FCC Test Report

(Part 24)

Report No.:	RF170302D08-1
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
RF170302D08-1	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 24, Subpart E

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 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1046 24.232(d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.73 dB at 3975.50MHz.

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	8447D	2432A03504	Feb. 21, 2017	Feb. 20, 2018
HP Preamplifier	8449B	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: 8449B) 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

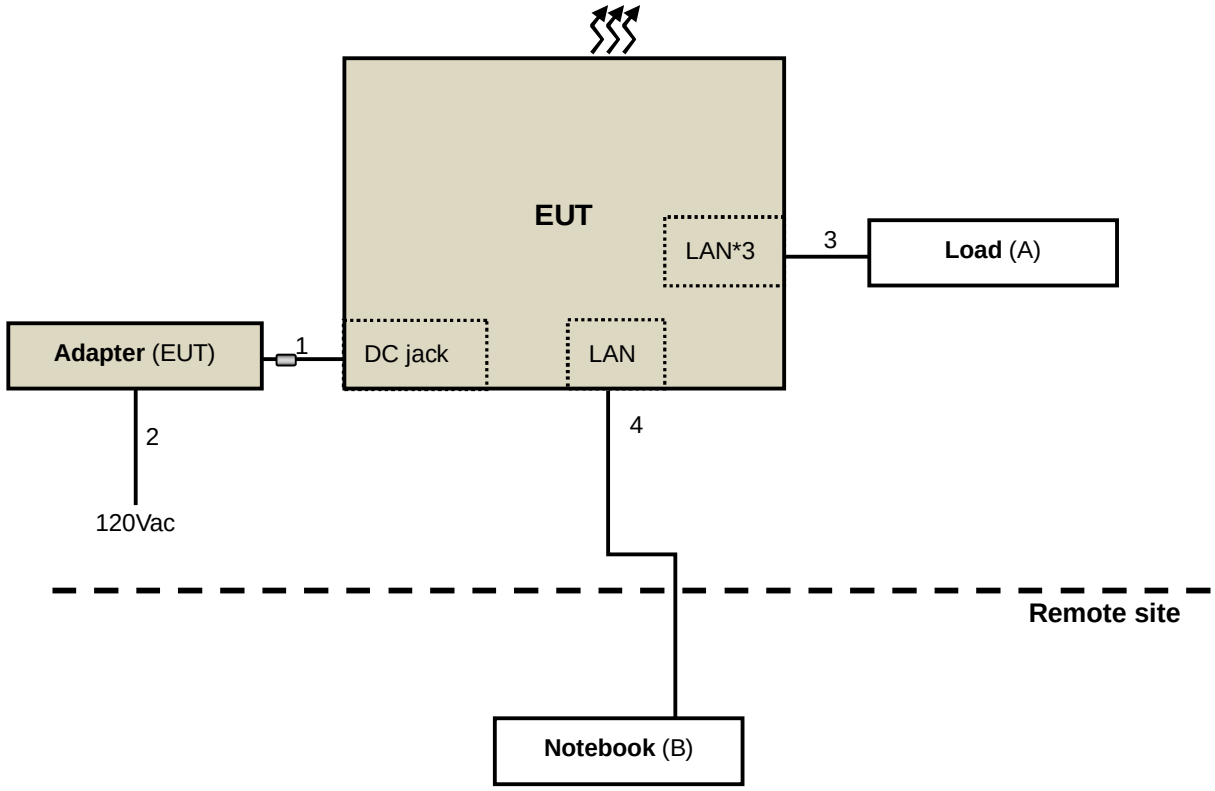
3.1 General Description of EUT

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 2 (Channel Bandwidth 5MHz)	1932.5MHz ~ 1987.5MHz
	LTE Band 2 (Channel Bandwidth 10MHz)	1935MHz ~ 1985MHz
	LTE Band 2 (Channel Bandwidth 15MHz)	1937.5MHz ~ 1982.5MHz
	LTE Band 2 (Channel Bandwidth 20MHz)	1940MHz ~ 1980MHz
Max. EIRP Power	LTE Band 2 (Channel Bandwidth 5MHz)	179.887mW (22.55dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	190.985mW (22.81dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	187.931mW (22.74dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	193.642mW (22.87dBm)
Antenna Type	LTE Band 2	Dipole antenna with 1.7dBi 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 2

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation
EIRP	625 to 1175	625, 900, 1175	5MHz	QPSK
	650 to 1150	650, 900, 1150	10MHz	QPSK
	675 to 1125	675, 900, 1125	15MHz	QPSK
	700 to 1100	700, 900, 1100	20MHz	QPSK
Modulation characteristics	675 to 1125	900	15MHz	QPSK, 16QAM, 64QAM
Frequency Stability	675 to 1125	900	5MHz	-
Occupied Bandwidth	625 to 1175	625, 900, 1175	5MHz	QPSK, 16QAM, 64QAM
	650 to 1150	650, 900, 1150	10MHz	QPSK, 16QAM, 64QAM
	675 to 1125	675, 900, 1125	15MHz	QPSK, 16QAM, 64QAM
	700 to 1100	700, 900, 1100	20MHz	QPSK, 16QAM, 64QAM
Band Edge	625 to 1175	625, 1175	5MHz	QPSK
	650 to 1150	650, 1150	10MHz	QPSK
	675 to 1125	675, 1125	15MHz	QPSK
	700 to 1100	700, 1100	20MHz	QPSK
Peak to Average Ratio	625 to 1175	625, 900, 1175	5MHz	QPSK, 16QAM, 64QAM
	650 to 1150	650, 900, 1150	10MHz	QPSK, 16QAM, 64QAM
	675 to 1125	675, 900, 1125	15MHz	QPSK, 16QAM, 64QAM
	700 to 1100	700, 900, 1100	20MHz	QPSK, 16QAM, 64QAM
Condcudeted Emission	625 to 1175	625, 900, 1175	5MHz	QPSK
	650 to 1150	650, 900, 1150	10MHz	QPSK
	675 to 1125	675, 900, 1125	15MHz	QPSK
	700 to 1100	700, 900, 1100	20MHz	QPSK
Radiated Emission Below 1GHz	625 to 1175	625	5MHz	QPSK
	650 to 1150	650	10MHz	QPSK
	675 to 1125	675	15MHz	QPSK
	700 to 1100	700	20MHz	QPSK
Radiated Emission Above 1GHz	625 to 1175	625, 900, 1175	5MHz	QPSK
	650 to 1150	650, 900, 1150	10MHz	QPSK
	675 to 1125	675, 900, 1125	15MHz	QPSK
	700 to 1100	700, 900, 1100	20MHz	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
Occupied Bandwidth	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Band Edge	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Peak To Average Ratio	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Conducted Emission	20deg. C, 73%RH	120Vac, 60Hz	Saxon Lee
Radiated Emission	20deg. C, 73%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 24

KDB 971168 D01 Power Meas License Digital Systems v02r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI/TIA/EIA-603-D 2010

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

Mobile / Portable station are limited to 2 watts e.i.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz 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

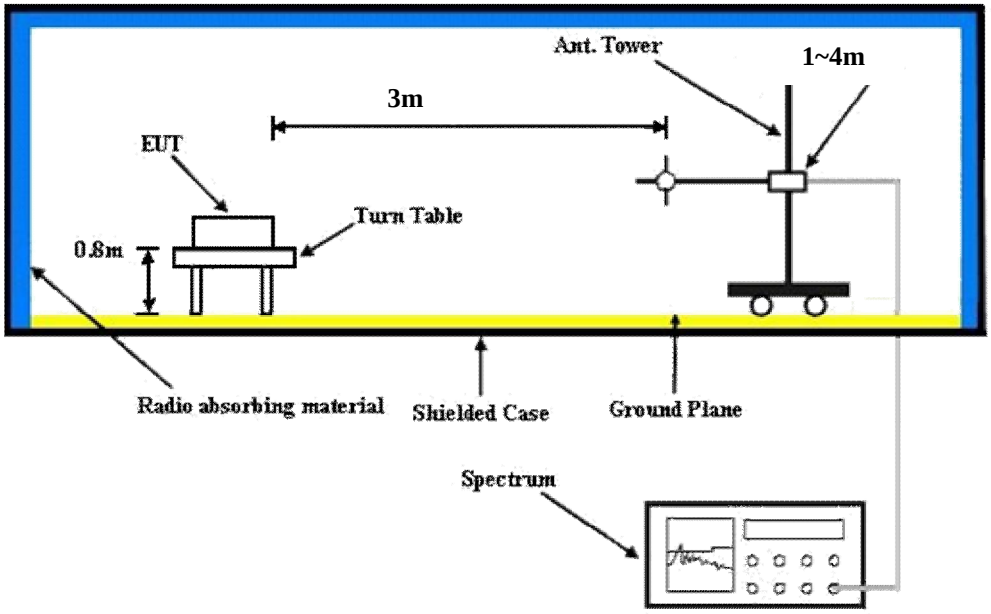
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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.

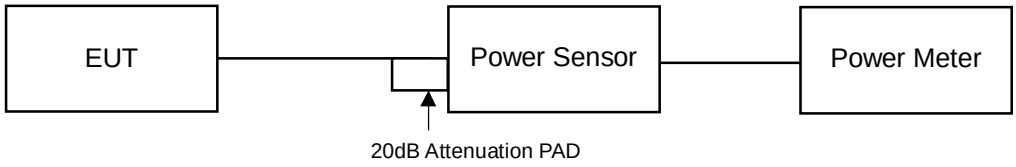
4.1.3 Test Setup

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)

Band / BW	Low CH			Mid CH			High CH		
	625			900			1175		
	1932.5 MHz			1960 MHz			1987.5 MHz		
	QPSK								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 5M	17.40	17.53	20.48	17.49	17.59	20.55	17.41	17.48	20.46
Band / BW	16QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 5M	17.40	17.54	20.48	17.42	17.61	20.53	17.40	17.52	20.47
Band / BW	64QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 5M	17.42	17.51	20.48	17.40	17.48	20.45	17.44	17.55	20.51

Band / BW	Low CH			Mid CH			High CH		
	650			900			1150		
	1935 MHz			1960 MHz			1985 MHz		
	QPSK								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 10M	17.51	17.63	20.58	17.48	17.59	20.55	17.43	17.55	20.50
Band / BW	16QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 10M	17.50	17.61	20.57	17.47	17.59	20.54	17.47	17.58	20.54
Band / BW	64QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 10M	17.49	17.62	20.57	17.51	17.61	20.57	17.44	17.57	20.52

Band / BW	Low CH			Mid CH			High CH		
	675			900			1125		
	1937.5 MHz			1960 MHz			1982.5 MHz		
	QPSK								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 15M	17.43	17.49	20.47	17.43	17.56	20.51	17.47	17.59	20.54
Band / BW	16QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 15M	17.41	17.50	20.47	17.41	17.54	20.49	17.44	17.61	20.54
Band / BW	64QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 15M	17.45	17.52	20.50	17.42	17.55	20.50	17.45	17.57	20.52

Band / BW	Low CH			Mid CH			High CH		
	700			900			1100		
	1940 MHz			1960 MHz			1980 MHz		
	QPSK								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 20M	17.41	17.68	20.56	17.44	17.69	20.58	17.41	17.64	20.54
Band / BW	16QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 20M	17.44	17.59	20.53	17.40	17.60	20.51	17.41	17.57	20.50
Band / BW	64QAM								
	Chain0	Chain1	Total	Chain0	Chain1	Total	Chain0	Chain1	Total
2 / 20M	17.43	17.57	20.51	17.45	17.59	20.53	17.48	17.62	20.56

EIRP Power (dBm)

LTE Band 2

Channel Bandwidth: 5MHz

MODE		TX channel 625					
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	1932.50	10.59	1.01	11.95	12.96	33.00	-20.04
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	1932.50	20.43	10.60	11.95	**22.55**	33.00	-10.45

MODE		TX channel 900					
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	1960.00	11.26	1.44	11.91	13.35	33.00	-19.65
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	1960.00	20.14	10.46	11.91	22.37	33.00	-10.63

MODE		TX channel 1175					
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	1987.50	11.11	1.04	11.87	12.91	33.00	-20.09
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	1987.50	20.06	10.54	11.87	22.41	33.00	-10.59

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

Channel Bandwidth: 10MHz

MODE		TX channel 650					
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	1935.00	10.87	1.28	11.94	13.22	33.00	-19.78
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	1935.00	20.68	10.87	11.94	**22.81**	33.00	-10.19

MODE		TX channel 900					
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	1960.00	11.39	1.57	11.91	13.48	33.00	-19.52
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	1960.00	20.50	10.82	11.91	22.73	33.00	-10.27

MODE		TX channel 1150					
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	1985.00	11.44	1.40	11.87	13.27	33.00	-19.73
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	1985.00	20.42	10.89	11.87	22.76	33.00	-10.24

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

Channel Bandwidth: 15MHz

MODE		TX channel 675					
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	1937.50	10.61	0.98	11.95	12.93	33.00	-20.07
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	1937.50	20.60	10.79	11.95	**22.74**	33.00	-10.26

MODE		TX channel 900					
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	1960.00	10.76	0.94	11.91	12.85	33.00	-20.15
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	1960.00	20.39	10.71	11.91	22.62	33.00	-10.38

MODE		TX channel 1125					
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	1982.50	11.13	1.10	11.88	12.98	33.00	-20.02
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	1982.50	20.35	10.80	11.88	22.68	33.00	-10.32

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

Channel Bandwidth: 20MHz

MODE		TX channel 700					
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	1940.00	10.85	1.20	11.94	13.14	33.00	-19.86
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	1940.00	20.72	10.93	11.94	**22.87**	33.00	-10.13

MODE		TX channel 900					
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	1960.00	11.11	1.29	11.91	13.20	33.00	-19.80
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	1960.00	20.46	10.78	11.91	22.69	33.00	-10.31

MODE		TX channel 1100					
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	1980.00	11.18	1.18	11.88	13.06	33.00	-19.94
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	1980.00	20.43	10.87	11.88	22.75	33.00	-10.25

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

4.2 Modulation characteristics Measurement

4.2.1 Limits of Modulation characteristics

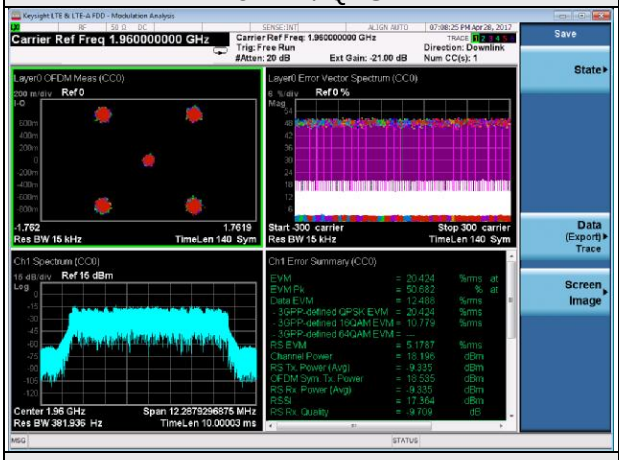
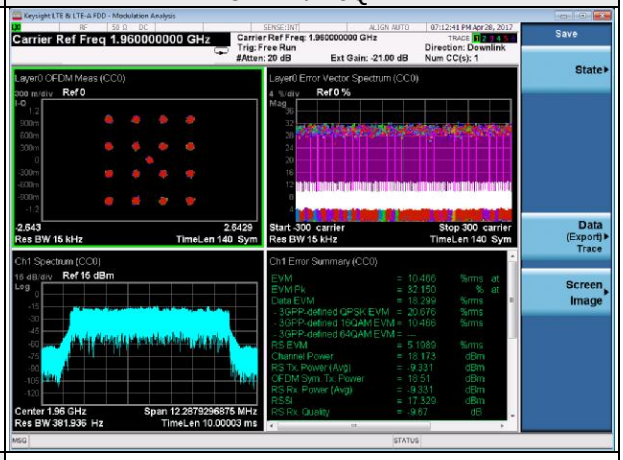
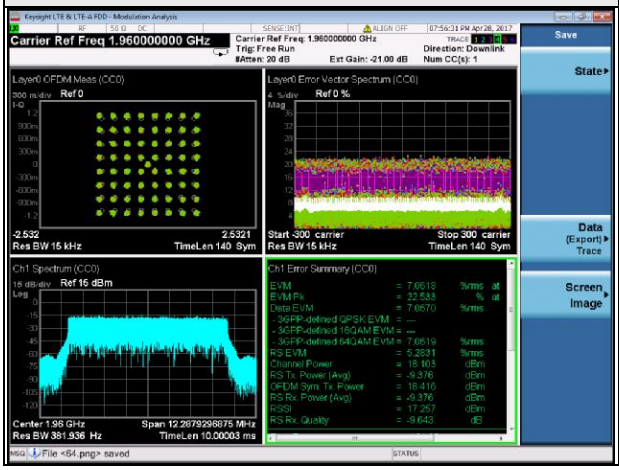
N/A

