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Report On

Application for Grant of Equipment Authorization of the
Novatel Wireless Inc.
USB620L MC620 USB Modem

FCC CFR 47 Part 2, Part 22 and Part 24: 2014
RSS-132 issue 3: 2013 and RSS-133 issue 6: 2013

Report No. SD72104197-0315B

April 2015

FCC ID: PKRNVWMC620
IC: 3229A-MC620
Report No. SD72104197-0315B

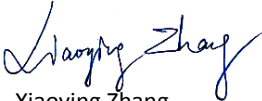



REPORT ON Radio Testing of the
Novatel Wireless Inc.
MC620 USB Modem

TEST REPORT NUMBER SD72104197-0315B

PREPARED FOR Novatel Wireless Inc.
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DATED April 30, 2015



Revision History

SD72104197-0315B Novatel Wireless Inc. USB620L MC620 USB Modem					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
04/30/2015	Initial Release				Ferdinand Custodio



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SECTION 1

REPORT SUMMARY

Radio Testing of the
Novatel Wireless Inc.
USB Modem



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Novatel Wireless Inc. MC620 USB Modem to the requirements of the following:

FCC CFR 47 Part 2, Part 22 and Part 24: 2014
RSS-132 issue 3: 2013 and RSS-133 issue 6: 2013

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Novatel Wireless Inc.
Model Name	USB620L
Model Number(s)	MC620
FCC ID Number	PKRNVWMC620
IC Number	3229A-MC620
Serial Number(s)	SP070315900027
Number of Samples Tested	1
Test Specification/Issue/Date	<ul style="list-style-type: none">• FCC CFR 47 Part 2, Part 22 and Part 24: 2014• RSS-132 issue 3: 2013; (Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz)• RSS-133 issue 6: 2013; (2 GHz Personal Communications Services)• RSS-GEN issue 4 November 2014; (General Requirements for Compliance of Radio Apparatus)
Start of Test	April 06, 2015
Finish of Test	April 28, 2015
Name of Engineer(s)	Xiaoying Zhang
Related Document(s)	<ul style="list-style-type: none">• 971168 D01 Power Meas License Digital Systems v02r02: October 17 2014; (Measurement guidance for certification of licensed digital transmitters)• Supporting documents for EUT certification are separate exhibits.



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 2, Part 22 and Part 24: 2014 and RSS-132 issue 3: 2013 and RSS-133 issue 6: 2013 standard is shown below.

Section	FCC Part Sections(s)	Industry Canada Sections	Test Description	Result
2.1	2.1046	RSS-132: 5.4, RSS-133: 6.4	Transmitter Conducted Output Power	Compliant
2.2	2.1046, 22.913(a)(2)	-	Effective Radiated Power	Compliant
2.3	2.1046, 24.232(c)	RSS-132: 5.4 RSS-133: 6.4	Equivalent Isotropic Radiated Power	Compliant
2.4	24.232(d)	RSS-132: 5.4, RSS-133: 6.4	Peak-Average Ratio	Compliant
2.5	2.1049, 22.917(b), 24.238(b)	RSS-GEN 4.6.1	Occupied Bandwidth	Compliant
2.6	2.1051, 22.917(a), 24.238(a)	RSS-132: 5.5, RSS-133: 6.5	Band Edge	Compliant
2.7	2.1051, 22.917(a), 24.238(a)	RSS-132: 5.5, RSS-133: 6.5	Conducted Spurious Emissions	Compliant
2.8	2.1053, 22.917(a), 24.238(a)	RSS-132: 5.5, RSS-133: 6.5	Field Strength Of Spurious Radiation	Compliant
2.9	2.1055, 22.355, 24.235	RSS-132: 5.3, RSS-133: 6.3	Frequency Stability	Compliant



1.3 PRODUCT INFORMATION

1.3.1 EUT General Description

The Equipment Under Test (EUT) was a Novatel Wireless Inc. USB620L USB Modem. . The EUT is a Wireless USB Broadband Modem supporting 2G/3G/4G Technologies. The EUT comes with a USB Port.

1.3.2 EUT General Description

EUT Description	USB Modem
Model Name	USB620L
Model Number(s)	MC620
FCC Classification	Portable Transmitter
Rated Voltage	Nominal 5.0VDC USB
Mode Verified	GSM850/1900, Cell band and PCS Band CDMA2000 1xRTT, 1xEvDO Release 0 and A, WCDMA Band 2 and Band 5, LTE Band 2, 5
Capability	GSM850/1900, Cell band and PCS Band CDMA2000 1xRTT, 1xEvDO Release 0 and A, WCDMA Band 2 and Band 5, LTE Band 2, 4, 5, 13
Primary Unit (EUT)	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
Frequency Tolerance	±0.00025% (2.5ppm)
Internal Antennas Details (Client declaration, max. antenna gain covered under this test report)	<p><u>Antenna – CDMA/GPRS/EDGE/WCDMA/LTE</u> Manufacturer: NVTL Part Number: 12023208 Type: Monopole Antenna Gain:</p> <ul style="list-style-type: none"> • CDMA BC0 – 850MHz: 1.36 dBi • CDMA BC1 – 1900MHz: 1.15 dBi • GSM850 – 850MHz: 1.36 dBi • GSM1900 – 1900MHz: 1.04 dBi • WCDMA Band 5 – 850MHz: 1.36 dBi • WCDMA Band 2 – 1900MHz: 1.23 dBi • LTE Band 5 – 800MHz: 1.07 dBi • LTE Band 2 – 1900MHz: 1.23 dBi • LTE Band 4 – 1700MHz: 1.21 dBi • LTE Band 13 – 700MHz: 1.14 dBi



1.3.3 Transmit Frequency Table

Technology / Mode	Tx Frequency (MHz)	Emission Designator	ERP (Part 22) / EIRP (RSS-132 and Part 24/RSS-133)	
			Max. Power (dBm)	Max. Power (dBm)
CDMA2000 – 1xRTT Cell Band (BC0)	824-849	1M28F9W	23.68	25.83
CDMA2000 – 1xRTT PCS Band (BC1)	1850-1910	1M28F9W	-	25.06
CDMA2000 – 1xEvDO Release 0 Cell Band (BC0)	824-849	1M28F9W	23.21	25.36
CDMA2000 – 1xEvDO Release 0 PCS Band (BC1)	1850-1910	1M28F9W	-	25.03
CDMA2000 – 1xEvDO Release A Cell Band (BC0)	824-849	1M28F9W	23.20	25.35
CDMA2000 – 1xEvDO Release A PCS Band (BC1)	1850-1910	1M29F9W	-	25.13
GSM850 / GSM1900 (GPRS) Cell Band (BC0)	824-849	244KGXW	31.68	33.83
GSM850 / GSM1900 (GPRS) PCS Band (BC1)	1850-1910	244KGXW	-	30.91
GSM850 / GSM1900 (EGPRS) Cell Band (BC0)	824-849	244KG7W	25.80	27.95
GSM850 / GSM1900 (EGPRS) PCS Band (BC1)	1850-1910	245KG7W	-	27.03
WCDMA (3GPP Release Version 99) Cell Band 5	824-849	4M16F9W	23.06	25.21
WCDMA (3GPP Release Version 99) PCS Band 2	1850-1910	4M18F9W	-	24.15



Technology / Mode	Modulation	Bandwidth (MHz)	Tx Frequency (MHz)	Emission Designator	ERP (Part 22) / EIRP (RSS-132 and Part 24/RSS-133)	
					Max. Power (dBm)	Max. Power (dBm)
LTE Band 2	QPSK	1.4	1850-1910	1M09G7D	-	24.34
		3	1850-1910	2M67G7D	-	25.23
		5	1850-1910	4M48G7D	-	25.23
		10	1850-1910	8M96G7D	-	25.23
		15	1850-1910	13M4G7D	-	25.23
		20	1850-1910	17M8G7D	-	25.20
	16QAM	1.4	1850-1910	1M09G7D	-	23.39
		3	1850-1910	2M69G7D	-	24.57
		5	1850-1910	4M47G7D	-	24.51
		10	1850-1910	8M94G7D	-	24.63
		15	1850-1910	13M4G7D	-	24.61
		20	1850-1910	17M8G7D	-	24.13
LTE Band 5	QPSK	1.4	824-849	1M08G7D	22.59	24.74
		3	824-849	2M68G7D	22.67	24.82
		5	824-849	4M48G7D	22.63	24.78
		10	824-849	8M96G7D	22.67	24.82
	16QAM	1.4	824-849	1M09G7D	21.60	23.75
		3	824-849	2M67G7D	21.87	24.02
		5	824-849	4M46G7D	21.68	23.83
		10	824-849	8M94G7D	21.90	24.05



1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	Conducted antenna port measurement. EUT Tx at a max power and connected to a USB port
B	Raidated test setup. EUT Tx through integral antenna and connected to a USB port

1.4.2 EUT Exercise Software

EUT is controlled by a CMW 500 Wideband Radio Communication Tester. There are no other test software used during verification.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Novatel Wireless	USB Cable	Micro USB Type B to Standard USB Type B

1.4.4 Worst Case Configuration

Worst-case configuration used in this test report:

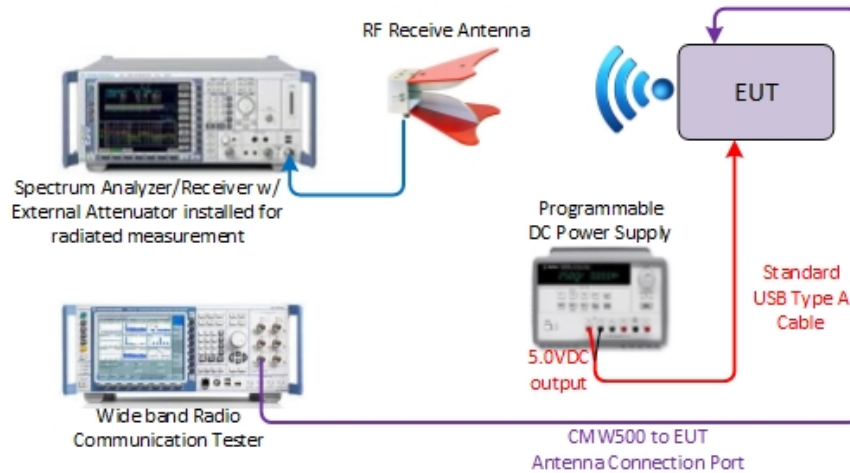
Technology	Band
CDMA 2000 – 1xRTT	Cell (BC0)
CDMA 2000 – 1xRTT	PCS (BC1)
GSM850 / GSM1900 (GPRS)	Cell
	PCS
WCDMA (3GPP Release Version 99)	Cell (Band 5)
	PCS (Band 2)

Band	Modulation
LTE Band 5	QPSK
LTE Band 2	QPSK

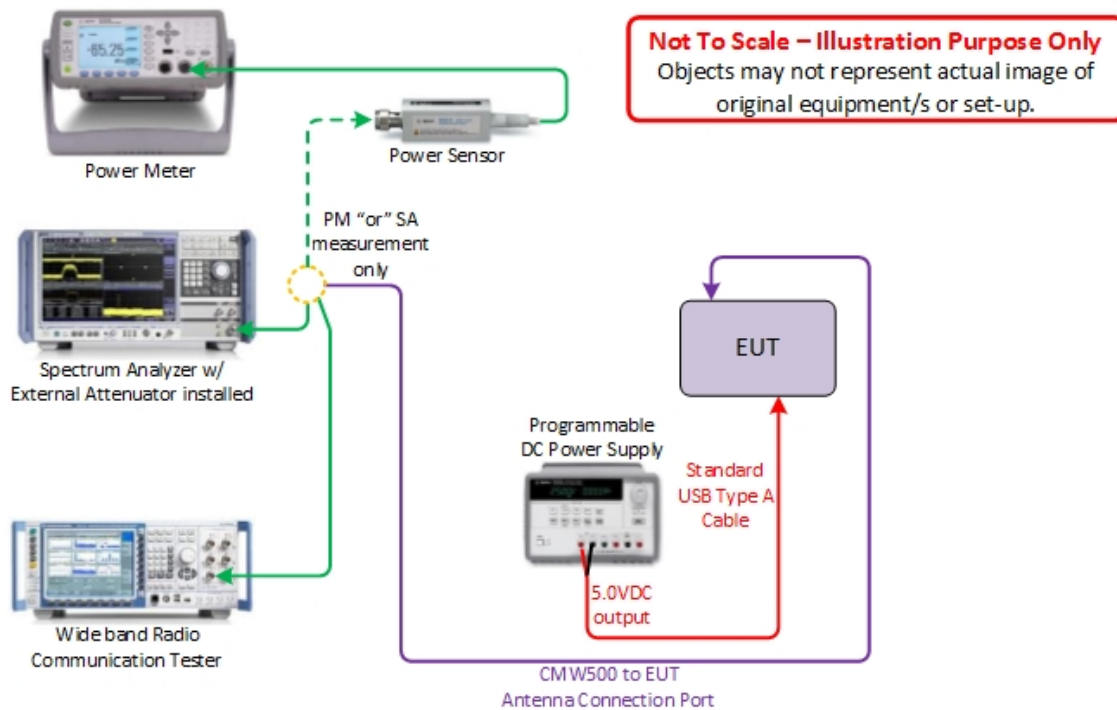
For radiated measurements X, Y, and Z orientations were verified. The verification was determined “Y” as worst case configuration.

1.4.5 Simplified Test Configuration Diagram

Radiated/Conducted Emission Test Configuration via Conducted Port



Conducted (Antenna Port) Test Configuration





1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number SP070315900027		
N/A	—	—

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements by Substitution method were conducted according to ANSI/TIA/EIA-603-C-2004, August 17,2004. Land Mobile FM or PM -Communications Equipment -Measurement and Performance Standards. For conducted and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.4-2009. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.8 TEST FACILITY LOCATION

1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: 858 678 1400 FAX: 858-546 0364

1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

Sony Electronics Inc., Building #8 16530 Via Esprillo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: 858 942 5542 FAX: 858-546 0364



1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Registration No.: US1146

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US1146.

1.9.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego) has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.



