

FCC Test Report

(Part 90S)

Report No.: RF150504C40-4

FCC ID: T5UAQT80

Test Model: AQT80

Received Date: May 04, 2015

Test Date: May 08 ~ Aug. 31, 2015

Issued Date: Sep. 01, 2015

Applicant: Quanta Microsystems, Inc.

Address: 188 Wenhwa 2nd Rd., Guishan Dist., Tao Yuan City, Taiwan, 33377

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

Test Location: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, TAIWAN (R.O.C.)



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Test Site and Instruments	7
3 General Information	8
3.1 General Description of EUT	8
3.2 Configuration of System Under Test	9
3.2.1 Description of Support Units	9
3.3 Test Mode Applicability and Tested Channel Detail	10
3.4 EUT Operating Conditions	11
3.5 General Description of Applied Standards	11
4 Test Types and Results	12
4.1 Output Power Measurement	12
4.1.1 Limits of Output Power Measurement	12
4.1.2 Test Procedures	12
4.1.3 Test Setup	13
4.1.4 Test Results	14
4.2 Frequency Stability Measurement	19
4.2.1 Limits of Frequency Stability Measurement	19
4.2.2 Test Procedure	19
4.2.3 Test Setup	19
4.2.4 Test Results	20
4.3 Occupied Bandwidth Measurement	21
4.3.1 Limits of Occupied Bandwidth Measurement	21
4.3.2 Test Procedure	21
4.3.3 Test Setup	21
4.3.4 Test Result	22
4.4 Band Edge Measurement	24
4.4.1 Limits of Band Edge Measurement	24
4.4.2 Test Setup	24
4.4.3 Test Procedures	24
4.4.4 Test Results	25
4.5 Emission Mask Measurement	28
4.5.1 Limits of Emission Mask Measurement	28
4.5.2 Test Procedures	28
4.5.3 Test Setup	28
4.5.4 Test Results	29
4.6 Peak to Average Ratio	43
4.6.1 Limits of Peak to Average Ratio Measurement	43
4.6.2 Test Setup	43
4.6.3 Test Procedures	43
4.6.4 Test Results	44
4.7 Conducted Spurious Emissions	45
4.7.1 Limits of Conducted Spurious Emissions Measurement	45
4.7.2 Test Setup	45
4.7.3 Test Procedure	45
4.7.4 Test Results	46
4.8 Radiated Emission Measurement	56
4.8.1 Limits of Radiated Emission Measuremen	56
4.8.2 Test Procedure	56
4.8.3 Deviation from Test Standard	56
4.8.4 Test Setup	57



4.8.5 Test Results	58
5 Pictures of Test Arrangements.....	69
Appendix – Information on the Testing Laboratories	70



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150504C40-4	Original release	Sep. 01, 2015

1 Certificate of Conformity

Product: LTE Tablet PC

Brand: Sprint

Test Model: AQT80

Sample Status: Engineering sample

Applicant: Quanta Microsystems, Inc.

Test Date: May 08 ~ Aug. 31, 2015

Standards: FCC Part 90, Subpart S

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 : Polly Chien, **Date:** Sep. 01, 2015
Polly Chien / Specialist

Approved by : Jeremy Lin, **Date:** Sep. 01, 2015
Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 90.635 (b)	Maximum Peak Output Power Limit: max. 3 watts e.r.p peak power	PASS	Meet the requirement of limit.
2.1055 90.213	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 90.209	Occupied Bandwidth	PASS	Meet the requirement of limit.
2.1051 90.691	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 90.691	Emission Mask	PASS	Meet the requirement of limit.
---	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1051 90.691	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 90.691	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -18.00dB at 705.10MHz.

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB



A D T

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 01, 2014	Nov. 30, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2014 Aug. 09, 2015	Aug. 08, 2015 Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2014 Aug. 09, 2015	Aug. 08, 2015 Aug. 08, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 09, 2014 Aug. 09, 2015	Aug. 08, 2015 Aug. 08, 2016
RF signal cable Worken	8D-FB	Cable-CH9-01	Aug. 11, 2014 Aug. 11, 2015	Aug. 10, 2015 Aug. 10, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2014 Jun. 08, 2015	Jun. 07, 2015 Jun. 07, 2016
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 09, 2014 Jun. 09, 2015	Jun. 08, 2015 Jun. 08, 2016
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 215374.
5. The IC Site Registration No. is IC 7450F-9.

3 General Information

3.1 General Description of EUT

Product	LTE Tablet PC	
Brand	Sprint	
Test Model	AQT80	
Status of EUT	Engineering sample	
Power Supply Rating	5Vdc (adapter) 3.8Vdc (battery)	
Modulation Type	QPSK, 16QAM	
Operating Frequency	LTE Band 26 (Channel Bandwidth 1.4MHz)	814.7MHz ~ 823.3MHz
	LTE Band 26 (Channel Bandwidth 3MHz)	815.5MHz ~ 822.5MHz
	LTE Band 26 (Channel Bandwidth 5MHz)	816.5MHz ~ 821.5MHz
	LTE Band 26 (Channel Bandwidth 10MHz)	819MHz
Max. ERP Power	LTE Band 26 (Channel Bandwidth 1.4MHz)	239.883mW (23.80dBm)
	LTE Band 26 (Channel Bandwidth 3MHz)	257.632mW (24.11dBm)
	LTE Band 26 (Channel Bandwidth 5MHz)	251.189mW (24.00dBm)
	LTE Band 26 (Channel Bandwidth 10MHz)	239.883mW (23.80dBm)
Antenna Type	Main Ant.: LDS antenna with -0.76dBi gain Aux Ant.: LDS antenna with -4.95dBi gain	
Antenna Connector	U.FL	
Accessory Device	Adapter, Battery	
Data Cable Supplied	0.9m shielded USB Cable	

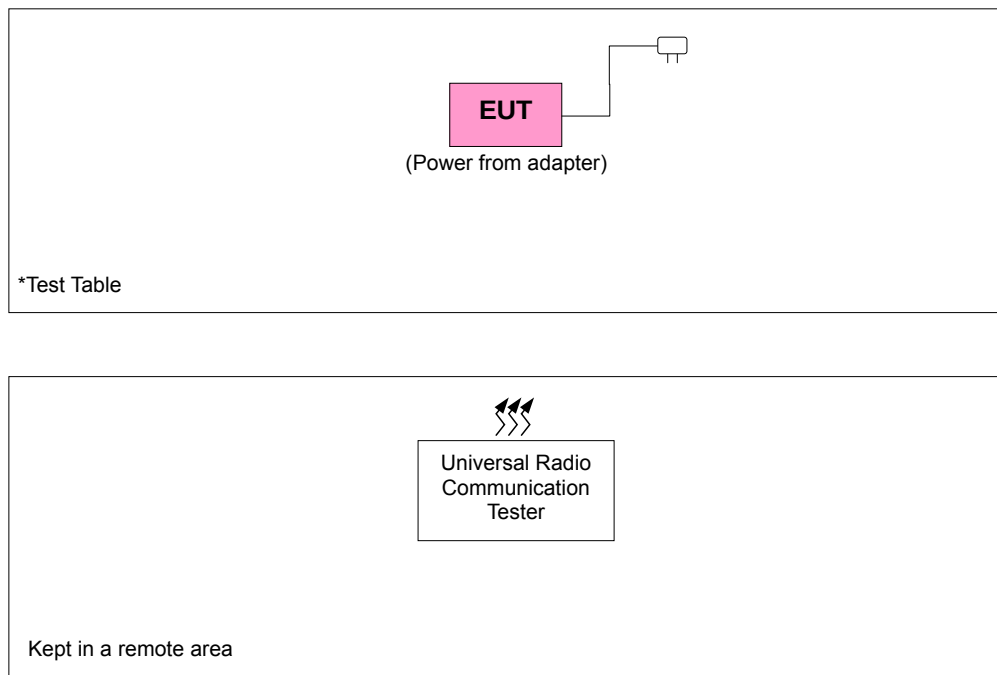
Note:

1. The EUT uses following adapter and battery.

Adapter	
Brand	TPT
Model	NSS050200B
Input Power	100-240Vac, 50-60Hz, 0.3A
Output Power	5Vdc, 2A

Battery	
Brand	Ningbo Veken Battery
Model	NKS
Rating	3.8Vdc, 4450mAh, 16.91Wh

3.2 Configuration of System Under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Universal Radio Communication Tester	R&S	CMU200	123112	NA

NO.	Signal Cable Description Of The Above Support Units
1	NA

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
EIRP	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK	1 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK	1 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset
Frequency Stability	26697 to 26783	26740	1.4MHz	QPSK	1 RB / 0 RB Offset
	26705 to 26775	26740	3MHz	QPSK	1 RB / 0 RB Offset
	26715 to 26765	26740	5MHz	QPSK	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset
Occupied Bandwidth	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK/16QAM	6 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK/16QAM	15 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK/16QAM	25 RB / 0 RB Offset
	26740	26740	10MHz	QPSK/16QAM	50 RB / 0 RB Offset
Band Edge	26697 to 26783	26697, 26783	1.4MHz	QPSK	1 RB / 0 RB Offset
					6 RB / 0 RB Offset
	26705 to 26775	26705, 26775	3MHz	QPSK	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	26715 to 26765	26715, 26765	5MHz	QPSK	1 RB / 0 RB Offset
					25 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
Emission Mask	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK/16QAM	1 RB / 0 RB Offset
					1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK/16QAM	1 RB / 0 RB Offset
					1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK/16QAM	1 RB / 0 RB Offset
					1 RB / 24 RB Offset
					25 RB / 0 RB Offset
	26740	26740	10MHz	QPSK/16QAM	1 RB / 0 RB Offset
					1 RB / 49 RB Offset
					50 RB / 0 RB Offset
Peak to Average Ratio	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
Condcudeted Emission	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK	1 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK	1 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
Radiated Emission Below 1GHz	26697 to 26783	26783	1.4MHz	QPSK	1 RB / 0 RB Offset
	26705 to 26775	26775	3MHz	QPSK	1 RB / 0 RB Offset
	26715 to 26765	26765	5MHz	QPSK	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset
Radiated Emission Above 1GHz	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK	1 RB / 0 RB Offset
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK	1 RB / 0 RB Offset
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK	1 RB / 0 RB Offset
	26740	26740	10MHz	QPSK	1 RB / 0 RB Offset

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	16deg. C, 70%RH	120Vac, 60Hz	Frank Liu
Frequency Stability	24deg. C, 64%RH	3.8Vdc	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	3.8Vdc	Match Tsui
Band Edge	24deg. C, 64%RH	3.8Vdc	Match Tsui
Emission Mask	26deg. C, 70%RH	3.8Vdc	Jun Wu
Peak To Average Ratio	24deg. C, 64%RH	3.8Vdc	Match Tsui
Conducted Emission	24deg. C, 64%RH	3.8Vdc	Match Tsui
Radiated Emission	25deg. C, 65%RH	120Vac, 60Hz	Tank Wu
	18deg. C, 70%RH	120Vac, 60Hz	Frank Liu

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 90

KDB 971168 D01 Power Meas License Digital Systems v02r02

ANSI/TIA/EIA-603-C 2004

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

Note: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

The radiated peak output power shall be according to the specific rule Part 90.635 that “Mobile station are limited to 100 watts e.r.p”.

4.1.2 Test Procedures

EIRP / ERP Measurement:

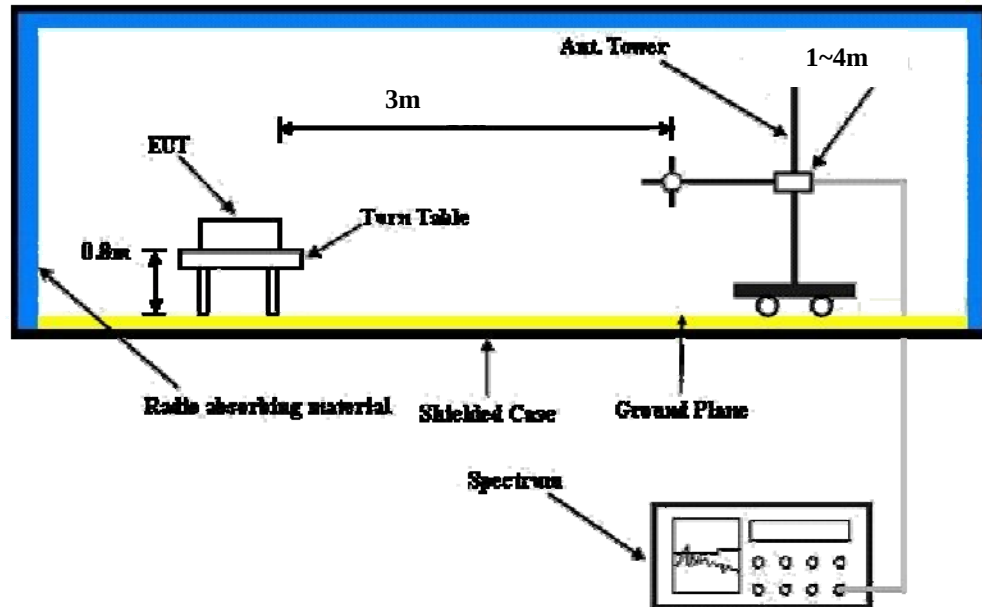
- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Agilent Spectrum Analyzer. All measurements were done at 1 channel. RWB is 1MHz and VBW is 3MHz.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15\text{dBi}$.

Conducted Power Measurement:

The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

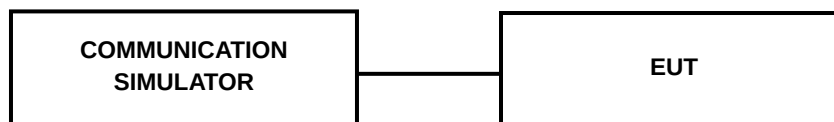
4.1.3 Test Setup

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	RB Size	RB Offset	QPSK			16QAM		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			26697	26740	26783	26697	26740	26783
			814.7 MHz	819 MHz	823.3 MHz	814.7 MHz	819 MHz	823.3 MHz
26 / 1.4M	1	0	22.49	22.53	22.57	21.43	21.46	21.53
	1	2	22.28	22.32	22.36	21.22	21.24	21.32
	1	5	22.42	22.46	22.51	21.36	21.38	21.45
	3	0	22.42	22.45	22.50	21.36	21.39	21.46
	3	1	22.24	22.28	22.31	21.18	21.21	21.27
	3	3	22.27	22.30	22.34	21.21	21.23	21.31
	6	0	21.57	21.61	21.65	20.51	20.54	20.61
Band / BW	RB Size	RB Offset	QPSK			16QAM		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			26705	26740	26775	26705	26740	26775
			815.5 MHz	819 MHz	822.5 MHz	815.5 MHz	819 MHz	822.5 MHz
26 / 3M	1	0	22.61	22.64	22.69	21.55	21.59	21.65
	1	7	22.40	22.43	22.48	21.34	21.37	21.45
	1	14	22.54	22.56	22.60	21.48	21.52	21.59
	8	0	21.74	21.77	21.81	20.68	20.73	20.78
	8	3	21.56	21.59	21.64	20.50	20.54	20.61
	8	7	21.59	21.62	21.66	20.53	20.58	20.62
	15	0	21.69	21.71	21.77	20.63	20.67	20.73
Band / BW	RB Size	RB Offset	QPSK			16QAM		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			26715	26740	26765	26715	26740	26765
			816.5 MHz	819 MHz	821.5 MHz	816.5 MHz	819 MHz	821.5 MHz
26 / 5M	1	0	22.70	22.74	22.78	21.64	21.67	21.73
	1	12	22.49	22.53	22.56	21.43	21.46	21.51
	1	24	22.63	22.67	22.71	21.57	21.61	21.66
	12	0	21.83	21.87	21.94	20.77	20.83	20.84
	12	6	21.65	21.68	21.73	20.59	20.60	20.68
	12	13	21.68	21.72	21.73	20.62	20.65	20.72
	25	0	21.78	21.82	21.86	20.72	20.72	20.81

Band / BW	RB Size	RB Offset	QPSK	16QAM
			Mid CH	Mid CH
			26740	26740
			819 MHz	819 MHz
26 / 10M	1	0	22.84	21.78
	1	24	22.63	21.57
	1	49	22.77	21.71
	25	0	21.97	20.91
	25	12	21.79	20.73
	25	25	21.82	20.76
	50	0	21.92	20.86

ERP Power (dBm)

Channel Bandwidth: 1.4MHz

MODE		TX channel 26697					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-15.4	12.40	3.90	16.30	50.00	-33.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-7.90	19.00	3.90	22.90	50.00	-27.10

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-7.70	19.50	3.90	23.40	50.00	-26.60
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-15.60	12.50	3.90	16.40	50.00	-33.60

MODE		TX channel 26783					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	823.30	-7.70	19.90	3.90	23.80	50.00	-26.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	823.30	-16.40	12.00	3.90	15.90	50.00	-34.10

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

Channel Bandwidth: 3MHz

MODE		TX channel 26705					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-8.14	18.76	3.92	22.68	50.00	-27.32
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-13.81	14.01	3.92	17.93	50.00	-32.07

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-7.22	19.93	3.92	23.85	50.00	-26.15
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-13.12	14.91	3.92	18.83	50.00	-31.17

MODE		TX channel 26775					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	822.50	-7.24	20.20	3.91	24.11	50.00	-25.89
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	822.50	-12.94	15.35	3.91	19.26	50.00	-30.74

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

Channel Bandwidth: 5MHz

MODE		TX channel 26715					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-8.02	18.96	3.90	22.86	50.00	-27.14
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-13.49	14.43	3.90	18.33	50.00	-31.67

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-7.18	19.97	3.92	23.89	50.00	-26.11
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-12.84	15.19	3.92	19.11	50.00	-30.89

MODE		TX channel 26765					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	821.50	-7.26	20.08	3.92	24.00	50.00	-26.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	821.50	-12.87	15.34	3.92	19.26	50.00	-30.74

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

Channel Bandwidth: 10MHz

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-7.27	19.88	3.92	23.80	50.00	-26.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-12.85	15.18	3.92	19.10	50.00	-30.90

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

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

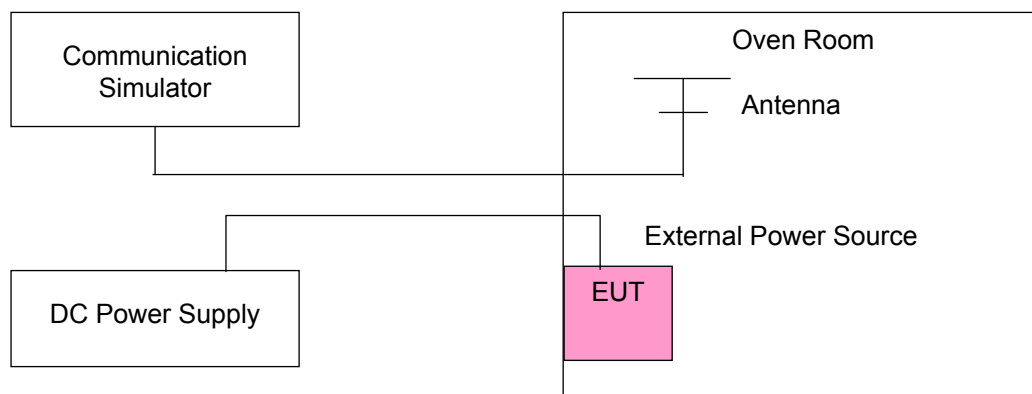
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.2.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C 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.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)				Limit (ppm)
	1.4MHz	3MHz	5MHz	10MHz	
4.35	-0.018	-0.013	-0.013	-0.017	2.5
3.8	-0.020	-0.015	-0.015	-0.018	2.5
3.5	-0.017	-0.016	-0.016	-0.020	2.5

Note: The applicant defined the normal working voltage is from 3.5Vdc to 4.35Vdc.

