FCC Test Report

(PART 27)

Report No.: RF171218C14-10

FCC ID: NM82Q55200

Test Model: 2Q55200

Received Date: Dec. 18, 2017

Test Date: Dec. 23, 2017 ~ Feb. 05, 2018

Issued Date: Feb. 08, 2018

Applicant: HTC Corporation

Address: 88 Section 3, Zhongxing Road, Xindian District, New Taipei City 231, 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

FCC Registration / Designation Number: 788550 / TW0003
427177 / TW0011

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

Table of Contents

Release Control Record **3**

1 Certificate of Conformity **4**

2 Summary of Test Results **5**

2.1 Measurement Uncertainty 5
2.2 Test Site and Instruments 6

3 General Information **8**

3.1 General Description of EUT 8
3.2 Configuration of System under Test 9
3.2.1 Description of Support Units 9
3.3 Test Mode Applicability and Tested Channel Detail 10
3.4 EUT Operating Conditions 13
3.5 General Description of Applied Standards 13

4 Test Types and Results **14**

4.1 Output Power Measurement 14
4.1.1 Limits of Output Power Measurement 14
4.1.2 Test Procedures 14
4.1.3 Test Setup 15
4.1.4 Test Results 16
4.2 Frequency Stability Measurement 27
4.2.1 Limits of Frequency Stabiliity Measurement 27
4.2.2 Test Procedure 27
4.2.3 Test Setup 27
4.2.4 Test Results 28
4.3 Occupied Bandwidth Measurement 37
4.3.1 Limits of Occupied Bandwidth Measurement 37
4.3.2 Test Procedure 37
4.3.3 Test Setup 37
4.3.4 Test Result 38
4.4 Out-of-Band Emissions Measurement 43
4.4.1 Limits of Out-of-Band Emissions Measurement 43
4.4.2 Test Setup 43
4.4.3 Test Procedures 43
4.4.4 Test Results 44
4.5 Peak to Average Ratio 68
4.5.1 Limits of Peak to Average Ratio Measurement 68
4.5.2 Test Setup 68
4.5.3 Test Procedures 68
4.5.4 Test Results 69
4.6 Conducted Spurious Emissions 74
4.6.1 Limits of Conducted Spurious Emissions Measurement 74
4.6.2 Test Setup 74
4.6.3 Test Procedure 74
4.6.4 Test Results 75
4.7 Radiated Emission Measurement 100
4.7.1 Limits of Radiated Emission Measurement 100
4.7.2 Test Procedure 100
4.7.3 Deviation from Test Standard 100
4.7.4 Test Setup 101
4.7.5 Test Results 102

5 Pictures of Test Arrangements **116**

Appendix – Information on the Testing Laboratories **117**

Release Control Record

Issue No.	Description	Date Issued
RF171218C14-10	Original Release	Feb. 08, 2018

1 Certificate of Conformity

Product: Smartphone

Brand: HTC

Test Model: 2Q55200

Sample Status: Production Unit

Applicant: HTC Corporation

Test Date: Dec. 23, 2017 ~ Feb. 05, 2018

Standards: FCC Part 27, Subpart C, M

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

Prepared by : _____ , **Date:** Feb. 08, 2018

Ivonne Wu / Supervisor

Approved by : _____ , **Date:** Feb. 08, 2018

Dylan Chiou / 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)	Out-of-Band Emissions 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 -12.54 dB at 8040.00 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) (±)
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
Signal Analyzer Keysight	N9010A	MY56070348	Sep. 13, 2017	Sep. 12, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Aug. 21, 2017	Aug. 20, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 26, 2017	Jun. 25, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 26, 2017	Jun. 25, 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
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The 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 IC Site Registration No. is IC7450I-1.

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Nov. 23, 2017	Nov. 22, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
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
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 30, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 13, 2017	Oct. 12, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8000&3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450F-10.

3 General Information

3.1 General Description of EUT

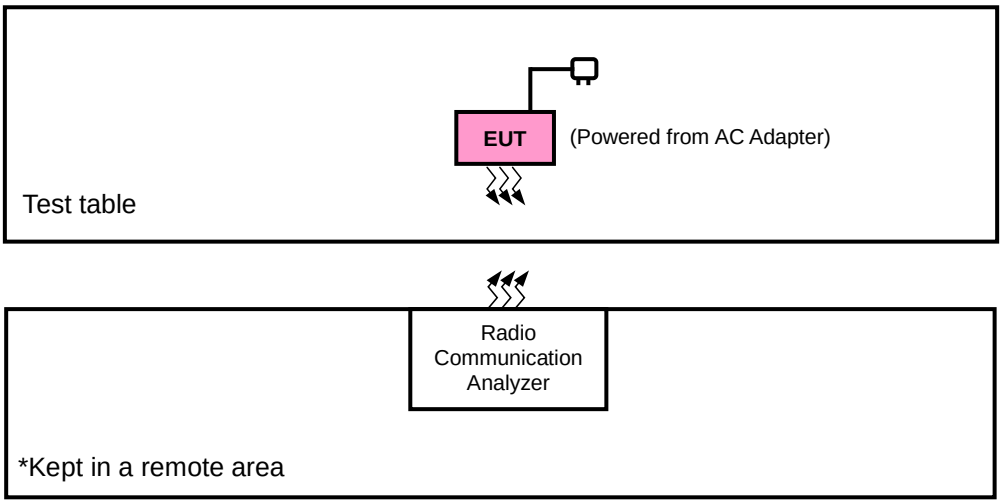
Product	Smartphone	
Brand	HTC	
Test Model	2Q55200	
Status of EUT	Production Unit	
Power Supply Rating	5 Vdc or 9 Vdc or 12 Vdc (adapter) 5.0 Vdc (host equipment) 3.85 Vdc (Li-ion battery)	
Modulation Type	QPSK, 16QAM, 64QAM	
Frequency Range	LTE Band 7 (Channel Bandwidth: 5 MHz)	2502.5 ~ 2567.5 MHz
	LTE 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)	2498.5 ~ 2687.5 MHz
	LTE Band 41 (Channel Bandwidth: 10 MHz)	2501.0 ~ 2685.0 MHz
	LTE Band 41 (Channel Bandwidth: 15 MHz)	2503.5 ~ 2682.5 MHz
	LTE Band 41 (Channel Bandwidth: 20 MHz)	2506.0 ~ 2680.0 MHz
Max. EIRP Power	LTE Band 7 (Channel Bandwidth: 5 MHz)	300.47 mW
	LTE Band 7 (Channel Bandwidth: 10 MHz)	307.11 mW
	LTE Band 7 (Channel Bandwidth: 15 MHz)	305.28 mW
	LTE Band 7 (Channel Bandwidth: 20 MHz)	311.67 mW
	CA LTE Band 7 (Channel Bandwidth: 20+20 MHz)	78.34 mW
	LTE Band 41 (Channel Bandwidth: 5 MHz)	256.27 mW
	LTE Band 41 (Channel Bandwidth: 10 MHz)	253.10 mW
	LTE Band 41 (Channel Bandwidth: 15 MHz)	256.86 mW
	LTE Band 41 (Channel Bandwidth: 20 MHz)	260.44 mW
Emission Designator	LTE Band 7 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 7 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 7 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 7 (Channel Bandwidth: 20 MHz)	17M9W7D
	LTE Band 7 (Channel Bandwidth: 20+20 MHz)	37M6G7D
	LTE Band 41 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 41 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 41 (Channel Bandwidth: 15 MHz)	13M4G7D
	LTE Band 41 (Channel Bandwidth: 20 MHz)	17M9W7D
Antenna Type	Fixed Internal Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

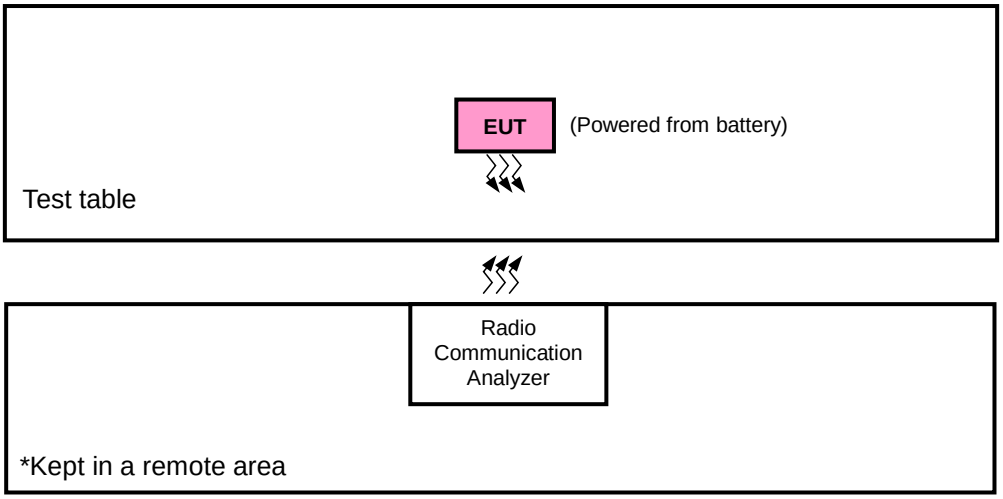
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.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. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Communications Tester-Wireless	Agilent	8960 Series 10	MY53201073	N/A
2.	Radio Communication Analyzer	ANRITSU	MT8821C	6201502978	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1~2 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

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

SIM	Band	EIRP	Radiated Emission
1	LTE Band 7	X-plane	X-axis
	CA LTE Band 7	Z-plane	X-axis
	LTE Band 41	X-plane	X-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, 64QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM, 64QAM	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, 64QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Out-of-Band Emissions	20775 to 21425	20775, 21425	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21400	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21375	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21350	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Conducted Spurious 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.

CA LTE Band 7

EUT Configure Mode	Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	21350 & 21152	20 + 20 MHz	QPSK	1 RB / 0 RB Offset
-	Frequency Stability	21350 & 21152	20 + 20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	21350 & 21152	20 + 20 MHz	QPSK	100 RB / 0 RB Offset
-	Peak to Average Ratio	21350 & 21152	20 + 20 MHz	QPSK	1 RB / 0 RB Offset
	Out-of-Band Emissions	21350 & 21152	20 + 20 MHz	QPSK	100 RB / 0 RB Offset
	Conducted Spurious Emission	21350 & 21152	20 + 20 MHz	QPSK	1 RB / 0 RB Offset
	Radiated Emission	21350 & 21152	20 + 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	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 74 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 99 RB Offset
-	Frequency Stability	39675 to 41565	39675, 41565	5 MHz	QPSK	1 RB / 24 RB Offset
		39700 to 41540	39700, 41540	10 MHz	QPSK	1 RB / 49 RB Offset
		39725 to 41515	39725, 41515	15 MHz	QPSK	1 RB / 74 RB Offset
		39750 to 41490	39750, 41490	20 MHz	QPSK	1 RB / 99 RB Offset
-	Occupied Bandwidth	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Out-of-Band Emissions	39675 to 41565	39675, 41565	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		39700 to 41540	39700, 41540	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		39725 to 41515	39725, 41515	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 41490	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Conducted Spurious Emission	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK	1 RB / 24 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK	1 RB / 49 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK	1 RB / 74 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK	1 RB / 99 RB Offset
-	Radiated Emission	39750 to 41490	39750, 40620, 41490	20 MHz	QPSK	1 RB / 99 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	Charles Hsiao
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Out-of-Band Emissions	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Conducted Spurious Emission	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao & Karl Lee & Getaz Yang

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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-E 2016
ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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:

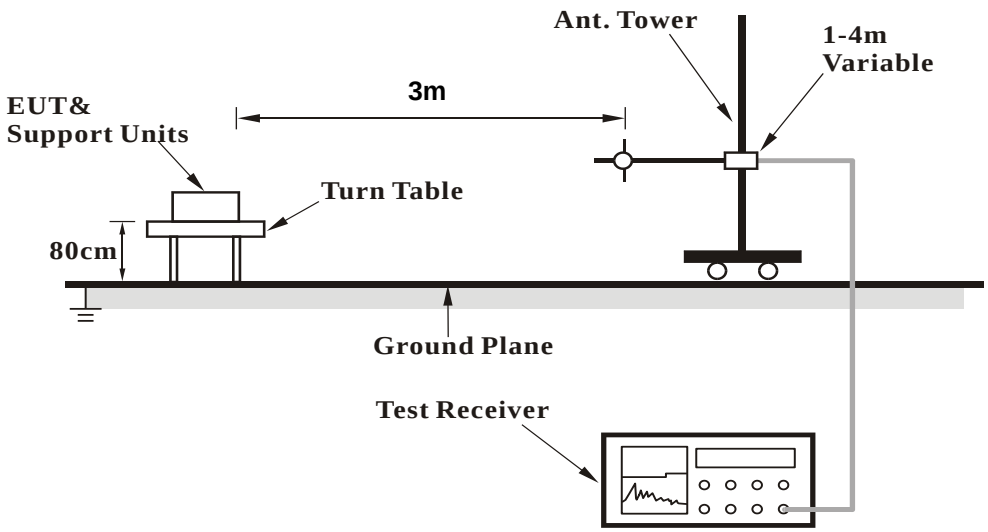
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
c. 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:

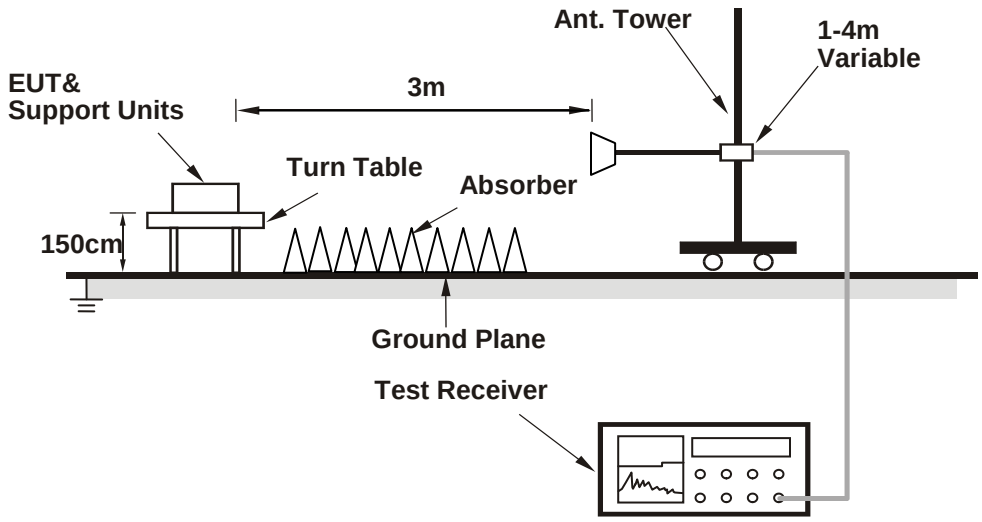
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

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



<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 7

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20850	21100	21350	
		Frequency (MHz)		2510.0	2535.0	2560.0	
20M	QPSK	1	0	23.77	23.81	23.79	0
		1	50	23.66	23.71	23.69	0
		1	99	23.60	23.65	23.63	0
		50	0	22.76	22.81	22.79	1
		50	25	22.74	22.79	22.77	1
		50	50	22.68	22.73	22.71	1
		100	0	22.73	22.78	22.76	1
	16QAM	1	0	22.75	22.79	22.77	1
		1	50	22.64	22.69	22.67	1
		1	99	22.58	22.63	22.61	1
		50	0	21.74	21.79	21.77	2
		50	25	21.72	21.77	21.75	2
		50	50	21.66	21.71	21.69	2
		100	0	21.71	21.76	21.74	2
	64QAM	1	0	21.77	21.81	21.79	2
		1	50	21.66	21.71	21.69	2
		1	99	21.60	21.65	21.63	2
		50	0	20.76	20.81	20.79	3
		50	25	20.74	20.79	20.77	3
		50	50	20.68	20.73	20.71	3
		100	0	20.73	20.78	20.76	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20825	21100	21375	
		Frequency (MHz)		2507.5	2535.0	2562.5	
15M	QPSK	1	0	23.68	23.72	23.70	0
		1	37	23.57	23.62	23.60	0
		1	74	23.51	23.56	23.54	0
		36	0	22.67	22.72	22.70	1
		36	19	22.65	22.70	22.68	1
		36	39	22.59	22.64	22.62	1
		75	0	22.64	22.69	22.67	1
	16QAM	1	0	22.66	22.70	22.68	1
		1	37	22.55	22.60	22.58	1
		1	74	22.49	22.54	22.52	1
		36	0	21.65	21.70	21.68	2
		36	19	21.63	21.68	21.66	2
		36	39	21.57	21.62	21.60	2
		75	0	21.62	21.67	21.65	2
	64QAM	1	0	21.68	21.72	21.70	2
		1	37	21.57	21.62	21.60	2
		1	74	21.51	21.56	21.54	2
		36	0	20.67	20.72	20.70	3
		36	19	20.65	20.70	20.68	3
		36	39	20.59	20.64	20.62	3
		75	0	20.64	20.69	20.67	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20800	21100	21400	
		Frequency (MHz)		2505.0	2535.0	2565.0	
10M	QPSK	1	0	23.60	23.64	23.62	0
		1	24	23.49	23.54	23.52	0
		1	49	23.43	23.48	23.46	0
		25	0	22.59	22.64	22.62	1
		25	12	22.57	22.62	22.60	1
		25	25	22.51	22.56	22.54	1
		50	0	22.56	22.61	22.59	1
	16QAM	1	0	22.58	22.62	22.60	1
		1	24	22.47	22.52	22.50	1
		1	49	22.41	22.46	22.44	1
		25	0	21.57	21.62	21.60	2
		25	12	21.55	21.60	21.58	2
		25	25	21.49	21.54	21.52	2
		50	0	21.54	21.59	21.57	2
	64QAM	1	0	21.60	21.64	21.62	2
		1	24	21.49	21.54	21.52	2
		1	49	21.43	21.48	21.46	2
		25	0	20.59	20.64	20.62	3
		25	12	20.57	20.62	20.60	3
		25	25	20.51	20.56	20.54	3
		50	0	20.56	20.61	20.59	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20775	21100	21425	
		Frequency (MHz)		2502.5	2535.0	2567.5	
5M	QPSK	1	0	23.52	23.56	23.54	0
		1	12	23.41	23.46	23.44	0
		1	24	23.35	23.40	23.38	0
		12	0	22.51	22.56	22.54	1
		12	6	22.49	22.54	22.52	1
		12	13	22.43	22.48	22.46	1
		25	0	22.48	22.53	22.51	1
	16QAM	1	0	22.50	22.54	22.52	1
		1	12	22.39	22.44	22.42	1
		1	24	22.33	22.38	22.36	1
		12	0	21.49	21.54	21.52	2
		12	6	21.47	21.52	21.50	2
		12	13	21.41	21.46	21.44	2
		25	0	21.46	21.51	21.49	2
	64QAM	1	0	21.52	21.56	21.54	2
		1	12	21.41	21.46	21.44	2
		1	24	21.35	21.40	21.38	2
		12	0	20.51	20.56	20.54	3
		12	6	20.49	20.54	20.52	3
		12	13	20.43	20.48	20.46	3
		25	0	20.48	20.53	20.51	3

PCC							SCC							Power	
Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	MPR Level (dB)	Tx Power with UL-CA Active (dBm)
7	20	QPSK	0	0	20850	2510	7	20	QPSK	1	99	21048	2529.8	0	22.69
			1	0						0	0			0	22.73
			100	0						0	0			0-1	22.14
			100	0						100	0			0-2	21.77
			1	0						1	99			0-8.5	15.15
			1	0						1	0			0-4.5	19.41
			1	99						1	0			0	23.79
			100	0						1	99			0-3.5	19.36
7	20	QPSK	0	0	21100	2535	7	20	QPSK	1	99	21298	2554.8	0	22.72
			1	0						0	0			0	22.38
			100	0						0	0			0-1	20.21
			100	0						100	0			0-2	20.11
			1	0						1	99			0-8.5	15.32
			1	0						1	0			0-4.5	19.30
			1	99						1	0			0	22.69
			100	0						1	99			0-3.5	19.44
7	20	QPSK	0	0	21152	2540.2	7	20	QPSK	1	99	21350	2560	0	22.67
			1	0						0	0			0	22.72
			100	0						0	0			0-1	19.86
			100	0						100	0			0-2	20.62
			1	0						1	99			0-8.5	15.34
			1	0						1	0			0-4.5	19.45
			1	99						1	0			0	22.72
			100	0						1	99			0-3.5	19.56

LTE Band 41

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		39750	40620	41490				Channel		39725	40620	41515	
		Frequency (MHz)		2506.0	2593.0	2680.0				Frequency (MHz)		2503.5	2593.0	2682.5	
20M	QPSK	1	0	23.57	23.77	23.75	0	15M	QPSK	1	0	23.55	23.73	23.75	0
		1	50	23.47	23.65	23.67	0			1	37	23.45	23.63	23.65	0
		1	99	23.44	23.62	23.64	0			1	74	23.42	23.60	23.62	0
		50	0	22.60	22.78	22.80	1			36	0	22.58	22.76	22.78	1
		50	25	22.58	22.76	22.78	1			36	19	22.56	22.74	22.76	1
		50	50	22.51	22.69	22.71	1			36	39	22.49	22.67	22.69	1
		100	0	22.57	22.75	22.77	1			75	0	22.55	22.73	22.75	1
	16QAM	1	0	22.55	22.73	22.75	1		16QAM	1	0	22.53	22.71	22.73	1
		1	50	22.45	22.63	22.65	1			1	37	22.43	22.61	22.63	1
		1	99	22.42	22.60	22.62	1			1	74	22.40	22.58	22.60	1
		50	0	21.58	21.76	21.78	2			36	0	21.56	21.74	21.76	2
		50	25	21.56	21.74	21.76	2			36	19	21.54	21.72	21.74	2
		50	50	21.49	21.67	21.69	2			36	39	21.47	21.65	21.67	2
		100	0	21.55	21.73	21.75	2			75	0	21.53	21.71	21.73	2
	64QAM	1	0	21.54	21.72	21.74	2		64QAM	1	0	21.52	21.70	21.72	2
		1	50	21.44	21.62	21.64	2			1	37	21.42	21.60	21.62	2
		1	99	21.41	21.59	21.61	2			1	74	21.39	21.57	21.59	2
		50	0	20.57	20.75	20.77	3			36	0	20.55	20.73	20.75	3
		50	25	20.55	20.73	20.75	3			36	19	20.53	20.71	20.73	3
		50	50	20.48	20.66	20.68	3			36	39	20.46	20.64	20.66	3
		100	0	20.54	20.72	20.74	3			75	0	20.52	20.70	20.72	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		39700	40620	41540				Channel		39675	40620	41565	
		Frequency (MHz)		2501.0	2593.0	2685.0				Frequency (MHz)		2498.5	2593.0	2687.5	
10M	QPSK	1	0	23.52	23.70	23.72	0	5M	QPSK	1	0	23.50	23.68	23.70	0
		1	24	23.42	23.60	23.62	0			1	12	23.40	23.58	23.60	0
		1	49	23.39	23.57	23.59	0			1	24	23.37	23.55	23.57	0
		25	0	22.55	22.73	22.75	1			12	0	22.53	22.71	22.73	1
		25	12	22.53	22.71	22.73	1			12	6	22.51	22.69	22.71	1
		25	25	22.46	22.64	22.66	1			12	13	22.44	22.62	22.64	1
		50	0	22.52	22.70	22.72	1			25	0	22.50	22.68	22.70	1
	16QAM	1	0	22.50	22.68	22.70	1		16QAM	1	0	22.48	22.66	22.68	1
		1	24	22.40	22.58	22.60	1			1	12	22.38	22.56	22.58	1
		1	49	22.37	22.55	22.57	1			1	24	22.35	22.53	22.55	1
		25	0	21.53	21.71	21.73	2			12	0	21.51	21.69	21.71	2
		25	12	21.51	21.69	21.71	2			12	6	21.49	21.67	21.69	2
		25	25	21.44	21.62	21.64	2			12	13	21.42	21.60	21.62	2
		50	0	21.50	21.68	21.70	2			25	0	21.48	21.66	21.68	2
	64QAM	1	0	21.49	21.67	21.69	2		64QAM	1	0	21.47	21.65	21.67	2
		1	24	21.39	21.57	21.59	2			1	12	21.37	21.55	21.57	2
		1	49	21.36	21.54	21.56	2			1	24	21.34	21.52	21.54	2
		25	0	20.52	20.70	20.72	3			12	0	20.50	20.68	20.70	3
		25	12	20.50	20.68	20.70	3			12	6	20.48	20.66	20.68	3
		25	25	20.43	20.61	20.63	3			12	13	20.41	20.59	20.61	3
		50	0	20.49	20.67	20.69	3			25	0	20.47	20.65	20.67	3

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)**
X	20775	2502.5	-19.46	44.24	24.78	300.47	H
	21100	2535.0	-19.42	44.20	24.78	300.40	
	21425	2567.5	-20.05	44.80	24.75	298.61	
	20775	2502.5	-23.44	44.19	20.75	118.88	V
	21100	2535.0	-23.30	44.09	20.79	119.89	
	21425	2567.5	-23.68	44.50	20.82	120.75	
Channel Bandwidth: 5 MHz / 16QAM							
X	20775	2502.5	-20.45	44.24	23.79	239.22	H
	21100	2535.0	-20.43	44.20	23.77	238.07	
	21425	2567.5	-21.00	44.80	23.80	239.94	
	20775	2502.5	-24.41	44.19	19.78	95.08	V
	21100	2535.0	-24.38	44.09	19.71	93.50	
	21425	2567.5	-24.63	44.50	19.87	97.03	
Channel Bandwidth: 5 MHz / 64QAM							
X	20775	2502.5	-21.46	44.24	22.78	189.58	H
	21100	2535.0	-21.40	44.20	22.80	190.41	
	21425	2567.5	-22.05	44.80	22.75	188.41	
	20775	2502.5	-25.43	44.19	18.76	75.18	V
	21100	2535.0	-25.39	44.09	18.70	74.10	
	21425	2567.5	-25.64	44.50	18.86	76.90	

LTE Band 7							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20800	2505.0	-19.48	44.34	24.86	306.27	H
	21100	2535.0	-19.41	44.20	24.79	301.09	
	21400	2565.0	-19.85	44.72	24.87	307.11	
	20800	2505.0	-23.45	44.23	20.78	119.56	V
	21100	2535.0	-23.37	44.09	20.72	117.98	
	21400	2565.0	-23.60	44.41	20.81	120.39	
Channel Bandwidth: 10 MHz / 16QAM							
X	20800	2505.0	-20.49	44.34	23.85	242.72	H
	21100	2535.0	-20.41	44.20	23.79	239.17	
	21400	2565.0	-20.83	44.72	23.89	245.08	
	20800	2505.0	-24.46	44.23	19.77	94.75	V
	21100	2535.0	-24.39	44.09	19.70	93.28	
	21400	2565.0	-24.57	44.41	19.84	96.29	
Channel Bandwidth: 10 MHz / 64QAM							
X	20800	2505.0	-21.46	44.34	22.88	194.13	H
	21100	2535.0	-21.42	44.20	22.78	189.54	
	21400	2565.0	-21.89	44.72	22.83	192.00	
	20800	2505.0	-25.48	44.23	18.75	74.92	V
	21100	2535.0	-25.37	44.09	18.72	74.44	
	21400	2565.0	-25.52	44.41	18.89	77.37	

LTE Band 7							
Channel Bandwidth: 15 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20825	2507.5	-19.48	44.32	24.84	304.65	H
	21100	2535.0	-19.35	44.20	24.85	305.28	
	21375	2562.5	-20.02	44.85	24.83	303.95	
	20825	2507.5	-23.26	43.99	20.73	118.36	V
	21100	2535.0	-23.24	44.09	20.85	121.56	
	21375	2562.5	-23.71	44.51	20.80	120.23	
Channel Bandwidth: 15 MHz / 16QAM							
X	20825	2507.5	-20.45	44.32	23.87	243.67	H
	21100	2535.0	-20.38	44.20	23.82	240.82	
	21375	2562.5	-21.07	44.85	23.78	238.67	
	20825	2507.5	-24.21	43.99	19.78	95.10	V
	21100	2535.0	-24.20	44.09	19.89	97.45	
	21375	2562.5	-24.73	44.51	19.78	95.06	
Channel Bandwidth: 15 MHz / 64QAM							
X	20825	2507.5	-21.43	44.32	22.89	194.45	H
	21100	2535.0	-21.35	44.20	22.85	192.62	
	21375	2562.5	-22.05	44.85	22.80	190.46	
	20825	2507.5	-25.26	43.99	18.73	74.68	V
	21100	2535.0	-25.34	44.09	18.75	74.95	
	21375	2562.5	-25.70	44.51	18.81	76.03	

LTE Band 7							
Channel Bandwidth: 20 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
X	20850.0	2510.0	-19.44	44.16	24.72	296.48	H
	21100.0	2535.0	-19.26	44.20	24.94	311.67	
	21350.0	2560.0	-20.00	44.81	24.81	302.48	
	20850.0	2510.0	-24.00	44.78	20.78	119.67	V
	21100.0	2535.0	-23.17	44.09	20.92	123.54	
	21350.0	2560.0	-23.89	44.72	20.83	121.06	
Channel Bandwidth: 20 MHz / 16QAM							
X	20850.0	2510.0	-20.43	44.16	23.73	236.05	H
	21100.0	2535.0	-20.28	44.20	23.92	246.43	
	21350.0	2560.0	-21.02	44.81	23.79	239.17	
	20850.0	2510.0	-25.03	44.78	19.75	94.41	V
	21100.0	2535.0	-24.13	44.09	19.96	99.04	
	21350.0	2560.0	-24.92	44.72	19.80	95.50	
Channel Bandwidth: 20 MHz / 64QAM							
X	20850.0	2510.0	-21.40	44.16	22.76	188.80	H
	21100.0	2535.0	-21.26	44.20	22.94	196.65	
	21350.0	2560.0	-22.04	44.81	22.77	189.10	
	20850.0	2510.0	-26.02	44.78	18.76	75.16	V
	21100.0	2535.0	-25.14	44.09	18.95	78.49	
	21350.0	2560.0	-25.93	44.72	18.79	75.68	

CA LTE Band 7							
Channel Bandwidth: 20 + 20 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	21350+21152	2550.1	-19.64	38.58	18.94	78.34	H
	21350+21152	2550.1	-24.27	39.22	14.95	31.26	V

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	39675	2498.5	-20.16	44.24	24.08	255.74	H
	40620	2593.0	-20.11	44.20	24.09	256.27	
	41565	2687.5	-20.76	44.80	24.04	253.57	
	39675	2498.5	-24.16	44.19	20.03	100.72	V
	40620	2593.0	-24.06	44.09	20.03	100.65	
	41565	2687.5	-24.41	44.50	20.09	102.07	
Channel Bandwidth: 5 MHz / 16QAM							
X	39675	2498.5	-21.17	44.24	23.07	202.67	H
	40620	2593.0	-21.11	44.20	23.09	203.56	
	41565	2687.5	-21.79	44.80	23.01	200.03	
	39675	2498.5	-25.13	44.19	19.06	80.56	V
	40620	2593.0	-25.09	44.09	19.00	79.40	
	41565	2687.5	-25.42	44.50	19.08	80.89	
Channel Bandwidth: 5 MHz / 64QAM							
X	39675	2498.5	-22.20	44.24	22.04	159.88	H
	40620	2593.0	-22.10	44.20	22.10	162.07	
	41565	2687.5	-22.76	44.80	22.04	159.99	
	39675	2498.5	-26.17	44.19	18.02	63.40	V
	40620	2593.0	-26.06	44.09	18.03	63.50	
	41565	2687.5	-26.43	44.50	18.07	64.11	

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	39700	2501.0	-20.31	44.34	24.03	252.99	H
	40620	2593.0	-20.20	44.20	24.00	251.02	
	41540	2685.0	-20.69	44.72	24.03	253.10	
	39700	2501.0	-24.21	44.23	20.02	100.37	V
	40620	2593.0	-24.03	44.09	20.06	101.34	
	41540	2685.0	-24.36	44.41	20.05	101.06	
Channel Bandwidth: 10 MHz / 16QAM							
X	39700	2501.0	-21.32	44.34	23.02	200.49	H
	40620	2593.0	-21.16	44.20	23.04	201.23	
	41540	2685.0	-21.72	44.72	23.00	199.66	
	39700	2501.0	-25.20	44.23	19.03	79.91	V
	40620	2593.0	-25.06	44.09	19.03	79.95	
	41540	2685.0	-25.37	44.41	19.04	80.09	
Channel Bandwidth: 10 MHz / 64QAM							
X	39700	2501.0	-22.30	44.34	22.04	159.99	H
	40620	2593.0	-22.16	44.20	22.04	159.85	
	41540	2685.0	-22.71	44.72	22.01	158.96	
	39700	2501.0	-26.20	44.23	18.03	63.47	V
	40620	2593.0	-26.09	44.09	18.00	63.07	
	41540	2685.0	-26.34	44.41	18.06	64.02	

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	39725	2503.5	-20.30	44.32	24.02	252.23	H
	40620	2593.0	-20.10	44.20	24.10	256.86	
	41515	2682.5	-20.80	44.85	24.05	253.98	
	39725	2503.5	-23.97	43.99	20.02	100.51	V
	40620	2593.0	-24.05	44.09	20.04	100.88	
	41515	2682.5	-24.47	44.51	20.04	100.93	
Channel Bandwidth: 15 MHz / 16QAM							
X	39725	2503.5	-21.28	44.32	23.04	201.28	H
	40620	2593.0	-21.16	44.20	23.04	201.23	
	41515	2682.5	-21.82	44.85	23.03	200.82	
	39725	2503.5	-24.94	43.99	19.06	80.46	V
	40620	2593.0	-25.01	44.09	19.08	80.87	
	41515	2682.5	-25.49	44.51	19.02	79.80	
Channel Bandwidth: 15 MHz / 64QAM							
X	39725	2503.5	-22.31	44.32	22.01	158.78	H
	40620	2593.0	-22.18	44.20	22.02	159.11	
	41515	2682.5	-22.80	44.85	22.05	160.25	
	39725	2503.5	-25.92	43.99	18.07	64.15	V
	40620	2593.0	-26.04	44.09	18.05	63.80	
	41515	2682.5	-26.47	44.51	18.04	63.68	

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	39750	2506.0	-20.03	44.16	24.13	258.82	H
	40620	2593.0	-20.04	44.20	24.16	260.44	
	41490	2680.0	-20.70	44.81	24.11	257.45	
	39750	2506.0	-24.63	44.78	20.15	103.51	V
	40620	2593.0	-23.92	44.09	20.17	103.94	
	41490	2680.0	-24.60	44.72	20.12	102.80	
Channel Bandwidth: 20 MHz / 16QAM							
X	39750	2506.0	-21.06	44.16	23.10	204.17	H
	40620	2593.0	-21.04	44.20	23.16	206.87	
	41490	2680.0	-21.68	44.81	23.13	205.45	
	39750	2506.0	-25.64	44.78	19.14	82.04	V
	40620	2593.0	-24.93	44.09	19.16	82.38	
	41490	2680.0	-25.60	44.72	19.12	81.66	
Channel Bandwidth: 20 MHz / 64QAM							
X	39750	2506.0	-22.09	44.16	22.07	161.06	H
	40620	2593.0	-22.01	44.20	22.19	165.46	
	41490	2680.0	-22.68	44.81	22.13	163.19	
	39750	2506.0	-26.68	44.78	18.10	64.57	V
	40620	2593.0	-25.92	44.09	18.17	65.58	
	41490	2680.0	-26.59	44.72	18.13	65.01	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

