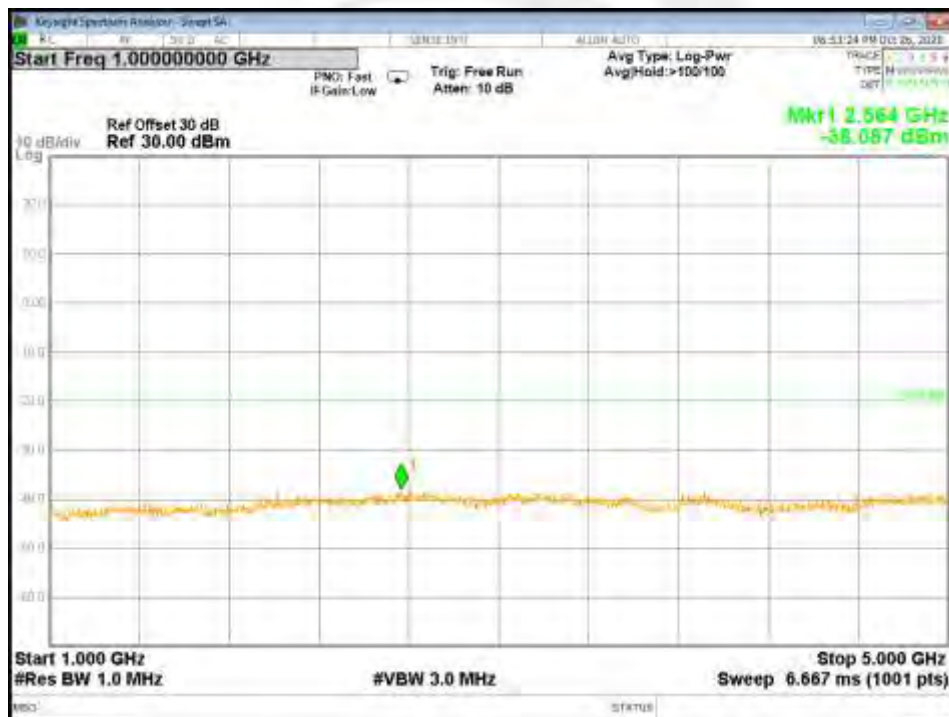
Model 5



30M-500M



500M-1G

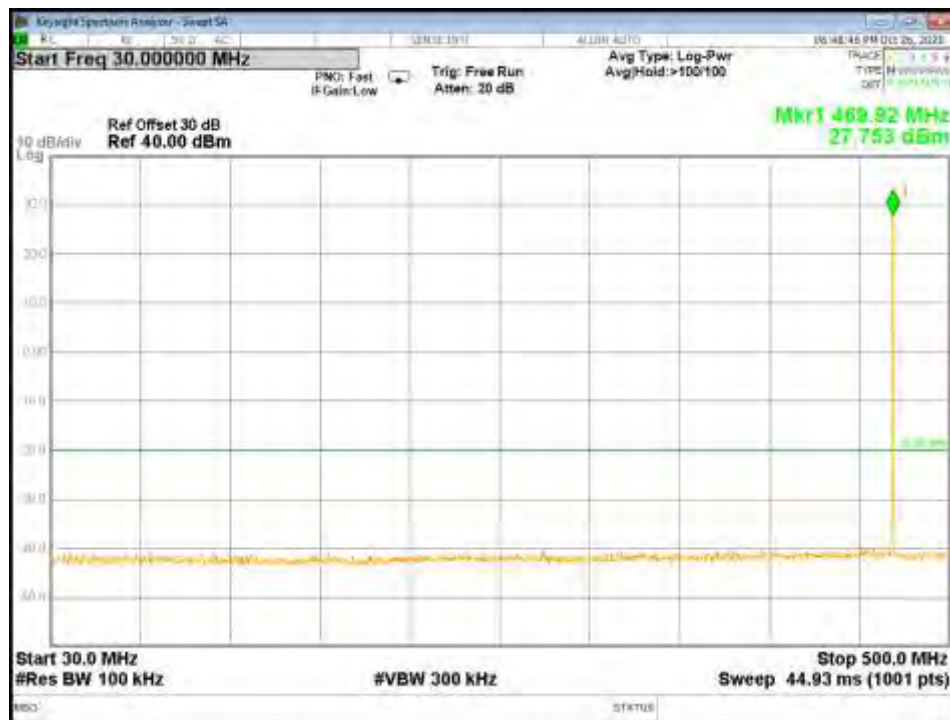


1G-5G

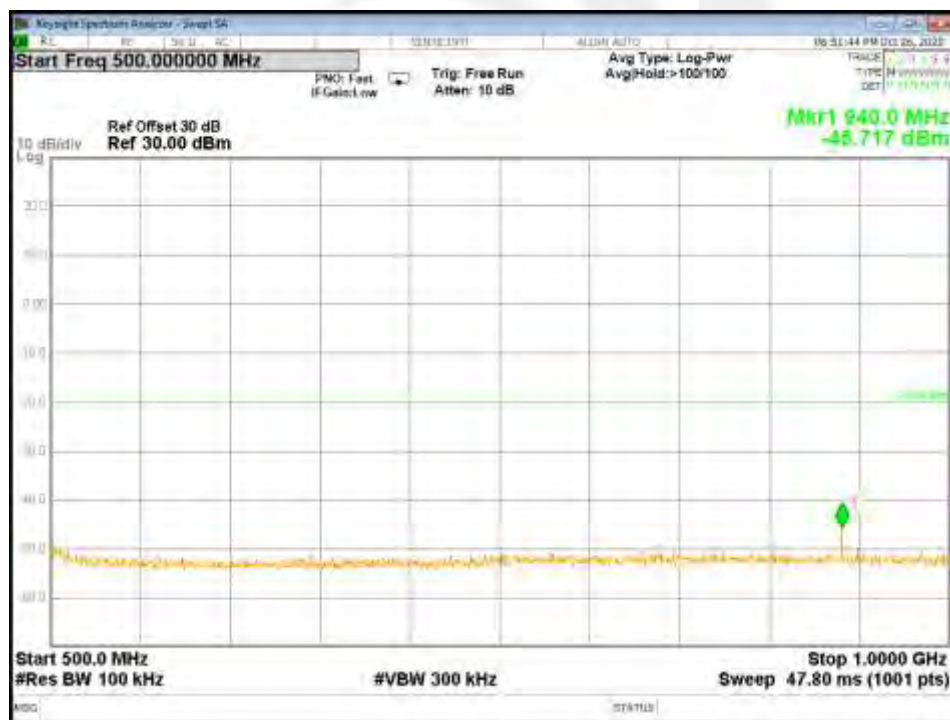


CH 1599

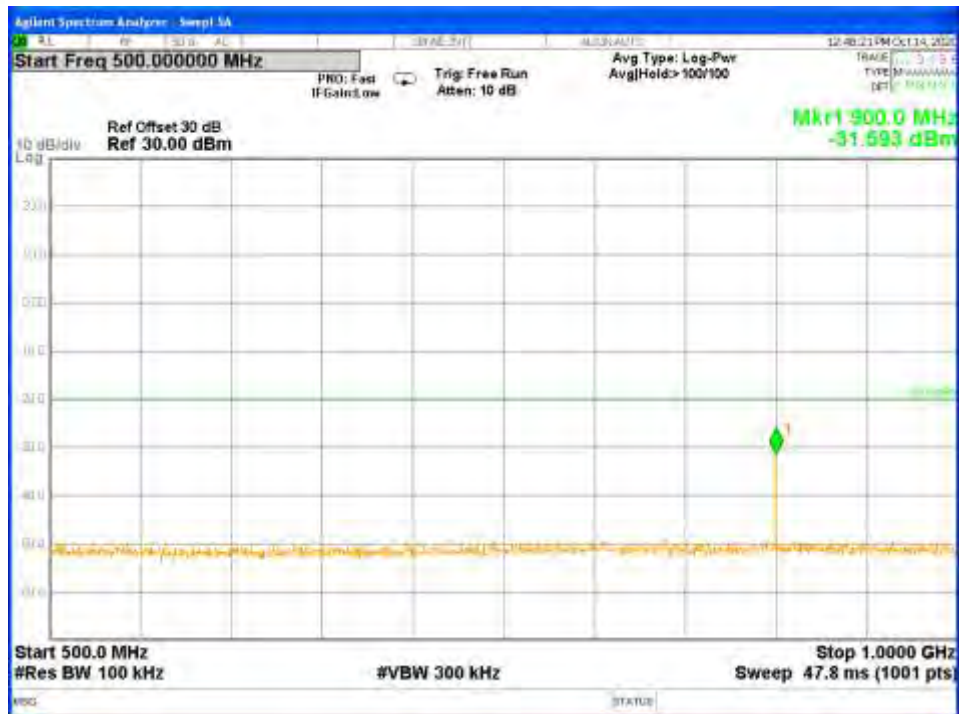
Model 5



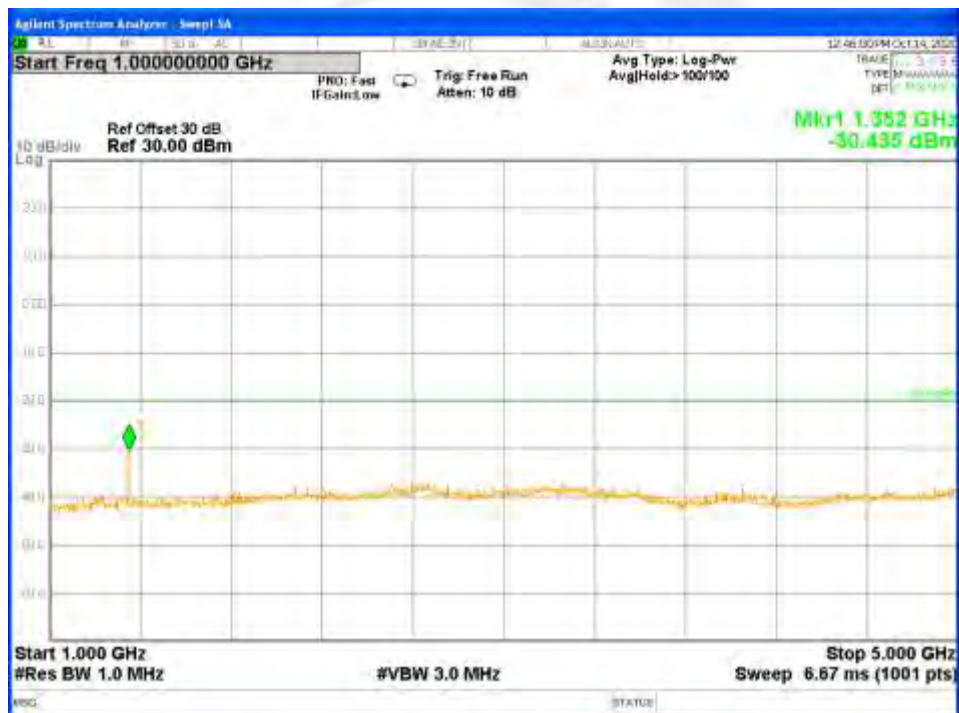
30M-500M



500M-1G



500M-1G



1G-5G

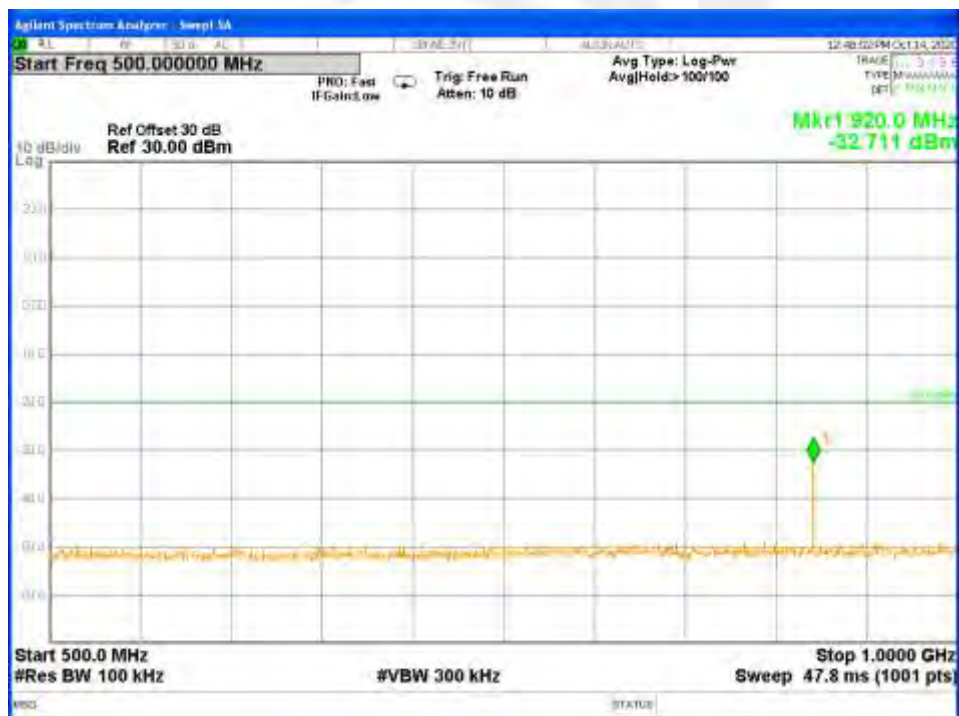


CH 800

Model 6



30M-500M



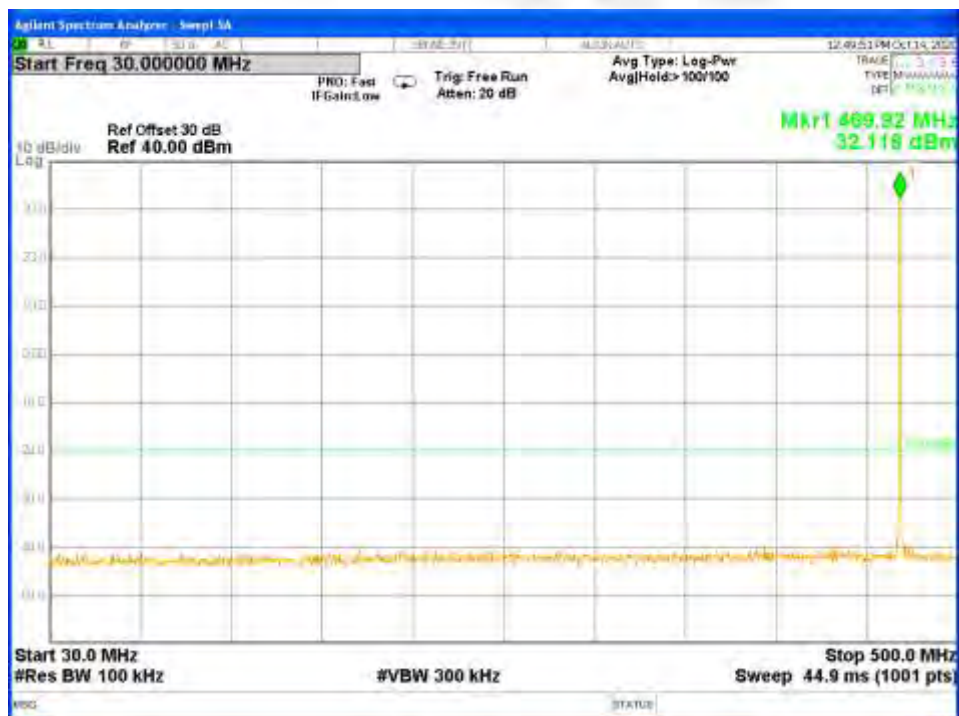
500M-1G



1G-5G

CH 1599

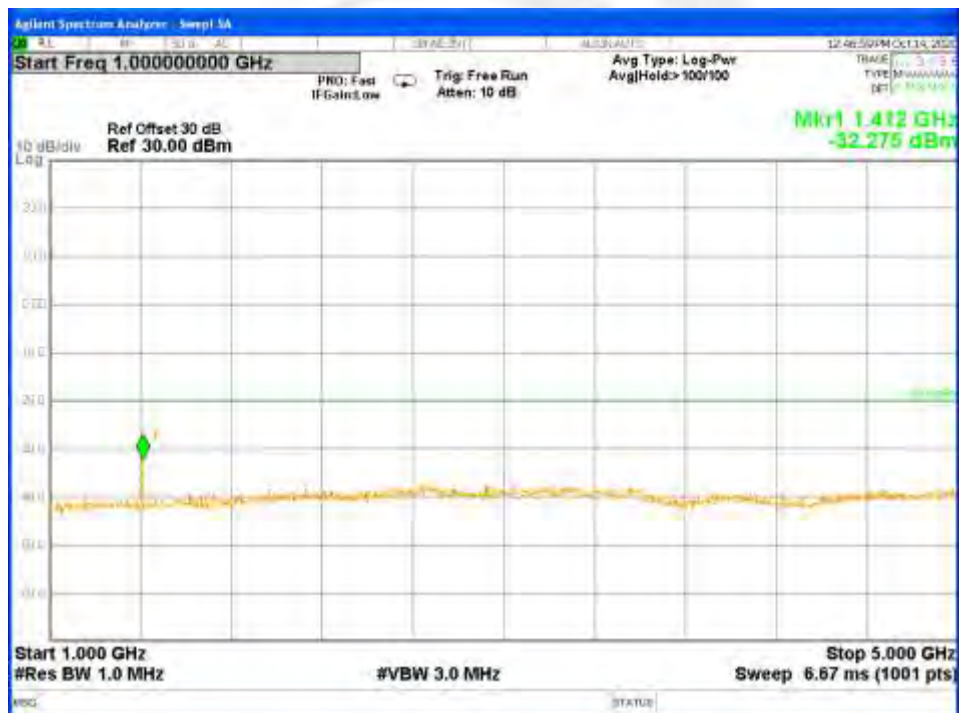
Model 6



30M-500M



500M-1G



1G-5G

8. FREQUENCY STABILITY

8.1 PROVISIONS APPLICABLE

- 1) The frequency stability shall be measured with variation of ambient temperature from -30°C to +50°C centigrade.
- 2) For battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
- 3) Vary primary supply voltage from 85 to 115 percent of the nominal value.

4)

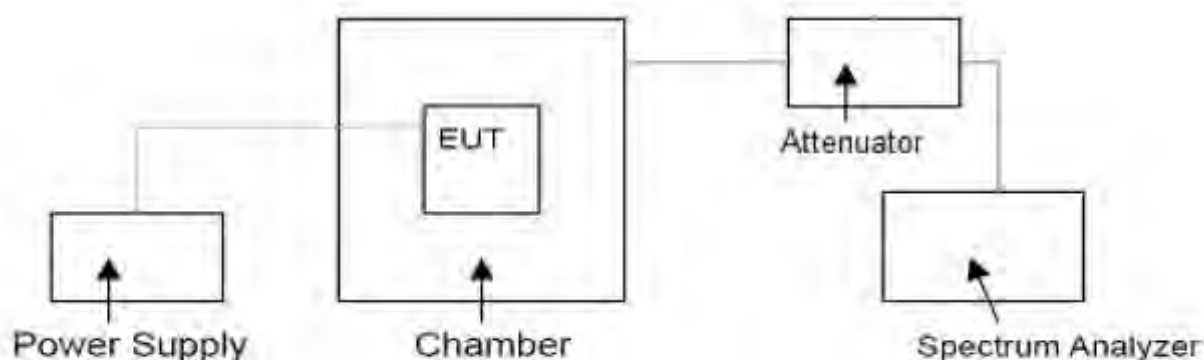
Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
Below 25	1 ² 3 ¹ 100	100	200
25-50	20	20	50
72-76	5		50
150-174	5 ¹ 1 ¹ 5	6 ⁵	4 ⁶ 50
216-220	1.0		1.0
220-222 ¹²	0.1	1.5	1.5
421-512	7 ¹ 1 ¹ 14 ² 2.5	8 ⁵	8 ⁵
806-809	14 ¹ 1.0	1.5	1.5
809-824	14 ¹ 1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	14 ⁰ 0.1	1.5	1.5
902-928	2.5	2.5	2.5
902-928 ¹³	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	9 ³ 300	300	300
Above 2450 ¹⁰			

Note: In the 421-512 MHz band, mobile stations designed to operate with a 12.5 kHz channel bandwidth must have a frequency stability of 2.5 ppm. Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm.

8.2 MEASUREMENT PROCEDURE

- a. The EUT was connected to the spectrum analyzer through sufficient attenuation.
- b. The EUT was set in the climate chamber and connected to an external DC power supply
- c. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded.
- d. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

8.3 TEST SETUP BLOCK DIAGRAM





8.4 TEST RESULT

CH 1

Mode 1

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0126	0.111	2.5ppm	PASS
-20		450.0125	450.0125	-0.022		
-10		450.0125	450.0125	0.000		
0		450.0125	450.0126	0.156		
10		450.0125	450.0125	-0.022		
20		450.0125	450.0126	0.111		
30		450.0125	450.0126	0.178		
40		450.0125	450.0126	0.244		
50		450.0125	450.0126	0.289		
20	Maximum Voltage	450.0125	450.0125	0.089		
20	BEP	450.0125	450.0125	-0.044		

CH 800

Mode 1

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0001	0.109	2.5ppm	PASS
