

FCC PART 27
MEASUREMENT AND TEST REPORT

For

Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

FCC ID: QISEA360-123

Report Type: Original Report	Product Type: LTE CPE
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Report Date: 2014-08-01	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE.....	4
RELATED SUBMITTAL(S)/GRANT(S)	4
TEST METHODOLOGY	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION	6
JUSTIFICATION	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS.....	7
FCC §1.1307(B) & §27.52 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	8
APPLICABLE STANDARD.....	8
FCC §2.1047 - MODULATION CHARACTERISTIC	9
APPLICABLE STANDARD.....	9
TEST PROCEDURE	9
TEST EQUIPMENT LIST AND DETAILS	9
TEST DATA.....	9
FCC § 2.1046 & § 27.50 - RF OUTPUT POWER AND DUTY CYCLE.....	20
APPLICABLE STANDARD.....	20
TEST PROCEDURE	20
TEST EQUIPMENT LIST AND DETAILS	20
TEST DATA.....	20
FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH.....	39
APPLICABLE STANDARDS	39
TEST PROCEDURE	39
TEST EQUIPMENT LIST AND DETAILS	39
TEST DATA.....	39
FCC §2.1051 & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	51
APPLICABLE STANDARDS.....	51
TEST PROCEDURE	51
TEST EQUIPMENT LIST AND DETAILS	51
TEST DATA.....	51
FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS	88
APPLICABLE STANDARDS.....	88
TEST PROCEDURE	88
TEST EQUIPMENT LIST AND DETAILS	88
TEST DATA.....	89
FCC §27.53 - BAND EDGES	91
APPLICABLE STANDARDS.....	91
TEST PROCEDURE	91
TEST EQUIPMENT LIST AND DETAILS	91
TEST DATA.....	91

FCC §2.1055 & §27.54 - FREQUENCY STABILITY..... 110
APPLICABLE STANDARDS..... 110
TEST PROCEDURE 110
TEST EQUIPMENT LIST AND DETAILS 110
TEST DATA..... 110

FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Huawei Technologies Co., Ltd.*'s product, model number: *eA360-123* (FCC ID: *QISEA360-123*) or the "EUT" as referred to in this report is a *LTE CPE*, which measures approximately: 25.5 cm (L) x 22.0 cm (W) x 6.6 cm (H), input voltage: DC 54V from adapter.

Adapter information:

Model: UE-PoE-35

Input: AC 100-240V, 50/60Hz, 1.0A MAX

Output: DC 54V, 0.65A

Frequency Range:

2305-2320 MHz band for 5MHz, 10MHz and 15MHz bandwidth

2345-2360 MHz band for 5MHz, 10MHz and 15MHz bandwidth

2570-2620 MHz band for 5MHz, 10MHz, 15MHz and 20MHz bandwidth

Modulation Type: QPSK, 16-QAM

**All measurement and test data in this report was gathered from production sample serial number: 140714005 (Assigned by BACL, Dongguan). The EUT supplied by applicant was received on 2014-07-17.*

Objective

This type approval report is prepared on behalf of *Huawei Technologies Co., Ltd.* in accordance with Part 2, Part 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

No related submittal(s).

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-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Dongguan). 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. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications 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 February 02, 2012. 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.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

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

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

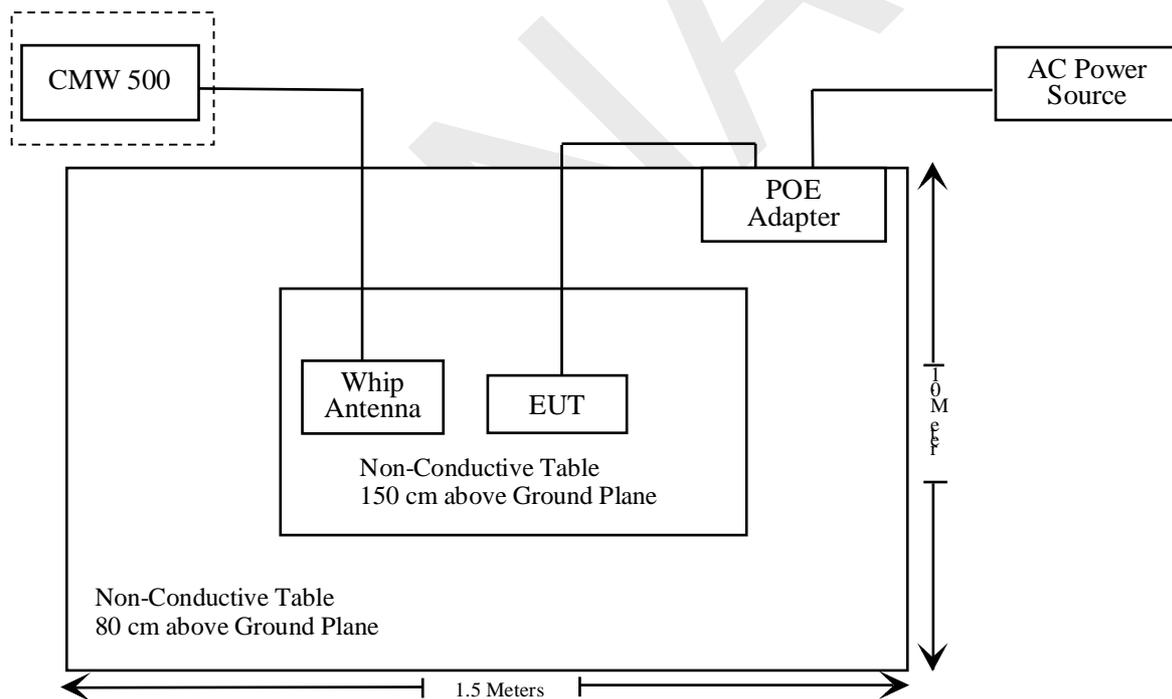
Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R & S	Wideband Radio Communication Tester	CMW500	114772

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091, §27.52	Maximum Permissible Exposure	Compliance
§2.1046; §27.50	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Compliance
§ 2.1049; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; §27.53	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; §27.53	Spurious Radiated Emissions	Compliance
§27.53	Band Edge	Compliance
§ 2.1055; §27.54	Frequency stability	Compliance

FCC §1.1307(b) & §27.52 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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);

Calculated Data:

Frequency Band	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2305-2320MHz	13	19.95	19.28	84.72	20.00	0.34	1.0
2345-2360MHz	13	19.95	19.27	84.53	20.00	0.34	1.0
2570-2620MHz*	13	19.95	21.72	148.59	20.00	0.59	1.0

Result: 0.59<1.0, the device meet FCC MPE at 20 cm distance

FCC §2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

FCC§2.1047:

(a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

(b) Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

(c) Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power. A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.

(d) Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

Test Procedure

Test Method: TIA/EIA-603 2.2.3

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

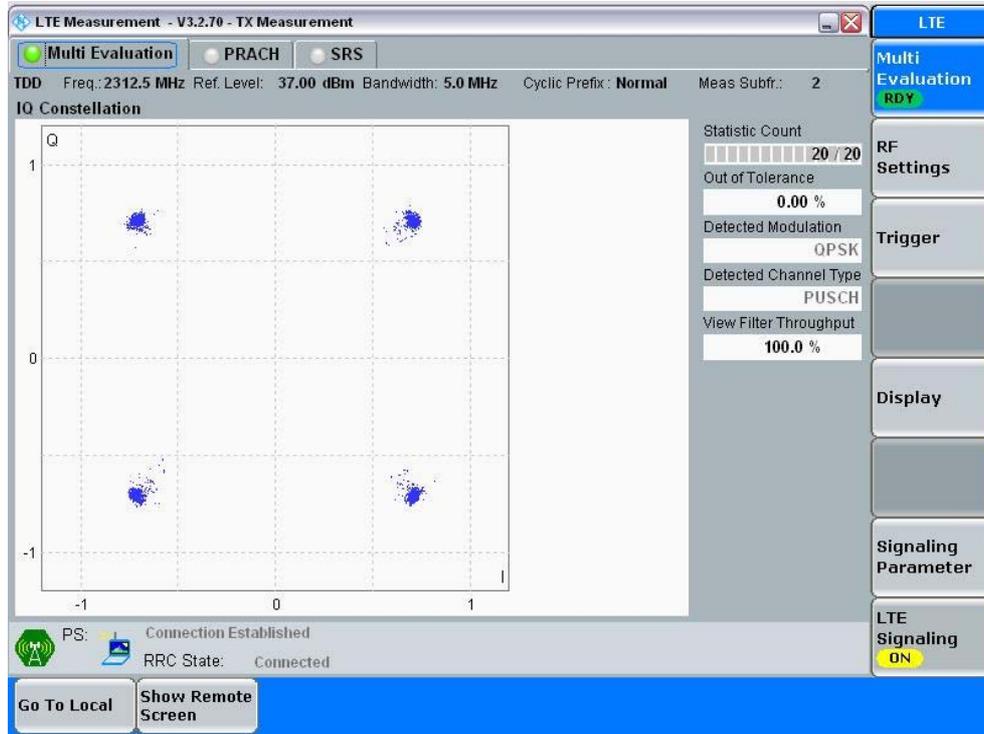
Temperature:	30.4
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Allen Qiao on 2014-07-29.

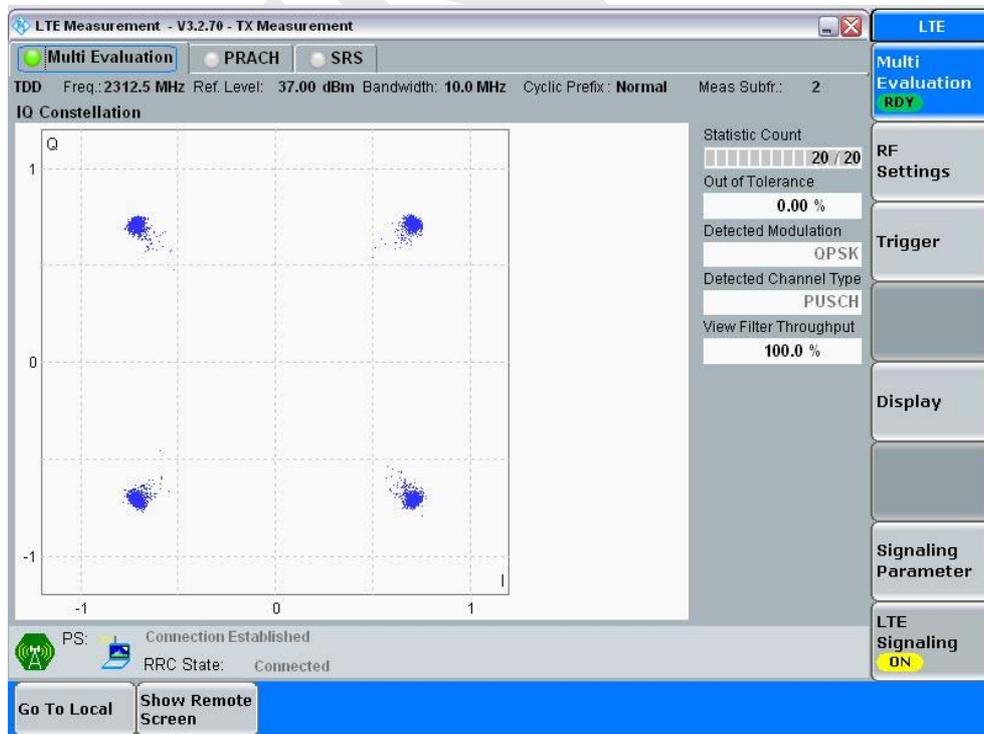
Please refer to the following plots.

2305MHz-2320MHz:

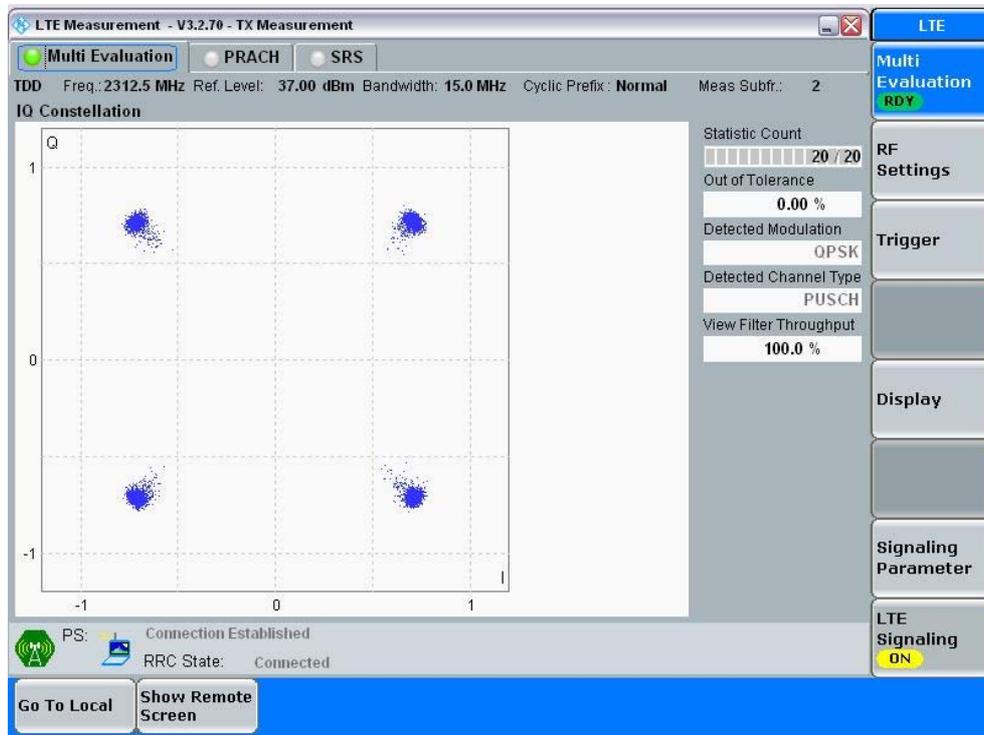
QPSK, 5MHz



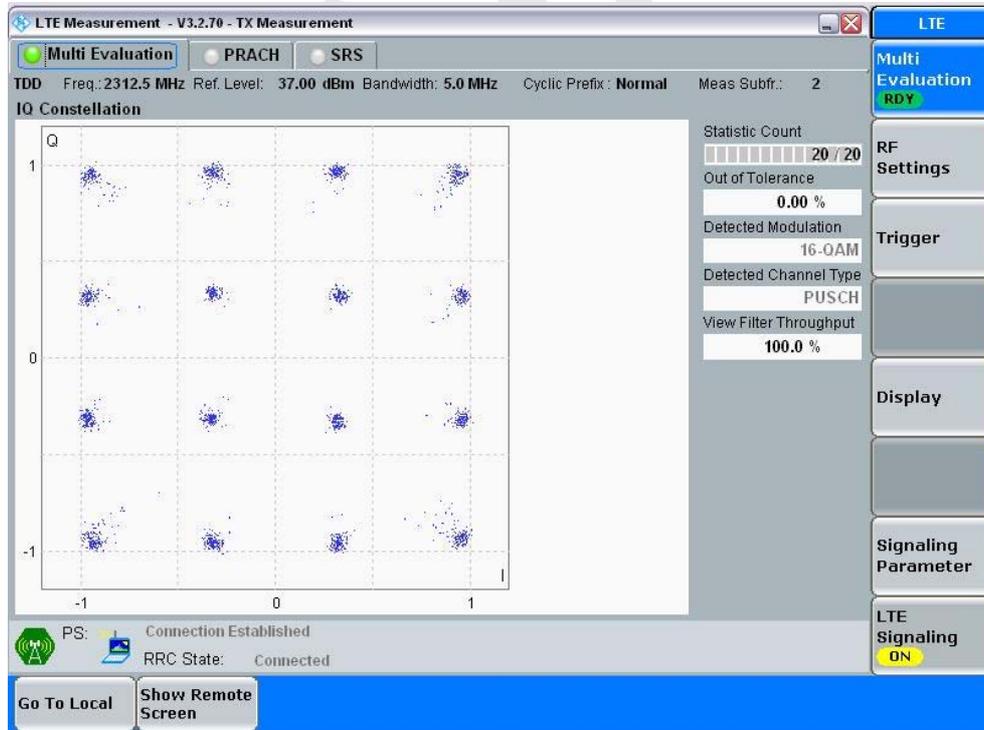
QPSK, 10MHz



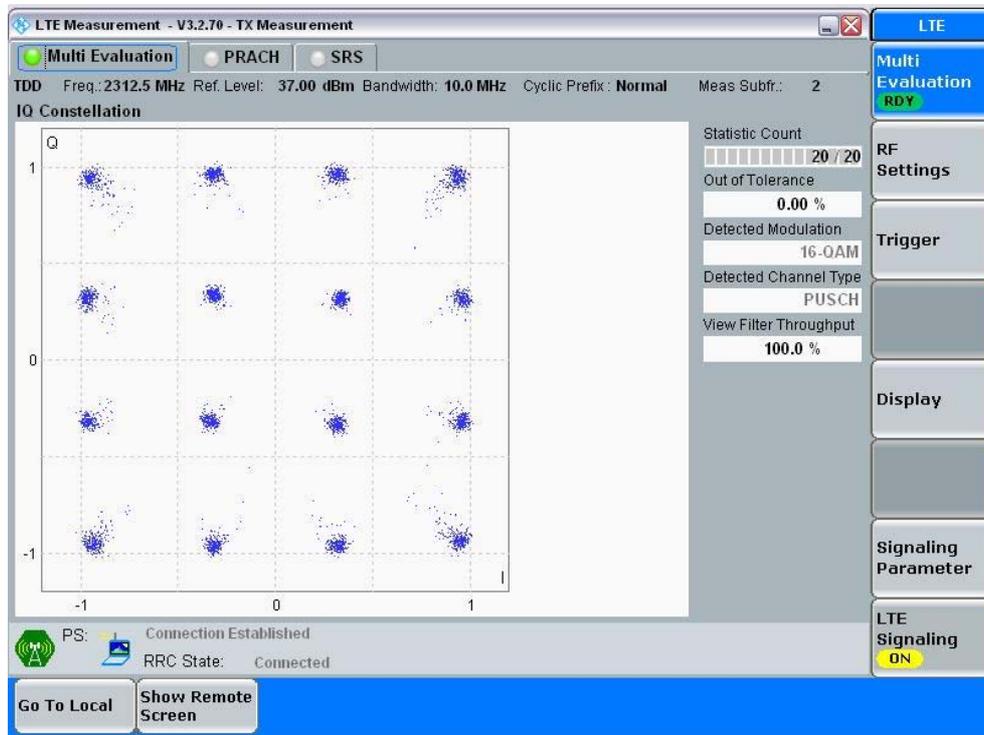
QPSK, 15MHz



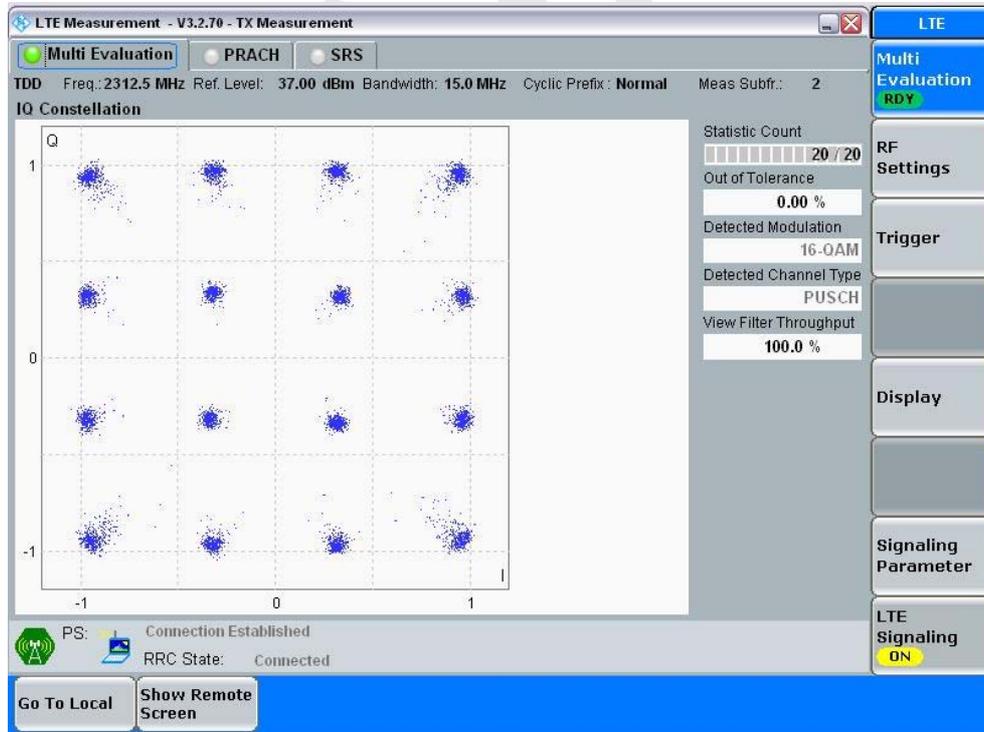
16QAM, 5MHz



16QAM, 10MHz

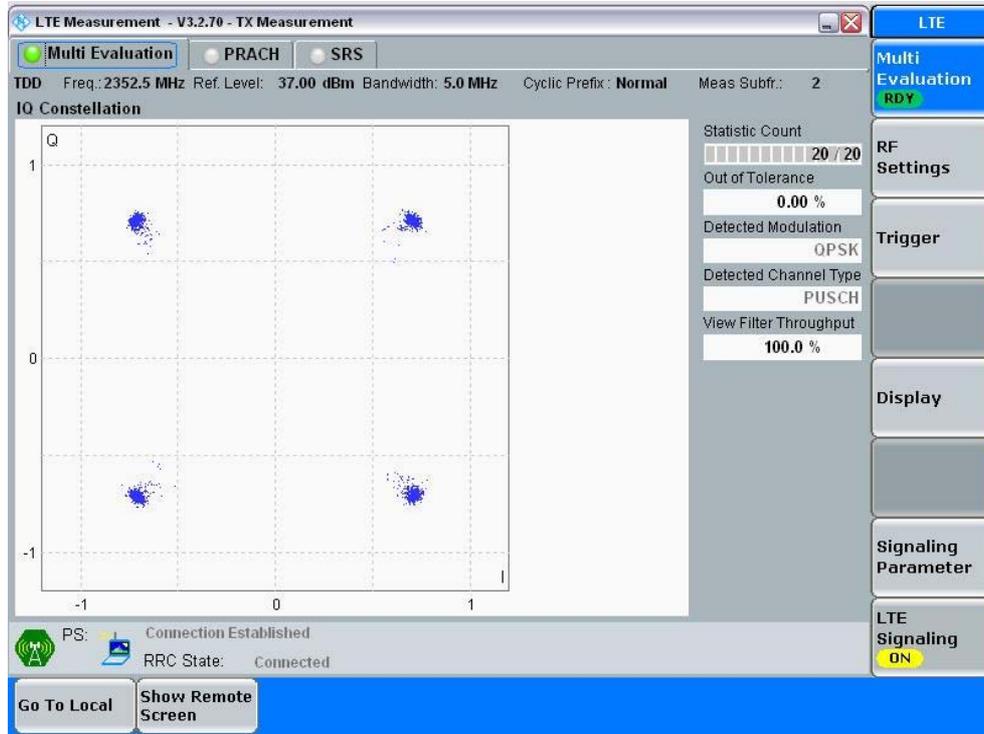


16QAM, 15MHz

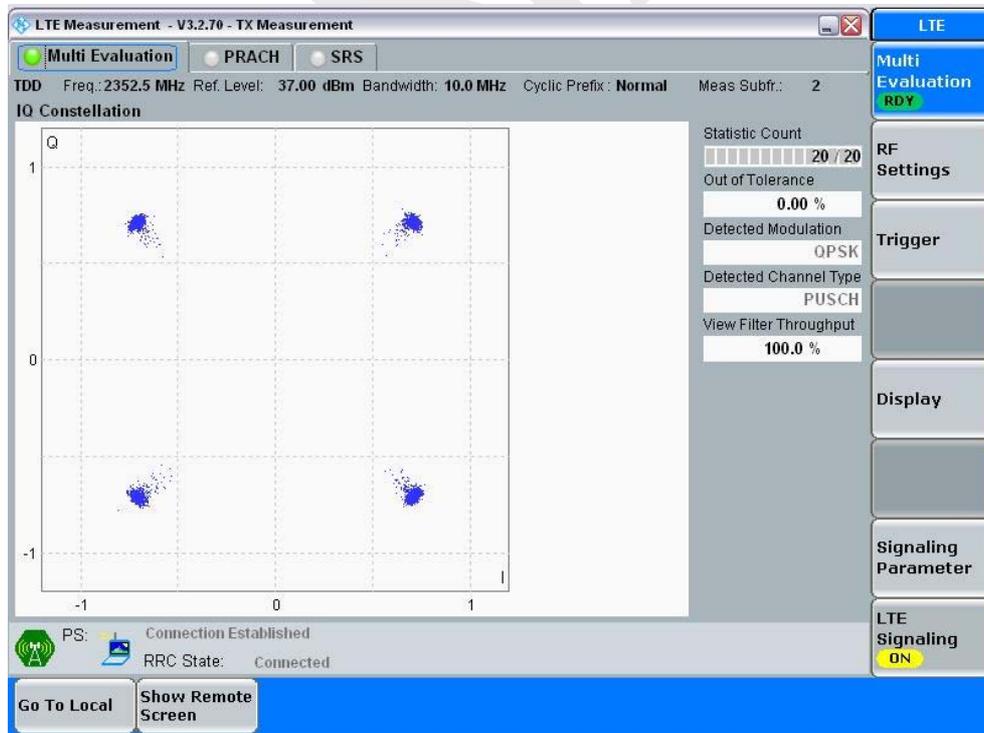


2345MHz-2360MHz:

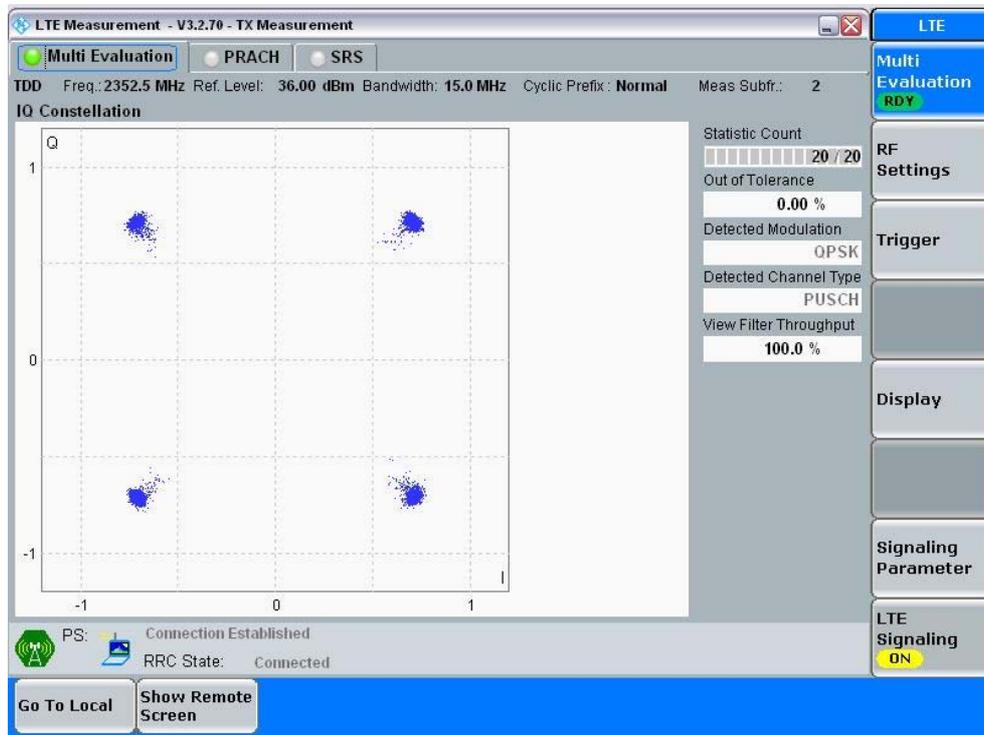
QPSK, 5MHz



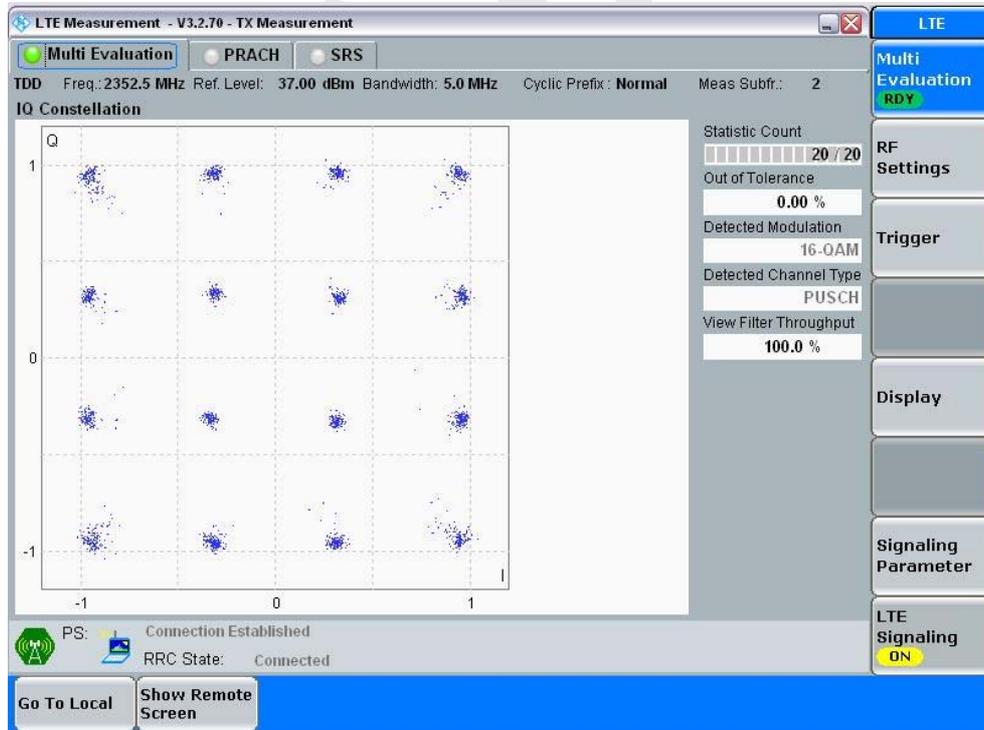
QPSK, 10MHz



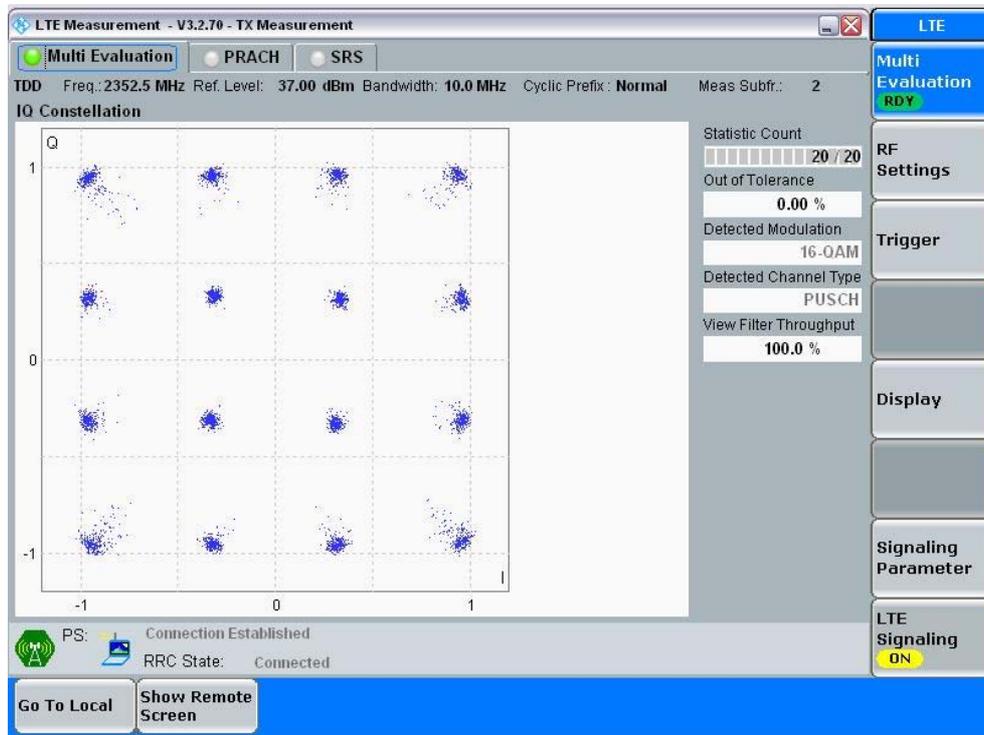
QPSK, 15MHz



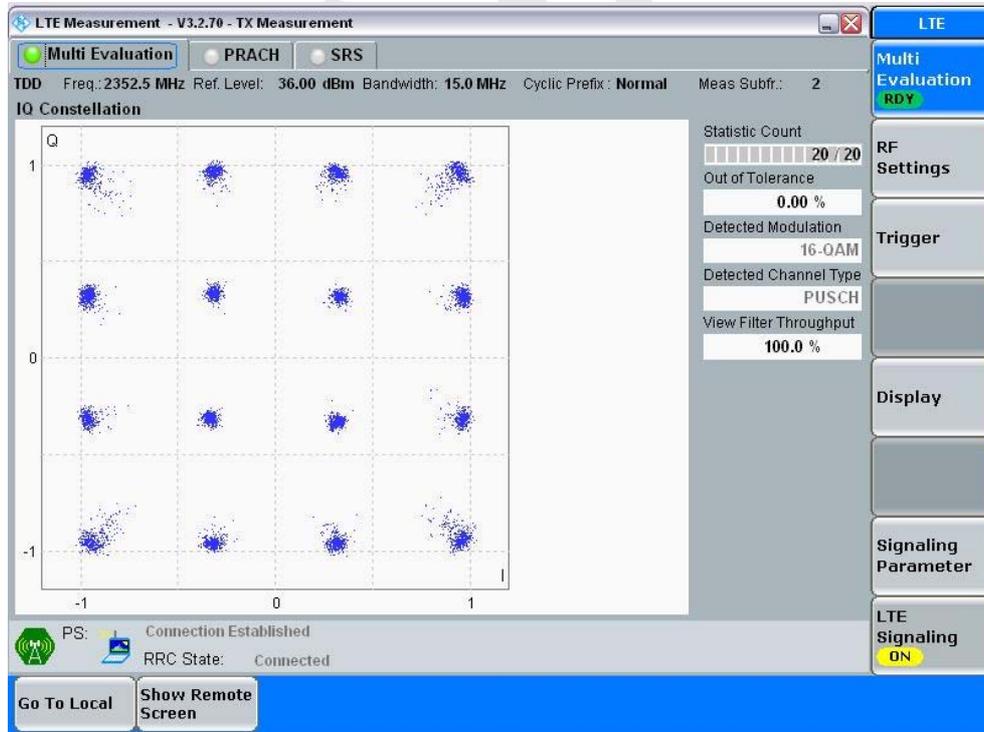
16QAM, 5MHz



16QAM, 10MHz

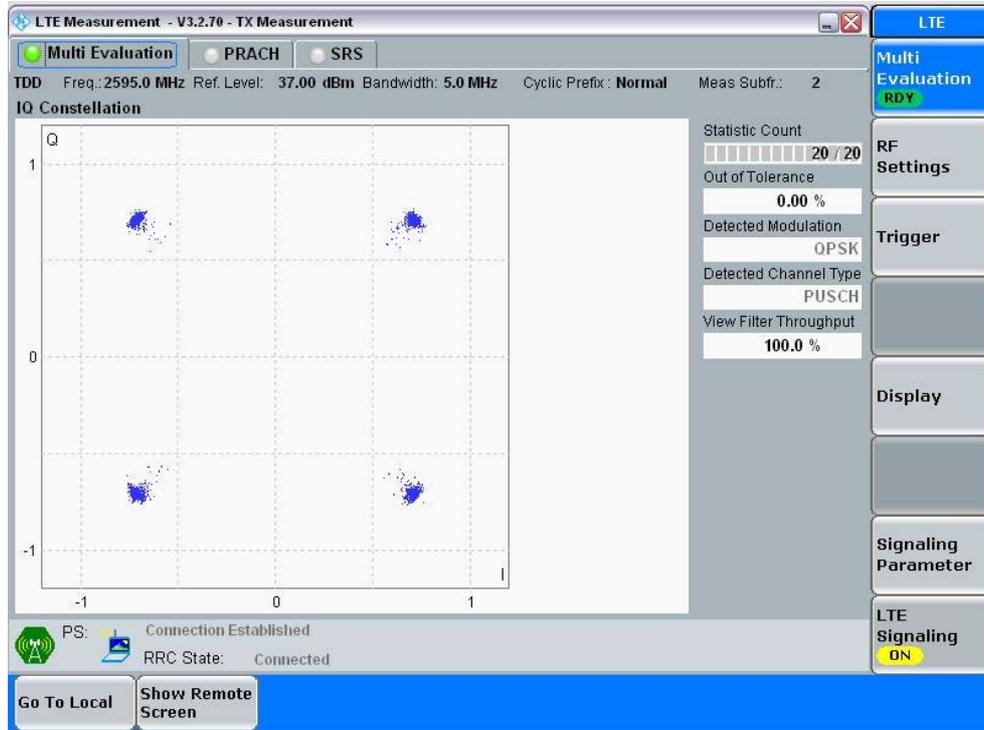


16QAM, 15MHz

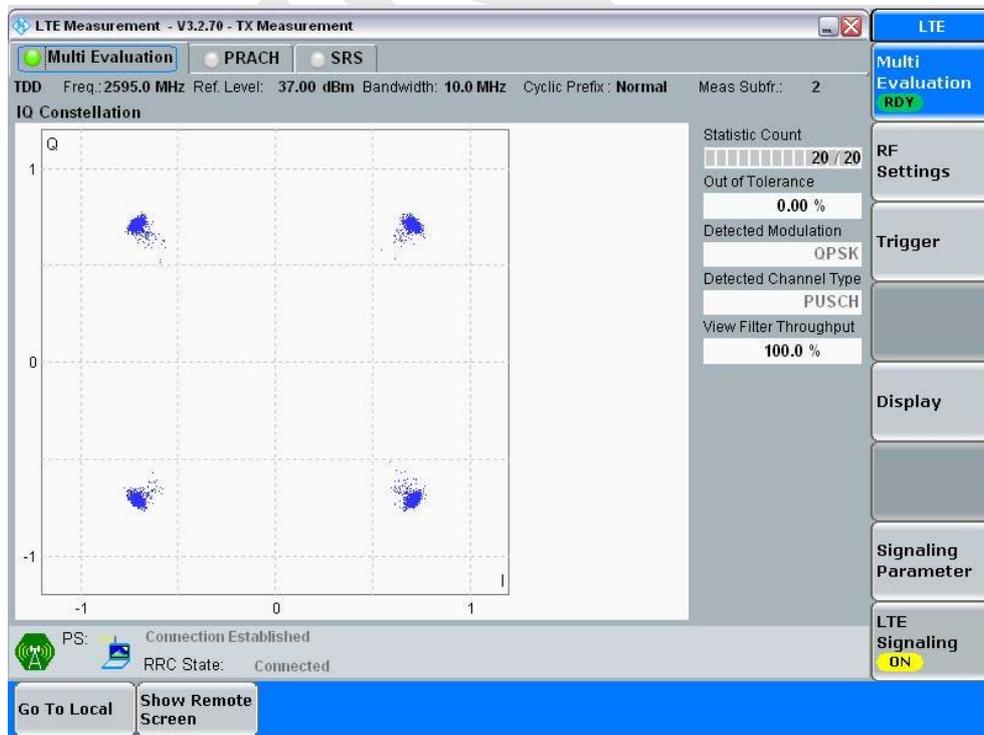


2570MHz-2620MHz:

