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Report On

FCC and Industry Canada Testing of the
Ericsson AB (1900 MHz) RRUS 11 B2 KRC 161 276/2 Remote Radio Unit In accordance with FCC CFR 47 Part 24 and Industry Canada RSS-133: Issue 6

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161276-2
IC: 287AB-AS1612762

PREPARED BY	APPROVED BY	DATED
Guangdi Dong Project Engineer	Simon Bennett Authorised Signatory	05 December 2014

Document 75928359 Report 01 Issue 1 December 2014

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SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

The information contained in this report is intended to show verification of the Ericsson RRUS 11 B2 KRC 161 276/2 Remote Radio Unit to the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133.

Testing was carried out in support of a C2PC application for Grant of RRUS 11 B2 KRC 161 276/2 in WCDMA and LTE mode.

Manufacturer	Ericsson AB
Address	Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Product Name	RRUS 11 B2
Product Number	KRC 161 276/2
IC Model Number	AS1612762
Serial Number(s)	CF82089083
Software Version	CXP 902 3291 Rev R2JA14 for WCDMA CXP 102 051/19 Rev R30H for LTE
Hardware Version	R3B
Number of Sample Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 24: 2013 Industry Canada RSS-133 Issue 6: 2013
Start of Test	22 October 2014
Finish of Test	15 November 2014
Name of Engineer(s)	Guangdi Dong
Related Document(s)	ANSI C63.4: 2009 ANSI/TIA-603-C-2004 FCC CFR 47 Part 2: 2013 Industry Canada RSS-GEN Issue 4: 2014 Industry Canada SRSP-510 Issue 5: 2009

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, Part 24 and RSS-133 is shown below.

Section	Spec Clause			Test Description	Result
	Part 2	Part 24	RSS 133		
2.1	2.1046	24.232(a) 24.232(d)	6.4	Maximum RMS Output Power and Peak to Average Ratio – Conducted	Pass
	-	24.232(a)	6.4	Equivalent Isotropically Radiated Power (EIRP)	N/A[1]
2.2	2.1049(h)	24.238(b)	RSS-Gen 4.6.1	Occupied Bandwidth	Pass
2.3	2.1051	24.238(b)	6.5.1	Spurious Emissions at Band Edge	Pass
2.4	2.1053	24.238(a)	6.5.1	Radiated Spurious Emissions	Pass
2.5	2.1051	24.238(a)	6.5.1	Conducted Spurious Emissions	Pass
-	2.1055	24.235	6.3	Frequency Stability	N/T
-	-	-	6.6	Receiver Spurious Emissions	N/A[2]

N/A[1]– Not Applicable, due to no integral antenna
N/A[2]– Not Applicable, due to being a transceiver
N/T: Not Tested (due to C2PC)

1.3 CONFIGURATION DESCRIPTION

Configuration Code	Carrier(s)	Configuration Description
W-SC	1C	WCDMA Single Antenna, Single Carrier
W-MC 1	2C	WCDMA Single Antenna, Multi Carrier x2
W-MC 2	4C	WCDMA Single Antenna, Multi Carrier x4
W-MIMO-SC	1C	WCDMA MIMO, Single Carrier
W-MIMO-MC 1	2C	WCDMA MIMO, Multi Carrier x2
W-MIMO-MC 2	4C	WCDMA MIMO, Multi Carrier x4
L-MIMO-SC	1C	LTE MIMO, Single Carrier
L-MIMO-MC 1	2C	LTE MIMO, Multi Carrier x2
W+L-MC 1	1W+1L	WCDMA+LTE Single Antenna, One Tx, 1WCDMA+1LTE
W+L-MC 2	2W+2L	WCDMA+LTE Single Antenna, One Tx, 2WCDMA+2LTE
W+L-MIMO-MC 1	1W+1L	WCDMA+LTE MIMO, 1WCDMA+1LTE
W+L-MIMO-MC 2	2W+2L	WCDMA+LTE MIMO, 2WCDMA+2LTE
W+L-MIMO-MC 3	2W+1L	WCDMA+LTE MIMO, 2WCDMA+1LTE

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number for carriers and RF configurations has been tested to find the worst case setting. The settings below were used for all measurements if not otherwise noted:

WCDMA:
Single Atenna:
Single carrier TM1: 64 DPCHs at 30ksps (SF=128)
Multi carrier TM1 (x2): 32 DPCHs at 30ksps (SF=128) in each carrier
Multi carrier TM1 (x4): 16 DPCHs at 30ksps (SF=128) in each carrier

MIMO:
Single carrier TM5 and TM6: 30 DPCHs at 30ksps (SF=128) and 8 HS-PDSCHs at 240 ksps (SF16)
Multi carrier TM5 and TM6 (x2): 30 DPCHs at 30ksps (SF=128) and 8 HS-PDSCHs at 240 ksps (SF16)
Mulit carrier TM5 and TM6 (x4): 14 DPCHs at 30ksps (SF=128) and 4 HS-PDSCHs at 240 ksps (SF16)

Channel Bandwidth: 5MHz

LTE:
MIMO mode single carrier: E-TM1.1
MIMO mode multi carrier (x2): E-TM1.1

The complete testing was performed with the EUT transmiting at maximum RF power Unless otherwise stated.

The Maximum Output Power was tested on both TX/RX output connector RF A and RF B, all other TX measurements were performed on the combined TX/RX output connector RF A of the EUT as the representative ports.

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Remote Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	RRUS 11 B2
PRODUCT NUMBER	KRC 161 276/2
IC MODLE NUMBER	AS1612762
TRANSMITTER OPERATING RANGE	TX: 1930MHz - 1990MHz RX: 1850MHz - 1910MHz
MODULATIONS	WCDMA: QPSK, 16QAM, 64QAM LTE: QPSK, 16QAM, 64QAM
ITU DESIGNATION OF EMISSION	WCDMA: 5M00F9W LTE: 1M40F9W, 3M00F9W, 5M00F9W, 10M0F9W, 15M0F9W, 20M0F9W
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	WCDMA: 4.2 to 5MHz (configurable in steps of 100/200kHz) LTE: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz
OUTPUT POWER (RMS) (W or dBm)	Single Antenna: 46dBm (40W) MIMO: 2 x 46dBm (2 x 40W)
OUTPUT POWER TOLERANCE	± 2dBm
ANTENNA GAIN	No integral Antenna
SUPPORTED CONFIGUATION	Single Carrier, Multi Carrier, 2x2 MIMO
NUMBER OF CARRIERS	WCDMA: Maximum 4 carriers LTE: Maximum 2 carriers W+L: Maximum 2W+2L
INSTANTANEOUS BANDWIDTH	20MHz
NUMBER OF ANTENNA PORTS	2 TX/RX ports
FCC ID	TA8AKRC161276-2
IC	287AB-AS1612762
POWER SOURCE	-48V DC
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is a WCDMA and LTE Radio Base Station

Signature

Date 17 November 2014

D of B S Serial No 75928359/01

No responsibility will be accepted by TÜV SÜD Product Service UK Limited as to the accuracy of the information declared in this document by the manufacturer.

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) RRUS 11 B2 KRC 161 276/2 is an Ericsson Remote Radio Unit working in the public mobile service 1900MHz band which provides communication connections to 1900MHz network in WCDMA/LTE Modes. The RRUS 11 B2 Remote Radio Unit supports -48 VDC power supply.

The EUT includes two TX/RX ports and it can be configured to transmit in MIMO mode, and MIMO mode was used for measurements as the worst configuration.

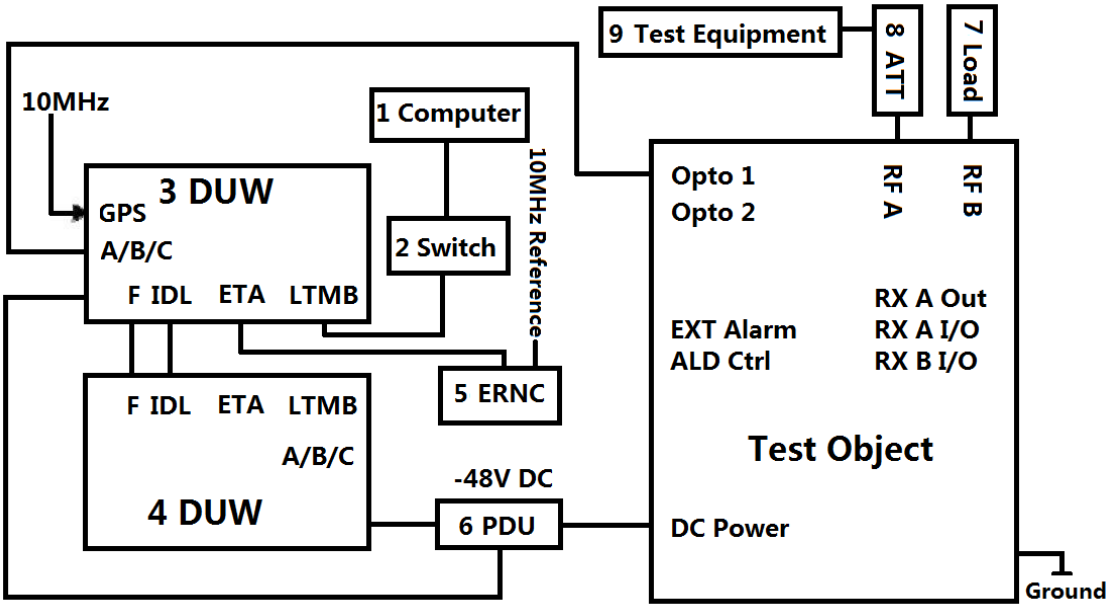
The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.

Equipment Under Test

1.6 TEST SETUP

Test Setup, Conducted Measurement:

WCDMA Configuration setup:

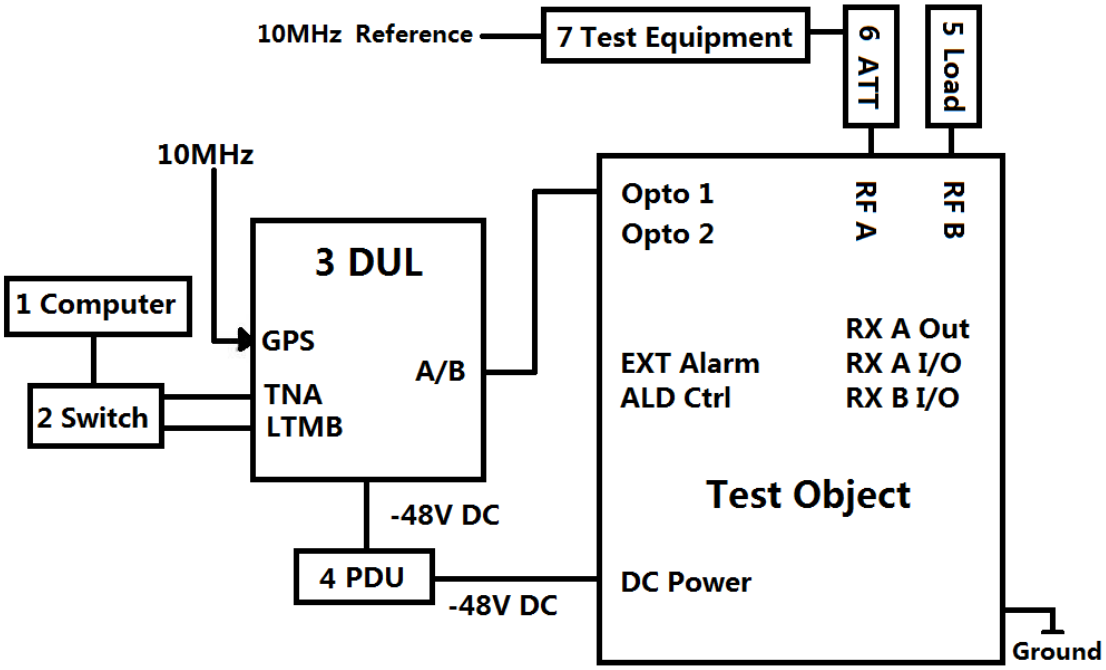


Product Name	Product Number	Version	Serial Number
RRUS 11 B2	KRC 161 276/2	R3B	CF82089083

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Advantech-610H	--	ETD/L913
2	Switch	TEH1085K	--	S108SK014848011011
3	DUW3001	KDU127161/3	R4F	TU8X959107
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
4	DUW3001	KDU127161/3	R4F	TU8X960825
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
5	eRNC-SIM	LPA 108 214	--	ETD/L171
6	DC Power Supply	DH1716A-10	--	1000303181
7	Load	TFE100	--	09121647
8	Attenuator	48-40-43-LIM	--	BR5020
9	Spectrum Analyzer	FSQ26	--	101140
	Power Meter	NRP	--	101593
	Power Sensor	NRP-Z51	--	102311

Test Setup, Conducted Measurement:

LTE Configuration setup:

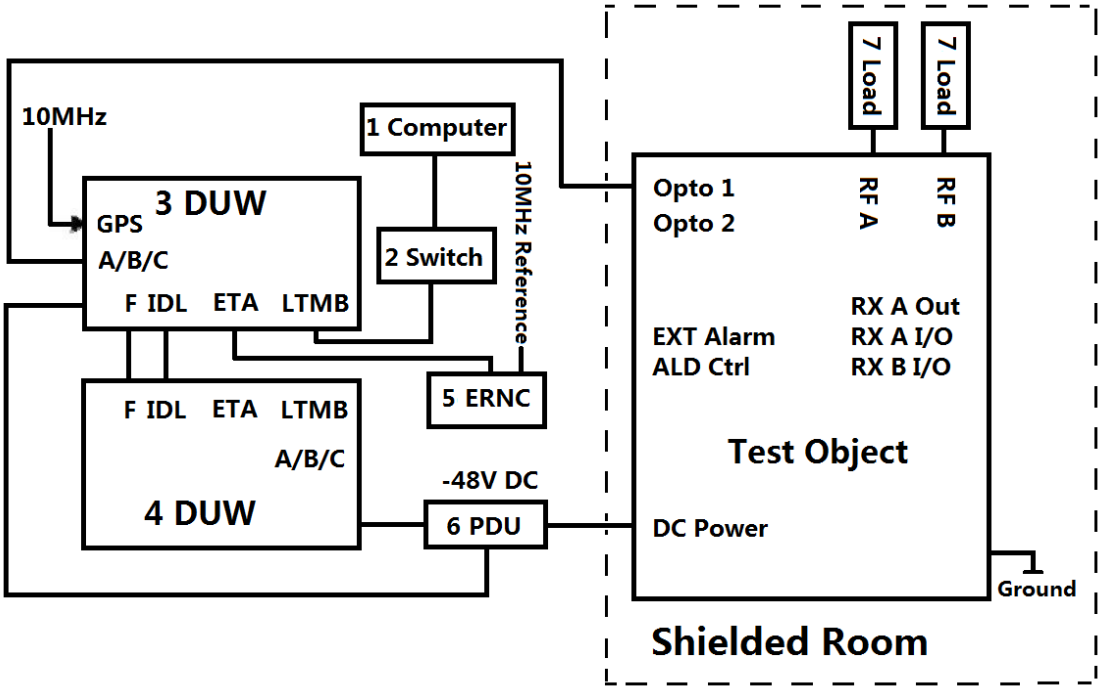


Product Name	Product Number	Version	Serial Number
RRUS 11 B2	KRC 161 276/2	R3B	CF82089083

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Advantech-610H	--	ETD/L913
2	Switch	TEH1085K	--	S108SK014848011011
3	DUL 20 01	KUD137533/4	R1C	CB4H451296
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
4	DC Power Supply	DH1716A-10	--	1000303181
5	Load	TFE100	--	09121647
6	Attenuator	48-40-43-LIM	--	BR5020
7	Spectrum Analyzer	FSQ26	--	101140
	Power Meter	NRP	--	101593
	Power Sensor	NRP-Z51	--	102311

Test Setup, Radiated Measurement:

WCDMA Configuration setup:

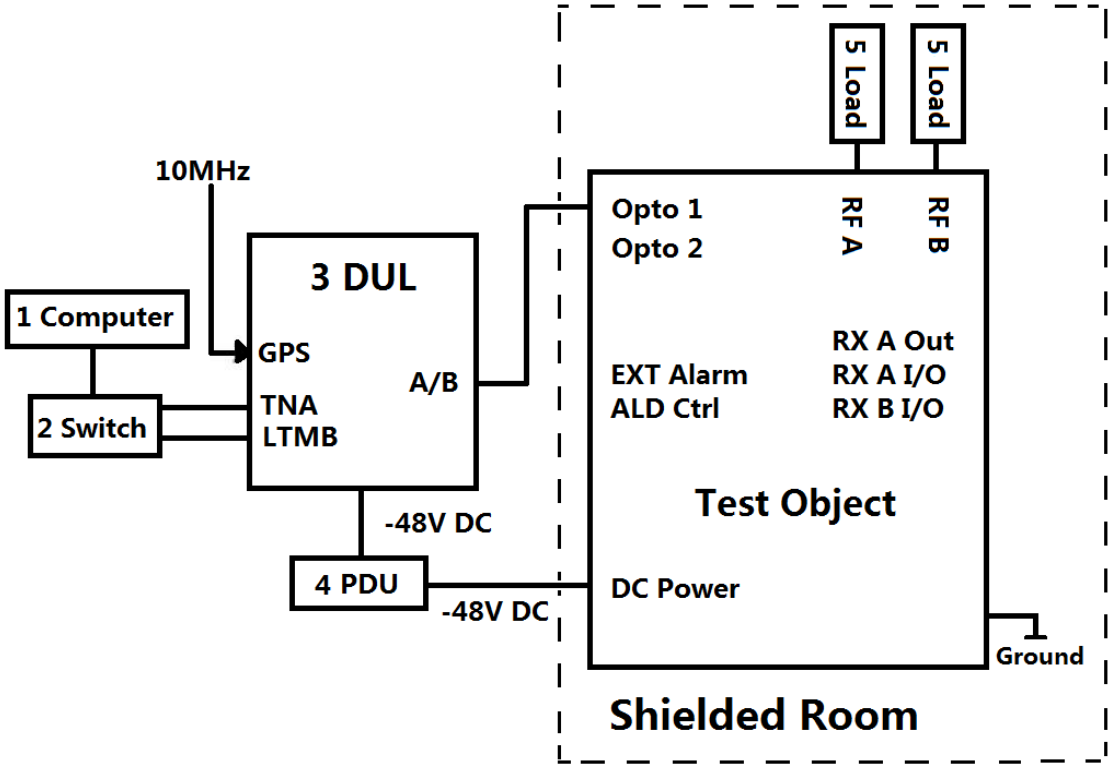


Product Name	Product Number	Version	Serial Number
RRUS 11 B2	KRC 161 276/2	R3B	CF82089083

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Advantech-610H	--	ETD/L913
2	Switch	TEH1085K	--	S108SK014848011011
3	DUW3001	KDU127161/3	R4F	TU8X959107
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
4	DUW3001	KDU127161/3	R4F	TU8X960825
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
5	eRNC-SIM	LPA 108 214	--	ETD/L171
6	DC Power Supply	DH1716A-10	--	1000303181
7	Load	TFE100	--	09121647
	Load	TFZ10-3R	--	20100908079

Test Setup, Radiated Measurement:

LTE Configuration setup:



Product Name	Product Number	Version	Serial Number
RRUS 11 B2	KRC 161 276/2	R3B	CF82089083

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Advantech-610H	--	ETD/L913
2	Switch	TEH1085K	--	S108SK014848011011
3	DUL 20 01	KUD137533/4	R1C	CB4H451296
	SUP 6601	1/BFL 901 009/1	R3B	BR80907931
4	DC Power Supply	DH1716A-10	--	1000303181
5	Load	TFE100	--	09121647
	Load	TFZ10-3R	--	20100908079

1.7 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or a chamber as appropriate.

All test cases were tested with the EUT supplied with -48V DC by an external power supply.

1.8 DEVIATION FROM THE STANDARD

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

1.9 MODIFICATION RECORD

Modification State 0 - No modifications were made to the EUT during testing.

1.10 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV SÜD Product Service conducted the following tests at Ericsson in Beijing, China:

- Maximum RMS Output Power and Peak to Average Ratio – Conducted
- Occupied Bandwidth
- Band Edge
- Conducted Spurious Emissions

Radiated Spurious Emissions testing have been performed under the following site registrations:

FCC Accreditation 413514:
TA Beijing Limited, Building B-4, No.1 JingHai 3rd Road, BDA East Park, Beijing, 100176, China

Industry Canada Accreditation 10852A-1:
TA Beijing Limited, Building B-4, No.1 JingHai 3rd Road, BDA East Park, Beijing, 100176, China

SECTION 2

TEST DETAILS

2.1 MAXIMUM RMS OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 24, Clause 24.232 (a)(d)
Industry Canada RSS-133, Clause 6.4

2.1.2 Equipment Under Test

RRUS 11 B2, KRC 161 276/2, S/N: CF82089083

2.1.3 Date of Test and Modification State

22 to 23 October 2014 - Modification State 0

2.1.4 Test Equipment Used

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

2.1.5 Environmental Conditions

Ambient Temperature	22.6 - 23.8°C
Relative Humidity	24.0 - 25.5%

2.1.6 Test Method

The test was applied in accordance with the test method requirements of FCC Part 24 and Industry Canada RSS-133.

Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal. The path loss between the EUT and the power sensor was measured and recorded for the test band. The path loss was entered as an offset into the Power Meter and Spectrum Analyzer.

The EUT was configured to transmit on maximum power on the configurations defined in the tables below. Since the EUT transmits on two antennas simultaneously in the same frequency range for MIMO devices, i.e., TX MIMO mode, using the Measure-and-Sum approach, the output power at both antennas were tested, and the total output power were then summed mathematically in linear power units According to FCC KDB 662911 D01.

A peak to average ratio measurement is performed at the conducted ports of the EUT for single carrier for single RAT mode. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) was used and 0.1% probability value recorded.

The RMS Power and Peak to Average Ratio was measured and recorded with the results being compared with the limits.

2.1.7 Test Results

Configuration W-SC (1C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.4MHz			Channel Position M 1960.0MHz			Channel Position T 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK/ 5.0 MHz	46.01	40.13	6.53	46.03	40.37	6.35	45.96	40.36	6.41
Total		46.01	-	-	46.03	-	-	45.96	-	-

Configuration W-MC1 (2C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK/ 5.0 MHz	45.94	-	-	46.02	-	-	45.96	-	-
Total		45.94	-	-	46.02	-	-	45.96	-	-

Configuration W-MC2 (4C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1937.4MHz + 1942.6MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1957.4MHz + 1962.6MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1977.4MHz + 1982.6MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK/ 5.0 MHz	45.98	-	-	45.81	-	-	45.73	-	-
Total		45.98	-	-	45.81	-	-	45.73	-	-

Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.4MHz			Channel Position M 1960.0MHz			Channel Position T 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM/ 5.0 MHz	46.01	40.16	6.44	46.18	40.68	6.33	45.94	40.35	6.41
B		45.83	40.91	6.48	45.96	40.16	6.30	45.75	40.75	6.41
Total		48.93	-	-	49.08	-	-	48.86	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.4MHz			Channel Position M 1960.0MHz			Channel Position T 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM/ 5.0 MHz	45.84	40.43	6.57	46.19	40.12	6.50	45.78	40.19	6.59
B		45.67	40.48	6.67	45.97	40.60	6.49	45.58	40.40	6.56
Total		48.77	-	-	49.09	-	-	48.69	-	-

Configuration W-MIMO-MC 1 (2C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM/ 5.0 MHz	45.96	-	-	46.03	-	-	45.95	-	-
B		45.77	-	-	45.81	-	-	45.78	-	-
Total		48.88	-	-	48.93	-	-	48.88	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM/ 5.0 MHz	45.75	-	-	45.82	-	-	45.76	-	-
B		45.57	-	-	45.61	-	-	45.58	-	-
Total		48.67	-	-	48.73	-	-	48.68	-	-

Configuration W-MIMO-MC 2 (4C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1937.4MHz + 1942.6MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1957.4MHz + 1962.6MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1977.4MHz + 1982.6MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM/ 5.0 MHz	45.73	-	-	45.77	-	-	45.73	-	-
B		45.56	-	-	45.55	-	-	45.54	-	-
Total		48.66	-	-	48.67	-	-	48.65	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.4MHz + 1937.4MHz + 1942.6MHz + 1947.6MHz			Channel Position M_{RFBW} 1952.4MHz + 1957.4MHz + 1962.6MHz + 1967.6MHz			Channel Position T_{RFBW} 1972.4MHz + 1977.4MHz + 1982.6MHz + 1987.6MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM/ 5.0 MHz	45.52	-	-	45.58	-	-	45.51	-	-
B		45.34	-	-	45.36	-	-	45.32	-	-
Total		48.44	-	-	48.48	-	-	48.43	-	-

Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1930.7MHz			Channel Position M 1960.0MHz			Channel Position T 1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 1.4 MHz	45.84	44.13	6.32	45.88	44.77	6.37	45.81	44.65	6.37
B		45.58	44.45	6.38	45.60	44.67	6.36	45.52	44.81	6.44
Total		48.72	-	-	48.75	-	-	48.68	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1931.5MHz			Channel Position M 1960.0MHz			Channel Position T 1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 3.0 MHz	-	-	-	45.94	42.03	6.40	-	-	-
B		-	-	-	45.67	42.03	6.46	-	-	-
Total		-	-	-	48.82	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.5MHz			Channel Position M 1960.0MHz			Channel Position T 1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 5.0 MHz	-	-	-	45.95	39.95	6.39	-	-	-
B		-	-	-	45.68	40.15	6.41	-	-	-
Total		-	-	-	48.83	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1935.0MHz			Channel Position M 1960.0MHz			Channel Position T 1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 10.0 MHz	-	-	-	45.93	37.04	6.44	-	-	-
B		-	-	-	45.72	36.99	6.45	-	-	-
Total		-	-	-	48.84	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1937.5MHz			Channel Position M 1960.0MHz			Channel Position T 1982.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 15.0 MHz	-	-	-	45.90	35.27	6.50	-	-	-
B		-	-	-	45.69	35.14	6.50	-	-	-
Total		-	-	-	48.81	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1940.0MHz			Channel Position M 1960.0MHz			Channel Position T 1980.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 20.0 MHz	45.84	33.98	6.32	45.89	33.97	6.48	45.84	34.08	6.65
B		45.67	34.00	6.55	45.67	34.04	6.57	45.65	33..93	6.73
Total		48.77	-	-	48.79	-	-	48.76	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1930.7MHz			Channel Position M 1960.0MHz			Channel Position T 1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 1.4 MHz	-	-	-	45.84	44.82	6.49	-	-	-
B		-	-	-	45.60	44.80	6.39	-	-	-
Total		-	-	-	48.73	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1931.5MHz			Channel Position M 1960.0MHz			Channel Position T 1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 3.0 MHz	-	-	-	45.89	42.30	6.40	-	-	-
B		-	-	-	45.65	42.16	6.44	-	-	-
Total		-	-	-	48.78	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.5MHz			Channel Position M 1960.0MHz			Channel Position T 1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 5.0 MHz	-	-	-	45.87	40.33	6.37	-	-	-
B		-	-	-	45.64	40.16	6.50	-	-	-
Total		-	-	-	48.77	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1935.0MHz			Channel Position M 1960.0MHz			Channel Position T 1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 10.0 MHz	-	-	-	45.87	37.12	6.49	-	-	-
B		-	-	-	45.64	36.99	6.52	-	-	-
Total		-	-	-	48.77	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1937.5MHz			Channel Position M 1960.0MHz			Channel Position T 1982.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 15.0 MHz	-	-	-	45.86	35.55	6.57	-	-	-
B		-	-	-	45.64	35.55	6.47	-	-	-
Total		-	-	-	48.76	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1940.0MHz			Channel Position M 1960.0MHz			Channel Position T 1980.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 20.0 MHz	-	-	-	45.87	34.07	6.53	-	-	-
B		-	-	-	45.65	34.13	6.58	-	-	-
Total		-	-	-	48.77	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1930.7MHz			Channel Position M 1960.0MHz			Channel Position T 1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 1.4 MHz	-	-	-	45.79	44.70	6.41	-	-	-
B		-	-	-	45.59	44.94	6.42	-	-	-
Total		-	-	-	48.70	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1931.5MHz			Channel Position M 1960.0MHz			Channel Position T 1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 3.0 MHz	-	-	-	45.90	42.09	6.39	-	-	-
B		-	-	-	45.68	42.01	6.40	-	-	-
Total		-	-	-	48.80	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1932.5MHz			Channel Position M 1960.0MHz			Channel Position T 1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 5.0 MHz	-	-	-	45.91	39.85	6.40	-	-	-
B		-	-	-	45.69	40.14	6.44	-	-	-
Total		-	-	-	48.81	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1935.0MHz			Channel Position M 1960.0MHz			Channel Position T 1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 10.0 MHz	-	-	-	45.91	36.91	6.48	-	-	-
B		-	-	-	45.70	37.07	6.46	-	-	-
Total		-	-	-	48.82	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1937.5MHz			Channel Position M 1960.0MHz			Channel Position T 1982.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 15.0 MHz	-	-	-	45.85	35.21	6.48	-	-	-
B		-	-	-	45.68	35.18	6.51	-	-	-
Total		-	-	-	48.78	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 1940.0MHz			Channel Position M 1960.0MHz			Channel Position T 1980.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 20.0 MHz	-	-	-	45.90	34.04	6.57	-	-	-
B		-	-	-	45.67	34.10	6.49	-	-	-
Total		-	-	-	48.80	-	-	-	-	-

