HCT CO.,LTD

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE
FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
March 11, 2013

Test Site/Location:
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea

Report No.: HCTR1303FR14

HCT FRN: 0005866421

FCC ID:	**ZNFP875H**
APPLICANT:	**LG Electronics MobileComm U.S.A., Inc.**

FCC Model(s):	LG-P875h	
Additional FCC Model(s):	P875h, LGP875h	
EUT Type:	Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA/HSUPA, LTE Phone with Bluetooth/WLAN/NFC	
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)	
FCC Rule Part(s):	§2 , §27	
Tx Frequency:	2502.5 MHz – 2567.5 MHz (LTE – Band 7): 5 MHz 2505.0 MHz – 2565.0 MHz (LTE – Band 7): 10 MHz 2507.5 MHz – 2562.5 MHz (LTE – Band 7): 15 MHz 2510.0 MHz – 2560.0 MHz (LTE – Band 7): 20 MHz	
Max. RF Output Power:	Band 7 (5 MHz) :	0.448 W (QPSK) (26.51 dBm) 0.452 W (16-QAM) (26.55 dBm)
	Band 7 (10 MHz) :	0.514 W (QPSK) (27.11 dBm) 0.532 W (16-QAM) (27.26 dBm)
	Band 7 (15 MHz) :	0.583 W (QPSK) (27.66 dBm) 0.608 W (16-QAM) (27.84 dBm)
	Band 7 (20 MHz) :	0.638 W (QPSK) (28.05 dBm) 0.659 W (16-QAM) (28.19 dBm)
Emission Designator(s):	Band 7 (5 MHz) :	4M48G7D (QPSK) / 4M48W7D (16-QAM)
	Band 7 (10 MHz) :	8M91G7D (QPSK) / 8M90W7D (16-QAM)
	Band 7 (15 MHz) :	13M35G7D (QPSK) / 13M37W7D (16-QAM)
	Band 7 (20 MHz) :	17M77G7D (QPSK) / 17M80W7D (16-QAM)

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by
: Jae Chul Shin
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1303FR14	March 11, 2013	First Approval Report

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics MobileComm U.S.A., Inc.
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Date(s) of Tests:	January 18, 2013 ~ March 06, 2013
Antenna Specification	Manufacturer: ace technologyA Antenna type: LDS Peak Gain: LTE Band7 : -0.57 dBi

2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics MobileComm U.S.A., Inc. LG-P875h Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA/HSUPA, LTE Phone with Bluetooth/WLAN/NFC consists of LTE 7.

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

The Fully-anechoic and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea.

The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

3. DESCRIPTION OF TESTS

3.1 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

Note: ERP(Effective Radiated Power), EIRP(Effective Isotropic Radiated Power)

Test Procedure

Radiated emission measurements are performed in the Fully-anechoic chamber. The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-C-2004 Clasue 2.2.17. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and postion of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.
A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
The power is caculated by the following formula;

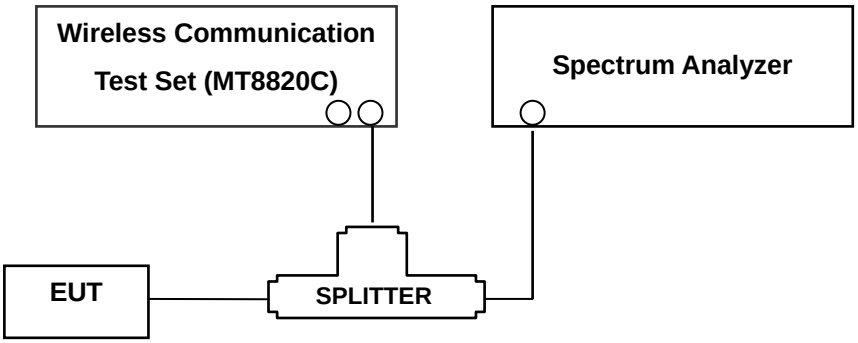
$$P_{d(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

3.2 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)
Test Procedure

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

3.3 PEAK-AVERAGE RATIO.

§27.50(d)(5)

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a giver bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 30 MHz to 26.5 GHz. A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

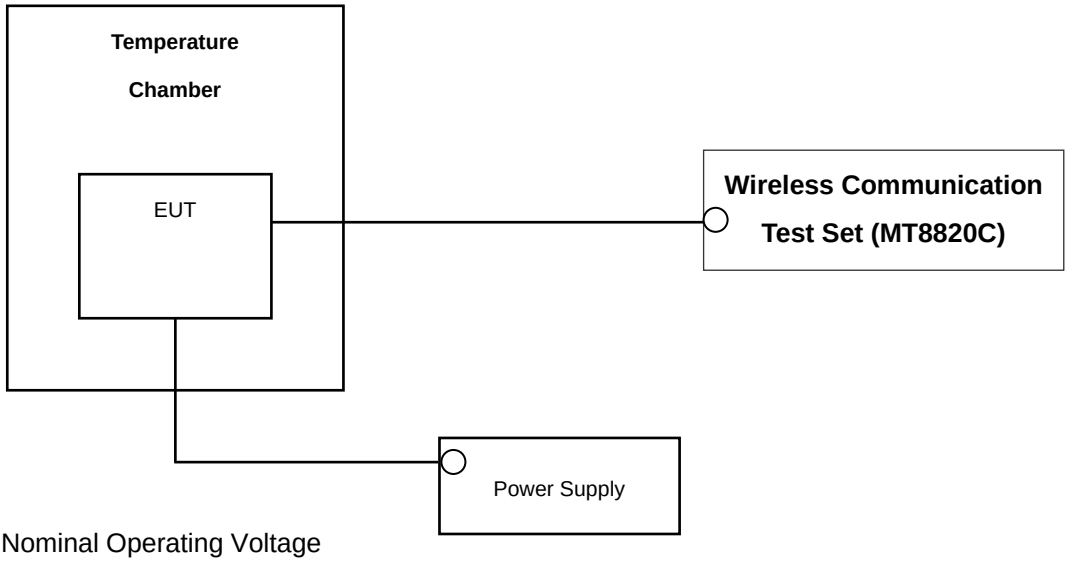
- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

NOTES: The analyzer plot offsets were determined by below conditions.

- For LTE Band 7, total offset 27.95 dBm = 20 dBm attenuator + 6 dBm Divider + 1.95 dBm RF cables.

3.5 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



* Nominal Operating Voltage

Test Procedure

The frequency stability of the transmitter is measured by:
a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification **—** the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency.

Time Period and Procedure:

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.

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
Agilent	E9327A/ Power Sensor	MY4442009	Annual	05/02/2013
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	Annual	09/11/2013
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	05/02/2013
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	05/02/2013
Hewlett Packard	11667B / Power Splitter	10126	Annual	11/07/2013
Digital	EP-3010/ Power Supply	3110117	Annual	11/07/2013
Schwarzbeck	UHAP/ Dipole Antenna	557	Biennial	03/11/2013
Schwarzbeck	UHAP/ Dipole Antenna	558	Biennial	03/11/2013
Korea Engineering	KR-1005L / Chamber	KRAB05063-3CH	Annual	11/07/2013
Schwarzbeck	BBHA 9120D/ Horn Antenna	296	Biennial	02/20/2014
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	05/02/2013
WEINSCHEL	ATTENUATOR	BR0592	Annual	11/07/2013
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	Annual	06/11/2013
Anritsu	MT8820C/ Radio Communication Analyer	6200951754	Annual	08/24/2013
REOHDE&SCHWARZ	CMW500/ Wideband Radio Communication Tester	1201.0002K50-10395	Annual	02/14/2014
Agilent	N9020A/Spectrum Analyzer	US46220219	Annual	05/02/2013

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049,	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 27.53(g), 27.53(h)	Band Edge / Conducted Spurious Emissions.	< 43 +10 $\log_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
27.50(d)(5)	Peak-Average Ratio	< 13 dB		PASS
2.1046	Conducted Output Power	N/A		PASS
2.1055, 27.54	Frequency stability	< 2.5 ppm		PASS
27.50(h)(2)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	RADIATED	PASS
2.1053, 27.53(g),27.53(h)	Undesirable Out-of-Band Emissions	< 43 +10 $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS

6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitude LEVEL(dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
LTE Band13	23230	782	-21.59	38.25	-10.62	0.83	H	0.479	26.80

ERP = SubstitudeLEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
2) During the test , the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (**ERP**).

B. Emission Designator

QPSK Modulation

Emission Designator = 8M95G7D

LTE BW = 8.95 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Amplitude/Angle Modulated

16QAM Modulation

Emission Designator = 8M94W7D

LTE BW = 8.94 MHz

D = Amplitude/Angle Modulated

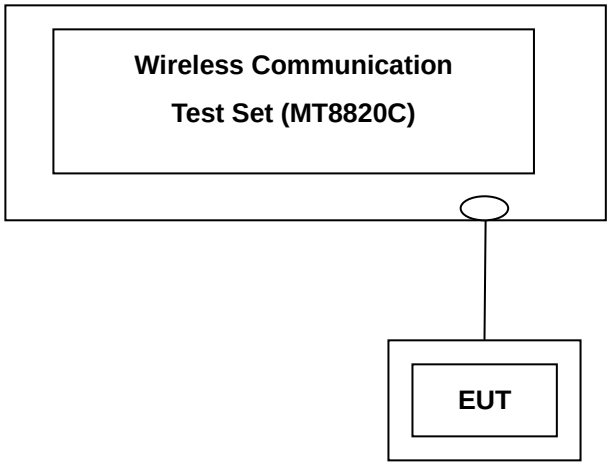
7 = Quantized/Digital Info

W = Combination (Audio/Data)

7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



Test Result

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 7	5	2502.5	20775	1	0	23.18	22.33
				1	12	23.28	22.52
				1	24	23.13	22.56
				12	0	22.43	21.39
				12	6	22.56	21.34
				12	11	22.58	21.39
				25	0	22.47	21.43
		2535.0	21100	1	0	23.26	22.35
				1	12	23.36	22.39
				1	24	23.27	22.46
				12	0	22.47	21.38
				12	6	22.38	21.37
				12	11	22.48	21.40
				25	0	22.41	21.37
		2567.5	21425	1	0	23.12	22.45
				1	12	23.11	22.40
				1	24	23.02	22.32
				12	0	22.40	21.40
				12	6	22.38	21.36
				12	11	22.35	21.42
				25	0	22.35	21.43

LTE Conducted Average Output Powers (5 MHz Band 7 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 7	10	2505.0	20800	1	0	23.10	22.09
				1	24	23.06	22.37
				1	49	23.12	22.41
				25	0	22.42	21.40
				25	12	22.34	21.42
				25	24	22.34	21.43
				50	0	22.41	21.40
		2535.0	21100	1	0	23.26	22.31
				1	24	23.29	22.38
				1	49	23.33	22.48
				25	0	22.5	21.51
				25	12	22.57	21.58
				25	24	22.63	21.59
				50	0	22.58	21.50
		2565.0	21400	1	0	23.09	22.53
				1	24	23.24	22.36
				1	49	23.13	22.27
				25	0	22.40	21.35
				25	12	22.48	21.48
				25	24	22.42	21.53
				50	0	22.35	21.51

LTE Conducted Average Output Powers (10 MHz Band 7 LTE)

Band	Band Width (MHz)	Frequency (MH1715.0z)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 7	15	2507.5	20825	1	0	23.16	22.56
				1	37	23.14	22.39
				1	74	23.28	22.38
				36	0	22.49	21.45
				36	18	22.37	21.38
				36	38	22.51	21.41
				75	0	22.40	21.40
		2535.0	21100	1	0	23.28	22.45
				1	37	23.33	22.48
				1	74	23.26	22.46
				36	0	22.52	21.59
				36	18	22.54	21.63
				36	38	22.54	21.64
				75	0	22.59	21.62
		2562.5	21375	1	0	23.07	22.29
				1	37	23.24	22.41
				1	74	23.13	22.46
				36	0	22.38	21.43
				36	18	22.43	21.45
				36	38	22.37	21.39
				75	0	22.39	21.43

LTE Conducted Average Output Powers (15 MHz Band 7 LTE)

Band	Band Width (MHz)	Frequency (MH1715.0z)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 7	20	2510.0	20850	1	0	23.30	22.44
				1	49	23.11	22.49
				1	99	23.50	22.69
				50	0	22.28	21.35
				50	25	22.44	21.55
				50	49	22.46	21.46
				100	0	22.41	21.48
		2535.0	21100	1	0	23.20	22.39
				1	49	23.29	22.51
				1	99	23.21	22.48
				50	0	22.43	21.38
				50	25	22.57	21.55
				50	49	22.50	21.54
				100	0	22.53	21.57
		2560.0	21350	1	0	23.04	22.25
				1	49	23.14	22.20
				1	99	23.10	22.40
				50	0	22.25	21.25
				50	25	22.30	21.35
				50	49	22.48	21.42
				100	0	22.27	21.30

LTE Conducted Average Output Powers (20 MHz Band 7 LTE)

Note : Detecting mode is average.

7.2 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 7	5 MHz	2535.0	QPSK	25	0	28.08
			16-QAM	25	0	27.85
	10 MHz	2535.0	QPSK	50	0	28.10
			16-QAM	50	0	28.22
	15 MHz	2535.0	QPSK	75	0	28.59
			16-QAM	75	0	28.82
	20 MHz	2535.0	QPSK	100	0	27.89
			16-QAM	100	0	28.10

- Plots of the EUT's Peak- to- Average Ratio are shown Page 36 ~ 39

7.3 OCCUPIED BANDWIDTH

Band	Band Width (MHz)	Frequency (Mhz)	Modulation	Resource Block Size	Resource Block Offset	Data (RB 1 : KHz / RB 25,50 : MHz)
Band 7	5	2535.0	QPSK	25	0	4.4805
			16-QAM	25	0	4.4805
	10	2535.0	QPSK	50	0	8.9146
			16-QAM	50	0	8.9001
	15	2535.0	QPSK	75	0	13.3502
			16-QAM	75	0	13.3719
	20	2535.0	QPSK	100	0	17.7713
			16-QAM	100	0	17.8003

- Plots of the EUT's Occupied Bandwidth are shown Page 32 ~ 35

7.4 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (Mhz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 7	5	2502.5	QPSK `	1	0	25.4568	-26.923
		2535.0		1	0	26.1979	-26.611
		2567.5		1	0	26.9138	-26.876
	10	2505.0		1	0	26.1173	-27.049
		2535.0		1	0	26.2377	-27.207
		2565.0		1	0	25.5071	-27.140
	15	2507.5		1	0	25.5535	-26.499
		2535.0		1	0	25.4724	-26.413
		2562.5		1	0	26.6356	-26.621
	20	2510.0		1	0	26.0085	-27.236
		2535.0		1	0	25.5080	-26.554
		2560.0		1	0	25.5050	-27.006

- Plots of the EUT's Conducted Spurious Emissions are shown Page 48 ~ 59

7.4.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 40 ~ 47

7.5 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
2502.5	5 MHz	QPSK	-17.95	17.04	10.64	1.75	H	0.392	25.93
		16-QAM	-17.96	17.03	10.64	1.75	H	0.391	25.92
2535.0		QPSK	-17.83	16.99	10.72	1.78	H	0.392	25.93
		16-QAM	-17.74	17.08	10.72	1.78	H	0.400	26.02
2567.5		QPSK	-17.18	17.59	10.77	1.85	H	0.448	26.51
		16-QAM	-17.14	17.63	10.77	1.85	H	0.452	26.55

