NVLAP LAB CODE 200707-0

FCC PART 27

MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-Tech, Industrial Park, Nanshan District,

Shenzhen, Guangdong, P.R. of China

FCC ID: Q78-R9110

Report Type:	**Product Type:**
Original Report	Remote Radio Unit(4x8)

Test Engineer:	Cookies Bu
Report Number:	RSZ10060703-27
Report Date:	2010-07-22
Reviewed By:	Merry Zhao EMC Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *ZTE Corporation*'s product, model number: *ZXMBW R9110 (FCC ID: Q78-R9110)* or the "EUT" as referred to in this report is a *Remote Radio Unit(4x8),* which measures approximately: 47.0 cm L x 32.0 cm W x 12.7 cm H, rated input voltage: DC- 48V battery.

Frequency Range:

EBS Band: 2506 ~ 2686 MHz (5 MHz bandwidth)
2508.5 ~ 2683.5 MHz (10 MHz bandwidth)

Transmitter Output Power:

40 dBm （Single Port）

** All measurement and test data in this report was gathered from production sample serial number: 1006015 (Assigned by BACL). The EUT was received on 2010-06-07.*

Objective

This type approval report is prepared on behalf of *ZTE Corporation* in accordance with Part 2, Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA-1037, TIA/EIA 603-C.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modifications were made to the EUT.

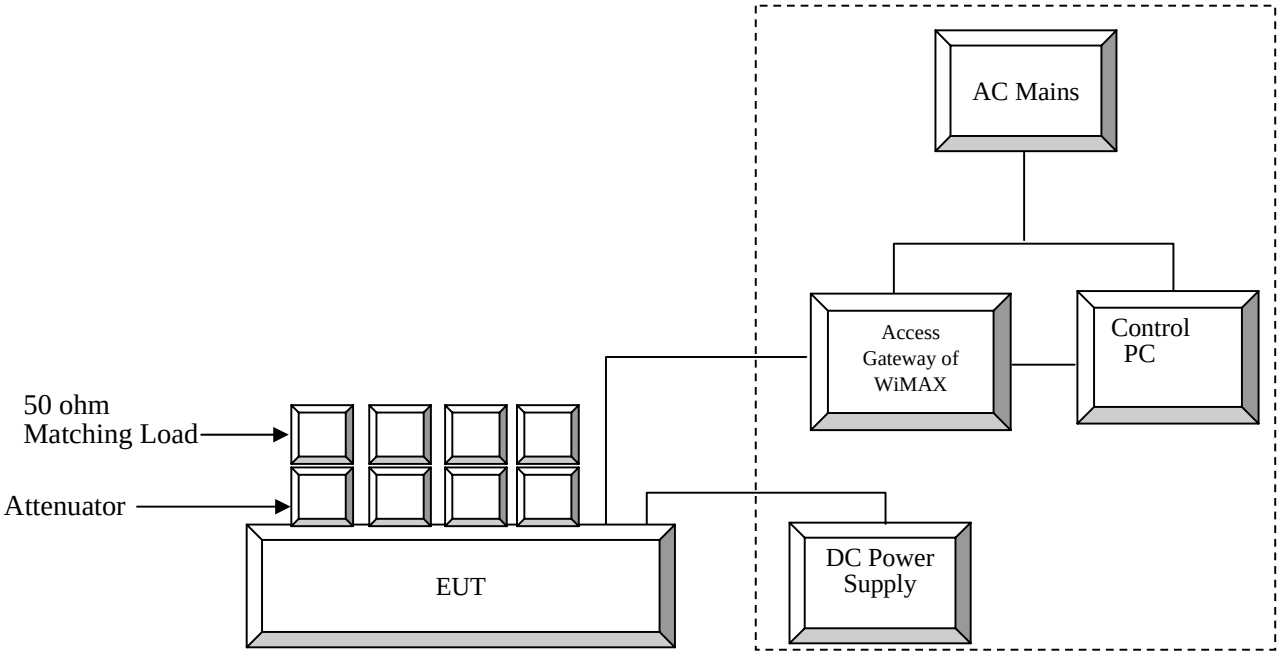
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
ZTE	Power Supply	ZXD1500	N/A	N/A
ZTE	Access Gateway of WiMAX	ZXMBW R9100	N/A	N/A

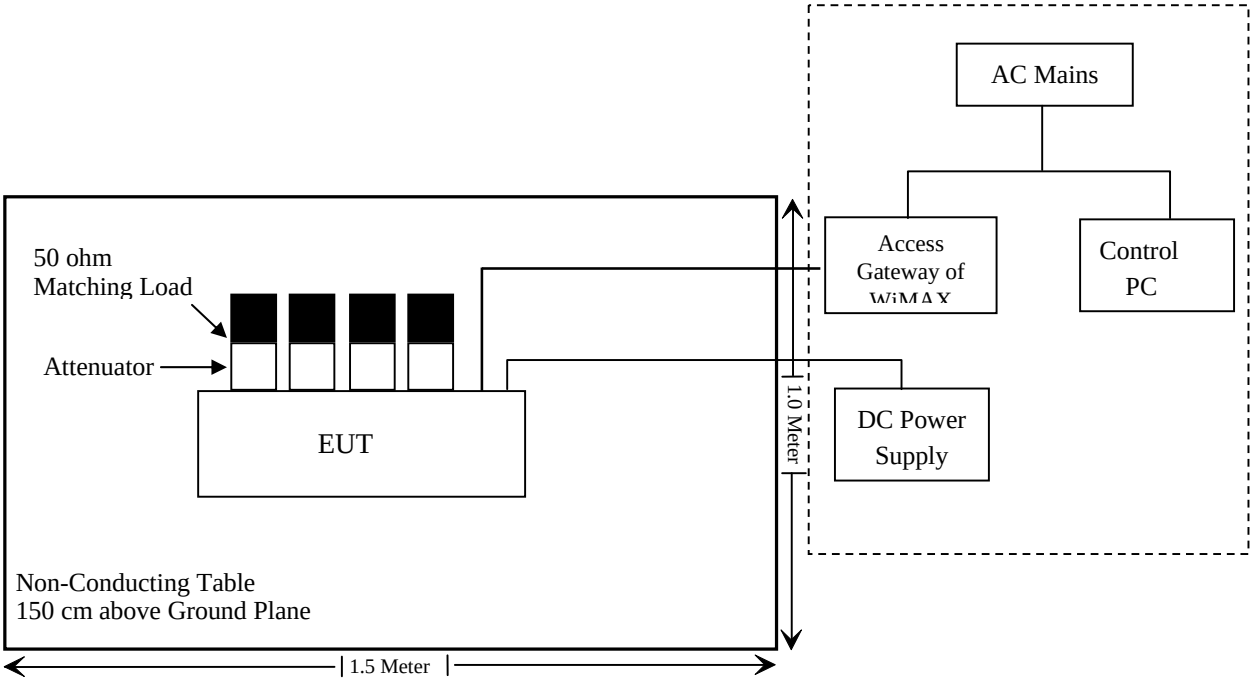
External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable Power Line	2.0	Power Supply	EUT
RF Cable	1.0	Antenna Port of EUT	Spectrum Analyzer
Optical Cable	10.0	RJ45 Port of EUT	RJ45 Port of ZXMBW R9100

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091	Maximum Permissible exposure (MPE)	Compliant
§2.1047	Modulation Characteristics	N/A
§2.1046; §27.50(h)	Effective Radiated Power	Compliant
§2.1049	Occupied Bandwidth	Compliant
§2.1051; §27.53(m)	Spurious Emissions at Antenna Terminal	Compliant
§2.1053; §27.53(m)	Spurious Radiation Emission	Compliant
§27.53(m)	Band Edge	Compliant
§2.1055; §27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant

FCC §1.1307 (b)(1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for Occupation/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-3.0	614	1.63	*(100)	6
3.0-30.0	1824/f	4.89/f	*(900/f\2\)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5.0	6

f = frequency in MHz
* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally ***numeric*** gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Mode	**Frequency (MHz)**	**Antenna Gain**		**Total Conducted Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
		(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
5 MHz 2 Carriers	2508.5	16	39.811	46.486	44524.597	300	1.567	5.0
10 MHz 2 Carriers	2513.5	16	39.811	46.556	45248.064	300	1.593	5.0

Result: Compliant

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC §2.1047(d), Part 27, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046 & § 27.50(h) – EFFECTIVE RADIATED POWER

Applicable Standard

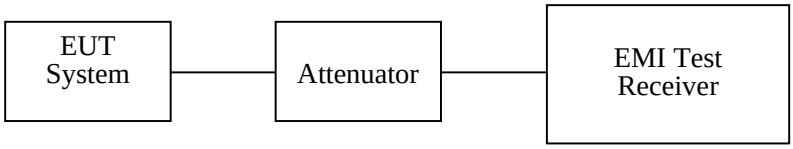
According to FCC §2.1046 and §27.50(h),

For main, booster and response stations utilizing digital emissions with non-uniform power spectral density (e.g. unfiltered QPSK), the power measured within any 100 kHz resolution bandwidth within the 6 MHz channel occupied by the non-uniform emission cannot exceed the power permitted within any 100 kHz resolution bandwidth within the 6 MHz channel if it were occupied by an emission with uniform power spectral density, i.e. , if the maximum permissible power of a station utilizing a perfectly uniform power spectral density across a 6 MHz channel were 2000 watts EIRP, this would result in a maximum permissible power flux density for the station of 2000/60 = 33.3 watts EIRP per 100 kHz bandwidth. If a non-uniform emission were substituted at the station, station power would still be limited to a maximum of 33.3 watts EIRP within any 100 kHz segment of the 6 MHz channel, irrespective of the fact that this would result in a total 6 MHz channel power of less than 2000 watts EIRP.

Test Procedure

Conducted method:

The RF output port of the EUT system was connected to the wireless test set and the EMI test receiver through sufficient attenuation.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI test receiver	ESCI	100224	2009-11-24	2010-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

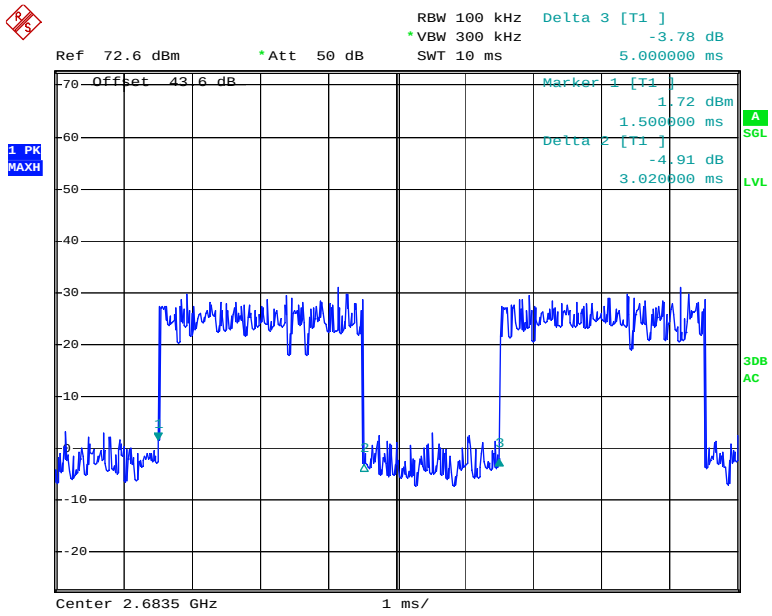
Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Cookies Bu on 2010-06-13 to 2010-06-18.

Duty cycle=3.02ms/5.0ms=60.4%
Duty cycle factor=10log1/60.4%=2.19
P = A+G+10log1/X
Note: A: Total Average Power; G: Antenna gain; X: Duty cycle



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Note: the duty cycle of QPSK, 16QAM and 64QAM are the same.

Test Mode: 5 MHz/1 Carrier

Modulation	Frequency（MHz）	Antenna Port	Average Power (dBm)	Total Average Power (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
QPSK	2506.0	Chain 0	37.56	43.786	2.19	16	61.976	63
		Chain 1	37.83					
		Chain 2	38.09					
		Chain 3	37.56					
	2596.0	Chain 0	38.13	44.077	2.19	16	62.267	63
		Chain 1	38.28					
		Chain 2	38.01					
		Chain 3	37.79					
	2686.0	Chain 0	37.72	43.647	2.19	16	61.837	63
		Chain 1	37.88					
		Chain 2	37.45					
		Chain 3	37.44					
16QAM	2506.0	Chain 0	37.46	43.653	2.19	16	61.843	63
		Chain 1	37.71					
		Chain 2	38.00					
		Chain 3	37.33					
	2596.0	Chain 0	38.05	44.000	2.19	16	62.190	63
		Chain 1	38.12					
		Chain 2	38.00					
		Chain 3	37.74					
	2686.0	Chain 0	37.51	43.501	2.19	16	61.691	63
		Chain 1	37.77					
		Chain 2	37.36					
		Chain 3	37.35					
64QAM	2506.0	Chain 0	37.69	43.872	2.19	16	62.062	63
		Chain 1	37.96					
		Chain 2	38.18					
		Chain 3	37.55					
	2596.0	Chain 0	38.23	44.224	2.19	16	62.414	63
		Chain 1	38.31					
		Chain 2	38.08					
		Chain 3	38.19					
	2686.0	Chain 0	37.78	43.754	2.19	16	61.944	63
		Chain 1	37.98					
		Chain 2	37.60					
		Chain 3	37.56					

Note: 2000 Watt = 63 dBm

Test Mode: 5 MHz/2 Carriers

Modulation	Frequency（MHz）	Antenna Port	Average Power (dBm)	Total Average Power (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
QPSK	2508.5	Chain 0	38.39	44.273	2.19	16	62.463	63
		Chain 1	38.26					
		Chain 2	38.33					
		Chain 3	38.02					
	2596.0	Chain 0	38.15	44.043	2.19	16	62.233	63
		Chain 1	37.89					
		Chain 2	38.17					
		Chain 3	37.87					
	2683.5	Chain 0	37.71	43.858	2.19	16	62.048	63
		Chain 1	38.17					
		Chain 2	37.73					
		Chain 3	37.72					
16QAM	2508.5	Chain 0	38.25	44.171	2.19	16	62.361	63
		Chain 1	38.18					
		Chain 2	38.26					
		Chain 3	37.90					
	2596.0	Chain 0	38.05	43.889	2.19	16	62.079	63
		Chain 1	37.79					
		Chain 2	37.83					
		Chain 3	37.80					
	2683.5	Chain 0	37.58	43.740	2.19	16	61.930	63
		Chain 1	38.05					
		Chain 2	37.62					
		Chain 3	37.61					
64QAM	2508.5	Chain 0	38.43	44.296	2.19	16	62.486	63
		Chain 1	38.26					
		Chain 2	38.40					
		Chain 3	38.00					
	2596.0	Chain 0	38.24	44.102	2.19	16	62.292	63
		Chain 1	37.99					
		Chain 2	38.04					
		Chain 3	38.05					
	2683.5	Chain 0	37.83	43.936	2.19	16	62.126	63
		Chain 1	38.20					
		Chain 2	37.81					
		Chain 3	37.81					

Note: 2000 Watt = 63 dBm

Test Mode: 10 MHz/1 Carrier

Modulation	Frequency（MHz）	Antenna Port	Average Power (dBm)	Total Average Power (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
QPSK	2508.5	Chain 0	38.24	43.970	2.19	16	62.160	63
		Chain 1	37.75					
		Chain 2	38.13					
		Chain 3	37.65					
	2596.0	Chain 0	37.55	43.968	2.19	16	62.158	63
		Chain 1	38.30					
		Chain 2	37.79					
		Chain 3	38.11					
	2683.5	Chain 0	38.08	44.022	2.19	16	62.212	63
		Chain 1	38.06					
		Chain 2	37.67					
		Chain 3	38.18					
16QAM	2508.5	Chain 0	38.06	43.916	2.19	16	62.106	63
		Chain 1	37.87					
		Chain 2	38.09					
		Chain 3	37.54					
	2596.0	Chain 0	37.44	43.837	2.19	16	62.027	63
		Chain 1	38.19					
		Chain 2	37.66					
		Chain 3	37.94					
	2683.5	Chain 0	37.87	43.937	2.19	16	62.127	63
		Chain 1	38.07					
		Chain 2	37.62					
		Chain 3	38.09					
64QAM	2508.5	Chain 0	38.32	44.044	2.19	16	62.234	63
		Chain 1	38.07					
		Chain 2	38.00					
		Chain 3	37.68					
	2596.0	Chain 0	37.63	44.145	2.19	16	62.335	63
		Chain 1	38.39					
		Chain 2	38.31					
		Chain 3	38.13					
	2683.5	Chain 0	38.06	44.166	2.19	16	62.356	63
		Chain 1	38.39					
		Chain 2	37.82					
		Chain 3	38.29					

Note: 2000 Watt = 63 dBm

Test Mode: 10 MHz/2 Carriers

Modulation	Frequency（MHz）	Antenna Port	Average Power (dBm)	Total Average Power (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
QPSK	2513.5	Chain 0	37.60	43.849	2.19	16	62.039	63
		Chain 1	37.90					
		Chain 2	38.27					
		Chain 3	37.50					
	2596.0	Chain 0	37.75	43.850	2.19	16	62.040	63
		Chain 1	38.00					
		Chain 2	37.55					
		Chain 3	38.00					
	2678.5	Chain 0	37.72	43.772	2.19	16	61.962	63
		Chain 1	37.74					
		Chain 2	37.64					
		Chain 3	37.90					
16QAM	2513.5	Chain 0	38.20	44.101	2.19	16	62.291	63
		Chain 1	38.35					
		Chain 2	37.94					
		Chain 3	37.81					
	2596.0	Chain 0	37.60	43.877	2.19	16	62.067	63
		Chain 1	37.68					
		Chain 2	38.37					
		Chain 3	37.73					
	2678.5	Chain 0	38.10	43.897	2.19	16	62.087	63
		Chain 1	38.00					
		Chain 2	37.64					
		Chain 3	37.75					
64QAM	2513.5	Chain 0	38.48	44.366	2.19	16	62.556	63
		Chain 1	38.60					
		Chain 2	38.24					
		Chain 3	38.04					
	2596.0	Chain 0	37.75	44.025	2.19	16	62.215	63
		Chain 1	38.00					
		Chain 2	38.31					
		Chain 3	37.94					
	2678.5	Chain 0	38.30	44.083	2.19	16	62.273	63
		Chain 1	38.22					
		Chain 2	37.90					
		Chain 3	37.81					

Note: 2000 Watt = 63 dBm

FCC §2.1049 - OCCUPIED BANDWIDTH

Applicable Standards

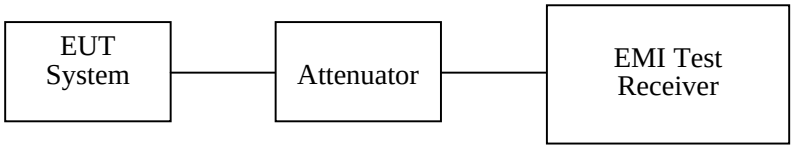
FCC §2.1049

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 as applicable:

Test Procedure

The RF output of the EUT system was connected to the simulator and the EMI test receiver through sufficient attenuation.

The resolution bandwidth of the EMI test receiver was set at 100 kHz and 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

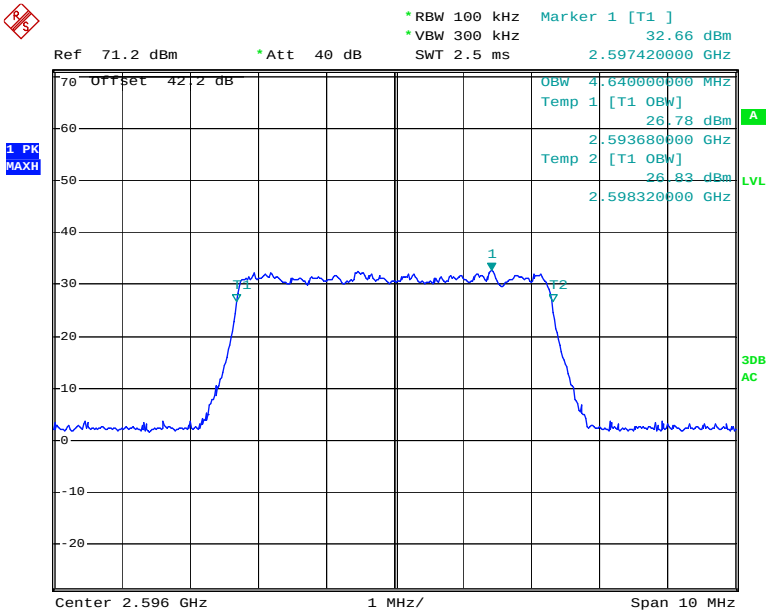
The testing was performed by Cookies Bu on 2010-06-13 and 2010-06-22.

Bandwidth/Carrier No.	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)
5MHz/1carrier	QPSK	2596.0	4.64
	16QAM	2596.0	4.64
	64QAM	2596.0	4.64
5MHz/2carriers	QPSK	2596.0	9.56
	16QAM	2596.0	9.56
	64QAM	2596.0	9.60
10MHz/1carrier	QPSK	2596.0	9.24
	16QAM	2596.0	9.24
	64QAM	2596.0	9.24
10MHz/2carriers	QPSK	2596.0	19.20
	16QAM	2596.0	19.20
	64QAM	2596.0	19.20

Please refer to the following plots.