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 45.5dBm per port for LTE Bandwidth 1.4MHz, 3MHz and 5MHz

Maximum Output Power 46.0dBm per port for LTE Bandwidth 10.0MHz

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1930.7MHz +1949.3MHz			Channel Position M_{RFBW} 1950.7MHz+1969.3MHz			Channel Position T_{RFBW} 1970.7MHz+1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 1.4 MHz	45.22	-	-	45.34	-	-	45.28	-	-
B		45.01	-	-	45.08	-	-	45.06	-	-
Total		48.13	-	-	48.22	-	-	48.18	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1931.5MHz +1948.5MHz			Channel Position M_{RFBW} 1951.5MHz+1968.5MHz			Channel Position T_{RFBW} 1971.5MHz+1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 3.0 MHz	-	-	-	45.41	-	-	-	-	-
B		-	-	-	45.17	-	-	-	-	-
Total		-	-	-	48.30	-	-	--	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.5MHz +1947.5MHz			Channel Position M_{RFBW} 1952.5MHz+1967.5MHz			Channel Position T_{RFBW} 1972.5MHz+1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 5.0 MHz	-	-		45.41	-	-	-	-	-
B		-	-		45.19	-	-	-	-	-
Total		-	-	-	48.31	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1935.0MHz +1945.0MHz			Channel Position M_{RFBW} 1955.0MHz+1965.0MHz			Channel Position T_{RFBW} 1975.0MHz+1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / 10.0 MHz	45.86	-	-	45.91	-	-	45.85	-	-
B		45.69	-	-	45.70	-	-	45.68	-	-
Total		48.79	-	-	48.82	-	-	48.78	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1930.7MHz +1949.3MHz			Channel Position M_{RFBW} 1950.7MHz+1969.3MHz			Channel Position T_{RFBW} 1970.7MHz+1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 1.4 MHz	-	-	-	45.32	-	-	-	-	
B		-	-	-	45.09	-	-	-	-	
Total		-	-	-	48.22	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1931.5MHz +1948.5MHz			Channel Position M_{RFBW} 1951.5MHz+1968.5MHz			Channel Position T_{RFBW} 1971.5MHz+1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 3.0 MHz	-	-	-	45.39	-	-	-	-	-
B		-	-	-	45.16	-	-	-	-	-
Total		-	-	-	48.29	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.5MHz +1947.5MHz			Channel Position M_{RFBW} 1952.5MHz+1967.5MHz			Channel Position T_{RFBW} 1972.5MHz+1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 5.0 MHz	-	-	-	45.35	-	-	-	-	-
B		-	-	-	45.14	-	-	-	-	-
Total		-	-	-	48.26	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1935.0MHz +1945.0MHz			Channel Position M_{RFBW} 1955.0MHz+1965.0MHz			Channel Position T_{RFBW} 1975.0MHz+1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / 10.0 MHz	-	-	-	45.87	-	-	-	-	-
B		-	-	-	45.66	-	-	-	-	-
Total		-	-	-	48.78	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1930.7MHz +1949.3MHz			Channel Position M_{RFBW} 1950.7MHz+1969.3MHz			Channel Position T_{RFBW} 1970.7MHz+1989.3MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 1.4 MHz	-	-	-	45.29	-	-	-	-	-
B		-	-	-	45.05	-	-	-	-	-
Total		-	-	-	48.18	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1931.5MHz +1948.5MHz			Channel Position M_{RFBW} 1951.5MHz+1968.5MHz			Channel Position T_{RFBW} 1971.5MHz+1988.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 3.0 MHz	-	-	-	45.41	-	-	-	-	-
B		-	-	-	45.16	-	-	-	-	-
Total		-	-	-	48.30	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1932.5MHz +1947.5MHz			Channel Position M_{RFBW} 1952.5MHz+1967.5MHz			Channel Position T_{RFBW} 1972.5MHz+1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 5.0 MHz	-	-	-	45.41	-	-	-	-	-
B		-	-	-	45.20	-	-	-	-	-
Total		-	-	-	48.32	-	-	-	-	-

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} 1935.0MHz +1945.0MHz			Channel Position M_{RFBW} 1955.0MHz+1965.0MHz			Channel Position T_{RFBW} 1975.0MHz+1985.0MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	64QAM / 10.0 MHz	-	-	-	45.90	-	-	-	-	-
B		-	-	-	45.69	-	-	-	-	-
Total		-	-	-	48.81	-	-	-	-	-

Configuration W+L-MC 1 (1W+1L)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position BRFBW (W) 1932.4MHz + (L)1947.5MHz			Channel Position MRFBW (W) 1952.4MHz + (L)1967.5MHz			Channel Position TRFBW (W) 1972.4MHz + (L)1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / QPSK 5.0 MHz	45.36	-	-	45.49	-	-	45.44	-	-
Total		45.36	-	-	45.49	-	-	45.44	-	-

Configuration W+L-MC 2 (2W+2L)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position BRFBW (W) 1932.4MHz + (W) 1937.4MHz + (L)1942.5MHz + (L)1947.5MHz			Channel Position MRFBW (W) 1952.4MHz + (W) 1957.4MHz + (L)1962.5MHz + (L)1967.5MHz			Channel Position TRFBW (W) 1972.4MHz + (W) 1977.4MHz + (L)1982.5MHz + (L)1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	QPSK / QPSK 5.0 MHz	45.42	-	-	45.48	-	-	45.43	-	-
Total		45.42	-	-	45.48	-	-	45.43	-	-

Configuration W+L-MIMO-MC 1 (1W+1L)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position BRFBW (W) 1932.4MHz + (L)1947.5MHz			Channel Position MRFBW (W) 1952.4MHz + (L)1967.5MHz			Channel Position TRFBW (W) 1972.4MHz + (L)1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / QPSK 5.0 MHz	45.38	-	-	45.46	-	-	45.47	-	-
B		45.21	-	-	45.22	-	-	45.29	-	-
Total		48.31	-	-	48.35	-	-	49.39	-	-

Configuration W+L-MIMO-MC 2 (2W+2L)

Maximum Output Power 46.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	RMS Output Power / Peak to Average Ratio (PAR)								
		Channel Position B_{RFBW} (W) 1932.4MHz + (W) 1937.4MHz + (L)1942.5MHz + (L)1947.5MHz			Channel Position M_{RFBW} (W) 1952.4MHz + (W) 1957.4MHz + (L)1962.5MHz + (L)1967.5MHz			Channel Position T_{RFBW} (W) 1972.4MHz + (W) 1977.4MHz + (L)1982.5MHz + (L)1987.5MHz		
		dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)	dBm	dBm/MHz	PAR (dB)
A	16QAM / QPSK 5.0 MHz	45.41	-	-	45.44	-	-	45.40	-	-
B		45.23	-	-	45.23	-	-	45.23	-	-
Total		48.33	-	-	48.35	-	-	48.33	-	-

Limit	
Output Power	FCC: (e.i.r.p) 1640Watts/MHz or 62.15dBm IC: (e.i.r.p) 100Watts or 50dBm
Peak to Average Ratio	13 dB

This unit is tested without antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensees are required to take into account maximum allowed antenna gain used in combination with above power settings to prevent the radiated output power to exceed the limits.

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 (h)
FCC CFR 47 Part 24, Clause 24.238(b)
Industry Canada RSS-GEN, Clause 4.6.1

2.2.2 Equipment Under Test

RRUS 11 B2, KRC 161 276/2, S/N: CF82089083

2.2.3 Date of Test and Modification State

27 to 29 October 2014 - Modification State 0

2.2.4 Test Equipment Used

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

2.2.5 Environmental Conditions

Ambient Temperature	23.2 – 24.5°C
Relative Humidity	26.5 – 28.5%

2.2.6 Test Method

The test was applied in accordance with the test method requirements of FCC Part 24 and Industry Canada RSS-133.

The EUT was set to transmit at maximum power and testing was carried out on Bottom, Middle and Top Channels. Using the Occupied Bandwidth measurement function in the Spectrum Analyser, the Occupied Bandwidth is defined as the width of the signal between two points, one below the carrier centre frequency and one above the carrier centre frequency.

For FCC requirement, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26. The -26dBc Bandwidth was measured in accordance with FCC KDB 971168 D01 Clause 4.2.

For IC requirement, the 99% Occupied Bandwidth measurements were made in accordance with Industry Canada RSS-GEN Clause 4.6.1. The RBW was configured to 1% of the theoretical channel bandwidth, meeting the requirement of being between 1 to 5% of the Occupied Bandwidth described in the KDB aforementioned.

The results are shown in the plots below.

2.2.7 Test Results

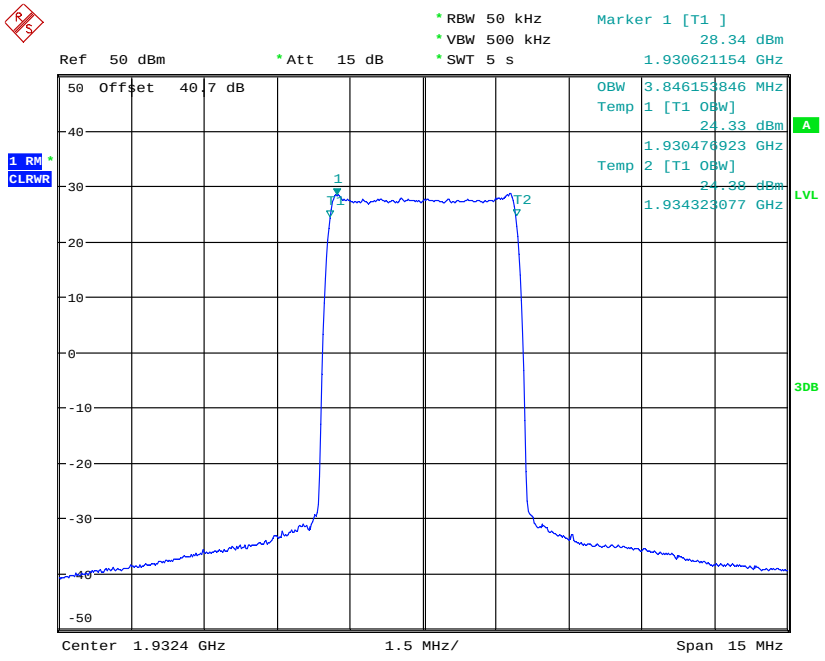
Configuration W-SC (1C)

Maximum Output Power 46.0dBm per port

99% Occupied Bandwidth for IC requirement

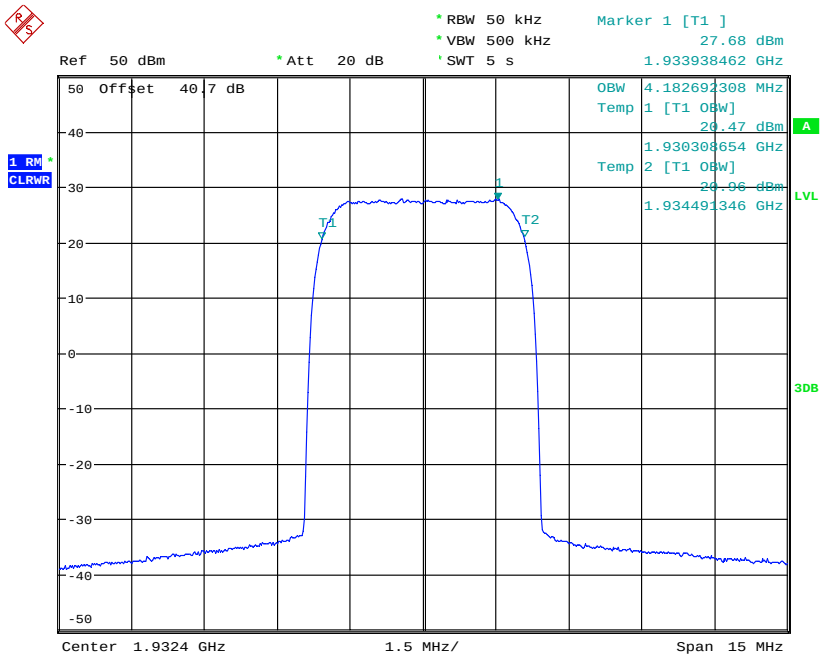
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
QPSK / 4.2 MHz	3.85	3.85	3.85
QPSK / 5.0 MHz	4.18	4.18	4.18

Channel Position B - QPSK / Bandwidth 4.2 MHz



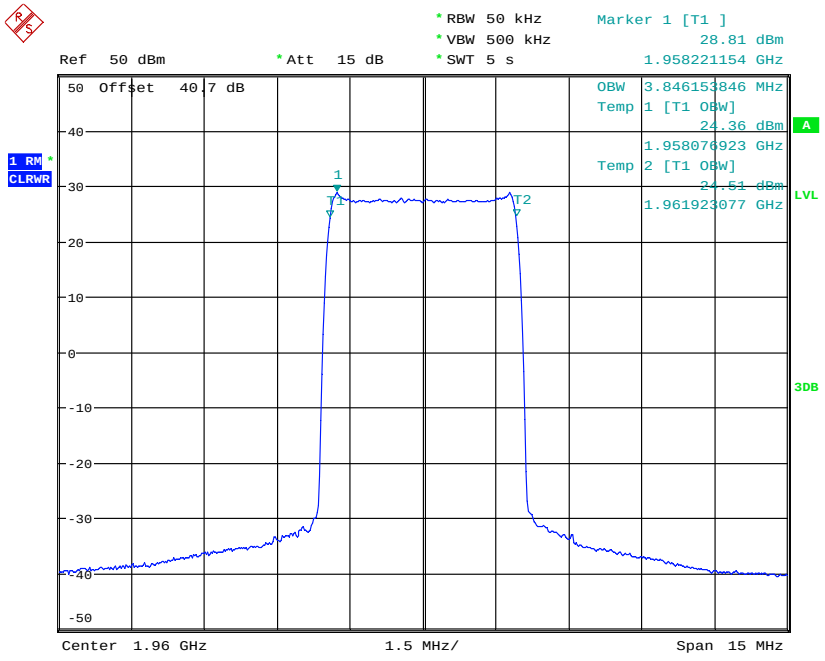
Date: 27.OCT.2014 14:55:46

Channel Position B - QPSK / Bandwidth 5.0 MHz



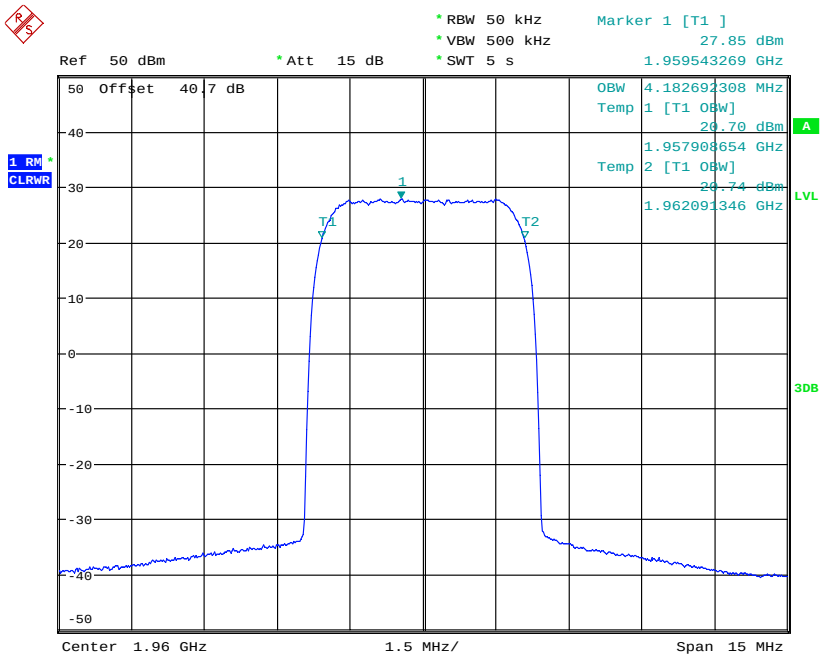
Date: 27.OCT.2014 13:50:29

Channel Position M - QPSK / Bandwidth 4.2 MHz



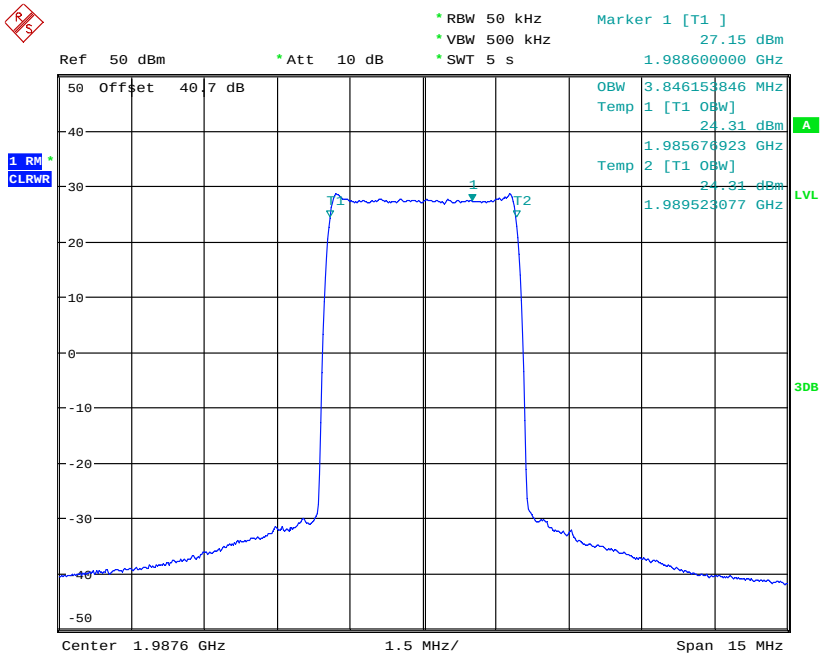
Date: 27.OCT.2014 14:50:24

Channel Position M - QPSK / Bandwidth 5.0 MHz



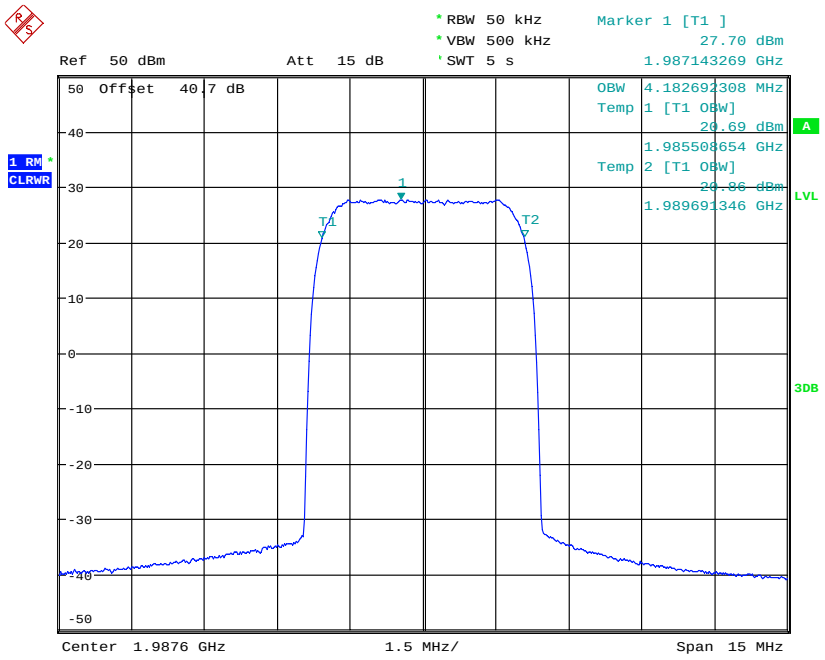
Date: 27.OCT.2014 14:20:41

Channel Position T - QPSK / Bandwidth 4.2 MHz



Date: 27.OCT.2014 14:42:52

Channel Position T - QPSK / Bandwidth 5.0 MHz



Date: 27.OCT.2014 14:32:21

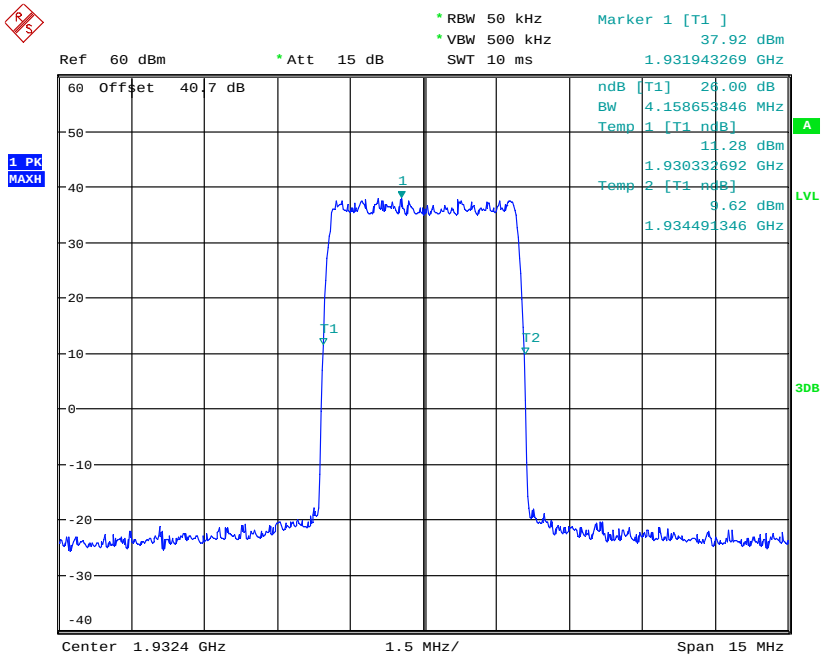
Configuration W-SC (1C)

Maximum Output Power 46.0dBm per port

-26dBc Occupied Bandwidth for FCC requirement

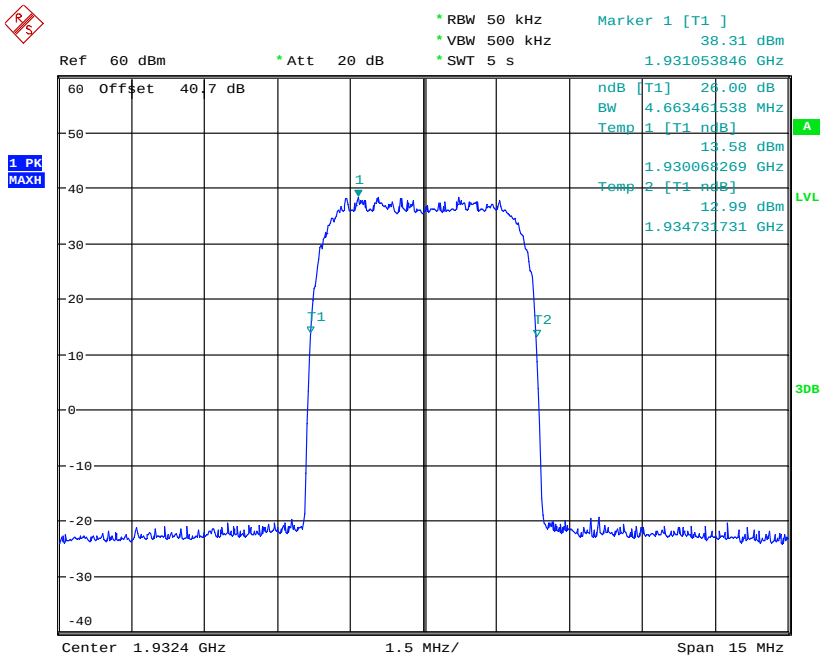
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
QPSK / 4.2 MHz	4.16	4.13	4.13
QPSK / 5.0 MHz	4.66	4.66	4.66