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 7 – 5 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
2505.0	10 MHz	QPSK	-16.75	18.23	10.64	1.76	H	0.514	27.11
		16-QAM	-16.60	18.38	10.64	1.76	H	0.532	27.26
2535.0		QPSK	-17.00	17.82	10.72	1.78	H	0.474	26.76
		16-QAM	-16.98	17.84	10.72	1.78	H	0.476	26.78
2565.0		QPSK	-17.19	17.60	10.77	1.77	H	0.457	26.60
		16-QAM	-17.14	17.65	10.77	1.77	H	0.462	26.65

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 7 – 10 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
2507.5	15 MHz	QPSK	-16.05	18.77	10.65	1.76	H	0.583	27.66
		16-QAM	-15.87	18.95	10.65	1.76	H	0.608	27.84
2535.0		QPSK	-17.57	17.25	10.72	1.78	H	0.416	26.19
		16-QAM	-17.55	17.27	10.72	1.78	H	0.418	26.21
2562.5		QPSK	-16.99	18.26	10.77	1.91	H	0.515	27.12
		16-QAM	-16.94	18.31	10.77	1.91	H	0.521	27.17

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 7 – 15 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
2510.0	20 MHz	QPSK	-15.65	19.26	10.66	1.87	H	0.638	28.05
		16-QAM	-15.51	19.40	10.66	1.87	H	0.659	28.19
2535.0		QPSK	-17.42	17.40	10.72	1.78	H	0.431	26.34
		16-QAM	-17.33	17.49	10.72	1.78	H	0.440	26.43
2560.0		QPSK	-16.61	18.57	10.77	1.88	H	0.557	27.46
		16-QAM	-16.48	18.70	10.77	1.88	H	0.574	27.59

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 7 – 20 MHz)

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For 1 MHz BW signals, a peak detector is used, with RBW = VBW = 1 MHz. For 10 MHz BW signals, a peak detector is used, with RBW = VBW = 10 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is x plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

7.6 RADIATED SPURIOUS EMISSIONS

7.6.1 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENCY : 2535.00 MHz

▣ MEASURED OUTPUT POWER: 26.55 dBm = 0.452W

▣ MODULATION SIGNAL: 5 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.55 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20775 (2502.5)	5005.0	-45.60	12.69	-46.02	2.66	H	-35.99	-62.54
	7507.5	-54.28	11.53	-44.66	3.40	H	-36.53	-63.08
	10010.0	-53.73	11.13	-39.94	3.87	H	-32.68	-59.23
21100 (2535.0)	5070.0	-51.72	12.75	-51.38	2.71	H	-41.34	-67.89
	7605.0	-50.75	11.65	-41.01	3.32	V	-32.68	-59.23
	10140.0	-52.72	11.16	-38.84	4.54	H	-32.22	-58.77
21425 (2567.5)	5135.0	-50.30	12.86	-49.97	2.71	V	-39.82	-66.37
	7702.5	-49.68	11.76	-40.31	3.32	H	-31.87	-58.42
	10270.0	-48.41	11.00	-34.24	3.97	H	-27.21	-53.76

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ OPERATING FREQUENCY : 2535.00 MHz

▣ MEASURED OUTPUT POWER: 27.26 dBm = 0.532W

▣ MODULATION SIGNAL: 10 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 40.26 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20800 (2505.0)	5010.0	-45.84	12.69	-46.26	2.66	H	-36.23	-63.49
	7515.0	-54.14	11.55	-44.62	3.34	H	-36.41	-63.67
	10020.0	-53.20	11.14	-40.05	3.71	V	-32.62	-59.88
21100 (2535.0)	5070.0	-50.79	12.75	-50.45	2.71	H	-40.41	-67.67
	7605.0	-50.28	11.65	-40.54	3.32	H	-32.21	-59.47
	10140.0	-52.86	11.16	-38.98	4.54	V	-32.36	-59.62
21400 (2565.0)	5130.0	-50.64	12.85	-50.32	2.71	H	-40.18	-67.44
	7695.0	-47.86	11.75	-38.48	3.32	H	-30.05	-57.31
	10260.0	-48.97	11.02	-34.80	3.94	H	-27.72	-54.98

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ OPERATING FREQUENCY : 2535.00 MHz

▣ MEASURED OUTPUT POWER: 27.84 dBm = 0.608W

▣ MODULATION SIGNAL: 15 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 40.84 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20825 (2507.5)	5015.0	-45.91	12.69	-46.09	2.65	V	-36.05	-63.89
	7522.5	-53.11	11.57	-43.31	3.34	H	-35.08	-62.92
	10030.0	-54.75	11.16	-41.55	3.77	H	-34.16	-62.00
21100 (2535.0)	5070.0	-52.41	12.75	-52.07	2.71	H	-42.03	-69.87
	7605.0	-46.87	11.65	-37.13	3.32	H	-28.80	-56.64
	10140.0	-52.37	11.16	-38.49	4.54	H	-31.87	-59.71
21375 (2562.5)	5125.0	-50.03	12.85	-49.67	2.70	H	-39.52	-67.36
	7687.5	-52.05	11.74	-42.81	3.34	H	-34.41	-62.25
	10250.0	-48.44	11.04	-34.69	3.91	H	-27.56	-55.40

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ OPERATING FREQUENCY : 2535.00 MHz

▣ MEASURED OUTPUT POWER: 28.19 dBm = 0.659 W

▣ MODULATION SIGNAL: 20 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 41.19 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20850 (2510.0)	5020.0	-47.50	12.69	-47.68	2.65	V	-37.64	-65.83
	7530.0	-50.04	11.57	-40.17	3.41	H	-32.01	-60.20
	10040.0	-54.67	11.17	-40.62	4.86	H	-34.31	-62.50
21100 (2535.0)	5070.0	-50.74	12.75	-50.40	2.71	H	-40.36	-68.55
	7605.0	-49.86	11.65	-40.12	3.32	H	-31.79	-59.98
	10140.0	-53.00	11.16	-39.12	4.54	H	-32.50	-60.69
21350 (2560.0)	5120.0	-49.63	12.84	-49.26	2.70	H	-39.12	-67.31
	7680.0	-51.60	11.74	-42.45	3.36	H	-34.07	-62.26
	10240.0	-47.67	11.05	-33.59	4.08	H	-26.62	-54.81

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5th Harmonic for all channel.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

7.6.2 RECEIVER SPURIOUS EMISSIONS

FCC Rule(s)	**RSS-Gen**
Test Requirements:	**Emission Level shall not exceed RSS-Gen 6(a) limits**
Operating conditions:	**Under normal test conditions**
Method of testing:	**Radiated**
S/A. Settings:	**F < 1 GHz: RBW: 100 kHz, VBW: 300 kHz (Peak)** **F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30 – 88	100 (40 dBuV)	3
88 - 216	150 (43.5 dBuV))	3
216 – 960	200 (46 dBuV)	3
Above 960	500 (54 dBuV)	3

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency MHz	Reading dBuV	Factor (dB)	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
834.1	1.90	25.95	V	27.85	46.00	18.15
932.1	3.92	27.13	V	31.05	46.00	14.95

Above 1 GHz

Frequency MHz	Reading dBuV	Factor (dB)	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
No Critical peaks found						

7.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.7.1 FREQUENCY STABILITY

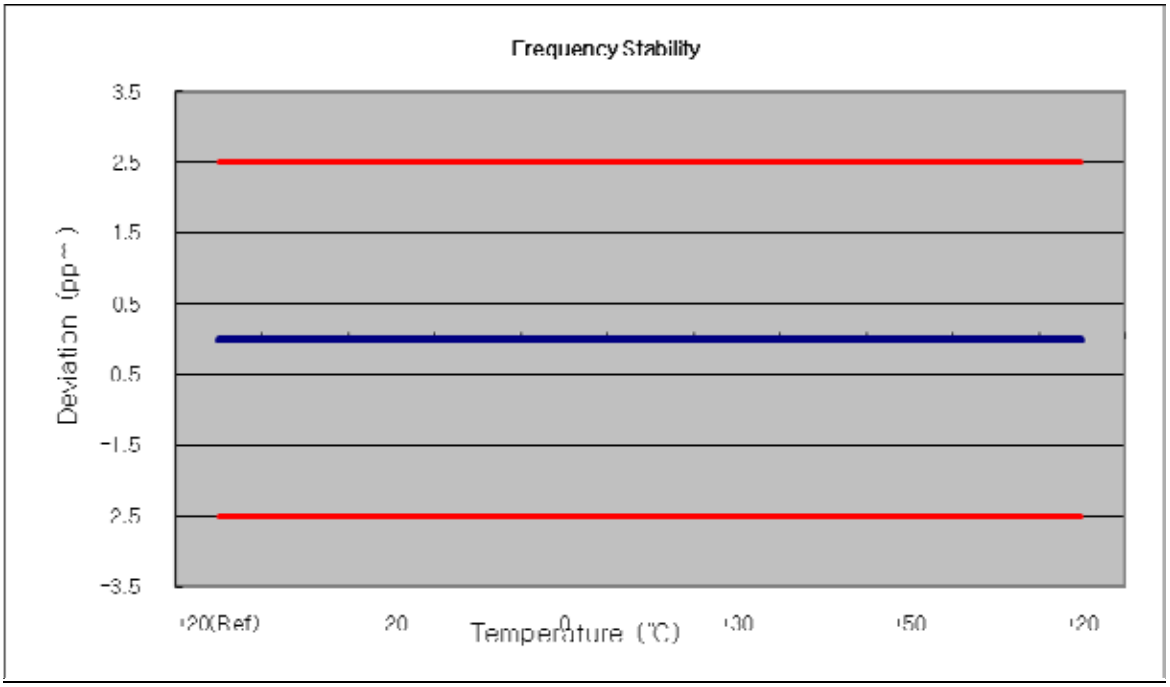
▣ OPERATING FREQUENCY: 2535.000,000 Hz

▣ CHANNEL: 21100 (5 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	2535 000 001	0	0.000 000	0.000
100%		-30	2535 000 002	0.7	0.000 000	0.000
100%		-20	2535 000 003	1.8	0.000 000	0.001
100%		-10	2534 999 997	-4.3	0.000 000	-0.002
100%		0	2534 999 998	-3.6	0.000 000	-0.001
100%		+10	2535 000 001	0.1	0.000 000	0.000
100%		+30	2534 999 996	-4.8	0.000 000	-0.002
100%		+40	2534 999 998	-3.4	0.000 000	-0.001
100%		+50	2534 999 993	-8.1	0.000 000	-0.003
115%	4.370	+20	2535 000 003	1.8	0.000 000	0.001
Batt. Endpoint	3.500	+20	2535 000 001	-0.4	0.000 000	0.000



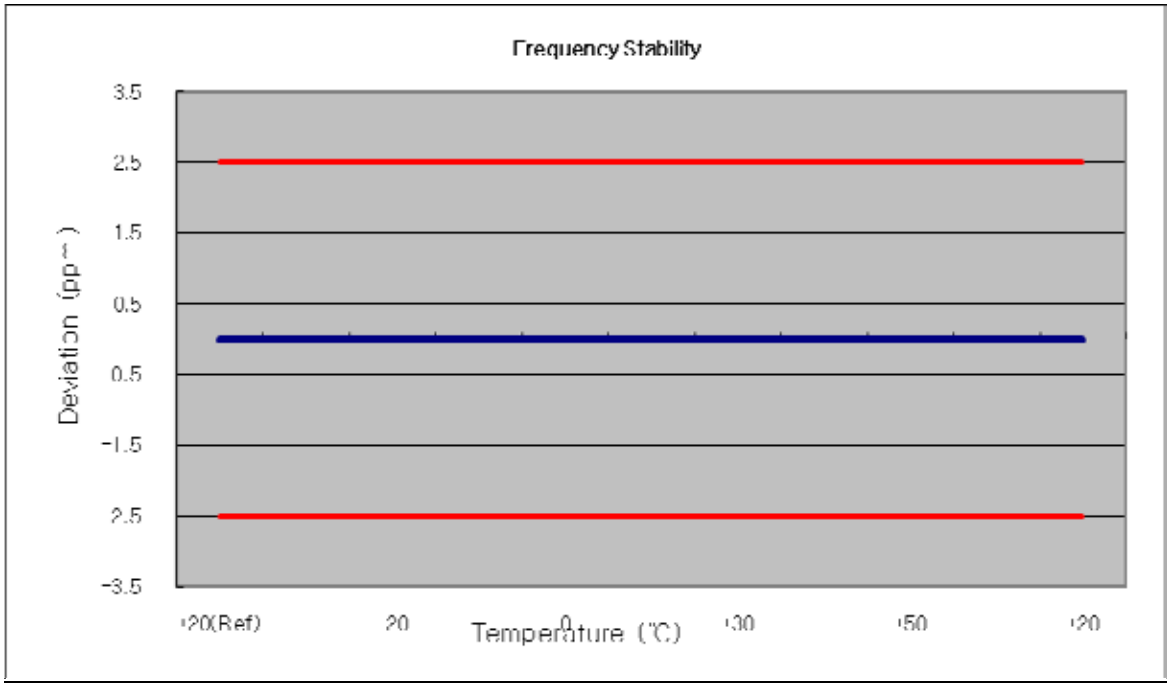
▣ OPERATING FREQUENCY: 2535.000,000 Hz

▣ CHANNEL: 21100 (10 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	2535 000 003	0	0.000 000	0.000
100%		-30	2534 999 998	-4.9	0.000 000	-0.002
100%		-20	2535 000 007	3.8	0.000 000	0.001
100%		-10	2535 000 004	0.6	0.000 000	0.000
100%		0	2535 000 004	0.7	0.000 000	0.000
100%		+10	2535 000 005	2.1	0.000 000	0.001
100%		+30	2534 999 998	-4.8	0.000 000	-0.002
100%		+40	2535 000 006	2.7	0.000 000	0.001
100%		+50	2535 000 003	-0.7	0.000 000	0.000
115%	4.370	+20	2535 000 003	0.0	0.000 000	0.000
Batt. Endpoint	3.500	+20	2534 999 999	-4.3	0.000 000	-0.002



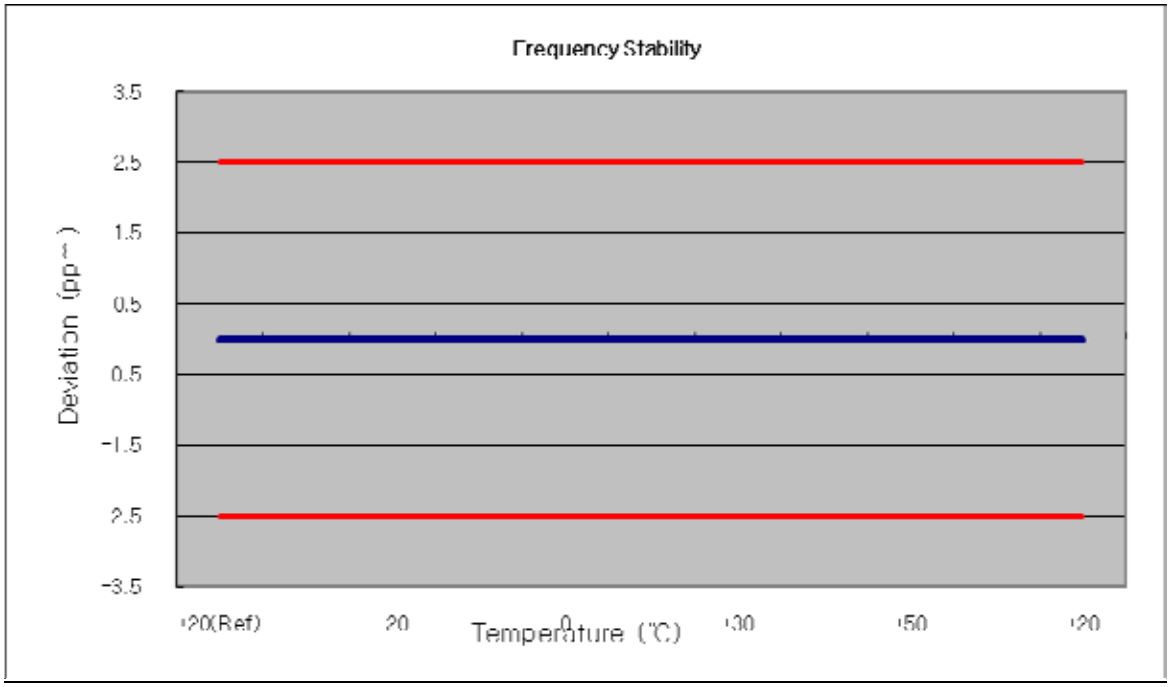
▣ OPERATING FREQUENCY: 2535.000,000 Hz

▣ CHANNEL: 21100 (15 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	2535 000 003	0	0.000 000	0.000
100%		-30	2535 000 008	5.3	0.000 000	0.002
100%		-20	2535 000 000	-2.9	0.000 000	-0.001
100%		-10	2535 000 000	-3.2	0.000 000	-0.001
100%		0	2535 000 004	1.5	0.000 000	0.001
100%		+10	2535 000 001	-1.5	0.000 000	-0.001
100%		+30	2535 000 001	-2.2	0.000 000	-0.001
100%		+40	2535 000 005	2.4	0.000 000	0.001
100%		+50	2535 000 008	5.0	0.000 000	0.002
115%	4.370	+20	2535 000 001	-1.9	0.000 000	-0.001
Batt. Endpoint	3.500	+20	2535 000 000	-2.8	0.000 000	-0.001