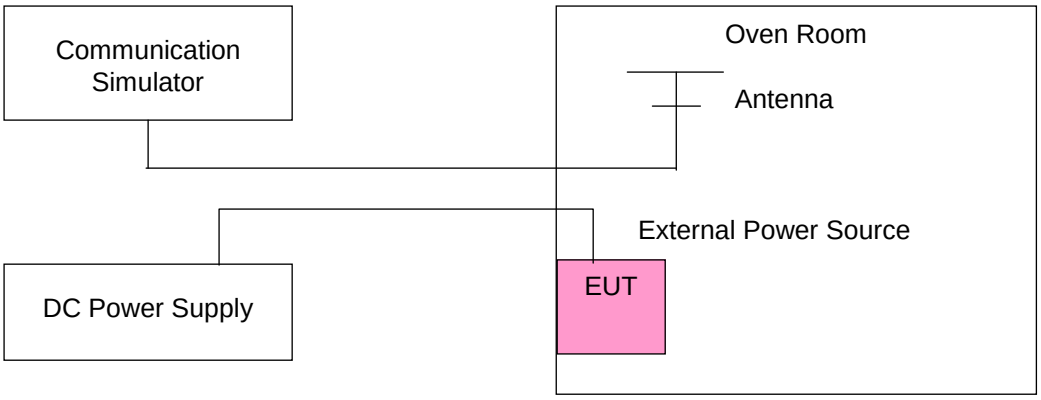
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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	2502.500002	0.0008	2567.500004	0.0015	2.5
3.6	2502.500003	0.0012	2567.500001	0.0005	2.5
4.4	2502.500002	0.0009	2567.500004	0.0015	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2502.500003	0.0011	2567.500003	0.0011	2.5
-20	2502.500003	0.0010	2567.500002	0.0006	2.5
-10	2502.500002	0.0006	2567.500002	0.0009	2.5
0	2502.500003	0.0012	2567.500003	0.0013	2.5
10	2502.500002	0.0009	2567.500003	0.0010	2.5
20	2502.499998	-0.0007	2567.499997	-0.0013	2.5
30	2502.499996	-0.0014	2567.499997	-0.0012	2.5
40	2502.499996	-0.0016	2567.499998	-0.0008	2.5
50	2502.499997	-0.0010	2567.499997	-0.0011	2.5
55	2502.499997	-0.0010	2567.499999	-0.0004	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	2505.000001	0.0004	2565.000004	0.0016	2.5
3.6	2505.000003	0.0011	2565.000003	0.0012	2.5
4.4	2505.000001	0.0005	2565.000002	0.0008	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	0.0007	2565.000001	0.0004	2.5
-20	2505.000003	0.0012	2565.000003	0.0011	2.5
-10	2505.000001	0.0004	2565.000004	0.0014	2.5
0	2505.000004	0.0016	2565.000003	0.0011	2.5
10	2505.000002	0.0008	2565.000002	0.0008	2.5
20	2504.999998	-0.0006	2564.999997	-0.0014	2.5
30	2504.999997	-0.0012	2564.999997	-0.0013	2.5
40	2504.999998	-0.0007	2564.999998	-0.0006	2.5
50	2504.999997	-0.0012	2564.999998	-0.0008	2.5
55	2504.999997	-0.0012	2564.999997	-0.0011	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	2507.500001	0.0005	2562.500001	0.0005	2.5
3.6	2507.500002	0.0008	2562.500003	0.0012	2.5
4.4	2507.500001	0.0005	2562.500002	0.0007	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2507.500002	0.0008	2562.500002	0.0007	2.5
-20	2507.500004	0.0014	2562.500003	0.0013	2.5
-10	2507.500001	0.0004	2562.500001	0.0005	2.5
0	2507.500003	0.0010	2562.500003	0.0011	2.5
10	2507.500003	0.0011	2562.500002	0.0009	2.5
20	2507.499999	-0.0004	2562.499997	-0.0011	2.5
30	2507.499996	-0.0016	2562.499998	-0.0007	2.5
40	2507.499996	-0.0014	2562.499997	-0.0011	2.5
50	2507.499998	-0.0007	2562.499997	-0.0013	2.5
55	2507.499998	-0.0009	2562.499999	-0.0004	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	2510.000003	0.0010	2560.000002	0.0009	2.5
3.6	2510.000002	0.0006	2560.000004	0.0015	2.5
4.4	2510.000004	0.0015	2560.000002	0.0008	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2510.000002	0.0010	2560.000004	0.0015	2.5
-20	2510.000002	0.0008	2560.000002	0.0006	2.5
-10	2510.000004	0.0016	2560.000002	0.0008	2.5
0	2510.000003	0.0011	2560.000003	0.0013	2.5
10	2510.000001	0.0006	2560.000001	0.0005	2.5
20	2509.999997	-0.0012	2559.999997	-0.0011	2.5
30	2509.999998	-0.0008	2559.999996	-0.0015	2.5
40	2509.999996	-0.0015	2559.999998	-0.0007	2.5
50	2509.999998	-0.0009	2559.999997	-0.0012	2.5
55	2509.999997	-0.0011	2559.999998	-0.0007	2.5

Frequency Error vs. Voltage

Voltage (Volts)	CA LTE Band 7		Limit (ppm)
	Channel Bandwidth: 20 + 20 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.85	2550.100003	0.0012	2.5
3.6	2550.100001	0.0005	2.5
4.4	2550.100003	0.0010	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	CA LTE Band 7		Limit (ppm)
	Channel Bandwidth: 20 + 20 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	2550.100001	0.0004	2.5
-20	2550.100004	0.0016	2.5
-10	2550.100002	0.0007	2.5
0	2550.100003	0.0010	2.5
10	2550.100001	0.0005	2.5
20	2550.099999	-0.0005	2.5
30	2550.099996	-0.0015	2.5
40	2550.099999	-0.0006	2.5
50	2550.099996	-0.0016	2.5
55	2550.099997	-0.0010	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	2498.500002	0.0006	2687.500003	0.0012	2.5
3.6	2498.500002	0.0008	2687.500002	0.0008	2.5
4.4	2498.500004	0.0014	2687.500003	0.0013	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2498.500003	0.0010	2687.500004	0.0013	2.5
-20	2498.500002	0.0010	2687.500003	0.0010	2.5
-10	2498.500003	0.0011	2687.500003	0.0011	2.5
0	2498.500003	0.0010	2687.500001	0.0005	2.5
10	2498.500002	0.0006	2687.500002	0.0008	2.5
20	2498.499997	-0.0012	2687.499999	-0.0004	2.5
30	2498.499997	-0.0012	2687.499999	-0.0005	2.5
40	2498.499996	-0.0015	2687.499998	-0.0007	2.5
50	2498.499996	-0.0016	2687.499997	-0.0012	2.5
55	2498.499997	-0.0011	2687.499996	-0.0013	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	2501.000004	0.0016	2685.000002	0.0009	2.5
3.6	2501.000002	0.0006	2685.000002	0.0007	2.5
4.4	2501.000001	0.0005	2685.000003	0.0010	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2501.000004	0.0014	2685.000002	0.0009	2.5
-20	2501.000003	0.0014	2685.000002	0.0006	2.5
-10	2501.000002	0.0009	2685.000003	0.0013	2.5
0	2501.000002	0.0008	2685.000004	0.0014	2.5
10	2501.000003	0.0012	2685.000001	0.0005	2.5
20	2500.999999	-0.0005	2684.999998	-0.0007	2.5
30	2500.999997	-0.0014	2684.999997	-0.0010	2.5
40	2500.999997	-0.0011	2684.999997	-0.0010	2.5
50	2500.999997	-0.0011	2684.999999	-0.0004	2.5
55	2500.999997	-0.0012	2684.999998	-0.0009	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	2503.500004	0.0016	2682.500002	0.0009	2.5
3.6	2503.500003	0.0010	2682.500003	0.0011	2.5
4.4	2503.500004	0.0016	2682.500002	0.0007	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2503.500002	0.0009	2682.500002	0.0006	2.5
-20	2503.500002	0.0007	2682.500003	0.0010	2.5
-10	2503.500003	0.0012	2682.500002	0.0008	2.5
0	2503.500003	0.0013	2682.500003	0.0010	2.5
10	2503.500002	0.0006	2682.500002	0.0009	2.5
20	2503.499997	-0.0014	2682.499997	-0.0012	2.5
30	2503.499999	-0.0004	2682.499996	-0.0014	2.5
40	2503.499997	-0.0011	2682.499996	-0.0014	2.5
50	2503.499997	-0.0014	2682.499996	-0.0015	2.5
55	2503.499996	-0.0015	2682.499999	-0.0004	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	2506.000001	0.0005	2680.000002	0.0009	2.5
3.6	2506.000004	0.0016	2680.000003	0.0012	2.5
4.4	2506.000002	0.0006	2680.000001	0.0004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 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	2506.000001	0.0005	2680.000003	0.0011	2.5
-20	2506.000002	0.0009	2680.000004	0.0014	2.5
-10	2506.000001	0.0004	2680.000003	0.0009	2.5
0	2506.000003	0.0014	2680.000004	0.0013	2.5
10	2506.000002	0.0006	2680.000002	0.0007	2.5
20	2505.999997	-0.0012	2679.999996	-0.0015	2.5
30	2505.999996	-0.0016	2679.999998	-0.0008	2.5
40	2505.999996	-0.0015	2679.999999	-0.0004	2.5
50	2505.999997	-0.0013	2679.999999	-0.0005	2.5
55	2505.999998	-0.0006	2679.999999	-0.0004	2.5

4.3 Occupied Bandwidth Measurement

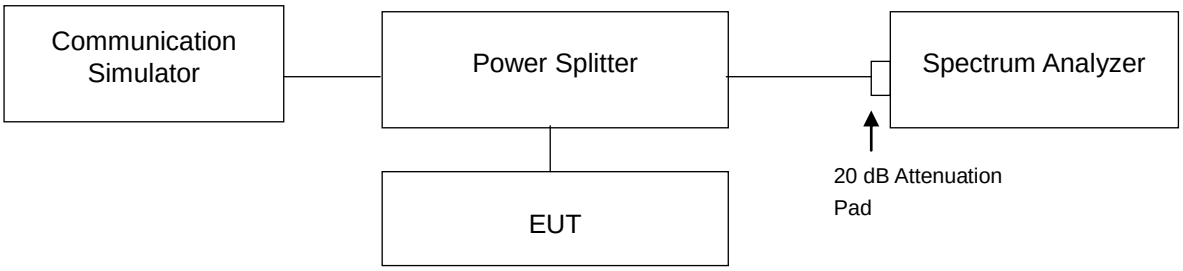
4.3.1 Limits of Occupied Bandwidth Measurement

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

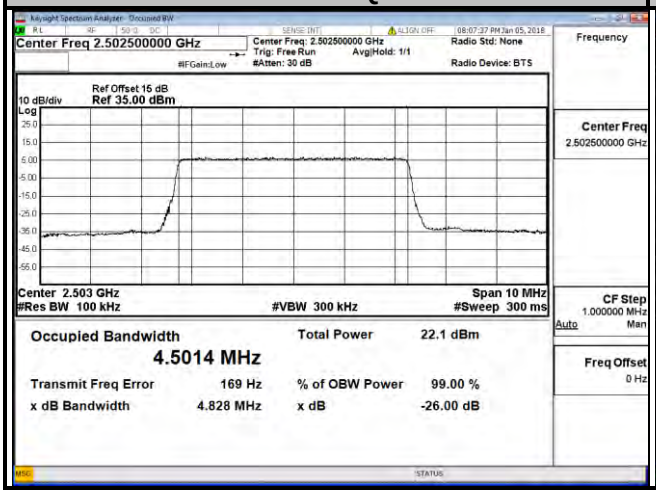
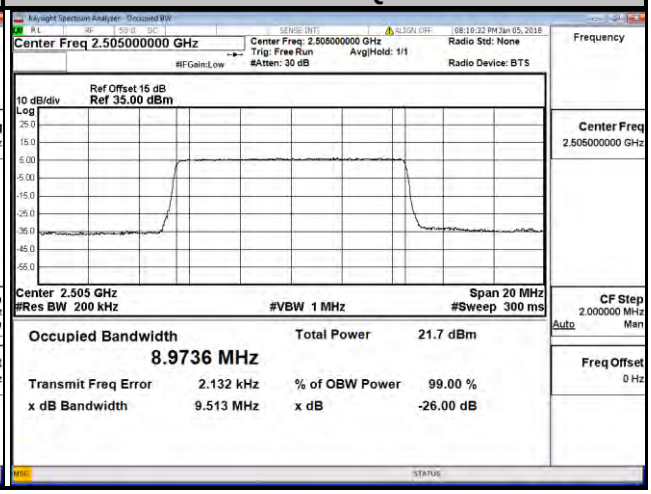
a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup

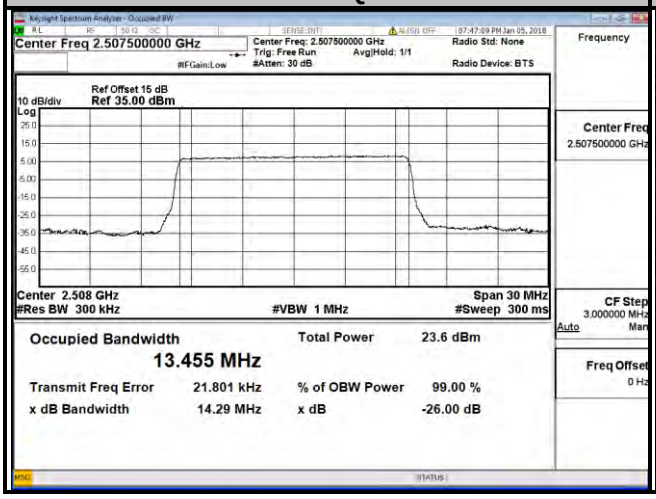
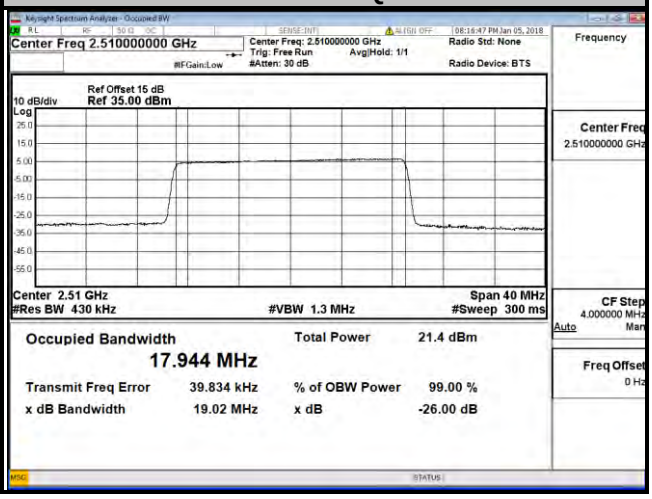


4.3.4 Test Result

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	64QAM			QPSK	16QAM	64QAM
20775	2502.5	4.4870	4.4884	4.5014	20800	2505.0	8.9663	8.9710	8.9736
21100	2535.0	4.4873	4.4880	4.4960	21100	2535.0	8.9633	8.9658	8.9691
21425	2567.5	4.4859	4.4865	4.4939	21400	2565.0	8.9506	8.9552	8.9624

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

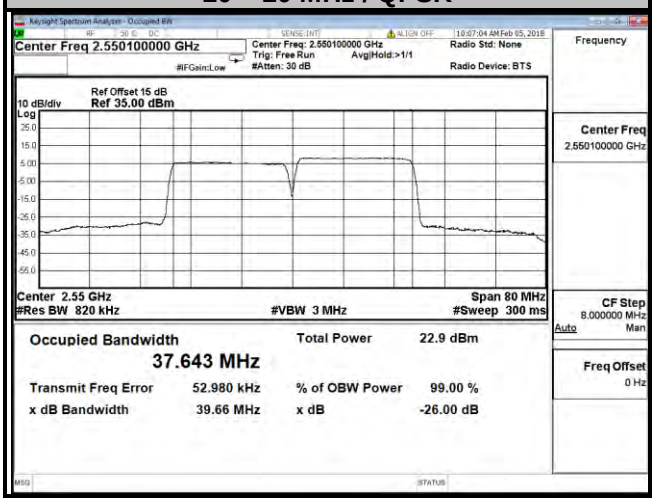
LTE Band 7									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20825	2507.5	13.455	13.452	13.445	20850	2510.0	17.928	17.943	17.944
21100	2535.0	13.445	13.437	13.426	21100	2535.0	17.898	17.918	17.910
21375	2562.5	13.441	13.424	13.421	21350	2560.0	17.883	17.905	17.904

Spectrum Plot of Worst Value	
15 MHz / QPSK	20 MHz / 64QAM
	

CA LTE Band 7		
Channel Bandwidth: 20 + 20 MHz		
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
		QPSK
21350 & 21152	2550.1	37.643

Spectrum Plot of Worst Value

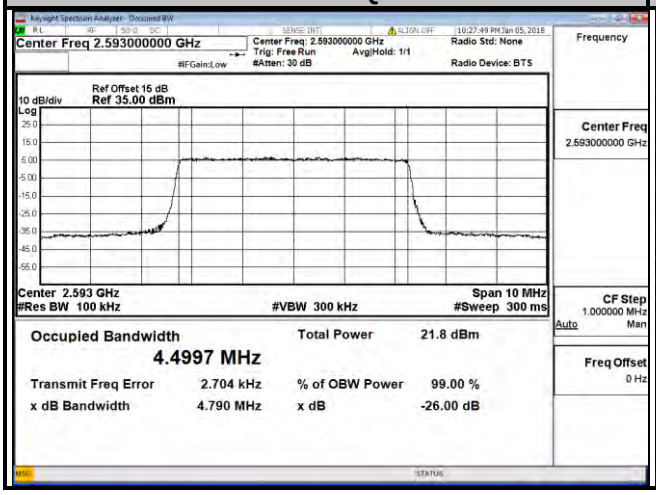
20 + 20 MHz / QPSK



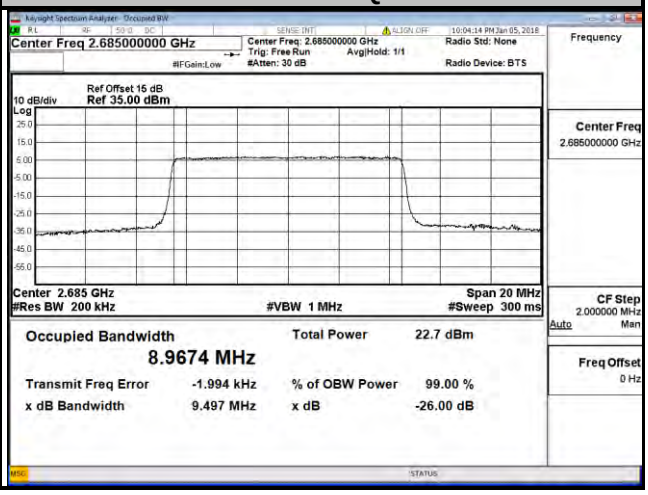
LTE Band 41									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
39675	2498.5	4.4862	4.4881	4.4986	39700	2501.0	8.9481	8.9610	8.9597
40620	2593.0	4.4897	4.4819	4.4997	40620	2593.0	8.9519	8.9642	8.9637
41565	2687.5	4.4880	4.4887	4.4949	41540	2685.0	8.9488	8.9674	8.9402

Spectrum Plot of Worst Value

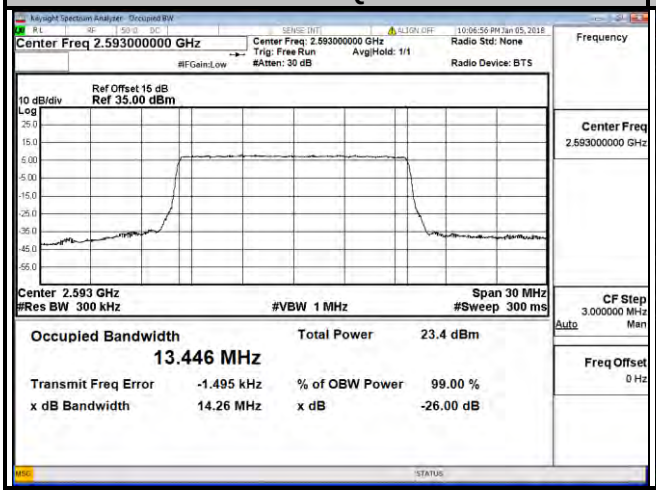
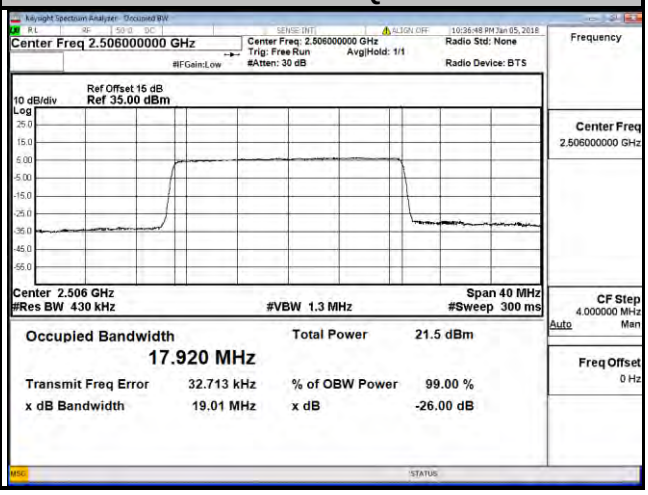
5 MHz / 64QAM



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	64QAM			QPSK	16QAM	64QAM
39725	2503.5	13.438	13.435	13.440	39750	2506.0	17.899	17.893	17.920
40620	2593.0	13.446	13.436	13.430	40620	2593.0	17.901	17.900	17.912
41515	2682.5	13.441	13.425	13.431	41490	2680.0	17.862	17.868	17.881

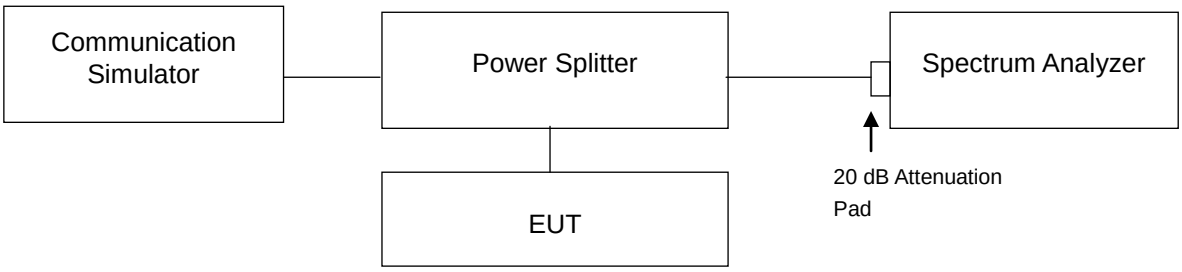
Spectrum Plot of Worst Value	
15 MHz / QPSK	20 MHz / 64QAM
	

4.4 Out-of-Band Emissions Measurement

4.4.1 Limits of Out-of-Band Emissions 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

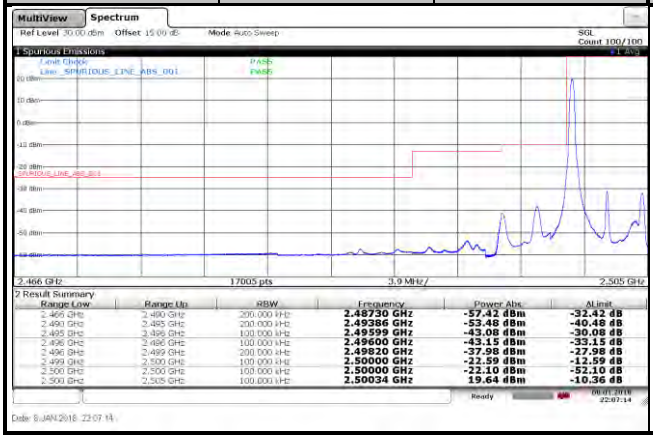


4.4.3 Test Procedures

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 out-of-band emissions measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
c. Record the max. trace plot into the test report.

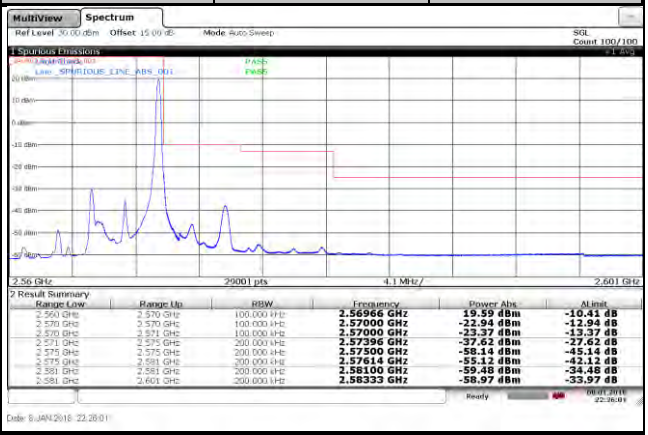
4.4.4 Test Results

LTE Band 7					
Channel Bandwidth: 5 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	20775	1 RB	Channel	21425	1 RB



2 Result Summary

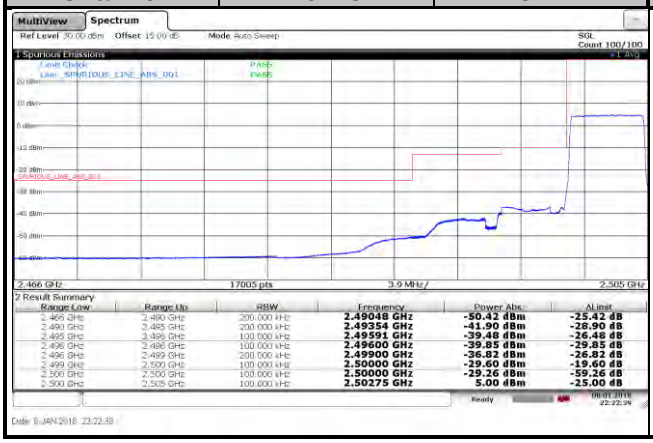
Range Low	Range Up	RBW	Frequency	Power Abs.	ALimit
2.465 GHz	2.480 GHz	200.000 kHz	2.48730 GHz	-57.42 dBm	-32.42 dB
2.480 GHz	2.485 GHz	200.000 kHz	2.49386 GHz	-53.48 dBm	-40.48 dB
2.485 GHz	2.489 GHz	100.000 kHz	2.49599 GHz	-43.08 dBm	-30.08 dB
2.486 GHz	2.486 GHz	100.000 kHz	2.49600 GHz	-43.15 dBm	-33.15 dB
2.486 GHz	2.489 GHz	200.000 kHz	2.49820 GHz	-37.98 dBm	-27.98 dB
2.489 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-22.59 dBm	-12.59 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-22.10 dBm	-52.10 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50034 GHz	19.64 dBm	-10.36 dB



2 Result Summary

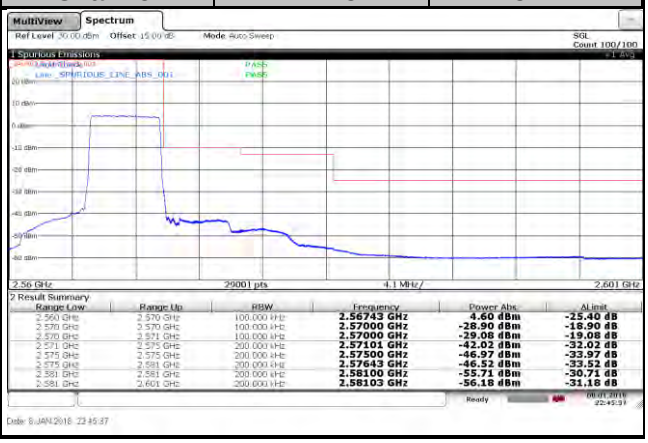
Range Low	Range Up	RBW	Frequency	Power Abs.	ALimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56966 GHz	19.59 dBm	-10.41 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-22.94 dBm	-12.94 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-23.37 dBm	-13.37 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57396 GHz	-37.62 dBm	-27.62 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-58.14 dBm	-45.14 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57614 GHz	-55.12 dBm	-42.12 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-59.48 dBm	-34.48 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58333 GHz	-58.97 dBm	-33.97 dB

Channel	20775	25 RB	Channel	21425	25 RB



2 Result Summary

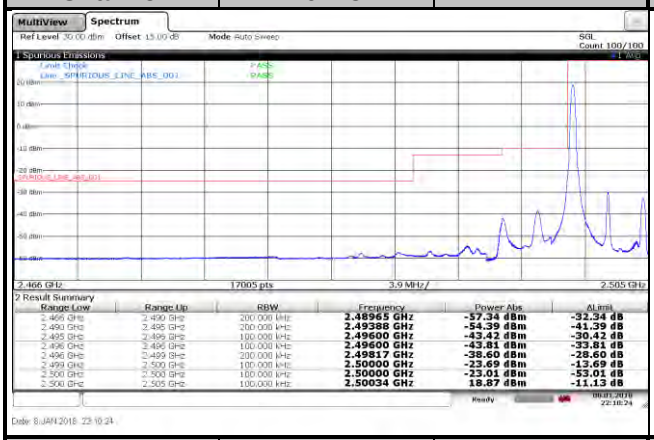
Range Low	Range Up	RBW	Frequency	Power Abs.	ALimit
2.465 GHz	2.480 GHz	200.000 kHz	2.49048 GHz	-50.42 dBm	-25.42 dB
2.480 GHz	2.485 GHz	200.000 kHz	2.49354 GHz	-41.90 dBm	-28.90 dB
2.485 GHz	2.489 GHz	100.000 kHz	2.49591 GHz	-39.48 dBm	-26.48 dB
2.486 GHz	2.486 GHz	100.000 kHz	2.49600 GHz	-39.85 dBm	-29.85 dB
2.486 GHz	2.489 GHz	200.000 kHz	2.49900 GHz	-36.82 dBm	-26.82 dB
2.489 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-29.60 dBm	-19.60 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-29.26 dBm	-59.26 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50275 GHz	5.00 dBm	-25.00 dB



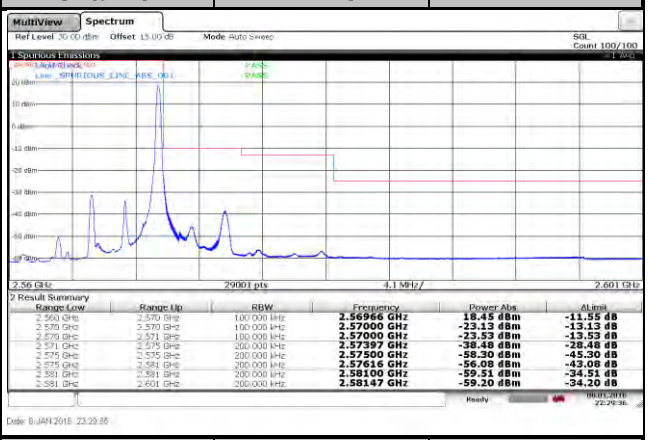
2 Result Summary

Range Low	Range Up	RBW	Frequency	Power Abs.	ALimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56743 GHz	4.60 dBm	-25.40 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-28.90 dBm	-18.90 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-29.08 dBm	-19.08 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57101 GHz	-42.02 dBm	-32.02 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-46.97 dBm	-33.97 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57643 GHz	-46.52 dBm	-33.52 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-55.71 dBm	-30.71 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58103 GHz	-56.18 dBm	-31.18 dB

LTE Band 7					
Channel Bandwidth: 5 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	20775	1 RB	Channel	21425	1 RB

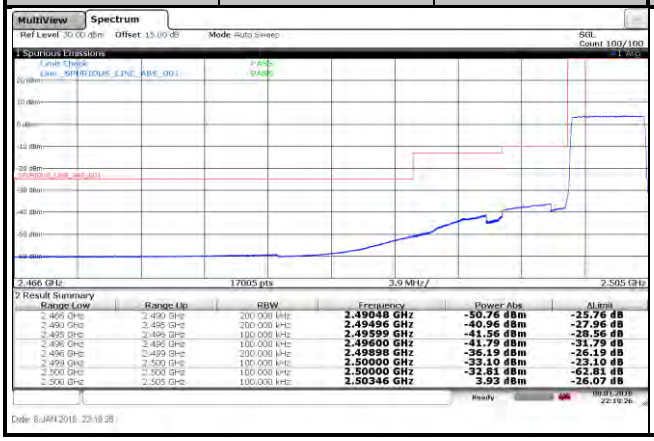


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.490 GHz	200.000 kHz	2.48965 GHz	-57.34 dBm	-32.34 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49388 GHz	-54.39 dBm	-41.39 dB
2.495 GHz	2.499 GHz	100.000 kHz	2.49600 GHz	-43.42 dBm	-30.42 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-43.81 dBm	-33.81 dB
2.496 GHz	2.499 GHz	200.000 kHz	2.49817 GHz	-38.60 dBm	-28.60 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-23.69 dBm	-13.69 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-23.01 dBm	-53.01 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50034 GHz	18.87 dBm	-11.13 dB

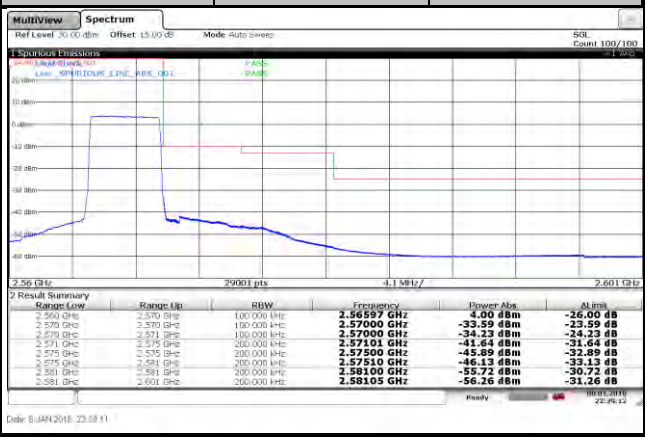


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56966 GHz	18.45 dBm	-11.55 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-23.13 dBm	-13.13 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-23.53 dBm	-13.53 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57397 GHz	-38.48 dBm	-28.48 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-58.30 dBm	-45.30 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57616 GHz	-56.08 dBm	-43.08 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-59.51 dBm	-34.51 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58147 GHz	-59.20 dBm	-34.20 dB

Channel	20775	25 RB	Channel	21425	25 RB

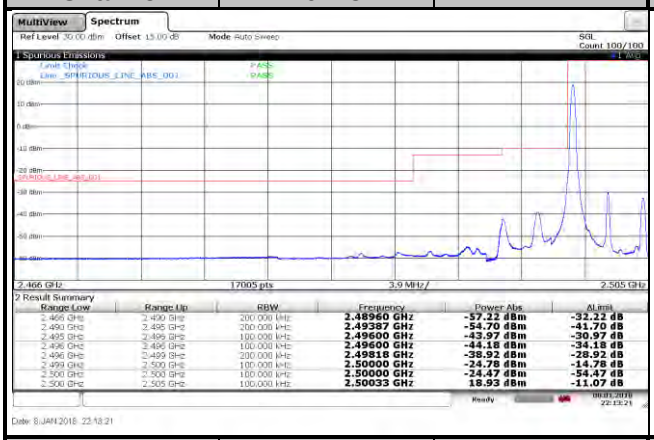


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.490 GHz	200.000 kHz	2.49048 GHz	-50.76 dBm	-25.76 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49496 GHz	-40.96 dBm	-27.96 dB
2.495 GHz	2.499 GHz	100.000 kHz	2.49599 GHz	-41.56 dBm	-28.56 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-41.79 dBm	-31.79 dB
2.496 GHz	2.499 GHz	200.000 kHz	2.49898 GHz	-36.19 dBm	-26.19 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-33.10 dBm	-23.10 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-32.81 dBm	-62.81 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50346 GHz	3.93 dBm	-26.07 dB



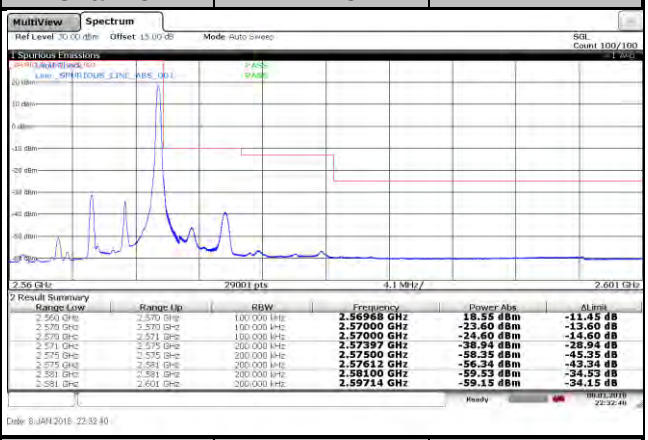
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56597 GHz	4.00 dBm	-26.00 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-33.59 dBm	-23.59 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-34.23 dBm	-24.23 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57101 GHz	-41.64 dBm	-31.64 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-45.89 dBm	-32.89 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57510 GHz	-46.13 dBm	-33.13 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-55.72 dBm	-30.72 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58105 GHz	-56.26 dBm	-31.26 dB

LTE Band 7					
Channel Bandwidth: 5 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	20775	1 RB	Channel	21425	1 RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.490 GHz	200.000 kHz	2.48960 GHz	-57.22 dBm	-32.22 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49387 GHz	-54.70 dBm	-41.70 dB
2.495 GHz	2.499 GHz	100.000 kHz	2.49600 GHz	-43.97 dBm	-30.97 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-44.18 dBm	-34.18 dB
2.496 GHz	2.499 GHz	200.000 kHz	2.49818 GHz	-38.92 dBm	-28.92 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-24.78 dBm	-14.78 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-24.47 dBm	-54.47 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50033 GHz	18.93 dBm	-11.07 dB

