TEST REPORT

REPORT NUMBER: B15W50007-FCC-RF_Rev4

ON

Type of Equipment: GPS Tracker
Type of Designation: All-In-One 3
Manufacturer: Presidio Networked Solutions, Inc.

ACCORDING TO
FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS; e-CFR, Mar 17, 2015
PART 22, PUBLIC MOBILE SERVICES , e-CFR, Mar 17, 2015
PART 24, PERSONAL COMMUNICATIONS SERVICES, e-CFR, Mar 17, 2015

China Telecommunication Technology Labs.

Month date, year
May, 14, 2015

Signature

He Guili
Director

FCC ID:	2AE24AIO3
Report Date:	2015-05-14

Test Firm Name:	China Telecommunication Technology Labs
Registration Number:	840587

Statement

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Parts 2, 22, 24. The sample tested was found to comply with the requirements defined in the applied rules.

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1 General Information

1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Parts 2, 22, 24.

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex C.

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1.2 Testers

Name: Chen Wen

Position: Engineer

Department: Department of RF test

Date: 2015-02-03 to 2015-5-14

Signature:

Editor of this test report:

Name: Zhou Jin

Position: Engineer

Department: Department of RF test

Date: 2015-05-14

Signature:

Technical responsibility for area of testing:

Name: Zhang Yan

Position: Manager

Department: Director of the laboratory

Date: 2015-05-14

Signature:

CTTL Test Report

1.3 Testing Laboratory information

1.3.1 Location

Name:	China Telecommunication Technology Labs.
Address:	No.8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China
Postal Code:	401336
Tel:	0086-23-88068315
Fax:	0086-23-88608777

1.3.2 Details of accreditation status

Accredited by:	China National Accreditation Service for Conformity Assessment (CNAS)
Registration number:	CNAS Registration No. CNAS L0570
Standard:	ISO/IEC 17025:2005

1.3.3 Test location, where different from section 1.3.1

Name:	------
Street:	------
City:	------
Country:	------
Telephone:	------
Fax:	------
Postcode:	------

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1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name:	Presidio Networked Solutions, Inc.
Address:	5337 Millenia Lakes Blvd, Suite 300, ORLANDO
Country:	USA
Telephone:	01 407 409 8208
Fax:	01 407 650 9786
Contact:	Thomas
Telephone:	01 407 409 8208
Email:	jthomas@presidio.com

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name:	eSky Wireless
Address:	22-303,#328 Xinghu Road Suzhou Industrial Park Jiangsu Province
City:	Suzhou
Country:	China

1.4.3 Manufactory (if different from applicant in section 1.4.1)

Name:	eSky Wireless
Address:	22-303,#328 Xinghu Road Suzhou Industrial Park Jiangsu Province
City:	Suzhou
Country:	China

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2 Test Item

2.1 General Information

Manufacturer: eSky Wireless
Name: GPS Tracker
Model Number: All-In-One 3
Serial Number: --
Production Status: Product
Receipt date of test item: 2015-01-08

2.2 Outline of EUT

E.U.T. is a GSM850/ PCS1900 bands GPRS/EGPRS and UMTS/HSDPA/HSUPA II/IV/V bands Terminal Equipment

2.3 Modifications Incorporated in EUT

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

2.4 Equipment Configuration

Equipment configuration list:

Item	Generic Description	Manufacturer	Type	Serial No.	Remarks
A	GPS Tracker	eSky Wireless	All-In-One 3	--	None
B	Battery	None	None	--	None
C	Adaptor	None	None	--	None

2.5 Other Information

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3 Summary of Test Results

A brief summary of the tests carried out is shown as following.

GSM/GPRS/EGPRS mode:		
Specification Clause	Name of Test	Result
2.1051, 24.238, 2.1053,22.917	Radiated Spurious Emission	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 1
2.1055,22.355, 24.235	Frequency Stability over Temperature Variation	Pass
2.1055,22.355, 24.235	Frequency Stability over Voltage Variation	Pass
2.1046,22.913(a), 24.232(c)	Conducted RF Power Output	Pass
2.1051,22.917, 24.238	Conducted spurious emissions	Pass
2.1051,24.238, 2.1053, 22.917	Band Edge	Pass
22.913(a), 22.232(b)	ERP and EIRP	Pass
Note 1: No applicable performance criteria.		

WCDMA/HSUPA/HSDPA mode:		
Specification Clause	Name of Test	Result
2.1051, 24.238, 2.1053,22.917	Radiated Spurious Emission	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 2
2.1055,22.355, 24.235	Frequency Stability over Temperature Variation	Pass
2.1055,22.355, 24.235	Frequency Stability over Voltage Variation	Pass
2.1046,22.913(a), 24.232(c)	Conducted RF Power Output	Pass
2.1051,22.917, 24.238	Conducted spurious emissions	Pass
2.1051,24.238, 2.1053, 22.917	Band Edge	Pass
22.913(a), 24.232(b)	ERP and EIRP	Pass
Note 2: No applicable performance criteria.		

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Test equipment Used:

Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
CWY5110	EMI Test Receiver	R/S	ESU26	100367	2016-03-05	Normal
CWY5119	Ultra Broadband Antenna	R/S	VULB 9163	9163-544	2016-012-13	Normal
CWY5127	Double-Ridged Horn Antenna	R/S	HF907	100356	2016-012-13	Normal
CNY5153	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2015-11-16	Normal
CNY0676	Radio Communications Analyzer	R/S	CMW500	128181	2016-03-05	Normal
CWY5125	Signal Generator	R/S	SMF100A	102222	2016-03-05	Normal

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4 Test Results

4.1 Radiated Spurious Emission

Specifications:	2.1051, 22.917, 2.1053, 22.917
Date of Tests	2015-02-03-2015-04-13
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661 for GMSK/8PSK mode, channel 9400,1413, and 4182 for QPSK/16QAM mode.
Test Results:	Pass

Limit Level Construction:
Part 22:
According to Part 22.917(a), i.e., Out of band emissions, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm
Part 24:
According to Part 24.238 (a), i.e., Out of band emissions, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

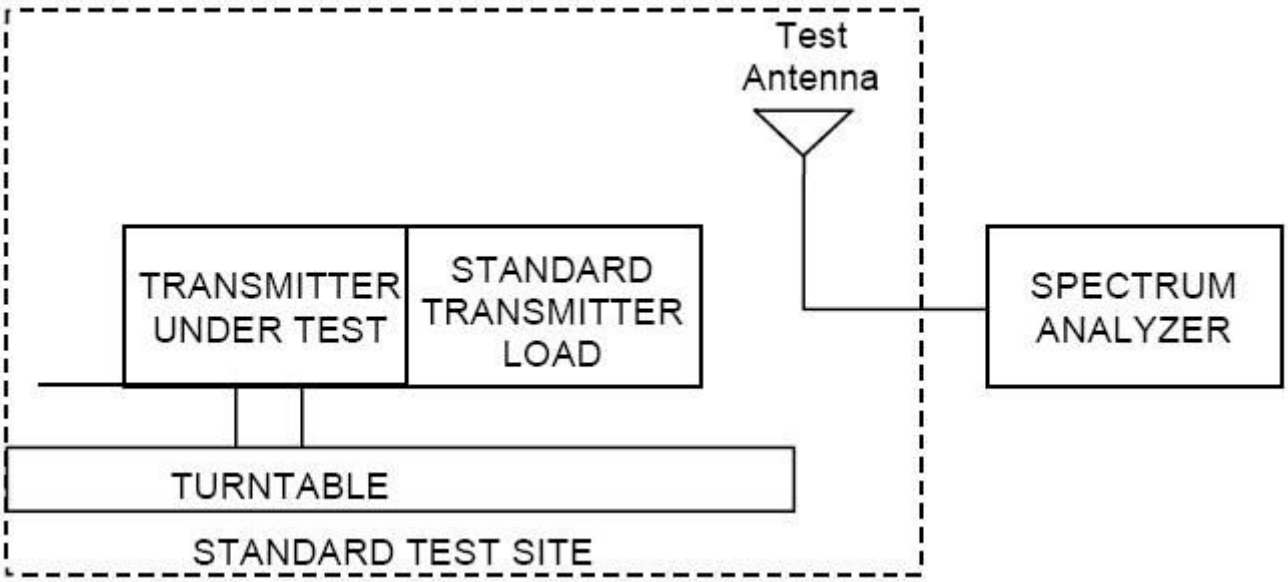
Test Setup:

The EUT was placed in an anechoic chamber. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

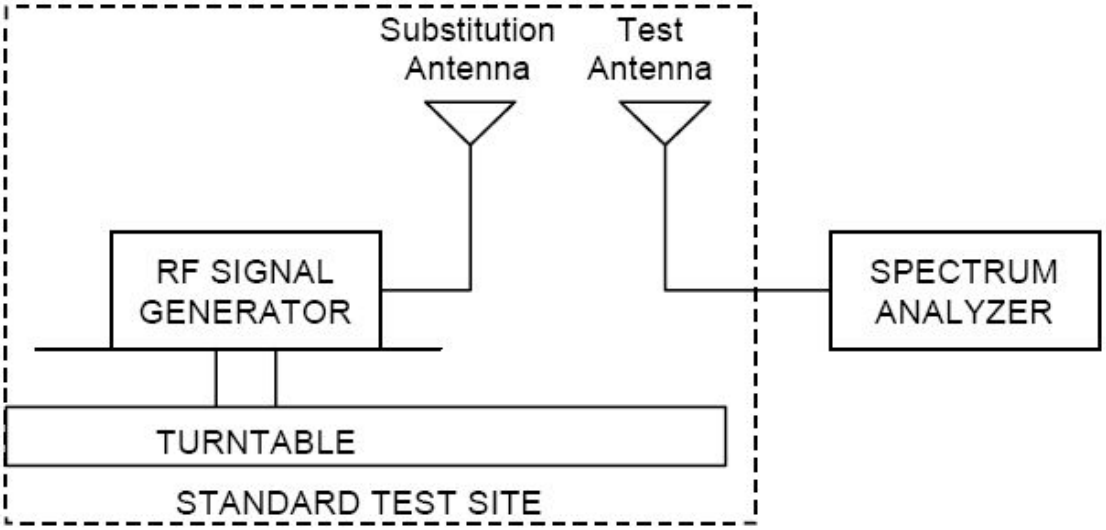
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-C: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above.



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by

reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

***P_d*(dBm) = *P_g*(dBm) – *cable loss* (dB) + *antenna gain* (dB)**

where:

P_d is the dipole equivalent power and

P_g is the generator output power into the substitution antenna.

Test Data （GPRS channel 190 GMSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1672.8	-19.64	4.7	9.4	-14.94	V
2509.2	-42.00	5.9	10.6	-37.30	V
3345.6	-36.32	6.8	12.6	-30.52	V
4182.0	-42.18	7.8	12.6	-37.38	V
5018.4	-43.66	7.5	12.7	-38.46	V
1672.8	-19.30	4.7	9.4	-14.60	H
2509.2	-18.99	5.9	10.6	-14.29	H
3345.6	-34.98	6.8	12.6	-29.18	H
4182.0	-43.25	7.8	12.6	-38.45	H
5018.4	-44.29	7.5	12.7	-39.09	H

Test Data （GPRS channel 661 GMSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-44.53	7.3	12.6	-39.23	V
5840.0	-56.45	1.1	13.1	-44.45	V
7520.0	-57.23	0.8	11.5	-46.53	V
9400.0	-47.46	0.8	12.0	-36.26	V
11280.0	-51.36	0.3	11.5	-40.16	V
3760.0	-43.23	7.3	12.6	-37.93	H
5840.0	-54.93	1.1	13.1	-42.93	H
7520.0	-56.87	0.8	11.5	-46.17	H
9400.0	-46.71	0.8	12.0	-35.51	H
11280.0	-51.17	0.3	11.5	-39.97	H

Test Data （EGPRS channel 190 8PSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1672.8	-19.23	4.7	9.4	-14.53	V
2509.2	-19.00	5.9	10.6	-14.30	V
3345.6	-48.98	6.8	12.6	-43.18	V
4182.0	-46.54	7.8	12.6	-41.74	V
5018.4	-48.58	7.5	12.7	-43.38	V
1672.8	-19.15	4.7	9.4	-14.45	H
2509.2	-18.52	5.9	10.6	-13.82	H
3345.6	-38.02	6.8	12.6	-32.22	H
4182.0	-40.43	7.8	12.6	-35.63	H
5018.4	-42.85	7.5	12.7	-37.65	H

Test Data （EGPRS channel 661 8PSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-47.97	7.3	12.6	-42.67	V
5840.0	-54.89	1.1	13.1	-42.89	V
7520.0	-43.12	0.8	11.5	-32.42	V
9400.0	-50.23	0.8	12.0	-39.03	V
11280.0	-51.32	0.3	11.5	-40.12	V
3760.0	-44.34	7.3	12.6	-39.04	H
5840.0	-53.56	1.1	13.1	-41.56	H
7520.0	-41.64	0.8	11.5	-30.94	H
9400.0	-49.23	0.8	12.0	-38.03	H
11280.0	-50.98	0.3	11.5	-39.78	H

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Test Data （WCDMA channel 9400 QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-43.81	7.3	12.6	-38.51	V
5840.0	-49.86	1.1	13.1	-37.86	V
7520.0	-50.73	0.8	11.5	-40.03	V
9400.0	-57.89	0.8	12.0	-46.69	V
11280.0	-59.67	0.3	11.5	-48.47	V
3760.0	-42.86	7.3	12.6	-37.56	H
5840.0	-51.64	1.1	13.1	-39.64	H
7520.0	-53.57	0.8	11.5	-42.87	H
9400.0	-56.73	0.8	12.0	-45.53	H
11280.0	-59.32	0.3	11.5	-48.12	H

Test Data （HSDPA/HSUPA channel 9400 16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-43.23	7.3	12.6	-37.93	V
5840.0	-50.73	1.1	13.1	-38.73	V
7520.0	-52.21	0.8	11.5	-41.51	V
9400.0	-59.98	0.8	12.0	-48.78	V
11280.0	-59.45	0.3	11.5	-48.25	V
3760.0	-42.96	7.3	12.6	-37.66	H
5840.0	-52.63	1.1	13.1	-40.63	H
7520.0	-53.01	0.8	11.5	-42.31	H
9400.0	-57.23	0.8	12.0	-46.03	H
11280.0	-59.93	0.3	11.5	-48.73	H

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Test Data （WCDMA channel 4182 QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1672.8	-19.87	4.7	9.4	-15.17	V
2509.2	-19.12	5.9	10.6	-14.42	V
3345.6	-48.65	6.8	12.6	-42.85	V
4182.0	-41.45	7.8	12.6	-36.65	V
5018.4	-50.65	7.5	12.7	-45.45	V
1672.8	-19.31	4.7	9.4	-14.61	H
2509.2	-19.66	5.9	10.6	-14.96	H
3345.6	-44.22	6.8	12.6	-38.42	H
4182.0	-39.06	7.8	12.6	-34.26	H
5018.4	-49.95	7.5	12.7	-44.75	H

Test Data （HSDPA/HSUPA channel 4182 16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1672.8	-19.65	4.7	9.4	-14.95	V
2509.2	-19.97	5.9	10.6	-15.27	V
3345.6	-48.79	6.8	12.6	-42.99	V
4182.0	-38.83	7.8	12.6	-34.03	V
5018.4	-51.56	7.5	12.7	-46.36	V
1672.8	-19.12	4.7	9.4	-14.42	H
2509.2	-19.52	5.9	10.6	-14.82	H
3345.6	-45.87	6.8	12.6	-40.07	H
4182.0	-40.53	7.8	12.6	-35.73	H
5018.4	-51.12	7.5	12.7	-45.92	H

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Test Data （WCDMA channel 1413 QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3465.2	-41.36	6.9	12.6	-35.66	V
5197.8	-52.36	5.8	12.7	-45.46	V
6930.4	-51.89	0.9	11.7	-41.09	V
8663.0	-54.76	0.9	11.9	-43.76	V
10395.6	-55.12	0.7	12.1	-43.72	V
3465.2	-40.78	6.9	12.6	-35.08	H
5197.8	-51.43	5.8	12.7	-44.53	H
6930.4	-51.78	0.9	11.7	-40.98	H
8663.0	-53.83	0.9	11.9	-42.83	H
10395.6	-54.98	0.7	12.1	-43.58	H

Test Data （HSDPA/HSUPA channel 1413 16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3465.2	-43.34	6.9	12.6	-37.64	V
5197.8	-50.54	5.8	12.7	-43.64	V
6930.4	-47.69	0.9	11.7	-36.89	V
8663.0	-49.87	0.9	11.9	-38.87	V
10395.6	-51.36	0.7	12.1	-39.96	V
3465.2	-42.43	6.9	12.6	-36.73	H
5197.8	-48.23	5.8	12.7	-41.33	H
6930.4	-49.23	0.9	11.7	-38.43	H
8663.0	-51.45	0.9	11.9	-40.45	H
10395.6	-52.69	0.7	12.1	-41.29	H

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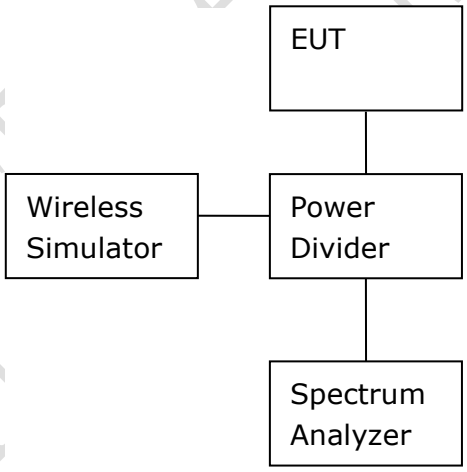
4.2 Occupied bandwidth

Specifications:	2.1049,22.917(b),24.238(b)
Date of Test	2015-02-09-2015-04-01
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251 and 512, 661, 810 for GPRS/EGPRS mode, channel 9262, 9400, 9538 and 1312, 1413, 1513 and 4132, 4182, 4233 for WCDMA/HSUPA/HSDPA mode.
Test Results:	--

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

The 99% occupied bandwidth was calculated form the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

Note:

None

Test Data:

GPRS/EGPRS mode

	EUT channel no.	99% occupied bandwidth [kHz]
GMSK	128 (824.2MHz)	243.58
	190 (836.4MHz)	240.38
	251 (848.8MHz)	243.58
	512 (1850.2MHz)	243.58
	661 (1880 MHz)	246.79
	810 (1909.8 MHz)	246.79
8PSK	128 (824.2MHz)	243.58
	190 (836.4MHz)	243.58
	251 (848.8MHz)	243.58
	512 (1850.2MHz)	243.58
	661 (1880 MHz)	240.38
	810 (1909.8 MHz)	240.38

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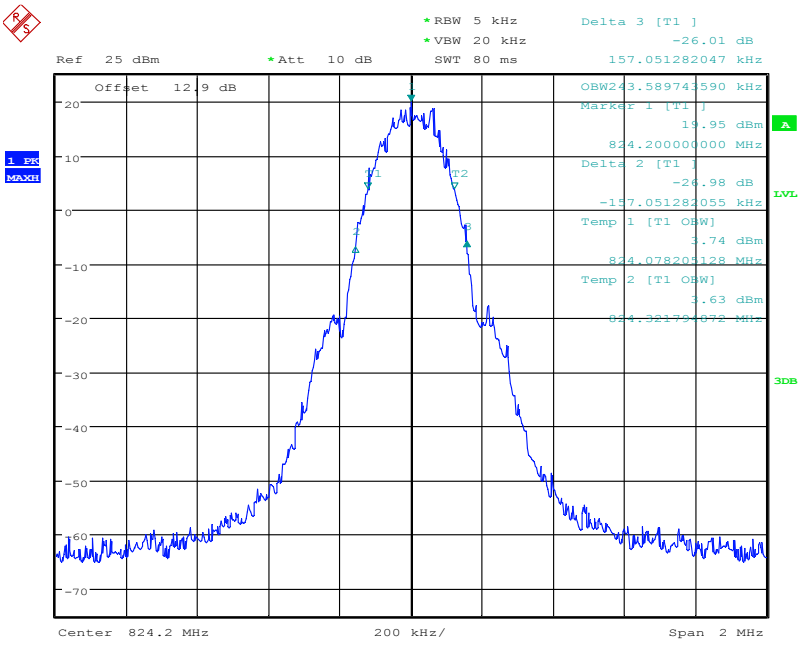
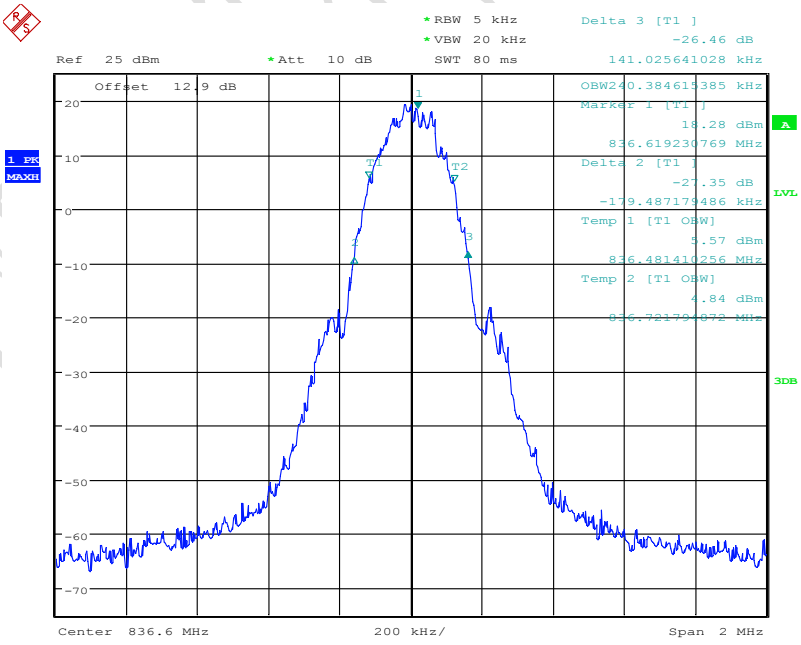
Graphical results for GPRS/EGPRS mode:



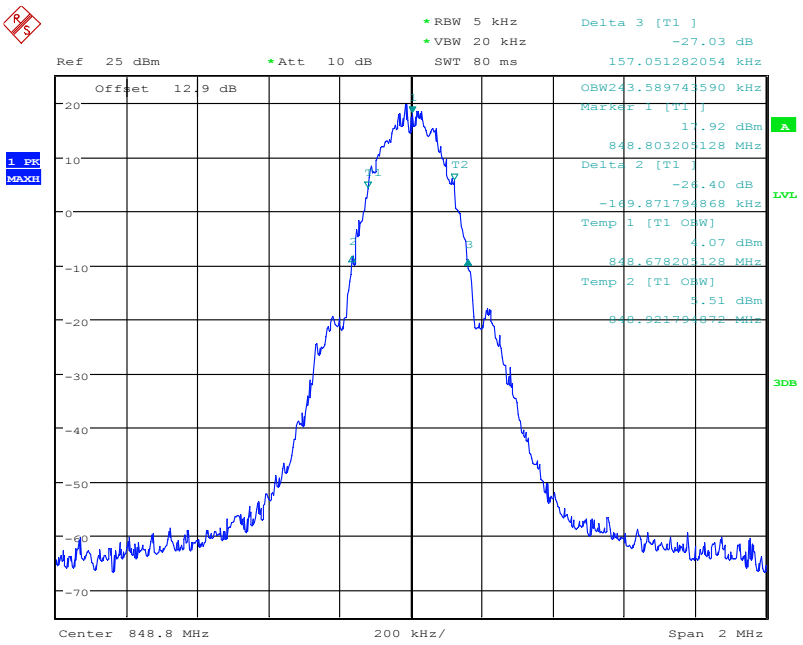
Date: 1.APR.2015 11:14:16

GMSK Channel 128



Date: 1.APR.2015 11:14:59

GMSK Channel 190



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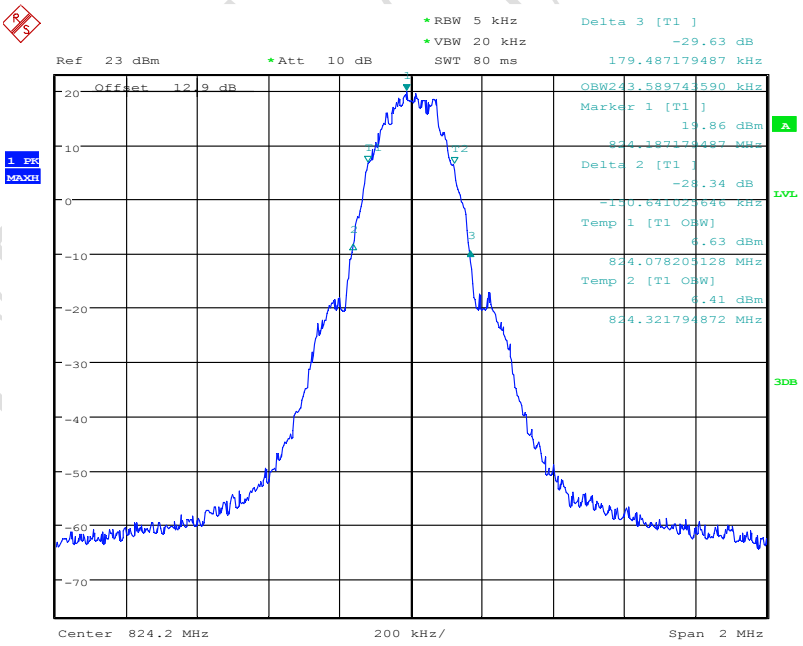
GMSK Channel 251



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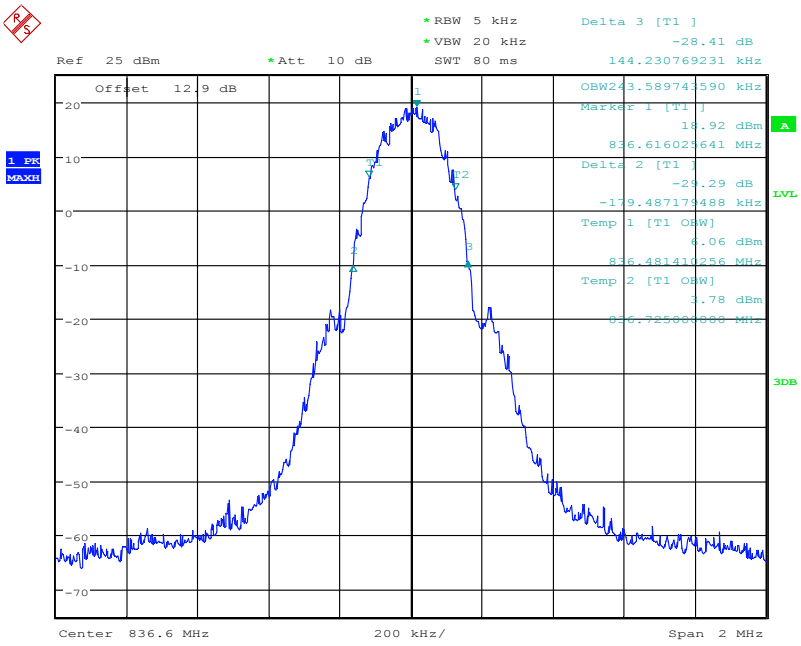
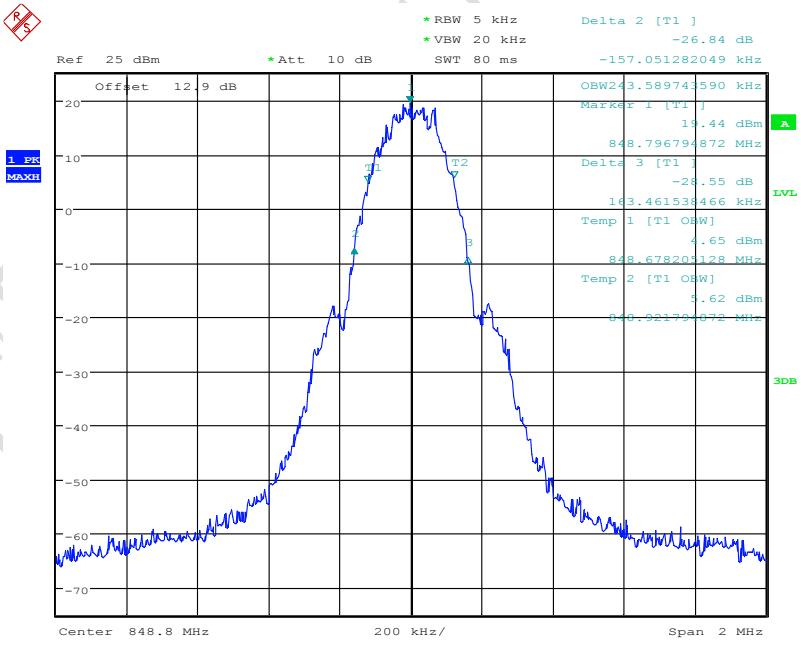
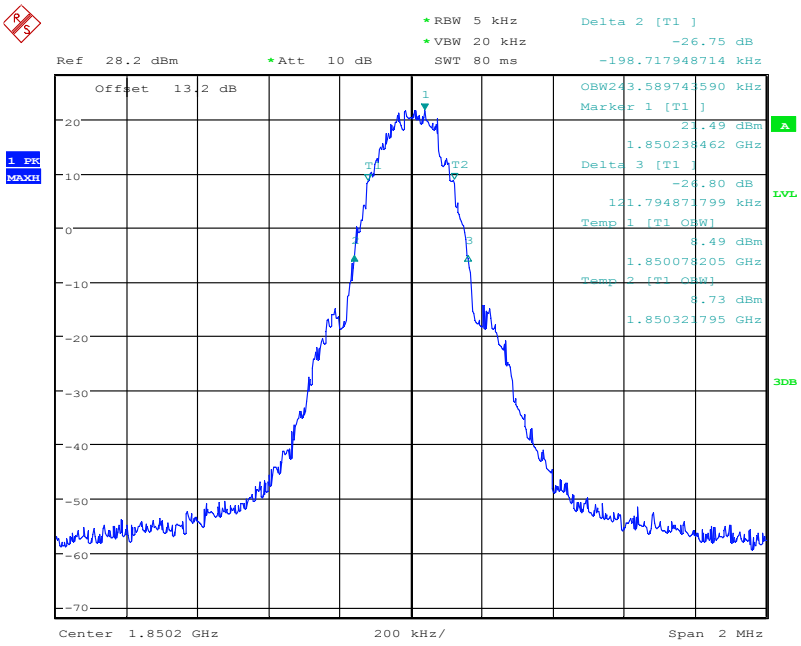
8PSK Channel 128