Channel Position B - QPSK / Bandwidth 4.2 MHz



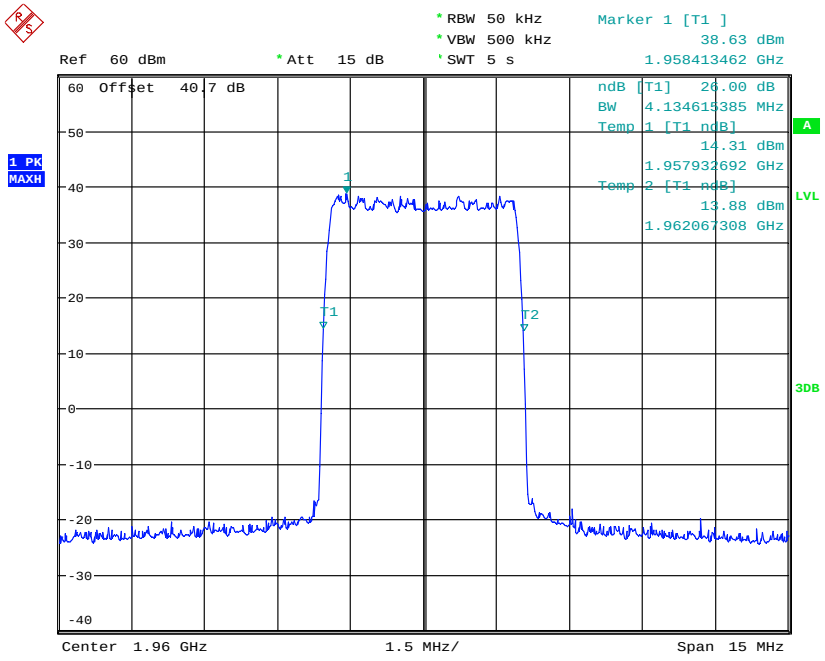
Date: 27.OCT.2014 14:56:23

Channel Position B - QPSK / Bandwidth 5.0 MHz



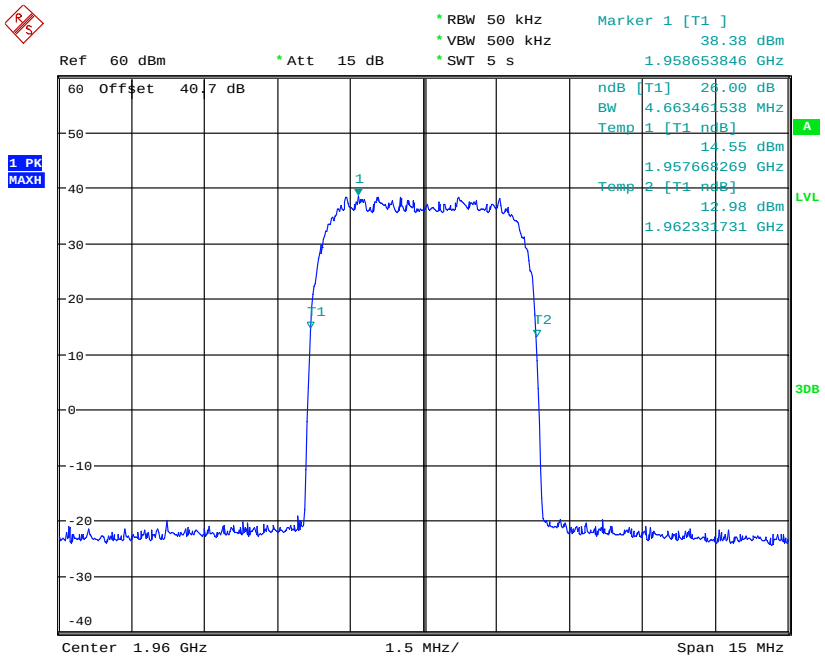
Date: 27.OCT.2014 14:01:50

Channel Position M - QPSK / Bandwidth 4.2 MHz



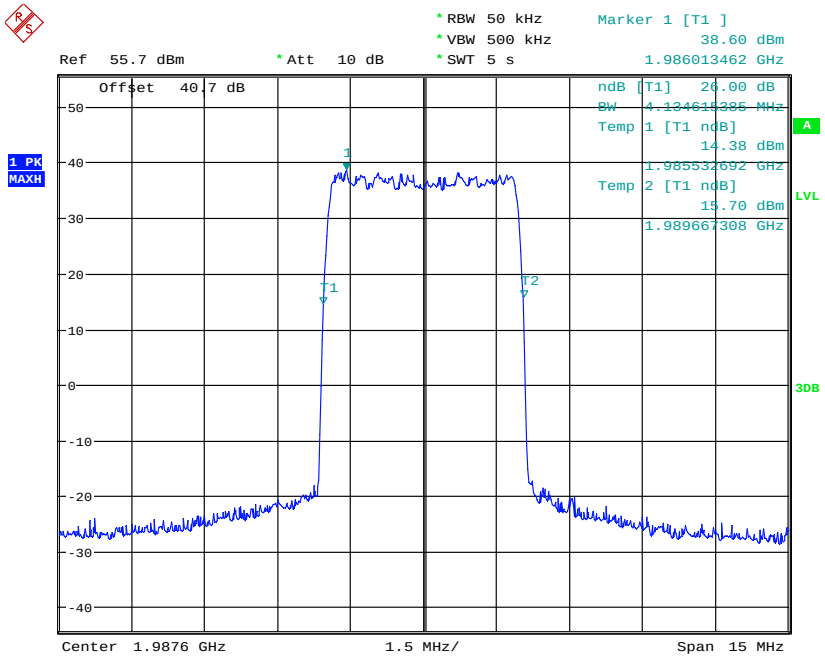
Date: 27.OCT.2014 14:49:44

Channel Position M - QPSK / Bandwidth 5.0 MHz



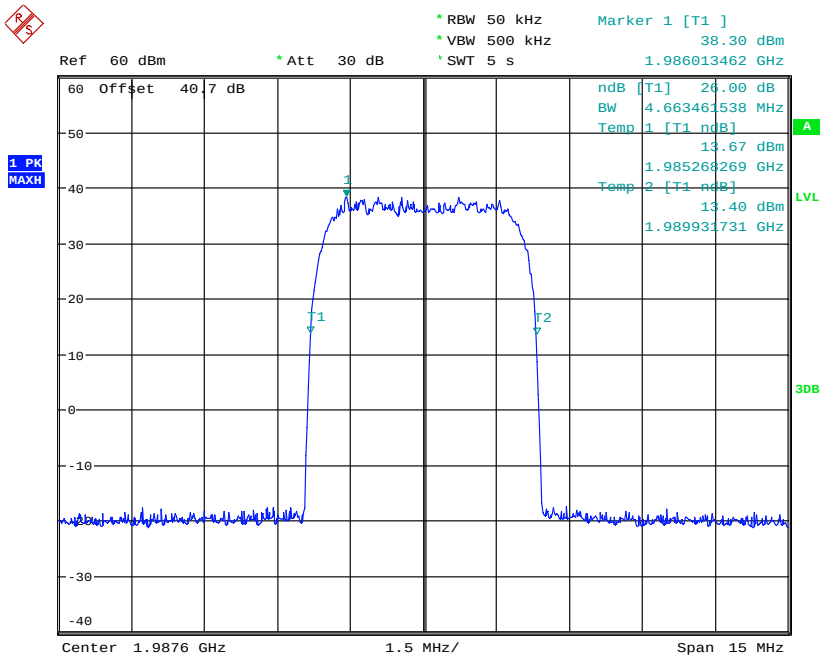
Date: 27.OCT.2014 14:20:06

Channel Position T - QPSK / Bandwidth 4.2 MHz



Date: 27.OCT.2014 14:43:36

Channel Position T - QPSK / Bandwidth 5.0 MHz



Date: 27.OCT.2014 14:33:17

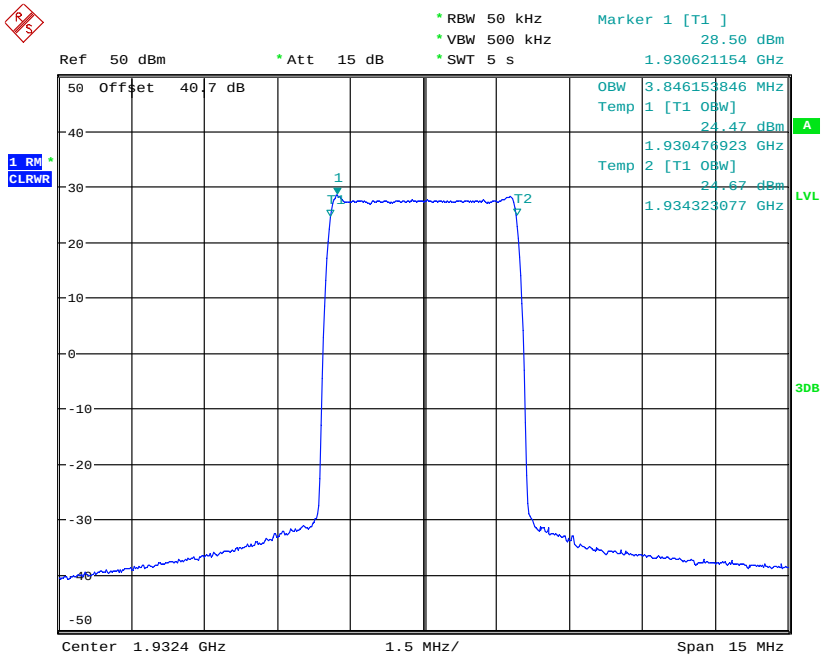
Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

99% Occupied Bandwidth for IC requirement

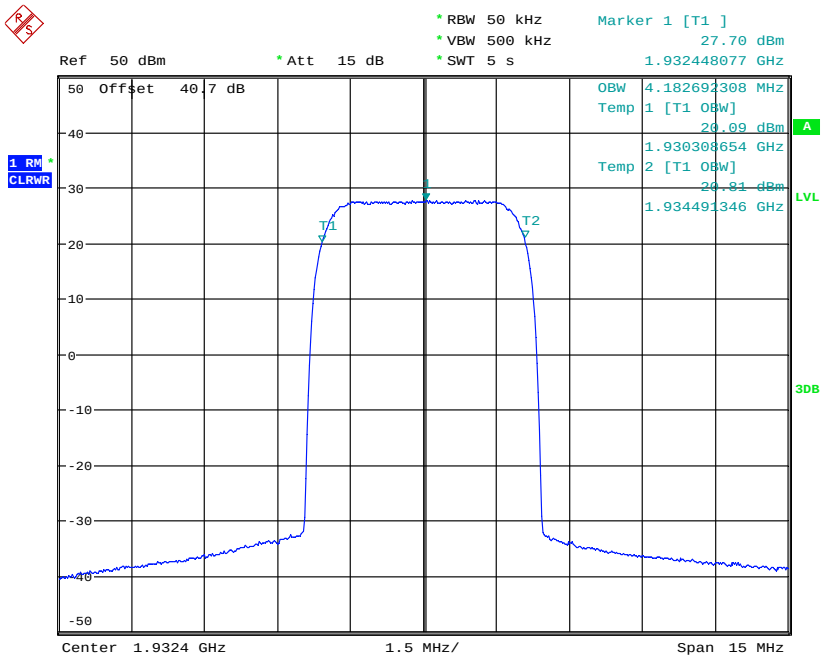
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
16QAM / 4.2 MHz	3.85	3.85	3.85
64QAM / 4.2 MHz	3.85	3.85	3.85
16QAM / 5.0 MHz	4.18	4.18	4.18
64QAM / 5.0 MHz	4.18	4.18	4.18

Channel Position B – 16QAM / Bandwidth 4.2 MHz



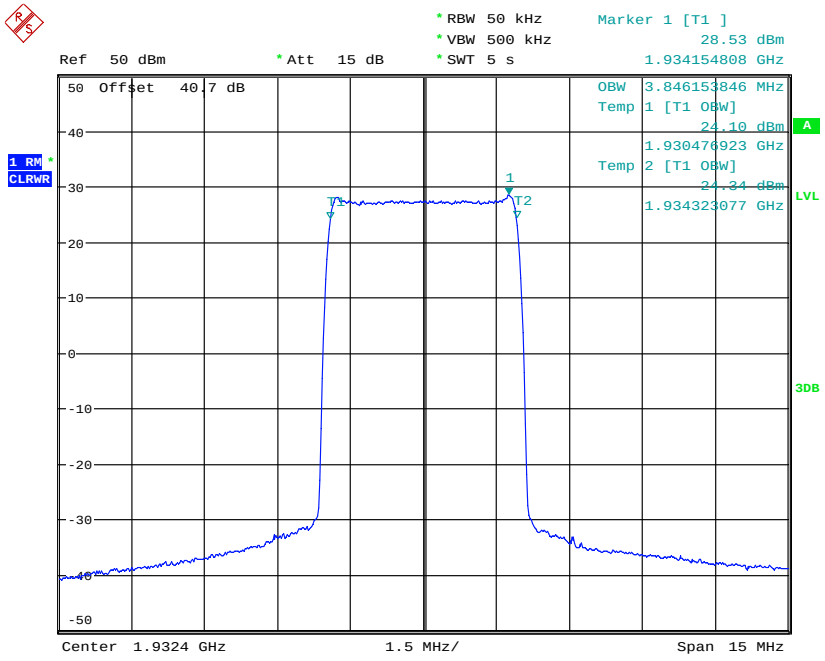
Date: 27.OCT.2014 15:08:30

Channel Position B – 16QAM / Bandwidth 5.0 MHz



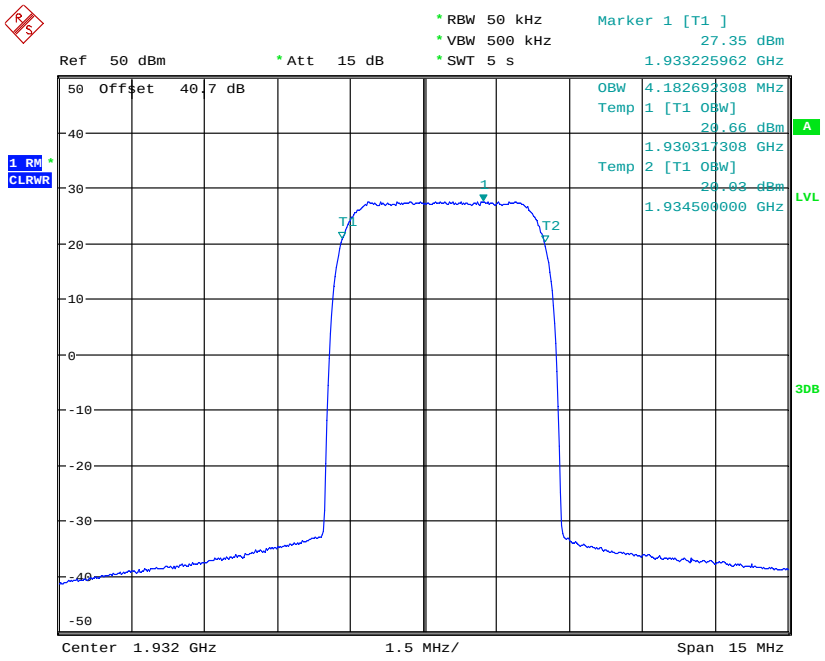
Date: 27.OCT.2014 16:22:57

Channel Position B - 64QAM / Bandwidth 4.2 MHz



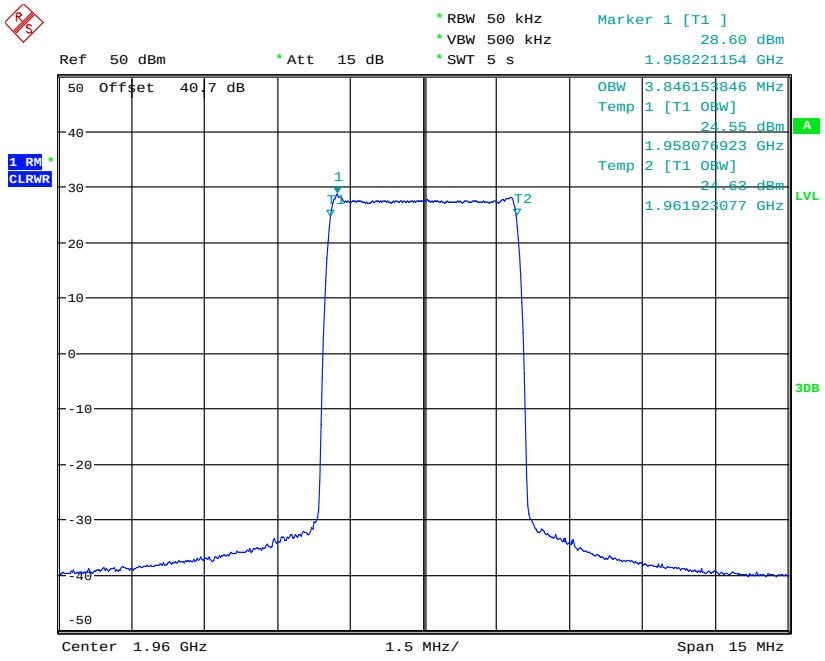
Date: 27.OCT.2014 15:12:27

Channel Position B - 64QAM / Bandwidth 5.0 MHz



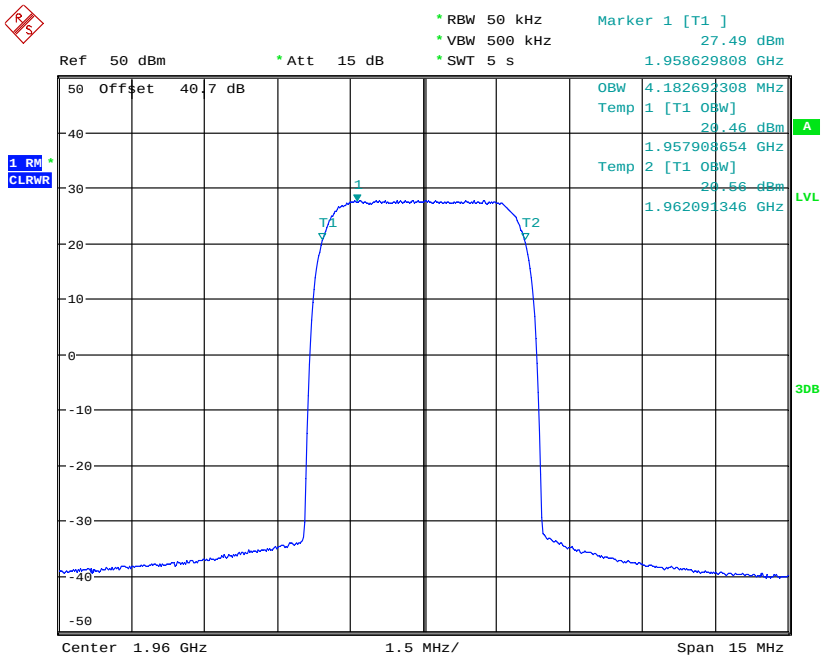
Date: 27.OCT.2014 16:32:33

Channel Position M - 16QAM / Bandwidth 4.2 MHz



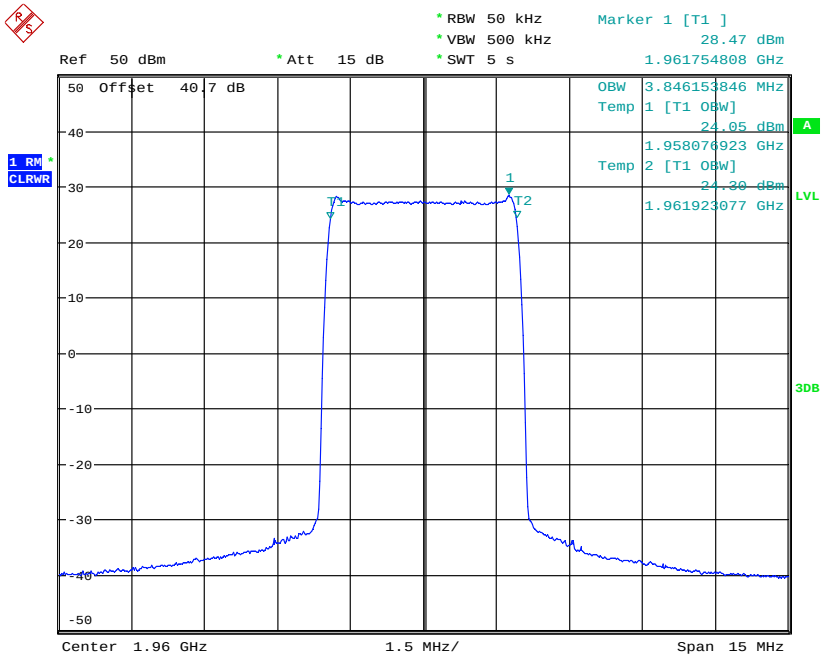
Date: 27.OCT.2014 15:22:20

Channel Position M - 16QAM / Bandwidth 5.0 MHz



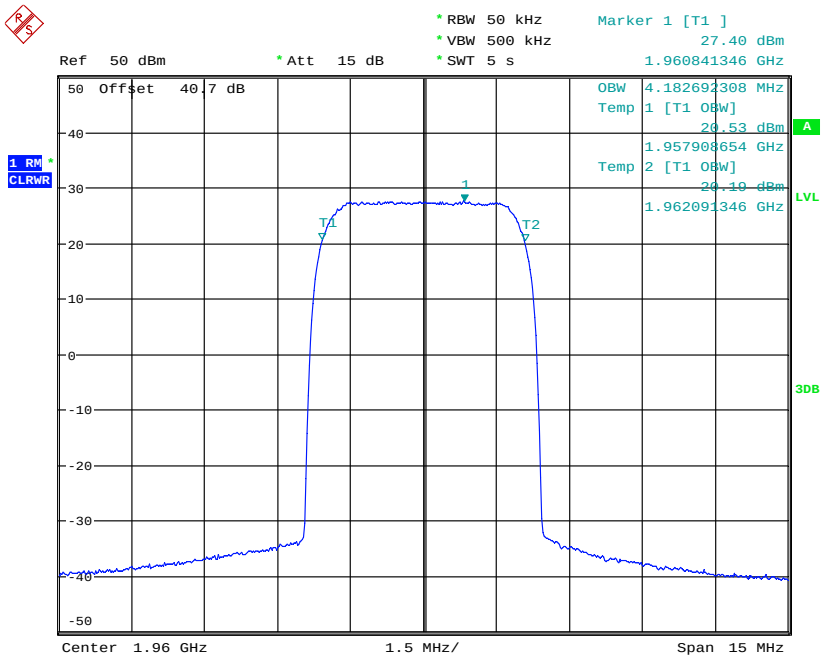
Date: 27.OCT.2014 16:17:20

Channel Position M - 64QAM / Bandwidth 4.2 MHz



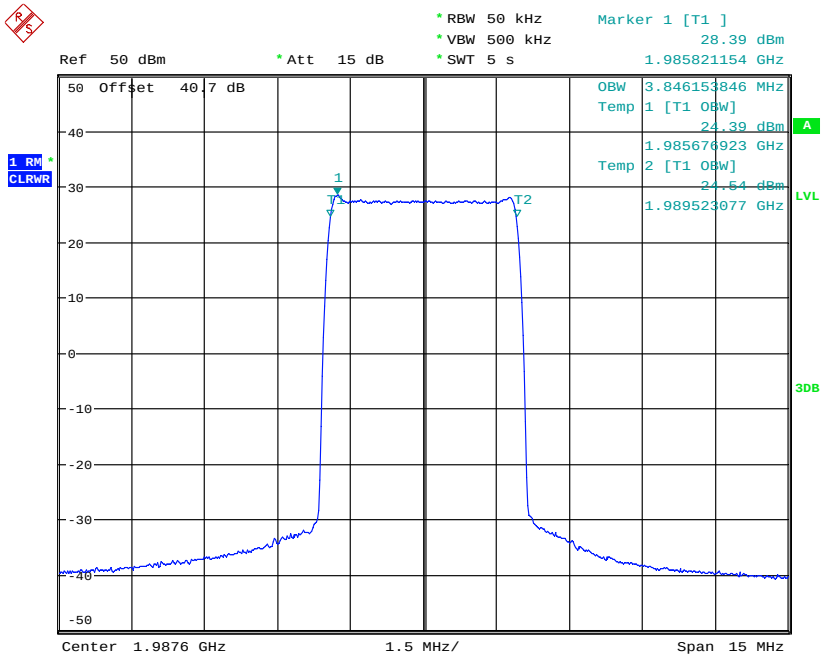
Date: 27.OCT.2014 15:18:41

Channel Position M - 64QAM / Bandwidth 5.0 MHz



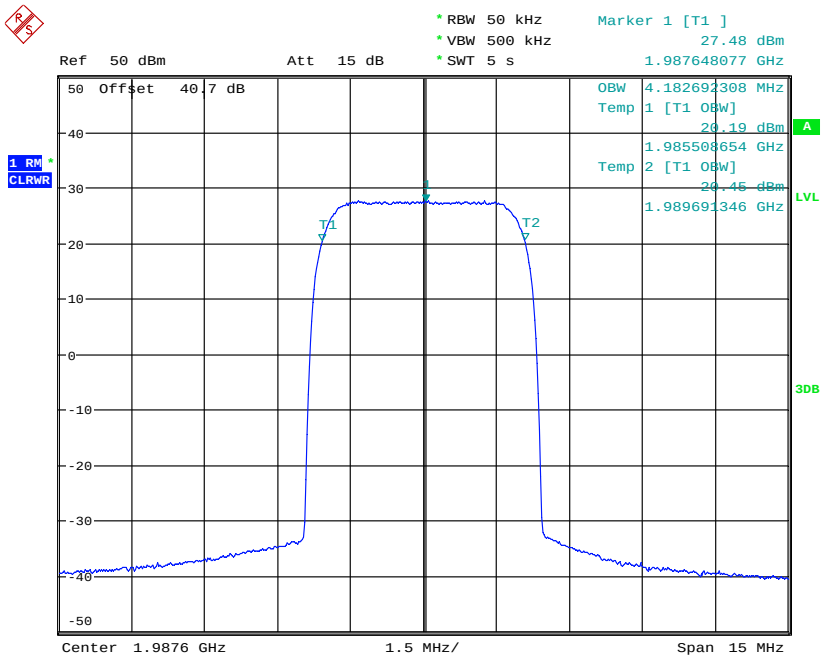
Date: 27.OCT.2014 16:12:38

Channel Position T - 16QAM / Bandwidth 4.2 MHz



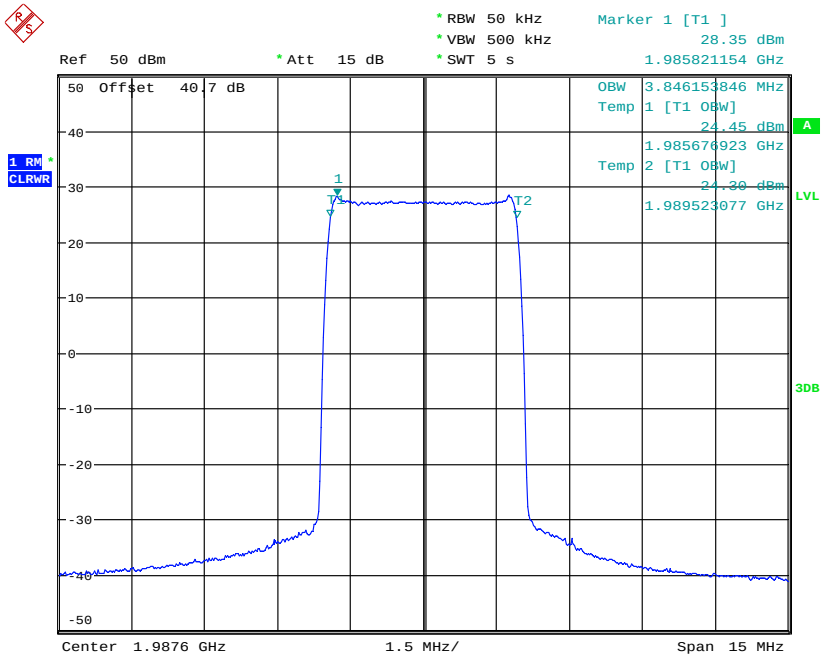
Date: 27.OCT.2014 15:27:16

Channel Position T - 16QAM / Bandwidth 5.0 MHz



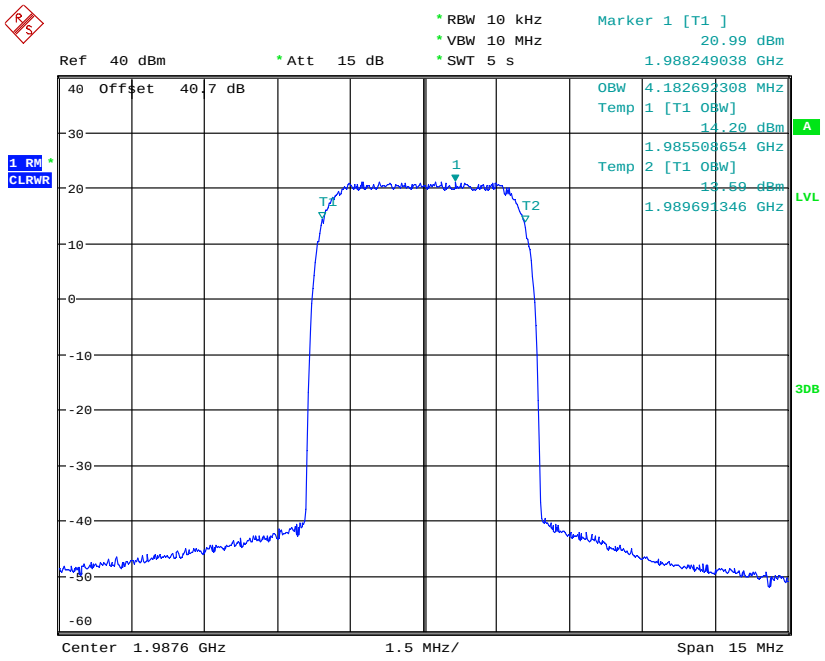
Date: 27.OCT.2014 15:59:36

Channel Position T - 64QAM / Bandwidth 4.2 MHz



Date: 27.OCT.2014 15:44:34

Channel Position T - 64QAM / Bandwidth 5.0 MHz



Date: 27.OCT.2014 15:49:26

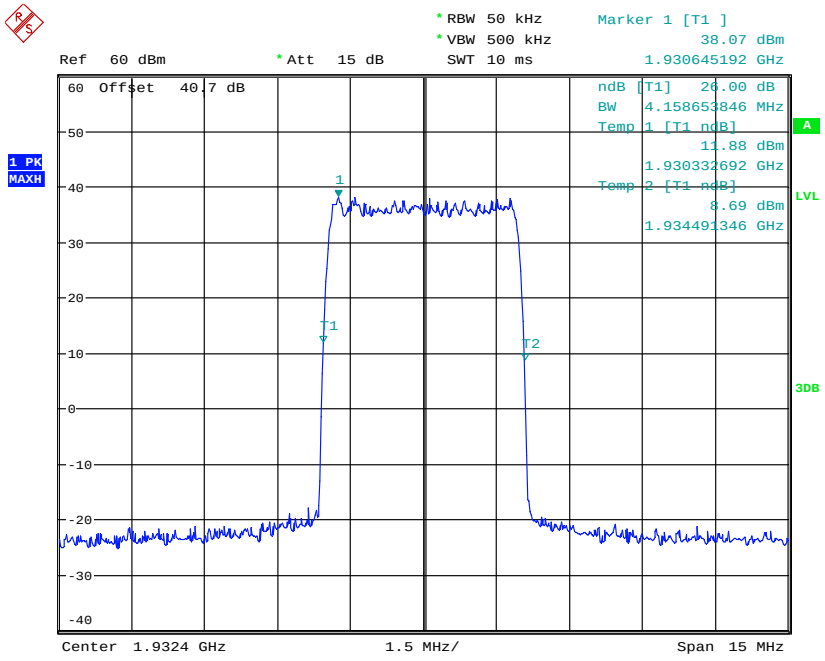
Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