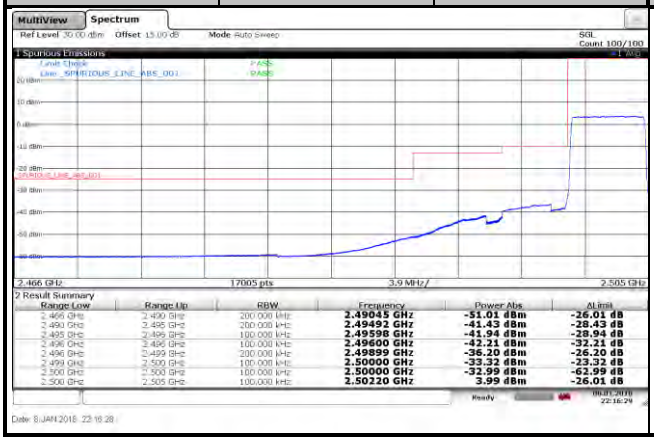
Date: 8.JAN.2018 22:18:21



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56968 GHz	18.55 dBm	-11.45 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-23.60 dBm	-13.60 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-24.60 dBm	-14.60 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57397 GHz	-38.94 dBm	-28.94 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-58.35 dBm	-45.95 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57612 GHz	-56.34 dBm	-43.34 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-59.53 dBm	-34.53 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.59714 GHz	-59.15 dBm	-34.15 dB

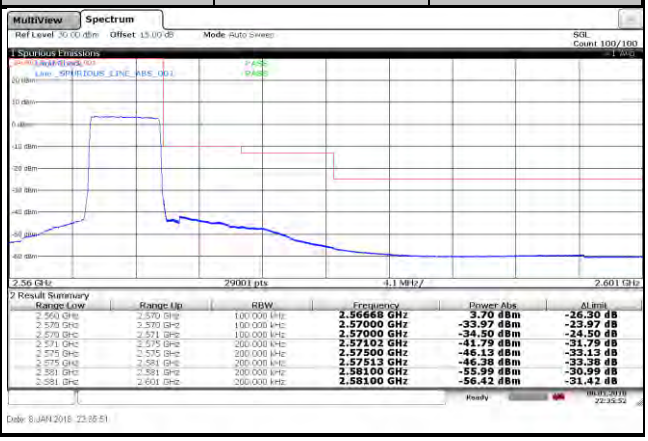
Date: 8.JAN.2018 22:32:40

Channel	20775	25 RB	Channel	21425	25 RB



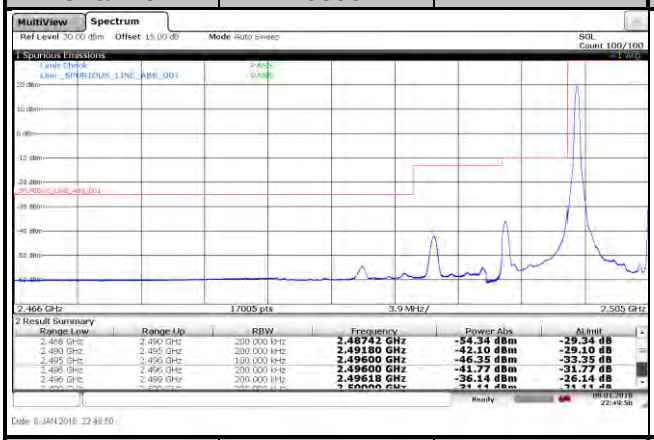
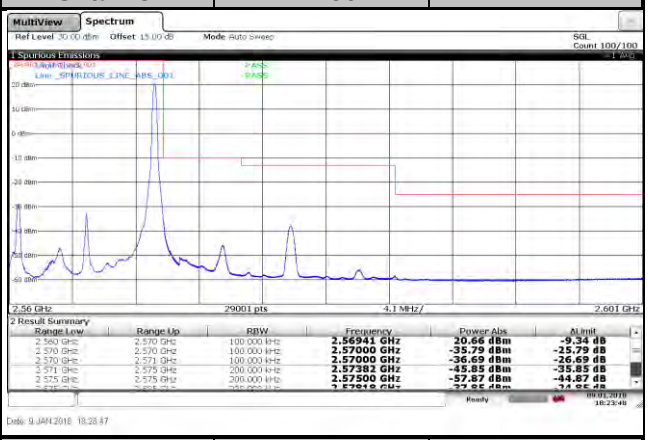
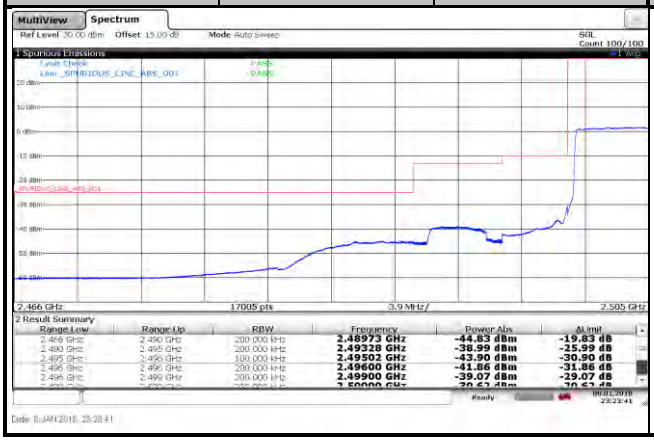
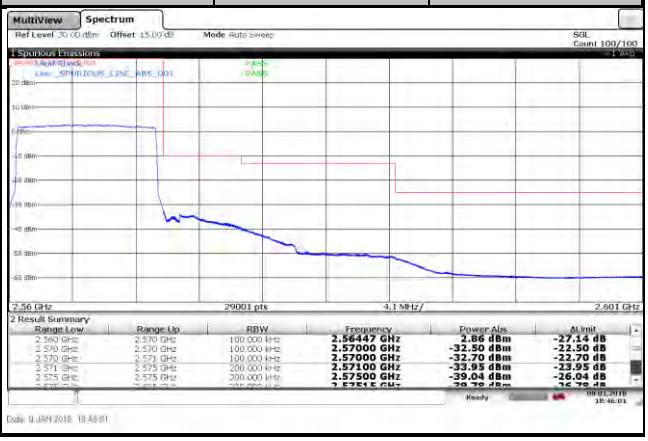
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.466 GHz	2.490 GHz	200.000 kHz	2.49045 GHz	-51.01 dBm	-26.01 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49492 GHz	-41.43 dBm	-28.43 dB
2.495 GHz	2.499 GHz	100.000 kHz	2.49598 GHz	-41.94 dBm	-28.94 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-42.21 dBm	-32.21 dB
2.496 GHz	2.499 GHz	200.000 kHz	2.49899 GHz	-36.20 dBm	-26.20 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-33.32 dBm	-23.32 dB
2.500 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-32.99 dBm	-62.99 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50220 GHz	3.99 dBm	-26.01 dB

Date: 8.JAN.2018 22:16:28

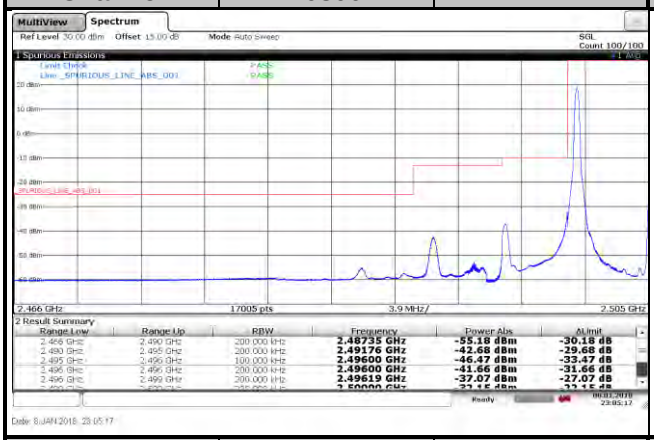


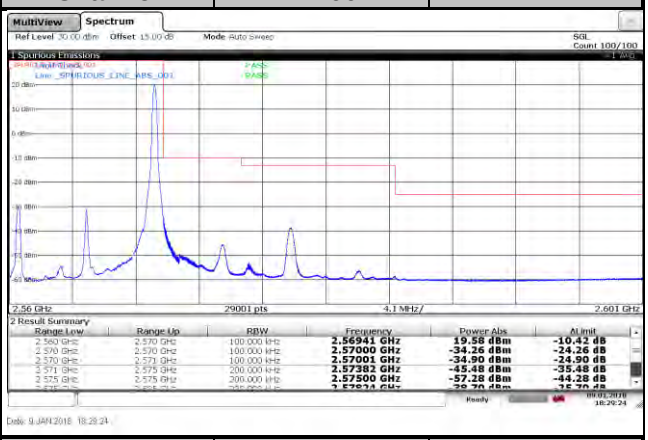
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56668 GHz	3.70 dBm	-26.30 dB
2.570 GHz	2.570 GHz	100.000 kHz	2.57000 GHz	-33.97 dBm	-23.97 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-34.50 dBm	-24.50 dB
2.571 GHz	2.575 GHz	200.000 kHz	2.57102 GHz	-41.79 dBm	-31.79 dB
2.575 GHz	2.575 GHz	200.000 kHz	2.57500 GHz	-46.13 dBm	-33.13 dB
2.575 GHz	2.581 GHz	200.000 kHz	2.57513 GHz	-46.38 dBm	-33.38 dB
2.581 GHz	2.581 GHz	200.000 kHz	2.58100 GHz	-55.99 dBm	-30.99 dB
2.581 GHz	2.601 GHz	200.000 kHz	2.58100 GHz	-56.42 dBm	-31.42 dB

Date: 8.JAN.2018 23:05:51

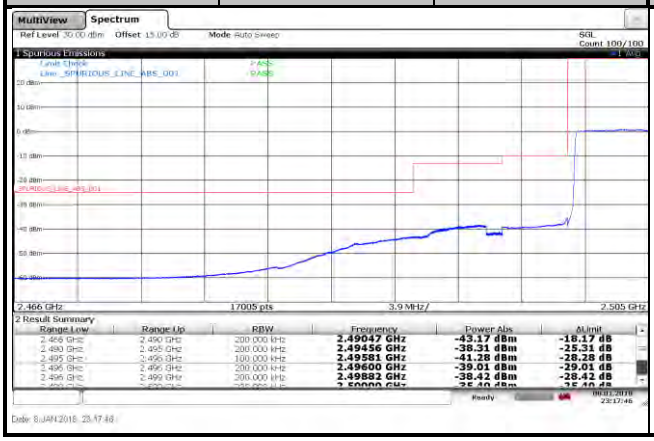
LTE Band 7					
Channel Bandwidth: 10 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	20800	1 RB	Channel	21400	1 RB
					
Channel	20800	50 RB	Channel	21400	50 RB
					

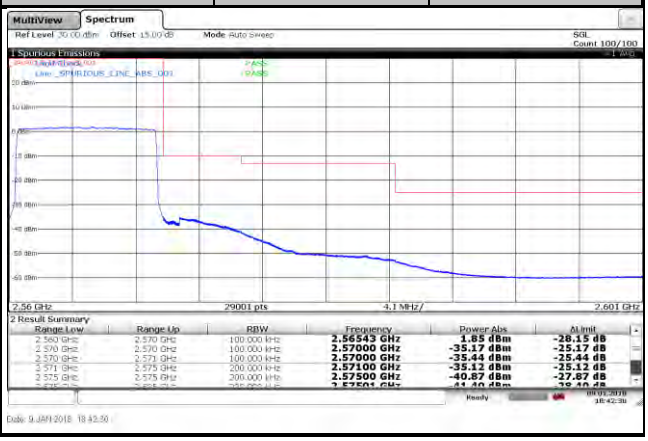
LTE Band 7					
Channel Bandwidth: 10 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	20800	1 RB	Channel	21400	1 RB

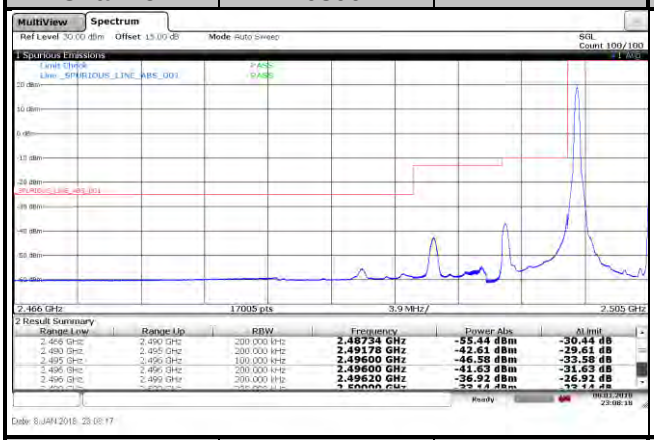
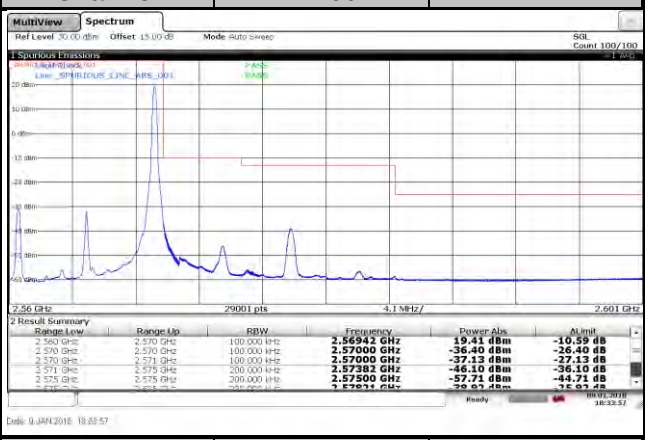
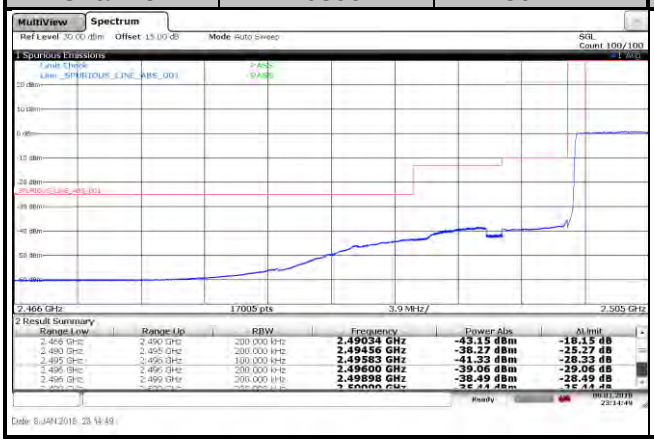


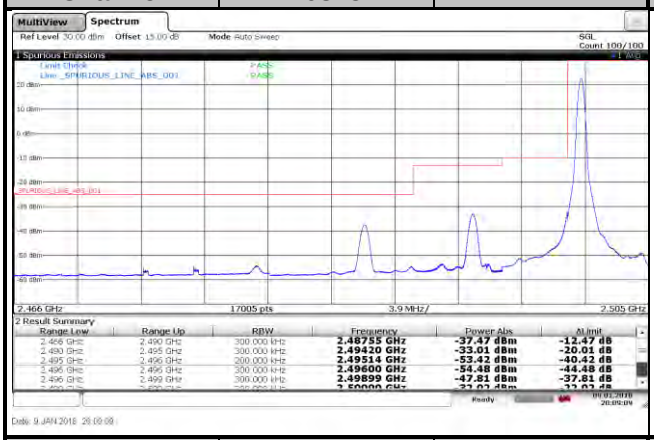
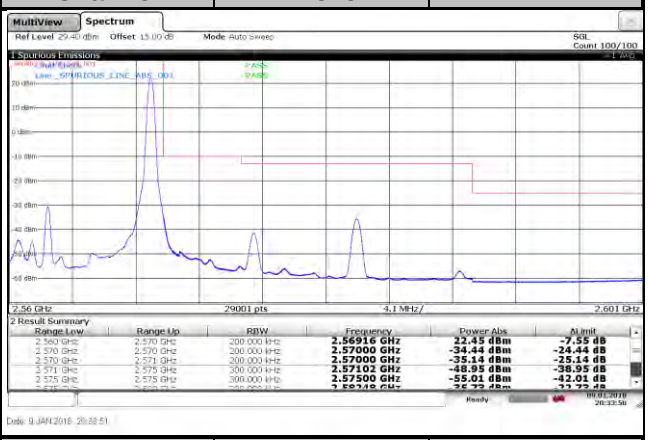
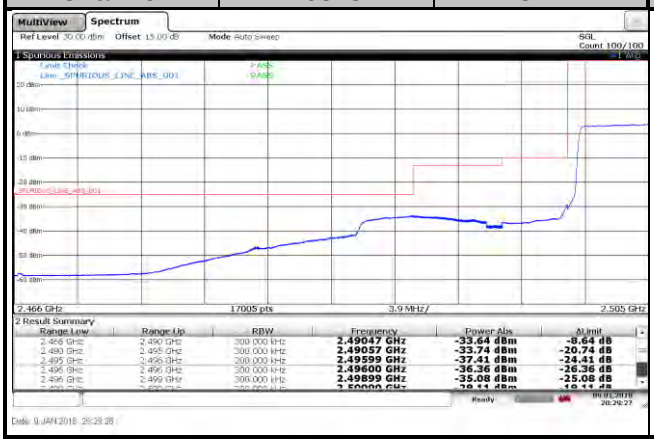
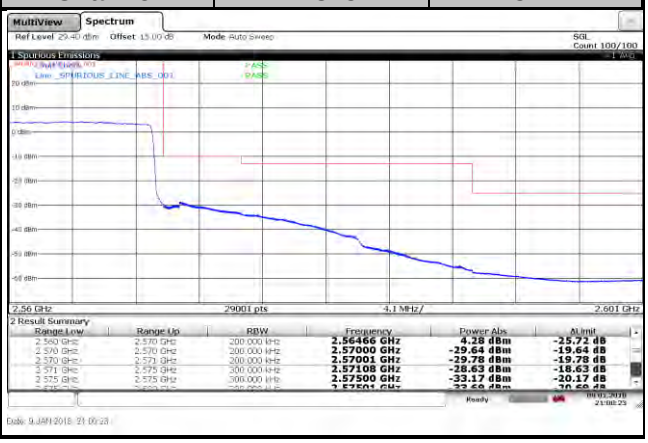


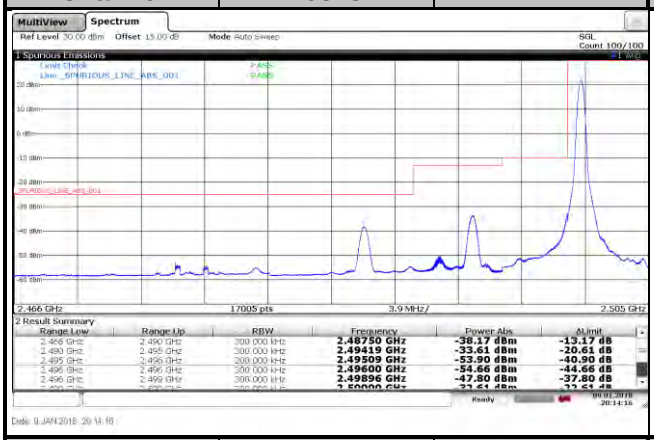
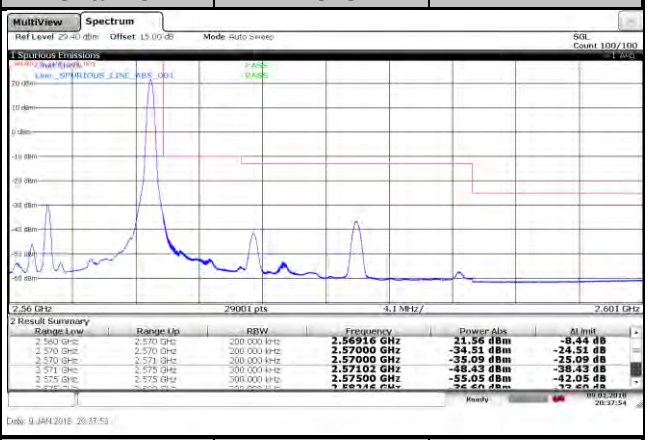
Channel	20800	50 RB	Channel	21400	50 RB

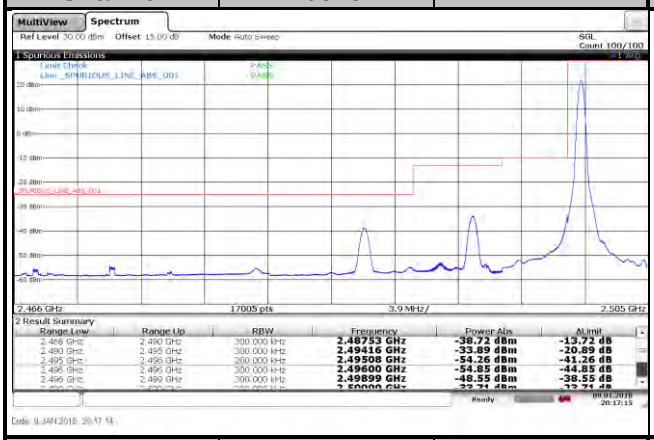
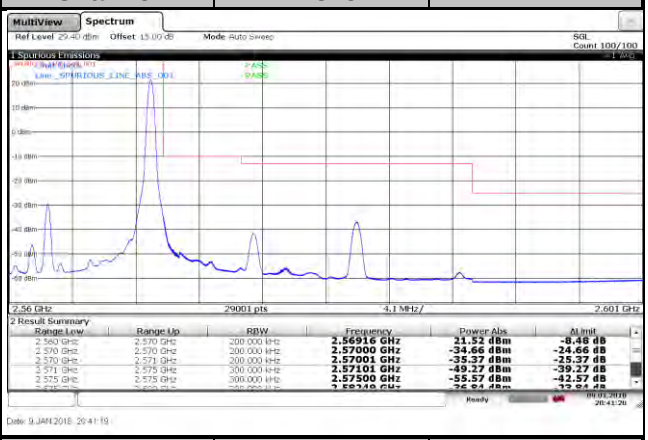
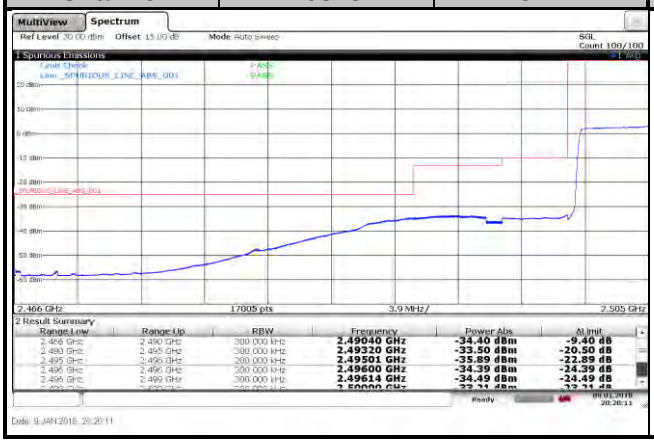
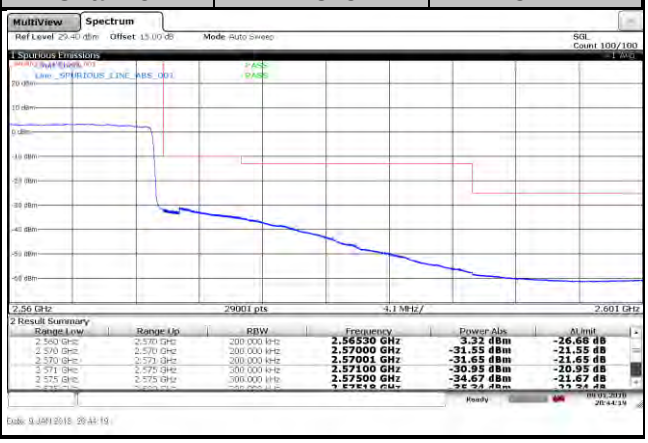


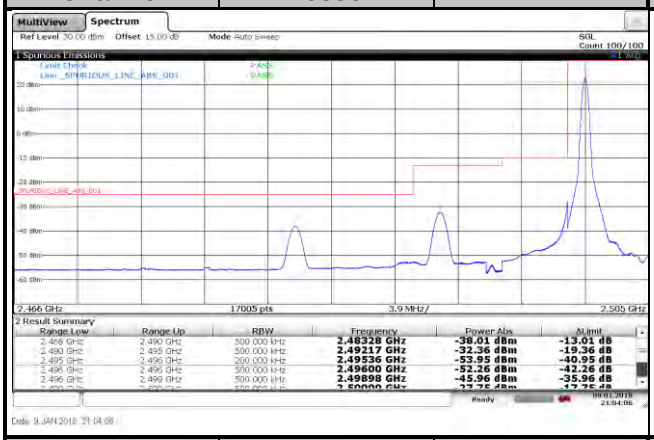
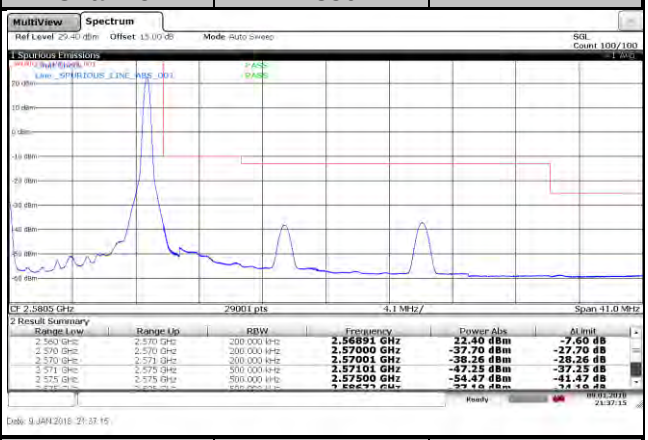
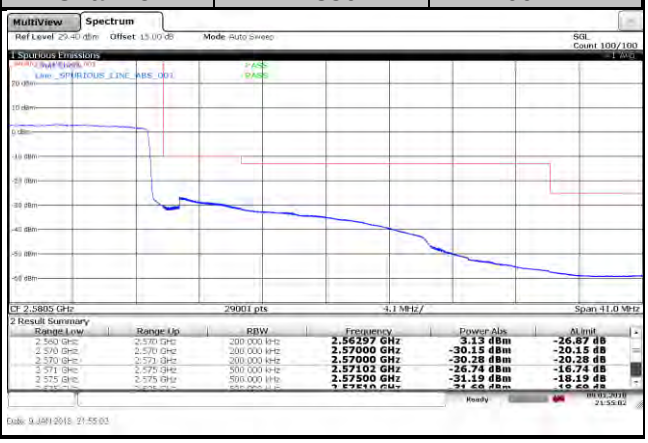


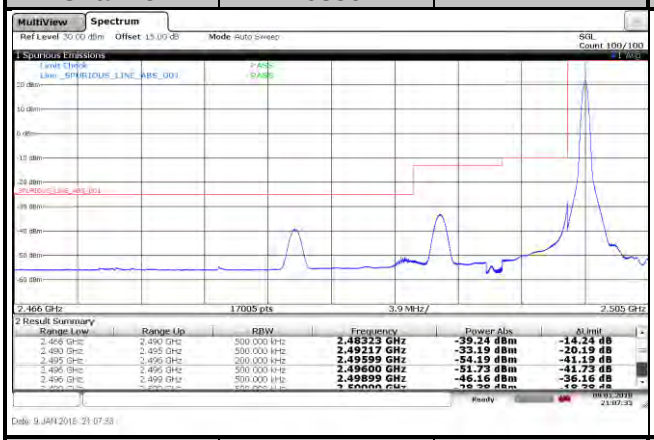
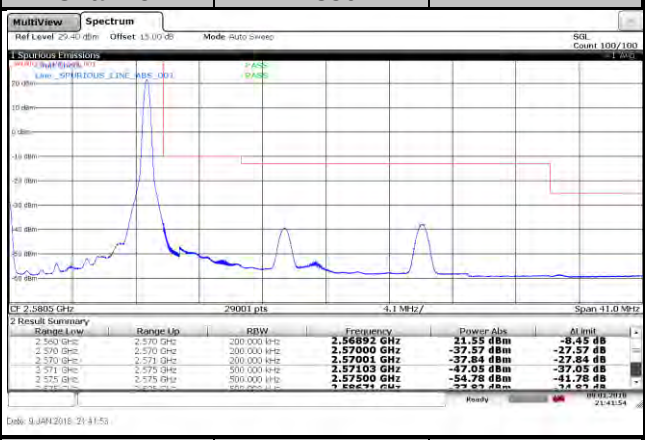
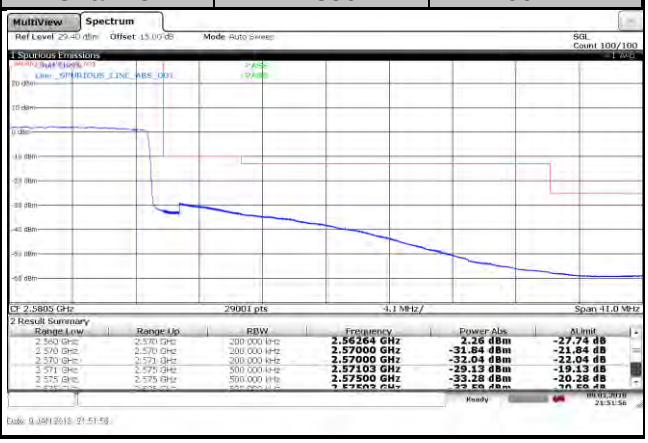
LTE Band 7					
Channel Bandwidth: 10 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	20800	1 RB	Channel	21400	1 RB
					
Channel	20800	50 RB	Channel	21400	50 RB
					

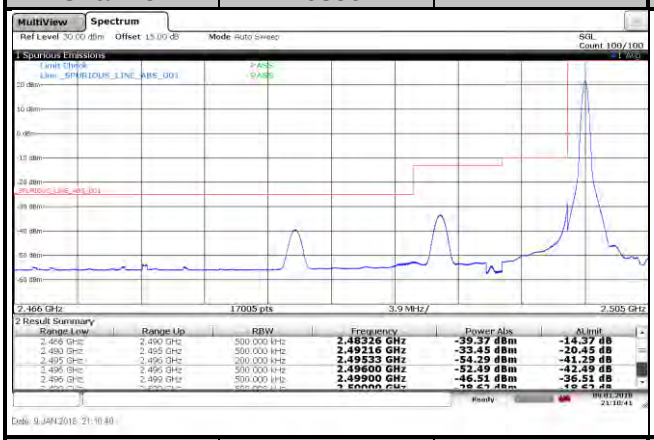
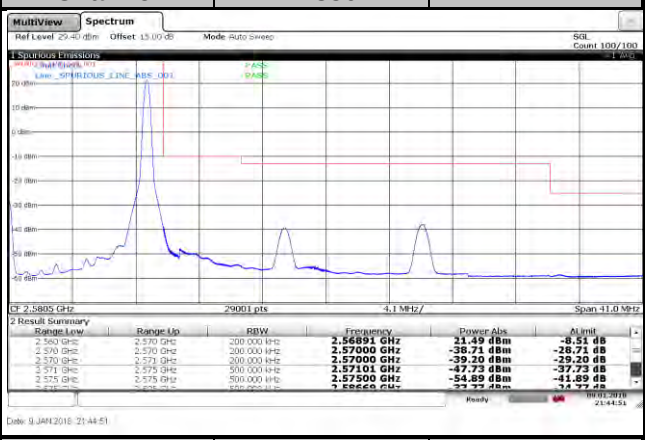
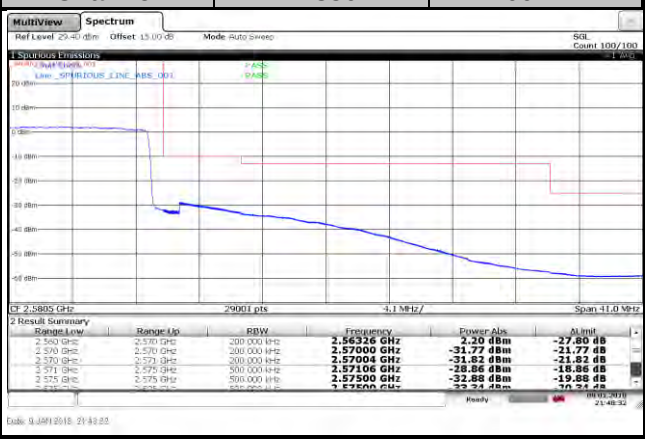
LTE Band 7					
Channel Bandwidth: 15 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	20825	1 RB	Channel	21375	1 RB
					
Channel	20825	75 RB	Channel	21375	75 RB
					

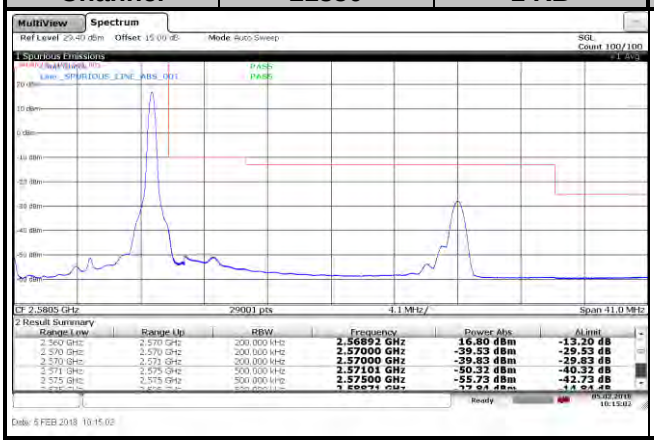
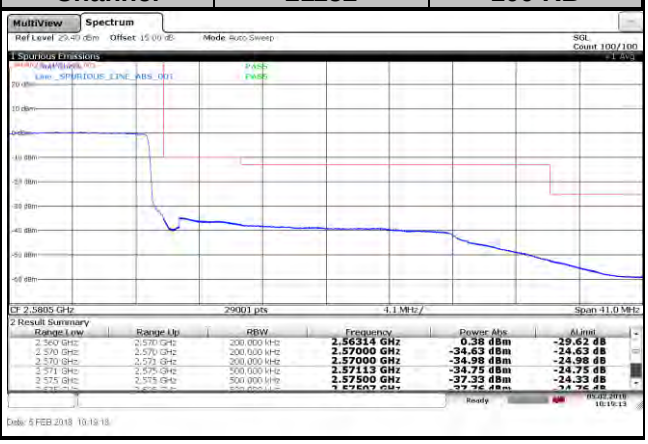
LTE Band 7					
Channel Bandwidth: 15 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	20825	1 RB	Channel	21375	1 RB
					
Channel	20825	75 RB	Channel	21375	75 RB

LTE Band 7					
Channel Bandwidth: 15 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	20825	1 RB	Channel	21375	1 RB
					
Channel	20825	75 RB	Channel	21375	75 RB
					

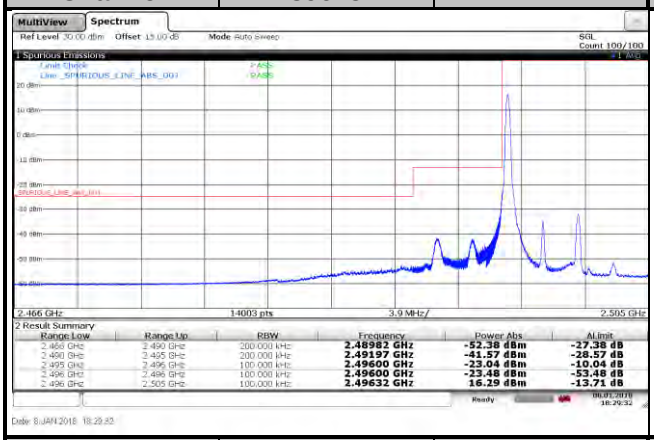
LTE Band 7					
Channel Bandwidth: 20 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	20850	1 RB	Channel	21350	1 RB
					
Channel	20850	100 RB	Channel	21350	100 RB
					

LTE Band 7					
Channel Bandwidth: 20 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	20850	1 RB	Channel	21350	1 RB
					
Channel	20850	100 RB	Channel	21350	100 RB
					

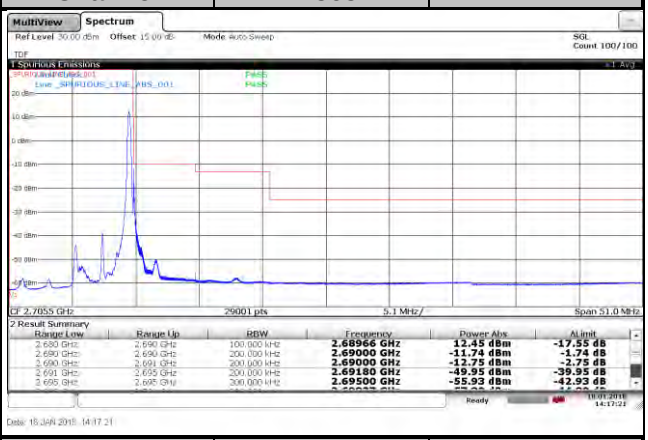
LTE Band 7					
Channel Bandwidth: 20 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	20850	1 RB	Channel	21350	1 RB
					
