FCC Test Report

(PART 27)

Report No.:	RF170726C31-2
FCC ID:	MSQZ01KDA
Test Model:	ASUS_Z01KDA / ASUS_Z01KS
Received Date:	Jul. 26, 2017
Test Date:	Aug. 17, 2017 ~ Aug. 27, 2017
Issued Date:	Oct. 12, 2017
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 (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Test Location (2):	No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C

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Release Control Record

Issue No.	Description	Date Issued
RF170726C31-2	Original Release	Oct. 12, 2017

1 Certificate of Conformity

Product:	ASUS Phone
Brand:	ASUS
Test Model:	ASUS_Z01KDA / ASUS_Z01KS
Sample Status:	Production Unit
Applicant:	ASUSTek COMPUTER INC.
Test Date:	Aug. 17, 2017 ~ Aug. 27, 2017
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 EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Oct. 12, 2017

Ivonne Wu / Supervisor

Approved by : _____ , **Date:** Oct. 12, 2017

David Huang / 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)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
--	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53(l)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(m)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(m)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -12.33 dB at 7605.00 MHz.

2.1 Measurement Uncertainty

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

Measurement	**Frequency**	**Expended Uncertainty (k=2) (±)**
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 16, 2016	Dec. 15, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 29, 2016	Dec. 28, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 27, 2016	Dec. 26, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 13, 2016	Dec. 12, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2017	Apr. 16, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 19, 2016	Oct. 18, 2017
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 23, 2017	Jun. 22, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Nov. 30, 2016	Nov. 29, 2017

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Designation Number is TW0011. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	ASUS Phone	
Brand	ASUS	
Test Model	ASUS_Z01KDA / ASUS_Z01KS	
SKU	Operator-3CA	
Status of EUT	Production Unit	
Power Supply Rating	5 Vdc or 9 Vdc (adapter) 3.85 Vdc (Li-ion battery)	
Modulation Type	QPSK, 16QAM	
Frequency Range	LTE Band 7 (Channel Bandwidth: 5 MHz)	2502.5 ~ 2567.5 MHz
	LTE Band 7 (Channel Bandwidth: 10 MHz)	2505 ~ 2565 MHz
	LTE Band 7 (Channel Bandwidth: 15 MHz)	2507.5 ~ 2562.5 MHz
	LTE Band 7 (Channel Bandwidth: 20 MHz)	2510 ~ 2560 MHz
	LTE Band 41 (Channel Bandwidth: 5 MHz)	2547.5 ~ 2652.5 MHz
	LTE Band 41 (Channel Bandwidth: 10 MHz)	2550.5 ~ 2650.0 MHz
	LTE Band 41 (Channel Bandwidth: 15 MHz)	2552.5 ~ 2647.5 MHz
	LTE Band 41 (Channel Bandwidth: 20 MHz)	2555.0 ~ 2645.0 MHz
Max. EIRP Power	LTE Band 7 (Channel Bandwidth: 5 MHz)	286.95 mW
	LTE Band 7 (Channel Bandwidth: 10 MHz)	287.14 mW
	LTE Band 7 (Channel Bandwidth: 15 MHz)	290.20 mW
	LTE Band 7 (Channel Bandwidth: 20 MHz)	288.20 mW
	LTE Band 41 (Channel Bandwidth: 5 MHz)	226.36 mW
	LTE Band 41 (Channel Bandwidth: 10 MHz)	229.46 mW
	LTE Band 41 (Channel Bandwidth: 15 MHz)	228.93 mW
	LTE Band 41 (Channel Bandwidth: 20 MHz)	226.83 mW
Emission Designator	LTE Band 7 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 7 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 7 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 7 (Channel Bandwidth: 20 MHz)	18M0W7D
	LTE Band 41 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 41 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 41 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 41 (Channel Bandwidth: 20 MHz)	17M9G7D
Antenna Type	Fixed Internal Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. All models are listed as below.

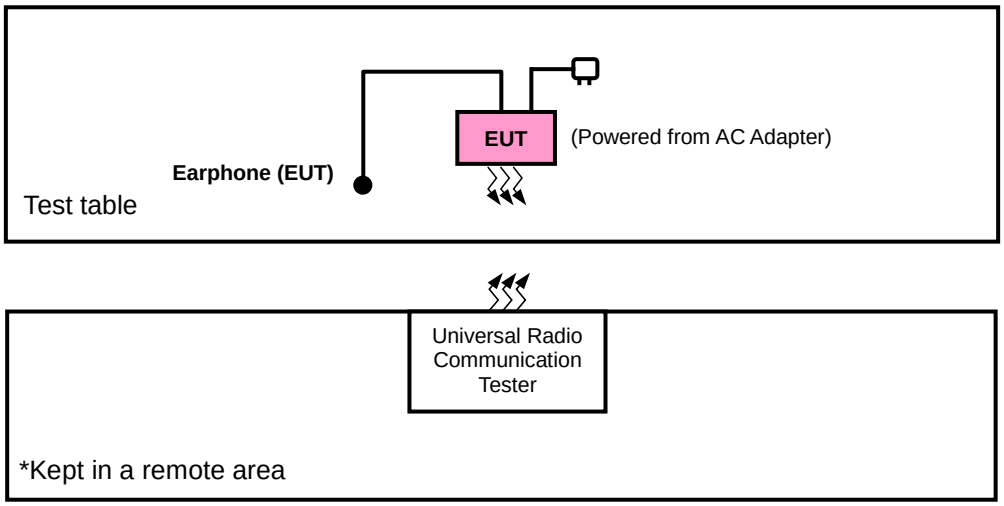
Brand	Model	Difference
ASUS	ASUS_Z01KDA	Dual SIM
	ASUS_Z01KS	Single SIM

* Since the difference doesn't affect the test result, only ASUS_Z01KDA was chosen for the final test.

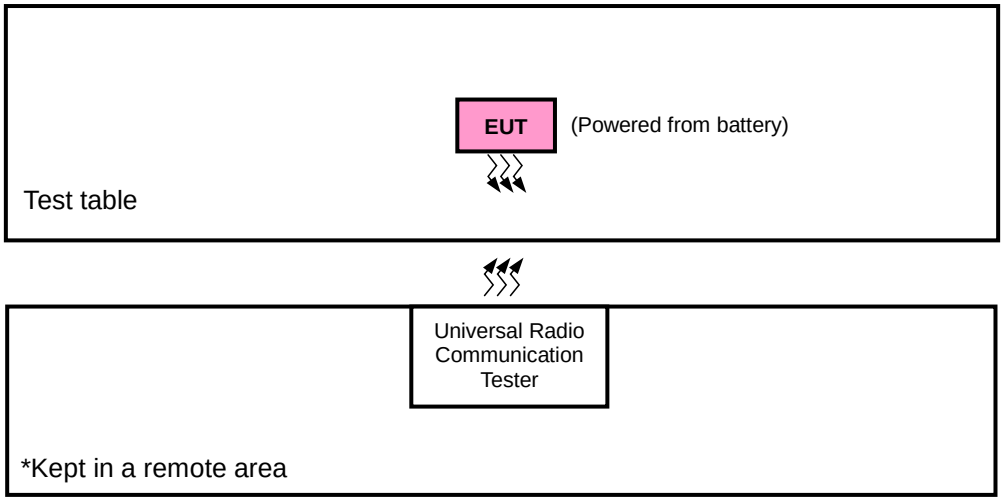
2. The EUT's accessories list refers to Ext. Pho.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.I.R.P. 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.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports.
The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	EIRP	Radiated Emission
LTE Band 7	Z-plane	Y-axis
LTE Band 41	X-plane	Y-axis

LTE Band 7

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	20775 to 21425	20775, 21425	5 MHz	QPSK	1 RB / 0 RB Offset
		20800 to 21400	20800, 21400	10 MHz	QPSK	1 RB / 0 RB Offset
		20825 to 21375	20825, 21375	15 MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	20850, 21350	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Band Edge	20775 to 21425	20775, 21425	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21400	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21375	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21350	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Conducted Emission	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	20850 to 21350	20850, 21100 21350	20 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 41

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	40165 to 41215	40165, 40690, 41215	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40190 to 41190	41090, 40690, 41190	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40215 to 41165	40215, 40690, 41165	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40240 to 41140	40240, 40690, 41140	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	40165 to 41215	40165, 41215	5 MHz	QPSK	1 RB / 0 RB Offset
		40190 to 41190	41090, 41190	10 MHz	QPSK	1 RB / 0 RB Offset
		40215 to 41165	40215, 41165	15 MHz	QPSK	1 RB / 0 RB Offset
		40240 to 41140	40240, 41140	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	40165 to 41215	40165, 40690, 41215	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		40190 to 41190	41090, 40690, 41190	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		40215 to 41165	40215, 40690, 41165	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		40240 to 41140	40240, 40690, 41140	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	40165 to 41215	40165, 40690, 41215	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40190 to 41190	41090, 40690, 41190	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40215 to 41165	40215, 40690, 41165	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		40240 to 41140	40240, 40690, 41140	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Band Edge	40165 to 41215	40165, 41215	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		40190 to 41190	41090, 41190	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		40215 to 41165	40215, 41165	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		40240 to 41140	40240, 41140	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Conducted Emission	40165 to 41215	40165, 40690, 41215	5 MHz	QPSK	1 RB / 0 RB Offset
		40190 to 41190	41090, 40690, 41190	10 MHz	QPSK	1 RB / 0 RB Offset
		40215 to 41165	40215, 40690, 41165	15 MHz	QPSK	1 RB / 0 RB Offset
		40240 to 41140	40240, 40690, 41140	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	40240 to 41140	40240, 40690, 41140	20 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25 deg. C, 65 % RH	3.85 Vdc	Karl Lee
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Condcudeted Emission	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee & Charles Hsiao

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2
FCC 47 CFR Part 27
KDB 971168 D01 Power Meas License Digital Systems v02r02
ANSI/TIA/EIA-603-D 2010

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

4.1.2 Test Procedures

EIRP Measurement:

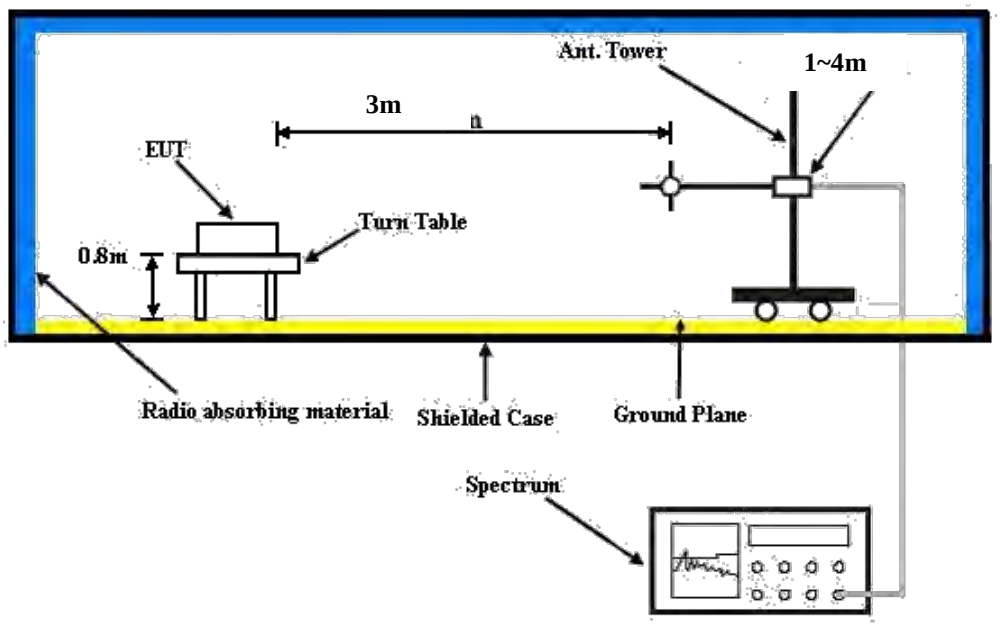
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
c. 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.

Conducted Power Measurement:

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

4.1.3 Test Setup

EIRP / ERP Measurement:



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20775	Mid Ch 21100	High Ch 21425		Low Ch 20775	Mid Ch 21100	High Ch 21425	
			2502.5 MHz	2535.0 MHz	2567.5 MHz		2502.5 MHz	2535.0 MHz	2567.5 MHz	
7 / 5M	1	0	22.26	22.28	22.37	0	21.18	21.20	21.29	1
	1	12	22.59	22.61	22.70	0	21.51	21.53	21.62	1
	1	24	22.56	22.58	22.67	0	21.48	21.50	21.59	1
	12	0	21.54	21.56	21.65	1	20.46	20.48	20.57	2
	12	6	21.65	21.67	21.76	1	20.57	20.59	20.68	2
	12	13	21.61	21.63	21.72	1	20.53	20.55	20.64	2
	25	0	21.59	21.61	21.70	1	20.51	20.53	20.62	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20800	Mid Ch 21100	High Ch 21400		Low Ch 20800	Mid Ch 21100	High Ch 21400	
			2505.0 MHz	2535.0 MHz	2565.0 MHz		2505.0 MHz	2535.0 MHz	2565.0 MHz	
7 / 10M	1	0	22.33	22.35	22.44	0	21.25	21.27	21.36	1
	1	24	22.66	22.68	22.77	0	21.58	21.60	21.69	1
	1	49	22.63	22.65	22.74	0	21.55	21.57	21.66	1
	25	0	21.61	21.63	21.72	1	20.53	20.55	20.64	2
	25	12	21.72	21.74	21.83	1	20.64	20.66	20.75	2
	25	25	21.68	21.70	21.79	1	20.60	20.62	20.71	2
	50	0	21.66	21.68	21.77	1	20.58	20.60	20.69	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20825	Mid Ch 21100	High Ch 21375		Low Ch 20825	Mid Ch 21100	High Ch 21375	
			2507.5 MHz	2535.0 MHz	2562.5 MHz		2507.5 MHz	2535.0 MHz	2562.5 MHz	
7 / 15M	1	0	22.41	22.43	22.52	0	21.33	21.35	21.44	1
	1	37	22.74	22.76	22.85	0	21.66	21.68	21.77	1
	1	74	22.71	22.73	22.82	0	21.63	21.65	21.74	1
	36	0	21.69	21.71	21.80	1	20.61	20.63	20.72	2
	36	19	21.80	21.82	21.91	1	20.72	20.74	20.83	2
	36	39	21.76	21.78	21.87	1	20.68	20.70	20.79	2
	75	0	21.74	21.76	21.85	1	20.66	20.68	20.77	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20850	Mid Ch 21100	High Ch 21350		Low Ch 20850	Mid Ch 21100	High Ch 21350	
			2510.0 MHz	2535.0 MHz	2560.0 MHz		2510.0 MHz	2535.0 MHz	2560.0 MHz	
7 / 20M	1	0	22.46	22.48	22.57	0	21.38	21.40	21.49	1
	1	50	22.79	22.81	22.90	0	21.71	21.73	21.82	1
	1	99	22.76	22.78	22.87	0	21.68	21.70	21.79	1
	50	0	21.74	21.76	21.85	1	20.66	20.68	20.77	2
	50	25	21.85	21.87	21.96	1	20.77	20.79	20.88	2
	50	50	21.81	21.83	21.92	1	20.73	20.75	20.84	2
	100	0	21.79	21.81	21.90	1	20.71	20.73	20.82	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 40165	Mid Ch 40690	High Ch 41215		Low Ch 40165	Mid Ch 40690	High Ch 41215	
			2547.5 MHz	2600.0 MHz	2652.5 MHz		2547.5 MHz	2600.0 MHz	2652.5 MHz	
41 / 5M	1	0	23.46	23.37	23.18	0	22.42	22.33	22.14	1
	1	12	23.67	23.58	23.39	0	22.63	22.54	22.35	1
	1	24	23.59	23.50	23.31	0	22.55	22.46	22.27	1
	12	0	22.49	22.40	22.21	1	21.45	21.36	21.17	2
	12	6	22.59	22.47	22.28	1	21.55	21.43	21.24	2
	12	13	22.56	22.50	22.31	1	21.52	21.46	21.27	2
	25	0	22.47	22.38	22.19	1	21.43	21.34	21.15	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 40190	Mid Ch 40690	High Ch 41190		Low Ch 40190	Mid Ch 40690	High Ch 41190	
			2550.0 MHz	2600.0 MHz	2650.0 MHz		2550.0 MHz	2600.0 MHz	2650.0 MHz	
41 / 10M	1	0	23.52	23.44	23.27	0	22.46	22.38	22.21	1
	1	24	23.73	23.65	23.48	0	22.67	22.59	22.42	1
	1	49	23.65	23.57	23.40	0	22.59	22.51	22.34	1
	25	0	22.55	22.47	22.30	1	21.49	21.41	21.24	2
	25	12	22.65	22.54	22.37	1	21.59	21.48	21.31	2
	25	25	22.62	22.57	22.40	1	21.56	21.51	21.34	2
	50	0	22.53	22.45	22.28	1	21.47	21.39	21.22	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 40215	Mid Ch 40690	High Ch 41165		Low Ch 40215	Mid Ch 40690	High Ch 41165	
			2552.5 MHz	2600.0 MHz	2647.5 MHz		2552.5 MHz	2600.0 MHz	2647.5 MHz	
41 / 15M	1	0	23.60	23.52	23.35	0	22.54	22.46	22.29	1
	1	37	23.81	23.73	23.56	0	22.75	22.67	22.50	1
	1	74	23.73	23.65	23.48	0	22.67	22.59	22.42	1
	36	0	22.63	22.55	22.38	1	21.57	21.49	21.32	2
	36	19	22.73	22.62	22.45	1	21.67	21.56	21.39	2
	36	39	22.70	22.65	22.48	1	21.63	21.59	21.42	2
	75	0	22.61	22.53	22.36	1	21.55	21.47	21.30	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 40240	Mid Ch 40620	High Ch 41140		Low Ch 40240	Mid Ch 40620	High Ch 41140	
			2555.0 MHz	2593.0 MHz	2645.0 MHz		2555.0 MHz	2593.0 MHz	2645.0 MHz	
41 / 20M	1	0	23.66	23.58	23.41	0	22.60	22.52	22.35	1
	1	50	23.87	23.79	23.62	0	22.81	22.73	22.56	1
	1	99	23.79	23.71	23.54	0	22.73	22.65	22.48	1
	50	0	22.69	22.61	22.44	1	21.63	21.55	21.38	2
	50	25	22.79	22.68	22.51	1	21.73	21.62	21.45	2
	50	50	22.76	22.71	22.54	1	21.70	21.65	21.48	2
	100	0	22.67	22.59	22.42	1	21.61	21.53	21.36	2

EIRP Power (dBm)

LTE Band 7							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	20775	2502.5	-19.66	44.24	24.58	286.95	H
	21100	2535.0	-19.70	44.20	24.50	281.64	
	21425	2567.5	-20.26	44.80	24.54	284.51	
	20775	2502.5	-23.66	44.19	20.53	113.01	V
	21100	2535.0	-23.57	44.09	20.52	112.67	
	21425	2567.5	-23.99	44.50	20.51	112.43	
Channel Bandwidth: 5 MHz / 16QAM							
Z	20775	2502.5	-20.62	44.24	23.62	230.04	H
	21100	2535.0	-20.68	44.20	23.52	224.75	
	21425	2567.5	-21.32	44.80	23.48	222.89	
	20775	2502.5	-24.68	44.19	19.51	89.35	V
	21100	2535.0	-24.61	44.09	19.48	88.67	
	21425	2567.5	-24.92	44.50	19.58	90.76	

LTE Band 7							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	20800	2505.0	-19.76	44.34	24.58	287.14	H
	21100	2535.0	-19.64	44.20	24.56	285.56	
	21400	2565.0	-20.16	44.72	24.56	285.96	
	20800	2505.0	-23.80	44.23	20.43	110.31	V
	21100	2535.0	-23.64	44.09	20.45	110.87	
	21400	2565.0	-23.89	44.41	20.52	112.62	
Channel Bandwidth: 10 MHz / 16QAM							
Z	20800	2505.0	-20.86	44.34	23.48	222.89	H
	21100	2535.0	-20.71	44.20	23.49	223.20	
	21400	2565.0	-21.26	44.72	23.46	221.97	
	20800	2505.0	-24.61	44.23	19.62	91.54	V
	21100	2535.0	-24.57	44.09	19.52	89.52	
	21400	2565.0	-24.86	44.41	19.55	90.07	

LTE Band 7							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	20825	2507.5	-19.78	44.32	24.54	284.32	H
	21100	2535.0	-19.57	44.20	24.63	290.20	
	21375	2562.5	-20.26	44.85	24.59	287.61	
	20825	2507.5	-23.54	43.99	20.45	110.97	V
	21100	2535.0	-23.58	44.09	20.51	112.41	
	21375	2562.5	-23.94	44.51	20.57	114.13	
Channel Bandwidth: 15 MHz / 16QAM							
Z	20825	2507.5	-20.74	44.32	23.58	227.93	H
	21100	2535.0	-20.63	44.20	23.57	227.35	
	21375	2562.5	-21.34	44.85	23.51	224.28	
	20825	2507.5	-24.46	43.99	19.53	89.78	V
	21100	2535.0	-24.56	44.09	19.53	89.70	
	21375	2562.5	-24.92	44.51	19.59	90.99	

LTE Band 7							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	20850.0	2510.0	-19.62	44.16	24.54	284.45	H
	21100.0	2535.0	-19.60	44.20	24.60	288.20	
	21350.0	2560.0	-20.27	44.81	24.54	284.25	
	20850.0	2510.0	-24.26	44.78	20.52	112.72	V
	21100.0	2535.0	-23.49	44.09	20.60	114.76	
	21350.0	2560.0	-24.21	44.72	20.51	112.46	
Channel Bandwidth: 20 MHz / 16QAM							
Z	20850.0	2510.0	-20.68	44.16	23.48	222.84	H
	21100.0	2535.0	-20.64	44.20	23.56	226.83	
	21350.0	2560.0	-21.24	44.81	23.57	227.35	
	20850.0	2510.0	-25.26	44.78	19.52	89.54	V
	21100.0	2535.0	-24.63	44.09	19.46	88.27	
	21350.0	2560.0	-25.21	44.72	19.51	89.33	

LTE Band 41							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	40165	2547.5	-20.69	44.24	23.55	226.36	H
	40690	2600.0	-20.67	44.20	23.53	225.27	
	41215	2652.5	-21.33	44.80	23.47	222.38	
	40165	2547.5	-23.63	44.19	20.56	113.79	V
	40690	2600.0	-23.60	44.09	20.49	111.89	
	41215	2652.5	-23.86	44.50	20.64	115.85	
Channel Bandwidth: 5 MHz / 16QAM							
X	40165	2547.5	-21.63	44.24	22.61	182.31	H
	40690	2600.0	-21.66	44.20	22.54	179.35	
	41215	2652.5	-22.30	44.80	22.50	177.87	
	40165	2547.5	-24.68	44.19	19.51	89.35	V
	40690	2600.0	-24.54	44.09	19.55	90.12	
	41215	2652.5	-24.93	44.50	19.57	90.55	

LTE Band 41							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	40190	2550.0	-20.90	44.34	23.44	220.85	H
	40690	2600.0	-20.59	44.20	23.61	229.46	
	41190	2650.0	-21.21	44.72	23.51	224.54	
	40190	2501.0	-23.69	44.23	20.54	113.14	V
	40690	2593.0	-23.54	44.09	20.55	113.45	
	41190	2685.0	-23.96	44.41	20.45	110.82	
Channel Bandwidth: 10 MHz / 16QAM							
X	40190	2550.0	-21.80	44.34	22.54	179.51	H
	40690	2600.0	-21.72	44.20	22.48	176.89	
	41190	2650.0	-22.26	44.72	22.46	176.32	
	40190	2501.0	-24.74	44.23	19.49	88.84	V
	40690	2593.0	-24.53	44.09	19.56	90.32	
	41190	2685.0	-24.87	44.41	19.54	89.87	

LTE Band 41							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	40215	2552.5	-20.77	44.32	23.55	226.36	H
	40690	2600.0	-20.60	44.20	23.60	228.93	
	41165	2647.5	-21.29	44.85	23.56	226.88	
	40215	2503.5	-23.54	43.99	20.45	110.97	V
	40690	2593.0	-23.60	44.09	20.49	111.89	
	41165	2682.5	-23.94	44.51	20.57	114.02	
Channel Bandwidth: 15 MHz / 16QAM							
X	40215	2552.5	-21.80	44.32	22.52	178.57	H
	40690	2600.0	-21.63	44.20	22.57	180.59	
	41165	2647.5	-22.34	44.85	22.51	178.16	
	40215	2503.5	-24.53	43.99	19.46	88.35	V
	40690	2593.0	-24.49	44.09	19.60	91.16	
	41165	2682.5	-24.93	44.51	19.58	90.78	

LTE Band 41							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	40240	2555.0	-20.64	44.16	23.52	224.91	H
	40690	2600.0	-20.64	44.20	23.56	226.83	
	41140	2645.0	-21.32	44.81	23.49	223.20	
	40240	2506.0	-24.26	44.78	20.52	112.72	V
	40690	2593.0	-23.69	44.09	20.40	109.60	
	41140	2680.0	-24.16	44.72	20.56	113.76	
Channel Bandwidth: 20 MHz / 16QAM							
X	40240	2555.0	-21.59	44.16	22.57	180.72	H
	40690	2600.0	-21.74	44.20	22.46	176.08	
	41140	2645.0	-22.28	44.81	22.53	178.94	
	40240	2506.0	-25.23	44.78	19.55	90.16	V
	40690	2593.0	-24.58	44.09	19.51	89.29	
	41140	2680.0	-25.27	44.72	19.45	88.10	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