-20		460.0000	459.9995	-1.087		
-10		460.0000	459.9997	-0.652		
0		460.0000	460.0001	0.217		
10		460.0000	459.9999	-0.217		
20		460.0000	460.0001	0.109		
30		460.0000	460.0002	0.435		
40		460.0000	460.0001	0.217		
50		460.0000	460.0003	0.652		
20	Maximum Voltage	460.0000	460.0005	1.087		
20	BEP	460.0000	460.0003	0.652		



CH 1599

Mode 1

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9876	0.106	2.5ppm	PASS
-20		469.9875	469.9871	-0.851		
-10		469.9875	469.9878	0.638		
0		469.9875	469.9878	0.638		
10		469.9875	469.9870	-1.064		
20		469.9875	469.9876	0.106		
30		469.9875	469.9880	1.064		
40		469.9875	469.9871	-0.851		
50		469.9875	469.9879	0.851		
20	Maximum Voltage	469.9875	469.9872	-0.638		
20	BEP	469.9875	469.9879	0.851		

CH 1

Mode 2

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0125	-0.089	2.5ppm	PASS
-20		450.0125	450.0122	-0.733		
-10		450.0125	450.0126	0.267		
0		450.0125	450.0125	-0.067		
10		450.0125	450.0125	-0.044		
20		450.0125	450.0124	-0.244		
30		450.0125	450.0124	-0.200		
40		450.0125	450.0123	-0.511		
50		450.0125	450.0124	-0.178		
20	Maximum Voltage	450.0125	450.0126	0.178		
20	BEP	450.0125	450.0125	-0.089		



CH 800

Mode 2

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0000	-0.065	2.5ppm	PASS
-20		460.0000	459.9996	-0.957		
-10		460.0000	460.0001	0.130		
0		460.0000	460.0001	0.261		
10		460.0000	459.9999	-0.239		
20		460.0000	460.0001	0.152		
30		460.0000	459.9999	-0.326		
40		460.0000	460.0001	0.109		
50		460.0000	459.9998	-0.370		
20	Maximum Voltage	460.0000	460.0000	0.000		
20	BEP	460.0000	459.9998	-0.435		

CH 1599

Mode 2

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9875	-0.064	2.5ppm	PASS
-20		469.9875	469.9871	-0.936		
-10		469.9875	469.9873	-0.383		
0		469.9875	469.9875	-0.043		
10		469.9875	469.9876	0.149		
20		469.9875	469.9874	-0.213		
30		469.9875	469.9873	-0.383		
40		469.9875	469.9875	-0.106		
50		469.9875	469.9874	-0.255		
20	Maximum Voltage	469.9875	469.9874	-0.277		
20	BEP	469.9875	469.9874	-0.213		



CH 1

Mode 3

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0125	0.089	5ppm	PASS
-20		450.0125	450.0122	-0.711		
-10		450.0125	450.0126	0.311		
0		450.0125	450.0125	0.000		
10		450.0125	450.0124	-0.133		
20		450.0125	450.0127	0.444		
30		450.0125	450.0127	0.467		
40		450.0125	450.0126	0.222		
50		450.0125	450.0124	-0.178		
20	Maximum Voltage	450.0125	450.0125	-0.089		
20	BEP	450.0125	450.0124	-0.244		

