FCC Test Report

(Part 27_C2PC (Class II Permissive Change))

Report No.:	RF170123E07A
FCC ID:	2AD8UFW2PADPM01
Test Model:	FW2PADPM01
Received Date:	Jan. 15, 2019
Test Date:	Feb. 23 ~ Feb. 25, 2019, Apr. 29 ~ May 02, 2019 and Jul. 30 ~ Jul. 31, 2019
Issued Date:	Aug. 01, 2019
Applicant:	Nokia Solutions and Networks, OY
Address:	2000 W. Lucent Lane, City: Naperville, Illinois, United States, 60563
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration / Designation Number:	788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170123E07A	Original release.	Aug. 01, 2019

1 Certificate of Conformity

Product:	Nokia FW2P LTE module
Brand:	Nokia
Test Model:	FW2PADPM01
Sample Status:	MASS-PRODUCTION
Applicant:	Nokia Solutions and Networks, OY
Test Date:	Feb. 23 ~ Feb. 25, 2019, Apr. 29 ~ May 02, 2019 and Jul. 30 ~ Jul. 31, 2019
Standards:	FCC Part 27, Subpart C, F FCC Part 2, Subpart J

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Aug. 01, 2019

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Aug. 01, 2019

Bruce Chen / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(5)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement
----	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53(c)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(c)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1051 27.53(c)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -35.3dB at 31.94MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 11, 2018	Apr. 10, 2019
			Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May 29, 2018	May 28, 2019
			Jun. 04, 2019	Jun. 03, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
			Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2018	Aug. 07, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A01924	Feb. 21, 2019	Feb. 20, 2020
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2018	Aug. 07, 2019
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 31, 2018	Jul. 30, 2019
			Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Radio Communication Analyzer	MT8821C	6261786083	Dec. 11, 2018	Dec. 10, 2019
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 04, 2018	Jun. 03, 2019
			Jun. 03, 2019	Jun. 02, 2020
True RMS Clamp Meter Fluke	325	31130711WS	May 22, 2018	May 21, 2019
			May 21, 2019	May 20, 2020

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	Nokia FW2P LTE module		
Brand	Nokia		
Test Model	FW2PADPM01		
FCC ID	2AD8UFW2PADPM01		
Test Sample S/N	EB160810030		
Hardware Version	A101		
Status of EUT	MASS-PRODUCTION		
Power Supply Rating	12Vdc		
Modulation Type	LTE Band	QPSK, 16QAM, 64QAM, 256QAM	
	NB-IoT (In-Band/Guard Band)	QPSK	
Modulation Technology	FDD		
Bandwidth	LTE Band	5MHz, 10MHz	
	NB-IoT (In-Band)	5MHz, 10MHz	
	NB-IoT (Guard Band)	10MHz	
Operating Frequency	LTE Band	Channel Bandwidth: 5MHz	748.5MHz ~753.5MHz
		Channel Bandwidth: 10MHz	751MHz
	NB-IoT (In-Band/Guard Band)	Channel Bandwidth: 5MHz	748.5MHz ~ 753.5MHz
		Channel Bandwidth: 10MHz	751MHz
Max. ERP Power	LTE Band	Channel Bandwidth: 5MHz	QPSK: 2084.5mW
			16QAM: 2089.3mW
			64QAM: 2051.2mW
			256QAM: 1006.932mW
		Channel Bandwidth: 10MHz	QPSK: 1977.0mW
			16QAM: 1981.5mW
			64QAM: 1954.3mW
			256QAM: 977.237mW
	NB-IoT (Guard Band)	Channel Bandwidth: 10MHz	QPSK: 1496.236mW
	NB-IoT (In-Band)	Channel Bandwidth: 5MHz	QPSK: 1358.313mW
		Channel Bandwidth: 10MHz	QPSK: 1367.729mW
Emission Designator	LTE Band	Channel Bandwidth: 5MHz	QPSK: 4M51G7D
			16QAM: 4M50D7W
			64QAM: 4M50D7W
			256QAM: 4M49D7W
		Channel Bandwidth: 10MHz	QPSK: 9M02G7D
			16QAM: 9M02D7W
			64QAM: 9M02D7W
			256QAM: 9M16D7W
	NB-IoT (Guard Band)	Channel Bandwidth: 10MHz	QPSK: 9M20G7D
	NB-IoT (In-Band)	Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		Channel Bandwidth: 10MHz	QPSK: 8M94G7D
Antenna Type	Refer to note as below		
Antenna Connector	Refer to user's manual		
Accessory Device	NA		

Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. This is a supplementary report of Report No.: RF170123E07. The differences between them are as below information:
   - ◆ LTE B13 add NB-IoT Guard Band
   - ◆ LTE B13 add 256QAM
   - ◆ LTE B13 add NB-IoT In-band
2. For above changes, only LTE B13 256QAM, NB-IoT Guard Band and NB-IoT In-band mode test results has to be performed. The other test items were copied from the original test report (Report No.: RF170123E07) and all data was verified to meet the requirements.
3. The EUT incorporates a MIMO function for LTE mode

	Channel Bandwidth	Modulation	TX & RX configuration	
LTE Band	5MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX
	10MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX
Guard Band	10MHz	N-TM (QPSK)	2TX	2RX
In-band	5MHz	N-TM (QPSK)	2TX	2RX
	10MHz	N-TM (QPSK)	2TX	2RX

4. The EUT's spec. as below table:

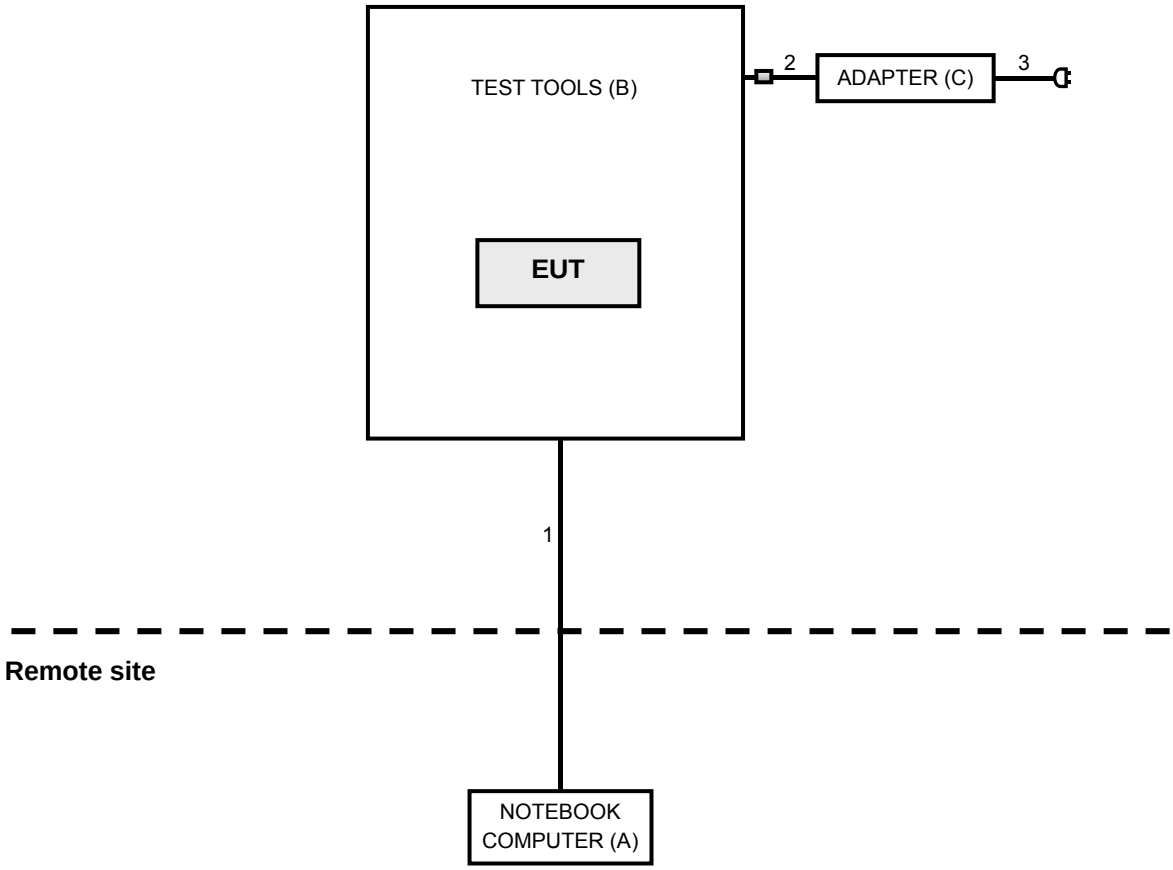
Model name	LTE				
	Freq.(MHz)		Freq.(MHz)		Band
FW2PADPM01	TX	BW 5MHz: 748.5 ~ 753.5 MHz BW 10MHz: 751 MHz	RX	BW 5MHz: 779.5 ~ 784.5 MHz BW 10MHz: 782 MHz	LTE Band 13
	TX	BW 10MHz: Bottom: 746.4025 MHz Top: 755.5975 MHz	RX	BW 10MHz: 782 MHz	LTE Band 13 Guard Band
	TX	BW 5MHz: Bottom: 746.70 MHz Top: 755.30 MHz BW 10MHz: Bottom: 747.22 MHz Top: 754.60 MHz	RX	BW 5MHz: 779.5 ~ 784.5 MHz BW 10MHz: 782 MHz	LTE Band 13 In-band

5. The antenna provided to the EUT, please refer to the following table:

Antenna Spec.	
Gain(dBi)	Frequency (MHz)
6	746~787

6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of 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.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	Notebook	DELL	E5420	BPQ8MQ1	NA	-
B	ADAPTER	DVE	DSA-60PFE-12	120500	NA	-

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ45	2	8	No	0	Provided by Lab
2	DC	1	1.2	No	1	Supplied by Client
3	AC	1	1.8	No	0	Supplied by Client

NOTE:

1. The core(s) is(are) originally attached to the cable(s).

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

For LTE Band 13

Test Item	Available Frequency (MHz)	Tested Frequency (MHz)	Channel Bandwidth	Modulation
Output Power	746 to 756	748.5, 751, 753.5	5MHz	256QAM
		751	10MHz	256QAM
Modulation Characteristics	746 to 756	751	10MHz	256QAM
Emission Bandwidth	746 to 756	748.5, 753.5	5MHz	256QAM
		751	10MHz	256QAM
Channel Edge	746 to 756	748.5, 751, 753.5	5MHz	256QAM
		751	10MHz	256QAM
Peak To Average Ratio	746 to 756	748.5, 751, 753.5	5MHz	256QAM
		751	10MHz	256QAM
Conducted Emission	746 to 756	748.5, 751, 753.5	5MHz	256QAM
		751	10MHz	256QAM

For LTE Band 13 Guard Band

EUT Configure Mode	Test item	Channel	Center Carrier Frequency of E-UTRA channel	Bottom Freq.	Top Freq.	Channel Bandwidth	Modulation	Mode
-	ERP	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Modulation Characteristics	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Frequency Stability	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Emission Bandwidth	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Band Edge	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Peak to Average Ratio	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Conducted Emission	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB
-	Radiated Emission below 1GHz	5230	751.0MHz	746.4025MHz	-	10MHz	QPSK	1RB
-	Radiated Emission above 1GHz	5230	751.0MHz	746.4025MHz	755.5975MHz	10MHz	QPSK	1RB

*****This module is based on FW2XXXX host assembly provide base band data during testing.

For LTE Band 13 In-Band

EUT Configure Mode	Test item	Channel	Center Carrier Frequency of E-UTRA channel	Bottom Freq.	Top Freq.	Channel Bandwidth	Modulation	Mode
-	ERP	5205 to 5255	748.5MHz 751.0MHz 753.5MHz	746.7MHz 753.5MHz 751.7MHz	750.3MHz 752.8MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Modulation Characteristics	5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Frequency Stability	5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Emission Bandwidth	5205 to 5255	748.5MHz 751.0MHz 753.5MHz	746.7MHz 753.5MHz 751.7MHz	750.3MHz 752.8MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Band Edge	5205 to 5255	748.5MHz 753.5MHz	746.7MHz 751.7MHz	750.3MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Peak to Average Ratio	5205 to 5255	748.5MHz 751.0MHz 753.5MHz	746.7MHz 753.5MHz 751.7MHz	750.3MHz 752.8MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Conducted Emission	5205 to 5255	748.5MHz 751.0MHz 753.5MHz	746.7MHz 753.5MHz 751.7MHz	750.3MHz 752.8MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB
-	Radiated Emission below 1GHz	5205 to 5255	751.0MHz	753.5MHz	752.8MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	-	10MHz	QPSK	1RB
-	Radiated Emission above 1GHz	5205 to 5255	748.5MHz 751.0MHz 753.5MHz	746.7MHz 753.5MHz 751.7MHz	750.3MHz 752.8MHz 755.3MHz	5MHz	QPSK	1RB
		5230	751.0MHz	747.22MHz	754.60MHz	10MHz	QPSK	1RB

*****This module is based on FW2XXXX host assembly provide base band data during testing.

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
Output Power	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Modulation Characteristics	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Frequency Stability	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Emission Bandwidth	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Channel Edge	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Conducted Emission	25deg. C, 63%RH	120Vac, 60Hz	James Yang
Radiated Emission	23deg. C, 68%RH	120Vac, 60Hz	Greg Lin

Note: Above input power with the AC/DC PSU (Brand: MEAN WELL, Model: RSP-500-48, S/N: EB8B336856) used during testing.

3.4 EUT Operating Conditions

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 746-757 MHz and 776-787 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of 2000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts/MHz ERP in accordance with Table 4 of this section.

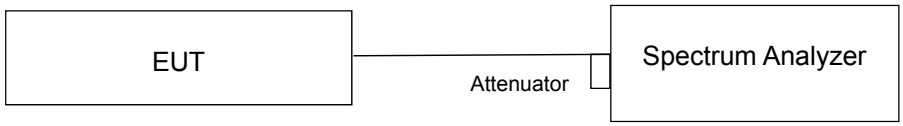
4.1.2 Test Procedures

Conducted Power Measurement:

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.1.3 Test Setup

CONDUCTED POWER MEASUREMENT:



4.1.4 Test Results

Conducted Power

For LTE Band 13:

1TX

Band / BW	Chain	256QAM		
		Low CH	Mid CH	High CH
		748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0	23.09	23.15	23.06
	1	23.11	23.08	22.99

Band / BW	Chain	256QAM
		Mid CH
		751 MHz
13 / 10M	0	23.03
	1	22.95

2TX

Band / BW	Chain	256QAM		
		Low CH	Mid CH	High CH
		748.5 MHz	751 MHz	753.5 MHz
13 / 5M	2TX	26.16	26.18	26.09

Band / BW	Chain	256QAM
		Mid CH
		751 MHz
13 / 10M	2TX	26.05

For NB-IoT Guard Band:

Channel Bandwidth: 10MHz

1TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	0	24.93	24.92
	1	24.57	24.85

2TX

Band / BW	Chain	QPSK_ NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	2TX	27.76	27.90

For NB-IoT In-Band

Channel Bandwidth: 5MHz

1TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom			QPSK_ NB-IoT Signal at Top		
		748.5 MHz	751 MHz	753.5 MHz	748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0	24.31	24.28	24.41	24.25	24.32	24.33
	1	24.62	24.65	24.37	24.54	24.62	24.48

2TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom			QPSK_ NB-IoT Signal at Top		
		748.5 MHz	751 MHz	753.5 MHz	748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0+1	27.48	27.48	27.40	27.41	27.48	27.42

Channel Bandwidth: 10MHz

1TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	0	24.52	24.54
	1	24.36	24.45

2TX

Band / BW	Chain	QPSK_ NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	2TX	27.45	27.51

ERP power

For LTE Band 13:

1TX

Band / BW	Chain	256QAM		
		Low CH	Mid CH	High CH
		748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0	26.94	27.00	26.91
	1	26.96	26.93	26.84

Band / BW	Chain	256QAM
		Mid CH
		751 MHz
13 / 10M	0	26.88
	1	26.80

2TX

Band / BW	Chain	256QAM		
		Low CH	Mid CH	High CH
		748.5 MHz	751 MHz	753.5 MHz
13 / 5M	2TX	30.01	**30.03**	29.94

Band / BW	Chain	256QAM
		Mid CH
		751 MHz
13 / 10M	2TX	**29.90**

*ERP= Conducted power + Gain -2.15

For NB-IoT Guard Band:

Channel Bandwidth: 10MHz

1TX

Band / BW	Chain	QPSK_ NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	0	28.78	28.77
	1	28.42	28.70

2TX

Band / BW	Chain	QPSK_ NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	2TX	31.61	31.75

*ERP= Conducted power + Gain -2.15

For NB-IoT In-Band

Channel Bandwidth: 5MHz

1TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom			QPSK_ NB-IoT Signal at Top		
		748.5 MHz	751 MHz	753.5 MHz	748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0	28.16	28.13	28.26	28.10	28.17	28.18
	1	28.47	**28.50**	28.22	28.39	28.47	28.33

2TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom			QPSK_ NB-IoT Signal at Top		
		748.5 MHz	751 MHz	753.5 MHz	748.5 MHz	751 MHz	753.5 MHz
13 / 5M	0+1	31.33	**31.33**	31.25	31.26	**31.33**	31.27

*ERP= Conducted power + Gain -2.15

Channel Bandwidth: 10MHz

1TX

Band / BW	Chain	QPSK_NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	0	28.37	28.39
	1	28.21	28.30

2TX

Band / BW	Chain	QPSK_ NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
		Mid CH	Mid CH
		751 MHz	751 MHz
13 / 10M	2TX	31.30	**31.36**

*ERP= Conducted power + Gain -2.15

4.2 Modulation characteristics Measurement

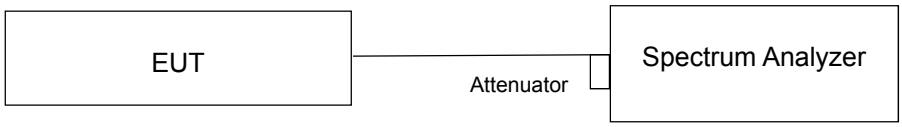
4.2.1 Limits of Modulation characteristics

N/A

4.2.2 Test Procedure

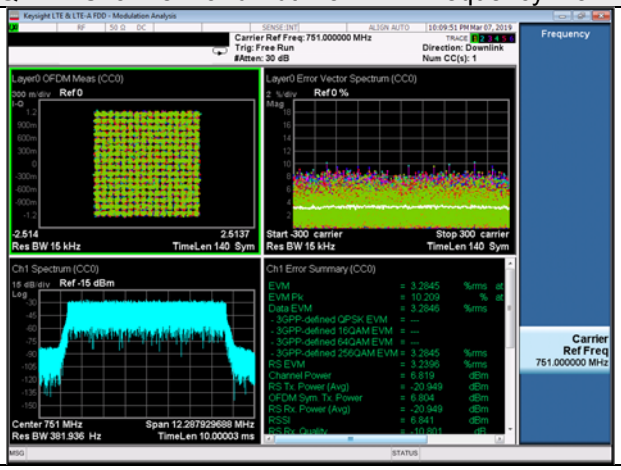
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup



4.2.4 Test Results

For LTE Band 13:

Spectrum Plot of Measurement Value
256QAM / Channel Bandwidth: 5MHz / Frequency: 751 MHz


For NB-IoT Guard Band:

LTE Band 13	
Spectrum Plot of Measurement Value	
Channel Bandwidth: 10MHz / QPSK	
QPSK_NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
751 MHz	751 MHz
	

For NB-IoT In-Band:

LTE Band 13	
Spectrum Plot of Measurement Value	
Channel Bandwidth: 10MHz / QPSK	
QPSK_NB-IoT Signal at Bottom	QPSK_ NB-IoT Signal at Top
751 MHz	751 MHz
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stabiliity Measurement

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30℃ ~ 50℃.

4.3.2 Test Procedure

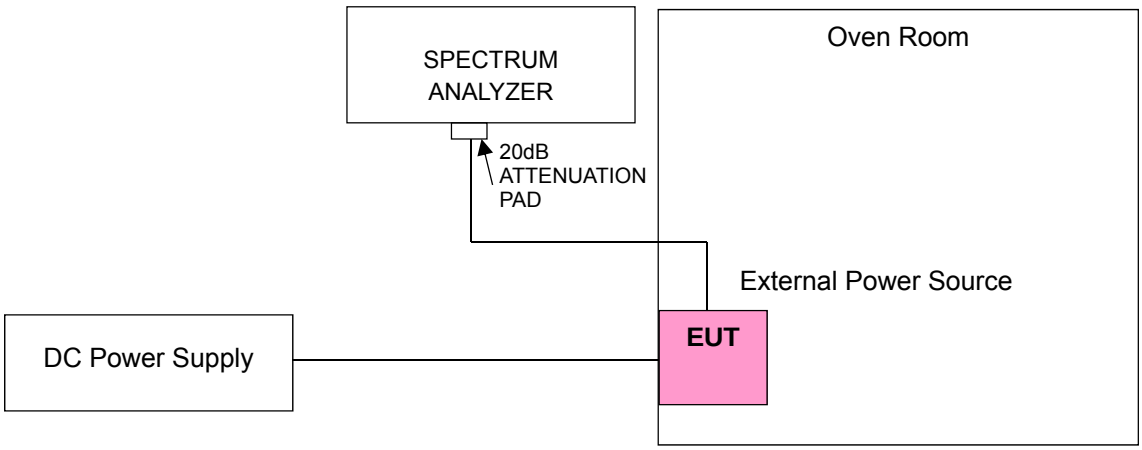
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13 Guard Band
	Frequency error (ppm)
13.2	0.02670
12	0.03606
10.8	0.03541

Note: The applicant defined the normal working voltage is from 10.8Vdc to 13.2Vdc.