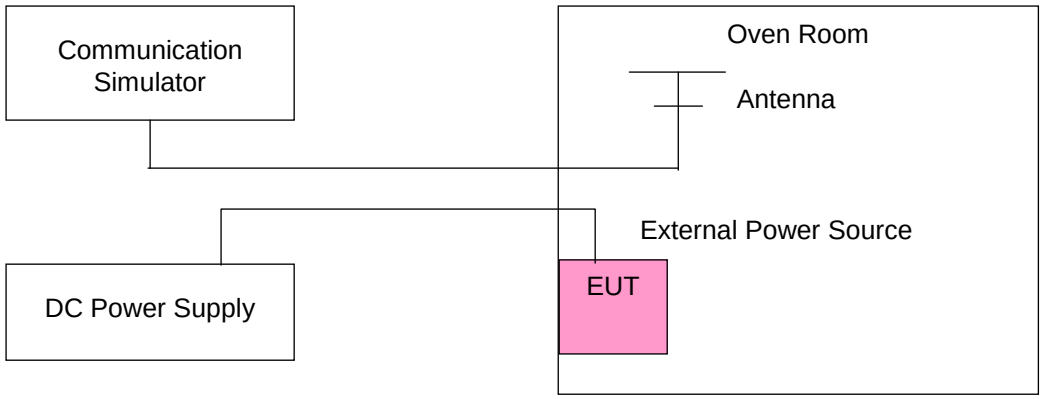
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 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.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2502.500003	0.0014	2567.500004	0.0014	2.5
3.27	2502.500004	0.0015	2567.500002	0.0007	2.5
4.43	2502.500003	0.0014	2567.500004	0.0014	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2502.500004	0.0015	2567.500004	0.0014	2.5
-20	2502.500001	0.0004	2567.500002	0.0007	2.5
-10	2502.500002	0.0007	2567.500004	0.0015	2.5
0	2502.500003	0.0011	2567.500003	0.0011	2.5
10	2502.500001	0.0004	2567.500003	0.0010	2.5
20	2502.499997	-0.0013	2567.499997	-0.0012	2.5
30	2502.499998	-0.0009	2567.499998	-0.0010	2.5
40	2502.499998	-0.0009	2567.499999	-0.0004	2.5
50	2502.499999	-0.0006	2567.499998	-0.0008	2.5
55	2502.499999	-0.0006	2567.499998	-0.0009	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2505.000002	0.0007	2565.000002	0.0007	2.5
3.27	2505.000003	0.0013	2565.000001	0.0005	2.5
4.43	2505.000001	0.0005	2565.000003	0.0010	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2505.000002	0.0010	2565.000002	0.0007	2.5
-20	2505.000002	0.0008	2565.000002	0.0007	2.5
-10	2505.000002	0.0009	2565.000003	0.0010	2.5
0	2505.000003	0.0011	2565.000001	0.0004	2.5
10	2505.000002	0.0009	2565.000004	0.0016	2.5
20	2504.999998	-0.0007	2564.999999	-0.0005	2.5
30	2504.999998	-0.0008	2564.999999	-0.0006	2.5
40	2504.999997	-0.0012	2564.999996	-0.0015	2.5
50	2504.999996	-0.0014	2564.999997	-0.0012	2.5
55	2504.999997	-0.0014	2564.999998	-0.0008	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2507.500002	0.0007	2562.500003	0.0010	2.5
3.27	2507.500002	0.0008	2562.500002	0.0009	2.5
4.43	2507.500004	0.0016	2562.500002	0.0007	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2507.500004	0.0015	2562.500001	0.0004	2.5
-20	2507.500001	0.0006	2562.500002	0.0006	2.5
-10	2507.500004	0.0014	2562.500003	0.0010	2.5
0	2507.500002	0.0008	2562.500003	0.0012	2.5
10	2507.500001	0.0004	2562.500004	0.0016	2.5
20	2507.499998	-0.0008	2562.499999	-0.0005	2.5
30	2507.499997	-0.0011	2562.499996	-0.0014	2.5
40	2507.499997	-0.0013	2562.499997	-0.0013	2.5
50	2507.499998	-0.0009	2562.499998	-0.0009	2.5
55	2507.499999	-0.0004	2562.499997	-0.0012	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2510.000001	0.0004	2560.000001	0.0004	2.5
3.27	2510.000002	0.0006	2560.000001	0.0005	2.5
4.43	2510.000002	0.0008	2560.000003	0.0011	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2510.000003	0.0013	2560.000004	0.0016	2.5
-20	2510.000001	0.0005	2560.000001	0.0005	2.5
-10	2510.000003	0.0012	2560.000001	0.0004	2.5
0	2510.000001	0.0004	2560.000001	0.0004	2.5
10	2510.000003	0.0010	2560.000004	0.0015	2.5
20	2509.999996	-0.0016	2559.999996	-0.0014	2.5
30	2509.999999	-0.0004	2559.999996	-0.0014	2.5
40	2509.999999	-0.0005	2559.999997	-0.0010	2.5
50	2509.999997	-0.0011	2559.999997	-0.0013	2.5
60	2509.999999	-0.0004	2559.999996	-0.0016	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2547.500002	0.0009	2652.500003	0.0012	2.5
3.27	2547.500002	0.0007	2652.500004	0.0014	2.5
4.43	2547.500004	0.0015	2652.500001	0.0004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2547.500004	0.0014	2652.500003	0.0012	2.5
-20	2547.500004	0.0016	2652.500003	0.0009	2.5
-10	2547.500004	0.0014	2652.500004	0.0014	2.5
0	2547.500004	0.0014	2652.500001	0.0005	2.5
10	2547.500002	0.0009	2652.500004	0.0014	2.5
20	2547.499996	-0.0014	2652.499998	-0.0007	2.5
30	2547.499996	-0.0015	2652.499998	-0.0008	2.5
40	2547.499998	-0.0007	2652.499999	-0.0004	2.5
50	2547.499997	-0.0011	2652.499997	-0.0012	2.5
55	2547.499998	-0.0007	2652.499997	-0.0012	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2550.000001	0.0005	2650.000004	0.0014	2.5
3.27	2550.000004	0.0014	2650.000003	0.0011	2.5
4.43	2550.000004	0.0015	2650.000004	0.0015	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2550.000004	0.0016	2650.000002	0.0009	2.5
-20	2550.000002	0.0008	2650.000002	0.0007	2.5
-10	2550.000002	0.0007	2650.000003	0.0012	2.5
0	2550.000002	0.0007	2650.000002	0.0006	2.5
10	2550.000004	0.0014	2650.000002	0.0007	2.5
20	2549.999997	-0.0013	2649.999997	-0.0013	2.5
30	2549.999999	-0.0004	2649.999997	-0.0011	2.5
40	2549.999997	-0.0012	2649.999998	-0.0008	2.5
50	2549.999999	-0.0004	2649.999996	-0.0014	2.5
55	2549.999998	-0.0007	2649.999996	-0.0015	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2552.500002	0.0008	2647.500004	0.0014	2.5
3.27	2552.500002	0.0008	2647.500003	0.0011	2.5
4.43	2552.500001	0.0004	2647.500002	0.0008	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2552.500003	0.0010	2647.500001	0.0004	2.5
-20	2552.500002	0.0008	2647.500003	0.0013	2.5
-10	2552.500002	0.0009	2647.500002	0.0006	2.5
0	2552.500002	0.0008	2647.500001	0.0004	2.5
10	2552.500002	0.0009	2647.500003	0.0010	2.5
20	2552.499999	-0.0004	2647.499998	-0.0009	2.5
30	2552.499996	-0.0015	2647.499996	-0.0014	2.5
40	2552.499996	-0.0015	2647.499997	-0.0011	2.5
50	2552.499998	-0.0009	2647.499997	-0.0010	2.5
55	2552.499997	-0.0013	2647.499998	-0.0009	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	2555.000002	0.0006	2645.000002	0.0008	2.5
3.27	2555.000004	0.0016	2645.000002	0.0006	2.5
4.43	2555.000002	0.0006	2645.000003	0.0012	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.43 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2555.000004	0.0015	2645.000003	0.0012	2.5
-20	2555.000002	0.0006	2645.000003	0.0010	2.5
-10	2555.000002	0.0008	2645.000001	0.0005	2.5
0	2555.000002	0.0008	2645.000002	0.0009	2.5
10	2555.000003	0.0010	2645.000002	0.0008	2.5
20	2554.999997	-0.0012	2644.999999	-0.0005	2.5
30	2554.999998	-0.0009	2644.999996	-0.0015	2.5
40	2554.999999	-0.0004	2644.999997	-0.0011	2.5
50	2554.999997	-0.0013	2644.999996	-0.0015	2.5
55	2554.999996	-0.0015	2644.999999	-0.0005	2.5

4.3 Occupied Bandwidth Measurement

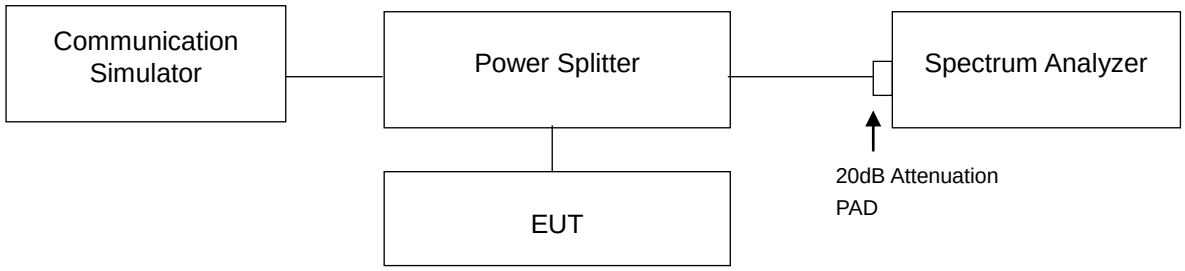
4.3.1 Limits of Occupied Bandwidth Measurement

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

4.3.2 Test Procedure

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup

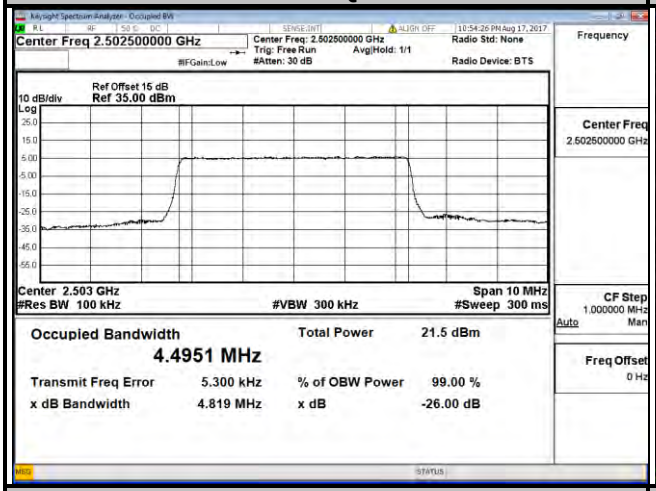


4.3.4 Test Result

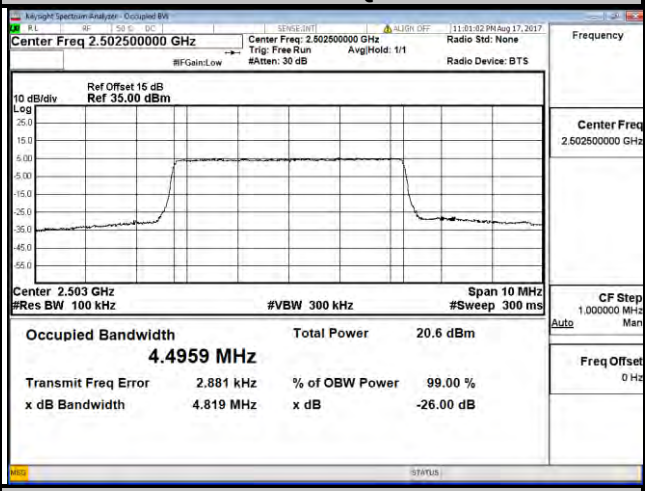
LTE Band 7							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.4951	4.4959	20800	2505.0	8.9636	8.9689
21100	2535.0	4.4919	4.4939	21100	2535.0	8.9747	8.9768
21425	2567.5	4.4949	4.4942	21400	2565.0	8.9739	8.9702

Spectrum Plot of Worst Value

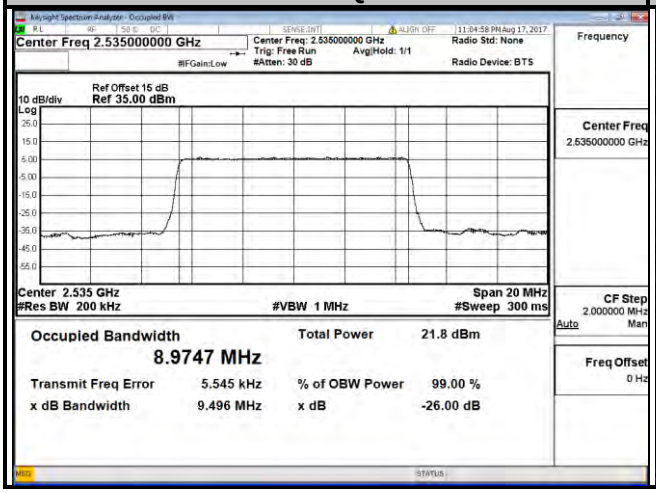
5 MHz / QPSK



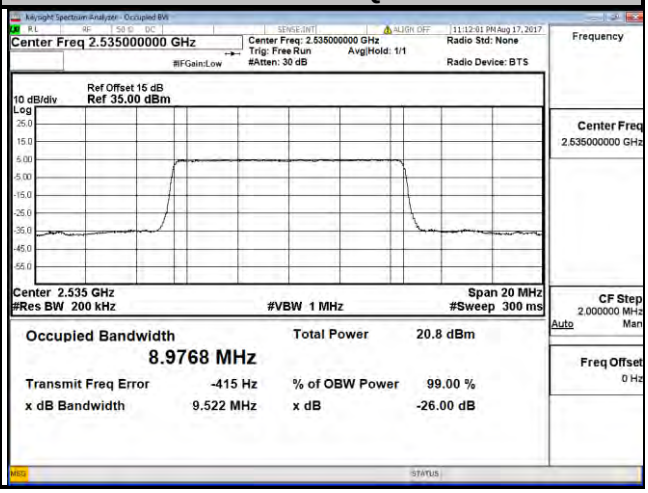
5 MHz / 16QAM



10 MHz / QPSK



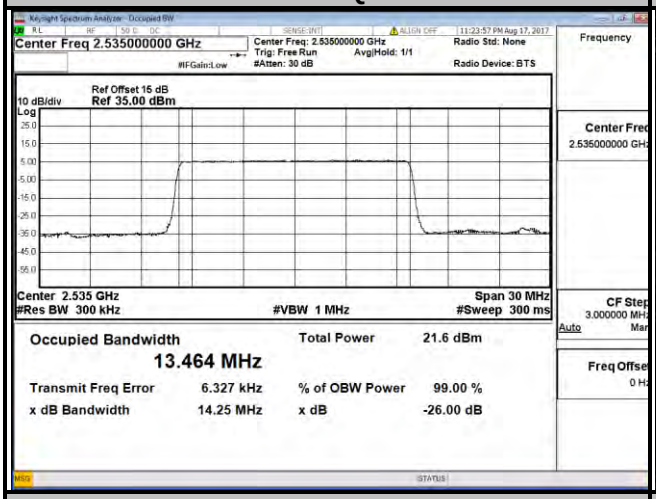
10 MHz / 16QAM



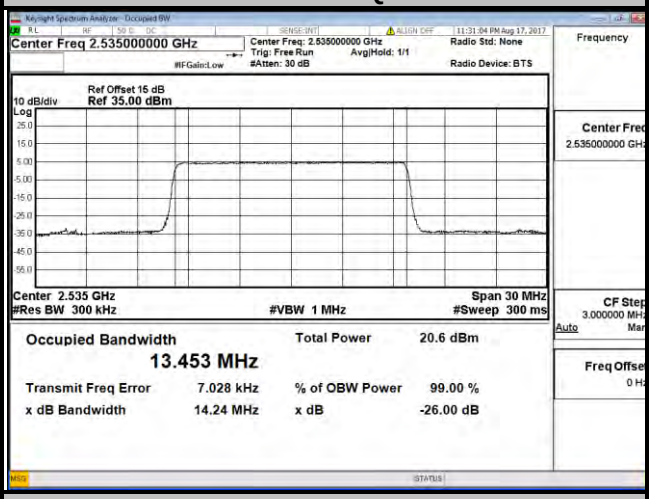
LTE Band 7							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	13.426	13.416	20850	2510.0	17.862	17.882
21100	2535.0	13.464	13.453	21100	2535.0	17.945	17.966
21375	2562.5	13.450	13.439	21350	2560.0	17.897	17.917

Spectrum Plot of Worst Value

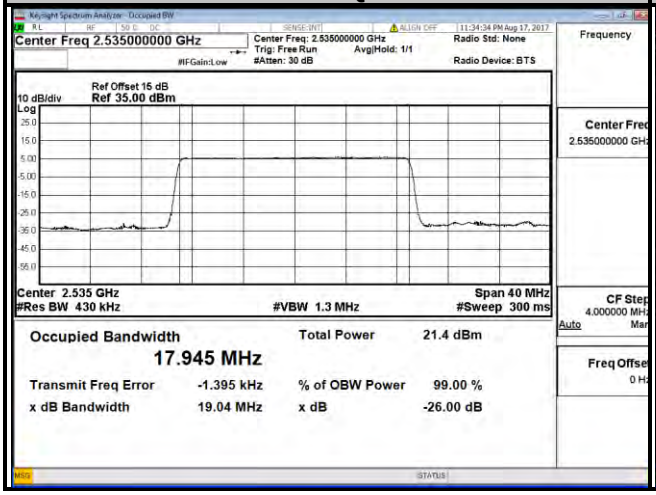
15 MHz / QPSK



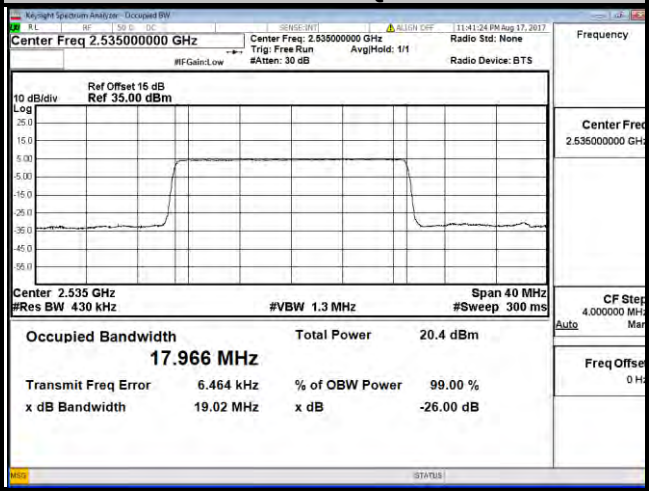
15 MHz / 16QAM



20 MHz / QPSK



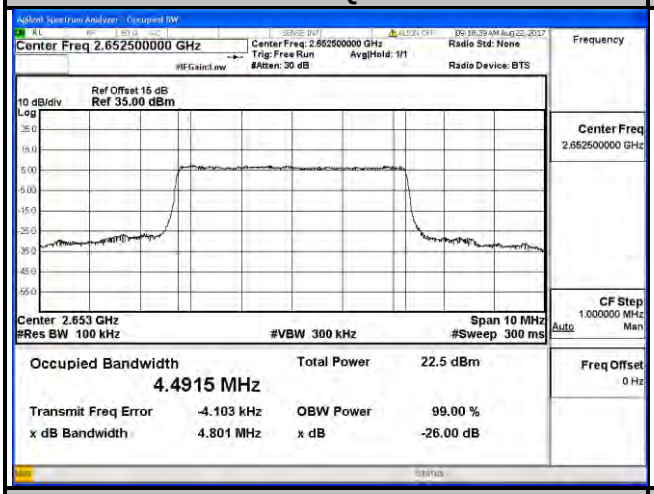
20 MHz / 16QAM



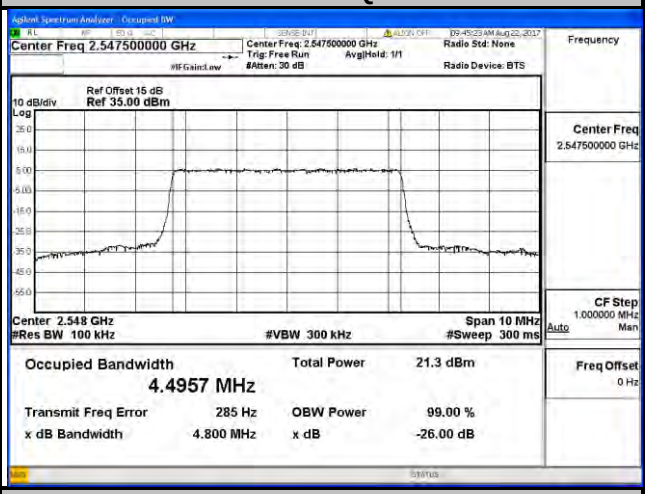
LTE Band 41							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
40165	2547.5	4.4889	4.4957	40190	2550.0	8.9588	8.9812
40690	2600.0	4.4858	4.4949	40690	2600.0	8.9499	8.9758
41215	2652.5	4.4915	4.4938	41190	2650.0	8.9665	8.9762

Spectrum Plot of Worst Value

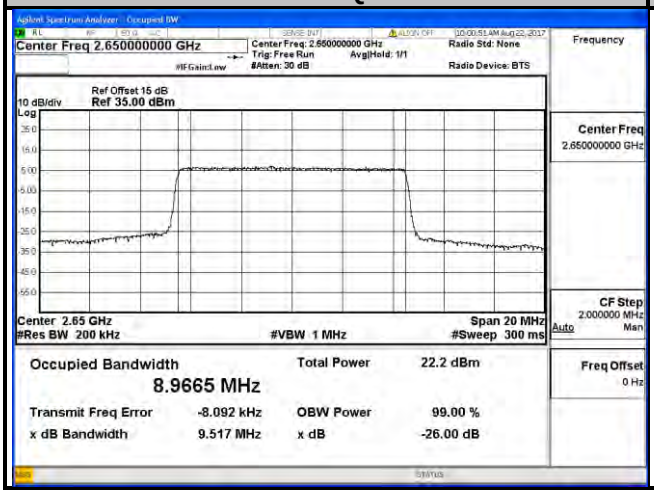
5 MHz / QPSK



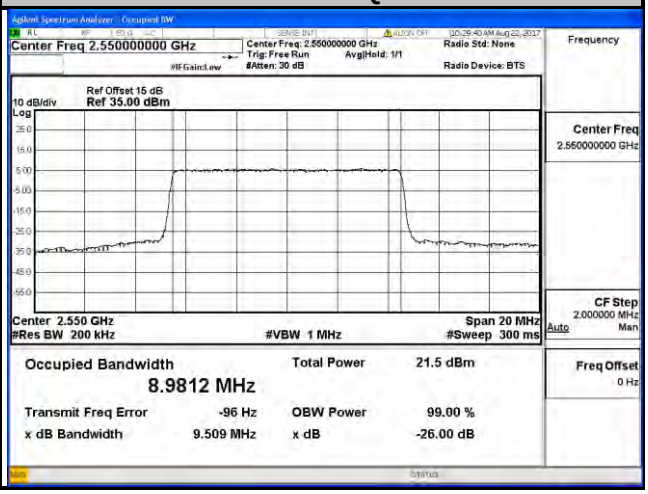
5 MHz / 16QAM



10 MHz / QPSK



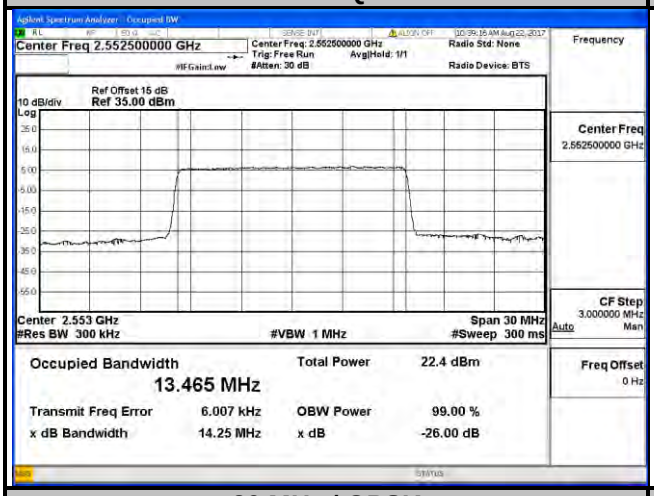
10 MHz / 16QAM



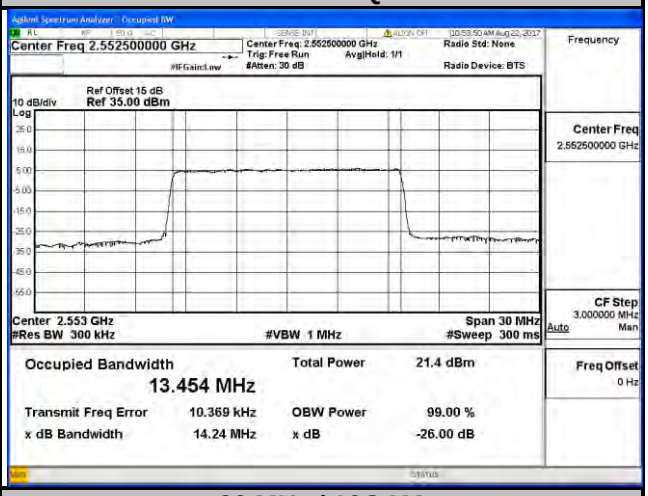
LTE Band 41							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
40215	2552.5	13.465	13.454	40240	2555.0	17.937	17.923
40690	2600.0	13.448	13.443	40690	2600.0	17.913	17.911
41165	2647.5	13.447	13.434	41140	2645.0	17.893	17.891

Spectrum Plot of Worst Value

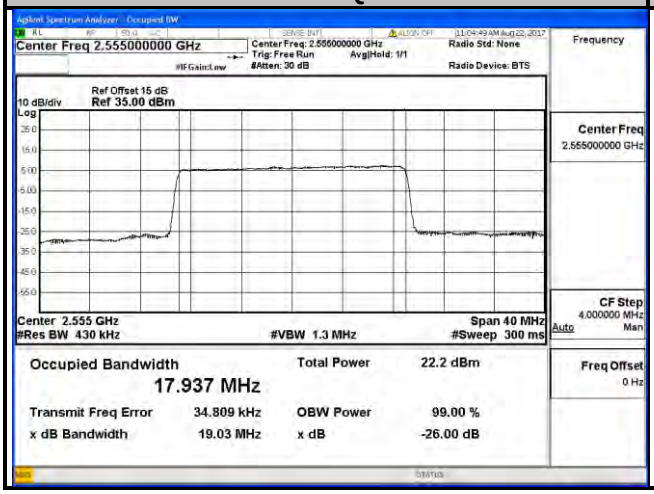
15 MHz / QPSK



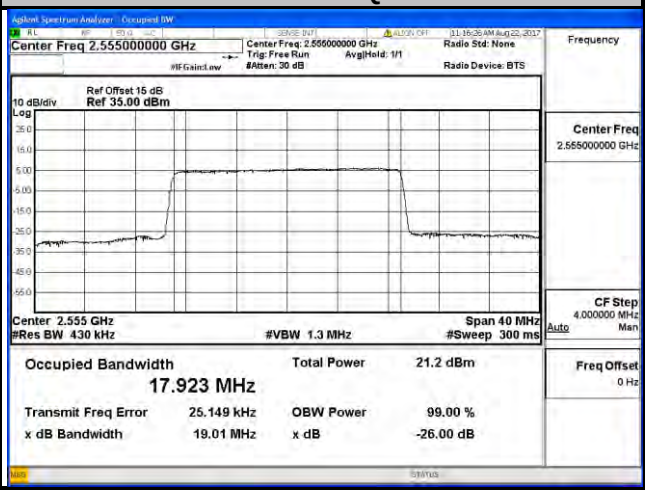
15 MHz / 16QAM



20 MHz / QPSK



20 MHz / 16QAM

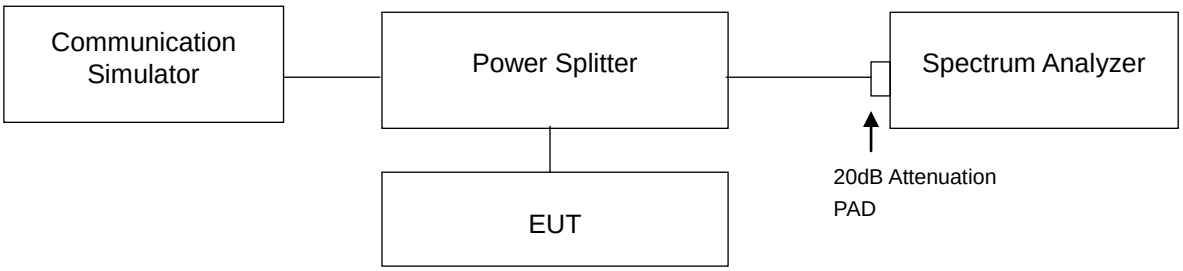


4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

According to FCC 27.53(l)(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.