99% Occupied Bandwidth

Middle Channel for 5 MHz-1 Carrier-QPSK



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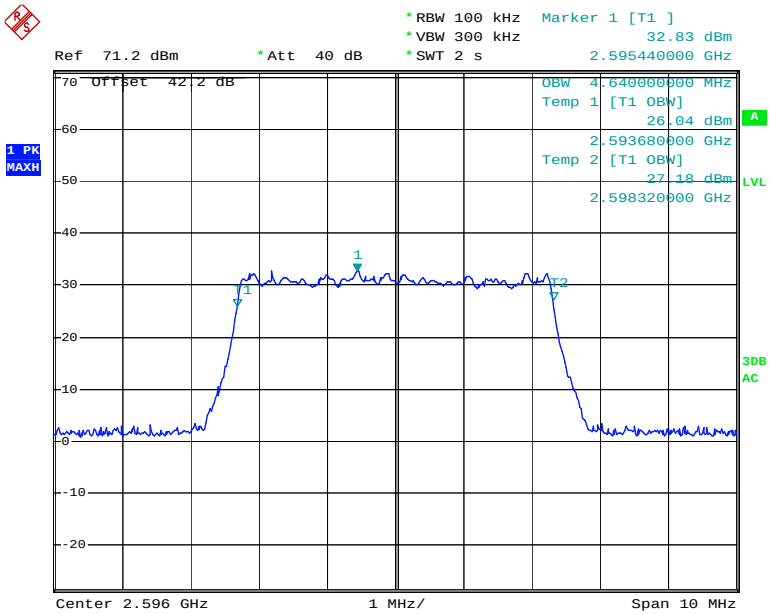
Middle Channel for 5 MHz-1 Carrier-16QAM



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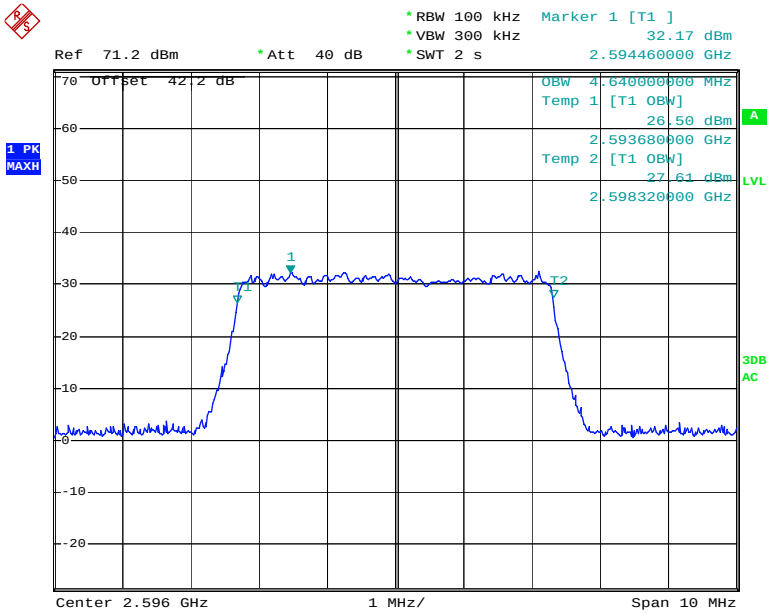
Middle Channel for 5 MHz-1 Carrier-64QAM



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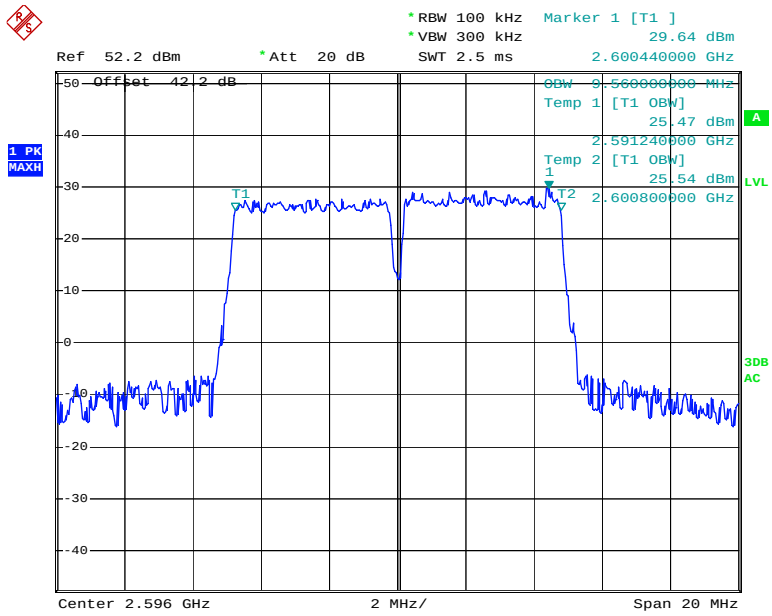
High Channel for 5 MHz-2 Carriers-QPSK



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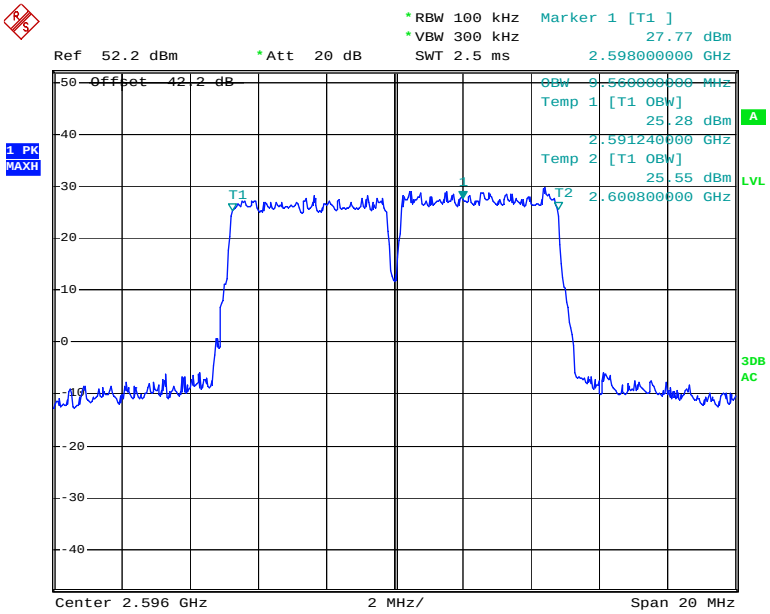
Middle Channel for 5 MHz-2 Carriers-16QAM



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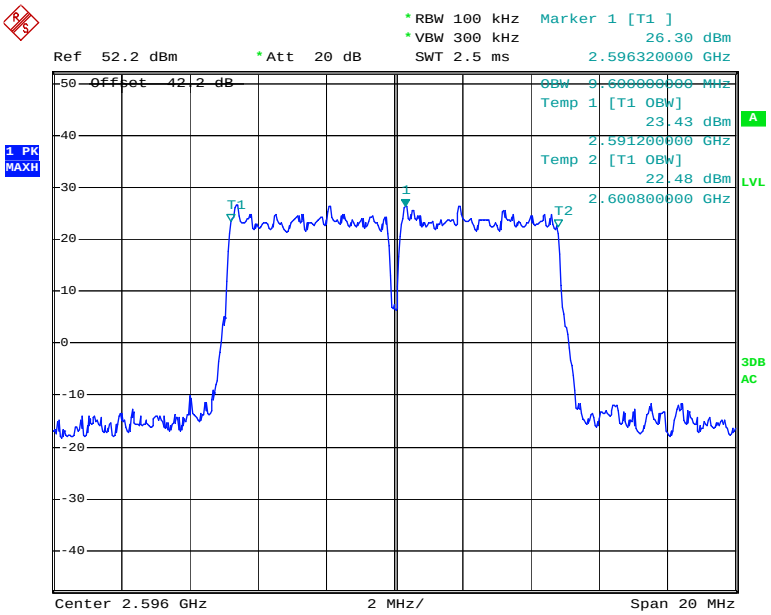
Middle Channel for 5 MHz-2 Carriers-64QAM



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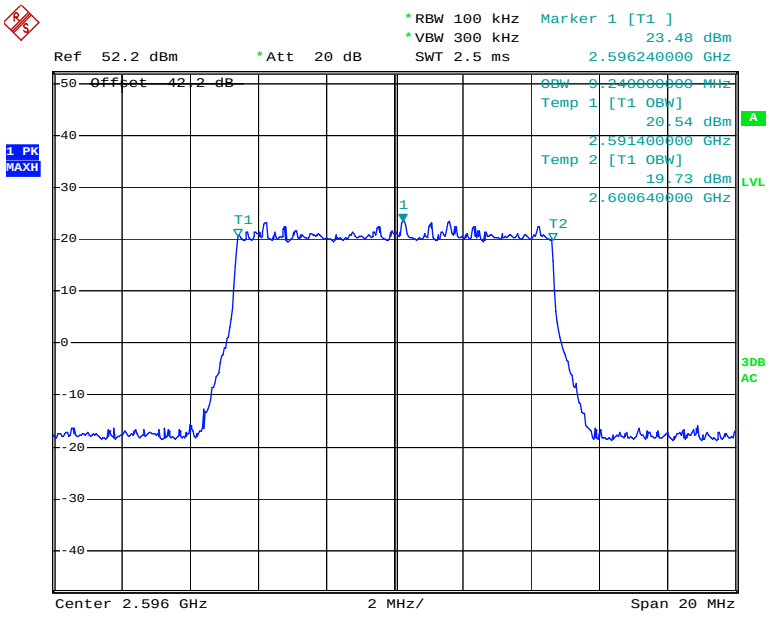
Middle Channel for 10 MHz-1 Carrier-QPSK



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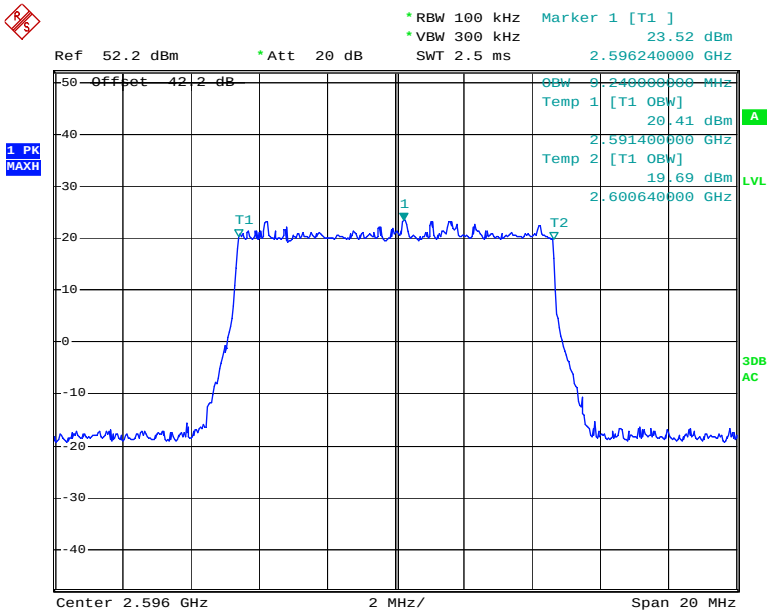
Middle Channel for 10 MHz-1 Carrier-16QAM



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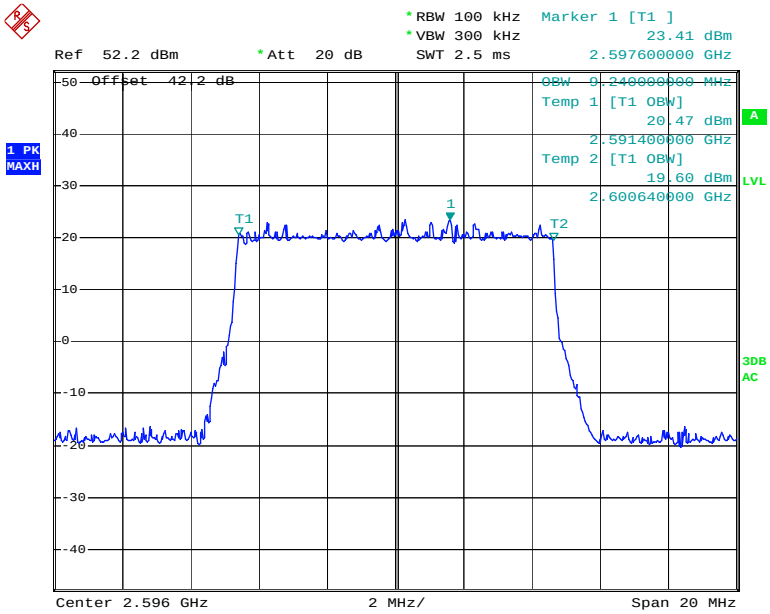
Middle Channel for 10 MHz-1 Carrier-64QAM



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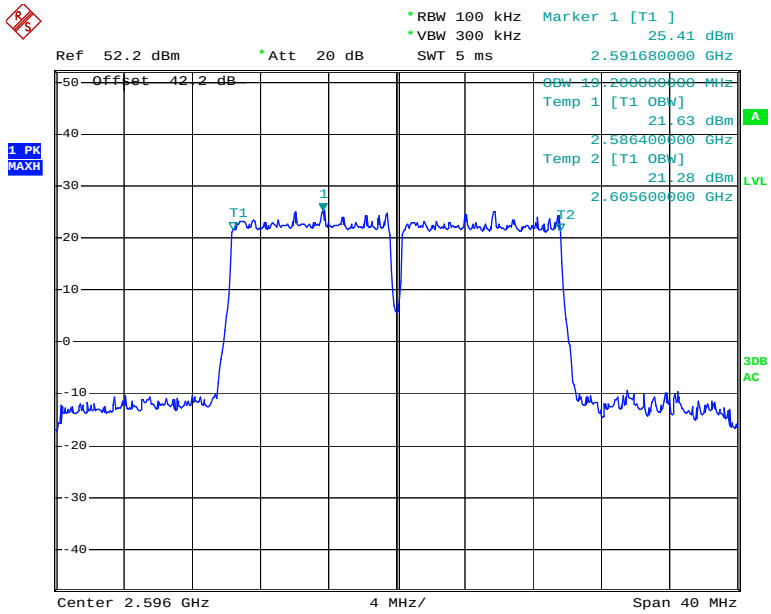
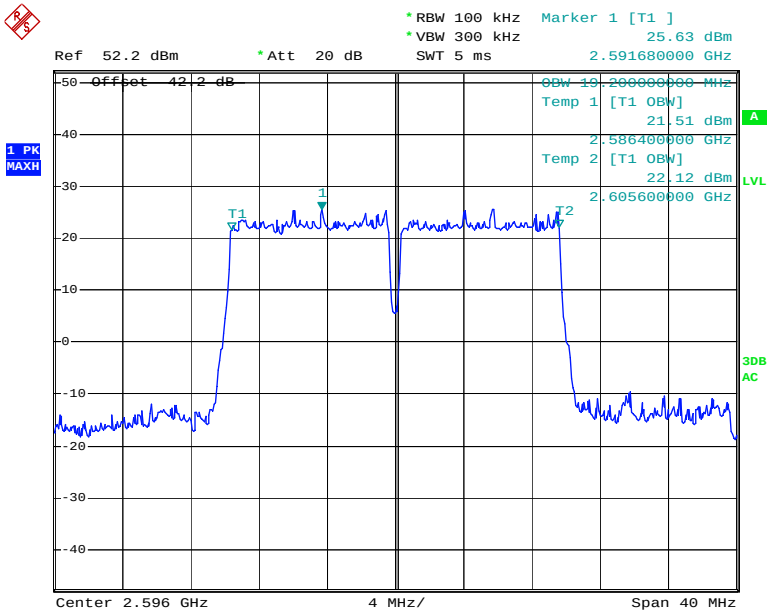
Middle Channel for 10MHz-2 Carriers-QPSK



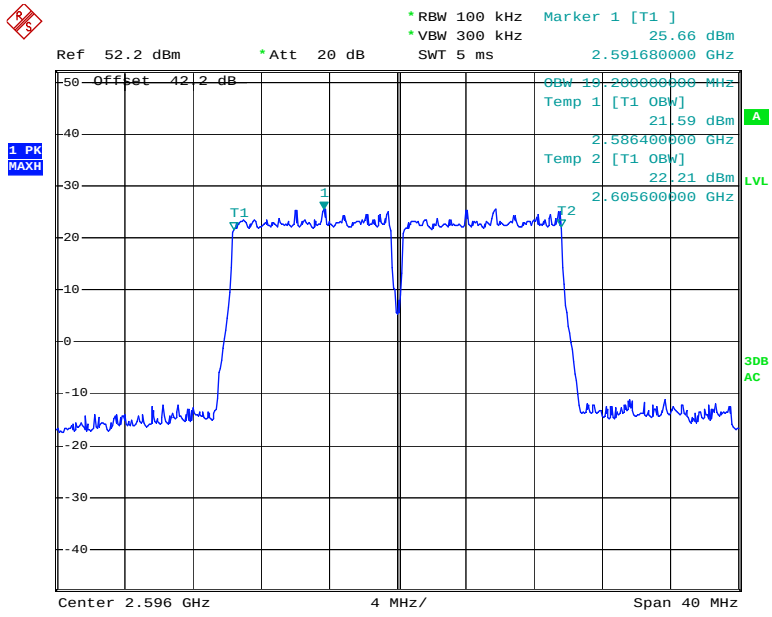
Date: 22.JUN.2010 14:29:46

Middle Channel for 10 MHz-2 Carriers-16QAM



Date: 22.JUN.2010 14:32:36

Middle Channel for 10 MHz-2 Carrier-64QAM



Date: 22.JUN.2010 14:35:03

FCC §2.1051, §27.53(m) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

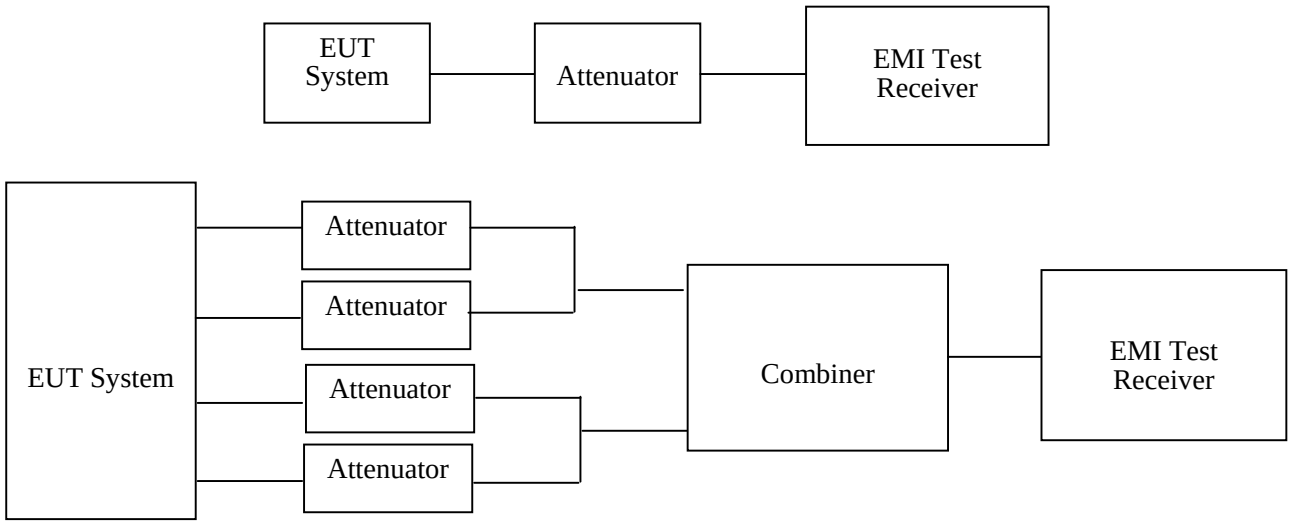
FCC §2.1051, §27.53(m)(2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the EUT system was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the EMI test receiver was set at as following table. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Frequency	RBW	VBW
9kHz ~ 150kHz	1kHz	3kHz
150kHz ~ 30MHz	10kHz	30kHz
30MHz ~ 1GHz	100kHz	300kHz
Above 1GHz	1MHz	3MHz



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

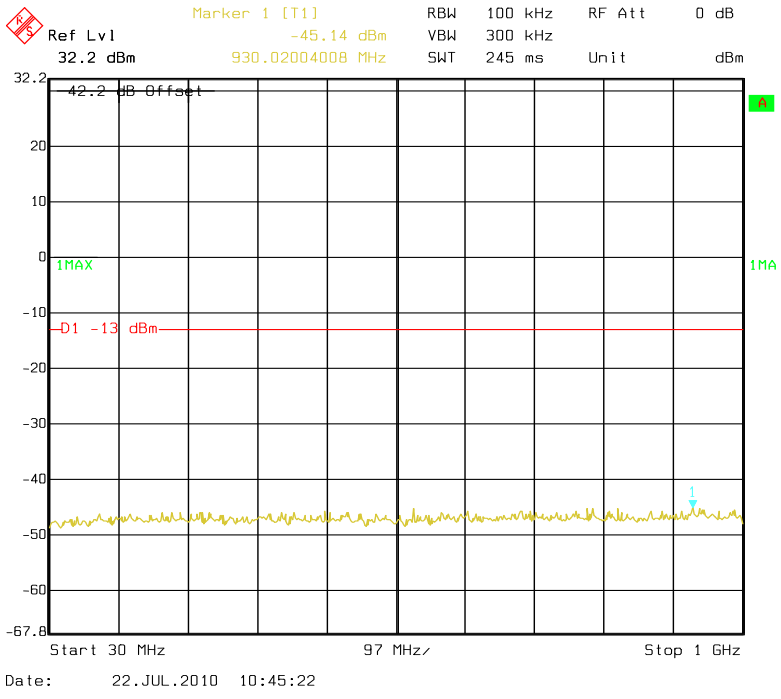
The testing was performed by Cookies Bu on 2010-06-22.

Please refer to the following plots.