1.10 SAMPLE CALCULATIONS

1.10.1 GSM Emission Designator

Emission Designator = 250KGXW
 GSM BW = 250 kHz
 G = Phase Modulation
 X = Cases not otherwise covered
 W = Combination (Audio/Data)

1.10.2 WCDMA Emission Designator

Emission Designator = 4M15F9W
 WCDMA BW = 4.15 MHz
 F = Frequency Modulation
 9= Composite Digital Info
 W = Combination (Audio/Data)

1.10.3 CDMA Emission Designator

Emission Designator = 1M30F9W
 F = Frequency Modulation
 9= Composite Digital Info
 W = Combination (Audio/Data)

1.10.4 LTE Emission Designator (QPSK)

Emission Designator = 4M51G7D
 G = Phase Modulation
 7= Quantized/Digital Info
 D = Combination (Audio/Data)

1.10.5 LTE Emission Designator (16QAM)

Emission Designator = 4M52W7D
 W = Frequency Modulation
 7= Quantized/Digital Info
 D = Combination (Audio/Data)

1.10.6 Spurious Radiated Emission (below 1GHz)

Measuring equipment raw measurement (dBµV/m) @ 30 MHz		24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3
	Asset# 1172 (cable)	0.3
	Asset# 1016 (preamplifier)	-30.7
	Asset# 1175(cable)	0.3
	Asset# 1002 (antenna)	17.2
Reported QuasiPeak Final Measurement (dBµV/m) @ 30MHz		11.8

1.10.7 Spurious Radiated Emission – Substitution Method

Example = 84dBµV/m @ 1413 MHz (numerical sample only)



The field strength reading of $84\text{dB}\mu\text{V}/\text{m}$ @ 1413 MHz (2^{nd} Harmonic of 706.5 MHz) is the maximized measurement when the EUT is on the turntable measured at 3 meters. The gain of the substituted antenna is 7.8dBi while the transmit cable loss is 1.0 dB (cable between signal generator and the substituted antenna). The signal generator level is adjusted until the $84\text{dB}\mu\text{V}/\text{m}$ level at the receiving end is replicated (identical test setup, i.e. same antenna, cable/s and preamp). If the adjusted signal generator level is -18dBm, then we have the following for both EIRP and ERP as required:

$$\begin{aligned} P_{\text{EIRP}} &= -18 \text{ dBm} + 7.8 \text{ dBi} - 1 \text{ dB} \\ &= 11.2 \text{ dBm} \\ P_{\text{ERP}} &= P_{\text{EIRP}} - 2.15 \text{ dB} \\ &= 11.2 \text{ dBm} - 2.15 \text{ dB} \\ &= 9.05 \text{ dBm} \end{aligned}$$



SECTION 2

TEST DETAILS

Radio Testing of the
Novatel Wireless Inc.
USB Modem



2.1 TRANSMITTER CONDUCTED POWER MEASUREMENTS

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046
RSS-132, Clause 5.4
RSS-133, Clause 6.4

2.1.2 Standard Applicable

The conducted power measurements were made in accordance to FCC Part 2 Clause 2.1046 and RSS-132 Clause 5.4 and RSS-133 Clause 6.4.

2.1.3 Equipment Under Test and Modification State

Serial No: SP070315900027 / Test Configuration A

2.1.4 Date of Test/Initial of test personnel who performed the test

April 6 to 14 , 2015 / XYZ

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Additional Observations

- This is a conducted test using a peak/average power meter.
- The path loss for Cell Band (CDMA/EvDO/GSM850), WCDMA and LTE Band 5;PCS Band (CDMA/EvDO/GSM1900), WCDMA and LTE Band 2 was measured and entered as a level offset.
- Only worst case of SO/RC, RTAP, RETAP, RB size and RB offset presented and recorded in this test report.



2.1.7 Test Results

CDMA 2000 – 1xRTT				
Band	Channel	Frequency (MHz)	Max Power Average (dBm)	Service Option (SO) / (RC)
Cell (BC0)	1013	824.70	24.44	32 / 3
	384	836.52	24.47	32 / 3
	777	848.31	24.41	32 / 3
PCS (BC1)	25	1851.25	23.91	32 / 3
	600	1880.00	23.74	32 / 3
	1175	1908.75	23.76	32 / 3

CDMA 2000 – 1xEVDO Release 0				
Band	Channel	Frequency (MHz)	Max Power Average (dBm)	RTAP Data Rate (kbps)
Cell (BC0)	1013	824.70	24.00	153.6
	384	836.52	23.87	153.6
	777	848.31	24.00	153.6
PCS (BC1)	25	1851.25	23.88	153.6
	600	1880.00	23.74	153.6
	1175	1908.75	23.76	153.6

CDMA 2000 – 1xEVDO Release A				
Band	Channel	Frequency (MHz)	Max Power Average (dBm)	RETAP Data Rate (kbps)
Cell (BC0)	1013	824.70	23.99	4096
	384	836.52	23.98	4096
	777	848.31	23.92	4096
PCS (BC1)	25	1851.25	23.98	4096
	600	1880.00	23.93	4096
	1175	1908.75	23.75	4096

GSM850 / GSM1900 (GPRS)			
Band	Channel	Frequency (MHz)	Max Power Average (dBm)
Cell	128	824.2	31.19
	190	836.6	31.84
	251	848.8	32.47
PCS	512	1850.2	29.87
	661	1880.0	29.25
	810	1909.8	29.45



GSM850 / GSM1900 (EGPRS)			
Band	Channel	Frequency (MHz)	Max Power Average (dBm)
Cell	128	824.2	25.14
	190	836.6	25.77
	251	848.8	26.59
PCS	512	1850.2	25.99
	661	1880.0	25.95
	810	1909.8	25.78

WCDMA			
Band	Channel	Frequency (MHz)	Max Power Average (dBm)
Cell Band 5	4132	826.4	23.76
	4183	836.6	23.56
	4233	846.6	23.85
PCS Band 2	9262	1852.4	22.92
	9400	1880.0	22.89
	9538	1907.6	22.81



LTE Band 5							
Modulation	Bandwidth	RB Size	RB Offset	Channels	Frequency	Tx Average (dBm)	Tx Peak (dBm)
QPSK	1.4 MHz	1	0	20407	824.7	23.56	30.01
		1	0	20525	836.5	23.63	29.44
		1	0	20643	848.3	23.67	29.73
	3 MHz	1	0	20415	825.5	23.75	29.02
		1	0	20525	836.5	23.68	28.46
		1	0	20635	847.5	23.48	28.90
	5 MHz	1	0	20425	826.5	23.71	29.04
		1	0	20525	836.5	23.60	28.66
		1	0	20625	846.5	23.48	29.07
	10 MHz	1	0	20450	829.0	23.75	29.07
		1	0	20525	836.5	23.65	29.14
		1	0	20600	844.0	23.53	28.33

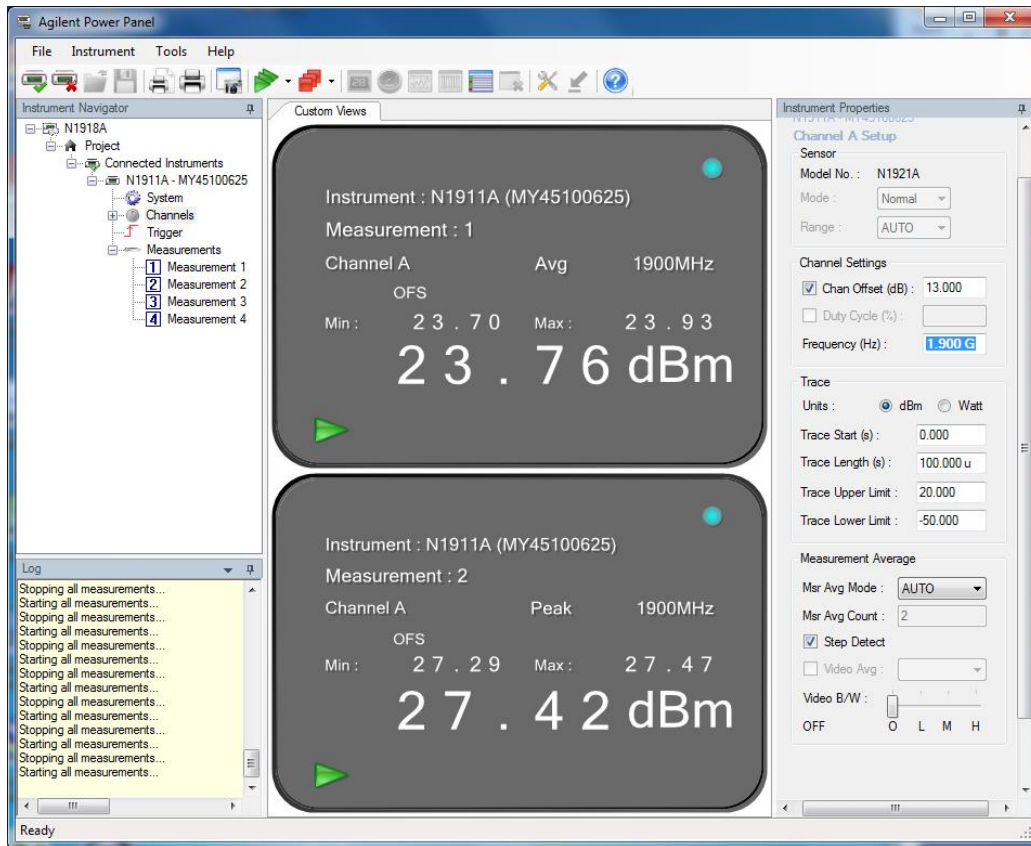
LTE Band 5							
Modulation	Bandwidth	RB Size	RB Offset	Channels	Frequency	Tx Average (dBm)	Tx Peak (dBm)
16QAM	1.4 MHz	1	0	20407	824.7	22.68	30.04
		1	0	20525	836.5	22.67	29.23
		1	0	20643	848.3	22.76	29.90
	3 MHz	1	0	20415	825.5	22.95	29.08
		1	0	20525	836.5	22.75	28.44
		1	0	20635	847.5	22.63	28.84
	5 MHz	1	0	20425	826.5	22.76	28.68
		1	0	20525	836.5	22.53	28.51
		1	0	20625	846.5	22.60	28.79
	10 MHz	1	0	20450	829.0	22.98	29.14
		1	0	20525	836.5	22.64	29.06
		1	0	20600	844.0	22.67	28.27



LTE Band 2							
Modulation	Bandwidth	RB Size	RB Offset	Channels	Frequency	Tx Average (dBm)	Tx Peak (dBm)
QPSK	1.4 MHz	1	0	18607	1850.7	23.11	27.51
		1	0	18900	1880.0	23.06	27.76
		1	0	19193	1909.3	22.99	26.62
	3 MHz	1	0	18615	1851.5	23.95	27.00
		1	0	18900	1880.0	23.98	27.77
		1	0	19185	1908.5	24.00	26.77
	5 MHz	1	0	18625	1852.5	24.00	27.06
		1	0	18900	1880.0	23.95	27.57
		1	0	19175	1907.5	23.94	24.72
	10 MHz	1	0	18650	1855.0	24.00	27.07
		1	0	18900	1880.0	23.97	27.47
		1	0	19150	1905.0	23.72	27.24
	15 MHz	1	0	18675	1857.5	24.00	27.17
		1	0	18900	1880.0	23.97	27.47
		1	0	19125	1902.5	23.78	27.64
	20 MHz	1	0	18700	1860.0	23.97	27.15
		1	0	18900	1880.0	23.96	27.60
		1	0	19100	1900.0	23.90	28.26

LTE Band 2							
Modulation	Bandwidth	RB Size	RB Offset	Channels	Frequency	Tx Average (dBm)	Tx Peak (dBm)
16QAM	1.4 MHz	1	0	18607	1850.7	22.12	27.39
		1	0	18900	1880.0	22.14	27.76
		1	0	19193	1909.3	22.16	26.81
	3 MHz	1	0	18615	1851.5	23.27	27.25
		1	0	18900	1880.0	23.27	27.77
		1	0	19185	1908.5	23.34	27.49
	5 MHz	1	0	18625	1852.5	23.28	27.23
		1	0	18900	1880.0	23.14	27.50
		1	0	19175	1907.5	22.83	27.52
	10 MHz	1	0	18650	1855.0	23.40	27.29
		1	0	18900	1880.0	23.05	27.49
		1	0	19150	1905.0	22.74	27.36
	15 MHz	1	0	18675	1857.5	23.38	27.42
		1	0	18900	1880.0	23.12	27.47
		1	0	19125	1902.5	22.72	27.62
	20 MHz	1	0	18700	1860.0	22.87	27.38
		1	0	18900	1880.0	22.90	27.49
		1	0	19100	1900.0	22.70	28.44

2.1.8 Sample Test Measurement Screen





2.2 EFFECTIVE RADIATED POWER

2.2.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046
FCC 47 CFR Part 22, Clause 22.913(a)(2)

2.2.2 Standard Applicable

FCC Part 22:
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

2.2.3 Equipment Under Test and Modification State

Serial No: SP070315900027 / Test Configuration (N/A, calculation only)

2.2.4 Date of Test/Initial of test personnel who performed the test

April 06 to 14, 2015 / XYZ

2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.6 Additional Observations

- ERP was calculated as per Section 1.3.2 of KDB412172 D01 (Determining ERP and EIRP v01).
- Calculation formula in logarithmic terms:

$$\text{ERP} = P_T + G_T - L_c - 2.15\text{dB}$$

Where:

P_T = transmitter conducted output power dBm (Section 2.1 of this test report)
 G_T = gain of the transmitting antenna, in dBi (EIRP: the -2.15 in the formula is to convert EIRP to ERP);
 L_c = signal attenuation in the connecting cable between the transmitter and antenna, in dB (EUT configuration during verification is mounted on an interface board with short direct connection to the antenna port. The loss between the EUT and the antenna port is considered negligible).



2.2.7 Test Results

CDMA2000 – 1xRTT Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
824.70	24.44	1.36	23.65	0.23	38.45	14.80
836.52	24.47	1.36	23.68	0.23	38.45	14.77
848.31	24.41	1.36	23.62	0.23	38.45	14.83

CDMA2000 – 1xEvDO Release 0 Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
824.70	24.00	1.36	23.21	0.21	38.45	15.24
836.52	23.87	1.36	23.08	0.20	38.45	15.37
848.31	24.00	1.36	23.21	0.21	38.45	15.24

CDMA2000 – 1xEvDO Release A Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
824.70	23.99	1.36	23.20	0.21	38.45	15.25
836.52	23.98	1.36	23.19	0.21	38.45	15.26
848.31	23.92	1.36	23.13	0.21	38.45	15.32

GSM850 (GPRS) Cell Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
824.2	31.19	1.36	30.40	1.10	38.45	8.05
836.6	31.94	1.36	31.15	1.30	38.45	7.30
848.8	32.47	1.36	31.68	1.47	38.45	6.77



GSM850 (EGPRS) Cell Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
824.2	25.14	1.36	24.35	0.27	38.45	14.10
836.6	25.77	1.36	24.98	0.31	38.45	13.47
848.8	26.59	1.36	25.80	0.38	38.45	12.65

WCDMA (3GPP Release Version 99) Cell Band 5						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	ERP			
			(dBm)	(W)	ERP Limit (dBm)	Margin (dB)
826.4	23.76	1.36	22.97	0.20	38.45	15.48
836.6	23.56	1.36	22.77	0.19	38.45	15.68
846.6	23.85	1.36	23.06	0.20	38.45	15.39

LTE Band 5									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dBm)
QPSK	1.4	1 / 0	20407	824.7	23.56	1.07	22.48	38.45	15.97
		1 / 0	20525	836.5	23.63	1.07	22.55	38.45	15.90
		1 / 0	20643	848.3	23.67	1.07	22.59	38.45	15.86
	3	1 / 0	20415	825.5	23.75	1.07	22.67	38.45	15.78
		1 / 0	20525	836.5	23.68	1.07	22.6	38.45	15.85
		1 / 0	20635	847.5	23.48	1.07	22.4	38.45	16.05
	5	1 / 0	20425	826.5	23.71	1.07	22.63	38.45	15.82
		1 / 0	20525	836.5	23.60	1.07	22.52	38.45	15.93
		1 / 0	20625	846.5	23.48	1.07	22.4	38.45	16.05
	10	1 / 0	20450	829	23.75	1.07	22.67	38.45	15.78
		1 / 0	20525	836.5	23.65	1.07	22.57	38.45	15.88
		1 / 0	20600	844	23.53	1.07	22.45	38.45	16.00



LTE Band 5									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dBm)
16QAM	1.4	1 / 0	20407	824.7	22.68	1.07	21.60	38.45	16.85
		1 / 0	20525	836.5	22.67	1.07	21.59	38.45	16.86
		1 / 0	20643	848.3	22.76	1.07	21.68	38.45	16.77
	3	1 / 0	20415	825.5	22.95	1.07	21.87	38.45	16.58
		1 / 0	20525	836.5	22.75	1.07	21.67	38.45	16.78
		1 / 0	20635	847.5	22.63	1.07	21.55	38.45	16.90
	5	1 / 0	20425	826.5	22.76	1.07	21.68	38.45	16.77
		1 / 0	20525	836.5	22.53	1.07	21.45	38.45	17.00
		1 / 0	20625	846.5	22.60	1.07	21.52	38.45	16.93
	10	1 / 0	20450	829	22.98	1.07	21.90	38.45	16.55
		1 / 0	20525	836.5	22.64	1.07	21.56	38.45	16.89
		1 / 0	20600	844	22.67	1.07	21.59	38.45	16.86



2.3 EQUIVALENT ISOTROPIC RADIATED POWER

2.3.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046
RSS-132, Clause 5.4
FCC 47 CFR Part 24, Clause 24.232 (c)
RSS-133, Clause 6.4

2.3.2 Standard Applicable

IC RSS-132:
The EIRP for mobile equipment shall not exceed 11.5 watts

FCC Part 24:
Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

IC RSS-133:
The equivalent isotropically radiated power (e.i.r.p.) for Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p.

