FCC Test Report

(PART 22)

Report No.: RFBGSN-WTW-P20070580

FCC ID: 2AX8C-3544

Test Model: FL44TE

Received Date: Jul. 29, 2020

Test Date: Aug. 05, 2020 ~ Nov. 17, 2020

Issued Date: Nov. 30, 2020

Applicant: Amazon.com Services LLC

Address: 410 Terry Ave N Seattle, WA 98109 650 694 8333

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

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

Test Location: No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan

FCC Registration / Designation Number: 788550 / TW0003

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.

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 10
3.2.1 Description of Support Units 10
3.3 Test Mode Applicability and Tested Channel Detail 11
3.4 EUT Operating Conditions 14
3.5 General Description of Applied Standards and references 14

4 Test Types and Results **15**

4.1 Output Power Measurement 15
4.1.1 Limits of Output Power Measurement 15
4.1.2 Test Procedures 15
4.1.3 Test Setup 16
4.1.4 Test Results 17
4.2 Modulation Characteristics Measurement 25
4.2.1 Limits of Modulation Characteristics 25
4.2.2 Test Setup 25
4.2.3 Test Procedure 25
4.2.4 Test Results 26
4.3 Frequency Stability Measurement 27
4.3.1 Limits of Frequency Stability Measurement 27
4.3.2 Test Procedure 27
4.3.3 Test Setup 27
4.3.4 Test Results 28
4.4 Occupied Bandwidth Measurement 38
4.4.1 Test Procedure 38
4.4.2 Test Setup 38
4.4.3 Test Result 38
4.5 Band Edge Measurement 44
4.5.1 Limits of Band Edge Measurement 44
4.5.2 Test Setup 44
4.5.3 Test Procedures 44
4.5.4 Test Results 45
4.6 Peak to Average Ratio 54
4.6.1 Limits of Peak to Average Ratio Measurement 54
4.6.2 Test Setup 54
4.6.3 Test Procedures 54
4.6.4 Test Results 54
4.7 Conducted Spurious Emissions 60
4.7.1 Limits of Conducted Spurious Emissions Measurement 60
4.7.2 Test Setup 60
4.7.3 Test Procedure 60
4.7.4 Test Results 61
4.8 Radiated Emission Measurement 71
4.8.1 Limits of Radiated Emission Measurement 71
4.8.2 Test Procedure 71
4.8.3 Deviation from Test Standard 71
4.8.4 Test Setup 72
4.8.5 Test Results 73

5 Pictures of Test Arrangements.....115

Appendix – Information of the Testing Laboratories 116

Release Control Record

Issue No.	Description	Date Issued
RFBGSN-WTW-P20070580	Original Release	Nov. 30, 2020

1 Certificate of Conformity

Product: Fleet Edge

Brand: N/A

Test Model: FL44TE

Sample Status: Engineering Sample

Applicant: Amazon.com Services LLC

Test Date: Aug. 05, 2020 ~ Nov. 17, 2020

Standards: FCC Part 22, Subpart H

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

Prepared by : Vera Huang , **Date:** Nov. 30, 2020

Vera Huang / Specialist

Approved by : , **Date:** Nov. 30, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
22.913 (d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -14.01 dB at 170.65 MHz.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 18, 2020	Mar. 17, 2021
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 12, 2019	Dec. 11, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 08, 2019	Nov. 07, 2020
			Nov. 06, 2020	Nov. 05, 2021
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-160	Nov. 07, 2019	Nov. 06, 2020
			Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	9120D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2019	Nov. 24, 2020
Preamplifier EMCI	EMC001340	980201	Oct. 14, 2019	Oct. 13, 2020
			Oct. 21, 2020	Oct. 20, 2021
Preamplifier EMCI	EMC 012645	980115	Oct. 08, 2019	Oct. 07, 2020
			Oct. 07, 2020	Oct. 06, 2021
Preamplifier EMCI	EMC 330H	980112	Oct. 08, 2019	Oct. 07, 2020
			Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-8000	180409	Jan. 18, 2020	Jan. 17, 2021
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 08, 2019	Oct. 07, 2020
			Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 08, 2019	Oct. 07, 2020
			Oct. 07, 2020	Oct. 06, 2021
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 13, 2020	Feb. 12, 2021
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 19, 2019	Aug. 18, 2021
Temperature & Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 09, 2020	Sep. 08, 2021
DC power supply Keysight	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021

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 test was performed in HwaYa Chamber 10.

3 General Information

3.1 General Description of EUT

Product	Fleet Edge	
Brand	N/A	
Test Model	FL44TE	
Status of EUT	Engineering Sample	
Power Supply Rating	12 Vdc (Power Supply)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA V	826.4 ~ 846.6 MHz
	LTE 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 26 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 26 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 26 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 15 MHz)	831.5 ~ 841.5 MHz
Max. ERP Power	WCDMA V	65.16 mW
	LTE 5 (Channel Bandwidth: 1.4 MHz)	57.28 mW
	LTE 5 (Channel Bandwidth: 3 MHz)	58.88 mW
	LTE 5 (Channel Bandwidth: 5 MHz)	59.57 mW
	LTE 5 (Channel Bandwidth: 10 MHz)	61.38 mW
	LTE 26 (Channel Bandwidth: 1.4 MHz)	52.24 mW
	LTE 26 (Channel Bandwidth: 3 MHz)	52.97 mW
	LTE 26 (Channel Bandwidth: 5 MHz)	53.58 mW
	LTE 26 (Channel Bandwidth: 10 MHz)	54.70 mW
	LTE 26 (Channel Bandwidth: 15 MHz)	55.46 mW
Emission Designator	WCDMA V	4M17F9W
	LTE 5 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE 5 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE 5 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE 5 (Channel Bandwidth: 10 MHz)	8M99D7W
	LTE 26 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE 26 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE 26 (Channel Bandwidth: 5 MHz)	4M49G7D
	LTE 26 (Channel Bandwidth: 10 MHz)	8M98G7D
	LTE 26 (Channel Bandwidth: 15 MHz)	13M5G7D
Antenna Type	Refer to Note as below	
Accessory Device	N/A	
Data Cable Supplied	N/A	

Note:

1. The information of module collocated in this EUT is listed as below.

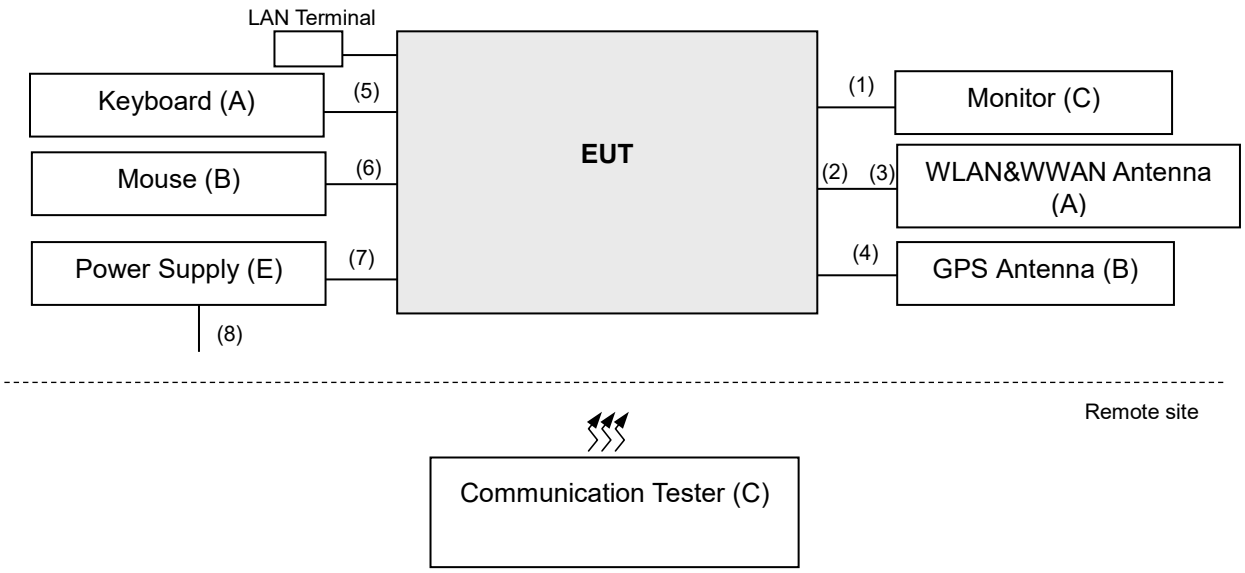
Product	Brand	Model
BT/WLAN Module	Intel	9560NGW
WWAN Module	Quectel	EM06-A

2. The antenna information is listed as below.

Ant.	Brand	Model	Antenna Type	Antenna Gain (dBi)		Remark
				WCDMA 5 / LTE 5	LTE 26	
1	TAOGLAS	MA491.A.BICG.005.gb	Multiband Antennas	-3	-3	Main Antenna
2	TAOGLAS	MA491.A.BICG.005.gb	Multiband Antennas	-3.4	-3.4	Diversity Antenna

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Keyboard	DELL	RT7D50	CN-0J4624-37172-44T-000M	FCC DOC Approved	--
B	Mouse	DELL	MS111-L	N/A	N/A	--
C	Monitor	ViewSonic	VX2457-MHD	UG0182942333	N/A	--
D	Communication Tester	R&S	CMU200	123295	N/A	For WCDMA
		ANRITSU	MT8821C	6201502978	NA	For LTE
E	Power Supply	NA	NA	NA	NA	--
F	WLAN&WWAN Antenna	TAOGLAS	MA491.A.BICG.005.gb	NA	NA	Provided by client
G	GPS Antenna	NA	NA	NA	NA	Provided by client

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	HDMI Cable	1	2	N	0	-
2.	RF Cable	1	0.5	N	0	-
3.	RF Cable	1	0.5	N	0	-
4.	RF Cable	1	0.5	N	0	-
5.	USB Cable	1	2.4	N	0	-
6.	USB Cable	1	2.2	N	0	-
7.	DC power Cable	1	1.2	N	0	-
8.	Power Cord	1	1.8	N	0	-

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 as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP	Radiated Emission
WCDMA	Z-plane	Z-axis
LTE Band 5	Y-plane	Y-axis
LTE Band 26	Y-plane	Y-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
-	Modulation Characteristics	4132 to 4233	4182	WCDMA
-	Frequency Stability	4132 to 4233	4132, 4233	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132, 4182, 4233	WCDMA
-	Band Edge	4132 to 4233	4132, 4233	WCDMA
-	Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA
-	Conducted Emission	4132 to 4233	4132, 4182, 4233	WCDMA
-	Radiated Emission	4132 to 4233	4132, 4182, 4233	WCDMA

Note: For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20450 to 20600	20525	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	20407 to 20643	20407, 20643	1.4 MHz	QPSK	6 RB / 0 RB Offset
		20415 to 20635	20415, 20635	3 MHz	QPSK	15 RB / 0 RB Offset
		20425 to 20625	20425, 20625	5 MHz	QPSK	25 RB / 0 RB Offset
		20450 to 20600	20450, 20600	10 MHz	QPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20643	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		20415 to 20635	20415	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			20635	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		20425 to 20625	20425	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			20625	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20450 to 20600	20450	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			20600	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only ERP, modulation characteristics, occupied bandwidth and peak to average ratio items had been tested under QPSK, 16QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel (above 1GHz) for final testing.

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26865 to 26965	26915	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
-	Frequency Stability	26797 to 27033	26797, 27033	1.4 MHz	QPSK	6 RB / 0 RB Offset
		26805 to 27025	26805, 27025	3 MHz	QPSK	15 RB / 0 RB Offset
		26815 to 27015	26815, 27015	5 MHz	QPSK	25 RB / 0 RB Offset
		26840 to 26990	26840, 26990	10 MHz	QPSK	50 RB / 0 RB Offset
		26865 to 26965	26865, 26965	15 MHz	QPSK	75 RB / 0 RB Offset
-	Occupied Bandwidth	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
-	Band Edge	26797 to 27033	26797	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			27033	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26805 to 27025	26805	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			27025	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		26815 to 27015	26815	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			27015	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26840 to 26990	26840	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			26990	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		26865 to 26965	26865	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			26965	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
-	Peak to Average Ratio	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK	1 RB / 0 RB Offset

Note:
1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only ERP, modulation characteristics, occupied bandwidth and peak to average ratio items had been tested under QPSK, 16QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel (above 1GHz) for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	12 Vdc	Tim Chen / Cyril Chen / Getaz Yang
Modulation Characteristics	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Frequency Stability	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Occupied Bandwidth	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Band Edge	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Peak to Average Ratio	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Conducted Emission	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tim Chen / Cyril Chen / Getaz Yang

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 and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 22
ANSI 63.26-2015

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

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016

Note: All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW is 5 MHz for WCDMA, and 1.4 MHz、3 MHz、5 MHz、10 MHz、15 MHz for LTE mode, and VBW ≥ 3 x RBW.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

c. 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 - 2.15 dB.

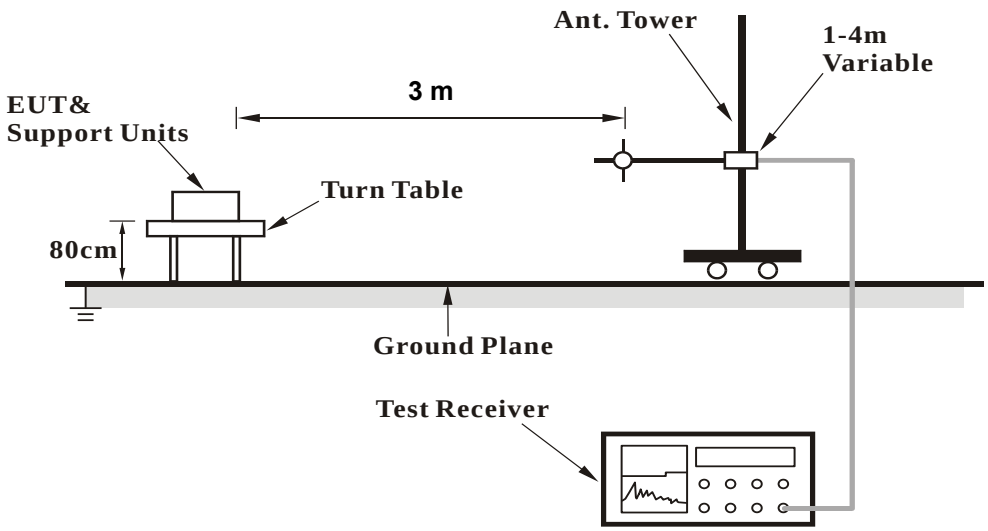
d. Correction Factor (includes EIRP and ERP unit conversion factor) = Antenna gain of substitution horn. – Tx cable loss. Measurement method refers to ANSI C63.26 section 5.2.7 & 5.2.4.

Conducted Power Measurement:

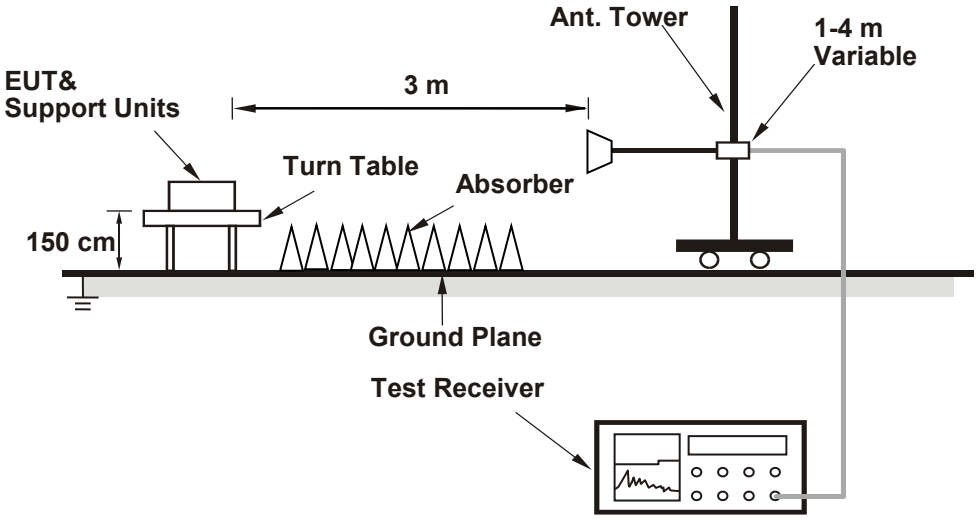
The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	23.56	23.66	23.72

LTE Band 5

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20450	20525	20600	
		Frequency (MHz)		829.0	836.5	844.0	
10M	QPSK	1	0	23.63	23.53	23.36	0
		1	24	23.58	23.43	23.25	0
		1	49	23.30	23.33	23.03	0
		25	0	22.57	22.40	22.17	1
		25	12	22.38	22.23	21.99	1
		25	25	22.26	22.13	21.96	1
		50	0	22.50	22.43	22.17	1
	16QAM	1	0	22.60	22.48	22.33	1
		1	24	22.52	22.38	22.19	1
		1	49	22.29	22.27	21.97	1
		25	0	21.51	21.31	20.95	2
		25	12	21.37	21.19	20.95	2
		25	25	21.21	21.06	20.94	2
		50	0	21.47	21.38	21.10	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20425	20525	20625	
		Frequency (MHz)		826.5	836.5	846.5	
5M	QPSK	1	0	23.60	23.50	23.30	0
		1	12	23.52	23.35	23.17	0
		1	24	23.22	23.29	22.96	0
		12	0	22.52	22.37	22.12	1
		12	6	22.33	22.20	21.95	1
		12	13	22.20	22.09	21.92	1
		25	0	22.46	22.35	22.10	1
	16QAM	1	0	22.56	22.46	22.26	1
		1	12	22.44	22.33	22.12	1
		1	24	22.21	22.24	21.92	1
		12	0	21.49	21.26	21.03	2
		12	6	21.25	21.19	20.90	2
		12	13	21.19	21.08	20.89	2
		25	0	21.35	21.33	20.92	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20415	20525	20635	
		Frequency (MHz)		825.5	836.5	847.5	
3M	QPSK	1	0	23.53	23.47	23.27	0
		1	7	23.44	23.31	23.12	0
		1	14	23.19	23.23	22.90	0
		8	0	22.49	22.33	22.09	1
		8	3	22.28	22.14	21.87	1
		8	7	22.15	22.01	21.86	1
		15	0	22.40	22.31	22.03	1
	16QAM	1	0	22.44	22.46	22.23	1
		1	7	22.37	22.29	22.08	1
		1	14	22.10	22.14	21.87	1
		8	0	21.45	21.12	20.88	2
		8	3	21.25	21.05	20.80	2
		8	7	21.13	20.99	20.79	2
		15	0	21.36	21.25	21.02	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20407	20525	20643	
		Frequency (MHz)		824.7	836.5	848.3	
1.4M	QPSK	1	0	23.49	23.40	23.22	0
		1	2	23.44	23.36	23.17	0
		1	5	23.36	23.28	23.11	0
		3	0	23.33	23.23	23.08	0
		3	1	23.28	23.20	23.03	0
		3	3	23.25	23.16	22.98	0
		6	0	22.33	22.28	21.98	1
	16QAM	1	0	22.48	22.31	22.13	1
		1	2	22.40	22.27	22.15	1
		1	5	22.29	22.21	22.09	1
		3	0	22.30	22.18	22.02	1
		3	1	22.19	22.13	21.99	1
		3	3	22.21	22.08	21.95	1
		6	0	21.30	21.27	20.91	2

LTE Band 26

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26865	26915	26965	
		Frequency (MHz)		831.5	836.5	841.5	
15M	QPSK	1	0	23.32	23.09	23.22	0
		1	37	23.00	22.93	23.13	0
		1	74	22.83	22.81	22.98	0
		36	0	22.04	21.96	22.13	1
		36	19	21.84	21.76	22.00	1
		36	39	21.86	21.62	21.97	1
		75	0	21.99	21.71	22.14	1
	16QAM	1	0	22.27	22.02	22.13	1
		1	37	22.05	21.90	22.08	1
		1	74	21.87	21.73	21.91	1
		36	0	21.04	20.82	21.13	2
		36	19	20.78	20.73	20.86	2
		36	39	20.70	20.71	20.84	2
		75	0	20.91	20.80	21.03	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26840	26915	26990	
		Frequency (MHz)		829.0	836.5	844.0	
10M	QPSK	1	0	23.29	23.03	23.40	0
		1	24	22.85	22.86	23.14	0
		1	49	22.73	22.67	22.99	0
		25	0	21.92	21.95	22.14	1
		25	12	21.78	21.65	21.87	1
		25	25	21.75	21.61	21.85	1
		50	0	21.84	21.57	22.15	1
	16QAM	1	0	22.26	21.93	22.38	1
		1	24	21.98	21.77	22.07	1
		1	49	21.87	21.65	21.99	1
		25	0	20.91	20.67	20.88	2
		25	12	20.77	20.66	20.86	2
		25	25	20.56	20.66	20.70	2
		50	0	20.78	20.75	21.06	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26815	26915	27015	
		Frequency (MHz)		826.5	836.5	846.5	
5M	QPSK	1	0	23.19	23.01	23.16	0
		1	12	22.77	22.85	23.02	0
		1	24	22.72	22.54	22.82	0
		12	0	21.84	21.94	22.04	1
		12	6	21.76	21.61	21.89	1
		12	13	21.69	21.58	21.81	1
		25	0	21.79	21.42	22.03	1
	16QAM	1	0	22.12	21.88	22.09	1
		1	12	21.92	21.76	21.94	1
		1	24	21.76	21.57	21.73	1
		12	0	20.77	20.58	20.91	2
		12	6	20.75	20.64	20.85	2
		12	13	20.45	20.66	20.72	2
		25	0	20.75	20.62	20.90	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26805	26915	27025	
		Frequency (MHz)		825.5	836.5	847.5	
3M	QPSK	1	0	23.01	23.33	22.73	1
		1	7	22.85	23.11	23.08	1
		1	14	22.61	22.86	22.77	1
		8	0	21.93	22.05	21.97	3
		8	3	21.62	21.73	21.83	3
		8	7	21.51	21.73	21.78	3
		15	0	21.55	22.03	22.07	6
	16QAM	1	0	21.84	22.23	21.67	1
		1	7	21.67	21.92	22.05	1
		1	14	21.54	21.94	21.68	1
		8	0	20.66	20.84	20.95	2
		8	3	20.58	20.78	20.76	2
		8	7	20.64	20.58	20.77	2
		15	0	20.62	21.01	20.92	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26797	26915	27033	
		Frequency (MHz)		824.7	836.5	848.3	
1.4M	QPSK	1	0	22.97	23.33	22.81	0
		1	2	22.84	23.04	22.74	0
		1	5	22.57	22.94	22.69	0
		3	0	22.88	23.09	22.64	0
		3	1	22.51	22.74	22.60	0
		3	3	22.58	22.84	22.57	0
		6	0	21.57	22.01	21.92	1
	16QAM	1	0	21.88	22.26	21.72	1
		1	2	21.73	22.01	21.70	1
		1	5	21.55	21.86	21.64	1
		3	0	21.66	21.83	21.56	1
		3	1	21.57	21.84	21.55	1
		3	3	21.53	21.64	21.50	1
		6	0	20.66	21.04	20.87	2

ERP Power (dBm)

WCDMA							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
Z	4132	826.4	-14.84	32.62	17.78	59.98	H
	4182	836.4	-14.38	32.52	18.14	65.16	
	4233	846.6	-14.71	32.65	17.94	62.23	
	4132	826.4	-19.20	32.76	13.56	22.70	V
	4182	836.4	-18.41	32.39	13.98	25.00	
	4233	846.6	-18.77	32.54	13.77	23.82	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 5							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
Y	20407	824.7	-15.65	32.62	16.97	49.77	H
	20525	836.5	-14.94	32.52	17.58	57.28	
	20643	848.3	-15.57	32.65	17.08	51.05	
	20407	824.7	-20.20	32.76	12.56	18.03	V
	20525	836.5	-19.24	32.39	13.15	20.65	
	20643	848.3	-19.65	32.54	12.89	19.45	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	20407	824.7	-16.93	32.62	15.69	37.07	H
	20525	836.5	-16.22	32.52	16.30	42.66	
	20643	848.3	-16.57	32.65	16.08	40.55	
	20407	824.7	-21.13	32.76	11.63	14.55	V
	20525	836.5	-20.21	32.39	12.18	16.52	
	20643	848.3	-20.67	32.54	11.87	15.38	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 5							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	20415	825.5	-15.47	32.62	17.15	51.88	H
	20525	836.5	-14.82	32.52	17.70	58.88	
	20635	847.5	-15.37	32.65	17.28	53.46	
	20415	825.5	-20.00	32.76	12.76	18.88	V
	20525	836.5	-19.11	32.39	13.28	21.28	
	20635	847.5	-19.53	32.54	13.01	20.00	
Channel Bandwidth: 3 MHz / 16QAM							
Y	20415	825.5	-16.74	32.62	15.88	38.73	H
	20525	836.5	-16.03	32.52	16.49	44.57	
	20635	847.5	-16.38	32.65	16.27	42.36	
	20415	825.5	-21.05	32.76	11.71	14.83	V
	20525	836.5	-20.08	32.39	12.31	17.02	
	20635	847.5	-20.52	32.54	12.02	15.92	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 5							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	20425	826.5	-15.43	32.62	17.19	52.36	H
	20525	836.5	-14.77	32.52	17.75	59.57	
	20625	846.5	-15.27	32.65	17.38	54.70	
	20425	826.5	-19.89	32.76	12.87	19.36	V
	20525	836.5	-18.97	32.39	13.42	21.98	
	20625	846.5	-19.39	32.54	13.15	20.65	
Channel Bandwidth: 5 MHz / 16QAM							
Y	20425	826.5	-16.52	32.62	16.10	40.74	H
	20525	836.5	-15.86	32.52	16.66	46.34	
	20625	846.5	-16.24	32.65	16.41	43.75	
	20425	826.5	-20.87	32.76	11.89	15.45	V
	20525	836.5	-19.90	32.39	12.49	17.74	
	20625	846.5	-20.36	32.54	12.18	16.52	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 5							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	20450	829.0	-15.33	32.62	17.29	53.58	H
	20525	836.5	-14.64	32.52	17.88	61.38	
	20600	844.0	-15.19	32.65	17.46	55.72	
	20450	829.0	-19.78	32.76	12.98	19.86	V
	20525	836.5	-18.70	32.39	13.69	23.39	
	20600	844.0	-19.27	32.54	13.27	21.23	
Channel Bandwidth: 10 MHz / 16QAM							
Y	20450	829.0	-16.39	32.62	16.23	41.98	H
	20525	836.5	-15.67	32.52	16.85	48.42	
	20600	844.0	-16.08	32.65	16.57	45.39	
	20450	829.0	-20.75	32.76	12.01	15.89	V
	20525	836.5	-19.84	32.39	12.55	17.99	
	20600	844.0	-20.18	32.54	12.36	17.22	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 26							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	26797	824.7	-16.08	32.62	16.54	45.08	H
	26915	836.5	-15.34	32.52	17.18	52.24	
	27033	848.3	-15.74	32.65	16.91	49.09	
	26797	824.7	-20.58	32.76	12.18	16.52	V
	26915	836.5	-19.47	32.39	12.92	19.59	
	27033	848.3	-19.98	32.54	12.56	18.03	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	26797	824.7	-17.24	32.62	15.38	34.51	H
	26915	836.5	-16.35	32.52	16.17	41.40	
	27033	848.3	-17.01	32.65	15.64	36.64	
	26797	824.7	-21.56	32.76	11.20	13.18	V
	26915	836.5	-20.38	32.39	12.01	15.89	
	27033	848.3	-21.01	32.54	11.53	14.22	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 26							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	26805	825.5	-16.00	32.62	16.62	45.92	H
	26915	836.5	-15.28	32.52	17.24	52.97	
	27025	847.5	-15.66	32.65	16.99	50.00	
	26805	825.5	-20.48	32.76	12.28	16.90	V
	26915	836.5	-19.40	32.39	12.99	19.91	
	27025	847.5	-19.84	32.54	12.70	18.62	
Channel Bandwidth: 3 MHz / 16QAM							
Y	26805	825.5	-17.18	32.62	15.44	34.99	H
	26915	836.5	-16.25	32.52	16.27	42.36	
	27025	847.5	-16.86	32.65	15.79	37.93	
	26805	825.5	-21.47	32.76	11.29	13.46	V
	26915	836.5	-20.30	32.39	12.09	16.18	
	27025	847.5	-20.93	32.54	11.61	14.49	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 26							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	26815	826.5	-15.91	32.62	16.71	46.88	H
	26915	836.5	-15.23	32.52	17.29	53.58	
	27015	846.5	-15.57	32.65	17.08	51.05	
	26815	826.5	-20.37	32.76	12.39	17.34	V
	26919	836.5	-19.34	32.39	13.05	20.18	
	27015	846.5	-19.76	32.54	12.78	18.97	
Channel Bandwidth: 5 MHz / 16QAM							
Y	26815	826.5	-17.07	32.62	15.55	35.89	H
	26915	836.5	-16.14	32.52	16.38	43.45	
	27015	846.5	-16.71	32.65	15.94	39.26	
	26815	826.5	-21.36	32.76	11.40	13.80	V
	26919	836.5	-20.21	32.39	12.18	16.52	
	27015	846.5	-20.74	32.54	11.80	15.14	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 26							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	26840	829.0	-15.82	32.62	16.80	47.86	H
	26915	836.5	-15.14	32.52	17.38	54.70	
	26990	844.0	-15.46	32.65	17.19	52.36	
	26840	829.0	-20.30	32.76	12.46	17.62	V
	26919	836.5	-19.23	32.39	13.16	20.70	
	26990	844.0	-19.63	32.54	12.91	19.54	
Channel Bandwidth: 10 MHz / 16QAM							
Y	26840	829.0	-16.97	32.62	15.65	36.73	H
	26915	836.5	-16.03	32.52	16.49	44.57	
	26990	844.0	-16.62	32.65	16.03	40.09	
	26840	829.0	-21.27	32.76	11.49	14.09	V
	26919	836.5	-20.08	32.39	12.31	17.02	
	26990	844.0	-20.63	32.54	11.91	15.52	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 26							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	26865	831.5	-15.73	32.62	16.89	48.87	H
	26915	836.5	-15.08	32.52	17.44	55.46	
	26965	841.5	-15.40	32.65	17.25	53.09	
	26865	831.5	-20.24	32.76	12.52	17.86	V
	26915	836.5	-19.18	32.39	13.21	20.94	
	26965	841.5	-19.56	32.54	12.98	19.86	
Channel Bandwidth: 15 MHz / 16QAM							
Y	26865	831.5	-16.89	32.62	15.73	37.41	H
	26915	836.5	-15.98	32.52	16.54	45.08	
	26965	841.5	-16.52	32.65	16.13	41.02	
	26865	831.5	-21.18	32.76	11.58	14.39	V
	26915	836.5	-20.02	32.39	12.37	17.26	
	26965	841.5	-20.55	32.54	11.99	15.81	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Setup