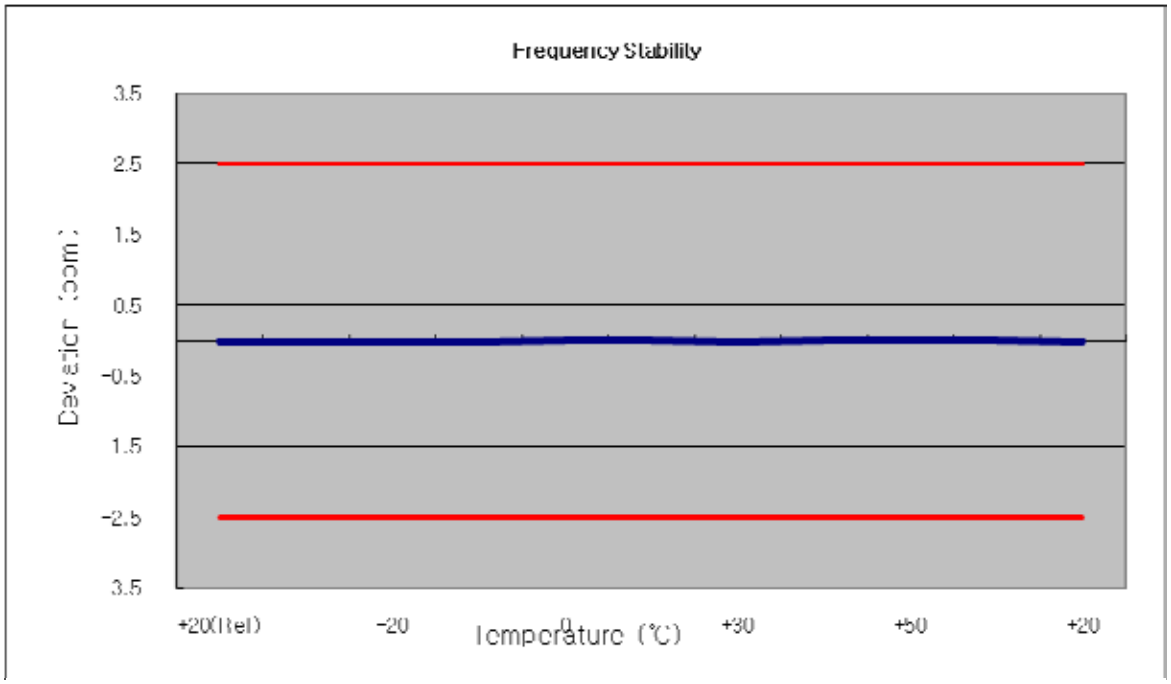
▣ OPERATING FREQUENCY: 2535.000,000 Hz

▣ CHANNEL: 21100 (20 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

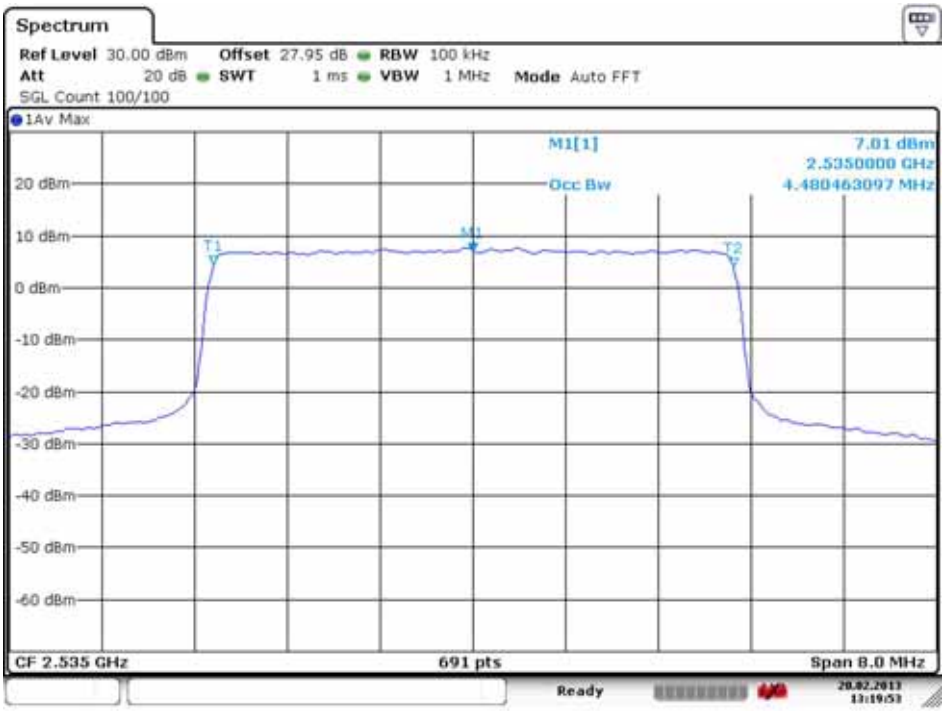
▣ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%		+20(Ref)	2535 000 005	0	0.000 000	0.000
100%		-30	2535 000 005	0.0	0.000 000	0.000
100%		-20	2535 000 005	-0.1	0.000 000	0.000
100%		-10	2535 000 003	-1.6	0.000 000	-0.001
100%	3.800	0	2535 000 006	1.1	0.000 000	0.000
100%		+10	2535 000 007	1.8	0.000 000	0.001
100%		+30	2535 000 004	-0.8	0.000 000	0.000
100%		+40	2535 000 010	5.3	0.000 000	0.002
100%		+50	2535 000 011	6.2	0.000 000	0.002
115%	4.370	+20	2535 000 005	0.3	0.000 000	0.000
Batt. Endpoint	3.500	+20	2535 000 001	-4.2	0.000 000	-0.002



8. TEST PLOTS

Occupied Bandwidth Plot (21100 ch_5 MHz_QPSK_RB Size 25)



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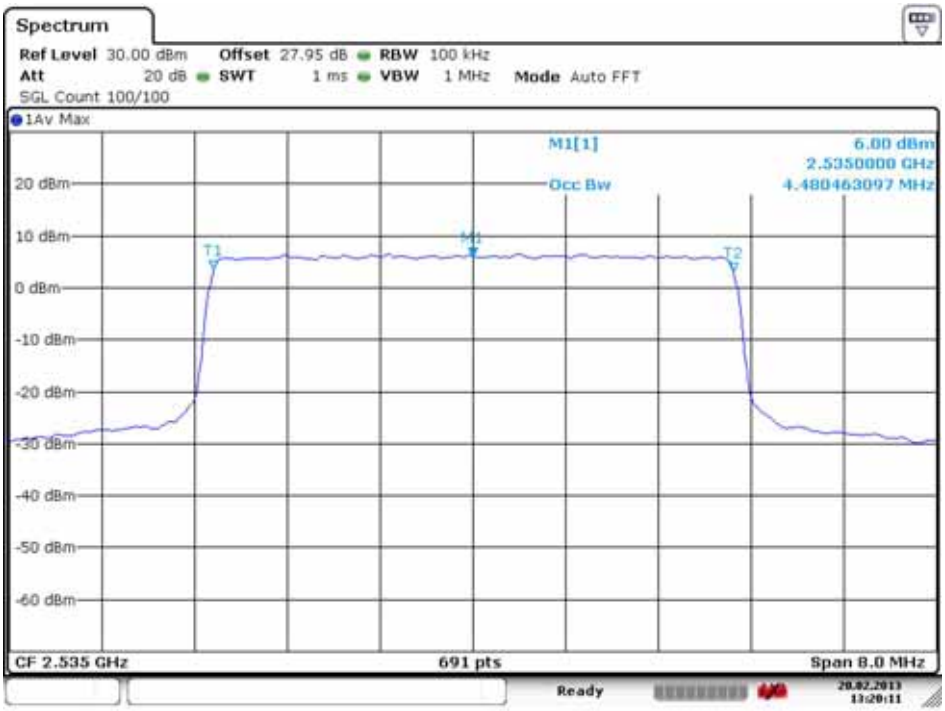
Occupied Bandwidth Plot (21100 ch_5 MHz_16-QAM_RB 25)



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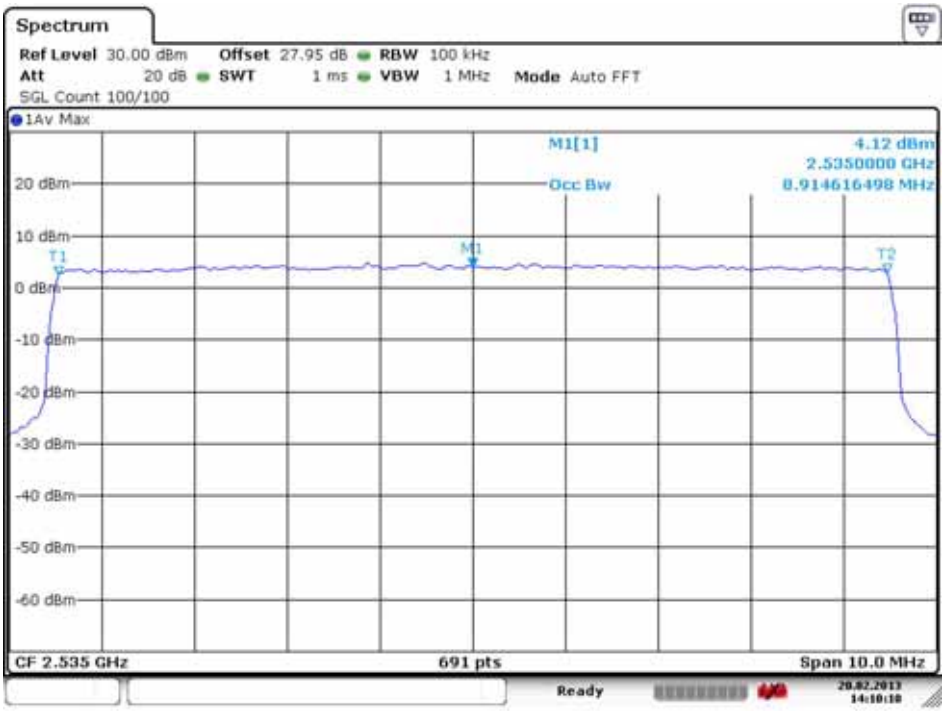
Occupied Bandwidth Plot (21100 ch_10 MHz_QPSK_RB 50)



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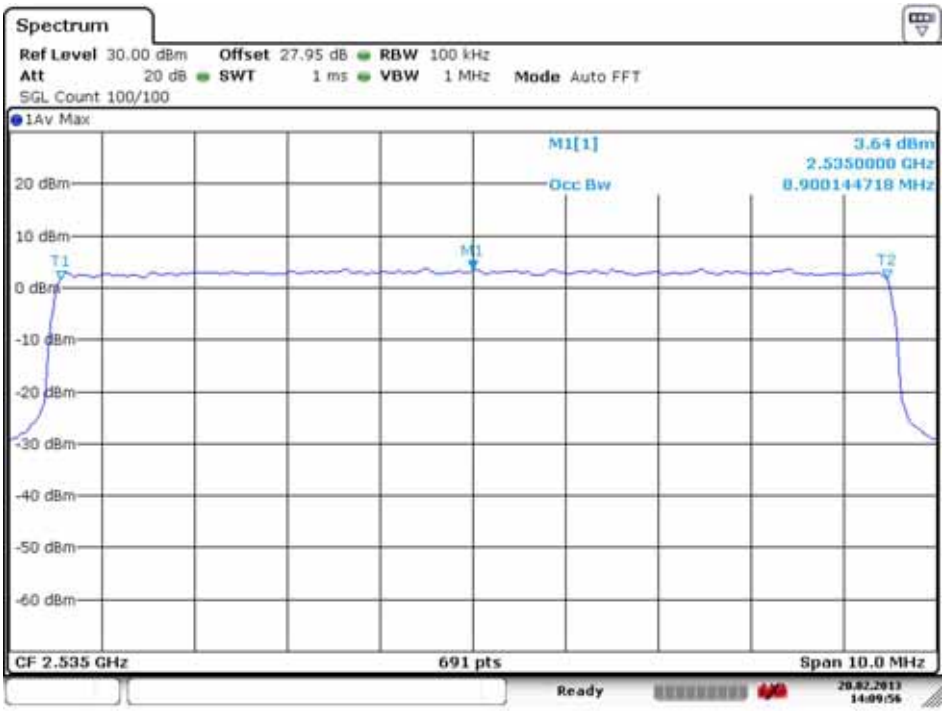
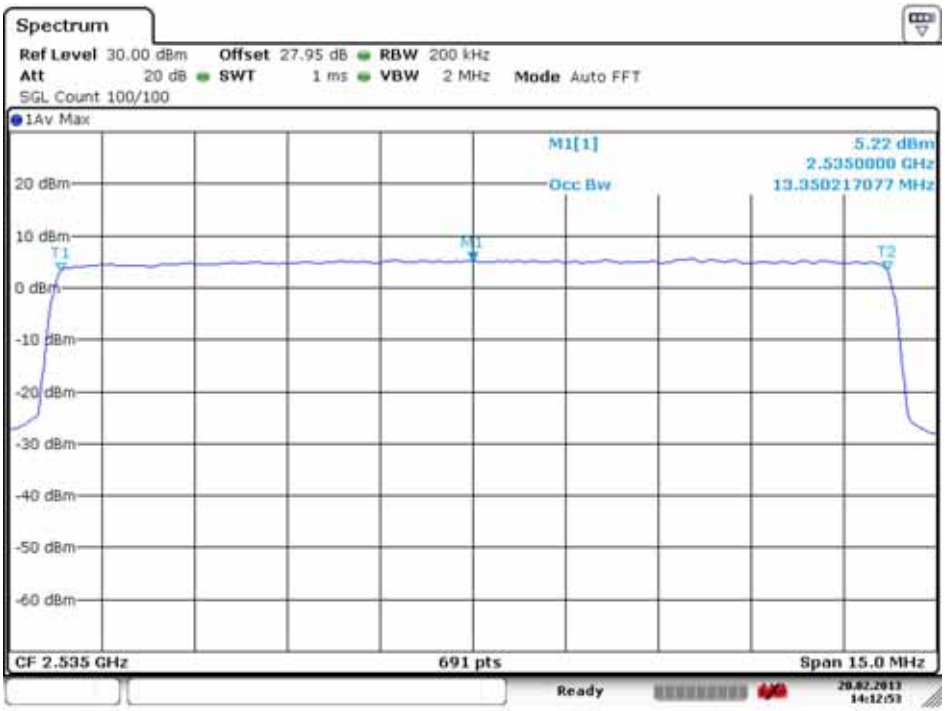
Occupied Bandwidth Plot (21100 ch_10 MHz_16-QAM_RB 50)