Channel	20850	100 RB	Channel	21350	100 RB
					

CA LTE Band 7					
Channel Bandwidth: 20 + 20 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	21350	1 RB	Channel	21152	100 RB
					

LTE Band 41					
Channel Bandwidth: 5 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	39675	1 RB	Channel	41565	1 RB

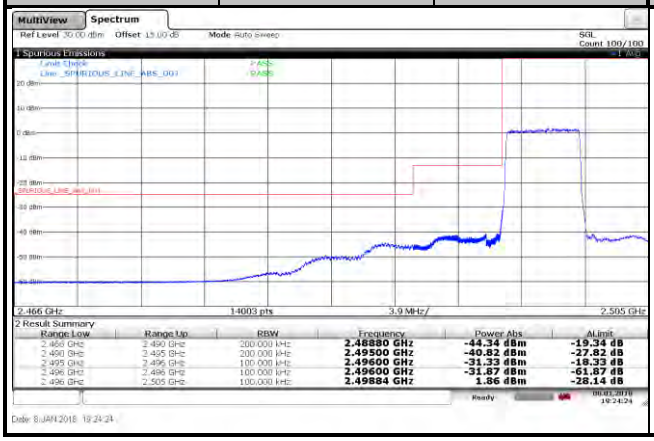


Range Low	Range Up	RBW	Frequency	Power Abs	ALimit
2.466 GHz	2.490 GHz	200.000 kHz	2.48982 GHz	-52.38 dBm	-27.38 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49197 GHz	-41.57 dBm	-28.57 dB
2.495 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-23.04 dBm	-10.04 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-23.48 dBm	-53.48 dB
2.496 GHz	2.505 GHz	100.000 kHz	2.49632 GHz	16.29 dBm	-13.71 dB

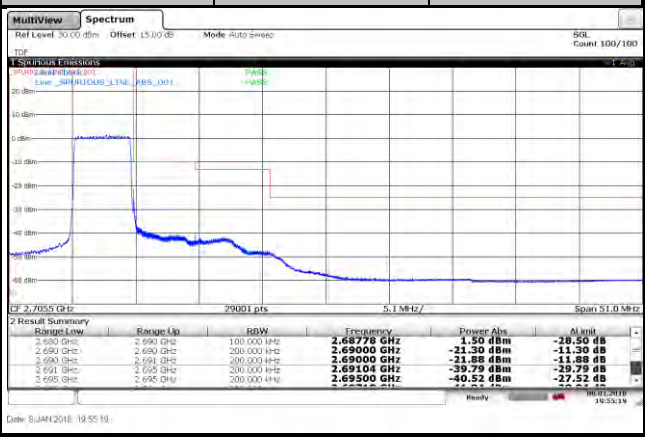


Range Low	Range Up	RBW	Frequency	Power Abs	ALimit
2.680 GHz	2.690 GHz	100.000 kHz	2.68966 GHz	12.45 dBm	-17.55 dB
2.690 GHz	2.690 GHz	200.000 kHz	2.69000 GHz	-11.74 dBm	-1.74 dB
2.690 GHz	2.691 GHz	200.000 kHz	2.69000 GHz	-12.75 dBm	-2.75 dB
2.691 GHz	2.695 GHz	200.000 kHz	2.69180 GHz	-49.95 dBm	-39.95 dB
2.695 GHz	2.695 GHz	200.000 kHz	2.69500 GHz	-55.93 dBm	-42.93 dB

Channel	39675	25 RB	Channel	41565	25 RB

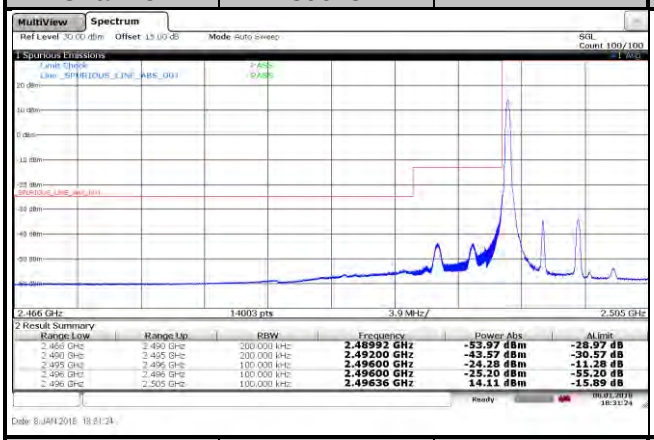


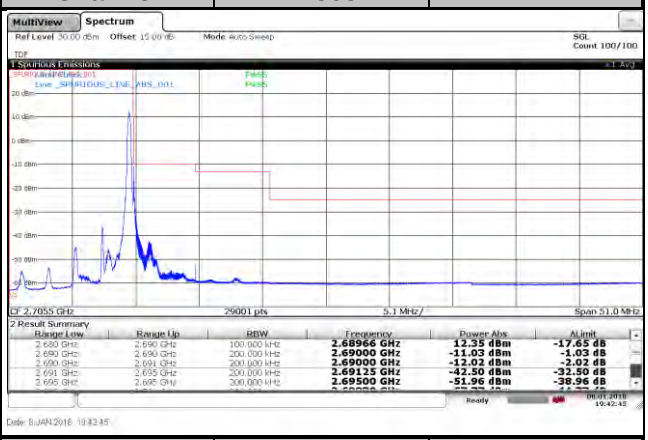
Range Low	Range Up	RBW	Frequency	Power Abs	ALimit
2.466 GHz	2.490 GHz	200.000 kHz	2.48880 GHz	-44.34 dBm	-19.34 dB
2.490 GHz	2.495 GHz	200.000 kHz	2.49500 GHz	-40.82 dBm	-27.82 dB
2.495 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-31.33 dBm	-18.33 dB
2.496 GHz	2.496 GHz	100.000 kHz	2.49600 GHz	-31.87 dBm	-61.87 dB
2.496 GHz	2.505 GHz	100.000 kHz	2.49884 GHz	1.86 dBm	-28.14 dB



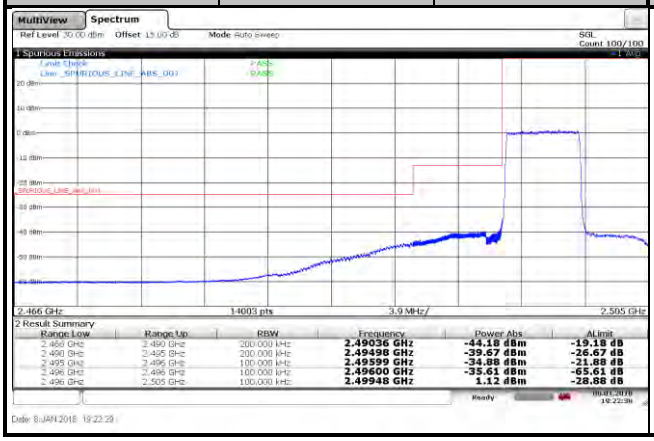
Range Low	Range Up	RBW	Frequency	Power Abs	ALimit
2.680 GHz	2.690 GHz	100.000 kHz	2.68778 GHz	1.50 dBm	-28.50 dB
2.690 GHz	2.690 GHz	200.000 kHz	2.69000 GHz	-21.30 dBm	-11.30 dB
2.690 GHz	2.691 GHz	200.000 kHz	2.69000 GHz	-21.88 dBm	-11.88 dB
2.691 GHz	2.695 GHz	200.000 kHz	2.69104 GHz	-39.79 dBm	-29.79 dB
2.695 GHz	2.695 GHz	200.000 kHz	2.69500 GHz	-40.52 dBm	-27.52 dB

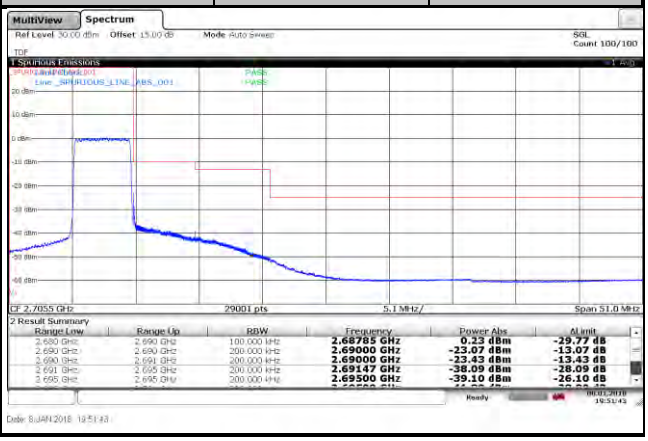
LTE Band 41					
Channel Bandwidth: 5 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	39675	1 RB	Channel	41565	1 RB



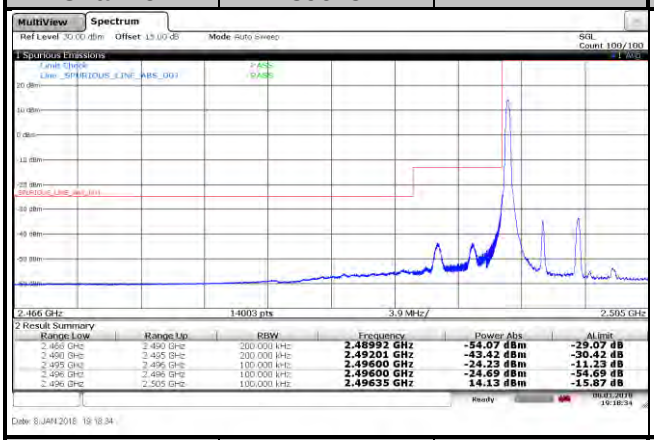


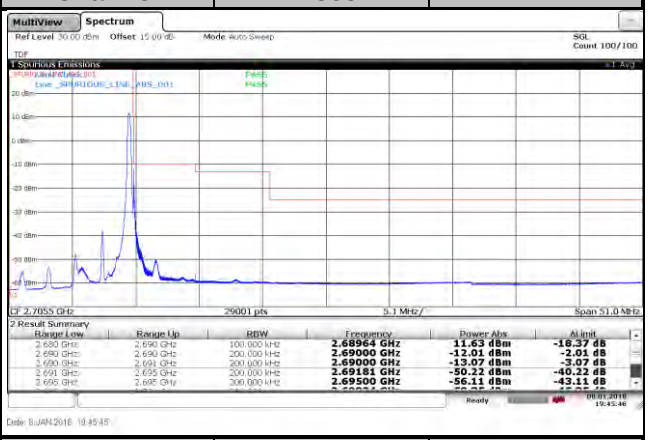
Channel	39675	25 RB	Channel	41565	25 RB



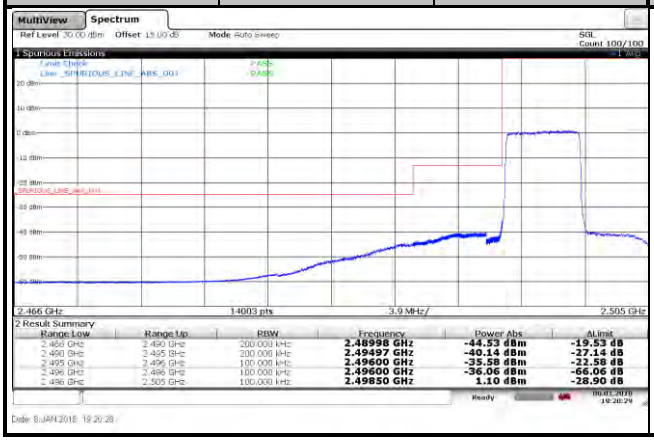


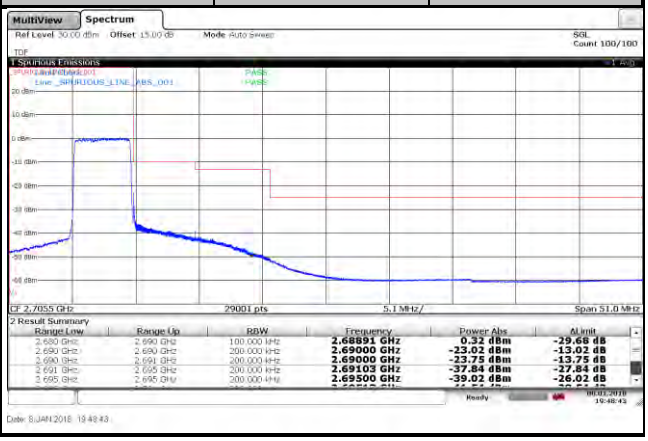
LTE Band 41					
Channel Bandwidth: 5 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	39675	1 RB	Channel	41565	1 RB



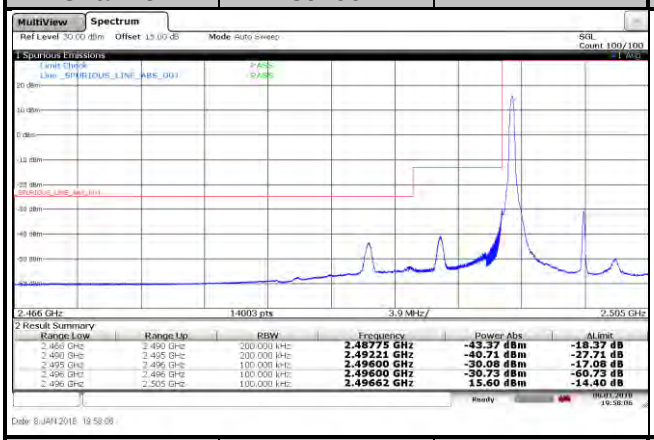


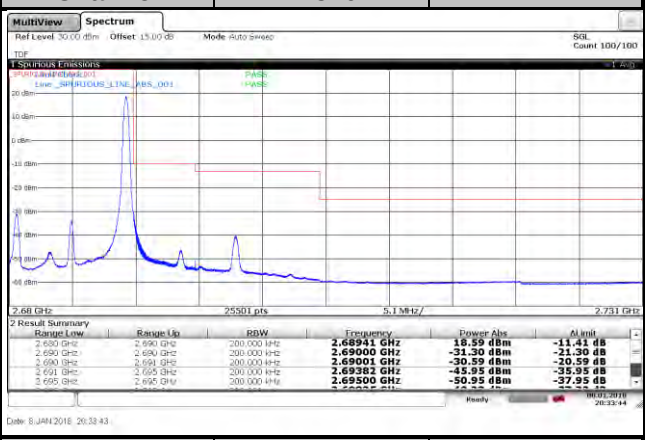
Channel	39675	25 RB	Channel	41565	25 RB



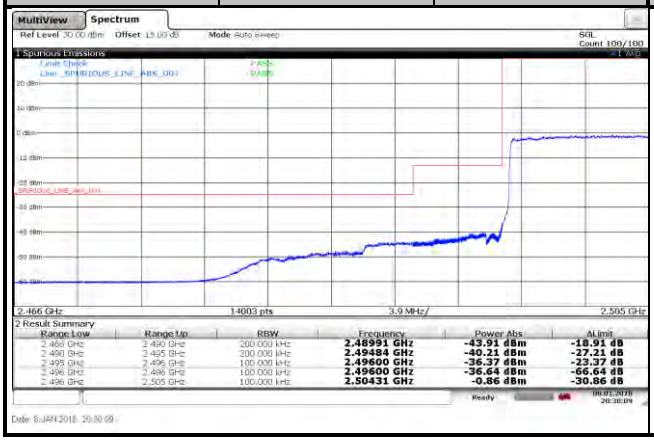


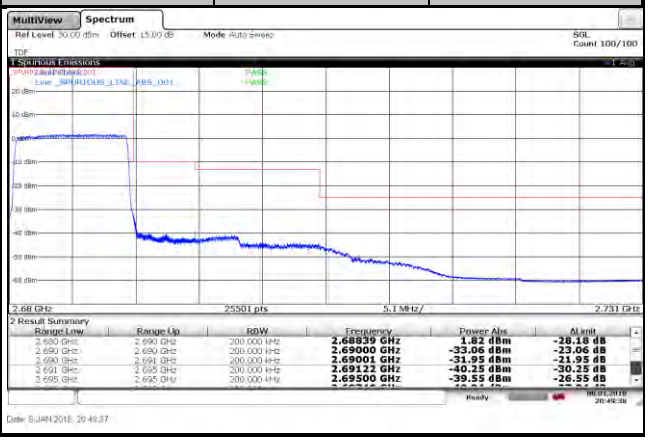
LTE Band 41					
Channel Bandwidth: 10 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	39700	1 RB	Channel	41540	1 RB



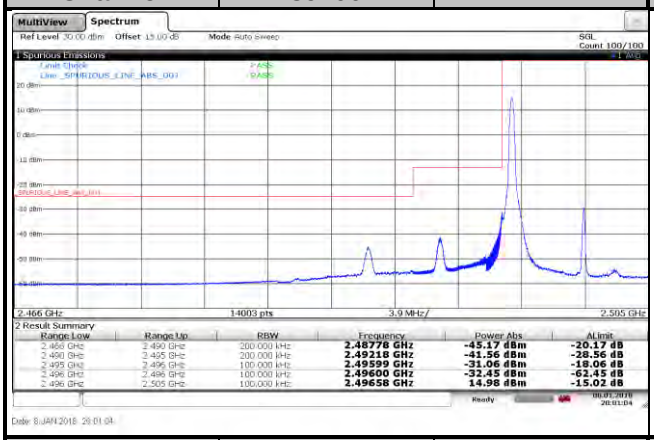


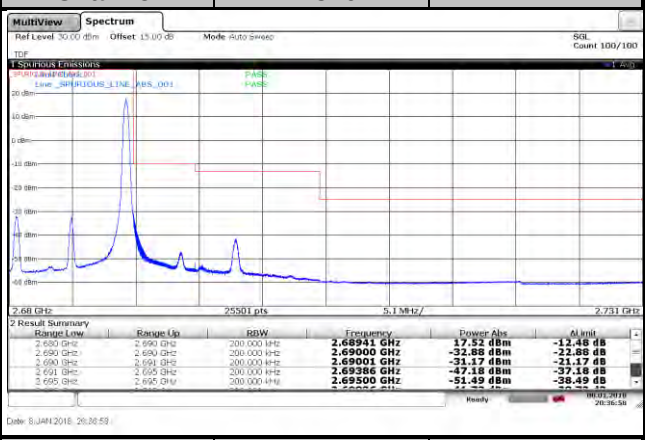
Channel	39700	50 RB	Channel	41540	50 RB



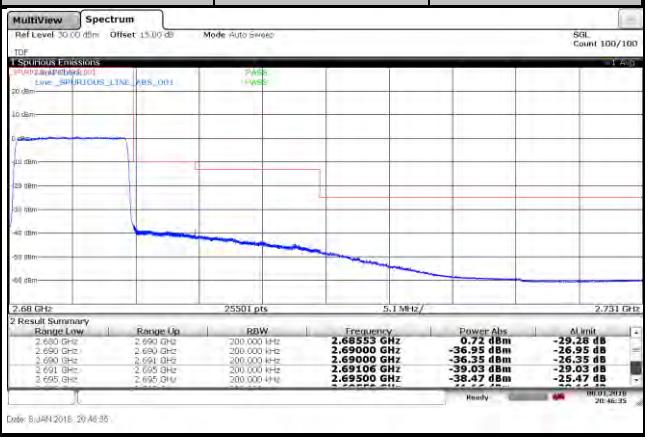


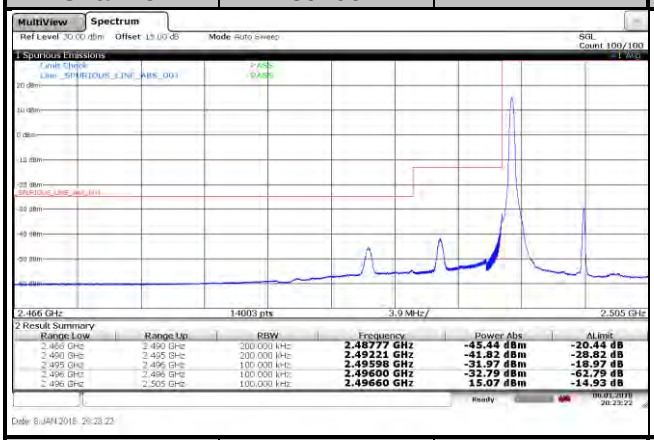
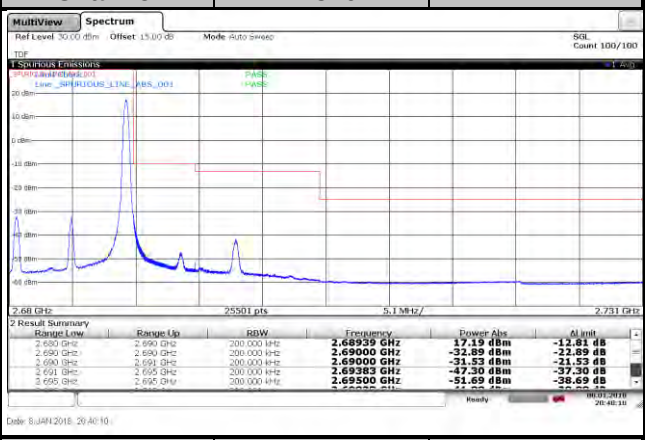
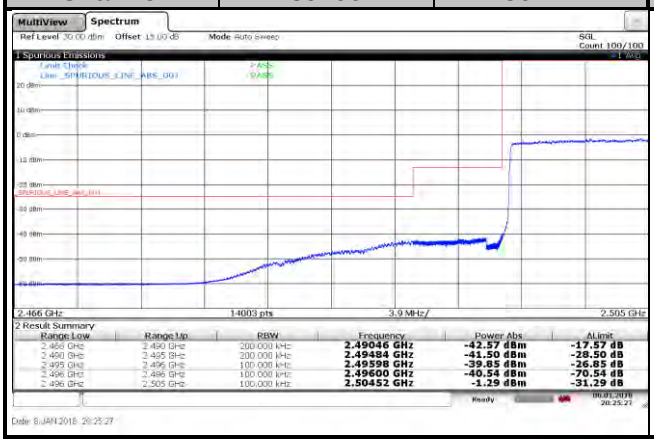
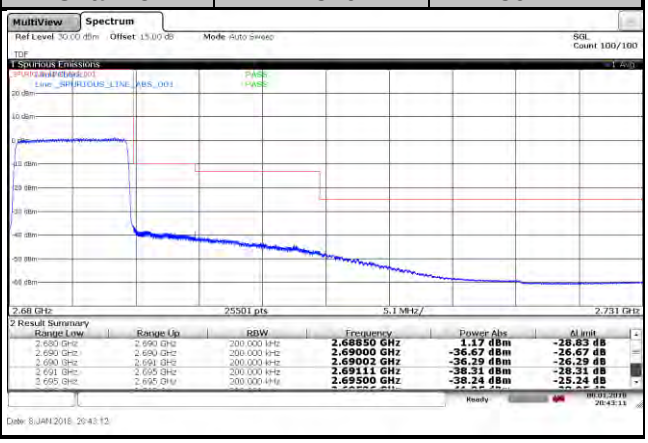
LTE Band 41					
Channel Bandwidth: 10 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	39700	1 RB	Channel	41540	1 RB



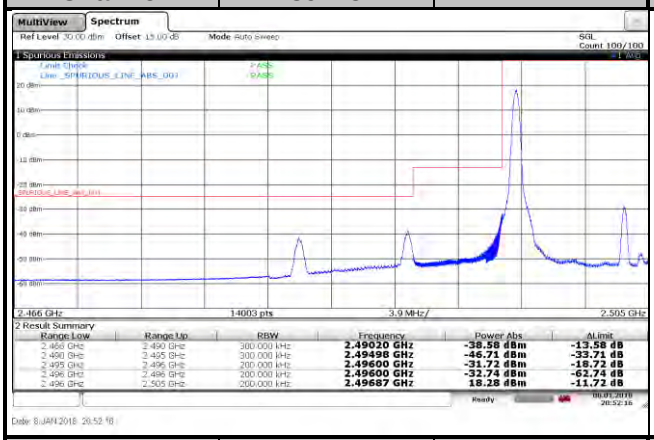


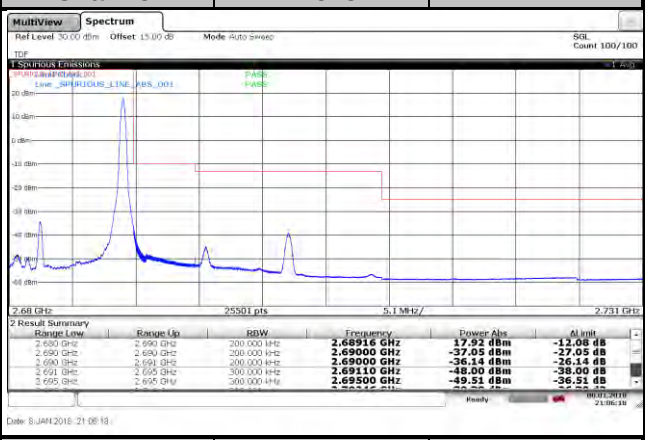
Channel	39700	50 RB	Channel	41540	50 RB



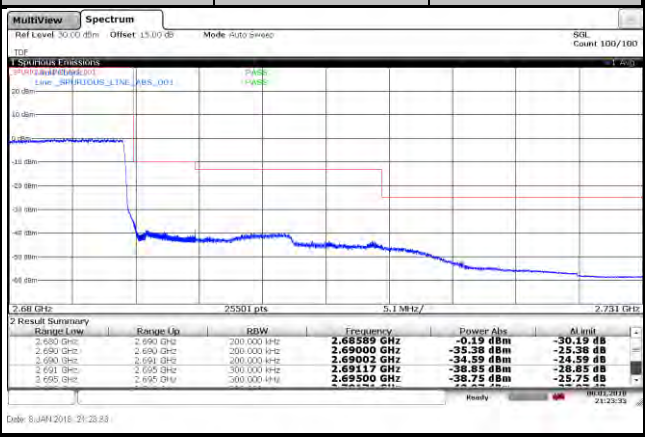
LTE Band 41					
Channel Bandwidth: 10 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	39700	1 RB	Channel	41540	1 RB
					
Channel	39700	50 RB	Channel	41540	50 RB
					

LTE Band 41					
Channel Bandwidth: 15 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	39725	1 RB	Channel	41515	1 RB

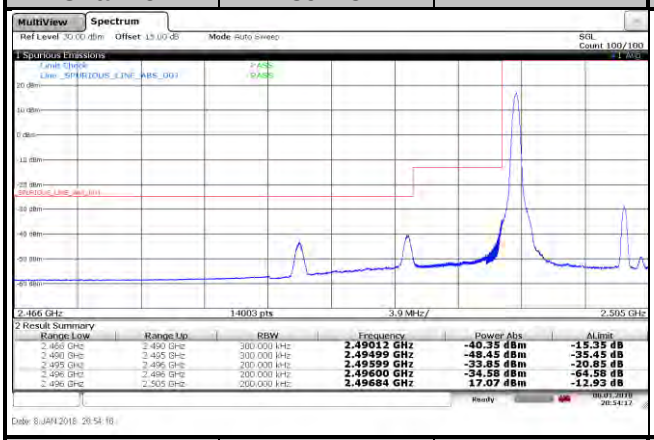


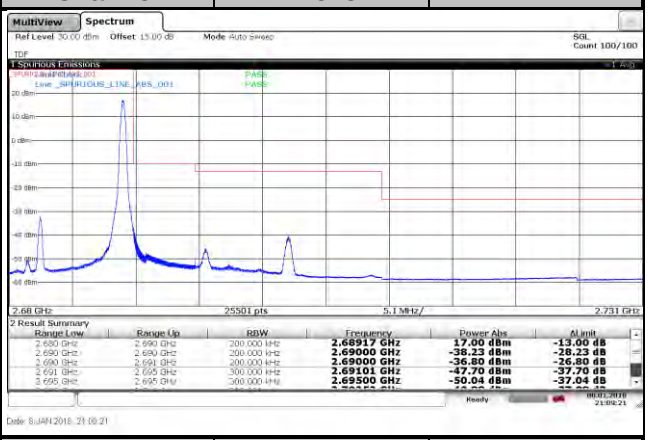


Channel	39725	75 RB	Channel	41515	75 RB

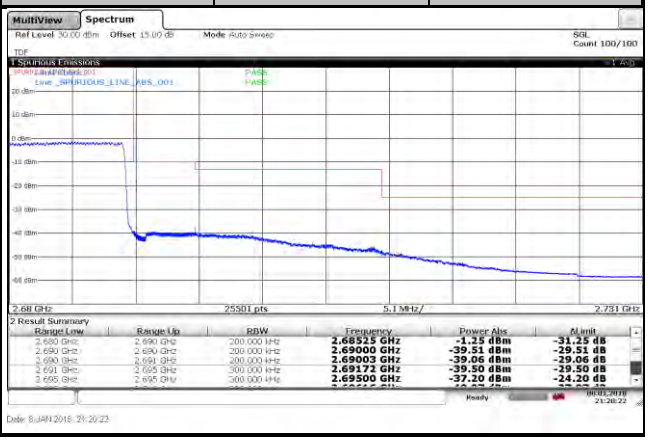


LTE Band 41					
Channel Bandwidth: 15 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	39725	1 RB	Channel	41515	1 RB

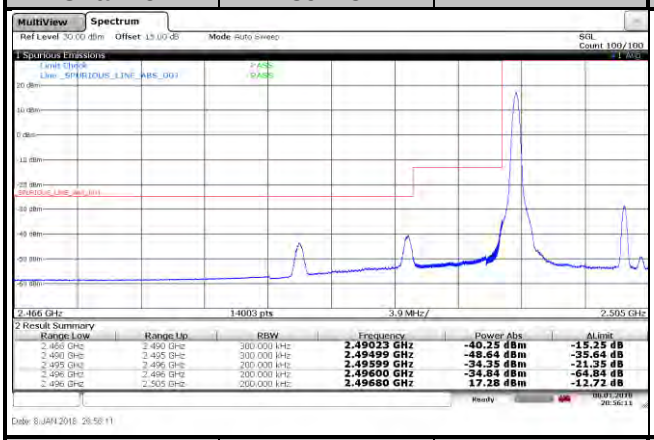


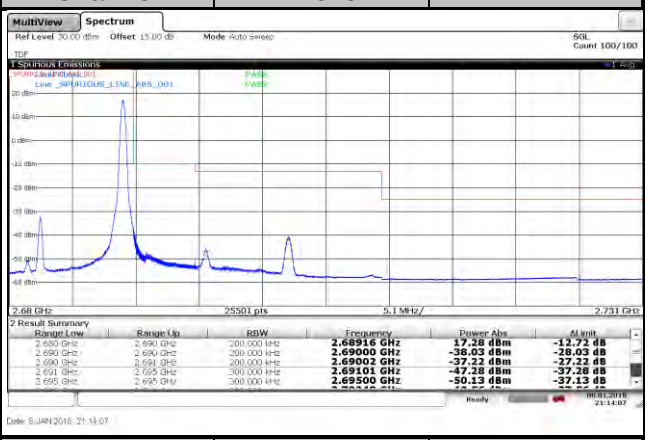


Channel	39725	75 RB	Channel	41515	75 RB

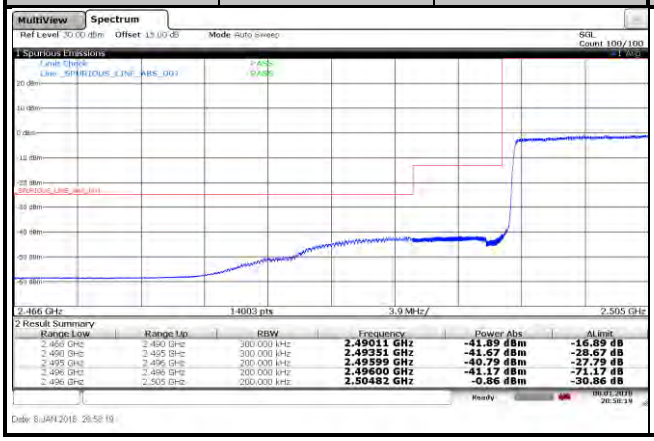


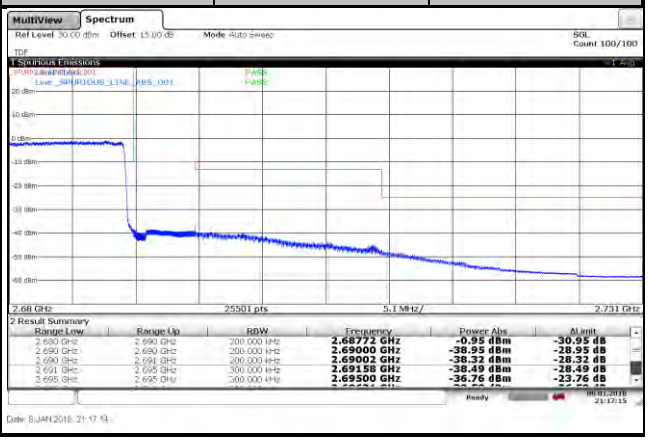
LTE Band 41					
Channel Bandwidth: 15 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	39725	1 RB	Channel	41515	1 RB

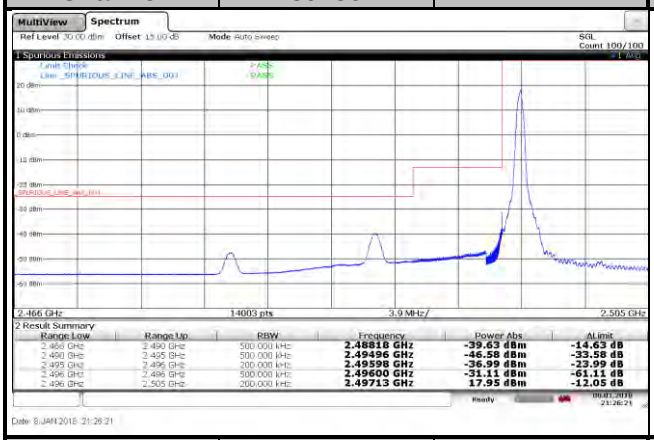
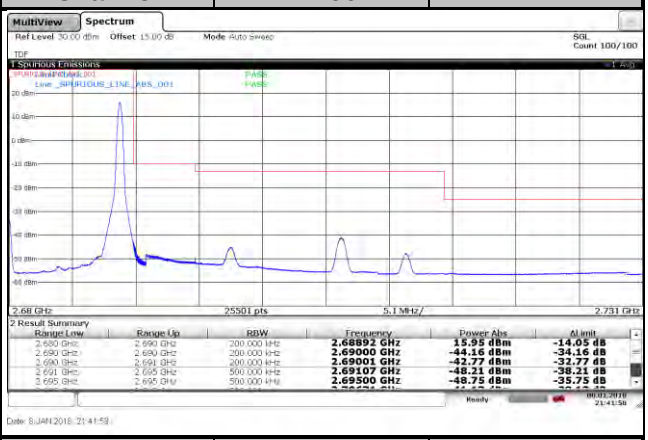
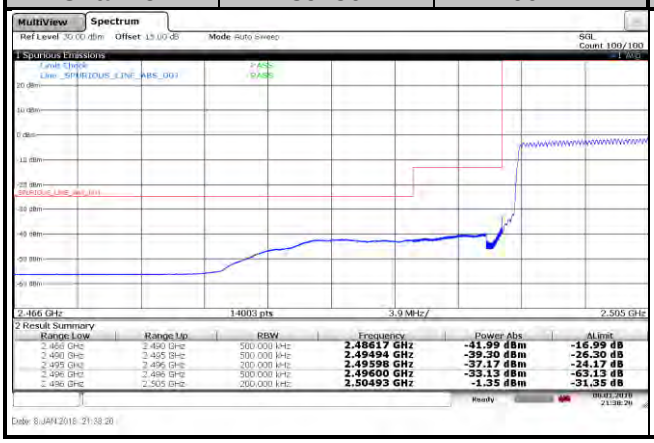
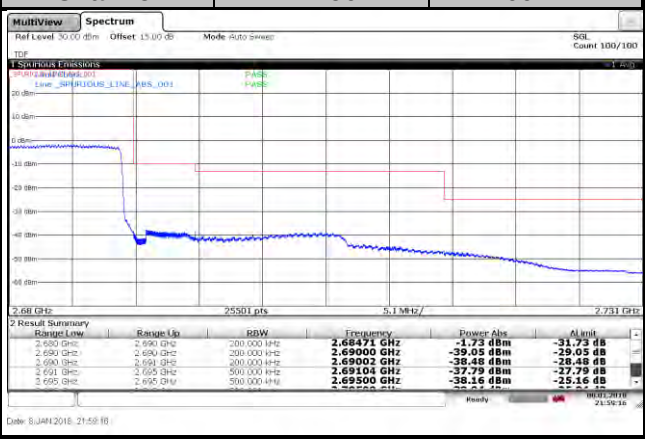




