FCC Test Report

Report No.: AGC00529141101FE02

FCC ID	:	Y7WPLUMZ513
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Might LTE
BRAND NAME	:	plum
MODEL NAME	:	Z513
CLIENT	:	CLC Hong Kong Limited
DATE OF ISSUE	:	Nov.24, 2014
STANDARD(S)	:	FCC Part 27(L) Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd.

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov.24, 2014	Valid	Original Report

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1.VERIFICATION OF COMPLIANCE

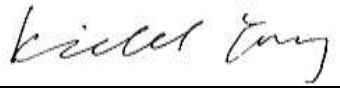
Applicant	CLC Hong Kong Limited
Address	1011A, 10/F., Harbour Centre Tower 1, No.1 Hok Cheung St., Hung Hom, Kowloon, Hong Kong
Manufacturer	CLC Technology Co., Ltd.
Address	Room 6G, Block C, NEO Building, Chegongmiao, Futian District, Shenzhen, P.R.China
Product Designation	Might LTE
Brand Name	plum
Test Model	Z513
Date of test	Nov.17, 2014 to Nov.20, 2014
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

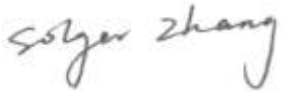
The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 27(L).
The test results of this report relate only to the tested sample identified in this report.

Tested By : 

Bart Xie Nov.24, 2014

Reviewed By : 

Kidd Yang Nov.24, 2014

Approved By: 

Solger Zhang Nov.24, 2014

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Radio System Type:	LTE	
Hardware version:	Q850	
Software version:	N/A	
Frequency Bands:	☐FDD Band 2 ☒FDD Band 4 ☐FDD Band 5 ☐FDD Band 17 ☐FDD Band 25 ☐FDD Band 26 ☐TDD Band 41 (U.S. Bands) ☐FDD Band 1 ☐FDD Band 3 ☐FDD Band 7 ☐FDD Band 8 ☐FDD Band 20 ☐TDD Band 33 ☐TDD Band 34 ☐TDD Band 38 ☐FDD Band 40 ☐FDD Band 42 ☐FDD Band 43 (Non-U.S. Bands)	
Frequency Range	LTE Band 4	Transmission (TX): 1710 to 1755 MHz
		Receiving (RX): 2110 to 2155 MHz
Supported Channel Bandwidth	LTE Band 4	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz
Antenna:	PIFA Antenna	
Type of Modulation	QPSK/16QAM	
Antenna gain:	-1.0dBi	
Power Supply:	DC 3.7V by Battery	
Battery parameter:	DC3.7V/2000 mAh	
Adapter Input:	AC100-240V 50/60Hz 0.15A	
Adapter Output:	DC5V, 1A	
Single SIM Card:	GSM/WCDMA/LTE Card Slot	
Power Class	3	
Extreme Vol. Limits:	DC3.4 V to 4.2 V (Normal: DC3.7 V)	
Extreme Temp. Tolerance	-10℃ to +50℃	
*** Note: The High Voltage DC4.2V and Low Voltage DC3.4V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.		

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: Y7WPLUMZ513**, filing to comply with the FCC Part27 requirements.

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.
KDB 971168 D01 Power Meas License Digital Systems v02r01

2.4 TEST FACILITY

The test site used to collect the radiated data is located at:
Attestation of Global Compliance (Shenzhen) Co., Ltd.
2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC register No.: 259865

2.5 MEASUREMENT INSTRUMENTS

Name of Equipment	Manufacturer	Model	Calibration Date	Calibration Due.
Spectrum Analyzer	agilent	e4440a	Feb.17,2014	Feb.16,2015
test receiver	r&s	esCI	July 25, 2014	July 24, 2015
Communication Tester	agilent	8960	July 25, 2014	July 24, 2015
UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMW500	Oct.24, 2014	Oct.23, 2015
SIGNAL GENERATOR	AGILENT	E4438C	Feb.23,2014	Feb. 22,2015
LISN	R&S	ESH3-Z5	July 25, 2014	July 24, 2015
Climate Chamber	Albatross	--	July 25, 2014	July 24, 2015
Loop Antenna	A.H.	SAS-562B	May 10, 2014	May 09, 2015
WIDEBAND REQUENCY ANTENNA	SCHWARZBECK	VULB9168	Aug.16, 2014	Aug.15, 2015
Substitution Antenna	EMCO	3142C	Aug.16, 2014	Aug.15, 2015
Substitution Antenna	EM	EM-AH-10180	Apr.19, 2014	Apr.18, 2015
Horn Antenna	EM	EM-AH-10180	Feb.17,2014	Feb.16,2015
Horn Antenna	A.H. Systems Inc.	SAS-574	June 6, 2014	June 5, 2015
Radiation Cable 1	Sat	RE1	June 4, 2014	June 3, 2015
Radiation Cable 2	Sat	RE2	June 4, 2014	June 3, 2015
Conduction Cable	Sat	CE1	June 4, 2014	June 3, 2015

2.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	2.1046/27.50(d)
		Radiated output power	
2	Peak-to-Average Ratio	Peak-to-Average Ratio	27.50(d)
3	Spurious Emission	Conducted spurious emission	2.1051 / 27.53(h)
		Radiated spurious emission	
4	Mains Conducted Emission		15.107 / 15.207
5	Frequency Stability		2.1055/27.54
6	Occupied Bandwidth		2.1049 (h)(i)
7	Emission Bandwidth		2.1049
8	Band Edge		27.53(h)

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

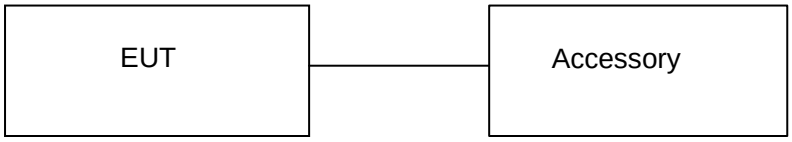


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	Z513	FCC ID: Y7WPLUMZ513	EUT
2	Adapter	PMC43	DC5.0V / 1A	Accessory
3	Battery	PMB43	DC3.7V / 2000mAh	Accessory
4	Earphone	Z513	N/A	Accessory
5	USB Cable	Z513	N/A	Accessory

****Note: All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.*

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	2.1046 /27.50(d)	Pass
		Radiated Output Power		
2	Peak-to-Average Ratio	Peak-to-Average Ratio	27.50(d)	Pass
3	Spurious Emission	Conducted Spurious Emission	2.1051 / 27.53(h)	Pass
		Radiated Spurious Emission		
4	Mains Conducted Emission		15.107 / 15.207	Pass
5	Frequency Stability		2.1055/27.54	Pass
6	Occupied Bandwidth		2.1049 (h)(i)	Pass
7	Emission Bandwidth		2.1049	Pass
8	Band Edge		27.53(h)	Pass

5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.

*****Note:** LTE band 4 mode have been tested during the test.

The worst condition was recorded in the test report if no other modes test data.

Test Mode	Test Modes Description
LTE	LTE system, QPSK modulation
LTE	LTE system, 16QAM modulation

Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 4	TX (1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7 MHz	1732.5 MHz	1754.3 MHz
	TX (3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	TX (5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	TX (10M)	Channel 20000	Channel 20175	Channel 20350
		1715 MHz	1732.5 MHz	1750 MHz
	TX (15M)	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	TX (20M)	Channel 20050	Channel 20175	Channel 20300
		1720 MHz	1732.5 MHz	1745 MHz
	RX (1.4M)	Channel 1957	Channel 2175	Channel 2393
		2110.7 MHz	2132.5 MHz	2154.3 MHz
	RX (3M)	Channel 1965	Channel 2175	Channel 2385
		2111.5 MHz	2132.5 MHz	2153.5 MHz
	RX (5M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5 MHz	2152.5 MHz
	RX (10M)	Channel 2000	Channel 2175	Channel 2350
		2115 MHz	2132.5 MHz	2150 MHz
	RX (15M)	Channel 2025	Channel 2175	Channel 2325
		2117.5 MHz	2132.5 MHz	2147.5 MHz
	RX (20M)	Channel 2050	Channel 2175	Channel 2300
		2120 MHz	2132.5 MHz	2145 MHz

6. OUTPUT POWER

6.1 Conducted Output Power

6.1.1 Procedures: (According with KDB 971168)

The transmitter output port was connected to base station.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Measure the maximum burst average power and average power for other modulation signal.

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes (LTE Band 7) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The instrument must have an available measurement/resolution bandwidth that is equal to or exceeds the OBW. If this capability is available, then the following procedure can be used to determine the total peak output power.

a) Set the RBW ≥ OBW.

b) Set VBW ≥ 3 × RBW. c)

Set span ≥ 2 x RBW

d) Sweep time = auto couple.

e) Detector = peak.

f) Ensure that the number of measurement points ≥ span/RBW.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

1) Use the peak marker function to determine the peak amplitude level.

6.1.2 MEASUREMENT RESULT

Conducted Output Power Limits for LTE Band 7		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
LTE	23 dBm (0.2W)	- 2.7

LTE Band 4

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
20MHz	20050	1720.0	QPSK	1	0	0	21.83
				1	49	0	21.90
				1	99	0	21.88
				50	0	1	21.01
				50	24	1	21.16
				50	49	1	21.08
				100	0	1	21.03
			16QAM	1	0	1	21.13
				1	49	1	21.11
				1	99	1	21.14
				50	0	2	20.15
				50	24	2	20.12
				50	49	2	20.04
				100	0	2	20.06
	20175	1732.5	QPSK	1	0	0	21.92
				1	49	0	22.04
				1	99	0	21.86
				50	0	1	21.14
				50	24	1	21.21
				50	49	1	21.18
				100	0	1	21.02
			16QAM	1	0	1	21.01
				1	49	1	21.05
				1	99	1	20.84
				50	0	2	20.39
				50	24	2	20.43
				50	49	2	20.55
				100	0	2	20.54
	20300	1745.0	QPSK	1	0	0	21.60
				1	49	0	21.89
				1	99	0	21.60
				50	0	1	20.93
				50	24	1	20.90
				50	49	1	20.94
				100	0	1	20.68
			16QAM	1	0	1	20.86
				1	49	1	20.93
				1	99	1	20.84
				50	0	2	20.16
				50	24	2	20.24
				50	49	2	20.31
				100	0	2	20.65

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	20025	1717.5	QPSK	1	0	0	21.47
				1	37	0	21.35
				1	74	0	21.11
				36	0	1	20.44
				36	16	1	20.25
				36	35	1	20.03
				75	0	1	20.33
			16QAM	1	0	1	20.50
				1	37	1	20.49
				1	74	1	20.40
				36	0	2	19.97
				36	16	2	20.02
				36	35	2	20.10
				75	0	2	19.54
	20175	1732.5	QPSK	1	0	0	21.20
				1	37	0	21.19
				1	74	0	21.44
				36	0	1	20.56
				36	16	1	20.54
				36	35	1	20.48
				75	0	1	20.41
			16QAM	1	0	1	20.95
				1	37	1	20.81
				1	74	1	20.95
				36	0	2	20.26
				36	16	2	20.17
				36	35	2	20.20
				75	0	2	19.50
	20325	1747.5	QPSK	1	0	0	21.34
				1	37	0	21.50
				1	74	0	21.47
				36	0	1	20.63
				36	16	1	20.59
				36	35	1	20.61
				75	0	1	20.65
			16QAM	1	0	1	20.37
				1	37	1	20.66
				1	74	1	20.71
				36	0	2	20.30
				36	16	2	20.26
				36	35	2	20.32
				75	0	2	19.95

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20000	1715.0	QPSK	1	0	0	21.61
				1	24	0	21.45
				1	49	0	21.15
				25	0	1	20.82
				25	12	1	20.77
				25	24	1	20.66
				50	0	1	20.81
			16QAM	1	0	1	21.04
				1	24	1	20.98
				1	49	1	20.99
				25	0	2	20.31
				25	12	2	20.29
				25	24	2	20.36
				50	0	2	20.34
	20175	1732.5	QPSK	1	0	0	21.34
				1	24	0	21.42
				1	49	0	21.66
				25	0	1	20.82
				25	12	1	20.79
				25	24	1	20.88
				50	0	1	20.82
			16QAM	1	0	1	20.60
				1	24	1	20.56
				1	49	1	20.48
				25	0	2	20.09
				25	12	2	19.81
				25	24	2	19.91
				50	0	2	19.91
	20350	1750.0	QPSK	1	0	0	21.48
				1	24	0	21.58
				1	49	0	21.80
				25	0	1	20.88
				25	12	1	20.99
				25	24	1	20.75
				50	0	1	20.90
			16QAM	1	0	1	20.93
				1	24	1	20.91
				1	49	1	20.99
				25	0	2	20.64
				25	12	2	20.75
				25	24	2	20.74
				50	0	2	20.38

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	20000	1715.0	QPSK	1	0	0	21.54
				1	12	0	21.41
				1	24	0	21.37
				12	0	1	20.79
				12	6	1	20.67
				12	11	1	20.64
				25	0	1	20.35
			16QAM	1	0	1	21.01
				1	12	1	21.07
				1	24	1	21.07
				12	0	2	20.75
				12	6	2	20.62
				12	11	2	20.64
				25	0	2	20.67
	20175	1732.5	QPSK	1	0	0	21.49
				1	12	0	21.54
				1	24	0	21.46
				12	0	1	20.45
				12	6	1	20.67
				12	11	1	20.75
				25	0	1	20.64
			16QAM	1	0	1	20.70
				1	12	1	20.66
				1	24	1	20.57
				12	0	2	19.83
				12	6	2	19.62
				12	11	2	19.75
				25	0	2	19.51
	20350	1750.0	QPSK	1	0	0	21.33
				1	12	0	21.35
				1	24	0	21.21
				12	0	1	20.80
				12	6	1	20.85
				12	11	1	20.86
				25	0	1	20.69
			16QAM	1	0	1	20.83
				1	12	1	20.86
				1	24	1	20.84
				12	0	2	19.59
				12	6	2	19.53
				12	11	2	19.47
				25	0	2	19.43

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	19965	1711.5	QPSK	1	0	0	21.42
				1	7	0	21.50
				1	14	0	21.49
				8	0	1	20.64
				8	4	1	20.60
				8	7	1	20.62
				15	0	1	20.67
			16QAM	1	0	1	20.97
				1	7	1	21.06
				1	14	1	20.96
				8	0	2	19.80
				8	4	2	19.86
				8	7	2	19.73
				15	0	2	19.76
	20175	1732.5	QPSK	1	0	0	21.29
				1	7	0	21.48
				1	14	0	21.37
				8	0	1	20.79
				8	4	1	20.78
				8	7	1	20.61
				15	0	1	20.79
			16QAM	1	0	1	20.62
				1	7	1	20.52
				1	14	1	20.83
				8	0	2	19.79
				8	4	2	19.87
				8	7	2	19.95
				15	0	2	19.51
	20385	1753.5	QPSK	1	0	0	21.48
				1	7	0	21.55
				1	14	0	21.54
				8	0	1	20.75
				8	4	1	20.83
				8	7	1	20.92
				15	0	1	20.82
			16QAM	1	0	1	20.60
				1	7	1	20.65
				1	14	1	20.52
				8	0	2	19.88
				8	4	2	19.85
				8	7	2	19.84
				15	0	2	19.98

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	19957	1710.7	QPSK	1	0	0	21.53
				1	2	0	21.68
				1	5	0	21.55
				3	0	0	21.40
				3	1	0	21.57
				3	2	0	21.44
				6	0	1	20.69
			16QAM	1	0	1	20.78
				1	2	1	20.77
				1	5	1	20.85
				3	0	1	20.82
				3	1	1	20.88
				3	2	1	20.81
				6	0	2	20.05
	20175	1732.5	QPSK	1	0	0	21.23
				1	2	0	21.43
				1	5	0	21.39
				3	0	0	21.10
				3	1	0	21.12
				3	2	0	21.10
				6	0	1	20.91
			16QAM	1	0	1	20.91
				1	2	1	20.87
				1	5	1	20.70
				3	0	1	20.59
				3	1	1	20.42
				3	2	1	20.50
				6	0	2	19.49
	20393	1754.3	QPSK	1	0	0	21.67
				1	2	0	21.59
				1	5	0	21.71
				3	0	0	21.40
				3	1	0	21.42
				3	2	0	21.35
				6	0	1	20.83
			16QAM	1	0	1	20.89
				1	2	1	20.88
				1	5	1	20.77
				3	0	1	20.92
				3	1	1	20.87
				3	2	1	21.00
				6	0	2	19.92

According to 3GPP 36.521 sub-clause 6.2.3.3, the maximum output power is allowed to be reduced by following the table.