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

Spectrum Plot of Measurement Value	
Channel: 900 Frequency (MHz): 1960	
15MHz / QPSK	15MHz / 16QAM
	
15MHz / 64QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stabiliity Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

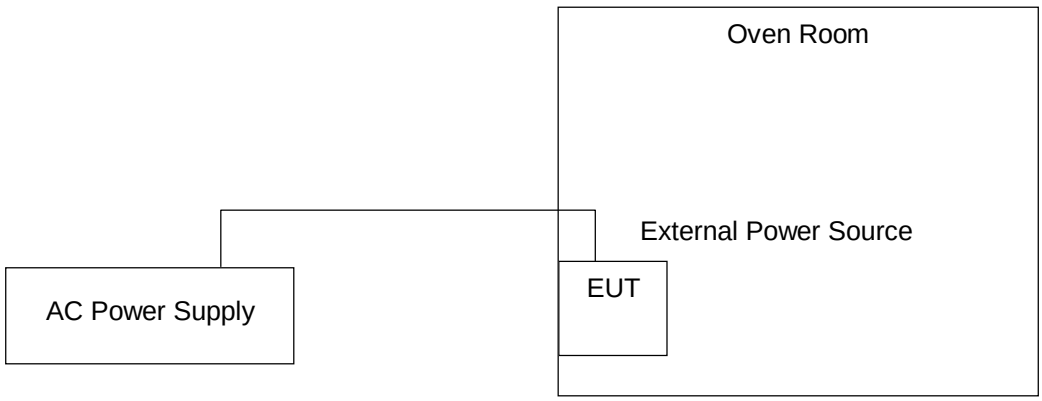
4.3.2 Test Procedure

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 DC 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.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 2		
	Chain 0	Chain 1	
132	0.0056122449	0.0056122449	2.5
120	0.0051020408	0.0051020408	2.5
108	0.0045918367	0.0045918367	2.5

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

Frequency Error vs. Temperature

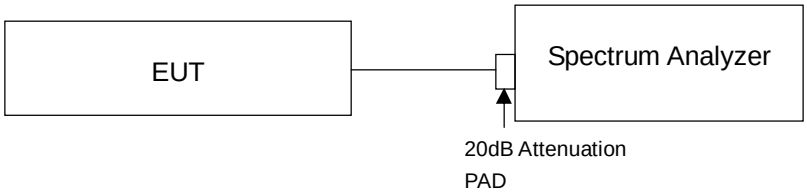
Temp. (℃)	Frequency Error (ppm)		Limit (ppm)
	LTE Band 2		
	Chain 0	Chain 1	
40	0.0061224490	0.0056122449	2.5
30	0.0056122449	0.0056122449	2.5
20	0.0051020408	0.0051020408	2.5
10	0.0045918367	0.0045918367	2.5
0	0.0045918367	0.0040816327	2.5

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.2 Test Setup

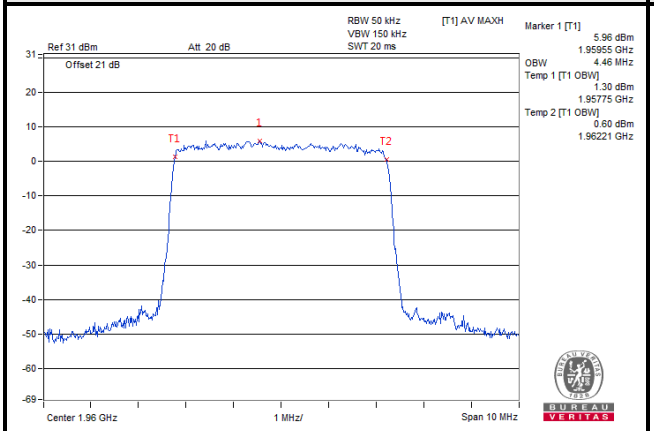


4.4.3 Test Result

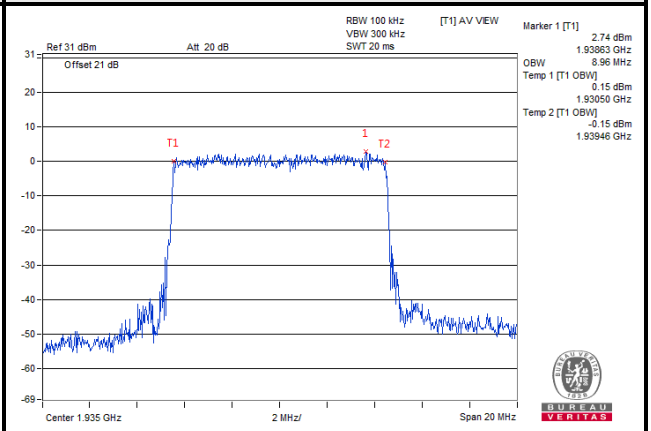
LTE Band 2							
Channel Bandwidth 5MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
625	1932.5	4.43	4.43	4.43	4.43	4.45	4.45
900	1960	4.43	4.43	4.38	4.40	4.46	4.46
1175	1987.5	4.43	4.43	4.43	4.41	4.46	4.46
Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		QPSK		16QAM		64QAM	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
650	1935	8.90	8.93	8.93	8.86	8.93	8.96
900	1960	8.93	8.93	8.93	8.90	8.90	8.90
1150	1985	8.90	8.93	8.93	8.93	8.93	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
675	1937.5	13.33	13.30	13.30	13.30	13.30	13.30
900	1960	13.30	13.36	13.33	13.30	13.30	13.26
1125	1982.5	13.30	13.30	13.23	13.20	13.26	13.26
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
700	1940	17.80	17.80	17.86	17.73	17.80	17.86
900	1960	17.80	17.80	17.86	17.86	17.86	17.86
1100	1980	17.66	17.73	17.73	17.73	17.66	17.80

Spectrum Plot Of Worst Value

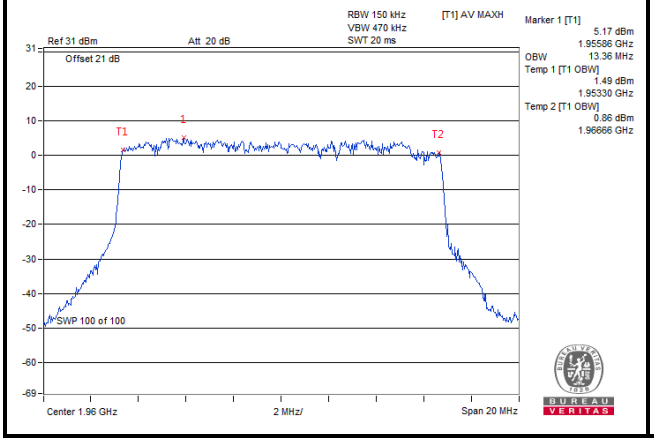
5MHz / 64QAM



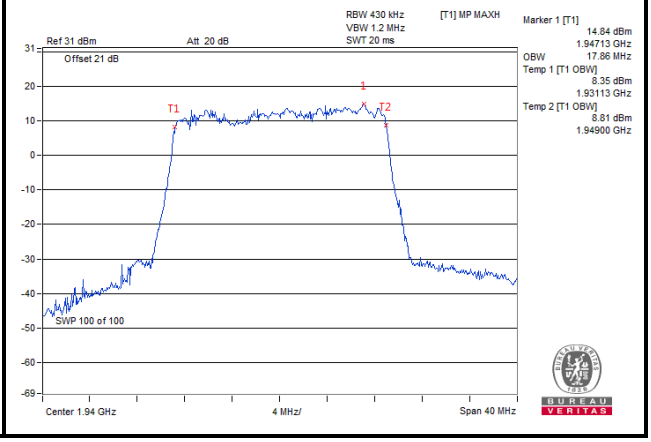
10MHz / 64QAM



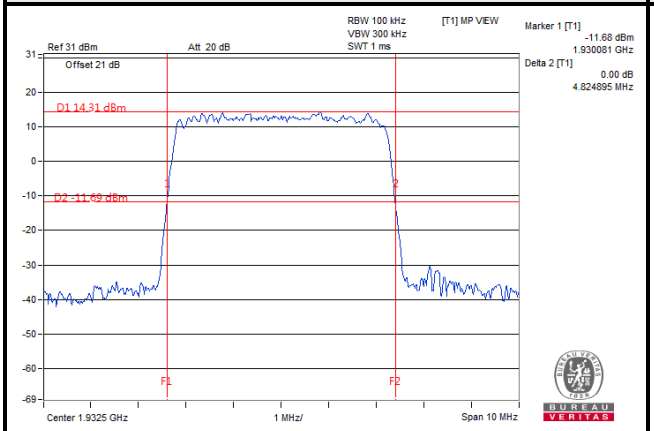
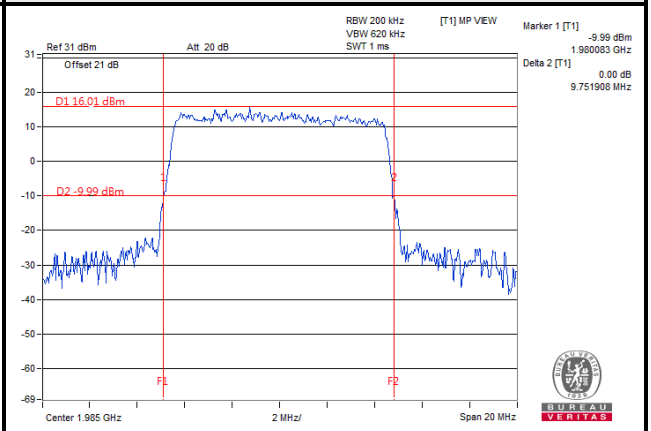
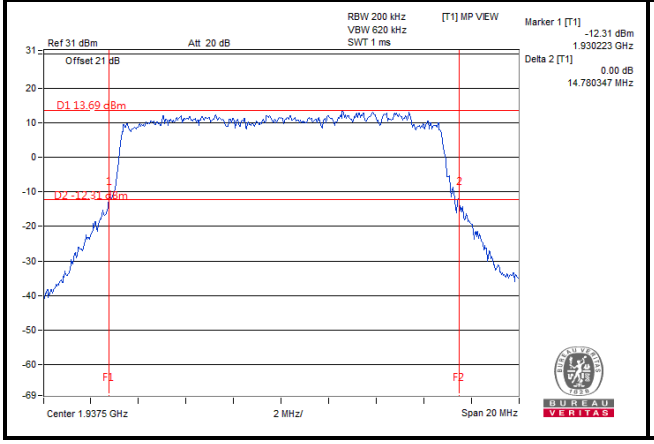
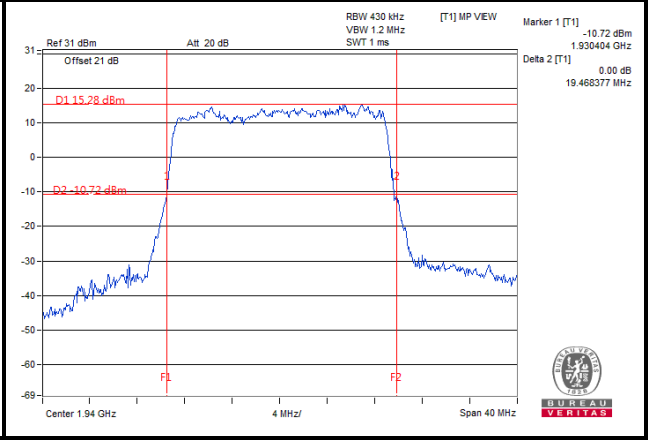
15MHz / QPSK



20MHz / 16QAM



LTE Band 2			
Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	-26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
625	1932.5	4.82	4.81
900	1960	4.80	4.81
1175	1987.5	4.79	4.78
Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	-26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
650	1935	9.72	9.74
900	1960	9.74	9.75
1150	1985	9.75	9.70
Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	-26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
675	1937.5	14.78	14.62
900	1960	14.55	14.48
1125	1982.5	14.68	14.49
Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	-26dBc Bandwidth (MHz)	
		QPSK	
		Chain 0	Chain 1
700	1940	19.46	19.29
900	1960	19.44	19.26
1100	1980	19.16	19.27

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

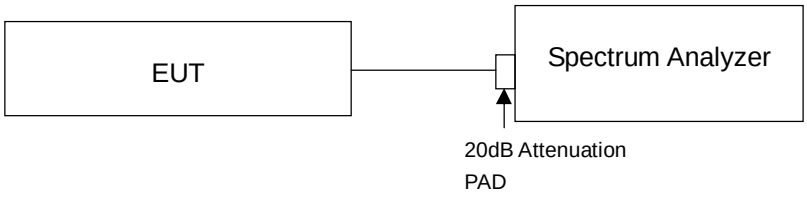
4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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. All measurements were done at low 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).

