FCC Test Report
(CA Mode)

Report No.: RF190114C07-10

FCC ID: MSQI01WD

Test Model: ASUS_I01WD

Received Date: Jan. 14, 2019

Test Date: Jan. 22 ~ Feb. 23, 2019

Issued Date: Feb. 23, 2019

Applicant: ASUSTek COMPUTER INC.

Address: 4F, No. 150, LI-TE Rd., PEITOU, TAIPEI 112, TAIWAN

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

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

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

FCC Registration / Designation Number: 788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF190114C07-10	Original release	Feb. 23, 2019

1 Certificate of Conformity

Product: ASUS Phone

Brand: ASUS

Test Model: ASUS_I01WD

Sample Status: Identical Prototype

Applicant: ASUSTek COMPUTER INC.

Test Date: Jan. 22 ~ Feb. 23, 2019

Standards: FCC Part 27, Subpart C, M

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 : Celine Chou , **Date:** Feb. 23, 2019

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Feb. 23, 2019

Bruce Chen / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(h)(2)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
----	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(m)(6)	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.70dB at 49.40MHz.

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	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Jan. 03, 2019	Jan. 02, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 25, 2018	Sep. 24, 2019
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 02, 2018	Jul. 01, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	9120D	9120D-408	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Aug. 08, 2018	Aug. 07, 2019
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jul. 02, 2018	Jul. 01, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 08, 2018	Aug. 07, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Aug. 08, 2018	Aug. 07, 2019
RF signal cable WOKEN	8D-FB	Cable-CH4-01	Aug. 29, 2018	Aug. 28, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2018	Nov. 13, 2019
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 04, 2018	Jun. 03, 2019
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
4. The IC Site Registration No. is 7450F-4.

3 General Information

3.1 General Description of EUT

Product	ASUS Phone		
Brand	ASUS		
Test Model	ASUS_I01WD		
Status of EUT	Identical Prototype		
Power Supply Rating	3.85 Vdc (Battery) 5 or 9 Vdc (Adapter) 5 Vdc (Host equipment)		
Modulation Type	WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM, 64QAM		
Operating Frequency	LTE Band 7	Channel Bandwidth 20MHz	2510.0MHz ~ 2560.0MHz
	LTE Band 38	Channel Bandwidth 20MHz	2580.0MHz ~ 2610.0MHz
	LTE Band 41	Channel Bandwidth 20MHz	2545.0MHz ~ 2645.0MHz
Max. EIRP Power	Refer to Note as below		
Emission Designator	Refer to Note as below		
Antenna Type	Refer to Note as below		
Antenna Connector	Refer to Note as below		
Accessory Device	Refer to Note as below		
Cable Supplied	Refer to Note as below		

Note:

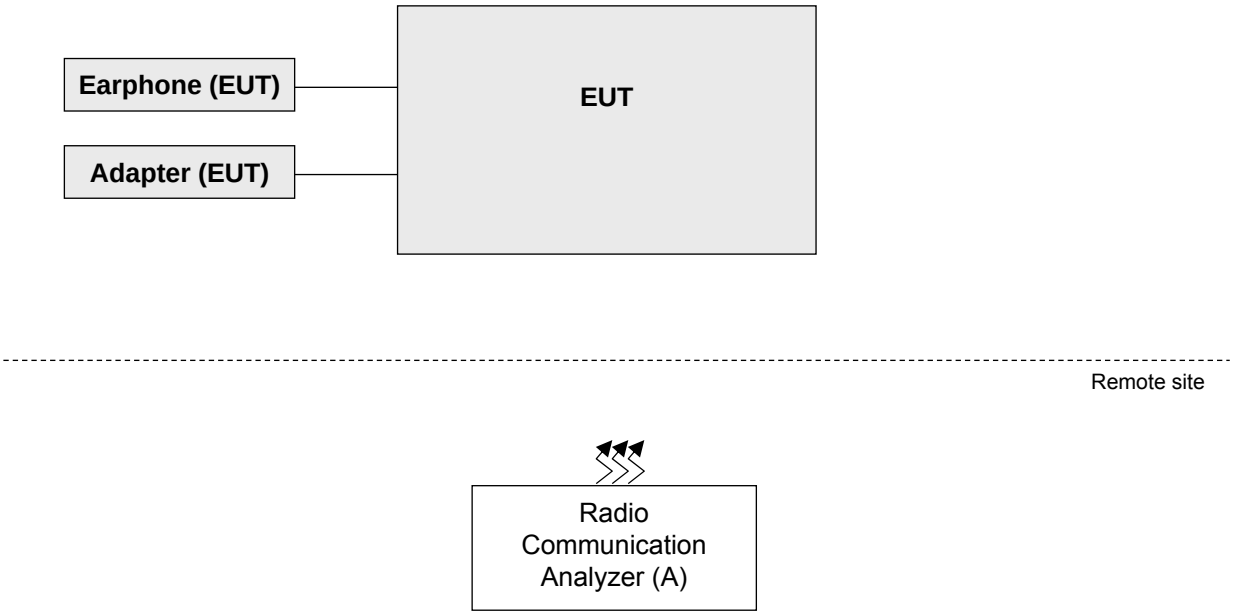
1. The EUT accessories list refers to EUT Photo.pdf.
2. The following antennas were provided to the EUT.

Ant. No.	Type	Connector	Gain (dBi)											
			GSM 850	GSM 1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B26	LTE B38	LTE B41
WWAN Antenna-0	PIFA	NA	-4.5	-2.6	-2.6	-1.9	-4.5	-2.5	-1.9	-4.5	-1.3	-4.4	-1.0	-1.0
WWAN Antenna-1	PIFA	NA	-3.4	-3.2	-3.2	-5.3	-3.4	-3.2	-5.3	-3.3	-4.7	-3.3	-5.7	-5.7

3. Max. EIRP Power and Emission Designator as below.

Mode	Output power (W)	Emission Designator
CA mode: LTE Band 7 20M + LTE Band 7 20M	60.256mW (17.80dBm)	689KG7D
CA mode: LTE Band 38 20M + LTE Band 38 20M	44.668mW (16.50dBm)	685KG7D
CA mode: LTE Band 41 20M + LTE Band 41 20M	54.954mW (17.40dBm)	734KG7D

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.	Radio Communication Analyzer	Anritsu	MT8860C	1702001	NA	-

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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

LTE Band 7 + LTE Band 7

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	EIRP	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 0 RB Offset	QPSK
-	Modulation Characteristics	LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	QPSK
-	Frequency Stability	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	-	-	-	QPSK
-	Emission Bandwidth	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 0 RB Offset	QPSK
-	Band Edge	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Peak to Average Ratio	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 0 RB Offset	QPSK
-	Conducted Emission	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 0 RB Offset	QPSK
-	Radiated Emission Below 1GHz	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Radiated Emission Above 1GHz	LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	20850	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21048	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21001	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21199	1 RB / 0 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 0 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 99 RB Offset	QPSK
		LTE Band 7 (Channel Bandwidth 20MHz)	21152	1 RB / 99 RB Offset	LTE Band 7 (Channel Bandwidth 20MHz)	21350	1 RB / 0 RB Offset	QPSK

Note:

1. Depends on 3GPP TS 36.141 Ver. 13.4.0 clause 4.7 and consult with manufacturer to declare test mode.
2. For radiated emission below 1GHz, low, mid and high channels were pre-tested in chamber. Low channel was found to be the worst case and therefore had been chosen for all final tests.
3. The conducted output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, all test items were performed under QPSK mode only.

LTE Band 38 + LTE Band 38

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	EIRP	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 0 RB Offset	QPSK
-	Modulation Characteristics	LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
-	Frequency Stability	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	-	-	-	QPSK
-	Emission Bandwidth	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 0 RB Offset	QPSK
-	Band Edge	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Peak to Average Ratio	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 0 RB Offset	QPSK
-	Conducted Emission	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 0 RB Offset	QPSK
-	Radiated Emission Below 1GHz	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Radiated Emission Above 1GHz	LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37850	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38048	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37901	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38099	1 RB / 0 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 0 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 99 RB Offset	QPSK
		LTE Band 38 (Channel Bandwidth 20MHz)	37952	1 RB / 99 RB Offset	LTE Band 38 (Channel Bandwidth 20MHz)	38150	1 RB / 0 RB Offset	QPSK

Note:

1. Depends on 3GPP TS 36.141 Ver. 13.4.0 clause 4.7 and consult with manufacturer to declare test mode.
2. For radiated emission below 1GHz, low, mid and high channels were pre-tested in chamber. Low channel was found to be the worst case and therefore had been chosen for all final tests.
3. The conducted output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, all test items were performed under QPSK mode only.

LTE Band 41 + LTE Band 41

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	EIRP	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 0 RB Offset	QPSK
-	Modulation Characteristics	LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
-	Frequency Stability	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	-	-	-	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Emission Bandwidth	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 0 RB Offset	QPSK
-	Band Edge	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
-	Peak to Average Ratio	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 0 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Conducted Emission	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 0 RB Offset	QPSK
-	Radiated Emission Below 1GHz	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK

EUT Configure Mode	Test item	Band	Tested Channel		Band	Tested Channel		Modulation
-	Radiated Emission Above 1GHz	LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40140	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40338	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40470	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	40668	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40810	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41008	1 RB / 0 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 0 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 99 RB Offset	QPSK
		LTE Band 41 (Channel Bandwidth 20MHz)	40942	1 RB / 99 RB Offset	LTE Band 41 (Channel Bandwidth 20MHz)	41140	1 RB / 0 RB Offset	QPSK

Note:
1. Depends on 3GPP TS 36.141 Ver. 13.4.0 clause 4.7 and consult with manufacturer to declare test mode.
2. For radiated emission below 1GHz, low, mid and high channels were pre-tested in chamber. Low channel was found to be the worst case and therefore had been chosen for all final tests.
3. The conducted output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, all test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25deg. C, 70%RH	120Vac, 60Hz	Han Wu
Modulation characteristics	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Radiated Emission	25deg. C, 70%RH	120Vac, 60Hz	Noah Chang

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p. for LTE Band 7, Band 38 and Band 41.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RWB and VBW is 10MHz for LTE mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

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

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

Where:

$ERP/EIRP = P_{Meas} + G_T - L_C$

P_{Meas} : Measure transmitter output power.
G_T : Gain of the transmitting antenna.
L_C : signal attenuation in the connecting cable between the transmitter and antenna.

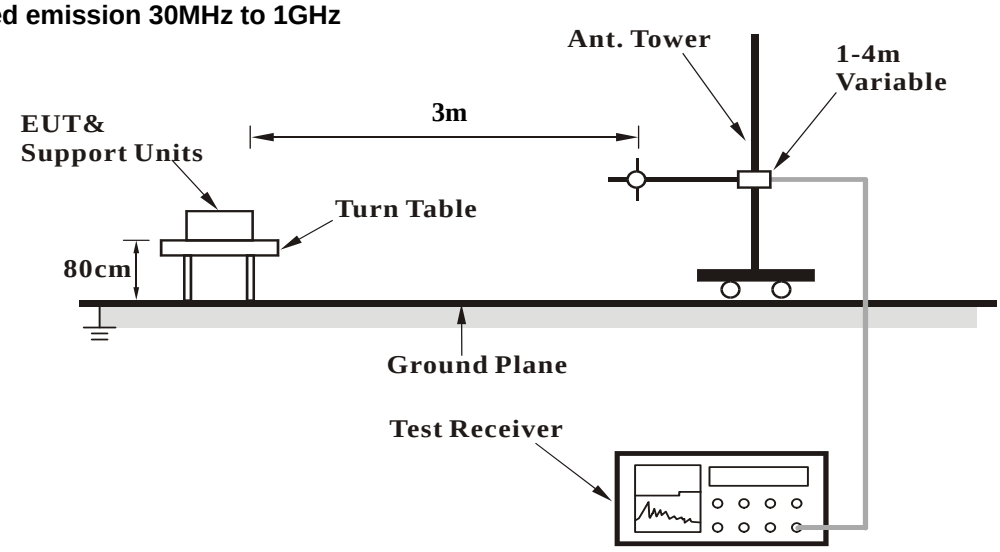
Conducted Power Measurement:

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

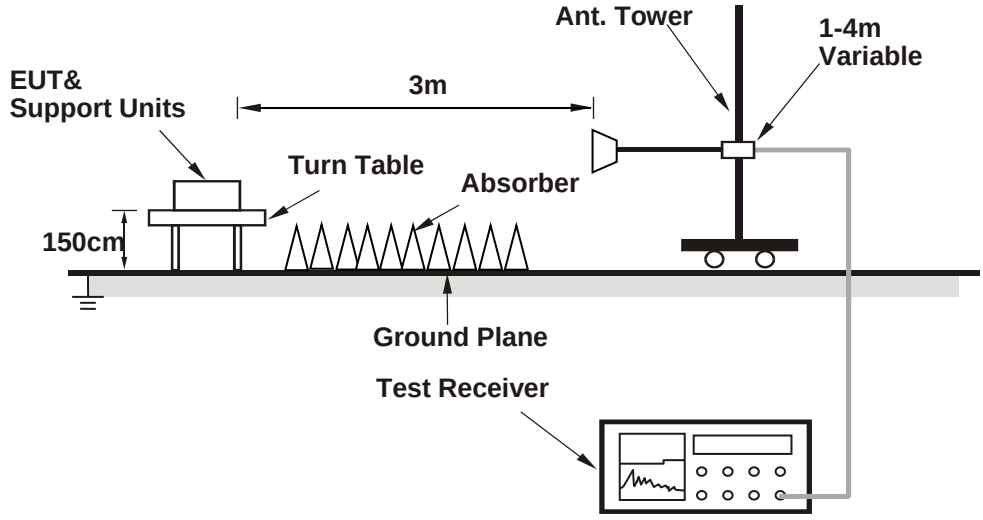
4.1.3 Test Setup

EIRP / ERP Measurement:

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



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

Conducted Power Measurement:

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

4.1.4 Test Results

Conducted Output Power (dBm)

PCC							SCC							Measurement Power			
Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Single Carrier Tx Power without UL-CA Active (dBm)	Tx Power with UL-CA Active (dBm)		
															PCC	SCC	Total
7	20	QPSK	1	0	20850	2510	7	20	QPSK	1	99	21048	2529.8	22.82	13.87	7.18	14.71
			1	99						1	0			22.67	21.68	14.14	22.38
7	20	QPSK	1	0	21001	2525.1	7	20	QPSK	1	99	21199	2544.9	22.54	13.49	6.97	14.36
			1	99						1	0			22.69	21.41	16.44	22.61
7	20	QPSK	1	0	21152	2540.2	7	20	QPSK	1	99	21350	2560	22.49	13.27	7.36	14.26
			1	99						1	0			22.64	21.29	16.41	22.51
38	20	QPSK	1	0	37850	2580	38	20	QPSK	1	99	38048	2599.8	22.77	11.29	10.93	14.12
			1	99						1	0			22.53	19.45	19.52	22.50
38	20	QPSK	1	0	37901	2585.1	38	20	QPSK	1	99	38099	2604.9	22.73	11.36	11.02	14.20
			1	99						1	0			22.49	19.35	19.32	22.35
38	20	QPSK	1	0	37952	2590.2	38	20	QPSK	1	99	38150	2610	22.75	11.62	11.25	14.45
			1	99						1	0			22.51	19.36	19.47	22.43
41	20	QPSK	1	0	40140	2545	41	20	QPSK	1	99	40338	2564.8	22.87	11.28	11.54	14.42
			1	99						1	0			22.69	18.54	18.48	21.52
41	20	QPSK	1	0	40470	2578	41	20	QPSK	1	99	40668	2597.8	22.48	11.11	11.02	14.08
			1	99						1	0			22.3	19.25	19.31	22.29
41	20	QPSK	1	0	40810	2612	41	20	QPSK	1	99	41008	2631.8	22.51	10.45	10.41	13.44
			1	99						1	0			22.33	18.91	19.11	22.02
41	20	QPSK	1	0	40942	2625.2	41	20	QPSK	1	99	41140	2645	22.89	9.52	9.71	12.63
			1	99						1	0			22.71	18.08	18.38	21.24

EIRP Power (dBm)

LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Mode		TX channel 20850 (1 RB / 0 RB Offset) + TX channel 21048 (1 RB / 99 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-38.80	3.70	0.70	4.40	33.00	-28.60
2	2529.80	-40.20	2.40	0.70	3.10	33.00	-29.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-33.10	9.60	0.70	10.30	33.00	-22.70
2	2529.80	-36.00	6.80	0.70	7.50	33.00	-25.50

Mode		TX channel 20850 (1 RB / 99 RB Offset) + TX channel 21048 (1 RB / 0 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-31.90	10.60	0.70	11.30	33.00	-21.70
2	2529.80	-33.50	9.10	0.70	9.80	33.00	-23.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-25.60	17.10	0.70	17.80	33.00	-15.20
2	2529.80	-28.90	13.90	0.70	14.60	33.00	-18.40

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

Mode	TX channel 21001 (1 RB / 0 RB Offset) + TX channel 21199 (1 RB / 99 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2525.10	-38.60	4.00	0.70	4.70	33.00	-28.30
2	2544.90	-40.00	2.50	0.80	3.30	33.00	-29.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2525.10	-33.30	9.50	0.70	10.20	33.00	-22.80
2	2544.90	-35.80	7.00	0.80	7.80	33.00	-25.20

Mode	TX channel 21001 (1 RB / 99 RB Offset) + TX channel 21199 (1 RB / 0 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2525.10	-32.00	10.60	0.70	11.30	33.00	-21.70
2	2544.90	-33.10	9.40	0.80	10.20	33.00	-22.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2525.10	-25.80	17.00	0.70	17.70	33.00	-15.30
2	2544.90	-28.70	14.10	0.80	14.90	33.00	-18.10