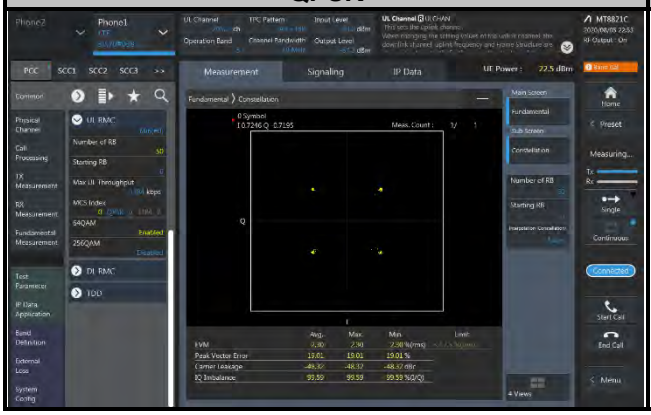
4.2.3 Test Procedure

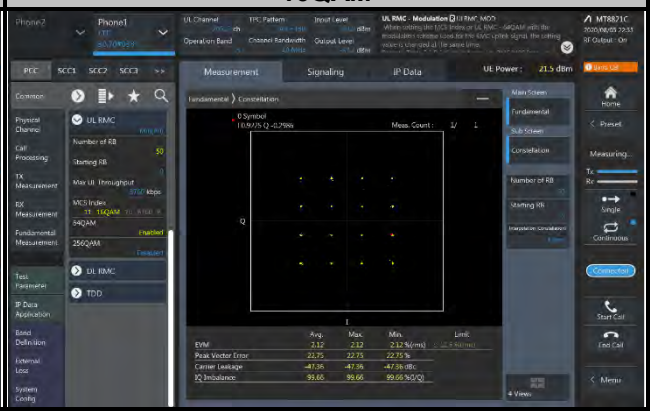
Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

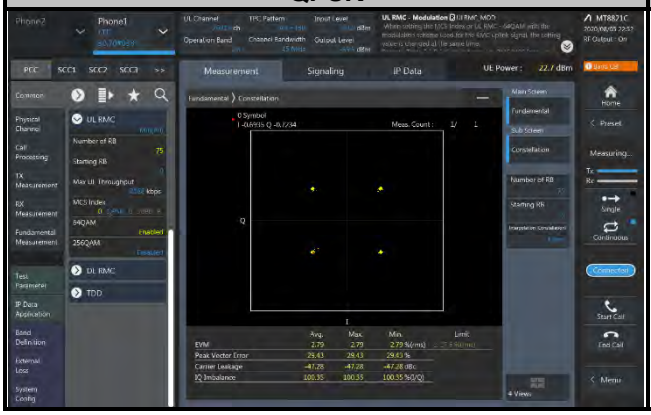
Spectrum Plot of Measurement
WCDMA
Channel 4182

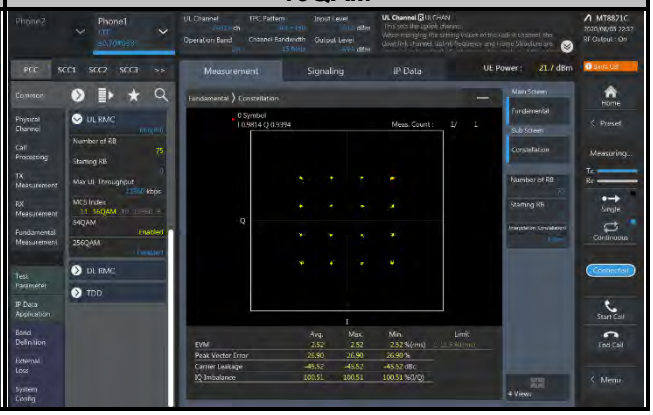
Spectrum Plot of Measurement	
LTE Band 5	
Channel 20525	
QPSK	16QAM





Spectrum Plot of Measurement	
LTE Band 26	
Channel 26915	
QPSK	16QAM





4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

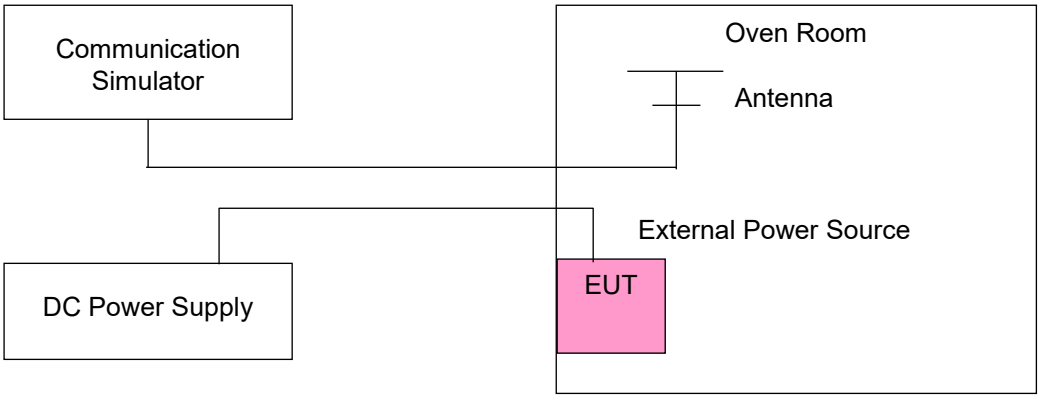
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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.

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.400001	0.001	846.600004	0.004	2.5
10.2	826.400002	0.003	846.600003	0.004	2.5
13.8	826.400003	0.003	846.600002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.400003	0.003	846.600001	0.002	2.5
-20	826.400002	0.002	846.600003	0.003	2.5
-10	826.400003	0.004	846.600002	0.002	2.5
0	826.400003	0.003	846.600002	0.002	2.5
10	826.399997	-0.004	846.599999	-0.002	2.5
20	826.399999	-0.001	846.599997	-0.004	2.5
30	826.399998	-0.002	846.599998	-0.002	2.5
40	826.399997	-0.003	846.599997	-0.004	2.5
50	826.399997	-0.004	846.599999	-0.001	2.5
60	826.399996	-0.005	846.599997	-0.004	2.5
70	826.399999	-0.001	846.599996	-0.004	2.5
80	826.399997	-0.004	846.599998	-0.002	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	824.700001	0.001	848.299997	-0.003	2.5
10.2	824.700004	0.005	848.299998	-0.002	2.5
13.8	824.700002	0.002	848.299999	-0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700002	0.002	848.300002	0.002	2.5
-20	824.700001	0.002	848.300003	0.004	2.5
-10	824.700002	0.002	848.300003	0.003	2.5
0	824.700001	0.001	848.300004	0.004	2.5
10	824.699998	-0.003	848.300002	0.002	2.5
20	824.699996	-0.004	848.300003	0.004	2.5
30	824.699996	-0.005	848.300001	0.001	2.5
40	824.699997	-0.004	848.299996	-0.004	2.5
50	824.699997	-0.004	848.299998	-0.002	2.5
60	824.699999	-0.002	848.299996	-0.004	2.5
70	824.699997	-0.004	848.299996	-0.005	2.5
80	824.699998	-0.003	848.299996	-0.005	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	825.500001	0.002	847.499999	-0.002	2.5
10.2	825.500004	0.005	847.499997	-0.004	2.5
13.8	825.500001	0.001	847.499999	-0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500002	0.002	847.500003	0.003	2.5
-20	825.500001	0.001	847.500004	0.004	2.5
-10	825.500001	0.001	847.500004	0.004	2.5
0	825.500003	0.003	847.500004	0.004	2.5
10	825.499997	-0.004	847.500003	0.003	2.5
20	825.499998	-0.002	847.500003	0.003	2.5
30	825.499997	-0.004	847.500002	0.002	2.5
40	825.499999	-0.001	847.499998	-0.003	2.5
50	825.499996	-0.005	847.499997	-0.004	2.5
60	825.499996	-0.004	847.499998	-0.002	2.5
70	825.499999	-0.002	847.499997	-0.004	2.5
80	825.499997	-0.004	847.499996	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.500004	0.005	846.499996	-0.005	2.5
10.2	826.500004	0.005	846.499998	-0.002	2.5
13.8	826.500002	0.003	846.499997	-0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500002	0.003	846.500004	0.004	2.5
-20	826.500002	0.003	846.500002	0.003	2.5
-10	826.500004	0.004	846.500003	0.004	2.5
0	826.500003	0.004	846.500002	0.002	2.5
10	826.499998	-0.002	846.500002	0.002	2.5
20	826.499999	-0.001	846.500004	0.004	2.5
30	826.499998	-0.002	846.500001	0.002	2.5
40	826.499997	-0.004	846.499997	-0.004	2.5
50	826.499997	-0.003	846.499997	-0.003	2.5
60	826.499999	-0.002	846.499996	-0.004	2.5
70	826.499997	-0.004	846.499997	-0.003	2.5
80	826.499998	-0.002	846.499998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	829.000001	0.001	843.999998	-0.002	2.5
10.2	829.000003	0.004	843.999998	-0.002	2.5
13.8	829.000004	0.004	843.999998	-0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000002	0.002	844.000003	0.004	2.5
-20	829.000002	0.002	844.000003	0.004	2.5
-10	829.000002	0.002	844.000001	0.001	2.5
0	829.000004	0.004	844.000002	0.002	2.5
10	828.999998	-0.003	844.000004	0.004	2.5
20	828.999997	-0.004	844.000003	0.003	2.5
30	828.999997	-0.004	844.000004	0.004	2.5
40	828.999999	-0.002	843.999998	-0.002	2.5
50	828.999997	-0.004	843.999997	-0.004	2.5
60	828.999996	-0.005	843.999996	-0.005	2.5
70	828.999998	-0.002	843.999998	-0.003	2.5
80	828.999998	-0.003	843.999997	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	824.700001	0.001	848.300000	-0.004	2.5
10.2	824.700001	0.001	848.300000	-0.002	2.5
13.8	824.700002	0.002	848.300000	-0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700003	0.003	848.300000	0.002	2.5
-20	824.700002	0.002	848.300000	0.004	2.5
-10	824.700003	0.004	848.300000	0.002	2.5
0	824.700002	0.003	848.300000	0.003	2.5
10	824.699997	-0.004	848.300000	0.003	2.5
20	824.699999	-0.001	848.300000	0.003	2.5
30	824.699997	-0.003	848.300000	0.003	2.5
40	824.699997	-0.003	848.300000	-0.005	2.5
50	824.699998	-0.002	848.300000	-0.004	2.5
60	824.699998	-0.002	848.300000	-0.003	2.5
70	824.699997	-0.004	848.300000	-0.004	2.5
80	824.699996	-0.004	848.300000	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	825.500003	0.003	847.500000	-0.002	2.5
10.2	825.500003	0.003	847.500000	-0.001	2.5
13.8	825.500004	0.005	847.500000	-0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500003	0.003	847.500000	0.003	2.5
-20	825.500002	0.002	847.500000	0.002	2.5
-10	825.500002	0.002	847.500000	0.002	2.5
0	825.500004	0.004	847.500000	0.002	2.5
10	825.499998	-0.002	847.500000	0.001	2.5
20	825.499996	-0.005	847.500000	0.002	2.5
30	825.499997	-0.003	847.500000	0.003	2.5
40	825.499997	-0.004	847.500000	-0.003	2.5
50	825.499996	-0.004	847.500000	-0.003	2.5
60	825.499998	-0.003	847.500000	-0.004	2.5
70	825.499999	-0.002	847.500000	-0.003	2.5
80	825.499997	-0.004	847.500000	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.500001	0.001	846.499997	-0.004	2.5
10.2	826.500003	0.004	846.499998	-0.003	2.5
13.8	826.500001	0.001	846.499999	-0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500003	0.004	846.500002	0.003	2.5
-20	826.500003	0.003	846.500004	0.004	2.5
-10	826.500001	0.002	846.500002	0.002	2.5
0	826.500002	0.002	846.500003	0.004	2.5
10	826.499996	-0.005	846.500001	0.002	2.5
20	826.499996	-0.004	846.500002	0.003	2.5
30	826.499996	-0.005	846.500001	0.002	2.5
40	826.499998	-0.002	846.499996	-0.005	2.5
50	826.499997	-0.004	846.499997	-0.004	2.5
60	826.499999	-0.002	846.499997	-0.003	2.5
70	826.499998	-0.002	846.499996	-0.004	2.5
80	826.499999	-0.002	846.499998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	829.000004	0.005	843.999998	-0.002	2.5
10.2	829.000003	0.004	843.999998	-0.002	2.5
13.8	829.000003	0.004	843.999999	-0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000002	0.002	844.000002	0.003	2.5
-20	829.000001	0.001	844.000004	0.004	2.5
-10	829.000002	0.002	844.000004	0.004	2.5
0	829.000003	0.004	844.000004	0.005	2.5
10	828.999997	-0.004	844.000003	0.003	2.5
20	828.999997	-0.003	844.000002	0.002	2.5
30	828.999999	-0.001	844.000003	0.003	2.5
40	828.999996	-0.004	843.999998	-0.003	2.5
50	828.999997	-0.004	843.999997	-0.003	2.5
60	828.999998	-0.002	843.999997	-0.003	2.5
70	828.999996	-0.005	843.999999	-0.002	2.5
80	828.999996	-0.005	843.999999	-0.001	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	831.500002	0.003	841.499997	-0.003	2.5
10.2	831.500003	0.004	841.499997	-0.004	2.5
13.8	831.500002	0.002	841.499997	-0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	831.500002	0.002	841.500002	0.003	2.5
-20	831.500001	0.001	841.500004	0.004	2.5
-10	831.500003	0.003	841.500001	0.002	2.5
0	831.500004	0.004	841.500002	0.002	2.5
10	831.499997	-0.003	841.500002	0.002	2.5
20	831.499999	-0.002	841.500003	0.004	2.5
30	831.499999	-0.002	841.500004	0.005	2.5
40	831.499999	-0.001	841.499996	-0.005	2.5
50	831.499996	-0.005	841.499997	-0.003	2.5
60	831.499999	-0.002	841.499998	-0.002	2.5
70	831.499998	-0.002	841.499997	-0.004	2.5
80	831.499999	-0.001	841.499996	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

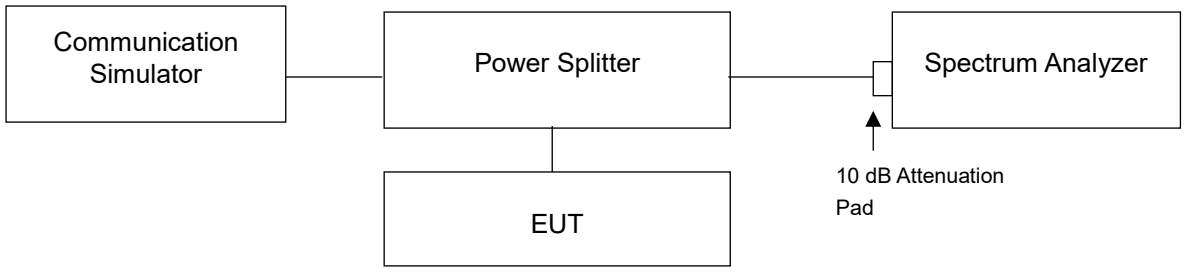
4.4 Occupied Bandwidth Measurement

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. Measurement method, please refer to section 5.4.4 of ANSI C63.26. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

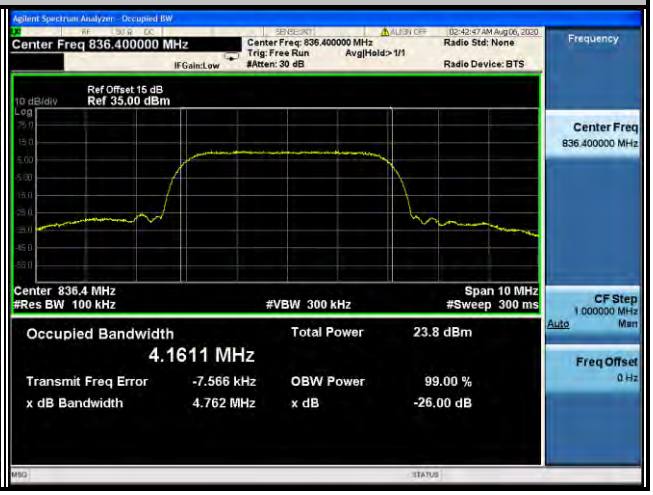
For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

4.4.2 Test Setup



4.4.3 Test Result

WCDMA			
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**	**26 dB Bandwidth (MHz)**
4132	826.4	4.15	4.76
4182	836.4	4.16	4.76
4233	846.6	4.17	4.76

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
WCDMA	
	

LTE Band 5					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20407	824.7	1.09	1.09	1.22	1.22
20525	836.5	1.09	1.09	1.21	1.21
20643	848.3	1.09	1.09	1.21	1.22
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20415	825.5	2.70	2.69	2.92	2.93
20525	836.5	2.70	2.69	2.93	2.93
20635	847.5	2.70	2.70	2.93	2.93

Spectrum Plot of Worst Value

99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	1.4 MHz / 16QAM

3 MHz / QPSK	3 MHz / QPSK

LTE Band 5					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20425	826.5	4.49	4.49	4.79	4.79
20525	836.5	4.49	4.49	4.81	4.82
20625	846.5	4.49	4.50	4.81	4.82
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20450	829.0	8.95	8.95	9.51	9.52
20525	836.5	8.98	8.99	9.52	9.53
20600	844.0	8.95	8.94	9.49	9.49

Spectrum Plot of Worst Value

99 % Occupied Bandwidth	26 dB Bandwidth
5 MHz / 16QAM	5 MHz / 16QAM

10 MHz / 16QAM	10 MHz / 16QAM

LTE Band 26					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26797	824.7	1.09	1.09	1.22	1.21
26915	836.5	1.09	1.09	1.22	1.21
27033	848.3	1.09	1.09	1.22	1.22
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26805	825.5	2.70	2.70	2.93	2.93
26915	836.5	2.70	2.70	2.94	2.93
27025	847.5	2.70	2.70	2.93	2.94

Spectrum Plot of Worst Value

99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	1.4 MHz / QPSK

3 MHz / QPSK	3 MHz / 16QAM

LTE Band 26					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26815	826.5	4.49	4.49	4.80	4.80
26915	836.5	4.49	4.49	4.81	4.81
27015	846.5	4.49	4.49	4.80	4.81
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26840	829.0	8.95	8.95	9.50	9.51
26915	836.5	8.98	8.98	9.55	9.52
26990	844.0	8.95	8.95	9.50	9.50

Spectrum Plot of Worst Value

99 % Occupied Bandwidth	26 dB Bandwidth
5 MHz / QPSK	5 MHz / QPSK

10 MHz / QPSK	10 MHz / QPSK

LTE Band 26					
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26865	831.5	13.46	13.44	14.25	14.22
26915	836.5	13.49	13.48	14.29	14.27
26965	841.5	13.44	13.42	14.24	14.23

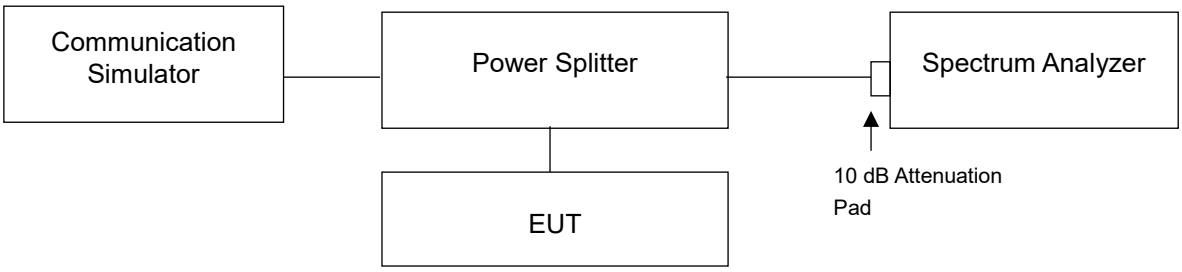
Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
15 MHz / QPSK	15 MHz / QPSK

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.

4.5.2 Test Setup



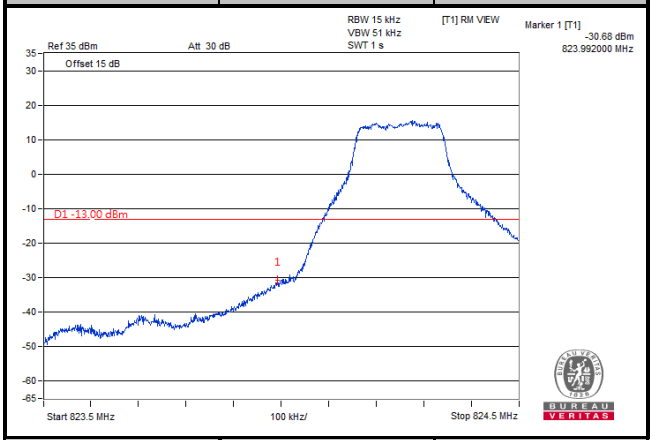
4.5.3 Test Procedures

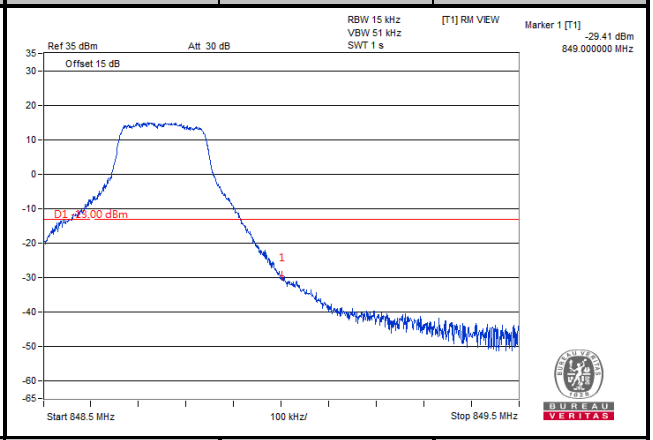
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (LTE Bandwidth 5 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
g. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
h. Record the max trace plot into the test report.

4.5.4 Test Results

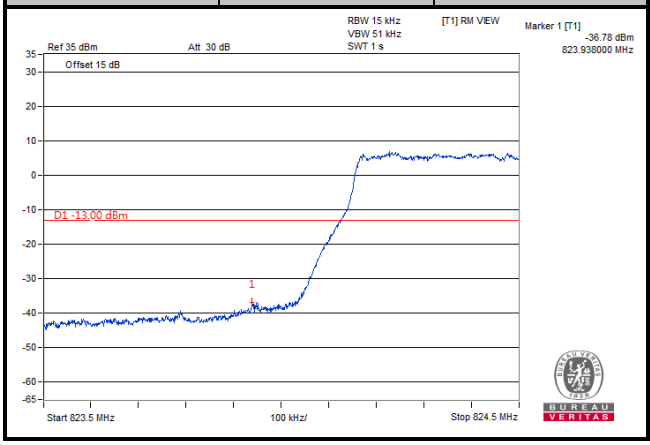
WCDMA			
Channel	4132	Channel	4233

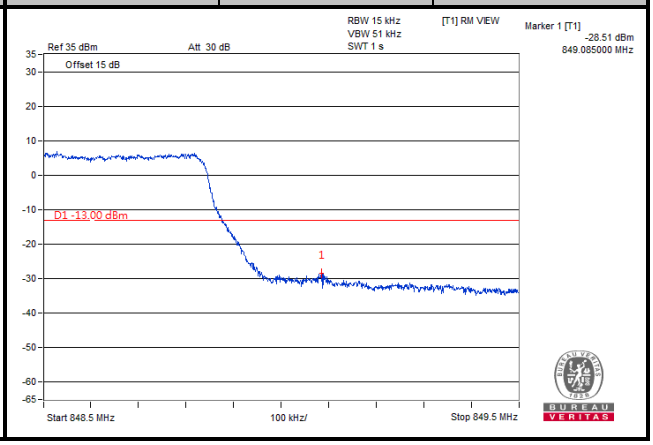
LTE Band 5					
Channel Bandwidth: 1.4 MHz					
Channel	20407	1 RB	Channel	20643	1 RB

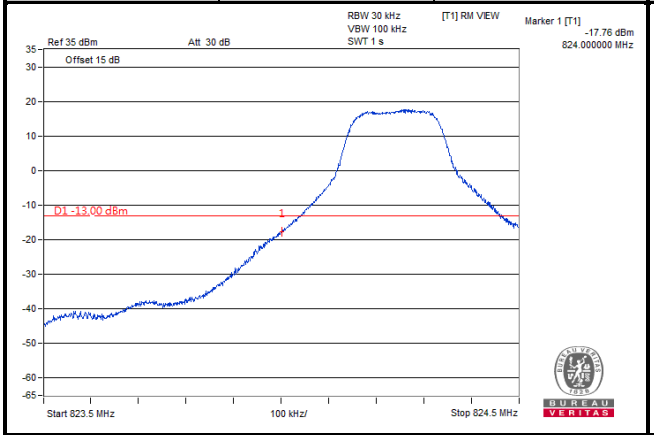
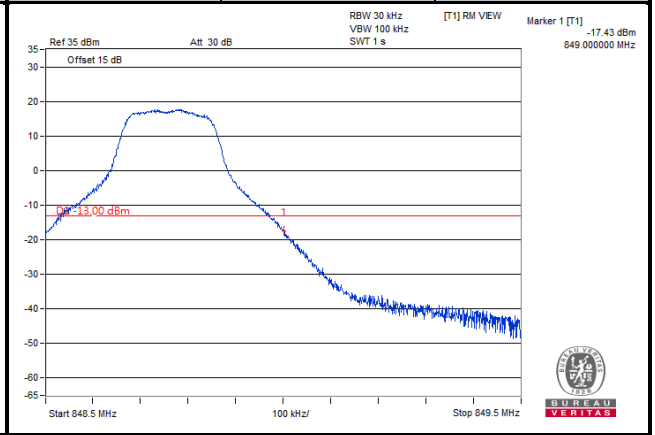
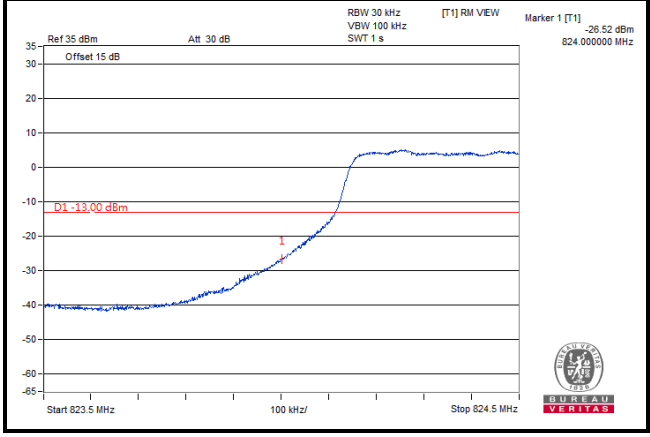
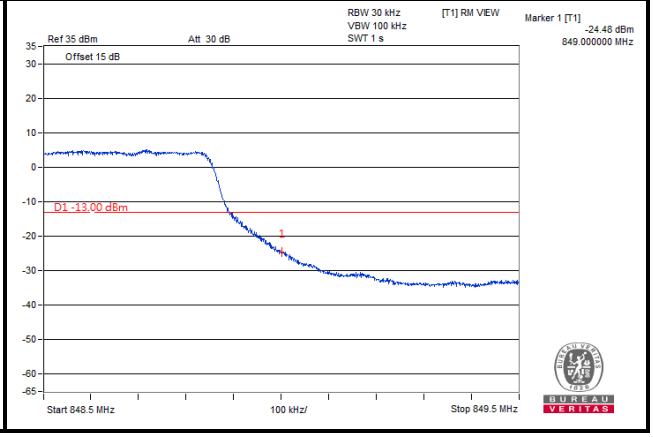