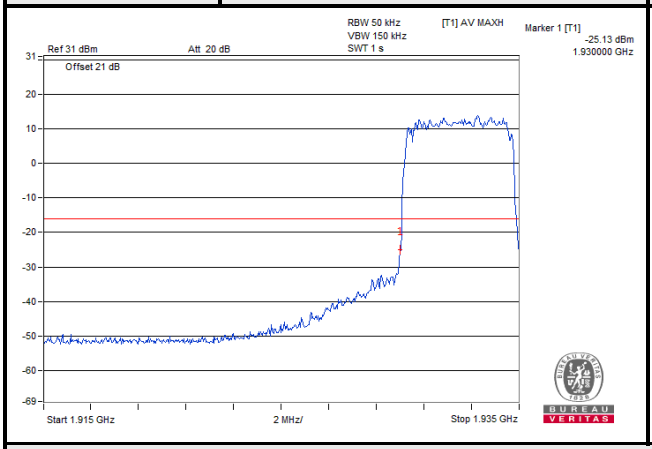
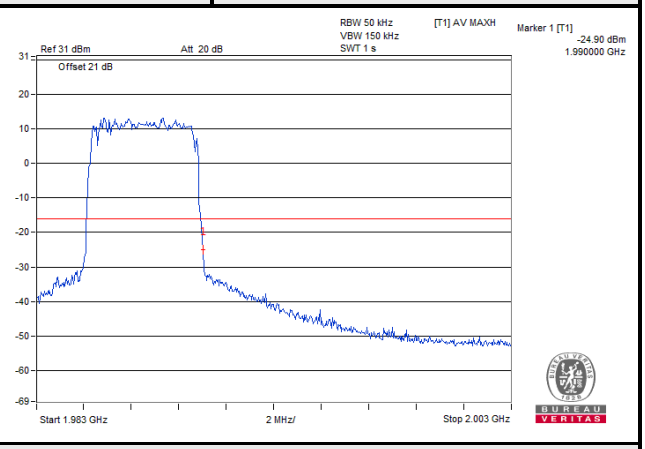
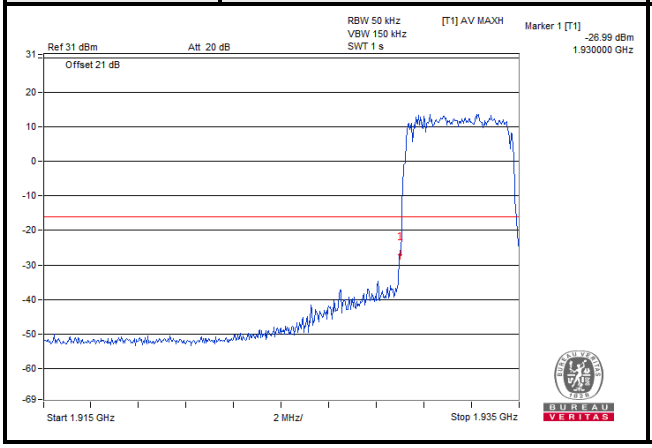
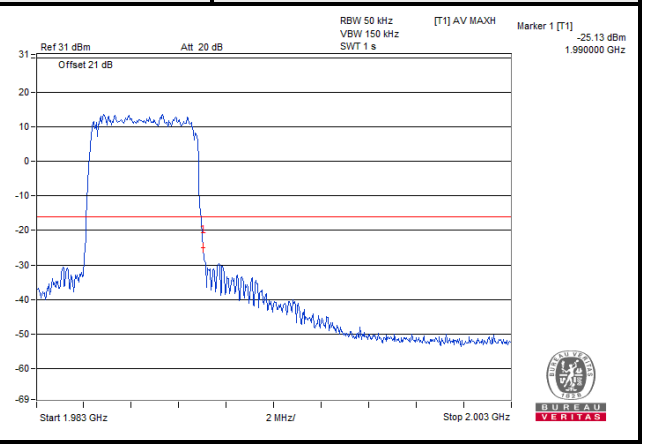
c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).

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

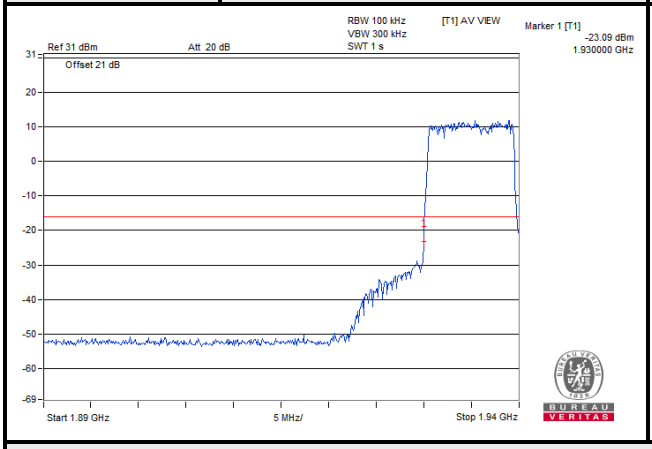
LTE Band 2			
Channel Bandwidth 5MHz			
Chain 0			
Channel	625	Channel	1175
			