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

Mode	TX channel 21152 (1 RB / 0 RB Offset) + TX channel 21350 (1 RB / 99 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2540.20	-39.20	3.30	0.80	4.10	33.00	-28.90
2	2560.00	-40.50	2.00	0.80	2.80	33.00	-30.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2540.20	-33.00	9.80	0.80	10.60	33.00	-22.40
2	2560.00	-35.90	7.10	0.80	7.90	33.00	-25.10

Mode	TX channel 21152 (1 RB / 99 RB Offset) + TX channel 21350 (1 RB / 0 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2540.20	-31.50	11.00	0.80	11.80	33.00	-21.20
2	2560.00	-33.30	9.20	0.80	10.00	33.00	-23.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2540.20	-25.90	16.90	0.80	17.70	33.00	-15.30
2	2560.00	-28.50	14.50	0.80	15.30	33.00	-17.70

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

LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Mode		TX channel 37850 (1 RB / 0 RB Offset) + TX channel 38048 (1 RB / 99 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2580.00	-40.20	2.40	0.80	3.20	33.00	-29.80
2	2599.80	-40.90	1.70	0.90	2.60	33.00	-30.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2580.00	-35.20	7.90	0.80	8.70	33.00	-24.30
2	2599.80	-35.60	7.60	0.90	8.50	33.00	-24.50

Mode		TX channel 37850 (1 RB / 99 RB Offset) + TX channel 38048 (1 RB / 0 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2580.00	-33.00	9.60	0.80	10.40	33.00	-22.60
2	2599.80	-34.20	8.40	0.90	9.30	33.00	-23.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2580.00	-27.80	15.30	0.80	16.10	33.00	-16.90
2	2599.80	-28.10	15.10	0.90	16.00	33.00	-17.00

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

Mode	TX channel 37901 (1 RB / 0 RB Offset) + TX channel 38099 (1 RB / 99 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2585.10	-40.00	2.50	0.90	3.40	33.00	-29.60
2	2604.90	-40.50	2.10	0.90	3.00	33.00	-30.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2585.10	-35.10	8.00	0.90	8.90	33.00	-24.10
2	2604.90	-35.80	7.40	0.90	8.30	33.00	-24.70

Mode	TX channel 37901 (1 RB / 99 RB Offset) + TX channel 38099 (1 RB / 0 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2585.10	-33.50	9.00	0.90	9.90	33.00	-23.10
2	2604.90	-34.00	8.60	0.90	9.50	33.00	-23.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2585.10	-27.50	15.60	0.90	16.50	33.00	-16.50
2	2604.90	-28.30	14.90	0.90	15.80	33.00	-17.20

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

Mode	TX channel 37952 (1 RB / 0 RB Offset) + TX channel 38150 (1 RB / 99 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2590.20	-40.50	2.00	0.90	2.90	33.00	-30.10
2	2610.00	-40.10	2.50	0.90	3.40	33.00	-29.60
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2590.20	-35.00	8.10	0.90	9.00	33.00	-24.00
2	2610.00	-35.90	7.30	0.90	8.20	33.00	-24.80

Mode	TX channel 37952 (1 RB / 99 RB Offset) + TX channel 38150 (1 RB / 0 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2590.20	-32.80	9.70	0.90	10.60	33.00	-22.40
2	2610.00	-34.10	8.50	0.90	9.40	33.00	-23.60
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2590.20	-27.50	15.60	0.90	16.50	33.00	-16.50
2	2610.00	-27.90	15.30	0.90	16.20	33.00	-16.80

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

LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Mode		TX channel 40140 (1 RB / 0 RB Offset) + TX channel 40338 (1 RB / 99 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2545.00	-40.20	2.30	0.80	3.10	33.00	-29.90
2	2564.80	-40.80	1.80	0.80	2.60	33.00	-30.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2545.00	-35.00	7.80	0.80	8.60	33.00	-24.40
2	2564.80	-36.10	6.90	0.80	7.70	33.00	-25.30

Mode		TX channel 40140 (1 RB / 99 RB Offset) + TX channel 40338 (1 RB / 0 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2545.00	-33.20	9.30	0.80	10.10	33.00	-22.90
2	2564.80	-34.10	8.50	0.80	9.30	33.00	-23.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2545.00	-27.90	14.90	0.80	15.70	33.00	-17.30
2	2564.80	-28.50	14.50	0.80	15.30	33.00	-17.70

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

Mode		TX channel 40470 (1 RB / 0 RB Offset) + TX channel 40668 (1 RB / 99 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2578.00	-39.90	2.70	0.80	3.50	33.00	-29.50
2	2597.80	-40.10	2.40	0.90	3.30	33.00	-29.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2578.00	-34.20	8.90	0.80	9.70	33.00	-23.30
2	2597.80	-35.80	7.40	0.90	8.30	33.00	-24.70

Mode		TX channel 40470 (1 RB / 99 RB Offset) + TX channel 40668 (1 RB / 0 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2578.00	-32.70	9.90	0.80	10.70	33.00	-22.30
2	2597.80	-33.90	8.60	0.90	9.50	33.00	-23.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2578.00	-28.10	14.90	0.80	15.70	33.00	-17.30
2	2597.80	-27.60	15.60	0.90	16.50	33.00	-16.50

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

Mode		TX channel 40810 (1 RB / 0 RB Offset) + TX channel 41008 (1 RB / 99 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2612.00	-39.50	3.10	0.90	4.00	33.00	-29.00
2	2631.80	-39.90	2.70	0.90	3.60	33.00	-29.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2612.00	-34.20	9.00	0.90	9.90	33.00	-23.10
2	2631.80	-35.70	7.60	0.90	8.50	33.00	-24.50

Mode		TX channel 40810 (1 RB / 99 RB Offset) + TX channel 41008 (1 RB / 0 RB Offset)					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2612.00	-32.40	10.20	0.90	11.10	33.00	-21.90
2	2631.80	-33.50	9.10	0.90	10.00	33.00	-23.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2612.00	-26.70	16.50	0.90	17.40	33.00	-15.60
2	2631.80	-27.30	16.00	0.90	16.90	33.00	-16.10

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

Mode	TX channel 40942 (1 RB / 0 RB Offset) + TX channel 41140 (1 RB / 99 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2625.20	-40.80	1.80	0.90	2.70	33.00	-30.30
2	2645.00	-41.00	1.60	0.90	2.50	33.00	-30.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2625.20	-35.80	7.50	0.90	8.40	33.00	-24.60
2	2645.00	-36.30	7.10	0.90	8.00	33.00	-25.00

Mode	TX channel 40942 (1 RB / 99 RB Offset) + TX channel 41140 (1 RB / 0 RB Offset)						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2625.20	-33.60	9.00	0.90	9.90	33.00	-23.10
2	2645.00	-34.30	8.30	0.90	9.20	33.00	-23.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2625.20	-28.20	15.10	0.90	16.00	33.00	-17.00
2	2645.00	-28.90	14.50	0.90	15.40	33.00	-17.60

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

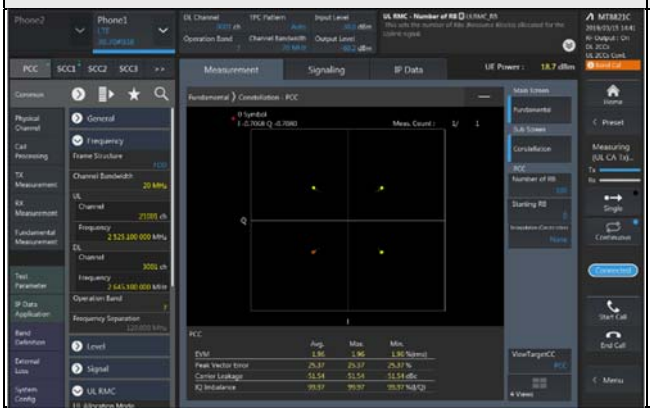
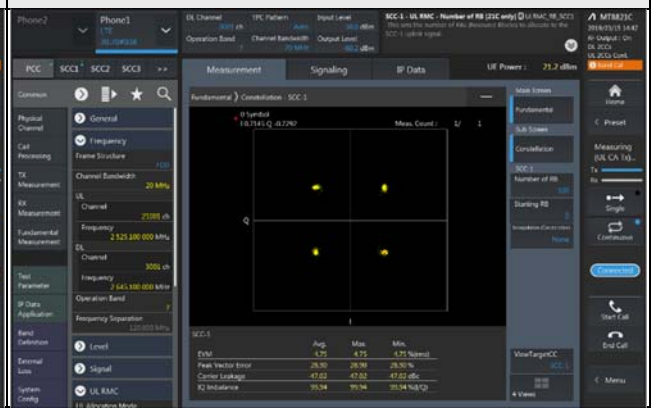
4.2.2 Test Procedure

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

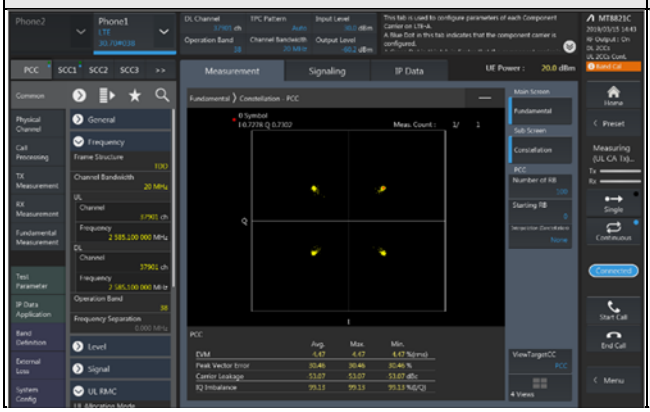
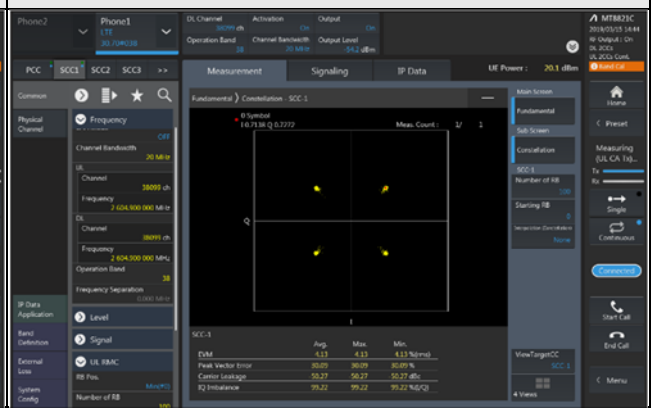
4.2.3 Test Setup

4.2.4 Test Results

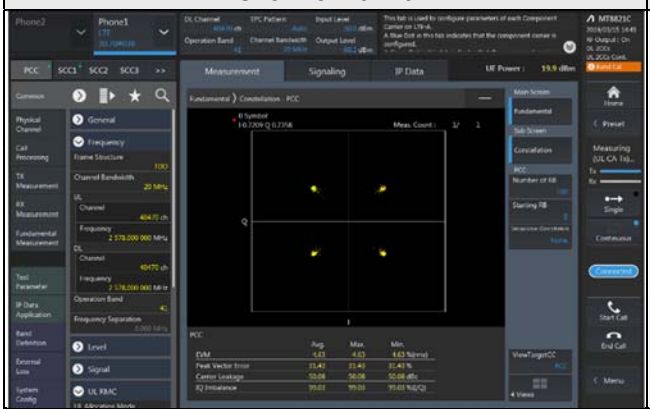
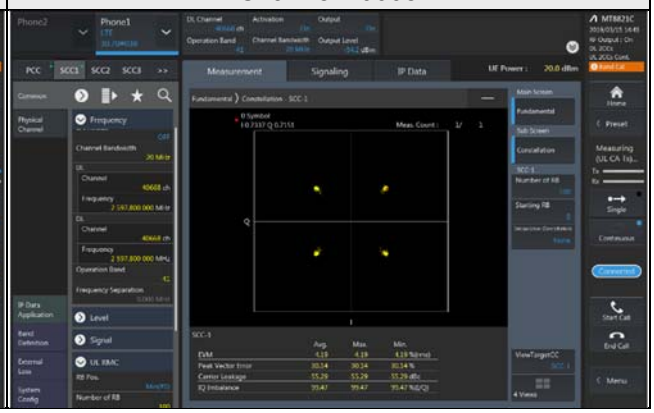
LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Spectrum Plot of Measurement Value	
Channel 21001	Channel 21001
	

LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Spectrum Plot of Measurement Value	
Channel 37901	Channel 38099
	

LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Spectrum Plot of Measurement Value	
Channel 40470	Channel 40668
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

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

4.3.2 Test Procedure

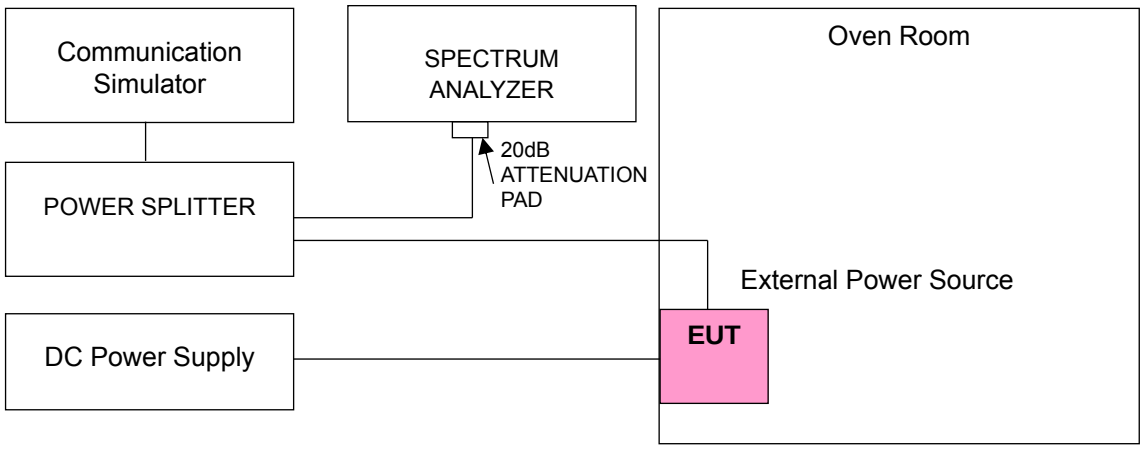
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the 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)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.4275	2510.000001	0.000	2560.000001	0.000
3.85	2510.000001	0.001	2560.000004	0.001
3.2725	2510.000004	0.002	2560.000002	0.001

Note: The applicant defined the normal working voltage is from 3.2725Vdc to 4.4275Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000003	0.001	2560.000003	0.001
-20	2510.000003	0.001	2560.000004	0.002
-10	2510.000004	0.001	2560.000002	0.001
0	2510.000002	0.001	2560.000002	0.001
10	2510.000002	0.001	2560.000002	0.001
20	2509.999997	-0.001	2559.999997	-0.001
30	2509.999999	-0.001	2559.999998	-0.001
40	2509.999998	-0.001	2559.999999	0.000
50	2509.999999	0.000	2559.999996	-0.002
55	2509.999997	-0.001	2559.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 38			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.4275	2580.000003	0.001	2610.000001	0.000
3.85	2580.000003	0.001	2610.000003	0.001
3.2725	2580.000002	0.001	2610.000000	0.001

Note: The applicant defined the normal working voltage is from 3.2725Vdc to 4.4275Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 38			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2580.000003	0.001	2610.000004	0.001
-20	2580.000002	0.001	2610.000002	0.001
-10	2580.000001	0.000	2610.000002	0.001
0	2580.000002	0.001	2610.000002	0.001
10	2580.000003	0.001	2610.000003	0.001
20	2579.999997	-0.001	2609.999999	0.000
30	2579.999999	0.000	2609.999998	-0.001
40	2579.999999	0.000	2609.999997	-0.001
50	2579.999998	-0.001	2609.999999	-0.001
55	2579.999999	-0.001	2609.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.4275	2545.000003	0.001	2645.000002	0.001
3.85	2545.000002	0.001	2645.000001	0.000
3.2725	2545.000004	0.001	2645.000003	0.001

Note: The applicant defined the normal working voltage is from 3.2725Vdc to 4.4275Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2545.000004	0.001	2645.000003	0.001
-20	2545.000002	0.001	2645.000004	0.001
-10	2545.000002	0.001	2645.000004	0.001
0	2545.000001	0.000	2645.000004	0.002
10	2545.000003	0.001	2645.000004	0.002
20	2544.999998	-0.001	2644.999996	-0.001
30	2544.999998	-0.001	2644.999996	-0.001
40	2544.999998	-0.001	2644.999999	0.000
50	2544.999996	-0.001	2644.999999	-0.001
55	2544.999998	-0.001	2644.999997	-0.001

4.4 Emission Bandwidth Measurement

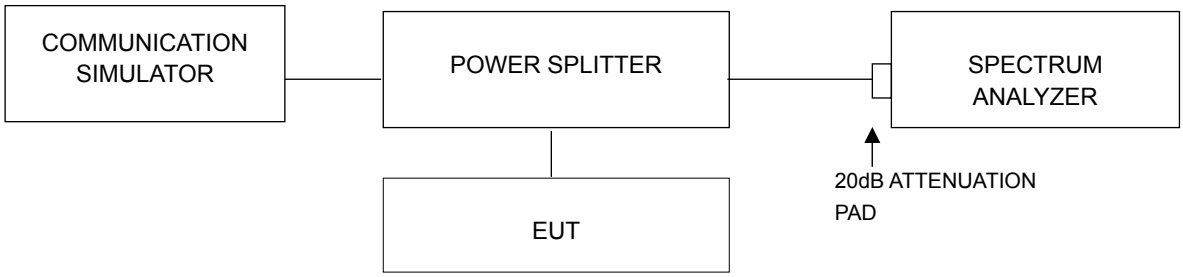
4.4.1 Limits of Emission Bandwidth Measurement

