FCC Test Report

(Part 27: LTE Band 4, 13)

Report No.:	RF170302D08-2
FCC ID:	P2713245
Test Model:	13245
Received Date:	Mar. 2, 2017
Test Date:	Apr. 18 ~ 27, 2017
Issued Date:	May 4, 2017
Applicant:	Sercomm Corp.
Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)
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.

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Release Control Record

Issue No.	Description	Date Issued
RF170302D08-2	Original release.	May 4, 2017

1 Certificate of Conformity

Product: Verizon LTE

Brand: Verizon

Test Model: 13245

Sample Status: Engineering sample

Applicant: Sercomm Corp.

Test Date: Apr. 18 ~ 27, 2017

Standards: FCC Part 27, Subpart C

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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** May 4, 2017

Celia Chen / Supervisor

Approved by :  , **Date:** May 4, 2017

Rex Lai / Assistant Manager

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2				
FCC Clause		Test Item	Result	Remarks
LTE Band 4	LTE Band 13			
2.1046 27.50(d)(4)	2.1046 27.50(b)(10)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1047	2.1047	Modulation characteristics	Pass	Meet the requirement
----	----	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049 27.53(m)(6)	2.1049 27.53(m)(6)	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53(h)	2.1051 27.53(c)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	2.1051 27.53(c)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1051 27.53(h)	2.1051 27.53(c)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -6.74dB at 4490.00MHz.

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	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	5.54 dB
Radiated Emissions above 1 GHz	1GHz ~ 40GHz	5.48 dB

2.2 Test Site and Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	886.57D	2432A03504	Feb. 21, 2017	Feb. 20, 2018
HP Preamplifier	886.59B	3008A01201	Feb. 22, 2017	Feb. 21, 2018
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2017	Feb. 20, 2018
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 08, 2017	Feb. 07, 2018
Schwarzbeck Antenna	VULB 9168	139	Dec. 13, 2016	Dec. 12, 2017
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2015	May 28, 2017
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 30, 2016	Dec. 29, 2017
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Dec. 27, 2016	Dec. 26, 2017
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 15, 2016	Aug. 14, 2017
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 15, 2016	Aug. 14, 2017
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 25, 2016	May 24, 2017
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 26, 2016	Jul. 25, 2017
Loop Antenna EMCI	LPA600	270	Aug. 20, 2015	Aug. 19, 2017
EMCO Horn Antenna	3115	00028257	Dec. 15, 2016	Dec. 14, 2017
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 30, 2016	Sep. 29, 2017
Anritsu Power Sensor	MA2411B	0738404	Apr. 24, 2016	Apr. 23, 2017
			Apr. 24, 2017	Apr. 23, 2018
Anritsu Power Meter	ML2495A	0842014	Apr. 24, 2016	Apr. 23, 2017
			Apr. 24, 2017	Apr. 23, 2018

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 886.59B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

3 General Information

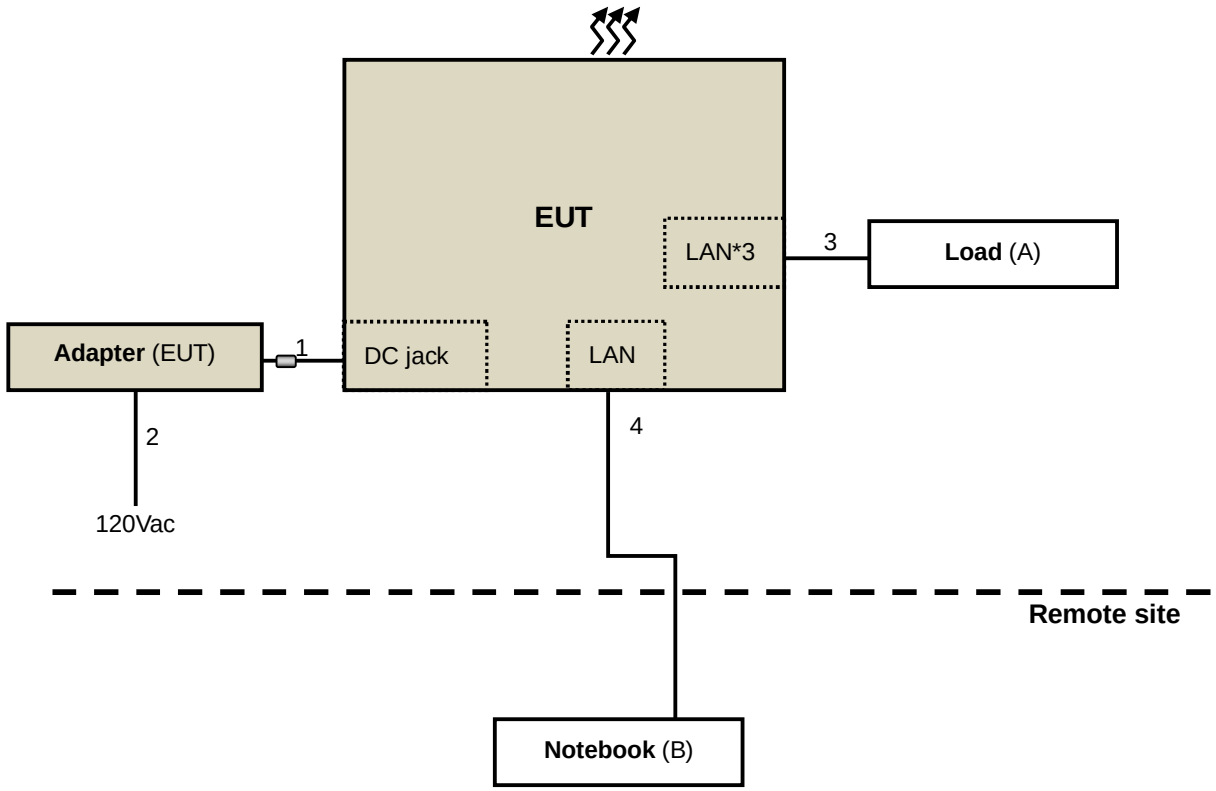
3.1 General Description of EUT

Product	Verizon LTE		
Brand	Verizon		
Test Model	13245		
Status of EUT	Engineering sample		
Power Supply Rating	12Vdc (adapter)		
Modulation Type	QPSK, 16QAM, 64QAM		
Operating Frequency	LTE Band 4	Channel Bandwidth 5MHz	2112.5MHz ~ 2152.5MHz
		Channel Bandwidth 10MHz	2115MHz ~ 2150MHz
		Channel Bandwidth 15MHz	2117.5MHz ~ 2147.5MHz
		Channel Bandwidth 20MHz	2120MHz ~ 2145MHz
	LTE Band 13	Channel Bandwidth 5MHz	748.5MHz ~ 753.5MHz
		Channel Bandwidth 10MHz	751MHz
Max. EIRP Power	LTE Band 4	Channel Bandwidth 5MHz	203.235mW (23.08dBm)
		Channel Bandwidth 10MHz	193.642mW (22.87dBm)
		Channel Bandwidth 15MHz	197.242mW (22.95dBm)
		Channel Bandwidth 20MHz	207.491mW (23.17dBm)
Max. ERP Power	LTE Band 13	Channel Bandwidth 5MHz	201.372mW (23.04dBm)
		Channel Bandwidth 10MHz	199.986mW (23.01dBm)
Antenna Type	LTE Band 4	Dipole antenna with 1.7dBi gain	
	LTE Band 13	Dipole antenna with 1.2dBi gain	
Antenna Connector	SMA		
Accessory Device	Adapter		
Data Cable Supplied	N/A		

Note: The EUT uses following adapter.

Adapter	
Brand	PHIHONG
Model	PSA120U-120L6
Input Power	100-240Vac, 1.6A, 50-60Hz
Output Power	12Vdc, 9A
Power cord	Non-shielded AC 3 Pin (1.8m) Non-shielded DC (1m) with one ferrite core

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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Load	N/A	N/A	N/A	N/A	Provided by Lab
B.	Notebook PC	DELL	E6530	9331GV1	FCC DoC Approved	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item B acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.0	N	1	Supplied by client
2.	AC power cord	1	1.8	N	0	Supplied by client
3.	LAN cable	3	1.0	N	0	Provided by Lab
4.	LAN cable	1	10.0	N	0	Provided by Lab

3.3 Test Mode Applicability and Tested Channel Detail

LTE Band 4

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
EIRP	1975 to 2375	1975, 2175, 2375	5MHz	QPSK
	2000 to 2350	2000, 2175, 2350	10MHz	QPSK
	2025 to 2325	2025, 2175, 2325	15MHz	QPSK
	2050 to 2300	2050, 2175, 2300	20MHz	QPSK
Modulation characteristics	2025 to 2325	2175	15MHz	QPSK, 16QAM, 64QAM
Frequency Stability	1975 to 2375	2175	5MHz	QPSK
Emission Bandwidth	1975 to 2375	1975, 2175, 2375	5MHz	QPSK, 16QAM, 64QAM
	2000 to 2350	2000, 2175, 2350	10MHz	QPSK, 16QAM, 64QAM
	2025 to 2325	2025, 2175, 2325	15MHz	QPSK, 16QAM, 64QAM
	2050 to 2300	2050, 2175, 2300	20MHz	QPSK, 16QAM, 64QAM
Band Edge	1975 to 2375	1975, 2375	5MHz	QPSK
	2000 to 2350	2000, 2350	10MHz	QPSK
	2025 to 2325	2025, 2325	15MHz	QPSK
	2050 to 2300	2050, 2300	20MHz	QPSK
Conducted Emission	1975 to 2375	1975, 2175, 2375	5MHz	QPSK
	2000 to 2350	2000, 2175, 2350	10MHz	QPSK
	2025 to 2325	2025, 2175, 2325	15MHz	QPSK
	2050 to 2300	2050, 2175, 2300	20MHz	QPSK
Radiated Emission Below 1GHz	1975 to 2375	1975	5MHz	QPSK
	2000 to 2350	2000	10MHz	QPSK
	2025 to 2325	2025	15MHz	QPSK
	2050 to 2300	2050	20MHz	QPSK
Radiated Emission Above 1GHz	1975 to 2375	1975, 2175, 2375	5MHz	QPSK
	2000 to 2350	2000, 2175, 2350	10MHz	QPSK
	2025 to 2325	2025, 2175, 2325	15MHz	QPSK
	2050 to 2300	2050, 2175, 2300	20MHz	QPSK

LTE Band 13

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
ERP	5205 to 5255	5205, 5230, 5255	5MHz	QPSK
	5230	5230	10MHz	QPSK
Modulation characteristics	5205 to 5255	5230	5MHz	QPSK, 16QAM, 64QAM
Frequency Stability	5205 to 5255	5230	5MHz	QPSK
Emission Bandwidth	5205 to 5255	5205, 5230, 5255	5MHz	QPSK, 16QAM, 64QAM
	5230	5230	10MHz	QPSK, 16QAM, 64QAM
Band Edge	5205 to 5255	5205, 5255	5MHz	QPSK
	5230	5230	10MHz	QPSK
Conducted Emission	5205 to 5255	5205, 5230, 5255	5MHz	QPSK
	5230	5230	10MHz	QPSK
Radiated Emission Below 1GHz	5205 to 5255	5205	5MHz	QPSK
	5230	5230	10MHz	QPSK
Radiated Emission Above 1GHz	5205 to 5255	5205, 5230, 5255	5MHz	QPSK
	5230	5230	10MHz	QPSK

Note:

1. For radiated emission below 1 GHz, the low, mid and high channels were pre-tested in chamber. The low channel was the worst case and chosen for final test.
2. The conducted output power for QPSK /16QAM / 64QAM, measured value of QPSK is higher than 16QAM / 64QAM mode. Therefore, the Frequency Stability, Band Edge, Condcudeted Emission and Radiated Emission were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	20deg. C, 76%RH	120Vac, 60Hz	Dalen Dai
Modulation characteristics	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Frequency Stability	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Emission Bandwidth	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Band Edge	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Conducted Emission	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Radiated Emission	20deg. C, 76%RH	120Vac, 60Hz	Dalen Dai

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. 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 v02r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI/TIA/EIA-603-C 2004

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

LTE Band 4

The power of each fixed or base station transmitting in the 1995-2000 MHz, the 2110-2155 MHz, 2155-2180 MHz band, or 2180-2200 MHz bands are limited to:

(i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

LTE Band 13

The following power and antenna height limits apply to transmitters operating in the 746-758 MHz, 775-788 MHz and 805-806 MHz bands:

(1) Fixed and base stations transmitting a signal in the 757-758 and 775-776 MHz bands must not exceed an effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT), except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP.

(2) Fixed and base stations transmitting a signal in the 746-757 MHz and 776-787 MHz bands with an emission bandwidth of 1 MHz or less must not exceed an ERP of 1000 watts 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 1000 watts ERP.

(3) 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 of 1 MHz or less must not exceed an ERP of 2000 watts 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 ERP.

(4) Fixed and base stations 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 1000 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 1000 watts/MHz ERP.

(5) 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.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RWB and VBW is 5MHz for LTE Mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

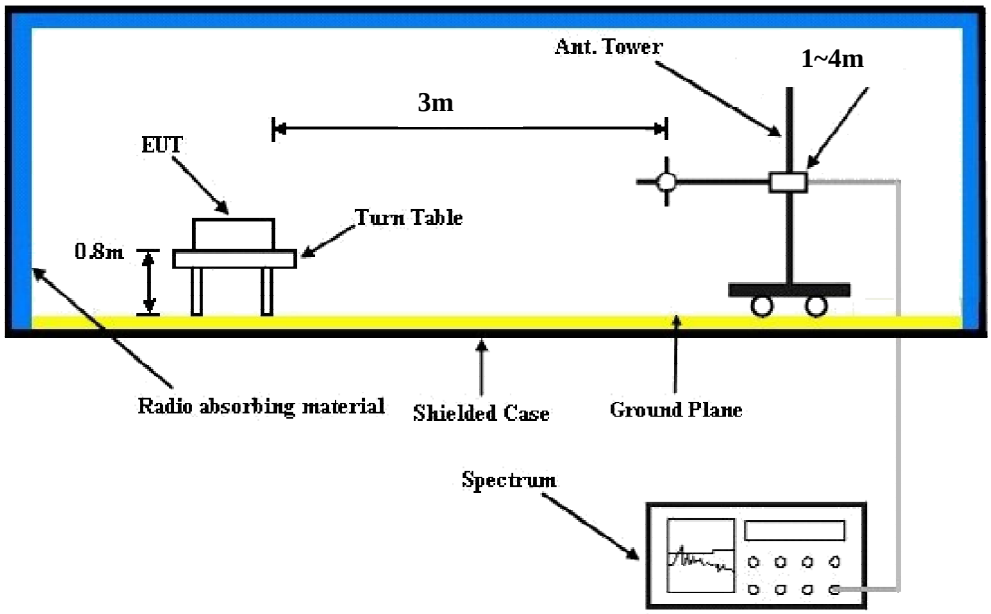
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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.

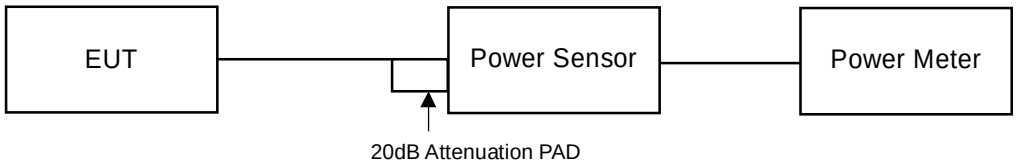
4.1.3 Test Setup

EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

CONDUCTED OUTPUT POWER (dBm)

LTE Band 4 (Channel Bandwidth 5MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
1975	2112.5	17.43	17.57	20.51	17.43	17.51	20.48	17.46	17.60	20.54
2175	2132.5	17.41	17.59	20.51	17.48	17.58	20.54	17.45	17.58	20.53
2375	2152.5	17.45	17.62	20.55	17.45	17.61	20.54	17.49	17.57	20.54

LTE Band 4 (Channel Bandwidth 10MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2000	2115	17.49	17.61	20.56	17.47	17.58	20.54	17.51	17.57	20.55
2175	2132.5	17.47	17.55	20.52	17.45	17.54	20.51	17.48	17.59	20.55
2350	2150	17.43	17.52	20.49	17.42	17.60	20.52	17.45	17.57	20.52

LTE Band 4 (Channel Bandwidth 15MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2025	2117.5	17.45	17.54	20.51	17.43	17.51	20.48	17.43	17.52	20.49
2175	2132.5	17.41	17.52	20.48	17.45	17.55	20.51	17.46	17.57	20.53
2325	2147.5	17.46	17.59	20.54	17.43	17.54	20.50	17.45	17.58	20.53

LTE Band 4 (Channel Bandwidth 20MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2050	2120	17.42	17.51	20.48	17.42	17.61	20.53	17.40	17.56	20.49
2175	2132.5	17.43	17.53	20.49	17.47	17.56	20.53	17.46	17.55	20.52
2300	2145	17.48	17.57	20.54	17.45	17.57	20.52	17.43	17.51	20.48

LTE Band 13 (Channel Bandwidth 5MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
5205	748.5	17.42	17.55	20.50	17.42	17.53	20.49	17.42	17.50	20.47
5230	751	17.40	17.52	20.47	17.45	17.51	20.49	17.42	17.53	20.49
5255	753.5	17.40	17.49	20.46	17.41	17.52	20.48	17.40	17.51	20.47

LTE Band 13 (Channel Bandwidth 10MHz):

CH	Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
		QPSK			16QAM			64QAM		
		Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
5230	751	17.42	17.51	20.48	17.43	17.48	20.47	17.45	17.47	20.47

EIRP Power (dBm)

LTE Band 4

Channel Bandwidth: 5MHz

MODE		TX channel 1975			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2112.50	10.60	0.43	12.41	12.84
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2112.50	20.72	10.67	12.41	**23.08**

MODE		TX channel 2175			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	10.64	0.46	12.49	12.95
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	20.59	10.42	12.49	22.91

MODE		TX channel 2375			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2152.50	10.52	0.32	12.58	12.90
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2152.50	20.72	10.43	12.58	23.01

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE	TX channel 2000				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2115.00	10.82	0.65	12.42	13.07
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2115.00	20.52	10.45	12.42	**22.87**

MODE	TX channel 2175				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	10.87	0.69	12.49	13.18
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	20.47	10.30	12.49	22.79

MODE	TX channel 2350				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2150.00	10.62	0.42	12.57	12.99
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2150.00	20.39	10.11	12.57	22.68

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 15MHz

MODE	TX channel 2025				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2117.50	11.17	0.98	12.44	13.42
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2117.50	20.60	10.51	12.44	**22.95**

MODE	TX channel 2175				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	11.27	1.09	12.49	13.58
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	20.56	10.39	12.49	22.88

MODE	TX channel 2325				
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2147.50	11.02	0.83	12.56	13.39
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2147.50	20.61	10.34	12.56	22.90

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 20MHz

MODE		TX channel 2050			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2120.00	10.96	0.78	12.44	13.22
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2120.00	20.83	10.73	12.44	**23.17**

MODE		TX channel 2175			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	10.75	0.57	12.49	13.06
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2132.50	20.62	10.45	12.49	22.94

MODE		TX channel 2300			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2145.00	10.61	0.42	12.55	12.97
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)
1	2145.00	20.73	10.48	12.55	23.03

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13

Channel Bandwidth: 5MHz

MODE		TX channel 5205			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	748.50	9.41	-13.11	26.19	13.08
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	748.50	20.03	-3.15	26.19	**23.04**

MODE		TX channel 5230			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	751.00	9.52	-12.98	26.19	13.21
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	751.00	19.83	-3.32	26.19	22.87

MODE		TX channel 5255			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	753.50	8.95	-13.47	26.19	12.72
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	753.50	19.53	-3.53	26.19	22.66

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 5230			
Antenna Polarity & Test Distance: Horizontal at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	751.00	9.86	-12.64	26.19	13.55
Antenna Polarity & Test Distance: Vertical at 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)
1	751.00	19.97	-3.18	26.19	**23.01**

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Modulation characteristics Measurement

4.2.1 Limits of Modulation characteristics

N/A

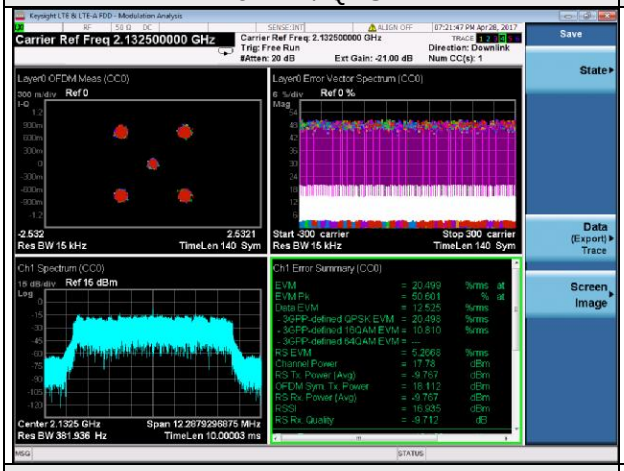
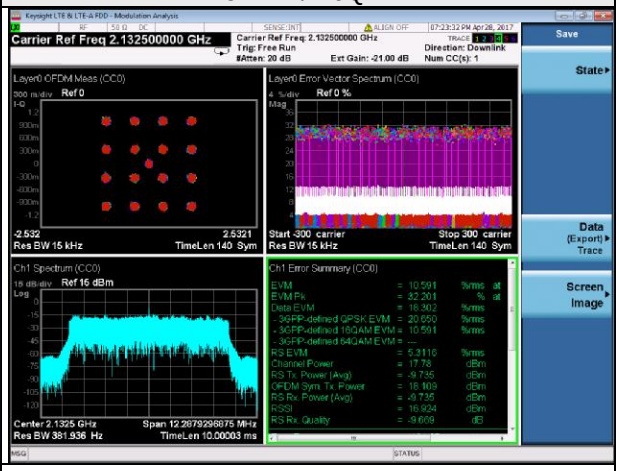
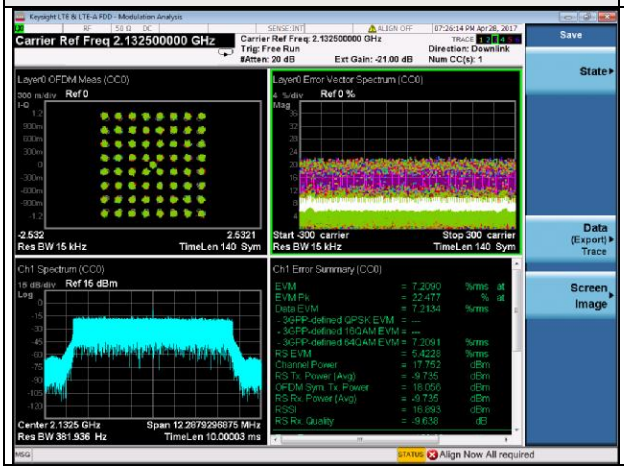
4.2.2 Test Procedure

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.

