TEST REPORT

Application No.:	SZEM2005003996CR (GZEM2001010291CR)
Applicant:	Comba Telecom Ltd.
Address of Applicant:	611 East Wing, No. 8 Science Park West Avenue, Hong Kong Science Park, Tai Po, Hong Kong
Manufacturer:	Comba Telecom Systems (China) Ltd.
Address of Manufacturer:	No.10 Shenzhou Road, Guangzhou Science City, Guangzhou 510663, Guangdong, P.R. China
Factory:	Comba Telecom Technology (Guangzhou) Ltd.
Address of Factory:	No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, P.R.China
Equipment Under Test (EUT):	
EUT Name:	700MHz/800MHz Public Safety Bi-directional Amplifier
FCC ID:	PX8RXA37, PX8RXB37
Model No.:	RXA3748, RXA3792,RXB3748, RXB3792¤,
¤	Please refer to section 2 of this report for further details.
Standard(s):	FCC CRF 47 Part 2, FCC Part 90.219;
	KDB 935210 D02 General requirement for all Signal Boosters V04r02
	KDB 935210 D05 Indus Booster Basic Meas V01r04
Date of Receipt:	2020-01-17
Date of Test:	2020-04-01 to 2020-04-16
Date of Issue:	2020-05-27
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Keny Xu
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2020-05-27		Original

Authorized for issue by:			
Tested By		Lily Kuang **Lily_Kuang /Project Engineer**	2020-04-01 to 2020-04-16 **Date**
Checked By		Eric Fu **Eric Fu /Reviewer**	2020-05-27 **Date**

2 Test Summary

Test Item	Test Requirement	Test Method	Result
Output Power	FCC part90.219e(1)	FCC part 2.1037	PASS
Conducted Spurious Emissions	FCC part90.219e(1)	KDB 935210 D05 V01r04	PASS
Input-versus-output signal comparison Emission mask (Emission mask)	FCC part90.210	FCC part 2.1051	PASS
Band Edge& Intermodulation	FCC part90.219(e)(3)	KDB 935210 D05 V01r04	PASS
Noise figure	FCC part90.219(e)	KDB 935210 D05 V01r04	PASS
Noise at Antenna Terminals	FCC part 90.219(e)(2) 90.219(d)(6)(ii)	FCC part 2.1051	PASS
Radiated Spurious Emissions	FCC part90.219e(1)	KDB 935210 D05 V01r04	PASS
Occupied Bandwidth	FCC part 2.1049	KDB 935210 D05 V01r04	PASS
Out of Band Rejection	KDB 935210 D05 V01r04	KDB 935210 D05 V01r04	PASS
Frequency Stablility	FCC part90.213	FCC part 2.1055	PASS

¤¤ **Model No:** RXA3748, RXA3792, RXB3748, RXB3792

According to the confirmation from the applicant, all above model numbers with identical hardware except the power supply unit(PSU) and supported operation frequency bands, the different frequency was disabled by software when factory production. The detailed power supply unit and frequency band information as below:

DC -48V for RXA3748,RXB3748, AC 100-240VAC for RXA3792,RXB3792

1.For FCC PART 90 Class A model number:

Model number: RXA3748, RXA3792 (FCC ID: PX8RXA37), Operation frequency band:

Band 700MHz:

Downlink: 769MHz to 775MHz, Uplink: 799MHz to 805MHz

Band 800MHz:

Downlink: 851MHz to 862MHz, Uplink: 806MHz to 817MHz

2.For FCC PART 90 Class B model number:

Model number: RXB3748, RXB3792 (FCC ID: PX8RXB37), Operation frequency band:

Band 700MHz:

Downlink: 758MHz to 768MHz,Uplink: 788MHz to 798MHz; (LTE Broadband)

Downlink: 769MHz to 775MHz,Uplink: 799MHz to 805MHz;(Narrow band)

Band 800MHz:

Downlink: 851MHz to 862MHz,Uplink: 806MHz to 817MHz

According to the above differences , the RXB3748 & RXA3748 ware performed full tests and the model RXB3792 & RXA3792 ware tested the Radiated Emission in this report.

3 Contents

4 General Information

4.1 General Description of E.U.T.

DUT power supply:	DC -40V~-58V
Test voltage:	DC -48V
Operating Temperature:	-33 °C to +60°C
Operating Humidity:	≤ 95%

4.2 Details of E.U.T.

Modulation type for support input singal:	P25 Phase I:C4FM ; P25 Phase II: H-DQPSK Analog FM
Emission Designator:	F1D, F1E,F3E,
Operation frequency for class B Model NO. RXB3748, RXB3792	**Band 700MHz:** Downlink: 758MHz to 768MHz Uplink: 788MHz to 798MHz; Downlink: 769MHz to 775MHz Uplink: 799MHz to 805MHz **Band 800MHz:** Downlink: 851MHz to 862MHz, Uplink: 806MHz to 817MHz
Operation frequency for class A Model number RXA3748, RXA3792:	**Band 700MHz:** Downlink: 769MHz to 775MHz Uplink: 799MHz to 805MHz **Band 800MHz:** Downlink: 851MHz to 862MHz, Uplink: 806MHz to 817MHz
Modulation type:	LTE in 758Mhz to 768MHz and 788MHz to 798MHz; C4FM/HDQPSK/FM in 769MHz to 775MHz and 799MHz to 805MHz; C4FM/HDQPSK/FM in 851MHz to 862MHz and 806MHz to 817MHz
Channel spacing	12.5kHz for C4FM; 12.5kHz for HDQPSK; 12.5kHz for FM; 25kHz for FM 10MHz for LTE
Nominal Power Output:	37dBm for downlink 30dBm for uplink
Nominal System Gain:	100dB

EUT function description: 700MHz/800MHz Public Safety signal booster
Remark: This report only for frequency band 800Mhz.

4.3 Product Description

The EUT is a Class A public Safety Bi-Directional Amplifier which is a wireless enhanced solution where high-quality voice or high-speed data service is not available between a mobile and a base station.BDA is ideal for the first phase of the network rollout and for any subsequent phase where cost,coverage,and quality need to be optimized.

BDA offers a modular,robust design that is easy to install,manage an upgrade.It supports three individually adjustable sub-bands for flexibility and high RF performance,supports multi-band opearation.

Remote configuration and surveillance is possible through Comba's remote and monitoring system via PC or wireless modem to the OMT/OMC.

4.4 Standards Applicable for Testing

The standard used was FCC part 2 & FCC part 90

According the definition of KDB935210, the product belongs to the industrial Signal Booster.

Definition of Industrial signal booster(Part 20)
KDB 935210 D02 Signal Booster Certification v04 **An Industrial Signal Booster (Part 20)** is any signal booster that is not a Consumer Signal Booster (Part 20) [i.e., CMRS parts 22, 24, 27, 90 (ESMR)].10 [Section 20.3] Industrial Signal Boosters are designed to serve multiple users simultaneously. [*Order*, ¶ 16 and fn 31] Industrial Signal Boosters may be fixed-station equipment or mobile-station equipment, and are designed for installation by licensees or qualified installers. Unlike Consumer Signal Boosters, industrial signal boosters used in the CMRS bands are not distinguished as wideband or provider-specific. Part 90 Signal Boosters, other than Consumer Signal Boosters, are a type of Industrial Signal Booster—see also other specific part 90 terms and definitions below. [*Order*, ¶ 15]
Remark : 10 Industrial Signal Boosters include large, high powered devices intended for professional or enterprise use. These devices tend to have more expansive functionality than Consumer Signal Boosters. For example, unlike Consumer Signal Boosters, many Industrial Signal Boosters incorporate remote monitoring capability to allow the operator to use a graphical user interface to control the device's functions, including remote power control, turn-on, and turn-off. The output power and gain for Industrial Signal Boosters are typically multiple times the power and gain of Consumer Signal Boosters. These devices are designed to serve multiple users simultaneously and cover larger areas such as stadiums, shopping malls, office buildings, tunnels, and campuses. An Industrial Signal Booster installation may support a single wireless provider or multiple wireless providers. In addition, such an installation may utilize a greater number of antennas, amplifiers, and other components, compared to Consumer Signal Boosters. [Order, ¶ 16]

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

5 Equipment Used during Test

RF conducted test						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	DC Power Supply	ZhaoXin	PS-3005D	SEM011-05	2019-09-27	2020-09-26
2	Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2020-04-13	2021-04-12
3	Signal Generator (9kHz-40GHz)	KEYSIGHT	N5173B	SEM006-05	2019-09-27	2020-09-26
4	Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.6	N/A	N/A	N/A
5	Coaxial Cable	SGS	N/A	SEM031-01	2019-07-13	2020-07-12
6	Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
2	MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2019-09-27	2020-09-26
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
4	Horn Antenna 1GHz-18GHz	R& S	HF906	EMC0518	2018-09-02	2021-09-01
5	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2020-04-02	2021-04-01
6	Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
7	Coaxial Cable	SGS	N/A	SEM025-01	2019-07-13	2020-07-12

General used equipment						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
1	Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2019-09-29	2020-09-28
2	Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-29	2020-09-28
3	Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-08	2021-04-07

6 Test Results

6.1 E.U.T. test conditions

Temperature:	22°C ~26°C
Humidity:	37%~56% RH
Atmospheric Pressure:	990~1005mbar
Test Requirement:	The RF output power of the EUT was measured at the antenna port, by adjusting the input power of signal generter to drive the EUT to get to maximum output power point and keep the EUT at maximum gain setteing for all tests. The device should be tested on downlink. For detail test Modulation and Frequency, please refer to 6.2.

Remark:

Synonyms and related terms: in-building radiation system, coverage enhancer, distributed antenna system, fiber-optic distribution system, converter, donor anten

Typical in-building or distributed antenna systems can consist of five different components (enclosures), not counting antennas:

1) host unit

a) transmits uplink to base station via antenna thru coax, ***passive interface unit*** , or ***active interface unit*** (amplifier)
b) sends base-station downlink via fiber-optic or coax to ***remote***
c) receives handset uplink via fiber-optic or coax from ***remote***
d) optional connection to ***expansion unit*** via fiber-optic
e) separate FCC ID from ***remote***, unless electrically identical
f) ***non-transmitting host unit***
i) connects directly to a base station via coax cable but does not connect to antenna or amplifier
ii) Part 15 digital device subject to Verification, no FCC ID

2) remote unit

a) receives base-station downlink via fiber-optic or coax from ***host***, transmits via antenna to handsets
b) returns handset uplink via fiber-optic or coax to ***host***
c) separate FCC ID from ***remote***, unless electrically identical

3) expansion unit

a) fiber-optic or coax from ***host***
b) fiber-optic or coax fan-out to ***remote(s)***
c) Part 15 digital device subject to Verification, no FCC ID

4) *passive interface unit*

a) contains attenuators, splitters, combiners
b) coax cable connection between ***host*** and base-station
c) passive device, no FCC ID

5) *active interface unit*

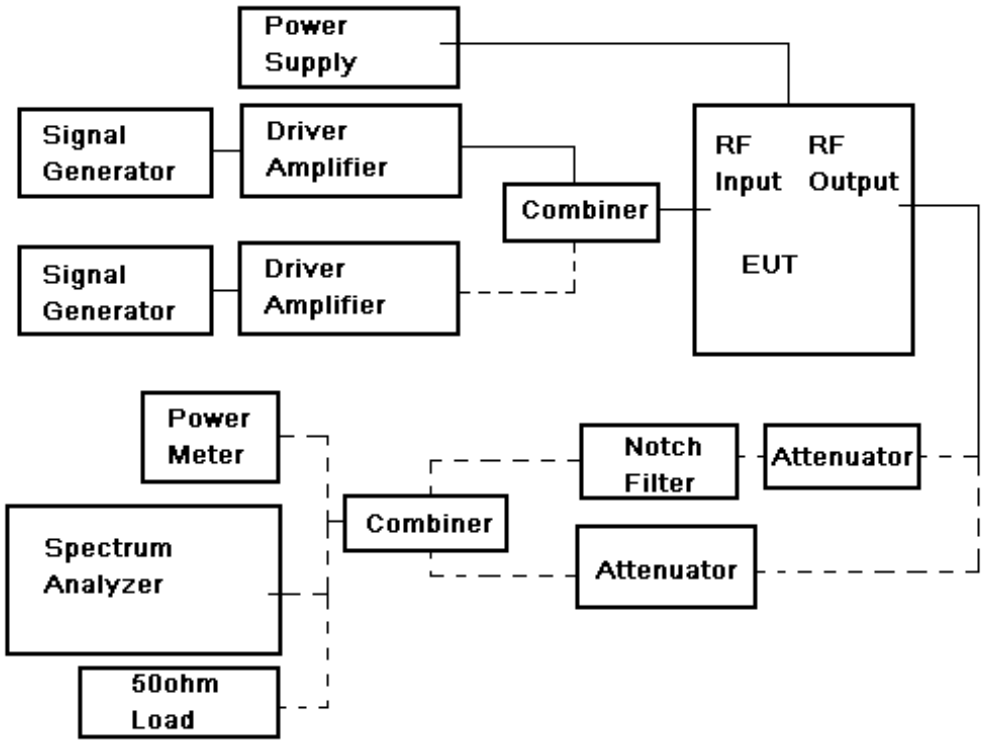
a) amplifies uplink signal from ***host unit*** for transmit by donor antenna
b) attenuates downlink from donor antenna
c) coax cable connection between ***host*** and ***active interface unit***
d) usually has separate FCC ID; in some cases could be combined/included with ***host*** as one enclosure

General Definitions for Certification Purposes:
The following three general definitions follow from those stated in the Part 22, 24, and 90 rule sections as listed above. Two of the definitions replace previous EAB internal definitions given for booster, repeater and extender. The general term “extender” is the same as booster, but booster should be used rather than extender. The general term “translator” is the same as repeater, but repeater should be used rather than translator.
External radio frequency power amplifier (ERFPA) - any device which, (1) when used in conjunction with a radio transmitter signal source, is capable of amplification of that signal, and (2) is not an integral part of a radio transmitter as manufactured. The EAS equipment class AMP is used only for an ERFPA device inserted between a transmitter (TNB/PCB) and an antenna (has only one antenna port)
Booster is a device that automatically reradiates signals from base transmitters without channel translation, for the purpose of improving the reliability of existing service by increasing the signal strength in dead spots. An “in-building radiation system” is a signal booster. These devices are not intended to extend the size of coverage from the originating base station. A booster can be either single or multiple channels***.***
Repeater is a device that retransmits the signals of other stations. Repeaters are different from boosters in that they can include frequency translation and can extend coverage beyond the design of the original base station. A repeater is typically single channel but can also be multiple channels.
ERFPA (AMP) and boosters/repeaters (TNB/PCB) can generally be authorized for all rule parts except 15 and 18.
Tests should be done with each typical signal. e.g., for F3E emissions use 2500 Hz with 2.5 or 5 kHz deviation. Use of CW signal for some tests is acceptable in lieu of actual emission, in some cases when CW signal gives worst case.

So the Equipment belongs to the booster.

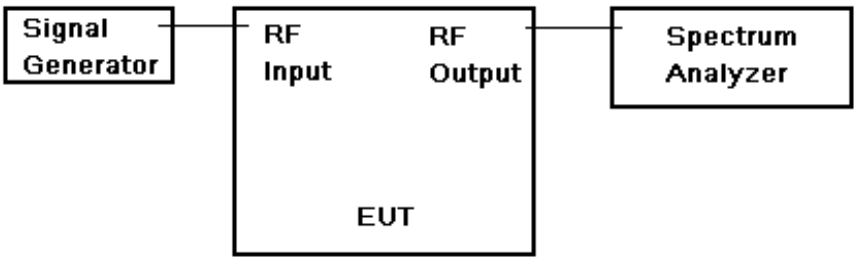
,

General Test Setup:



6.1.1 AGC Threshold level

Test Method:	KDB935210 D05
Test Requirement:	Not specified
EUT Operation:	
Status:	Drive the EUT to maximum output power. Pretest was performed in both channels, only kept the final measurement data of worse case.
Conditions:	Normal conditions
Application:	Cellular Band RF output ports
Test Configuration:	



AGC threshold test configuration

Test Procedure:

a) Connect a signal generator to the input of the EUT.

b) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.

c) The signal generator should initially be configured to produce either of the required test signals (i.e., broadband or narrowband).

d) Set the signal generator frequency to the center frequency of the EUT operating band.

e) While monitoring the output power of the EUT, measured using the methods of 3.5.3 or 3.5.4, increase the input level until a 1 dB increase in the input signal power no longer causes a 1 dB increase in the output signal power.

f) Record this level as the AGC threshold level.

g) Repeat the procedure with the remaining test signal.

6.1.1.1 Measurement Record:

Class A Model number:

Downlink: 851MHz ~ 862MHz

Test items	Modulation	Carrier frequency(MHz)	Level(dBm)
AGC Threshold	C4FM	851.00625	-62.4
AGC Threshold	C4FM	856.50625	-62.3
AGC Threshold	C4FM	861.99875	-62.7
AGC Threshold	HDQPSK	851.00625	-62.5
AGC Threshold	HDQPSK	856.50625	-62.6
AGC Threshold	HDQPSK	861.99735	-62.7
AGC Threshold	FM(12.5k)	851.00625	-62.6
AGC Threshold	FM(12.5k)	856.50625	-62.5
AGC Threshold	FM(12.5k)	861.99735	-62.4
AGC Threshold	FM(25k)	851.0125	-62.5
AGC Threshold	FM(25k)	856.5125	-62.7
AGC Threshold	FM(25k)	861.9875	-62.5

Uplink: 806MHz ~ 817MHz

Test items	Modulation	Carrier frequency(MHz)	Level(dBm)
AGC Threshold	C4FM	806.00625	-69.6
AGC Threshold	C4FM	811.50625	-69.8
AGC Threshold	C4FM	816.99875	-69.7
AGC Threshold	HDQPSK	806.00625	-69.5
AGC Threshold	HDQPSK	811.50625	-69.4
AGC Threshold	HDQPSK	816.99875	-69.3
AGC Threshold	FM(12.5k)	806.00625	-69.6
AGC Threshold	FM(12.5k)	811.50625	-69.5
AGC Threshold	FM(12.5k)	816.99875	-69.8
AGC Threshold	FM(25k)	806.0125	-69.6
AGC Threshold	FM(25k)	811.5125	-69.4
AGC Threshold	FM(25k)	816.9875	-69.3

Class B model number:

Downlink: 851MHz ~ 862MHz

Test items	Modulation	Carrier frequency(MHz)	Level(dBm)
AGC Threshold	C4FM	851.00625	-62.1
AGC Threshold	C4FM	856.50625	-62.6
AGC Threshold	C4FM	861.99735	-62.3
AGC Threshold	HDQPSK	851.00625	-62.7
AGC Threshold	HDQPSK	856.50625	-62.8
AGC Threshold	HDQPSK	861.99735	-62.4
AGC Threshold	FM(12.5k)	851.00625	-62.3
AGC Threshold	FM(12.5k)	856.50625	-62.2
AGC Threshold	FM(12.5k)	861.99735	-62.6
AGC Threshold	FM(25k)	851.0125	-62.7
AGC Threshold	FM(25k)	856.5125	-62.5
AGC Threshold	FM(25k)	861.9875	-62.9

Uplink: 806MHz ~ 817MHz

Test items	Modulation	Carrier frequency(MHz)	Level(dBm)
AGC Threshold	C4FM	806.00625	-69.7
AGC Threshold	C4FM	811.50625	-69.3
AGC Threshold	C4FM	816.99875	-69.8
AGC Threshold	HDQPSK	806.00625	-69.6
AGC Threshold	HDQPSK	811.50625	-69.2
AGC Threshold	HDQPSK	816.99875	-69.5
AGC Threshold	FM(12.5k)	806.00625	-69.4
AGC Threshold	FM(12.5k)	811.50625	-69.1
AGC Threshold	FM(12.5k)	816.99875	-69.9
AGC Threshold	FM(25k)	806.0125	-69.7
AGC Threshold	FM(25k)	811.5125	-69.2
AGC Threshold	FM(25k)	816.9875	-69.5

6.1.2 Conducted Output Power and Amplifier Gain

Test Requirement: FCC part 90.219(e)(1)
90.219(e) The output power capability of a signal booster must be designed for deployments providing a radiated power not exceeding 5 Watts ERP for each retransmitted channel.

Test Method: FCC part 2.1037

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

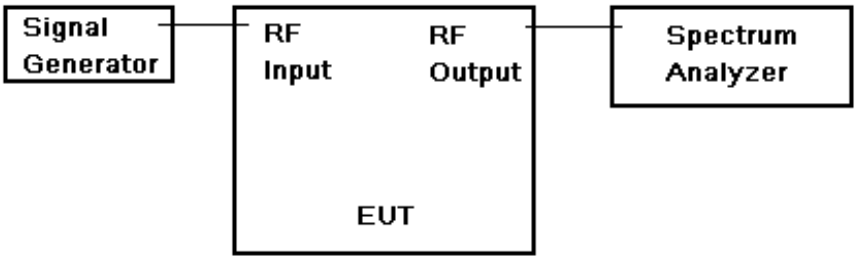


Fig.1 RF Output Power test configuration

Test Procedure:

RF output power test procedure:

1.

a) Connect the equipment as illustrated, when the output power is over the max value of the Spectrum Analyzer, add the attenuator to avoid destroying the facility.

b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.

c) do not apply any tone to modulate the EUT.

d1) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth >> the carrier bandwidth,

2) Video Bandwidth refer to standard requirement.

d2) Use spectrum analyzer channel power measurement function;

e) Record the frequencies and levels of carrier power;

f) Calculate the signal link way loss and final power value.

Or 2.

a) Connect the equipment as illustrated;

b) Read the value from the power meter;

c) Calculate the signal link way loss and final power value.

RF gain test procedure:

The EUT was connected to a spectrum analyzer throught a 40dB power attenuator.All cable and attenuator losses were input into the spectrum analyzer

As a reference level offset to ensure accurate readings were obtained.

A CW signal was utilized, set to the frequency of the peak amplitude measured in the Out of Band Rejection test.

The RF input signal level was set to 0.2dB below the AGC Threshod.

Gain(dB) =Output Power(dBm)-Input Power(dBm)

Remark:

Output power –

Power on Form 731 should be clearly understood as either composite of multichannels or per carrier. If power is composite include in comments field: "Power output listed is composite for multi-channel operation."

Check that the input drive level is at maximum input rating and maximum gain settings for all tests. Check both uplink and downlink input levels. See manual or brochures/technical description for maximum rating. May need to check FCC identifier of transmitter used for tests.

Confirm device can not operate in saturation. Are there means to control maximum power and to assure linear operation (use in system configuration may be necessary)? How is saturation or over-modulation prevented for pulsed signal inputs?

Measurement Record:

FCC regulation mandate that the ERP of type B signal boosters should not exceed 5W, this booster has a maximum programmable composite output power of 5W(37dBm) for Downlink, 1W(30dBm) for uplink. Therefore, the gain of the antenna should be of 0dBi or less. Below test was just performed the conducted method, and caculated the max ERP with antenna gain is 0dBi.

Class A model number:

Downlink: 851MHz ~ 862MHz

Modulation	Carrier frequency(MHz)	Maximum Output power(dBm)	Antenna Gain(dBi)	Limit: ERP (i.e. 200W) dBm	Result
C4FM	851.00625	36.2	0	37	Pass
C4FM	856.50625	36.3	0	37	Pass
C4FM	861.99735	36.1	0	37	Pass
HDQPSK	851.00625	36.2	0	37	Pass
HDQPSK	856.50625	36.4	0	37	Pass
HDQPSK	861.99735	36.1	0	37	Pass
FM(12.5k)	851.00625	36.4	0	37	Pass
FM(12.5k)	856.50625	36.5	0	37	Pass
FM(12.5k)	861.99735	36.3	0	37	Pass
FM(25k)	851.0125	36.3	0	37	Pass
FM(25k)	856.5125	36.4	0	37	Pass
FM(25k)	861.9875	36.3	0	37	Pass

Uplink: 806MHz ~ 817MHz：

Modulation	Carrier frequency(MHz)	Maximum Output power(dBm)	Antenna Gain(dBi)	Limit: ERP (i.e. 200W) dBm	Result
C4FM	806.00625	29.4	0	37	Pass
C4FM	811.50625	29.9	0	37	Pass
C4FM	816.99875	29.2	0	37	Pass
HDQPSK	806.00625	28.6	0	37	Pass
HDQPSK	811.50625	29.2	0	37	Pass
HDQPSK	816.99875	28.7	0	37	Pass
FM(12.5k)	806.00625	29.3	0	37	Pass
FM(12.5k)	811.50625	29.8	0	37	Pass
FM(12.5k)	816.99875	29.5	0	37	Pass
FM(25k)	806.0125	29.4	0	37	Pass
FM(25k)	811.5125	29.8	0	37	Pass
FM(25k)	816.9875	29.3	0	37	Pass

Class B model number:

Downlink: 851MHz ~ 862MHz

Modulation	Carrier frequency(MHz)	Maximum Output power(dBm)	Antenna Gain(dBi)	Limit: ERP (i.e. 200W) dBm	Result
C4FM	851.00625	36.1	0	37	Pass
C4FM	856.50625	36.3	0	37	Pass
C4FM	861.99735	36.2	0	37	Pass
HDQPSK	851.00625	36.5	0	37	Pass
HDQPSK	856.50625	36.3	0	37	Pass
HDQPSK	861.99735	36.2	0	37	Pass
FM(12.5k)	851.00625	36.3	0	37	Pass
FM(12.5k)	856.50625	36.4	0	37	Pass
FM(12.5k)	861.99735	36.2	0	37	Pass
FM(25k)	851.0125	36.1	0	37	Pass
FM(25k)	856.5125	36.2	0	37	Pass
FM(25k)	861.9875	36.4	0	37	Pass

Uplink: 806MHz ~ 817MHz：

Modulation	Carrier frequency(MHz)	Maximum Output power(dBm)	Antenna Gain(dBi)	Limit: ERP (i.e. 200W) dBm	Result
C4FM	806.00625	29.5	0	37	Pass
C4FM	811.50625	29.7	0	37	Pass
C4FM	816.99875	29.6	0	37	Pass
HDQPSK	806.00625	28.9	0	37	Pass
HDQPSK	811.50625	29.1	0	37	Pass
HDQPSK	816.99875	28.8	0	37	Pass
FM(12.5k)	806.00625	29.2	0	37	Pass
FM(12.5k)	811.50625	29.5	0	37	Pass
FM(12.5k)	816.99875	29.3	0	37	Pass
FM(25k)	806.0125	29.2	0	37	Pass
FM(25k)	811.5125	29.6	0	37	Pass
FM(25k)	816.9875	29.4	0	37	Pass

6.1.3 Conducted Spurious Emissions

Test Requirement: FCC part 90.219(3)

(3) Spurious emissions from a signal booster must not exceed −13dBm within any 100 kHz measurement bandwidth..

Test Method: FCC part 2.1053

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

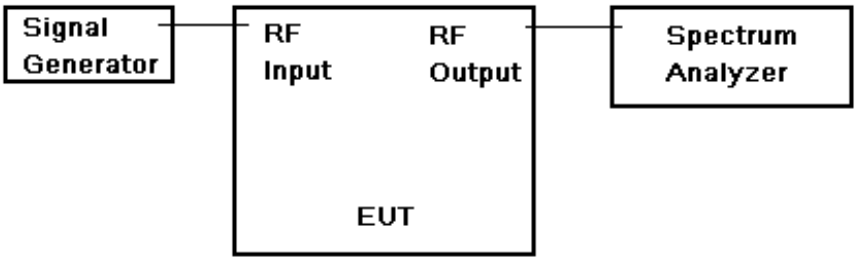
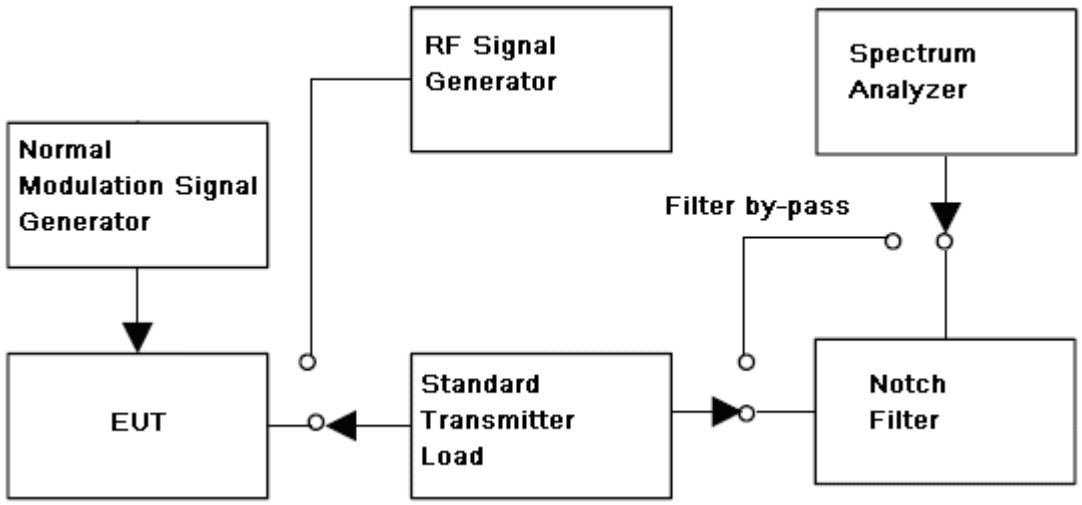


Fig.2. Conducted Spurious Emissions test configuration



Test Procedure:

Conducted Emissions test procedure:

a) Connect the equipment as illustrated, with the notch filter by-passed, when the output power is over the max value of the Spectrum Analyzer, add the attenuator to avoid destroying the facility.

b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.

c) do not apply any tone to modulate the EUT.

d) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth,(base the standard, apply the different set),her is 100KHz for frequency band less than 1GHz, 1MHz for frequency over 1GHz;

2) Video Bandwidth refer to standard requirement.

e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:

1) the lowest radio frequency generated in the equipment, it can be 9KHz base the test method, here select 30MHz as lowest frequency start point;

2) the highest radion frequency shall higher than 10 times of carrier frequency;

f) Record the frequencies and levels of spurious emissions from step e)

Remark:

The notch filter is used for avoid the EUT fundamental carrier output power making the spectrum overload and the harmonic spurious brought by it.

When the EUT fundamental carrier is not enough to make the status, the notch filter could be not used.