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

4.4.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 200kHz and VBW = 620kHz. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.4.3 Test Setup



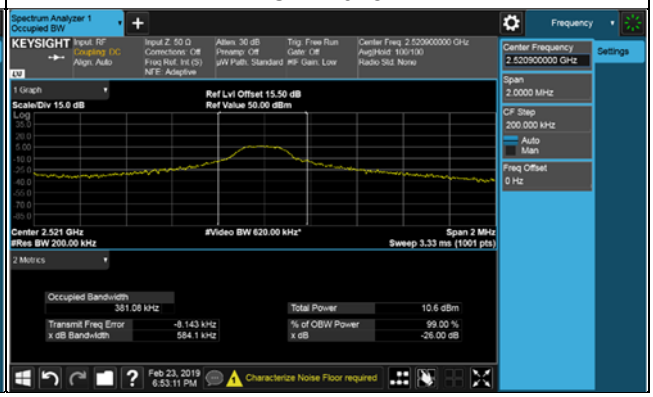
4.4.4 Test Result

LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
20850	1 RB / 0 RB Offset	297.95
21048	1 RB / 99 RB Offset	303.27
Total		601.22

Ch 20850	Ch 21048

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
20850	1 RB / 99 RB Offset	308.33
21048	1 RB / 0 RB Offset	381.08
Total		689.41

Ch 20850	Ch 21048
	

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
21001	1 RB / 0 RB Offset	302.33
21199	1 RB / 99 RB Offset	299.06
Total		601.39

Ch 21001	Ch 21199

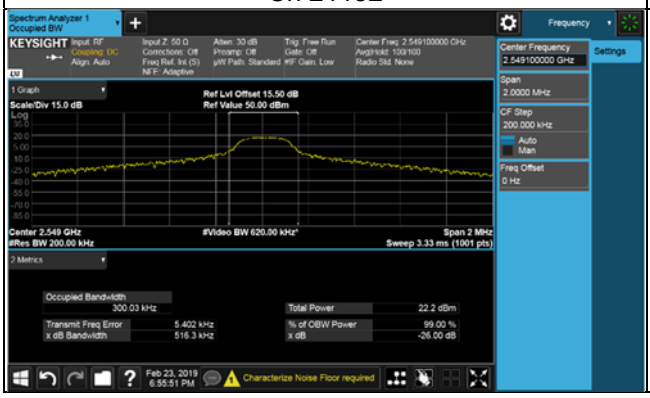
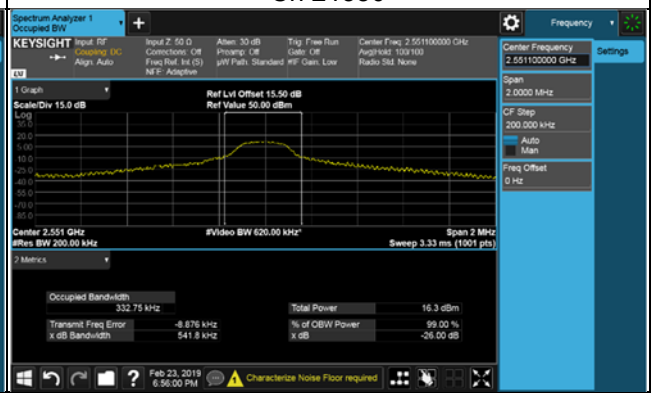
Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
21001	1 RB / 99 RB Offset	299.26
21199	1 RB / 0 RB Offset	326.35
Total		625.61

Ch 21001	Ch 21199

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
21152	1 RB / 0 RB Offset	308.83
21350	1 RB / 99 RB Offset	315.34
Total		624.17

Ch 21152	Ch 21350

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
21152	1 RB / 99 RB Offset	300.03
21350	1 RB / 0 RB Offset	332.75
Total		632.78

Ch 21152	Ch 21350
	

LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37850	1 RB / 0 RB Offset	294.11
38048	1 RB / 99 RB Offset	307.95
Total		602.06

Ch 37850	Ch 38048

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37850	1 RB / 99 RB Offset	335.82
38048	1 RB / 0 RB Offset	338.69
Total		674.51

Ch 37850	Ch 38048

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37901	1 RB / 0 RB Offset	307.10
38099	1 RB / 99 RB Offset	298.18
Total		605.28

Ch 37901	Ch 38099

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37901	1 RB / 99 RB Offset	322.62
38099	1 RB / 0 RB Offset	330.38
Total		653.00

Ch 37901	Ch 38099

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37952	1 RB / 0 RB Offset	394.32
38150	1 RB / 99 RB Offset	290.69
Total		685.01

Ch 37952	Ch 38150

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
37952	1 RB / 99 RB Offset	324.53
38150	1 RB / 0 RB Offset	336.27
Total		660.80

Ch 37952	Ch 38150

LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

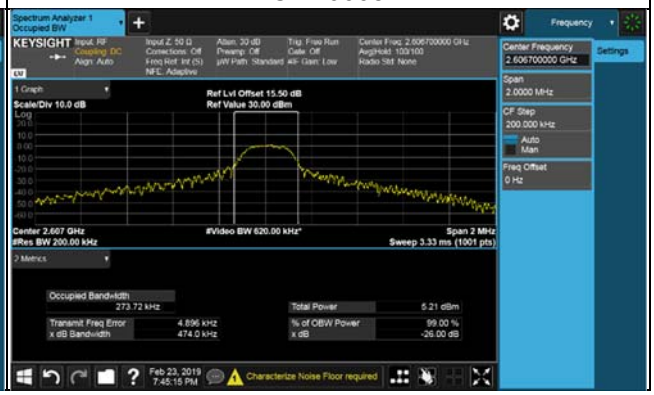
Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40140	1 RB / 0 RB Offset	287.93
40338	1 RB / 99 RB Offset	293.86
Total		581.79

Ch 40140	Ch 40338

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40140	1 RB / 99 RB Offset	305.87
40338	1 RB / 0 RB Offset	319.65
Total		625.52

Ch 40140	Ch 40338

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40470	1 RB / 0 RB Offset	271.41
40668	1 RB / 99 RB Offset	273.72
Total		545.13

Ch 40470	Ch 40668
	

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40470	1 RB / 99 RB Offset	301.52
40668	1 RB / 0 RB Offset	284.40
Total		585.92

Ch 40470	Ch 40668

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40810	1 RB / 0 RB Offset	269.13
41008	1 RB / 99 RB Offset	268.65
Total		537.78

Ch 40810	Ch 41008

Channel	Mode	Occupied Bandwidth (kHz)
		QPSK
40810	1 RB / 99 RB Offset	308.40
41008	1 RB / 0 RB Offset	349.82
Total		658.22

Ch 40810	Ch 41008

Channel	Mode	Occupied Bandwidth (MHz)
		QPSK
40942	1 RB / 0 RB Offset	275.92
41140	1 RB / 99 RB Offset	296.66
Total		572.58

Ch 40942	Ch 41140

Channel	Mode	Occupied Bandwidth (MHz)
		QPSK
40942	1 RB / 99 RB Offset	357.90
41140	1 RB / 0 RB Offset	376.20
Total		734.10

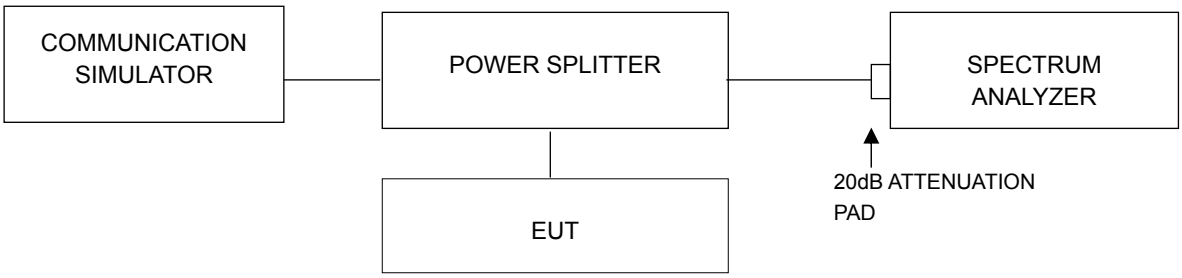
Ch 40942	Ch 41140

4.5 Channel Edge Measurement

4.5.1 Limits of Band Edge Measurement

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

4.5.2 Test Setup



4.5.3 Test Procedures

a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer.

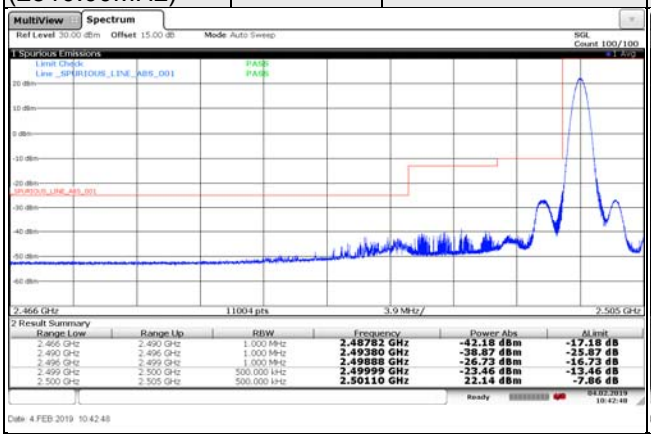
b. The center frequency of spectrum is the band edge frequency measurement procedure refer 27.53(m)(6).

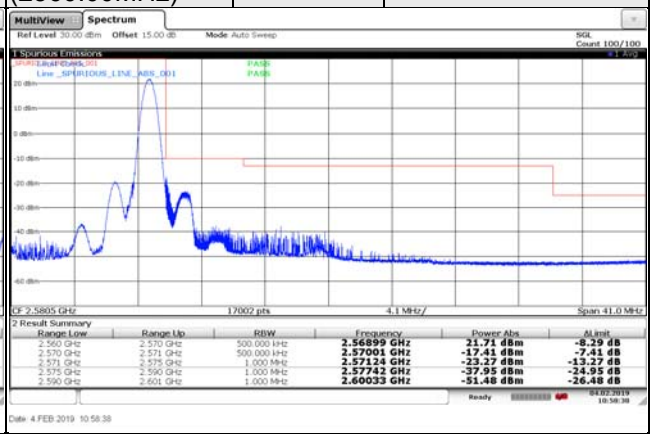
c. Record the max trace plot into the test report.

4.5.4 Test Results

LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

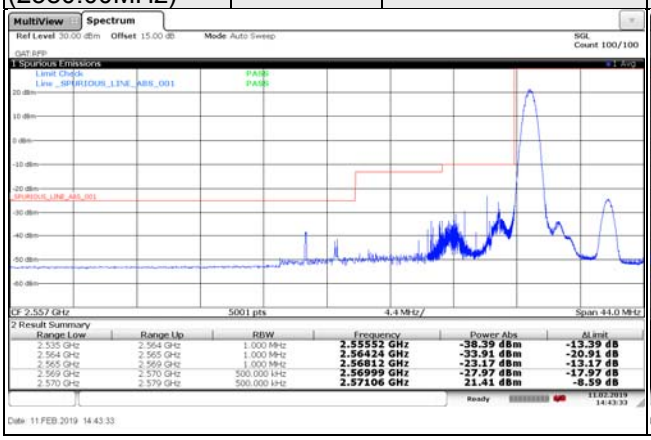
Channel 20850 (2510.00MHz)	QPSK	1 RB / 0 RB Offset	Channel 21350 (2560.00MHz)	QPSK	1 RB / 99 RB Offset

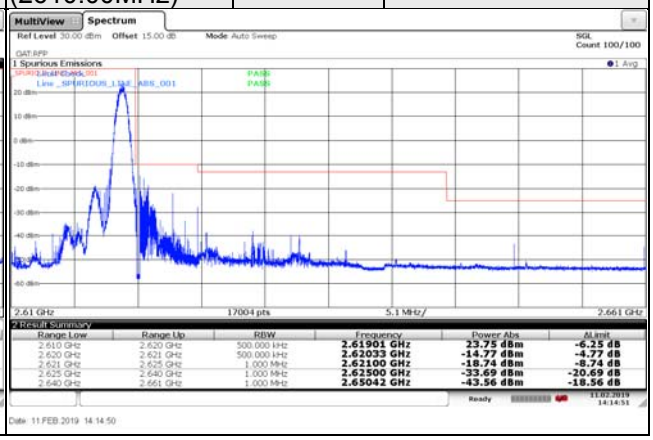




LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

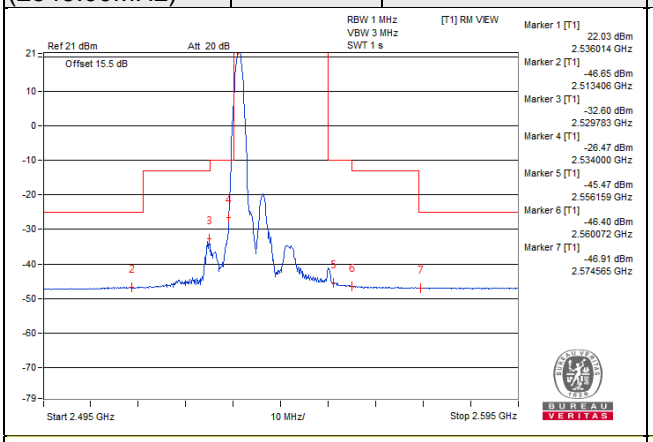
Channel 37850 (2580.00MHz)	QPSK	1 RB / 0 RB Offset	Channel 38150 (2610.00MHz)	QPSK	1 RB / 99 RB Offset

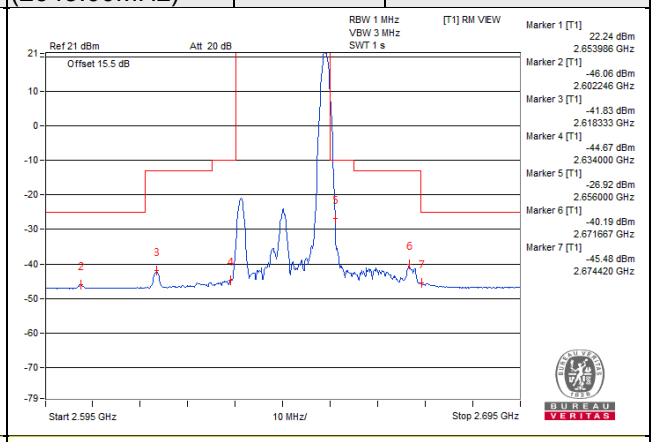


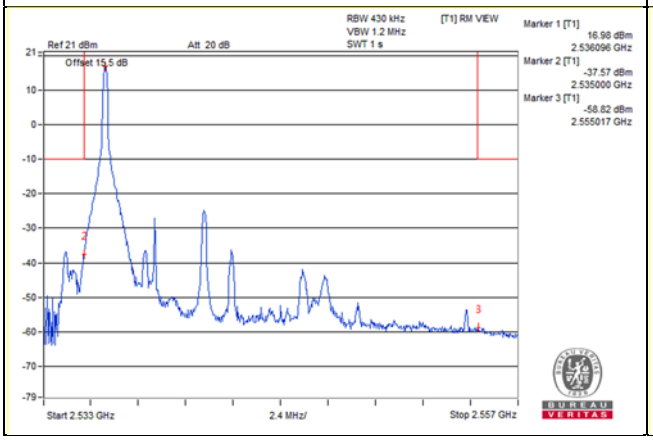


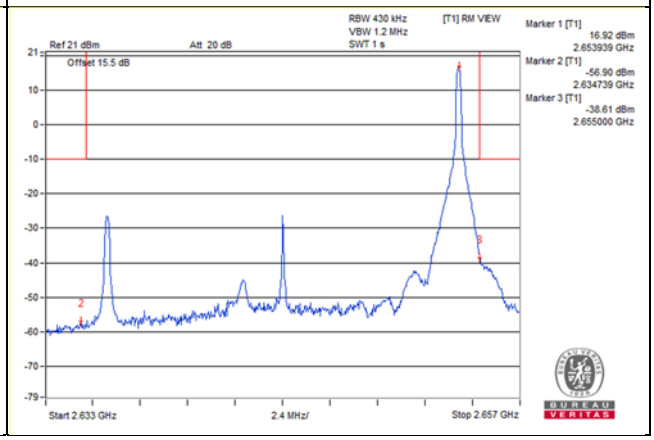
LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Channel 40140 (2545.00MHz)	QPSK	1 RB / 0 RB Offset	Channel 41140 (2645.00MHz)	QPSK	1 RB / 99 RB Offset







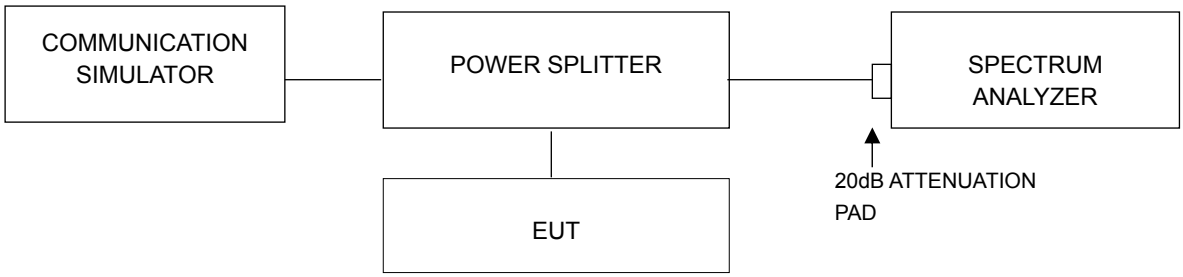


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup



4.6.3 Test Procedures

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

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

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

4.6.4 Test Results

LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
20850	2510.00	1 RB / 0 RB Offset	3.67
21048	2529.80	1 RB / 99 RB Offset	7.37