2.3.3 Equipment Under Test and Modification State

Serial No: SP070315900027 / Test Configuration (N/A, calculation only)

2.3.4 Date of Test/Initial of test personnel who performed the test

April 06 to 14, 2015 / XYZ

2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.6 Additional Observations

- EIRP was calculated as per Section 1.3.2 of KDB412172 D01 (Determining ERP and EIRP v01).
- Calculation formula in logarithmic terms:

$$\text{EIRP} = P_T + G_T - L_C$$

Where:

P_T = transmitter conducted output power dBm (Section 2.1 of this test report)

G_T = gain of the transmitting antenna, in dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB (EUT poses an internal Antenna. The loss between the EUT and the antenna port is considered negligible).



2.3.7 Test Results

CDMA2000 – 1xRTT Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
824.70	24.44	1.36	25.80	0.38	40.61	14.81
836.52	24.47	1.36	25.83	0.38	40.61	14.78
848.31	24.41	1.36	25.77	0.38	40.61	14.84

CDMA2000 – 1xEvDO Release 0 Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
824.70	24.00	1.36	25.36	0.34	40.61	15.25
836.52	23.87	1.36	25.23	0.33	40.61	15.38
848.31	24.00	1.36	25.36	0.34	40.61	15.25

CDMA2000 – 1xEvDO Release A Cell Band (BC0)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
824.70	23.99	1.36	25.35	0.34	40.61	15.26
836.52	23.98	1.36	25.34	0.34	40.61	15.27
848.31	23.92	1.36	25.28	0.34	40.61	15.33

GSM850 (GPRS) Cell Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
824.2	31.19	1.36	32.55	1.80	40.61	8.06
836.6	31.94	1.36	33.30	2.14	40.61	7.31
848.8	32.47	1.36	33.83	2.42	40.61	6.78

GSM850 (EGPRS) Cell Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
824.2	25.14	1.36	26.50	0.45	40.61	14.11
836.6	25.77	1.36	27.13	0.52	40.61	13.48
848.8	26.59	1.36	27.95	0.62	40.61	12.66



WCDMA (3GPP Release Version 99) Cell Band 5						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	EIRP Limit (dBm)	Margin (dB)
826.4	23.76	1.36	25.12	0.33	40.61	15.49
836.6	23.56	1.36	24.92	0.31	40.61	15.69
846.6	23.85	1.36	25.21	0.33	40.61	15.40

LTE Band 5									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dBm)
QPSK	1.4	1/0	20407	824.7	23.56	1.07	24.63	40.61	15.98
		1/0	20525	836.5	23.63	1.07	24.70	40.61	15.91
		1/0	20643	848.3	23.67	1.07	24.74	40.61	15.87
	3	1/0	20415	825.5	23.75	1.07	24.82	40.61	15.79
		1/0	20525	836.5	23.68	1.07	24.75	40.61	15.86
		1/0	20635	847.5	23.48	1.07	24.55	40.61	16.06
	5	1/0	20425	826.5	23.71	1.07	24.78	40.61	15.83
		1/0	20525	836.5	23.60	1.07	24.67	40.61	15.94
		1/0	20625	846.5	23.48	1.07	24.55	40.61	16.06
	10	1/0	20450	829.0	23.75	1.07	24.82	40.61	15.79
		1/0	20525	836.5	23.65	1.07	24.72	40.61	15.89
		1/0	20600	844.0	23.53	1.07	24.60	40.61	16.01

LTE Band 5									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dBm)
16QAM	1.4	1/0	20407	824.7	22.68	1.07	23.75	40.61	16.86
		1/0	20525	836.5	22.67	1.07	23.74	40.61	16.87
		1/0	20643	848.3	22.76	1.07	23.83	40.61	16.78
	3	1/0	20415	825.5	22.95	1.07	24.02	40.61	16.59
		1/0	20525	836.5	22.75	1.07	23.82	40.61	16.79
		1/0	20635	847.5	22.63	1.07	23.70	40.61	16.91
	5	1/0	20425	826.5	22.76	1.07	23.83	40.61	16.78
		1/0	20525	836.5	22.53	1.07	23.60	40.61	17.01
		1/0	20625	846.5	22.6	1.07	23.67	40.61	16.94
	10	1/0	20450	829.0	22.98	1.07	24.05	40.61	16.56
		1/0	20525	836.5	22.64	1.07	23.71	40.61	16.90
		1/0	20600	844.0	22.67	1.07	23.74	40.61	16.87



CDMA2000 – 1xRTT PCS Band (BC1)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1851.25	23.91	1.15	25.06	0.32	33	7.94
1880.00	23.74	1.15	24.89	0.31	33	8.11
1908.75	23.76	1.15	24.91	0.31	33	8.09

CDMA2000 – 1xEvDO Release 0 PCS Band (BC1)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1851.25	23.88	1.15	25.03	0.32	33	7.97
1880.00	23.74	1.15	24.89	0.31	33	8.11
1908.75	23.76	1.15	24.91	0.31	33	8.09

CDMA2000 – 1xEvDO Release A PCS Band (BC1)						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1851.25	23.98	1.15	25.13	0.33	33	7.87
1880.00	23.93	1.15	25.08	0.32	33	7.92
1908.75	23.75	1.15	24.90	0.31	33	8.10

GSM1900 (GPRS) PCS Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1850.2	29.87	1.04	30.91	1.23	33	2.09
1880.0	29.25	1.04	30.29	1.07	33	2.71
1909.8	29.45	1.04	30.49	1.12	33	2.51

GSM1900 (EGPRS) PCS Band						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1850.2	25.99	1.04	27.03	0.50	33	5.97
1880.0	25.95	1.04	26.99	0.50	33	6.01
1909.8	25.78	1.04	26.82	0.48	33	6.18



WCDMA (3GPP Release Version 99) PCS Band 2						
Frequency (MHz)	Max Power Average (dBm)	Antenna Gain (dBi)	EIRP			
			(dBm)	(W)	Limit (dBm)	Margin (dB)
1852.4	22.92	1.23	24.15	0.26	33	8.85
1880.0	22.89	1.23	24.12	0.26	33	8.88
1907.6	22.81	1.23	24.04	0.25	33	8.96

LTE Band 2									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dBm)
QPSK	1.4	3 / 1	18607	1850.7	23.11	1.23	24.34	33	8.66
		3 / 1	18900	1880.0	23.06	1.23	24.29	33	8.71
		1 / 5	19193	1909.3	22.99	1.23	24.22	33	8.78
	3	1 / 0	18615	1851.5	23.95	1.23	25.18	33	7.82
		1 / 0	18900	1880.0	23.98	1.23	25.21	33	7.79
		1 / 14	19185	1908.5	24.00	1.23	25.23	33	7.77
	5	1 / 0	18625	1852.5	24.00	1.23	25.23	33	7.77
		1 / 0	18900	1880.0	23.95	1.23	25.18	33	7.82
		1 / 24	19175	1907.5	23.94	1.23	25.17	33	7.83
	10	1 / 0	18650	1855.0	24.00	1.23	25.23	33	7.77
		1 / 24	18900	1880.0	23.97	1.23	25.20	33	7.80
		1 / 24	19150	1905.0	23.72	1.23	24.95	33	8.05
	15	1 / 0	18675	1857.5	24.00	1.23	25.23	33	7.77
		1 / 0	18900	1880.0	23.97	1.23	25.20	33	7.80
		1 / 74	19125	1902.5	23.78	1.23	25.01	33	7.99
	20	1 / 0	18700	1860.0	23.97	1.23	25.20	33	7.80
		1 / 0	18900	1880.0	23.96	1.23	25.19	33	7.81
		1 / 99	19100	1900.0	23.90	1.23	25.13	33	7.87



LTE Band 2									
Modulation	Bandwidth (MHz)	RB Size/Offset	Channels	Frequency (MHz)	Tx Average Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dBm)
16QAM	1.4	6 / 0	18607	1850.7	22.12	1.23	23.35	33	9.65
		3 / 1	18900	1880.0	22.14	1.23	23.37	33	9.63
		1 / 5	19193	1909.3	22.16	1.23	23.39	33	9.61
	3	1 / 0	18615	1851.5	23.27	1.23	24.50	33	8.50
		1 / 0	18900	1880.0	23.27	1.23	24.50	33	8.50
		1 / 0	19185	1908.5	23.34	1.23	24.57	33	8.43
	5	1 / 0	18625	1852.5	23.28	1.23	24.51	33	8.49
		1 / 0	18900	1880.0	23.14	1.23	24.37	33	8.63
		1 / 24	19175	1907.5	22.83	1.23	24.06	33	8.94
	10	1 / 0	18650	1855.0	23.40	1.23	24.63	33	8.37
		1 / 24	18900	1880.0	23.05	1.23	24.28	33	8.72
		1 / 24	19150	1905.0	22.74	1.23	23.97	33	9.03
	15	1 / 0	18675	1857.5	23.38	1.23	24.61	33	8.39
		1 / 0	18900	1880.0	23.12	1.23	24.35	33	8.65
		1 / 74	19125	1902.5	22.72	1.23	23.95	33	9.05
	20	1 / 0	18700	1860.0	22.87	1.23	24.10	33	8.90
		1 / 0	18900	1880.0	22.90	1.23	24.13	33	8.87
		1 / 99	19100	1900.0	22.70	1.23	23.93	33	9.07



2.4 PEAK-AVERAGE RATIO

2.4.1 Specification Reference

FCC 47 CFR Part 24, Clause 24.2329 (d)
RSS-133, Clause 6.4
RSS-132, Clause 5.4

2.4.2 Standard Applicable

FCC Part 24:

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 13dB

IC RSS-132 and RSS-133:

The transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

2.4.3 Equipment Under Test and Modification State

Serial No: SP070315900027 / Test Configuration A

2.4.4 Date of Test/Initial of test personnel who performed the test

April 06 to 22, 2015 / XYZ

2.4.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

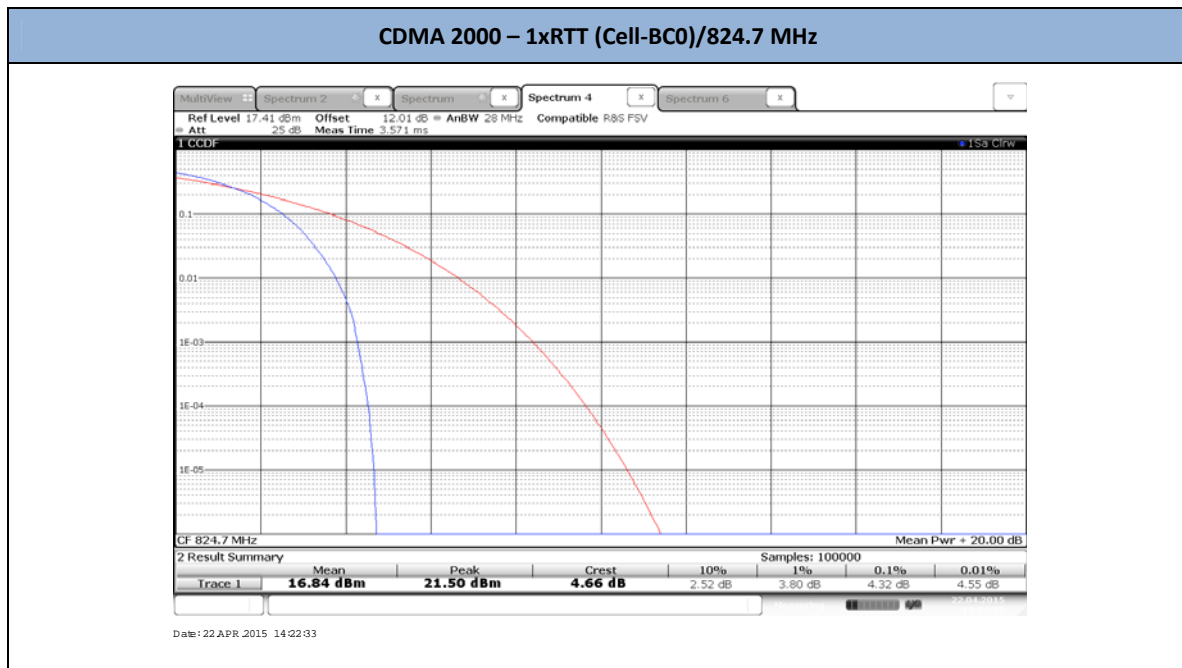
Ambient Temperature	24.3 - 25.4°C
Relative Humidity	37.8 - 42.4
ATM Pressure	99.2 - 99.7 kPa



2.4.7 Additional Observations

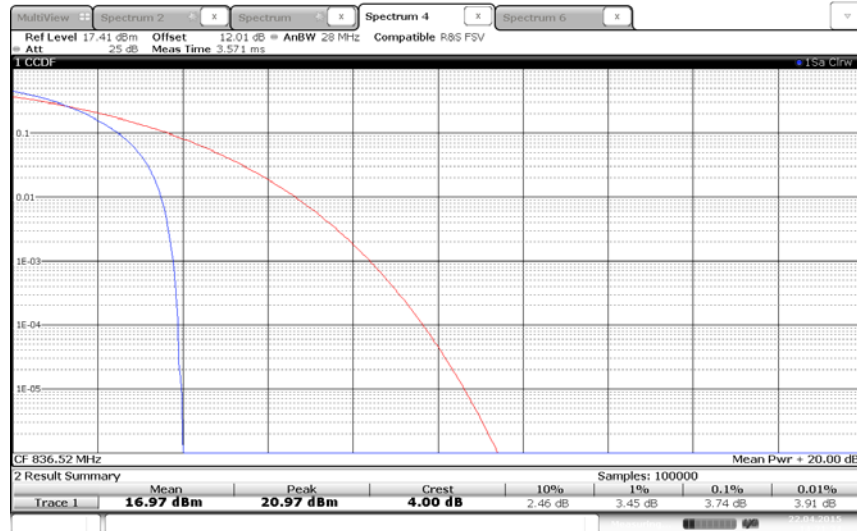
- This is a conducted test. Test procedure is per Section 3.0 of KDB971168 (D01 Power Meas License Digital Systems v01).
- Measurement was done using the Spectrum Analyzer’s Complementary Cumulative Distribution Function (CCDF) measurement profile. The built-in function is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth (crest factor or peak-to-average ratio) The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signals spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth.
- All channels based from worst case configuration were verified. Only the worst channel and configuration presented.
- The path loss for Cell Band (CDMA/EvDO/GSM850), WCDMA and LTE Band 5;PCS Band (CDMA/EvDO/GSM1900), WCDMA and LTE Band 2 was measured and entered as a level offset.
- There are no measured PAPR levels greater than 13dB. EUT complies.