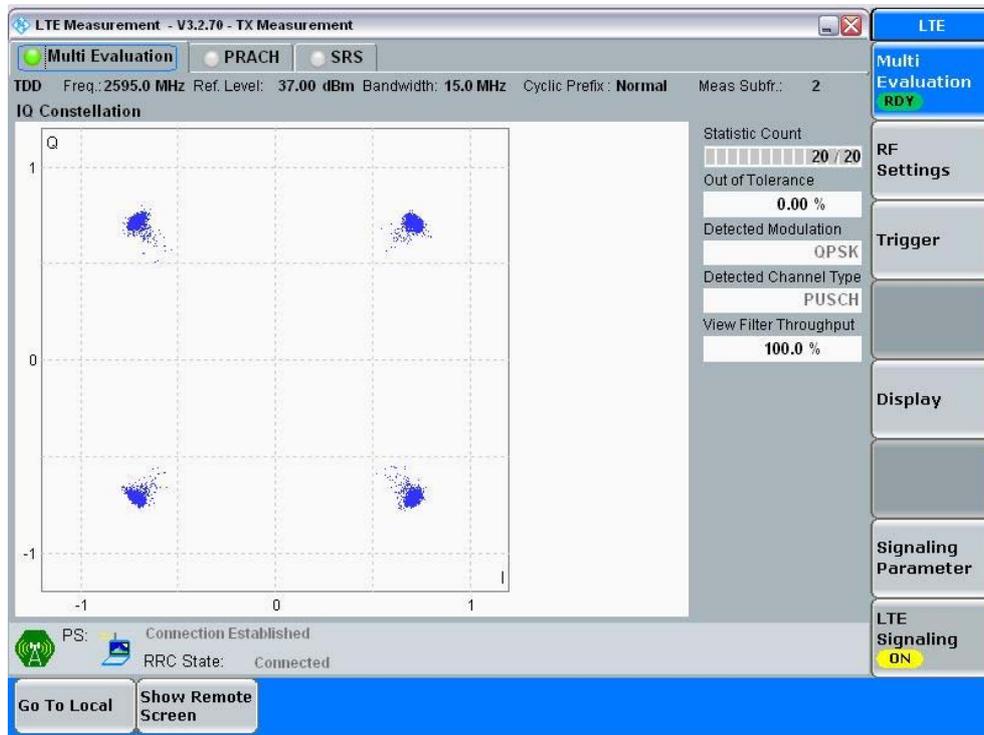
QPSK, 5MHz



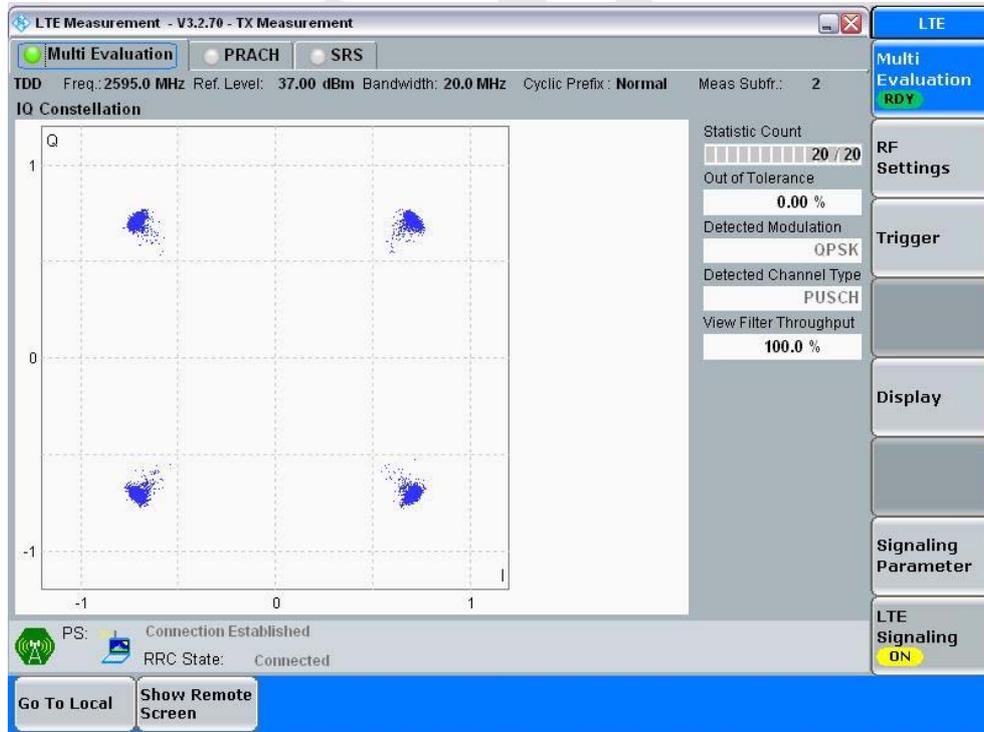
QPSK, 10MHz



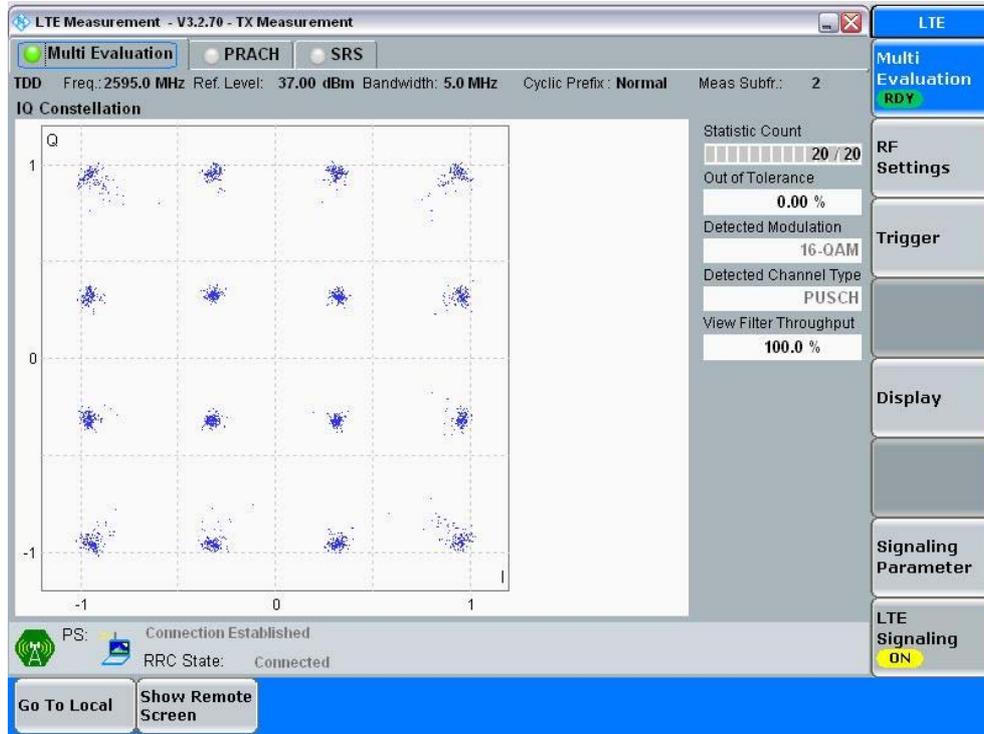
QPSK, 15MHz



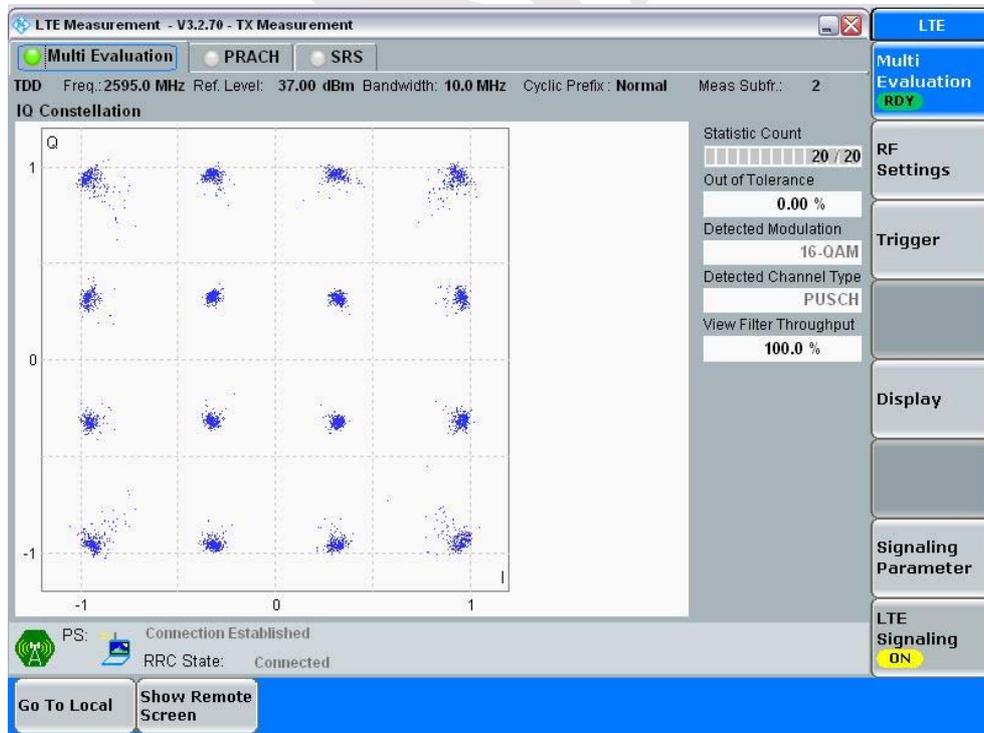
QPSK, 20MHz



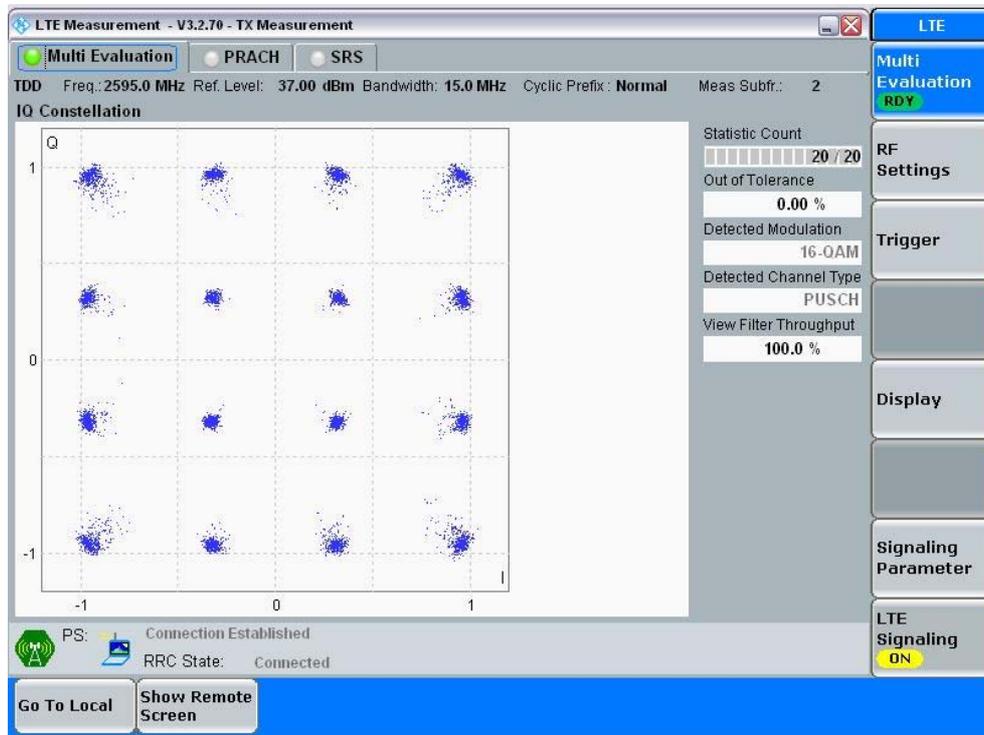
16QAM, 5MHz



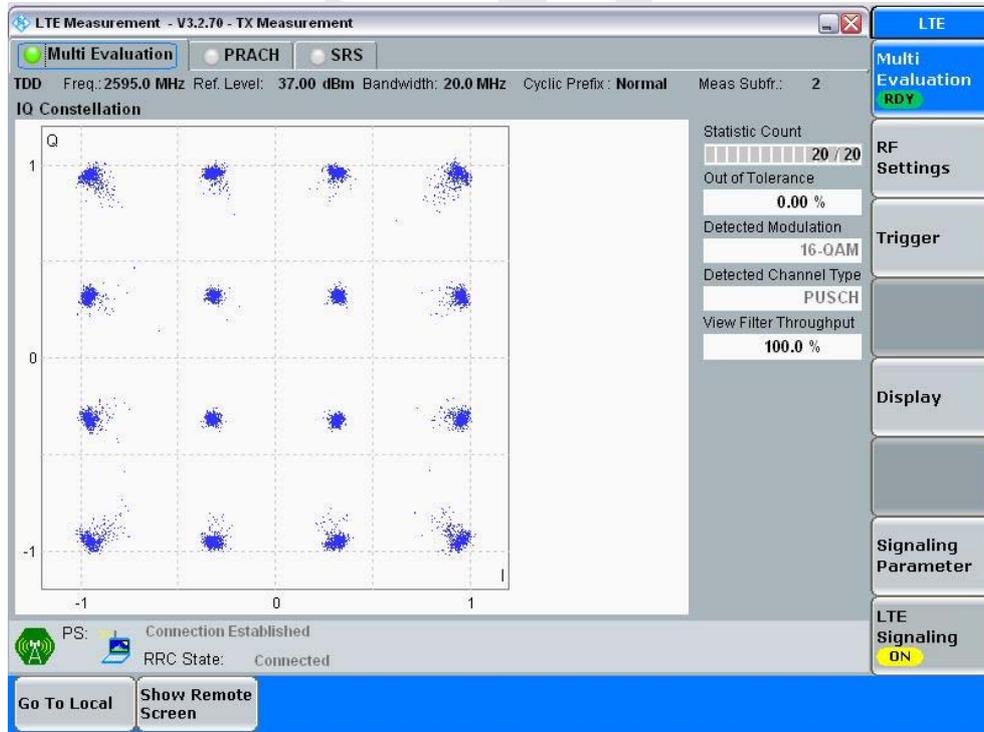
16QAM, 10MHz



16QAM, 15MHz



16QAM, 20MHz



FCC § 2.1046 & § 27.50 - RF OUTPUT POWER AND DUTY CYCLE

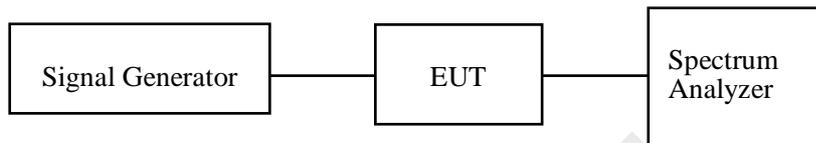
Applicable Standard

FCC 47 §2.1046 and §27.50.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the Signal Generator and the spectrum analyzer through sufficient attenuation.



Radiated method:

TIA603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Signal Generator	E8247C	MY43321350	2012-10-15	2014-10-15
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-06
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	29.2
Relative Humidity:	65%
ATM Pressure:	100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28.

2305MHz-2320MHz:

RF PEAK OUTPUT POWER

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
5M	L	1#0	22.27	22.49	13.00	35.27	35.49	43.01
		1#13	22.82	23.03	13.00	35.82	36.03	
		1#24	22.38	22.38	13.00	35.38	35.38	
		12#0	22.00	22.55	13.00	35.00	35.55	
		12#6	22.97	23.10	13.00	35.97	36.10	
		12#13	22.49	22.17	13.00	35.49	35.17	
		25#0	22.66	22.16	13.00	35.66	35.16	
	M	1#0	22.43	23.26	13.00	35.43	36.26	
		1#13	22.41	22.66	13.00	35.41	35.66	
		1#24	23.06	22.48	13.00	36.06	35.48	
		12#0	23.21	23.43	13.00	36.21	36.43	
		12#6	23.52	23.47	13.00	36.52	36.47	
		12#13	22.80	23.30	13.00	35.80	36.30	
		25#0	23.16	23.38	13.00	36.16	36.38	
	H	1#0	22.85	22.76	13.00	35.85	35.76	
		1#13	23.40	22.73	13.00	36.40	35.73	
		1#24	22.51	22.60	13.00	35.51	35.60	
		12#0	22.65	22.82	13.00	35.65	35.82	
		12#6	23.07	22.60	13.00	36.07	35.60	
		12#13	23.12	23.26	13.00	36.12	36.26	
		25#0	22.70	22.99	13.00	35.70	35.99	
10M	L	1#0	23.39	23.15	13.00	36.39	36.15	46.02
		1#25	22.90	22.74	13.00	35.90	35.74	
		1#49	22.66	22.77	13.00	35.66	35.77	
		25#0	22.51	22.09	13.00	35.51	35.09	
		25#13	23.34	23.20	13.00	36.34	36.20	
		25#25	22.60	23.08	13.00	35.60	36.08	
		50#0	22.70	22.93	13.00	35.70	35.93	
	M	1#0	22.33	22.62	13.00	35.33	35.62	
		1#25	23.10	23.31	13.00	36.10	36.31	
		1#49	23.58	22.78	13.00	36.58	35.78	
		25#0	23.11	22.54	13.00	36.11	35.54	
		25#13	22.40	23.26	13.00	35.40	36.26	
		25#25	23.56	22.95	13.00	36.56	35.95	
		50#0	22.87	23.57	13.00	35.87	36.57	
	H	1#0	22.33	22.78	13.00	35.33	35.78	
		1#25	22.73	22.73	13.00	35.73	35.73	
		1#49	23.47	22.96	13.00	36.47	35.96	
		25#0	22.30	22.65	13.00	35.30	35.65	
		25#13	22.38	23.03	13.00	35.38	36.03	
		25#25	22.67	23.04	13.00	35.67	36.04	
		50#0	22.44	22.73	13.00	35.44	35.73	

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
15M	M	1#0	21.83	21.68	13.00	34.83	34.68	47.78
		1#38	22.38	22.15	13.00	35.38	35.15	
		1#74	23.10	22.87	13.00	36.10	35.87	
		36#0	22.52	21.62	13.00	35.52	34.62	
		36#19	23.36	22.71	13.00	36.36	35.71	
		36#39	23.11	22.24	13.00	36.11	35.24	
		75#0	22.72	22.47	13.00	35.72	35.47	

RF AVERAGE OUTPUT POWER

Test Bandwidth	Test Channel	Resource Block & RB offset	Average Output Power (dBm)	Average Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
5M	L	1#0	18.10	18.33	13.00	31.10	31.33	33.01
		1#13	18.77	18.99	13.00	31.77	31.99	
		1#24	18.60	18.84	13.00	31.60	31.84	
		12#0	18.46	18.31	13.00	31.46	31.31	
		12#6	18.78	18.62	13.00	31.78	31.62	
		12#13	18.76	18.59	13.00	31.76	31.59	
		25#0	18.73	18.58	13.00	31.73	31.58	
	M	1#0	18.85	18.83	13.00	31.85	31.83	
		1#13	18.47	18.52	13.00	31.47	31.52	
		1#24	18.66	18.59	13.00	31.66	31.59	
		12#0	19.06	19.01	13.00	32.06	32.01	
		12#6	19.25	19.22	13.00	32.25	32.22	
		12#13	19.22	19.19	13.00	32.22	32.19	
		25#0	19.22	19.07	13.00	32.22	32.07	
	H	1#0	18.55	18.53	13.00	31.55	31.53	
		1#13	19.04	18.98	13.00	32.04	31.98	
		1#24	18.95	18.92	13.00	31.95	31.92	
		12#0	18.65	18.61	13.00	31.65	31.61	
		12#6	18.88	18.85	13.00	31.88	31.85	
		12#13	19.03	19.05	13.00	32.03	32.05	
		25#0	18.83	18.92	13.00	31.83	31.92	

Test Bandwidth	Test Channel	Resource Block & RB offset	Average Output Power (dBm)	Average Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
			10M	L		1#0	18.97	
		1#25	19.08	19.06	13.00	32.08	32.06	
		1#49	19.02	18.98	13.00	32.02	31.98	
		25#0	18.61	18.57	13.00	31.61	31.57	
		25#13	18.98	18.89	13.00	31.98	31.89	
		25#25	19.01	18.96	13.00	32.01	31.96	
		50#0	18.75	18.71	13.00	31.75	31.71	
	M	1#0	18.39	18.35	13.00	31.39	31.35	
		1#25	19.22	19.28	13.00	32.22	32.28	
		1#49	19.25	19.24	13.00	32.25	32.24	
		25#0	18.80	18.78	13.00	31.80	31.78	
		25#13	18.30	19.19	13.00	31.30	32.19	
		25#25	19.16	19.23	13.00	32.16	32.23	
		50#0	19.13	19.15	13.00	32.13	32.15	
	H	1#0	18.66	18.76	13.00	31.66	31.76	
		1#25	18.75	18.83	13.00	31.75	31.83	
		1#49	19.13	19.15	13.00	32.13	32.15	
		25#0	18.66	18.62	13.00	31.66	31.62	
		25#13	18.72	18.78	13.00	31.72	31.78	
		25#25	18.63	18.66	13.00	31.63	31.66	
		50#0	18.43	18.51	13.00	31.43	31.51	
15M	M	1#0	17.35	17.53	13.00	30.35	30.53	37.78
		1#38	18.56	18.32	13.00	31.56	31.32	
		1#74	18.93	18.79	13.00	31.93	31.79	
		36#0	18.78	17.84	13.00	31.78	30.84	
		36#19	18.87	18.43	13.00	31.87	31.43	
		36#39	18.83	18.59	13.00	31.83	31.59	
		75#0	18.56	18.35	13.00	31.56	31.35	

2345MHz-2360MHz:

RF PEAK OUTPUT POWER

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
5M	L	1#0	22.91	23.00	13.00	35.91	36.00	43.01
		1#13	22.70	22.64	13.00	35.70	35.64	
		1#24	23.12	22.22	13.00	36.12	35.22	
		12#0	22.30	23.01	13.00	35.30	36.01	
		12#6	22.52	22.38	13.00	35.52	35.38	
		12#13	23.06	22.38	13.00	36.06	35.38	
		25#0	23.17	22.14	13.00	36.17	35.14	
	M	1#0	23.36	23.26	13.00	36.36	36.26	
		1#13	23.39	22.65	13.00	36.39	35.65	
		1#24	22.73	22.89	13.00	35.73	35.89	
		12#0	22.91	22.66	13.00	35.91	35.66	
		12#6	23.25	22.14	13.00	36.25	35.14	
		12#13	23.58	22.71	13.00	36.58	35.71	
		25#0	23.17	21.83	13.00	36.17	34.83	
	H	1#0	22.54	22.86	13.00	35.54	35.86	
		1#13	23.50	23.53	13.00	36.50	36.53	
		1#24	22.89	23.20	13.00	35.89	36.20	
		12#0	23.23	23.10	13.00	36.23	36.10	
		12#6	22.90	22.66	13.00	35.90	35.66	
		12#13	23.62	22.79	13.00	36.62	35.79	
		25#0	23.61	23.59	13.00	36.61	36.59	
10M	L	1#0	22.77	22.66	13.00	35.77	35.66	46.02
		1#25	22.86	22.87	13.00	35.86	35.87	
		1#49	23.14	22.79	13.00	36.14	35.79	
		25#0	22.66	22.39	13.00	35.66	35.39	
		25#13	22.37	22.86	13.00	35.37	35.86	
		25#25	23.12	22.93	13.00	36.12	35.93	
		50#0	22.44	23.07	13.00	35.44	36.07	
	M	1#0	22.97	22.49	13.00	35.97	35.49	
		1#25	23.59	23.11	13.00	36.59	36.11	
		1#49	23.20	22.75	13.00	36.20	35.75	
		25#0	22.43	22.98	13.00	35.43	35.98	
		25#13	22.95	22.55	13.00	35.95	35.55	
		25#25	22.81	22.61	13.00	35.81	35.61	
		50#0	22.51	22.93	13.00	35.51	35.93	
	H	1#0	22.83	22.40	13.00	35.83	35.40	
		1#25	23.51	23.09	13.00	36.51	36.09	
		1#49	23.29	23.54	13.00	36.29	36.54	
		25#0	22.67	22.75	13.00	35.67	35.75	
		25#13	23.19	23.31	13.00	36.19	36.31	
		25#25	22.82	23.10	13.00	35.82	36.10	
		50#0	23.13	23.18	13.00	36.13	36.18	

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
15M	M	1#0	22.99	22.41	13.00	35.99	35.41	47.78
		1#38	23.13	22.54	13.00	36.13	35.54	
		1#74	23.19	22.95	13.00	36.19	35.95	
		36#0	22.78	22.45	13.00	35.78	35.45	
		36#19	22.71	22.82	13.00	35.71	35.82	
		36#39	22.56	22.70	13.00	35.56	35.70	
		75#0	22.99	22.32	13.00	35.99	35.32	

RF AVERAGE OUTPUT POWER

Test Bandwidth	Test Channel	Resource Block & RB offset	Average Output Power (dBm)	Average Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
5M	L	1#0	18.64	18.69	13.00	31.64	31.69	33.01
		1#13	18.96	19.01	13.00	31.96	32.01	
		1#24	18.67	18.72	13.00	31.67	31.72	
		12#0	18.71	18.74	13.00	31.71	31.74	
		12#6	18.84	18.74	13.00	31.84	31.74	
		12#13	18.73	18.68	13.00	31.73	31.68	
		25#0	18.74	18.61	13.00	31.74	31.61	
	M	1#0	19.17	18.83	13.00	32.17	31.83	
		1#13	19.25	19.09	13.00	32.25	32.09	
		1#24	19.06	18.80	13.00	32.06	31.80	
		12#0	19.18	18.44	13.00	32.18	31.44	
		12#6	19.20	18.42	13.00	32.20	31.42	
		12#13	19.17	18.38	13.00	32.17	31.38	
		25#0	19.19	18.28	13.00	32.19	31.28	
	H	1#0	18.92	18.76	13.00	31.92	31.76	
		1#13	19.27	19.18	13.00	32.27	32.18	
		1#24	19.13	19.01	13.00	32.13	32.01	
		12#0	19.22	19.05	13.00	32.22	32.05	
		12#6	19.26	19.14	13.00	32.26	32.14	
		12#13	19.25	19.10	13.00	32.25	32.10	
		25#0	19.24	19.09	13.00	32.24	32.09	

Test Bandwidth	Test Channel	Resource Block & RB offset	Average Output Power (dBm)	Average Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)		Limit (dBm)
			QPSK	16-QAM		QPSK	16-QAM	
10M	L	1#0	18.74	18.55	13.00	31.74	31.55	36.02
		1#25	19.14	18.93	13.00	32.14	31.93	
		1#49	18.92	18.72	13.00	31.92	31.72	
		25#0	18.79	18.78	13.00	31.79	31.78	
		25#13	18.82	18.75	13.00	31.82	31.75	
		25#25	18.77	18.76	13.00	31.77	31.76	
	50#0	18.73	18.70	13.00	31.73	31.70		
	M	1#0	18.67	18.64	13.00	31.67	31.64	
		1#25	19.18	19.15	13.00	32.18	32.15	
		1#49	19.13	19.07	13.00	32.13	32.07	
		25#0	18.84	18.82	13.00	31.84	31.82	
		25#13	18.92	18.77	13.00	31.92	31.77	
		25#25	18.81	18.75	13.00	31.81	31.75	
	50#0	18.89	18.82	13.00	31.89	31.82		
	H	1#0	18.74	18.78	13.00	31.74	31.78	
		1#25	19.22	19.23	13.00	32.22	32.23	
		1#49	19.26	19.27	13.00	32.26	32.27	
		25#0	18.87	18.90	13.00	31.87	31.90	
25#13		19.04	19.01	13.00	32.04	32.01		
25#25		18.99	18.99	13.00	31.99	31.99		
50#0	18.89	18.87	13.00	31.89	31.87			
15M	M	1#0	18.57	18.55	13.00	31.57	31.55	37.78
		1#38	18.97	18.87	13.00	31.97	31.87	
		1#74	19.02	18.93	13.00	32.02	31.93	
		36#0	18.77	18.65	13.00	31.77	31.65	
		36#19	18.93	18.75	13.00	31.93	31.75	
		36#39	18.88	18.73	13.00	31.88	31.73	
		75#0	18.84	18.72	13.00	31.84	31.72	

Note:

- For peak power limit = $10\text{Log}(20 \times 1000)\text{dBm} + 10\text{Log}(\text{Bandwidth}/5\text{MHz})$
 Eg: For 10 MHz Bandwidth, the limit = $43.01\text{dBm} + 10\text{Log}(10/5) = 46.02\text{ dBm}$
- For average power limit = $10\text{Log}(2 \times 1000)\text{dBm} + 10\text{Log}(\text{Bandwidth}/5\text{MHz})$
 Eg: For 10 MHz Bandwidth, the limit = $33.01\text{dBm} + 10\text{Log}(10/5) = 36.02\text{ dBm}$
- Test data shows that average EIRP is less than 33 dBm per 5 MHz in the 2305-2320 MHz band or the 2345-2360 MHz band and EUT is classified outdoor CPE station installations operating with 2 watts per 5 megahertz or less average EIRP.

2570MHz-2620MHz:

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Limit (dBm)
			QPSK	16-QAM	
5M	L	1#0	20.21	20.37	33.00
		1#13	20.70	20.85	
		1#24	20.53	20.72	
		12#0	20.51	20.56	
		12#6	20.66	20.76	
		12#13	20.82	20.85	
		25#0	20.69	20.72	
	M	1#0	21.21	21.19	
		1#13	21.53	21.49	
		1#24	21.01	20.98	
		12#0	21.34	21.32	
		12#6	21.26	21.22	
		12#13	21.20	21.18	
		25#0	21.34	21.31	
	H	1#0	20.59	20.61	
		1#13	20.88	20.91	
		1#24	20.69	20.71	
		12#0	20.71	20.69	
		12#6	20.72	20.71	
		12#13	20.76	20.75	
		25#0	20.77	20.75	
10M	L	1#0	20.06	20.04	33.00
		1#25	21.03	21.01	
		1#49	20.92	20.91	
		25#0	20.47	20.46	
		25#13	20.49	20.55	
		25#25	20.70	20.71	
		50#0	20.65	20.62	
	M	1#0	21.01	21.13	
		1#25	21.57	21.67	
		1#49	21.28	21.42	
		25#0	21.11	21.10	
		25#13	21.06	21.05	
		25#25	21.02	21.03	
		50#0	21.07	21.06	
	H	1#0	20.44	20.45	
		1#25	20.82	20.82	
		1#49	20.83	20.85	
		25#0	20.65	20.63	
		25#13	20.62	20.58	
		25#25	20.57	20.56	
		50#0	20.56	20.42	

Test Bandwidth	Test Channel	Resource Block & RB offset	Peak Output Power (dBm)	Peak Output Power (dBm)	Limit (dBm)
			QPSK	16-QAM	
15M	L	1#0	20.23	20.15	33.00
		1#38	21.07	20.92	
		1#74	21.03	20.89	
		36#0	20.76	20.67	
		36#19	20.83	20.73	
		36#39	20.98	20.84	
		75#0	20.84	20.80	
	M	1#0	21.22	21.21	
		1#38	21.56	21.55	
		1#74	21.19	21.19	
		36#0	21.26	21.10	
		36#19	21.25	21.08	
		36#39	21.24	21.07	
		75#0	21.25	21.09	
	H	1#0	20.69	20.70	
		1#38	20.91	20.92	
		1#74	20.87	20.83	
		36#0	20.68	20.57	
		36#19	20.71	20.60	
		36#39	20.72	20.59	
		75#0	20.69	20.60	
20M	L	1#0	20.93	21.00	33.00
		1#50	20.94	21.02	
		1#99	20.71	20.81	
		50#0	20.94	20.74	
		50#25	20.85	20.69	
		50#50	20.73	20.55	
		100#0	20.79	20.64	
	M	1#0	21.18	21.42	
		1#50	21.54	21.72	
		1#99	21.03	21.25	
		50#0	21.29	21.17	
		50#25	21.23	21.09	
		50#50	21.16	21.06	
		100#0	21.18	21.05	
	H	1#0	20.26	20.19	
		1#50	21.23	21.12	
		1#99	21.38	21.28	
		50#0	20.81	20.72	
		50#25	21.23	20.86	
		50#50	21.14	21.02	
		100#0	20.98	20.85	

Radiated Power:

2305MHz-2320MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	
QPSK 5M BW Middle Channel (2312.5MHz)						
2312.500	H	91.42	22.4	11.4	1.9	31.9
2312.500	V	74.87	6.5	11.4	1.9	16.0
QPSK 10M BW Middle Channel (2312.5MHz)						
2312.500	H	91.27	22.2	11.4	1.9	31.7
2312.500	V	77.81	9.4	11.4	1.9	18.9
QPSK 15M BW Middle Channel (2312.5MHz)						
2312.500	H	91.03	22	11.4	1.9	31.5
2312.500	V	76.87	8.5	11.4	1.9	18.0
16-QAM 5M BW Middle Channel (2312.5MHz)						
2312.500	H	91.79	22.7	11.4	1.9	32.2
2312.500	V	78.14	9.8	11.4	1.9	19.3
16-QAM 10M BW Middle Channel (2312.5MHz)						
2312.500	H	90.87	21.8	11.4	1.9	31.3
2312.500	V	78.59	10.2	11.4	1.9	19.7
16-QAM 15M BW Middle Channel (2312.5MHz)						
2312.500	H	91.77	22.7	11.4	1.9	32.2
2312.500	V	78.92	10.6	11.4	1.9	20.1

2345MHz-2360MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	
QPSK 5M BW Middle Channel (2352.5MHz)						
2352.500	H	91.33	21.9	11.8	2	31.7
2352.500	V	76.23	7.6	11.8	2	17.4
QPSK 10M BW Middle Channel (2352.5MHz)						
2352.500	H	91.07	21.7	11.8	2	31.5
2352.500	V	76.11	7.5	11.8	2	17.3
QPSK 15M BW Middle Channel (2352.5MHz)						
2352.500	H	91.52	22.1	11.8	2	31.9
2352.500	V	76.89	8.2	11.8	2	18.0
16-QAM 5M BW Middle Channel (2352.5MHz)						
2352.500	H	92.07	22.7	11.8	2	32.5
2352.500	V	76.81	8.2	11.8	2	18.0
16-QAM 10M BW Middle Channel (2352.5MHz)						
2352.500	H	91.88	22.5	11.8	2	32.3
2352.500	V	77.44	8.8	11.8	2	18.6
16-QAM 15M BW Middle Channel (2352.5MHz)						
2352.500	H	91.71	22.3	11.8	2	32.1
2352.500	V	77.20	8.5	11.8	2	18.3

2570MHz-2620MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	
QPSK 5M BW Middle Channel (2595MHz)						
2595.000	H	95.63	24.9	13.2	2.9	35.2
2595.000	V	78.59	9.7	13.2	2.9	20.0
QPSK 10M BW Middle Channel (2595MHz)						
2595.000	H	95.87	25.1	13.2	2.9	35.4
2595.000	H	78.81	8.1	13.2	2.9	18.4
QPSK 15M BW Middle Channel (2595MHz)						
2595.000	H	96.45	25.7	13.2	2.9	36.0
2595.000	H	78.67	7.9	13.2	2.9	18.2
QPSK 20M BW Middle Channel (2595MHz)						
2595.000	H	96.06	25.3	13.2	2.9	35.6
2595.000	V	79.88	11	13.2	2.9	21.3
16-QAM 5M BW Middle Channel (2595MHz)						
2595.000	H	95.36	24.6	13.2	2.9	34.9
2595.000	V	78.55	9.7	13.2	2.9	20.0
16-QAM 10M BW Middle Channel (2595MHz)						
2595.000	H	96.85	26.1	13.2	2.9	36.4
2595.000	H	78.11	7.4	13.2	2.9	17.7
16-QAM 15M BW Middle Channel (2595MHz)						
2595.000	H	95.96	25.2	13.2	2.9	35.5
2595.000	V	78.97	10.1	13.2	2.9	20.4
16-QAM 20M BW Middle Channel (2595MHz)						
2595.000	H	95.41	24.7	13.2	2.9	35.0
2595.000	V	79.37	10.5	13.2	2.9	20.8

Duty cycle:

2305-2320MHz

Test Modulation	Test Bandwidth	Ton(ms)	Total(ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	3.12	10.02	31.14	38
	10M	3.18	10.02	31.74	
	15M	3.12	10.02	31.14	
16-QAM	5M	3.12	10.02	31.14	
	10M	3.18	10.02	31.74	
	15M	3.12	10.02	31.14	