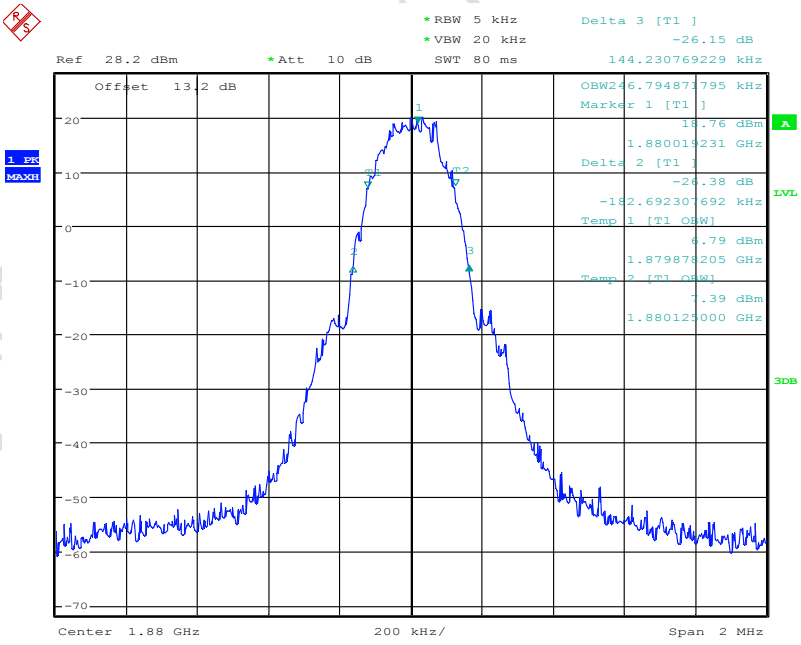
8PSK Channel 190



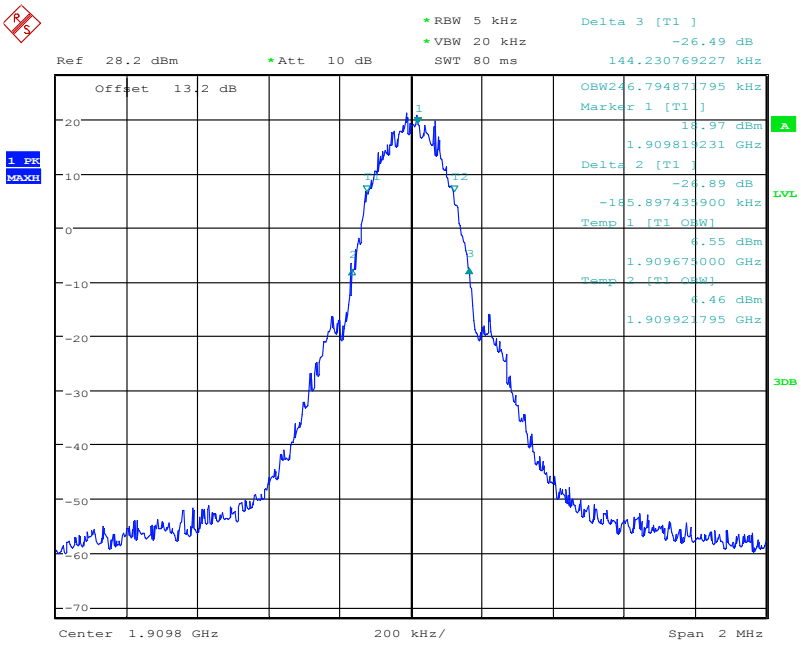
8PSK Channel 251



GMSK Channel 512

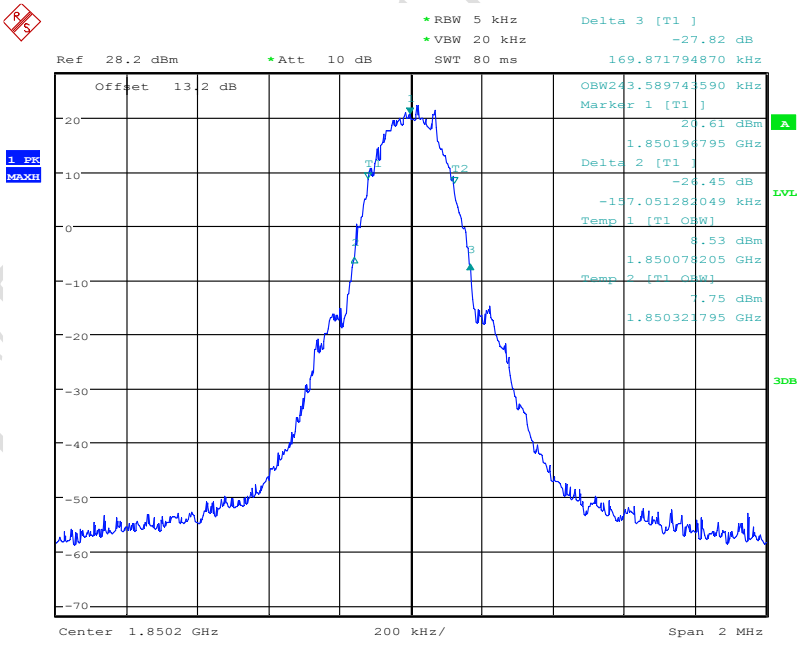


GMSK Channel 661



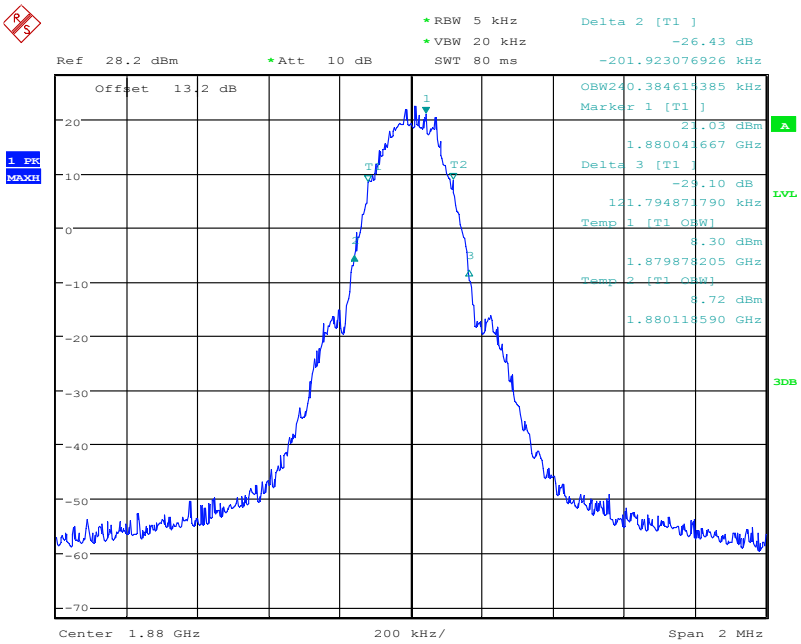
Date: 1.APR.2015 11:55:04

GMSK Channel 810

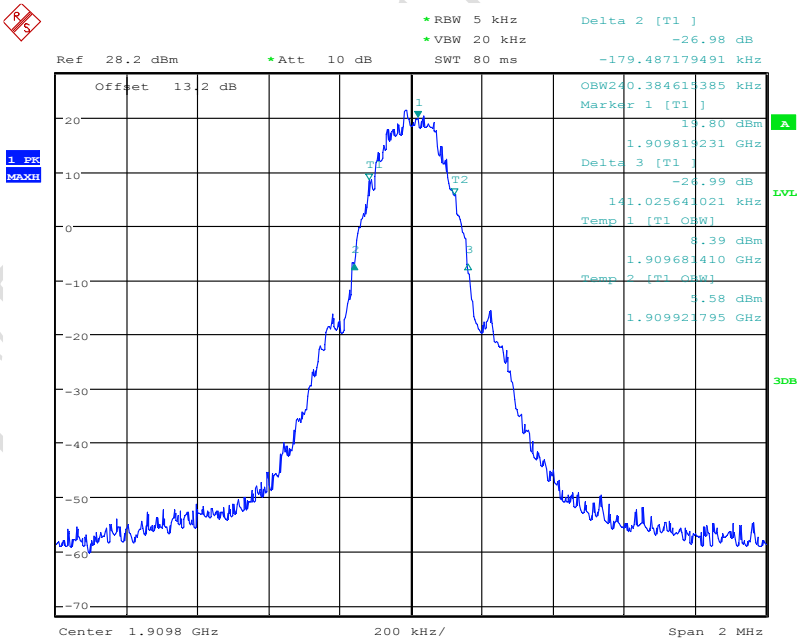


Date: 1.APR.2015 11:47:44

8PSK Channel 512



8PSK Channel 661



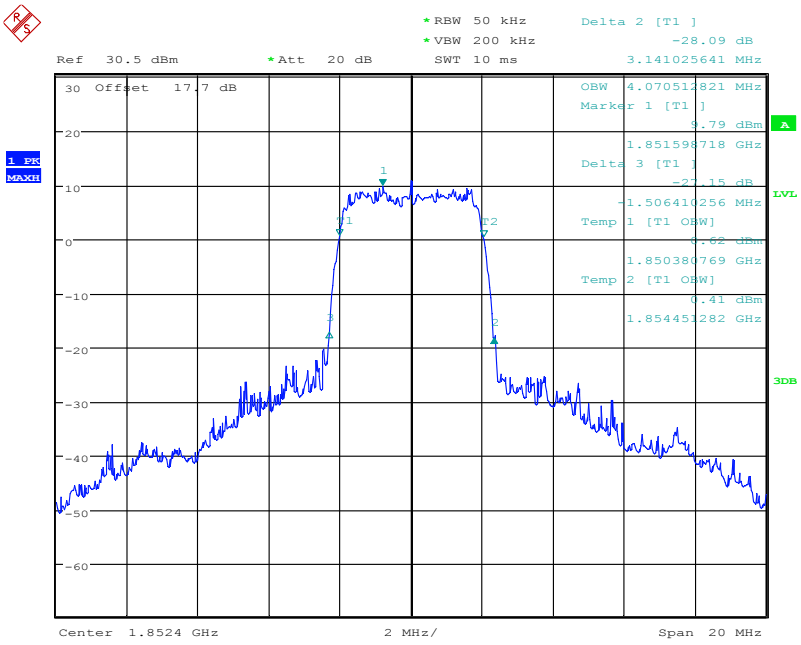
8PSK Channel 810

WCDMA/HSDPA/HSUPA mode

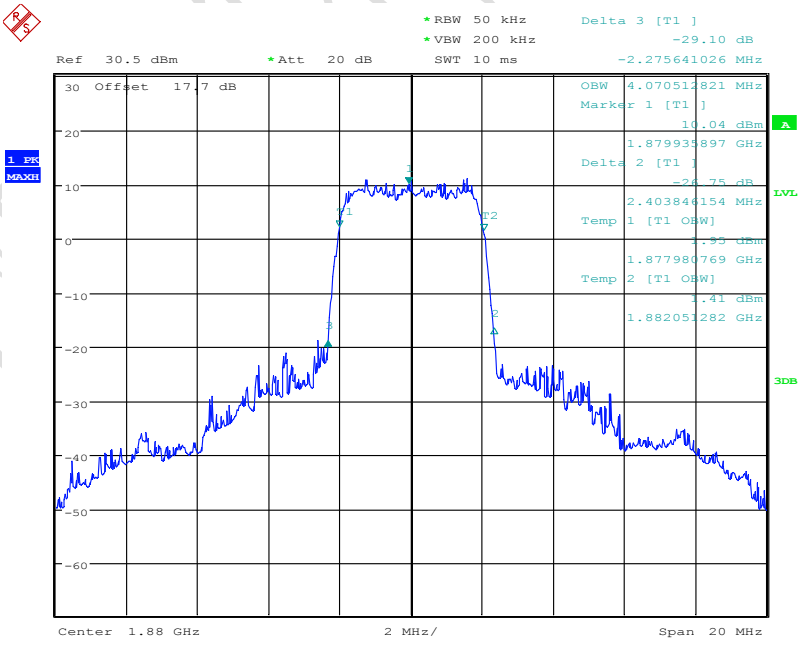
	EUT channel no.	99% occupied bandwidth [MHz]
QPSK	9262 (1852.4MHz)	4.0705
	9400 (1880 MHz)	4.0705
	9538 (1907.5 MHz)	4.0705
	1312 (1712.4MHz)	4.0705
	1413 (1732.6MHz)	4.0705
	1513 (1752.6MHz)	4.0705
	4132 (826.4MHz)	4.0705
	4182 (836.4MHz)	4.0705
	4233 (846.6MHz)	4.0705
16QAM	9262 (1852.4MHz)	4.0705
	9400 (1880 MHz)	4.0705
	9538 (1907.5 MHz)	4.0384
	1312 (1712.4MHz)	4.0705
	1413 (1732.6MHz)	4.0705
	1513 (1752.6MHz)	4.0705
	4132 (826.4MHz)	4.0705
	4182 (836.4MHz)	4.0705
	4233 (846.6MHz)	4.0705

CTTL Test Report

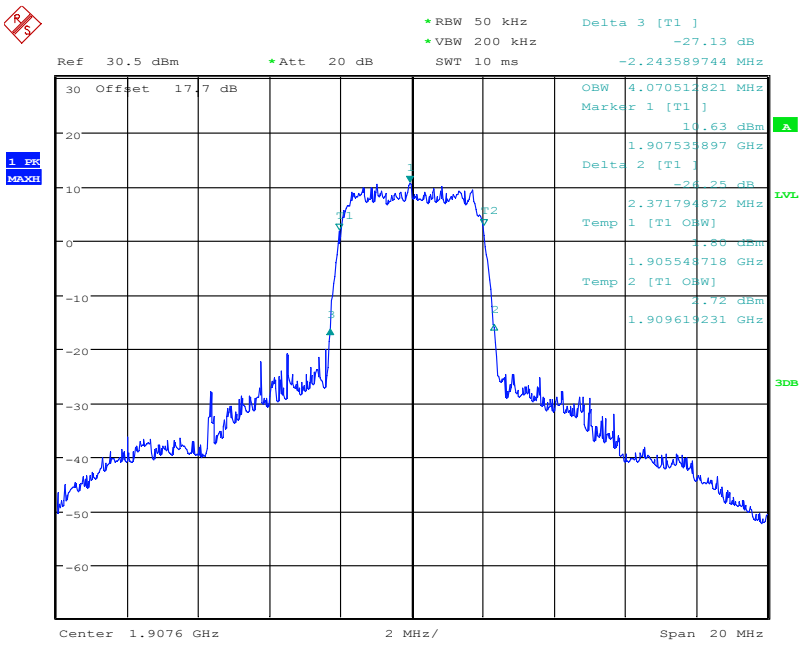
Graphical results for WCDMA/HSDPA/HSUPA mode:



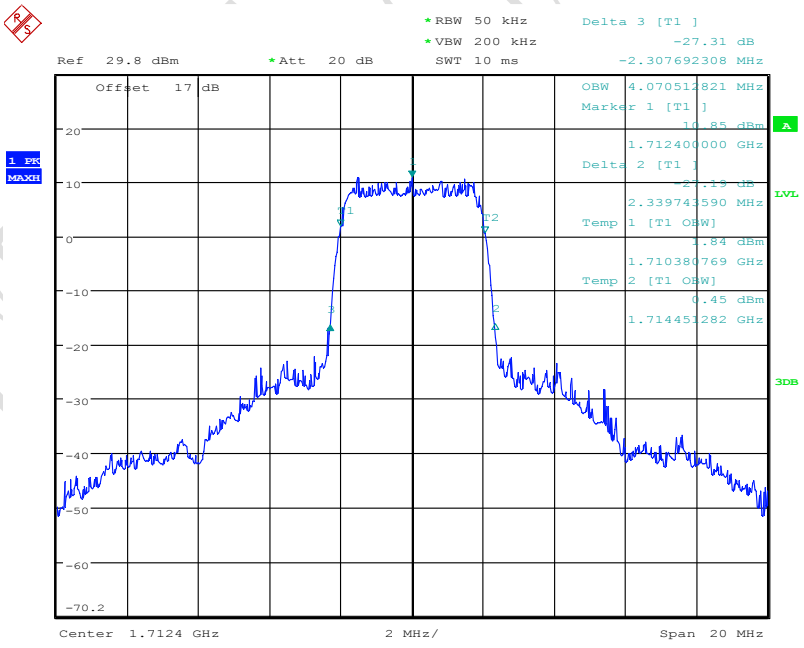
QPSK Channel 9262



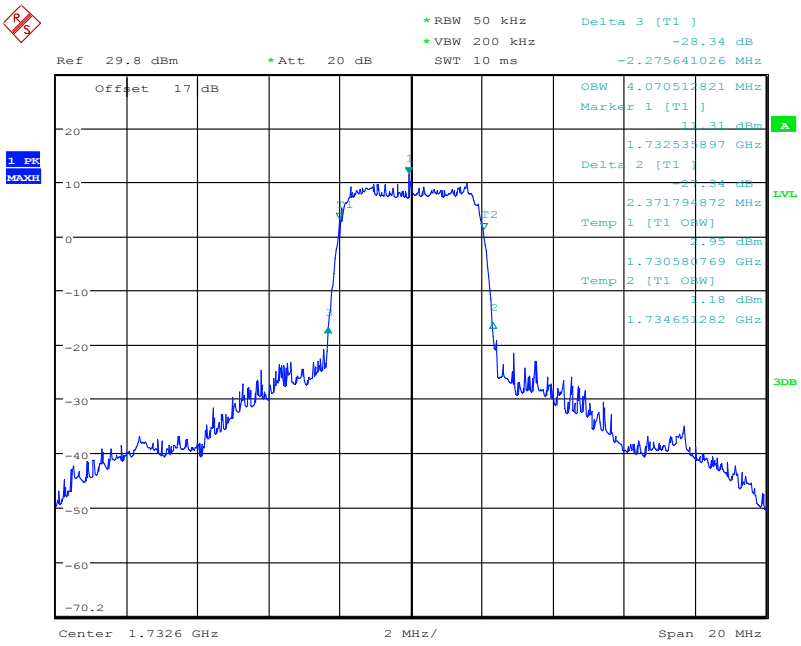
QPSK Channel 9400



QPSK Channel 9538

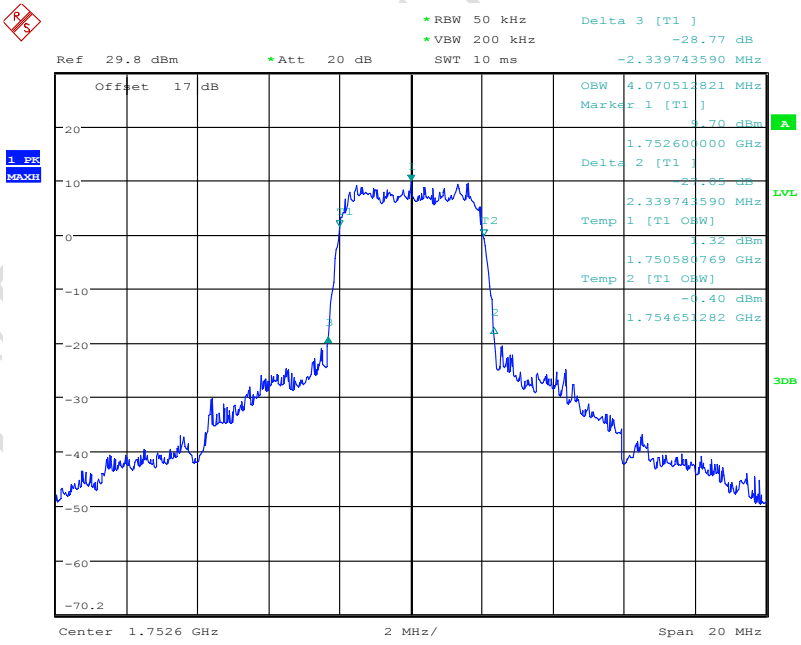


QPSK Channel 1312



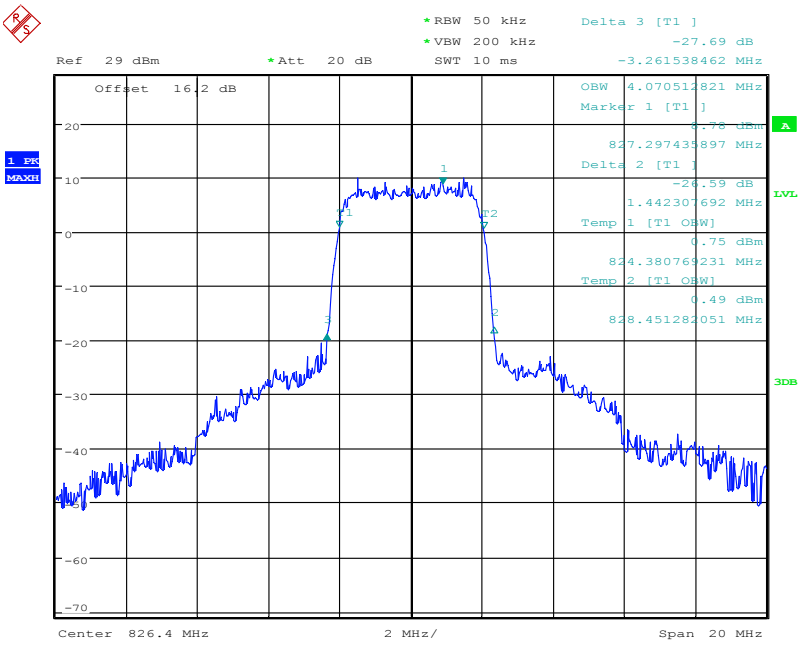
Date: 9.FEB.2015 13:33:46

QPSK Channel 1413

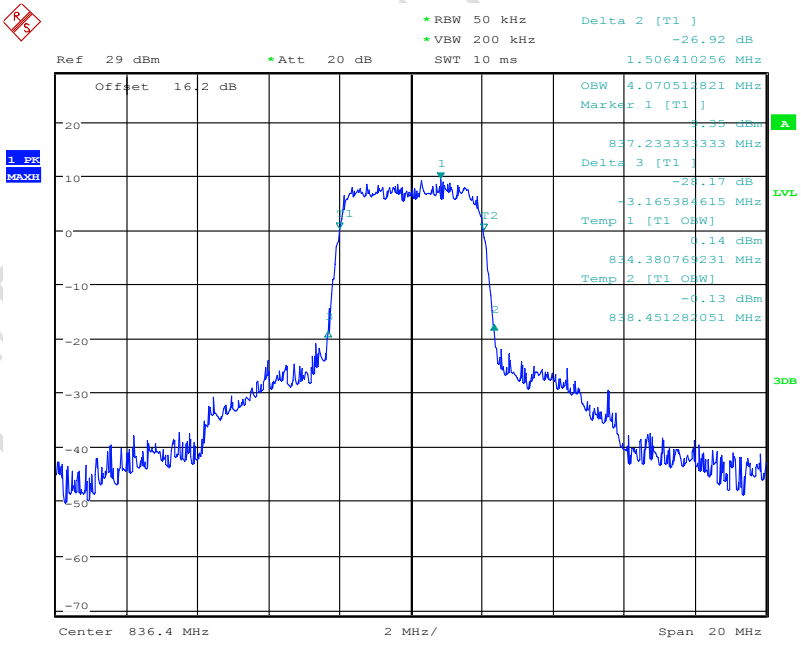


Date: 9.FEB.2015 13:33:10

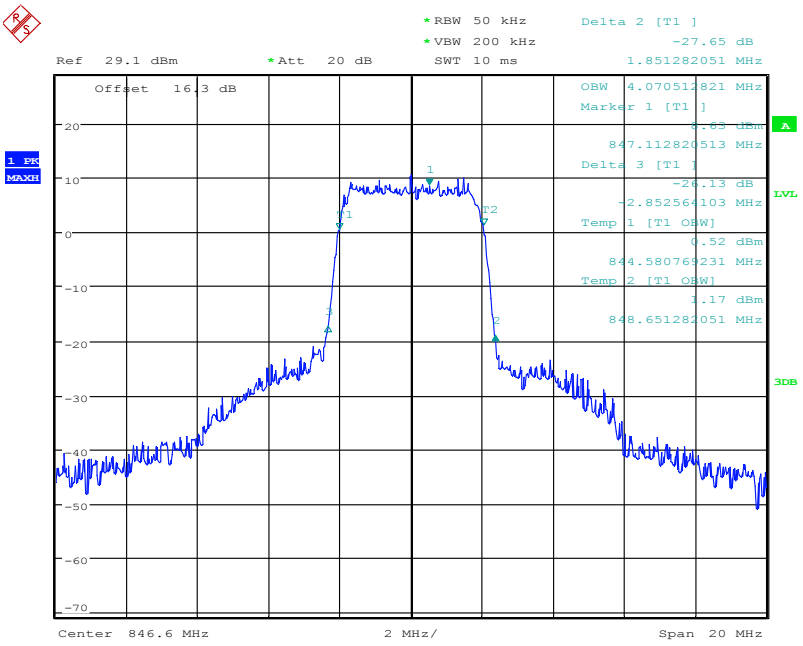
QPSK Channel 1513



QPSK Channel 4132

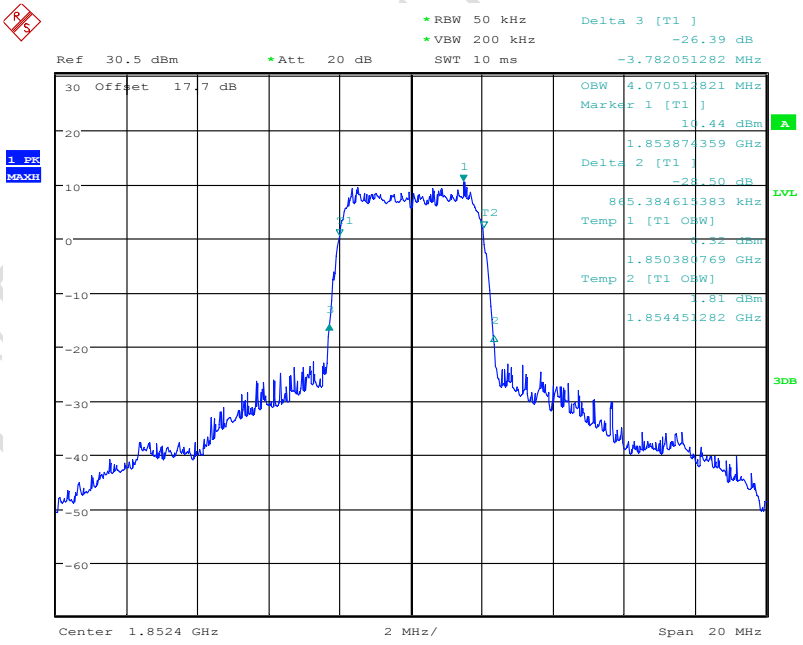


QPSK Channel 4182



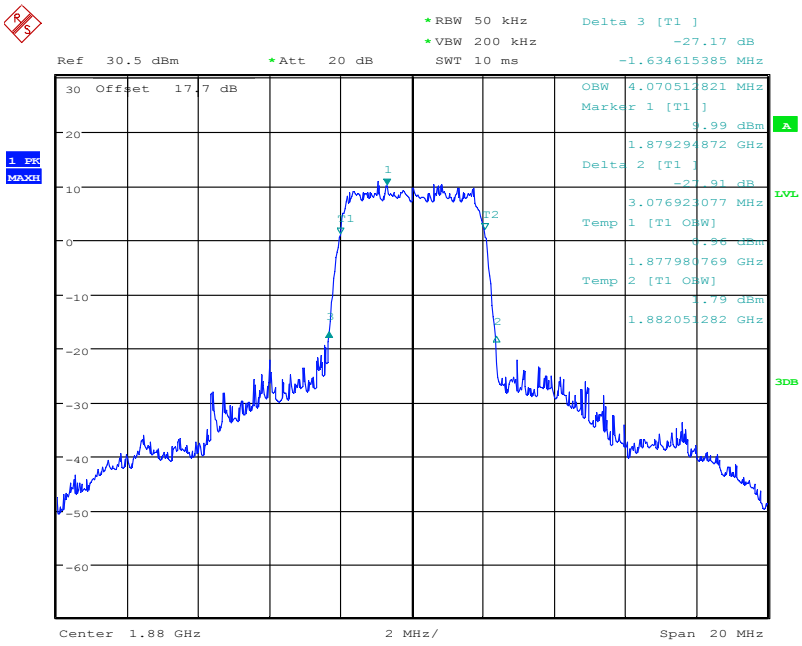
Date: 9.FEB.2015 13:07:06

QPSK Channel 4233

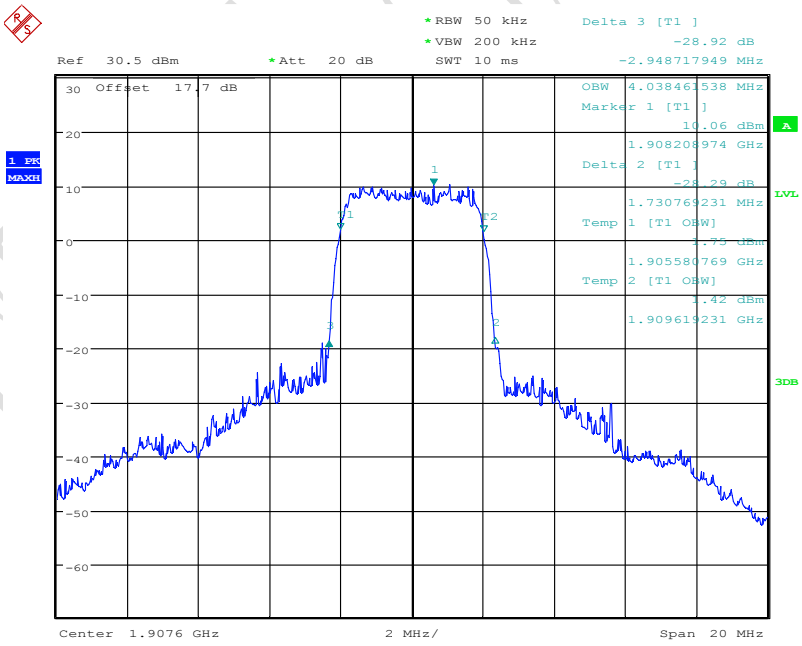


Date: 9.FEB.2015 12:02:36

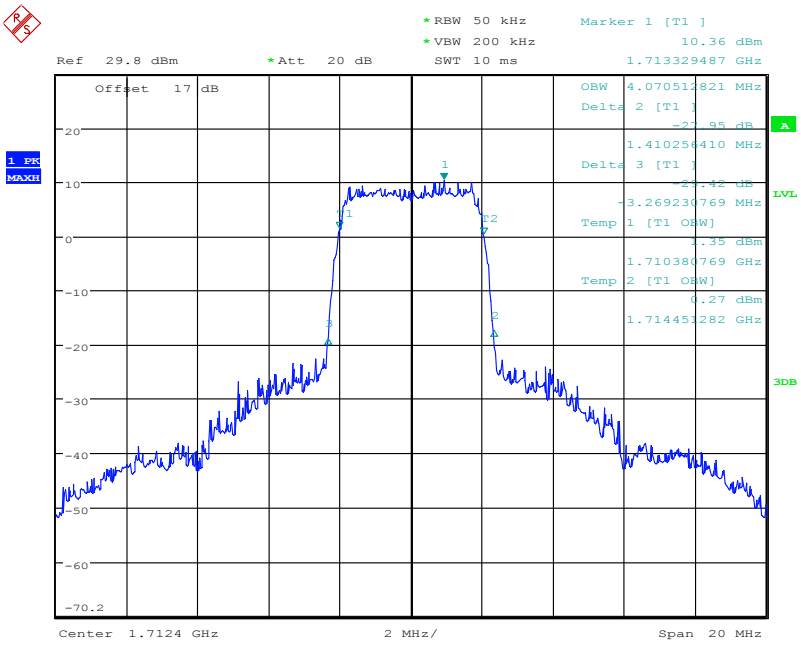
16QAM Channel 9262



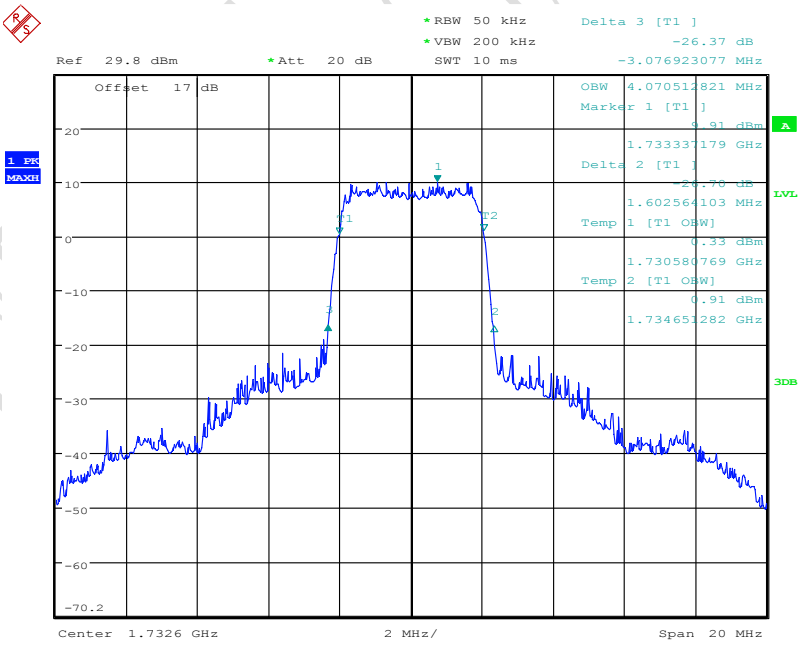
16QAM Channel 9400



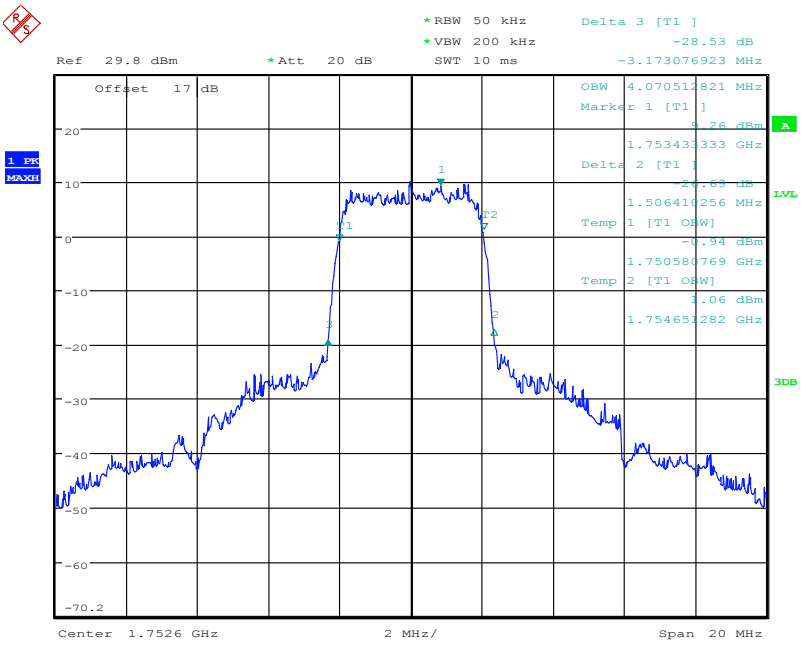
16QAM Channel 9538



16QAM Channel 1312

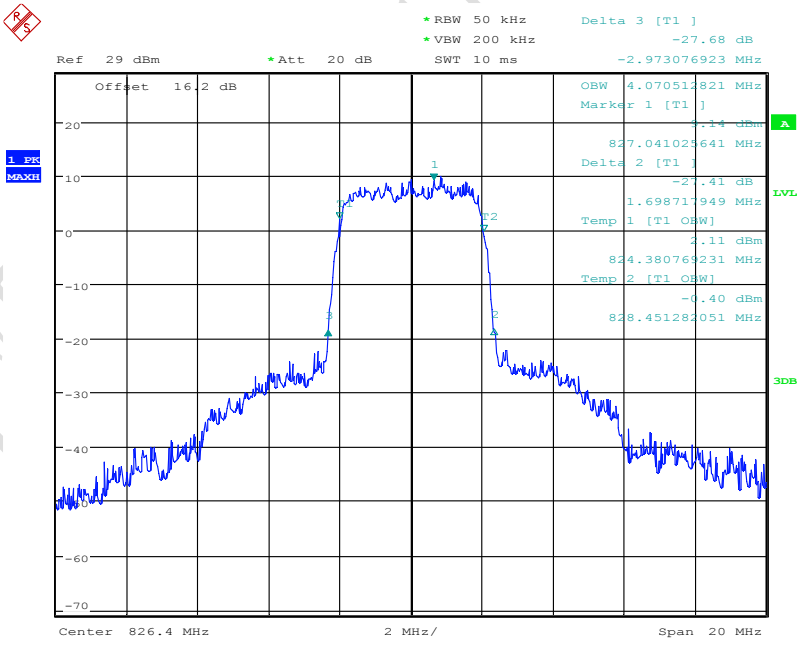


16QAM Channel 1413



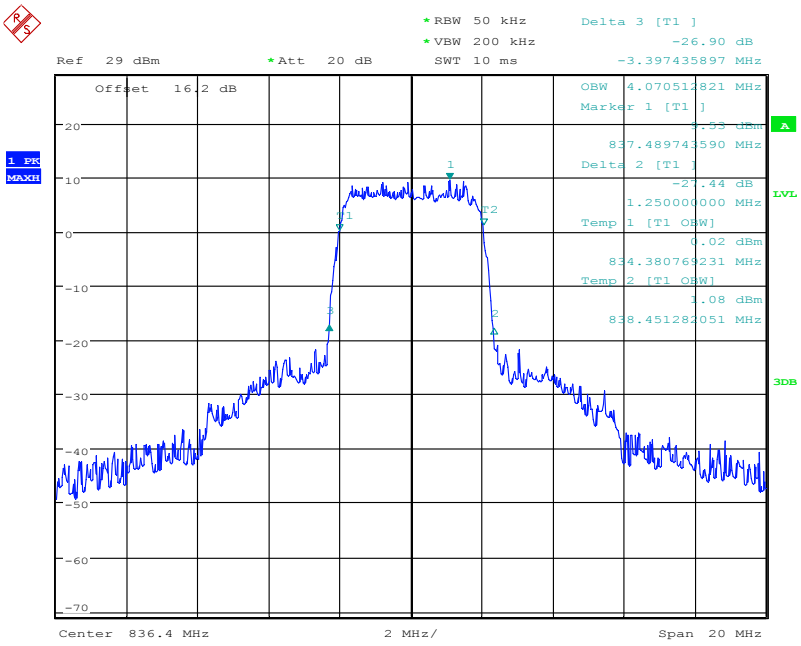
Date: 9.FEB.2015 13:36:34

16QAM Channel 1513



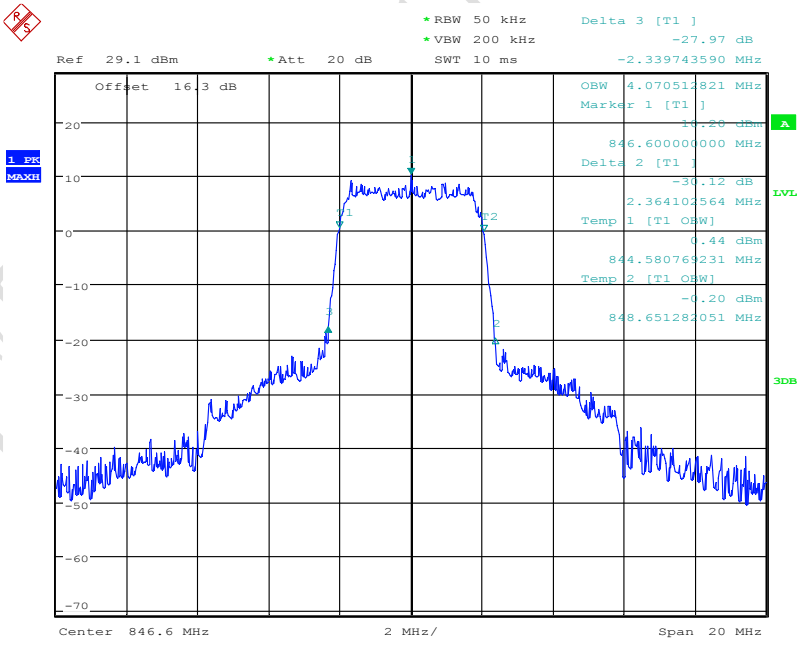
Date: 9.FEB.2015 13:09:11

16QAM Channel 4132



Date: 9.FEB.2015 13:09:46

16QAM Channel 4182



Date: 9.FEB.2015 13:11:11

16QAM Channel 4233

4.3 Frequency Stability over Temperature Variation

Specifications:	2.1055,22.355,24.235
Date of Test	2015-02-10-2015-04-02
Test conditions:	Ambient Temperature:-30℃-50℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661 for GPRS/EGPRS mode, channel 9400, 1413 and 4182 for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a temperature chamber, demonstrated as figure T. The Wireless Telecommunications Test Set was used to set the Tx channel and power level, modulate the TX signal with different bit patterns and measure the frequency of Tx.