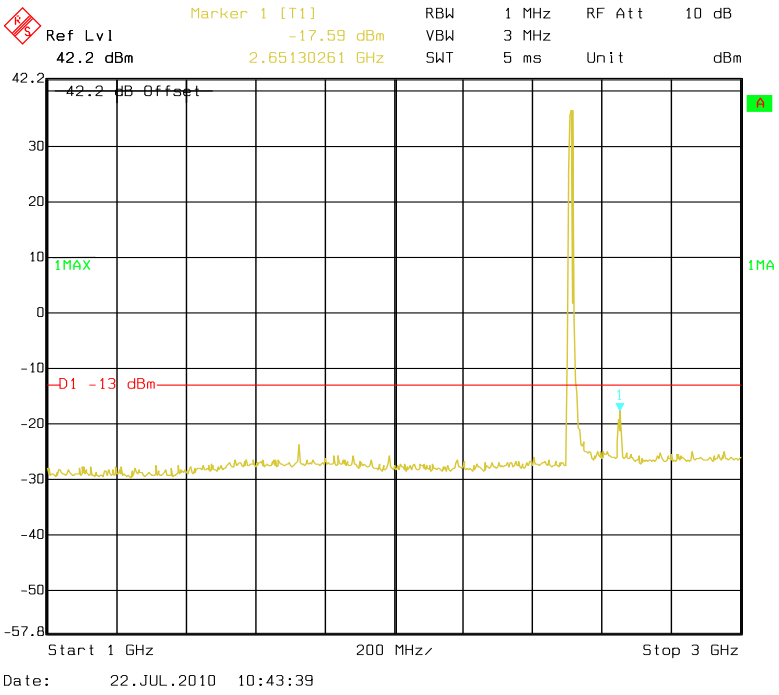
For 5 MHz Bandwidth (worst case)

Single port:

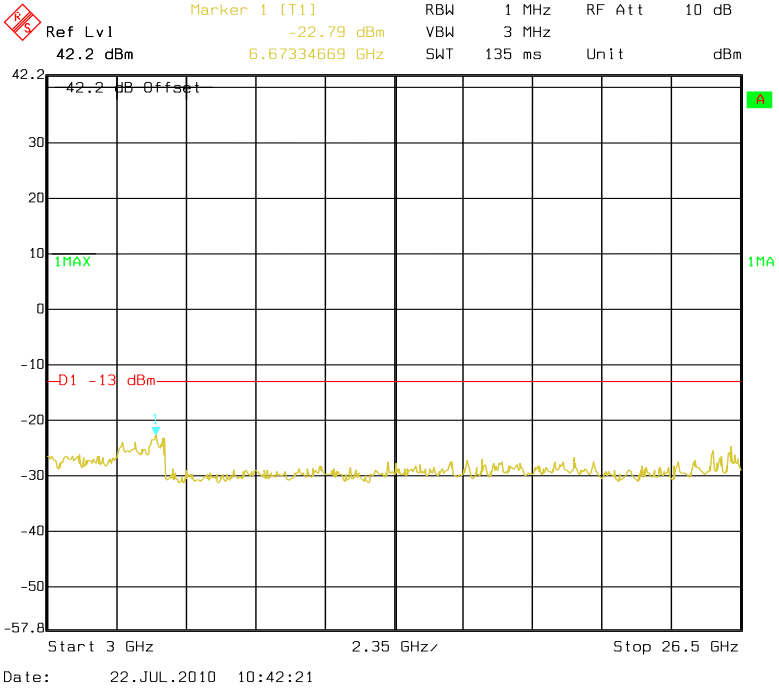
30-1000 MHz



1-3 GHz

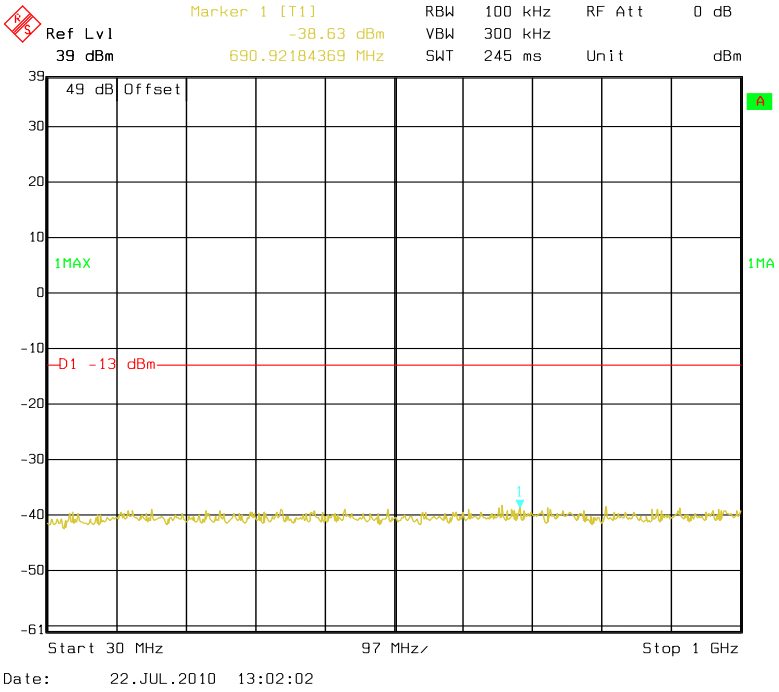


3-26.5 GHz

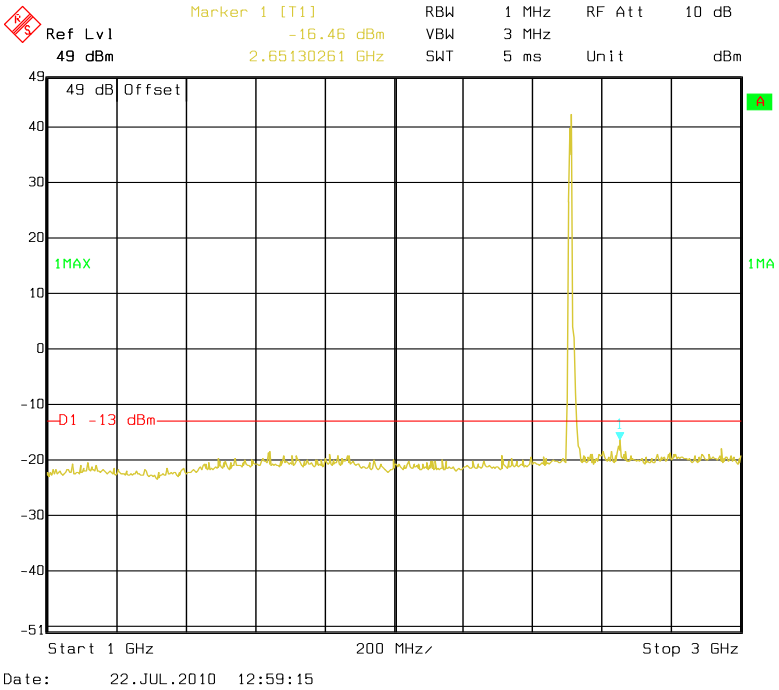


With Combiner:

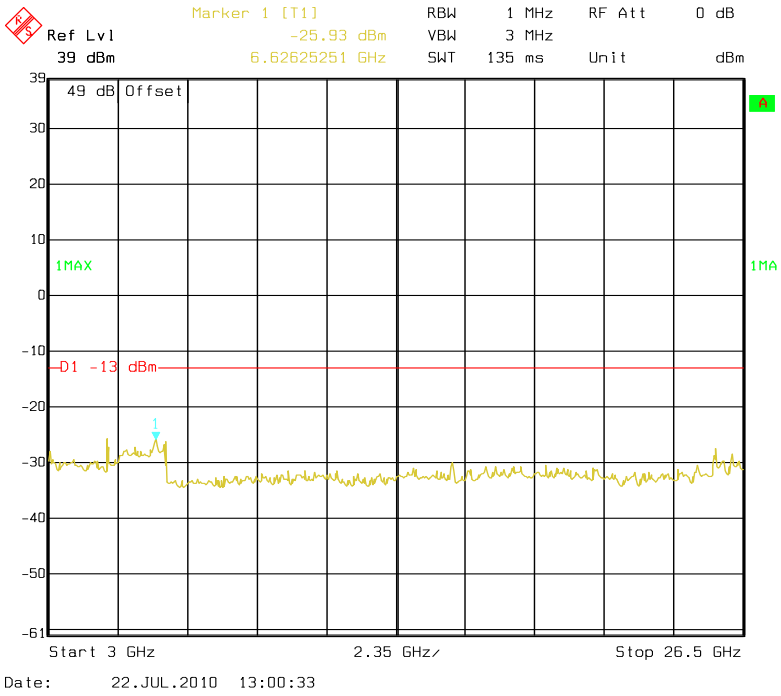
30-1000 MHz



1-3 GHz



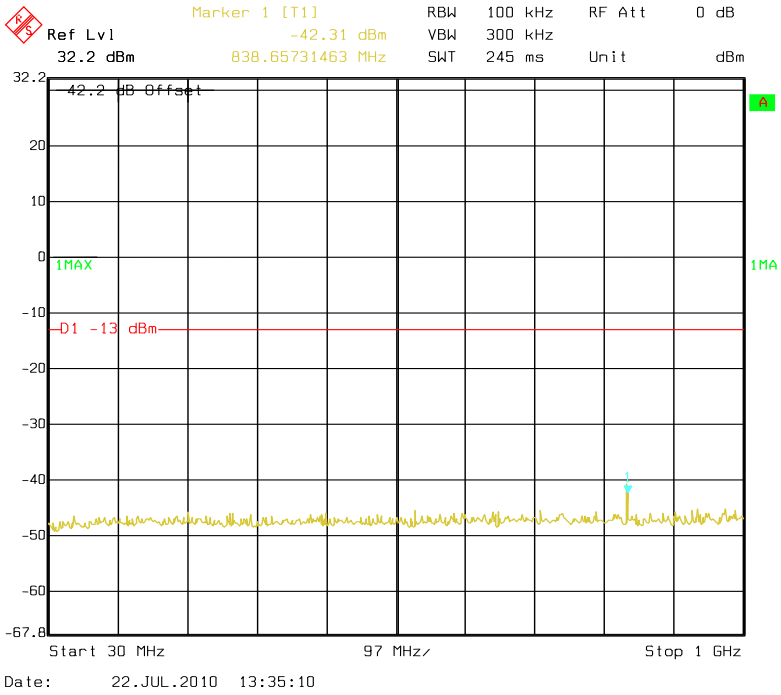
3-26.5 GHz



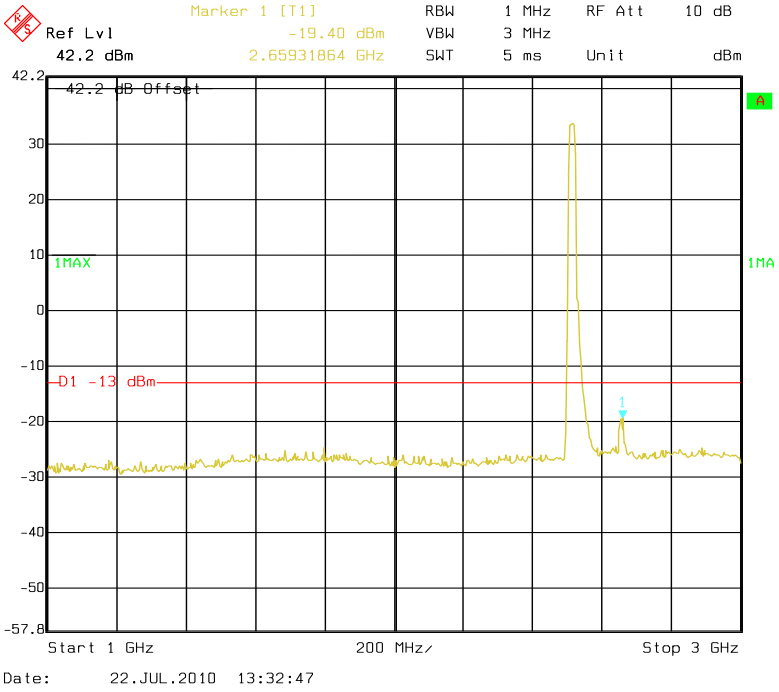
For 10 MHz Bandwidth

Single port:

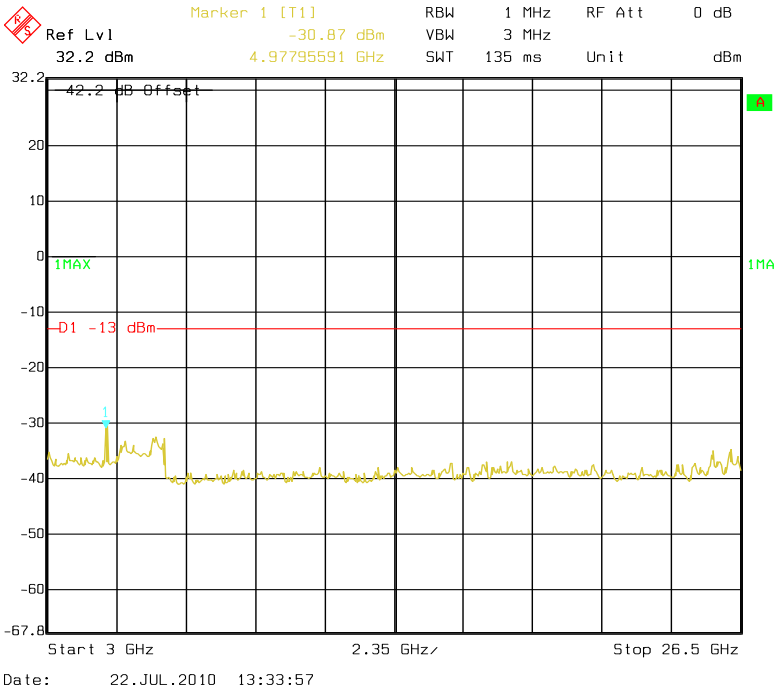
30-1000 MHz



1-3 GHz

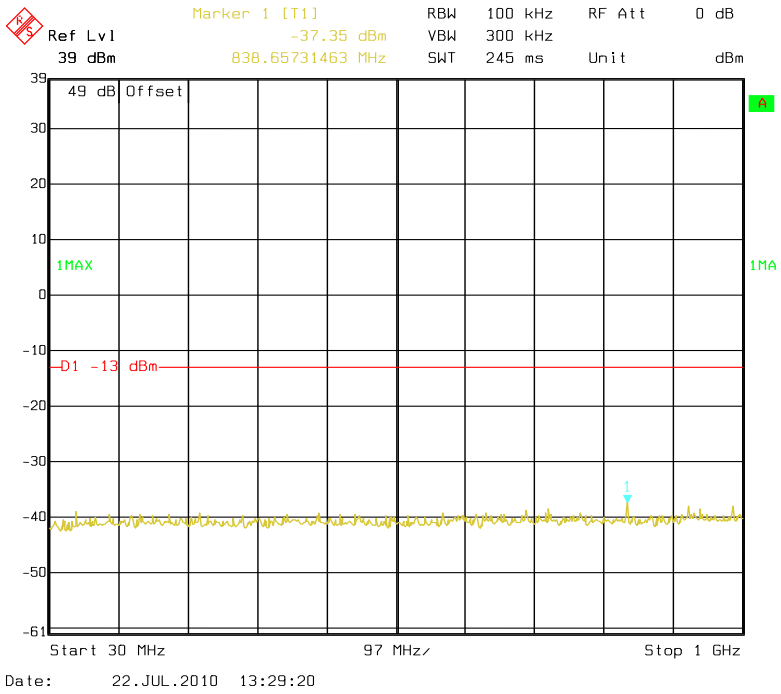


3-26.5 GHz

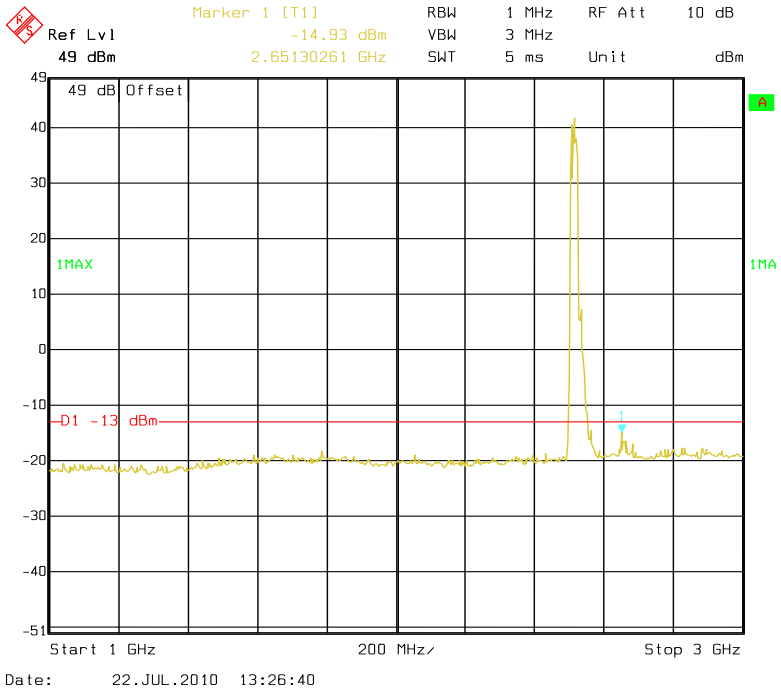


With Combiner:

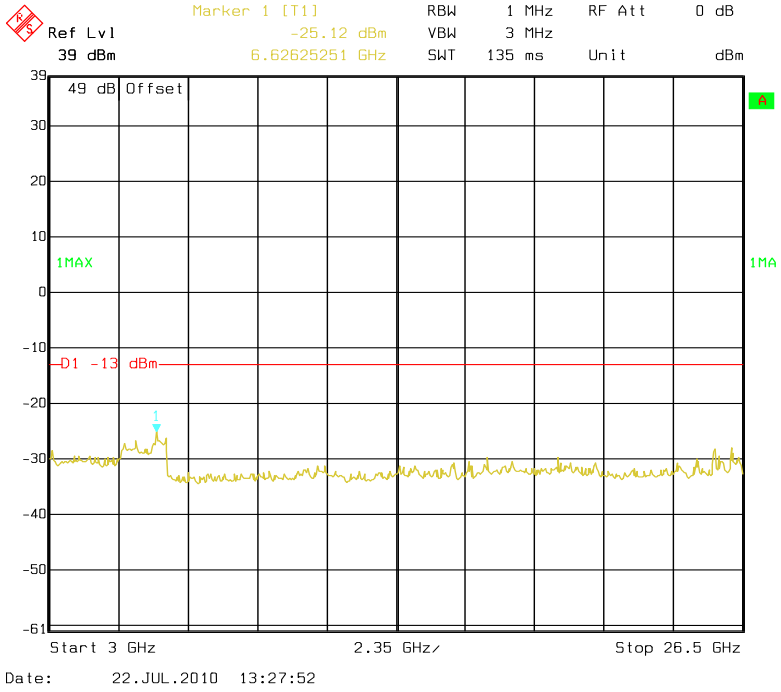
30-1000 MHz



1-3 GHz



3-26.5 GHz


Marker 1 [T1]
Ref Lvl
39 dBm
-25.12 dBm
6.62625251 GHz
RBW 1 MHz
VBW 3 MHz
SWT 135 ms
RF Att 0 dB
Unit dBm
49 dB Offset
1MAX
1MA
D1 -13 dBm
Start 3 GHz
2.35 GHz/
Stop 26.5 GHz
Date: 22.JUL.2010 13:27:52

FCC §2.1053 & §27.53(m) - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC §2.1053 & §27.53(m)

Test Procedure

The EUT system was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Amplifier Research	Biconilog Antenna	AT1080	301902	2010-03-11	2011-03-11
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-07
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27
HP	Amplifier	HP8447D	2944A09795	2009-08-02	2010-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2009-11-07	2010-11-06
COM POWER	Dipole Antenna	AD-100	041000	2009-09-25	2010-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2010-05-17	2011-05-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Cookies Bu on 2010-06-22.

Test Mode: Transmitting (worse case)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
5 MHz Bandwidth (Worse Case)											
1703.40	51.71	172	1.2	H	1703.40	-44.9	6.2	1.18	-39.88	-13	26.88
1701.40	50.33	174	1.1	V	1701.40	-45.1	6.2	1.18	-40.08	-13	27.08
1711.42	49.41	272	1.0	V	1711.42	-45.2	6.2	1.19	-40.19	-13	27.19
1721.44	50.58	357	1.0	H	1721.44	-45.8	6.2	1.19	-40.79	-13	27.79
5017.00	45.92	158	1.4	H	5017.00	-49.6	7.9	2.48	-44.18	-13	31.18
672.14	50.17	145	1.4	H	672.14	-47.2	0	0.74	-47.94	-13	34.94
5017.00	39.12	72	1.0	V	5017.00	-53.5	7.9	2.48	-48.08	-13	35.08
212.36	44.84	281	1.5	H	212.36	-54.8	0	0.55	-55.35	-13	42.35
560.10	43.12	312	1.2	V	560.10	-54.8	0	0.65	-55.45	-13	42.45
212.36	35.12	185	1.1	V	212.36	-59.8	0	0.55	-60.35	-13	47.35
10 MHz Bandwidth (Worse Case)											
1721.44	51.11	175	1.0	V	1721.44	-46.3	6.2	1.20	-41.30	-13	28.30
1865.73	47.61	360	1.2	H	1865.73	-47.9	6.2	1.28	-42.98	-13	29.98
5027.00	45.31	324	1.6	H	5027.00	-50.2	7.9	2.48	-44.78	-13	31.78
1883.76	42.99	89	1.1	V	1883.76	-51.5	6.1	1.28	-46.68	-13	33.68
5027.00	39.14	56	1.0	V	5027.00	-53.3	7.9	2.48	-47.88	-13	34.88
672.14	47.92	175	1.0	H	672.14	-49.8	0	0.74	-50.54	-13	37.54
224.60	48.38	285	1.0	H	224.60	-51.6	0	0.60	-52.20	-13	39.20
1721.44	48.43	10	1.5	H	1721.44	-57.9	6.2	1.20	-52.90	-13	39.90
102.02	36.24	145	1.1	V	102.02	-63.6	0	0.46	-64.06	-13	51.06
224.00	34.74	0	1.0	V	224.00	-64.8	0	0.60	-65.40	-13	52.40

FCC §27.53(m) - BAND EDGES

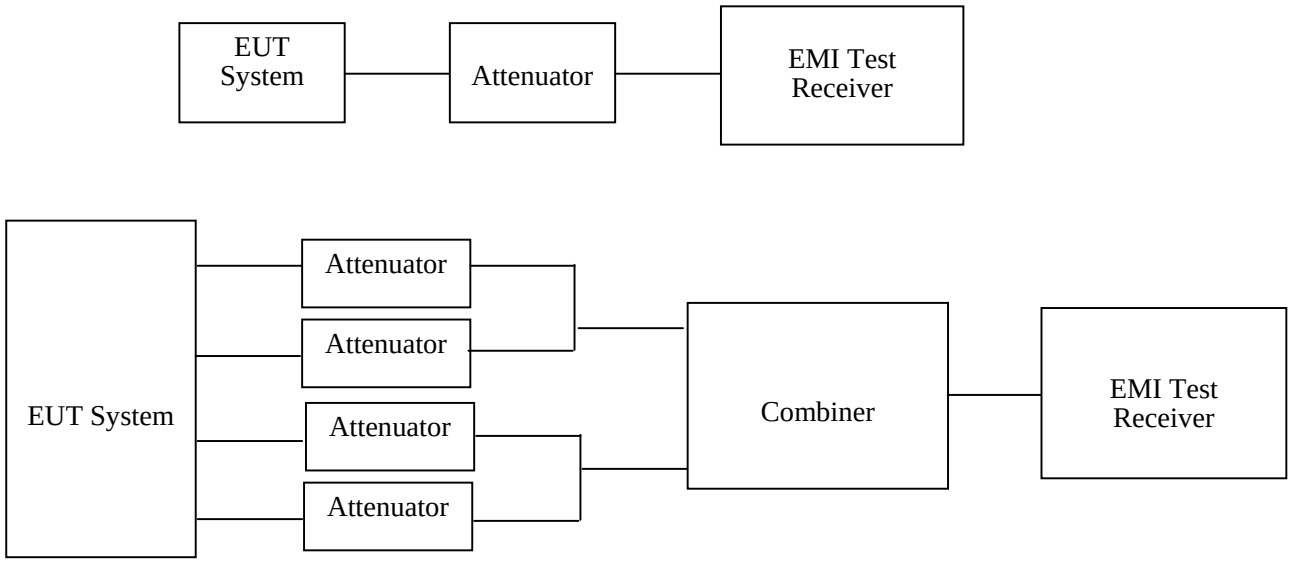
Applicable Standards

According to FCC §27.53(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

Test Procedure

The RF output of the EUT system was connected to the input of the EMI test receiver through sufficient attenuation.

The center of the EMI test receiver was set to block edge frequency, RBW set to 100 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Cookies Bu on 2010-06-23 and 2010-06-23.

Please refer to the following tables and plots.