2345-2360MHz

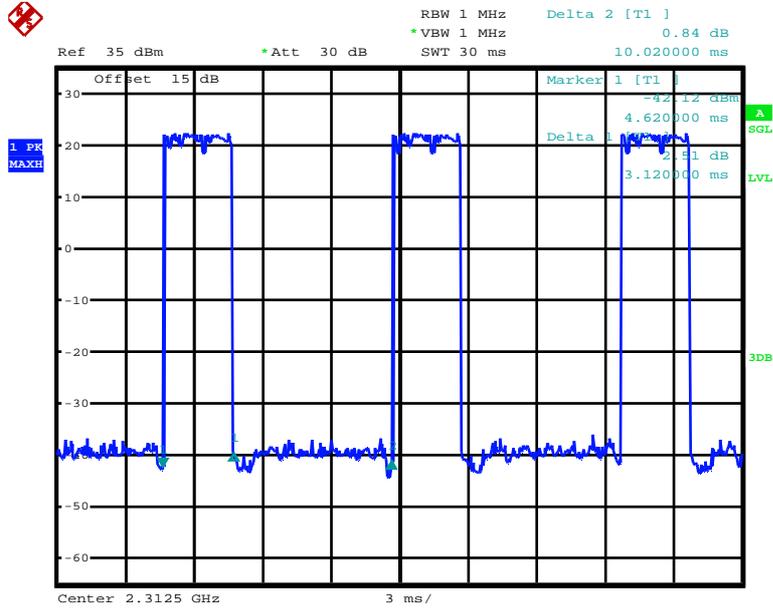
Test Modulation	Test Bandwidth	Ton(ms)	Total(ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	3.12	10.02	31.14	38
	10M	3.12	10.02	31.14	
	15M	3.12	10.02	31.14	
16-QAM	5M	3.12	10.02	31.14	
	10M	3.12	10.02	31.14	
	15M	3.18	10.02	31.74	

Note : EUT setup is as following:

Uplink Downlink configuration	Subframe number									
	0	1	2	3	4	5	6	7	8	9
3	D	S	U	U	U	D	D	D	D	D

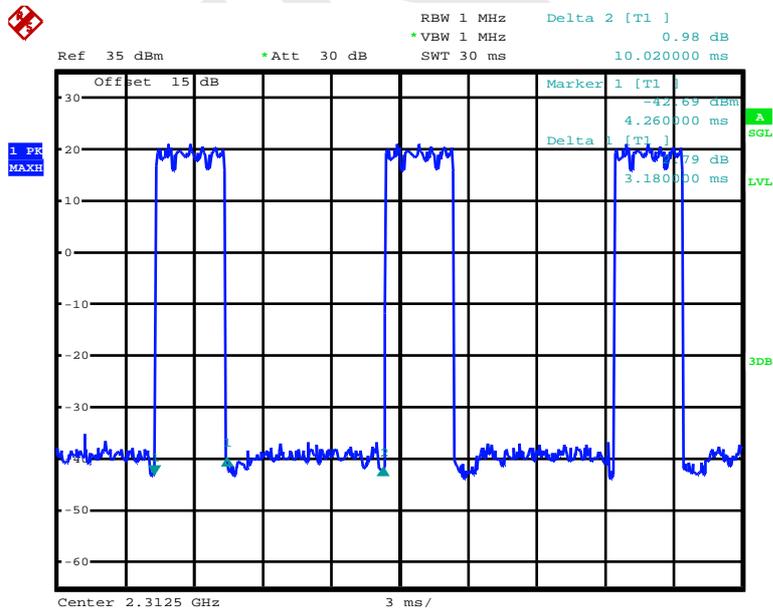
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QPSK, 5MHz



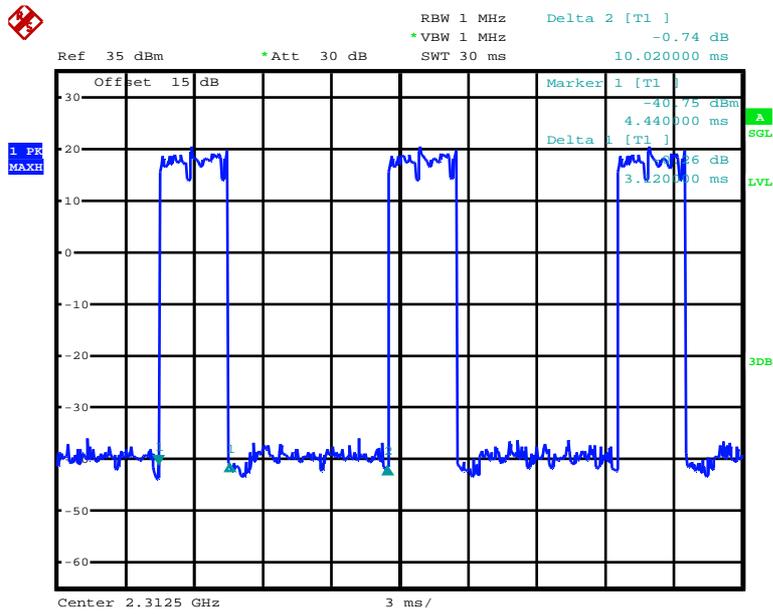
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QPSK, 10MHz



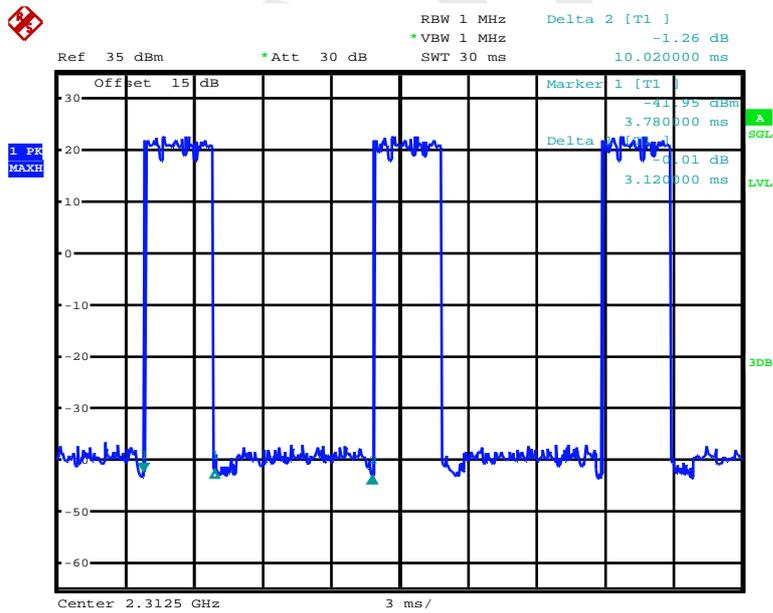
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QPSK, 15MHz



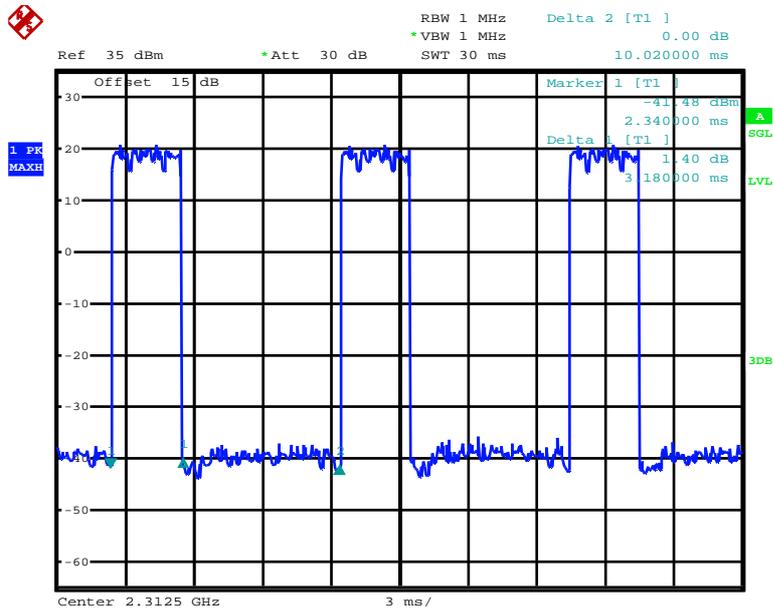
Date: 28.JUL.2014 14:24:11

16QAM, 5MHz



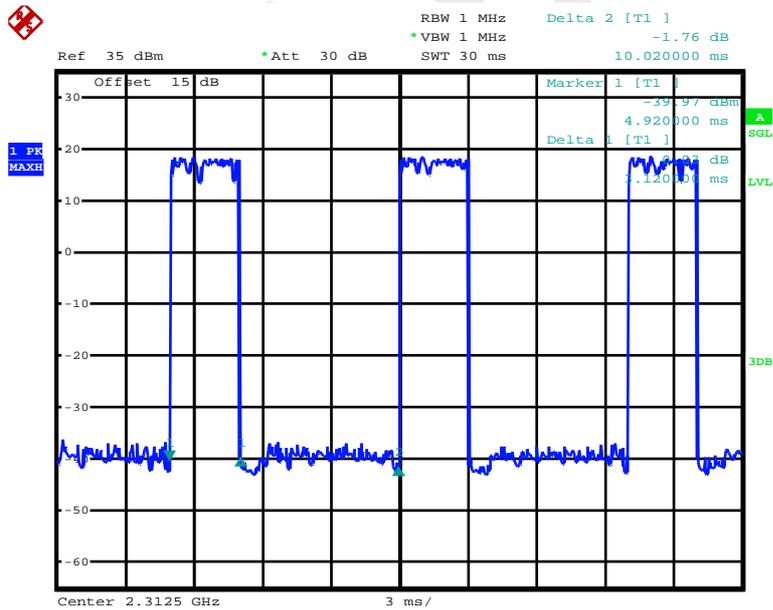
Date: 28.JUL.2014 14:17:49

16QAM, 10MHz



Date: 28.JUL.2014 14:23:08

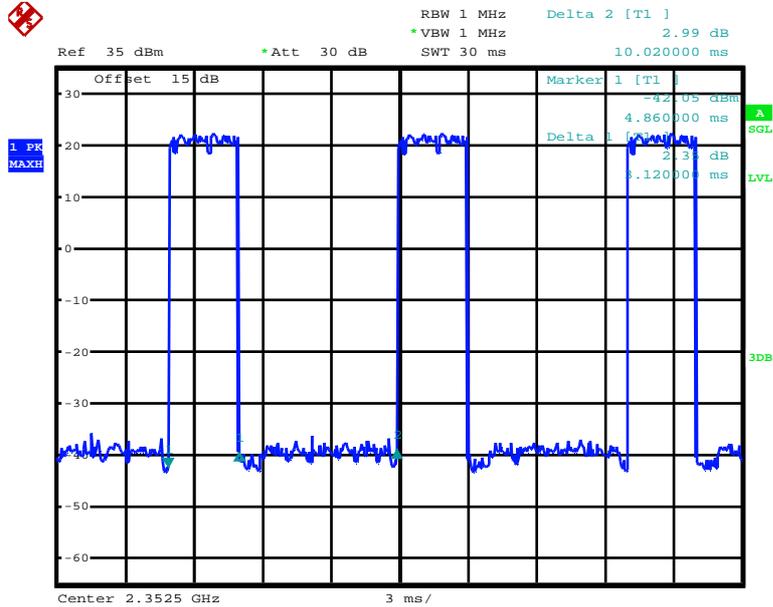
16QAM, 15MHz



Date: 28.JUL.2014 14:24:41

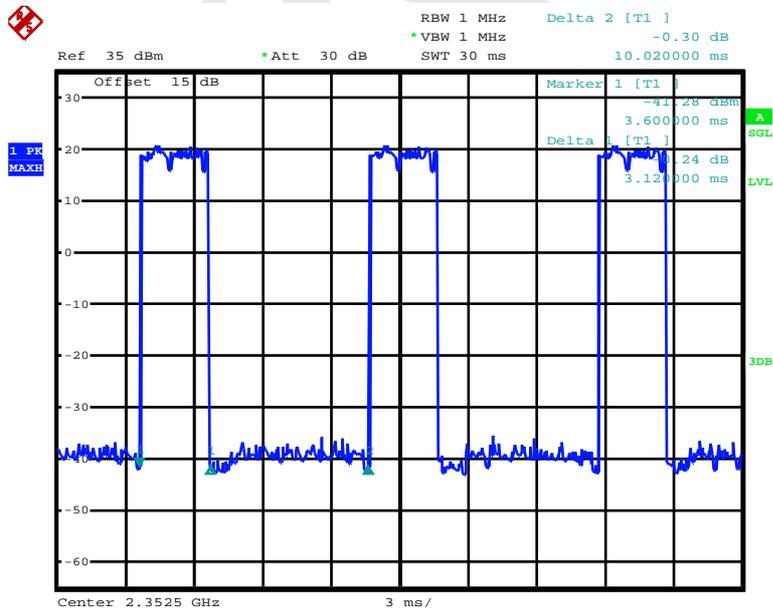
2345MHz-2360MHz:

QPSK, 5MHz



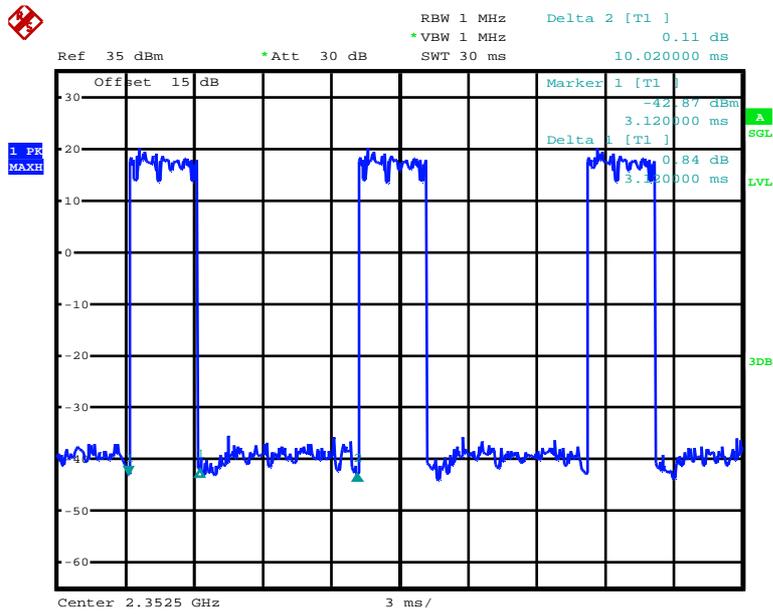
Date: 28.JUL.2014 14:20:49

QPSK, 10MHz



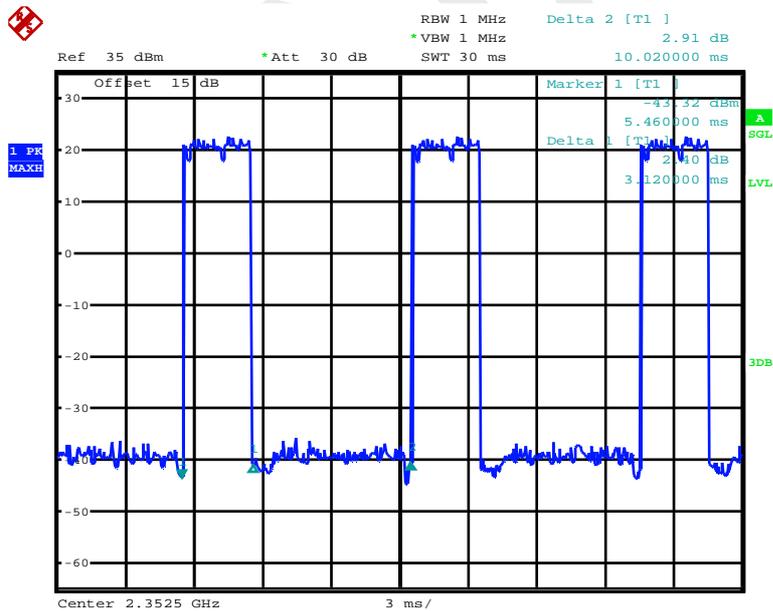
Date: 28.JUL.2014 14:21:46

QPSK, 15MHz



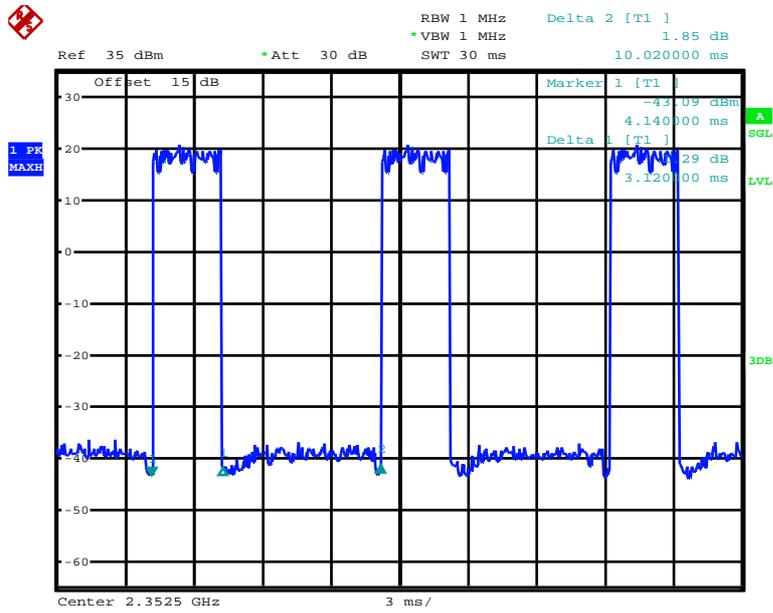
Date: 28.JUL.2014 14:26:18

16QAM, 5MHz



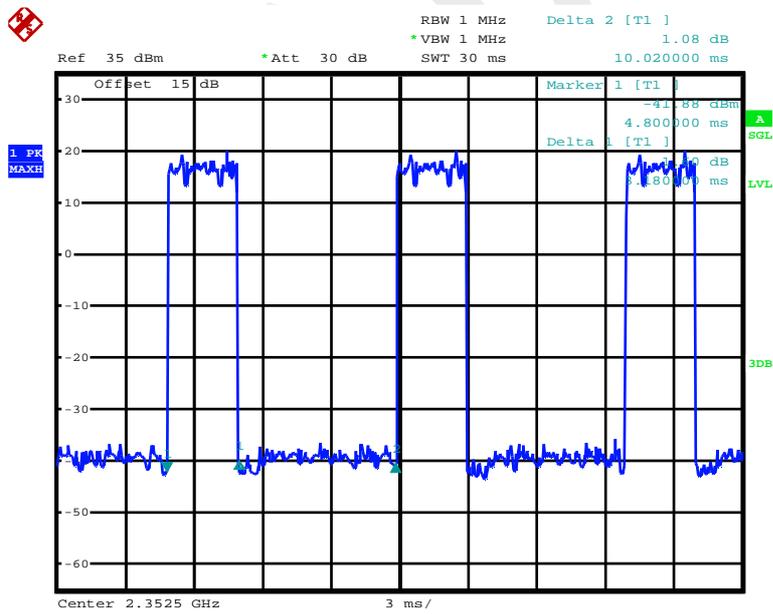
Date: 28.JUL.2014 14:18:35

16QAM, 10MHz



Date: 28.JUL.2014 14:21:25

16QAM, 15MHz



Date: 28.JUL.2014 14:25:41

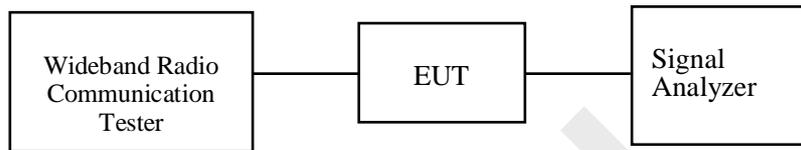
FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH

Applicable Standards

FCC 47 §2.1049 and §27.53.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	29.2 -29.5
Relative Humidity:	58 %-65 %
ATM Pressure:	100.0 kPa-100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28 & 2014-07-29.

2305MHz-2320MHz:

Test Modulation	Test Bandwidth	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	5M	M	4.54	5.16
	10M		8.96	9.68
	15M		13.62	15.46
16-QAM	5M		4.54	5.00
	10M		9.00	9.80
	15M		13.62	15.88

2345MHz-2360MHz:

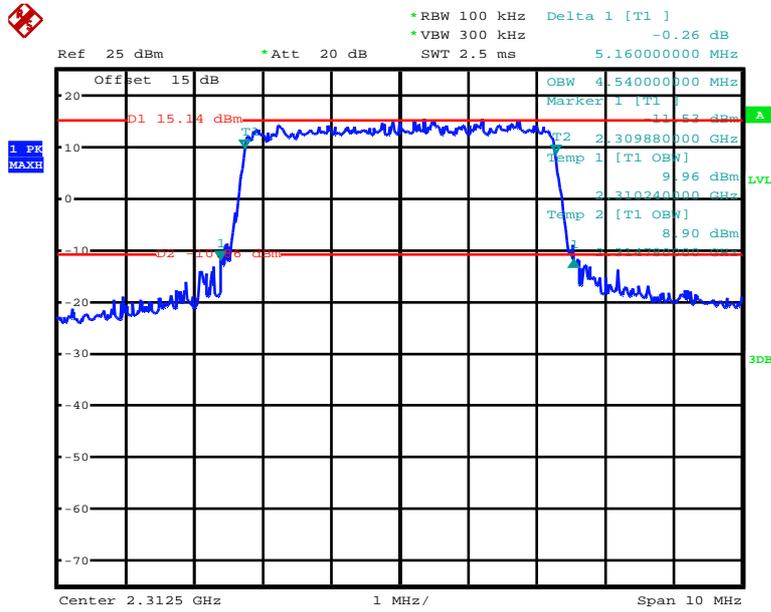
Test Modulation	Test Bandwidth	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	5M	M	4.52	5.12
	10M		8.96	9.74
	15M		13.56	16.44
16-QAM	5M		4.54	5.30
	10M		8.96	9.78
	15M		13.62	16.86

2570MHz-2620MHz:

Test Modulation	Test Bandwidth	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	5M	M	4.52	5.10
	10M		8.96	9.76
	15M		13.56	15.32
	20M		18.00	19.60
16-QAM	5M		4.52	5.06
	10M		8.96	9.76
	15M		13.50	15.14
	20M		18.00	19.76

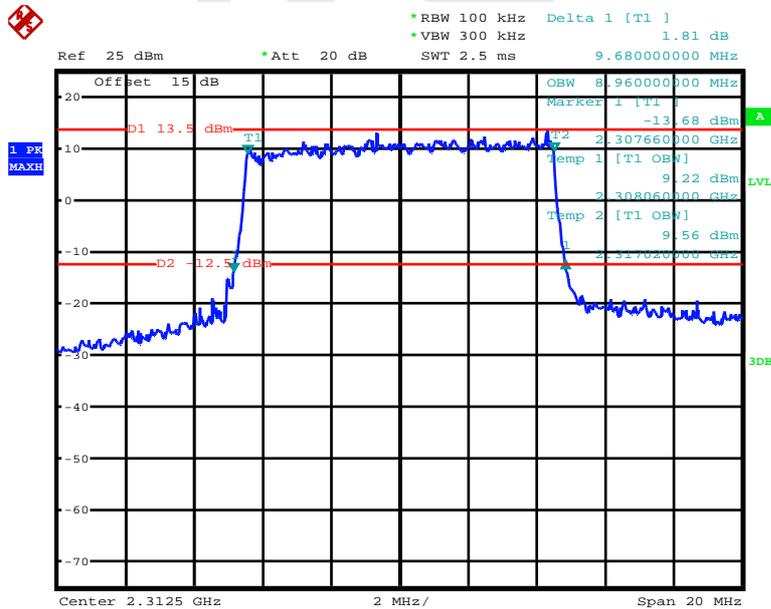
2305MHz-2320MHz:

QPSK, 5MHz



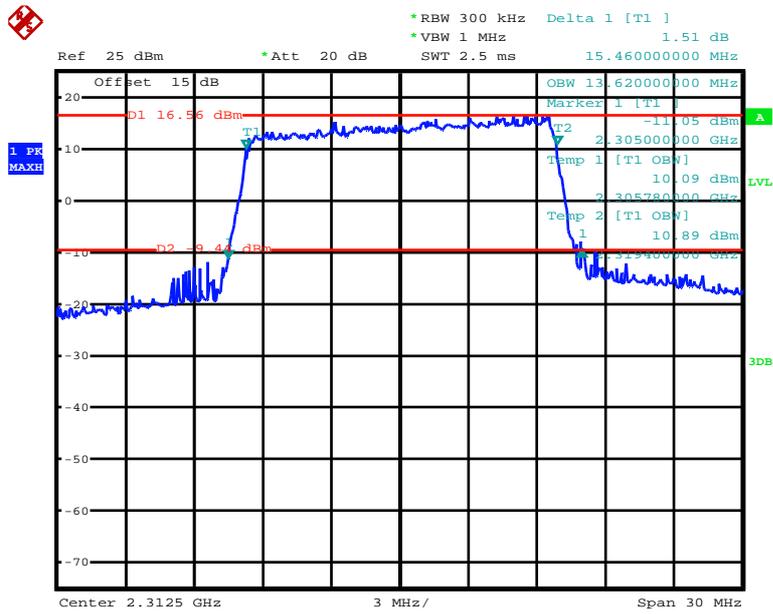
Date: 28.JUL.2014 21:09:44

QPSK, 10MHz



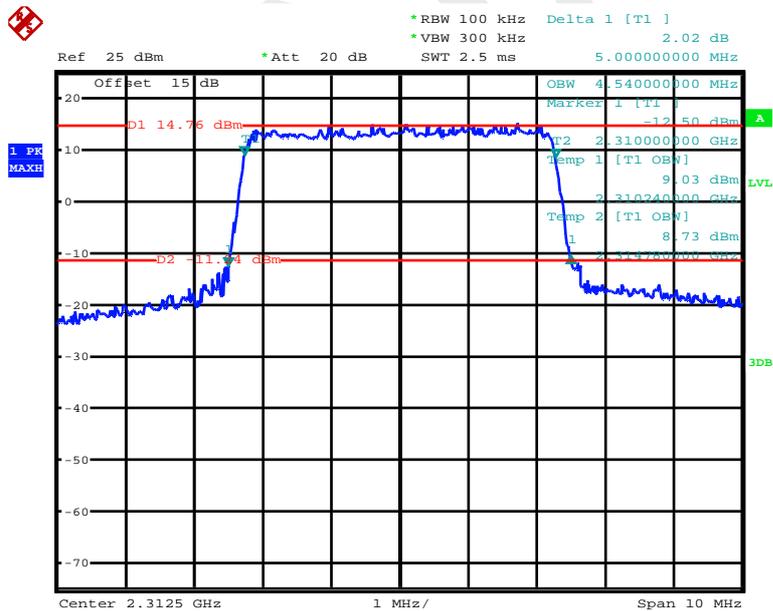
Date: 28.JUL.2014 21:17:13

QPSK, 15MHz



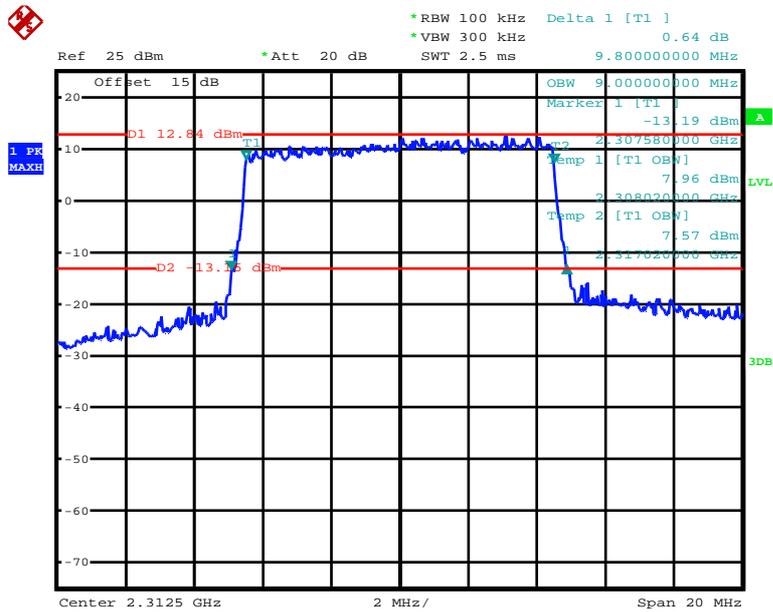
Date: 28.JUL.2014 21:19:25

16QAM, 5MHz



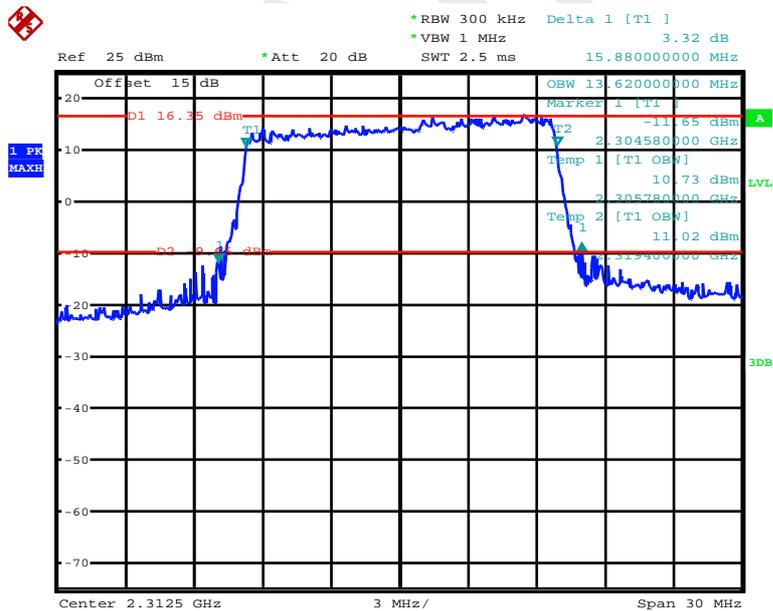
Date: 28.JUL.2014 21:08:59

16QAM, 10MHz



Date: 28.JUL.2014 21:16:43

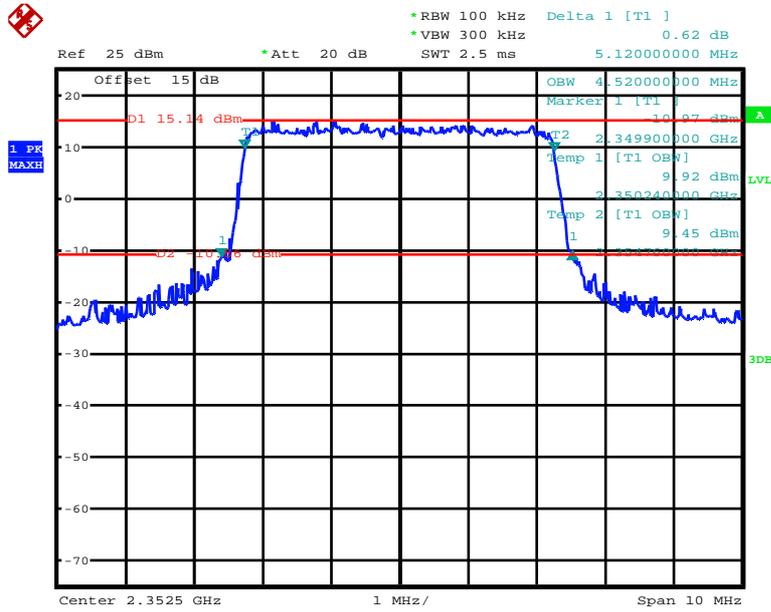
16QAM, 15MHz



Date: 28.JUL.2014 21:20:22

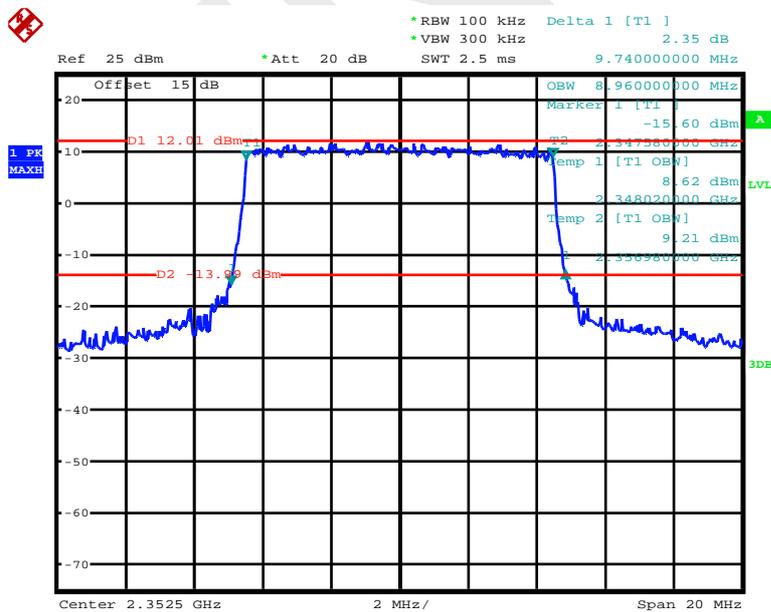
2345MHz-2360MHz:

QPSK, 5MHz



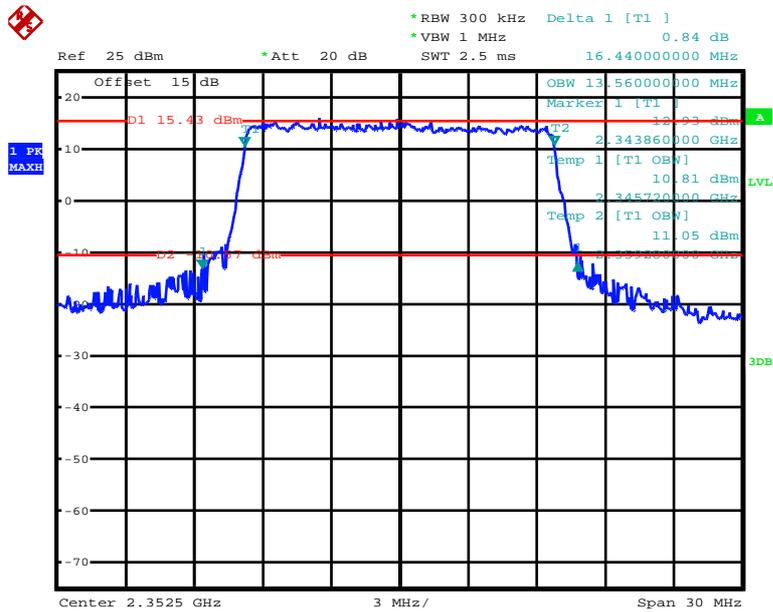
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QPSK, 10MHz



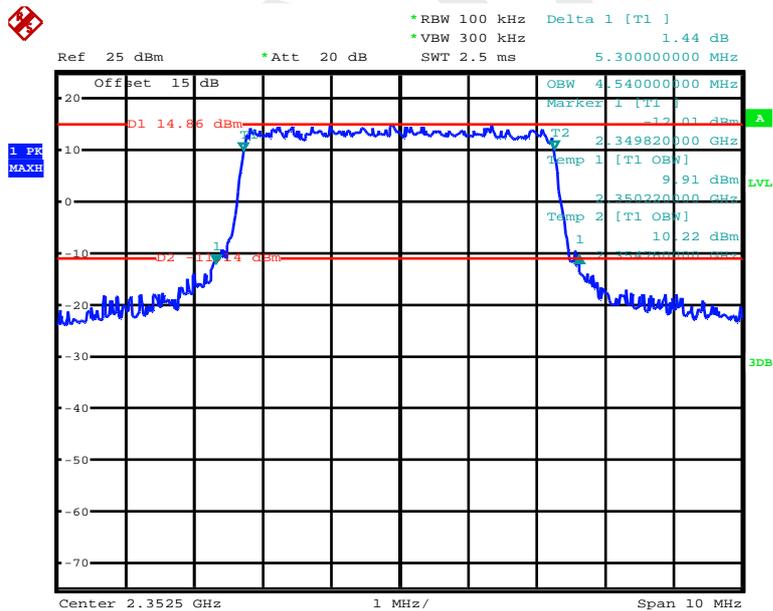
Date: 28.JUL.2014 21:14:21

QPSK, 15MHz



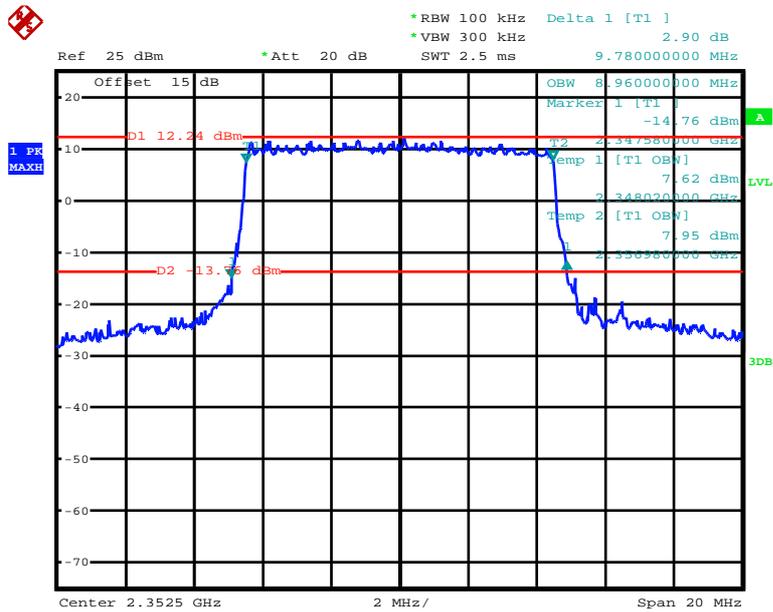
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16QAM, 5MHz



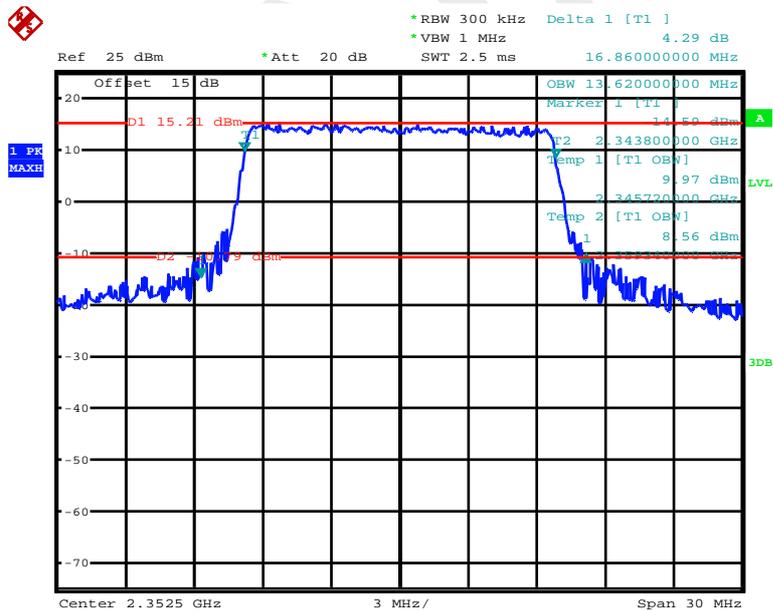
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16QAM, 10MHz