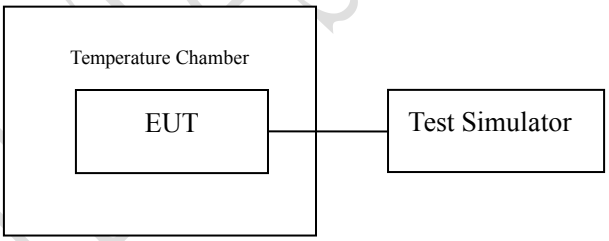


Figure T: setup for measurement of frequency stability over temperature variation

Test Method

1. The EUT was turned off and placed in the temperature chamber.
2. The temperature of the chamber was set to -30℃ and allowed to stabilize.
3. The EUT temperature was allowed to stabilize for 45 minutes.
4. The EUT was turned on and set to transmit with Wireless Telecommunications Test Set.
5. The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.
6. The steps 3-5 were repeated for -30℃,-20℃, -10℃, 0℃, 10℃, 20℃, 30℃, 40℃ and 50℃.

Test data:

GPRS/EGPRS 850 band mode

	Temperature[℃]	Offset[Hz]	Offset[ppm]	Remarks
GMSK	-30	37	0.04422	Pass
	-20	33	0.03944	Pass
	-10	-20	-0.02391	Pass
	0	42	0.05020	Pass
	10	26	0.03107	Pass
	20	-18	-0.02152	Pass
	30	16	0.01912	Pass
	40	24	0.02868	Pass
	50	31	0.03705	Pass
8PSK	-30	27	0.03227	Pass
	-20	32	0.03825	Pass
	-10	30	0.03585	Pass
	0	-19	-0.02271	Pass
	10	-24	-0.02869	Pass
	20	33	0.03944	Pass
	30	39	0.04661	Pass
	40	12	0.01434	Pass
	50	41	0.04900	Pass

GPRS/EGPRS 1900 band mode

	Temperature[℃]	Offset[Hz]	Offset[ppm]	Remarks
GMSK	-30	22	0.01170	Pass
	-20	37	0.01968	Pass
	-10	30	0.01595	Pass
	0	29	0.01542	Pass
	10	-21	-0.01117	Pass
	20	14	0.00744	Pass
	30	33	0.01755	Pass
	40	-16	-0.00851	Pass
	50	28	0.01489	Pass
8PSK	-30	27	0.01010	Pass
	-20	25	0.02180	Pass
	-10	38	0.01861	Pass
	0	32	-0.01436	Pass
	10	17	0.01755	Pass
	20	-22	0.02021	Pass
	30	25	0.01383	Pass
	40	32	-0.01543	Pass

	50	22	0.01170	Pass

WCDMA/HSDPA/HSUPA FDD 850MHz band mode:

	Temperature[℃]	Offset[Hz]	Offset[ppm]	Remarks
QPSK	-30	35	0.04184	Pass
	-20	26	0.03108	Pass
	-10	19	0.02271	Pass
	0	-23	-0.02750	Pass
	10	-12	-0.01435	Pass
	20	39	0.04662	Pass
	30	40	0.04782	Pass
	40	33	0.03945	Pass
	50	27	0.03228	Pass
16QAM	-30	16	0.01913	Pass
	-20	22	0.02630	Pass
	-10	30	0.03586	Pass
	0	-23	-0.02750	Pass
	10	28	0.03347	Pass
	20	31	0.03706	Pass
	30	-13	-0.01554	Pass
	40	20	0.02391	Pass
	50	36	0.04304	Pass

WCDMA/HSDPA/HSUPA FDD 1700MHz band mode:

	Temperature[℃]	Offset[Hz]	Offset[ppm]	Remarks
QPSK	-30	25	0.01442	Pass
	-20	-22	-0.01270	Pass
	-10	38	0.02193	Pass
	0	37	0.02135	Pass
	10	26	0.01500	Pass
	20	31	0.01789	Pass
	30	17	0.00981	Pass
	40	-25	-0.01443	Pass
	50	12	0.00692	Pass
16QAM	-30	21	0.01212	Pass
	-20	16	0.00923	Pass
	-10	32	0.01846	Pass
	0	25	0.01442	Pass
	10	-19	-0.01097	Pass
	20	36	0.02077	Pass
	30	-26	-0.01501	Pass

	40	30	0.01731	Pass
	50	28	0.01616	Pass

WCDMA/HSDPA/HSUPA FDD 1900MHz band mode:

	Temperature[℃]	Offset[Hz]	Offset[ppm]	Remarks
QPSK	-30	29	0.01542	Pass
	-20	41	0.02180	Pass
	-10	42	0.02234	Pass
	0	33	0.01755	Pass
	10	-18	-0.00957	Pass
	20	-29	-0.01543	Pass
	30	21	0.01117	Pass
	40	30	0.01595	Pass
	50	35	0.01861	Pass
16QAM	-30	19	0.01010	Pass
	-20	34	0.01808	Pass
	-10	30	0.01595	Pass
	0	26	0.01383	Pass
	10	-15	-0.00798	Pass
	20	19	0.01010	Pass
	30	29	0.01542	Pass
	40	34	0.01808	Pass
	50	45	0.02393	Pass

CTL Test Report

4.4 Frequency Stability over Voltage Variation

Specifications:	2.1055,22.355,24.235
Date of Test	2015-02-10-2015-04-03
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661 for GPRS/EGPRS mode, channel 9400, 1413 and 4182for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a shielding chamber and powered by an adjustable power supply, demonstrated as figure V. A Wireless Telecommunications Test Set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.

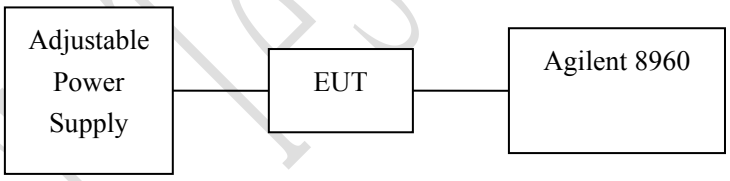


Figure V: test setup for measurement of frequency stability over voltage variation

Test Method

The EUT was powered by the adjustable power supply. The frequency stability is measured by the Wireless Telecommunications Test Set.

Test data:

GPRS/EGPRS 850MHz band GMSK mode

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	12	0.01434	Pass
5.0	19	0.02271	Pass
5.5	15	0.01793	Pass

GPRS/EGPRS 850MHz band 8PSK mode

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	16	0.01912	Pass
5.0	-28	-0.03347	Pass
5.5	18	0.02151	Pass

GPRS/EGPRS 1900MHz band GMSK mode

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	32	0.01702	Pass
5.0	-11	-0.00585	Pass
5.5	24	0.01276	Pass

GPRS/EGPRS 1900MHz band 8PSK mode

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	13	0.00691	Pass
5.0	18	0.00957	Pass
5.5	-16	-0.00851	Pass

WCDMA/HSDPA/HSUPA FDD 850MHz band QPSK mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	11	0.01315	Pass
5.0	13	0.01554	Pass
5.5	-20	-0.02391	Pass

WCDMA/HSDPA/HSUPA FDD 850MHz band 16QAM mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	24	0.02869	Pass
5.0	17	0.02032	Pass
5.5	9	0.01076	Pass

WCDMA/HSDPA/HSUPA FDD 1700MHz band QPSK mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	23	0.01327	Pass
5.0	20	0.01154	Pass
5.5	-15	-0.00866	Pass

WCDMA/HSDPA/HSUPA FDD 1700MHz band 16QAM mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	21	0.01212	Pass
5.0	19	0.01096	Pass
5.5	-11	-0.00635	Pass

WCDMA/HSDPA/HSUPA FDD 1900MHz band QPSK mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	16	0.00851	Pass
5.0	18	0.00957	Pass
5.5	28	0.01489	Pass

WCDMA/HSDPA/HSUPA FDD 1900MHz band 16QAM mode:

Voltage (V)	Offset[Hz]	Offset[ppm]	Remarks
4.5	27	0.01436	Pass
5.0	24	0.01276	Pass
5.5	17	0.00904	Pass

CTL Test Report

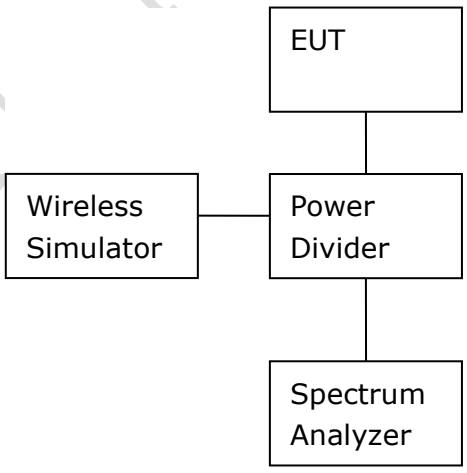
4.5 Conducted RF Power Output

Specifications:	2.1046,22.913(a),24.232(c)
Date of Tests	2015-02-08-2015-04-01
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251 and 512, 661, 810 for GPRS/EGPRS mode, channel 9262, 9400, 9538 and 1312, 1413, 1513, 4132, 4182, 4233 for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit Level Construction: ERP: According to Part 22.913(a) and 24.232(c), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.	
Limits for ERP	
Frequency range	**Limit Level (ERP)**
TX channel	7W or 38.5dBm

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

1) The EUT was coupled to the spectrum analyzer and the base station simulator through a power divider. The lost of the cables the test system is calibrated to correct the readings.

2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.

Note:

None

Test Results:

GSM 850 band GPRS mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
128 (824.2MHz)	24.96	24.64
190 (836.6MHz)	24.74	24.49
251 (848.8MHz)	24.81	24.58

GSM 850 band EGPRS(GMSK) mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
128 (824.2MHz)	24.81	24.62
190 (836.6MHz)	24.69	24.46
251 (848.8MHz)	24.75	24.53

GSM 850 band EGPRS(8PSK) mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
128 (824.2MHz)	23.36	23.18
190 (836.6MHz)	23.24	23.03
251 (848.8MHz)	23.30	23.11

GSM 1900 band GPRS mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
512 (1850.2MHz)	26.87	26.74
661 (1880.0MHz)	26.55	26.44
810 (1909.8MHz)	26.17	25.95

GSM 1900 band EGPRS(GMSK) mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
512 (1850.2MHz)	26.84	26.71
661 (1880.0MHz)	26.57	26.38
810 (1909.8MHz)	26.10	26.01

GSM 1900 band EGPRS(8PSK) mode

Channel No.	Maximum output power（PK）[dBm]	
	1TS	2TS
512 (1850.2MHz)	25.61	25.49
661 (1880.0MHz)	25.37	25.20
810 (1909.8MHz)	24.92	24.81

CTL Test Report

WCDMA II band mode

		Maximum output power（PK）[dBm]		
mode	3GPP Subtest	9262	9400	9538
RMC	--	24.18	24.02	23.68
HSDPA	1	23.50	23.15	23.21
	2	23.53	23.84	23.30
	3	23.26	23.17	23.30
	4	23.40	23.29	23.28
HSUPA (QPSK)	1	22.87	23.42	23.04
	2	22.93	23.26	23.18
	3	22.84	23.90	23.49
	4	22.72	23.29	23.24
	5	22.42	22.87	23.49
HSUPA (16QAM)	1	22.32	22.98	22.71
	2	22.53	22.85	22.77
	3	22.36	23.29	22.91
	4	22.26	22.79	22.75
	5	22.14	22.36	23.02

WCDMA IV band mode

		Maximum output power（PK）[dBm]		
mode	3GPP Subtest	1312	1413	1513
RMC	--	23.85	23.17	22.68
HSDPA	1	23.66	23.02	22.57
	2	23.75	23.15	22.17
	3	23.42	22.91	22.77
	4	23.59	23.06	22.11
HSUPA	1	23.59	22.74	22.58

(QPSK)	2	23.70	23.04	22.54
	3	23.39	23.07	22.69
	4	23.42	23.01	22.63
	5	23.47	22.97	22.71
HSUPA (16QAM)	1	23.12	22.38	22.13
	2	23.17	22.52	22.09
	3	22.83	22.67	22.19
	4	23.01	22.63	22.18
	5	22.94	22.45	22.37

WCDMA V band mode

		Maximum output power（PK）[dBm]		
mode	3GPP Subtest	4132	4182	4233
RMC	--	23.22	23.41	23.82
HSDPA	1	23.15	23.05	23.54
	2	22.98	23.24	23.41
	3	22.85	23.19	23.60
	4	23.04	22.87	23.26
HSUPA (QPSK)	1	23.02	23.01	23.49
	2	23.11	23.20	23.53
	3	22.95	23.17	23.39
	4	22.56	22.94	23.01
	5	23.14	22.87	23.27
HSUPA (16QAM)	1	22.54	22.49	22.83
	2	22.74	22.85	23.04
	3	22.42	22.79	22.87
	4	22.13	22.46	22.61
	5	22.65	22.23	22.74

CTTL Test Report

4.6 Conducted Spurious Emission

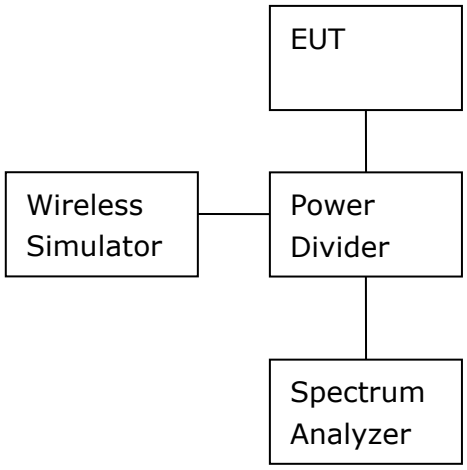
Specifications:	2.1051,22.917,24.238
Date of Tests	2015-02-09-2015-04-02
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251 and 512, 661, 810 for GPRS/EGPRS mode, channel 9262, 9400, 9538 and 1312, 1413, 1513 and 4132, 4182, 4233 for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit Level Construction:
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

Limits for Radiated spurious emissions(UE)	
Frequency range	**Limit Level /Resolution Bandwidth**
30 MHz to 20000 MHz	-13dBm/1MHz

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-B-2002: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.

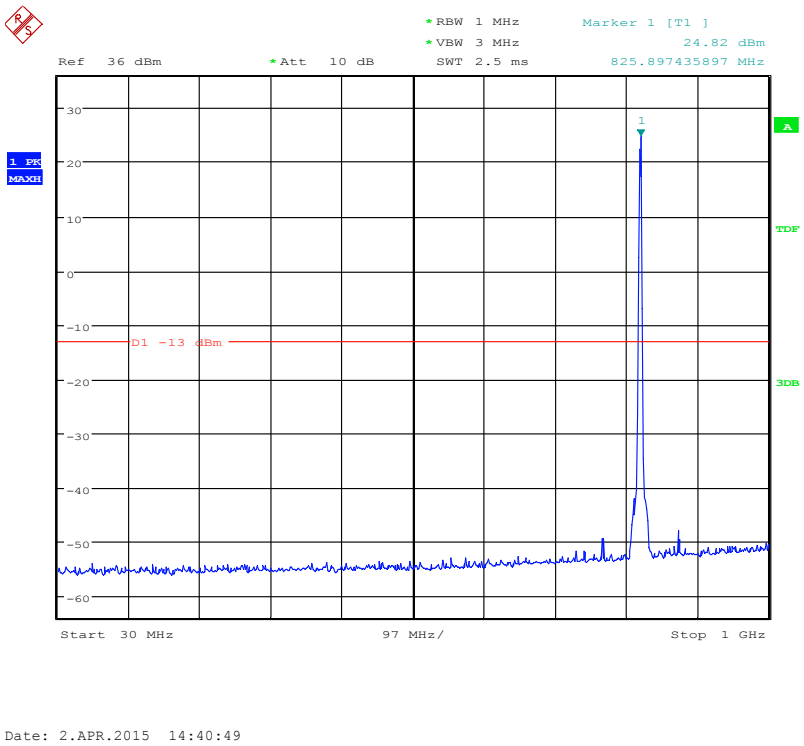
Note:

None

CTL Test Report

Graphical results :

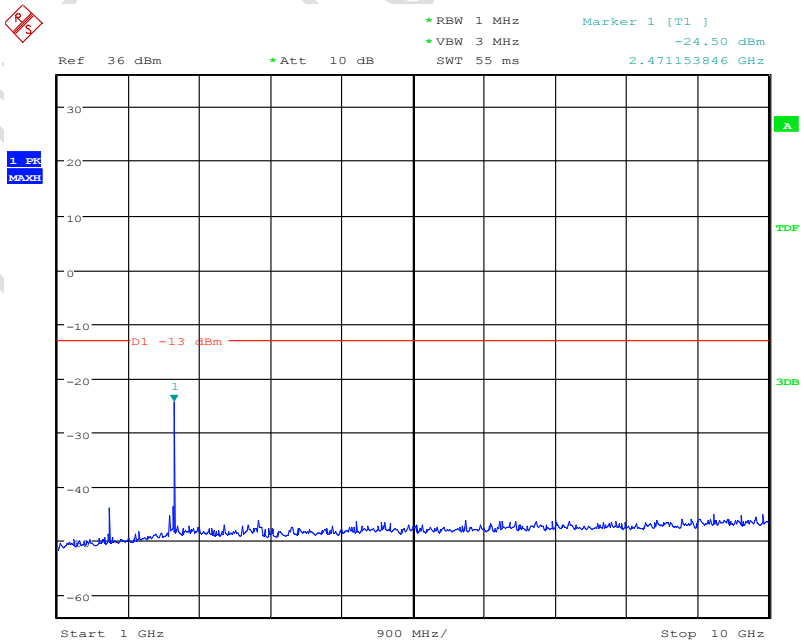
GMSK, Low channel, 824.200 MHz, 30MHz to 1GHz



Date: 2.APR.2015 14:40:49

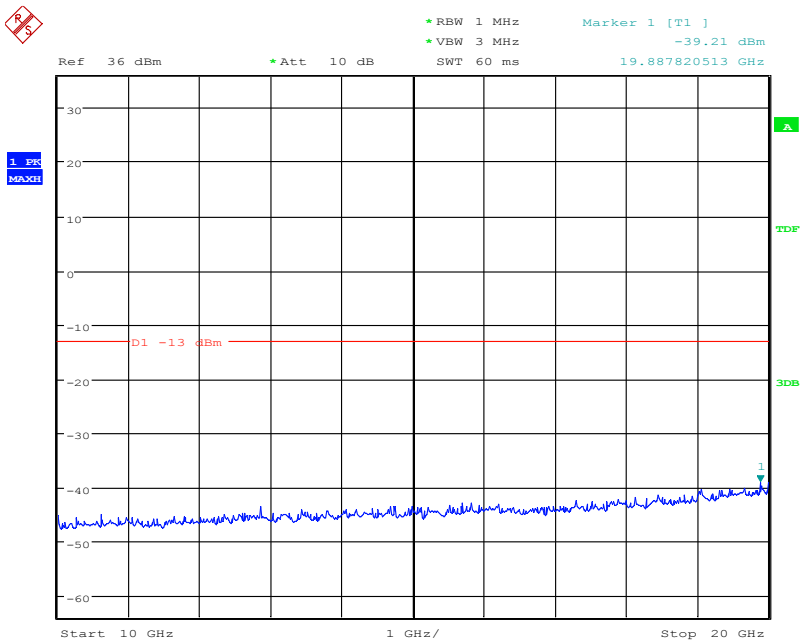
Note: The strong emission shown in each case is the carrier signal.

GMSK, Low channel, 824.200 MHz, 1GHz to 10GHz



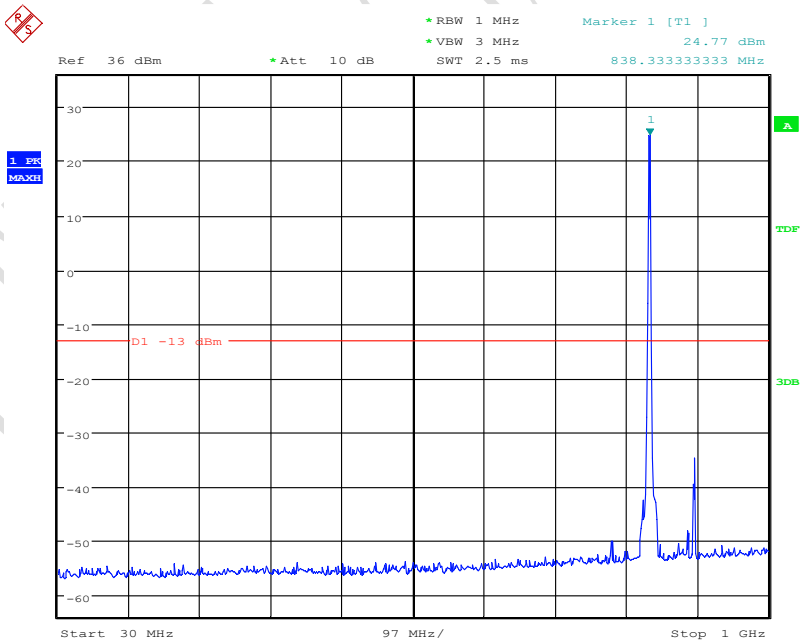
Date: 2.APR.2015 14:42:48

GMSK, Low channel, 824.200 MHz, 10GHz to 20GHz



Date: 2.APR.2015 14:43:20

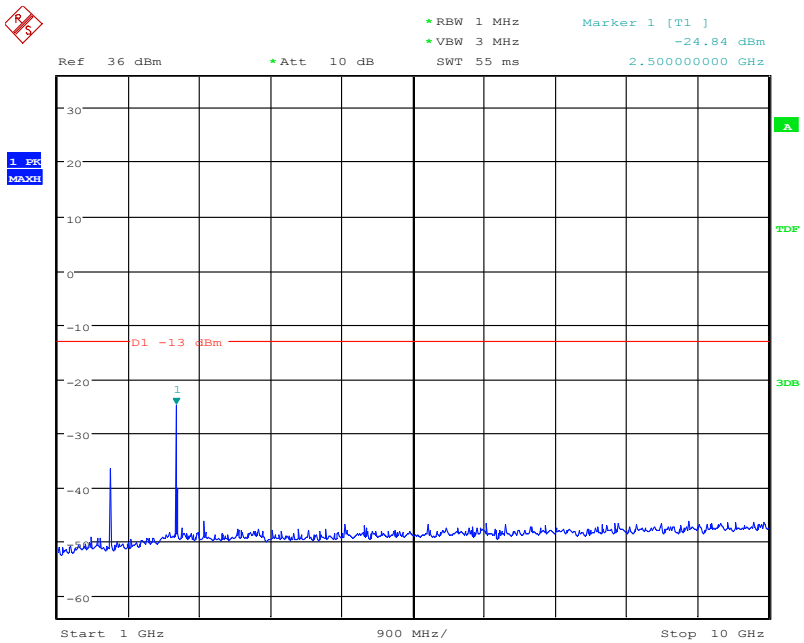
GMSK, Middle Channel, 836.6 MHz, 30MHz to 1GHz



Date: 2.APR.2015 14:43:57

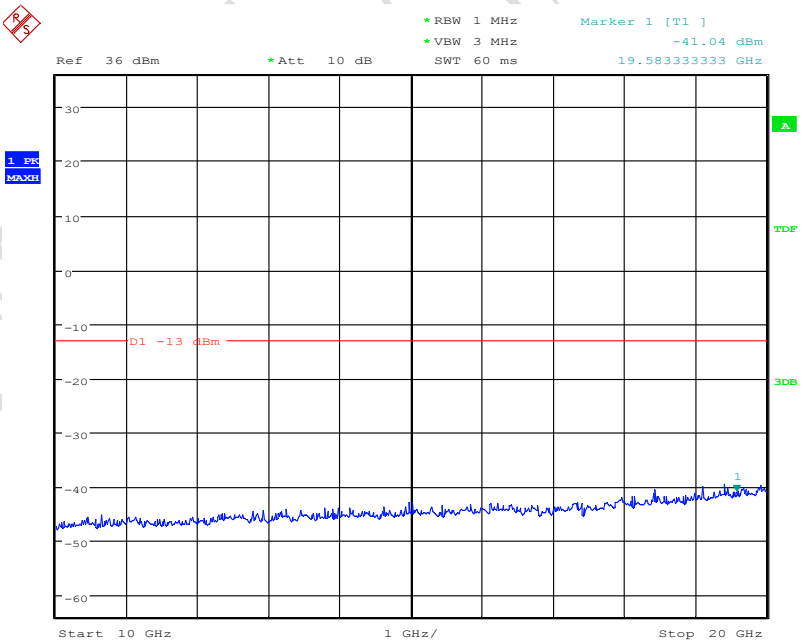
Note: The strong emission shown in each case is the carrier signal.

GMSK, Middle Channel, 836.6 MHz, 1GHz to 10GHz



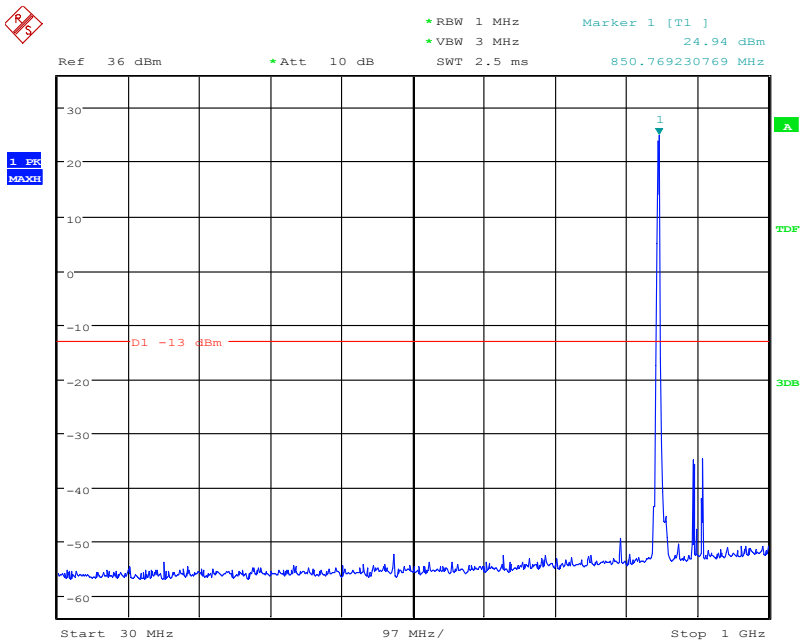
Date: 2.APR.2015 14:44:14

GMSK, Middle Channel, 836.6 MHz, 10GHz to 20GHz



Date: 2.APR.2015 14:44:30

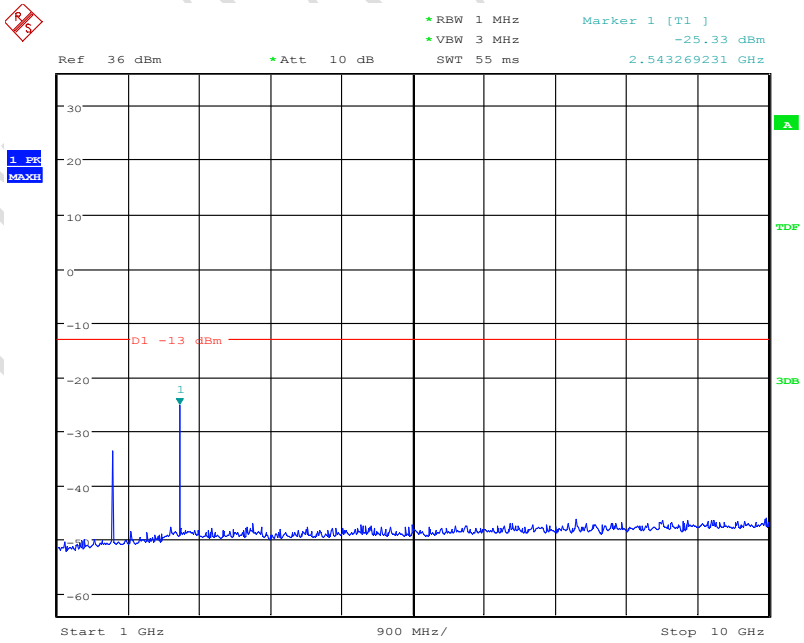
GMSK, High Channel, 848.8 MHz, 30MHz to 1GHz



Date: 2.APR.2015 14:44:51

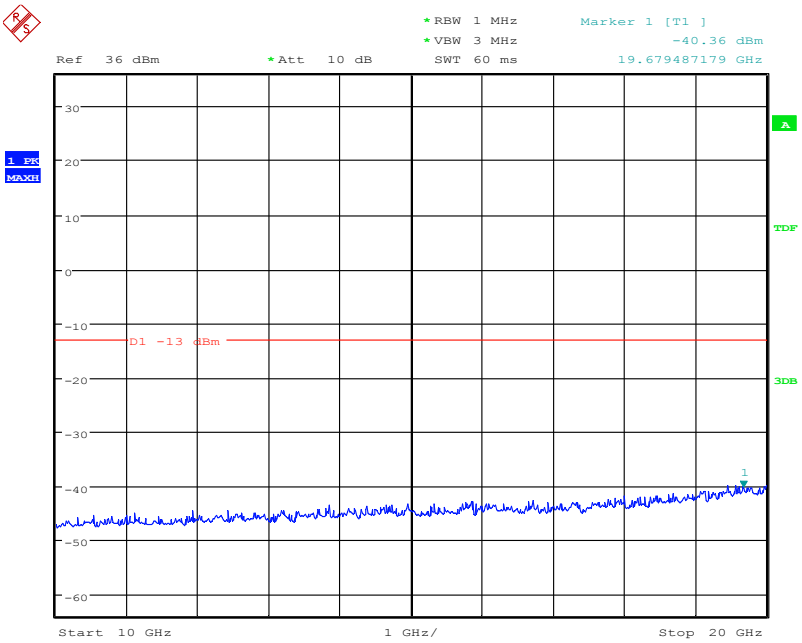
Note: The strong emission shown in each case is the carrier signal.

GMSK, High Channel, 848.8 MHz, 1GHz to 10GHz



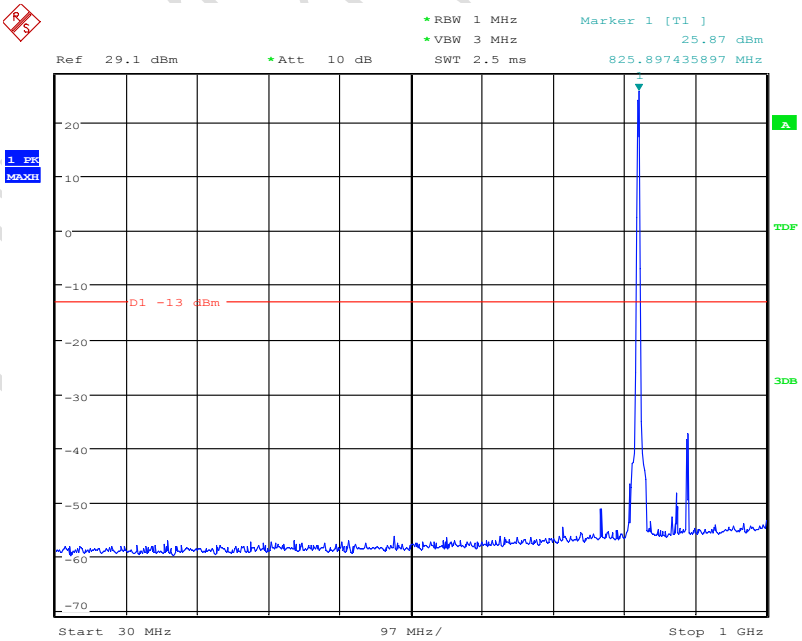
Date: 2.APR.2015 14:45:12

GMSK, High Channel, 848.8 MHz, 10GHz to 20GHz



Date: 2.APR.2015 14:45:31

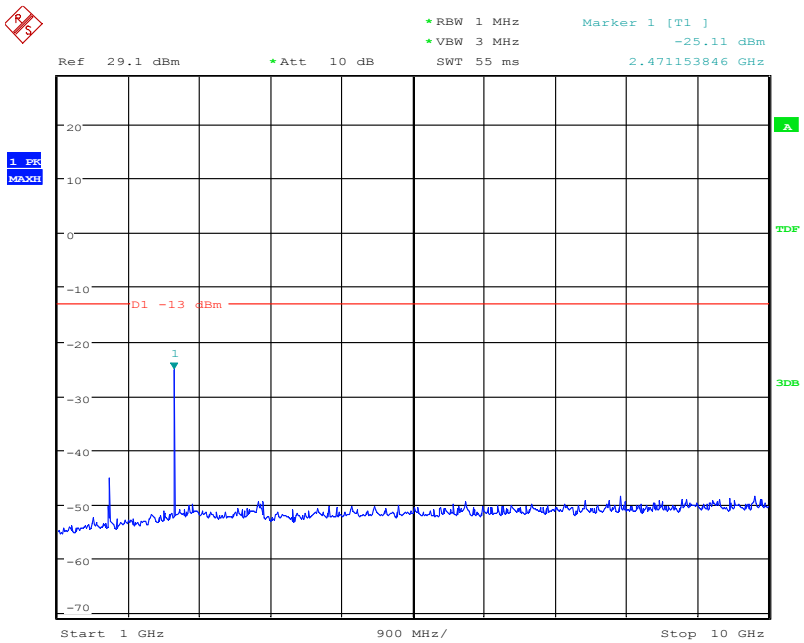
8PSK, Low channel, 824.200 MHz,30MHz to 1GHz



Date: 2.APR.2015 14:48:34

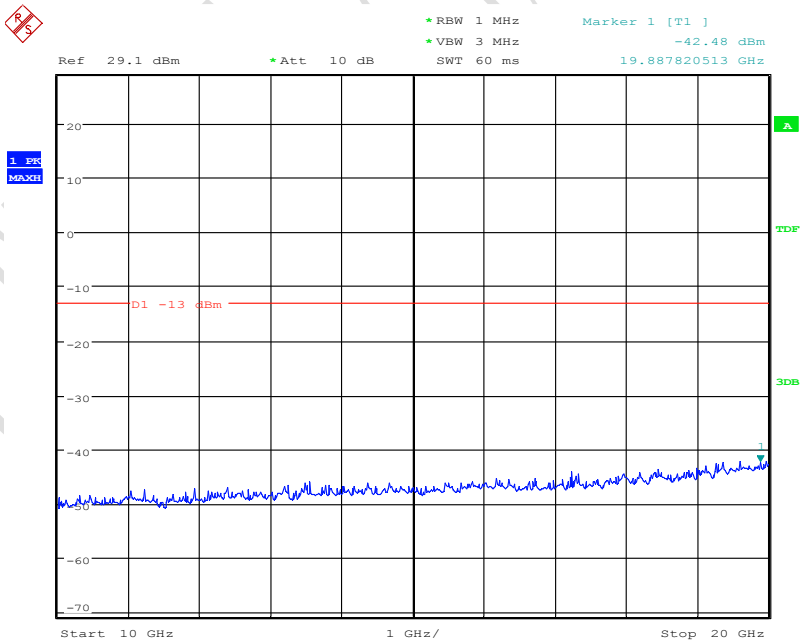
Note: The strong emission shown in each case is the carrier signal.