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (For PRACH, PUCCH and SRS transmission, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.).

When PRACH, PUCCH are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

For each subframe, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) within the slot, the maximum MPR over the two slots is then applied for the entire subframe.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply. The normative reference for this requirement is TS 36.101 clause 6.2.3.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

6.2 RADIATED OUTPUT POWER

6.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 27.50(d)(4). The "reference path loss" from Step1 is added to this result.

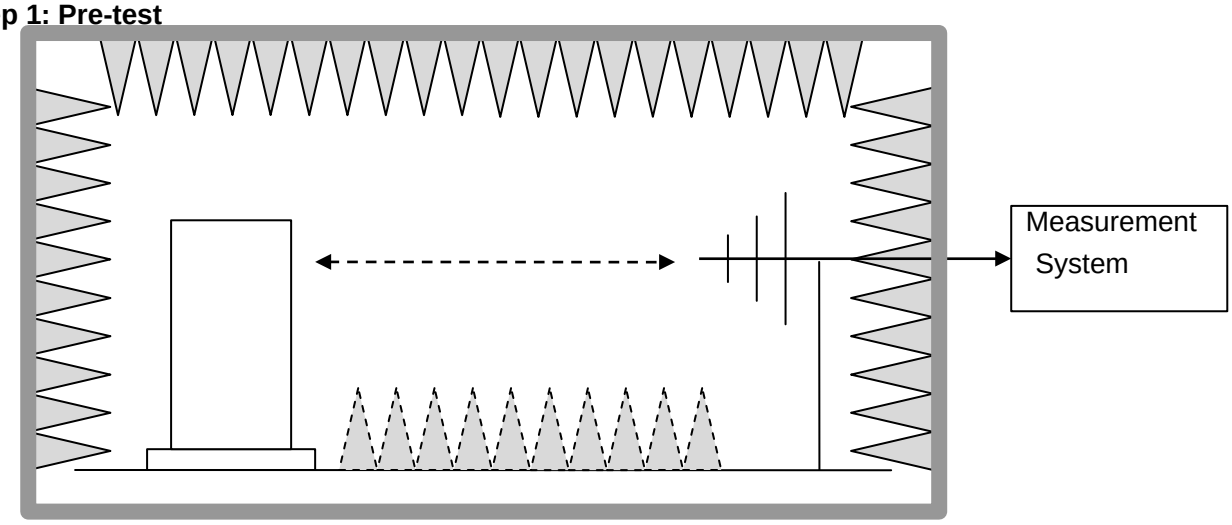
7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

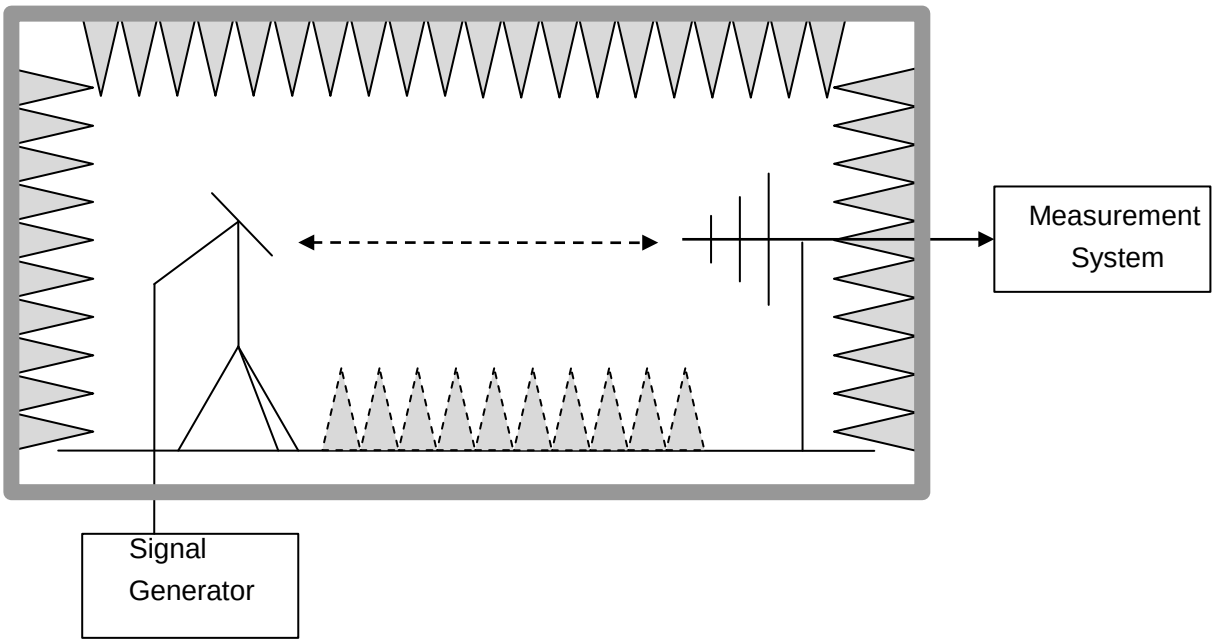
Test Setup

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

Step 1: Pre-test



Step 2: Substitution method to verify the maximum ERP



6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 27.50(d) specifies, “Mobile/portable stations are limited to 1 watts e.i.r.p.

Mode	Nominal Peak Power
LTE Band 4	<=30 dBm (1W)

6.2.3 MEASUREMENT RESULT

EIRP for LTE Band4 (Part 27)

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1710.7	1.4	QPSK	1/0	10.72	V	7.95	0.79	17.88	30
1732.5	1.4	QPSK	1/0	10.64	V	7.95	0.79	17.8	30
1754.3	1.4	QPSK	1/0	10.81	V	7.95	0.79	17.97	30
1710.7	1.4	QPSK	1/0	9.83	H	7.95	0.79	16.99	30
1732.5	1.4	QPSK	1/0	9.75	H	7.95	0.79	16.91	30
1754.3	1.4	QPSK	1/0	9.66	H	7.95	0.79	16.82	30
1710.7	1.4	16-QAM	1/5	10.67	V	7.95	0.79	17.83	30
1732.5	1.4	16-QAM	1/0	10.56	V	7.95	0.79	17.72	30
1754.3	1.4	16-QAM	1/0	10.77	V	7.95	0.79	17.93	30
1710.7	1.4	16-QAM	1/5	9.79	H	7.95	0.79	16.95	30
1732.5	1.4	16-QAM	1/0	9.84	H	7.95	0.79	17	30
1754.3	1.4	16-QAM	1/0	9.68	H	7.95	0.79	16.84	30
1711.5	3	QPSK	1/0	10.49	V	7.95	0.79	17.65	30
1732.5	3	QPSK	1/0	10.62	V	7.95	0.79	17.78	30
1753.5	3	QPSK	1/0	11.02	V	7.95	0.79	18.18	30
1711.5	3	QPSK	1/0	9.94	H	7.95	0.79	17.1	30
1732.5	3	QPSK	1/0	9.57	H	7.95	0.79	16.73	30
1753.5	3	QPSK	1/0	10.05	H	7.95	0.79	17.21	30
1711.5	3	16-QAM	1/0	11.01	V	7.95	0.79	18.17	30
1732.5	3	16-QAM	1/0	10.82	V	7.95	0.79	17.98	30
1753.5	3	16-QAM	1/0	10.57	V	7.95	0.79	17.73	30
1711.5	3	16-QAM	1/0	9.64	H	7.95	0.79	16.8	30
1732.5	3	16-QAM	1/0	10.16	H	7.95	0.79	17.32	30
1753.5	3	16-QAM	1/0	9.76	H	7.95	0.79	16.92	30
1712.5	5	QPSK	1/0	10.55	V	7.95	0.79	17.71	30
1732.5	5	QPSK	1/0	11.04	V	7.95	0.79	18.2	30
1752.5	5	QPSK	1/24	11.02	V	7.95	0.79	18.18	30
1712.5	5	QPSK	1/0	10.02	H	7.95	0.79	17.18	30
1732.5	5	QPSK	1/0	9.98	H	7.95	0.79	17.14	30
1752.5	5	QPSK	1/24	9.62	H	7.95	0.79	16.78	30
1712.5	5	16-QAM	1/0	10.88	V	7.95	0.79	18.04	30
1732.5	5	16-QAM	1/0	11.05	V	7.95	0.79	18.21	30
1752.5	5	16-QAM	1/24	10.56	V	7.95	0.79	17.72	30
1712.5	5	16-QAM	1/0	9.76	H	7.95	0.79	16.92	30
1732.5	5	16-QAM	1/0	9.89	H	7.95	0.79	17.05	30
1752.5	5	16-QAM	1/24	9.67	H	7.95	0.79	16.83	30
1715	10	QPSK	1/0	10.98	V	7.95	0.79	18.14	30
1732.5	10	QPSK	1/49	10.85	V	7.95	0.79	18.01	30
1750	10	QPSK	1/0	10.55	V	7.95	0.79	17.71	30
1715	10	QPSK	1/0	9.83	H	7.95	0.79	16.99	30
1732.5	10	QPSK	1/49	9.74	H	7.95	0.79	16.9	30
1750	10	QPSK	1/0	9.89	H	7.95	0.79	17.05	30
1715	10	16-QAM	1/0	11.02	V	7.95	0.79	18.18	30
1732.5	10	16-QAM	1/49	11.11	V	7.95	0.79	18.27	30
1750	10	16-QAM	1/0	10.79	V	7.95	0.79	17.95	30

Frequency	Channel BW	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1715	10	16-QAM	1/0	10.02	H	7.95	0.79	17.18	30
1732.5	10	16-QAM	1/49	10.13	H	7.95	0.79	17.29	30
1750	10	16-QAM	1/0	9.87	H	7.95	0.79	17.03	30
1717.5	15	QPSK	1/0	10.89	V	7.95	0.79	18.05	30
1732.5	15	QPSK	1/74	10.58	V	7.95	0.79	17.74	30
1747.5	15	QPSK	1/0	10.84	V	7.95	0.79	18	30
1717.5	15	QPSK	1/0	10.02	H	7.95	0.79	17.18	30
1732.5	15	QPSK	1/74	9.99	H	7.95	0.79	17.15	30
1747.5	15	QPSK	1/0	9.77	H	7.95	0.79	16.93	30
1717.5	15	16-QAM	1/0	10.69	V	7.95	0.79	17.85	30
1732.5	15	16-QAM	1/74	10.74	V	7.95	0.79	17.9	30
1747.5	15	16-QAM	1/0	10.94	V	7.95	0.79	18.1	30
1717.5	15	16-QAM	1/0	9.97	H	7.95	0.79	17.13	30
1732.5	15	16-QAM	1/74	9.83	H	7.95	0.79	16.99	30
1747.5	15	16-QAM	1/0	9.75	H	7.95	0.79	16.91	30
1720	20	QPSK	1/99	10.88	V	7.95	0.79	18.04	30
1732.5	20	QPSK	1/99	11.13	V	7.95	0.79	18.29	30
1745	20	QPSK	1/0	10.76	V	7.95	0.79	17.92	30
1720	20	QPSK	1/99	9.87	H	7.95	0.79	17.03	30
1732.5	20	QPSK	1/99	9.59	H	7.95	0.79	16.75	30
1745	20	QPSK	1/0	10.14	H	7.95	0.79	17.3	30
1720	20	16-QAM	1/99	11.18	V	7.95	0.79	18.34	30
1732.5	20	16-QAM	1/99	10.89	V	7.95	0.79	18.05	30
1745	20	16-QAM	1/0	10.76	V	7.95	0.79	17.92	30
1720	20	16-QAM	1/99	10.03	H	7.95	0.79	17.19	30
1732.5	20	16-QAM	1/99	9.87	H	7.95	0.79	17.03	30

Note: Above is worst mode data.

6.3. Peak-to-Average Ratio

6.3.1 MEASUREMENT METHOD

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = PPk (dBm) - PAvg (dBm).

6.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. 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.