Date: 20.FEB.2013 14:09:56

Occupied Bandwidth Plot (21100 ch_15 MHz_QPSK_RB Size 75)



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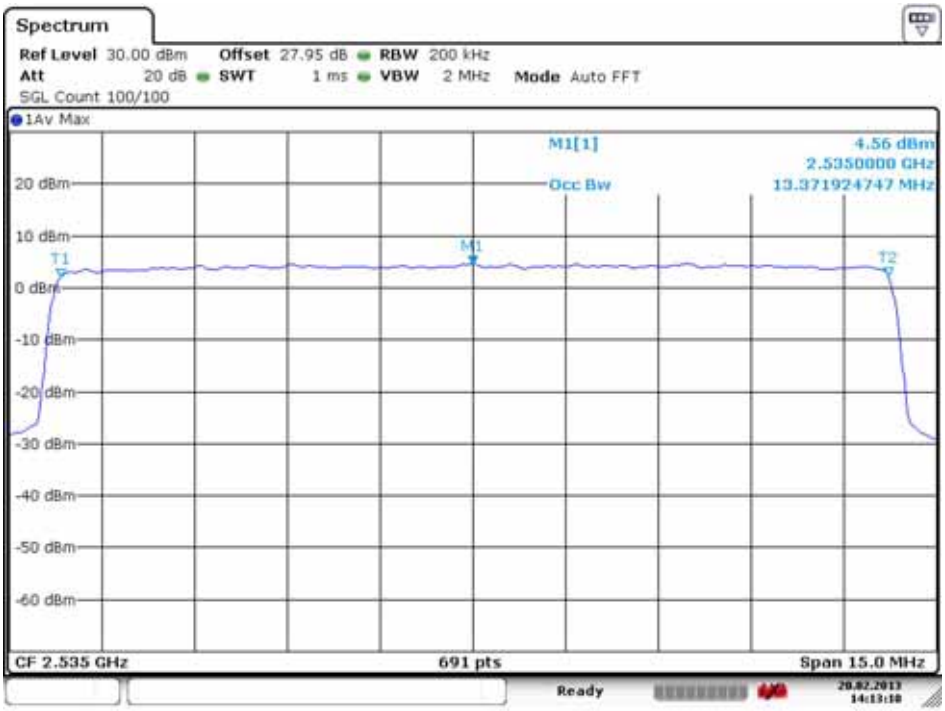
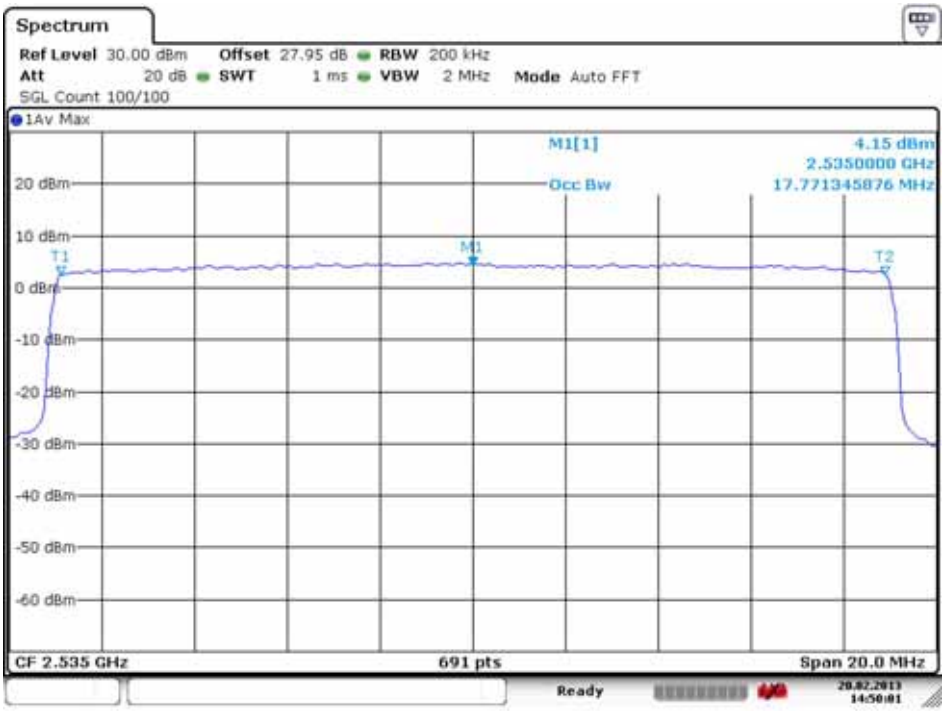
Occupied Bandwidth Plot (21100 ch_15 MHz_16-QAM_RB 75)



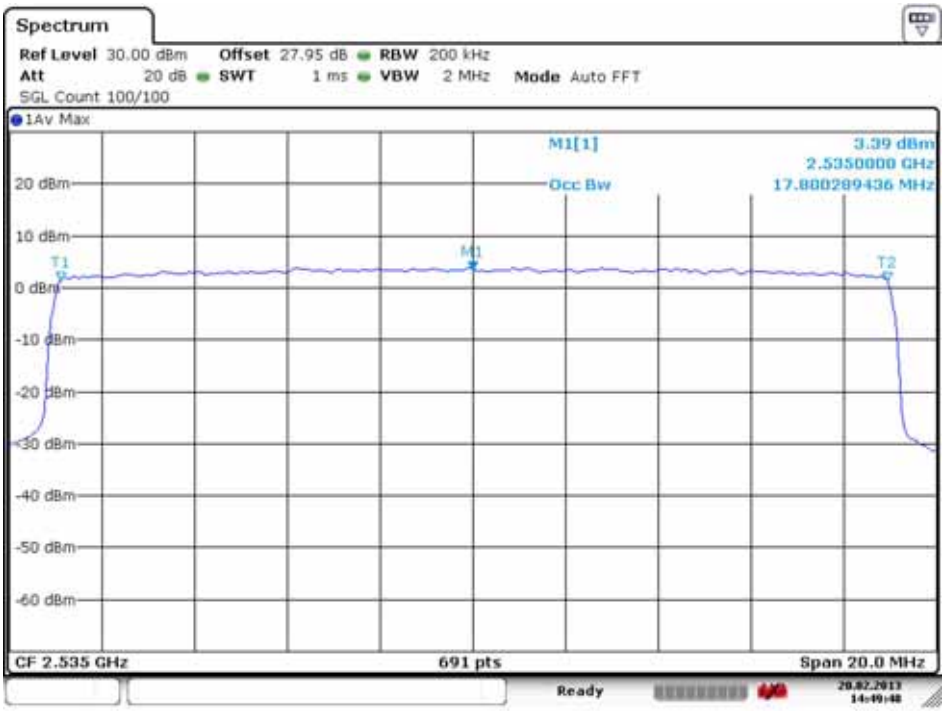
Date: 20.FEB.2013 14:13:10

Occupied Bandwidth Plot (21100 ch_20 MHz_QPSK_RB 100)



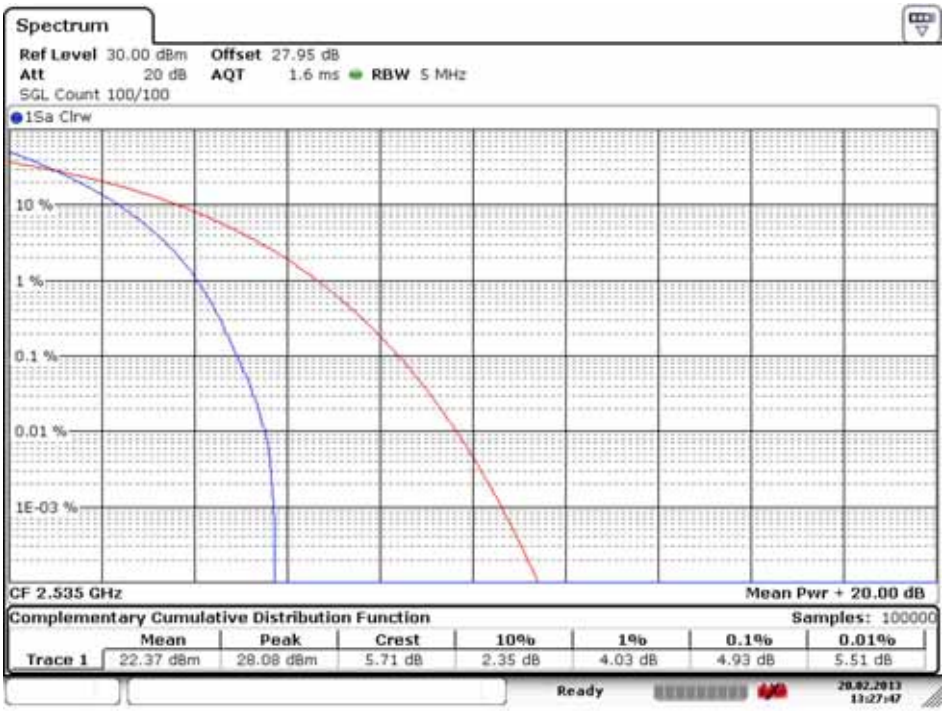
Date: 20.FEB.2013 14:50:01

Occupied Bandwidth Plot (21100 ch_20 MHz_16-Q`AM_RB 100)



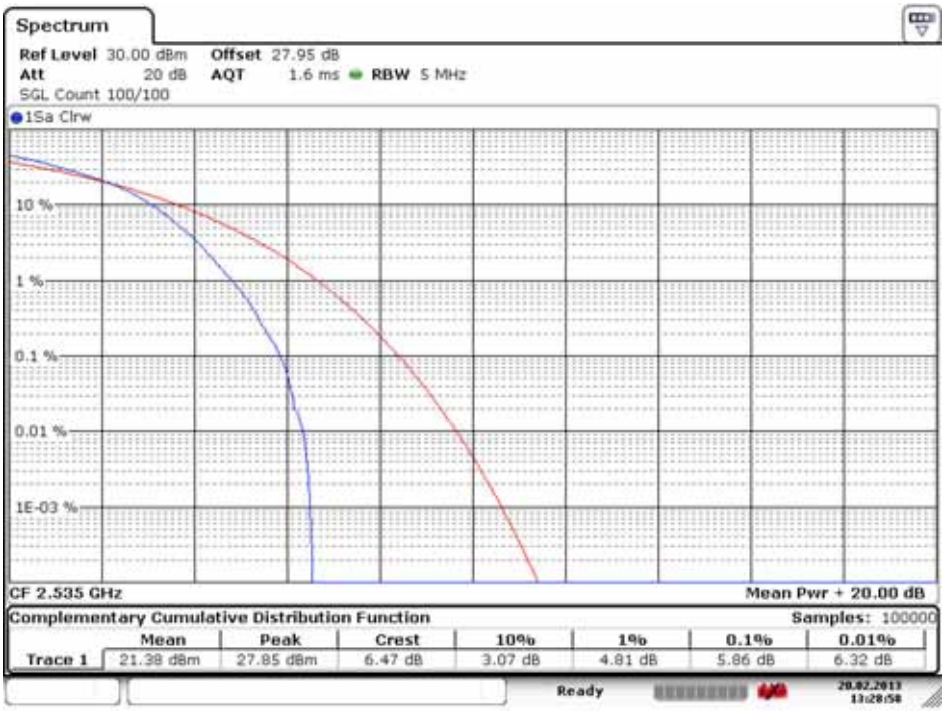
Date: 20.FEB.2013 14:49:48

PAR Plot (21100 ch_5 MHz_QPSK_RB 25)



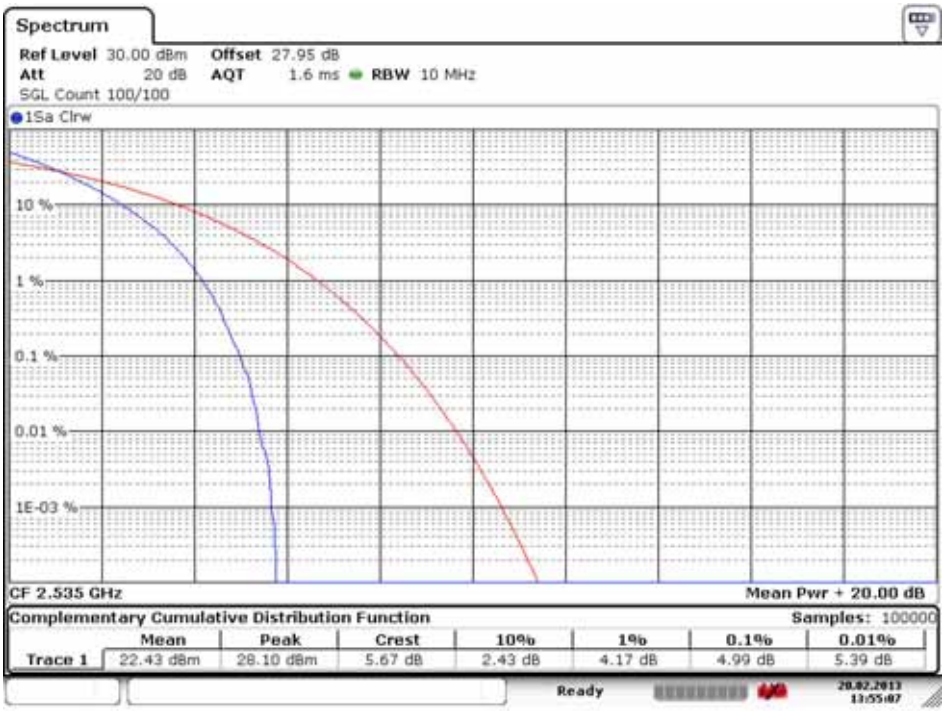
Date: 20.FEB.2013 13:27:47

PAR Plot (21100 ch_5 MHz_16-QAM_RB 25)



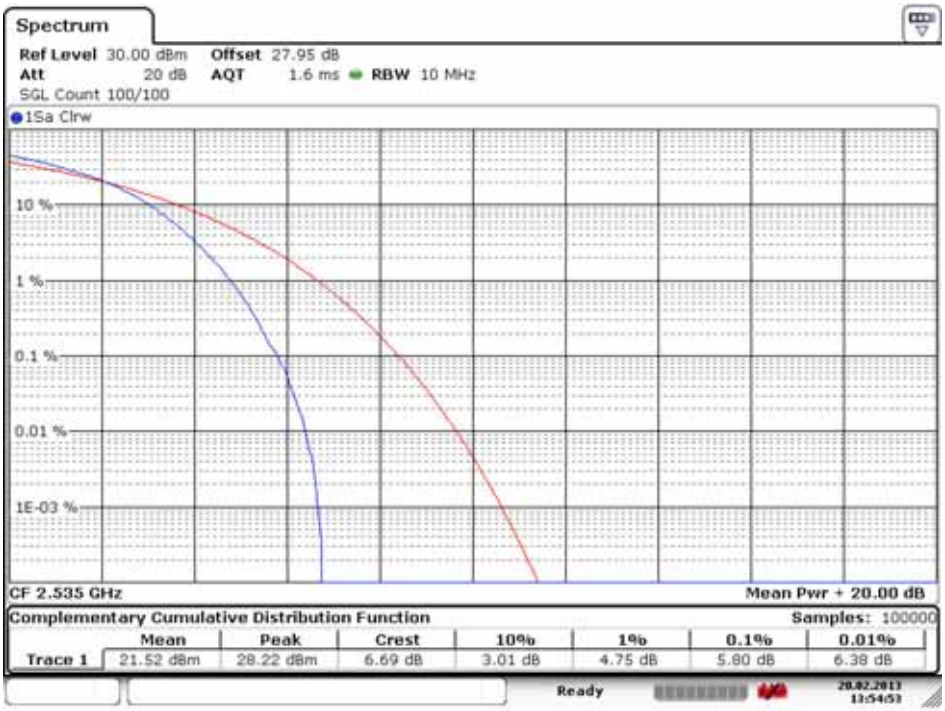
Date: 20.FEB.2013 13:28:58

PAR Plot (21100 ch_10 MHz_QPSK_RB 50)



