RF TEST REPORT

SIEMIC
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Report No.: FCC-IC_RF_SL15030401-SPC-017_0402 Rev1.0
Supersede Report No.: FCC-IC_RF_SL15030401-SPC-017_0402

Applicant	SpiderCloud Wireless, Inc.
Product Name	Universal Small Cell 8718 LTE/UMTS Module
Model No.	USC8718-M24-K9
Test Standard	47CFR Part24 47CFR Part27 RSS-Gen Issue4: 2014, RSS-133 Issue 6: 2013, RSS-139 Issue2: 2010
Test Method	TIA-603-D: 2009 RSS-Gen Issue4: 2014
FCC ID	Y478718M24
IC ID	9424A-8718M24
Date of test	04/13/2015 - 05/03/2015
Issue Date	05/15/2015
Test Resut	Pass Fail
Equipment complied with the specification	[x]
Equipment did not comply with the specification	[ ]

	
David Zhang	Nima Molaei
Test Engineer	Engineer Reviewer

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Test result presented in this test report is applicable to the tested sample only

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ilac-MRA
A2LA ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

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/RRA, 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_SL15030401-SPC-017_0402	None	Original	05/05/2015
FCC-IC_RF_SL15030401-SPC-017_0402 Rev1.0	Rev1.0	Update test procedure	05/15/2015

2 Executive Summary

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

Company: SpiderCloud Wireless, Inc.
Product: Universal Small Cell 8818 LTE/UMTS Module
Model: USC8718-M24-K9

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	Universal Small Cell 8818 LTE/UMTS Module
Model No.	USC8718-M24-K9
Trade Name	SpiderCloud
Serial No.	15105A44095
Input Power	56VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	-
Hardware version	-
Software version	-
Date of EUT received	04/13/2015
Equipment Class/ Category	PCB, TNB
Operating Frequencies	UMTS: TX (1930 MHz to 1995 MHz), UMTS: RX (1850 MHz to 1915 MHz) LTE: TX (2110 MHz to 2155 MHz), LTE: RX (1710 MHz to 1755 MHz)
Port/Connectors	N/A
Remark	NONE

6.2 Radio Description

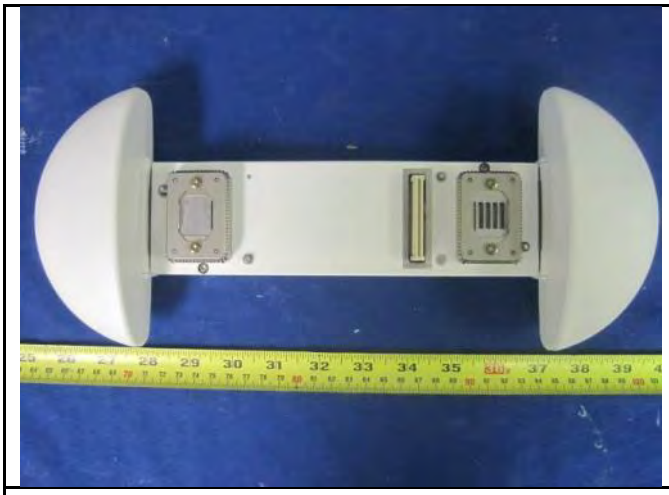
Item	LTE	WCDMA
Operating Band /Radio Type	LTE Band 4	UMTS 1900 (Band 2)
Bandwidth	5MHz, 10MHz, 15MHz, 20MHz	3.84 MHz
Modulation	QPSK/16QAM/64QAM	QPSK
Antenna Type	Internal Omni-directional antenna	Internal Omni-directional antenna
Antenna Gain	2 dBi	2 dBi
Frequency TX(MHz)	TX: 2110 MHz to 2155 MHz RX: 1710 MHz to 1755 MHz	TX: 1930 MHz to 1990 MHz RX: 1850 MHz to 1910 MHz

6.3 EUT test modes/configuration Description

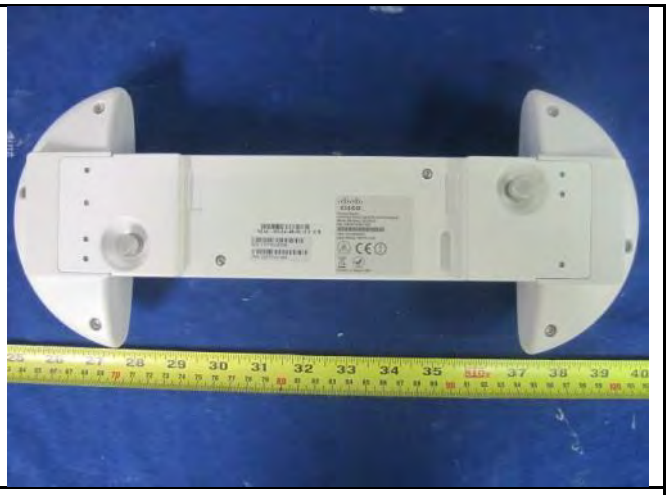
Test mode

Final Test Mode		Note
Final_test_mode_1	Continuous transmission, 5MHz, QPSK, Low CH	LTE
Final_test_mode_2	Continuous transmission, 5MHz, QPSK, Mid CH	LTE
Final_test_mode_3	Continuous transmission, 5MHz, QPSK, High CH	LTE
Final_test_mode_4	Continuous transmission, 5MHz, 16QAM, Low CH	LTE
Final_test_mode_5	Continuous transmission, 5MHz, 16QAM, Mid CH	LTE
Final_test_mode_6	Continuous transmission, 5MHz, 16QAM, High CH	LTE
Final_test_mode_7	Continuous transmission, 5MHz, 64QAM, Low CH	LTE
Final_test_mode_8	Continuous transmission, 5MHz, 64QAM, Mid CH	LTE
Final_test_mode_9	Continuous transmission, 5MHz, 64QAM, High CH	LTE
Final_test_mode_10	Continuous transmission, 10MHz, QPSK, Low CH	LTE
Final_test_mode_11	Continuous transmission, 10MHz, QPSK, Mid CH	LTE
Final_test_mode_12	Continuous transmission, 10MHz, QPSK, High CH	LTE
Final_test_mode_13	Continuous transmission, 10MHz, 16QAM, Low CH	LTE
Final_test_mode_14	Continuous transmission, 10MHz, 16QAM, Mid CH	LTE
Final_test_mode_15	Continuous transmission, 10MHz, 16QAM, High CH	LTE
Final_test_mode_16	Continuous transmission, 10MHz, 64QAM, Low CH	LTE
Final_test_mode_17	Continuous transmission, 10MHz, 64QAM, Mid CH	LTE
Final_test_mode_18	Continuous transmission, 10MHz, 64QAM, High CH	LTE
Final_test_mode_19	Continuous transmission, 15MHz, QPSK, Low CH	LTE
Final_test_mode_20	Continuous transmission, 15MHz, QPSK, Mid CH	LTE
Final_test_mode_21	Continuous transmission, 15MHz, QPSK, High CH	LTE
Final_test_mode_22	Continuous transmission, 15MHz, 16QAM, Low CH	LTE
Final_test_mode_23	Continuous transmission, 15MHz, 16QAM, Mid CH	LTE
Final_test_mode_24	Continuous transmission, 15MHz, 16QAM, High CH	LTE
Final_test_mode_25	Continuous transmission, 15MHz, 64QAM, Low CH	LTE
Final_test_mode_26	Continuous transmission, 15MHz, 64QAM, Mid CH	LTE
Final_test_mode_27	Continuous transmission, 15MHz, 64QAM, High CH	LTE
Final_test_mode_28	Continuous transmission, 20MHz, QPSK, Low CH	LTE
Final_test_mode_29	Continuous transmission, 20MHz, QPSK, Mid CH	LTE
Final_test_mode_30	Continuous transmission, 20MHz, QPSK, High CH	LTE
Final_test_mode_31	Continuous transmission, 20MHz, 16QAM, Low CH	LTE
Final_test_mode_32	Continuous transmission, 20MHz, 16QAM, Mid CH	LTE
Final_test_mode_33	Continuous transmission, 20MHz, 16QAM, High CH	LTE
Final_test_mode_34	Continuous transmission, 20MHz, 64QAM, Low CH	LTE
Final_test_mode_35	Continuous transmission, 20MHz, 64QAM, Mid CH	LTE
Final_test_mode_36	Continuous transmission, 20MHz, 64QAM, High CH	LTE
Final_test_mode_37	Continuous transmission, 3.84MHz, QPSK, Low CH	WCDMA
Final_test_mode_38	Continuous transmission, 3.84MHz, QPSK, Mid CH	WCDMA
Final_test_mode_39	Continuous transmission, 3.84MHz, QPSK, High CH	WCDMA
Remark: NONE		

6.4 EUT Photos - External



Top View

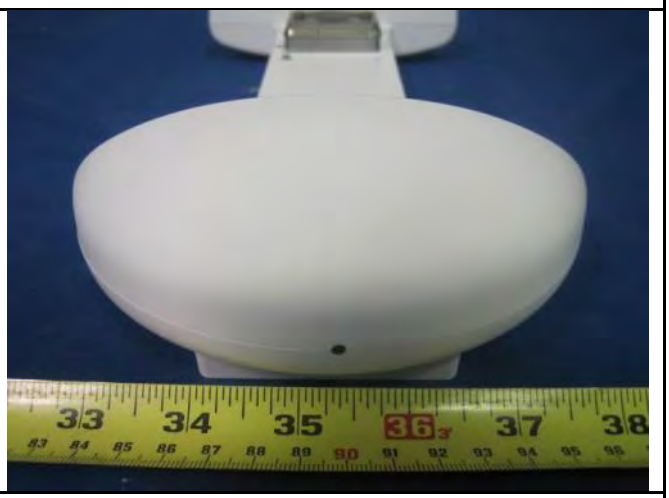


Bottom View

Front View

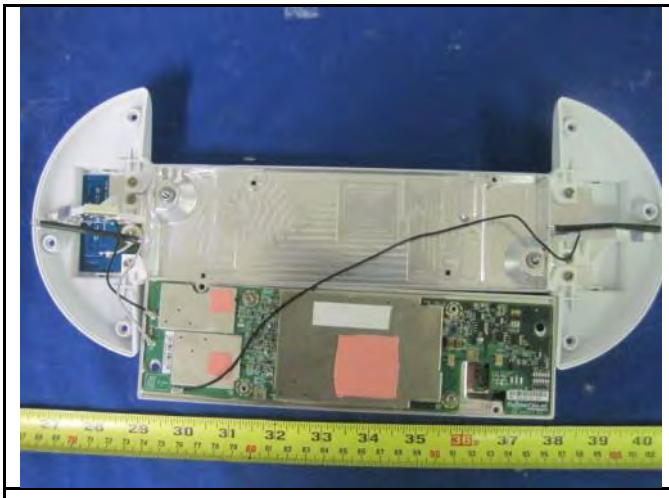
Rear View

Left Side View

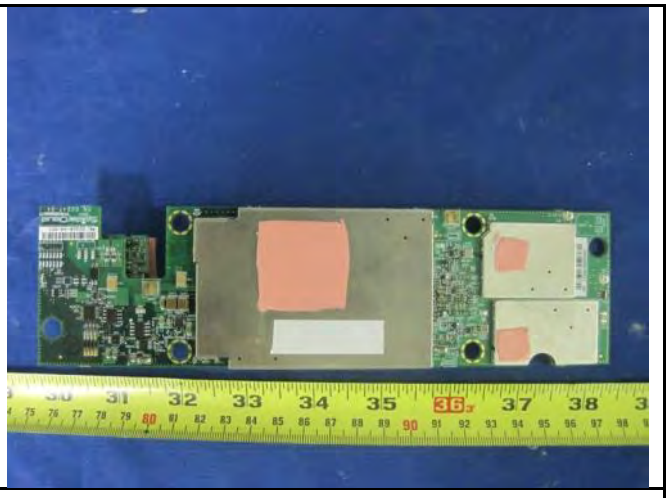


Right Side View

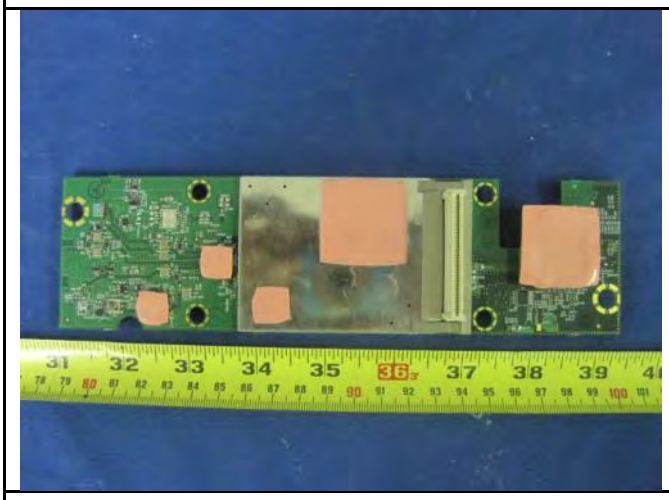
6.5 EUT Photos - Internal



Top View Top Cover Open

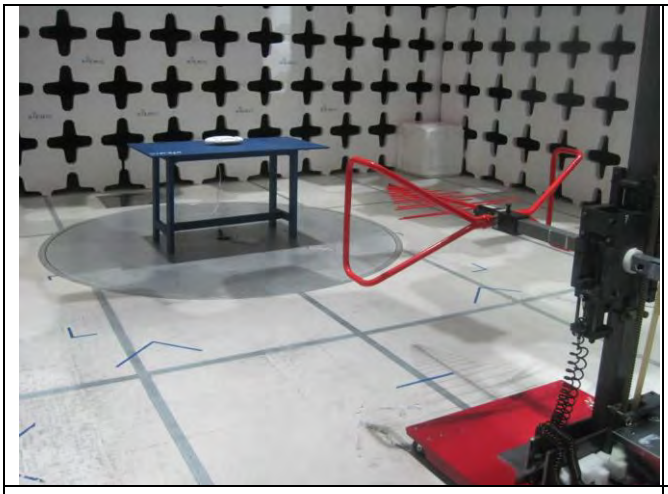


Main PCB - Top View

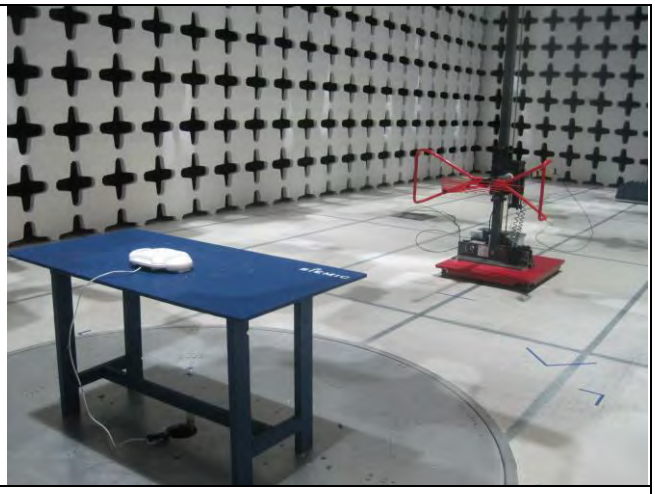


Main PCB - Bottom View

6.6 EUT Test Setup Photos

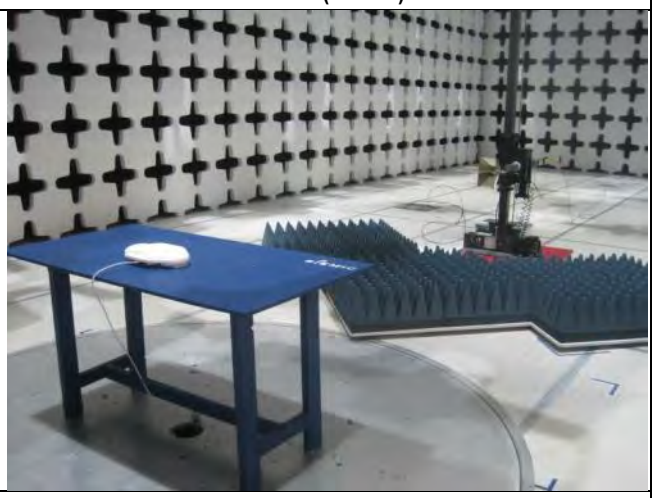


Radiated Emissions (<1GHz) – Front View



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	-
2	Service Node	SCSN-9000	14193C26505	SpiderCloud	-
3	Access Point	AIR-CAP3702I-A-K9	FTX1848RA30	Cisco	-

7.2 Test Software Description

Test Item	Software	Description
RF testing	ePview & Perview	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	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133(6.4), RSS-139(6.4)	IC	RSS-Gen Issue4: 2014	
Occupied Bandwidth	FCC	47CFR24.238(a), 47CFR27.53	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-Gen(6.6)	IC	RSS-Gen Issue4: 2014	
Peak-Average Ratio	FCC	47CFR24.232, 47CFR27.50	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133(6.4), RSS-139(6.4)	IC	RSS-Gen Issue4: 2014	
Spurious and harmonic Emission at antenna port	FCC	47CFR2.1051,47CFR24.238, 47CFR27.53	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue4: 2014	
Band Edge	FCC	47CFR2.1053,47CFR24.238, 47CFR27.53	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue4: 2014	
Radiated spurious and harmonic emission	FCC	47CFR2.1053,47CFR24.238, 47CFR27.53	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133 (6.5), RSS-139 (6.5)	IC	RSS-Gen Issue4: 2014	
Frequency stability	FCC	47CFR2.1055, 47CFR24.135, 47CFR27.54	FCC	TIA-603-D: 2009	☒ Pass ☐ N/A
	IC	RSS-133(6.3), RSS-139(6.3)	IC	RSS-Gen Issue4: 2014	
Receiver spurious emission	FCC	-	FCC	-	☐ Pass ☒ N/A
	IC	RSS-Gen (7), RSS-133 (6.6), RSS-139 (6.6)	IC	RSS-Gen Issue4: 2014	
Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 2. 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	04/14/2015 – 05/03/2015	Environmental condition	Temperature 22°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	For LTE mode, EUT is using 2x2 MIMO, which has 2 transmit antennas. They are correlated to each other. The directional gain is calculated per the formula at below, Directional gain dBi = Gmax + 10 Log10 N The max gain of single antenna is 2 dBi. So the directional gain = 5 dBi For WCDMA mode, EUT is using single antenna. So the maximum gain is 2 dBi.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

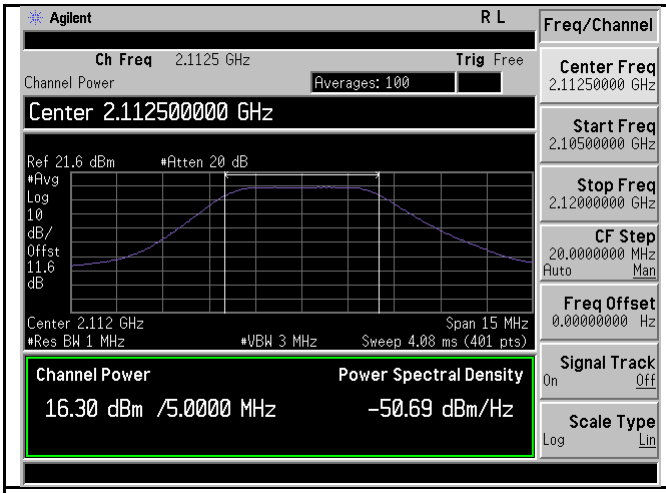
Test Data for LTE

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)
5MHz BW, QPSK	Low	2112.5	16.30	18.15	20.33	5	25.33
	Mid	2132.5	17.04	17.13	20.10	5	25.10
	High	2152.5	17.13	17.67	20.42	5	25.42
5MHz BW, 16QAM	Low	2112.5	16.38	18.11	20.34	5	25.34
	Mid	2132.5	17.99	17.86	20.94	5	25.94
	High	2152.5	17.10	17.37	20.25	5	25.25
5MHz BW, 64QAM	Low	2112.5	16.33	18.13	20.33	5	25.33
	Mid	2132.5	17.16	17.31	20.25	5	25.25
	High	2152.5	16.62	17.01	19.83	5	24.83
10MHz BW, QPSK	Low	2115.0	15.40	16.91	19.23	5	24.23
	Mid	2132.5	16.72	16.73	19.74	5	24.74
	High	2150.0	17.25	17.27	20.27	5	25.27
10MHz BW, 16QAM	Low	2115.0	14.72	16.64	18.80	5	23.80
	Mid	2132.5	16.23	16.35	19.30	5	24.30
	High	2150.0	17.14	17.20	20.18	5	25.18
10MHz BW, 64QAM	Low	2115.0	15.46	17.23	19.44	5	24.44
	Mid	2132.5	17.01	17.36	20.20	5	25.20
	High	2150.0	17.37	17.62	20.51	5	25.51
15MHz BW, QPSK	Low	2117.5	15.24	16.95	19.19	5	24.19
	Mid	2132.5	17.02	17.09	20.07	5	25.07
	High	2147.5	16.78	17.44	20.13	5	25.13
15MHz BW, 16QAM	Low	2117.5	16.08	16.53	19.32	5	24.32
	Mid	2132.5	17.48	17.48	20.49	5	25.49
	High	2147.5	17.01	17.24	20.14	5	25.14
15MHz BW, 64QAM	Low	2117.5	15.53	16.75	19.19	5	24.19
	Mid	2132.5	16.95	17.26	20.12	5	25.12
	High	2147.5	17.52	17.86	20.70	5	25.70
20MHz BW, QPSK	Low	2120.0	16.57	17.58	20.11	5	25.11
	Mid	2132.5	17.74	17.78	20.77	5	25.77
	High	2145.0	17.67	17.70	20.70	5	25.70
20MHz BW, 16QAM	Low	2120.0	16.13	17.40	19.82	5	24.82
	Mid	2132.5	17.34	17.47	20.42	5	25.42
	High	2145.0	17.07	17.24	20.17	5	25.17
20MHz BW, 64QAM	Low	2120.0	16.72	17.90	20.36	5	25.36
	Mid	2132.5	17.09	17.40	20.26	5	25.26
	High	2145.0	17.78	17.77	20.79	5	25.79

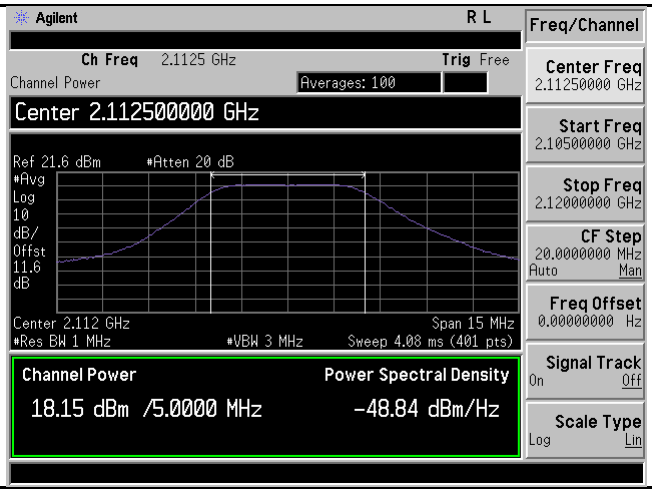
Test Data for WCDMA

Type	Channel	Frequency (MHz)	Measured PW (dBm)	Max Power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)
3.84MHz BW, QPSK	Low	1932.4	18.34	18.34	2	20.34
	Mid	1960.0	18.56	18.56	2	20.56
	High	1987.6	20.52	20.52	2	22.52