6.3.3 MEASUREMENT RESULT

LTE Band 4 (Part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted power(dBm)		Peak-Average Ratio(PAR)
				Peak	Average	
1.4	1732.5	RB 1/0	QPSK	26.15	21.92	4.23
			16QAM	26.07	21.86	4.21
3	1732.5	RB 1/0	QPSK	26.12	21.85	4.27
			16QAM	26.02	21.81	4.21
5	1732.5	RB 1/0	QPSK	26.20	21.98	4.22
			16QAM	26.10	21.90	4.20
10	1732.5	RB 1/0	QPSK	26.19	21.80	4.39
			16QAM	26.12	21.73	4.39
15	1732.5	RB 1/0	QPSK	26.09	21.84	4.25
			16QAM	26.01	21.77	4.24
20	1732.5	RB 1/0	QPSK	26.25	21.88	4.37
			16QAM	26.14	21.71	4.43

7. SPURIOUS EMISSION

7.1 CONDUCTED SPURIOUS EMISSION

7.1.1 MEASUREMENT METHOD

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

Test Procedure Used

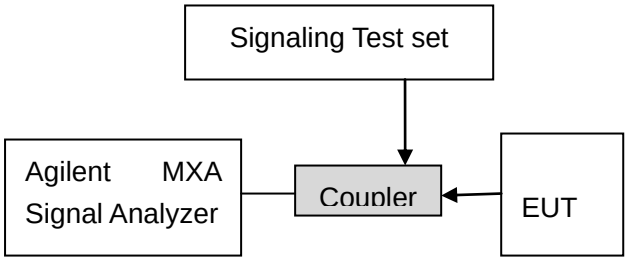
KDB 971168 v02r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = max hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Test Instrument & Measurement Setup

shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

7.1.2 MEASUREMENT RESULT

PLEASE REFER TO: APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. Below 30MHZ no Spurious found and The LTE modes is the worst condition.

2. As no emission found in standby or receive mode, no recording in this report.

7.2 Radiated Spurious Emission

7.2.1 TEST OVERVIEW

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r01 – Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

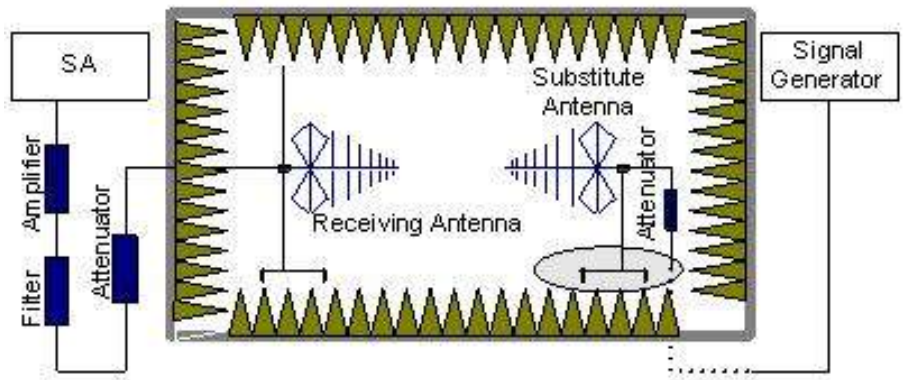
Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

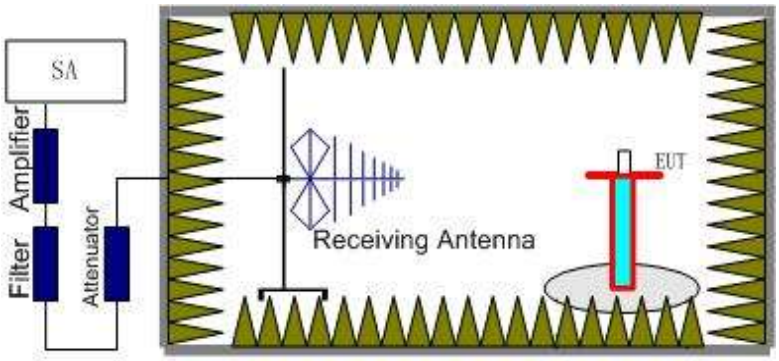
Test Setup

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE band 7. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

7.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

7.2.3 MEASUREMENT RESULT

LTE Band 4 (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-47.36	V	10.06	2.52	-39.82	-13	-26.82
3440	-48.13	H	10.06	2.52	-40.59	-13	-27.59
257.4	-54.39	V	6.7	0.24	-47.93	-13	-34.93
640.2	-50.22	H	6.5	0.39	-44.11	-13	-31.11

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-47.55	V	10.09	2.52	-39.98	-13	-26.98
3465	-48.29	H	10.09	2.52	-40.72	-13	-27.72
256.9	-54.72	V	6.7	0.24	-48.26	-13	-35.26
639.8	-50.17	H	6.5	0.39	-44.06	-13	-31.06

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-47.69	V	10.09	2.52	-40.12	-13	-27.12
3490	-48.37	H	10.09	2.52	-40.8	-13	-27.8
254.6	-54.82	V	6.7	0.24	-48.36	-13	-35.36
639.4	-50.09	H	6.5	0.39	-43.98	-13	-30.98

Note: EUT Field Strength (dBm) = Reading (Signal generator) + Antenna Gain (substitution antenna) - Cable loss (From Signal Generator to substitution antenna)

Below 30MHZ no Spurious found and The GSM modes is the worst condition.

8. MAINS CONDUCTED EMISSION

8.1 MEASUREMENT METHOD

The measurement procedure specified in ANSI C63.4-2003 was used for testing. Conducted Emission was measured with travel charger.

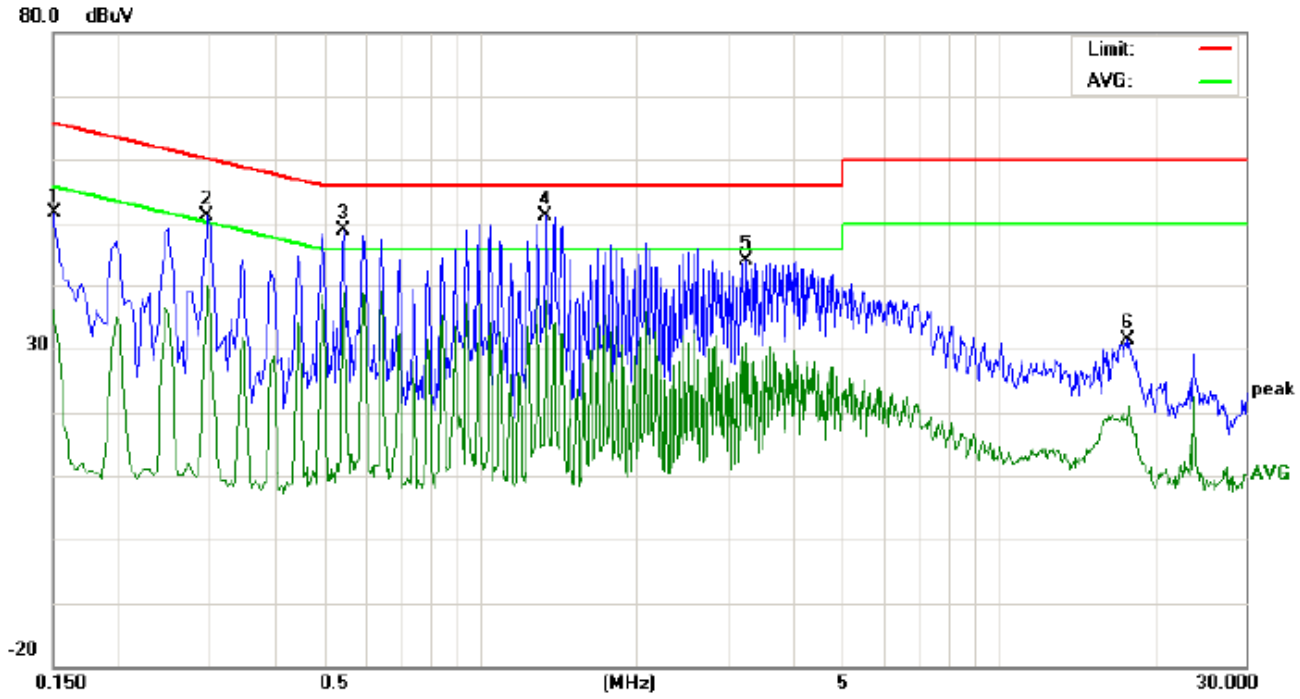
8.2 PROVISIONS APPLICABLE

Frequency of Emission (MHz)	Conducted Limit(dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
*Decreases with the logarithm of the frequency. *The lower limit shall apply at the transition frequency.		

Note: The LTE Band mode is the worst condition and the test result as following:

8.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION - L



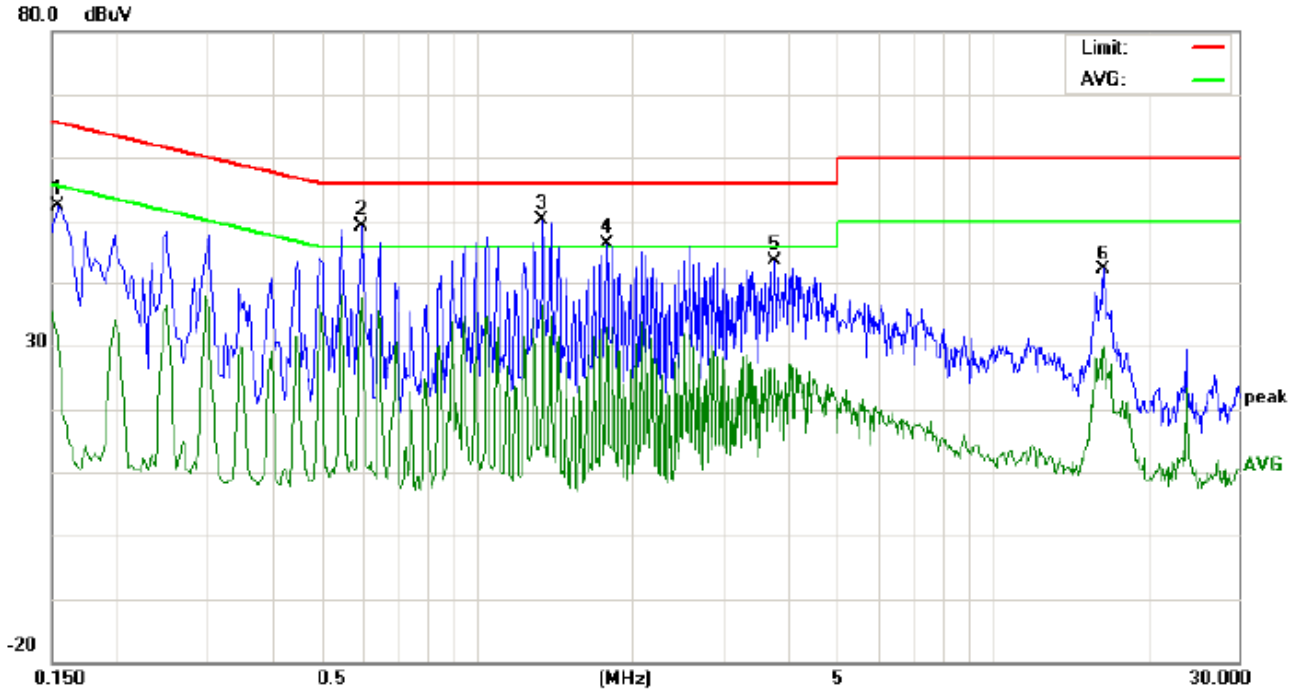
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Might LTE
M/N: Z513
Mode: Call
Note:

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1499	41.41		25.99	10.16	51.57		36.15	66.00	56.00	-14.43	-19.85	P	
2	0.2980	40.96		29.64	10.29	51.25		39.93	60.30	50.30	-9.05	-10.37	P	
3	0.5460	38.41		28.59	10.36	48.77		38.95	56.00	46.00	-7.23	-7.05	P	
4	1.3420	40.80		27.22	10.38	51.18		37.60	56.00	46.00	-4.82	-8.40	P	
5	3.2740	33.62		20.26	10.53	44.15		30.79	56.00	46.00	-11.85	-15.21	P	
6	17.7979	21.34		8.07	10.12	31.46		18.19	60.00	50.00	-28.54	-31.81	P	

LINE CONDUCTED EMISSION - N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Might LTE
M/N: Z513
Mode: Call
Note:

Phase: *N*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	42.17		20.30	10.16	52.33		30.46	65.78	55.78	-13.45	-25.32	P	
2	0.5980	38.71		27.21	10.31	49.02		37.52	56.00	46.00	-6.98	-8.48	P	
3	1.3420	39.76		26.05	10.38	50.14		36.43	56.00	46.00	-5.86	-9.57	P	
4	1.7900	36.17		22.64	10.29	46.46		32.93	56.00	46.00	-9.54	-13.07	P	
5	3.7780	33.07		15.82	10.47	43.54		26.29	56.00	46.00	-12.46	-19.71	P	
6	16.4139	32.12		19.72	10.12	42.24		29.84	60.00	50.00	-17.76	-20.16	P	

9. FREQUENCY STABILITY

9.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1 , Measure the carrier frequency at room temperature.

2 , Subject the EUT to overnight soak at -10℃.

, With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3 , Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

5 , Subject the EUT to overnight soak at +50℃.

6 , With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 , Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 , At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

9.2 PROVISIONS APPLICABLE

9.2.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to nsure that the fundamental emission stays within the authorized frequency block.