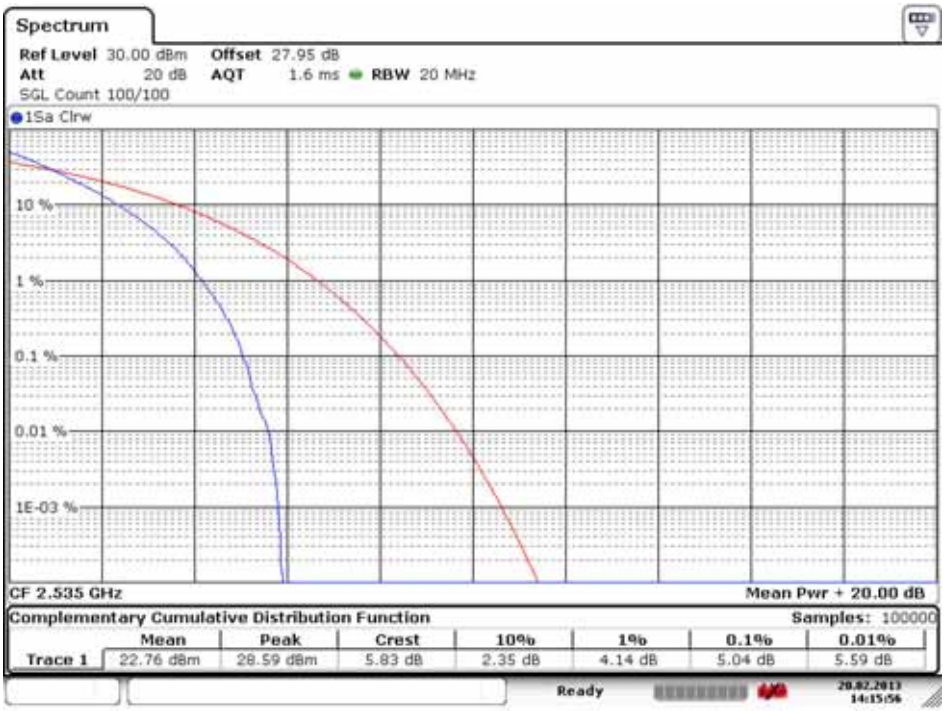
Date: 20.FEB.2013 13:55:07

PAR Plot (21100 ch_10 MHz_16-QAM_RB 50)



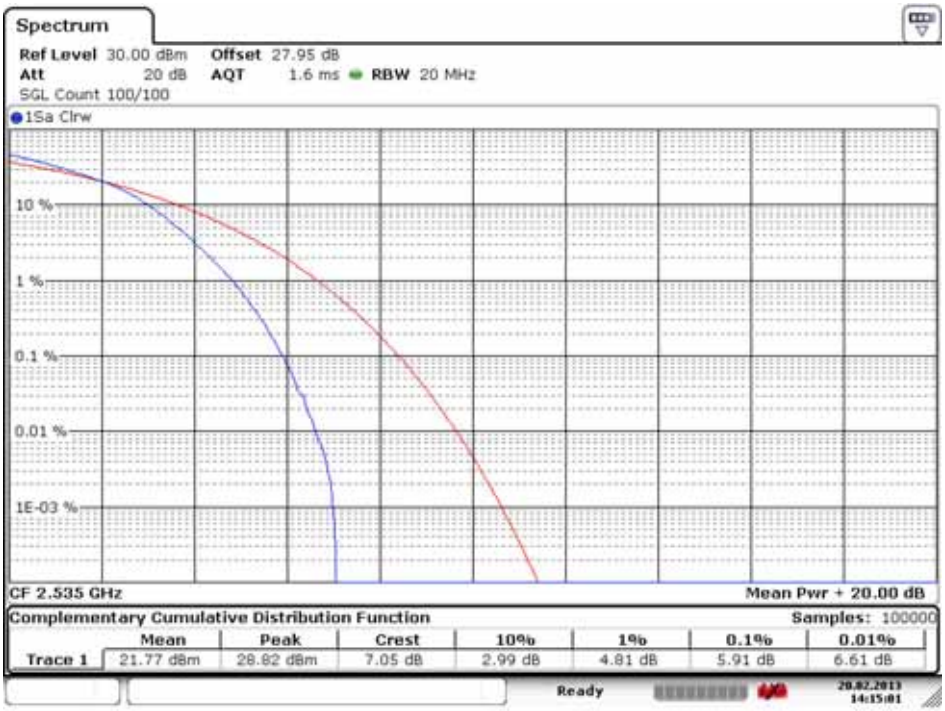
Date: 20.FEB.2013 13:54:53

PAR Plot (21100 ch_15 MHz_QPSK_RB 75)



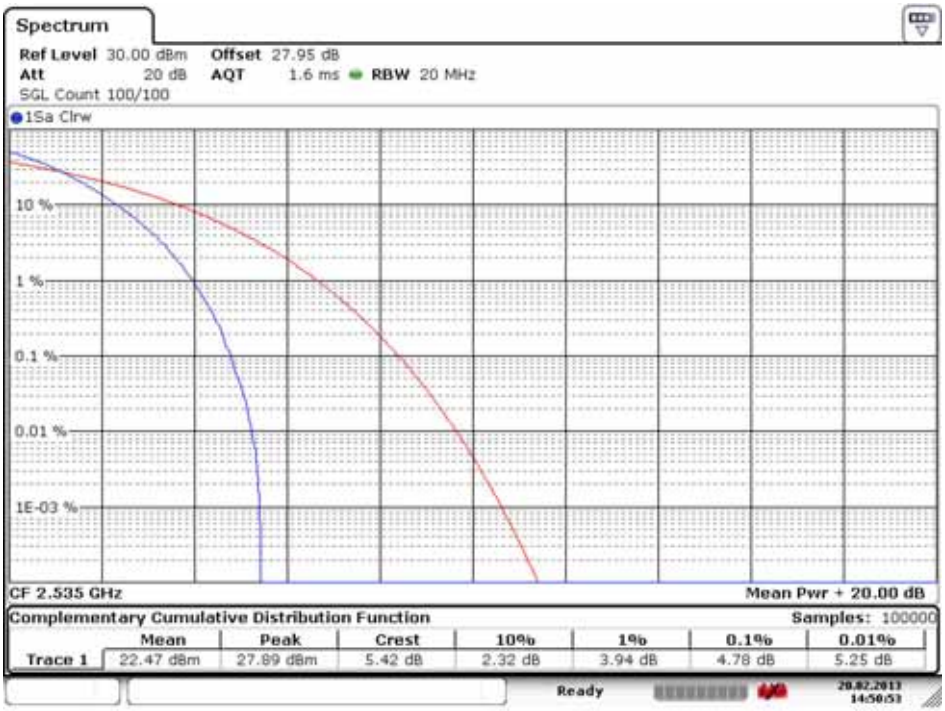
Date: 20.FEB.2013 14:15:56

PAR Plot (21100 ch_15 MHz_16-QAM_RB 75)



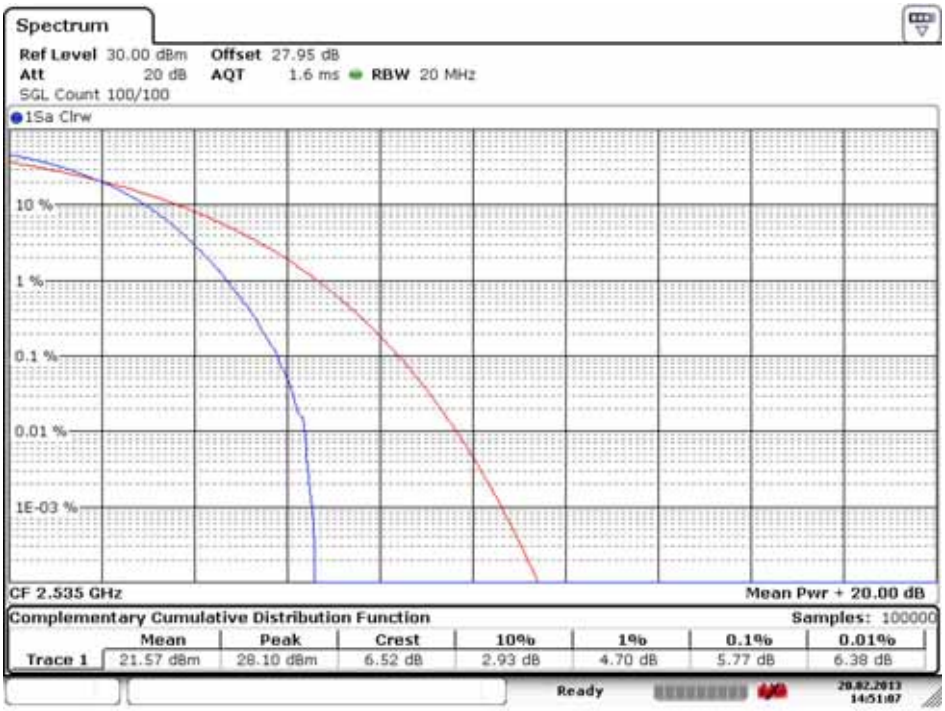
Date: 20.FEB.2013 14:15:01

PAR Plot (21100 ch_20 MHz_QPSK_RB 100)



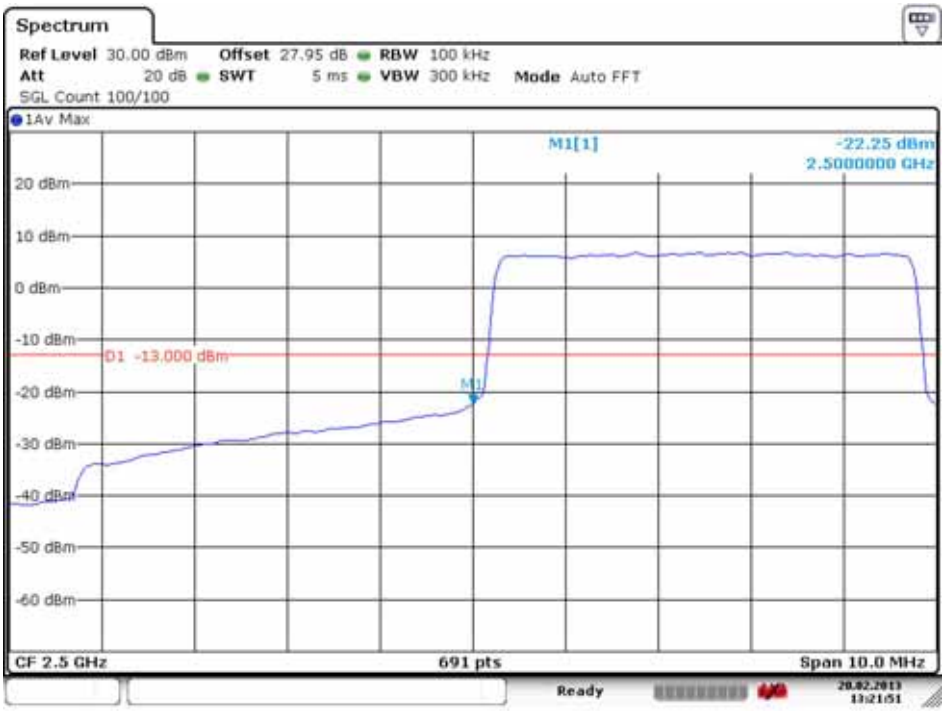
Date: 20.FEB.2013 14:50:53

PAR Plot (21100 ch_20 MHz_16-QAM_RB 100)



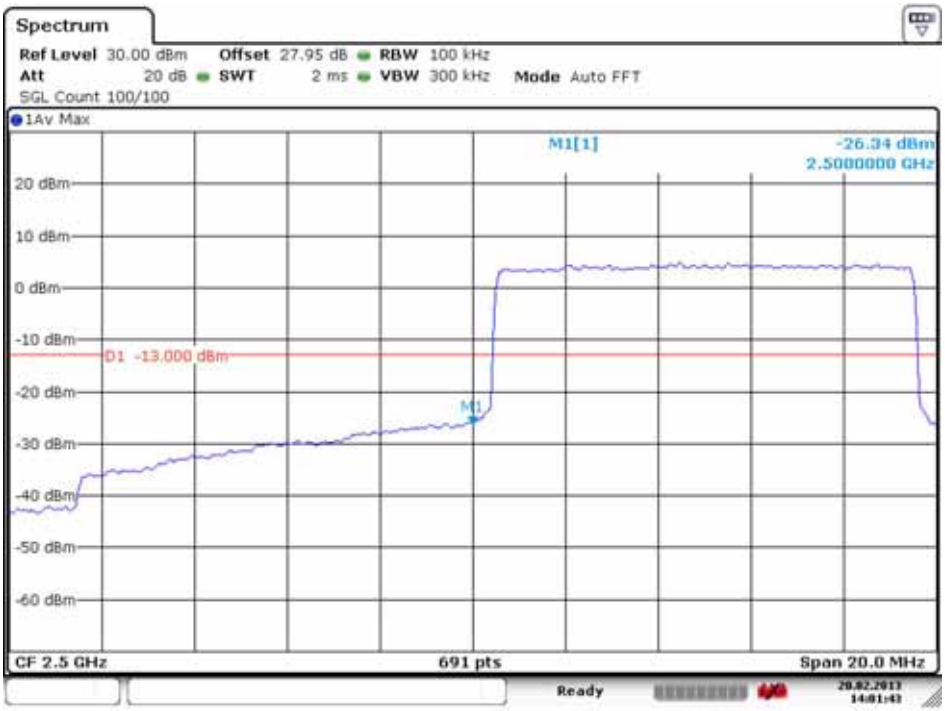
Date: 20.FEB.2013 14:51:07

Low Band Edge Plot (20775 ch_5 MHz_QPSK_RB 25_0)



Low Extended Band Edge Plot (20775_5 MHz_QPSK_RB 25_0)

Low Band Edge Plot (20800 ch_10 MHz_QPSK_RB 50_0)