4.4.2 Test Setup

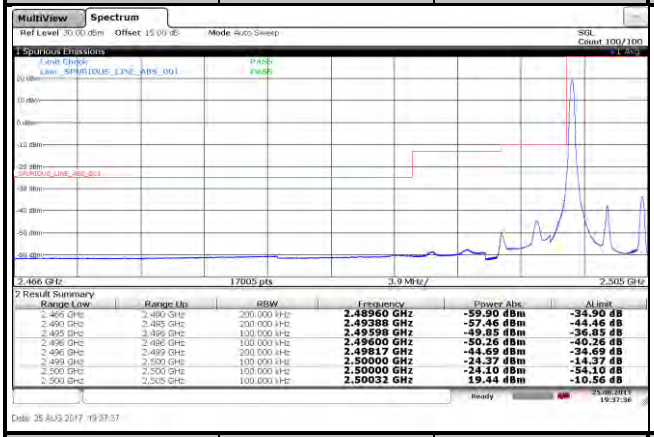


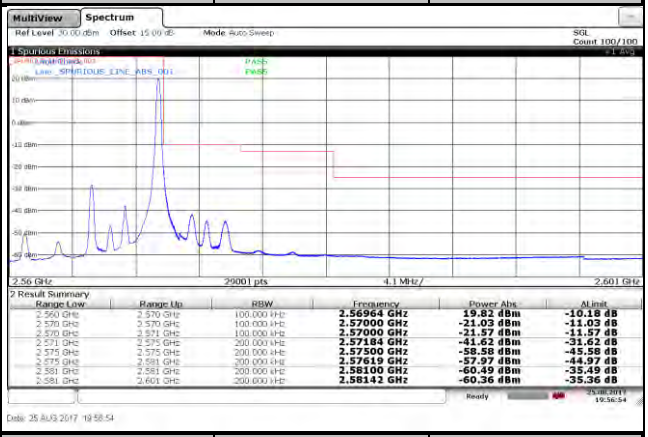
4.4.3 Test Procedures

a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
c. The center frequency of spectrum is the band edge frequency and span is 20 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (Channel bandwidth 5 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 40 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (Channel bandwidth 10 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 60 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (Channel bandwidth 15 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 80 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (Channel bandwidth 20 MHz).
g. Record the max trace plot into the test report.

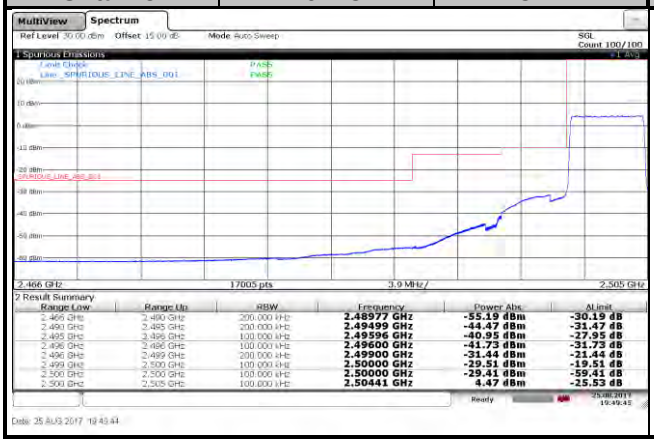
4.4.4 Test Results

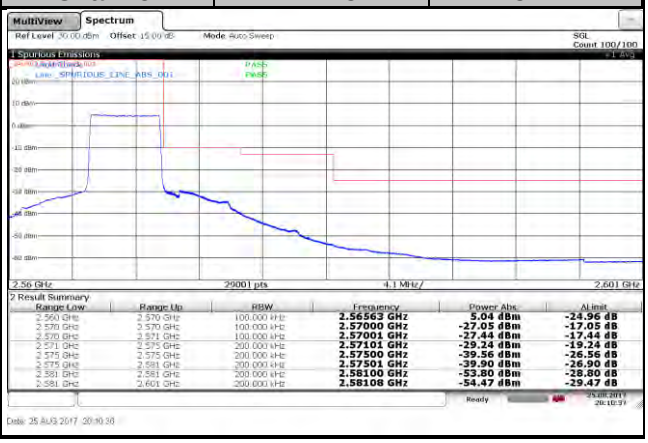
LTE Band 7					
Channel Bandwidth: 5 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	20775	1 RB	Channel	21425	1 RB



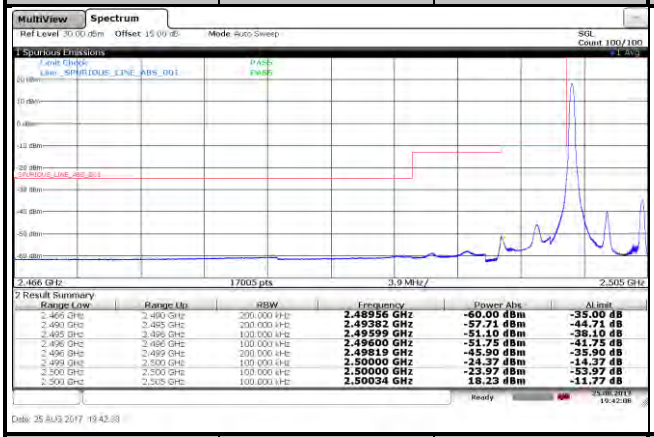


Channel	20775	25 RB	Channel	21425	25 RB

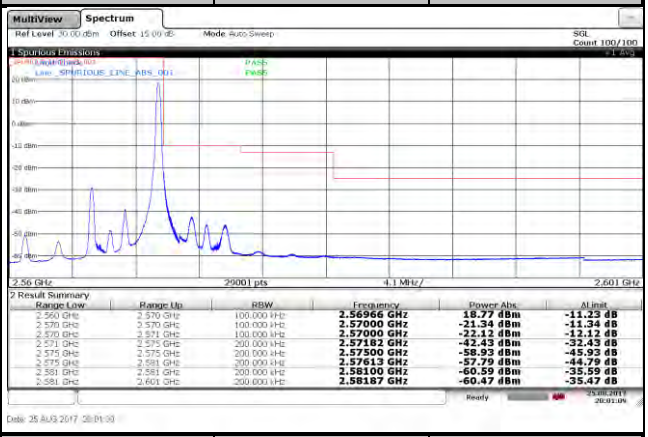




LTE Band 7					
Channel Bandwidth: 5 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	20775	1 RB	Channel	21425	1 RB

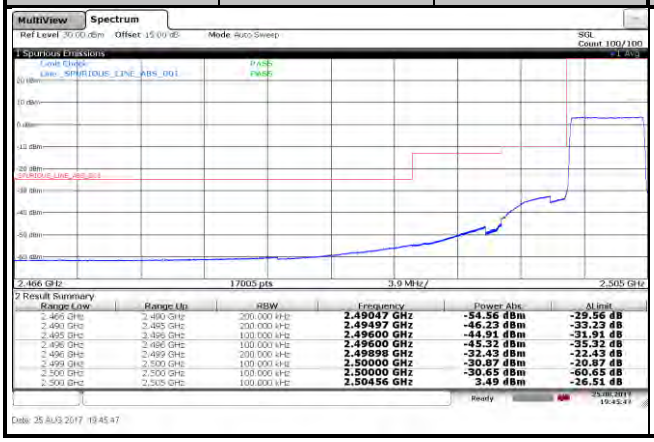


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.480 GHz	200.000 kHz	2.48956 GHz	-60.00 dBm	-35.00 dB
2.480 GHz	2.485 GHz	200.000 kHz	2.49382 GHz	-57.71 dBm	-44.71 dB
2.485 GHz	2.486 GHz	100.000 kHz	2.49599 GHz	-51.10 dBm	-38.10 dB
2.486 GHz	2.489 GHz	100.000 kHz	2.49600 GHz	-51.75 dBm	-41.75 dB
2.489 GHz	2.499 GHz	200.000 kHz	2.49819 GHz	-45.90 dBm	-35.90 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-24.37 dBm	-14.37 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-23.97 dBm	-53.97 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50034 GHz	18.23 dBm	-11.77 dB

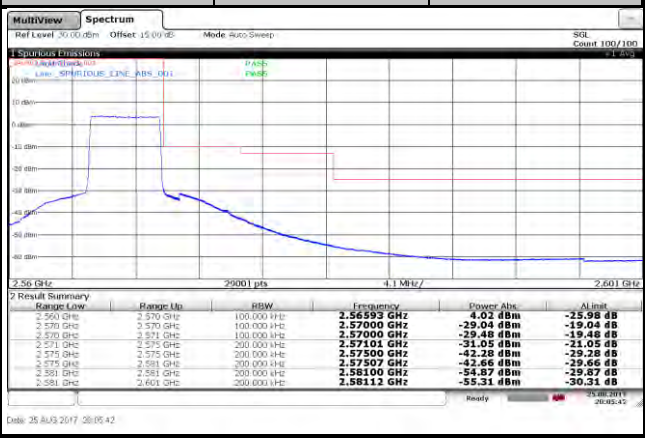


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56966 GHz	18.77 dBm	-11.23 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-21.34 dBm	-11.34 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-22.12 dBm	-12.12 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57182 GHz	-42.43 dBm	-32.43 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-58.93 dBm	-45.93 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57613 GHz	-57.79 dBm	-44.79 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-60.59 dBm	-35.59 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58187 GHz	-60.47 dBm	-35.47 dB

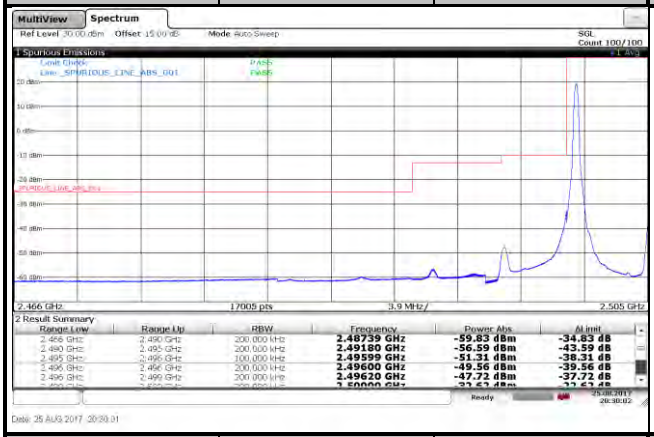
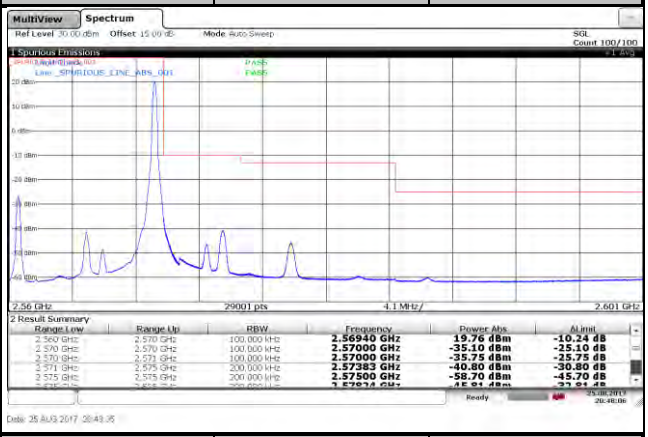
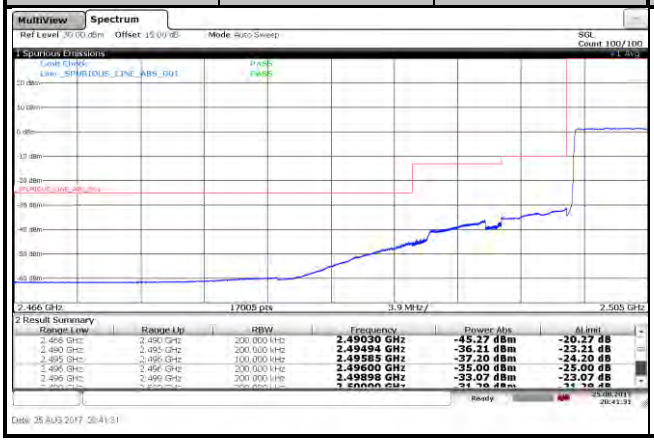
Channel	20775	25 RB	Channel	21425	25 RB

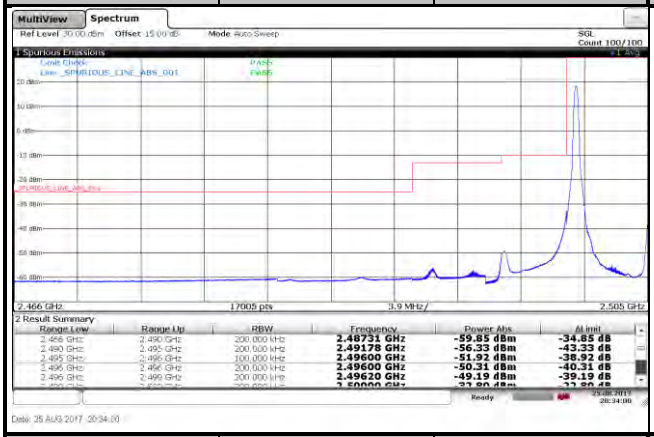
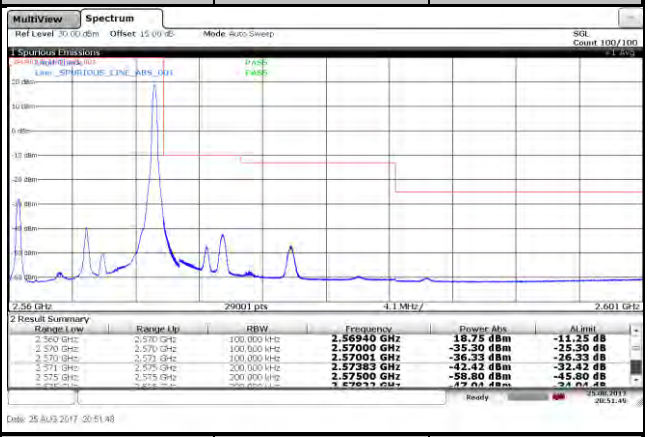
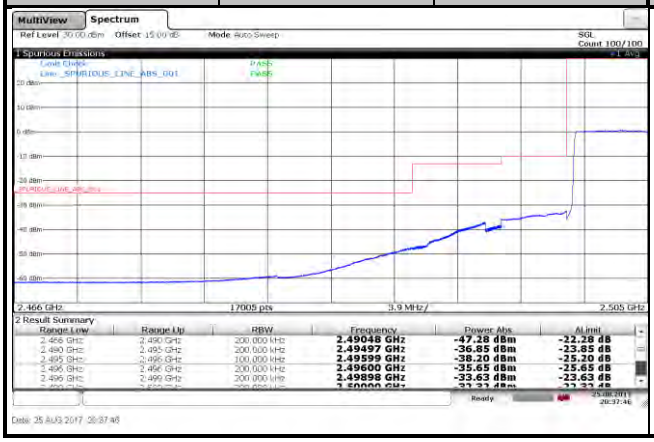


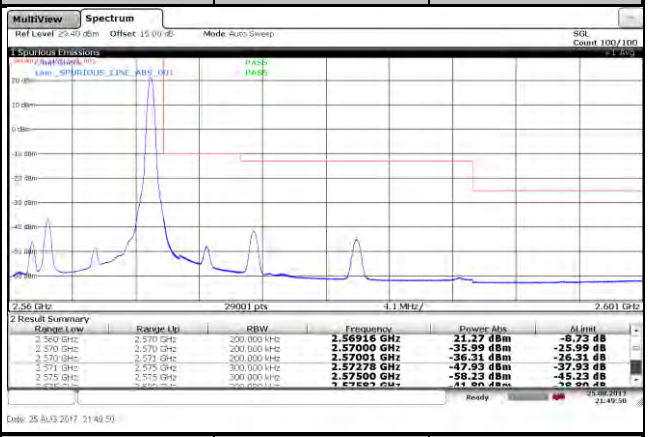
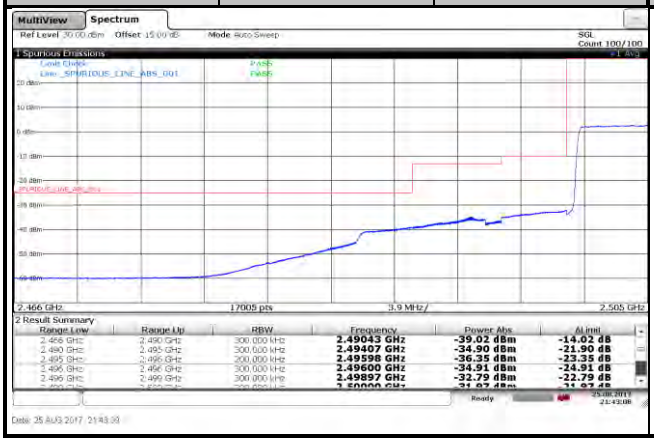
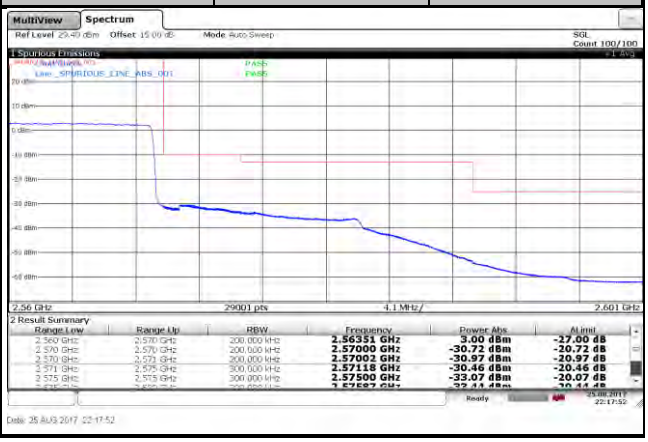
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.480 GHz	200.000 kHz	2.49047 GHz	-54.56 dBm	-29.56 dB
2.480 GHz	2.485 GHz	200.000 kHz	2.49497 GHz	-46.23 dBm	-33.23 dB
2.485 GHz	2.486 GHz	100.000 kHz	2.49600 GHz	-44.91 dBm	-31.91 dB
2.486 GHz	2.489 GHz	100.000 kHz	2.49600 GHz	-45.32 dBm	-35.32 dB
2.489 GHz	2.499 GHz	200.000 kHz	2.49898 GHz	-32.43 dBm	-22.43 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-30.87 dBm	-20.87 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-30.65 dBm	-60.65 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50456 GHz	3.49 dBm	-26.51 dB

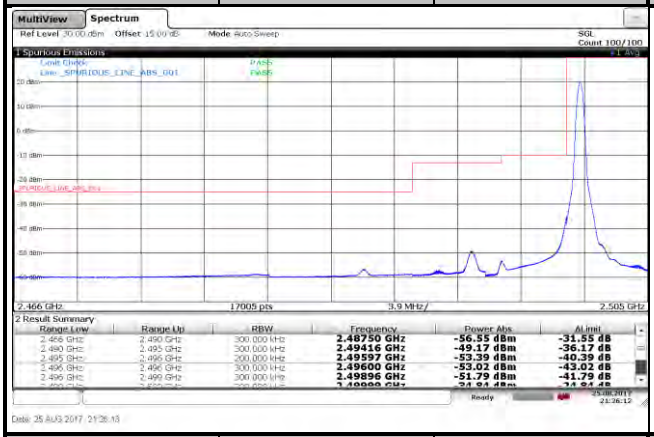
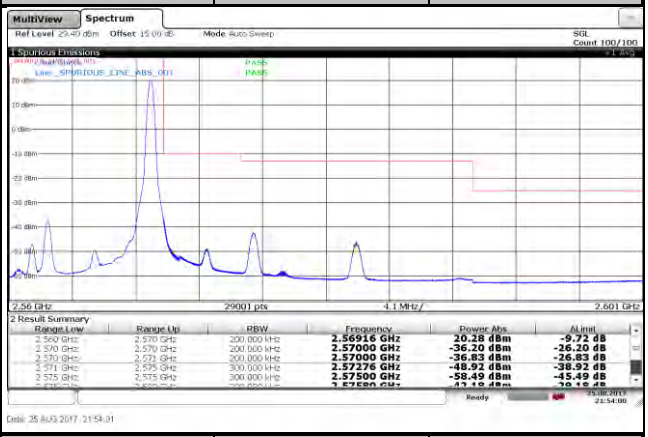
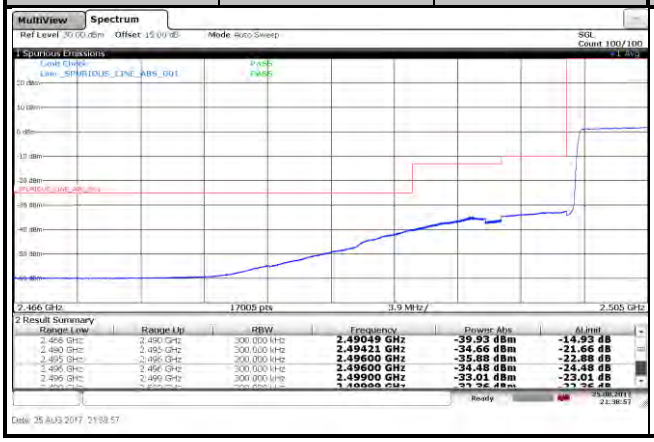


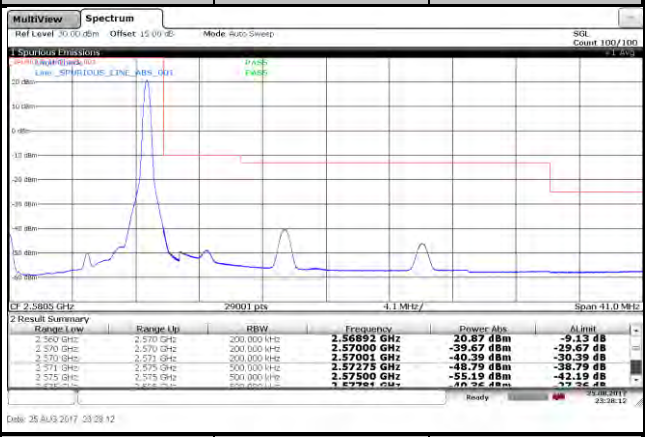
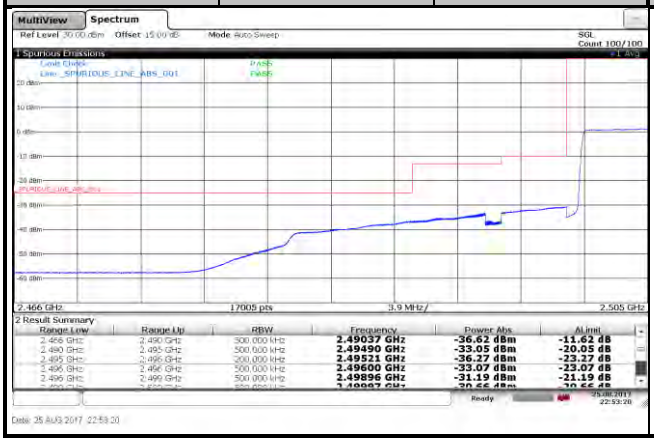
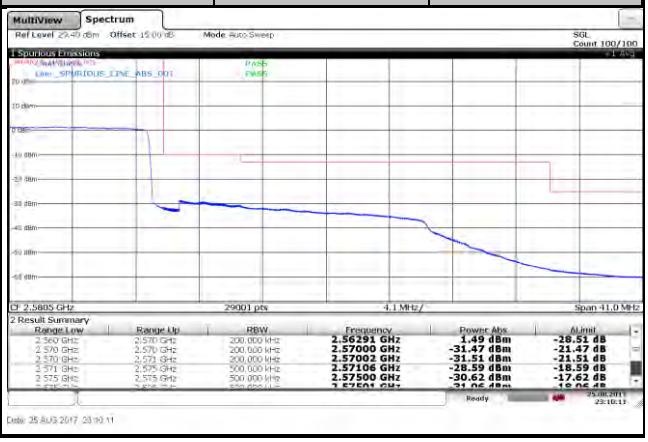
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56593 GHz	4.02 dBm	-25.98 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-29.04 dBm	-19.04 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-29.48 dBm	-19.48 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57101 GHz	-31.05 dBm	-21.05 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-42.28 dBm	-29.28 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57507 GHz	-42.66 dBm	-29.66 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-54.87 dBm	-29.87 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58112 GHz	-55.31 dBm	-30.31 dB

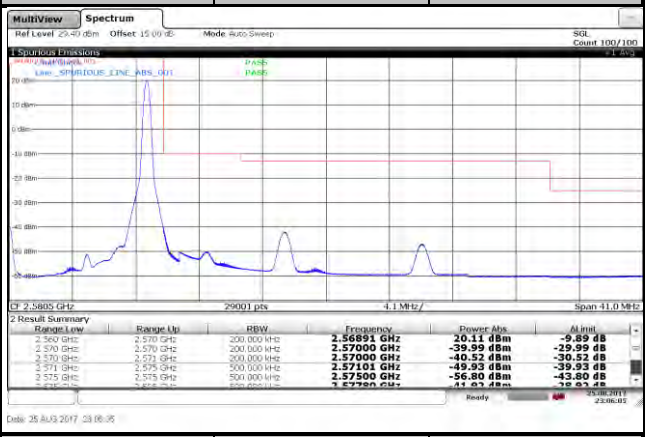
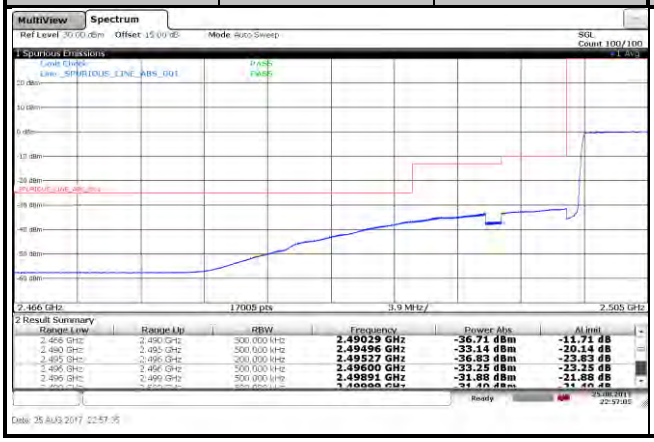
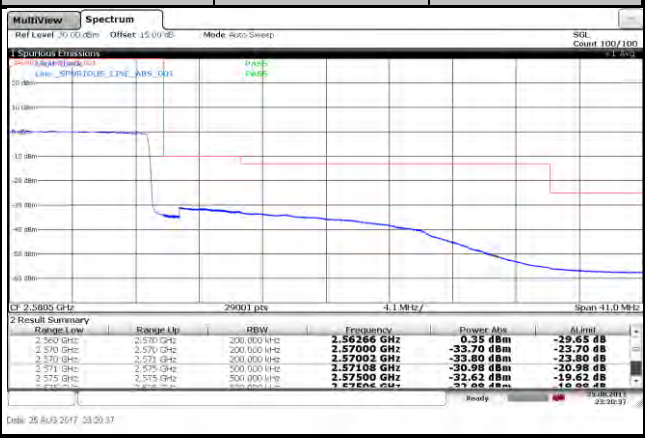
LTE Band 7					
Channel Bandwidth: 10 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	20800	1 RB	Channel	21400	1 RB
					