Date: 28.JUL.2014 21:15:47

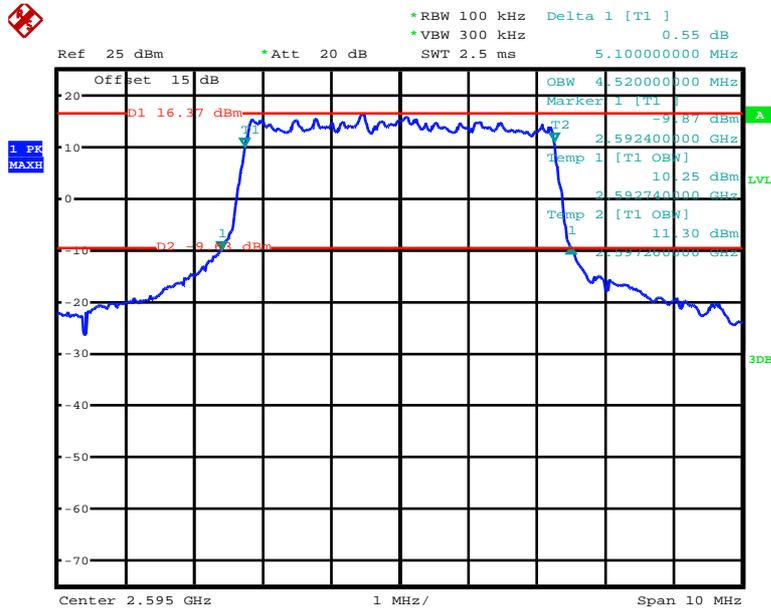
16QAM, 15MHz



Date: 28.JUL.2014 21:25:11

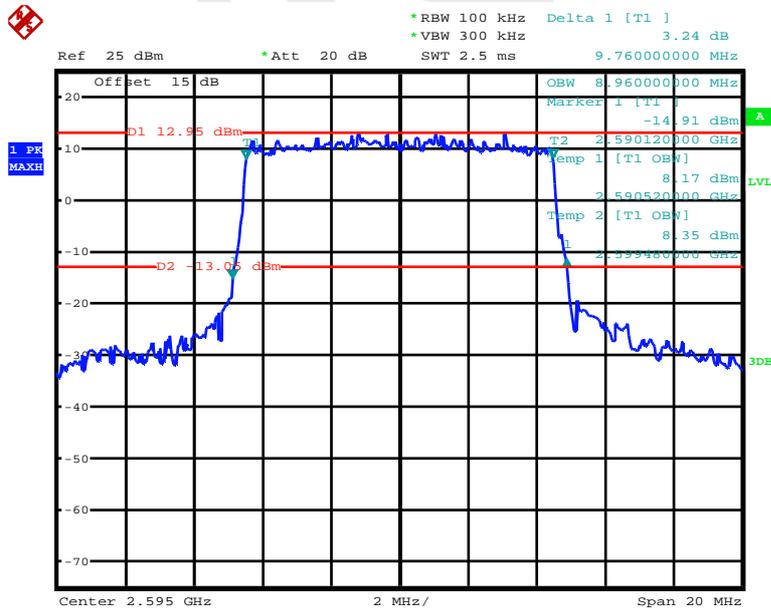
2570MHz-2620MHz:

QPSK, 5MHz



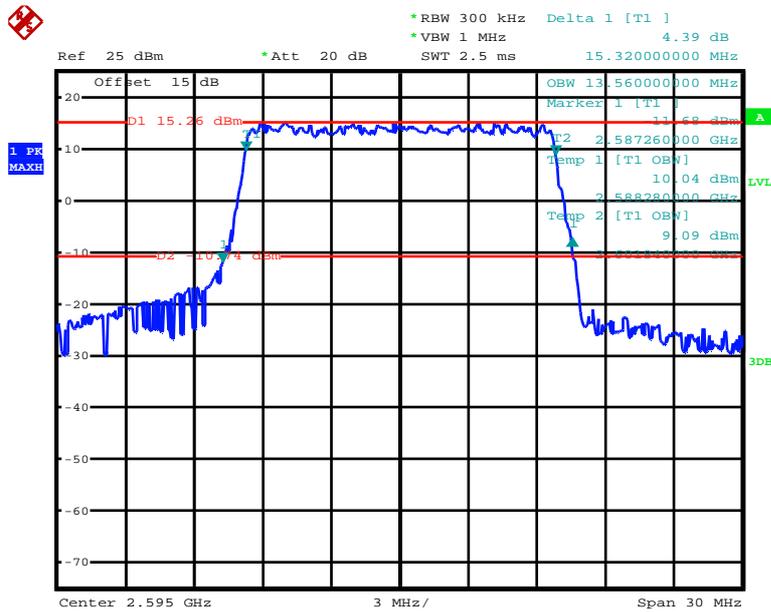
Date: 29.JUL.2014 22:02:27

QPSK, 10MHz



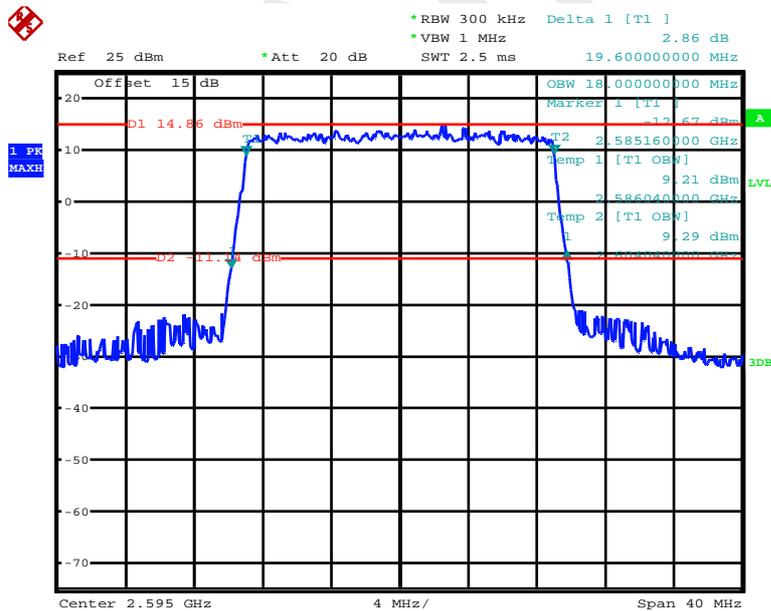
Date: 29.JUL.2014 22:15:18

QPSK, 15MHz



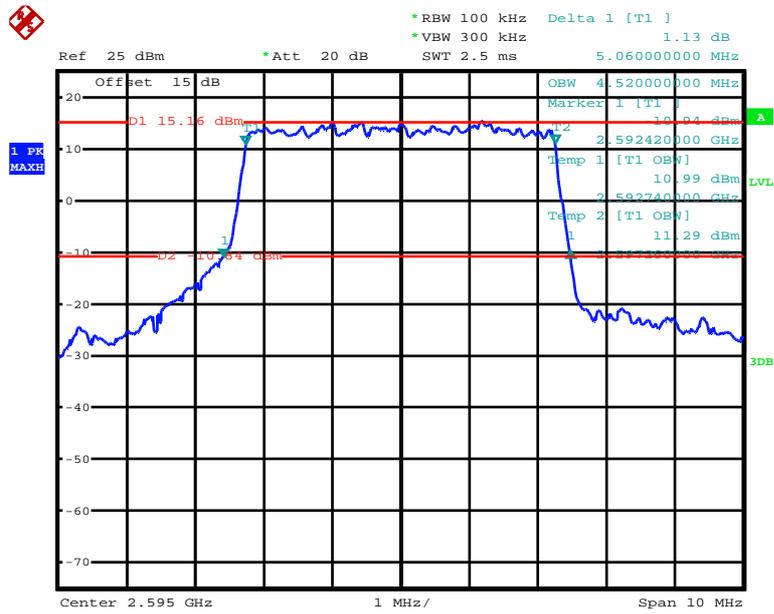
Date: 29.JUL.2014 22:16:24

QPSK, 20MHz



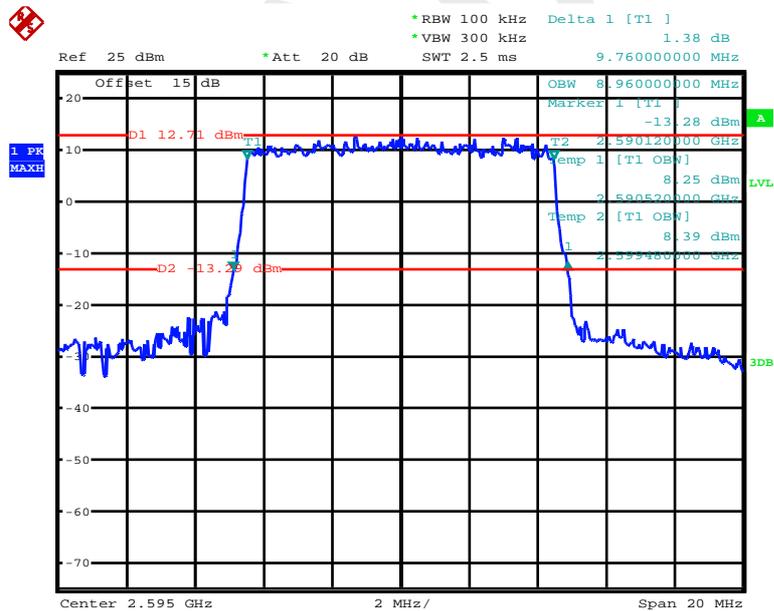
Date: 29.JUL.2014 22:23:44

16QAM, 5MHz



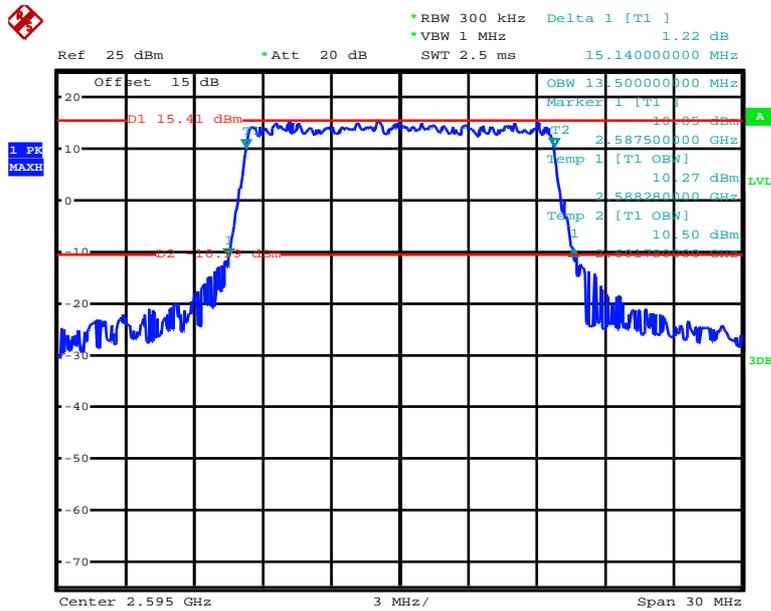
Date: 29.JUL.2014 22:05:06

16QAM, 10MHz



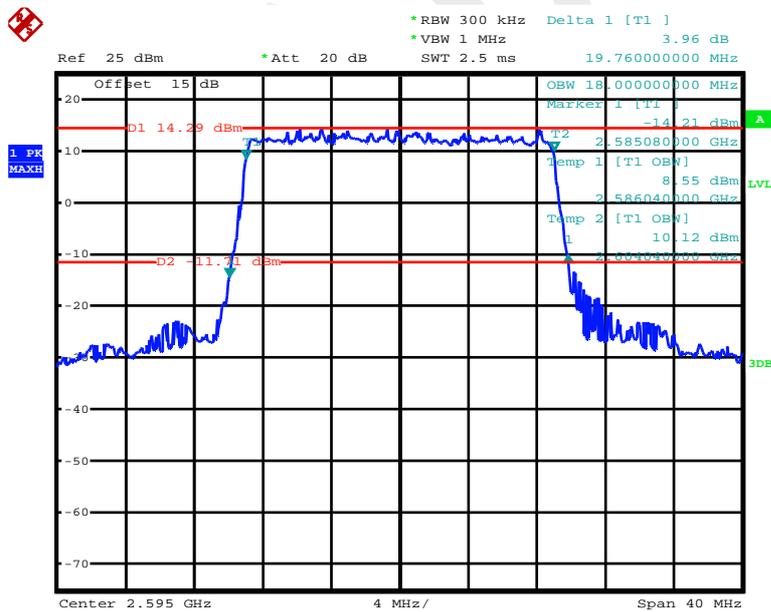
Date: 29.JUL.2014 22:14:03

16QAM, 15MHz



Date: 29.JUL.2014 22:17:11

16QAM, 20MHz



Date: 29.JUL.2014 22:23:00

FCC §2.1051 & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

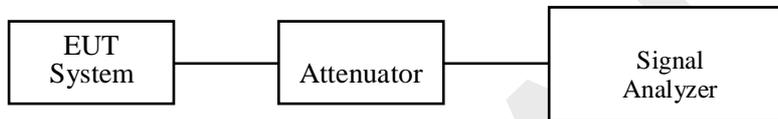
Applicable Standards

FCC §2.1051 and §27.53.

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 transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidths of the spectrum analyzer were set at 100 kHz @ below 1GHz, 1MHz @above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

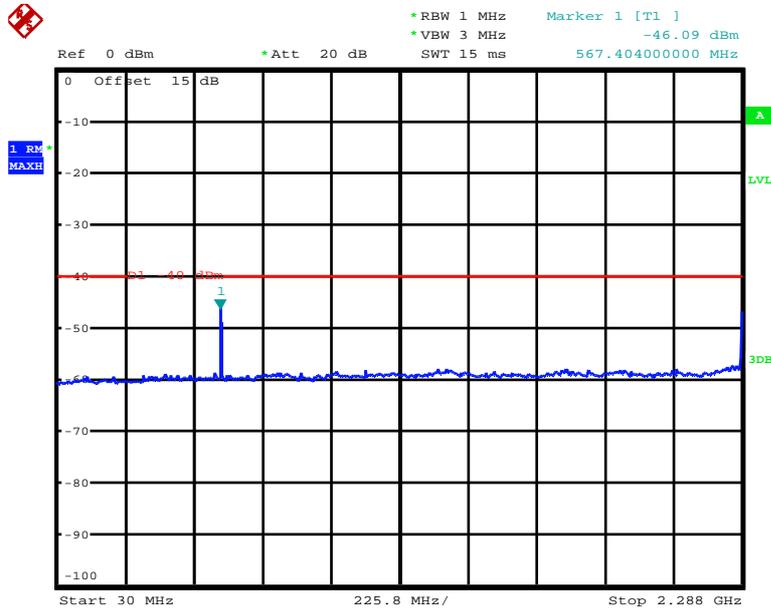
Temperature:	29.2 -29.5
Relative Humidity:	58 %-65 %
ATM Pressure:	100.0 kPa-100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28 & 2014-07-29.

Please refer to the following plots.

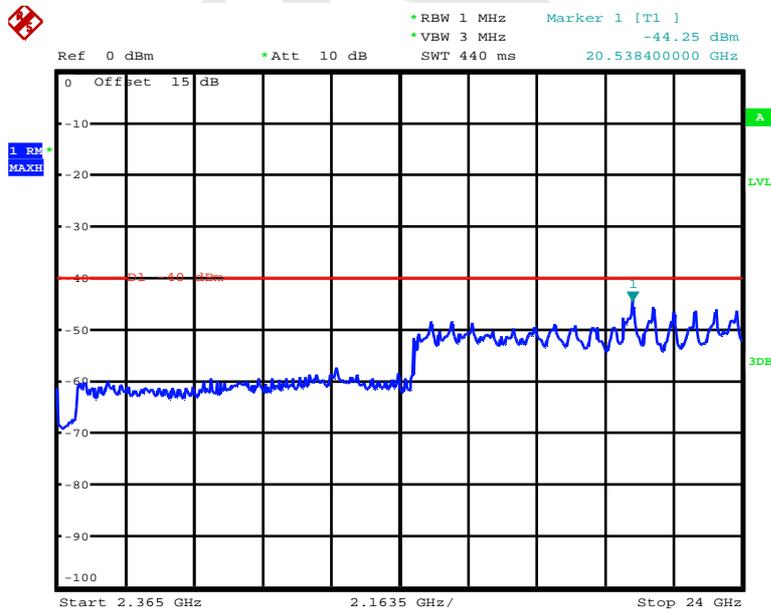
2305MHz-2320MHz:

QPSK, 5MHz, Low Channel, 30MHz – 2.288GHz



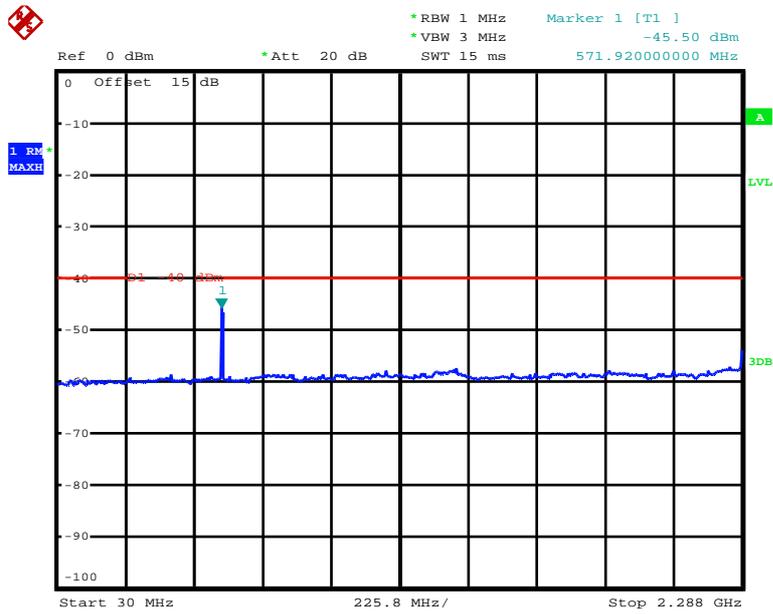
Date: 28.JUL.2014 20:43:09

QPSK, 5MHz, Low Channel, 2.365GHz - 24GHz



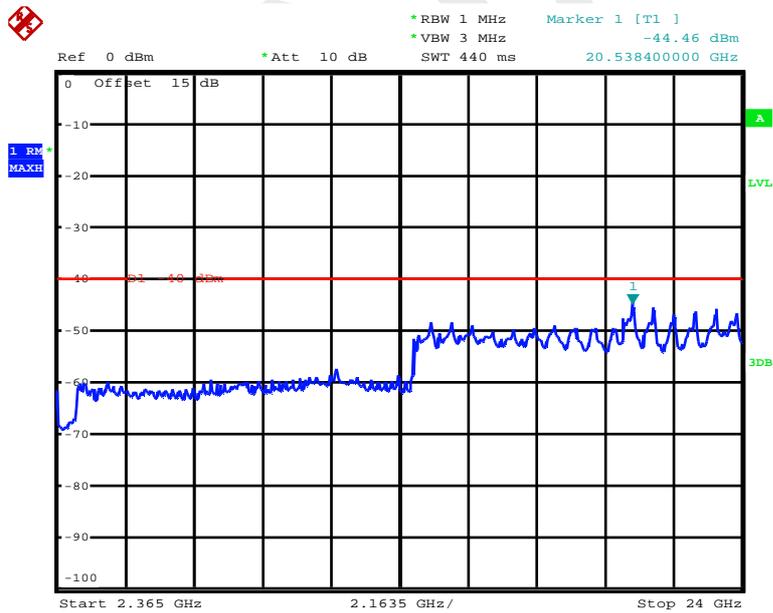
Date: 28.JUL.2014 20:42:57

QPSK, 5MHz, Middle Channel, 30MHz – 2.288GHz



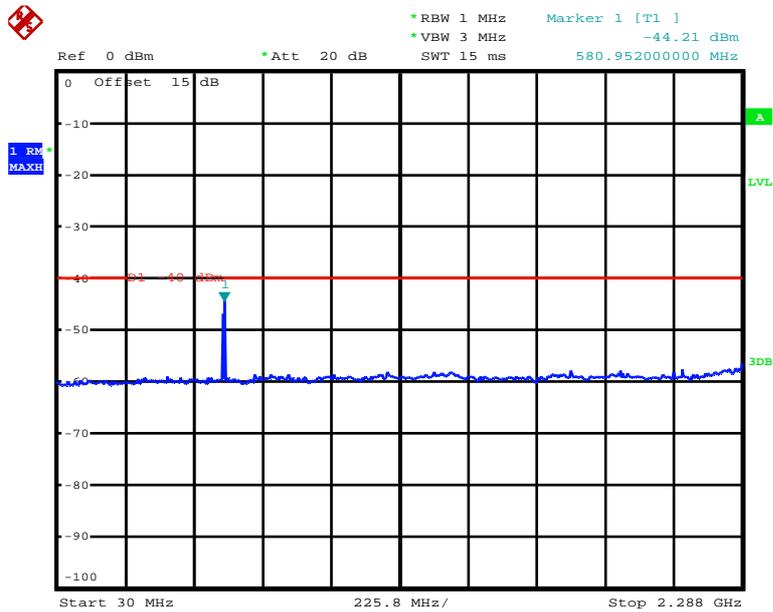
Date: 28.JUL.2014 20:43:26

QPSK, 5MHz, Middle Channel, 2.365GHz - 24GHz



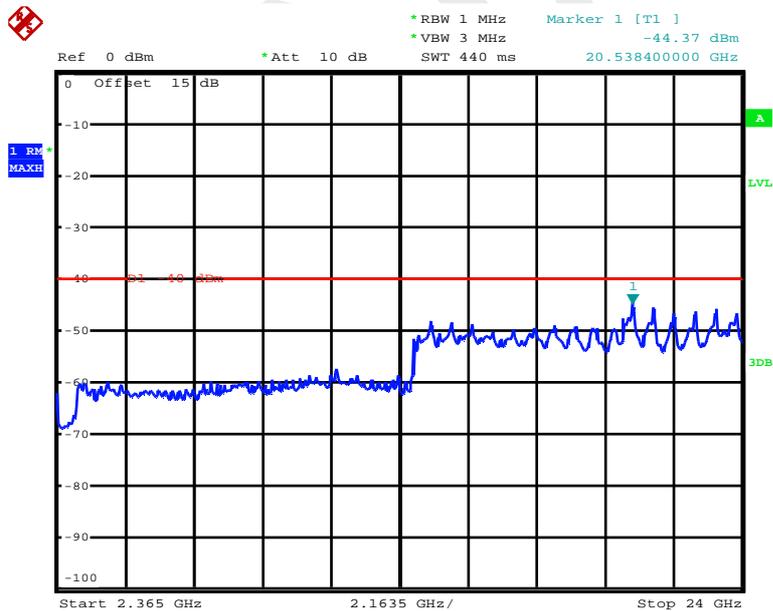
Date: 28.JUL.2014 20:43:39

QPSK, 5MHz, High Channel, 30MHz – 2.288GHz



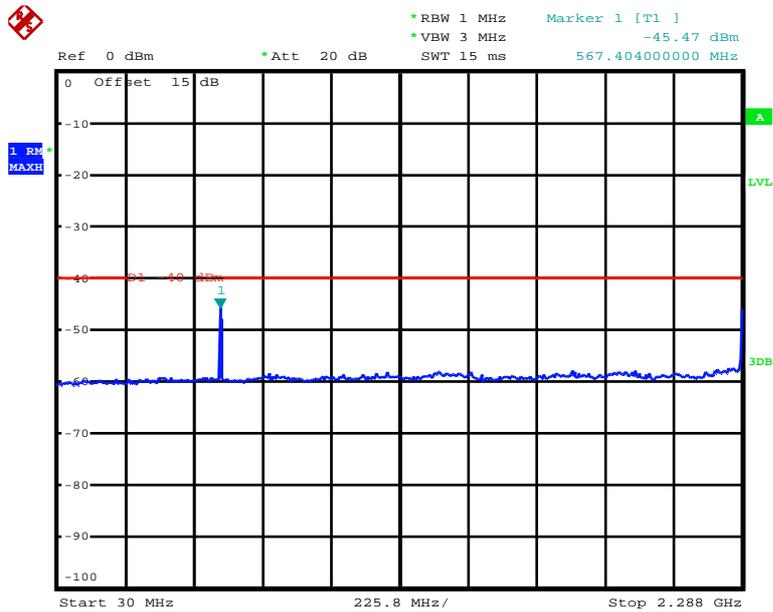
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QPSK, 5MHz, High Channel, 2.365GHz - 24GHz



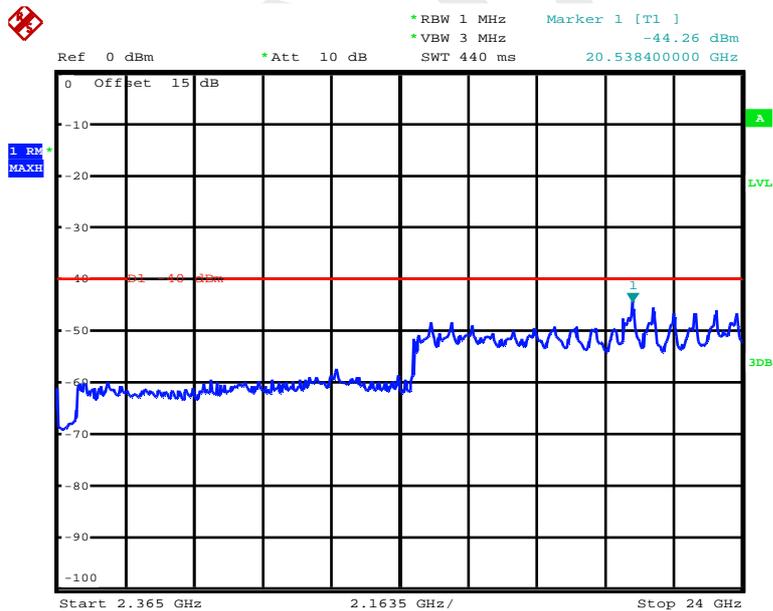
Date: 28.JUL.2014 20:44:51

16QAM, 5MHz, Low Channel, 30MHz – 2.288GHz



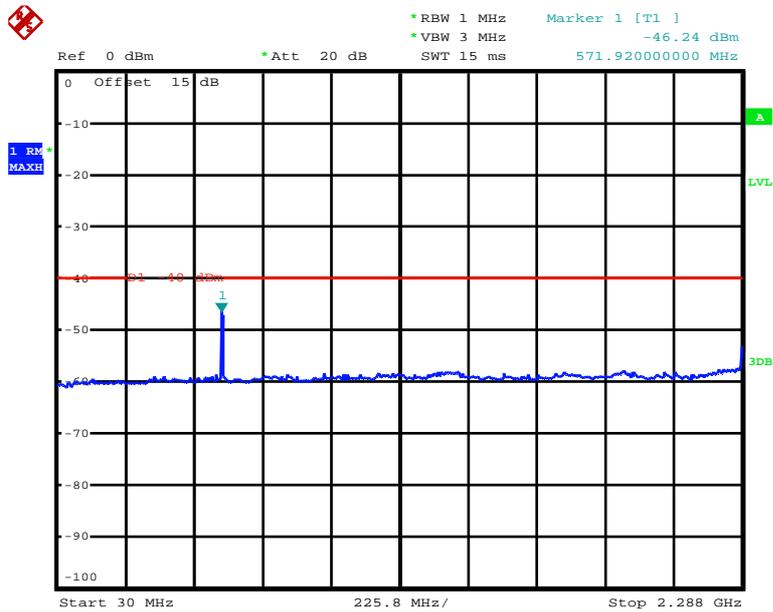
Date: 28.JUL.2014 20:42:21

16QAM, 5MHz, Low Channel, 2.365GHz - 24GHz



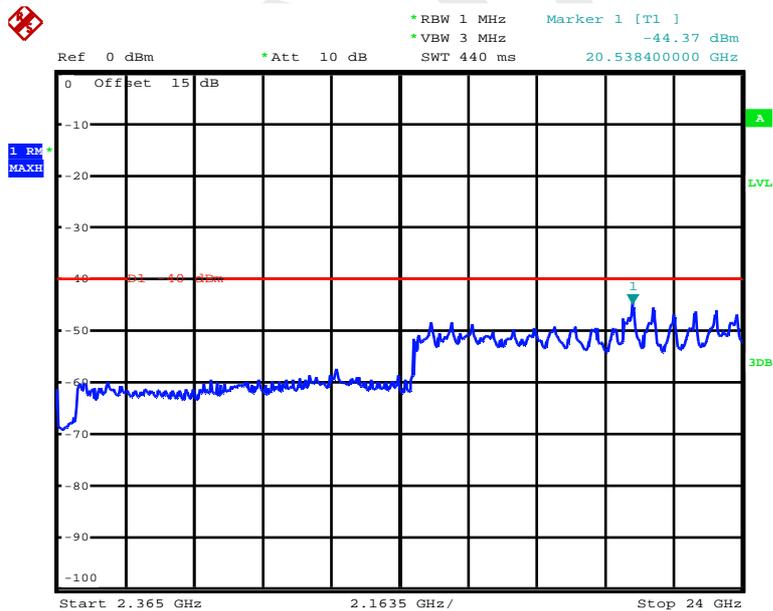
Date: 28.JUL.2014 20:42:34

16QAM, 5MHz, Middle Channel, 30MHz – 2.288GHz



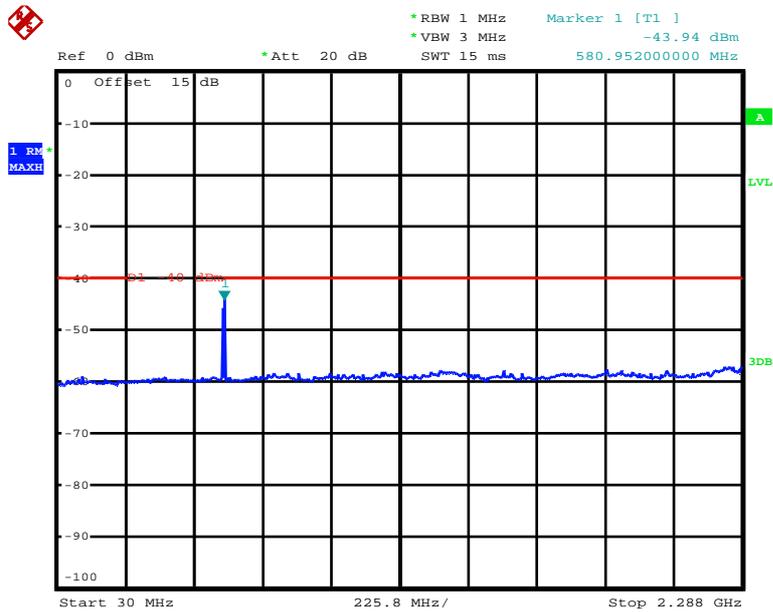
Date: 28.JUL.2014 20:44:03

16QAM, 5MHz, Middle Channel, 2.365GHz - 24GHz



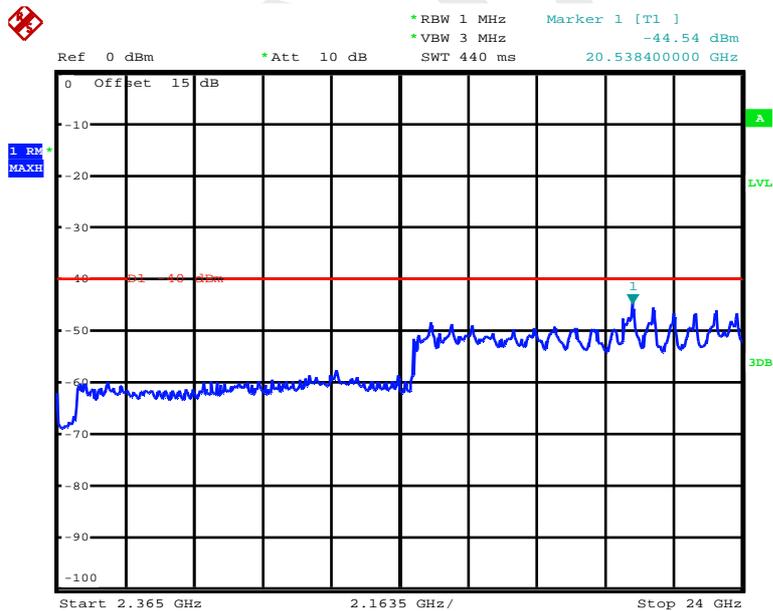
Date: 28.JUL.2014 20:43:51

16QAM, 5MHz, High Channel, 30MHz – 2.288GHz



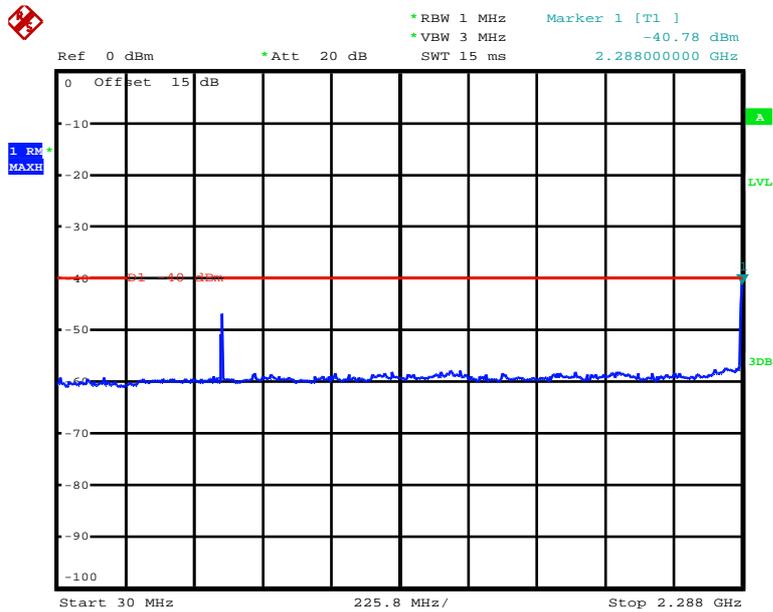
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16QAM, 5MHz, High Channel, 2.365GHz - 24GHz