Measurement Record:

Remark:

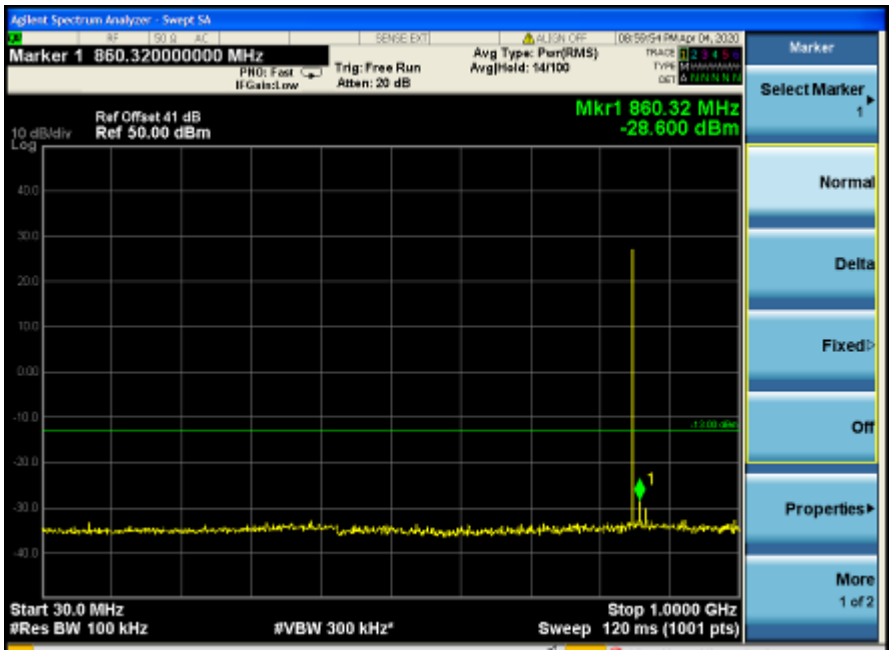
The data for the C4FM mode and HDQPSK, FM(12.5k) has enough margin, so we only show the photo in the FM(25k) mode,others record the worst data in the table.

Class A model number :

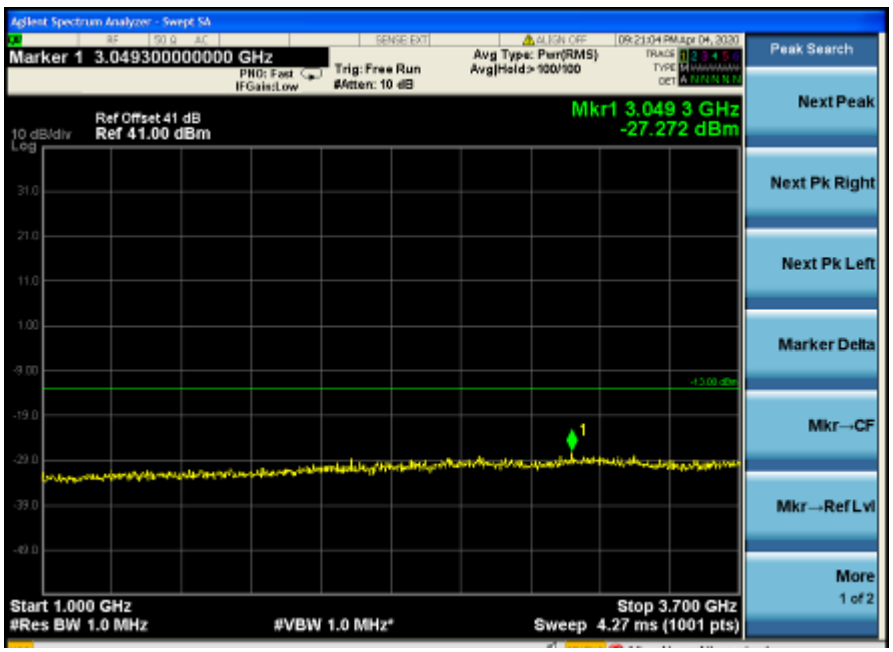
1.1 For FM(25k)mode:

1)Lowest frequency

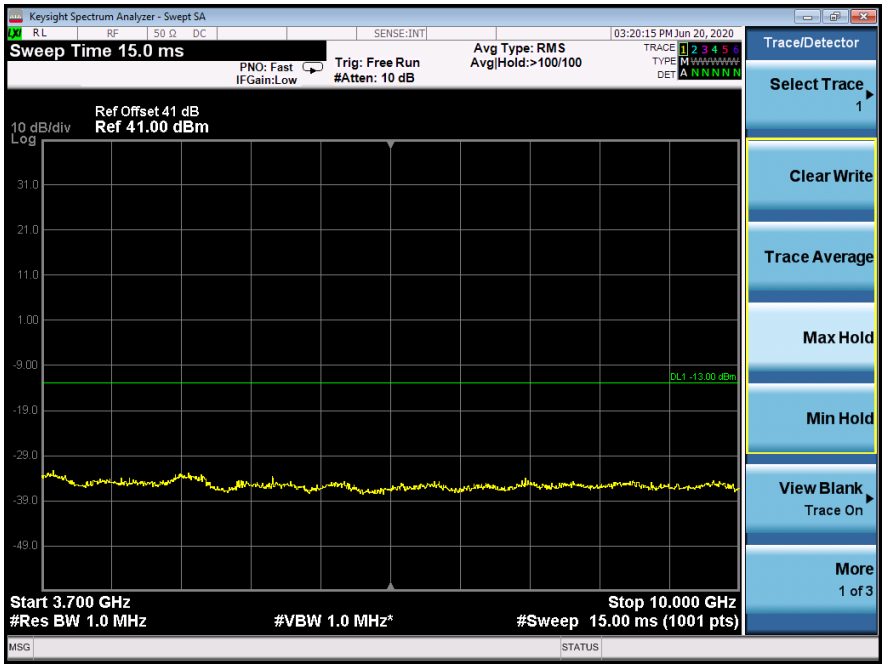
30MHz to 1GHz



1GHz to 3.7GHz

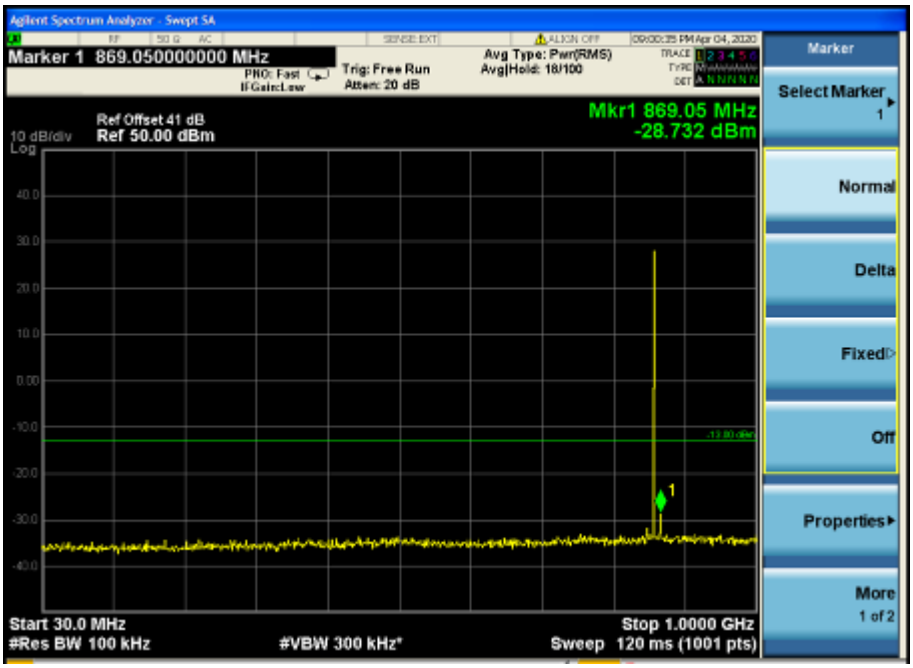


3.7GHz to 10GHz

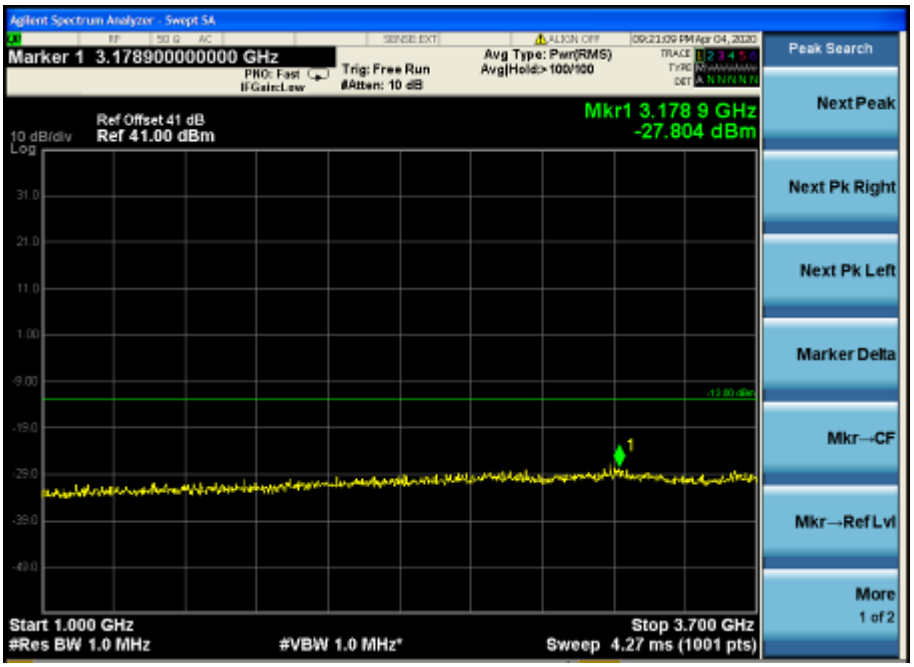


2)Middle frequency

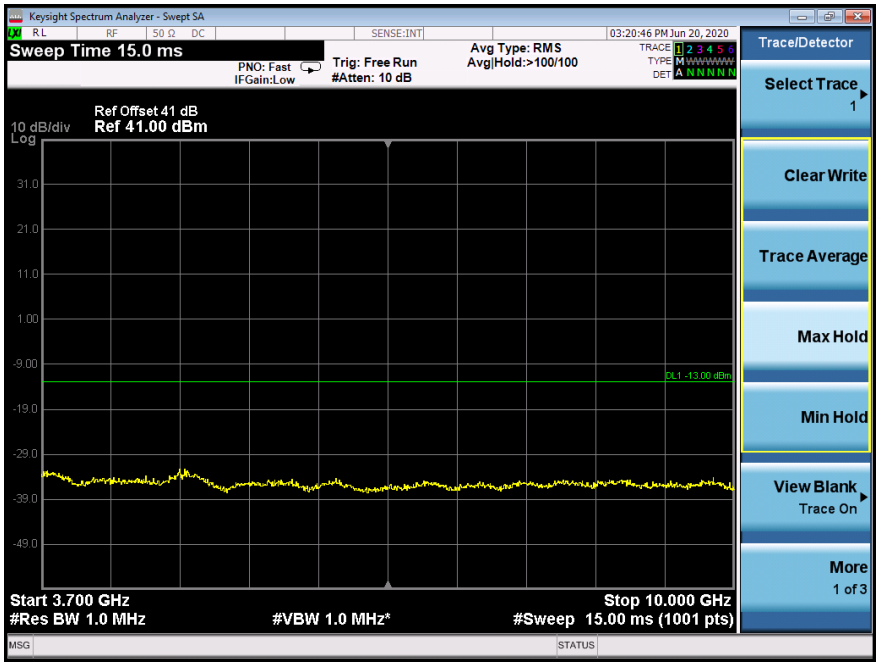
30MHz to 1GHz



1GHz to 3.7GHz

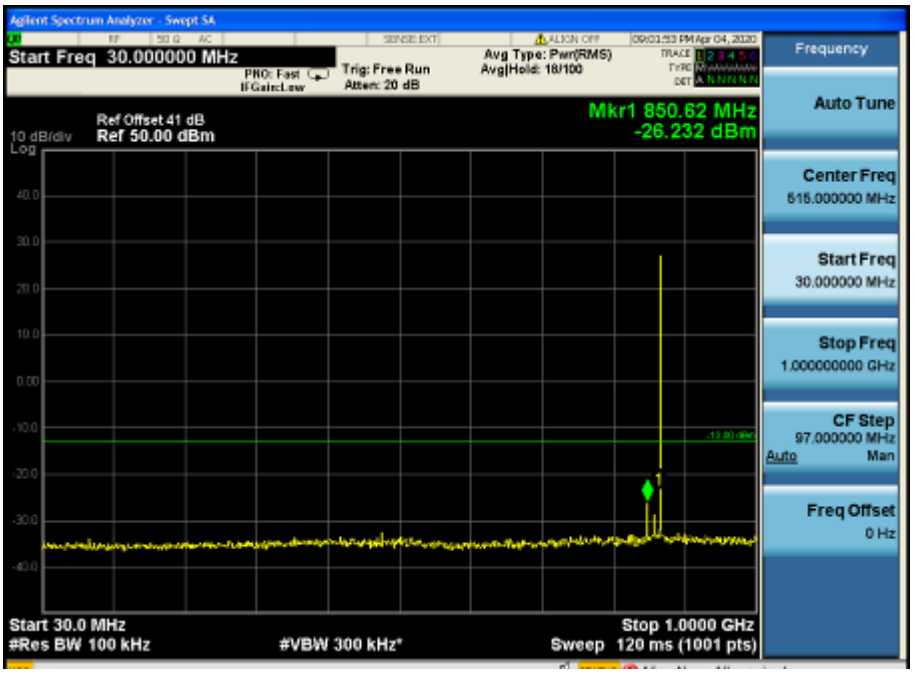


3.7GHz to 10GHz

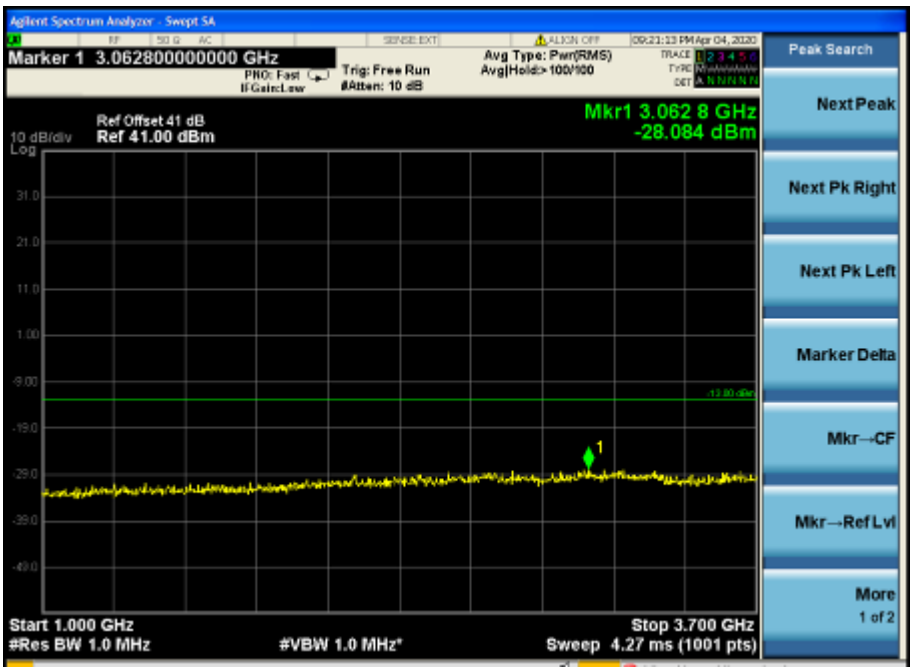


3)highest frequency

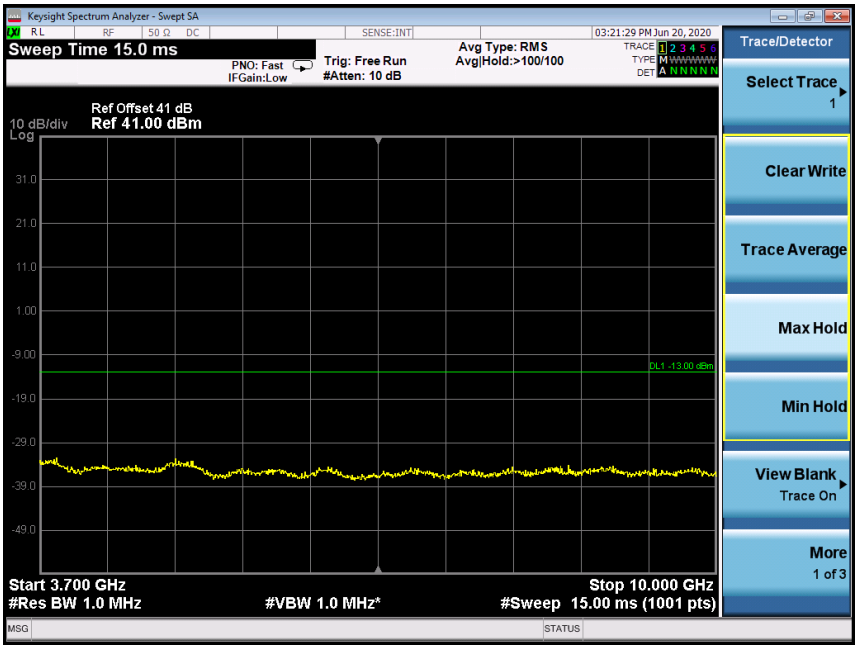
30MHz to 1GHz



1GHz to 3.7GHz



3.7GHz to 10GHz



For C4FM mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-29.85	-13.0	-16.85
1GHz to 3.7GHz	RBW=1MHz	-23.47	-13.0	-10.47
3.7GHz to 10GHz	RBW=1MHz	-24.35	-13.0	-11.35

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.69	-13.0	-15.69
1GHz to 3.7GHz	RBW=1MHz	-23.72	-13.0	-10.72
3.7GHz to 10GHz	RBW=1MHz	-23.85	-13.0	-10.85

3) highest frequency

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.56	-13.0	-15.56
1GHz to 3.7GHz	RBW=1MHz	-24.37	-13.0	-11.37
3.7GHz to 10GHz	RBW=1MHz	-23.16	-13.0	-10.16

For HDQPSK mode:

1) lowest frequency:

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.37	-13.0	-15.37
1GHz to 3.7GHz	RBW=1MHz	-23.62	-13.0	-10.62
3.7GHz to 10GHz	RBW=1MHz	-23.56	-13.0	-10.56

2) Middle frequency:

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.32	-13.0	-15.32
1GHz to 3.7GHz	RBW=1MHz	-23.15	-13.0	-10.15
3.7GHz to 10GHz	RBW=1MHz	-23.67	-13.0	-10.67

3) highest frequency

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.63	-13.0	-15.63
1GHz to 3.7GHz	RBW=1MHz	-24.15	-13.0	-11.15
3.7GHz to 10GHz	RBW=1MHz	-25.12	-13.0	-12.12

For FM(12.5k) mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.19	-13.0	-15.19
1GHz to 3.7GHz	RBW=1MHz	-23.74	-13.0	-10.74
3.7GHz to 10GHz	RBW=1MHz	-23.69	-13.0	-10.69

2) Middle frequency:

Measurement Record:

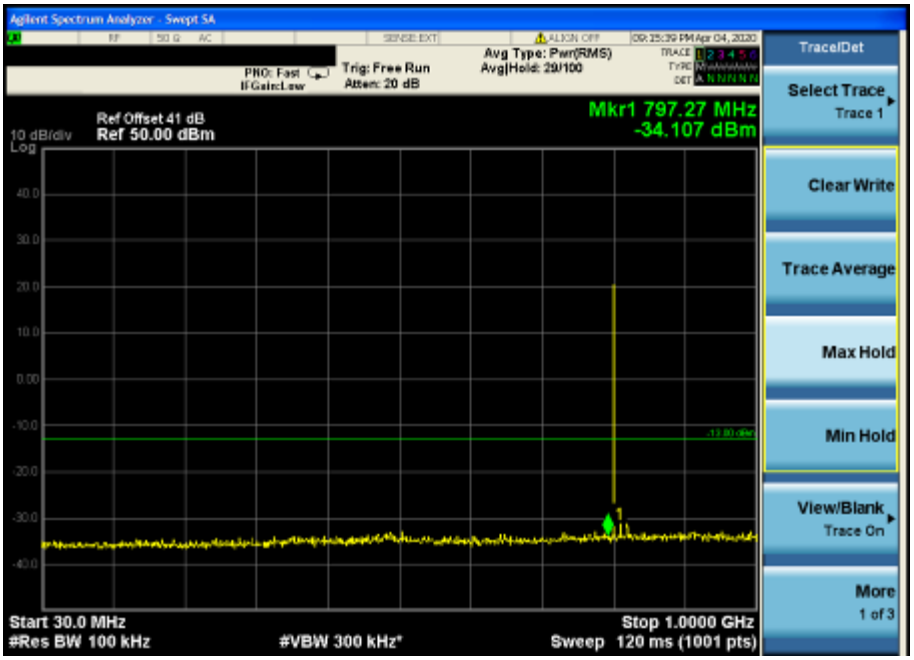
Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-23.28	-13.0	-10.28
3.7GHz to 10GHz	RBW=1MHz	-23.57	-13.0	-10.57

3) highest frequency

Measurement Record:

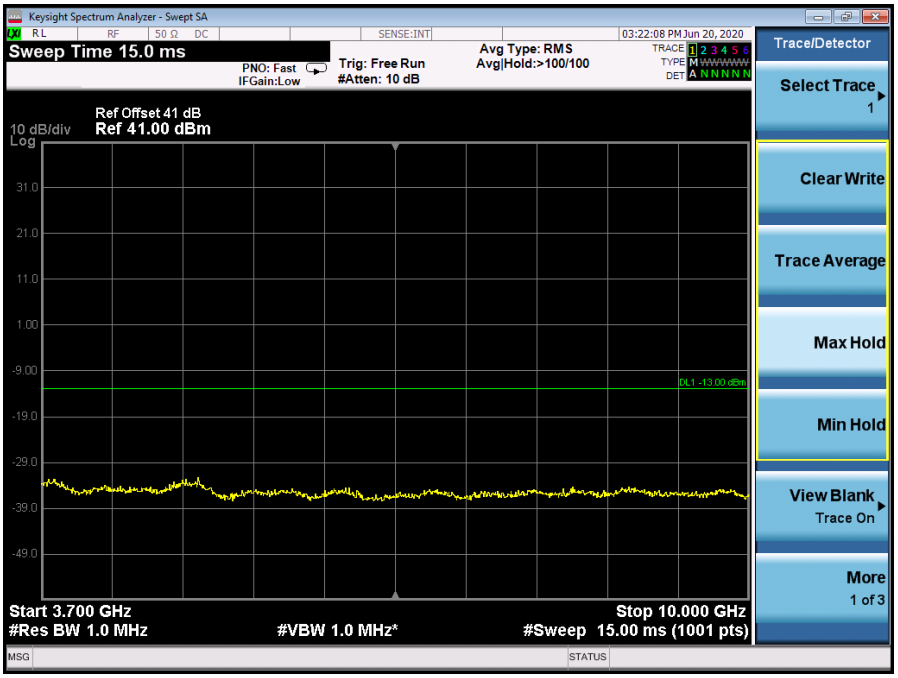
Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.27	-13.0	-15.27
1GHz to 3.7GHz	RBW=1MHz	-23.63	-13.0	-10.63
3.7GHz to 10GHz	RBW=1MHz	-24.12	-13.0	-11.12