9.2.2 For equipment powered by primary supply voltage

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

9.3 MEASUREMENT RESULT (WORST)

LTE Band 4 (Part 27)

Middle Channel, f_O = 1732.5 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-21	0.0121	2.5
0		-15	0.0087	2.5
10		-17	0.0098	2.5
20		-12	0.0069	2.5
30		-15	0.0087	2.5
40		-14	0.0081	2.5
50		-16	0.0092	2.5
55		-15	0.0087	2.5
25	4.2	-19	0.0110	2.5
	3.5	-20	0.0115	2.5

Note: The EUT doesn’t work below -10℃

10. OCCUPIED BANDWIDTH

10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

10.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 4 (Part 27)

BW(MHz)	Channel	Frequency (MHz)	Mode	99% Occupied Bandwidth (MHz)
1.4	19957	1710.7	QPSK	1.0904
			16QAM	1.0904
1.4	20175	1732.5	QPSK	1.0912
			16QAM	1.0882
1.4	20393	1754.3	QPSK	1.0908
			16QAM	1.0889
3	19965	1711.5	QPSK	2.7014
			16QAM	2.7002
3	20175	1732.5	QPSK	2.6960
			16QAM	2.6993
3	20385	1753.5	QPSK	2.6985
			16QAM	2.6992
5	19975	1712.5	QPSK	4.5014
			16QAM	4.4970
5	20175	1732.5	QPSK	4.5062
			16QAM	4.5064
5	20375	1752.5	QPSK	4.5058
			16QAM	4.4962
10	20000	1715	QPSK	8.9739
			16QAM	8.9536
10	20175	1732.5	QPSK	8.9838
			16QAM	8.9648

10	20350	1750	QPSK	8.9764
			16QAM	8.9569
15	20025	1717.5	QPSK	13.429
			16QAM	13.430
15	20175	1732.5	QPSK	13.469
			16QAM	13.467
15	20325	1747.5	QPSK	13.444
			16QAM	13.437
20	20050	1720	QPSK	17.917
			16QAM	17.902
20	20175	1732.5	QPSK	17.959
			16QAM	17.962
20	20300	1745	QPSK	17.909
			16QAM	17.902

11. EMISSION BANDWIDTH

11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

11.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

11.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 4 (Part 27)

BW(MHz)	Channel	Frequency (MHz)	Mode	-26 dB Bandwidth (MHz)
1.4	19957	1710.7	QPSK	1.268
			16QAM	1.275
1.4	20175	1732.5	QPSK	1.281
			16QAM	1.290
1.4	20393	1754.3	QPSK	1.267
			16QAM	1.275
3	19965	1711.5	QPSK	2.957
			16QAM	2.963
3	20175	1732.5	QPSK	2.946
			16QAM	2.980
3	20385	1753.5	QPSK	2.939
			16QAM	2.959
5	19975	1712.5	QPSK	4.929
			16QAM	4.936
5	20175	1732.5	QPSK	4.954
			16QAM	4.920
5	20375	1752.5	QPSK	4.934
			16QAM	4.912

10	20000	1715	QPSK	9.561
			16QAM	9.523
10	20175	1732.5	QPSK	9.578
			16QAM	9.568
10	20350	1750	QPSK	9.552
			16QAM	9.523
15	20025	1717.5	QPSK	14.26
			16QAM	14.29
15	20175	1732.5	QPSK	14.27
			16QAM	14.41
15	20325	1747.5	QPSK	14.25
			16QAM	14.29
20	20050	1720	QPSK	18.98
			16QAM	18.99
20	20175	1732.5	QPSK	19.03
			16QAM	19.01
20	20300	1745	QPSK	18.97
			16QAM	18.97

12. BAND EDGE

12.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

12.2 PROVISIONS APPLICABLE

As Specified in FCC rules of §2.1051 §24.238(a) §27.53(e) §27.53(g)
KDB 971168 v02r01 – Section 6.0

12.3 MEASUREMENT RESULT

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.
Please refers to Appendix III for compliance test plots for band edges

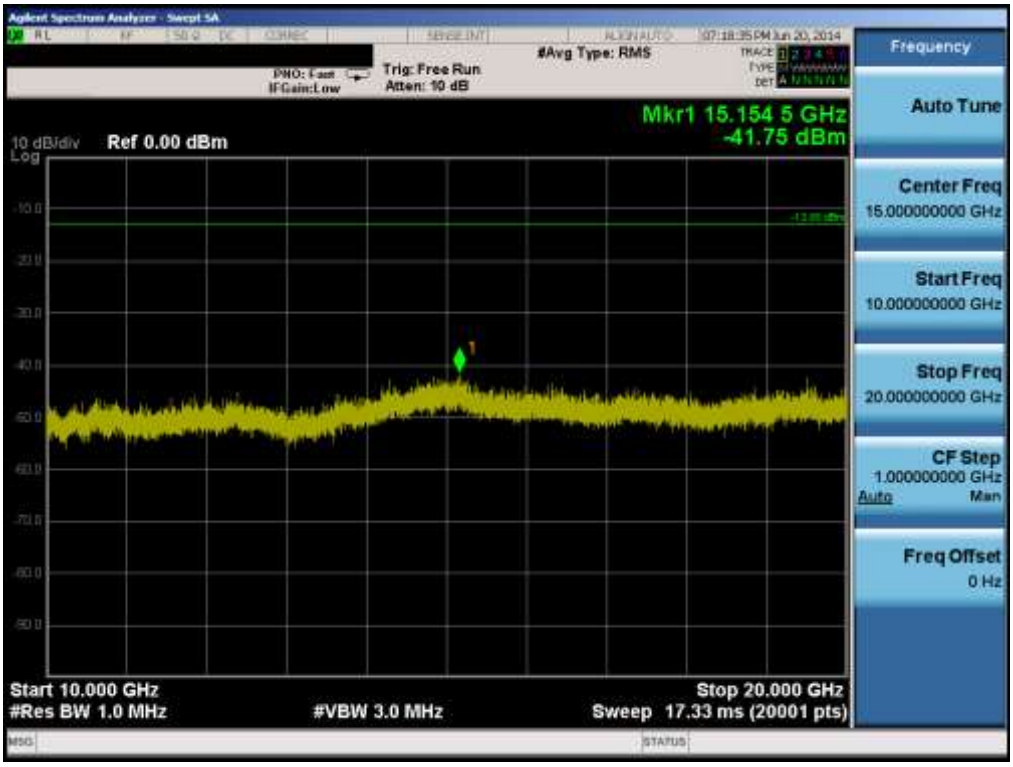
APPENDIX A

TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

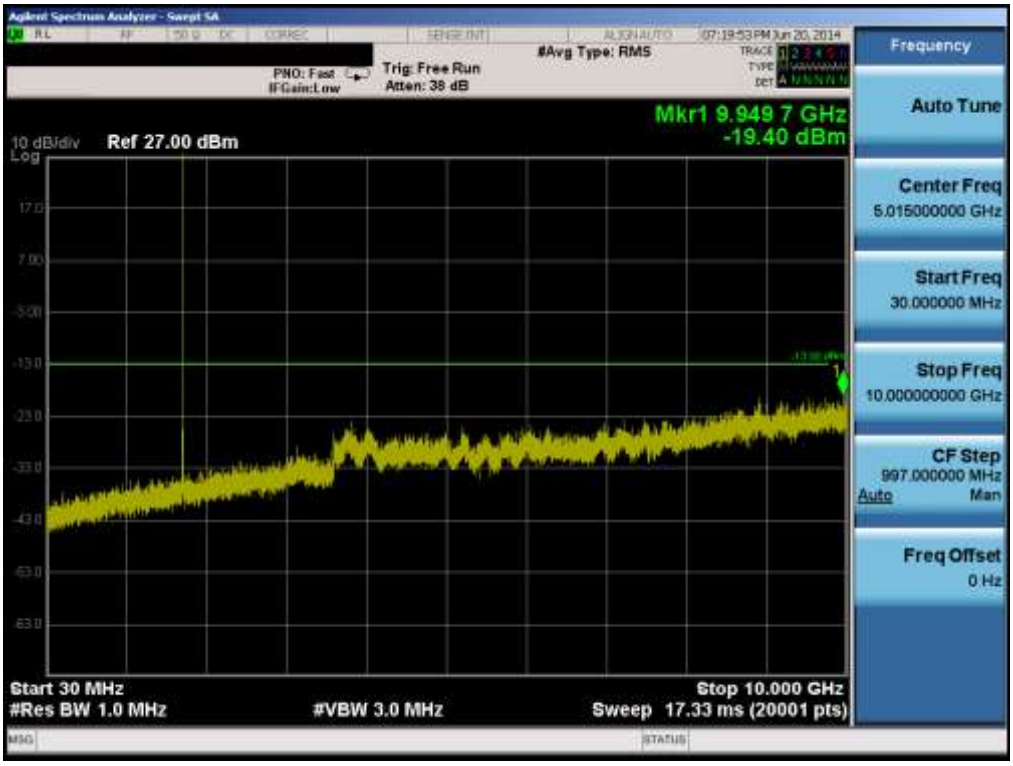
CONDUCTED EMISSION IN LTE BAND 4

Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

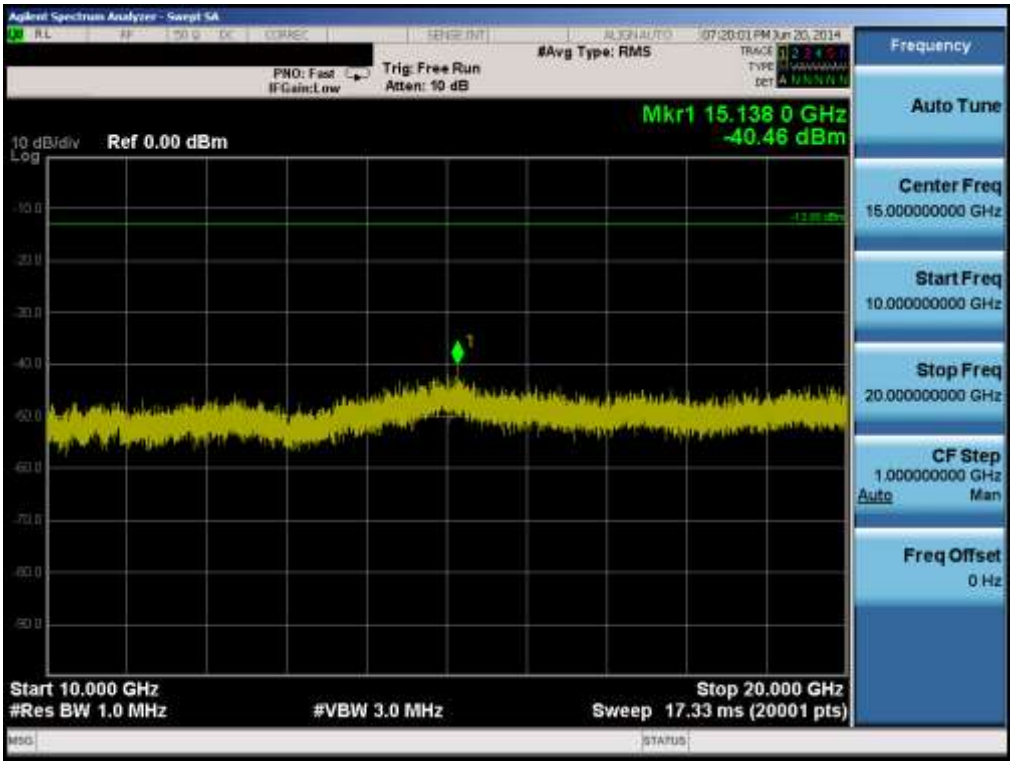
Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



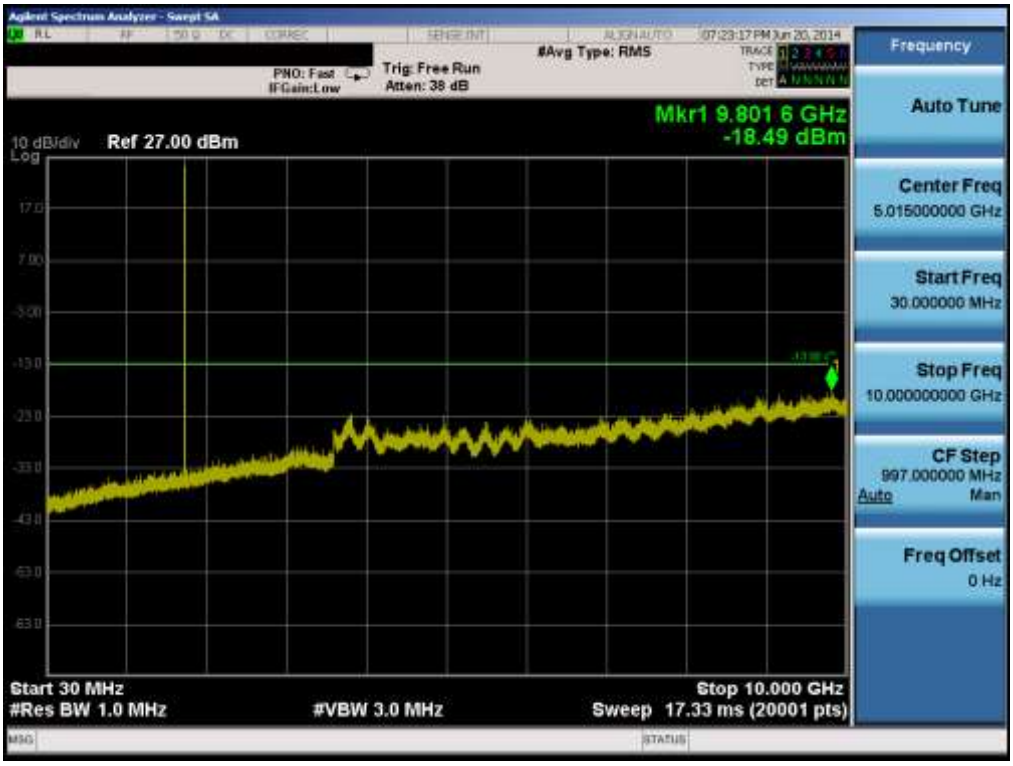
Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



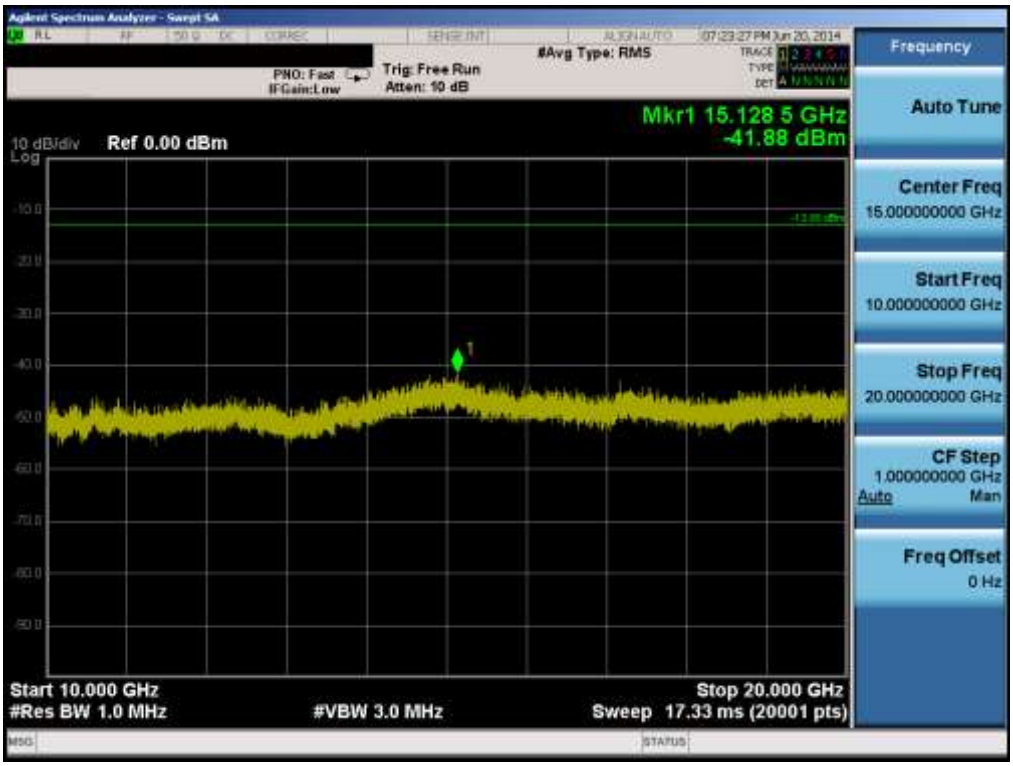
Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Conducted Spurious Plot (Band 4 – 5.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