CH 800

Mode 3

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0000	0.087	5ppm	PASS
-20		460.0000	459.9997	-0.630		
-10		460.0000	460.0002	0.457		
0		460.0000	460.0002	0.348		
10		460.0000	460.0000	0.000		
20		460.0000	460.0001	0.304		
30		460.0000	460.0001	0.261		
40		460.0000	459.9999	-0.304		
50		460.0000	460.0002	0.457		
20	Maximum Voltage	460.0000	460.0000	-0.022		
20	BEP	460.0000	460.0000	-0.043		



CH 1599

Mode 3

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9875	0.064	5ppm	PASS
-20		469.9875	469.9873	-0.489		
-10		469.9875	469.9874	-0.234		
0		469.9875	469.9877	0.319		
10		469.9875	469.9875	-0.085		
20		469.9875	469.9874	-0.255		
30		469.9875	469.9877	0.426		
40		469.9875	469.9874	-0.191		
50		469.9875	469.9874	-0.255		
20	Maximum Voltage	469.9875	469.9877	0.362		
20	BEP	469.9875	469.9875	0.043		

CH 1

Mode 4

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0125	-0.111	5ppm	PASS
-20		450.0125	450.0122	-0.644		
-10		450.0125	450.0126	0.222		
0		450.0125	450.0124	-0.267		
10		450.0125	450.0126	0.133		
20		450.0125	450.0126	0.200		
30		450.0125	450.0125	-0.111		
40		450.0125	450.0123	-0.356		
50		450.0125	450.0125	-0.111		
20	Maximum Voltage	450.0125	450.0124	-0.156		
20	BEP	450.0125	450.0123	-0.533		



CH 800

Mode 4

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0000	-0.087	5ppm	PASS
-20		460.0000	459.9995	-1.130		
-10		460.0000	460.0001	0.283		
0		460.0000	460.0001	0.261		
10		460.0000	460.0001	0.283		
20		460.0000	459.9998	-0.435		
30		460.0000	460.0001	0.283		
40		460.0000	459.9998	-0.370		
50		460.0000	460.0000	-0.065		
20	Maximum Voltage	460.0000	460.0001	0.283		
20	BEP	460.0000	460.0001	0.174		

CH 1599

Mode 4

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9875	-0.085	5ppm	PASS
-20		469.9875	469.9871	-0.830		
-10		469.9875	469.9873	-0.489		
0		469.9875	469.9875	0.000		
10		469.9875	469.9876	0.191		
20		469.9875	469.9876	0.298		
30		469.9875	469.9876	0.298		
40		469.9875	469.9876	0.255		
50		469.9875	469.9875	-0.085		
20	Maximum Voltage	469.9875	469.9876	0.213		
20	BEP	469.9875	469.9876	0.255		



CH 1

Mode 5

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0126	0.111	2.5ppm	PASS
-20		450.0125	450.0121	-0.978		
-10		450.0125	450.0124	-0.289		
0		450.0125	450.0125	-0.089		
10		450.0125	450.0124	-0.289		
20		450.0125	450.0126	0.178		
30		450.0125	450.0126	0.111		
40		450.0125	450.0127	0.400		
50		450.0125	450.0124	-0.133		
20	Maximum Voltage	450.0125	450.0124	-0.156		
20	BEP	450.0125	450.0125	-0.044		

CH 800

Mode 5

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0000	0.000	2.5ppm	PASS
-20		460.0000	459.9996	-0.783		
-10		460.0000	460.0000	0.000		
0		460.0000	460.0000	-0.022		
10		460.0000	460.0001	0.174		
20		460.0000	460.0000	-0.022		
30		460.0000	459.9999	-0.239		
40		460.0000	460.0000	0.087		
50		460.0000	460.0000	0.000		
20	Maximum Voltage	460.0000	459.9999	-0.283		
20	BEP	460.0000	459.9999	-0.196		



CH 1599

Mode 5

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9875	0.000	2.5ppm	PASS
-20		469.9875	469.9872	-0.660		
-10		469.9875	469.9876	0.170		
0		469.9875	469.9876	0.234		
10		469.9875	469.9877	0.383		
20		469.9875	469.9874	-0.277		
30		469.9875	469.9877	0.383		
40		469.9875	469.9873	-0.404		
50		469.9875	469.9876	0.255		
20	Maximum Voltage	469.9875	469.9875	0.021		
20	BEP	469.9875	469.9876	0.106		

CH 1

Mode 6

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	450.0125	450.0124	-0.222	2.5ppm	PASS
-20		450.0125	450.0121	-0.844		
-10		450.0125	450.0126	0.111		
0		450.0125	450.0123	-0.400		
10		450.0125	450.0125	-0.111		
20		450.0125	450.0125	0.089		
30		450.0125	450.0125	-0.067		
40		450.0125	450.0123	-0.356		
50		450.0125	450.0123	-0.556		
20	Maximum Voltage	450.0125	450.0123	-0.556		
20	BEP	450.0125	450.0125	-0.089		



CH 800

Mode 6

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	460.0000	460.0002	0.435	2.5ppm	PASS
-20		460.0000	460.0000	-0.087		
-10		460.0000	460.0001	0.152		
0		460.0000	460.0001	0.217		
10		460.0000	460.0003	0.739		
20		460.0000	460.0004	0.826		
30		460.0000	460.0002	0.348		
40		460.0000	460.0003	0.565		
50		460.0000	460.0004	0.848		
20	Maximum Voltage	460.0000	460.0001	0.239		
20	BEP	460.0000	460.0004	0.826		

CH 1599

Mode 6

Condition (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	ppm	Limit	Result
-30	Normal Voltage	469.9875	469.9874	-0.213	2.5ppm	PASS
-20		469.9875	469.9870	-1.043		
-10		469.9875	469.9873	-0.511		
0		469.9875	469.9873	-0.468		
10		469.9875	469.9875	0.043		
20		469.9875	469.9875	-0.085		
30		469.9875	469.9872	-0.553		
40		469.9875	469.9872	-0.574		
50		469.9875	469.9875	-0.106		
20	Maximum Voltage	469.9875	469.9875	-0.064		
20	BEP	469.9875	469.9874	-0.170		



9. TRANSMITTER FREQUENCY BEHAVIOR

9.1 PROVISIONS APPLICABLE

Transient frequencies must be within the maximum frequency difference limits during the time intervals indicated:

Time intervals ^{1, 2}	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels			
t ₁ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
t ₂ ⁴	± 12.5 KHz	20.0 ms	25.0 ms
t ₃ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 KHz Channels			
t ₁ ⁴	± 12.5 KHz	5.0 ms	10.0 ms
t ₂ ⁴	± 6.25 KHz	20.0 ms	25.0 ms
t ₃ ⁴	± 12.5 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 KHz Channels			
t ₁ ⁴	±6.25 KHz	5.0 ms	10.0 ms
t ₂ ⁴	±3.125 KHz	20.0 ms	25.0 ms
t ₃ ⁴	±6.25 KHz	5.0 ms	10.0 ms

1. t_{off} is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing.
 t_1 is the time period immediately following t_{off} .
 t_2 is the time period immediately following t_1 .
 t_3 is the time period from the instant when the transmitter is turned off until t_{off} .
 t_{on} is the instant when the 1 KHz test signal starts to rise.
2. During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in § 90.213.
3. Difference between the actual transmitter frequency and the assigned transmitter frequency.
4. If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

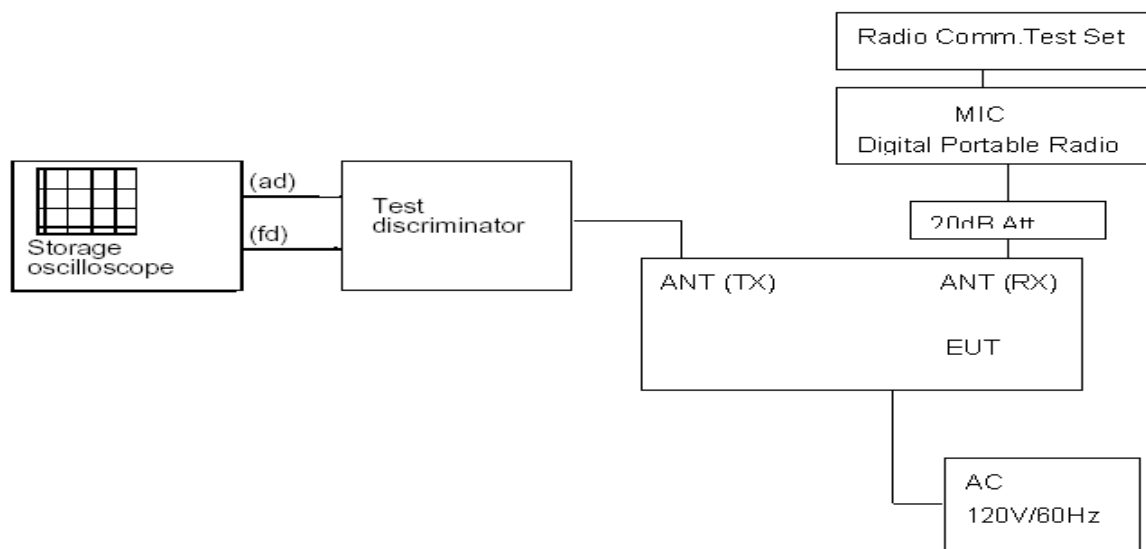
9.2 MEASUREMENT PROCEDURE

Use Digital portable radio which manufactured by VitelGlobal Communications Corporation

- Limited which uses same protocol as the DUT connect to RX antenna by 20Att in order to avoid damaging DUT;
- Connect DUT into Test discriminator and Storage Oscilloscope and keep DUT stats ON;
- Input 1KHz signal into digital portable radio;
- Set the modulation domain analyzer to trigger on the rising edge of the waveform in order to capture a single-shot turn-on of the transmitter signals;
- Keep the digital portable radio in OFF state and Key the PTT of digital portable radio;
Observe the stored oscilloscope of modulation domain analyzer. The signal trace shall be maintained within the allowable limits during the periods t_1 and t_2 , and shall also remain within limits following t_2 ;
- Adjust the modulation domain analyzer to trigger on the falling edge of the transmitter waveform in order to capture a single-shot turn-off transmitter of the transmitter signal.
- Keep the digital portable radio in ON state and Unkey the PTT of digital portable radio;
Observe the stored oscilloscope of modulation domain analyzer. The signal trace shall be maintained within the allowable limits during the period t_3