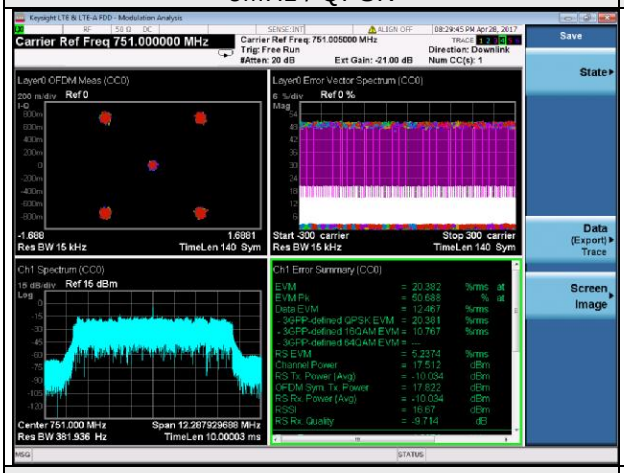
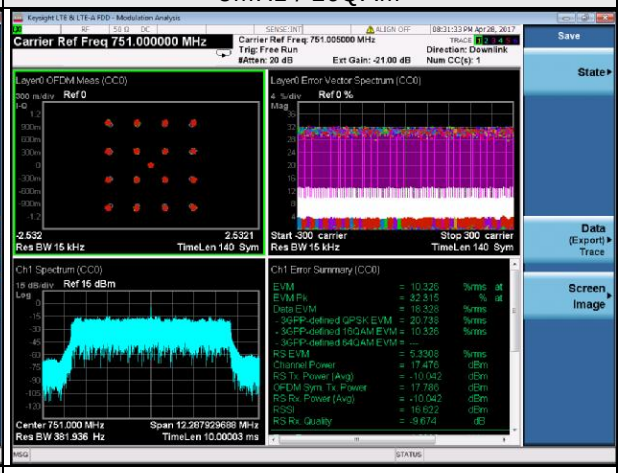
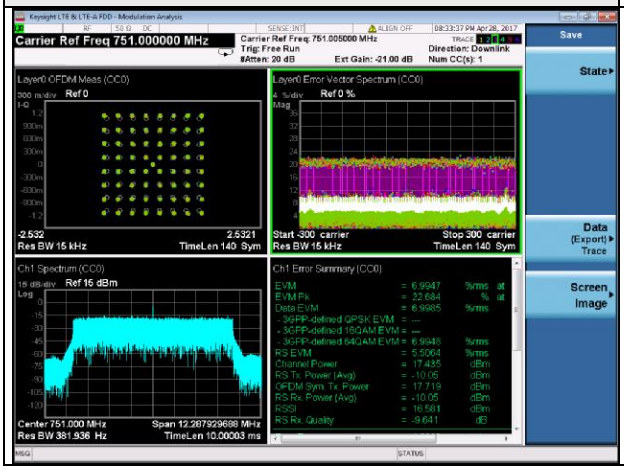
4.2.3 Test Setup

4.2.4 Test Results

LTE Band 4

Spectrum Plot of Measurement Value	
Channel: 2175 Frequency (MHz): 2132.5	
15MHz / QPSK	15MHz / 16QAM
	
15MHz / 64QAM	
	

LTE Band 13

Spectrum Plot of Measurement Value	
Channel: 5230 Frequency (MHz): 751	
5MHz / QPSK	5MHz / 16QAM
	
5MHz / 64QAM	
	

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

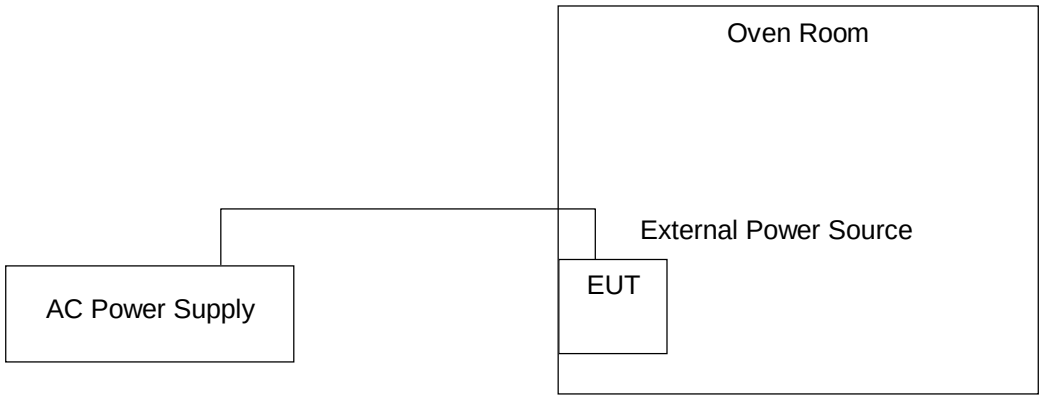
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. 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)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 4		
	Chain 0	Chain 1	
132	0.0051582649	0.0051582649	2.5
120	0.0051582649	0.0046893318	2.5
108	0.0051582649	0.0046893318	2.5

Note: The applicant defined the normal working voltage is from 132Vac to 108Vac.

Frequency Error vs. Temperature

Temp. (℃)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 4		
	Chain 0	Chain 1	
40	0.0056271981	0.0056271981	2.5
30	0.0056271981	0.0051582649	2.5
20	0.0051582649	0.0046893318	2.5
10	0.0046893318	0.0042203986	2.5
0	0.0042203986	0.0042203986	2.5

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 13		
	Chain 0	Chain 1	
132	0.0146471372	0.0133155792	2.5
120	0.0133155792	0.0133155792	2.5
108	0.0119840213	0.0119840213	2.5

Note: The applicant defined the normal working voltage is from 132Vac to 108Vac.

Frequency Error vs. Temperature

Temp. (℃)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 13		
	Chain 0	Chain 1	
40	0.0173102530	0.0159786951	2.5
30	0.0159786951	0.0146471372	2.5
20	0.0133155792	0.0146471372	2.5
10	0.0119840213	0.0133155792	2.5
0	0.0119840213	0.0119840213	2.5

4.4 Emission Bandwidth Measurement

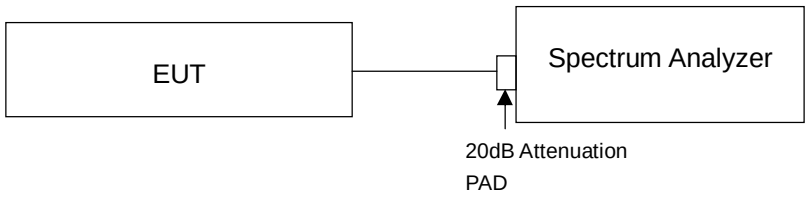
4.4.1 Limits of Emission Bandwidth Measurement

According to FCC 27.53(m)(6) specified that 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 = 50kHz and VBW = 150kHz (Channel Bandwidth: 3MHz and 5MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 10MHz), RBW = 150kHz and VBW = 470kHz (Channel Bandwidth: 15MHz) and RBW = 430kHz and VBW = 1.2MHz (Channel Bandwidth: 20MHz). 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

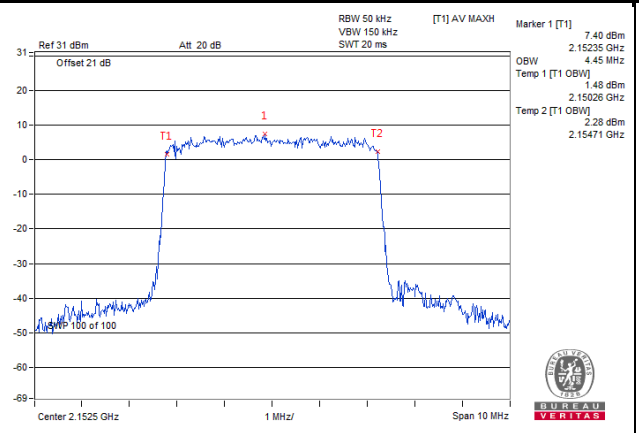


4.4.4 Test Result

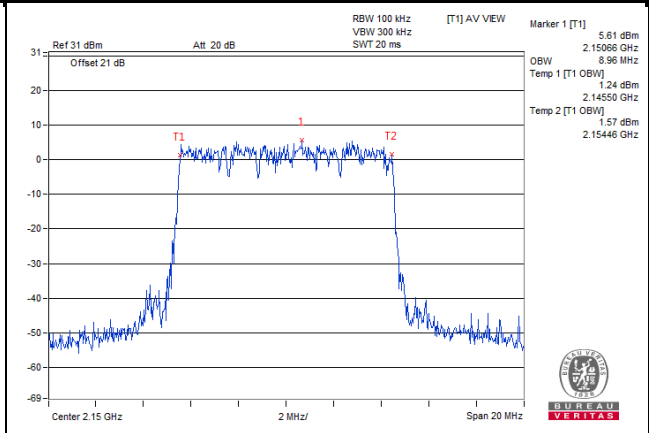
LTE Band 4							
Channel Bandwidth 5MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
1975	2112.5	4.41	4.41	4.43	4.43	4.43	4.43
2175	2132.5	4.41	4.40	4.40	4.43	4.41	4.41
2375	2152.5	4.38	4.40	4.45	4.43	4.41	4.41
Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2000	2115	8.86	8.93	8.93	8.93	8.90	8.90
2175	2132.5	8.90	8.96	8.93	8.93	8.93	8.90
2350	2150	8.96	8.96	8.93	8.90	8.90	8.90
Channel Bandwidth 15MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2025	2117.5	13.33	13.33	13.33	13.26	13.30	13.30
2175	2132.5	13.33	13.33	13.26	13.23	13.26	13.26
2325	2147.5	13.20	13.33	13.26	13.33	13.30	13.30
Channel Bandwidth 20MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2050	2120	17.66	17.60	17.53	17.60	17.80	17.73
2175	2132.5	17.60	17.60	17.60	17.60	17.80	17.66
2300	2145	17.73	17.66	17.66	17.66	17.86	17.86

Spectrum Plot Of Worst Value

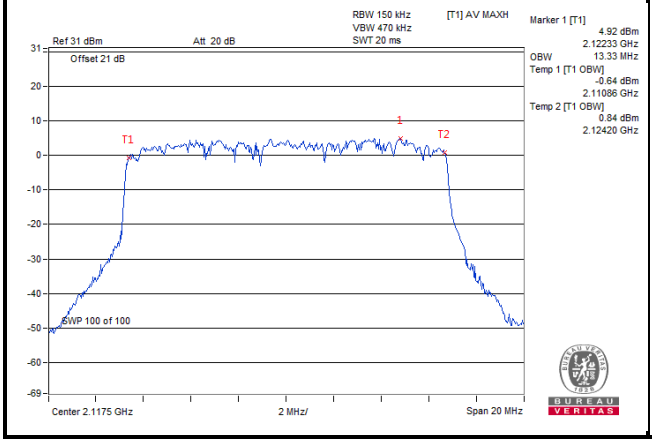
5MHz / 16QAM



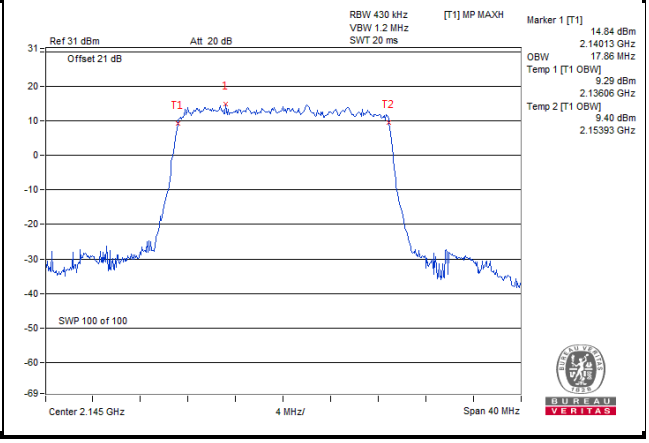
10MHz / QPSK



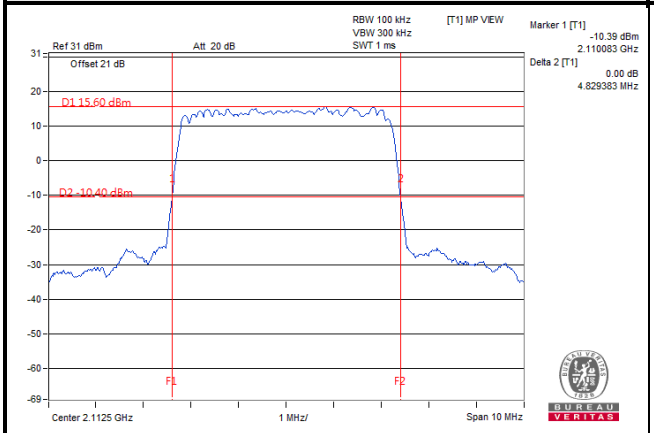
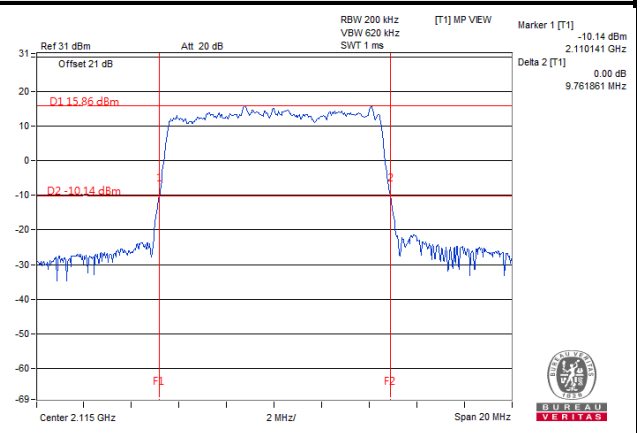
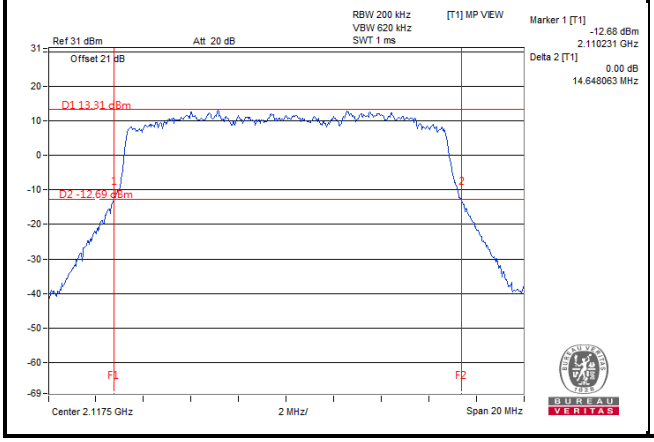
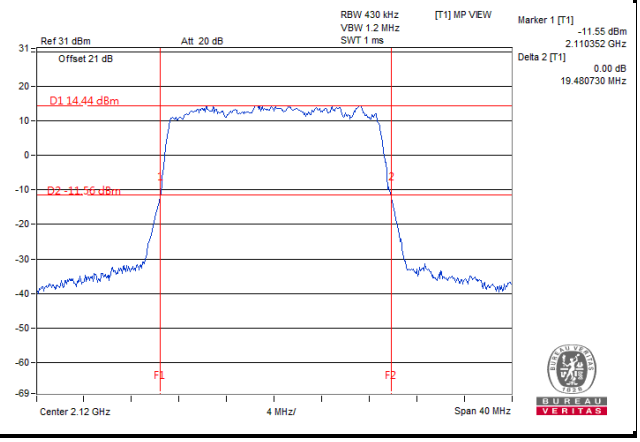
15MHz / QPSK



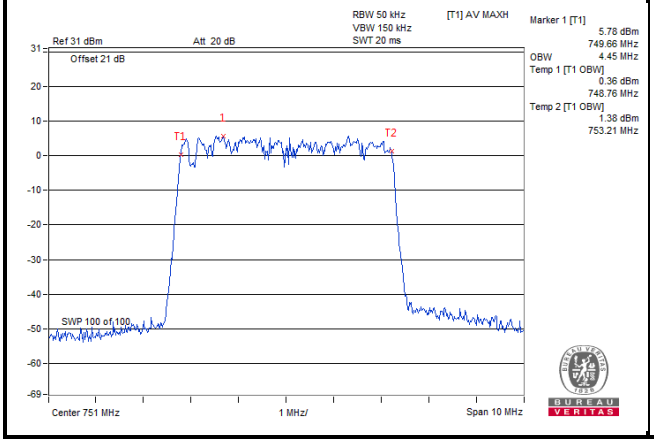
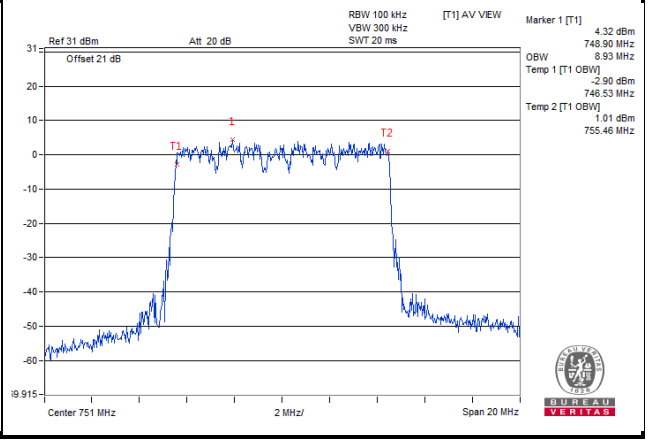
20MHz / 64QAM



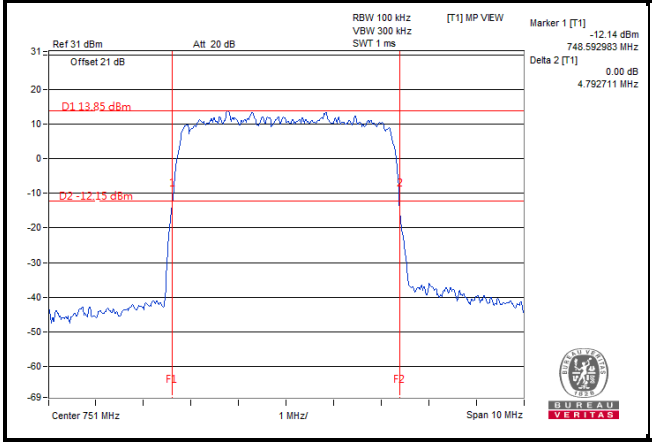
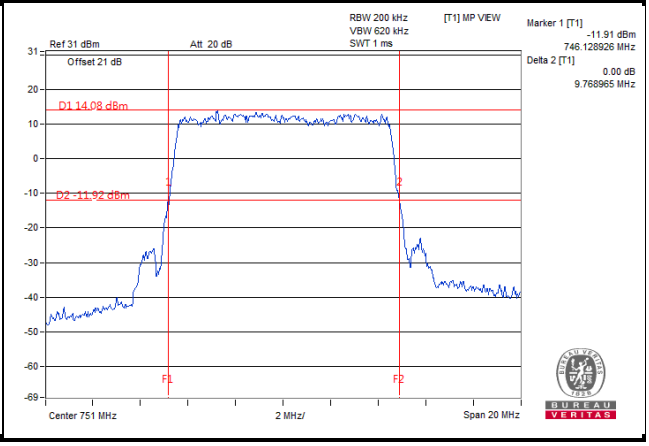
LTE Band 4			
Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
1975	2112.5	4.79	4.82
2175	2132.5	4.78	4.77
2375	2152.5	4.79	4.77
Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
2000	2115	9.76	9.71
2175	2132.5	9.76	9.73
2350	2150	9.69	9.69
Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
2025	2117.5	14.64	14.52
2175	2132.5	14.48	14.59
2325	2147.5	14.62	14.59
Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
2050	2120	19.48	19.43
2175	2132.5	19.38	19.19
2300	2145	19.40	19.26

Spectrum Plot Of Worst Value	
5MHz / QPSK	10MHz / QPSK
	
15MHz / QPSK	20MHz / QPSK
	

LTE Band 13							
Channel Bandwidth 5MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
5205	748.5	4.38	4.43	4.33	4.36	4.41	4.40
5230	751	4.45	4.45	4.41	4.38	4.43	4.43
5255	753.5	4.35	4.33	4.40	4.40	4.41	4.41
Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
5230	751	8.93	8.90	8.93	8.90	8.90	8.90

Spectrum Plot Of Worst Value	
5MHz / QPSK	10MHz / QPSK
	

LTE Band 13			
Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
5205	748.5	4.78	4.77
5230	751	4.77	4.79
5255	753.5	4.78	4.75
Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
5230	751	9.65	9.76

Spectrum Plot Of Worst Value	
5MHz / QPSK	10MHz / QPSK
	

4.5 Band Edge Measurement

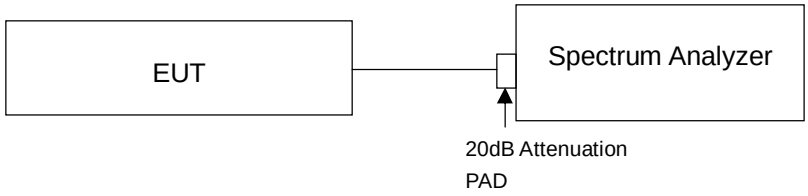
4.5.1 Limits of Band Edge Measurement

For LTE Band 4
According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

For LTE Band 13
According to FCC 27.53(c) (2) for 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.