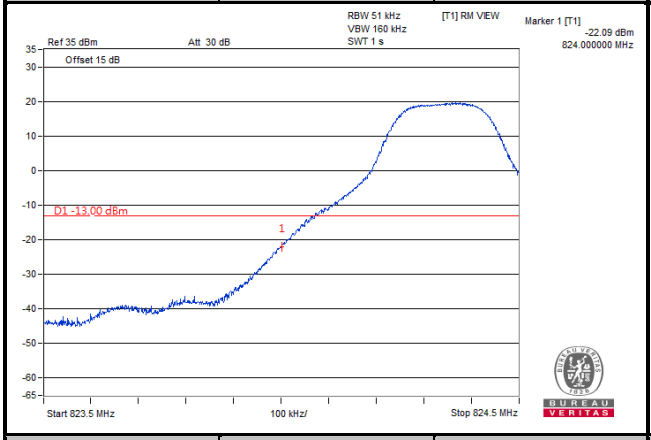
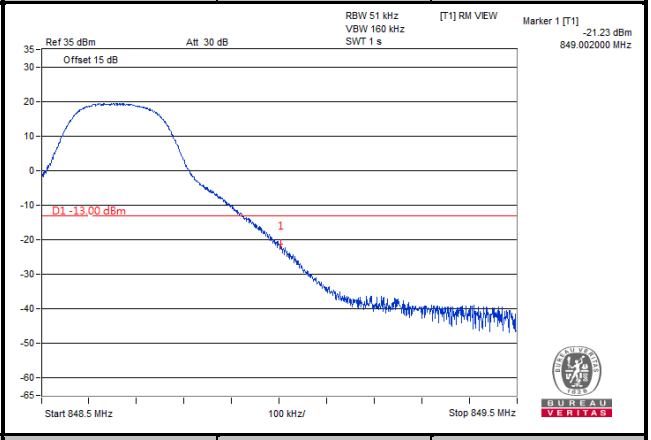
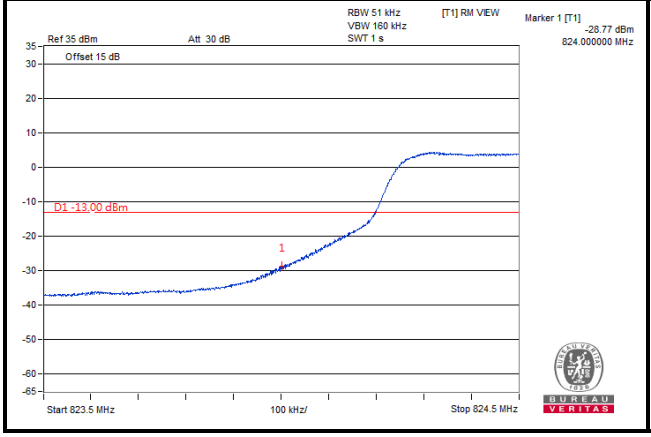
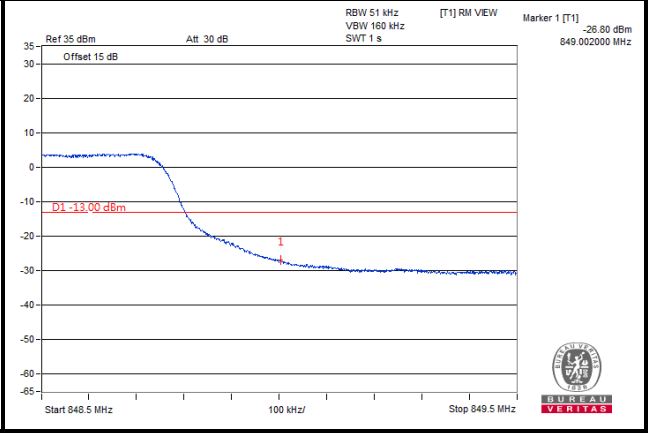


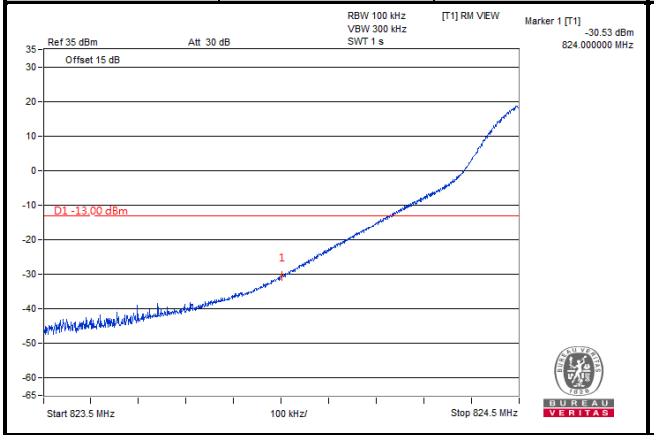
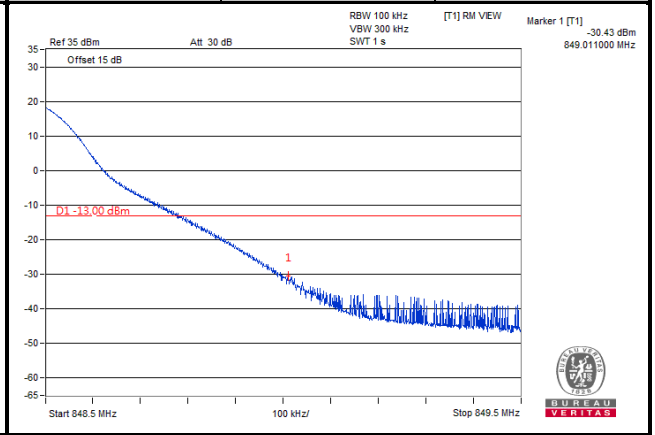
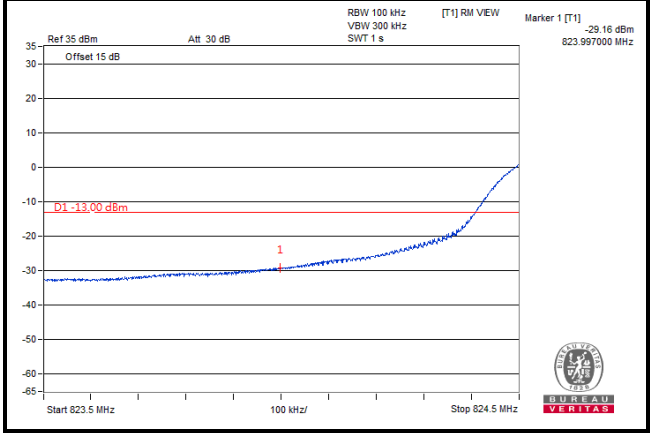
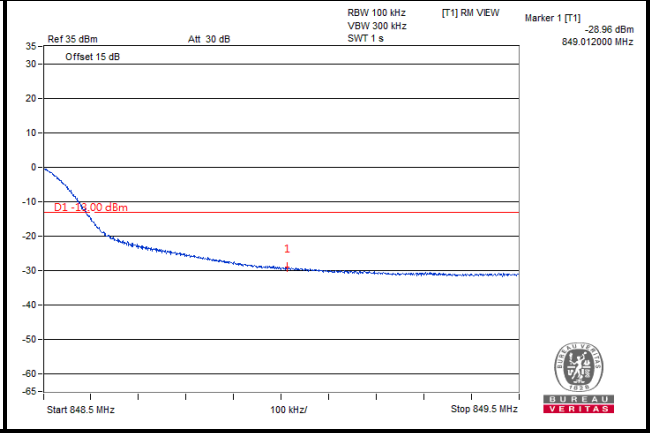
Channel	20407	6 RB	Channel	20643	6 RB

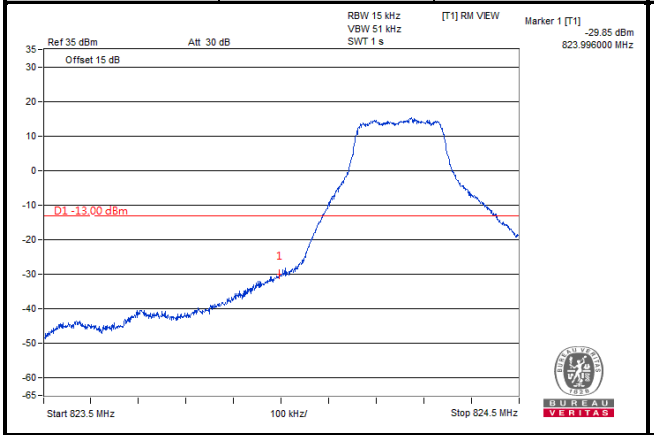
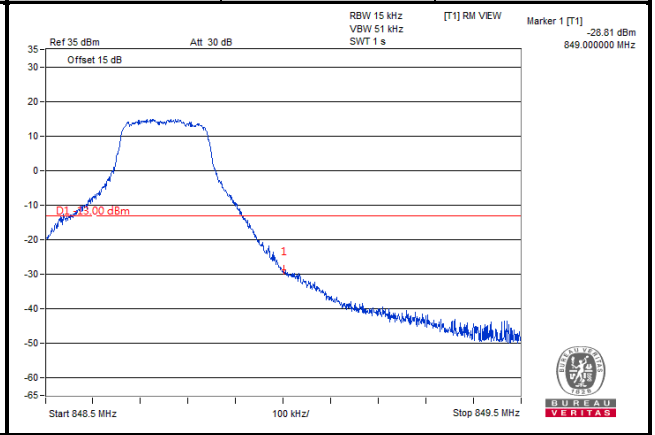
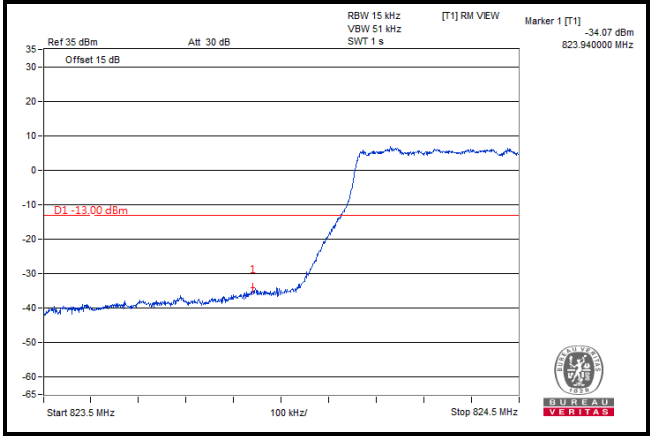
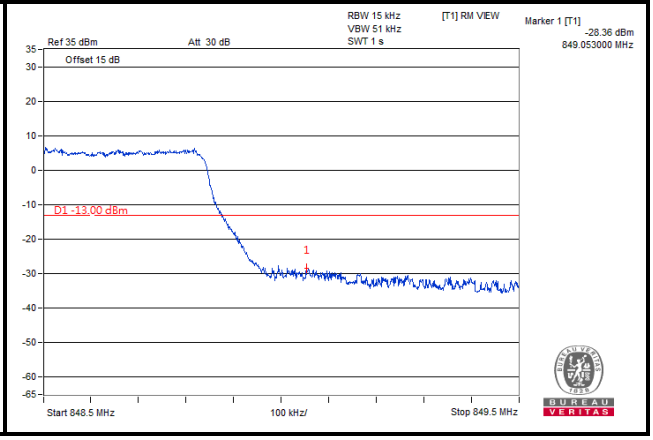


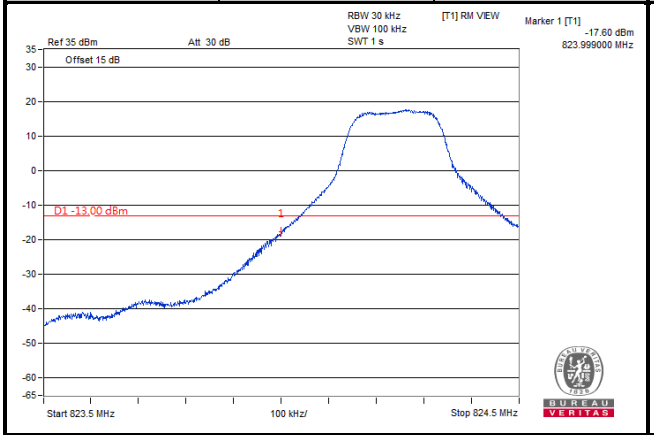
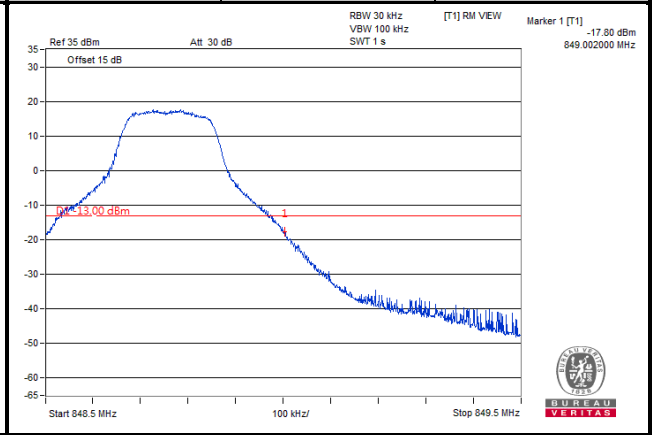
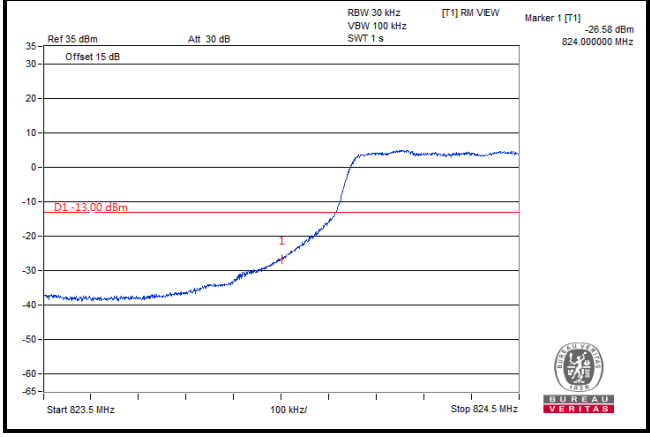
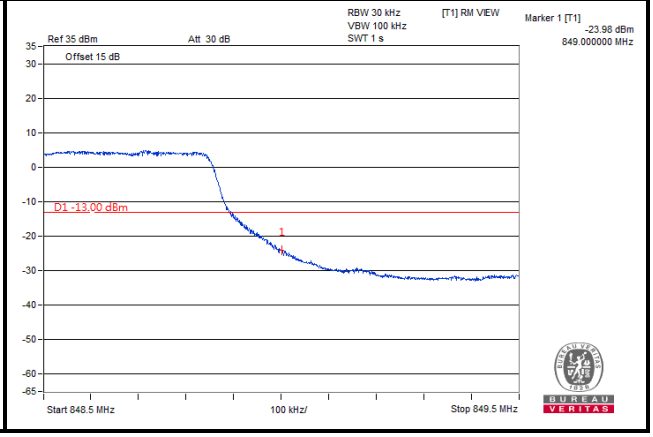


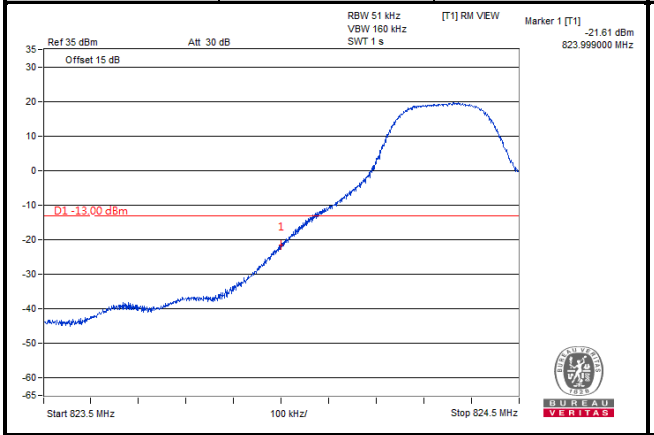
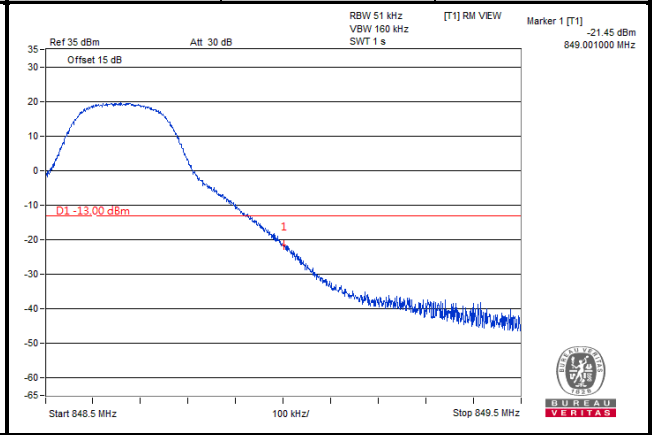
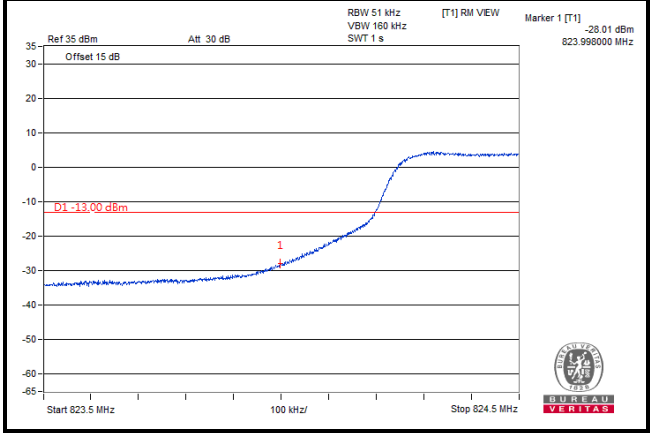
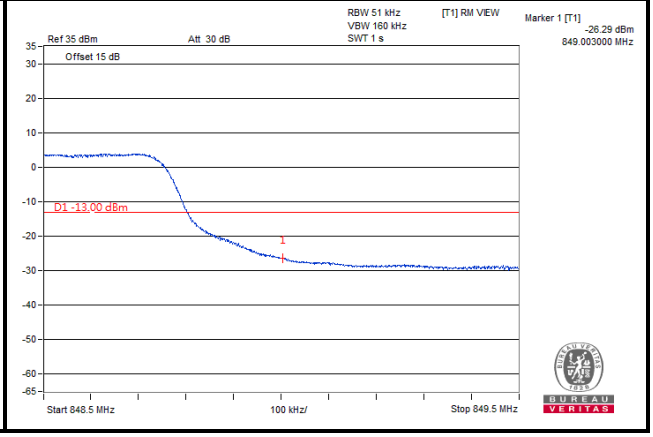
LTE Band 5					
Channel Bandwidth: 3 MHz					
Channel	20415	1 RB	Channel	20635	1 RB
					
Channel	20415	15 RB	Channel	20635	15 RB
					

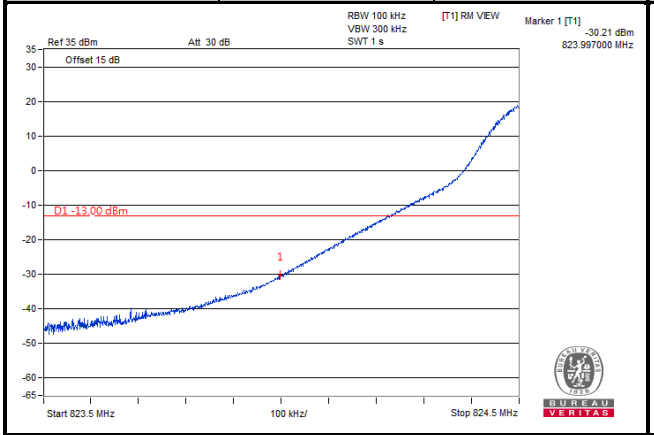
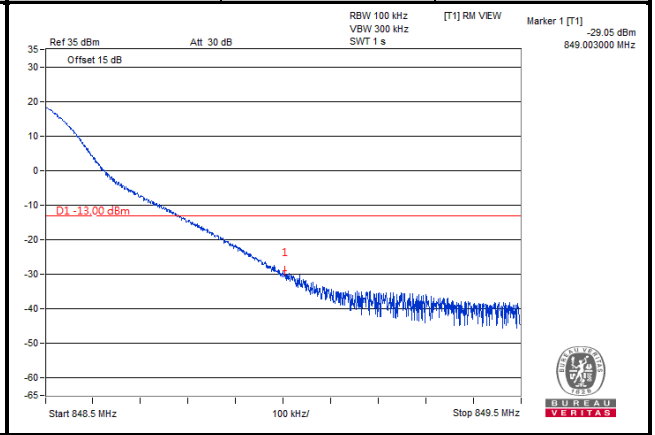
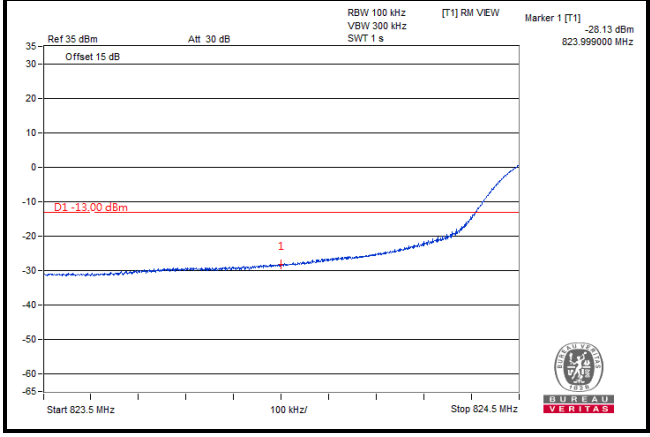
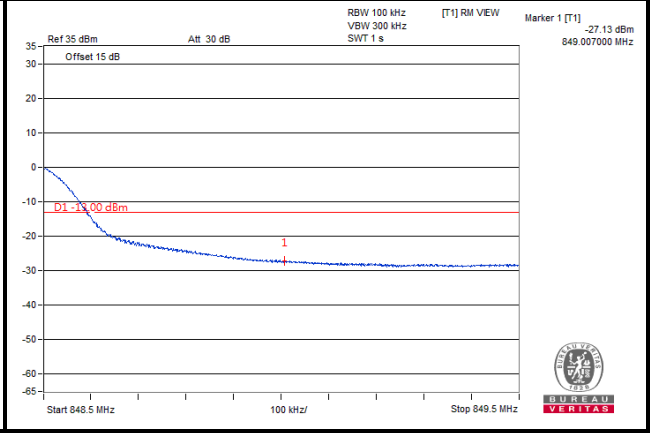
LTE Band 5					
Channel Bandwidth: 5 MHz					
Channel	20425	1 RB	Channel	20625	1 RB
					
Channel	20425	25 RB	Channel	20625	25 RB
					

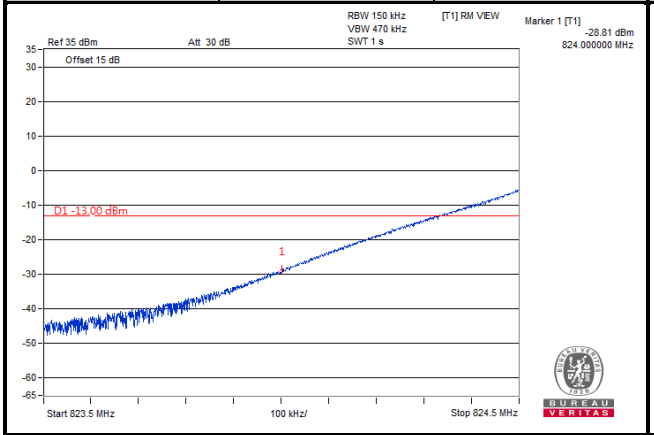
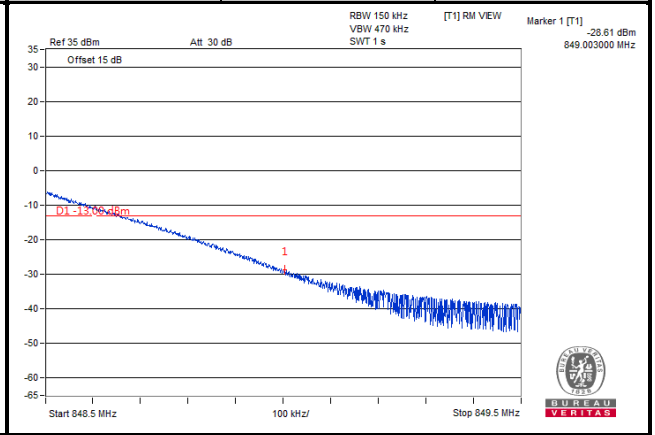
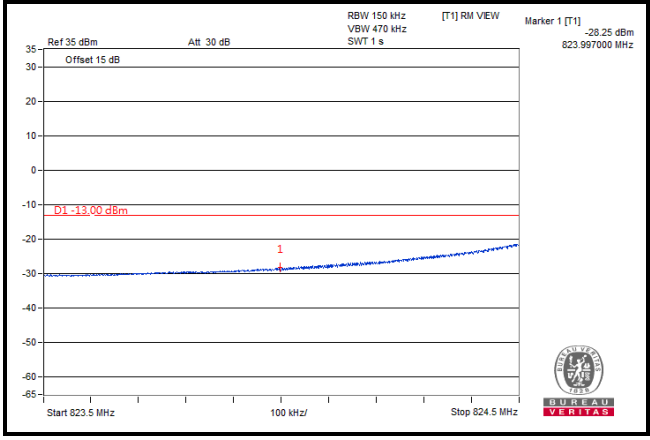
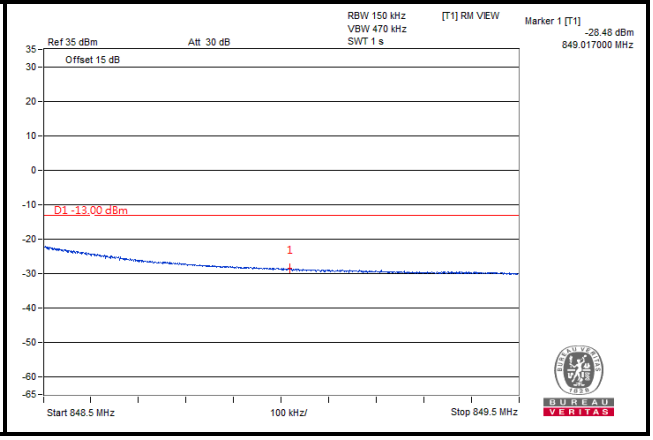
LTE Band 5					
Channel Bandwidth: 10 MHz					
Channel	20450	1 RB	Channel	20600	1 RB
					
Channel	20450	50 RB	Channel	20600	50 RB
					

LTE Band 26					
Channel Bandwidth: 1.4 MHz					
Channel	26797	1 RB	Channel	27033	1 RB
					
Channel	26797	6 RB	Channel	27033	6 RB
					

LTE Band 26					
Channel Bandwidth: 3 MHz					
Channel	26805	1 RB	Channel	27025	1 RB
					
Channel	26805	15 RB	Channel	27025	6 RB
					

LTE Band 26					
Channel Bandwidth: 5 MHz					
Channel	26815	1 RB	Channel	27015	1 RB
					
Channel	26815	25 RB	Channel	27015	25 RB
					

LTE Band 26					
Channel Bandwidth: 10 MHz					
Channel	26840	1 RB	Channel	26990	1 RB
					
Channel	26840	50 RB	Channel	26990	50 RB
					

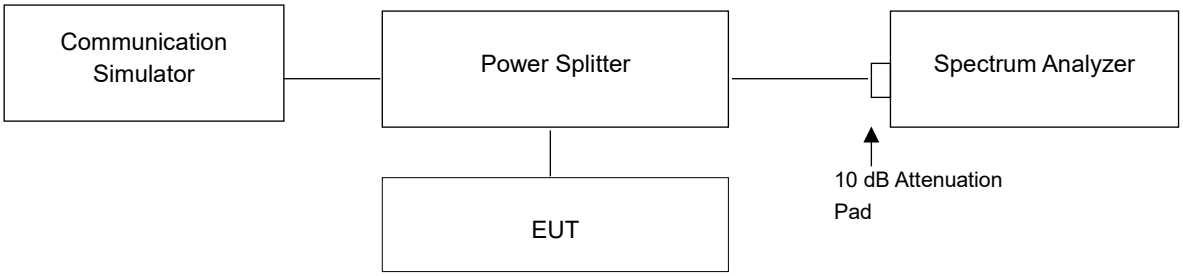
LTE Band 26					
Channel Bandwidth: 15 MHz					
Channel	26865	1 RB	Channel	26965	1 RB
					
Channel	26865	75 RB	Channel	26965	75 RB
					

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

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

4.6.4 Test Results

Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		WCDMA
4132	826.4	2.75
4182	836.4	2.82
4233	846.6	2.70

Spectrum Plot of Worst Value

WCDMA

LTE Band 5							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	3.69	4.46	20415	825.5	3.51	4.25
20525	836.5	3.54	4.27	20525	836.5	3.27	3.99
20643	848.3	3.37	4.14	20635	847.5	3.10	3.85

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 16QAM

LTE Band 5							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	3.46	4.20	20450	829.0	3.37	4.11
20525	836.5	3.16	3.99	20525	836.5	3.07	3.81
20625	846.5	3.05	3.80	20600	844.0	3.41	4.15

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM

LTE Band 26							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26797	824.7	3.58	4.35	26805	825.5	3.36	4.15
26915	836.5	3.48	4.18	26915	836.5	3.21	3.91
27033	848.3	3.42	4.19	27025	847.5	3.03	3.84

Spectrum Plot of Worst Value

1.4 MHz / 16QAM

3 MHz / 16QAM

LTE Band 26							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26815	826.5	3.37	4.12	26840	829.0	3.32	4.08
26915	836.5	3.11	3.86	26915	836.5	3.06	3.80
27015	846.5	3.02	3.76	26990	844.0	3.30	4.09

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM

LTE Band 26			
Channel Bandwidth: 15 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM
26865	831.5	3.39	4.09
26915	836.5	3.16	3.86
26965	841.5	3.34	3.97

Spectrum Plot of Worst Value

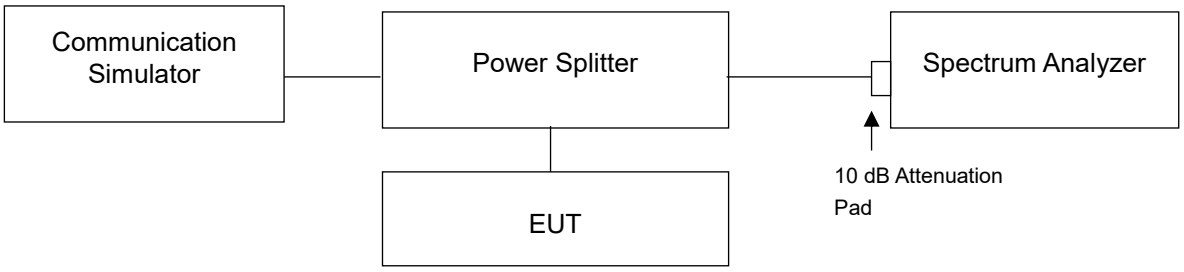
15 MHz / 16QAM

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 -13 dBm.