Frequency Error vs. Temperature.

TEMP. (°C)	Frequency Error (ppm)				Limit (ppm)
	1.4MHz	3MHz	5MHz	10MHz	
55	-0.031	-0.026	-0.027	-0.034	2.5
50	-0.033	-0.027	-0.027	-0.035	2.5
40	-0.029	-0.023	-0.029	-0.033	2.5
30	-0.026	-0.018	-0.018	-0.026	2.5
20	-0.020	-0.015	-0.015	-0.018	2.5
10	-0.021	-0.021	-0.021	-0.023	2.5
0	-0.037	-0.026	-0.026	-0.031	2.5
-10	-0.034	-0.033	-0.035	-0.038	2.5
-20	-0.042	-0.040	-0.038	-0.040	2.5

4.3 Occupied Bandwidth Measurement

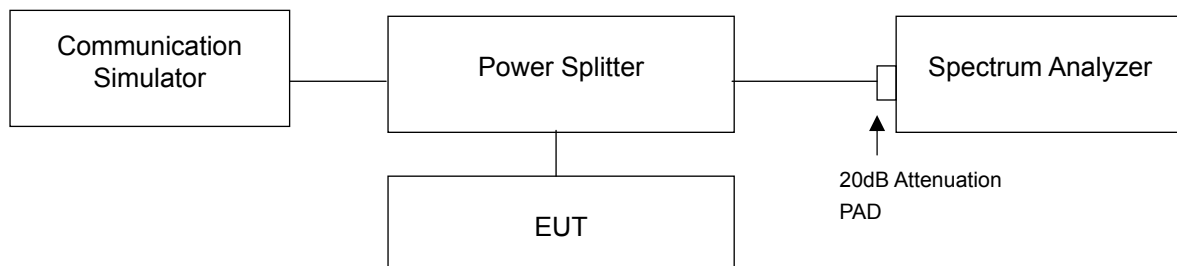
4.3.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.3.2 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range, RB of the spectrum is 1% of occupied bandwidth and VB of the spectrum is 3 times RBW. 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.

4.3.3 Test Setup

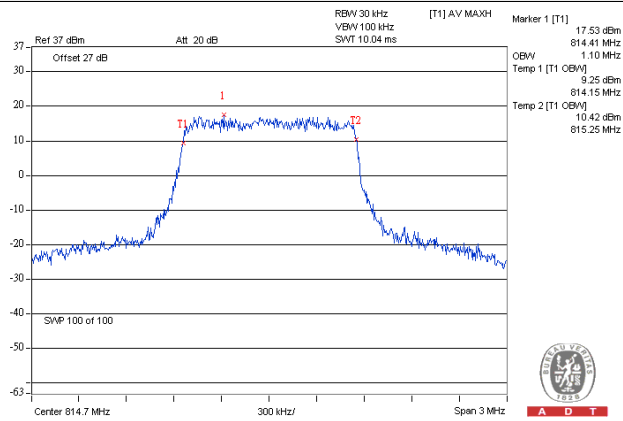


4.3.4 Test Result

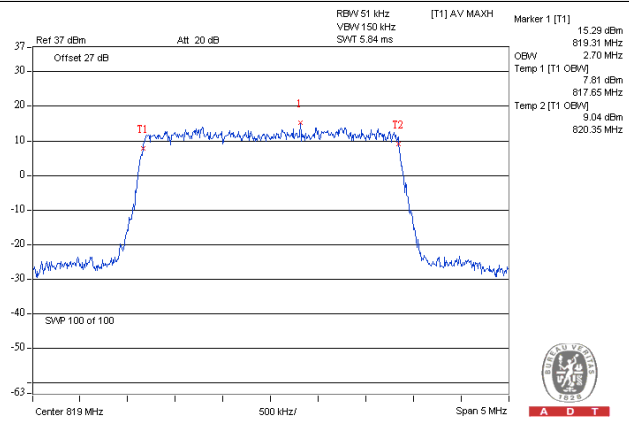
LTE Band 26							
Channel Bandwidth 1.4MHz				Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26697	814.70	1.10	1.10	26705	815.50	2.68	2.70
26740	819.00	1.09	1.09	26740	819.00	2.70	2.69
26783	823.30	1.10	1.10	26775	822.50	2.69	2.70
Channel Bandwidth 5MHz				Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26715	816.50	4.48	4.48	26740	819.00	8.97	8.93
26740	819.00	4.47	4.48				
26765	821.50	4.47	4.48				

Spectrum Plot Of Worst Value

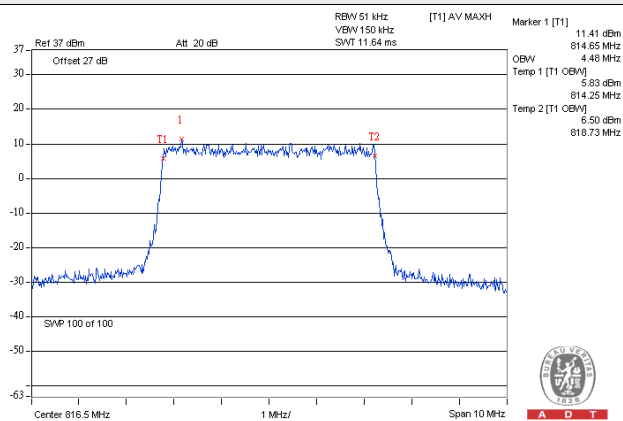
1.4MHz / QPSK



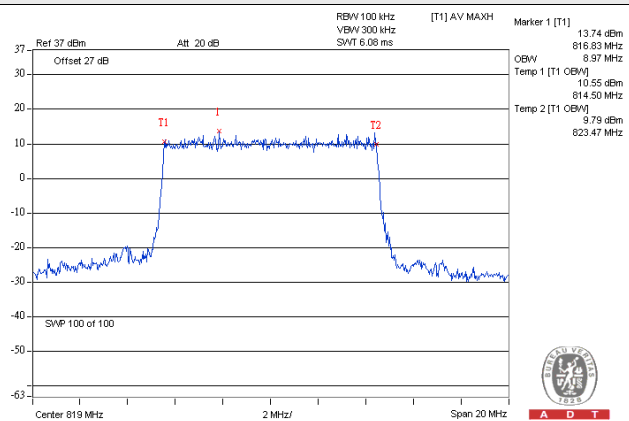
3MHz / QPSK



5MHz / QPSK



10MHz / QPSK

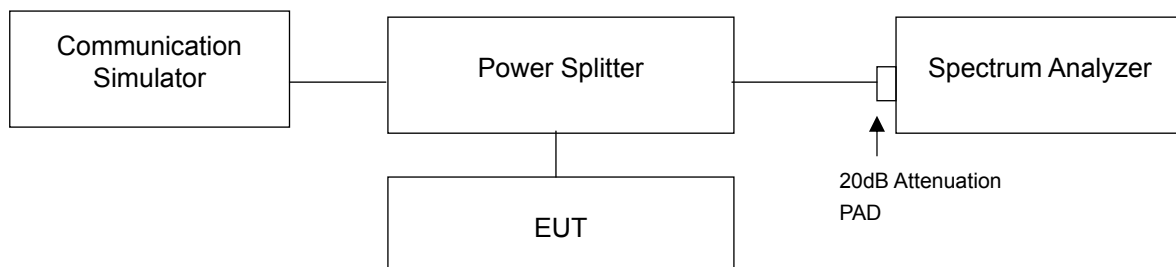


4.4 Band Edge Measurement

4.4.1 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.

4.4.2 Test Setup



4.4.3 Test Procedures

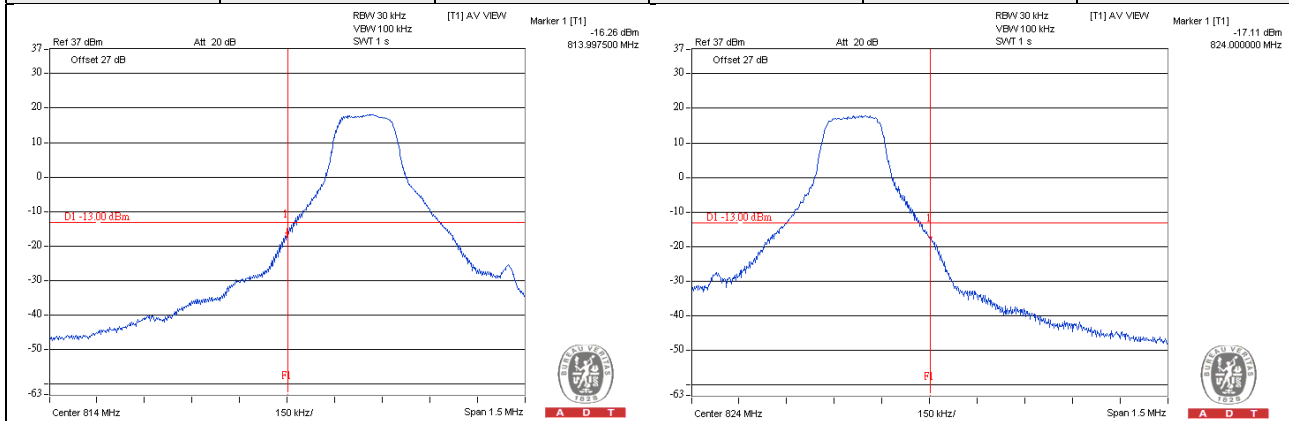
- All measurements were done at low and high operational frequency range.
- The band edge measurement used the power splitter via EUT RF power connector between signal generator and spectrum analyzer. This splitter loss, attenuator loss and cable loss are the worst loss 21 dB in the transmitted path track.
- The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz.
- Record the max trace plot into the test report.

4.4.4 Test Results

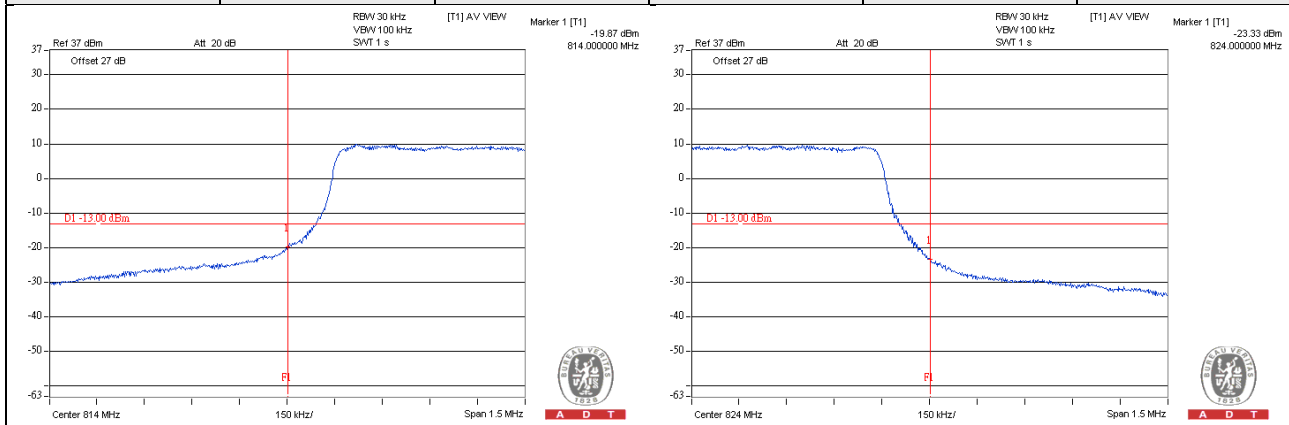
LTE Band 26

Channel Bandwidth 1.4MHz

Channel	26697	1 RB	Channel	26783	1 RB
---------	-------	------	---------	-------	------



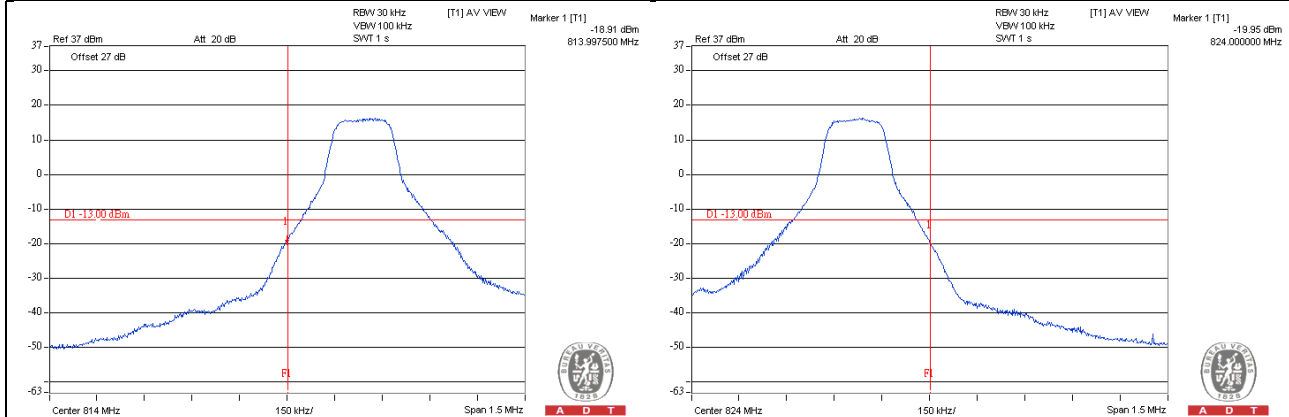
Channel	26697	6 RB	Channel	26783	6 RB
---------	-------	------	---------	-------	------



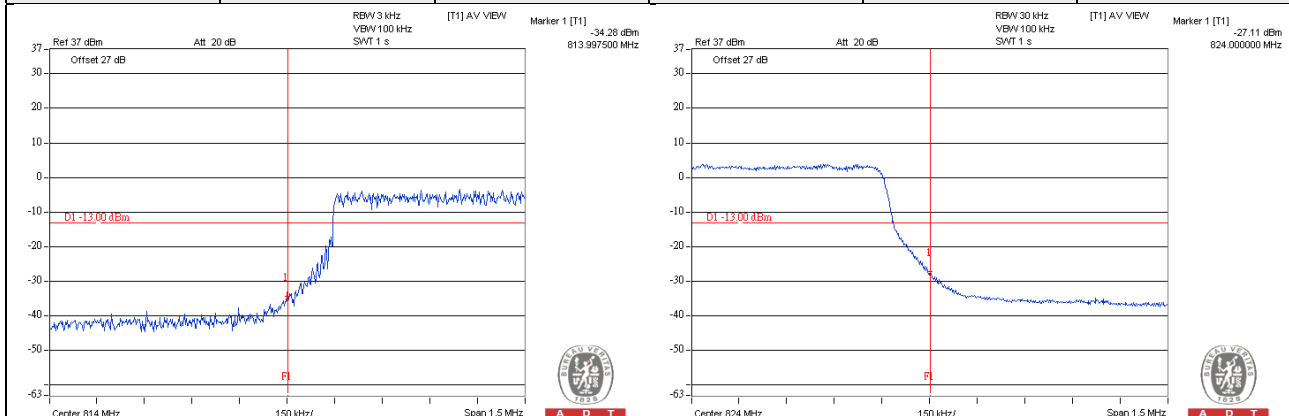
LTE Band 26

Channel Bandwidth 3MHz

Channel	26705	1 RB	Channel	26775	1 RB
---------	-------	------	---------	-------	------



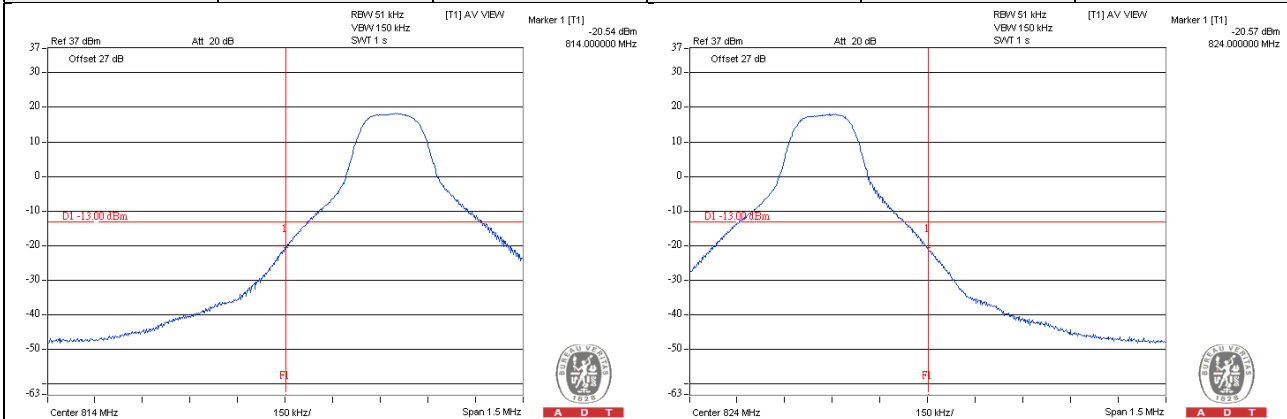
Channel	26705	1 RB	Channel	26775	15 RB
---------	-------	------	---------	-------	-------