9.3 TEST SETUP BLOCK DIAGRAM

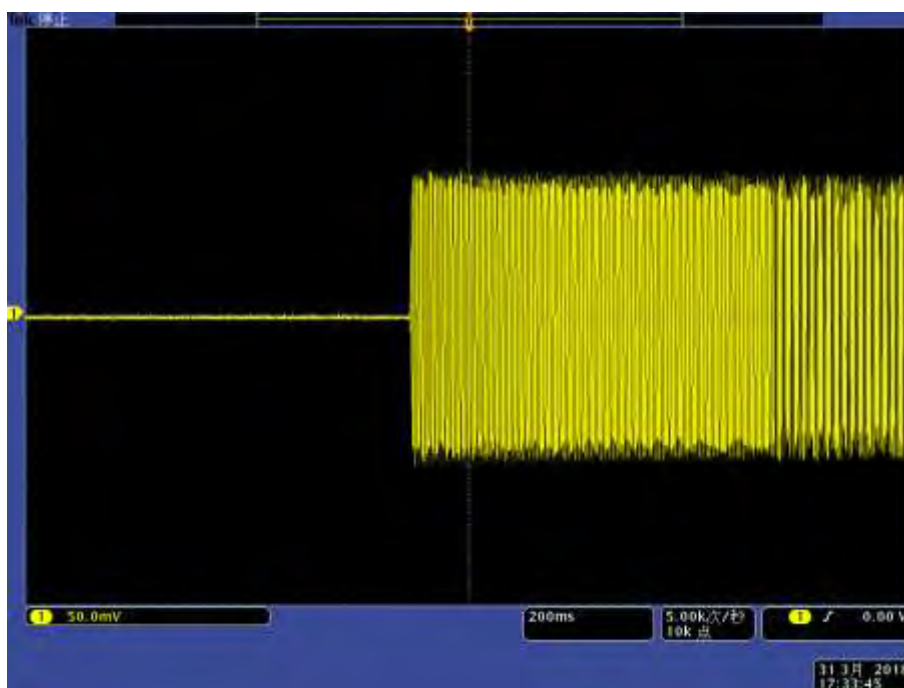




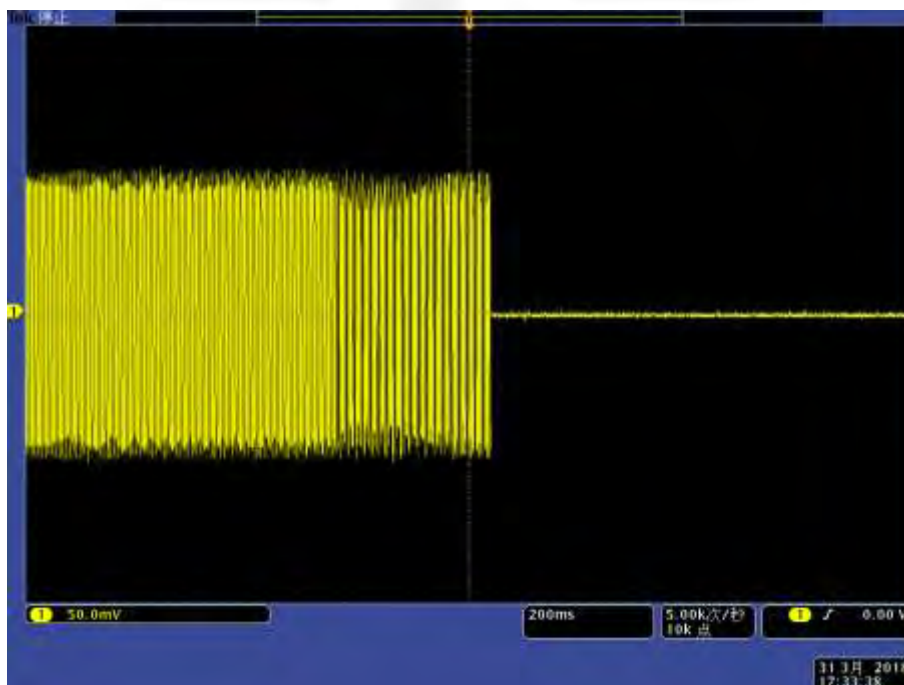
9.4 TEST RESULT

Mode 1

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On



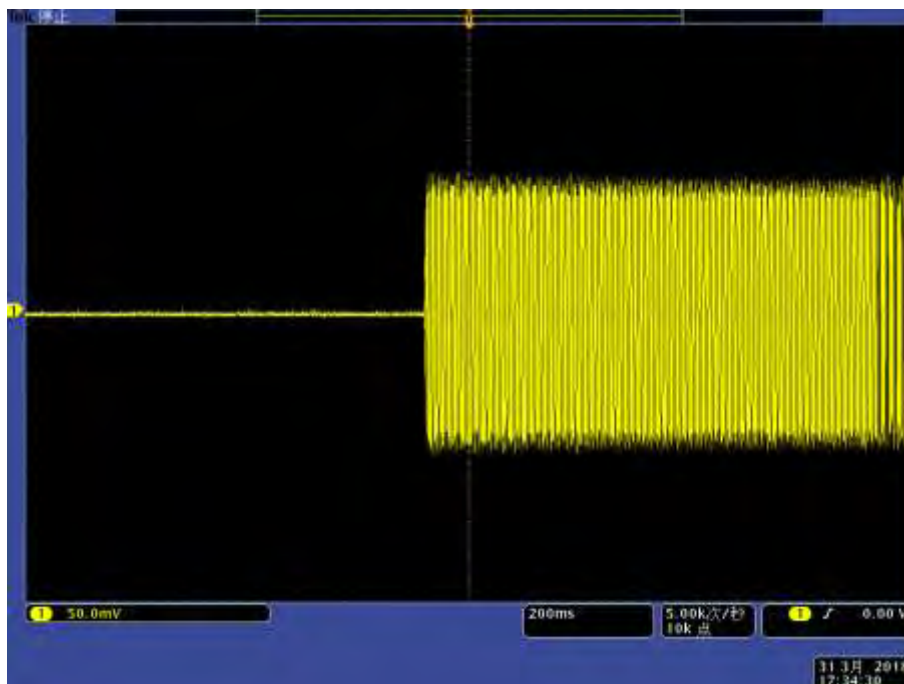
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On – Off



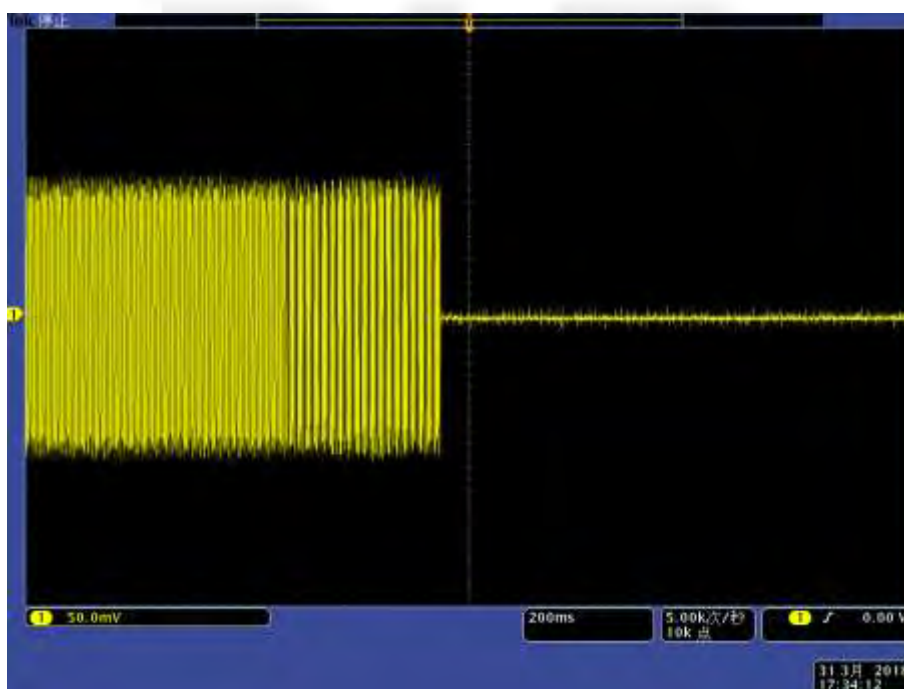


Mode 2

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On



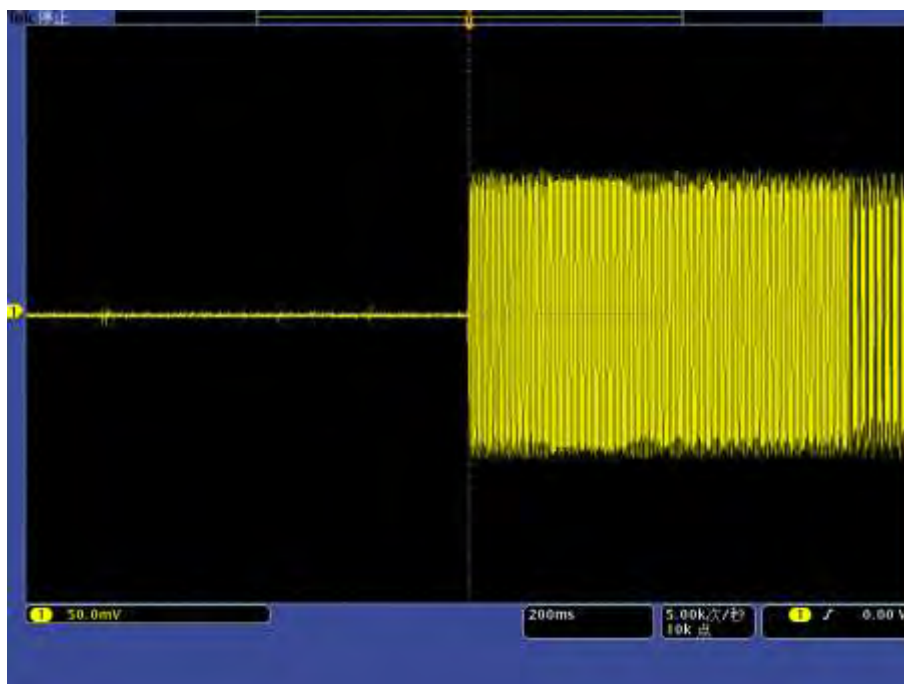
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On – Off



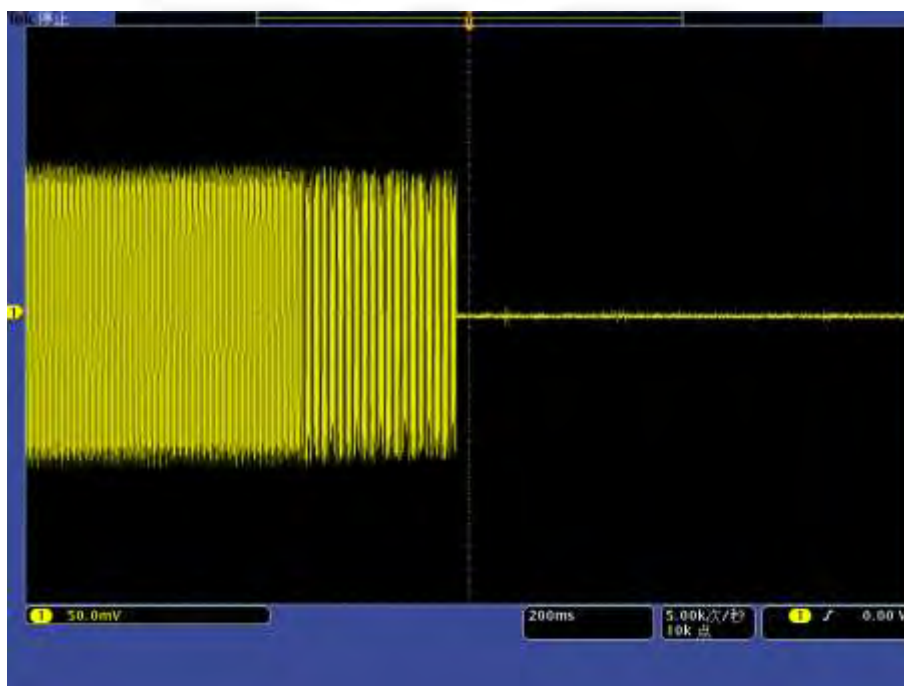


Mode 3

Transmitter Frequency Behaviour @ 25 KHz Channel Separation-----Off – On



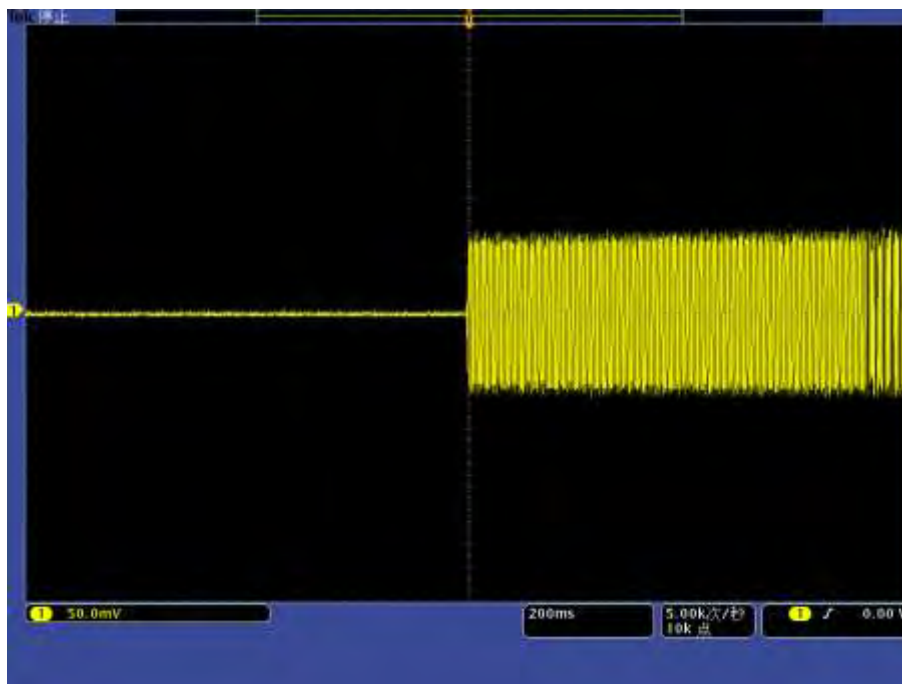
Transmitter Frequency Behaviour @ 25 KHz Channel Separation-----On – Off