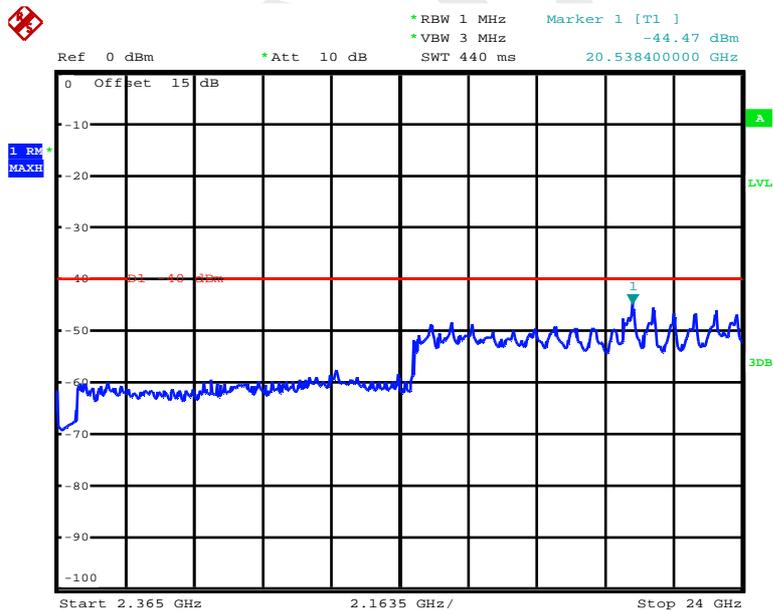
Date: 28.JUL.2014 20:44:40

QPSK, 10MHz, Low Channel, 30MHz – 2.288GHz



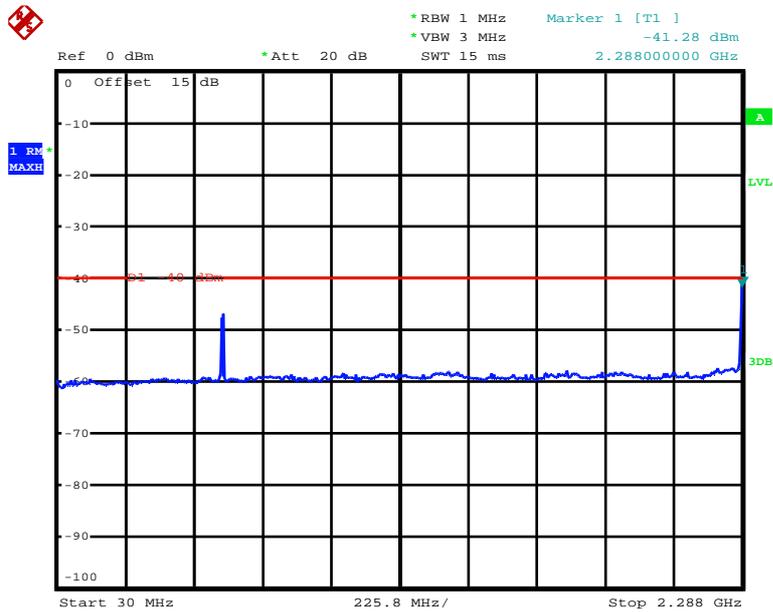
Date: 28.JUL.2014 20:29:31

QPSK, 10MHz, Low Channel, 2.365GHz - 24GHz



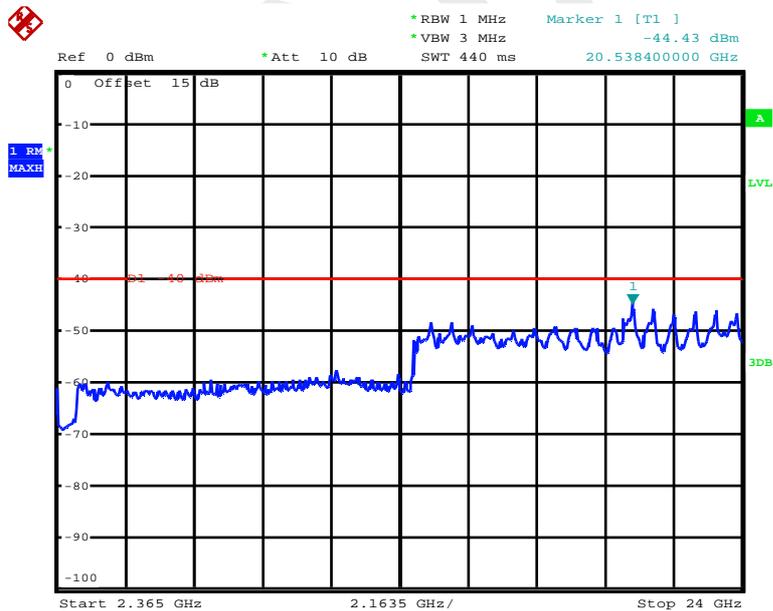
Date: 28.JUL.2014 20:29:21

QPSK, 10MHz, Middle Channel, 30MHz – 2.288GHz



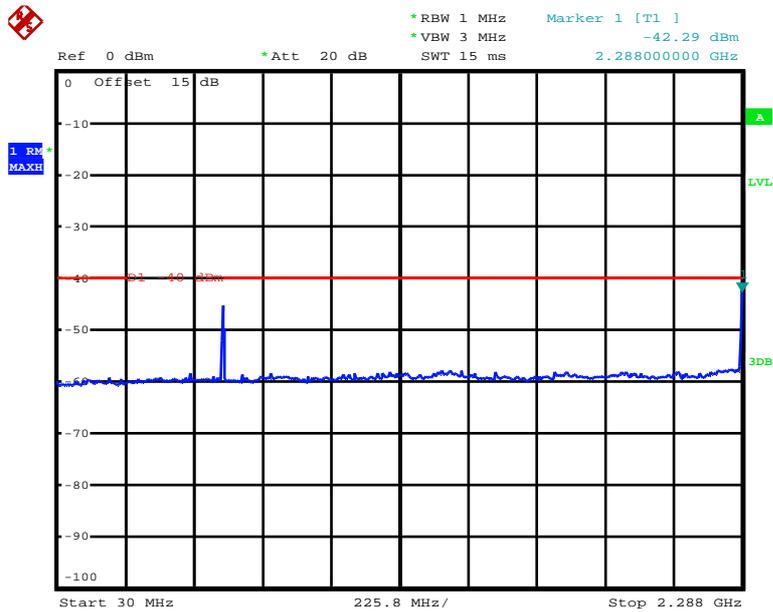
Date: 28.JUL.2014 20:28:07

QPSK, 10MHz, Middle Channel, 2.365GHz - 24GHz



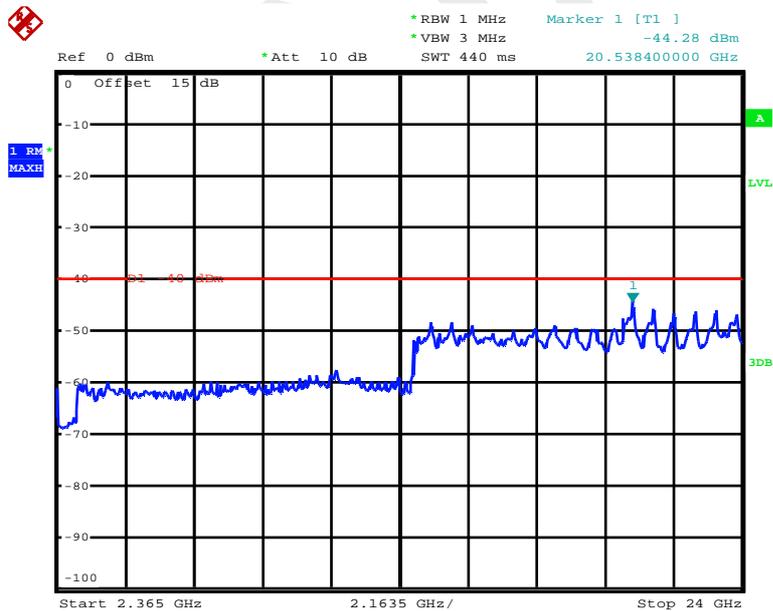
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QPSK, 10MHz, High Channel, 30MHz – 2.288GHz



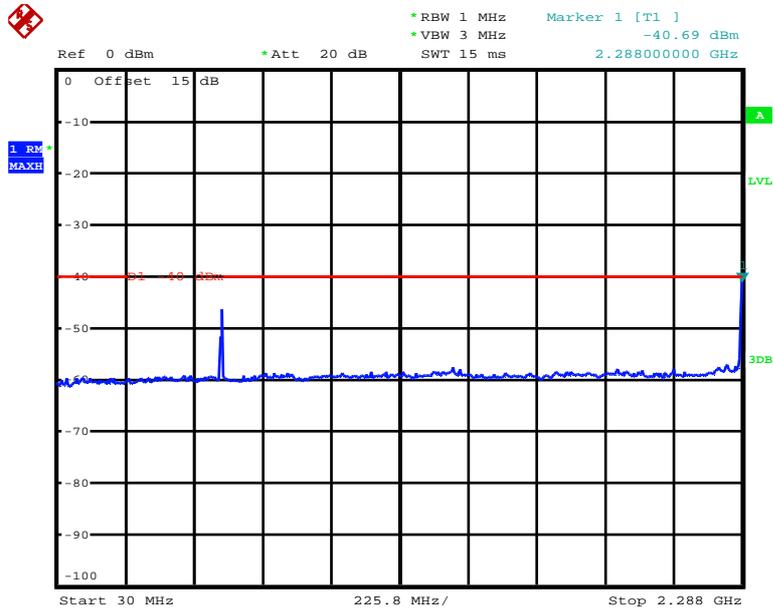
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QPSK, 10MHz, High Channel, 2.365GHz - 24GHz



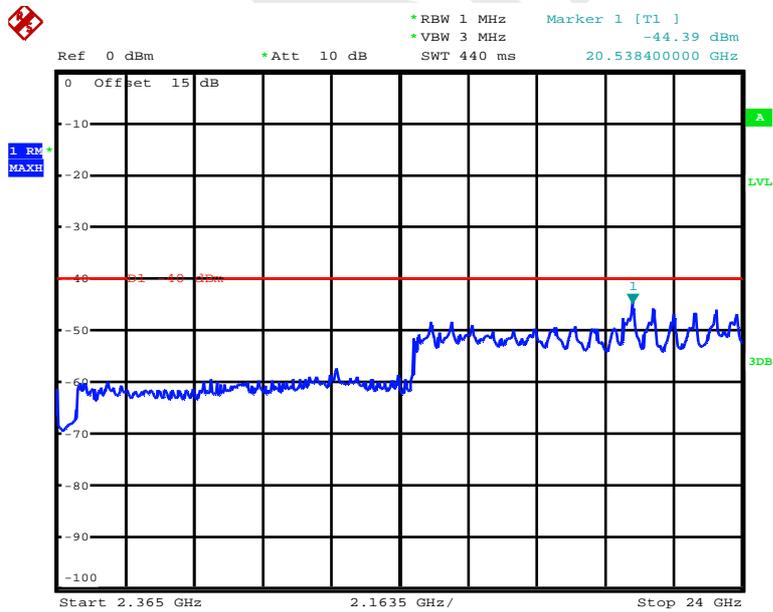
Date: 28.JUL.2014 20:27:00

16QAM, 10MHz, Low Channel, 30MHz – 2.288GHz



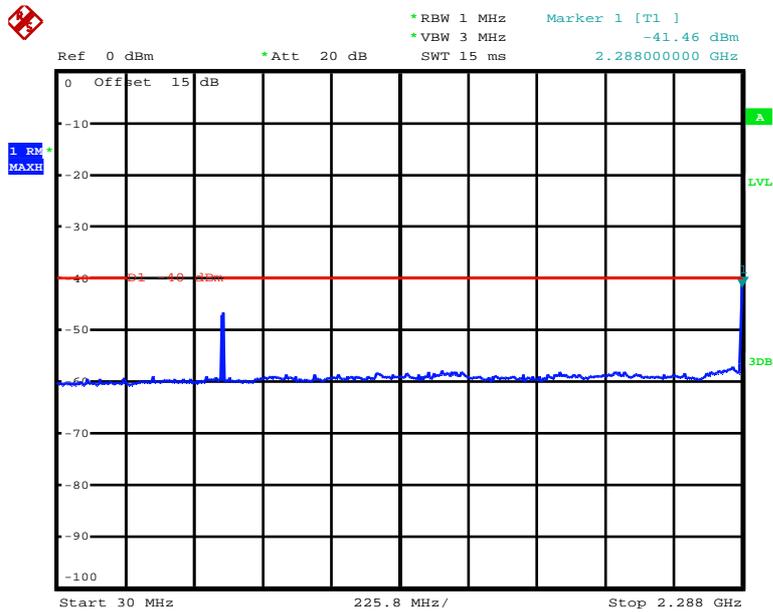
Date: 28.JUL.2014 20:29:04

16QAM, 10MHz, Low Channel, 2.365GHz - 24GHz



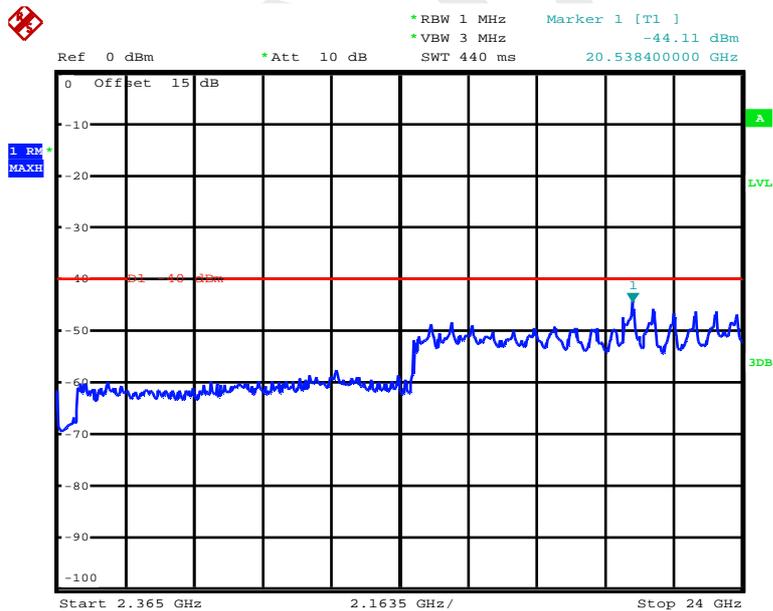
Date: 28.JUL.2014 20:29:16

16QAM, 10MHz, Middle Channel, 30MHz – 2.288GHz



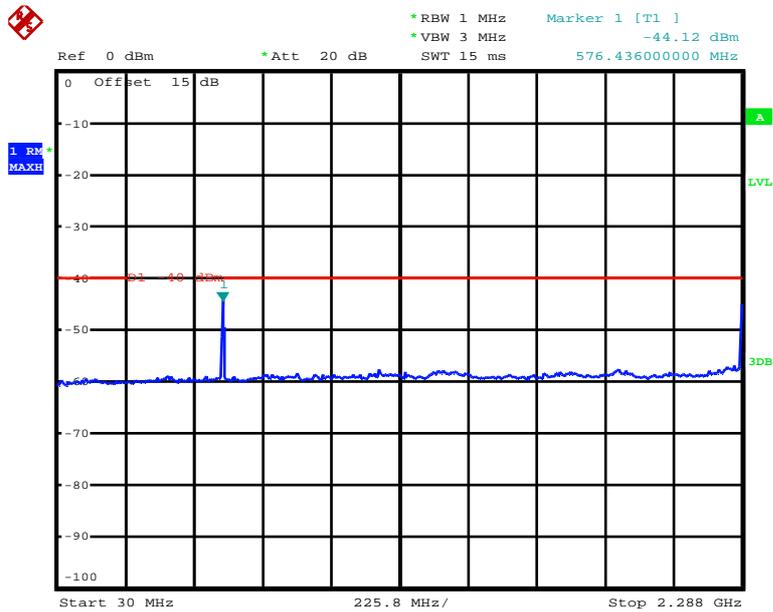
Date: 28.JUL.2014 20:28:49

16QAM, 10MHz, Middle Channel, 2.365GHz - 24GHz



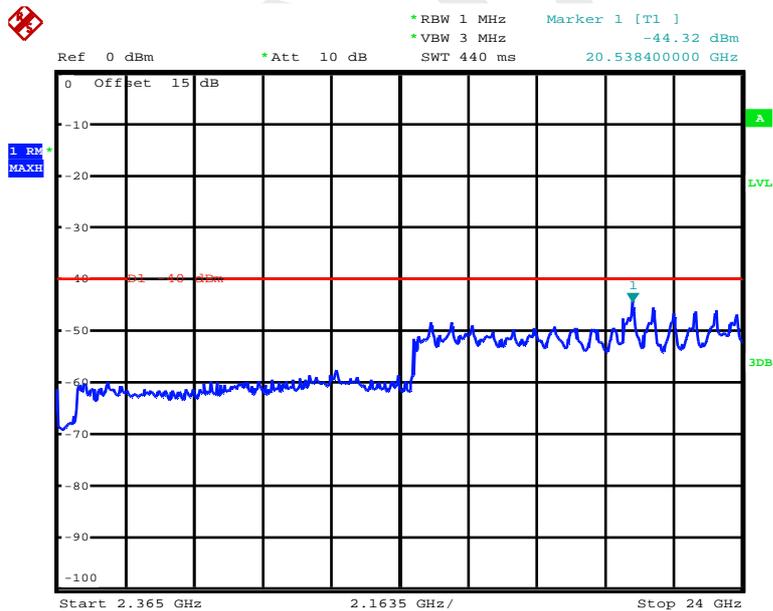
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16QAM, 10MHz, High Channel, 30MHz – 2.288GHz



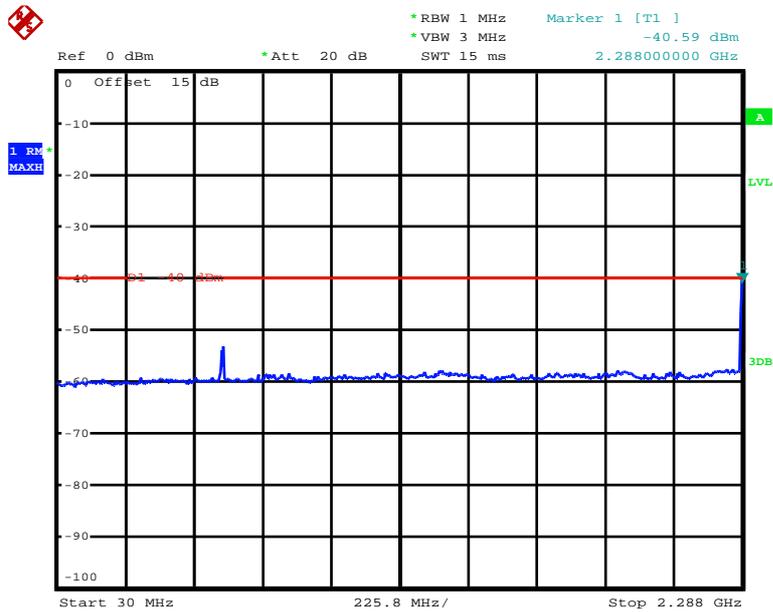
Date: 28.JUL.2014 20:25:26

16QAM, 10MHz, High Channel, 2.365GHz - 24GHz



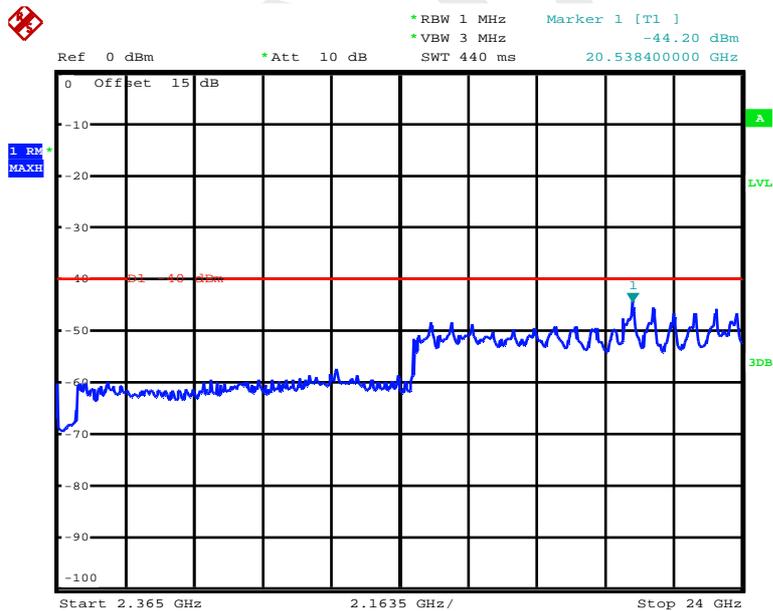
Date: 28.JUL.2014 20:26:50

QPSK, 15MHz, 30MHz – 2.288GHz



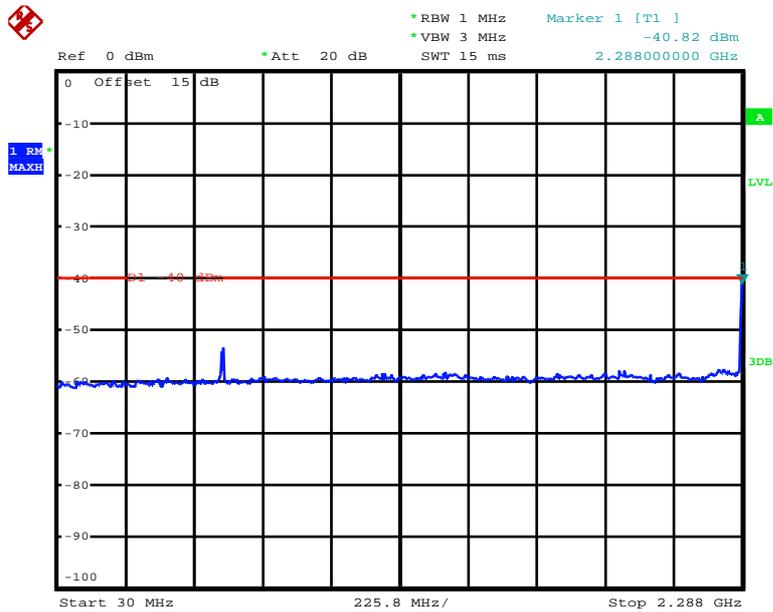
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QPSK, 15MHz, 2.365GHz - 24GHz



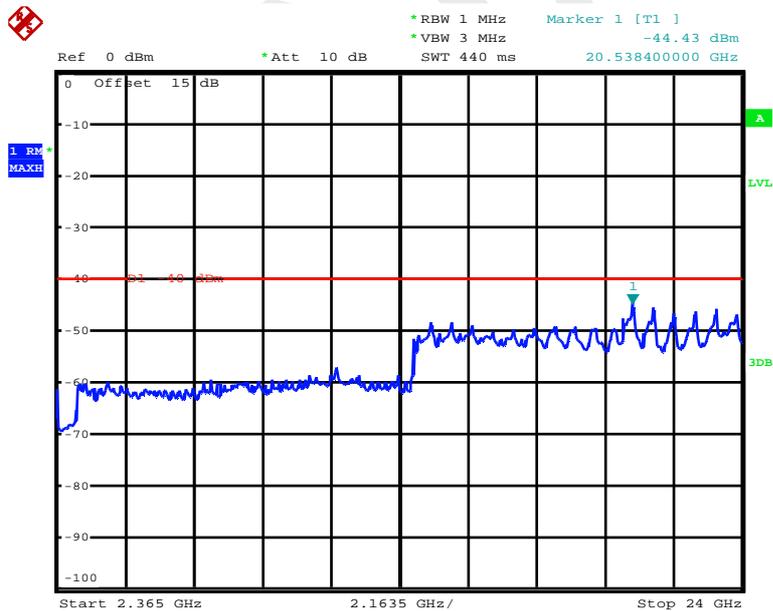
Date: 28.JUL.2014 20:52:05

16QAM, 15MHz, 30MHz – 2.288GHz



Date: 28.JUL.2014 20:51:32

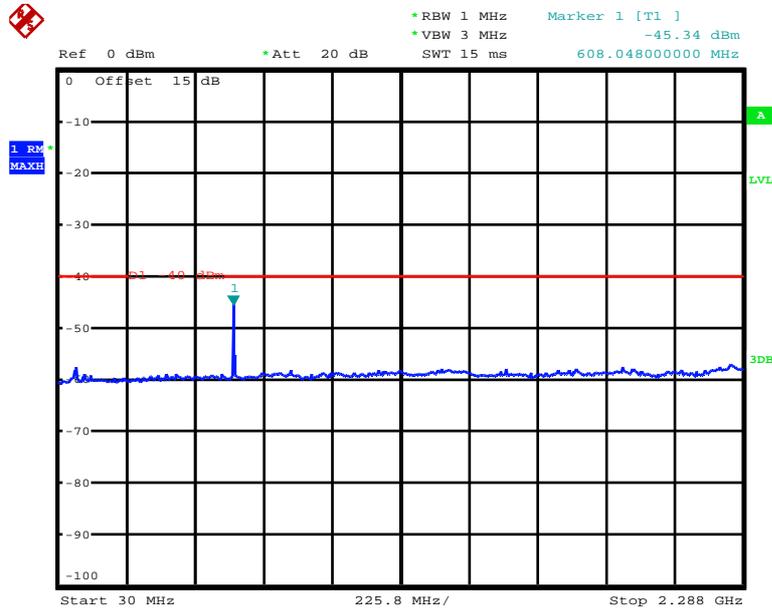
16QAM, 15MHz, 2.365GHz - 24GHz



Date: 28.JUL.2014 20:51:21

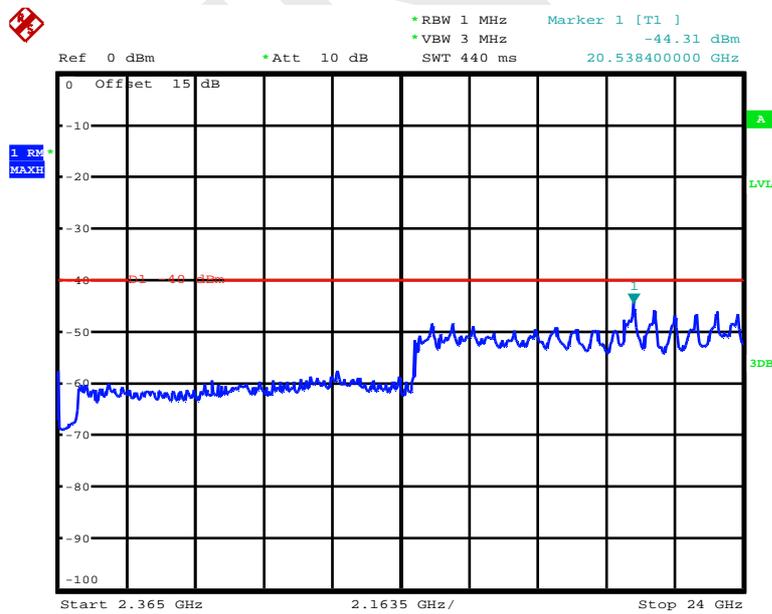
2345MHz-2360MHz:

QPSK, 5MHz, Low Channel, 30MHz – 2.288GHz



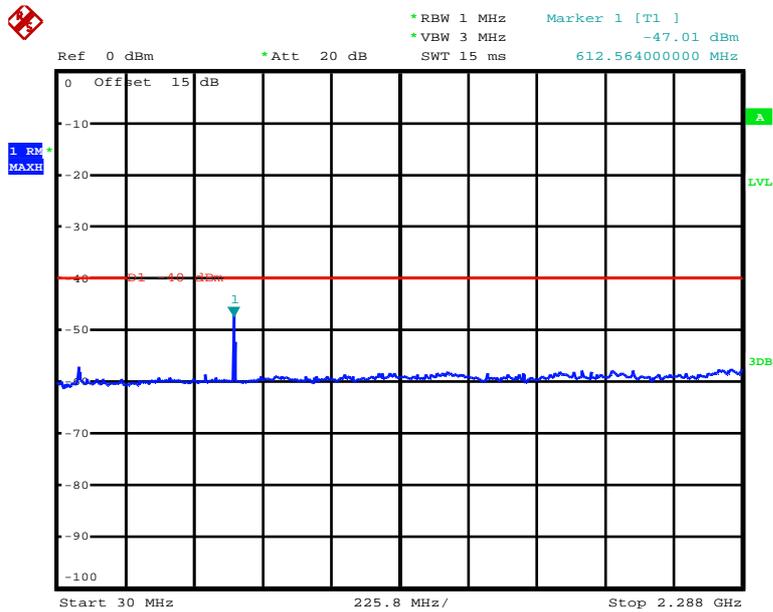
Date: 28.JUL.2014 20:39:11

QPSK, 5MHz, Low Channel, 2.365GHz - 24GHz



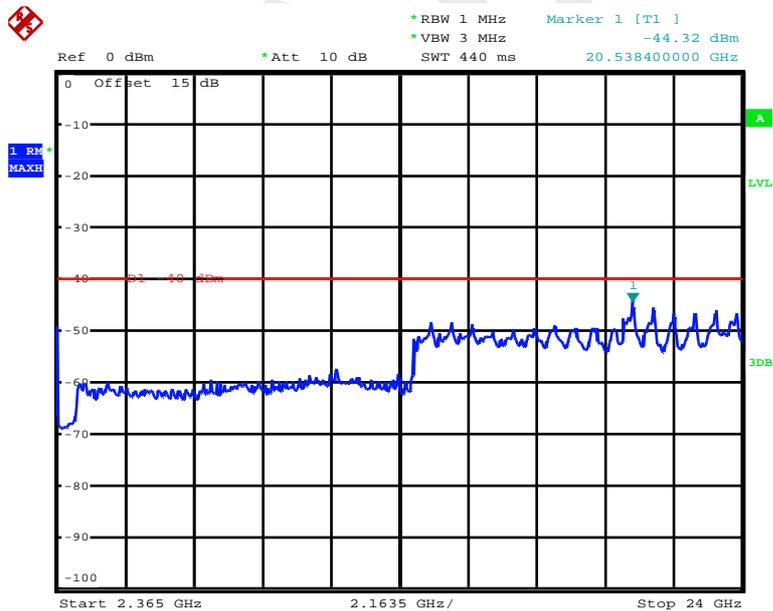
Date: 28.JUL.2014 20:38:51

QPSK, 5MHz, Middle Channel, 30MHz – 2.288GHz



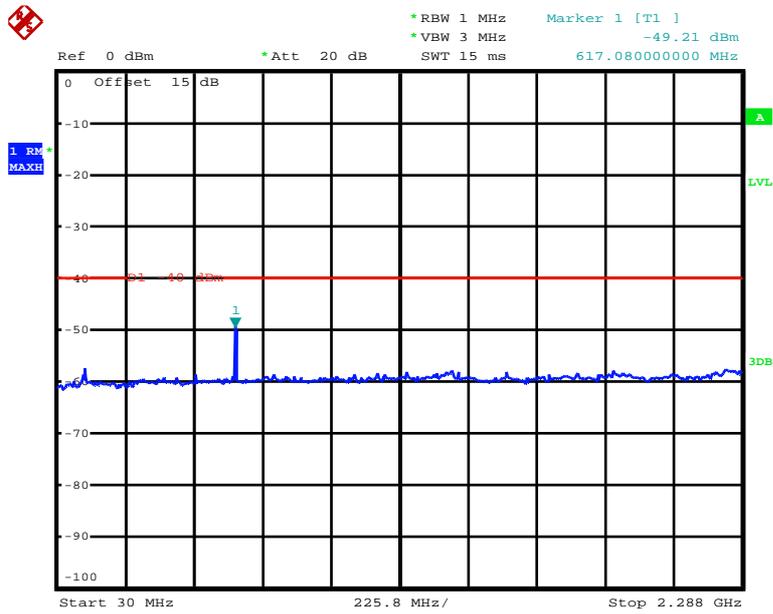
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QPSK, 5MHz, Middle Channel, 2.365GHz - 24GHz



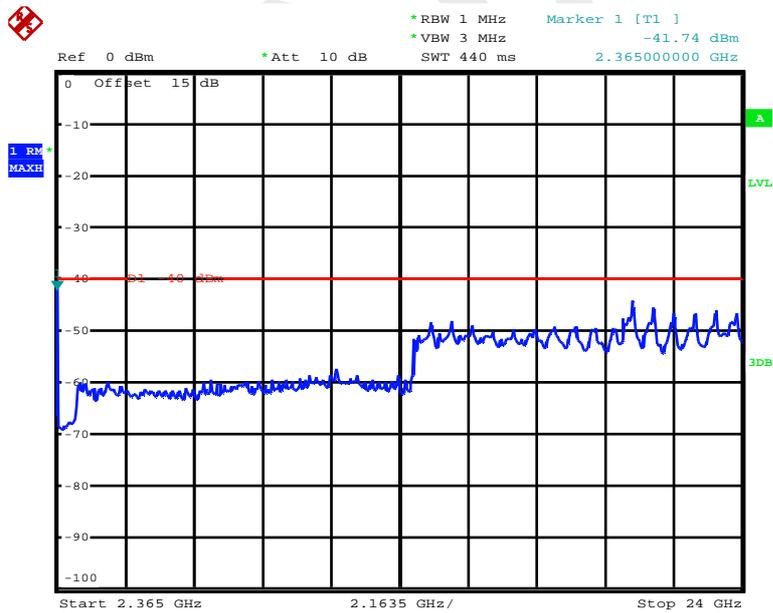
Date: 28.JUL.2014 20:39:43

QPSK, 5MHz, High Channel, 30MHz – 2.288GHz



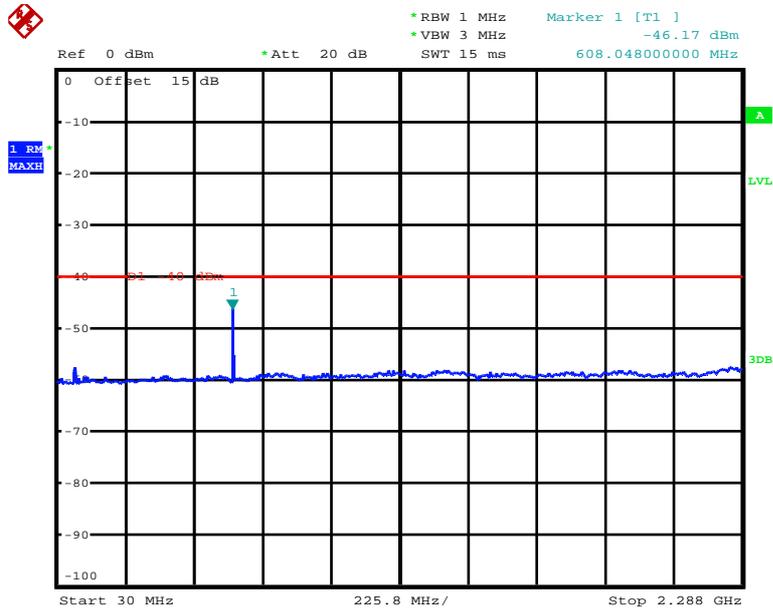
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QPSK, 5MHz, High Channel, 2.365GHz - 24GHz



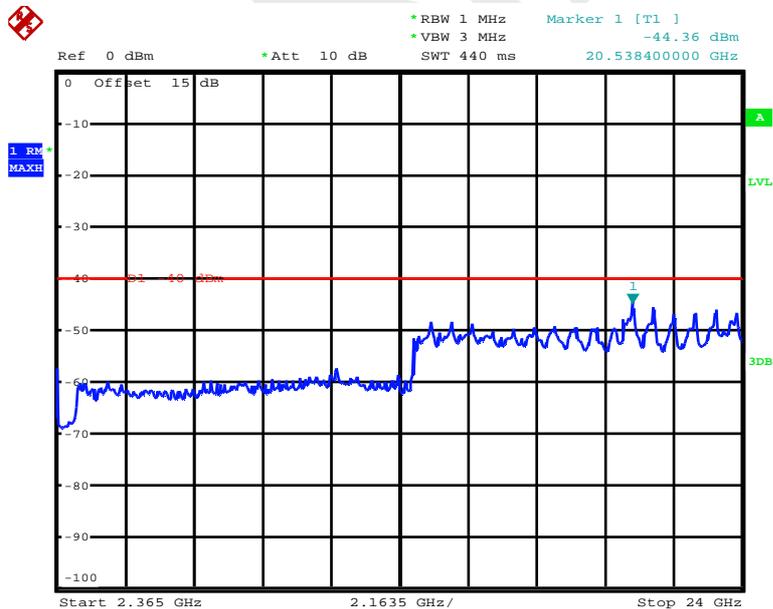
Date: 28.JUL.2014 20:40:56

16QAM, 5MHz, Low Channel, 30MHz – 2.288GHz



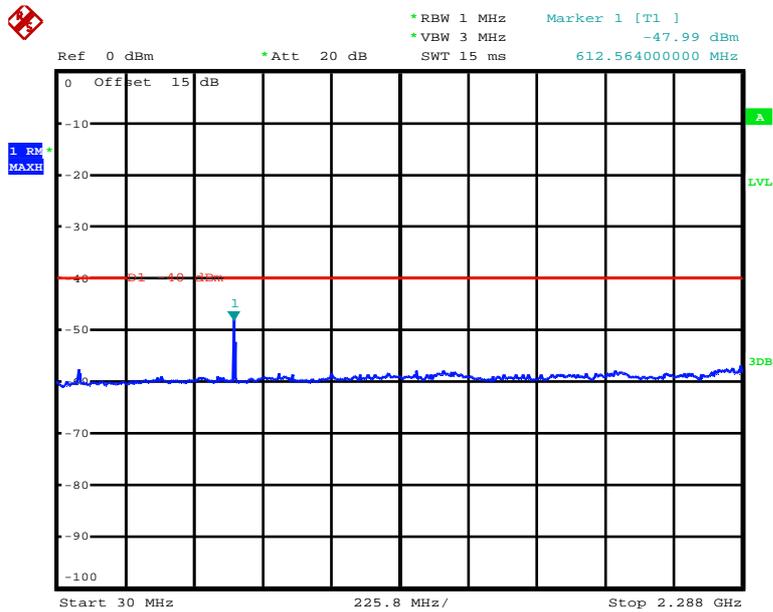
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16QAM, 5MHz, Low Channel, 2.365GHz - 24GHz



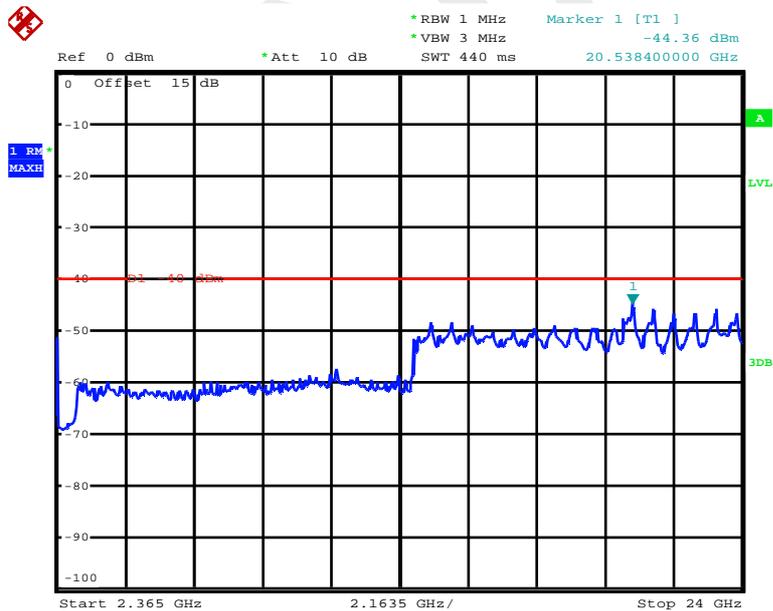
Date: 28.JUL.2014 20:38:40

16QAM, 5MHz, Middle Channel, 30MHz – 2.288GHz



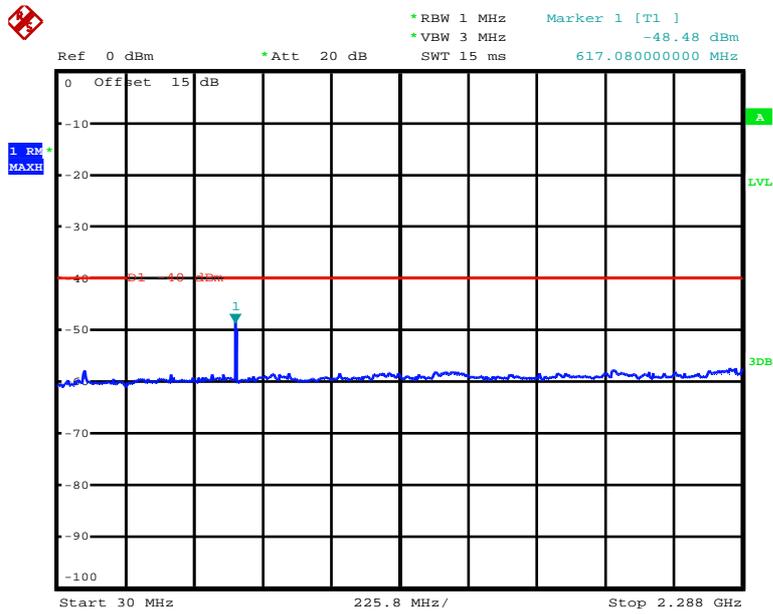
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16QAM, 5MHz, Middle Channel, 2.365GHz - 24GHz



