

RF TEST REPORT



Report No.: FCC-IC_RF_SL14091101-SPC-013

Supersede Report No.: None

Applicant	SpiderCloud Wireless, Inc.		
Product Name	SpiderCloud Radio Node		
Model No.	SCRN-310-0702		
Test Standard	47CFR Part24: 2014 47CFR Part27: 2014 RSS-Gen, RSS-133, RSS-139		
Test Method	ANSI C63.10: 2009 TIA-603-D: 2009 RSS-Gen Issue3: 2010		
Date of test	03/03/2014 - 11/06/2014		
Issue Date	11/24/2014		
Test Result	<u>Pass</u> Fail		
Equipment complied with the specification	[x]		
Equipment did not comply with the specification	[]		
			
Nima Molaei		David Zhang	
Test Engineer		Engineer Reviewer	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only			

Issued By:
SIEMIC Laboratories
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Laboratory Introduction

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRR, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF , Telecom
HongKong	OFTA (US002)	RF , Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC-IC_RF_SL14091101-SPC-013	None	Original	11/24/2014

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: SpiderCloud Wireless, Inc.
Product: SpiderCloud Radio Node
Model: SCRN-310-0702

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	SpiderCloud Wireless, Inc.
Applicant Address	408 E. Plumeria Drive, San Jose, CA 95134
Manufacturer Name	SpiderCloud Wireless, Inc.
Manufacturer Address	408 E. Plumeria Drive, San Jose, CA 95134

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	SpiderCloud Radio Node
Model No.	SCRN-310-0702
Trade Name	SpiderCloud
Serial No.	13338A10454
Input Power	56VDC (PoE)
Power Adapter Manu/Model	POE36U-1AT-R
Power Adapter SN	-
Hardware version	-
Software version	-
Date of EUT received	12/10/2014
Equipment Class/ Category	PCB, TNB
Operating Frequencies	UMTS: TX (1930 MHz to 1995 MHz), UMTS: RX (1850 MHz to 1915 MHz) LTE: TX (2620 MHz to 2690 MHz), LTE: RX (2500 MHz to 2570 MHz)
Port/Connectors	RJ45 (PoE)
Remark	NONE

6.2 Radio Description

Item	LTE	WCDMA
Operating Band /Radio Type	LTE Band 7	UMTS 1900 (Band 2)
Bandwidth	15 MHz	3.84 MHz
Modulation	QPSK/16QAM/64QAM	QPSK
Antenna Type	Internal Omni-directional antenna	Internal Omni-directional antenna
Antenna Gain	3 dBi	3 dBi
Frequency TX(MHz)	TX: 2620 MHz to 2690 MHz RX: 2500 MHz to 2570 MHz	TX: 1930 MHz to 1995 MHz RX: 1850 MHz to 1915 MHz

6.3 EUT test modes/configuration Description

Test mode

Final Test Mode		Note
Final_test_mode_1	Continuous transmission, 15MHz, QPSK, Low CH	LTE
Final_test_mode_2	Continuous transmission, 15MHz, QPSK, Mid CH	LTE
Final_test_mode_3	Continuous transmission, 15MHz, QPSK, High CH	LTE
Final_test_mode_7	Continuous transmission, 15MHz, 16QAM, Low CH	LTE
Final_test_mode_8	Continuous transmission, 15MHz, 16QAM, Mid CH	LTE
Final_test_mode_9	Continuous transmission, 15MHz, 16QAM, High CH	LTE
Final_test_mode_13	Continuous transmission, 15MHz, 64QAM, Low CH	LTE
Final_test_mode_14	Continuous transmission, 15MHz, 64QAM, Mid CH	LTE
Final_test_mode_15	Continuous transmission, 15MHz, 64QAM, High CH	LTE
Final_test_mode_19	Continuous transmission, 3.84MHz, QPSK, Low CH	WCDMA
Final_test_mode_20	Continuous transmission, 3.84MHz, QPSK, Mid CH	WCDMA
Final_test_mode_21	Continuous transmission, 3.84MHz, QPSK, High CH	WCDMA
Remark: NONE		

6.4 EUT Photos - External



Top View



Bottom View



Front View



Rear View

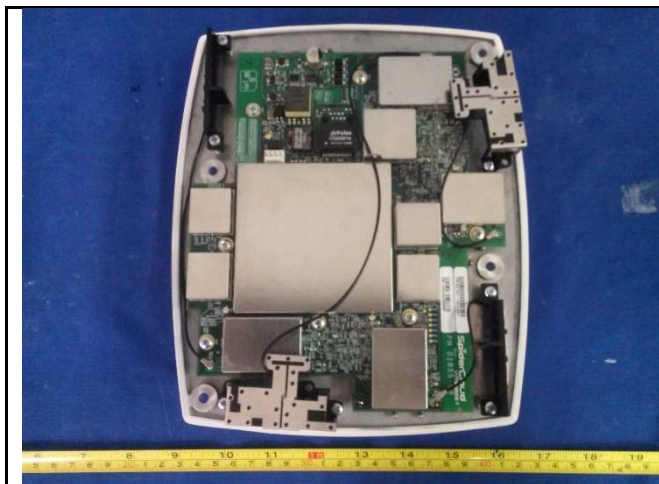


Left Side View



Right Side View

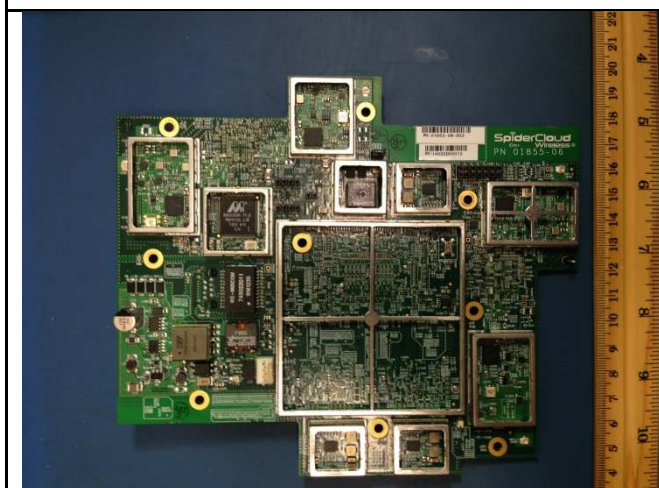
6.5 EUT Photos - Internal



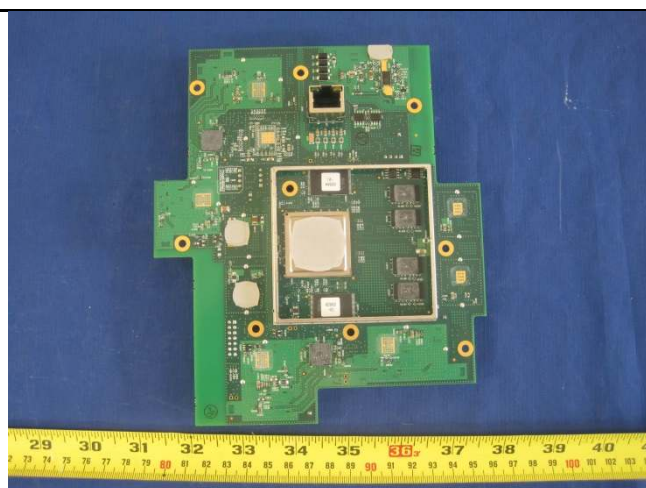
Top View Top Cover Open



Rear View Top Cover Off

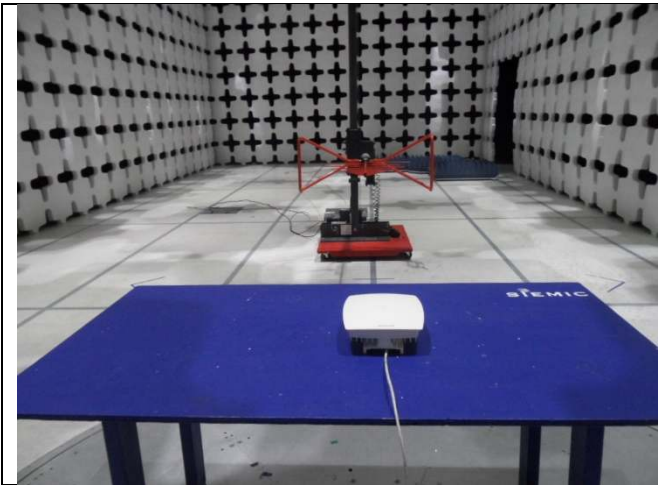


Main PCB - Top View



Main PCB - Bottom View

6.6 EUT Test Setup Photos



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

Note: The spurious emission in different EUT orientation was investigated, including the EUT standing up position and the laying down position. The EUT orientation shown in above setup photo is the worst case position.

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	PoE Adatper	POE36U-1AT-R	P90212324A1	Phihong	-

7.2 Test Software Description

Test Item	Software	Description
RF testing	ePview	Enable EUT continuous TX mode and change to different channel

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
E.R.P/ E.I.R.P	FCC	47CFR24.232, 47CFR27.50	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133(6.4), RSS-139(6.4)	IC	RSS-Gen Issue3: 2010	☐ N/A
Occupied Bandwidth	FCC	47CFR24.238(a), 47CFR27.53	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-Gen(4.6)	IC	RSS-Gen Issue3: 2010	☐ N/A
Peak-Average Ratio	FCC	47CFR24.232, 47CFR27.50	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133(6.4), RSS-139(6.4)	IC	RSS-Gen Issue3: 2010	☐ N/A
Spurious and harmonic Emission at antenna port	FCC	47CFR2.1051,47CFR24.238, 47CFR27.53	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue3: 2010	☐ N/A
Band Edge	FCC	47CFR2.1053,47CFR24.238, 47CFR27.53	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue3: 2010	☐ N/A
Radiated spurious and harmonic emission	FCC	47CFR2.1053,47CFR24.238, 47CFR27.53	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue3: 2010	☐ N/A
Frequency stability	FCC	47CFR2.1055, 47CFR24.135, 47CFR27.54	FCC	ANSI C63.10:2009, TIA-603-D: 2009	☒ Pass
	IC	RSS-133(6.3), RSS-139(6.3)	IC	RSS-Gen Issue3: 2010	☐ N/A
Receiver spurious emission	FCC	-	FCC	-	☒ Pass
	IC	RSS-Gen (6), RSS-133 (6.6), RSS-139 (6.6)	IC	RSS-Gen Issue3: 2010	☐ N/A
Remark	- All measurement uncertainties do not take into consideration for all presented test results. - The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.				

9 Measurement Uncertainty

Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

10 Measurements, Examination and Derived Results

10.1 RF Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR 22.913(a) RSS-133(6.4), RSS-139(6.4)	-	The maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.	☐
47CFR24.232 RSS-133(6.4), RSS-139(6.4)	-	Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.	☒
47CFR27.50 RSS-133(6.4), RSS-139(6.4)	-	The maximum effective radiated power (ERP) of fixed and base station must not exceed 1000 Watts.	☒
Test Setup			
Test Procedure	- EUT was set for low, mid, high channel with modulated mode and highest RF output power. - The spectrum analyzer was connected to the antenna terminal.		
Test Date	03/03/2014 – 11/05/2014	Environmental condition	Temperature 22°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	NONE		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