TEMP. (℃)	LTE Band 13 Guard Band
	Frequency error (ppm)
50	0.02416
40	0.05660
30	0.06483
20	0.03606
10	0.01695
0	0.06419
-10	0.04883
-20	0.03887
-30	0.02840

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13 In-Band
	Frequency error (ppm)
13.2	0.003
12	0.004
10.8	0.002

Note: The applicant defined the normal working voltage is from 10.8Vdc to 13.2Vdc.

TEMP. (℃)	LTE Band 13 In-Band
	Frequency error (ppm)
50	-0.004
40	-0.002
30	-0.005
20	-0.005
10	0.002
0	0.001
-10	0.001
-20	0.002
-30	0.005

4.4 Emission Bandwidth Measurement

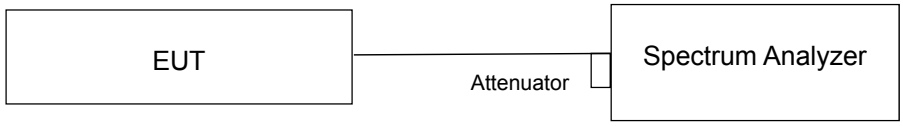
4.4.1 Limits of Emission Bandwidth Measurement

Emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

4.4.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz and VBW = 150kHz (Channel Bandwidth: 5MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 10MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.4.3 Test Setup

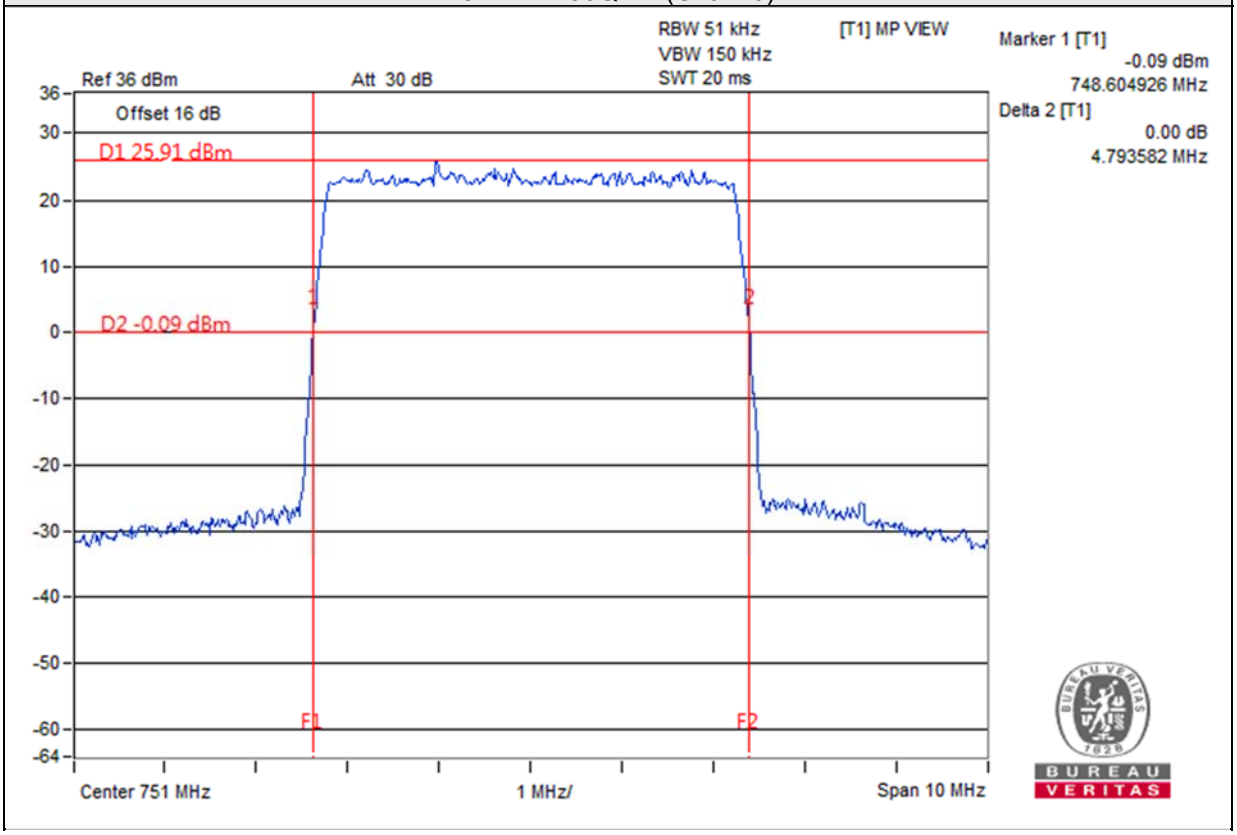


4.4.4 Test Results (-26dBc Bandwidth)

For LTE Band 13:

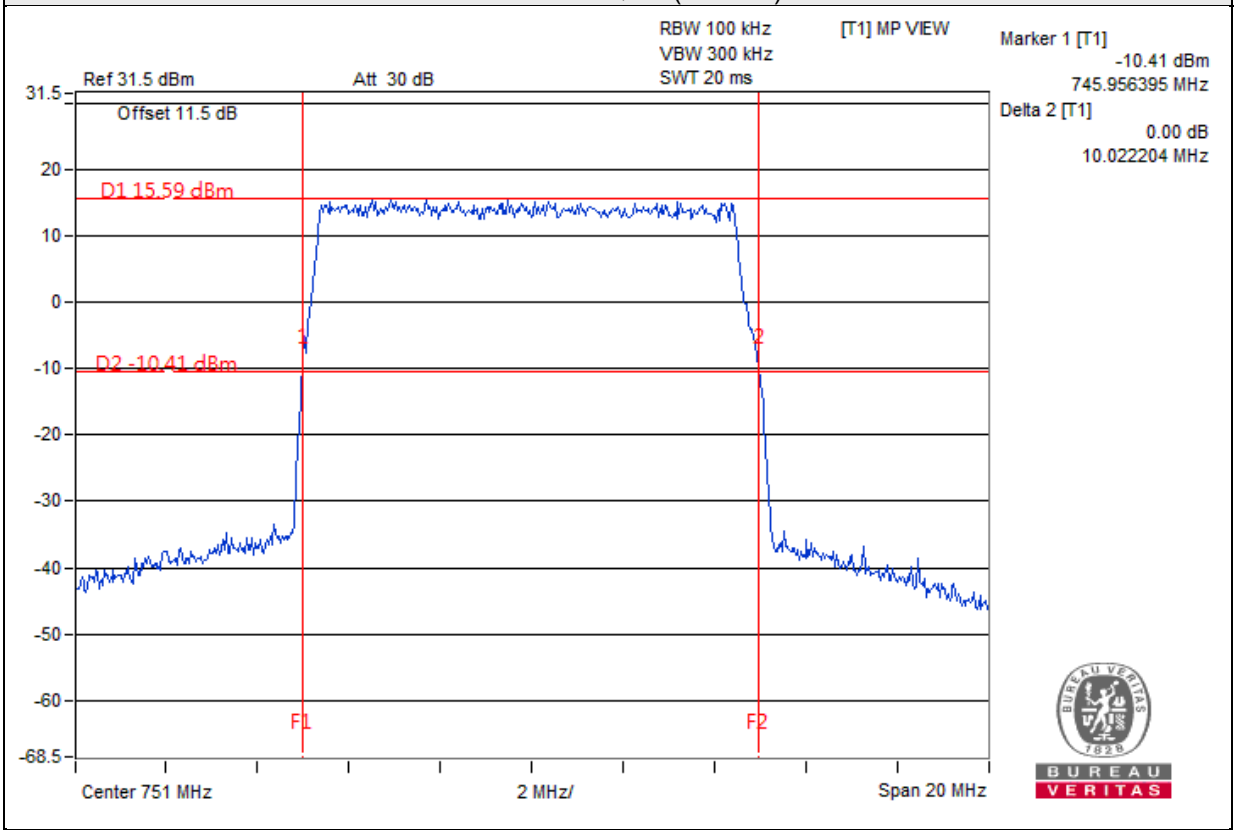
Channel Bandwidth: 5MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	256QAM	256QAM
748.5	4.780	4.784
751	4.794	4.777
753.5	4.774	4.781

26dBc Bandwidth
Spectrum Plot of Worst Value
5MHz / 256QAM (Chain 0)



Channel Bandwidth: 10MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	256QAM	256QAM
751	10.000	10.022

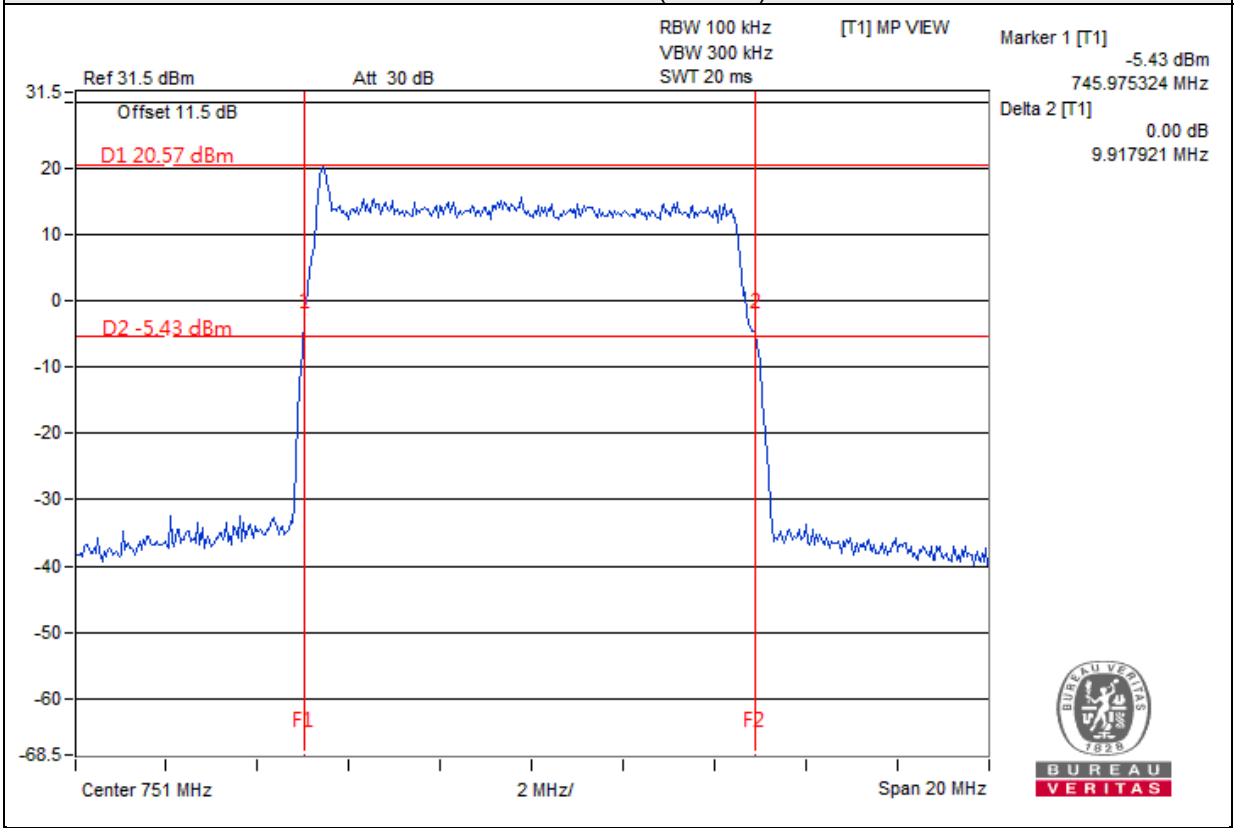
26dBc Bandwidth
Spectrum Plot of Worst Value
10MHz / 256QAM (Chain 1)



For LTE Band 13 Guard Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.918	9.852

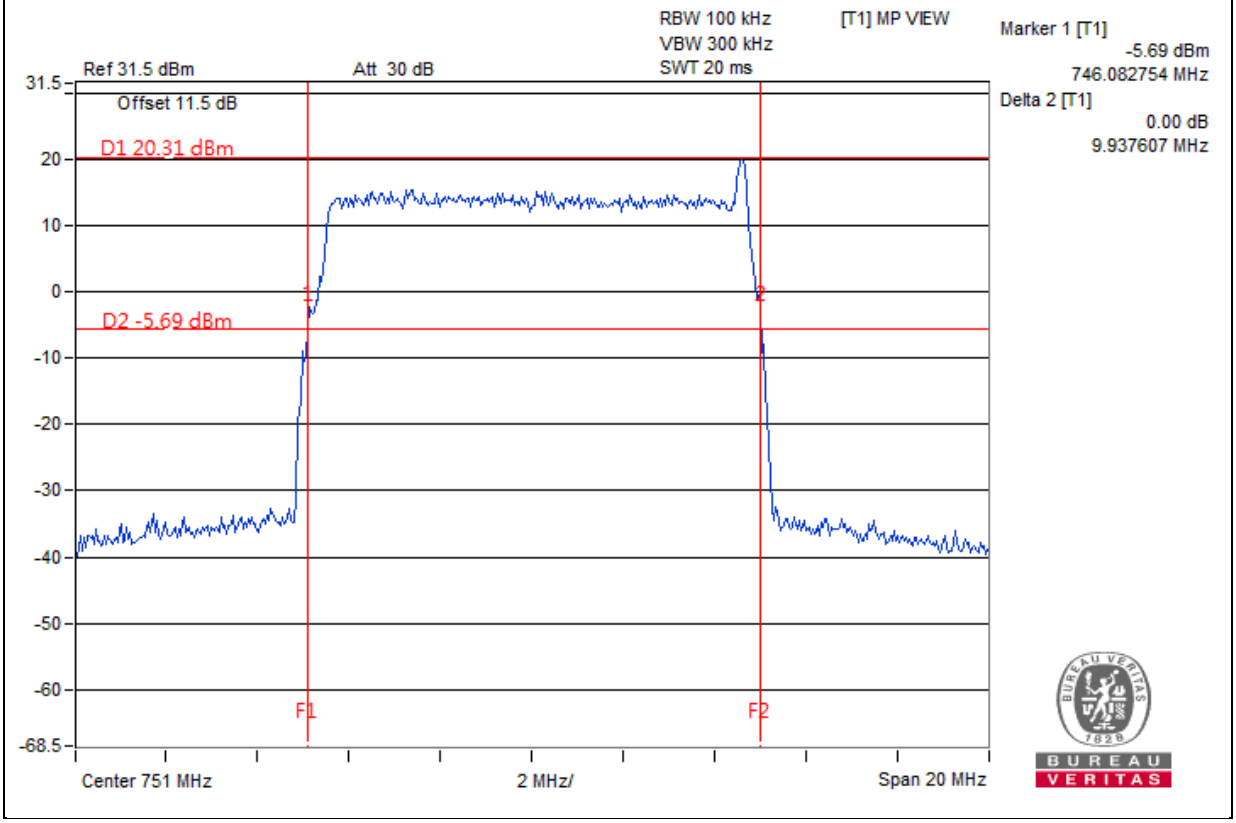
26dBc Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.909	9.938

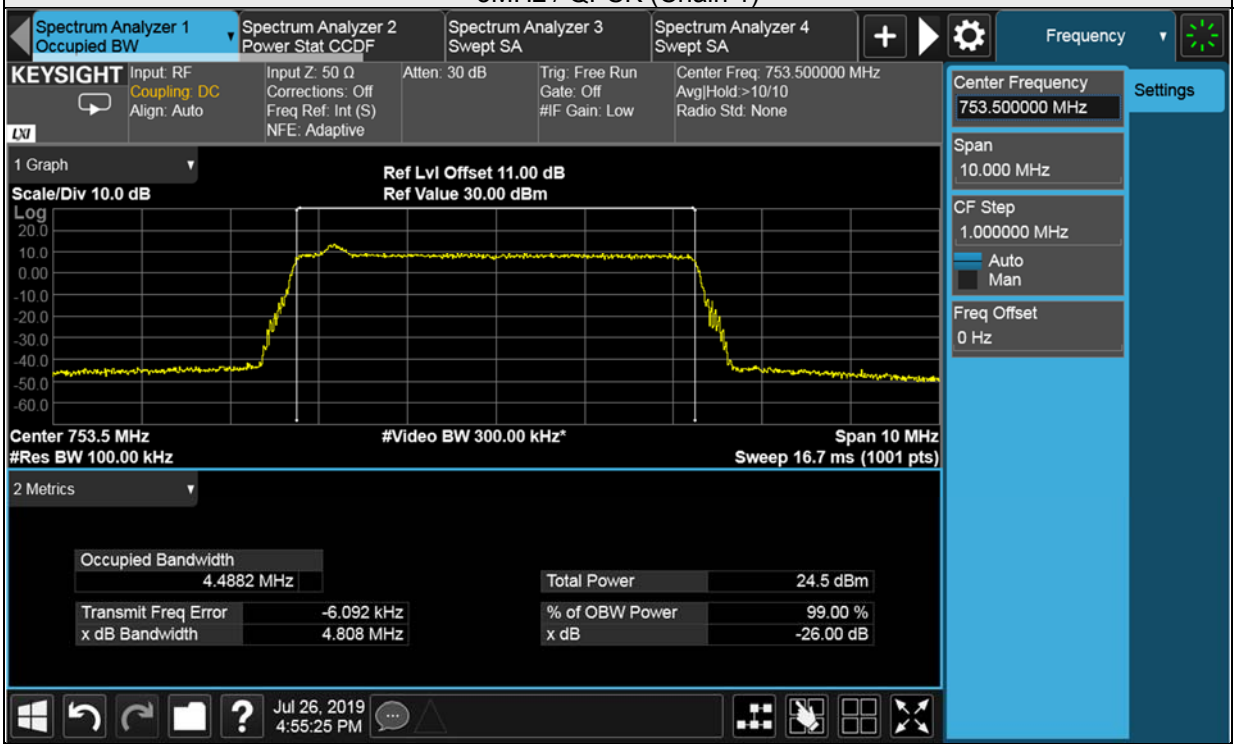
26dBc Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 1)



For NB-IoT In-Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 5MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
748.5	4.741	4.783
751.0	4.768	4.743
753.5	4.764	4.808

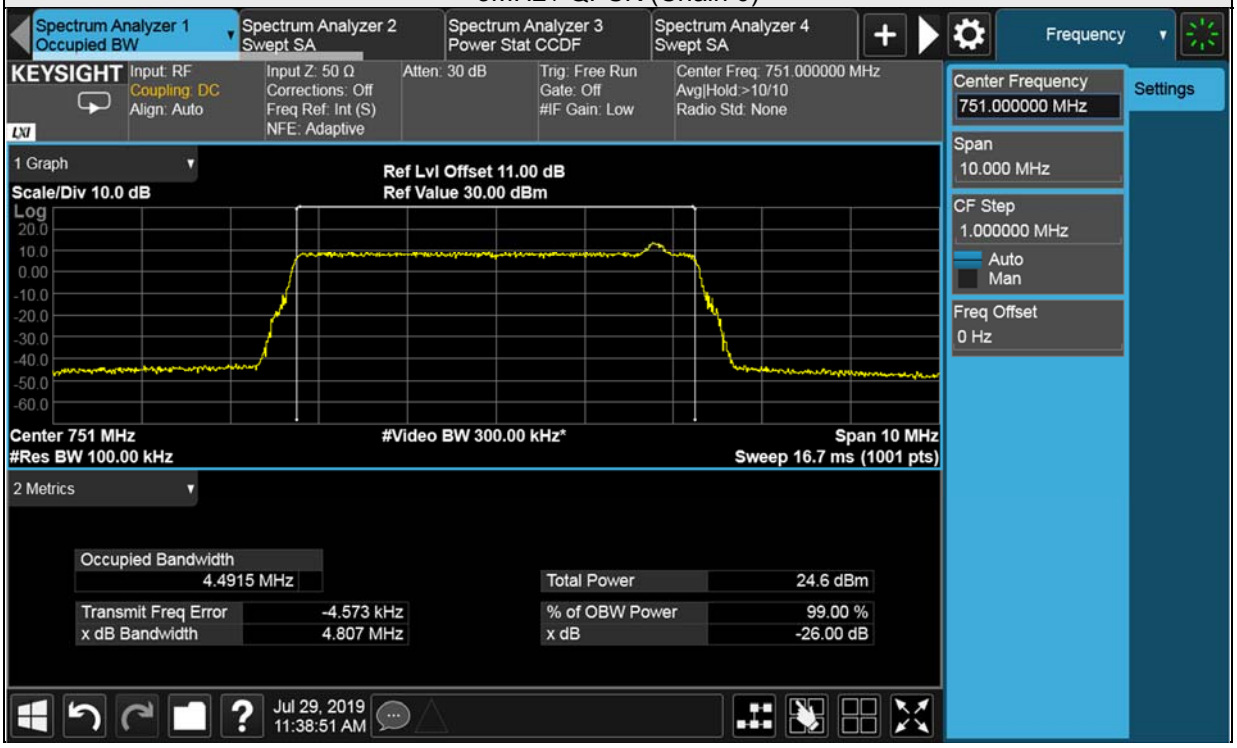
26dBc Bandwidth
Spectrum Plot of Worst Value
5MHz / QPSK (Chain 1)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 5MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
748.5	4.774	4.727
751.0	4.807	4.751
753.5	4.767	4.747