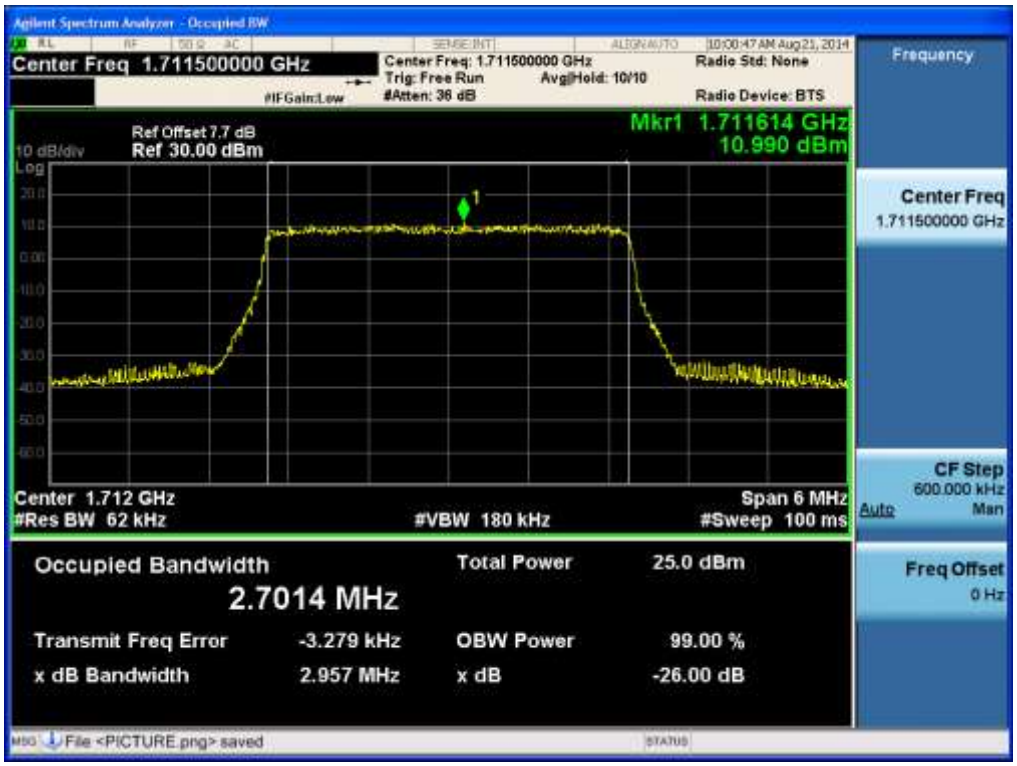
APPENDIX B
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)
EMISSION BANDWIDTH (-26dBC)

Occupied Bandwidth Plot (Band 4 – 1.4MHz QPSK – RB Size 6)-Low

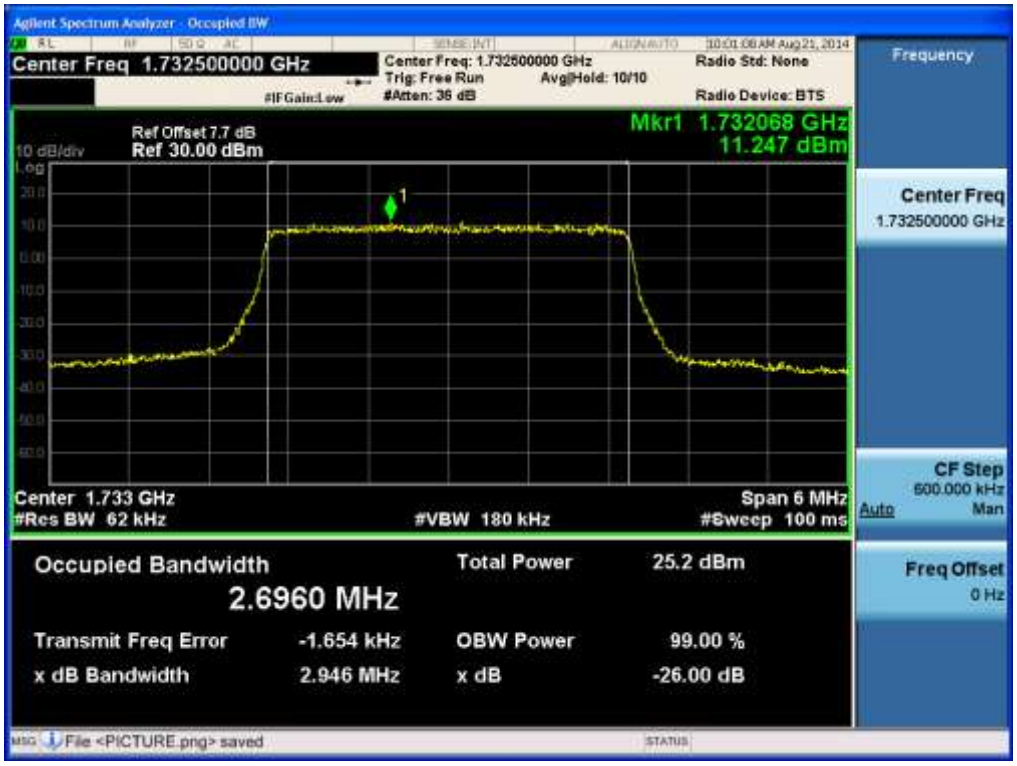
Occupied Bandwidth Plot (Band 4 – 1.4MHz QPSK – RB Size 6)-Middle

Occupied Bandwidth Plot (Band 4 – 1.4MHz QPSK – RB Size 6)-High

Occupied Bandwidth Plot (Band 4 – 3MHz QPSK – RB Size 15)-Low

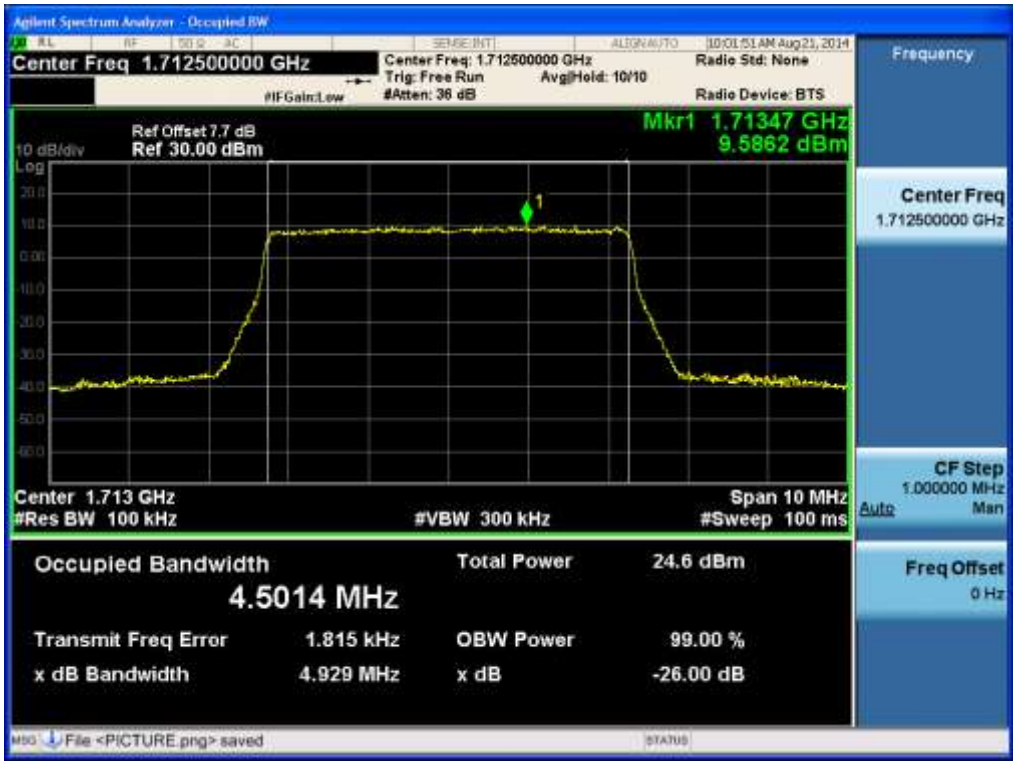


Occupied Bandwidth Plot (Band 4 – 3MHz QPSK – RB Size 15)-Middle



Occupied Bandwidth Plot (Band 4 – 3MHz QPSK – RB Size 15)-High

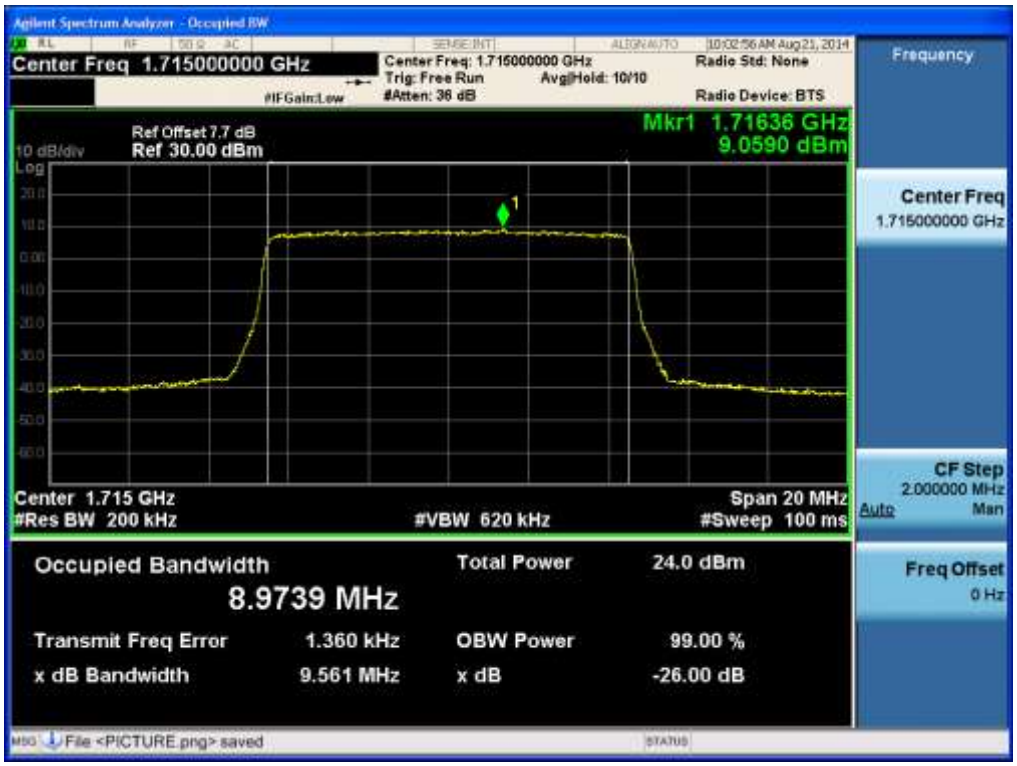
Occupied Bandwidth Plot (Band 4 – 5.0MHz QPSK – RB Size 25)-Low



Occupied Bandwidth Plot (Band 4 – 5.0MHz QPSK – RB Size 25)-Middle

Occupied Bandwidth Plot (Band 4 – 5.0MHz QPSK – RB Size 25)-High

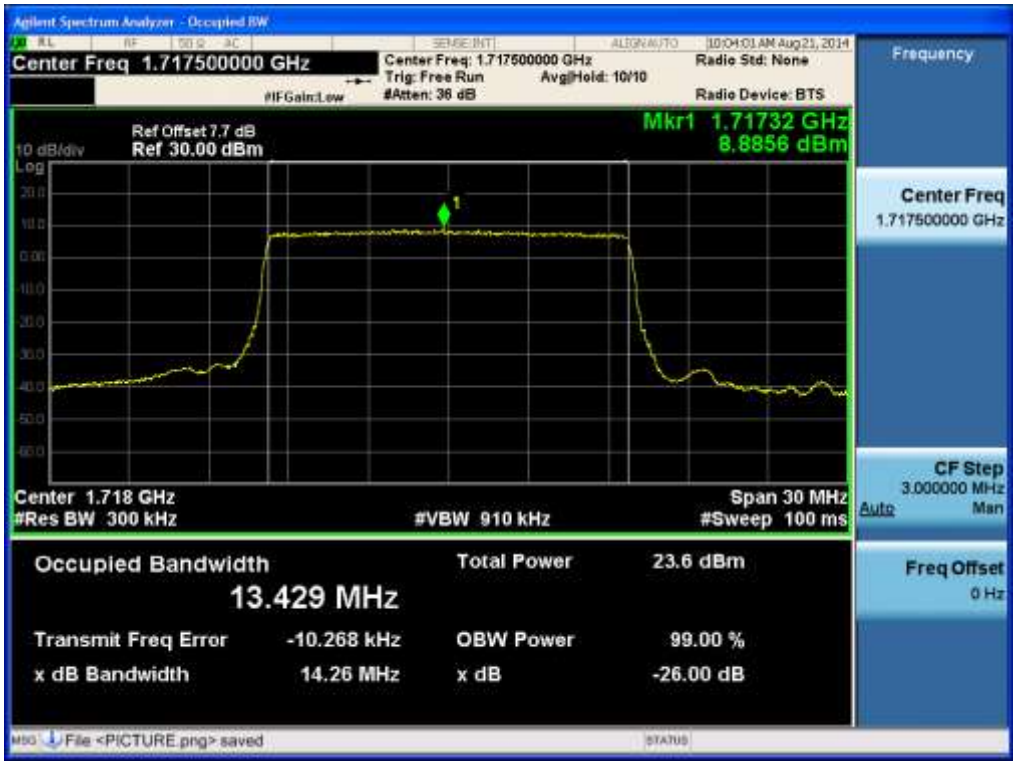
Occupied Bandwidth Plot (Band 4 – 10.0MHz QPSK – RB Size 50)-Low