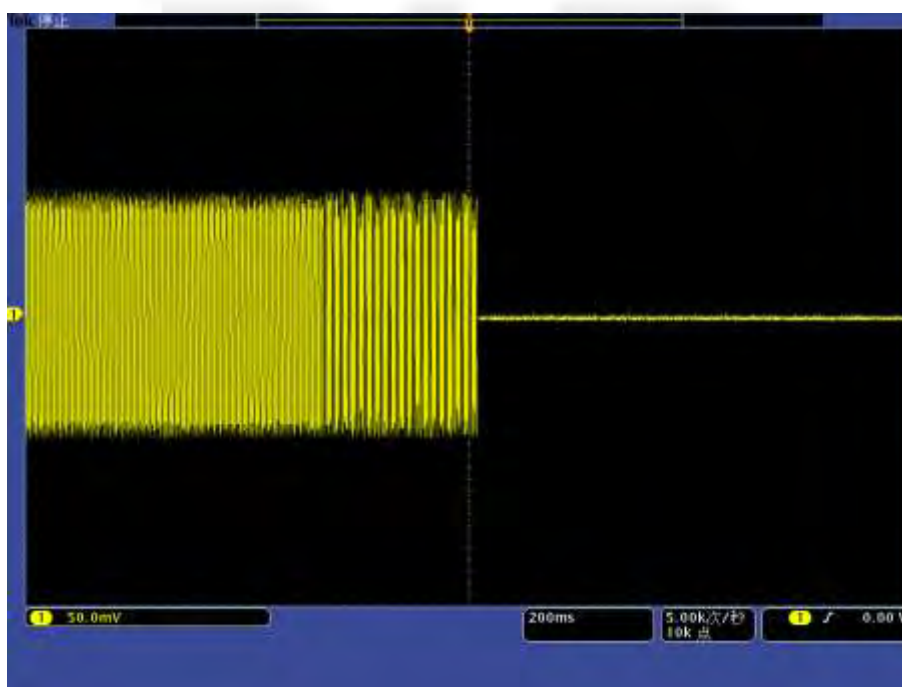


Mode 4

Transmitter Frequency Behaviour @ 25 KHz Channel Separation-----Off – On



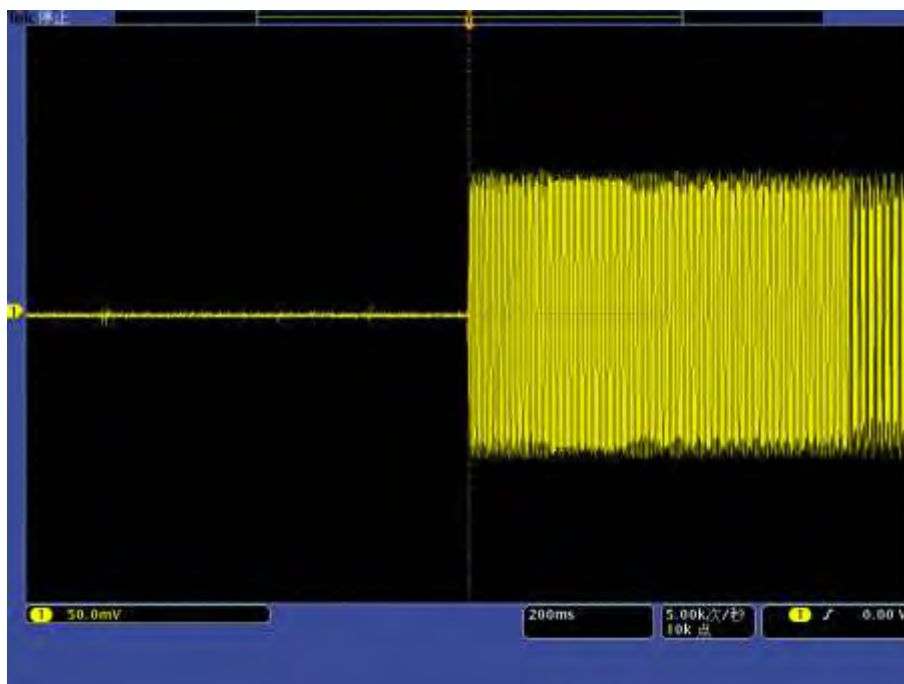
Transmitter Frequency Behaviour @ 25 KHz Channel Separation-----On – Off



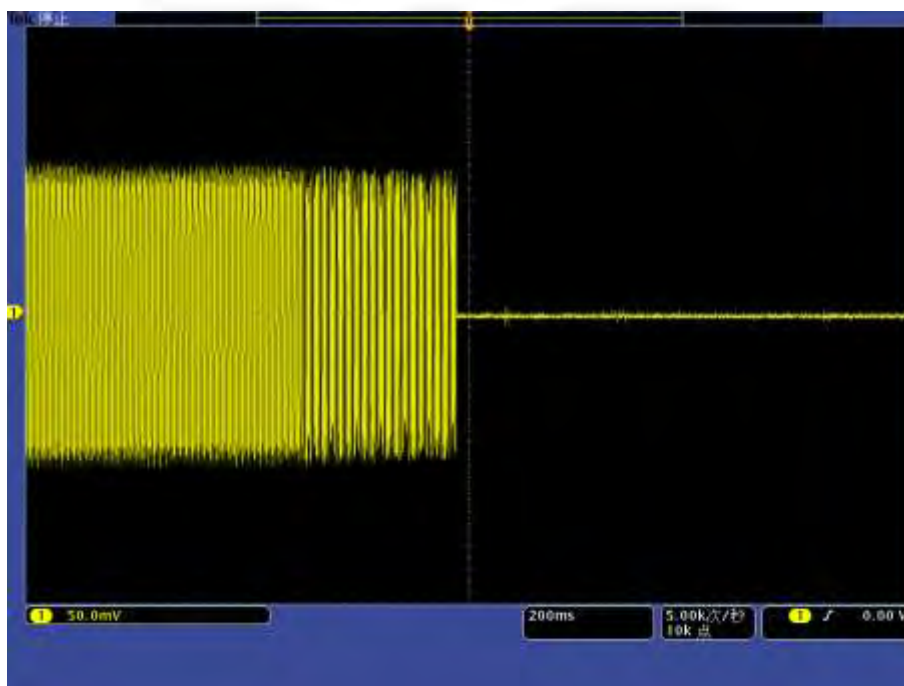


Mode 5

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On



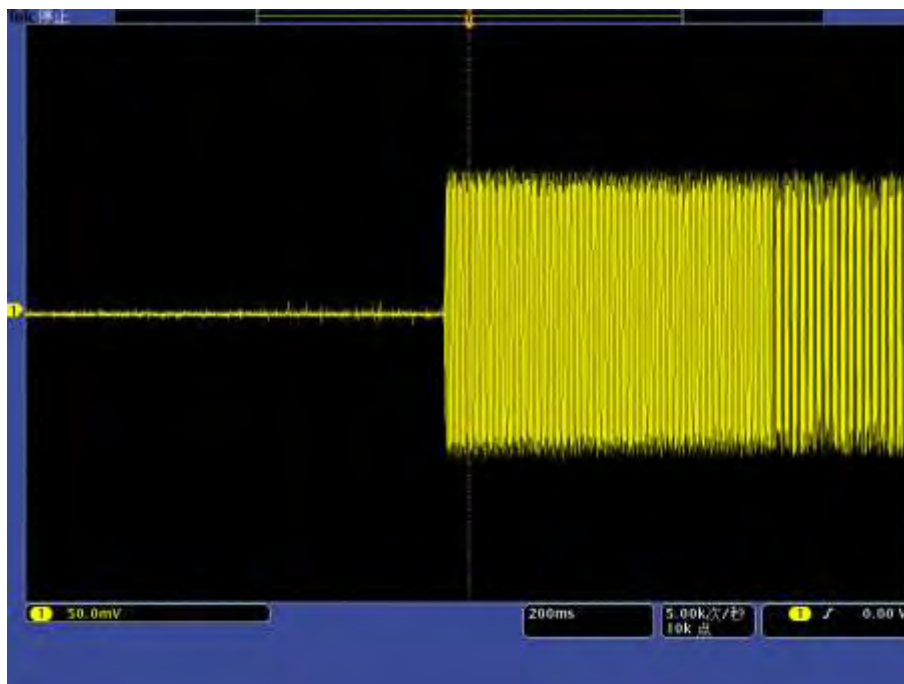
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On – Off



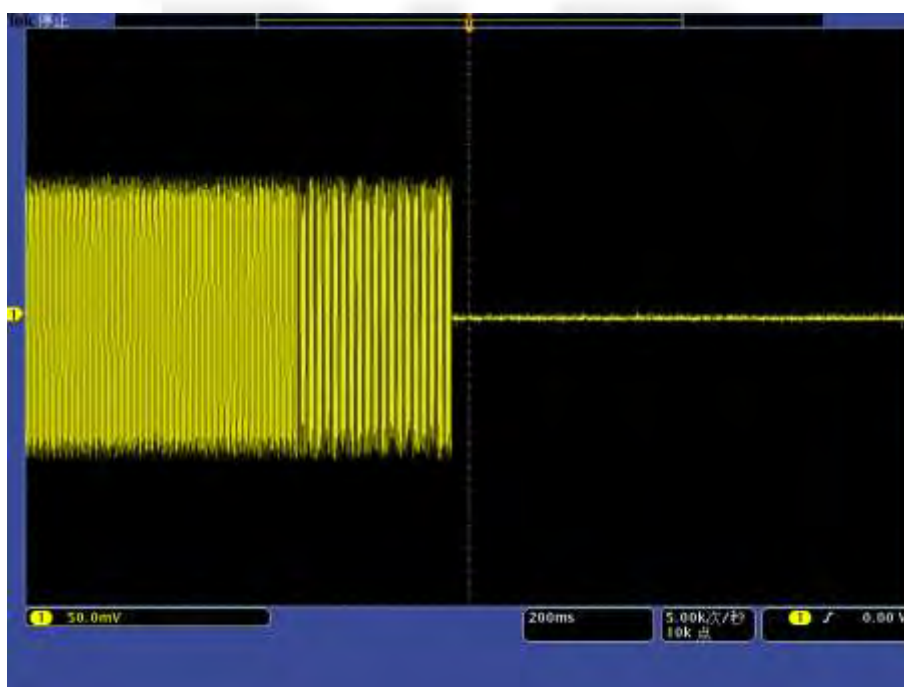


Mode 6

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On



Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On – Off





10. MODULATION CHARACTERISTIC

10.1 LIMIT

FCC Part 2.1047

- (a) Equipment which utilizes voice modulated communication show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

10.2 TEST PROCEDURE

The test procedure please reference ANSI C63.26-2015.