-26dBc Occupied Bandwidth for FCC requirement

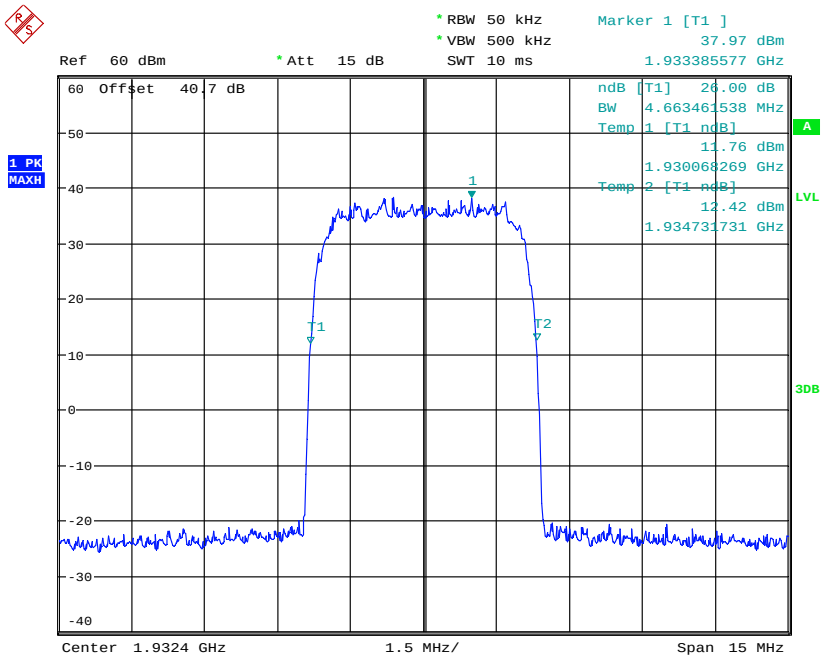
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
16QAM / 4.2 MHz	4.16	4.13	4.13
64QAM / 4.2 MHz	4.16	4.13	4.13
16QAM / 5.0 MHz	4.66	4.66	4.66
64QAM / 5.0 MHz	4.66	4.66	4.66

Channel Position B - 16QAM / Bandwidth 4.2 MHz



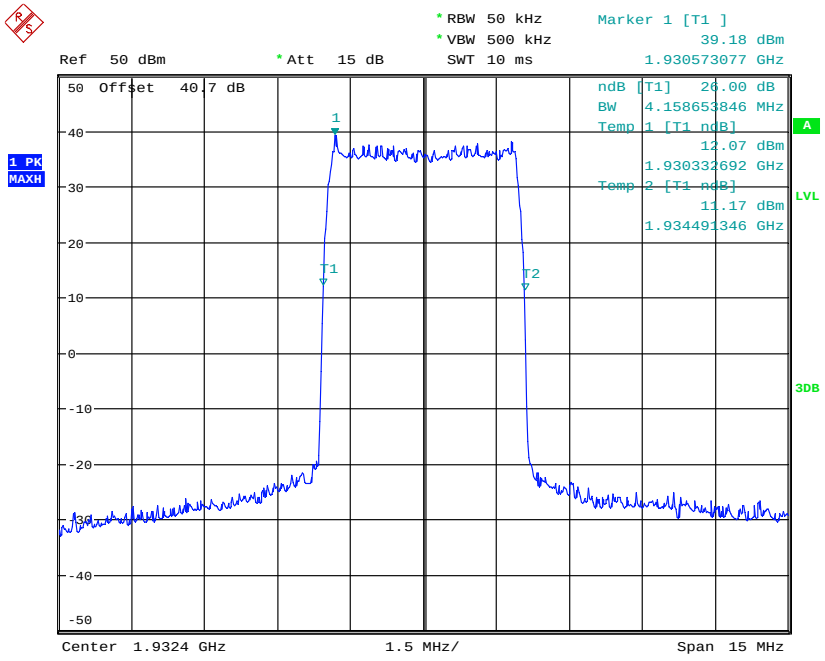
Date: 27.OCT.2014 15:06:57

Channel Position B - 16QAM / Bandwidth 5.0 MHz



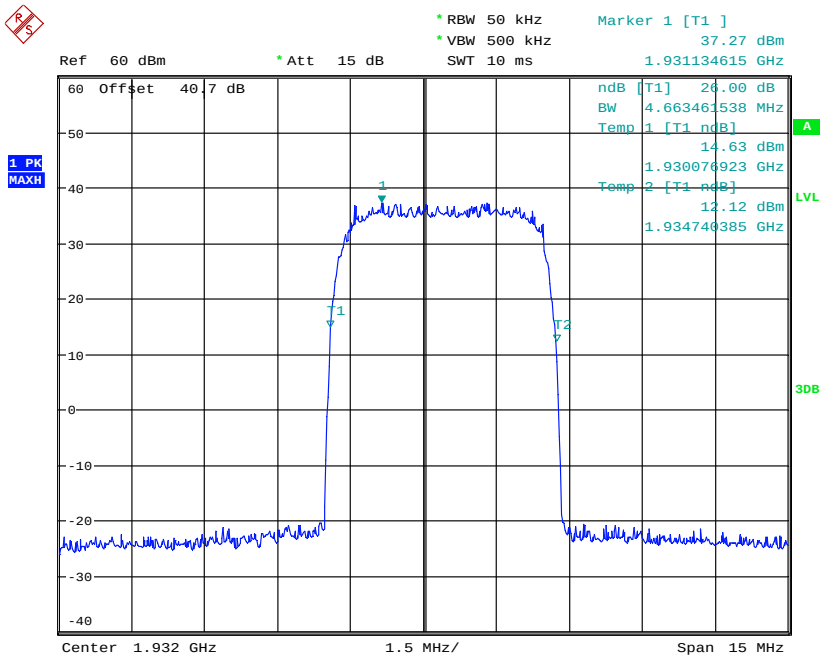
Date: 27.OCT.2014 16:23:40

Channel Position B - 64QAM / Bandwidth 4.2 MHz



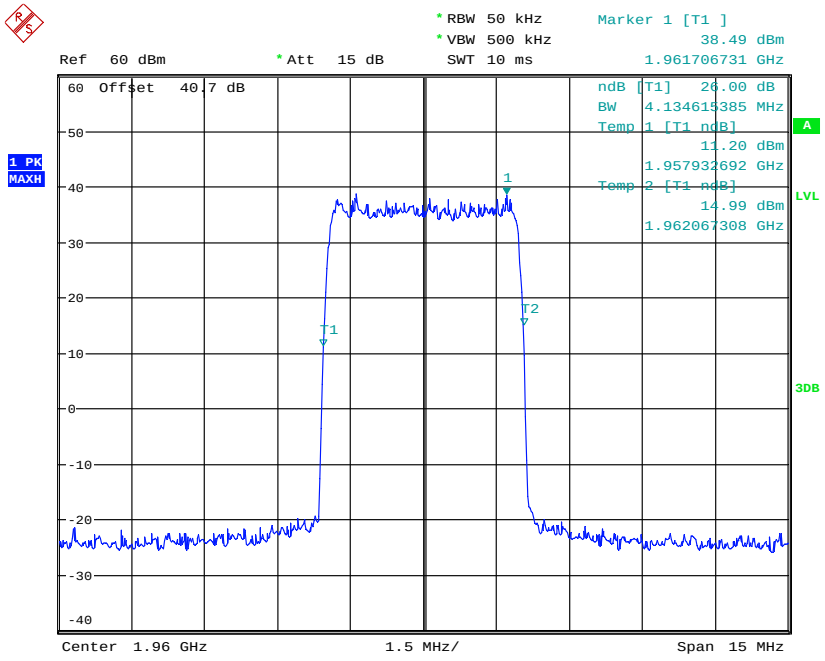
Date: 27.OCT.2014 15:13:11

Channel Position B - 64QAM / Bandwidth 5.0 MHz



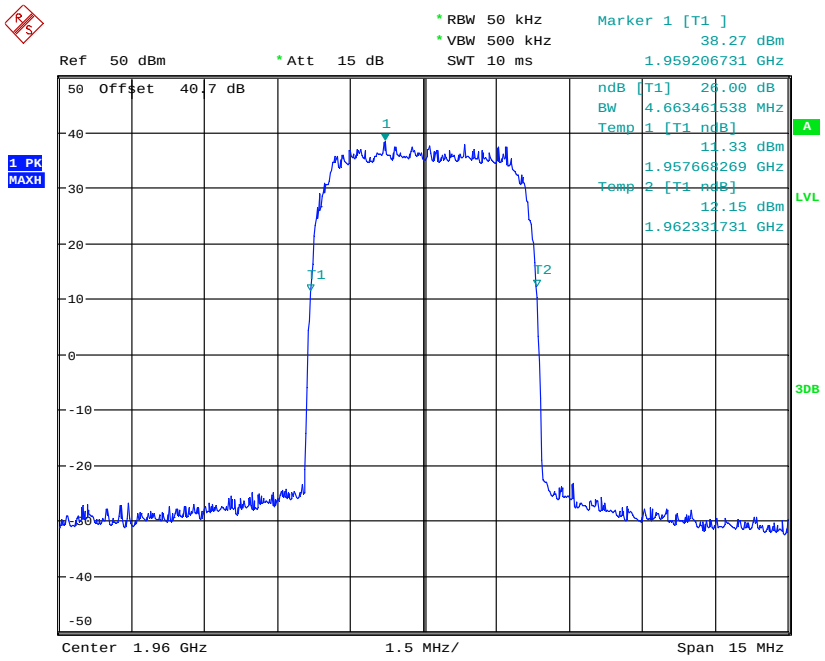
Date: 27.OCT.2014 16:33:16

Channel Position M - 16QAM / Bandwidth 4.2 MHz



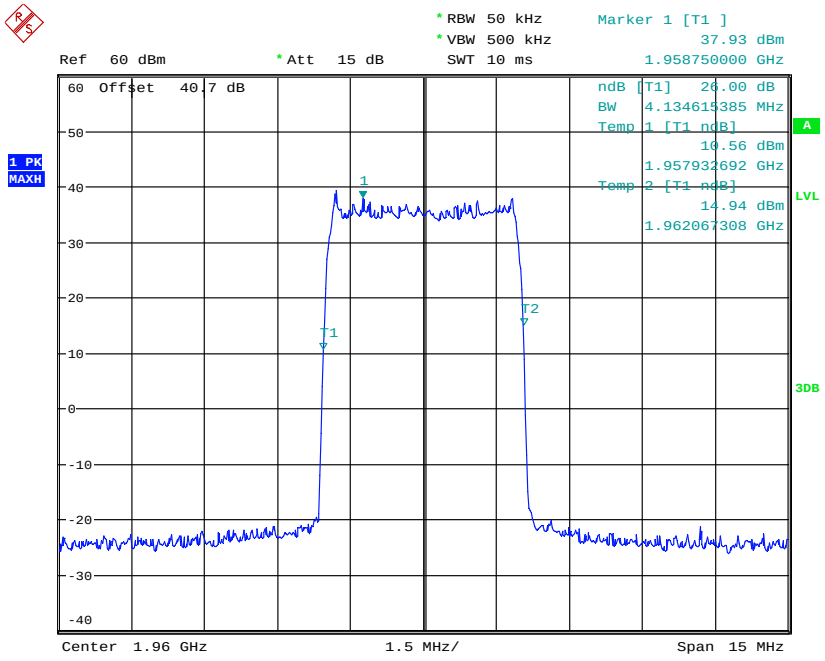
Date: 27.OCT.2014 15:22:53

Channel Position M - 16QAM / Bandwidth 5.0 MHz



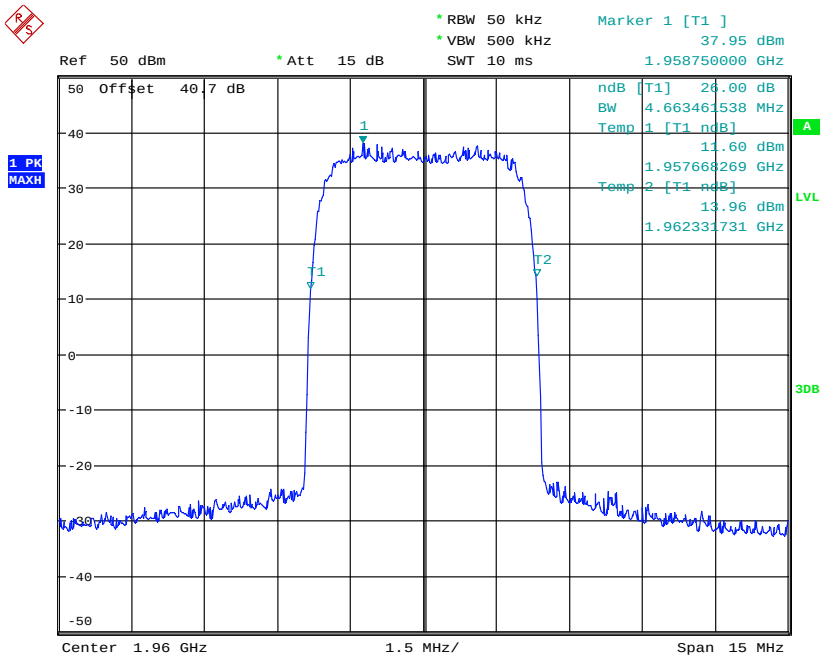
Date: 27.OCT.2014 16:16:40

Channel Position M - 64QAM / Bandwidth 4.2 MHz



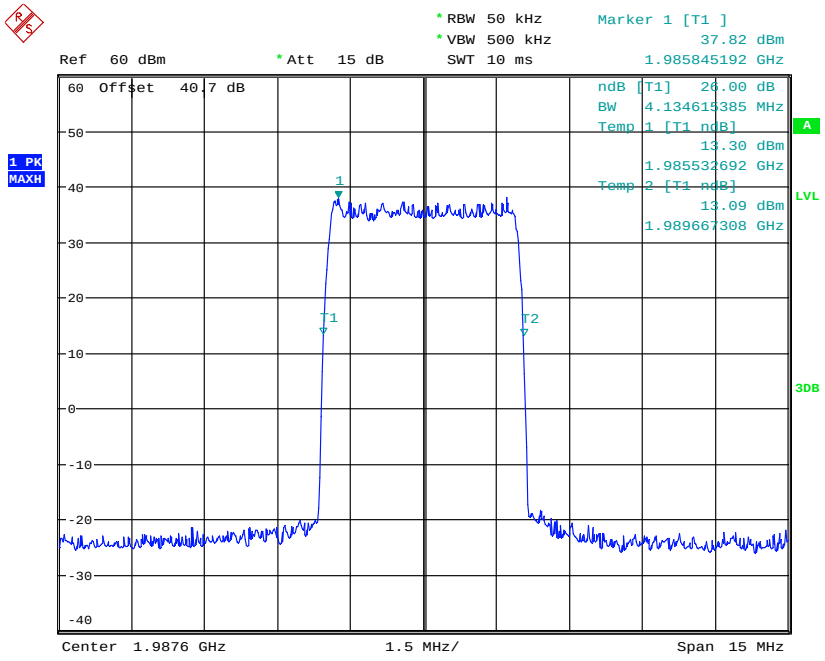
Date: 27.OCT.2014 15:18:12

Channel Position M - 64QAM / Bandwidth 5.0 MHz



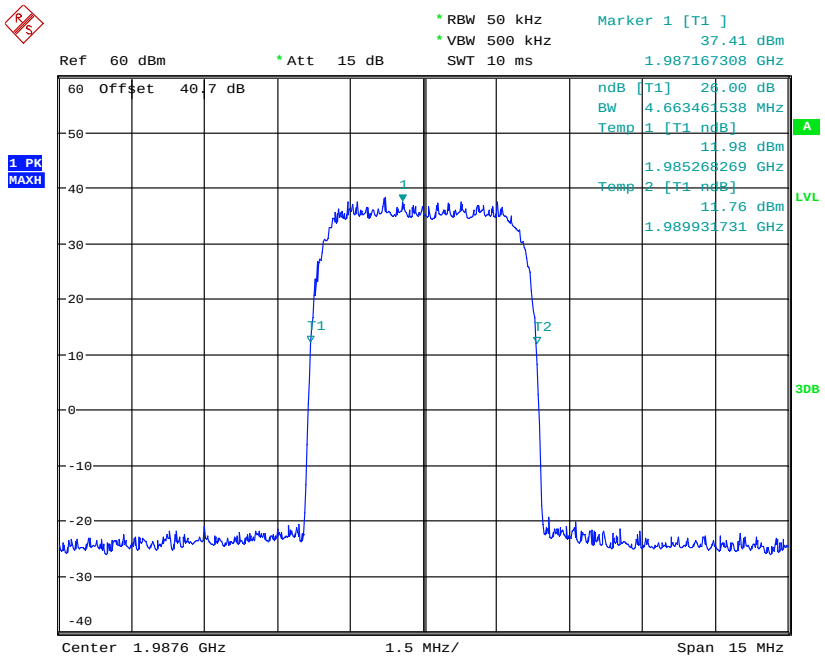
Date: 27.OCT.2014 16:13:19

Channel Position T - 16QAM / Bandwidth 4.2 MHz



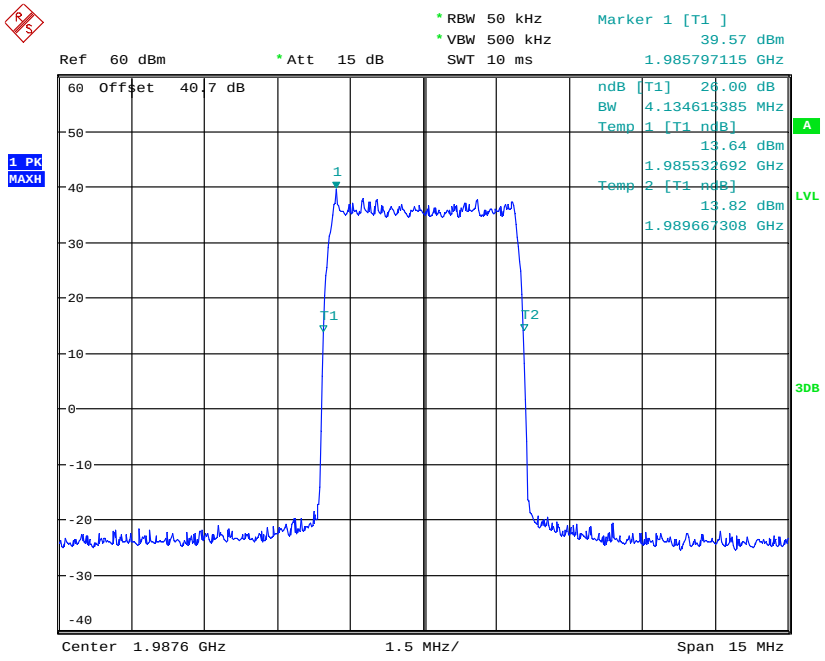
Date: 27.OCT.2014 15:26:23

Channel Position T - 16QAM / Bandwidth 5.0 MHz



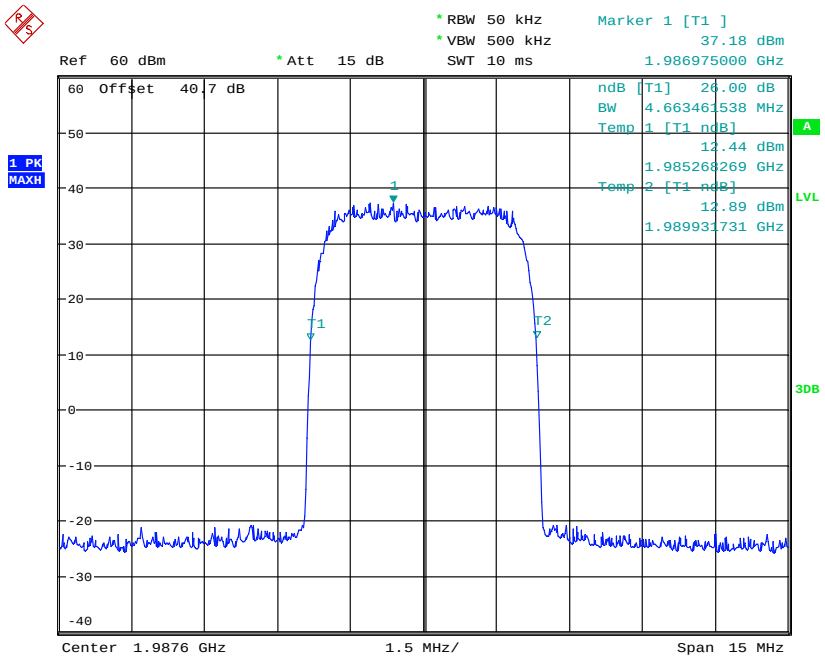
Date: 27.OCT.2014 16:00:47

Channel Position T - 64QAM / Bandwidth 4.2 MHz



Date: 27.OCT.2014 15:45:06

Channel Position T - 64QAM / Bandwidth 5.0 MHz



Date: 27.OCT.2014 15:48:42

Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

99% Occupied Bandwidth for IC requirement

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1930.7MHz	Channel Position M 1960.0MHz	Channel Position T 1989.3MHz
QPSK / 1.4 MHz	1.09	1.09	1.09
16QAM / 1.4 MHz	-	1.09	-
64QAM / 1.4 MHz	-	1.09	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1931.5MHz	Channel Position M 1960.0MHz	Channel Position T 1988.5MHz
QPSK / 3.0 MHz	-	2.70	-
16QAM / 3.0 MHz	-	2.70	-
64QAM / 3.0 MHz	-	2.70	-

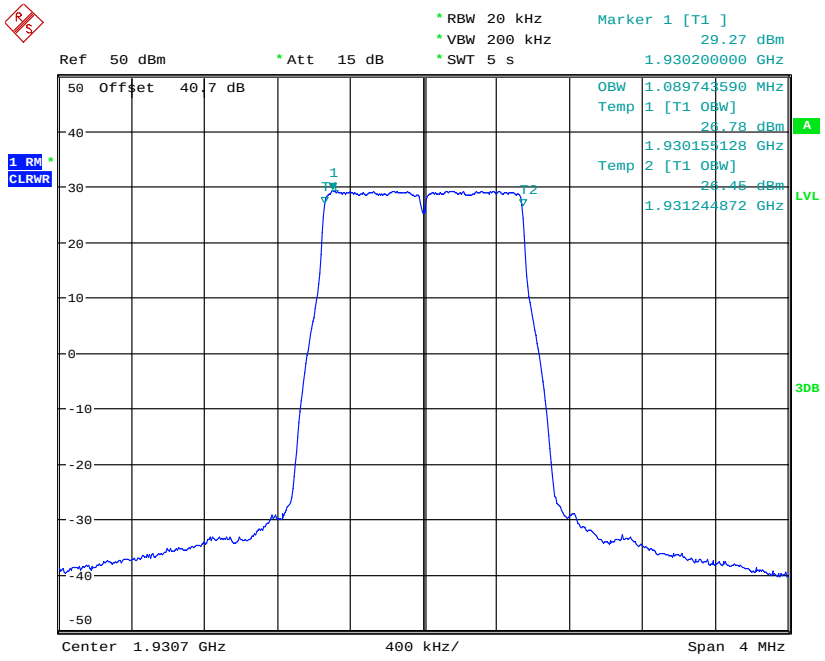
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.5MHz	Channel Position M 1960.0MHz	Channel Position T 1987.5MHz
QPSK / 5.0 MHz	-	4.47	-
16QAM / 5.0 MHz	-	4.47	-
64QAM / 5.0 MHz	-	4.47	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1935.0MHz	Channel Position M 1960.0MHz	Channel Position T 1985.0MHz
QPSK / 10.0 MHz	-	8.94	-
16QAM / 10.0 MHz	-	8.94	-
64QAM / 10.0 MHz	-	8.94	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1937.5MHz	Channel Position M 1960.0MHz	Channel Position T 1982.5MHz
QPSK / 15.0 MHz	-	13.41	-
16QAM / 15.0 MHz	-	13.41	-
64QAM / 15.0 MHz	-	13.41	-

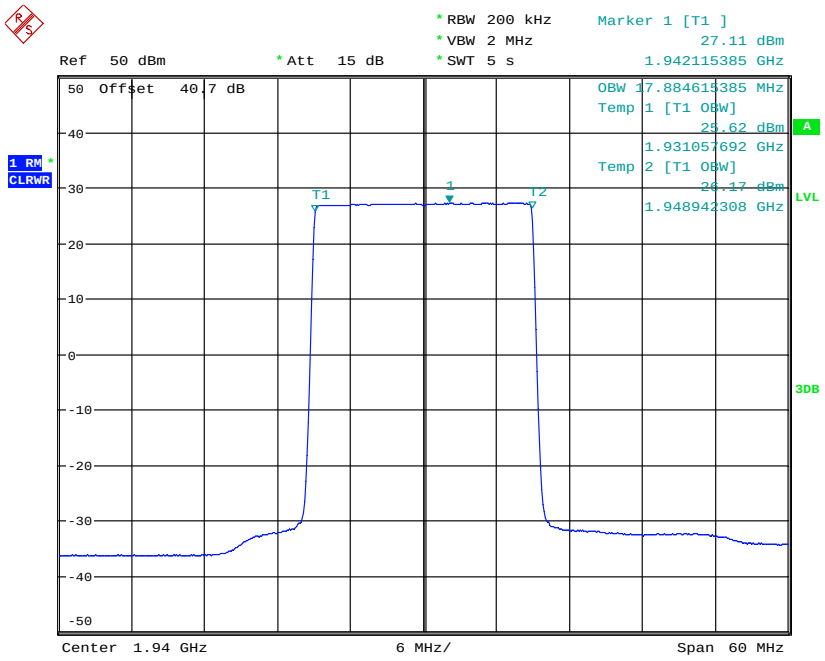
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1940.0MHz	Channel Position M 1960.0MHz	Channel Position T 1980.0MHz
QPSK / 20.0 MHz	17.88	17.88	17.88
16QAM / 20.0 MHz	-	17.88	-
64QAM / 20.0 MHz	-	17.88	-