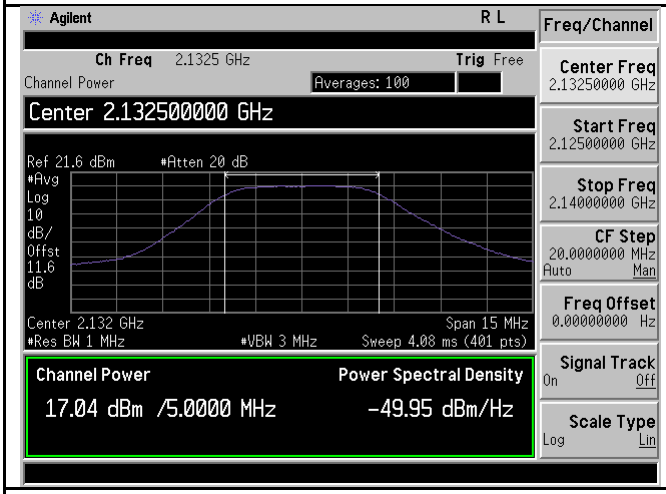
Test Plots for Band 4-QPSK-5MHz



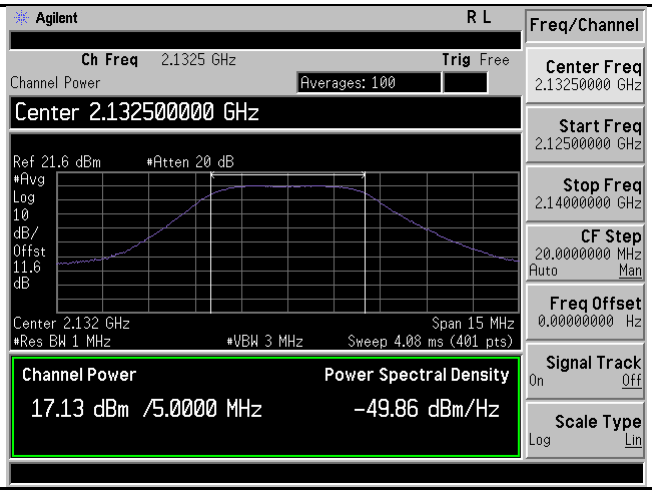
PWR-Band4-QPSK-5M BW-Low CH-Port1



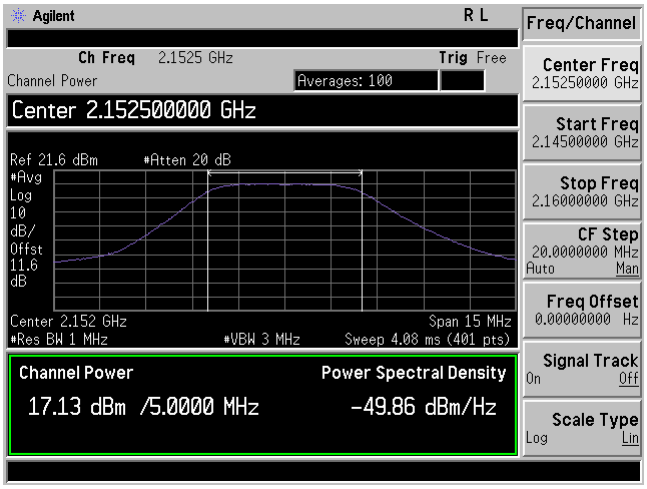
PWR-Band4-QPSK-5M BW-Low CH-Port2



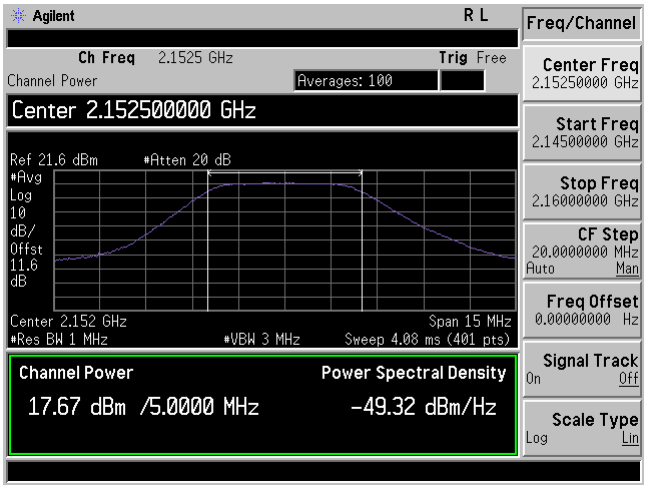
PWR-Band4-QPSK-5M BW-Mid CH-Port1



PWR-Band4-QPSK-5M BW-Mid CH-Port2

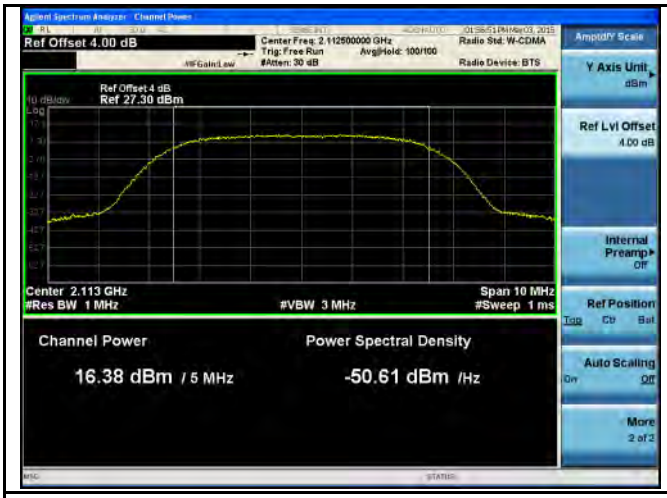


PWR-Band4-QPSK-5M BW-High CH-Port1

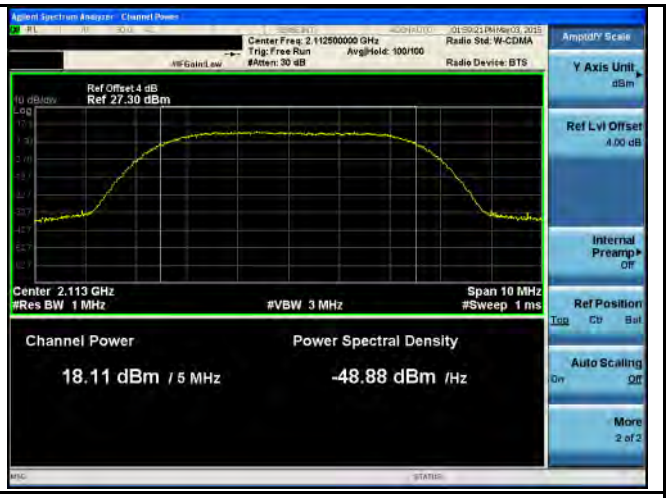


PWR-Band4-QPSK-5M BW-High CH-Port2

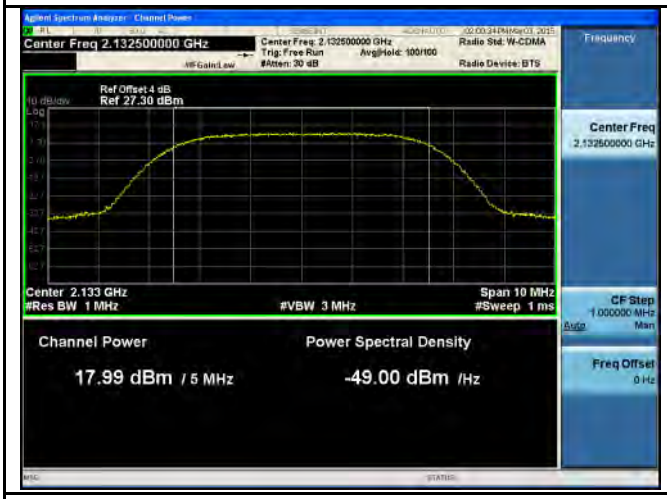
Test Plots for Band 4-16QAM-5MHz



PWR-Band4-16QAM-5M BW-Low CH-Port1



PWR-Band4-16QAM-5M BW-Low CH-Port2



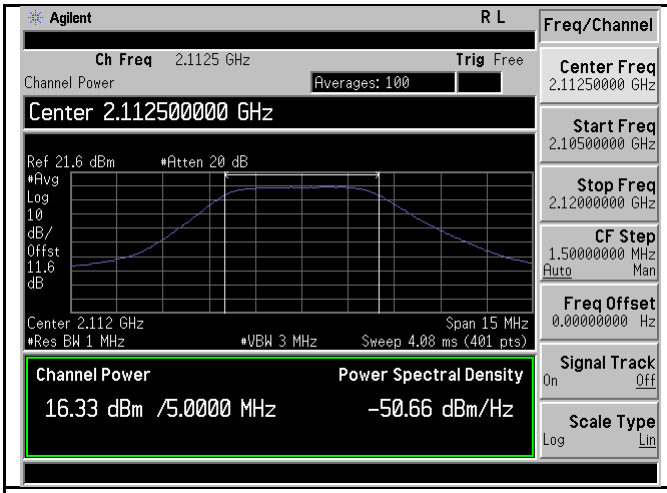
PWR-Band4-16QAM-5M BW-Mid CH-Port1

PWR-Band4-16QAM-5M BW-Mid CH-Port2

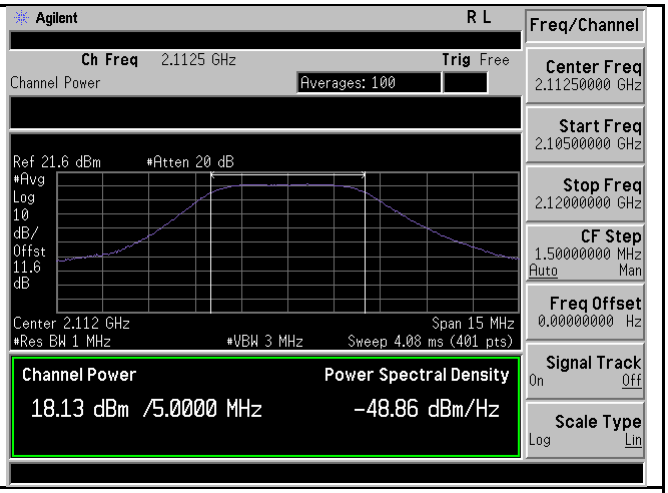
PWR-Band4-16QAM-5M BW-High CH-Port1

PWR-Band4-16QAM-5M BW-High CH-Port2

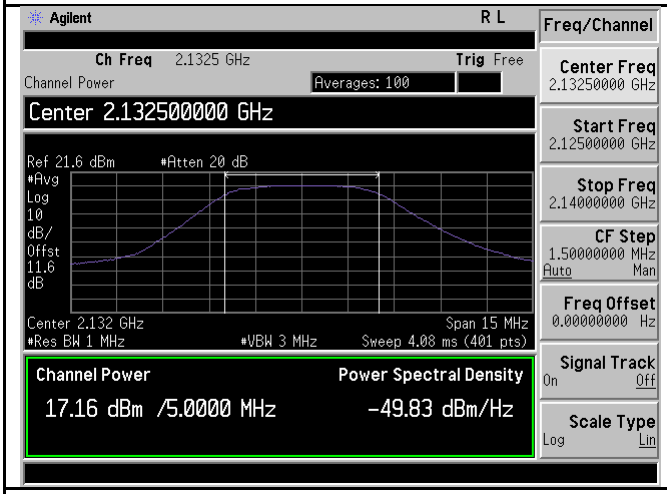
Test Plots for Band 4-64QAM-5MHz



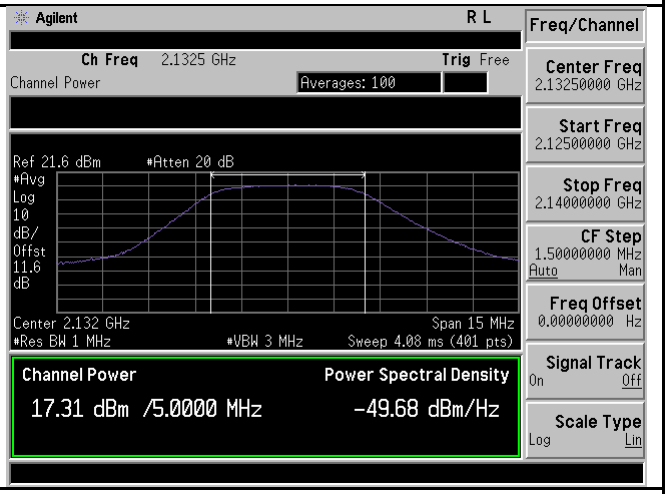
PWR-Band4-64QAM-5M BW-Low CH-Port1



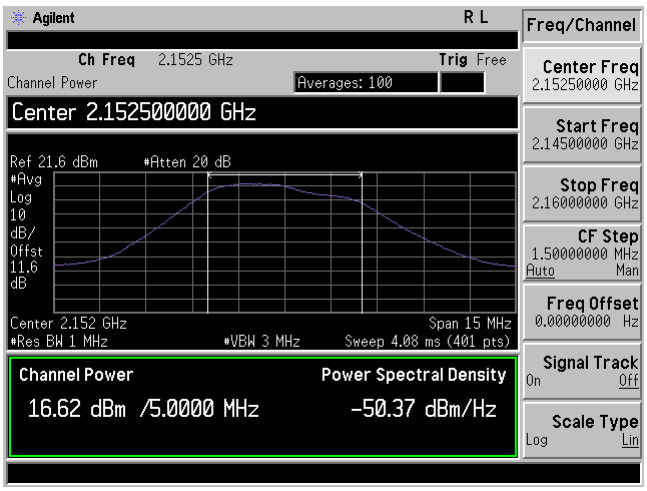
PWR-Band4-64QAM-5M BW-Low CH-Port2



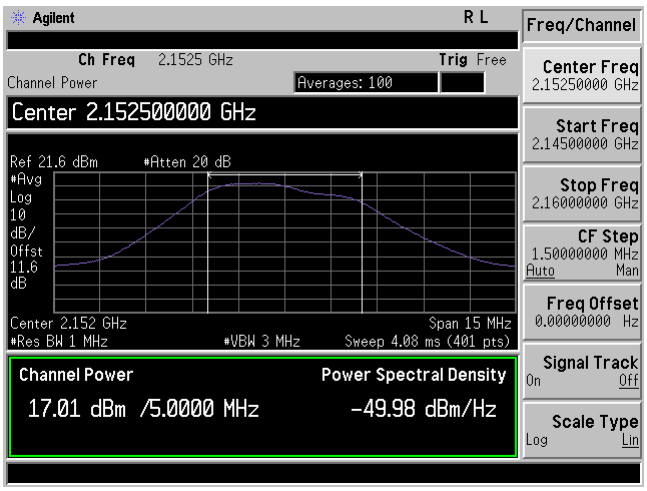
PWR-Band4-64QAM-5M BW-Mid CH-Port1



PWR-Band4-64QAM-5M BW-Mid CH-Port2

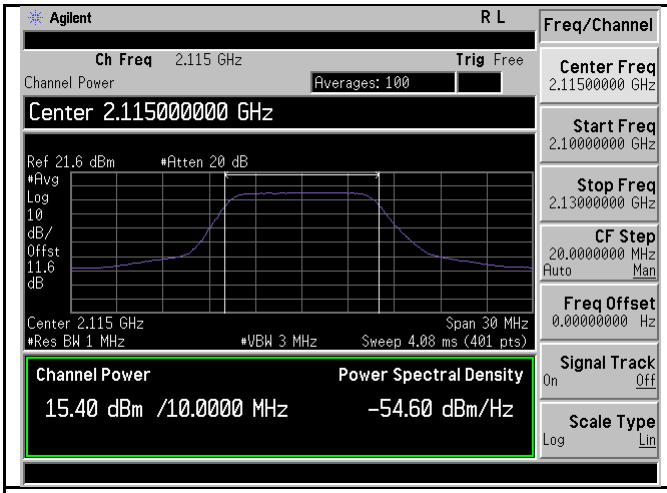


PWR-Band4-64QAM-5M BW-High CH-Port1

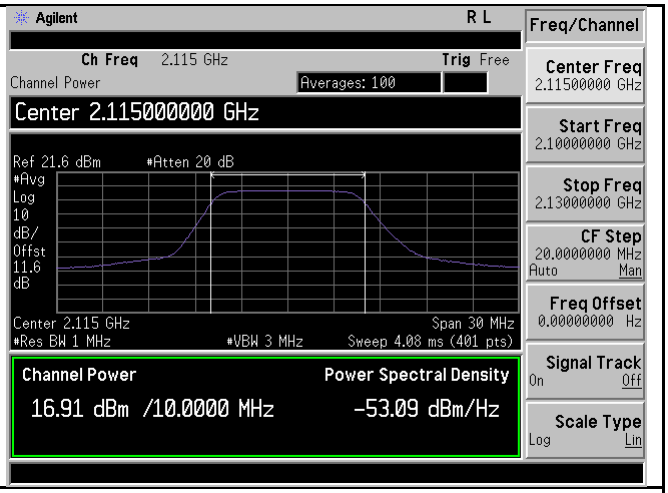


PWR-Band4-64QAM-5M BW-High CH-Port2

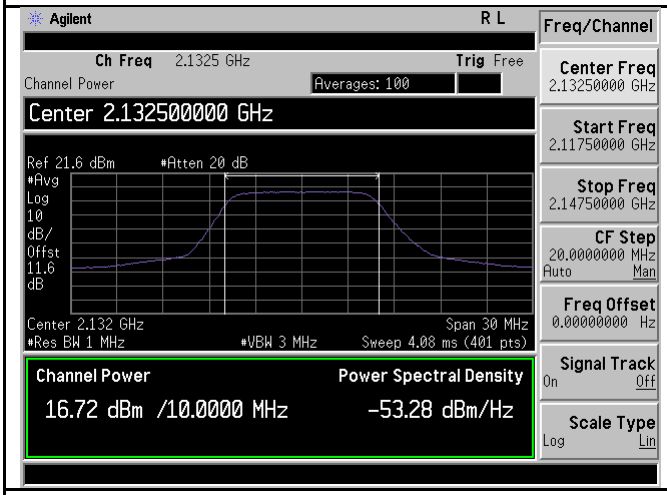
Test Plots for Band 4-QPSK-10MHz



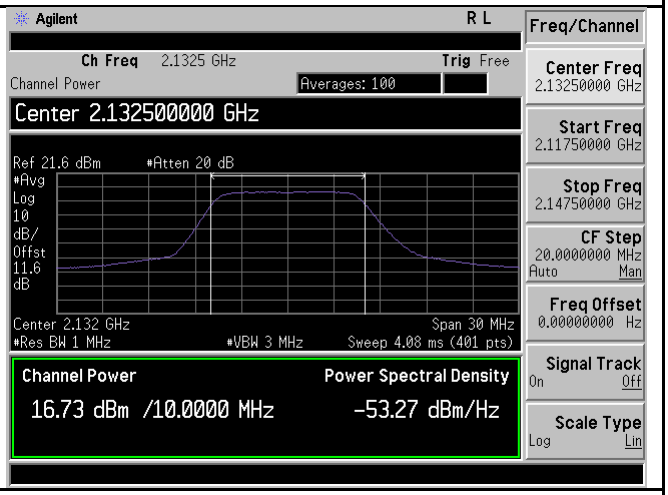
PWR-Band4-QPSK-10M BW-Low CH-Port1



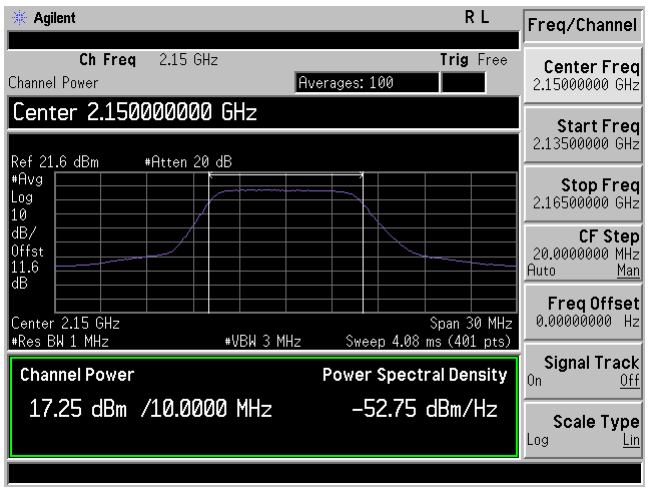
PWR-Band4-QPSK-10M BW-Low CH-Port2



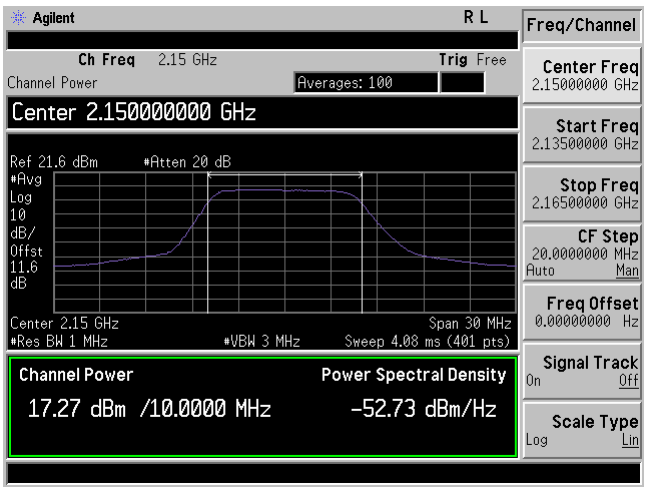
PWR-Band4-QPSK-10M BW-Mid CH-Port1



PWR-Band4-QPSK-10M BW-Mid CH-Port2

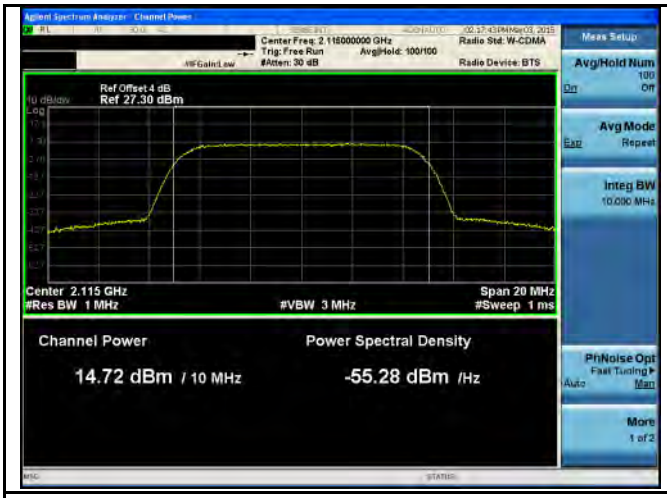


PWR-Band4-QPSK-10M BW-High CH-Port1

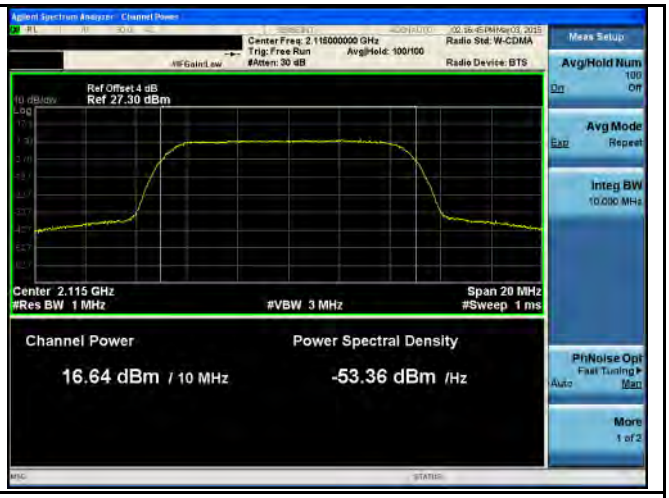


PWR-Band4-QPSK-10M BW-High CH-Port2

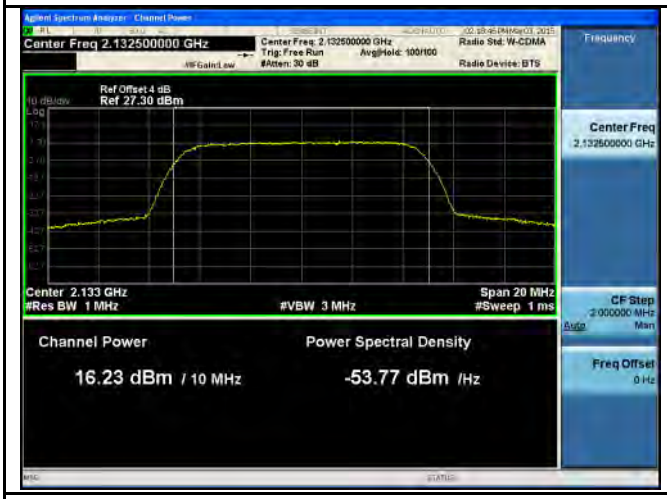
Test Plots for Band 4-16QAM-10MHz



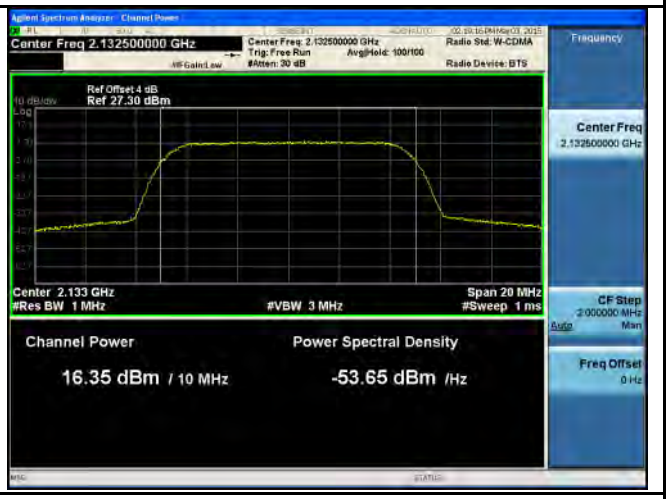
PWR-Band4-16QAM-10M BW-Low CH-Port1



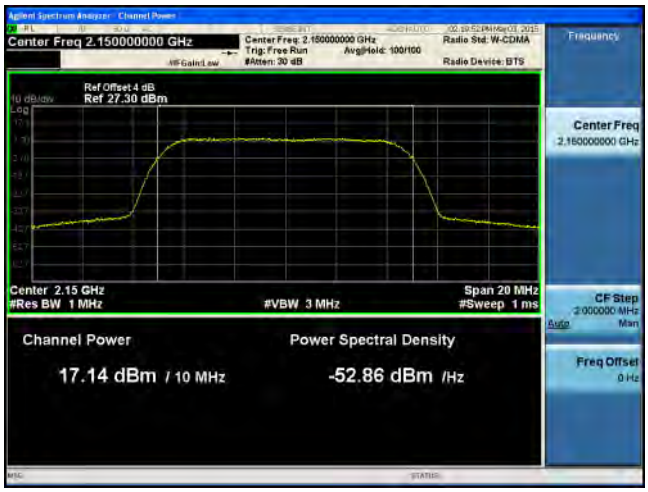
PWR-Band4-16QAM-10M BW-Low CH-Port2



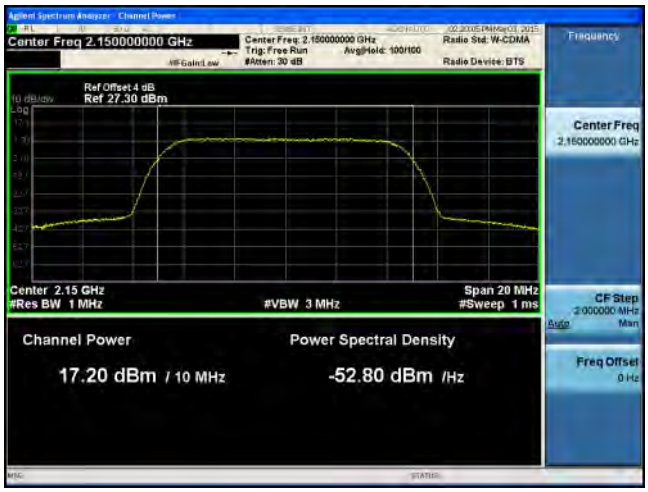
PWR-Band4-16QAM-10M BW-Mid CH-Port1



PWR-Band4-16QAM-10M BW-Mid CH-Port2

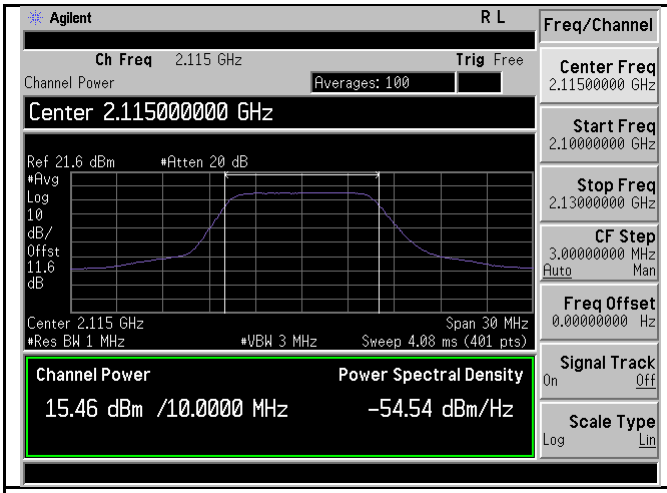


PWR-Band4-16QAM-10M BW-High CH-Port1

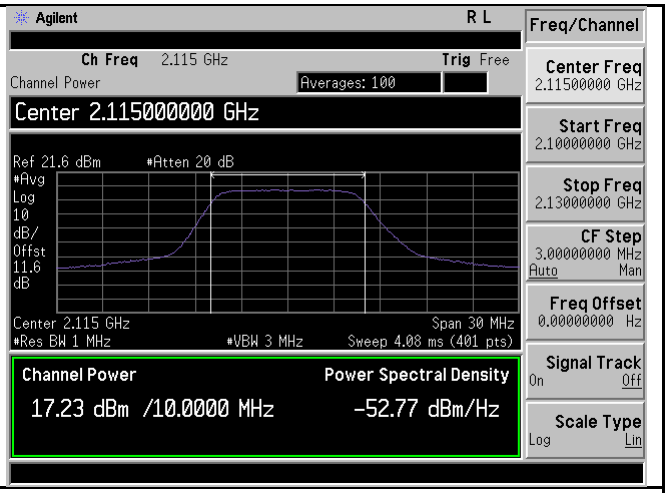


PWR-Band4-16QAM-10M BW-High CH-Port2

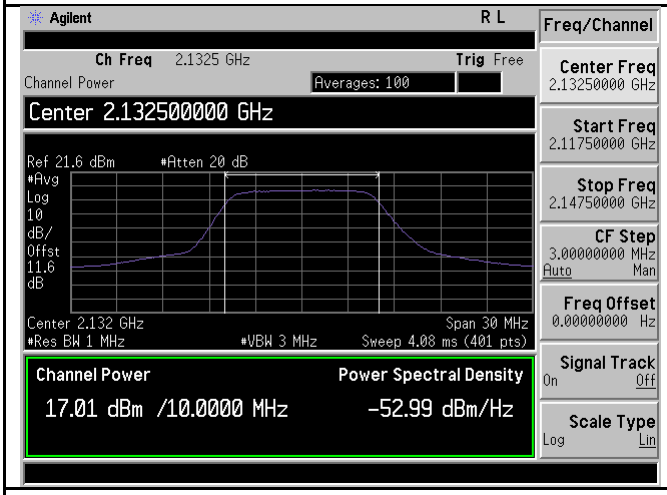
Test Plots for Band 4-64QAM-10MHz



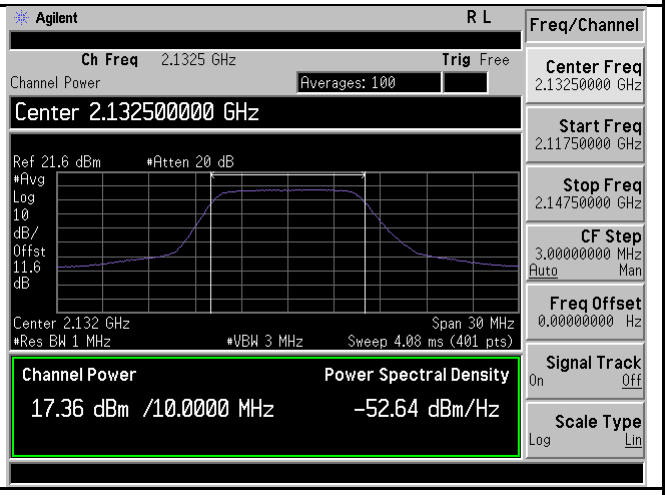
PWR-Band4-64QAM-10M BW-Low CH-Port1



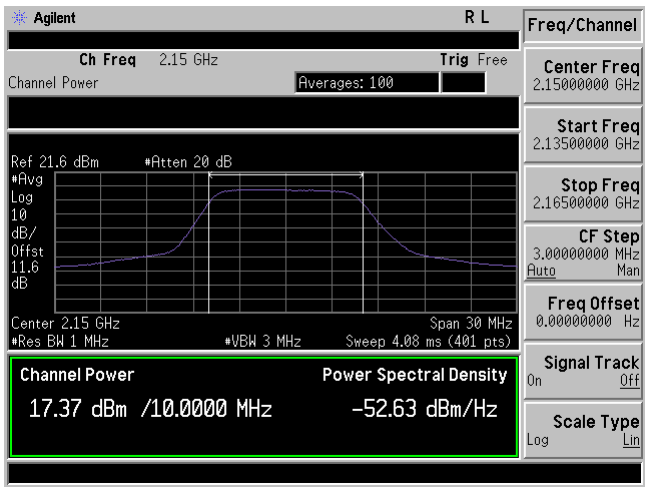
PWR-Band4-64QAM-10M BW-Low CH-Port2



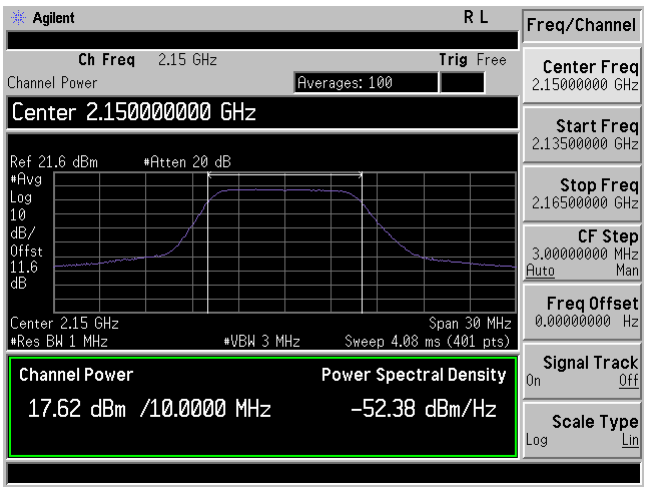
PWR-Band4-64QAM-10M BW-Mid CH-Port1



PWR-Band4-64QAM-10M BW-Mid CH-Port2

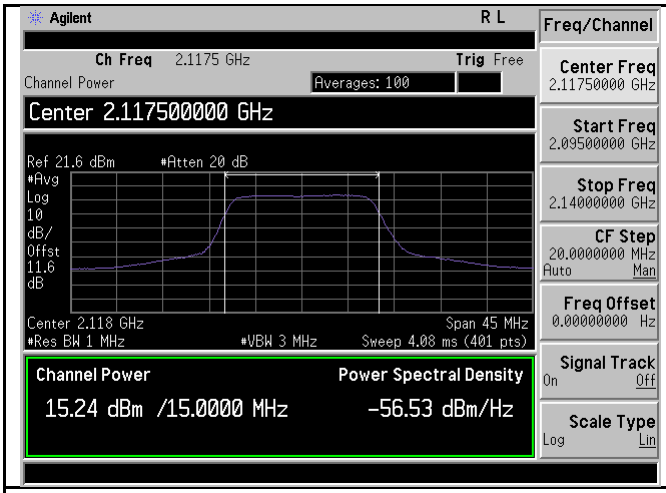


PWR-Band4-64QAM-10M BW-High CH-Port1

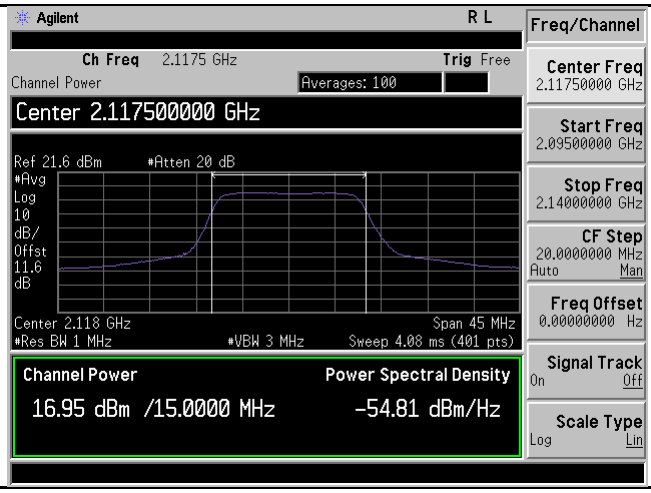


PWR-Band4-64QAM-10M BW-High CH-Port2

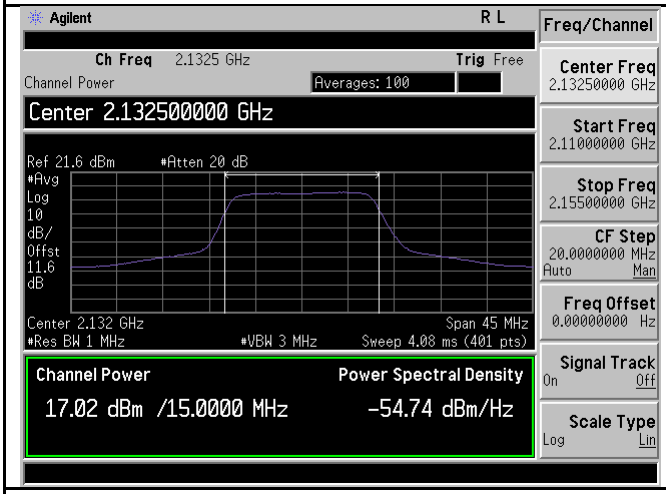
Test Plots for Band 4-QPSK-15MHz



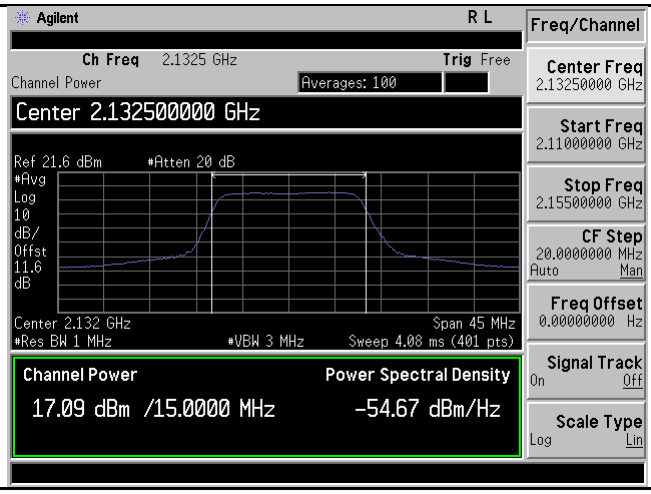
PWR-Band4-QPSK-15M BW-Low CH-Port1



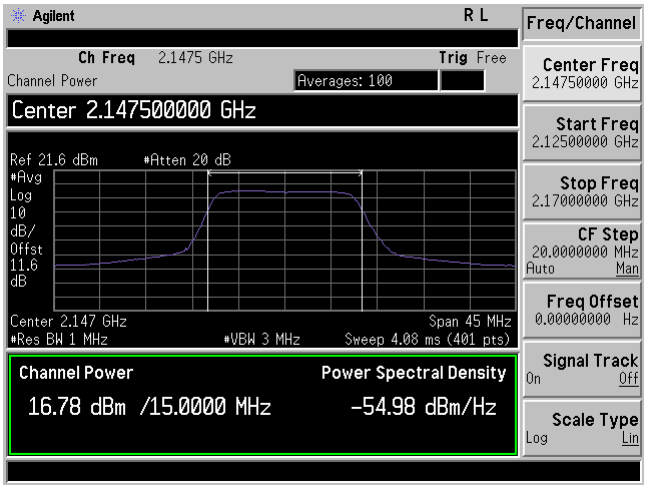
PWR-Band4-QPSK-15M BW-Low CH-Port2



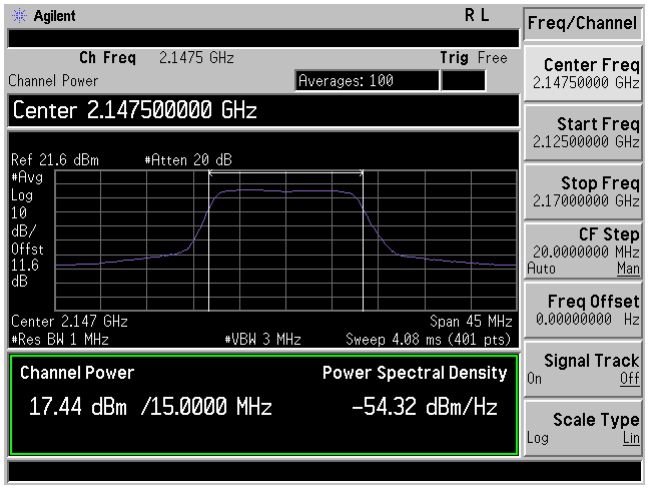
PWR-Band4-QPSK-15M BW-Mid CH-Port1



PWR-Band4-QPSK-15M BW-Mid CH-Port2

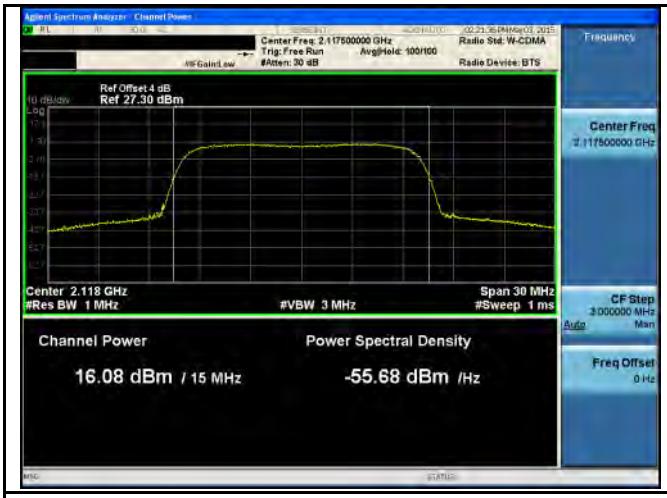


PWR-Band4-QPSK-15M BW-High CH-Port1

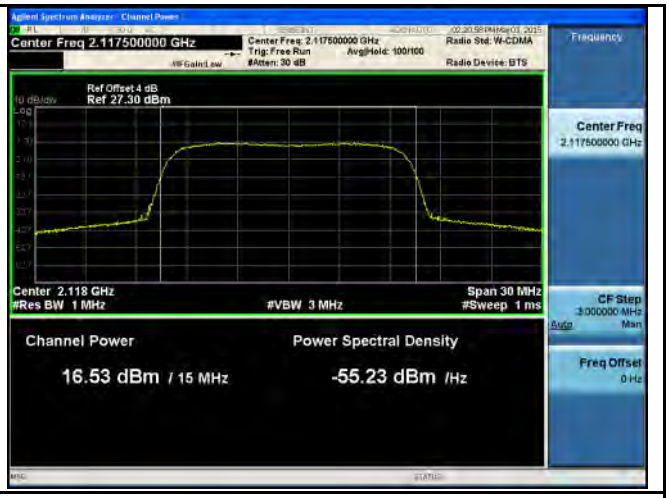


PWR-Band4-QPSK-15M BW-High CH-Port2

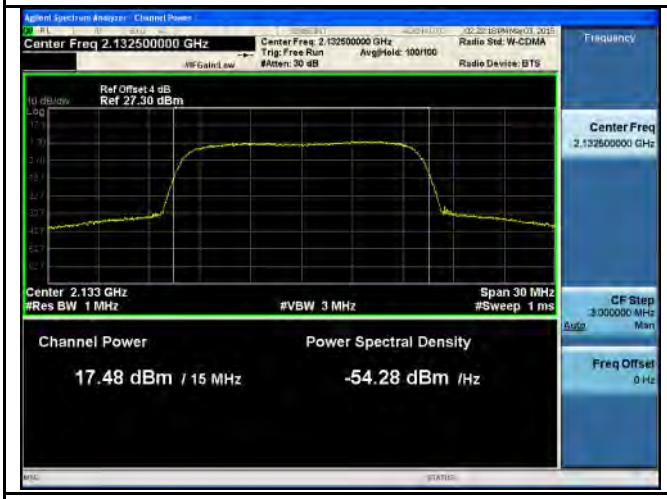
Test Plots for Band 4-16QAM-15MHz



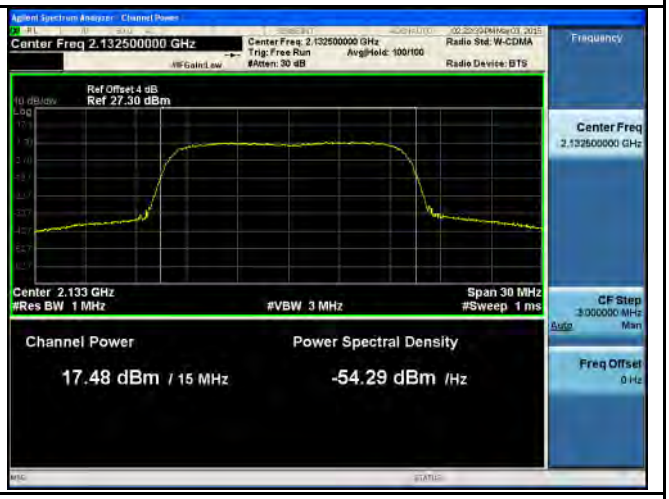
PWR-Band4-16QAM-15M BW-Low CH-Port1



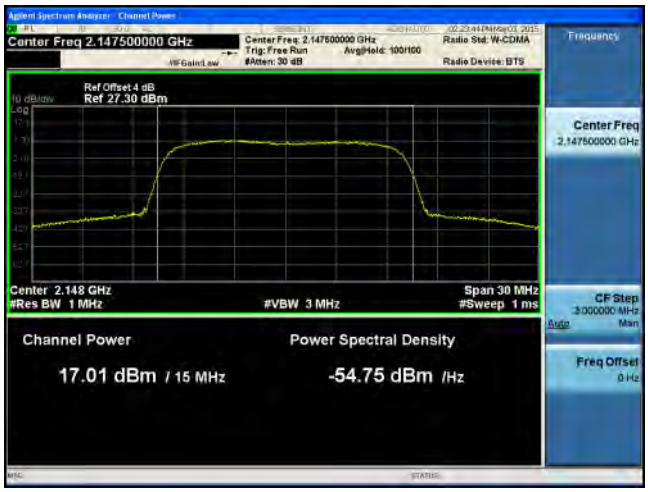
PWR-Band4-16QAM-15M BW-Low CH-Port2



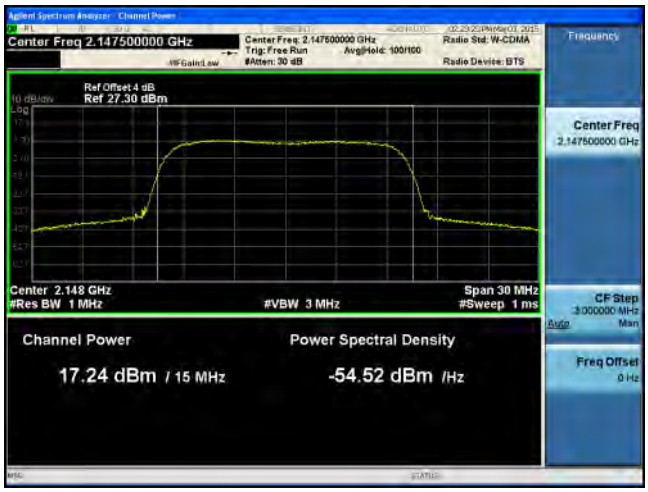