Note: The results for each of the transmit chains shall be individually compared with the limits after these limits have been added by 10 x log (N) (number of active transmit chains).

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 2MHz. RB of the spectrum is 50kHz and VB of the spectrum is 150kHz (LTE Channel Bandwidth 5MHz).

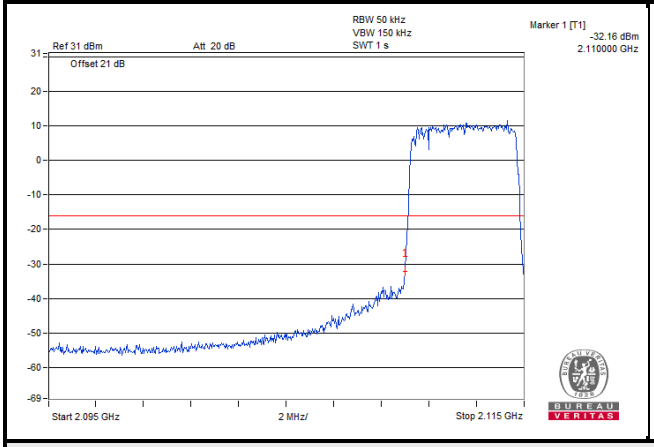
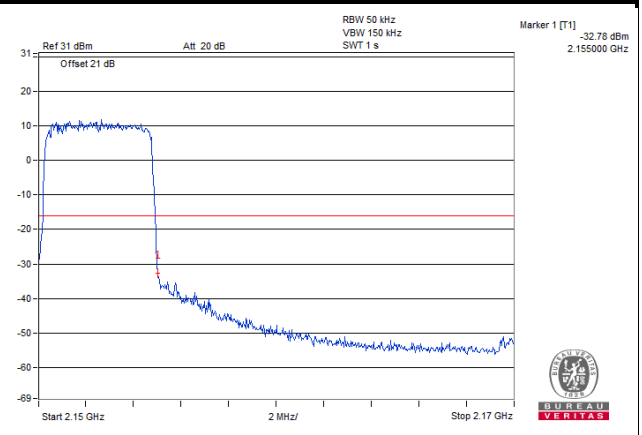
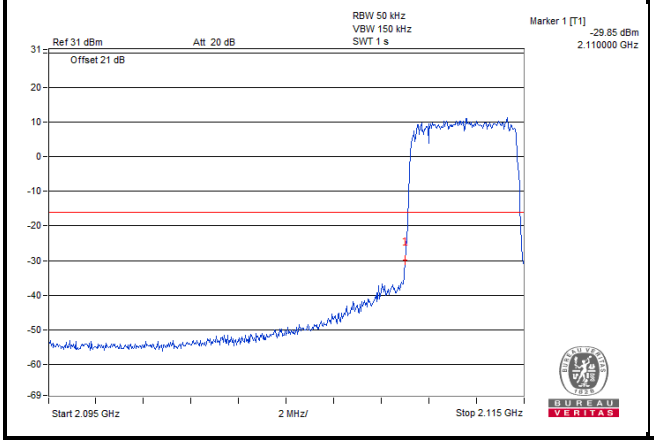
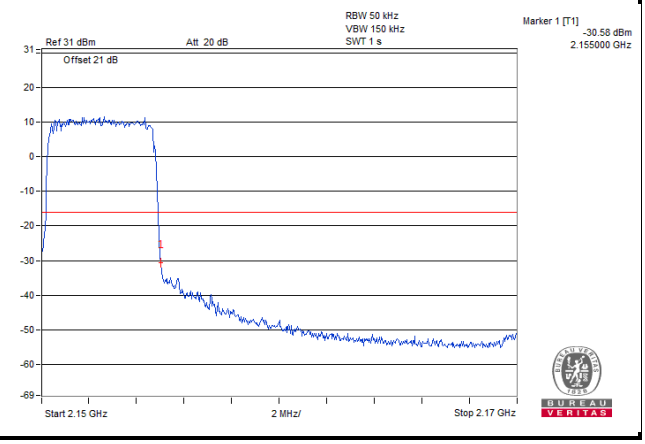
c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).

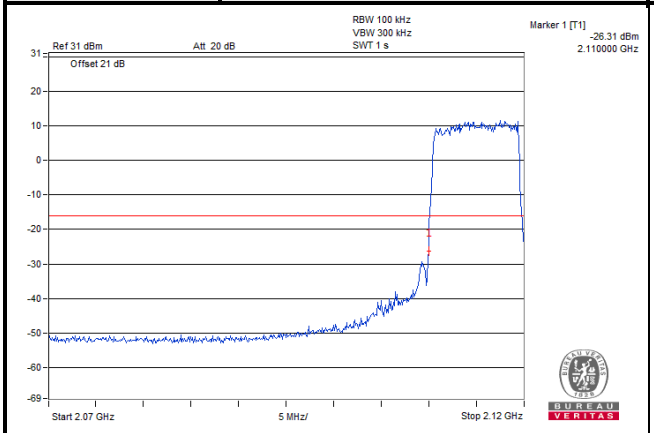
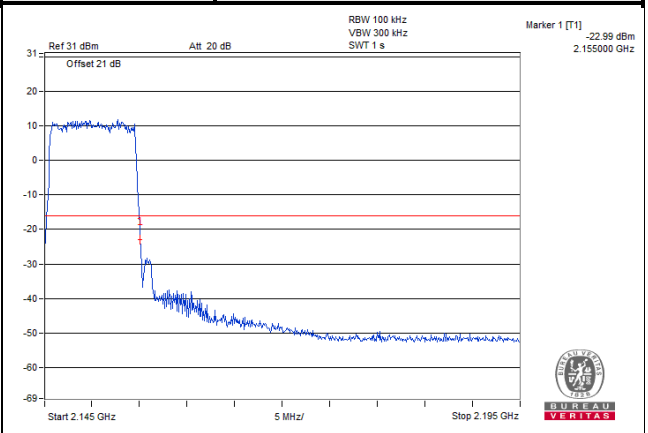
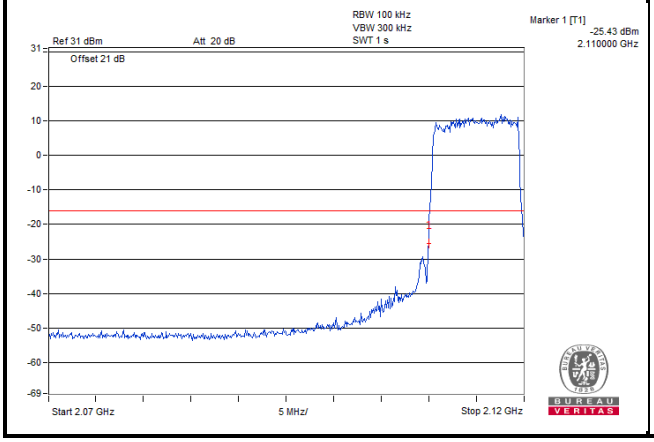
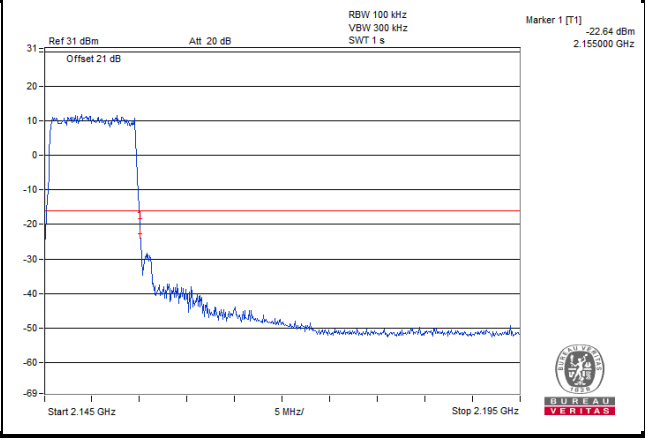
d. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).

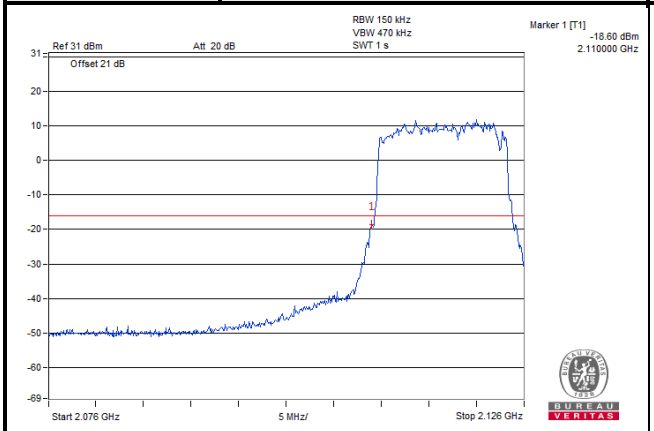
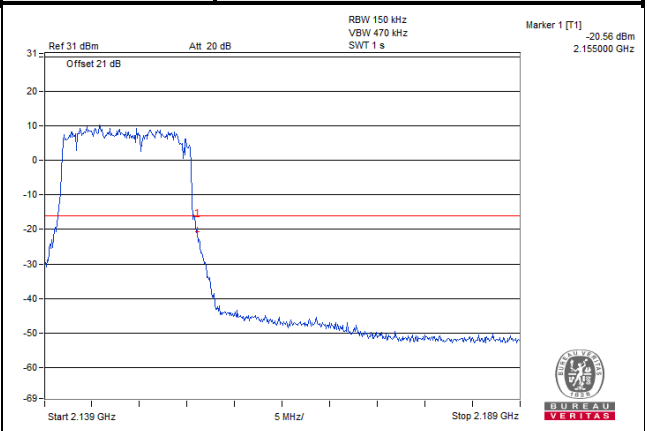
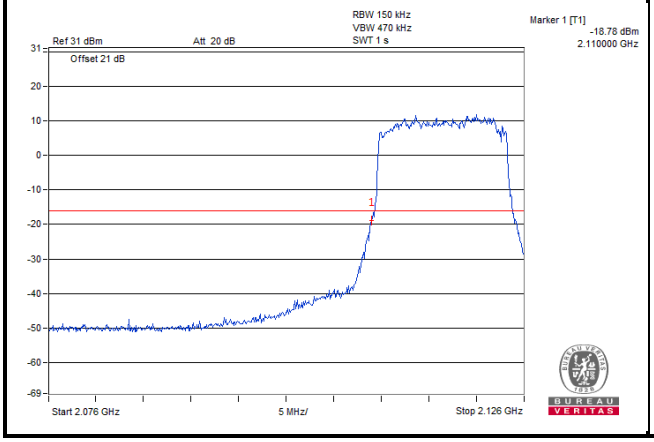
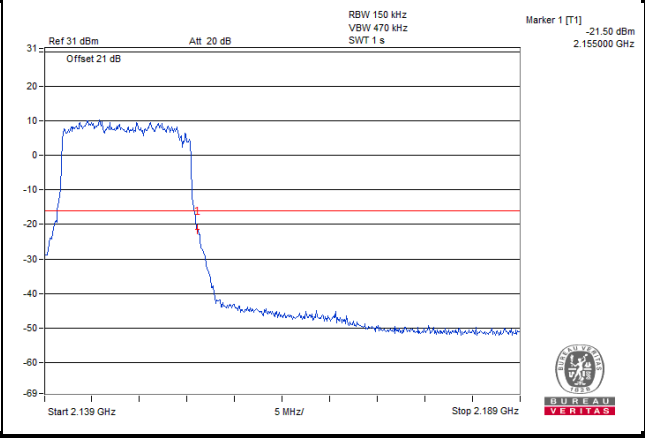
e. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 430kHz and VB of the spectrum is 1200kHz (LTE Channel Bandwidth 20MHz).

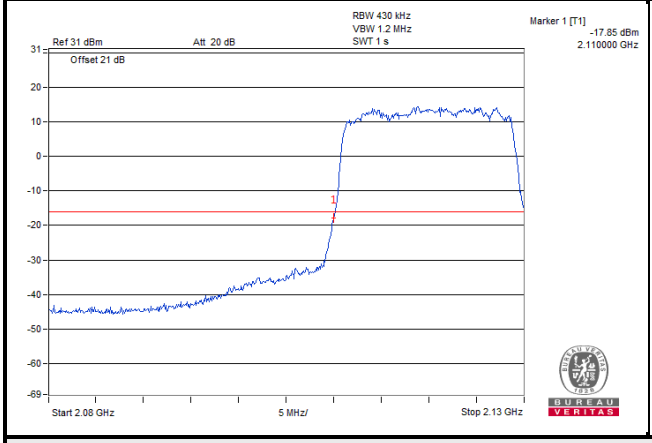
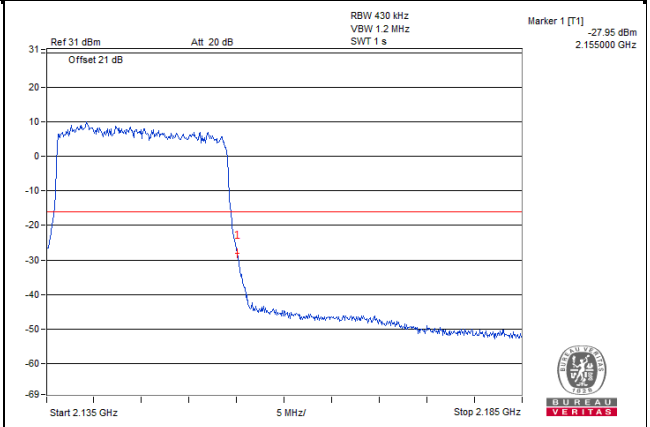
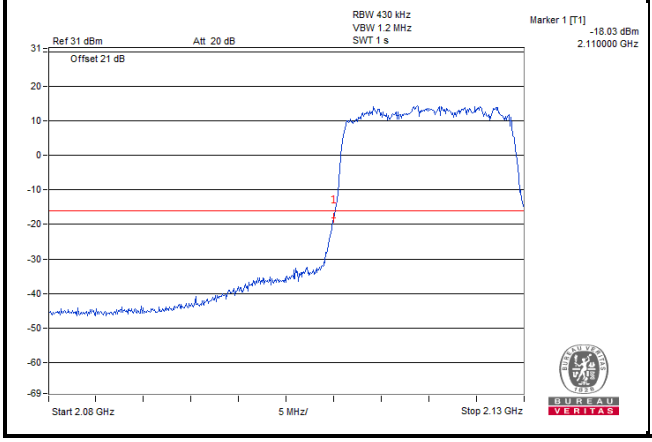
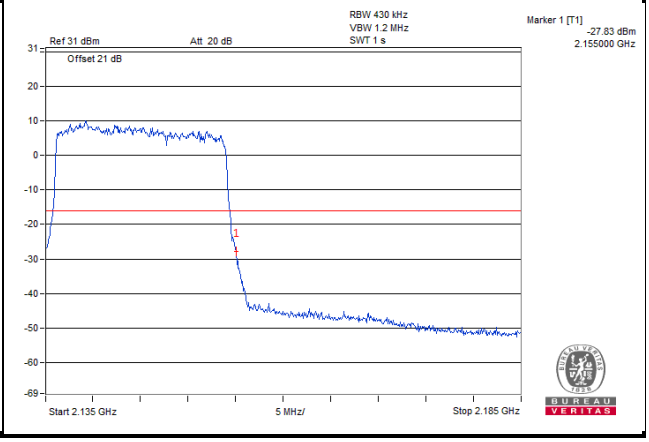
f. Record the max trace plot into the test report.

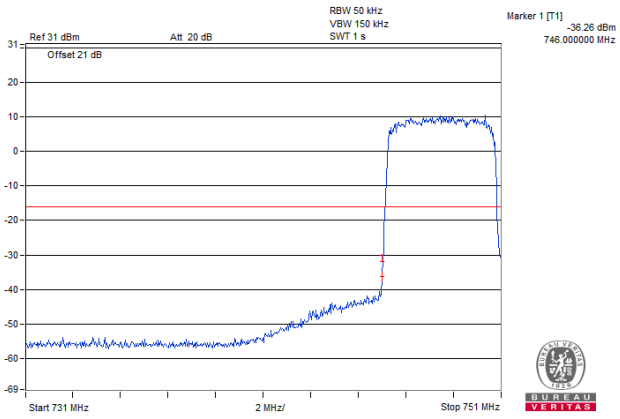
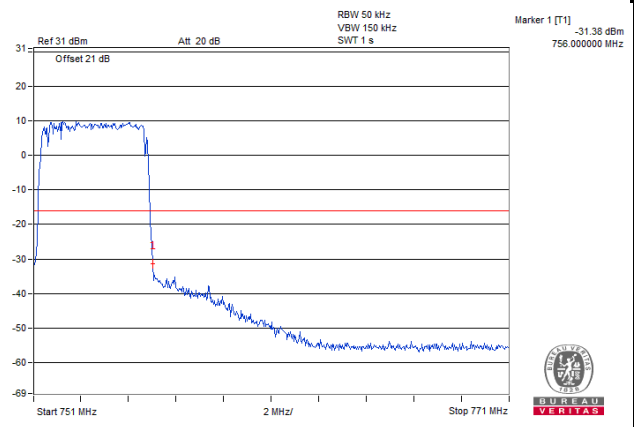
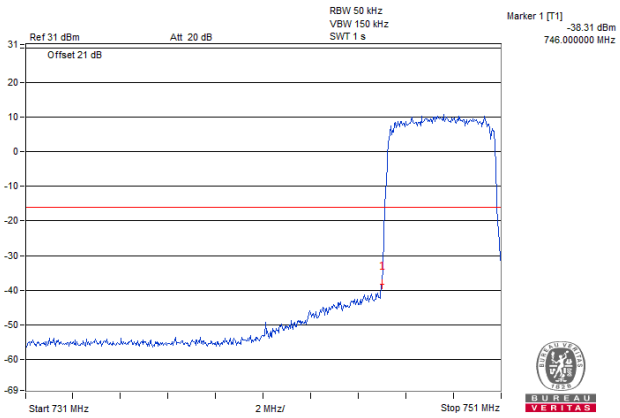
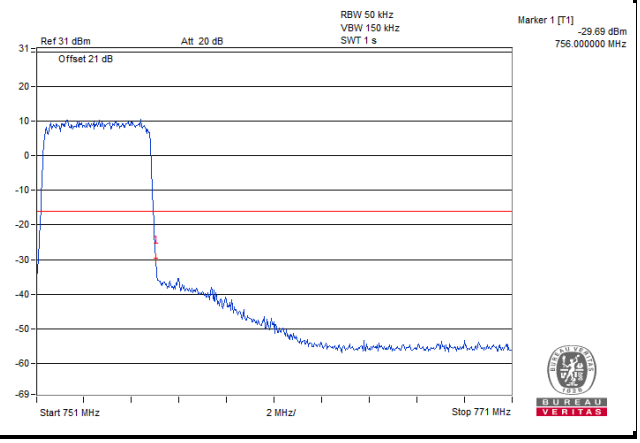
4.5.4 Test Results

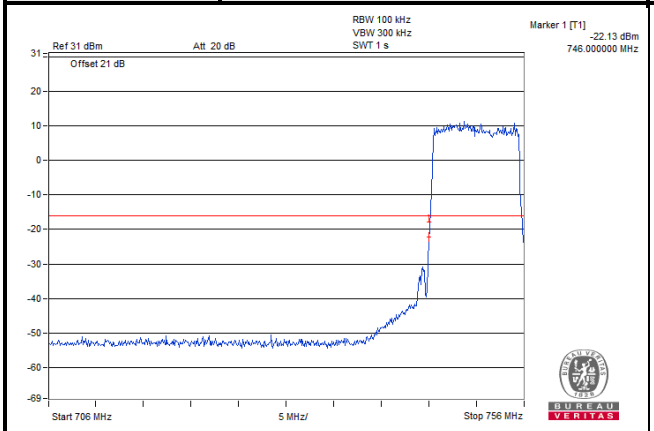
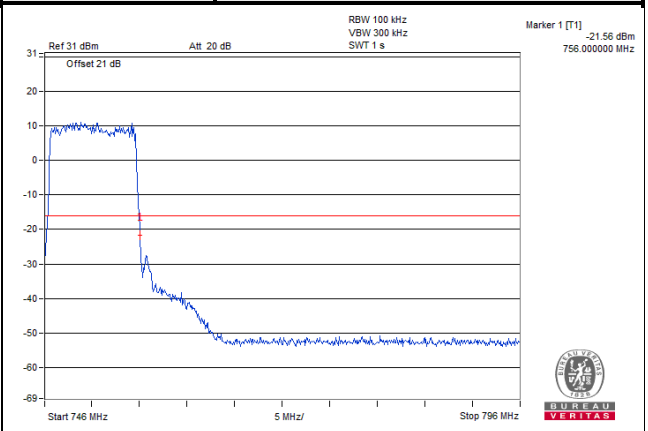
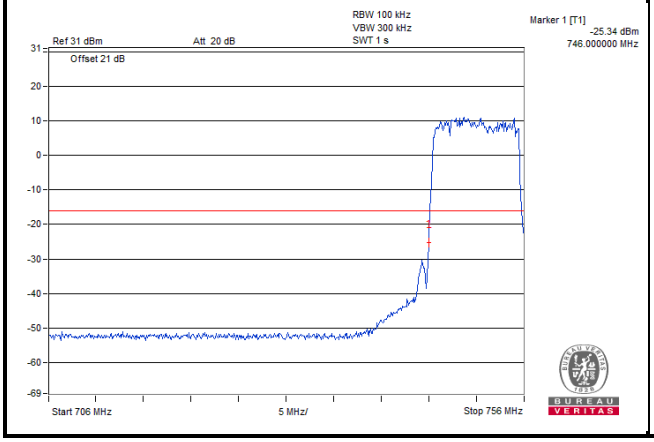
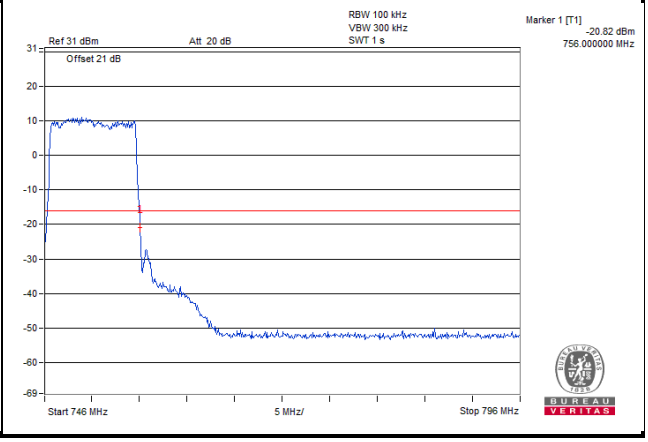
LTE Band 4			
Channel Bandwidth 5MHz			
Chain 0			
Channel	1975	Channel	2375
			