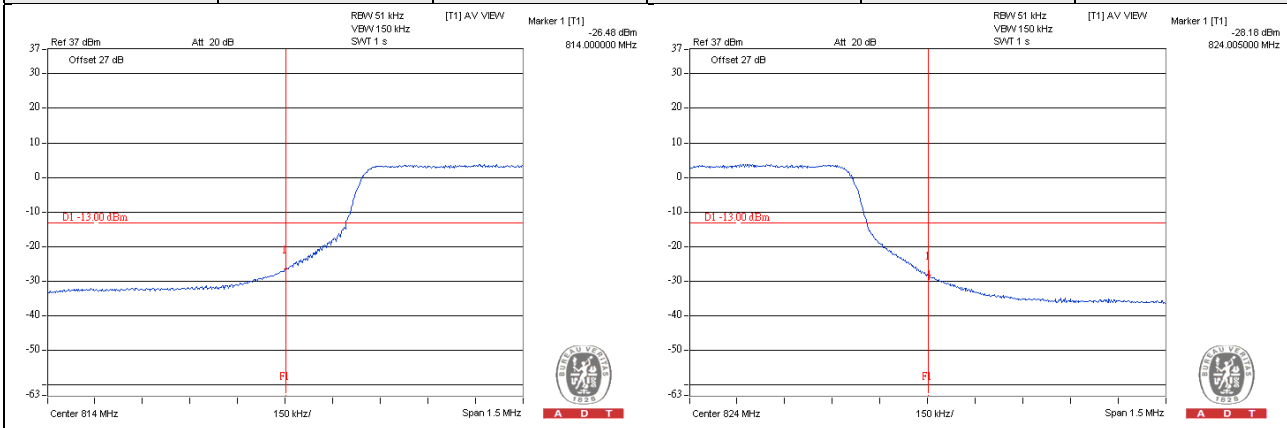
LTE Band 26

Channel Bandwidth 5MHz

Channel	26715	1 RB	Channel	26765	1 RB
---------	-------	------	---------	-------	------



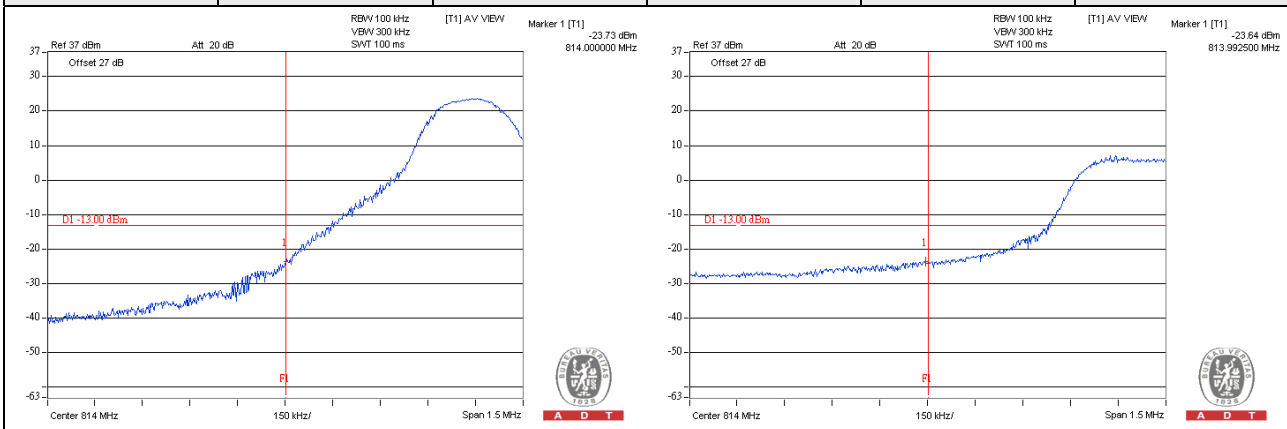
Channel	26715	25 RB	Channel	26765	25 RB
---------	-------	-------	---------	-------	-------



LTE Band 26

Channel Bandwidth 10MHz

Channel	26740	1 RB	Channel	26740	50 RB
---------	-------	------	---------	-------	-------



4.5 Emission Mask Measurement

4.5.1 Limits of Emission Mask Measurement

Per 90.210, equipment used in 809-824/854-869 MHz licensed band to EA or non-EA systems shall comply with the emission mask provisions of §90.691 of this chapter.

Per 90.691, Emission mask requirements

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

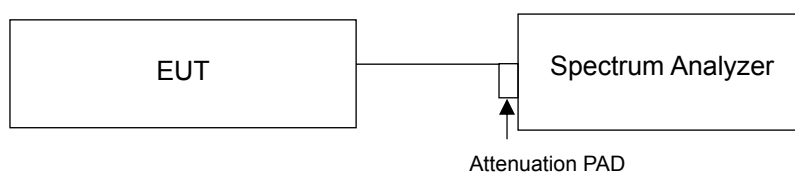
(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

4.5.2 Test Procedures

1. The power was measured with Agilent Spectrum Analyzer. All measurements were done at 1 channel.
2. The measurement used the power splitter via EUT RF power connector between signal generator and spectrum analyzer.
3. Record the test plot.

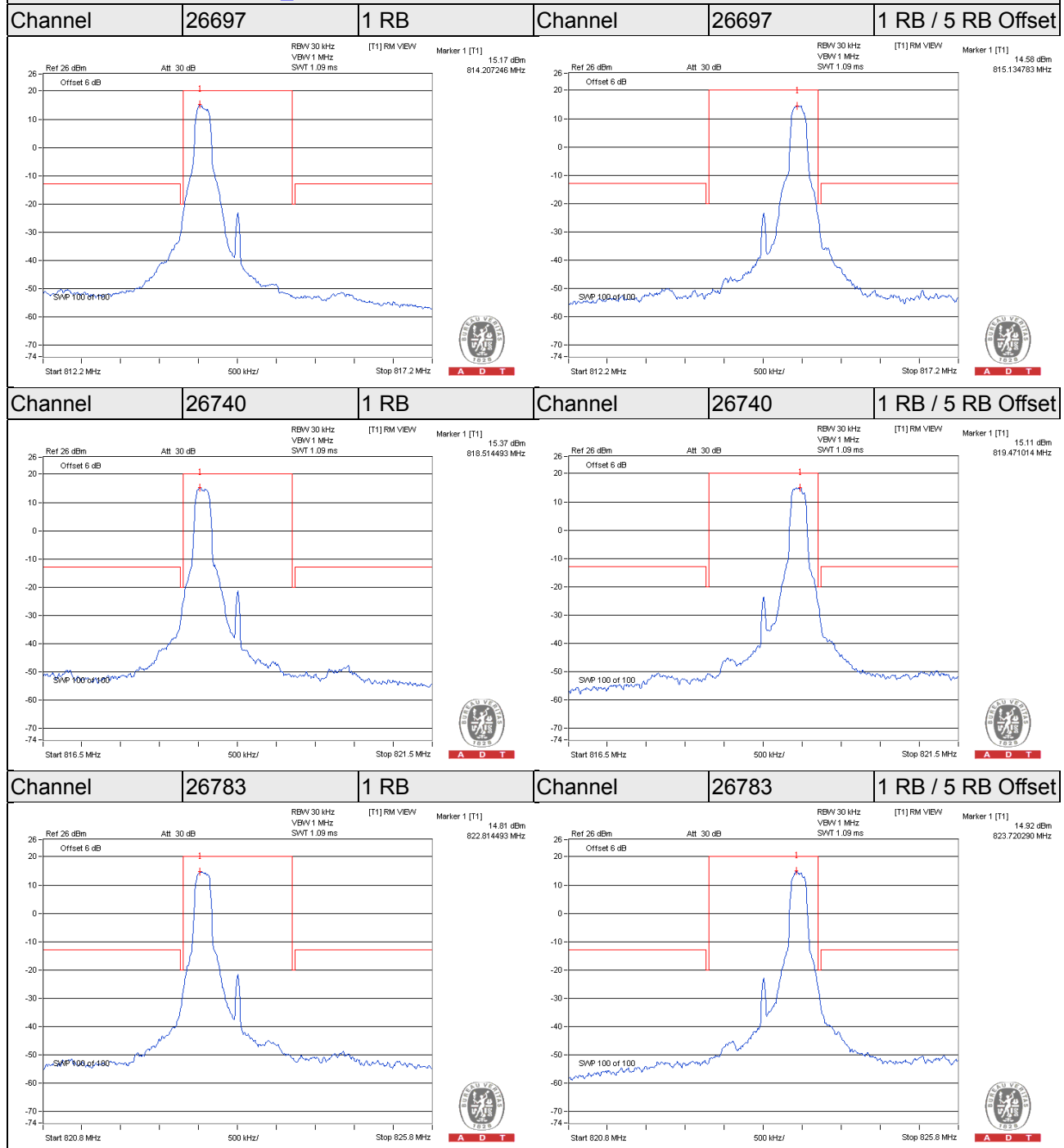
4.5.3 Test Setup



4.5.4 Test Results

LTE Band 26

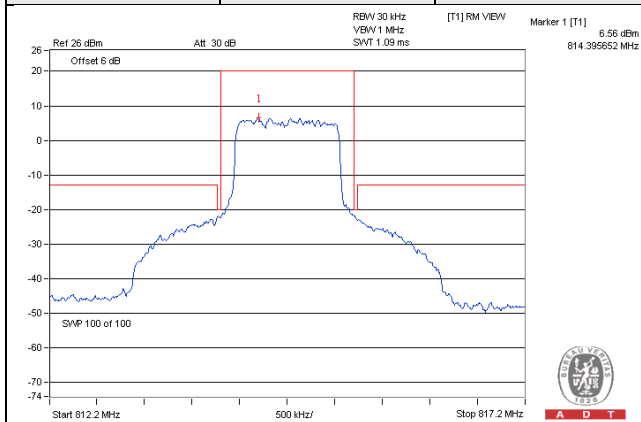
Channel Bandwidth 1.4MHz_ QPSK



LTE Band 26

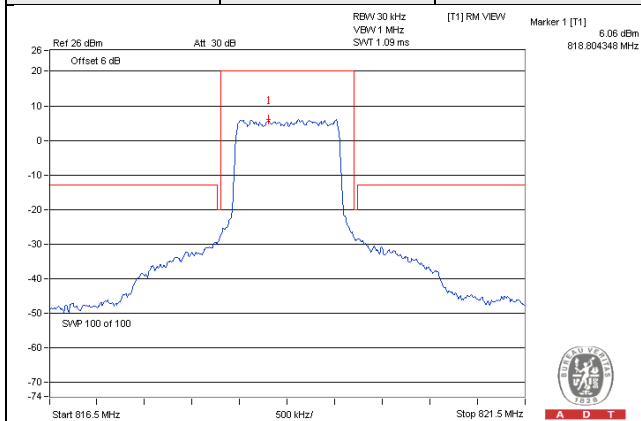
Channel Bandwidth 1.4MHz_ QPSK

Channel	26697	6 RB
---------	-------	------



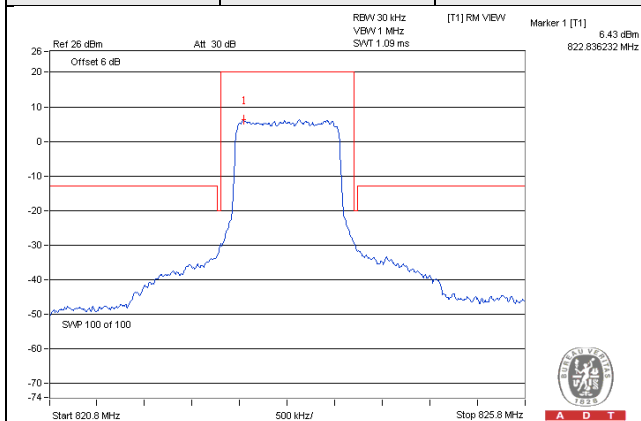
A D T

Channel	26740	6 RB
---------	-------	------



A D T

Channel	26783	6 RB
---------	-------	------

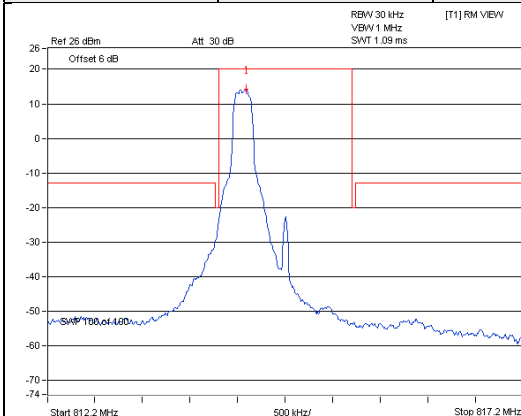


A D T

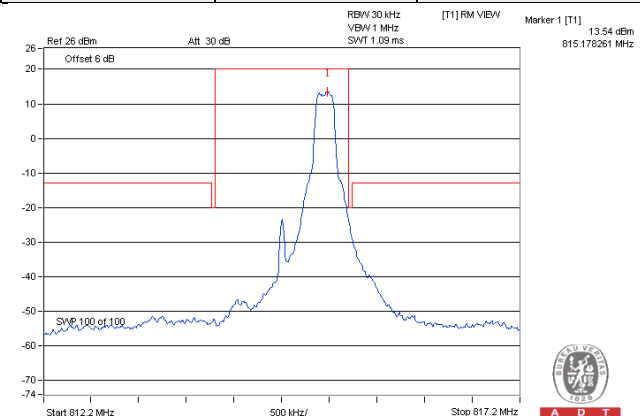
LTE Band 26

Channel Bandwidth 1.4MHz_16QAM

Channel	26697	1 RB	Channel	26697	1 RB / 5 RB Offset
---------	-------	------	---------	-------	--------------------

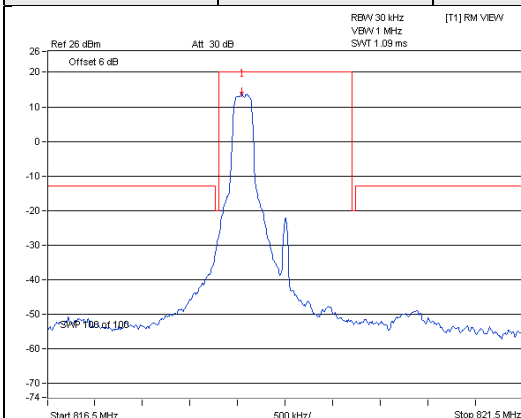


A D T

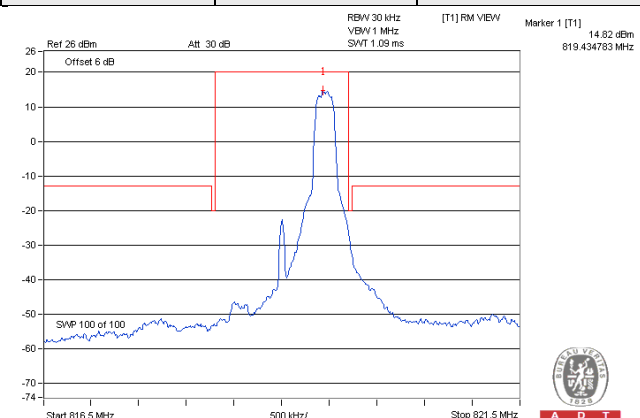


A D T

Channel	26740	1 RB	Channel	26740	1 RB / 5 RB Offset
---------	-------	------	---------	-------	--------------------

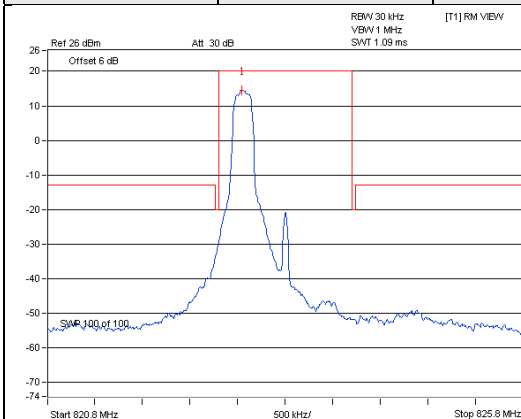


A D T

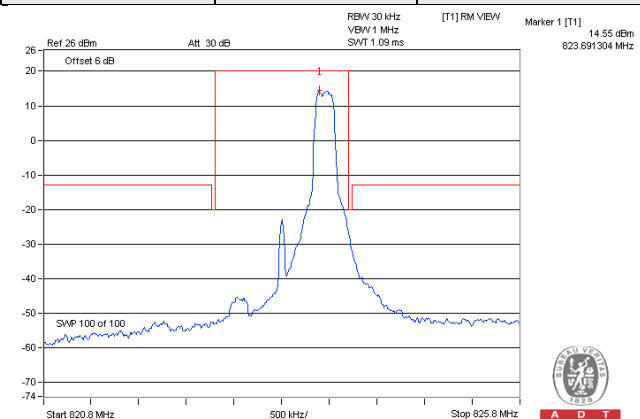


A D T

Channel	26783	1 RB	Channel	26783	1 RB / 5 RB Offset
---------	-------	------	---------	-------	--------------------