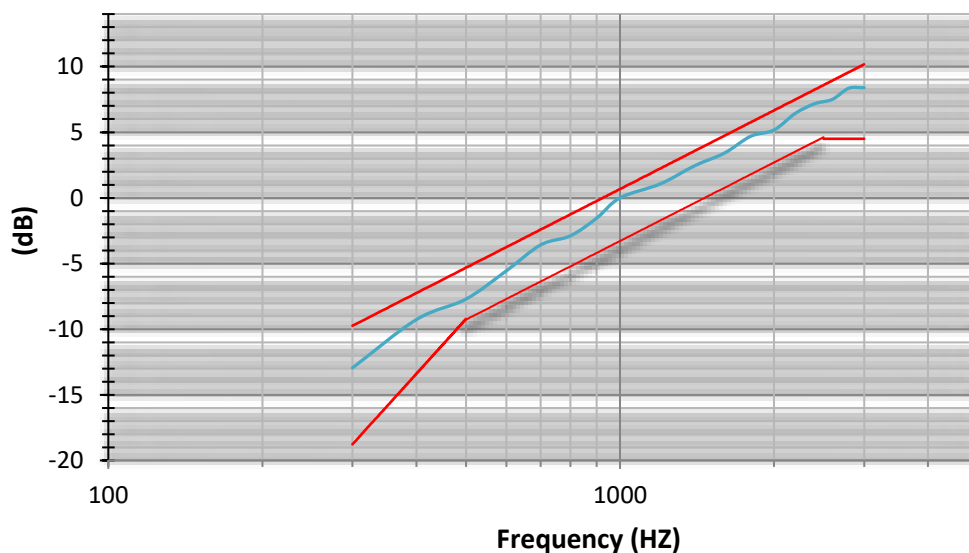


10.3 TEST RESULT

10.3.1 Audio Frequency Response

(Modulation Type:FM,Channel Separation:12.5kHz) Mode 1

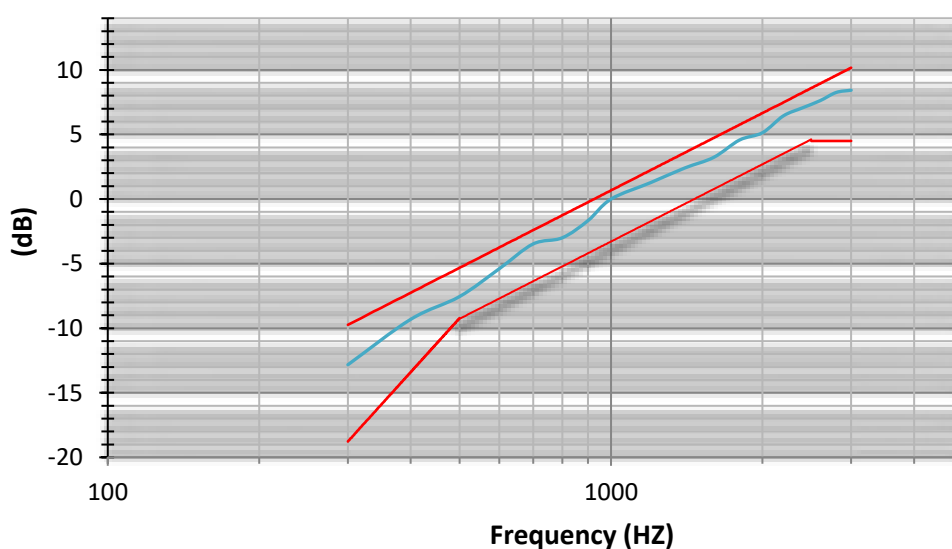
Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-12.95	
400	-9.27	
500	-7.71	
600	-5.55	
700	-3.58	
800	-2.89	
900	-1.55	
1000	0.00	
1200	1.07	
1400	2.45	
1600	3.41	
1800	4.69	
2000	5.17	
2200	6.43	
2400	7.17	
2600	7.5	
2800	8.35	
3000	8.39	





(Modulation Type:FM,Channel Separation:12.5kHz) Mode 2

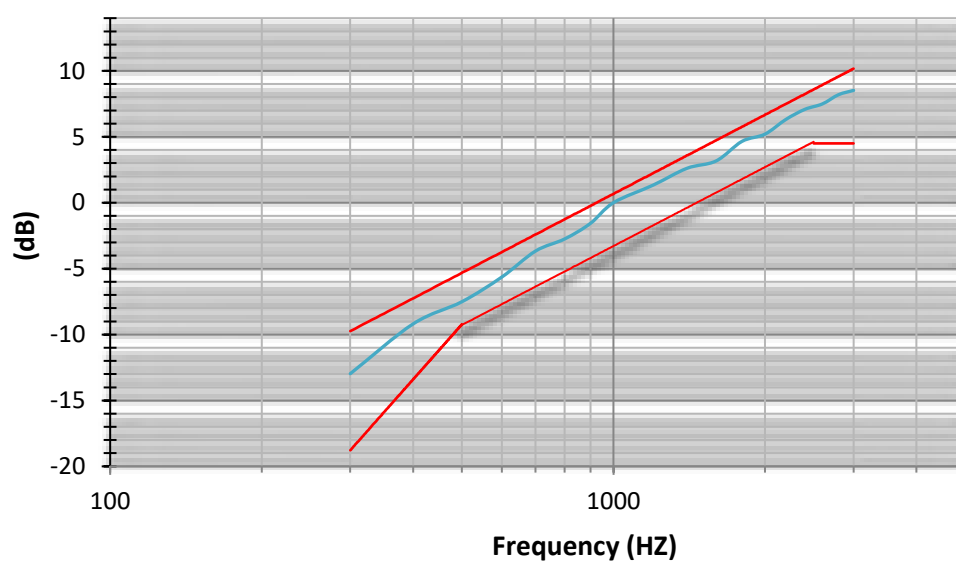
Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-12.83	
400	-9.31	
500	-7.55	
600	-5.39	
700	-3.48	
800	-3.00	
900	-1.67	
1000	0.00	
1200	1.28	
1400	2.40	
1600	3.23	
1800	4.57	
2000	5.14	
2200	6.44	
2400	7.06	
2600	7.61	
2800	8.25	
3000	8.43	





(Modulation Type:FM,Channel Separation:25kHz) Mode 3

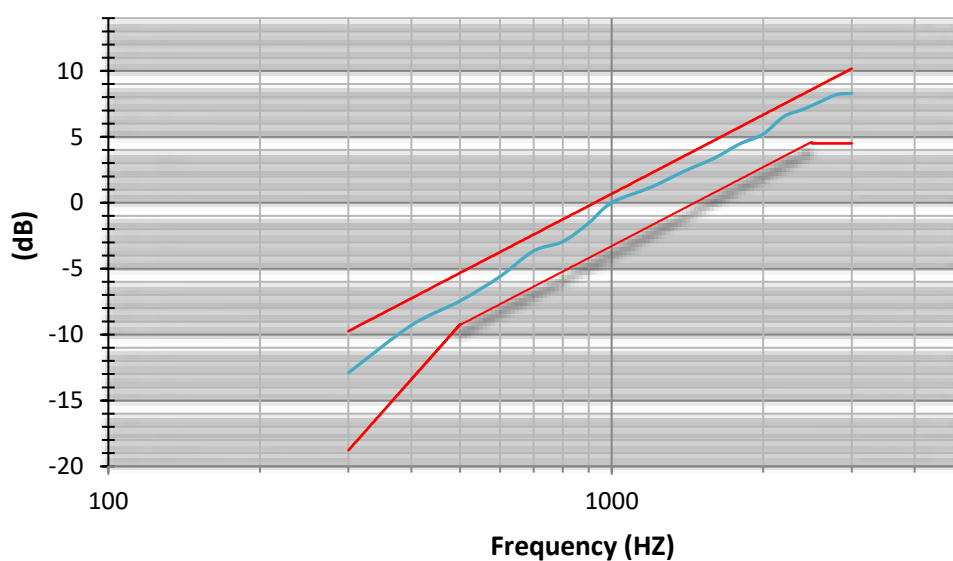
Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-12.97	
400	-9.19	
500	-7.51	
600	-5.64	
700	-3.67	
800	-2.75	
900	-1.57	
1000	0.00	
1200	1.34	
1400	2.61	
1600	3.17	
1800	4.65	
2000	5.20	
2200	6.31	
2400	7.08	
2600	7.49	
2800	8.19	
3000	8.52	





(Modulation Type:FM,Channel Separation:25kHz) Mode 4

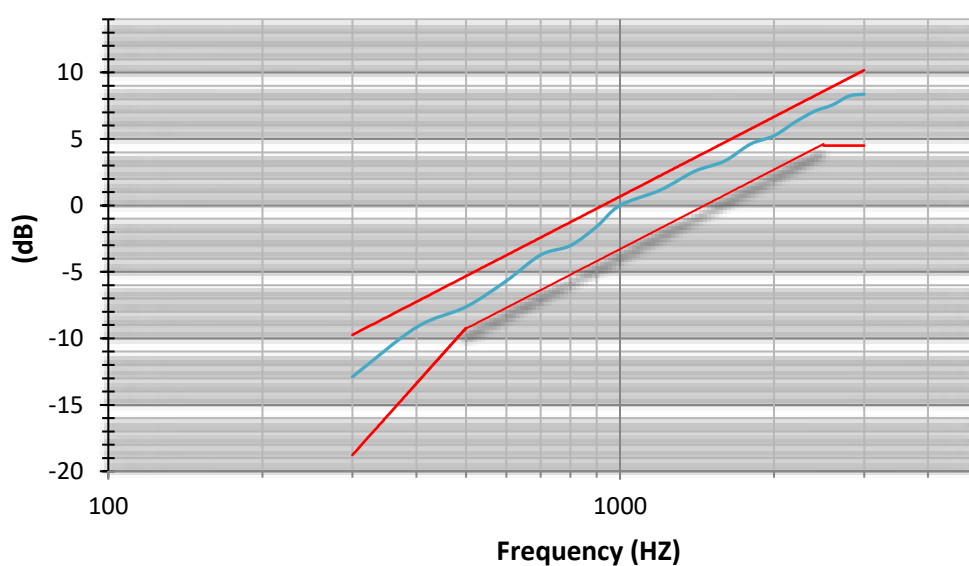
Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-12.89	
400	-9.30	
500	-7.45	
600	-5.60	
700	-3.66	
800	-2.95	
900	-1.55	
1000	0.00	
1200	1.19	
1400	2.42	
1600	3.38	
1800	4.47	
2000	5.20	
2200	6.54	
2400	7.08	
2600	7.67	
2800	8.2	
3000	8.29	





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 5

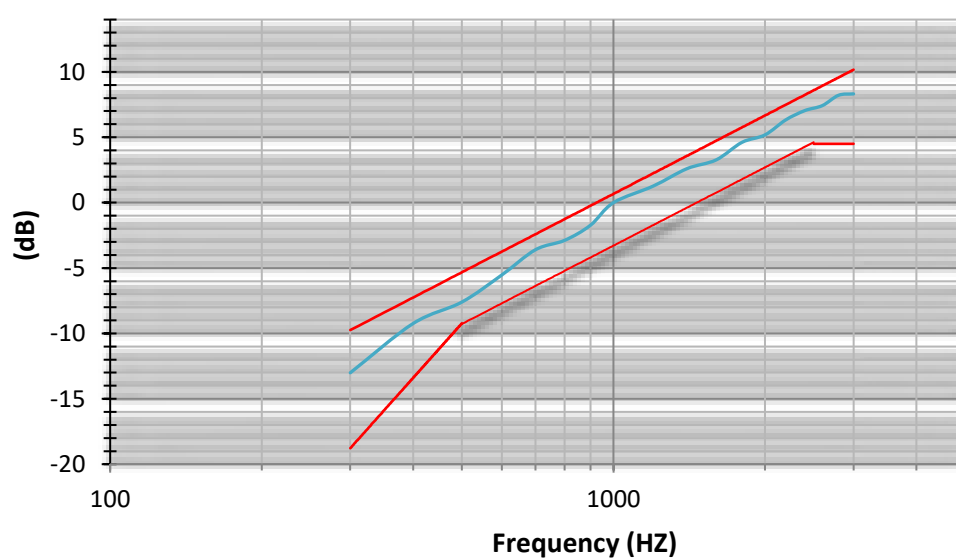
Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-12.89	
400	-9.17	
500	-7.63	
600	-5.67	
700	-3.72	
800	-3.02	
900	-1.60	
1000	0.00	
1200	1.16	
1400	2.57	
1600	3.33	
1800	4.62	
2000	5.24	
2200	6.27	
2400	7.08	
2600	7.55	
2800	8.22	
3000	8.37	





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 6

Audio Frequency	Audio Frequency Response	Result
(Hz)	(dB)	PASS
300	-13.01	
400	-9.24	
500	-7.60	
600	-5.53	
700	-3.60	
800	-2.88	
900	-1.73	
1000	0.00	
1200	1.27	
1400	2.60	
1600	3.27	
1800	4.61	
2000	5.18	
2200	6.33	
2400	7.04	
2600	7.42	
2800	8.21	
3000	8.32	