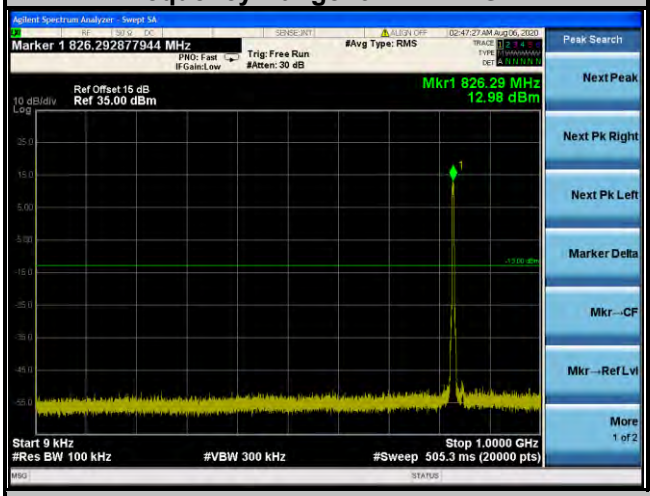
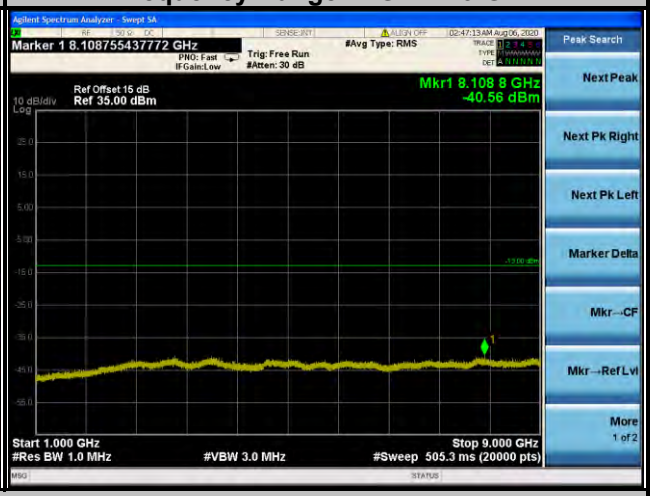
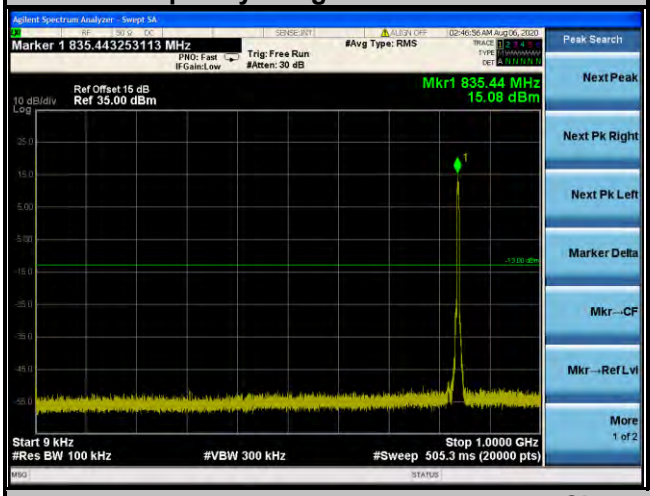
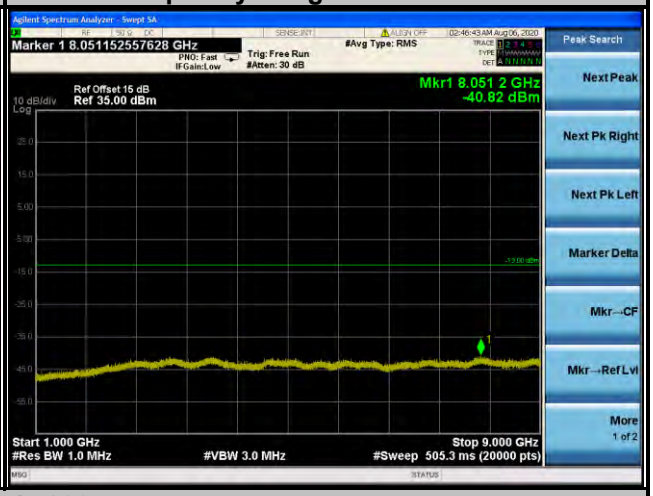
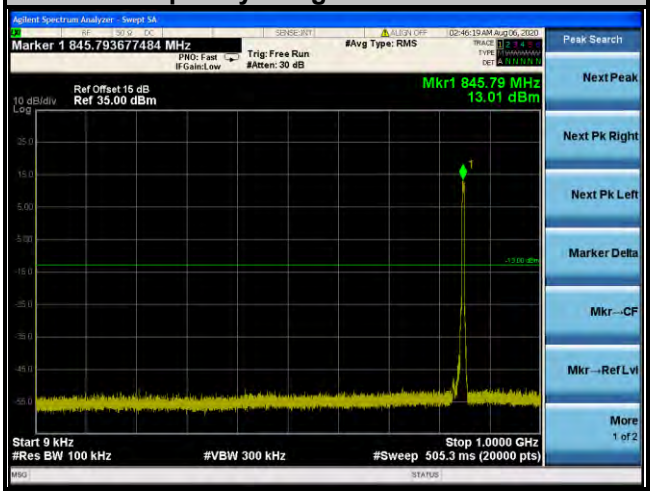
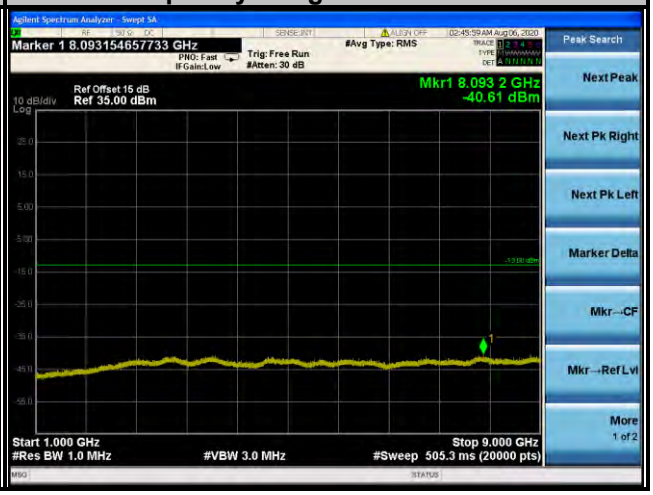
4.7.2 Test Setup



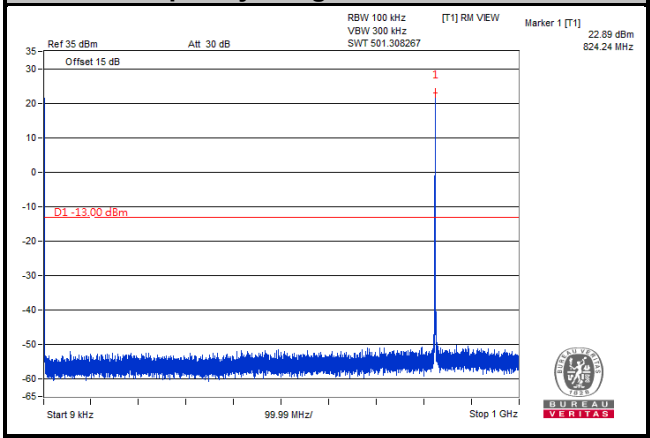
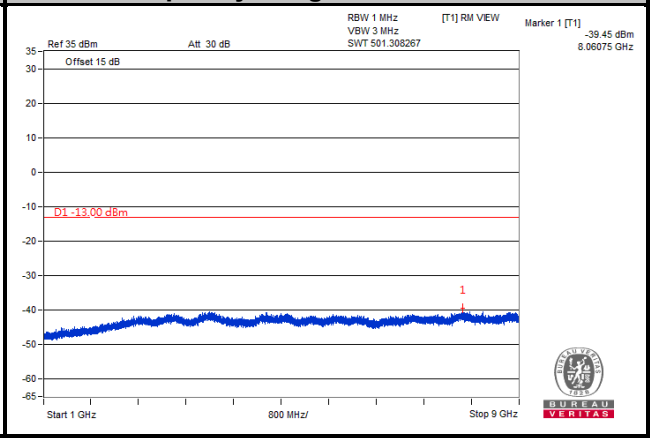
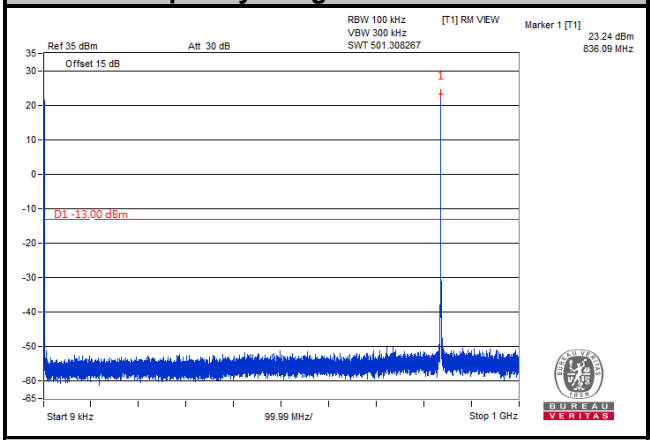
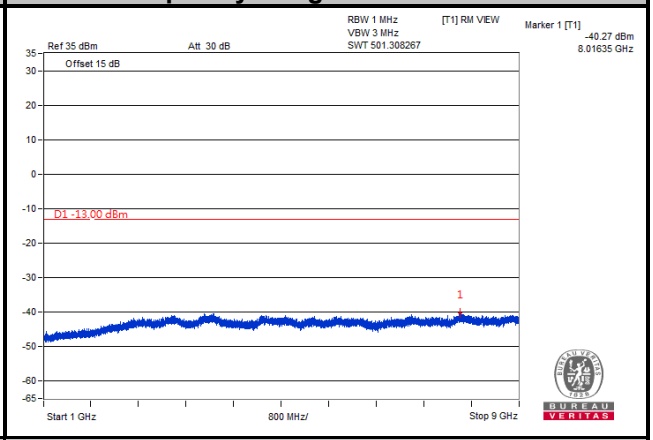
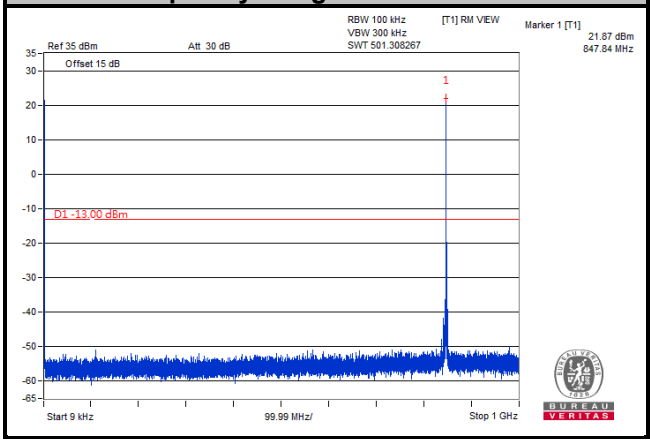
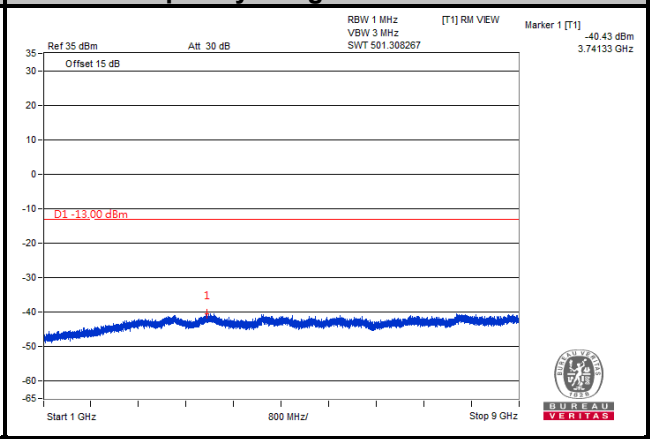
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 9 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

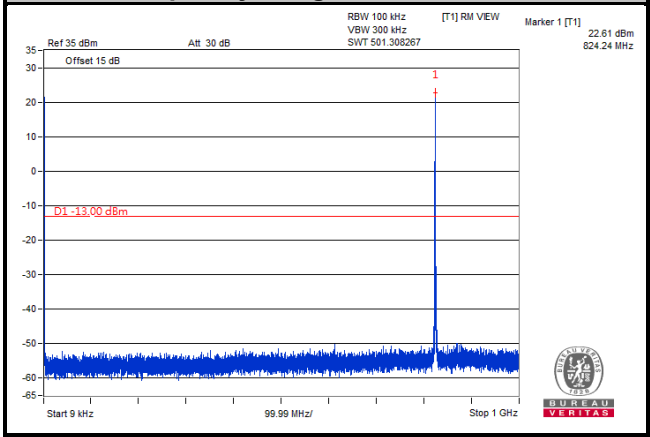
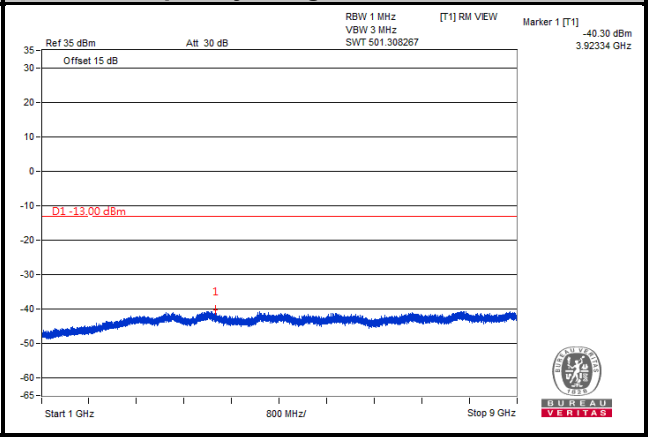
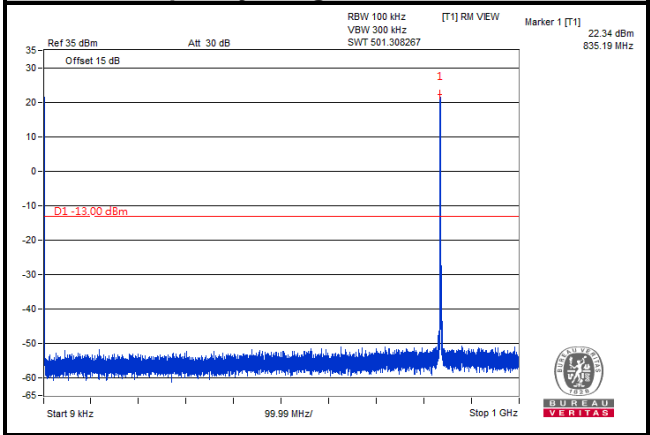
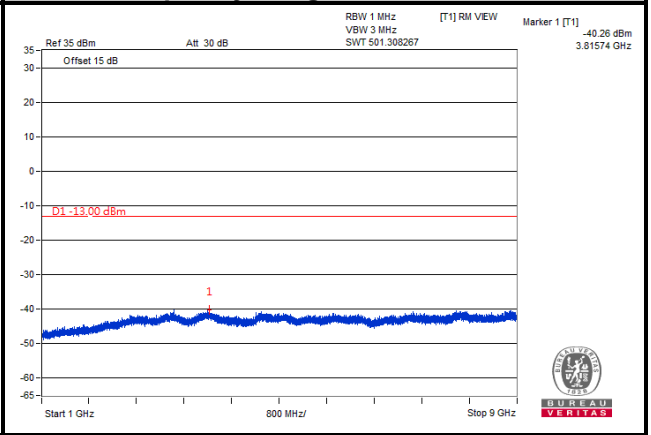
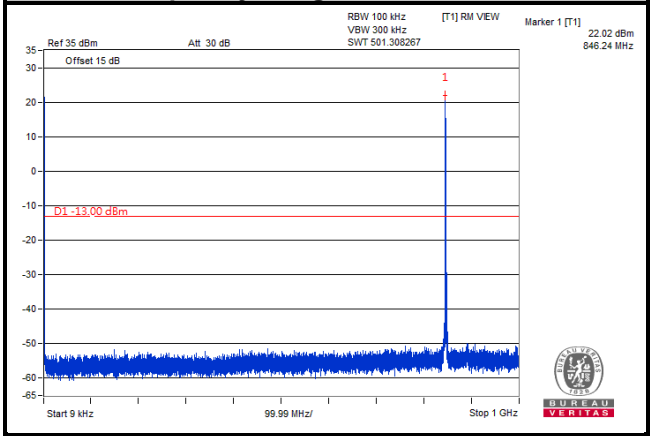
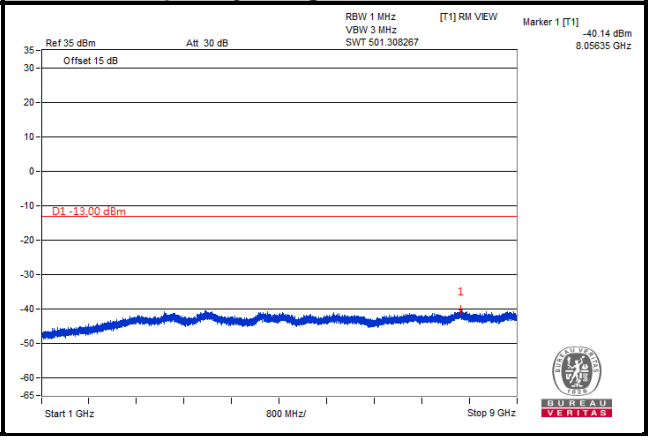
4.7.4 Test Results

WCDMA	
Channel 4132	
Frequency Range: 9 kHz ~ 1 GHz	**Frequency Range: 1 GHz ~ 9 GHz**
	
Channel 4182	
Frequency Range: 9 kHz ~ 1 GHz	**Frequency Range: 1 GHz ~ 9 GHz**
	
Channel 4233	
Frequency Range: 9 kHz ~ 1 GHz	**Frequency Range: 1 GHz ~ 9 GHz**
	

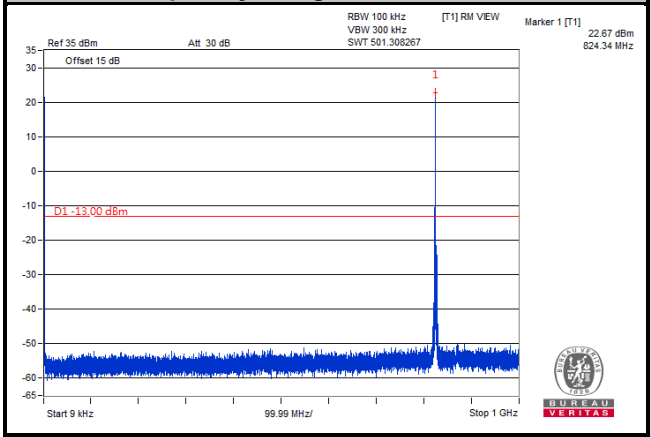
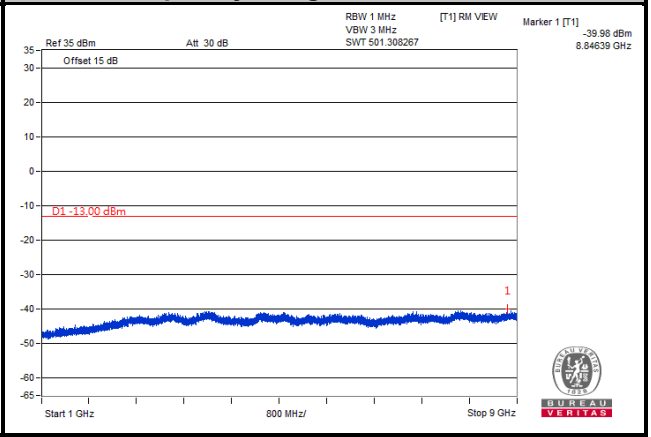
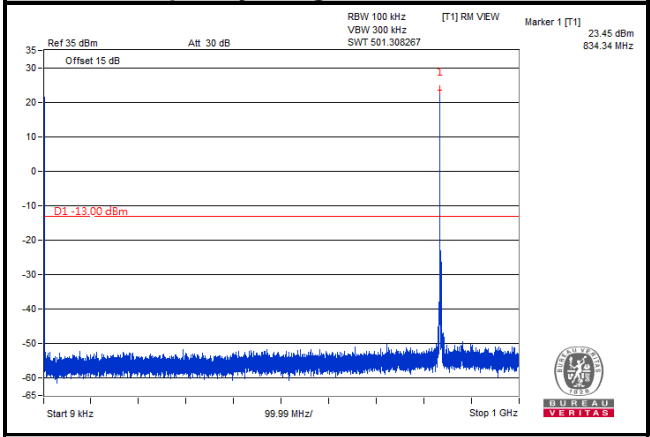
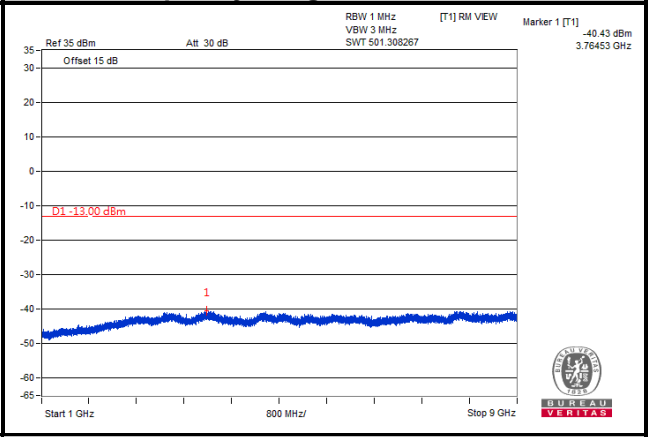
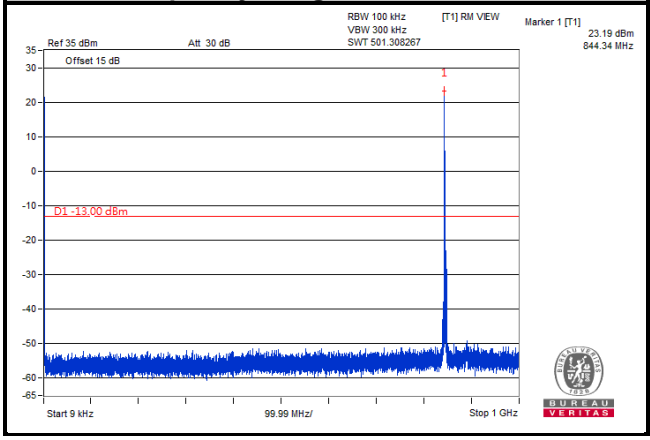
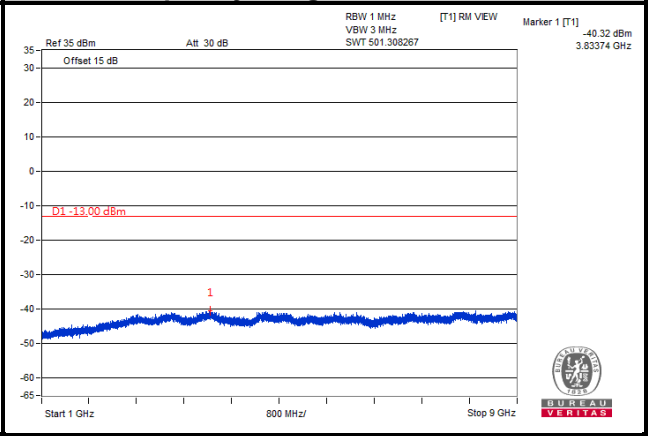
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 1.4 MHz	
Channel 20407	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20643	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

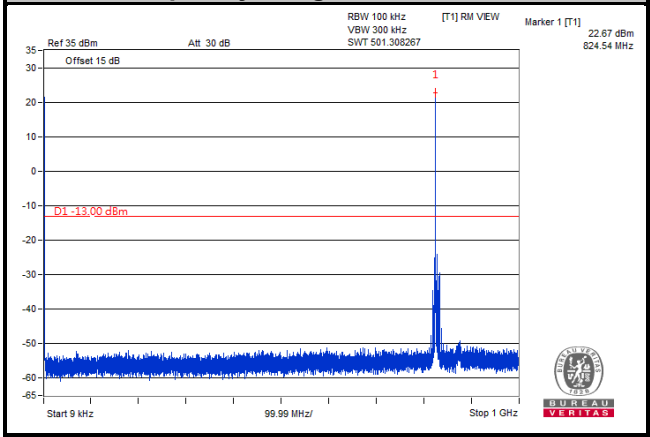
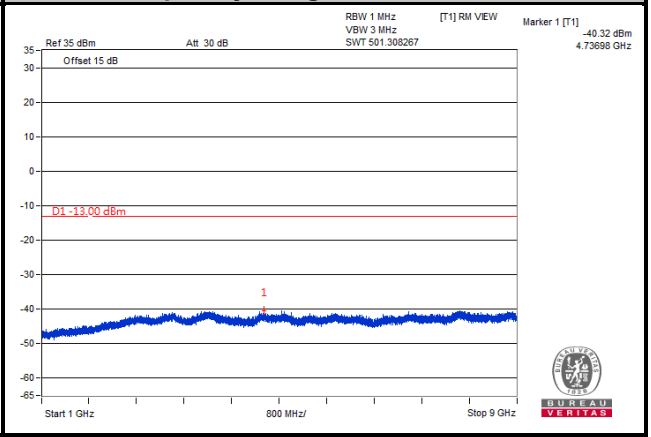
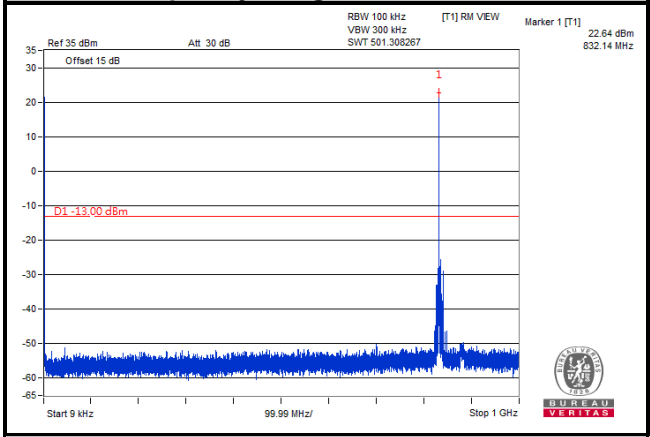
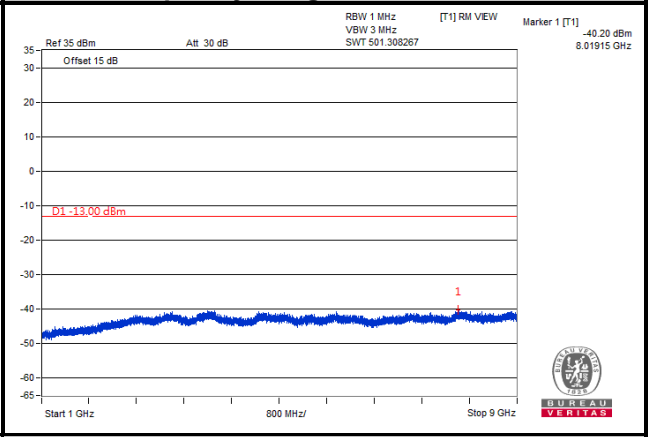
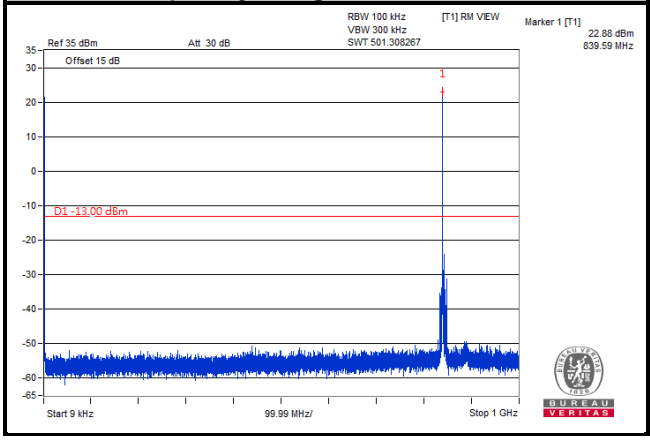
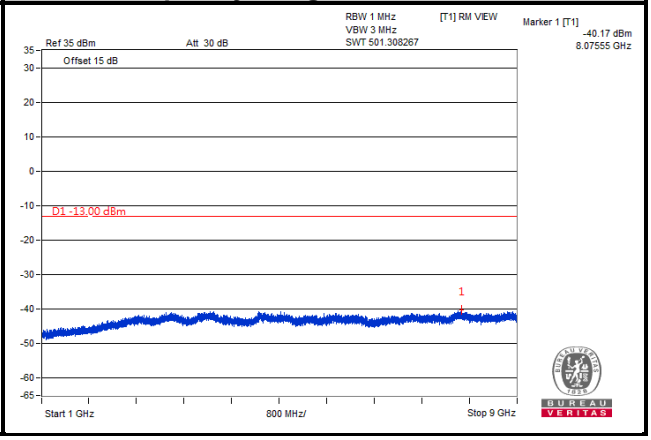
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 3 MHz	
Channel 20415	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20635	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