A D T

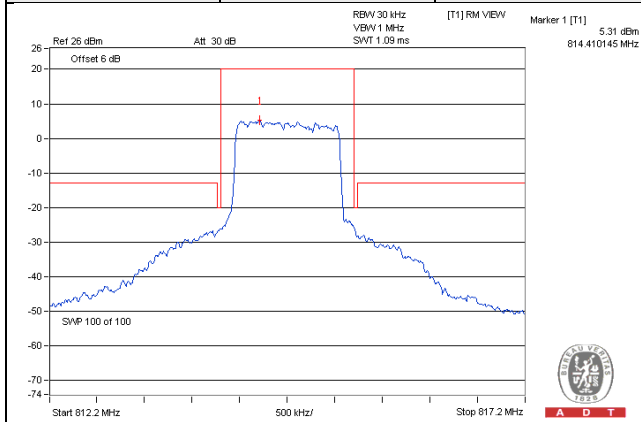


A D T

LTE Band 26

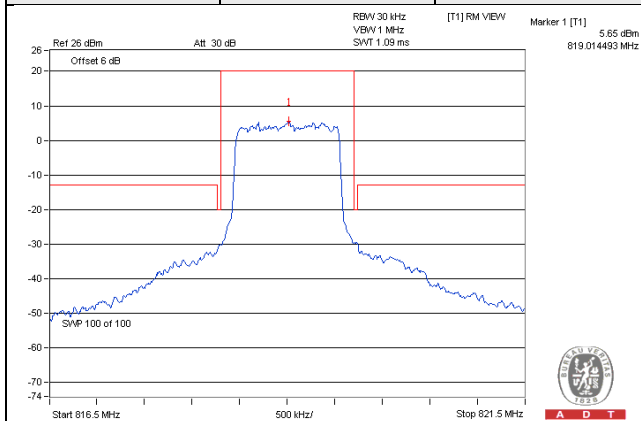
Channel Bandwidth 1.4MHz_16QAM

Channel	26697	6 RB
---------	-------	------



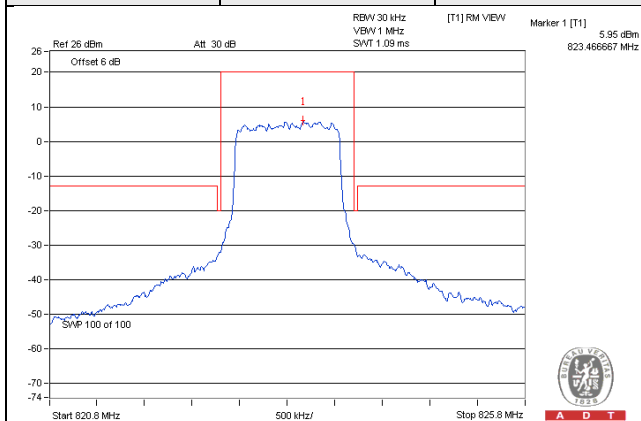
A D T

Channel	26740	6 RB
---------	-------	------



A D T

Channel	26783	6 RB
---------	-------	------

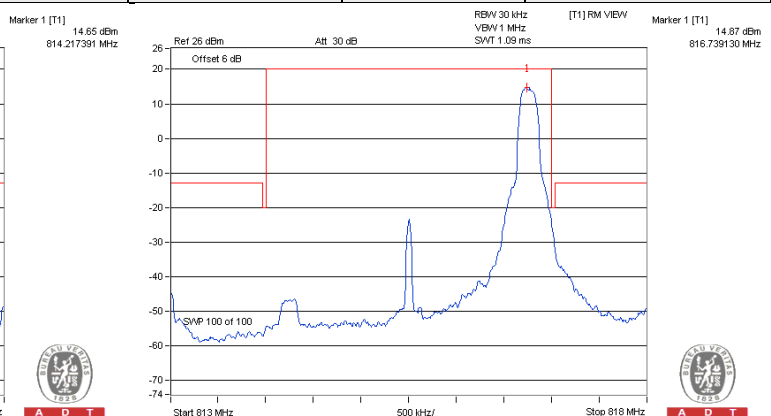
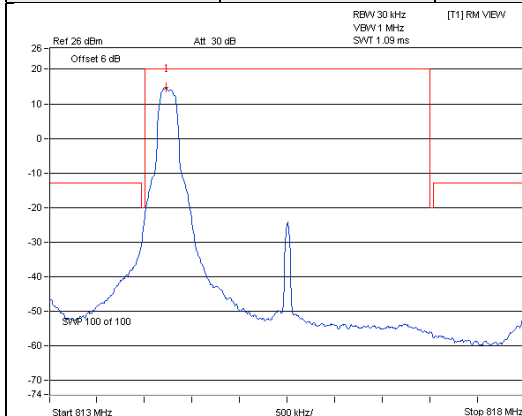


A D T

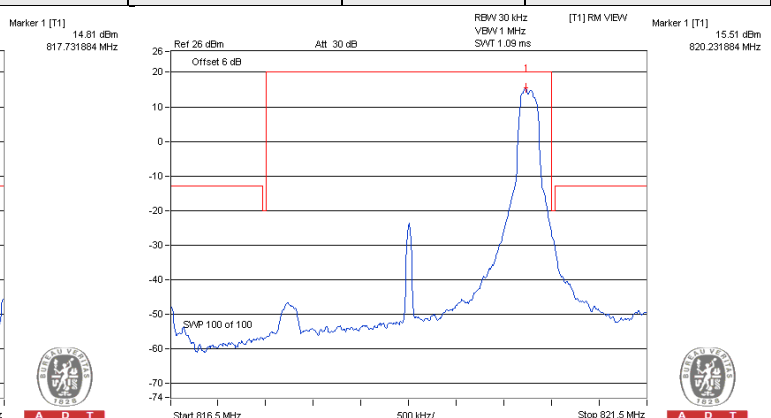
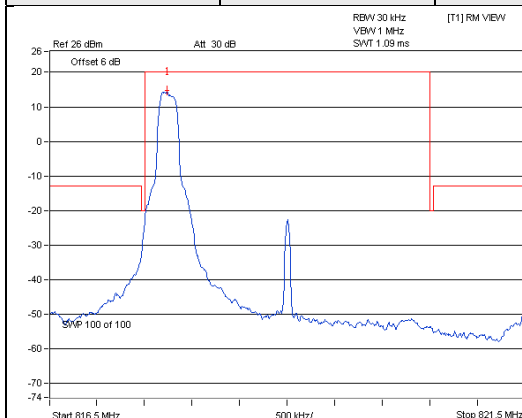
LTE Band 26

Channel Bandwidth 3MHz_QPSK

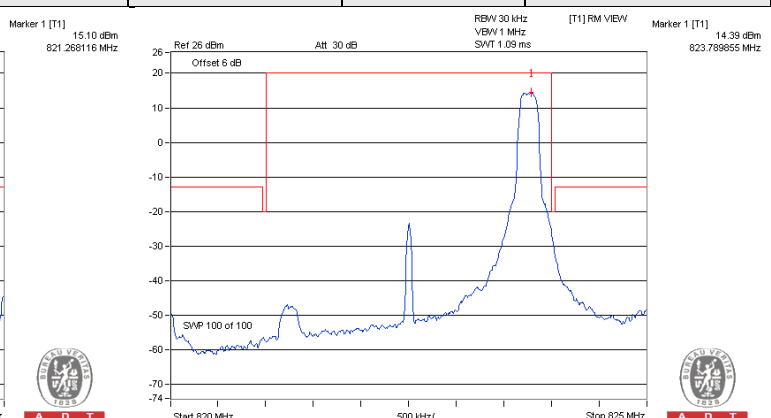
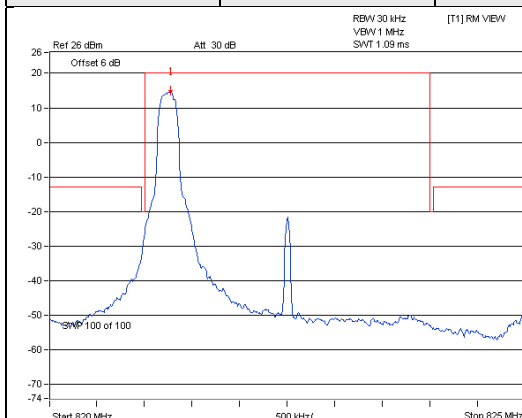
Channel	26705	1 RB	Channel	26705	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



Channel	26740	1 RB	Channel	26740	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



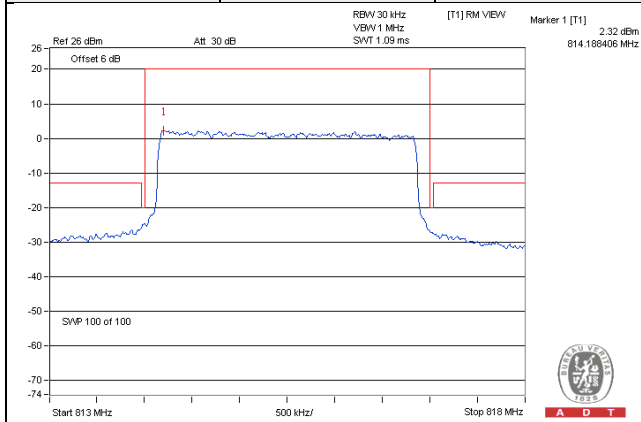
Channel	26775	1 RB	Channel	26775	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



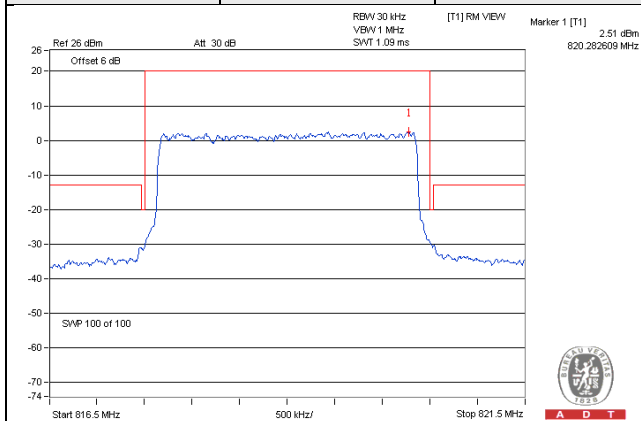
LTE Band 26

Channel Bandwidth 3MHz_ QPSK

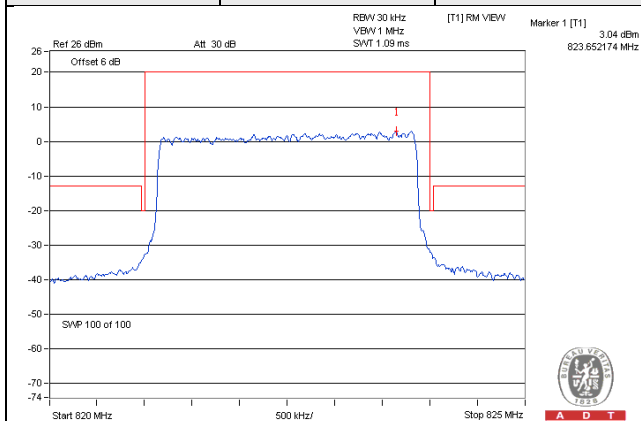
Channel	26705	15 RB
---------	-------	-------



Channel	26740	15 RB
---------	-------	-------



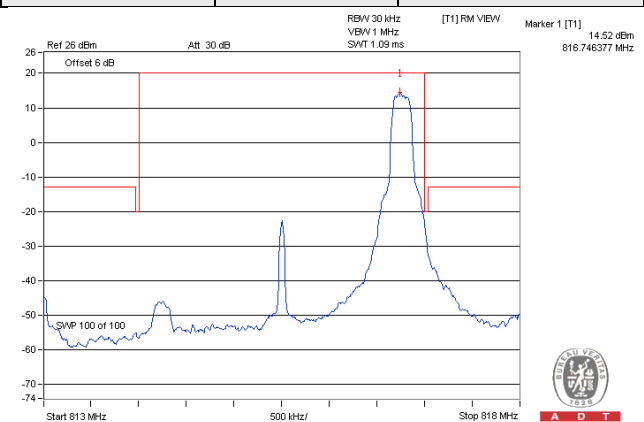
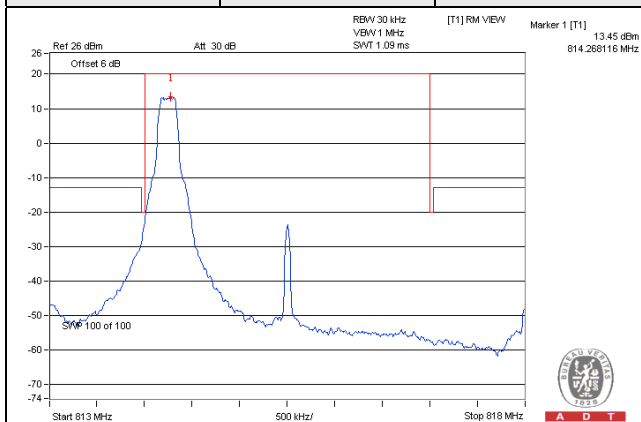
Channel	26775	15 RB
---------	-------	-------



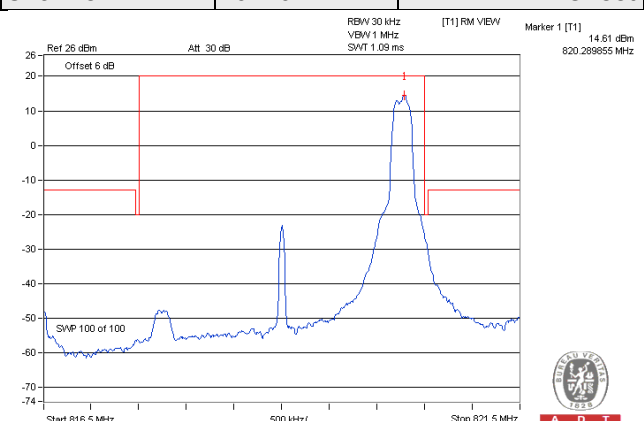
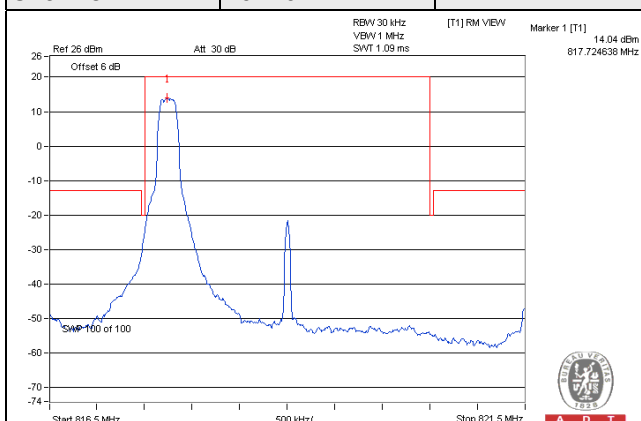
LTE Band 26

Channel Bandwidth 3MHz_16QAM

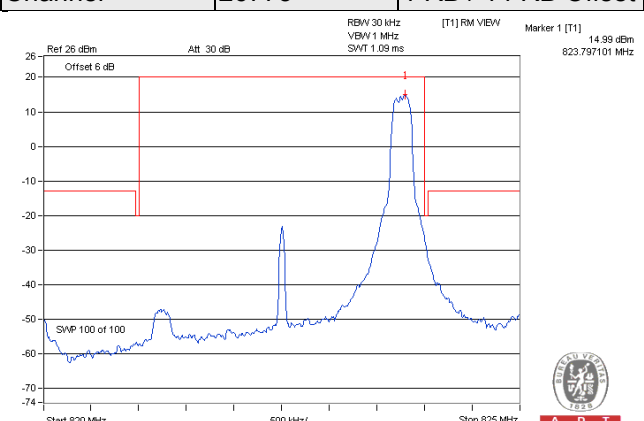
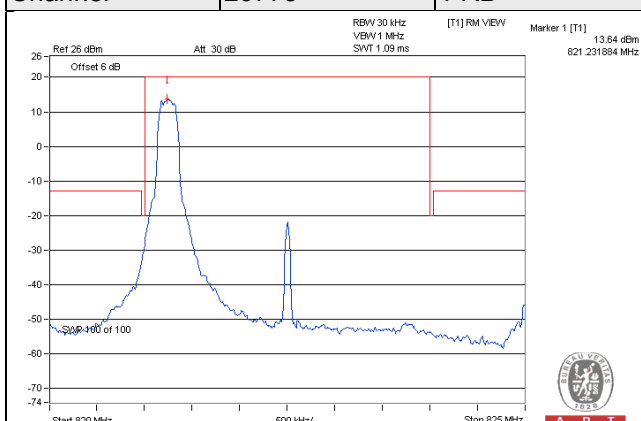
Channel	26705	1 RB	Channel	26705	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



Channel	26740	1 RB	Channel	26740	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



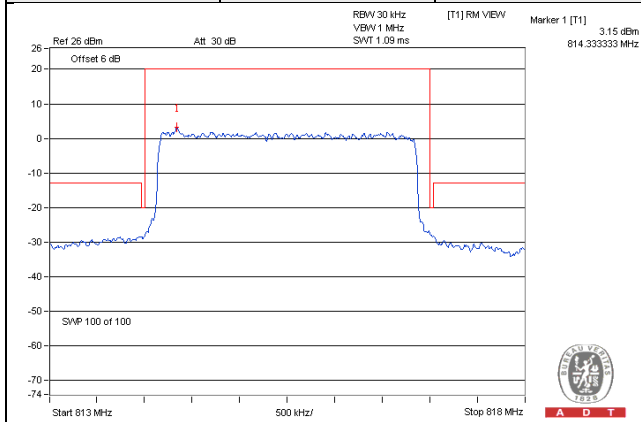
Channel	26775	1 RB	Channel	26775	1 RB / 14 RB Offset
---------	-------	------	---------	-------	---------------------



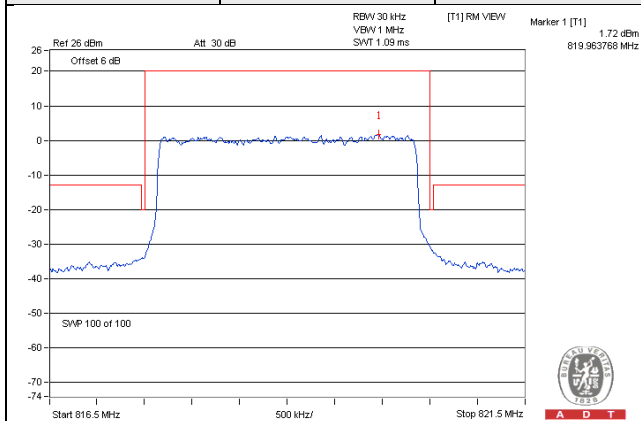
LTE Band 26

Channel Bandwidth 3MHz_16QAM

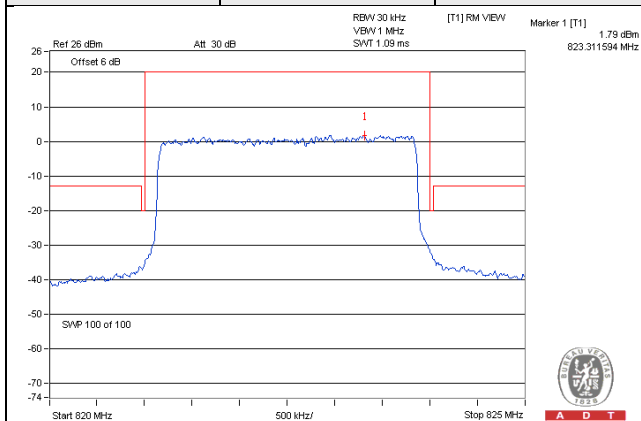
Channel	26705	15 RB
---------	-------	-------