Chain 1			
Channel	625	Channel	1175
			

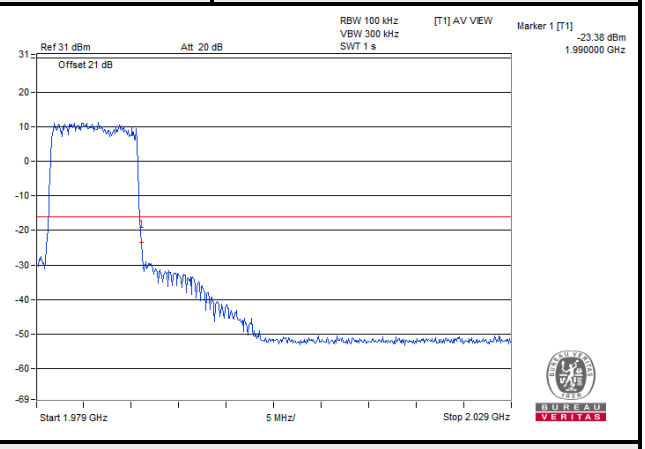
LTE Band 2

Channel Bandwidth 10MHz

Chain 0

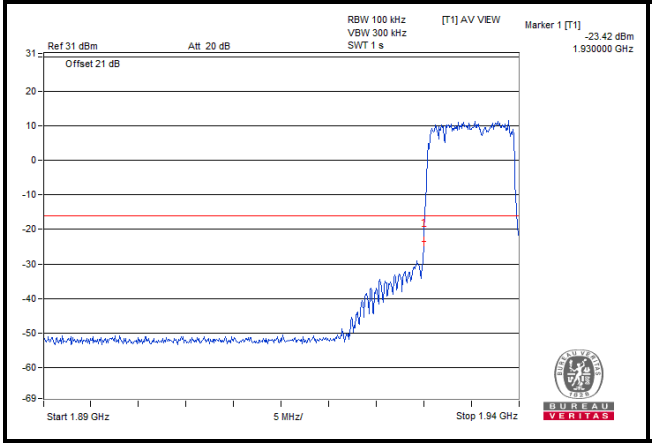
Channel	650	Channel	1150

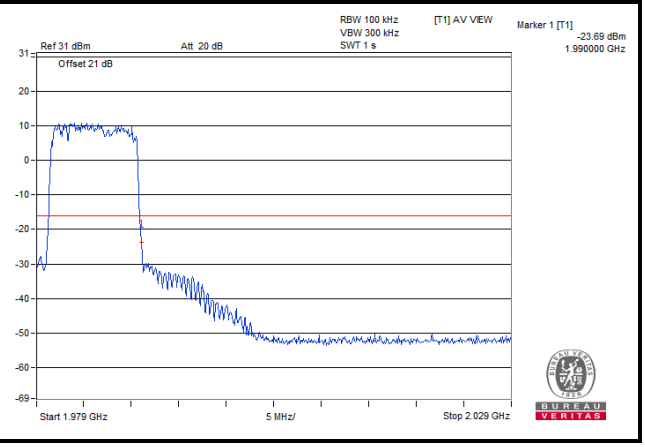




Chain 1

Channel	650	Channel	1150



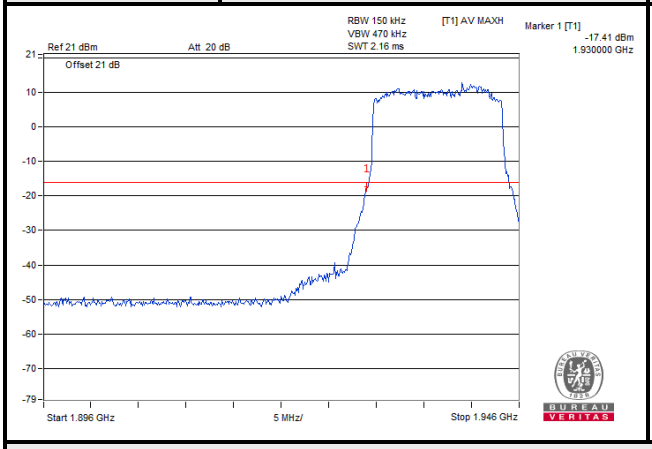


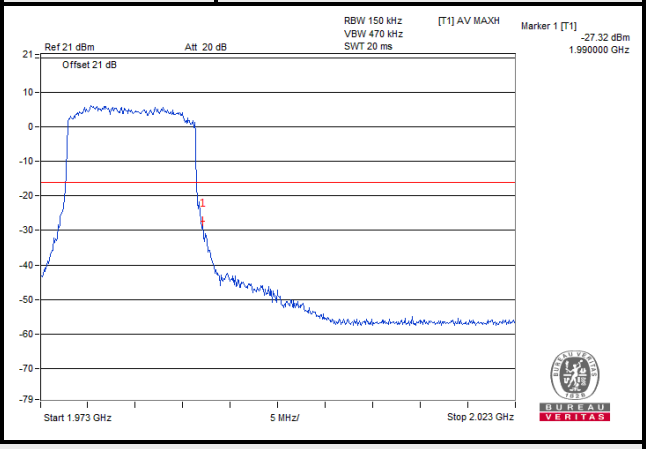
LTE Band 2

Channel Bandwidth 15MHz

Chain 0

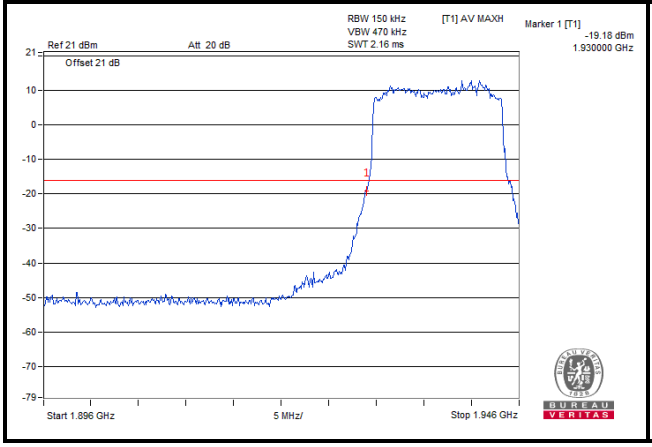
Channel	675	Channel	1125

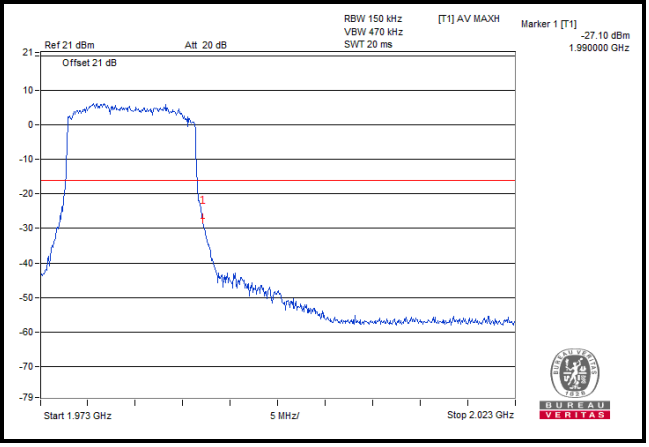




Chain 1

Channel	675	Channel	1125



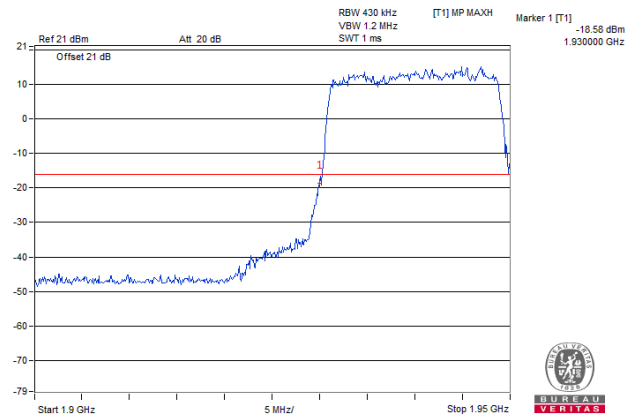


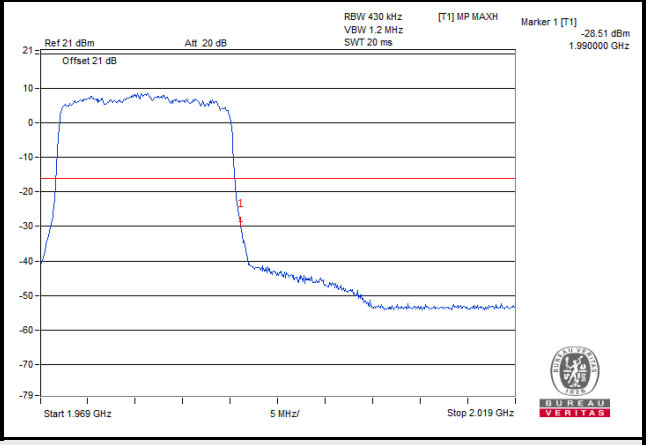
LTE Band 2

Channel Bandwidth 20MHz

Chain 0

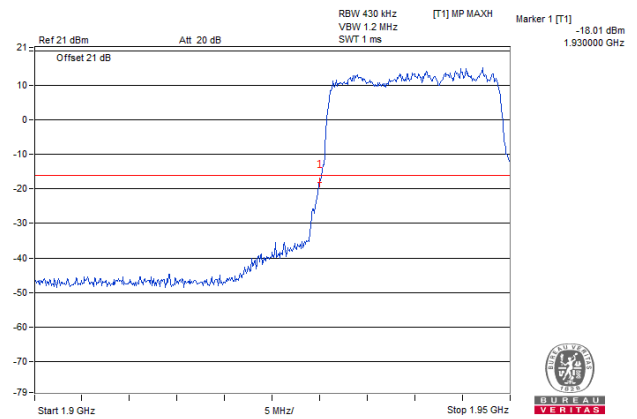
Channel	700	Channel	1100

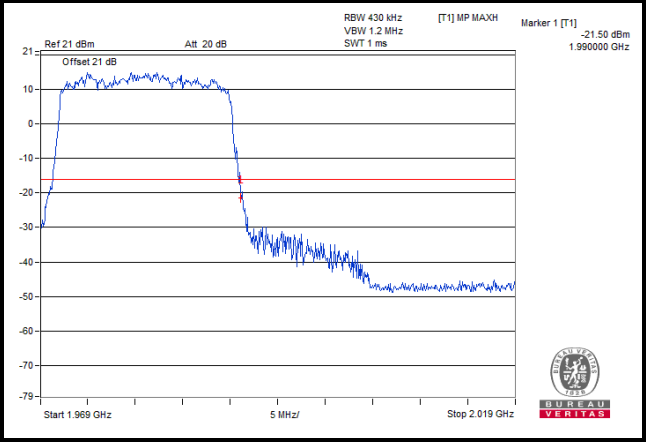




Chain 1

Channel	700	Channel	1100



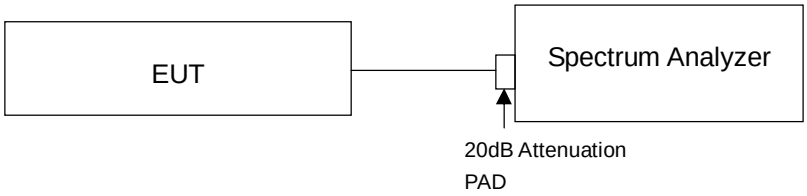


4.6 Peak To Average Ratio

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

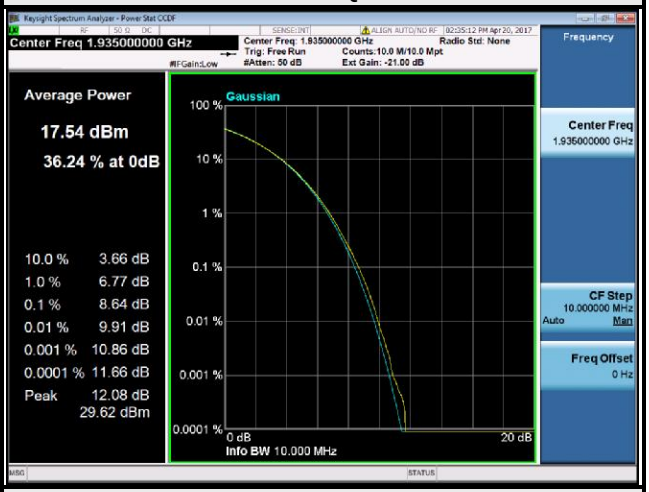
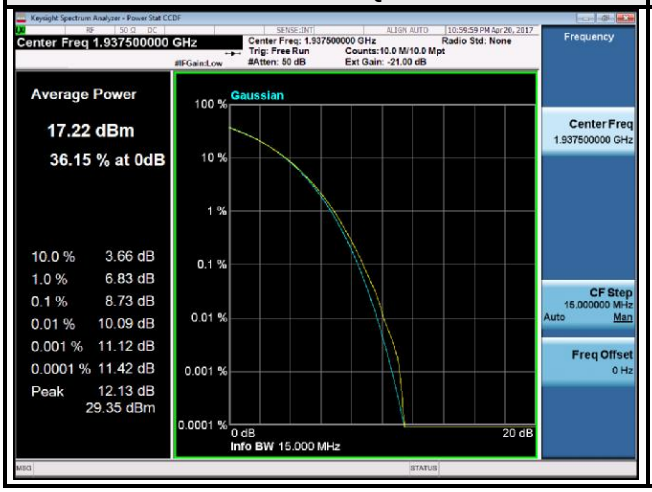
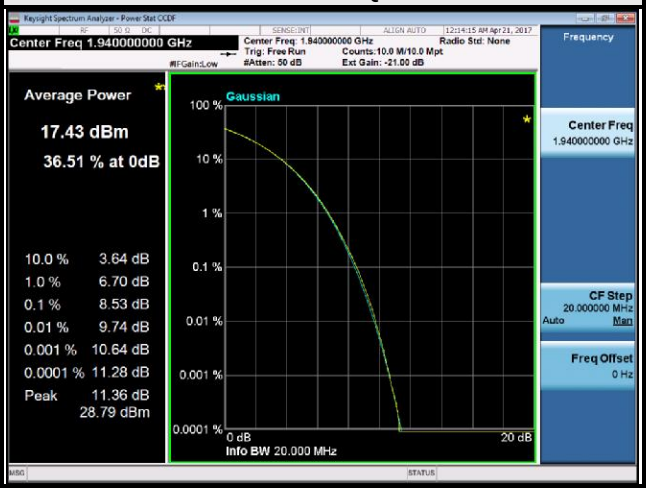
a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

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 2							
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
625	1932.5	8.61	8.63	8.48	8.50	8.39	8.40
900	1960.0	8.60	8.61	8.47	8.47	8.39	8.38
1175	1987.5	8.53	8.53	8.41	8.41	8.32	8.33
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
650	1935.0	8.64	8.61	8.58	8.55	8.56	8.61
900	1960.0	8.57	8.58	8.61	8.62	8.60	8.61
1150	1985.0	8.49	8.48	8.43	8.43	8.45	8.45
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
675	1937.5	8.54	8.54	8.73	8.69	8.58	8.58
900	1960.0	8.54	8.55	8.69	8.69	8.59	8.59
1125	1982.5	8.54	8.54	8.69	8.70	8.59	8.58
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
700	1940.0	8.49	8.50	8.50	8.50	8.52	8.53
900	1960.0	8.50	8.50	8.50	8.49	8.52	8.52
1100	1980.0	8.49	8.50	8.50	8.50	8.52	8.51

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

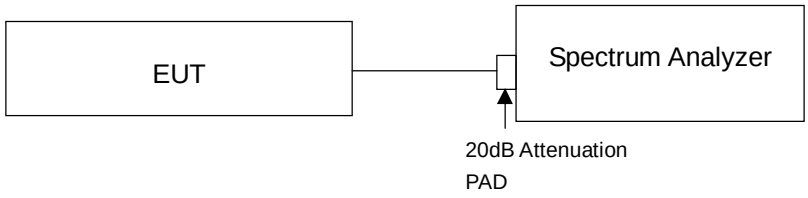
4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

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

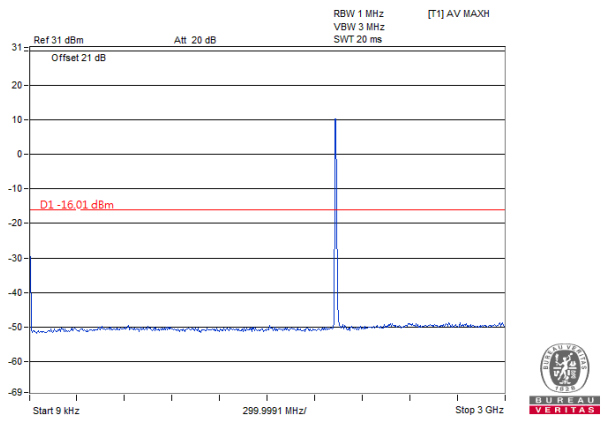
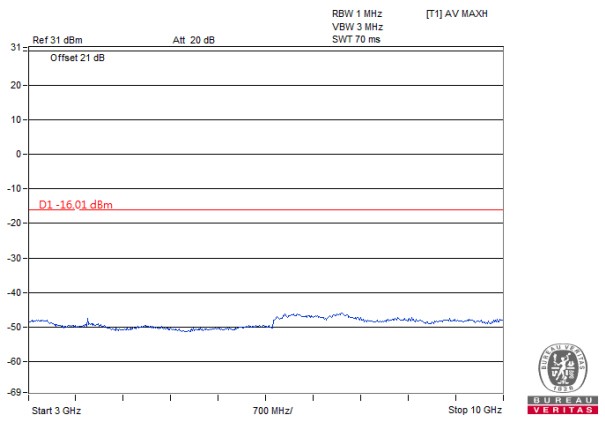
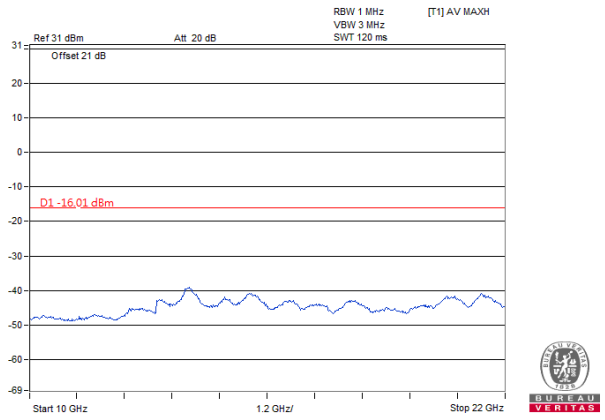


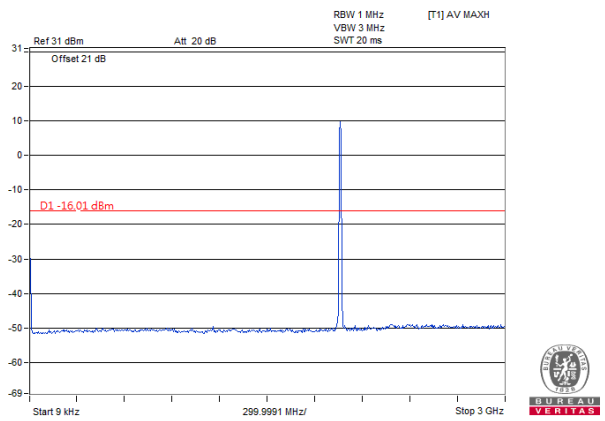
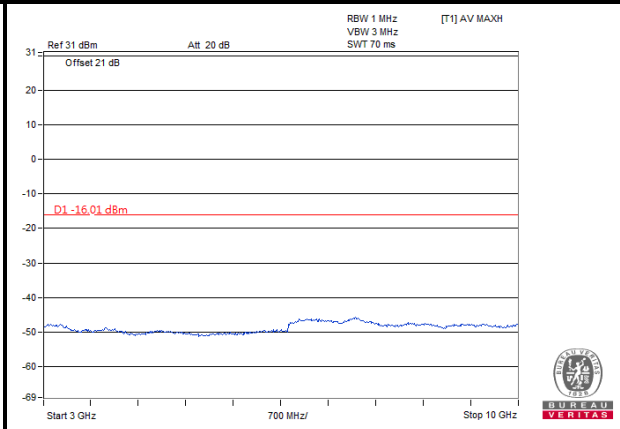
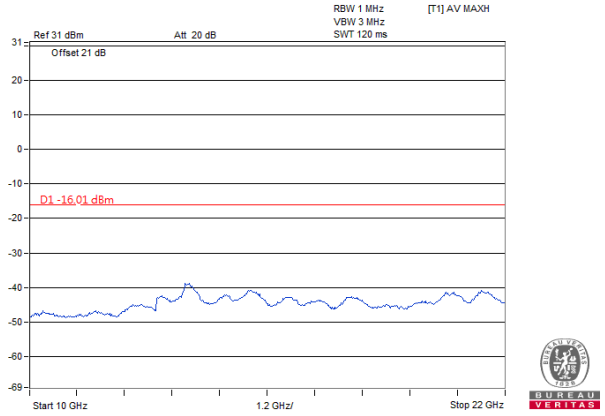
4.7.3 Test Procedure

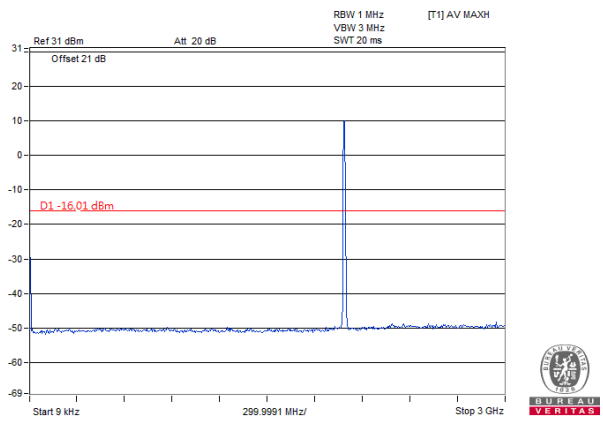
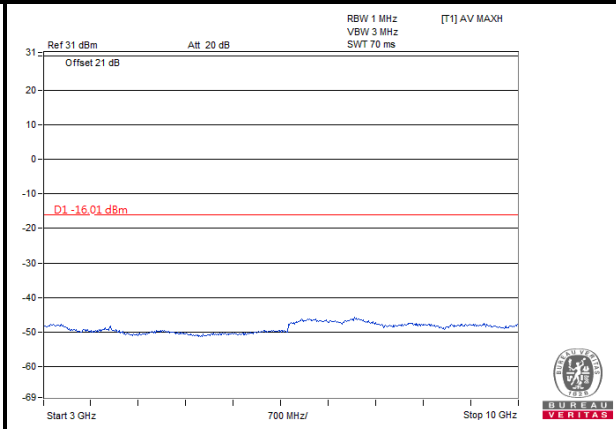
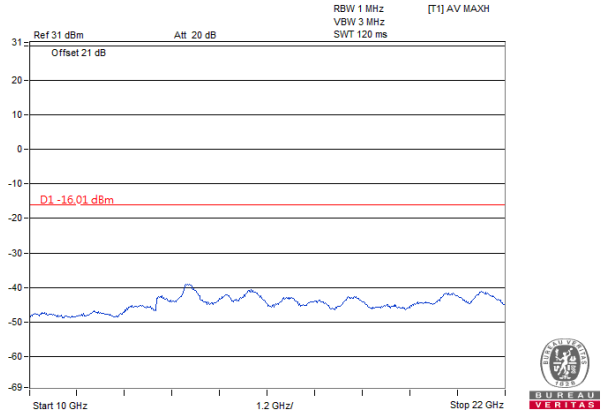
a. All measurements were done at low, middle and high operational frequency range.

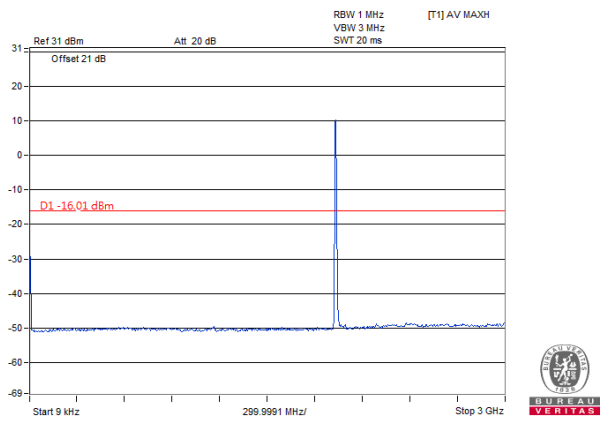
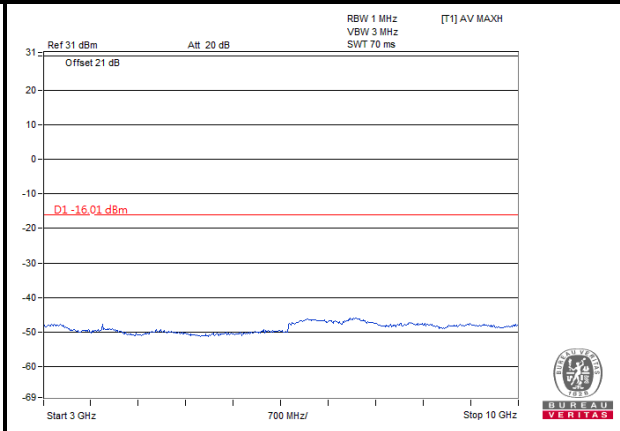
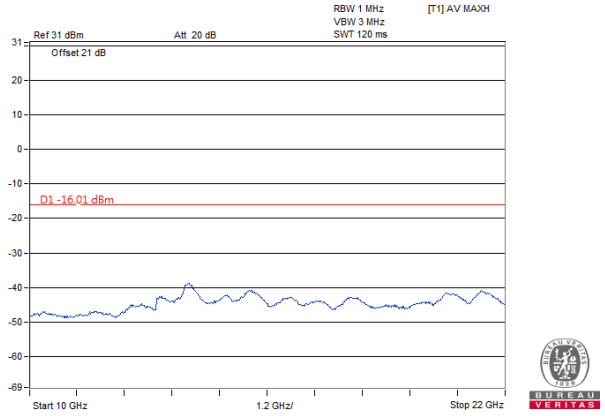
b. Measuring frequency range is from 9 kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