PWR-Band4-16QAM-15M BW-Mid CH-Port1



PWR-Band4-16QAM-15M BW-Mid CH-Port2

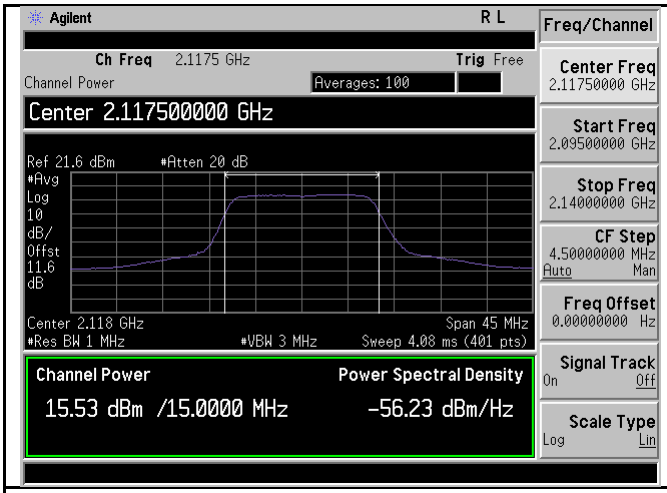


PWR-Band4-16QAM-15M BW-High CH-Port1

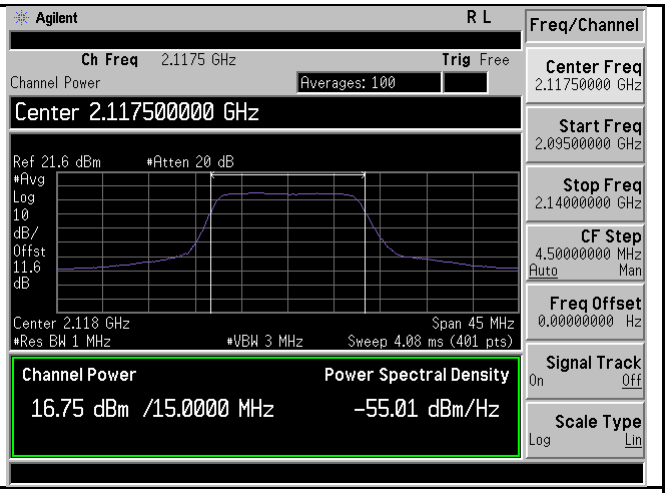


PWR-Band4-16QAM-15M BW-High CH-Port2

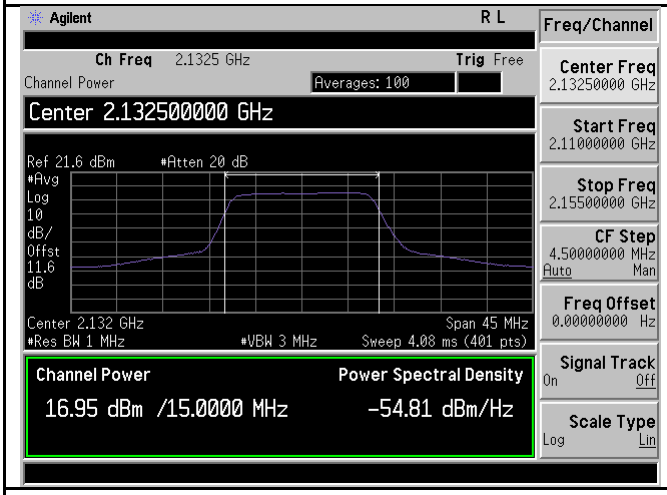
Test Plots for Band 4-64QAM-15MHz



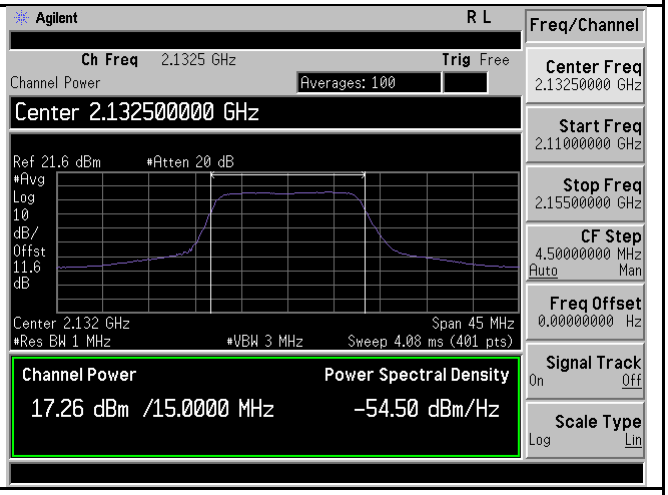
PWR-Band4-64QAM-15M BW-Low CH-Port1



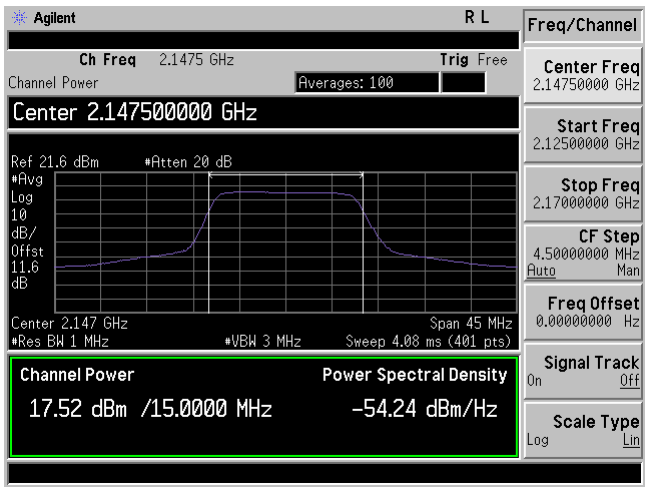
PWR-Band4-64QAM-15M BW-Low CH-Port2



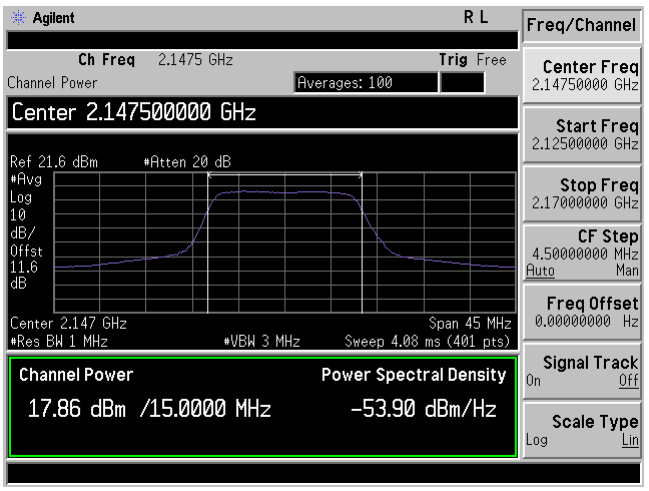
PWR-Band4-64QAM-15M BW-Mid CH-Port1



PWR-Band4-64QAM-15M BW-Mid CH-Port2

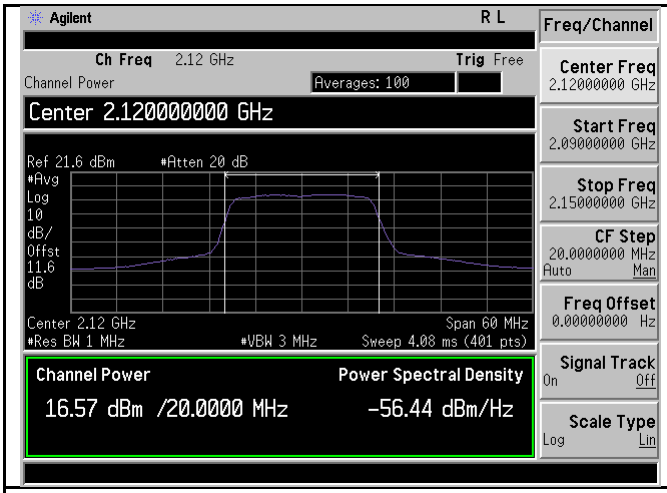


PWR-Band4-64QAM-15M BW-High CH-Port1

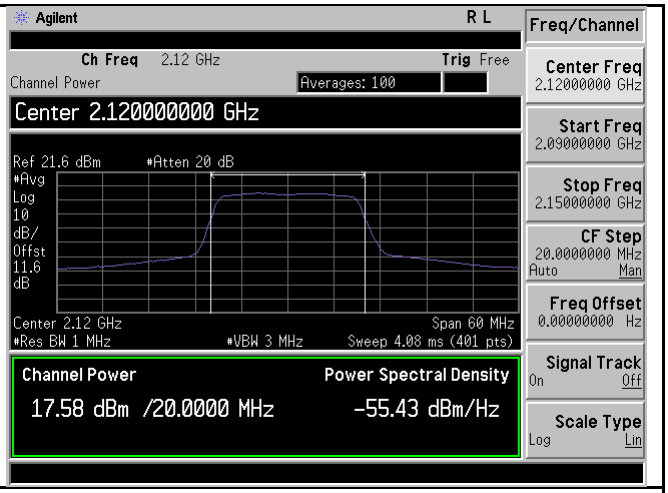


PWR-Band4-64QAM-15M BW-High CH-Port2

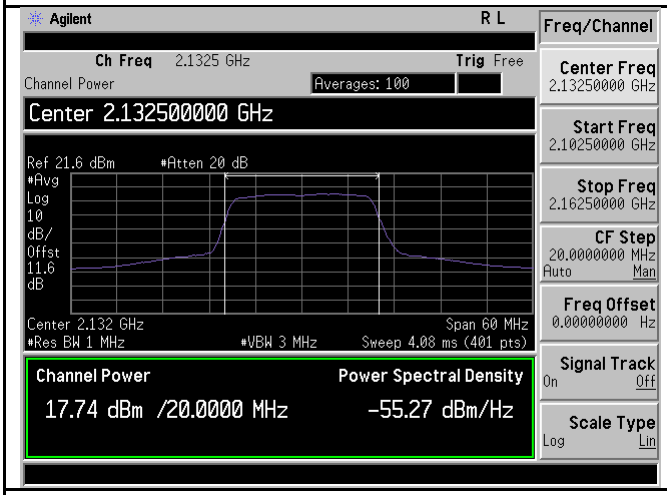
Test Plots for Band 4-QPSK-20MHz



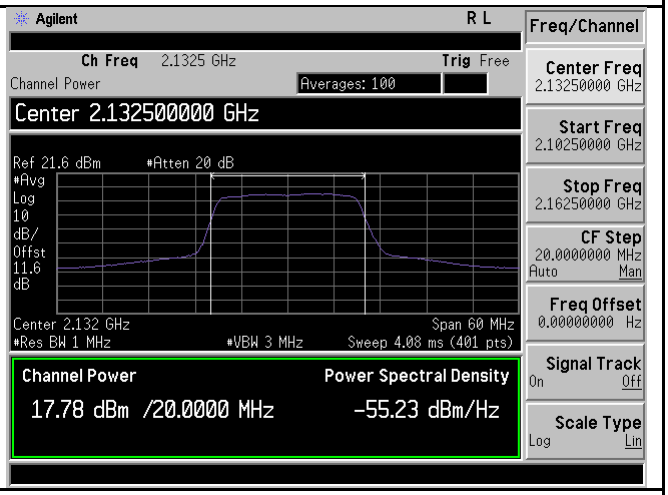
PWR-Band4-QPSK-20M BW-Low CH-Port1



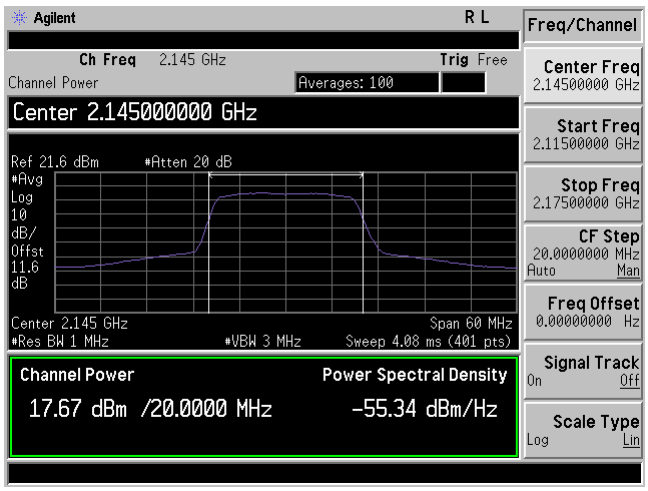
PWR-Band4-QPSK-20M BW-Low CH-Port2



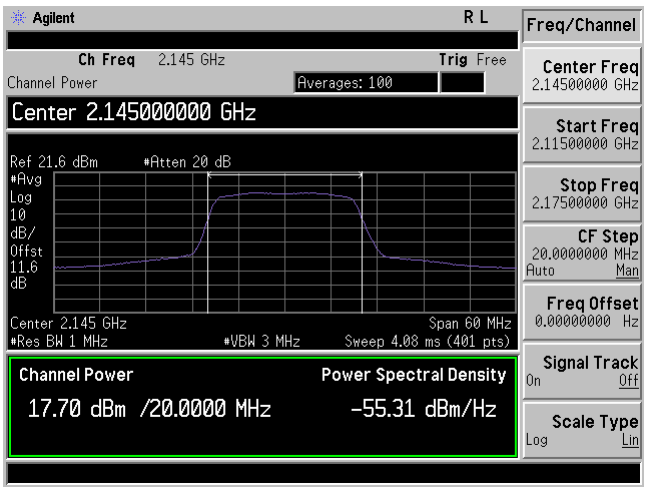
PWR-Band4-QPSK-20M BW-Mid CH-Port1



PWR-Band4-QPSK-20M BW-Mid CH-Port2



PWR-Band4-QPSK-20M BW-High CH-Port1

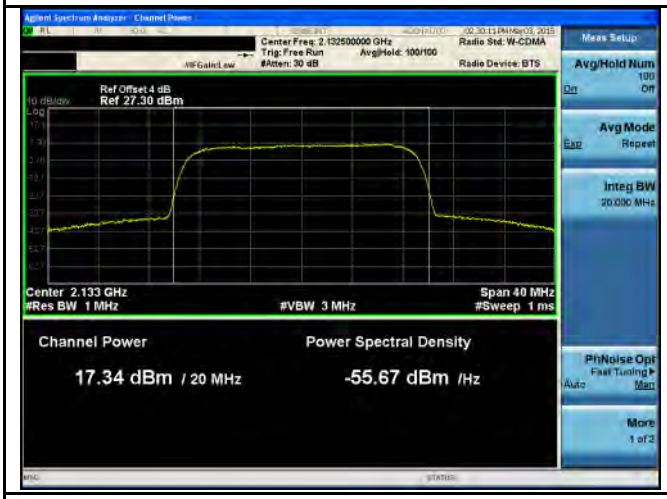


PWR-Band4-QPSK-20M BW-High CH-Port2

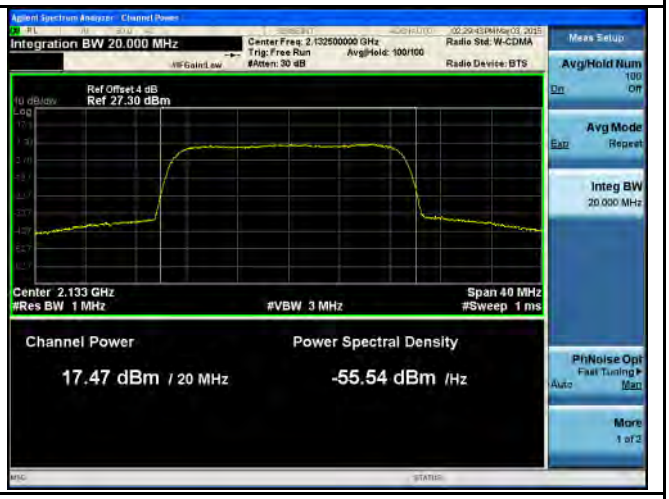
Test Plots for Band 4-16QAM-20MHz

PWR-Band4-16QAM-20M BW-Low CH-Port1

PWR-Band4-16QAM-20M BW-Low CH-Port2

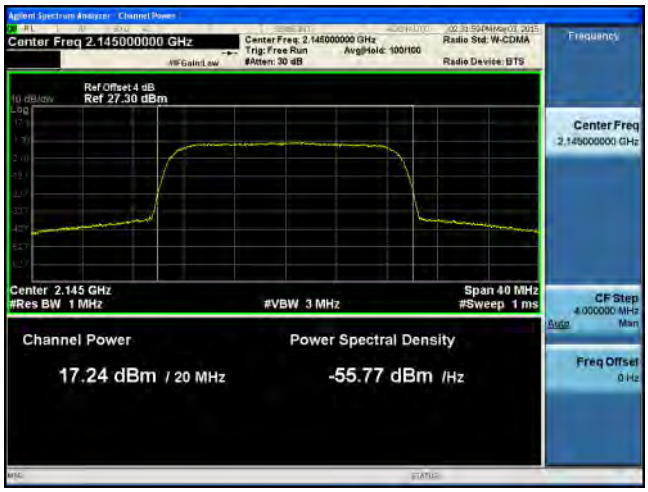


PWR-Band4-16QAM-20M BW-Mid CH-Port1



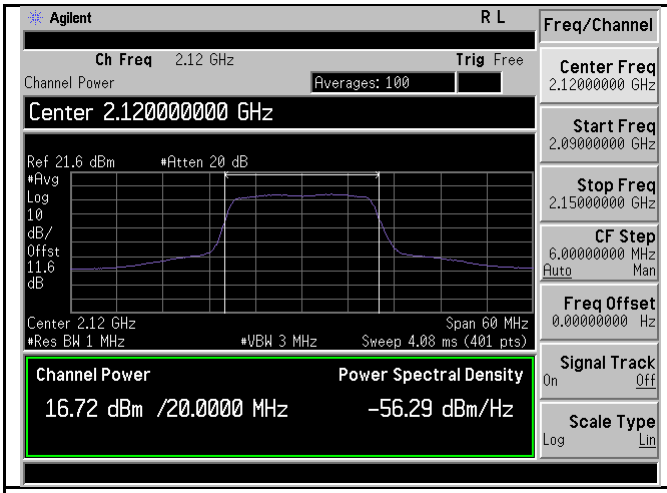
PWR-Band4-16QAM-20M BW-Mid CH-Port2

PWR-Band4-16QAM-20M BW-High CH-Port1

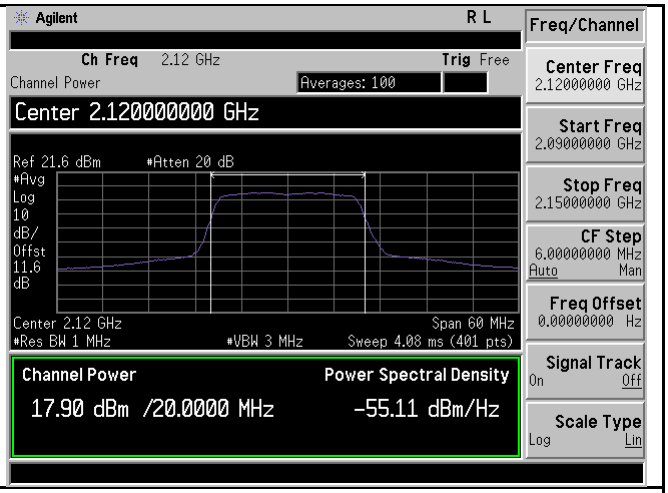


PWR-Band4-16QAM-20M BW-High CH-Port2

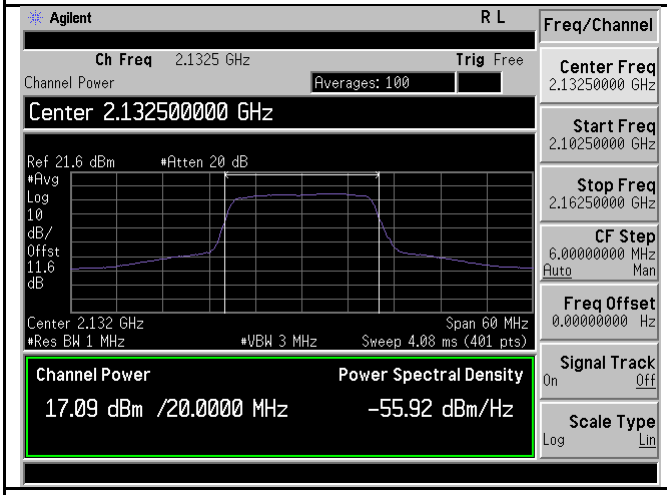
Test Plots for Band 4-64QAM-20MHz



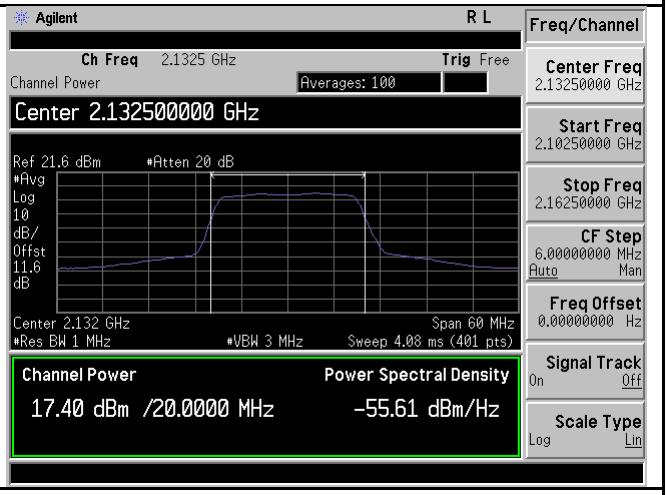
PWR-Band4-64QAM-20M BW-Low CH-Port1



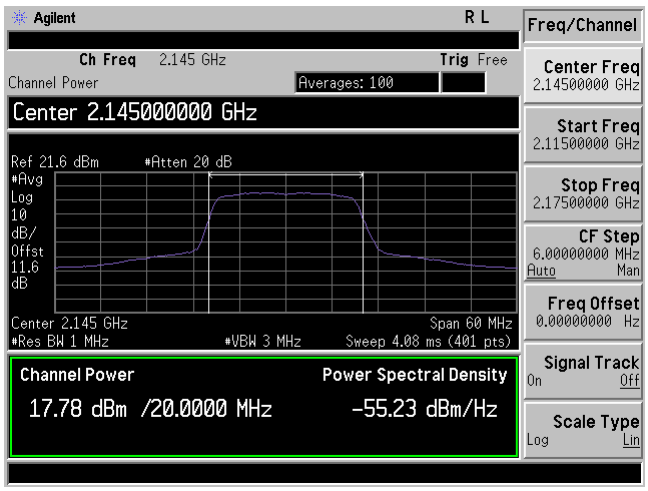
PWR-Band4-64QAM-20M BW-Low CH-Port2



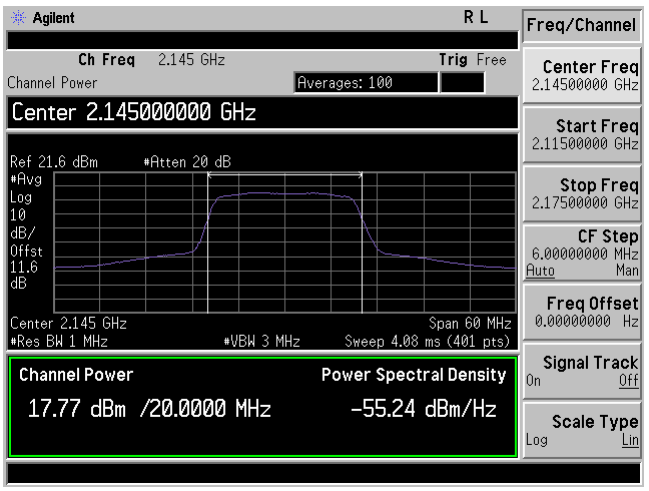
PWR-Band4-64QAM-20M BW-Mid CH-Port1



PWR-Band4-64QAM-20M BW-Mid CH-Port2

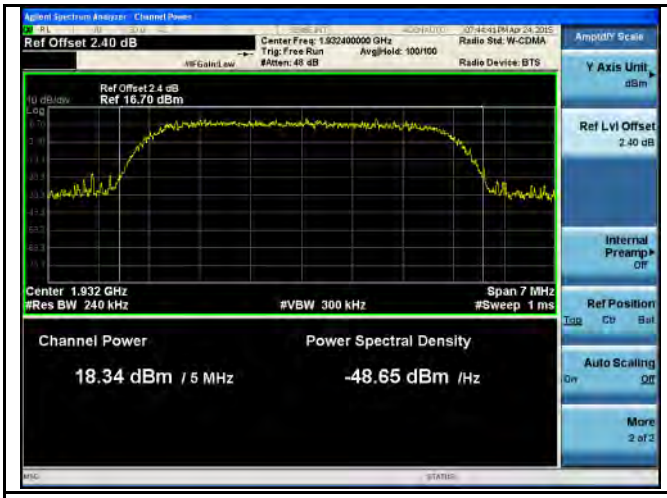


PWR-Band4-64QAM-20M BW-High CH-Port1

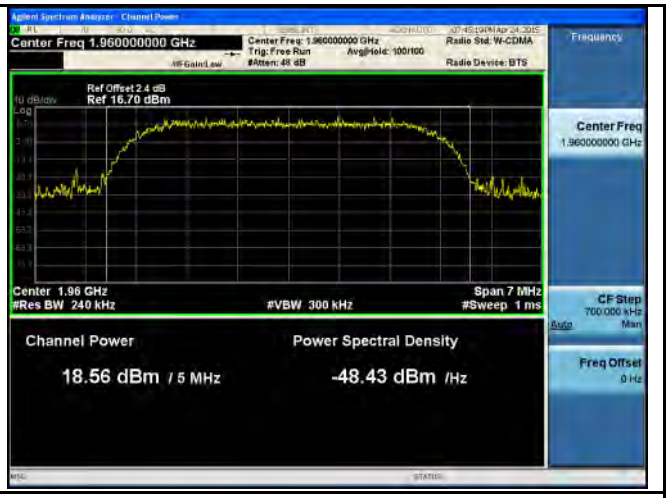


PWR-Band4-64QAM-20M BW-High CH-Port2

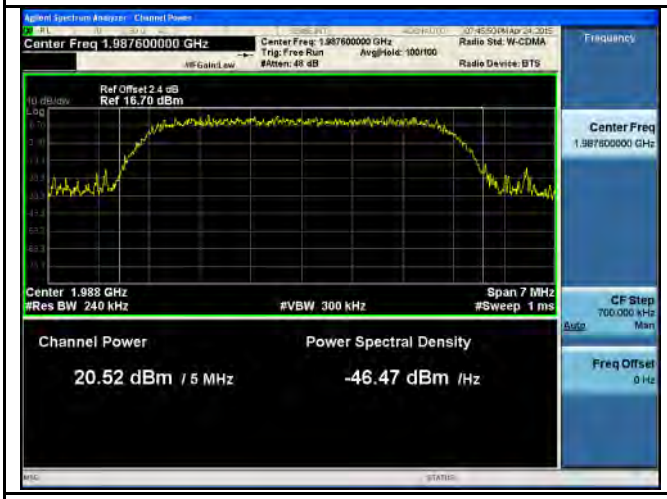
Test Plots for UMTS Band 2



PWR-Band2-QPSK-Low CH



PWR-Band2-QPSK-Mid CH



PWR-Band2-QPSK--High CH

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	04/30/2015 – 05/03/2015	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 48% 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 (dB)
5MHz BW, QPSK	Low	2112.5	9.62	13
	Mid	2132.5	9.53	13
	High	2152.5	9.53	13
5MHz BW, 16QAM	Low	2112.5	9.54	13
	Mid	2132.5	9.95	13
	High	2152.5	9.51	13
5MHz BW, 64QAM	Low	2112.5	9.65	13
	Mid	2132.5	9.52	13
	High	2152.5	9.49	13
10MHz BW, QPSK	Low	2115.0	8.94	13
	Mid	2132.5	8.93	13
	High	2150.0	8.87	13
10MHz BW, 16QAM	Low	2115.0	8.98	13
	Mid	2132.5	8.93	13
	High	2150.0	8.93	13
10MHz BW, 64QAM	Low	2115.0	8.94	13
	Mid	2132.5	8.94	13
	High	2150.0	8.91	13
15MHz BW, QPSK	Low	2117.5	9.11	13
	Mid	2132.5	9.01	13
	High	2147.5	9.01	13
15MHz BW, 16QAM	Low	2117.5	8.94	13
	Mid	2132.5	8.82	13
	High	2147.5	8.88	13
15MHz BW, 64QAM	Low	2117.5	9.09	13
	Mid	2132.5	9.02	13
	High	2147.5	9.00	13
20MHz BW, QPSK	Low	2120.0	8.98	13
	Mid	2132.5	8.90	13
	High	2145.0	8.87	13
20MHz BW, 16QAM	Low	2120.0	8.95	13
	Mid	2132.5	8.91	13
	High	2145.0	8.88	13
20MHz BW, 64QAM	Low	2120.0	8.95	13
	Mid	2132.5	8.88	13
	High	2145.0	8.85	13

Test Data for WCDMA

Type	Channel	Frequency (MHz)	Peak-Average Ratio (dB)	Peak-Average Ratio (dB)
3.84MHz BW, 16QAM	Low	1932.4	8.11	13
	Mid	1960.0	8.76	13
	High	1987.6	8.20	13

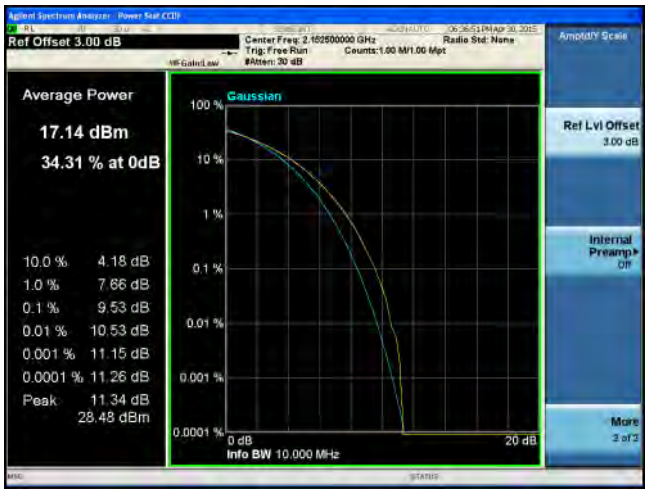
Test Plots

PK-AV-Ratio-Band4-QPSK-5M BW-Low