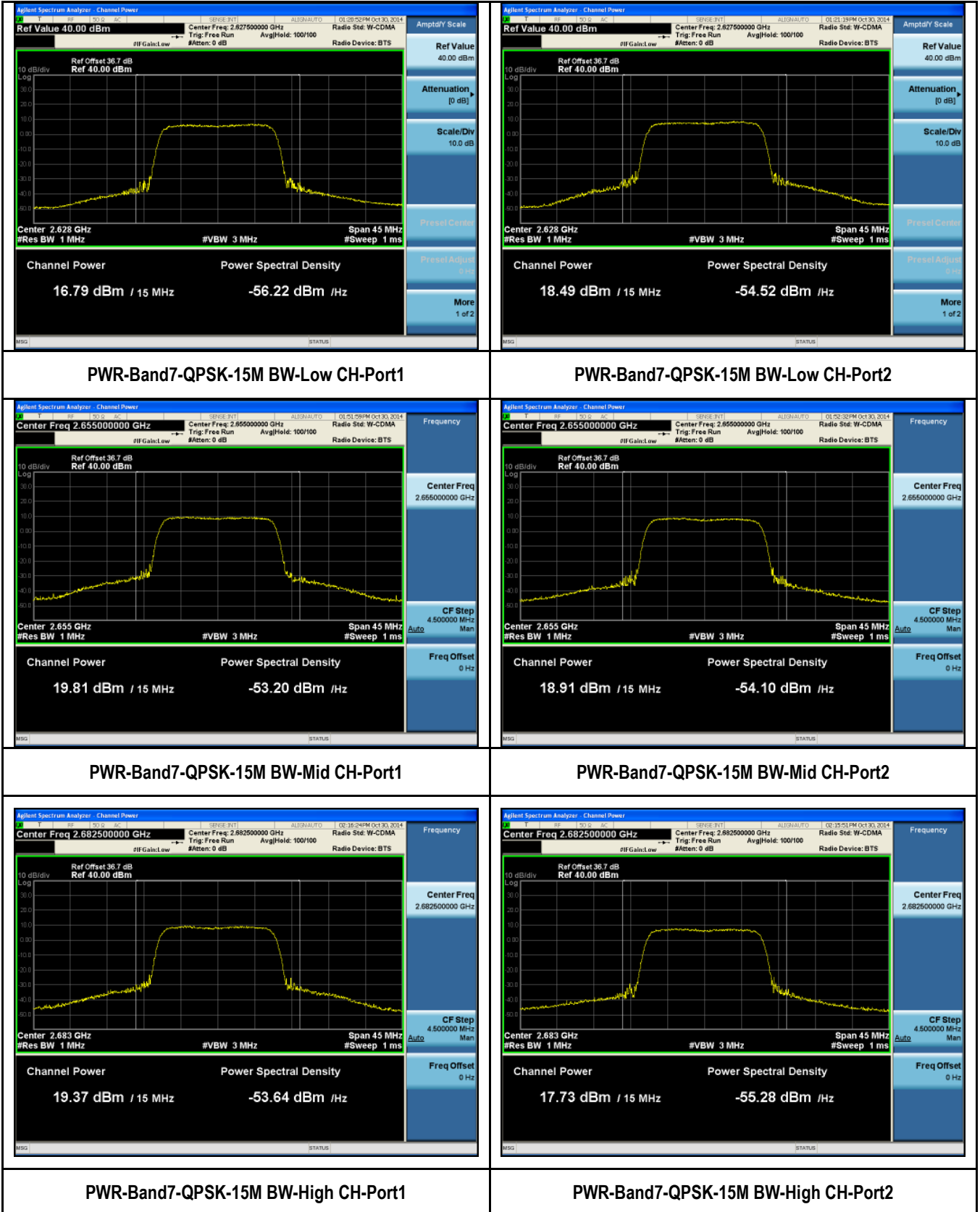
Test Data for LTE

Type	Channel	Frequency (MHz)	Measured PW –Port 1(dBm)	Measured PW –Port 2(dBm)	Combined Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)
15MHz BW, QPSK	Low	2627.5	16.79	18.49	20.73	3	23.73
	Mid	2655.0	19.81	19.91	22.87	3	25.87
	High	2682.5	19.37	17.73	21.64	3	24.64
15MHz BW, 64QAM	Low	2627.5	18.47	16.46	20.59	3	23.59
	Mid	2655.0	19.99	19.15	22.60	3	25.60
	High	2682.5	19.53	17.87	21.79	3	24.79

Test Data for WCDMA

Type	Channel	Frequency (MHz)	Measured PW –Port 1(dBm)	Measured PW –Port 2(dBm)	Max Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)
3.84MHz BW, QPSK	Low	1932.5	24.04	24.10	24.10	3	27.10
	Mid	1960.0	24.23	24.24	24.24	3	27.24
	High	1992.5	23.83	23.94	23.94	3	26.94

Test Plots for Band 7-QPSK-15MHz



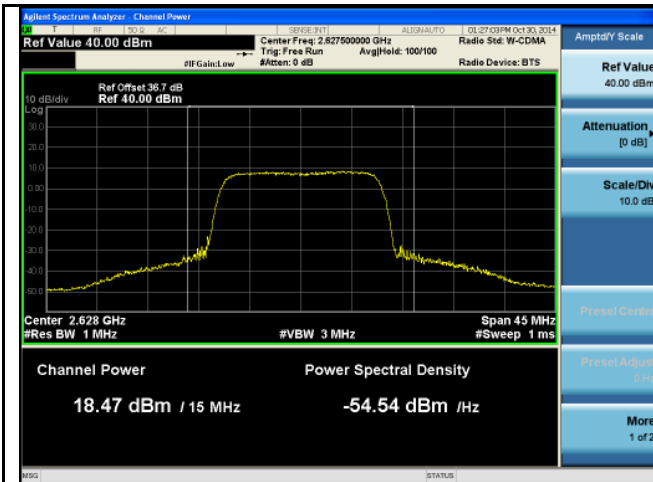
Test Plots for Band 4-16QAM-15MHz

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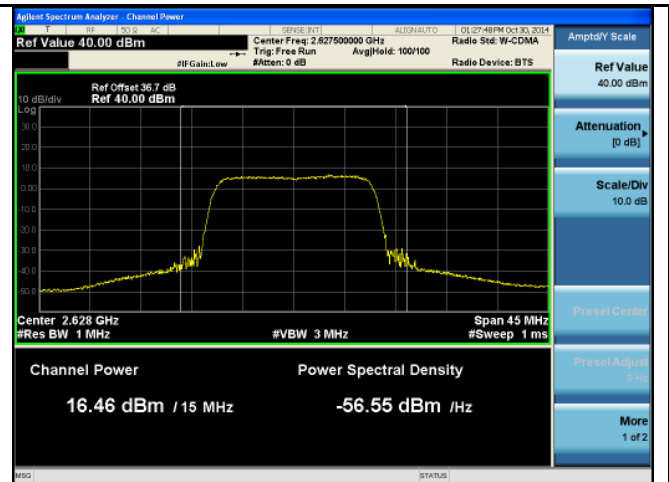
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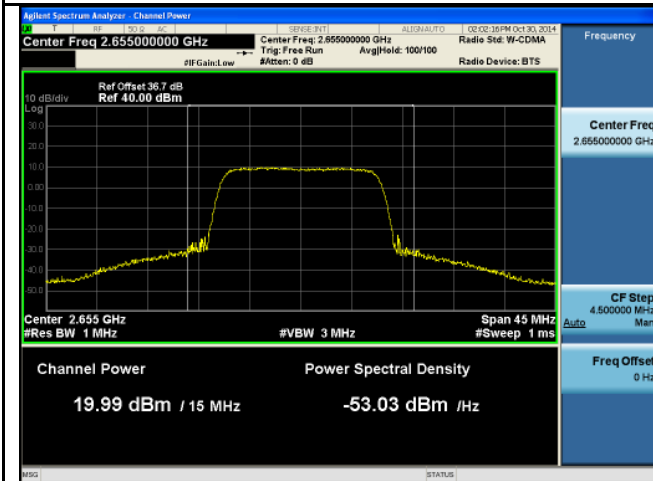
Test Plots for Band 4-64QAM-15MHz