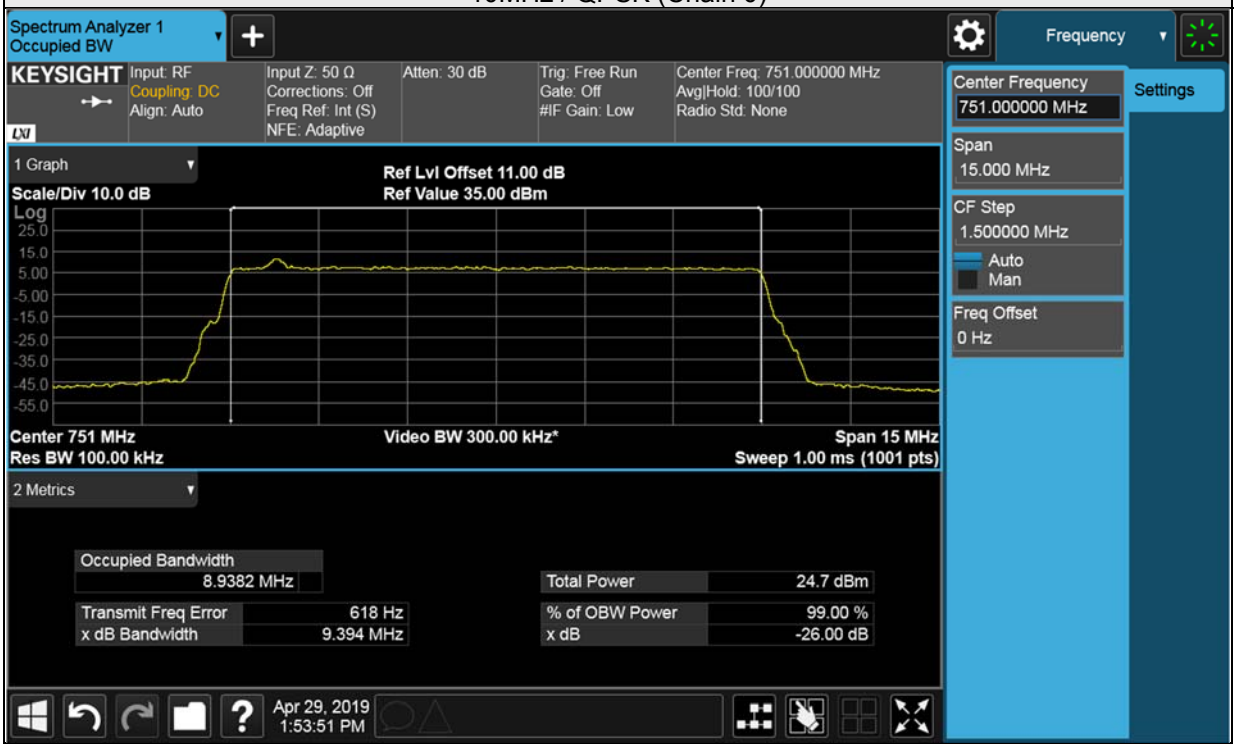
26dBc Bandwidth
Spectrum Plot of Worst Value
5MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.394	9.383

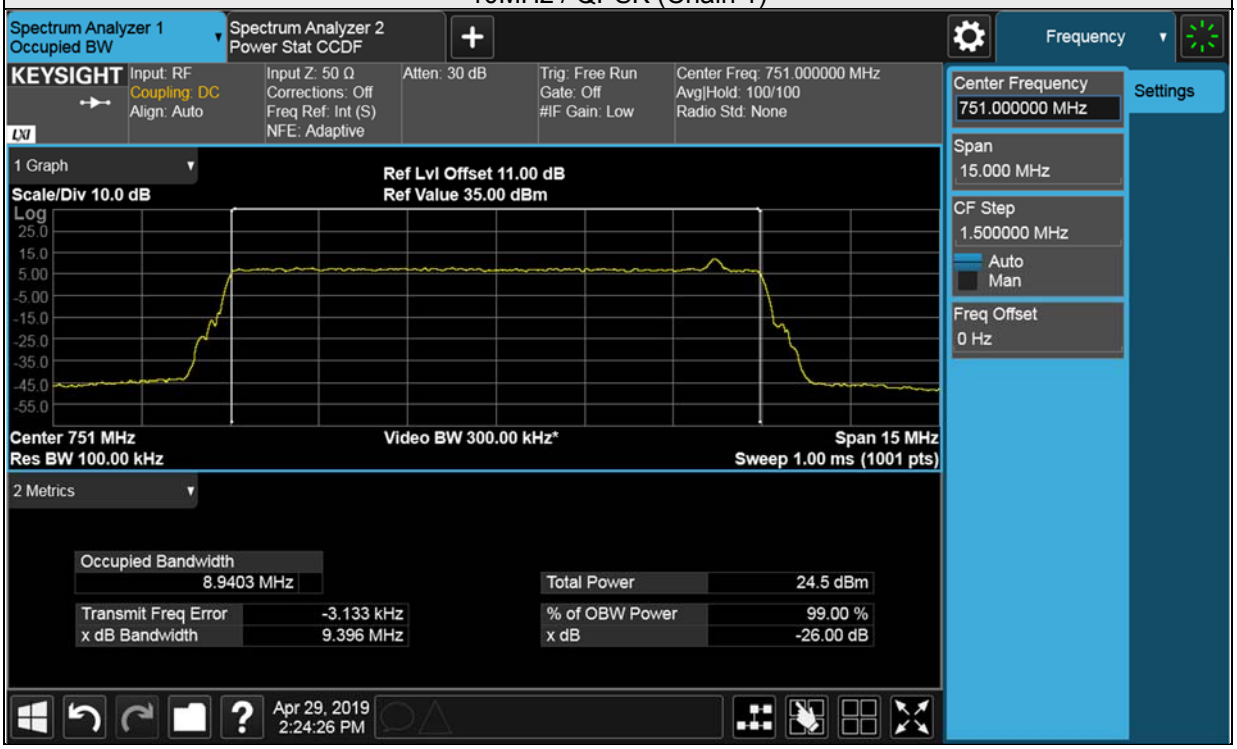
26dBc Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	26dBc Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.370	9.396

26dBc Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 1)



4.4.5 Test Results (Occupied Bandwidth)

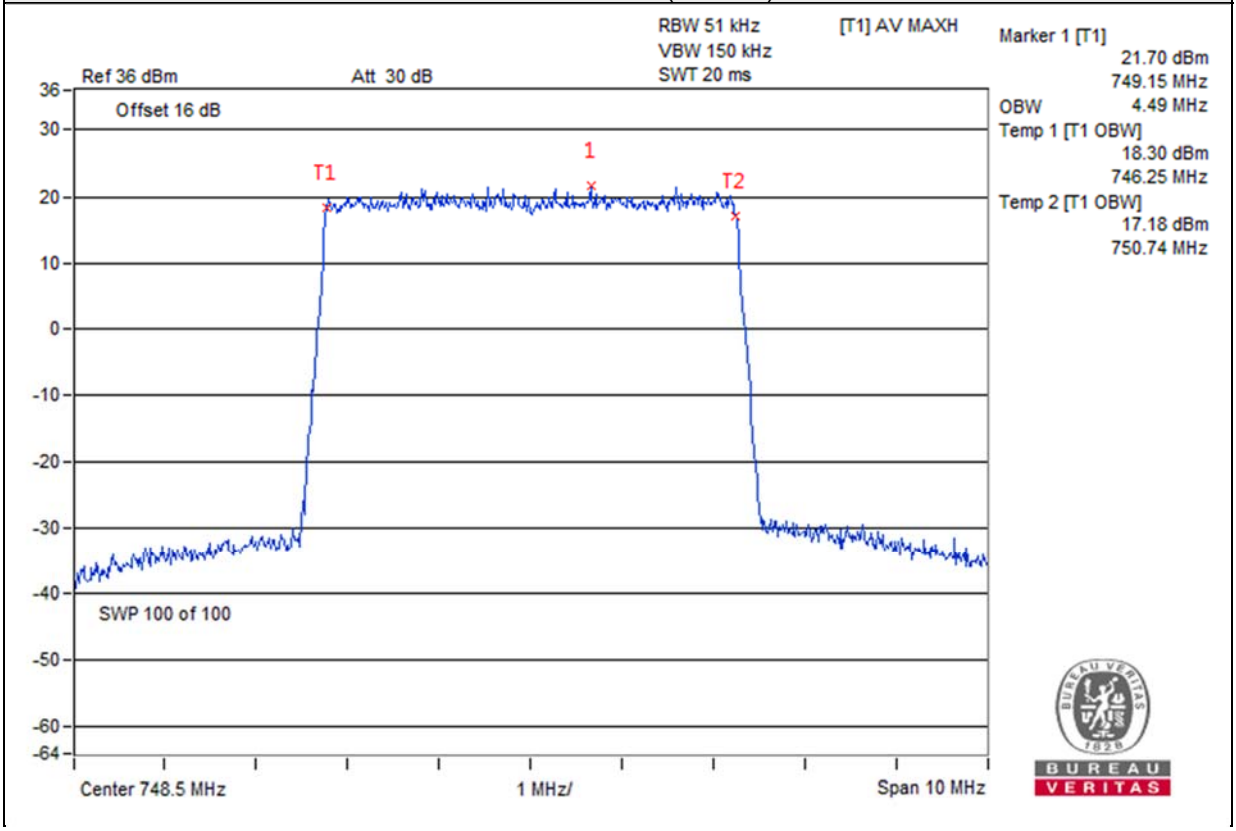
For LTE Band 13:

Channel Bandwidth: 5MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	256QAM	256QAM
748.5	4.49	4.49
751	4.49	4.49
753.5	4.47	4.47

Occupied Bandwidth

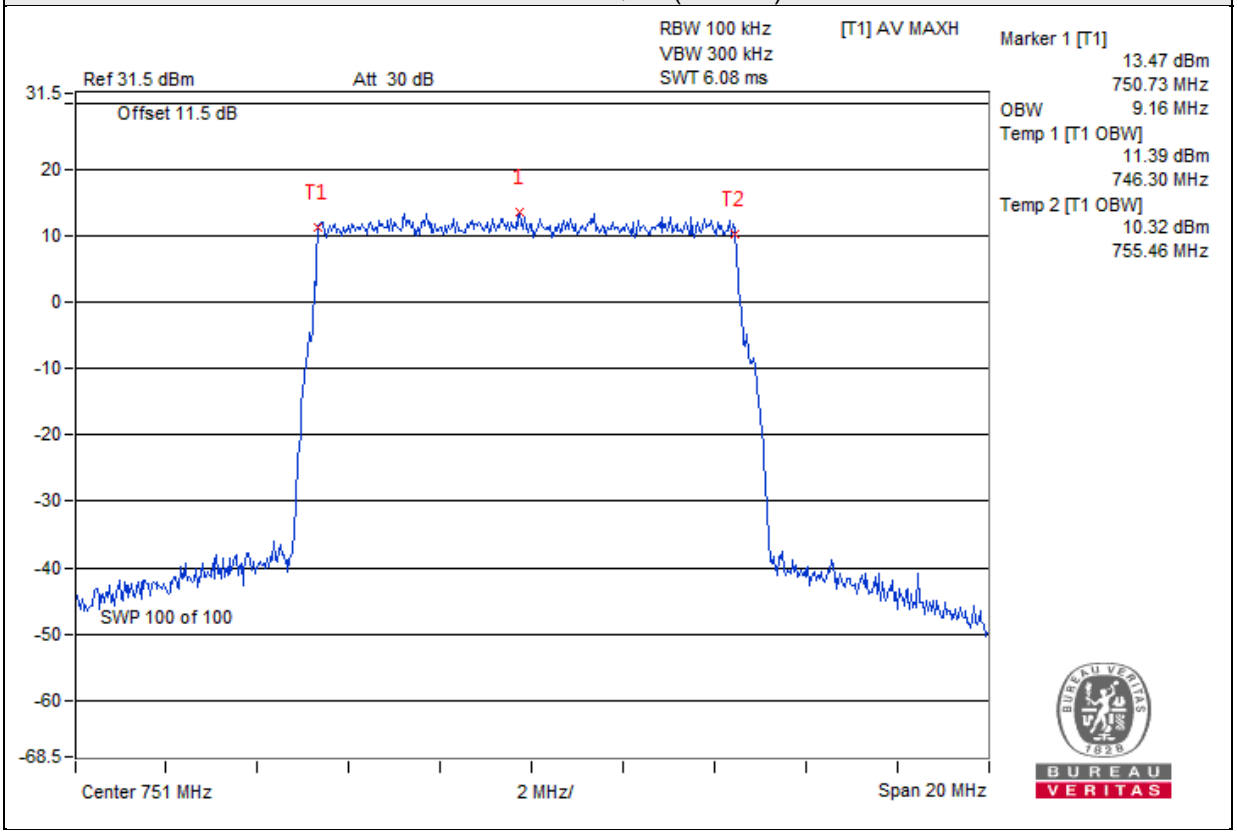
Spectrum Plot of Worst Value

5MHz / 256QAM (Chain 0)



Channel Bandwidth: 10MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	256QAM	256QAM
751.0	9.16	9.16

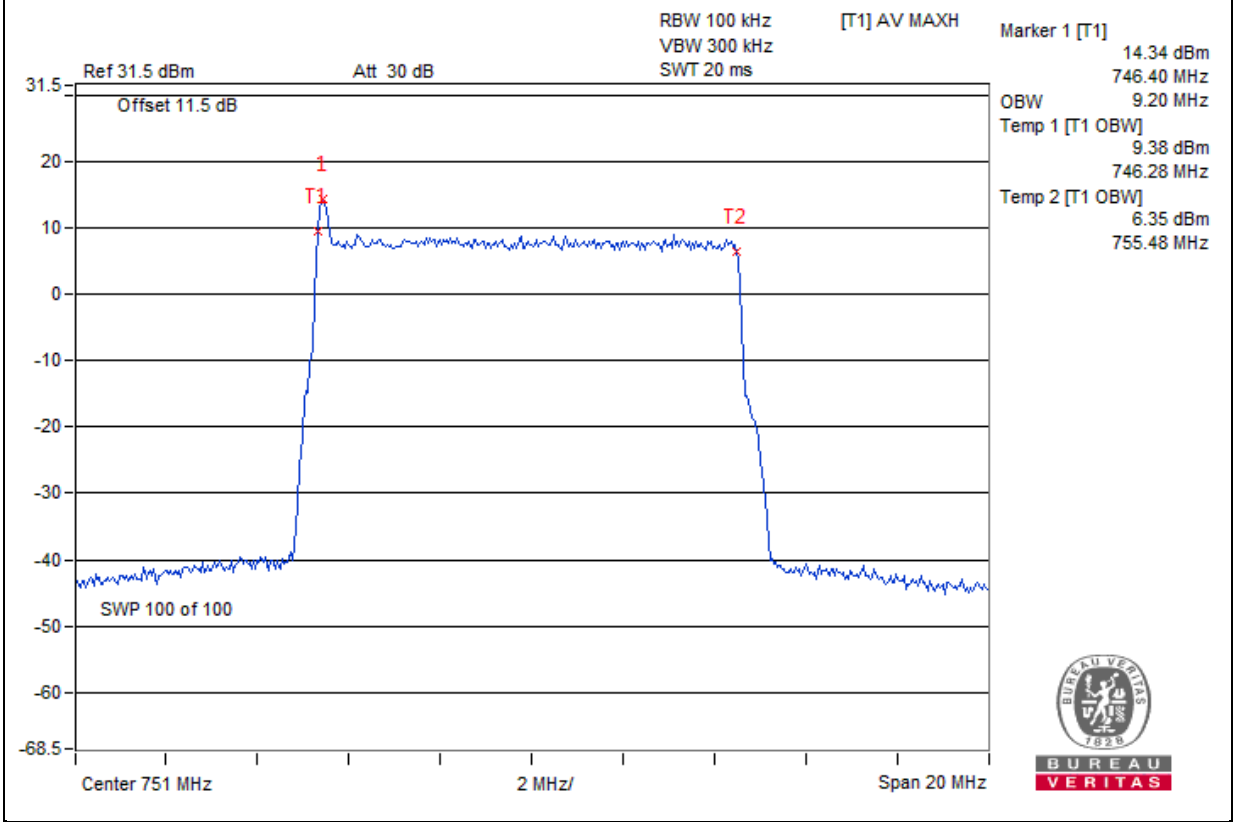
Occupied Bandwidth
Spectrum Plot of Worst Value
10MHz / 256QAM (Chain 1)



For LTE Band 13 Guard Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.20	9.20

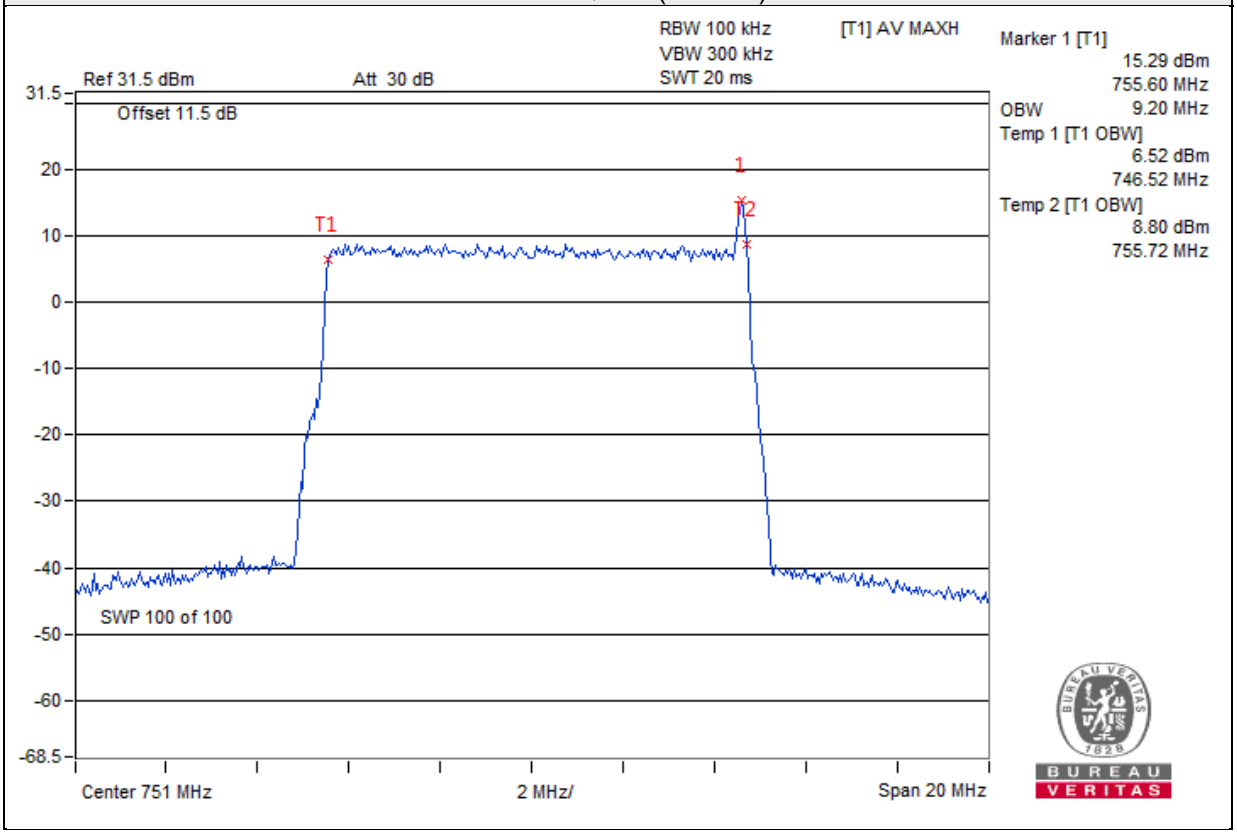
Occupied Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	9.20	9.20

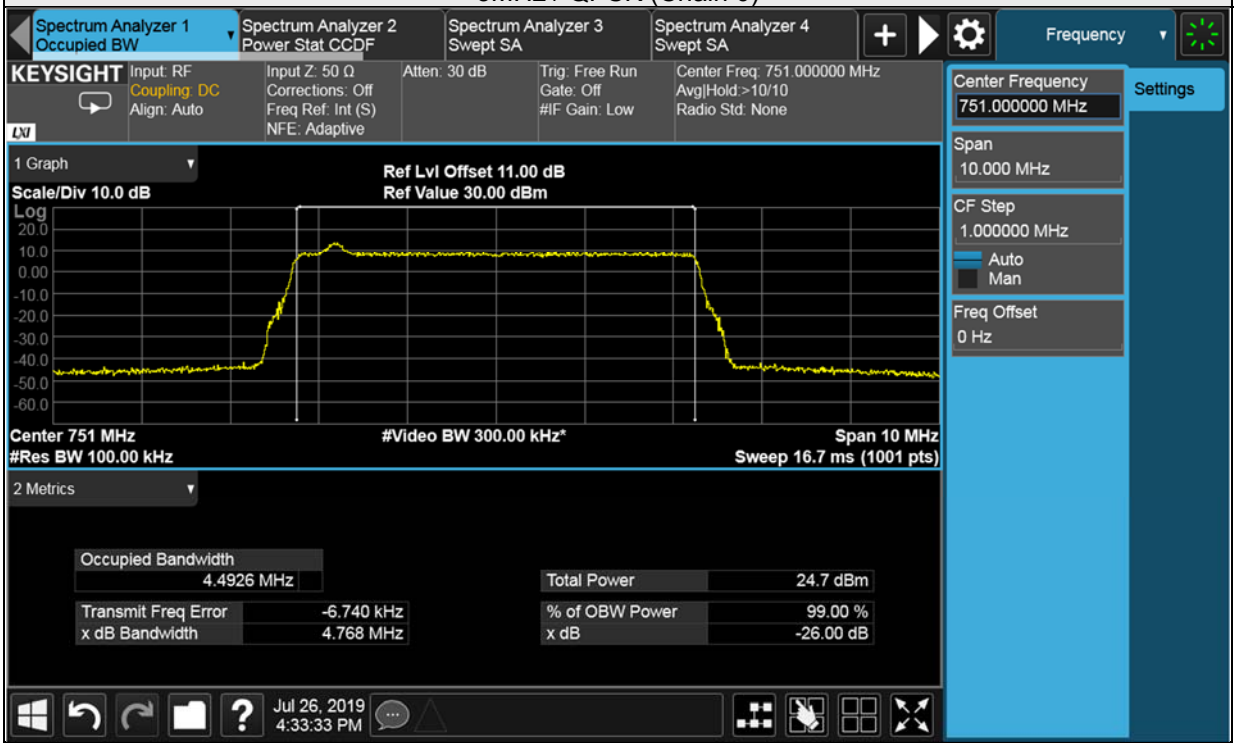
Occupied Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