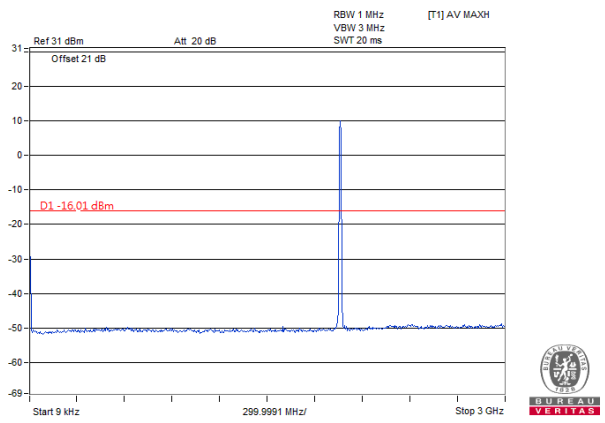
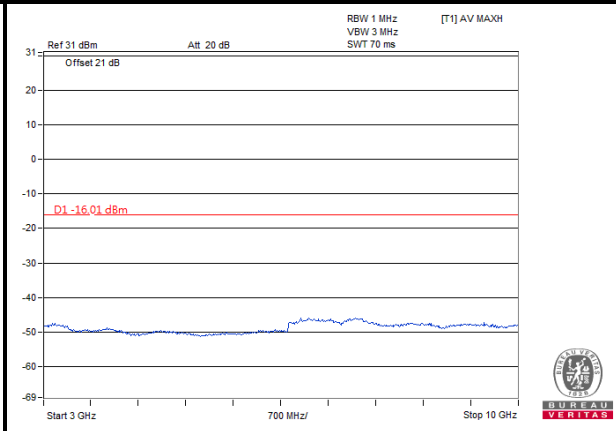
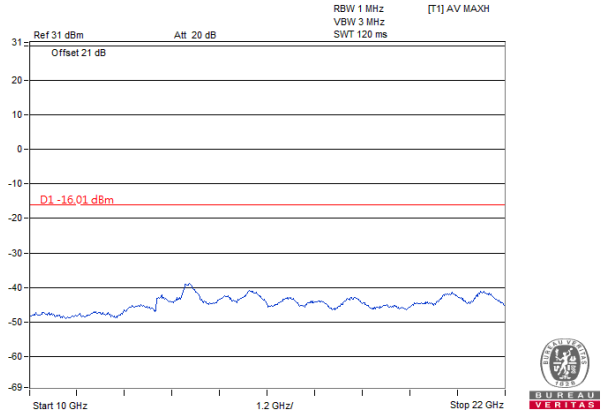
4.7.4 Test Results

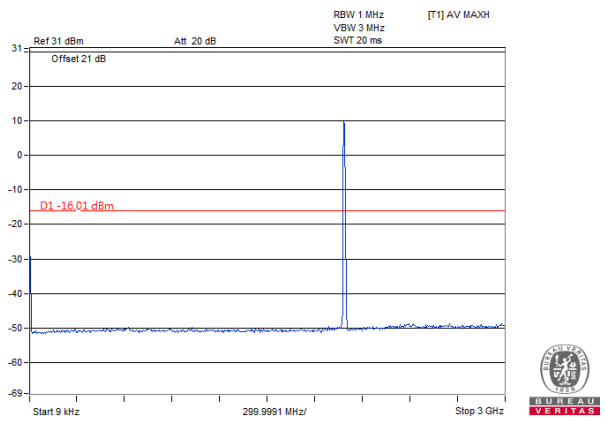
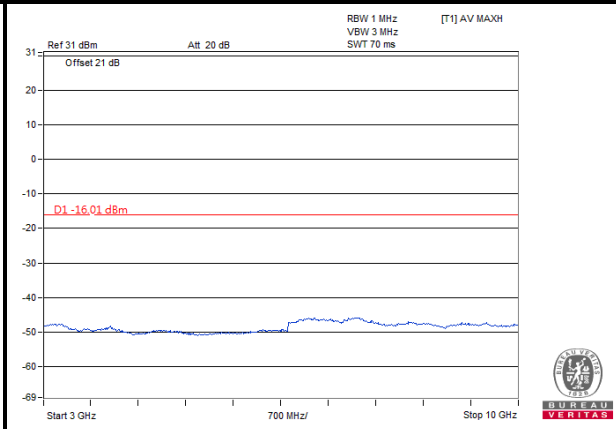
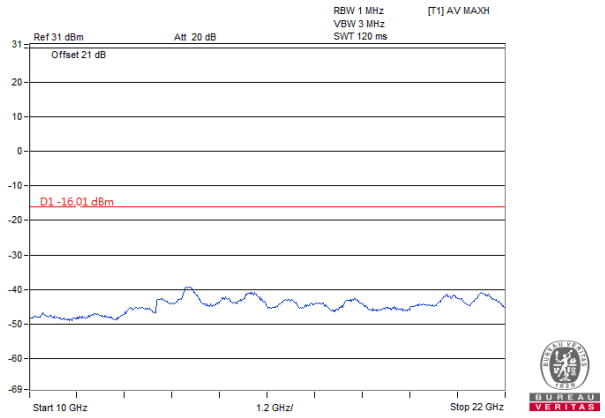
LTE Band 2	
Channel Band width: 5MHz	
Chain 0	
Channel 625	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

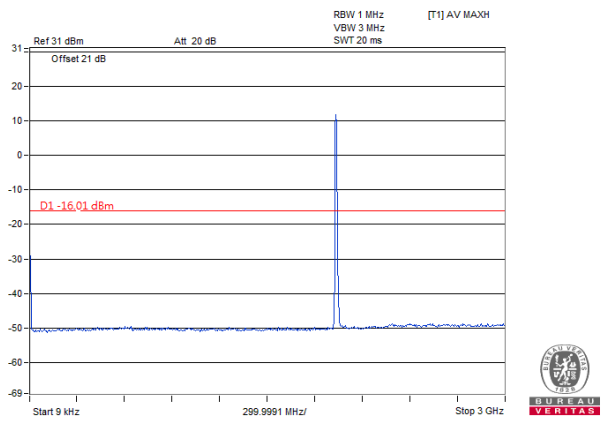
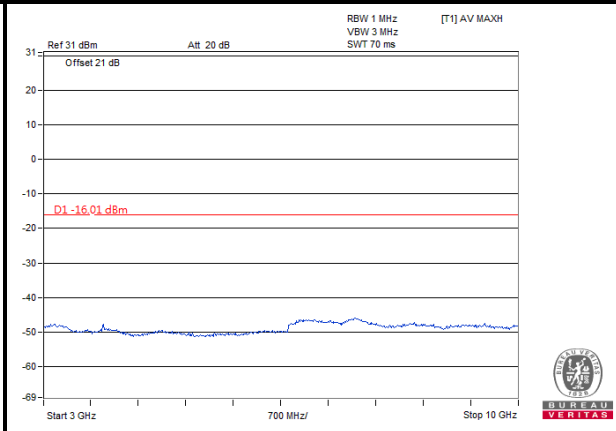
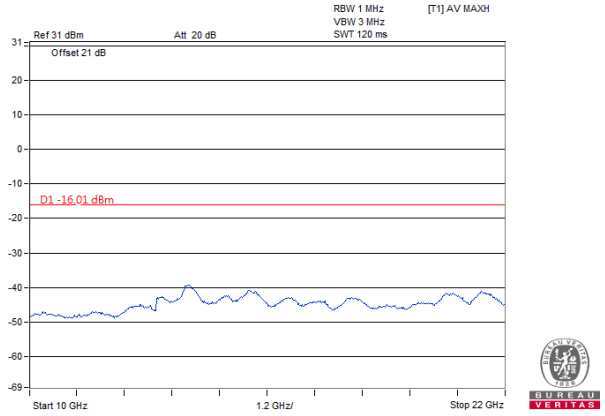
LTE Band 2	
Channel Band width: 5MHz	
Chain 0	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

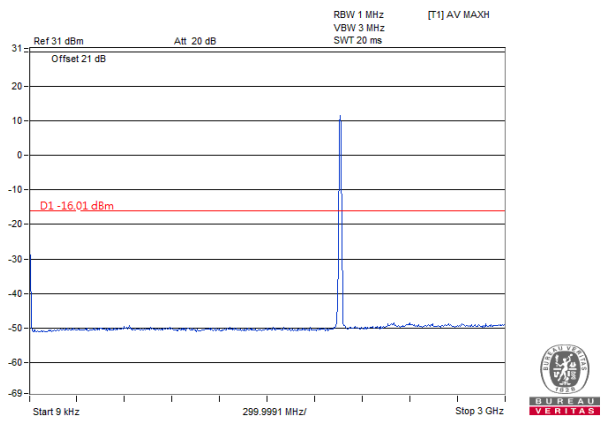
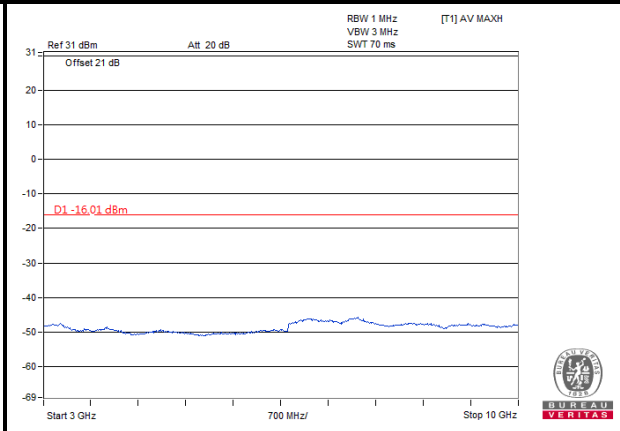
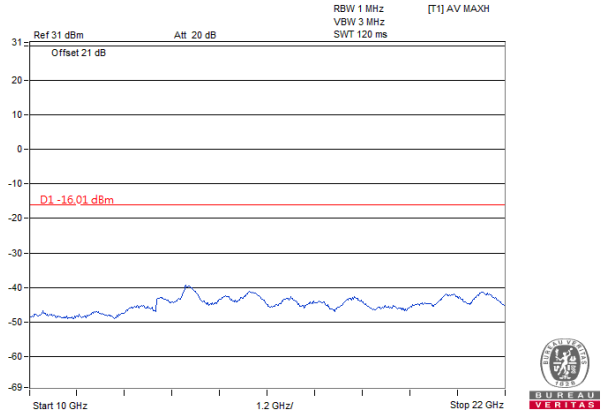
LTE Band 2	
Channel Band width: 5MHz	
Chain 0	
Channel 1175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

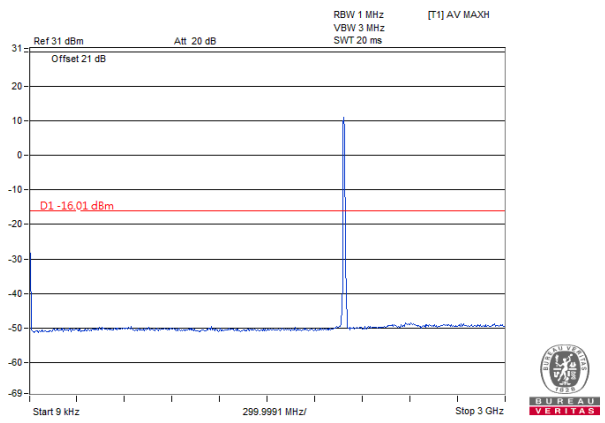
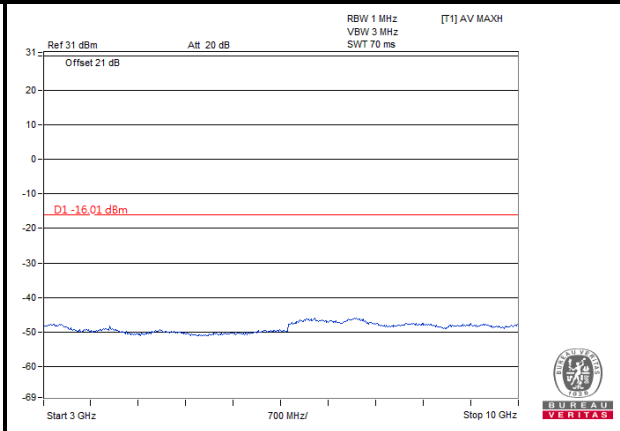
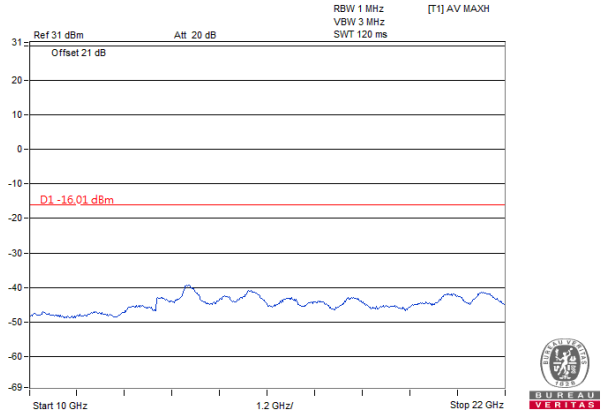
LTE Band 2	
Channel Band width: 5MHz	
Chain 1	
Channel 625	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

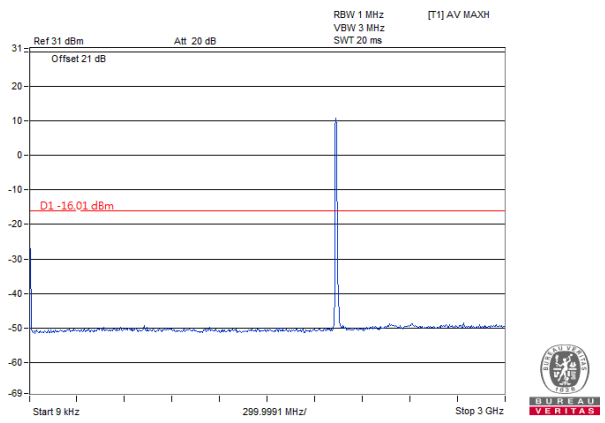
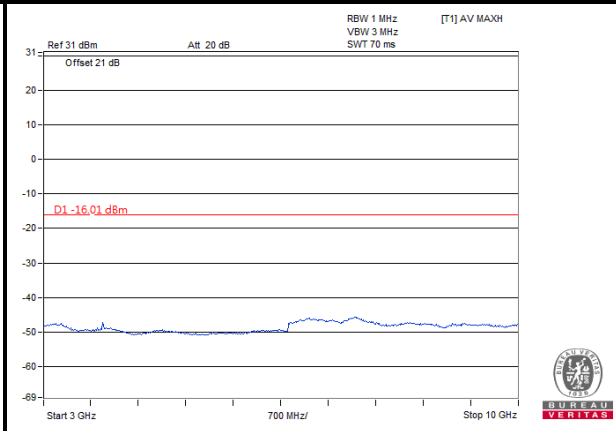
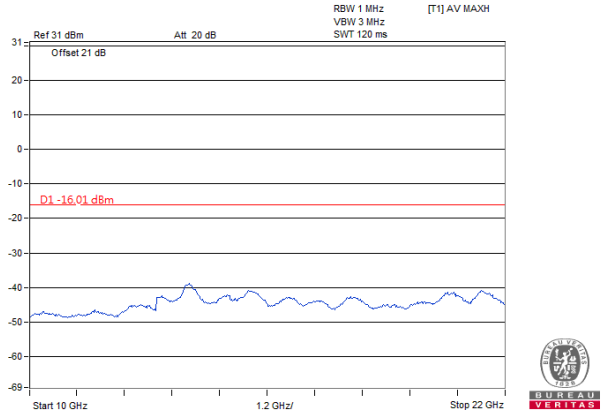
LTE Band 2	
Channel Band width: 5MHz	
Chain 1	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