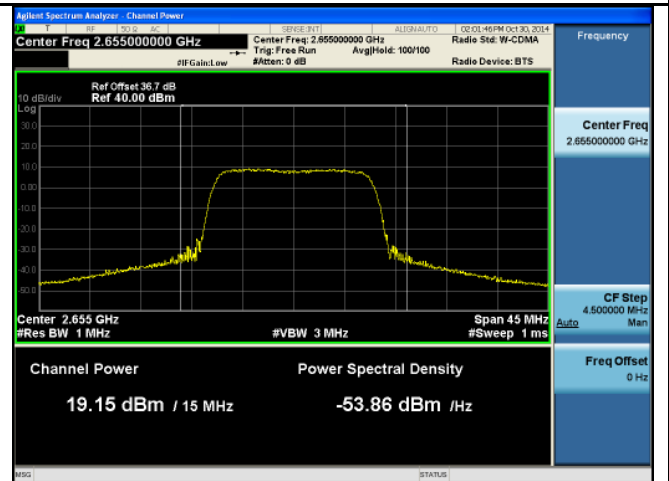
PWR-Band7-64QAM-15M BW-Low CH-Port1



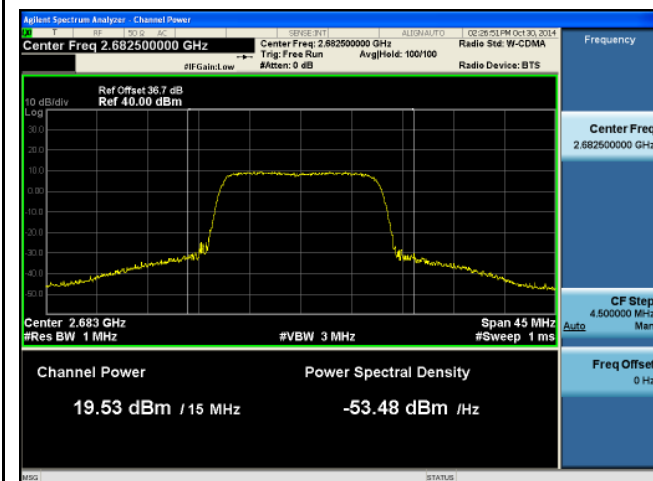
PWR-Band7-64QAM-15M BW-Low CH-Port2



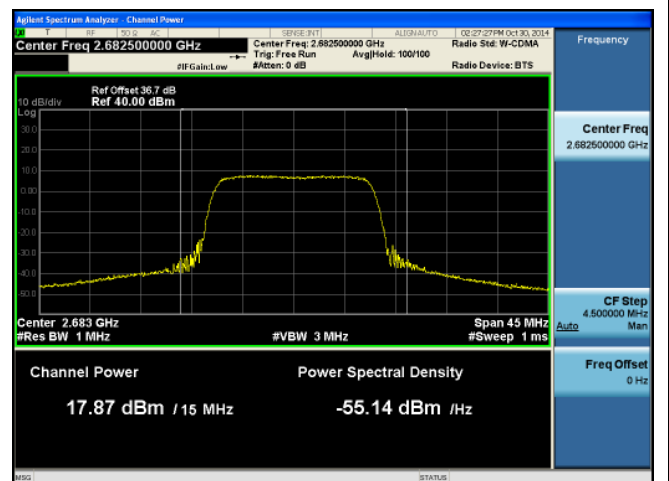
PWR-Band7-64QAM-15M BW-Mid CH-Port1



PWR-Band7-64QAM-15M BW-Mid CH-Port2

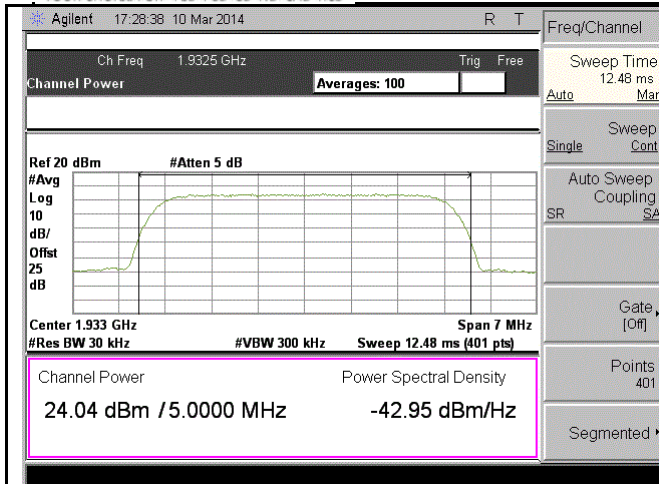


PWR-Band7-64QAM-15M BW-High CH-Port1

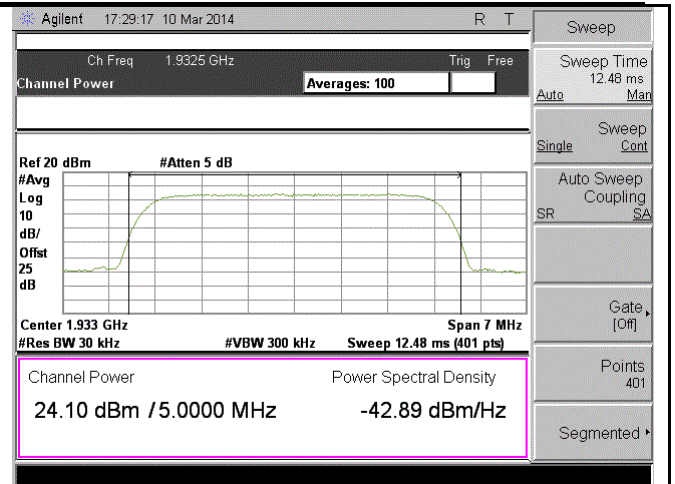


PWR-Band7-64QAM-15M BW-High CH-Port2

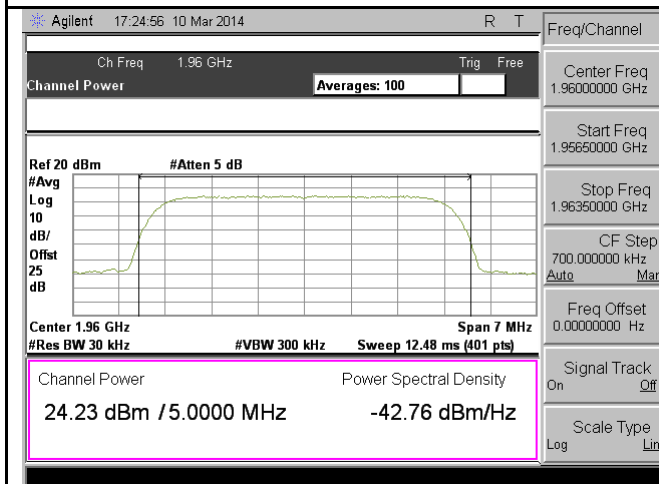
Test Plots for UMTS Band 2&25



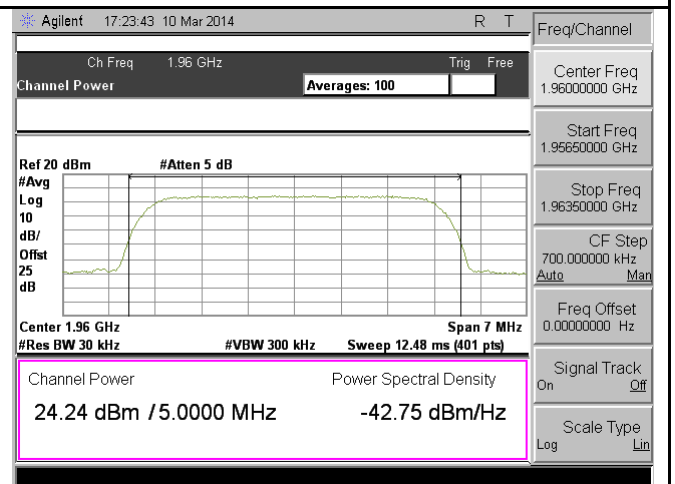
PWR-Band2&25-QPSK-Low CH-Port1



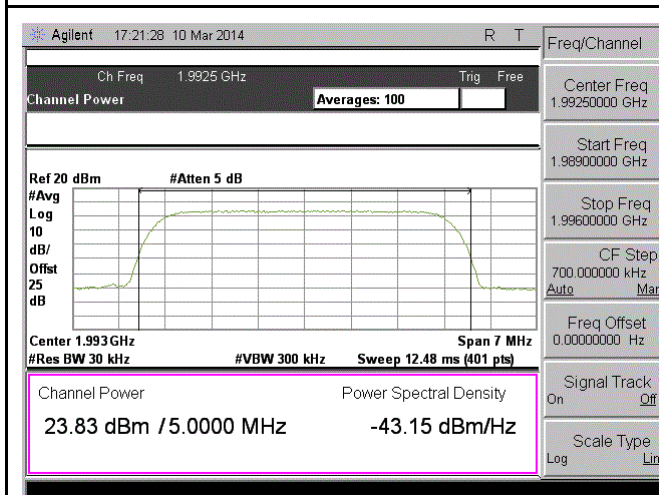
PWR-Band2&25-QPSK-Low CH-Port2



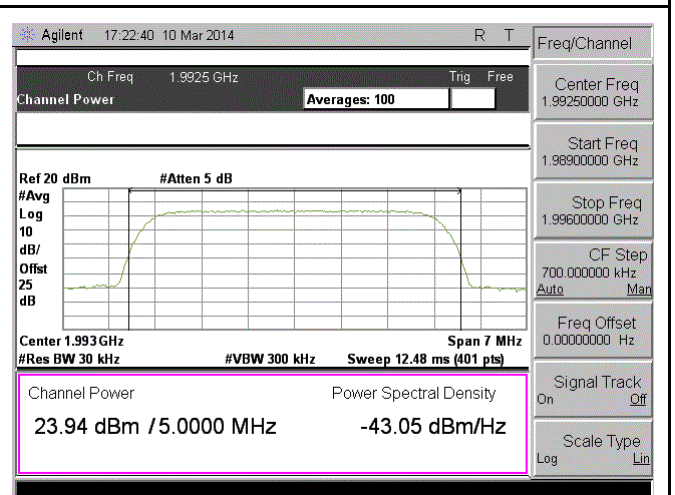
PWR-Band2&25-QPSK-Mid CH-Port1



PWR-Band2&25-QPSK-Mid CH-Port2



PWR-Band2&25-QPSK--High CH-Port1



PWR-Band2&25-QPSK-High CH-Port2

10.2 Peak-Average Ratio

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR24.232 RSS-132(5.4)	(d)	Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.	☒
47CFR27.50 RSS-133(6.4)	(b)	The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.	☒
RSS-139(6.4)	-	The average equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts. In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.	☒
Test Setup			
Test Procedure	- EUT was set for low, mid, high channel with modulated mode and highest RF output power. - The spectrum analyzer was connected to the antenna terminal.		
Test Date	03/10/2014-11/05/2014	Environmental condition	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	NONE		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

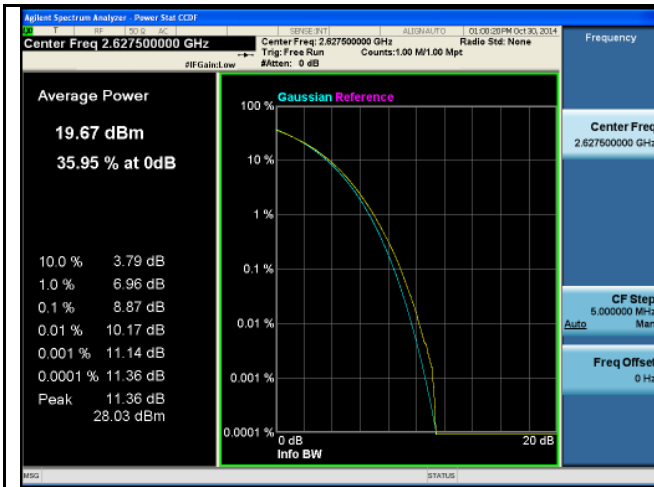
Test Data for LTE

Type	Channel	Frequency (MHz)	Peak-Average Ratio (dB)	Peak-Average Ratio Limit (dB)
15MHz BW, QPSK	Low	2627.5	8.87	13
	Mid	2655.0	8.97	13
	High	2682.5	8.96	13
15MHz BW, 64QAM	Low	2627.5	8.84	13
	Mid	2655.0	8.82	13
	High	2682.5	8.77	13

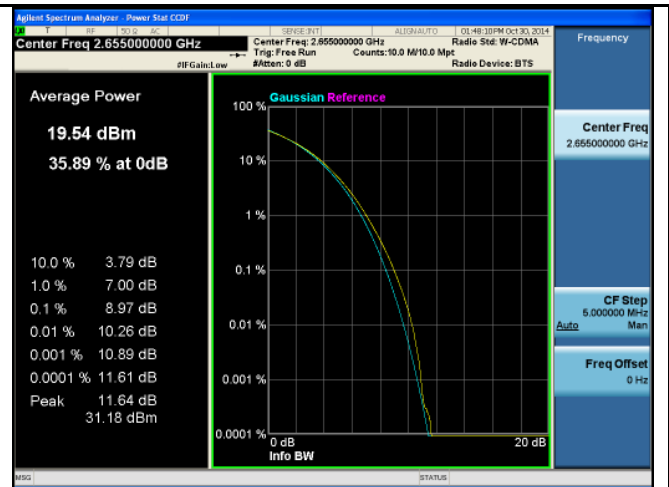
Test Data for WCDMA

Type	Channel	Frequency (MHz)	Peak-Average Ratio (dB)	Peak-Average Ratio Limit (dB)
3.84MHz BW, 16QAM	Low	1932.5	3.73	13
	Mid	1960.0	3.74	13
	High	1992.5	4.23	13