For NB-IoT In-Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 5MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
748.5	4.4922	4.4911
751.0	4.4926	4.4906
753.5	4.4894	4.4882

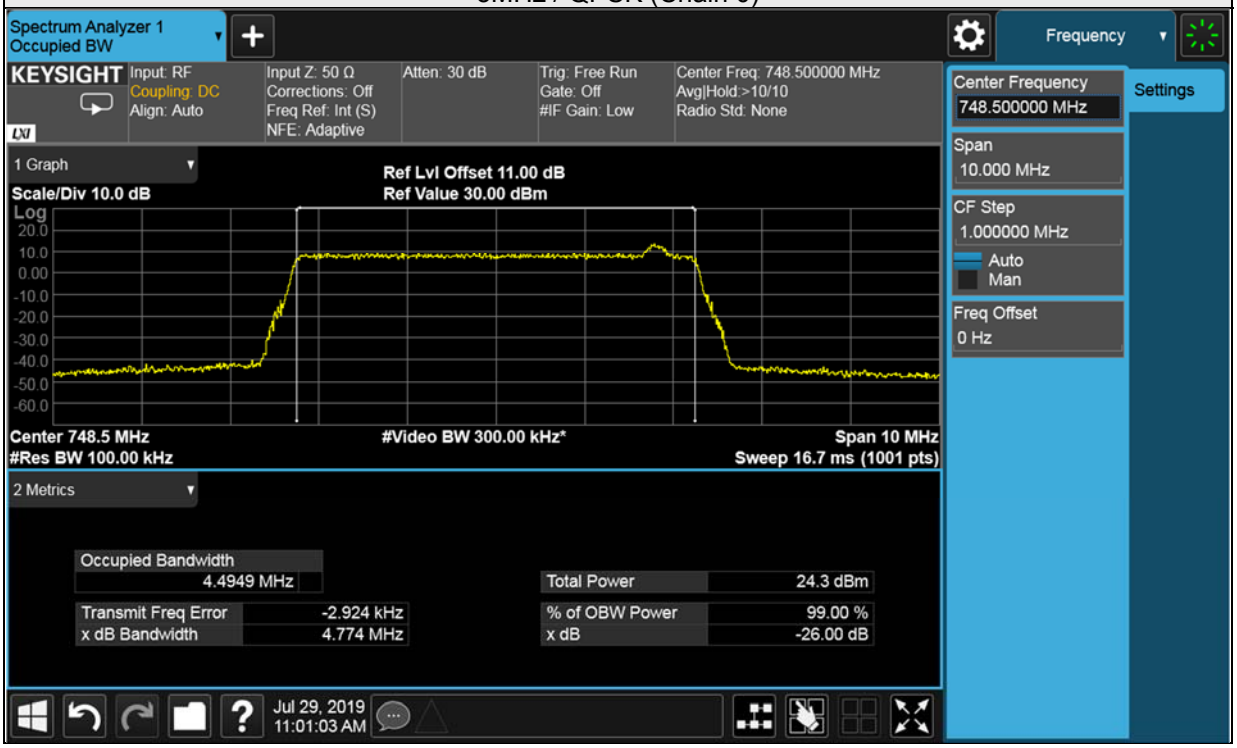
Occupied Bandwidth
Spectrum Plot of Worst Value
5MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 5MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
748.5	4.4949	4.4909
751.0	4.4915	4.4886
753.5	4.4918	4.4879

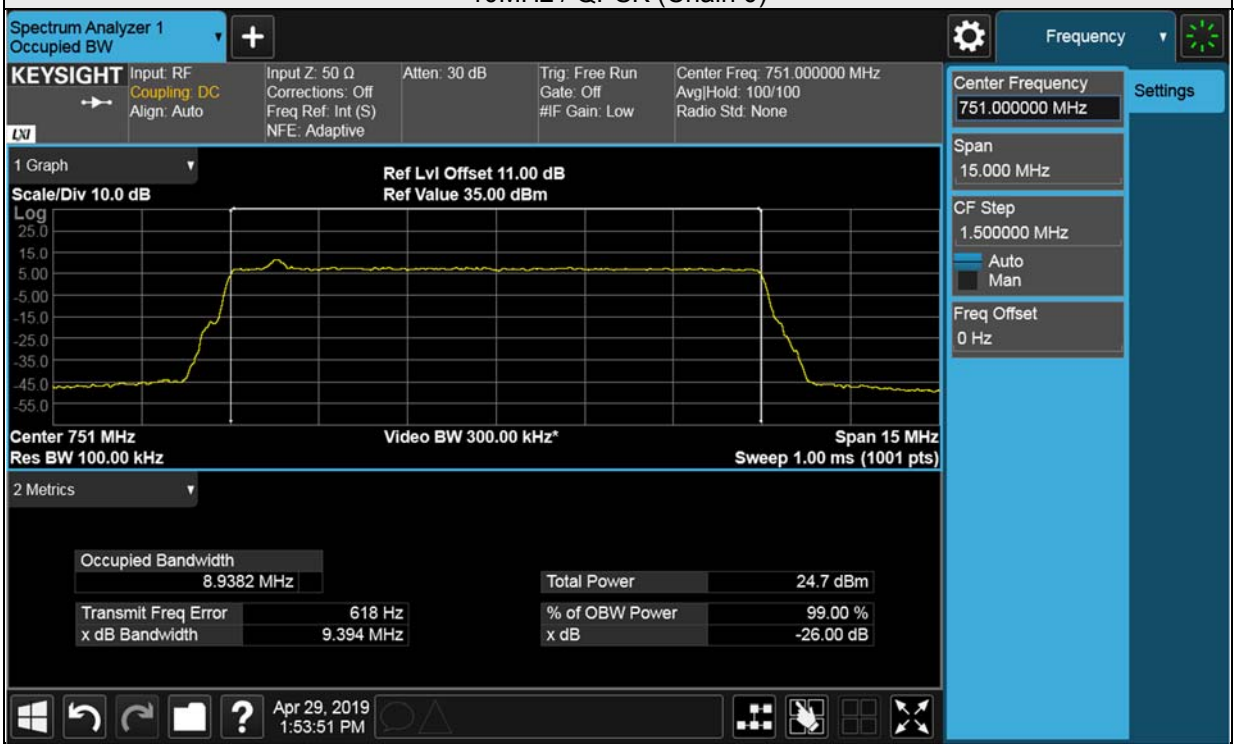
Occupied Bandwidth
Spectrum Plot of Worst Value
5MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	8.9382	8.9329

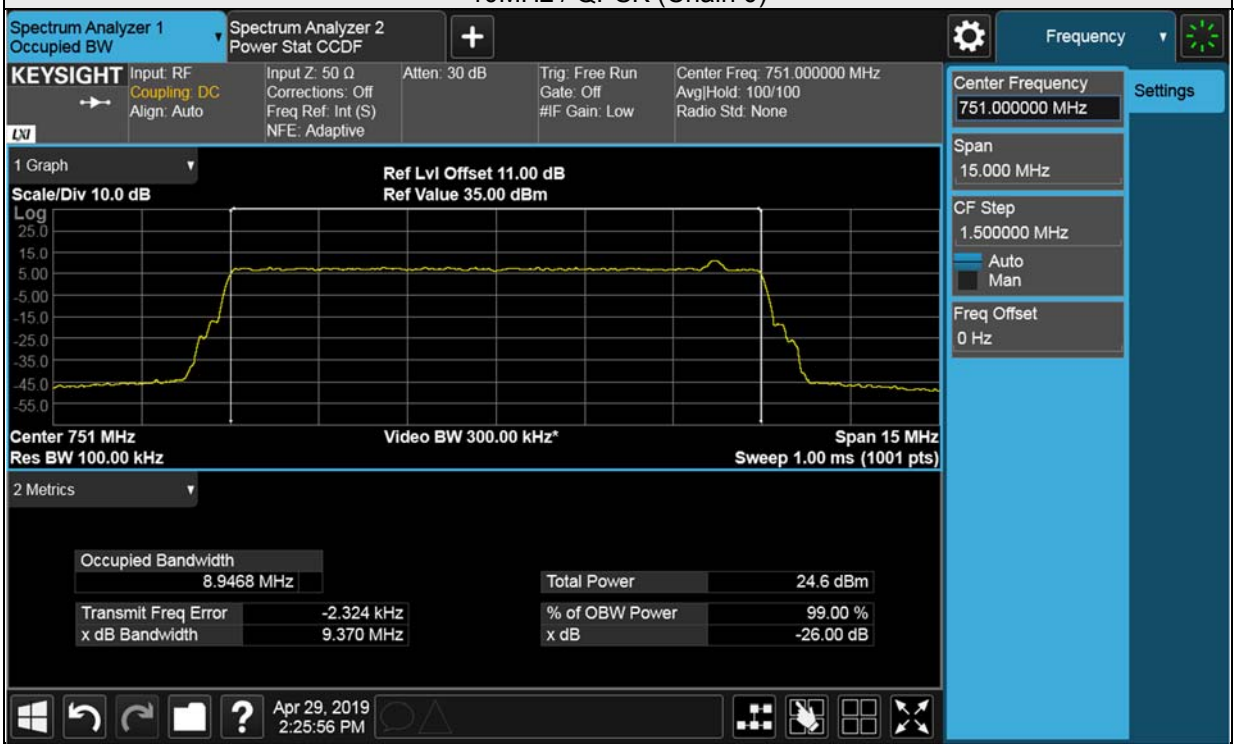
Occupied Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	Occupied Bandwidth (MHz)	
	Chain0	Chain1
	QPSK	QPSK
751.0	8.9468	8.9403

Occupied Bandwidth
Spectrum Plot of Worst Value
10MHz / QPSK (Chain 0)



4.5 Band Edge Measurement

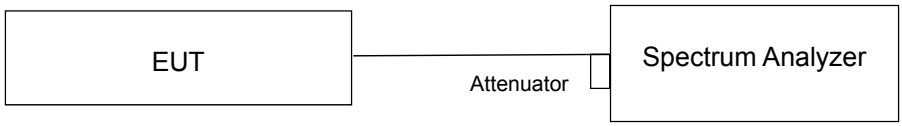
4.5.1 Limits of Band Edge Measurement

According to FCC 27.53(c), for operations in the 747 to 762 MHz band and the 777 to 792 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured watts, in accordance with the following:

(1) On any frequency outside the 747 to 762 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

Note: The Device has 2x2 MIMO function, so the limit of spurious emissions needs to be reduced by $10\log(Numbers_{Ant})$ according to FCC KDB 662911 D01 quidance.

4.5.2 Test Setup



4.5.3 Test Procedures

a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.

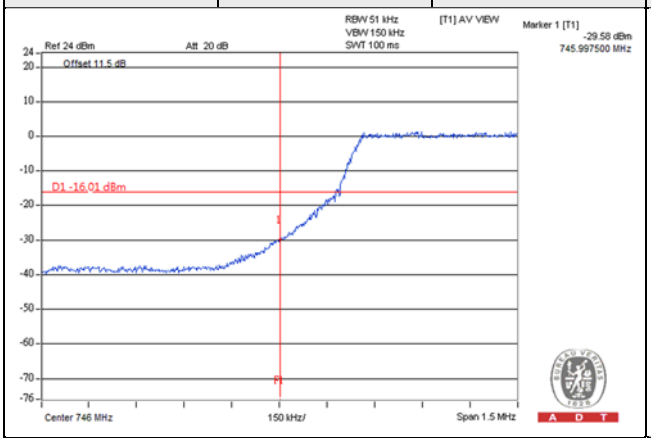
b. The center frequency of spectrum is the band edge frequency and span is RBW = 51kHz and VBW = 150kHz (Channel Bandwidth: 5MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 10MHz).

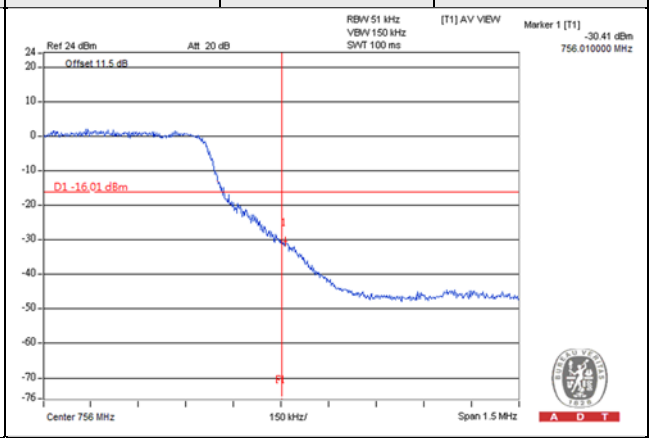
c. Record the max trace plot into the test report.

4.5.4 Test Results

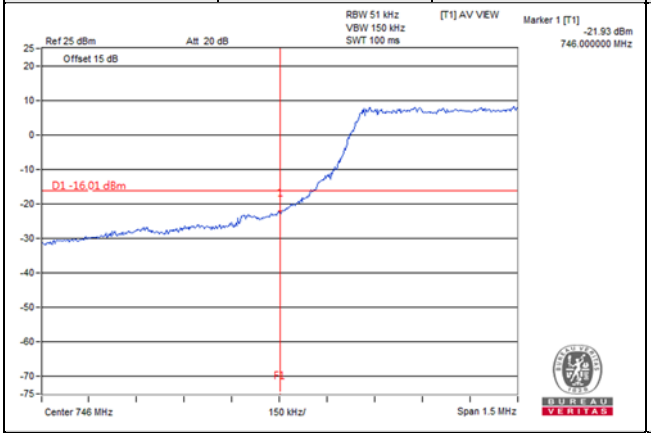
For LTE Band 13:

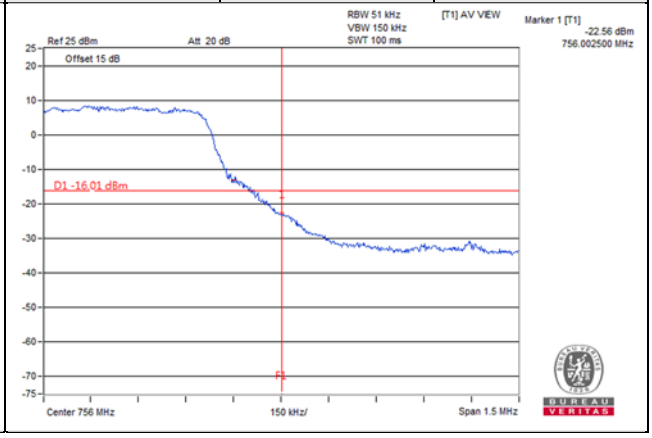
Channel Bandwidth: 5MHz					
748.5MHz	256QAM	Chain 0	753.5MHz	256QAM	Chain 0



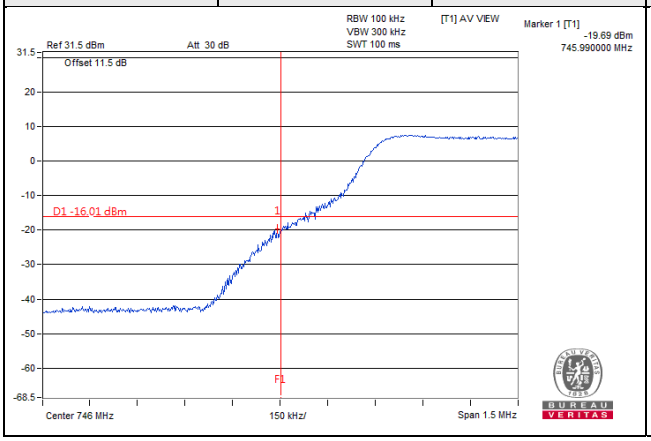


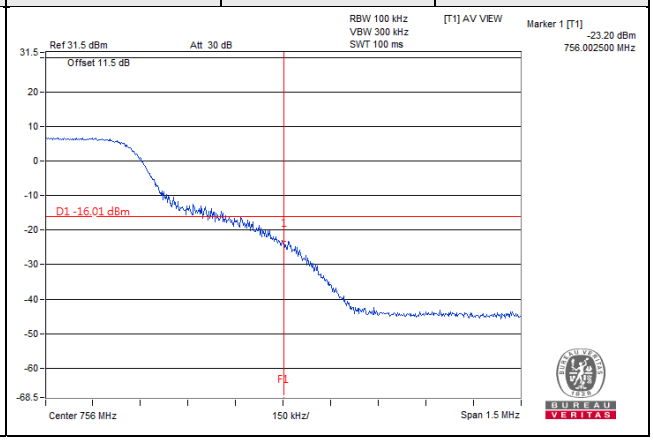
Channel Bandwidth: 5MHz					
748.5MHz	256QAM	Chain 1	753.5MHz	256QAM	Chain 1



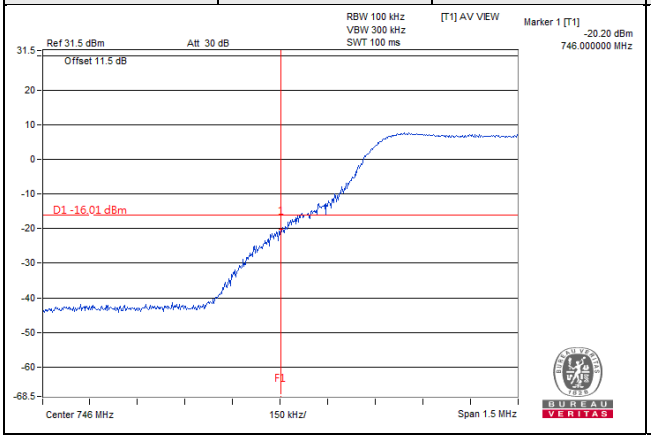


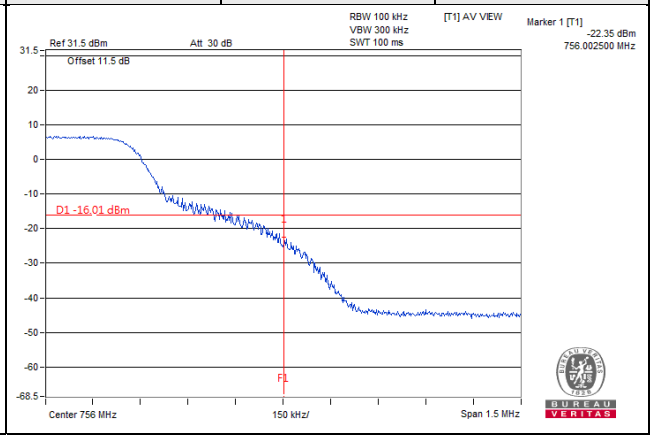
Channel Bandwidth: 10MHz					
751MHz	256QAM	Chain 0	751MHz	256QAM	Chain 0





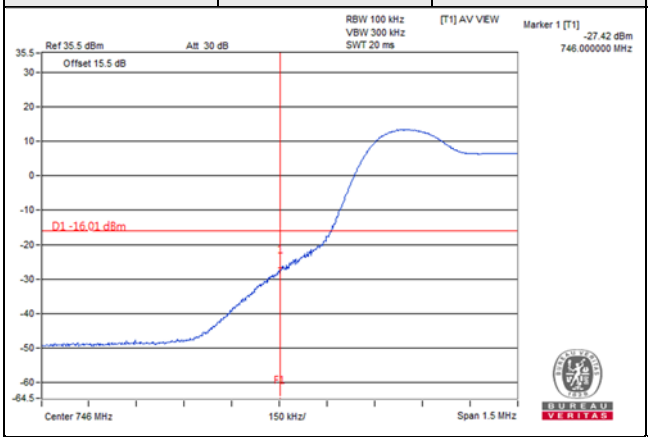
Channel Bandwidth: 10MHz					
751MHz	256QAM	Chain 1	751MHz	256QAM	Chain 1