2.4.8 Test Results



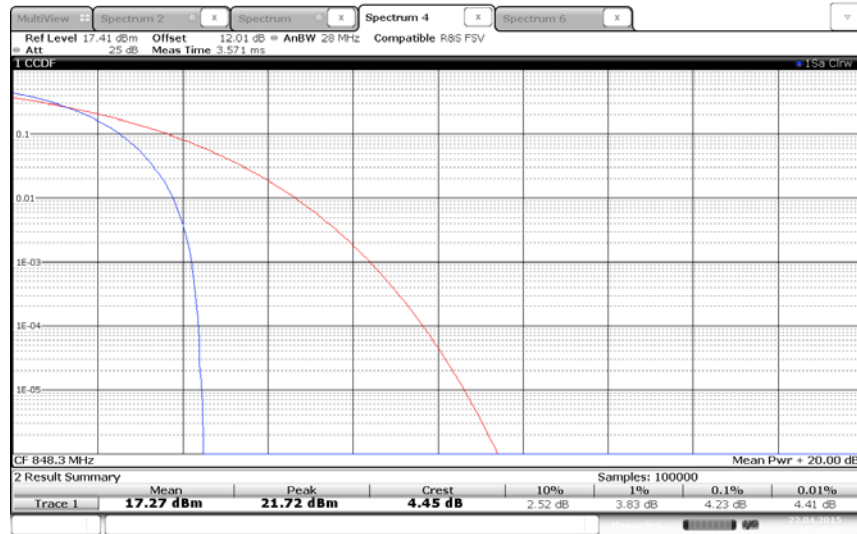


CDMA 2000 – 1xRTT (Cell-BC0)/836.52 MHz



Date: 22 APR 2015 14:21:34

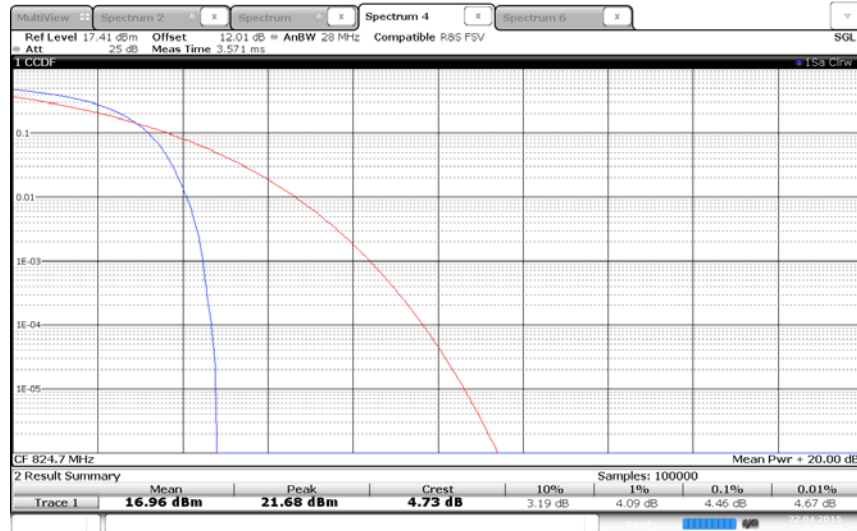
CDMA 2000 – 1xRTT (Cell-BC0)/848.31 MHz



Date: 22 APR 2015 15:08:48

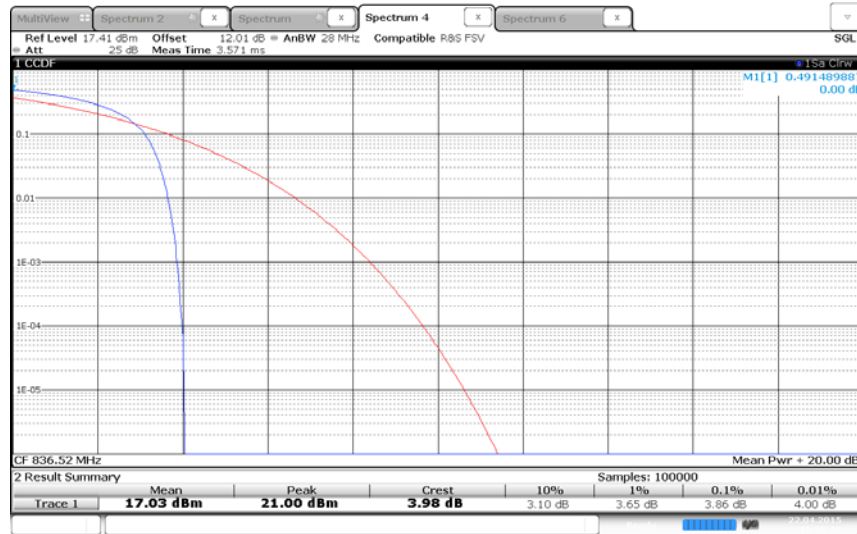


CDMA 2000 – 1xEvDO Rel 0 (Cell-BC0)/RTAP/824.7 MHz



Date: 22 APR. 2015 15:23:21

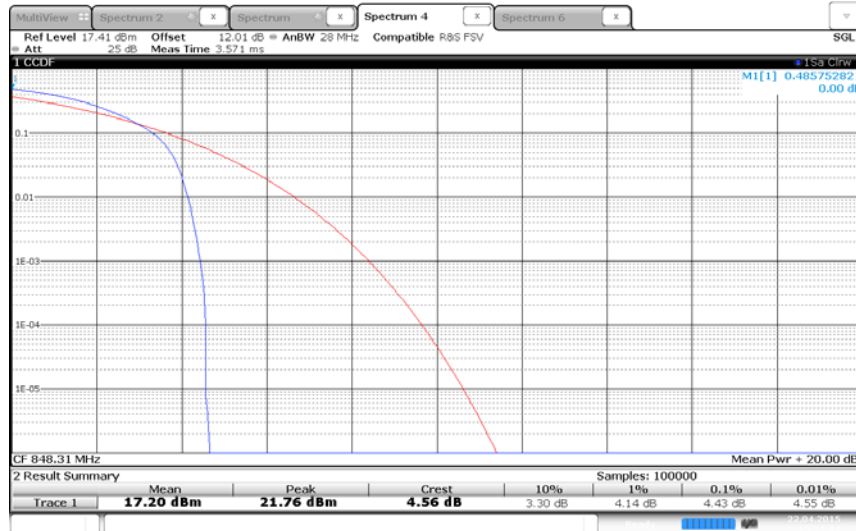
CDMA 2000 – 1xEvDO Rel 0 (Cell-BC0)/RTAP/836.52 MHz



Date: 22 APR. 2015 15:26:46

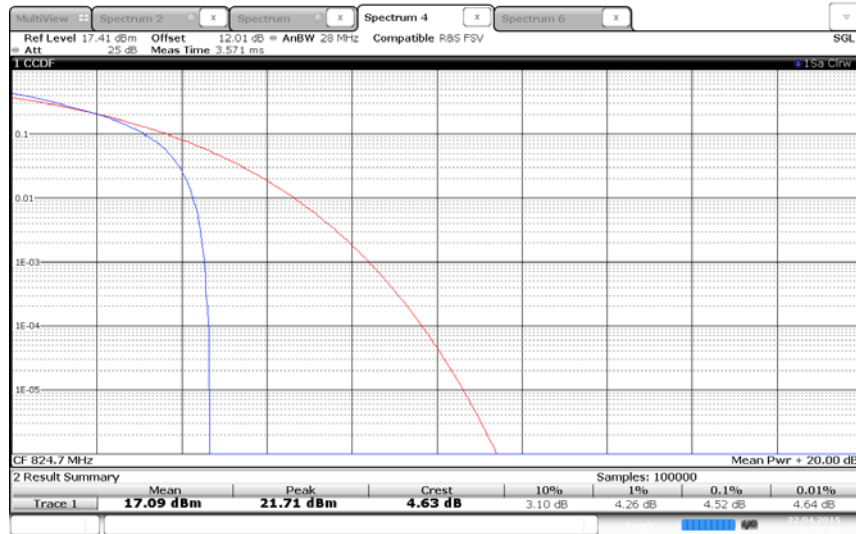


CDMA 2000 – 1xEVDO Rel 0 (Cell-BC0)/RTAP/848.31 MHz



Date: 22 APR. 2015 15:27:47

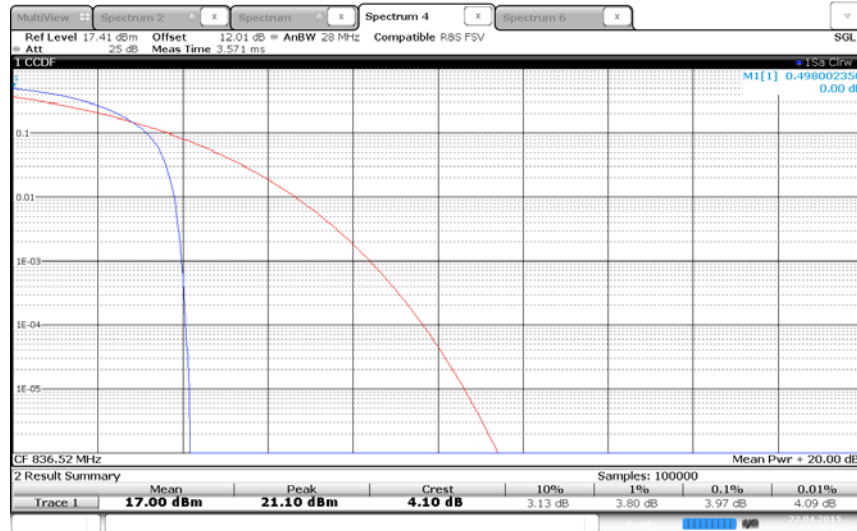
CDMA 2000 – 1xEVDO Rel A (Cell-BC0)/RETAP/824.7 MHz



Date: 22 APR. 2015 15:24:14

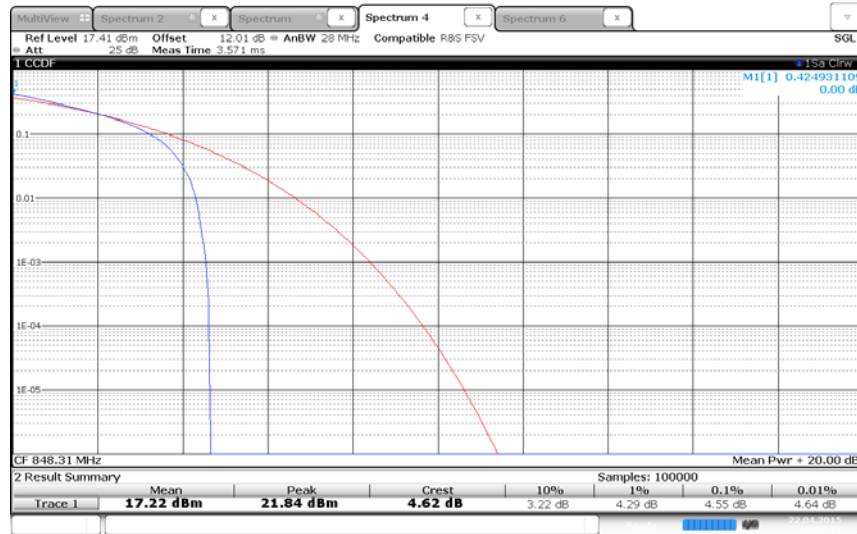


CDMA 2000 – 1xEvDO Rel A (Cell-BC0)/RETAP/836.52 MHz



Date: 22 APR. 2015 15:25:36

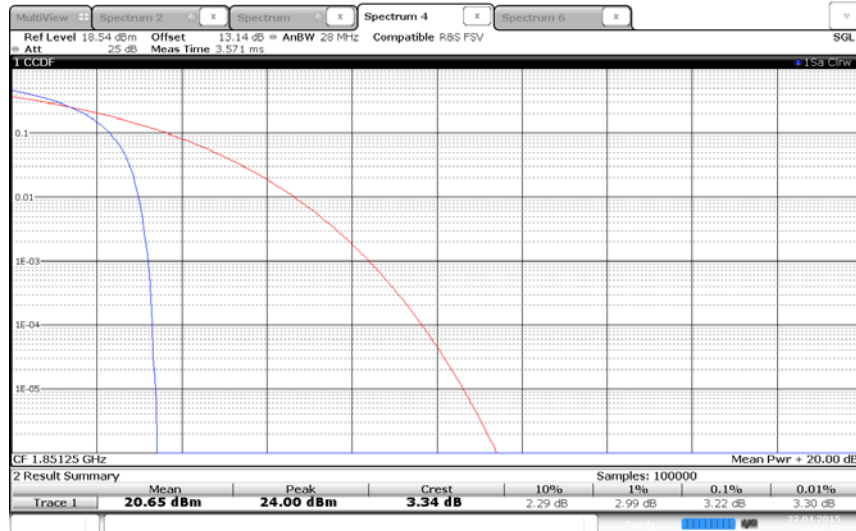
CDMA 2000 – 1xEvDO Rel A (Cell-BC0)/RETAP/848.31 MHz