Channel	20800	50 RB	Channel	21400	50 RB
					

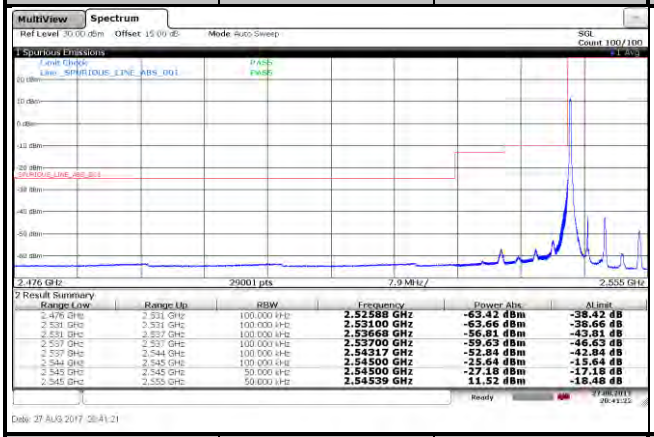
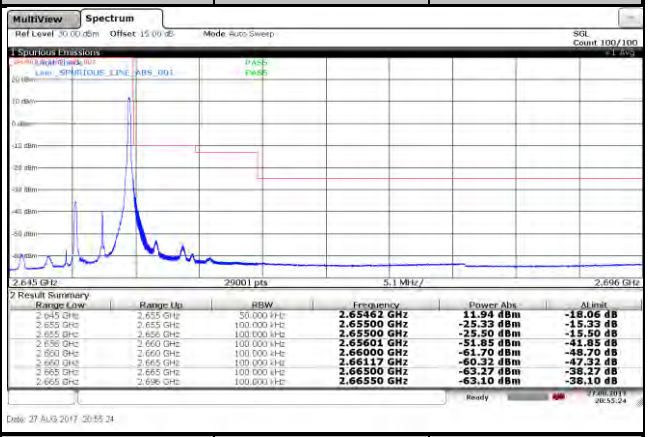
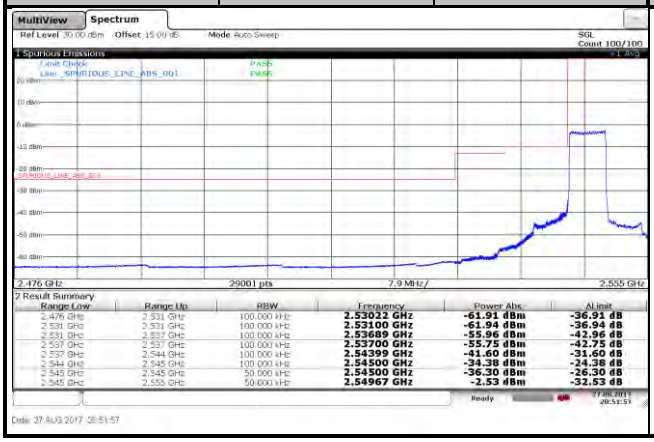
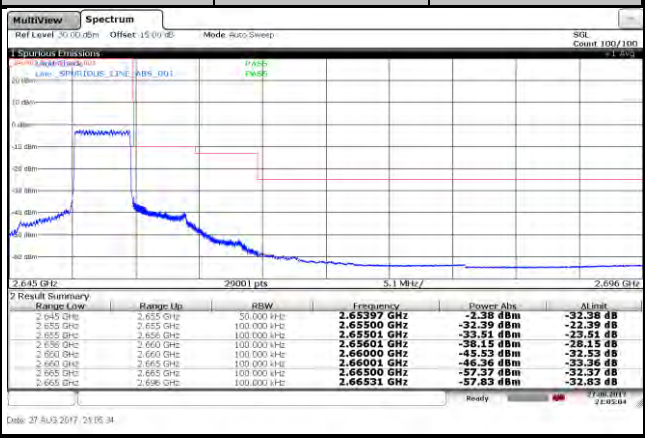
LTE Band 7					
Channel Bandwidth: 10 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	20800	1 RB	Channel	21400	1 RB
					
Channel	20800	50 RB	Channel	21400	50 RB
					

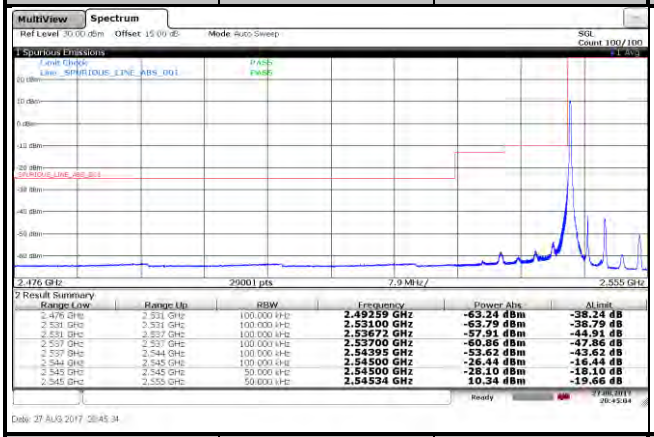
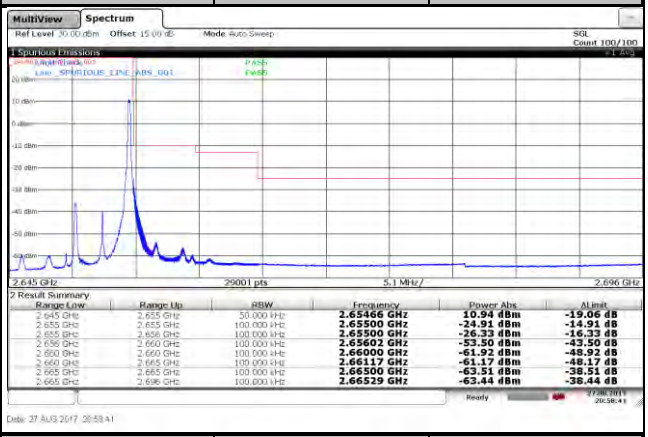
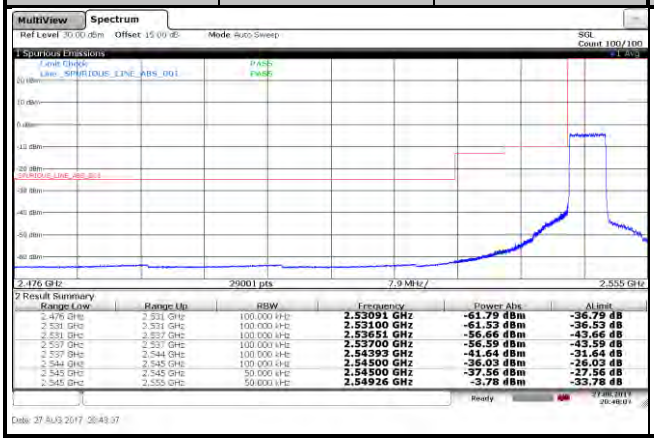
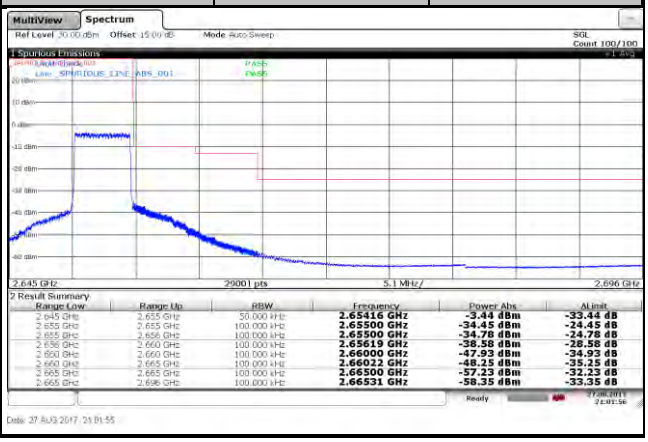
LTE Band 7					
Channel Bandwidth: 15 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	20825	1 RB	Channel	21375	1 RB
					
Channel	20825	75 RB	Channel	21375	75 RB
					

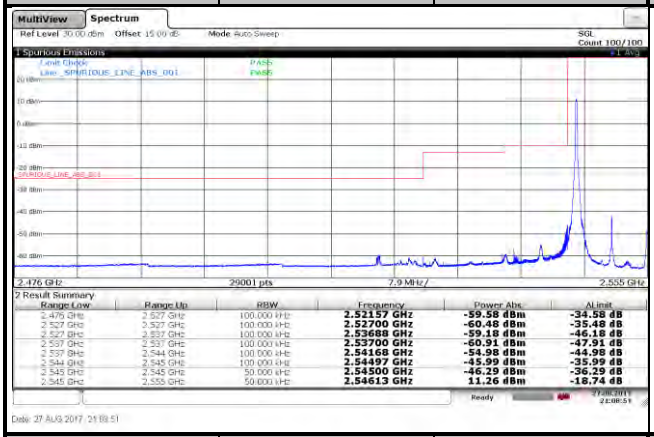
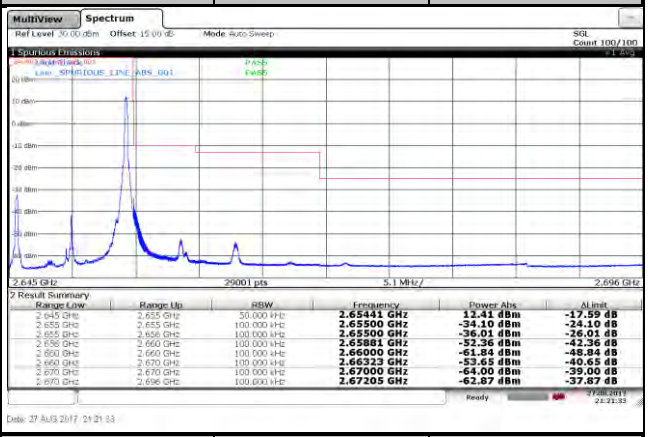
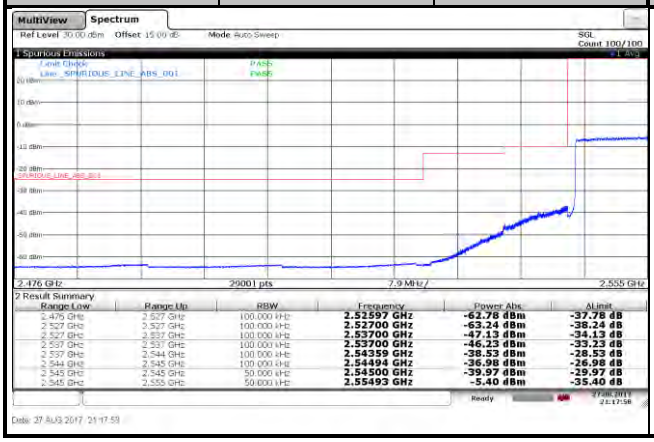
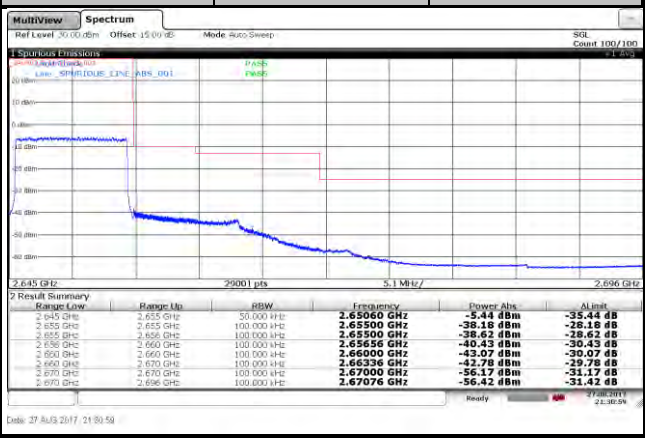
LTE Band 7					
Channel Bandwidth: 15 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	20825	1 RB	Channel	21375	1 RB
					
Channel	20825	75 RB	Channel	21375	75 RB
					

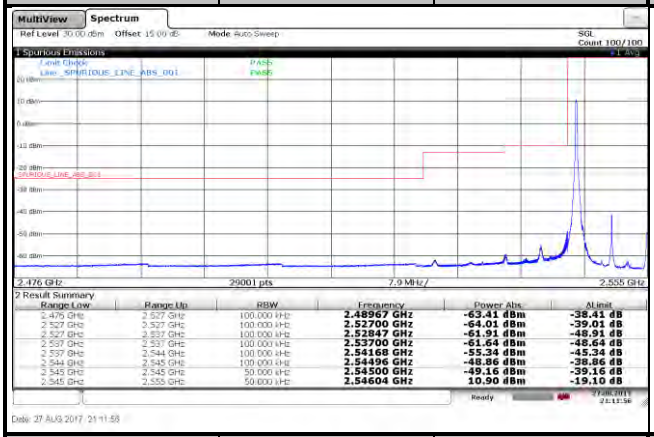
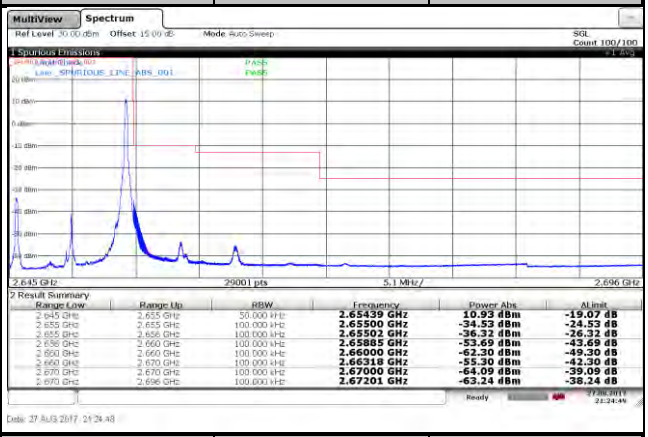
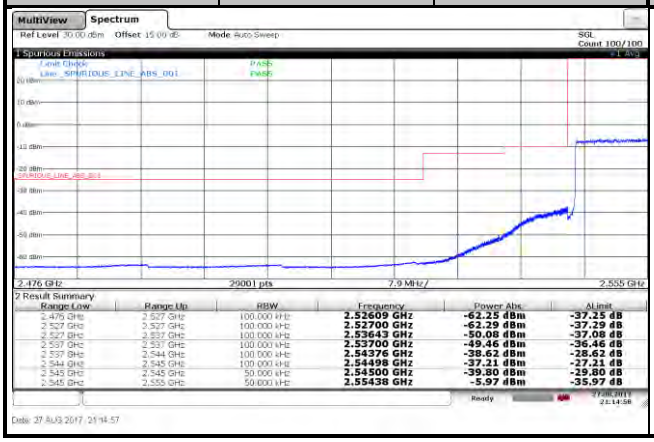
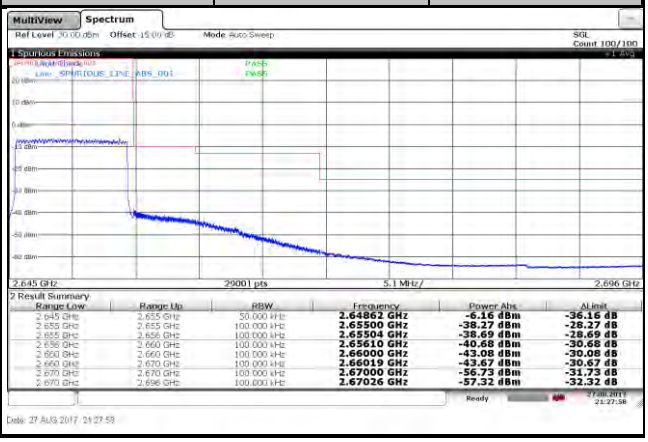
LTE Band 7					
Channel Bandwidth: 20 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	20850	1 RB	Channel	21350	1 RB
					
Channel	20850	100 RB	Channel	21350	100 RB
					

LTE Band 7					
Channel Bandwidth: 20 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	20850	1 RB	Channel	21350	1 RB
					
Channel	20850	100 RB	Channel	21350	100 RB
					

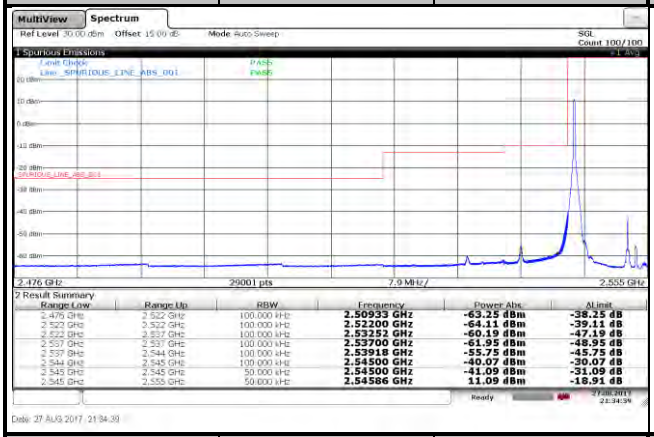
LTE Band 41					
Channel Bandwidth: 5 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	39675	1 RB	Channel	41565	1 RB
					
Channel	39675	25 RB	Channel	41565	25 RB
					

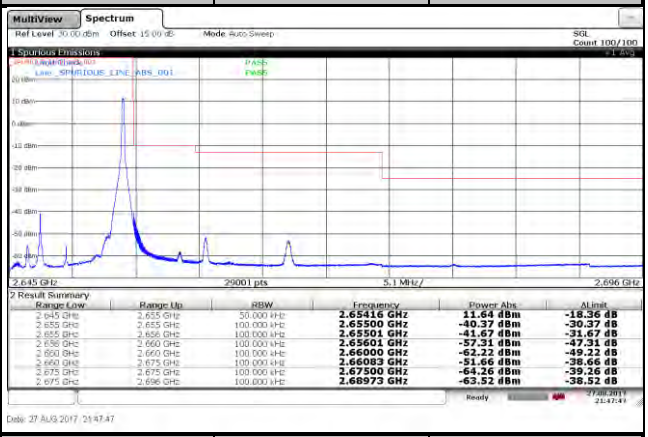
LTE Band 41					
Channel Bandwidth: 5 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	39675	1 RB	Channel	41565	1 RB
					
Channel	39675	25 RB	Channel	41565	25 RB
					

LTE Band 41					
Channel Bandwidth: 10 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	39700	1 RB	Channel	41540	1 RB
					
Channel	39700	50 RB	Channel	41540	50 RB
					

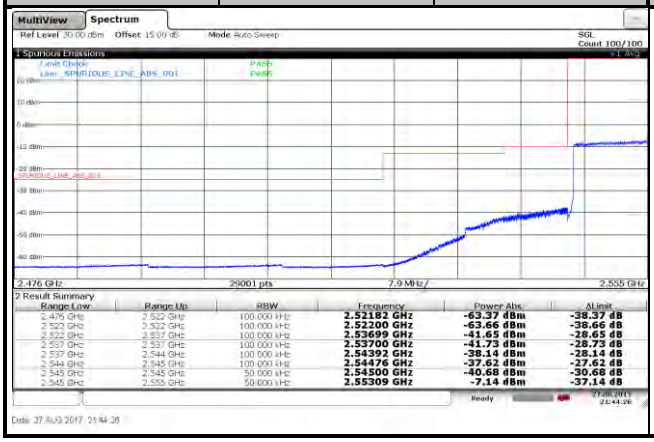
LTE Band 41					
Channel Bandwidth: 10 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	39700	1 RB	Channel	41540	1 RB
					
Channel	39700	50 RB	Channel	41540	50 RB
					

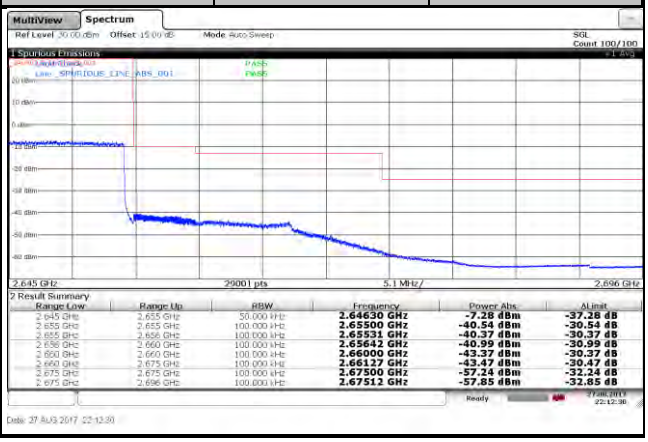
LTE Band 41					
Channel Bandwidth: 15 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	39725	1 RB	Channel	41515	1 RB

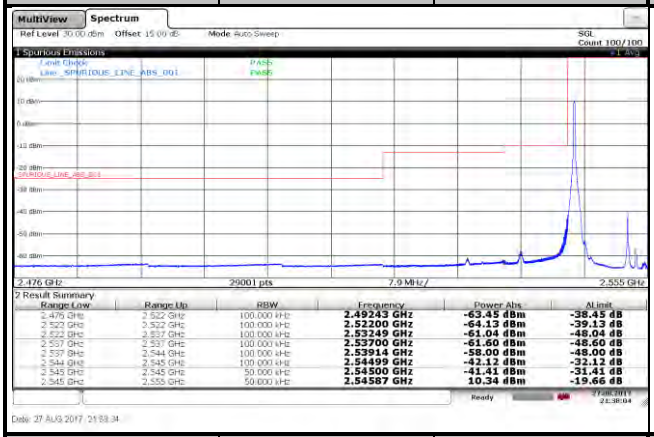
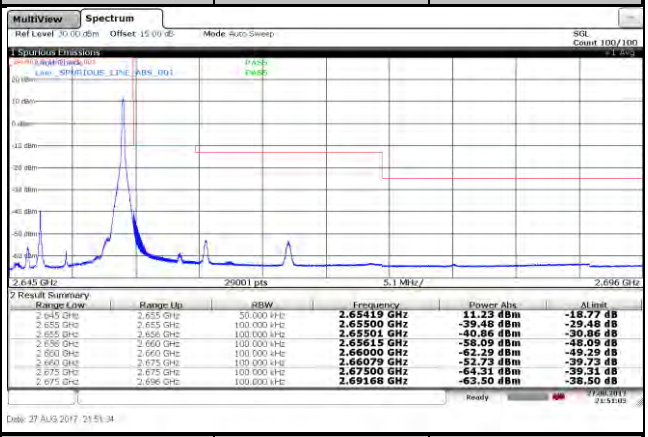
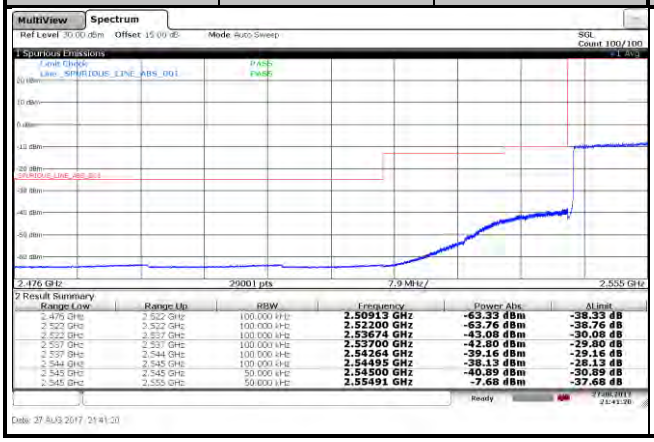
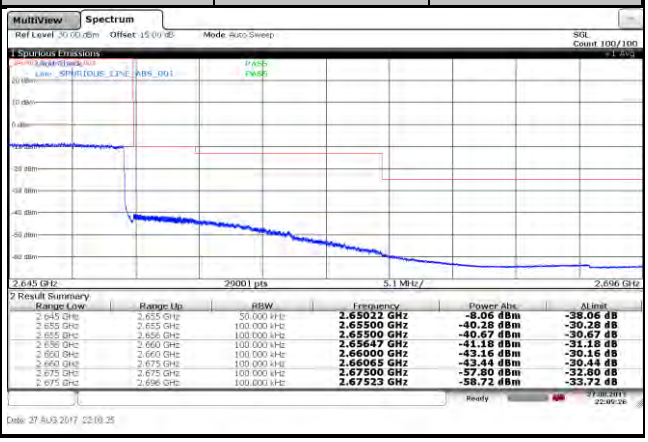




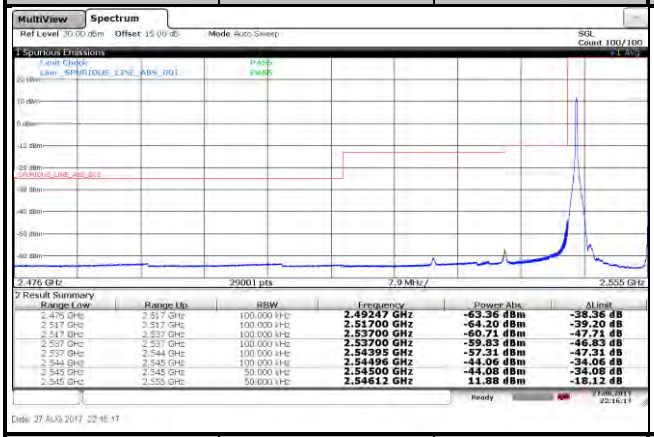
Channel	39725	75 RB	Channel	41515	75 RB

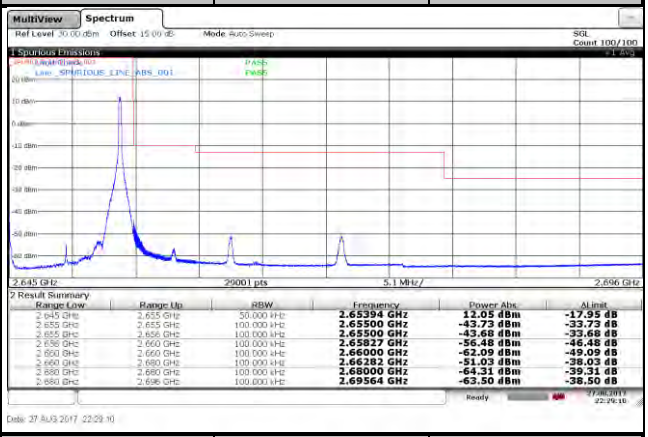




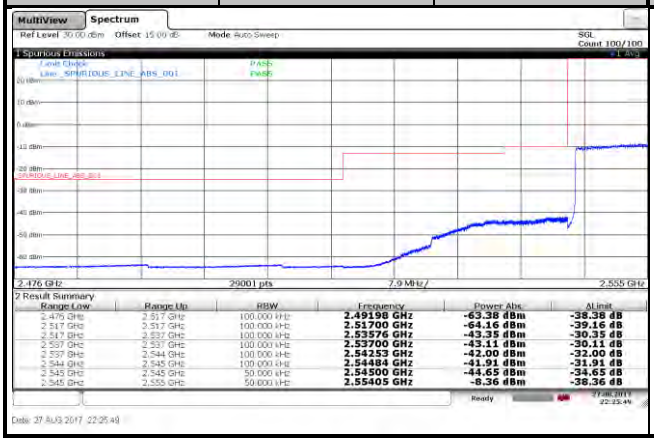
LTE Band 41					
Channel Bandwidth: 15 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	39725	1 RB	Channel	41515	1 RB
					