Single Port:

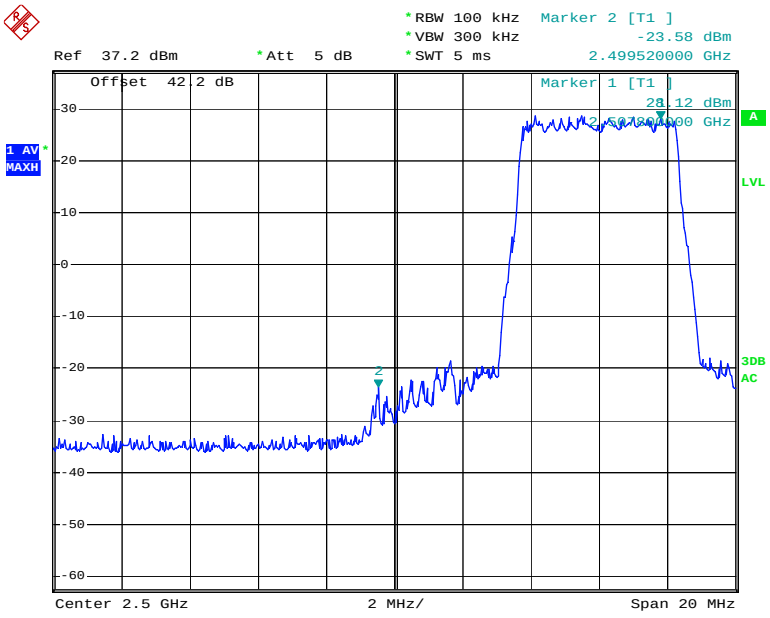
Modulation	Frequency (MHz)	Spurious Emissions (dBm)	Limit (dBm)
5 MHz/1 Carrier			
QPSK	2499.520	-23.58	-13
	2690.680	-24.78	-13
16QAM	2499.560	-25.42	-13
	2691.040	-23.71	-13
64QAM	2499.520	-24.55	-13
	2690.680	-25.49	-13
5 MHz/2 Carriers			
QPSK	2499.700	-23.20	-13
	2690.540	-24.22	-13
16QAM	2499.760	-23.81	-13
	2691.500	-24.68	-13
64QAM	2499.280	-24.24	-13
	2690.900	-23.82	-13
10 MHz/1 Carrier			
QPSK	2499.940	-25.78	-13
	2690.600	-25.74	-13
16QAM	2499.280	-29.04	-13
	2690.240	-25.77	-13
64QAM	2499.520	-28.34	-13
	2499.940	-25.78	-13
10 MHz/2 Carriers			
QPSK	2498.500	-27.25	-13
	2691.860	-26.01	-13
16QAM	2498.260	-26.05	-13
	2692.040	-26.53	-13
64QAM	2499.217	-20.45	-13
	2690.300	-25.76	-13

With Combiner

Modulation	Frequency (MHz)	Spurious Emissions (dBm)	Limit (dBm)
5 MHz/1 Carrier			
QPSK	2499.520	-20.28	-13
	2690.960	-17.36	-13
16QAM	2499.480	-20.36	-13
	2690.960	-19.24	-13
64QAM	2499.520	-20.95	-13
	2690.960	-17.80	-13
5 MHz/2 Carriers			
QPSK	2499.640	-22.52	-13
	2690.120	-13.31	-13
16QAM	2499.820	-19.78	-13
	2690.120	-13.21	-13
64QAM	2499.820	-20.94	-13
	2690.420	-13.81	-13
10 MHz/1 Carrier			
QPSK	2499.820	-15.75	-13
	2690.960	-22.95	-13
16QAM	2499.820	-15.98	-13
	2691.740	-22.47	-13
64QAM	2499.820	-17.78	-13
	2691.740	-21.27	-13
10 MHz/2 Carriers			
QPSK	2499.840	-23.42	-13
	2691.680	-19.77	-13
16QAM	2499.920	-19.22	-13
	2691.680	-20.42	-13
64QAM	2499.840	-20.45	-13
	2691.680	-19.94	-13

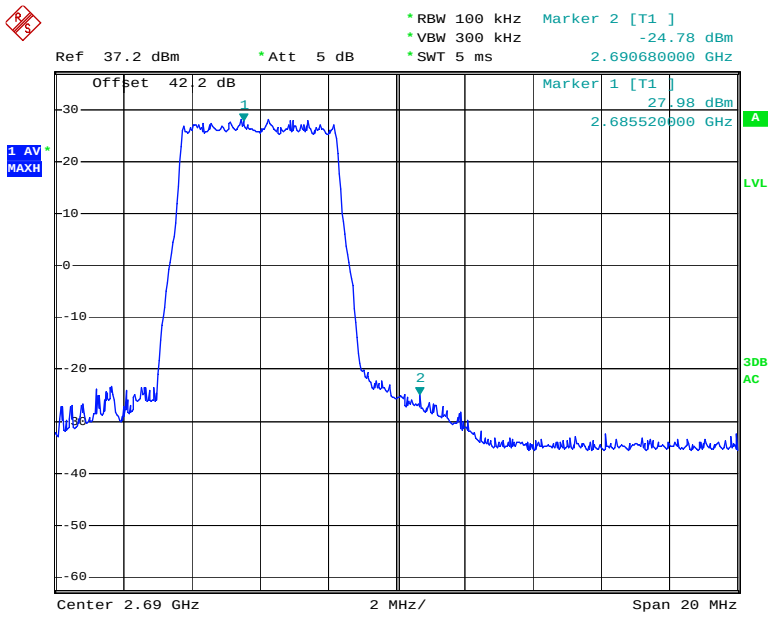
Single Port Test Plots:

5 MHz -QPSK -1 Carrier, Left



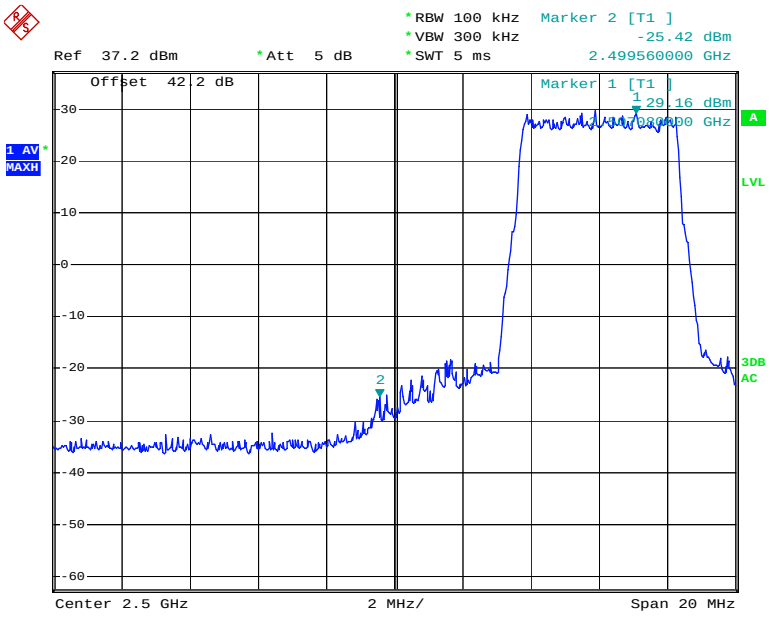
Date: 13.MAY.2010 09:40:33

5 MHz -QPSK -1 Carrier, Right



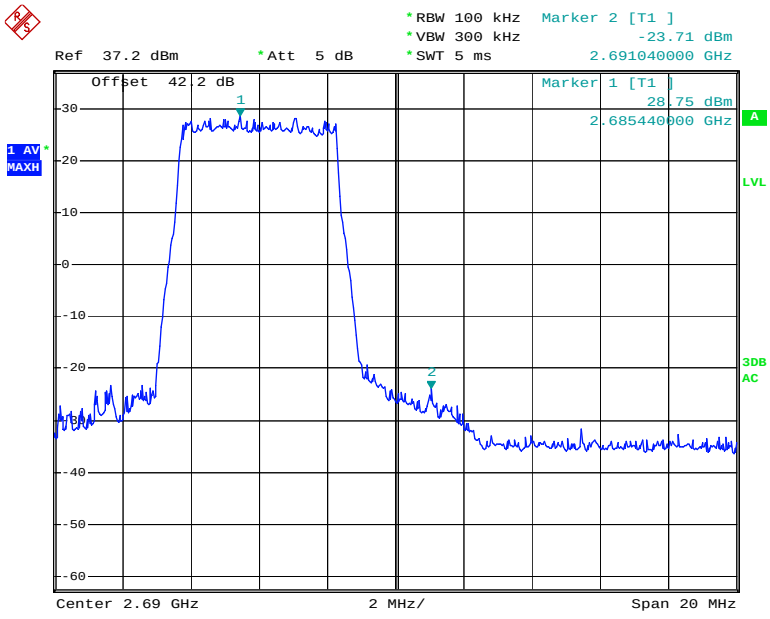
Date: 13.MAY.2010 09:24:51

5 MHz - 16QAM -1 Carrier, Left



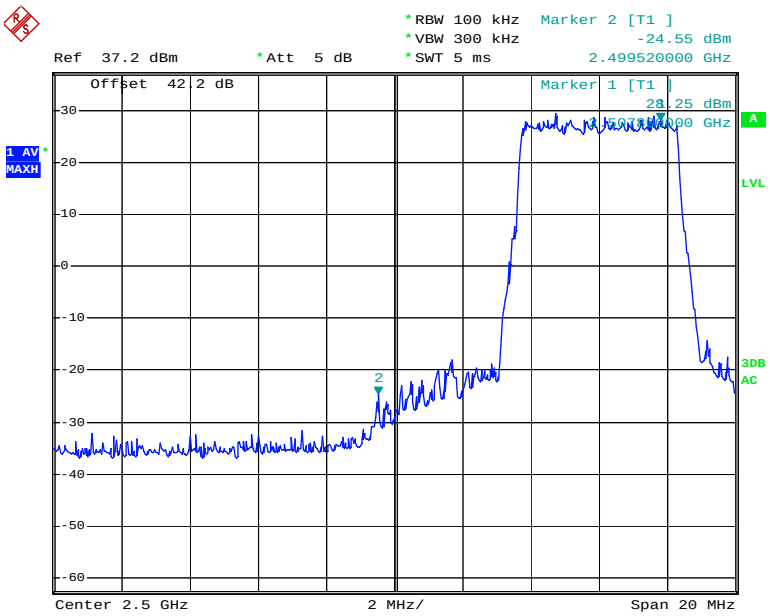
Date: 13.MAY.2010 09:38:41

5 MHz - 16QAM -1 Carrier, Right



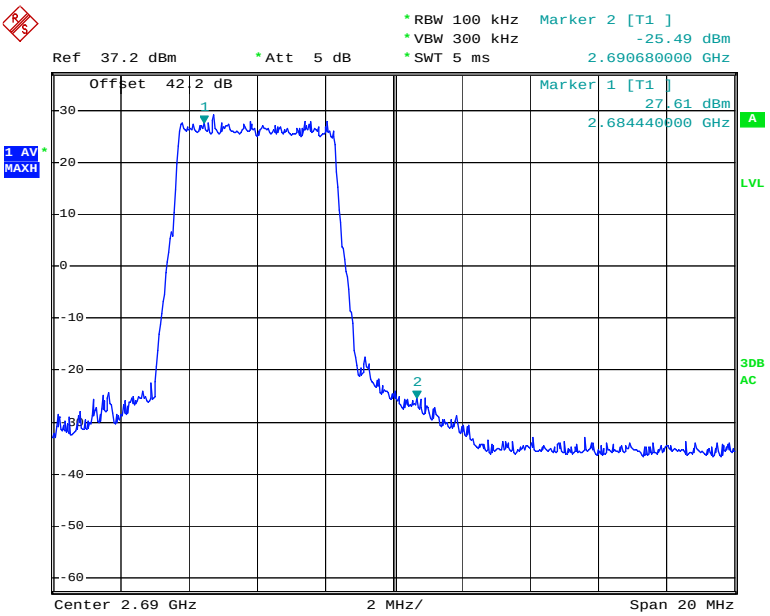
Date: 13.MAY.2010 09:25:58

5 MHz - 64QAM -1 Carrier, Left



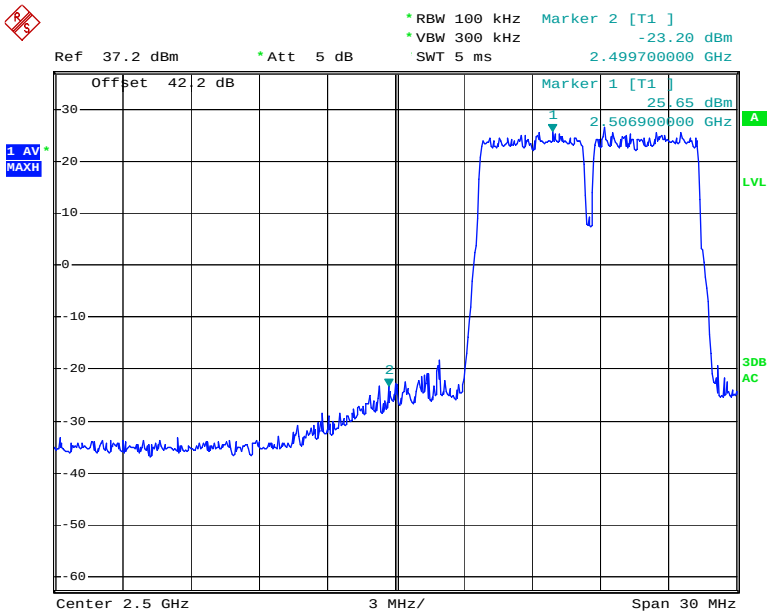
Date: 13.MAY.2010 09:39:37

5 MHz - 64QAM -1 Carrier, Right



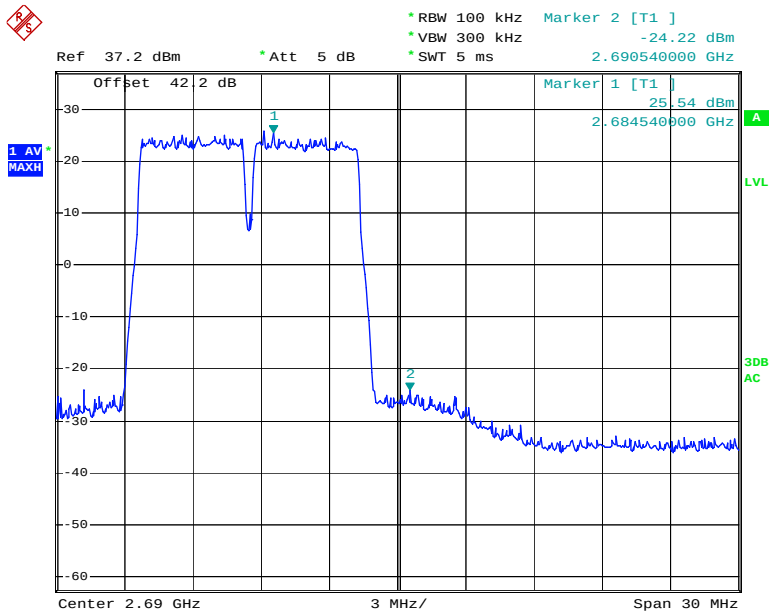
Date: 13.MAY.2010 09:26:42

5 MHz - QPSK -2 Carriers, Left



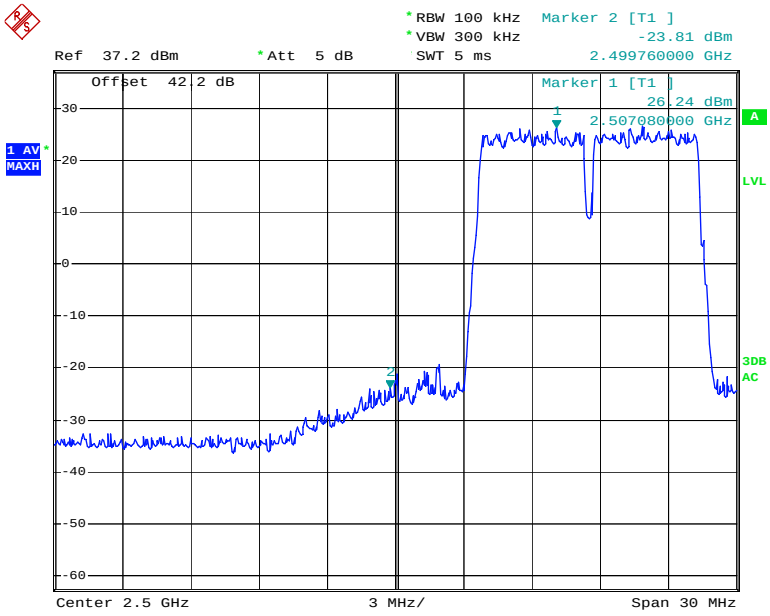
Date: 13.MAY.2010 09:49:10

5 MHz - QPSK -2 Carriers, Right



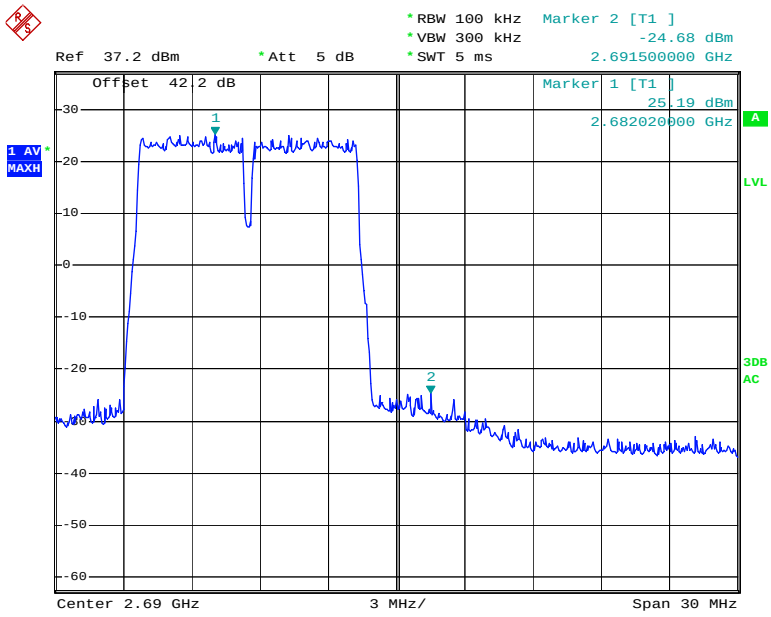
Date: 13.MAY.2010 10:01:45

5 MHz-16QAM-2 Carriers, Left



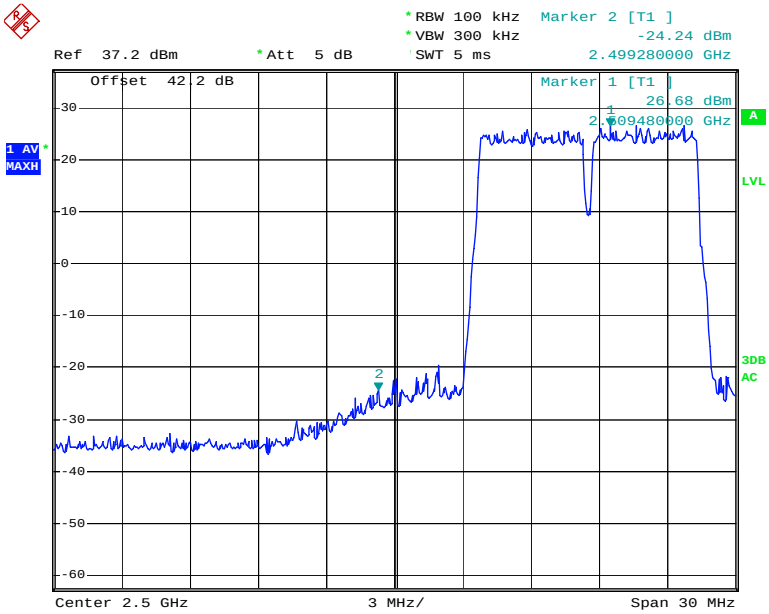
Date: 13.MAY.2010 09:51:12

5 MHz-16QAM 2 Carriers, Right



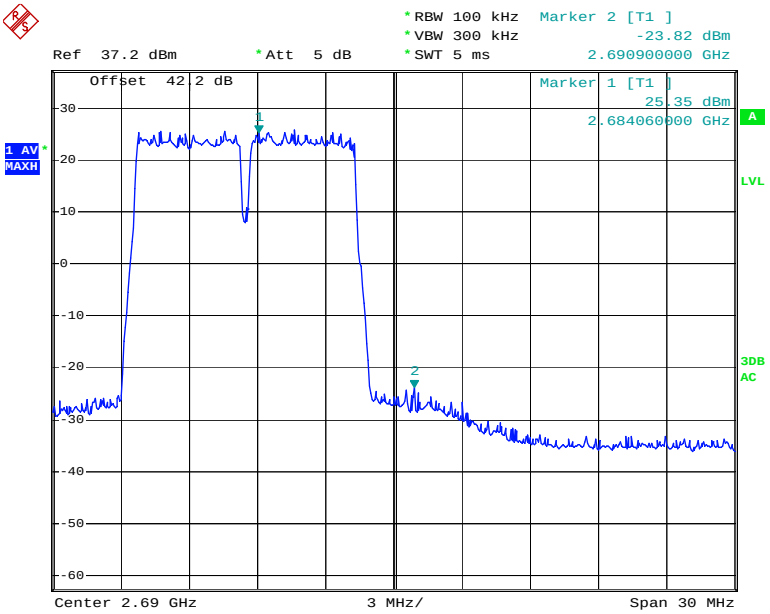
Date: 13.MAY.2010 10:00:27

5 MHz-64QAM-2 Carriers, Left



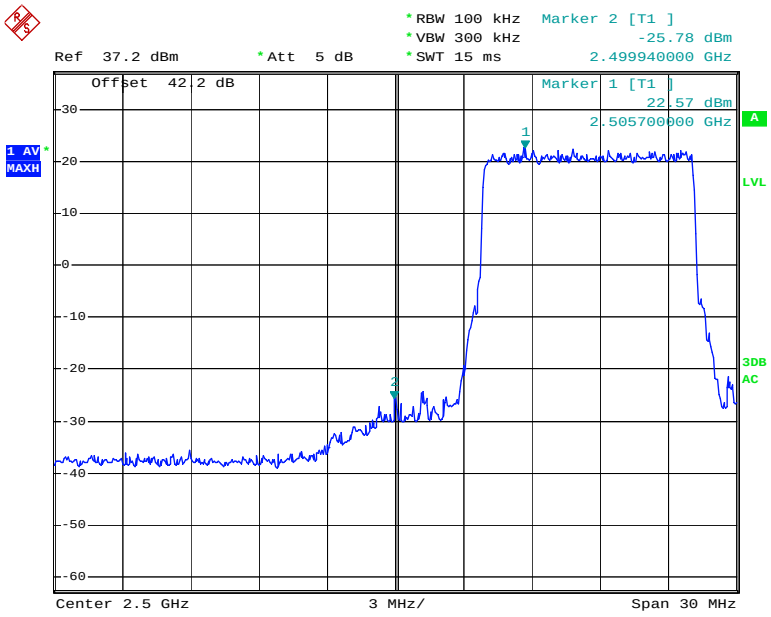
Date: 13.MAY.2010 09:52:13

5 MHz-64QAM-2 Carriers, Right



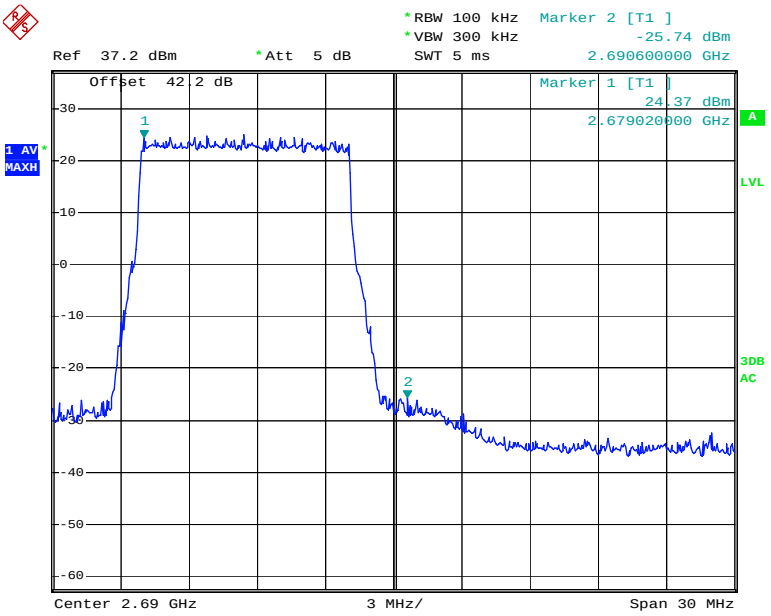
Date: 13.MAY.2010 09:59:32

10 MHz-QPSK-1 Carrier, Left



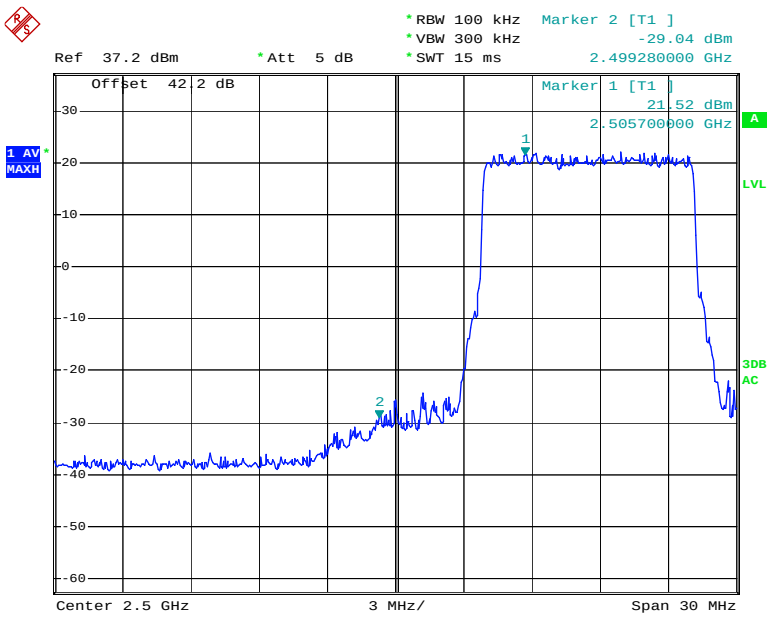
Date: 13.MAY.2010 10:33:43

10 MHz-QPSK-1 Carrier, Right



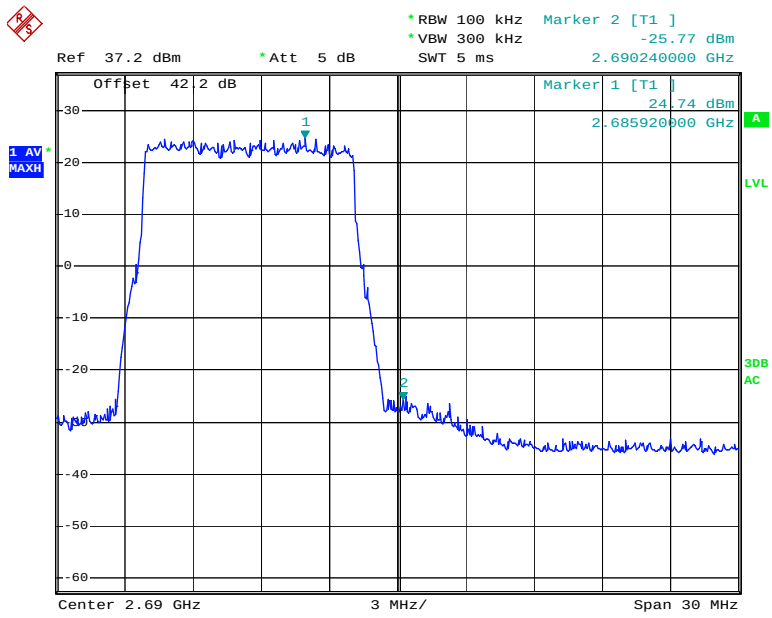
Date: 13.MAY.2010 10:43:36

10 MHz-16QAM-1 Carrier, Left



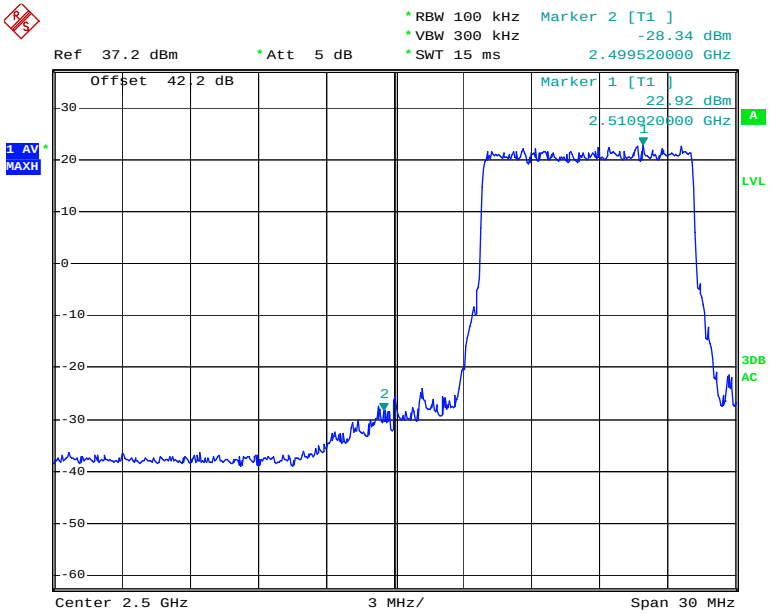
Date: 13.MAY.2010 10:34:34

10 MHz-16QAM-1 Carrier, Right



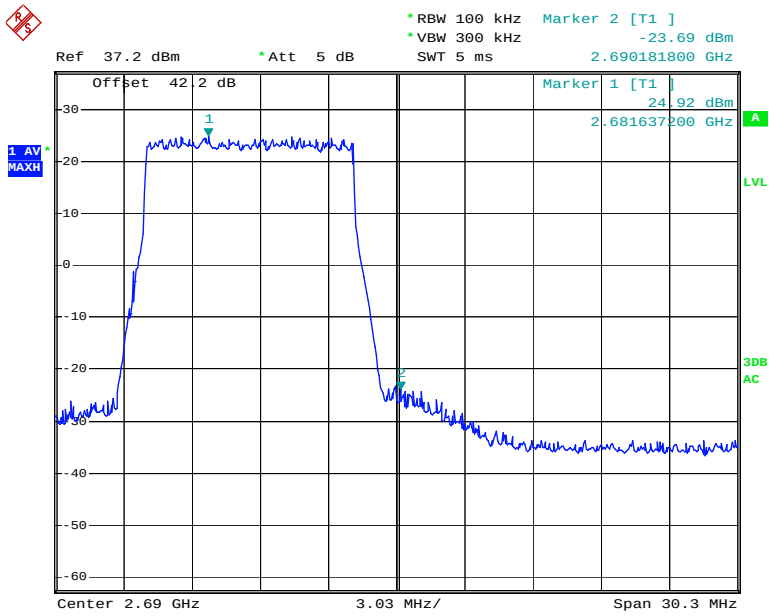
Date: 13.MAY.2010 10:44:51

10 MHz-64QAM-1 Carrier, Left



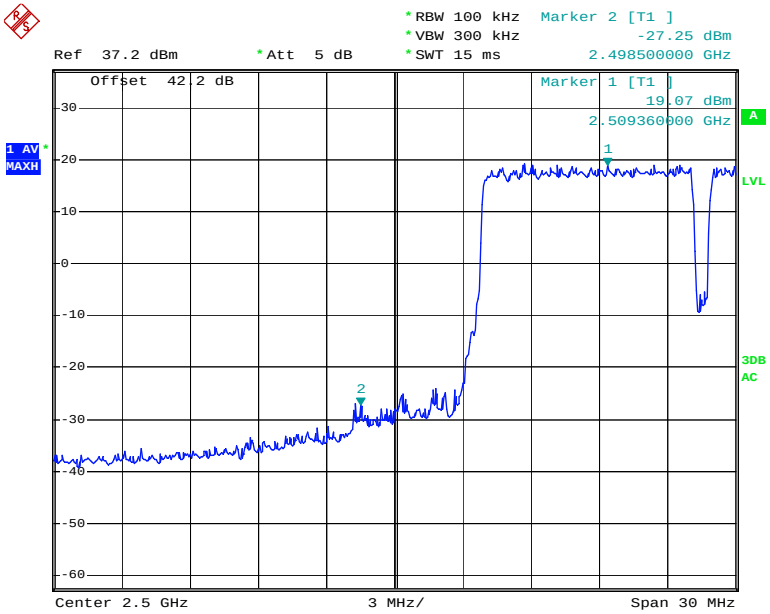
Date: 13.MAY.2010 10:35:56

10 MHz-64QAM-1 Carrier, Right



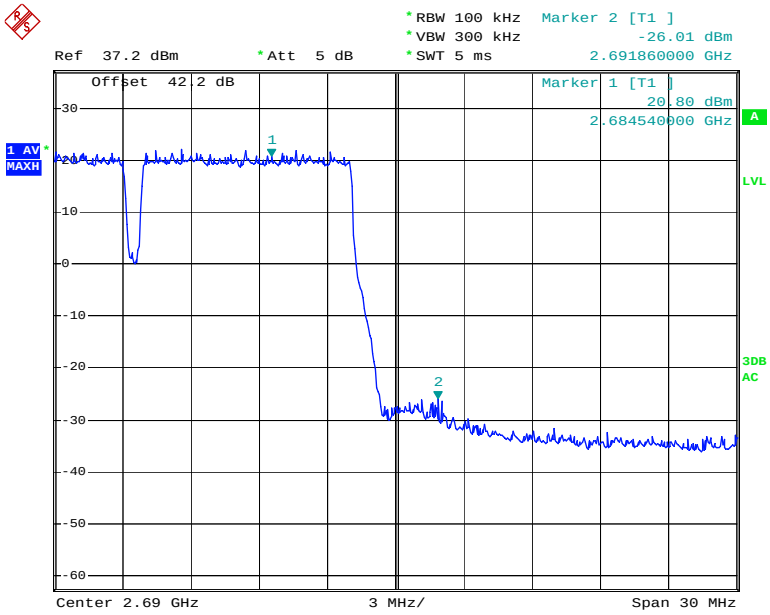
Date: 13.MAY.2010 10:46:11

10 MHz-QPSK-2 Carriers, Left