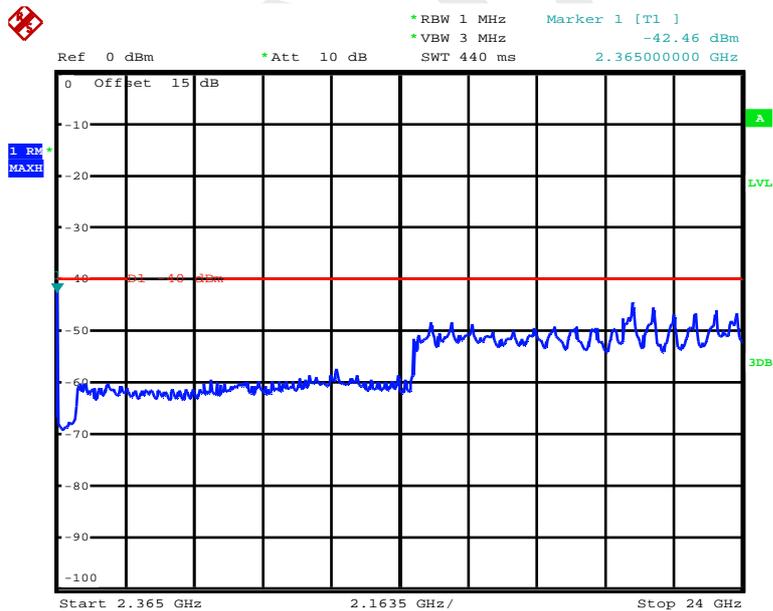
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16QAM, 5MHz, High Channel, 30MHz – 2.288GHz



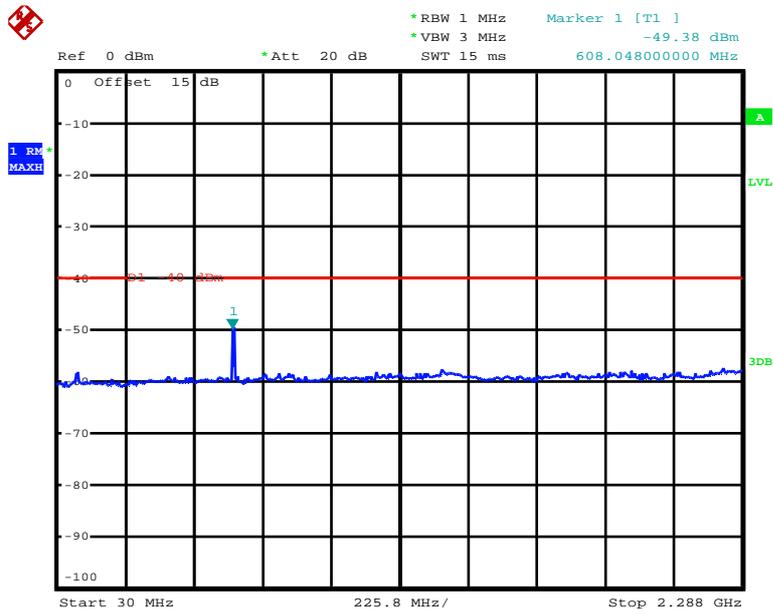
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16QAM, 5MHz, High Channel, 2.365GHz - 24GHz



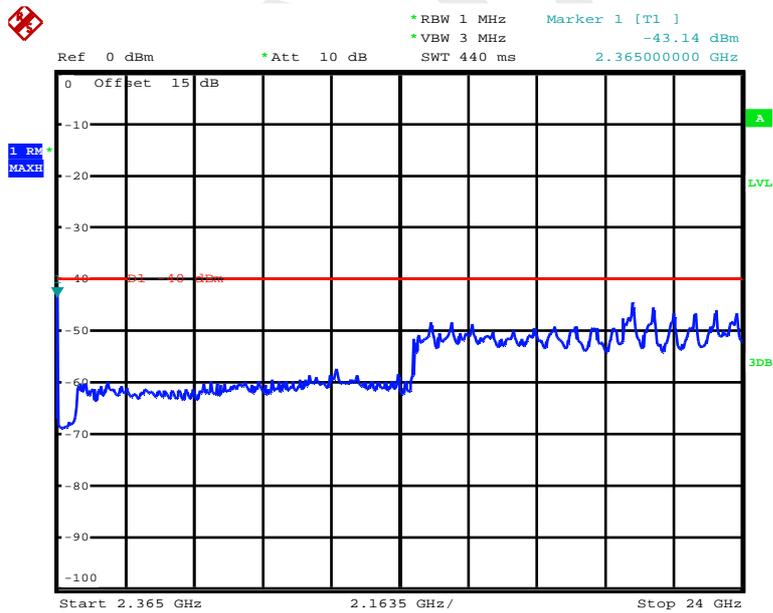
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QPSK, 10MHz, Low Channel, 30MHz – 2.288GHz



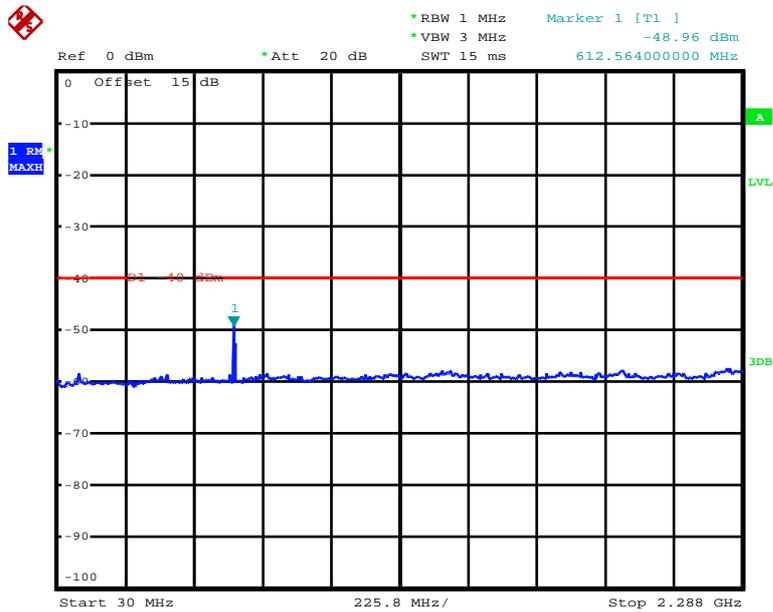
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QPSK, 10MHz, Low Channel, 2.365GHz - 24GHz



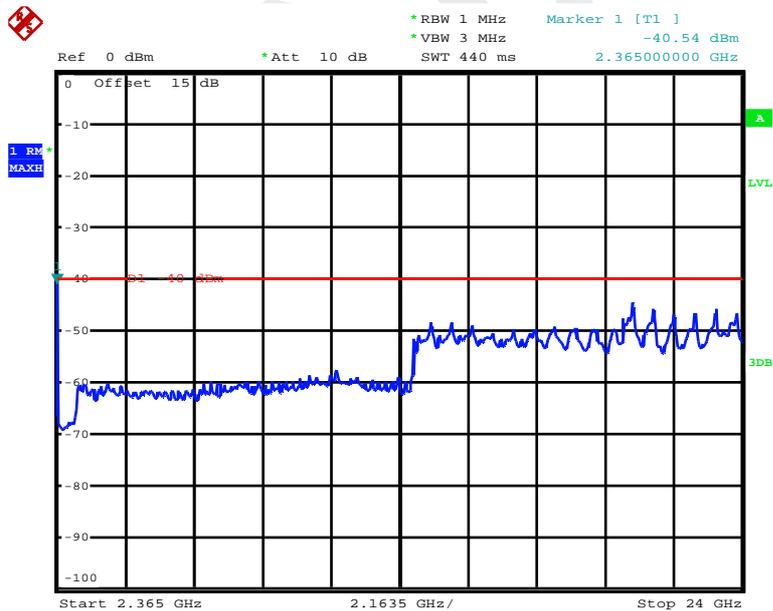
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QPSK, 10MHz, Middle Channel, 30MHz – 2.288GHz



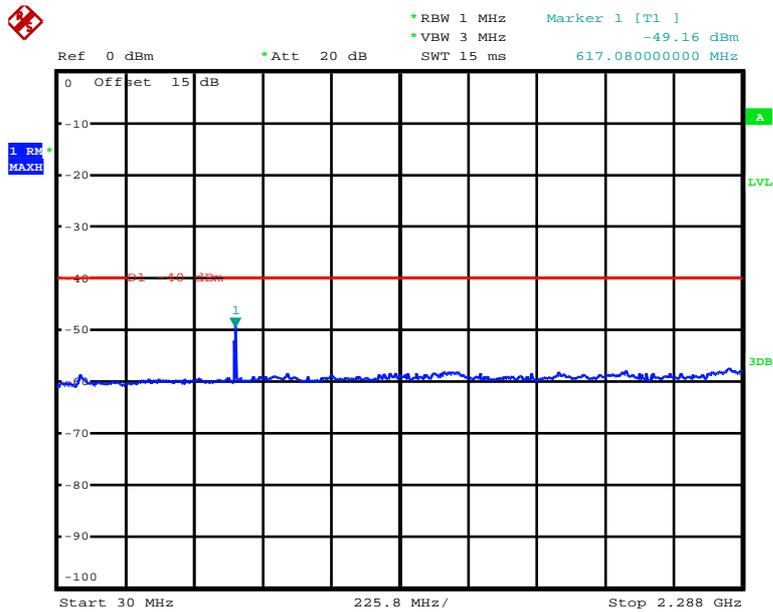
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QPSK, 10MHz, Middle Channel, 2.365GHz - 24GHz



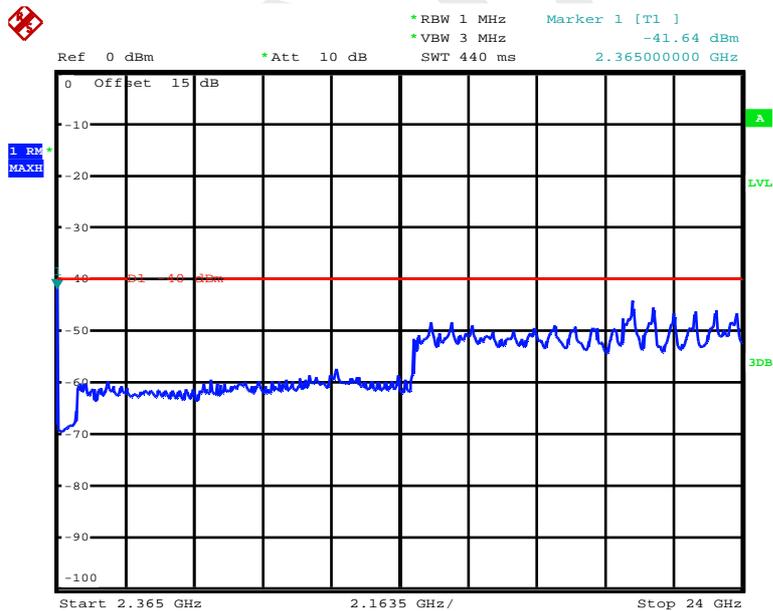
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QPSK, 10MHz, High Channel, 30MHz – 2.288GHz



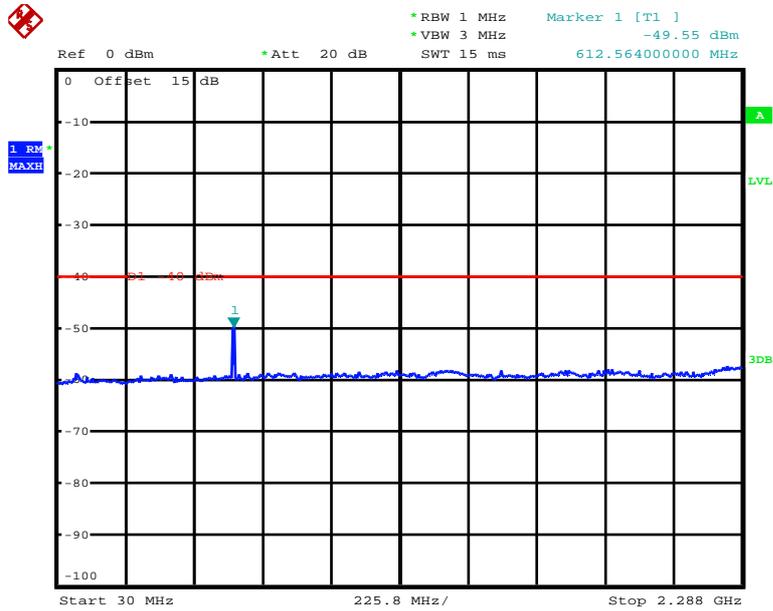
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QPSK, 10MHz, High Channel, 2.365GHz - 24GHz



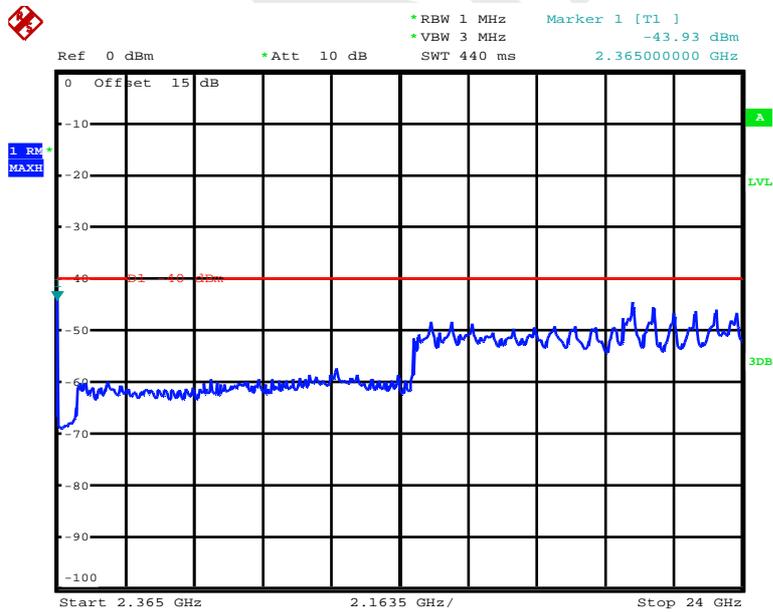
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16QAM, 10MHz, Low Channel, 30MHz – 2.288GHz



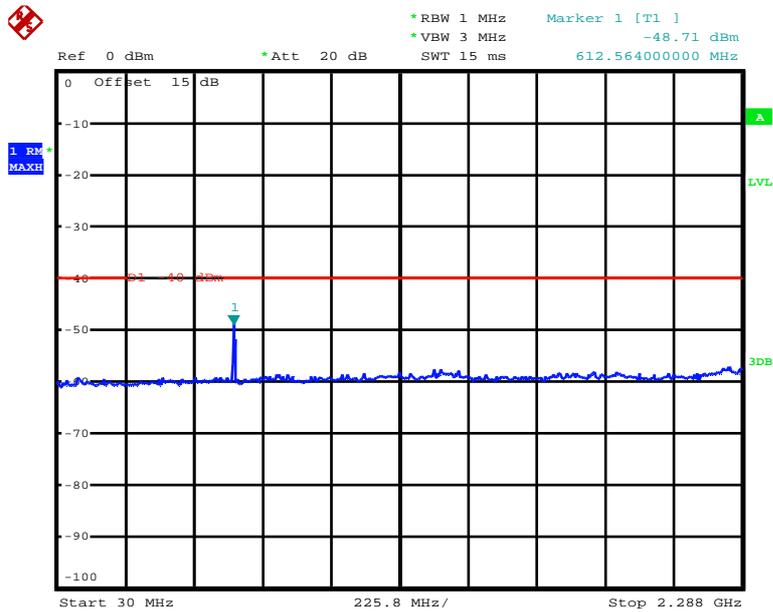
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16QAM, 10MHz, Low Channel, 2.365GHz - 24GHz



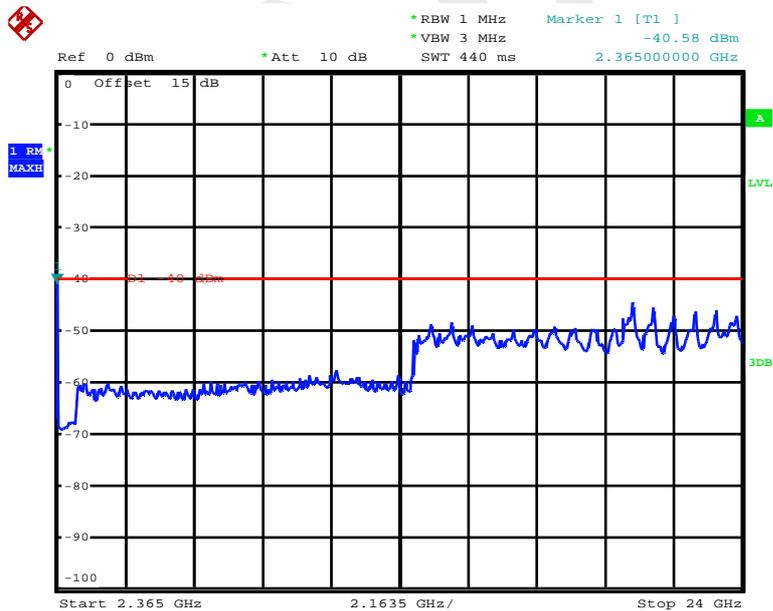
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16QAM, 10MHz, Middle Channel, 30MHz – 2.288GHz



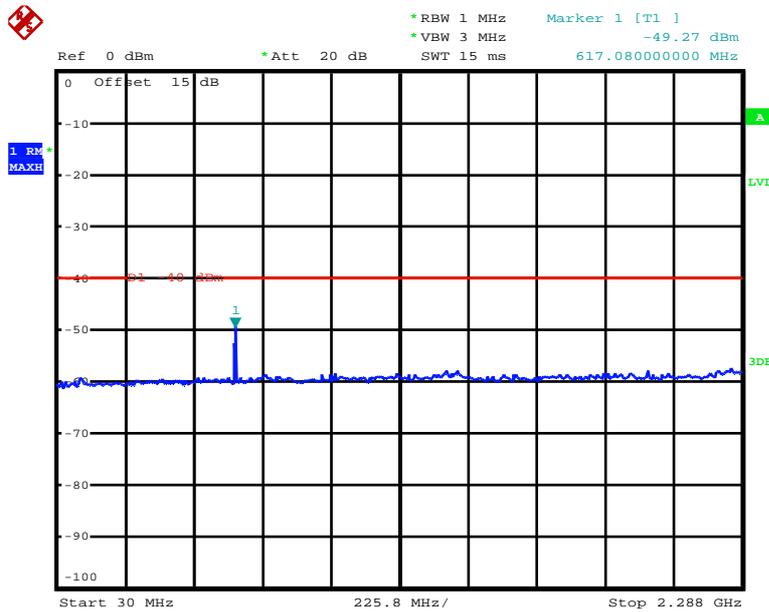
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16QAM, 10MHz, Middle Channel, 2.365GHz - 24GHz



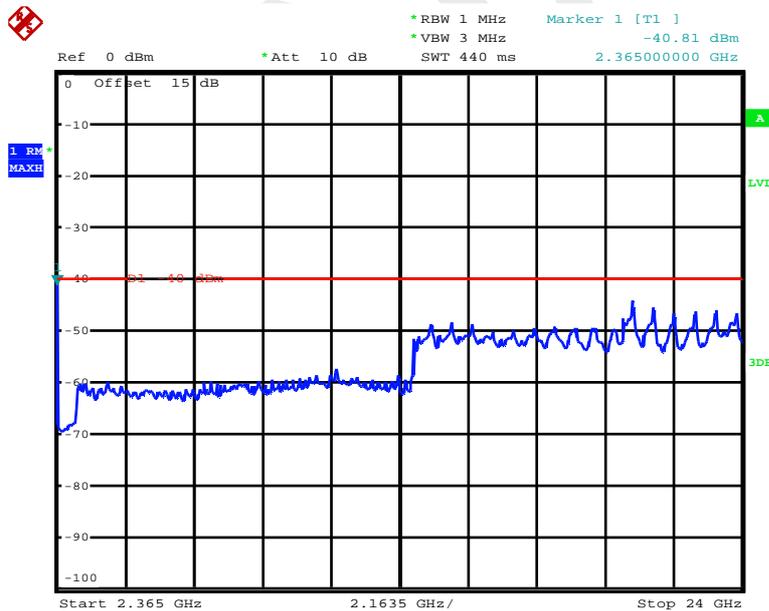
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16QAM, 10MHz, High Channel, 30MHz – 2.288GHz



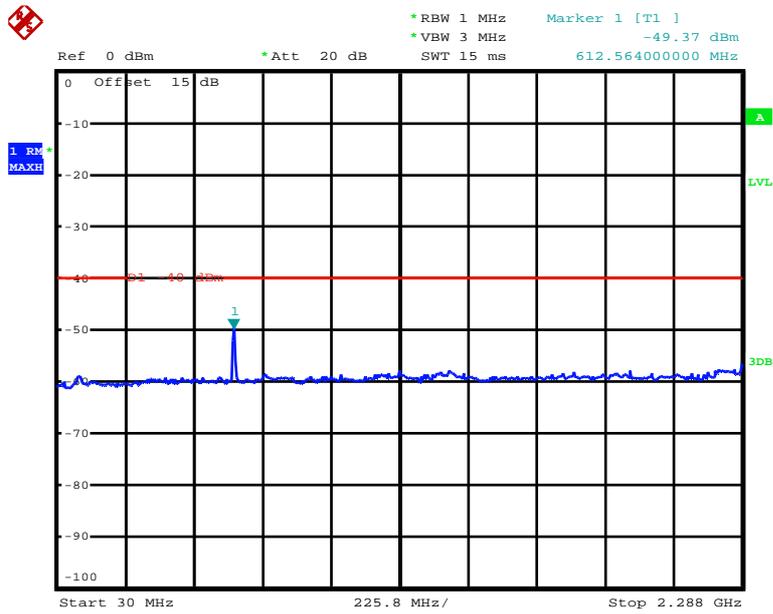
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16QAM, 10MHz, High Channel, 2.365GHz - 24GHz



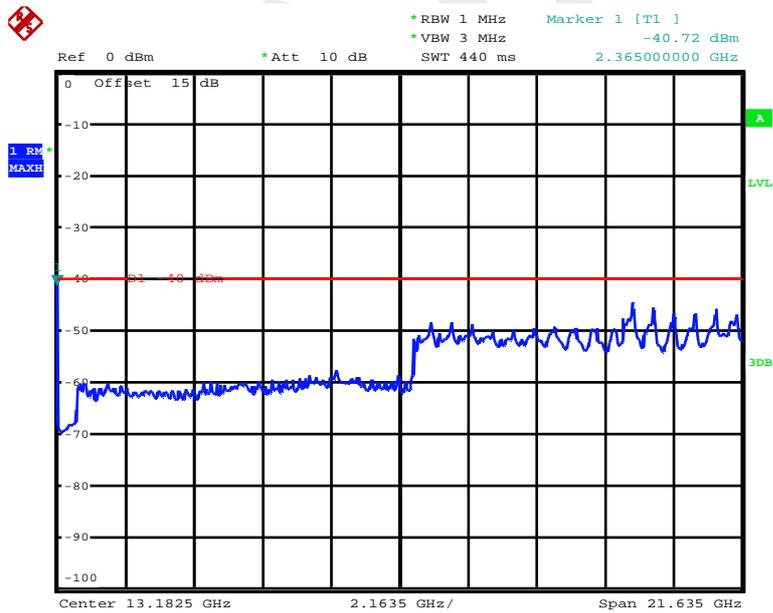
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QPSK, 15MHz, 30MHz – 2.288GHz



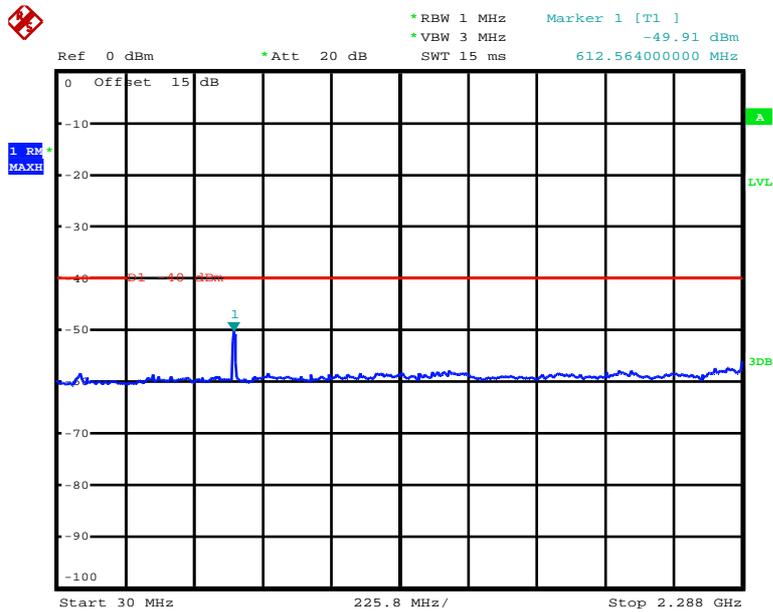
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QPSK, 15MHz, 2.365GHz - 24GHz



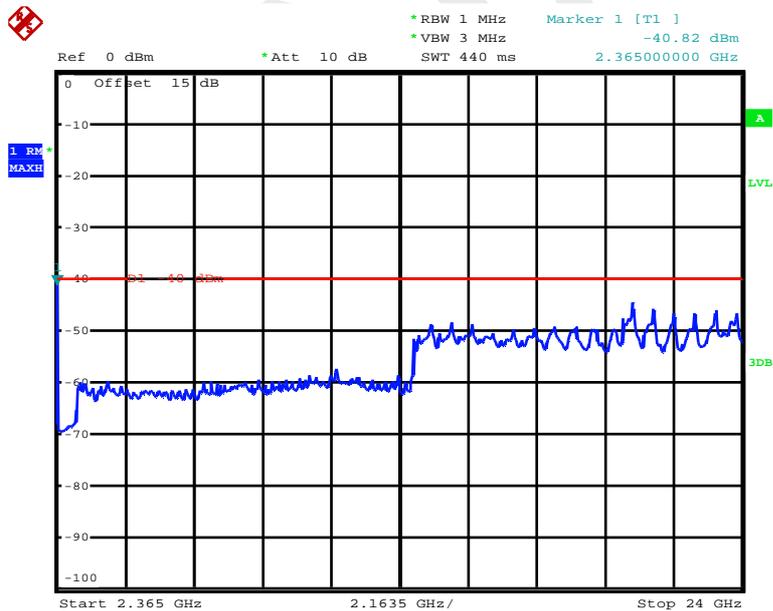
Date: 28.JUL.2014 20:54:43

16QAM, 15MHz, 30MHz – 2.288GHz



Date: 28.JUL.2014 20:55:16

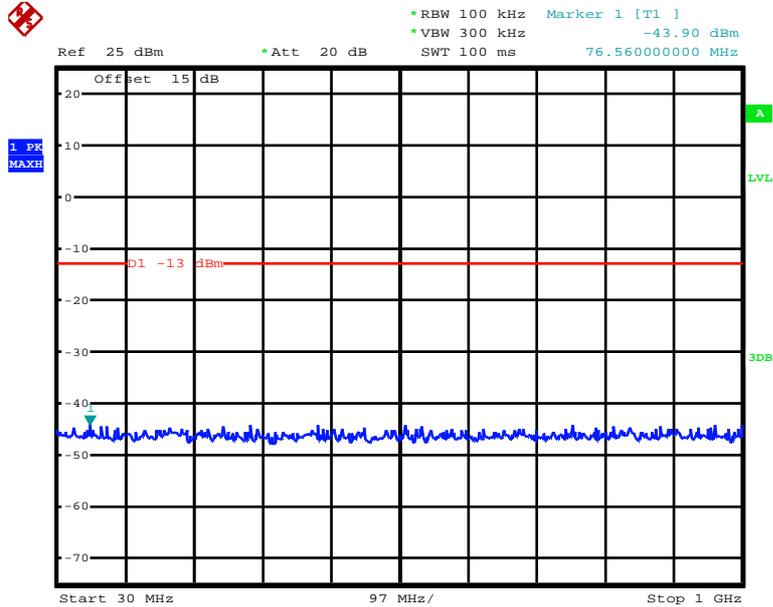
16QAM, 15MHz, 2.365GHz - 24GHz



Date: 28.JUL.2014 20:53:44

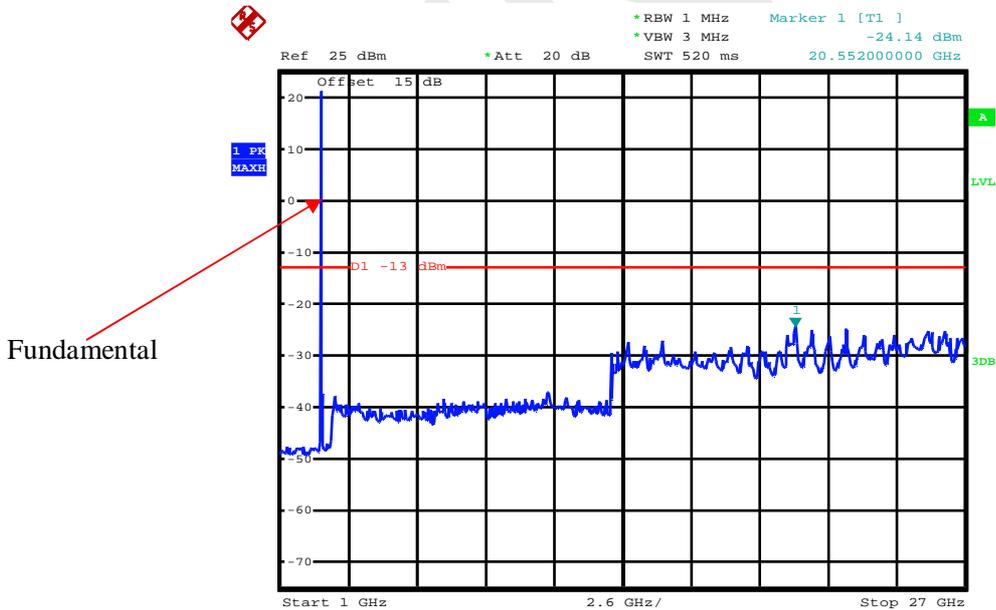
2570MHz-2620MHz:

QPSK, 5MHz, 30MHz - 1GHz



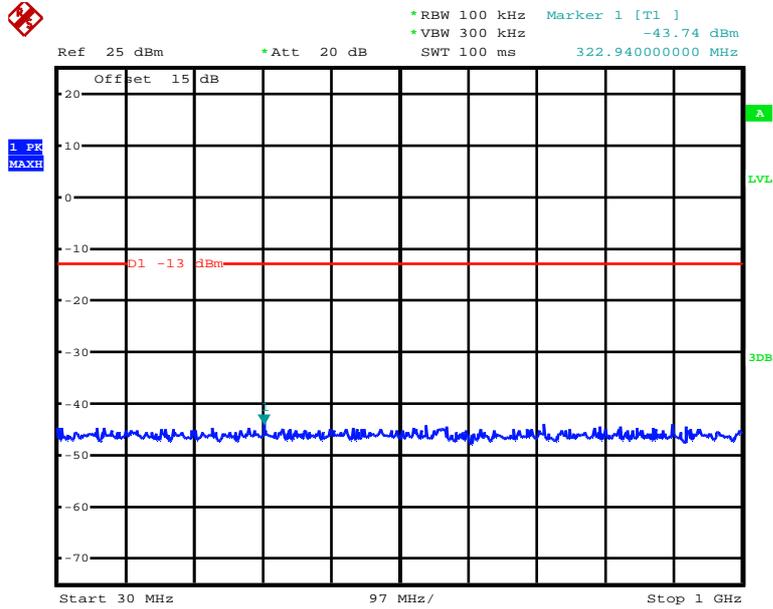
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QPSK, 5MHz, 1GHz - 24GHz



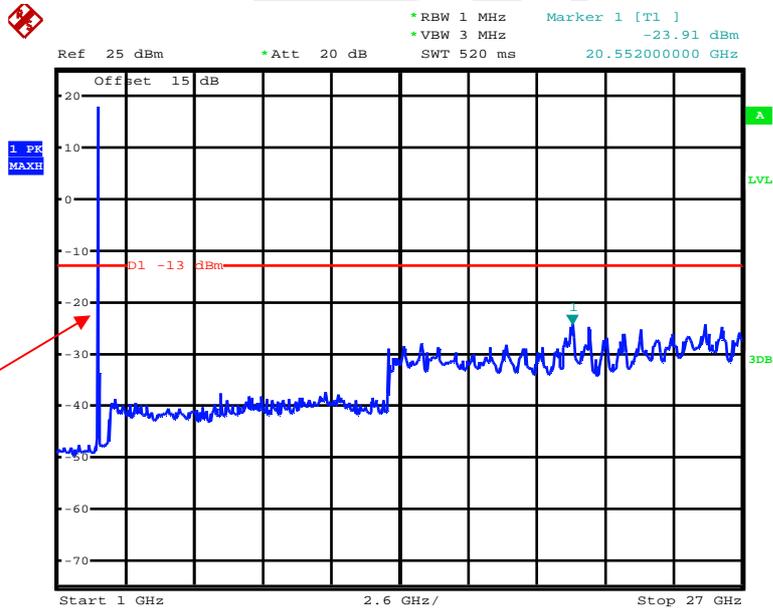
Date: 29.JUL.2014 22:31:48

QPSK, 10MHz, 30MHz - 1GHz



Date: 29.JUL.2014 22:32:22

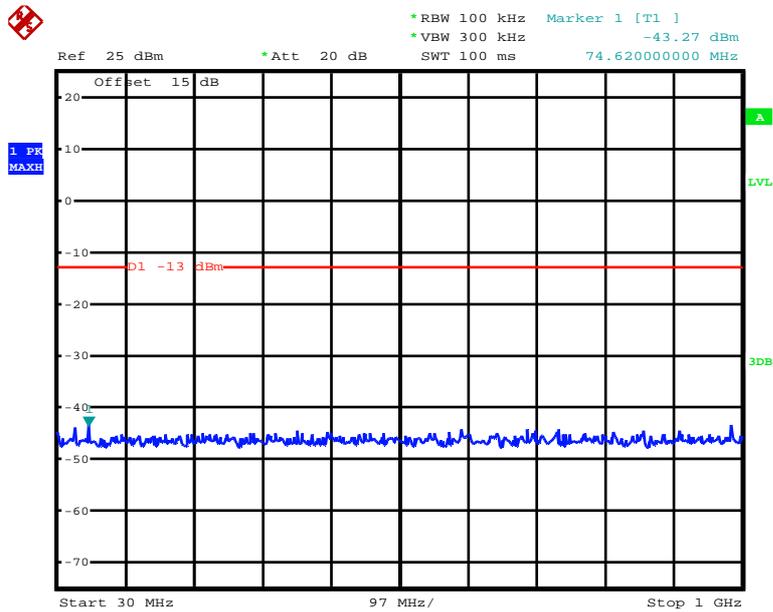
QPSK, 10MHz, 1GHz - 24GHz



Fundamental

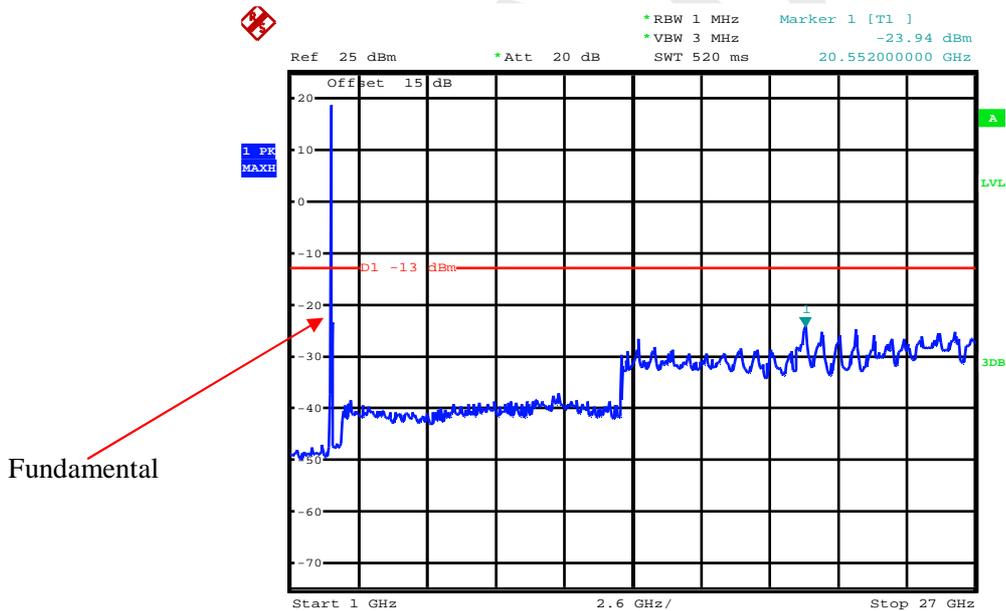
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QPSK, 15MHz, 30MHz - 1GHz



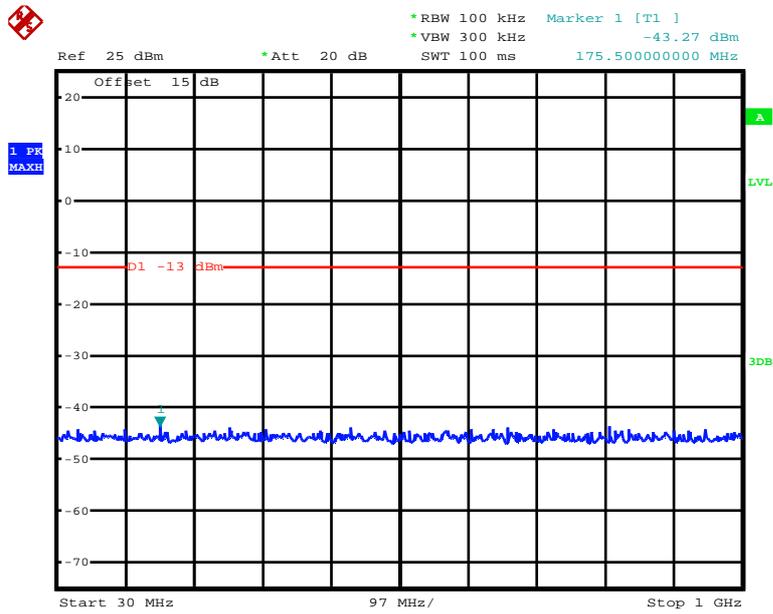
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QPSK, 15MHz, 1GHz - 24GHz