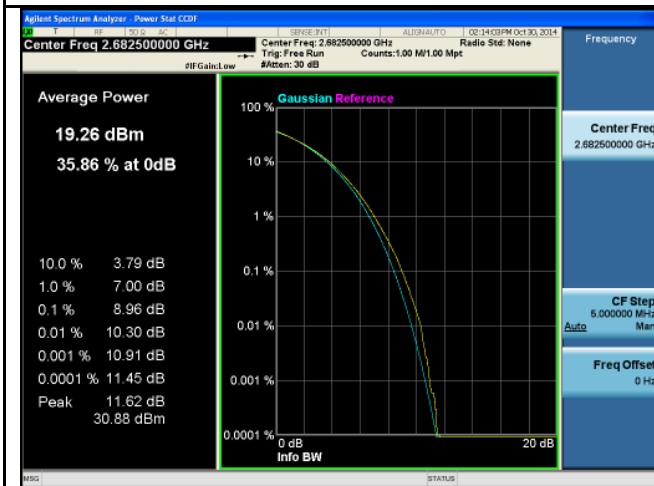
Test Plots



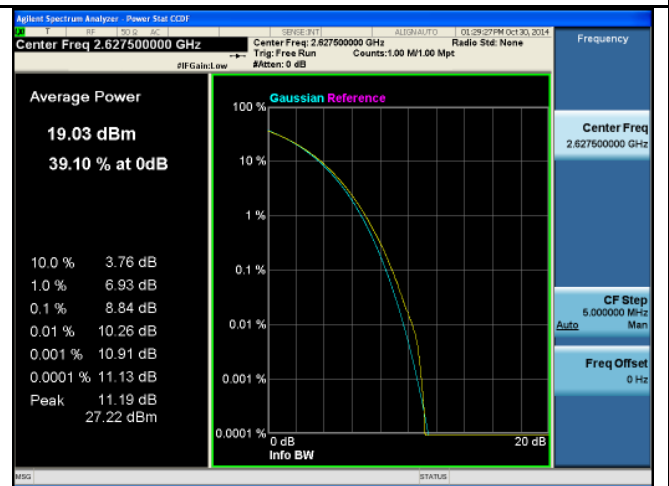
PK-AV-Ratio-Band7-QPSK-15M BW-Low



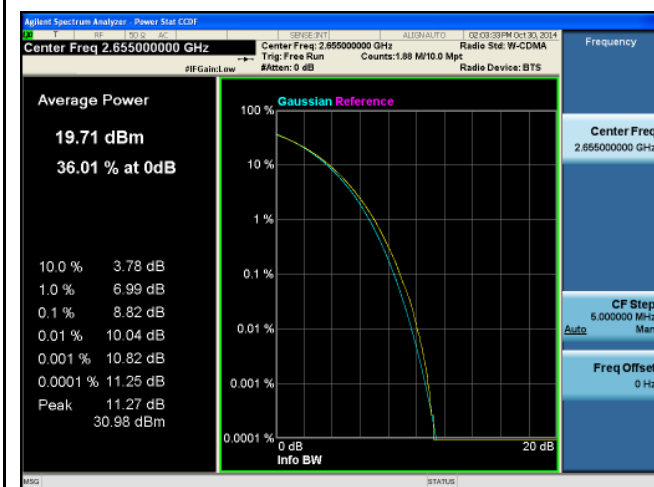
PK-AV-Ratio-Band7-QPSK-15M BW-Mid



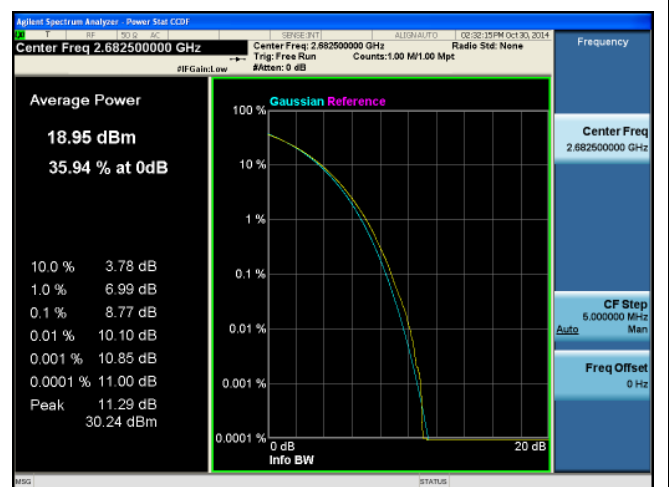
PK-AV-Ratio-Band7-QPSK-15M BW-High



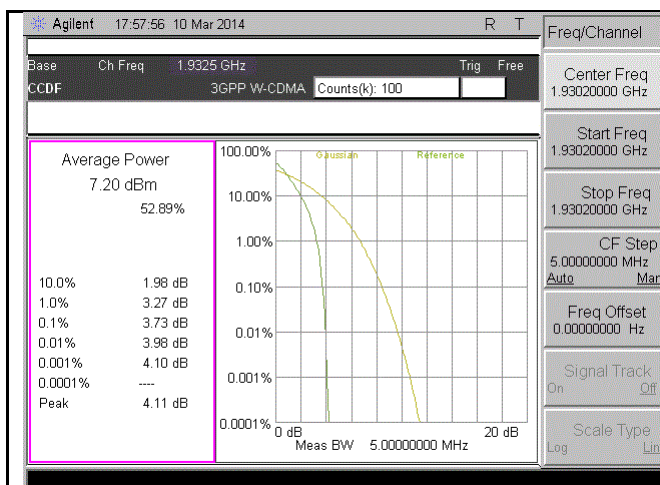
PK-AV-Ratio-Band7-64QAM-15M BW-Low



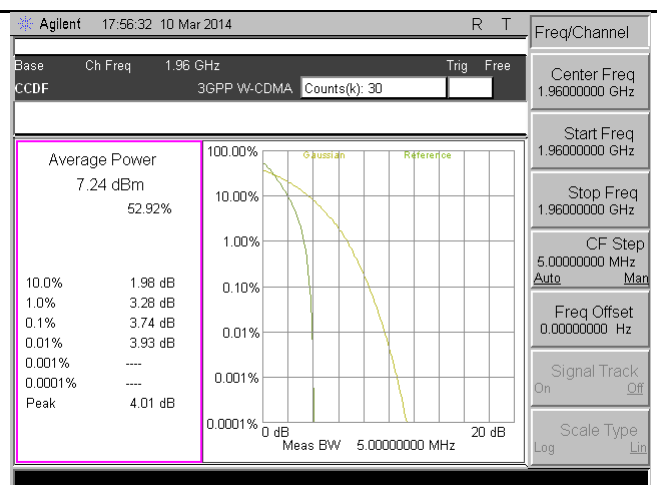
PK-AV-Ratio-Band7-64QAM-15M BW-Mid



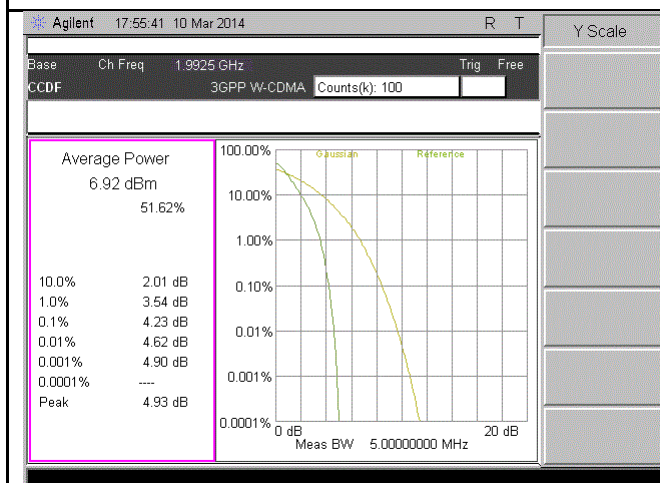
PK-AV-Ratio-Band7-64QAM-15M BW-High



PK-AV-Ratio-Band2&25-QPSK-10M BW-Low



PK-AV-Ratio-Band2&25-QPSK-10M BW-Mid



PK-AV-Ratio-Band2&25-QPSK-10M BW-High

10.3 Occupied Bandwidth

Requirement(s):

Spec	Requirement	Applicable
47 CFR §2.1049; RSS-GEN, 6.6	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 under the following conditions of § 2.1049 (a) through (i)	☒
Test Setup		
Procedure	1. EUT was set for low, mid, high channel with modulated mode and highest RF output power. 2. The spectrum analyzer was connected to the antenna terminal. 3. The 99% bandwidths are measured using spectrum analyzer's internal meas function.	
Test Date	02/27/2014 – 11/05/2014	Environmental condition Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	NONE	
Result	☒ Pass ☐ Fail	

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

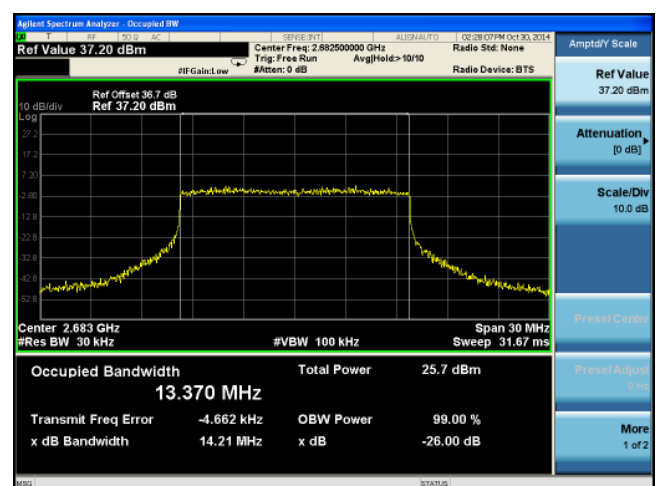
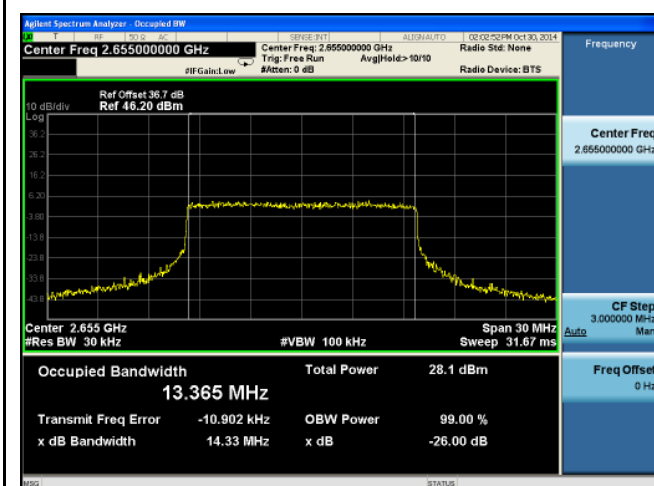
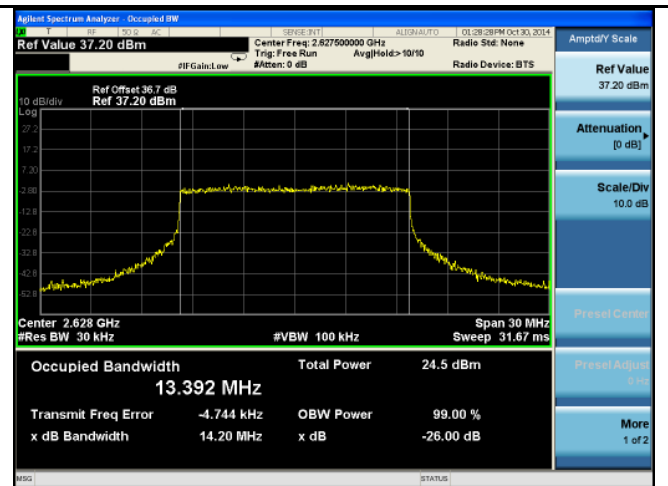
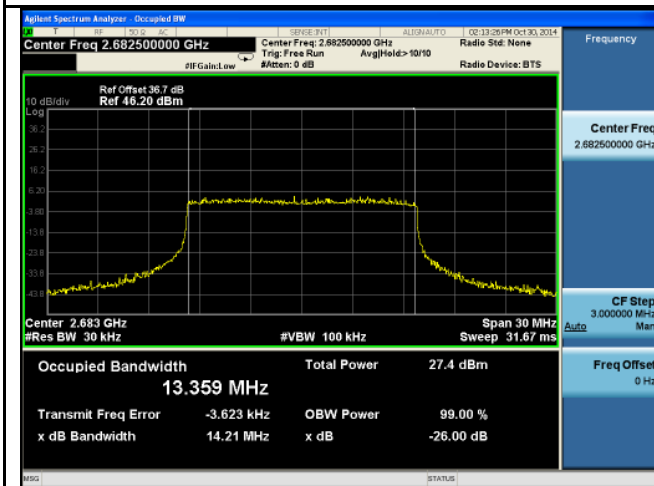
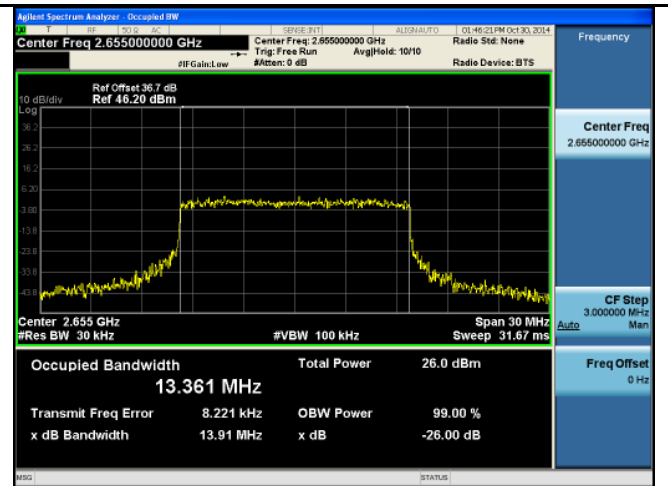
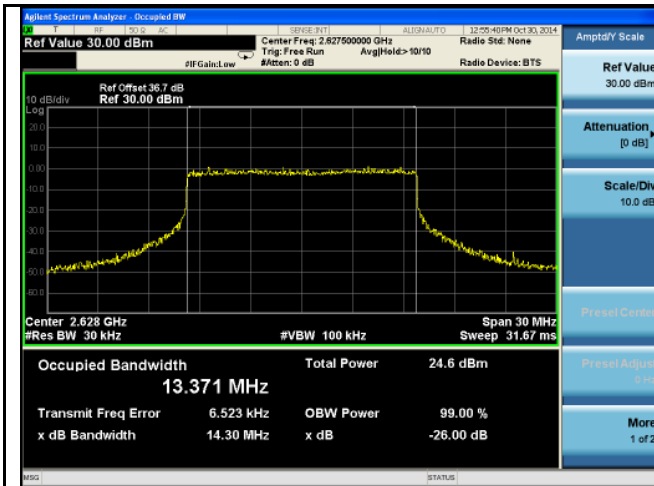
Test Data

99% Bandwidth measurement result for LTE

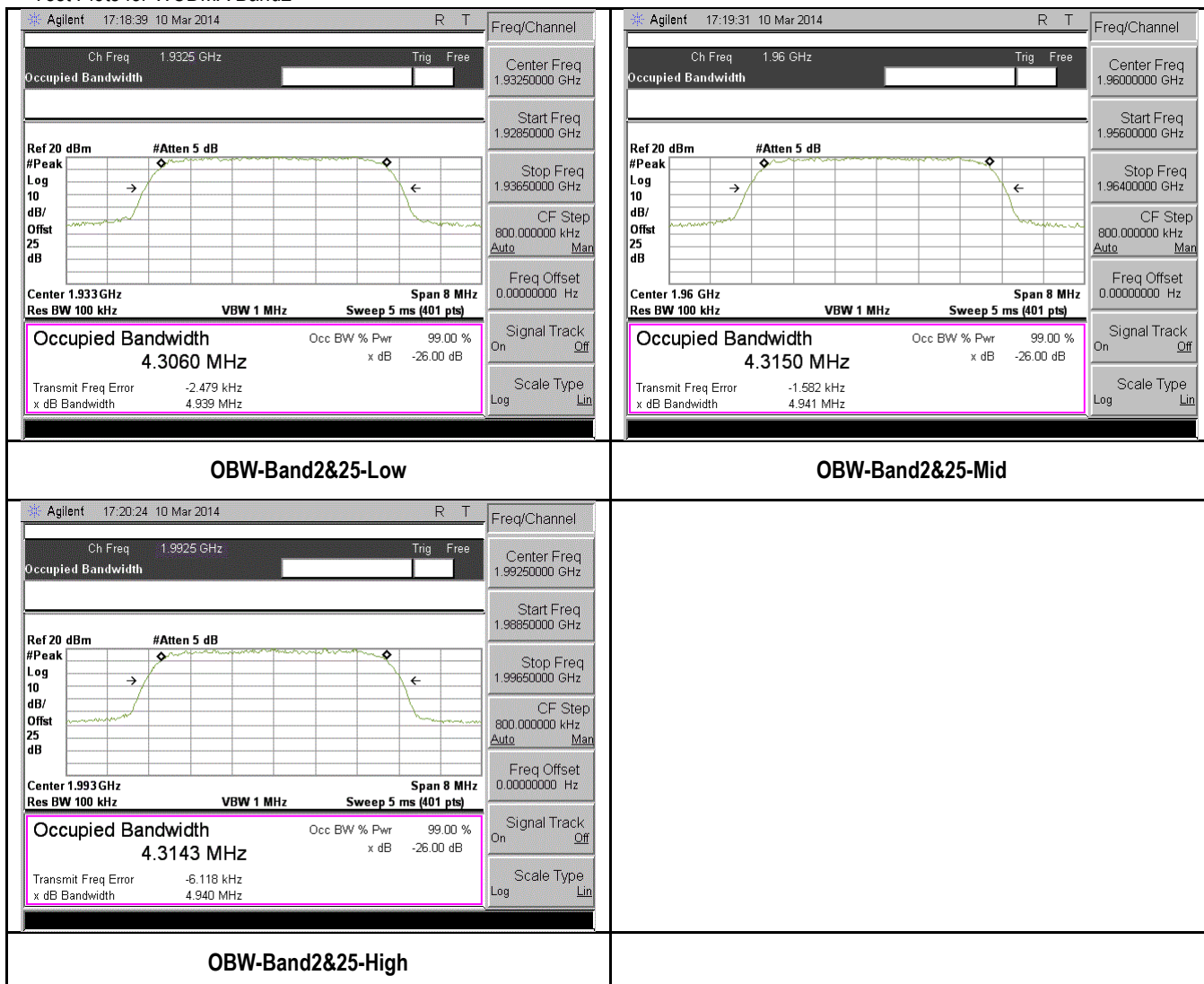
Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
15MHz BW, QPSK	Low	2627.5	13.37	14.30
	Mid	2655.0	13.36	13.91
	High	2682.5	13.36	14.21
15MHz BW, 64QAM	Low	2627.5	13.39	14.20
	Mid	2655.0	13.36	14.33
	High	2682.5	13.37	14.21