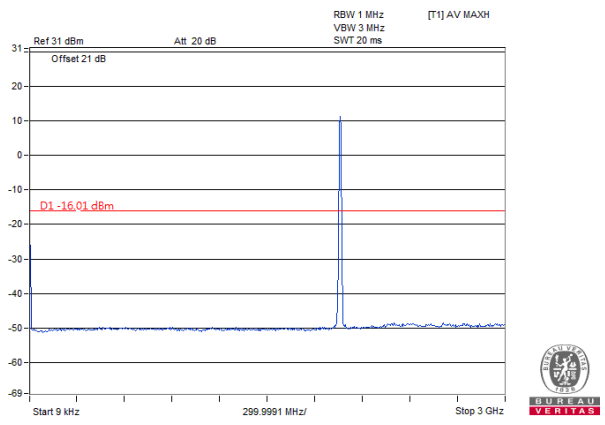
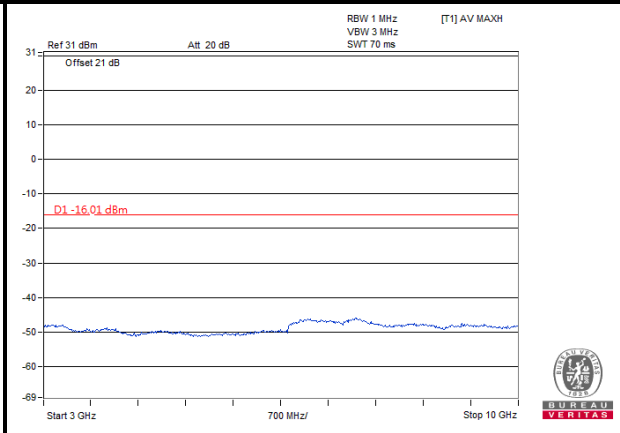
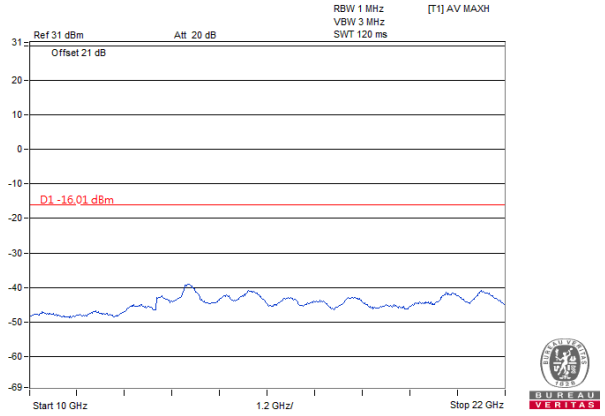
LTE Band 2	
Channel Band width: 5MHz	
Chain 1	
Channel 1175	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

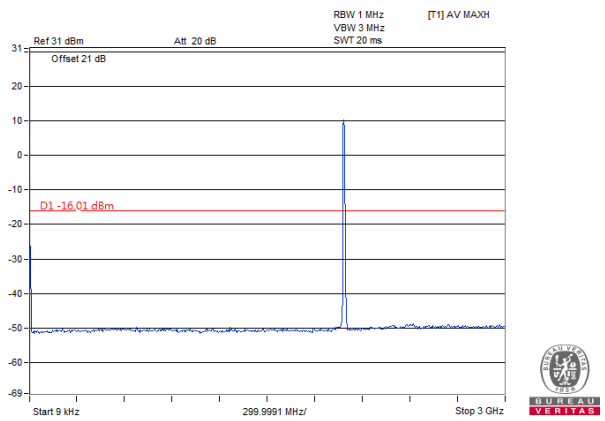
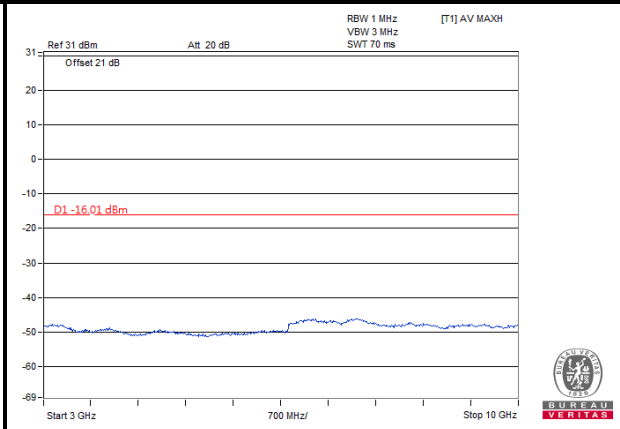
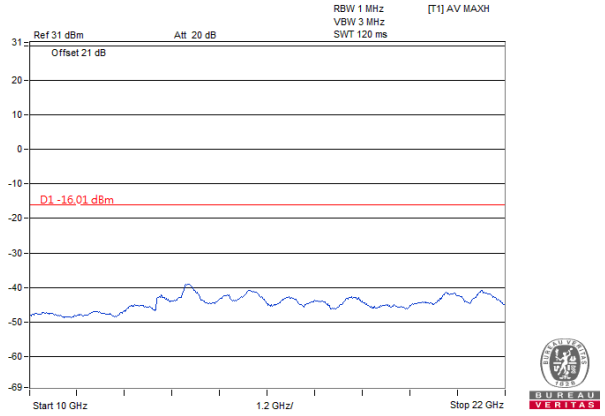
LTE Band 2	
Channel Band width: 10MHz	
Chain 0	
Channel 650	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

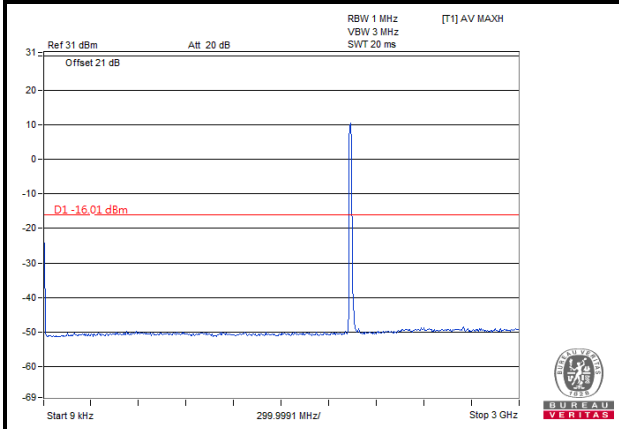
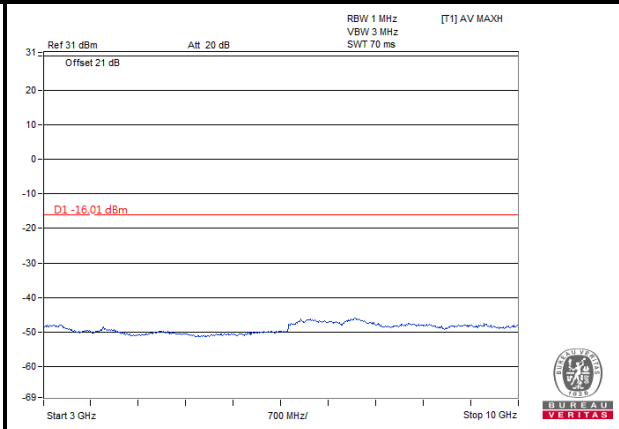
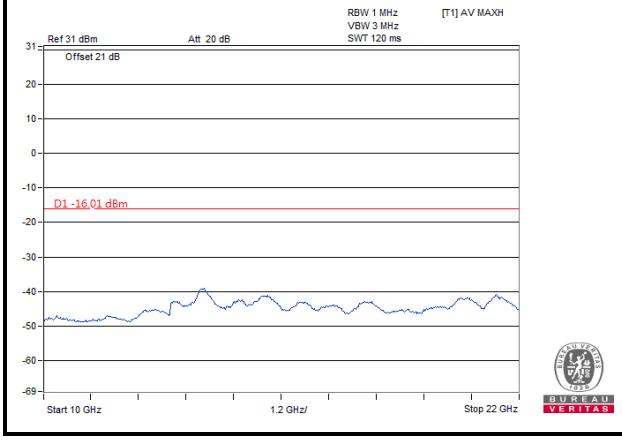
LTE Band 2	
Channel Band width: 10MHz	
Chain 0	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

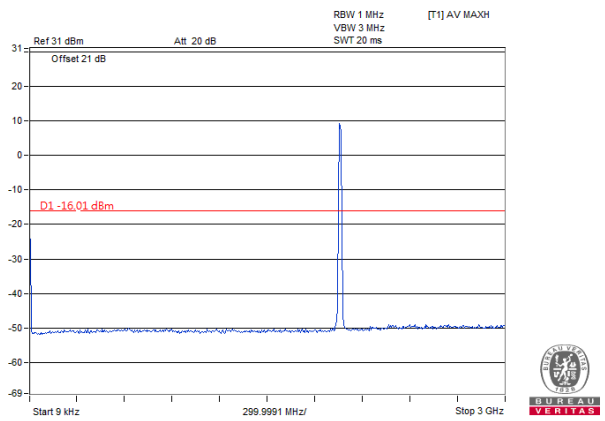
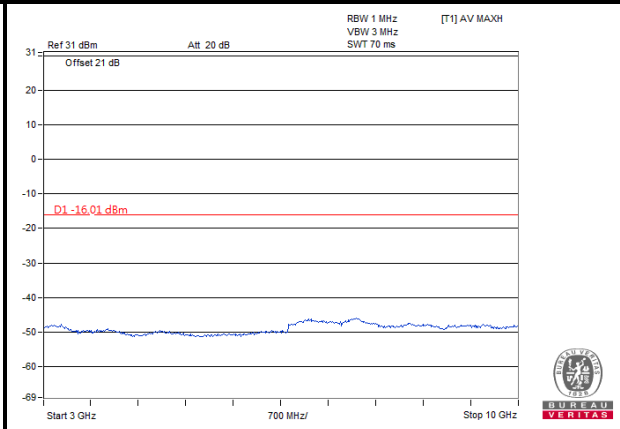
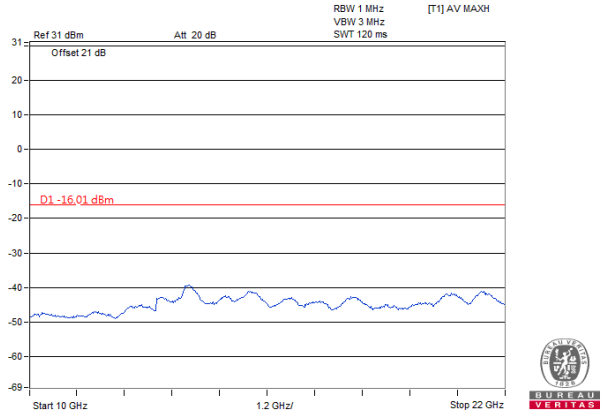
LTE Band 2	
Channel Band width: 10MHz	
Chain 0	
Channel 1150	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

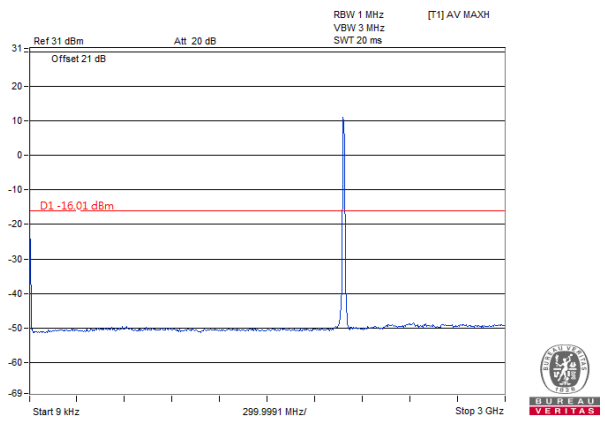
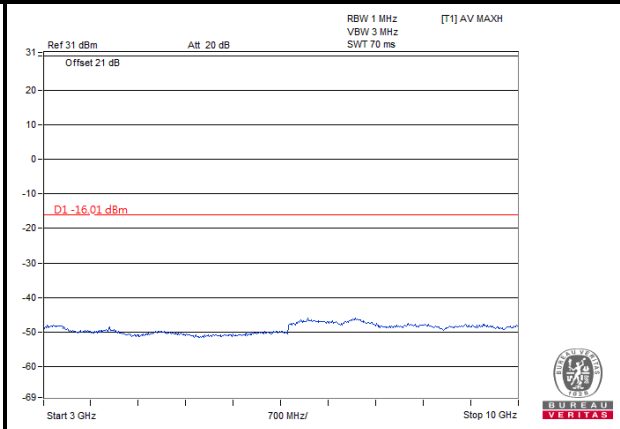
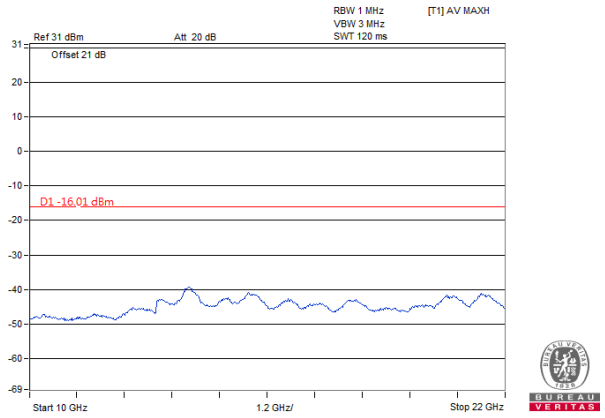
LTE Band 2	
Channel Band width: 10MHz	
Chain 1	
Channel 650	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

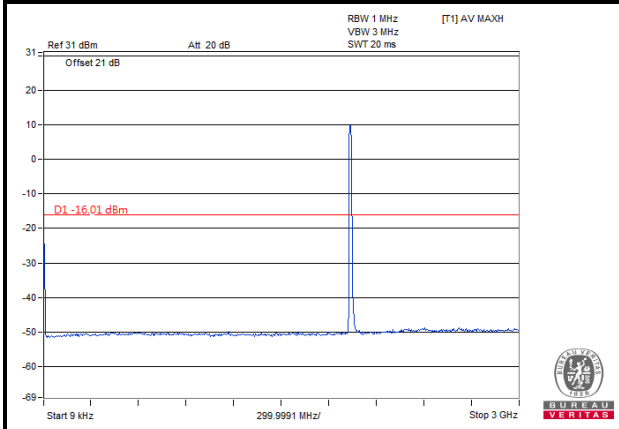
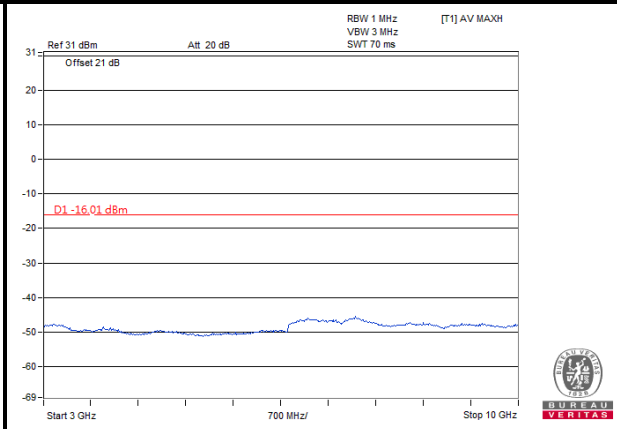
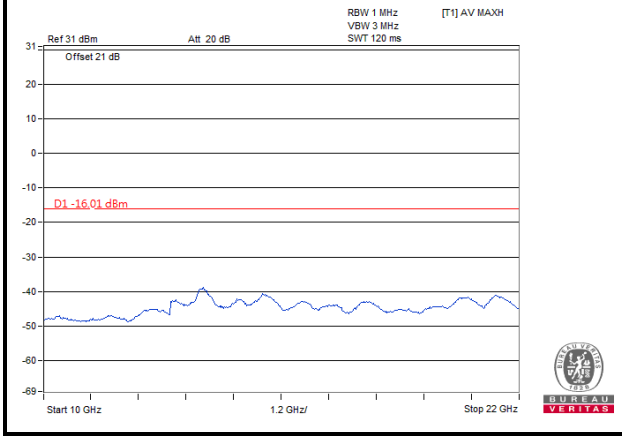
LTE Band 2	
Channel Band width: 10MHz	
Chain 1	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