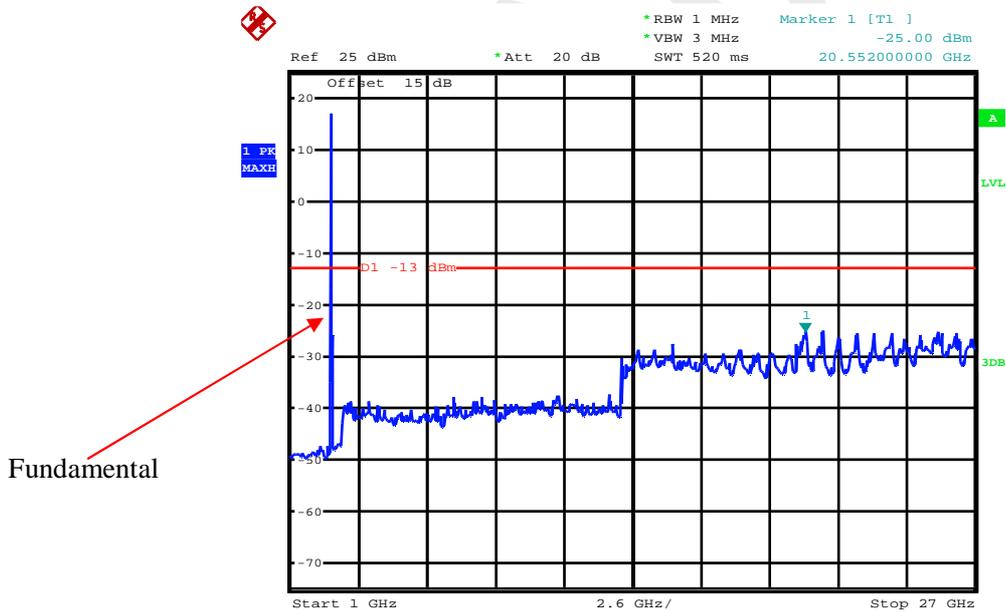
Date: 29.JUL.2014 22:34:22

QPSK, 20MHz, 30MHz - 1GHz



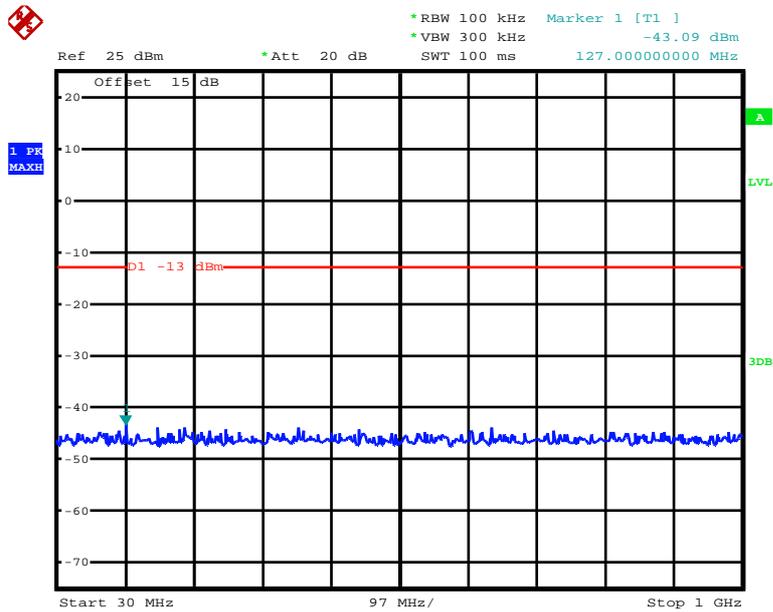
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QPSK, 20MHz, 1GHz - 24GHz



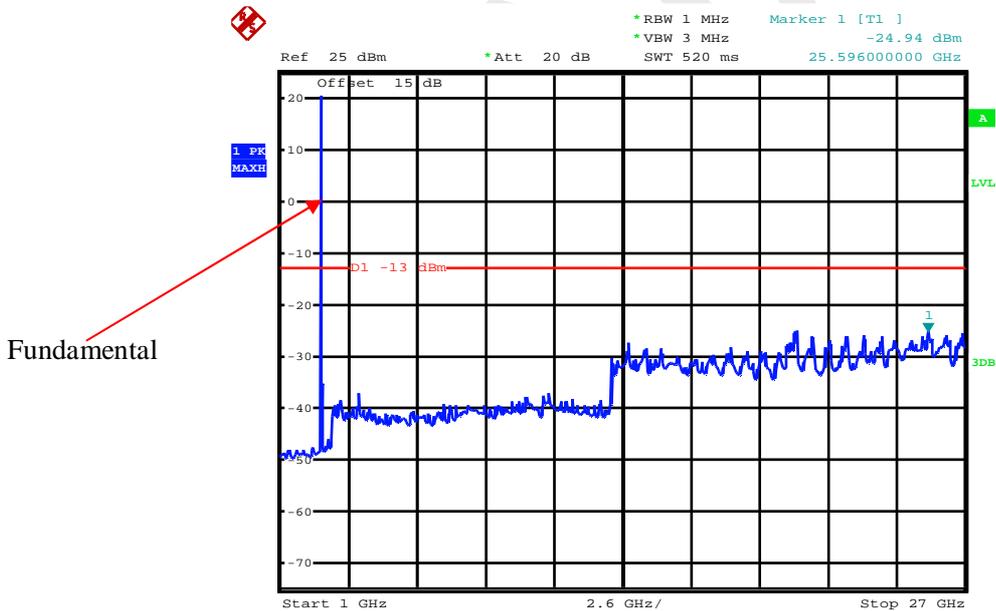
Date: 29.JUL.2014 22:29:42

16QAM, 5MHz, 30MHz - 1GHz



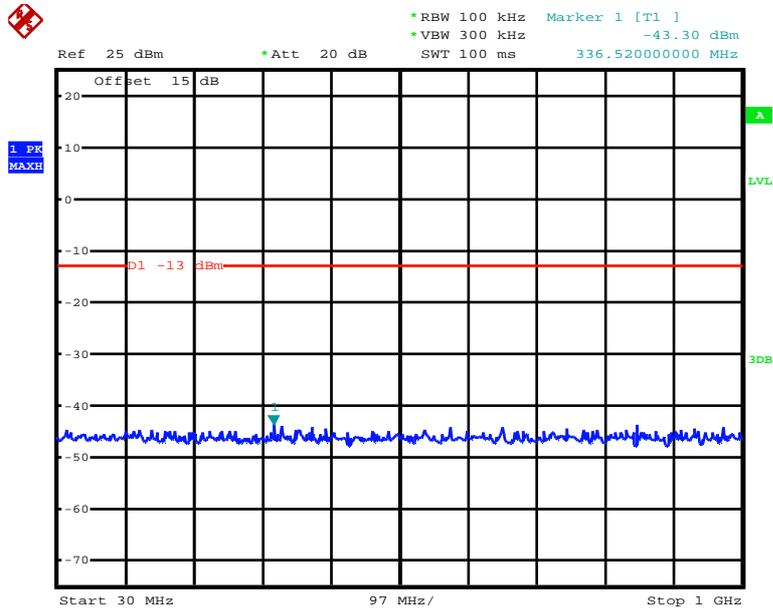
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16QAM, 5MHz, 1GHz - 24GHz



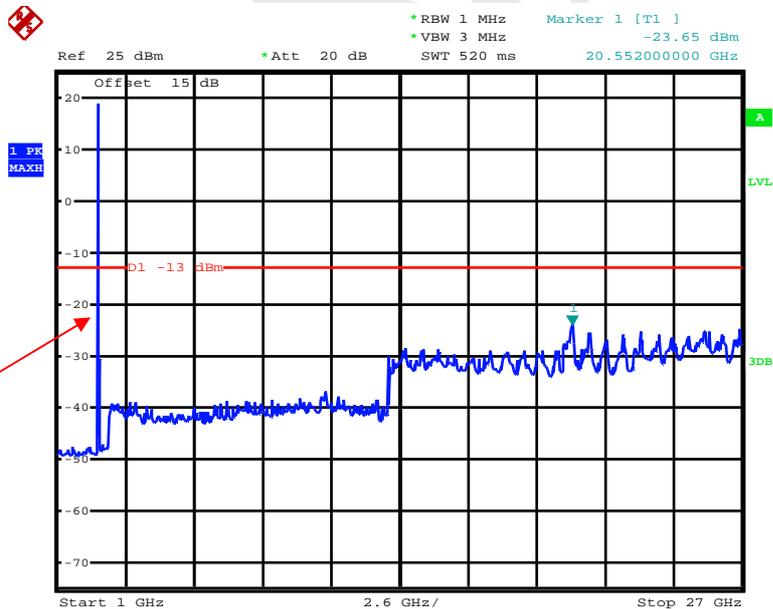
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16QAM, 10MHz, 30MHz - 1GHz



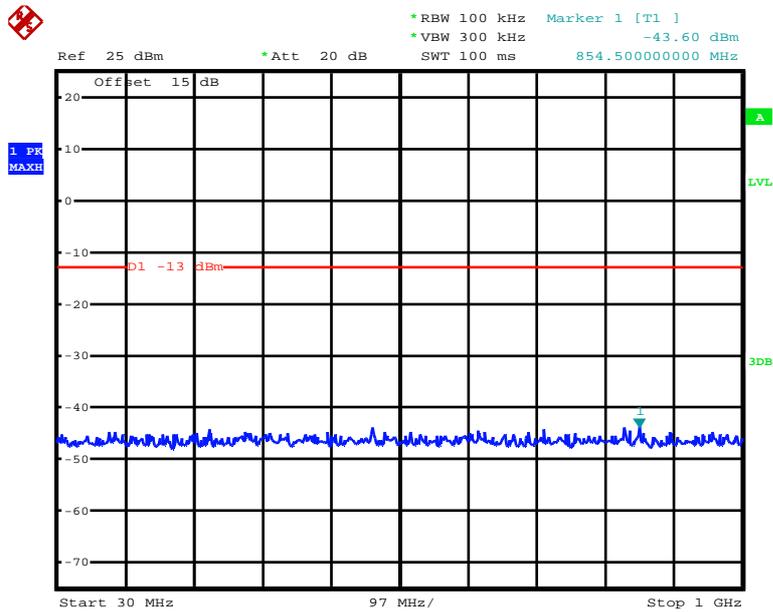
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16QAM, 10MHz, 1GHz - 24GHz



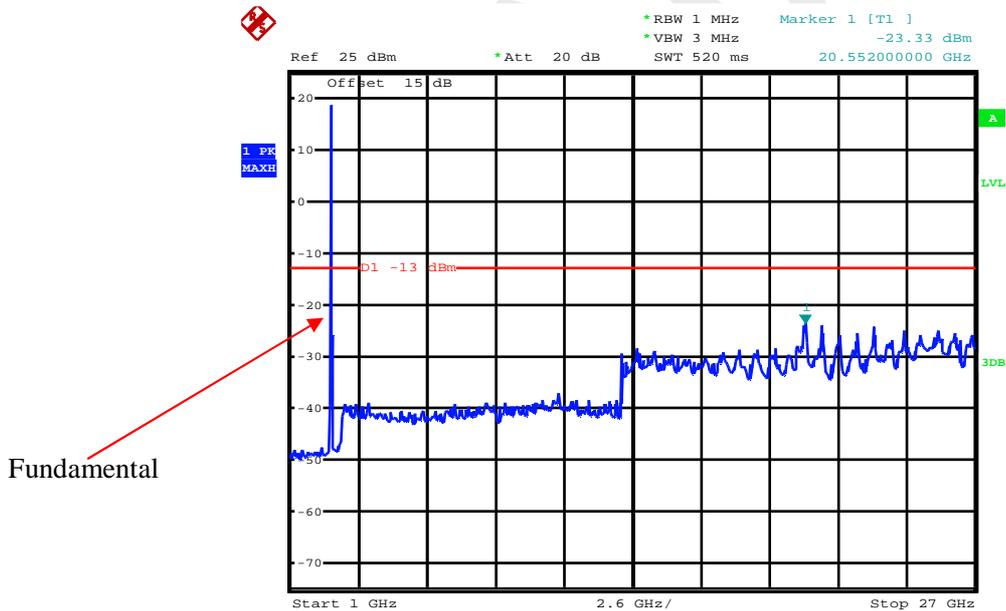
Date: 29.JUL.2014 22:32:52

16QAM, 15MHz, 30MHz - 1GHz



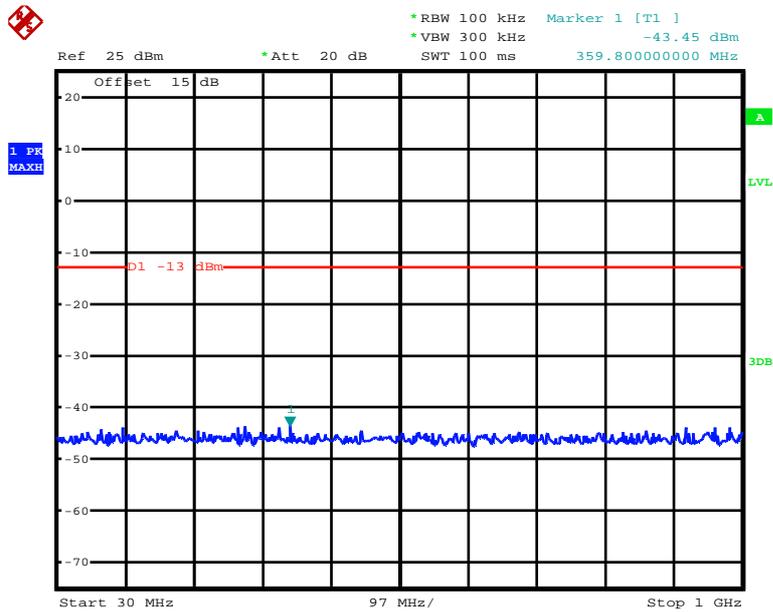
Date: 29.JUL.2014 22:33:51

16QAM, 15MHz, 1GHz - 24GHz



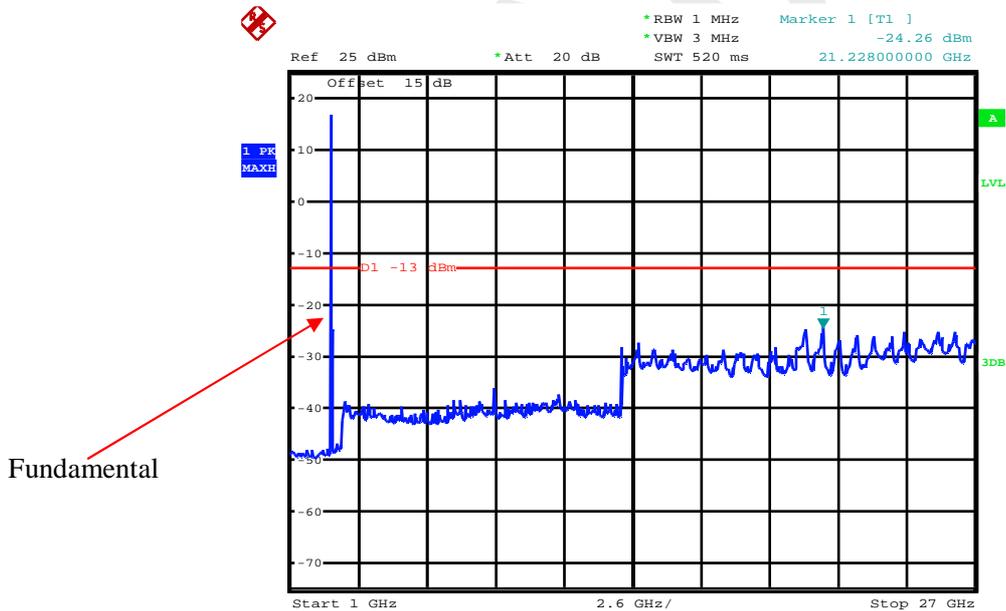
Date: 29.JUL.2014 22:34:07

16QAM, 20MHz, 30MHz - 1GHz



Date: 29.JUL.2014 22:30:14

16QAM, 20MHz, 1GHz - 24GHz



Date: 29.JUL.2014 22:30:00

FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053 and § 27.53.

Test Procedure

The transmitter 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	8648A	3426A00831	2013-11-06	2014-11-06
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-06
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Agilent	Signal Generator	E8247C	MY43321350	2012-10-15	2014-10-15
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-06
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.5
Relative Humidity:	65 %
ATM Pressure:	100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28.

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

2305MHz-2320MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK Middle Channel (2312.5MHz)								
4625.000	H	31.73	-61	14.3	2.3	-49.0	-40.0	9.0
4625.000	V	31.29	-62.1	14.3	2.3	-50.1	-40.0	10.1
6937.500	H	30.19	-59.5	13.6	3.5	-49.4	-40.0	9.4
6937.500	V	31.40	-57.8	13.6	3.5	-47.7	-40.0	7.7
16-QAM Middle Channel (2312.5MHz)								
4625.000	H	31.36	-61.4	14.3	2.3	-49.4	-40.0	9.4
4625.000	V	30.29	-63.1	14.3	2.3	-51.1	-40.0	11.1
6937.500	H	30.87	-58.8	13.6	3.5	-48.7	-40.0	8.7
6937.500	V	30.06	-59.1	13.6	3.5	-49.0	-40.0	9.0

2345MHz-2360MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK Middle Channel (2352.5MHz)								
4705.000	H	30.14	-62.3	14.4	3	-50.9	-40.0	10.9
4705.000	V	31.00	-61.6	14.4	3	-50.2	-40.0	10.2
7057.500	H	30.67	-58.6	13.3	3.4	-48.7	-40.0	8.7
7057.500	V	31.74	-57.1	13.3	3.4	-47.2	-40.0	7.2
16-QAM Middle Channel (2352.5MHz)								
4705.000	H	31.87	-60.6	14.4	3	-49.2	-40.0	9.2
4705.000	V	30.64	-62	14.4	3	-50.6	-40.0	10.6
7057.500	H	30.89	-58.4	13.3	3.4	-48.5	-40.0	8.5
7057.500	V	31.24	-57.6	13.3	3.4	-47.7	-40.0	7.7

2570MHz-2620MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK Middle Channel(2595MHz)								
5190.000	H	30.70	-60.3	14.0	2.3	-48.6	-13.0	35.6
5190.000	V	31.61	-60.9	14.0	2.3	-49.2	-13.0	36.2
7785.000	H	30.80	-56.4	13.3	3.6	-46.7	-13.0	33.7
7785.000	V	30.91	-56.7	13.3	3.6	-47.0	-13.0	34.0
16-QAM Middle Channel (2595MHz)								
5190.000	H	31.03	-60	14.0	2.3	-48.3	-13.0	35.3
5190.000	V	31.62	-60.9	14.0	2.3	-49.2	-13.0	36.2
7785.000	H	30.55	-56.7	13.3	3.6	-47.0	-13.0	34.0
7785.000	V	31.37	-56.2	13.3	3.6	-46.5	-13.0	33.5

Note:

- 1) Absolute Level = SG Level - Cable loss + Antenna Gain
- 2) Margin = Limit- Absolute Level
- 3) No emission was detected in the range below 1GHz.

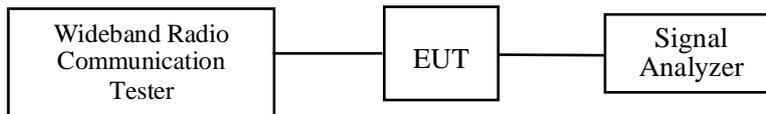
FCC §27.53 - BAND EDGES

Applicable Standards

FCC § 2.1053 and § 27.53.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

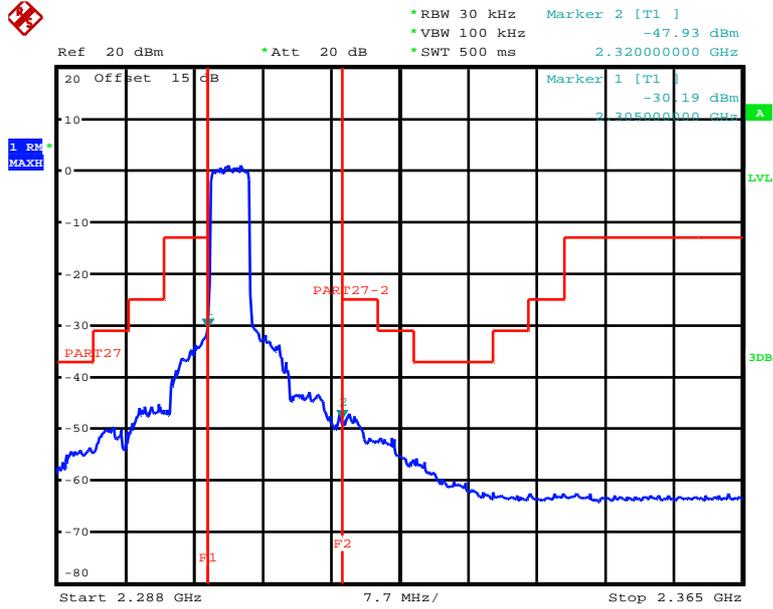
Environmental Conditions

Temperature:	29.2 -29.5
Relative Humidity:	58 %-65 %
ATM Pressure:	100.0 kPa-100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28 & 2014-07-29.

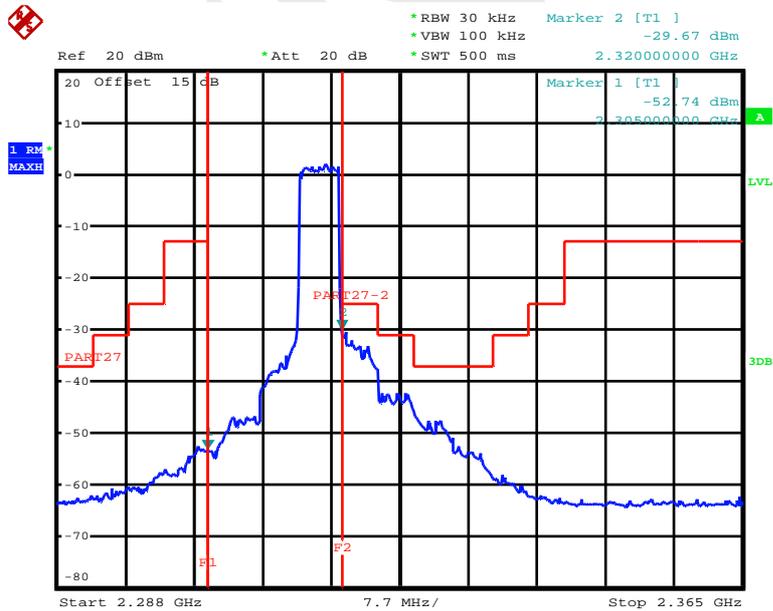
2305MHz-2320MHz:

QPSK, 5MHz, Low Channel



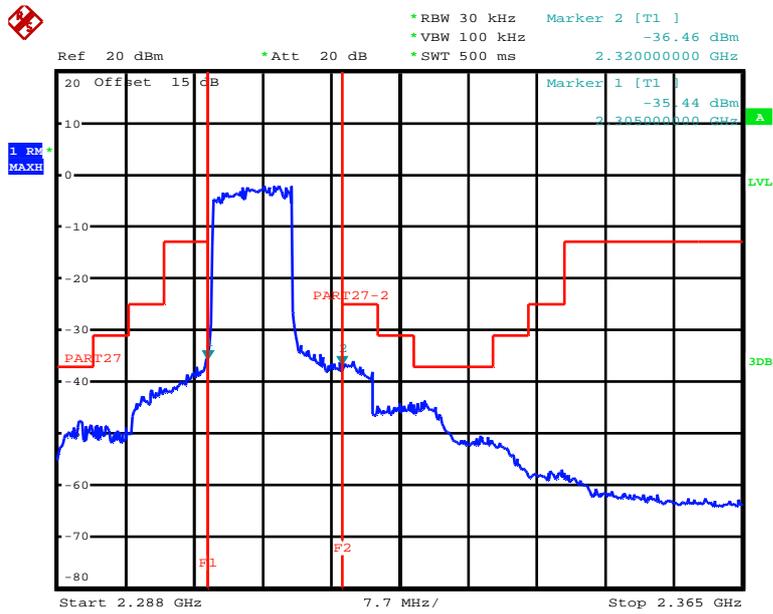
Date: 28.JUL.2014 16:35:44

QPSK, 5MHz, High Channel



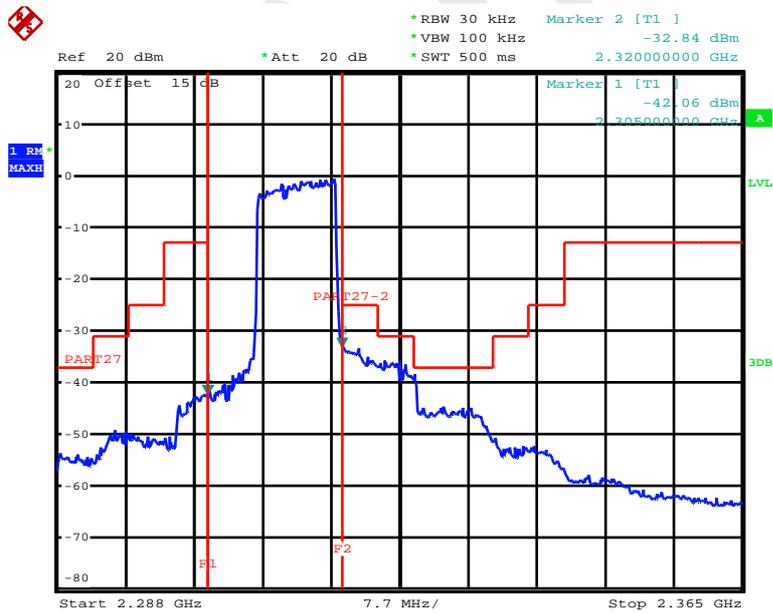
Date: 28.JUL.2014 16:37:04

QPSK, 10MHz, Low Channel



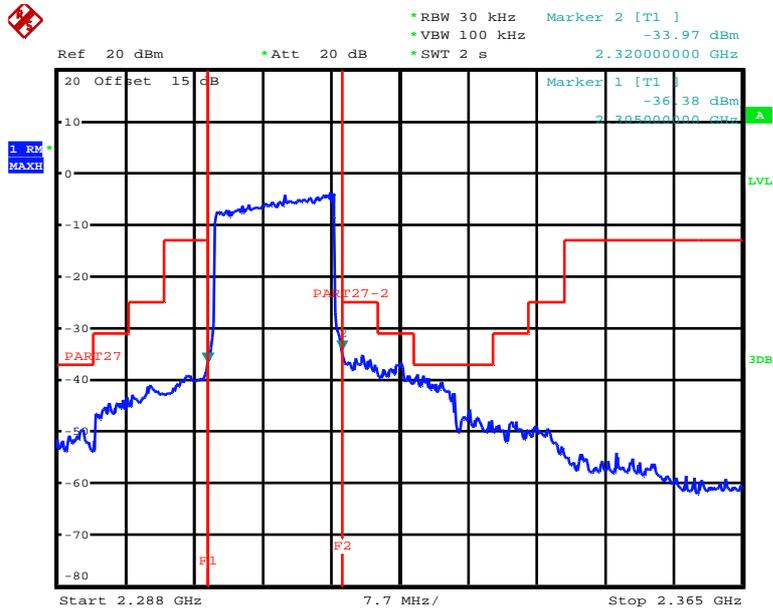
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QPSK, 10MHz, High Channel



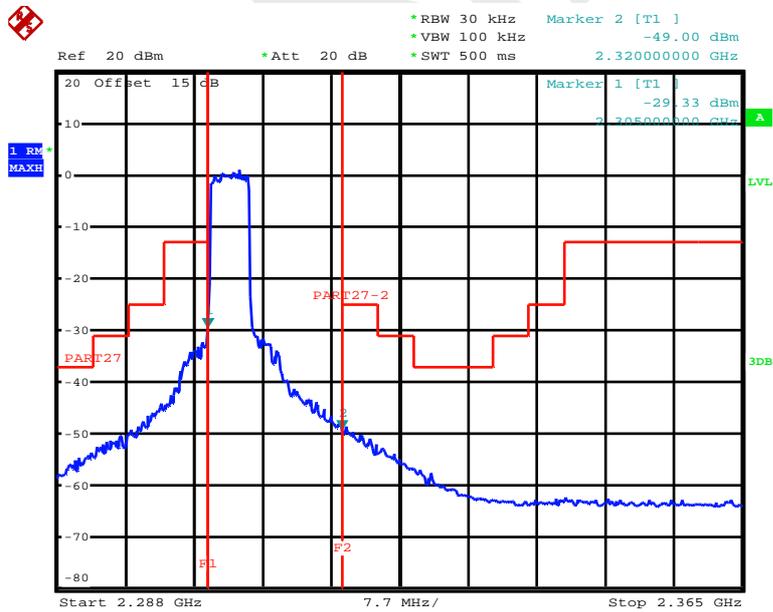
Date: 28.JUL.2014 17:48:04

QPSK, 15MHz



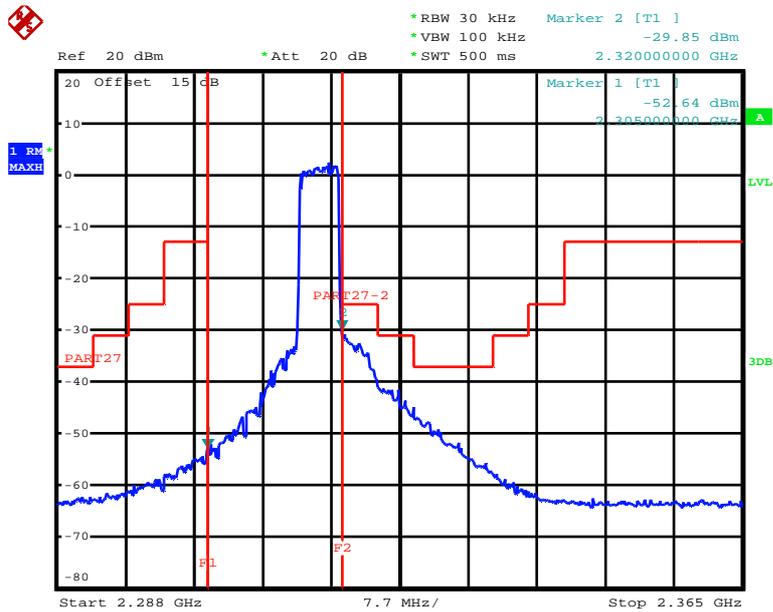
Date: 28.JUL.2014 19:38:14

16QAM, 5MHz, Low Channel



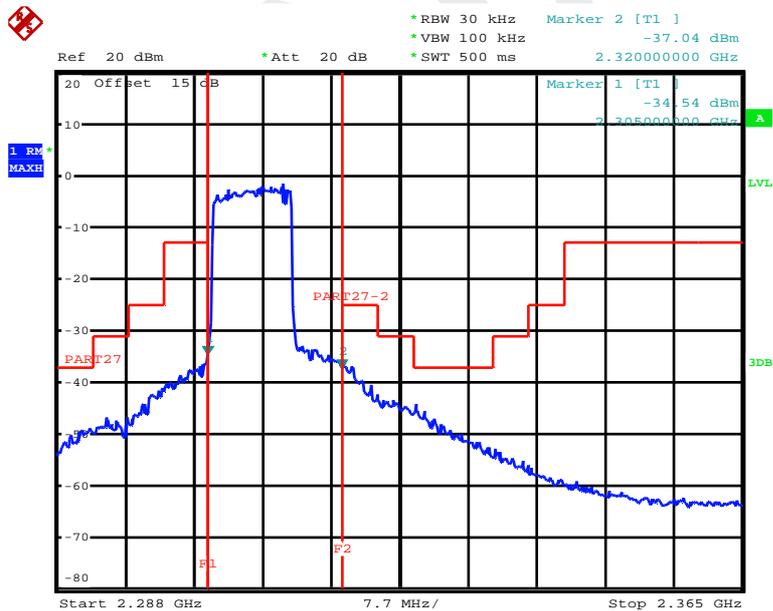
Date: 28.JUL.2014 16:36:10

16QAM, 5MHz, High Channel



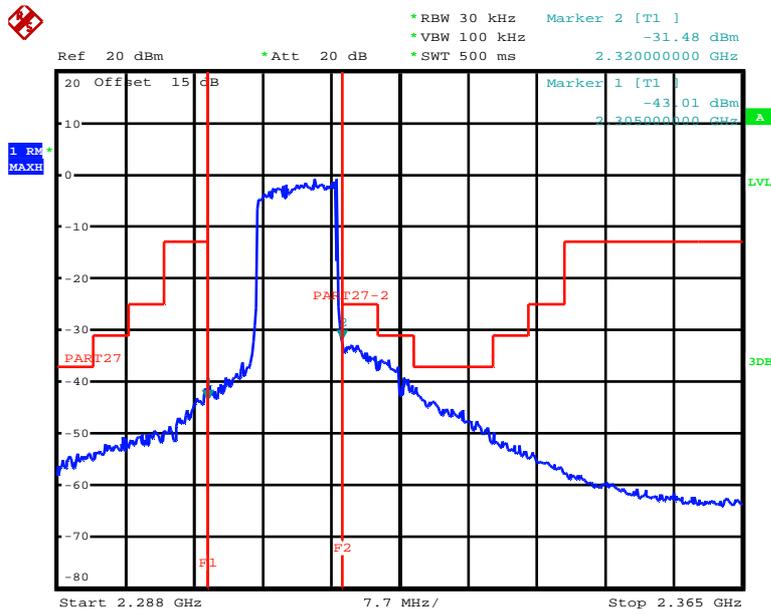
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16QAM, 10MHz, Low Channel



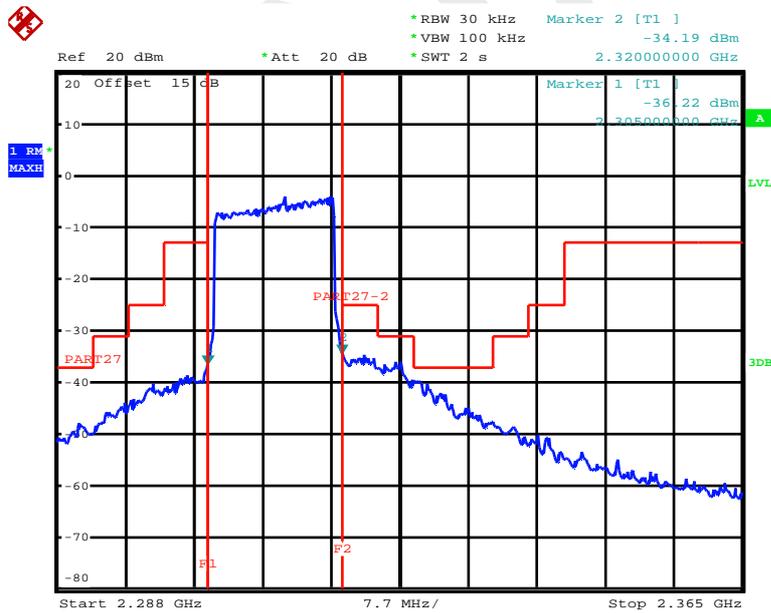
Date: 28.JUL.2014 17:49:15

16QAM, 10MHz, High Channel



Date: 28.JUL.2014 17:47:47

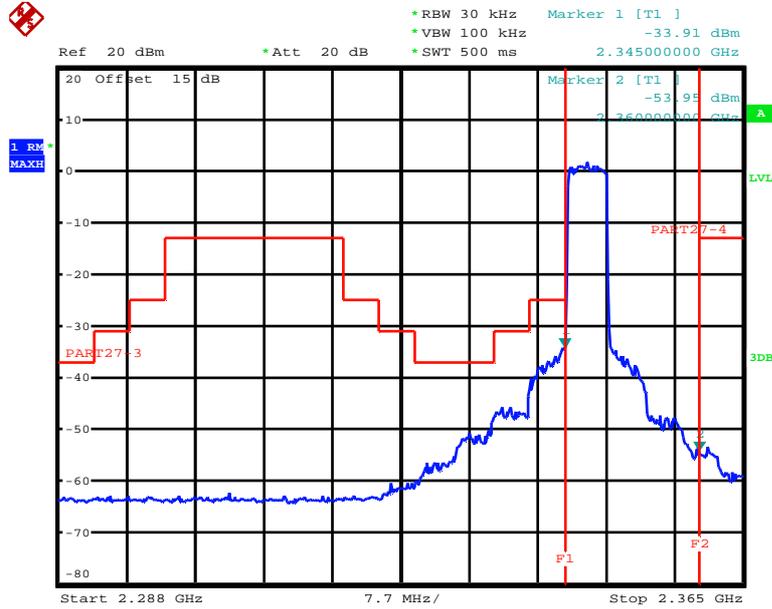
16QAM, 15MHz



Date: 28.JUL.2014 19:38:33

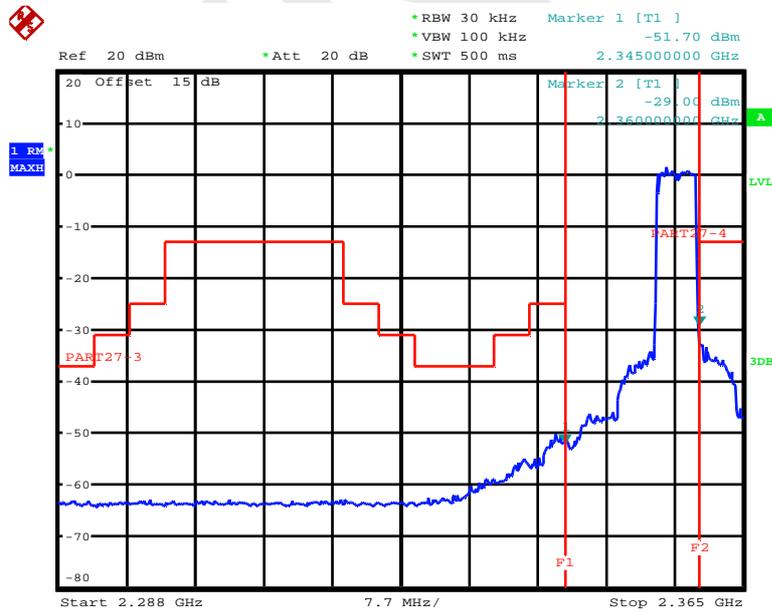
2345MHz-2360MHz:

QPSK, 5MHz, Low Channel



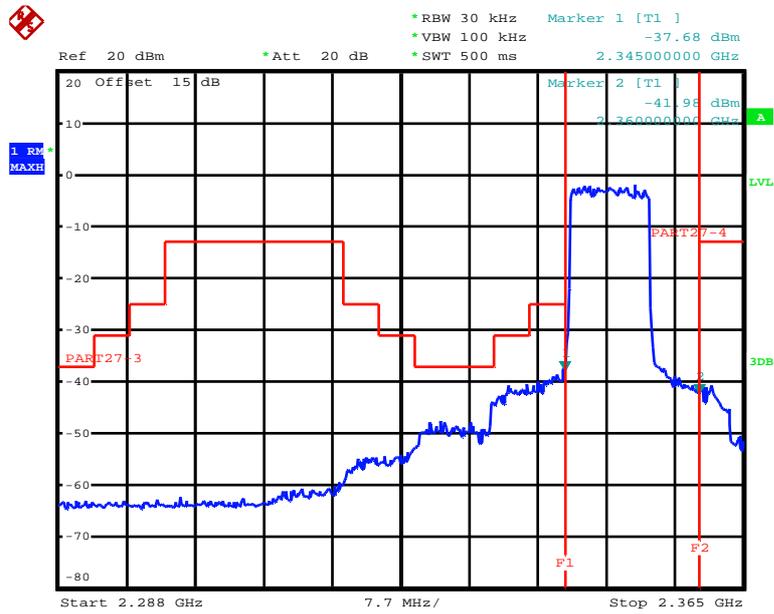
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QPSK, 5MHz, High Channel