Channel	26740	15 RB
---------	-------	-------



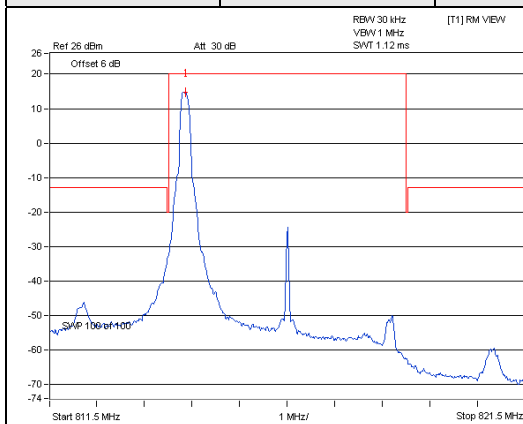
Channel	26775	15 RB
---------	-------	-------



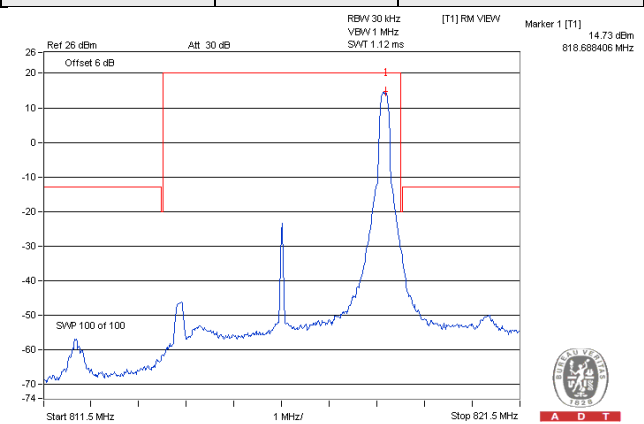
LTE Band 26

Channel Bandwidth 5MHz_QPSK

Channel	26715	1 RB	Channel	26715	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------

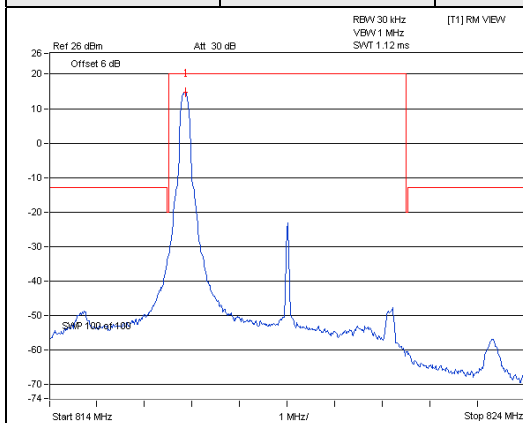


A D T

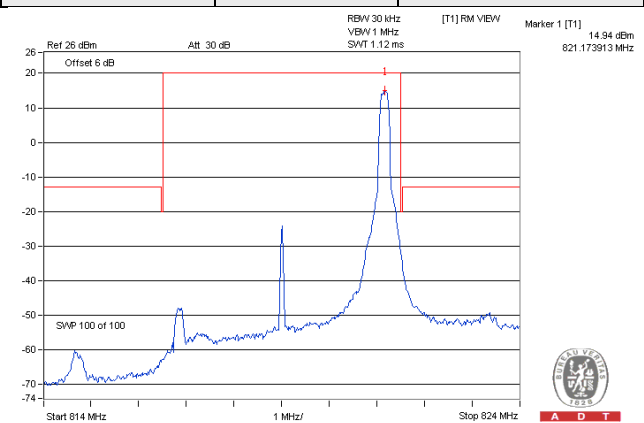


A D T

Channel	26740	1 RB	Channel	26740	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------

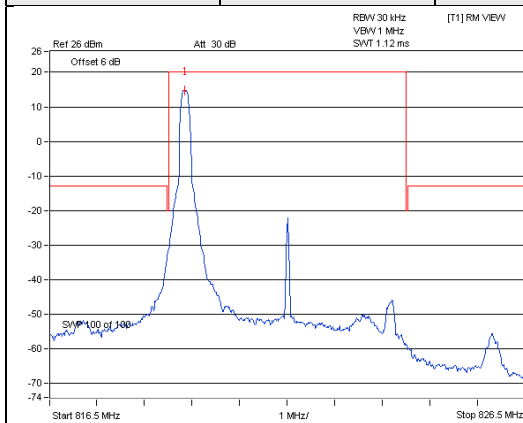


A D T

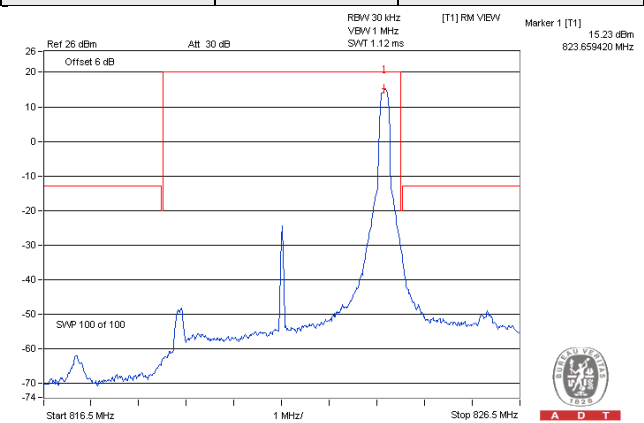


A D T

Channel	26765	1 RB	Channel	26765	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------



A D T

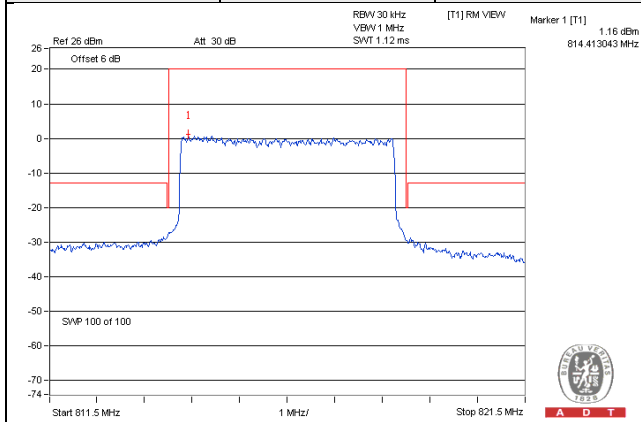


A D T

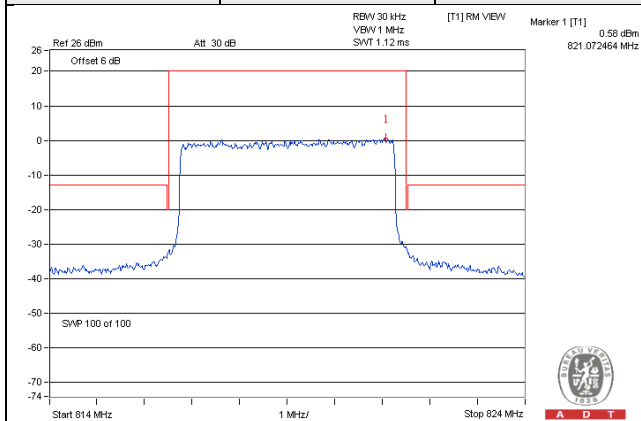
LTE Band 26

Channel Bandwidth 5MHz_QPSK

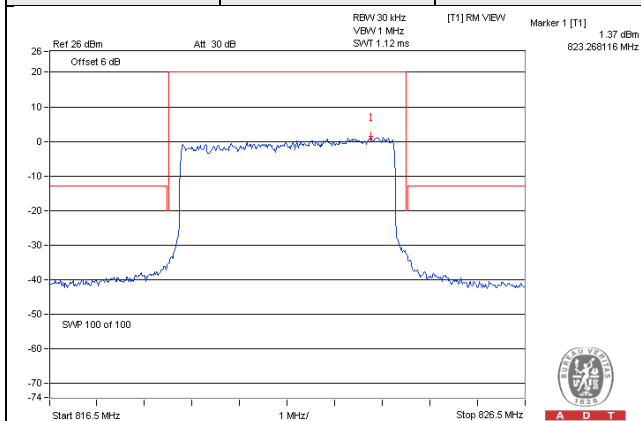
Channel	26715	25 RB
---------	-------	-------



Channel	26740	25 RB
---------	-------	-------



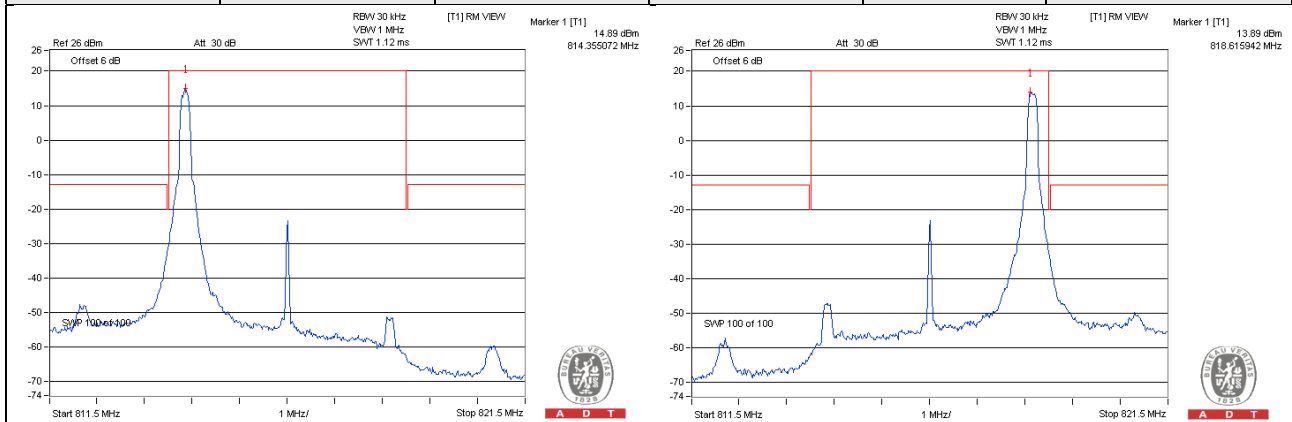
Channel	26765	25 RB
---------	-------	-------



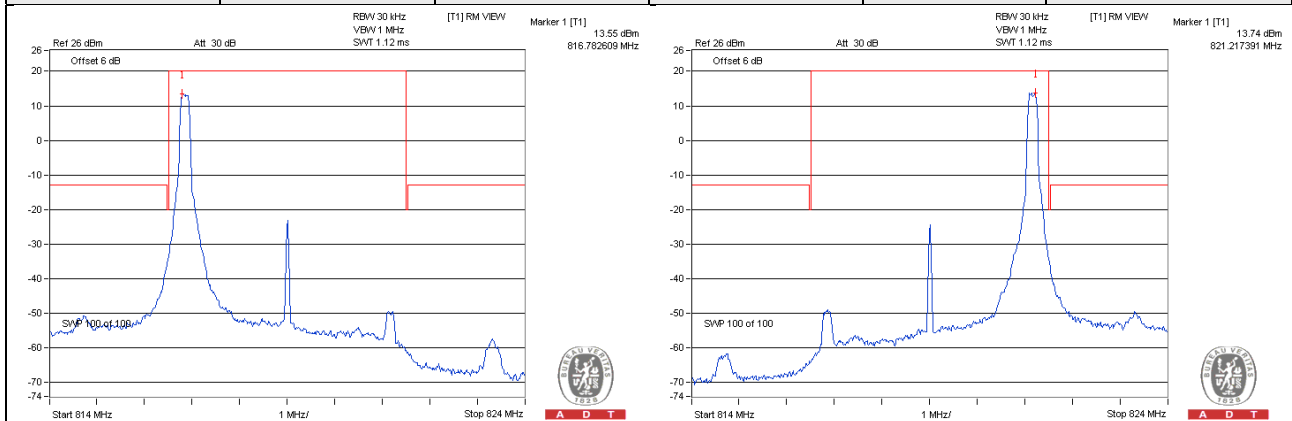
LTE Band 26

Channel Bandwidth 5MHz_16QAM

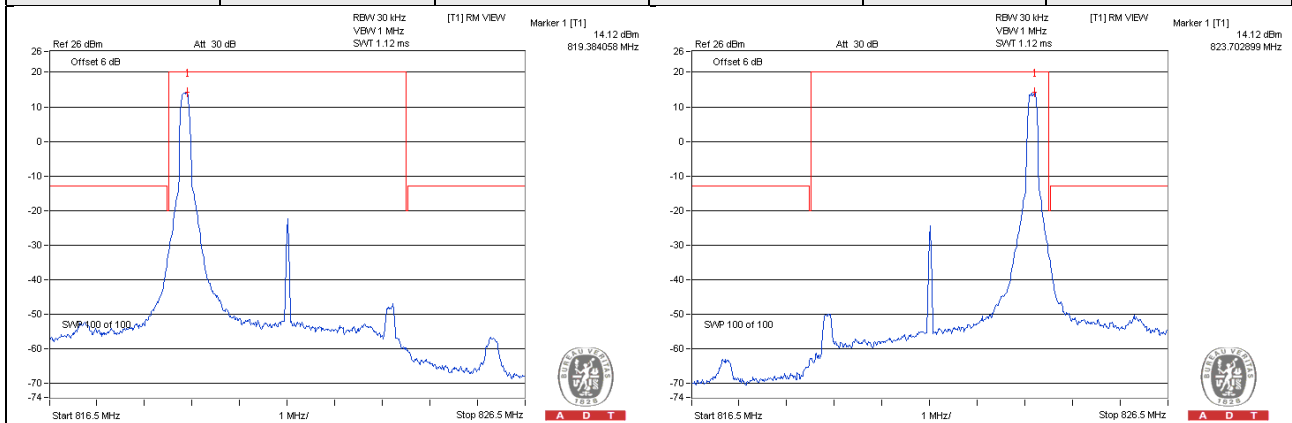
Channel	26715	1 RB	Channel	26715	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------



Channel	26740	1 RB	Channel	26740	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------



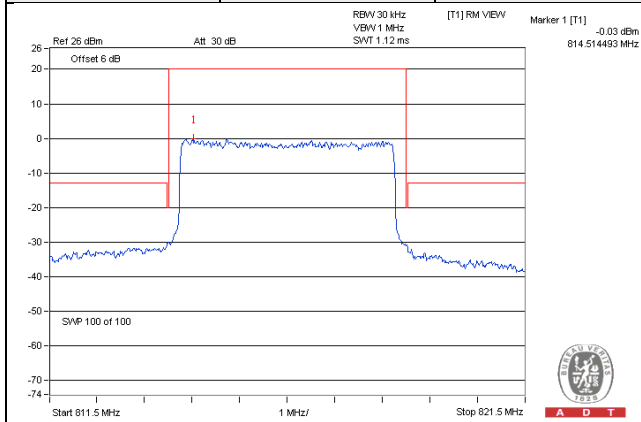
Channel	26765	1 RB	Channel	26765	1 RB / 24 RB Offset
---------	-------	------	---------	-------	---------------------



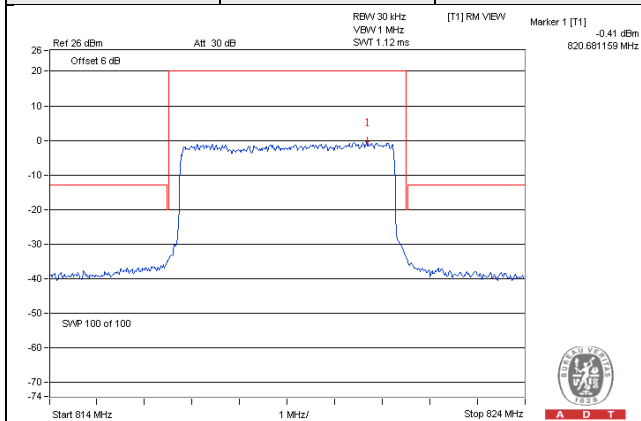
LTE Band 26

Channel Bandwidth 5MHz_16QAM

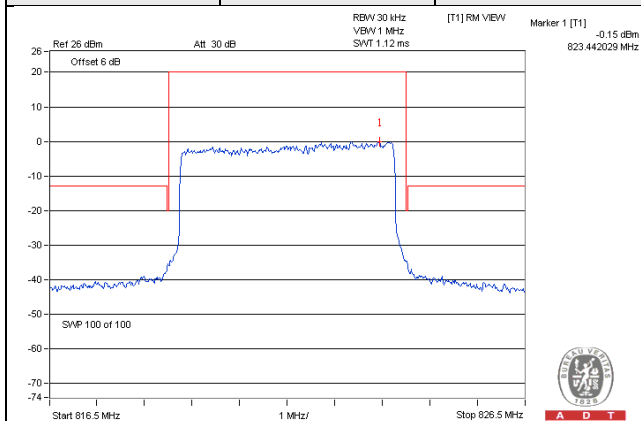
Channel	26715	25 RB
---------	-------	-------



Channel	26740	25 RB
---------	-------	-------



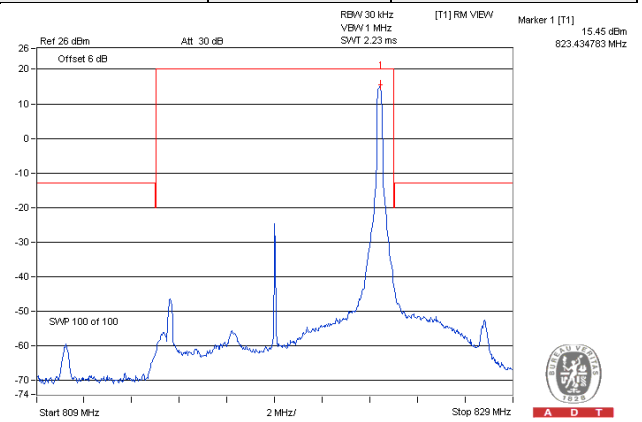
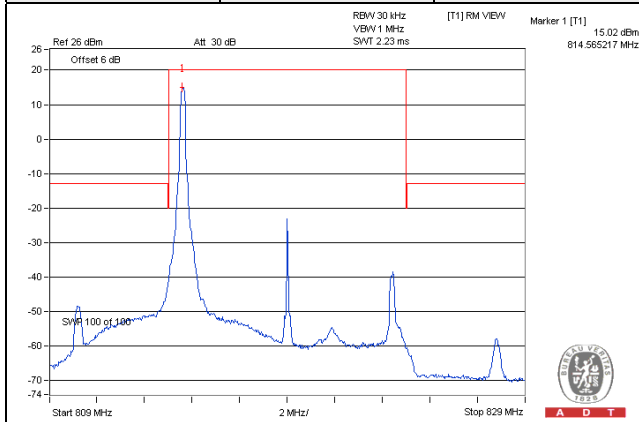
Channel	26765	25 RB
---------	-------	-------