Channel Position B - QPSK / Bandwidth 1.4 MHz



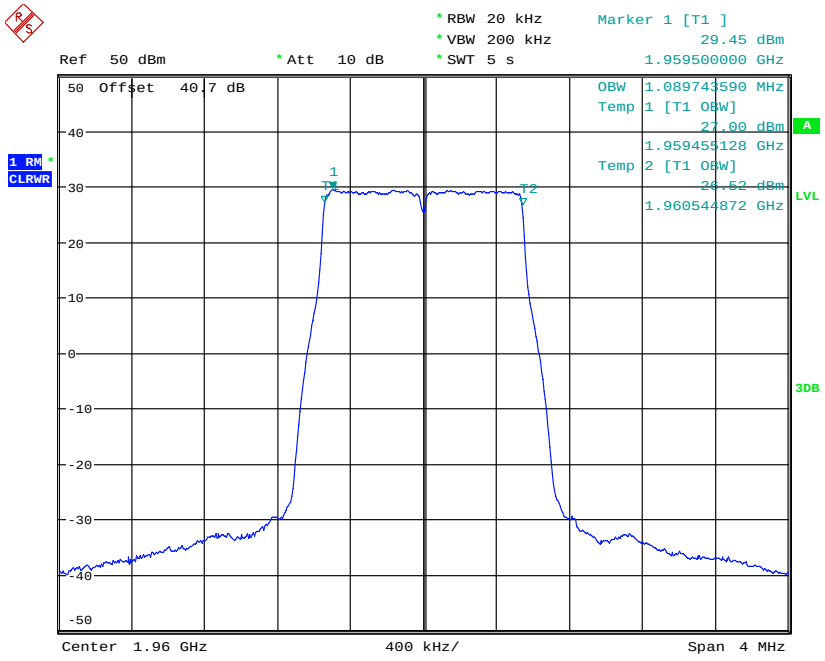
Date: 29.OCT.2014 09:57:46

Channel Position B - QPSK / Bandwidth 20.0 MHz



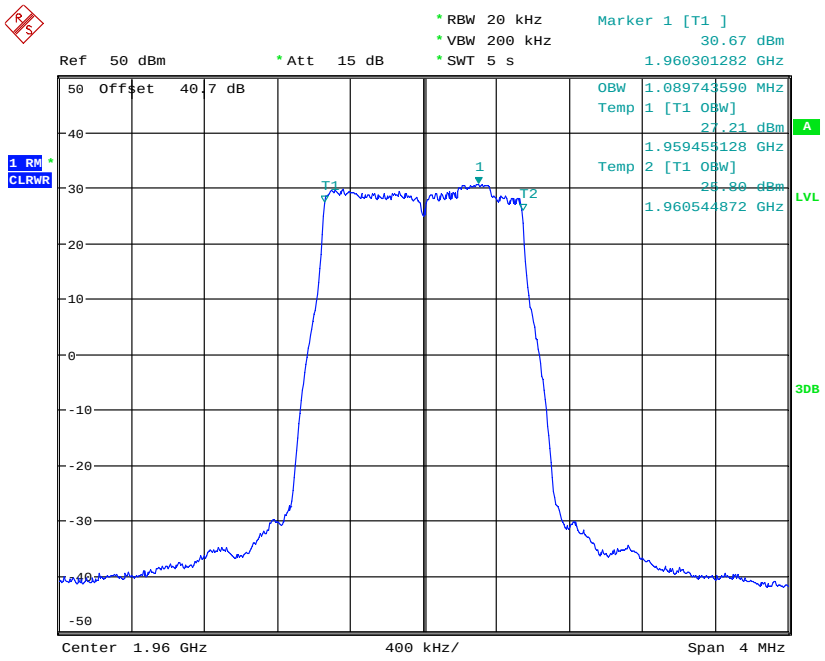
Date: 29.OCT.2014 15:23:46

Channel Position M - QPSK / Bandwidth 1.4 MHz



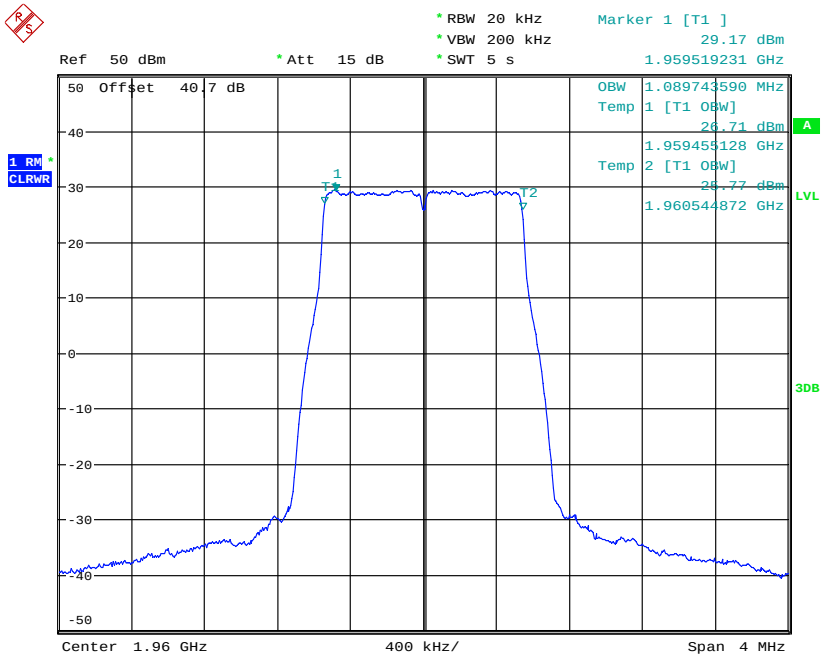
Date: 29.OCT.2014 10:18:50

Channel Position M - 16QAM / Bandwidth 1.4 MHz



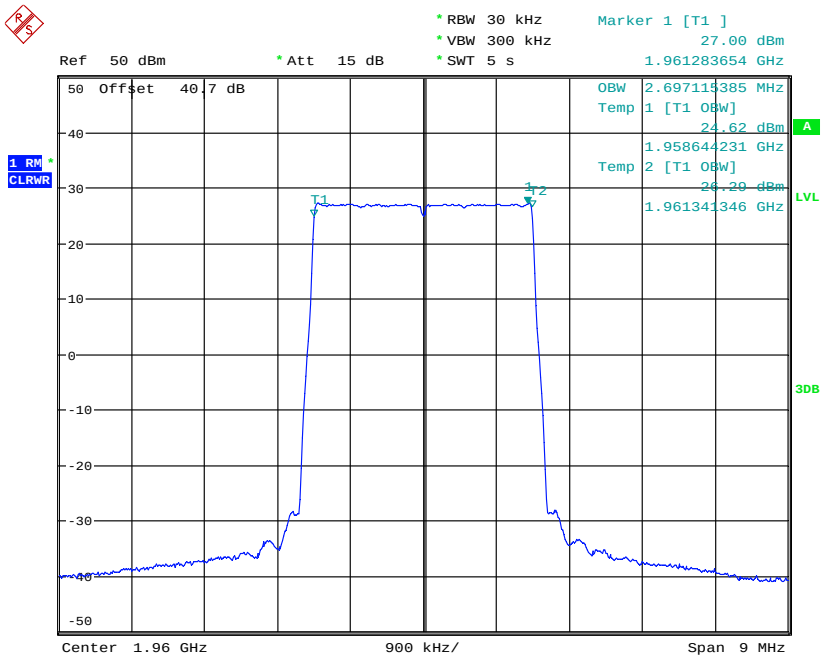
Date: 29.OCT.2014 15:32:41

Channel Position M - 64QAM / Bandwidth 1.4 MHz



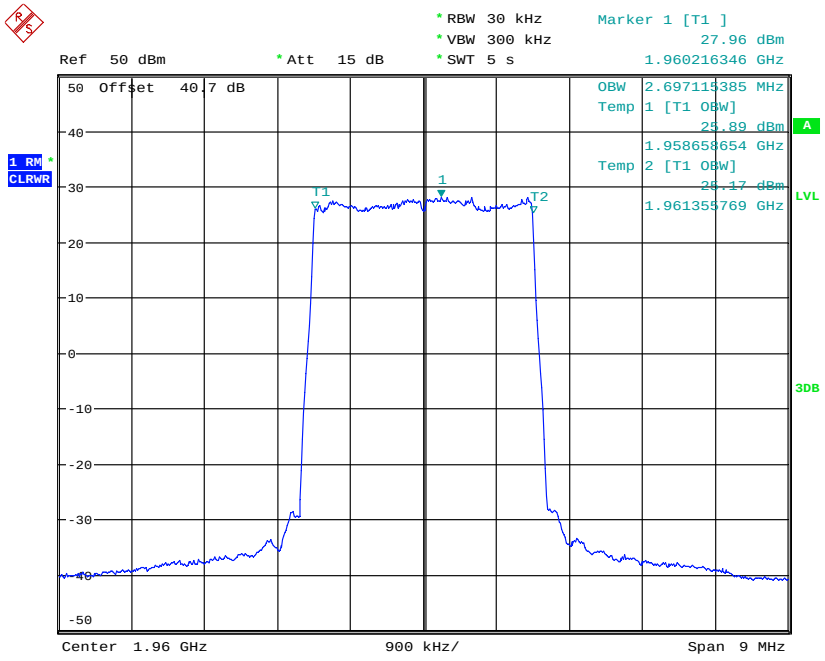
Date: 29.OCT.2014 15:35:37

Channel Position M - QPSK / Bandwidth 3.0 MHz



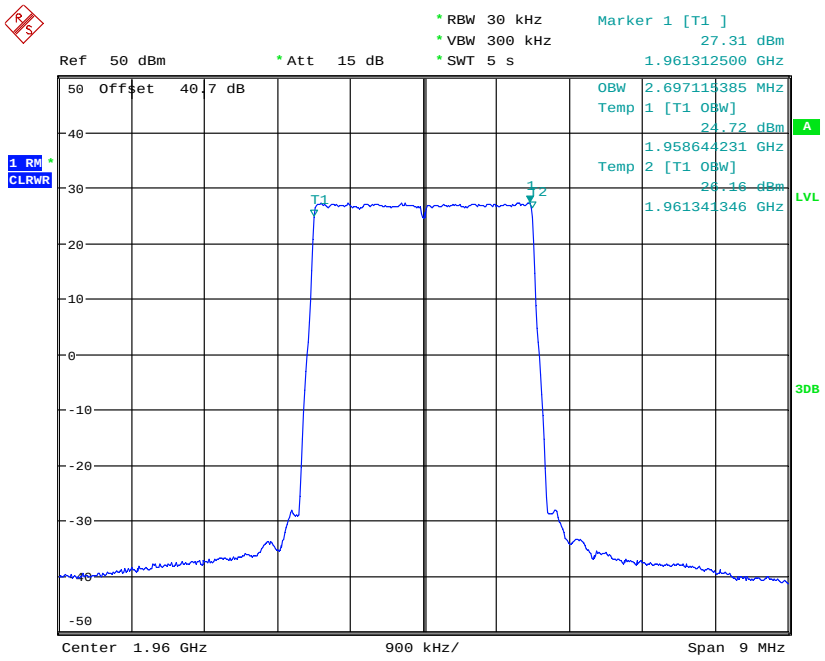
Date: 29.OCT.2014 15:02:40

Channel Position M - 16QAM / Bandwidth 3.0 MHz



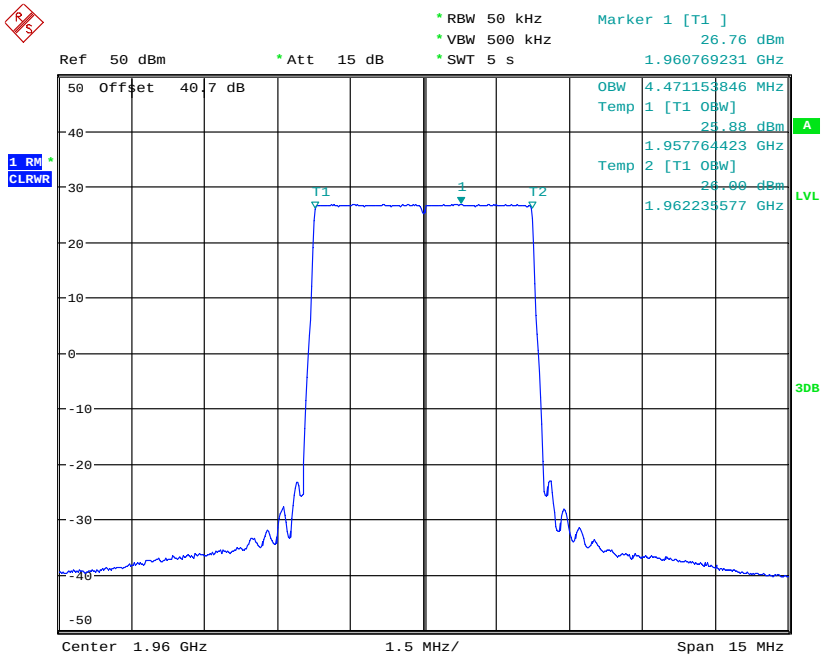
Date: 29.OCT.2014 15:40:23

Channel Position M - 64QAM / Bandwidth 3.0 MHz



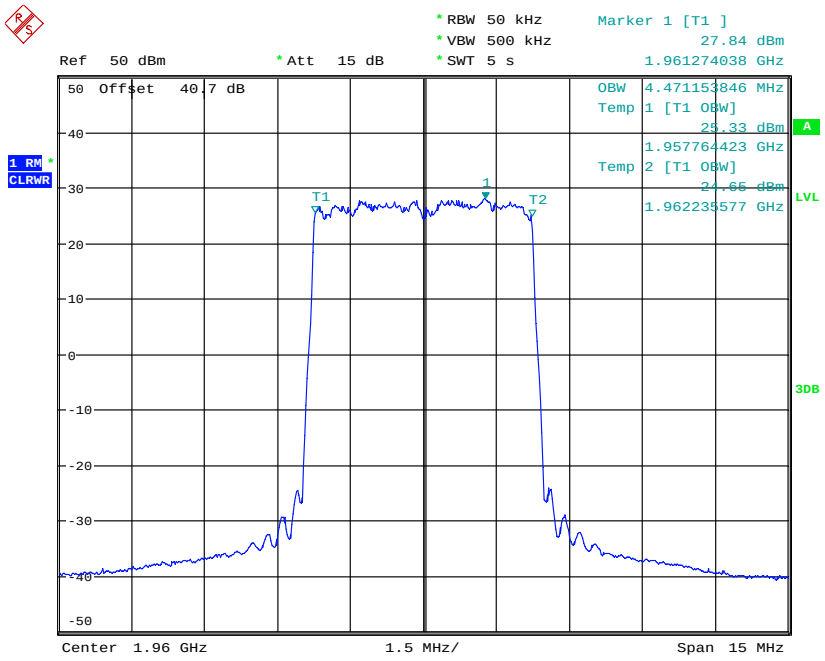
Date: 29.OCT.2014 15:43:24

Channel Position M - QPSK / Bandwidth 5.0 MHz



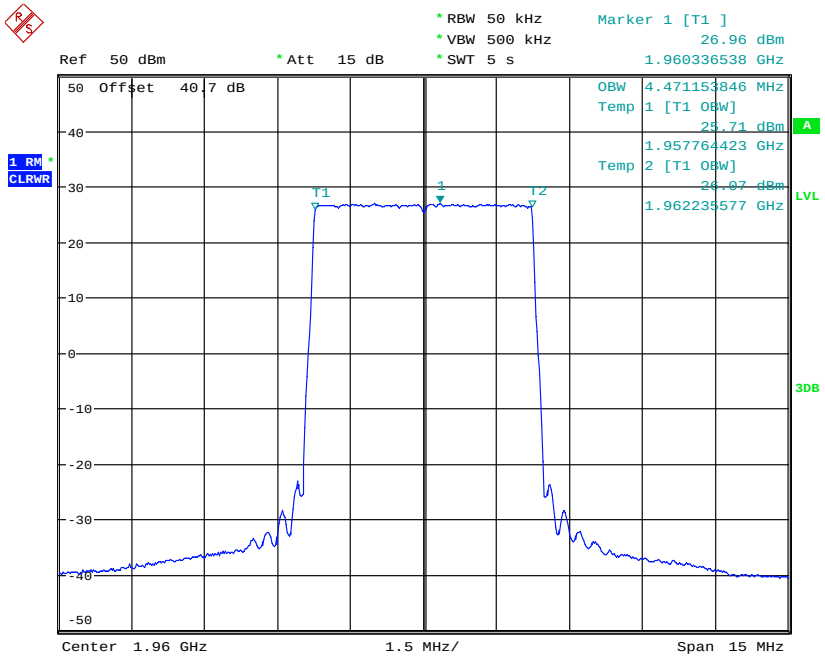
Date: 29.OCT.2014 15:00:02

Channel Position M - 16QAM / Bandwidth 5.0 MHz



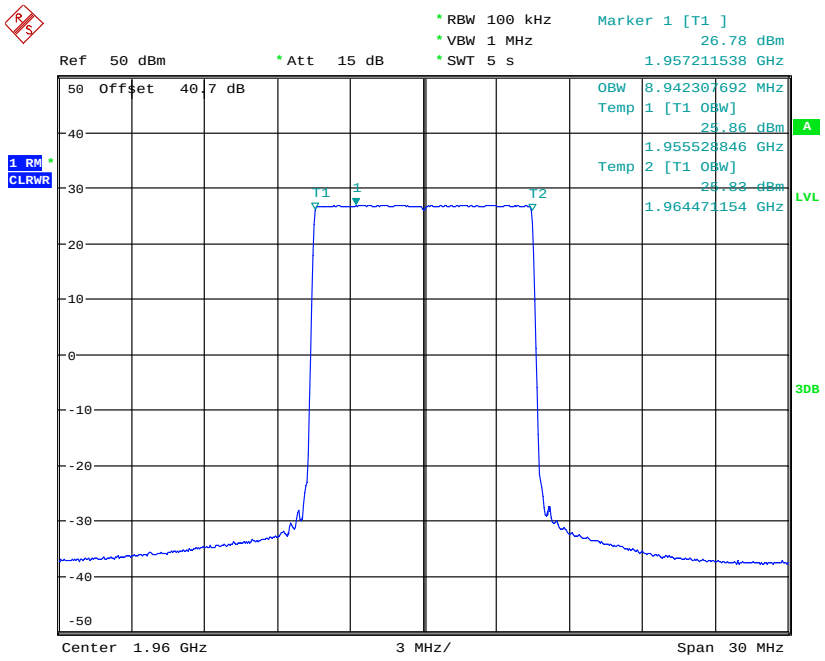
Date: 29.OCT.2014 15:49:04

Channel Position M - 64QAM / Bandwidth 5.0 MHz



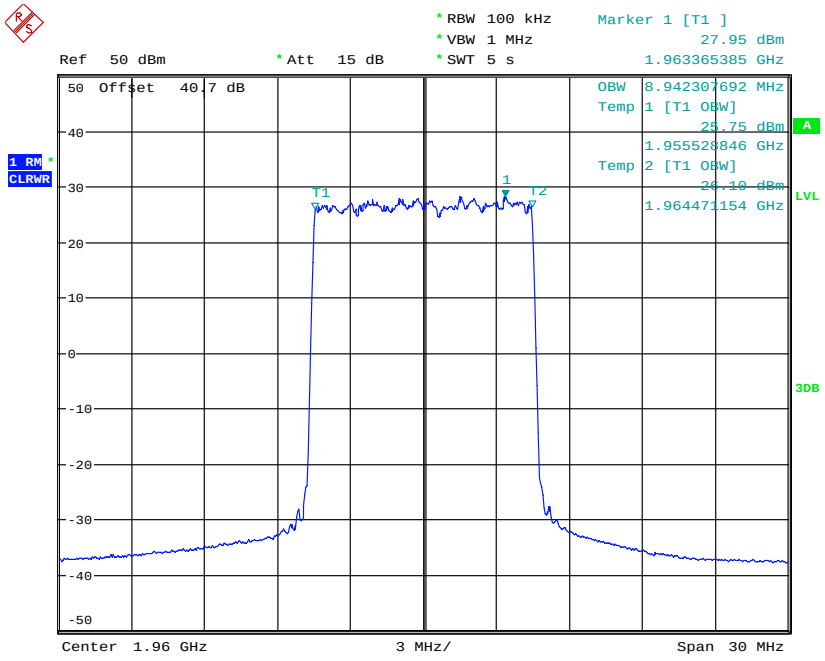
Date: 29.OCT.2014 15:52:10

Channel Position M - QPSK / Bandwidth 10.0 MHz



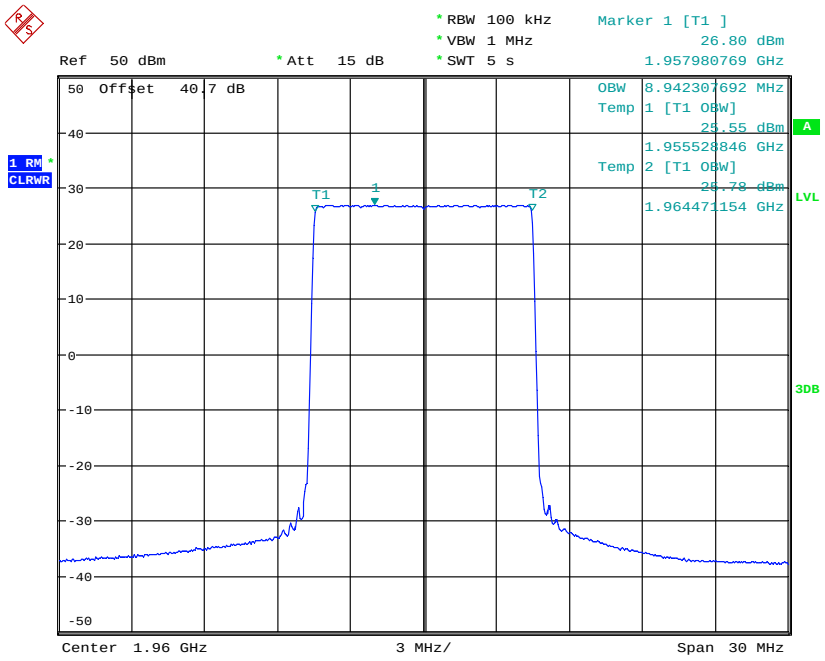
Date: 29.OCT.2014 15:07:58

Channel Position M - 16QAM / Bandwidth 10.0 MHz



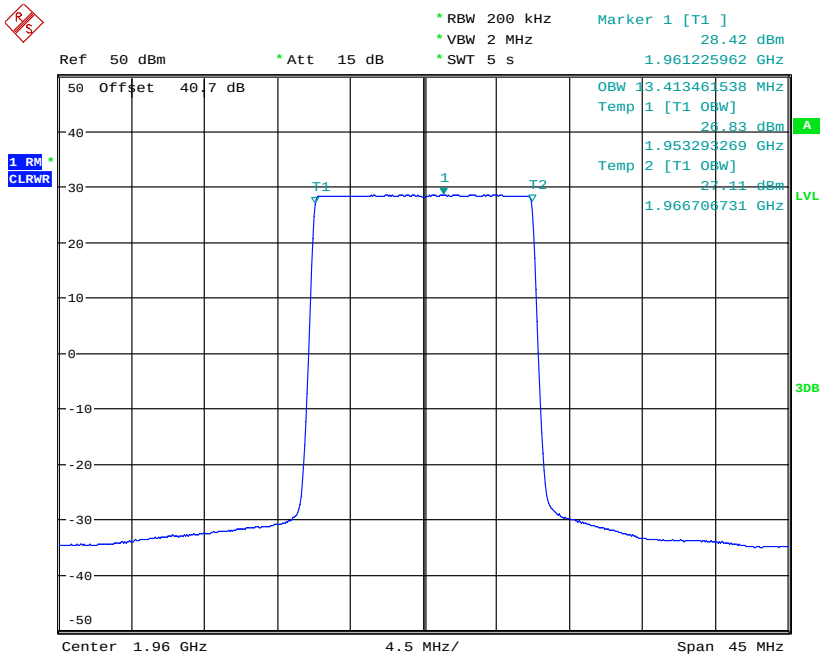
Date: 29.OCT.2014 15:55:51

Channel Position M - 64QAM / Bandwidth 10.0 MHz



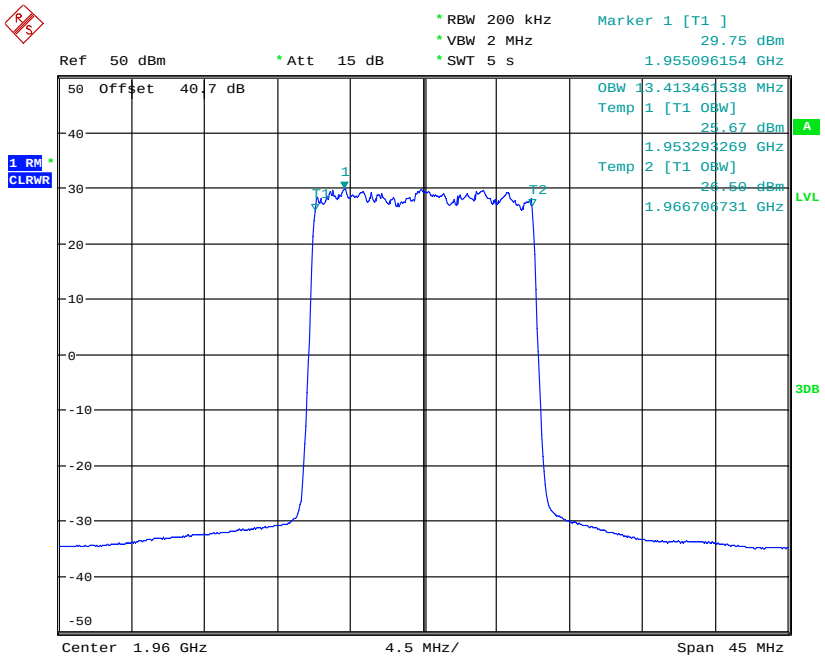
Date: 29.OCT.2014 15:58:53

Channel Position M - QPSK / Bandwidth 15.0 MHz



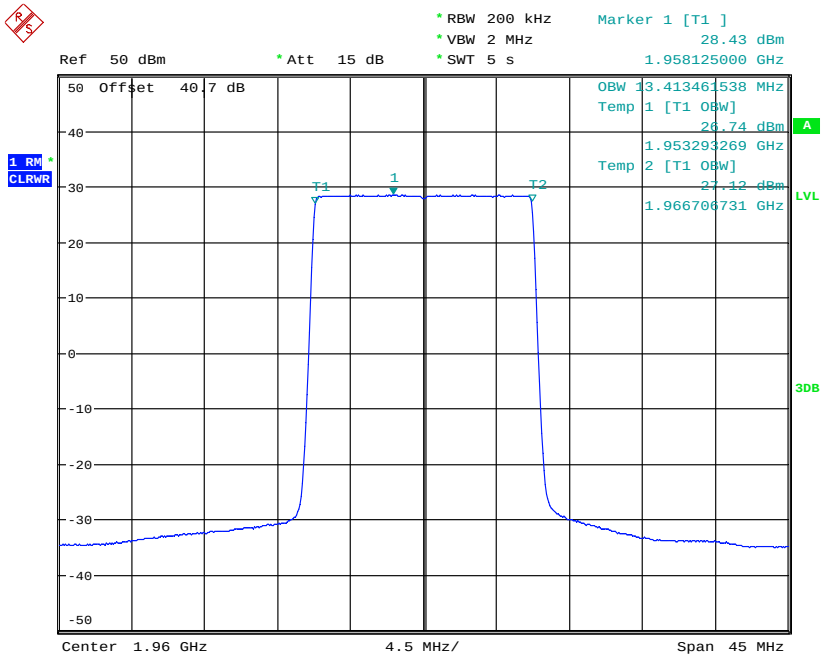
Date: 29.OCT.2014 15:15:30

Channel Position M - 16QAM / Bandwidth 15.0 MHz



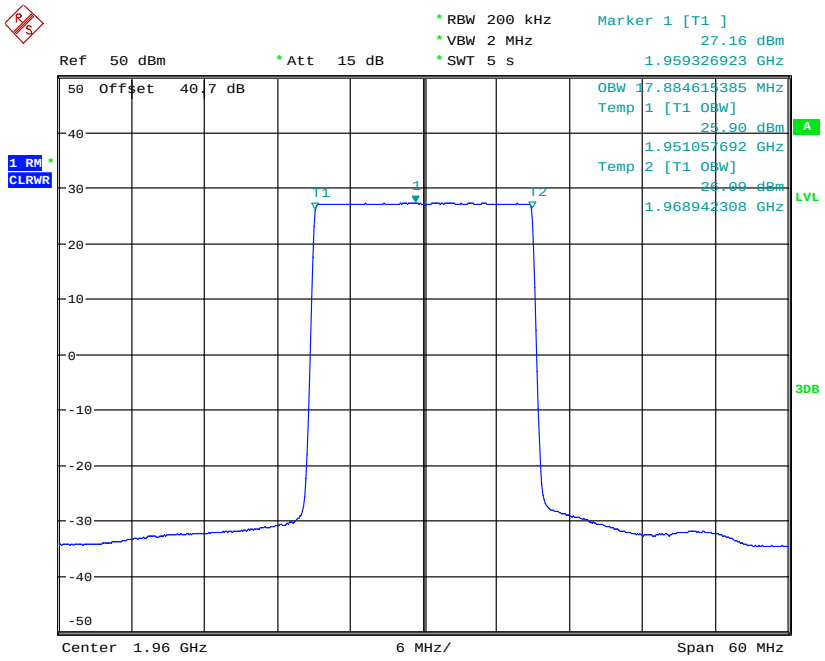
Date: 29.OCT.2014 16:03:36

Channel Position M - 64QAM / Bandwidth 15.0 MHz