Channel	39725	75 RB	Channel	41515	75 RB
					

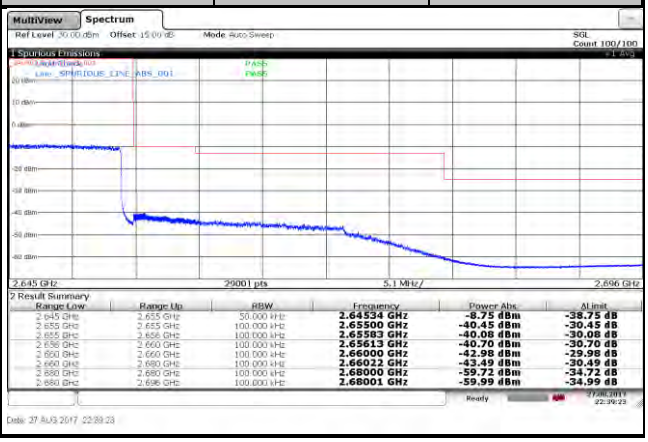
LTE Band 41					
Channel Bandwidth: 20 MHz / QPSK					
<Adjacent Channel Band Edge>					
Channel	39750	1 RB	Channel	41490	1 RB

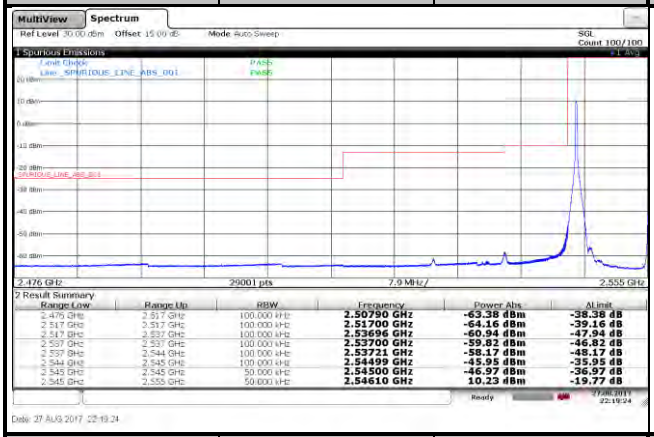
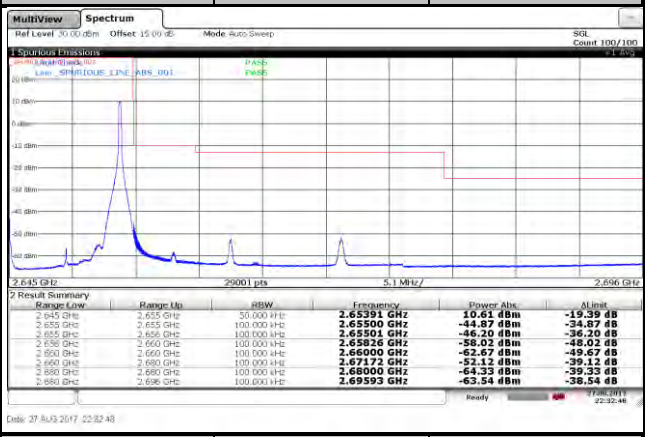
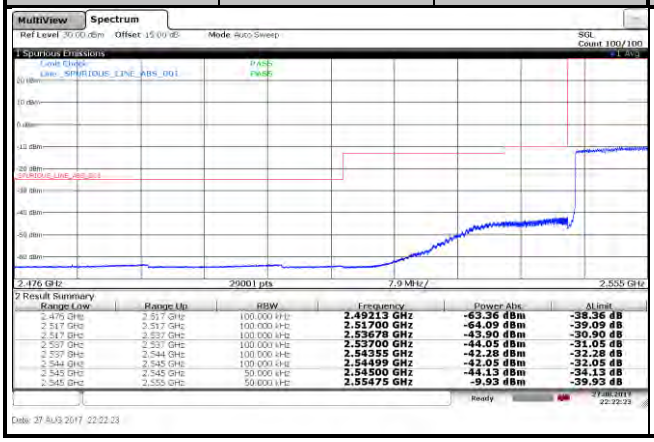
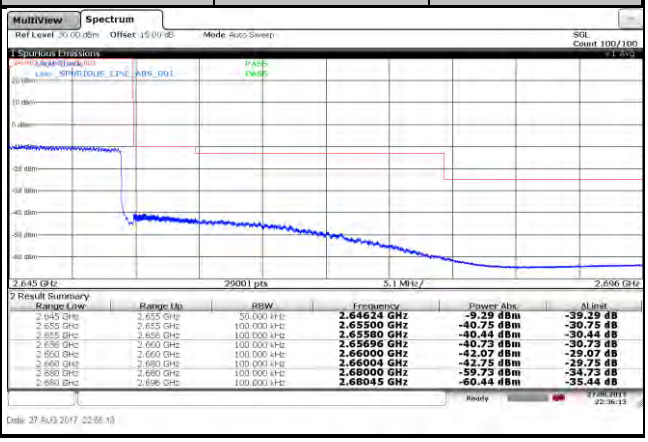




Channel	39750	100 RB	Channel	41490	100 RB





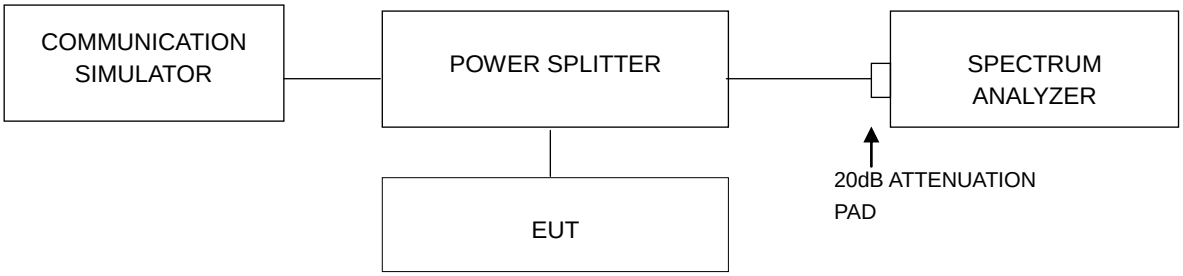
LTE Band 41					
Channel Bandwidth: 20 MHz / 16QAM					
<Adjacent Channel Band Edge>					
Channel	39750	1 RB	Channel	41490	1 RB
					
Channel	39750	100 RB	Channel	41490	100 RB
					

4.5 Peak to Average Ratio

4.5.1 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.

4.5.2 Test Setup



4.5.3 Test Procedures

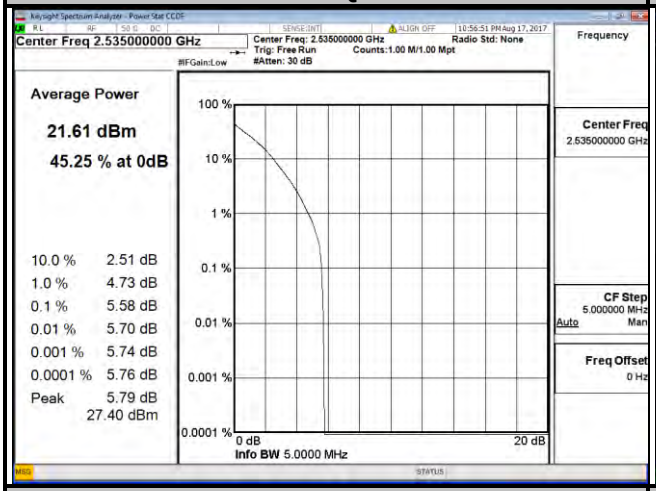
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.5.4 Test Results

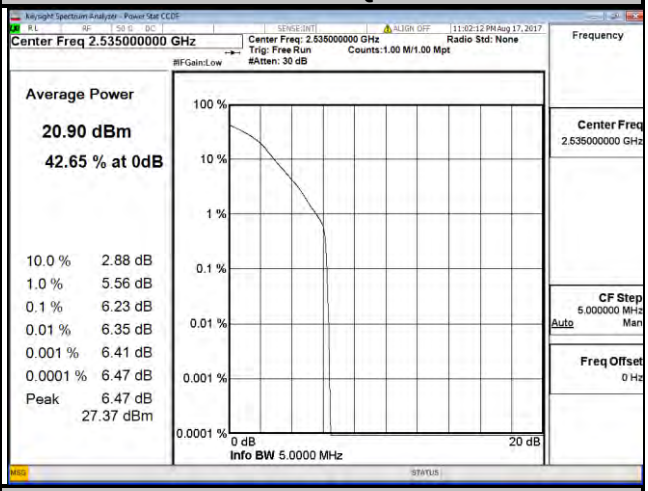
LTE Band 7							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.86	5.74	20800	2505.0	4.81	5.73
21100	2535.0	5.58	6.23	21100	2535.0	5.56	6.38
21425	2567.5	5.24	6.07	21400	2565.0	5.02	5.72

Spectrum Plot of Worst Value

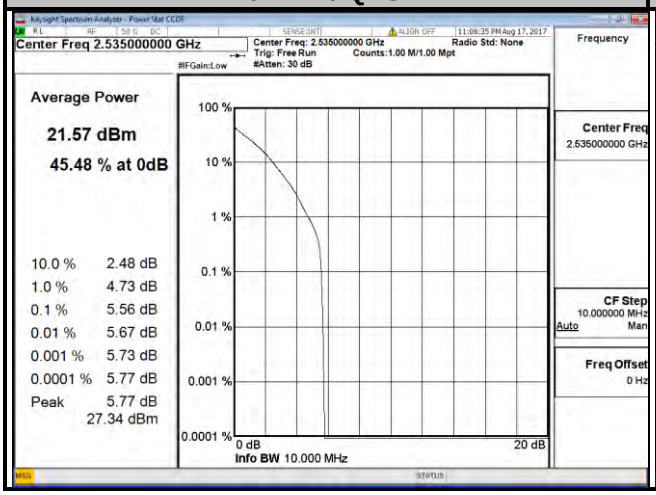
5 MHz / QPSK



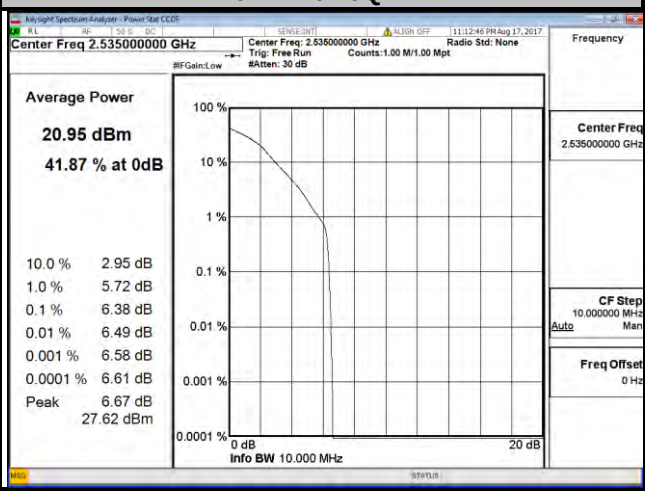
5 MHz / 16QAM



10 MHz / QPSK



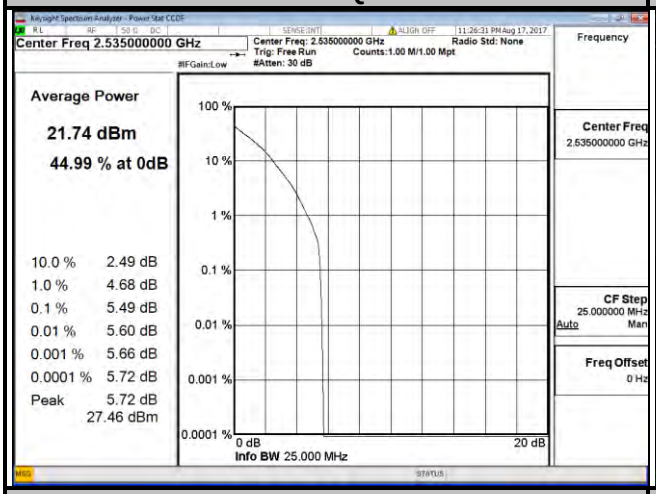
10 MHz / 16QAM



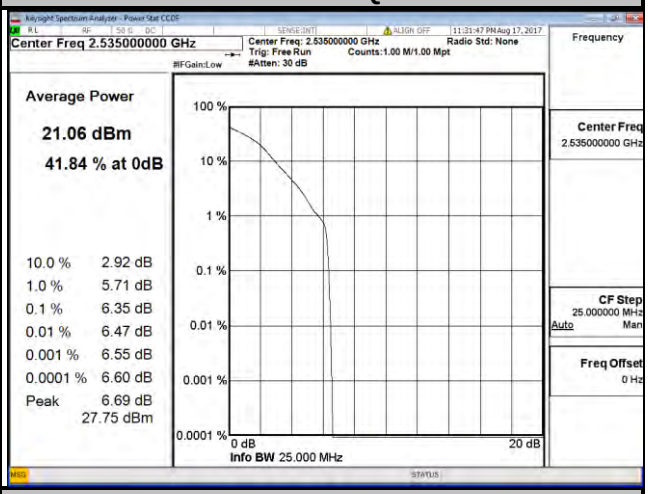
LTE Band 7							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	4.78	5.65	20850	2510.0	4.75	5.66
21100	2535.0	5.49	6.35	21100	2535.0	5.41	6.26
21375	2562.5	4.65	5.53	21350	2560.0	4.66	5.50

Spectrum Plot of Worst Value

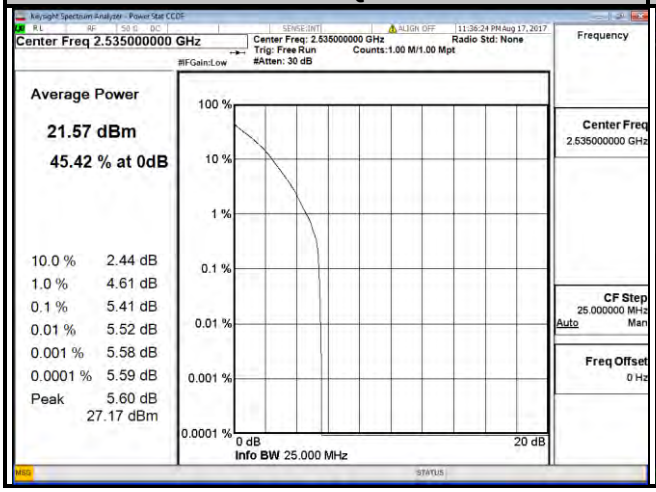
15 MHz / QPSK



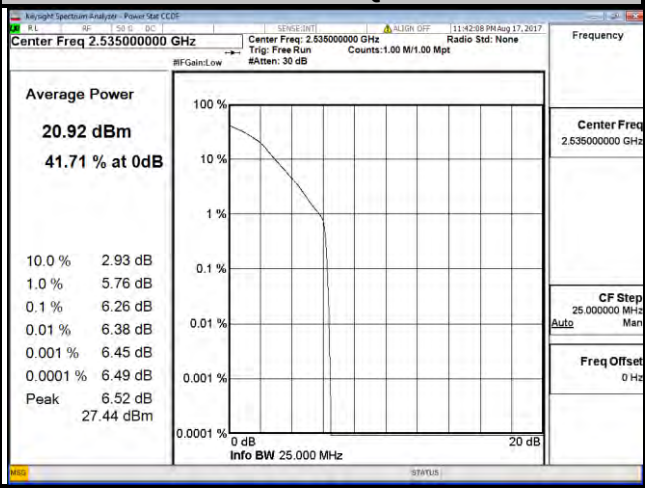
15 MHz / 16QAM



20 MHz / QPSK



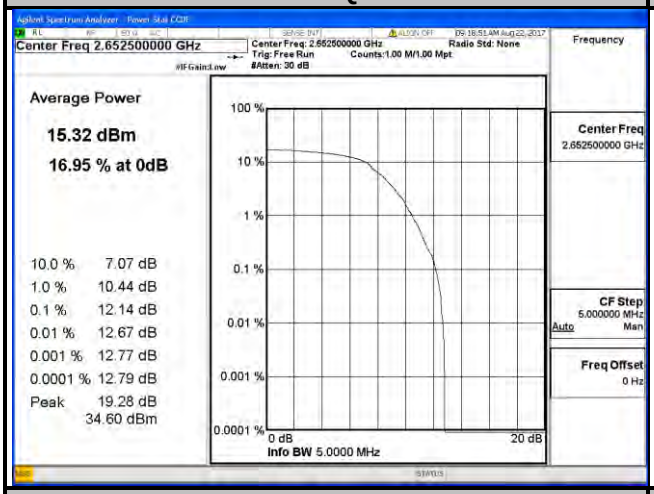
20 MHz / 16QAM



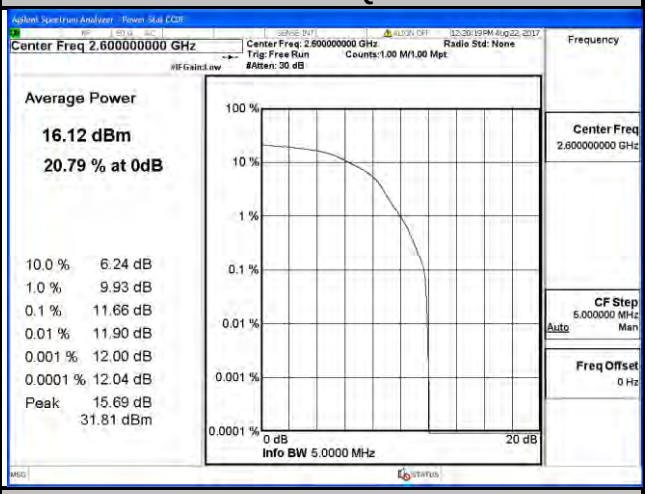
LTE Band 41							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
40165	2547.5	11.79	11.61	40190	2550.0	11.46	12.20
40690	2600.0	11.44	11.66	40690	2600.0	10.32	12.47
41215	2652.5	12.14	11.64	41190	2650.0	11.33	12.39

Spectrum Plot of Worst Value

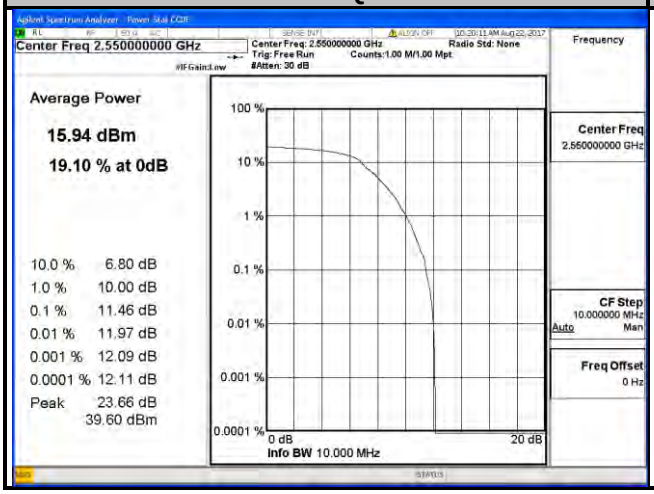
5 MHz / QPSK



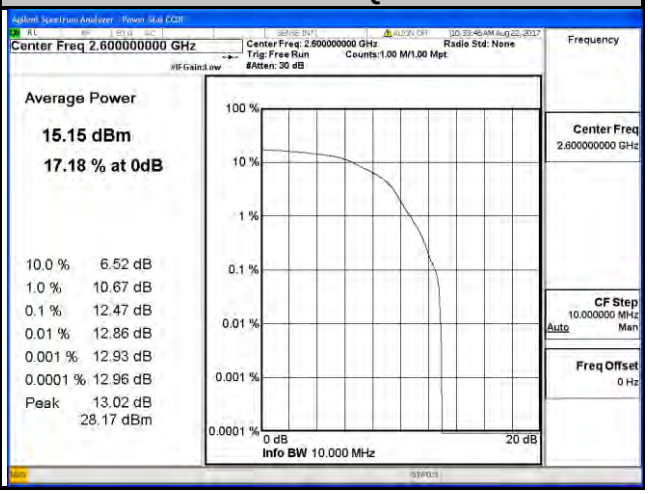
5 MHz / 16QAM



10 MHz / QPSK



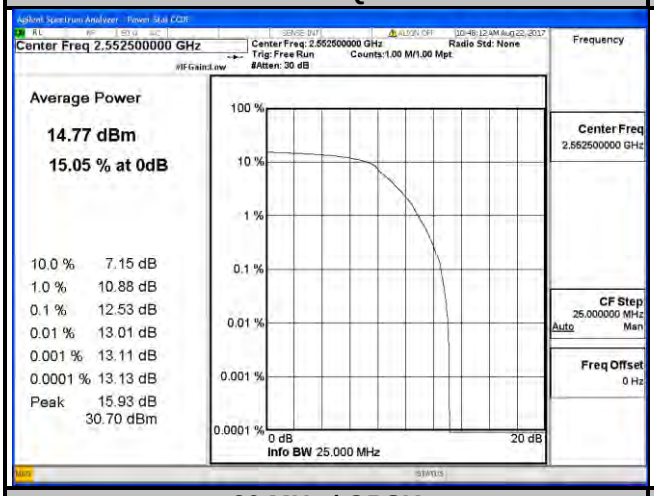
10 MHz / 16QAM



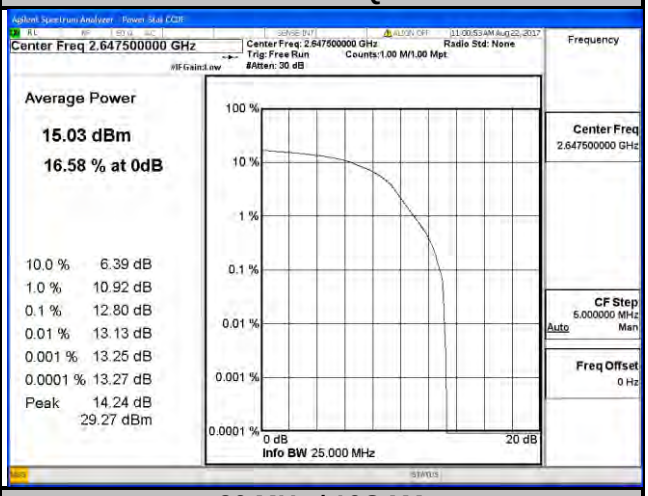
LTE Band 41							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
40215	2552.5	12.53	11.25	40240	2555.0	12.77	11.15
40690	2600.0	11.72	11.46	40690	2600.0	10.46	12.58
41165	2647.5	12.04	12.80	41140	2645.0	10.46	11.53

Spectrum Plot of Worst Value

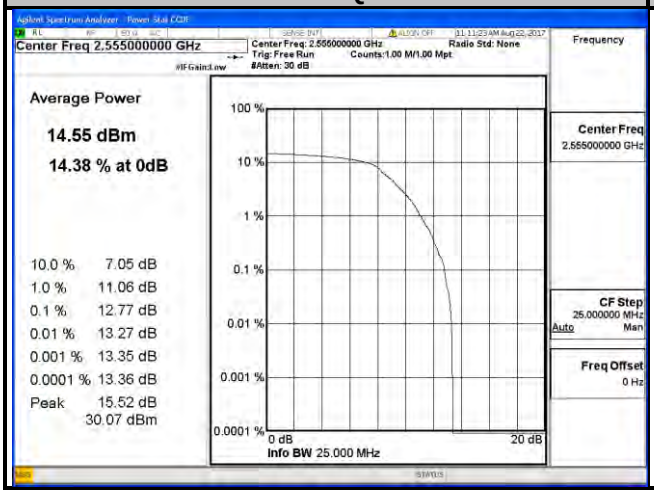
15 MHz / QPSK



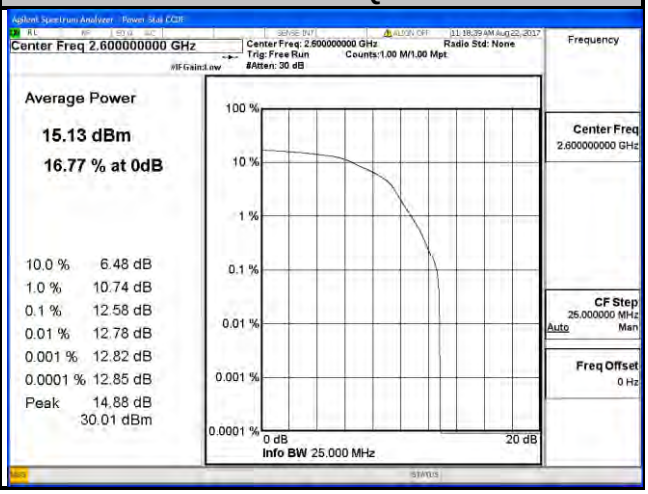
15 MHz / 16QAM



20 MHz / QPSK



20 MHz / 16QAM

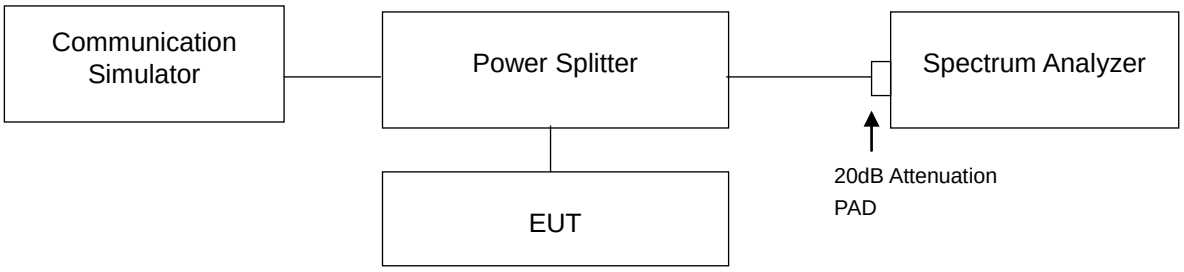


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25 dBm.