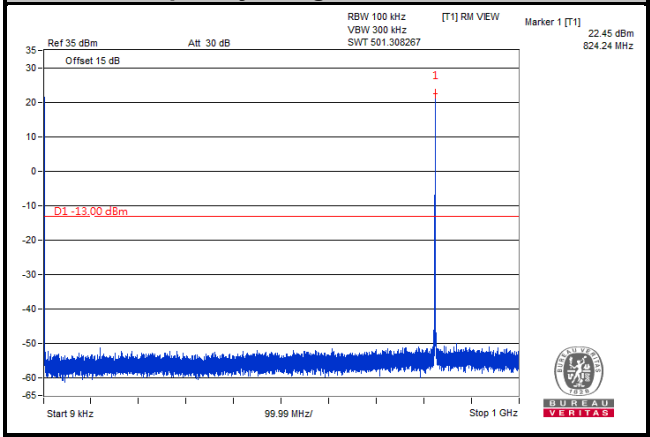
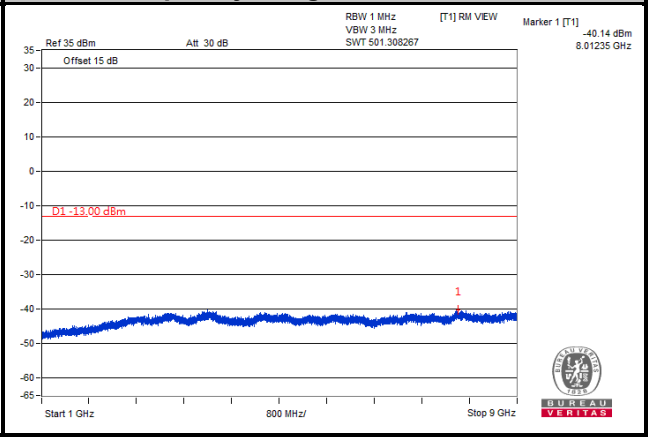
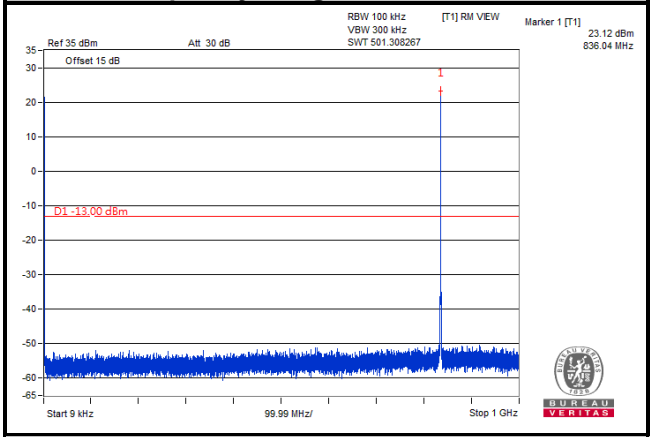
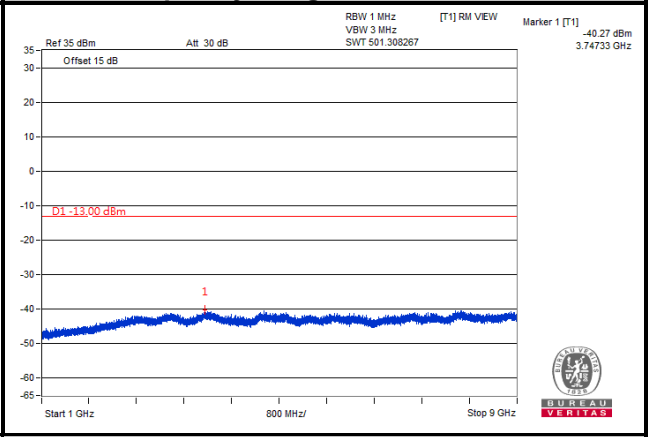
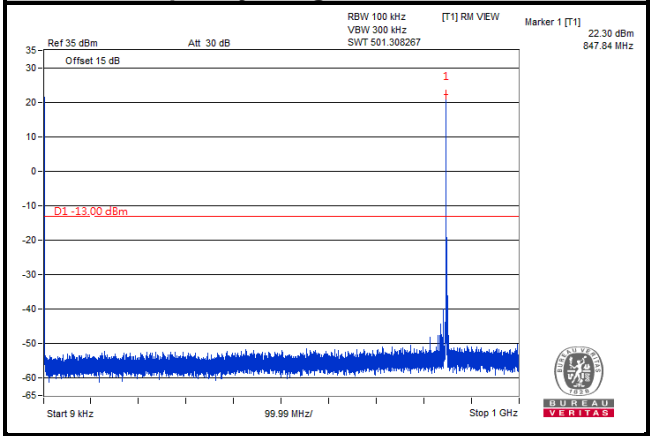
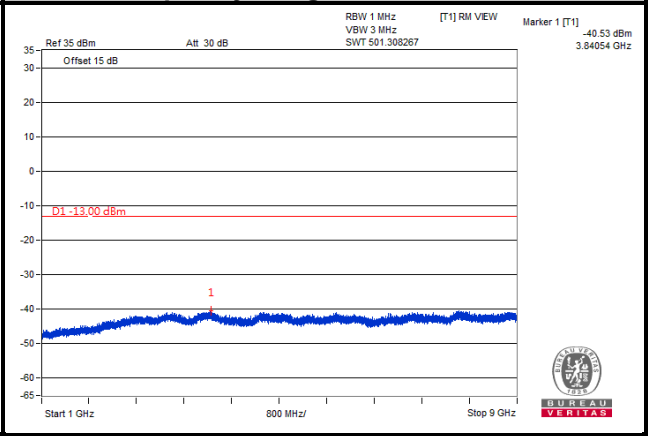
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 5 MHz	
Channel 20425	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20625	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

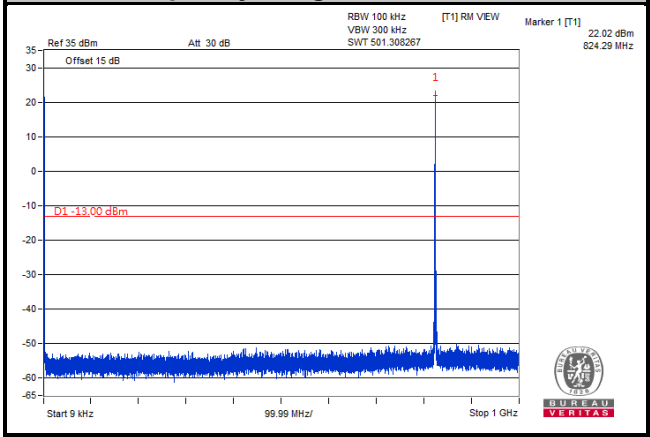
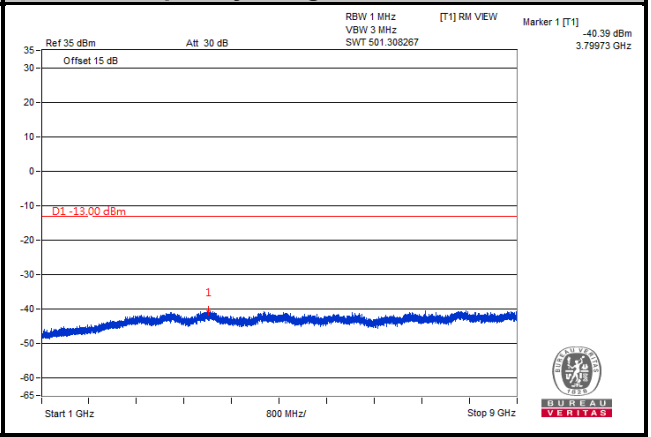
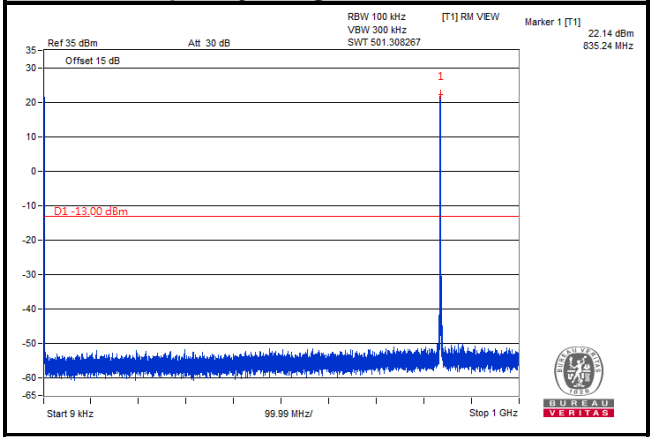
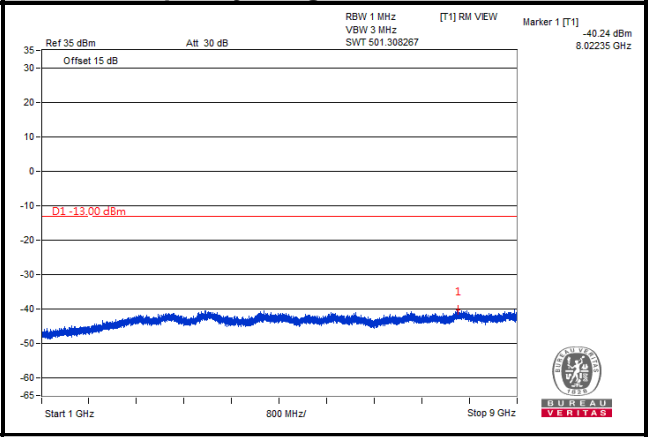
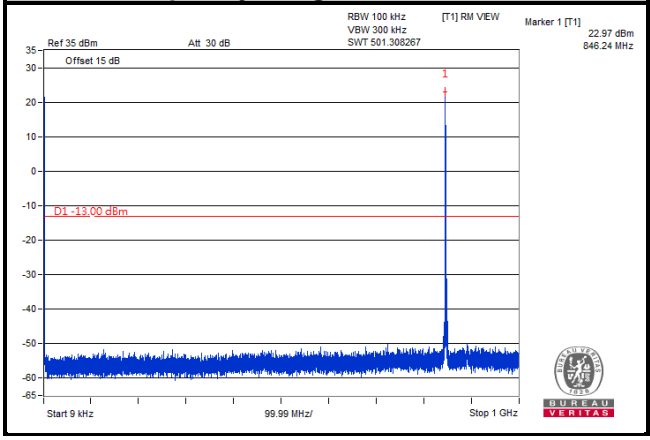
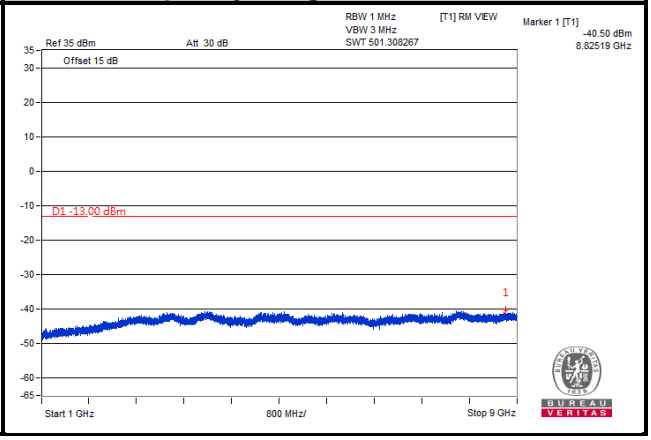
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 10 MHz	
Channel 20450	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20600	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

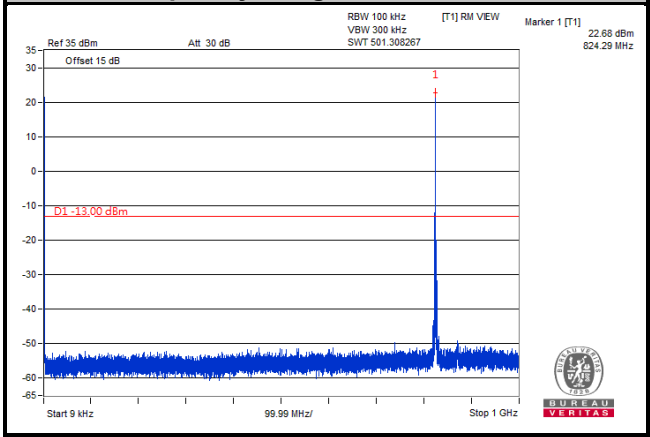
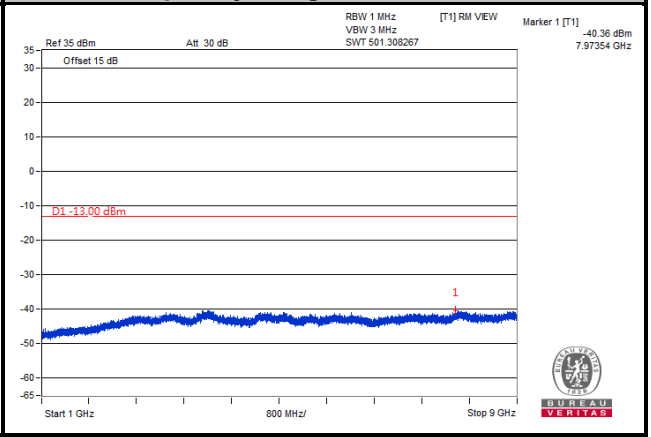
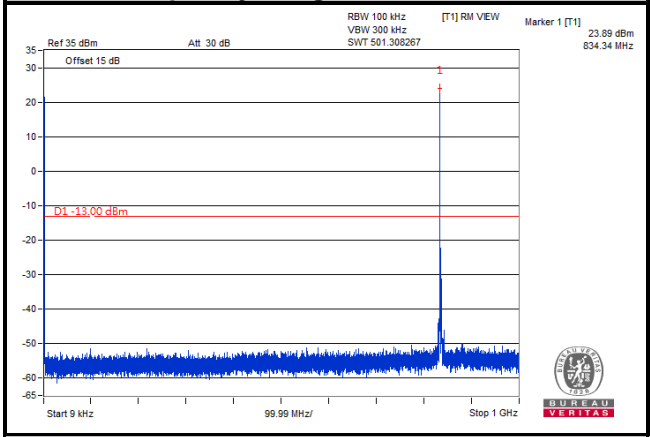
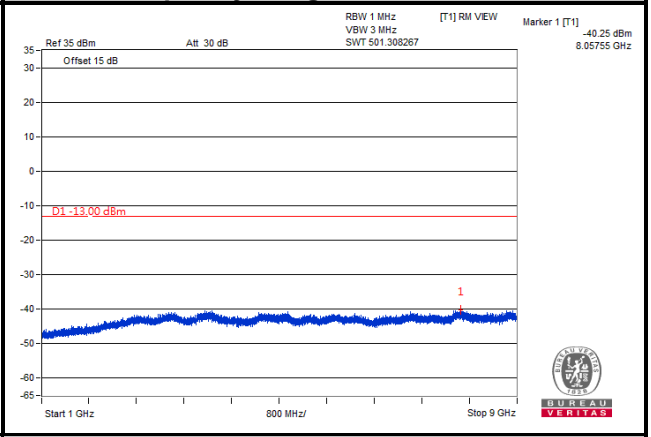
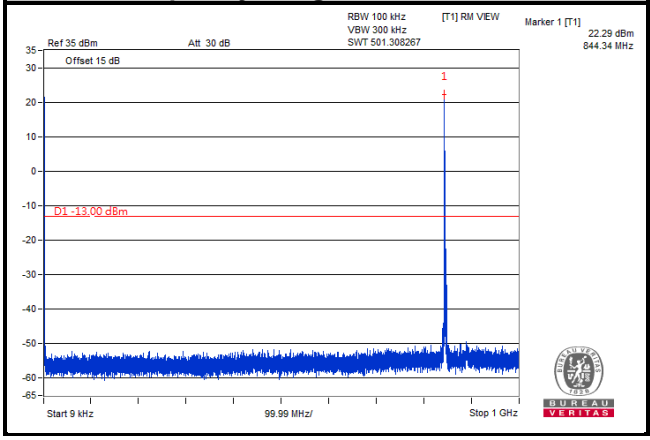
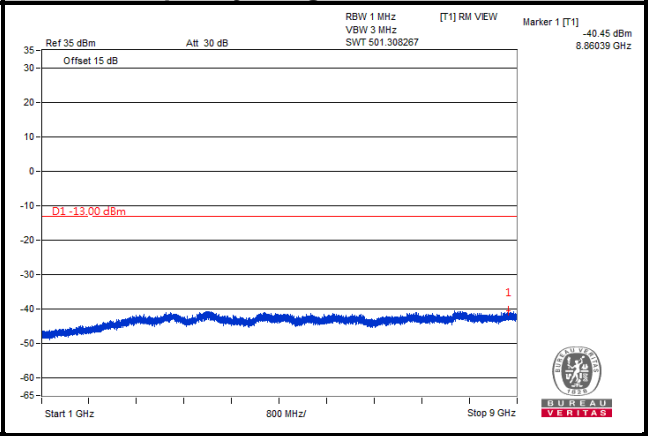
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 1.4 MHz	
Channel 26797	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27033	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

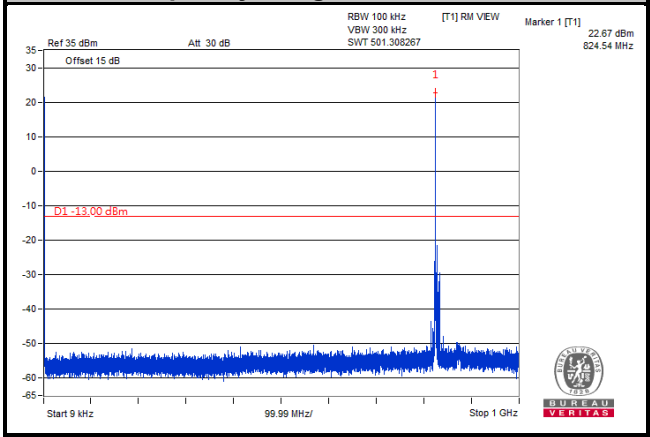
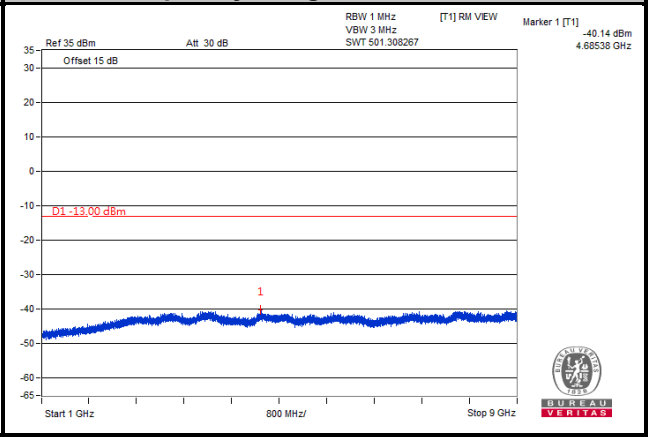
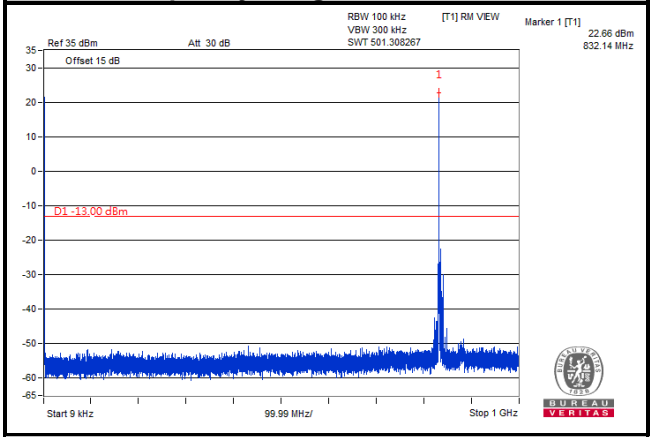
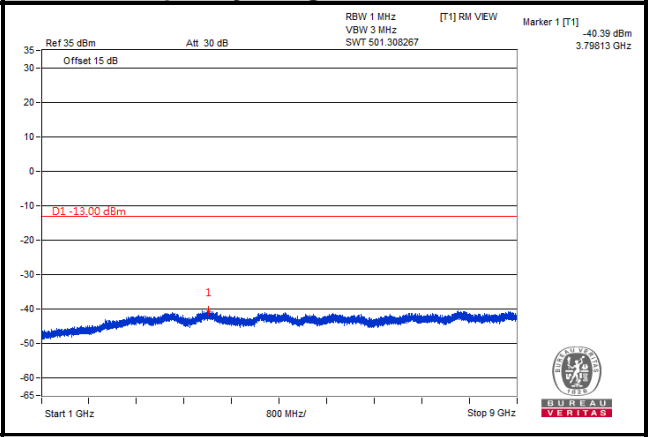
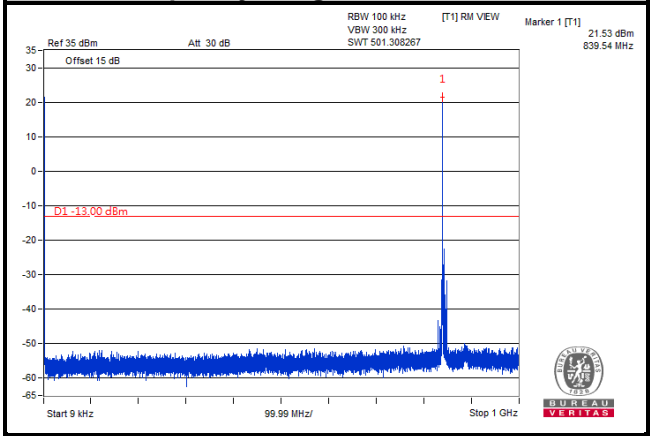
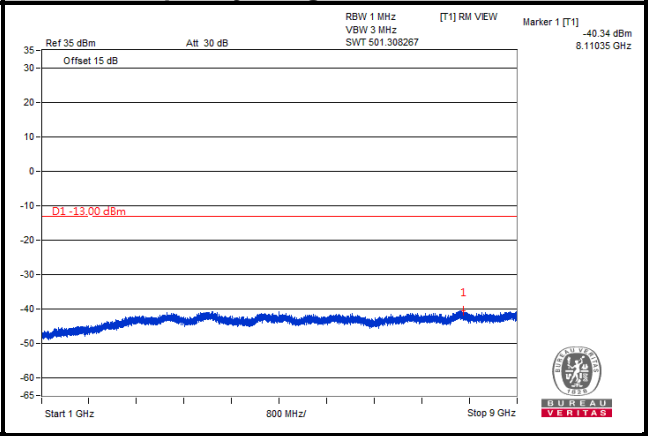
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 3 MHz	
Channel 26805	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

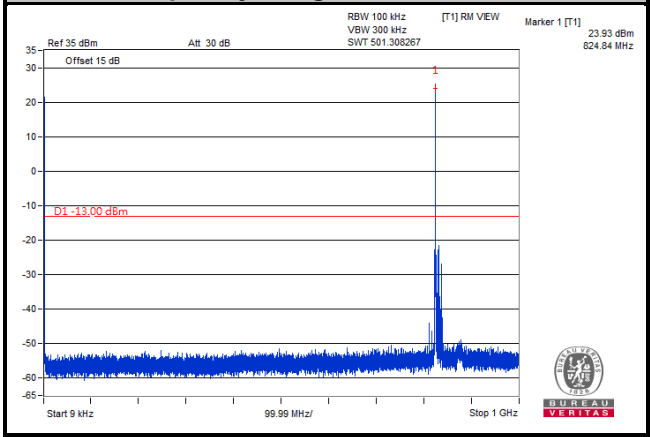
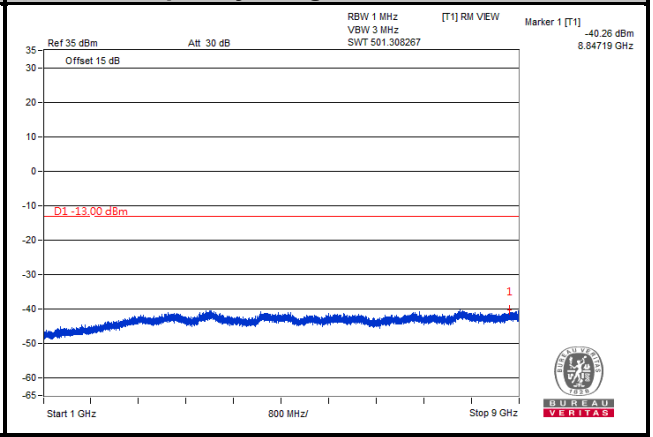
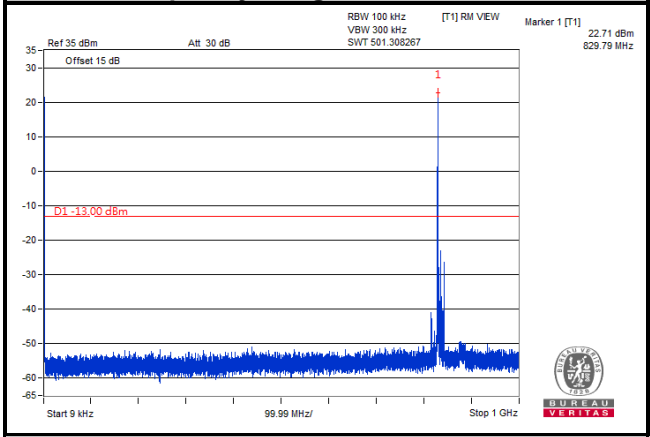
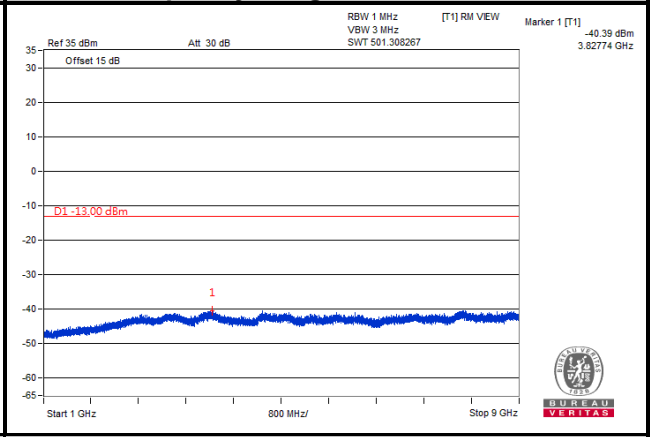
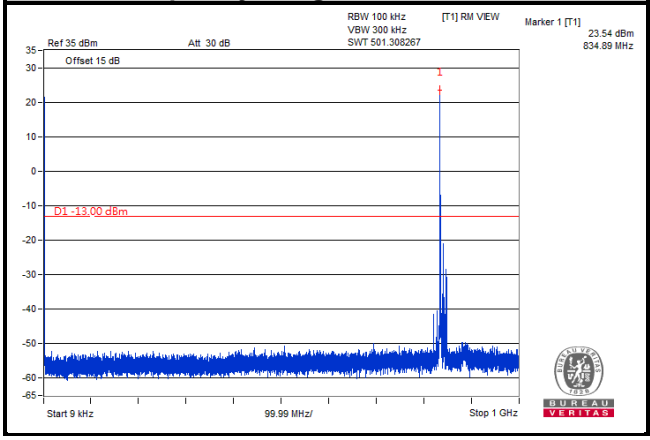
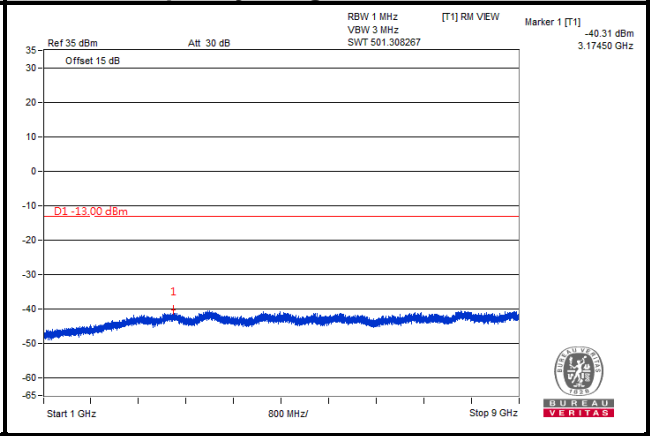
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 5 MHz	
Channel 26815	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27015	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 10 MHz	
Channel 26840	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26990	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 15 MHz	
Channel 26865	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26965	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

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 is equal to -13 dBm.