4.Uplink: 806MHz ~ 817MHz
1.1 For FM(25k) mode:
1)lowest frequency
30MHz to 1GHz



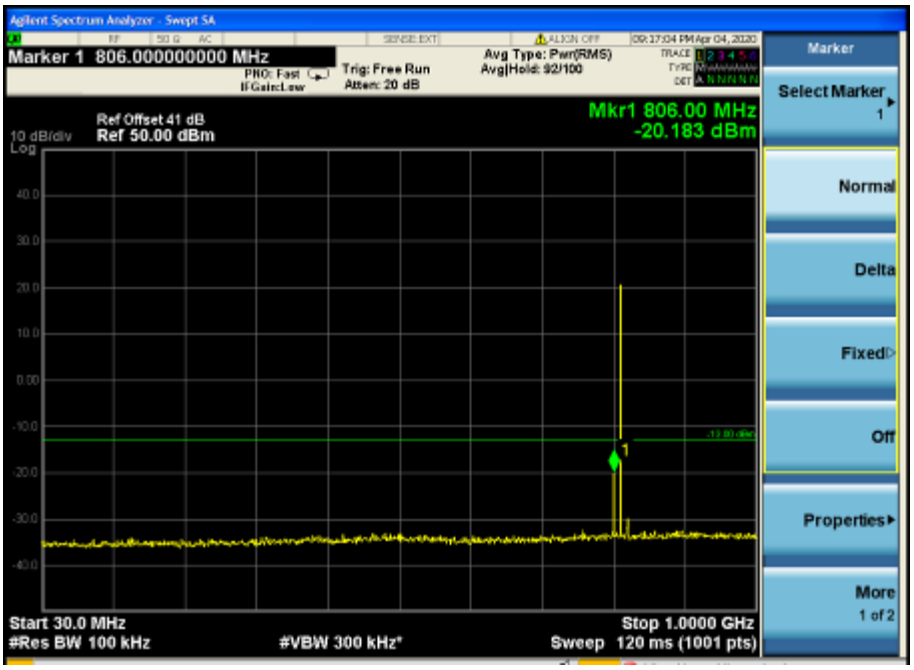
1GHz to 3.7GHz

3.7GHz-10GHz

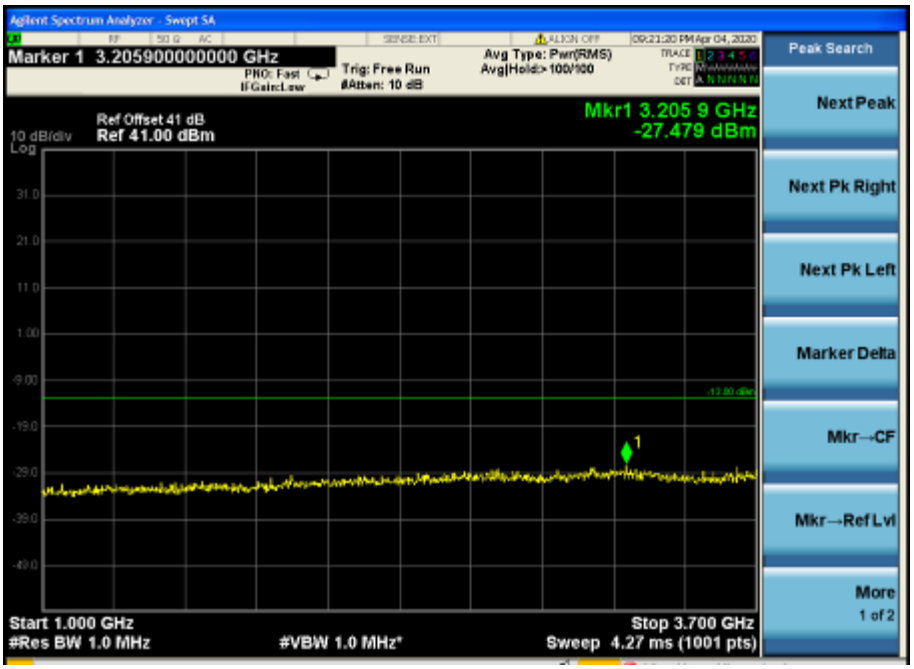


2)Middle frequency

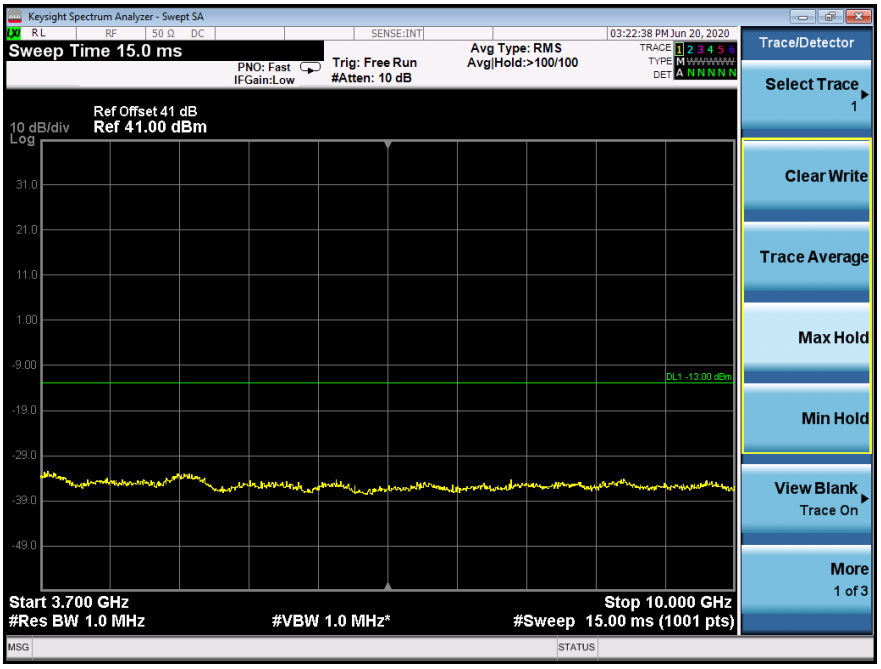
30MHz to 1GHz



1GHz to 3.7GHz

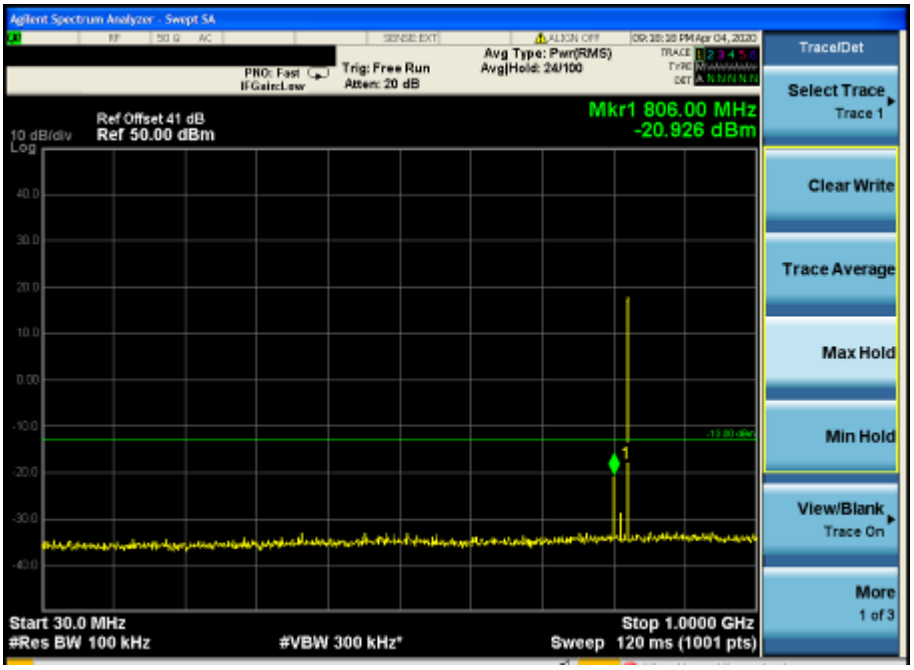


3.7GHz to 10GHz

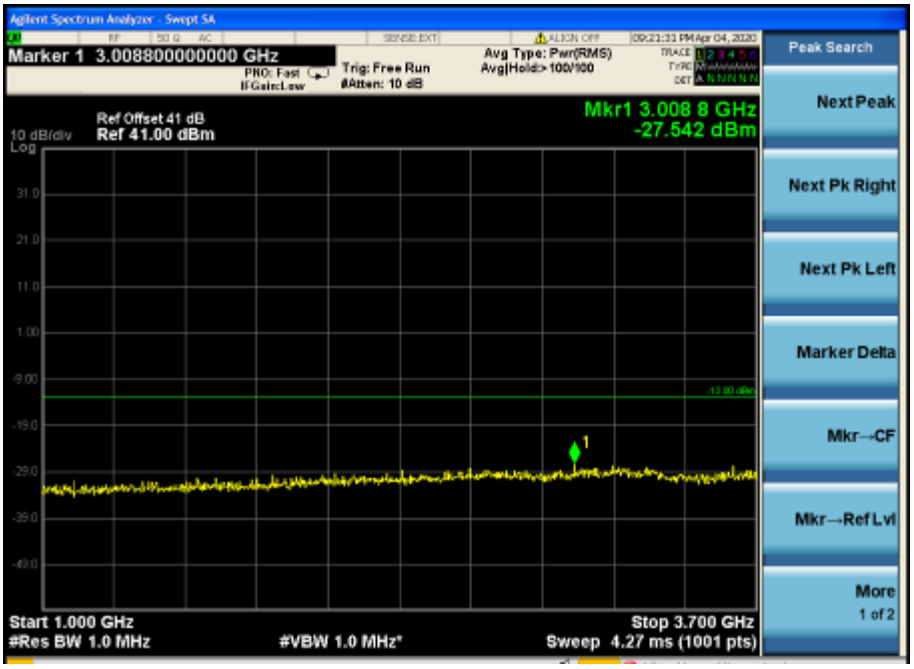


3)highest frequency

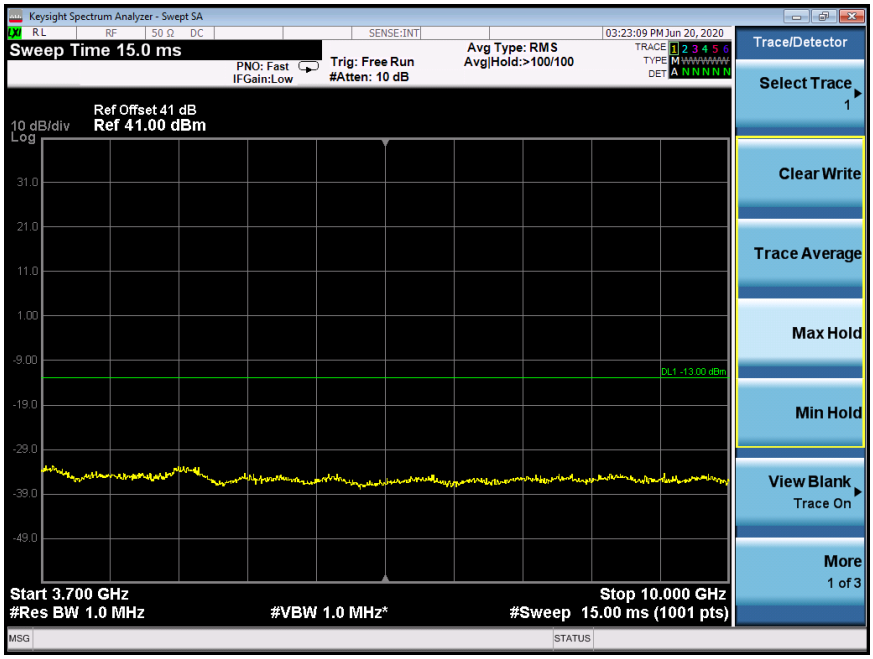
30MHz to 1GHz



1GHz to 3.7GHz



3.7GHz-10GHz :



For C4FM mode:

1) lowest frequency:

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-24.19	-13.0	-11.19
3.7GHz to 10GHz	RBW=1MHz	-23.20	-13.0	-10.2

2) Middle frequency:

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.42	-13.0	-15.42
1GHz to 3.7GHz	RBW=1MHz	-23.87	-13.0	-10.87
3.7GHz to 10GHz	RBW=1MHz	-22.19	-13.0	-9.19

3) highest frequency

Measurement Record:				
Frequency range	**Measurement bandwidth**	**Spurious Emission Level(dBm)**	**Limit(dBm)**	**Over Limit(dB)**
30MHz to 1GHz	RBW=100KHz	-28.25	-13.0	-15.25
1GHz to 3.7GHz	RBW=1MHz	-23.14	-13.0	-10.14

3.7GHz to 10GHz	RBW=1MHz	-22.06	-13.0	-9.06

For HDQPSK mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.42	-13.0	-15.42
1GHz to 3.7GHz	RBW=1MHz	-23.25	-13.0	-10.25
3.7GHz to 10GHz	RBW=1MHz	-22.81	-13.0	-9.81

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-23.49	-13.0	-10.49
3.7GHz to 10GHz	RBW=1MHz	-22.97	-13.0	-9.97

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.72	-13.0	-15.63
1GHz to 3.7GHz	RBW=1MHz	-23.16	-13.0	-11.15
3.7GHz to 10GHz	RBW=1MHz	-24.83	-13.0	-12.12

For FM(12.5k) mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.73	-13.0	-15.73
1GHz to 3.7GHz	RBW=1MHz	-24.56	-13.0	-11.56
3.7GHz to 10GHz	RBW=1MHz	-23.29	-13.0	-10.29

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-27.48	-13.0	-14.48
1GHz to 3.7GHz	RBW=1MHz	-24.16	-13.0	-11.16
3.7GHz to 10GHz	RBW=1MHz	-23.74	-13.0	-10.74

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.15	-13.0	-15.15
1GHz to 3.7GHz	RBW=1MHz	-24.06	-13.0	-11.06
3.7GHz to 10GHz	RBW=1MHz	-23.69	-13.0	-10.69

Class B model number:

3.Downlink: 851MHz ~ 862MHz

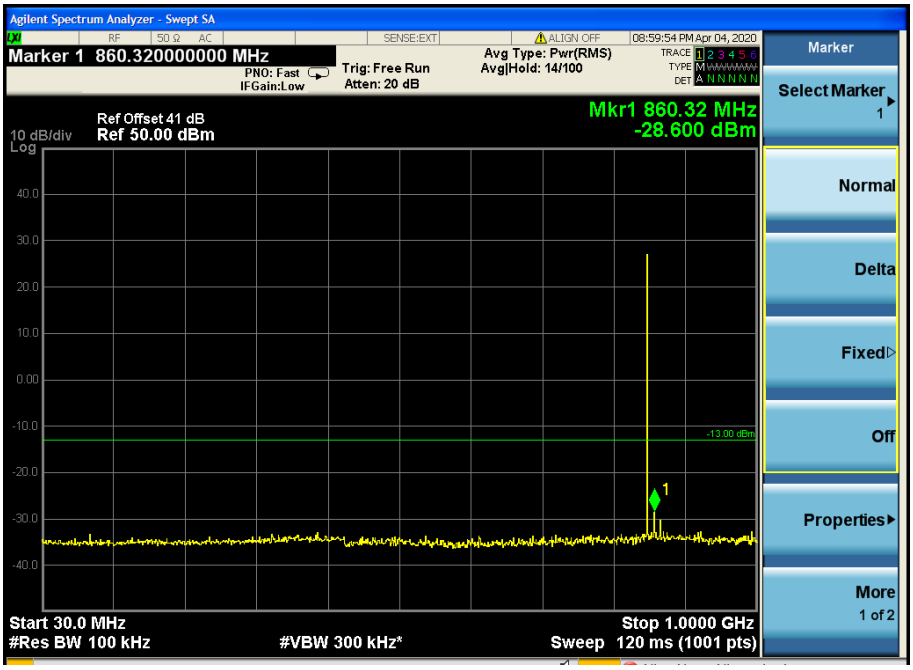
Remark:

The data of the C4FM mode and HDQPSK、FM(12.5k) is almost the same with FM(25k)mode, so we only show the photo in the FM(25k) mode,others record the data in table only.

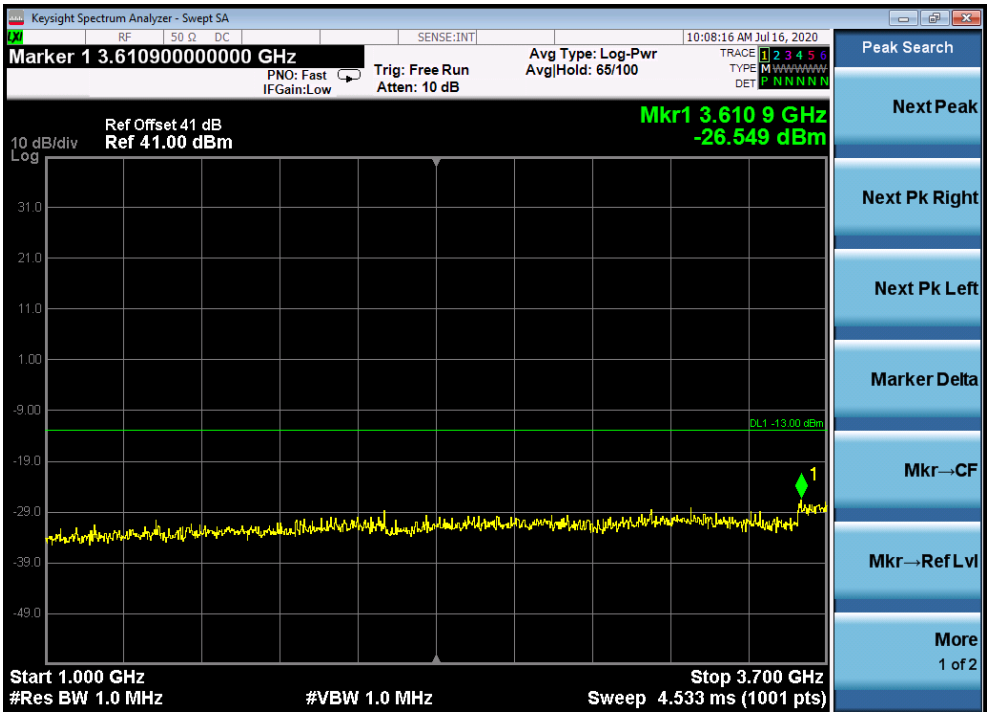
1.2 For FM(25k)mode:

1)Lowest frequency

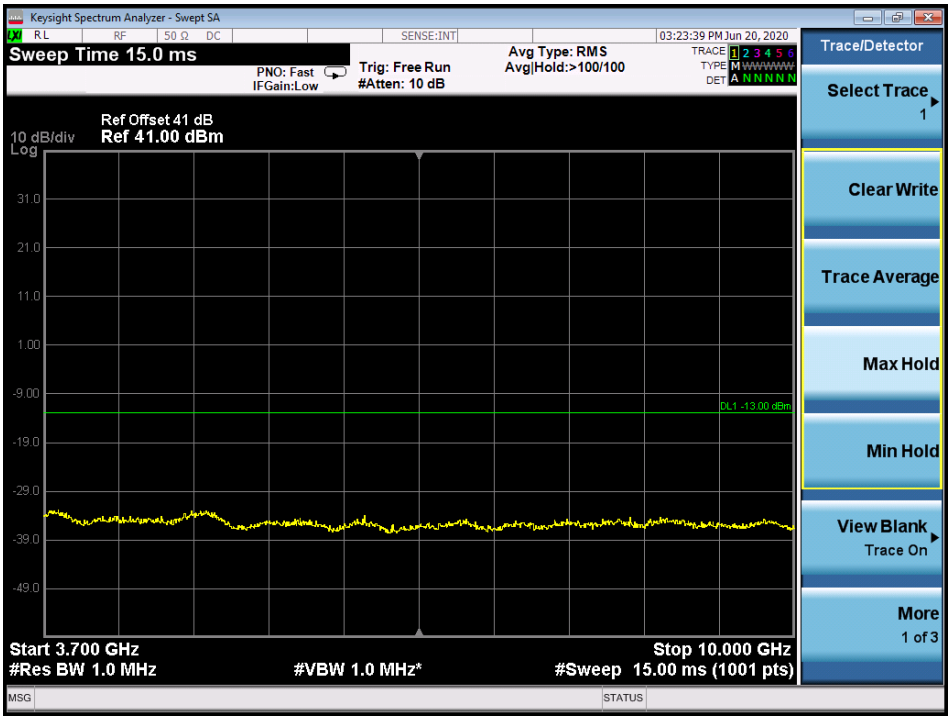
30MHz to 1GHz



1GHz to 3.7GHz

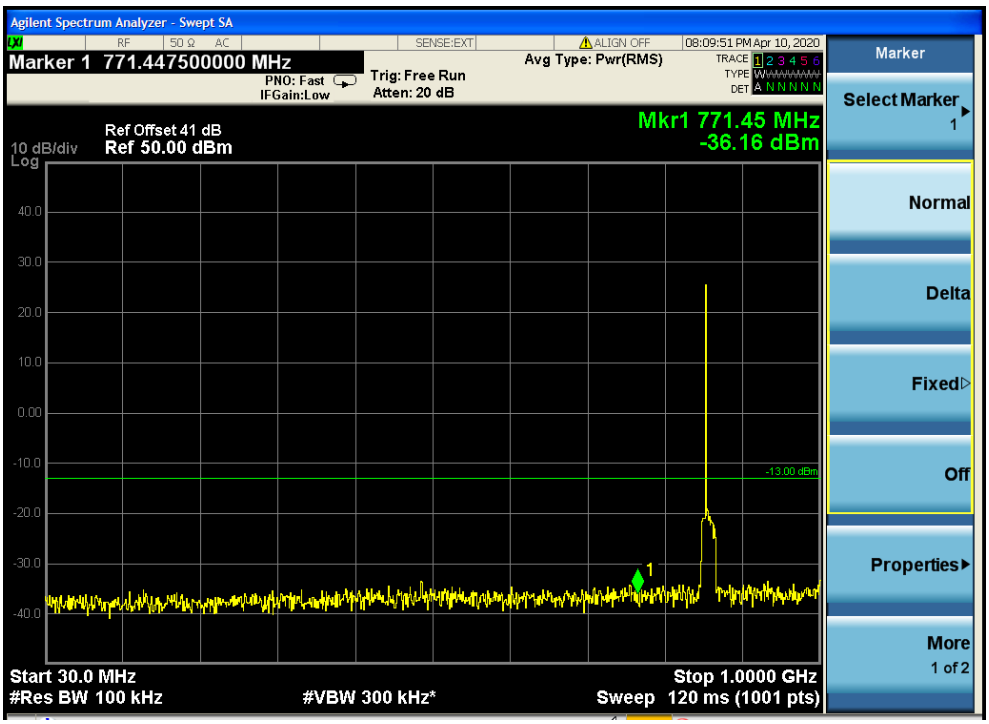


3.7GHz to 10GHz:

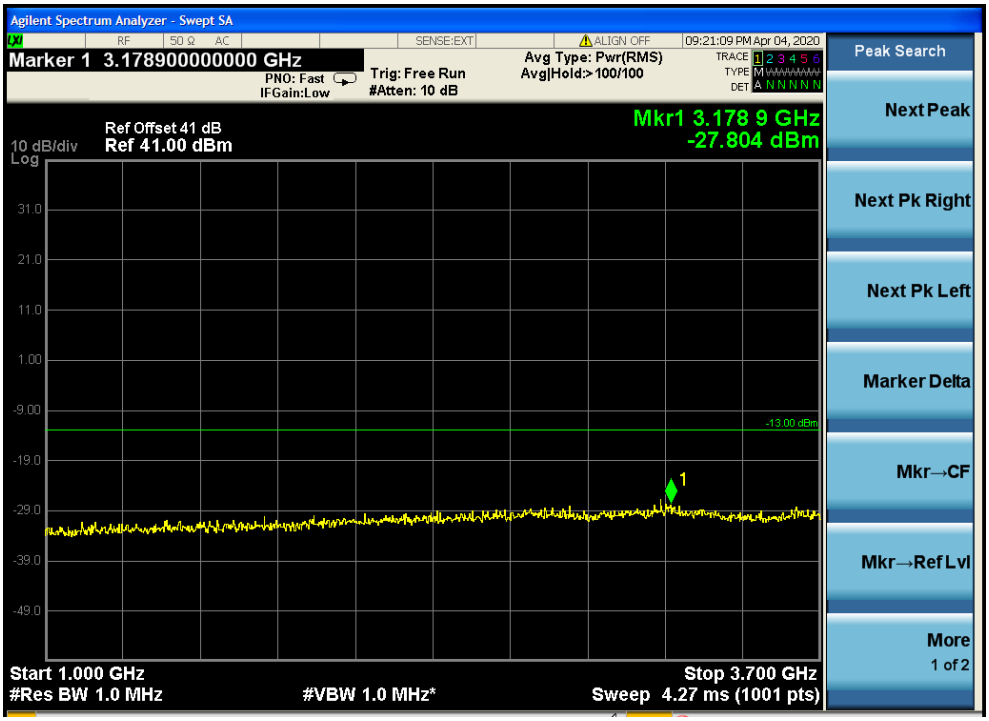


2)Middle frequency

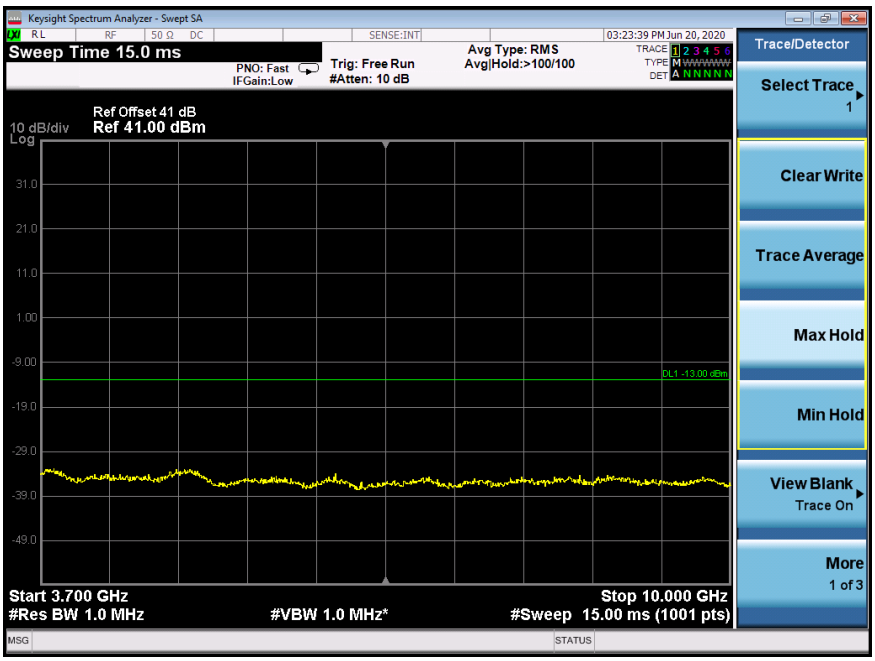
30MHz to 1GHz



1GHz to 3.7GHz

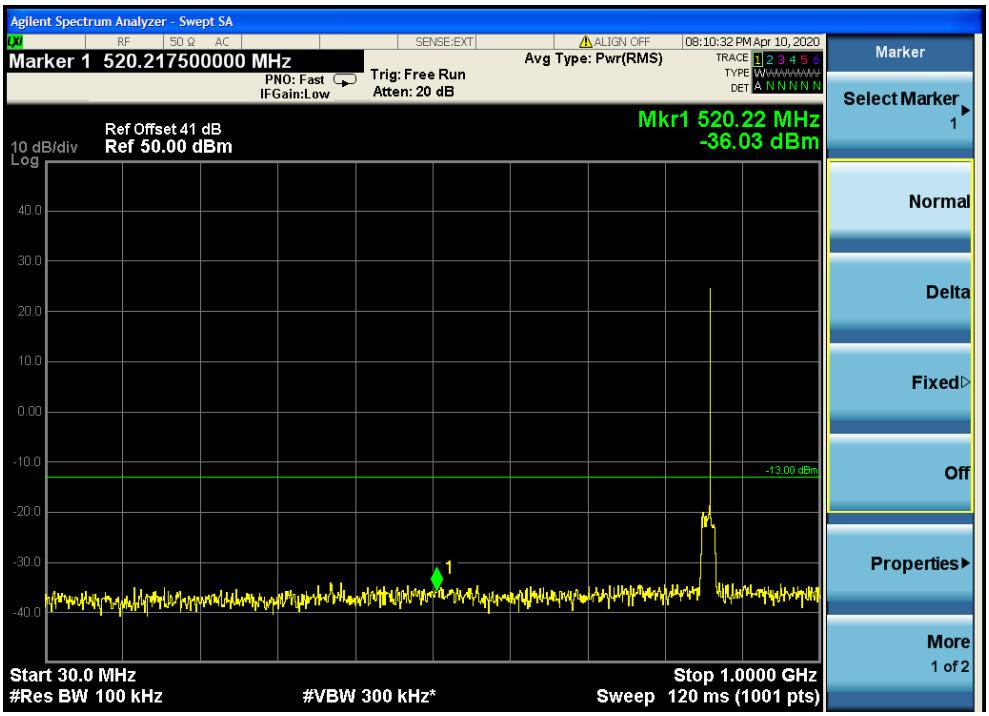


3.7GHz to 10GHz:

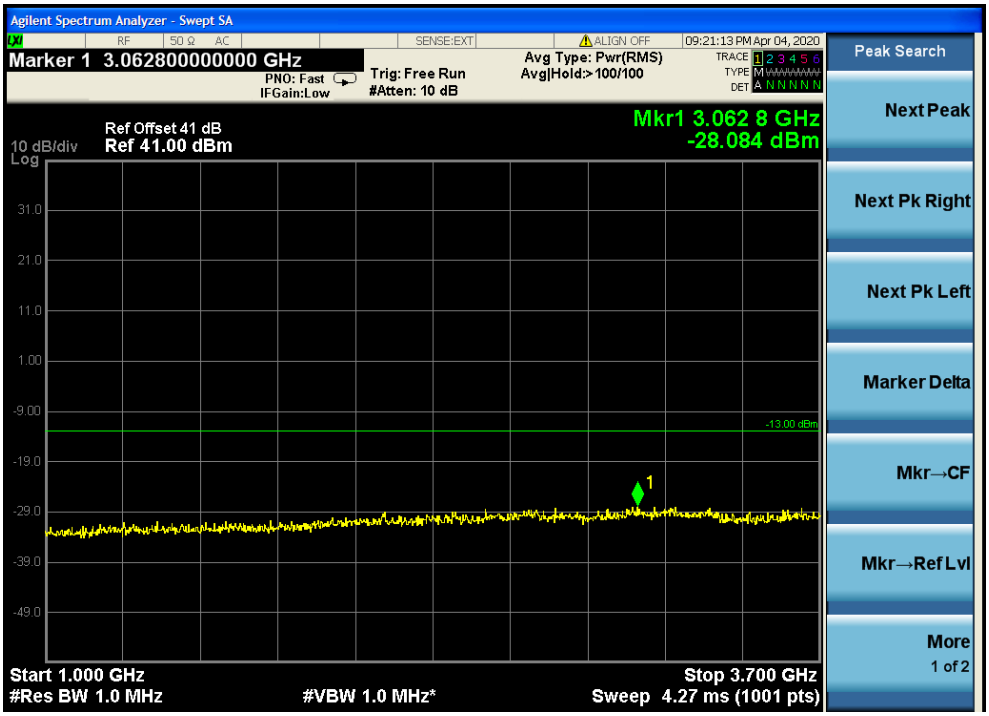


3)highest frequency

30MHz to 1GHz



1GHz to 3.7GHz



For C4FM mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-29.85	-13.0	-16.85
1GHz to 3.7GHz	RBW=1MHz	-23.47	-13.0	-10.47
3GHz to 10GHz	RBW=1MHz	-24.35	-13.0	-11.35

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.69	-13.0	-15.69
1GHz to 3.7GHz	RBW=1MHz	-23.72	-13.0	-10.72
3GHz to 10GHz	RBW=1MHz	-23.85	-13.0	-10.85

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.56	-13.0	-15.56
1GHz to 3.7GHz	RBW=1MHz	-24.37	-13.0	-11.37
3GHz to 10GHz	RBW=1MHz	-23.16	-13.0	-10.16

For HDQPSK mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.37	-13.0	-15.37
1GHz to 3.7GHz	RBW=1MHz	-23.62	-13.0	-10.62
3GHz to 10GHz	RBW=1MHz	-23.56	-13.0	-10.56

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.32	-13.0	-15.32
1GHz to 3.7GHz	RBW=1MHz	-23.15	-13.0	-10.15
3GHz to 10GHz	RBW=1MHz	-23.67	-13.0	-10.67

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.63	-13.0	-15.63
1GHz to 3.7GHz	RBW=1MHz	-24.15	-13.0	-11.15
3GHz to 10GHz	RBW=1MHz	-25.12	-13.0	-12.12

For FM(12.5k) mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.19	-13.0	-15.19
1GHz to 3.7GHz	RBW=1MHz	-23.74	-13.0	-10.74
3.7GHz to 10GHz	RBW=1MHz	-23.69	-13.0	-10.69

2) Middle frequency:

Measurement Record:

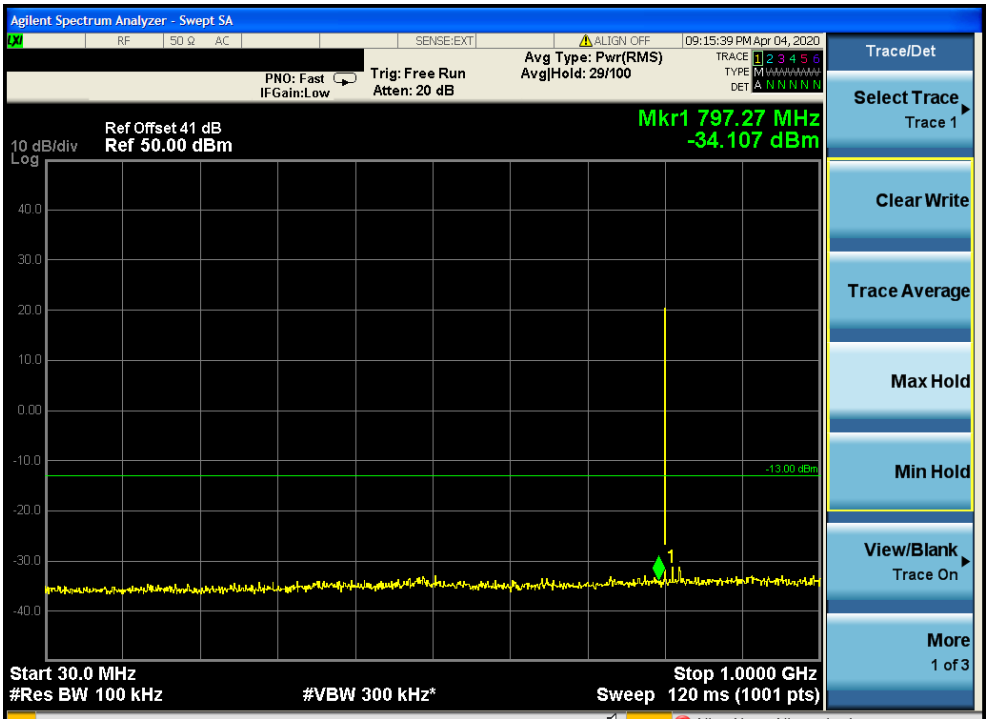
Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-23.28	-13.0	-10.28
3.7GHz to 10GHz	RBW=1MHz	-23.57	-13.0	-10.57

3) highest frequency

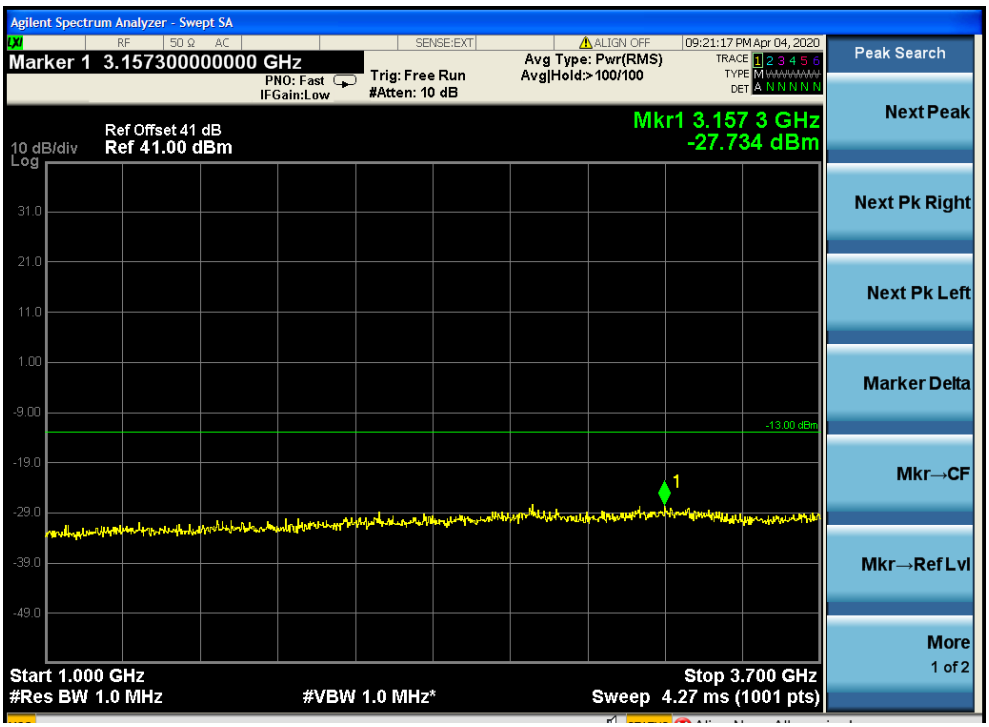
Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.27	-13.0	-15.27
1GHz to 3.7GHz	RBW=1MHz	-23.63	-13.0	-10.63
3.7GHz to 10GHz	RBW=1MHz	-24.12	-13.0	-11.12