LTE Band 26

Channel Bandwidth 10MHz_QPSK

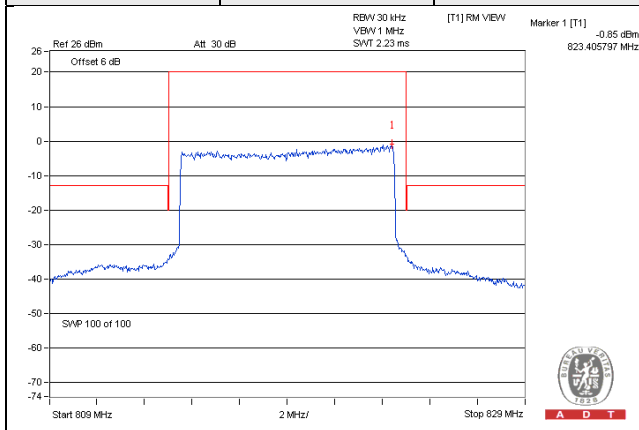
Channel	26740	1 RB	Channel	26740	1 RB / 49 RB Offset
---------	-------	------	---------	-------	---------------------



LTE Band 26

Channel Bandwidth 10MHz_QPSK

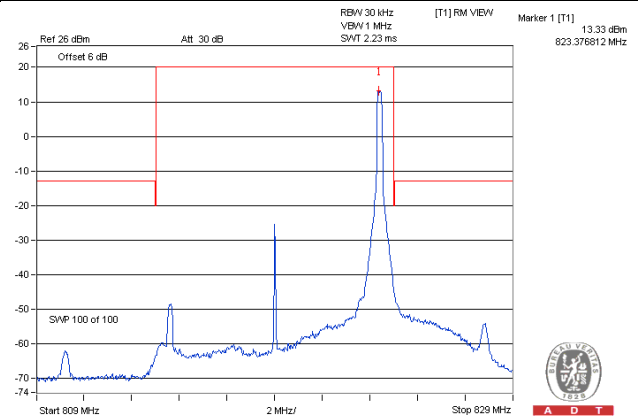
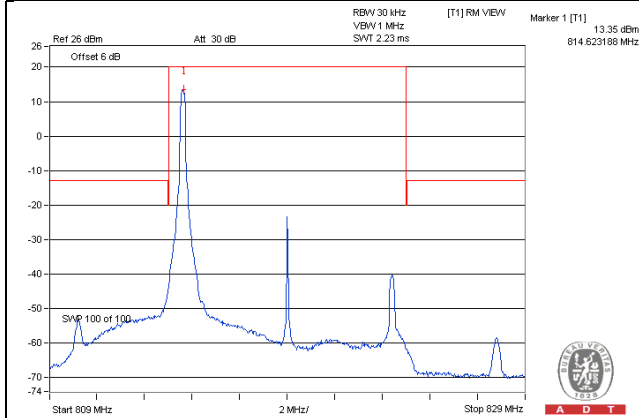
Channel	26740	50 RB
---------	-------	-------



LTE Band 26

Channel Bandwidth 10MHz_16QAM

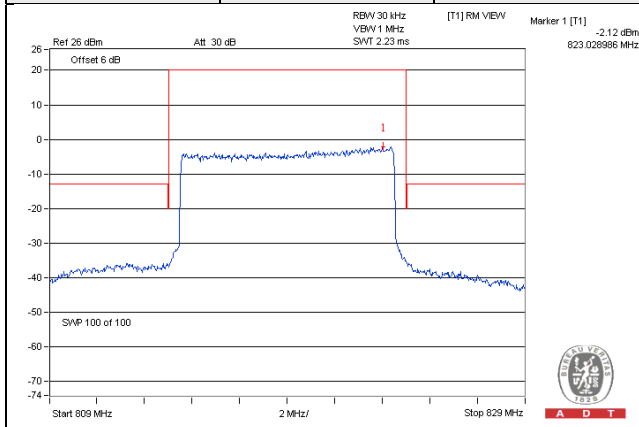
Channel	26740	1 RB	Channel	26740	1 RB / 49 RB Offset
---------	-------	------	---------	-------	---------------------



LTE Band 26

Channel Bandwidth 10MHz_16QAM

Channel	26740	50 RB
---------	-------	-------

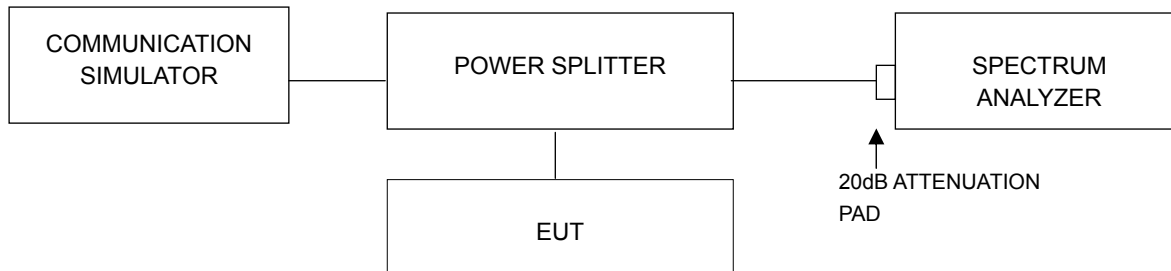


4.6 Peak to Average Ratio

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

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

4.6.4 Test Results

LTE Band 26							
Channel Bandwidth 1.4MHz				Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26697	814.70	5.00	5.00	26705	815.50	5.20	5.15
26740	819.00	5.23	5.23	26740	819.00	5.33	5.30
26783	823.30	5.37	5.35	26775	822.50	5.44	5.42
Channel Bandwidth 5MHz				Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26715	816.50	5.35	5.31	26740	819.00	5.76	5.77
26740	819.00	5.41	5.40				
26765	821.50	5.46	5.46				

Spectrum Plot Of Worst Value



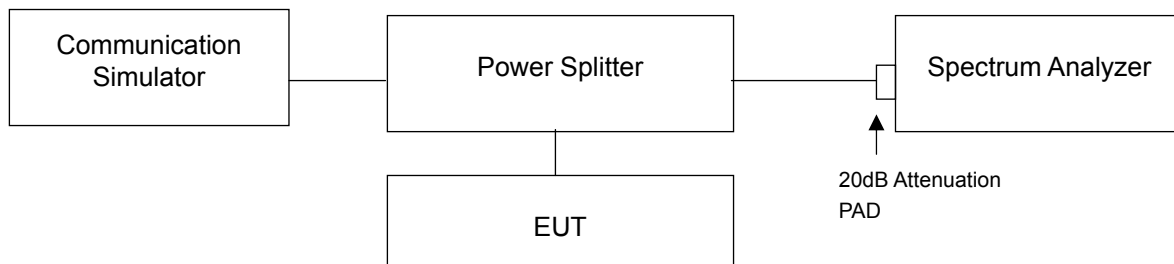
4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm .

On all frequencies between 769 – 775 MHz and 799 – 805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

4.7.2 Test Setup



4.7.3 Test Procedure

- The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Agilent Spectrum Analyzer.
- The conducted spurious emission used the power splitter via EUT RF power connector between signal generator and spectrum analyzer.
- When the spectrum scanned from 9kHz to 9GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set $RB=1\text{MHz}$, $VB=3\text{MHz}$.

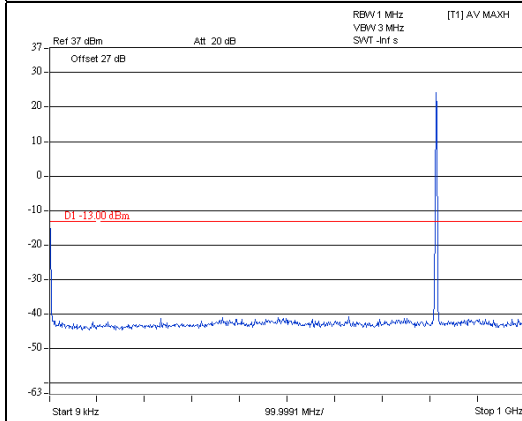
4.7.4 Test Results

LTE Band 26 Channel Band width: 1.4MHz

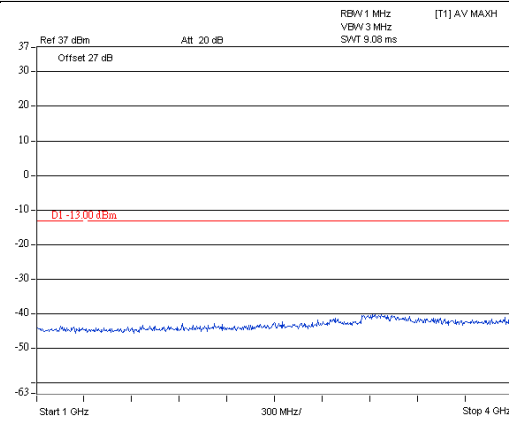
Channel 26697

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



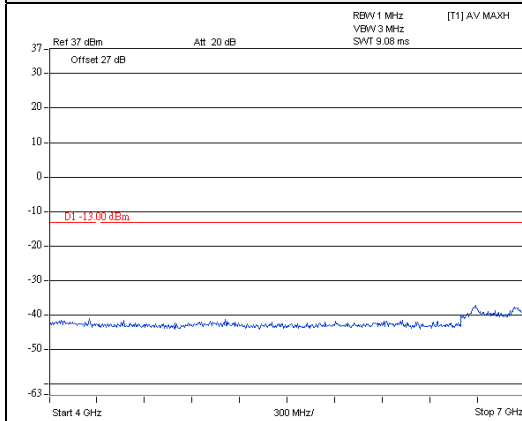
A D T



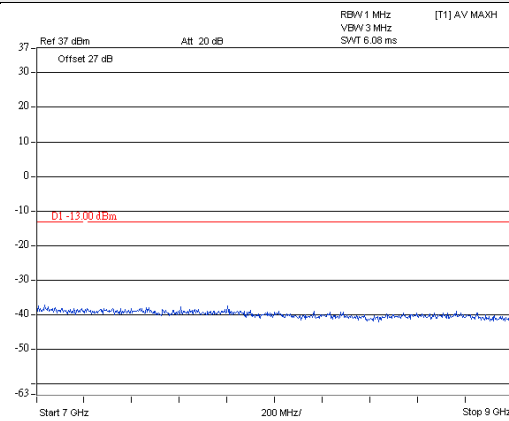
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



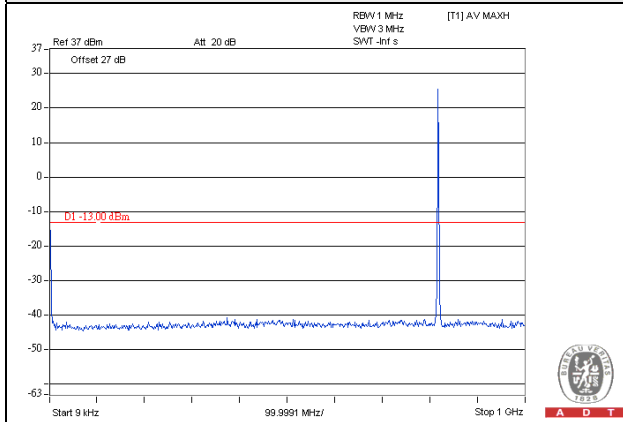
A D T

LTE Band 26 Channel Band width: 1.4MHz

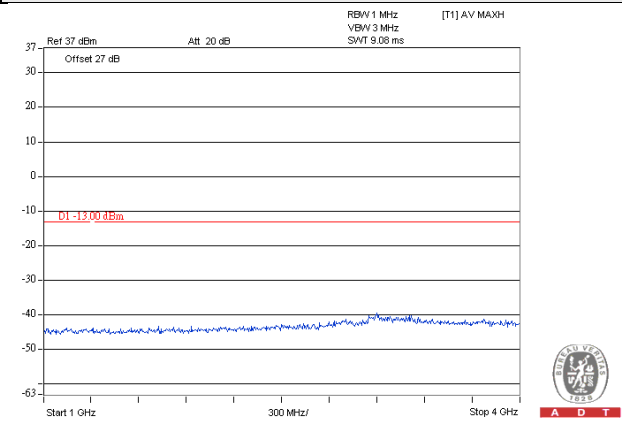
Channel 26740

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



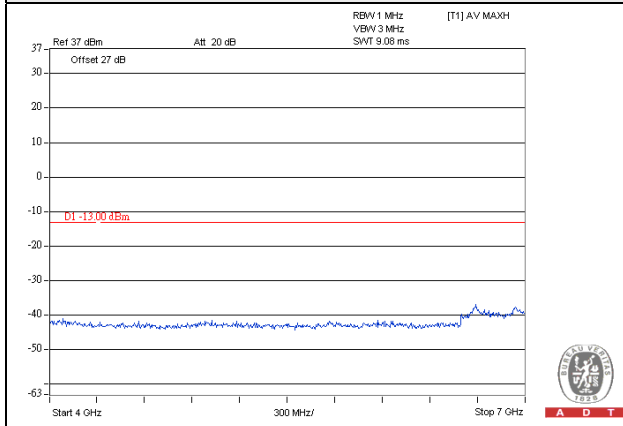
A D T



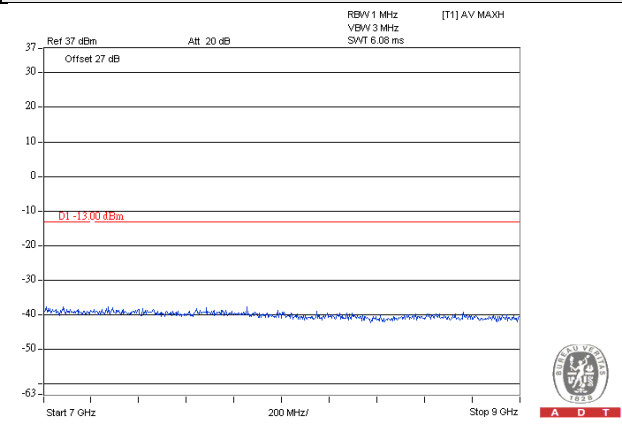
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



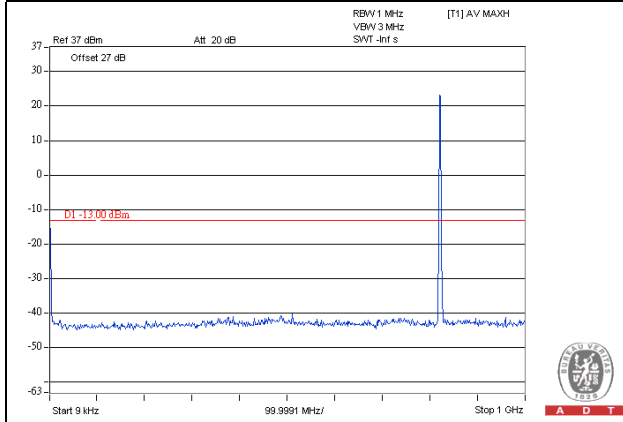
A D T

LTE Band 26 Channel Band width: 1.4MHz

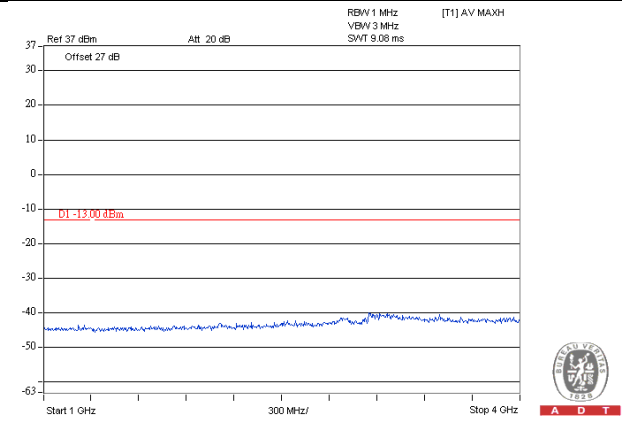
Channel 26783

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



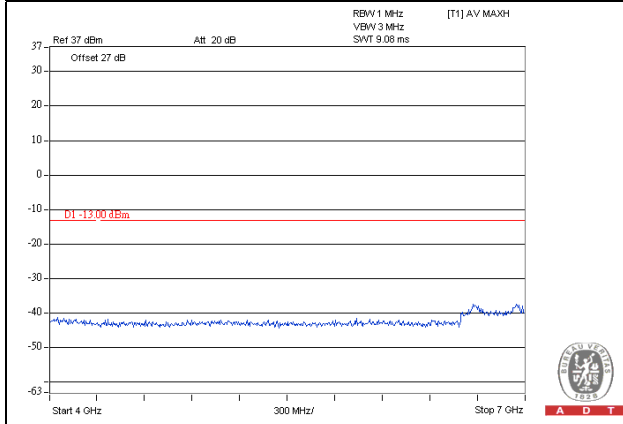
A D T



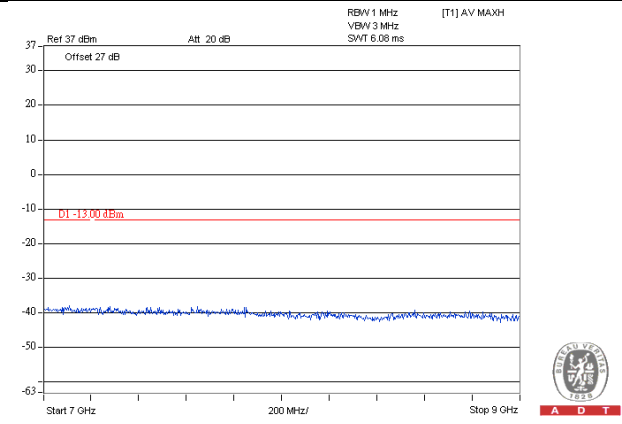
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