Ch 20850	Ch 21048

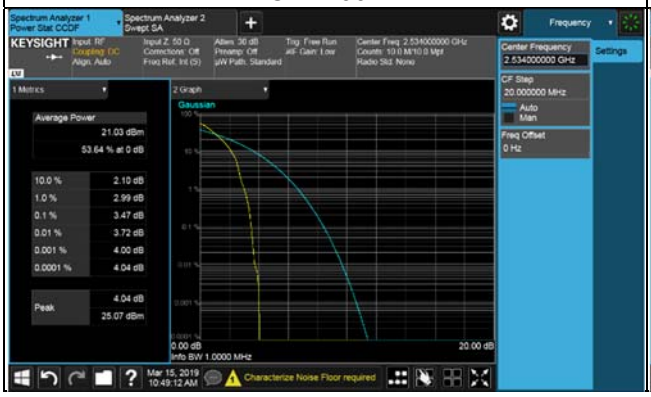
Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
20850	2510.00	1 RB / 99 RB Offset	3.22
21048	2529.80	1 RB / 0 RB Offset	6.11

Ch 20850	Ch 21048

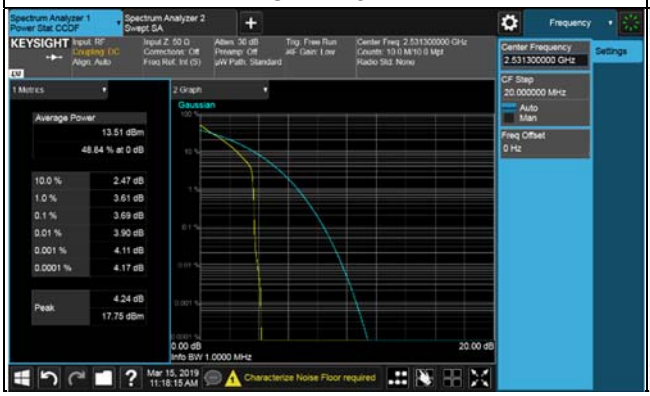
Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
21001	2525.10	1 RB / 0 RB Offset	3.80
21199	2544.90	1 RB / 99 RB Offset	7.47

Ch 21001	Ch 21199

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
21001	2525.10	1 RB / 99 RB Offset	3.47
21199	2544.90	1 RB / 0 RB Offset	6.34

Ch 21001	Ch 21199
	

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
21152	2540.20	1 RB / 0 RB Offset	3.69
21350	2560.00	1 RB / 99 RB Offset	7.47

Ch 21152	Ch 21350
	

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
21152	2540.20	1 RB / 99 RB Offset	3.51
21350	2560.00	1 RB / 0 RB Offset	6.33

Ch 21152	Ch 21350

LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37850	2580.00	1 RB / 0 RB Offset	4.98
38048	2599.80	1 RB / 99 RB Offset	6.75

Ch 37850	Ch 38048

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37850	2580.00	1 RB / 99 RB Offset	3.84
38048	2599.80	1 RB / 0 RB Offset	3.68

Ch 37850	Ch 38048

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37901	2585.10	1 RB / 0 RB Offset	5.09
38099	2604.90	1 RB / 99 RB Offset	6.77

Ch 37901	Ch 38099

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37901	2585.10	1 RB / 99 RB Offset	4.93
38099	2604.90	1 RB / 0 RB Offset	5.27

Ch 37901	Ch 38099

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37952	2590.20	1 RB / 0 RB Offset	4.93
38150	2610.00	1 RB / 99 RB Offset	6.69

Ch 37952	Ch 38150

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
37952	2590.20	1 RB / 99 RB Offset	4.59
38150	2610.00	1 RB / 0 RB Offset	5.48

Ch 37952	Ch 38150

LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40140	2545.00	1 RB / 0 RB Offset	5.18
40338	2564.80	1 RB / 99 RB Offset	6.55

Ch 40140	Ch 40338

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40140	2545.00	1 RB / 99 RB Offset	4.85
40338	2564.80	1 RB / 0 RB Offset	5.53

Ch 40140	Ch 40338

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40470	2578.00	1 RB / 0 RB Offset	5.22
40668	2597.80	1 RB / 99 RB Offset	6.50

Ch 40470	Ch 40668

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40470	2578.00	1 RB / 99 RB Offset	4.81
40668	2597.80	1 RB / 0 RB Offset	5.10

Ch 40470	Ch 40668

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40810	2612.00	1 RB / 0 RB Offset	5.50
41008	2631.80	1 RB / 99 RB Offset	6.77

Ch 40810	Ch 41008

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40810	2612.00	1 RB / 99 RB Offset	4.65
41008	2631.80	1 RB / 0 RB Offset	5.09

Ch 40810	Ch 41008

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40942	2625.20	1 RB / 0 RB Offset	5.16
41140	2645.00	1 RB / 99 RB Offset	5.09

Ch 40942	Ch 41140

Channel	Frequency (MHz)	Mode	Peak To Average Ratio (dB)
			QPSK
40942	2625.20	1 RB / 99 RB Offset	5.37
41140	2645.00	1 RB / 0 RB Offset	4.83

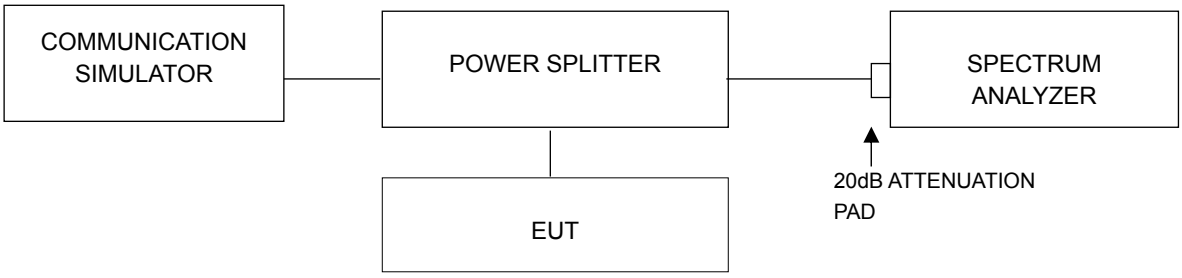
Ch 40942	Ch 41140

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

In the FCC 27.53(m)(4),On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB. The emission limit equal to –25dBm.

4.7.2 Test Setup



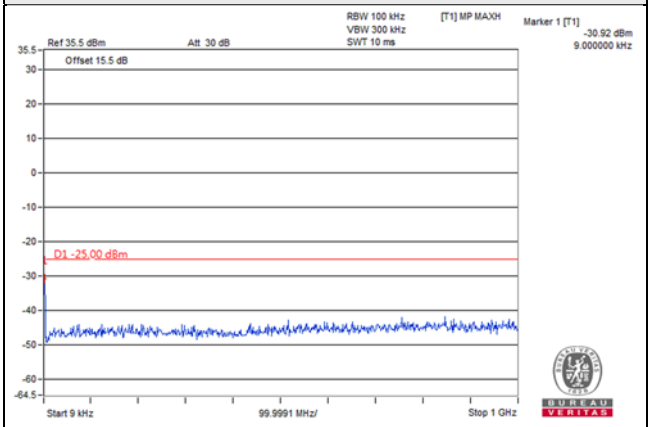
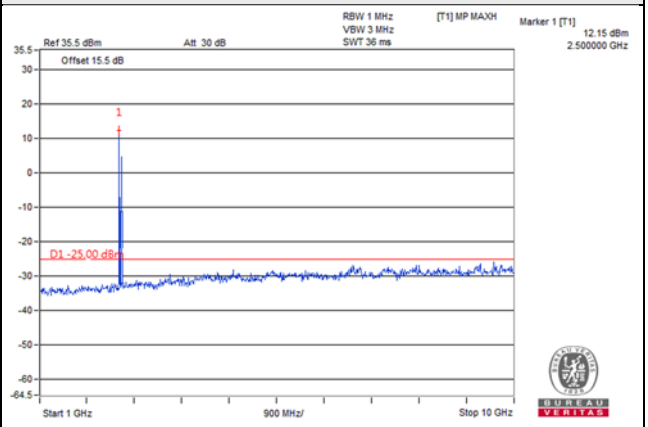
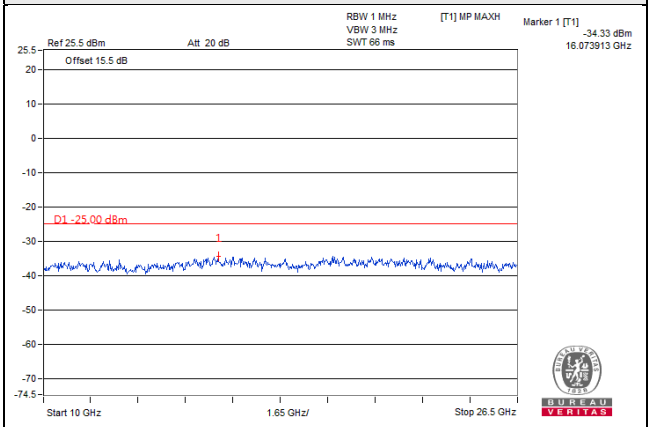
4.7.3 Test Procedure

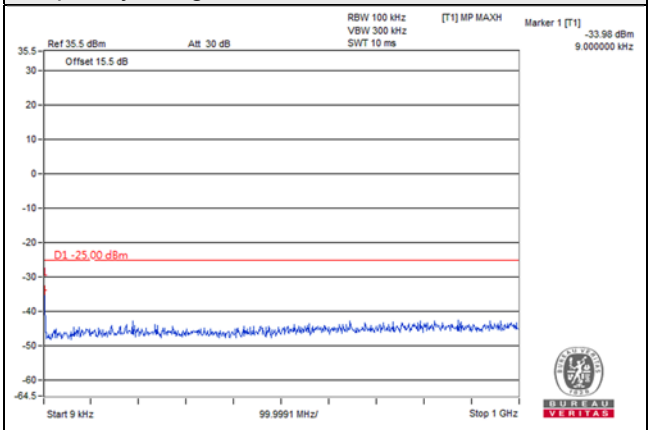
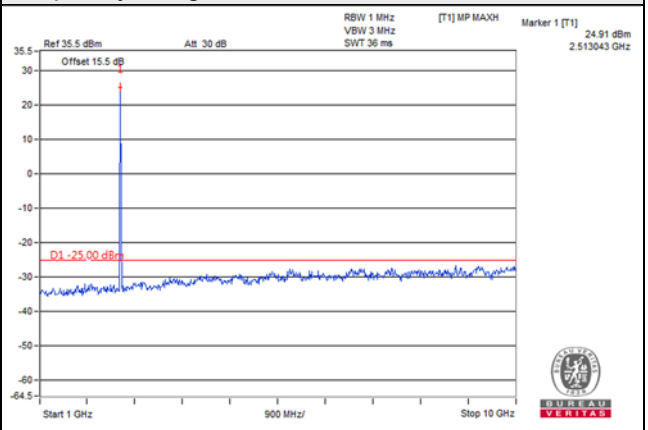
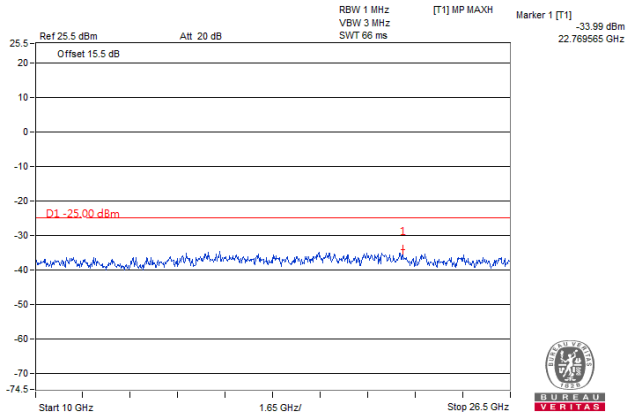
a. All measurements were done at 3 channels: low, middle and high operational frequency range.

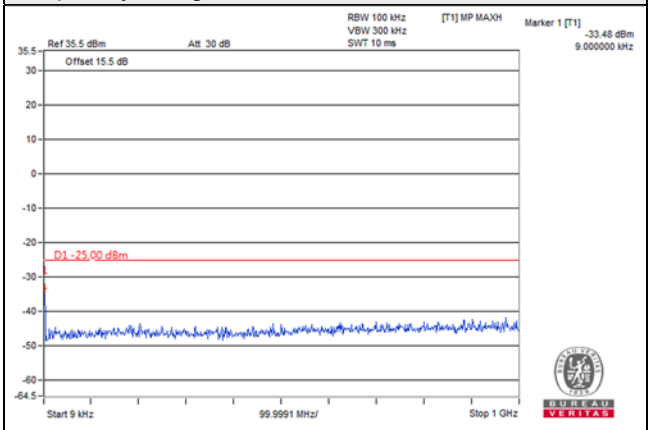
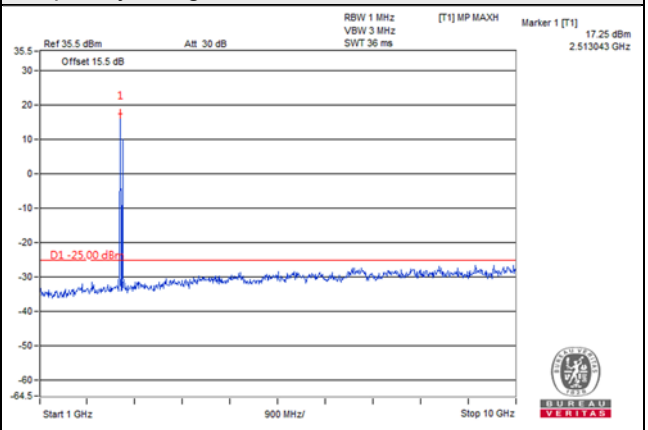
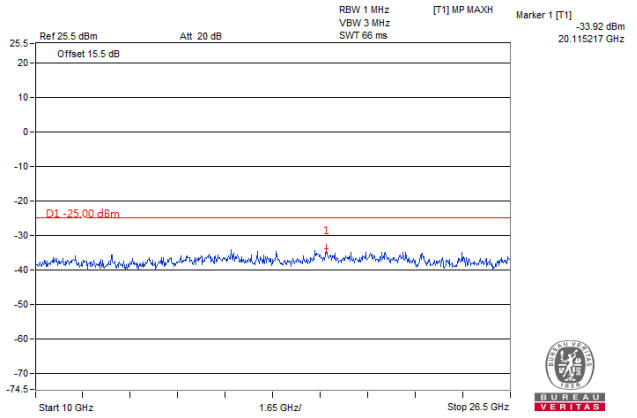
b. When the spectrum scanned from 9kHz to 26.5GHz or 27GHz, it shall be connected to the attenuator with the carried frequency.

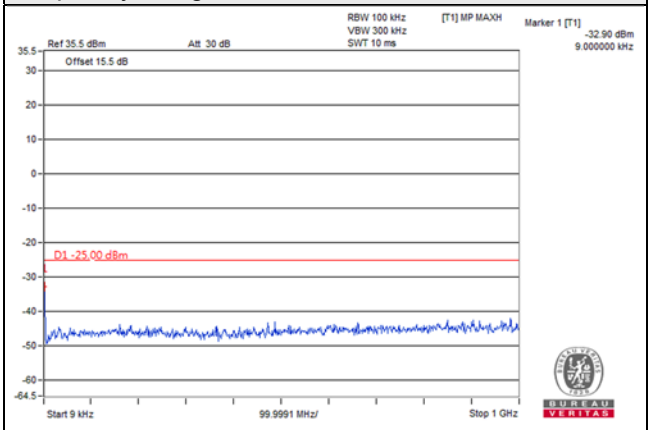
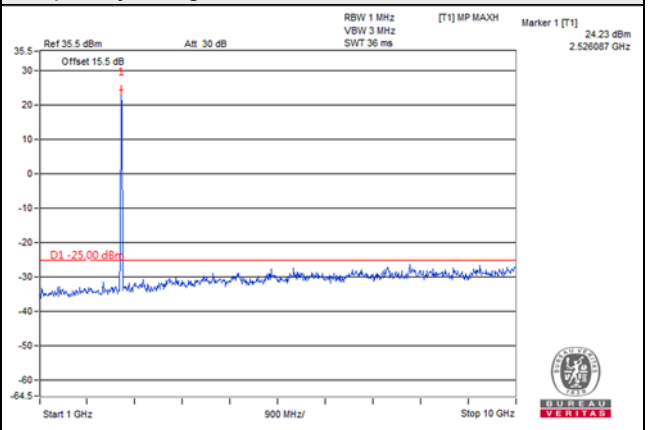
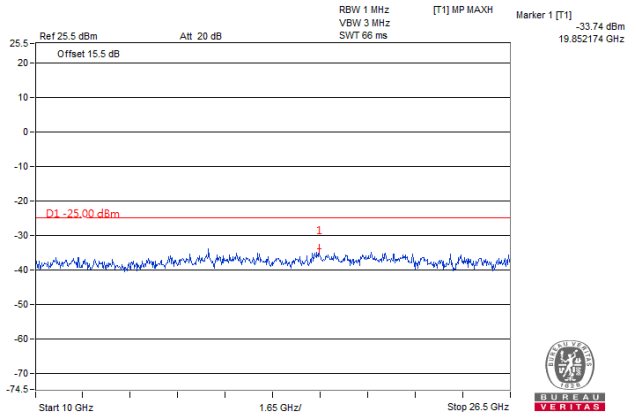
4.7.4 Test Results