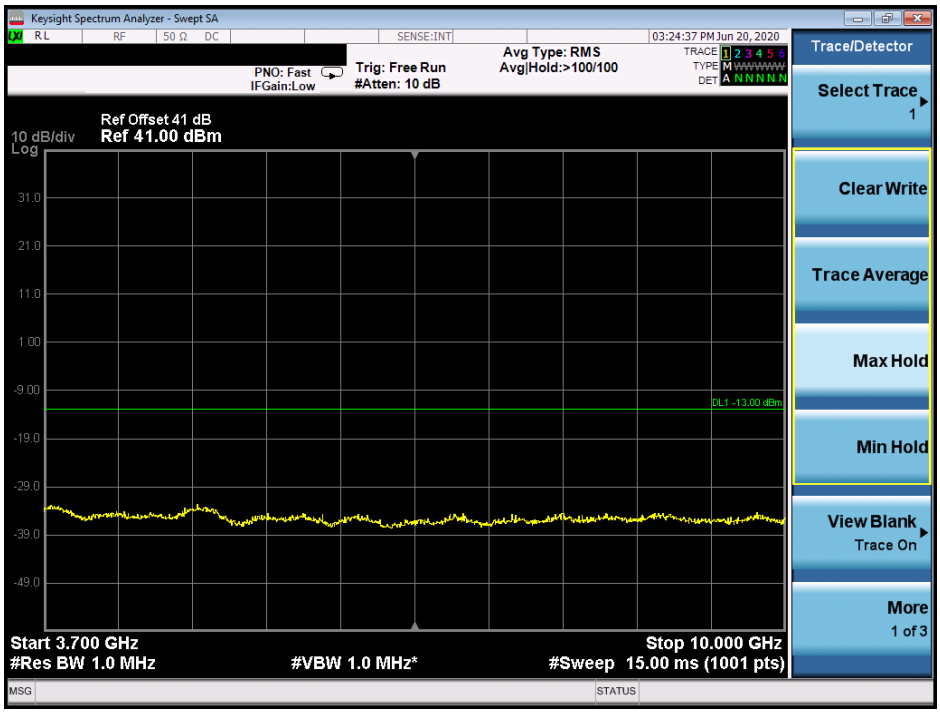
4.Uplink: 806MHz ~ 817MHz
1.1 For FM(25k) mode:
1)lowest frequency
30MHz to 1GHz



1GHz to 3.7GHz

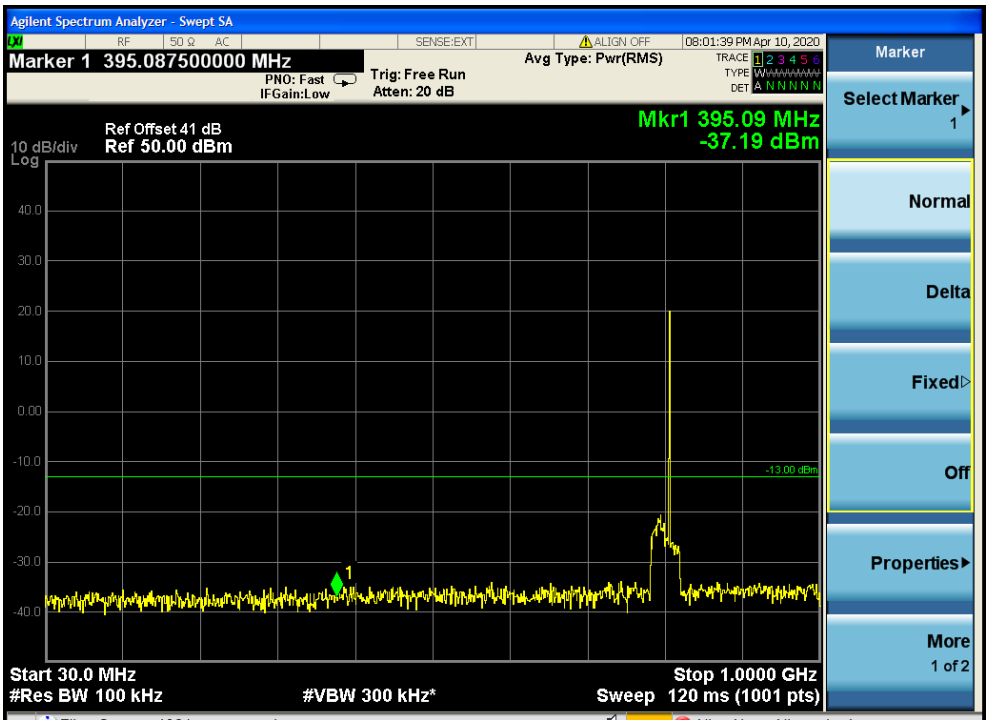


3.7GHz to 10GHz:

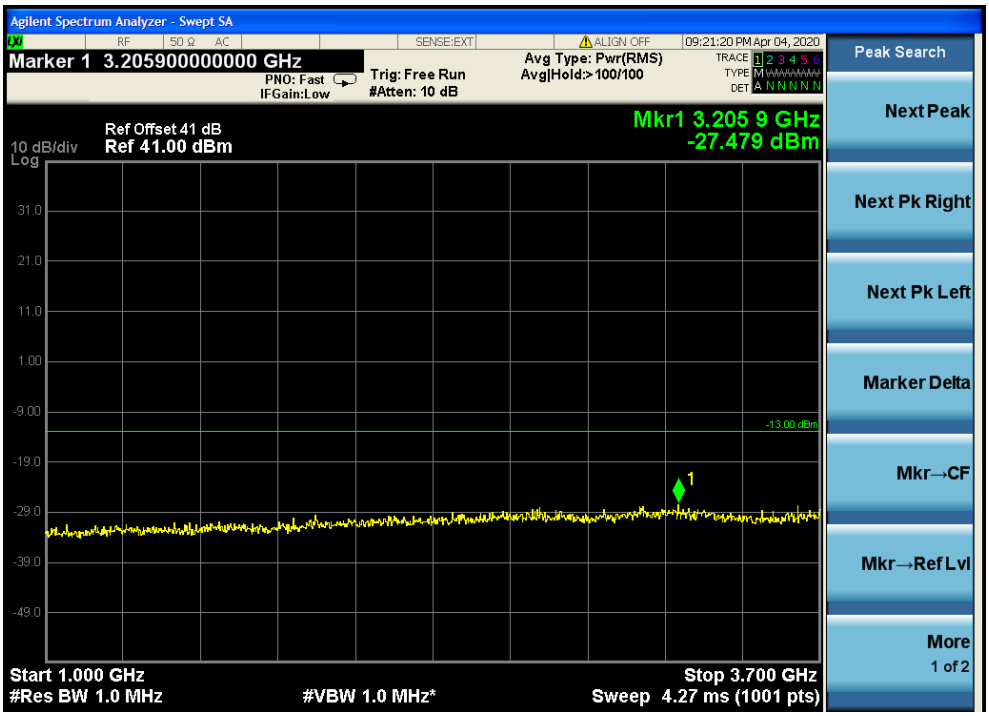


2)Middle frequency

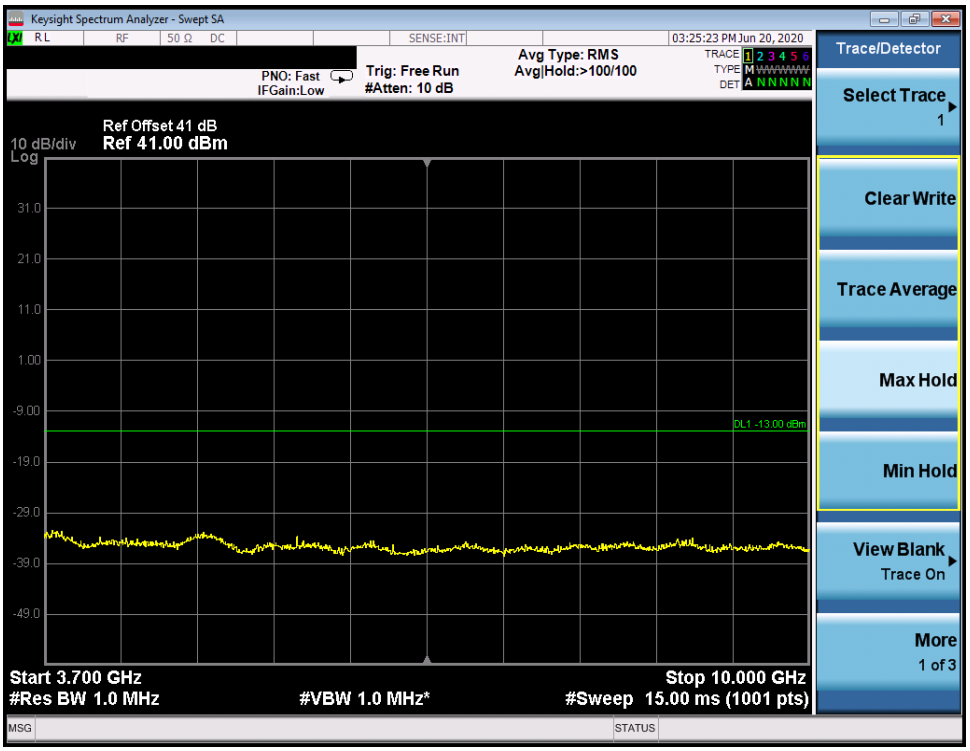
30MHz to 1GHz



1GHz to 3.7GHz

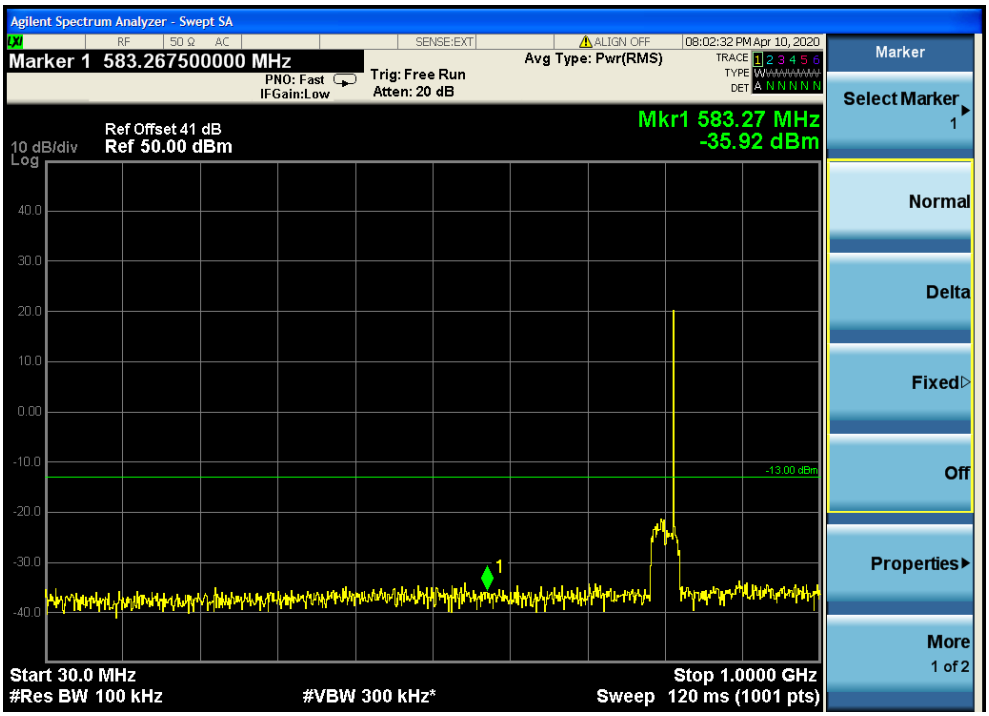


3.7GHz to 10GHz:

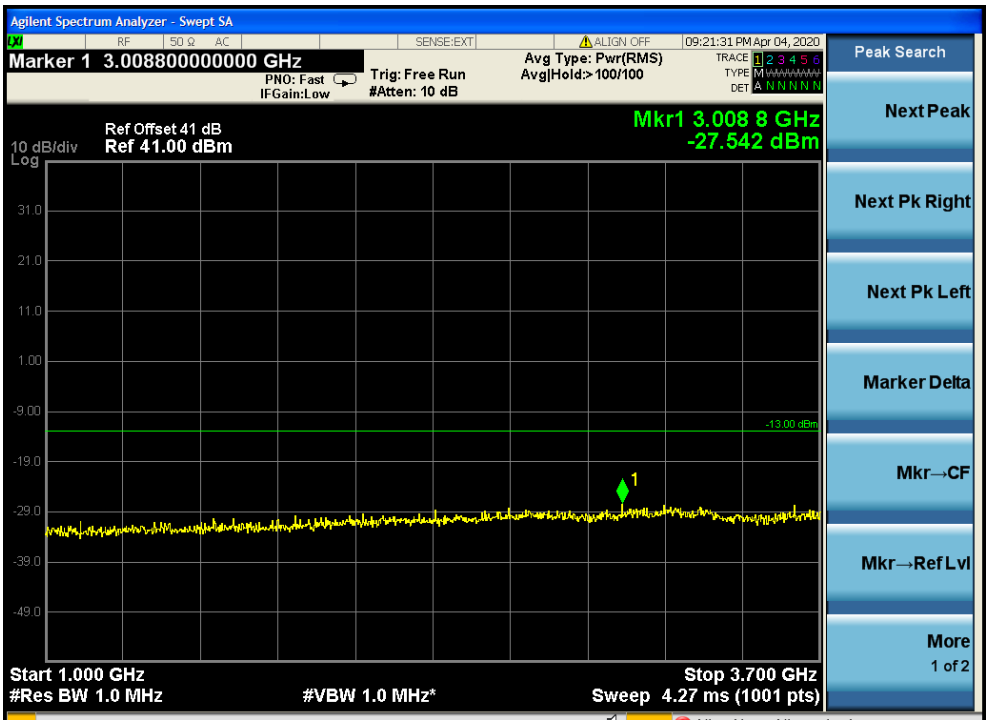


3)highest frequency

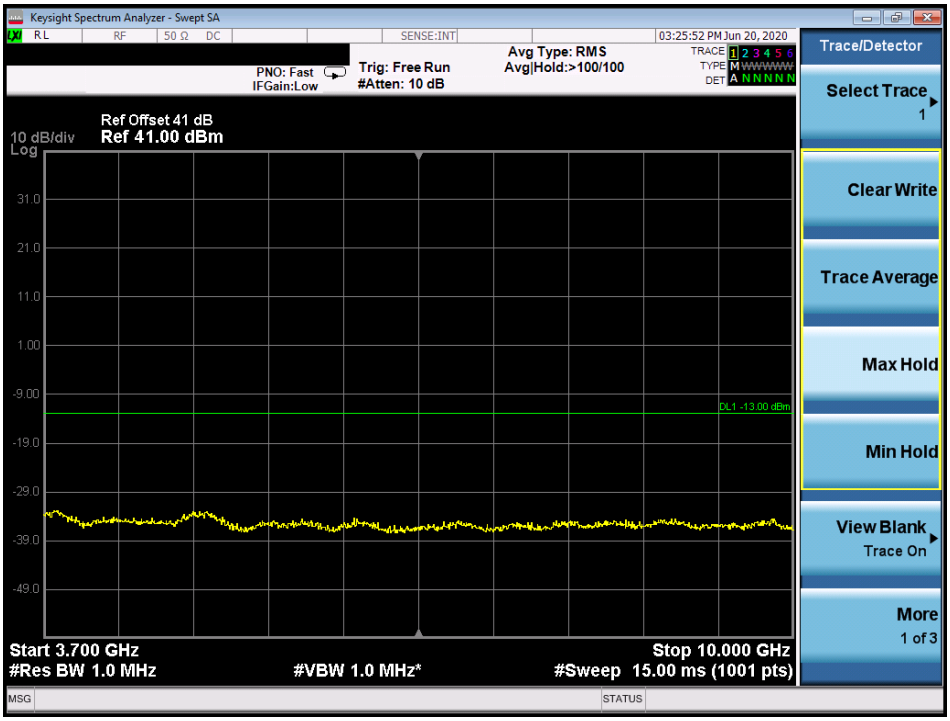
30MHz to 1GHz



1GHz to 3.7GHz



3.7GHz to 10GHz :



For C4FM mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-24.19	-13.0	-11.19
3.7GHz to 10GHz	RBW=1MHz	-23.20	-13.0	-10.2

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.42	-13.0	-15.42
1GHz to 3.7GHz	RBW=1MHz	-23.87	-13.0	-10.87
3.7GHz to 10GHz	RBW=1MHz	-22.19	-13.0	-9.19

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.25	-13.0	-15.25

1GHz to 3.7GHz	RBW=1MHz	-23.14	-13.0	-10.14
3.7GHz to 10GHz	RBW=1MHz	-22.06	-13.0	-9.06

For HDQPSK mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.42	-13.0	-15.42
1GHz to 3.7GHz	RBW=1MHz	-23.25	-13.0	-10.25
3.7GHz to 10GHz	RBW=1MHz	-22.81	-13.0	-9.81

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.36	-13.0	-15.36
1GHz to 3.7GHz	RBW=1MHz	-23.49	-13.0	-10.49
3.7GHz to 10GHz	RBW=1MHz	-22.97	-13.0	-9.97

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.72	-13.0	-15.63
1GHz to 3.7GHz	RBW=1MHz	-23.16	-13.0	-11.15
3.7GHz to 10GHz	RBW=1MHz	-24.83	-13.0	-12.12

For FM(12.5k) mode:

1) lowest frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.73	-13.0	-15.73
1GHz to 3.7GHz	RBW=1MHz	-24.56	-13.0	-11.56
3.7GHz to 10GHz	RBW=1MHz	-23.29	-13.0	-10.29

2) Middle frequency:

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-27.48	-13.0	-14.48
1GHz to 3.7GHz	RBW=1MHz	-24.16	-13.0	-11.16
3.7GHz to 10GHz	RBW=1MHz	-23.74	-13.0	-10.74

3) highest frequency

Measurement Record:

Frequency range	Measurement bandwidth	Spurious Emission Level(dBm)	Limit(dBm)	Over Limit(dB)
30MHz to 1GHz	RBW=100KHz	-28.15	-13.0	-15.15
1GHz to 3.7GHz	RBW=1MHz	-24.06	-13.0	-11.06
3.7GHz to 10GHz	RBW=1MHz	-23.69	-13.0	-10.69

6.1.4 Emission Mask

Test Requirement: FCC part 90.210
90.210,table"Application Emission Mask"

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
Below 25[1]	A or B	A or C
25-50	B	C
72-76	B	C
150-174[2]	B, D, or E	C, D or E
150 paging only	B	C
220-222	F	F
421-512[2 5]	B, D, or E	C, D, or E
450 paging only	B	G
806-809/851-854[6]	B	H
809-824/854-869[35]	B, D	D, G.
896-901/935-940	I	J
902-928	K	K
929-930	B	G
4940-4990 MHz	L or M	L or M
5850-5925[4]		
All other bands	B	C

The equipment with audio low passfielter, follow Marsk ware tested.

Frequency band	Marsk
806-809/851-854	B
809-824/854-869	B or G for 25K bandwidth D for 12.5K bandwidth
All other bands	B

Equipment designed to operate on 25 kilohertz bandwidth channels must meet the requirements of either Emission Mask B or G, whichever is applicable, while equipment designed to operate on 12.5 kilohertz bandwidth channels must meet the requirements of Emission Mask D. Equipment designed to operate on 25 kilohertz bandwidth channels may alternatively meet the Adjacent Channel Power limits of §90.221.

MASK B:

(b) *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.

(c) *Emission Mask C.* For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (f_d/5) dB;

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least 29 log (f_d^2/11) dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

MASK D:

(d) *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 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.

MASK G:

(g) *Emission Mask G.* For transmitters that are not 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 center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but no more than 250 percent of the authorized bandwidth: At least 116 log (f_d/6.1) dB, or 50 + 10 log (P) dB, or 70 dB, whichever is the lesser attenuation;

(2) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

MASK B:

C4FM Modulation:

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
C4FM Modulation: Channel bandwidth 12.5kHz, authorized bandwidth 8kHz with audio low pass filter.	
0~4.0	0 dB
4.0~8.0	25.0dB
8.0~20.0	35.0dB
More than 20.0	43+10logP(W) dB

HDQPSK Modulation:

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
HDQPSK Modulation: Channel bandwidth 12.5kHz, authorized bandwidth 10kHz with audio low pass filter.	
0~5.0	0 dB
5.0~10.0	25.0 dB
10.0~25.0	35.0 dB
More than 25.0	43+10logP(W) dB

FM (for 12.5kHz) :

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
FM Modulation: Channel bandwidth 12.5kHz, authorized bandwidth11.3kHz with audio low pass filter.	
0~5.65	0 dB
5.65~11.3	25.0 dB
11.3~28.25	35.0 dB
More than 28.25	43+10logP(W) dB

FM (for 25kHz) :

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
FM Modulation: Channel bandwidth 25kHz, authorized bandwidth 16kHz with audio low pass filter.	
0~8.0	0 dB
8.0~16.0	25.0 dB
16.0~40.0	35.0 dB
More than 40.0	43+10logP(W) dB

MASK D (Only for 12.5kHz):

C4FM Modulation:

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
C4FM Modulation: Channel bandwidth 12.5kHz, authorized bandwidth 8kHz with audio low pass filter.	
0~5.625	0 dB
5.625~12.5	$7.27(f_d - 2.88\ \text{kHz})$ dB
More than 12.5	50+10logP(W) dB or 70dB

MASK G(ONLY for 809MHz-824MHz/854-869MHz):
FM (for 25kHz) :

Frequcy displacement from carrier(kHz)	Attenuation below carrier:
FM Modulation: Channel bandwidth 25kHz, authorized bandwidth 16kHz with audio low pass filter.	
0~10.0	0 dB
10.0~40.0	$116 \log (f_d/6.1)$ dB or $50 + 10 \log (P)$ dB or 70 dB
More than 40.0	43+10logP(W) dB

Test Method: FCC part 2.1051

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

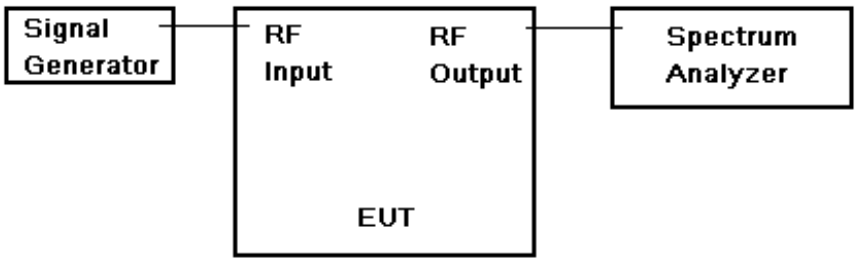
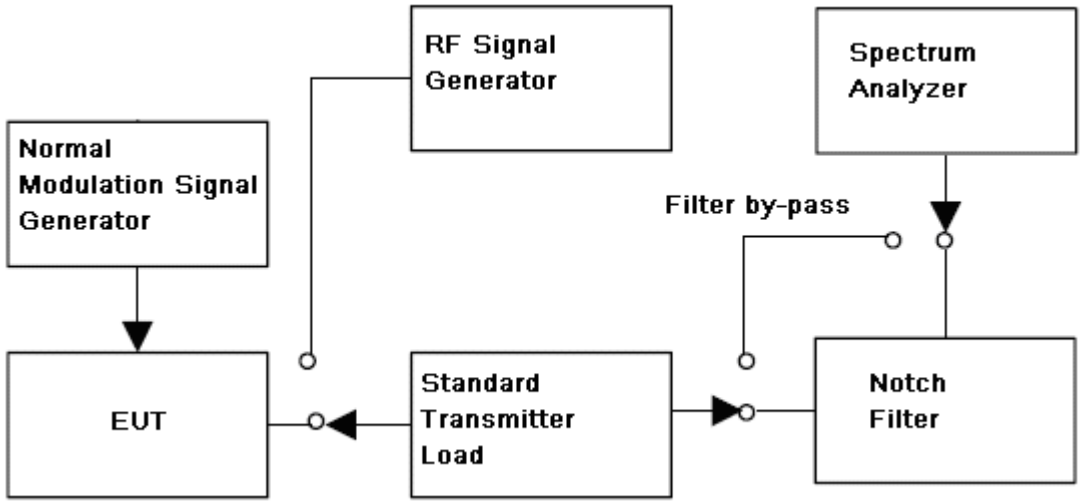


Fig.2. Conducted Spurious Emissions test configuration



Test Procedure:

Conducted Emissions test procedure:

a) Connect the equipment as illustrated, with the notch filter by-passed, when the output power is over the max value of the Spectrum Analyzer, add the attenuator to avoid destroying the facility.

b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.

c) do not apply any tone to modulate the EUT.

d) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth,(base the standard, apply the different set),her is 100KHz for frequency band less than 1GHz, 1MHz for frequency over 1GHz;

2) Video Bandwidth refer to standard requirement.

e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:

1) the lowest radio frequency generated in the equipment, it can be 9KHz base the test method, here select 30MHz as lowest frequency start point;

2) the highest radion frequency shall higher than 10 times of carrier frequency;

f) Record the frequencies and levels of spurious emissions from step e)

Remark:

The notch filter is used for avoid the EUT fundamental carrier output power making the spectrum overload and the harmonic spurious brought by it.

When the EUT fundamental carrier is not enough to make the status, the notch filter could be not used.

6.1.4.1 Measurement Record:

800MHz Band : Downlink: 851MHz ~ 862MHz (851MHz-854MHz,854-862MHz),
Perfrom the test on lowest channel / middle channel /highest channel, the middle channel with higher margin Than lowest or Highest channel. Only report the worse channel lowest and channel highest.