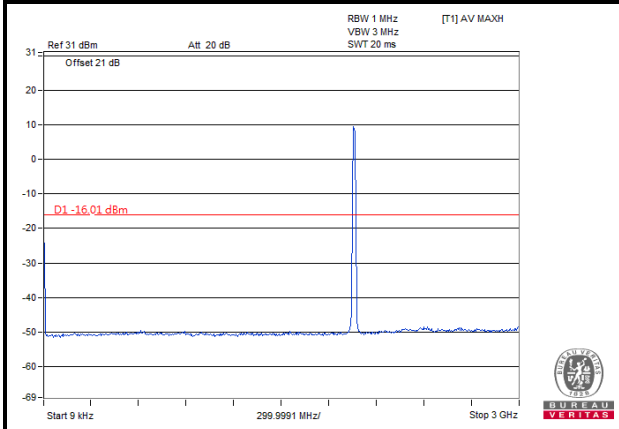
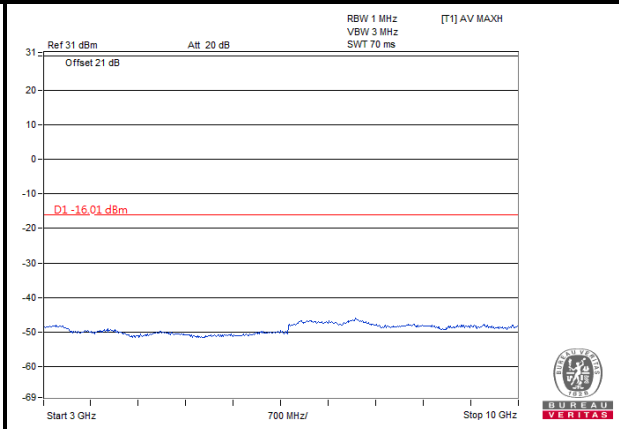
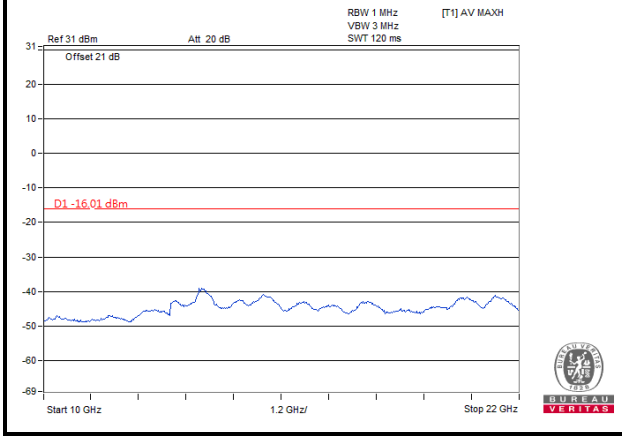
LTE Band 2	
Channel Band width: 10MHz	
Chain 1	
Channel 1150	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

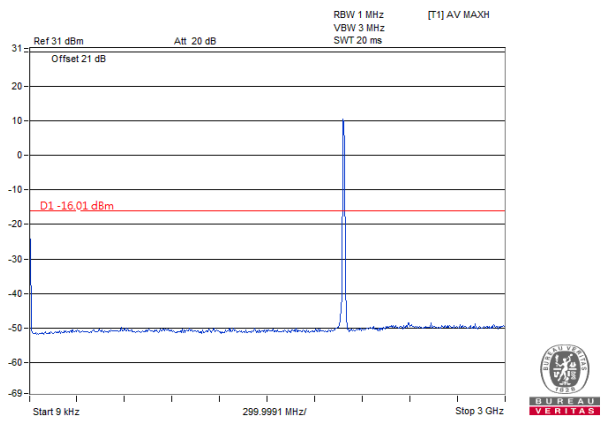
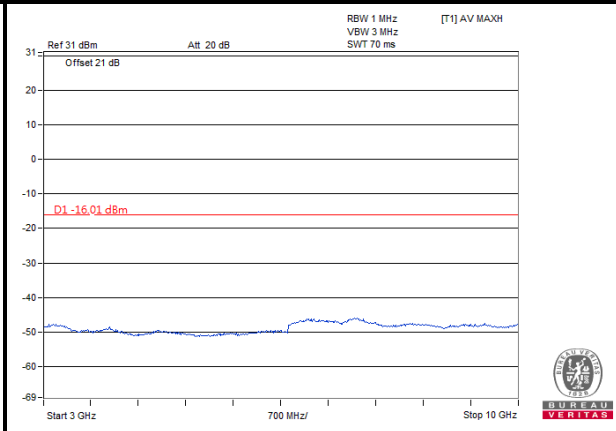
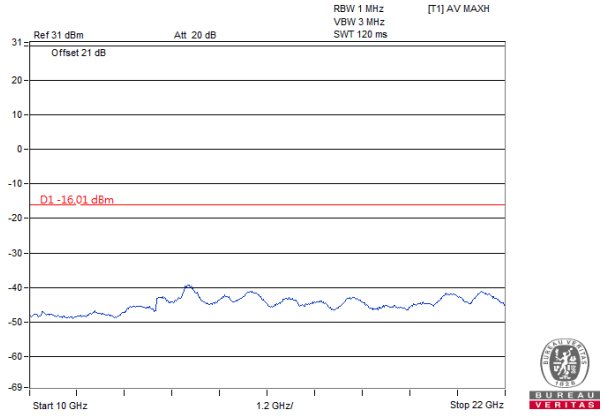
LTE Band 2	
Channel Band width: 15MHz	
Chain 0	
Channel 675	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

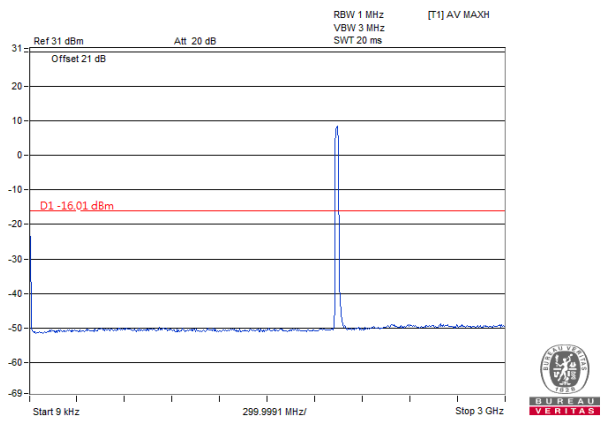
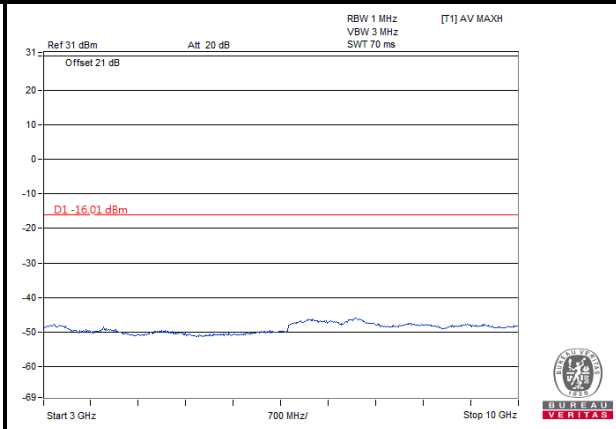
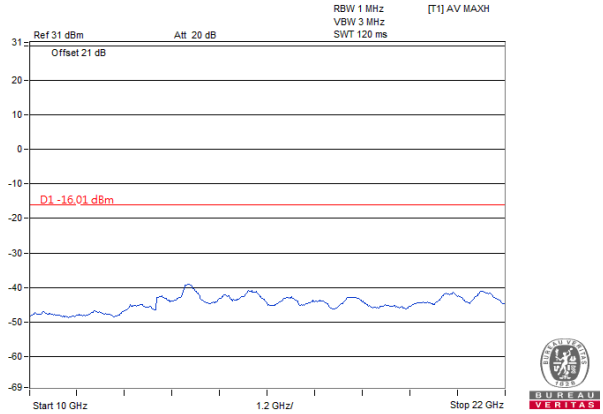
LTE Band 2	
Channel Band width: 15MHz	
Chain 0	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

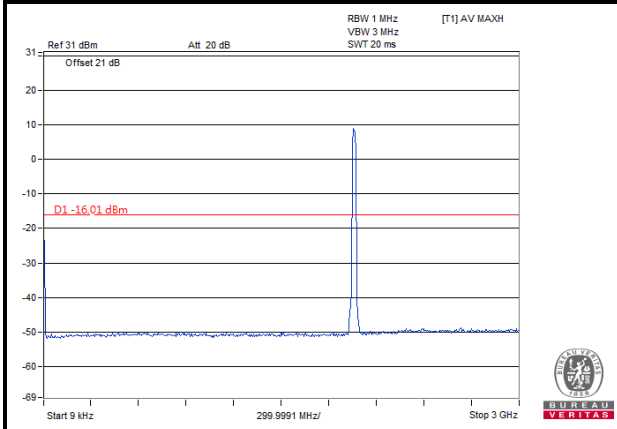
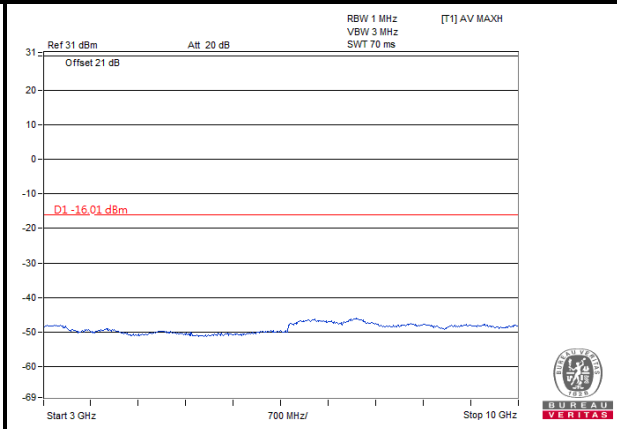
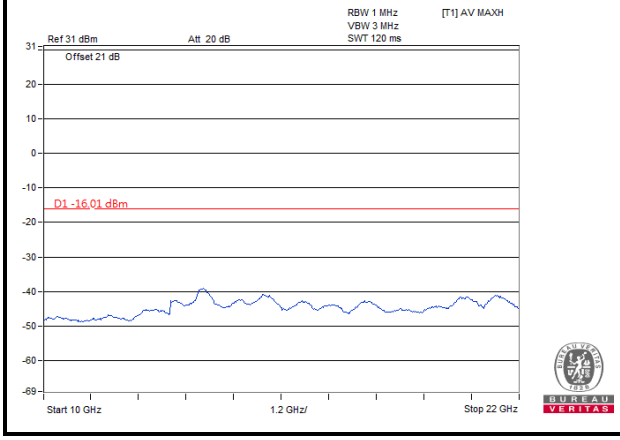
LTE Band 2	
Channel Band width: 15MHz	
Chain 0	
Channel 1125	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

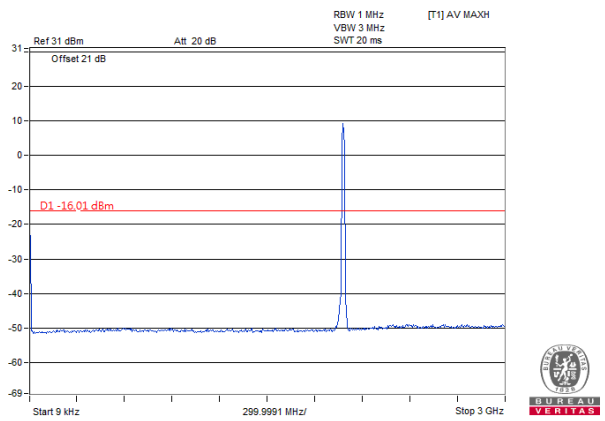
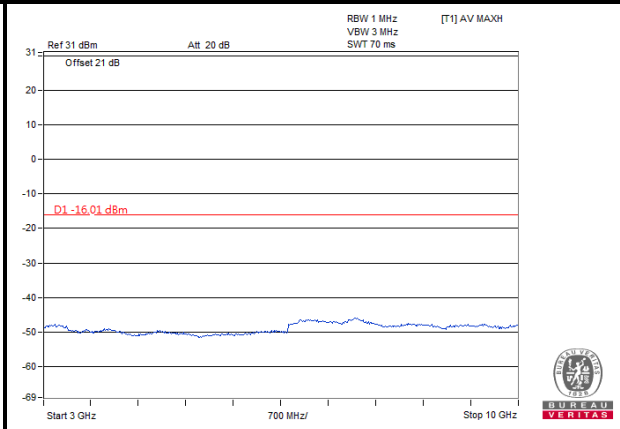
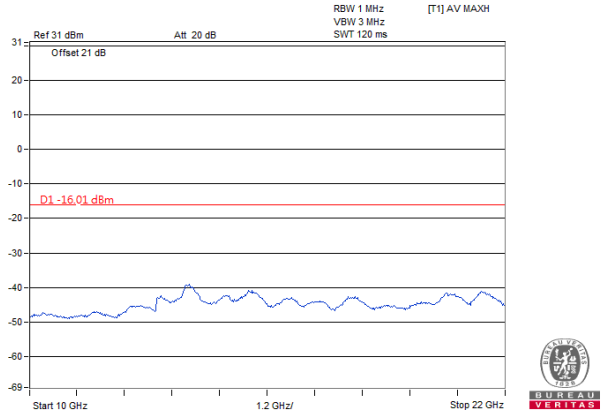
LTE Band 2	
Channel Band width: 15MHz	
Chain 1	
Channel 675	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

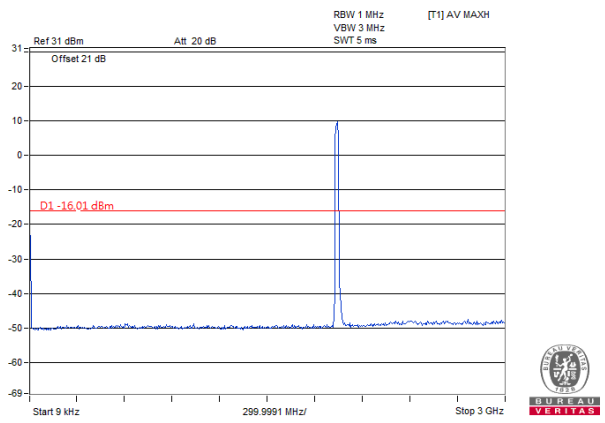
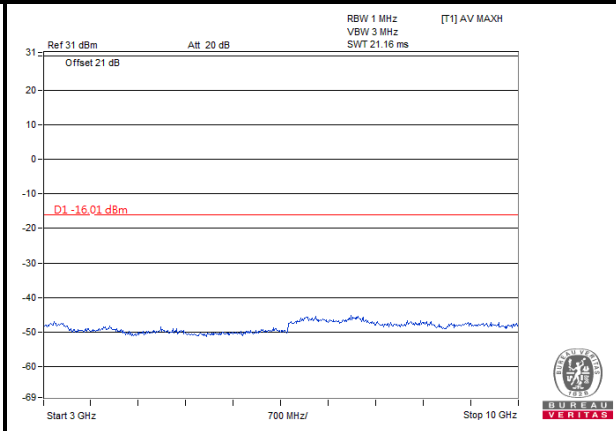
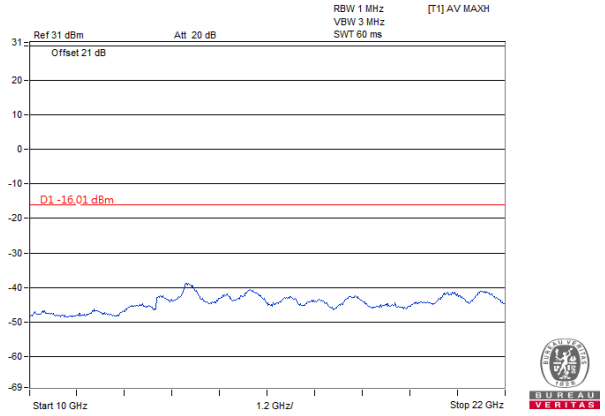
LTE Band 2	
Channel Band width: 15MHz	
Chain 1	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