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 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. Correction Factor (includes EIRP and ERP unit conversion factor) = Antenna gain of substitution horn. – Tx cable loss. Measurement method refers to ANSI C63.26 section 5.5.3.2.
c. 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 - 2.15 dB.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:

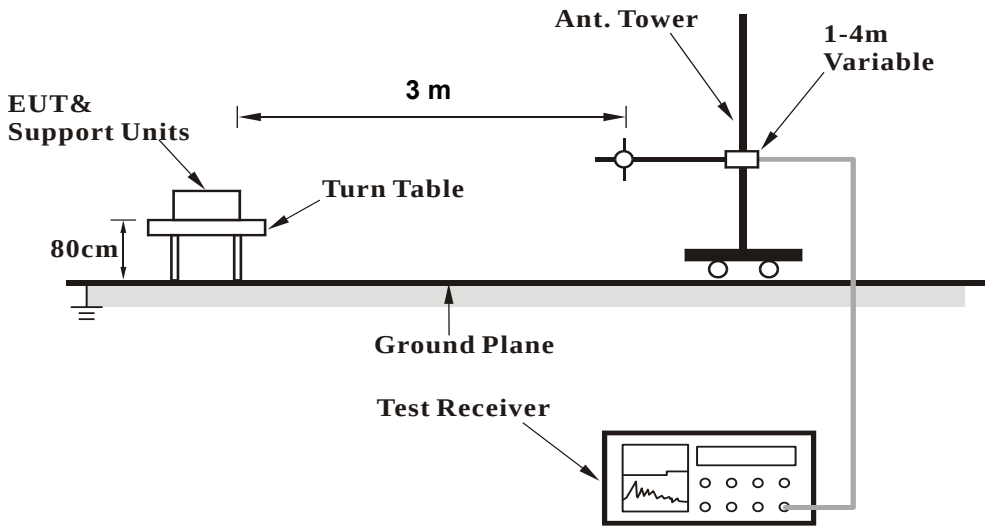
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

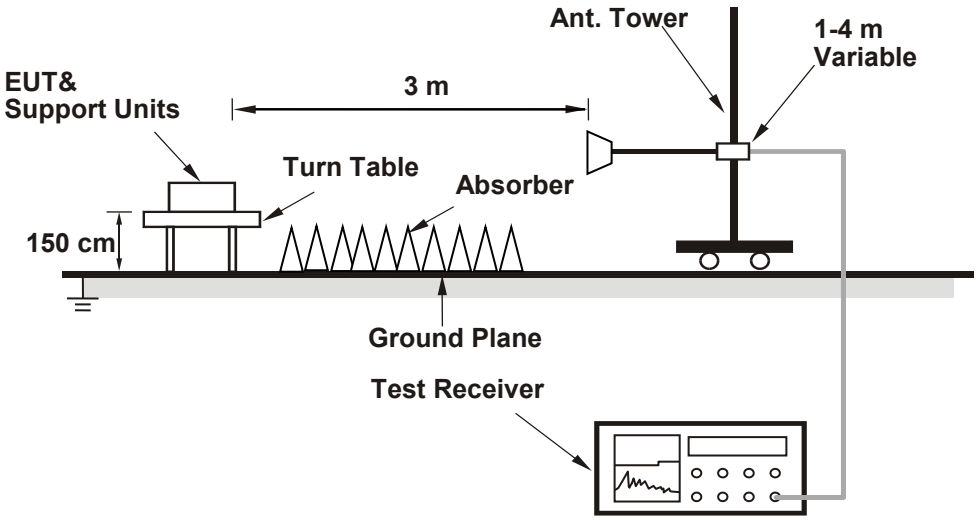
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



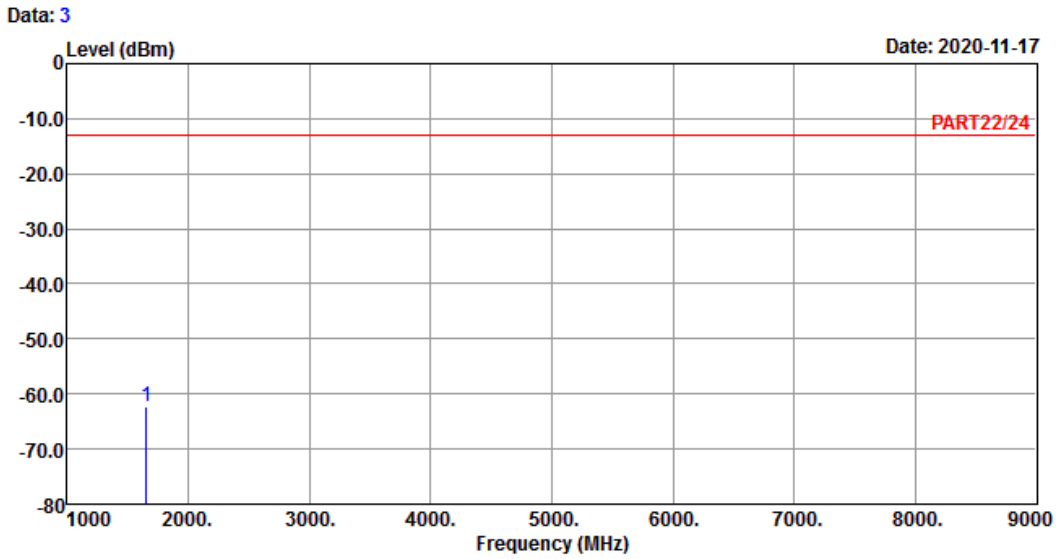
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.5 Test Results

WCDMA:

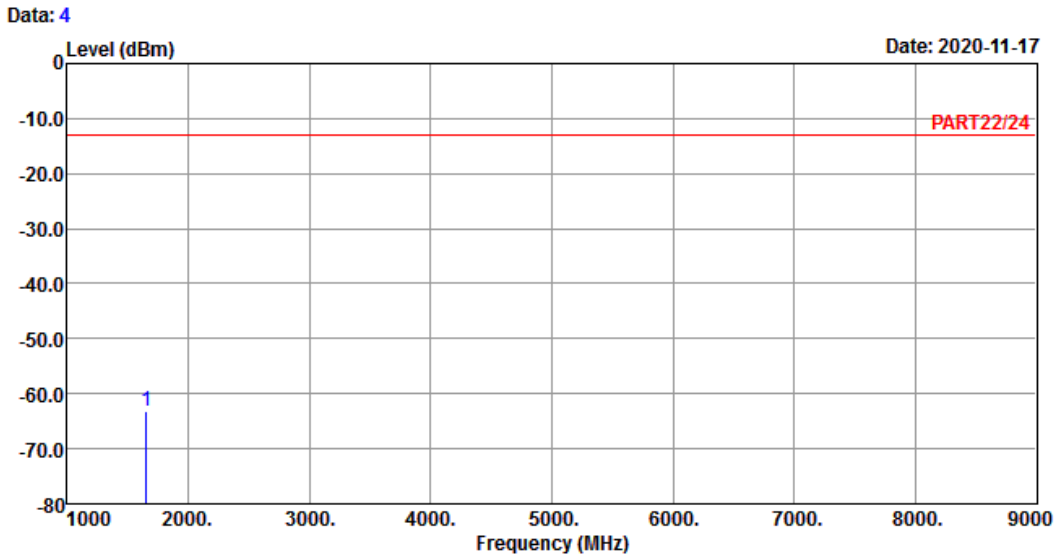
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : WCDMA Band 5 Link_L-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1652.80	-62.32	-48.55	-13.00	-13.77	-49.32	Peak

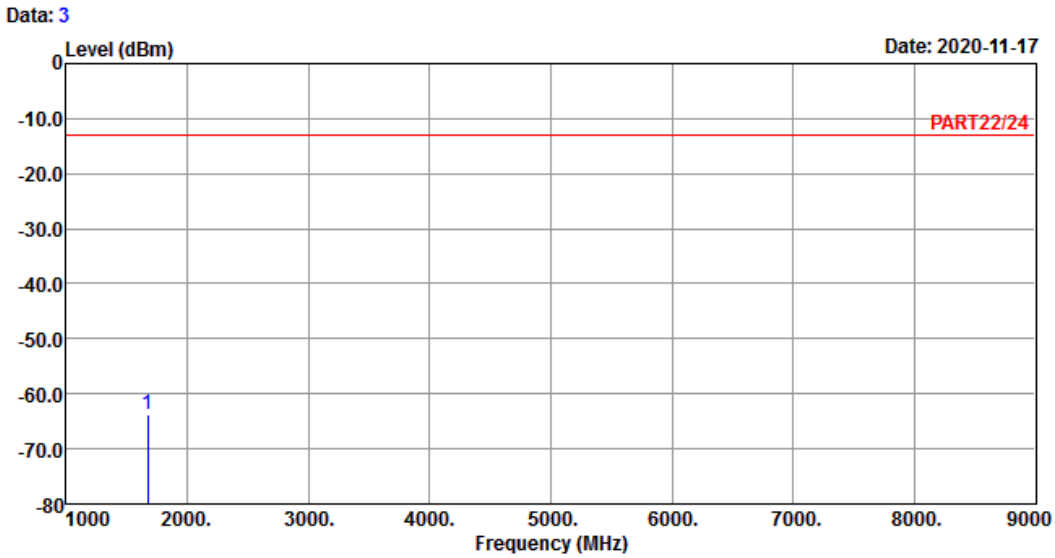


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : WCDMA Band 5 Link_L-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1652.80	-63.19	-49.42	-13.00	-13.77	-50.19	Peak

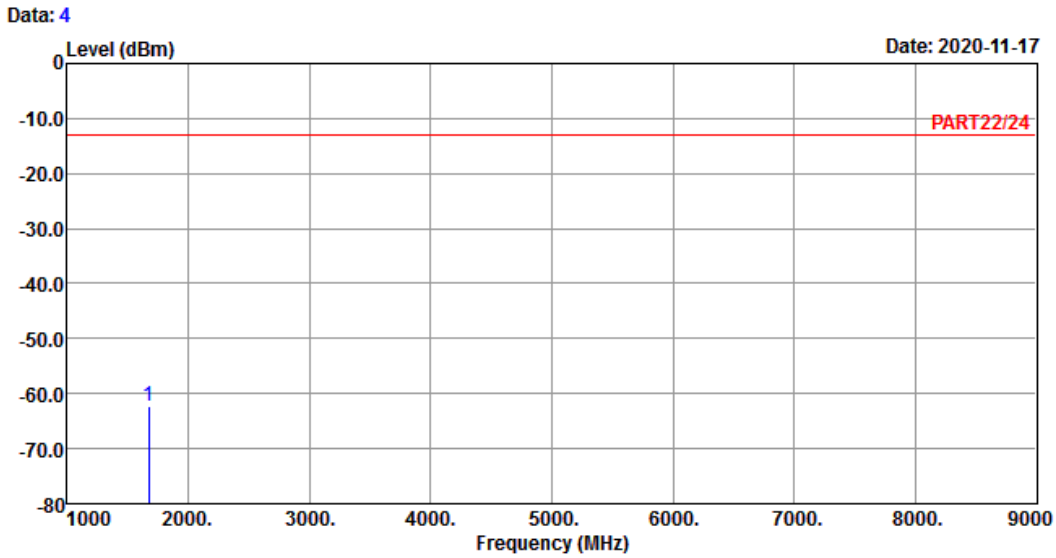
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : WCDMA Band 5 Link_M-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1672.80	-63.84	-49.94	-13.00	-13.90	-50.84	Peak

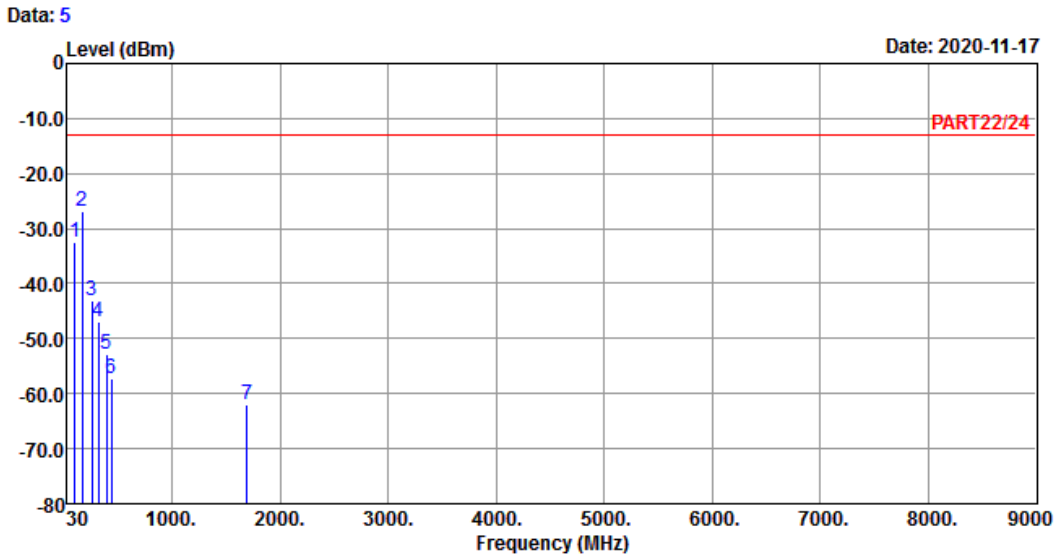


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : WCDMA Band 5 Link_M-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1672.80	-62.33	-48.43	-13.00	-13.90	-49.33	Peak

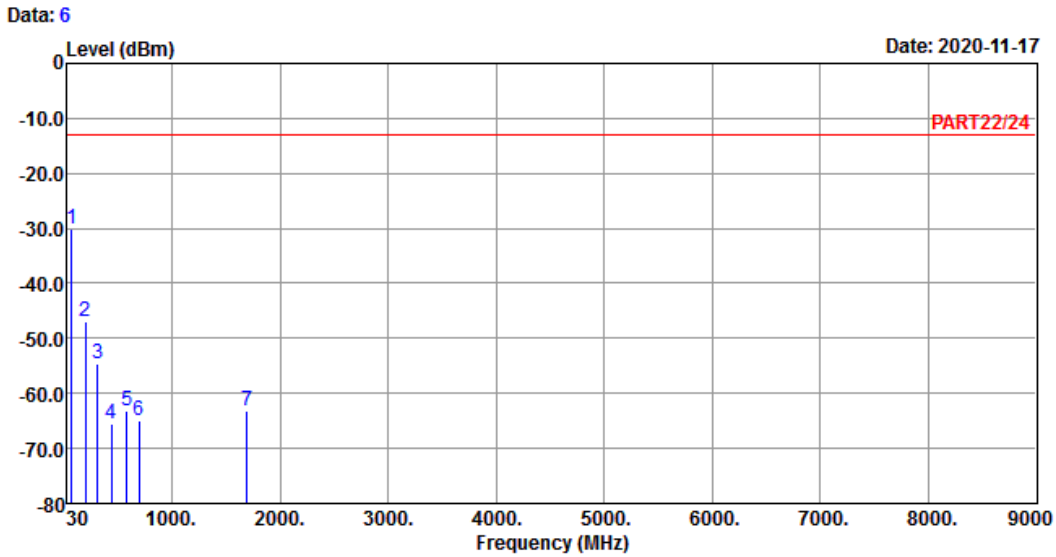
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : WCDMA Band 5 Link_H-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	97.90	-32.52	-21.85	-13.00	-10.67	-19.52	Peak
2 pp	170.65	-27.01	-21.31	-13.00	-5.70	-14.01	Peak
3	254.07	-43.06	-36.99	-13.00	-6.07	-30.06	Peak
4	317.12	-47.08	-40.33	-13.00	-6.75	-34.08	Peak
5	390.84	-52.90	-46.90	-13.00	-6.00	-39.90	Peak
6	439.34	-57.40	-51.77	-13.00	-5.63	-44.40	Peak
7	1693.20	-62.13	-48.11	-13.00	-14.02	-49.13	Peak

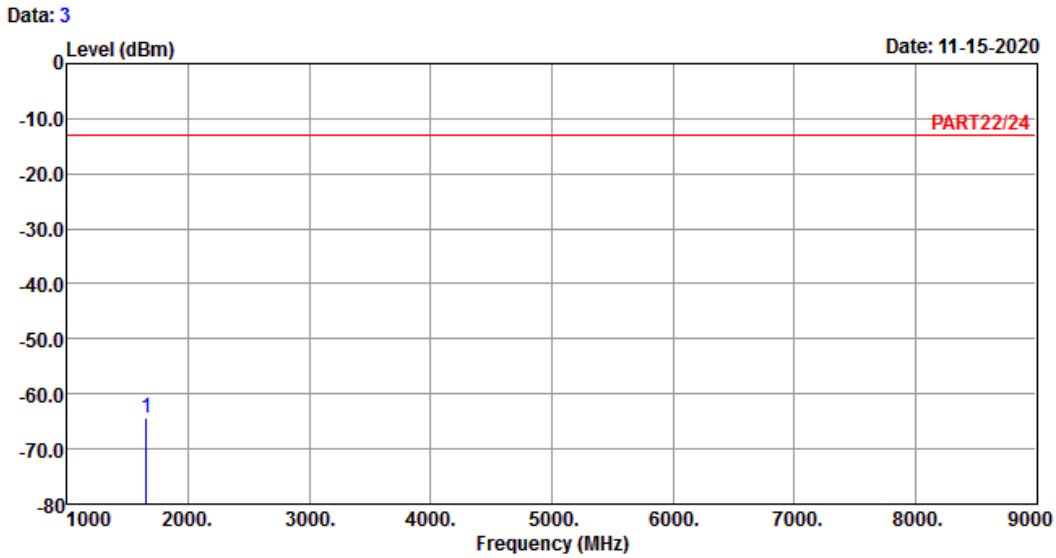


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : WCDMA Band 5 Link_H-CH
Tested by: tim-chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	67.83	-30.14	-21.89	-13.00	-8.25	-17.14	Peak
2	193.93	-47.00	-39.54	-13.00	-7.46	-34.00	Peak
3	308.39	-54.70	-47.82	-13.00	-6.88	-41.70	Peak
4	434.49	-65.42	-59.75	-13.00	-5.67	-52.42	Peak
5	578.05	-63.05	-61.37	-13.00	-1.68	-50.05	Peak
6	697.36	-64.80	-64.66	-13.00	-0.14	-51.80	Peak
7	1693.20	-63.22	-49.20	-13.00	-14.02	-50.22	Peak

LTE Band 5
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

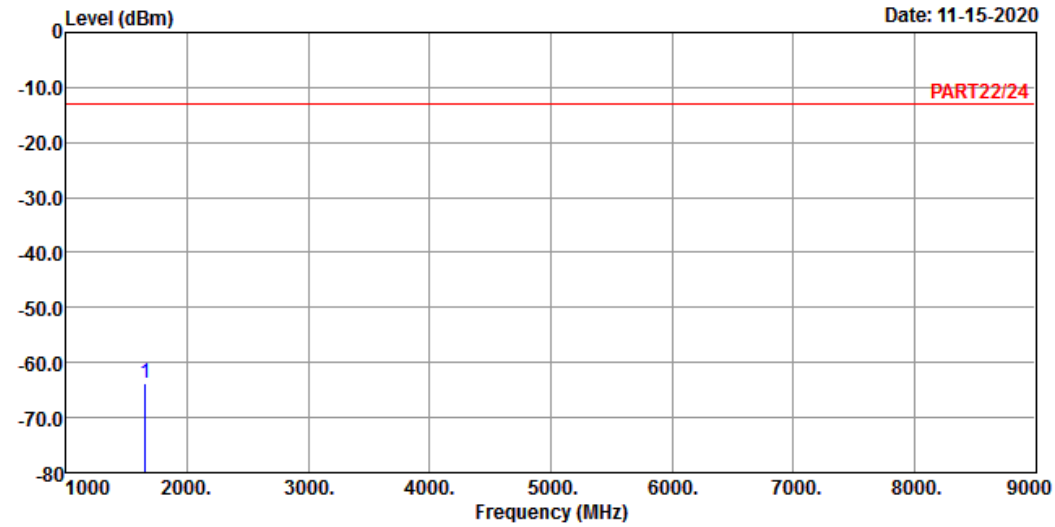
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_1.4M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1649.40	-64.22	-50.48	-13.00	-13.74	-51.22	Peak

Data: 4

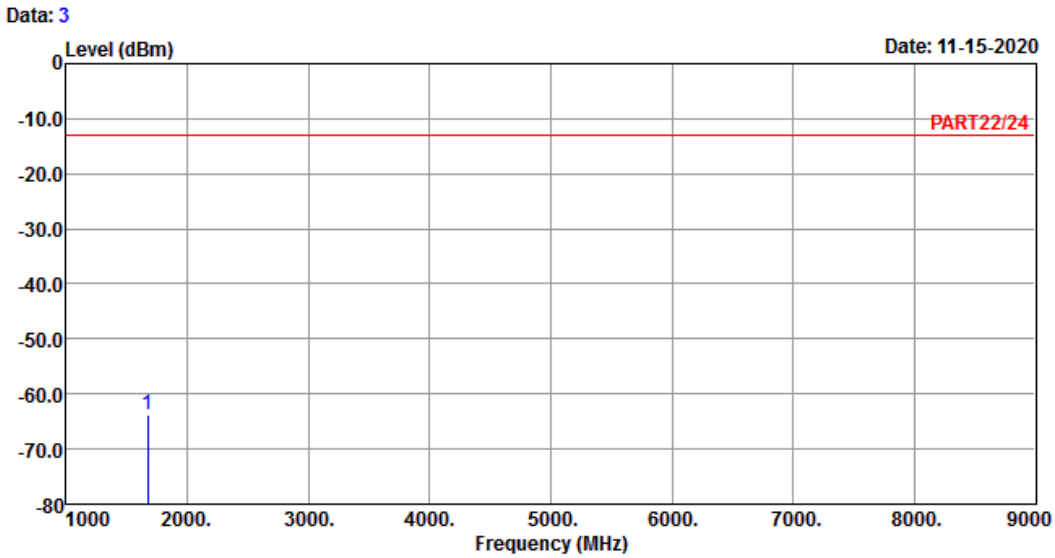


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_1.4M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1649.40	-63.83	-50.09	-13.00	-13.74	-50.83	Peak

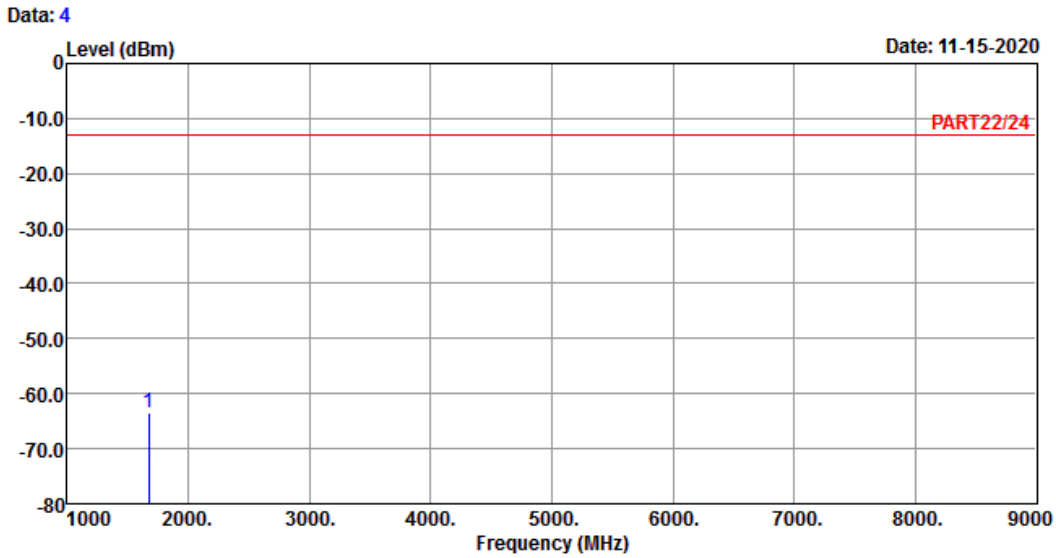
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_1.4M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.76	-49.86	-13.00	-13.90	-50.76	Peak

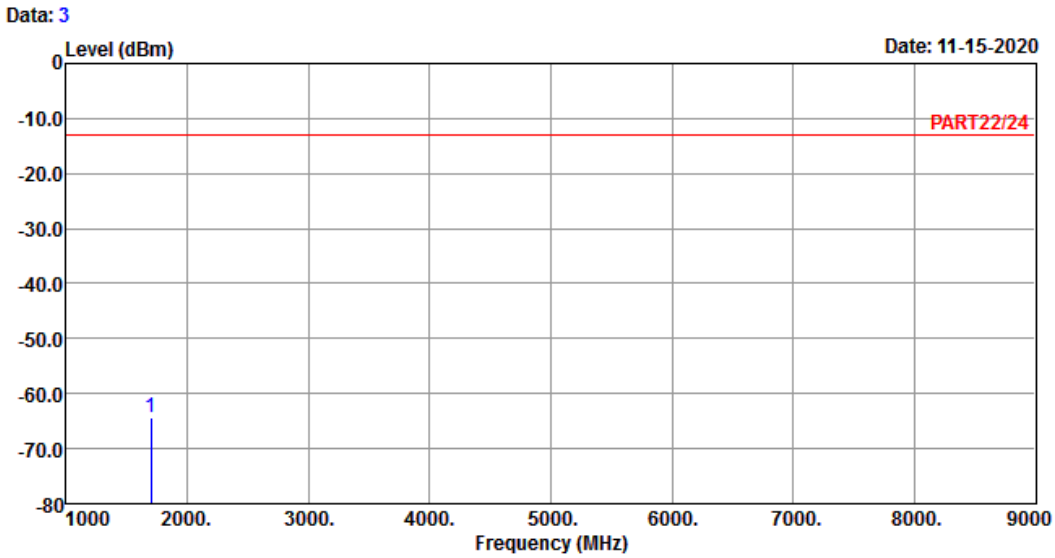


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_1.4M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.62	-49.72	-13.00	-13.90	-50.62	Peak

High Channel

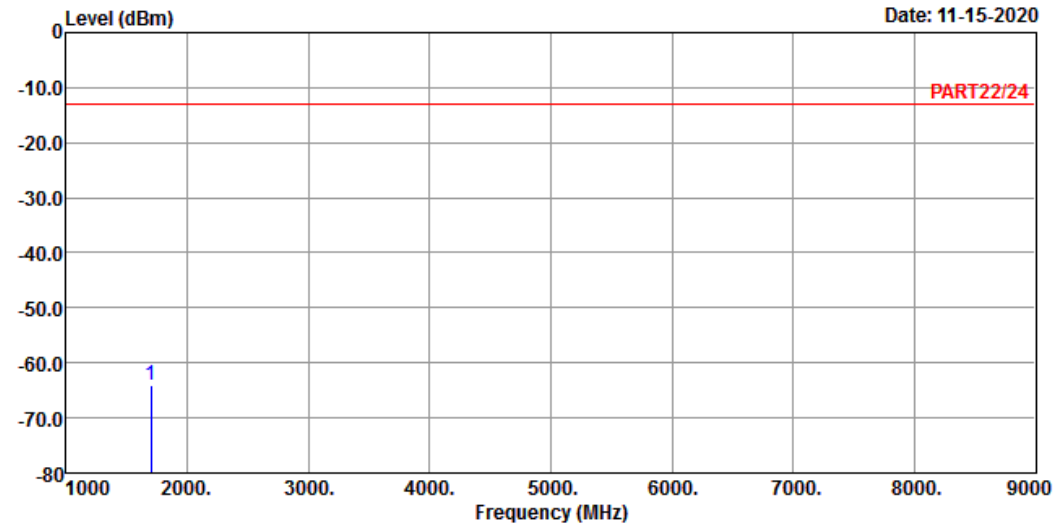
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_1.4M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1696.60	-64.21	-50.19	-13.00	-14.02	-51.21	Peak

Data: 4

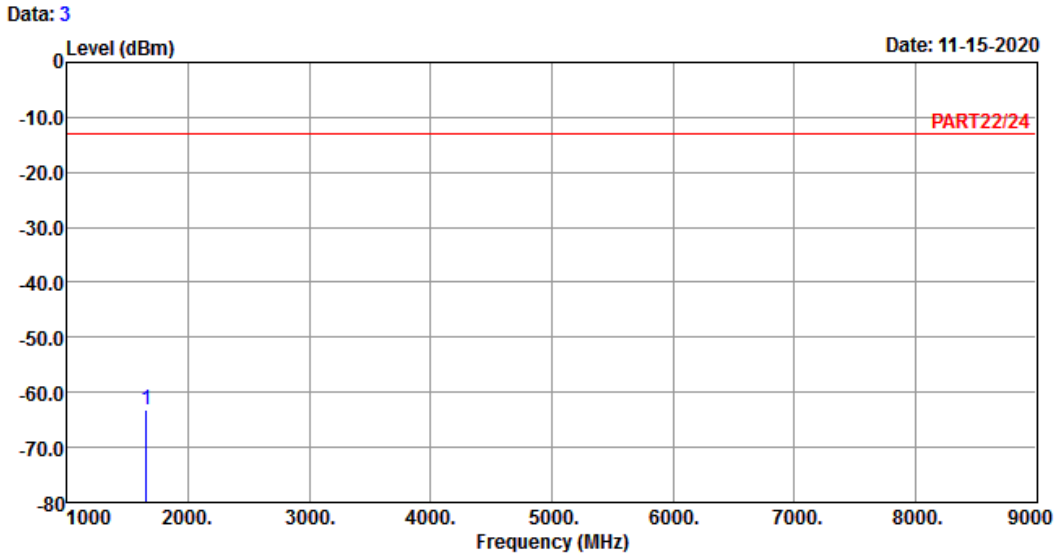


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_1.4M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1696.60	-64.11	-50.09	-13.00	-14.02	-51.11	Peak