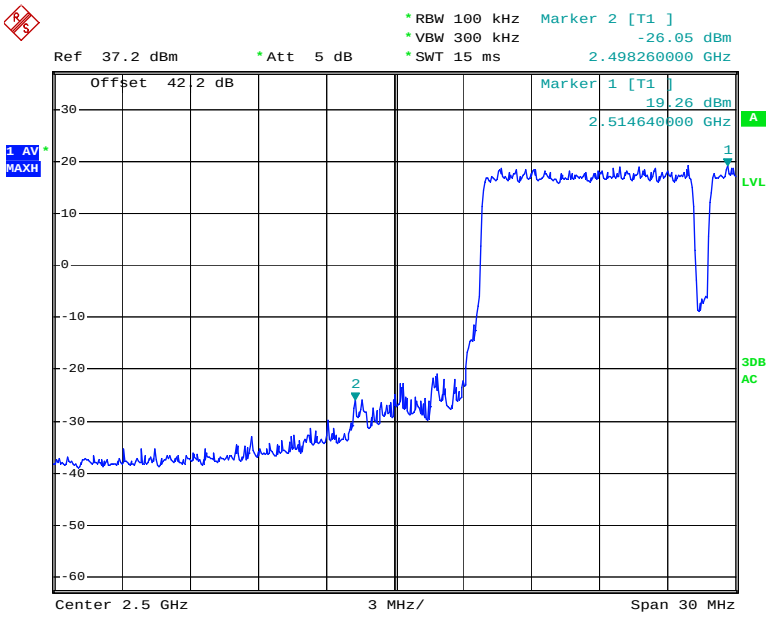
Date: 13.MAY.2010 10:24:51

10 MHz-QPSK-2 Carriers, Right



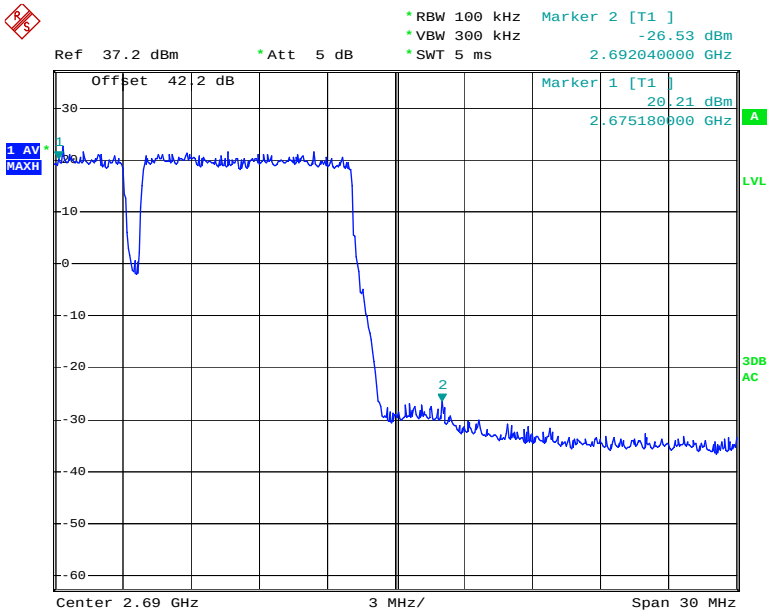
Date: 13.MAY.2010 10:14:46

10 MHz-16QAM-2 Carriers, Left



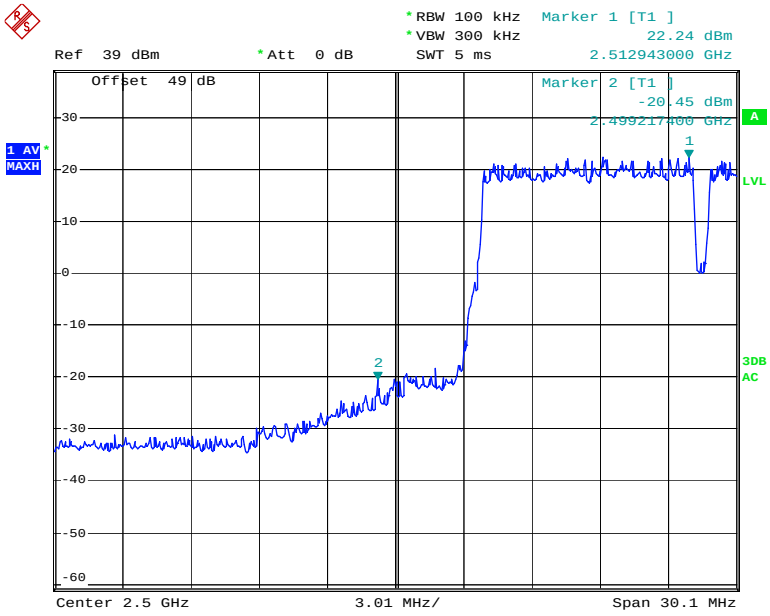
Date: 13.MAY.2010 10:25:40

10 MHz-16QAM-2 Carriers, Right



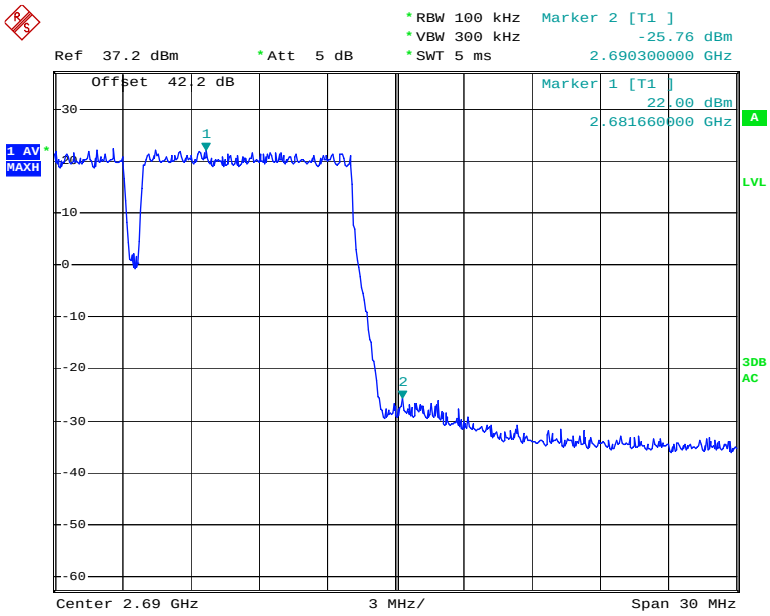
Date: 13.MAY.2010 10:15:30

10 MHz-64QAM-2 Carriers, Left



Date: 22.JUN.2010 13:48:50

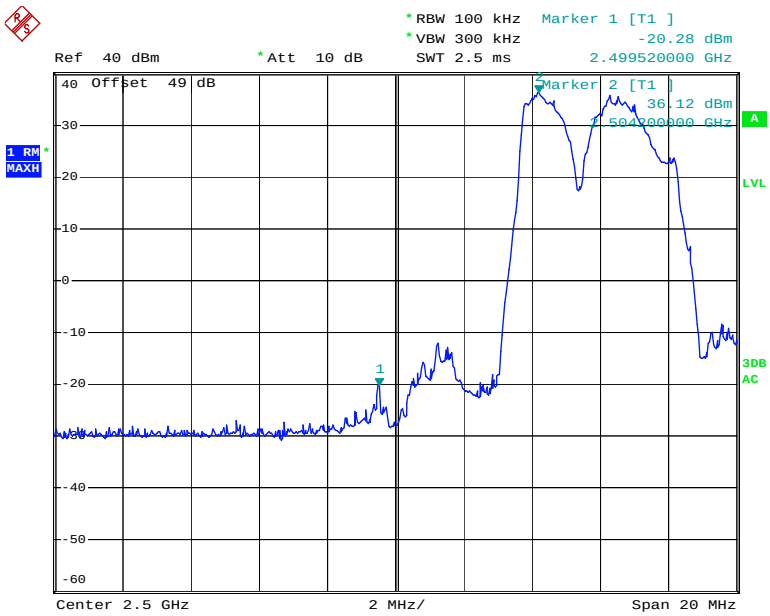
10 MHz-64QAM-2 Carriers, Right



Date: 13.MAY.2010 10:16:28

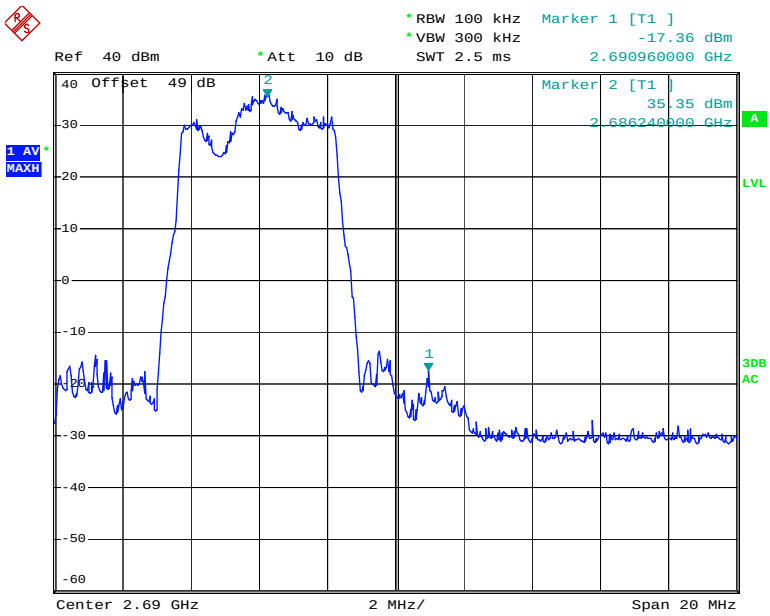
With Combiner Test Plots

5 MHz-QPSK-1 Carrier, Left



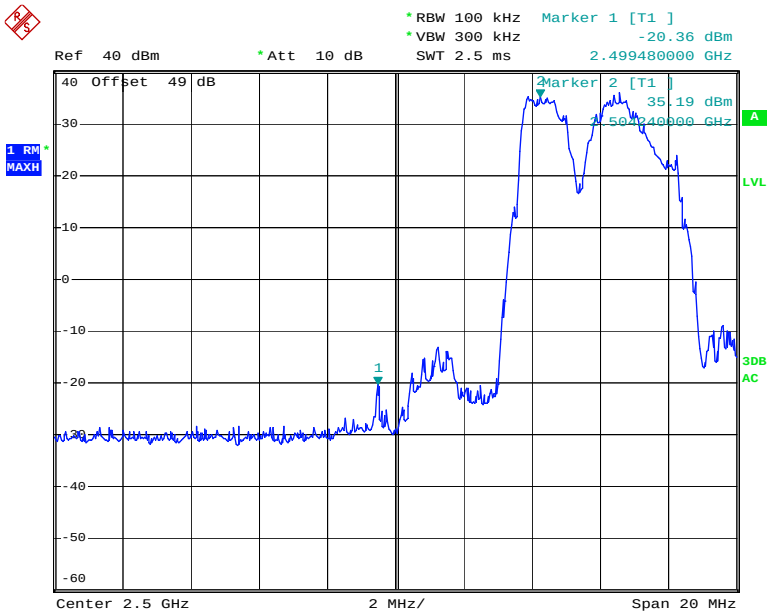
Date: 23.JUN.2010 15:27:49

5 MHz-QPSK-1 Carrier, Right



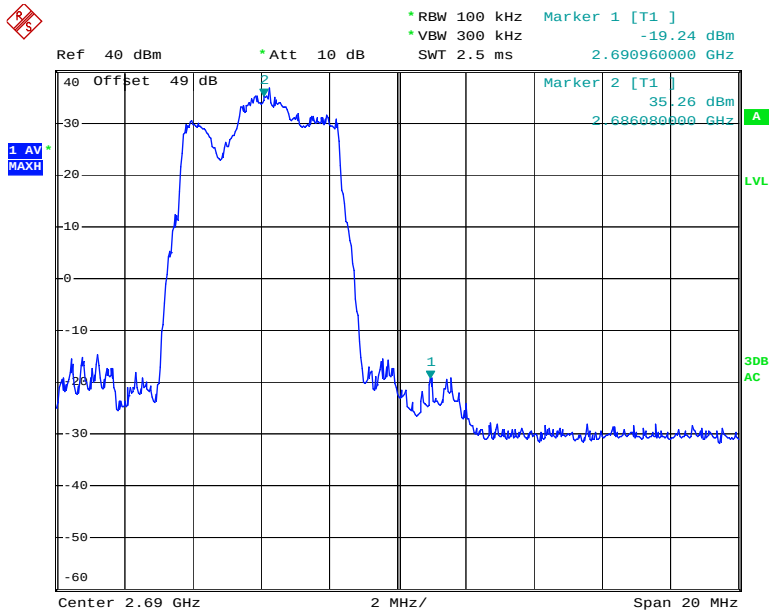
Date: 23.JUN.2010 15:38:59

5 MHz-16QAM-1 Carrier, Left



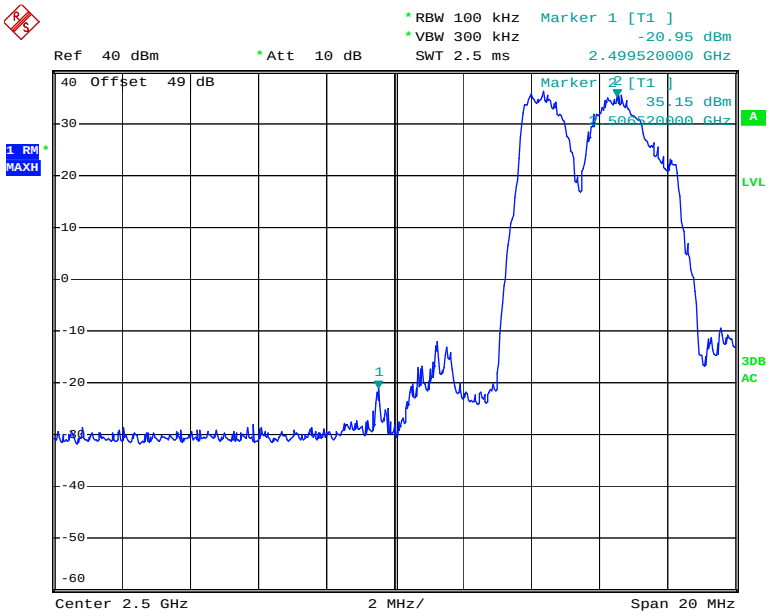
Date: 23.JUN.2010 15:28:26

5 MHz-16QAM-1 Carrier, Right



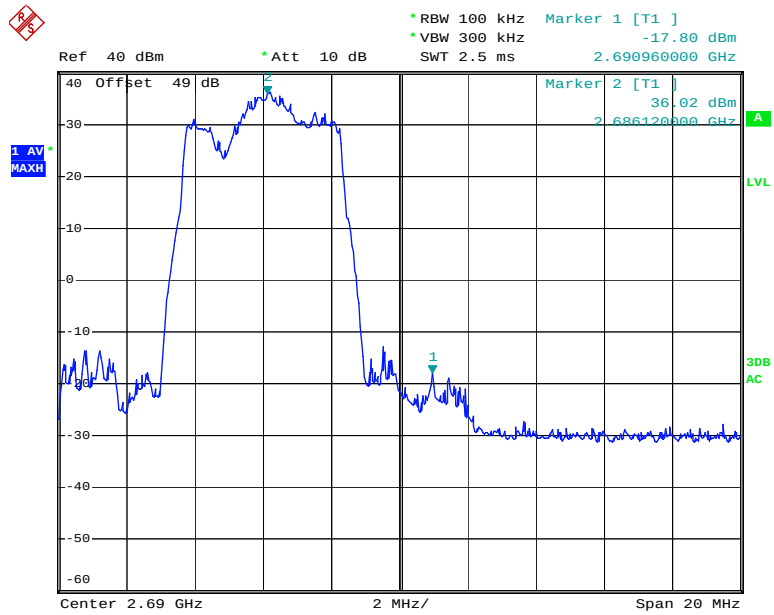
Date: 23.JUN.2010 15:38:20

5 MHz-64QAM-1 Carrier, Left



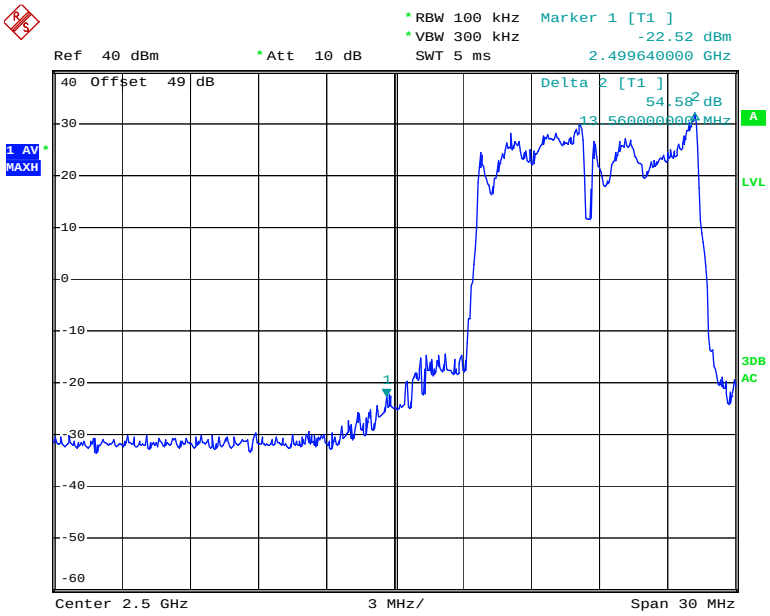
Date: 23.JUN.2010 15:28:54

5 MHz-64QAM-1 Carrier, Right



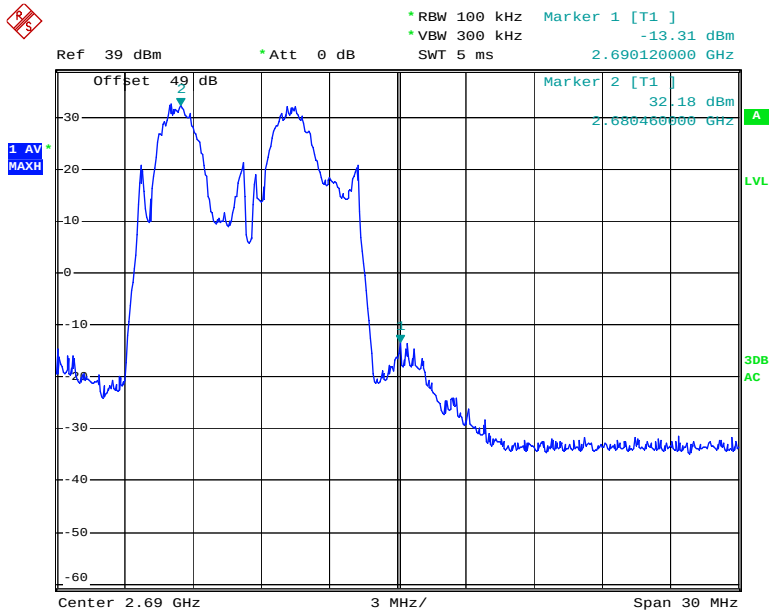
Date: 23.JUN.2010 15:37:40

5 MHz-QPSK-2 Carriers, Left



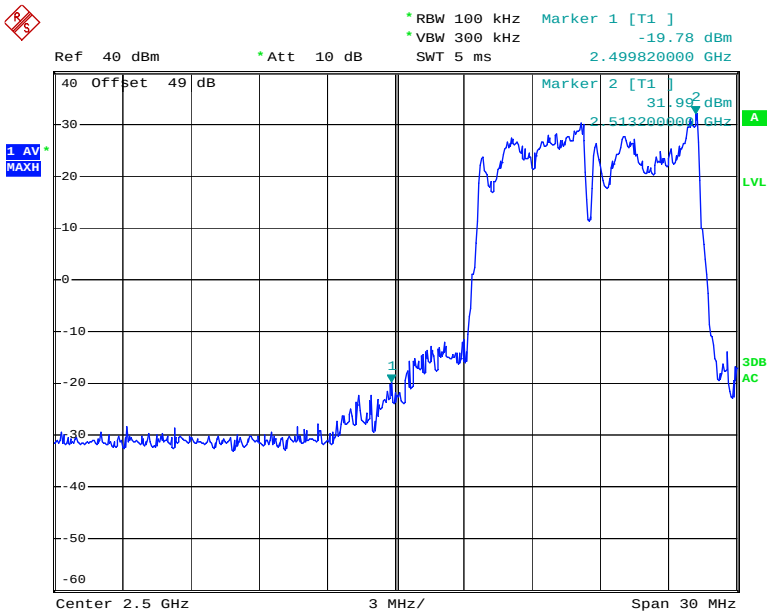
Date: 23.JUN.2010 16:50:06

5 MHz-QPSK-2 Carriers, Right



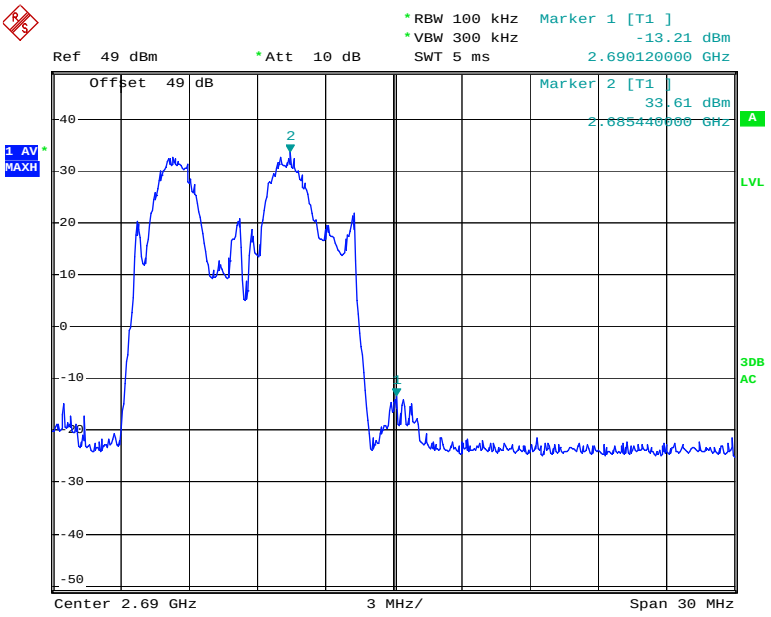
Date: 23.JUN.2010 17:34:58

5 MHz-16QAM-2 Carriers, Left



Date: 23.JUN.2010 16:51:34

5 MHz-16QAM-2 Carriers, Right



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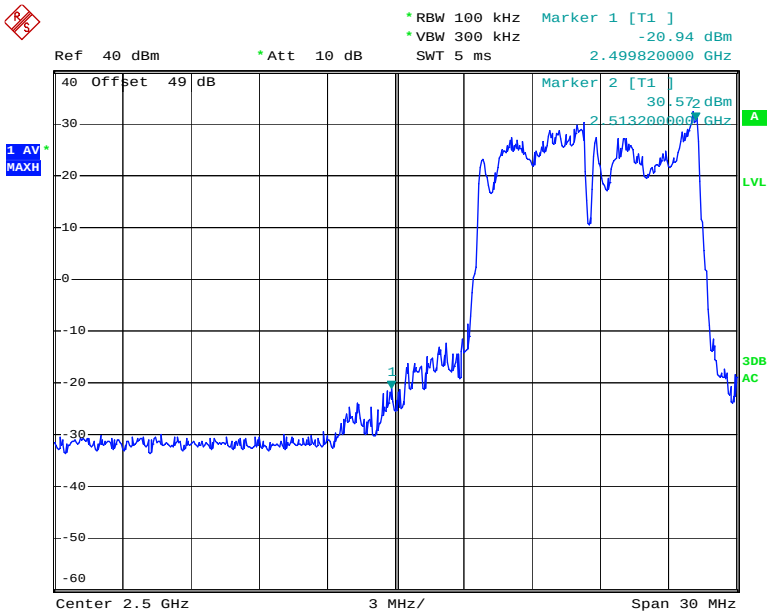
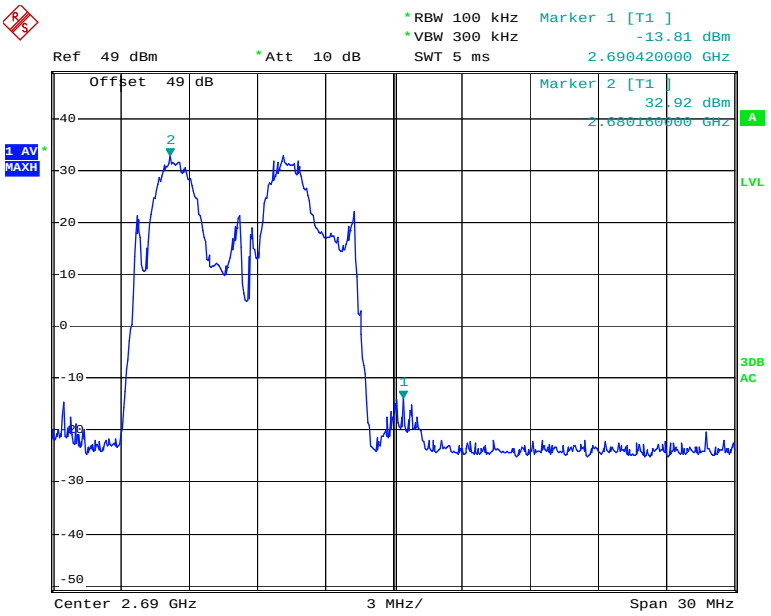
5 MHz-64QAM-2 Carriers, Left



Date: 23.JUN.2010 16:52:01

5 MHz-64QAM-2 Carriers, Right



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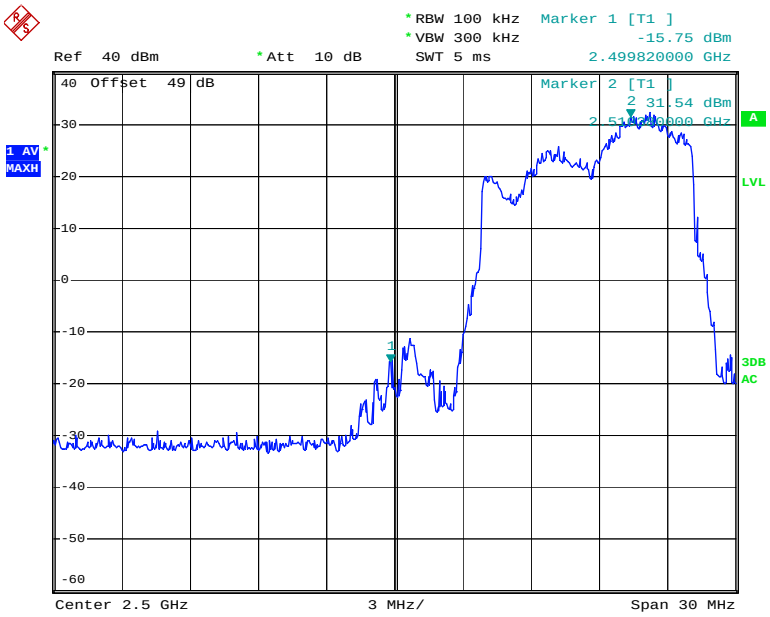
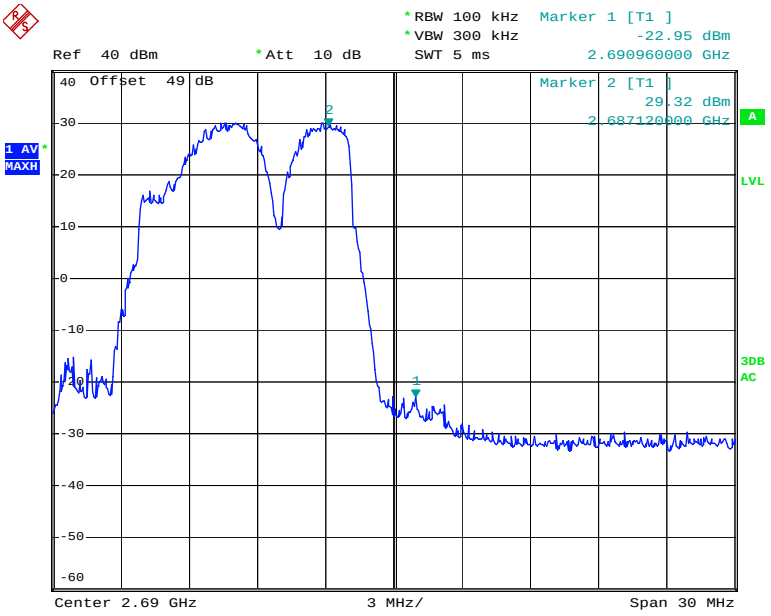
10 MHz-QPSK-1 Carrier, Left