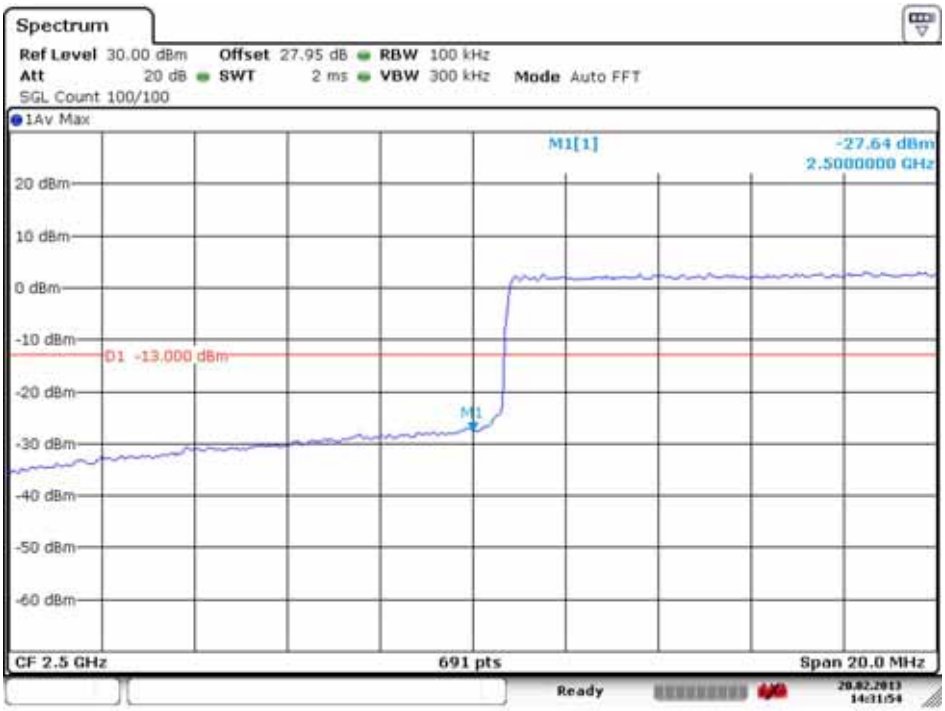


Date: 20.FEB.2013 14:01:43

Low Extended Band Edge (20800 ch_10 MHz_QPSK_RB 50_0)

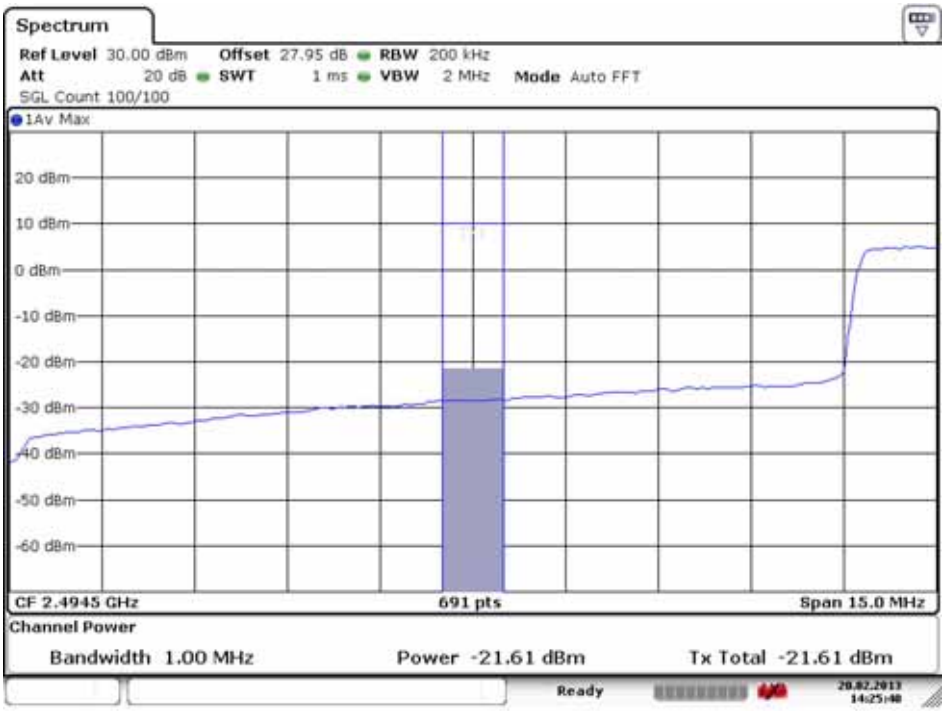
Date: 20.FEB.2013 14:26:20

Low Band Edge Plot (20825 ch_15 MHz_QPSK_RB 75_0)



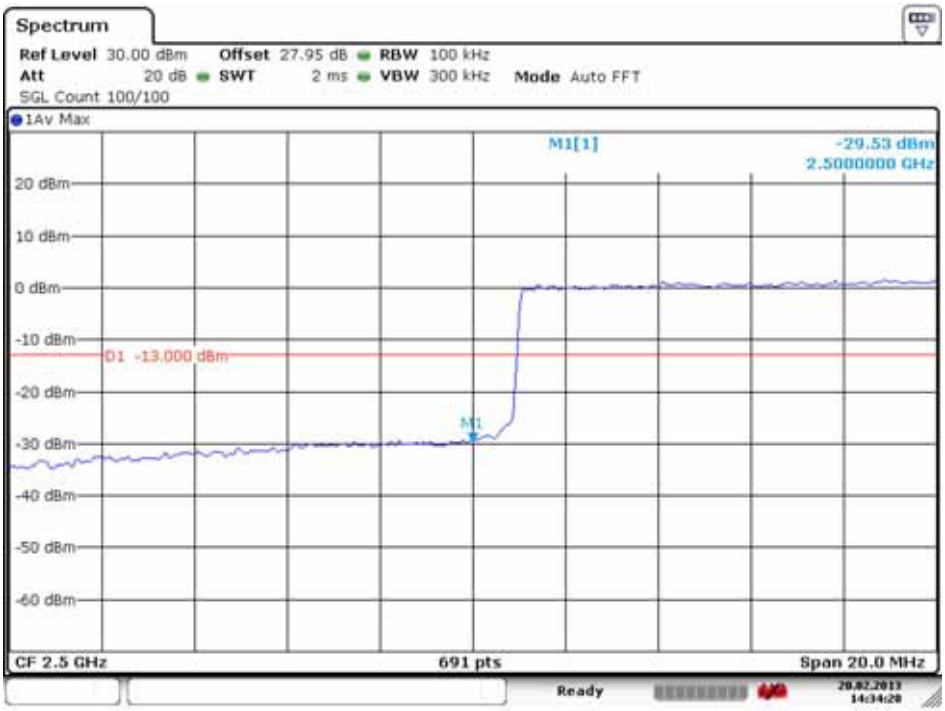
Date: 20.FEB.2013 14:31:54

Low Extended Band Edge Plot (20825_15 MHz_QPSK_RB 75_0)



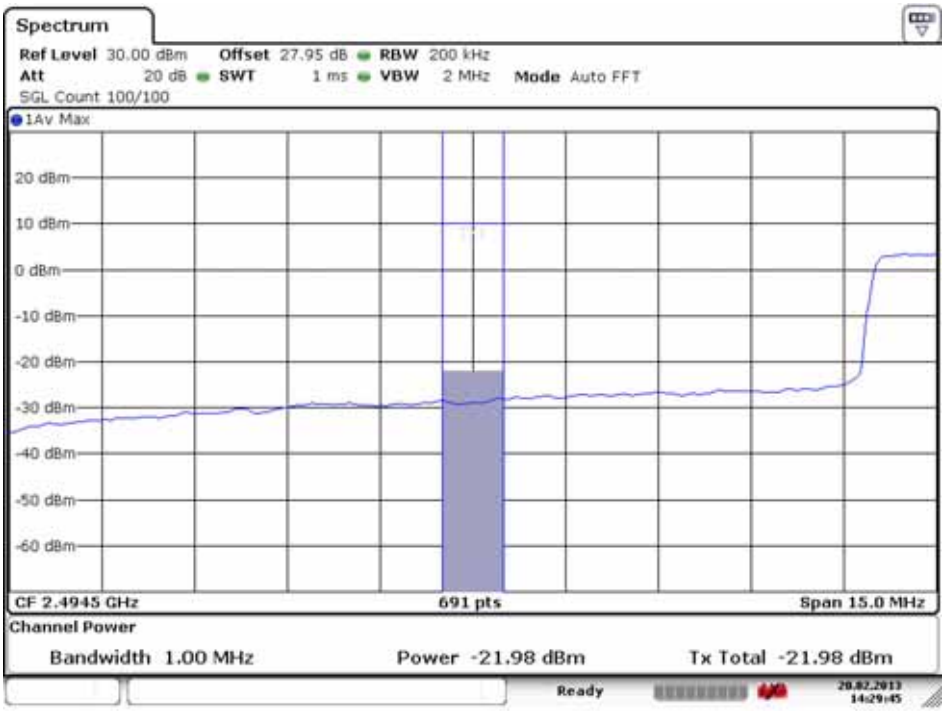
Date: 20.FEB.2013 14:25:40

Low Band Edge Plot (20850 ch_20 MHz_QPSK_RB 100_0)



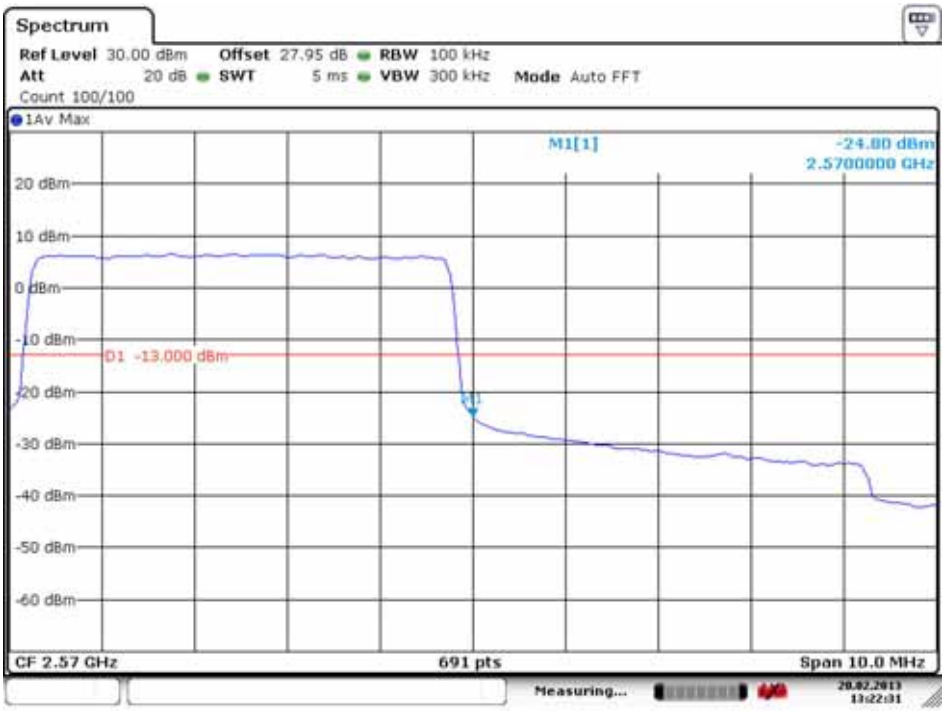
Date: 20.FEB.2013 14:34:20

Low Extended Band Edge (20850 ch_20 MHz_QPSK_RB 100_0)



Date: 20.FEB.2013 14:29:45

High Band Edge Plot (21425 ch_5 MHz_QPSK_RB 25_0)

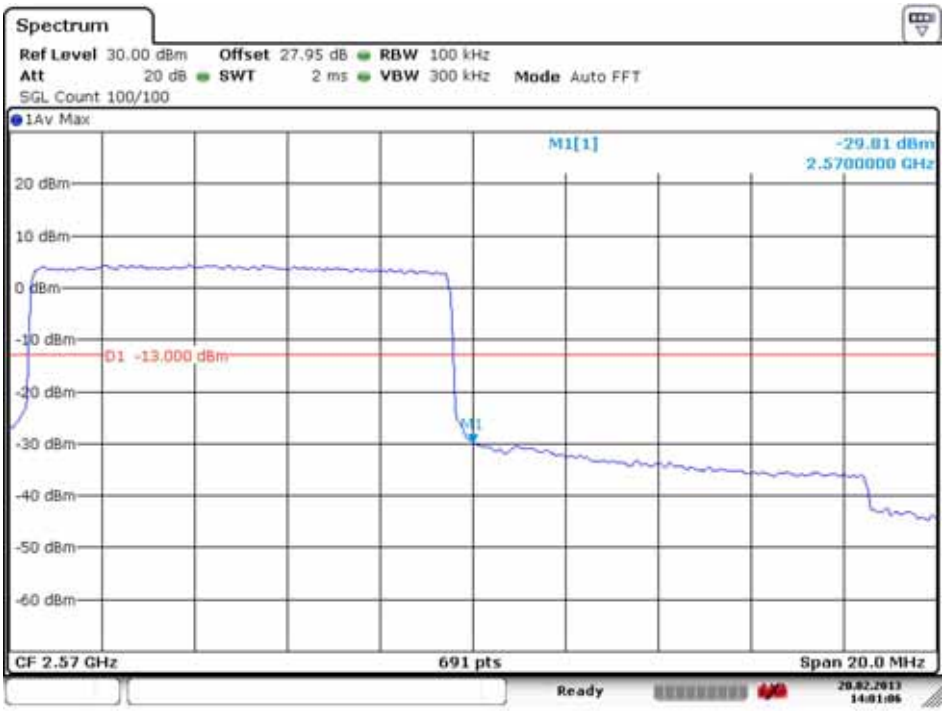


Date: 20.FEB.2013 13:22:31

High Extended Band Edge Plot (21425 ch_5 MHz_QPSK_RB 25_0)

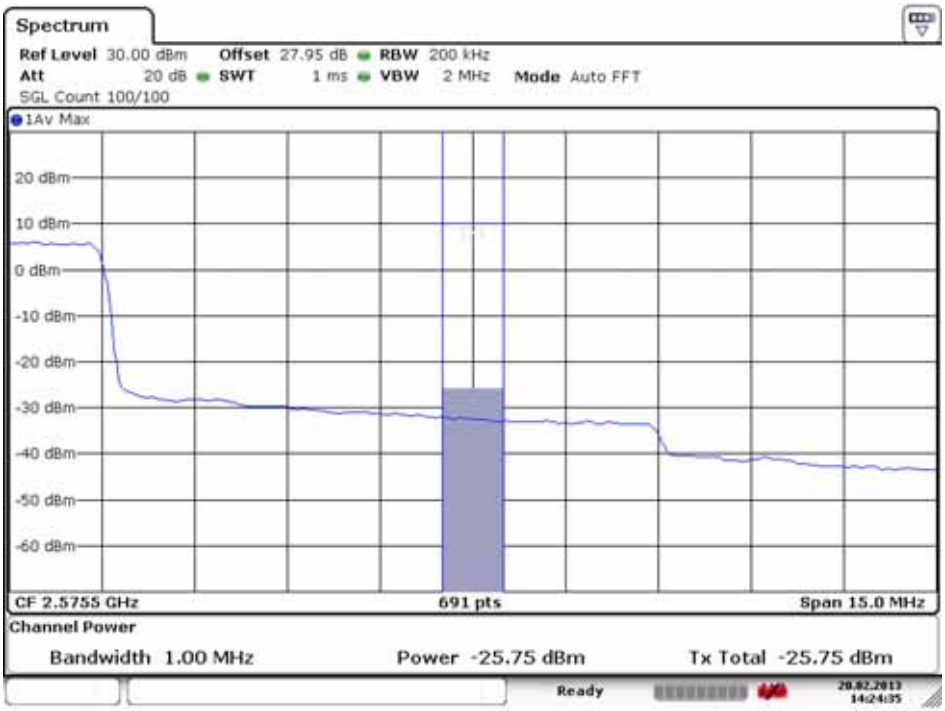
Date: 20.FEB.2013 14:23:01

High Band Edge Plot (21400 ch_10 MHz_QPSK_RB 50_0)