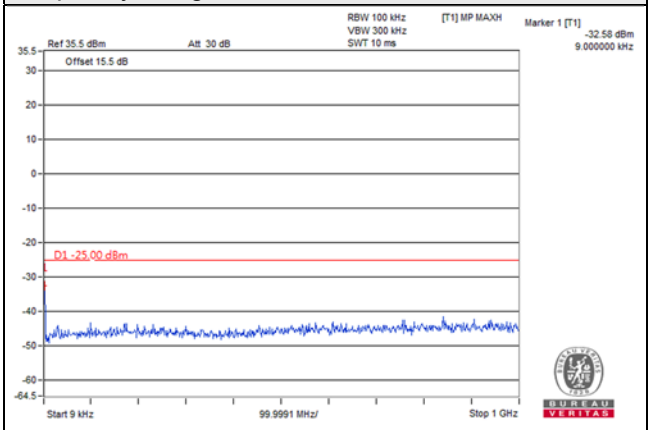
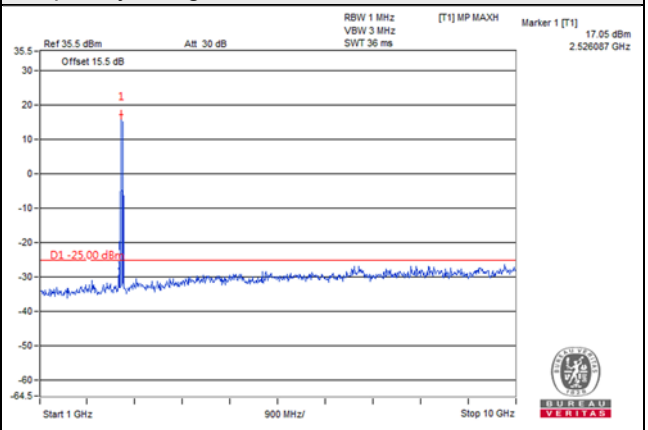
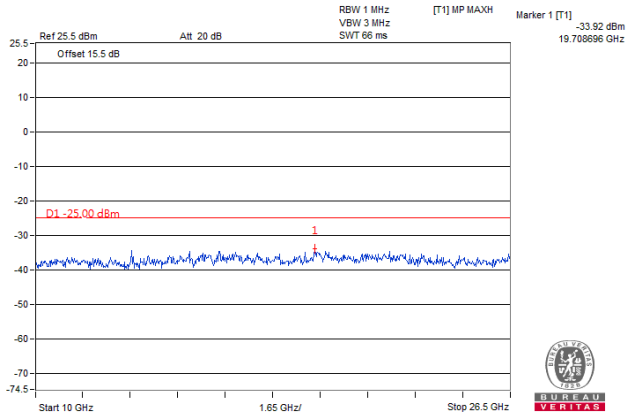
LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

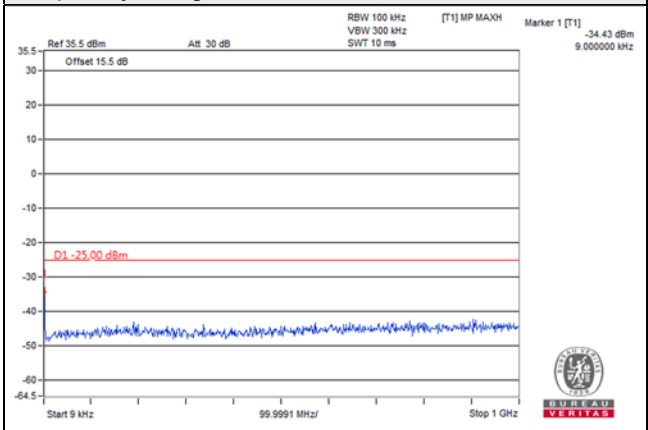
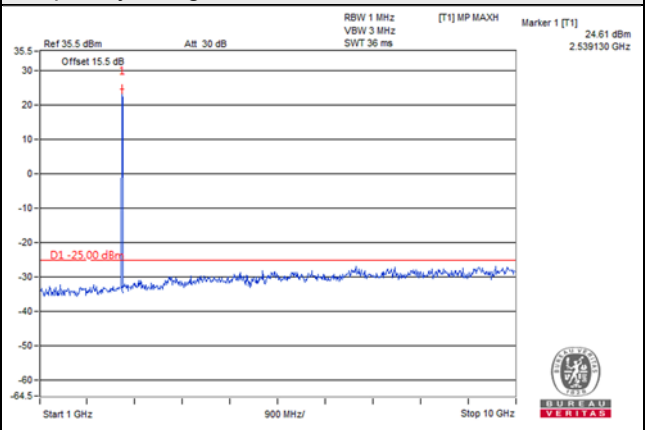
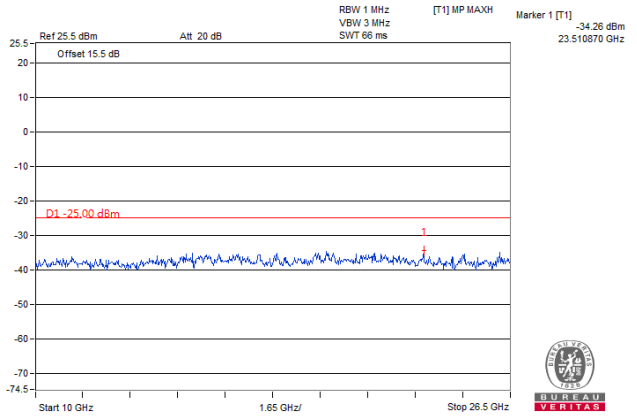
Channel 20850 (2510.0MHz) (1 RB / 0 RB Offset) + Channel 21048 (2529.80MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

Channel 20850 (2510.0MHz) (1 RB / 99 RB Offset) + Channel 21048 (2529.80MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

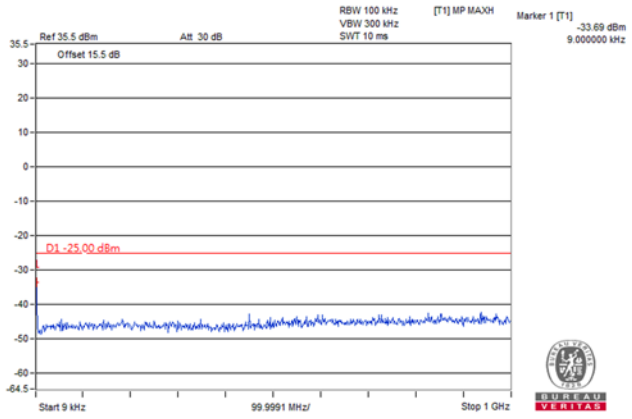
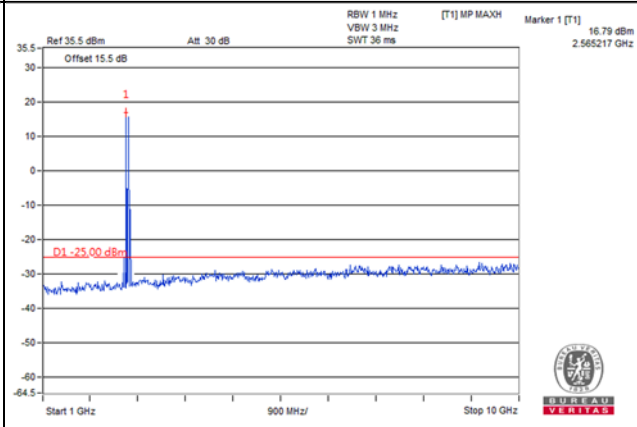
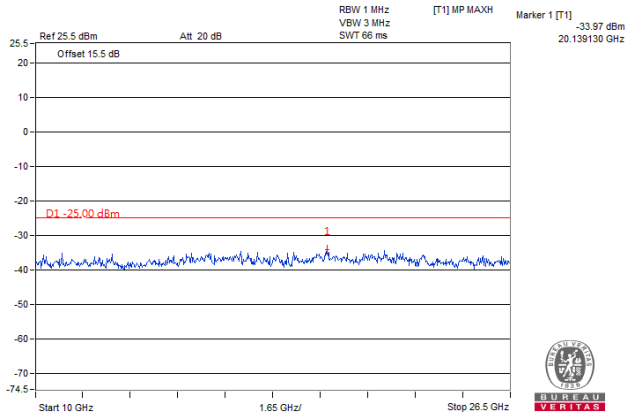
Channel 21001 (2525.1MHz) (1 RB / 0 RB Offset) + Channel 21199 (2544.90MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

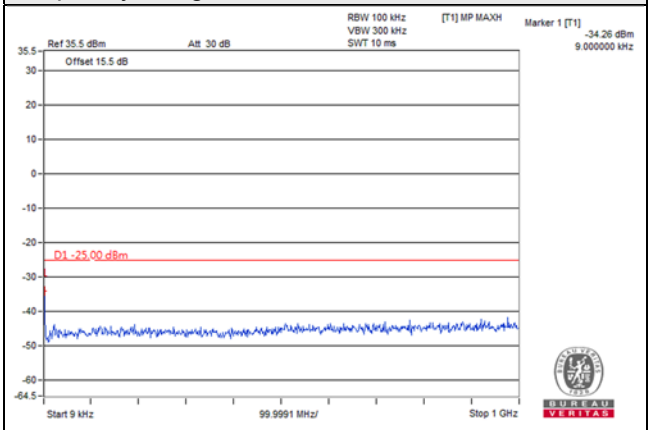
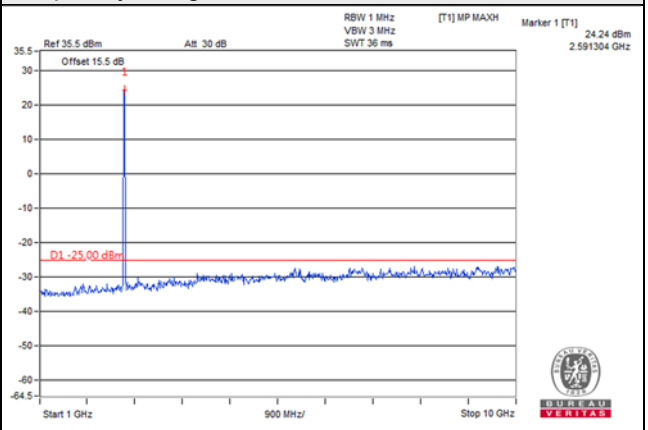
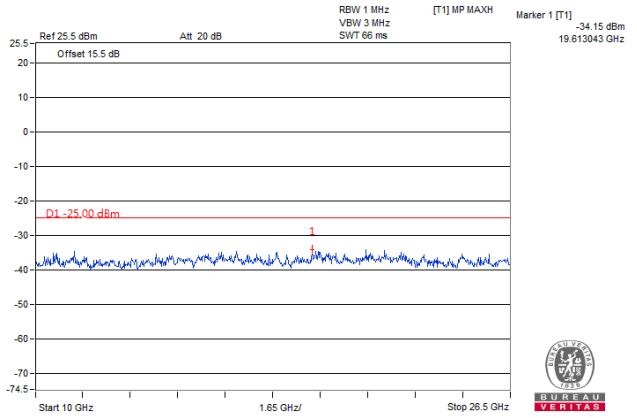
Channel 21001 (2525.1MHz) (1 RB / 99 RB Offset) + Channel 21199 (2544.90MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

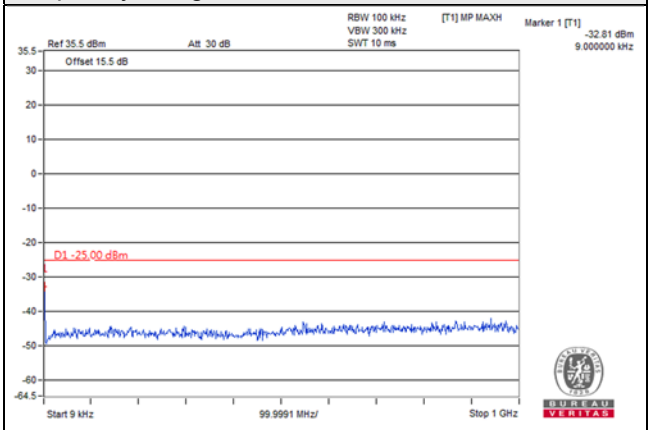
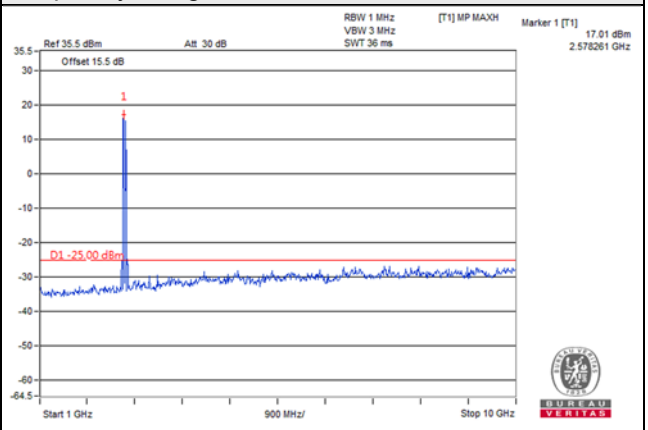
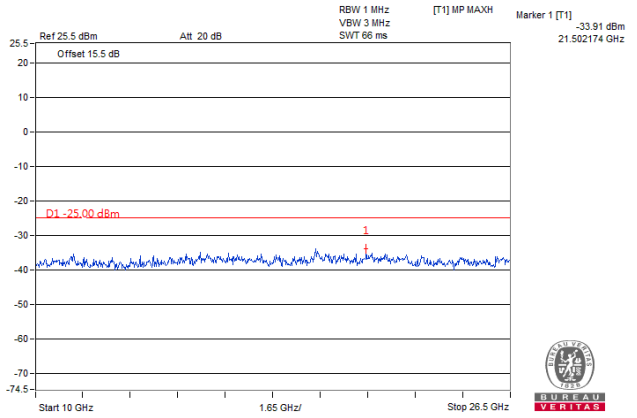
Channel 21152 (2540.20MHz) (1 RB / 0 RB Offset) + Channel 21350 (2560.00MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

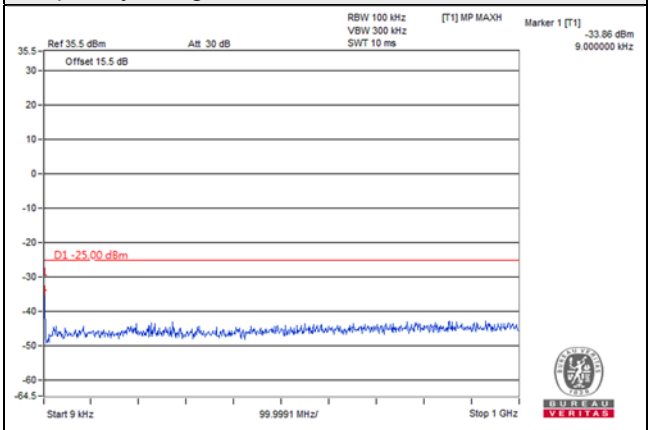
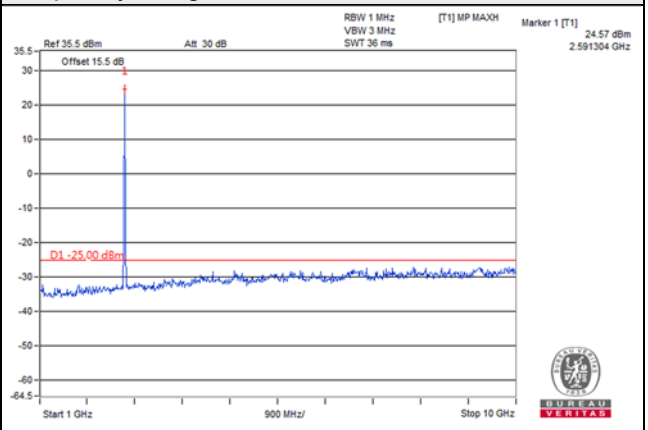
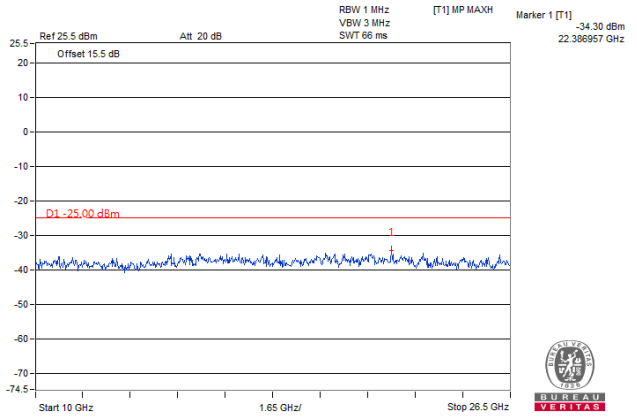
Channel 21152 (2540.20MHz) (1 RB / 99 RB Offset) + Channel 21350 (2560.00MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