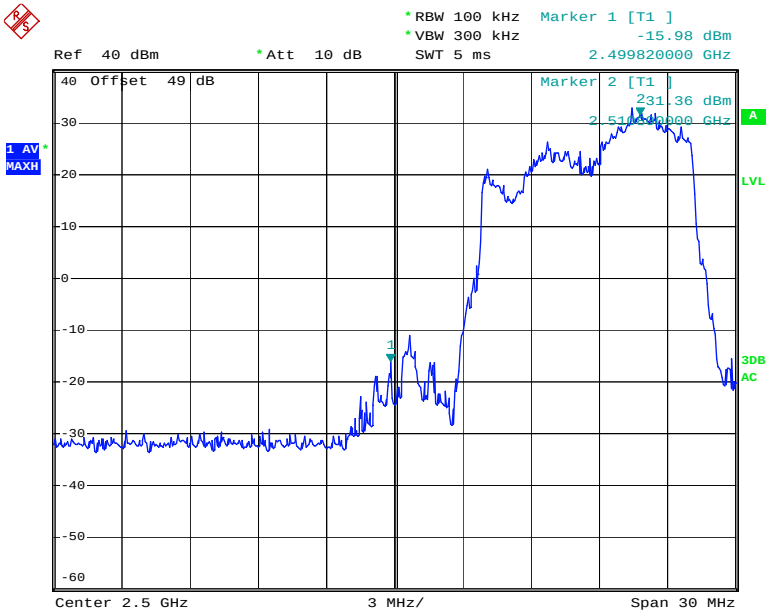
Date: 23.JUN.2010 15:58:29

10 MHz-QPSK-1 Carrier, Right



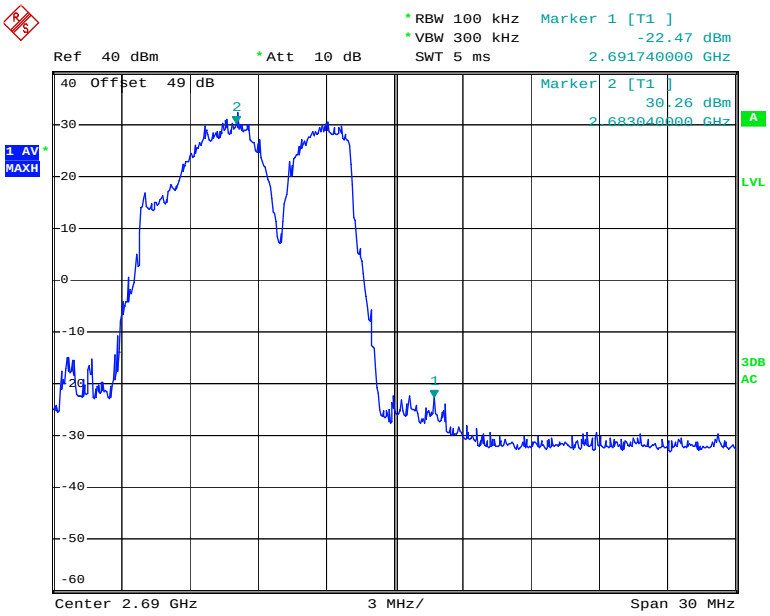
Date: 23.JUN.2010 16:08:22

10 MHz-16QAM-1 Carrier, Left



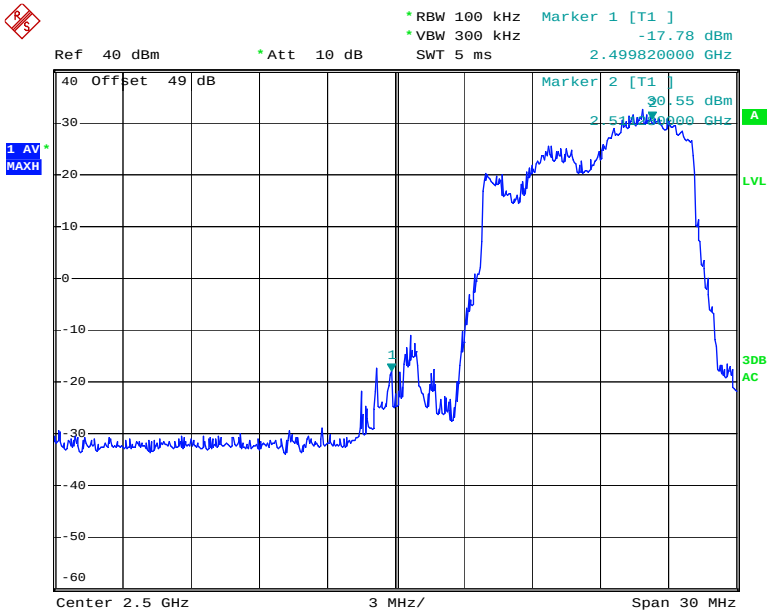
Date: 23.JUN.2010 15:59:06

10 MHz-16QAM-1 Carrier Right



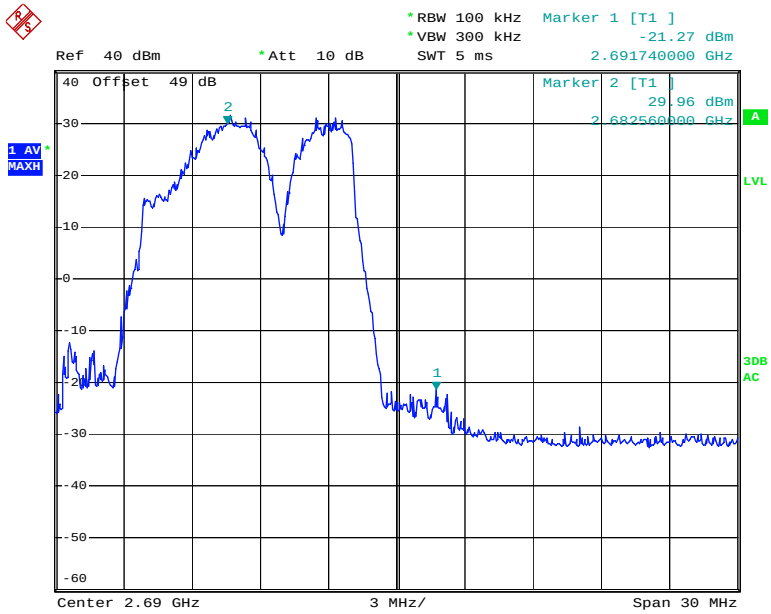
Date: 23.JUN.2010 16:07:44

10 MHz-64QAM-1 Carrier, Left



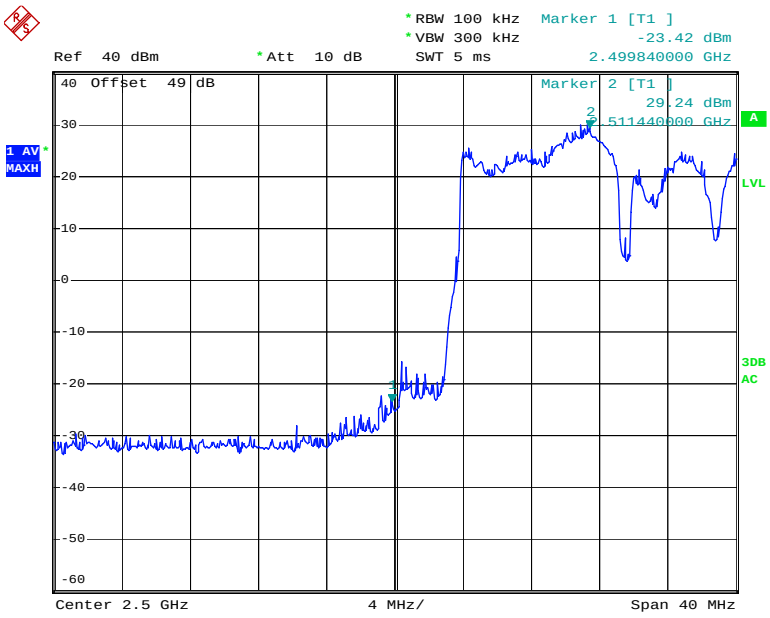
Date: 23.JUN.2010 15:59:27

10 MHz-64QAM-1 Carrier, Right



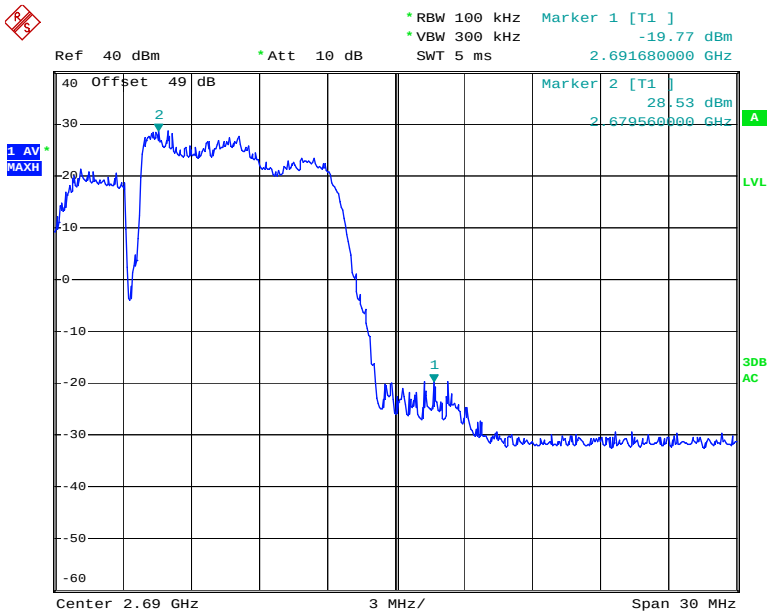
Date: 23.JUN.2010 16:07:08

10 MHz-QPSK-2 Carriers, Left



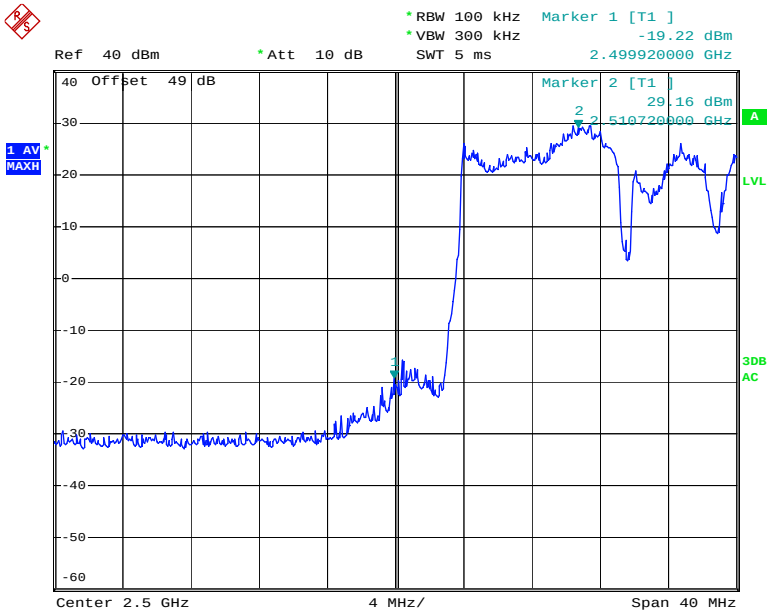
Date: 23.JUN.2010 16:33:06

10 MHz-QPSK-2 Carriers, Right



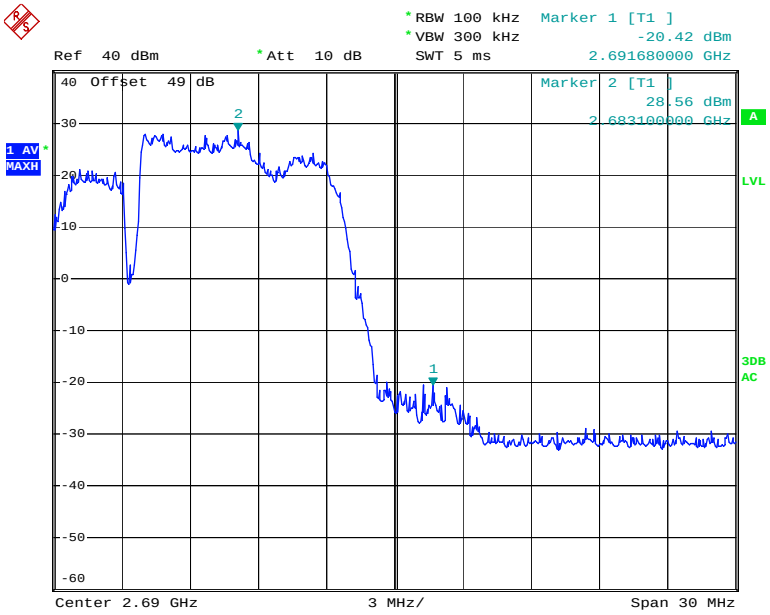
Date: 23.JUN.2010 16:19:06

10 MHz-16QAM-2 Carriers, Left



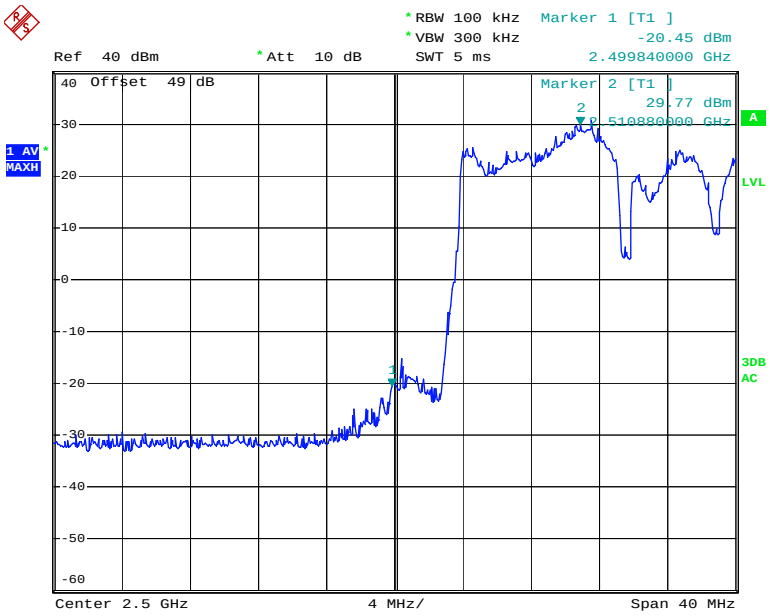
Date: 23.JUN.2010 16:32:35

10 MHz-16QAM-2 Carriers, Right



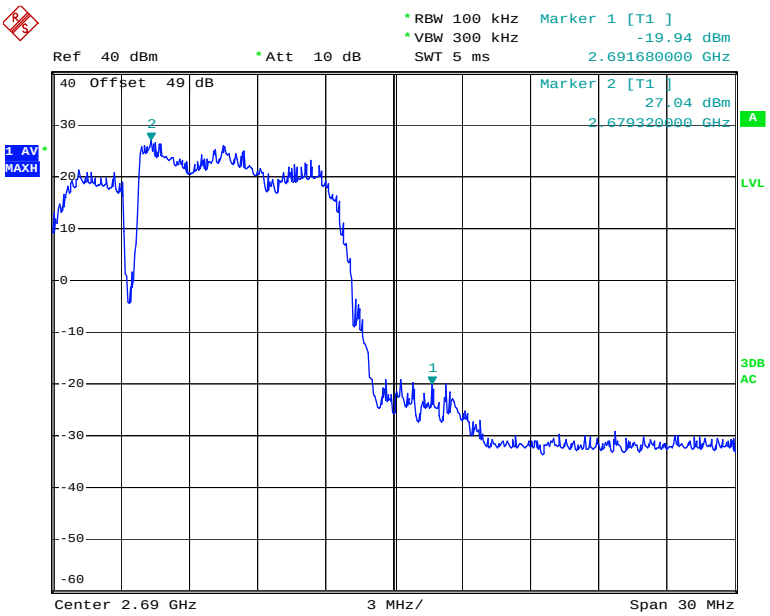
Date: 23.JUN.2010 16:19:46

10 MHz-64QAM-2 Carriers, Left



Date: 23.JUN.2010 16:31:37

10 MHz - 64QAM-2 Carriers, Right



Date: 23.JUN.2010 16:20:14

FCC §2.1055 & §27.54 - FREQUENCY STABILITY

Applicable Standard

FCC §2.1055 (a), §2.1055 (d), §27.54

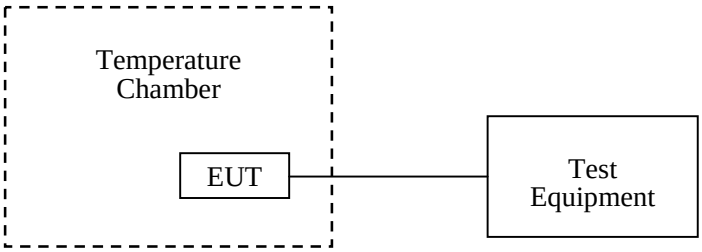
According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021115	2010-06-04	2011-06-03
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

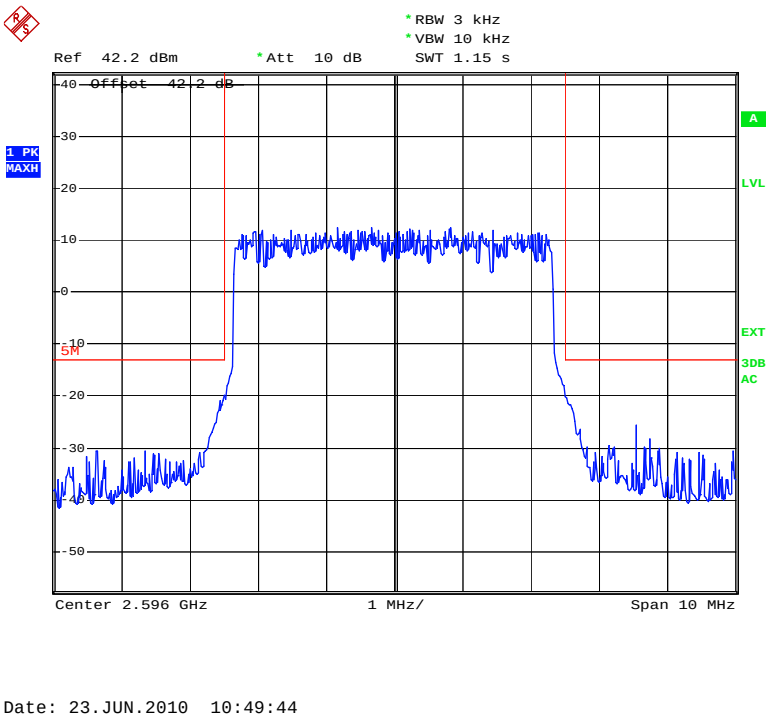
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Cookies Bu on 2010-06-23.

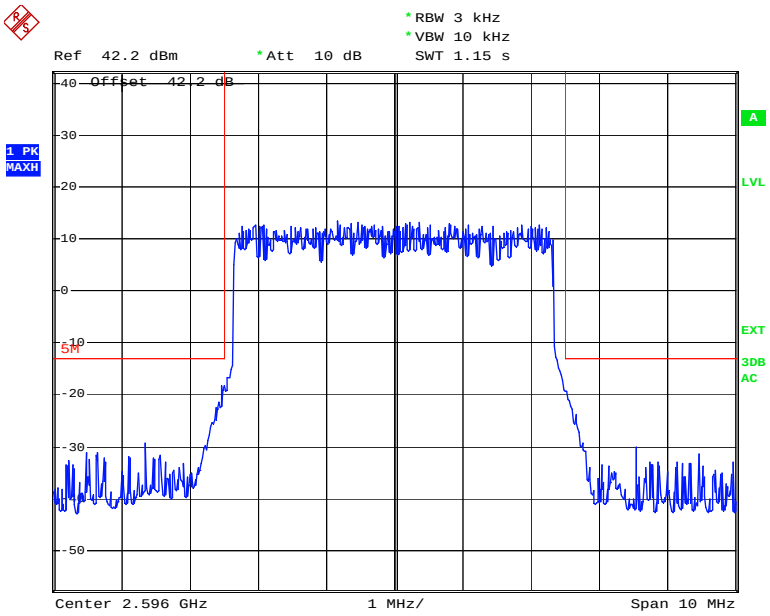
Test data please refer to the below plots