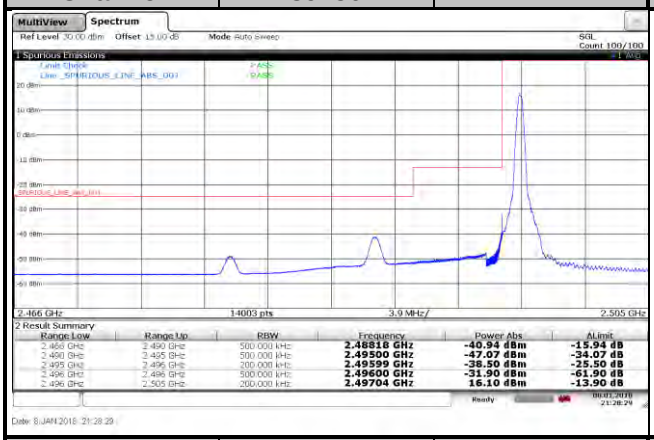
Channel	39725	75 RB	Channel	41515	75 RB

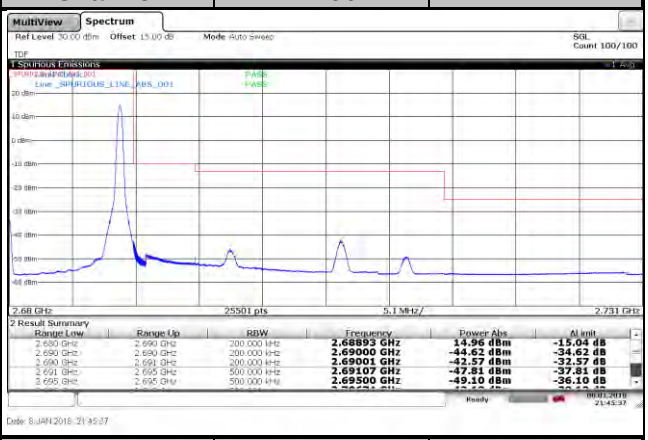




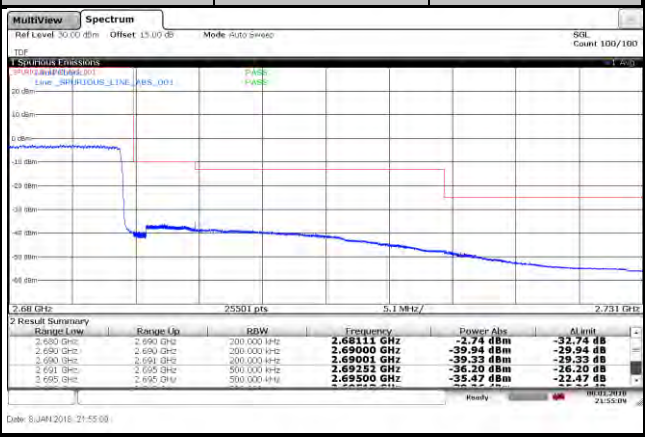
LTE Band 41					
Channel Bandwidth: 20 MHz / QPSK					
<Out-of-Band Emissions>					
Channel	39750	1 RB	Channel	41490	1 RB
					
Channel	39750	100 RB	Channel	41490	100 RB
					

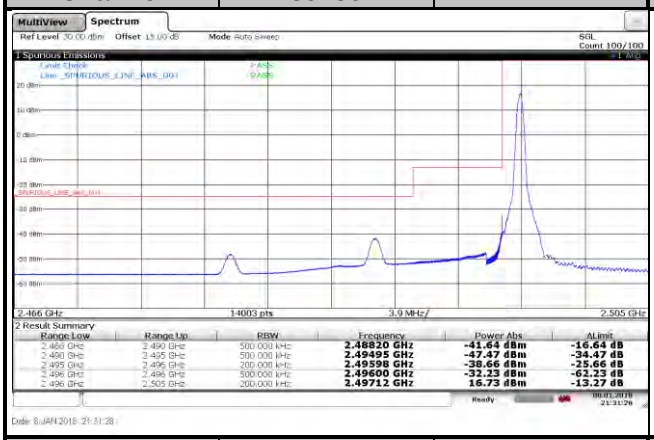
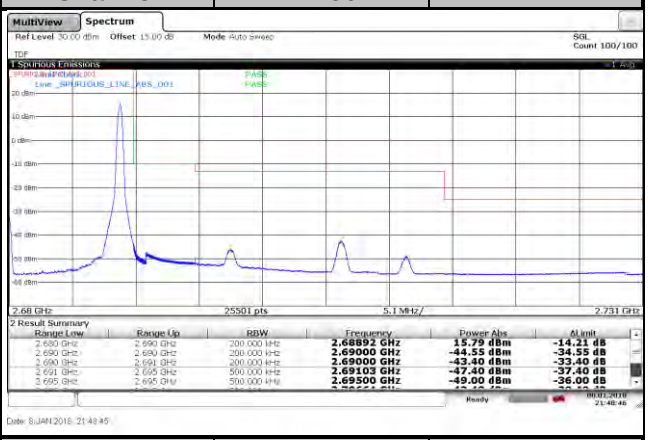
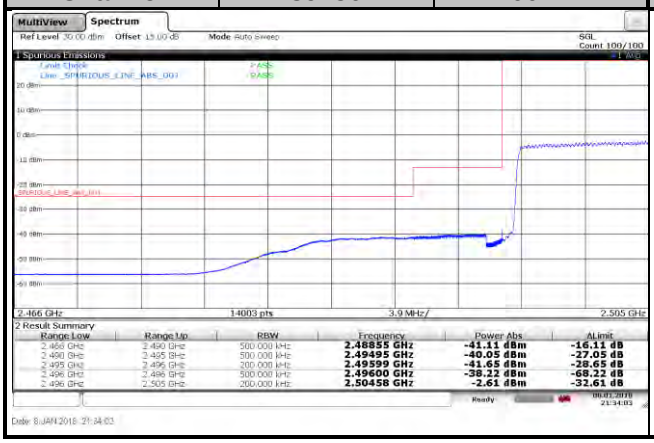
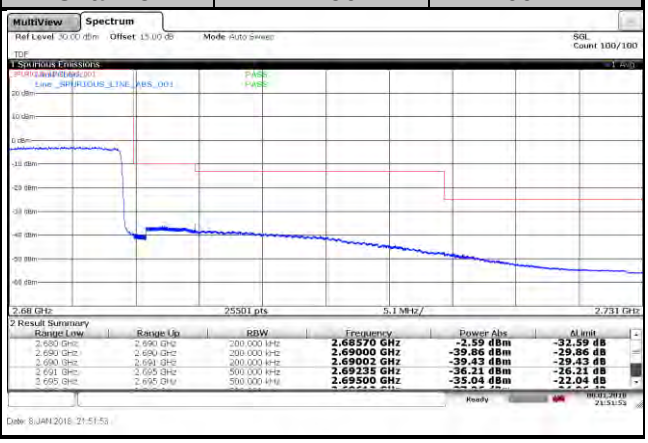
LTE Band 41					
Channel Bandwidth: 20 MHz / 16QAM					
<Out-of-Band Emissions>					
Channel	39750	1 RB	Channel	41490	1 RB





Channel	39750	100 RB	Channel	41490	100 RB



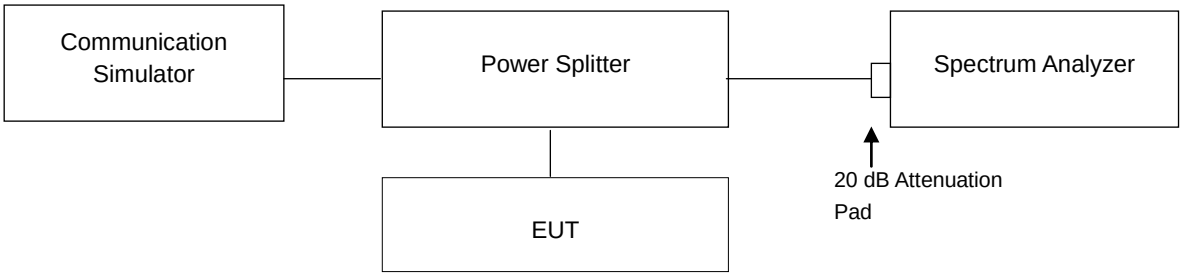
LTE Band 41					
Channel Bandwidth: 20 MHz / 64QAM					
<Out-of-Band Emissions>					
Channel	39750	1 RB	Channel	41490	1 RB
					
Channel	39750	100 RB	Channel	41490	100 RB
					

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

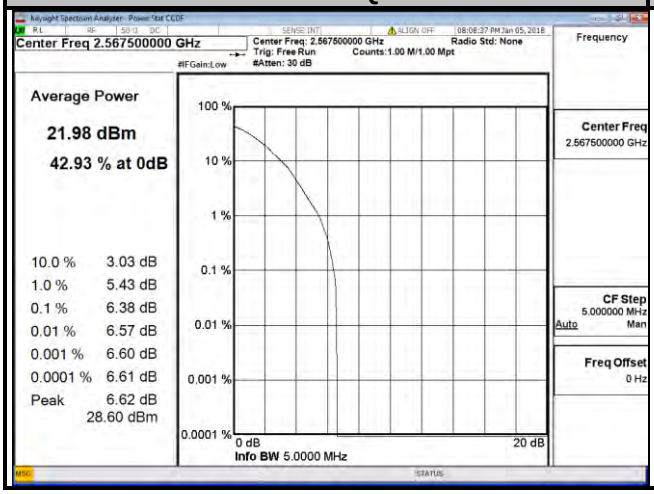
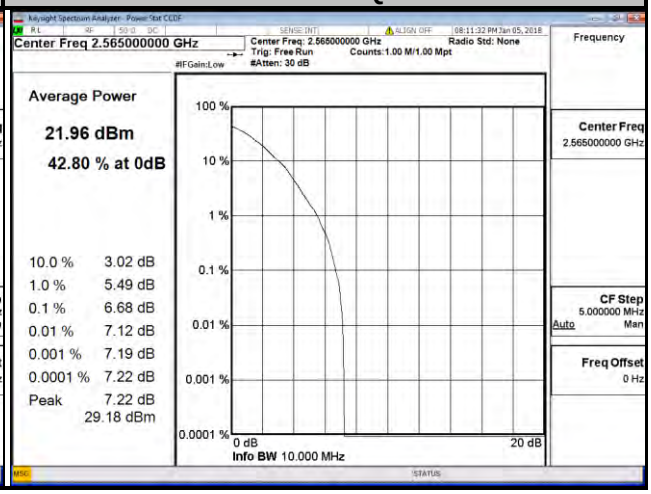


4.5.3 Test Procedures

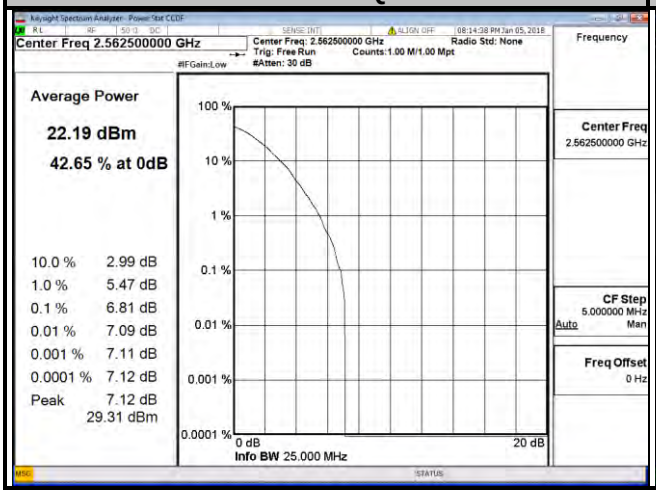
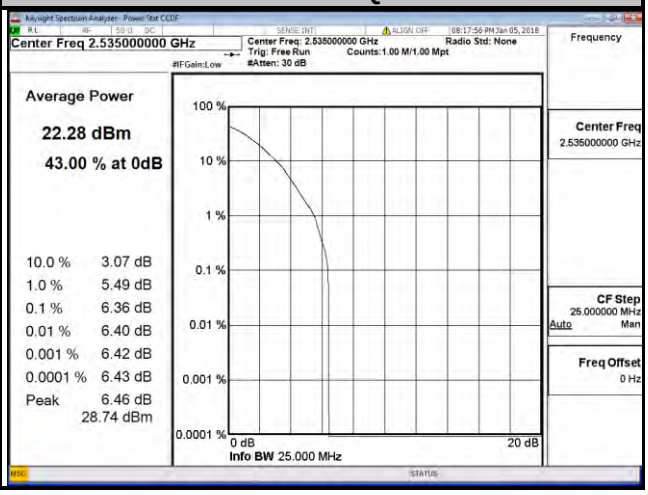
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

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	64QAM			QPSK	16QAM	64QAM
20775	2502.5	3.61	5.07	6.16	20800	2505.0	3.58	5.03	6.15
21100	2535.0	3.41	4.28	5.53	21100	2535.0	3.52	4.67	5.80
21425	2567.5	3.61	5.33	6.38	21400	2565.0	3.55	5.30	6.68

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

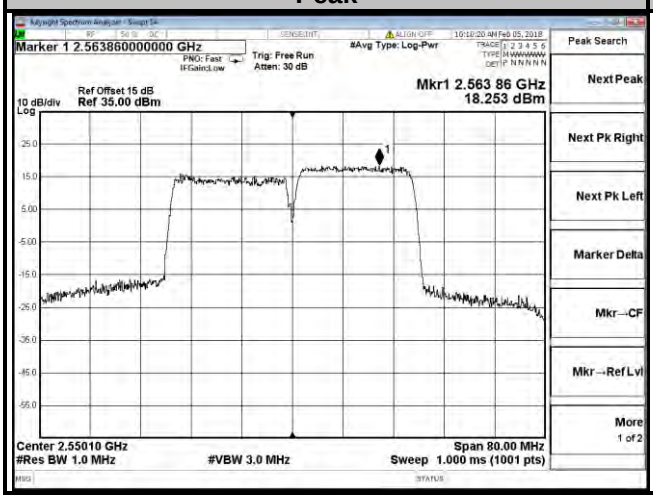
LTE Band 7									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20825	2507.5	3.49	4.99	6.15	20850	2510.0	3.52	5.01	6.10
21100	2535.0	3.49	4.95	6.09	21100	2535.0	3.46	5.22	6.36
21375	2562.5	3.52	5.26	6.81	21350	2560.0	3.50	5.28	6.25

Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

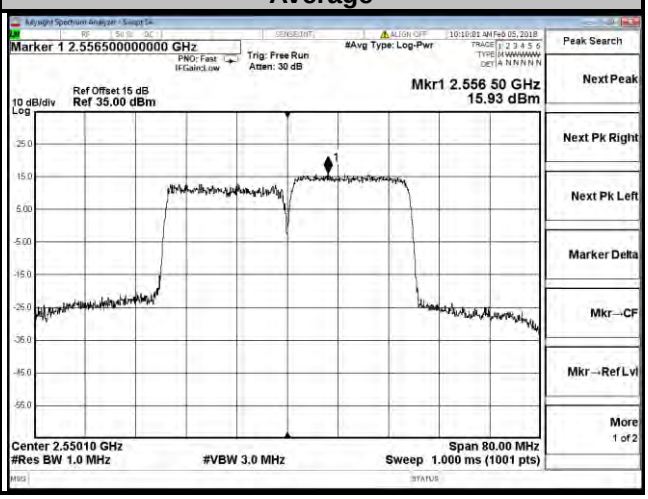
CA LTE Band 7		
Channel Bandwidth: 20 + 20 MHz		
Channel	**Frequency (MHz)**	**Peak to Average Ratio (dB)**
21350 & 21152	2550.1	2.32

Spectrum Plot of Worst Value

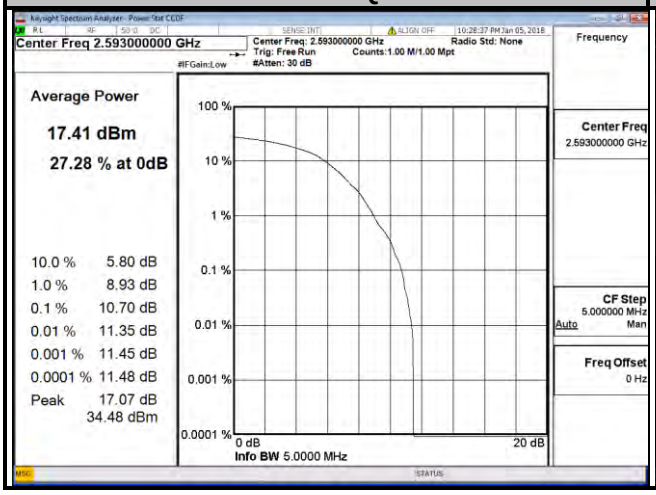
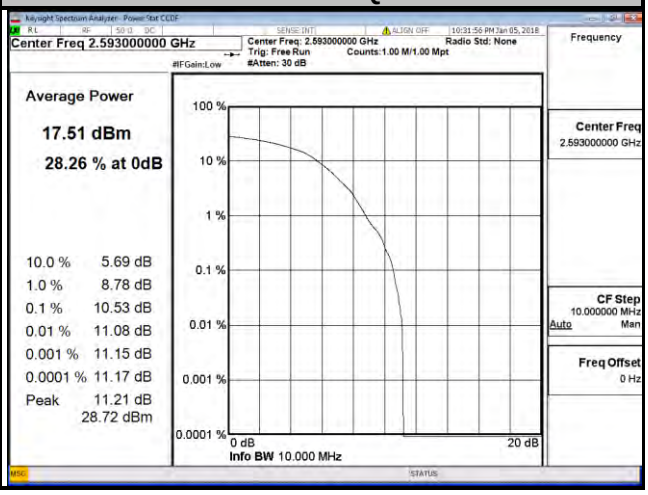
Peak



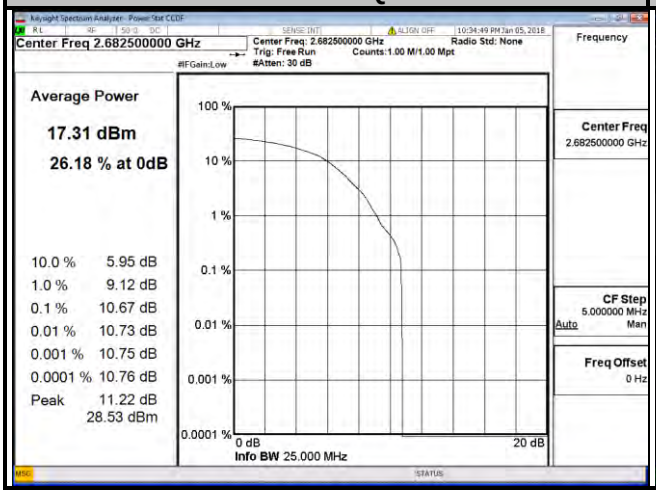
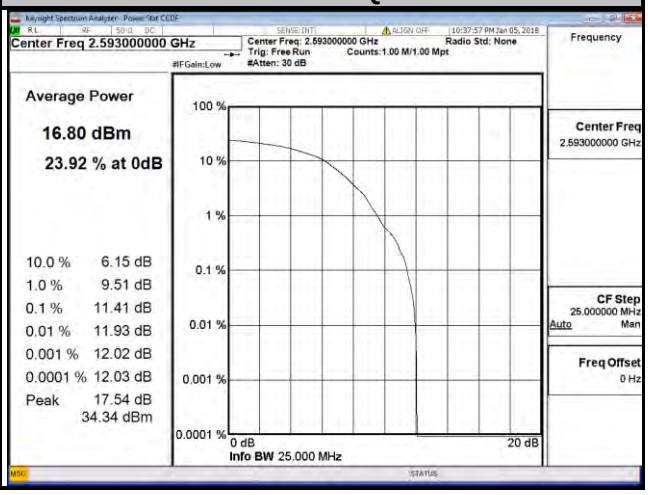
Average



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	64QAM			QPSK	16QAM	64QAM
39675	2498.5	7.52	9.45	9.68	39700	2501.0	8.75	9.66	10.40
40620	2593.0	7.42	9.43	10.70	40620	2593.0	7.09	9.53	10.53
41565	2687.5	7.33	8.18	9.79	41540	2685.0	7.26	9.33	9.22

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

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	64QAM			QPSK	16QAM	64QAM
39725	2503.5	7.65	8.51	10.41	39750	2506.0	7.74	9.82	9.69
40620	2593.0	7.91	8.90	10.09	40620	2593.0	7.99	9.32	11.41
41515	2682.5	6.56	8.75	10.67	41490	2680.0	9.67	8.54	10.11

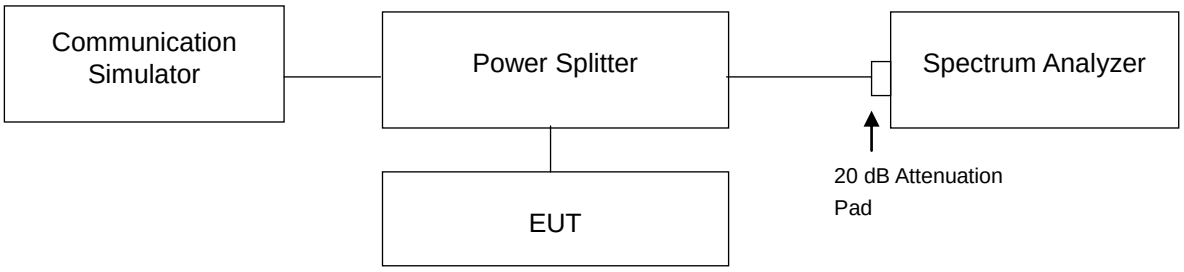
Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

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



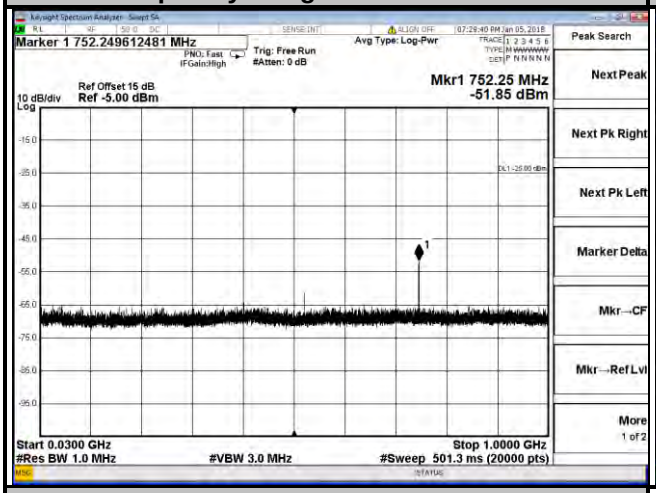
4.6.3 Test Procedure

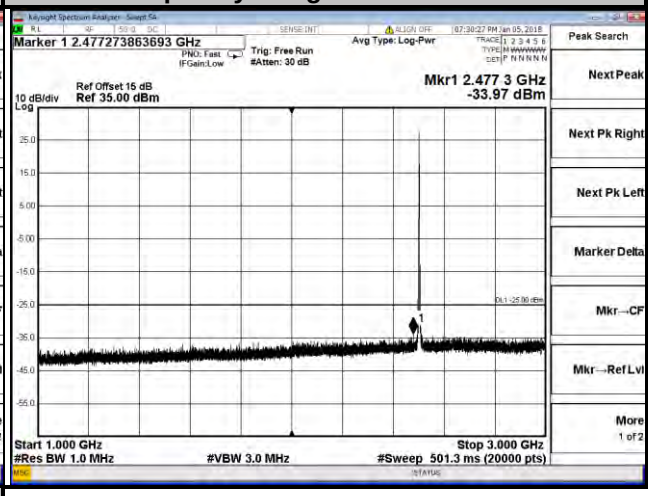
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 30 MHz to 26.5 GHz for LTE Band 7 and from 30 MHz to 27 GHz for LTE Band 41. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted spurious emission measurement.

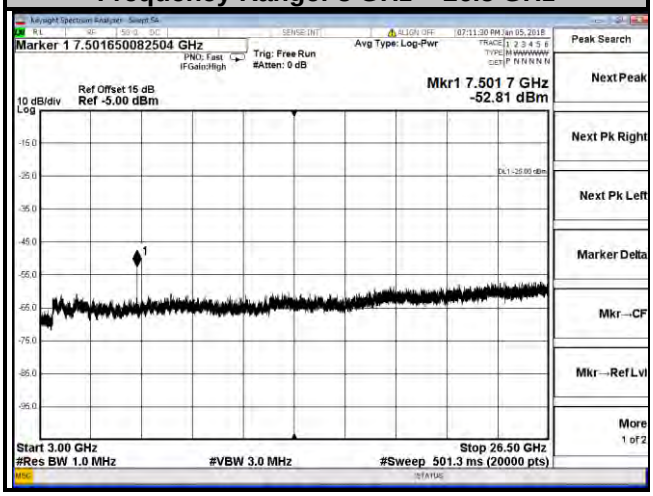
4.6.4 Test Results

LTE Band 7	
Channel Bandwidth: 5 MHz	
Channel 20775	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz

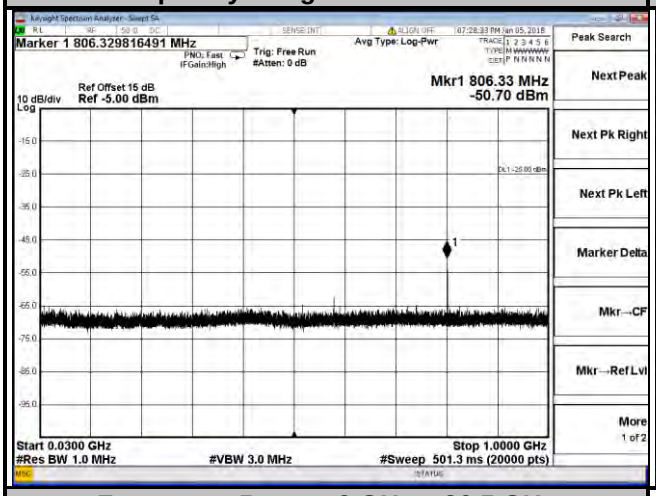


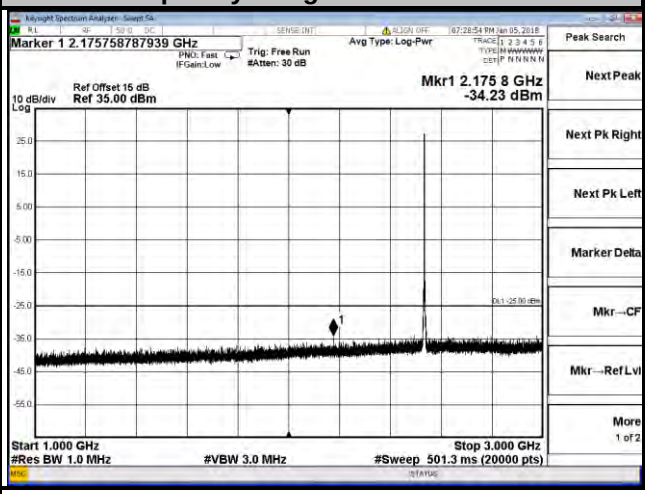


Frequency Range: 3 GHz ~ 26.5 GHz

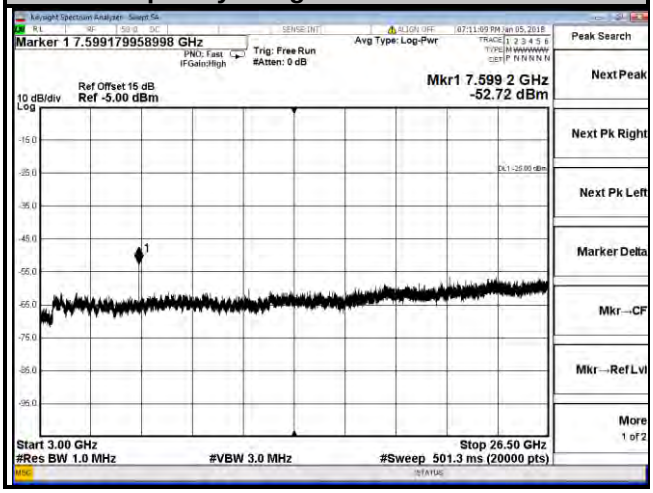


LTE Band 7	
Channel Bandwidth: 5 MHz	
Channel 21100	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz

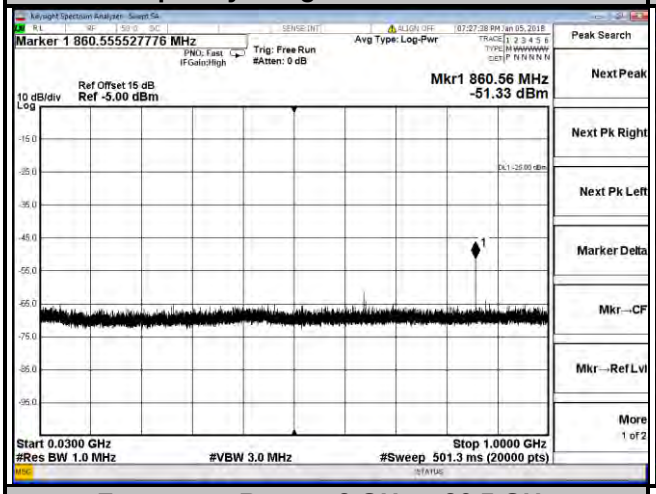


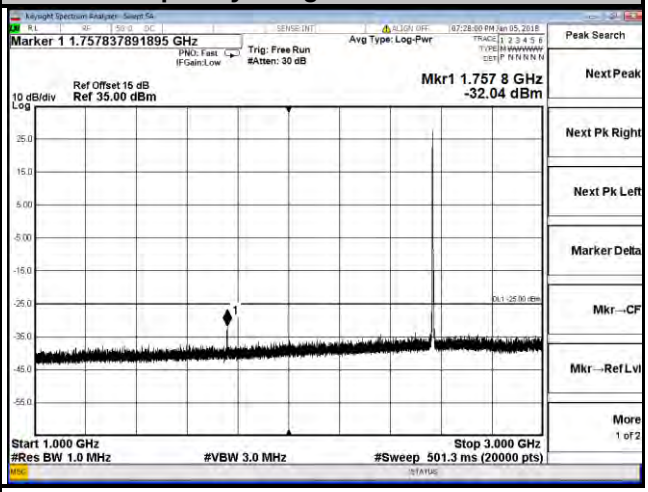


Frequency Range: 3 GHz ~ 26.5 GHz

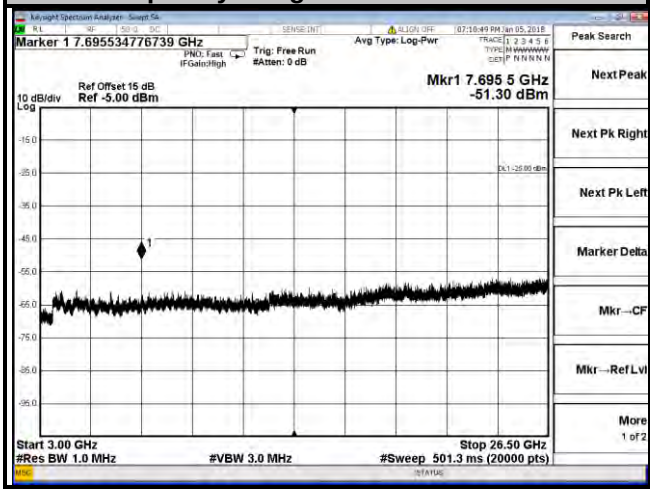


LTE Band 7	
Channel Bandwidth: 5 MHz	
Channel 21425	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz



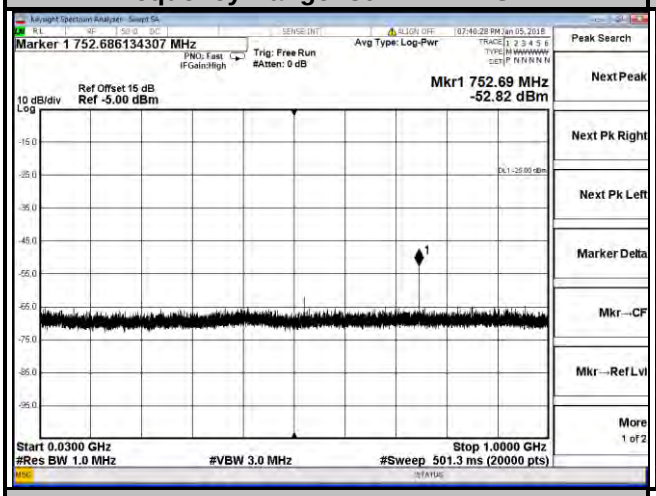


Frequency Range: 3 GHz ~ 26.5 GHz

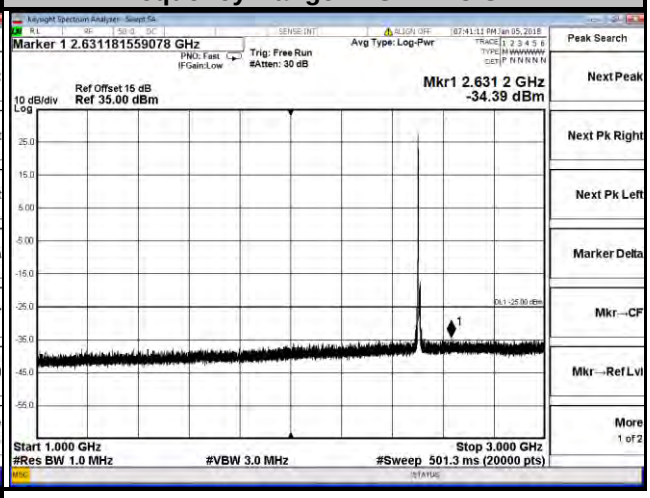


LTE Band 7
Channel Bandwidth: 10 MHz
Channel 20800

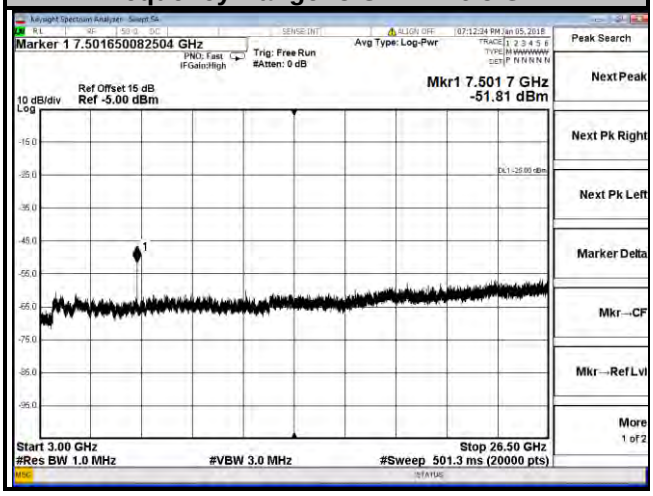
Frequency Range: 30 MHz ~ 1 GHz



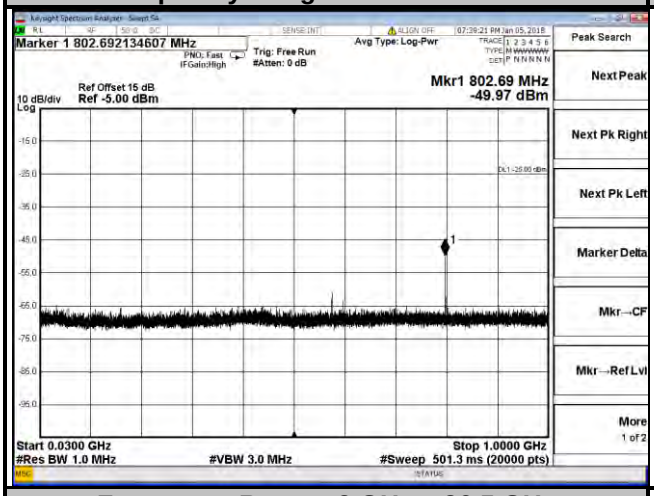
Frequency Range: 1 GHz ~ 3 GHz

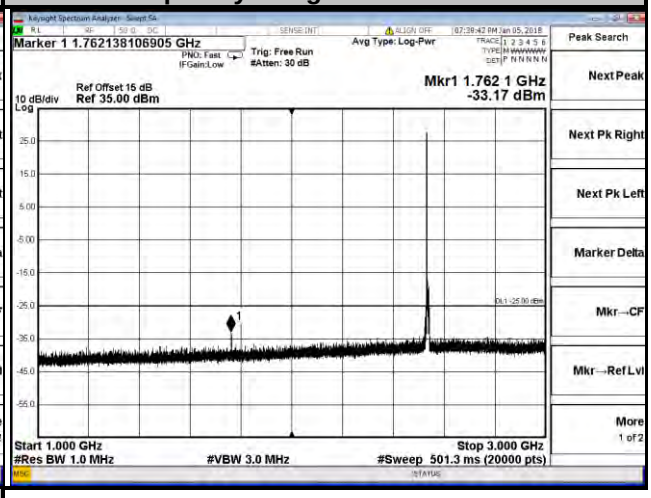


Frequency Range: 3 GHz ~ 26.5 GHz

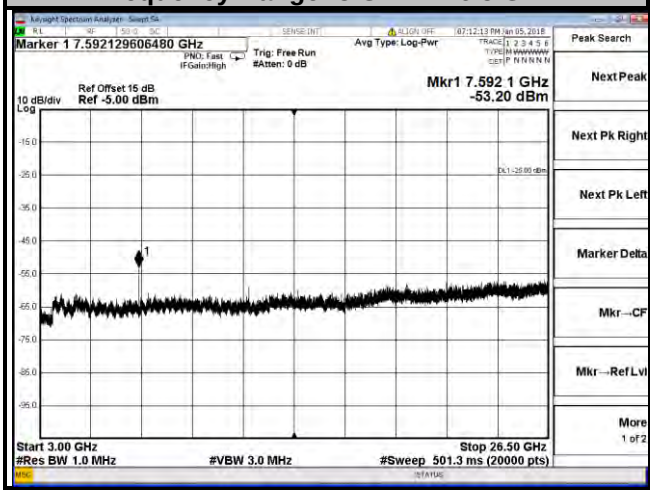


LTE Band 7	
Channel Bandwidth: 10 MHz	
Channel 21100	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz

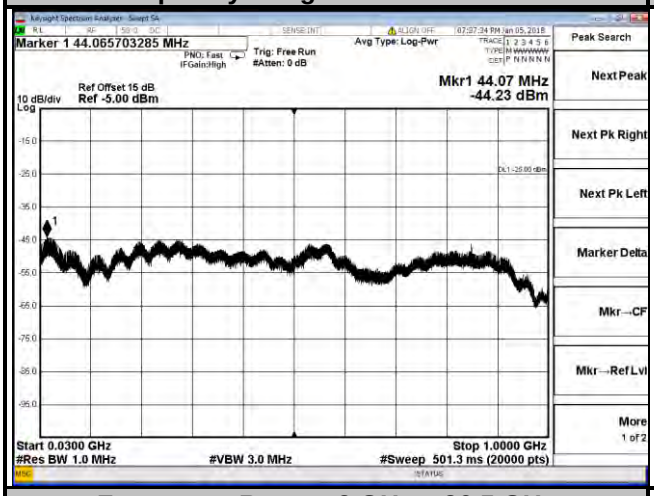


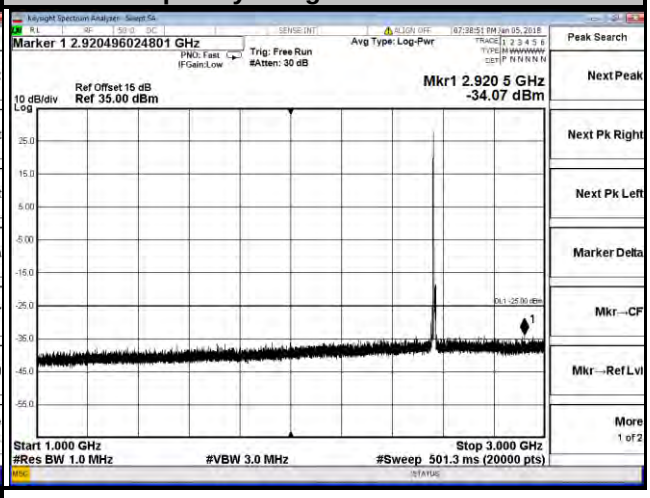


Frequency Range: 3 GHz ~ 26.5 GHz

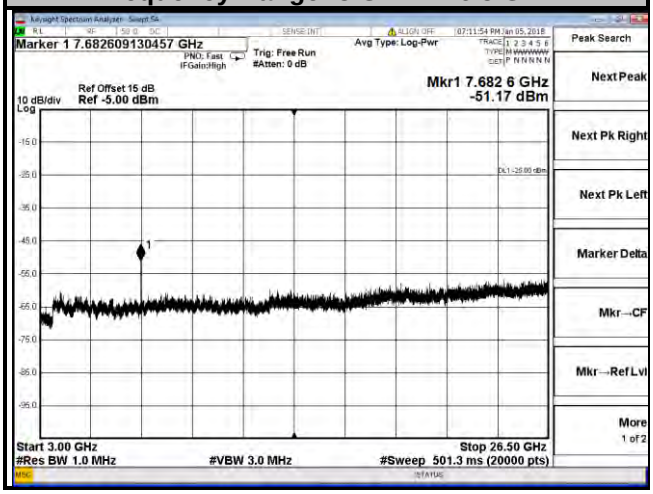


LTE Band 7	
Channel Bandwidth: 10 MHz	
Channel 21400	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz

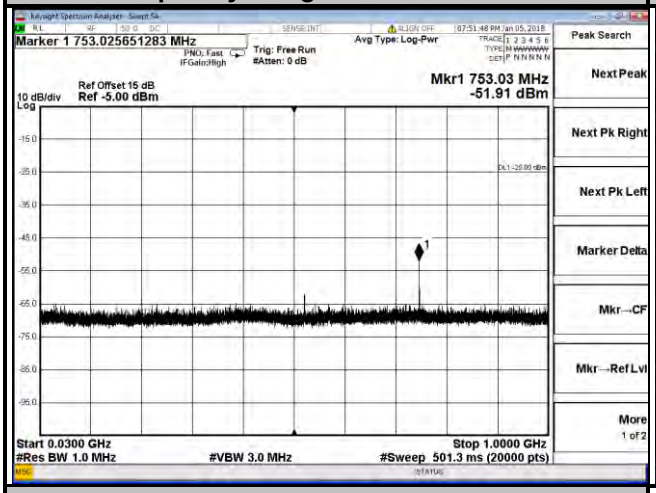


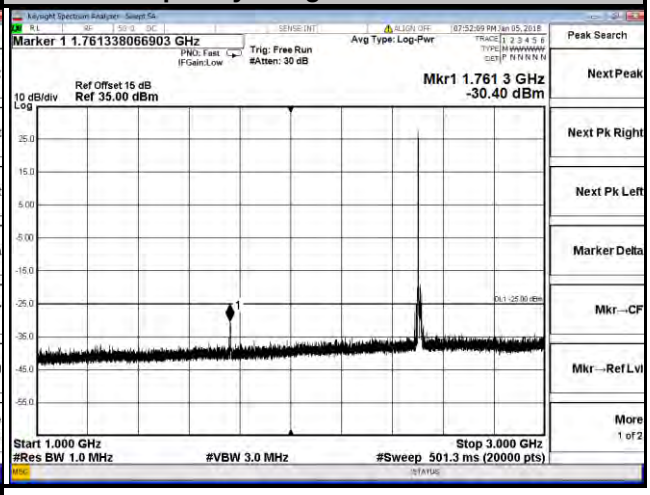


Frequency Range: 3 GHz ~ 26.5 GHz

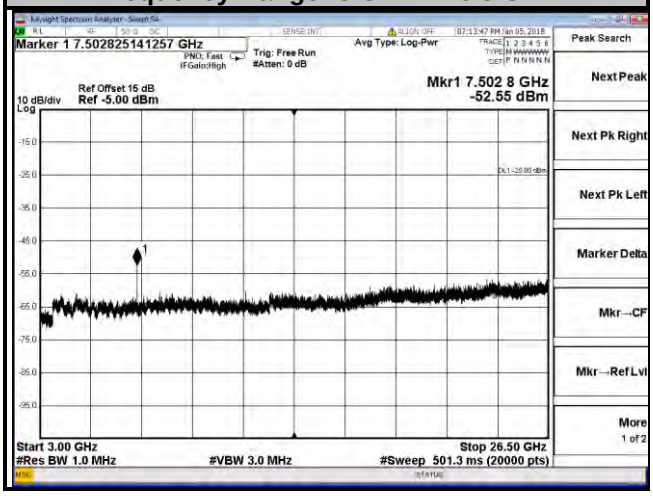


LTE Band 7	
Channel Bandwidth: 15 MHz	
Channel 20825	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz



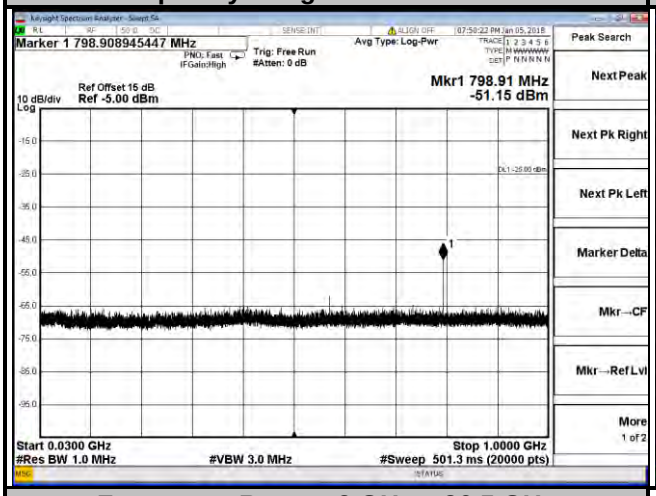


Frequency Range: 3 GHz ~ 26.5 GHz

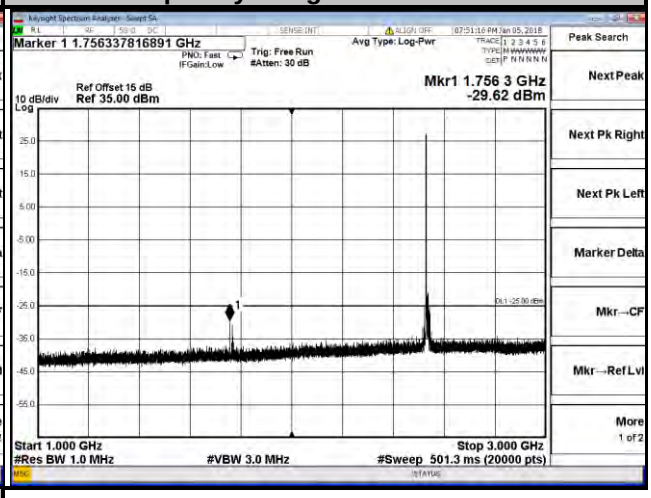


LTE Band 7
Channel Bandwidth: 15 MHz
Channel 21100

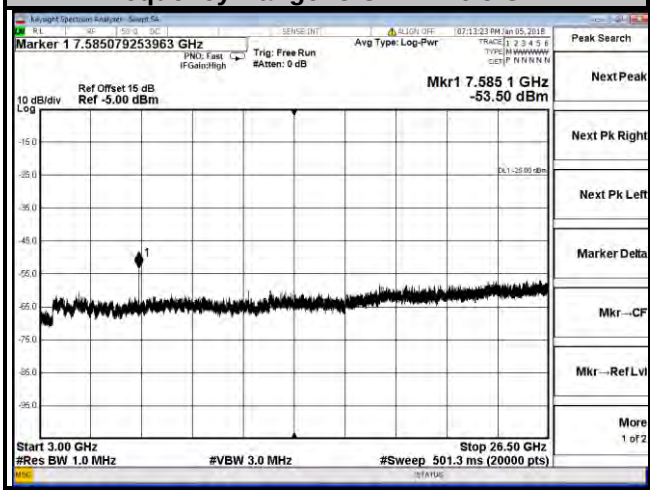
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

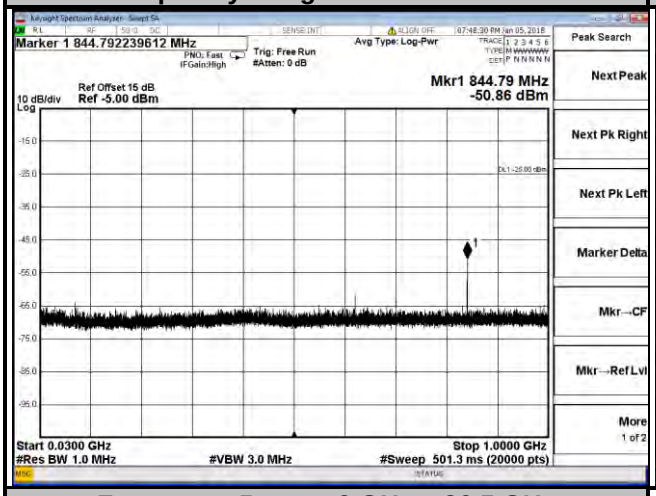


Frequency Range: 3 GHz ~ 26.5 GHz

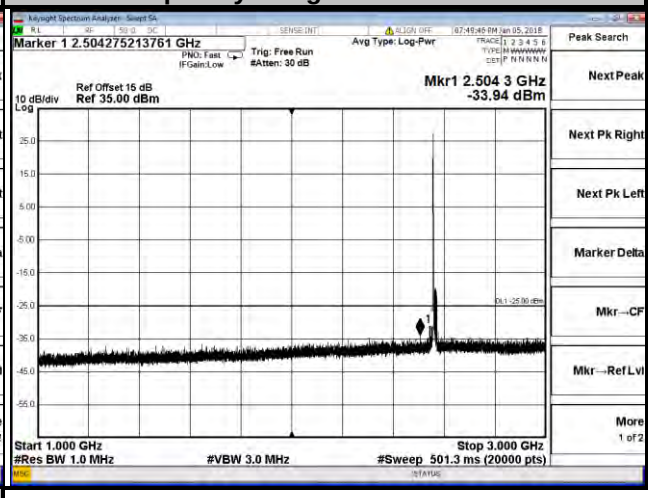


LTE Band 7
Channel Bandwidth: 15 MHz
Channel 21375

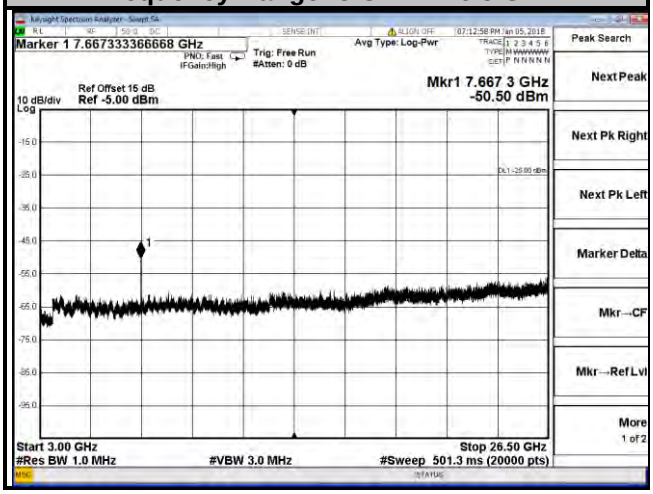
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

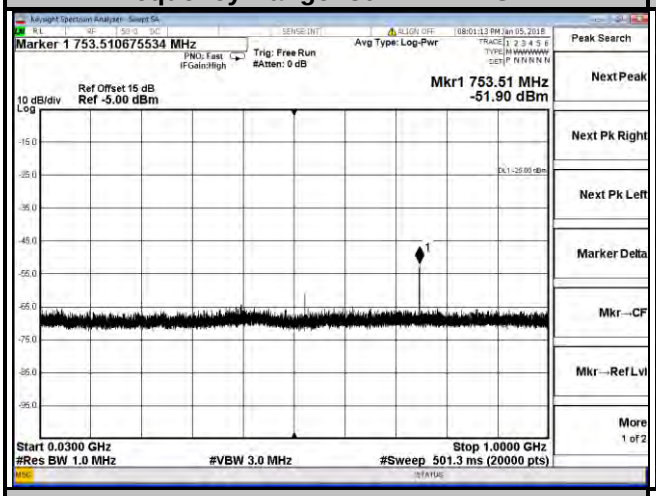


Frequency Range: 3 GHz ~ 26.5 GHz

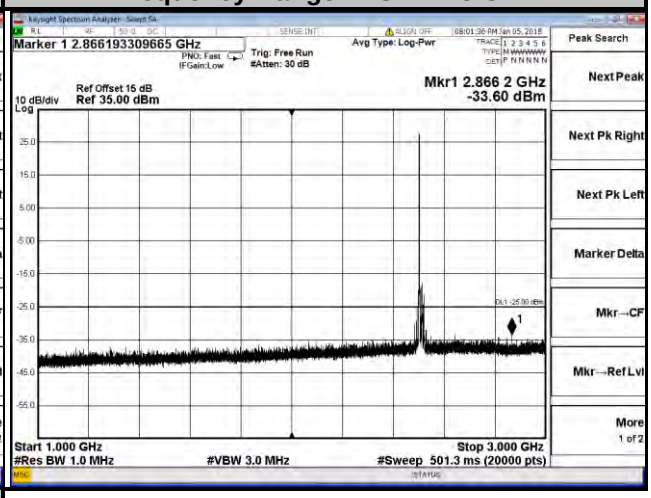


LTE Band 7
Channel Bandwidth: 20 MHz
Channel 20850

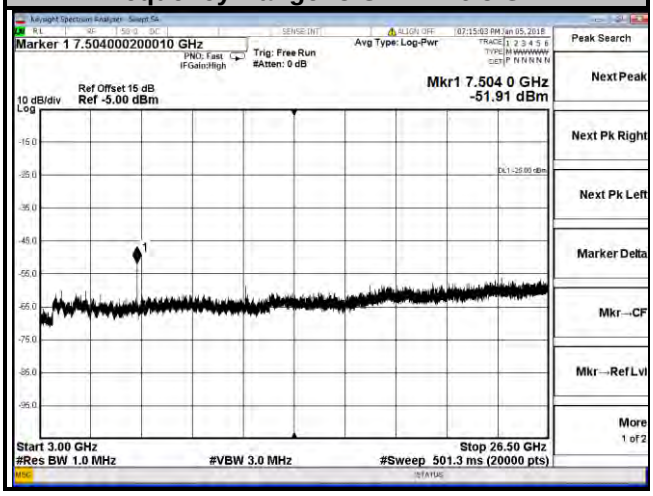
Frequency Range: 30 MHz ~ 1 GHz



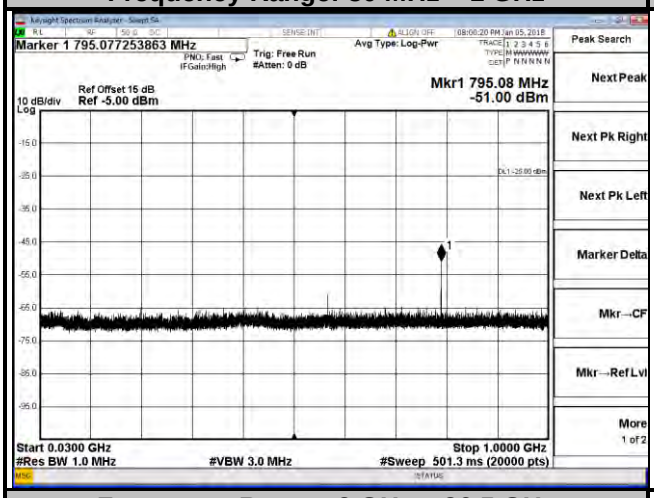
Frequency Range: 1 GHz ~ 3 GHz

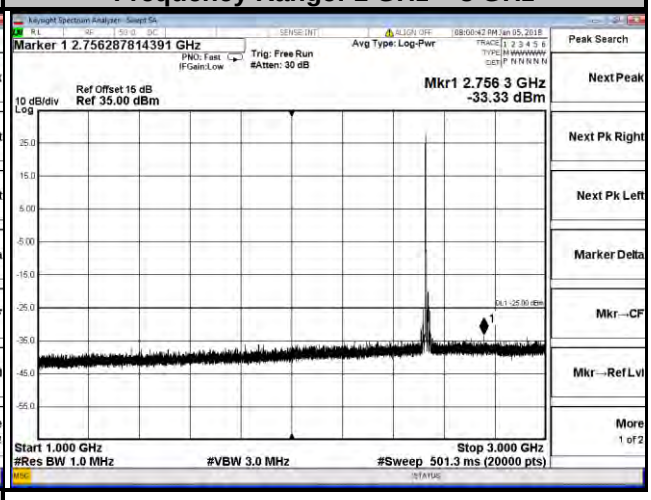


Frequency Range: 3 GHz ~ 26.5 GHz

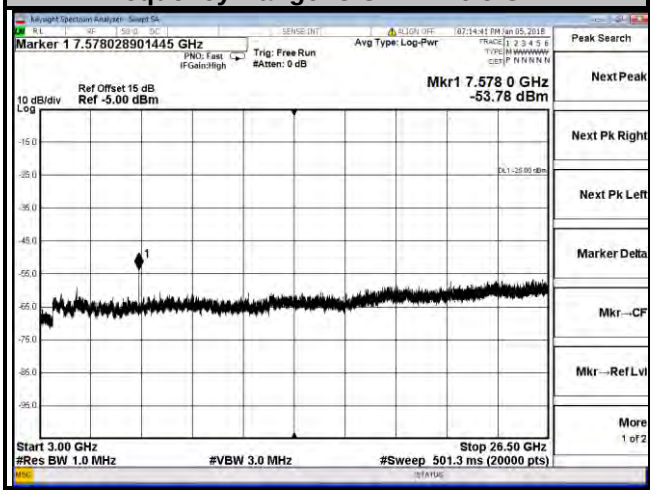


LTE Band 7	
Channel Bandwidth: 20 MHz	
Channel 21100	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz



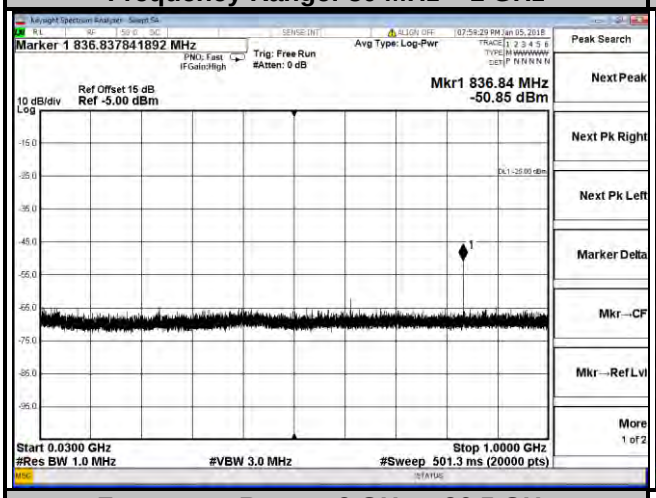


Frequency Range: 3 GHz ~ 26.5 GHz

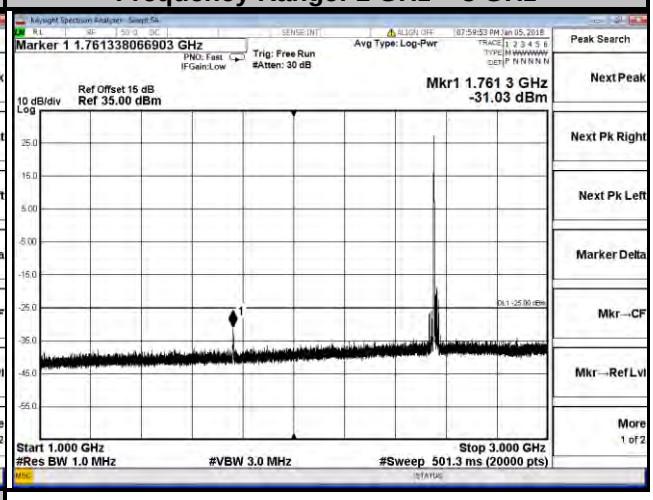


LTE Band 7
Channel Bandwidth: 20 MHz
Channel 21350

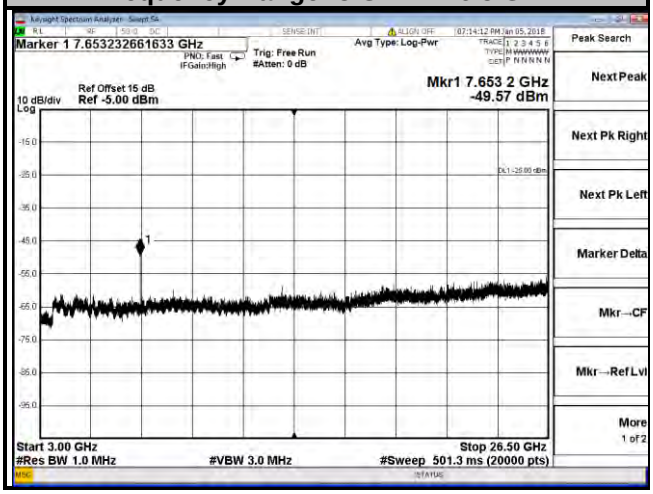
Frequency Range: 30 MHz ~ 1 GHz



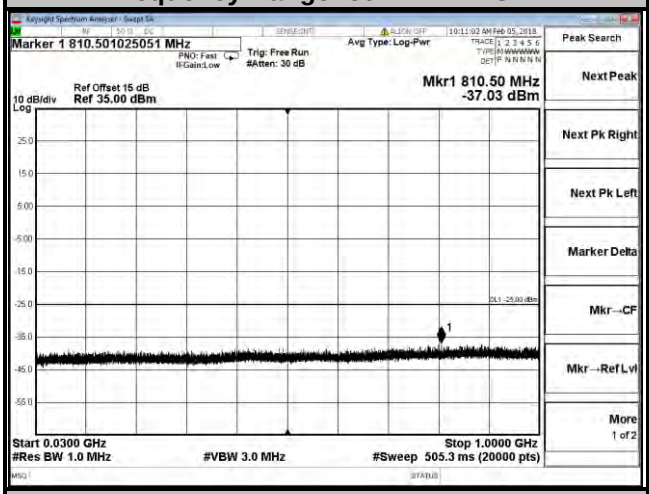
Frequency Range: 1 GHz ~ 3 GHz

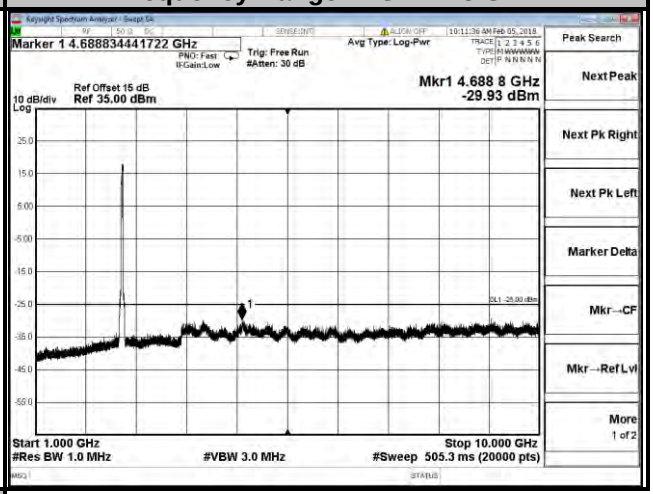


Frequency Range: 3 GHz ~ 26.5 GHz

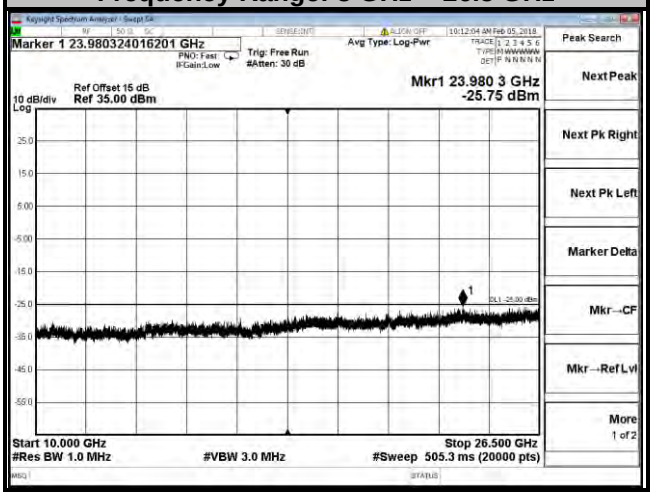


CA LTE Band 7	
Channel Bandwidth: 20 + 20 MHz	
Channel 21350 & 21152	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz



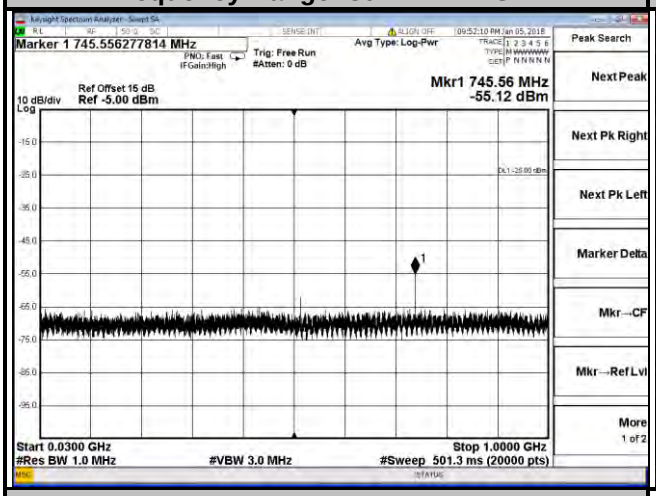


Frequency Range: 3 GHz ~ 26.5 GHz

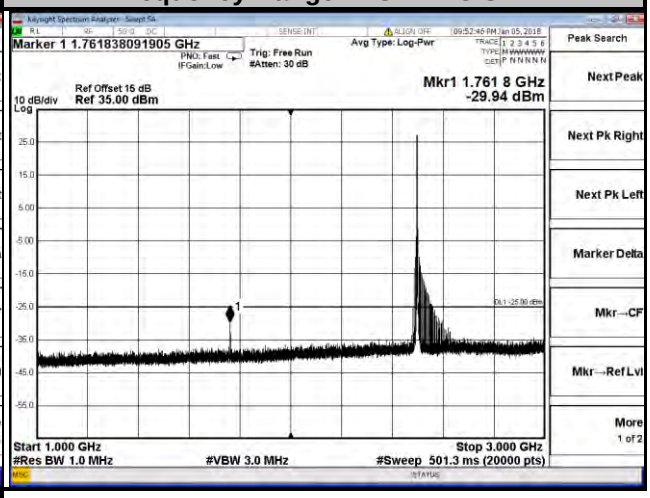


LTE Band 41
Channel Bandwidth: 5 MHz
Channel 39675

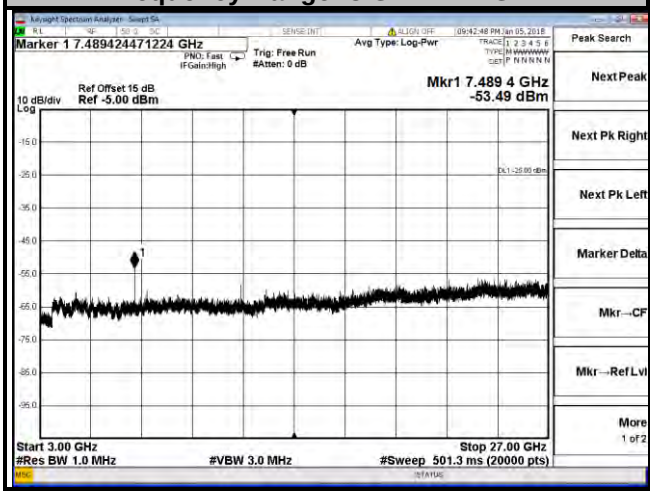
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

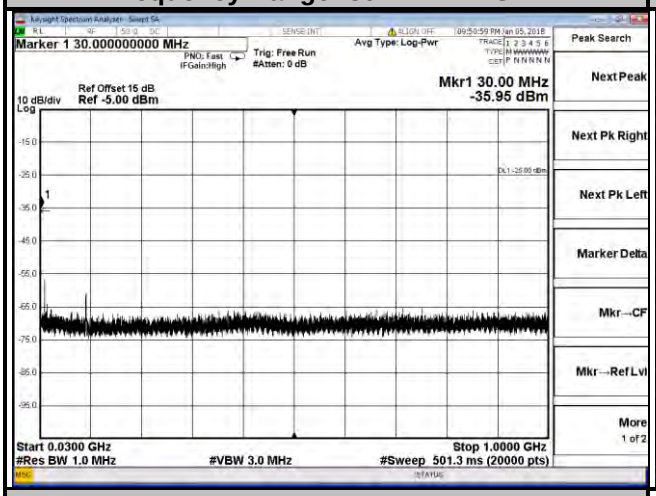


Frequency Range: 3 GHz ~ 27 GHz

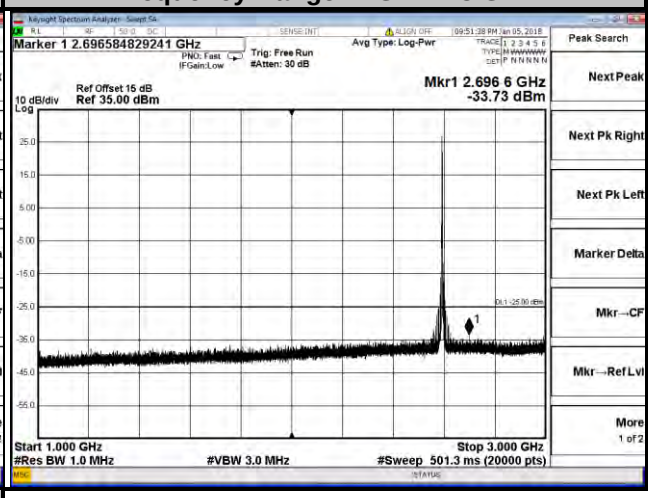


LTE Band 41
Channel Bandwidth: 5 MHz
Channel 40620

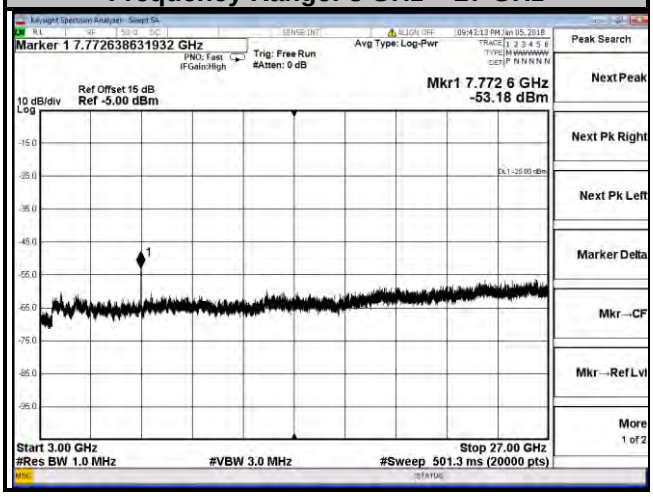
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

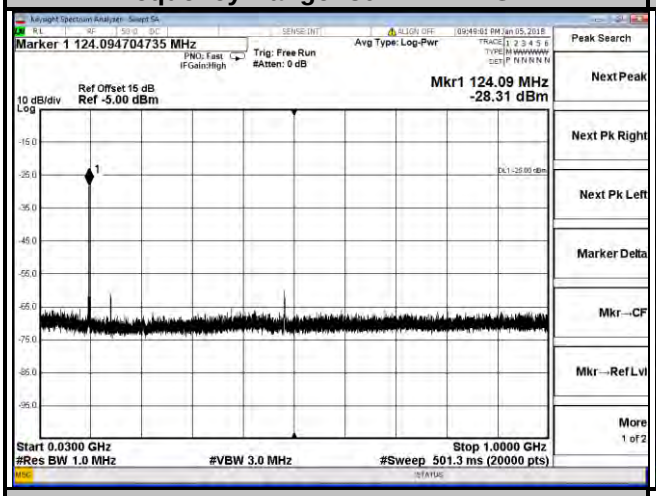


Frequency Range: 3 GHz ~ 27 GHz

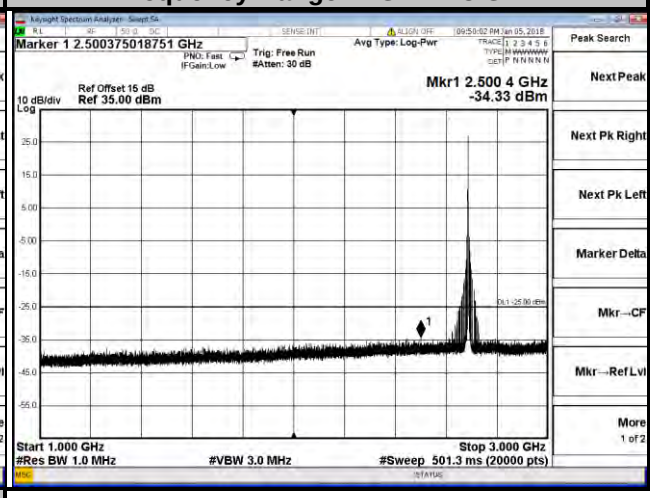


LTE Band 41
Channel Bandwidth: 5 MHz
Channel 41565

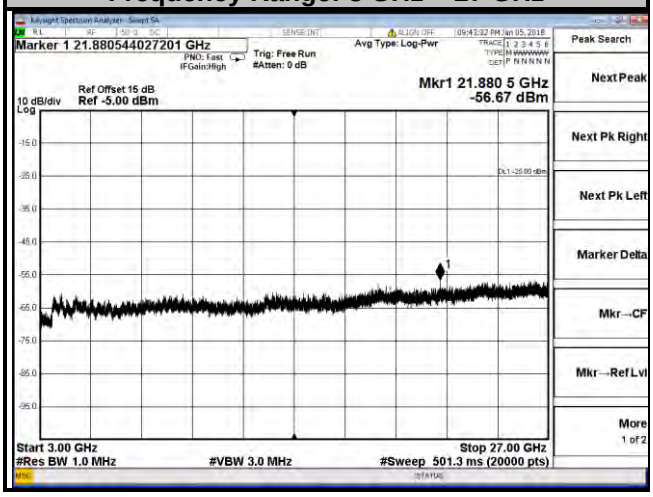
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