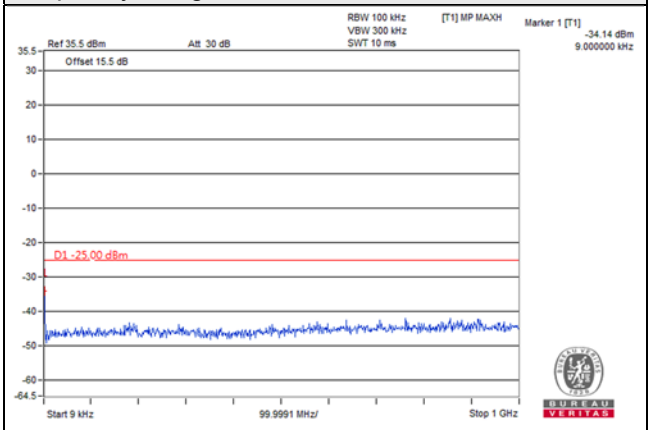
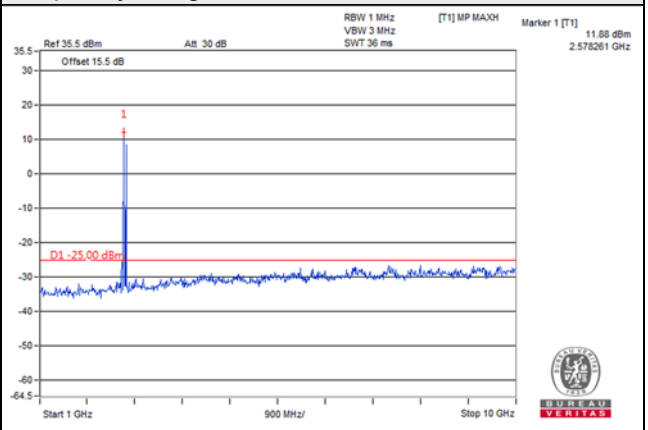
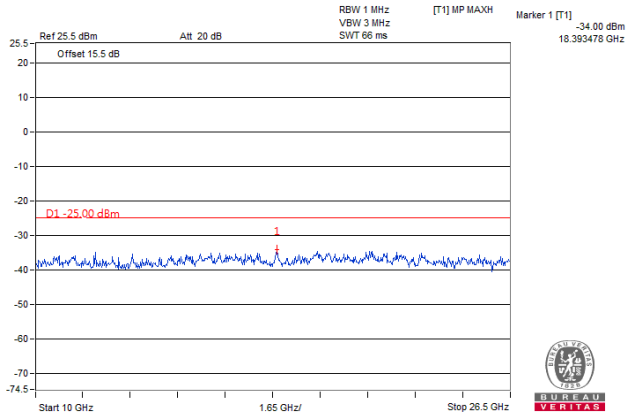
LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

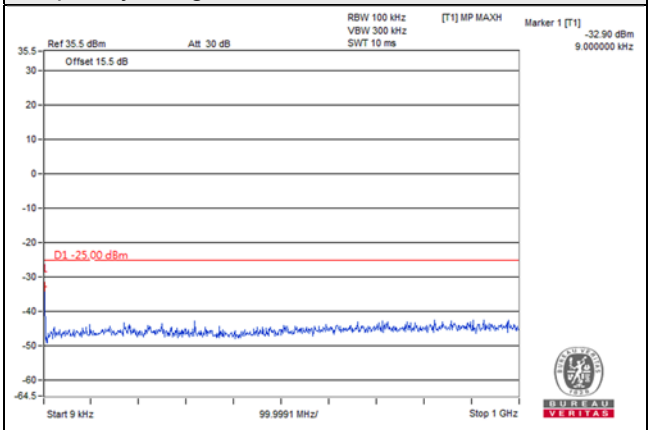
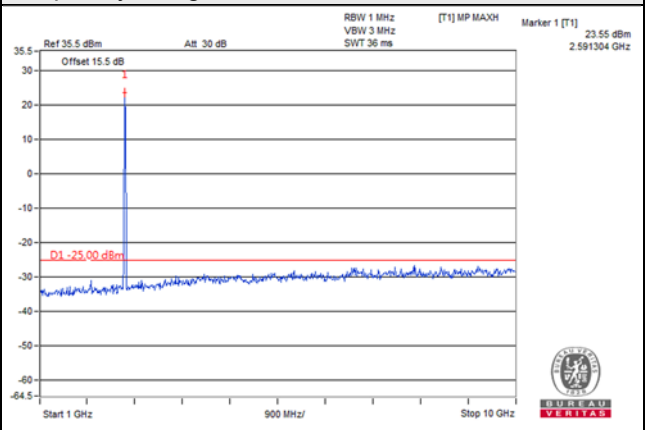
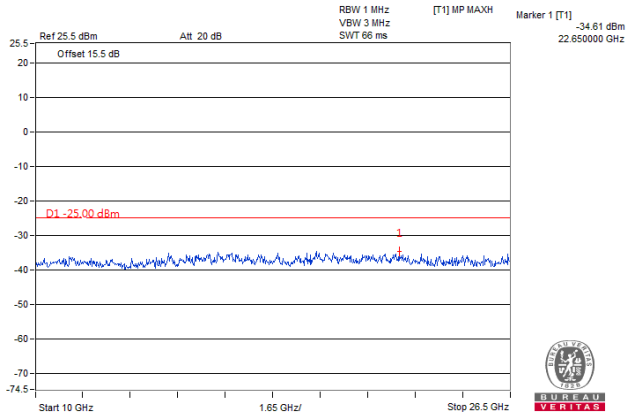
Channel 37850 (2580.00MHz) (1 RB / 0 RB Offset) + Channel 38048 (2599.80MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

Channel 37850 (2580.00MHz) (1 RB / 99 RB Offset) + Channel 38048 (2599.80MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

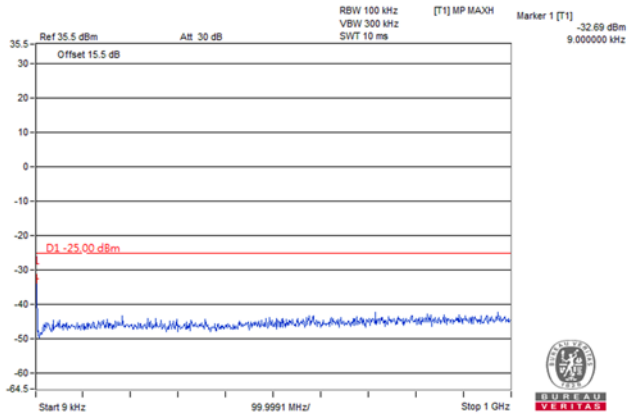
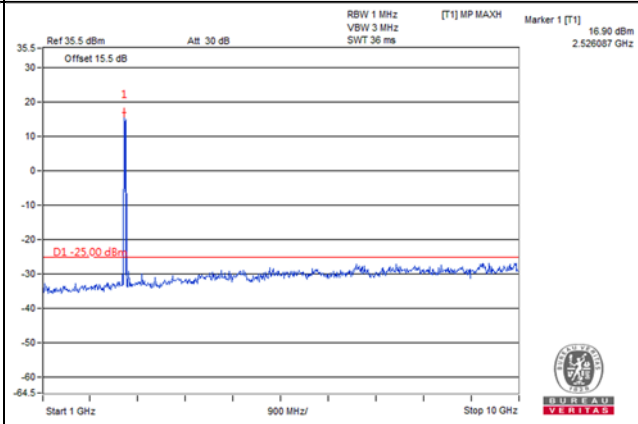
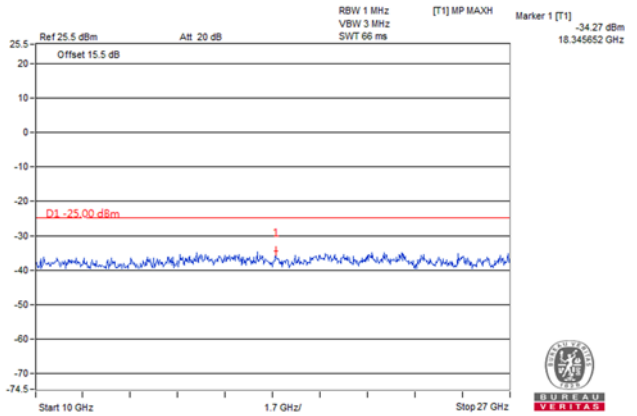
Channel 37901 (2585.10MHz) (1 RB / 0 RB Offset) + Channel 38099 (2604.90MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

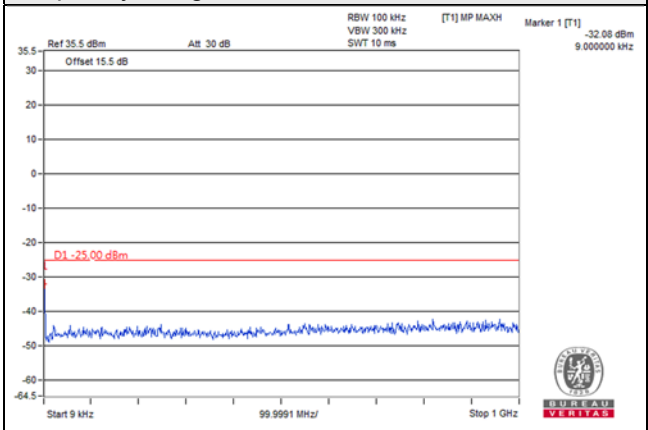
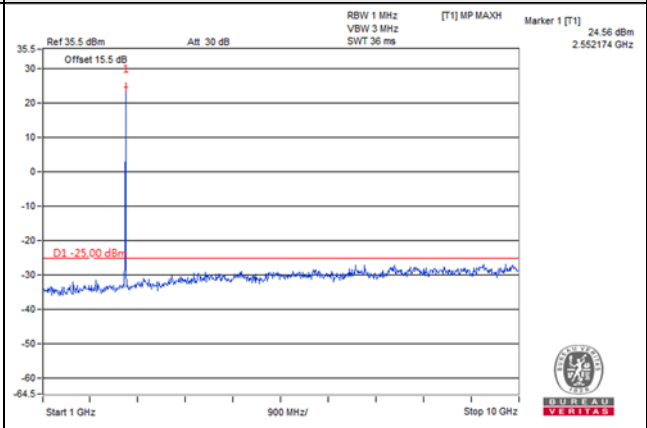
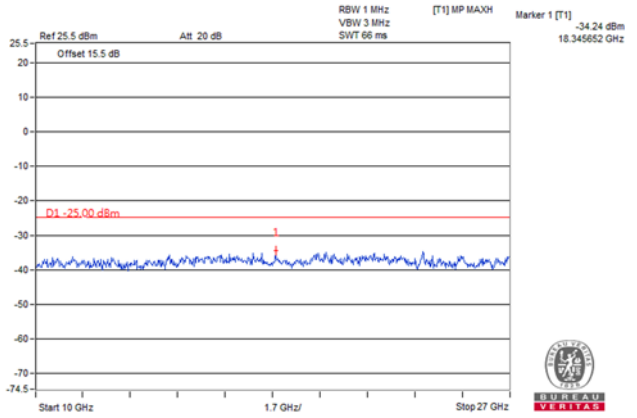
Channel 37901 (2585.10MHz) (1 RB / 99 RB Offset) + Channel 38099 (2604.90MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

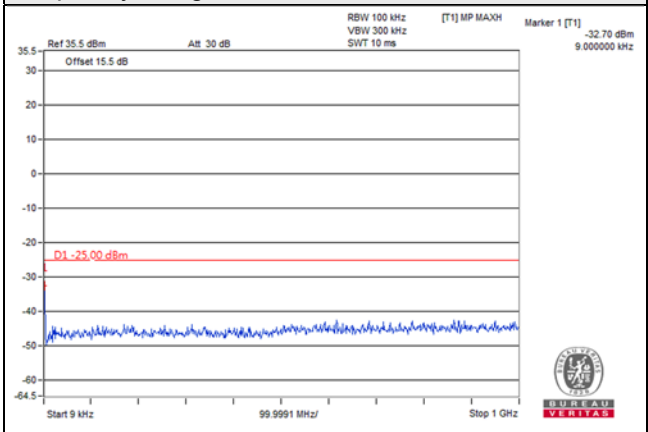
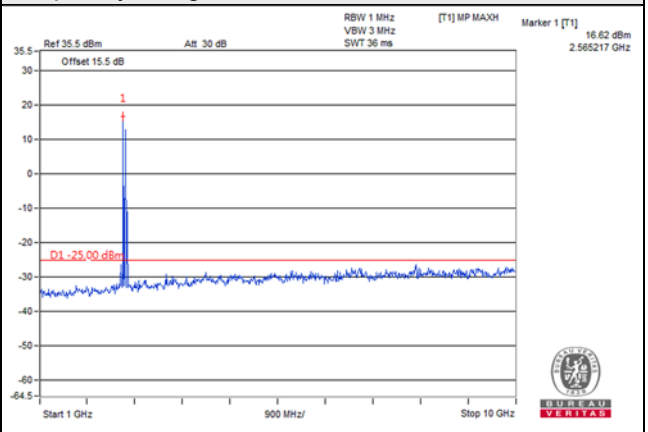
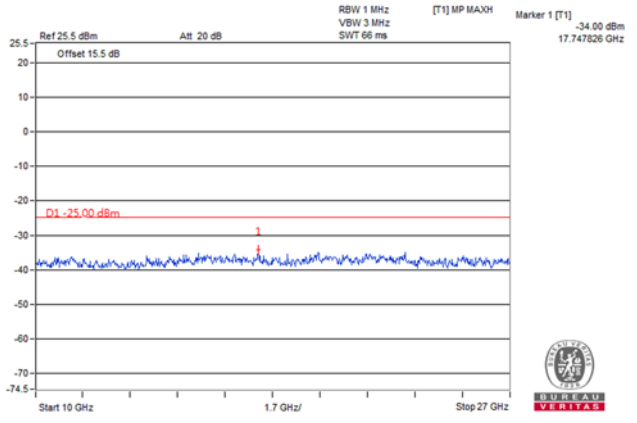
Channel 37952 (2590.20MHz) (1 RB / 0 RB Offset) + Channel 38150 (2610.00MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

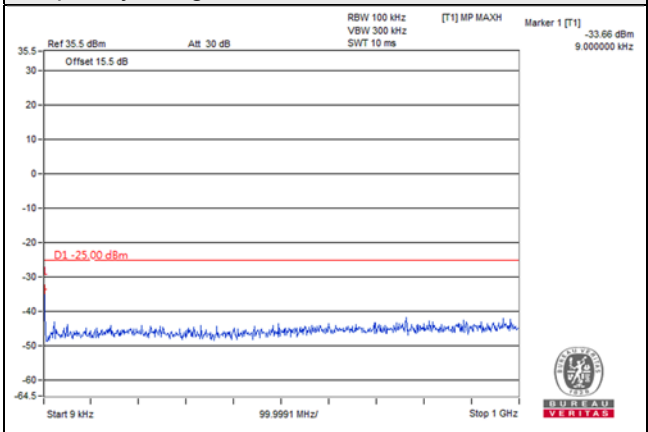
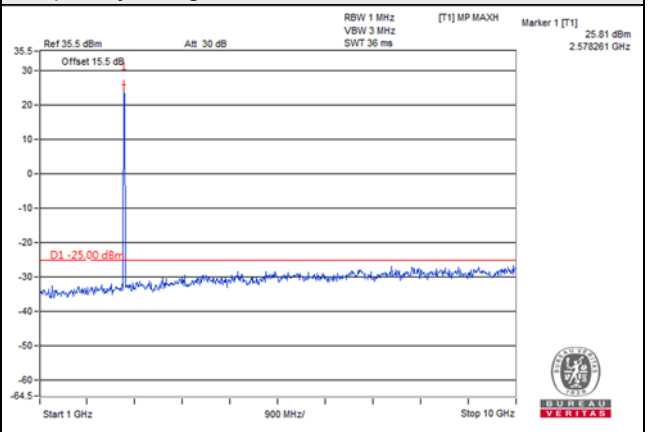
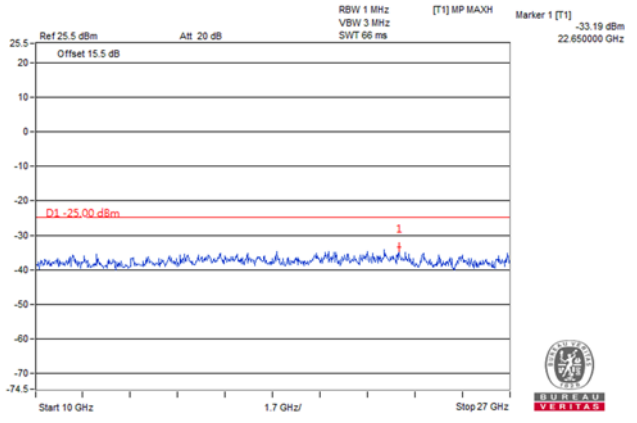
Channel 37952 (2590.20MHz) (1 RB / 99 RB Offset) + Channel 38150 (2610.00MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~26.5GHz	
	

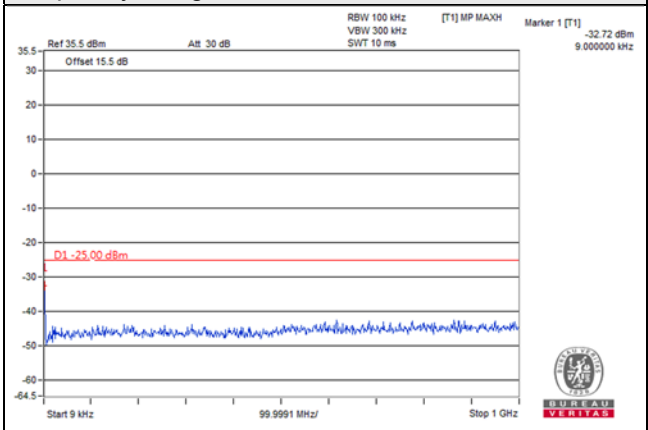
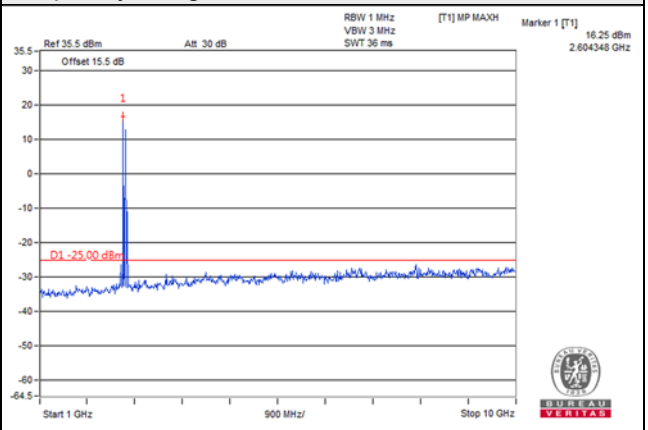
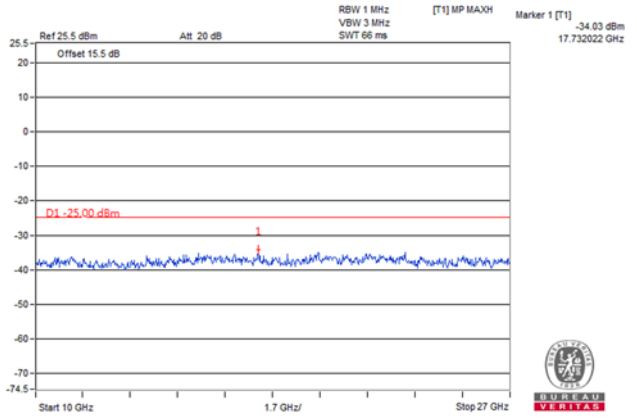
LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