8PSK, Low channel, 824.200 MHz, 1GHz to 10GHz



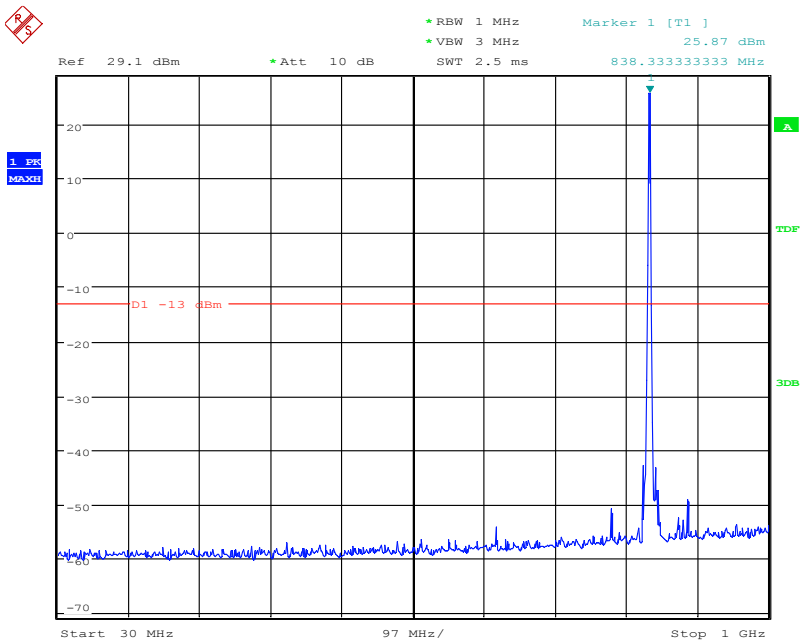
Date: 2.APR.2015 14:48:48

8PSK, Low channel, 824.200 MHz, 10GHz to 20GHz



Date: 2.APR.2015 14:49:01

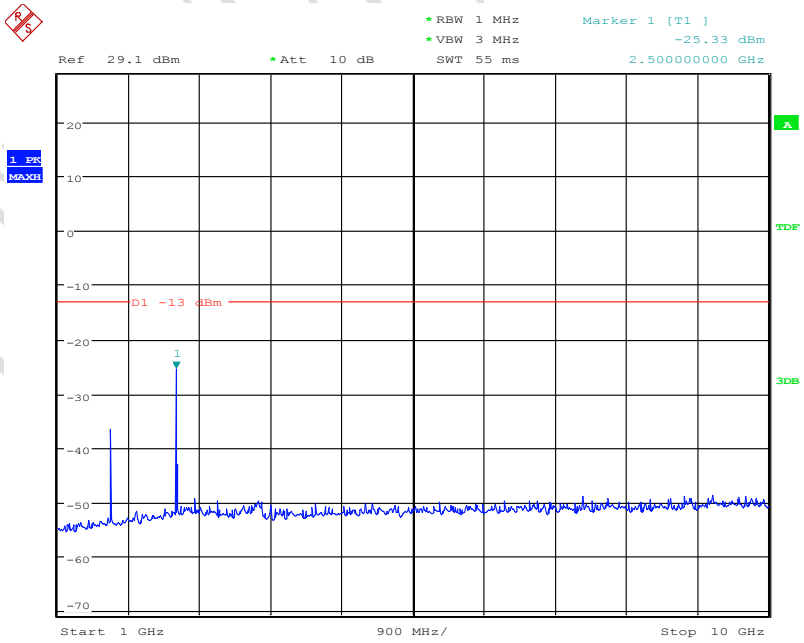
8PSK, Middle Channel, 836.6 MHz, 30MHz to 1GHz



Date: 2.APR.2015 14:49:27

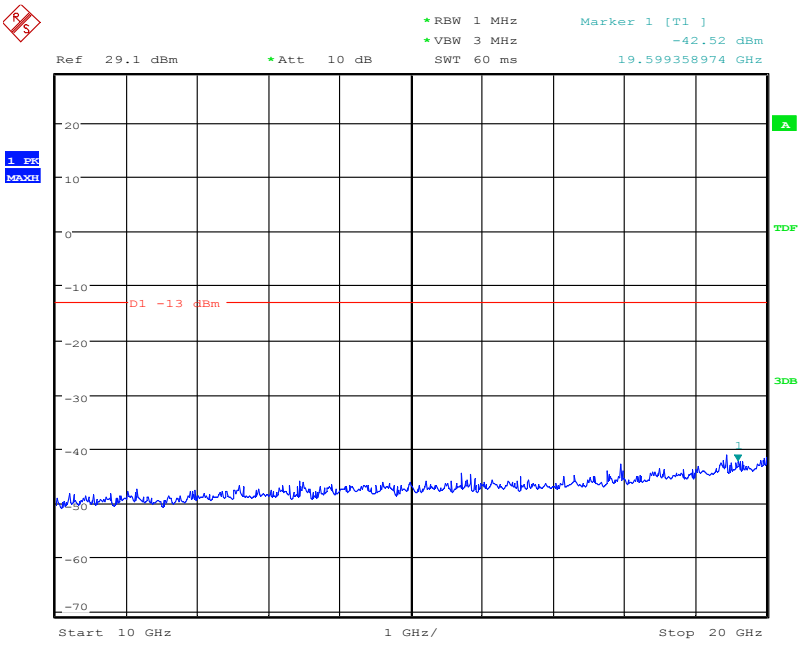
Note: The strong emission shown in each case is the carrier signal.

8PSK, Middle Channel, 836.6 MHz, 1GHz to 10GHz



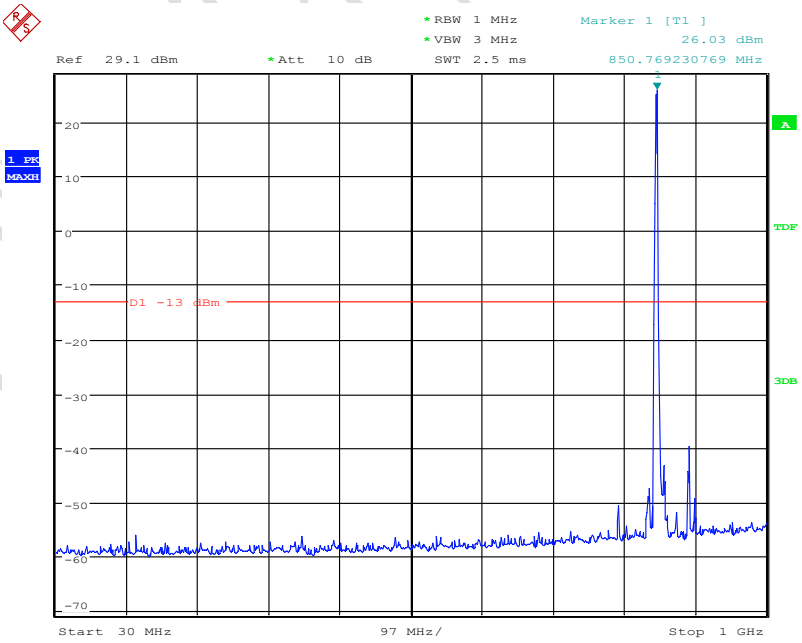
Date: 2.APR.2015 14:49:41

8PSK, Middle Channel, 836.6 MHz, 10GHz to 20GHz



Date: 2.APR.2015 14:49:53

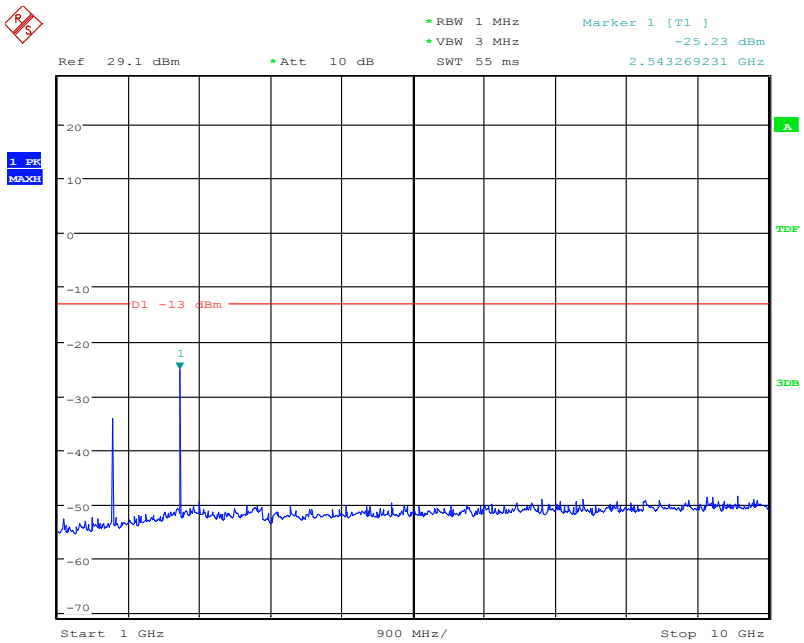
8PSK, High Channel, 848.8 MHz, 30MHz to 1GHz



Date: 2.APR.2015 14:50:19

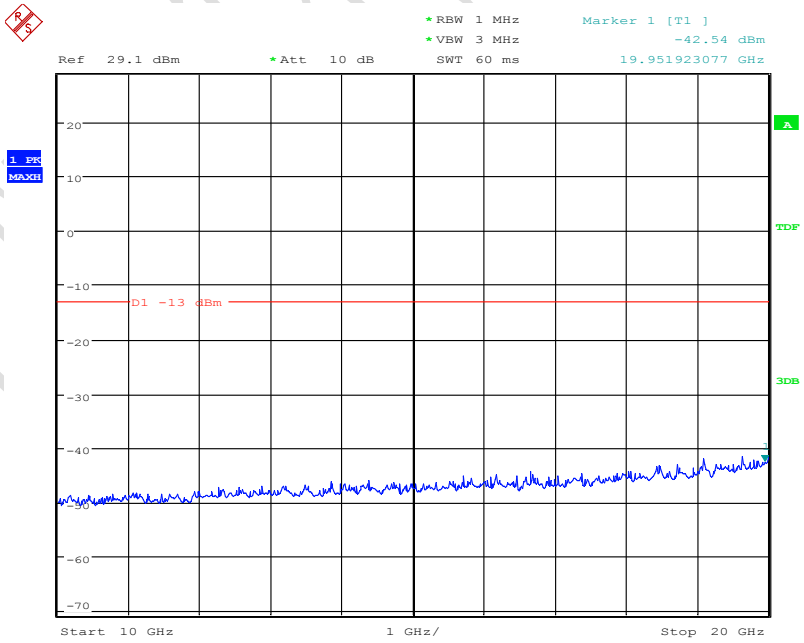
Note: The strong emission shown in each case is the carrier signal.

8PSK, High Channel, 848.8 MHz, 1GHz to 10GHz



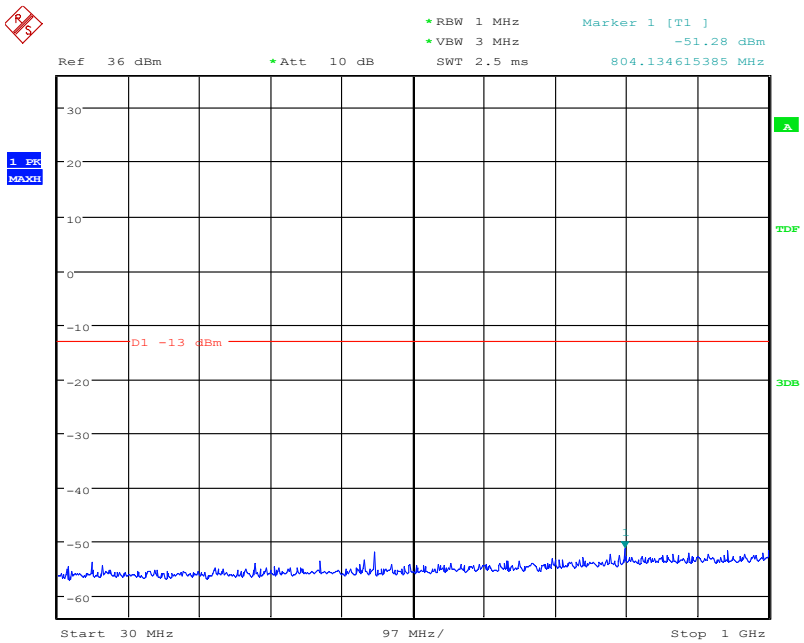
Date: 2.APR.2015 14:50:34

8PSK, High Channel, 848.8 MHz, 10GHz to 20GHz



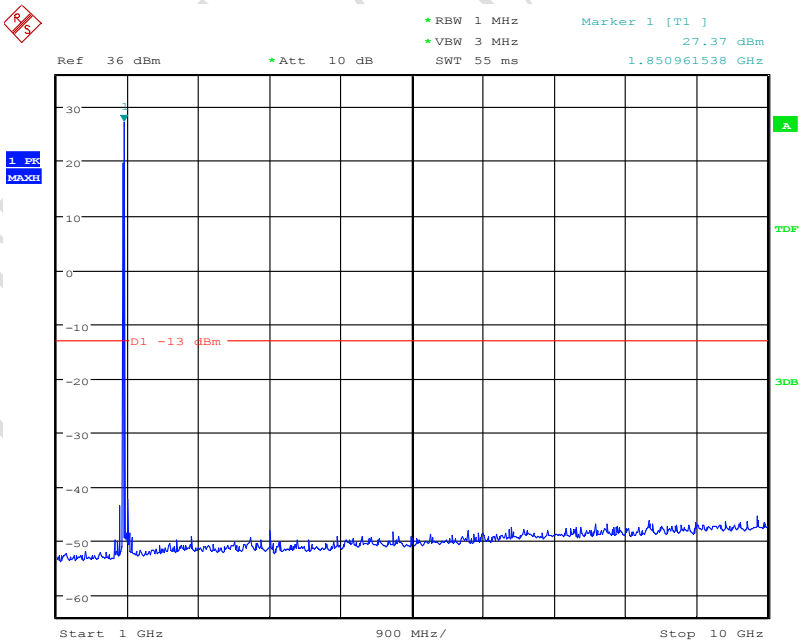
Date: 2.APR.2015 14:50:48

GMSK, Low channel, 1850.2 MHz, 30MHz to 1GHz



Date: 2.APR.2015 15:01:55

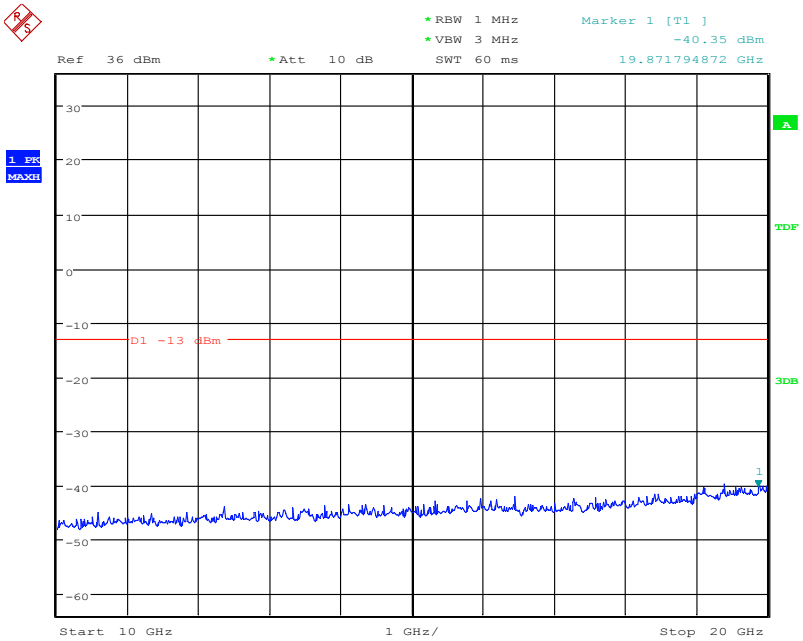
GMSK, Low channel, 1850.2 MHz, 1GHz to 10GHz



Date: 2.APR.2015 15:02:10

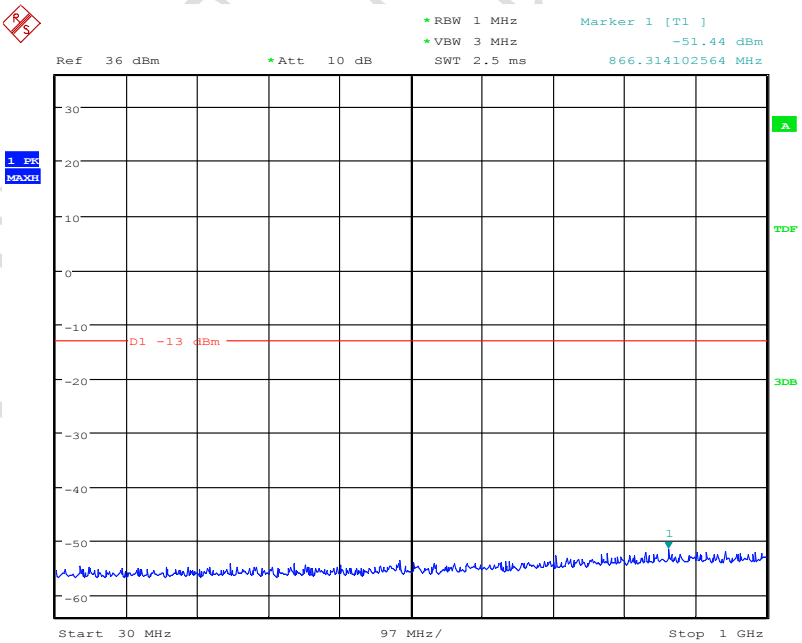
Note: The strong emission shown is the carrier signal.

GMSK, Low channel, 1850.2 MHz, 10GHz to 20GHz



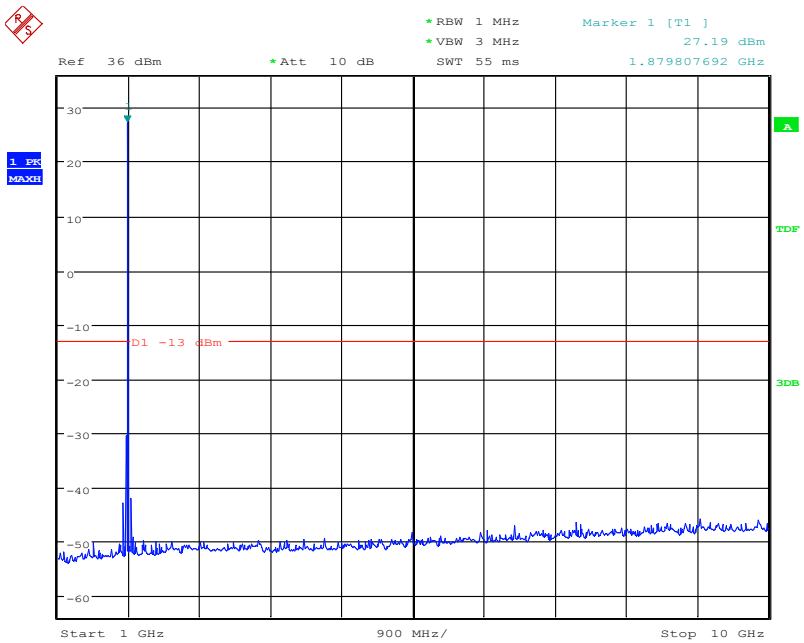
Date: 2.APR.2015 15:02:22

GMSK, Middle channel, 1880.0 MHz, 30MHz to 1GHz



Date: 2.APR.2015 15:03:32

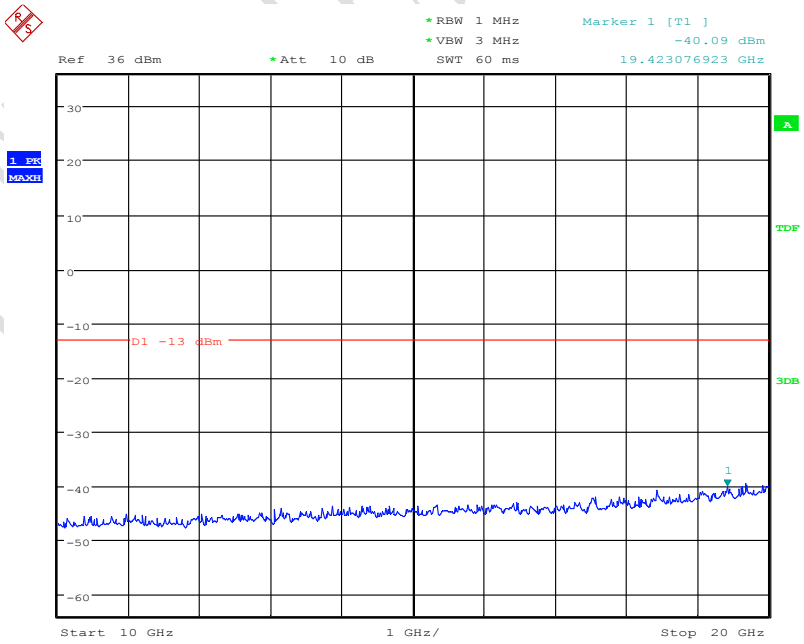
GMSK, Middle channel, 1880.0 MHz, 1GHz to 10GHz



Date: 2.APR.2015 15:03:46

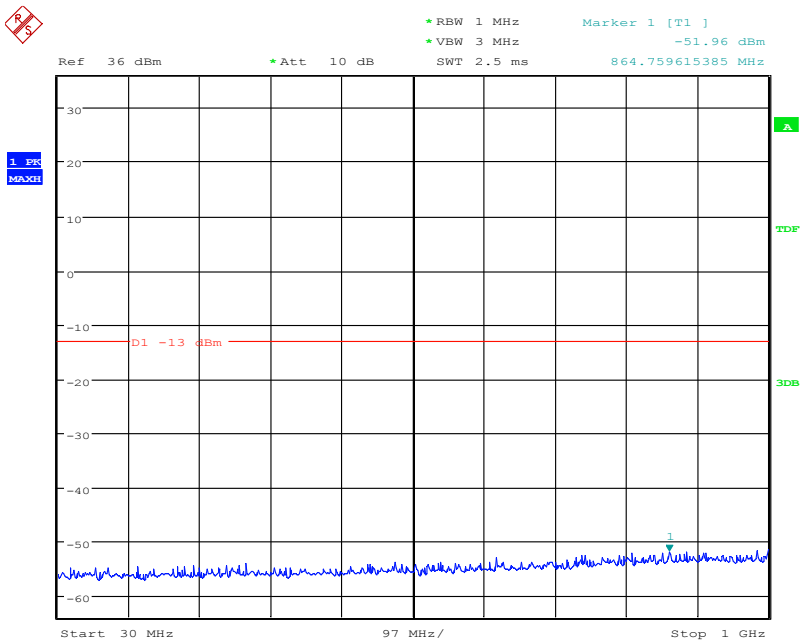
Note: The strong emission shown is the carrier signal.

GMSK, Middle channel, 1880.0 MHz, 10GHz to 20GHz



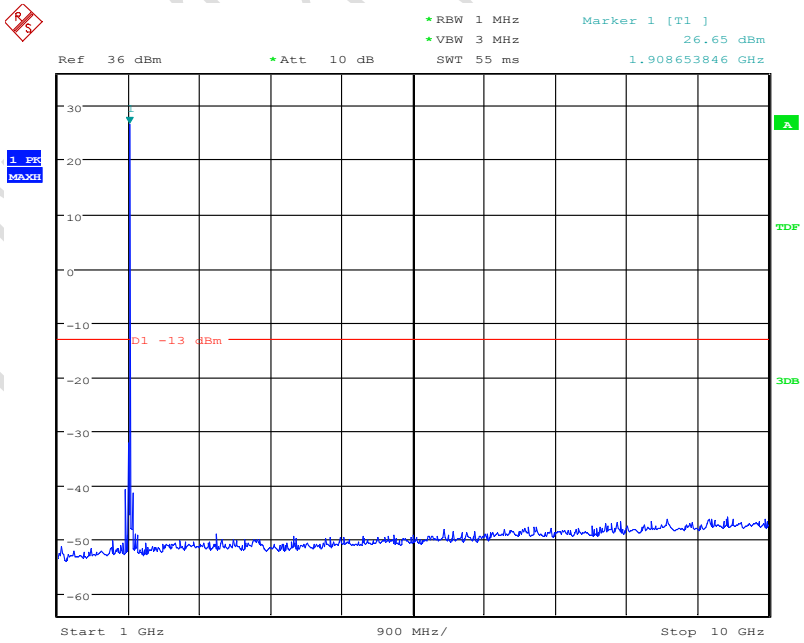
Date: 2.APR.2015 15:03:59

GMSK, High channel, 1909.8 MHz, 30MHz to 1GHz



Date: 2.APR.2015 15:04:25

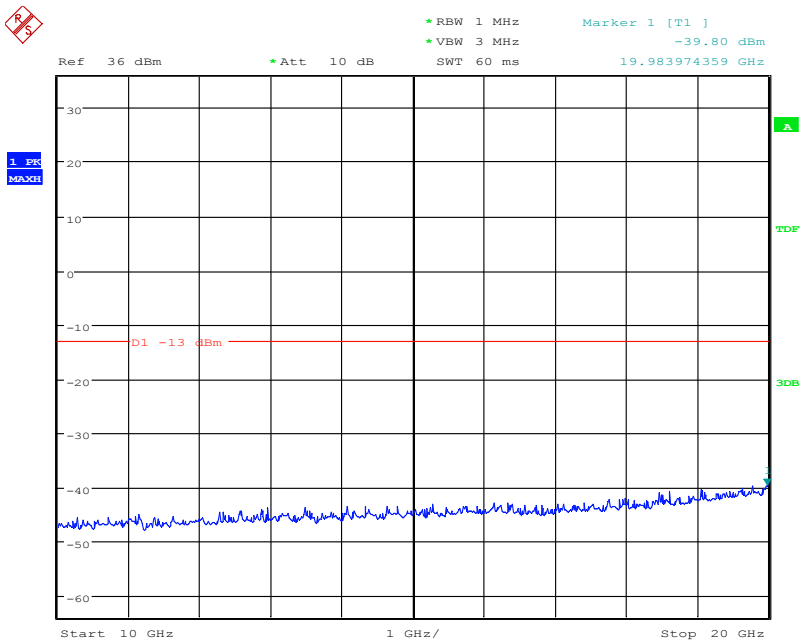
GMSK, High channel, 1909.8 MHz, 1GHz to 10GHz



Date: 2.APR.2015 15:04:40

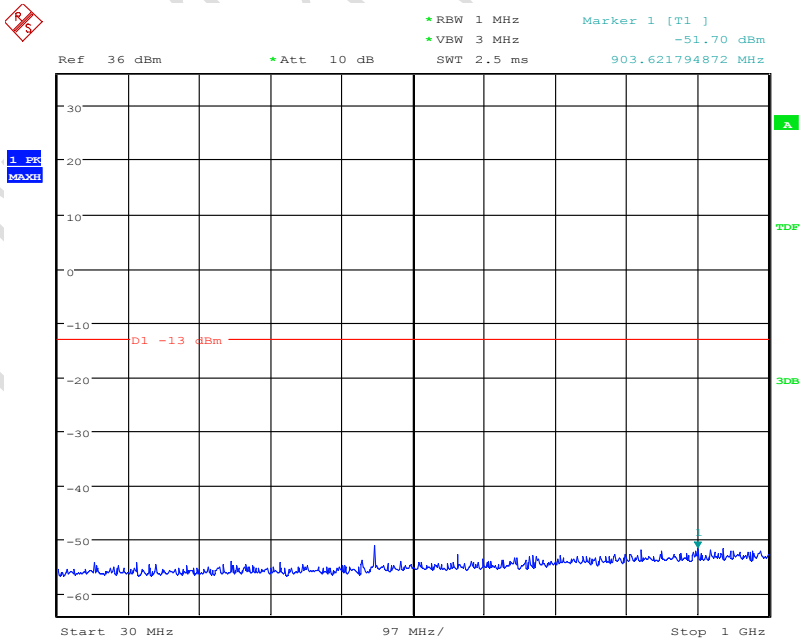
Note: The strong emission shown is the carrier signal.

GMSK, High channel, 1909.8 MHz, 10GHz to 20GHz



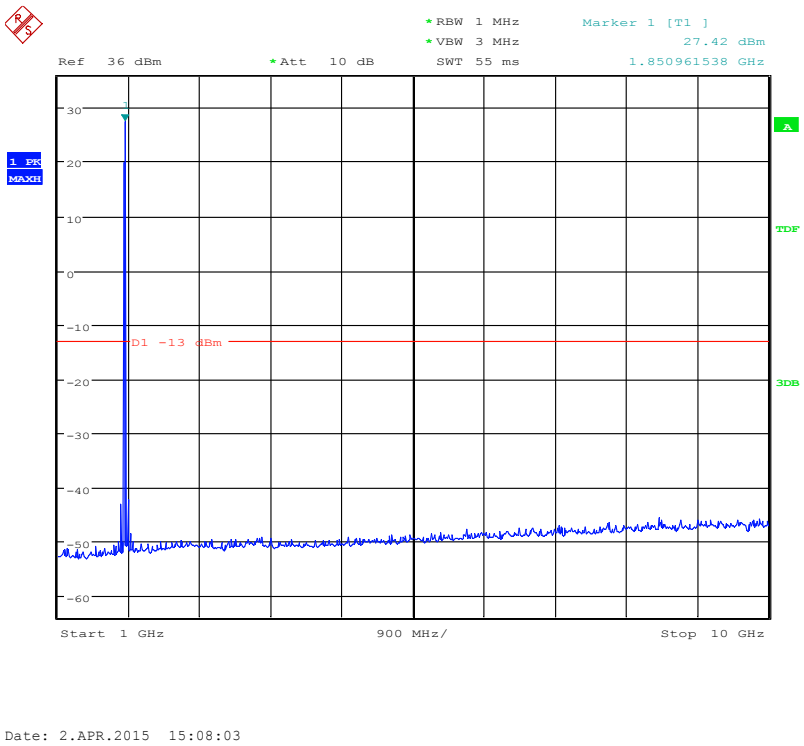
Date: 2.APR.2015 15:04:53

8PSK, Low channel, 1850.2 MHz, 30MHz to 1GHz



Date: 2.APR.2015 15:07:25

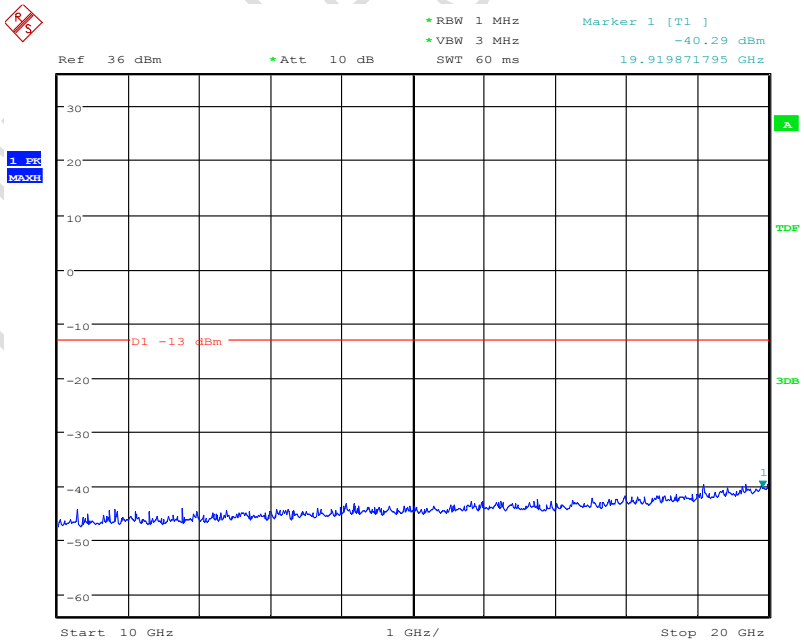
8PSK, Low channel, 1850.2 MHz, 1GHz to 10GHz



Date: 2.APR.2015 15:08:03

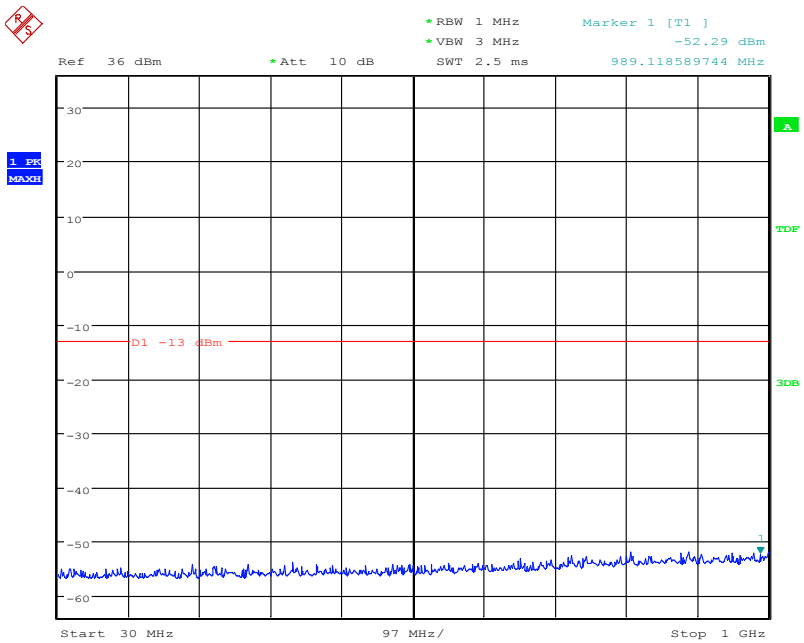
Note: The strong emission shown is the carrier signal.

8PSK, Low channel, 1850.2 MHz, 10GHz to 20GHz



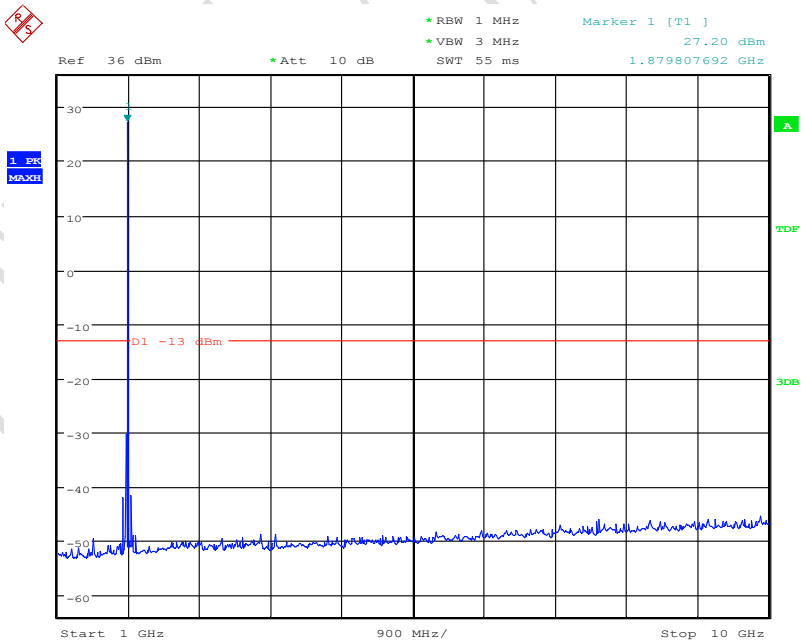
Date: 2.APR.2015 15:08:24

8PSK, Middle channel, 1880.0 MHz, 30MHz to 1GHz



Date: 2.APR.2015 15:08:55

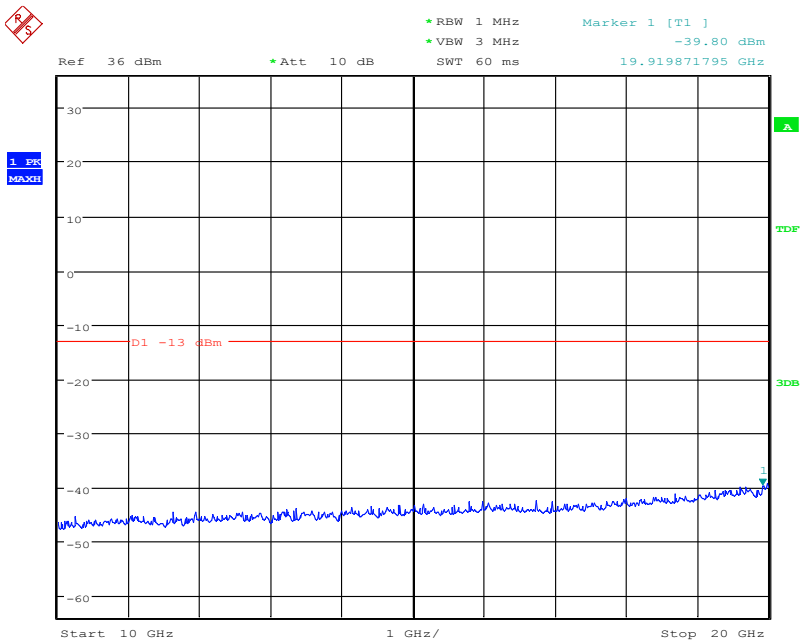
8PSK, Middle channel, 1880.0 MHz, 1GHz to 10GHz



Date: 2.APR.2015 15:09:20

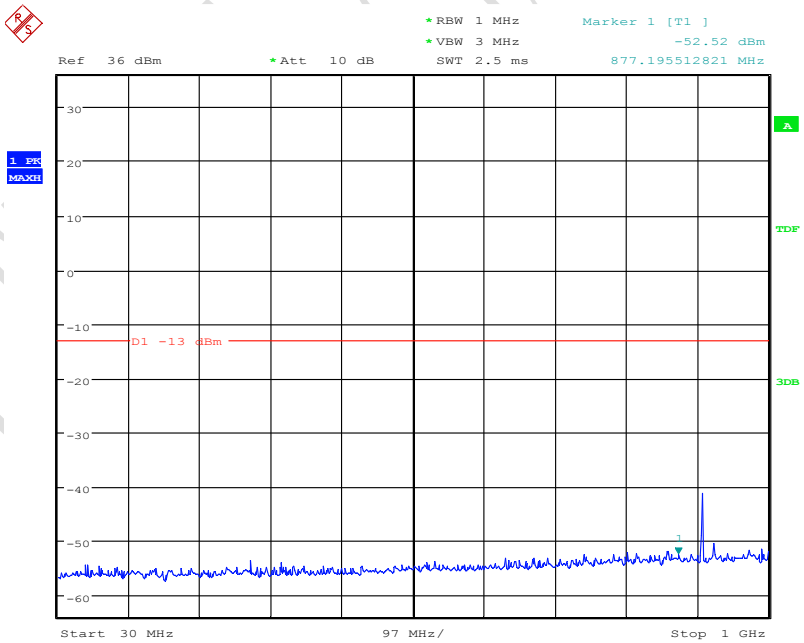
Note: The strong emission shown is the carrier signal.