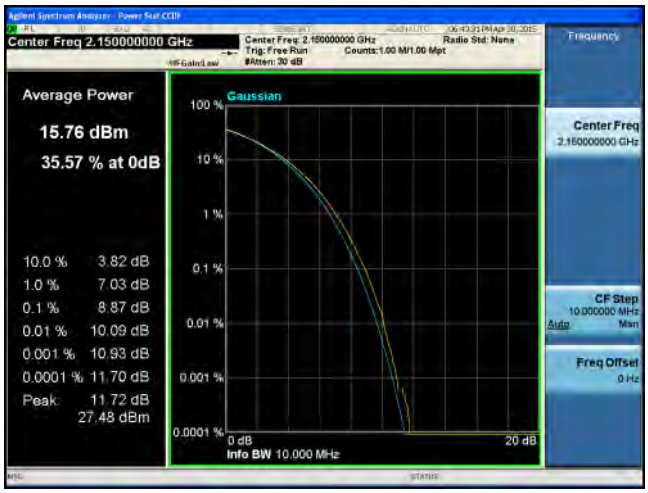
PK-AV-Ratio-Band4-QPSK-10M BW-Low

PK-AV-Ratio-Band4-QPSK-5M BW-Mid

PK-AV-Ratio-Band4-QPSK-10M BW-Mid



PK-AV-Ratio-Band4-QPSK-5M BW-High



PK-AV-Ratio-Band4-QPSK-10M BW-High

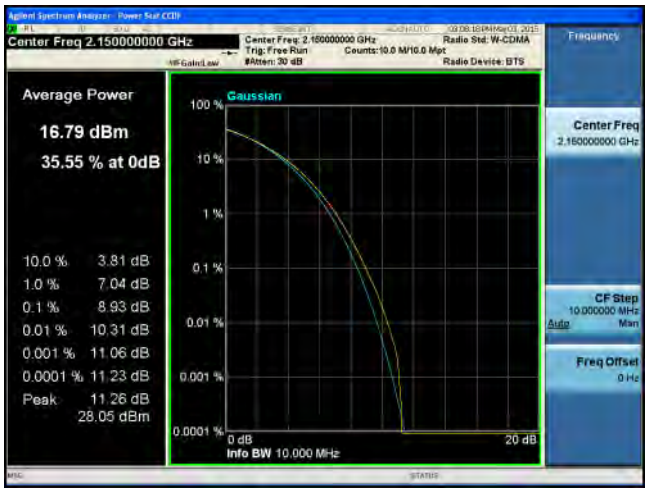
PK-AV-Ratio-Band4-16QAM-5M BW-Low

PK-AV-Ratio-Band4-16QAM-10M BW-Low

PK-AV-Ratio-Band4-16QAM-5M BW-Mid

PK-AV-Ratio-Band4-16QAM-10M BW-Mid

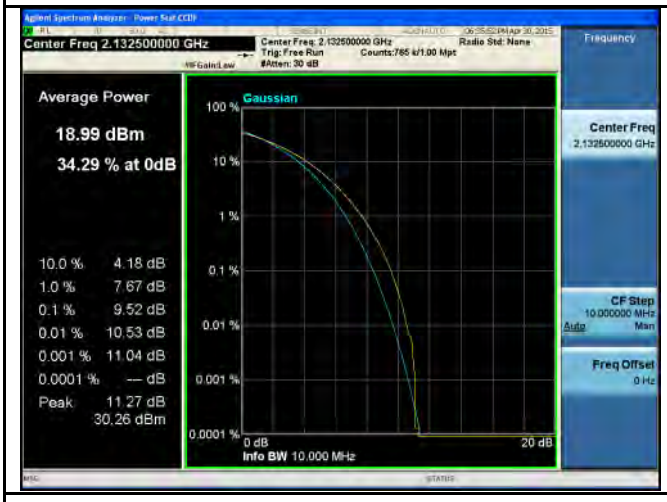
PK-AV-Ratio-Band4-16QAM-5M BW-High



PK-AV-Ratio-Band4-16QAM-10M BW-High

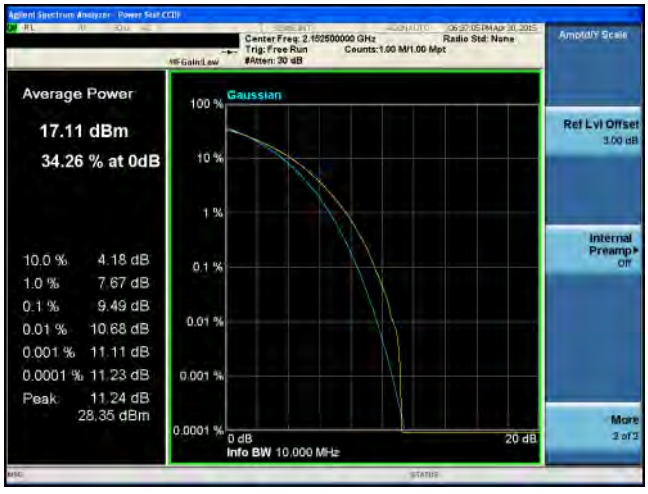
PK-AV-Ratio-Band4-64QAM-5M BW-Low

PK-AV-Ratio-Band4-64QAM-10M BW-Low



PK-AV-Ratio-Band4-64QAM-5M BW-Mid

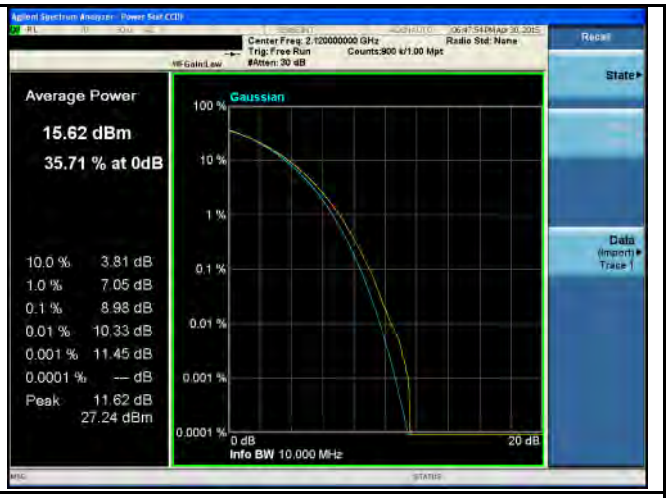
PK-AV-Ratio-Band4-64QAM-10M BW-Mid



PK-AV-Ratio-Band4-64QAM-5M BW-High

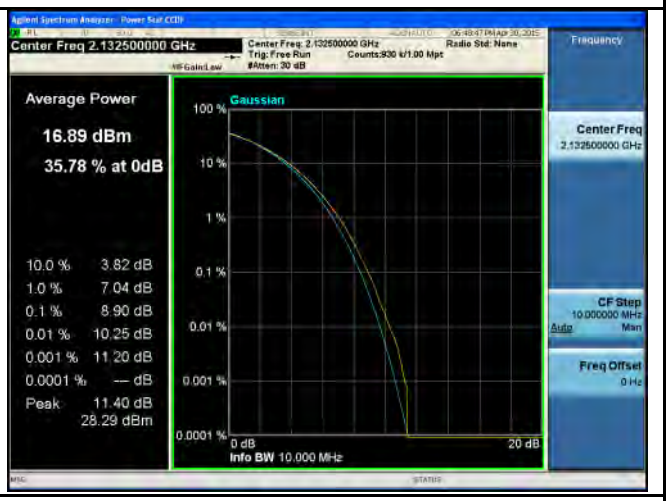
PK-AV-Ratio-Band4-64QAM-10M BW-High

PK-AV-Ratio-Band4-QPSK-15M BW-Low



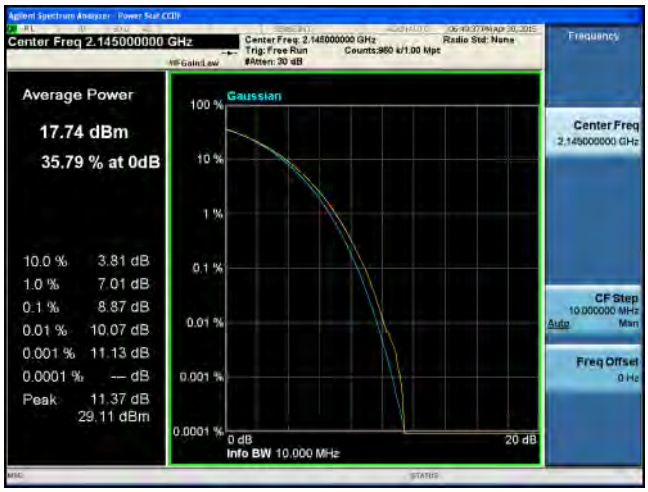
PK-AV-Ratio-Band4-QPSK-20M BW-Low

PK-AV-Ratio-Band4-QPSK-15M BW-Mid



PK-AV-Ratio-Band4-QPSK-20M BW-Mid

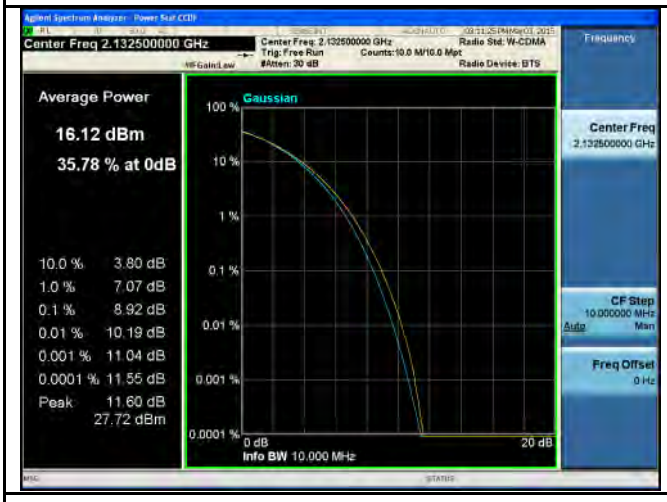
PK-AV-Ratio-Band4-QPSK-15M BW-High



PK-AV-Ratio-Band4-QPSK-20M BW-High

PK-AV-Ratio-Band4-16QAM-15M BW-Low

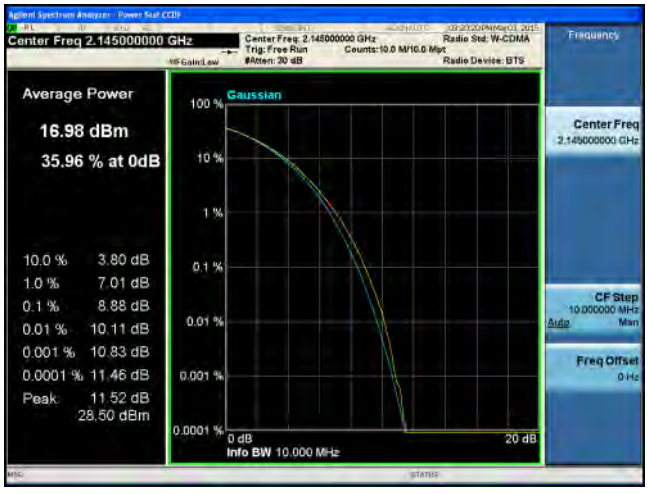
PK-AV-Ratio-Band4-16QAM-20M BW-Low



PK-AV-Ratio-Band4-16QAM-15M BW-Mid

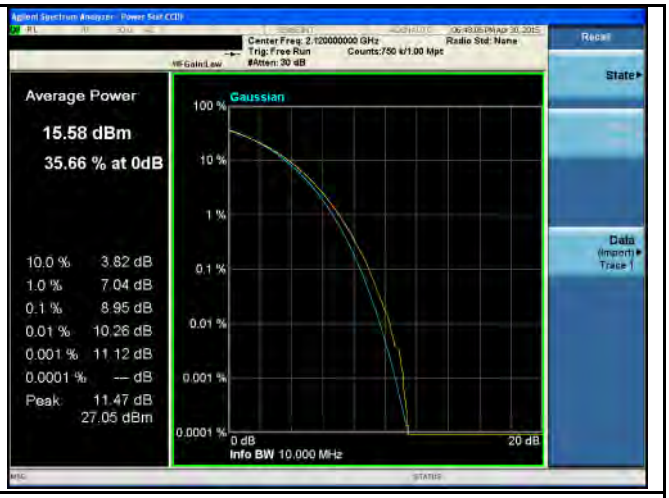
PK-AV-Ratio-Band4-16QAM-20M BW-Mid

PK-AV-Ratio-Band4-16QAM-15M BW-High



PK-AV-Ratio-Band4-16QAM-20M BW-High

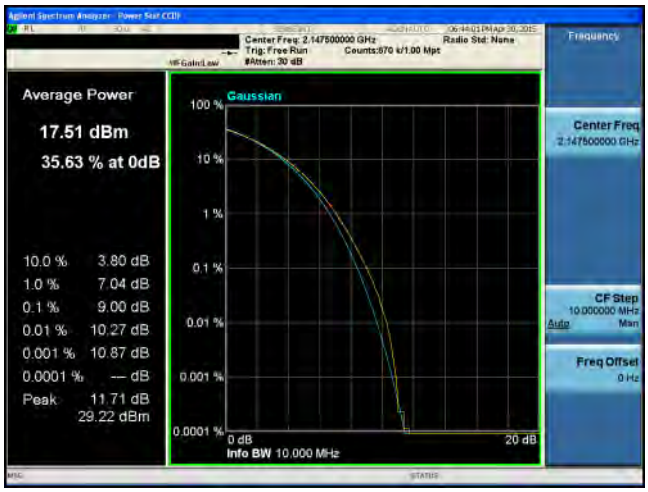
PK-AV-Ratio-Band4-64QAM-15M BW-Low



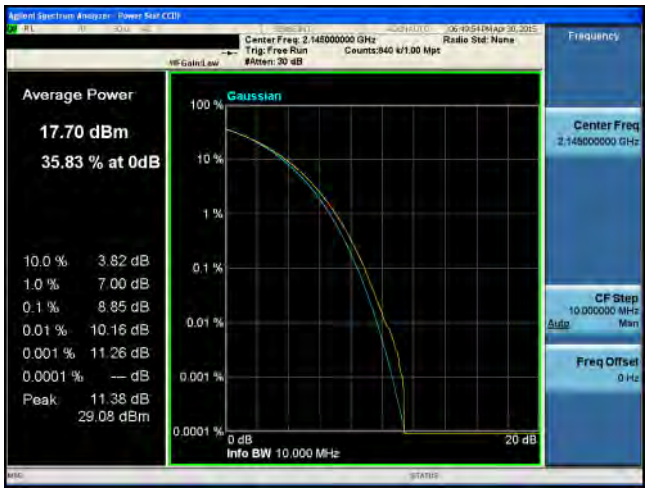
PK-AV-Ratio-Band4-64QAM-20M BW-Low

PK-AV-Ratio-Band4-64QAM-15M BW-Mid

PK-AV-Ratio-Band4-64QAM-20M BW-Mid

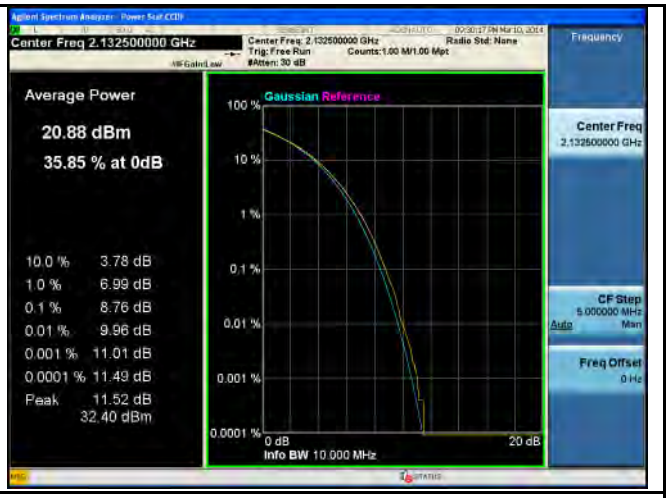


PK-AV-Ratio-Band4-64QAM-15M BW-High



PK-AV-Ratio-Band4-64QAM-20M BW-High

PK-AV-Ratio-Band2-QPSK-5M BW-Low



PK-AV-Ratio-Band2-QPSK-5M BW-Mid

PK-AV-Ratio-Band2-QPSK-5M 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	99% Occupied bandwidth measurement procedure - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26 dB bandwidth 99% OBW. ○ Set RBW = 1% -5% of Emission Bandwidth ○ Set VBW = approximately 3 x RBW ○ Detector = Peak ○ Trace mode = max hold ○ Sweep = auto couple - Capture the plot. Repeat above steps for different test channel and other modulation type.			
Test Date	04/30/2015 – 05/03/2015	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 48% 1008mbar
Remark	NONE			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Data

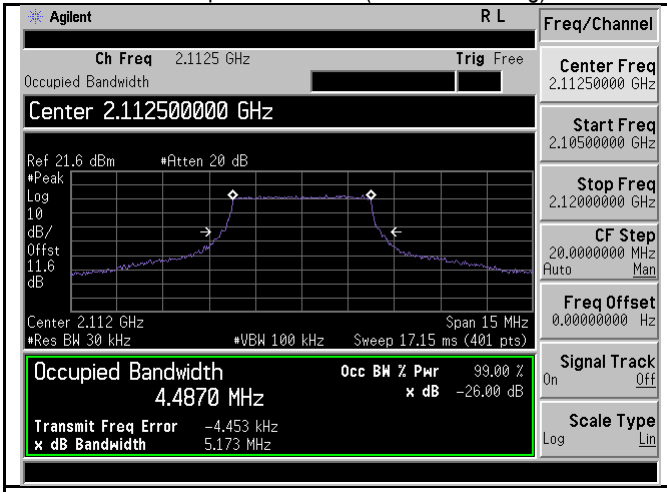
99% Bandwidth measurement result for LTE

Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
5MHz BW, QPSK	Low	2112.5	4.487	5.173
	Mid	2132.5	4.481	5.228
	High	2152.5	4.497	5.137
5MHz BW, 16QAM	Low	2112.5	4.424	4.629
	Mid	2132.5	4.416	4.592
	High	2152.5	4.426	4.594
5MHz BW, 64QAM	Low	2112.5	4.479	5.107
	Mid	2132.5	4.488	5.044
	High	2152.5	4.479	5.011
10MHz BW, 64QAM	Low	2115.0	8.931	9.609
	Mid	2132.5	8.916	9.756
	High	2150.0	8.933	9.789
10MHz BW, 16QAM	Low	2115.0	8.870	9.137
	Mid	2132.5	8.863	9.127
	High	2150.0	8.864	9.243
10MHz BW, 64QAM	Low	2115.0	8.936	9.751
	Mid	2132.5	8.913	9.648
	High	2150.0	8.931	9.725
15MHz BW, QPSK	Low	2117.5	13.402	14.309
	Mid	2132.5	13.379	14.431
	High	2147.5	13.361	14.332
15MHz BW, 16QAM	Low	2117.5	13.294	13.720
	Mid	2132.5	13.277	13.710
	High	2147.5	13.248	13.630
15MHz BW, 64QAM	Low	2117.5	13.401	14.430
	Mid	2132.5	13.399	14.315
	High	2147.5	13.370	14.045
20MHz BW, QPSK	Low	2120.0	17.808	18.828
	Mid	2132.5	17.782	18.623
	High	2145.0	17.992	18.756
20MHz BW, 16QAM	Low	2120.0	17.558	18.160
	Mid	2132.5	17.532	18.120
	High	2145.0	17.483	18.120
20MHz BW, 64QAM	Low	2120.0	17.819	18.685
	Mid	2132.5	17.808	18.712
	High	2145.0	17.805	18.607