Chain 1			
Channel	1975	Channel	2375
			

LTE Band 4			
Channel Bandwidth 10MHz			
Chain 0			
Channel	2000	Channel	2350
			
Chain 1			
Channel	2000	Channel	2350
			

LTE Band 4			
Channel Bandwidth 15MHz			
Chain 0			
Channel	2025	Channel	2325
			
Chain 1			
Channel	2025	Channel	2325
			

LTE Band 4			
Channel Bandwidth 20MHz			
Chain 0			
Channel	2050	Channel	2300
			
Chain 1			
Channel	2050	Channel	2300
			

LTE Band 13			
Channel Bandwidth 5MHz			
Chain 0			
Channel	5205	Channel	5255
			
Chain 1			
Channel	5205	Channel	5255
			

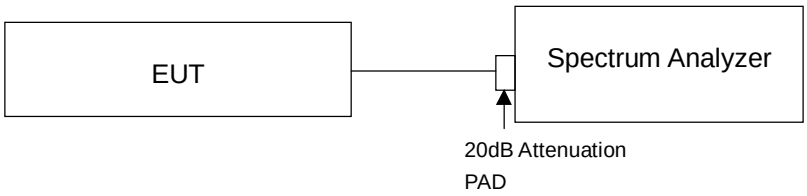
LTE Band 13			
Channel Bandwidth 10MHz			
Chain 0			
Channel	5230	Channel	5230
			
Chain 1			
Channel	5230	Channel	5230
			

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

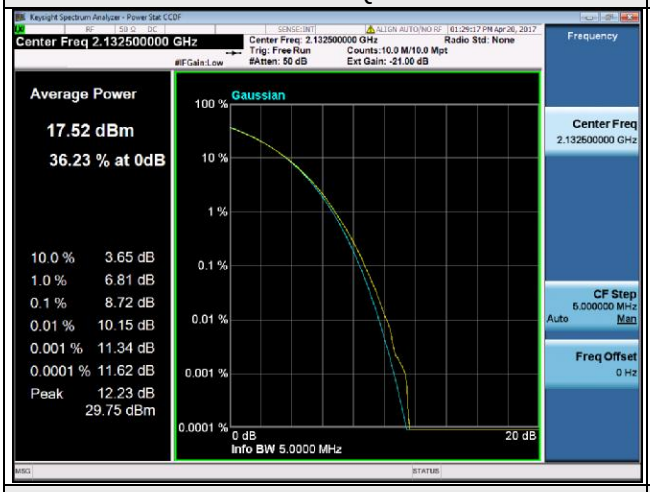
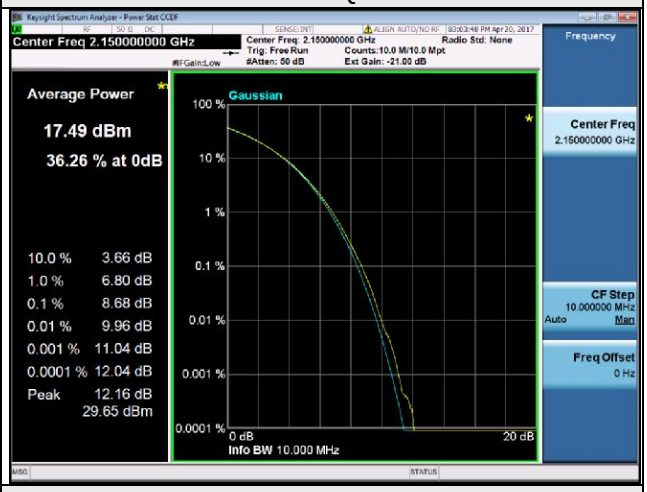
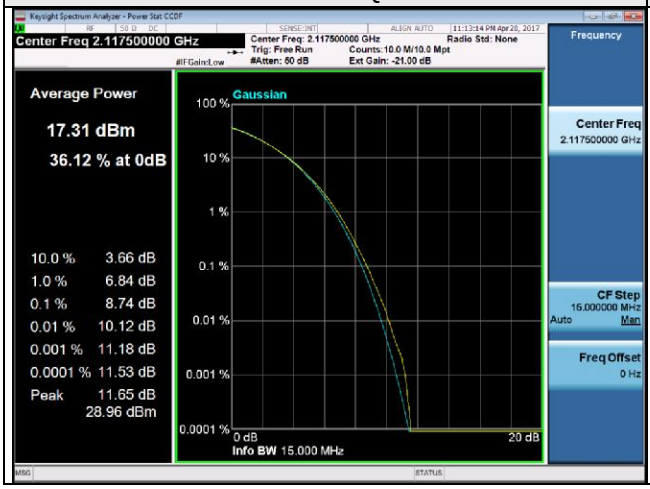
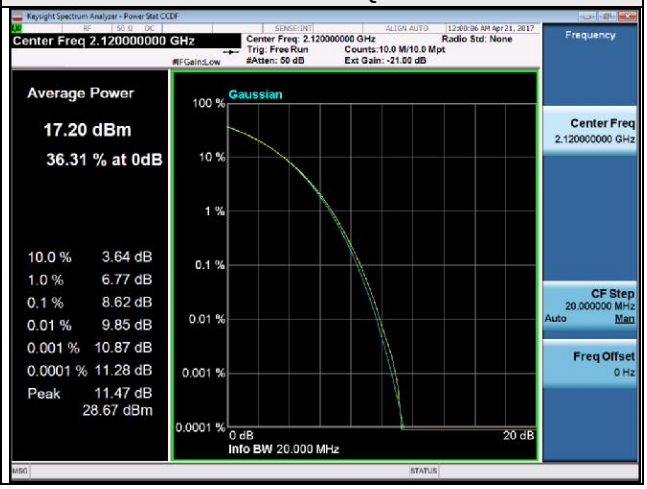
a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

b. Set the number of counts to a value that stabilizes the measured CCDF curve;

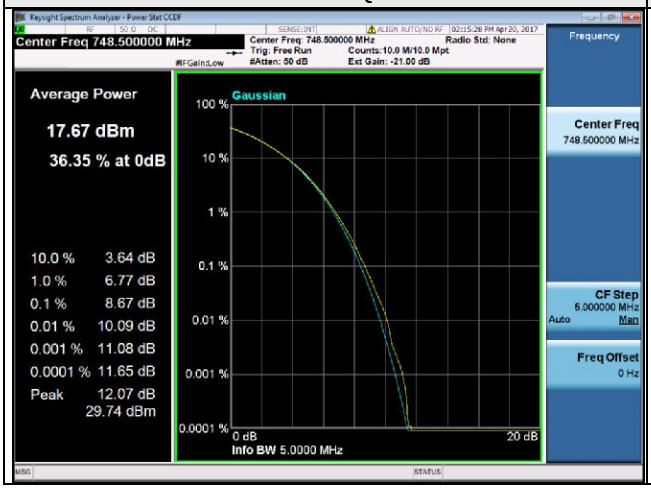
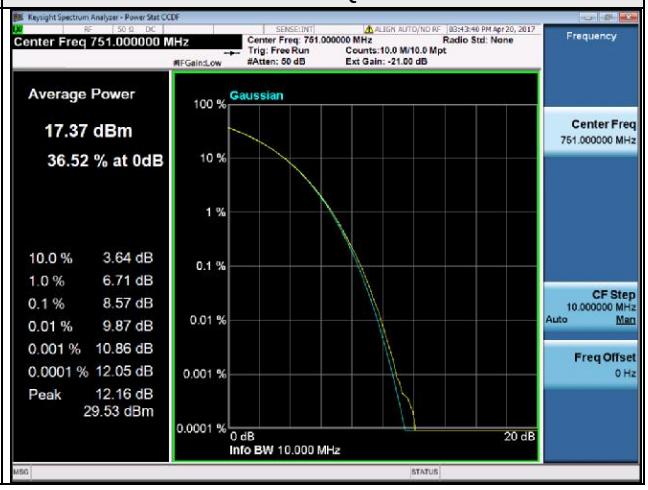
c. Record the maximum PAPR level associated with a probability of 0.1%.

4.6.4 Test Results

LTE Band 4							
Channel Bandwidth 5MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
1975	2112.5	8.55	8.54	8.66	8.66	8.47	8.46
2175	2132.5	8.55	8.55	8.68	8.72	8.47	8.47
2375	2152.5	8.53	8.47	8.60	8.60	8.39	8.39
Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2000	2115.0	8.67	8.67	8.58	8.60	8.63	8.60
2175	2132.5	8.67	8.67	8.59	8.59	8.61	8.61
2350	2150.0	8.68	8.67	8.60	8.58	8.60	8.60
Channel Bandwidth 15MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2025	2117.5	8.56	8.56	8.73	8.74	8.62	8.61
2175	2132.5	8.56	8.56	8.72	8.72	8.61	8.61
2325	2147.5	8.56	8.56	8.72	8.73	8.62	8.60
Channel Bandwidth 20MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
2050	2120.0	8.57	8.57	8.57	8.57	8.62	8.61
2175	2132.5	8.57	8.57	8.58	8.57	8.61	8.61
2300	2145.0	8.57	8.56	8.57	8.57	8.61	8.61

Spectrum Plot Of Worst Value	
5MHz / 16QAM	10MHz / QPSK
	
15MHz / 16QAM	20MHz / 64QAM
	

LTE Band 13							
Channel Bandwidth 5MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
5205	748.5	8.53	8.51	8.67	8.63	8.43	8.43
5230	751.0	8.47	8.51	8.61	8.62	8.38	8.38
5255	753.5	8.46	8.47	8.58	8.58	8.41	8.40
Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
5230	751.0	8.57	8.57	8.51	8.50	8.53	8.53

Spectrum Plot Of Worst Value	
5MHz / 16QAM	10MHz / QPSK
	

4.7 Conducted Spurious Emissions

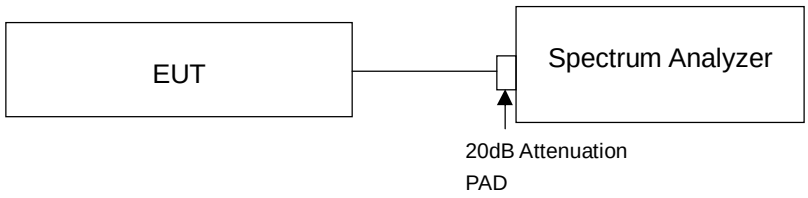
4.7.1 Limits of Conducted Spurious Emissions Measurement

For LTE Band 4
According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

For LTE Band 13
According to FCC 27.53(c) (2) for 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.

Note: The results for each of the transmit chains shall be individually compared with the limits after these limits have been added by 10 x log (N) (number of active transmit chains).

4.7.2 Test Setup

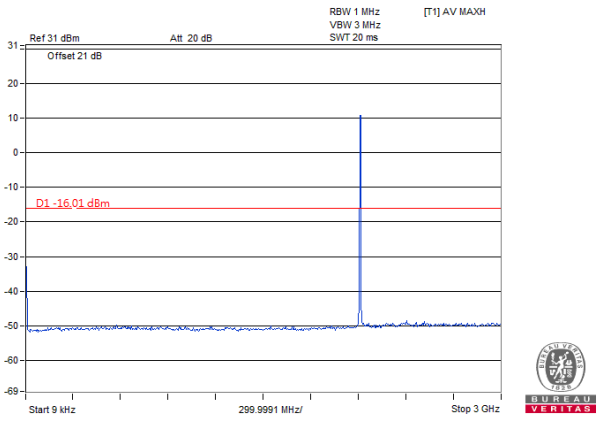
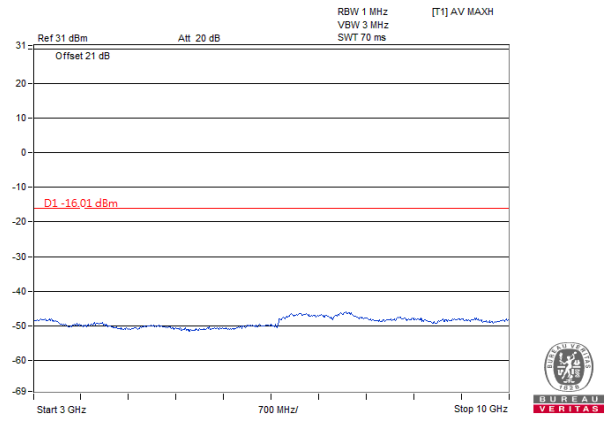
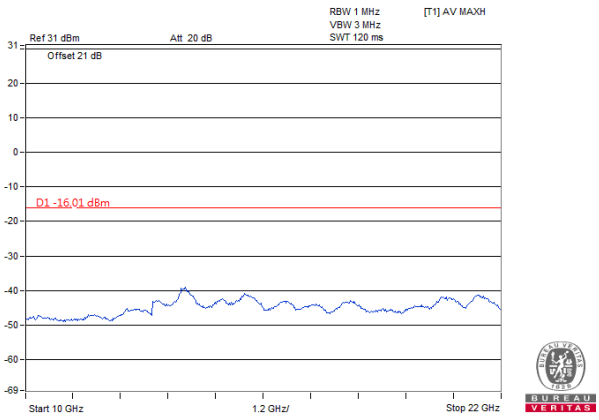


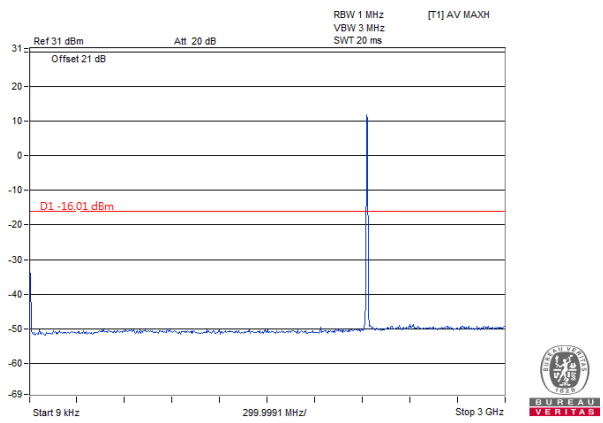
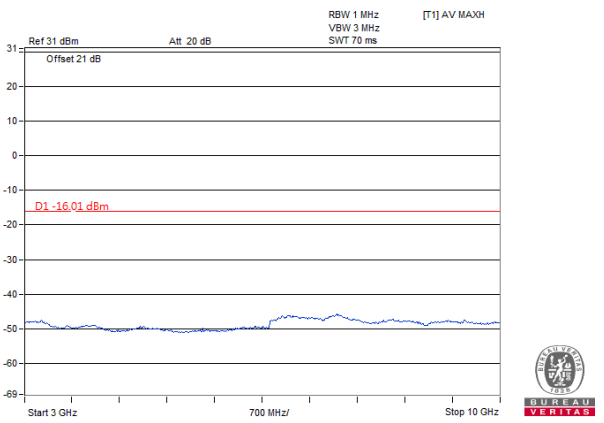
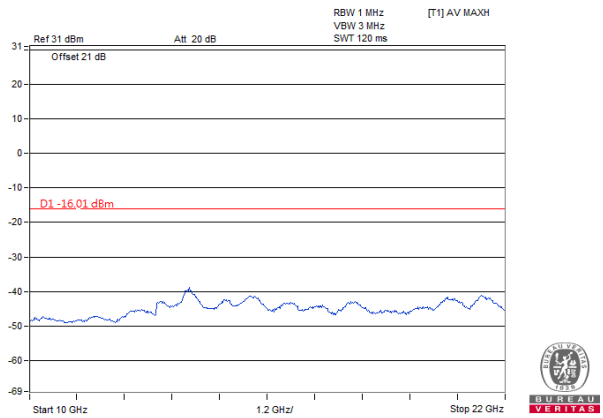
4.7.3 Test Procedure

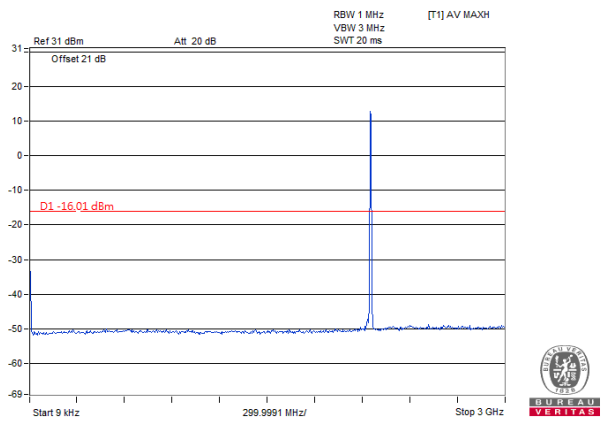
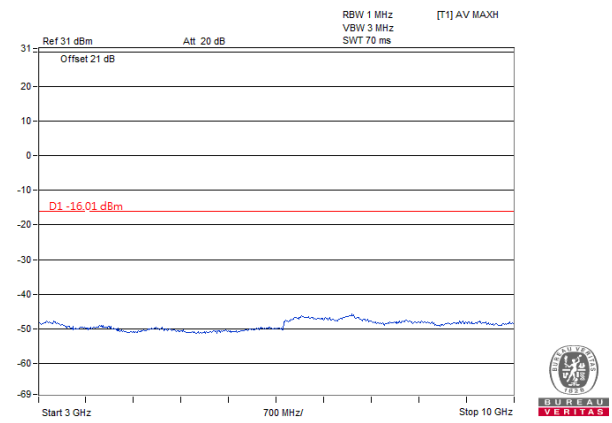
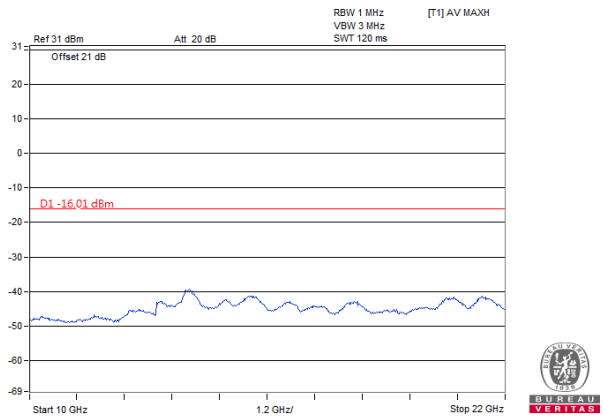
a. All measurements were done at 3 channels: low, middle and high operational frequency range.