8PSK, Middle channel, 1880.0 MHz, 10GHz to 20GHz



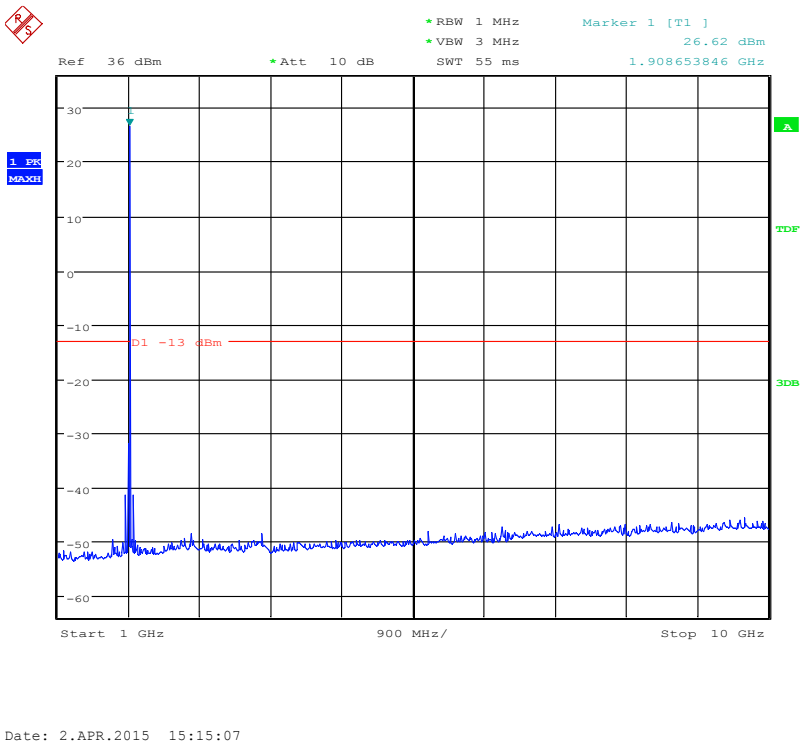
Date: 2.APR.2015 15:09:57

8PSK, High channel, 1909.8 MHz, 30MHz to 1GHz



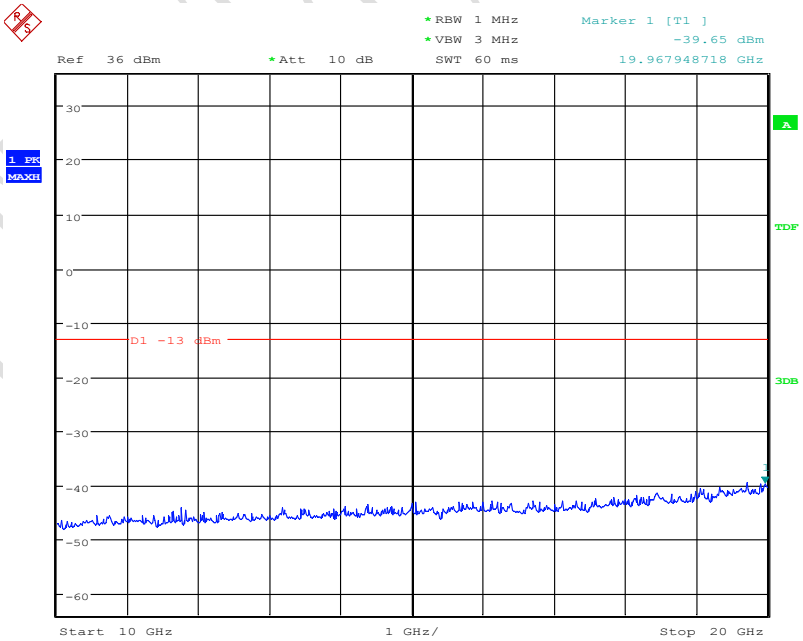
Date: 2.APR.2015 15:10:17

8PSK, High channel, 1909.8 MHz, 1GHz to 10GHz

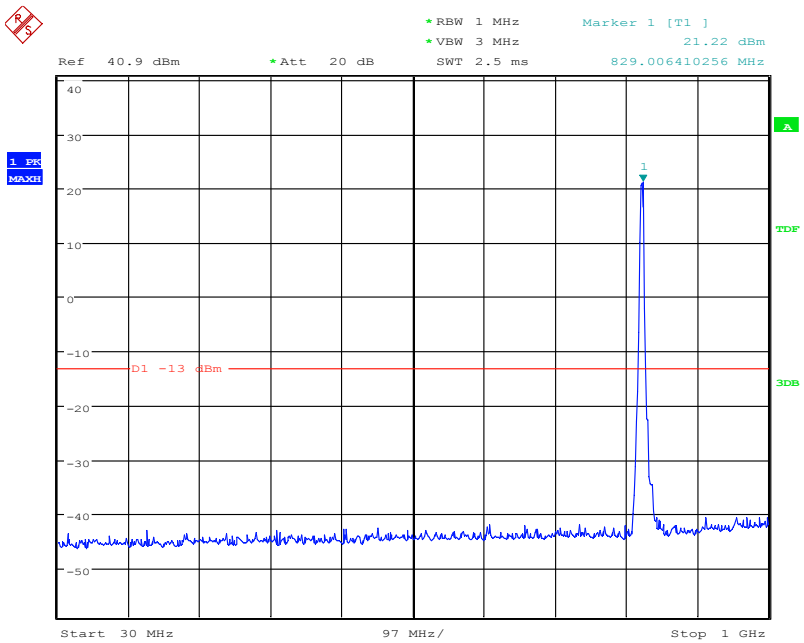


Note: The strong emission shown is the carrier signal

8PSK, High channel, 1909.8 MHz, 10GHz to 20GHz

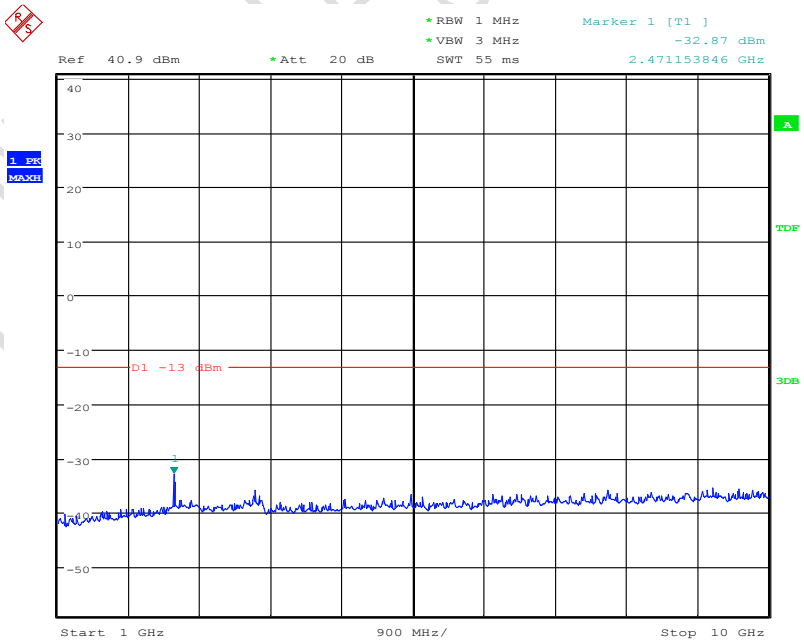


QPSK, Low channel, 826.4 MHz, 30MHz to 1GHz

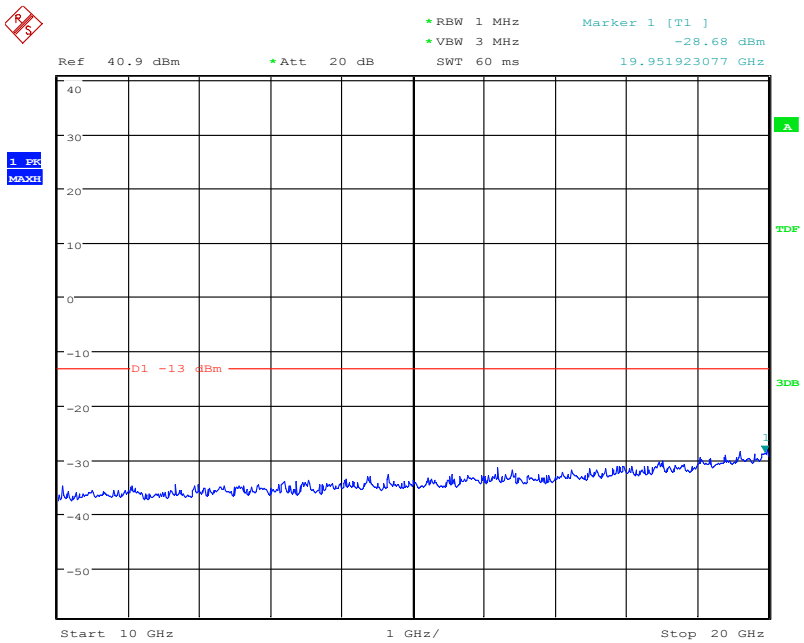


Note: The strong emission shown in each case is the carrier signal.

QPSK, Low channel, 826.4 MHz, 1GHz to 10GHz

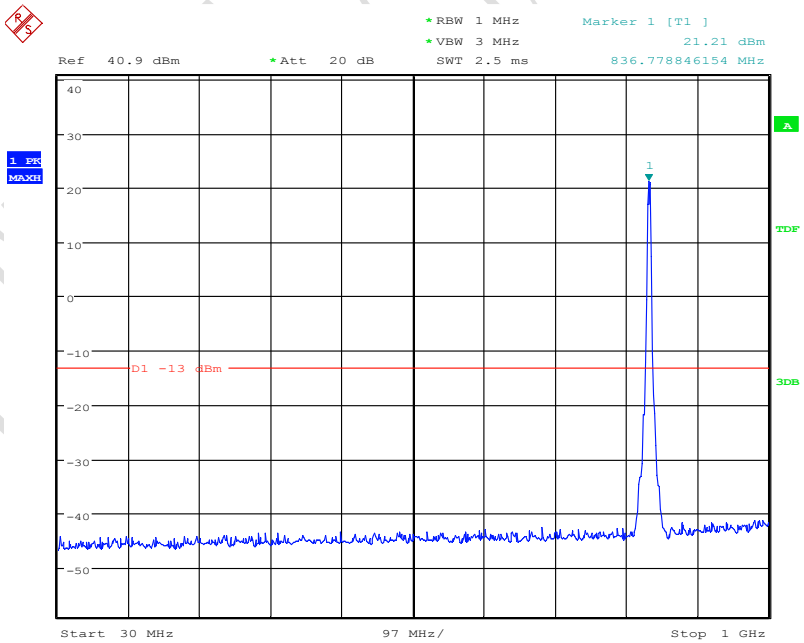


QPSK, Low channel, 826.4 MHz, 10GHz to 20GHz



Date: 9.FEB.2015 12:18:33

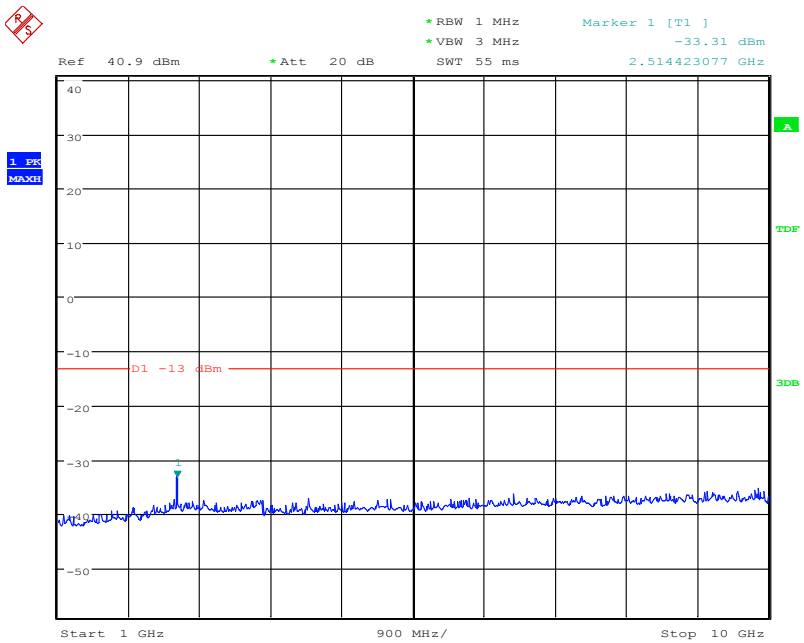
QPSK, Middle channel, 836.4 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:19:03

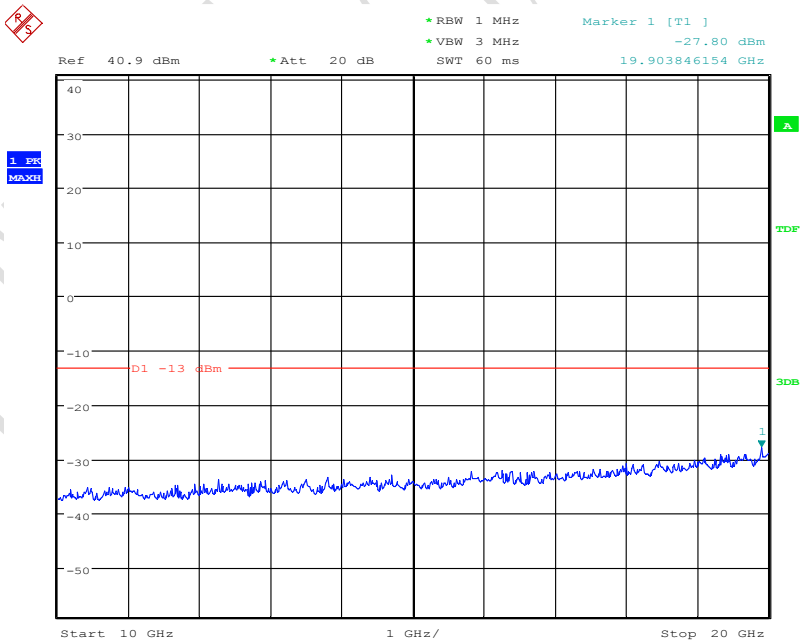
Note: The strong emission shown in each case is the carrier signal.

QPSK, Middle channel, 836.4 MHz, 1GHz to 10GHz



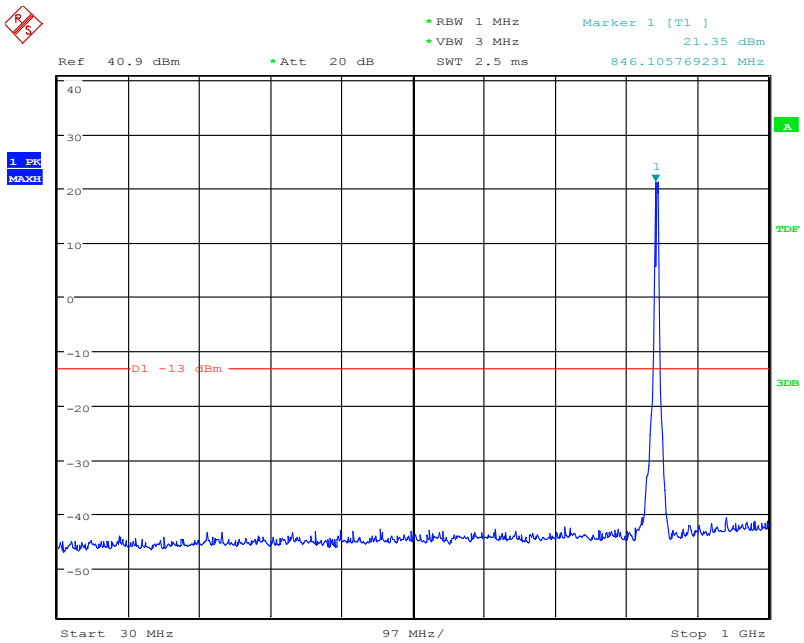
Date: 9.FEB.2015 12:19:18

QPSK, Middle channel, 836.4 MHz, 10GHz to 20GHz



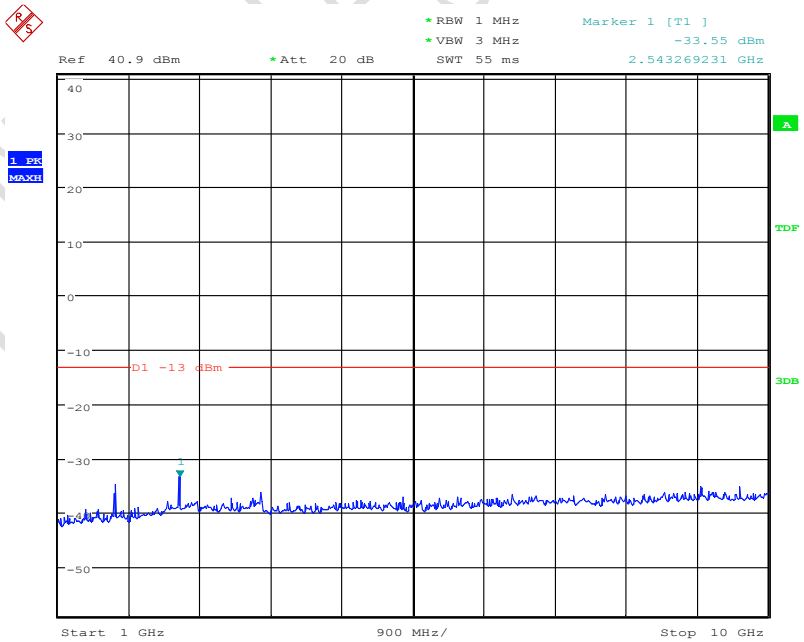
Date: 9.FEB.2015 12:19:32

QPSK, High Channel, 846.6 MHz, 30MHz to 1GHz

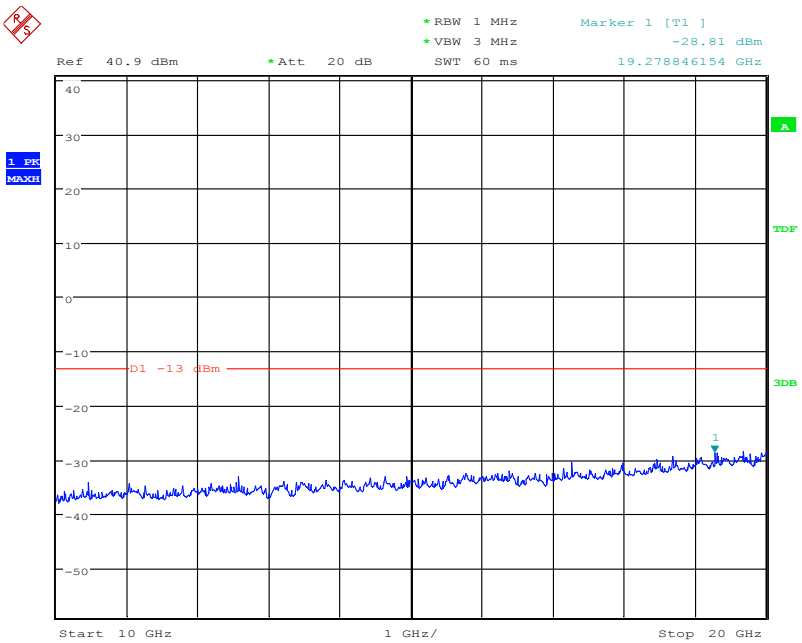


Note: The strong emission shown in each case is the carrier signal.

QPSK, High Channel, 846.6 MHz, 1GHz to 10GHz

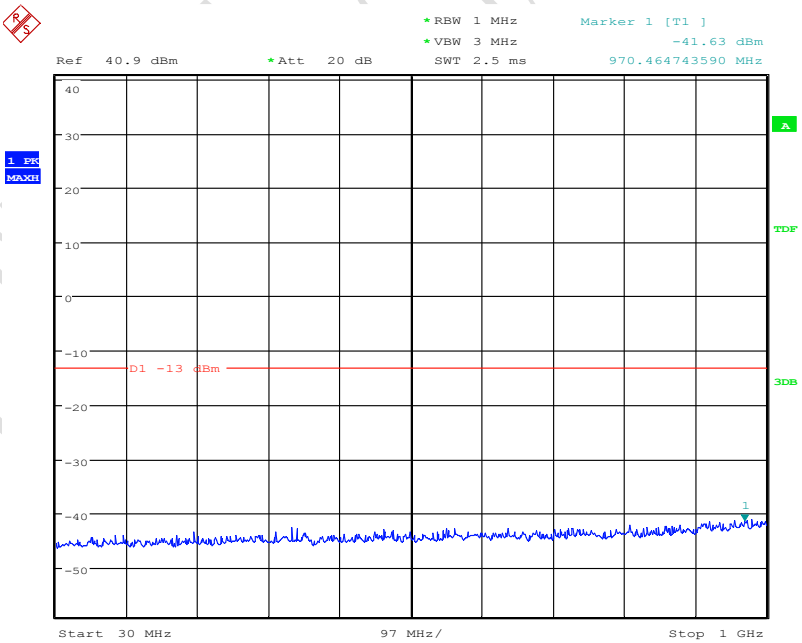


QPSK, High Channel, 846.6 MHz, 10GHz to 20GHz



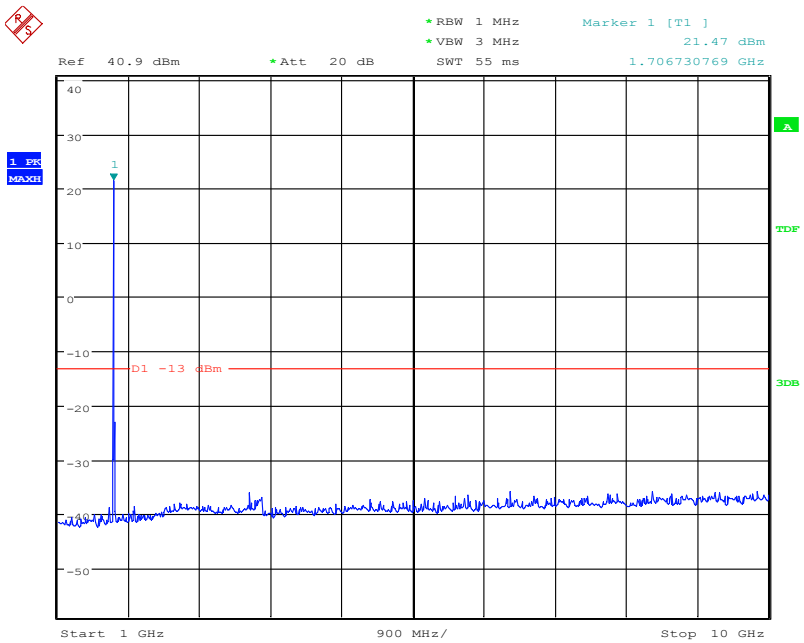
Date: 9.FEB.2015 12:20:24

QPSK, Low channel, 1712.4 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 13:42:37

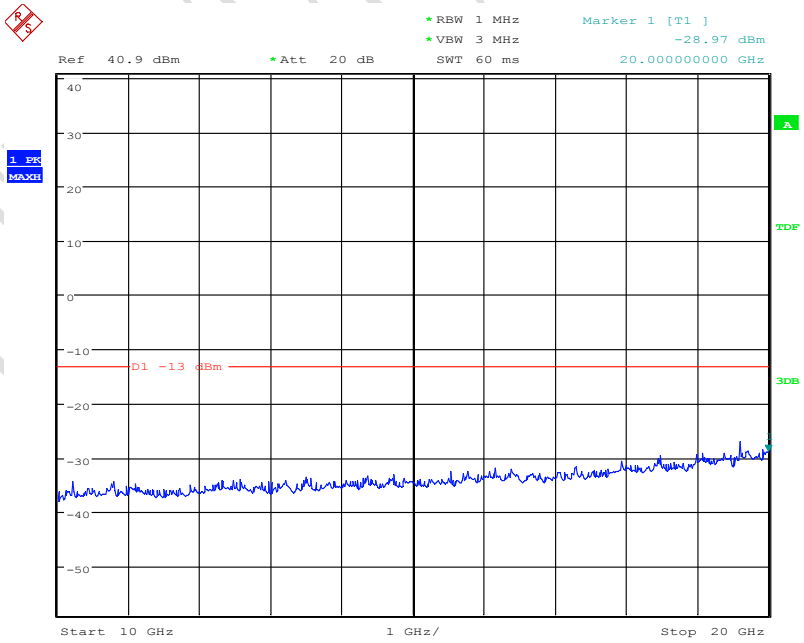
QPSK, Low channel, 1712.4 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 13:42:49

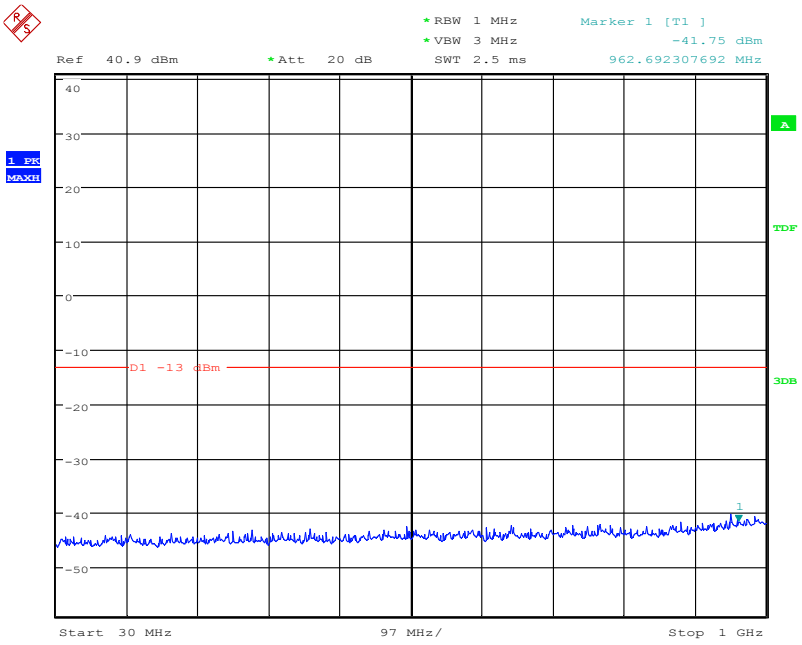
Note: The strong emission shown is the carrier signal.

QPSK, Low channel, 1712.4 MHz, 10GHz to 20GHz



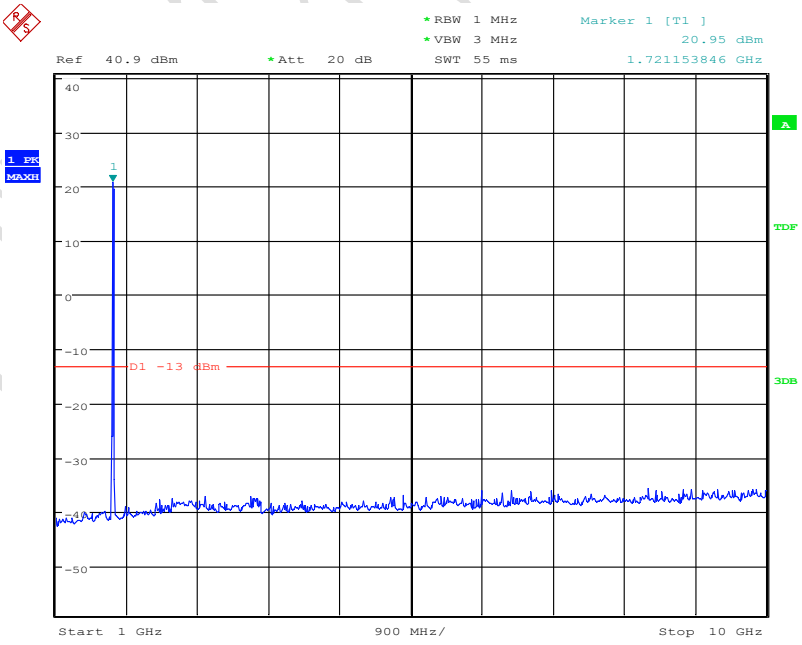
Date: 9.FEB.2015 13:43:02

QPSK, Middle channel, 1732.6 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 13:38:20

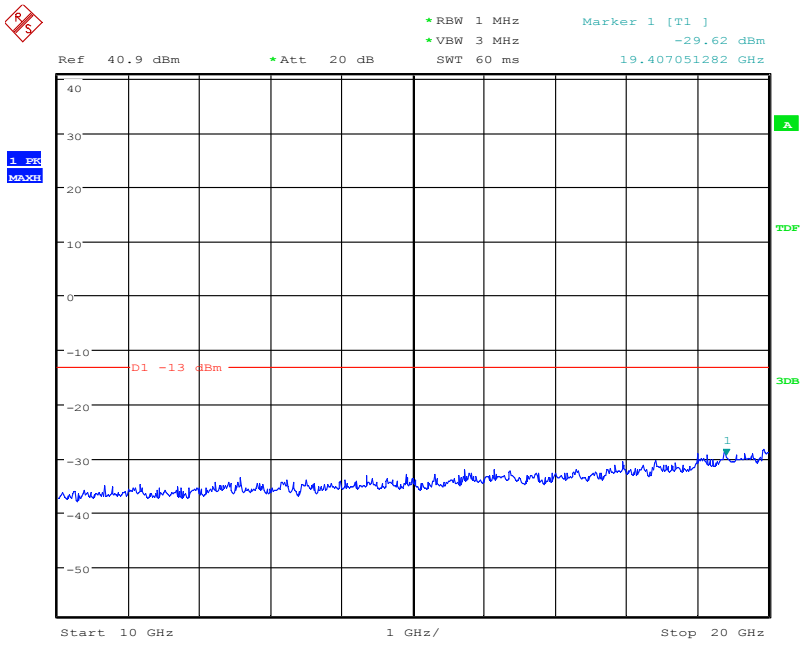
QPSK, Middle channel, 1732.6 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 13:43:41

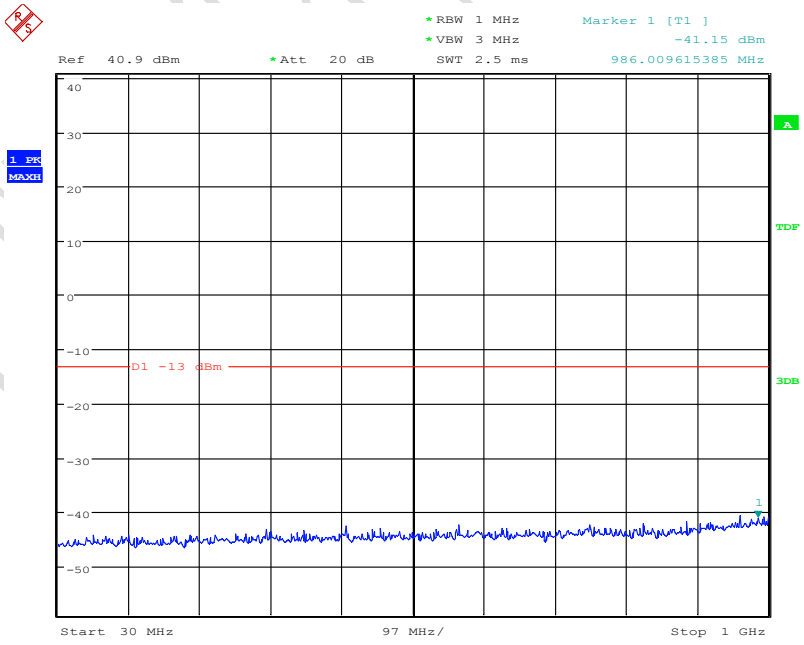
Note: The strong emission shown is the carrier signal.

QPSK, Middle channel, 1732.6 MHz, 10GHz to 20GHz



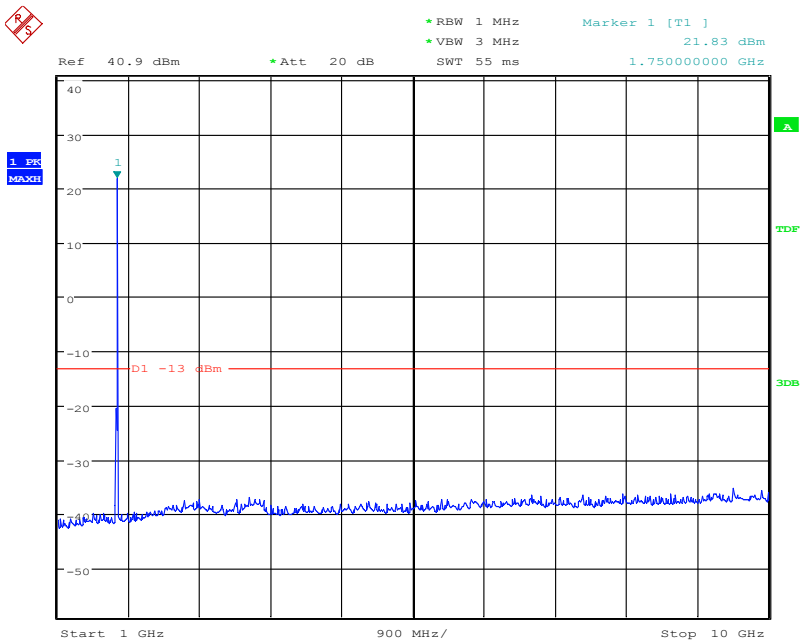
Date: 9.FEB.2015 13:40:41

QPSK, High channel, 1752.6 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 13:45:14

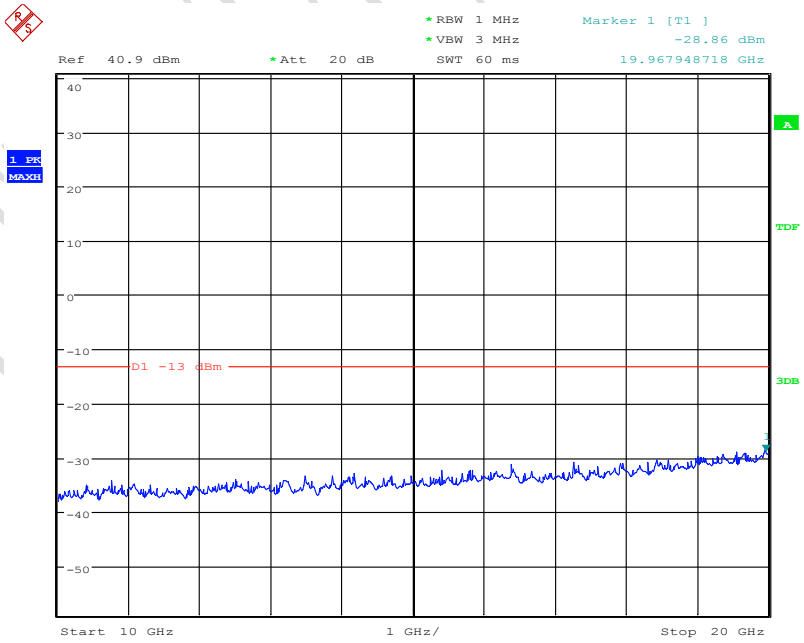
QPSK, High channel, 1752.6 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 13:45:30

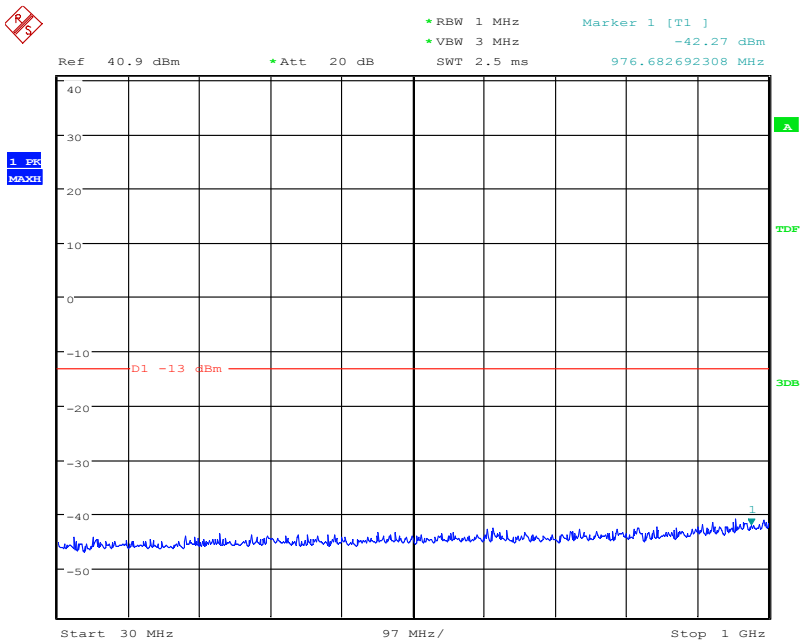
Note: The strong emission shown is the carrier signal.