4.6.2 Test Setup

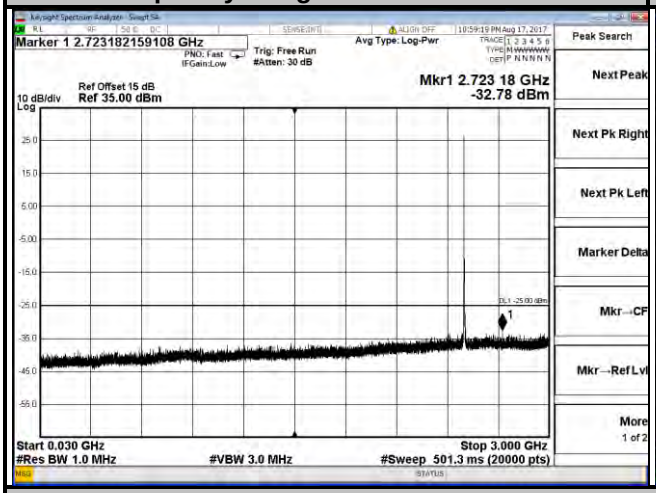
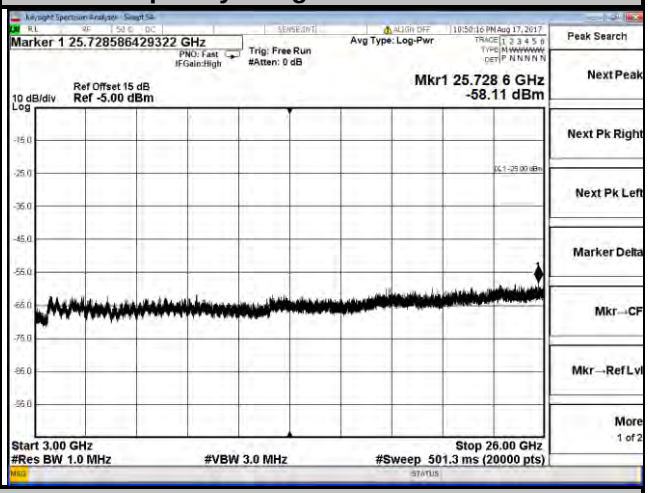
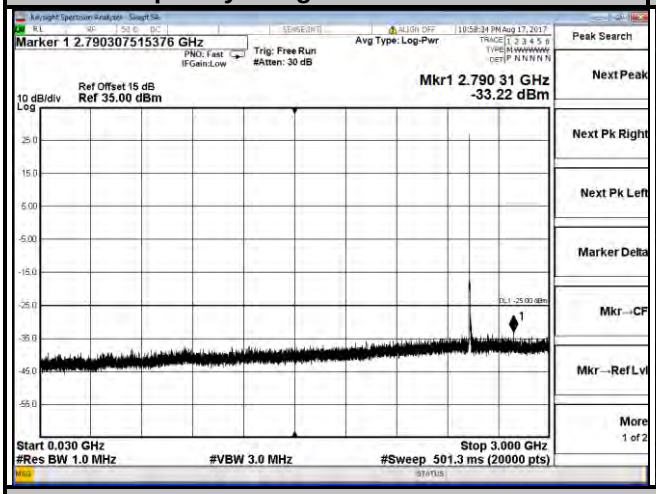
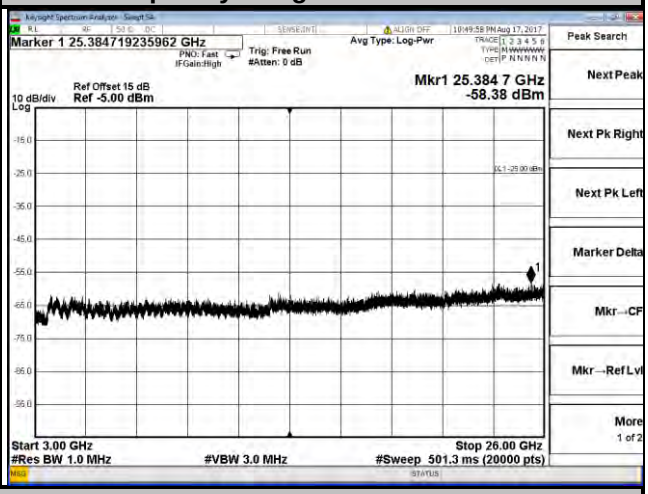
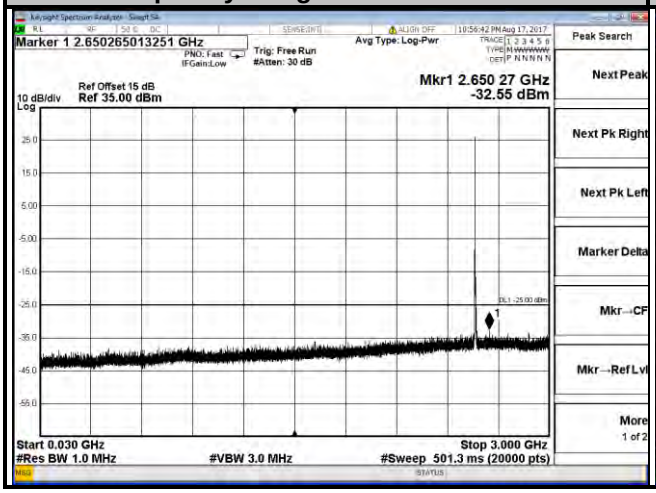
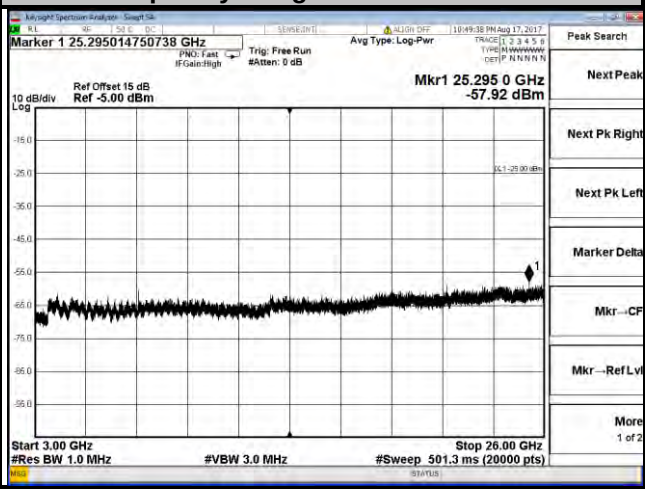


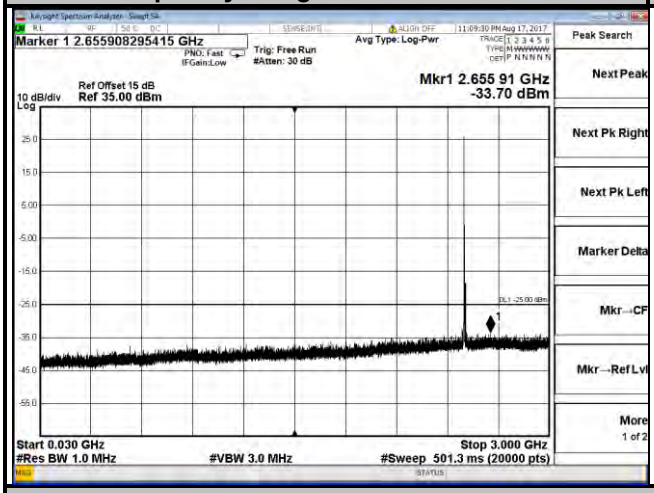
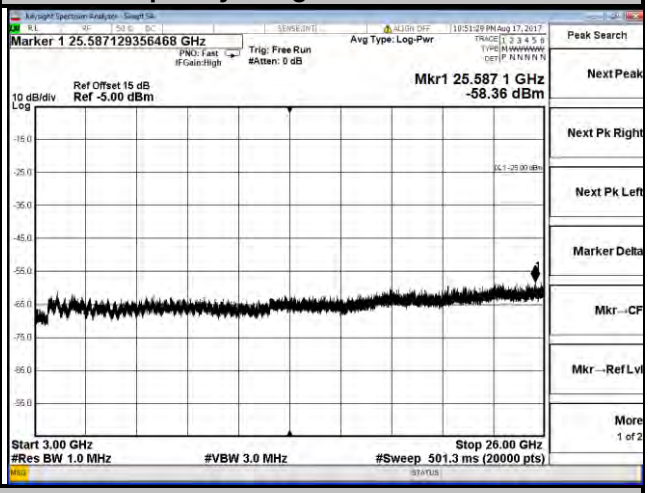
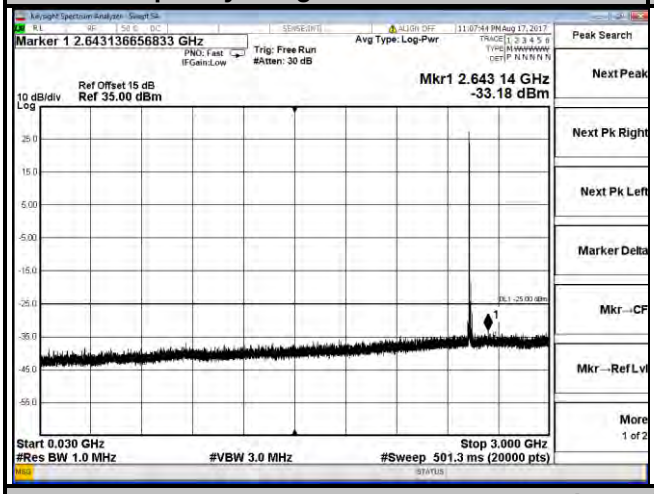
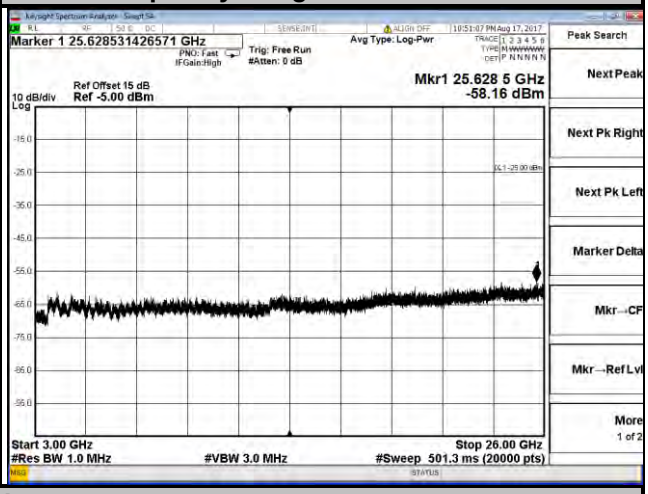
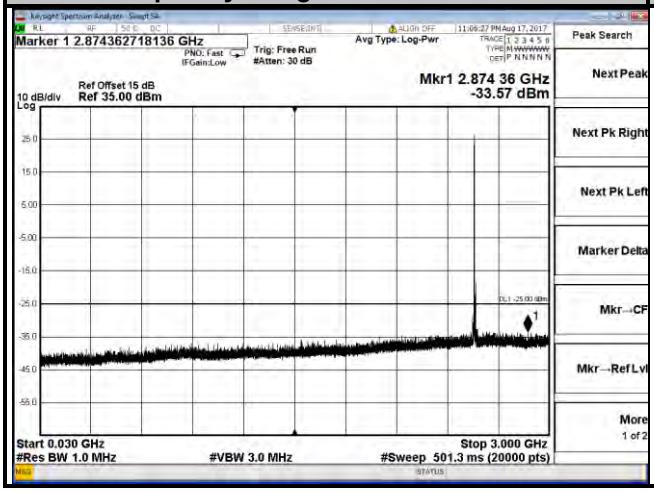
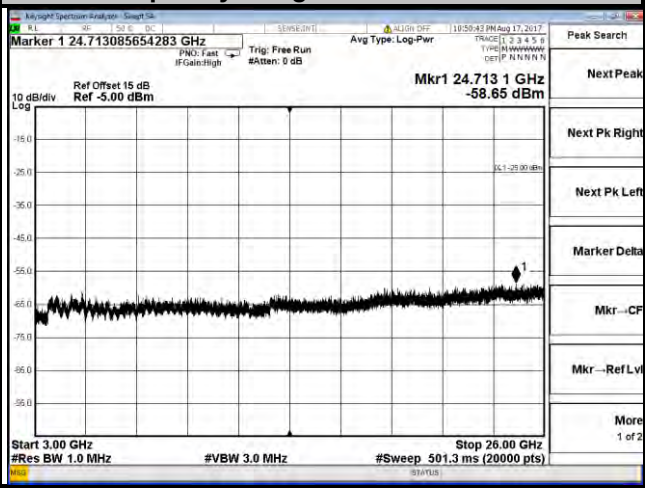
4.6.3 Test Procedure

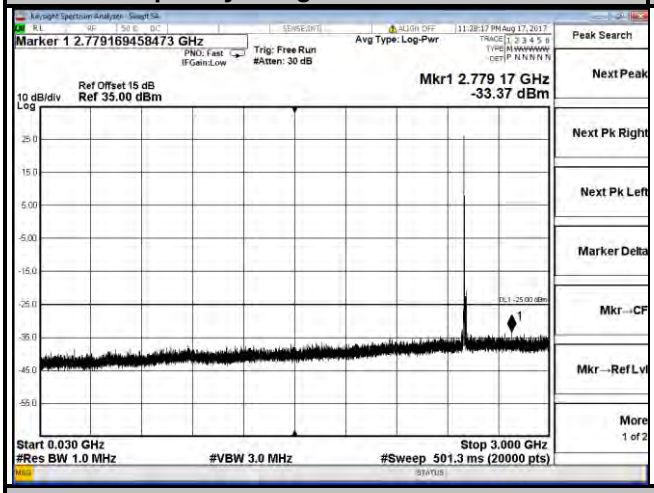
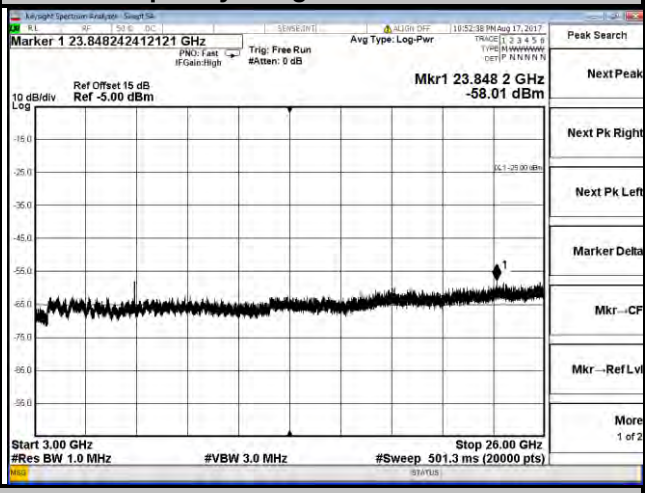
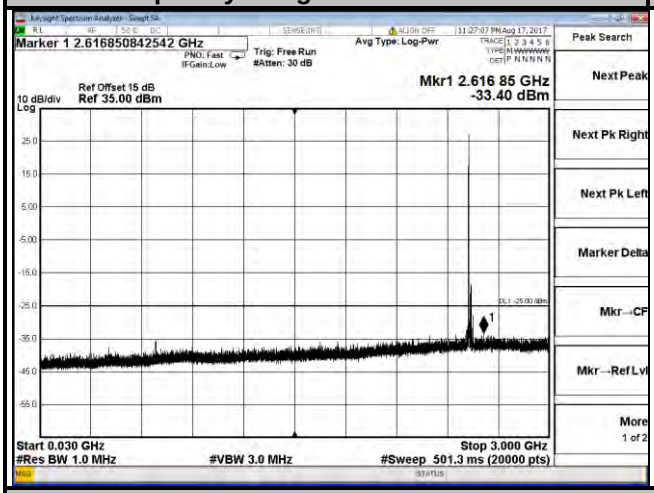
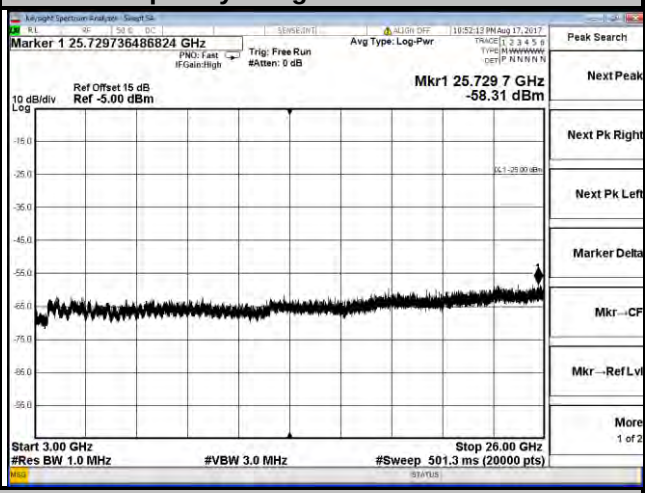
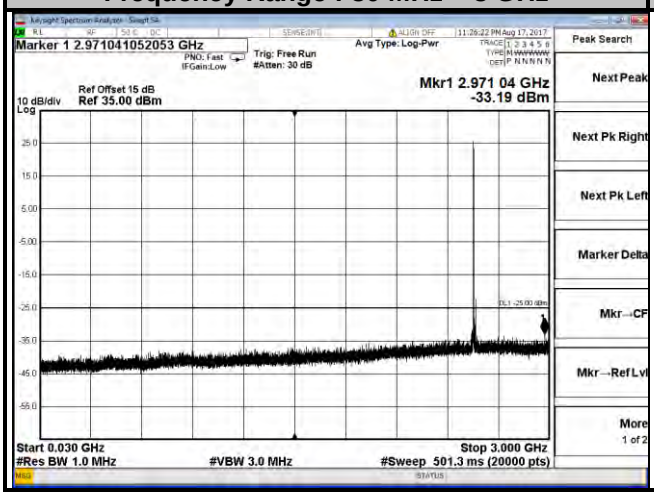
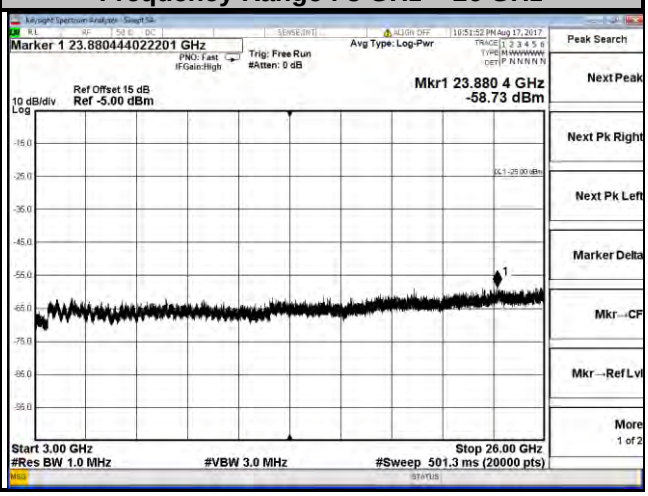
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

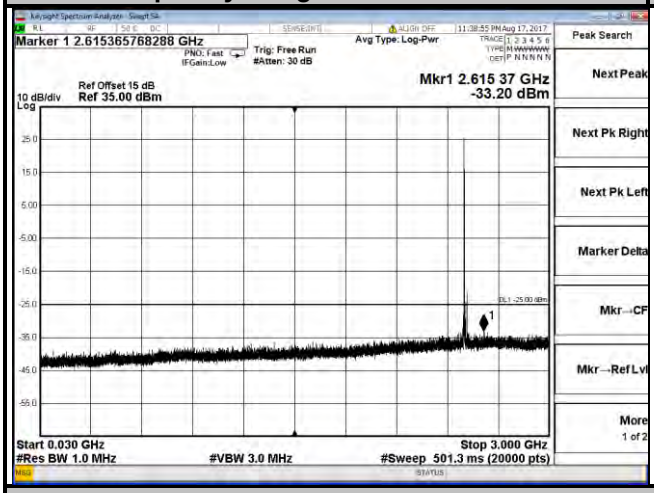
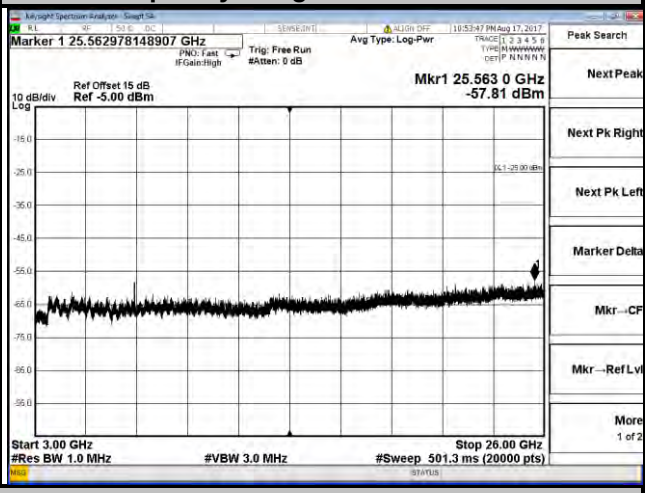
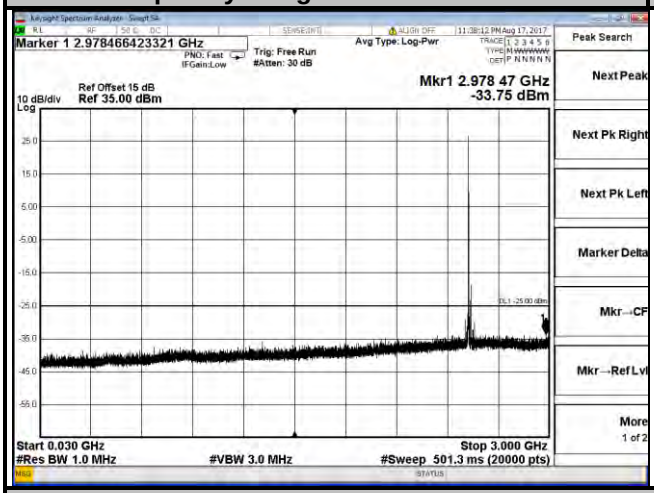
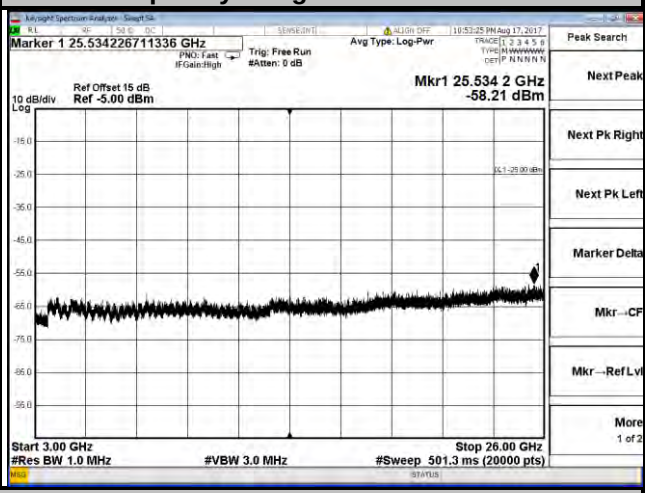
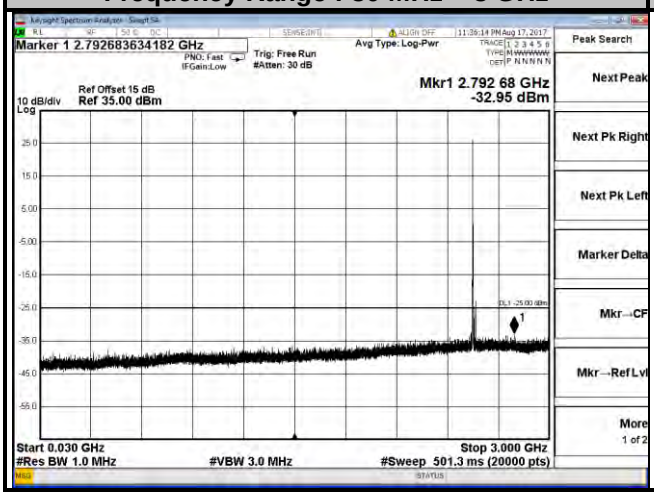
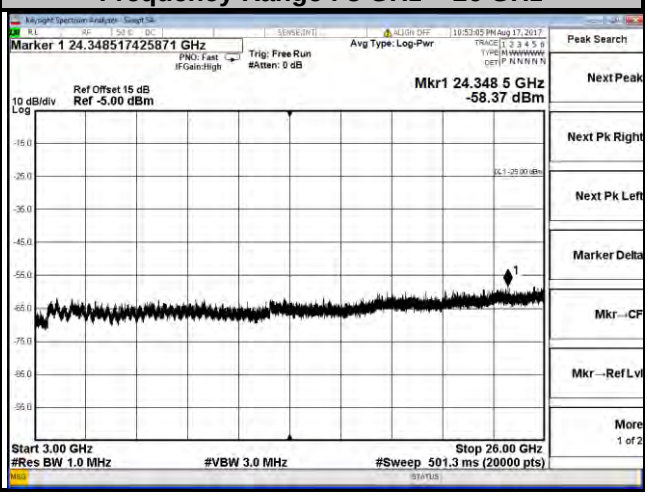
b. Measuring frequency range is from 30 MHz to 26 GHz for LTE Band 7 and from 30 MHz to 27 GHz for LTE Band 41. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

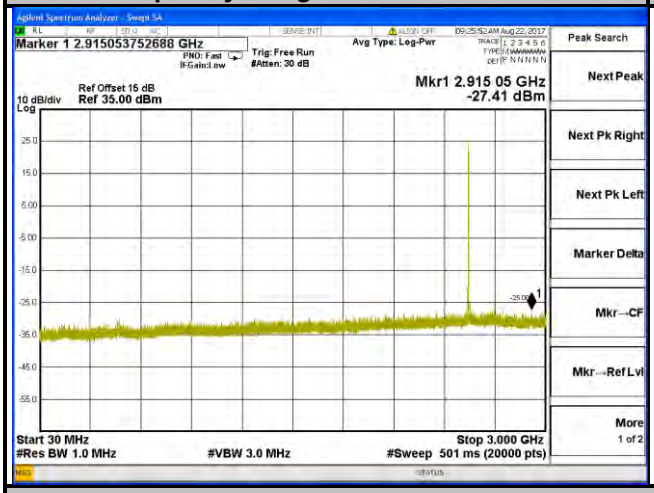
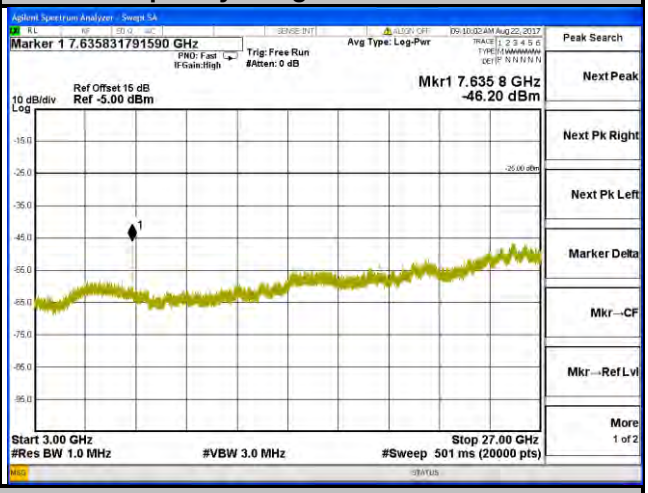
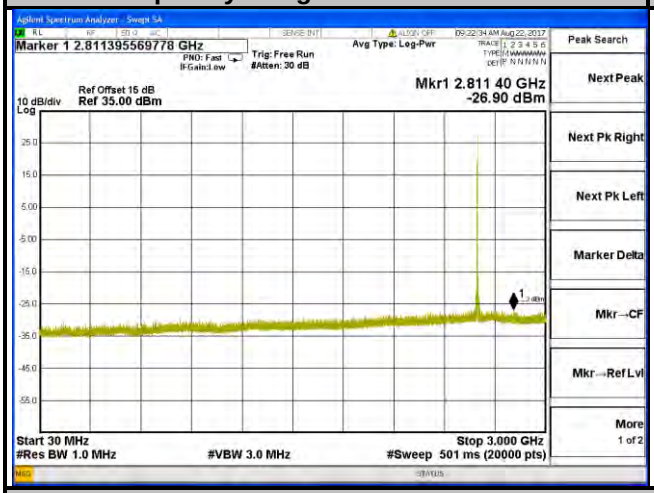
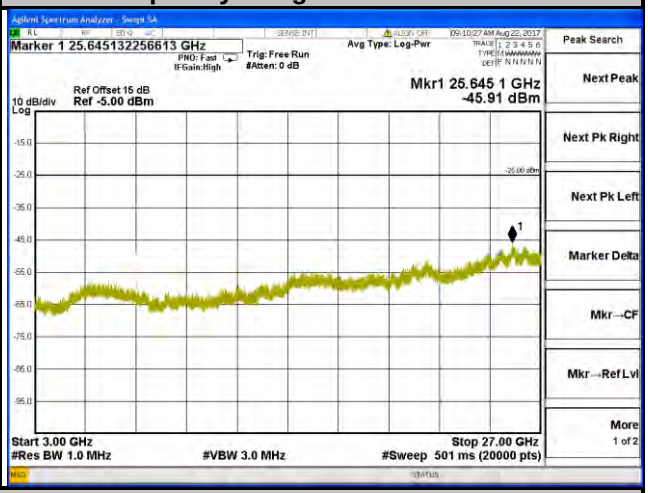
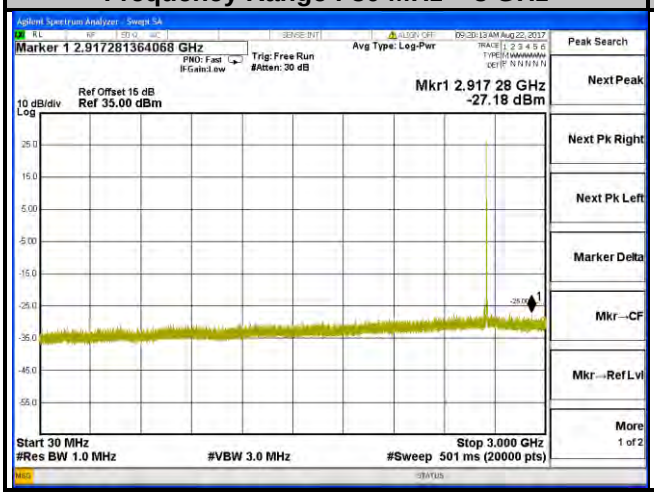
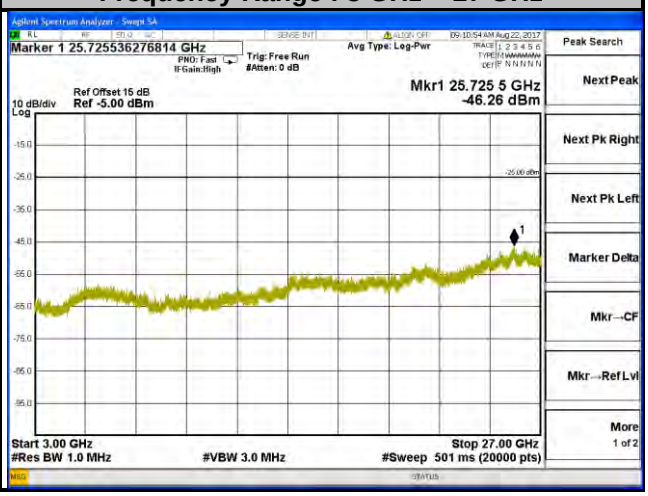
4.6.4 Test Results