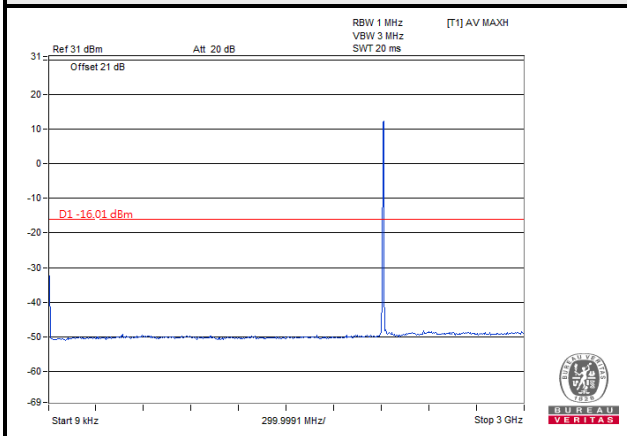
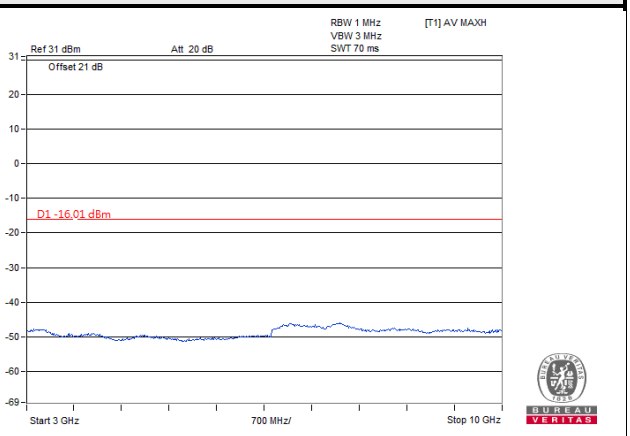
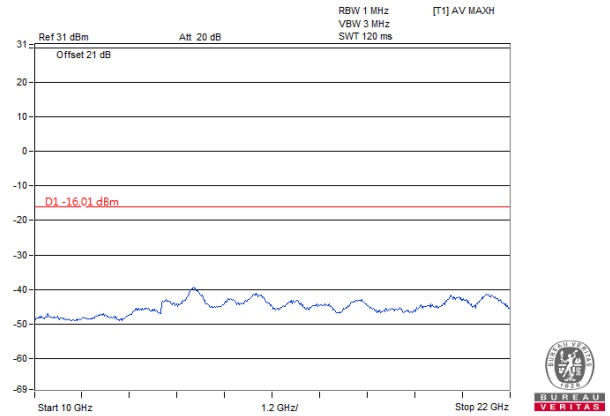
b. When the spectrum scanned from 9kHz to 20GHz for LTE Band 4 and 9kHz to 9GHz for LTE Band 13 & 17, it shall be connected to the 20dB pad attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

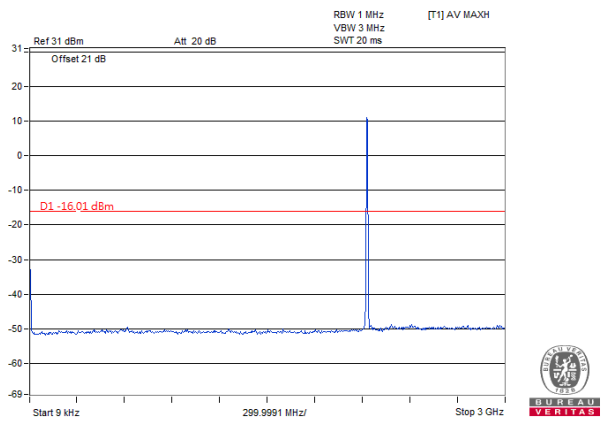
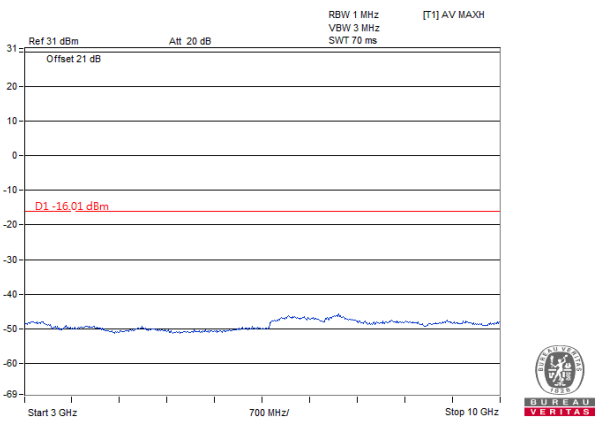
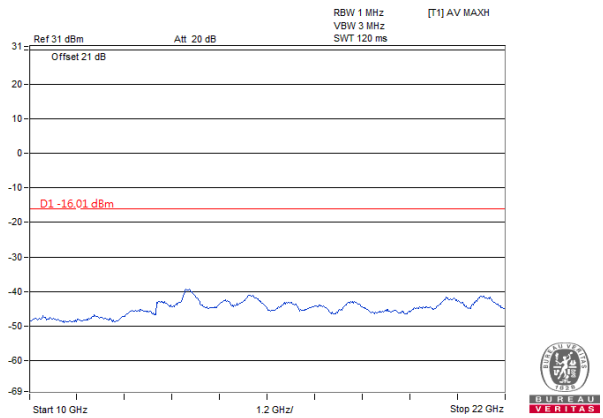
4.7.4 Test Results

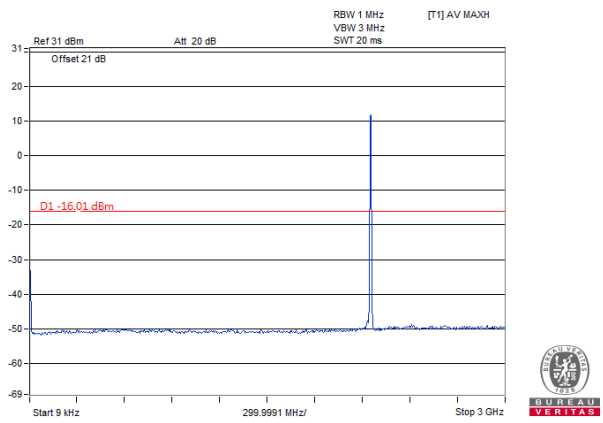
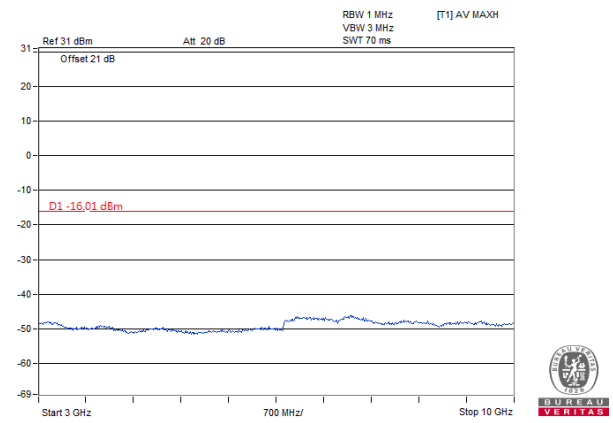
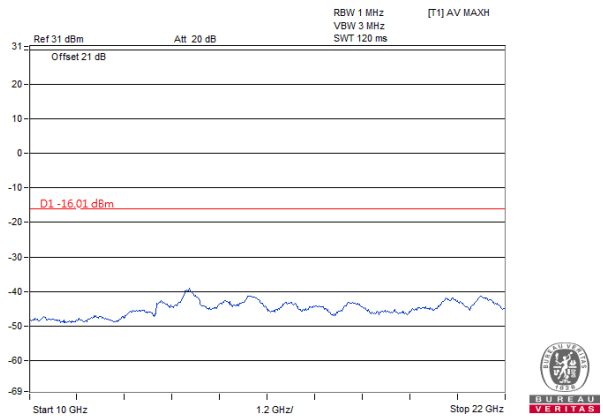
LTE Band 4	
Channel Band width: 5MHz	
Chain 0	
Channel 1975	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

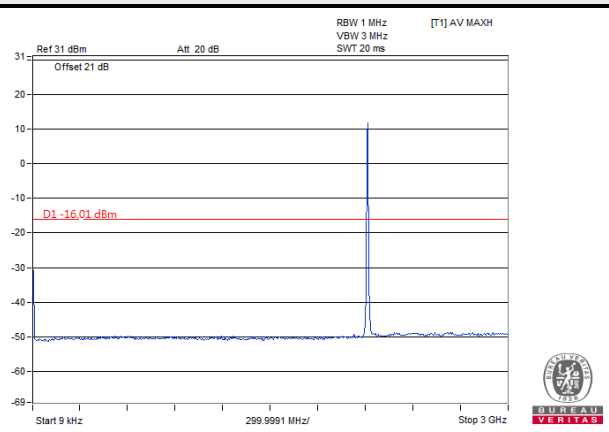
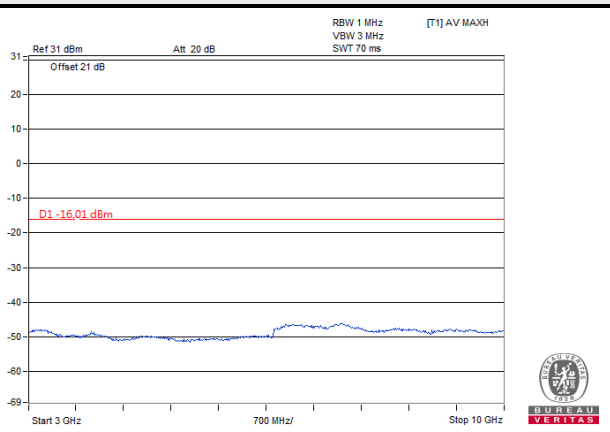
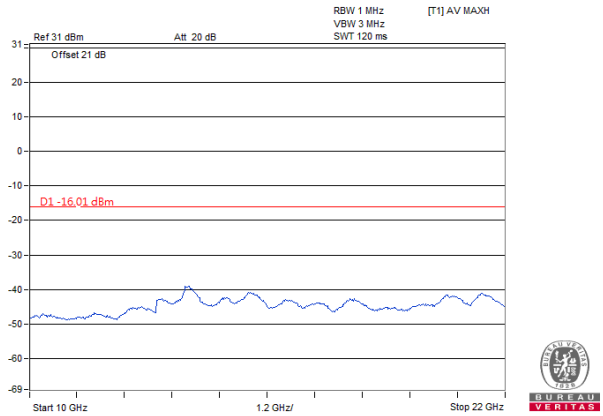
LTE Band 4	
Channel Band width: 5MHz	
Chain 0	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

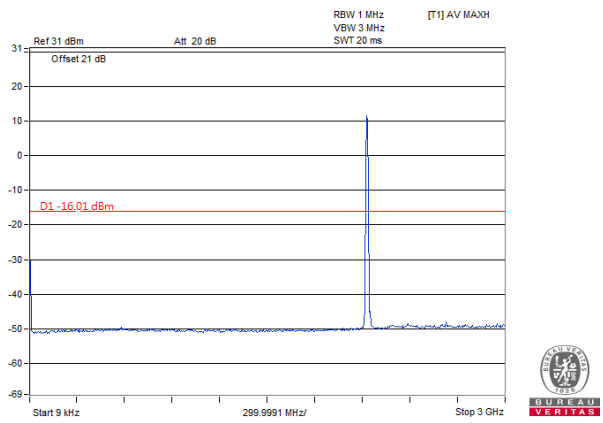
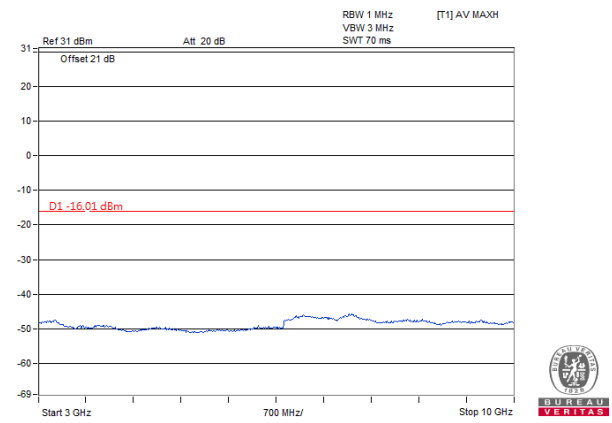
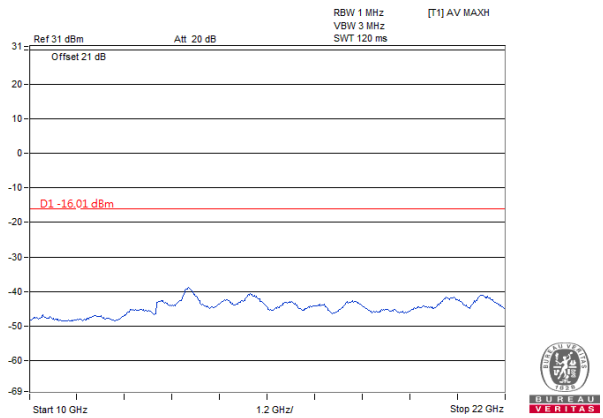
LTE Band 4	
Channel Band width: 5MHz	
Chain 0	
Channel 2375	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

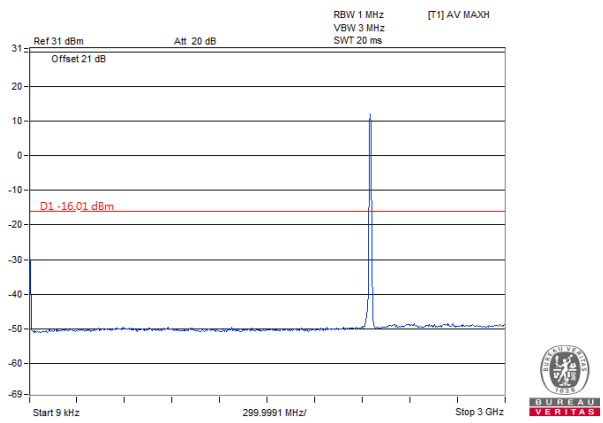
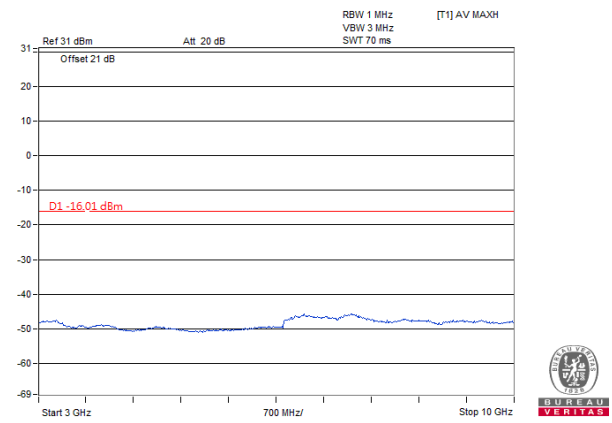
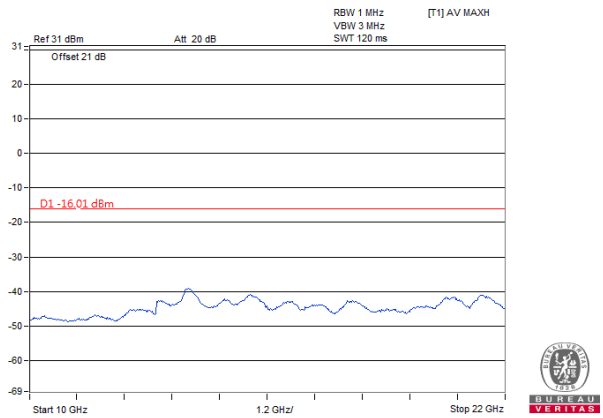
LTE Band 4	
Channel Band width: 5MHz	
Chain 1	
Channel 1975	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

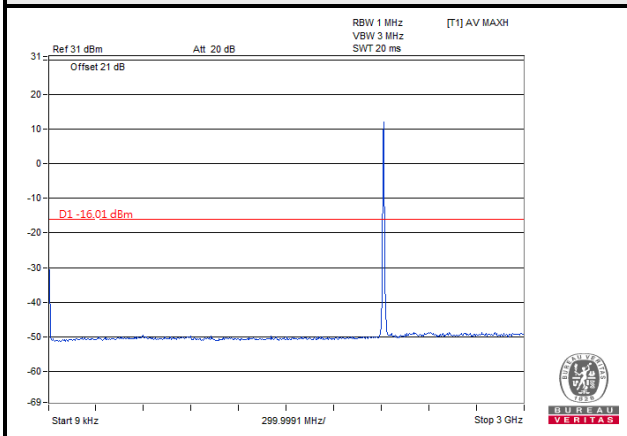
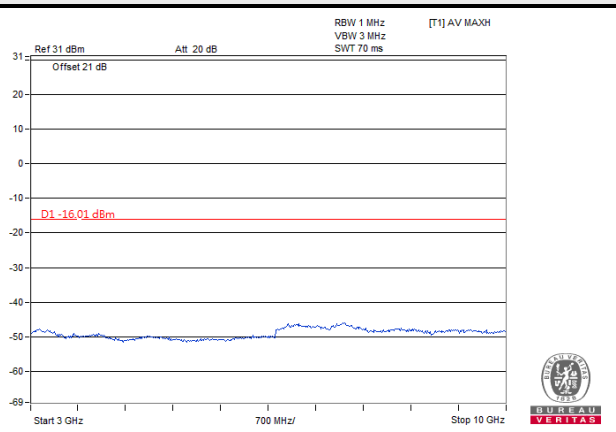
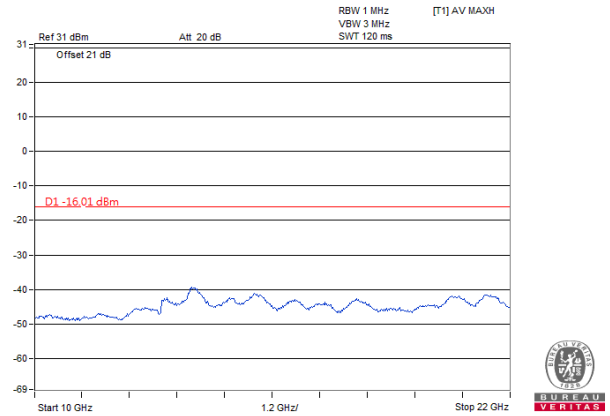
LTE Band 4	
Channel Band width: 5MHz	
Chain 1	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

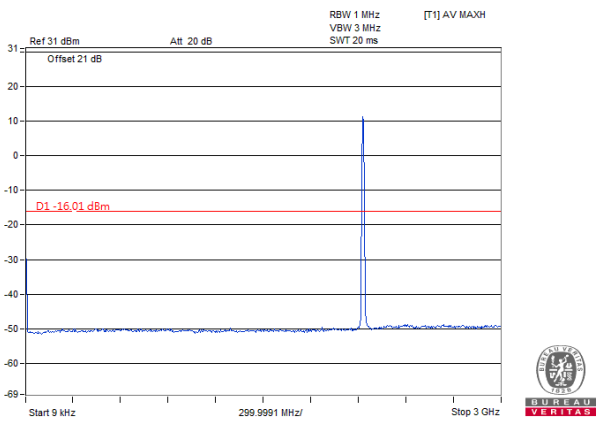
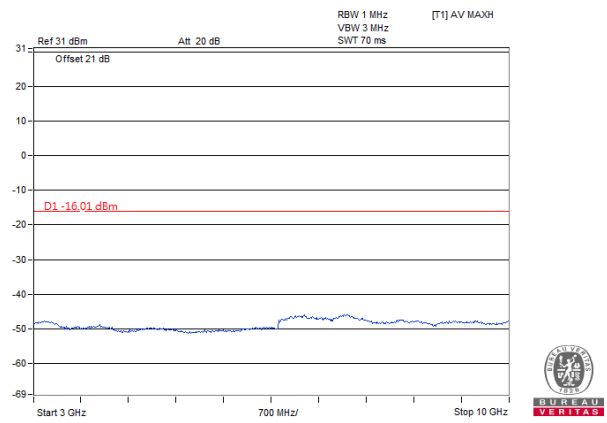
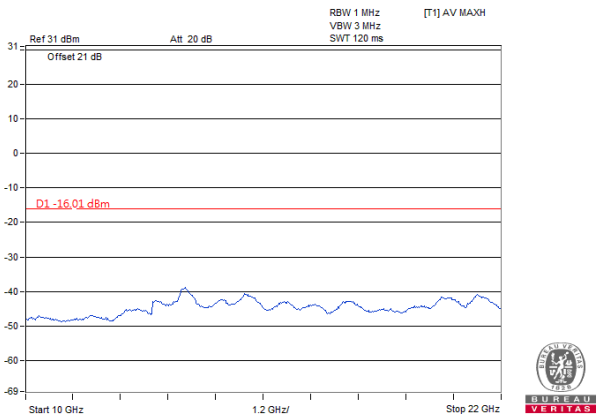
LTE Band 4	
Channel Band width: 5MHz	
Chain 1	
Channel 2375	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

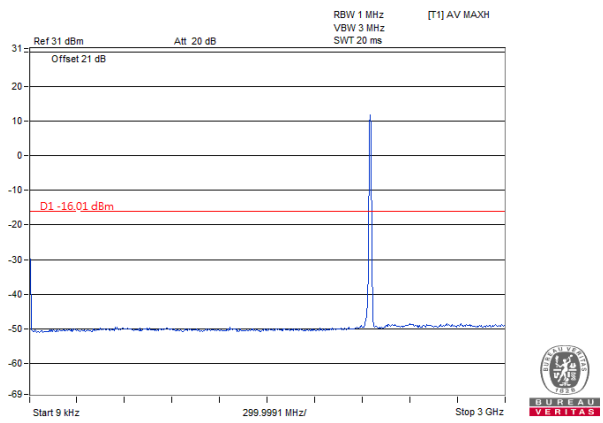
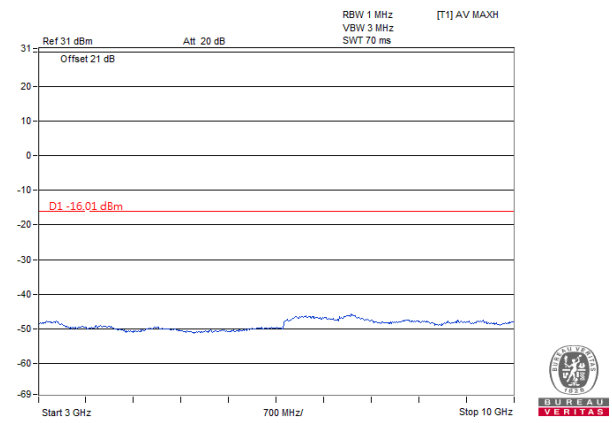
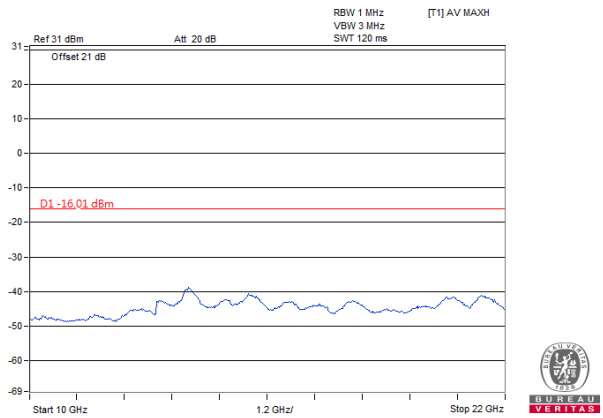
LTE Band 4	
Channel Band width: 10MHz	
Chain 0	
Channel 2000	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