QPSK, High channel, 1752.6 MHz, 10GHz to 20GHz



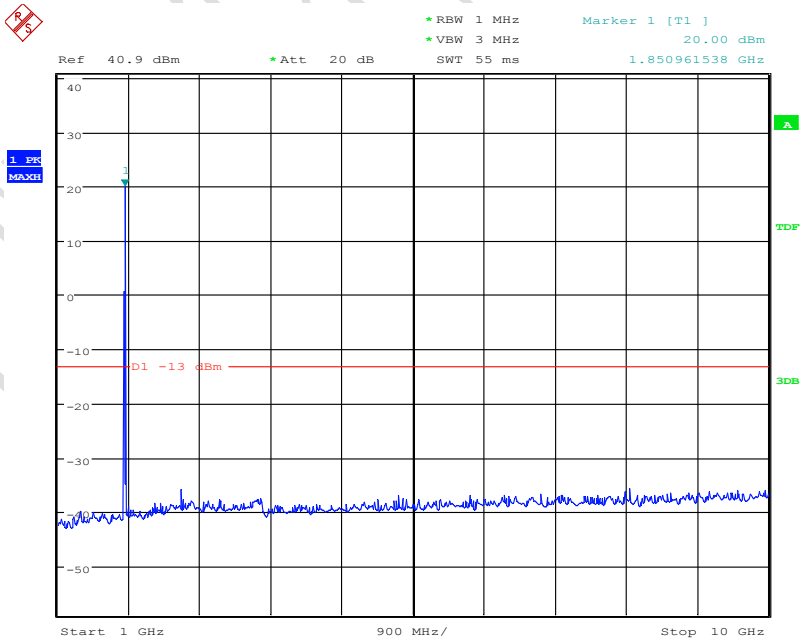
Date: 9.FEB.2015 13:45:42

QPSK, Low channel, 1852.4 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:12:52

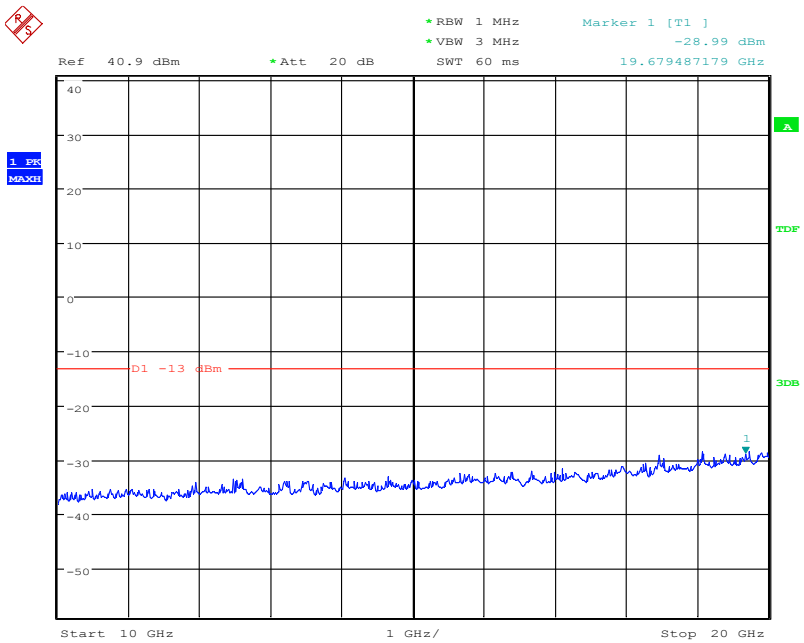
QPSK, Low channel, 1852.4 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 12:13:04

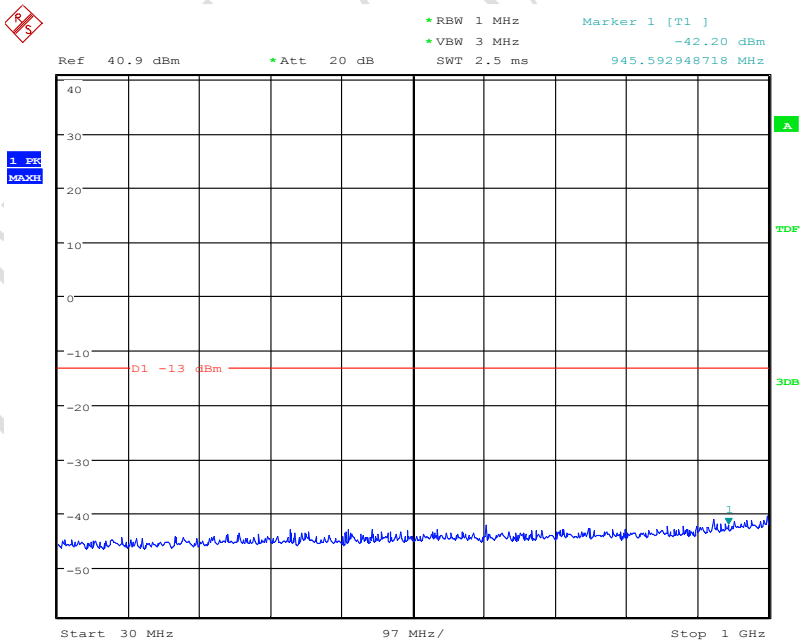
Note: The strong emission shown is the carrier signal.

QPSK, Low channel, 1852.4 MHz, 10GHz to 20GHz



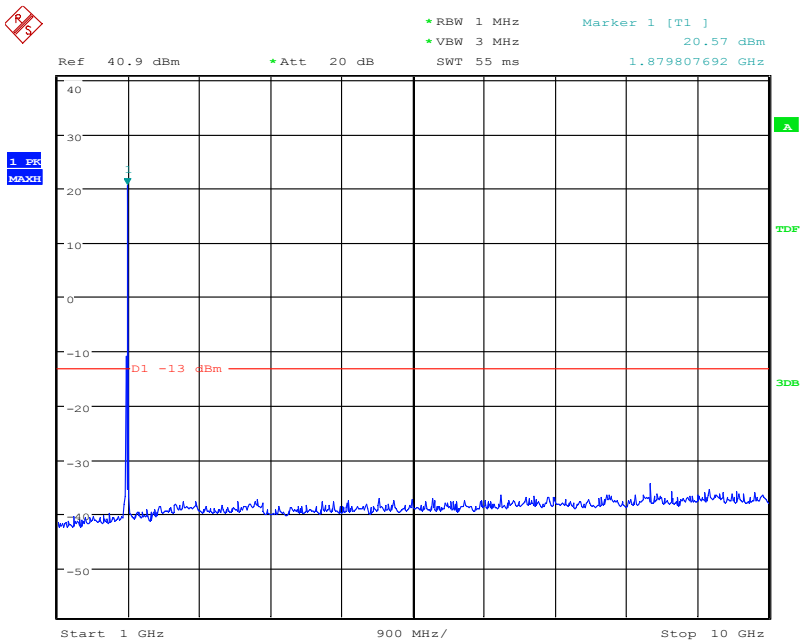
Date: 9.FEB.2015 12:13:16

QPSK, Middle channel, 1880 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:12:07

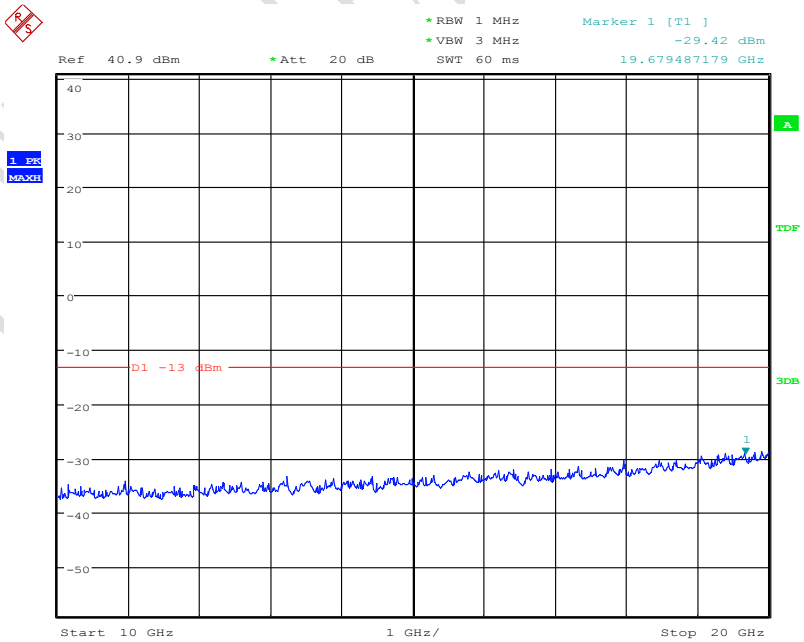
QPSK, Middle channel, 1880 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 12:12:19

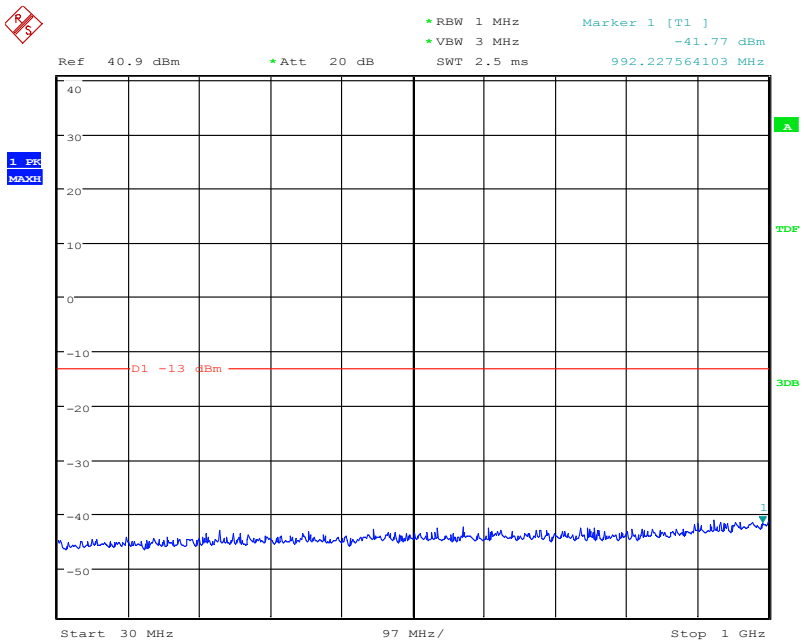
Note: The strong emission shown is the carrier signal.

QPSK, Middle channel, 1880 MHz, 10GHz to 20GHz



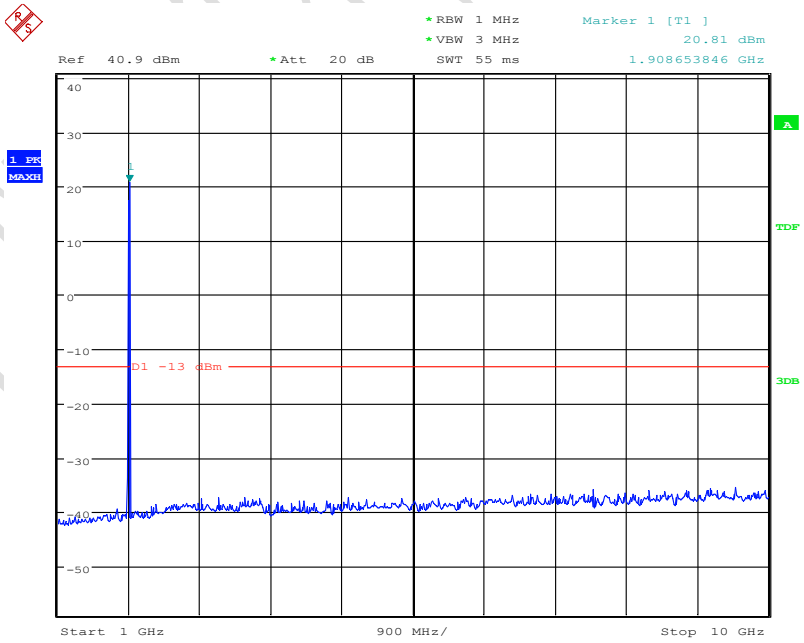
Date: 9.FEB.2015 12:12:32

QPSK, High channel, 1907.6 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:11:19

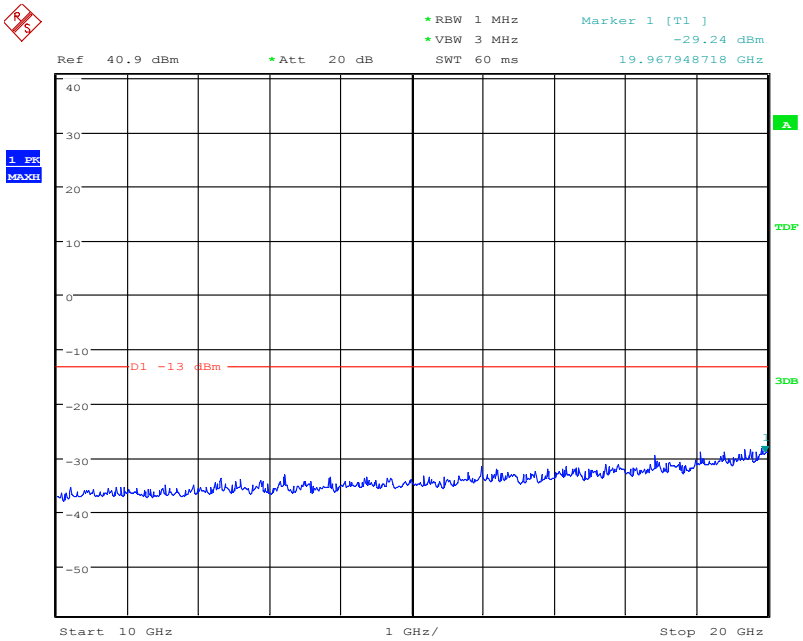
QPSK, High channel, 1907.6 MHz, 1GHz to 10GHz



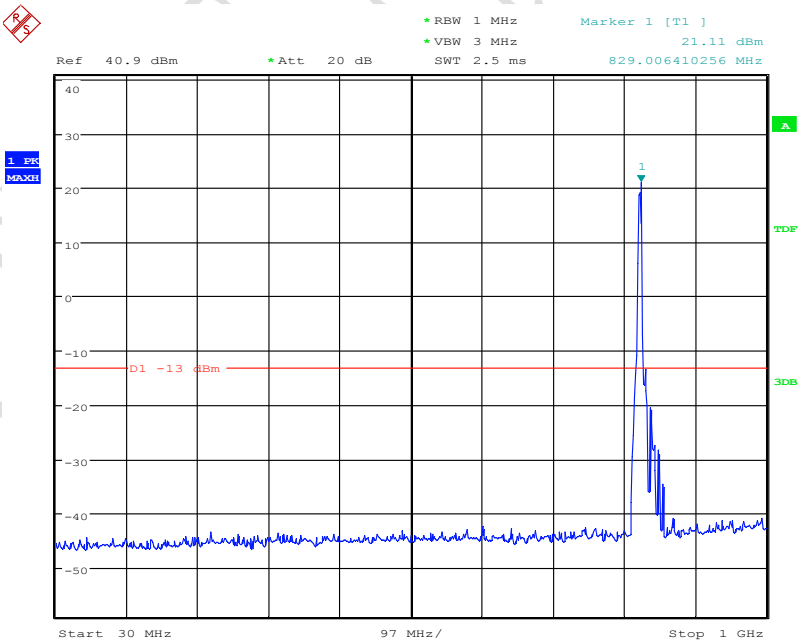
Date: 9.FEB.2015 12:11:32

Note: The strong emission shown is the carrier signal.

QPSK, High channel, 1907.6 MHz,10GHz to 20GHz

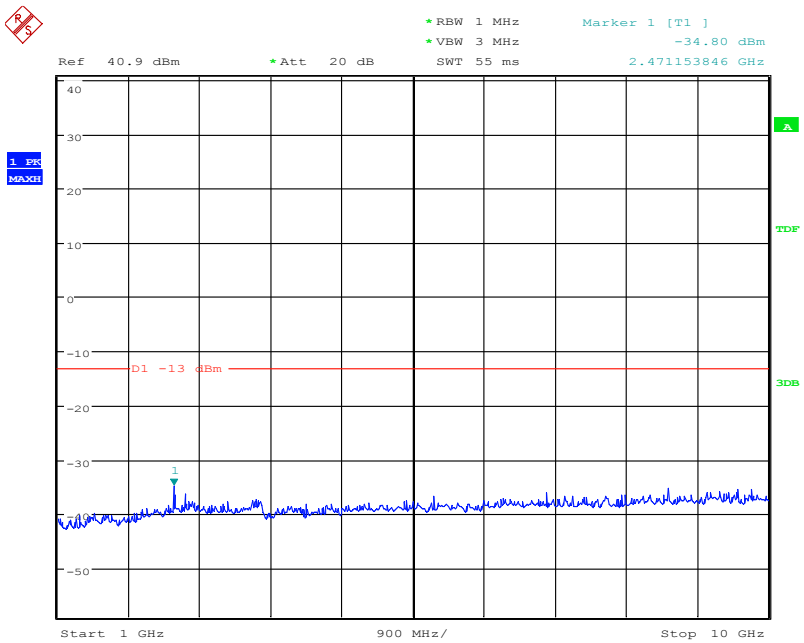


16QAM, Low channel, 826.4 MHz, 30MHz to 1GHz



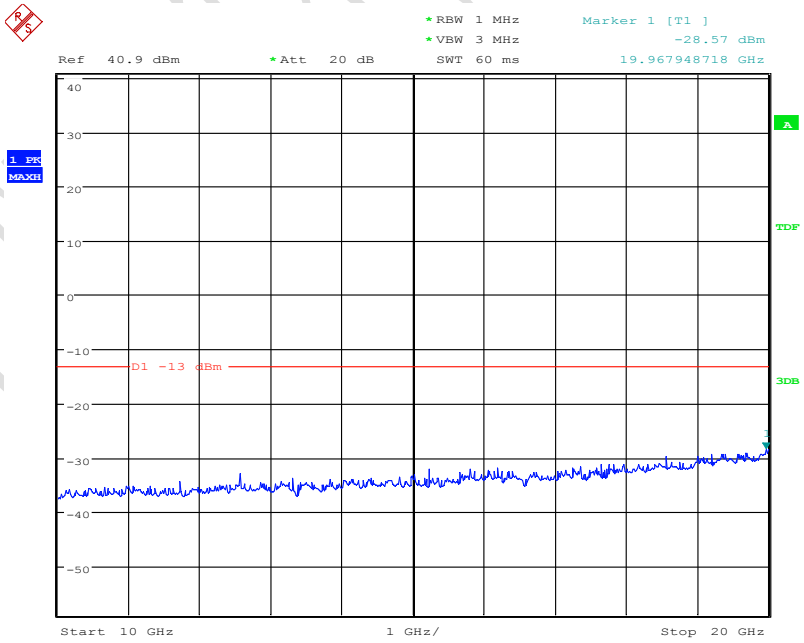
Note: The strong emission shown in each case is the carrier signal.

16QAM, Low channel, 826.4 MHz, 1GHz to 10GHz



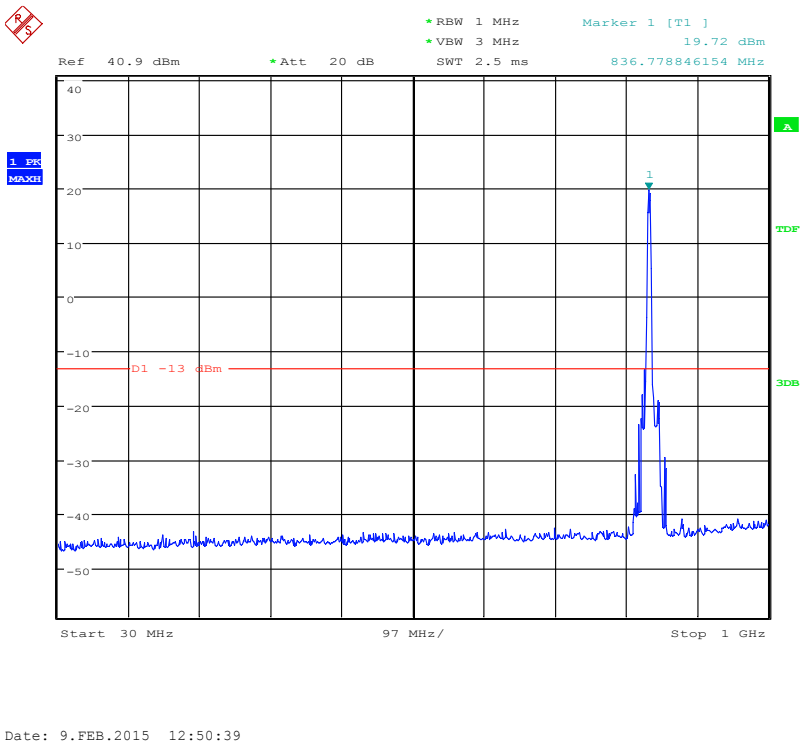
Date: 9.FEB.2015 12:51:47

16QAM, Low channel, 826.4 MHz, 10GHz to 20GHz



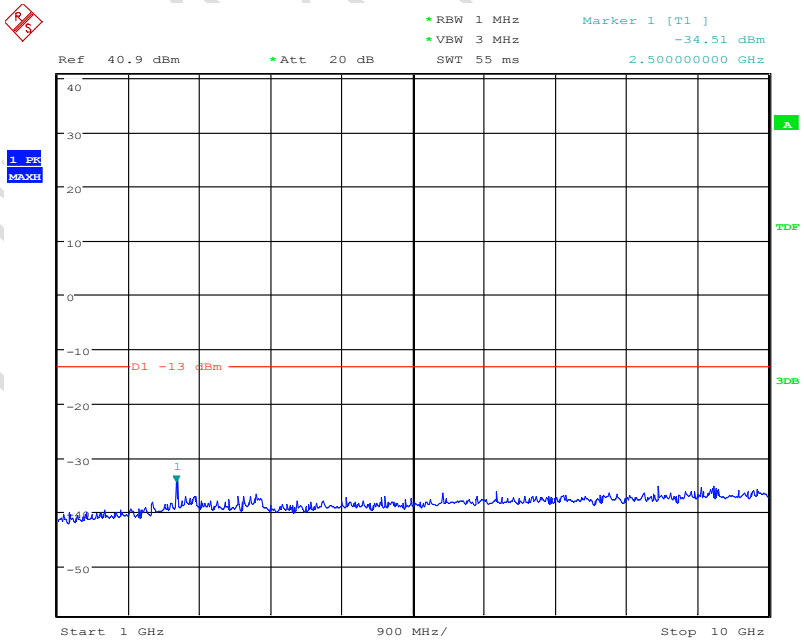
Date: 9.FEB.2015 12:52:07

16QAM, Middle channel, 836.4 MHz, 30MHz to 1GHz

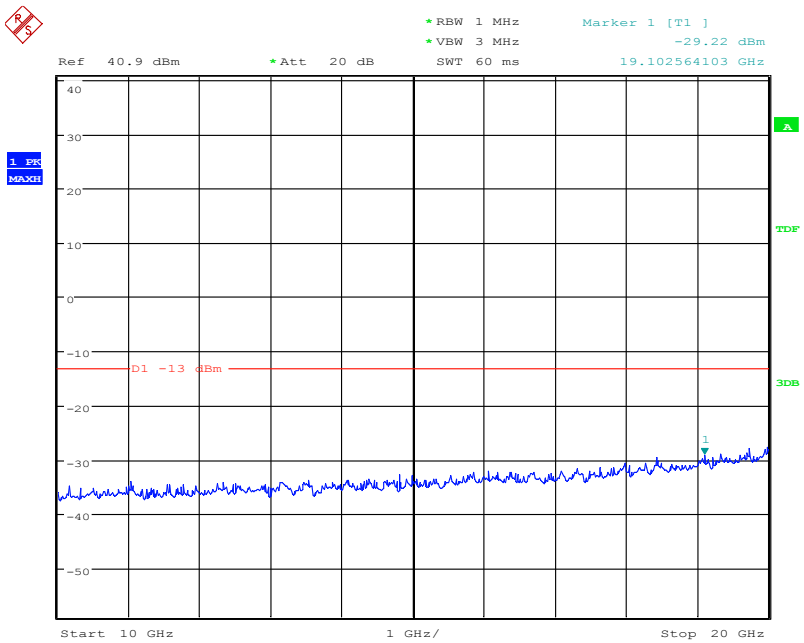


Note: The strong emission shown in each case is the carrier signal.

16QAM, Middle channel, 836.4 MHz, 1GHz to 10GHz

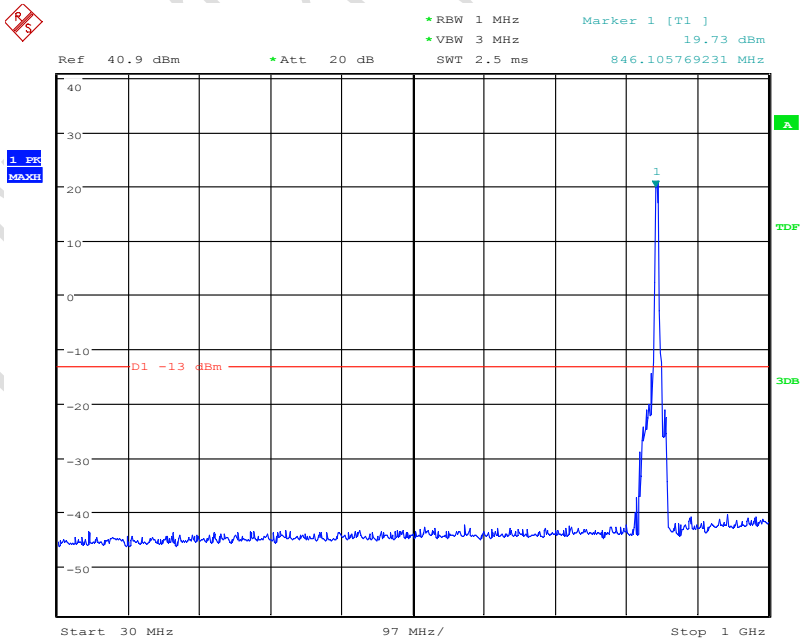


16QAM, Middle channel, 836.4 MHz, 10GHz to 20GHz



Date: 9.FEB.2015 12:51:14

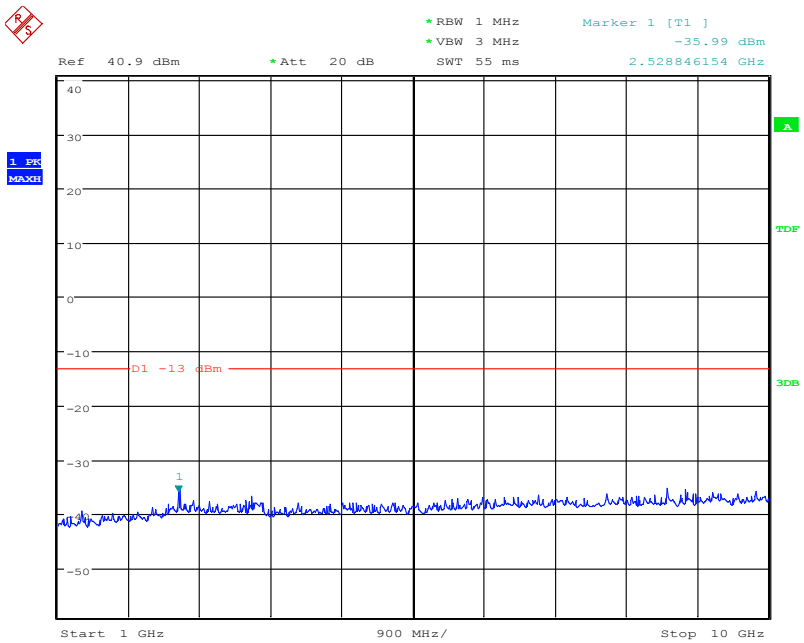
16QAM, High Channel, 846.6 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:49:49

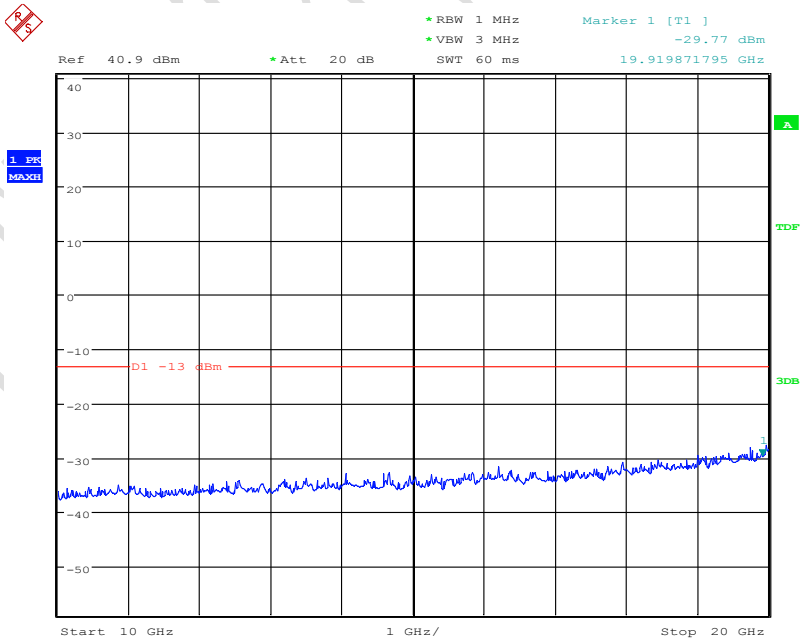
Note: The strong emission shown in each case is the carrier signal.

16QAM, High Channel, 846.6 MHz, 1GHz to 10GHz



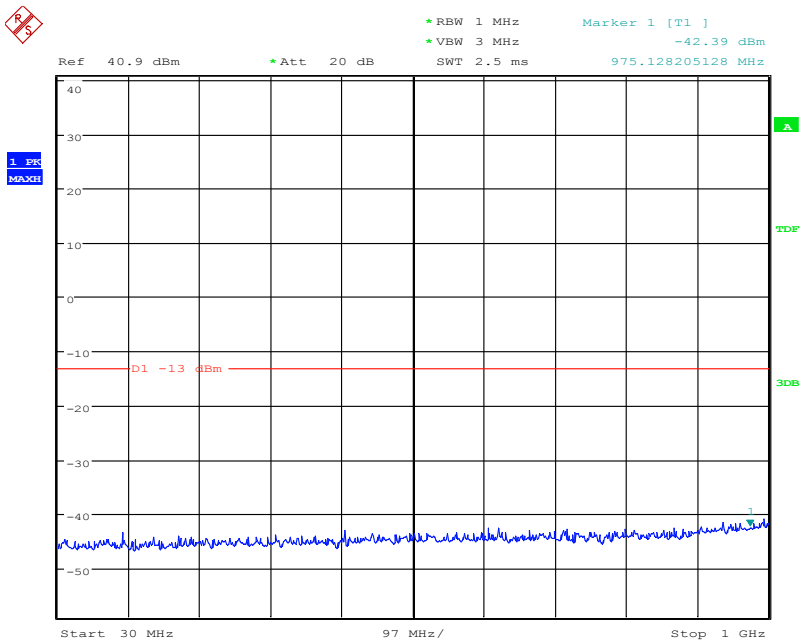
Date: 9.FEB.2015 12:50:01

16QAM, High Channel, 846.6 MHz, 10GHz to 20GHz



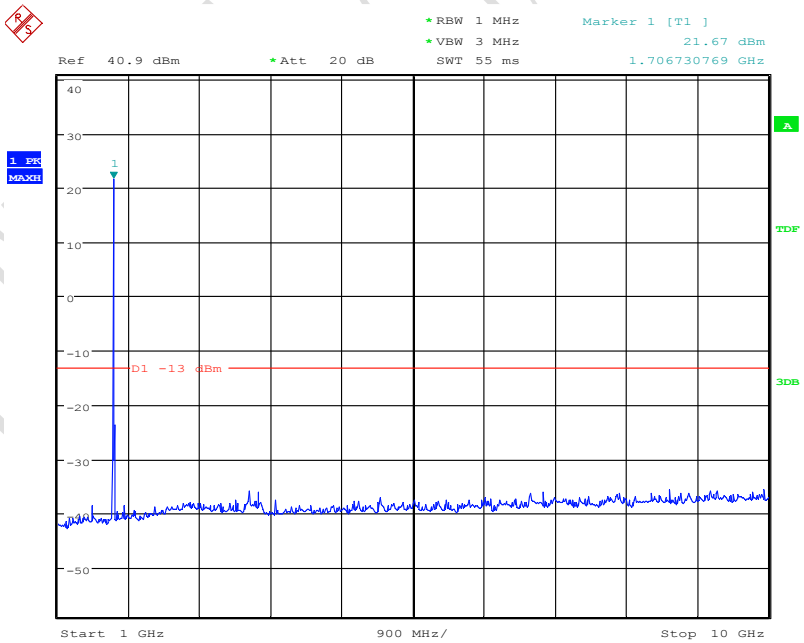
Date: 9.FEB.2015 12:50:15

16QAM, Low Channel, 1712.4 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 13:47:46

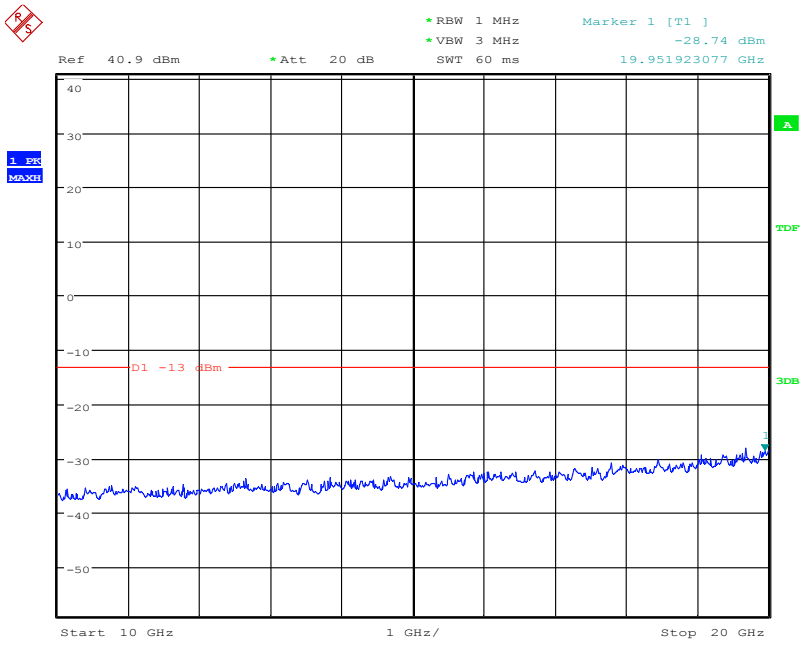
16QAM, Low Channel, 1712.4 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 13:47:58

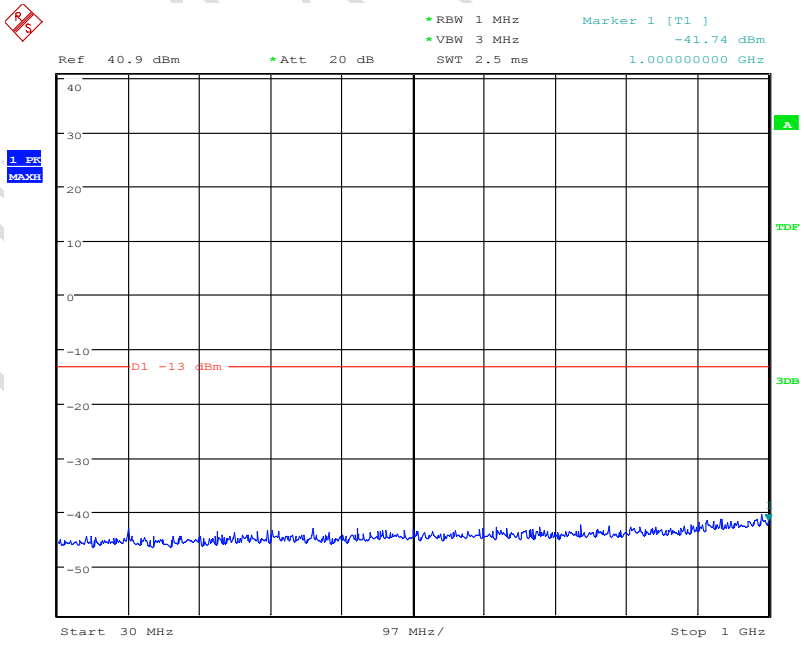
Note: The strong emission shown is the carrier signal.