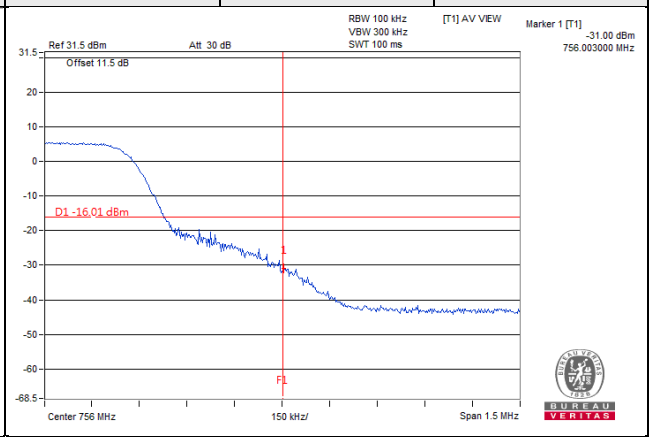




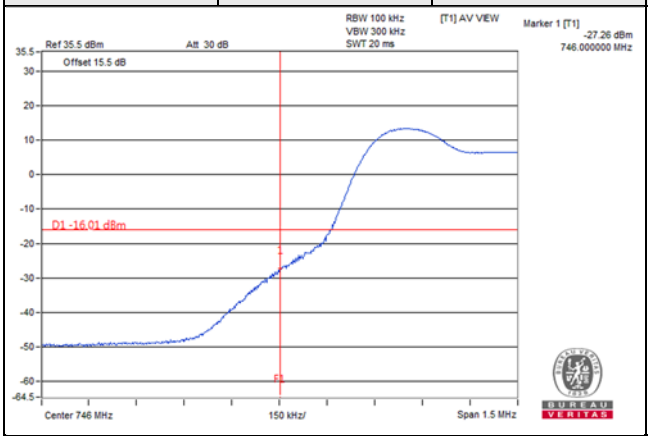
For LTE Band 13 Guard Band:
QPSK_NB-IoT Signal at Bottom

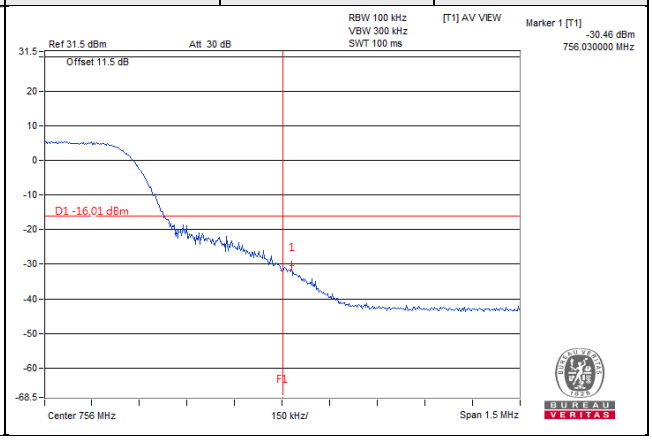
Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 0	751.0MHz	QPSK	Chain 0





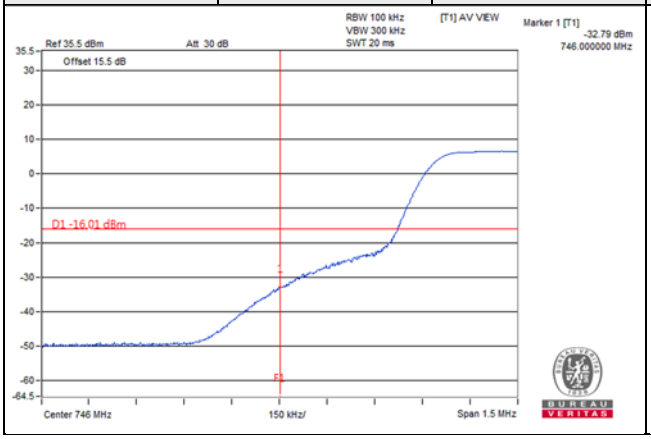
Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 1	751.0MHz	QPSK	Chain 1

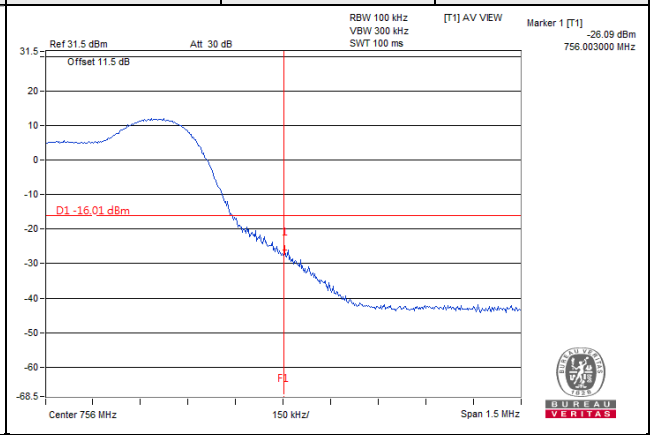




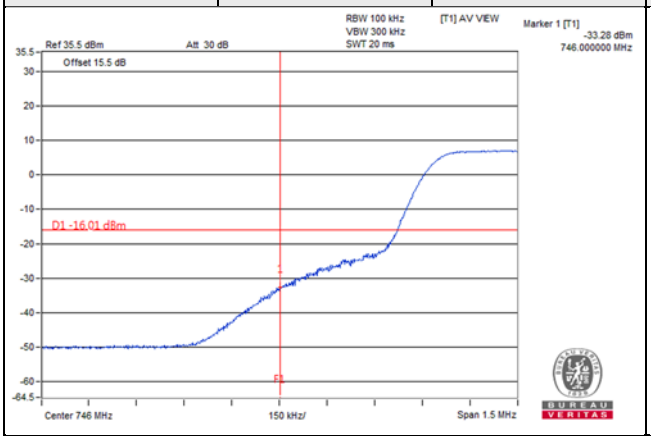
QPSK_NB-IoT Signal at Top

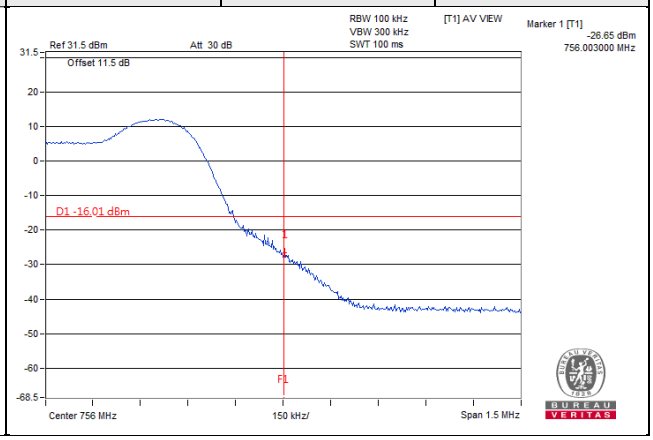
Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 0	751.0MHz	QPSK	Chain 0





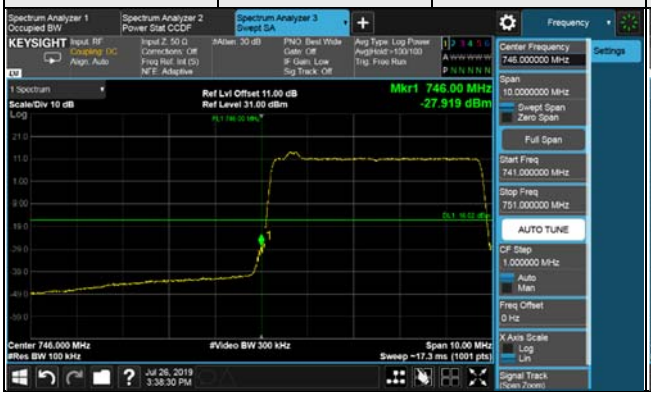
Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 1	751.0MHz	QPSK	Chain 1

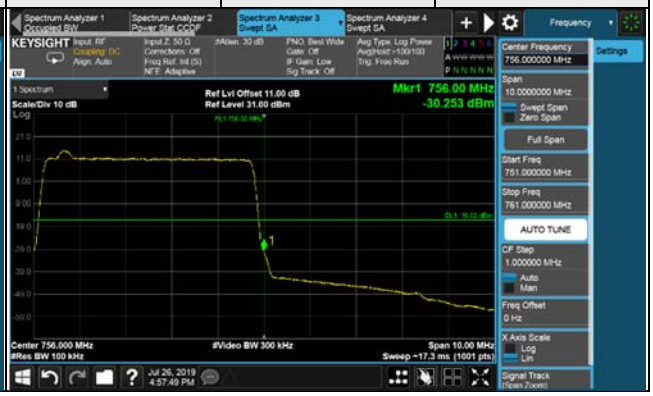




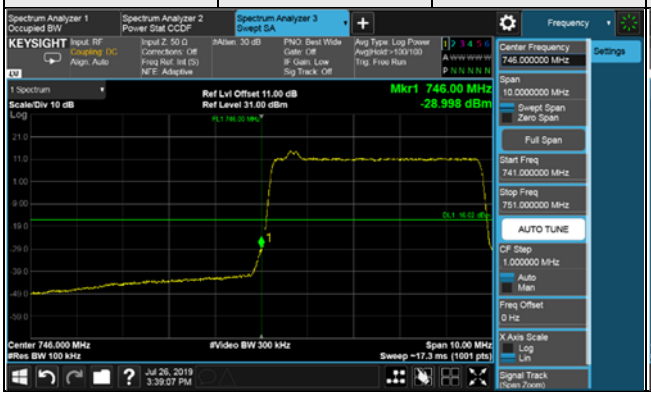
For NB-IoT In-Band:
QPSK_NB-IoT Signal at Bottom

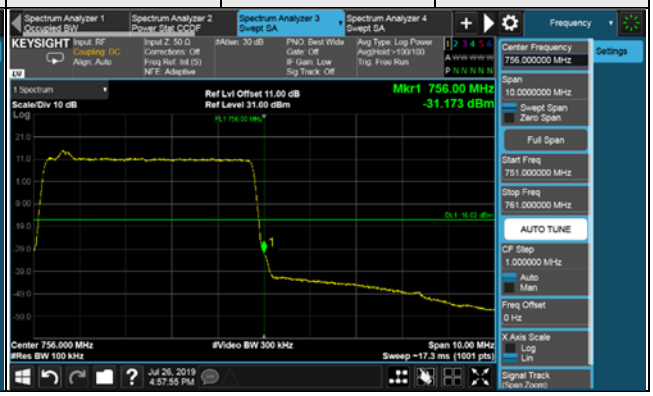
Channel Bandwidth: 5MHz					
748.5MHz	QPSK	Chain 0	753.5MHz	QPSK	Chain 0





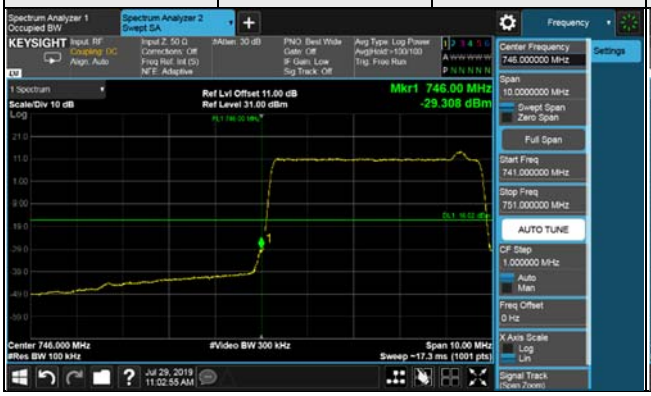
Channel Bandwidth: 5MHz					
748.5MHz	QPSK	Chain 1	753.5MHz	QPSK	Chain 1



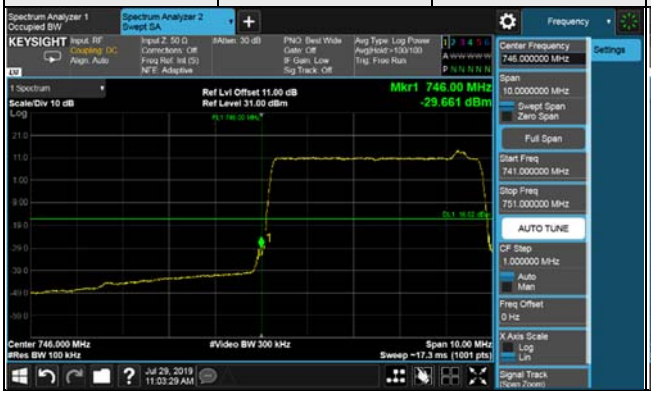


QPSK_NB-IoT Signal at Top

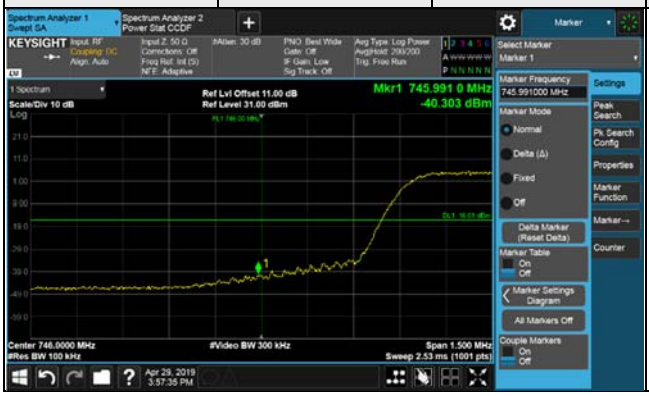
Channel Bandwidth: 5MHz					
748.5MHz	QPSK	Chain 0	753.5MHz	QPSK	Chain 0

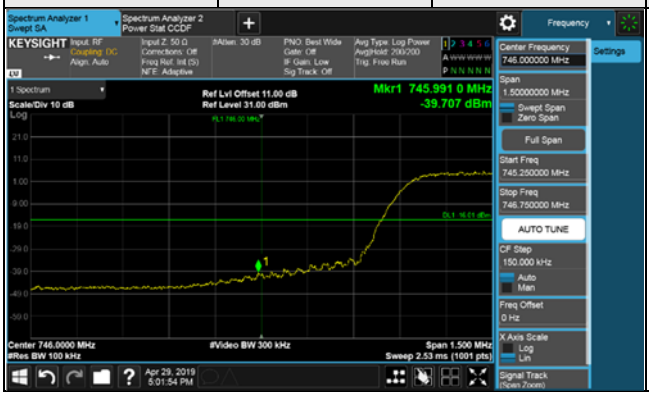
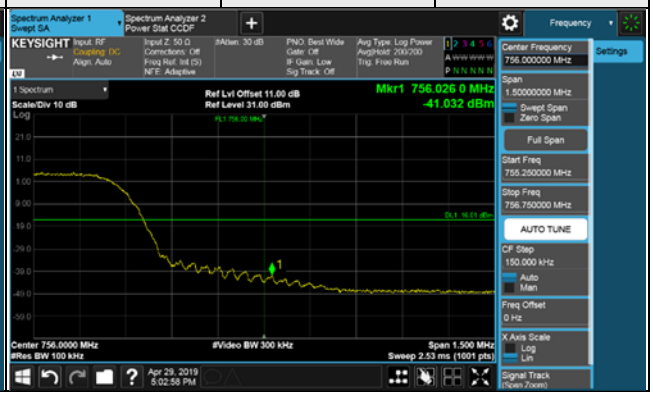


Channel Bandwidth: 5MHz					
748.5MHz	QPSK	Chain 1	753.5MHz	QPSK	Chain 1



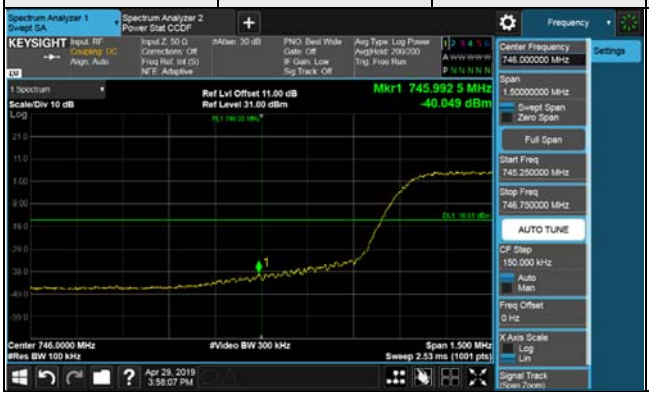
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 0	751.0MHz	QPSK	Chain 0
					

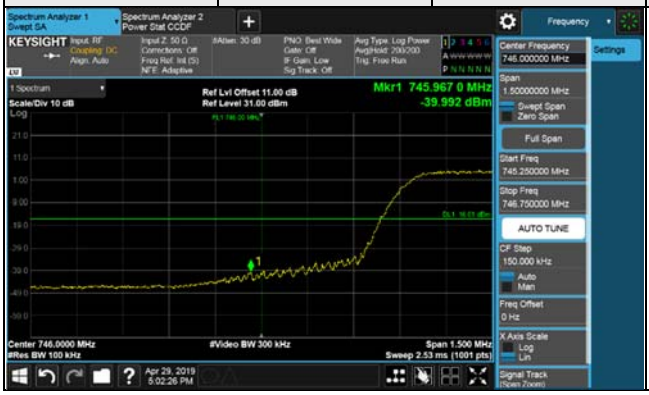
Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 1	751.0MHz	QPSK	Chain 1
					

QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 0	751.0MHz	QPSK	Chain 0



Channel Bandwidth: 10MHz					
751.0MHz	QPSK	Chain 1	751.0MHz	QPSK	Chain 1

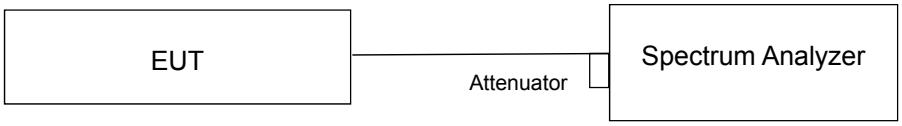


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.6.2 Test Setup



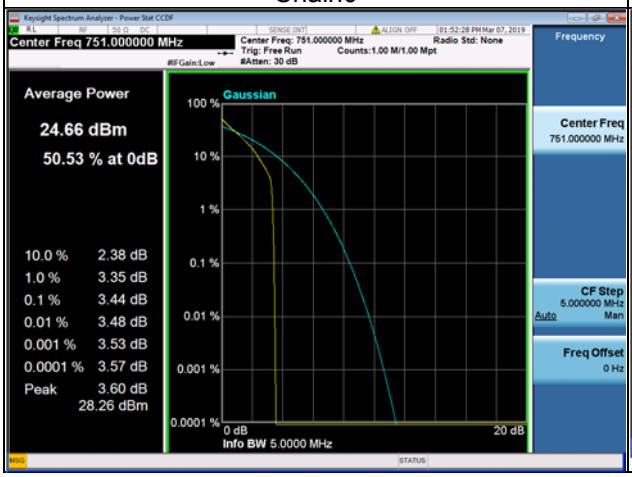
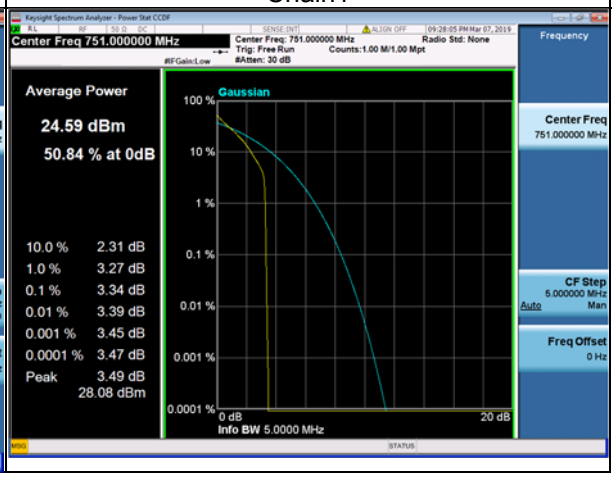
4.6.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

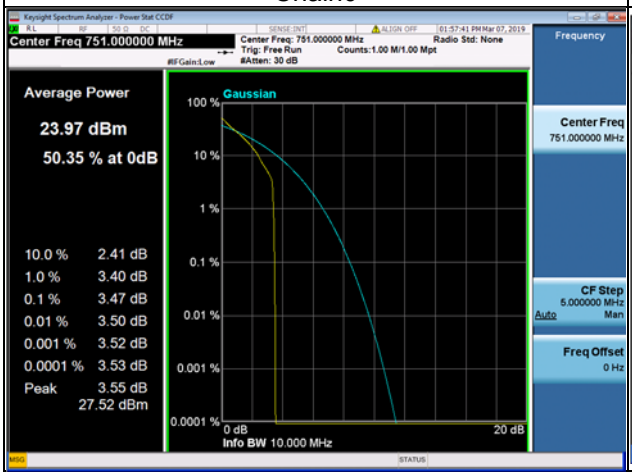
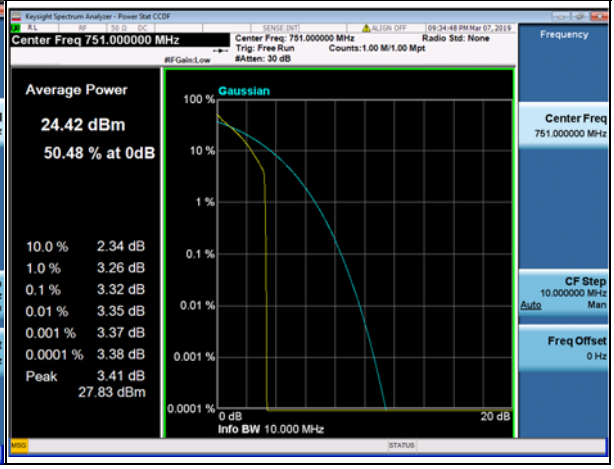
4.6.4 Test Results

For LTE Band 13:

Channel Bandwidth: 5MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	256QAM	256QAM
748.5	3.36	3.32
751	3.44	3.34
753.5	3.43	3.30