99% Bandwidth measurement result for WCDMA

Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
3.84MHz BW, QPSK	Low	1932.5	4.31	4.94
	Mid	1960.0	4.32	4.94
	High	1992.5	4.31	4.94



Test Plots for WCDMA Band2



10.4 Antenna Port Spurious Emission

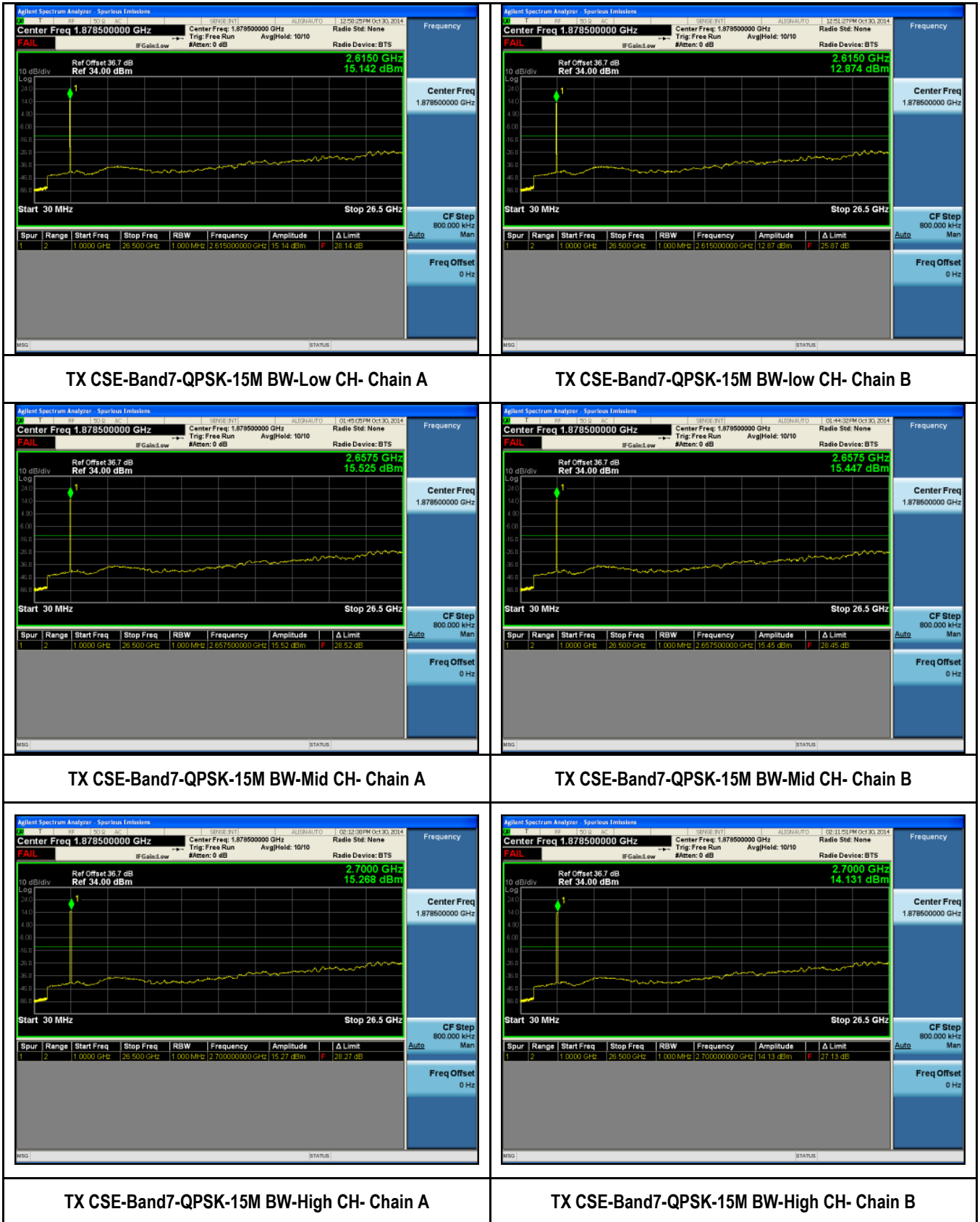
Requirement(s):

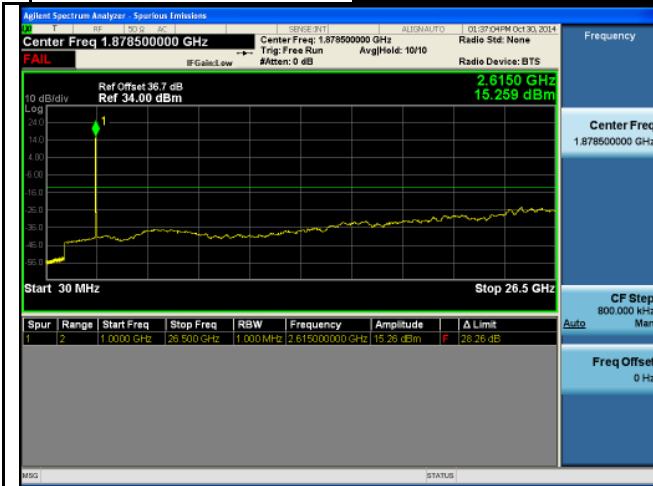
Spec	Item	Requirement	Applicable
47CFR22.917 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☐
47CFR24.238 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
47CFR27.53 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
Test Setup			
Test Procedure	- EUT was set for low , mid, high channel with modulated mode and highest RF output power. - The spectrum analyzer was connected to the antenna terminal.		
Test Date	02/27/2014 – 11/05/2014	Environmental condition	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	NONE		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Plots

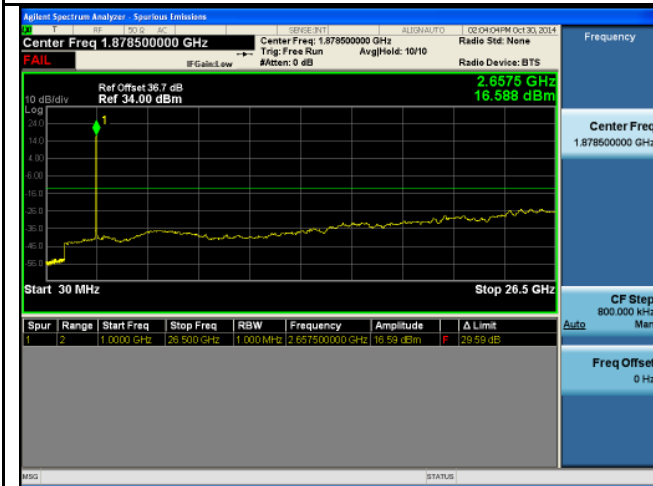




TX CSE-Band7-64QAM-15M BW-Low CH- Chain A



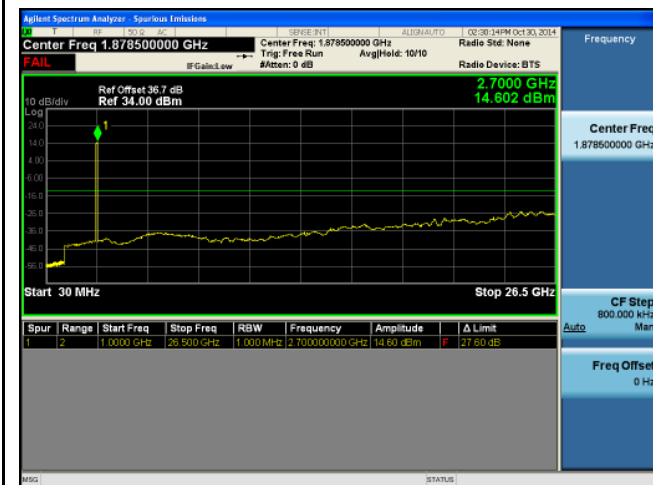
TX CSE-Band7-64QAM-15M BW-low CH- Chain B



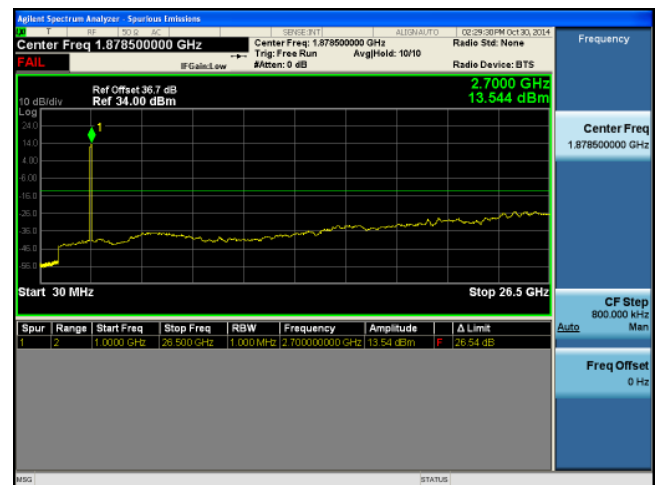
TX CSE-Band7-64QAM-15M BW-Mid CH- Chain A



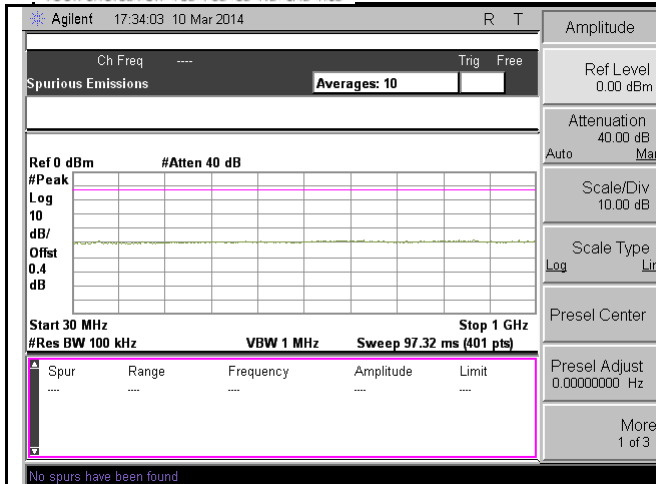
TX CSE-Band7-64QAM-15M BW-Mid CH- Chain B



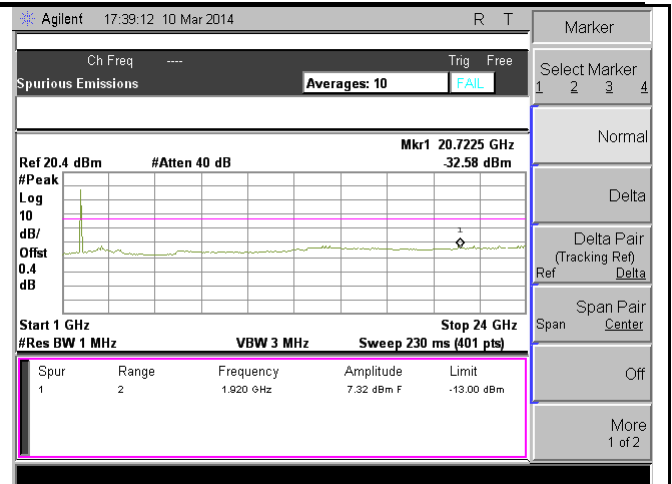
TX CSE-Band7-64QAM-15M BW-High CH- Chain A