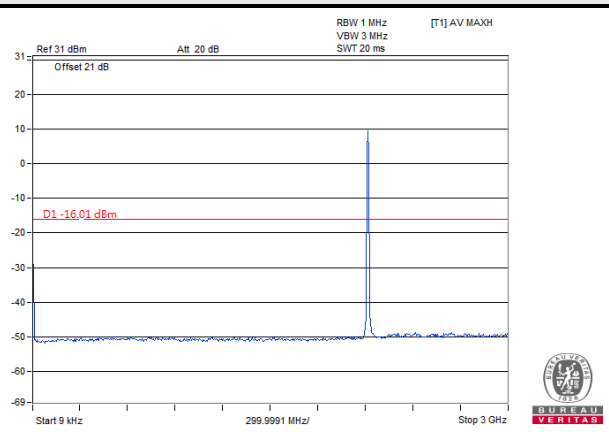
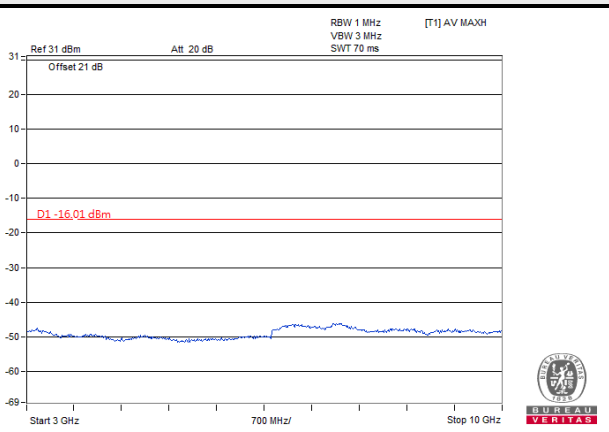
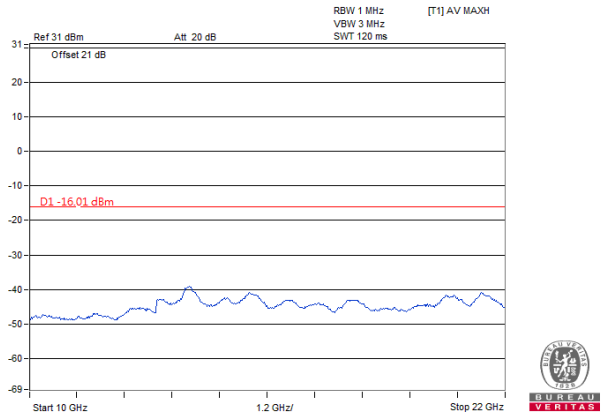
LTE Band 4	
Channel Band width: 10MHz	
Chain 0	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

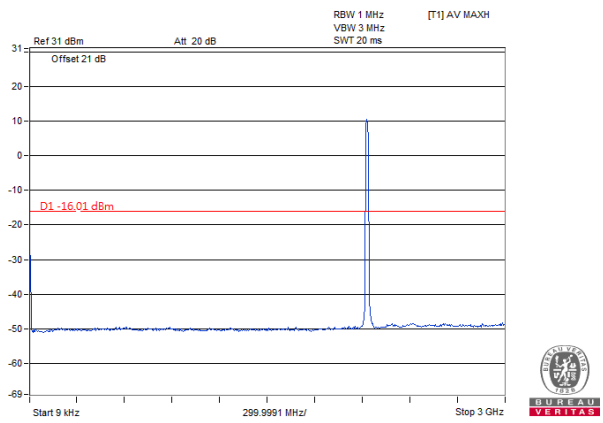
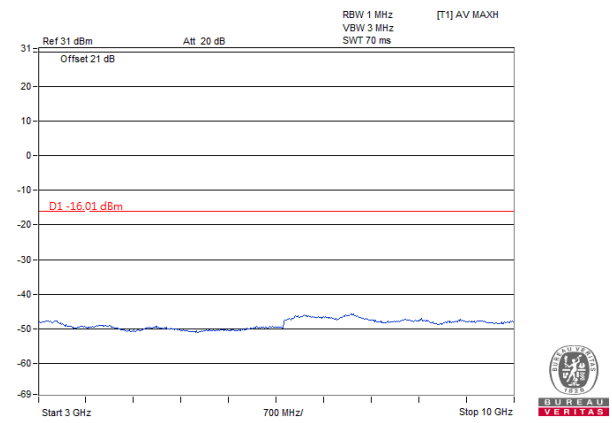
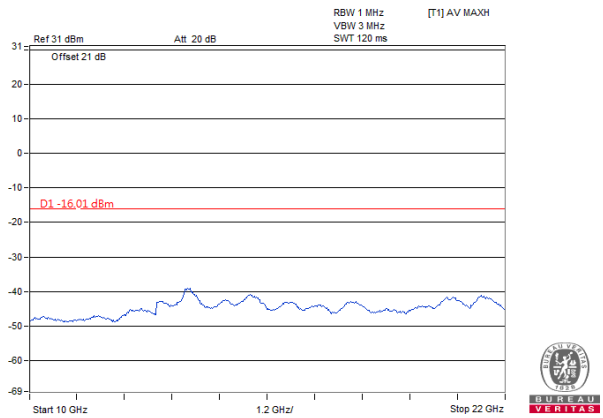
LTE Band 4	
Channel Band width: 10MHz	
Chain 0	
Channel 2350	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

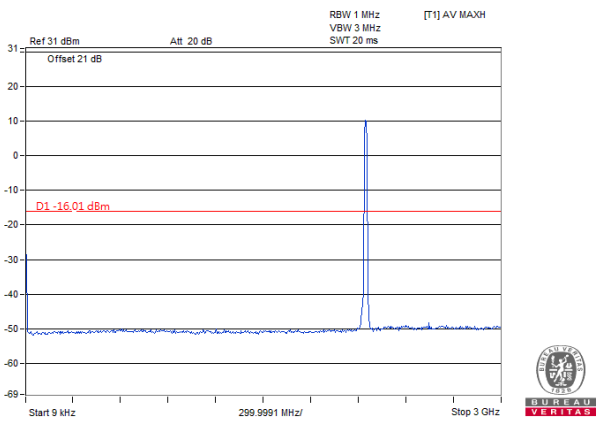
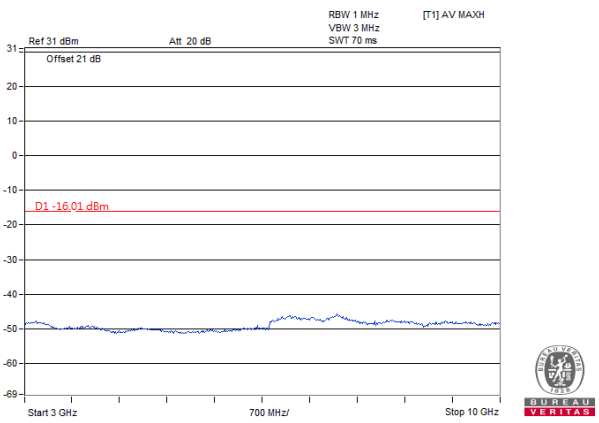
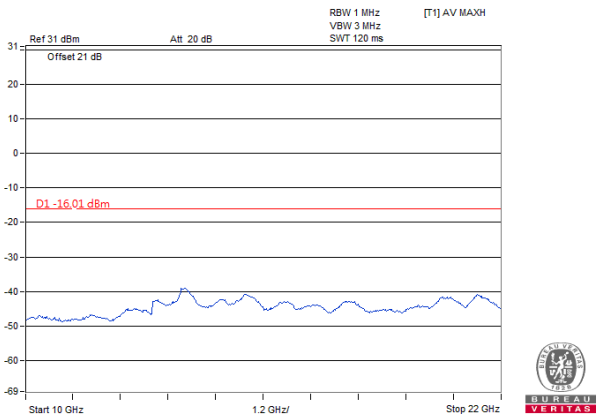
LTE Band 4	
Channel Band width: 10MHz	
Chain 1	
Channel 2000	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

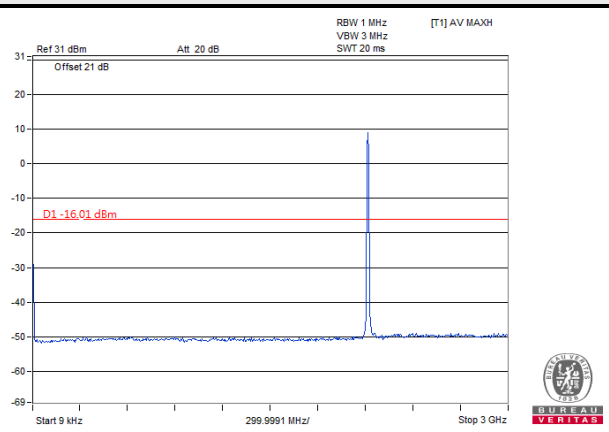
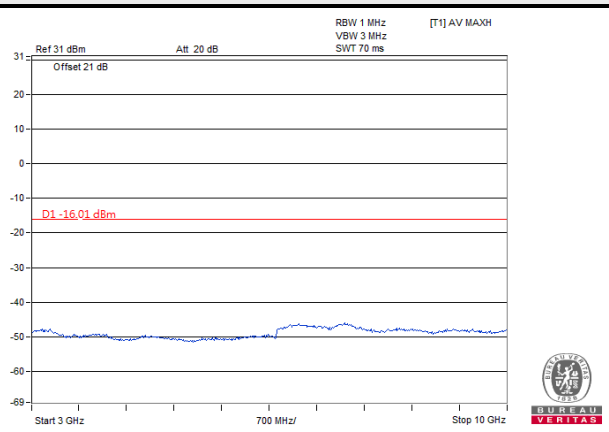
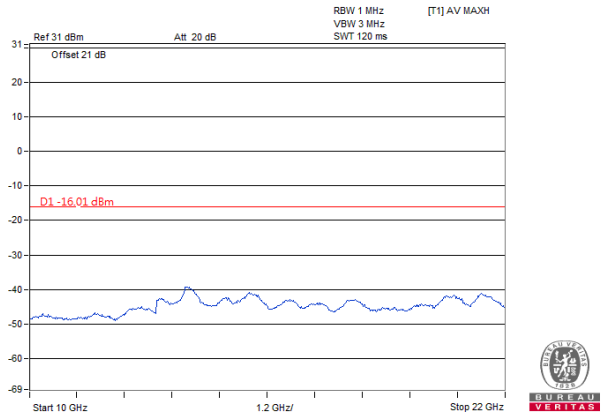
LTE Band 4	
Channel Band width: 10MHz	
Chain 1	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

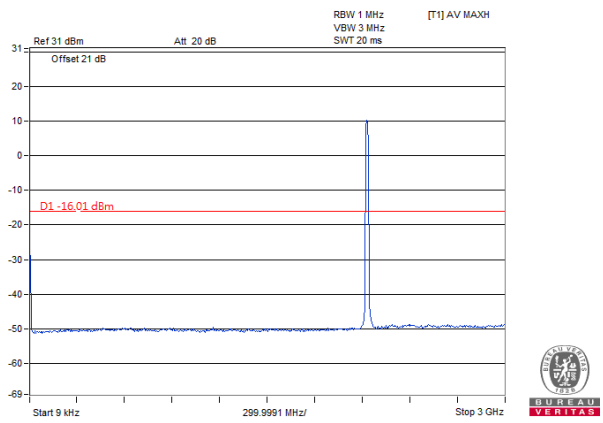
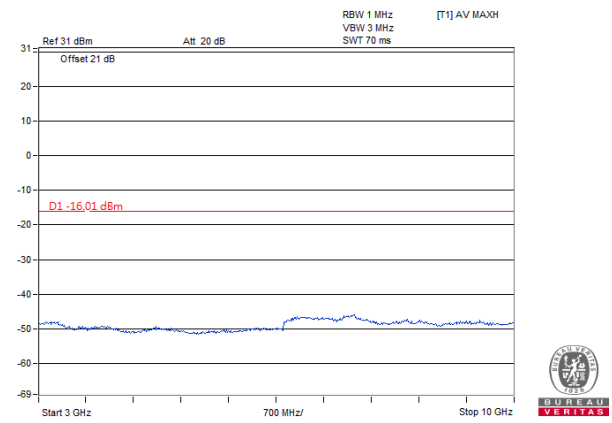
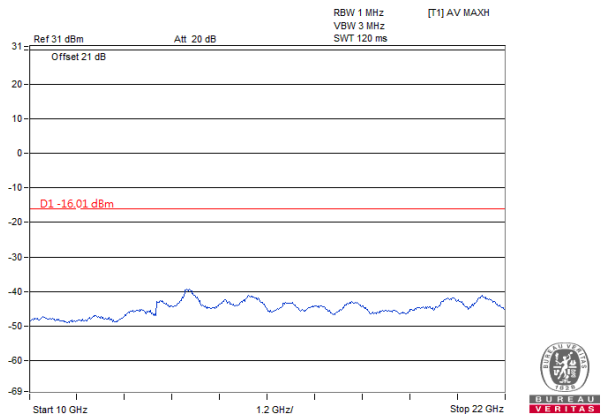
LTE Band 4	
Channel Band width: 10MHz	
Chain 1	
Channel 2350	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

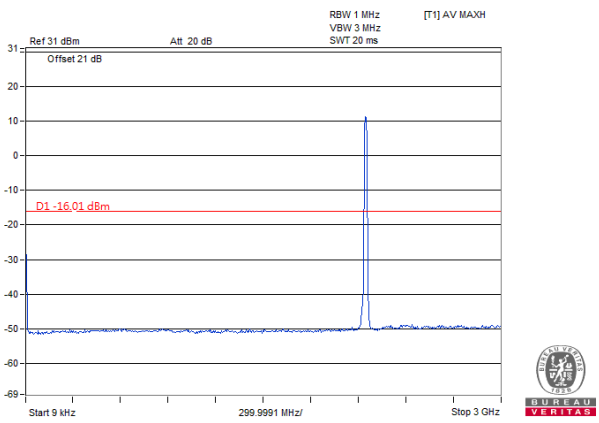
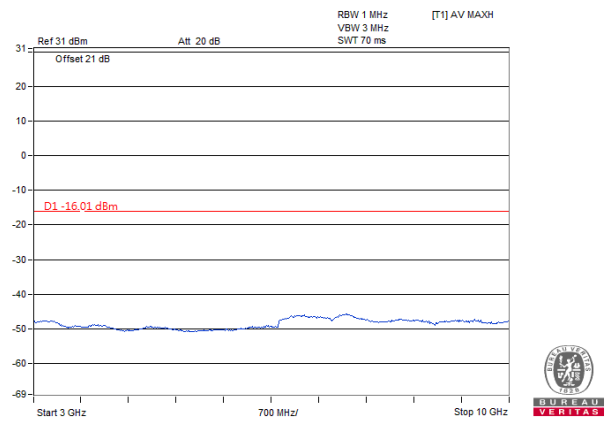
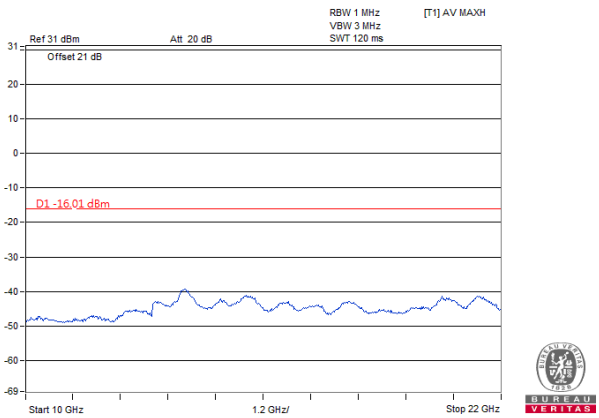
LTE Band 4	
Channel Band width: 15MHz	
Chain 0	
Channel 2025	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

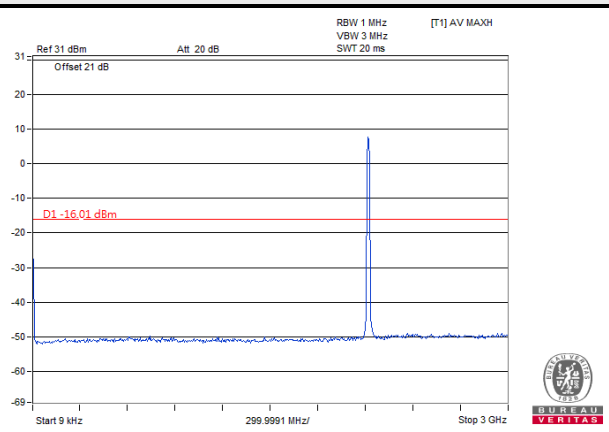
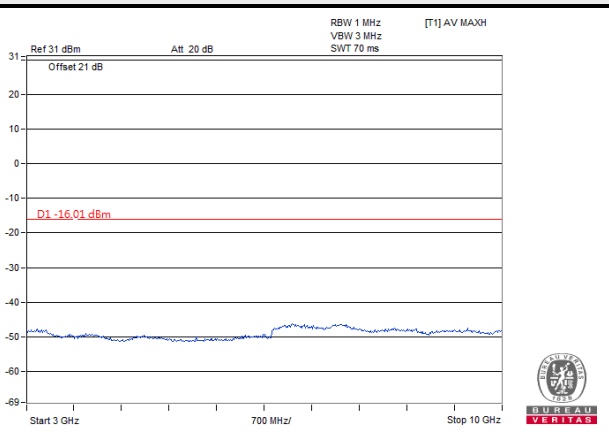
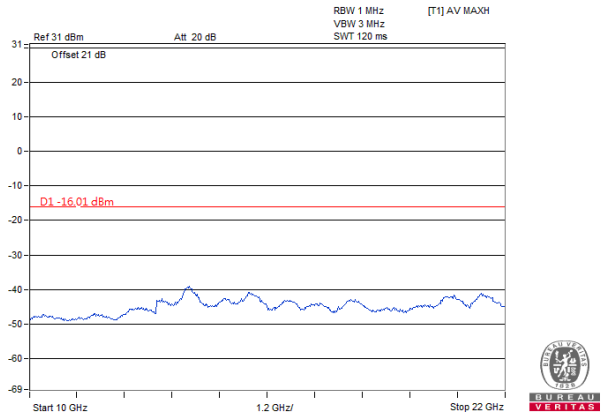
LTE Band 4	
Channel Band width: 15MHz	
Chain 0	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

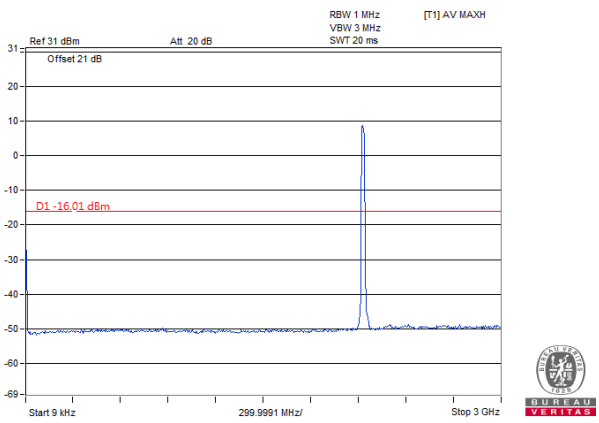
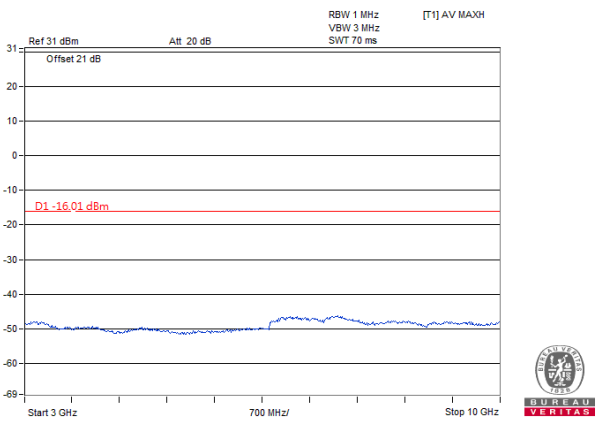
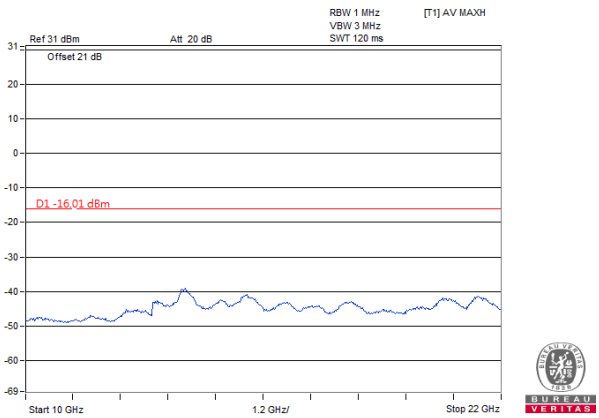
LTE Band 4	
Channel Band width: 15MHz	
Chain 0	
Channel 2325	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