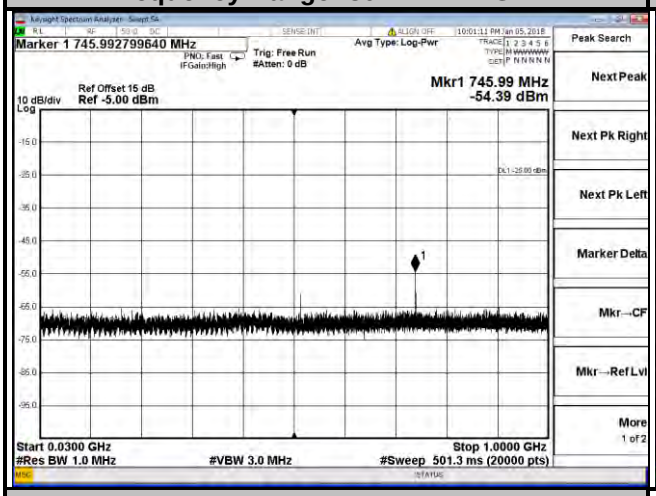


Frequency Range: 3 GHz ~ 27 GHz

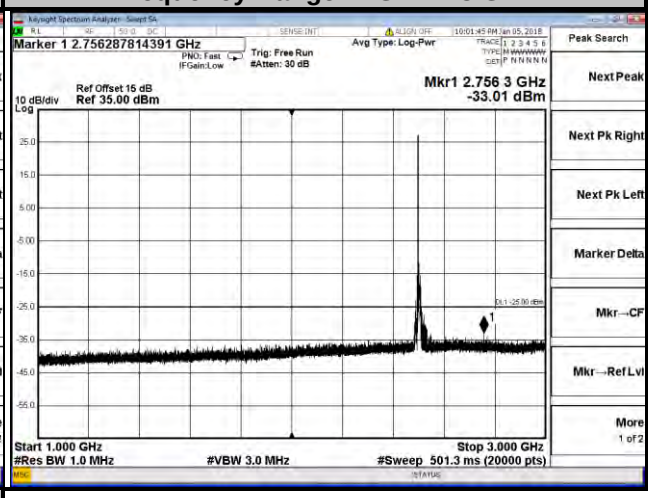


LTE Band 41
Channel Bandwidth: 10 MHz
Channel 39700

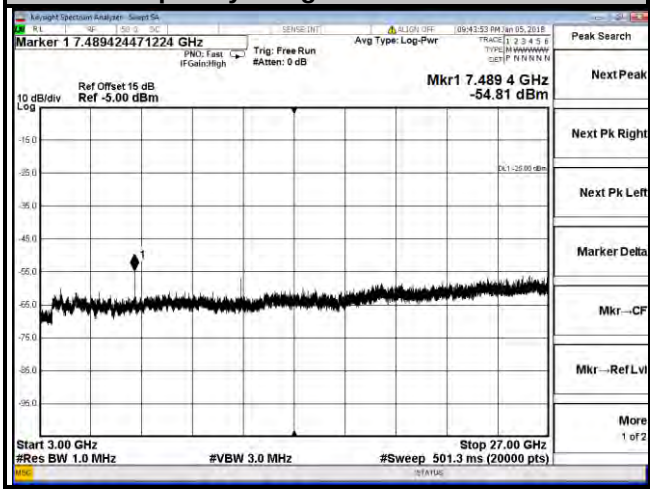
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

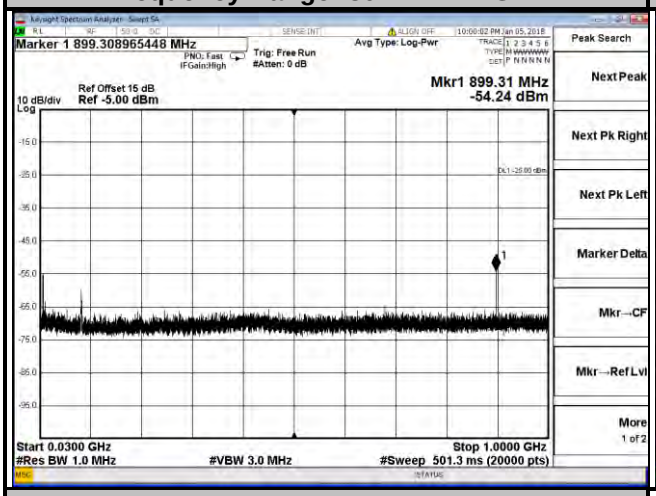


Frequency Range: 3 GHz ~ 27 GHz

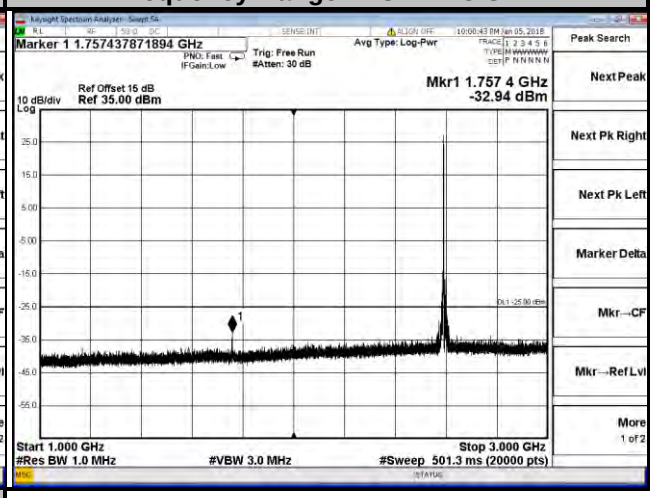


LTE Band 41
Channel Bandwidth: 10 MHz
Channel 40620

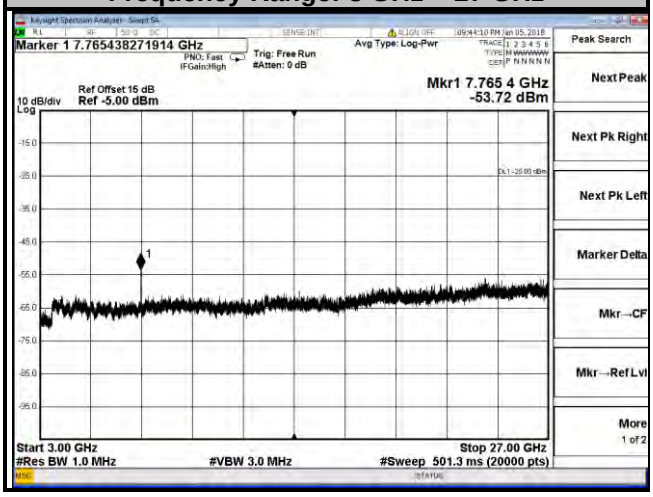
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

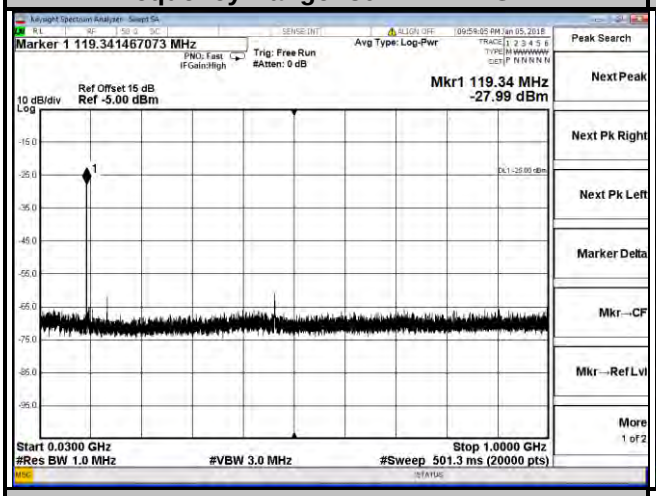


Frequency Range: 3 GHz ~ 27 GHz

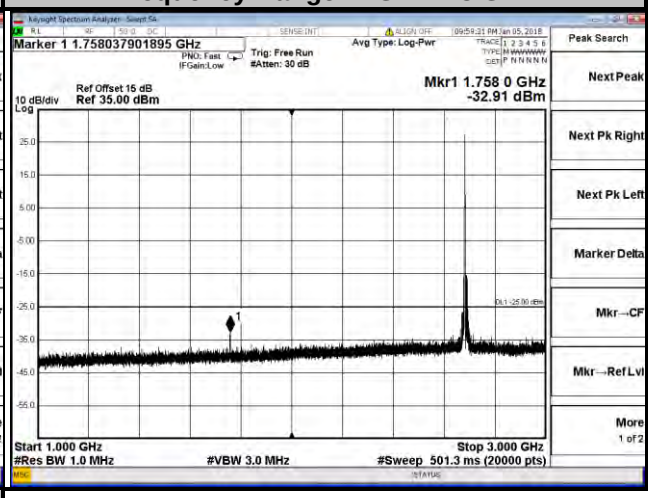


LTE Band 41
Channel Bandwidth: 10 MHz
Channel 41540

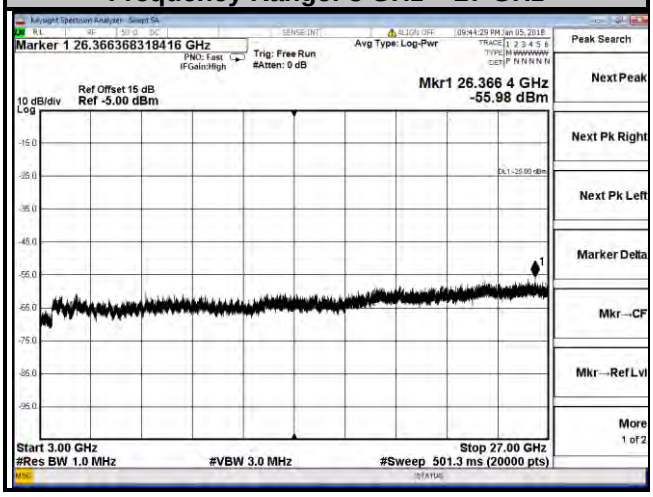
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

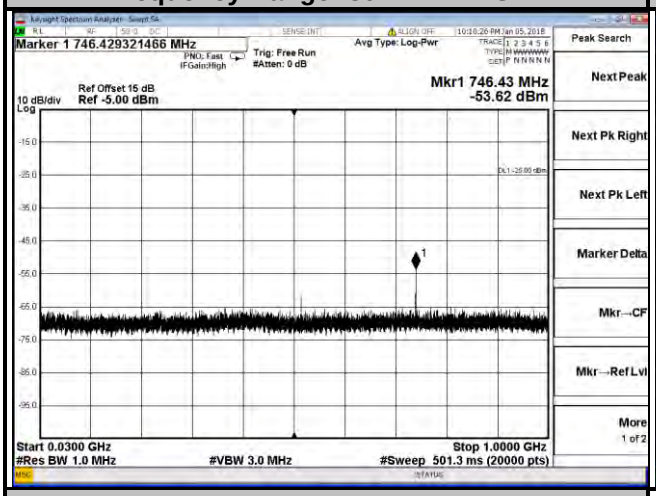


Frequency Range: 3 GHz ~ 27 GHz

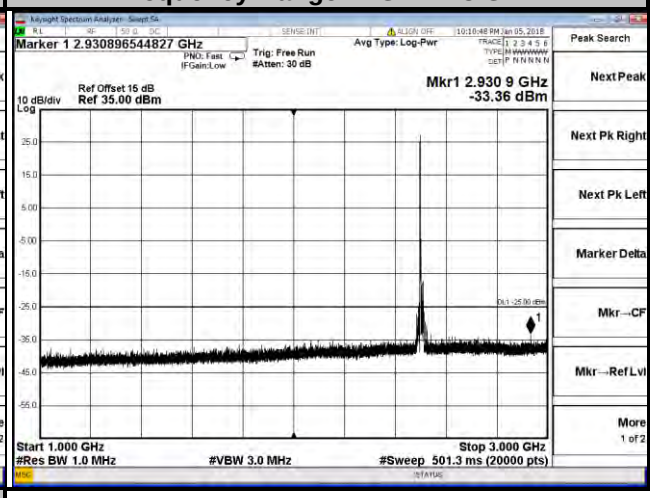


LTE Band 41
Channel Bandwidth: 15 MHz
Channel 39725

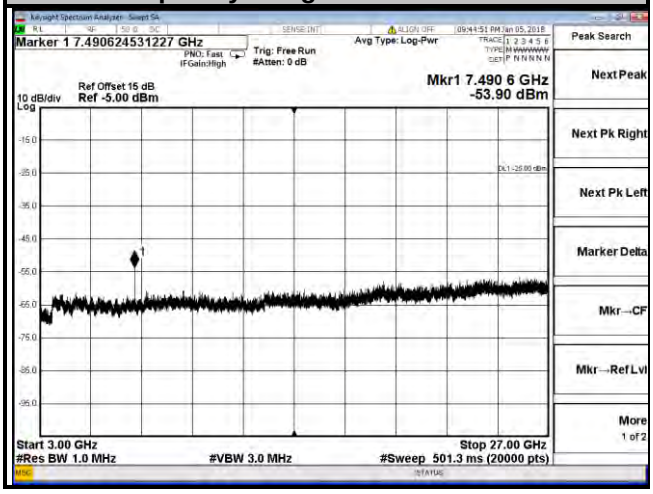
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

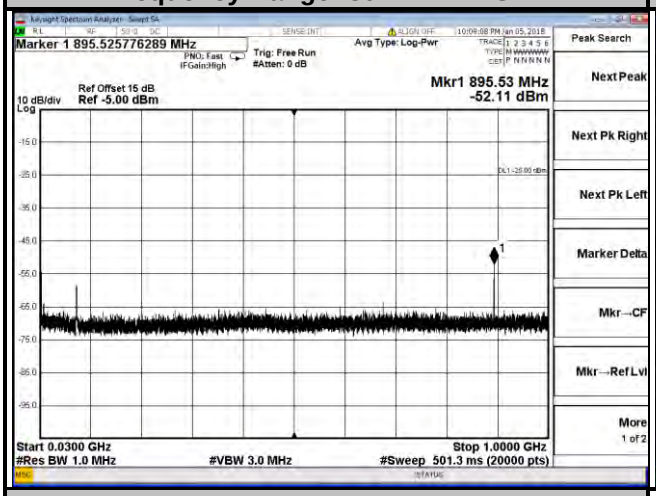


Frequency Range: 3 GHz ~ 27 GHz

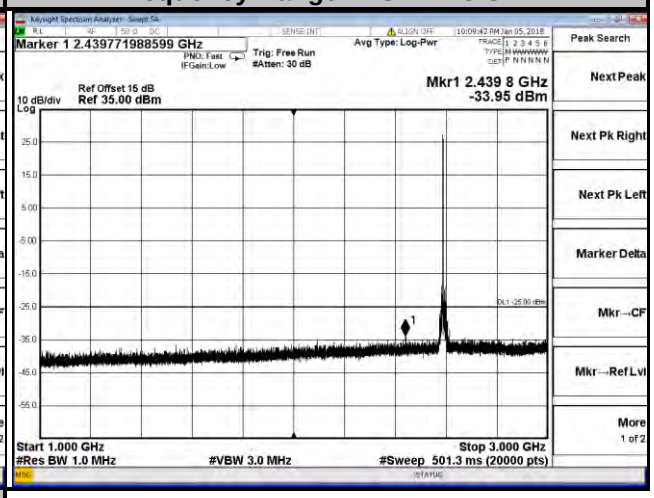


LTE Band 41
Channel Bandwidth: 15 MHz
Channel 40620

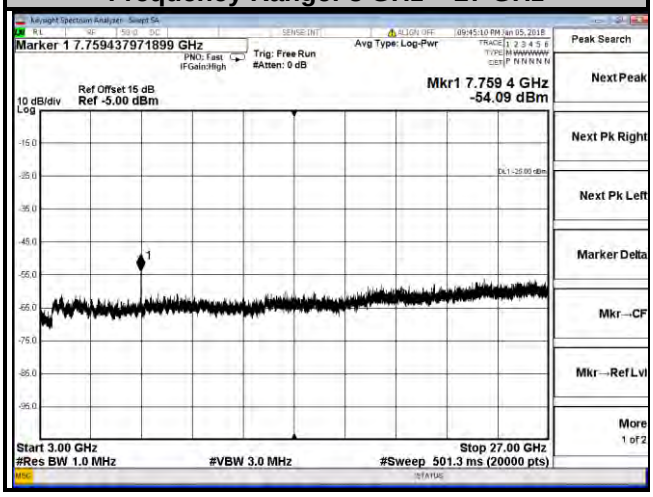
Frequency Range: 30 MHz ~ 1 GHz



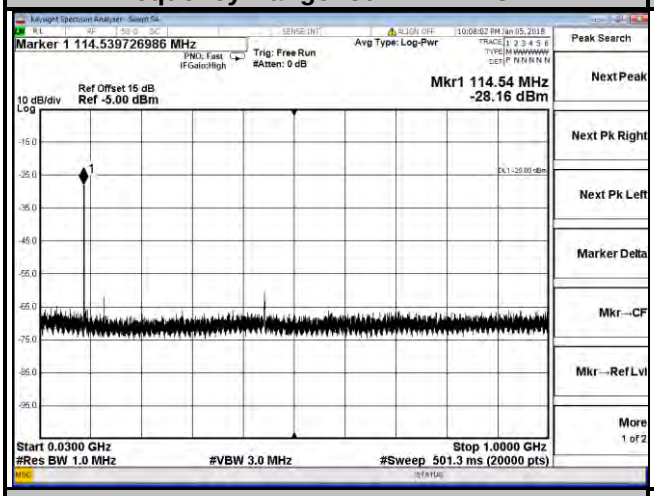
Frequency Range: 1 GHz ~ 3 GHz

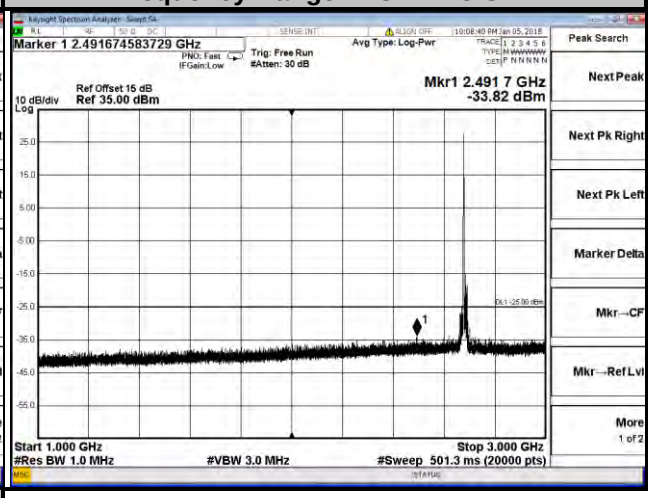


Frequency Range: 3 GHz ~ 27 GHz

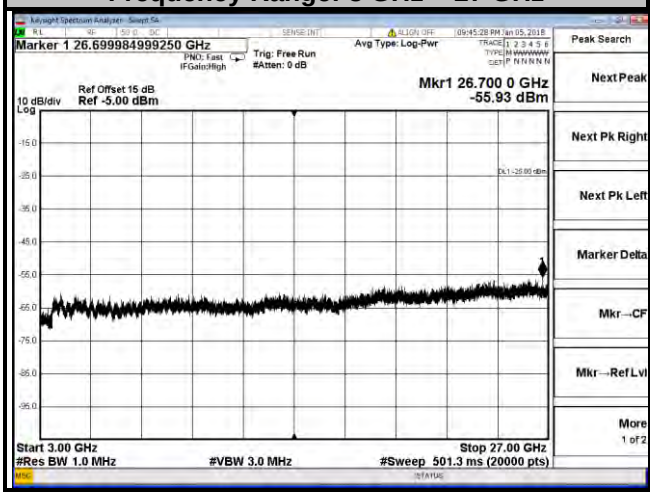


LTE Band 41	
Channel Bandwidth: 15 MHz	
Channel 41515	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz



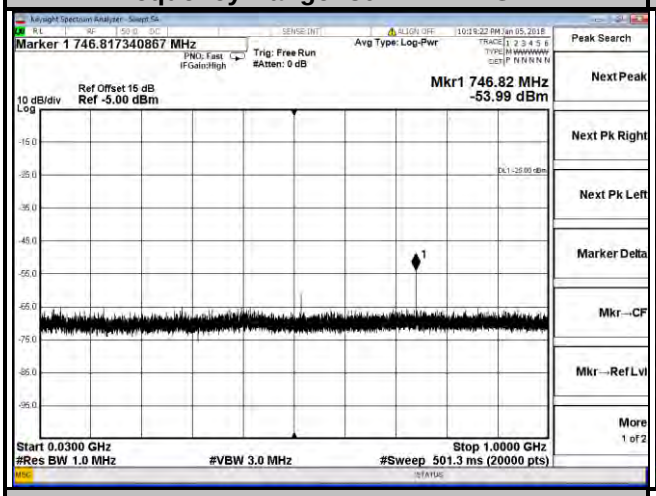


Frequency Range: 3 GHz ~ 27 GHz

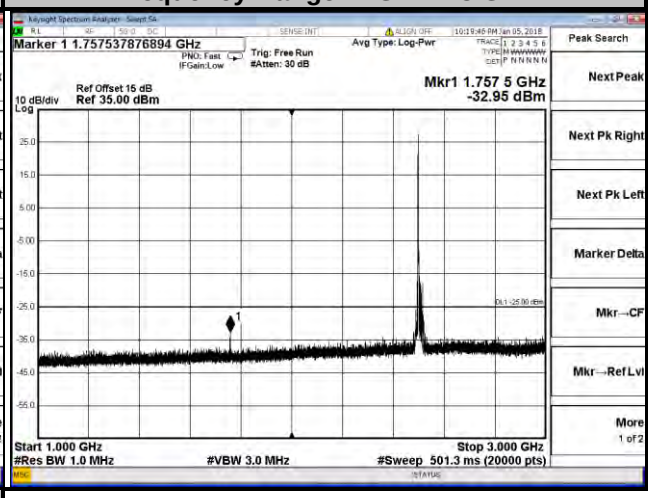


LTE Band 41
Channel Bandwidth: 20 MHz
Channel 39750

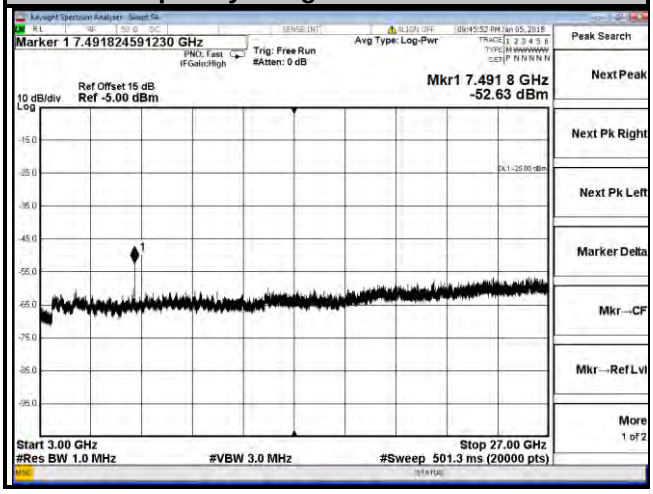
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz

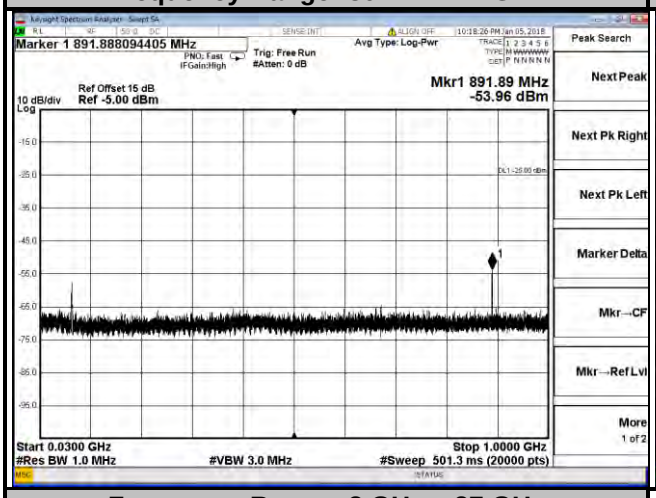


Frequency Range: 3 GHz ~ 27 GHz

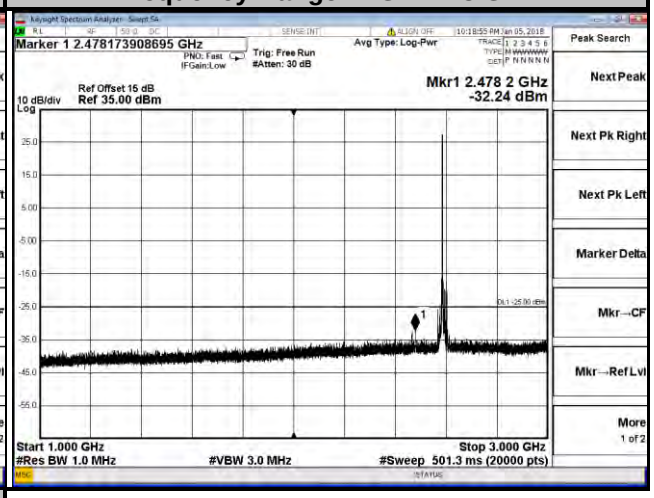


LTE Band 41
Channel Bandwidth: 20 MHz
Channel 40620

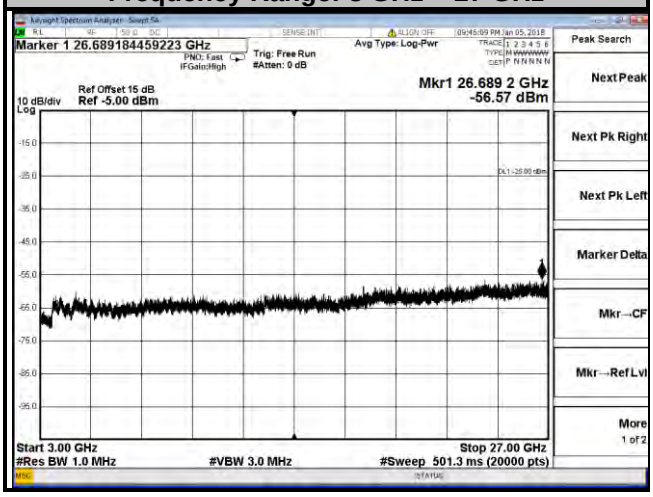
Frequency Range: 30 MHz ~ 1 GHz



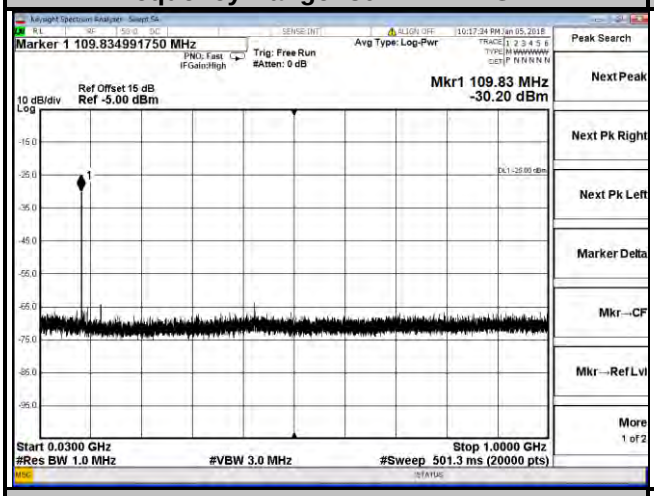
Frequency Range: 1 GHz ~ 3 GHz

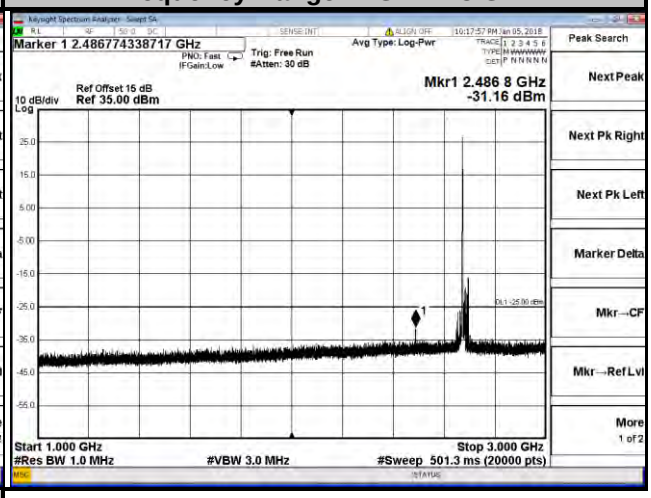


Frequency Range: 3 GHz ~ 27 GHz

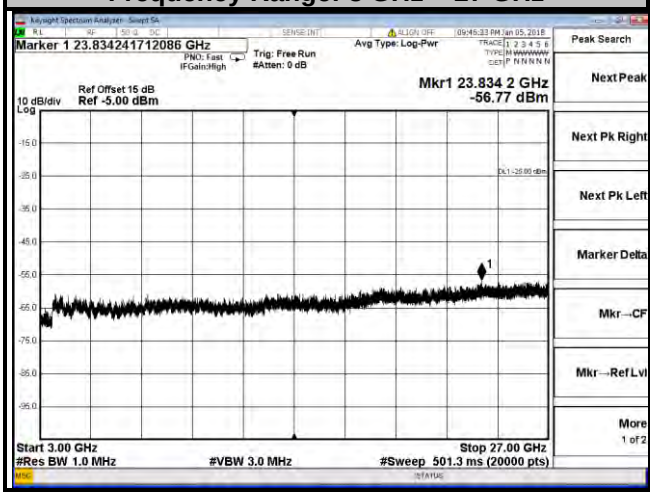


LTE Band 41	
Channel Bandwidth: 20 MHz	
Channel 41490	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 3 GHz





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 (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. 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.

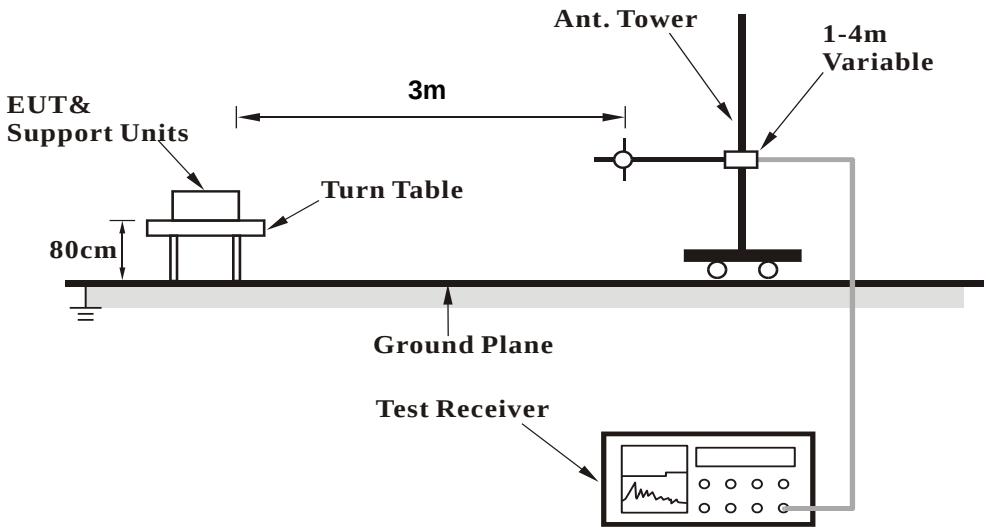
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

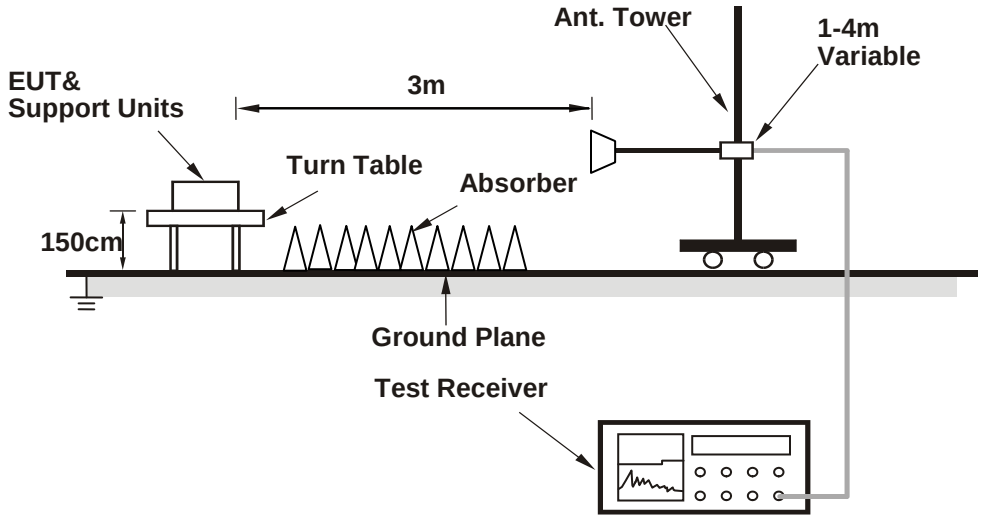
No deviation.