Date: 22 APR. 2015 15:28:43

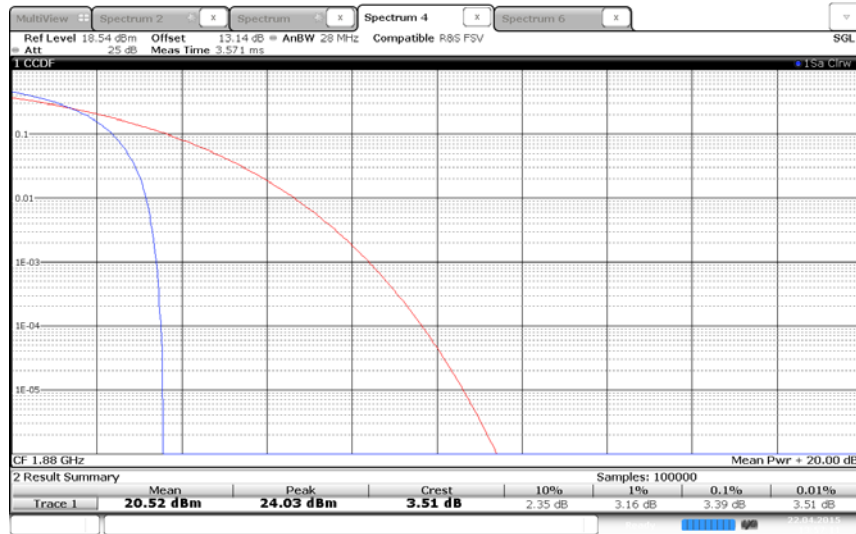


CDMA 2000 – 1xRTT (PCS-BC1)/1851.25 MHz



Date: 22 APR. 2015 13:57:53

CDMA 2000 – 1xRTT (PCS-BC1)/1880 MHz



Date: 22 APR. 2015 13:57:41

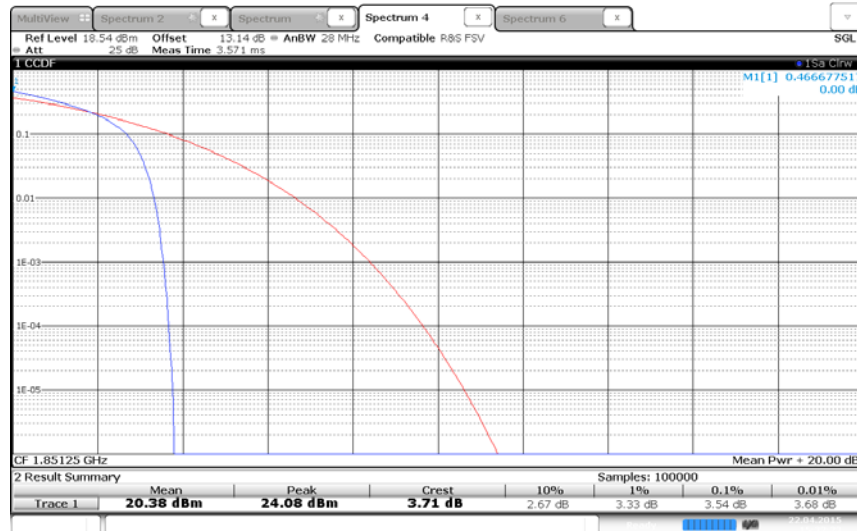


CDMA 2000 – 1xRTT (PCS-BC1)/1908.75 MHz



Date: 22 APR. 2015 13:58:57

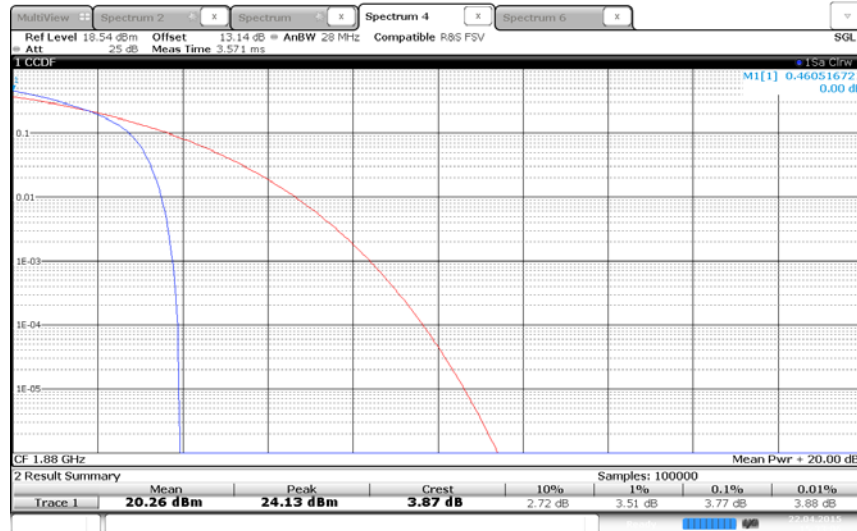
CDMA 2000 – 1xEvDO Rel 0 (PCS-BC1)/RTAP/1851.25 MHz



Date: 22 APR. 2015 15:32:22

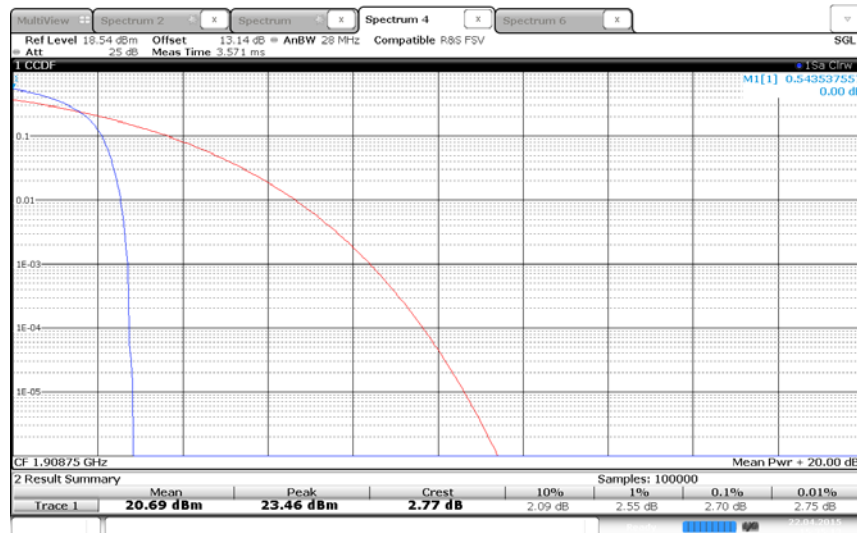


CDMA 2000 – 1xEvDO Rel 0 (PCS-BC1)/RTAP/1880 MHz



Date: 22 APR 2015 15:33:06

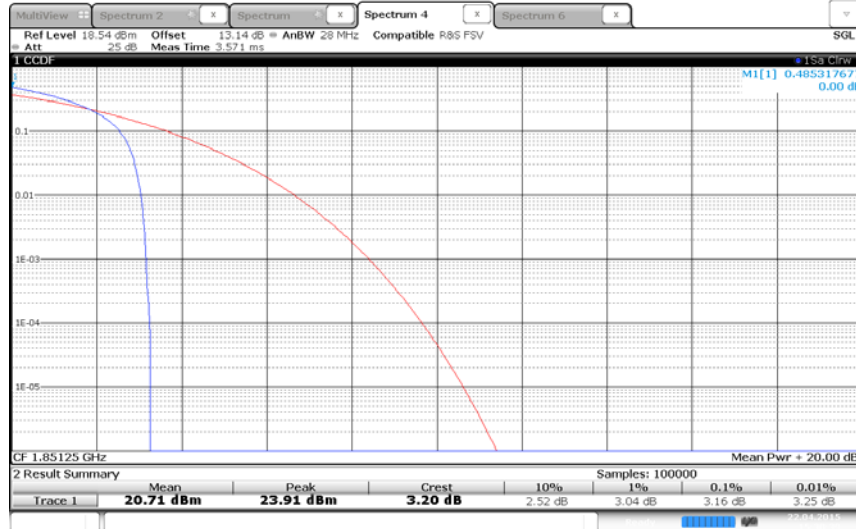
CDMA 2000 – 1xEvDO Rel 0 (PCS-BC1)/RTAP/1908.75 MHz



Date: 22 APR 2015 15:35:13

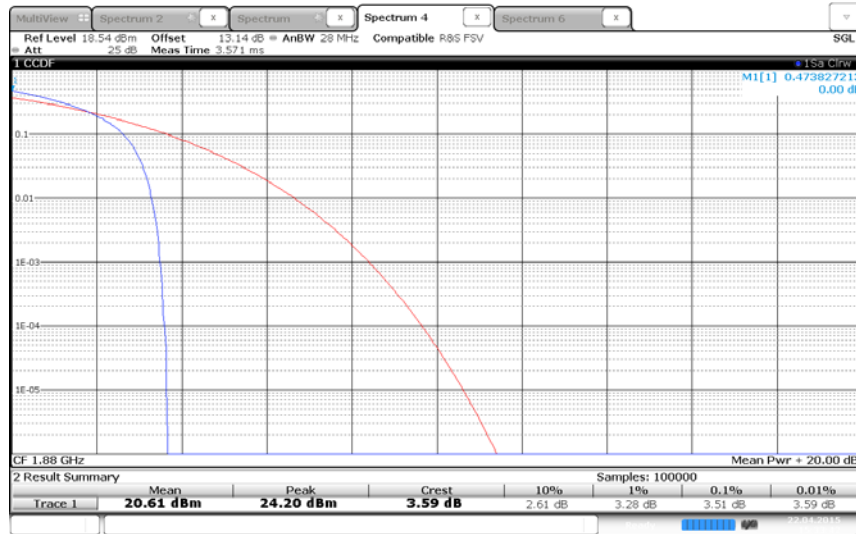


CDMA 2000 – 1xEvDO Release A (PCS-BC1)/RETAP/1851.25 MHz



Date: 22 APR. 2015 15:30:39

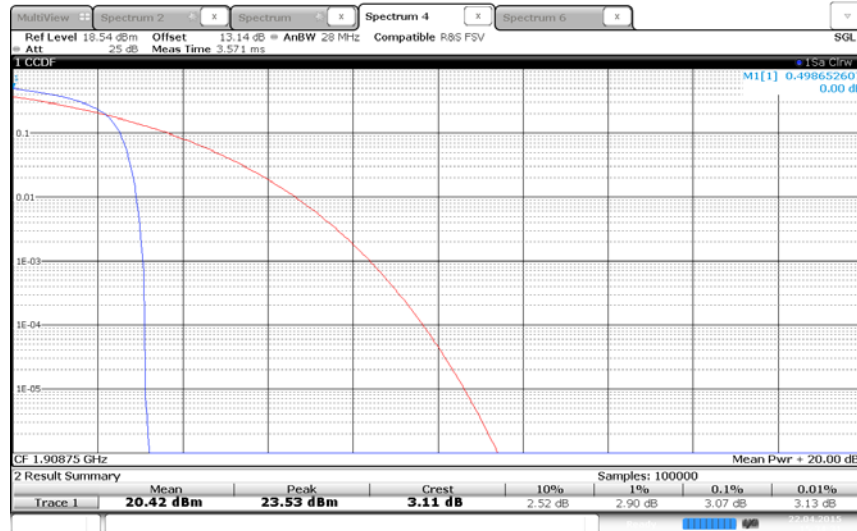
CDMA 2000 – 1xEvDO Rel A (PCS-BC1)/RETAP/1880 MHz