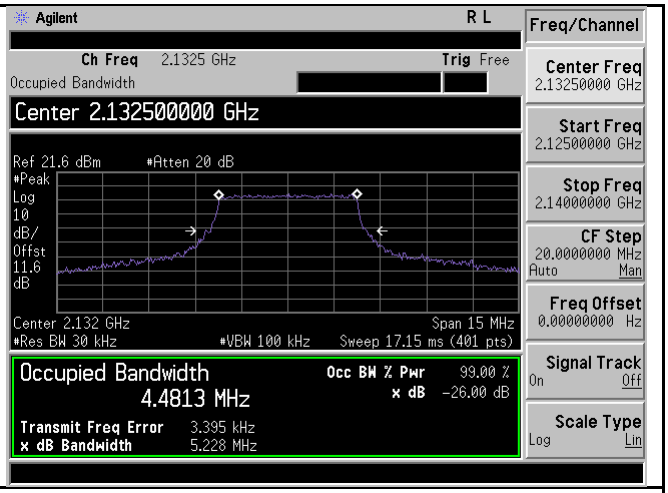
99% Bandwidth measurement result for WCDMA

Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
3.84MHz BW, QPSK	Low	1932.4	4.139	4.645
	Mid	1960.0	4.116	4.666
	High	1987.6	4.130	4.661

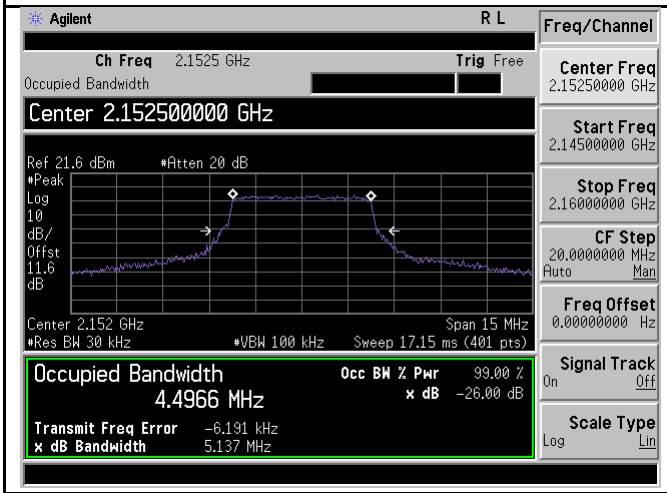
Test Plot for Occupied Bandwidth (5MHz BW setting)



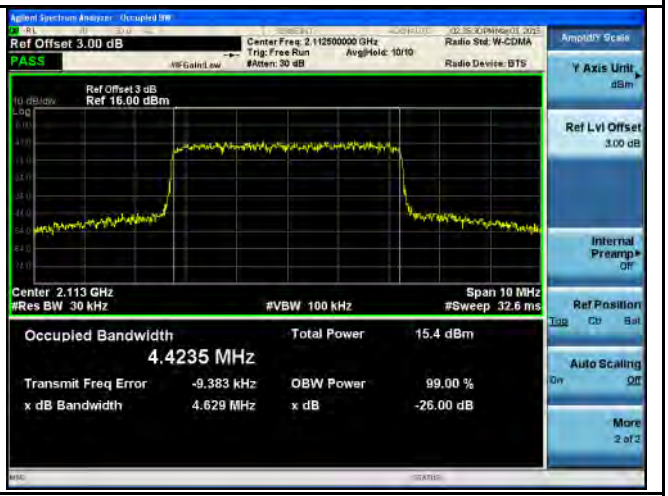
OBW-Band4-5M BW-Low- QPSK



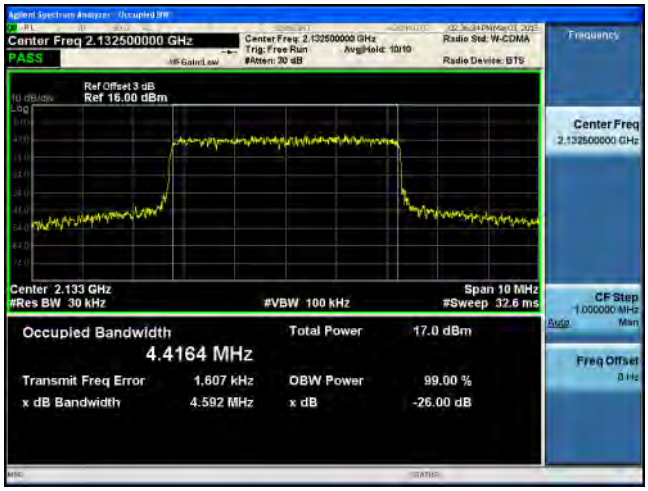
OBW-Band4-5M BW-Mid- QPSK



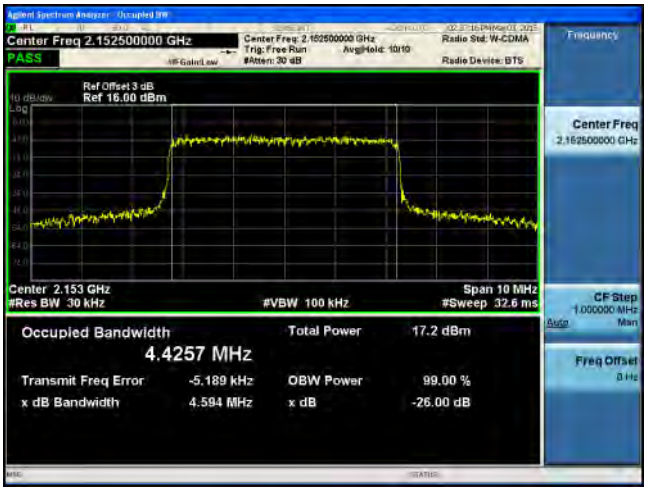
OBW-Band4-5M BW-High- QPSK



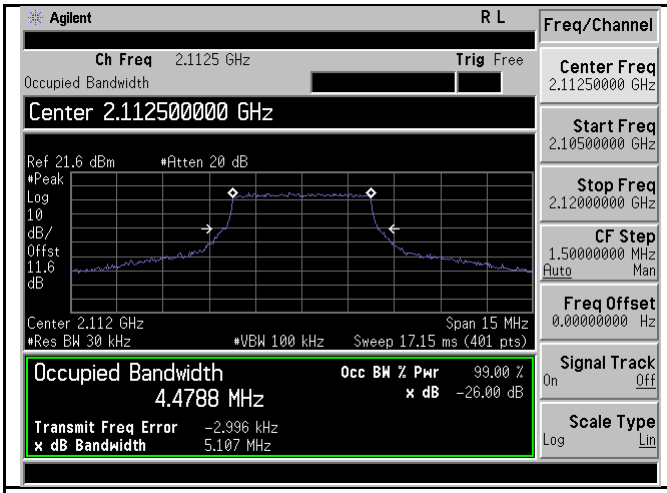
OBW-Band4-5M BW-Low- 16QAM



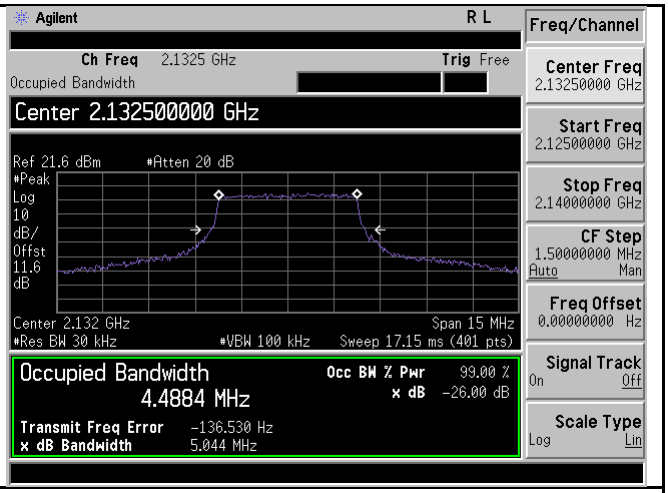
OBW-Band4-5M BW-Mid- 16QAM



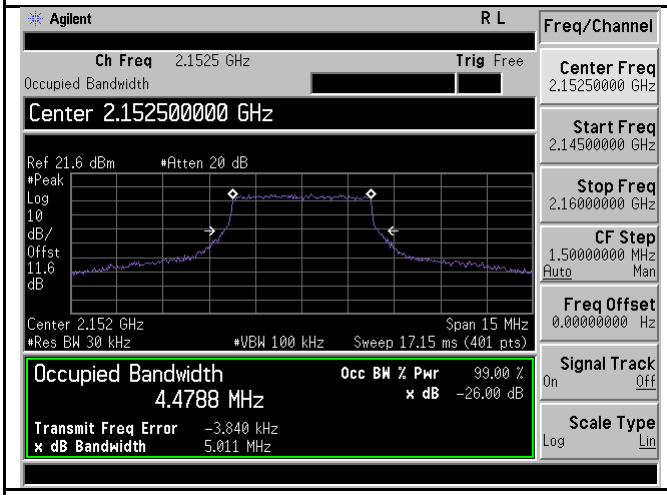
OBW-Band4-5M BW-High- 16QAM



OBW-Band4-5M BW-Low- 64QAM

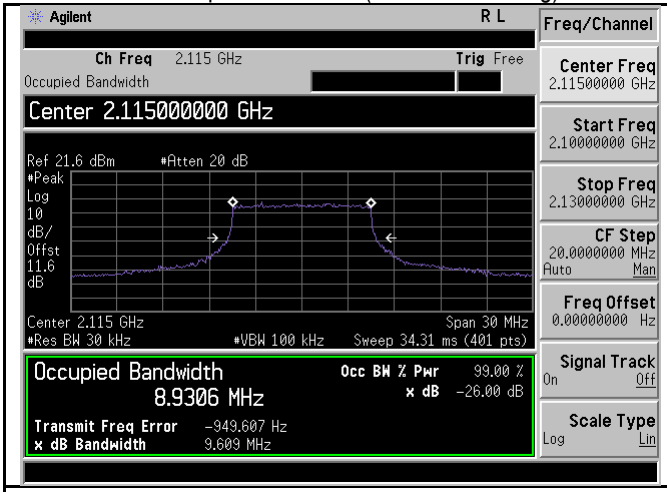


OBW-Band4-5M BW-Mid- 64QAM

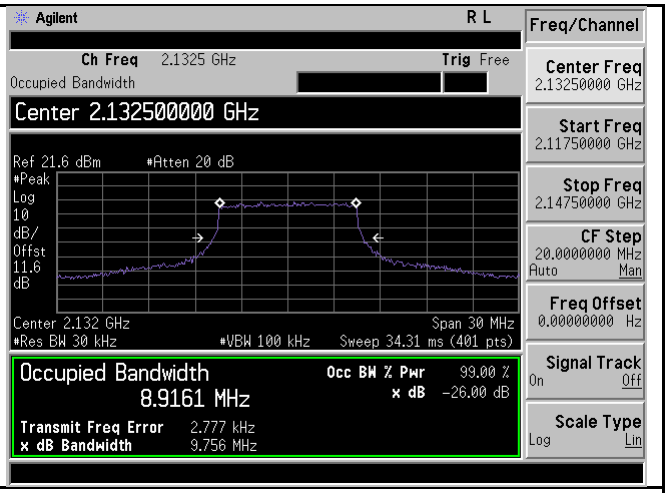


OBW-Band4-5M BW-High- 64QAM

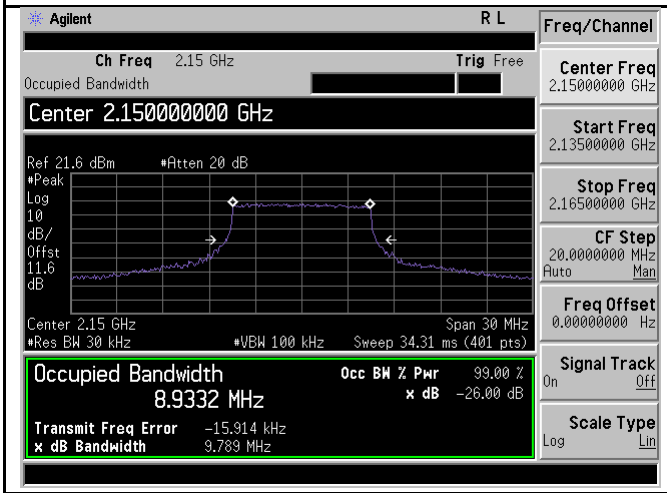
Test Plot for Occupied Bandwidth (10MHz BW setting)



OBW-Band4-10M BW-Low- QPSK



OBW-Band4-10M BW-Mid- QPSK

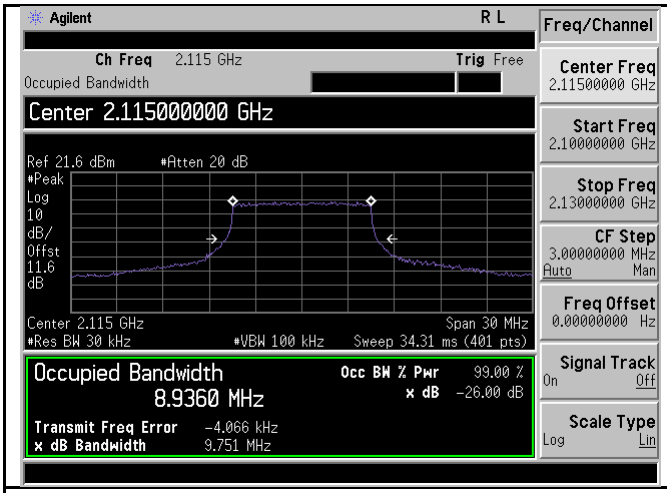


OBW-Band4-10M BW-High- QPSK

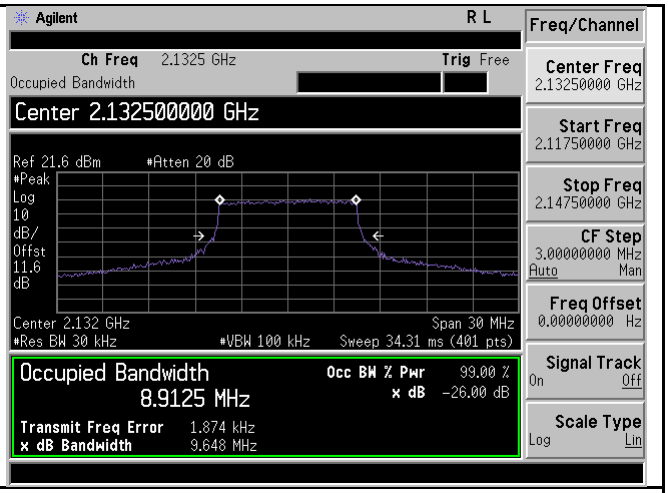
OBW-Band4-10M BW-Low- 16QAM

OBW-Band4-10M BW-Mid- 16QAM

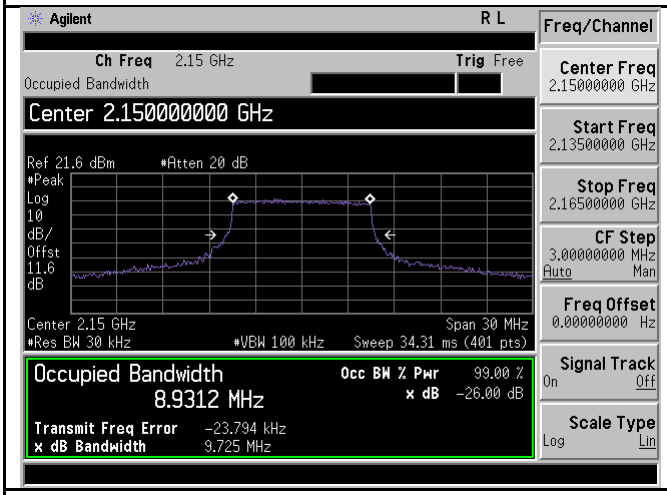
OBW-Band4-10M BW-Mid- 16QAM



OBW-Band4-10M BW-Low- 64QAM

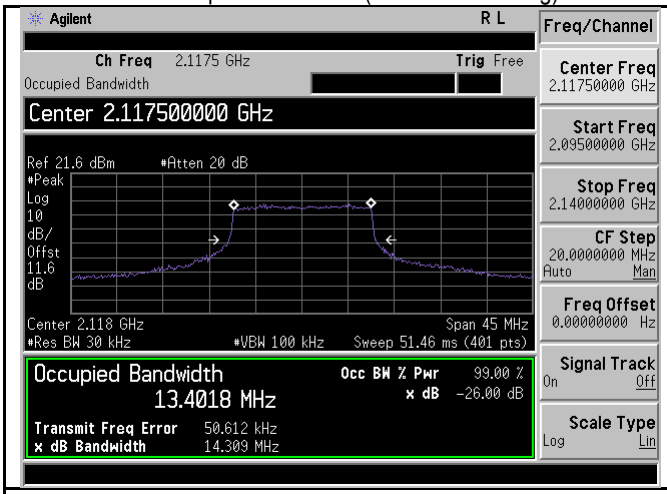


OBW-Band4-10M BW-Mid- 64QAM

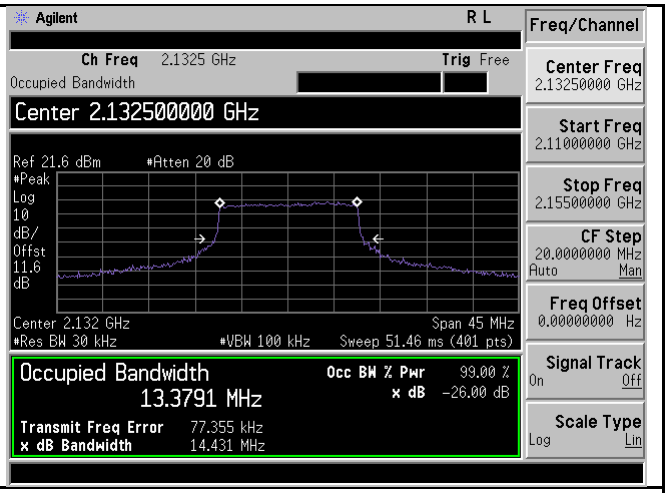


OBW-Band4-10M BW-High- 64QAM

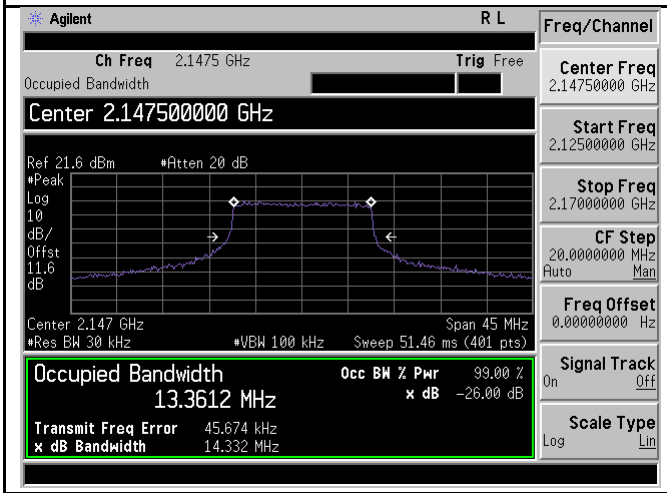
Test Plot for Occupied Bandwidth (15MHz BW setting)



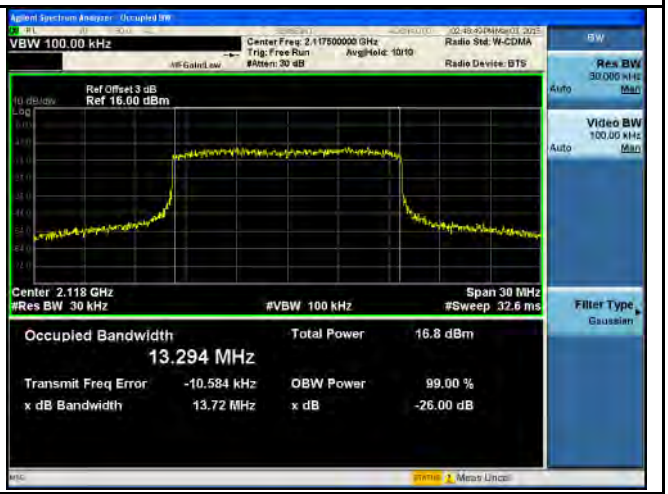
OBW-Band4-15M BW-Low- QPSK



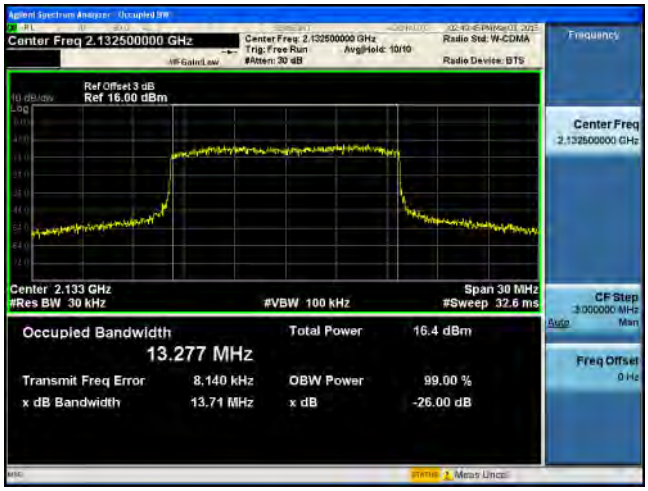
OBW-Band4-15M BW-Mid- QPSK



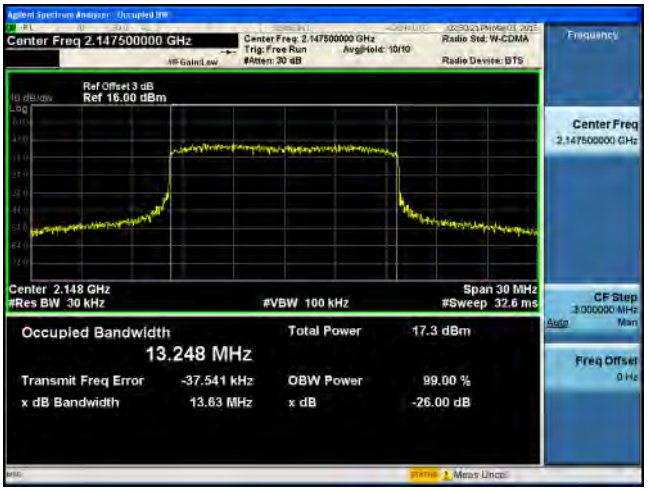
OBW-Band4-15M BW-High- QPSK



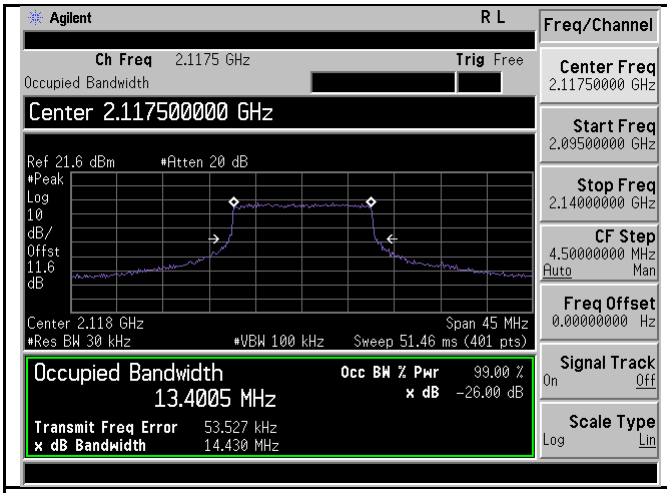
OBW-Band4-15M BW-Low- 16QAM



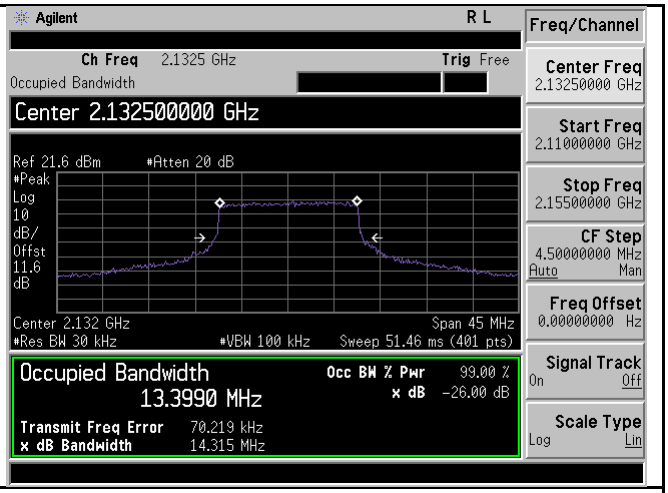
OBW-Band4-15M BW-Mid- 16QAM



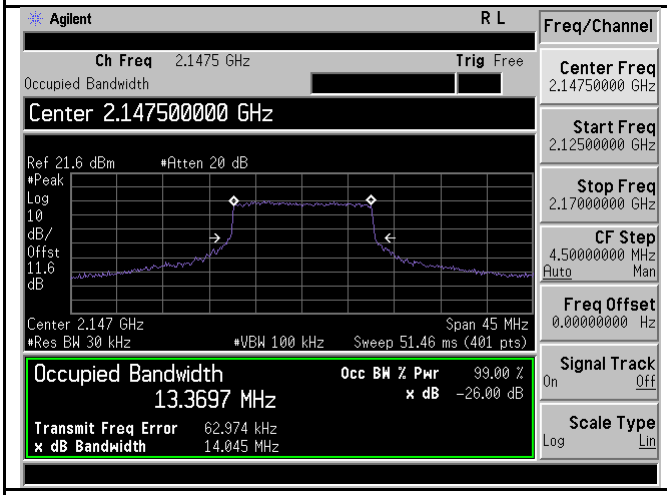
OBW-Band4-15M BW-Mid- 16QAM



OBW-Band4-15M BW-Low- 64QAM

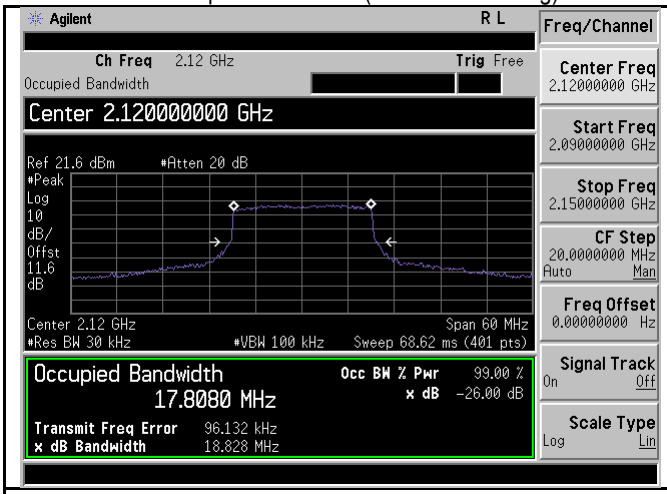


OBW-Band4-15M BW-Mid- 64QAM

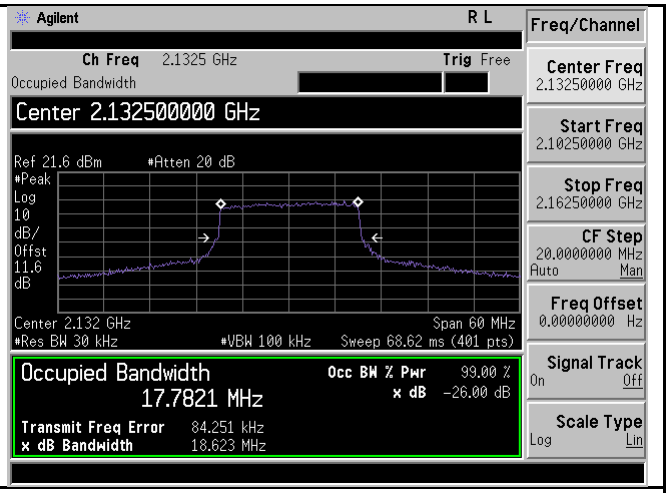


OBW-Band4-15M BW-High- 64QAM

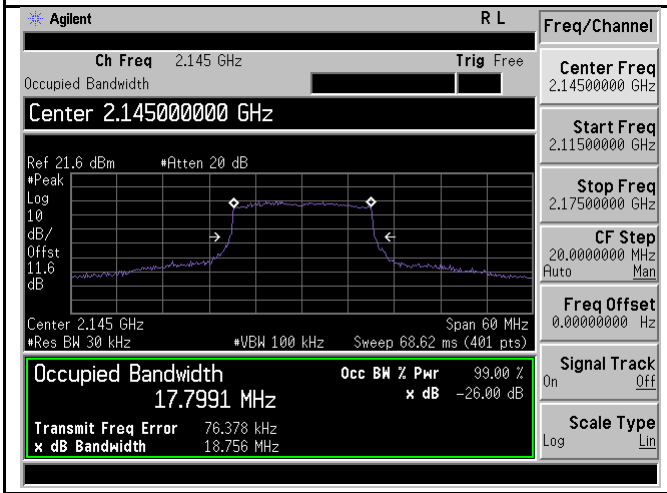
Test Plot for Occupied Bandwidth (20MHz BW setting)