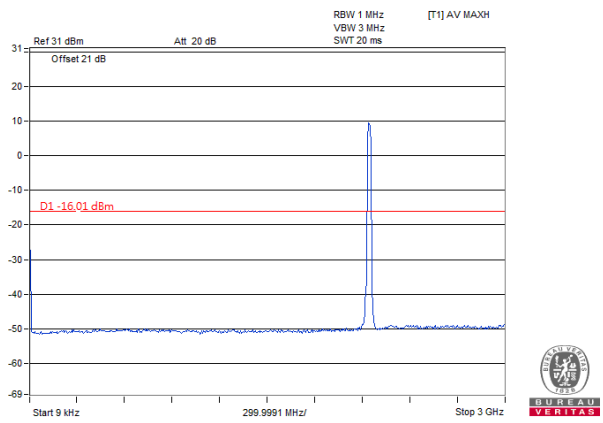
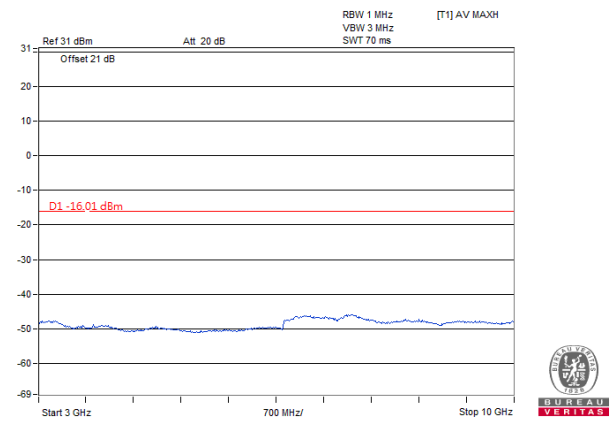
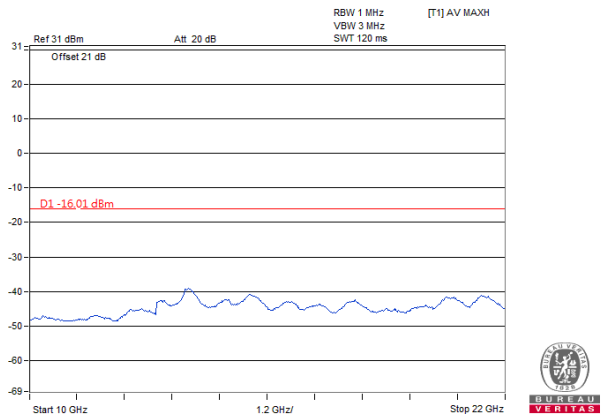
LTE Band 4	
Channel Band width: 15MHz	
Chain 1	
Channel 2025	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

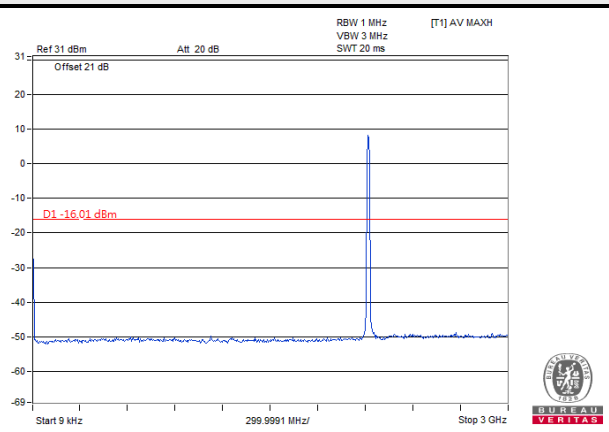
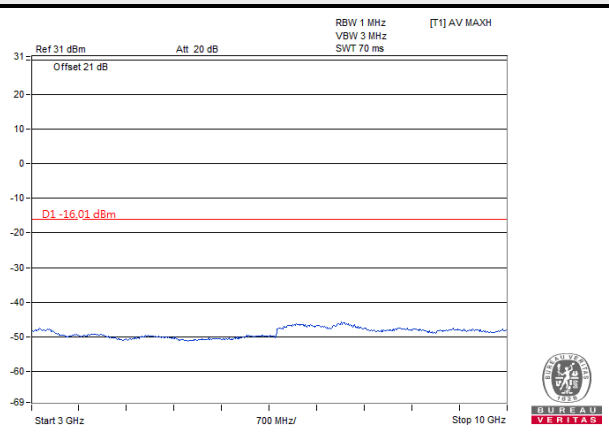
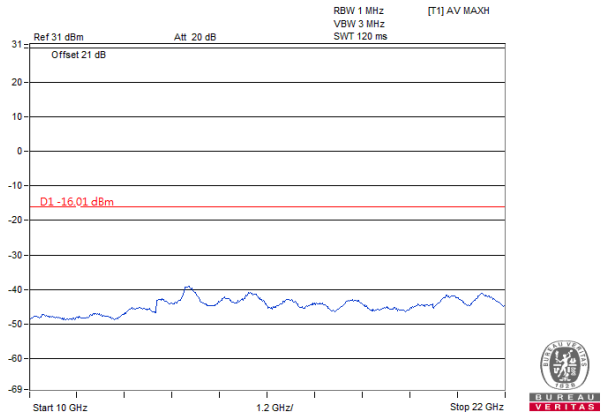
LTE Band 4	
Channel Band width: 15MHz	
Chain 1	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

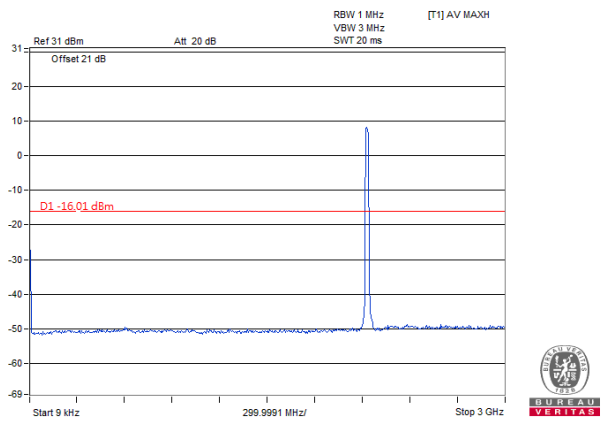
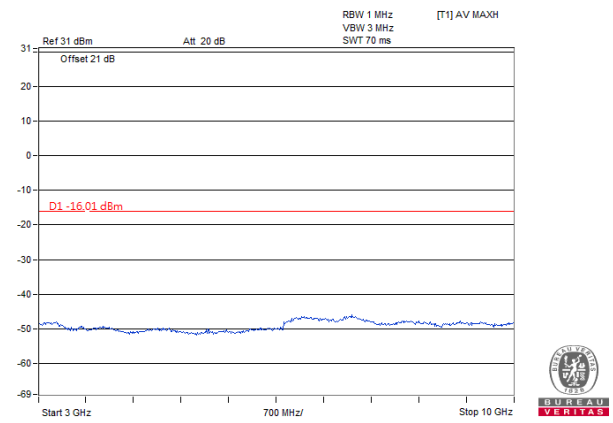
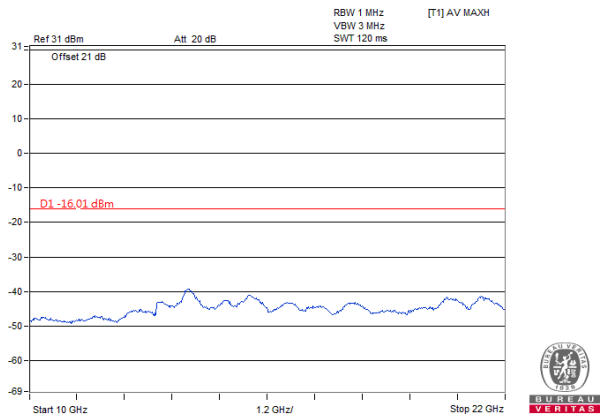
LTE Band 4	
Channel Band width: 15MHz	
Chain 1	
Channel 2325	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

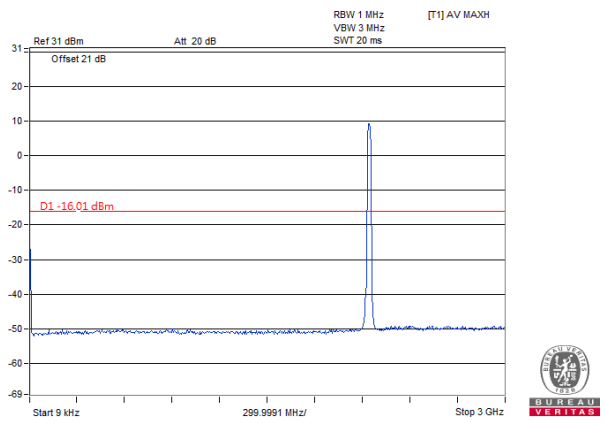
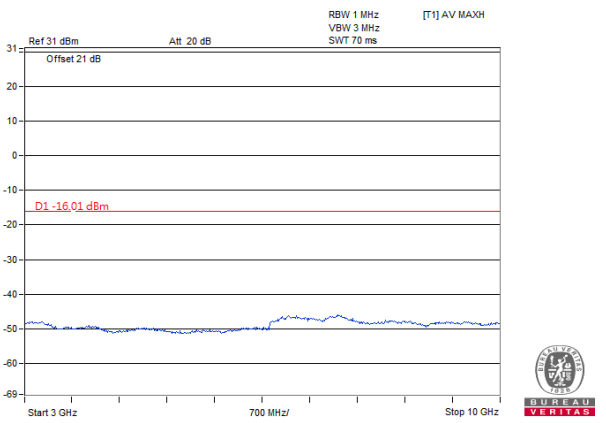
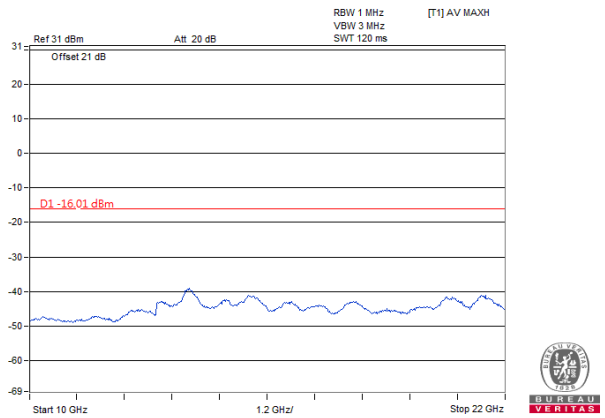
LTE Band 4	
Channel Band width: 20MHz	
Chain 0	
Channel 2050	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

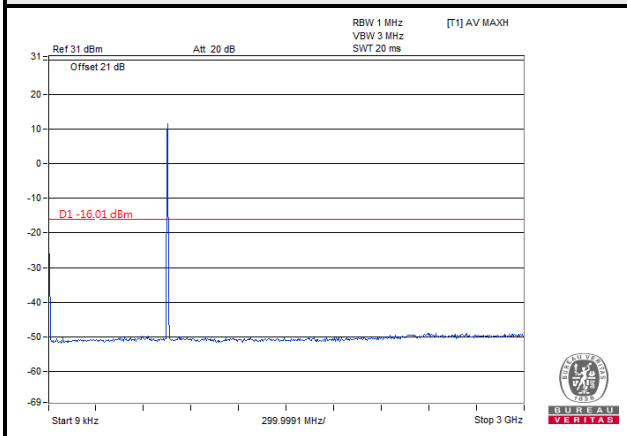
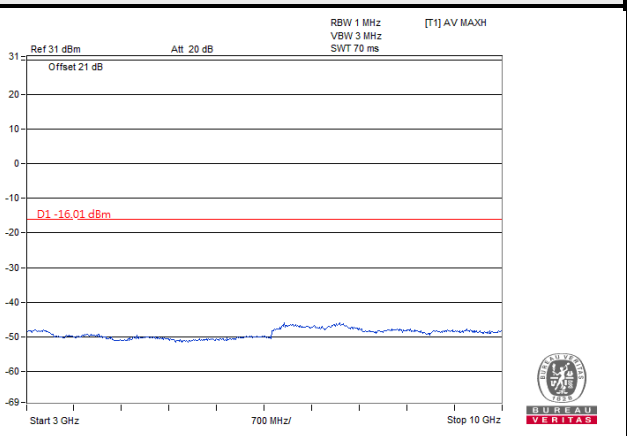
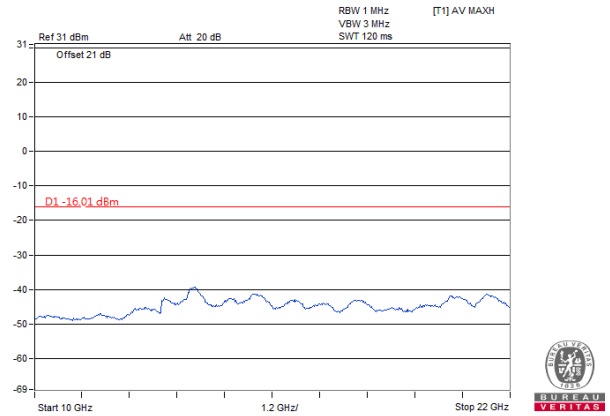
LTE Band 4	
Channel Band width: 20MHz	
Chain 0	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

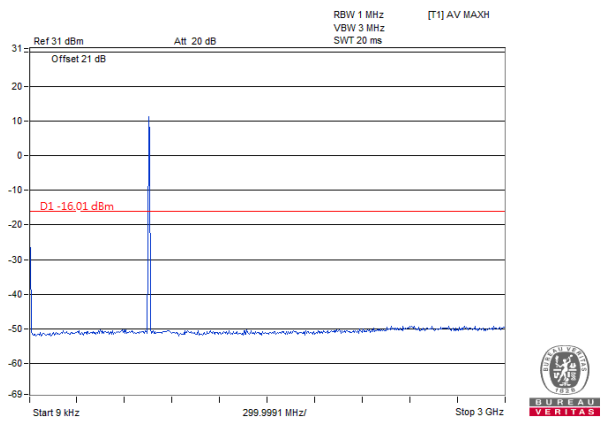
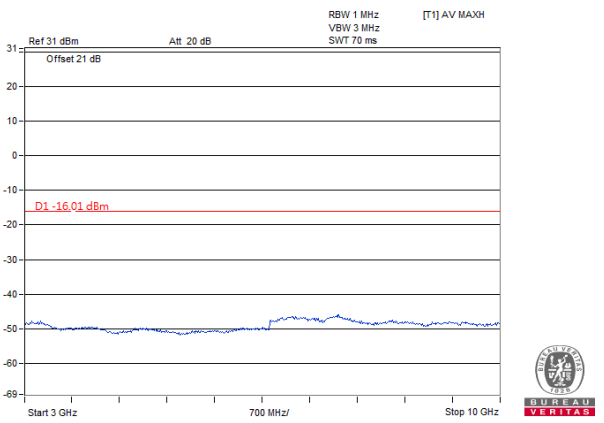
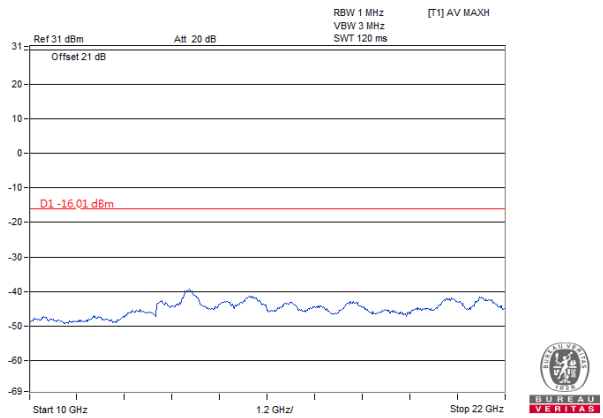
LTE Band 4	
Channel Band width: 20MHz	
Chain 0	
Channel 2300	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

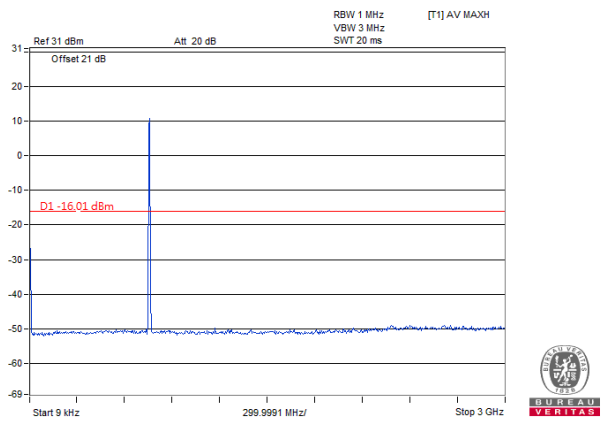
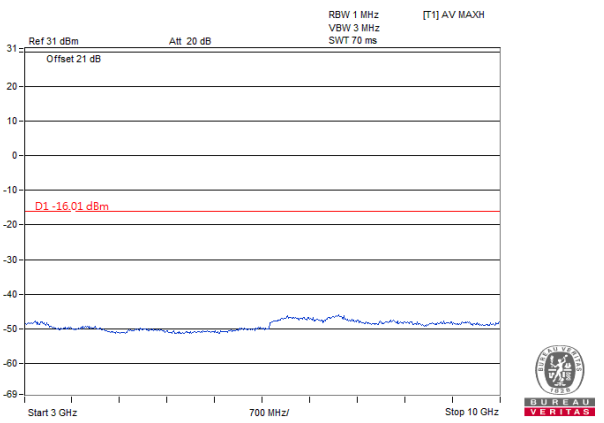
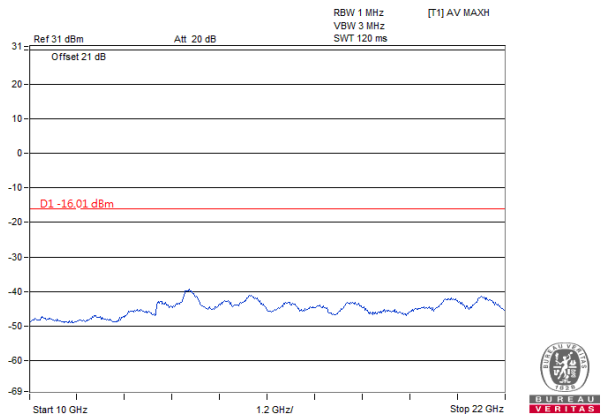
LTE Band 4	
Channel Band width: 20MHz	
Chain 1	
Channel 2050	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

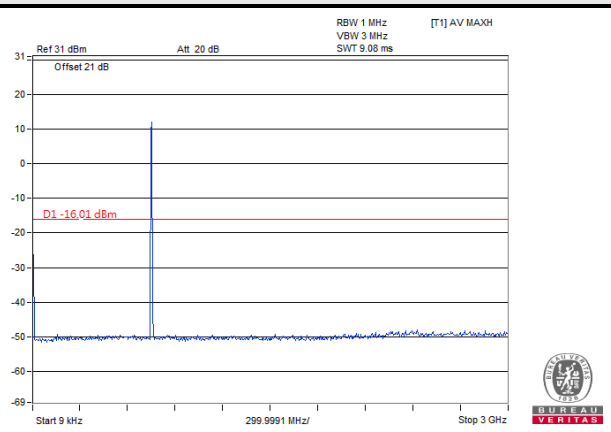
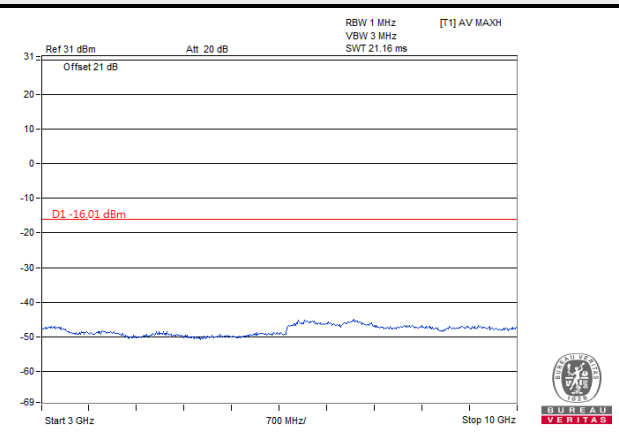
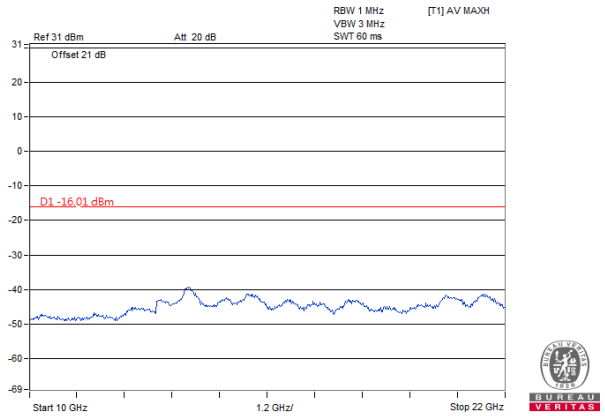
LTE Band 4	
Channel Band width: 20MHz	
Chain 1	
Channel 2175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

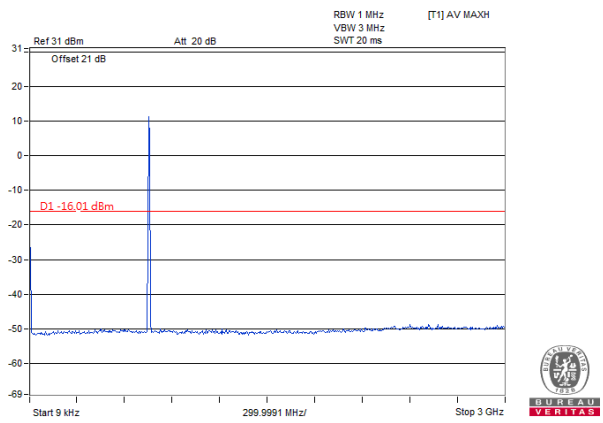
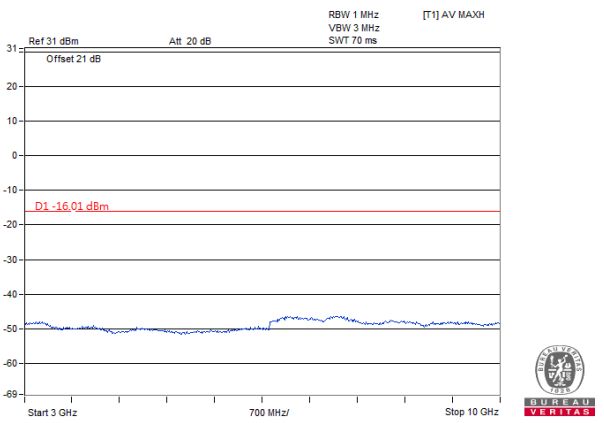
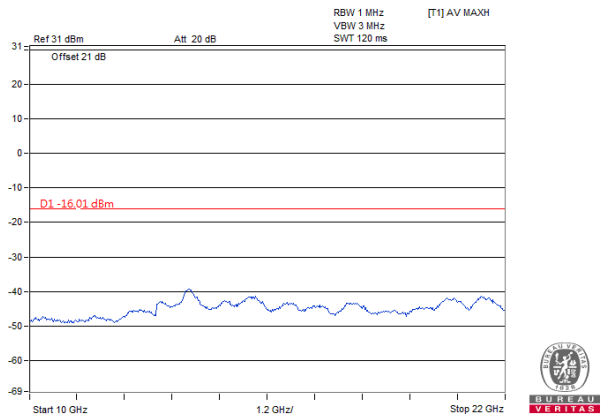
LTE Band 4	
Channel Band width: 20MHz	
Chain 1	
Channel 2300	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