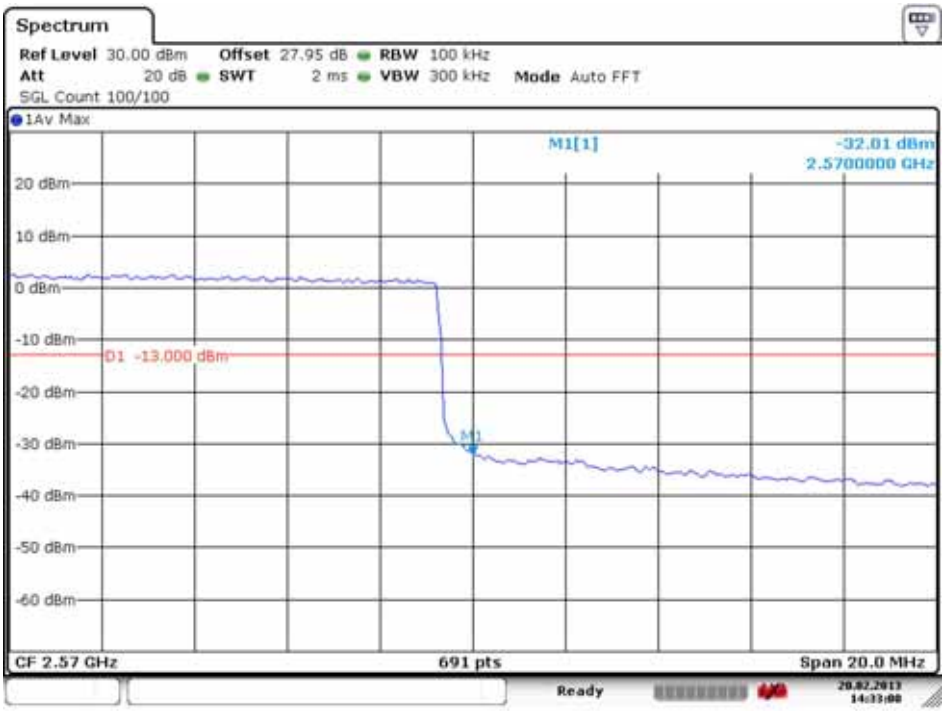
Date: 20.FEB.2013 14:01:06

High Extended Band Edge Plot (21400 ch_10 MHz_QPSK_RB 50_0)



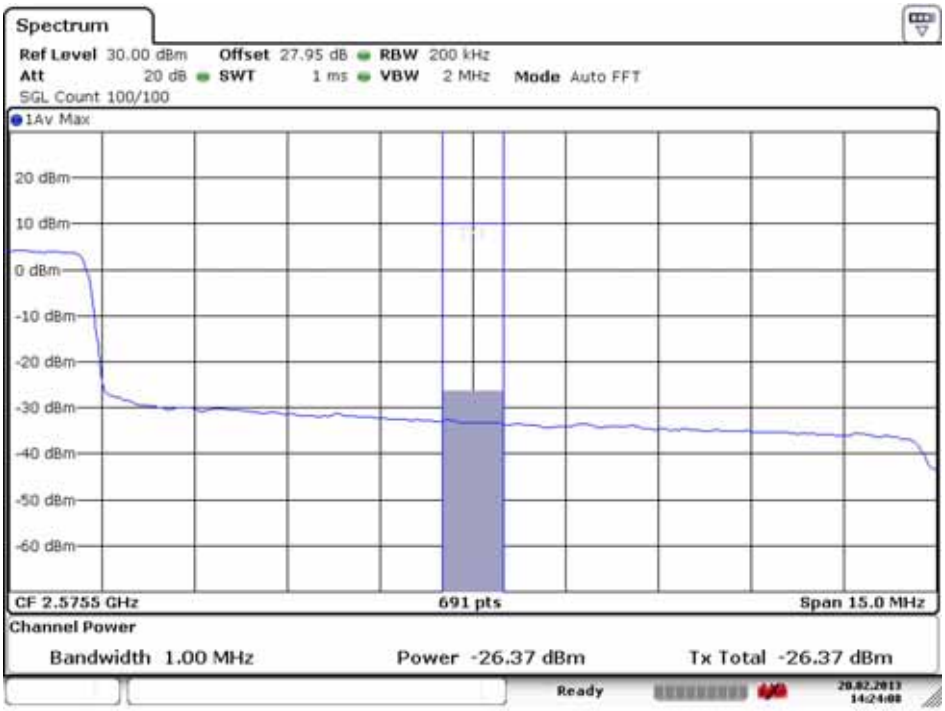
Date: 20.FEB.2013 14:24:36

High Band Edge Plot (21375 ch_15 MHz_QPSK_RB 75_0)



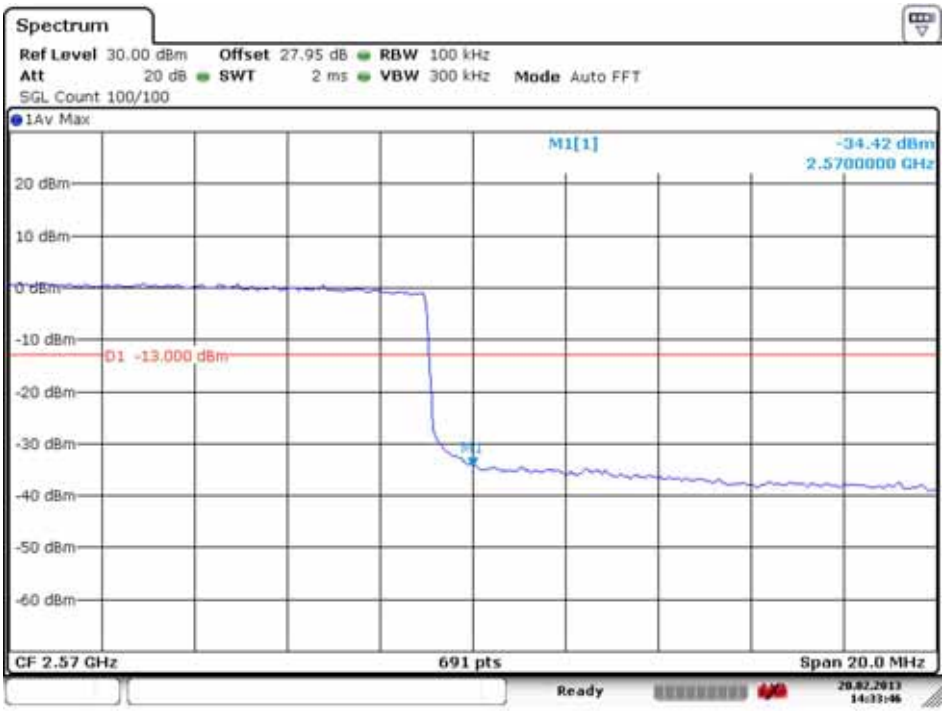
Date: 20.FEB.2013 14:33:00

High Extended Band Edge Plot (21375 ch_15 MHz_QPSK_RB 75_0)



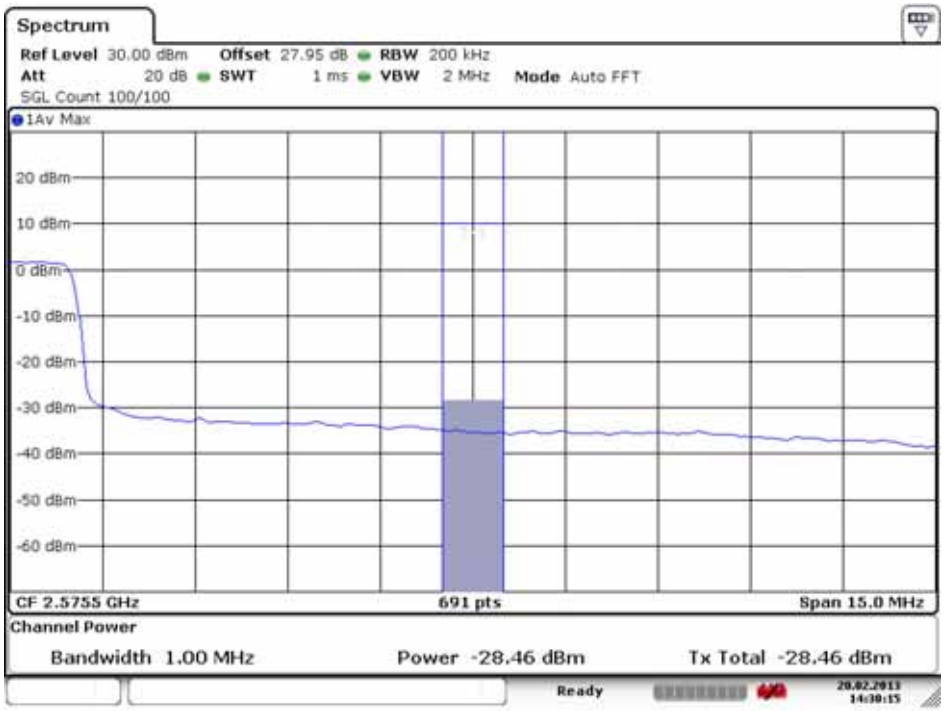
Date: 20.FEB.2013 14:24:08

High Band Edge Plot (21350 ch_20 MHz_QPSK_RB 100_0)



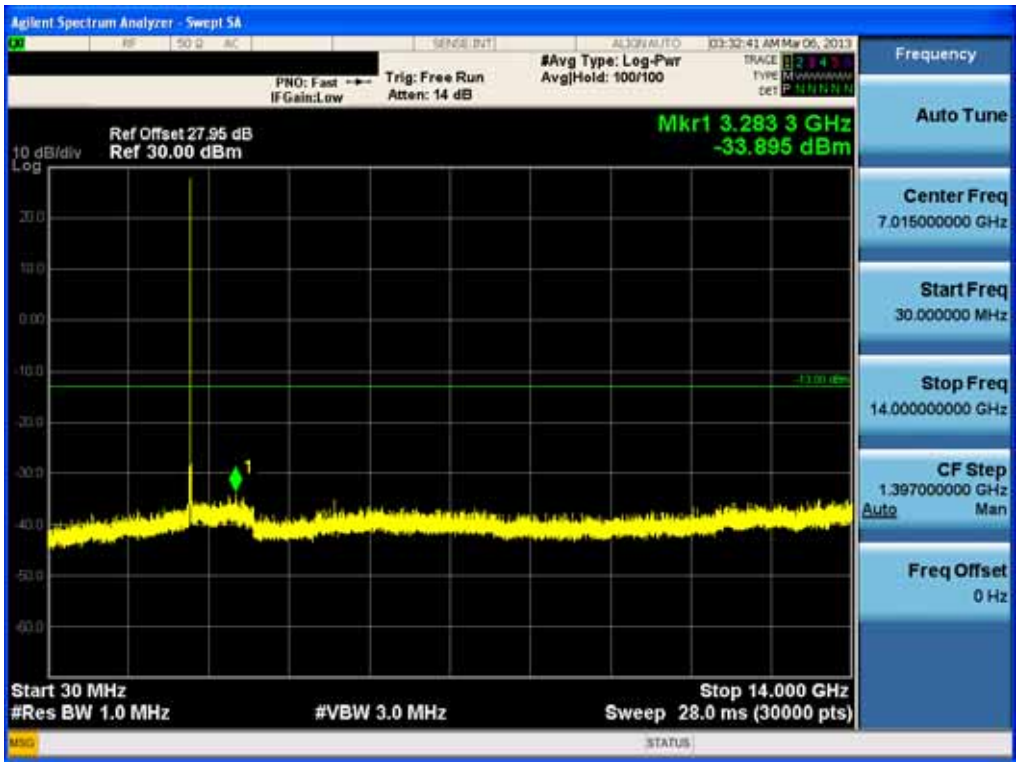
Date: 20.FEB.2013 14:33:46

High Extended Band Edge Plot (21350 ch_20 MHz_QPSK_RB 100_0)



Date: 20.FEB.2013 14:30:15

Conducted Spurious Plot_1 (20775 ch_5 MHz_QPSK_RB 1_0) -1



Conducted Spurious Plot_2 (20775 ch_5 MHz_QPSK_ RB 1_0) -2

Conducted Spurious Plot_1 (21100 ch_5 MHz_QPSK_RB 1_0) -1

Conducted Spurious Plot_2 (21100 ch_5 MHz_QPSK_RB 1_0) -2

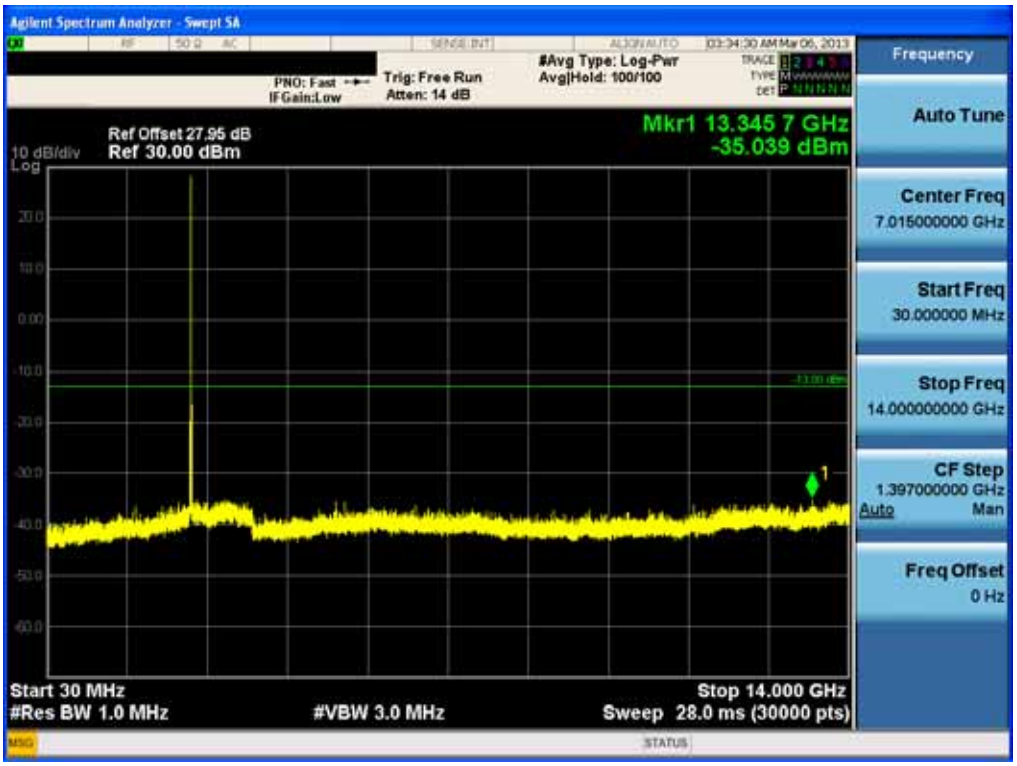
Conducted Spurious Plot_1 (21425 ch_5 MHz_QPSK_RB 1_0) -1

Conducted Spurious Plot_2 (21425 ch_5 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (20800 ch_10 MHz_QPSK_RB 1_0) -1

Conducted Spurious Plot_2 (20800 ch_10 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21100 ch_10 MHz_QPSK_RB 1_0) -1