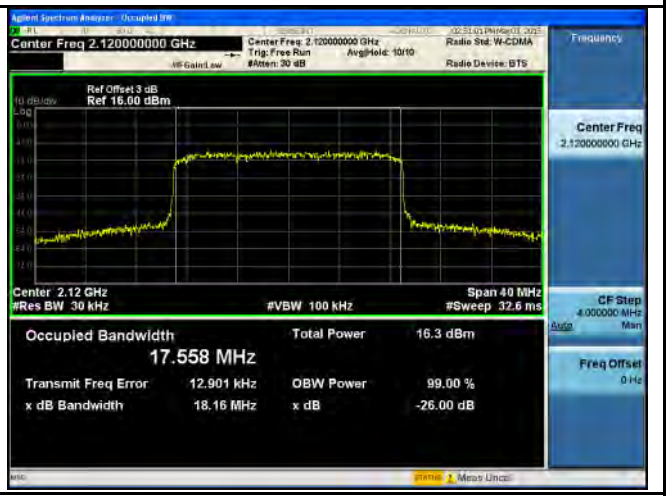
OBW-Band4-20M BW-Low- QPSK



OBW-Band4-20M BW-Mid- QPSK



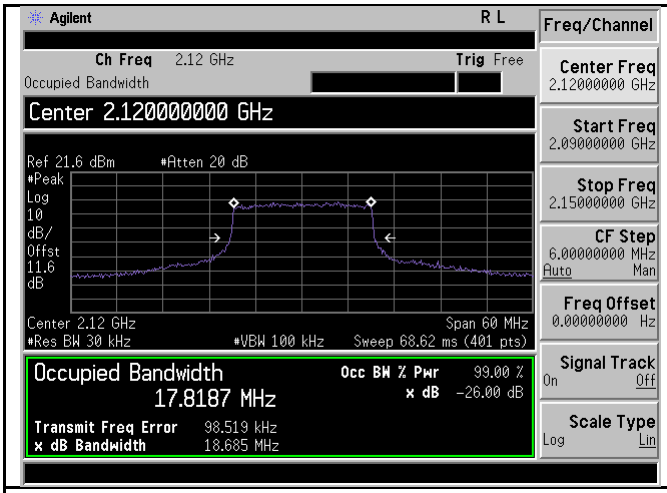
OBW-Band4-20M BW-High- QPSK



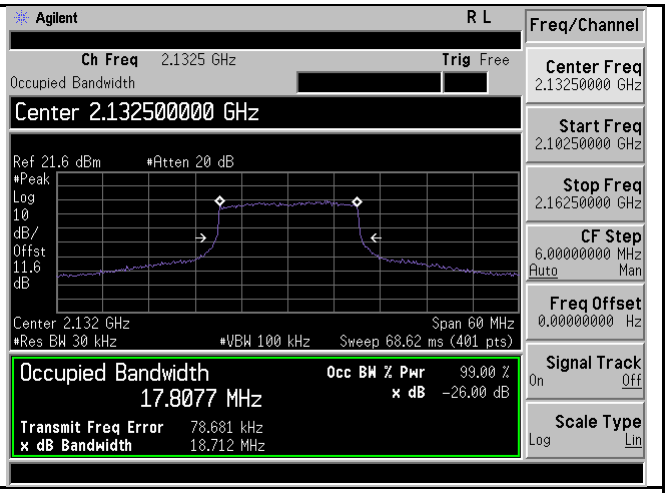
OBW-Band4-20M BW-Low- 16QAM

OBW-Band4-20M BW-Mid- 16QAM

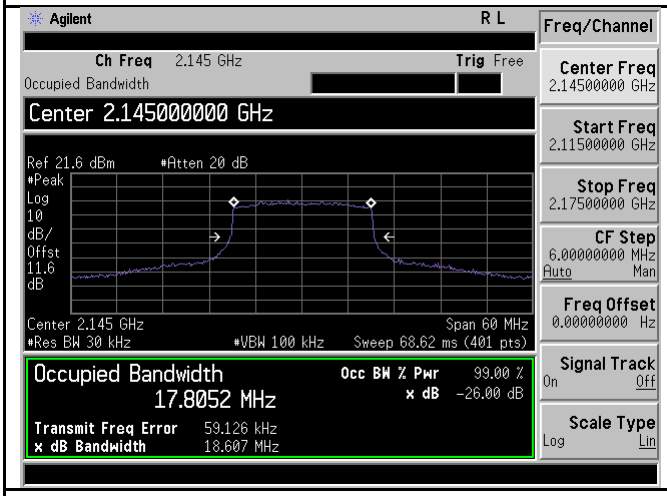
OBW-Band4-20M BW-Mid- 16QAM



OBW-Band4-20M BW-Low- 64QAM



OBW-Band4-20M BW-Mid- 64QAM



OBW-Band4-20M BW-High- 64QAM

Test Plots for WCDMA Band2

OBW-Band2&25-Low

OBW-Band2&25-Mid

OBW-Band2&25-High

10.4 Antenna Port Spurious Emission

Requirement(s):

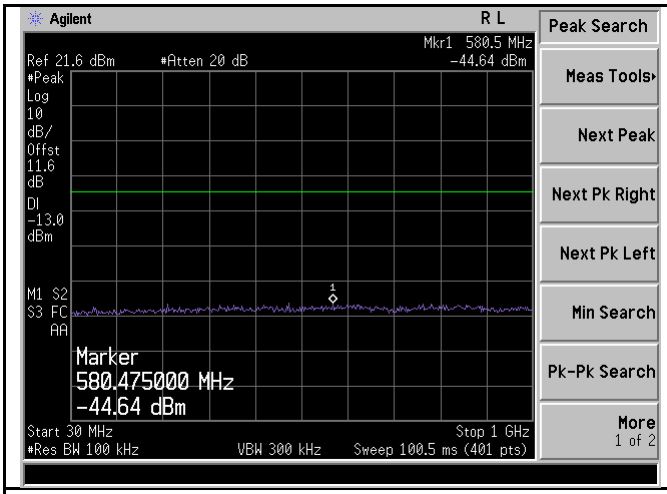
Spec	Item	Requirement	Applicable
47CFR22.917 RSS-133 (6.5), RSS-139 (6.5)	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.	☐
47CFR24.238 RSS-133 (6.5), 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	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.			
Test Date	04/30/2015 – 05/03/2015	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 48% 1008mbar
Remark	The EUT was scanned up to 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. Limit calculation: Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm The measurement was made with the spurious measurement function on spectrum analyzer. The failing frequency showing on the plot is the fundamental emission, not spurious emission.			
Result	☒ Pass ☐ Fail			

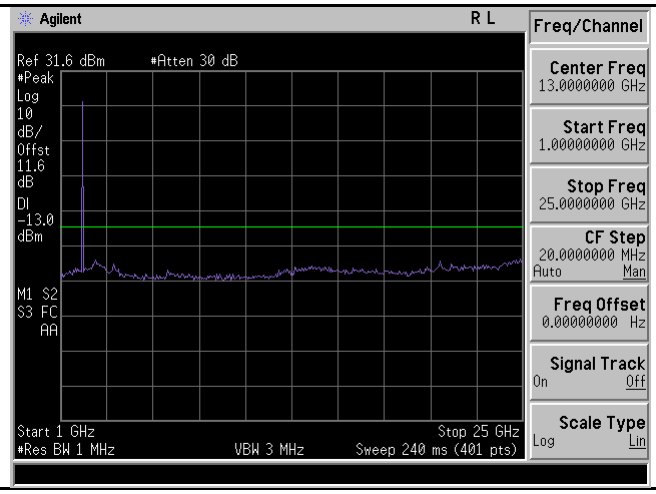
Test Data ☐ Yes ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

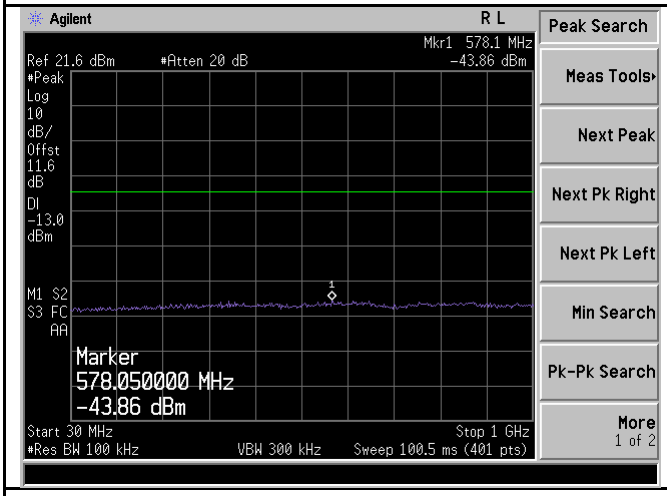
Test Plots



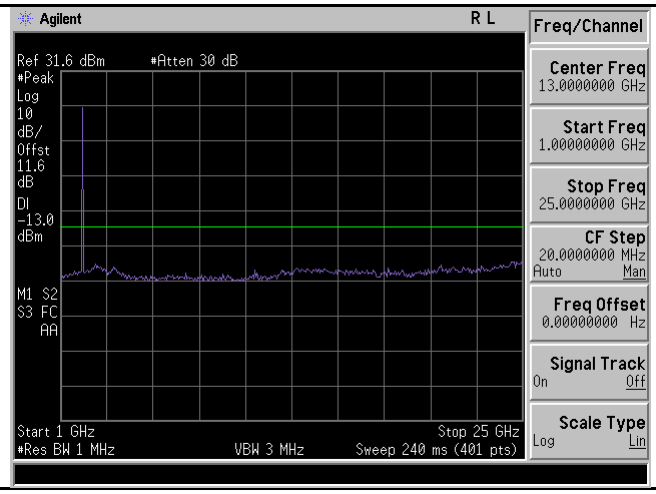
TX CSE-Band4-QPSK-5M BW-Low CH-below 1G



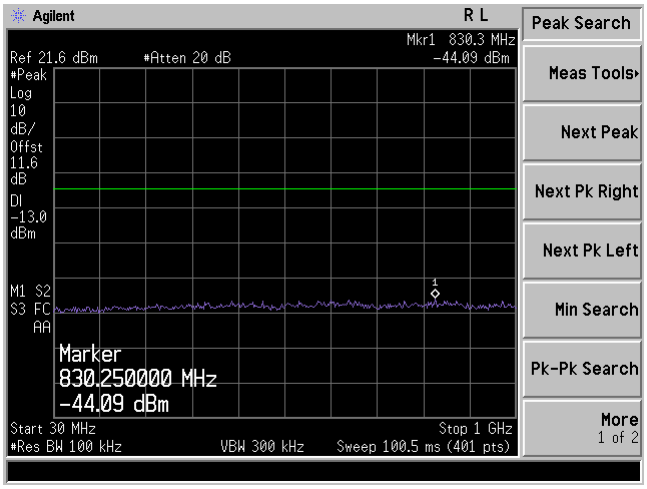
TX CSE-Band4-QPSK-5M BW-Low CH-above 1G



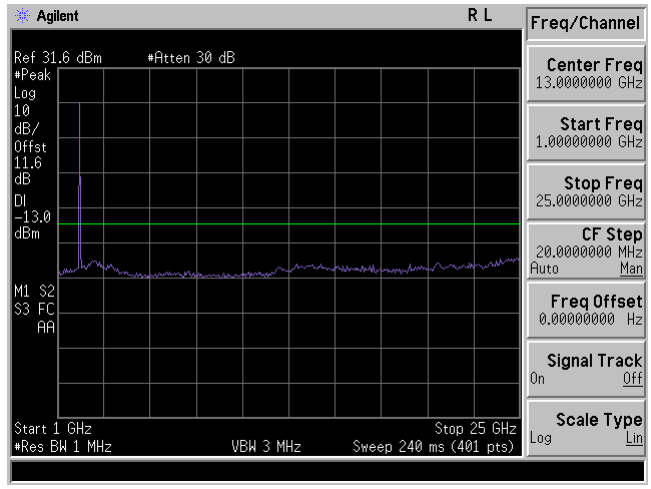
TX CSE-Band4-QPSK-5M BW-Mid CH-below 1G



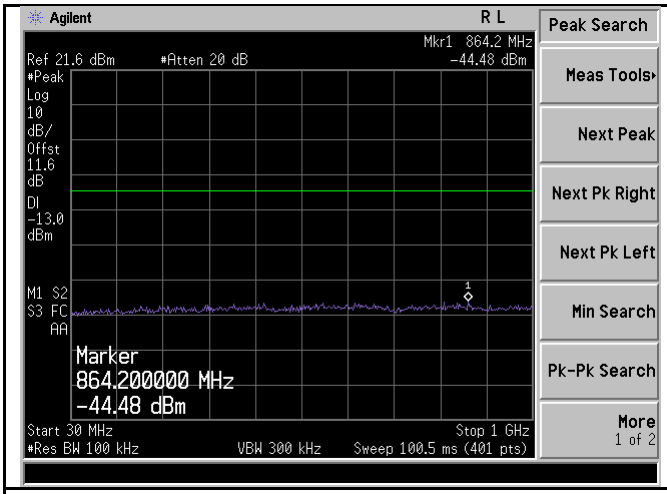
TX CSE-Band4-QPSK-5M BW-Mid CH-above 1G



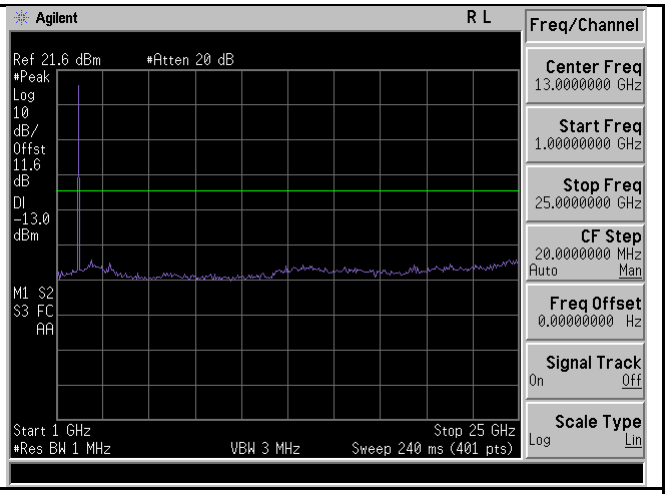
TX CSE-Band4-QPSK-5M BW-High CH-below 1G



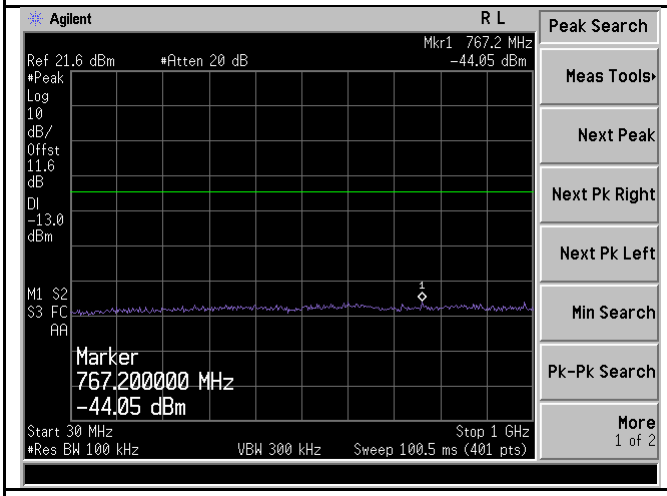
TX CSE-Band4-QPSK-5M BW-High CH-above 1G



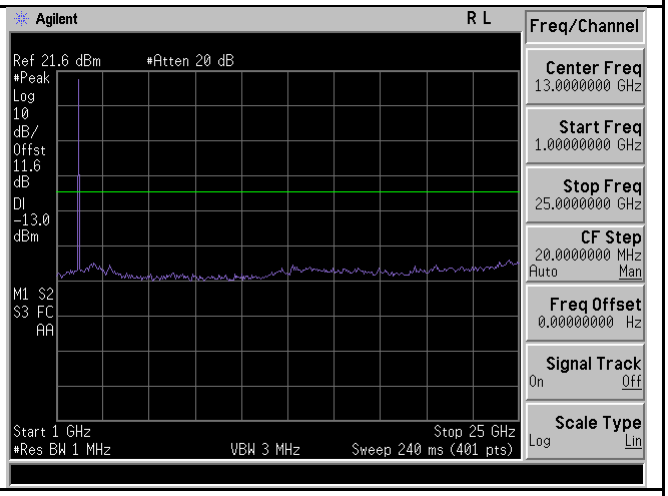
TX CSE-Band4-QPSK-10M BW-Low CH-below 1G



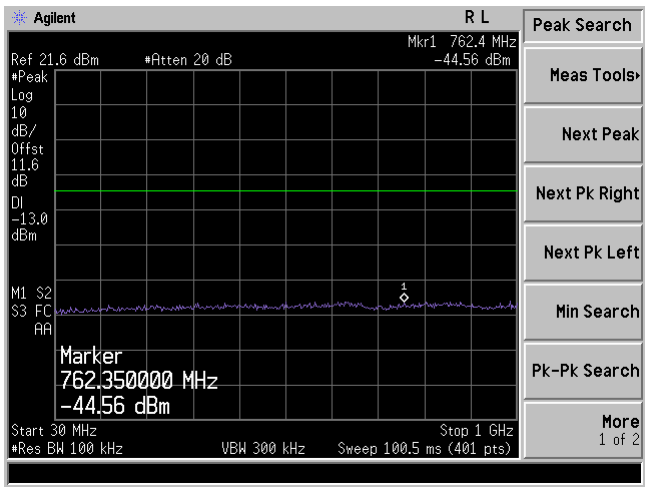
TX CSE-Band4-QPSK-10M BW-Low CH-above 1G



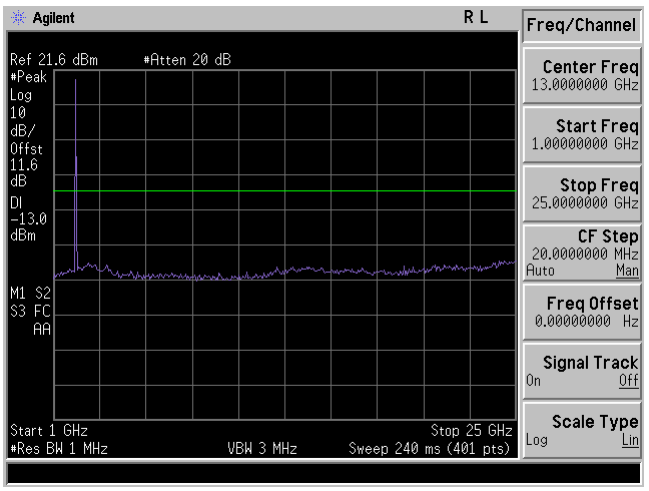
TX CSE-Band4-QPSK-10M BW-Mid CH-below 1G



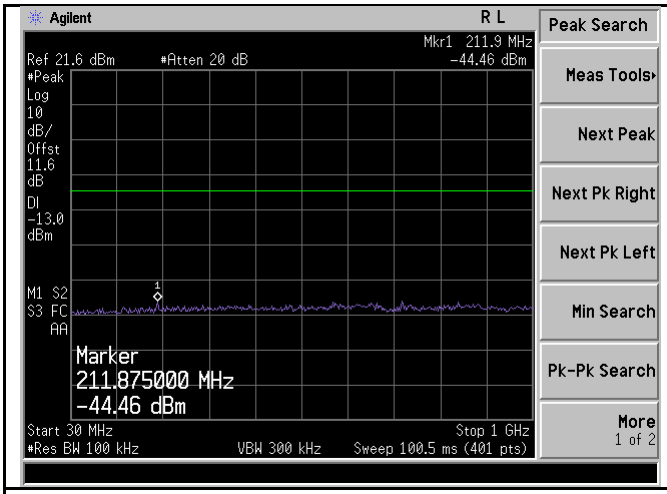
TX CSE-Band4-QPSK-10M BW-Mid CH-above 1G



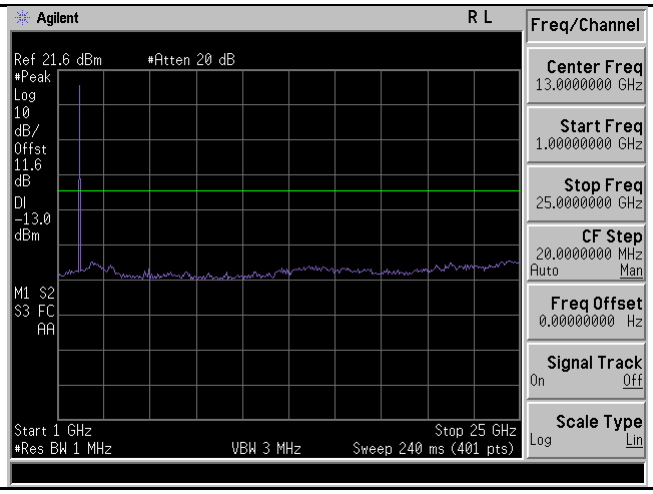
TX CSE-Band4-QPSK-10M BW-High CH-below 1G



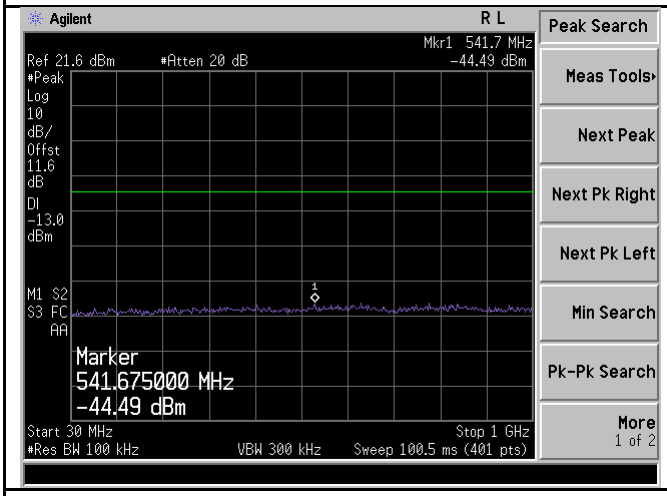
TX CSE-Band4-QPSK-10M BW-High CH-above 1G



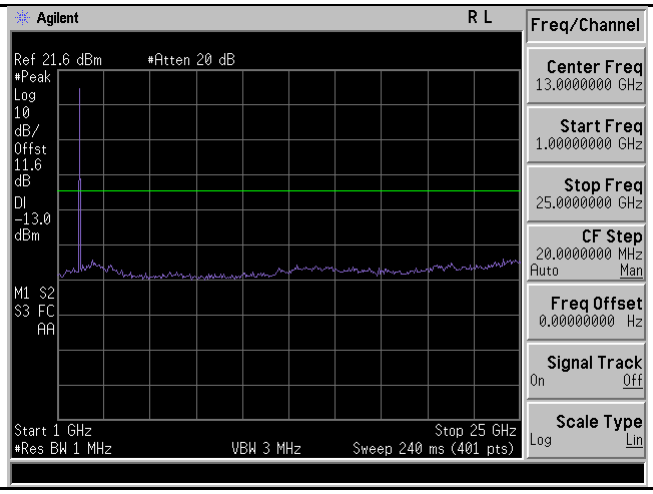
TX CSE-Band4-QPSK-15M BW-Low CH-below 1G



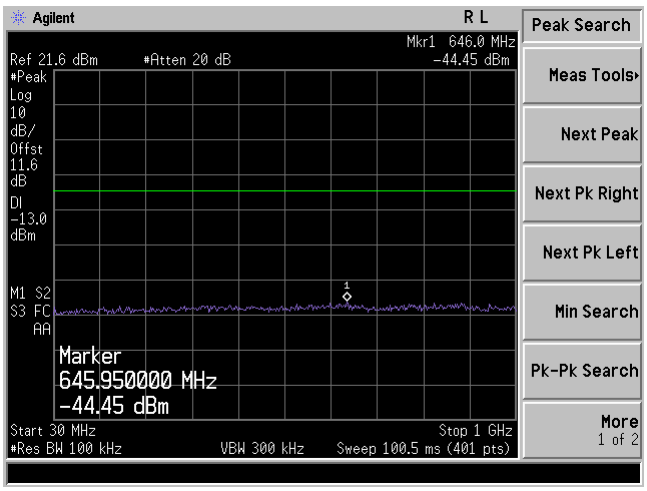
TX CSE-Band4-QPSK-15M BW-Low CH-above 1G



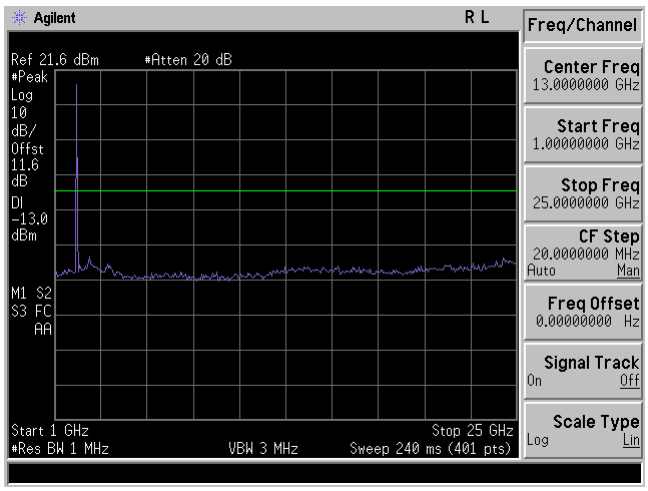
TX CSE-Band4-QPSK-15M BW-Mid CH-below 1G



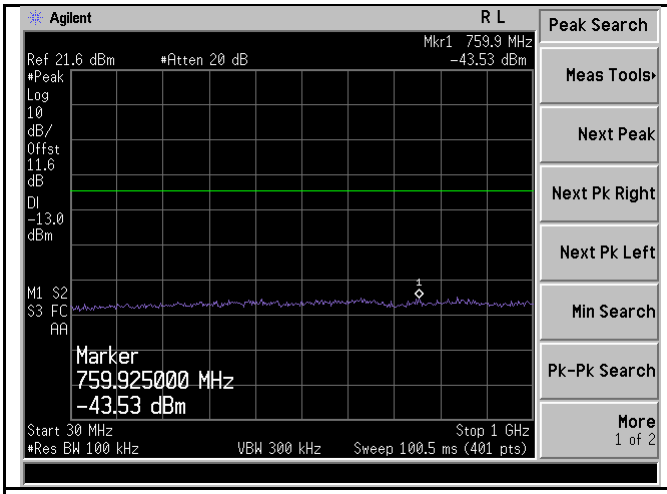
TX CSE-Band4-QPSK-15M BW-Mid CH-above 1G



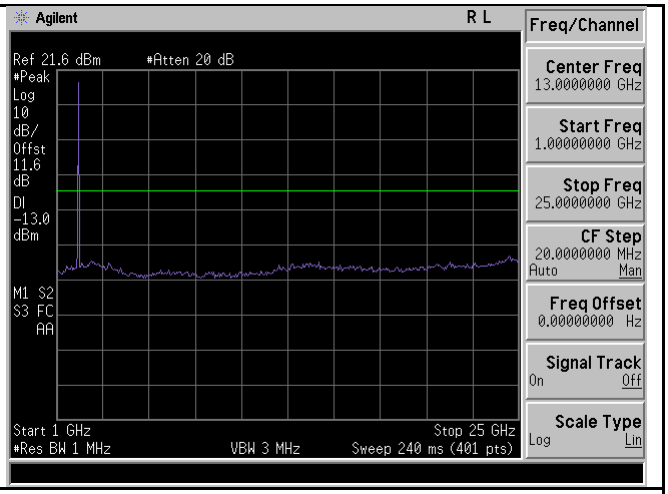
TX CSE-Band4-QPSK-15M BW-High CH-below 1G



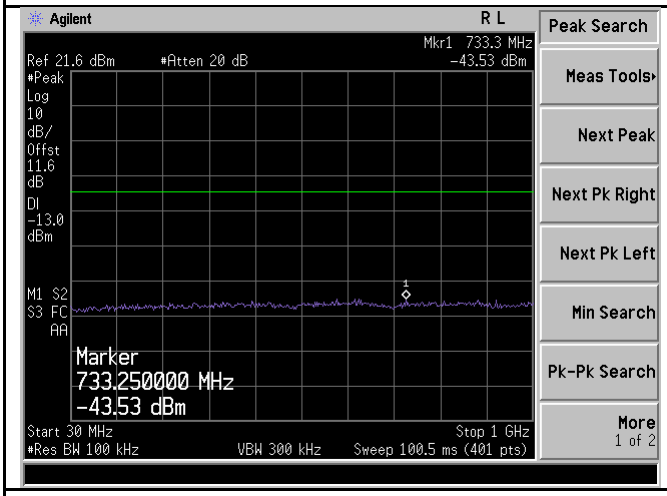
TX CSE-Band4-QPSK-15M BW-High CH-above 1G



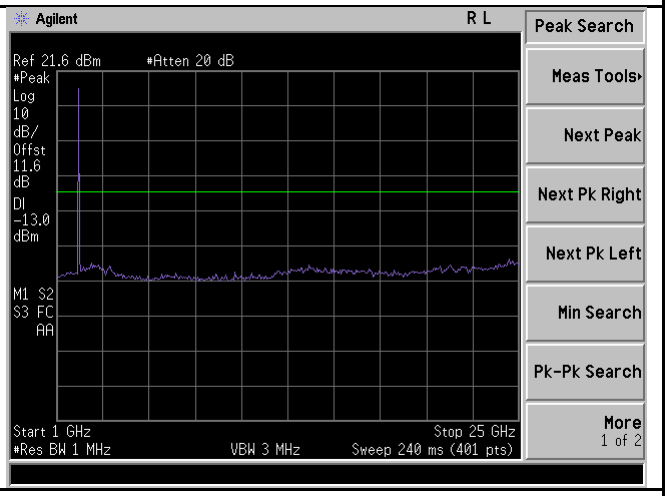
TX CSE-Band4-QPSK-20M BW-Low CH-below 1G



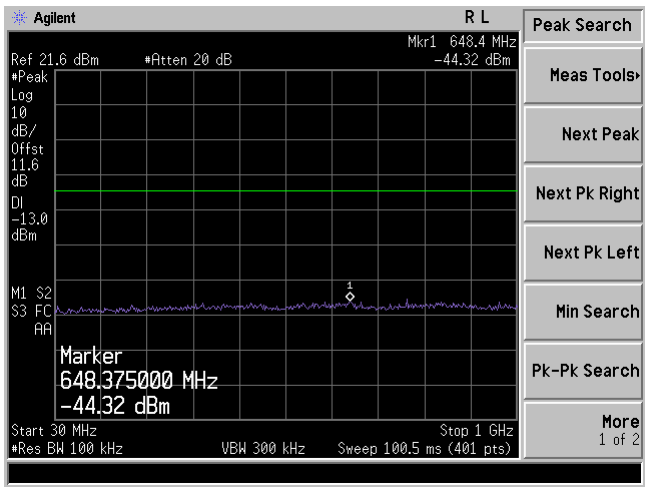
TX CSE-Band4-QPSK-20M BW-Low CH-above 1G