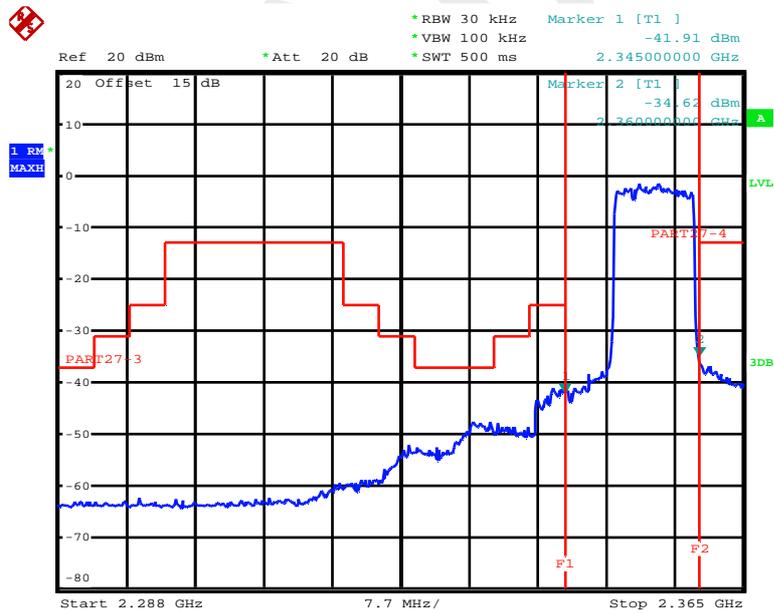
Date: 28.JUL.2014 16:42:33

QPSK, 10MHz, Low Channel



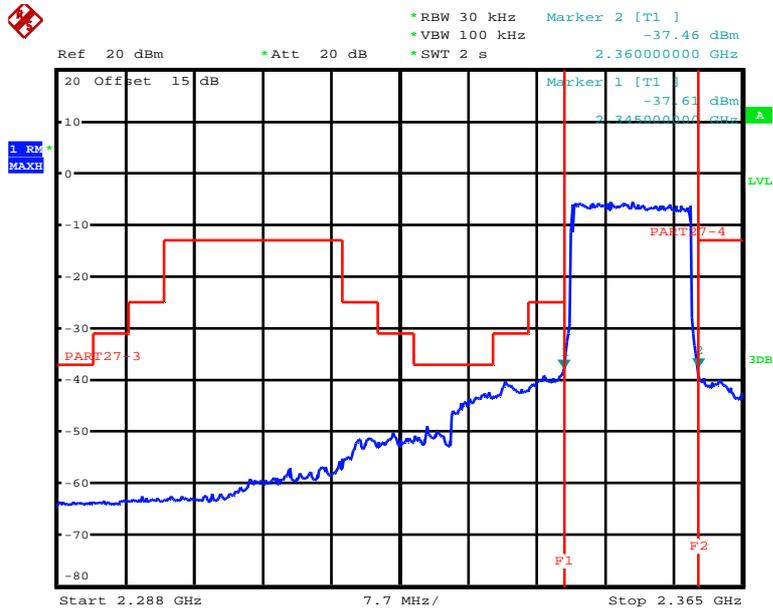
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QPSK, 10MHz, High Channel



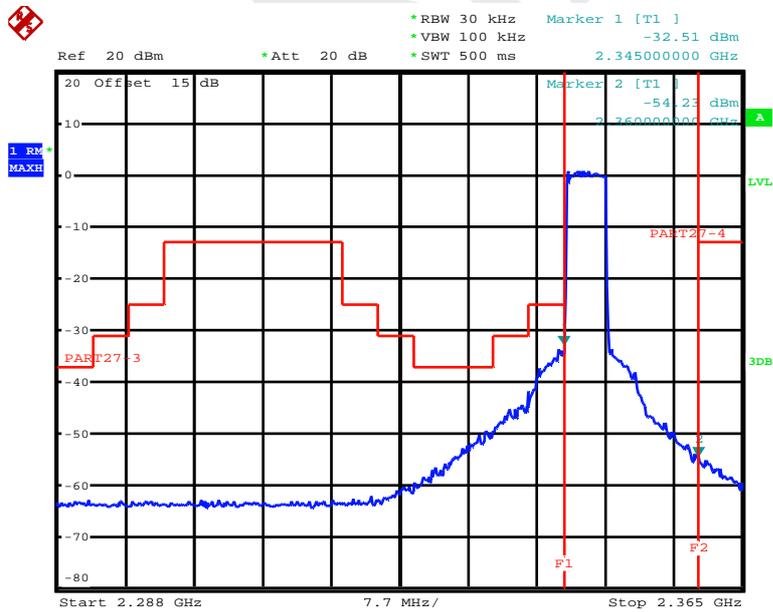
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QPSK, 15MHz



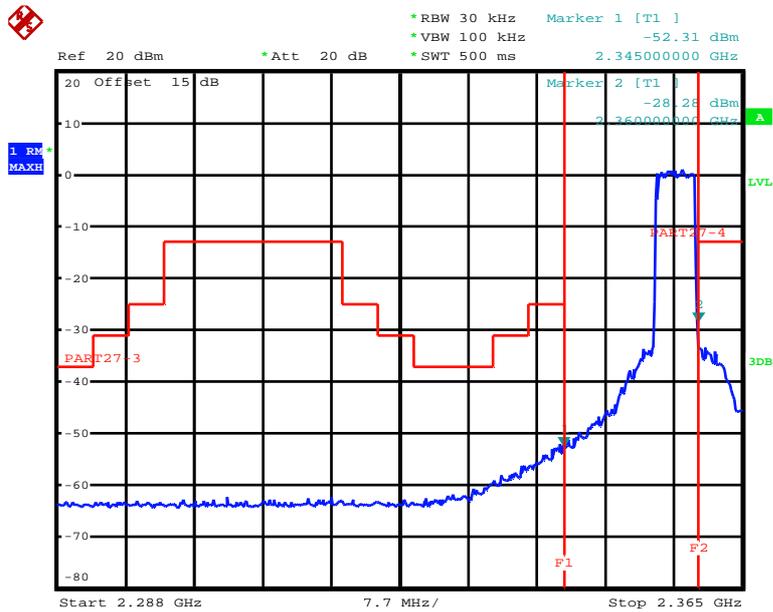
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16QAM, 5MHz, Low Channel



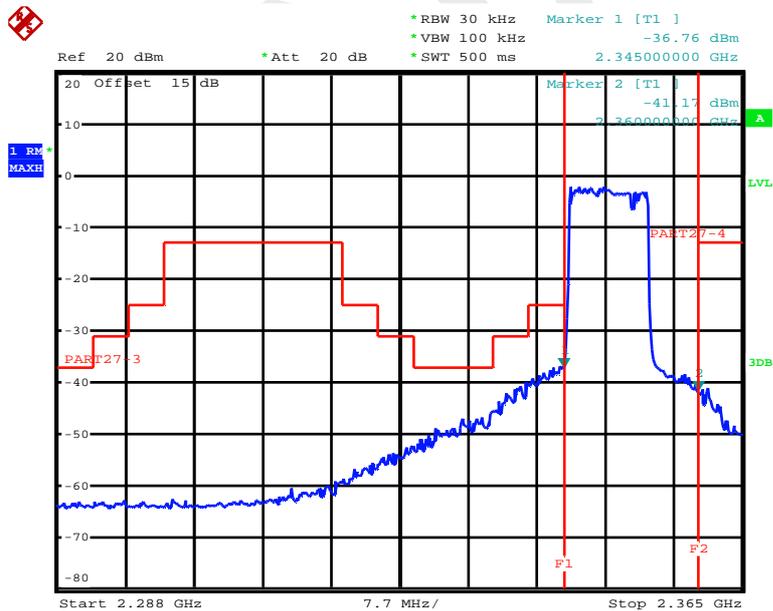
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16QAM, 5MHz, High Channel



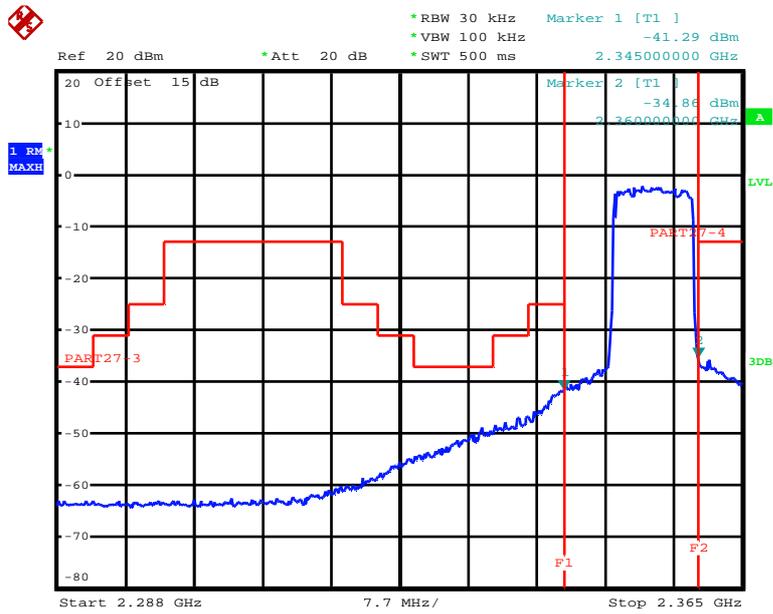
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16QAM, 10MHz, Low Channel



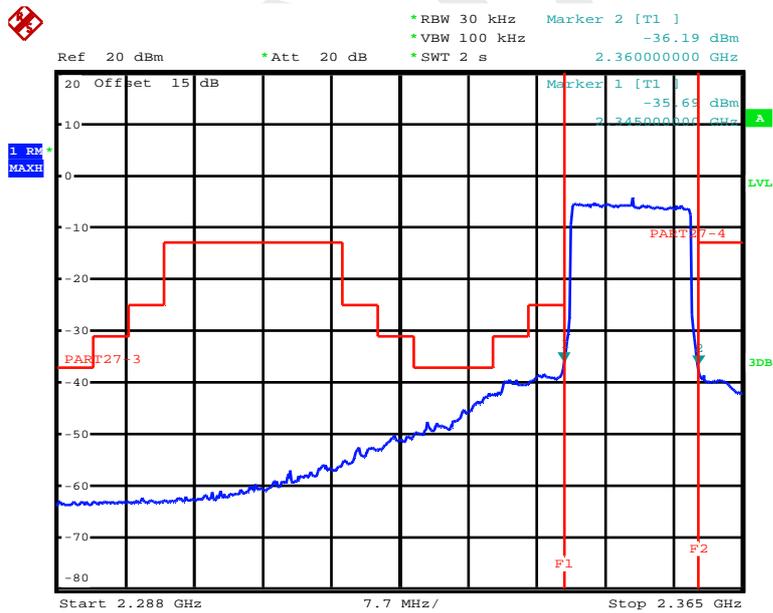
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16QAM, 10MHz, High Channel



Date: 28.JUL.2014 17:52:55

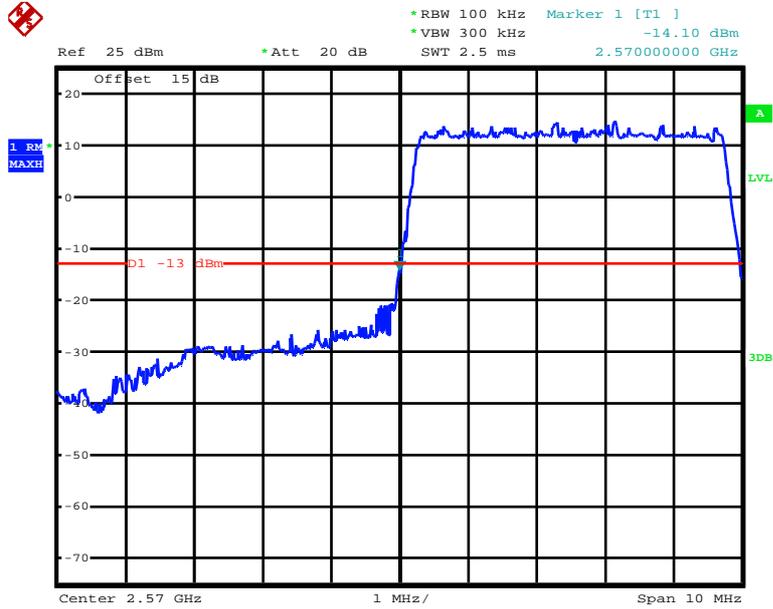
16QAM, 15MHz



Date: 28.JUL.2014 19:43:07

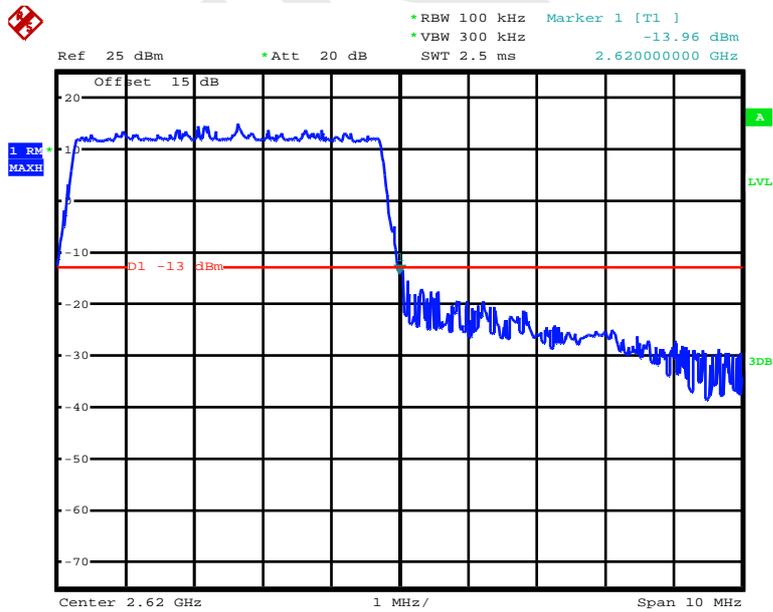
2570MHz-2620MHz:

QPSK, 5MHz, Low Channel



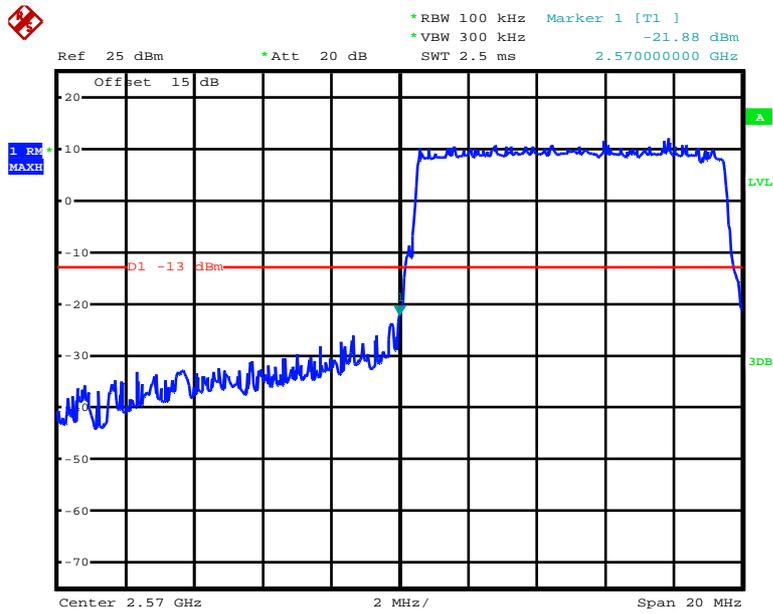
Date: 29.JUL.2014 22:06:53

QPSK, 5MHz, High Channel



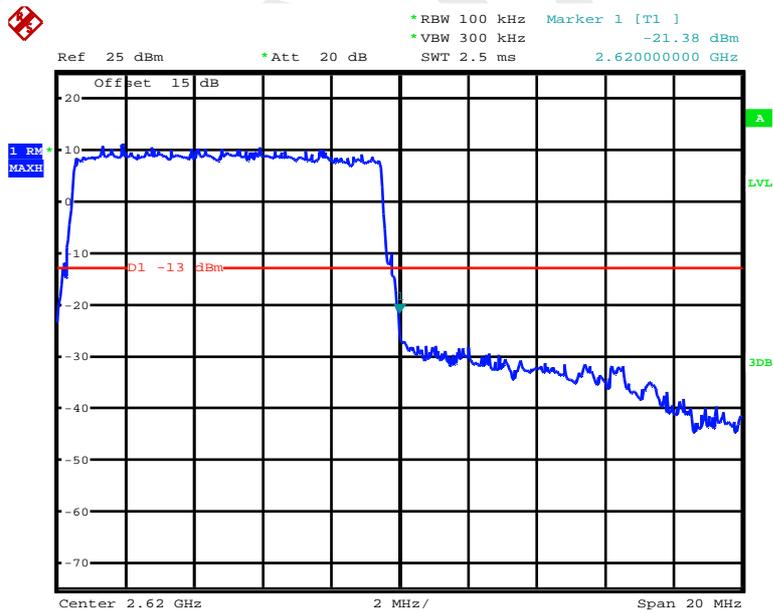
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QPSK, 10MHz, Low Channel



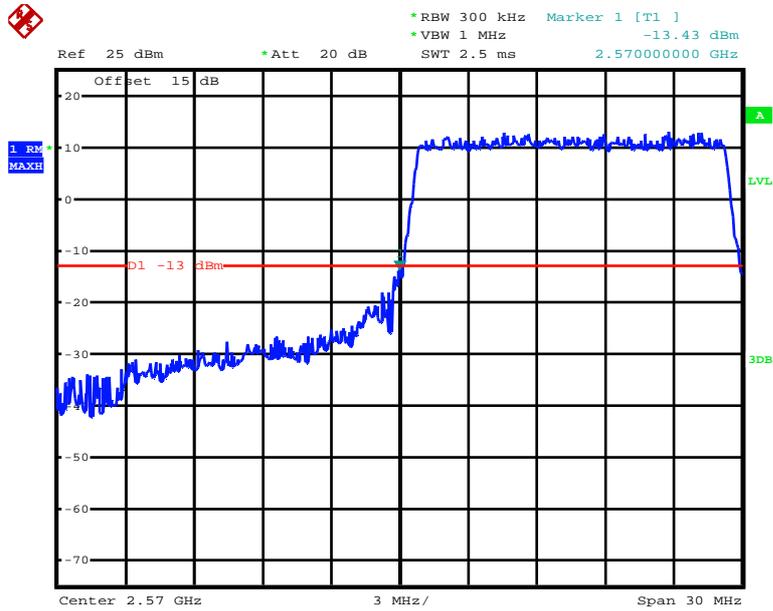
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QPSK, 10MHz, High Channel



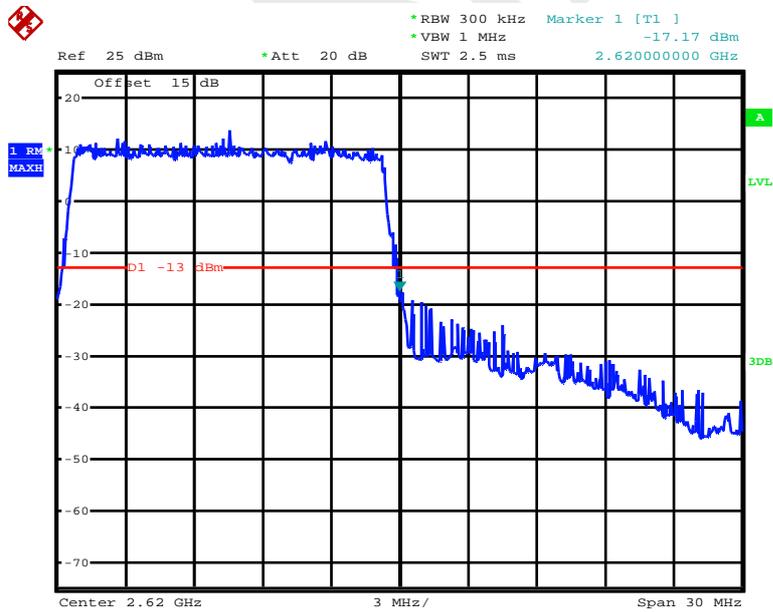
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QPSK, 15MHz, Low Channel



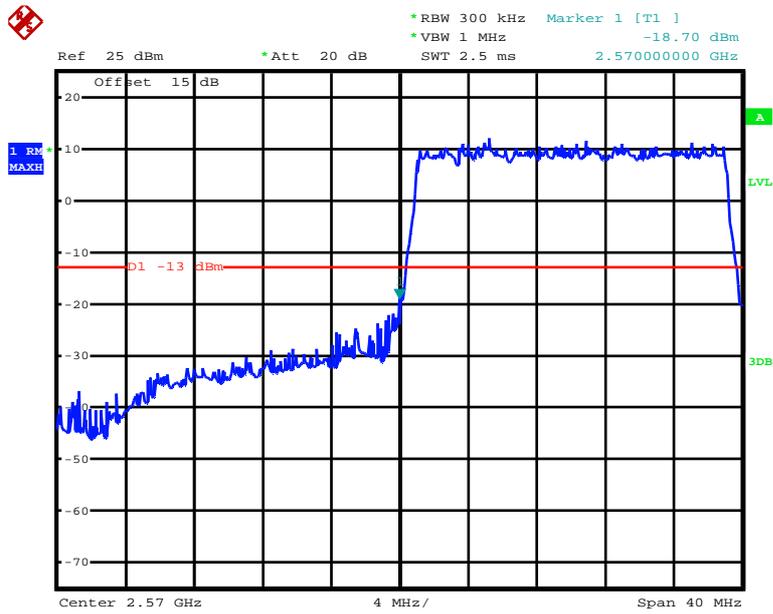
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QPSK, 15MHz, High Channel



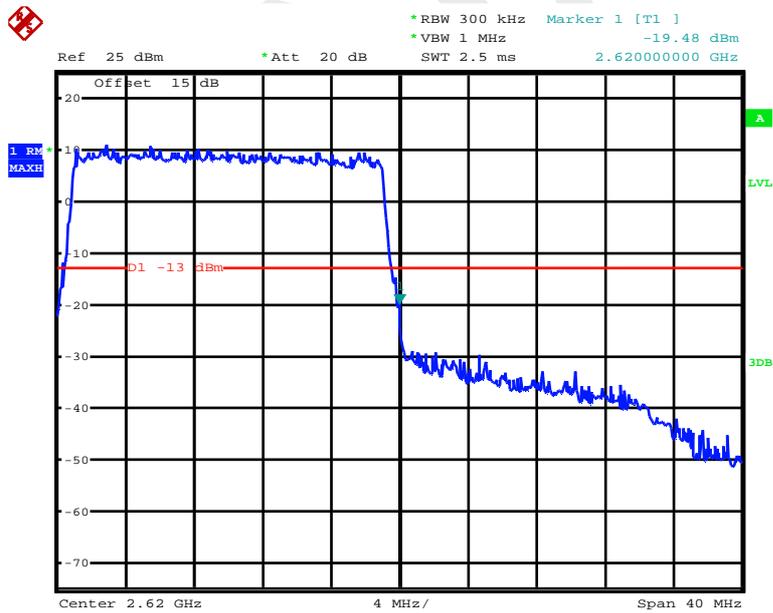
Date: 29.JUL.2014 22:19:04

QPSK, 20MHz, Low Channel



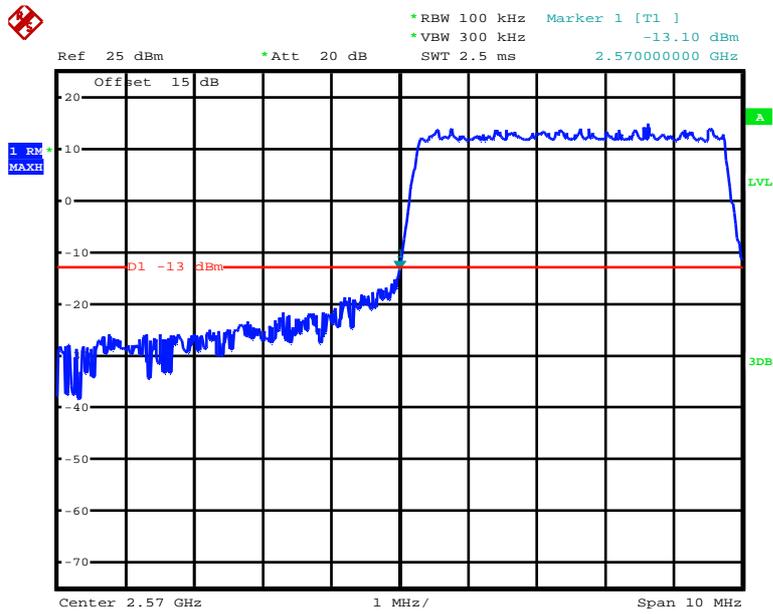
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QPSK, 20MHz, High Channel



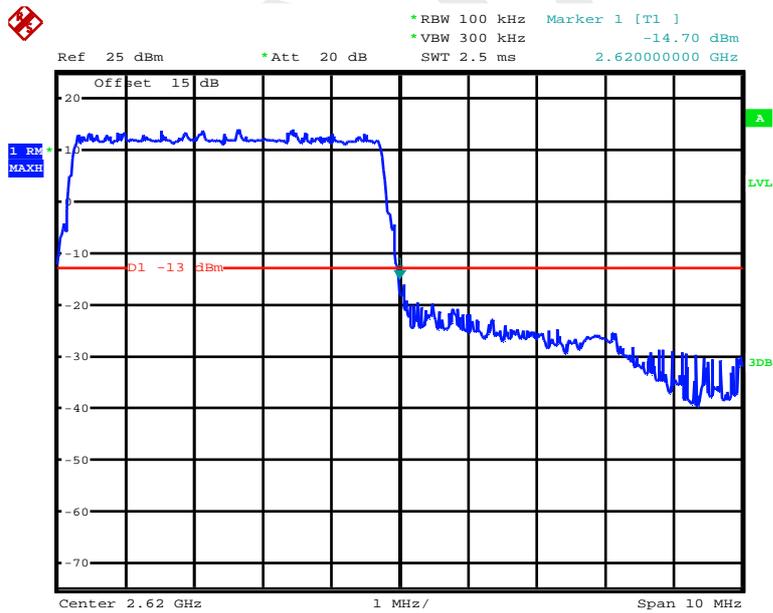
Date: 29.JUL.2014 22:21:03

16QAM, 5MHz, Low Channel



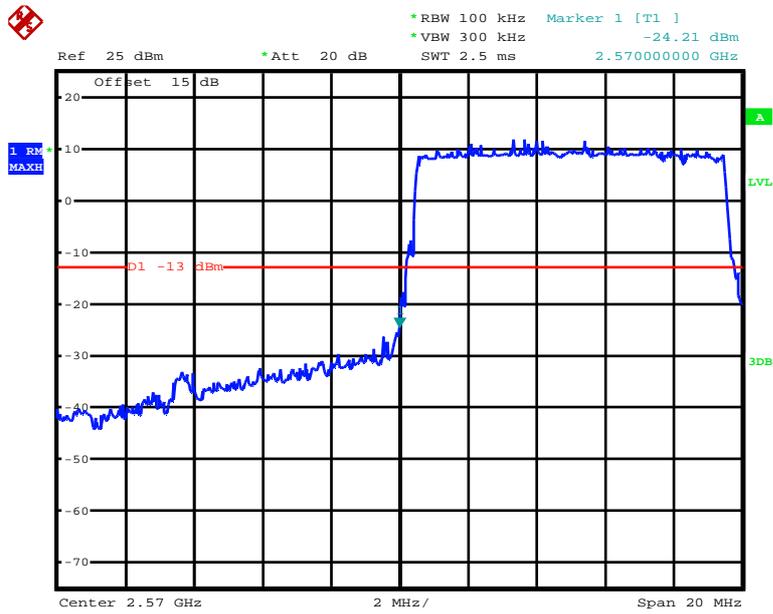
Date: 29.JUL.2014 22:06:25

16QAM, 5MHz, High Channel



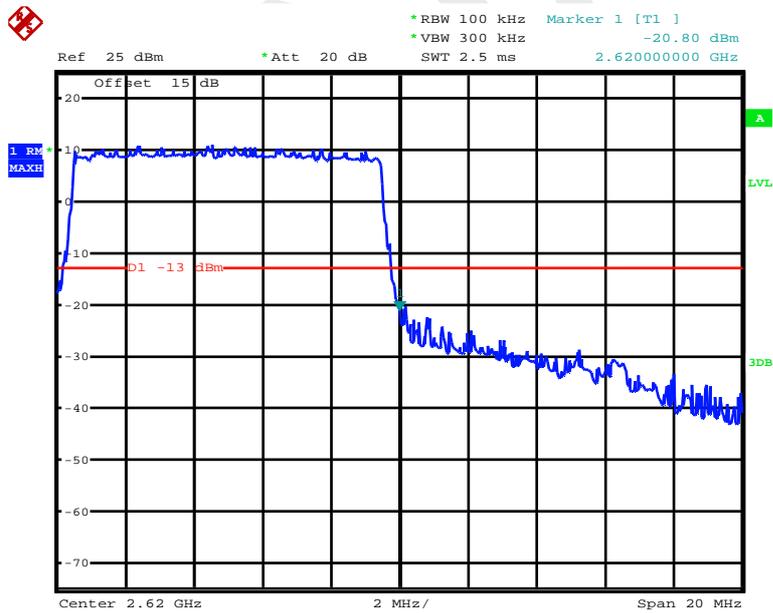
Date: 29.JUL.2014 22:09:27

16QAM, 10MHz, Low Channel



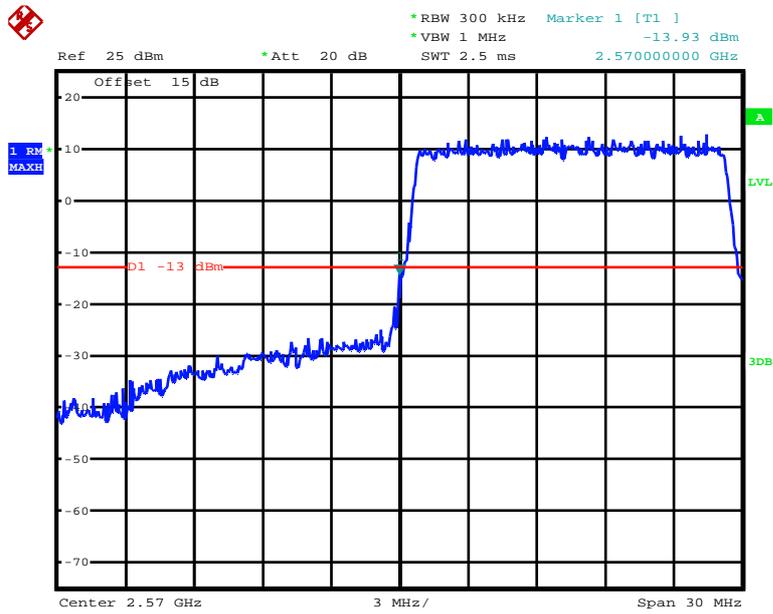
Date: 29.JUL.2014 22:12:13

16QAM, 10MHz, High Channel



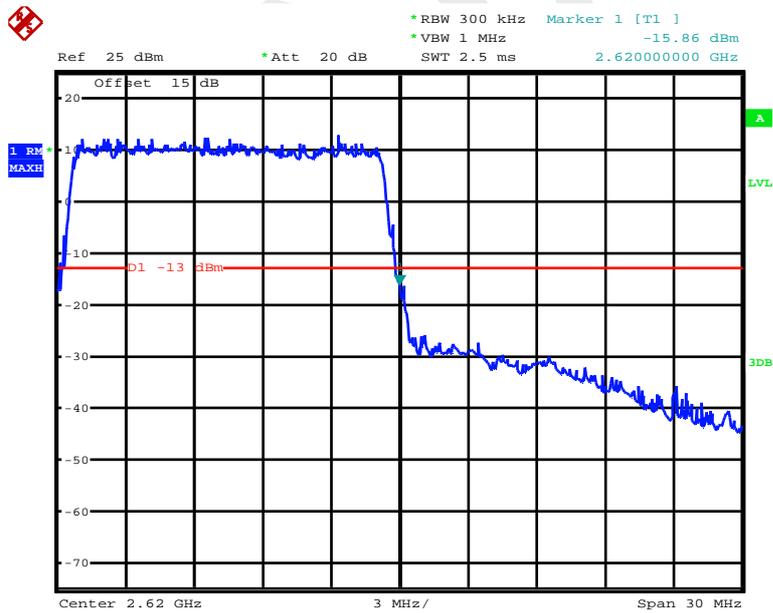
Date: 29.JUL.2014 22:10:57

16QAM, 15MHz, Low Channel



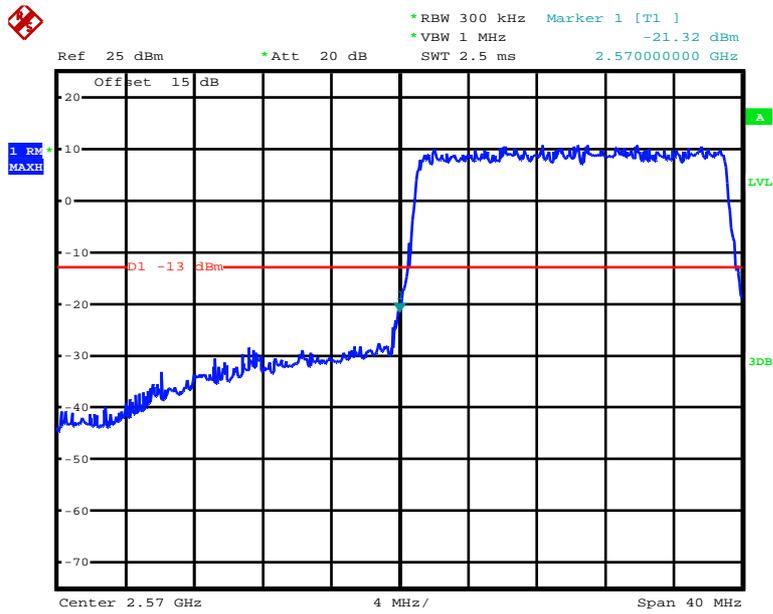
Date: 29.JUL.2014 22:17:38

16QAM, 15MHz, High Channel



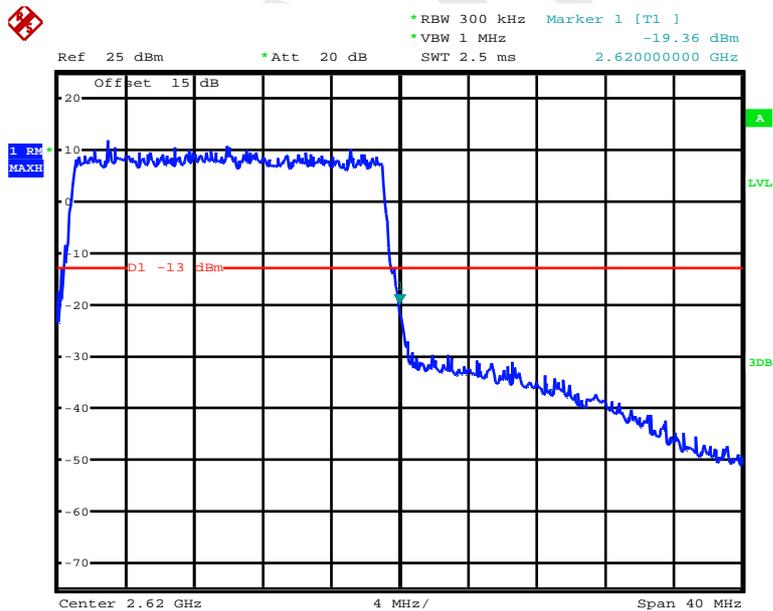
Date: 29.JUL.2014 22:19:32

16QAM, 20MHz, Low Channel



Date: 29.JUL.2014 22:22:08

16QAM, 20MHz, High Channel



Date: 29.JUL.2014 22:20:46

FCC §2.1055 & §27.54 - FREQUENCY STABILITY

Applicable Standards

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-3	2013-08-01	2014-08-01

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	29.2
Relative Humidity:	65 %
ATM Pressure:	100.1 kPa

The testing was performed by Allen Qiao on 2014-07-28.

2305MHz-2320MHz:

Middle Channel			
Power Supplied (Vac)	Temperature ()	Frequency Error (Hz)	Frequency Error (ppm)
120	-30	2.98	0.0011
	-20	1.89	0.0007
	-10	1.04	0.0004
	0	2.98	0.0011
	10	3.53	0.0014
	20	1.37	0.0005
	30	-2.37	-0.0009
	40	3.78	0.0015
	50	0.6	0.0002
102	25	-2.93	-0.0011
138	25	5.33	0.0021

2345MHz-2360MHz:

Middle Channel			
Power Supplied (Vac)	Temperature ()	Frequency Error (Hz)	Frequency Error (ppm)
120	-30	1.28	0.0005
	-20	-1.34	-0.0005
	-10	1.16	0.0004
	0	2.1	0.0008
	10	-0.27	-0.0001
	20	5.76	0.0022
	30	3.48	0.0013
	40	-2.99	-0.0012
	50	-2.96	-0.0011
102	25	1.71	0.0007
138	25	2.07	0.0008

2570MHz-2620MHz:

Middle Channel			
Power Supplied (Vac)	Temperature ()	Frequency Error (Hz)	Frequency Error (ppm)
120	-30	1.02	0.0004
	-20	0.68	0.0003
	-10	-0.82	-0.0003
	0	-0.63	-0.0002
	10	-1.82	-0.0007
	20	-0.1	0.0000
	30	0.86	0.0003
	40	1.16	0.0004
	50	1.99	0.0008
102	25	5.46	0.0021
138	25	-2.84	-0.0011

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