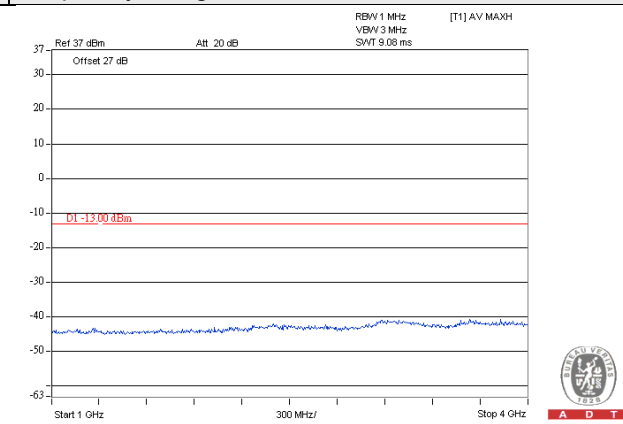
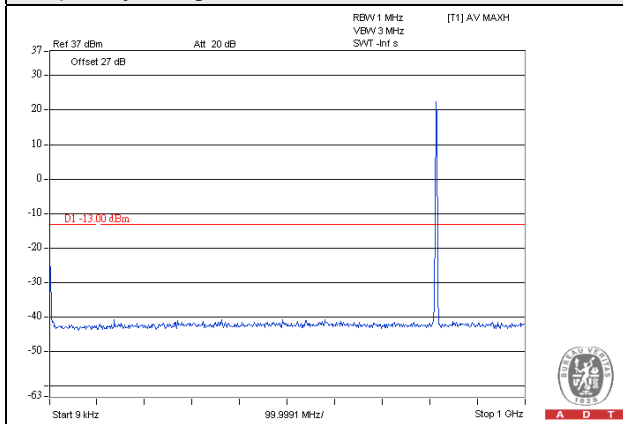
A D T

LTE Band 26 Channel Band width: 3MHz

Channel 26705

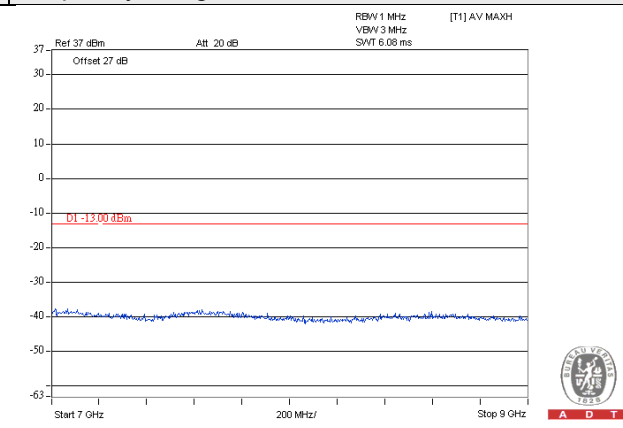
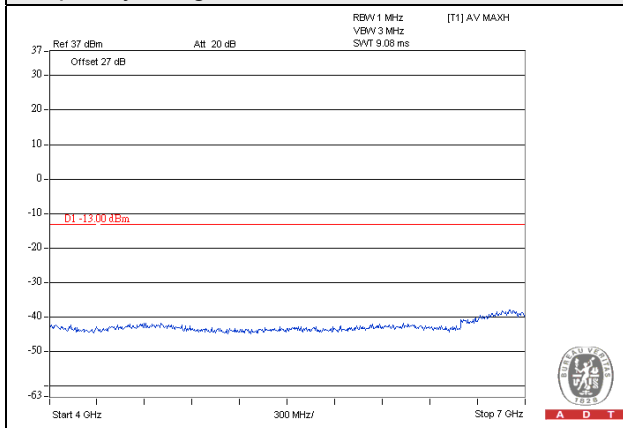
Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz

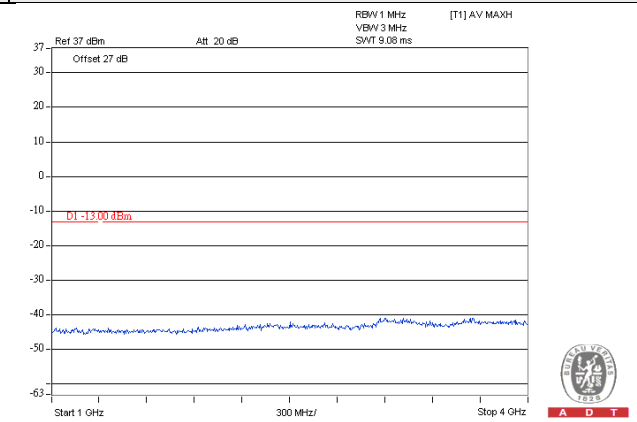
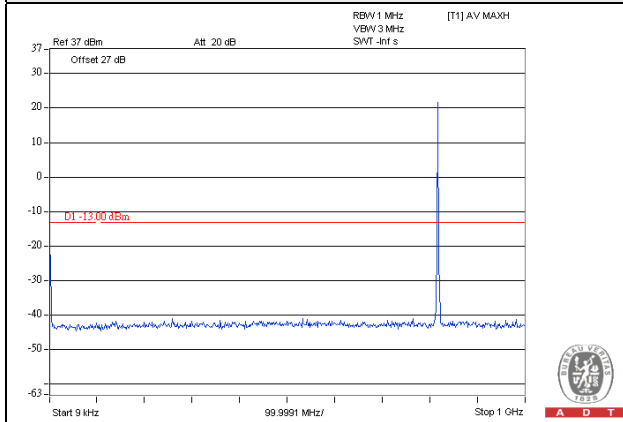


LTE Band 26 Channel Band width: 3MHz

Channel 26740

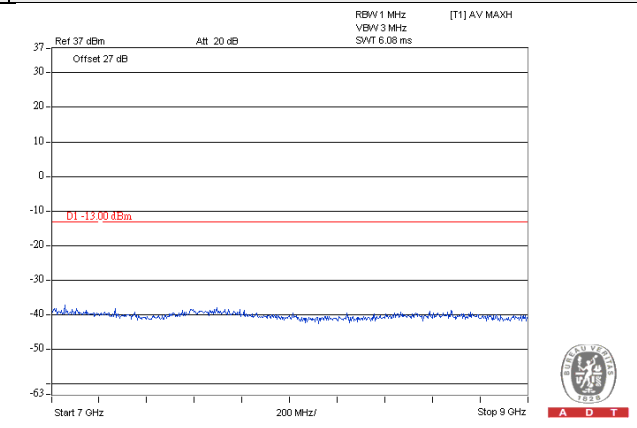
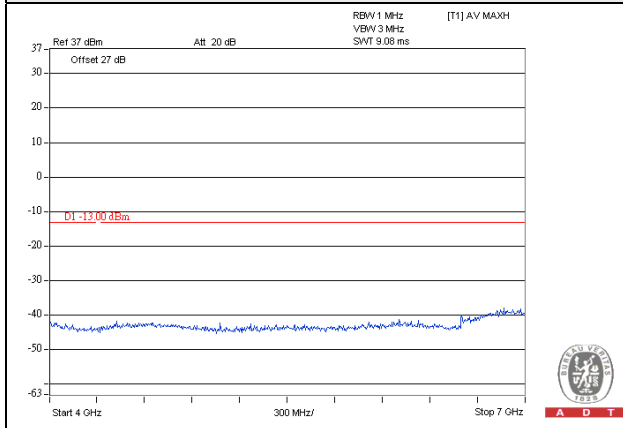
Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz

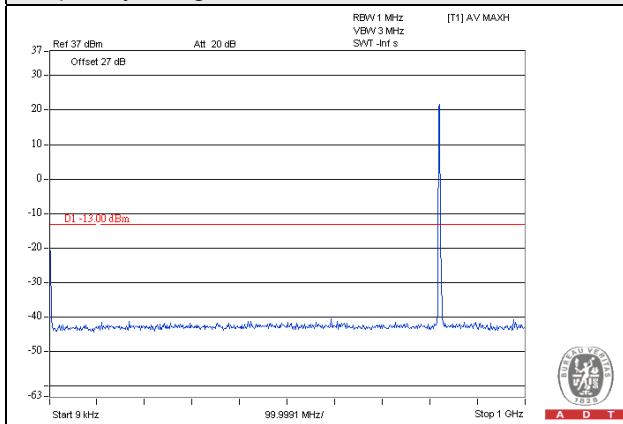


LTE Band 26 Channel Band width: 3MHz

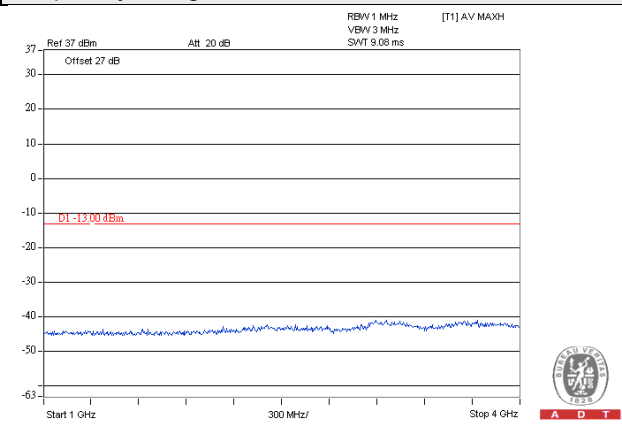
Channel 26775

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



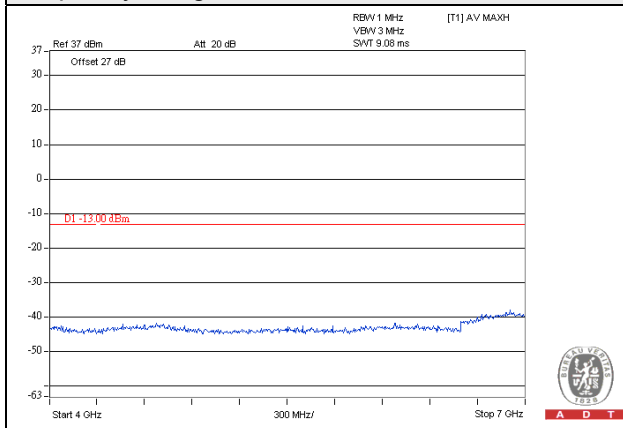
A D T



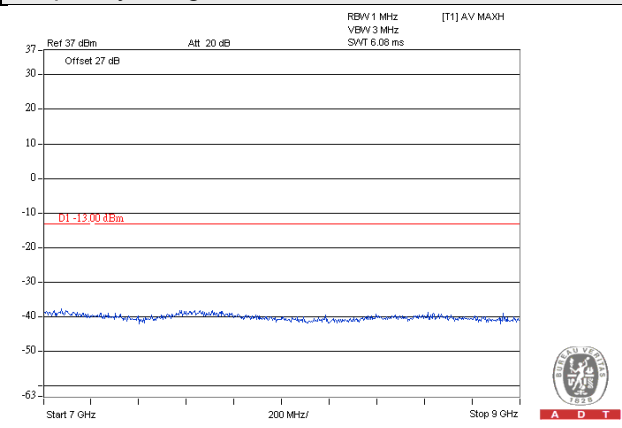
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



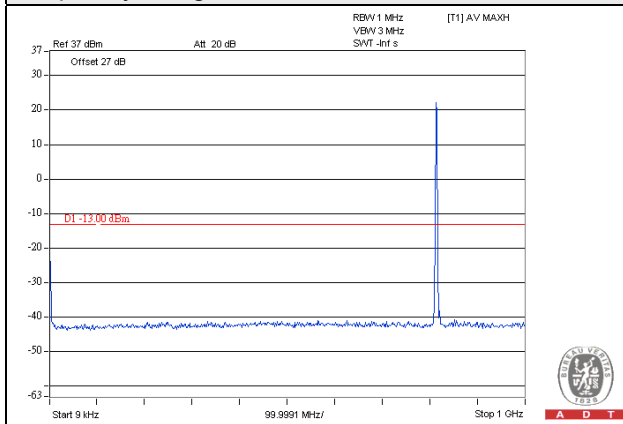
A D T

LTE Band 26 Channel Band width: 5MHz

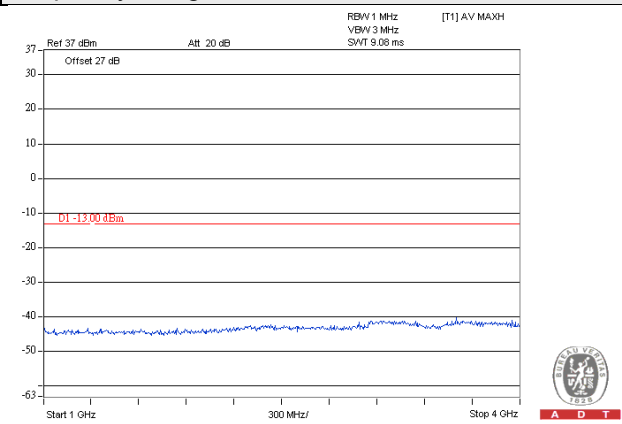
Channel 26715

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



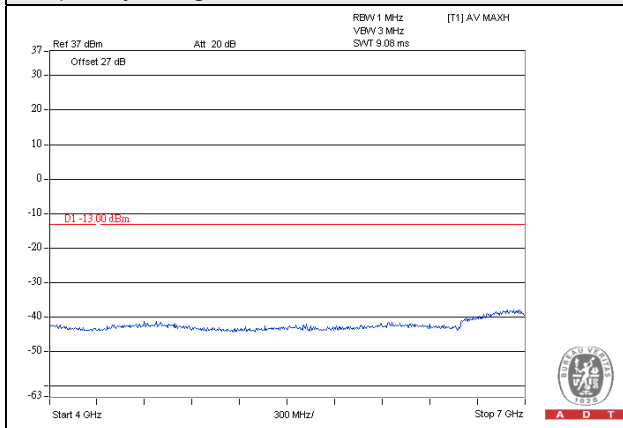
A D T



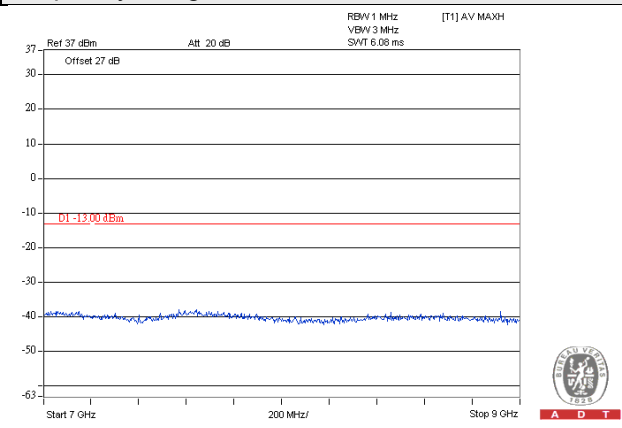
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



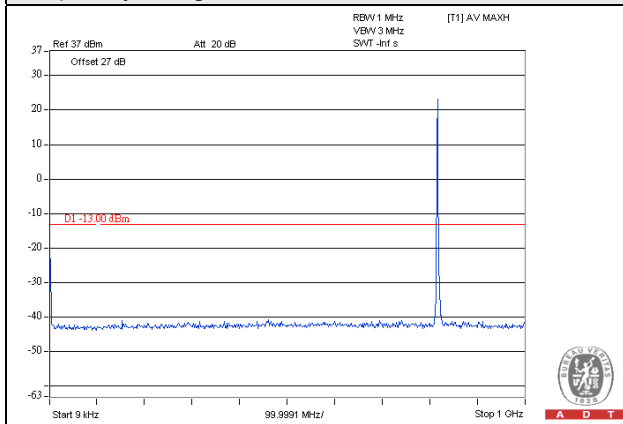
A D T

LTE Band 26 Channel Band width: 5MHz

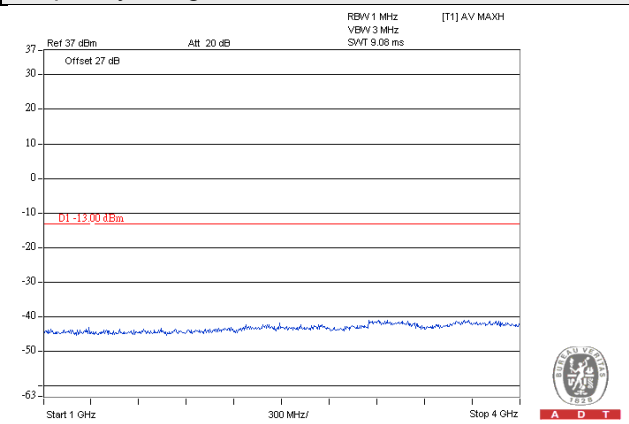
Channel 26740

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



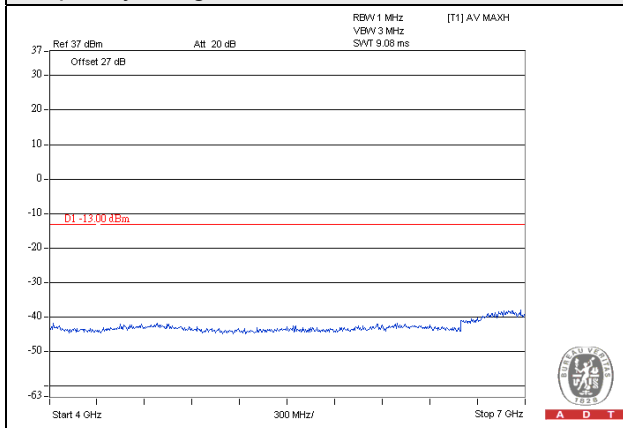
A D T



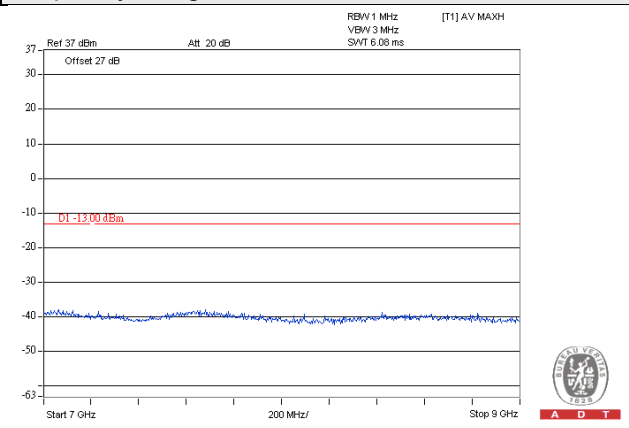
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