Date: 22 APR. 2015 15:33:42

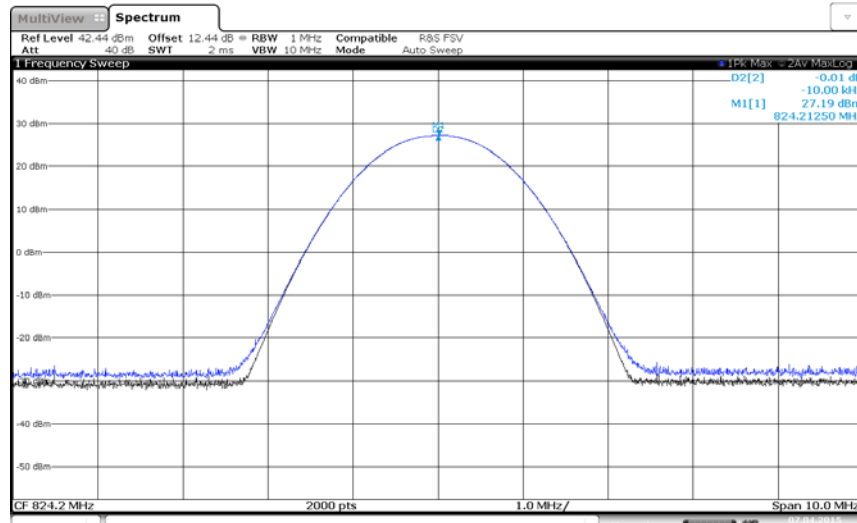


CDMA 2000 – 1xEVDO Rel A (PCS-BC1)/RETAP/1908.75 MHz



Date: 22 APR 2015 15:34:30

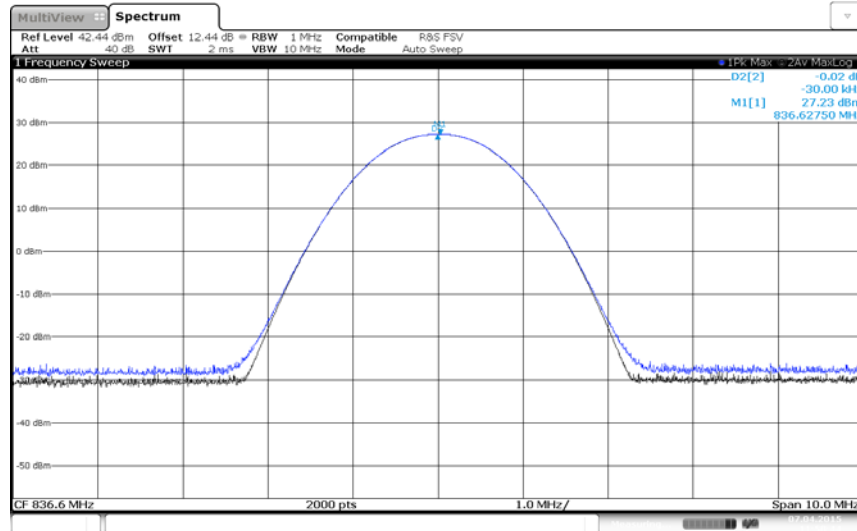
GSM850/GPRS (Cell-BC0)/824.2MHz



Date: 7 APR 2015 11:51:52

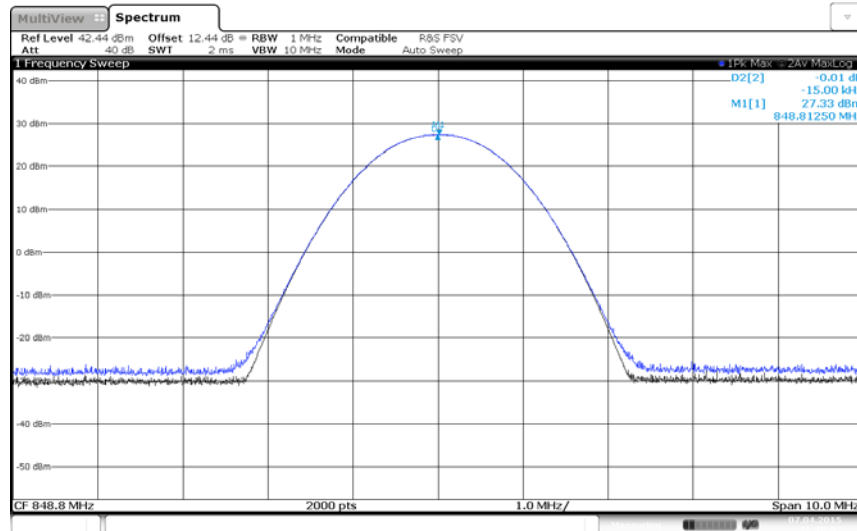


GSM850/GPRS (Cell-BC0)/836.6MHz



Date: 7 APR 2015 11:50:44

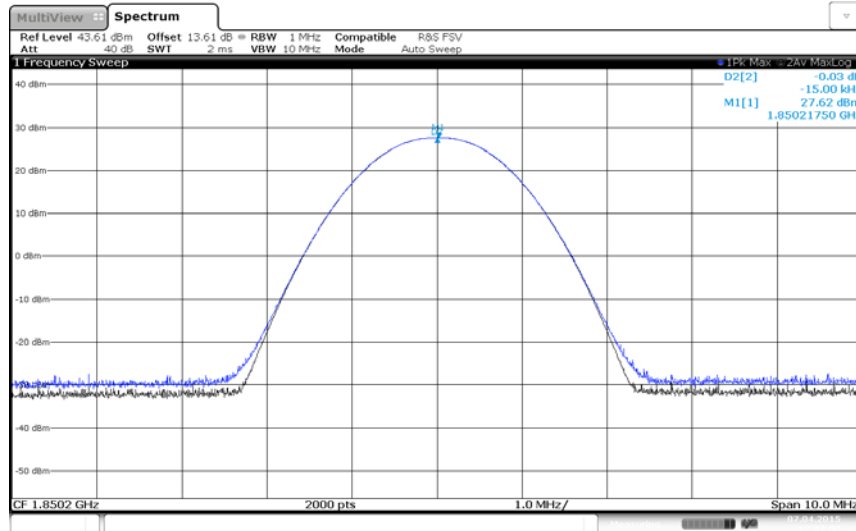
GSM850/GPRS (Cell-BC0)/848.8MHz



Date: 7 APR 2015 11:49:01

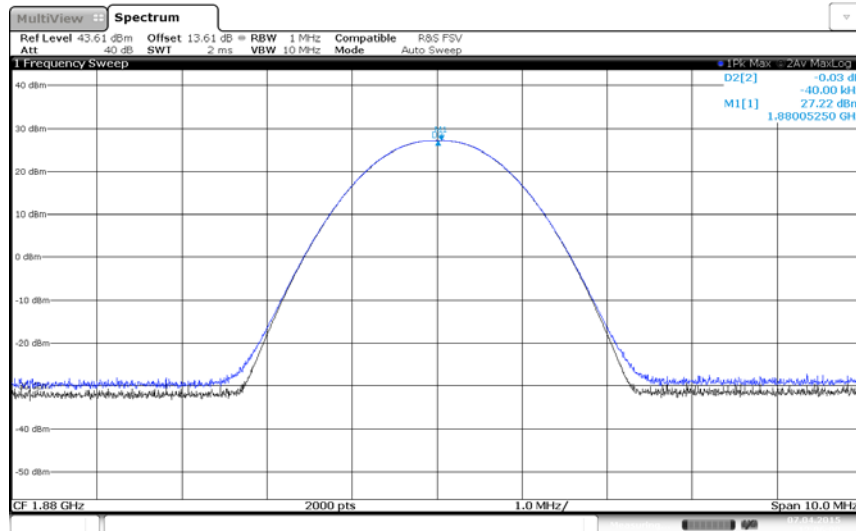


GSM1900/GPRS (PCS BC1)/1850.2MHz



Date: 7 APR 2015 12:07:00

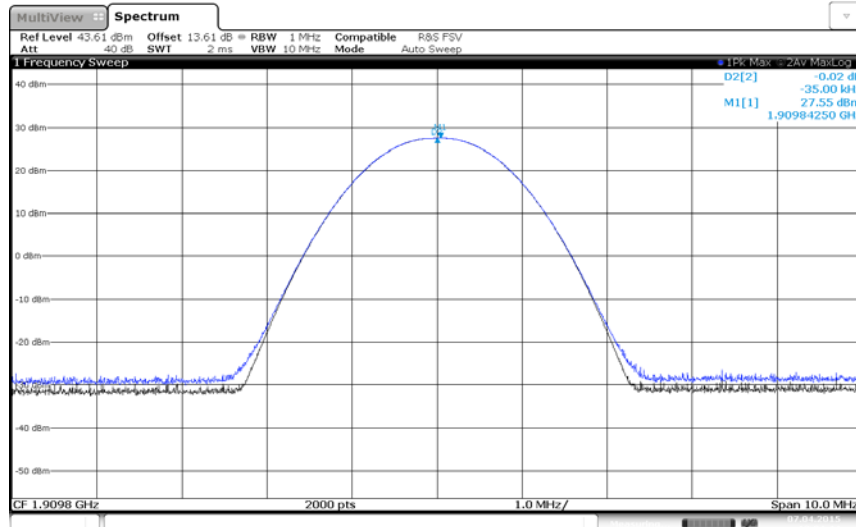
GSM1900/GPRS (PCS BC1)/1880.0MHz



Date: 7 APR 2015 12:06:00

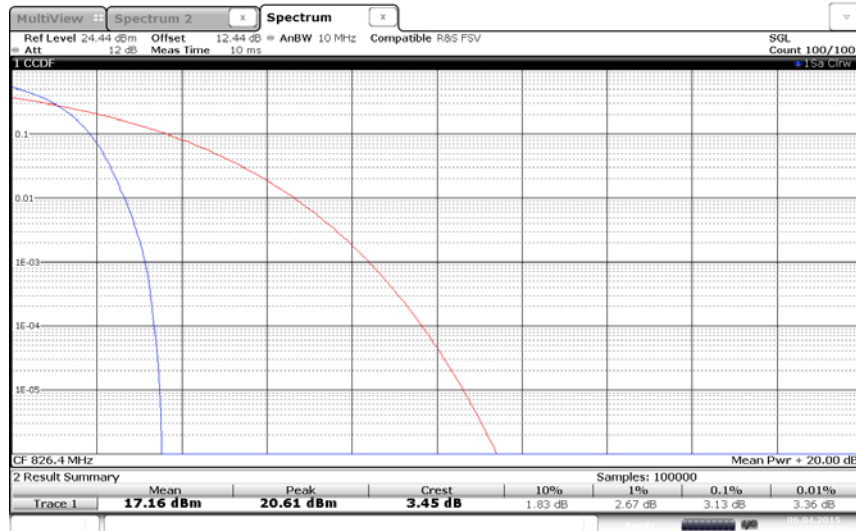


GSM1900/GPRS (PCS BC1)/1909.8MHz



Date: 7 APR 2015 12:04:44

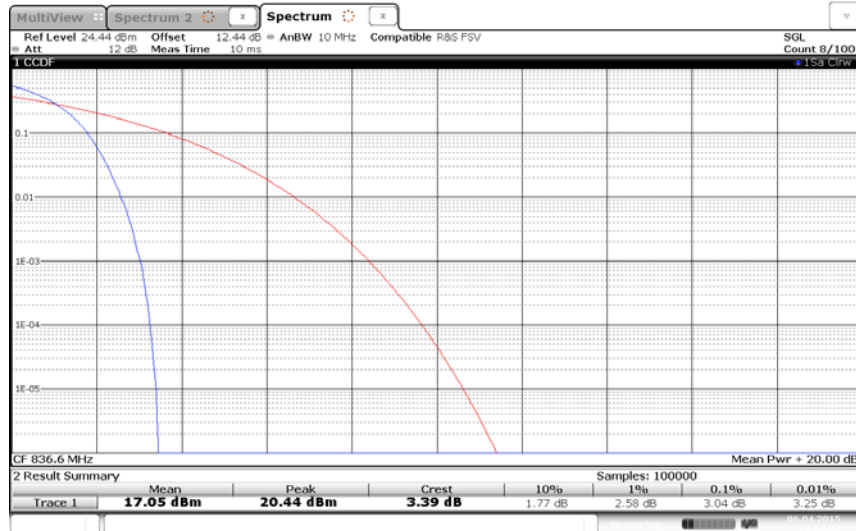
WCDMA/Band 5/826.4MHz



Date: 6 APR 2015 14:03:23

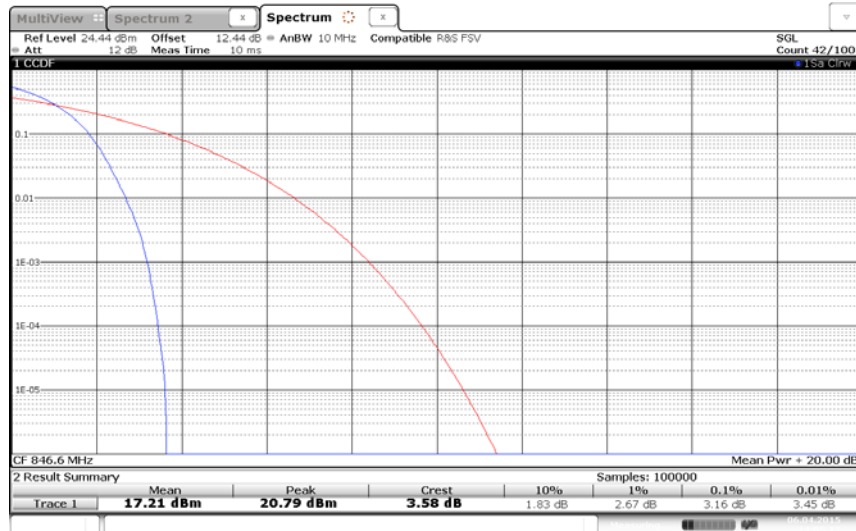


WCDMA/Band 5/836.6MHz



Date: 6 APR 2015 14:04:27

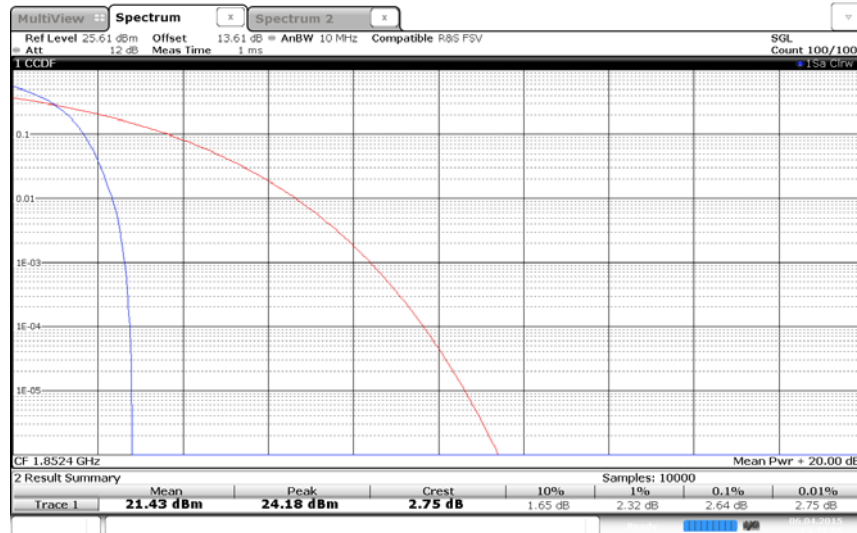
WCDMA/Band 5/846.6 MHz



Date: 6 APR 2015 14:05:12

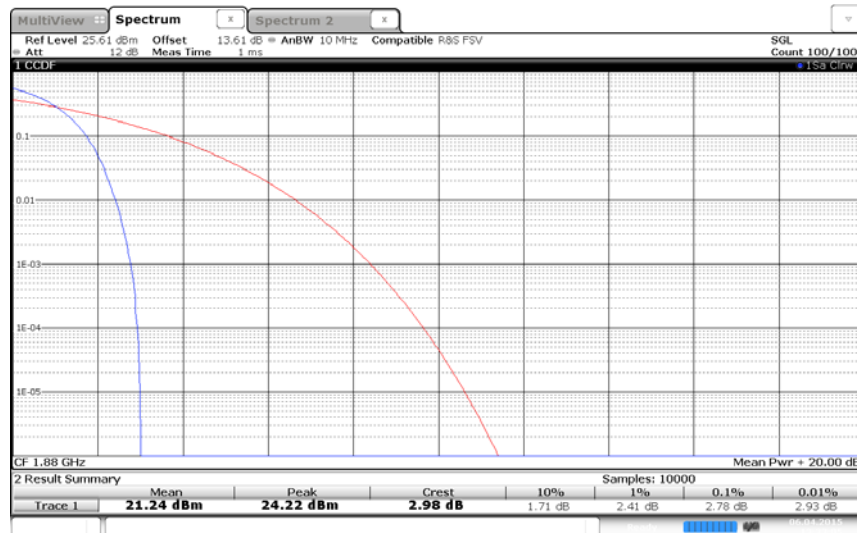


WCDMA/Band 2/1852.4MHz



Date: 6 APR 2015 13:31:56

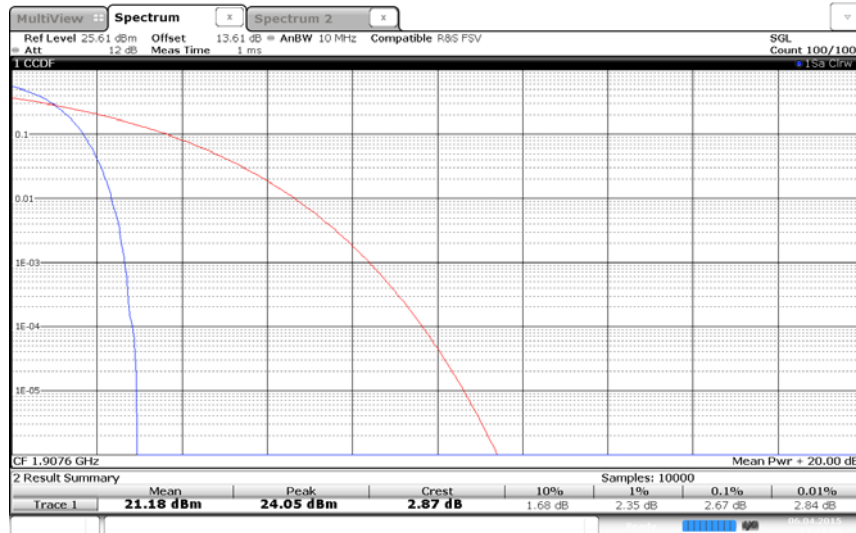