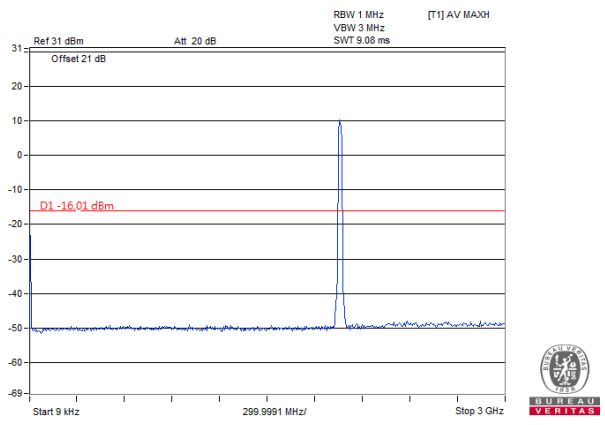
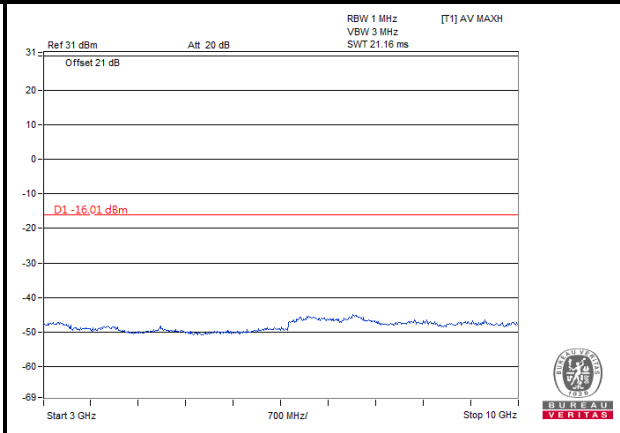
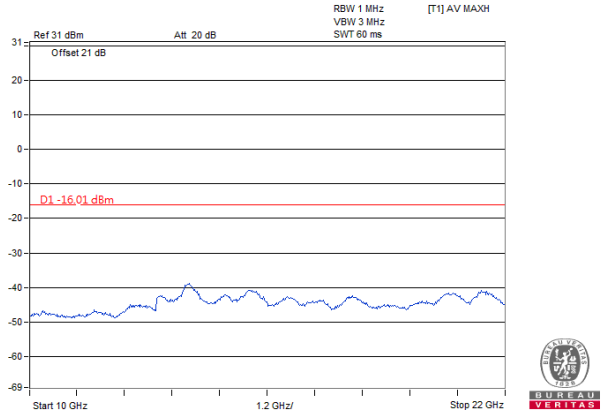
LTE Band 2	
Channel Band width: 15MHz	
Chain 1	
Channel 1125	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

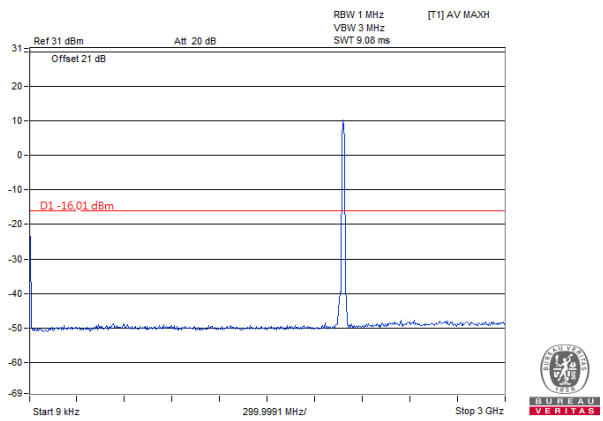
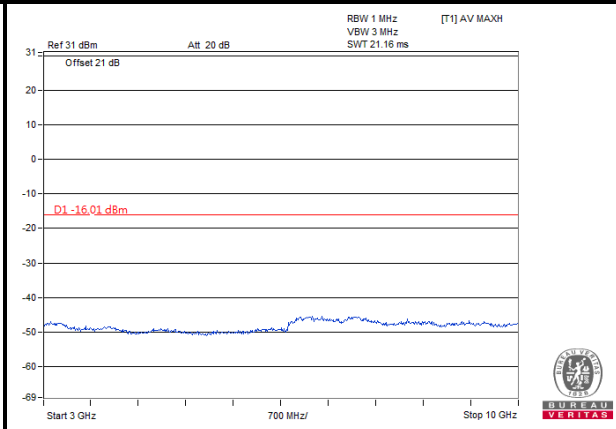
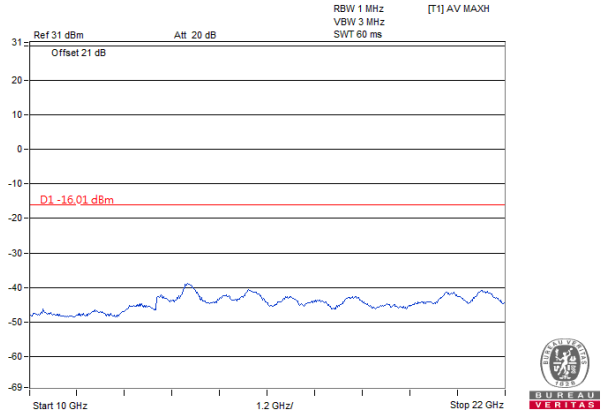
LTE Band 2	
Channel Band width: 20MHz	
Chain 0	
Channel 700	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2	
Channel Band width: 20MHz	
Chain 0	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2	
Channel Band width: 20MHz	
Chain 0	
Channel 1100	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2	
Channel Band width: 20MHz	
Chain 1	
Channel 700	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2	
Channel Band width: 20MHz	
Chain 1	
Channel 900	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2	
Channel Band width: 20MHz	
Chain 1	
Channel 1100	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.8.2 Test Procedure

a. 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.

b. 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 a. Record the power level of S.G

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

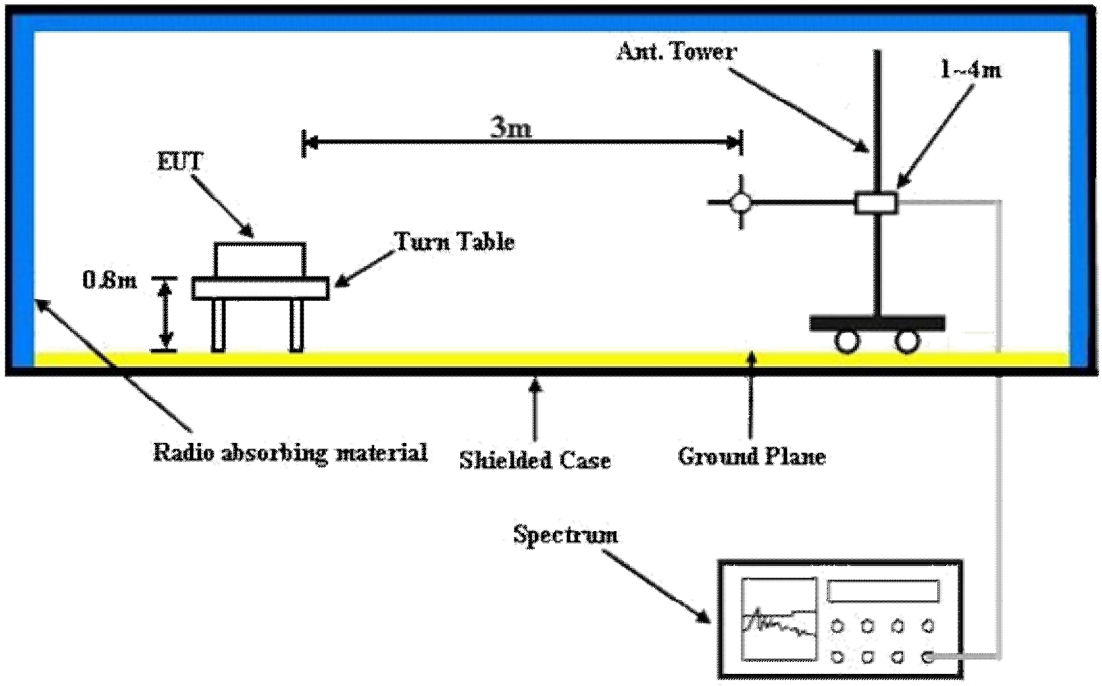
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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 2

Channel Bandwidth: 5MHz

Mode	TX channel 625	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	106.63	-61.64	-76.81	11.25	-65.56	-13.00	-52.56
2	302.57	-67.45	-84.38	16.22	-68.16	-13.00	-55.16
3	457.77	-67.83	-87.39	20.54	-66.85	-13.00	-53.85
4	613.94	-69.81	-89.66	24.13	-65.53	-13.00	-52.53
5	800.18	-66.38	-85.62	26.60	-59.02	-13.00	-46.02
6	874.87	-63.83	-83.46	27.67	-55.79	-13.00	-42.79
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	-60.55	-77.26	10.53	-66.73	-13.00	-53.73
2	168.71	-66.71	-81.79	14.34	-67.45	-13.00	-54.45
3	396.66	-71.16	-89.41	18.62	-70.79	-13.00	-57.79
4	624.61	-70.15	-90.44	24.12	-66.32	-13.00	-53.32
5	800.18	-66.86	-86.57	26.60	-59.97	-13.00	-46.97
6	983.51	-74.02	-93.83	28.95	-64.88	-13.00	-51.88

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 650	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	90.14	-61.88	-77.10	9.01	-68.09	-13.00	-55.09
2	250.19	-59.76	-77.50	14.23	-63.27	-13.00	-50.27
3	500.45	-72.13	-91.35	21.31	-70.04	-13.00	-57.04
4	624.61	-69.86	-89.84	24.12	-65.72	-13.00	-52.72
5	800.18	-73.68	-92.92	26.60	-66.32	-13.00	-53.32
6	874.87	-72.63	-92.26	27.67	-64.59	-13.00	-51.59
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	104.69	-63.20	-77.76	11.05	-66.71	-13.00	-53.71
2	389.87	-64.92	-83.10	18.47	-64.63	-13.00	-51.63
3	500.45	-69.89	-89.74	21.31	-68.43	-13.00	-55.43
4	567.38	-66.65	-86.10	22.52	-63.58	-13.00	-50.58
5	800.18	-67.43	-87.14	26.60	-60.54	-13.00	-47.54
6	874.87	-64.26	-84.08	27.67	-56.41	-13.00	-43.41

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 675	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	70.74	-63.78	-81.14	12.75	-68.39	-13.00	-55.39
2	250.19	-58.95	-76.69	14.23	-62.46	-13.00	-49.46
3	500.45	-63.07	-82.29	21.31	-60.98	-13.00	-47.98
4	599.39	-63.89	-83.08	23.61	-59.47	-13.00	-46.47
5	652.74	-63.54	-84.03	24.44	-59.59	-13.00	-46.59
6	874.87	-67.25	-86.88	27.67	-59.21	-13.00	-46.21
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	104.69	-67.29	-81.85	11.05	-70.80	-13.00	-57.80
2	287.05	-71.97	-89.42	15.83	-73.59	-13.00	-60.59
3	383.08	-67.71	-85.87	18.36	-67.51	-13.00	-54.51
4	547.98	-70.11	-89.53	22.17	-67.36	-13.00	-54.36
5	609.09	-68.27	-88.60	24.01	-64.59	-13.00	-51.59
6	800.18	-67.28	-86.99	26.60	-60.39	-13.00	-47.39

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 700	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	113.42	-64.84	-79.91	12.05	-67.86	-13.00	-54.86
2	250.19	-58.92	-76.66	14.23	-62.43	-13.00	-49.43
3	374.35	-69.28	-87.64	18.19	-69.45	-13.00	-56.45
4	576.11	-61.08	-80.64	22.90	-57.74	-13.00	-44.74
5	800.18	-70.16	-89.40	26.60	-62.80	-13.00	-49.80
6	874.87	-67.22	-86.85	27.67	-59.18	-13.00	-46.18
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	103.72	-63.25	-78.07	10.92	-67.15	-13.00	-54.15
2	349.13	-67.81	-85.30	17.27	-68.03	-13.00	-55.03
3	464.56	-67.83	-87.57	20.64	-66.93	-13.00	-53.93
4	614.91	-69.54	-89.94	24.13	-65.81	-13.00	-52.81
5	800.18	-67.55	-87.26	26.60	-60.66	-13.00	-47.66
6	874.87	-65.36	-85.18	27.67	-57.51	-13.00	-44.51

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 2

Channel Bandwidth: 5MHz

Mode	TX channel 625	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	3865.74	-42.76	-56.39	18.83	-37.56	-13.00	-24.56
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	3867.35	-33.90	-47.63	18.83	-28.80	-13.00	-15.80

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 900	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	3921.84	-44.42	-58.26	18.99	-39.27	-13.00	-26.27
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	3921.25	-35.35	-49.19	18.99	-30.20	-13.00	-17.20

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 1175	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	3975.53	-40.10	-53.82	19.15	-34.67	-13.00	-21.67
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	**3975.50**	**-30.42**	**-43.88**	**19.15**	**-24.73**	**-13.00**	**-11.73**

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 650	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	3876.62	-45.52	-59.23	18.86	-40.37	-13.00	-27.37
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	3877.50	-37.84	-51.65	18.86	-32.79	-13.00	-19.79

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 900	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	3921.05	-45.19	-59.03	18.99	-40.04	-13.00	-27.04
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	3920.55	-39.08	-52.92	18.99	-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 1150	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	3969.23	-42.06	-55.80	19.13	-36.67	-13.00	-23.67
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	3969.00	-34.30	-47.80	19.13	-28.67	-13.00	-15.67

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 675	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	3866.80	-47.11	-60.74	18.83	-41.91	-13.00	-28.91
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	3867.23	-39.01	-52.74	18.83	-33.91	-13.00	-20.91

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 900	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	3917.24	-46.47	-60.32	18.98	-41.34	-13.00	-28.34
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	3917.90	-39.46	-53.32	18.98	-34.34	-13.00	-21.34

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 1125	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	3967.51	-41.97	-55.72	19.13	-36.59	-13.00	-23.59
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	3968.70	-36.18	-49.68	19.13	-30.55	-13.00	-17.55

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 700	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	3877.04	-46.59	-60.30	18.86	-41.44	-13.00	-28.44
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	3877.80	-39.49	-53.30	18.86	-34.44	-13.00	-21.44

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 900	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	3916.30	-47.42	-61.28	18.98	-42.30	-13.00	-29.30
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	3917.40	-40.65	-54.52	18.98	-35.54	-13.00	-22.54

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 1100	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	3964.91	-43.98	-57.72	19.11	-38.61	-13.00	-25.61
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	3966.45	-38.21	-51.74	19.13	-32.61	-13.00	-19.61

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.

If you have any comments, please feel free to contact us at the following:

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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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