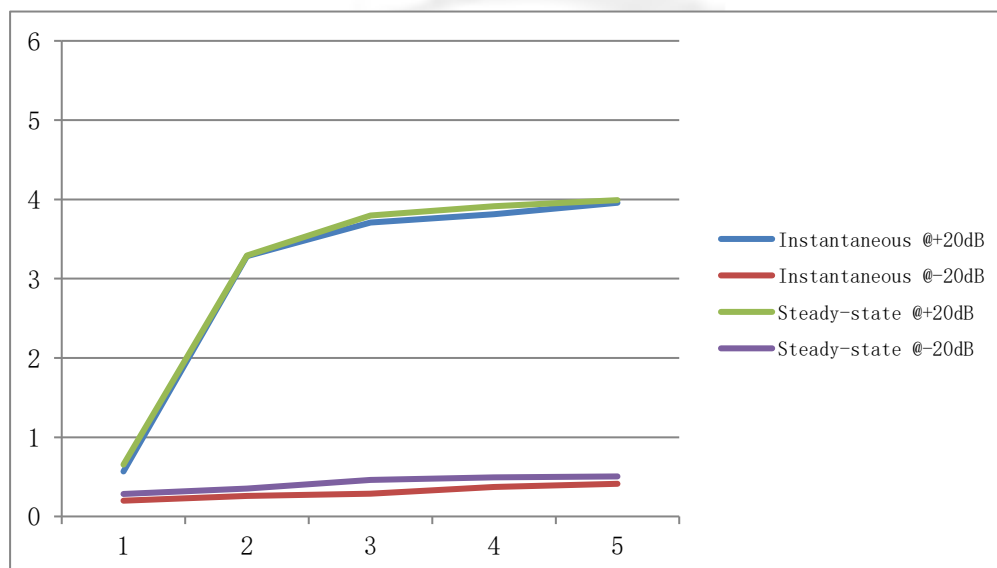




10.3.2 Modulation Limiting

(Modulation Type:FM,Channel Separation:12.5kHz) Mode 1

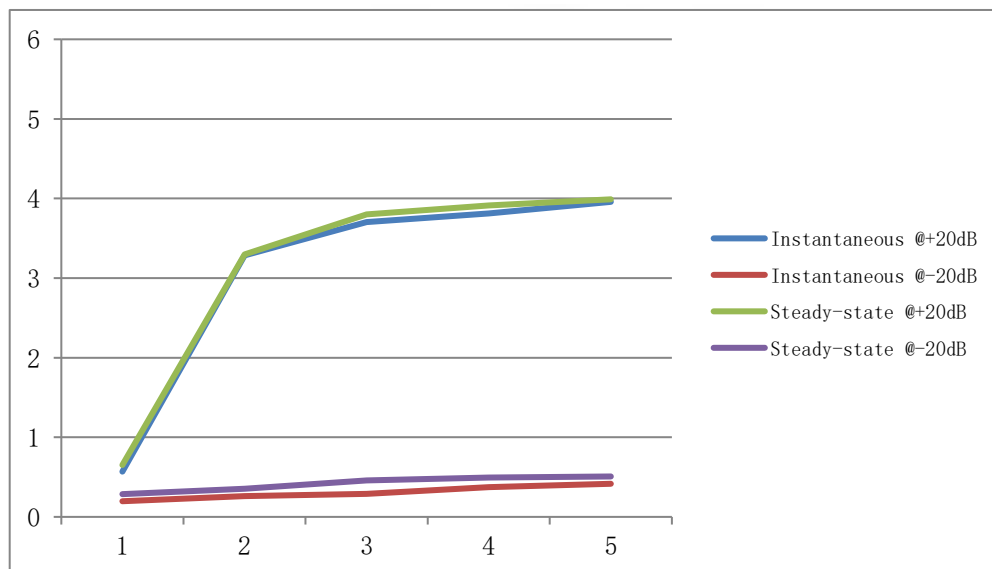
Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.568	0.199	0.654	0.284	±5	Pass
1000	3.283	0.26	3.294	0.352		
1500	3.707	0.289	3.796	0.46		
2500	3.815	0.371	3.916	0.492		
3000	3.958	0.412	3.991	0.505		





(Modulation Type:FM,Channel Separation:12.5kHz) Mode 2

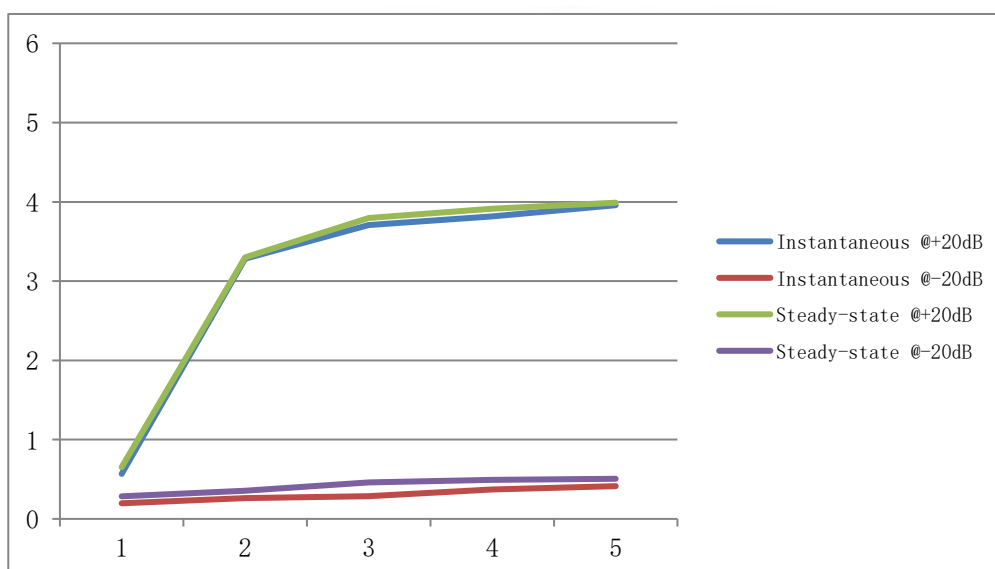
Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.569	0.197	0.652	0.286	±5	Pass
1000	3.284	0.263	3.298	0.354		
1500	3.704	0.29	3.799	0.46		
2500	3.813	0.373	3.915	0.494		
3000	3.958	0.416	3.99	0.508		





(Modulation Type:FM,Channel Separation:25kHz) Mode 3

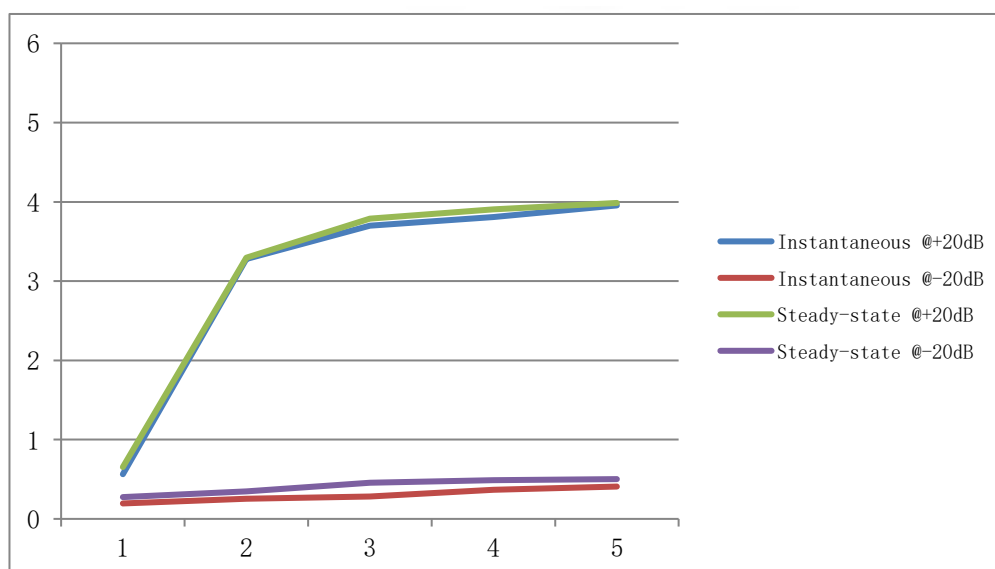
Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.568	0.197	0.653	0.285	±5	Pass
1000	3.284	0.264	3.299	0.354		
1500	3.706	0.288	3.796	0.459		
2500	3.815	0.372	3.913	0.491		
3000	3.958	0.413	3.989	0.506		





(Modulation Type:FM,Channel Separation:25kHz) Mode 4

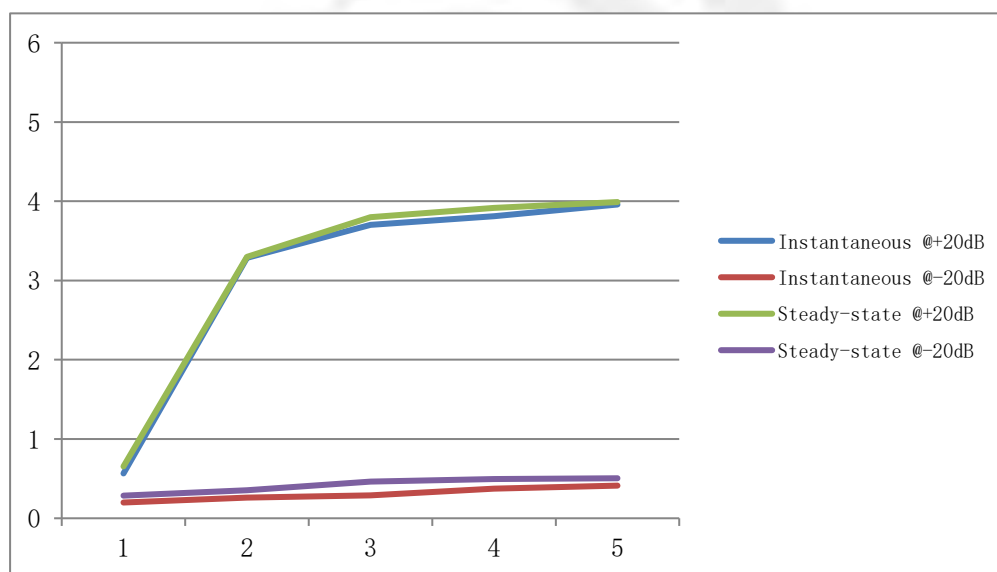
Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.564	0.195	0.654	0.275	±5	Pass
1000	3.281	0.256	3.295	0.349		
1500	3.698	0.281	3.79	0.455		
2500	3.807	0.368	3.907	0.488		
3000	3.955	0.408	3.986	0.502		





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 5

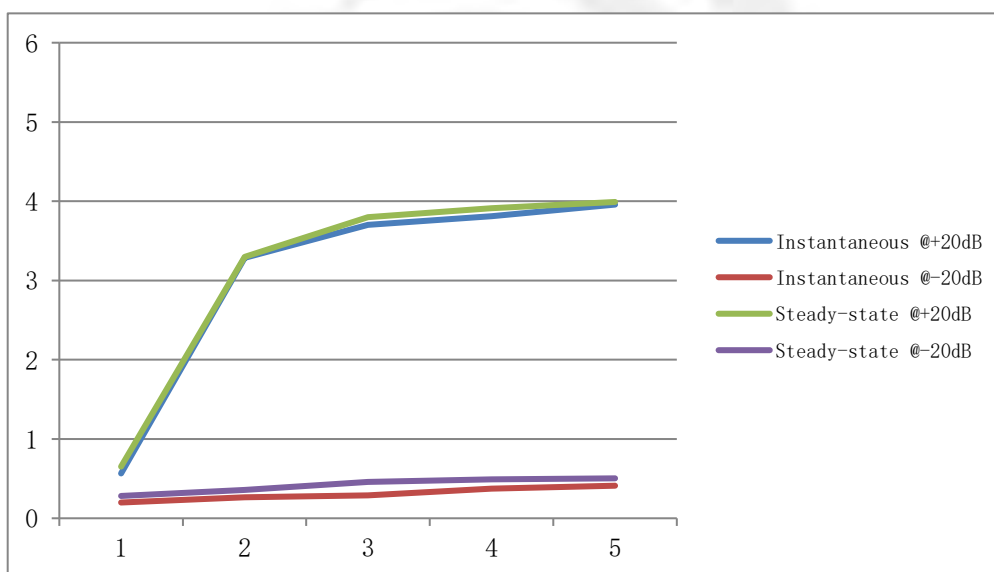
Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.566	0.199	0.654	0.286	±5	Pass
1000	3.288	0.262	3.297	0.353		
1500	3.704	0.289	3.797	0.462		
2500	3.812	0.373	3.915	0.495		
3000	3.959	0.412	3.99	0.505		





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 6

Audio Frequency	Instantaneous		Steady-state		Limit (kHz)	Result
(Hz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.566	0.199	0.652	0.282	±5	Pass
1000	3.286	0.265	3.298	0.357		
1500	3.703	0.288	3.798	0.46		
2500	3.812	0.373	3.914	0.491		
3000	3.958	0.411	3.991	0.504		