WCDMA/Band 2/1880 MHz



Date: 6 APR 2015 13:33:05

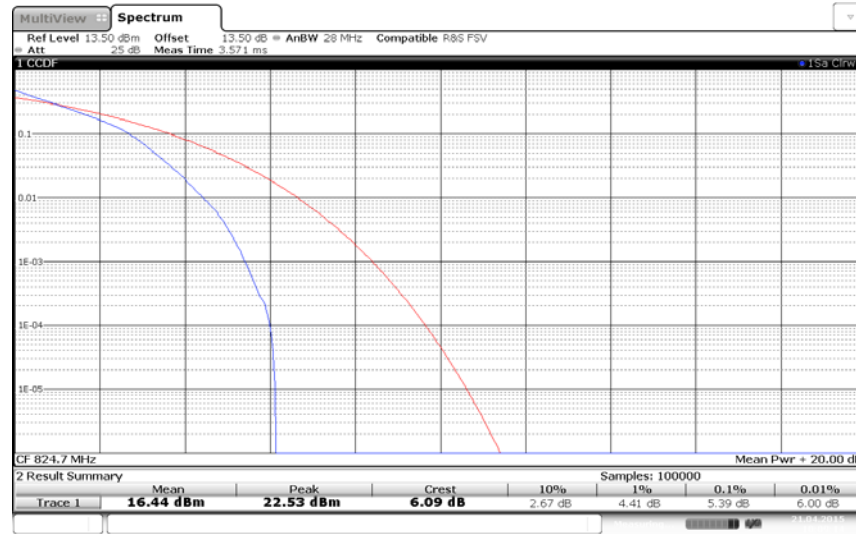


WCDMA/Band 2/1907.6 MHz



Date: 6 APR 2015 13:34:09

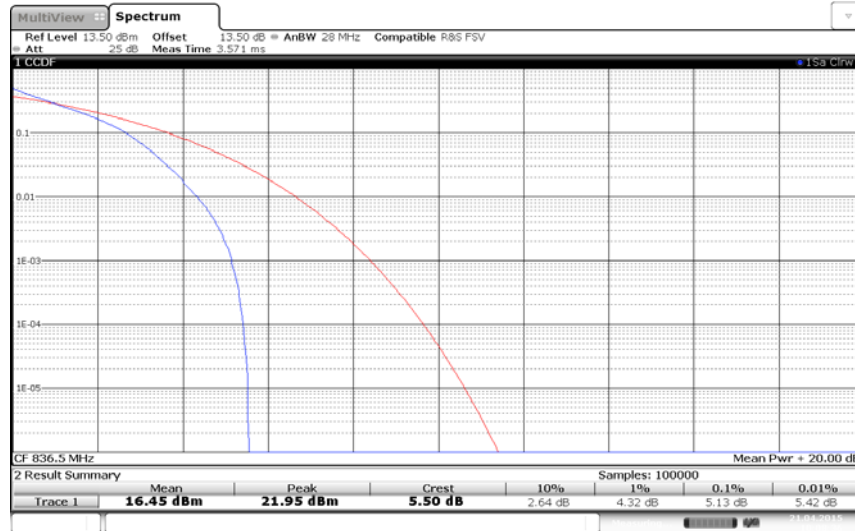
LTE Band 5 (1.4 MHz BW)/824.7 MHz/QPSK



Date: 21 APR 2015 10:09:14

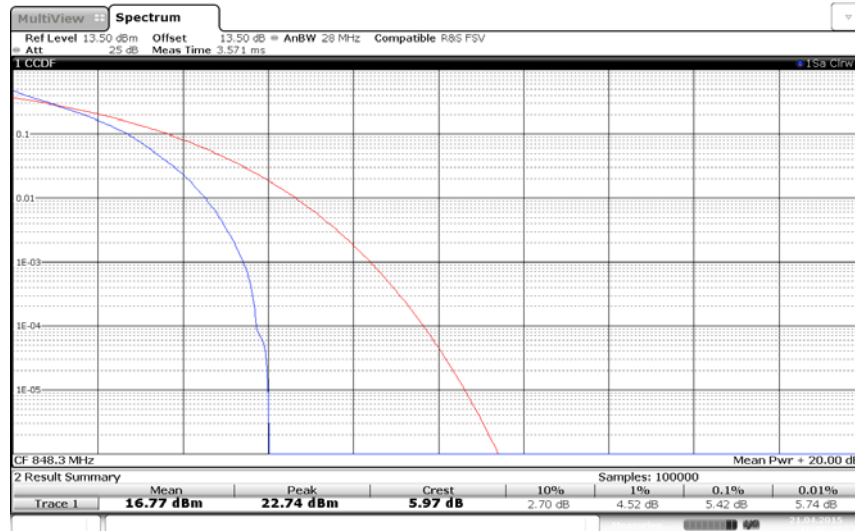


LTE Band 5 (1.4 MHz BW)/836.5 MHz/QPSK



Date: 21 APR 2015 10:08:36

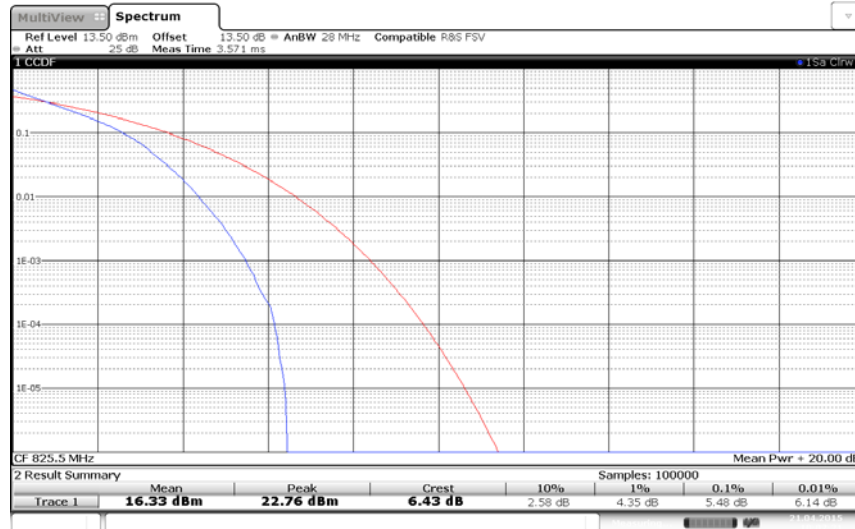
LTE Band 5 (1.4 MHz BW)/848.3 MHz/QPSK



Date: 21 APR 2015 10:09:43

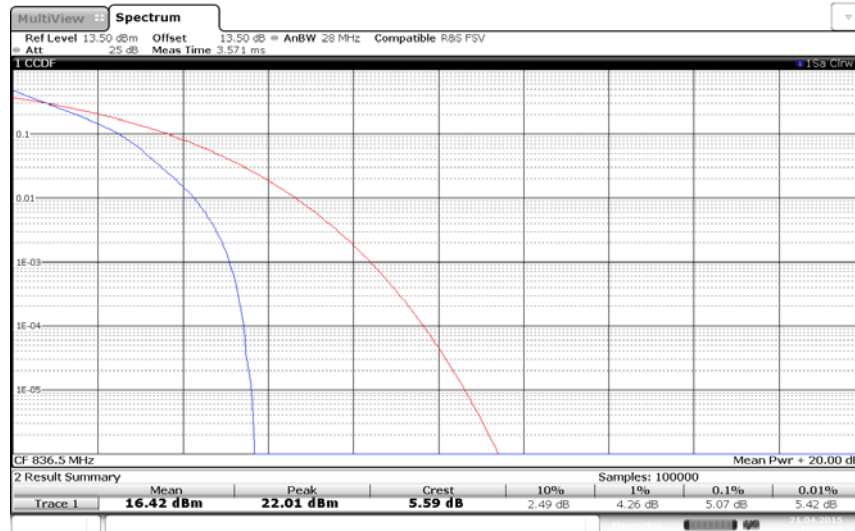


LTE Band 5 (3 MHz BW)/825.5MHz/QPSK



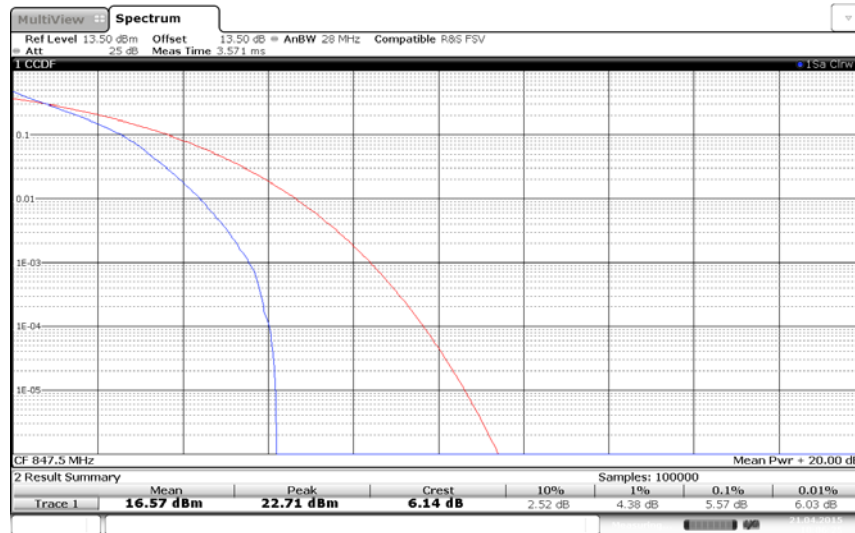
Date: 21 APR 2015 10:07:21

LTE Band 5 (3 MHz BW)/836.5 MHz/QPSK



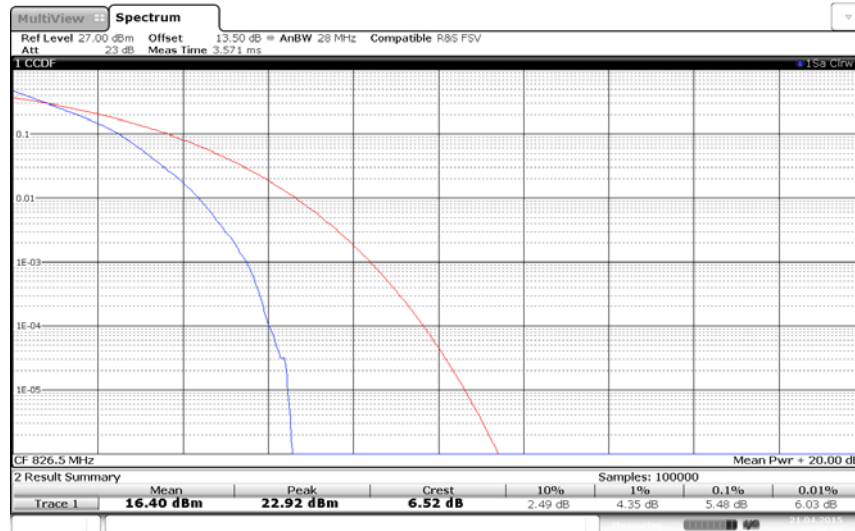
Date: 21 APR 2015 10:06:50

LTE Band 5 (3 MHz BW)/847.5 MHz/QPSK



Date: 21 APR 2015 10:06:25

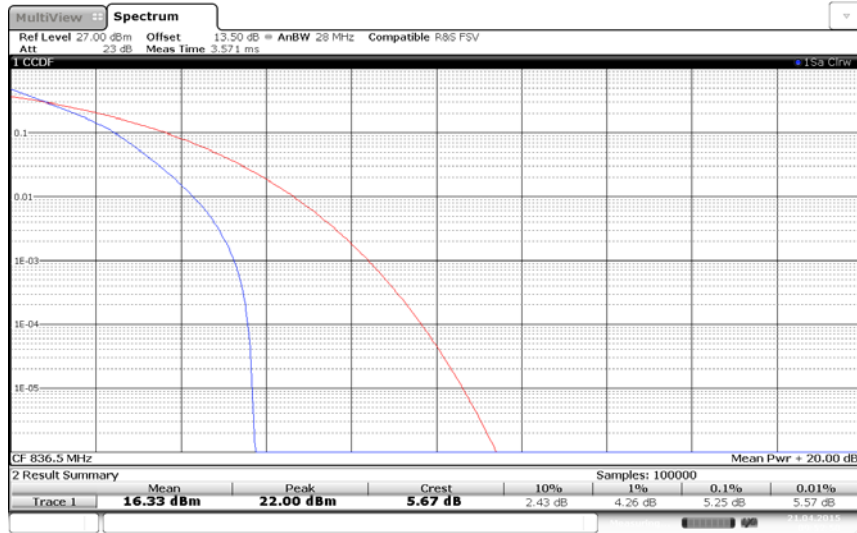
LTE Band 5 (5 MHz BW)/826.5 MHz/QPSK



Date: 21 APR 2015 09:54:36

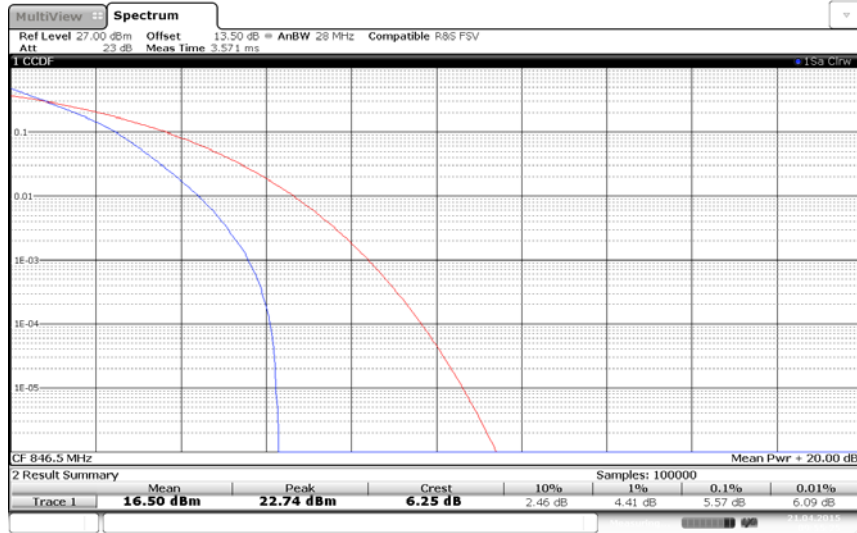


LTE Band 5 (5 MHz BW)/836.5 MHz/QPSK



Date: 21 APR 2015 09:52:50

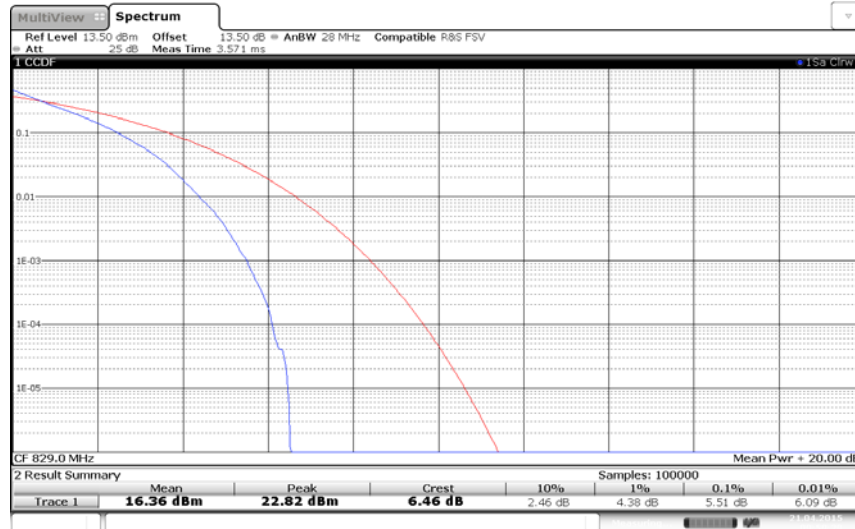
LTE Band 5 (5 MHz BW)/846.5 MHz/QPSK



Date: 21 APR 2015 09:55:25

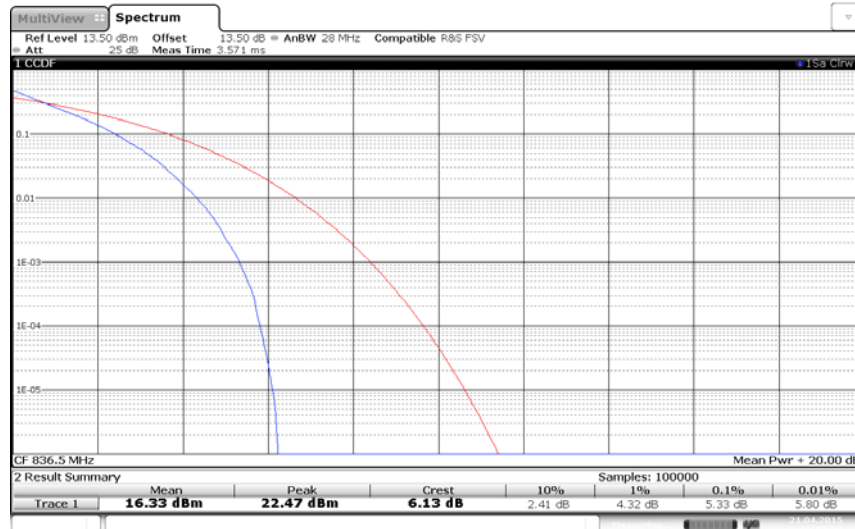


LTE Band 5 (10 MHz BW)/829 MHz/QPSK