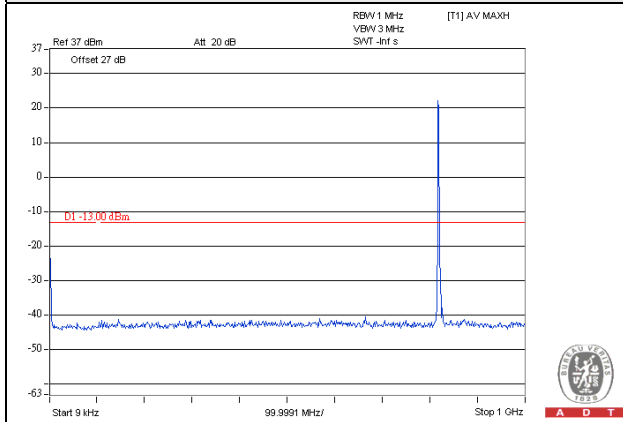
A D T

LTE Band 26 Channel Band width: 5MHz

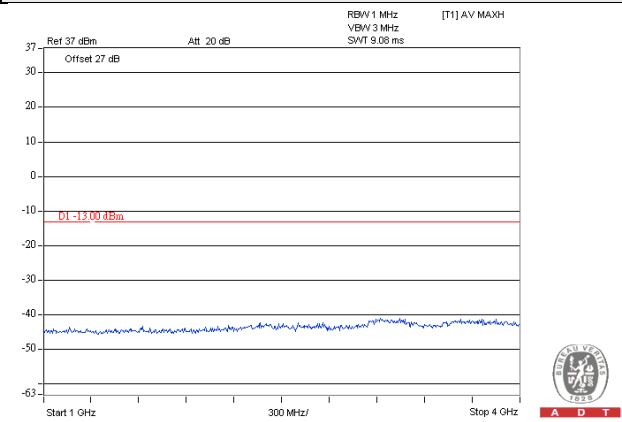
Channel 26765

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



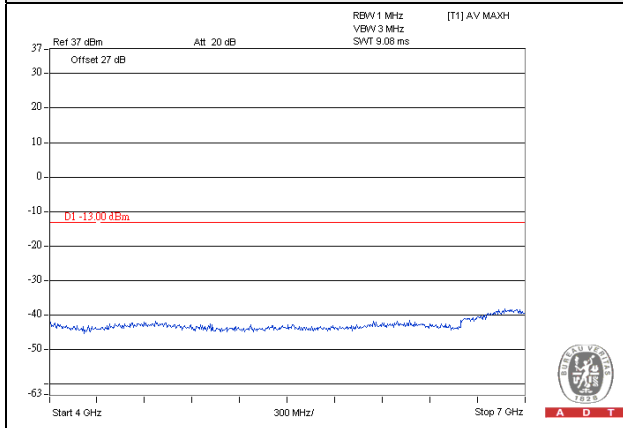
A D T



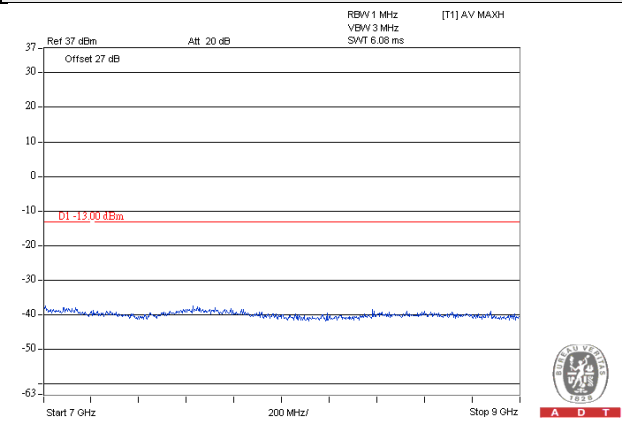
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



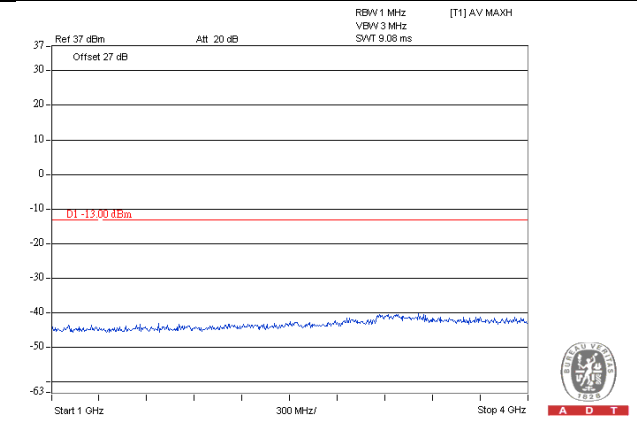
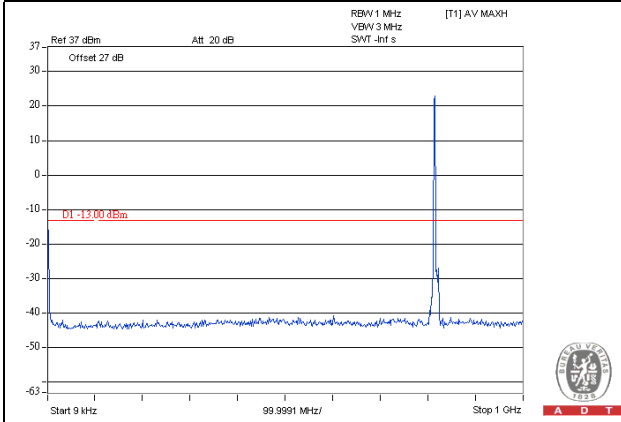
A D T

LTE Band 26 Channel Band width: 10MHz

Channel 26740

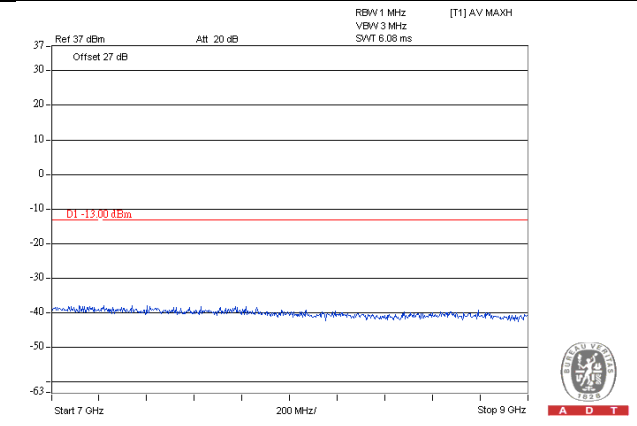
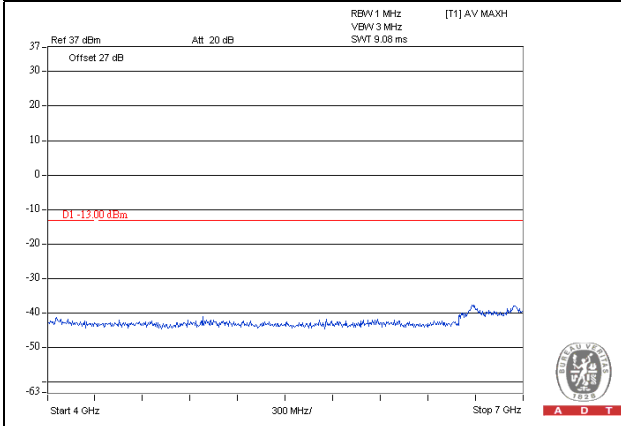
Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

4.8.2 Test Procedure

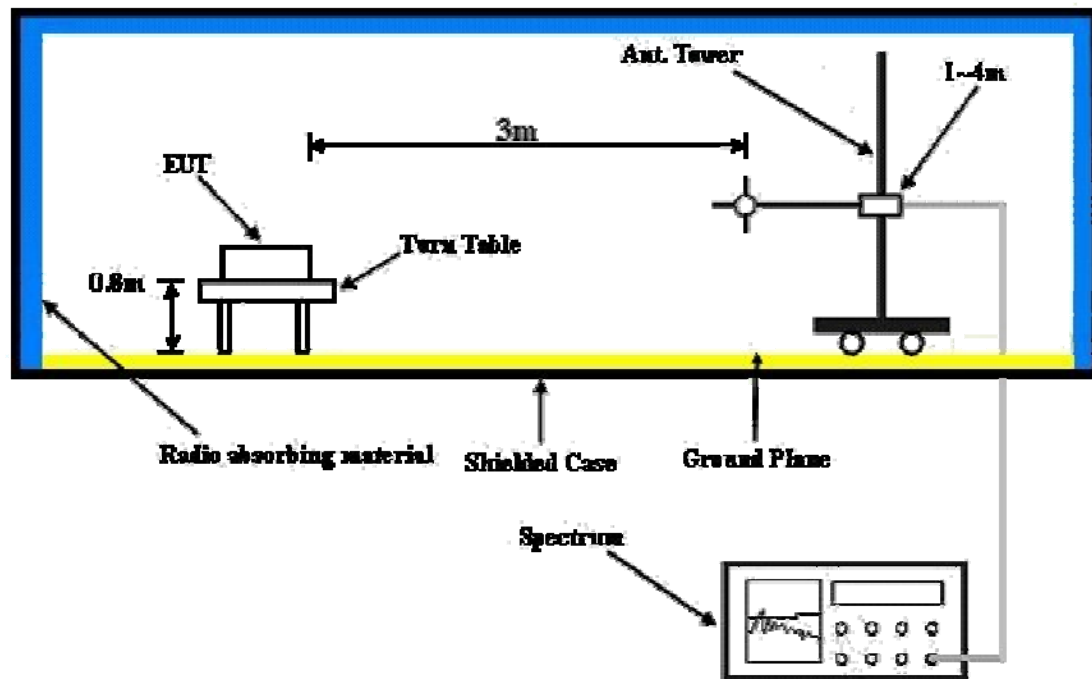
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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
- $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $\text{E.R.P power} = \text{E.I.R.P power} - 2.15\text{dBi}.$

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 26

Channel Bandwidth: 1.4MHz

Mode	TX channel 26783	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-37.40	-43.30	-3.20	-46.50	-13.00	-33.50
2	297.70	-33.80	-36.90	-1.70	-38.60	-13.00	-25.60
3	375.30	-33.30	-41.00	3.70	-37.30	-13.00	-24.30
4	396.70	-44.80	-50.90	3.30	-47.60	-13.00	-34.60
5	705.10	-36.10	-38.70	3.50	-35.20	-13.00	-22.20
6	939.90	-47.00	-44.60	3.70	-40.90	-13.00	-27.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-36.00	-41.00	-3.20	-44.20	-13.00	-31.20
2	297.70	-30.70	-31.40	-1.70	-33.10	-13.00	-20.10
3	375.30	-33.10	-39.30	3.70	-35.60	-13.00	-22.60
4	705.10	-34.90	-34.50	3.50	-31.00	-13.00	-18.00
5	769.10	-45.40	-44.50	3.90	-40.60	-13.00	-27.60
6	939.90	-46.20	-43.10	3.70	-39.40	-13.00	-26.40

Remarks:

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



A D T

Channel Bandwidth: 3MHz

Mode	TX channel 26775	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-37.10	-43.00	-3.20	-46.20	-13.00	-33.20
2	297.70	-33.50	-36.70	-1.70	-38.40	-13.00	-25.40
3	375.30	-33.30	-41.00	3.70	-37.30	-13.00	-24.30
4	396.70	-44.40	-50.60	3.30	-47.30	-13.00	-34.30
5	705.10	-35.90	-38.50	3.50	-35.00	-13.00	-22.00
6	939.90	-45.90	-43.40	3.70	-39.70	-13.00	-26.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-35.60	-40.70	-3.20	-43.90	-13.00	-30.90
2	297.70	-30.60	-31.30	-1.70	-33.00	-13.00	-20.00
3	375.30	-33.20	-39.40	3.70	-35.70	-13.00	-22.70
4	668.30	-47.80	-48.10	3.60	-44.50	-13.00	-31.50
5	705.10	-35.50	-35.20	3.50	-31.70	-13.00	-18.70
6	939.90	-45.40	-42.20	3.70	-38.50	-13.00	-25.50

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: 5MHz

Mode	TX channel 26765	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-37.40	-43.30	-3.20	-46.50	-13.00	-33.50
2	297.70	-33.60	-36.80	-1.70	-38.50	-13.00	-25.50
3	375.30	-33.40	-41.10	3.70	-37.40	-13.00	-24.40
4	396.70	-45.10	-51.30	3.30	-48.00	-13.00	-35.00
5	705.10	-35.90	-38.50	3.50	-35.00	-13.00	-22.00
6	939.90	-45.10	-42.70	3.70	-39.00	-13.00	-26.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-37.00	-42.10	-3.20	-45.30	-13.00	-32.30
2	196.80	-43.20	-43.80	-2.50	-46.30	-13.00	-33.30
3	297.70	-30.80	-31.50	-1.70	-33.20	-13.00	-20.20
4	375.30	-33.20	-39.50	3.70	-35.80	-13.00	-22.80
5	705.10	-35.50	-35.10	3.50	-31.60	-13.00	-18.60
6	939.90	-44.80	-41.60	3.70	-37.90	-13.00	-24.90

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: 10MHz

Mode	TX channel 26740	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-37.60	-43.60	-3.20	-46.80	-13.00	-33.80
2	297.70	-33.90	-37.10	-1.70	-38.80	-13.00	-25.80
3	375.30	-33.10	-40.80	3.70	-37.10	-13.00	-24.10
4	396.70	-44.50	-50.70	3.30	-47.40	-13.00	-34.40
5	705.10	-36.00	-38.60	3.50	-35.10	-13.00	-22.10
6	939.90	-46.50	-44.10	3.70	-40.40	-13.00	-27.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	125.10	-36.20	-41.30	-3.20	-44.50	-13.00	-31.50
2	297.70	-30.40	-31.20	-1.70	-32.90	-13.00	-19.90
3	375.30	-33.10	-39.30	3.70	-35.60	-13.00	-22.60
4	668.30	-47.40	-47.70	3.60	-44.10	-13.00	-31.10
5	705.10	-35.60	-35.30	3.50	-31.80	-13.00	-18.80
6	939.90	-44.90	-41.70	3.70	-38.00	-13.00	-25.00

Remarks:

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



A D T

Above 1GHz

LTE Band 26

Channel Bandwidth: 1.4MHz

Mode	TX channel 26697	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Frank Liu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1629.40	-57.96	-47.94	0.98	-46.96	-13.00	-33.96
2	2444.10	-60.64	-52.25	0.09	-52.16	-13.00	-39.16
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1629.40	-57.10	-47.68	0.98	-46.70	-13.00	-33.70
2	2444.10	-60.60	-54.32	0.09	-54.23	-13.00	-41.23

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 26740	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Frank Liu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1631.00	-57.63	-47.63	0.98	-46.65	-13.00	-33.65
2	2446.50	-59.57	-51.18	0.10	-51.08	-13.00	-38.08
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1631.00	-48.26	-38.84	0.98	-37.86	-13.00	-24.86
2	2446.50	-60.73	-54.47	0.10	-54.37	-13.00	-41.37

Remarks:

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



A D T

Mode	TX channel 26783	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Frank Liu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-56.79	-46.80	0.97	-45.83	-13.00	-32.83
2	2449.50	-62.85	-54.45	0.10	-54.35	-13.00	-41.35
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-57.15	-47.73	0.97	-46.76	-13.00	-33.76
2	2449.50	-59.64	-53.38	0.10	-53.28	-13.00	-40.28

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: 3MHz

Mode	TX channel 26705	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1631.00	-58.00	-48.00	1.00	-47.00	-13.00	-34.00
2	2446.50	-60.80	-52.40	0.10	-52.30	-13.00	-39.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1631.00	-55.50	-46.10	1.00	-45.10	-13.00	-32.10
2	2446.50	-59.40	-53.10	0.10	-53.00	-13.00	-40.00

Remarks:

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

Mode	TX channel 26740	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.50	-51.60	1.00	-50.60	-13.00	-37.60
2	2457.00	-60.40	-52.00	0.10	-51.90	-13.00	-38.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-58.70	-49.30	1.00	-48.30	-13.00	-35.30
2	2457.00	-59.90	-53.70	0.10	-53.60	-13.00	-40.60

Remarks:

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



Mode	TX channel 26775	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1645.00	-60.50	-52.70	1.00	-51.70	-13.00	-38.70
2	2467.50	-61.30	-55.00	0.10	-54.90	-13.00	-41.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1645.00	-59.80	-52.50	1.00	-51.50	-13.00	-38.50
2	2467.50	-58.80	-54.70	0.10	-54.60	-13.00	-41.60

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: 5MHz

Mode	TX channel 26715	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-61.00	-53.10	1.00	-52.10	-13.00	-39.10
2	2449.50	-61.10	-54.80	0.10	-54.70	-13.00	-41.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-60.90	-53.60	1.00	-52.60	-13.00	-39.60
2	2449.50	-60.20	-56.10	0.10	-56.00	-13.00	-43.00

Remarks:

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

Mode	TX channel 26740	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-62.00	-54.20	1.00	-53.20	-13.00	-40.20
2	2457.00	-62.10	-55.90	0.10	-55.80	-13.00	-42.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.20	-54.00	1.00	-53.00	-13.00	-40.00
2	2457.00	-61.40	-57.40	0.10	-57.30	-13.00	-44.30

Remarks:

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



Mode	TX channel 26765	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1643.00	-62.00	-54.20	1.00	-53.20	-13.00	-40.20
2	2464.50	-61.80	-55.40	0.10	-55.30	-13.00	-42.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1643.00	-61.40	-54.10	1.00	-53.10	-13.00	-40.10
2	2464.50	-61.50	-57.50	0.10	-57.40	-13.00	-44.40

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 26740	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.60	-53.90	1.00	-52.90	-13.00	-39.90
2	2457.00	-61.80	-55.50	0.10	-55.40	-13.00	-42.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-60.50	-53.30	1.00	-52.30	-13.00	-39.30
2	2457.00	-60.80	-56.70	0.10	-56.60	-13.00	-43.60

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:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---