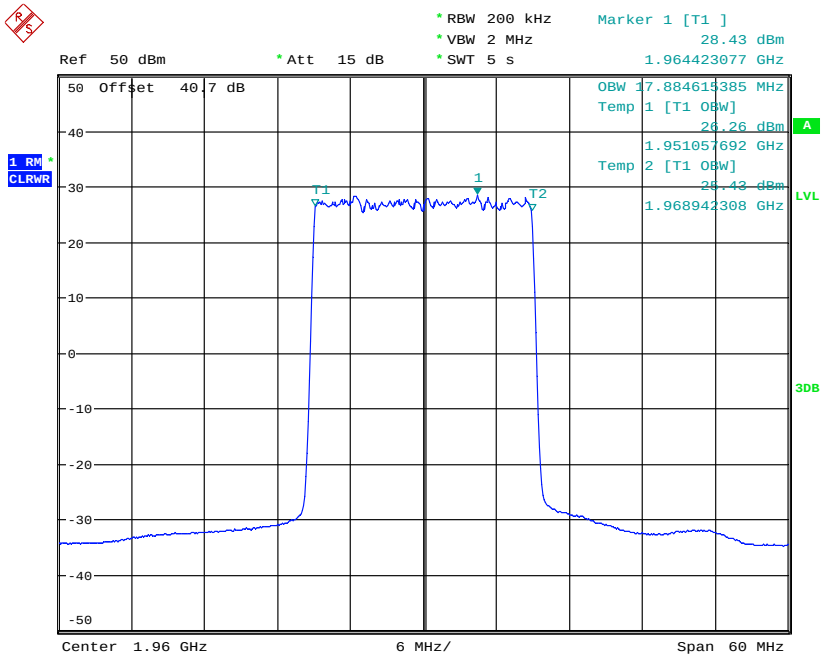
Date: 29.OCT.2014 16:06:13

Channel Position M - QPSK / Bandwidth 20.0 MHz



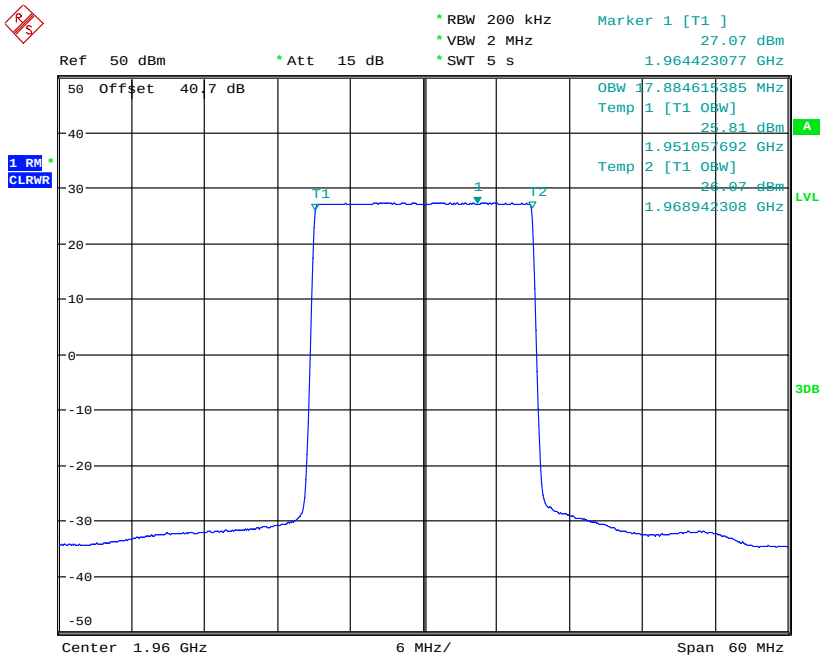
Date: 29.OCT.2014 15:19:33

Channel Position M – 16QAM / Bandwidth 20.0 MHz



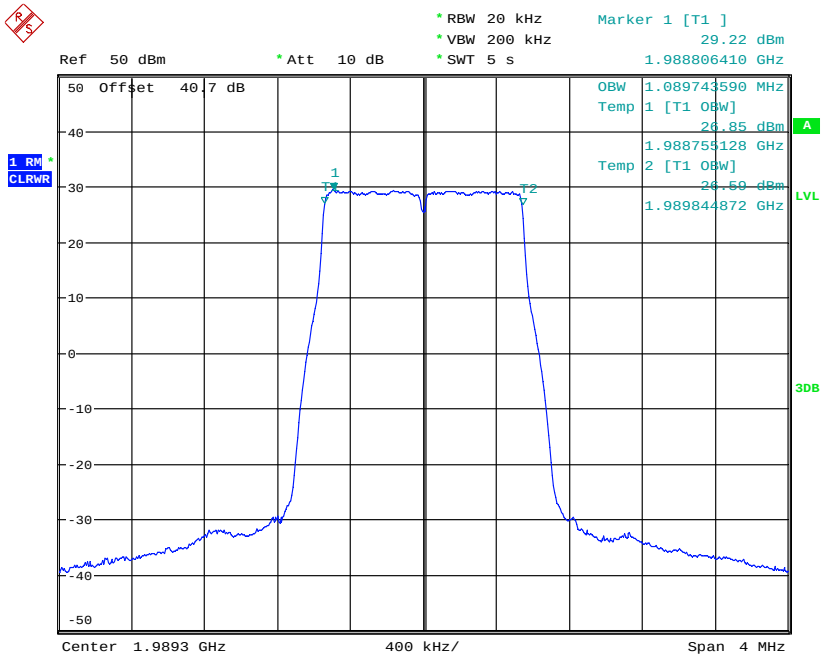
Date: 29.OCT.2014 16:10:42

Channel Position M – 64QAM / Bandwidth 20.0 MHz



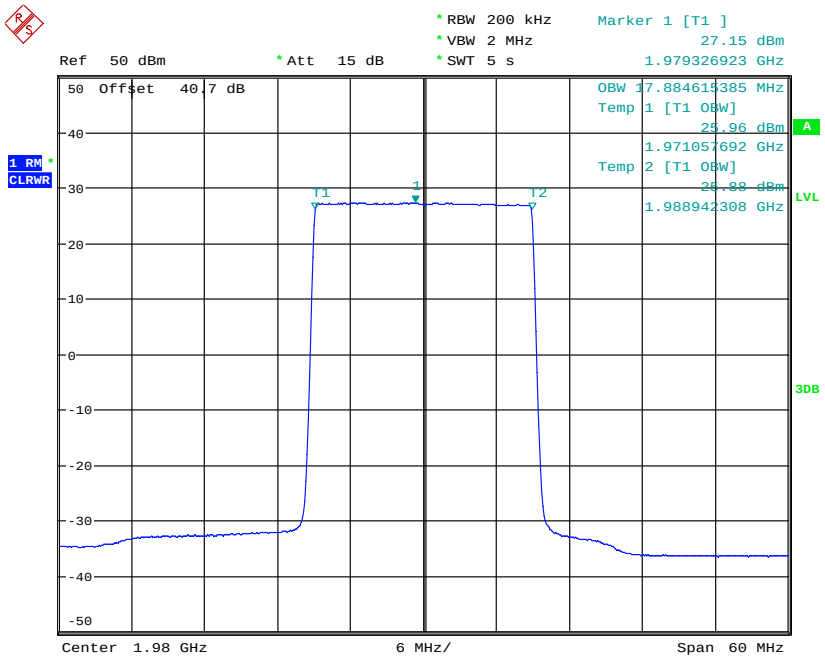
Date: 29.OCT.2014 16:11:38

Channel Position T - QPSK / Bandwidth 1.4 MHz



Date: 29.OCT.2014 10:25:30

Channel Position T - QPSK / Bandwidth 20.0 MHz



Date: 29.OCT.2014 15:27:35

Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

-26dBc Occupied Bandwidth for FCC requirement

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1930.7MHz	Channel Position M 1960.0MHz	Channel Position T 1989.3MHz
QPSK / 1.4 MHz	1.28	1.28	1.28
16QAM / 1.4 MHz	-	1.27	-
64QAM / 1.4 MHz	-	1.27	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1931.5MHz	Channel Position M 1960.0MHz	Channel Position T 1988.5MHz
QPSK / 3.0 MHz	-	2.91	-
16QAM / 3.0 MHz	-	2.91	-
64QAM / 3.0 MHz	-	2.91	-

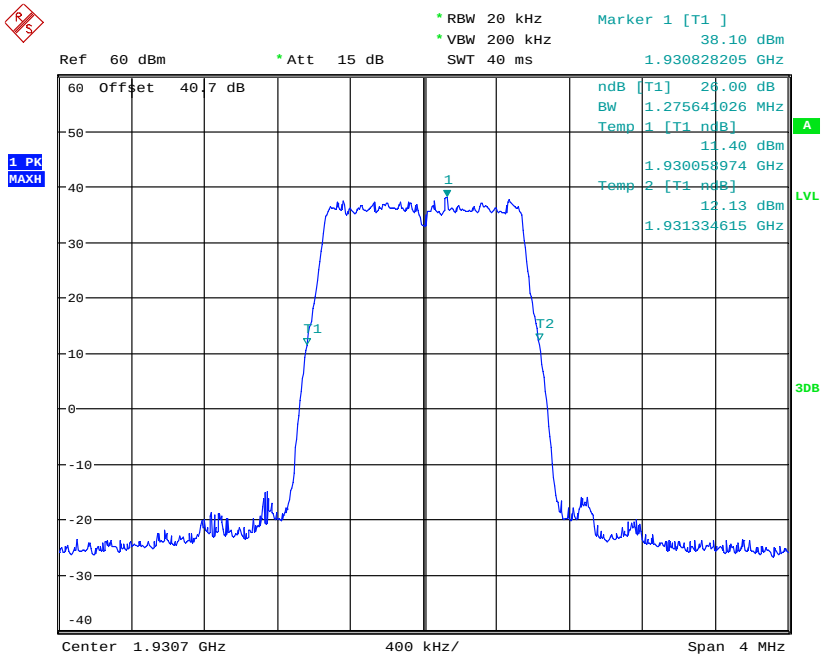
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1932.5MHz	Channel Position M 1960.0MHz	Channel Position T 1987.5MHz
QPSK / 5.0 MHz	-	4.83	-
16QAM / 5.0 MHz	-	4.78	-
64QAM / 5.0 MHz	-	4.83	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1935.0MHz	Channel Position M 1960.0MHz	Channel Position T 1985.0MHz
QPSK / 10.0 MHz	-	9.42	-
16QAM / 10.0 MHz	-	9.42	-
64QAM / 10.0 MHz	-	9.42	-

Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1937.5MHz	Channel Position M 1960.0MHz	Channel Position T 1982.5MHz
QPSK / 15.0 MHz	-	14.28	-
16QAM / 15.0 MHz	-	14.21	-
64QAM / 15.0 MHz	-	14.21	-

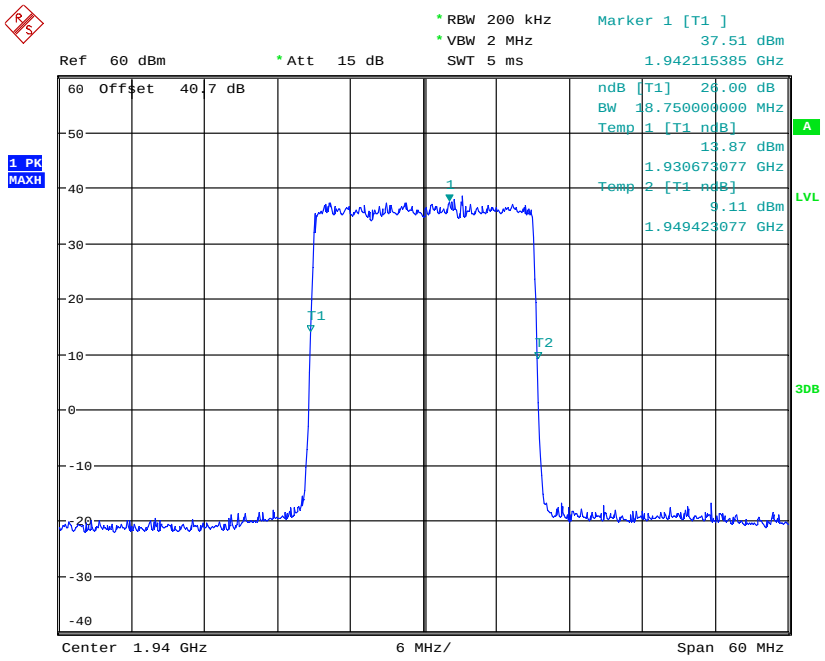
Modulation / Bandwidth	Occupied Bandwidth (MHz)		
	Channel Position B 1940.0MHz	Channel Position M 1960.0MHz	Channel Position T 1980.0MHz
QPSK / 20.0 MHz	18.75	18.75	18.75
16QAM / 20.0 MHz	-	18.65	-
64QAM / 20.0 MHz	-	18.75	-