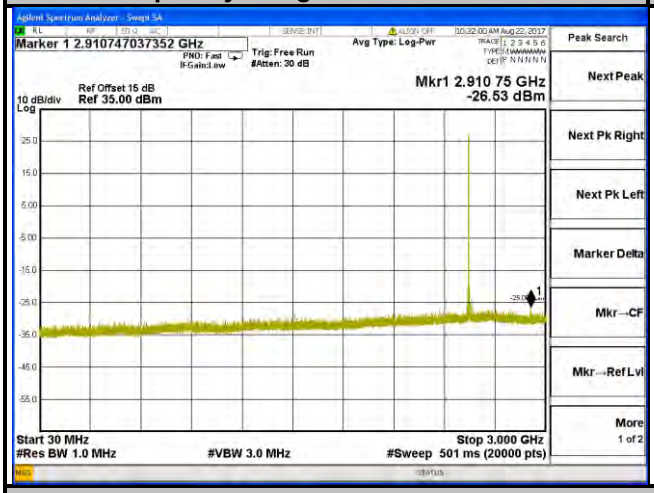
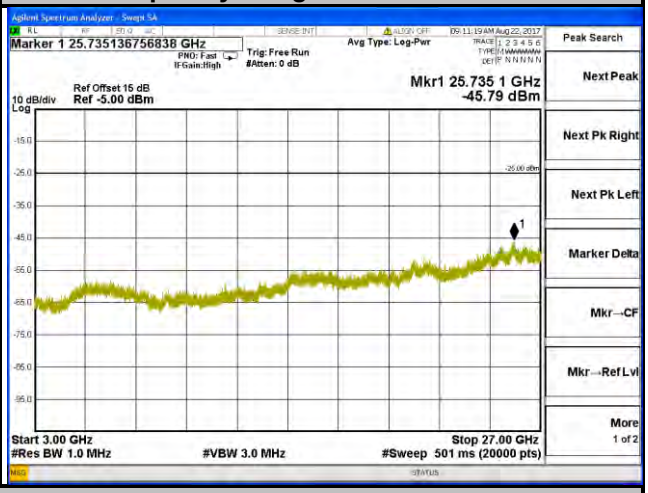
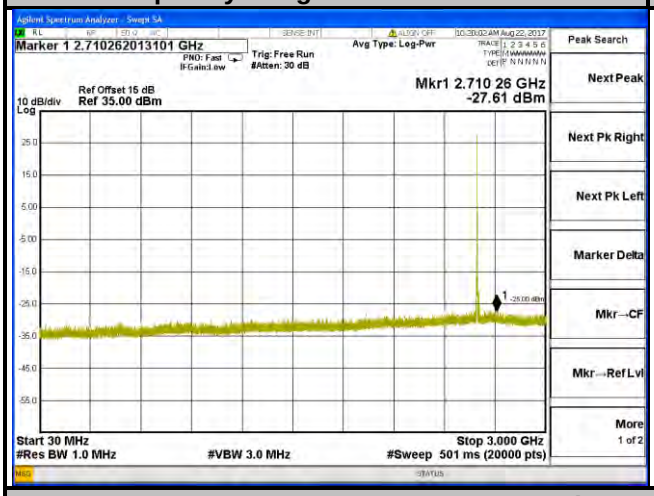
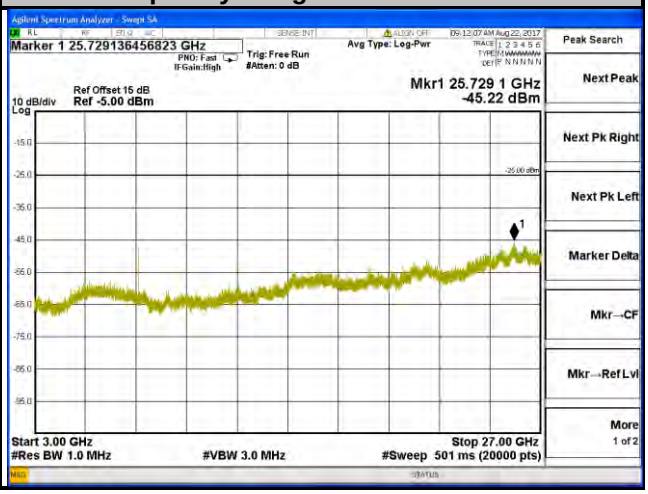
LTE Band 7	
Channel Bandwidth: 5 MHz	
Channel 20775	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21425	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

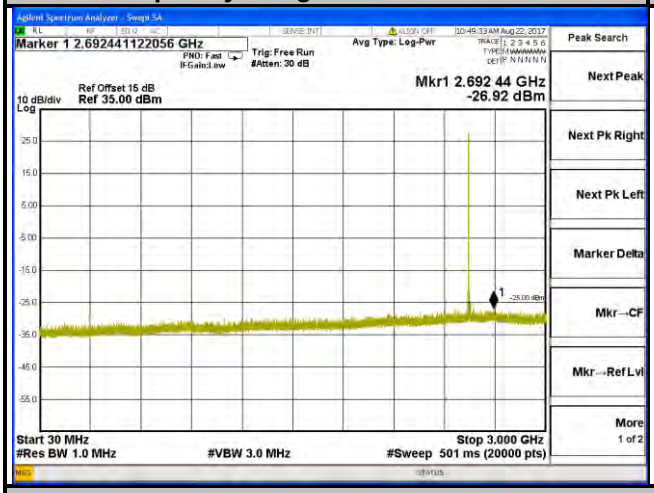
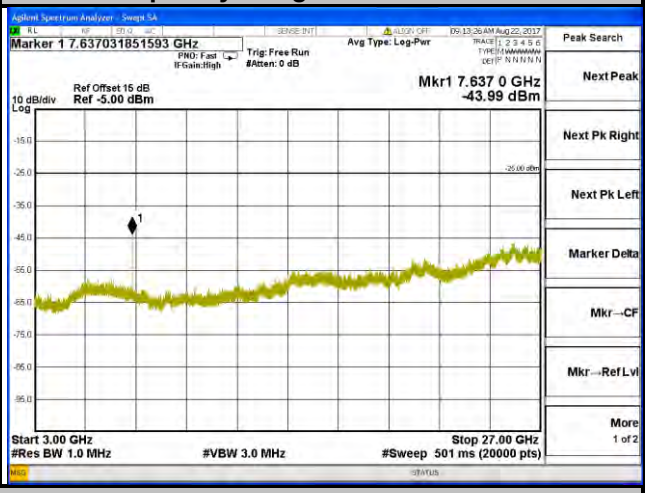
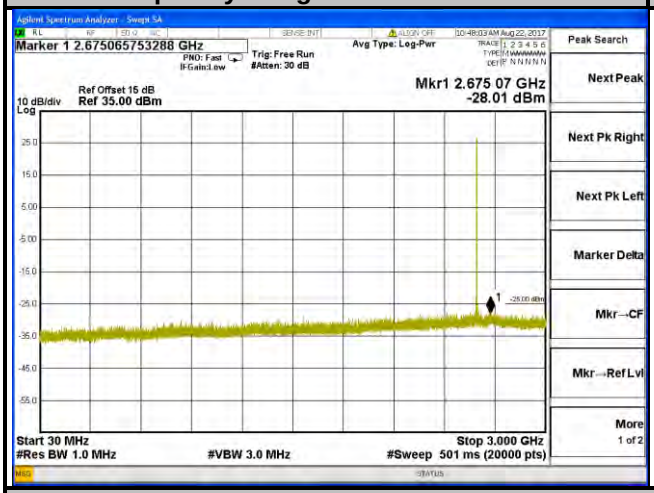
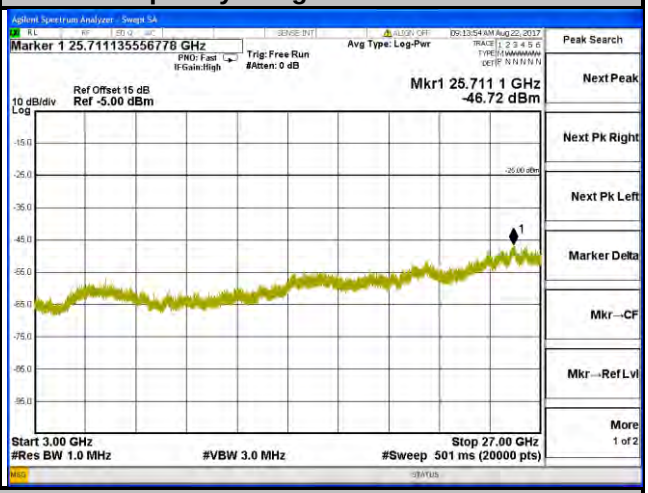
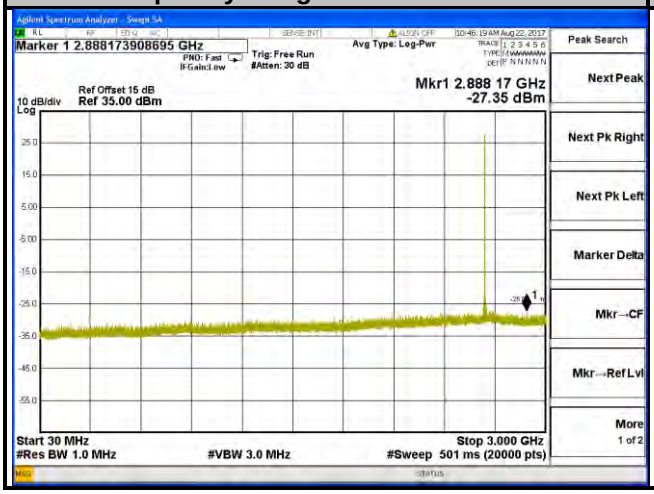
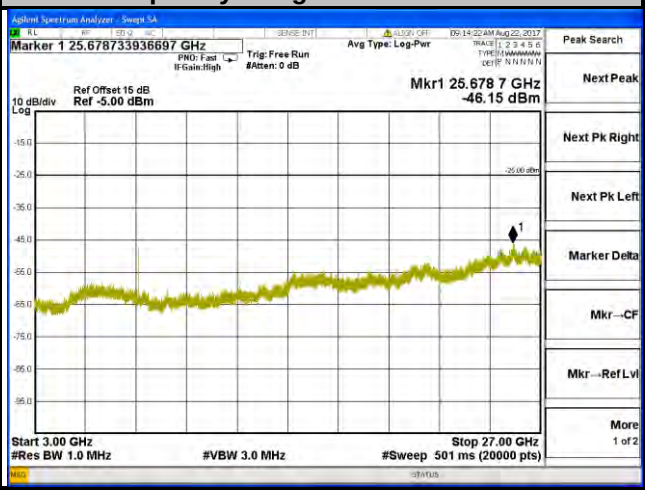
LTE Band 7	
Channel Bandwidth: 10 MHz	
Channel 20800	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21400	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

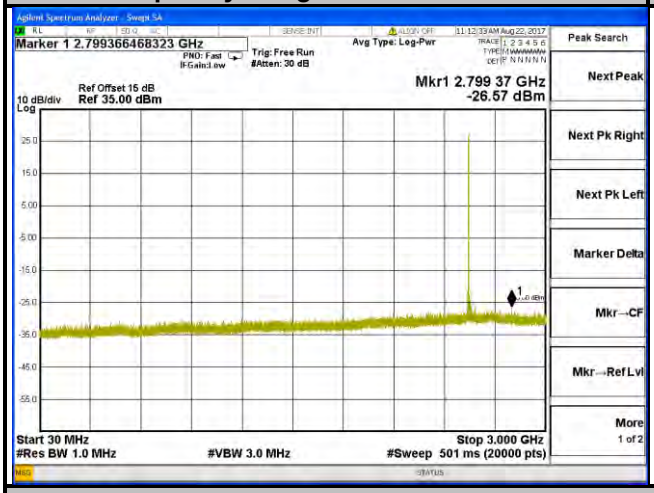
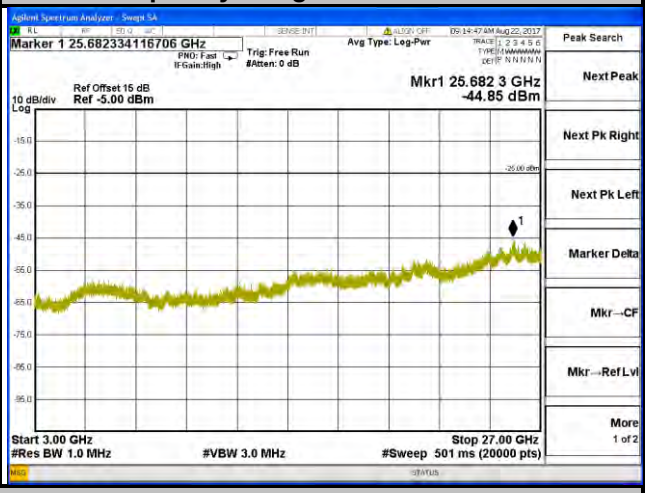
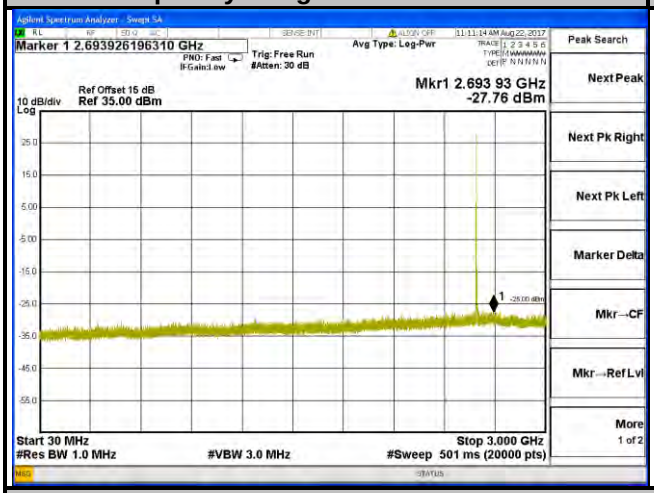
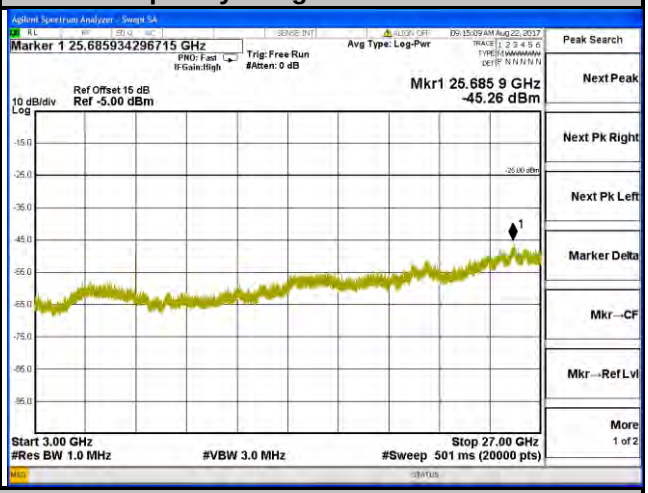
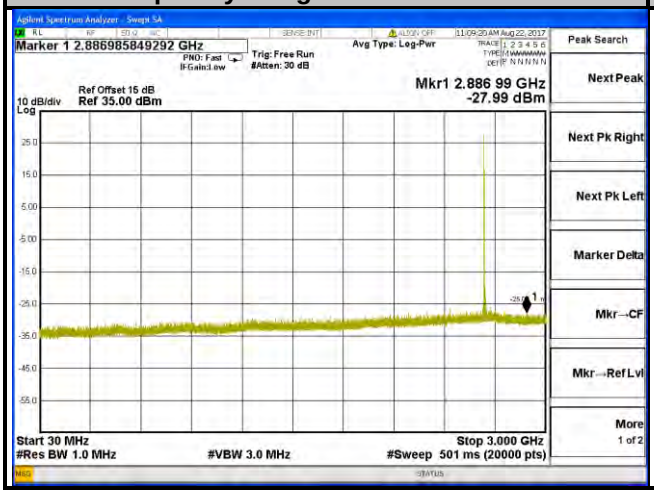
LTE Band 7	
Channel Bandwidth: 15 MHz	
Channel 20825	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21375	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

LTE Band 7	
Channel Bandwidth: 20 MHz	
Channel 20850	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21350	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

LTE Band 41	
Channel Bandwidth: 5 MHz	
Channel 40165	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 40690	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 41215	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 41	
Channel Bandwidth: 10 MHz	
Channel 40190	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 40690	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 41190	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 41	
Channel Bandwidth: 15 MHz	
Channel 40215	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 40690	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 41165	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 41	
Channel Bandwidth: 20 MHz	
Channel 40240	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 40690	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 41140	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25 dBm.

4.7.2 Test Procedure

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

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

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

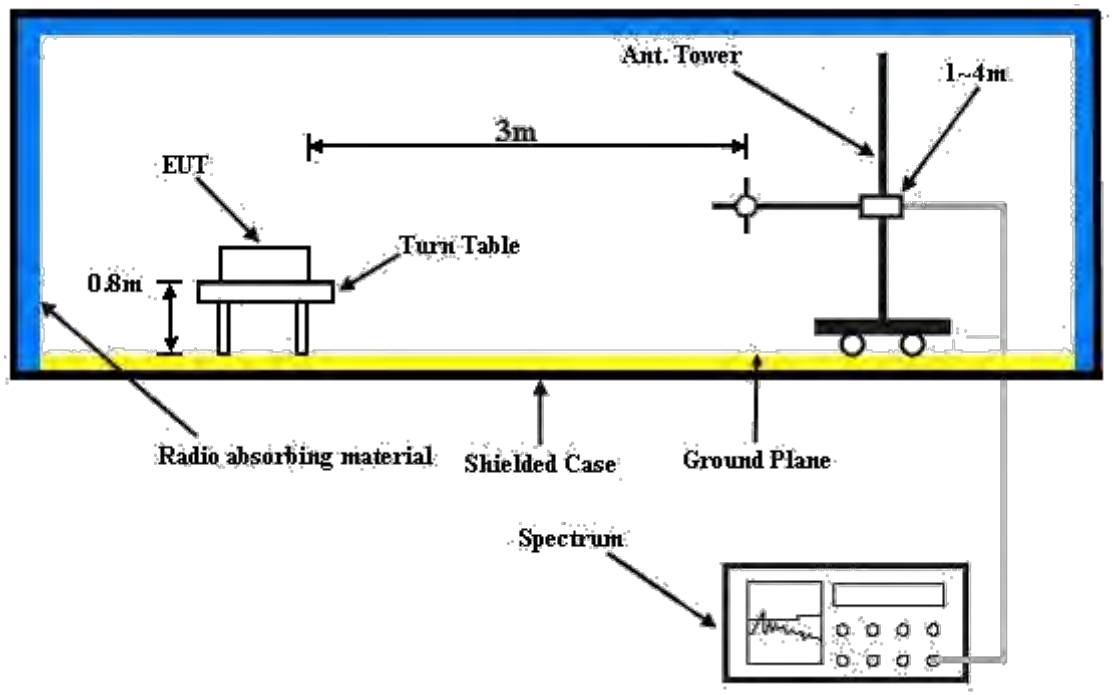
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup



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

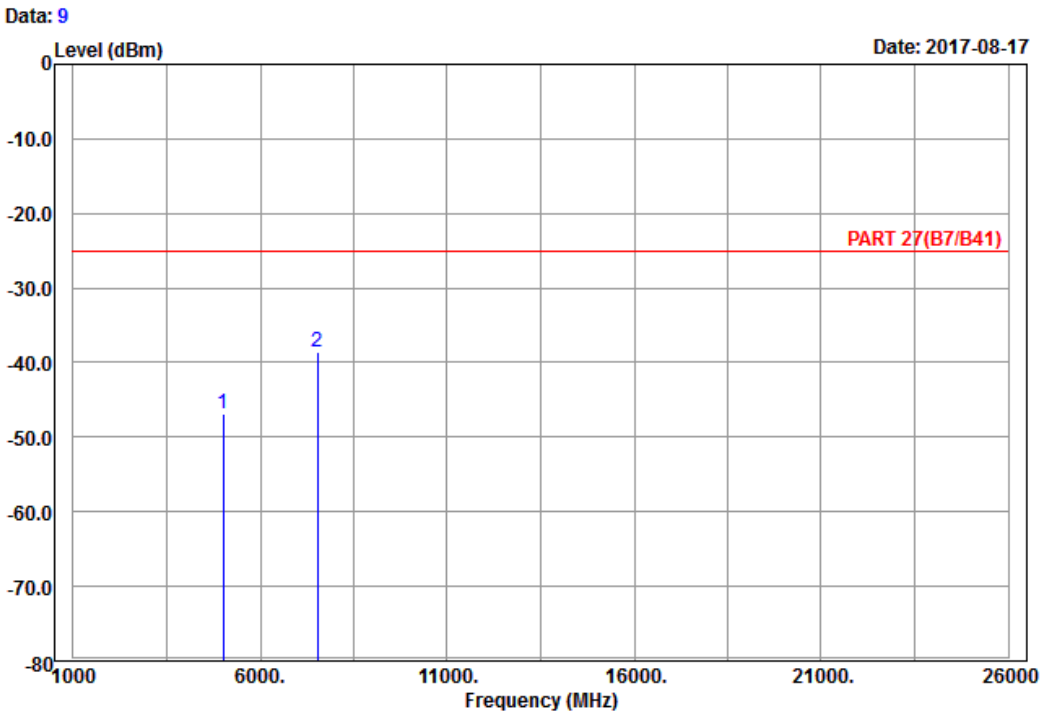
4.7.5 Test Results

LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

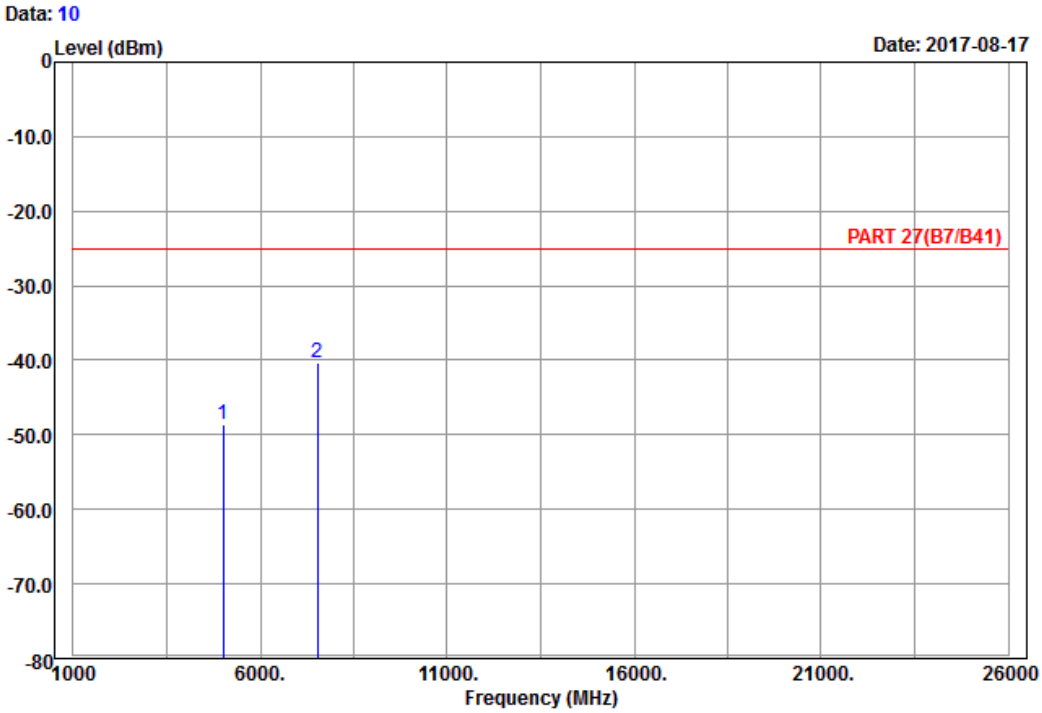
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark    : LTE_Band 7_Link_CH20850
Tested by: Charles Hsiao
                        Read  Limit   Over
           Freq  Level  Level   Line  Limit Factor Remark
          _______ ______ ______ ______ ______ ______ _________
                MHz    dBm    dBm    dBm     dB     dB