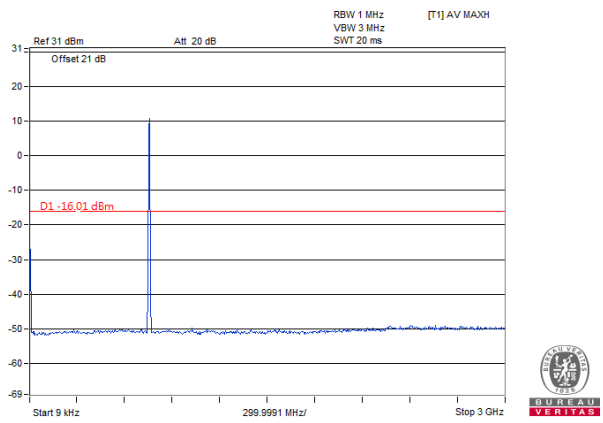
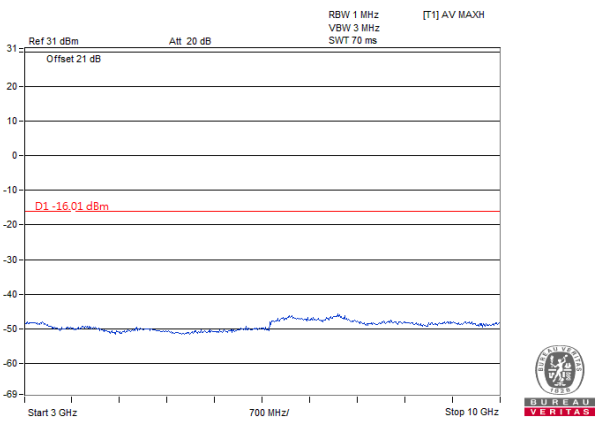
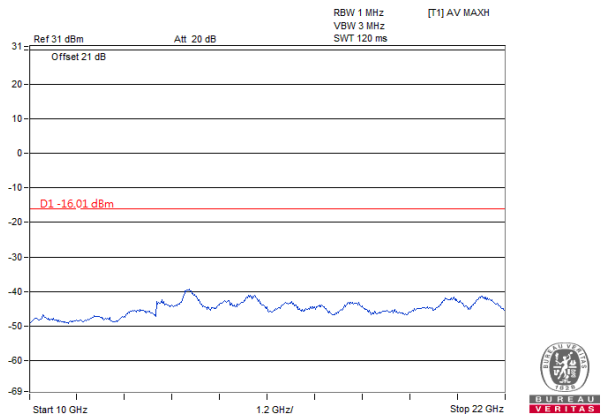
LTE Band 13	
Channel Band width: 5MHz	
Chain 0	
Channel 5205	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

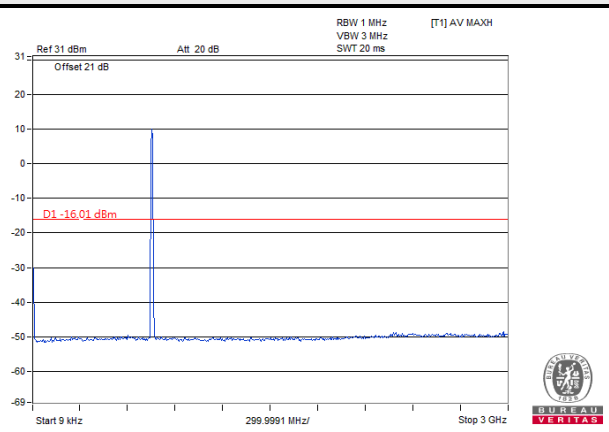
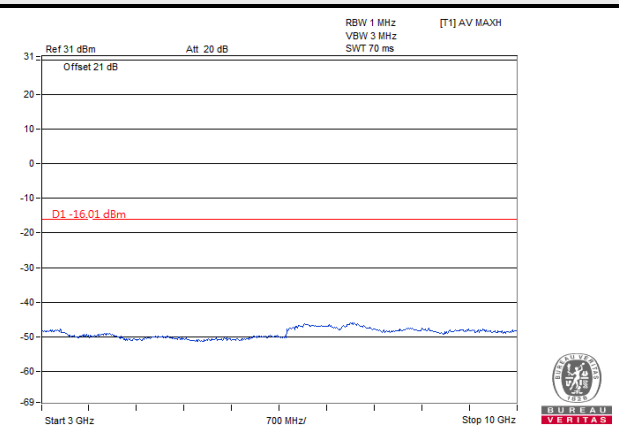
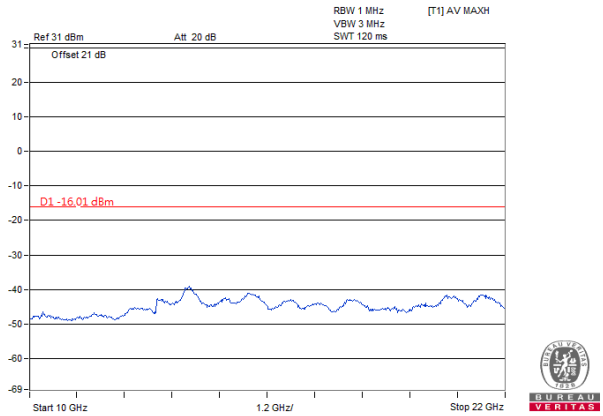
LTE Band 13	
Channel Band width: 5MHz	
Chain 0	
Channel 5230	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

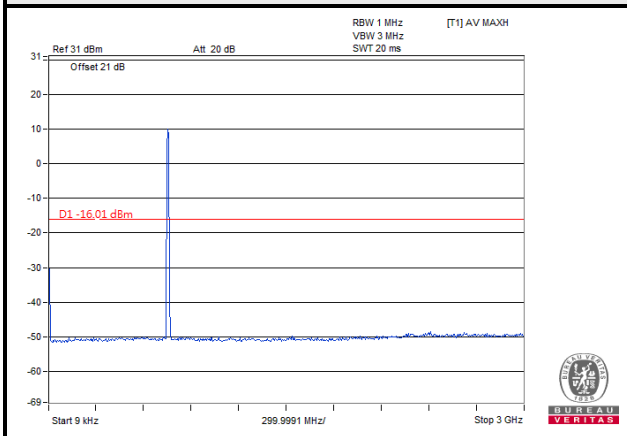
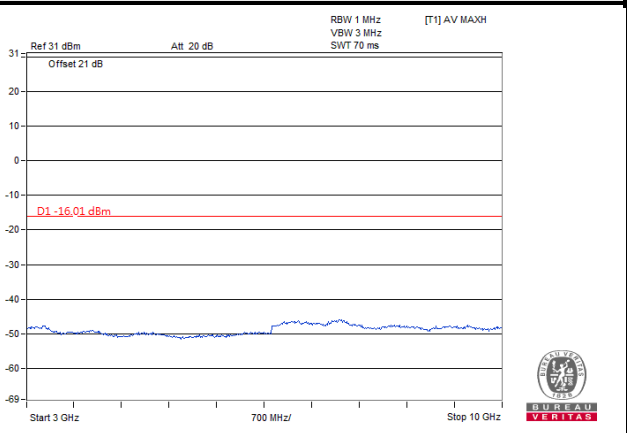
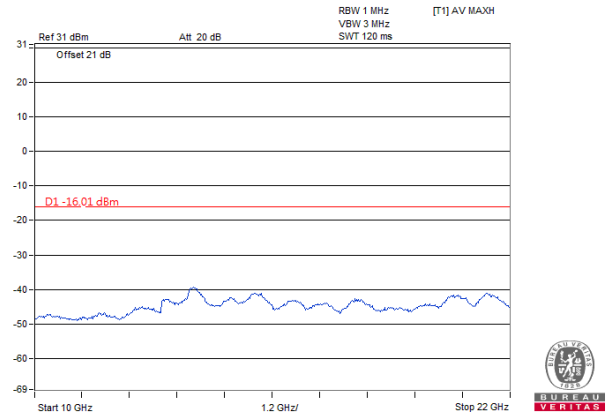
LTE Band 13	
Channel Band width: 5MHz	
Chain 0	
Channel 5255	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

LTE Band 13	
Channel Band width: 5MHz	
Chain 1	
Channel 5205	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

LTE Band 13	
Channel Band width: 5MHz	
Chain 1	
Channel 5230	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

LTE Band 13	
Channel Band width: 5MHz	
Chain 1	
Channel 5255	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

LTE Band 13	
Channel Band width: 10MHz	
Chain 0	
Channel 5230	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

LTE Band 13	
Channel Band width: 10MHz	
Chain 1	
Channel 5230	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	
	

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

For LTE Band 4
According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

For LTE Band 13
According to FCC 27.53(c) (2) for 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.

4.8.2 Test Procedure

a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G

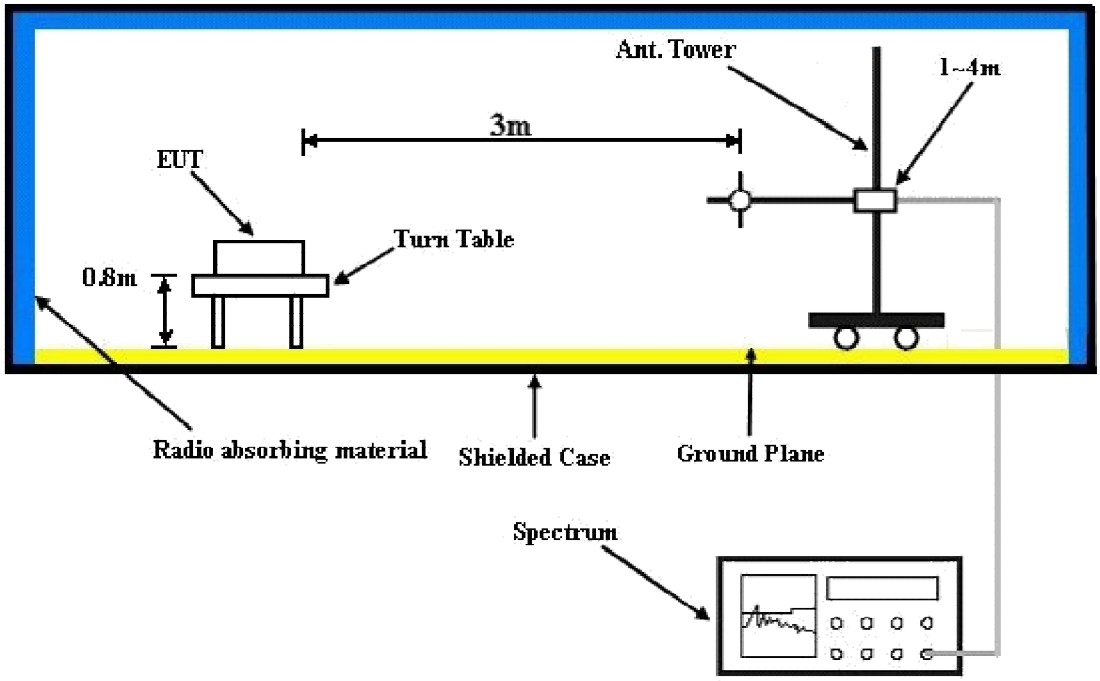
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.8.3 Deviation from Test Standard

No deviation.

4.8.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.5 Test Results

Below 1GHz

LTE Band 4

Channel Bandwidth: 5MHz

Mode	TX channel 1975	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	107.60	-65.33	-80.48	11.39	-69.09	-13.00	-56.09
2	229.82	-57.71	-73.97	12.40	-61.57	-13.00	-48.57
3	377.26	-70.16	-88.55	18.28	-70.27	-13.00	-57.27
4	529.55	-60.91	-80.67	21.87	-58.80	-13.00	-45.80
5	655.65	-64.52	-84.87	24.44	-60.43	-13.00	-47.43
6	874.87	-67.83	-87.46	27.67	-59.79	-13.00	-46.79
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	79.47	-57.47	-74.18	10.53	-63.65	-13.00	-50.65
2	301.60	-66.72	-84.49	16.19	-68.30	-13.00	-55.30
3	443.22	-67.61	-87.21	20.23	-66.98	-13.00	-53.98
4	567.38	-65.99	-85.44	22.52	-62.92	-13.00	-49.92
5	800.18	-67.51	-87.22	26.60	-60.62	-13.00	-47.62
6	874.87	-69.44	-89.26	27.67	-61.59	-13.00	-48.59

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 10MHz

Mode	TX channel 2000	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	77.53	-64.42	-80.94	10.80	-70.14	-13.00	-57.14
2	236.61	-61.40	-78.31	13.44	-64.87	-13.00	-51.87
3	295.78	-64.45	-81.11	15.99	-65.12	-13.00	-52.12
4	473.29	-64.13	-83.56	20.82	-62.74	-13.00	-49.74
5	589.69	-64.56	-83.92	23.33	-60.59	-13.00	-47.59
6	874.87	-67.82	-87.45	27.67	-59.78	-13.00	-46.78
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	110.51	-64.49	-77.72	11.80	-65.92	-13.00	-52.92
2	433.52	-67.27	-86.62	19.93	-66.69	-13.00	-53.69
3	588.72	-68.33	-88.23	23.31	-64.92	-13.00	-51.92
4	729.37	-68.81	-89.21	25.58	-63.63	-13.00	-50.63
5	800.18	-67.07	-86.78	26.60	-60.18	-13.00	-47.18
6	874.87	-65.28	-85.10	27.67	-57.43	-13.00	-44.43

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 15MHz

Mode	TX channel 2025	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	76.56	-58.07	-74.79	11.15	-63.64	-13.00	-50.64
2	301.60	-65.54	-82.44	16.19	-66.25	-13.00	-53.25
3	433.52	-68.35	-87.63	19.93	-67.70	-13.00	-54.70
4	614.91	-64.16	-84.02	24.13	-59.89	-13.00	-46.89
5	689.60	-67.01	-86.26	24.88	-61.38	-13.00	-48.38
6	874.87	-67.31	-86.94	27.67	-59.27	-13.00	-46.27
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	79.47	-55.82	-72.53	10.53	-62.00	-13.00	-49.00
2	358.83	-70.89	-88.59	17.61	-70.98	-13.00	-57.98
3	458.74	-69.61	-89.35	20.55	-68.80	-13.00	-55.80
4	661.47	-70.65	-90.79	24.47	-66.32	-13.00	-53.32
5	800.18	-67.51	-87.22	26.60	-60.62	-13.00	-47.62
6	921.43	-73.06	-93.43	28.53	-64.90	-13.00	-51.90

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 20MHz

Mode	TX channel 2050	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	77.53	-65.12	-81.64	10.80	-70.84	-13.00	-57.84
2	239.52	-61.02	-78.04	13.71	-64.33	-13.00	-51.33
3	500.45	-62.32	-81.54	21.31	-60.23	-13.00	-47.23
4	557.68	-63.38	-83.31	22.41	-60.90	-13.00	-47.90
5	658.56	-67.56	-87.77	24.43	-63.34	-13.00	-50.34
6	874.87	-67.24	-86.87	27.67	-59.20	-13.00	-46.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	107.60	-63.22	-76.96	11.39	-65.57	-13.00	-52.57
2	376.29	-68.63	-86.76	18.25	-68.51	-13.00	-55.51
3	539.25	-66.07	-85.58	22.02	-63.56	-13.00	-50.56
4	685.72	-69.72	-89.66	24.82	-64.84	-13.00	-51.84
5	800.18	-67.08	-86.79	26.60	-60.19	-13.00	-47.19
6	874.87	-64.93	-84.75	27.67	-57.08	-13.00	-44.08

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 13

Channel Bandwidth: 5MHz

Mode	TX channel 5205	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	99.84	-60.08	-77.64	10.38	-67.26	-13.00	-54.26
2	250.19	-58.04	-77.93	14.23	-63.70	-13.00	-50.70
3	307.42	-66.06	-85.33	16.41	-68.92	-13.00	-55.92
4	500.45	-60.00	-81.37	21.31	-60.06	-13.00	-47.06
5	560.59	-63.74	-85.74	22.46	-63.28	-13.00	-50.28
6	874.87	-66.09	-87.87	27.67	-60.20	-13.00	-47.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	92.08	-60.63	-77.92	9.03	-68.89	-13.00	-55.89
2	161.92	-66.82	-83.97	14.90	-69.07	-13.00	-56.07
3	500.45	-64.59	-86.59	21.31	-65.28	-13.00	-52.28
4	624.61	-67.05	-89.49	24.12	-65.37	-13.00	-52.37
5	800.18	-66.61	-88.47	26.60	-61.87	-13.00	-48.87
6	874.87	-64.98	-86.95	27.67	-59.28	-13.00	-46.28

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 10MHz

Mode	TX channel 5230	Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	99.84	-60.08	-77.64	10.38	-67.26	-13.00	-54.26
2	250.19	-58.04	-77.93	14.23	-63.70	-13.00	-50.70
3	301.60	-63.31	-82.36	16.19	-66.17	-13.00	-53.17
4	500.45	-60.00	-81.37	21.31	-60.06	-13.00	-47.06
5	592.60	-65.64	-87.08	23.40	-63.68	-13.00	-50.68
6	874.87	-66.09	-87.87	27.67	-60.20	-13.00	-47.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	110.51	-63.02	-78.40	11.80	-66.60	-13.00	-53.60
2	167.74	-65.60	-82.80	14.40	-68.40	-13.00	-55.40
3	364.65	-66.97	-86.99	17.85	-69.14	-13.00	-56.14
4	500.45	-63.10	-85.10	21.31	-63.79	-13.00	-50.79
5	800.18	-65.15	-87.01	26.60	-60.41	-13.00	-47.41
6	874.87	-66.07	-88.04	27.67	-60.37	-13.00	-47.37

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Above 1GHz

LTE Band 4

Channel Bandwidth: 5MHz

Mode	TX channel 1975	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4224.65	-45.55	-60.14	19.82	-40.32	-13.00	-27.32
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4224.48	-39.73	-54.13	19.81	-34.32	-13.00	-21.32

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2175	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4267.37	-40.74	-55.69	20.28	-35.41	-13.00	-22.41
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4267.10	-34.82	-49.55	20.28	-29.27	-13.00	-16.27

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2375	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4306.82	-43.79	-59.03	20.64	-38.39	-13.00	-25.39
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4307.32	-38.75	-53.71	20.64	-33.07	-13.00	-20.07

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 10MHz

Mode	TX channel 2000	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4229.92	-46.93	-61.55	19.87	-41.68	-13.00	-28.68
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4229.60	-41.94	-56.39	19.87	-36.52	-13.00	-23.52

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2175	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4268.98	-46.82	-61.79	20.30	-41.49	-13.00	-28.49
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4269.02	-39.49	-54.23	20.30	-33.93	-13.00	-20.93

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2350	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4295.17	-47.03	-62.22	20.58	-41.64	-13.00	-28.64
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4293.30	-42.29	-57.20	20.56	-36.64	-13.00	-23.64

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 15MHz

Mode	TX channel 2025	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4245.30	-49.66	-64.42	20.04	-44.38	-13.00	-31.38
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4243.95	-45.21	-59.77	20.03	-39.74	-13.00	-26.74

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2175	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4269.31	-44.51	-59.48	20.30	-39.18	-13.00	-26.18
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4269.65	-40.13	-54.87	20.30	-34.57	-13.00	-21.57

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2325	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4286.70	-44.67	-59.78	20.48	-39.30	-13.00	-26.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4289.65	-39.79	-54.68	20.52	-34.16	-13.00	-21.16

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 20MHz

Mode	TX channel 2050	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4242.35	-49.23	-63.97	20.01	-43.96	-13.00	-30.96
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4242.70	-45.00	-59.54	20.01	-39.53	-13.00	-26.53

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2175	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4270.96	-44.65	-59.63	20.32	-39.31	-13.00	-26.31
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4270.45	-40.26	-55.00	20.31	-34.69	-13.00	-21.69

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 2300	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4279.27	-45.20	-60.25	20.40	-39.85	-13.00	-26.85
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4278.60	-37.81	-52.61	20.40	-32.21	-13.00	-19.21

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 13

Channel Bandwidth: 5MHz

Mode	TX channel 5205	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4489.00	-28.73	-45.80	20.99	-24.81	-13.00	-11.81
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**4490.00**	**-23.97**	**-40.73**	**20.99**	**-19.74**	**-13.00**	**-6.74**

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 5230	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4504.00	-29.41	-46.42	21.00	-25.42	-13.00	-12.42
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4505.00	-24.54	-41.27	21.00	-20.27	-13.00	-7.27

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 5255	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4515.00	-35.25	-52.26	21.00	-31.26	-13.00	-18.26
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4516.00	-30.80	-47.57	21.00	-26.57	-13.00	-13.57

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 10MHz

Mode	TX channel 5230	Frequency Range	Above 1000MHz

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4496.00	-37.08	-54.12	21.00	-33.12	-13.00	-20.12
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	4494.00	-30.39	-47.13	20.99	-26.14	-13.00	-13.14

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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