Date: 21 APR 2015 09:59:29

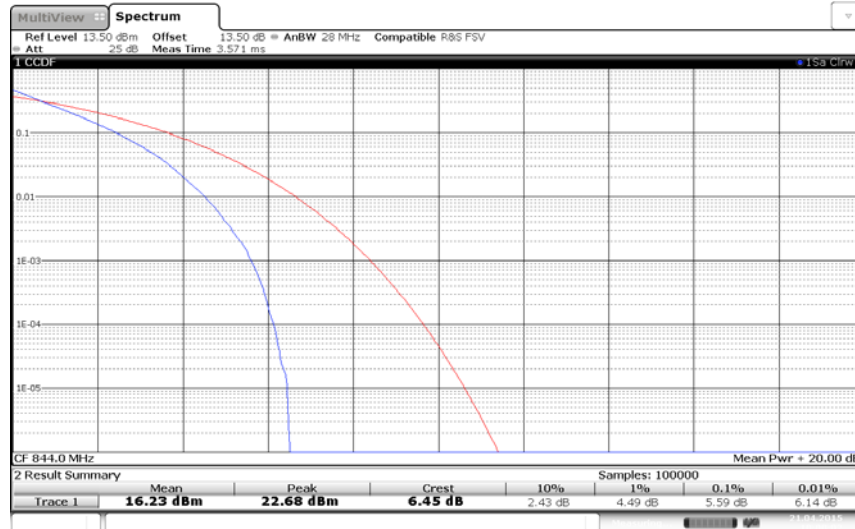
LTE Band 5 (10 MHz BW)/836.5 MHz/QPSK



Date: 21 APR 2015 09:57:33

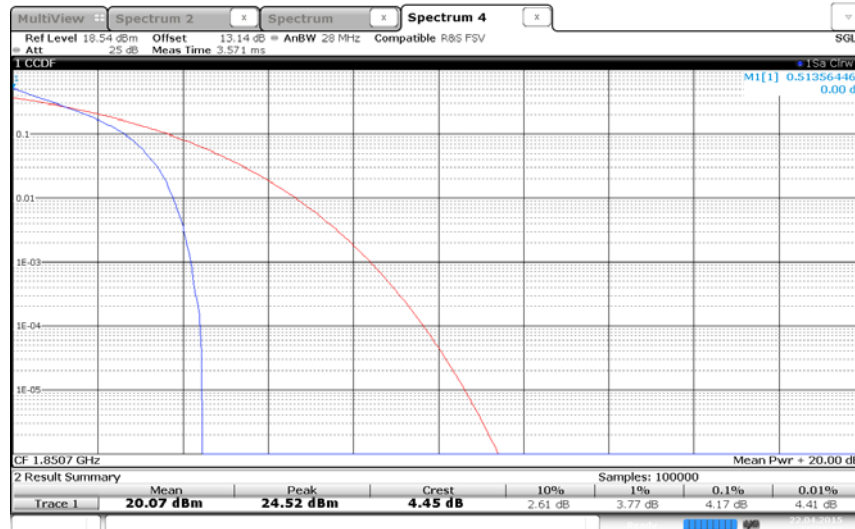


LTE Band 5 (10 MHz BW)/844 MHz/QPSK



Date: 21 APR 2015 10:00:02

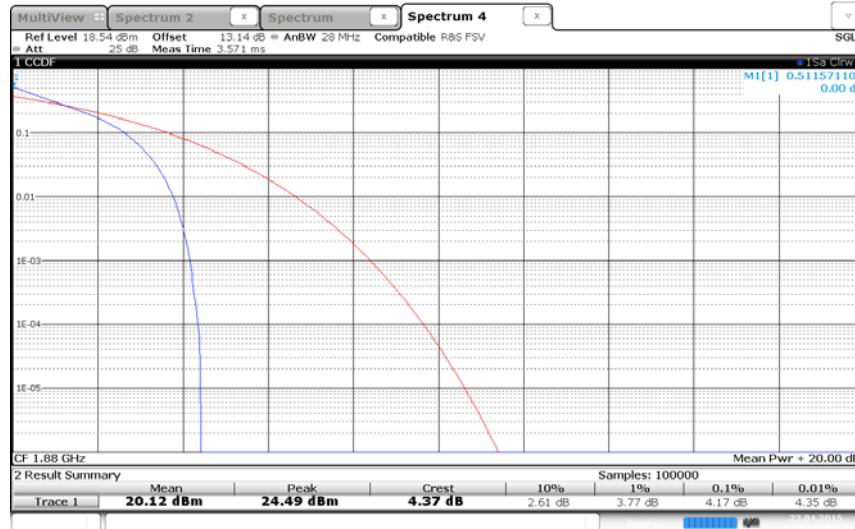
LTE Band 2 (1.4 MHz BW)/1850.7 MHz/QPSK



Date: 22 APR 2015 16:34:49

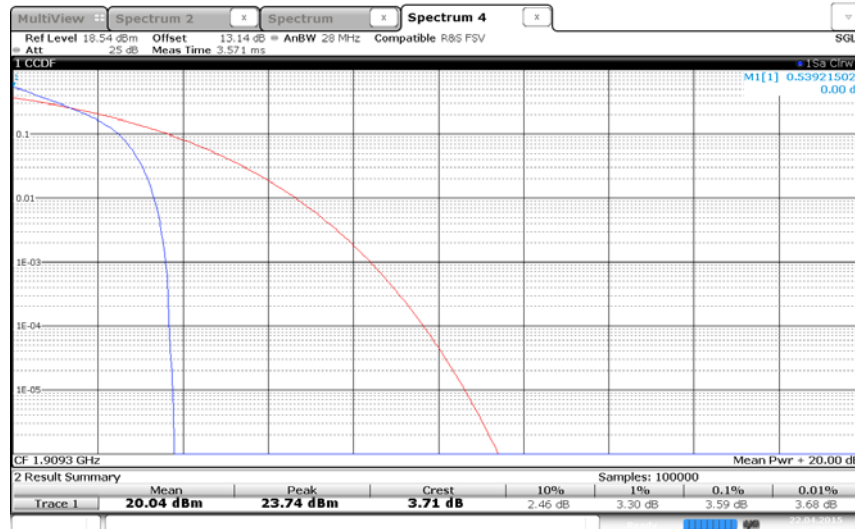


LTE Band 2 (1.4 MHz BW)/1880 MHz/QPSK



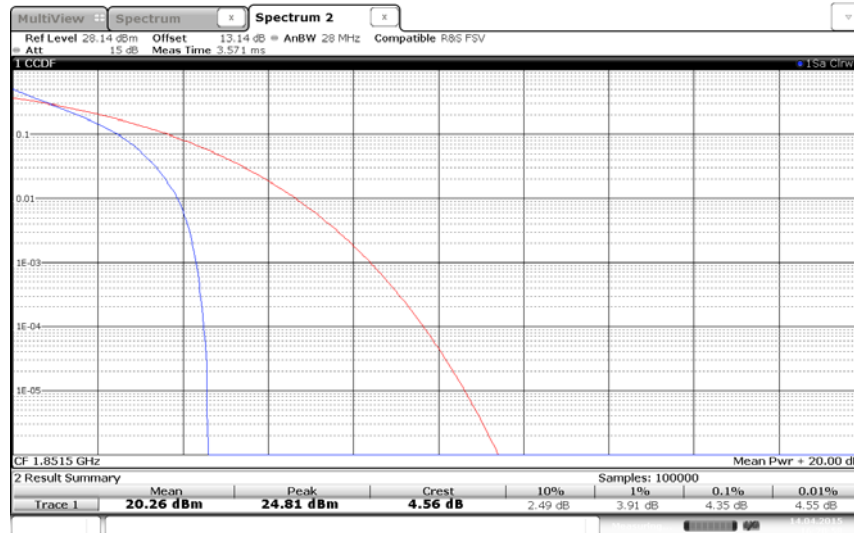
Date: 22 APR 2015 16:28:16

LTE Band 2 (1.4 MHz BW)/1909.3 MHz/QPSK



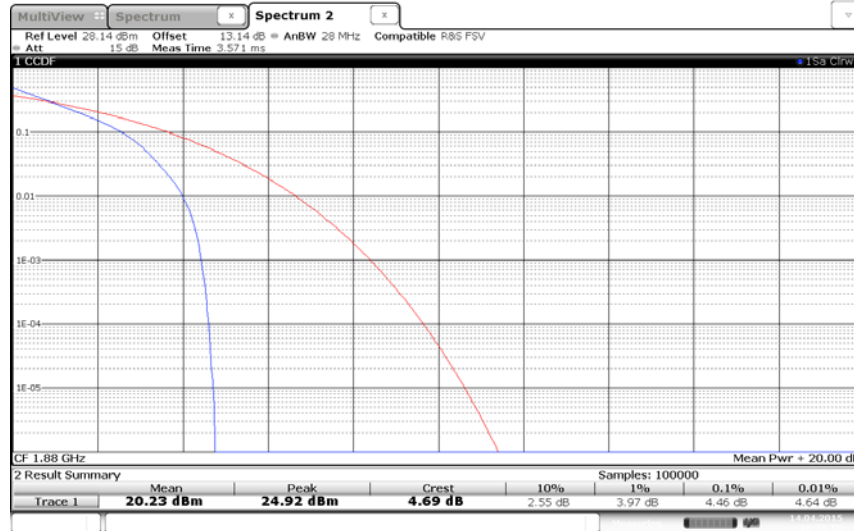
Date: 22 APR 2015 16:35:43

LTE Band 2 (3 MHz BW)/1851.5 MHz/QPSK



Date: 14 APR 2015 16:20:58

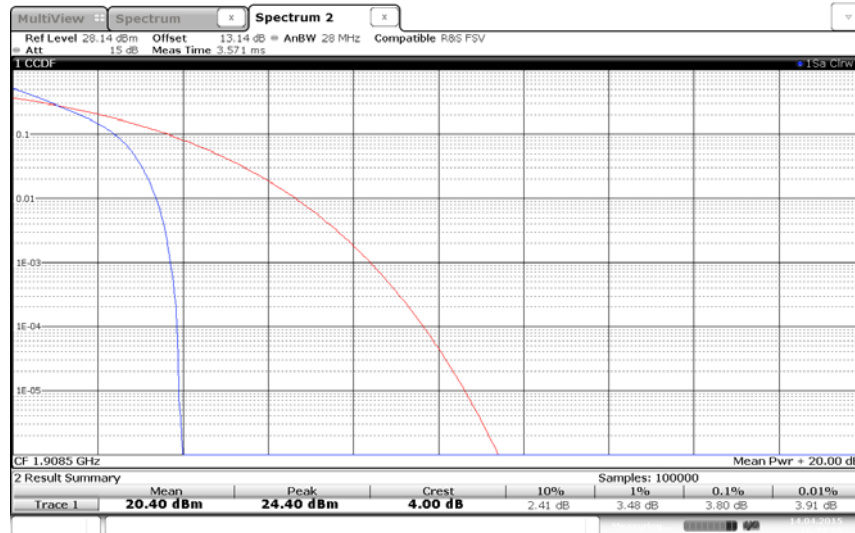
LTE Band 2 (3 MHz BW)/1880 MHz/QPSK



Date: 14 APR 2015 16:21:57

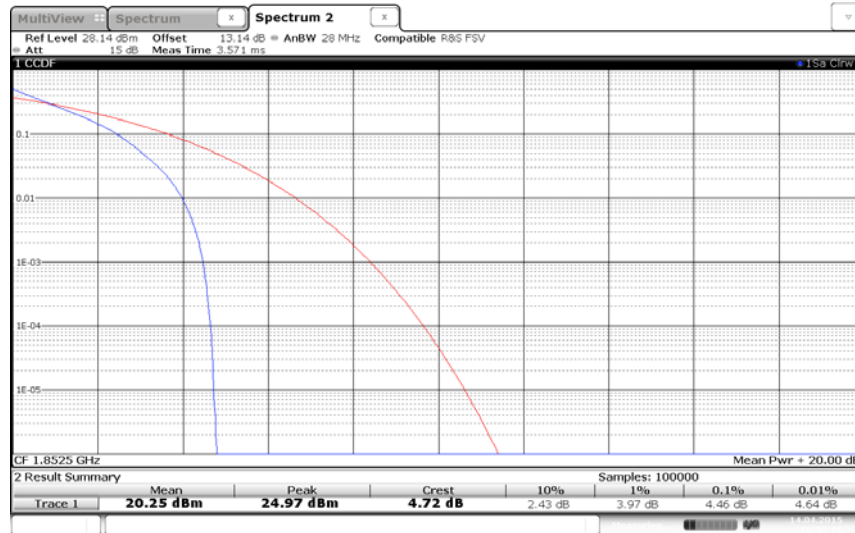


LTE Band 2 (3 MHz BW)/1908.5 MHz/QPSK



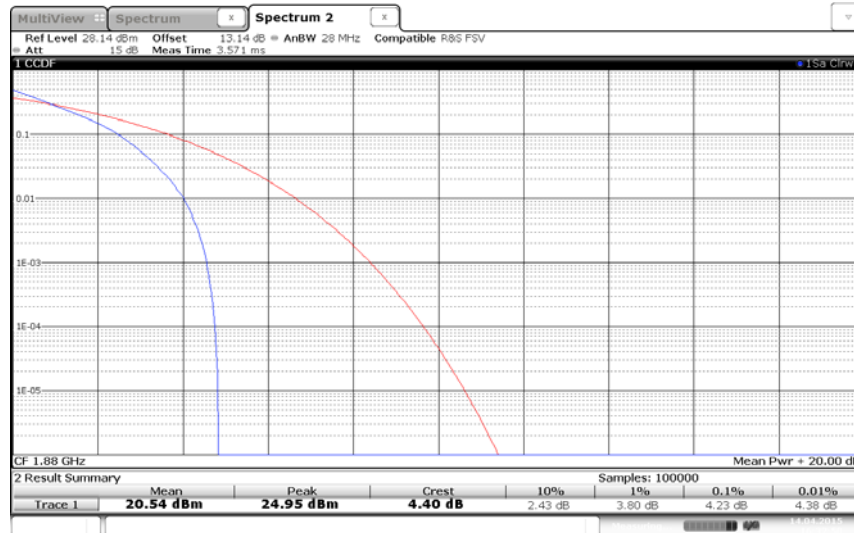
Date: 14 APR 2015 16:24:59

LTE Band 2 (5 MHz BW)/1852.5 MHz/QPSK



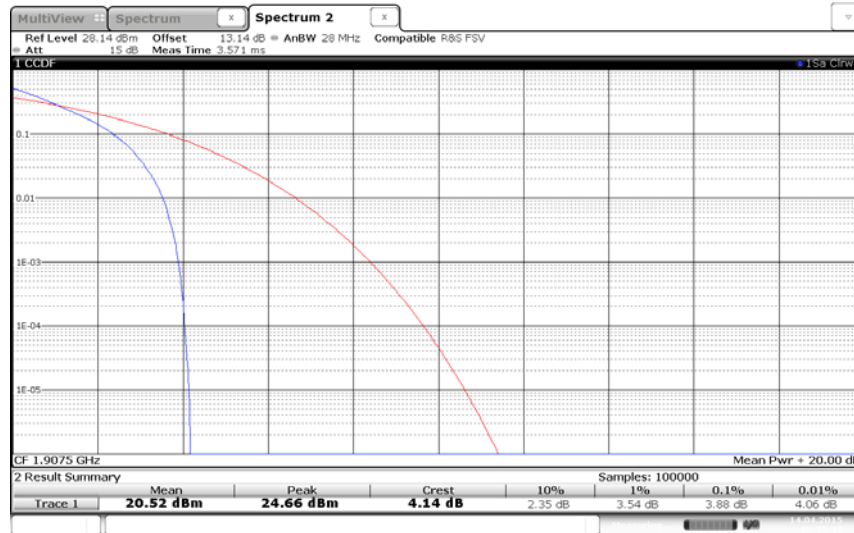
Date: 14 APR 2015 16:32:16

LTE Band 2 (5 MHz BW)/1880 MHz/QPSK



Date: 14 APR 2015 16:32:50

LTE Band 2 (5 MHz BW)/1907.5 MHz/QPSK



Date: 14 APR 2015 16:33:37