Occupied Bandwidth Plot (Band 4 – 10.0MHz QPSK – RB Size 50)-Middle

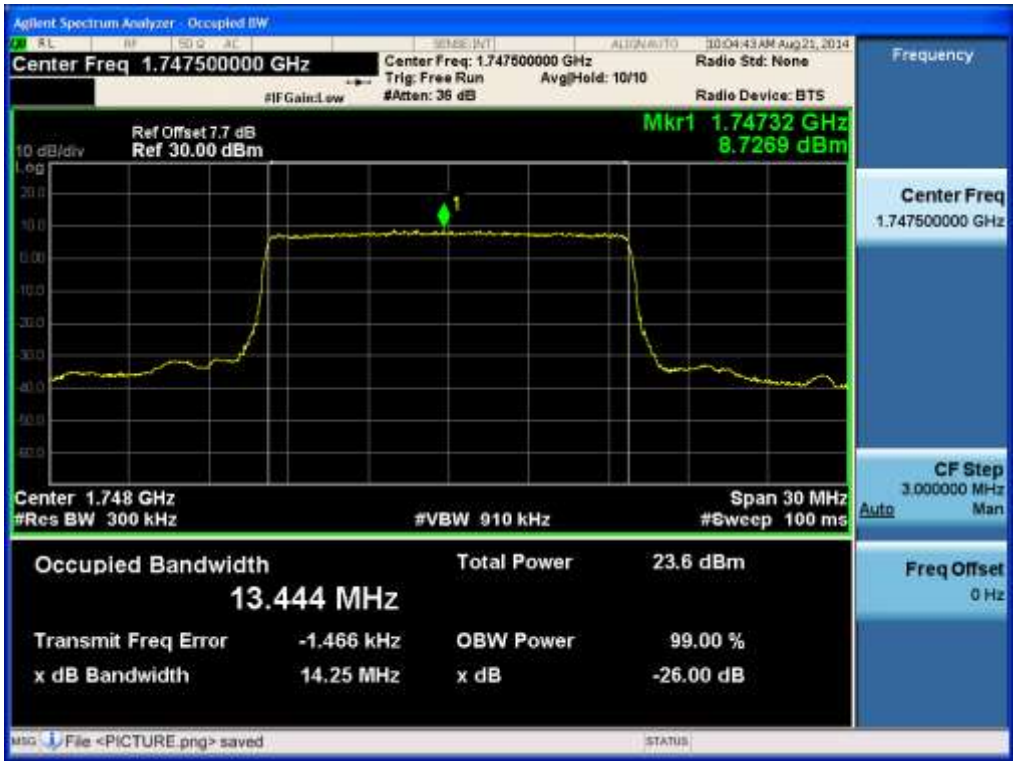
Occupied Bandwidth Plot (Band 4 – 10.0MHz QPSK – RB Size 50)-High

Occupied Bandwidth Plot (Band 4 – 15.0MHz QPSK – RB Size 75)-Low



Occupied Bandwidth Plot (Band 4 – 15.0MHz QPSK – RB Size 75)-Middle

Occupied Bandwidth Plot (Band 4 – 15.0MHz QPSK – RB Size 75)-High

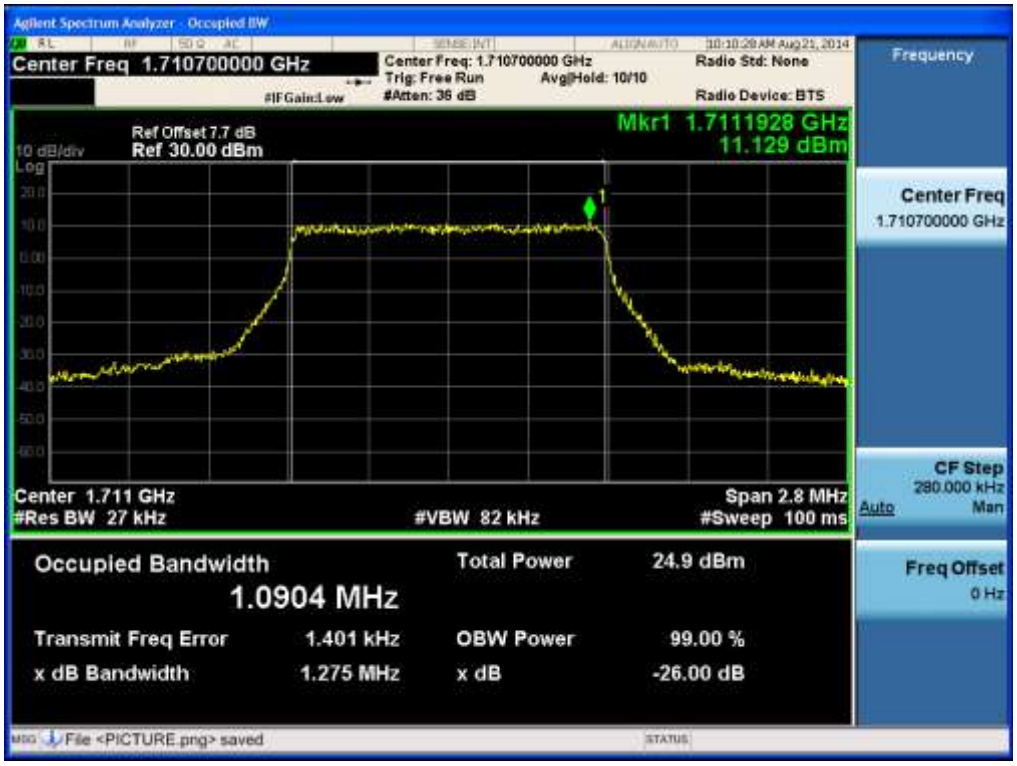


Occupied Bandwidth Plot (Band 4 – 20.0MHz QPSK – RB Size 100)-Low

Occupied Bandwidth Plot (Band 4 – 20.0MHz QPSK – RB Size 100)-Middle

Occupied Bandwidth Plot (Band 4 – 20.0MHz QPSK – RB Size 100)-High

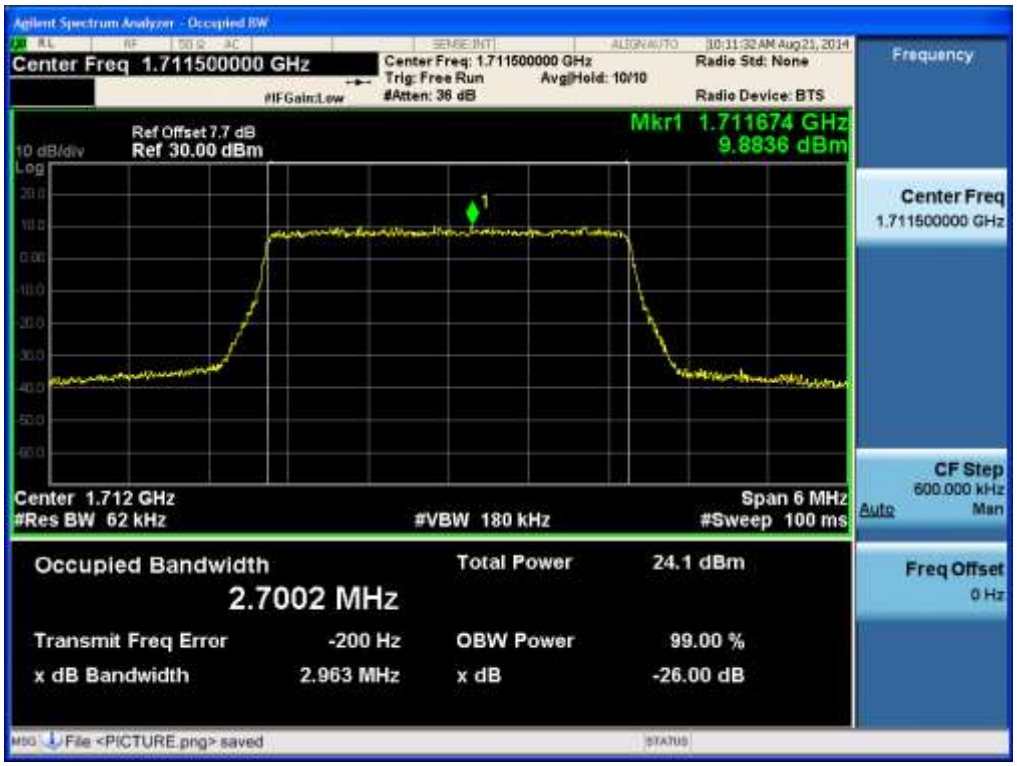
Occupied Bandwidth Plot (Band 4 – 1.4MHz 16-QAM – RB Size 6)-Low



Occupied Bandwidth Plot (Band 4 – 1.4MHz 16-QAM – RB Size 6)-Middle

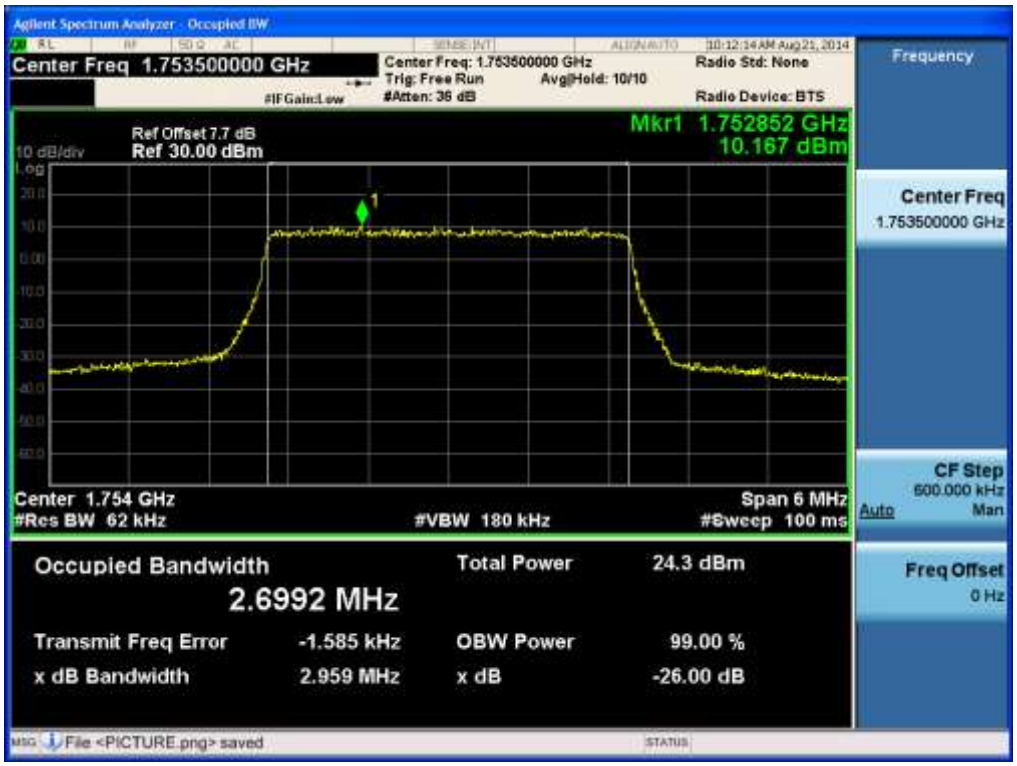
Occupied Bandwidth Plot (Band 4 – 1.4MHz 16-QAM – RB Size 6)-High

Occupied Bandwidth Plot (Band 4 – 3.0MHz 16-QAM – RB Size 15)-Low

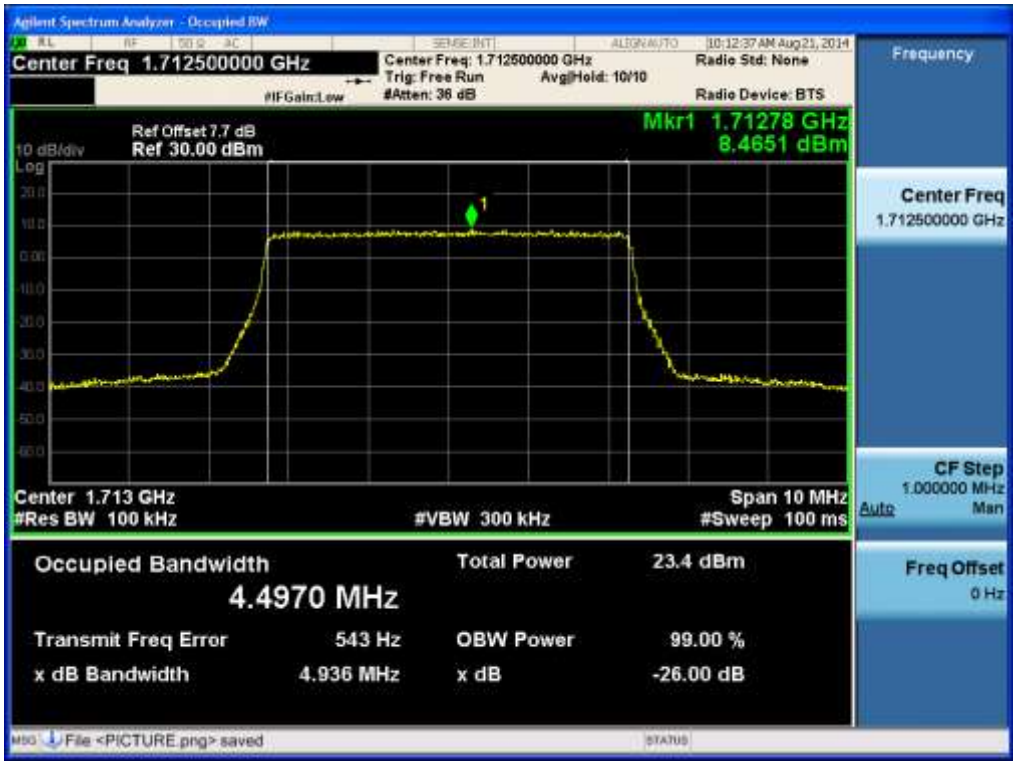


Occupied Bandwidth Plot (Band 4 – 3.0MHz 16-QAM – RB Size 15)-Middle

Occupied Bandwidth Plot (Band 4 – 3.0MHz 16-QAM – RB Size 15)-High



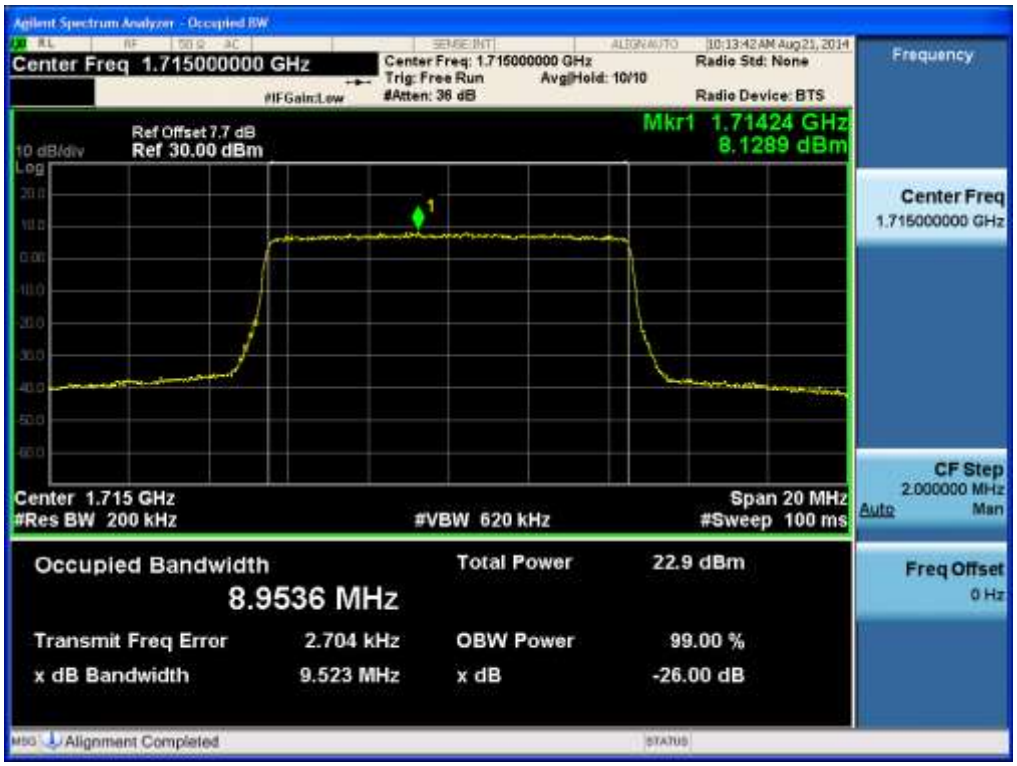
Occupied Bandwidth Plot (Band 4 – 5.0MHz 16-QAM – RB Size 25)-Low