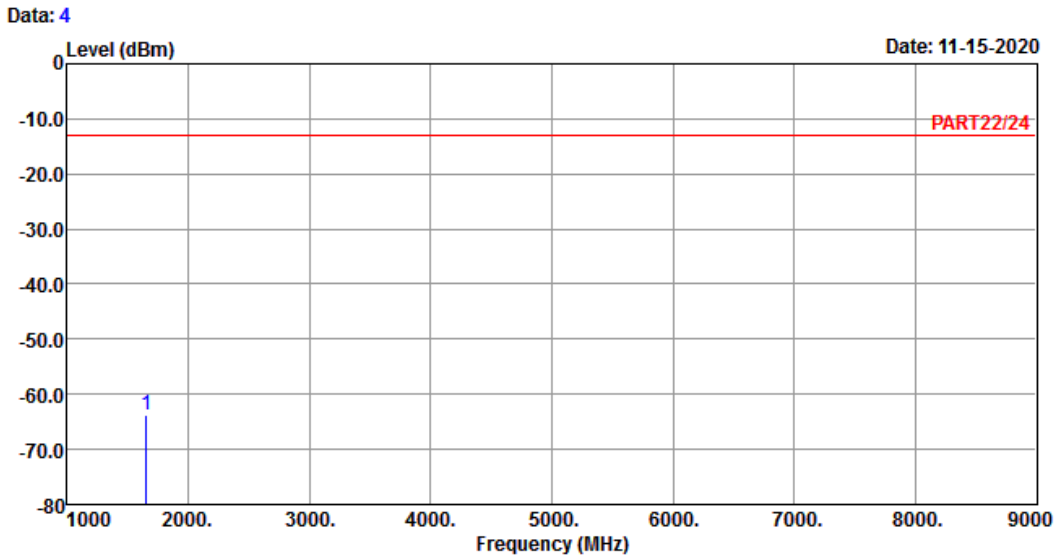
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_5M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1653.00	-63.30	-49.53	-13.00	-13.77	-50.30	Peak

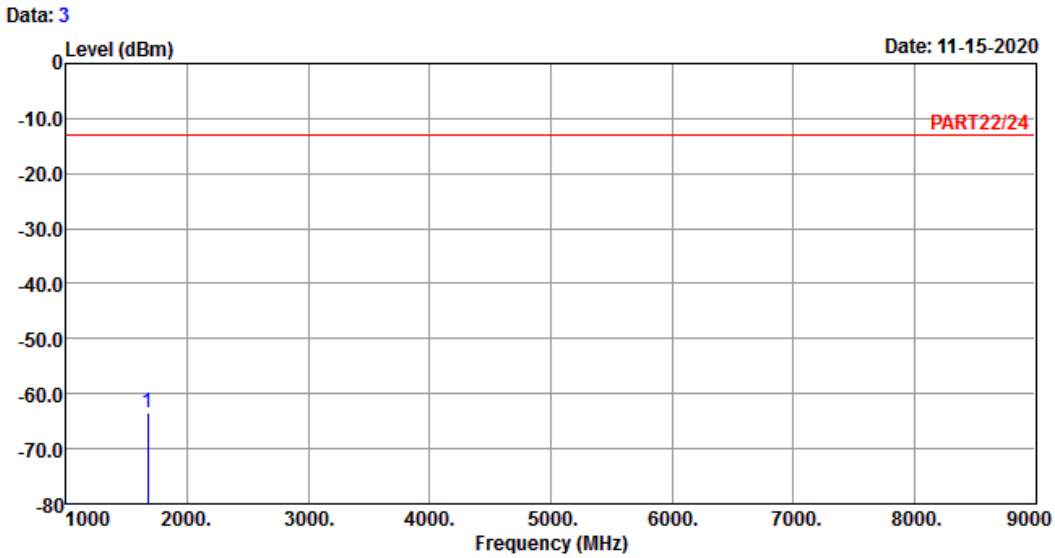


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_5M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1653.00	-63.71	-49.94	-13.00	-13.77	-50.71	Peak

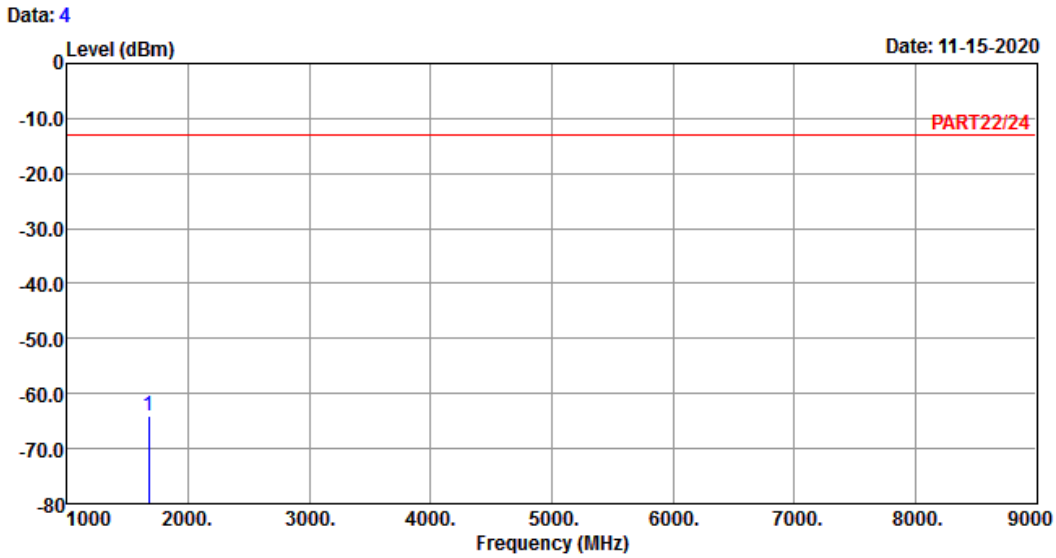
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_5M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.56	-49.66	-13.00	-13.90	-50.56	Peak

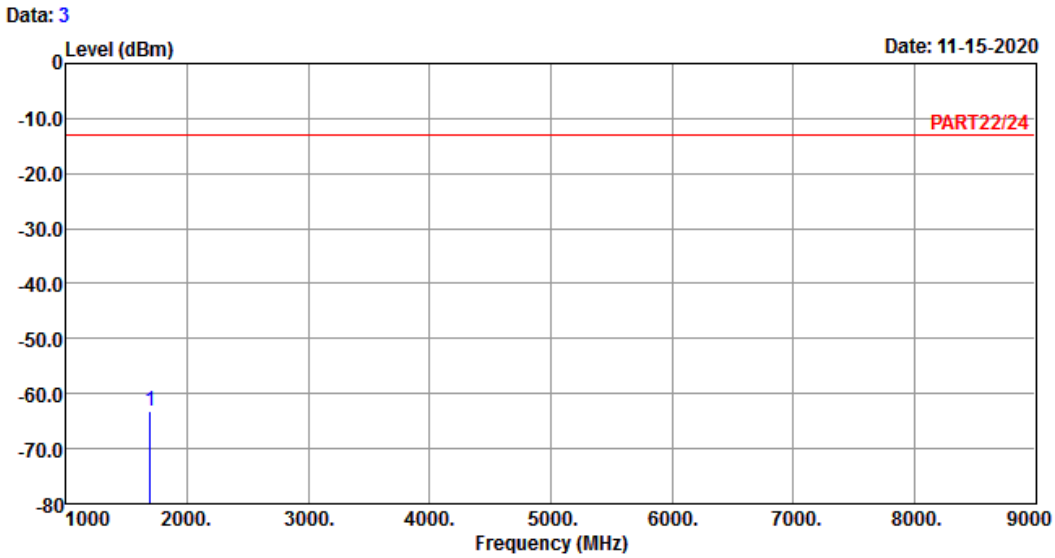


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_5M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.93	-50.03	-13.00	-13.90	-50.93	Peak

High Channel

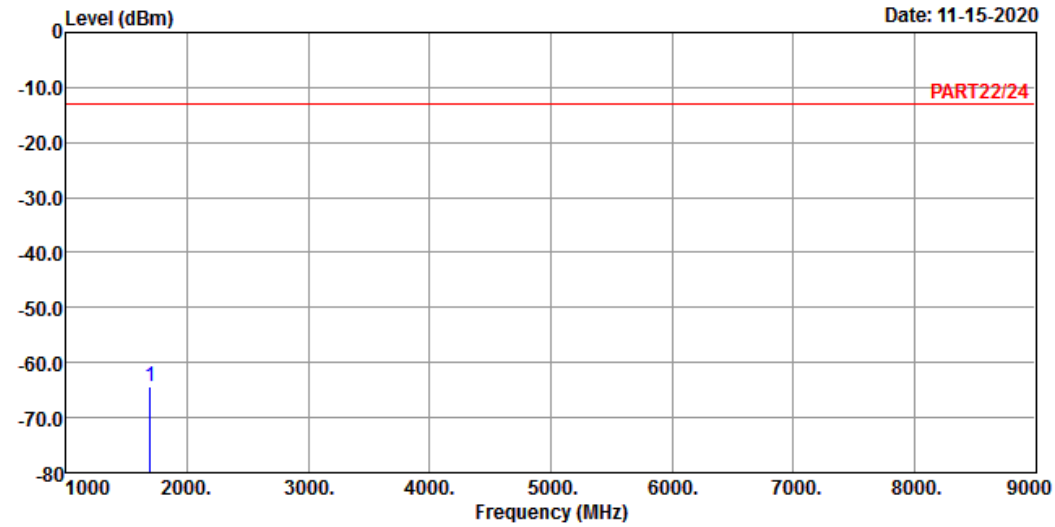
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_5M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1693.00	-63.28	-49.26	-13.00	-14.02	-50.28	Peak

Data: 4

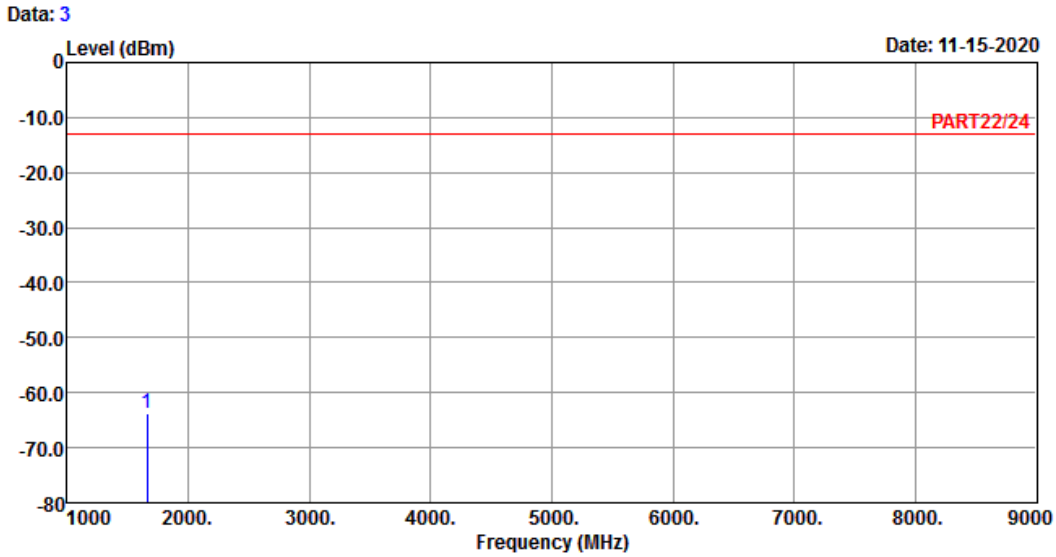


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_5M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1693.00	-64.36	-50.34	-13.00	-14.02	-51.36	Peak

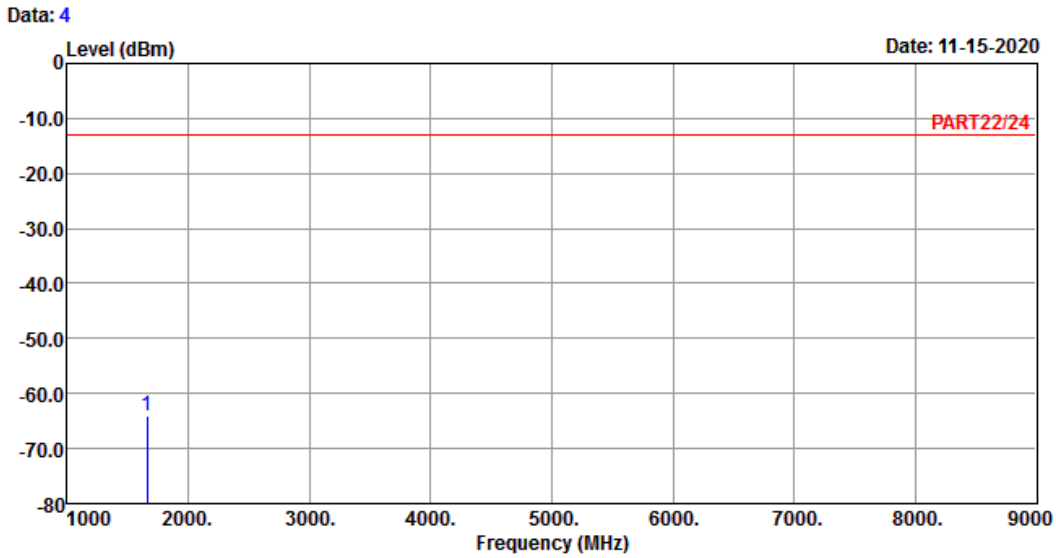
Channel Bandwidth: 10 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_10M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1658.00	-63.88	-50.08	-13.00	-13.80	-50.88	Peak

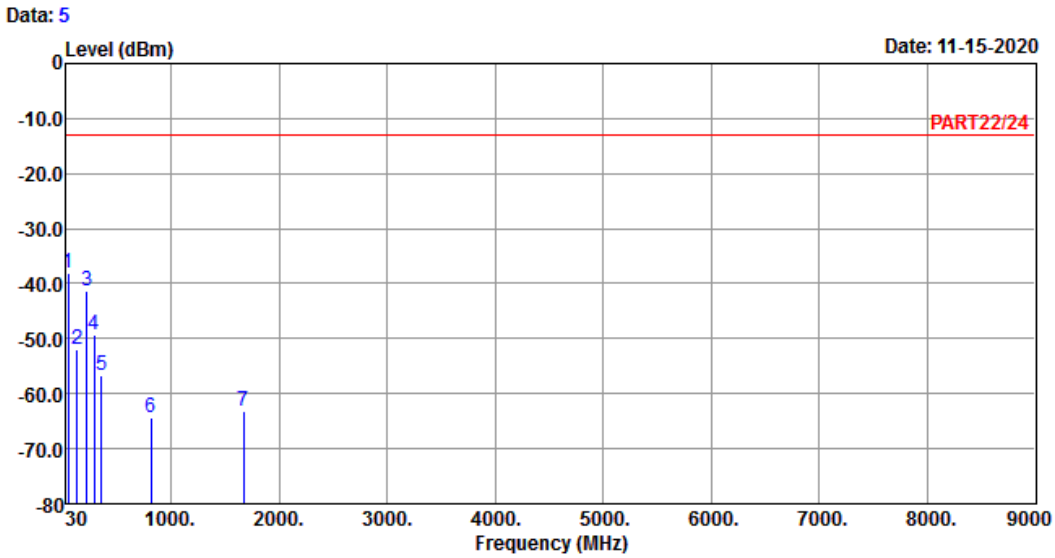


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_10M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1658.00	-64.20	-50.40	-13.00	-13.80	-51.20	Peak

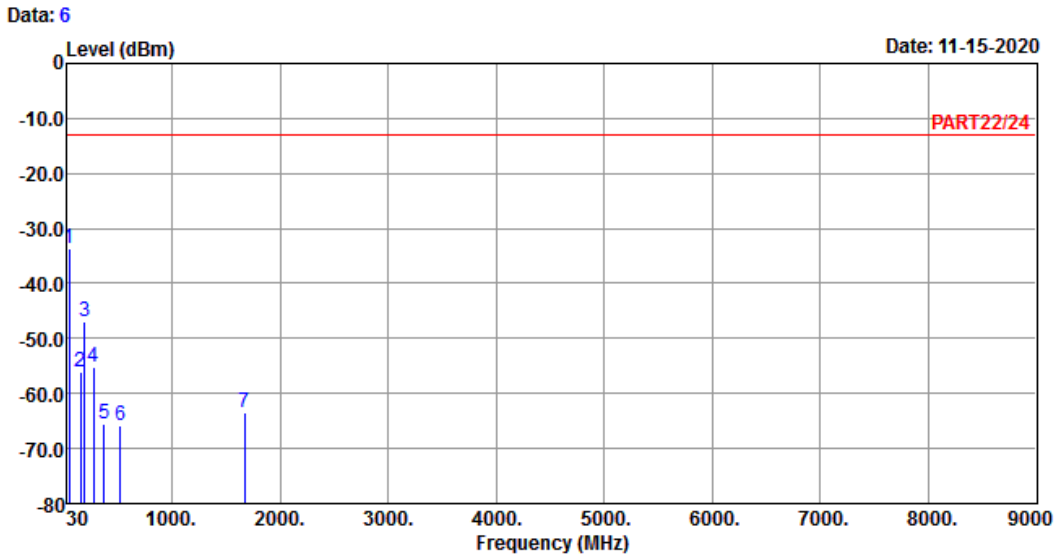
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_10M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	43.58	-38.22	-36.75	-13.00	-1.47	-25.22	Peak
2	131.85	-51.84	-43.16	-13.00	-8.68	-38.84	Peak
3	218.18	-41.19	-33.91	-13.00	-7.28	-28.19	Peak
4	288.02	-49.16	-42.39	-13.00	-6.77	-36.16	Peak
5	353.01	-56.79	-50.57	-13.00	-6.22	-43.79	Peak
6	816.67	-64.26	-64.85	-13.00	0.59	-51.26	Peak
7	1673.00	-63.26	-49.36	-13.00	-13.90	-50.26	Peak

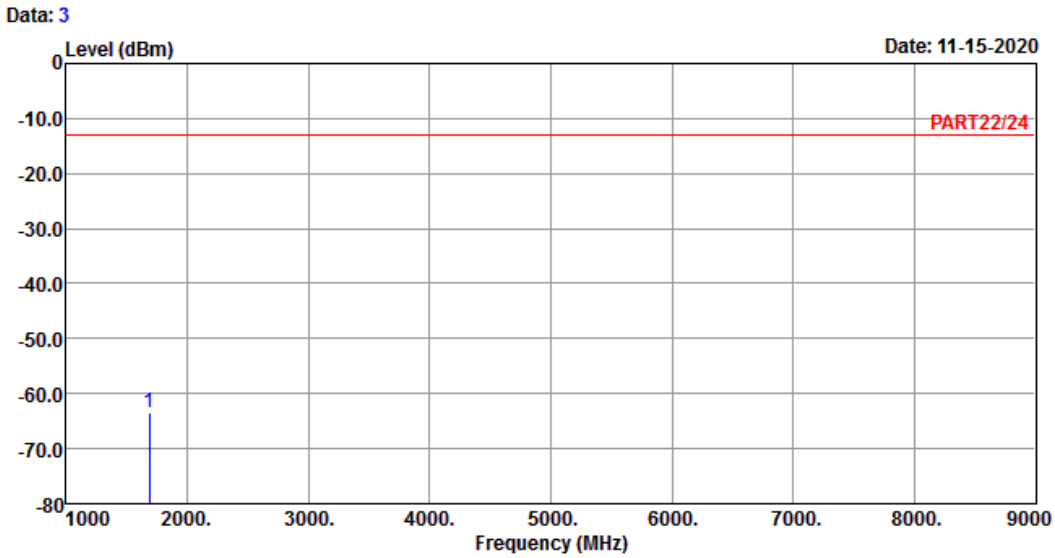


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_10M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	48.43	-33.53	-29.52	-13.00	-4.01	-20.53	Peak
2	152.22	-56.11	-49.08	-13.00	-7.03	-43.11	Peak
3	188.11	-46.92	-39.77	-13.00	-7.15	-33.92	Peak
4	276.38	-55.14	-48.61	-13.00	-6.53	-42.14	Peak
5	372.41	-65.60	-59.49	-13.00	-6.11	-52.60	Peak
6	520.82	-65.72	-61.83	-13.00	-3.89	-52.72	Peak
7	1673.00	-63.40	-49.50	-13.00	-13.90	-50.40	Peak

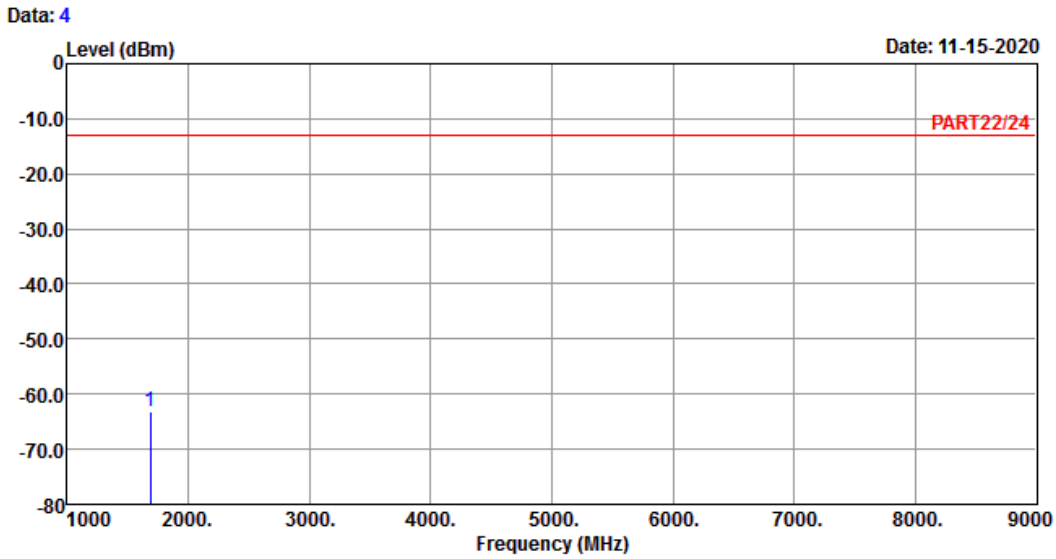
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_10M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1688.00	-63.33	-49.34	-13.00	-13.99	-50.33	Peak

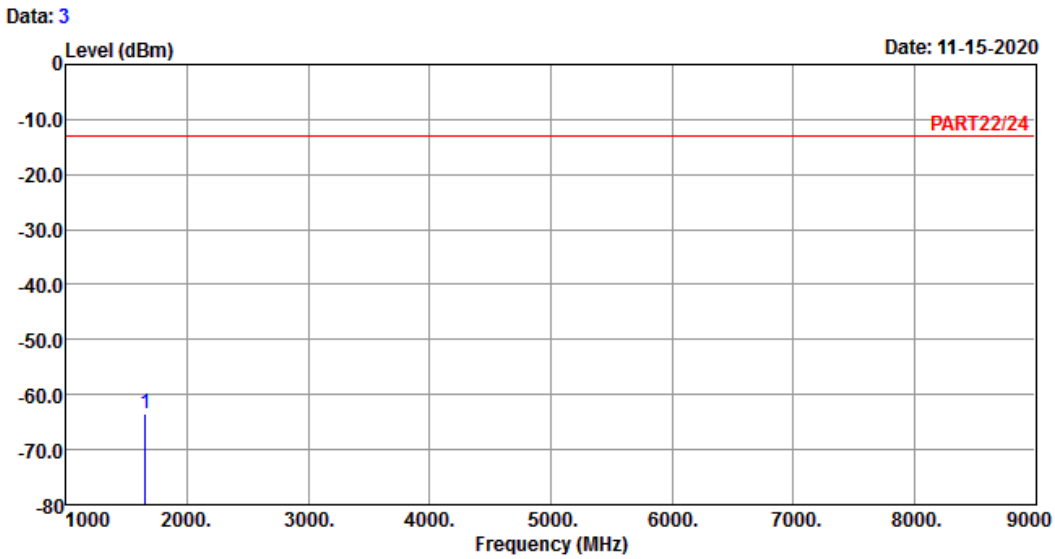


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 5 QPSK_10M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1688.00	-63.32	-49.33	-13.00	-13.99	-50.32	Peak

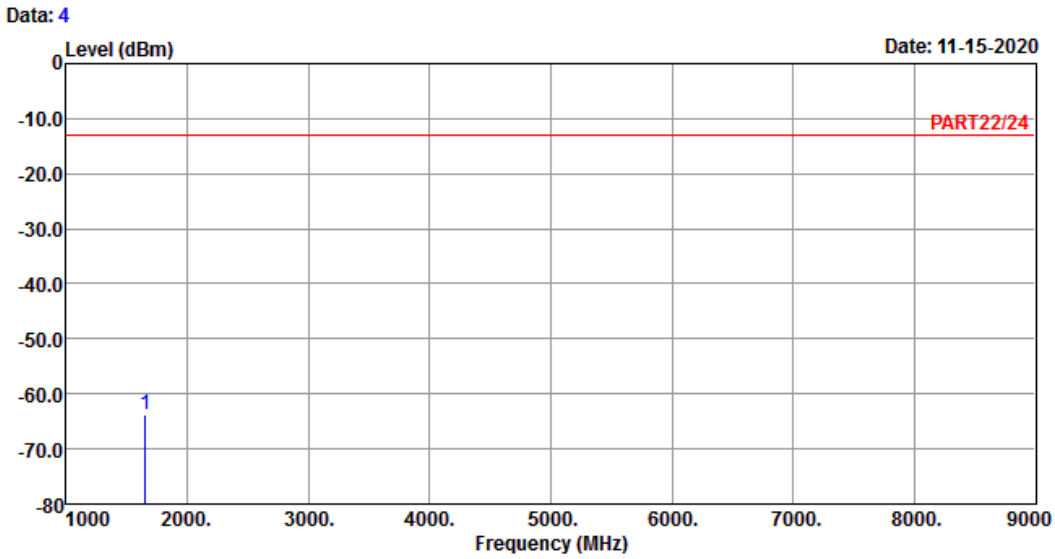
LTE Band 26
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_1.4M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1649.40	-63.58	-49.84	-13.00	-13.74	-50.58	Peak

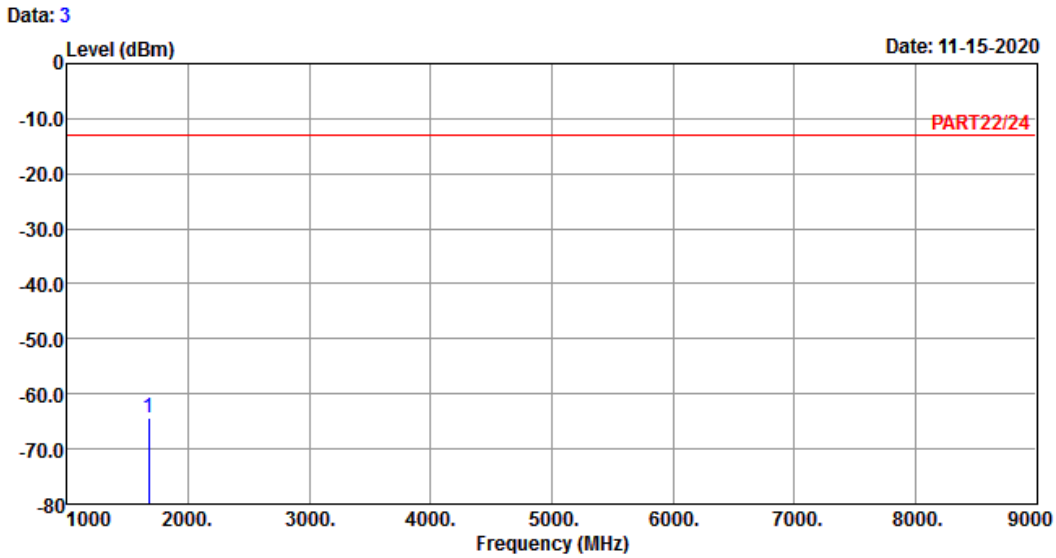


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1649.40	-63.86	-50.12	-13.00	-13.74	-50.86	Peak