16QAM, Low Channel, 1712.4 MHz, 10GHz to 20GHz



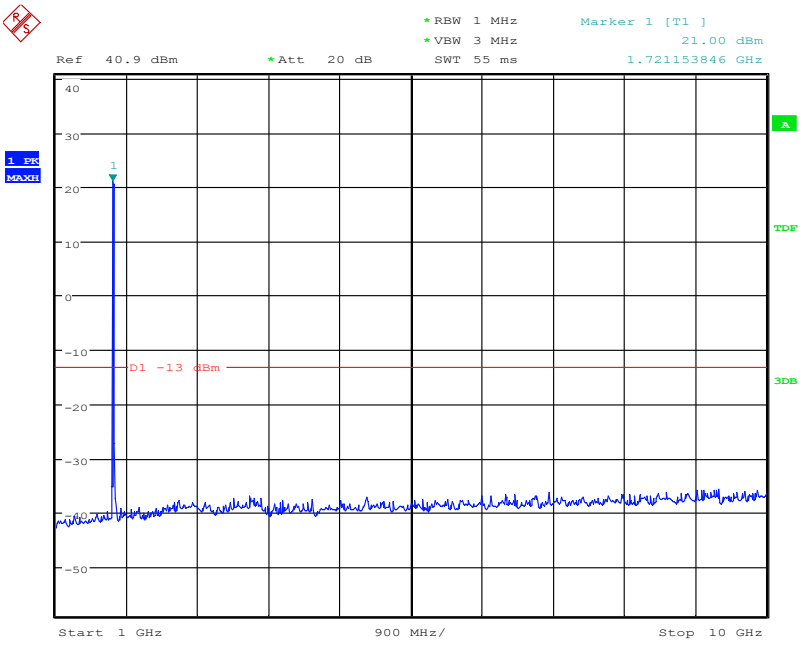
Date: 9.FEB.2015 13:48:11

16QAM, Middle Channel, 1732.6 MHz, 30MHz to 1GHz



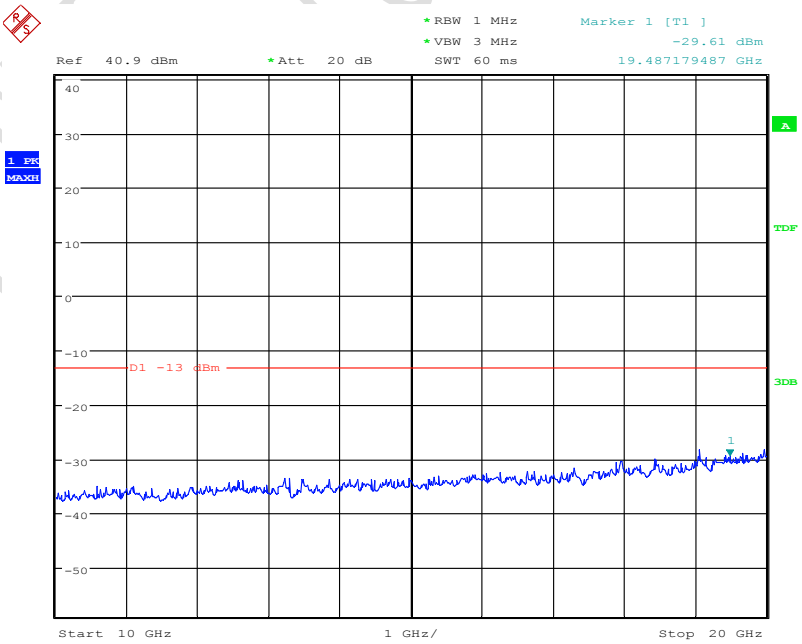
Date: 9.FEB.2015 13:47:00

16QAM, Middle Channel, 1732.6 MHz, 1GHz to 10GHz

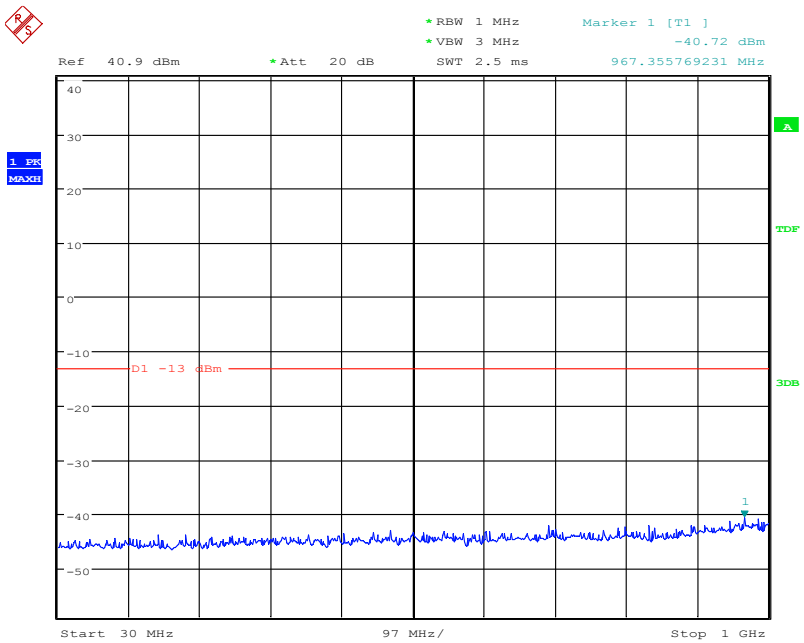


Note: The strong emission shown is the carrier signal.

16QAM, Middle Channel, 1732.6 MHz, 10GHz to 20GHz

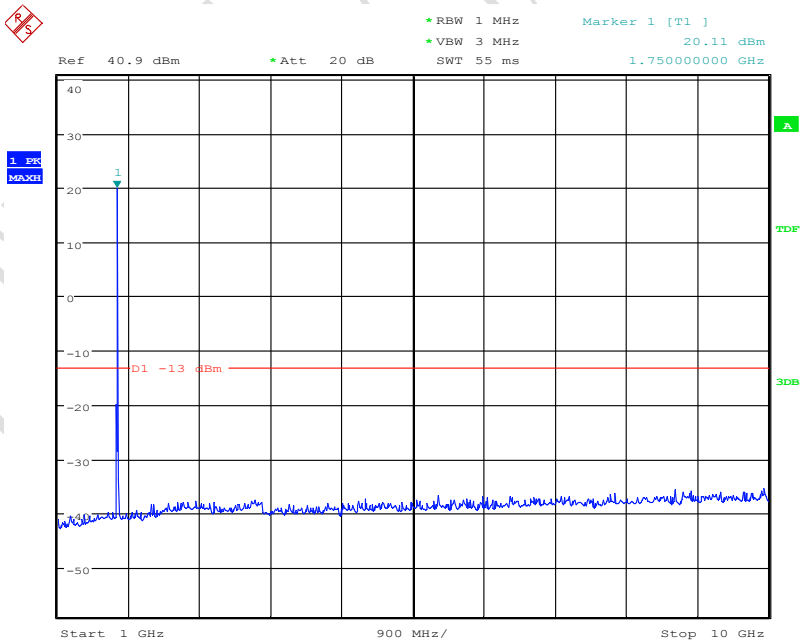


16QAM, High Channel, 1752.6 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 13:46:07

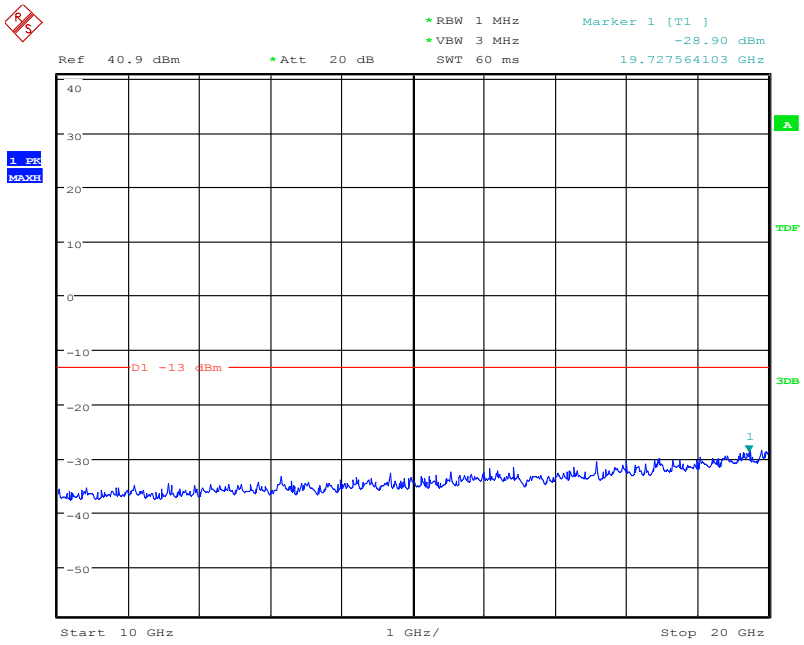
16QAM, High Channel, 1752.6 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 13:46:20

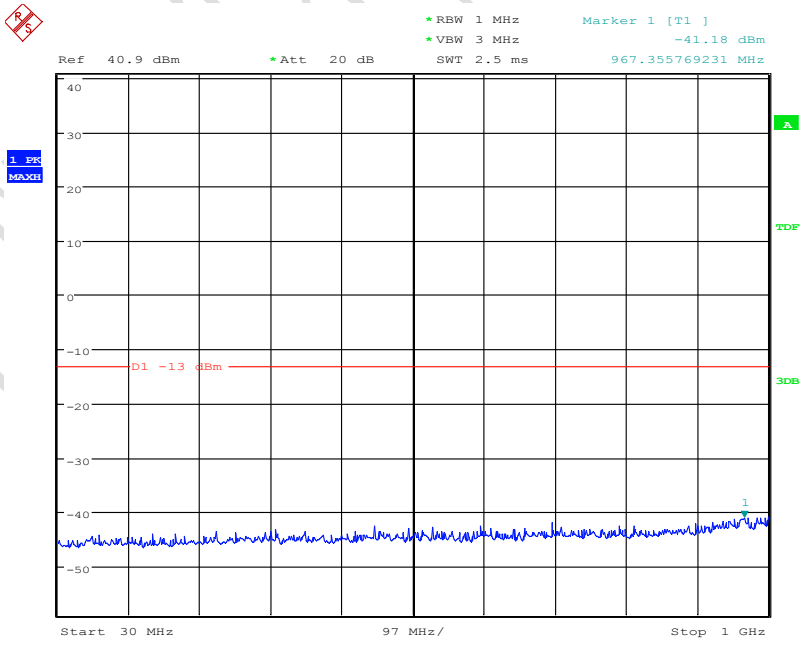
Note: The strong emission shown is the carrier signal.

16QAM, High Channel, 1752.6 MHz, 10GHz to 20GHz



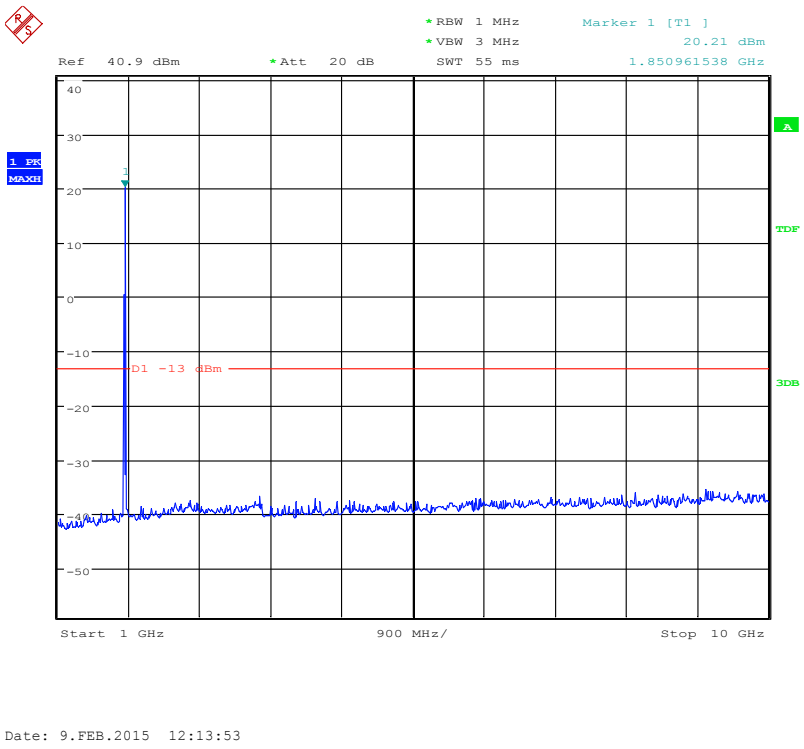
Date: 9.FEB.2015 13:46:32

16QAM, Low channel, 1852.4 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:13:41

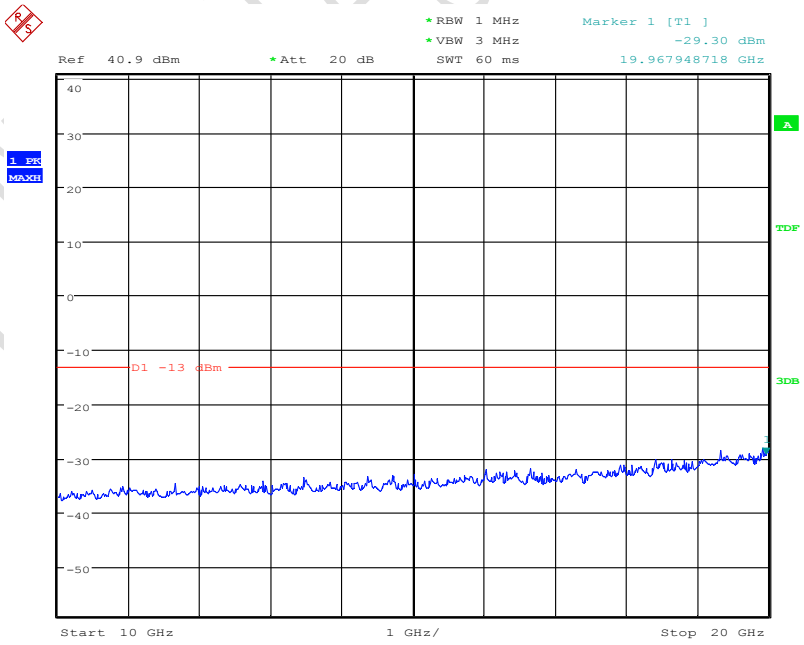
16QAM, Low channel, 1852.4 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 12:13:53

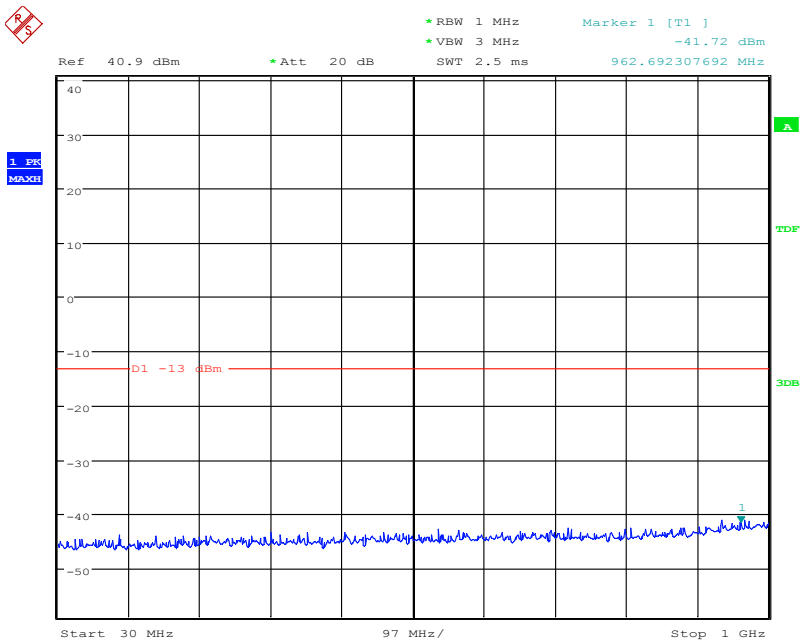
Note: The strong emission shown is the carrier signal.

16QAM, Low channel, 1852.4 MHz, 10GHz to 20GHz



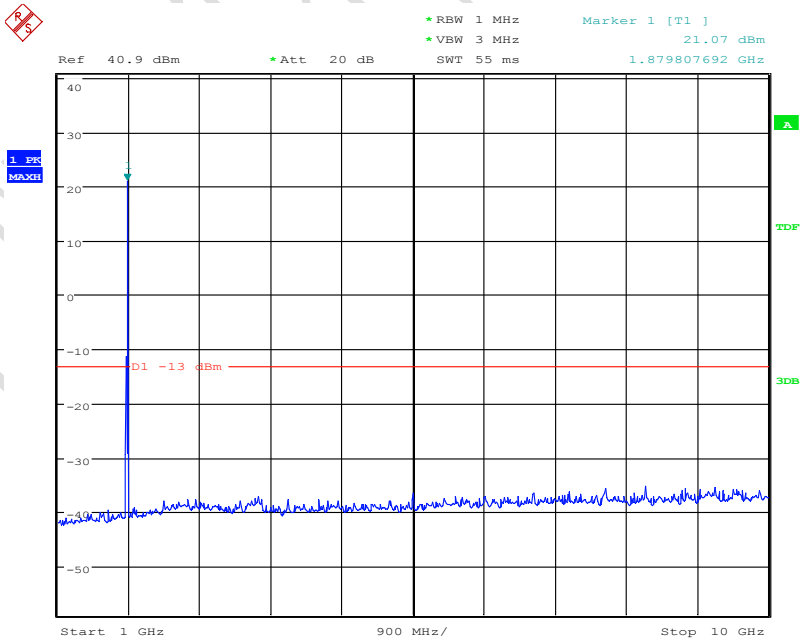
Date: 9.FEB.2015 12:14:04

16QAM, Middle channel, 1880 MHz, 30MHz to 1GHz



Date: 9.FEB.2015 12:14:26

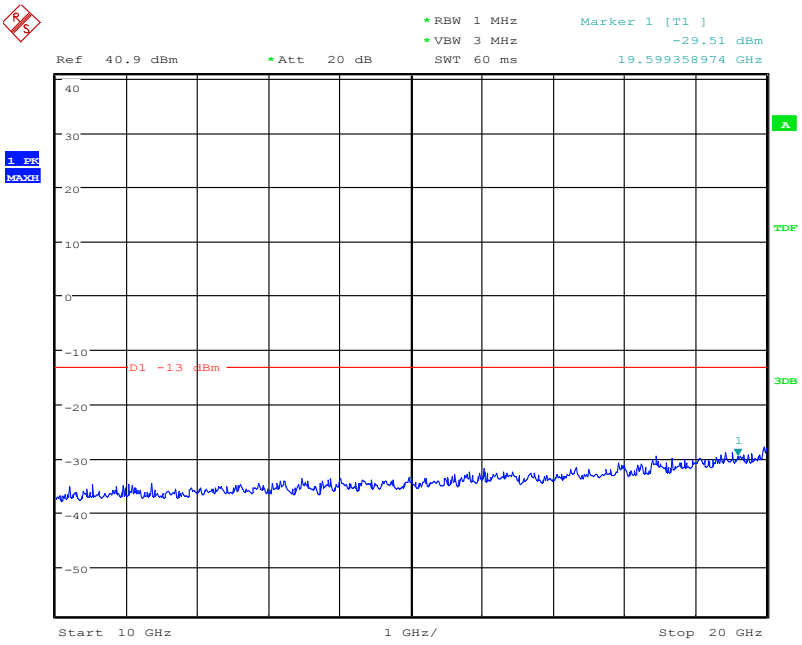
16QAM, Middle channel, 1880 MHz, 1GHz to 10GHz



Date: 9.FEB.2015 12:14:38

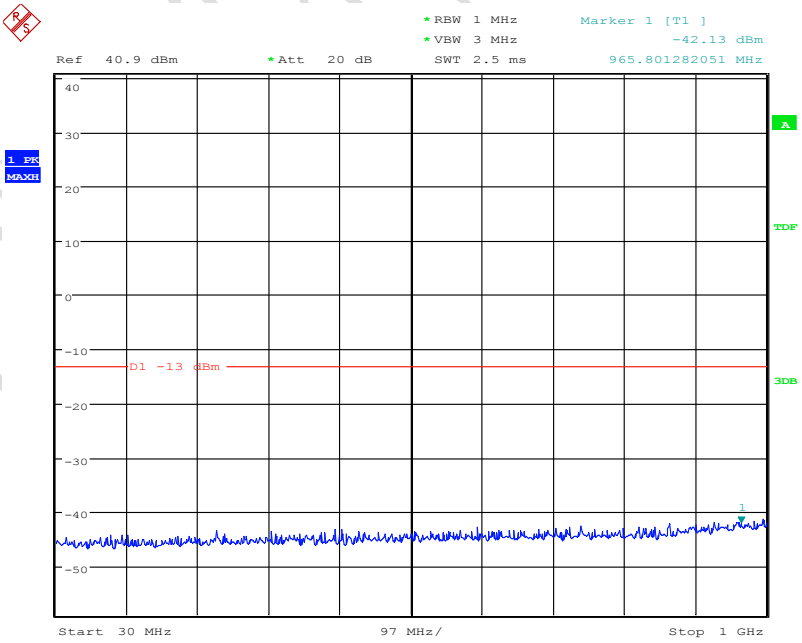
Note: The strong emission shown is the carrier signal.

16QAM, Middle channel, 1880 MHz, 10GHz to 20GHz



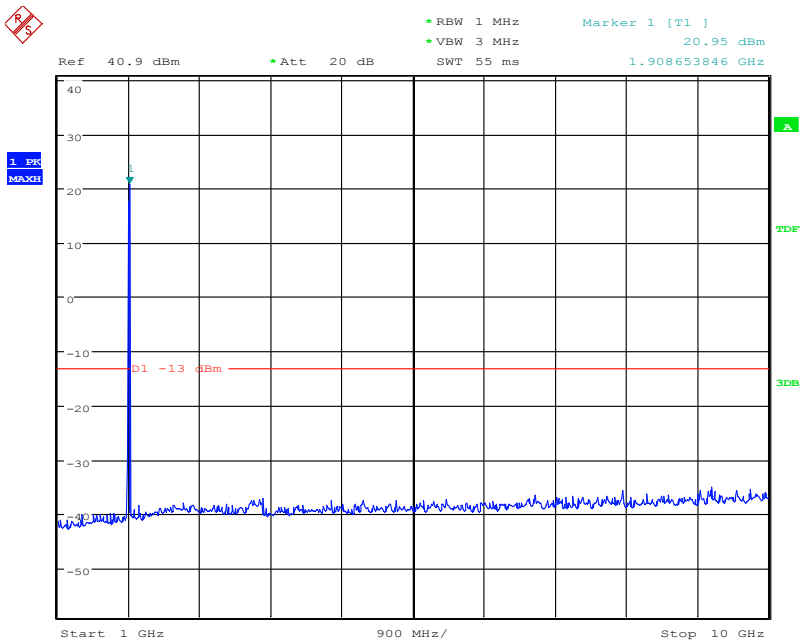
Date: 9.FEB.2015 12:14:50

16QAM, High channel, 1907.6 MHz, 30MHz to 1GHz



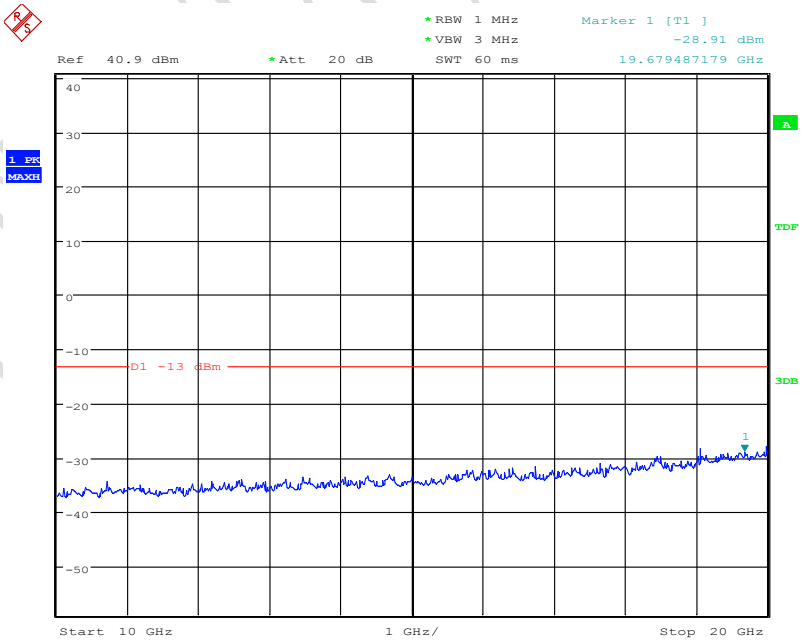
Date: 9.FEB.2015 12:15:12

16QAM, High channel, 1907.6 MHz, 1GHz to 10GHz



Note: The strong emission shown is the carrier signal.

16QAM, High channel, 1907.6 MHz,10GHz to 20GHz



4.7 Band Edge

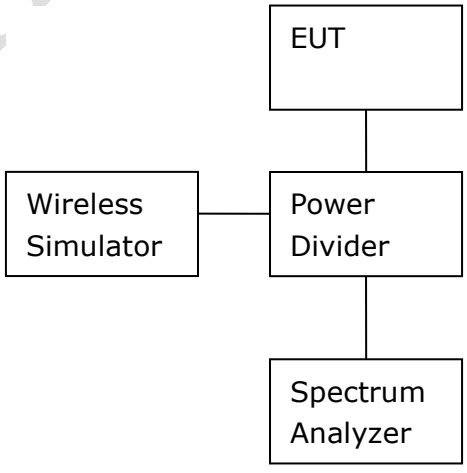
Specifications:	2.1051, 24.238, 2.1053, 22.917
Date of Tests	2015-02-09-2015-04-02
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 251 and 512, 810 for GPRS/EGPRS mode, channel 9262, 9538 and 1312, 1513 and 4132, 4233 for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit Level Construction:
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

Limits for Radiated spurious emissions	
Frequency range	**Limit Level**
Band edge	-13dBm

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The lost of the cables the test system is calibrated to correct the readings.
2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
3) The resolution bandwidth of the spectrum analyzer was a little greater than 1% of the 26dB emission bandwidth.

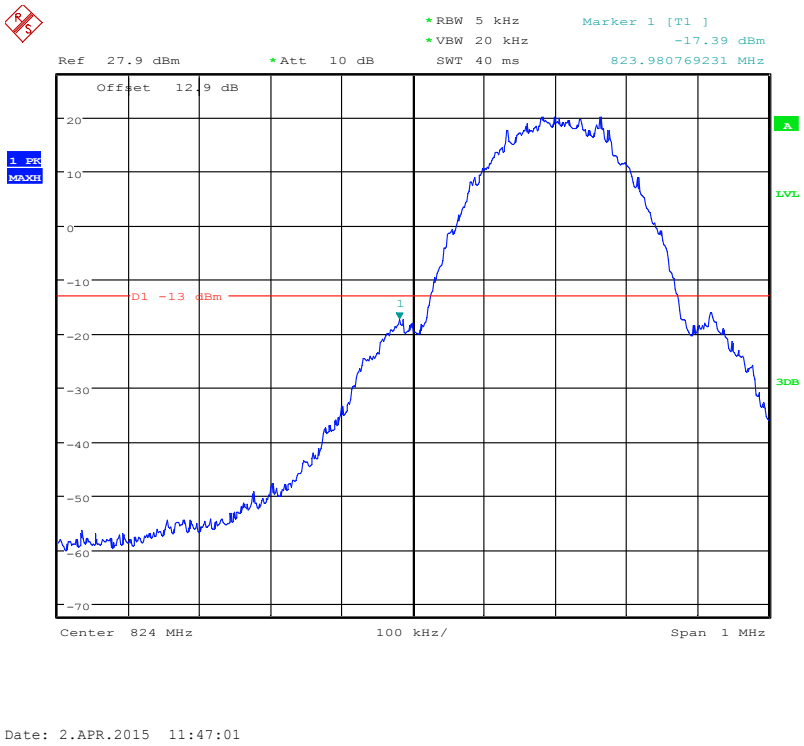
Note: --

CTL Test Report

Test Results:

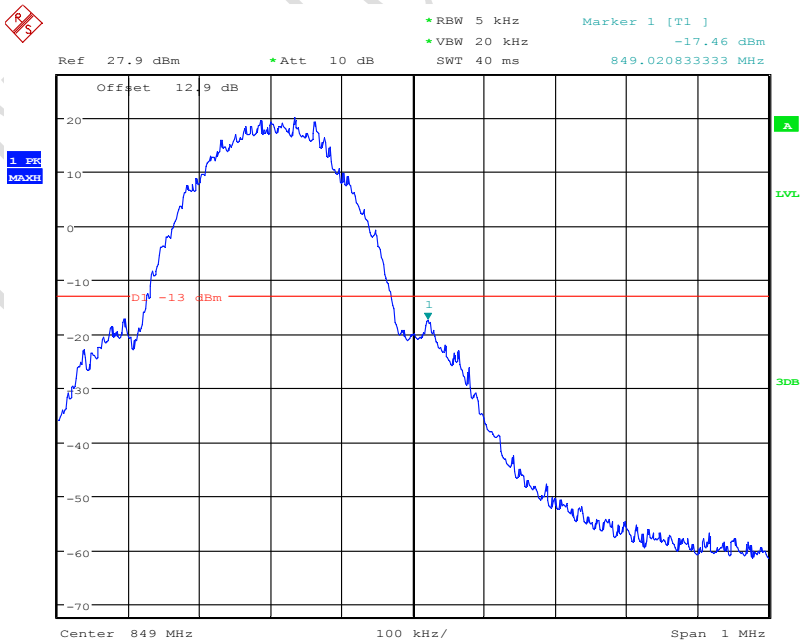
Graphical results:

GMSK; Cellular low channel, below 824 MHz



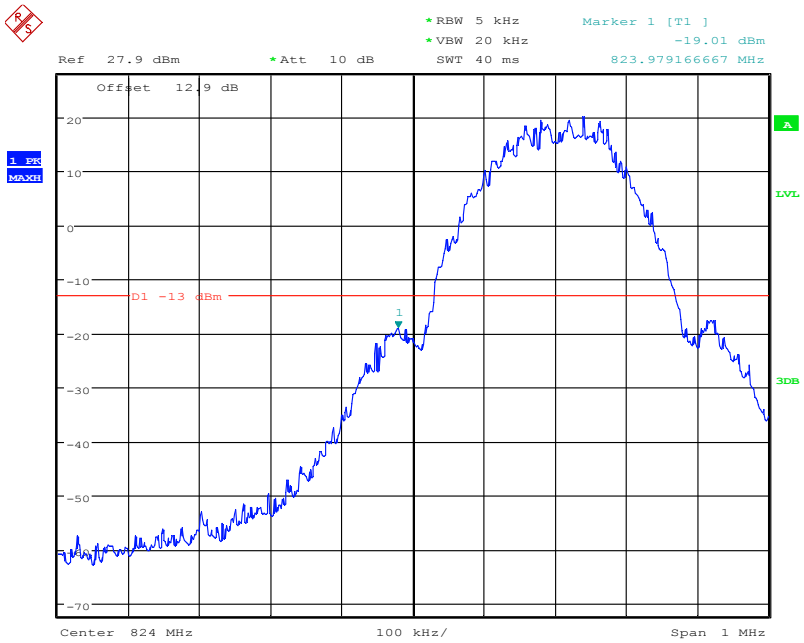
Date: 2.APR.2015 11:47:01

GMSK; Cellular high channel, above 849 MHz

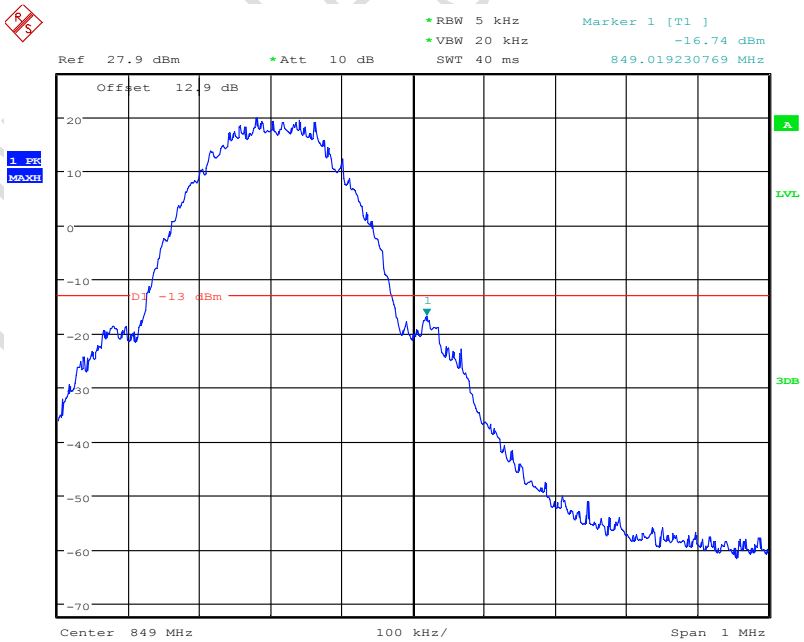


Date: 2.APR.2015 11:47:45

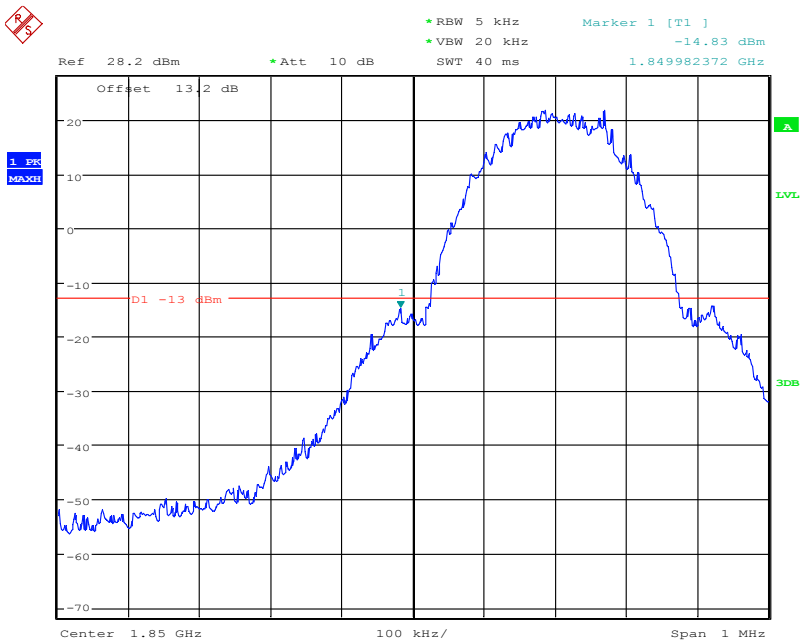
8PSK; Cellular low channel, below 824 MHz