4.7.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

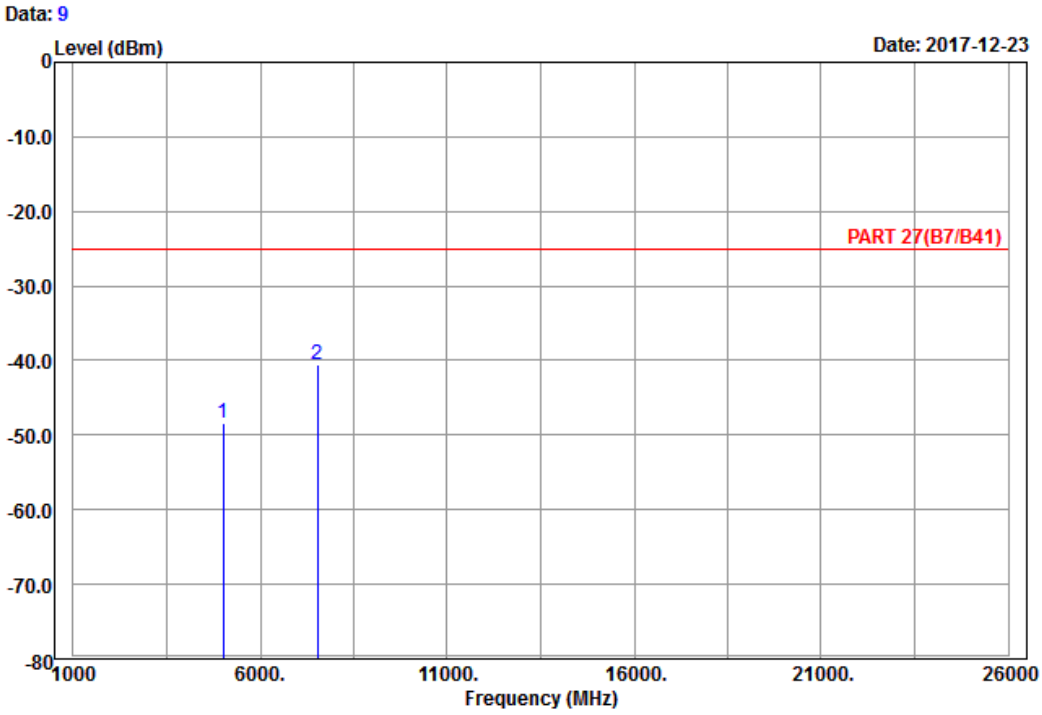
4.7.5 Test Results

LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

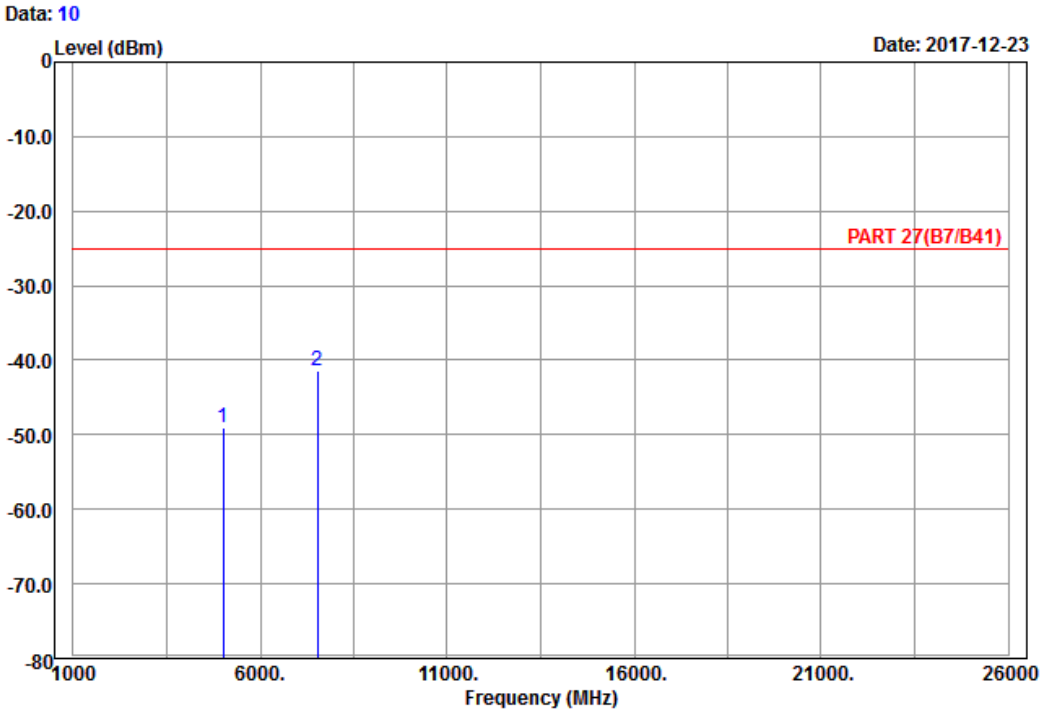
Low Channel

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 -48.35 -67.43 -25.00 -23.35  19.08 Peak
  2 pp  7530.00 -40.44 -63.29 -25.00 -15.44  22.85 Peak
```

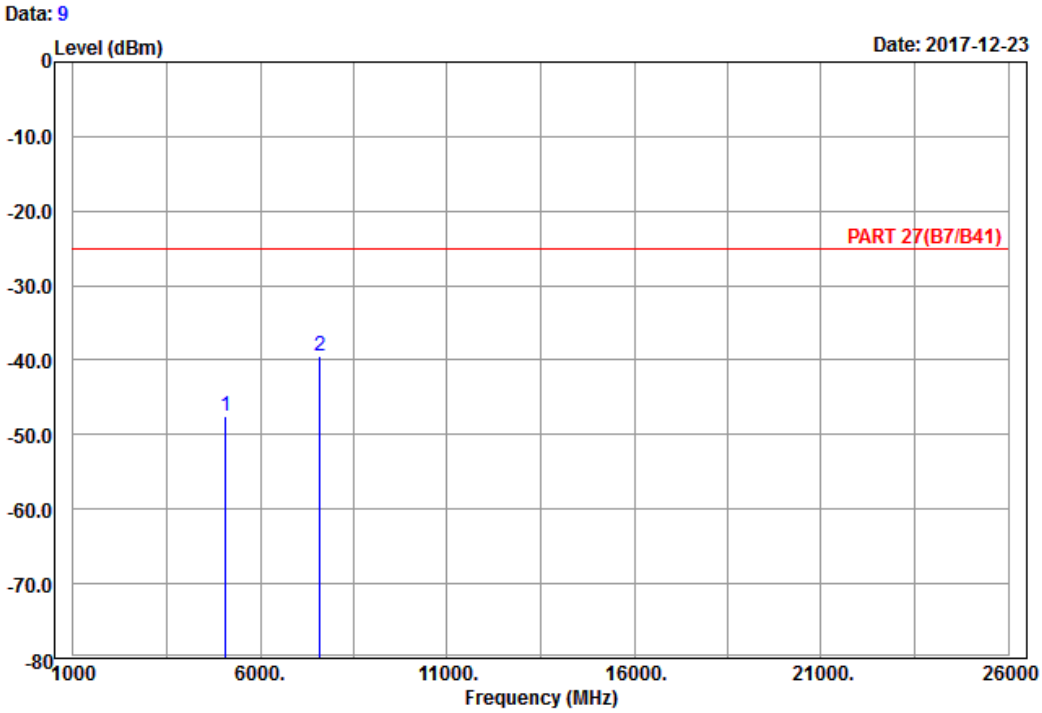


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20850
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5020.00	-49.12	-68.20	-25.00	-24.12	19.08	Peak
2 pp	7530.00	-41.46	-64.31	-25.00	-16.46	22.85	Peak

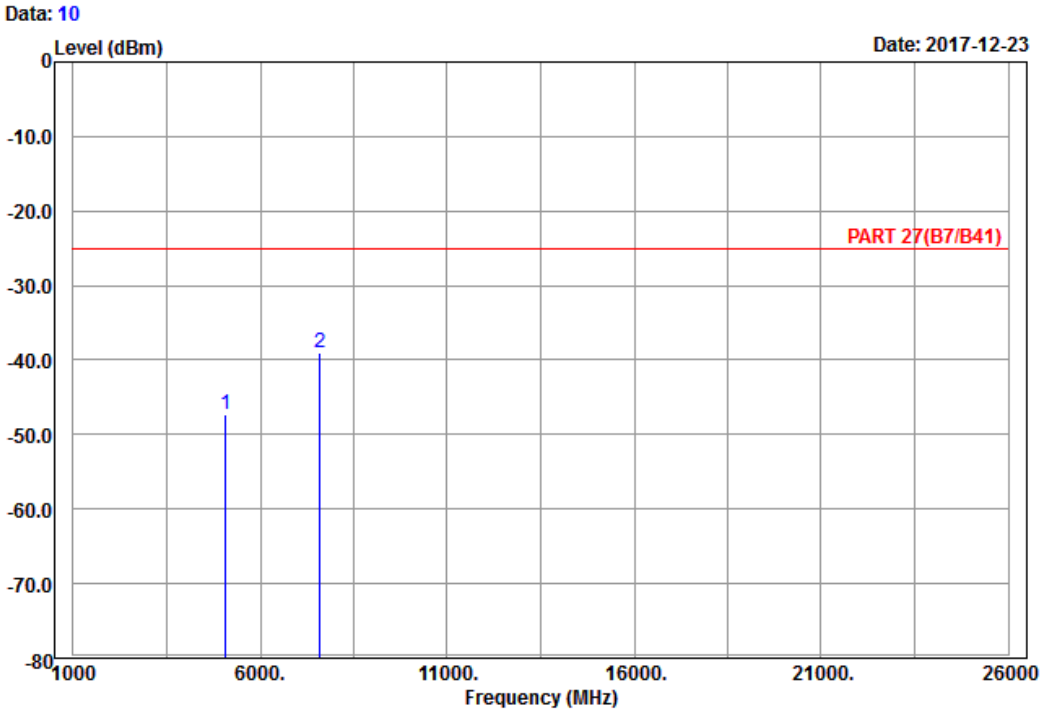
Middle Channel

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	5070.00	-47.48	-66.87	-25.00	-22.48	19.39	Peak
2 pp	7605.00	-39.44	-62.43	-25.00	-14.44	22.99	Peak

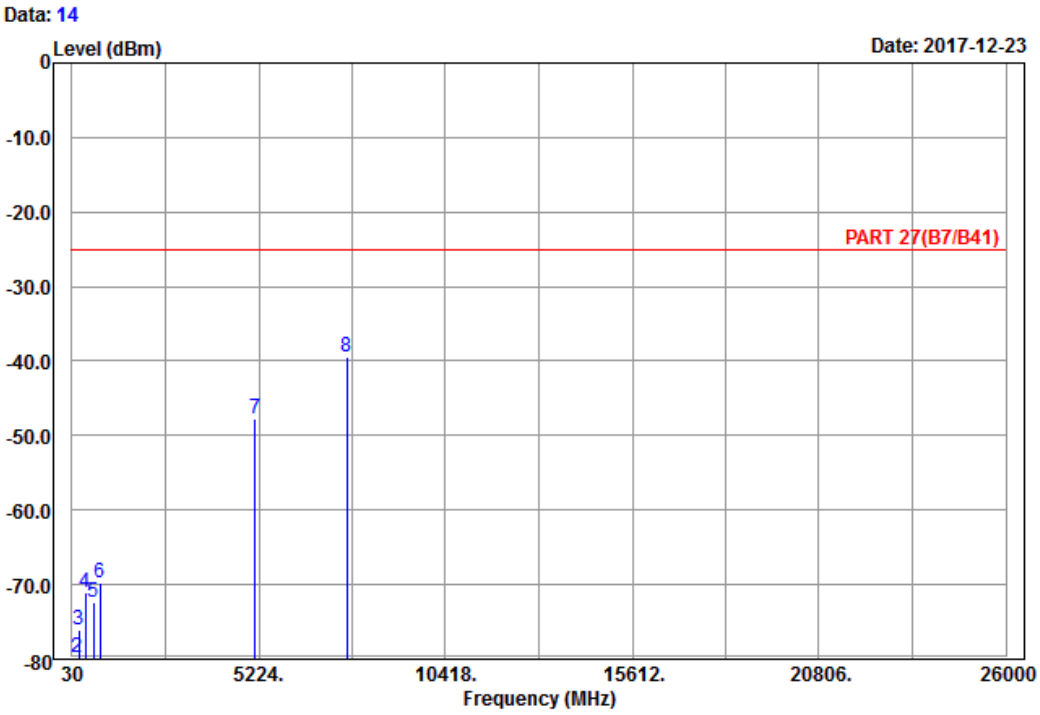


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5070.00	-47.32	-66.71	-25.00	-22.32	19.39	Peak
2 pp	7605.00	-39.03	-62.02	-25.00	-14.03	22.99	Peak

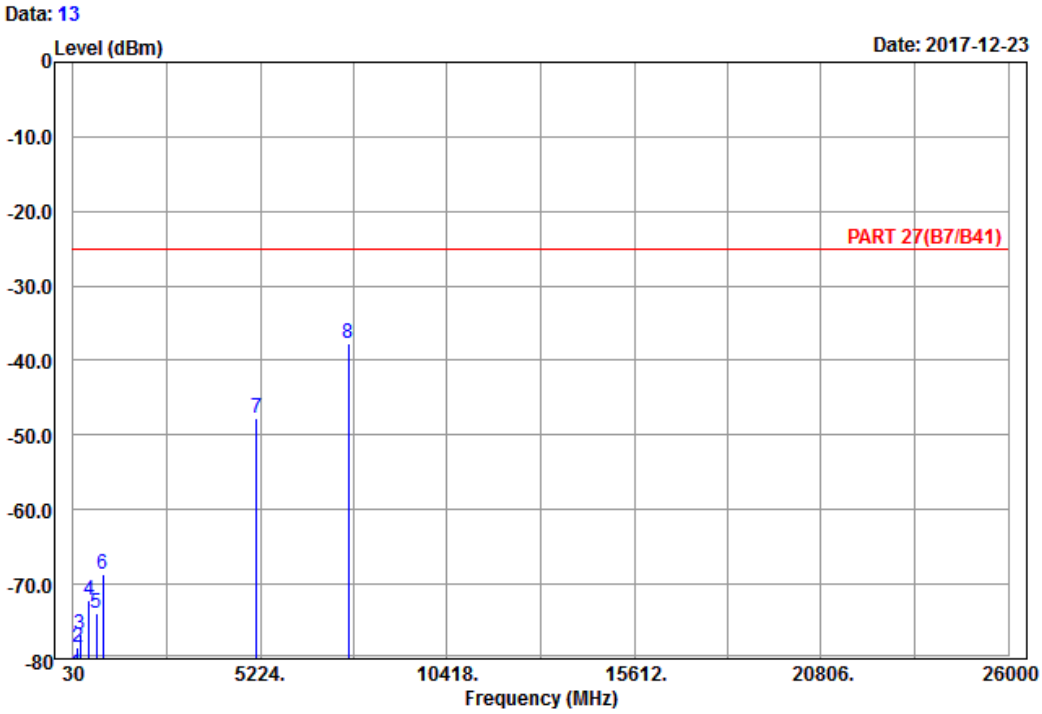
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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	102.09	-82.66	-72.77	-25.00	-57.66	-9.89	Peak
2	156.63	-79.72	-71.97	-25.00	-54.72	-7.75	Peak
3	231.96	-76.10	-70.35	-25.00	-51.10	-5.75	Peak
4	399.40	-71.14	-68.40	-25.00	-46.14	-2.74	Peak
5	633.20	-72.37	-72.42	-25.00	-47.37	0.05	Peak
6	804.70	-69.80	-71.76	-25.00	-44.80	1.96	Peak
7	5120.00	-47.82	-67.53	-25.00	-22.82	19.71	Peak
8 pp	7680.00	-39.37	-62.49	-25.00	-14.37	23.12	Peak



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

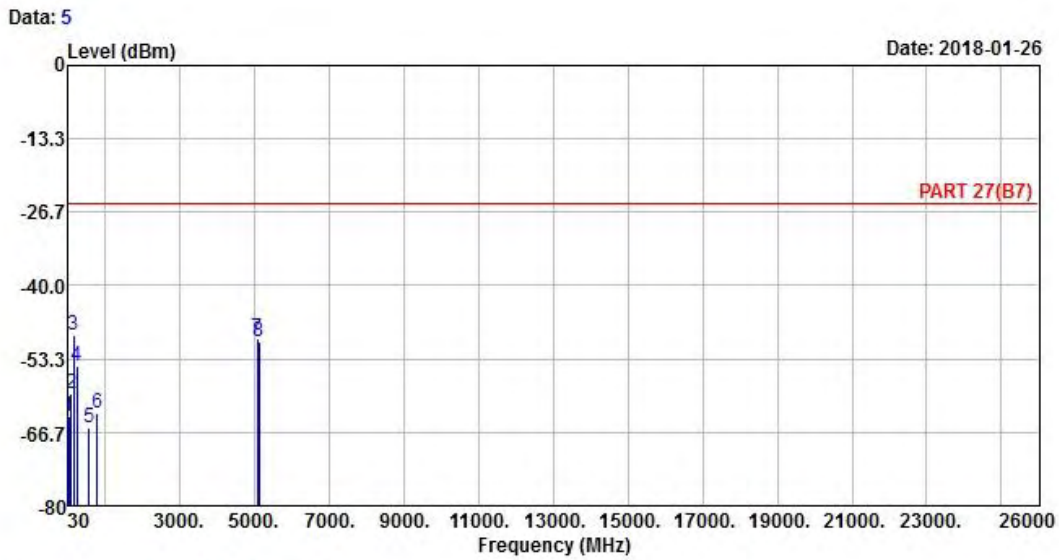
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	105.60	-81.92	-72.50	-25.00	-56.92	-9.42	Peak
2	164.46	-78.50	-71.31	-25.00	-53.50	-7.19	Peak
3	216.57	-76.78	-70.82	-25.00	-51.78	-5.96	Peak
4	468.70	-72.26	-67.89	-25.00	-47.26	-4.37	Peak
5	667.50	-73.82	-73.60	-25.00	-48.82	-0.22	Peak
6	852.30	-68.57	-70.10	-25.00	-43.57	1.53	Peak
7	5120.00	-47.75	-67.46	-25.00	-22.75	19.71	Peak
8 pp	7680.00	-37.63	-60.75	-25.00	-12.63	23.12	Peak

CA LTE Band 7

Channel Bandwidth: 20 + 20 MHz / QPSK

Low Channel

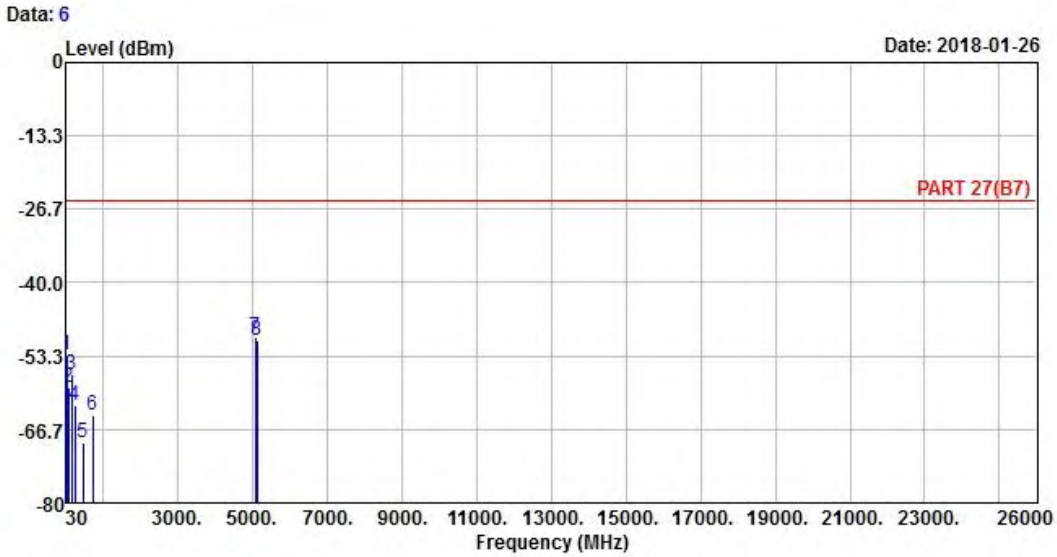
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 27(B7) HORIZONTAL
Remak : LTE Band 7_CA
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	39.70	-63.83	-64.47	-25.00	-38.83	0.64	Peak
2	91.11	-59.58	-48.53	-25.00	-34.58	-11.05	Peak
3 pp	169.68	-49.02	-43.49	-25.00	-24.02	-5.53	Peak
4	261.83	-54.49	-48.26	-25.00	-29.49	-6.23	Peak
5	571.26	-65.94	-63.98	-25.00	-40.94	-1.96	Peak
6	802.12	-63.13	-63.85	-25.00	-38.13	0.72	Peak
7	5080.40	-49.60	-46.52	-25.00	-24.60	-3.08	Peak
8	5120.00	-50.18	-47.17	-25.00	-25.18	-3.01	Peak

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 27(B7) VERTICAL
Remak : LTE Band 7_CA
Tested by: Getaz Yang

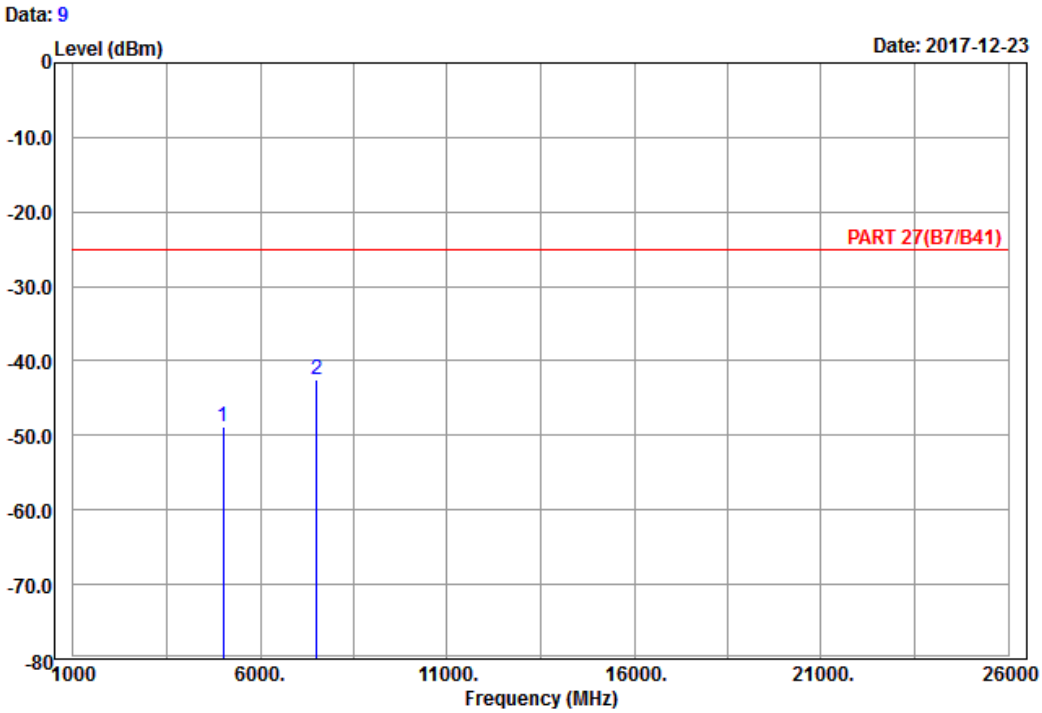
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	33.88	-53.07	-51.49	-25.00	-28.07	-1.58	Peak
2	69.77	-58.92	-50.52	-25.00	-33.92	-8.40	Peak
3	170.65	-56.67	-50.97	-25.00	-31.67	-5.70	Peak
4	243.40	-62.43	-56.16	-25.00	-37.43	-6.27	Peak
5	481.05	-69.20	-64.23	-25.00	-44.20	-4.97	Peak
6	742.95	-63.91	-64.66	-25.00	-38.91	0.75	Peak
7 pp	5080.40	-49.84	-46.76	-25.00	-24.84	-3.08	Peak
8	5120.00	-50.36	-47.35	-25.00	-25.36	-3.01	Peak

LTE Band 41

Channel Bandwidth: 20 MHz / QPSK

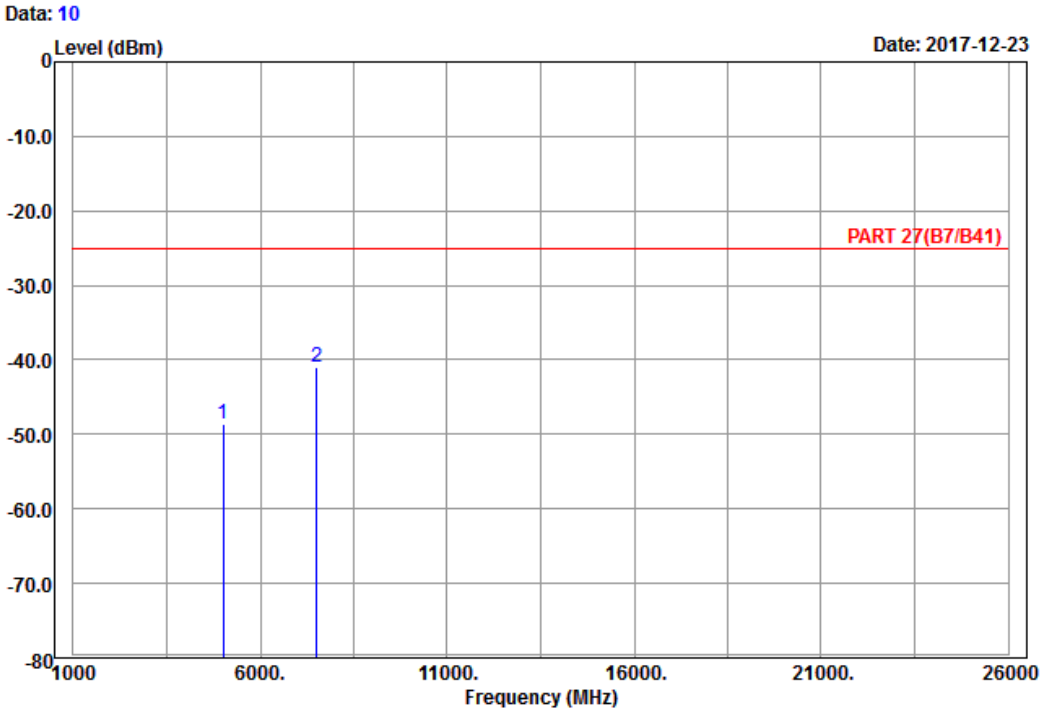
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark    : LTE_Band 41_Link_CH39750
Tested by: Karl Lee
                        Read  Limit   Over
           Freq  Level  Level   Line  Limit Factor Remark
        _________ ______ ______ ______ ______ ______ _______
              MHz    dBm    dBm    dBm     dB     dB

  1      5012.00 -48.93 -68.01 -25.00 -23.93  19.08 Peak
  2 pp   7518.00 -42.55 -65.23 -25.00 -17.55  22.68 Peak
```

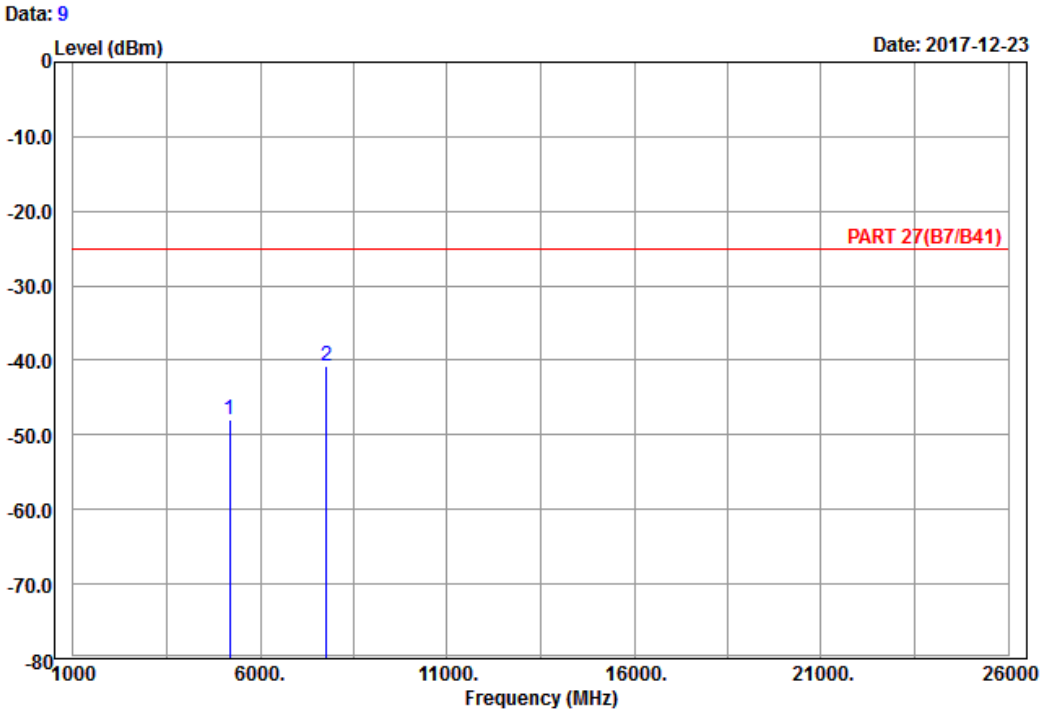


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH39750
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5012.00	-48.67	-67.75	-25.00	-23.67	19.08	Peak
2 pp	7518.00	-40.95	-63.63	-25.00	-15.95	22.68	Peak

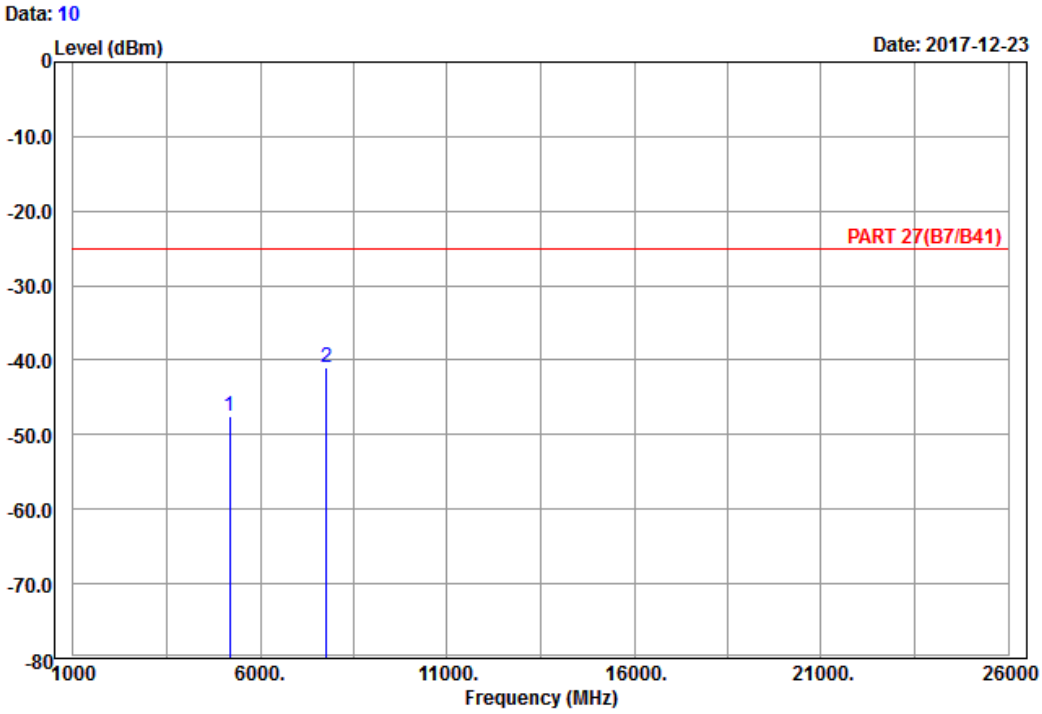
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH40620
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5186.00	-47.86	-67.98	-25.00	-22.86	20.12	Peak
2 pp	7779.00	-40.69	-64.02	-25.00	-15.69	23.33	Peak

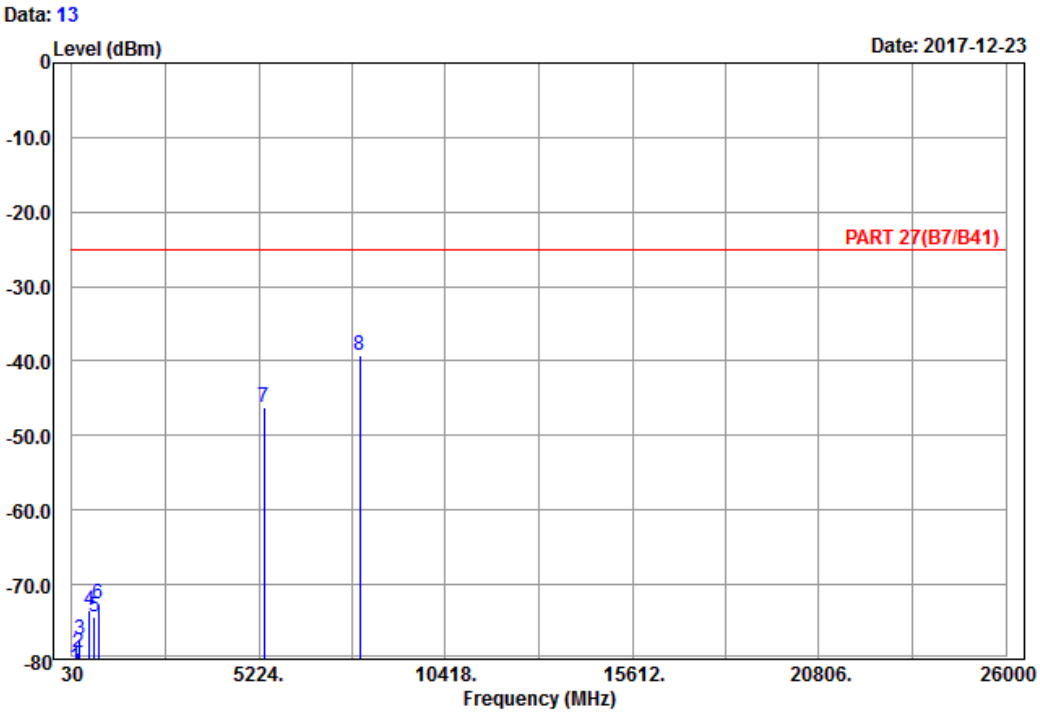


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40620
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5186.00	-47.57	-67.69	-25.00	-22.57	20.12	Peak
2 pp	7779.00	-41.03	-64.36	-25.00	-16.03	23.33	Peak

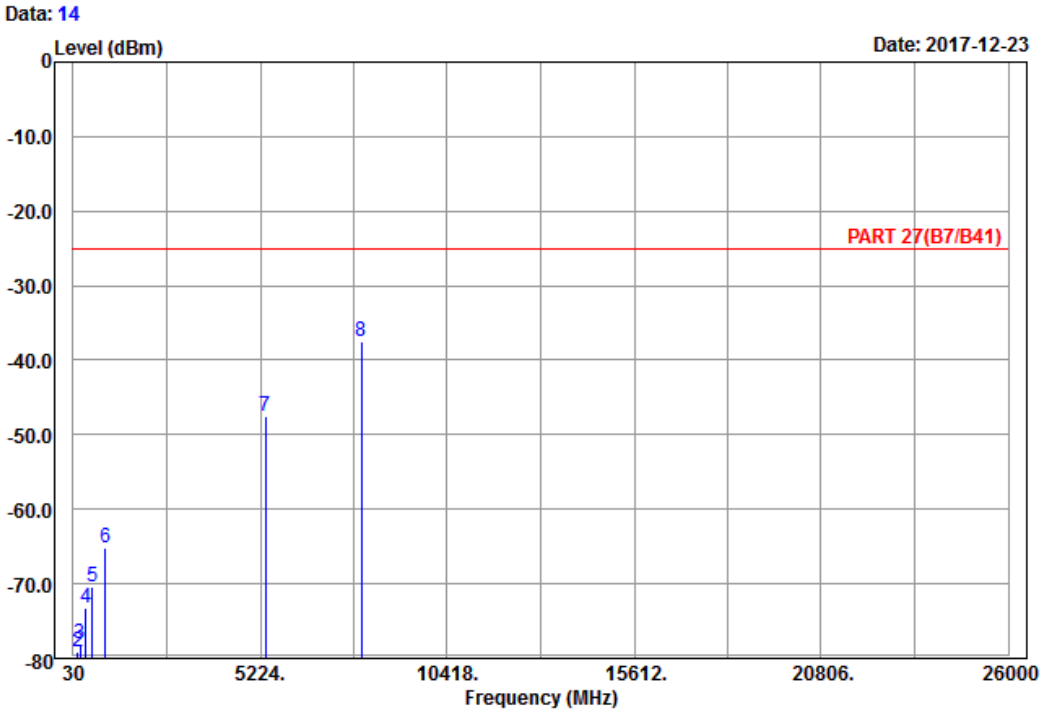
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH41490
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	128.55	-81.05	-73.34	-25.00	-56.05	-7.71	Peak
2	189.30	-79.07	-73.35	-25.00	-54.07	-5.72	Peak
3	242.22	-77.41	-71.80	-25.00	-52.41	-5.61	Peak
4	506.50	-73.48	-68.62	-25.00	-48.48	-4.86	Peak
5	650.70	-74.28	-74.14	-25.00	-49.28	-0.14	Peak
6	771.10	-72.67	-72.76	-25.00	-47.67	0.09	Peak
7	5360.00	-46.16	-66.46	-25.00	-21.16	20.30	Peak
8 pp	8040.00	-39.28	-63.03	-25.00	-14.28	23.75	Peak



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH41490
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	101.55	-84.44	-74.55	-25.00	-59.44	-9.89	Peak
2	162.84	-79.09	-71.71	-25.00	-54.09	-7.38	Peak
3	211.17	-78.00	-71.97	-25.00	-53.00	-6.03	Peak
4	384.70	-73.26	-69.74	-25.00	-48.26	-3.52	Peak
5	561.80	-70.31	-69.13	-25.00	-45.31	-1.18	Peak
6	924.40	-65.21	-69.18	-25.00	-40.21	3.97	Peak
7	5360.00	-47.53	-67.83	-25.00	-22.53	20.30	Peak
8 pp	8040.00	-37.54	-61.29	-25.00	-12.54	23.75	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
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---