Middle Channel

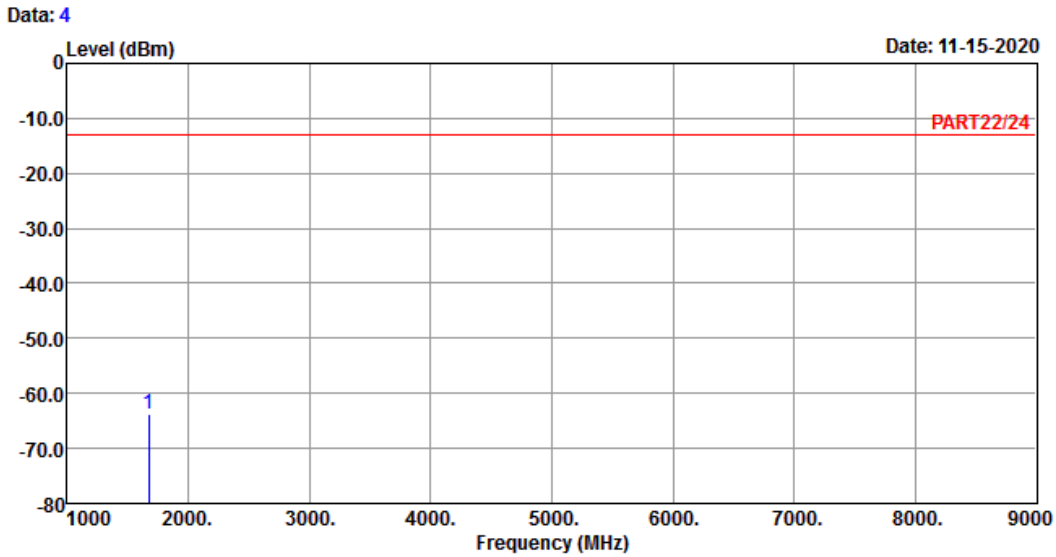
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_1.4M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-64.40	-50.50	-13.00	-13.90	-51.40	Peak

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

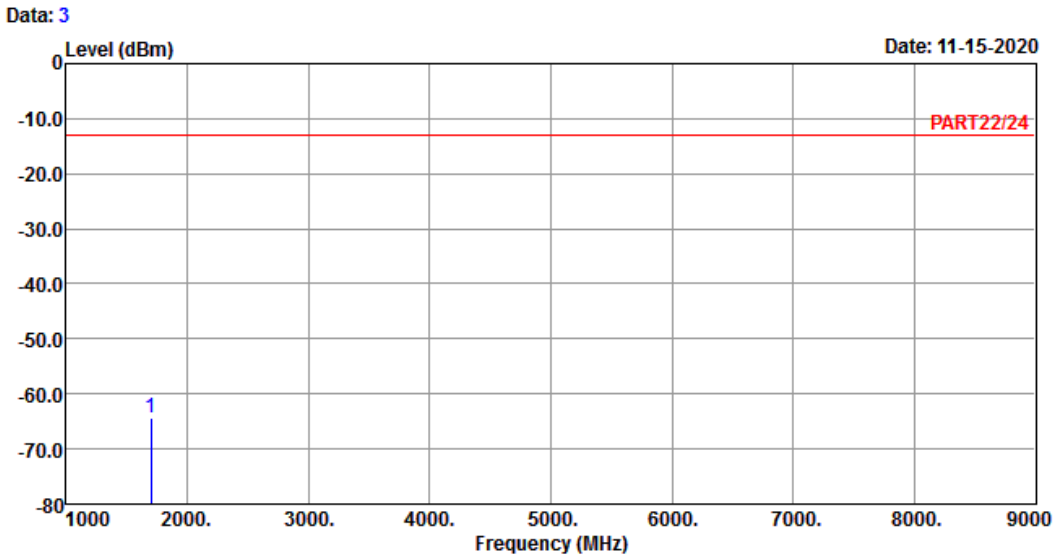


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.87	-49.97	-13.00	-13.90	-50.87	Peak

High Channel

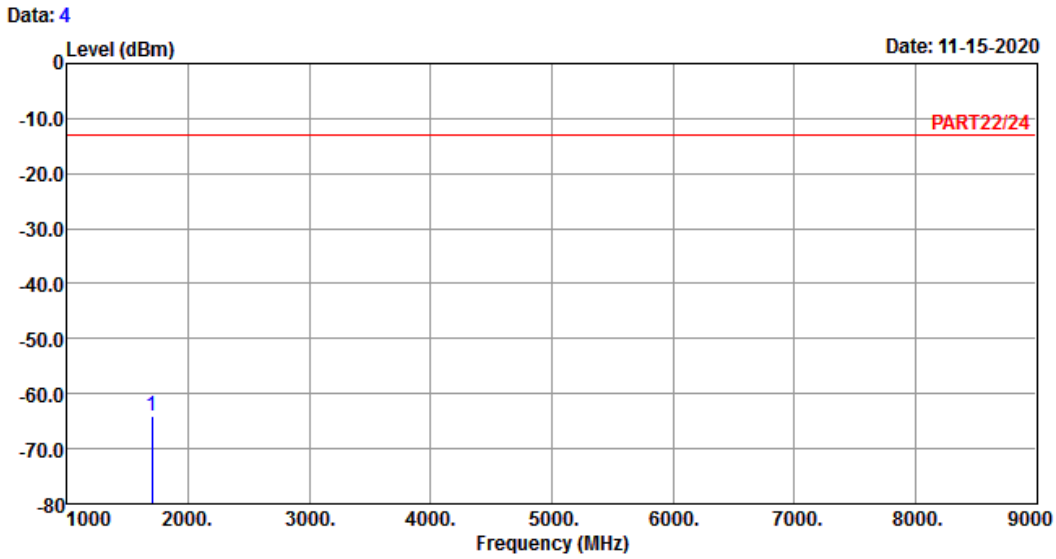
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_1.4M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1696.60	-64.42	-50.40	-13.00	-14.02	-51.42	Peak

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

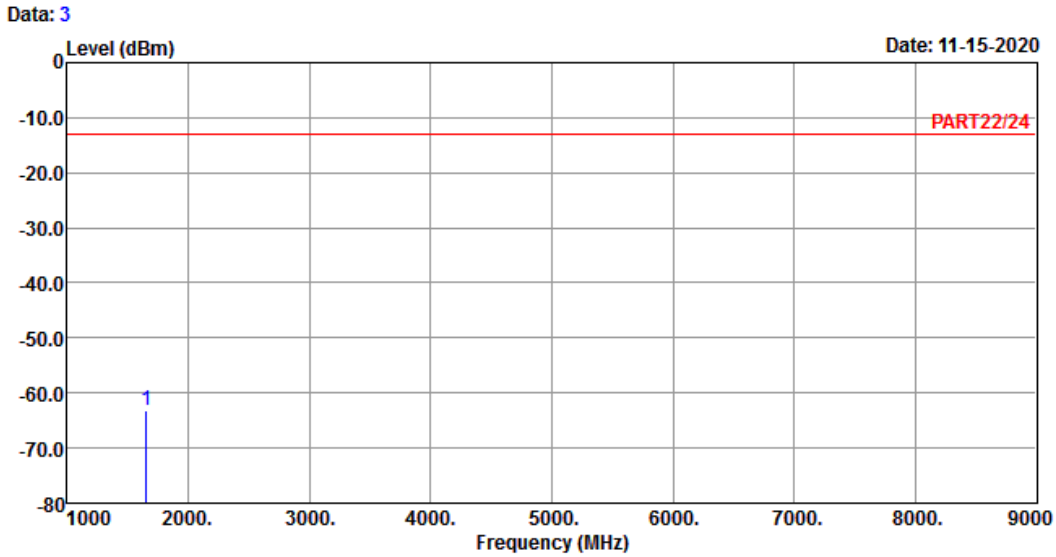


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1696.60	-63.97	-49.95	-13.00	-14.02	-50.97	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

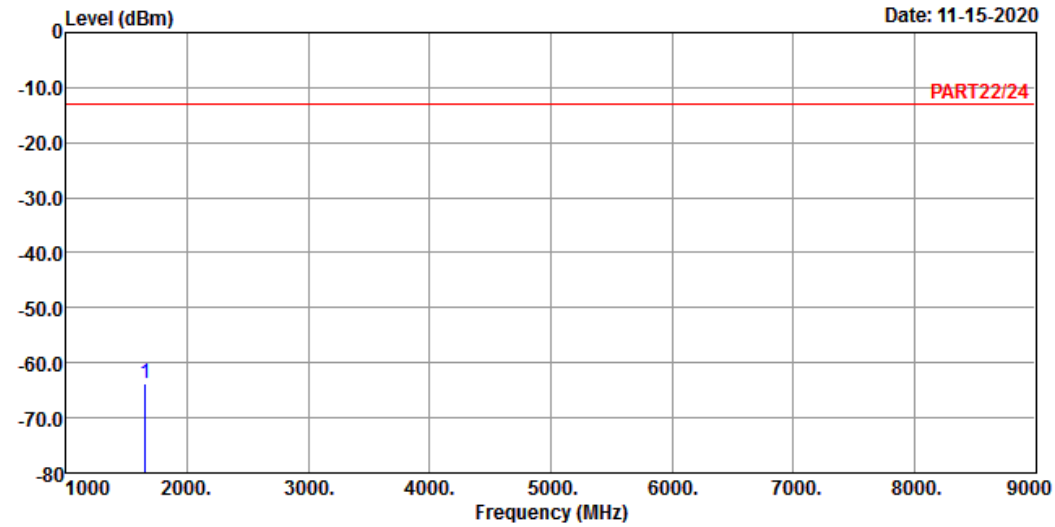
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_5M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1653.00	-63.10	-49.33	-13.00	-13.77	-50.10	Peak

Data: 4

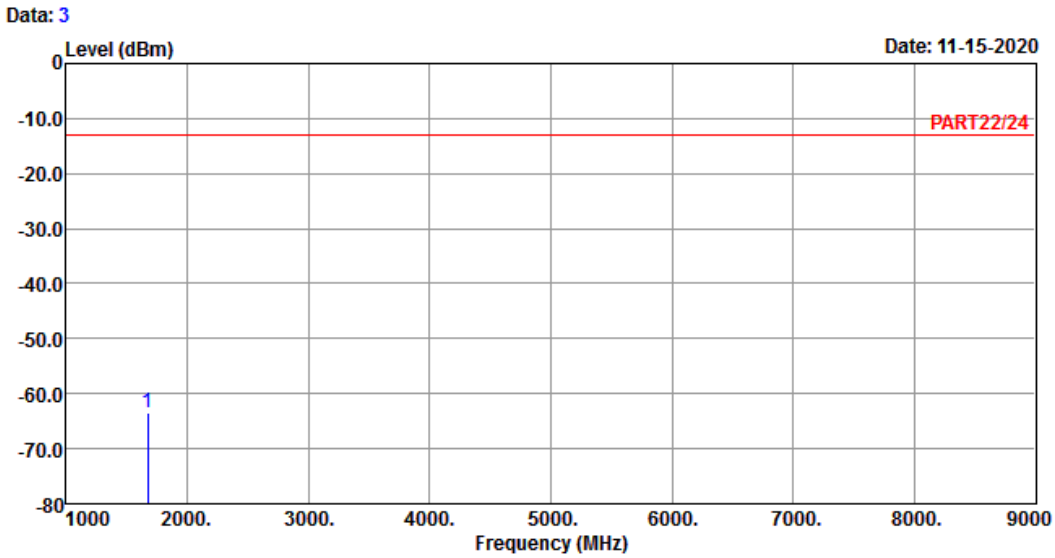


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_L-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1653.00	-63.74	-49.97	-13.00	-13.77	-50.74	Peak

Middle Channel

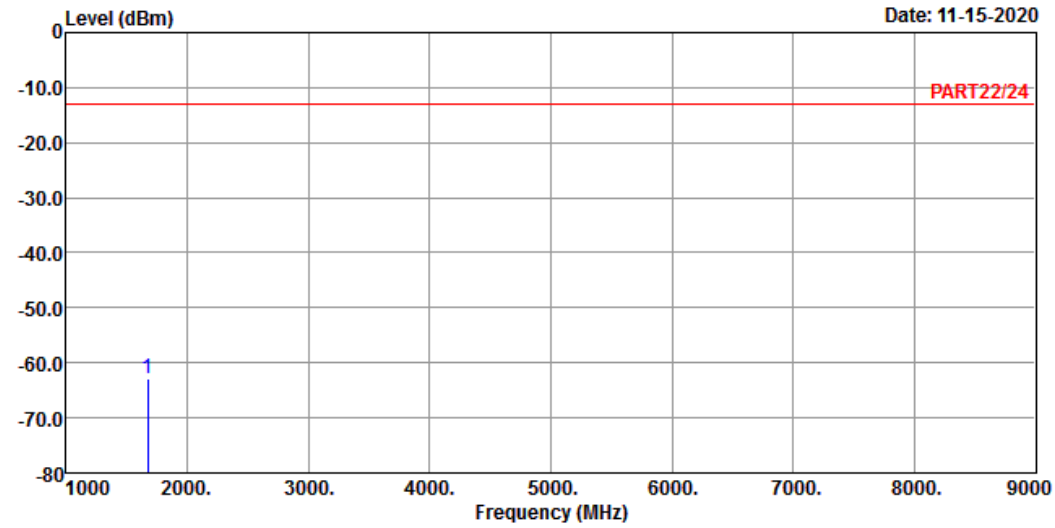
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_5M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-63.52	-49.62	-13.00	-13.90	-50.52	Peak

Data: 4

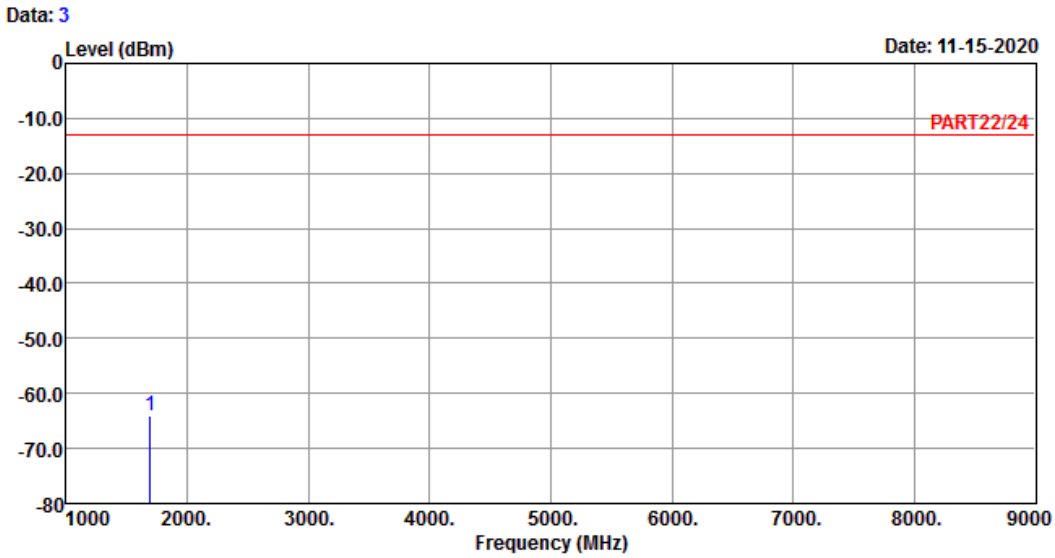


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1673.00	-62.91	-49.01	-13.00	-13.90	-49.91	Peak

High Channel

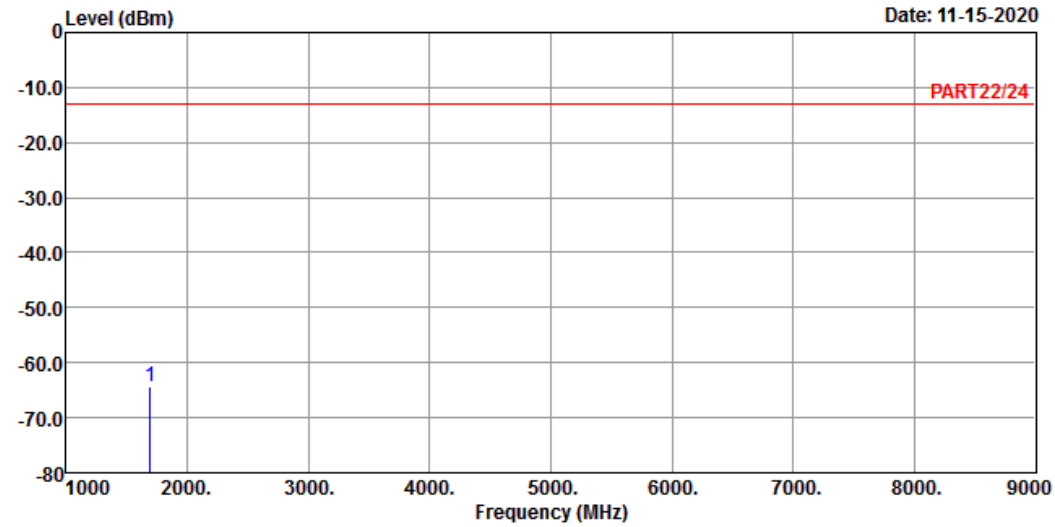
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_5M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1693.00	-64.20	-50.18	-13.00	-14.02	-51.20	Peak

Data: 4

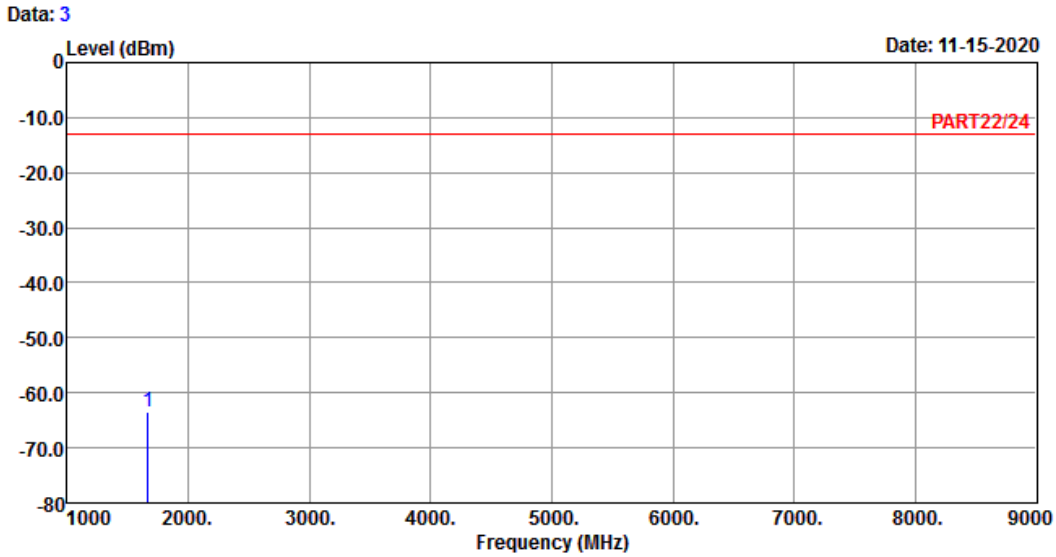


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1693.00	-64.28	-50.26	-13.00	-14.02	-51.28	Peak

Channel Bandwidth: 15 MHz / QPSK
Low Channel

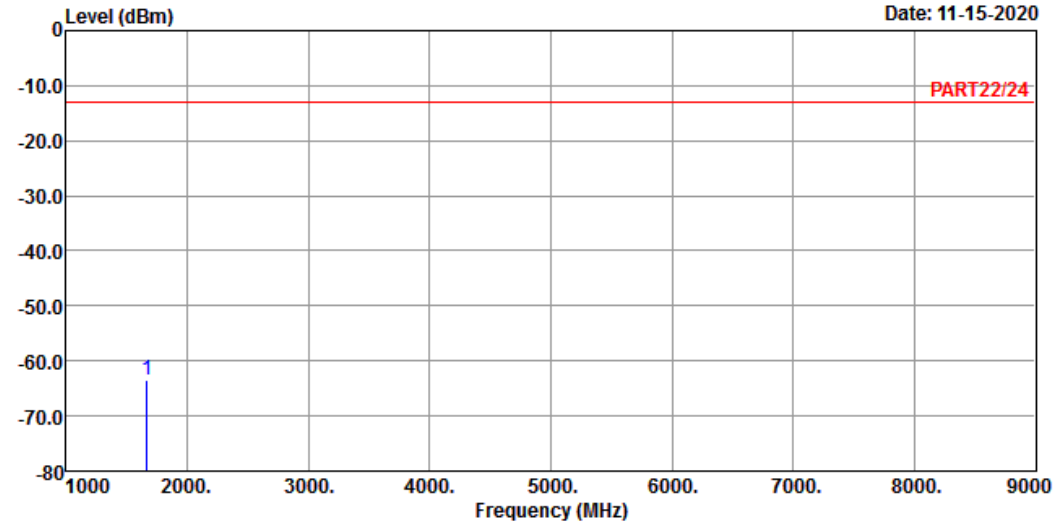
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_15M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1663.00	-63.42	-49.59	-13.00	-13.83	-50.42	Peak

Data: 4

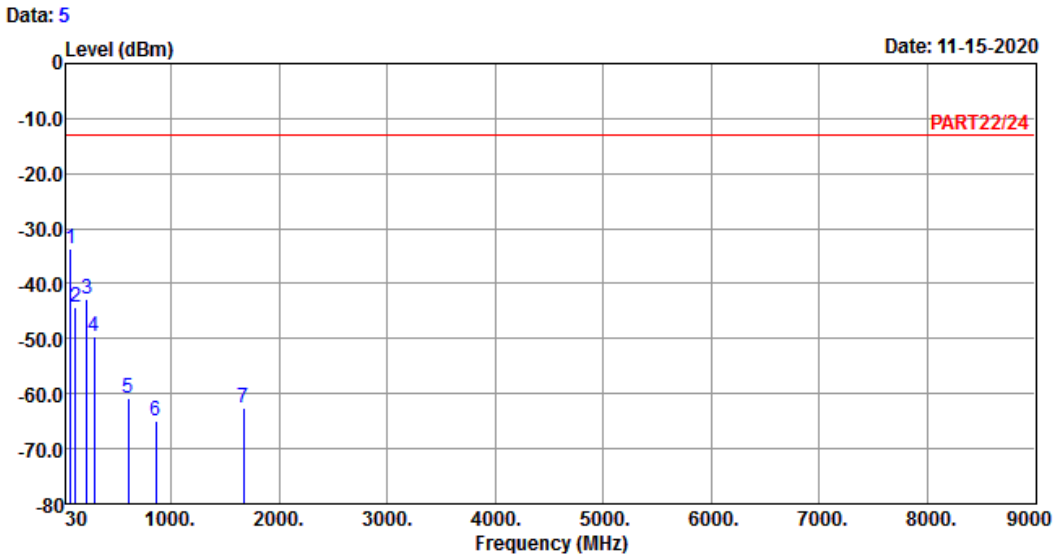


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_15M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1663.00	-63.55	-49.72	-13.00	-13.83	-50.55	Peak

Middle Channel

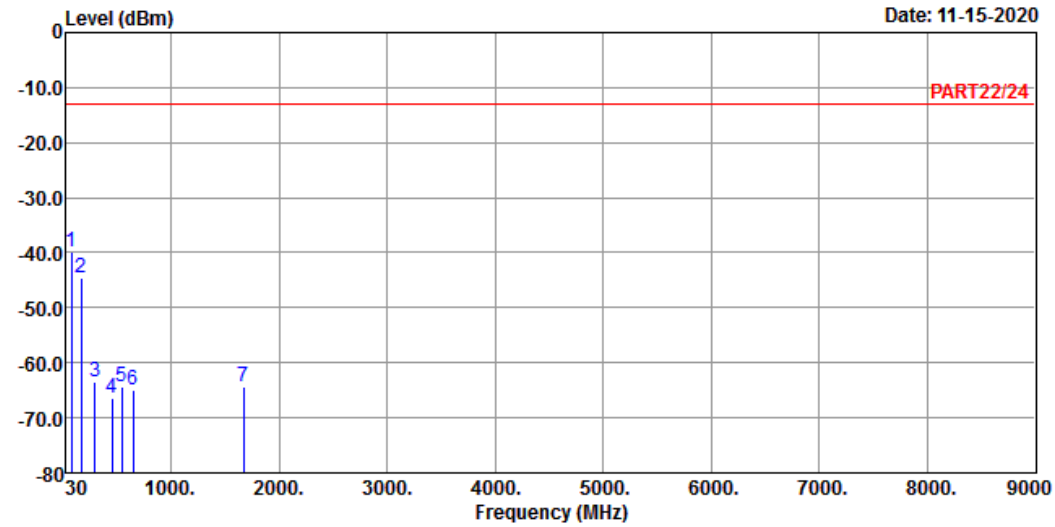
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_15M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	66.86	-33.78	-25.60	-13.00	-8.18	-20.78	Peak
2	111.48	-44.22	-33.98	-13.00	-10.24	-31.22	Peak
3	220.12	-42.77	-35.57	-13.00	-7.20	-29.77	Peak
4	289.96	-49.47	-42.66	-13.00	-6.81	-36.47	Peak
5	606.18	-60.93	-60.16	-13.00	-0.77	-47.93	Peak
6	858.38	-64.98	-65.32	-13.00	0.34	-51.98	Peak
7	1673.00	-62.58	-48.68	-13.00	-13.90	-49.58	Peak

Data: 6

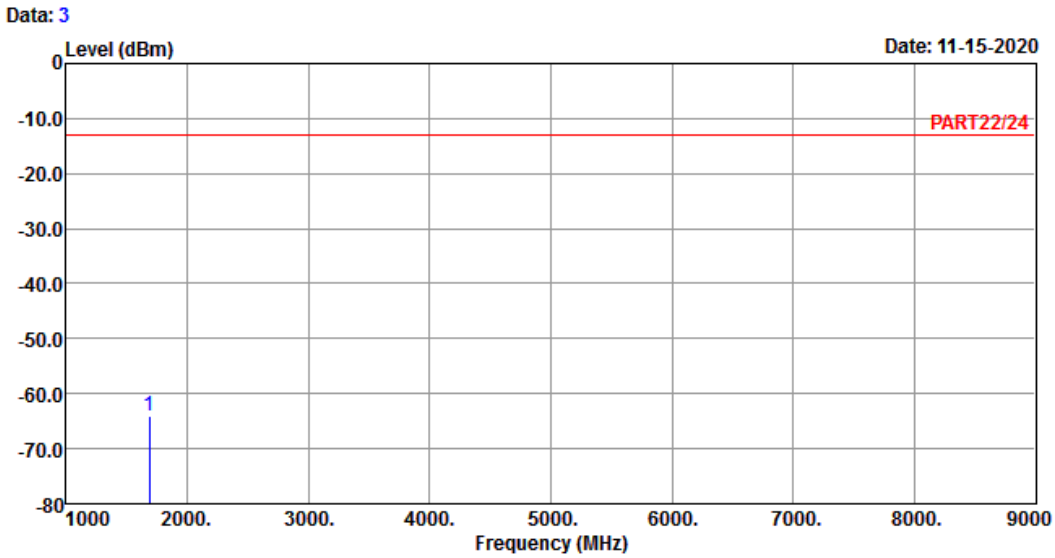


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_15M Link_M-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	75.59	-39.92	-30.17	-13.00	-9.75	-26.92	Peak
2	166.77	-44.56	-39.24	-13.00	-5.32	-31.56	Peak
3	296.75	-63.33	-56.38	-13.00	-6.95	-50.33	Peak
4	451.95	-66.50	-60.99	-13.00	-5.51	-53.50	Peak
5	544.10	-64.29	-61.23	-13.00	-3.06	-51.29	Peak
6	645.95	-65.04	-64.17	-13.00	-0.87	-52.04	Peak
7	1673.00	-64.28	-50.38	-13.00	-13.90	-51.28	Peak

High Channel

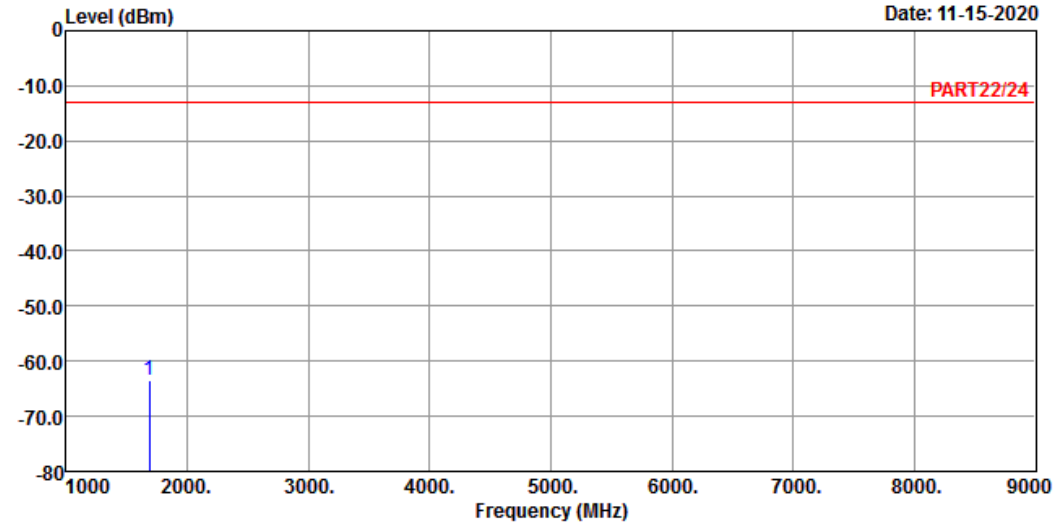
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 26 QPSK_15M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1683.00	-64.00	-50.04	-13.00	-13.96	-51.00	Peak

Data: 4



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : LTE Band 26 QPSK_15M Link_H-CH
Tested by: Cyril Chen

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1683.00	-63.49	-49.53	-13.00	-13.96	-50.49	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

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 ---