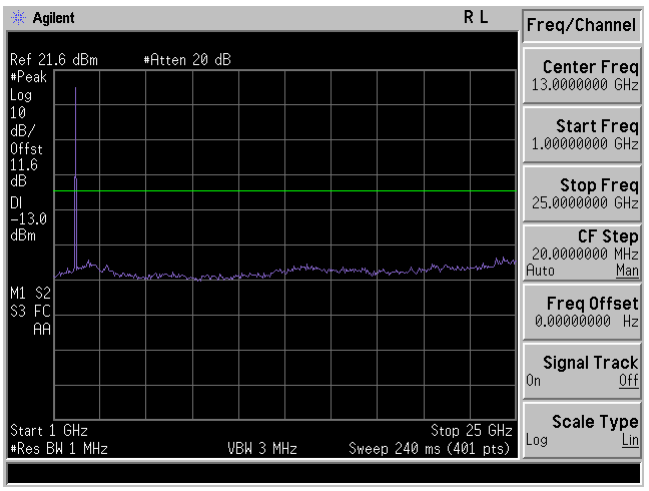
TX CSE-Band4-QPSK-20M BW-Mid CH-below 1G



TX CSE-Band4-QPSK-20M BW-Mid CH-above 1G



TX CSE-Band4-QPSK-20M BW-High CH-below 1G



TX CSE-Band4-QPSK-20M BW-High CH-above 1G

TX CSE-Band4-16QAM-5M BW-Low CH

TX CSE-Band4-16QAM-5M BW-Mid CH

TX CSE-Band4-16QAM-5M BW-High CH

TX CSE-Band4-16QAM-10M BW-Low CH

TX CSE-Band4-16QAM-10M BW-Mid CH

TX CSE-Band4-16QAM-10M BW-High CH

TX CSE-Band4-16QAM-15M BW-Low CH

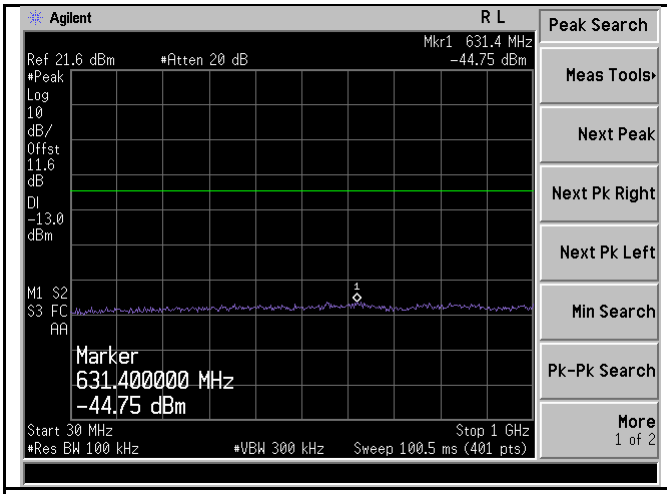
TX CSE-Band4-16QAM-15M BW-Mid CH

TX CSE-Band4-16QAM-15M BW-High CH

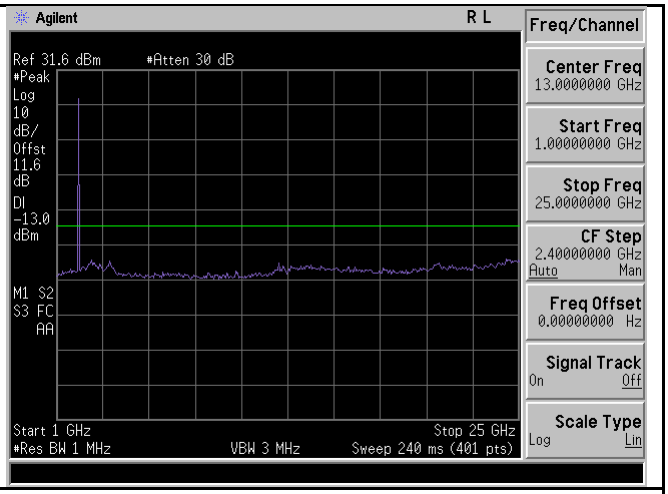
TX CSE-Band4-16QAM-20M BW-Low CH

TX CSE-Band4-16QAM-20M BW-Mid CH

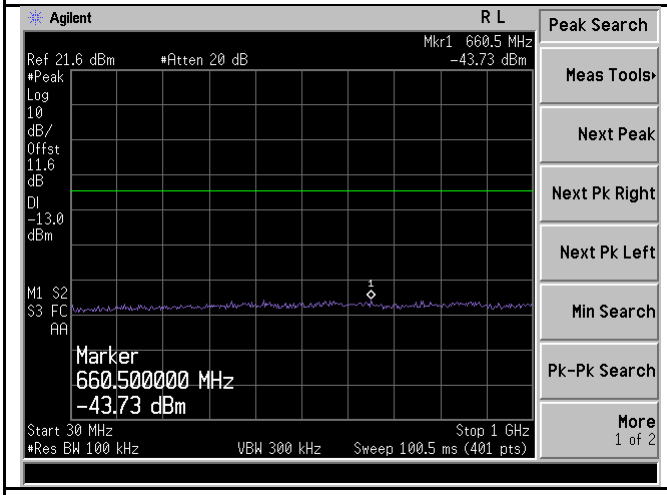
TX CSE-Band4-16QAM-20M BW-High CH



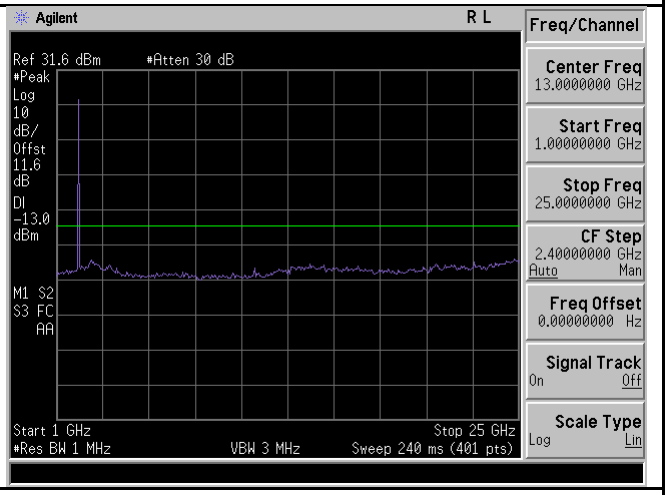
TX CSE-Band4-64QAM-5M BW-Low CH-below 1G



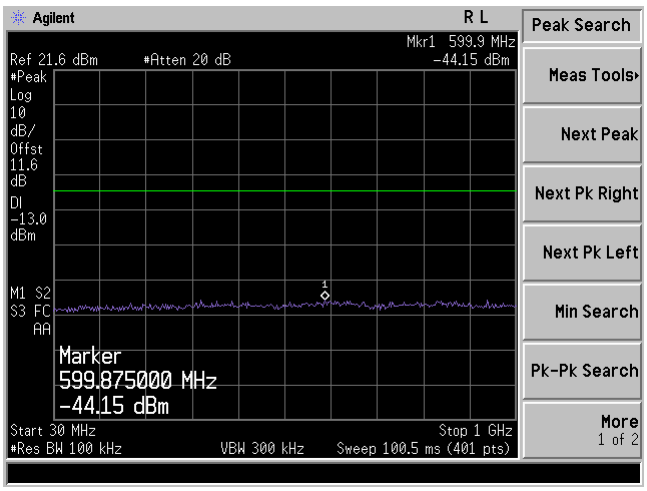
TX CSE-Band4-64QAM-5M BW-Low CH-above 1G



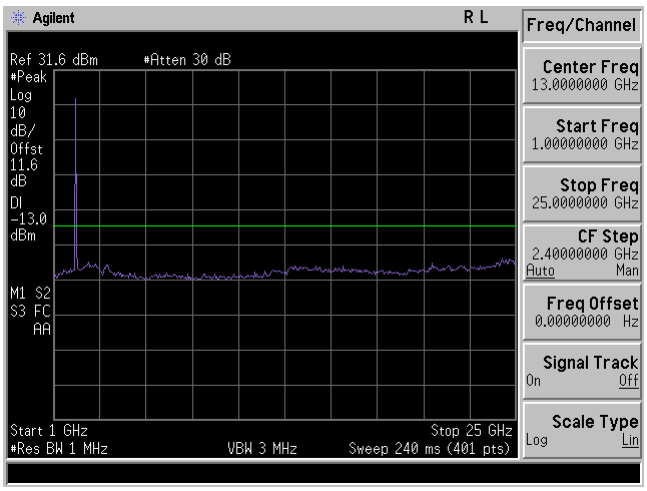
TX CSE-Band4-64QAM-5M BW-Mid CH-below 1G



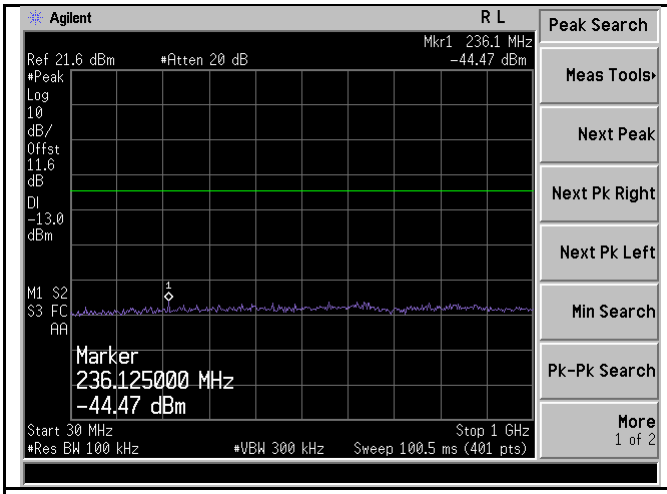
TX CSE-Band4-64QAM-5M BW-Mid CH-above 1G



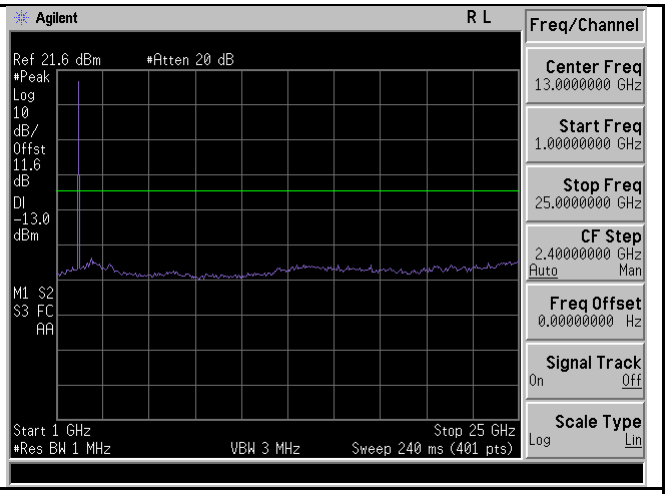
TX CSE-Band4-64QAM-5M BW-High CH-below 1G



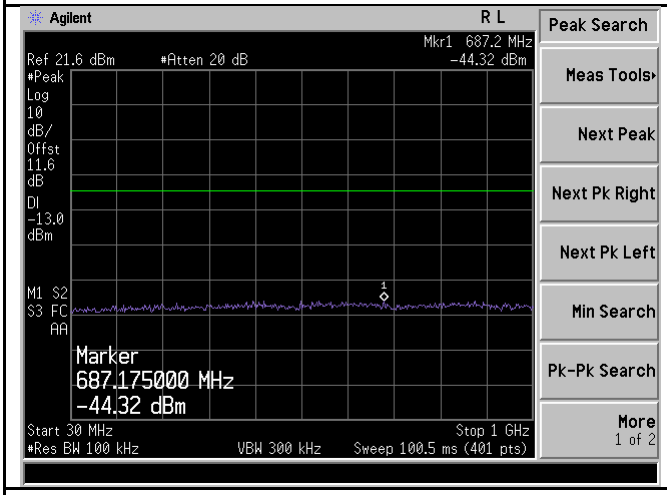
TX CSE-Band4-64QAM-5M BW-High CH-above 1G



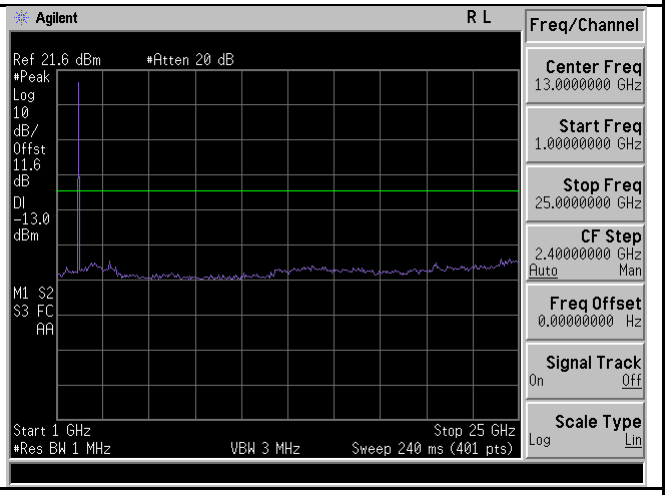
TX CSE-Band4-64QAM-10M BW-Low CH-below 1G



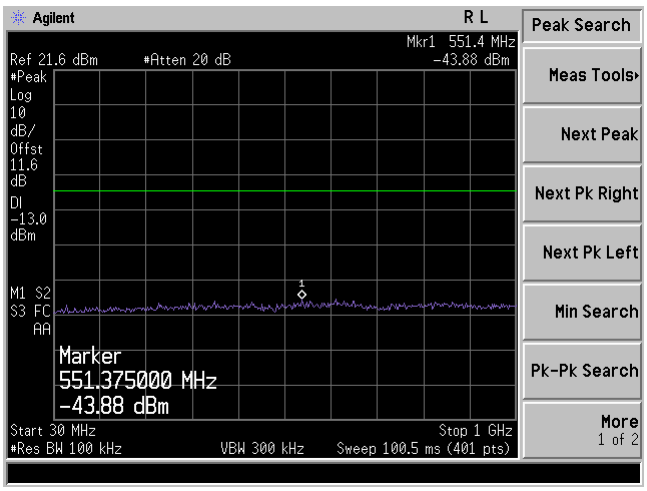
TX CSE-Band4-64QAM-10M BW-Low CH-above 1G



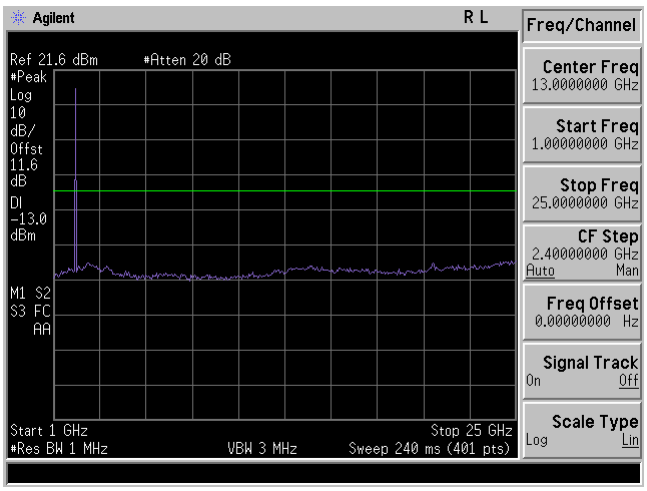
TX CSE-Band4-64QAM-10M BW-Mid CH-below 1G



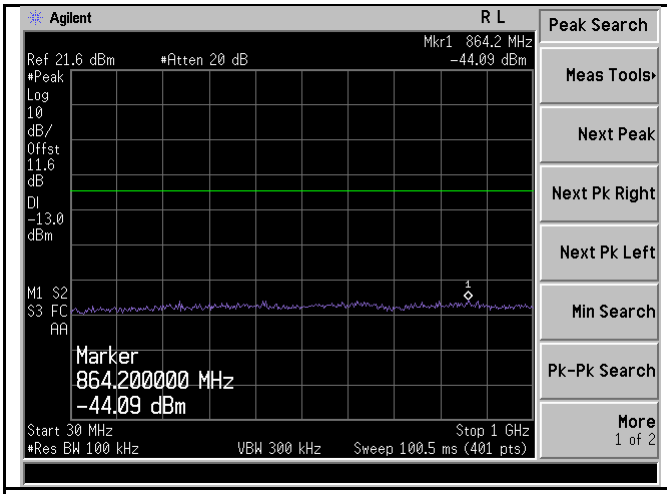
TX CSE-Band4-64QAM-10M BW-Mid CH-above 1G



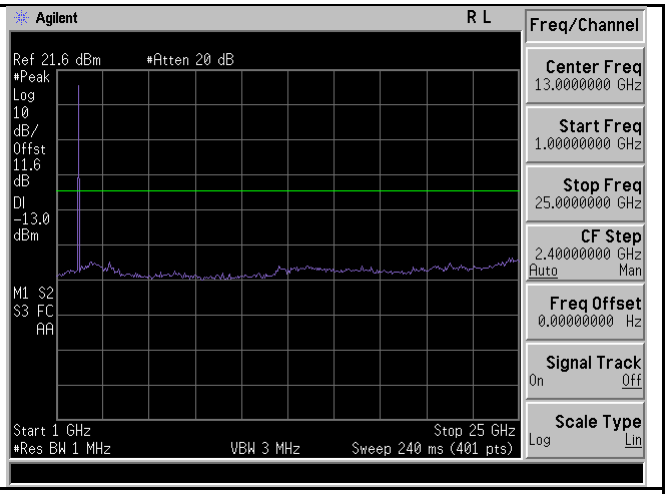
TX CSE-Band4-64QAM-10M BW-High CH-below 1G



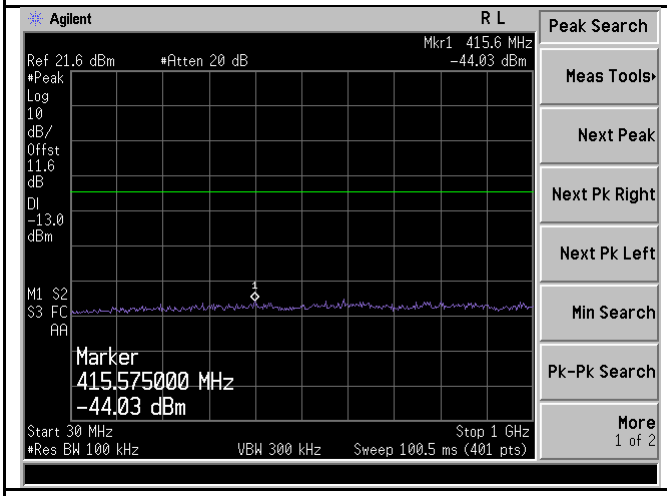
TX CSE-Band4-64QAM-10M BW-High CH-above 1G



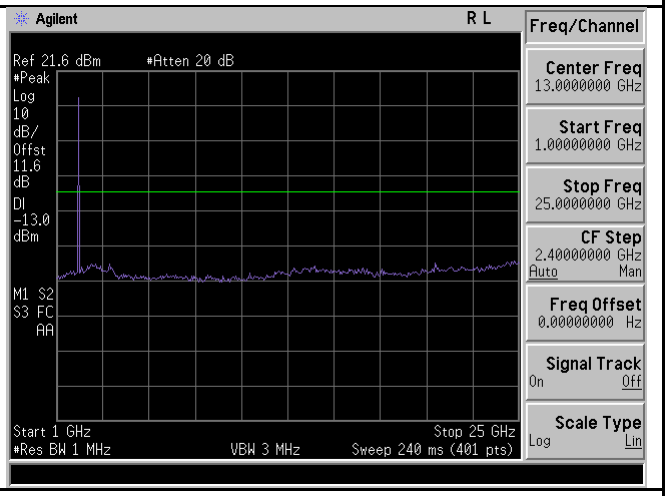
TX CSE-Band4-64QAM-15M BW-Low CH-below 1G



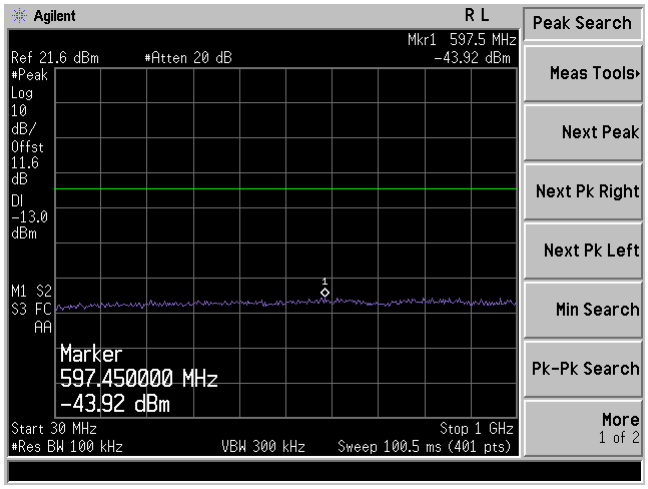
TX CSE-Band4-64QAM-15M BW-Low CH-above 1G



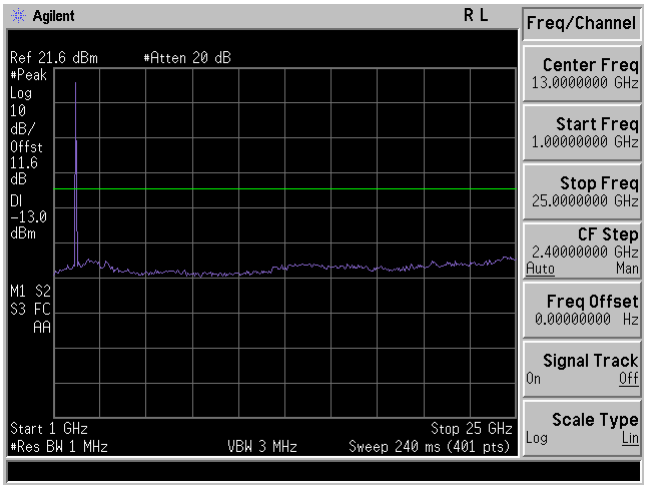
TX CSE-Band4-64QAM-15M BW-Mid CH-below 1G



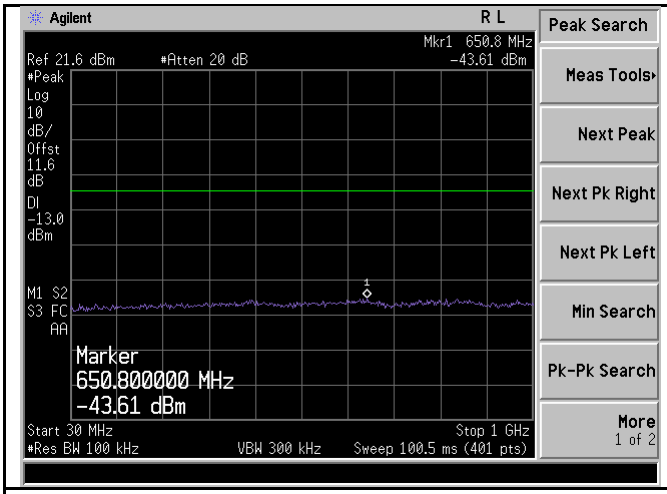
TX CSE-Band4-64QAM-15M BW-Mid CH-above 1G



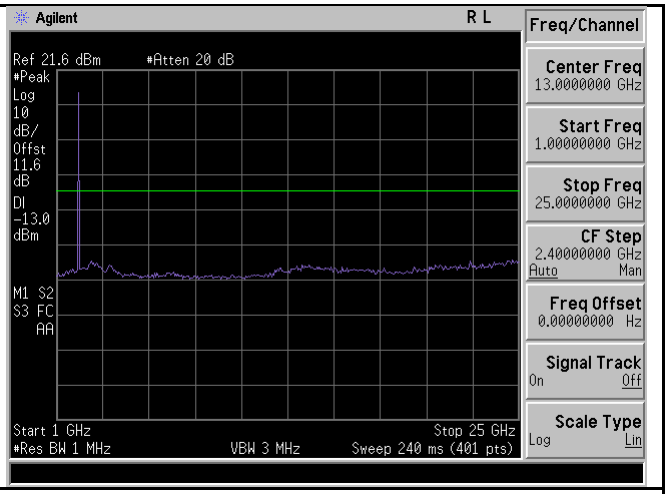
TX CSE-Band4-64QAM-15M BW-High CH-below 1G



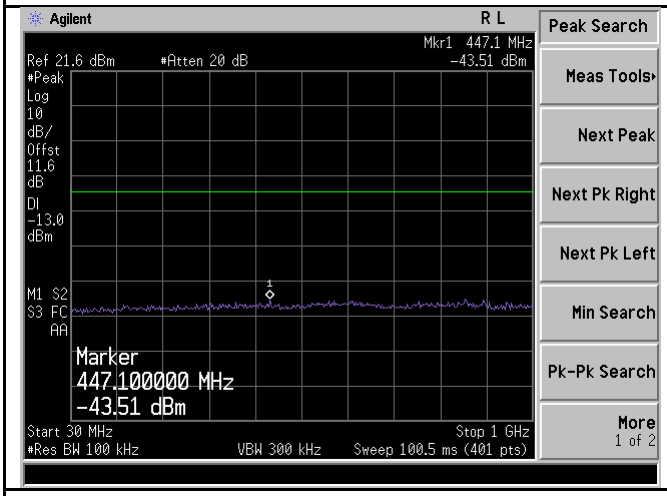
TX CSE-Band4-64QAM-15M BW-High CH-above 1G



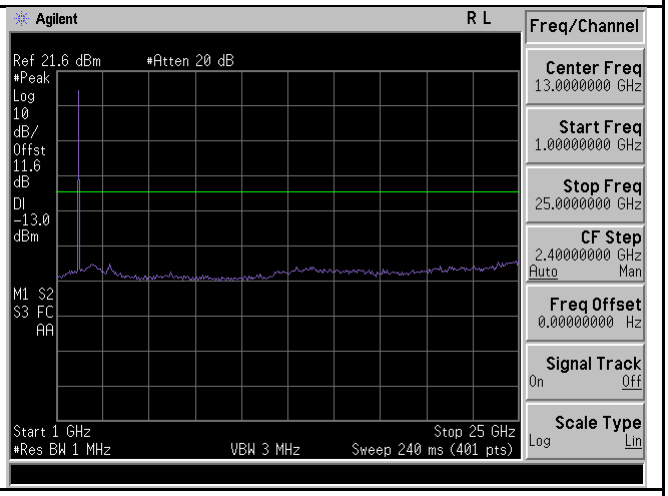
TX CSE-Band4-64QAM-20M BW-Low CH-below 1G



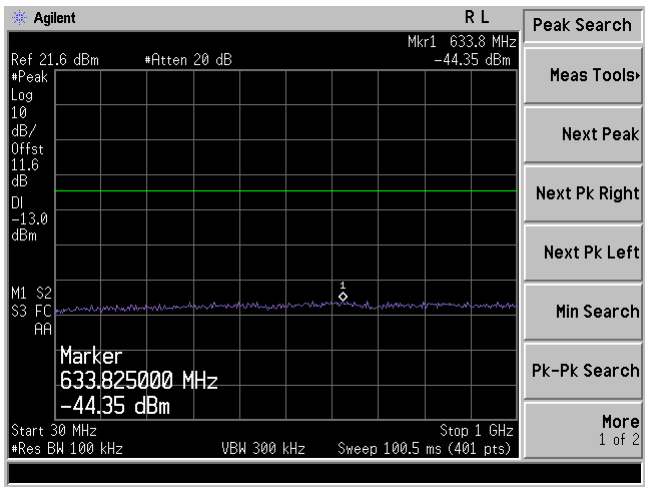
TX CSE-Band4-64QAM-20M BW-Low CH-above 1G



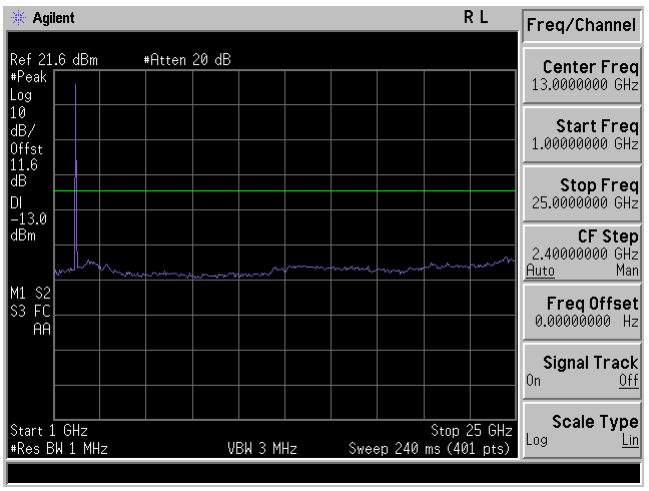
TX CSE-Band4-64QAM-20M BW-Mid CH-below 1G



TX CSE-Band4-64QAM-20M BW-Mid CH-above 1G



TX CSE-Band4-64QAM-20M BW-High CH-below 1G



TX CSE-Band4-64QAM-20M BW-High CH-above 1G

TX CSE-Band2-QPSK-Low CH

TX CSE-Band2-QPSK-Mid CH

TX CSE-Band2-QPSK-High CH

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	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. 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*log (EBW/BW_{meas}) will be added to the result.			
Test Date	04/30/2015 - 05/03/2015	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22°C 48% 1008mbar
Remark	The EUT was scanned up to 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. Limit calculation: Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm 100KHz RBW was used to make measurement for LTE Band 4 with 20MHz 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