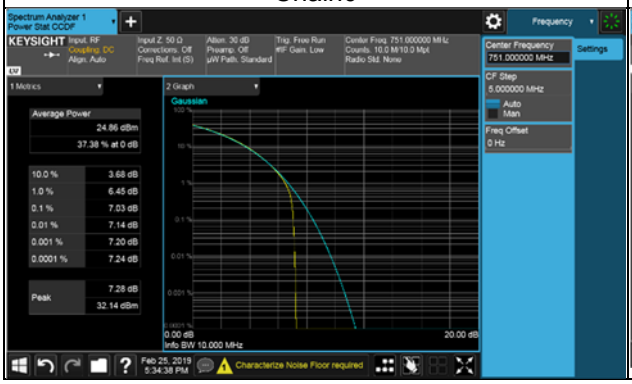
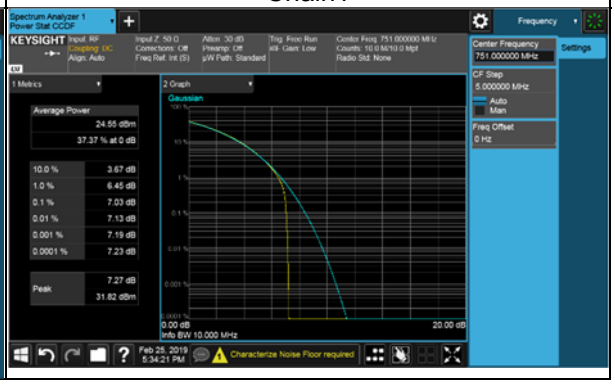
Spectrum Plot of Worst Value	
Peak To Average Ratio	
5MHz / 256QAM	
Chain0	Chain1
	

Channel Bandwidth: 10MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	256QAM	256QAM
751	3.47	3.32

Spectrum Plot of Worst Value	
Peak To Average Ratio	
10MHz / 256QAM	
Chain0	Chain1
	

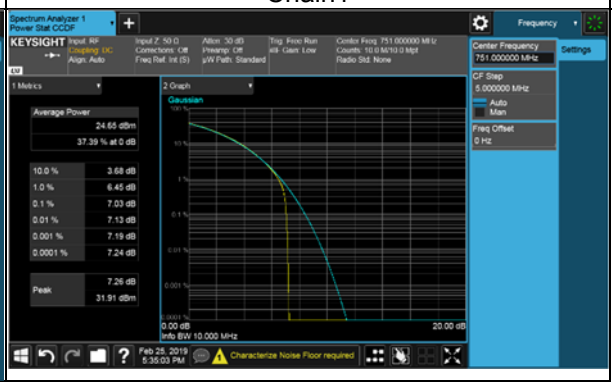
For LTE Band 13 Guard Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
751.0	7.03	7.03

Spectrum Plot of Worst Value	
Peak To Average Ratio	
10MHz / QPSK	
Chain0	Chain1
	

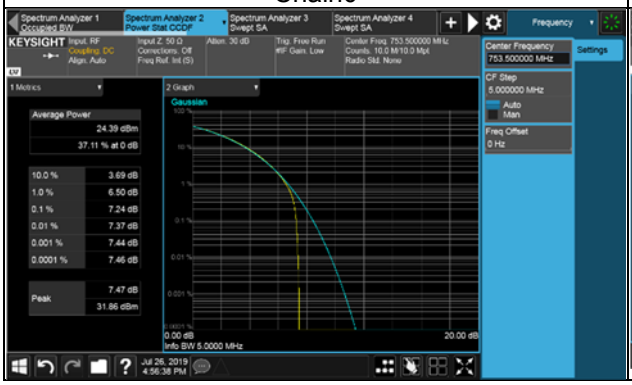
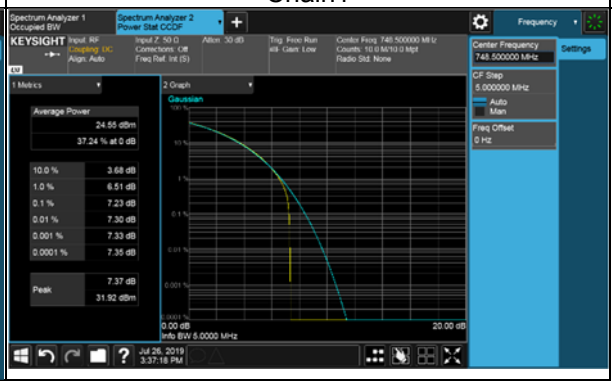
QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
751.0	7.02	7.03

Spectrum Plot of Worst Value	
Peak To Average Ratio	
10MHz / QPSK	
Chain0	Chain1
	

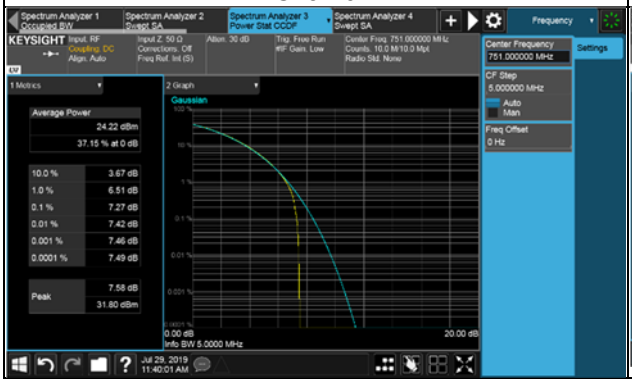
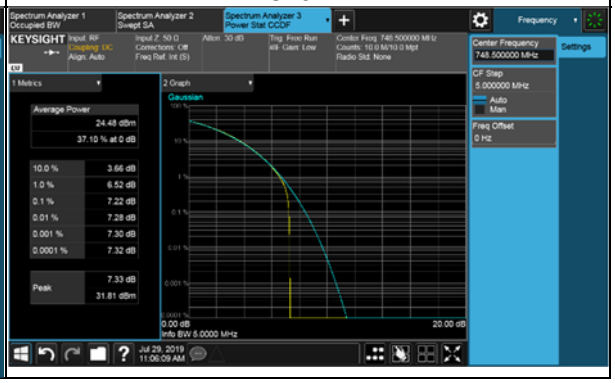
For NB-IoT In-Band:
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 5MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
748.5	7.22	7.23
751.0	7.23	7.21
753.5	7.24	7.22

Spectrum Plot of Worst Value	
Peak To Average Ratio	
5MHz / QPSK	
Chain0	Chain1
	

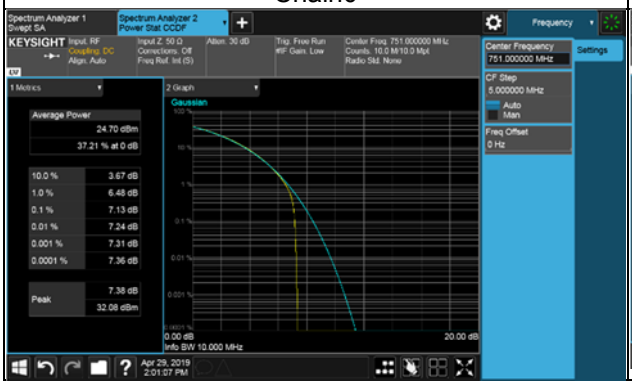
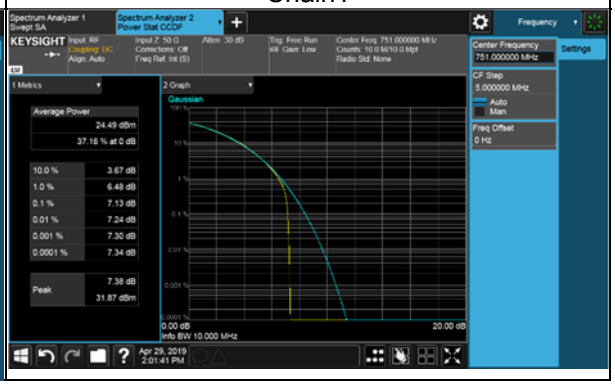
QPSK_NB-IoT Signal at Top

Channel Bandwidth: 5MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
748.5	7.21	7.22
751.0	7.27	7.22
753.5	7.23	7.21

Spectrum Plot of Worst Value	
Peak To Average Ratio	
5MHz / QPSK	
Chain0	Chain1
	

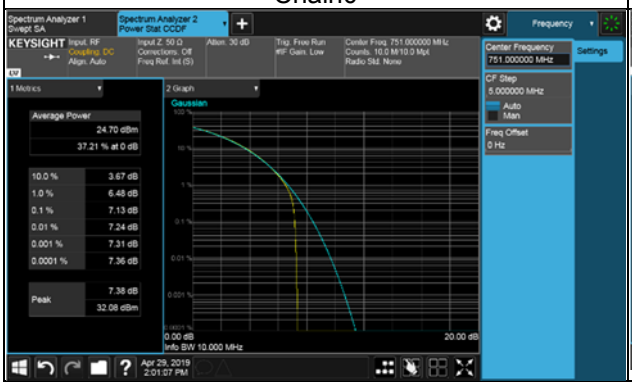
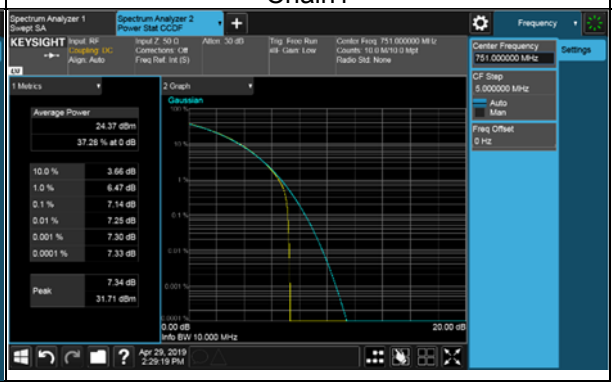
QPSK_NB-IoT Signal at Bottom

Channel Bandwidth: 10MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
751.0	7.13	7.13

Spectrum Plot of Worst Value	
Peak To Average Ratio	
10MHz / QPSK	
Chain0	Chain1
	

QPSK_NB-IoT Signal at Top

Channel Bandwidth: 10MHz		
Frequency (MHz)	Peak To Average Ratio (dB)	
	Chain0	Chain1
	QPSK	QPSK
751.0	7.13	7.14

Spectrum Plot of Worst Value	
Peak To Average Ratio	
10MHz / QPSK	
Chain0	Chain1
	

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

According to FCC 27.53(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

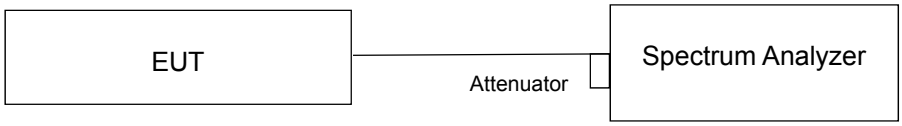
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

According to FCC 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz.

Note: The Device has 2x2 MIMO function, so the limit of spurious emissions needs to be reduced by 10log($Numbers_{Ant}$) according to FCC KDB 662911 D01 quidance.

4.7.2 Test Setup



4.7.3 Test Procedure

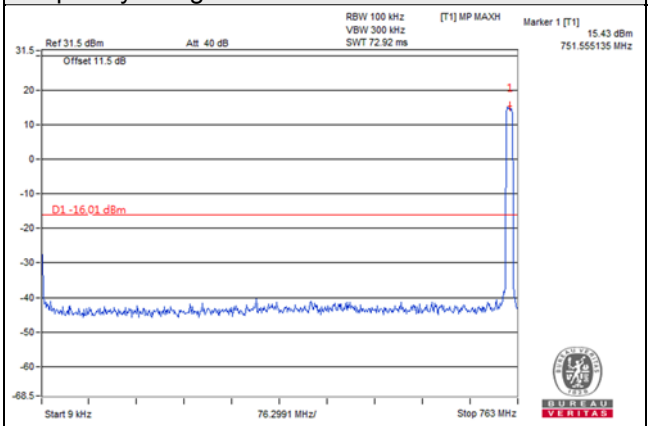
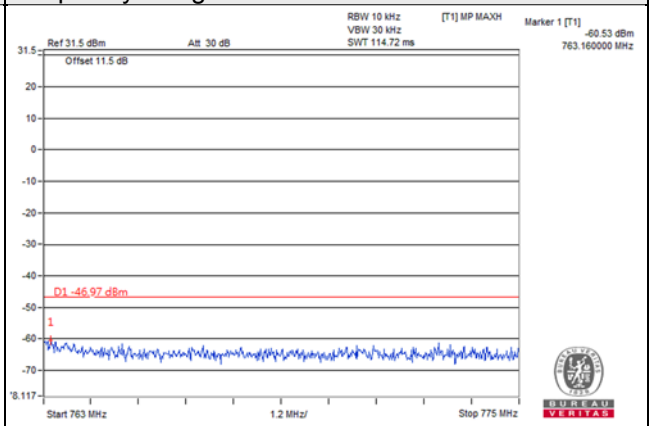
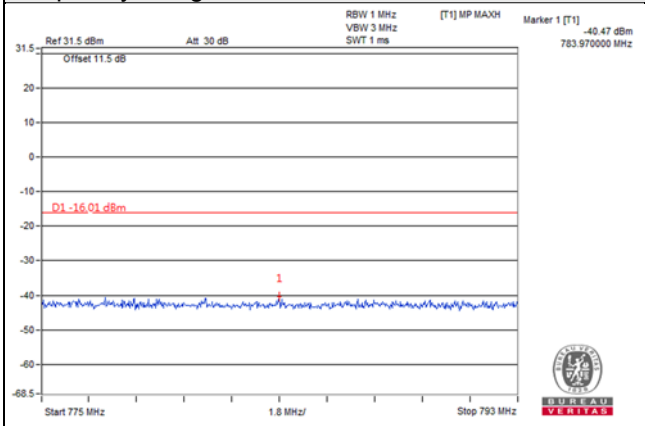
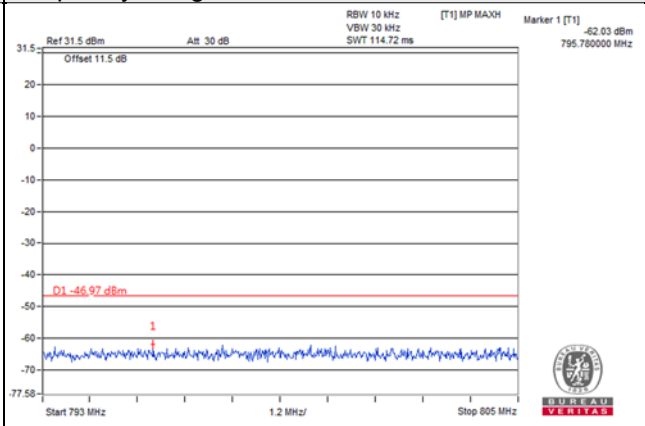
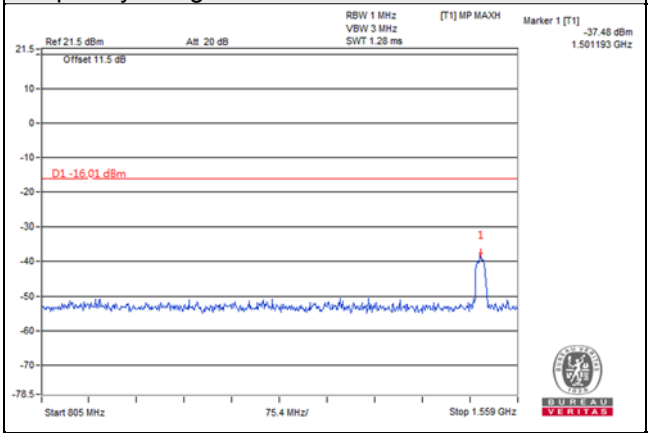
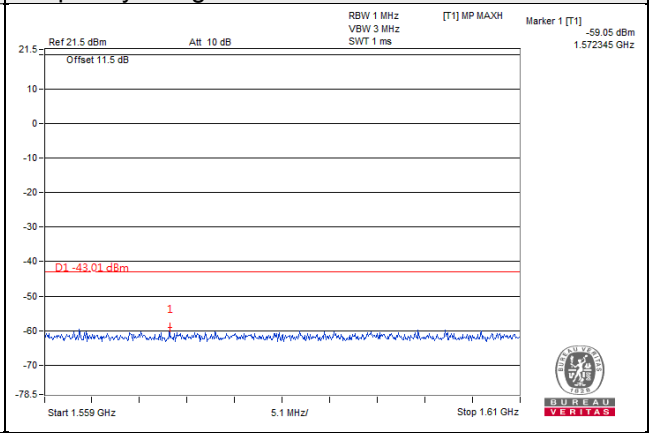
a. All measurements were done at 3 channels: low, middle and high operational frequency range.

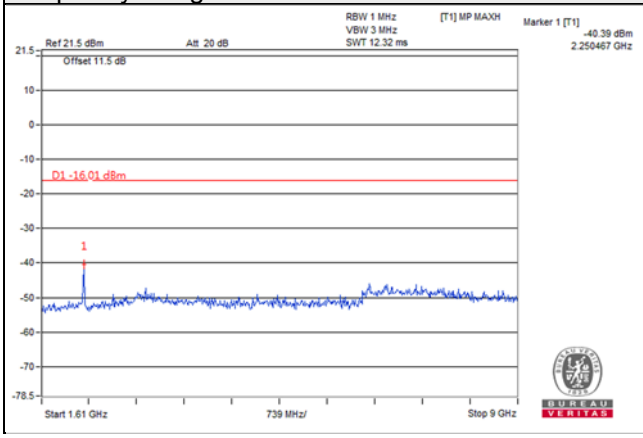
b. When the spectrum scanned from 9kHz to 9GHz, it shall be connected to the attenuator with the carried frequency.

4.7.4 Test Results

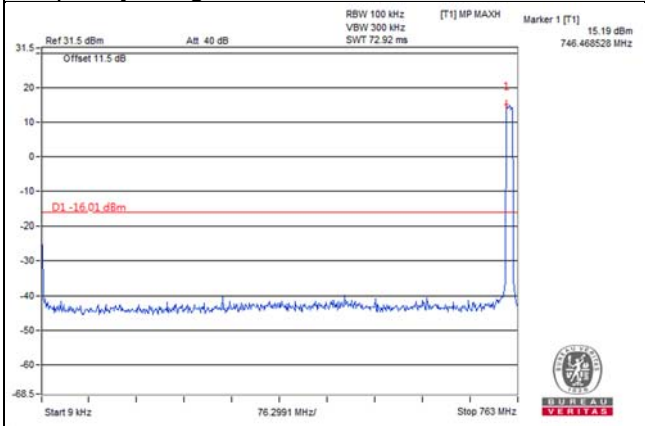
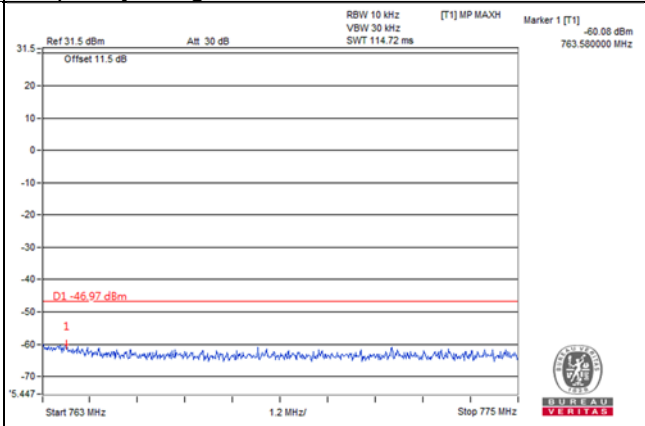
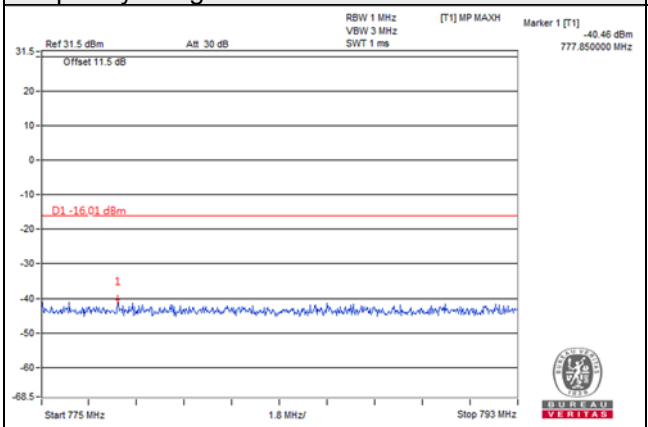
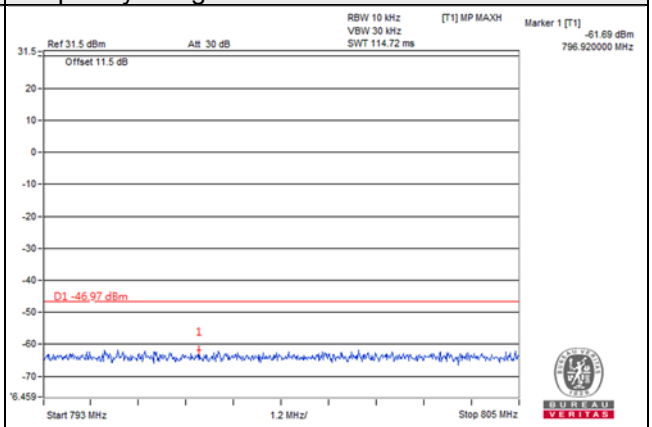
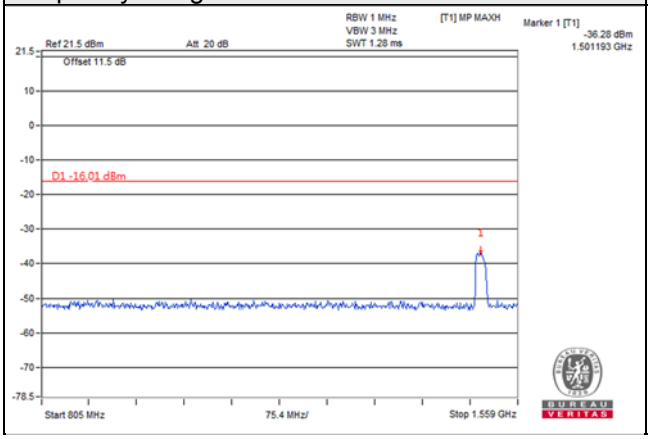
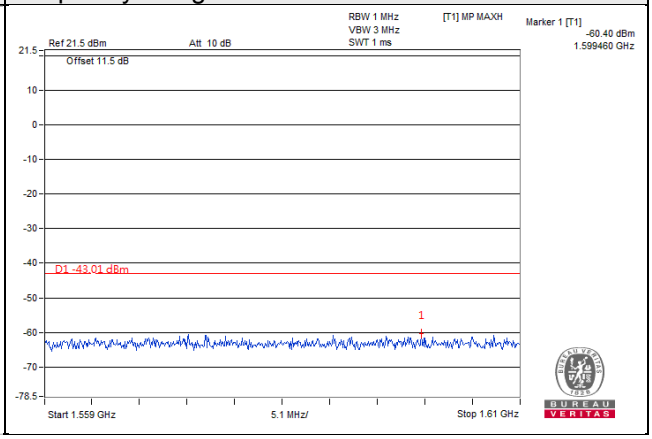
4.7.4.1 256QAM data