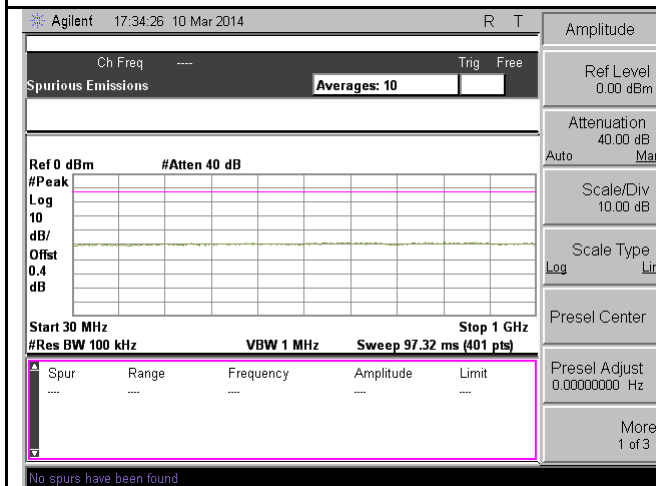
TX CSE-Band7-64QAM-15M BW-High CH- Chain B



TX CSE-Band2&25-QPSK-Low CH-below 1G



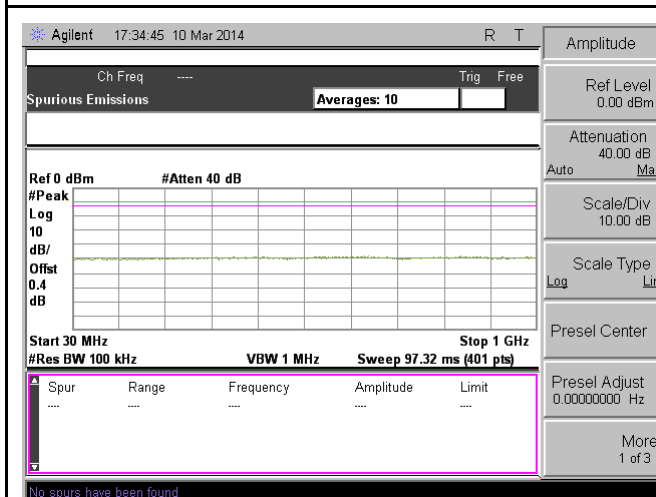
TX CSE-Band2&25-QPSK-Low CH-above 1G



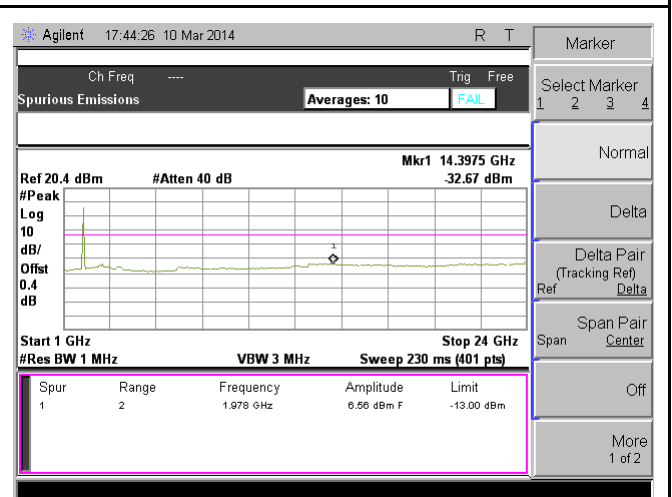
TX CSE-Band2&25-QPSK-Mid CH-below 1G



TX CSE-Band2&25-QPSK-Mid CH-above 1G



TX CSE-Band2&25-QPSK-High CH-below 1G



TX CSE-Band2&25-QPSK-High CH-above 1G

10.5 Band Edge

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR22.917 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☐
47CFR24.238 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
47CFR27.53 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
Test Setup			
Test Procedure	- EUT was set for low, mid, high channel with modulated mode and highest RF output power. - The spectrum analyzer was connected to the antenna terminal. - A RBW of 1% greater than the 26 dB emission bandwidth should be used for band edge measurement or if narrower RBW is used, a correct factor calculated with formula $10 \cdot \log (EBW/BW_{meas})$ will be added to the result.		
Test Date	03/17/2014 - 11/05/2014	Environmental condition	Temperature 22°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	100KHz RBW was used to make measurement for LTE Band 7 with 15MHz BW, so the correction factor will be added to correct the result to be using 200 KHz RBW.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

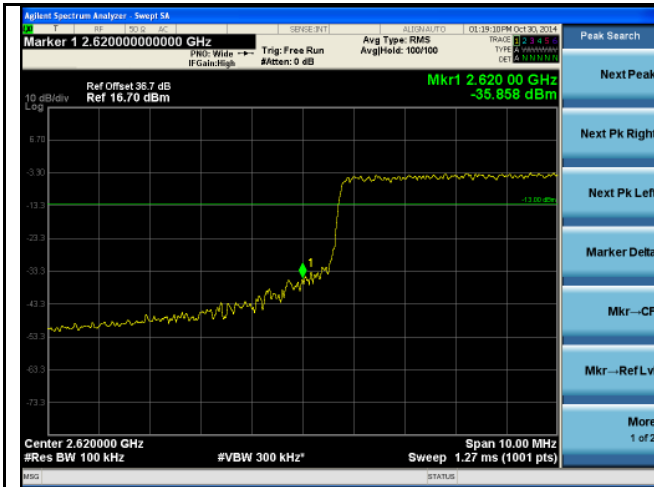
Test Plot ☒ Yes (See below) ☐ N/A

Band Edge Measurement Data for LTE

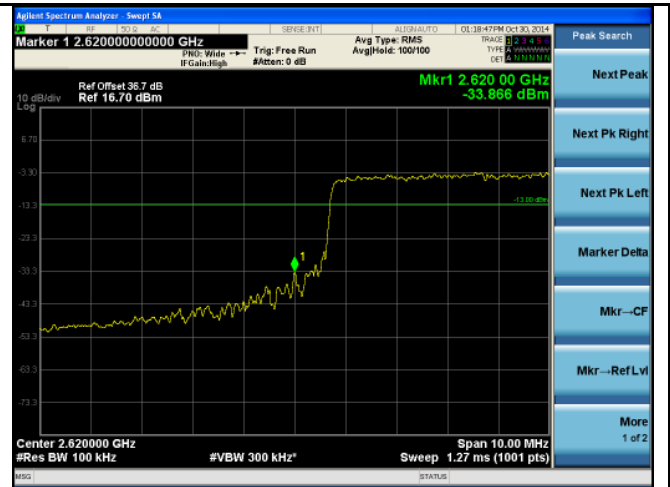
Type	Channel	Channel Frequency (MHz)	Measurement Band Edge (dBm)			RBW Correction factor (dB)	Corrected Band Edge (dBm)	Limit (dBm)
			Chain A	Chain B	Combined (dBm)			
15MHz BW, QPSK	Low	2627.5	-35.86	-33.87	-31.74	3.01	-28.73	-13
	High	2682.5	-34.44	-36.73	-32.43	3.01	-29.42	-13
15MHz BW, 64QAM	Low	2627.5	-35.90	-37.04	-33.42	3.01	-30.41	-13
	High	2682.5	-34.95	-37.10	-32.88	3.01	-29.87	-13

Band Edge Measurement Data for WCDMA

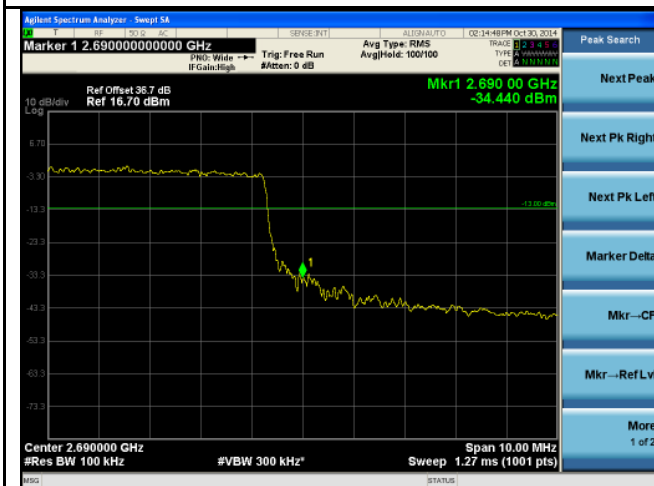
Type	Channel	Channel Frequency (MHz)	Measurement Band Edge (dBm)	RBW Correction factor (dB)	Corrected Band Edge (dBm)	Limit (dBm)
3.84MHz BW, QPSK	Low	1932.5	-17.809	0	-17.809	-13
	High	1992.5	-24.119	0	-24.119	-13



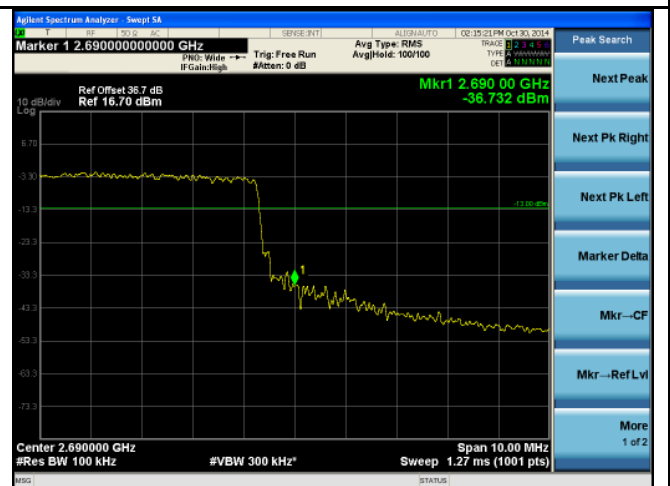
BandEdge-LTE-Band7-15MHz-QPSK-Low – Chain A



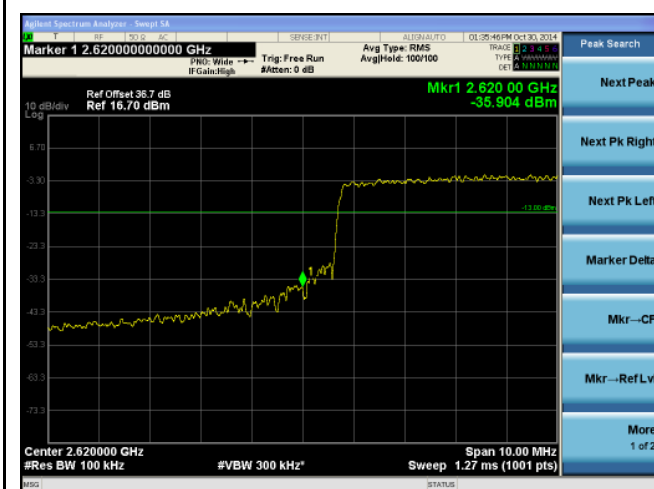
BandEdge-LTE-Band7-15MHz-QPSK-Low – Chain B



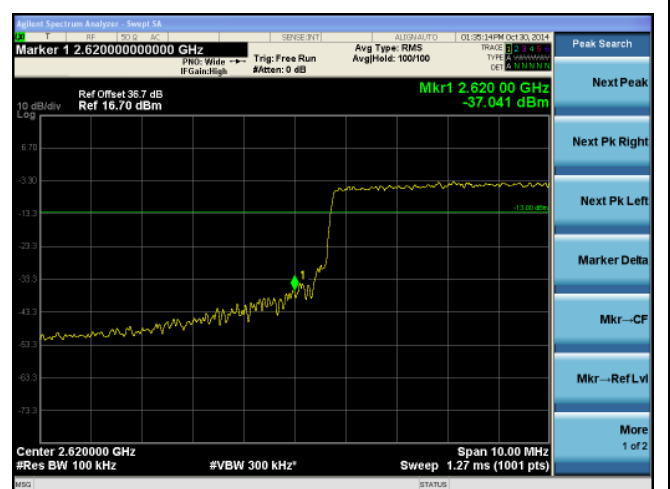
BandEdge-LTE-Band7-15MHz-QPSK-High – Chain A