Center frequency (MHz)	Modulation type	Limit Mask type	Result
852.5MHz	C4FM	B	Pass
	HDQPSK	B	Pass
	FM (12.5KHz)	B	Pass
	FM(25KHz)	B	Pass

Center frequency (MHz)	Modulation type	Limit Mask type	Result
861.5MHz	C4FM	D	Pass
	HDQPSK	D	Pass
	FM (12.5KHz)	D	Pass
	FM(25KHz)	B	Pass

800MHz Band : Uplink: 806-817MHz (806MHz-809MHz,809-817MHz)

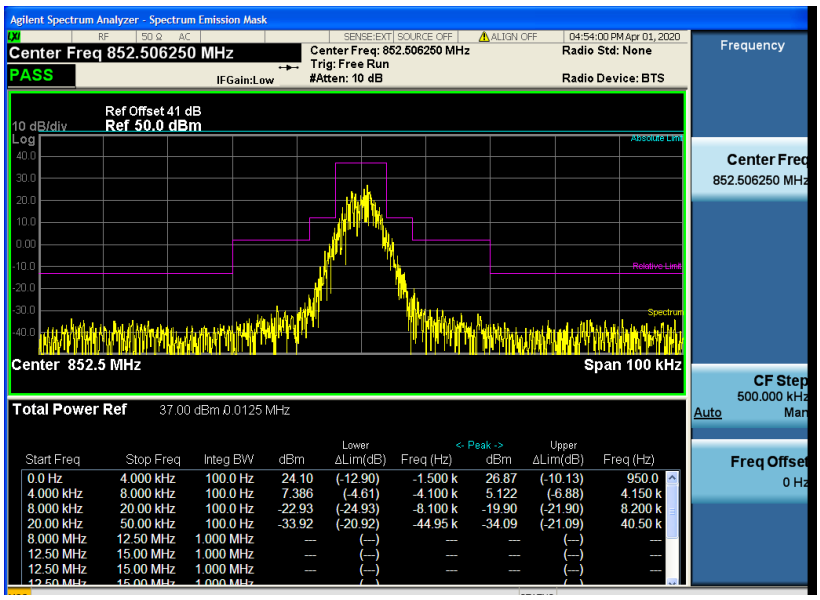
Center frequency (MHz)	Modulation type	Limit Mask type	Result
807.5MHz	C4FM	B	Pass
	HDQPSK	B	Pass
	FM (12.5KHz)	B	Pass
	FM(25KHz)	B	Pass

Center frequency (MHz)	Modulation type	Limit Mask type	Result
816.5MHz	C4FM	D	Pass
	HDQPSK	D	Pass
	FM (12.5KHz)	D	Pass
	FM(25KHz)	B	Pass

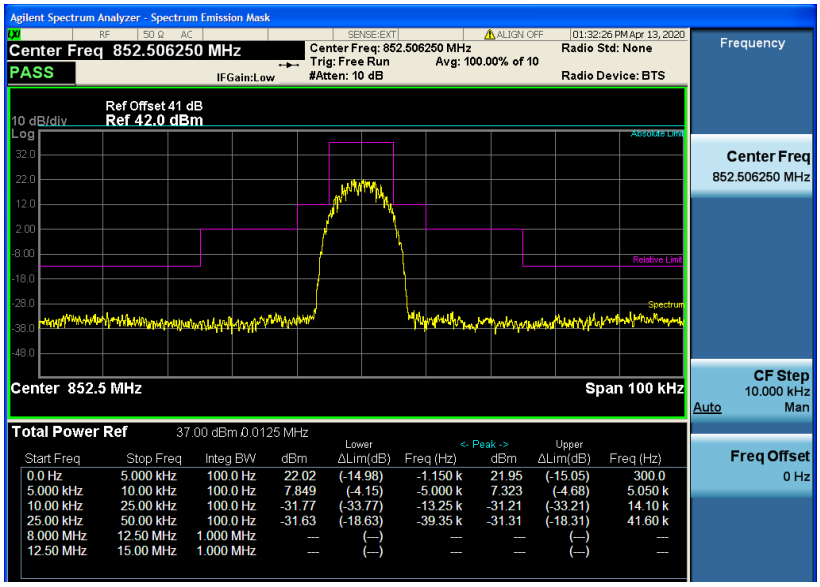
Class A model number:

Test plot: 800MHz Band : Downlink: 851MHz ~ 862MHz lowest channel :

C4FM

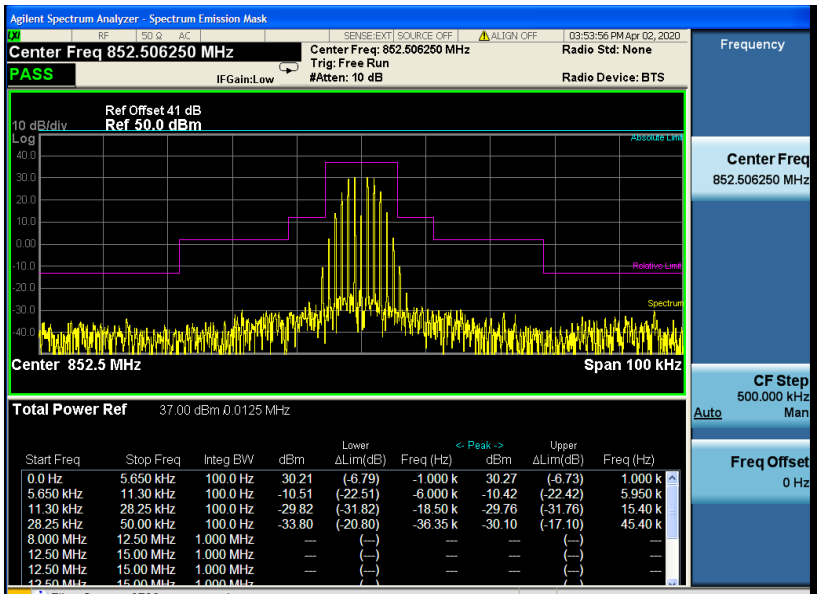


HDQPSK



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.000 kHz	100.0 Hz	22.02	(-14.98)	-1.150 k	21.95	(-15.05)	300.0
5.000 kHz	10.00 kHz	100.0 Hz	7.849	(-4.15)	-5.000 k	7.323	(-4.68)	5.050 k
10.00 kHz	25.00 kHz	100.0 Hz	-31.77	(-33.77)	-13.25 k	-31.21	(-33.21)	14.10 k
25.00 kHz	50.00 kHz	100.0 Hz	-31.63	(-18.63)	-39.35 k	-31.31	(-18.31)	41.60 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM (12.5KHz)



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.650 kHz	100.0 Hz	30.21	(-6.79)	-1.000 k	30.27	(-6.73)	1.000 k
5.650 kHz	11.30 kHz	100.0 Hz	-10.51	(-22.51)	-6.000 k	-10.42	(-22.42)	5.950 k
11.30 kHz	28.25 kHz	100.0 Hz	-29.82	(-31.82)	-18.50 k	-29.76	(-31.76)	15.40 k
28.25 kHz	50.00 kHz	100.0 Hz	-33.80	(-20.80)	-36.35 k	-30.10	(-17.10)	45.40 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

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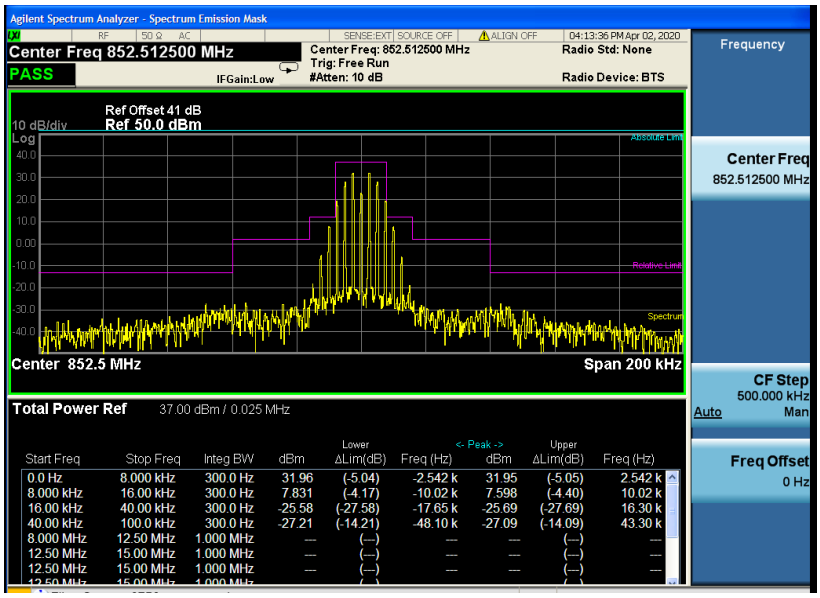
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

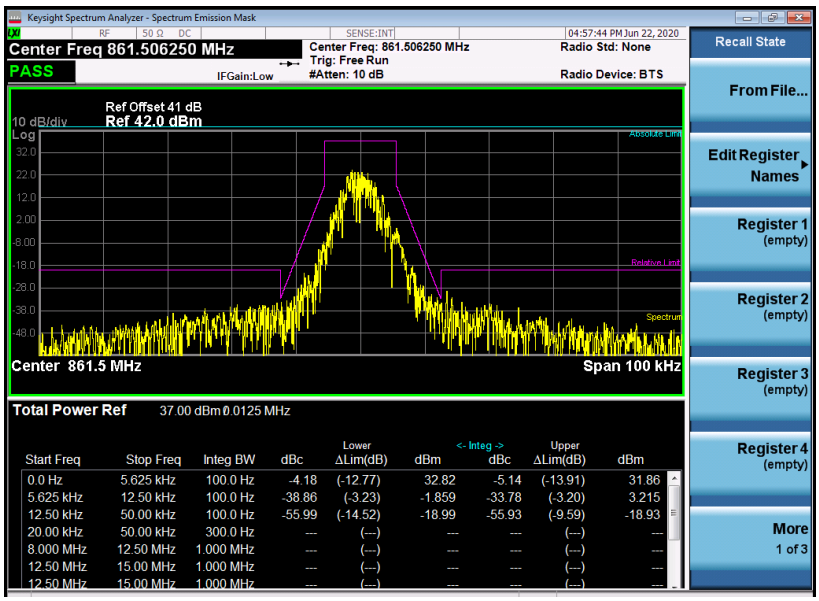
FM (25KHz)



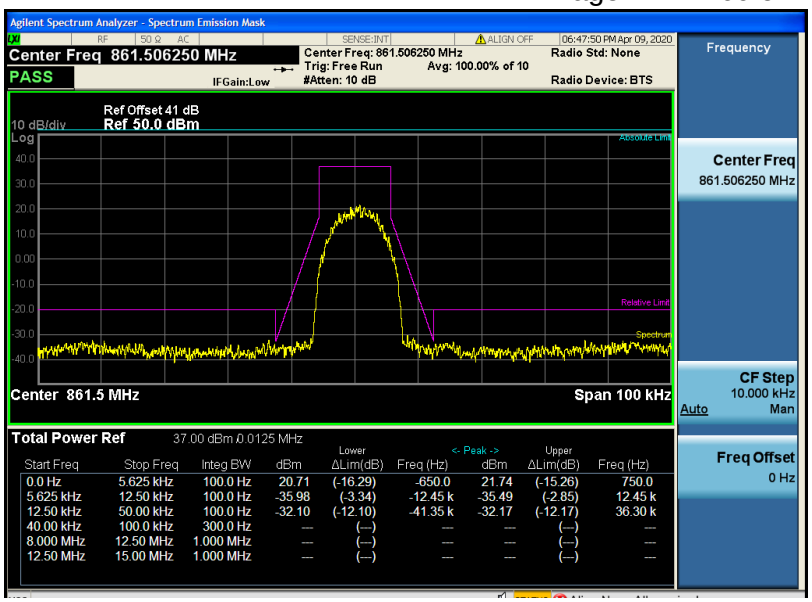
Test plot: 800MHz Band : Downlink: 851MHz ~ 862MHz Highest channel :

C4FM

MASK D:

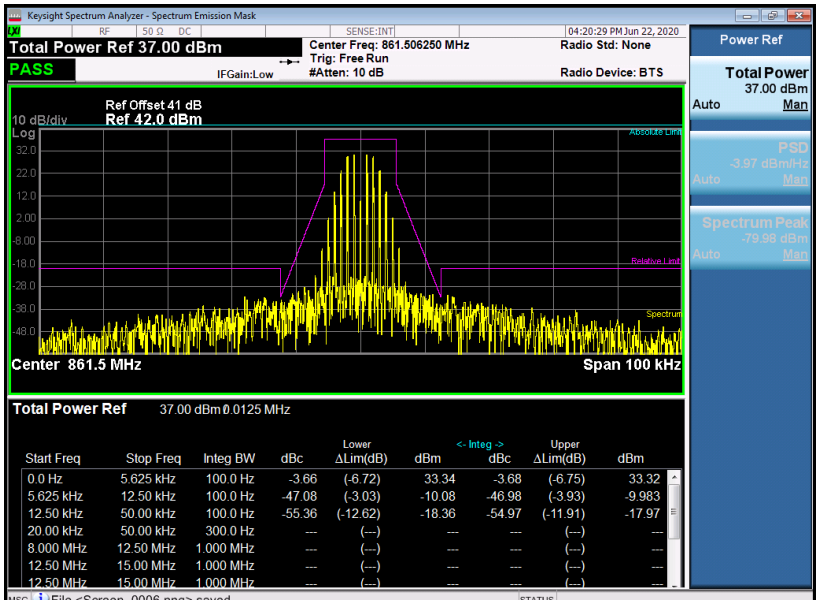


HDQPSK

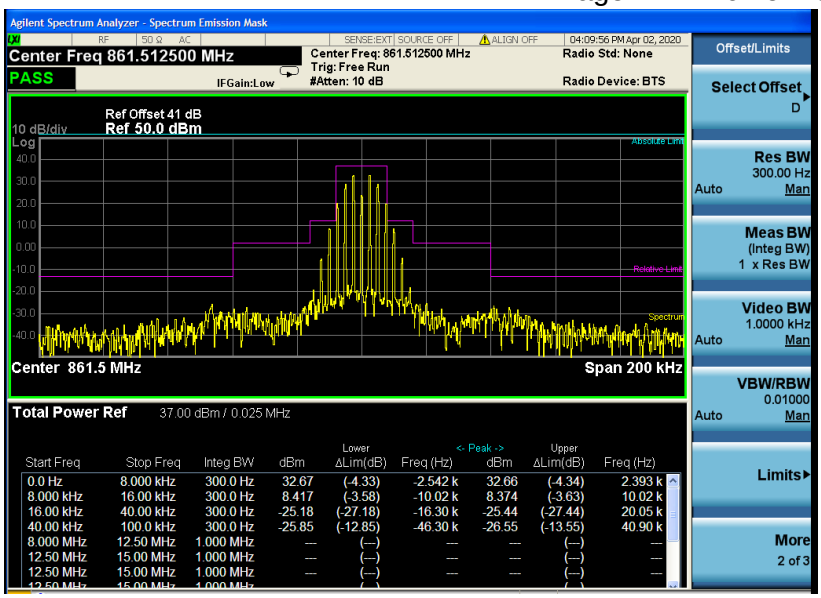


FM (12.5KHz)

Mask D:

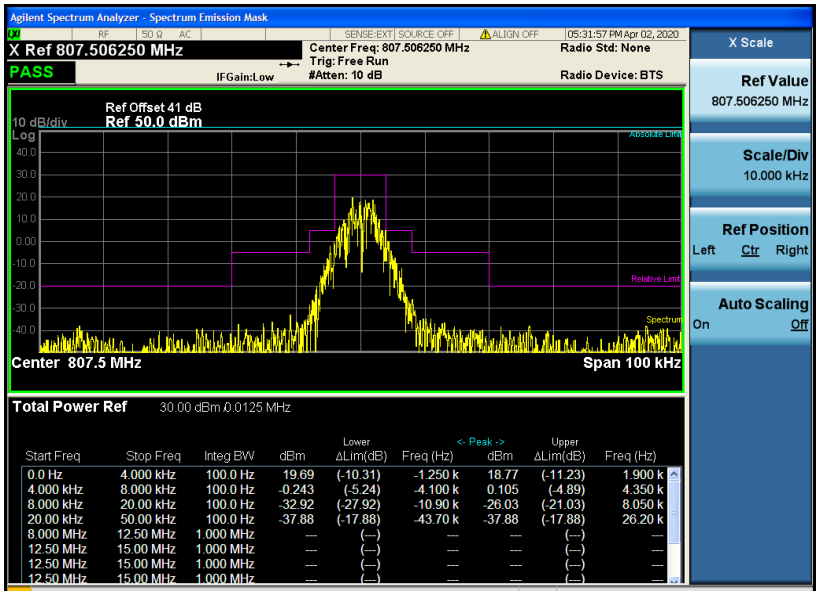


FM (25KHz)

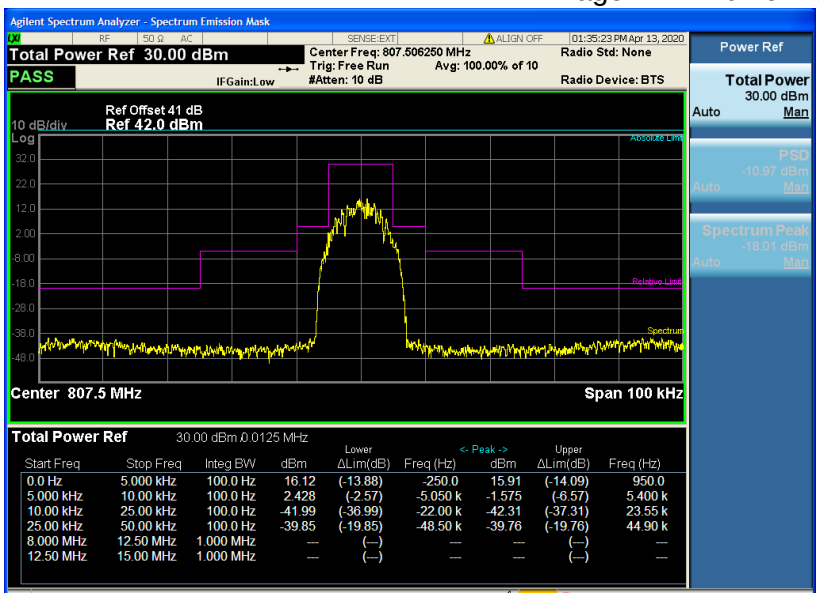


Test plot 800MHz Band : Uplink: 806-817MHz (806MHz-809MHz) lowest channel :

C4FM

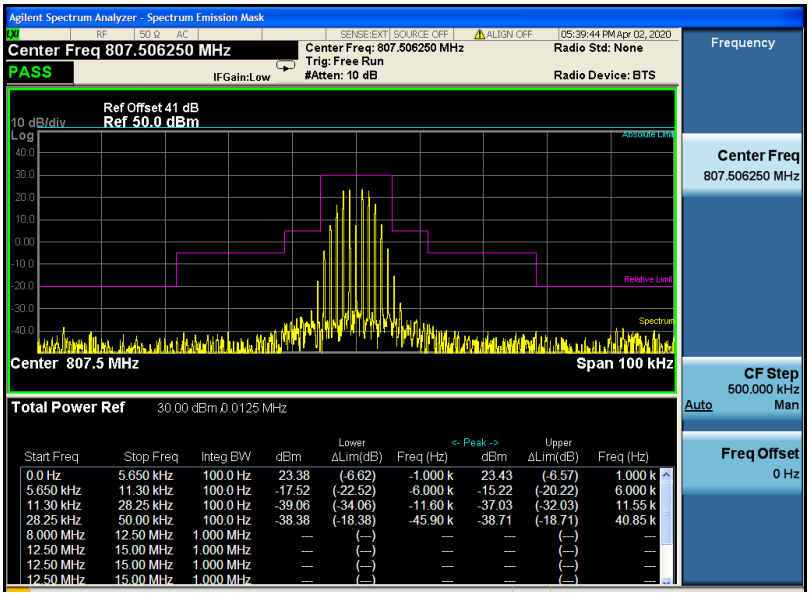


HDQPSK



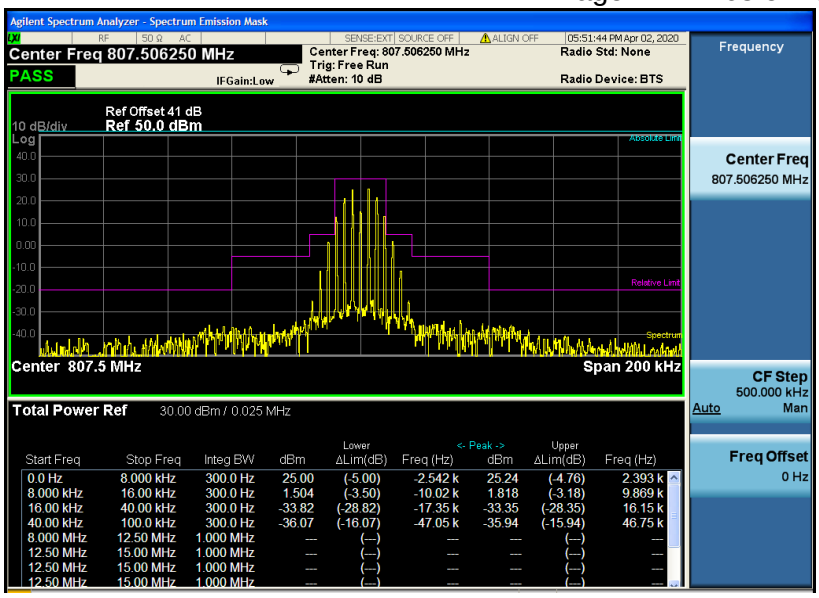
Total Power Ref 30.00 dBm 0.0125 MHz									
				Lower		<- Peak ->		Upper	
Start Freq	Stop Freq	Integ BW	dBm	ΔLim(dB)	Freq (Hz)	dBm	ΔLim(dB)	Freq (Hz)
0.0 Hz	5.000 kHz	100.0 Hz	16.12	(-13.88)	-250.0	15.91	(-14.09)	950.0
5.000 kHz	10.00 kHz	100.0 Hz	2.428	(-2.57)	-5.050 k	-1.575	(-6.57)	5.400 k
10.00 kHz	25.00 kHz	100.0 Hz	-41.99	(-36.99)	-22.00 k	-42.31	(-37.31)	23.55 k
25.00 kHz	50.00 kHz	100.0 Hz	-39.85	(-19.85)	-48.50 k	-39.76	(-19.76)	44.90 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM 12.5KHz



Total Power Ref 30.00 dBm 0.0125 MHz									
				Lower		<- Peak ->		Upper	
Start Freq	Stop Freq	Integ BW	dBm	ΔLim(dB)	Freq (Hz)	dBm	ΔLim(dB)	Freq (Hz)
0.0 Hz	5.650 kHz	100.0 Hz	23.38	(-6.62)	-1.000 k	23.43	(-6.57)	1.000 k
5.650 kHz	11.30 kHz	100.0 Hz	-17.52	(-22.52)	-6.000 k	-15.22	(-20.22)	6.000 k
11.30 kHz	28.25 kHz	100.0 Hz	-39.06	(-34.06)	-11.60 k	-37.03	(-32.03)	11.55 k
28.25 kHz	50.00 kHz	100.0 Hz	-38.38	(-18.38)	-45.90 k	-38.71	(-18.71)	40.85 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

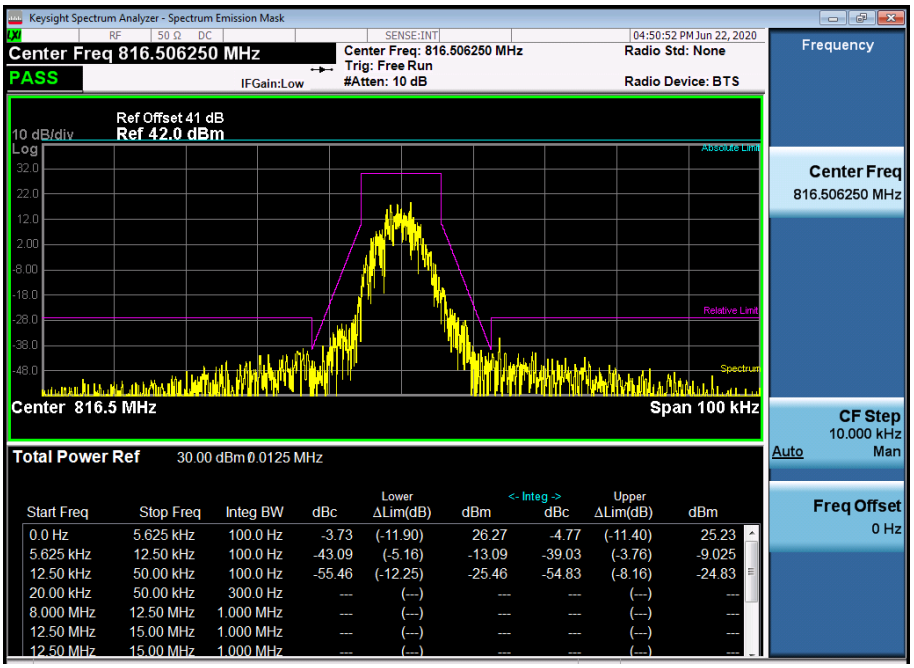
FM 25KHz



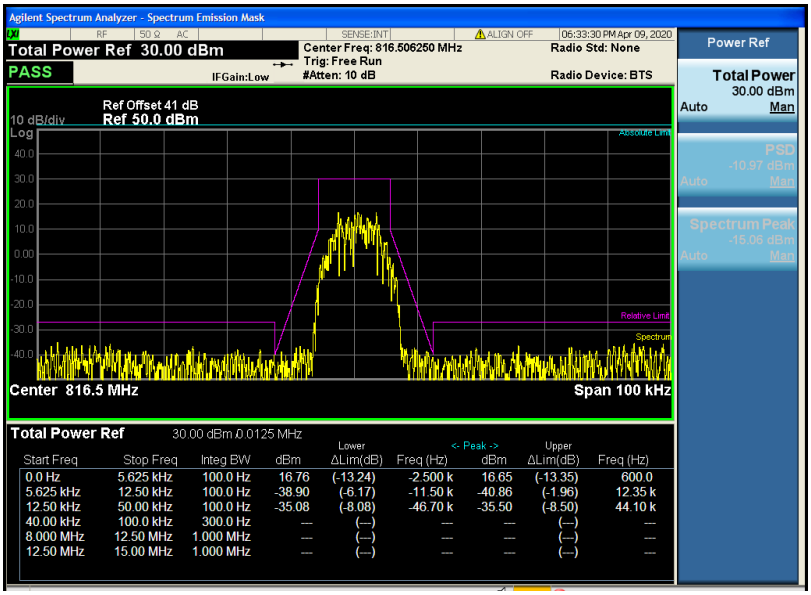
Test plot 800MHz Band : Uplink: 806-817MHz highest channel :

C4FM

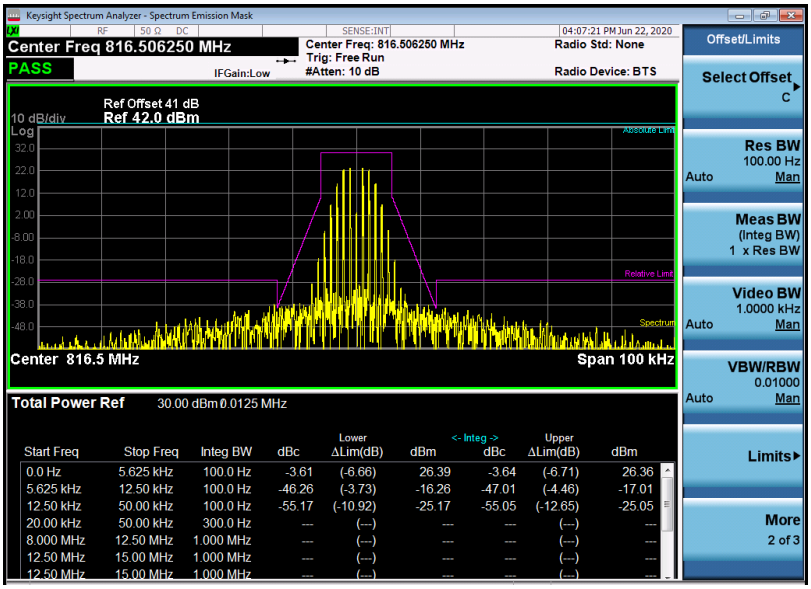
MASK D:



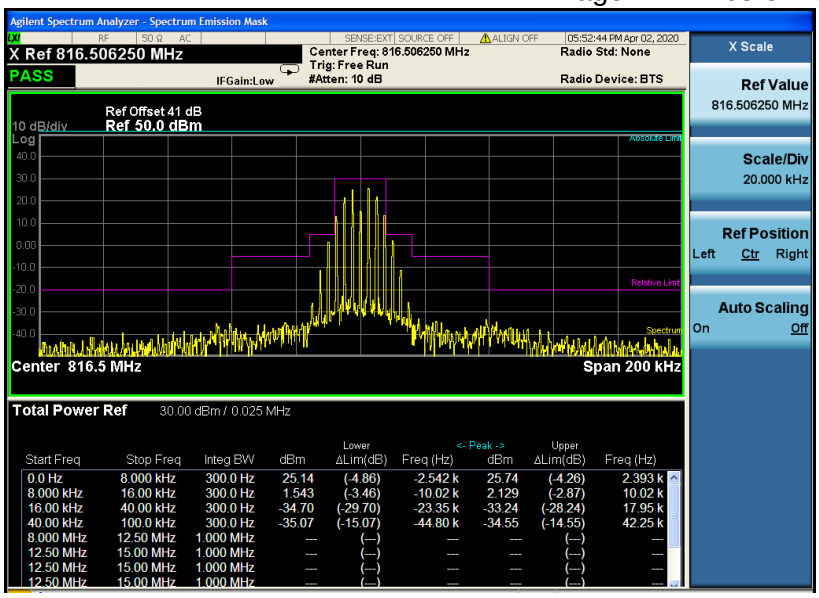
HDQPSK



FM 12.5KHz



FM (25KHz)

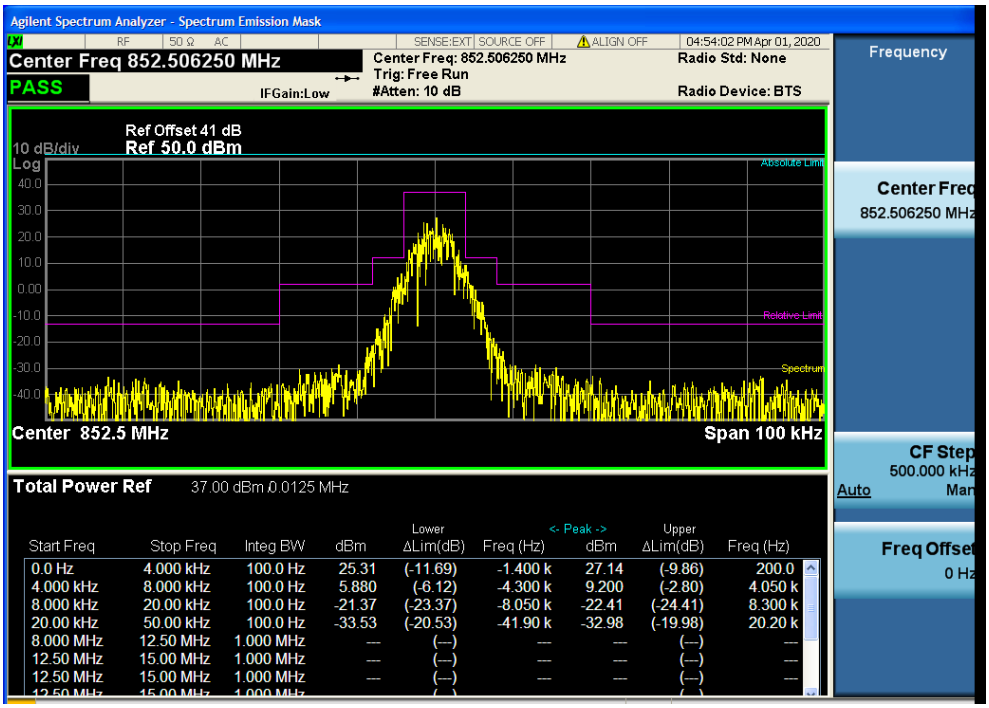


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	8.000 kHz	300.0 Hz	25.14	(-4.86)	-2.542 k	25.74	(-4.26)	2.393 k
8.000 kHz	16.00 kHz	300.0 Hz	1.543	(-3.46)	-10.02 k	2.129	(-2.87)	10.02 k
16.00 kHz	40.00 kHz	300.0 Hz	-34.70	(-29.70)	-23.35 k	-33.24	(-28.24)	17.95 k
40.00 kHz	100.0 kHz	300.0 Hz	-35.07	(-15.07)	-44.80 k	-34.55	(-14.55)	42.25 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Class B model number:

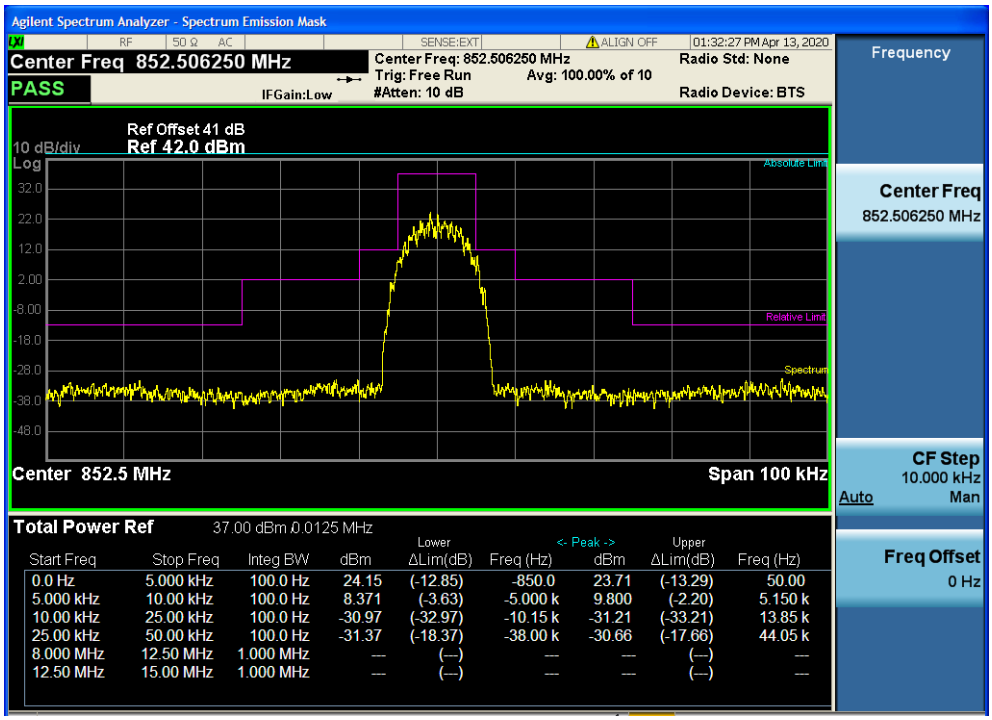
Test plot: 800MHz Band : Downlink: 851MHz ~ 862MHz lowest channel :

C4FM



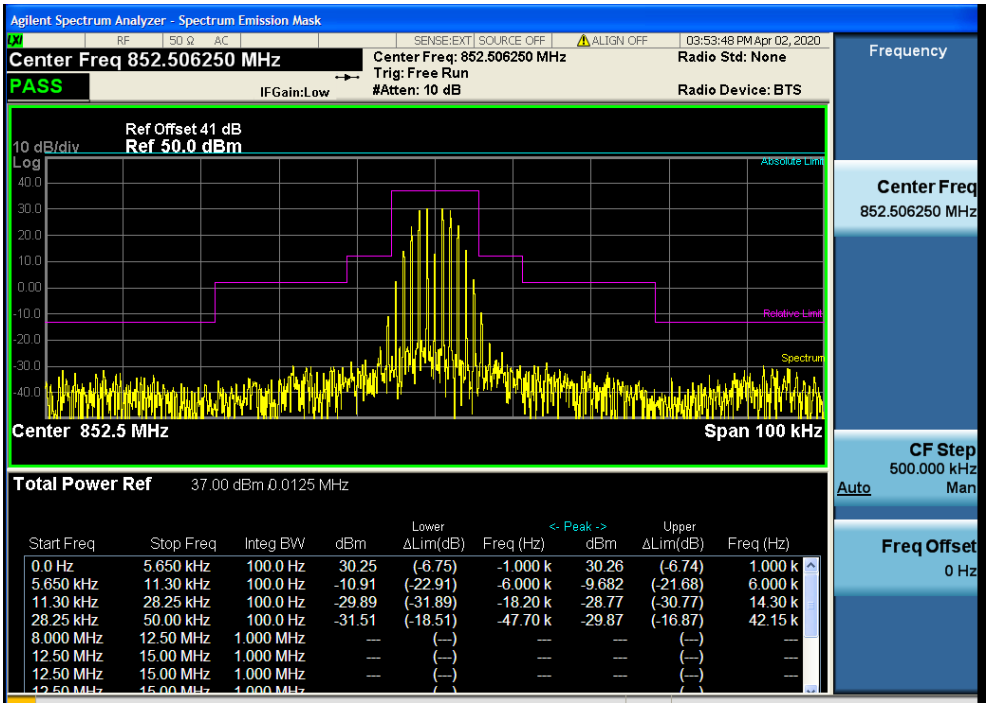
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	4.000 kHz	100.0 Hz	25.31	(-11.69)	-1.400 k	27.14	(-9.86)	200.0
4.000 kHz	8.000 kHz	100.0 Hz	5.880	(-6.12)	-4.300 k	9.200	(-2.80)	4.050 k
8.000 kHz	20.00 kHz	100.0 Hz	-21.37	(-23.37)	-8.050 k	-22.41	(-24.41)	8.300 k
20.00 kHz	50.00 kHz	100.0 Hz	-33.53	(-20.53)	-41.90 k	-32.98	(-19.98)	20.20 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

HDQPSK



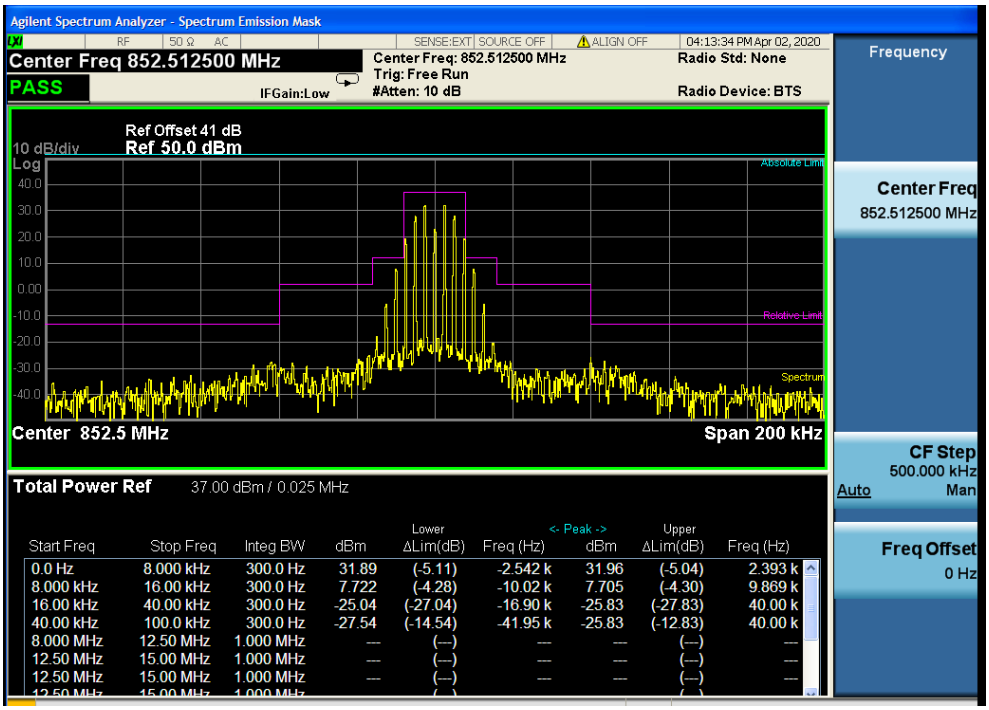
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.000 kHz	100.0 Hz	24.15	(-12.85)	-850.0	23.71	(-13.29)	50.00
5.000 kHz	10.00 kHz	100.0 Hz	8.371	(-3.63)	-5.000 k	9.800	(-2.20)	5.150 k
10.00 kHz	25.00 kHz	100.0 Hz	-30.97	(-32.97)	-10.15 k	-31.21	(-33.21)	13.85 k
25.00 kHz	50.00 kHz	100.0 Hz	-31.37	(-18.37)	-38.00 k	-30.66	(-17.66)	44.05 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM (12.5KHz)



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	5.650 kHz	100.0 Hz	30.25	(-6.75)	-1.000 k	30.26	(-6.74)	1.000 k
5.650 kHz	11.30 kHz	100.0 Hz	-10.91	(-22.91)	-6.000 k	-9.682	(-21.68)	6.000 k
11.30 kHz	28.25 kHz	100.0 Hz	-29.89	(-31.89)	-18.20 k	-28.77	(-30.77)	14.30 k
28.25 kHz	50.00 kHz	100.0 Hz	-31.51	(-18.51)	-47.70 k	-29.87	(-16.87)	42.15 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM (25KHz)

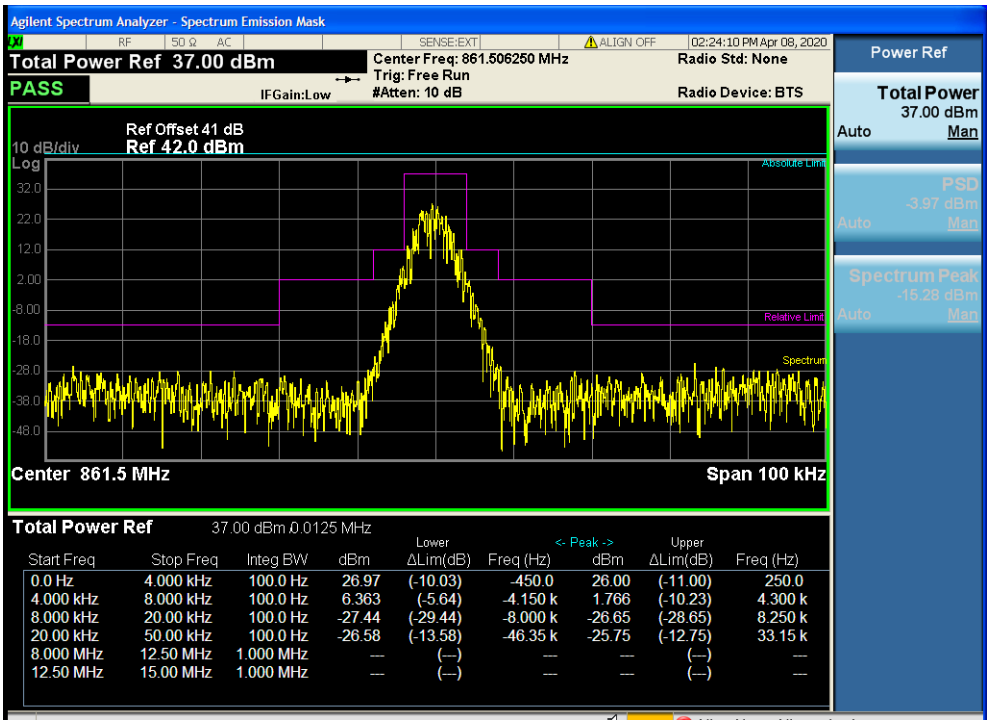


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	8.000 kHz	300.0 Hz	31.89	(-5.11)	-2.542 k	31.96	(-5.04)	2.393 k
8.000 kHz	16.00 kHz	300.0 Hz	7.722	(-4.28)	-10.02 k	7.705	(-4.30)	9.869 k
16.00 kHz	40.00 kHz	300.0 Hz	-25.04	(-27.04)	-16.90 k	-25.83	(-27.83)	40.00 k
40.00 kHz	100.0 kHz	300.0 Hz	-27.54	(-14.54)	-41.95 k	-25.83	(-12.83)	40.00 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

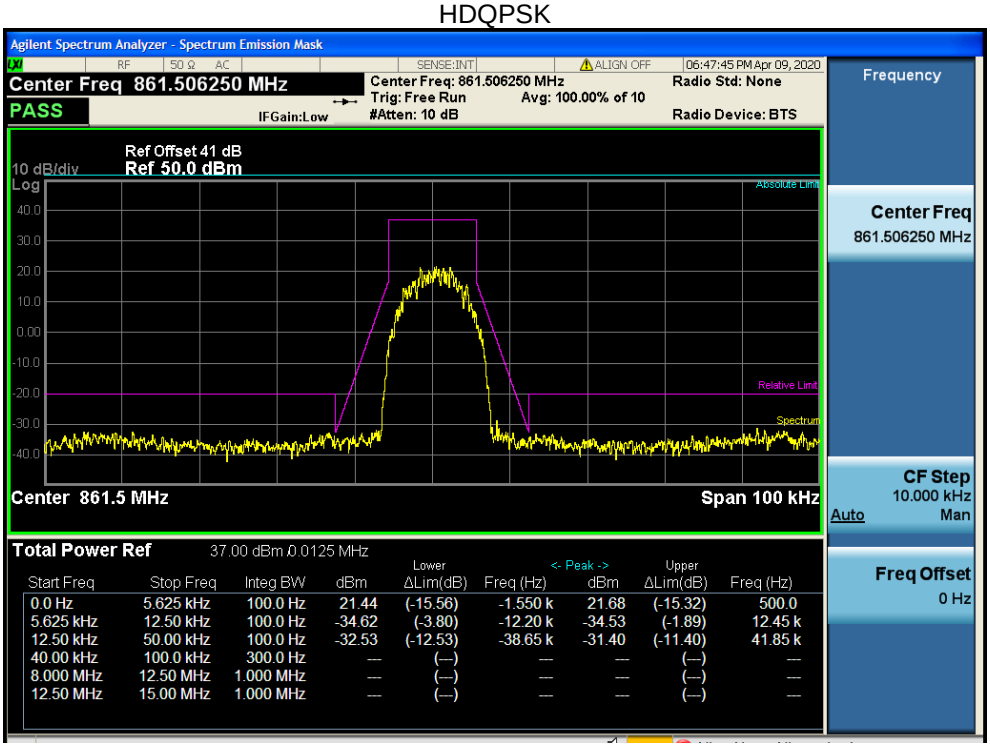
Test plot: 800MHz Band : Downlink: 851MHz ~ 862MHz highest channel .

C4FM

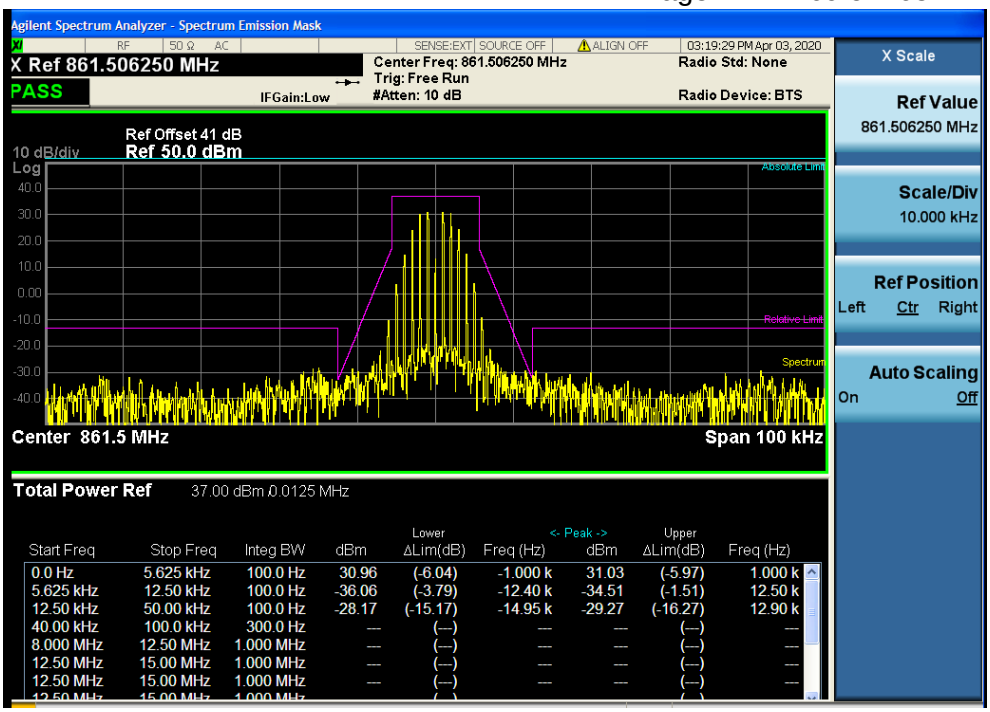
MASK D:



HDQPSK



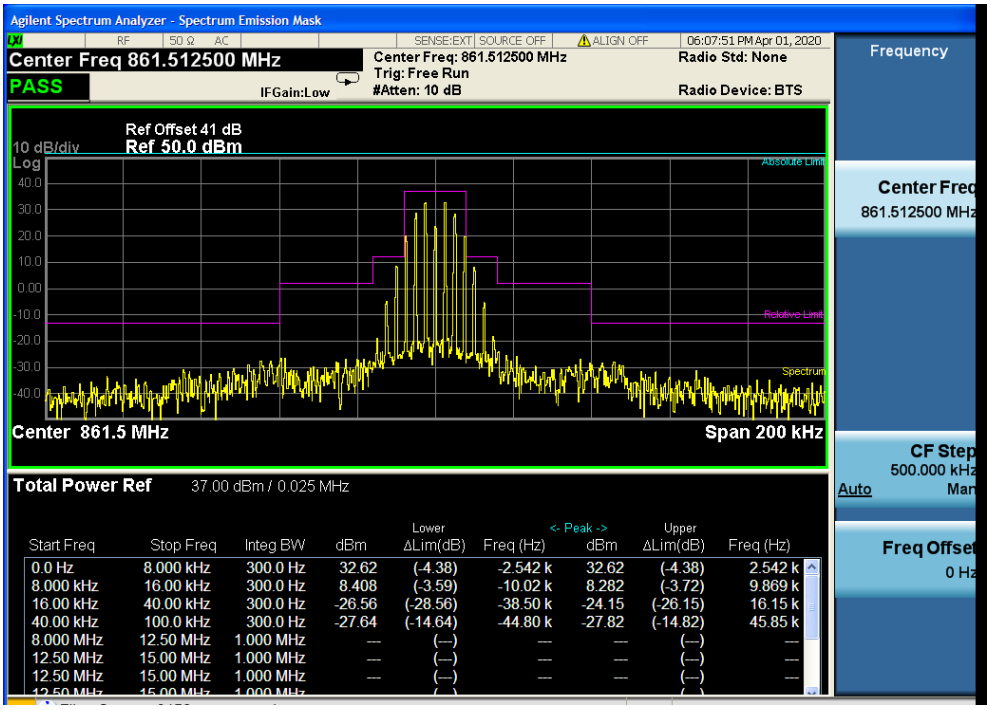
FM (12.5KHz)



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.625 kHz	100.0 Hz	30.96	(-6.04)	-1.000 k	31.03	(-5.97)	1.000 k
5.625 kHz	12.50 kHz	100.0 Hz	-36.06	(-3.79)	-12.40 k	-34.51	(-1.51)	12.50 k
12.50 kHz	50.00 kHz	100.0 Hz	-28.17	(-15.17)	-14.95 k	-29.27	(-16.27)	12.90 k
40.00 kHz	100.0 kHz	300.0 Hz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Marsk D:

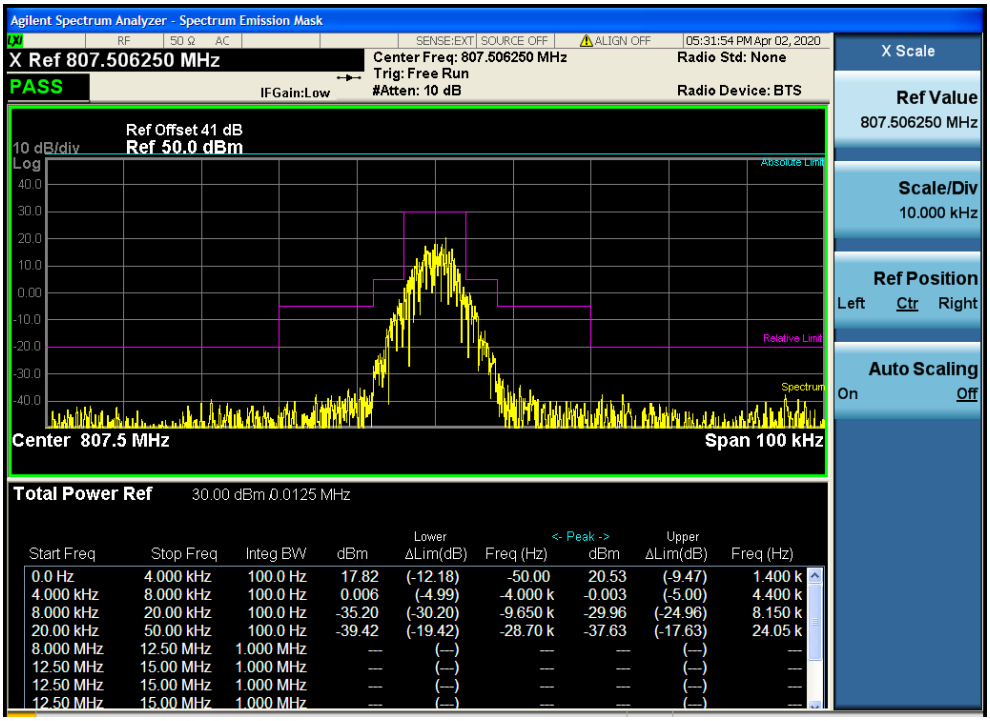
FM (25KHz)



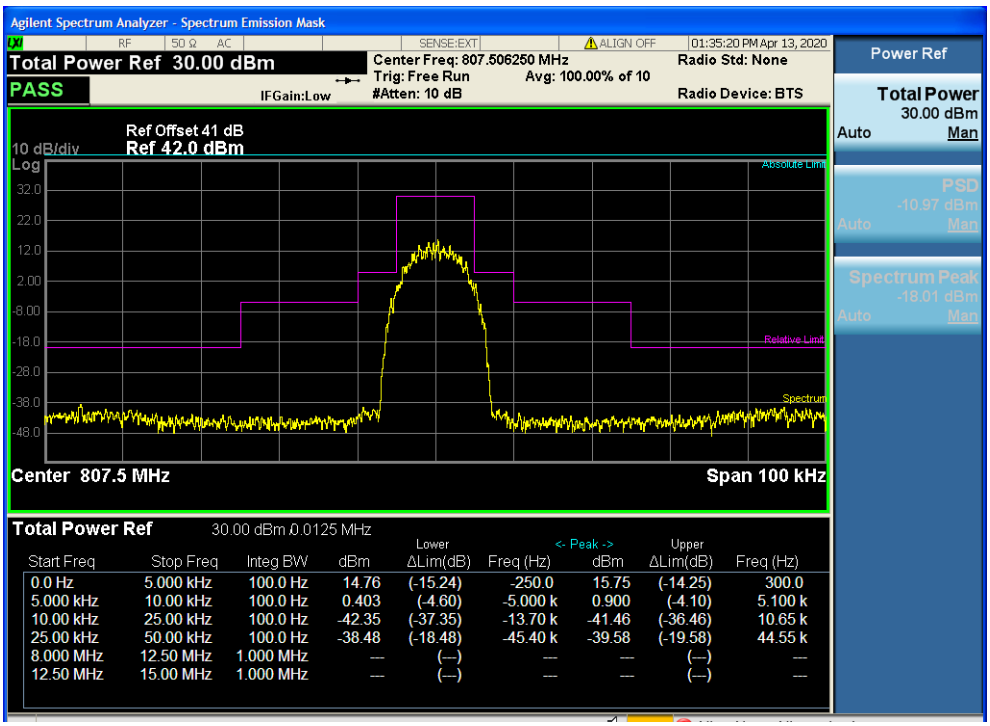
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	8.000 kHz	300.0 Hz	32.62	(-4.38)	-2.542 k	32.62	(-4.38)	2.542 k
8.000 kHz	16.00 kHz	300.0 Hz	8.408	(-3.59)	-10.02 k	8.282	(-3.72)	9.869 k
16.00 kHz	40.00 kHz	300.0 Hz	-26.56	(-28.56)	-38.50 k	-24.15	(-26.15)	16.15 k
40.00 kHz	100.0 kHz	300.0 Hz	-27.64	(-14.64)	-44.80 k	-27.82	(-14.82)	45.85 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Test plot 800MHz Band : Uplink: 806-817MHz (806MHz-809MHz) lowest channel :

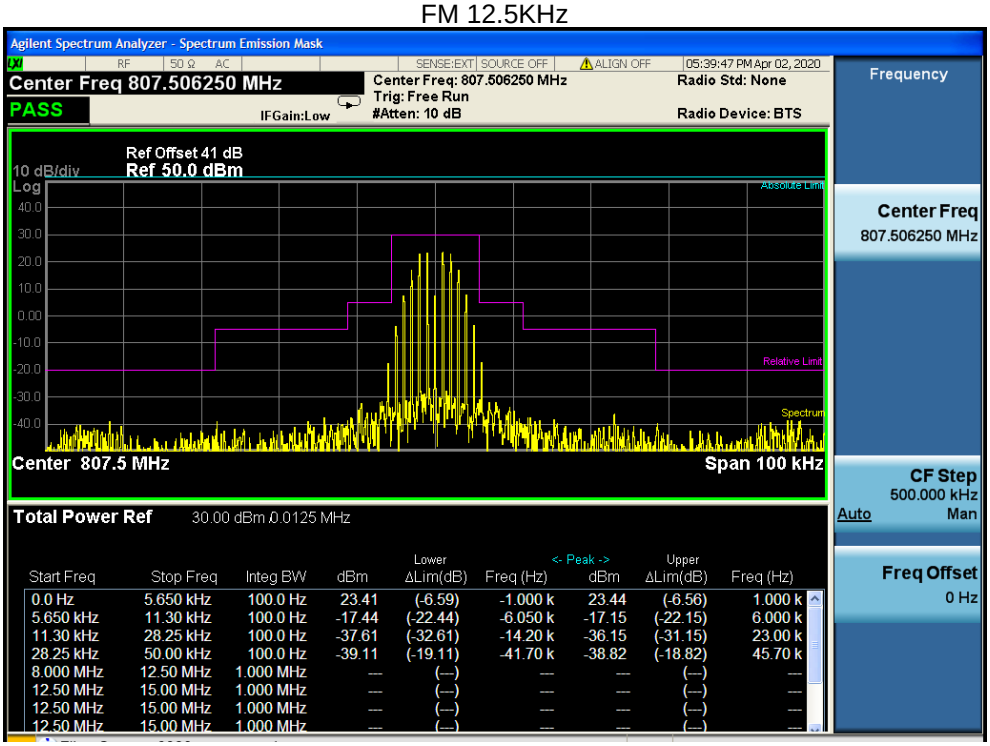
C4FM



HDQPSK

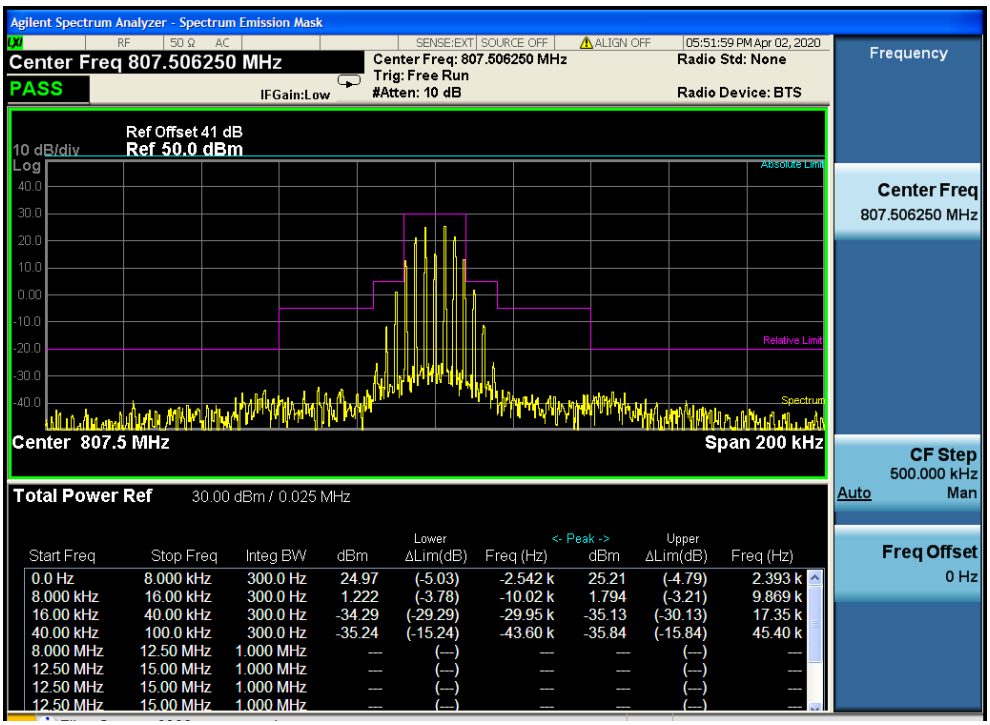


FM 12.5KHz



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.650 kHz	100.0 Hz	23.41	(-6.59)	-1.000 k	23.44	(-6.56)	1.000 k
5.650 kHz	11.30 kHz	100.0 Hz	-17.44	(-22.44)	-6.050 k	-17.15	(-22.15)	6.000 k
11.30 kHz	28.25 kHz	100.0 Hz	-37.61	(-32.61)	-14.20 k	-36.15	(-31.15)	23.00 k
28.25 kHz	50.00 kHz	100.0 Hz	-39.11	(-19.11)	-41.70 k	-38.82	(-18.82)	45.70 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM 25KHz

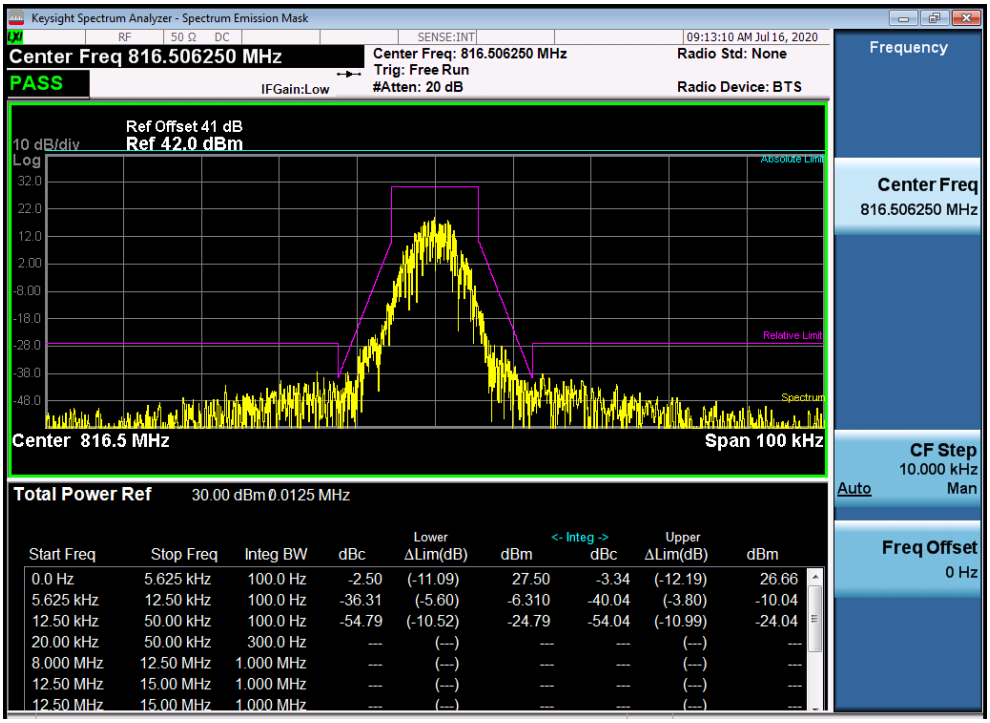


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	8.000 kHz	300.0 Hz	24.97	(-5.03)	-2.542 k	25.21	(-4.79)	2.393 k
8.000 kHz	16.00 kHz	300.0 Hz	1.222	(-3.78)	-10.02 k	1.794	(-3.21)	9.869 k
16.00 kHz	40.00 kHz	300.0 Hz	-34.29	(-29.29)	-29.95 k	-35.13	(-30.13)	17.35 k
40.00 kHz	100.0 kHz	300.0 Hz	-35.24	(-15.24)	-43.60 k	-35.84	(-15.84)	45.40 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