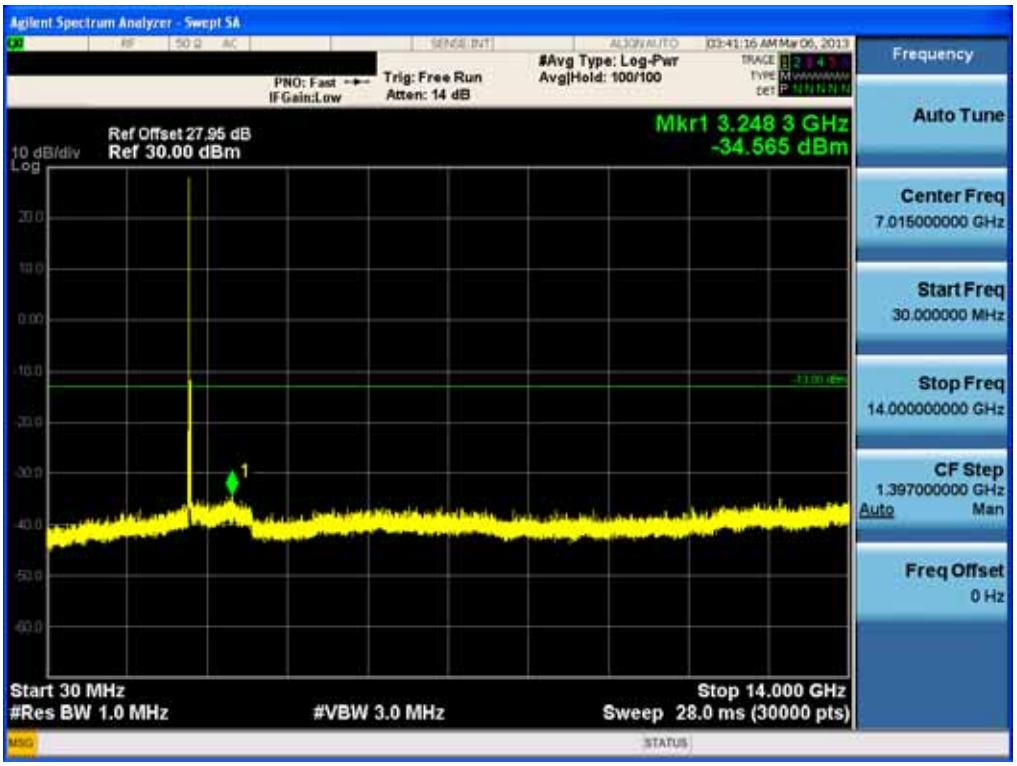


Conducted Spurious Plot_2 (21100 ch_10 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21400 ch_10 MHz_QPSK_RB 1_0) -1

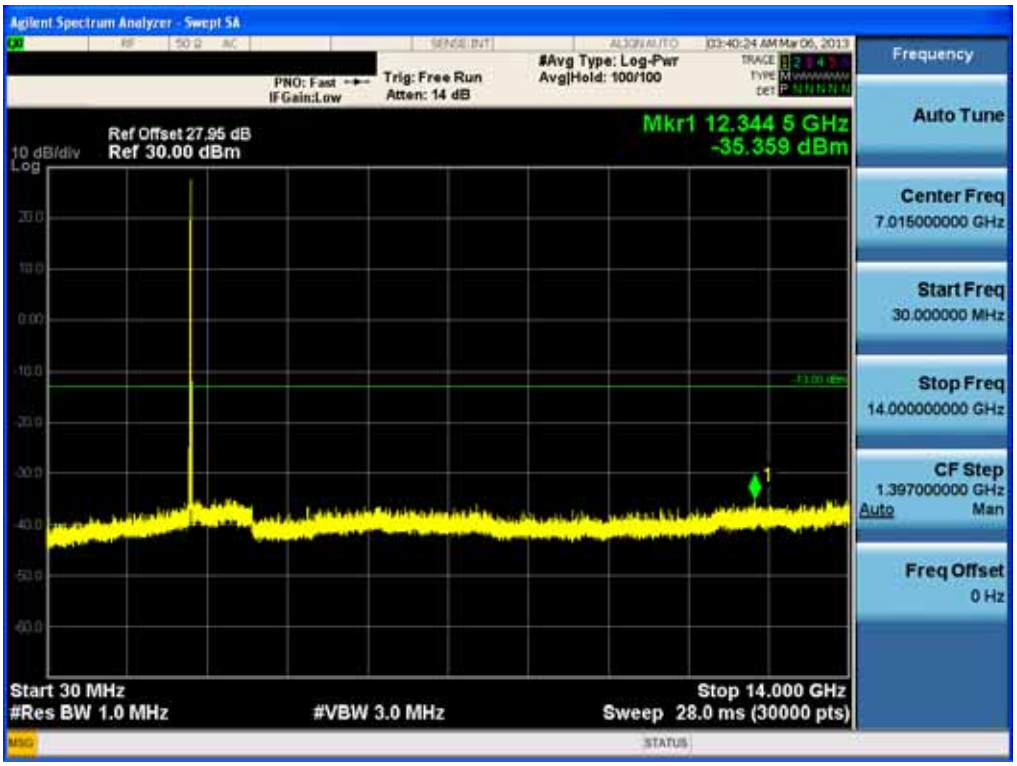
Conducted Spurious Plot_2 (21400 ch_10 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (20825 ch_15 MHz_QPSK_RB 1_0) -1



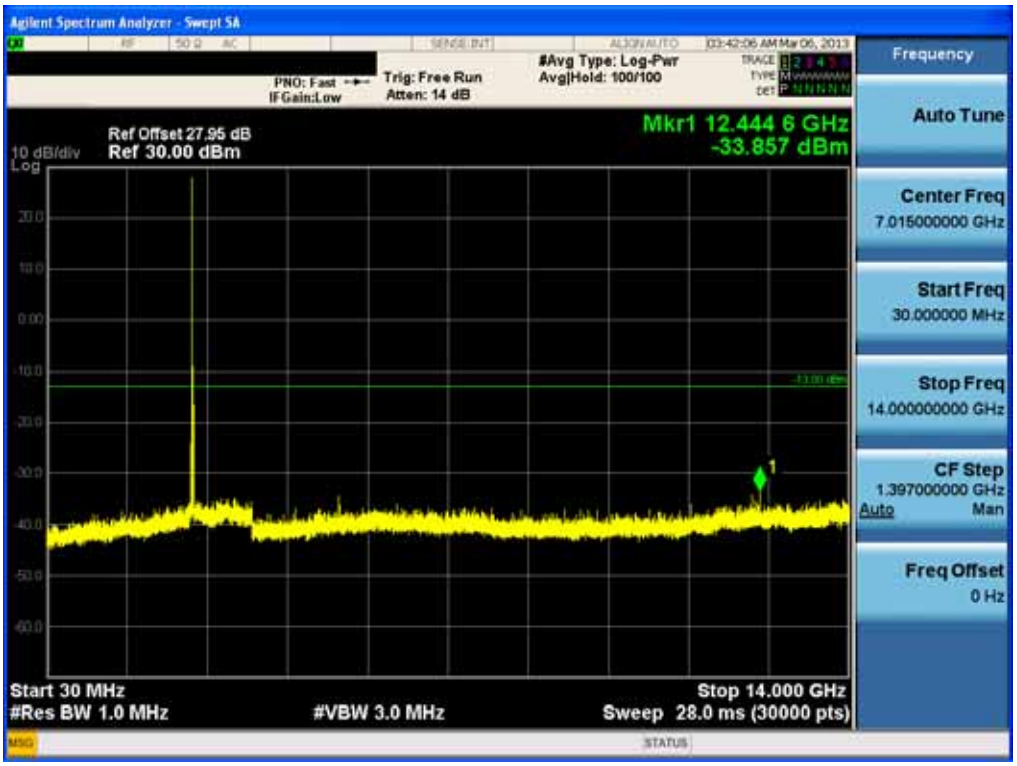
Conducted Spurious Plot_2 (20825 ch_15 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21100 ch_15 MHz_QPSK_RB 1_0) -1



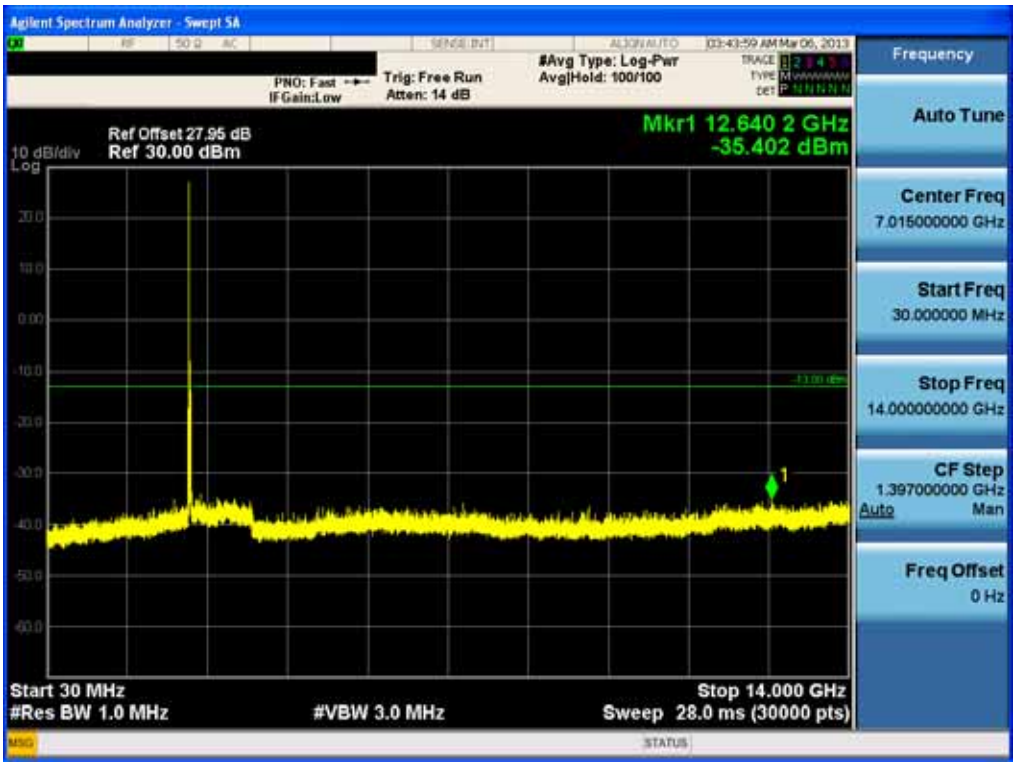
Conducted Spurious Plot_2 (21100 ch_15 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21375 ch_15 MHz_QPSK_RB 1_0) -1



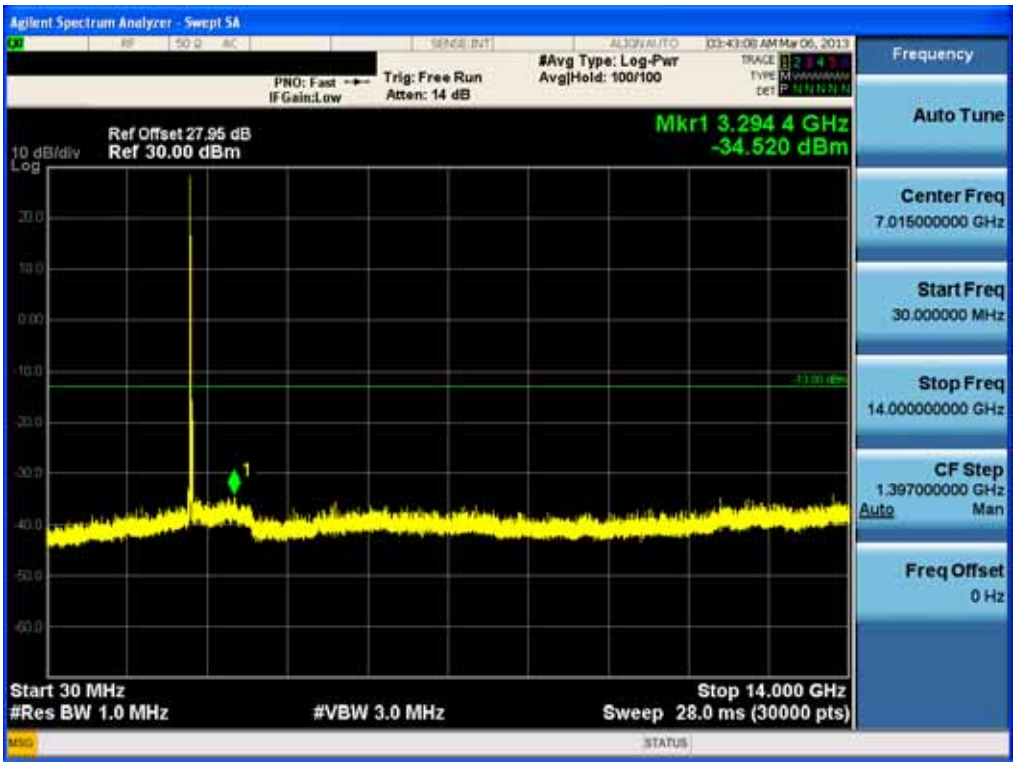
Conducted Spurious Plot_2 (21375 ch_15 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (20850 ch_20 MHz_QPSK_RB 1_0) -1



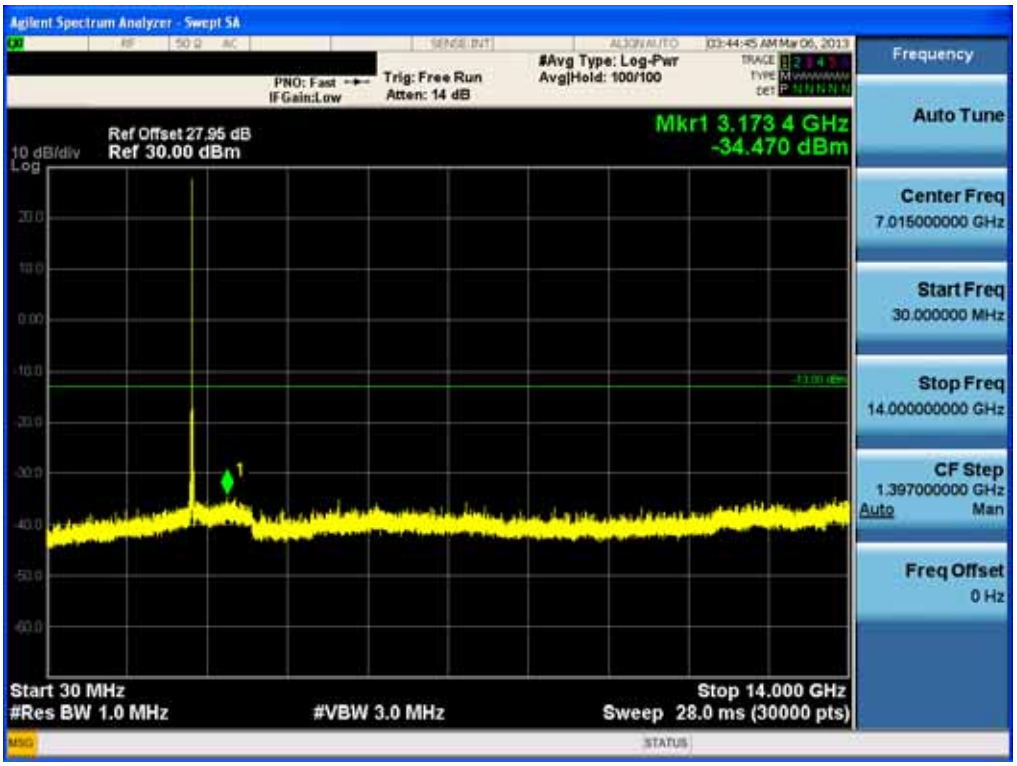
Conducted Spurious Plot_2 (20850 ch_20 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21100 ch_20 MHz_QPSK_RB 1_0) -1



Conducted Spurious Plot_2 (21100 ch_20 MHz_QPSK_RB 1_0) -2

Conducted Spurious Plot_1 (21350 ch_20 MHz_QPSK_RB 1_0) -1



Conducted Spurious Plot_2 (21350 ch_20 MHz_QPSK_RB 1_0) -2