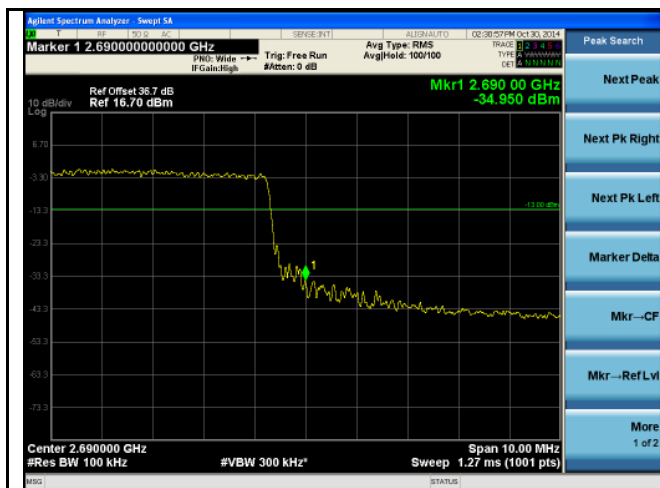
BandEdge-LTE-Band7-15MHz-QPSK-High – Chain B



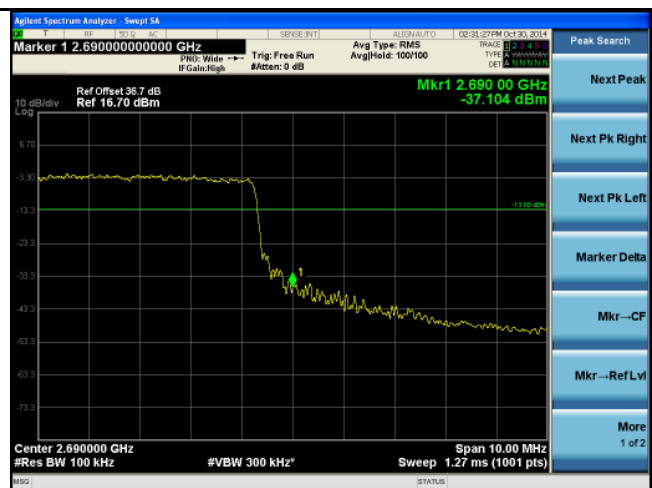
BandEdge-LTE-Band7-15MHz-64QAM-Low – Chain A



BandEdge-LTE-Band7-15MHz-64QAM-Low – Chain B



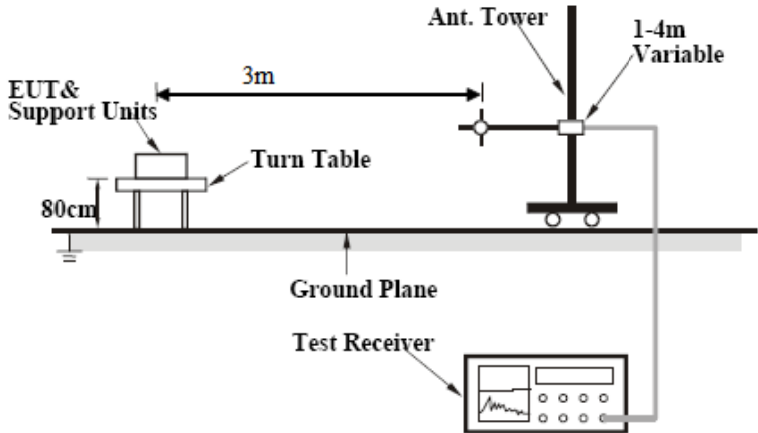
BandEdge-LTE-Band7-15MHz-64QAM-High – Chain A



BandEdge-LTE-Band7-15MHz-64QAM-High – Chain B

10.6 Radiated Spurious Emission below 1GHz

Requirement(s):

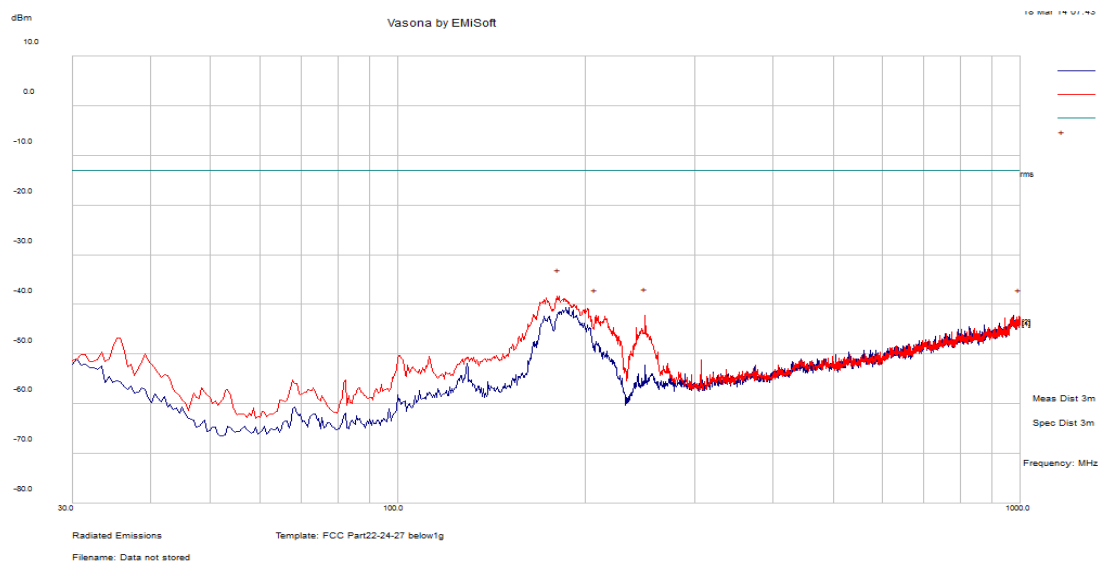
Spec	Item	Requirement	Applicable
47CFR22.917 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☐
47CFR24.238 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
47CFR27.53 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.	☒
Test Setup			
Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - A peak measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	All different modulation and bandwidth configuration has been verified and only the test data of worst case with QPSK modulation and greatest bandwidth was presented in this report.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

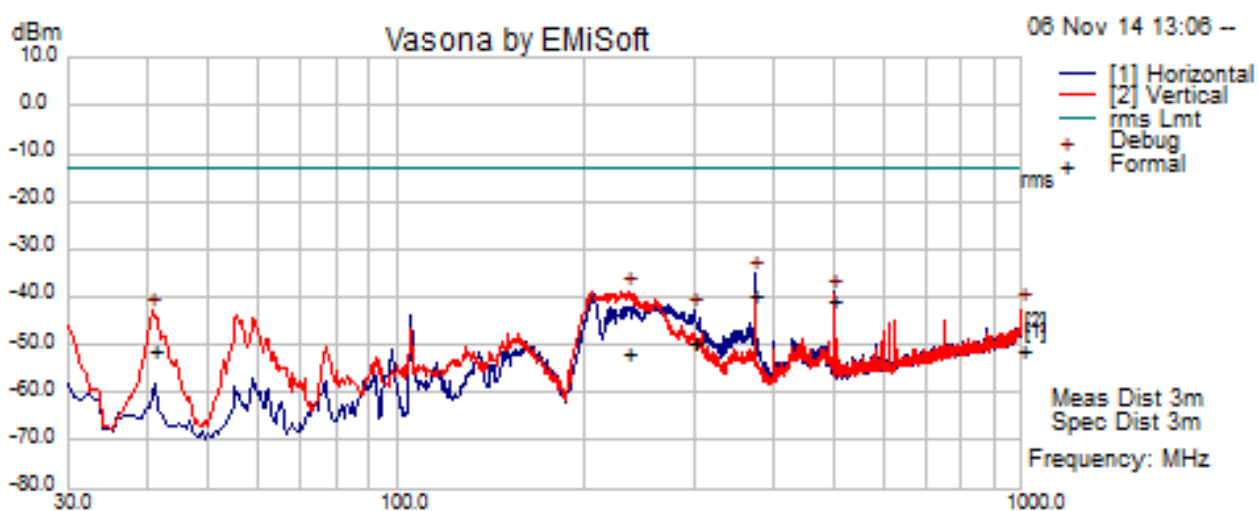
Radiated Emission Test Results

Test specification	Radiated Spurious Emissions (30MHz – 1000MHz)			
Environmental Conditions:	Temp (°C):	22	Result	Pass
	Humidity (%)	45		
	Atmospheric (mbar):	1008		
Mains Power:	56VDC PoE			
Tested by:	David Zhang			
Test Date:	02/13/2014			
Remarks:	WCDMA band2, Mid CH			



Frequency MHz	Raw dBm	Cable Loss	AF dB	Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
181.32	-42.23	14.42	-10.50	-38.31	RMS Max	V	140.00	356.00	-13.00	-25.31	Pass
249.71	-46.94	14.79	-10.01	-42.15	RMS Max	V	100.00	341.00	-13.00	-29.15	Pass
208.00	-46.03	14.57	-10.82	-42.28	RMS Max	V	100.00	100.00	-13.00	-29.28	Pass
995.64	-62.78	18.34	2.04	-42.40	RMS Max	H	161.00	23.00	-13.00	-29.40	Pass

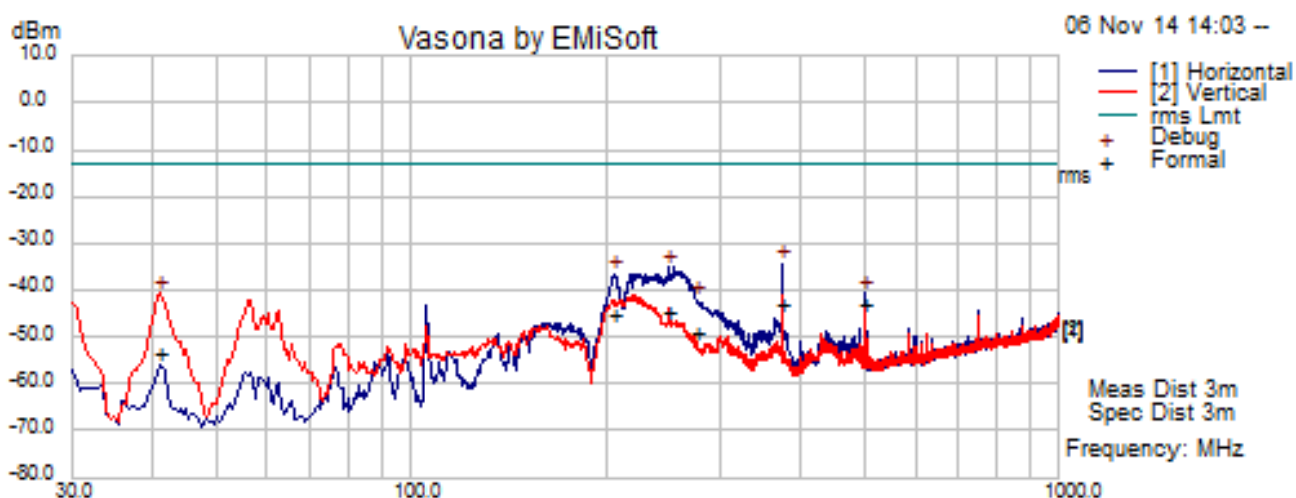
Test specification:	Radiated Spurious Emissions (30MHz – 1000MHz)			
Environmental Conditions:	Temp(°C):	20	Result:	☒ Pass ☐ Fail
	Humidity (%):	36		
	Atmospheric(mbar):	1021		
Mains Power:	56VDC PoE			
Tested by:	Teody Manansala			
Test Date:	6-Nov-2014			
Remarks:	LTE 15MHz 2.655 GHz			



Quasi Max Measurement

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
375.00	-49.52	15.49	-5.80	-39.84	RMS Max	H	100.00	229.00	-13.00	-26.84	Pass
235.29	-57.15	14.72	-9.49	-51.92	RMS Max	V	206.00	200.00	-13.00	-38.92	Pass
499.99	-53.08	16.26	-3.80	-40.62	RMS Max	H	171.00	235.00	-13.00	-27.62	Pass
998.30	-73.15	18.35	3.61	-51.19	RMS Max	V	391.00	75.00	-13.00	-38.19	Pass
41.13	-54.32	13.19	-10.11	-51.24	RMS Max	V	112.00	337.00	-13.00	-38.24	Pass
298.58	-57.17	15.01	-7.53	-49.68	RMS Max	H	103.00	107.00	-13.00	-36.68	Pass

Test specification:	Radiated Spurious Emissions (30MHz – 1000MHz)			
Environmental Conditions:	Temp(°C):	20	Result:	☒ Pass ☐ Fail
	Humidity (%):	36		
	Atmospheric(mbar):	1021		
Mains Power:	120VAC, 60Hz			
Tested by:	Teody Manansala			
Test Date:	6-Nov-14			
Remarks:	LTE (2.655 GHz) and WCDMA (2.1124 GHz) transmitting simultaneously			