8PSK; Cellular high channel, above 849 MHz

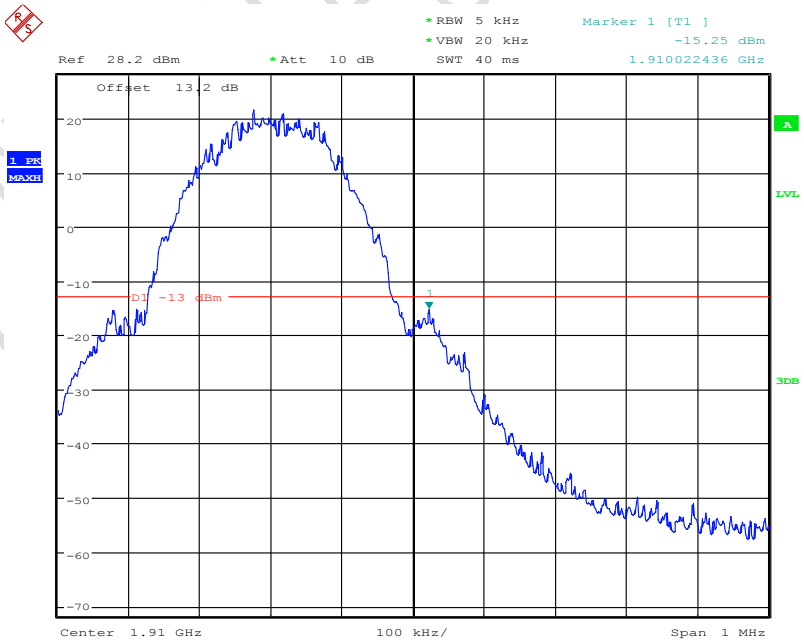


GMSK; PCS low channel, below 1850 MHz



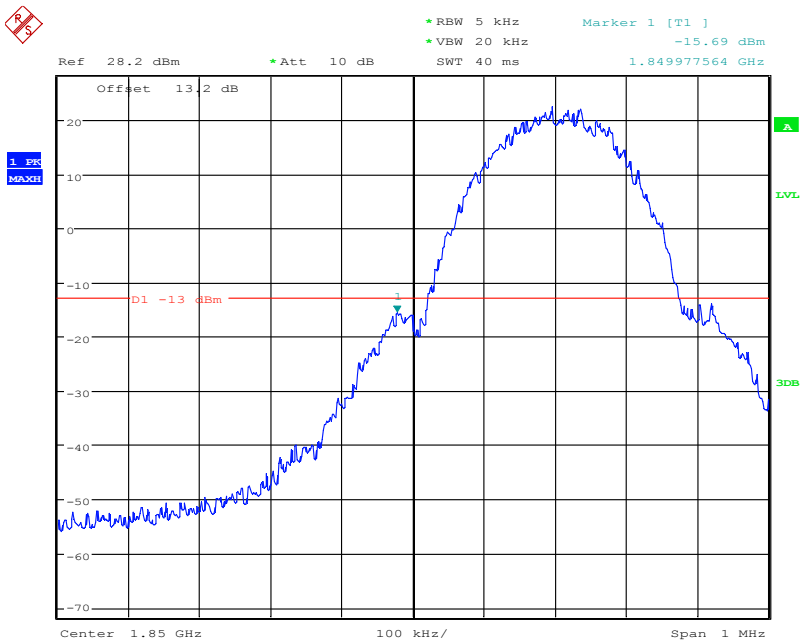
Date: 2.APR.2015 11:57:05

GMSK; PCS high channel, above 1910 MHz



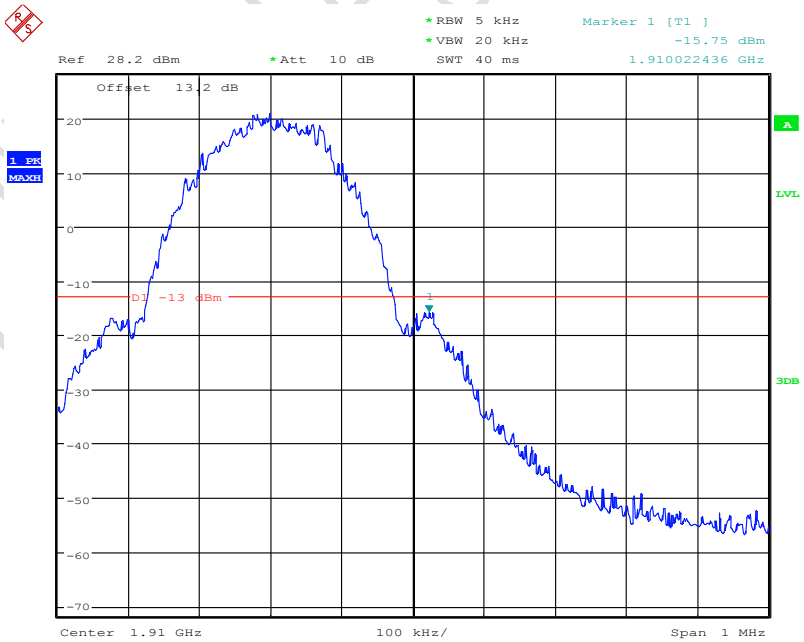
Date: 2.APR.2015 11:57:35

8PSK; PCS low channel, below 1850 MHz



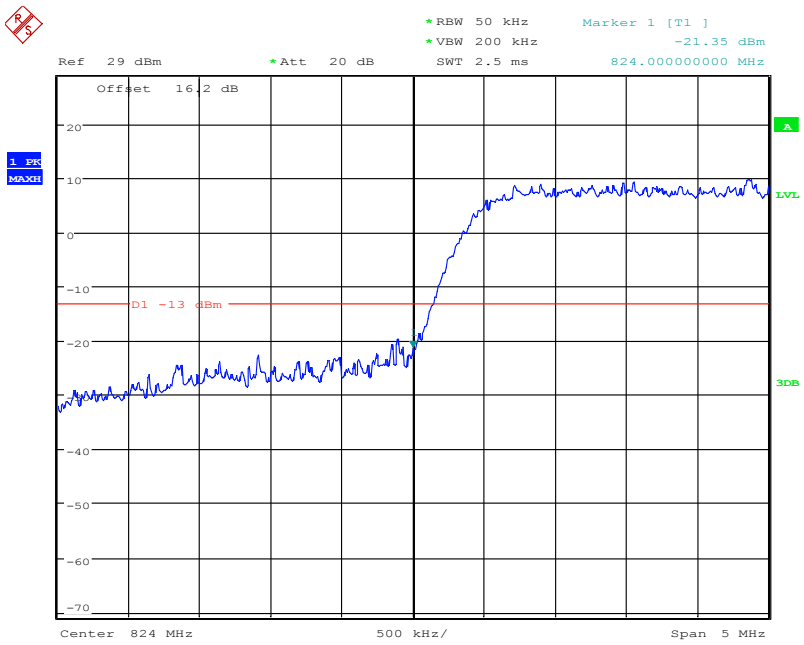
Date: 2.APR.2015 12:00:04

8PSK; PCS high channel, above 1910 MHz



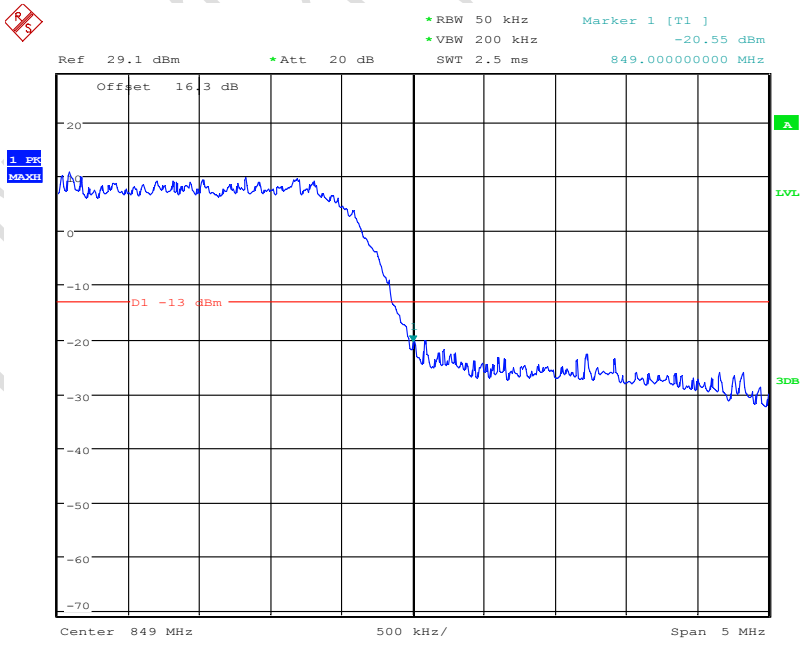
Date: 2.APR.2015 11:59:20

QPSK; Cellular low channel, below 824 MHz



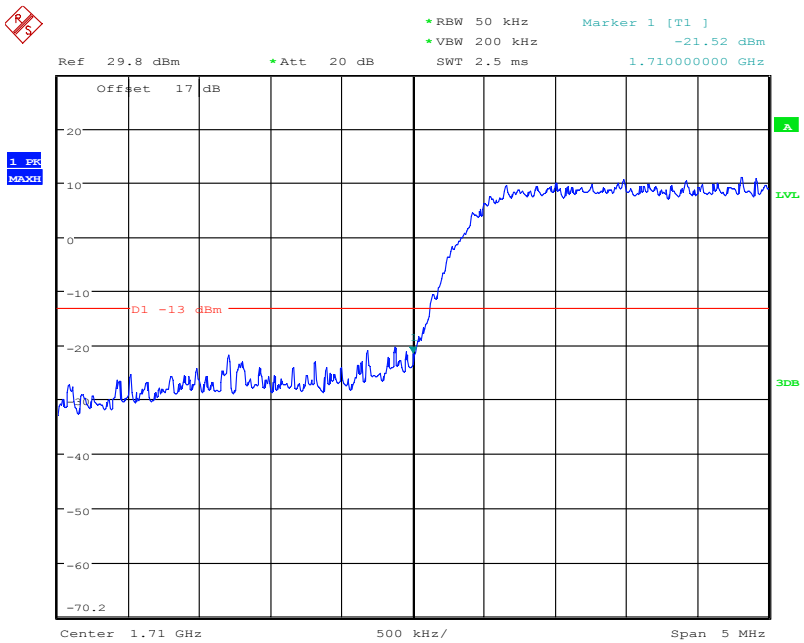
Date: 9.FEB.2015 13:14:23

QPSK; Cellular high channel, above 849 MHz



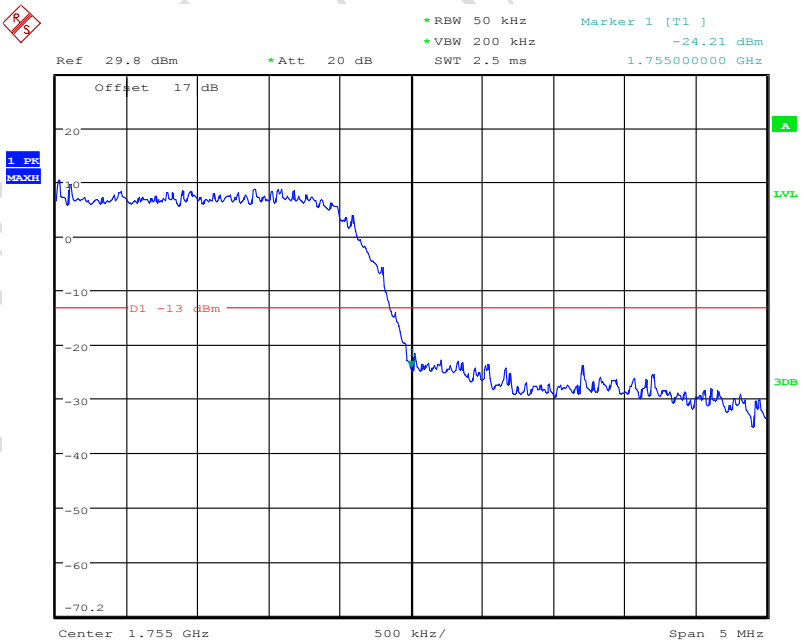
Date: 9.FEB.2015 13:13:32

QPSK; PCS low channel, below 1710 MHz



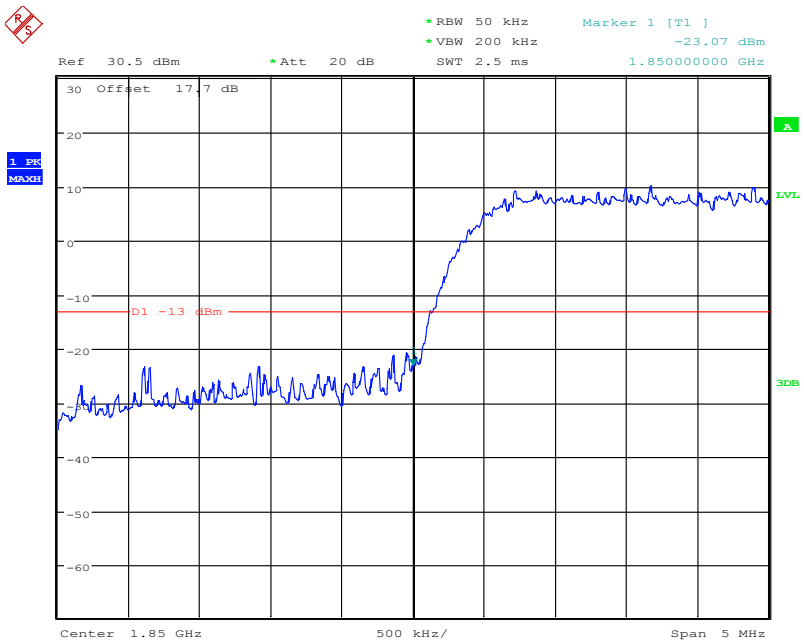
Date: 9.FEB.2015 13:22:43

QPSK; PCS high channel, above 1755 MHz



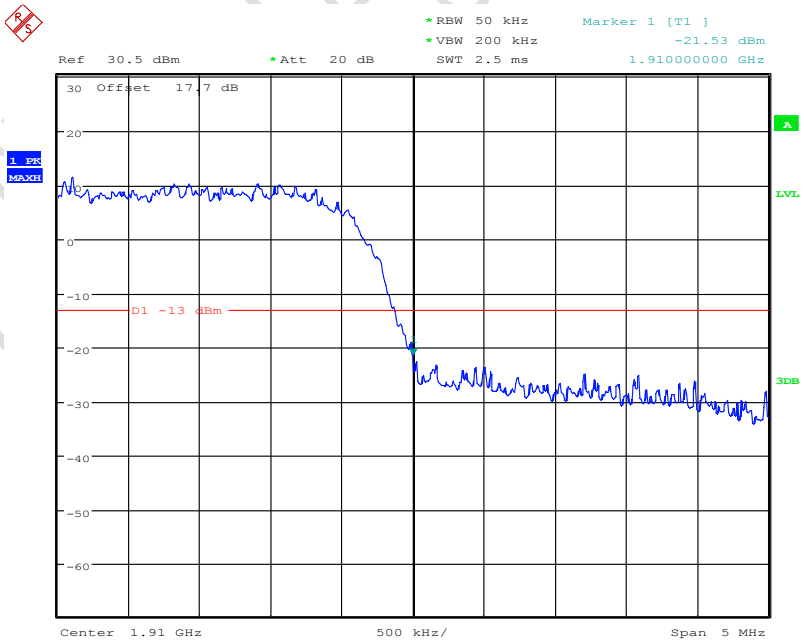
Date: 9.FEB.2015 13:20:45

QPSK; PCS low channel, below 1850 MHz



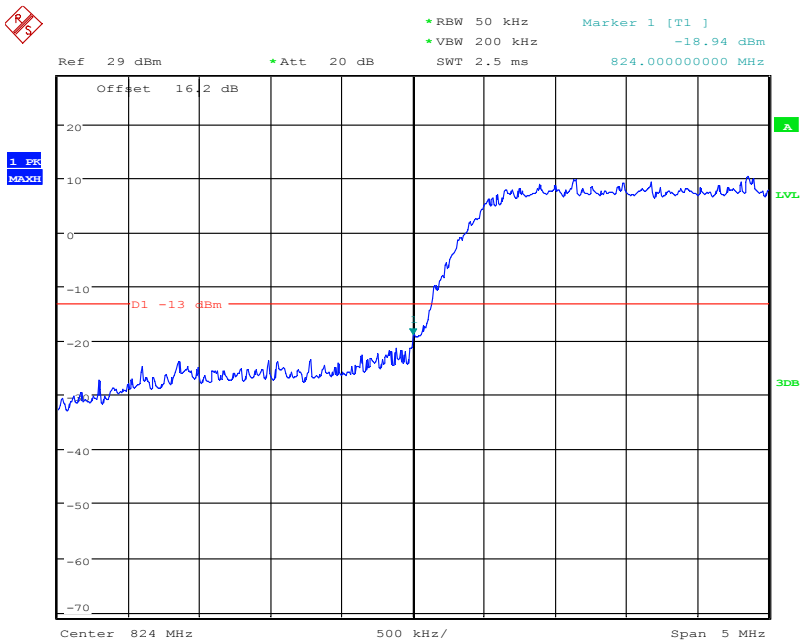
Date: 9.FEB.2015 11:56:06

QPSK; PCS high channel, above 1910 MHz



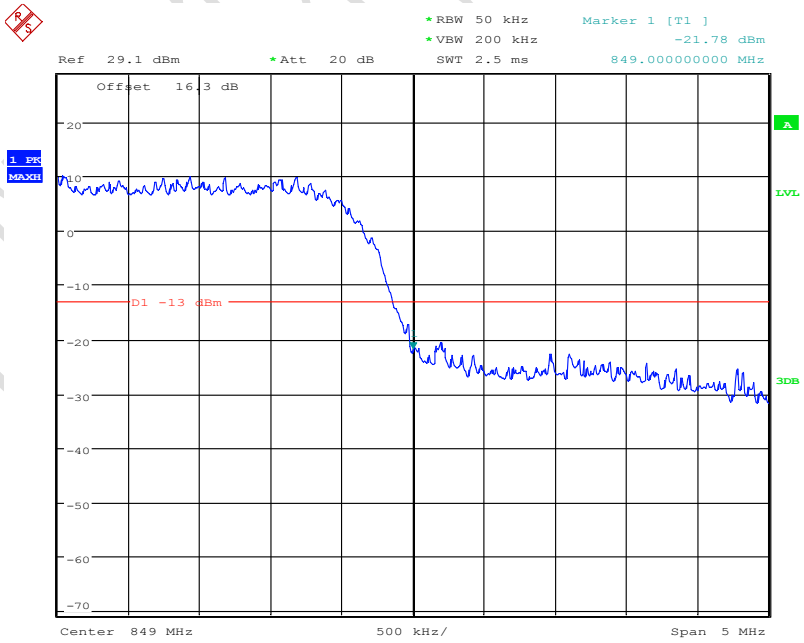
Date: 9.FEB.2015 11:54:02

16QAM; Cellular low channel, below 824 MHz



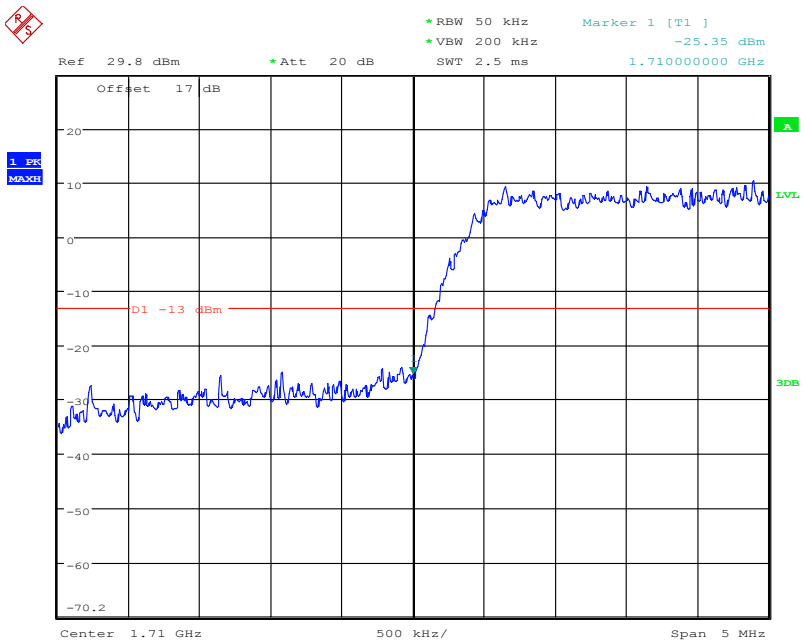
Date: 9.FEB.2015 13:15:21

16QAM; Cellular high channel, above 849 MHz



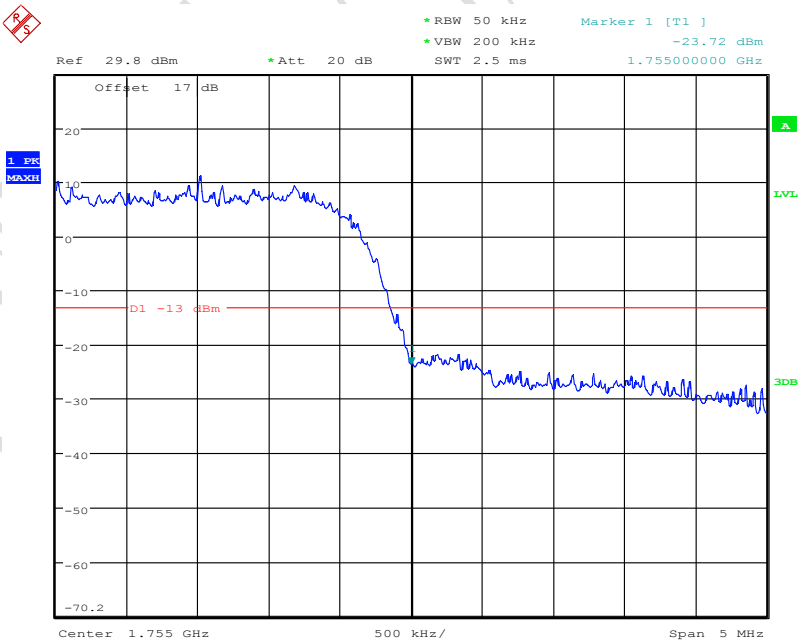
Date: 9.FEB.2015 13:16:04

16QAM; PCS low channel, below 1710 MHz



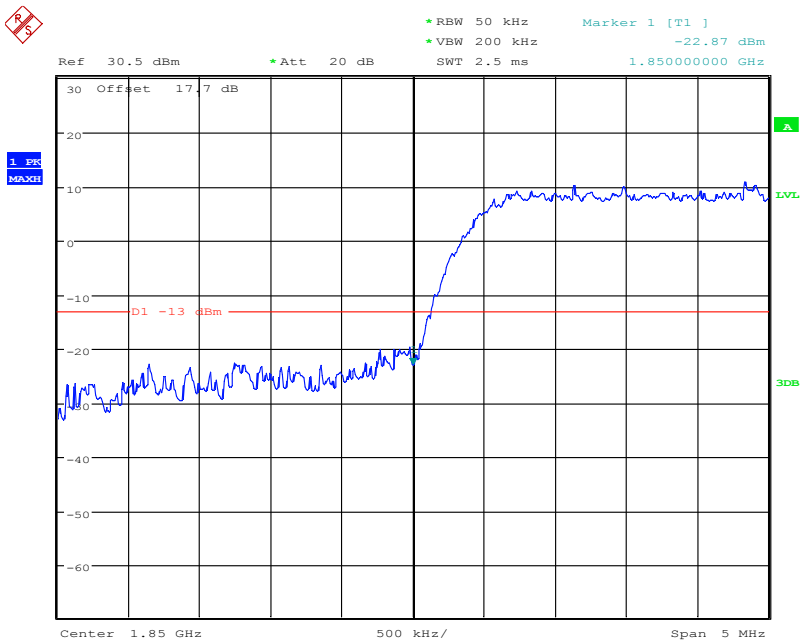
Date: 9.FEB.2015 13:25:43

16QAM; PCS high channel, above 1755 MHz



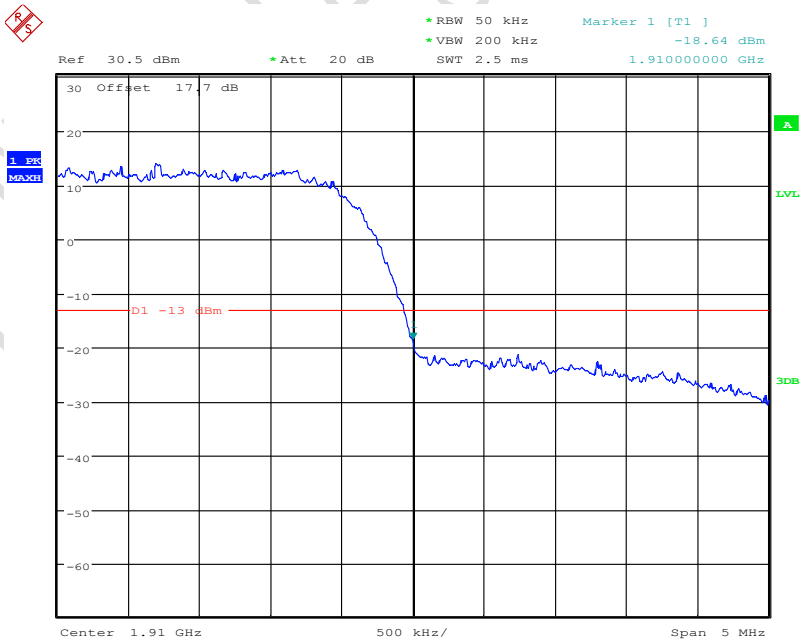
Date: 9.FEB.2015 13:27:32

16QAM; PCS low channel, below 1850 MHz



Date: 9.FEB.2015 11:57:53

16QAM; PCS high channel, above 1910 MHz



Date: 9.FEB.2015 11:50:53

4.8 ERP and EIRP

Specifications:	22.913(a), 24.232(b)
Date of Tests	2015-02-12-2015-04-09
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251 and 512, 661, 810 for GPRS/EGPRS mode, channel 9262, 9400, 9538 and 1312, 1413, 1513 and 4132, 4182, 4233 for WCDMA/HSUPA/HSDPA mode.
Test Results:	Pass

Limit Level Construction:
Part 22:
According to Part 22.913(a)(2):The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
Part 24:
According to Part 24.232(b):The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

Test Setup:

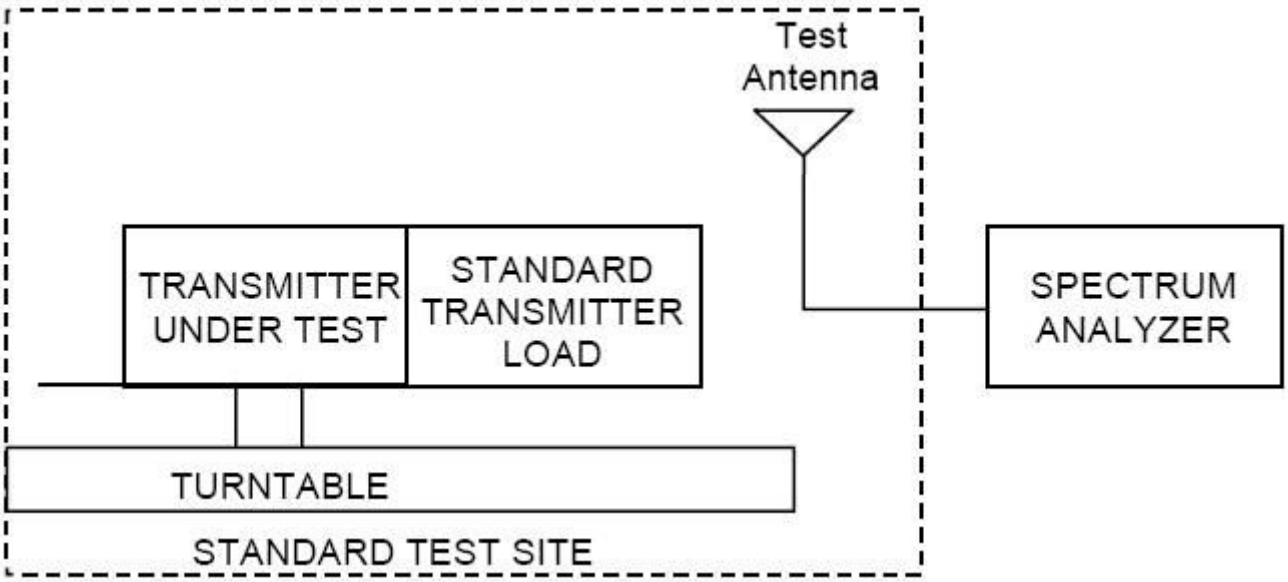
The EUT was placed in an anechoic chamber. The Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

Test Method:

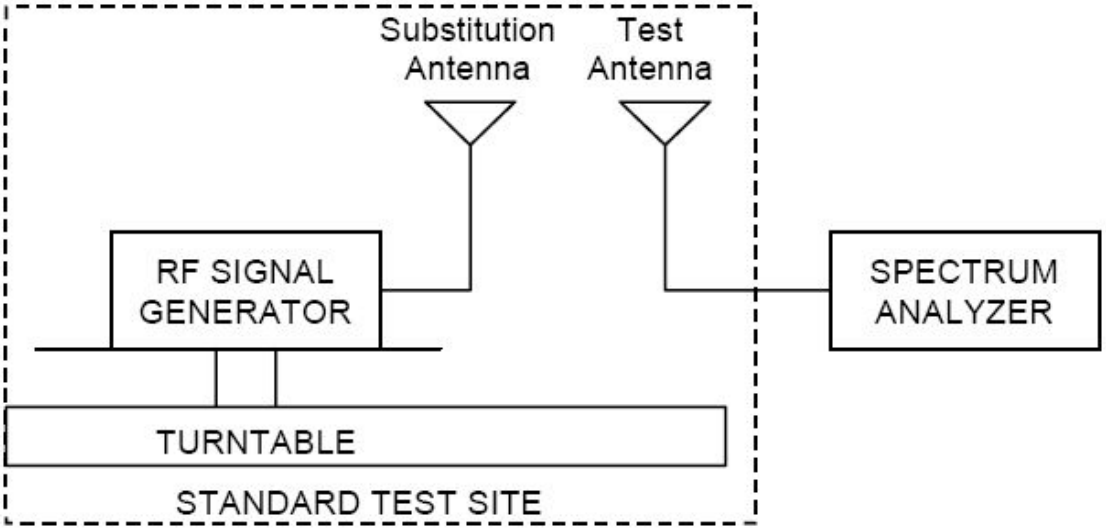
The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-C: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above.

CTTL Test Report



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by

reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

***ERP=S.G output(dBM)-cable loss* (dB) + *antenna gain* (dBd)**

***EIRP=S.G output(dBM)-cable loss* (dB) + *antenna gain* (dBi)**

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Test Data （GSM 850 GPRS）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	28.36	3.4	-2.87	22.09
836.4	28.56	3.4	-3.11	22.05
848.8	28.79	3.4	-3.11	22.28

Test Data （GSM 850 EGPRS GMSK）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	28.56	3.4	-2.87	22.29
836.4	28.49	3.4	-3.11	21.98
848.8	27.99	3.4	-3.11	21.48

Test Data （GSM 850 EGPRS 8PSK）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	27.03	3.4	-2.87	20.76
836.4	26.89	3.4	-3.11	20.38
848.8	26.54	3.4	-3.11	20.03

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Test Data （PCS 1900 GPRS）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	19.95	5.0	10.4	25.35
1880.0	20.20	5.0	10.4	25.60
1909.8	19.56	5.1	10.4	24.86

Test Data （PCS 1900 EGPRS GMSK）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	19.48	5.0	10.4	24.88
1880.0	19.01	5.0	10.4	24.41
1909.8	19.85	5.1	10.4	25.15

Test Data （PCS 1900 EGPRS 8PSK）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	18.23	5.0	10.4	23.63
1880.0	18.12	5.0	10.4	23.52
1909.8	17.96	5.1	10.4	23.26

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Test Data （WCDMA BandⅡ WCDMA）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.4	17.54	5.0	10.4	22.94
1880.0	17.11	5.0	10.4	22.51
1907.6	17.23	5.1	10.4	22.53

Test Data （WCDMA BandⅡ HSDPA）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.5	16.70	5.0	10.4	22.10
1880.0	16.51	5.0	10.4	21.91
1907.6	16.54	5.1	10.4	21.84

Test Data （WCDMA BandⅡ HSUPA QPSK）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.5	16.65	5.0	10.4	22.05
1880.0	15.94	5.0	10.4	21.34
1907.6	15.97	5.1	10.4	21.27

Test Data （WCDMA BandⅡ HSUPA 16QAM）

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.5	14.87	5.0	10.4	20.27
1880.0	14.94	5.0	10.4	20.34
1907.6	15.23	5.1	10.4	20.53

Test Data （WCDMA Band Ⅴ WCDMA）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	26.56	3.4	-2.87	20.29
836.4	27.12	3.4	-3.11	20.61
846.6	27.36	3.4	-3.11	20.85

Test Data （WCDMA Band Ⅴ HSDPA）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	26.36	3.4	-2.87	20.09
836.4	26.45	3.4	-3.11	19.94
846.6	26.87	3.4	-3.11	20.36

Test Data （WCDMA Band Ⅴ HSUPA QPSK）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	25.98	3.4	-2.87	19.71
836.4	26.03	3.4	-3.11	19.52
846.6	26.32	3.4	-3.11	19.81

Test Data （WCDMA Band Ⅴ HSUPA 16QAM）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	24.58	3.4	-2.87	18.31
836.4	24.92	3.4	-3.11	18.41
846.6	25.12	3.4	-3.11	18.61

Test Data （WCDMA Band Ⅳ WCDMA）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1712.4	17.32	4.8	10.4	22.92
1732.6	16.96	4.9	10.4	22.46
1752.6	16.95	4.9	10.4	22.50

Test Data （WCDMA Band Ⅳ HSDPA）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1712.4	15.55	4.8	10.4	21.15
1732.6	15.43	4.9	10.4	20.93
1752.6	15.70	4.9	10.4	21.20

Test Data （WCDMA Band Ⅳ HSUPA QPSK）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1712.4	16.65	4.8	10.4	22.25
1732.6	16.92	4.9	10.4	22.42
1752.6	15.81	4.9	10.4	21.31

Test Data （WCDMA Band ⅣHSUPA 16QAM）

Frequency [GHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1712.4	16.23	4.8	10.4	21.83
1732.6	16.01	4.9	10.4	21.51
1752.6	15.23	4.9	10.4	20.73

Annex A External Photos

See the document ”ES910- External Photos_Rev1”.

Annex B Internal Photos

See the document ”ES910- Internal Photos_Rev1”.

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ANNEX C Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

The End of this Report

CTL Test Report