Channel Position B - QPSK / Bandwidth 1.4 MHz



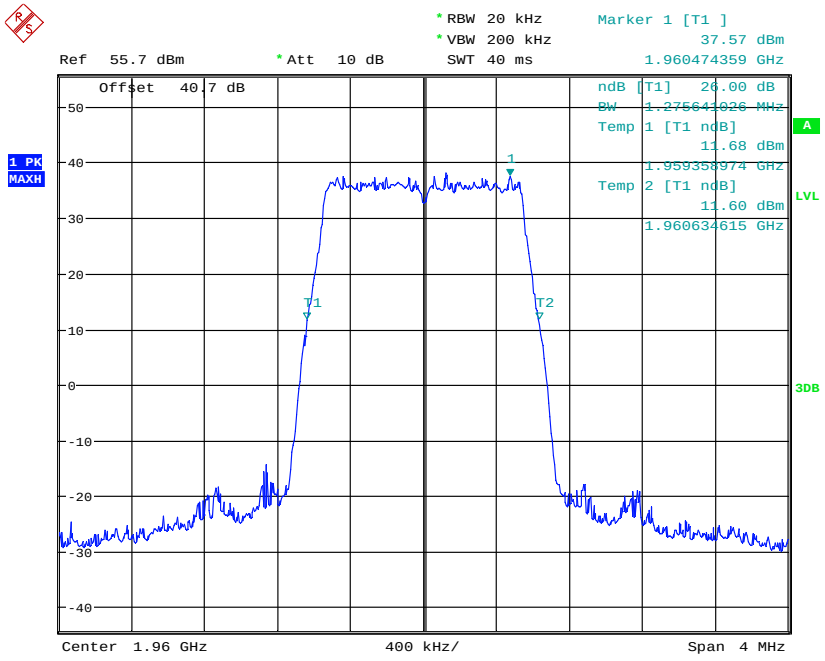
Date: 29.OCT.2014 09:58:52

Channel Position B - QPSK / Bandwidth 20.0 MHz



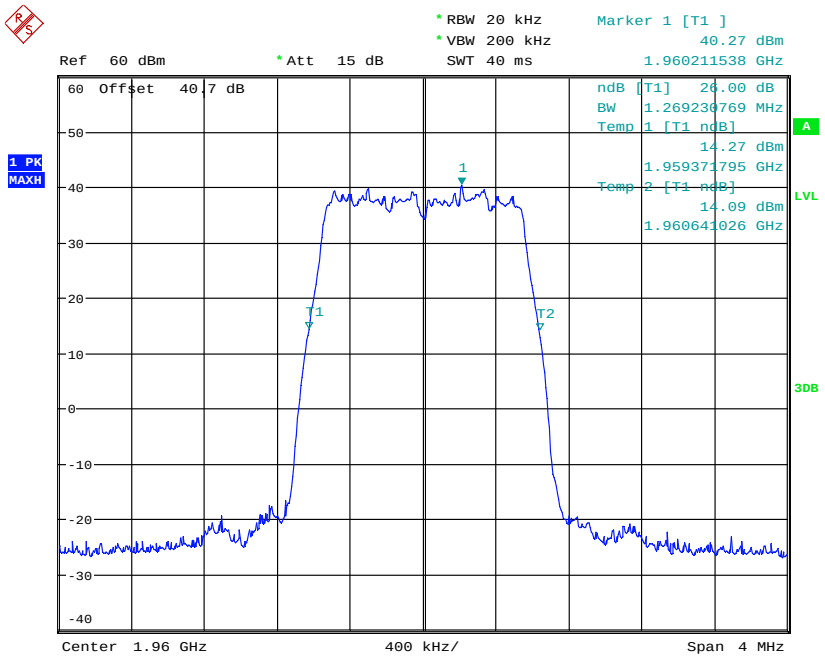
Date: 29.OCT.2014 15:23:00

Channel Position M - QPSK / Bandwidth 1.4 MHz



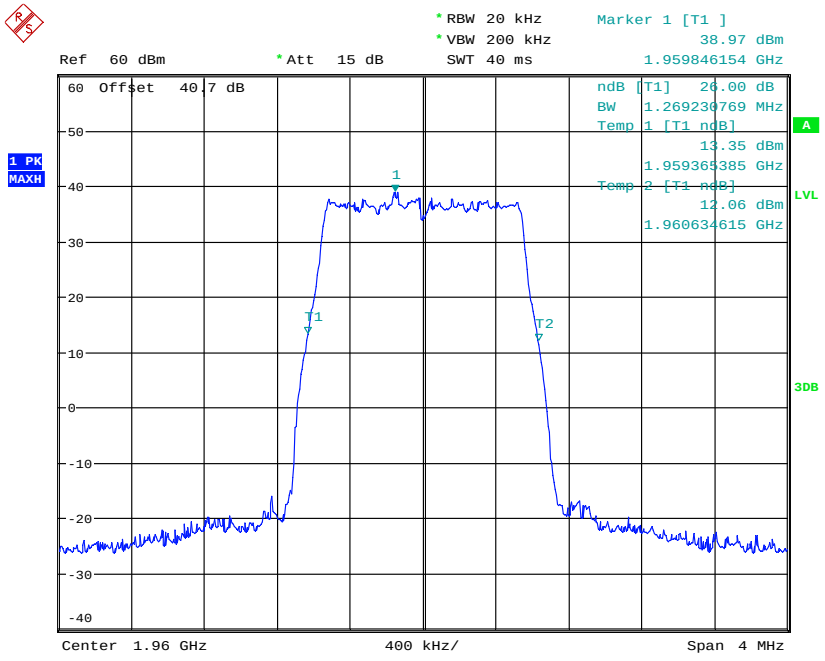
Date: 29.OCT.2014 10:18:05

Channel Position M - 16QAM / Bandwidth 1.4 MHz



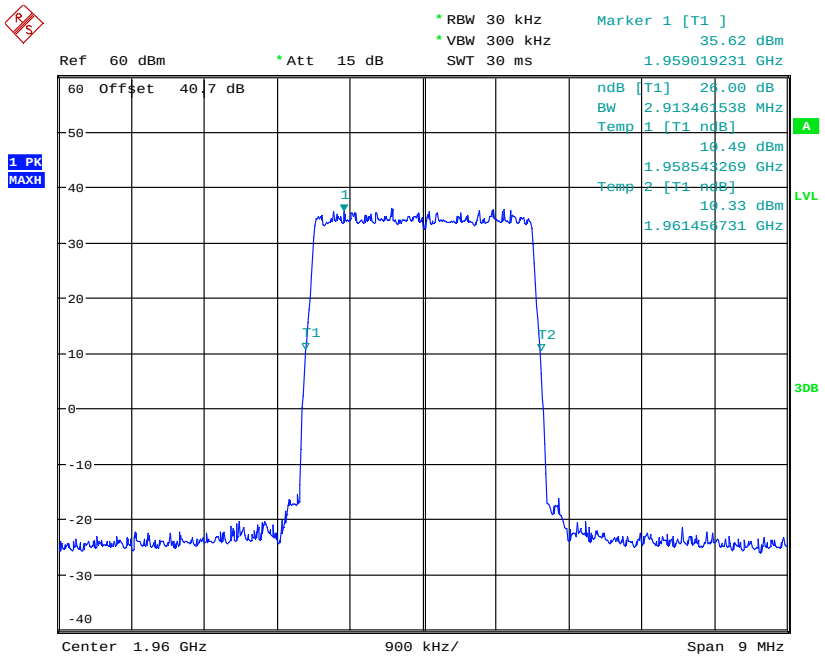
Date: 29.OCT.2014 15:33:48

Channel Position M - 64QAM / Bandwidth 1.4 MHz



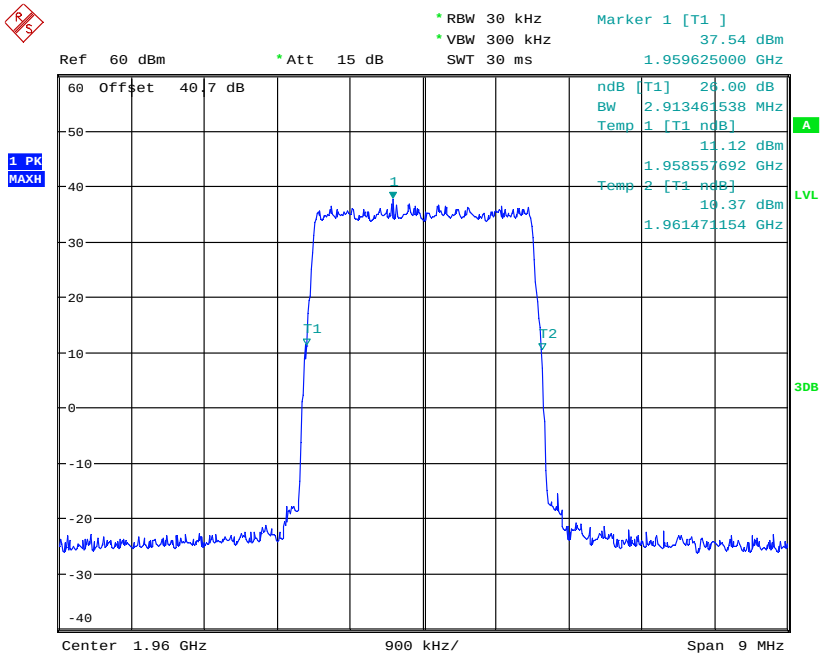
Date: 29.OCT.2014 15:34:41

Channel Position M - QPSK / Bandwidth 3.0 MHz



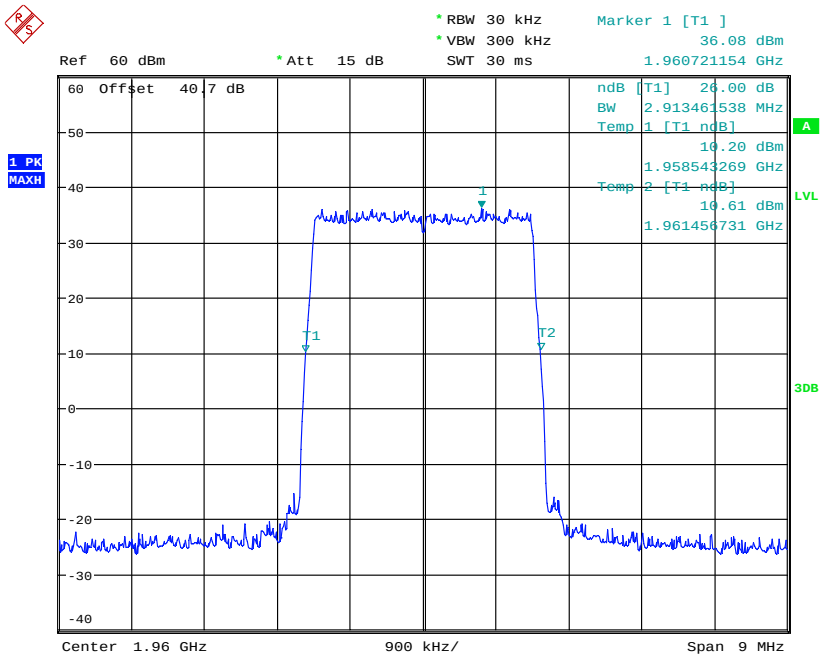
Date: 29.OCT.2014 15:03:33

Channel Position M - 16QAM / Bandwidth 3.0 MHz



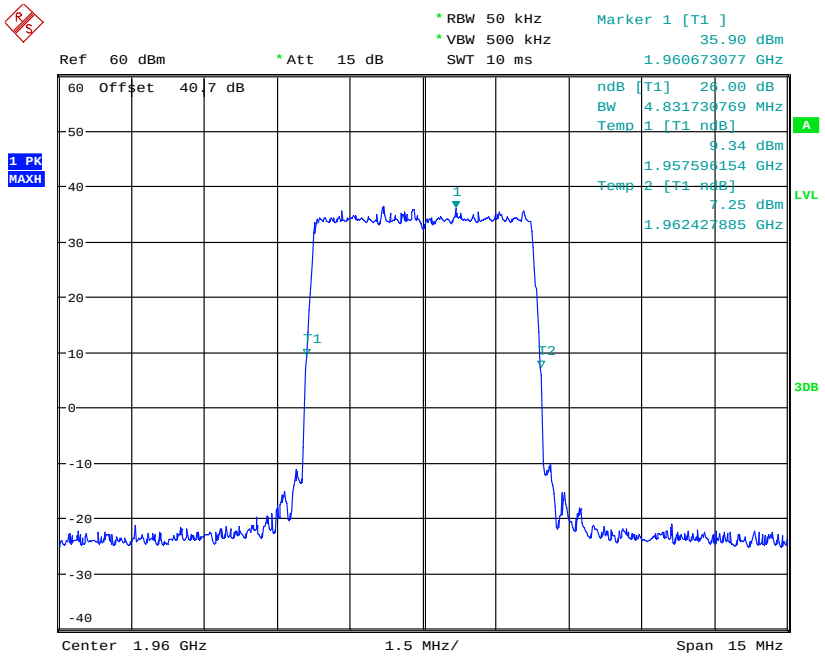
Date: 29.OCT.2014 15:40:51

Channel Position M - 64QAM / Bandwidth 3.0 MHz



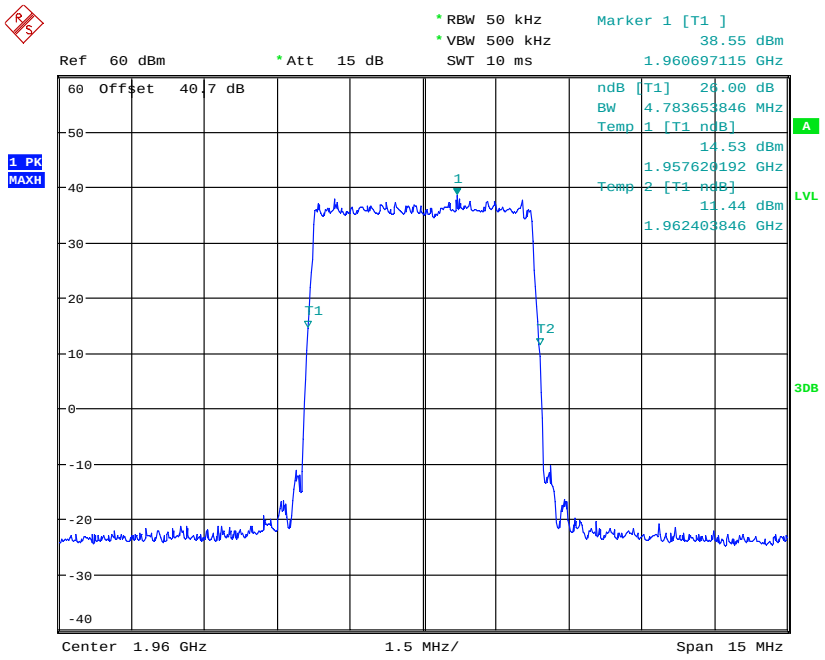
Date: 29.OCT.2014 15:42:53

Channel Position M - QPSK / Bandwidth 5.0 MHz



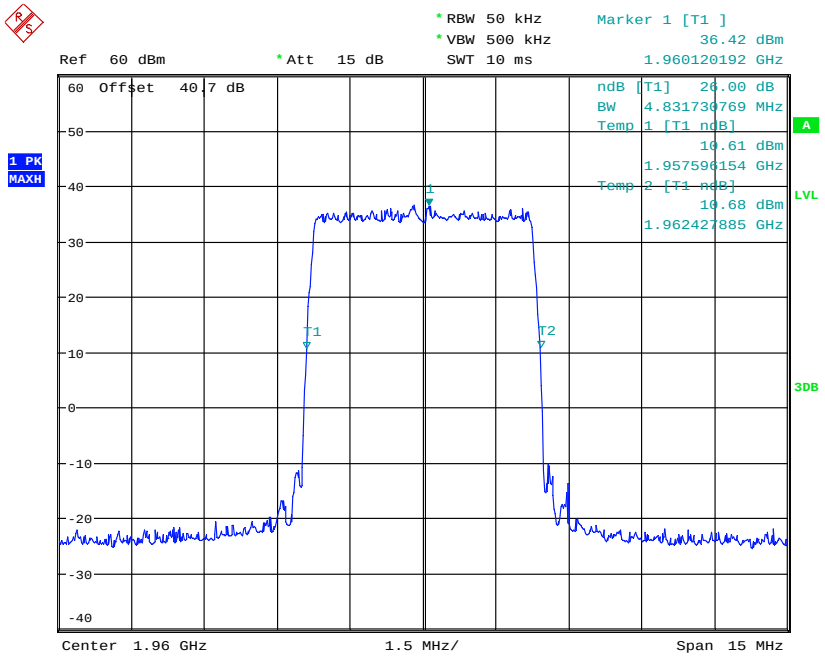
Date: 29.OCT.2014 14:58:41

Channel Position M - 16QAM / Bandwidth 5.0 MHz



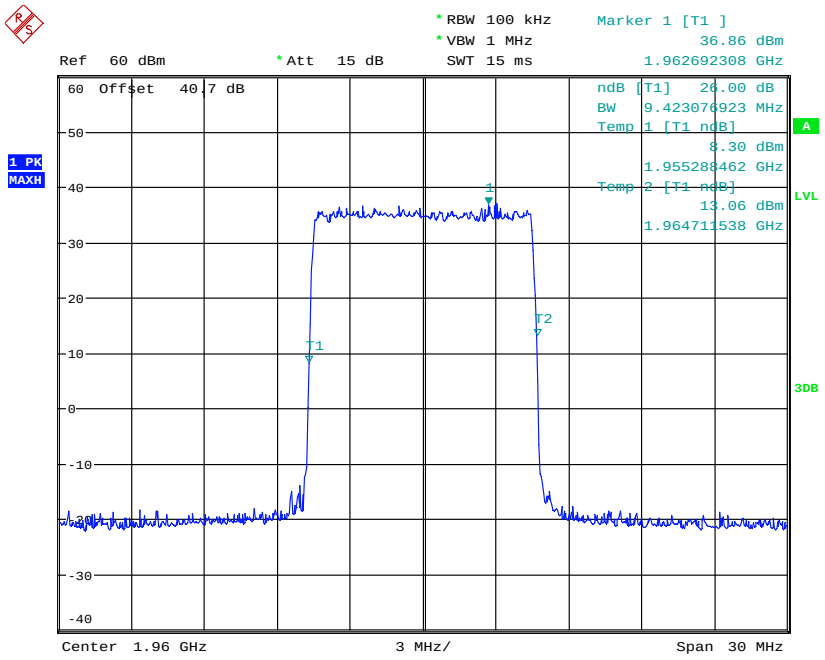
Date: 29.OCT.2014 15:50:17

Channel Position M - 64QAM / Bandwidth 5.0 MHz



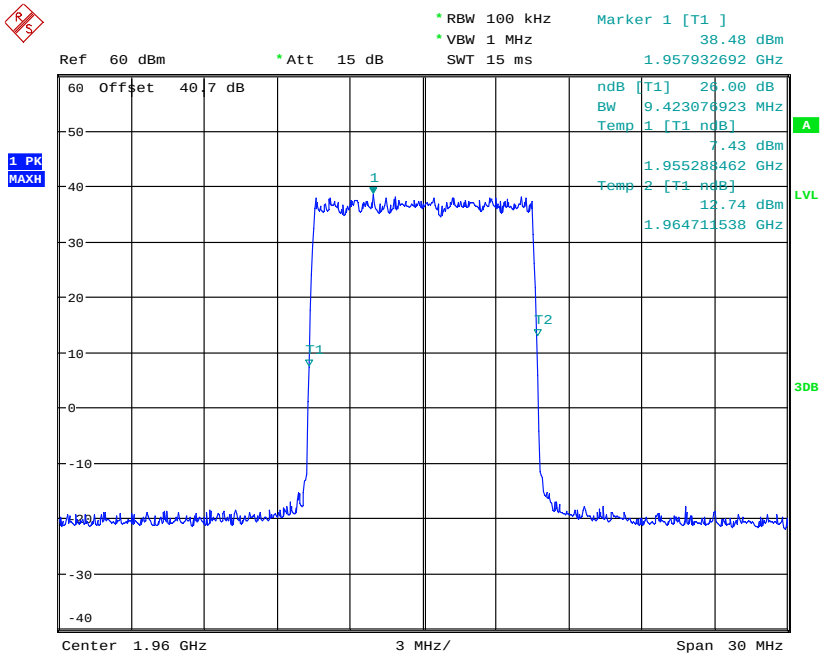
Date: 29.OCT.2014 15:51:20

Channel Position M - QPSK / Bandwidth 10.0 MHz



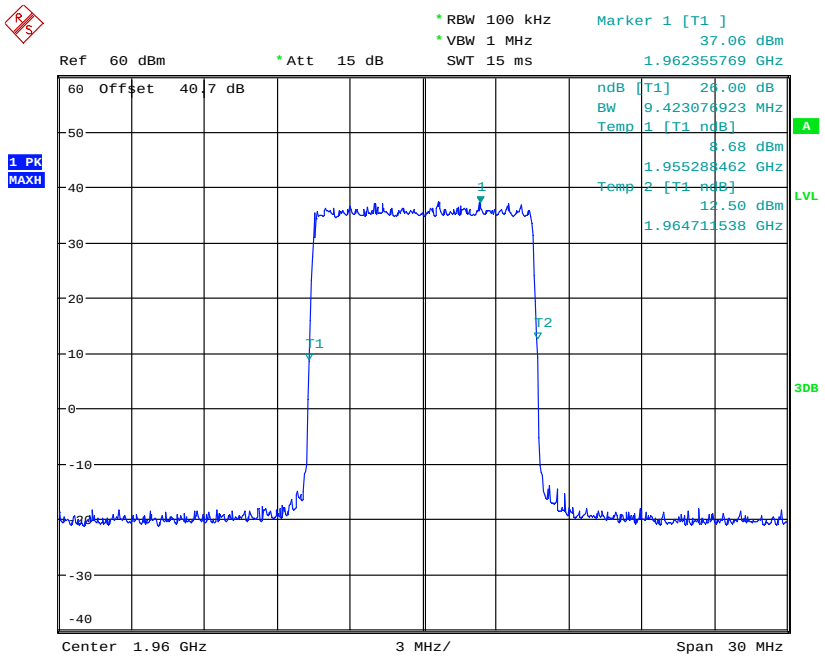
Date: 29.OCT.2014 15:08:45

Channel Position M - 16QAM / Bandwidth 10.0 MHz



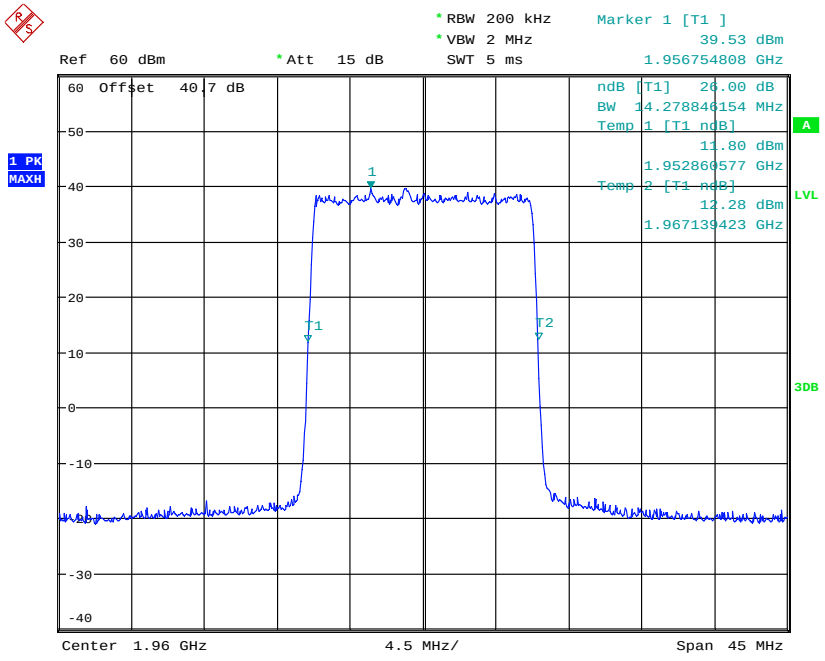
Date: 29.OCT.2014 15:06:03

Channel Position M - 64QAM / Bandwidth 10.0 MHz



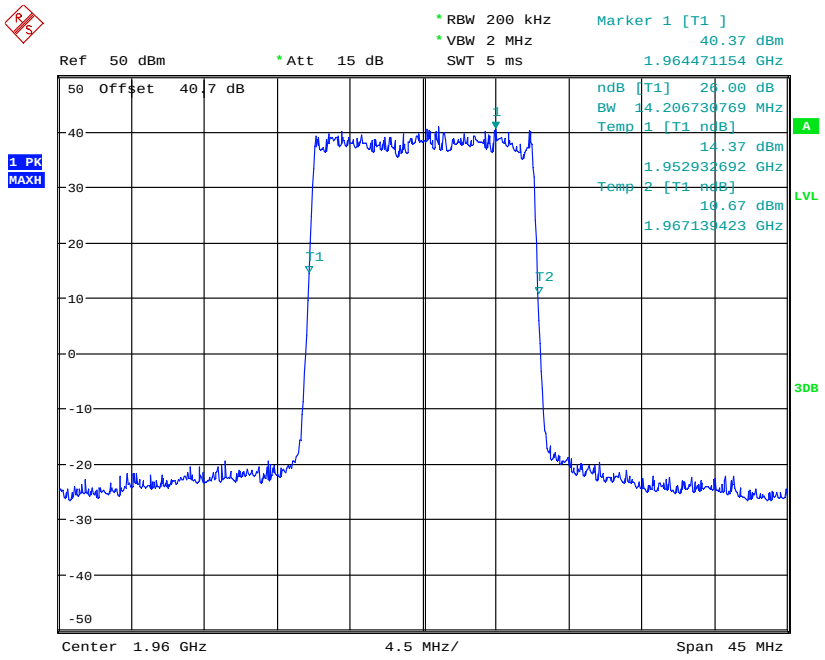
Date: 29.OCT.2014 15:59:39

Channel Position M - QPSK / Bandwidth 15.0 MHz



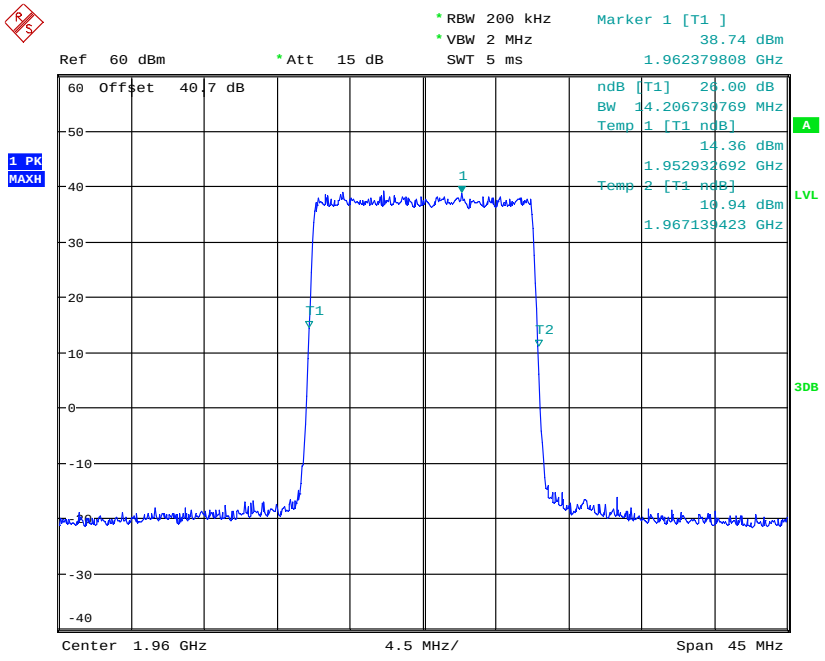
Date: 29.OCT.2014 15:14:39

Channel Position M - 16QAM / Bandwidth 15.0 MHz



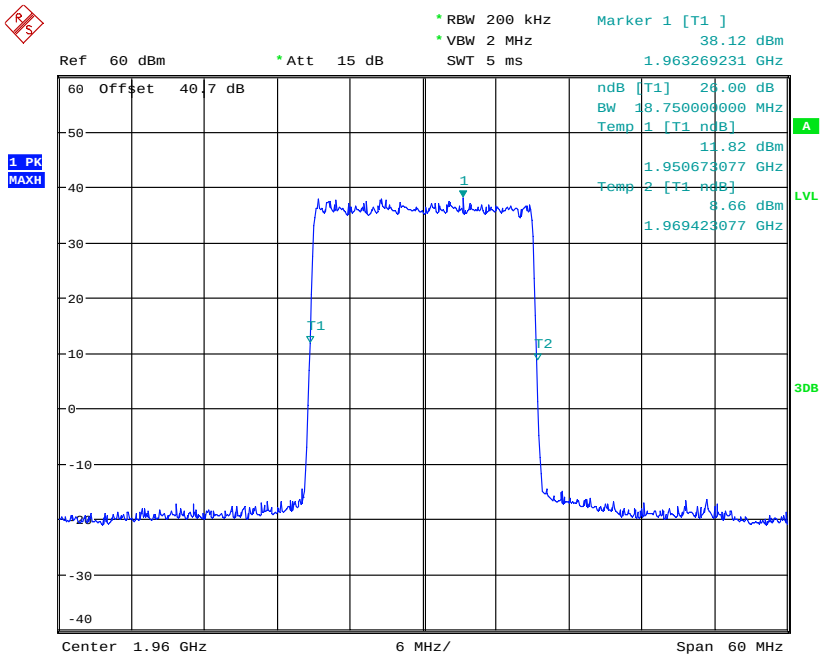
Date: 29.OCT.2014 16:02:39

Channel Position M - 64QAM / Bandwidth 15.0 MHz



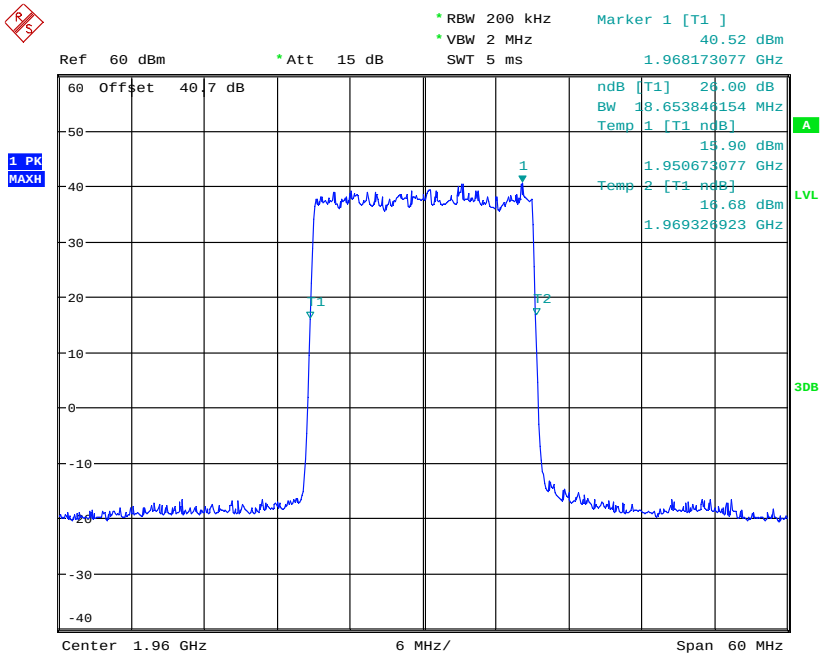
Date: 29.OCT.2014 16:06:57

Channel Position M - QPSK / Bandwidth 20.0 MHz



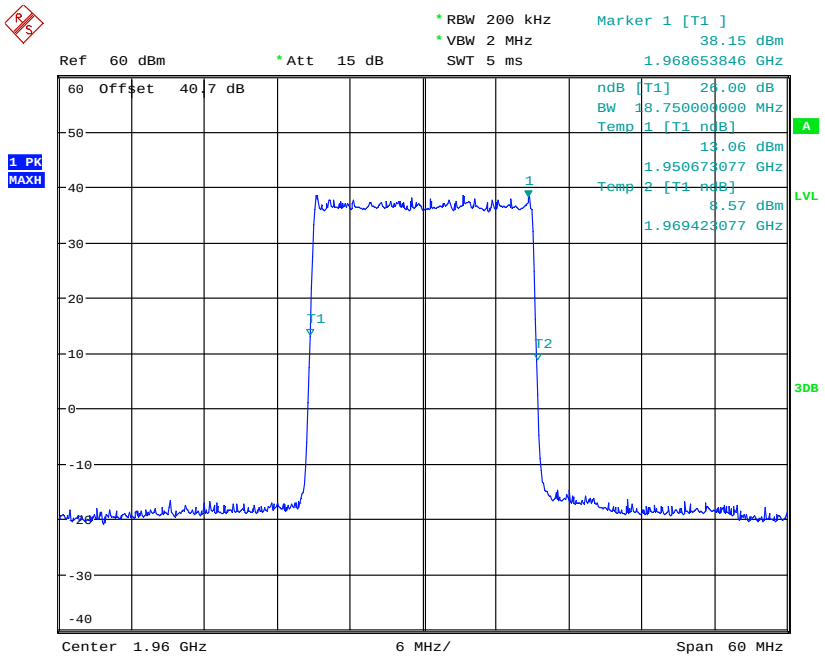
Date: 29.OCT.2014 15:20:22

Channel Position M – 16QAM / Bandwidth 20.0 MHz



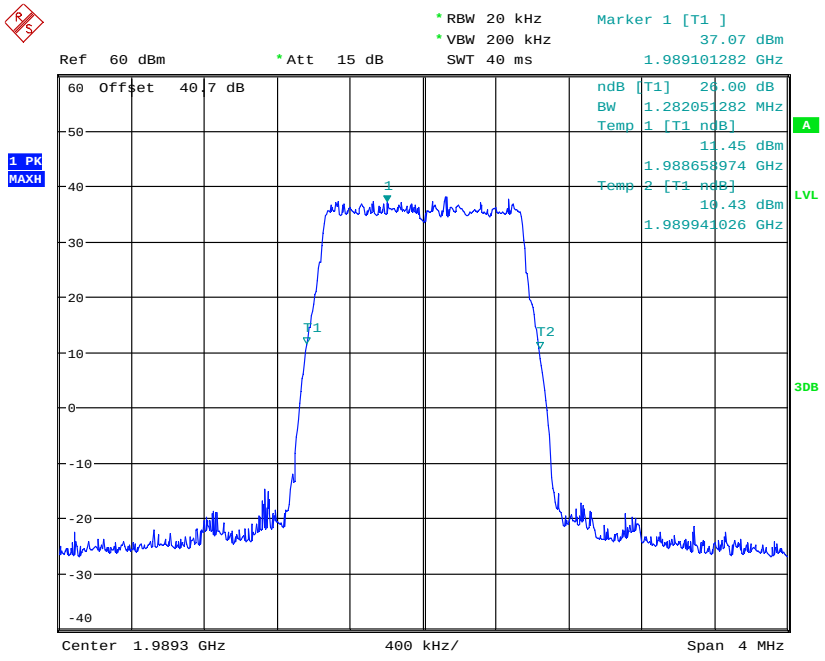
Date: 29.OCT.2014 16:09:45

Channel Position M – 64QAM / Bandwidth 20.0 MHz



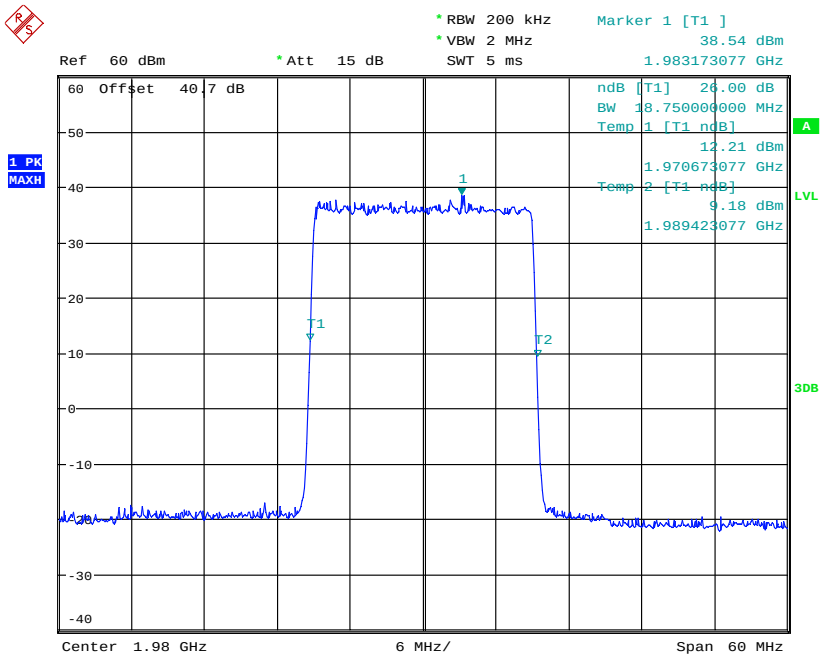
Date: 29.OCT.2014 16:12:30

Channel Position T - QPSK / Bandwidth 1.4 MHz



Date: 29.OCT.2014 10:26:14

Channel Position T - QPSK / Bandwidth 20.0 MHz



Date: 29.OCT.2014 15:28:08

2.3 SPURIOUS EMISSION AT BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238(b)
Industry Canada RSS-133, Clause 6.5

2.3.2 Equipment Under Test

RRUS 11 B2, KRC 161 276/2, S/N: CF82089083

2.3.3 Date of Test and Modification State

28 October to 03 November 2014 - Modification State 0

2.3.4 Test Equipment Used

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

2.3.5 Environmental Conditions

Ambient Temperature	24.1 - 25.5°C
Relative Humidity	26.5 - 28.6%

2.3.6 Test Method

In accordance with FCC CFR 47 Part 24, Clause 24.238(b) and Industry Canada RSS-133, Clause 6.5, any emissions outside of the block edges shall be attenuated by at least 43 + 10 log (P). In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1% of the emission bandwith should be used.

For measurements of emissions > 1MHz away from the band edges, a RBW is 1MHz or greater should be used. A resolution bandwidth of 50kHz was used between 1MHz to 6MHz from the band edge. to compensate for the reduced mesurement bandwidth, the limit was adjusted with -13dB to -26dBm.

For MIMO mode configurations, the limit was adjusted with a correction of -3dB [10Log(2)] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 accounting for simultaneous transmission from antennas port RF A and RF B.

The path loss measured and entered as a reference level offset. The EUT was set to transmit at its maximum rated output power in the configurations described in the tables below. Measurements were made at the Top and Bottom of the band.

The results are shown in the plots below.