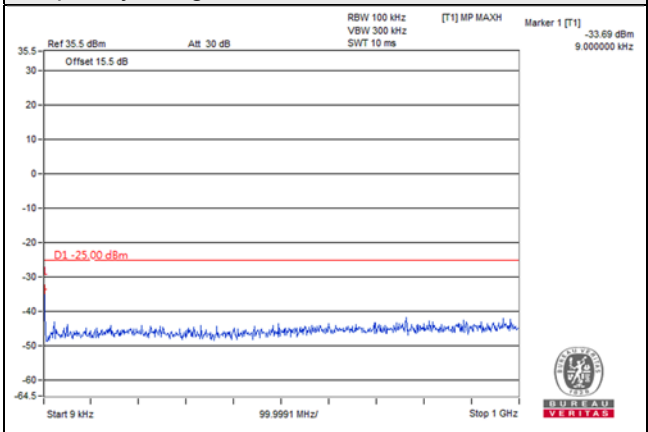
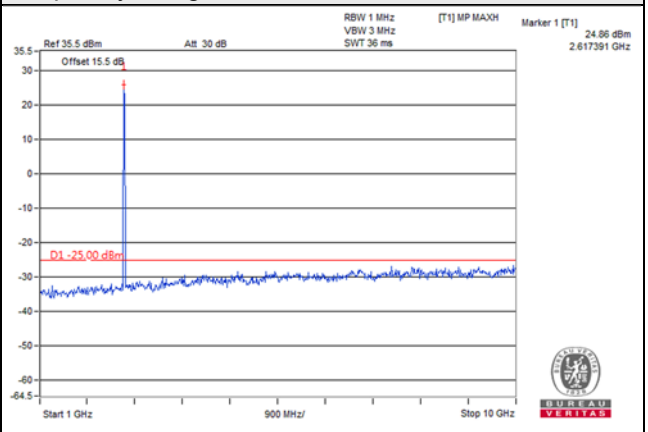
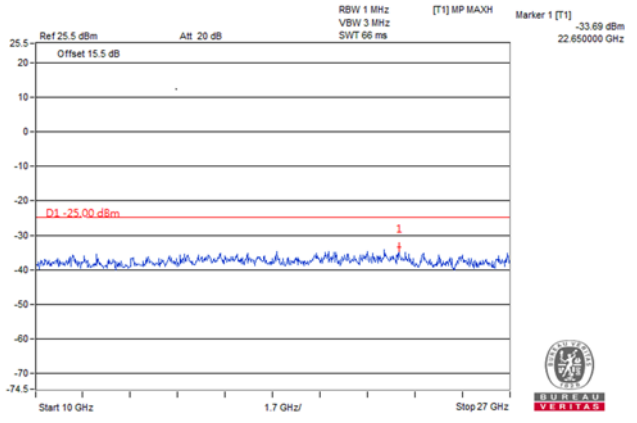
Channel 40140 (2545.00MHz) (1 RB / 0 RB Offset) + Channel 40338 (2564.80MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

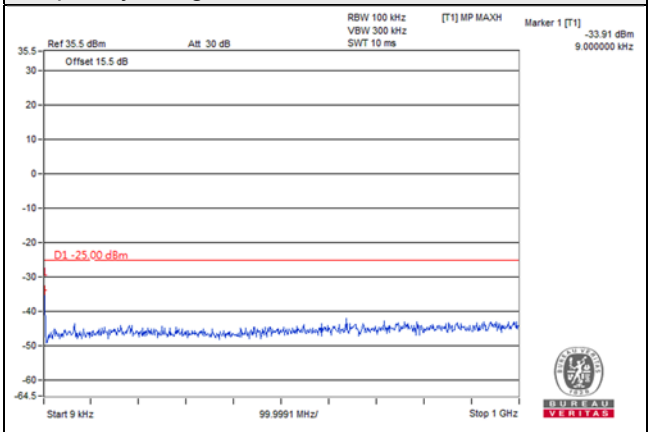
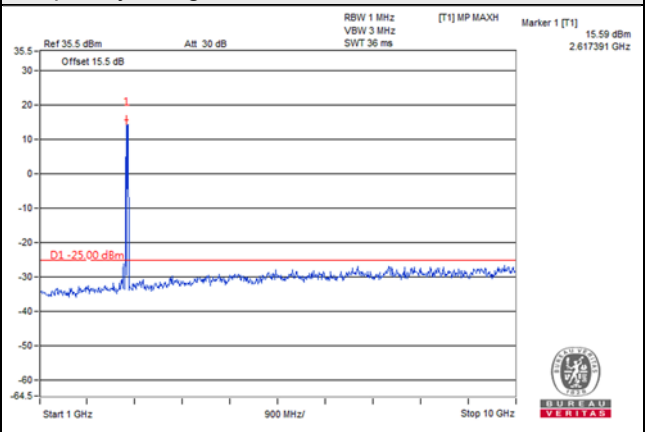
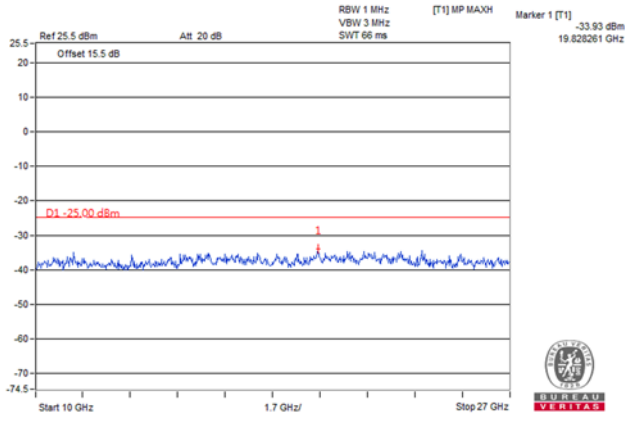
Channel 40140 (2545.00MHz) (1 RB / 99 RB Offset) + Channel 40338 (2564.80MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

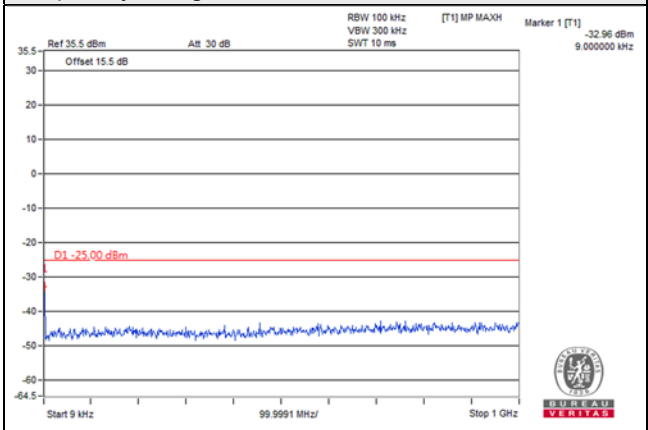
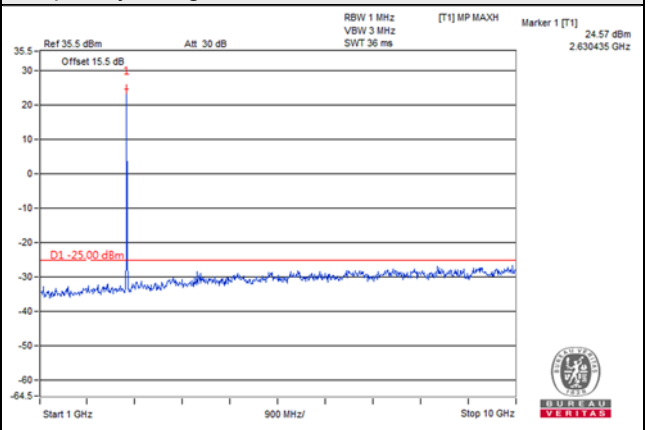
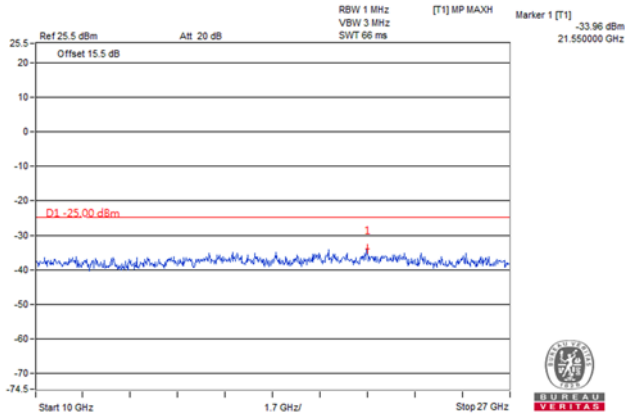
Channel 40470 (2578.00MHz) (1 RB / 0 RB Offset) + Channel 40668 (2597.80MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

Channel 40470 (2578.00MHz) (1 RB / 99 RB Offset) + Channel 40668 (2597.80MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

Channel 40810 (2612.00MHz) (1 RB / 0 RB Offset) + Channel 41008 (2631.80MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

Channel 40810 (2612.00MHz) (1 RB / 99 RB Offset) + Channel 41008 (2631.80MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

Channel 40942 (2625.20MHz) (1 RB / 0 RB Offset) + Channel 41140 (2645.00MHz) (1 RB / 99 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

Channel 40942 (2625.20MHz) (1 RB / 99 RB Offset) + Channel 41140 (2645.00MHz) (1 RB / 0 RB Offset)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~10GHz
	
Frequency Range : 10GHz~27GHz	
	

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

In the FCC 27.53(m) (4)(6),On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB. The emission limit equal to –25dBm.

4.8.2 Test Procedure

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

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

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

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

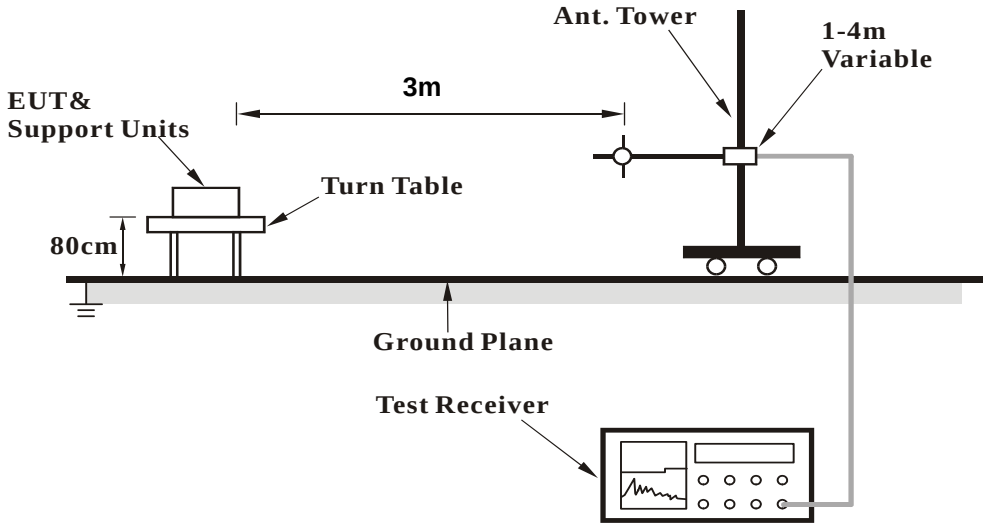
Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.8.3 Deviation from Test Standard

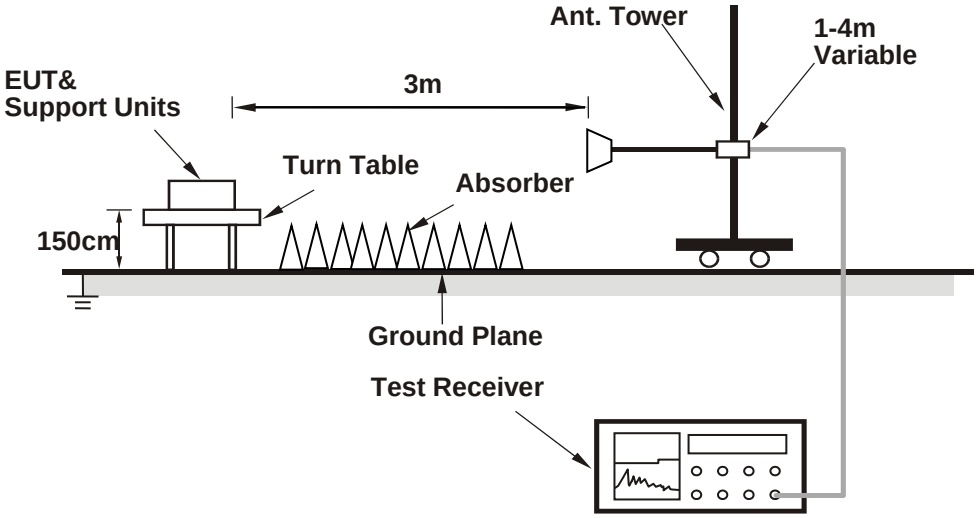
No deviation.

4.8.4 Test Setup

For Radiated Emission below or equal 1GHz



For Radiated Emission above 1GHz



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

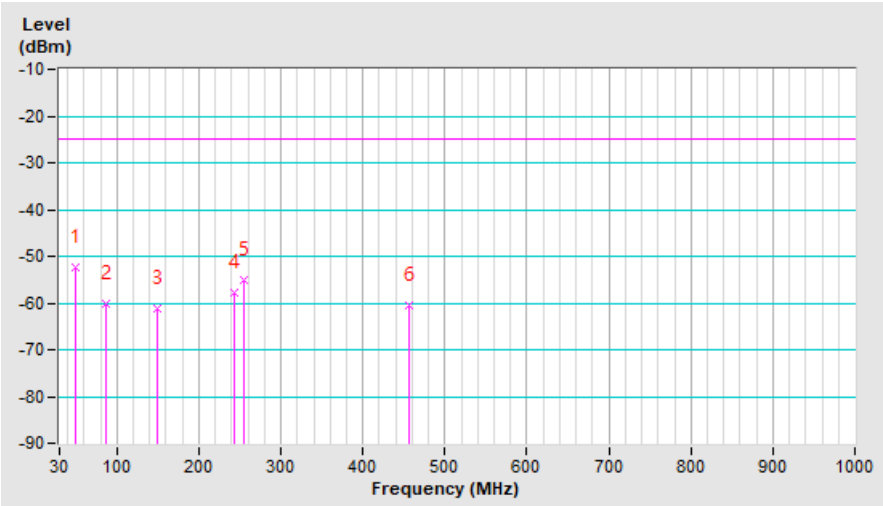
4.8.5 Test Results

Below 1GHz
LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Mode	TX channel 20850 (1 RB / 0 RB Offset) + TX channel 21048 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-52.50	-43.00	-9.30	-52.30	-25.00	-27.30
2	86.26	-53.40	-60.20	0.10	-60.10	-25.00	-35.10
3	148.34	-56.90	-60.90	-0.20	-61.10	-25.00	-36.10
4	243.40	-49.70	-63.40	5.50	-57.90	-25.00	-32.90
5	255.04	-49.20	-60.40	5.30	-55.10	-25.00	-30.10
6	456.80	-59.50	-65.60	5.00	-60.60	-25.00	-35.60

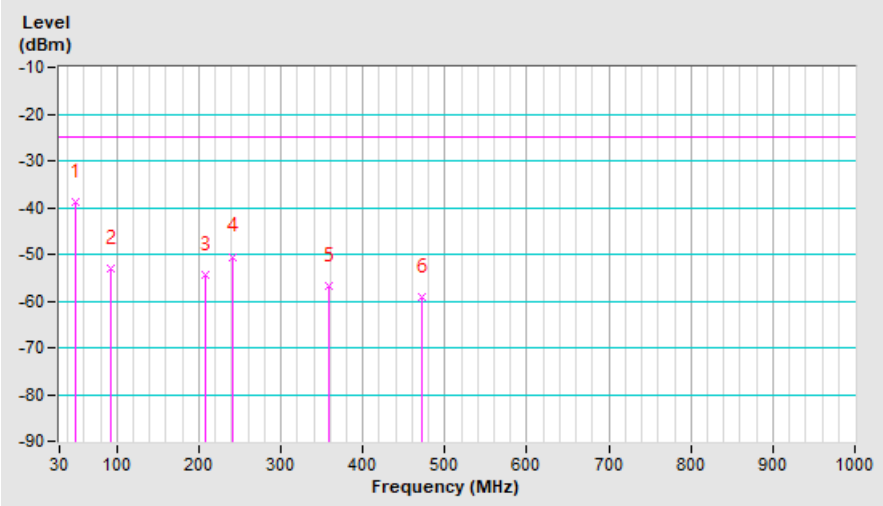
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Mode	TX channel 20850 (1 RB / 0 RB Offset) + TX channel 21048 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**49.40**	**-32.50**	**-29.40**	**-9.30**	**-38.70**	**-25.00**	**-13.70**
2	92.08	-47.80	-54.20	1.10	-53.10	-25.00	-28.10
3	208.48	-53.10	-59.80	5.40	-54.40	-25.00	-29.40
4	241.46	-50.30	-56.00	5.50	-50.50	-25.00	-25.50
5	357.86	-55.40	-61.90	5.20	-56.70	-25.00	-31.70
6	472.32	-58.40	-64.10	5.00	-59.10	-25.00	-34.10