Occupied Bandwidth Plot (Band 4 – 5.0MHz 16-QAM – RB Size 25)-Middle

Occupied Bandwidth Plot (Band 4 – 5.0MHz 16-QAM – RB Size 25)-High

Occupied Bandwidth Plot (Band 4 – 10.0MHz 16-QAM – RB Size 50)-Low

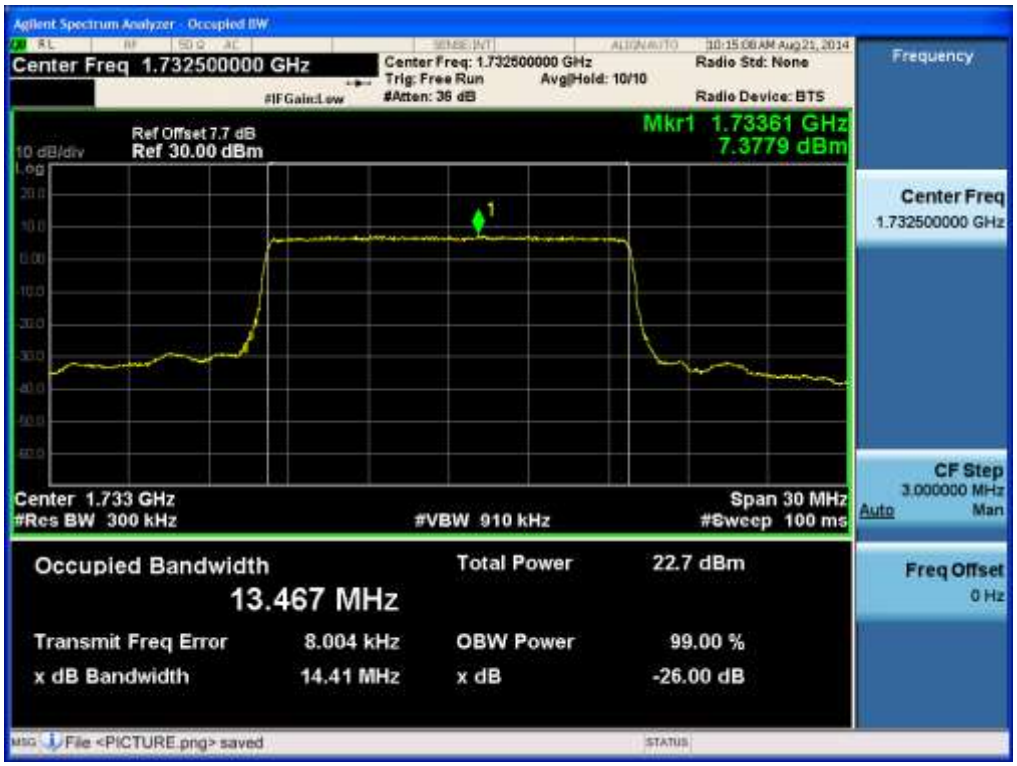


Occupied Bandwidth Plot (Band 4 – 10.0MHz 16-QAM – RB Size 50)-Middle

Occupied Bandwidth Plot (Band 4 – 10.0MHz 16-QAM – RB Size 50)-High

Occupied Bandwidth Plot (Band 4 – 15.0MHz 16-QAM – RB Size 75)-Low

Occupied Bandwidth Plot (Band 4 – 15.0MHz 16-QAM – RB Size 75)-Middle



Occupied Bandwidth Plot (Band 4 – 15.0MHz 16-QAM – RB Size 75)-High

Occupied Bandwidth Plot (Band 4 – 20.0MHz 16-QAM – RB Size 100)-Low

Occupied Bandwidth Plot (Band 4 – 20.0MHz 16-QAM – RB Size 100)-Middle

Occupied Bandwidth Plot (Band 4 – 20.0MHz 16-QAM – RB Size 100)-High

APPENDIX C

TEST PLOTS FOR BAND EDGES

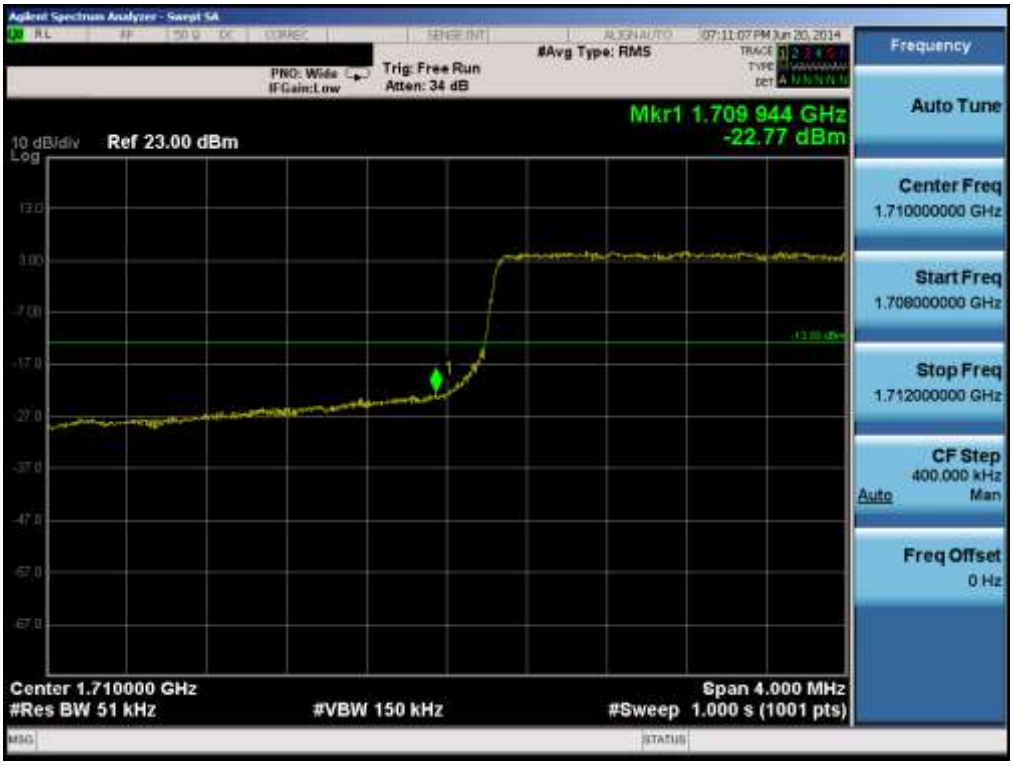
Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 25)

High Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 25)

Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

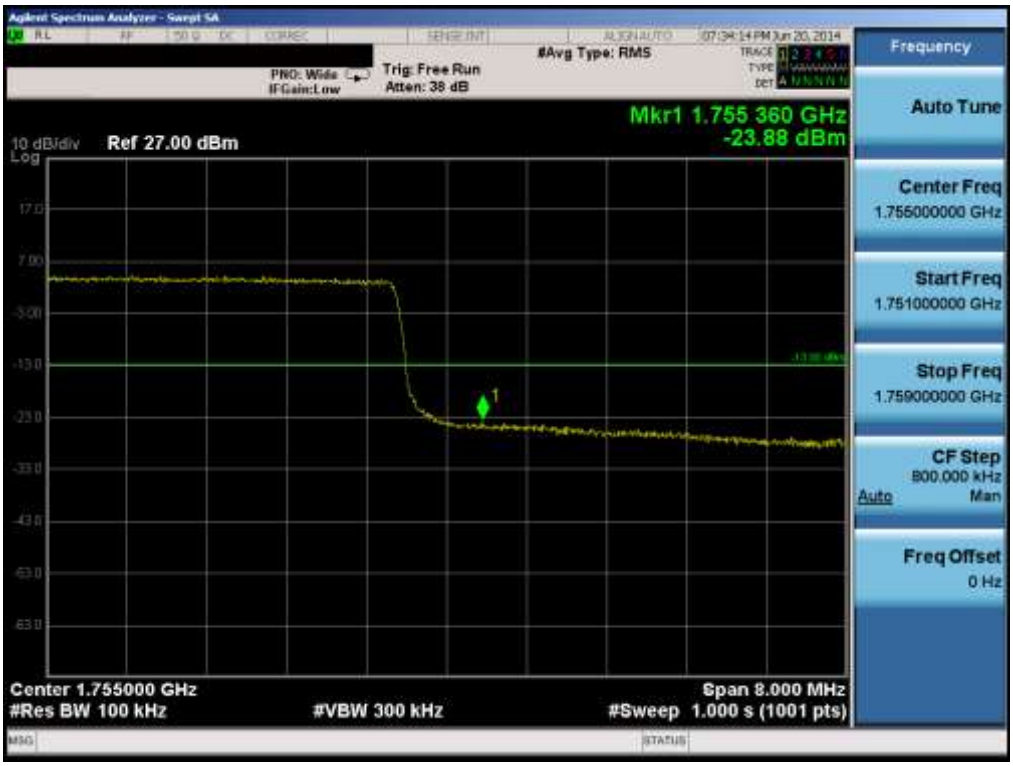
Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



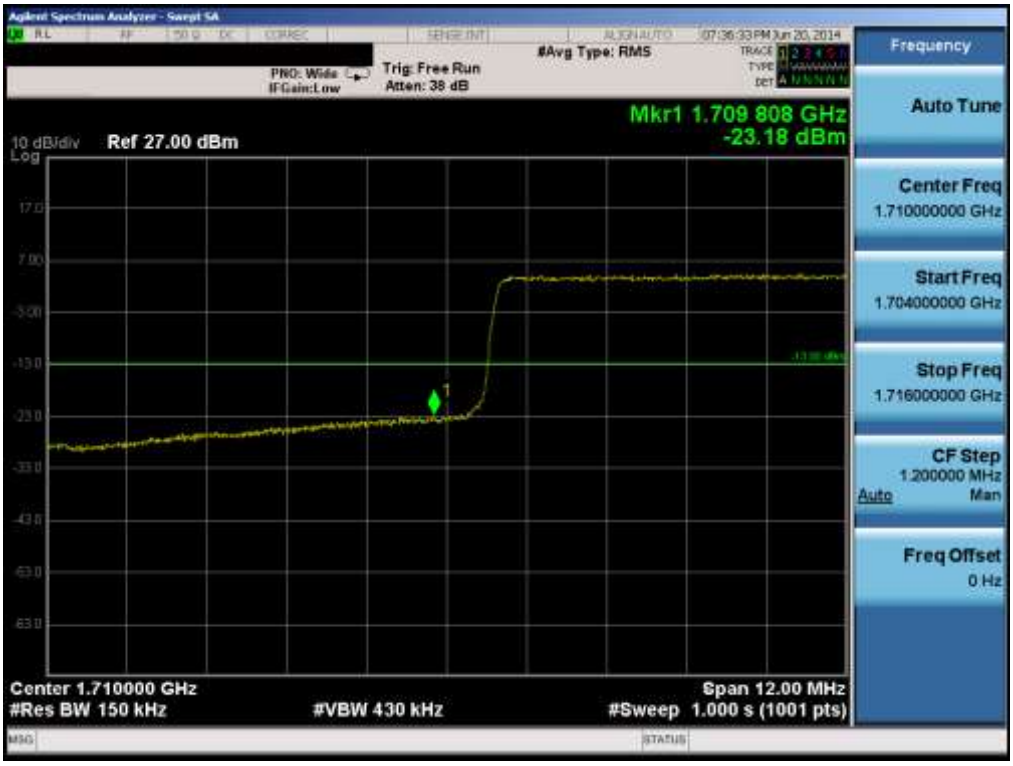
High Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

High Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

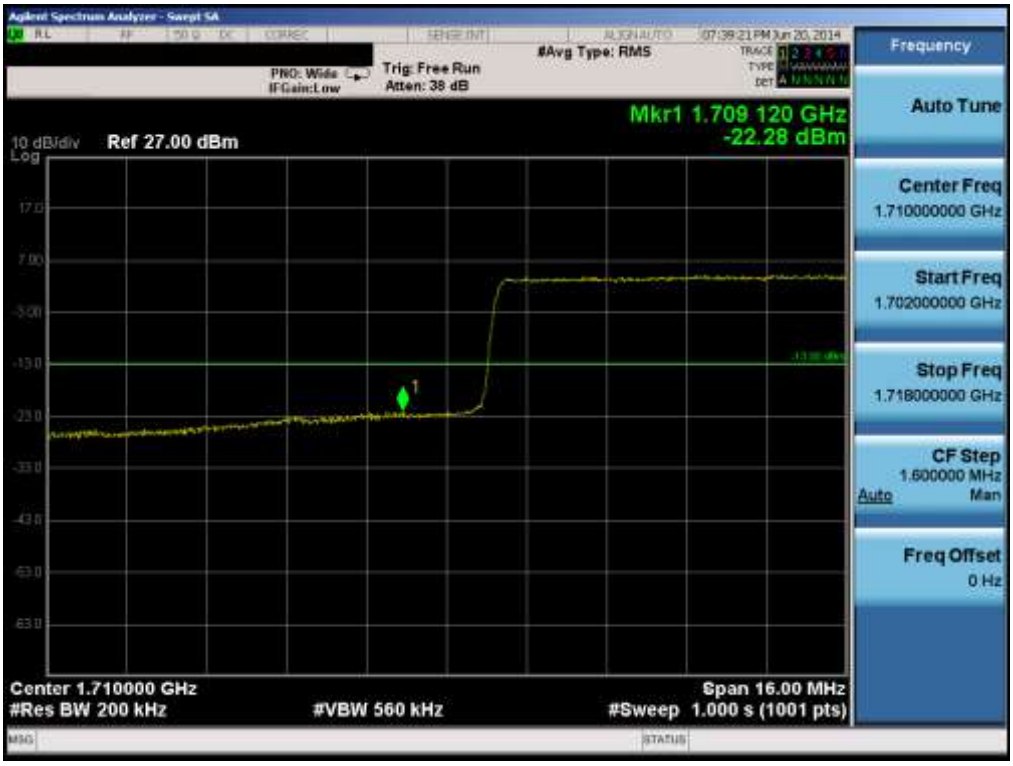


Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

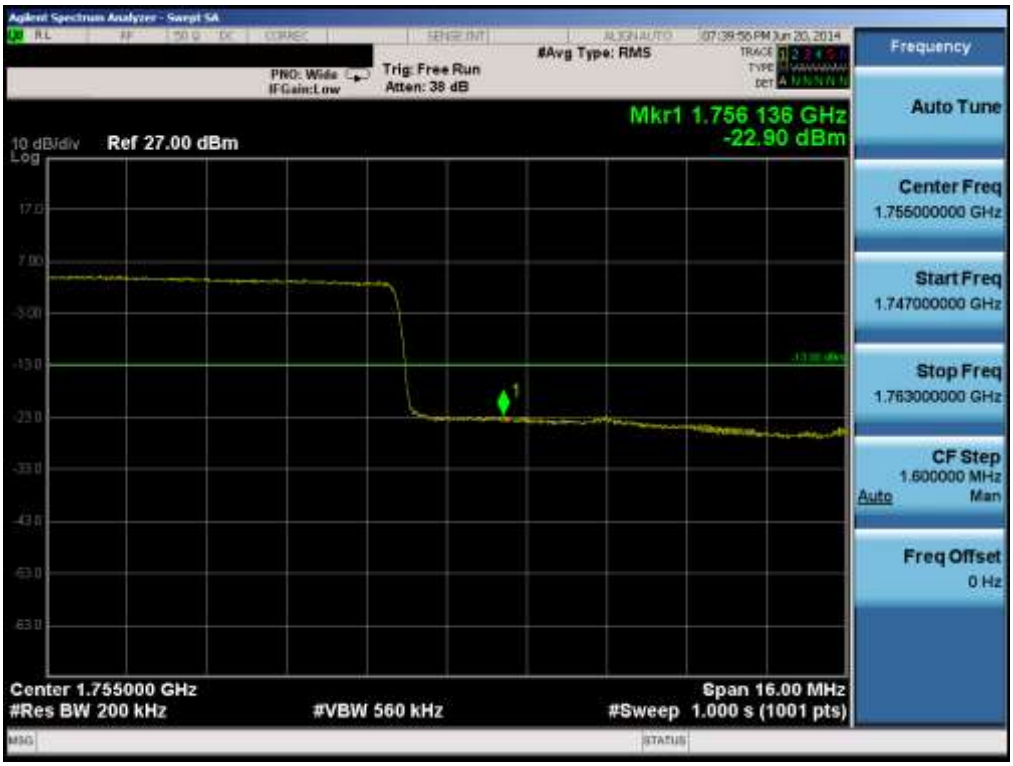


High Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



High Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

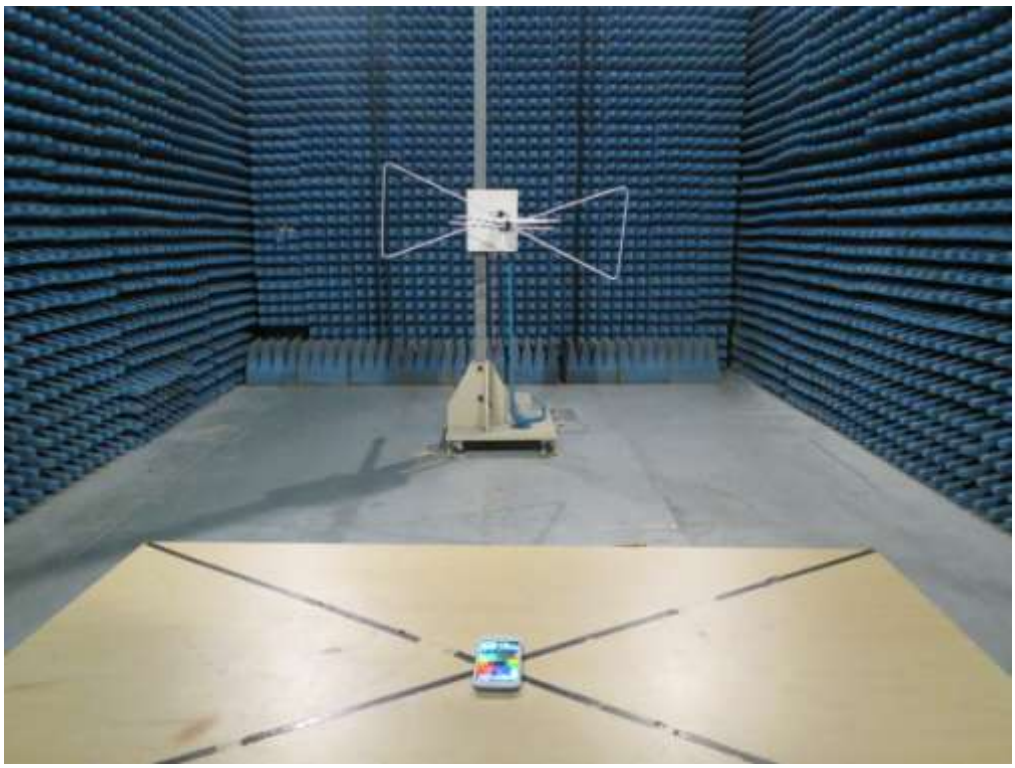


APPENDIX D

PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION

RADIATED SPURIOUS EMISSION



APPENDIX E
PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

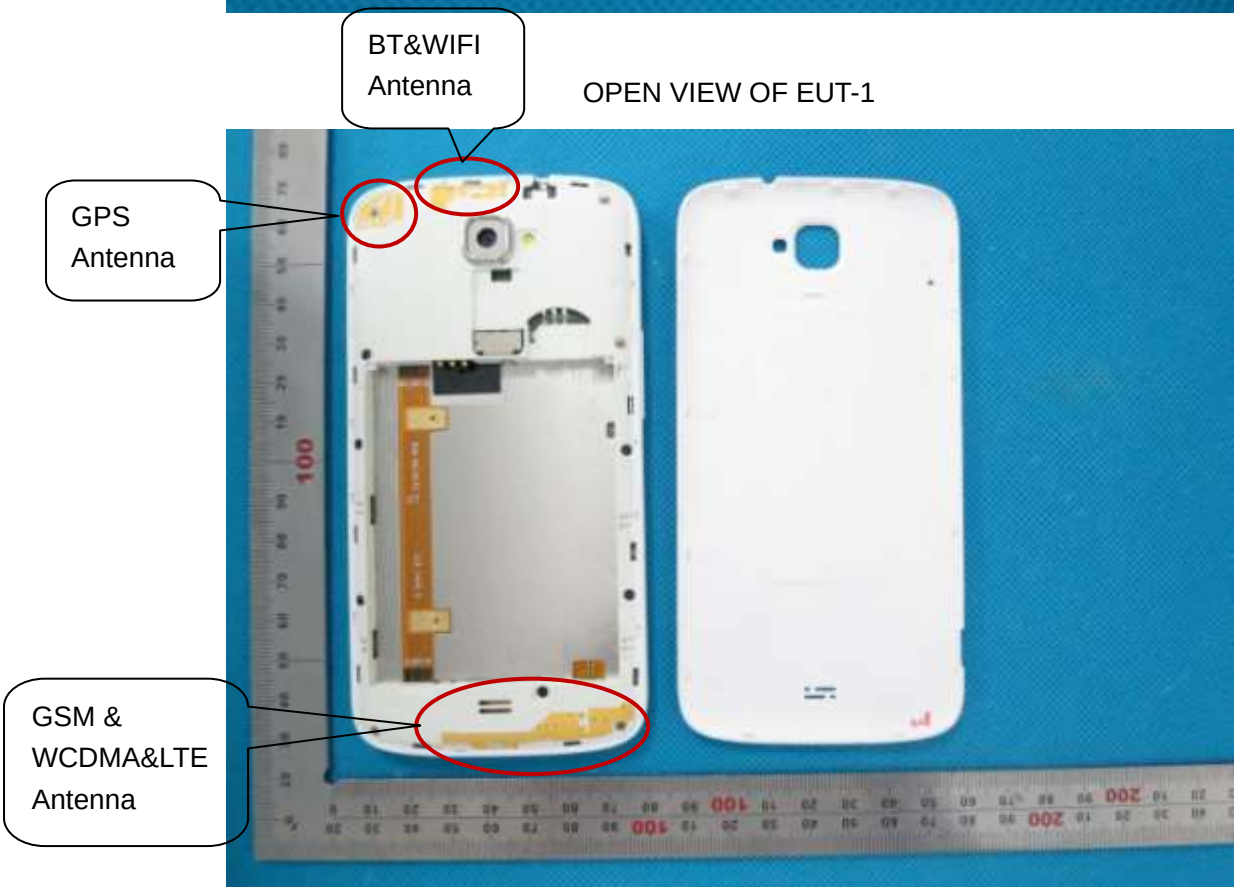
FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT

RIGHT VIEW OF EUT

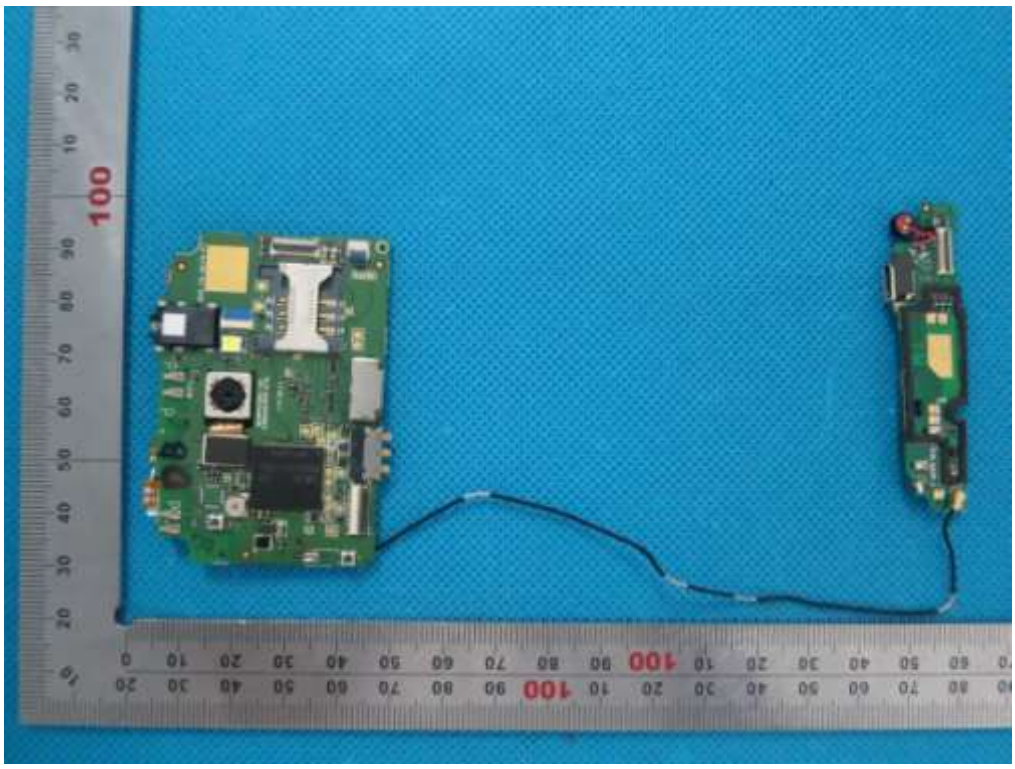
OPEN VIEW OF EUT-1



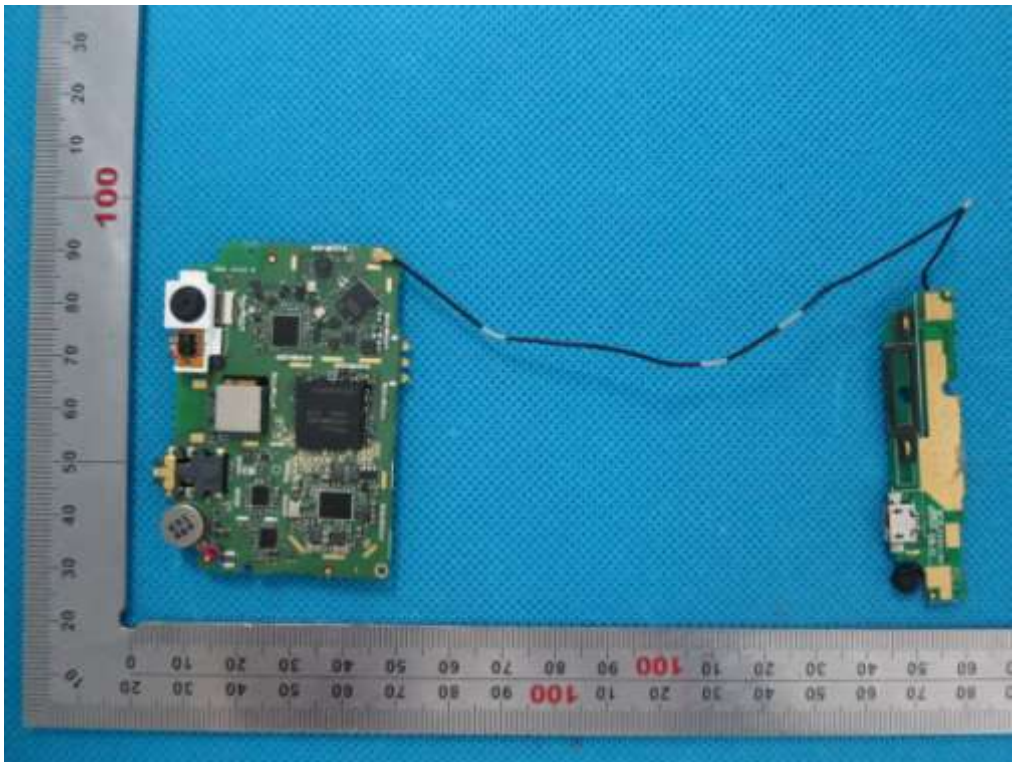
OPEN VIEW OF EUT-2

OPEN VIEW OF EUT-3

INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----