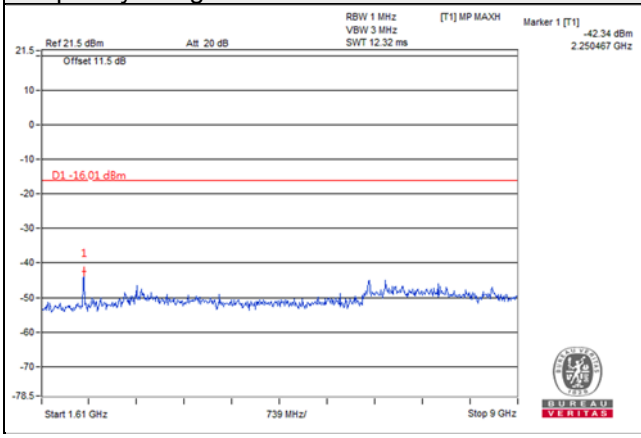
For LTE Band 13:

Channel Bandwidth: 5MHz, Chain 0	
748.5MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

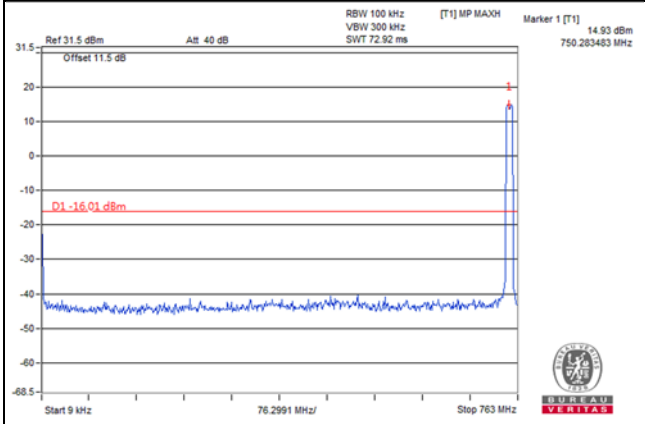
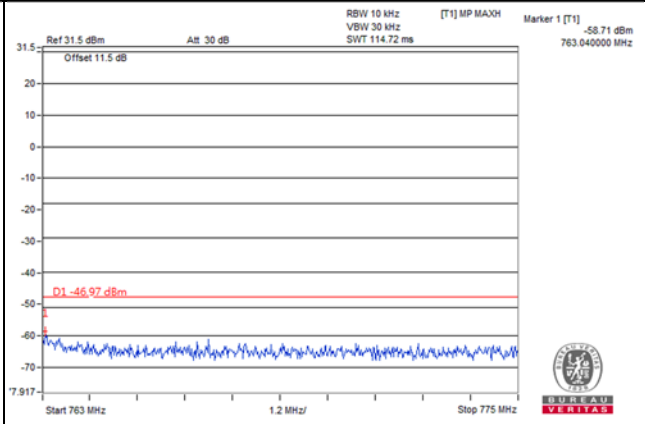
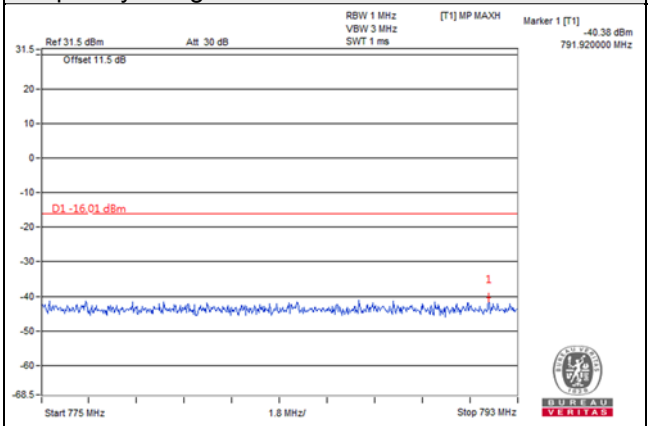
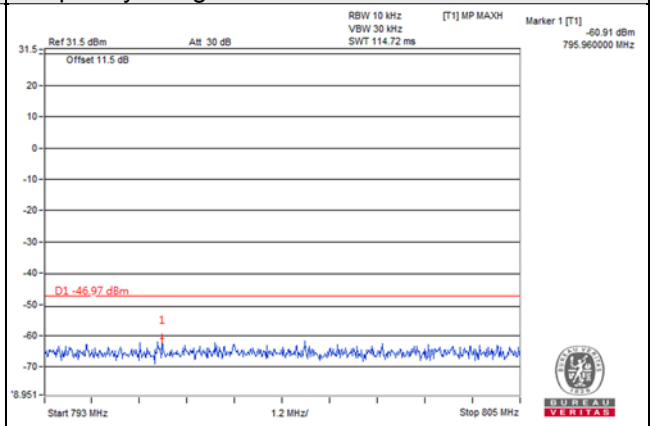
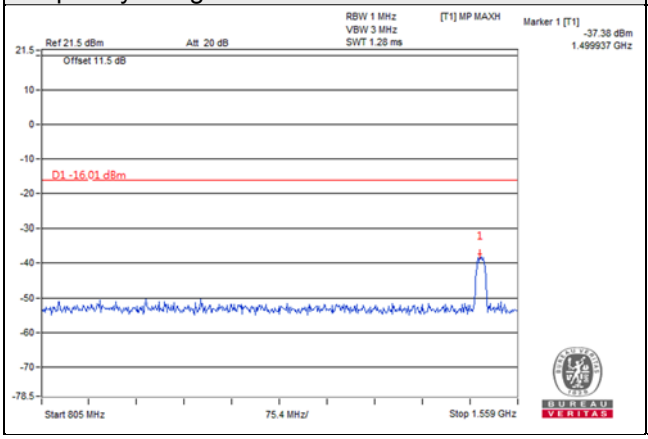
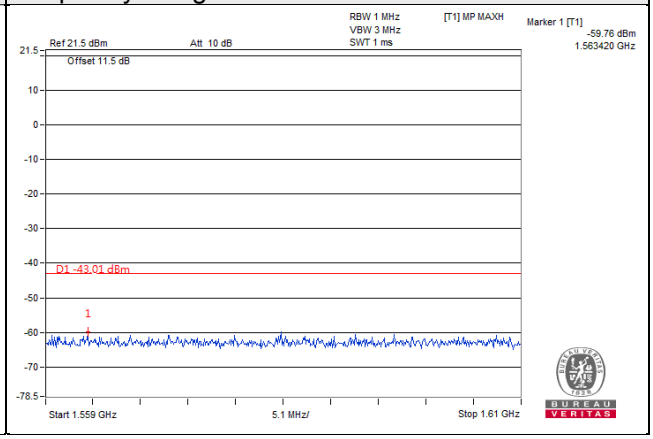
Frequency Range : 1.61GHz~9GHz	
	

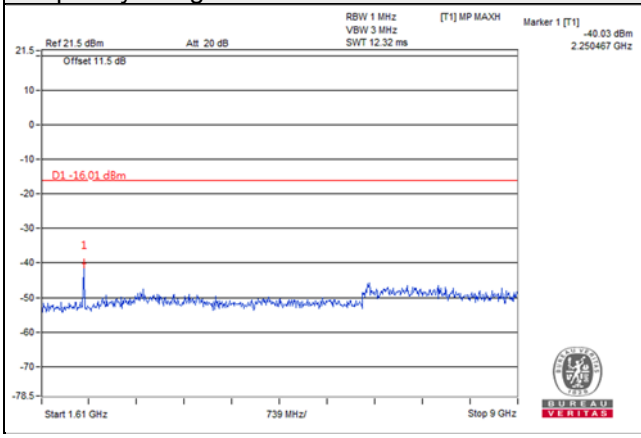
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 0	
751MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

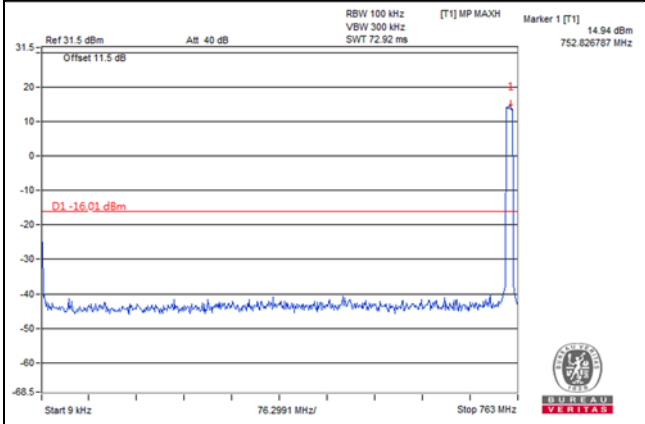
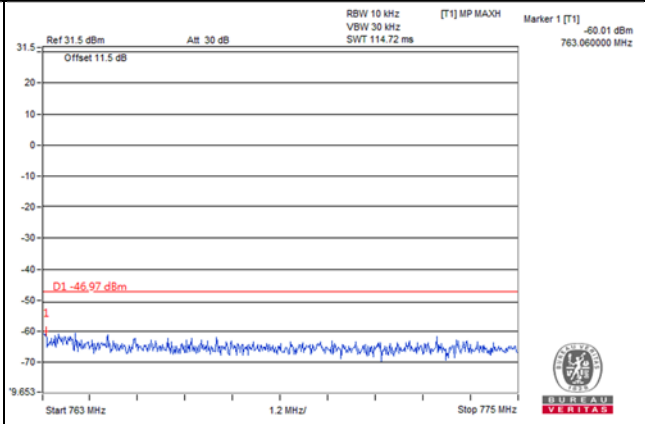
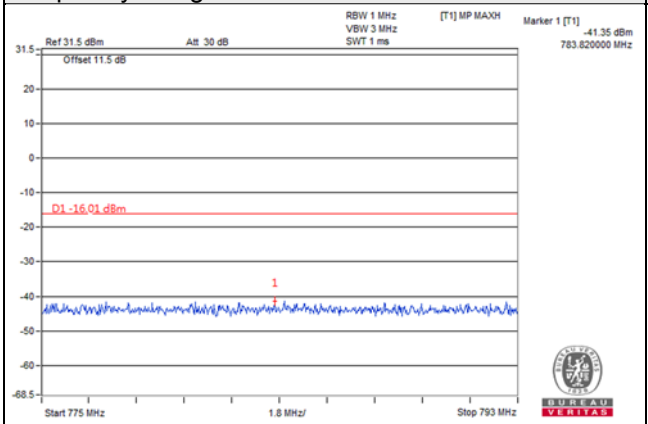
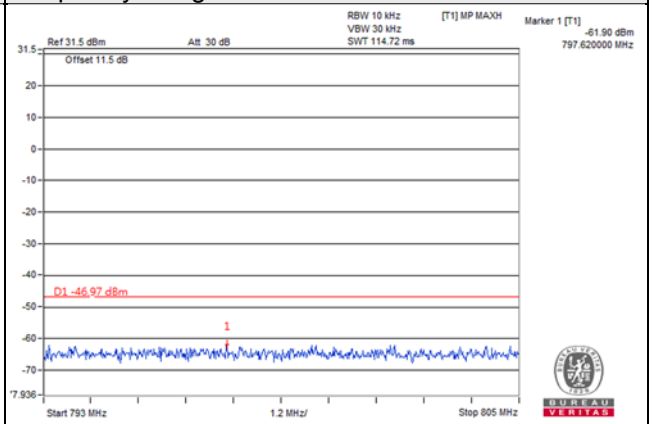
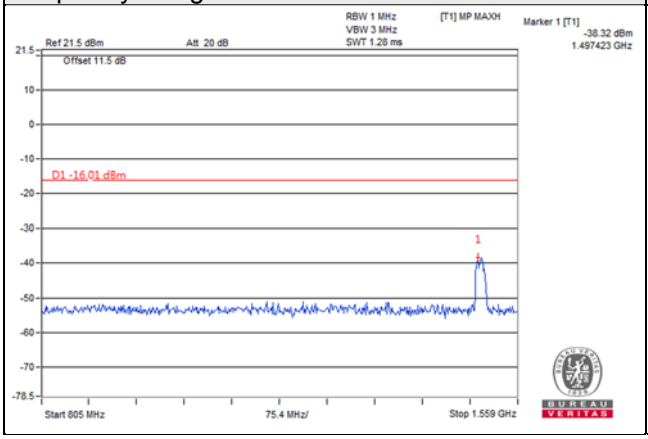
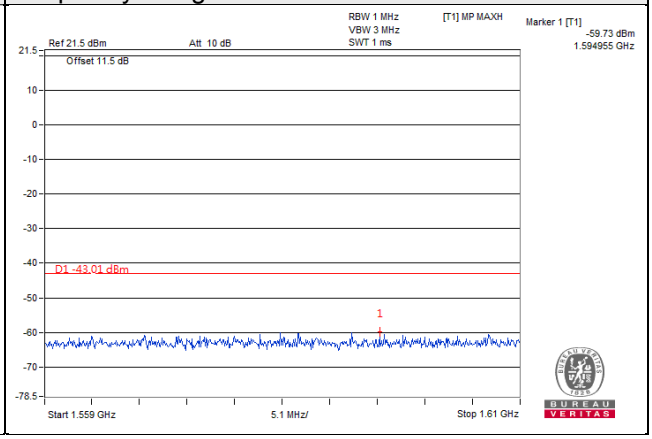
Frequency Range : 1.61GHz~9GHz	
	

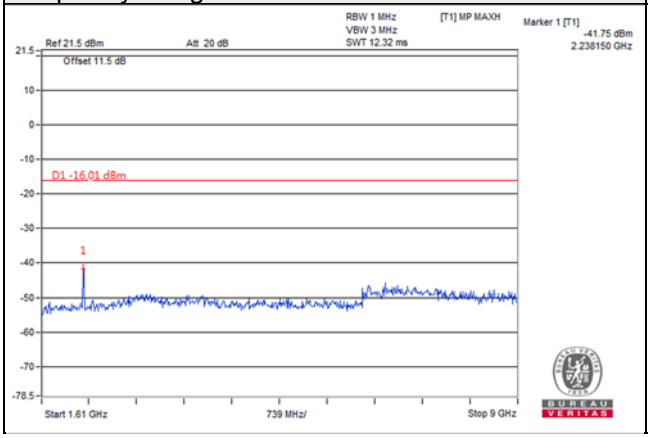
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 0	
753.5MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

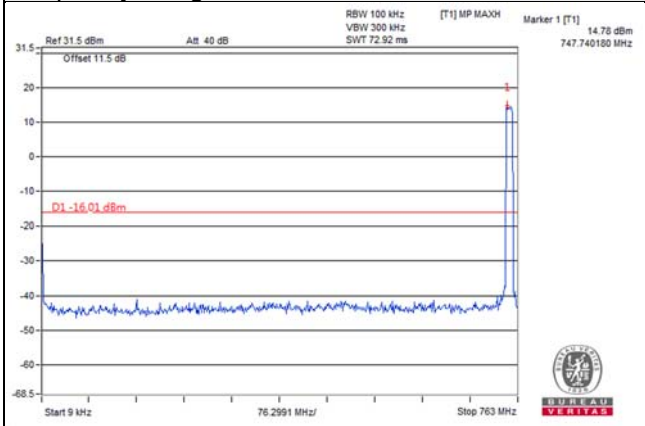
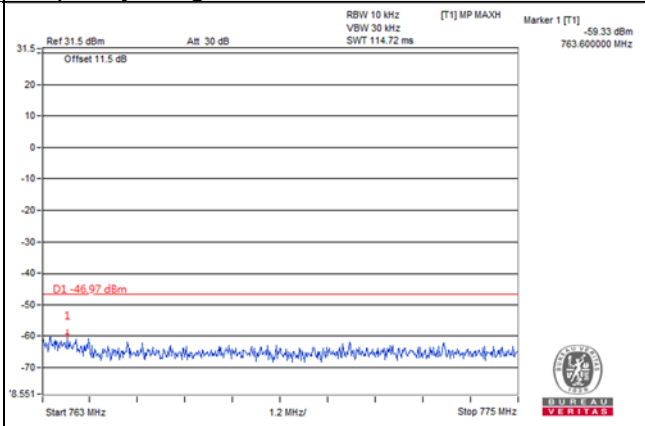
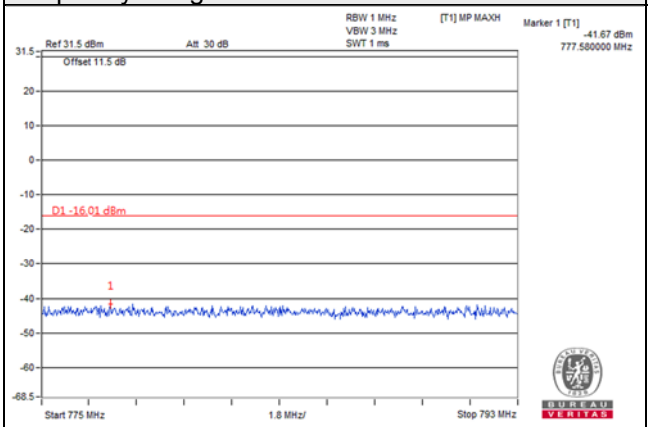
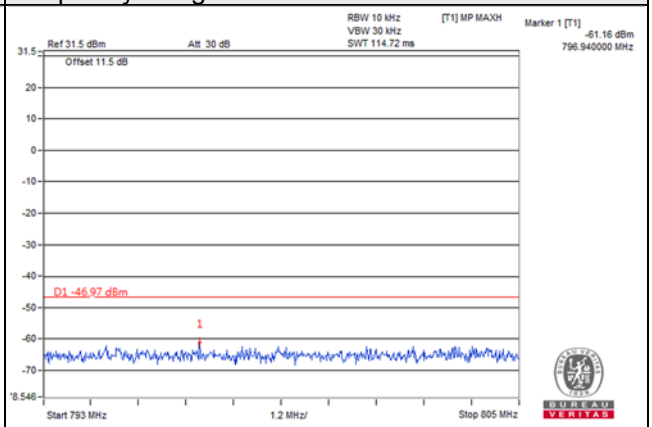
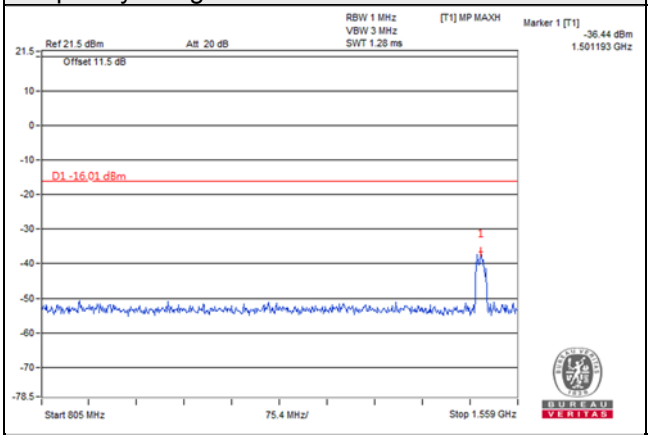
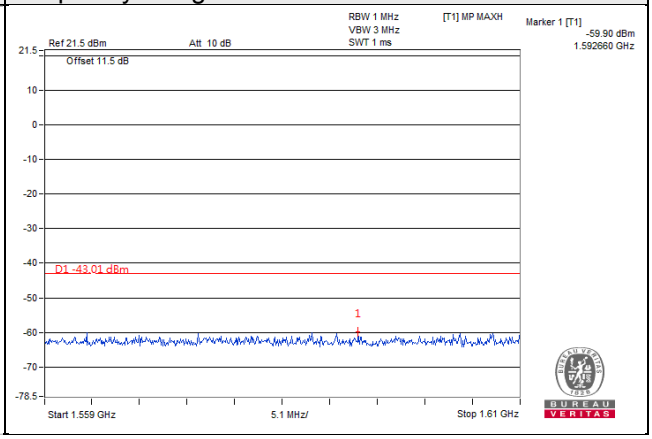
Frequency Range : 1.61GHz~9GHz	
	