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

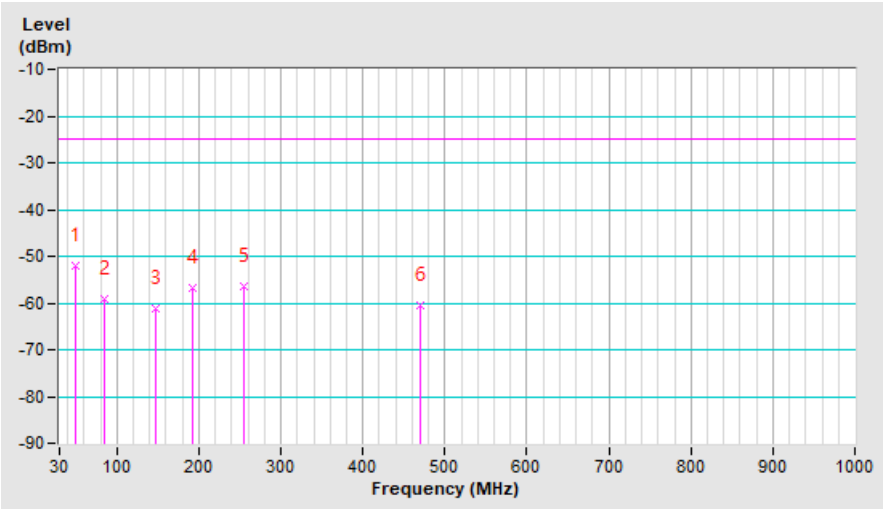


LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Mode	TX channel 37850 (1 RB / 0 RB Offset) + TX channel 38048 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-52.40	-42.90	-9.30	-52.20	-25.00	-27.20
2	84.32	-52.70	-58.60	-0.50	-59.10	-25.00	-34.10
3	146.40	-56.70	-60.90	-0.20	-61.10	-25.00	-36.10
4	192.96	-47.80	-61.40	4.60	-56.80	-25.00	-31.80
5	255.04	-50.40	-61.60	5.30	-56.30	-25.00	-31.30
6	470.38	-59.60	-65.60	5.00	-60.60	-25.00	-35.60

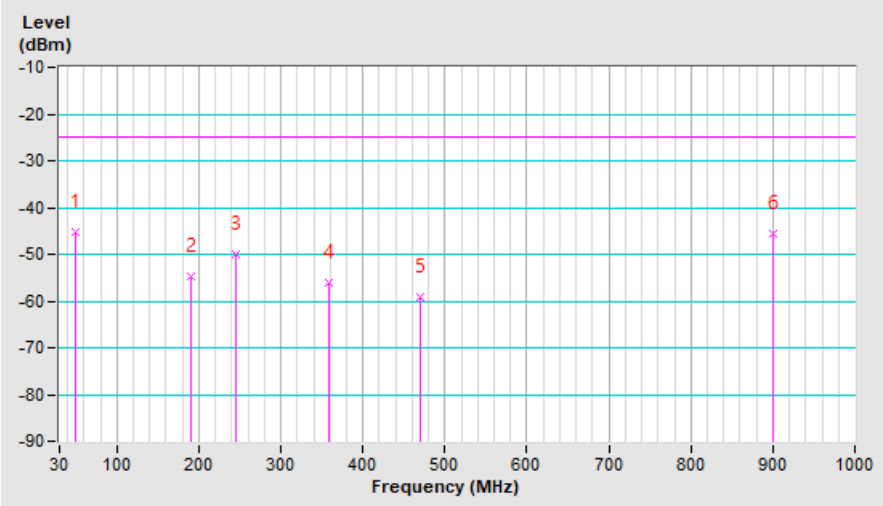
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Mode	TX channel 37850 (1 RB / 0 RB Offset) + TX channel 38048 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-39.10	-36.00	-9.30	-45.30	-25.00	-20.30
2	191.02	-51.30	-58.90	4.30	-54.60	-25.00	-29.60
3	245.34	-49.80	-55.50	5.40	-50.10	-25.00	-25.10
4	357.86	-54.90	-61.40	5.20	-56.20	-25.00	-31.20
5	470.38	-58.60	-64.20	5.00	-59.20	-25.00	-34.20
6	901.06	-52.90	-49.60	3.90	-45.70	-25.00	-20.70

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

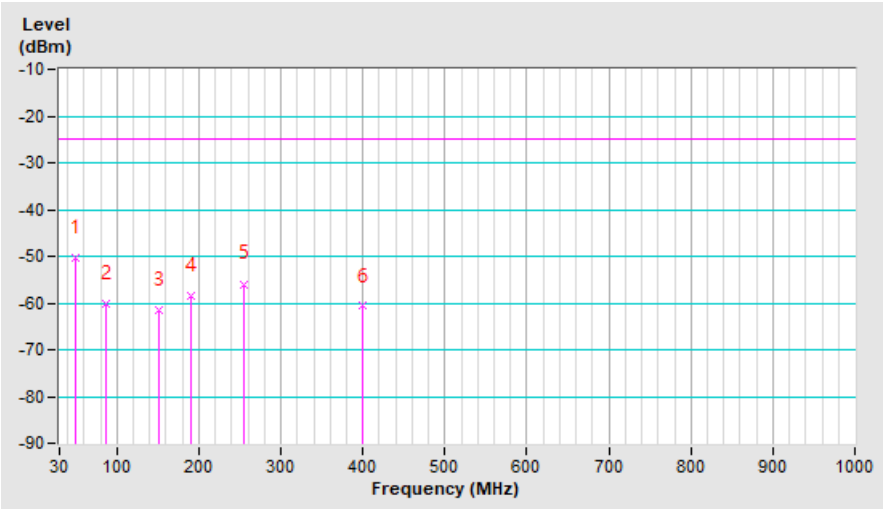


LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Mode	TX channel 40140 (1 RB / 0 RB Offset) + TX channel 40338 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-50.40	-40.90	-9.30	-50.20	-25.00	-25.20
2	86.26	-53.50	-60.30	0.10	-60.20	-25.00	-35.20
3	150.28	-56.80	-61.40	-0.10	-61.50	-25.00	-36.50
4	191.02	-49.70	-62.80	4.30	-58.50	-25.00	-33.50
5	255.04	-50.00	-61.20	5.30	-55.90	-25.00	-30.90
6	400.54	-59.30	-65.90	5.20	-60.70	-25.00	-35.70

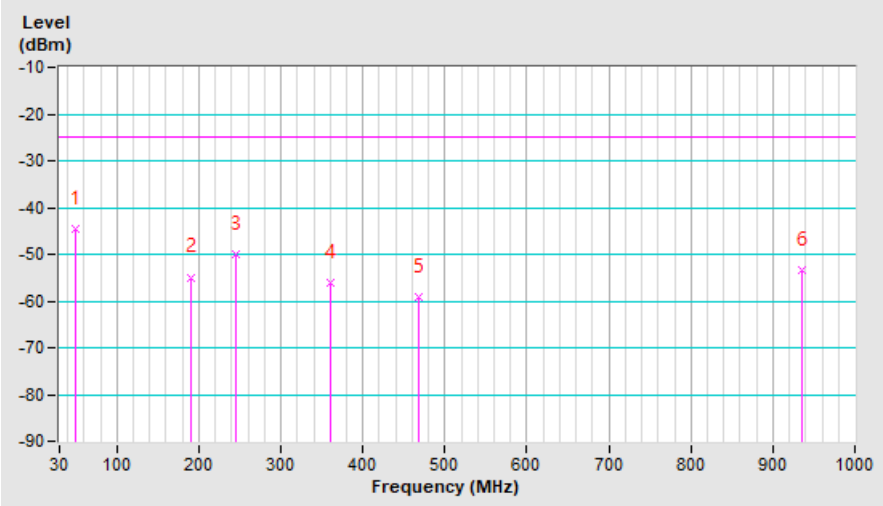
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Mode	TX channel 40140 (1 RB / 0 RB Offset) + TX channel 40338 (1 RB / 99 RB Offset)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	49.40	-38.50	-35.40	-9.30	-44.70	-25.00	-19.70
2	191.02	-51.60	-59.20	4.30	-54.90	-25.00	-29.90
3	245.34	-49.80	-55.50	5.40	-50.10	-25.00	-25.10
4	359.80	-54.90	-61.30	5.20	-56.10	-25.00	-31.10
5	468.44	-58.30	-64.10	5.00	-59.10	-25.00	-34.10
6	935.98	-62.10	-57.30	3.90	-53.40	-25.00	-28.40

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



Above 1GHz
LTE Band 7, Channel Bandwidth: 20MHz + LTE Band 7, Channel Bandwidth: 20MHz

Mode	TX channel 20850 (1 RB / 0 RB Offset) + TX channel 21048 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5020.00	-65.90	-55.20	6.60	-48.60	-25.00	-23.60
2	5059.60	-66.50	-55.30	6.60	-48.70	-25.00	-23.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5020.00	-66.10	-55.40	6.60	-48.80	-25.00	-23.80
2	5059.60	-65.70	-54.90	6.60	-48.30	-25.00	-23.30

Mode	TX channel 20850 (1 RB / 99 RB Offset) + TX channel 21048 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5020.00	-66.30	-55.60	6.60	-49.00	-25.00	-24.00
2	5059.60	-65.90	-54.70	6.60	-48.10	-25.00	-23.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5020.00	-66.70	-56.00	6.60	-49.40	-25.00	-24.40
2	5059.60	-65.80	-55.00	6.60	-48.40	-25.00	-23.40

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

Mode	TX channel 21001 (1 RB / 0 RB Offset) + TX channel 21199 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5050.20	-66.30	-55.20	6.60	-48.60	-25.00	-23.60
2	5089.80	-66.70	-55.10	6.60	-48.50	-25.00	-23.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5050.20	-66.70	-55.90	6.60	-49.30	-25.00	-24.30
2	5089.80	-66.10	-55.30	6.60	-48.70	-25.00	-23.70

Mode	TX channel 21001 (1 RB / 99 RB Offset) + TX channel 21199 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5050.20	-65.90	-54.80	6.60	-48.20	-25.00	-23.20
2	5089.80	-65.70	-54.10	6.60	-47.50	-25.00	-22.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5050.20	-66.50	-55.70	6.60	-49.10	-25.00	-24.10
2	5089.80	-66.20	-55.40	6.60	-48.80	-25.00	-23.80

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

Mode	TX channel 21152 (1 RB / 0 RB Offset) + TX channel 21350 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5080.40	-66.90	-55.40	6.60	-48.80	-25.00	-23.80
2	5120.00	-66.50	-54.70	6.60	-48.10	-25.00	-23.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5080.40	-66.60	-55.80	6.60	-49.20	-25.00	-24.20
2	5120.00	-66.00	-55.30	6.60	-48.70	-25.00	-23.70

Mode	TX channel 21152 (1 RB / 99 RB Offset) + TX channel 21350 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5080.40	-66.70	-55.20	6.60	-48.60	-25.00	-23.60
2	5120.00	-66.30	-54.50	6.60	-47.90	-25.00	-22.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5080.40	-66.30	-55.50	6.60	-48.90	-25.00	-23.90
2	5120.00	-65.70	-55.00	6.60	-48.40	-25.00	-23.40

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

LTE Band 38, Channel Bandwidth: 20MHz + LTE Band 38, Channel Bandwidth: 20MHz

Mode	TX channel 37850 (1 RB / 0 RB Offset) + TX channel 38048 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5160.00	-66.10	-54.20	6.70	-47.50	-25.00	-22.50
2	5199.60	-66.30	-54.20	6.70	-47.50	-25.00	-22.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5160.00	-66.50	-56.10	6.70	-49.40	-25.00	-24.40
2	5199.60	-65.90	-55.80	6.70	-49.10	-25.00	-24.10

Mode	TX channel 37850 (1 RB / 99 RB Offset) + TX channel 38048 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5160.00	-66.40	-54.50	6.70	-47.80	-25.00	-22.80
2	5199.60	-66.00	-53.90	6.70	-47.20	-25.00	-22.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5160.00	-66.20	-55.80	6.70	-49.10	-25.00	-24.10
2	5199.60	-65.70	-55.60	6.70	-48.90	-25.00	-23.90

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

Mode	TX channel 37901 (1 RB / 0 RB Offset) + TX channel 38099 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5170.20	-66.20	-54.30	6.70	-47.60	-25.00	-22.60
2	5209.80	-65.90	-53.90	6.70	-47.20	-25.00	-22.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5170.20	-66.30	-56.00	6.70	-49.30	-25.00	-24.30
2	5209.80	-65.60	-55.40	6.70	-48.70	-25.00	-23.70

Mode	TX channel 37901 (1 RB / 99 RB Offset) + TX channel 38099 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5170.20	-65.80	-53.90	6.70	-47.20	-25.00	-22.20
2	5209.80	-66.10	-54.10	6.70	-47.40	-25.00	-22.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5170.20	-65.80	-55.50	6.70	-48.80	-25.00	-23.80
2	5209.80	-66.20	-56.00	6.70	-49.30	-25.00	-24.30

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

Mode	TX channel 37952 (1 RB / 0 RB Offset) + TX channel 38150 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5180.40	-66.70	-54.70	6.70	-48.00	-25.00	-23.00
2	5220.00	-65.90	-54.00	6.70	-47.30	-25.00	-22.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5180.40	-65.70	-55.50	6.70	-48.80	-25.00	-23.80
2	5220.00	-65.90	-55.50	6.70	-48.80	-25.00	-23.80

Mode	TX channel 37952 (1 RB / 99 RB Offset) + TX channel 38150 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5180.40	-66.20	-54.20	6.70	-47.50	-25.00	-22.50
2	5220.00	-65.80	-53.90	6.70	-47.20	-25.00	-22.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5180.40	-66.20	-56.00	6.70	-49.30	-25.00	-24.30
2	5220.00	-65.90	-55.50	6.70	-48.80	-25.00	-23.80

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

LTE Band 41, Channel Bandwidth: 20MHz + LTE Band 41, Channel Bandwidth: 20MHz

Mode	TX channel 40140 (1 RB / 0 RB Offset) + TX channel 40338 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5090.00	-66.10	-54.50	6.60	-47.90	-25.00	-22.90
2	5129.60	-65.80	-53.90	6.60	-47.30	-25.00	-22.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5090.00	-66.20	-55.40	6.60	-48.80	-25.00	-23.80
2	5129.60	-65.70	-55.00	6.60	-48.40	-25.00	-23.40

Mode	TX channel 40140 (1 RB / 99 RB Offset) + TX channel 40338 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5090.00	-65.70	-54.10	6.60	-47.50	-25.00	-22.50
2	5129.60	-65.30	-53.40	6.60	-46.80	-25.00	-21.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5090.00	-66.20	-55.40	6.60	-48.80	-25.00	-23.80
2	5129.60	-65.70	-55.00	6.60	-48.40	-25.00	-23.40

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

Mode	TX channel 40470 (1 RB / 0 RB Offset) + TX channel 40668 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5156.00	-66.80	-54.90	6.70	-48.20	-25.00	-23.20
2	5195.60	-65.90	-53.90	6.70	-47.20	-25.00	-22.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5156.00	-66.10	-55.70	6.70	-49.00	-25.00	-24.00
2	5195.60	-65.80	-55.70	6.70	-49.00	-25.00	-24.00

Mode	TX channel 40470 (1 RB / 99 RB Offset) + TX channel 40668 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5156.00	-66.20	-54.30	6.70	-47.60	-25.00	-22.60
2	5195.60	-65.80	-53.80	6.70	-47.10	-25.00	-22.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5156.00	-65.90	-55.50	6.70	-48.80	-25.00	-23.80
2	5195.60	-66.30	-56.20	6.70	-49.50	-25.00	-24.50

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

Mode	TX channel 40810 (1 RB / 0 RB Offset) + TX channel 41008 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5224.00	-66.80	-54.90	6.70	-48.20	-25.00	-23.20
2	5263.60	-66.10	-54.50	6.70	-47.80	-25.00	-22.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5224.00	-65.70	-55.30	6.70	-48.60	-25.00	-23.60
2	5263.60	-66.00	-55.10	6.70	-48.40	-25.00	-23.40

Mode	TX channel 40810 (1 RB / 99 RB Offset) + TX channel 41008 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5224.00	-65.90	-54.00	6.70	-47.30	-25.00	-22.30
2	5263.60	-66.50	-54.90	6.70	-48.20	-25.00	-23.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5224.00	-66.20	-55.80	6.70	-49.10	-25.00	-24.10
2	5263.60	-65.70	-54.80	6.70	-48.10	-25.00	-23.10

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

Mode	TX channel 40942 (1 RB / 0 RB Offset) + TX channel 41140 (1 RB / 99 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5250.40	-66.30	-54.60	6.70	-47.90	-25.00	-22.90
2	5290.00	-66.60	-55.20	6.70	-48.50	-25.00	-23.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5250.40	-66.10	-55.40	6.70	-48.70	-25.00	-23.70
2	5290.00	-65.80	-54.60	6.70	-47.90	-25.00	-22.90

Mode	TX channel 40942 (1 RB / 99 RB Offset) + TX channel 41140 (1 RB / 0 RB Offset)	Frequency Range	1GHz ~ 27GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5250.40	-65.60	-53.90	6.70	-47.20	-25.00	-22.20
2	5290.00	-65.30	-53.90	6.70	-47.20	-25.00	-22.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	5250.40	-66.30	-55.60	6.70	-48.90	-25.00	-23.90
2	5290.00	-65.80	-54.60	6.70	-47.90	-25.00	-22.90

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

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 and approved according to ISO/IEC 17025.

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

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