  1     5020.00 -46.79 -65.87 -25.00 -21.79  19.08 Peak
  2 pp  7530.00 -38.62 -61.47 -25.00 -13.62  22.85 Peak
```

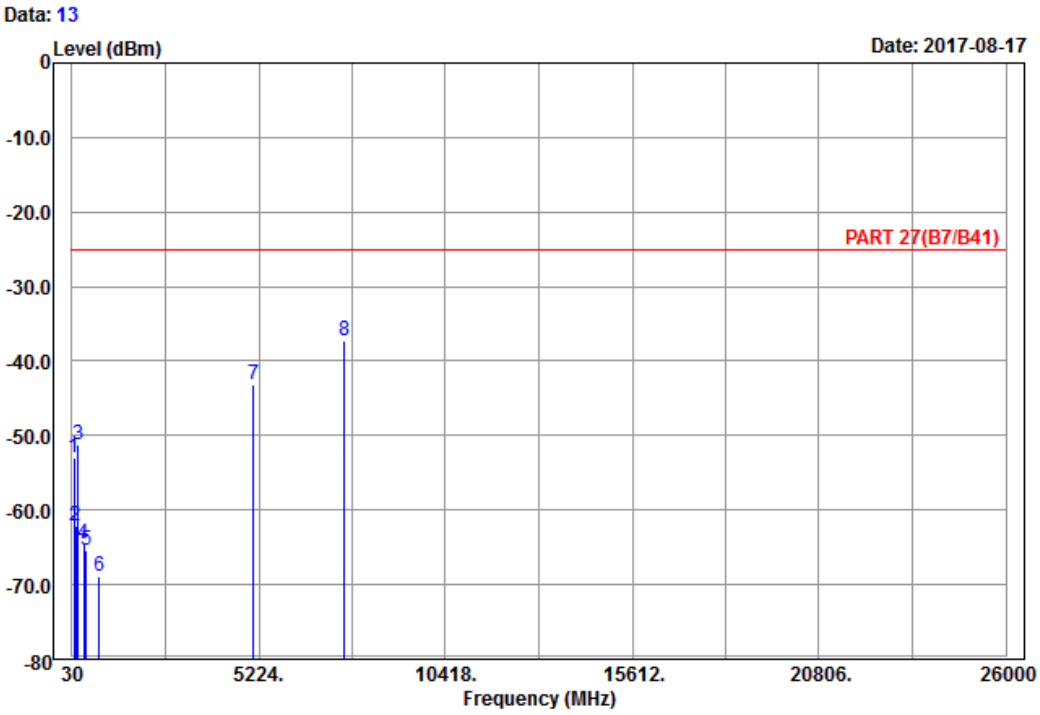


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20850
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5020.00	-48.55	-67.63	-25.00	-23.55	19.08	Peak
2 pp	7530.00	-40.30	-63.15	-25.00	-15.30	22.85	Peak

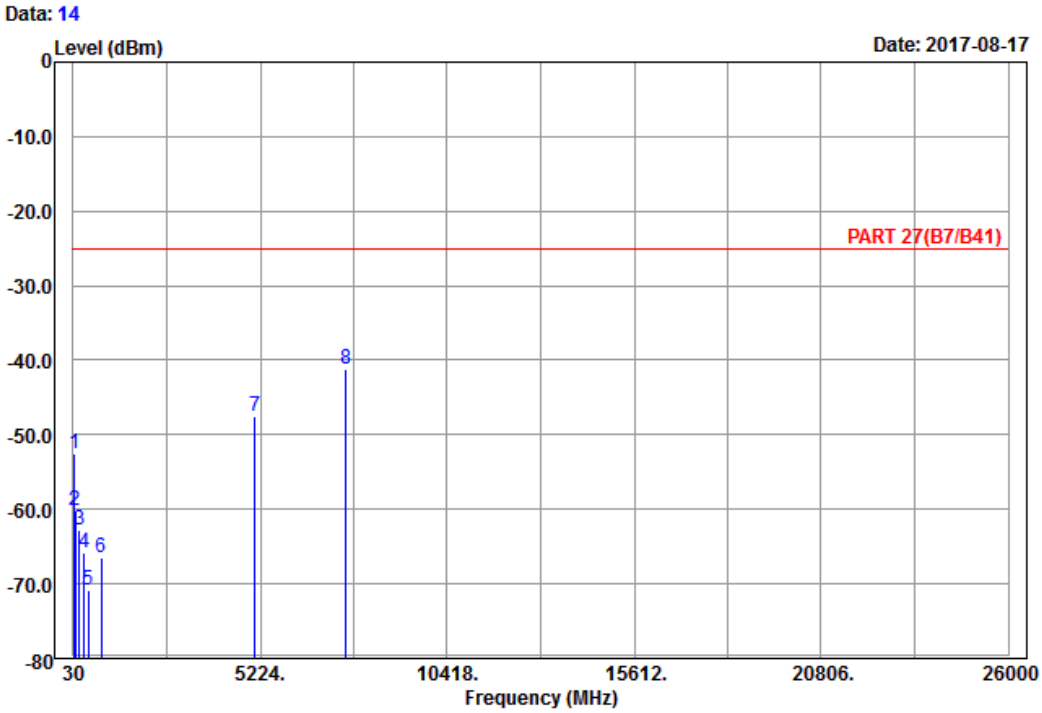
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21100
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	97.50	-52.89	-42.66	-25.00	-27.89	-10.23	Peak
2	139.08	-62.09	-54.40	-25.00	-37.09	-7.69	Peak
3	200.91	-51.31	-45.14	-25.00	-26.31	-6.17	Peak
4	348.30	-64.56	-59.16	-25.00	-39.56	-5.40	Peak
5	426.00	-65.29	-61.98	-25.00	-40.29	-3.31	Peak
6	791.40	-68.83	-70.27	-25.00	-43.83	1.44	Peak
7	5070.00	-43.05	-62.44	-25.00	-18.05	19.39	Peak
8 pp	7605.00	-37.33	-60.32	-25.00	-12.33	22.99	Peak



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	54.57	-52.58	-38.52	-25.00	-27.58	-14.06	Peak
2	96.15	-60.08	-49.74	-25.00	-35.08	-10.34	Peak
3	201.18	-62.79	-56.62	-25.00	-37.79	-6.17	Peak
4	336.40	-65.75	-60.22	-25.00	-40.75	-5.53	Peak
5	439.30	-70.81	-67.20	-25.00	-45.81	-3.61	Peak
6	806.80	-66.47	-68.40	-25.00	-41.47	1.93	Peak
7	5070.00	-47.49	-66.88	-25.00	-22.49	19.39	Peak
8 pp	7605.00	-41.10	-64.09	-25.00	-16.10	22.99	Peak

High Channel

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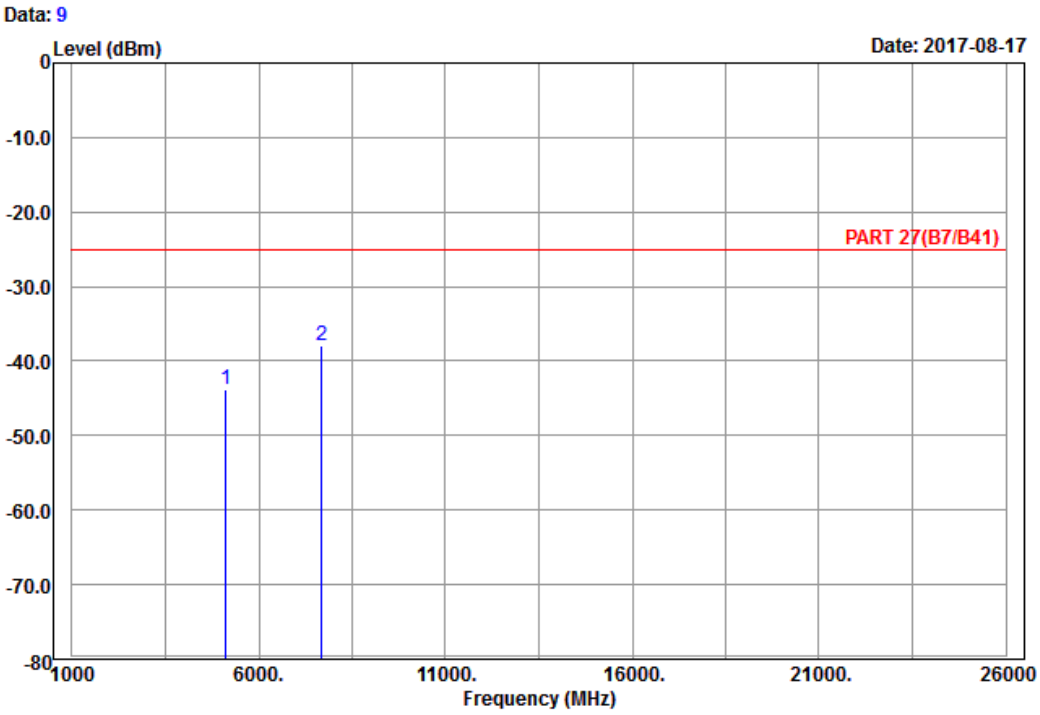
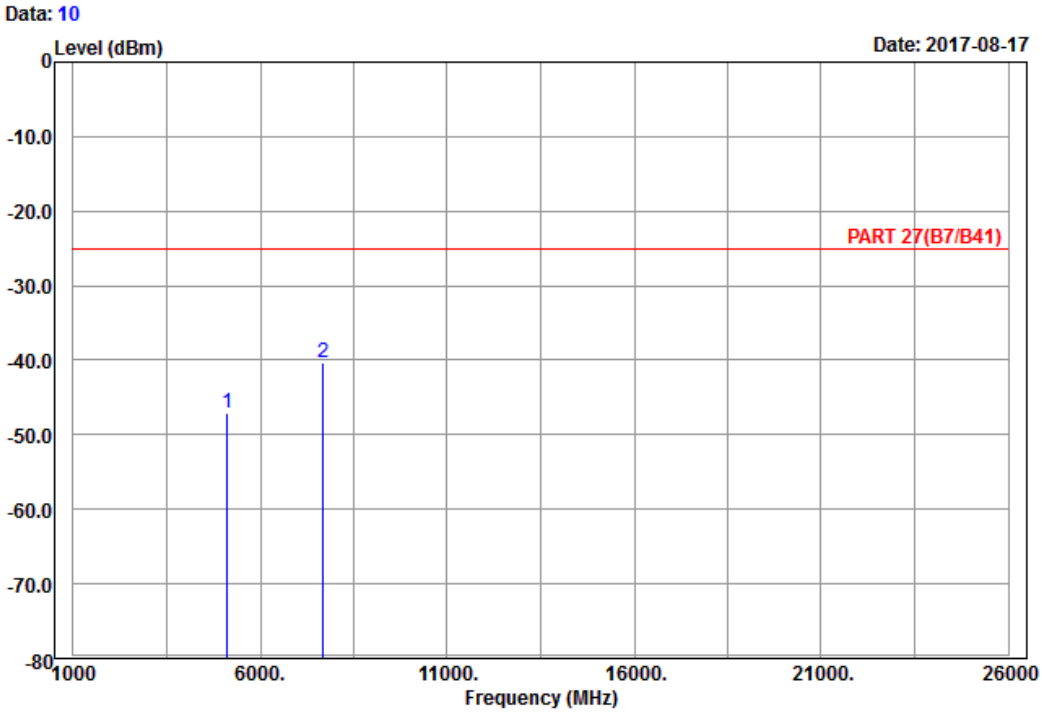


Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21350
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5120.00	-43.78	-63.49	-25.00	-18.78	19.71	Peak
2 pp	7680.00	-37.95	-61.07	-25.00	-12.95	23.12	Peak

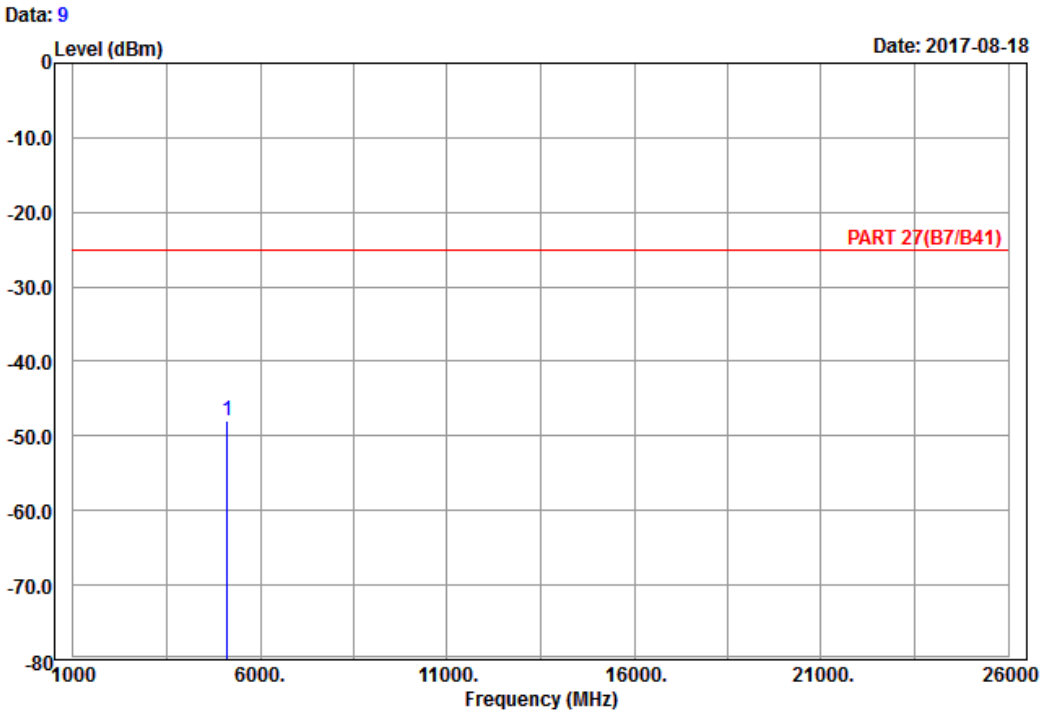


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21350
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5120.00	-46.99	-66.70	-25.00	-21.99	19.71	Peak
2 pp	7680.00	-40.35	-63.47	-25.00	-15.35	23.12	Peak

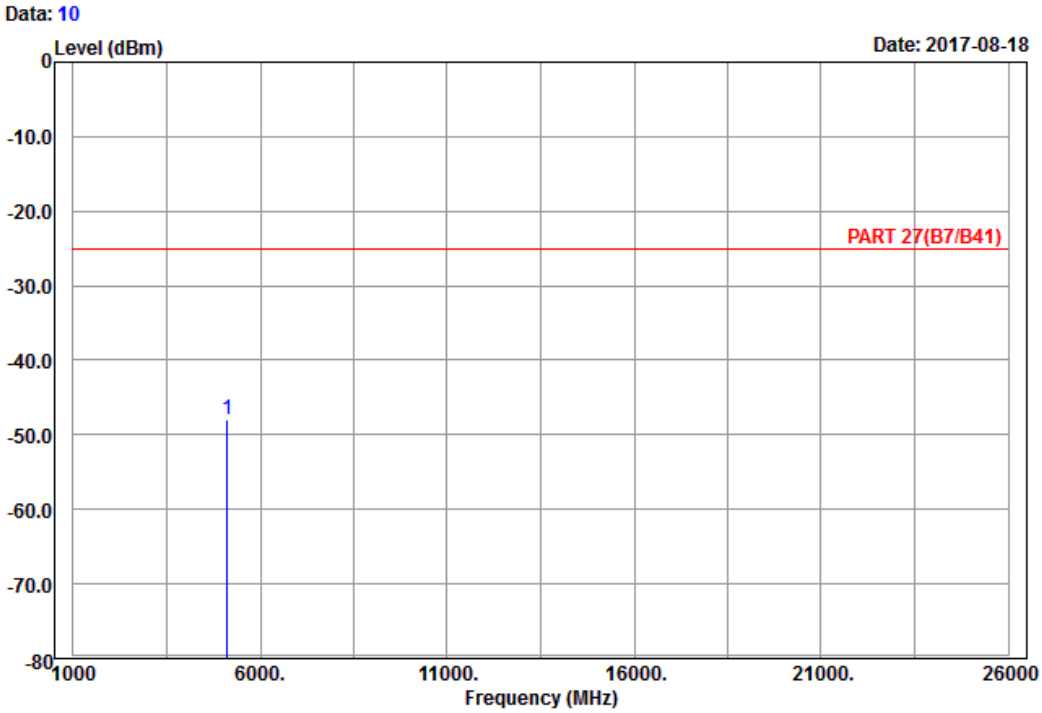
LTE Band 41
Channel Bandwidth: 20 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH40240
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5110.00	-47.94	-67.54	-25.00	-22.94	19.60	Peak

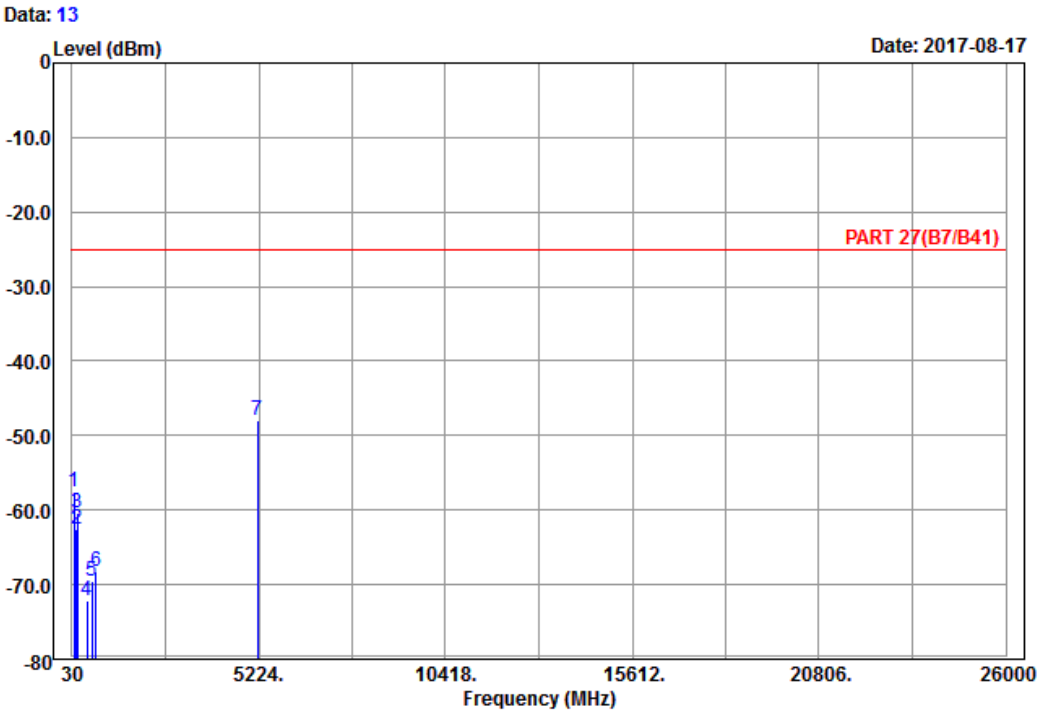


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40240
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5110.00	-48.00	-67.60	-25.00	-23.00	19.60	Peak

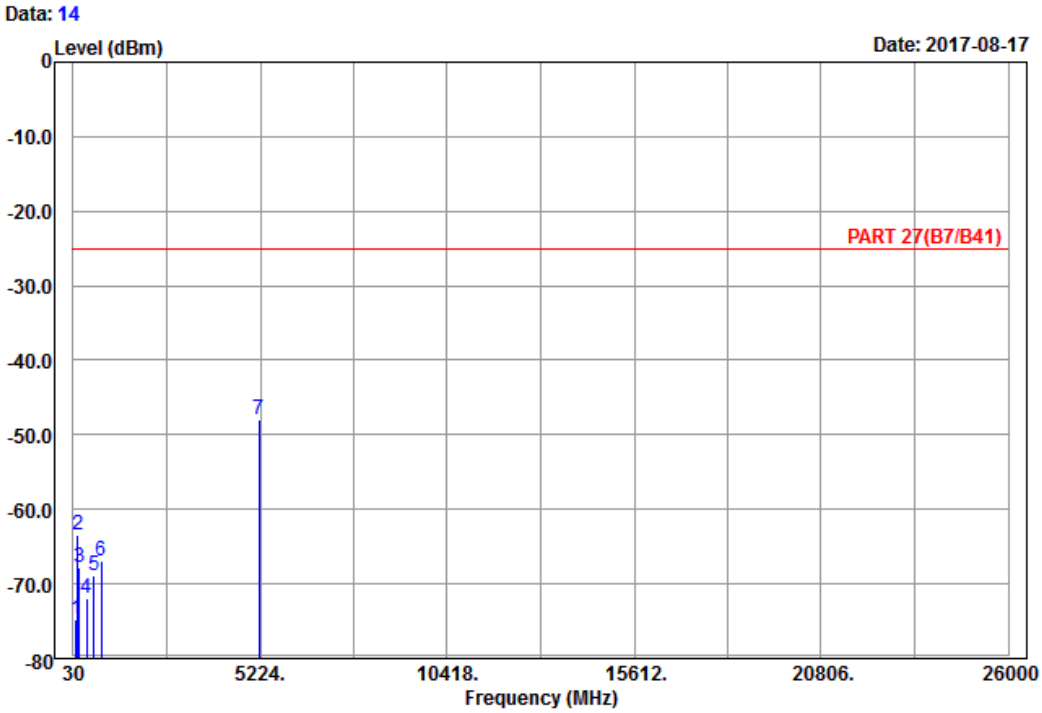
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH40690
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	97.50	-57.50	-47.27	-25.00	-32.50	-10.23	Peak
2	156.63	-62.65	-54.90	-25.00	-37.65	-7.75	Peak
3	187.95	-60.42	-54.72	-25.00	-35.42	-5.70	Peak
4	456.10	-72.10	-68.09	-25.00	-47.10	-4.01	Peak
5	576.50	-69.58	-69.00	-25.00	-44.58	-0.58	Peak
6	697.60	-68.14	-67.78	-25.00	-43.14	-0.36	Peak
7 pp	5200.00	-47.85	-67.97	-25.00	-22.85	20.12	Peak

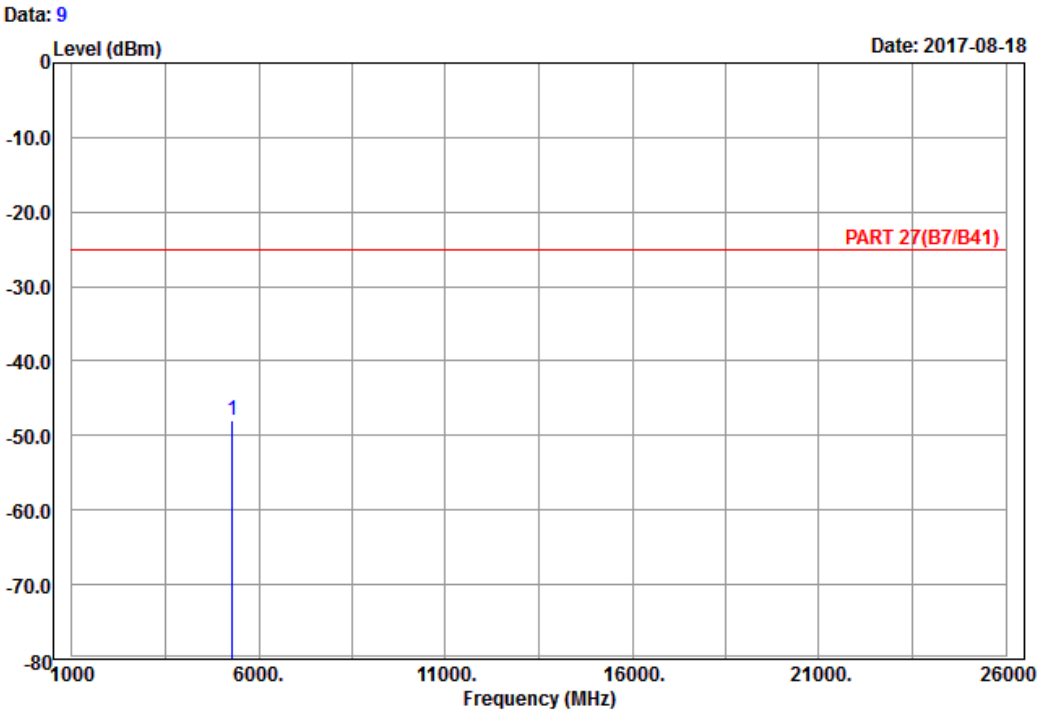


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40690
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	118.02	-74.77	-66.39	-25.00	-49.77	-8.38	Peak
2	153.39	-63.43	-55.57	-25.00	-38.43	-7.86	Peak
3	203.07	-67.90	-61.76	-25.00	-42.90	-6.14	Peak
4	405.70	-72.01	-69.14	-25.00	-47.01	-2.87	Peak
5	603.10	-68.94	-69.33	-25.00	-43.94	0.39	Peak
6	801.20	-66.87	-68.87	-25.00	-41.87	2.00	Peak
7 pp	5200.00	-47.85	-67.97	-25.00	-22.85	20.12	Peak

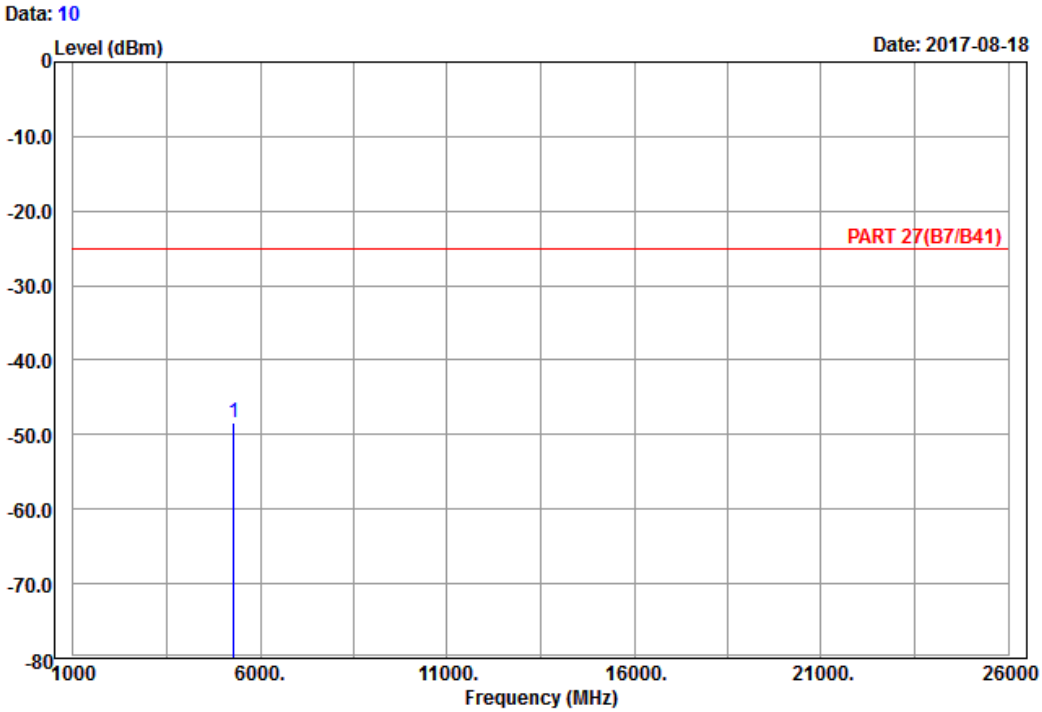
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH41140
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5290.00	-48.00	-68.22	-25.00	-23.00	20.22	Peak



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH41140
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5290.00	-48.32	-68.54	-25.00	-23.32	20.22	Peak

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

Hsin Chu EMC/RF/Telecom Lab
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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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