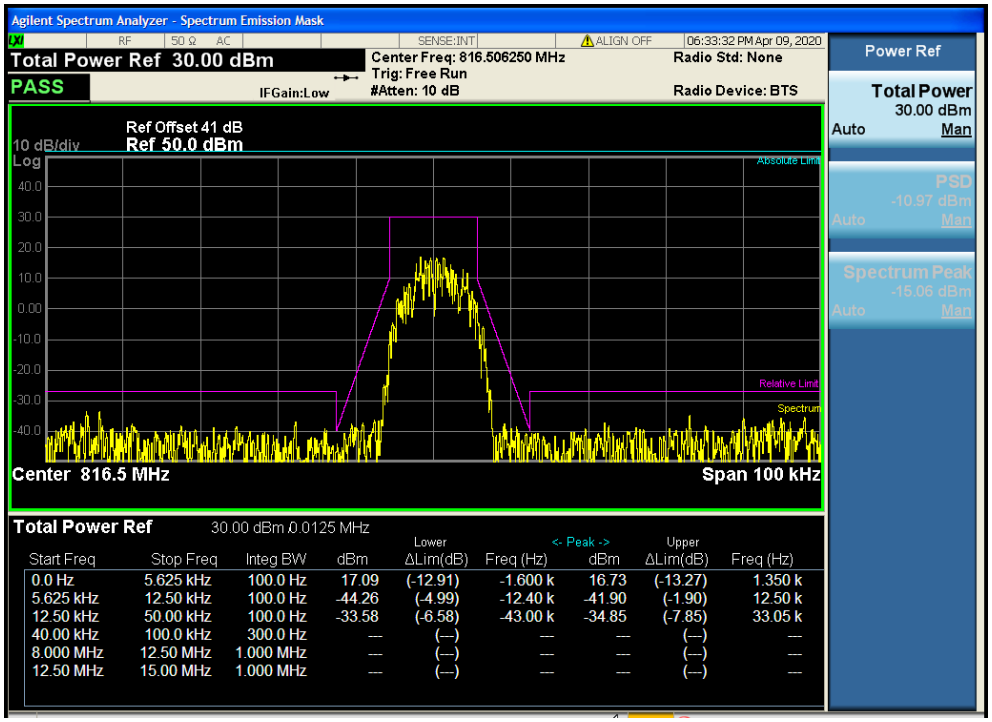
Test plot 800MHz Band : Uplink: 806-817MHz highest channel :

C4FM

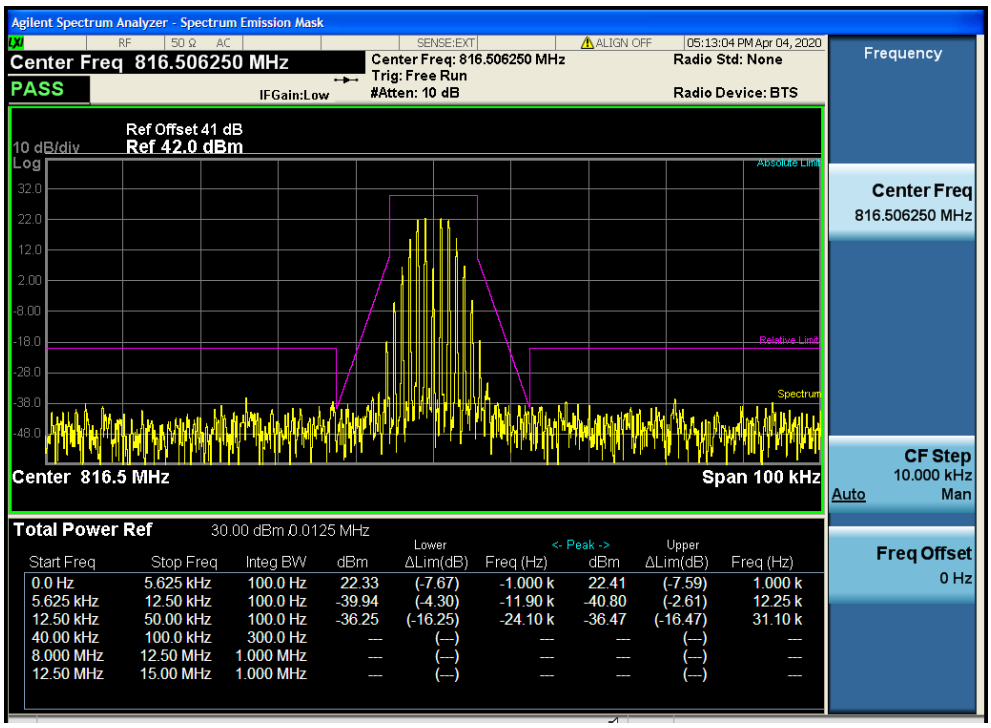
MASK D:



HDQPSK

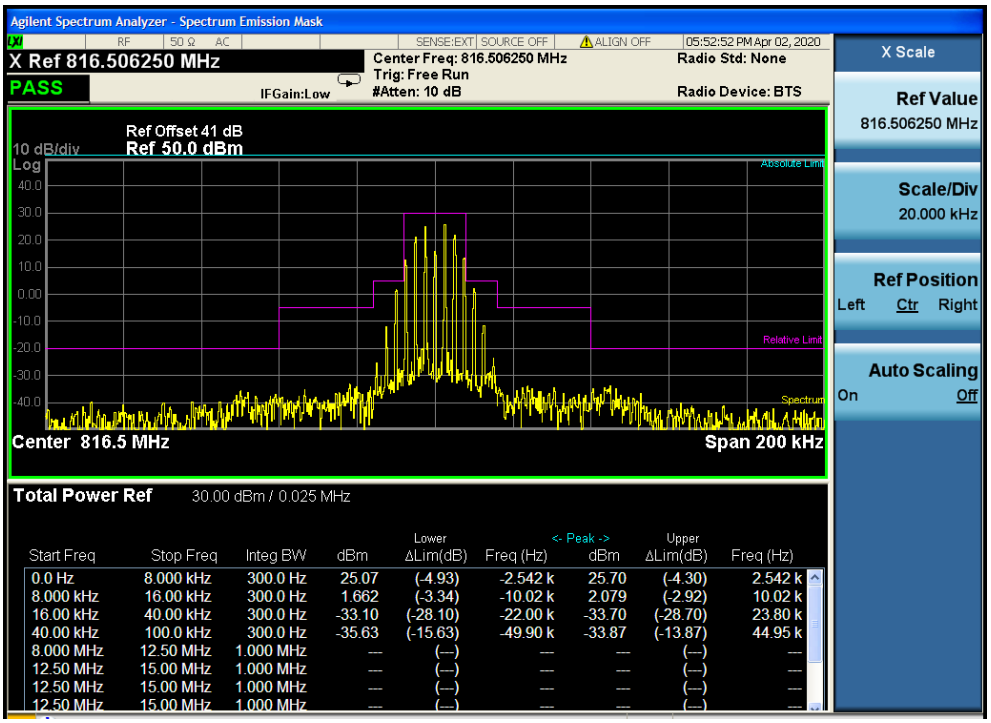


FM 12.5KHz



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	5.625 kHz	100.0 Hz	22.33	(-7.67)	-1.000 k	22.41	(-7.59)	1.000 k
5.625 kHz	12.50 kHz	100.0 Hz	-39.94	(-4.30)	-11.90 k	-40.80	(-2.61)	12.25 k
12.50 kHz	50.00 kHz	100.0 Hz	-36.25	(-16.25)	-24.10 k	-36.47	(-16.47)	31.10 k
40.00 kHz	100.0 kHz	300.0 Hz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

FM (25KHz)



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	8.000 kHz	300.0 Hz	25.07	(-4.93)	-2.542 k	25.70	(-4.30)	2.542 k
8.000 kHz	16.00 kHz	300.0 Hz	1.662	(-3.34)	-10.02 k	2.079	(-2.92)	10.02 k
16.00 kHz	40.00 kHz	300.0 Hz	-33.10	(-28.10)	-22.00 k	-33.70	(-28.70)	23.80 k
40.00 kHz	100.0 kHz	300.0 Hz	-35.63	(-15.63)	-49.90 k	-33.87	(-13.87)	44.95 k
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

6.1.5 Intermodulation&Band edge

Test Requirement: FCC part 90.219 e(3)
90.219 e(3)

Two signal generators were utilized to produce a two tone signal with two tone signal with the 12.5kHz/25kHz channel spacing set so the intermodulation products fell within the operational band.

Limit: (3)Spurious emissions from a signal booster must not exceed −13 dBm within any 100 kHz measurement bandwidth.

Test Method: FCC part 2.1051

EUT Operation:

Status: Drive the EUT to maximum output power.the EUT was pretested at compression and 10dB into compression to show AGC operation, worse case results taken.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

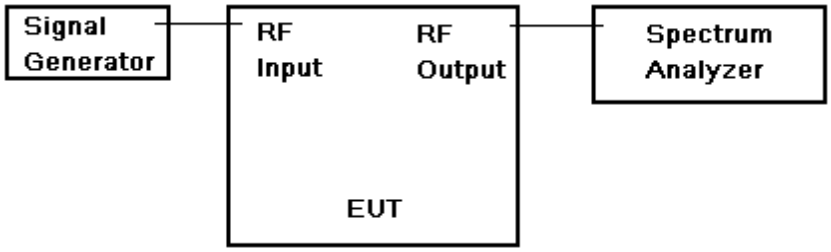
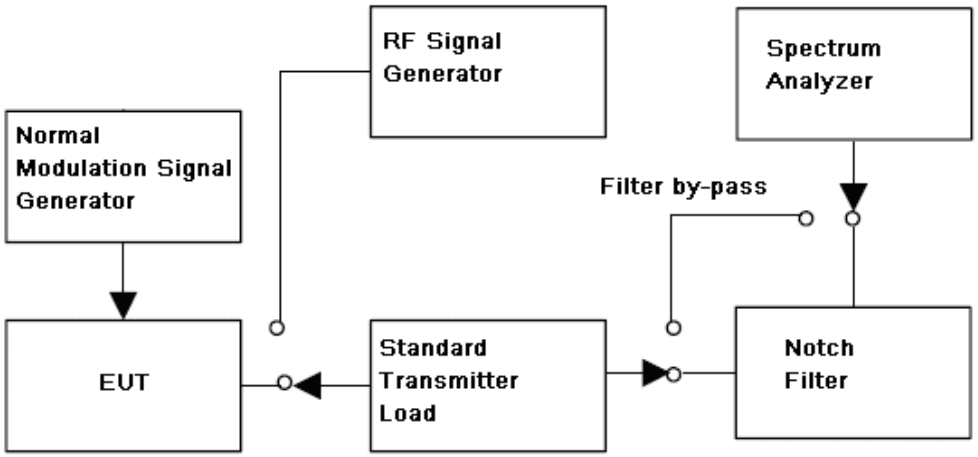


Fig.3. Band edge and Intermodulation test configuration



Test Procedure: Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05

6.1.5.1 Measurement Record:

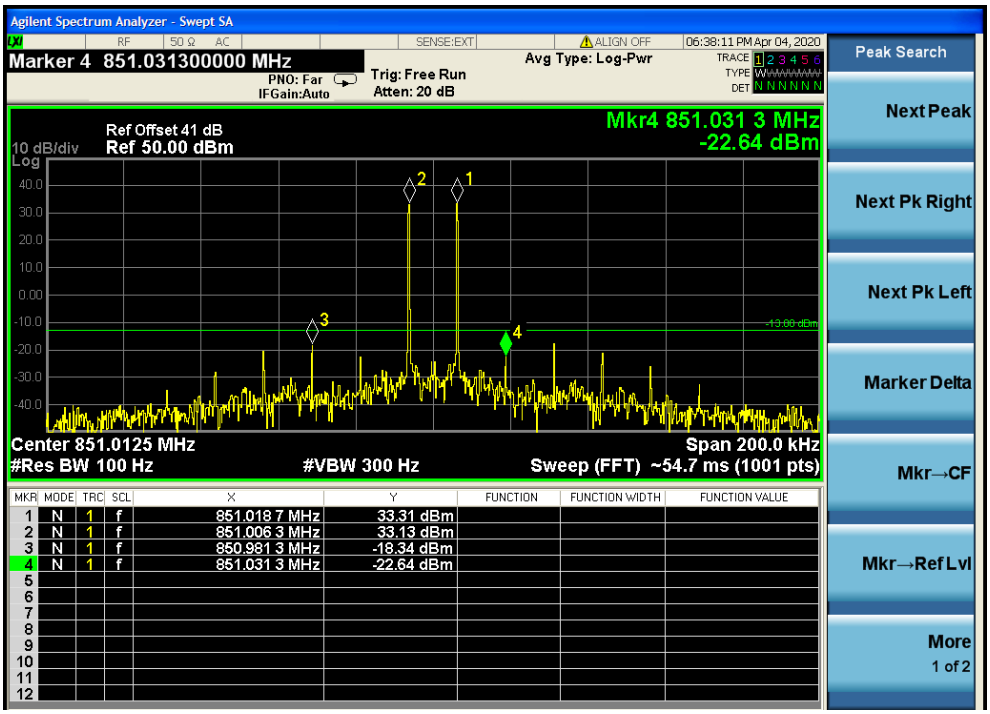
Pretest intermodulation with the AGC threshold level and with the input signal amplitude set 3dB above AGC threshold level, find the worst case is 3dB above the AGC threshold level, so report the worst case.

Class A model number:

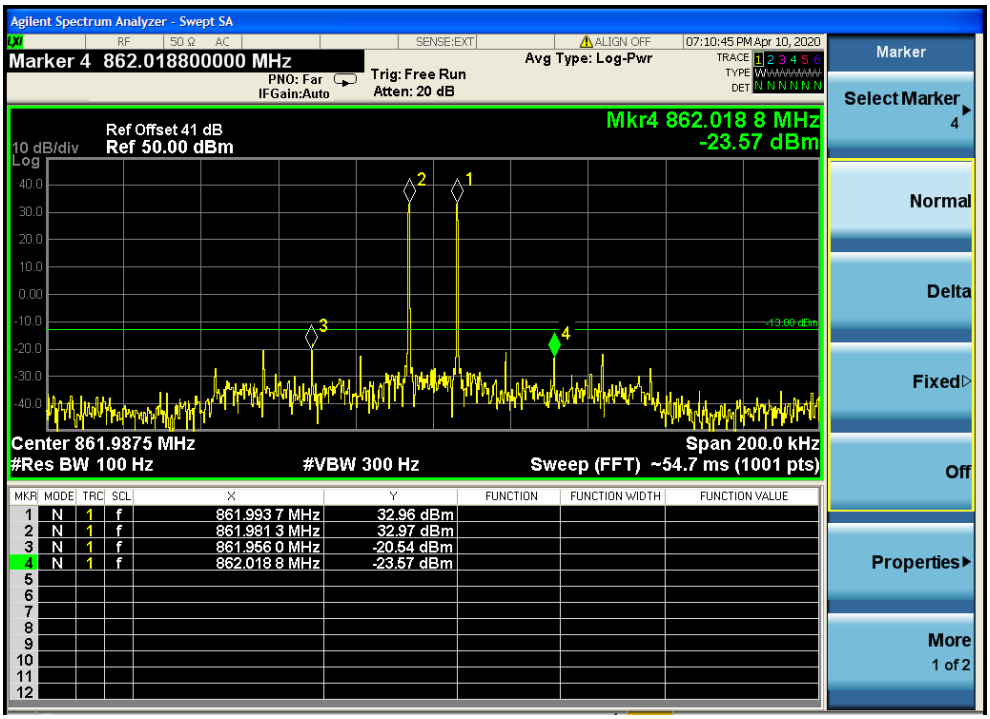
Downlink: 851MHz to 862MHz

Channel spacings:12.5kHz

1.1 two signal input —Lower Edge

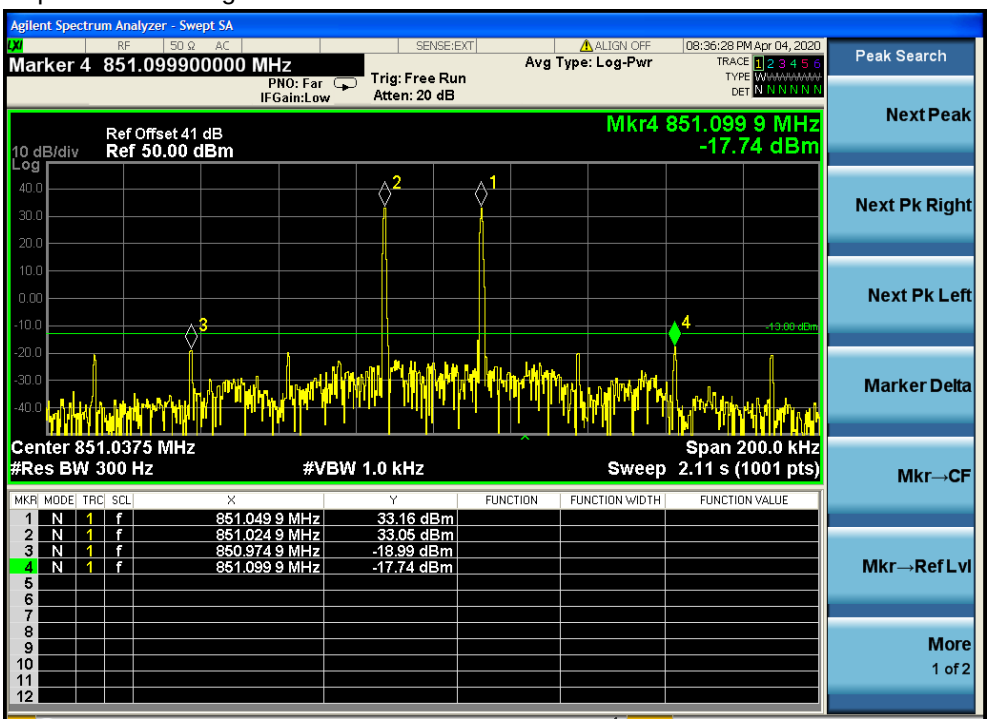


1.2 two signal input —Upper Edge

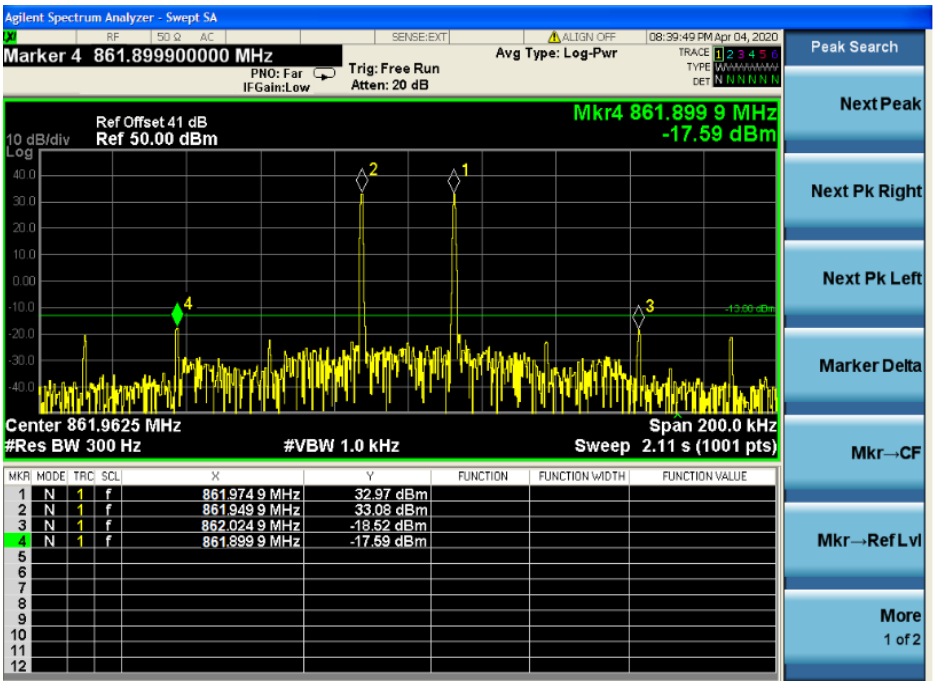


Channel spacings:25kHz

1.1 two signal input —Lower Edge

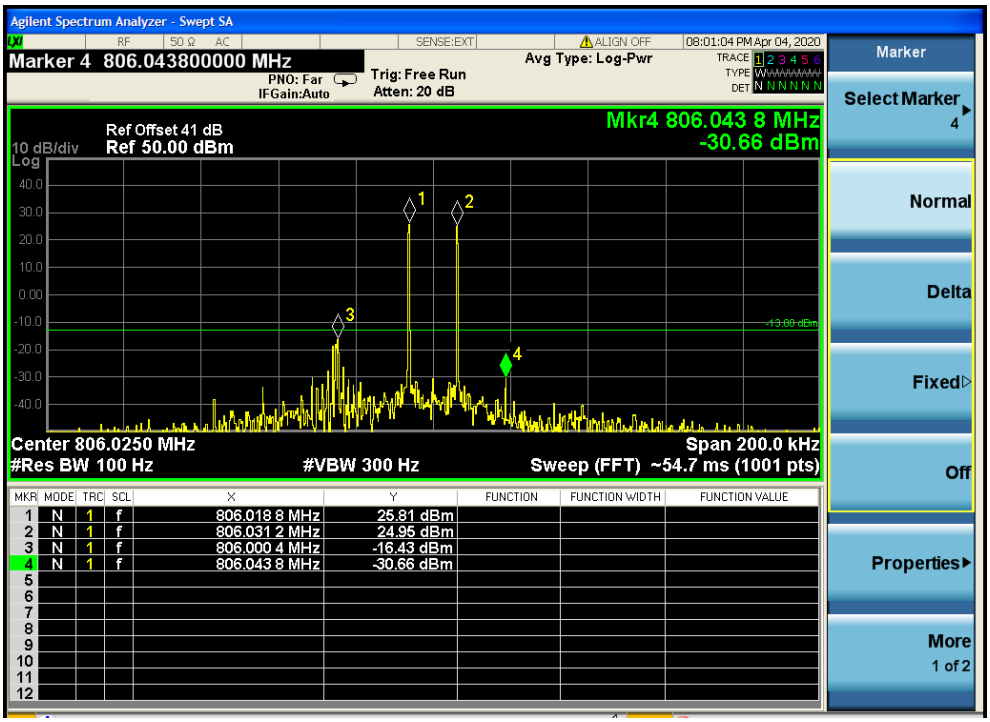


1.2 two signal input —Upper Edge

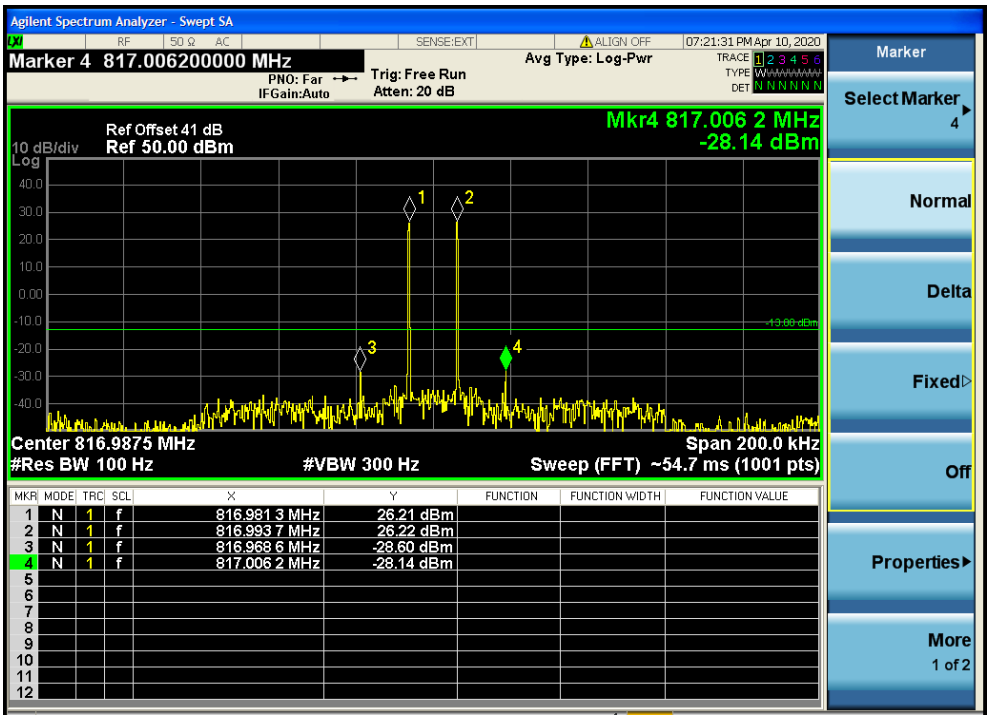


Uplink: 806MHz to 817MHz
Channel spacings:12.5kHz

1.1 two signal input —Lower Edge

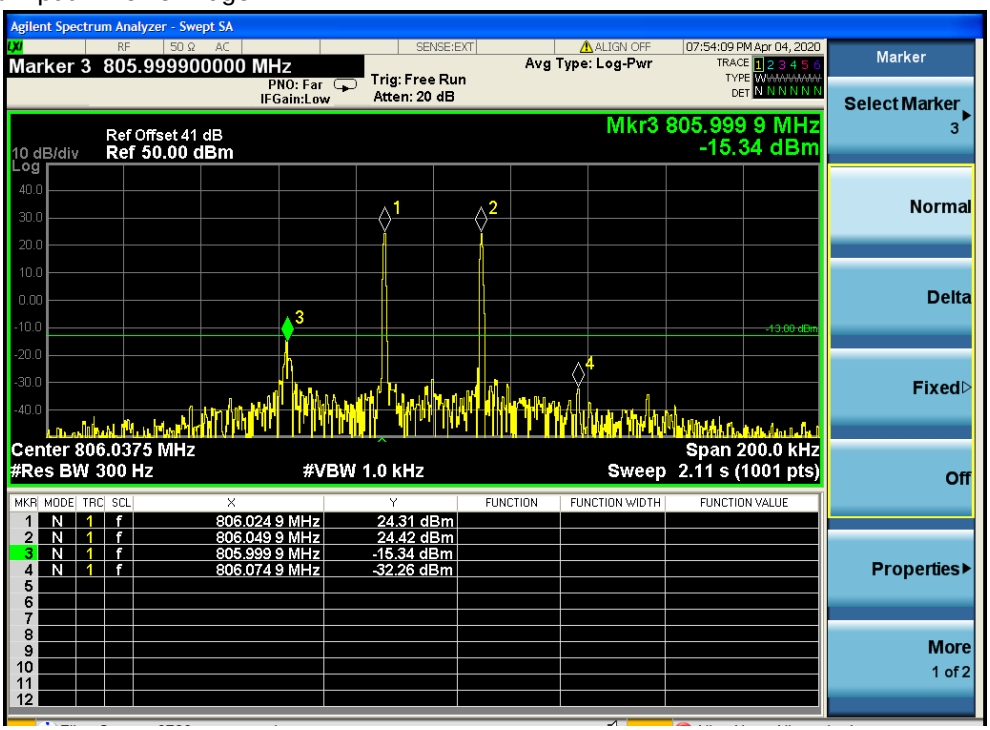


1.2 two signal input —Upper Edge

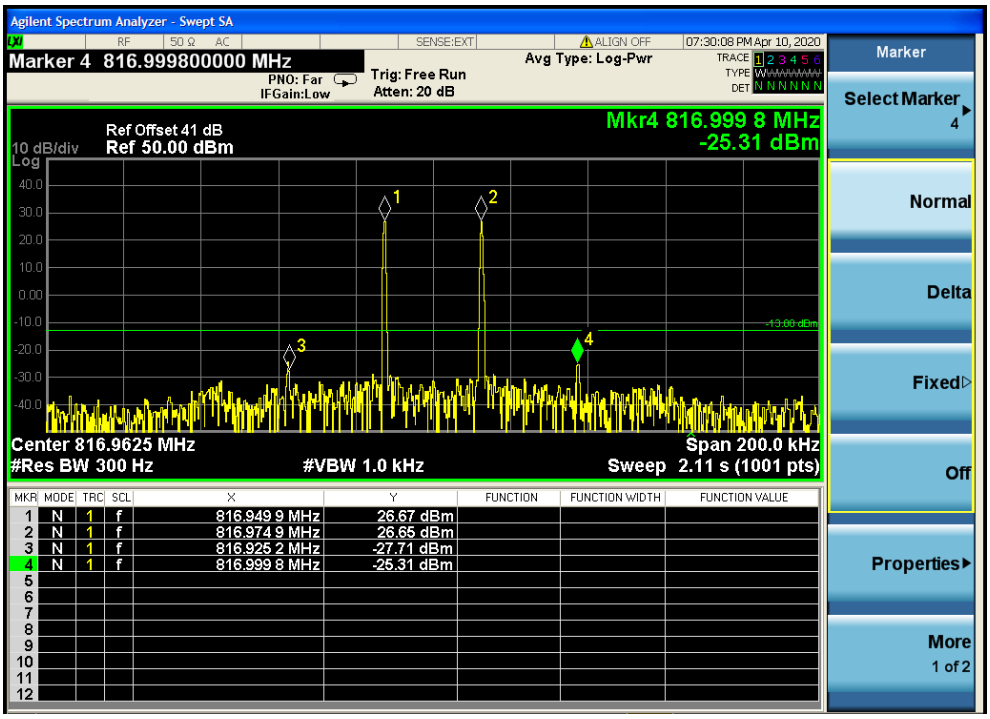


Channel spacings:25kHz

1.1 two signal input —Lower Edge

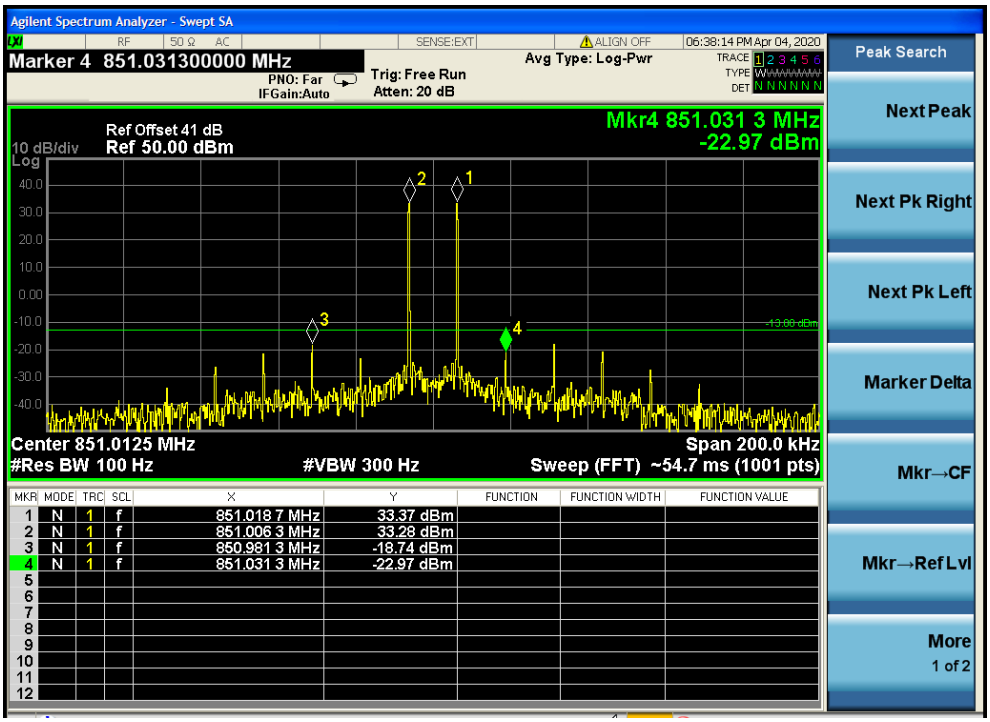


1.2 two signal input —Upper Edge

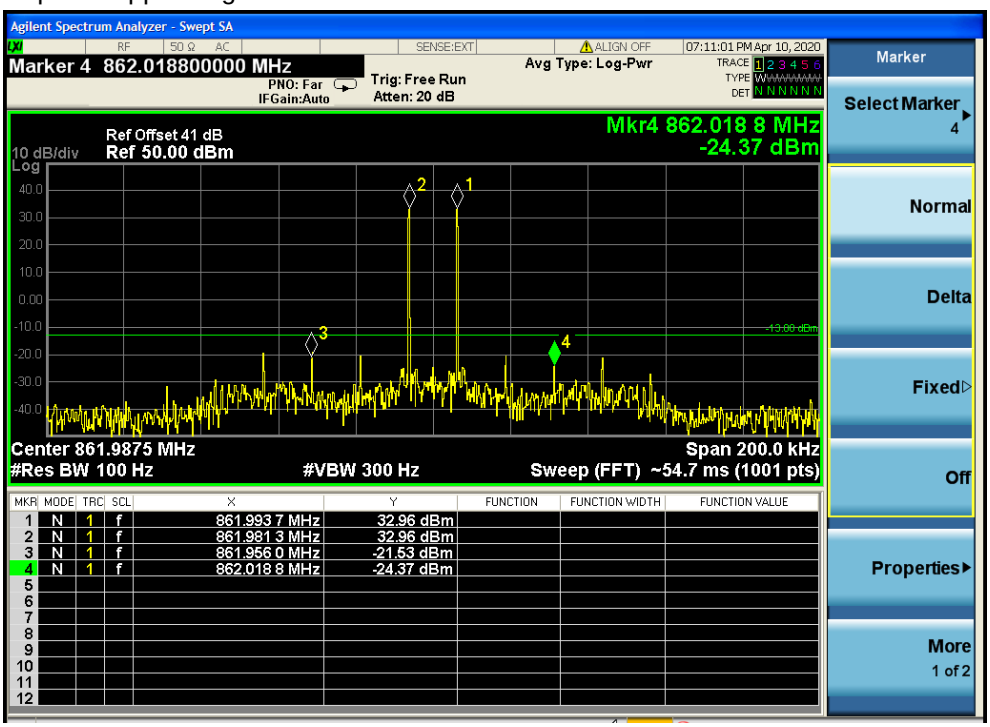


Class B model number: Downlink: 851MHz to 862MHz
Channel spacings:12.5kHz

1.1 two signal input —Lower Edge

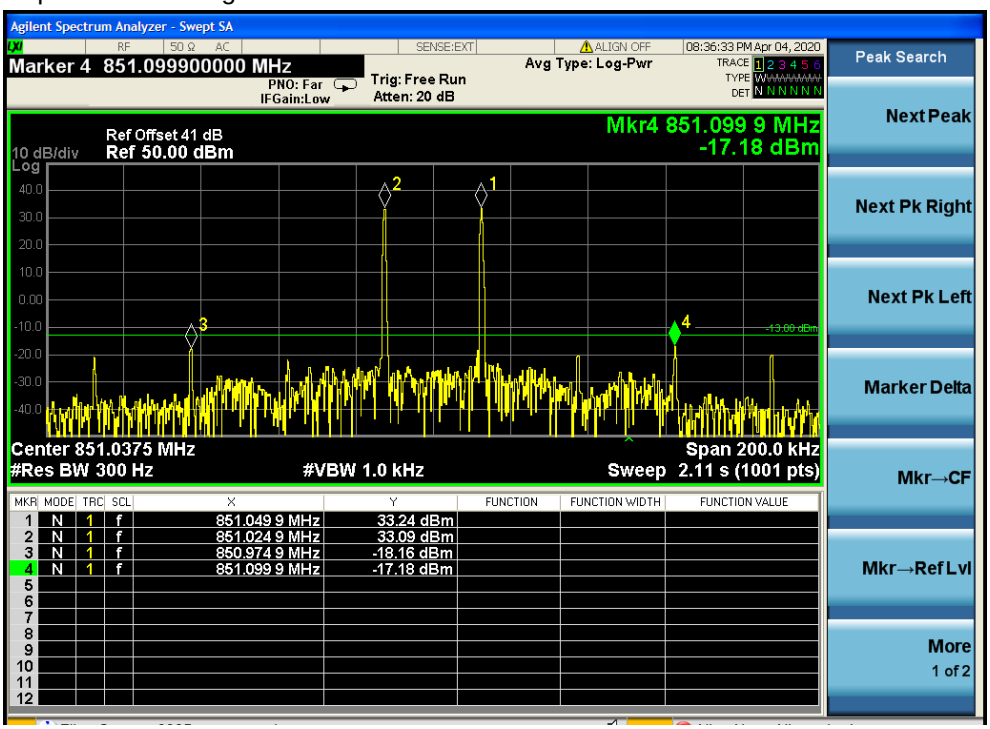


1.2 two signal input —Upper Edge

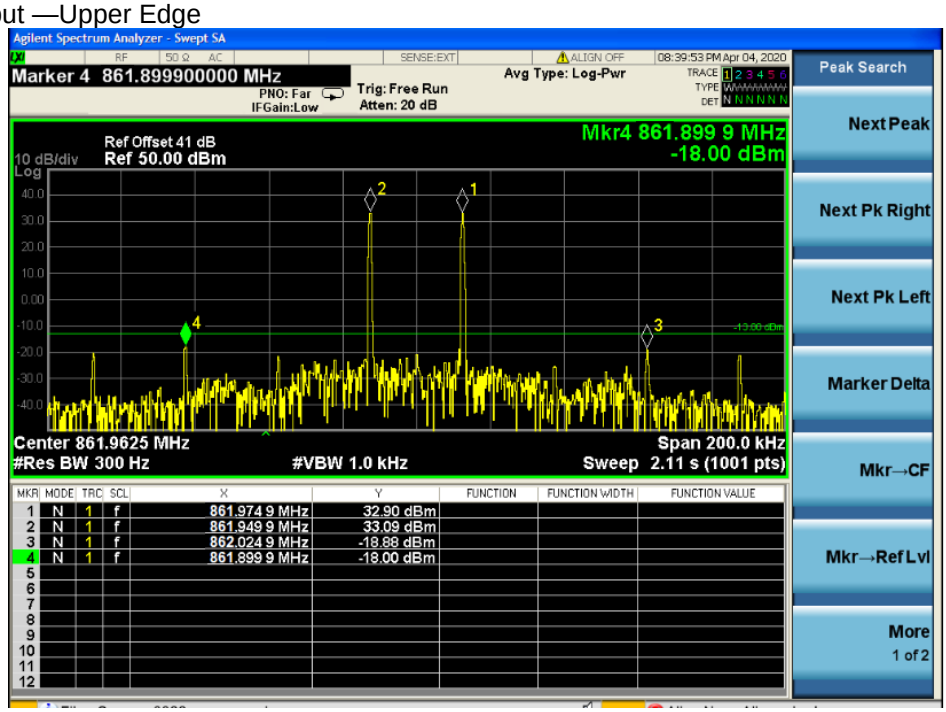


Channel spacings:25kHz

1.1 two signal input —Lower Edge

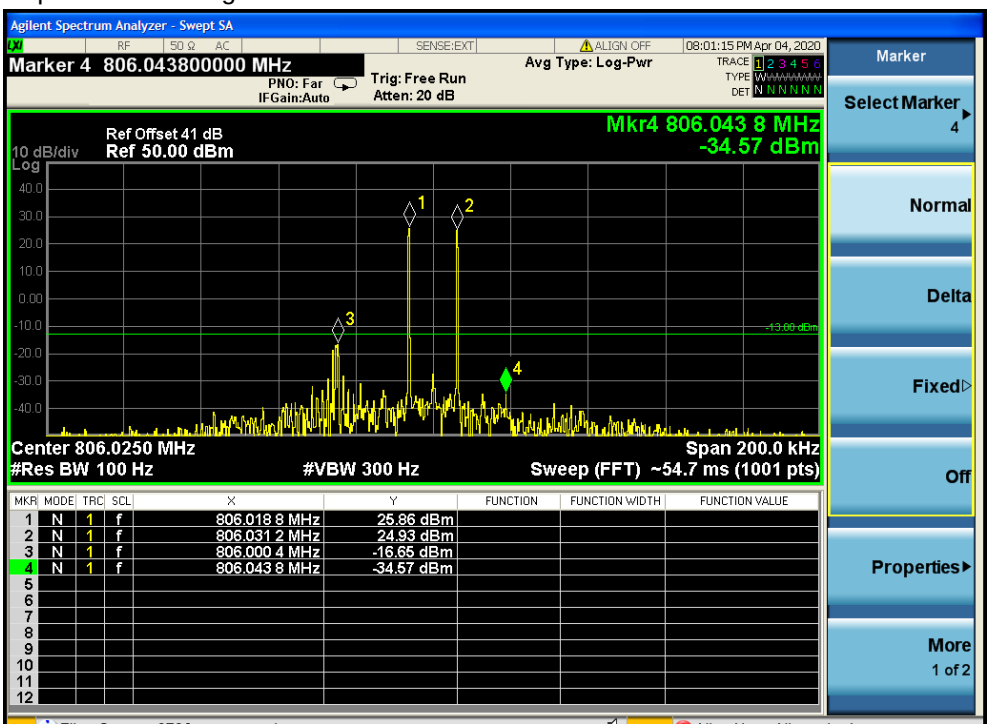


1.2 two signal input —Upper Edge

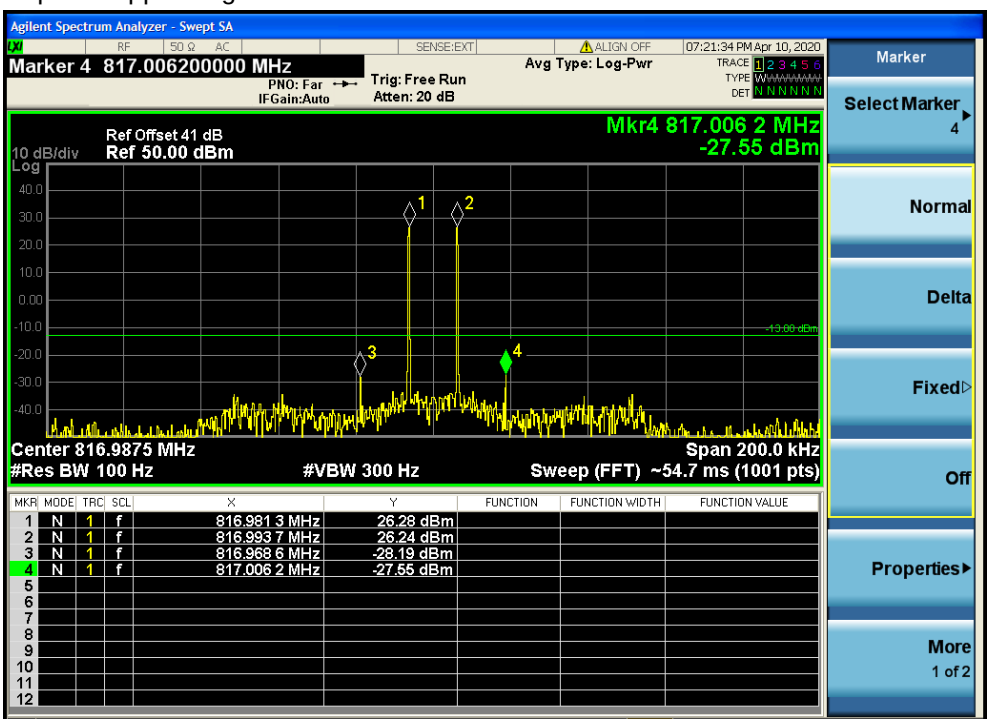


Uplink: 806MHz to 817MHz
Channel spacings:12.5kHz

1.1 two signal input —Lower Edge

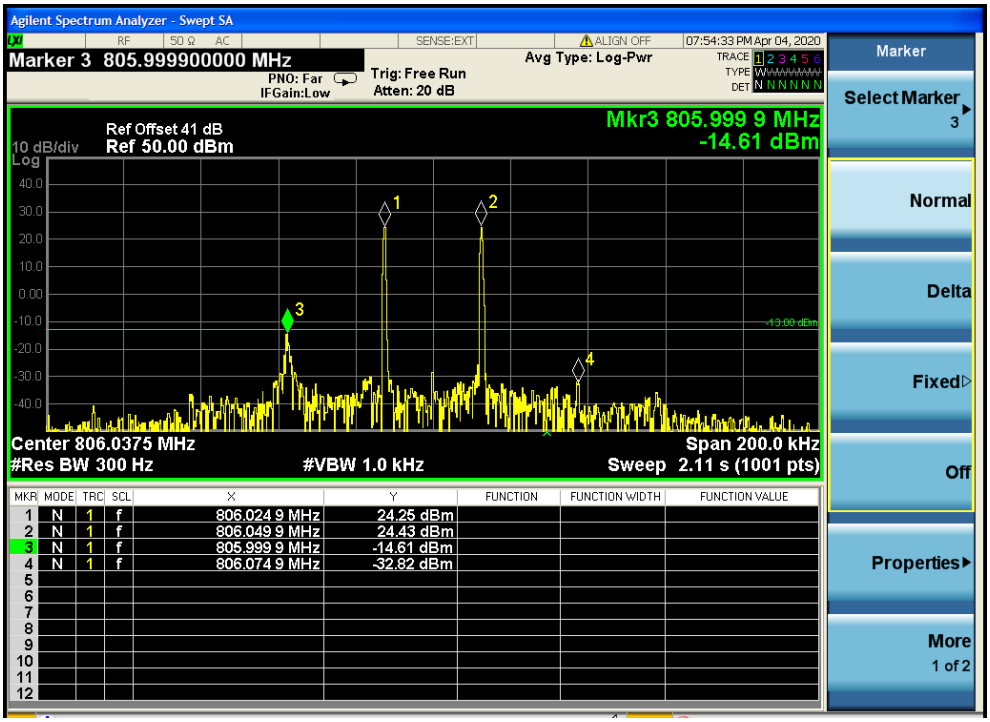


1.2 two signal input —Upper Edge

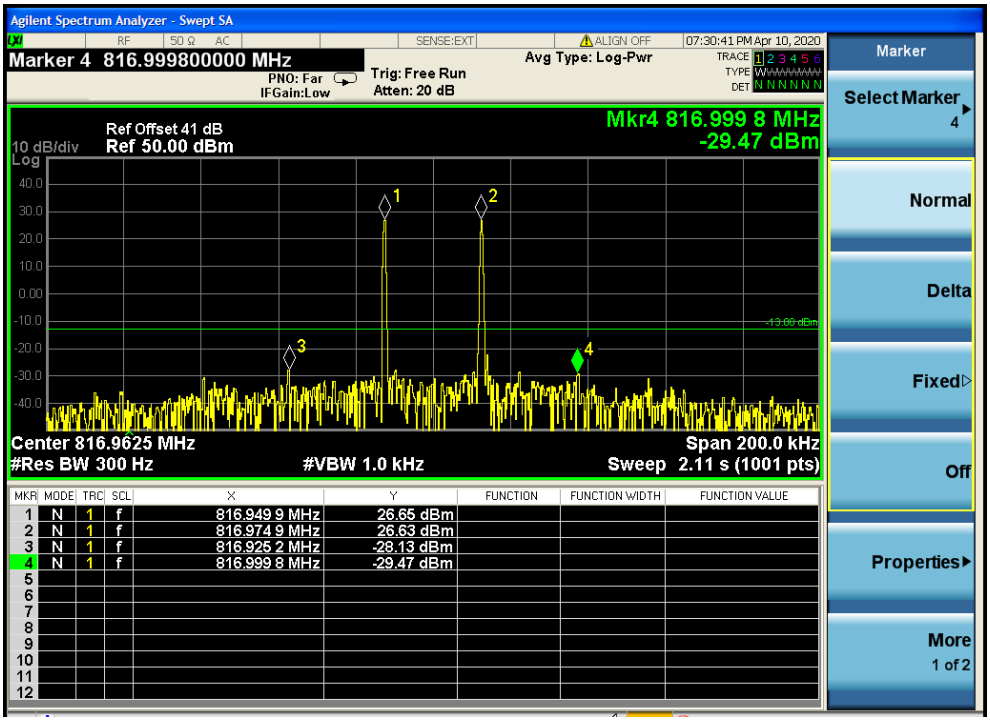


Uplink: 806MHz to 817MHz
Channel spacings:25kHz

1.1 two signal input —Lower Edge



1.2 two signal input —Upper Edge



6.1.6 Noise Figure

Test Requirement: FCC part 90.219(e)
90.219(e)
A signal booster must meet
(2) The noise figure of a signal booster must not exceed 9dB in either direction.

Test Method: FCC part 2.1051

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

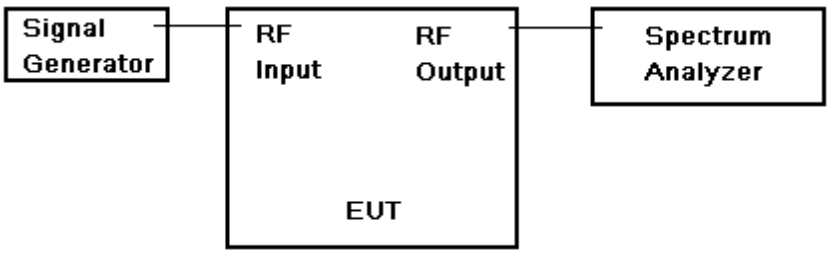
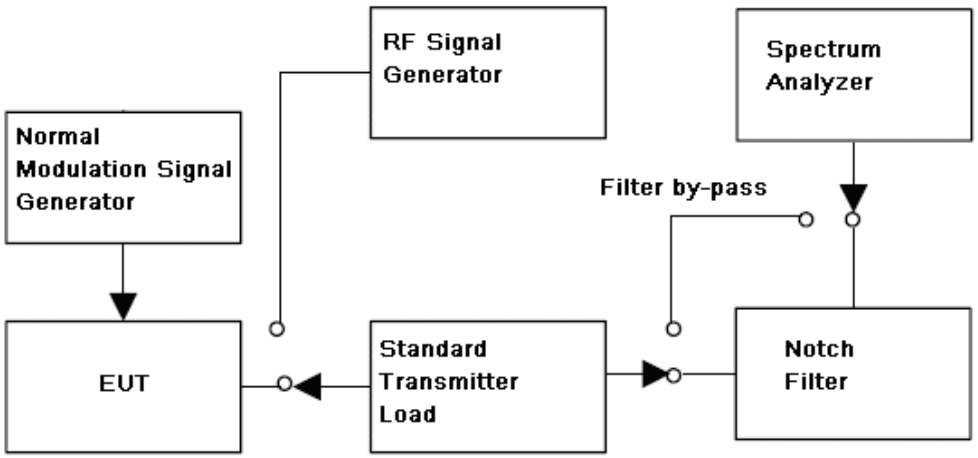


Fig.3. Band edge and Intermodulation test configuration



Test Procedure:

Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05v01.

a) Connect a signal generator to the input of the EUT.

b) Configure to generate the AWGN (broadband) test signal.

c) The frequency of the signal generator shall be set to the frequency of (f0) as determined from 3.3.

d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.

e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

f) Measure the output power of the EUT and record (Power measurement with a spectrum

g) Remove the EUT from the measurement setup and using the same signal generator settings, repeat the power measurement on the input signal to the EUT and record as input power.

h) Repeat the procedure with the narrowband test signal.

i) Repeat the procedure for both test signals with input signal amplitude set to 3 dB above the AGC threshold level.

j) Repeat for all frequency bands authorized for use by the EUT.

Power measurement Method :

Guidance for performing input/output power measurements using a spectrum or signal analyzer is provided in 5.2 of KDB Publication 971168

Remark:

The notch filter is used for avoid the EUT fundamental carrier output power making the spectrum overload and the harmonic spurious brought by it.

When the EUT fundamental carrier is not enough to make the status, the notch filter could be not used.

800MHz Band:

Class A model number :

Downlink(Max.channel band 75kHz)			
Frequency range	**Test data(dB)**	**Limit(dB)**	**Result**
851.0125	4.72	9	Pass
856.5125	4.95	9	Pass
861.9875	4.69	9	Pass
Uplink(Max.channel band 75kHz)			
Frequency range	**Test data(dB)**	**Limit(dB)**	**Result**
806.0125	2.93	9	Pass
811.5125	2.57	9	Pass
816.9875	3.31	9	Pass

Class B Model number:

800MHz Band:

Frequency range	Test data(dB)	Limit(dB)	Result
Downlink: 851~862	3.52	9	Pass
Uplink: 806~817	3.99	9	Pass

6.1.7 Noise at Antenna Terminals

Test Requirement: FCC part 90.219(e)(2) 90.219(d)(6)(ii)

90.219(e)

6) Good engineering practice must be used in regard to the radiation of intermodulation products and noise, such that interference to licensed communications systems is avoided. In the event of harmful interference caused by any given deployment, the FCC may require additional attenuation or filtering of the emissions and/or noise from signal boosters or signal booster systems, as necessary to eliminate the interference.

(i)In general, the ERP of intermodulation products should not exceed −30 dBm in 10 kHz measurement bandwidth.

(ii)n general, the ERP of noise within the passband should not exceed −43 dBm in 10 kHz measurement bandwidth.

(iii) In general, the ERP of noise on spectrum more than 1 MHz outside of the passband should not exceed −70 dBm in a 10 kHz measurement bandwidth.

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Test Method: FCC part 2.1051

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:

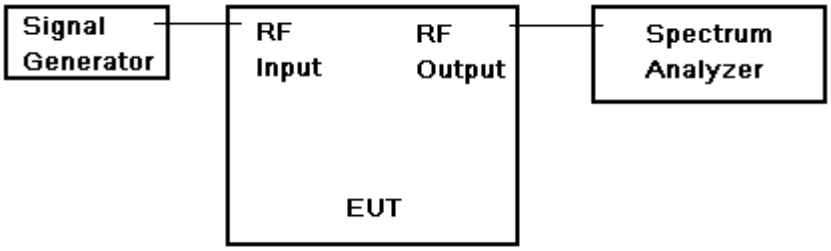
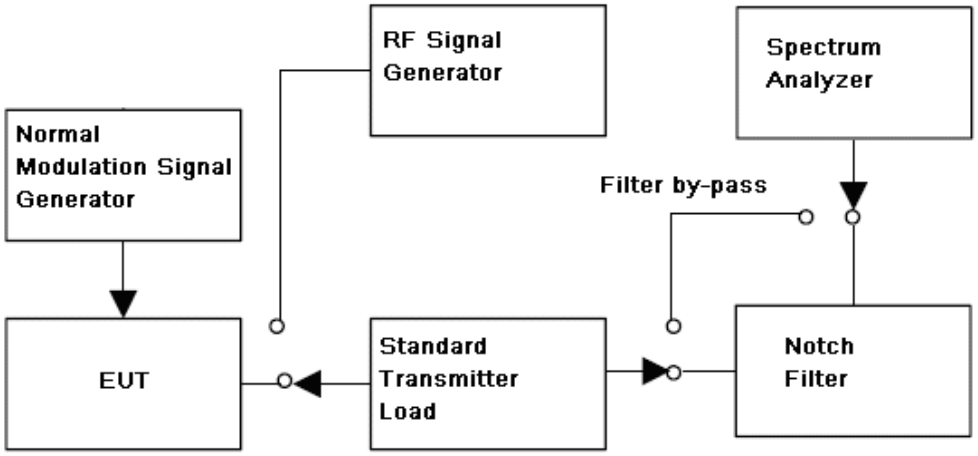


Fig.3. Band edge and Intermodulation test configuration



Test Procedure: Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05v01.

a) Connect a signal generator to the input of the EUT.

b) Configure to generate the AWGN (broadband) test signal.

c) The frequency of the signal generator shall be set to the frequency of (f0) as determined from 3.3.

d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.

e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

f) Measure the output power of the EUT and record (Power measurement with a spectrum

g) Remove the EUT from the measurement setup and using the same signal generator settings, repeat the power measurement on the input signal to the EUT and record as input power.

h) Repeat the procedure with the narrowband test signal.

i) Repeat the procedure for both test signals with input signal amplitude set to 3 dB above the AGC threshold level.

j) Repeat for all frequency bands authorized for use by the EUT.

Power measurement Method :

Guidance for performing input/output power measurements using a spectrum or signal analyzer is provided in 5.2 of KDB Publication 971168

Remark:

The notch filter is used for avoid the EUT fundamental carrier output power making the spectrum overload and the harmonic spurious brought by it.

When the EUT fundamental carrier is not enough to make the status, the notch filter could be not used.

Measurement Record:

800MHz Band:

Frequency range(MHz)	The ERP of noise within passband	The ERP of noise more than 1MHz outside of passband
Downlink: 851~862	-28.26	-56.25
Uplink: 806~817	-31.00	-59.00

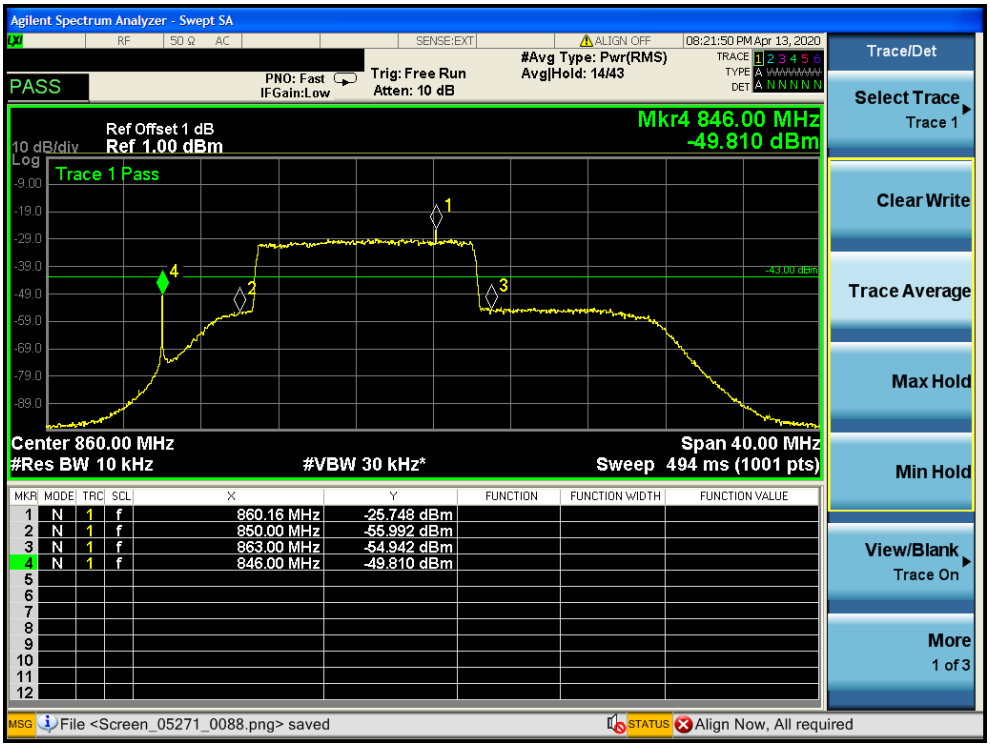
Good engineering practice must be used in regard to the signal booster's noise radiation. Thus, the gain of the signal booster should be set so that the ERP of the output noise from PS BDA should not exceed the level of -43 dBm in 10 kHz measurement bandwidth.by any given deployment, the FCC may require additional attenuation or filtering of the emissions and/or noise from signal boosters or signal booster systems, as necessary to eliminate the interference. Detailed setting was declared by manufacture and stated in the user manual.

Below test plot is only for recored the case without engineering practice for refence.

Class A model number:

Downlink:851MHz to 862MHz

IN Band Amplifier noise



Uplink: 806MHz to 817MHz

IN Band Amplifier noise