For 5 MHz bandwidth

V= -48V, T= -30℃

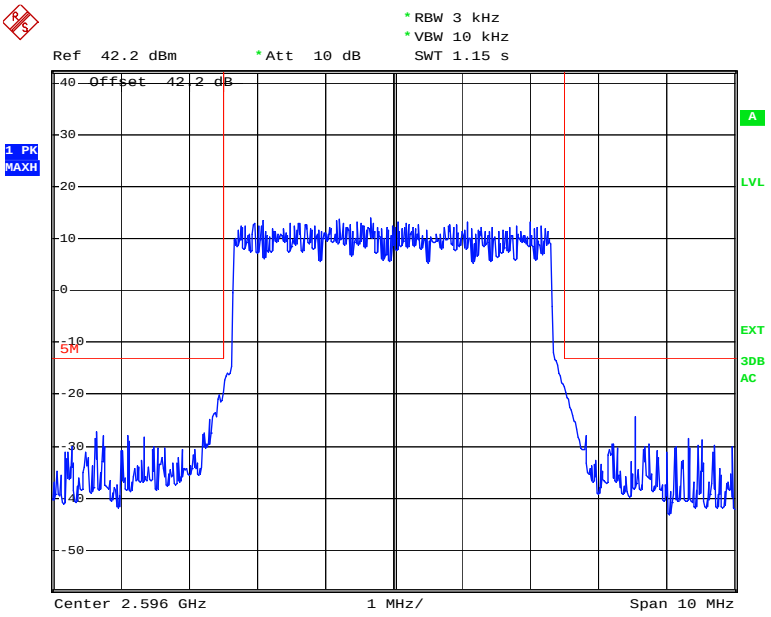


V= -48V, T= -20℃



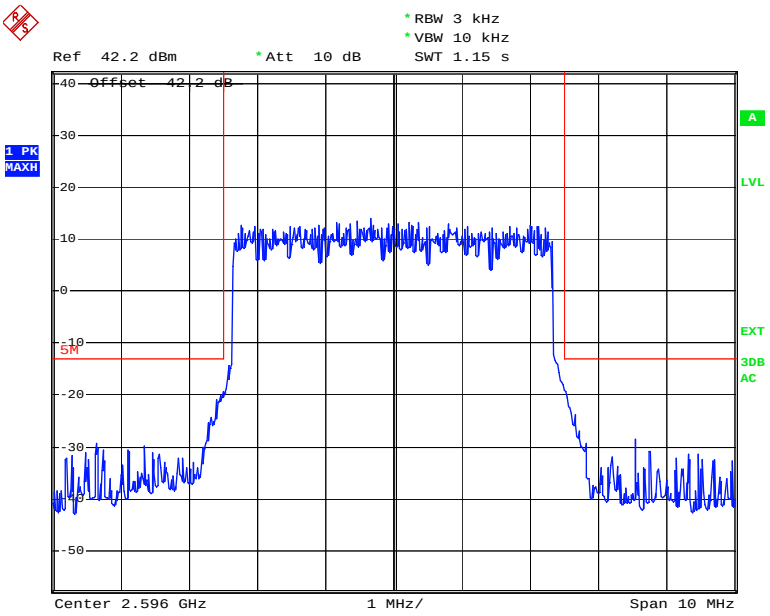
Date: 23.JUN.2010 11:10:09

V= -48V, T= -10℃



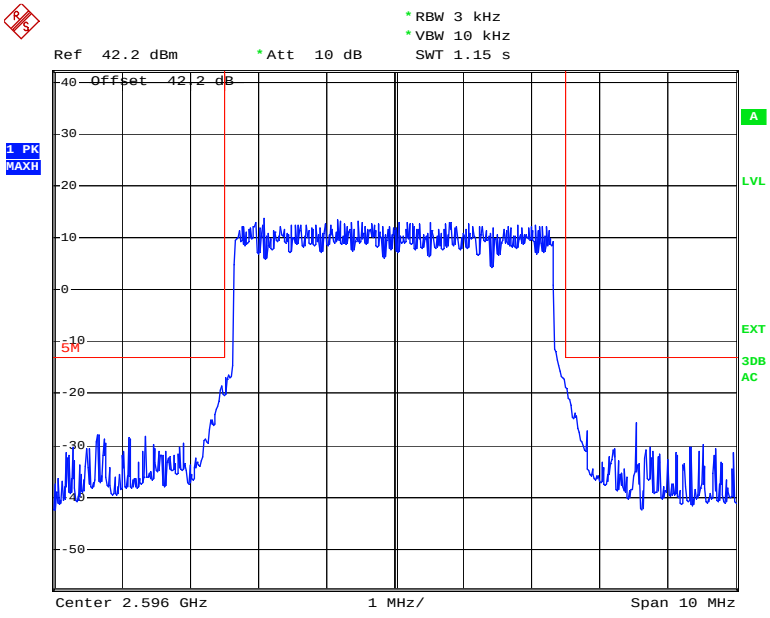
Date: 23.JUN.2010 12:06:41

V= -48V, T= 0℃



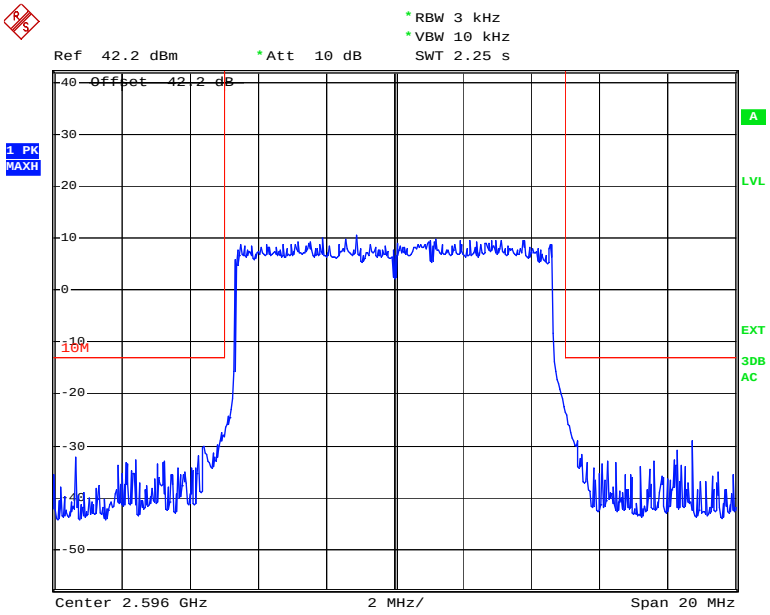
Date: 23.JUN.2010 12:39:06

V= -48V, T= +10℃



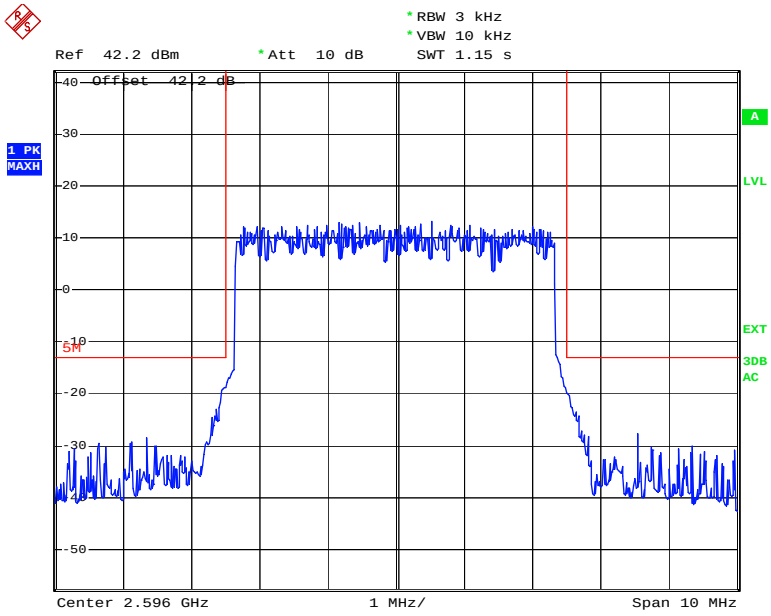
Date: 23.JUN.2010 12:48:52

V= -48V, T= +20℃



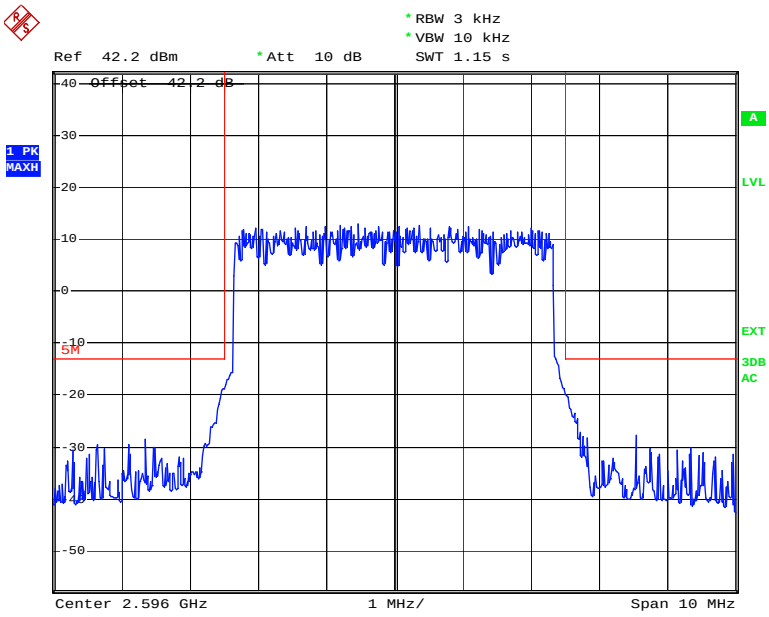
Date: 23.JUN.2010 13:01:14

V= -48V, T= +30℃



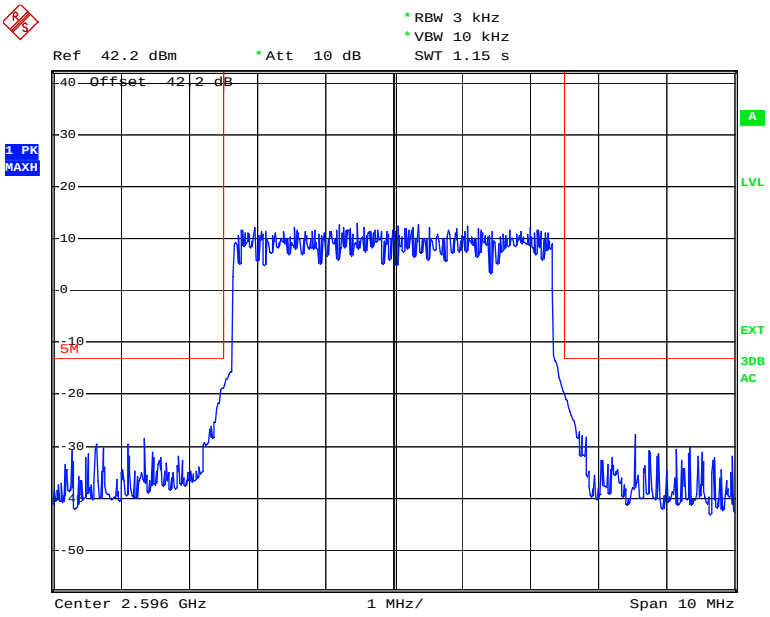
Date: 23.JUN.2010 13:17:37

V= -48V, T= +40℃



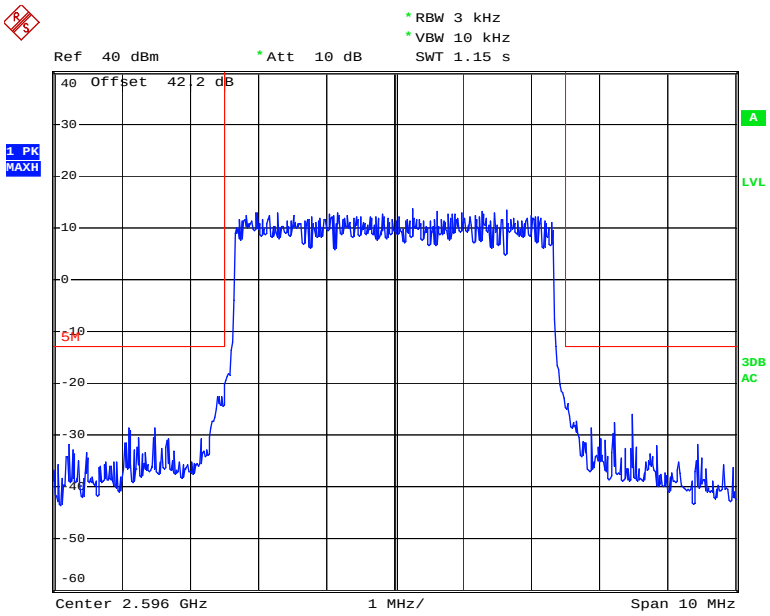
Date: 23.JUN.2010 13:27:18

V= -48V, T= +50℃



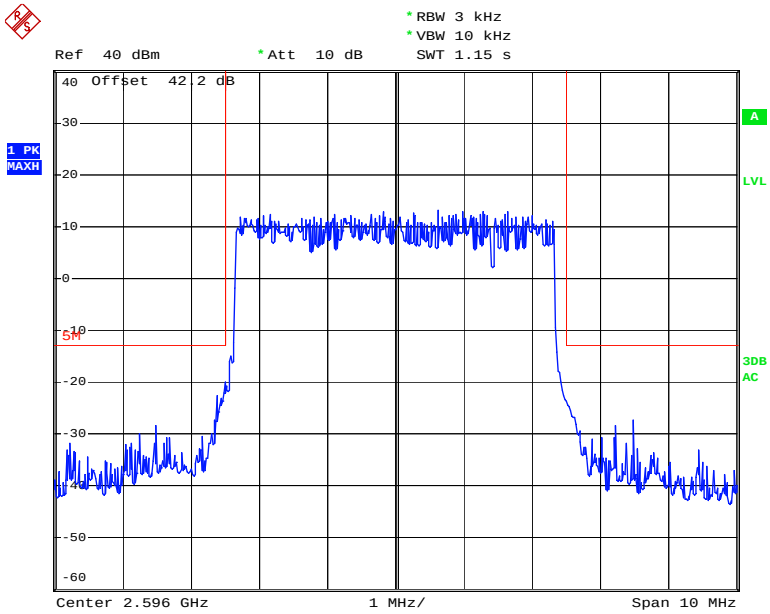
Date: 23.JUN.2010 13:37:01

V= -55.2V, T= +25℃



Date: 23.JUN.2010 18:16:42

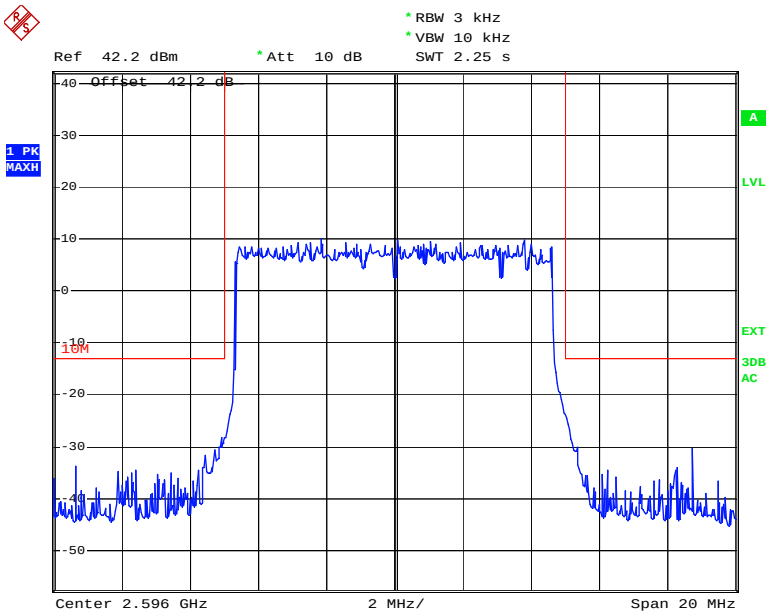
V= -40.8V, T= +25℃



Date: 23.JUN.2010 19:10:03

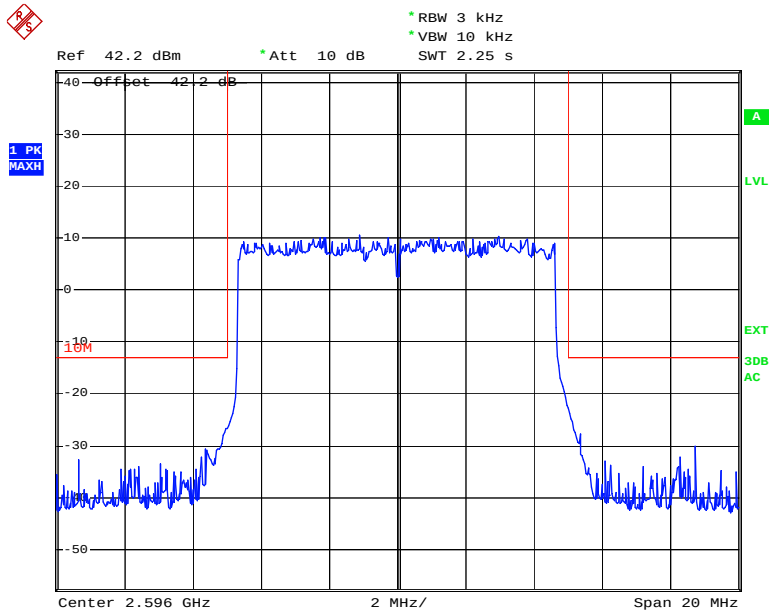
For 10 MHz bandwidth

V= -48V, T= -30℃



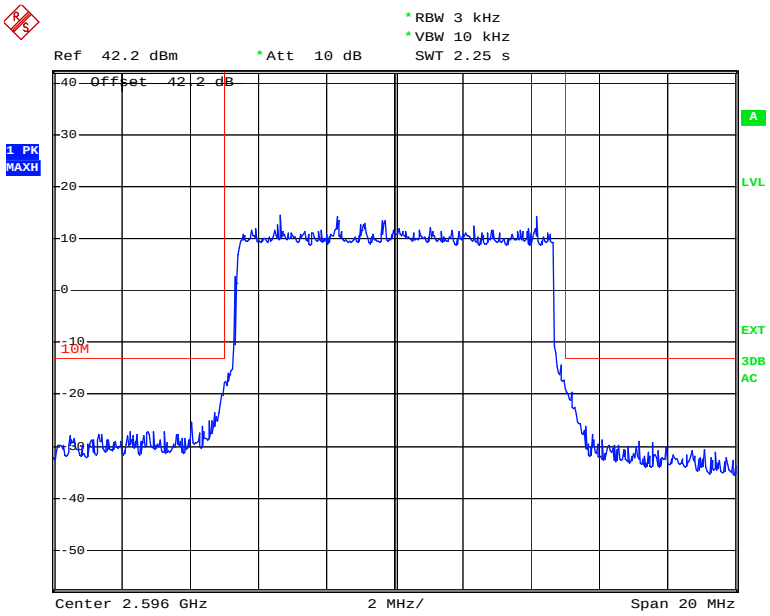
Date: 23.JUN.2010 10:56:23

V= -48V, T= -20℃



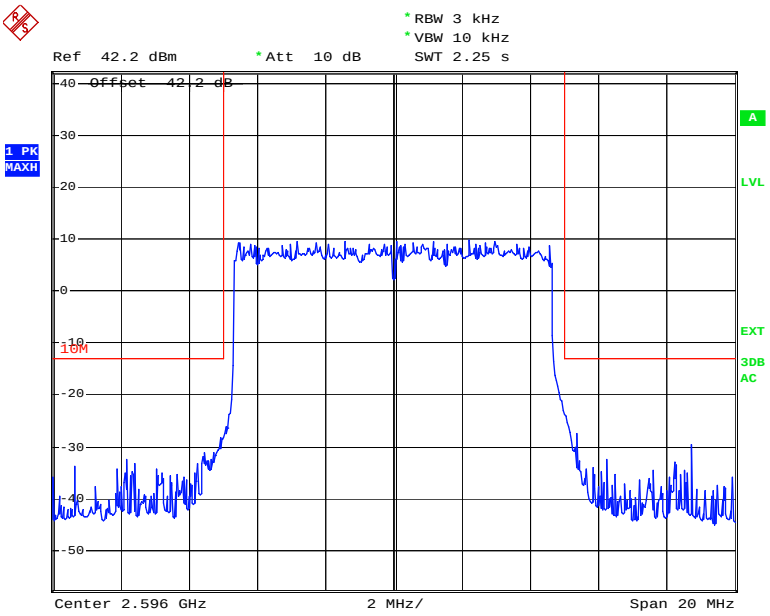
Date: 23.JUN.2010 11:03:34

V= -48V, T= -10℃



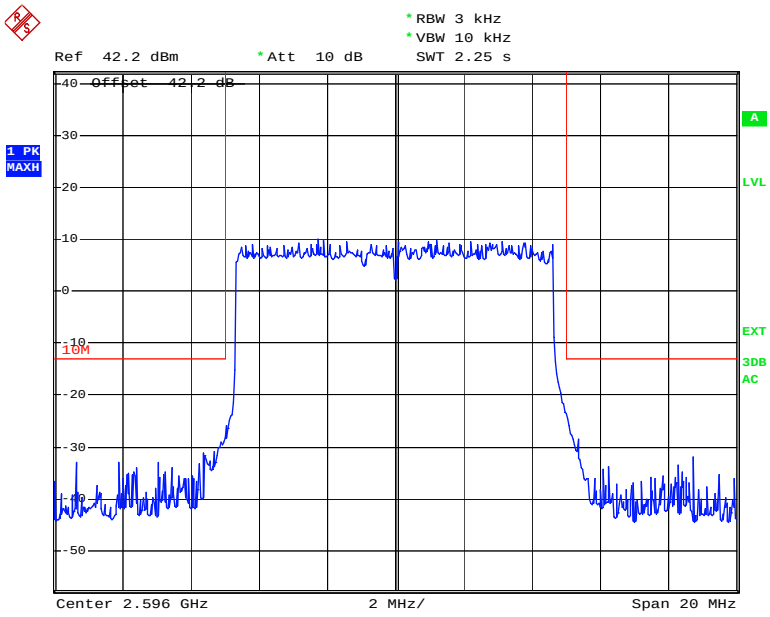
Date: 23.JUN.2010 12:24:50

V= -48V, T= 0℃



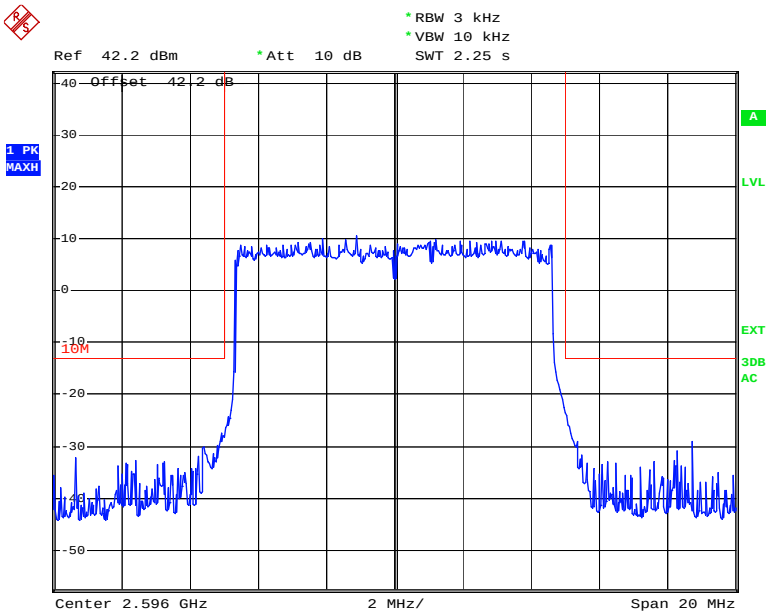
Date: 23.JUN.2010 12:33:20

V= -48V, T= +10℃



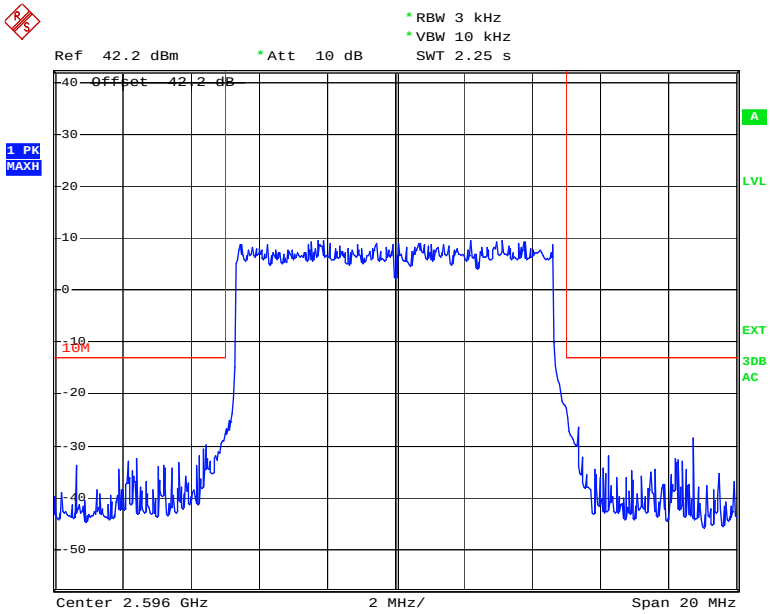
Date: 23.JUN.2010 12:54:46

V= -48V, T= +20℃



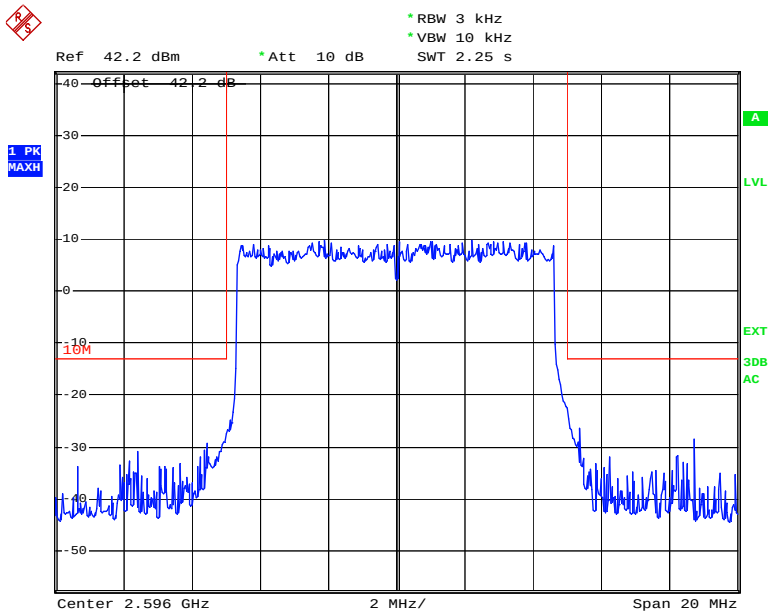
Date: 23.JUN.2010 13:01:14

V= -48V, T= +30℃



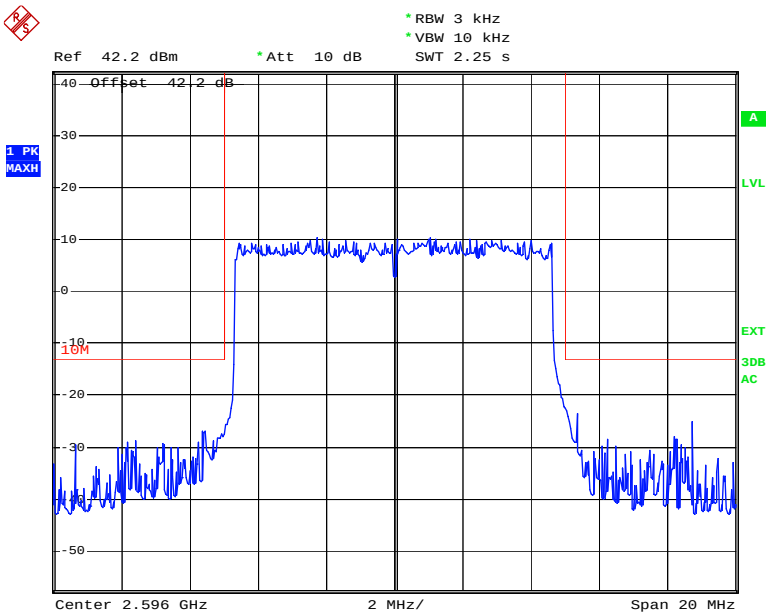
Date: 23.JUN.2010 13:11:03

V= -48V, T= +40℃



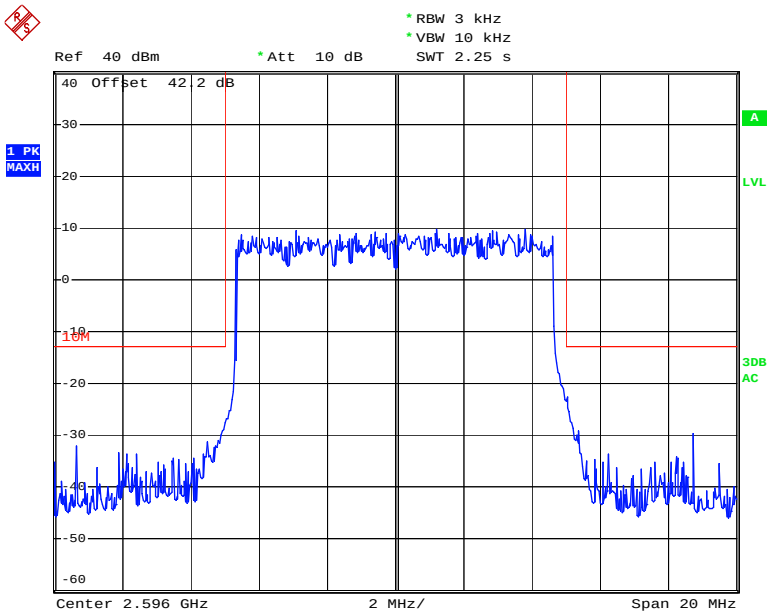
Date: 23.JUN.2010 13:20:32

V= -48V, T= +50℃



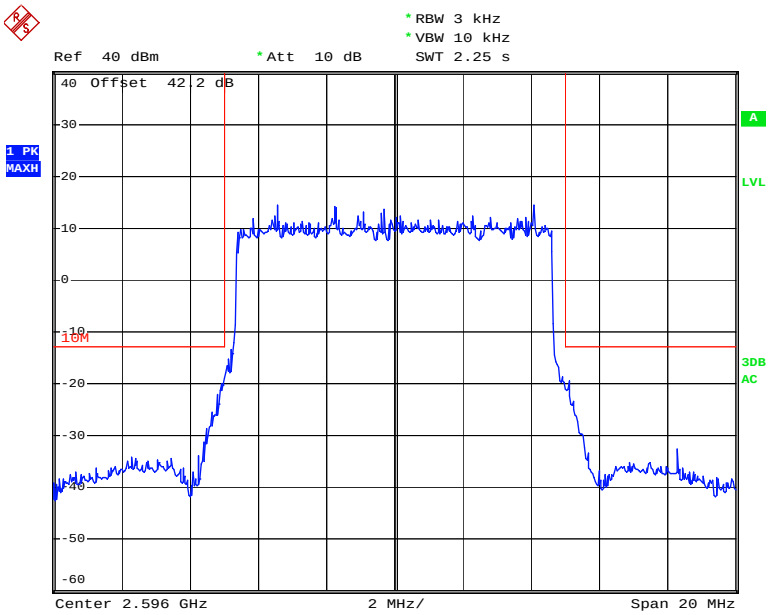
Date: 23.JUN.2010 13:29:12

V= -55.2V, T= +25℃



Date: 23.JUN.2010 18:58:46

V= -40.8V, T= +25℃



******* END OF REPORT *******