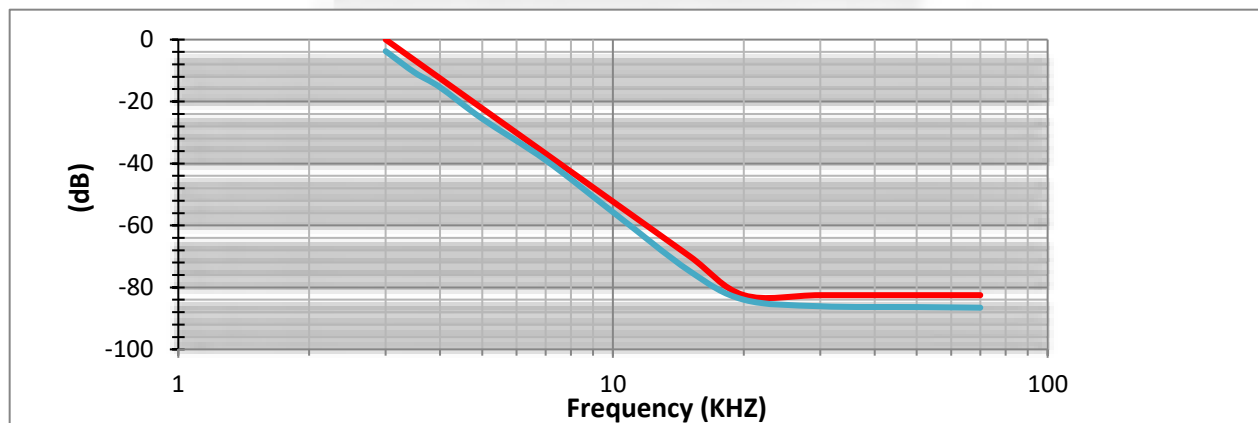




10.3.3 Audio Low Pass Filter Response

(Modulation Type:FM,Channel Separation:12.5kHz) Mode 1

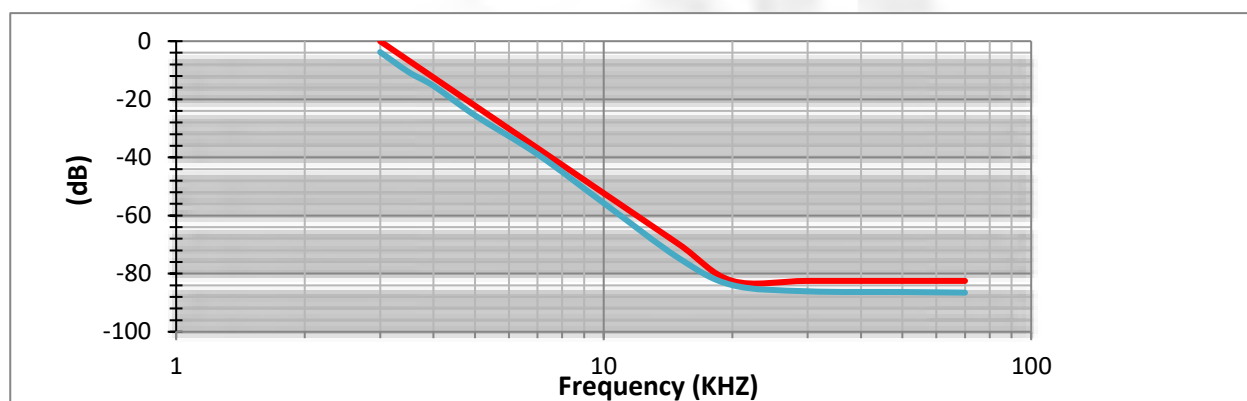
Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.75	0	Pass
3.5	-10.65	-6.7	
4	-15.38	-12.5	
5	-25.52	-22.2	
7	-38.92	-36.8	
10	-55.69	-52.3	
15	-74.71	-69.9	
20	-83.97	-82.5	
30	-86.08	-82.5	
50	-86.34	-82.5	
70	-86.54	-82.5	





(Modulation Type:FM,Channel Separation:12.5kHz) Mode 2

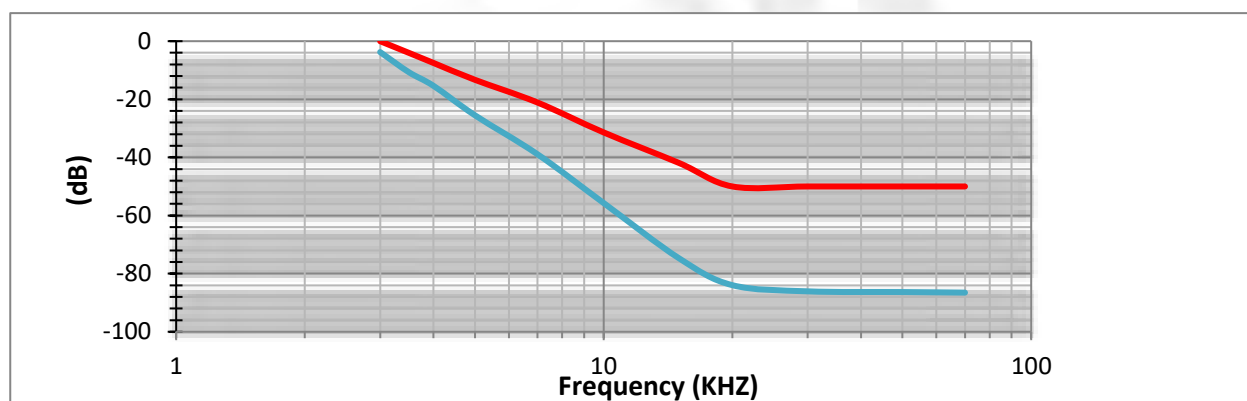
Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.75	0	Pass
3.5	-10.65	-6.7	
4	-15.39	-12.5	
5	-25.52	-22.2	
7	-38.90	-36.8	
10	-55.70	-52.3	
15	-74.71	-69.9	
20	-83.96	-82.5	
30	-86.08	-82.5	
50	-86.33	-82.5	
70	-86.53	-82.5	





(Modulation Type:FM,Channel Separation:25kHz) Mode 3

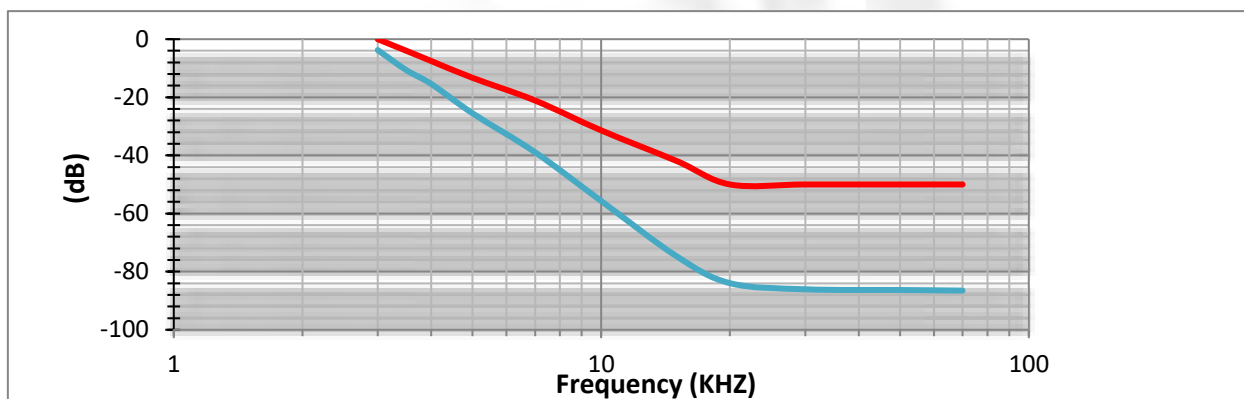
Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.75	0	Pass
3.5	-10.65	-4	
4	-15.38	-7.5	
5	-25.51	-13.3	
7	-38.91	-21.1	
10	-55.70	-31.4	
15	-74.70	-41.9	
20	-83.97	-50	
30	-86.09	-50	
50	-86.34	-50	
70	-86.53	-50	





(Modulation Type:FM,Channel Separation:25kHz) Mode 4

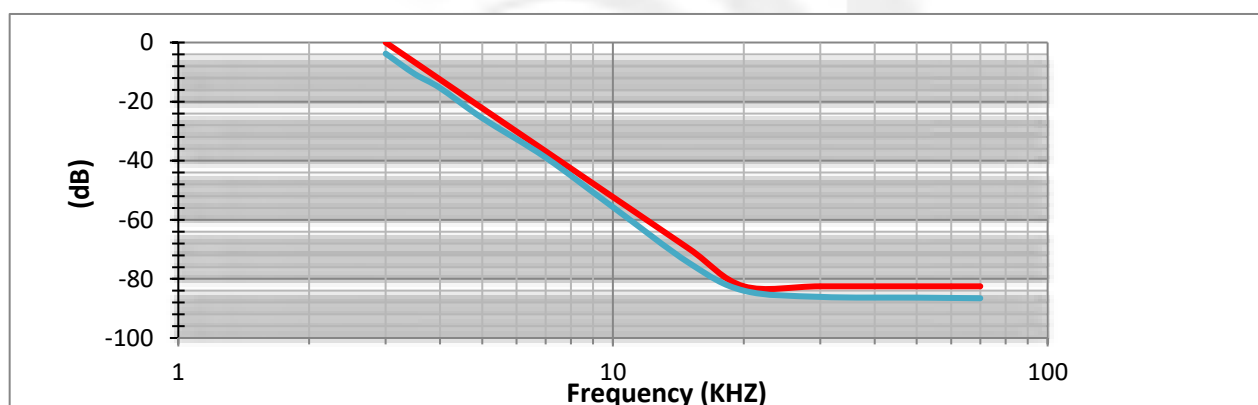
Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.75	0	Pass
3.5	-10.66	-4	
4	-15.38	-7.5	
5	-25.52	-13.3	
7	-38.91	-21.1	
10	-55.71	-31.4	
15	-74.71	-41.9	
20	-83.97	-50	
30	-86.08	-50	
50	-86.33	-50	
70	-86.53	-50	





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 5

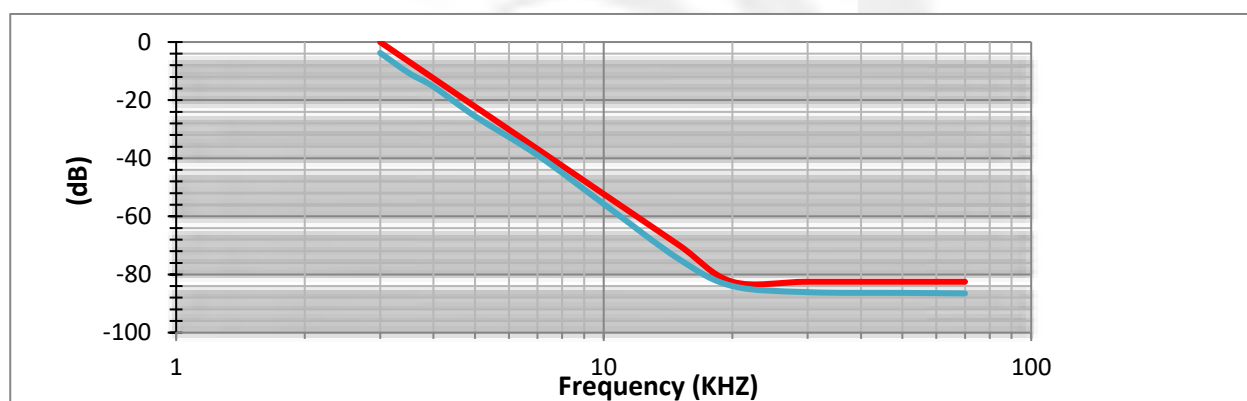
Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.75	0	Pass
3.5	-10.66	-6.7	
4	-15.37	-12.5	
5	-25.53	-22.2	
7	-38.92	-36.8	
10	-55.70	-52.3	
15	-74.70	-69.9	
20	-83.98	-82.5	
30	-86.08	-82.5	
50	-86.34	-82.5	
70	-86.54	-82.5	





(Modulation Type:4FSK,Channel Separation:12.5kHz) Mode 6

Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
3	-3.74	0	Pass
3.5	-10.64	-6.7	
4	-15.38	-12.5	
5	-25.51	-22.2	
7	-38.92	-36.8	
10	-55.71	-52.3	
15	-74.71	-69.9	
20	-83.97	-82.5	
30	-86.08	-82.5	
50	-86.33	-82.5	
70	-86.53	-82.5	





12. 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*****