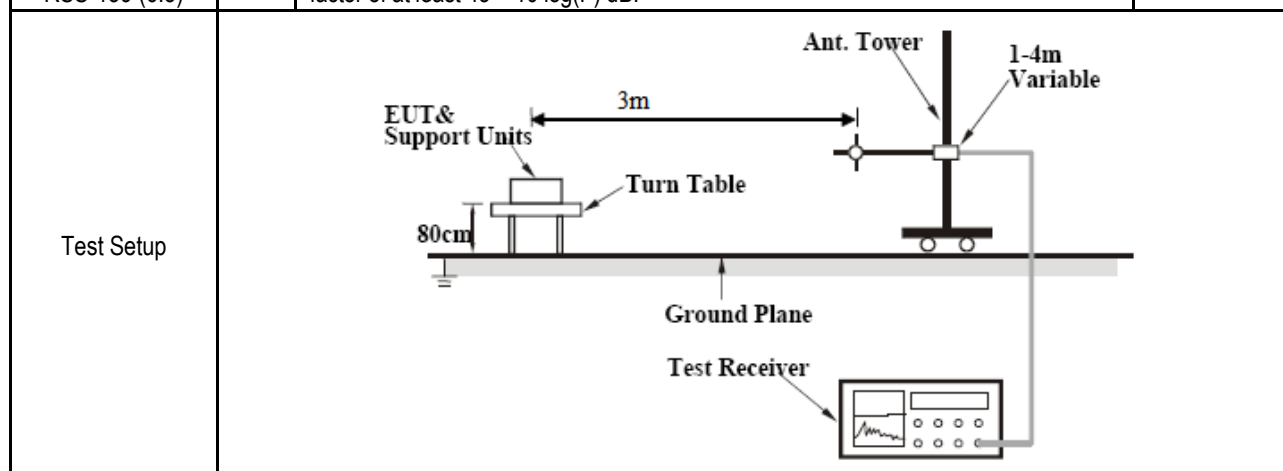
Quasi Max Measurement

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
374.99	-52.68	15.49	-5.80	-42.99	RMS Max	H	119.00	233.00	-13.00	-29.99	Pass
250.00	-50.16	14.80	-9.40	-44.77	RMS Max	H	147.00	84.00	-13.00	-31.77	Pass
205.76	-49.75	14.56	-9.89	-45.09	RMS Max	H	107.00	79.00	-13.00	-32.09	Pass
40.95	-56.70	13.19	-10.00	-53.51	RMS Max	V	132.00	318.00	-13.00	-40.51	Pass
500.01	-55.45	16.26	-3.80	-42.99	RMS Max	H	162.00	104.00	-13.00	-29.99	Pass
276.01	-56.24	14.92	-7.70	-49.02	RMS Max	H	104.00	250.00	-13.00	-36.02	Pass

10.7 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR22.917 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.	☐
47CFR24.238 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.	☒
47CFR27.53 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.	☒



Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - A peak measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Test Date	02/13/2014 – 11/05/2014	Environmental condition	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	All different modulation and bandwidth configuration has been verified and only the test data of worst case with QPSK modulation and greatest bandwidth was presented in this report.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Radiated Emission Test Results (Above 1GHz)

LTE band 7 Low Channel, 15MHz BW, QPSK

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
8778.89	-77.47	15.84	5.56	-56.07	RMS Max	H	187.00	212.00	-13.00	-43.07	Pass
4154.43	-77.22	14.72	-0.22	-62.72	RMS Max	H	110.00	284.00	-13.00	-49.72	Pass
6596.83	-75.50	15.99	2.28	-57.23	RMS Max	V	177.00	103.00	-13.00	-44.23	Pass

LTE band 7 Mid Channel, 15MHz BW, QPSK

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
8029.73	-76.87	15.77	4.50	-56.60	RMS Max	H	125.00	170.00	-13.00	-43.60	Pass
4066.23	-76.85	14.68	-0.20	-62.36	RMS Max	H	137.00	278.00	-13.00	-49.36	Pass
6270.39	-74.23	15.66	1.89	-56.69	RMS Max	V	101.00	41.00	-13.00	-43.69	Pass

LTE band 7 High Channel, 15MHz BW, QPSK

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
8782.66	-77.51	15.84	5.56	-56.10	RMS Max	H	133.00	302.00	-13.00	-43.10	Pass
6808.31	-74.45	16.19	2.51	-55.75	RMS Max	V	186.00	350.00	-13.00	-42.75	Pass
4316.98	-77.31	14.78	-0.25	-62.78	RMS Max	V	132.00	323.00	-13.00	-49.78	Pass

WCDMA Low Channel

Frequency MHz	Raw dBm	Cable Loss	AF dB	Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
5967.87	-61.60	15.36	1.50	-44.74	RMS Max	H	114.00	151.00	-13.00	-31.74	Pass
1492.00	-73.99	13.19	-6.29	-67.10	RMS Max	V	123.00	202.00	-13.00	-54.10	Pass
1625.03	-56.94	13.33	-5.80	-49.41	RMS Max	V	138.00	10.00	-13.00	-36.41	Pass

WCDMA Mid Channel

Frequency MHz	Raw dBm	Cable Loss	AF dB	Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
8267.14	-76.95	15.79	4.97	-56.19	RMS Max	V	121.00	177.00	-13.00	-43.19	Pass
7015.03	-76.60	16.36	2.74	-57.50	RMS Max	H	130.00	127.00	-13.00	-44.50	Pass
5844.40	-76.62	15.32	1.35	-59.94	RMS Max	V	193.00	327.00	-13.00	-46.94	Pass
4129.15	-77.09	14.71	-0.21	-62.59	RMS Max	V	128.00	13.00	-13.00	-49.59	Pass

WCDMA High Channel

Frequency MHz	Raw dBm	Cable Loss	AF dB	Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
6054.95	-75.14	15.43	1.61	-58.10	RMS Max	H	105.00	84.00	-13.00	-45.10	Pass
3056.58	-77.19	14.06	-1.93	-65.06	RMS Max	V	127.00	271.00	-13.00	-52.06	Pass
1607.75	-74.27	13.31	-5.86	-66.82	RMS Max	V	108.00	265.00	-13.00	-53.82	Pass

LTE Band 7 and WCDMA Mid Channel transmit simultaneously, QPSK

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
8160.32	-77.36	15.78	4.76	-56.82	RMS Max	V	169.00	42.00	-13.00	-43.82	Pass
6670.50	-74.18	16.06	2.36	-55.77	RMS Max	H	122.00	214.00	-13.00	-42.77	Pass
4135.41	-76.81	14.71	-0.21	-62.31	RMS Max	V	127.00	162.00	-13.00	-49.31	Pass

10.8 Frequency Stability

Requirement(s):

Spec	Item	Requirement	Applicable																																
47 CFR 2.1055, 47 CFR 22.355, RSS-133(6.3), RSS-139(6.3)	-	Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table at below, <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤3 watts (ppm)</th><th>Mobile ≤3 watts (ppm)</th></tr> </thead> <tbody> <tr> <td>25 to 50</td><td>20</td><td>20</td><td>50</td></tr> <tr> <td>50 to 450</td><td>5</td><td>5</td><td>50</td></tr> <tr> <td>450 to 512</td><td>2.5</td><td>5</td><td>5</td></tr> <tr> <td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>928 to 929</td><td>5</td><td>n/a</td><td>n/a</td></tr> <tr> <td>929 to 960</td><td>1.5</td><td>n/a</td><td>n/a</td></tr> <tr> <td>2110 to 2220</td><td>10</td><td>n/a</td><td>n/a</td></tr> </tbody> </table>	Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)	25 to 50	20	20	50	50 to 450	5	5	50	450 to 512	2.5	5	5	821 to 896	1.5	2.5	2.5	928 to 929	5	n/a	n/a	929 to 960	1.5	n/a	n/a	2110 to 2220	10	n/a	n/a	☐
Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)																																
25 to 50	20	20	50																																
50 to 450	5	5	50																																
450 to 512	2.5	5	5																																
821 to 896	1.5	2.5	2.5																																
928 to 929	5	n/a	n/a																																
929 to 960	1.5	n/a	n/a																																
2110 to 2220	10	n/a	n/a																																
47 CFR 2.1055, 47 CFR 24.135(a), RSS-133(6.3), RSS-139(6.3)	-	The frequency stability of the transmitter shall be maintained within ± 0.0001 percent (± 1 ppm) of the center frequency over a temperature variation of -30°C to $+50^{\circ}\text{C}$ at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20°C .	☒																																
47 CFR 2.1055, 47 CFR 27.54 RSS-133(6.3), RSS-139(6.3)	-	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.	☒																																
Test Setup																																			
Test Procedure	The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference). - The equipment is turned on in a "standby" condition for one minute 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. - Frequency measurements are made at 10°C intervals ranging from -30°C to $+50^{\circ}\text{C}$. A period of at least one half hour is provided to allow stabilization of the equipment at each temperature level.																																		
Test Date	03/10/2014 - 11/05/2014	Environmental condition	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar																																
Remark	NONE																																		
Result	☒ Pass ☐ Fail																																		

Test Data ☒ Yes ☒ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test Data for LTE

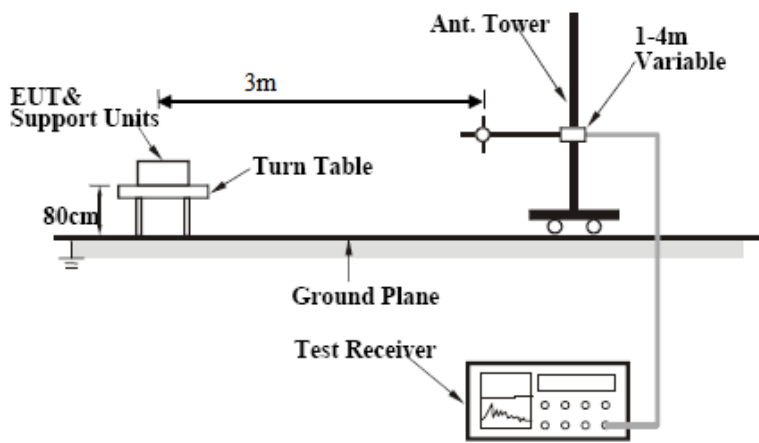
Voltage (%)	Power (VDC)	Temp. (°)	Frequency (KHz)	Frequency Error (Hz)	Deviation (ppm)
100%	56	20 (ref)	2655000.008	0	0.000
100%		-30	2655000.002	-6	-0.002
100%		-20	2655000.006	-2	-0.001
100%		-10	2655000.005	-3	-0.001
100%		0	2655000.009	1	-0.001
100%		10	2655000.013	5	0.002
100%		30	2655000.01	2	0.001
100%		40	2655000.015	7	0.003
100%		50	2655000.022	14	0.005
115%	64.4	20	2655000.024	16	0.006
85%	47.6	20	2655000.026	18	0.007

Test Data for WCDMA

Voltage (%)	Power (VDC)	Temp. (°)	Frequency (KHz)	Frequency Error (Hz)	Deviation (ppm)
100%	56	20 (ref)	1960000.032	0	0.000
100%		-30	1960000.012	-20	-0.010
100%		-20	1960000.016	-16	-0.008
100%		-10	1960000.019	-13	-0.007
100%		0	1960000.021	-11	-0.006
100%		10	1960000.011	-21	-0.011
100%		30	1960000.022	-10	-0.005
100%		40	1960000.017	-15	-0.008
100%		50	1960000.019	-13	-0.007
115%	64.4	20	1960000.028	-4	-0.002
85%	47.6	20	1960000.028	-4	-0.002

10.9 Receiver Spurious Emissions

Requirement(s):

Spec	Item	Requirement	Applicable
RSS-Gen 7.1	-	Receivers shall comply with the limits of spurious emissions set out in this section, measured over the frequency range determined in accordance with Section 4.10.	☒
Test Setup			
Procedure	1. 2. The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. A peak measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	No outstanding emission except the noise floor was found.		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☐
R&S LISN	ESH2-Z5	861741/013	05/18/2014	1 Year	05/18/2015	☐
CHASE LISN	MN2050B	1018	07/24/2014	1 Year	07/24/2015	☐
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☐
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2014	1 Year	03/01/2015	☒
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☒
ETS-Lingren Loop Antenna	6512	00049120	05/13/2014	1 Year	05/13/2015	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	07/03/2014	1 Year	07/03/2015	☒
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2014	1 Year	04/26/2015	☒
Horn Antenna (18-40 GHz)	AH-840	101013	04/23/2014	1 Year	04/23/2015	☐
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	05/30/2014	1 Year	05/30/2015	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2014	1 Year	05/30/2015	☐
3 Meters SAC	3M	N/A	10/13/2014	1 Year	10/13/2015	☒
10 Meters SAC	10M	N/A	06/05/2014	1 Year	06/05/2015	☒
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☒
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2014	1 Year	05/30/2015	☒
Spectrum Analyzer	E4407B	US88441016	05/31/2014	1 Year	05/31/2015	☒
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☒

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
HongKong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio : A1. Terminal equipment for purpose of calling Telecom : B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2