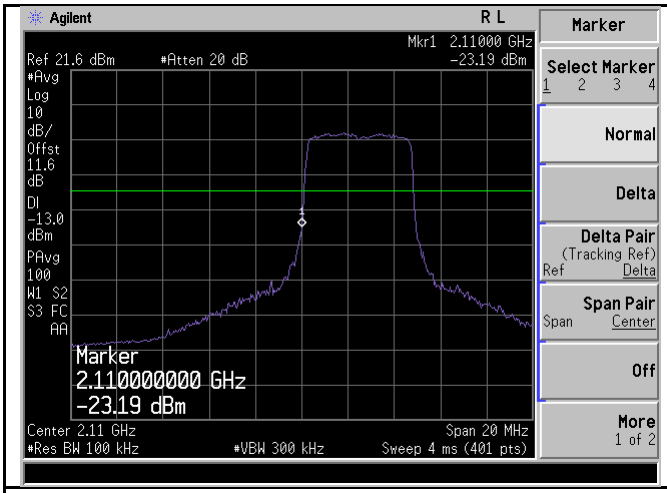
Band Edge Measurement Data for LTE

Type	Channel	Channel Frequency (MHz)	Measurement Band Edge (dBm)	RBW Correction factor (dB)	Corrected Band Edge (dBm)	Limit (dBm)
5MHz BW, QPSK	Low	2115	-23.19	0	-23.19	-13
	High	2150	-26.13	0	-26.13	-13
5MHz BW, 16QAM	Low	2115	-38.97	0	-38.97	-13
	High	2150	-34.55	0	-34.55	-13
5MHz BW, 64QAM	Low	2115	-26.10	0	-26.10	-13
	High	2150	-29.02	0	-29.02	-13
10MHz BW, QPSK	Low	2120	-32.03	0	-32.03	-13
	High	2145	-32.66	0	-32.66	-13
10MHz BW, 16QAM	Low	2120	-42.35	0	-42.35	-13
	High	2145	-42.59	0	-42.59	-13
10MHz BW, 64QAM	Low	2120	-34.03	0	-34.03	-13
	High	2145	-35.73	0	-35.73	-13
15MHz BW, QPSK	Low	2115	-36.39	3.01	-33.38	-13
	High	2150	-37.51	3.01	-34.50	-13
15MHz BW, 16QAM	Low	2115	-41.83	3.01	-38.82	-13
	High	2150	-40.24	3.01	-37.23	-13
15MHz BW, 64QAM	Low	2115	-38.90	3.01	-35.89	-13
	High	2150	-37.41	3.01	-34.40	-13
20MHz BW, QPSK	Low	2120	-37.83	3.01	-34.82	-13
	High	2145	-39.44	3.01	-36.43	-13
20MHz BW, 16QAM	Low	2120	-45.58	3.01	-42.57	-13
	High	2145	-43.42	3.01	-40.41	-13
20MHz BW, 64QAM	Low	2120	-40.24	3.01	-37.23	-13
	High	2145	-40.52	3.01	-37.51	-13

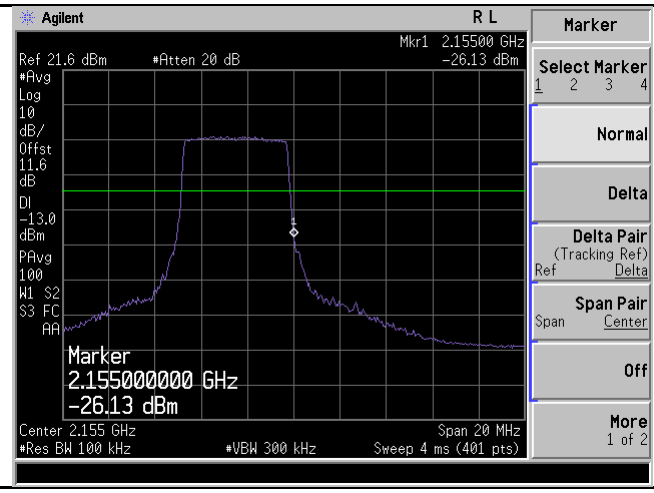
Band Edge Measurement Data for WCDMA

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	-25.56	0	-25.56	-13
	High	1992.5	-23.17	0	-23.17	-13

Test Plots



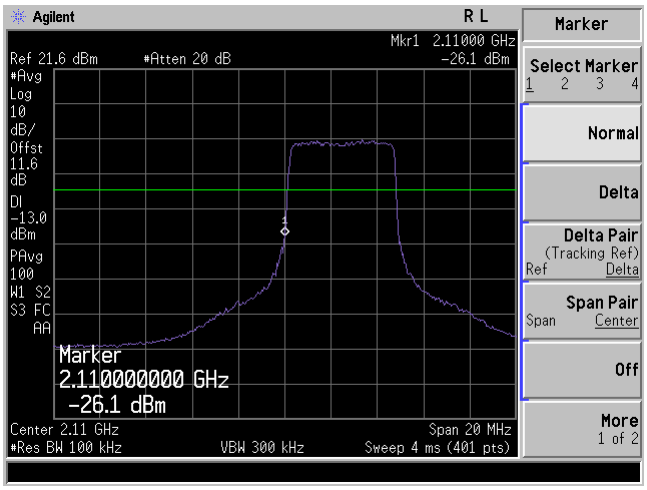
BandEdge-LTE-Band4-5MHz-QPSK-Low



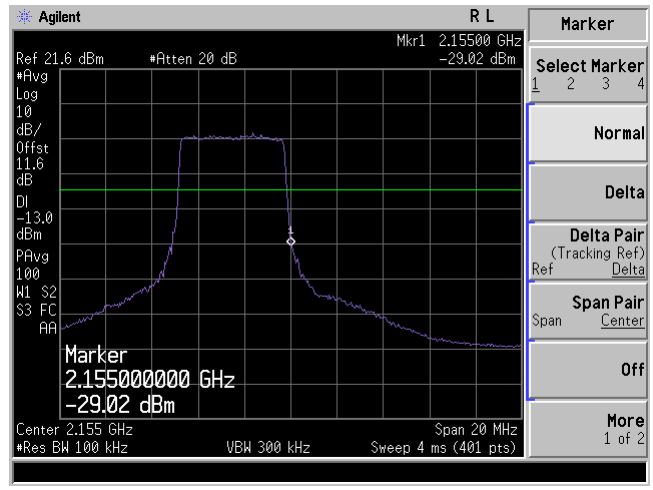
BandEdge-LTE-Band4-5MHz-QPSK-High

BandEdge-LTE-Band4-5MHz-16QAM-Low

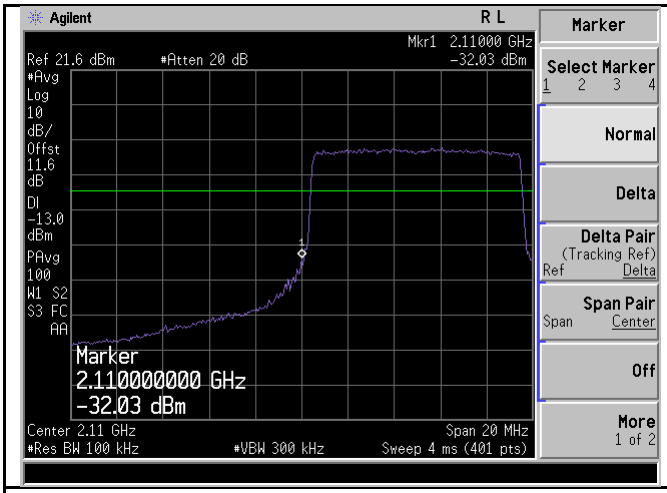
BandEdge-LTE-Band4-5MHz-16QAM-High



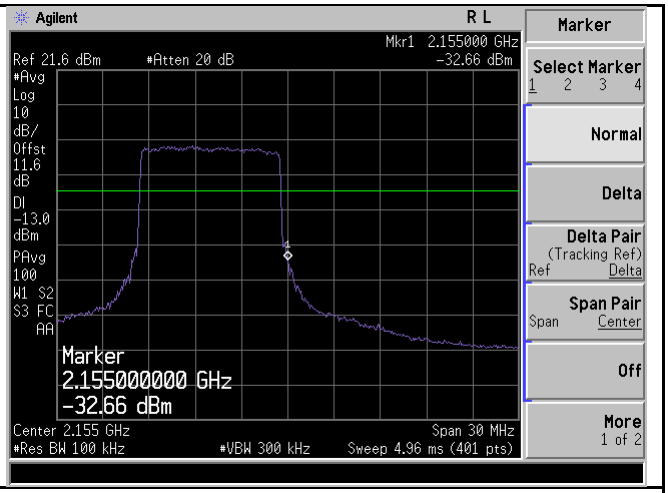
BandEdge-LTE-Band4-5MHz-64QAM-Low



BandEdge-LTE-Band4-5MHz-64QAM-High



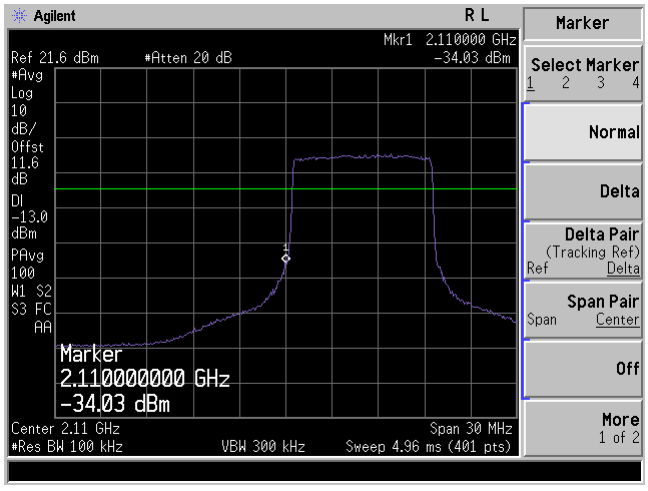
BandEdge-LTE-Band4-10MHz-QPSK-Low



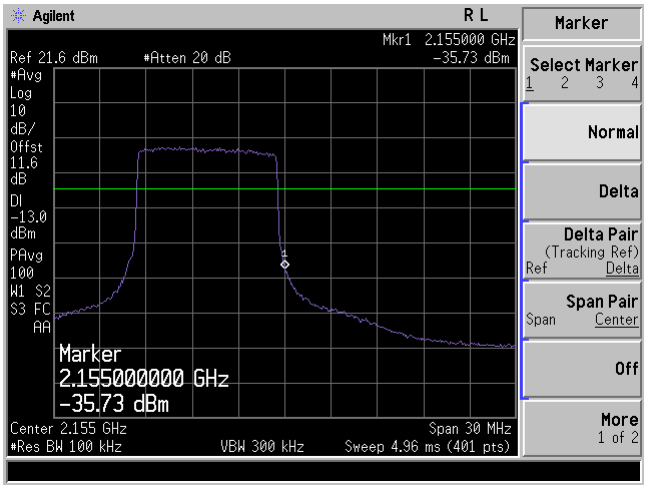
BandEdge-LTE-Band4-10MHz-QPSK-High

BandEdge-LTE-Band4-10MHz-16QAM-Low

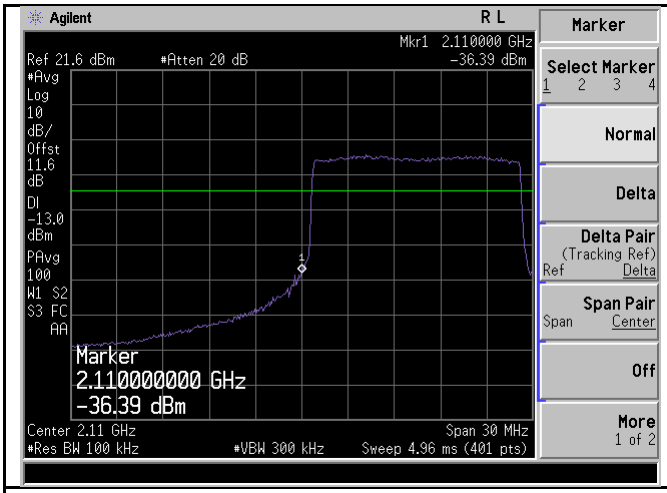
BandEdge-LTE-Band4-10MHz-16QAM-High



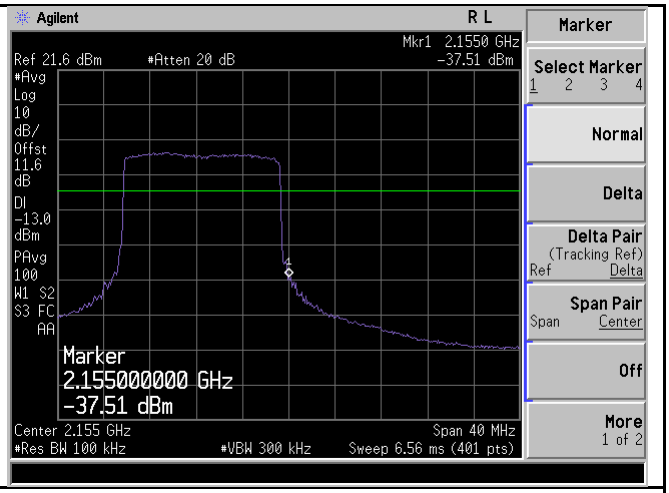
BandEdge-LTE-Band4-10MHz-64QAM-Low



BandEdge-LTE-Band4-10MHz-64QAM-High



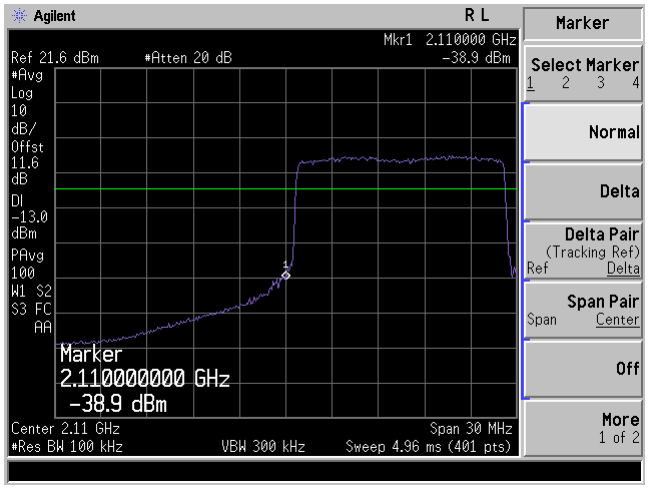
BandEdge-LTE-Band4-15MHz-QPSK-Low



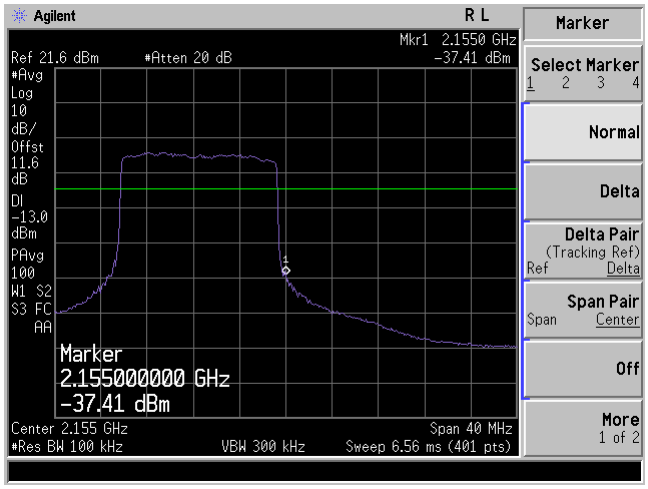
BandEdge-LTE-Band4-15MHz-QPSK-High

BandEdge-LTE-Band4-15MHz-16QAM-Low

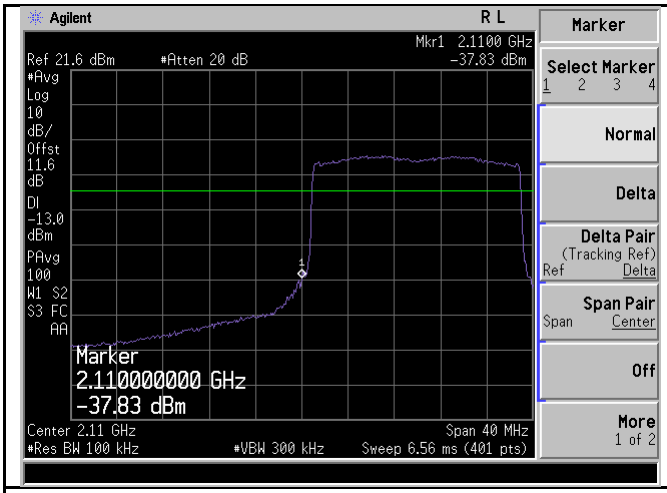
BandEdge-LTE-Band4-15MHz-16QAM-High



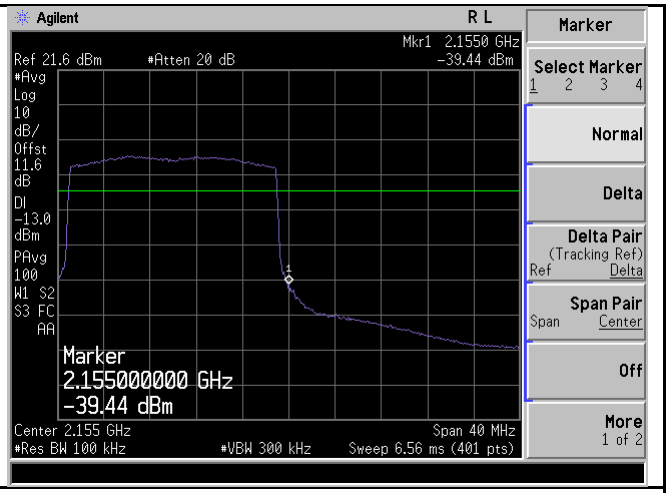
BandEdge-LTE-Band4-15MHz-64QAM-Low



BandEdge-LTE-Band4-15MHz-64QAM-High



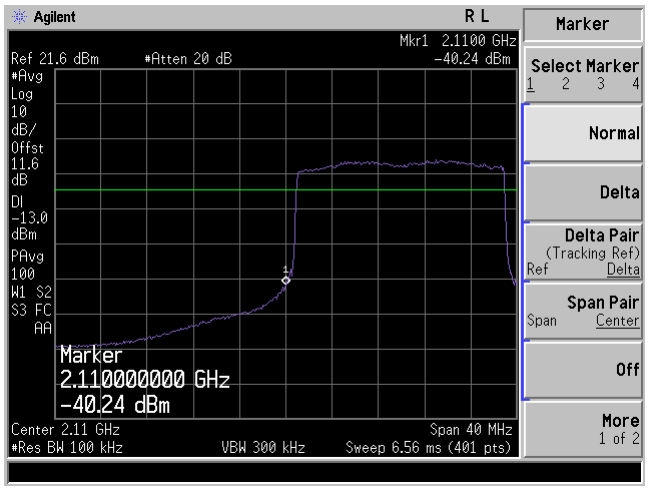
BandEdge-LTE-Band4-20MHz-QPSK-Low



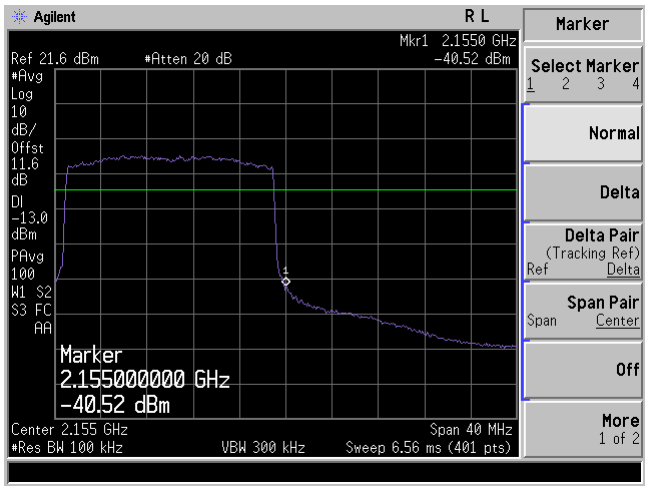
BandEdge-LTE-Band4-20MHz-QPSK-High

BandEdge-LTE-Band4-20MHz-16QAM-Low

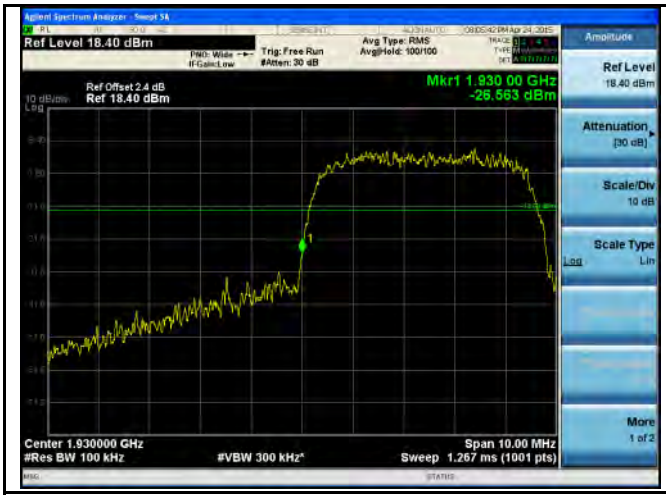
BandEdge-LTE-Band4-20MHz-16QAM-High



BandEdge-LTE-Band4-20MHz-64QAM-Low



BandEdge-LTE-Band4-20MHz-64QAM-High



BandEdge-WCDMA-Band2-5MHz-QPSK-Low

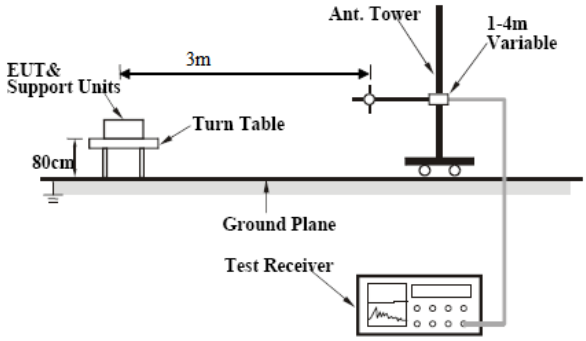
BandEdge-WCDMA-Band2-5MHz-QPSK-High

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



Test Procedure

Substitution method:

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. 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.
3. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
4. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.
5. Steps 4 were repeated for the next frequency point, until all selected frequency points were measured.

Test Date	04/30/2015	Environmental condition	Temperature	23°C
			Relative Humidity	48%
			Atmospheric Pressure	1008mbar

Remark

The EUT was scanned up to 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.

Limit calculation:
Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm

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 for LTE mode

Test specification	below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	22		
	Humidity (%)	45		
	Atmospheric (mbar):	1008		
Mains Power:	56VDC			
Tested by:	David Zhang			
Test Date:	04/30/2015			
Remarks:	LTE band4-Mid CH-20MHz BW, QPSK			

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
492.52	-69.94	4.11	4.45	-61.38	RMS Max	H	186.00	315.00	-13.00	-48.38	Pass
500.22	-69.48	4.15	4.75	-60.58	RMS Max	H	133.00	293.00	-13.00	-47.58	Pass
486.57	-71.12	4.09	4.45	-62.58	RMS Max	H	159.00	224.00	-13.00	-49.58	Pass
68.95	-43.67	1.44	-3.35	-45.58	RMS Max	V	284.00	344.00	-13.00	-32.58	Pass
125.01	-46.92	2.03	-4.05	-48.94	RMS Max	V	359.00	305.00	-13.00	-35.94	Pass
224.41	-57.08	2.65	4.55	-49.88	RMS Max	H	332.00	356.00	-13.00	-36.88	Pass

Radiated Emission Test Results for UMTS mode

Test specification	below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	22		
	Humidity (%)	45		
	Atmospheric (mbar):	1008		
Mains Power:	56VDC			
Tested by:	David Zhang			
Test Date:	04/30/2015			
Remarks:	UMTS band2-Mid CH, QPSK			

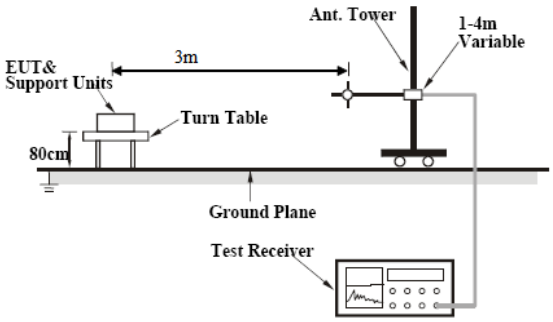
Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
72.77	-35.49	1.49	-3.05	-37.05	RMS Max	V	100.00	213.00	-36.00	-1.05	Pass
125.25	-45.40	2.03	-4.05	-47.42	RMS Max	V	132.00	226.00	-36.00	-11.42	Pass
1000.00	-70.76	7.04	5.85	-57.87	RMS Max	V	150.00	19.00	-36.00	-21.87	Pass
31.94	-37.63	1.00	-21.55	-58.18	RMS Max	V	200.00	274.00	-36.00	-22.18	Pass
284.65	-56.42	2.90	3.75	-49.77	RMS Max	V	132.00	302.00	-36.00	-13.77	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.	☒

Test Setup



Test Procedure

Substitution method:

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. 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.
3. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
4. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.
5. Steps 4 were repeated for the next frequency point, until all selected frequency points were measured.

Test Date	04/30/2015 – 05/03/2015	Environmental condition	Temperature	23°C
			Relative Humidity	48%
			Atmospheric Pressure	1008mbar

Remark

The EUT was scanned up to 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.

Limit calculation:
Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm

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 4 Low Channel, 20MHz BW, QPSK

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
8009.29	-79.57	14.97	9.97	-54.63	RMS Max	V	223.00	254.00	-13.00	-41.63	Pass
2143.31	-82.55	13.36	6.28	-62.91	RMS Max	H	150.00	211.00	-13.00	-49.91	Pass
1001.19	-81.66	12.51	3.61	-65.54	RMS Max	H	153.00	267.00	-13.00	-52.54	Pass

LTE band 4 Mid Channel, 20MHz BW, QPSK

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
8662.96	-77.82	14.97	8.93	-53.92	RMS Max	V	187.00	290.00	-13.00	-40.92	Pass
4091.46	-81.69	13.36	7.99	-60.34	RMS Max	V	283.00	88.00	-13.00	-47.34	Pass
1001.19	-75.95	12.51	3.61	-59.83	RMS Max	H	153.00	267.00	-13.00	-46.83	Pass

LTE band 4 High Channel, 20MHz BW, QPSK

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
6997.09	-79.23	15.45	9.65	-54.13	RMS Max	H	162.00	261.00	-13.00	-41.13	Pass
3167.55	-84.47	13.67	7.15	-63.65	RMS Max	V	297.00	183.00	-13.00	-50.65	Pass
12661.61	-81.22	16.26	10.08	-54.88	RMS Max	H	137.00	161.00	-13.00	-41.88	Pass

WCDMA Low Channel

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
12697.50	-79.87	16.27	9.76	-53.84	RMS Max	H	223.00	307.00	-13.00	-40.84	Pass
4090.16	-84.08	14.11	7.99	-61.98	RMS Max	H	113.00	57.00	-13.00	-48.98	Pass
2044.78	-76.73	13.32	6.08	-57.33	RMS Max	H	178.00	274.00	-13.00	-44.33	Pass

WCDMA Mid Channel

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
12572.70	-78.87	16.28	9.76	-52.83	RMS Max	H	127.00	94.00	-13.00	-39.83	Pass
4080.32	-83.74	15.42	7.99	-60.33	RMS Max	H	168.00	287.00	-13.00	-47.33	Pass
2038.82	-83.61	12.54	6.08	-64.99	RMS Max	H	239.00	145.00	-13.00	-51.99	Pass

WCDMA High Channel

Frequency MHz	SG Level dBm	Cable Loss dB	Antenna Gain dBd	Substituted Level dBm	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBm	Margin dB	Pass /Fail
12715.39	-80.65	14.97	9.76	-55.92	RMS Max	H	197.00	130.00	-13.00	-42.92	Pass
6961.19	-85.98	14.17	7.99	-63.82	RMS Max	V	281.00	348.00	-13.00	-50.82	Pass
1033.11	-79.41	12.51	6.08	-60.82	RMS Max	H	237.00	63.00	-13.00	-47.82	Pass

10.8 Frequency Stability

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47 CFR 2.1055,
47 CFR 22.355,
RSS-133(6.3),
RSS-139(6.3)</td><td>-</td><td>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>
<tr><th>Frequency range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤3 watts (ppm)</th><th>Mobile ≤3 watts (ppm)</th></tr>
<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>
</table></td><td>☐</td></tr>
<tr><td>47 CFR 2.1055,
47 CFR 24.135(a),
RSS-133(6.3),
RSS-139(6.3)</td><td>-</td><td>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 °Celsius to +50 °Celsius 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 °Celsius.</td><td>☒</td></tr>
<tr><td>47 CFR 2.1055,
47 CFR 27.54
RSS-133(6.3),
RSS-139(6.3)</td><td>-</td><td>The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Test Procedure</td><td colspan="3">The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
1. 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.
2. 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.</td></tr>
<tr><td>Test Date</td><td>04/30/2015</td><td>Environmental condition</td><td>Temperature 23°C
Relative Humidity 48%
Atmospheric Pressure 1008mbar</td></tr>
<tr><td>Remark</td><td colspan="3">NONE</td></tr>
<tr><td>Result</td><td colspan="3">☒ Pass ☐ Fail</td></tr>
</table>

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)	2132000.012	0	0.000
100%		-30	2132000.001	-11	-0.005
100%		-20	2132000.003	-9	-0.004
100%		-10	2132000.01	-2	-0.001
100%		0	2132000.01	-2	-0.001
100%		10	2132000.021	9	0.004
100%		30	2132000.019	7	0.003
100%		40	2132000.015	3	0.001
100%		50	2132000.026	14	0.007
115%	64.4	20	2132000.02	8	0.004
85%	47.6	20	2132000.019	7	0.003

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

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
EMI Test Receiver (9 kHz – 30 MHz)	ESHS10	830223/0009	04/08/2014	1 Year	04/08/2015	☐
Spectrum Analyzer	FSIQ7	825555/013	05/31/2014	1 Year	05/31/2015	☐
V-LISN (150 kHz – 30 MHz)	NNLK 8129	8129-190	08/11/2014	1 Year	08/11/2015	☐
LISN (9 kHz – 30 MHz)	MN2050B	1018	07/31/2014	1 Year	07/31/2015	☐
Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☐
Radiated Emissions						
EMI Test Receiver	ESIB 40	100179	05/24/2014	1 Year	05/24/2015	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2014	1 Year	08/12/2015	☑
Horn Antenna (1-18GHz)	3115	10SL0059	08/11/2014	1 Year	08/11/2015	☑
Horn Antenna (18-40 GHz)	AH-840	101013	08/11/2014	1 Year	08/11/2015	☑
Pre-Amplifier	LPA-6-30	11140711	02/19/2015	1 Year	02/19/2016	☑
Microwave Preamplifier (18-40 GHz)	PA-840	181251	02/19/2015	1 Year	02/19/2016	☑
3 Meters SAC	3M	N/A	08/29/2014	1 Year	08/29/2015	☐
10 Meters SAC	10M	N/A	09/05/2014	1 Year	09/05/2015	☑
Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	08/13/2014	1 Year	08/13/2015	☑
EMI Test Receiver	ESIB 40	100179	05/24/2014	1 Year	05/24/2015	☑

Annex B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex C. 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 Measuremet
Australia CAB Regocnition		**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