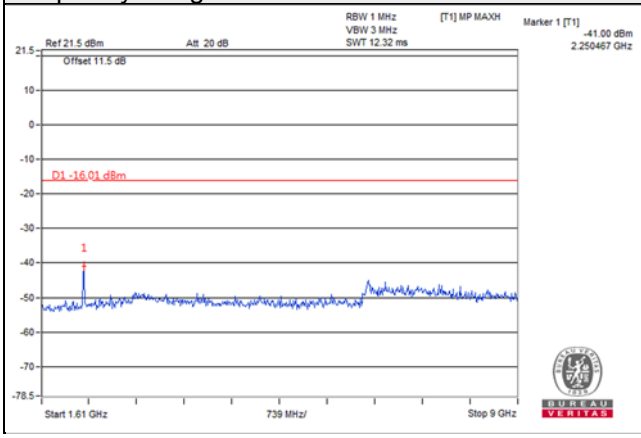
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 1	
748.5MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

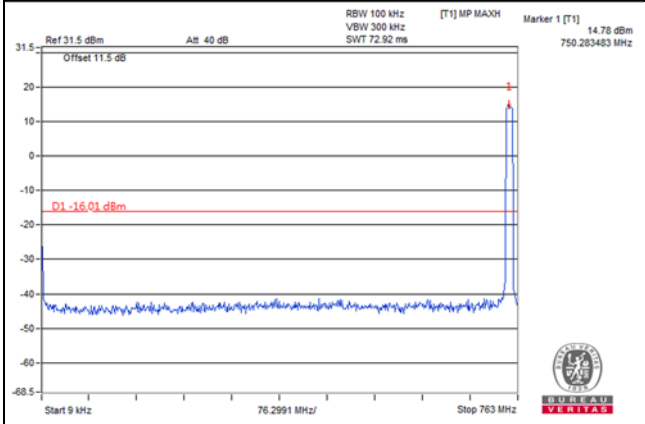
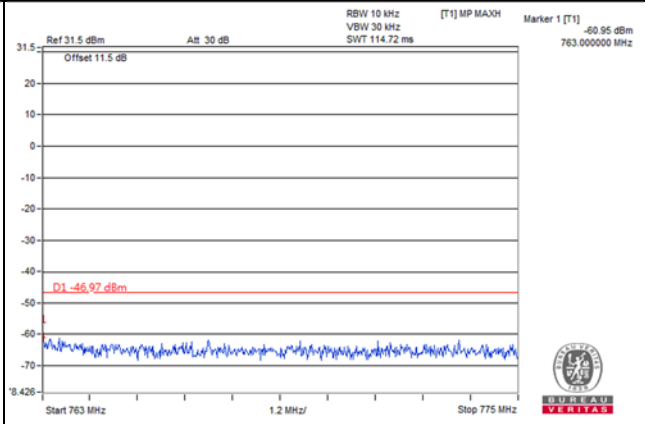
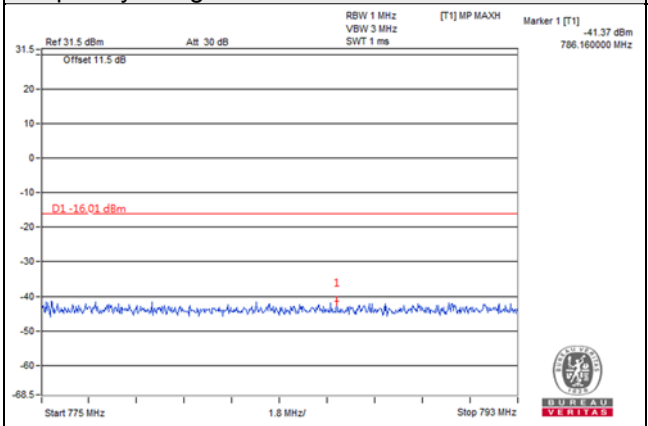
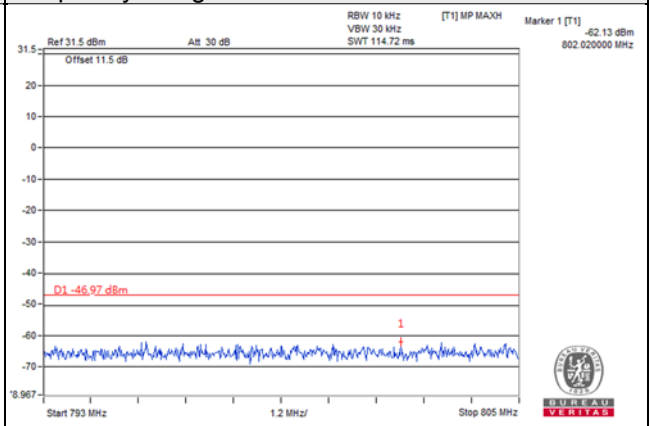
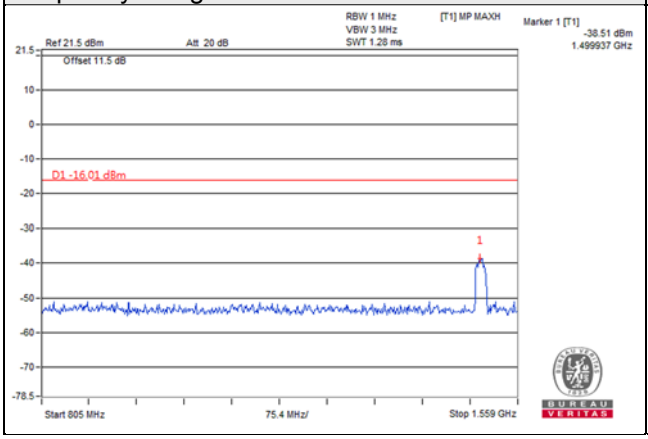
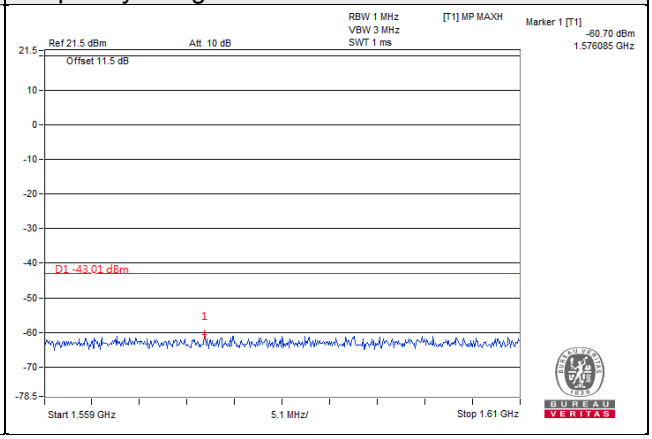
Frequency Range : 1.61GHz~9GHz	
	

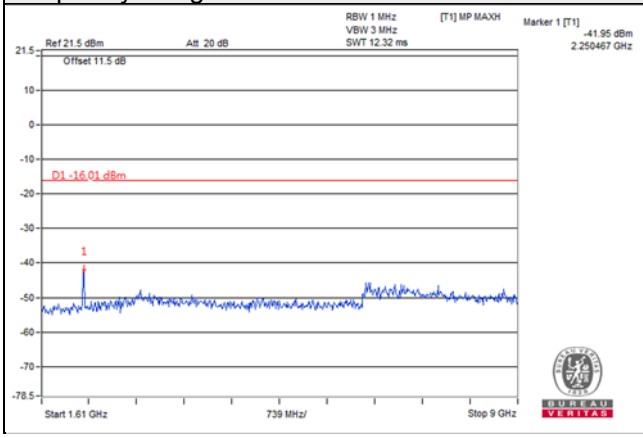
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 1	
751MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

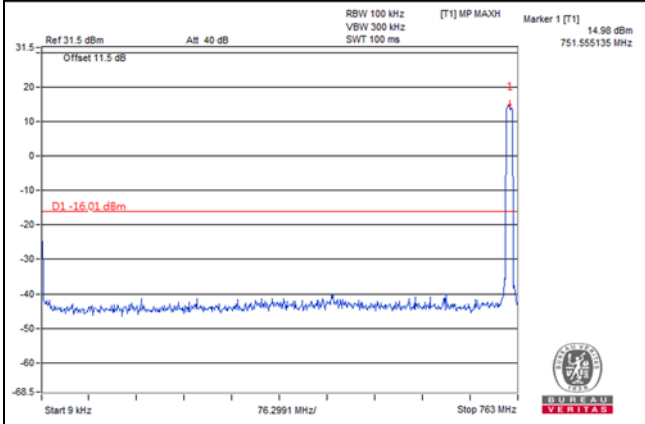
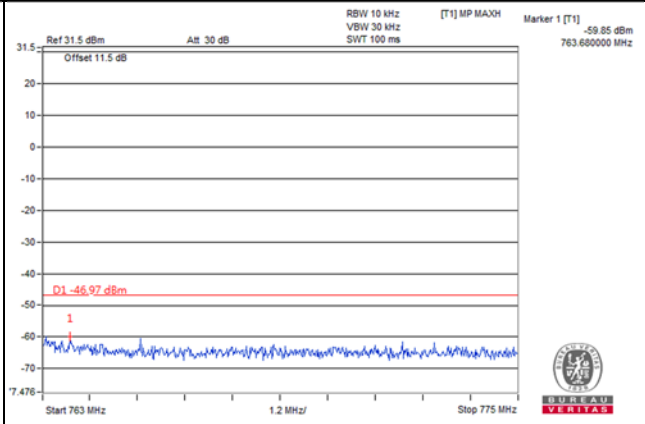
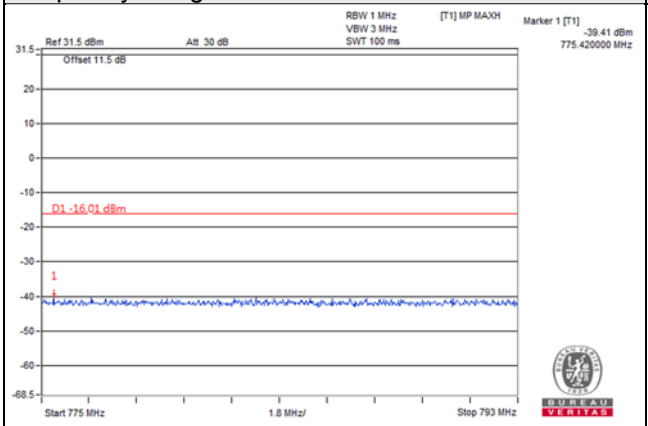
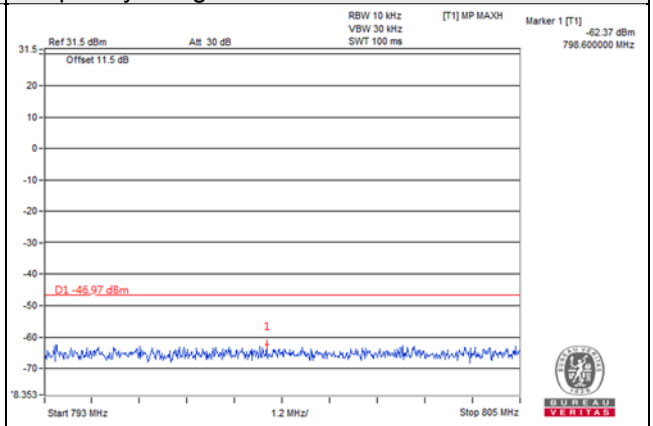
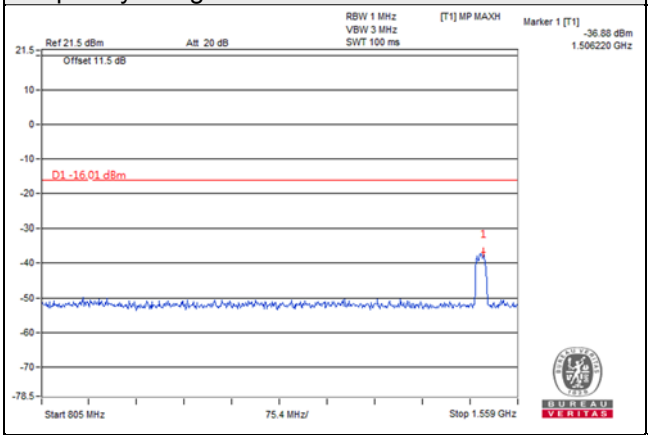
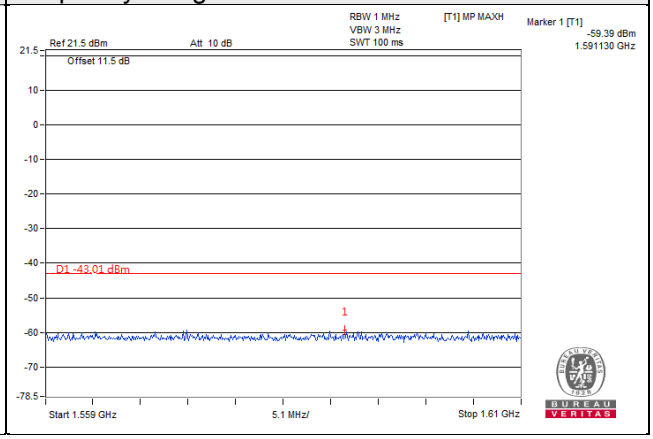
Frequency Range : 1.61GHz~9GHz	
	

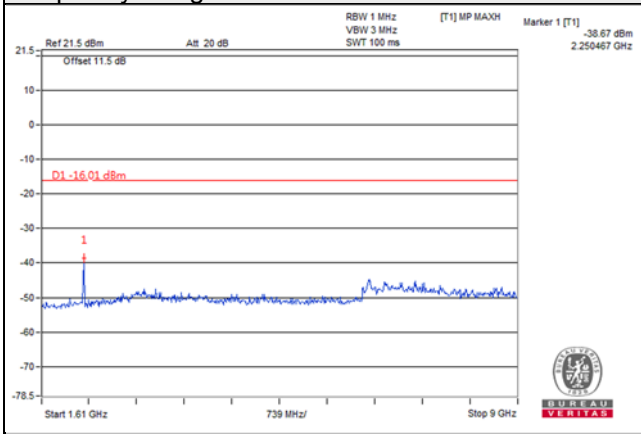
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 1	
753.5MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

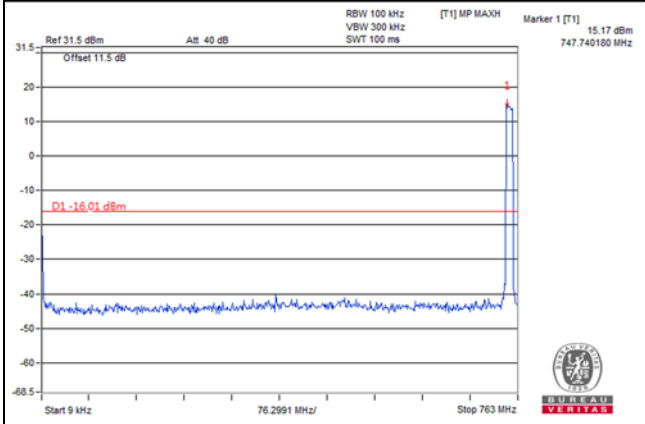
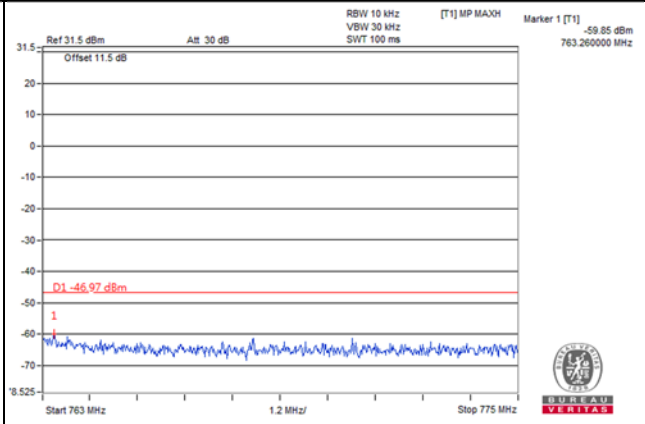
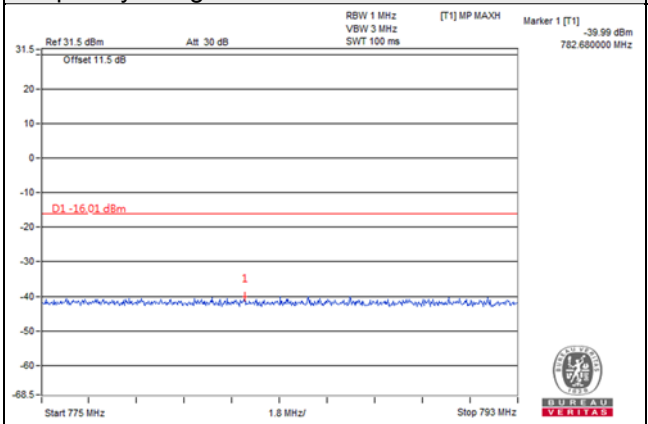
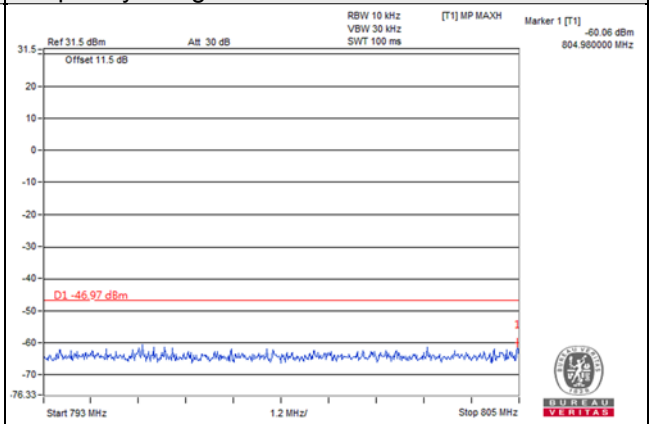
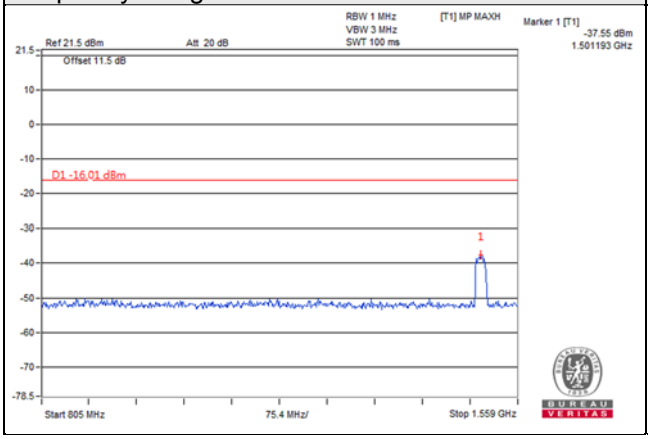
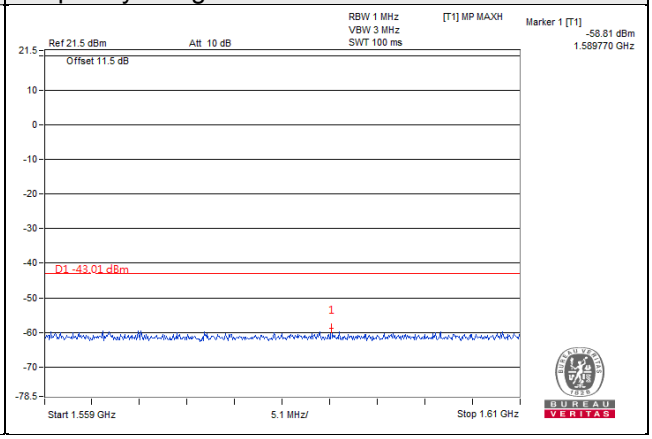
Frequency Range : 1.61GHz~9GHz	
	

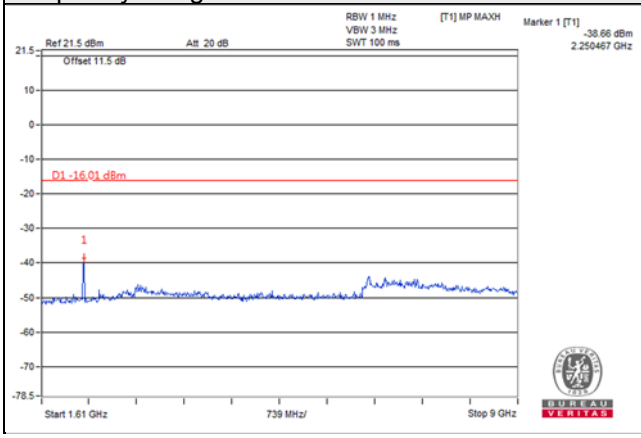
Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 10MHz, Chain 0	
751.0MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

Frequency Range : 1.61GHz~9GHz	
	

Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 10MHz, Chain 1	
751.0MHz	
Frequency Range : 9kHz~763MHz	Frequency Range : 763MHz~775MHz
	
Frequency Range : 775MHz~793MHz	Frequency Range : 793MHz~805MHz
	
Frequency Range : 805MHz~1.559GHz	Frequency Range : 1.559GHz~1.61GHz
	

Frequency Range : 1.61GHz~9GHz	
	

Note: For 9kHz, the signal is from spectrum analyzer.