2.3.7 Test Results

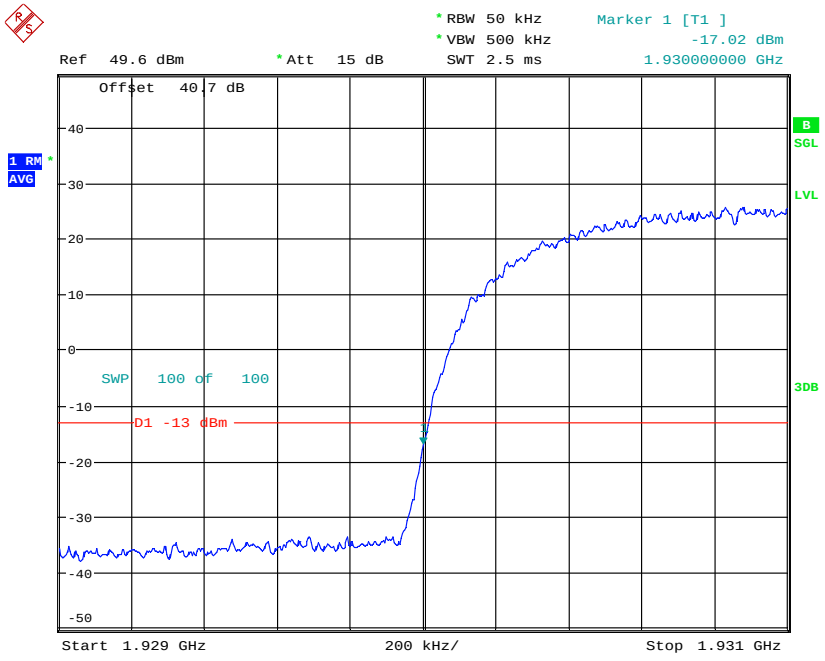
Configuration W- SC (1C)

Maximum Output Power 46.0dBm per port

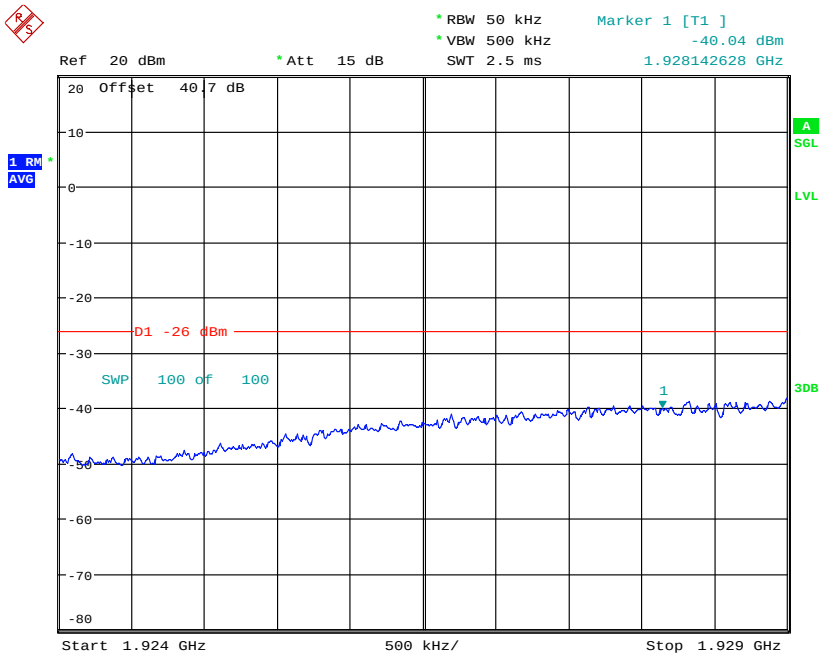
Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 1930.0 MHz	5.0 MHz	1932.4MHz
Channel Position T 1990.0 MHz	5.0 MHz	1987.6MHz

Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B – QPSK / Bandwidth 5.0 MHz

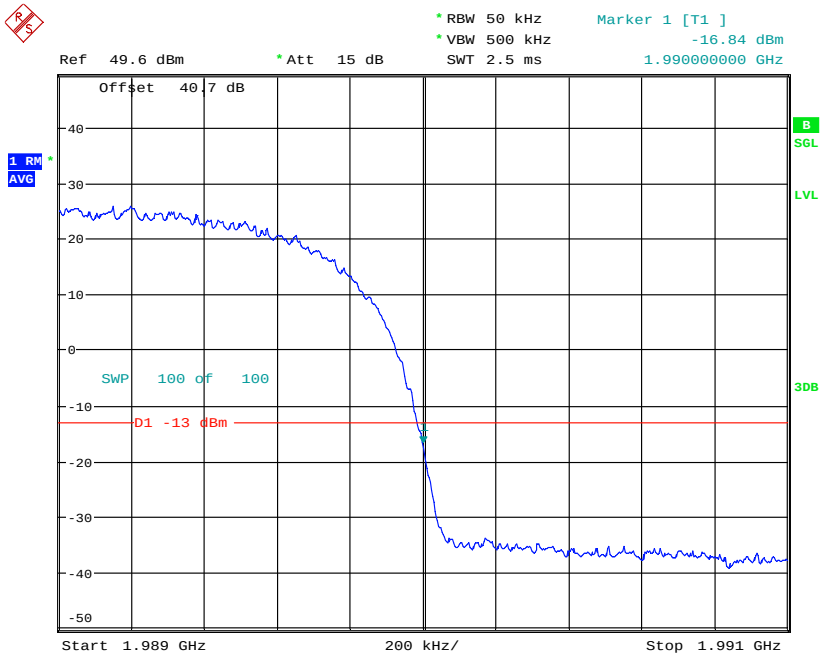


Date: 3.NOV.2014 14:00:22

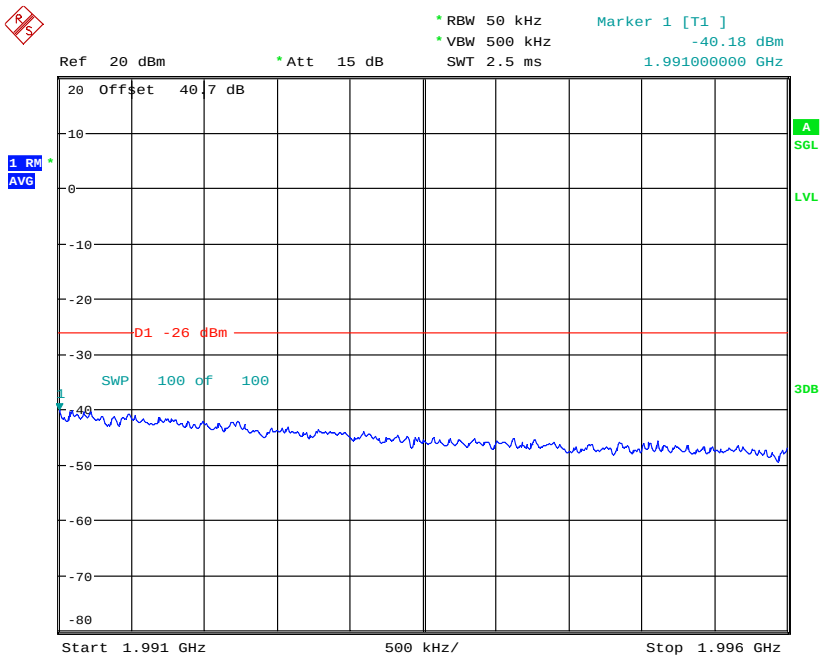


Date: 28.OCT.2014 15:18:12

Channel Position T – QPSK / Bandwidth 5.0 MHz



Date: 3.NOV.2014 14:06:09



Date: 28.OCT.2014 15:36:08

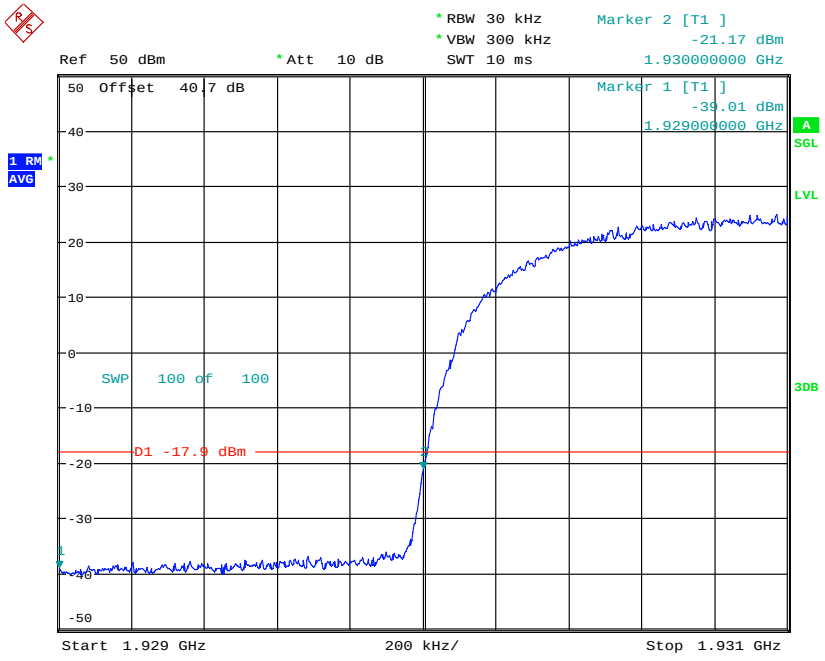
Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Band Edge Frequency	Channel Bandwidth	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	5.0 MHz	1932.4MHz
Channel Position T 1990.0 MHz	5.0 MHz	1987.6MHz

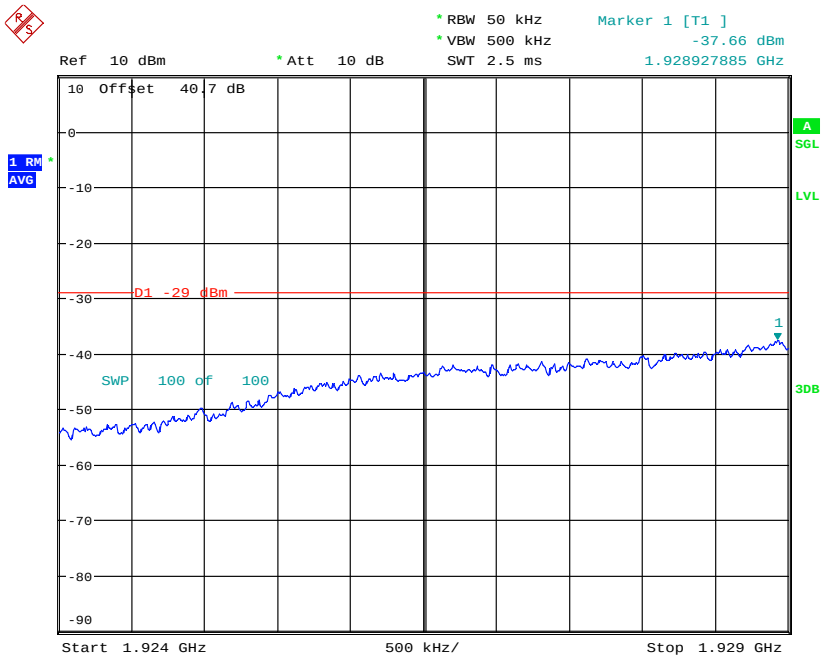
Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B_{RFBW} - 16QAM / Bandwidth 5.0 MHz



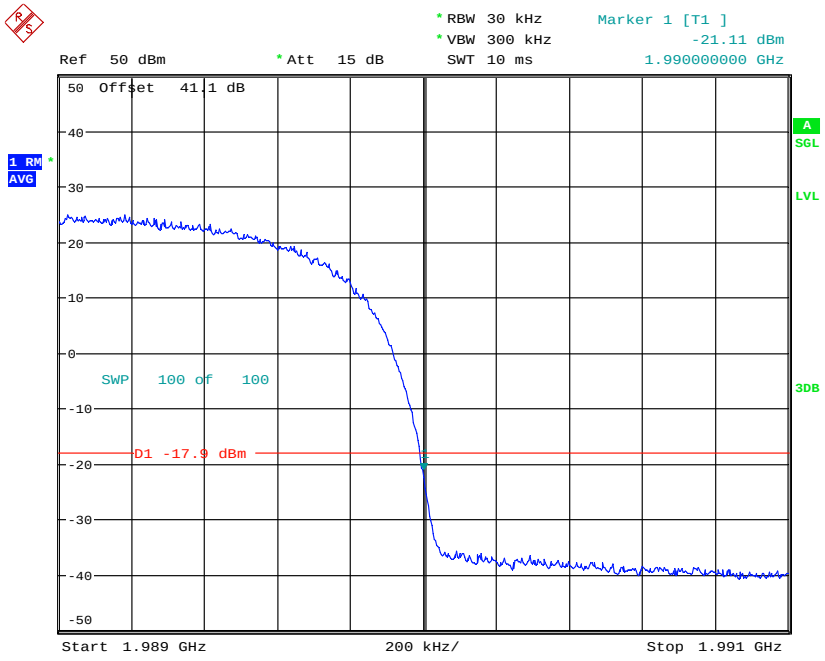
Date: 28.OCT.2014 14:57:01

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.66MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm (-13dBm -3dB [10Log(2)]) to -17.9dBm



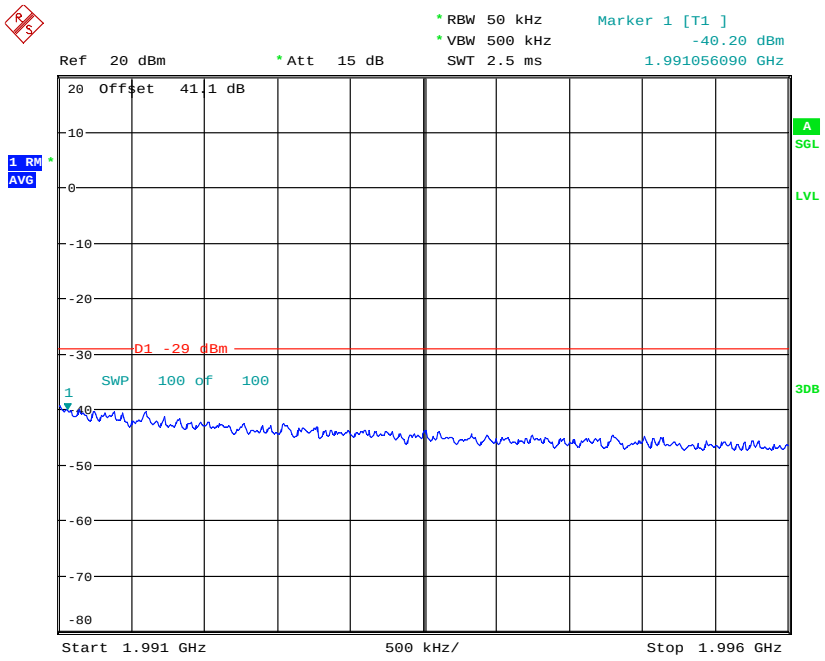
Date: 28.OCT.2014 14:57:47

Channel Position T_{RFBW} - 16QAM / Bandwidth 5.0 MHz



Date: 28.OCT.2014 16:17:46

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.66MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm (-13dBm -3dB [10Log(2)]) to -17.9dBm



Date: 28.OCT.2014 16:19:06

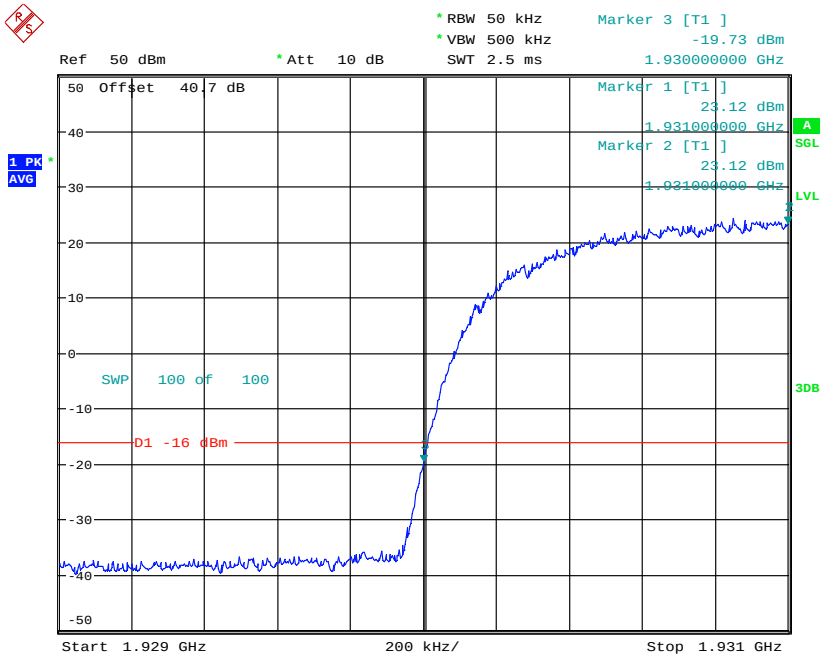
Configuration W-MIMO-MC 1 (2C)

Maximum Output Power 46.0dBm per port

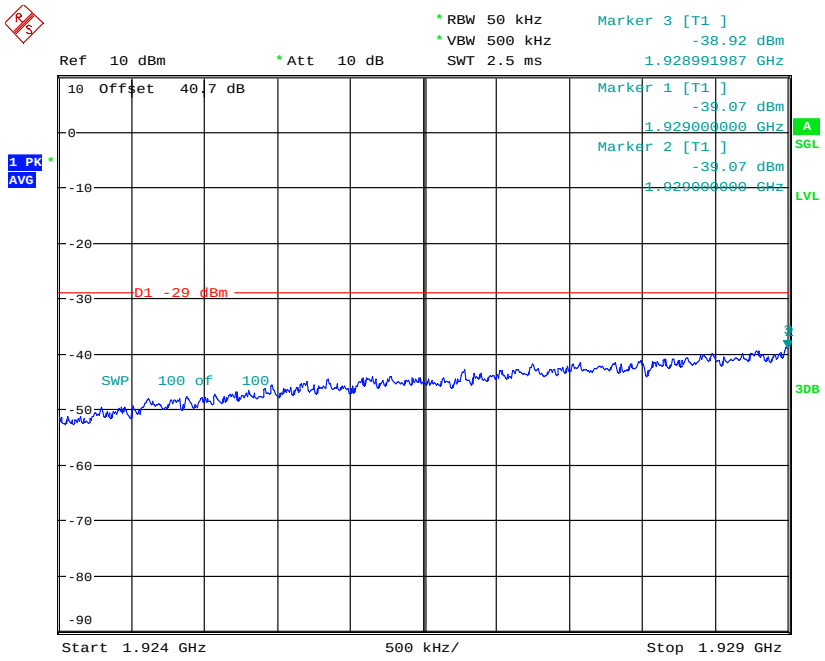
Band Edge Frequency	Channel Bandwidth	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	5.0 MHz	1932.4MHz + 1937.4MHz
Channel Position T_{RFBW} 1990.0 MHz	5.0 MHz	1982.6MHz + 1987.6MHz

Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B_{RFBW} - 16QAM / Bandwidth 5.0 MHz

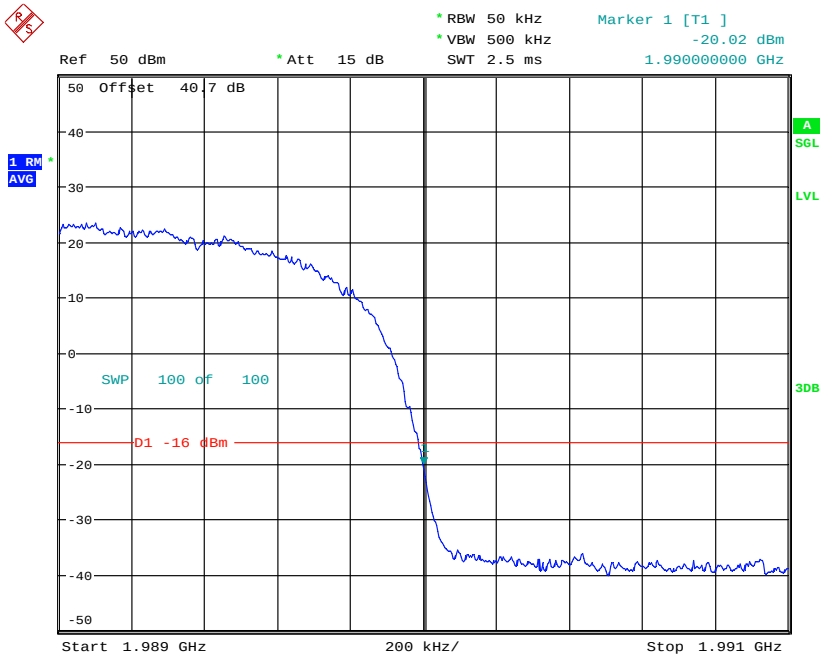


Date: 28.OCT.2014 12:55:32

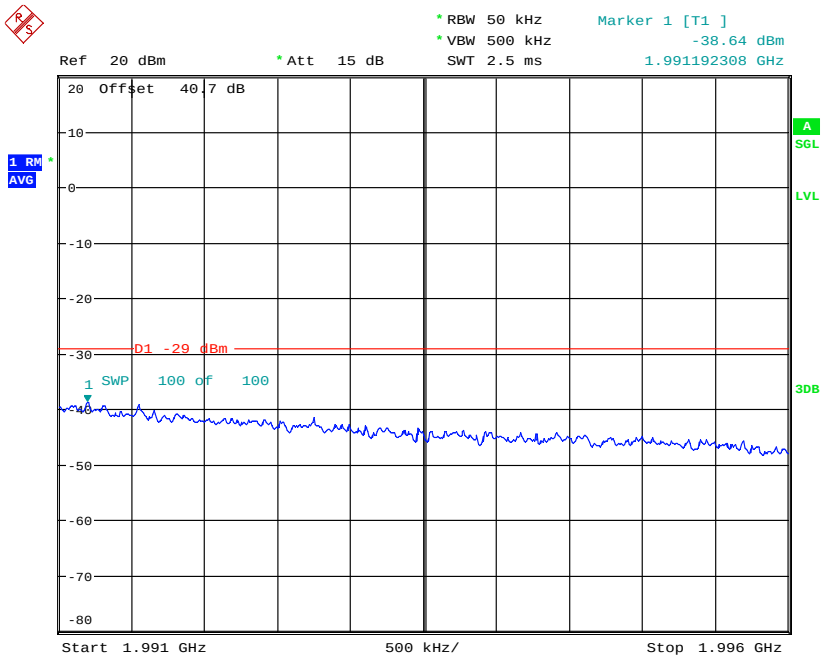


Date: 28.OCT.2014 12:56:36

Channel Position T_{RFBW} - 16QAM / Bandwidth 5.0 MHz



Date: 28.OCT.2014 10:31:49



Date: 28.OCT.2014 10:32:32

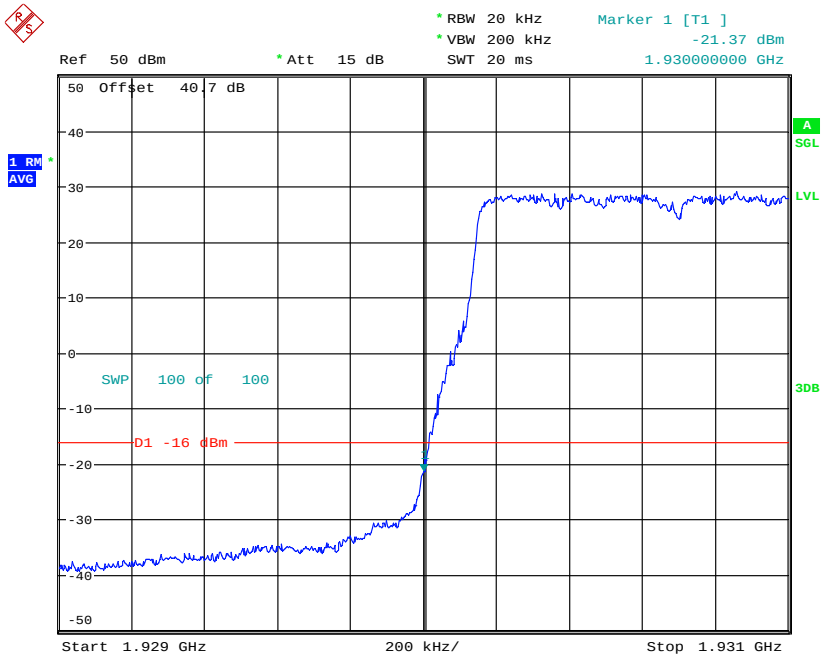
Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

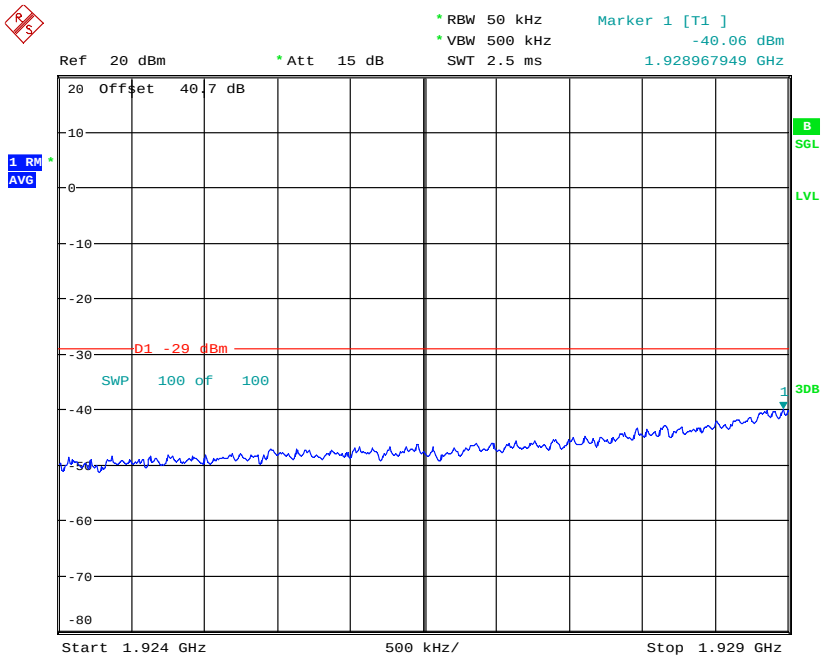
Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 1930.0 MHz	1.4 MHz	1930.7MHz
	3.0 MHz	1931.5MHz
	5.0 MHz	1932.5MHz
	10.0 MHz	1935.0MHz
	15.0 MHz	1937.5MHz
	20.0 MHz	1940.0MHz
Channel Position T 1990.0 MHz	1.4 MHz	1989.3MHz
	3.0 MHz	1988.5MHz
	5.0 MHz	1987.5MHz
	10.0 MHz	1985.0MHz
	15.0 MHz	1982.5MHz
	20.0 MHz	1980.0MHz

Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B - QPSK / Bandwidth 1.4 MHz

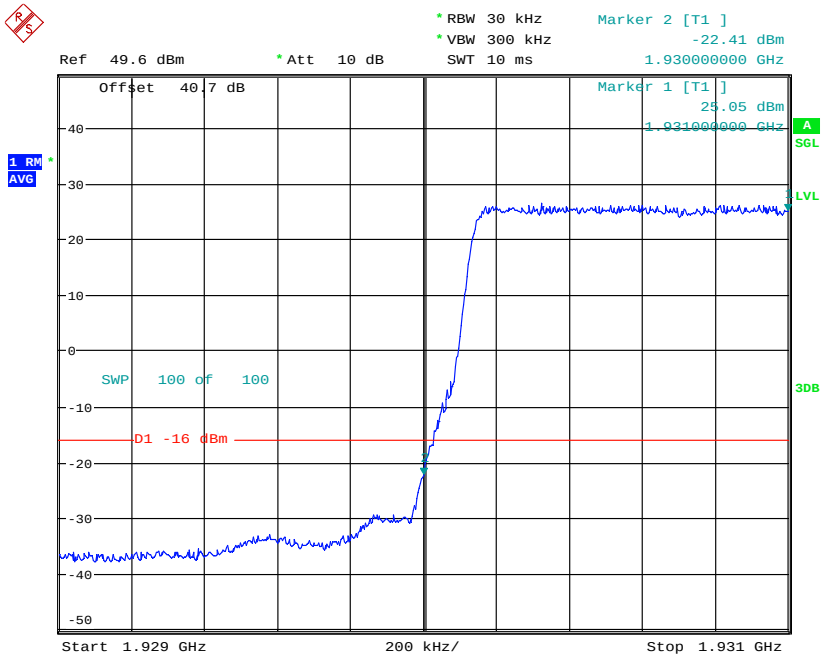


Date: 29.OCT.2014 10:01:21

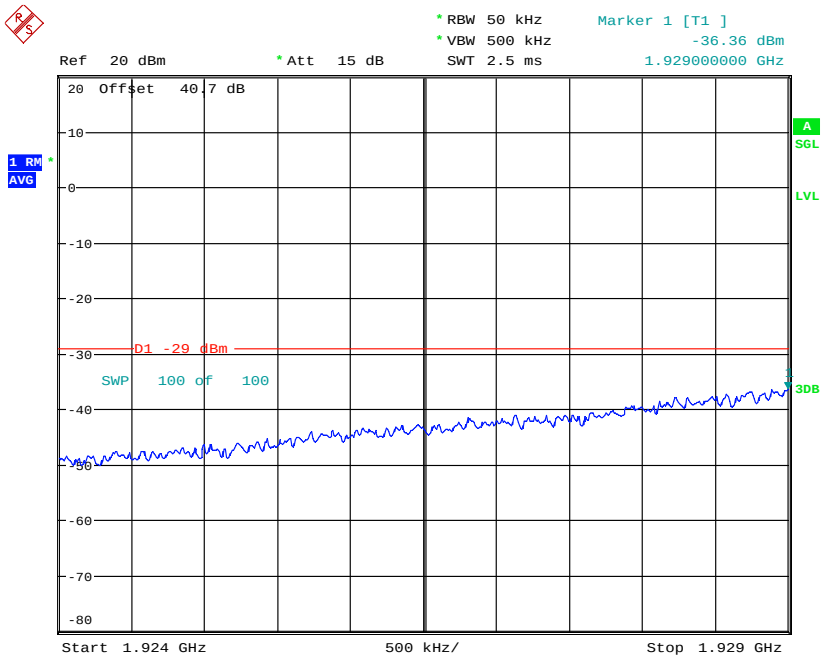


Date: 30.OCT.2014 09:39:03

Channel Position B - QPSK / Bandwidth 3.0 MHz

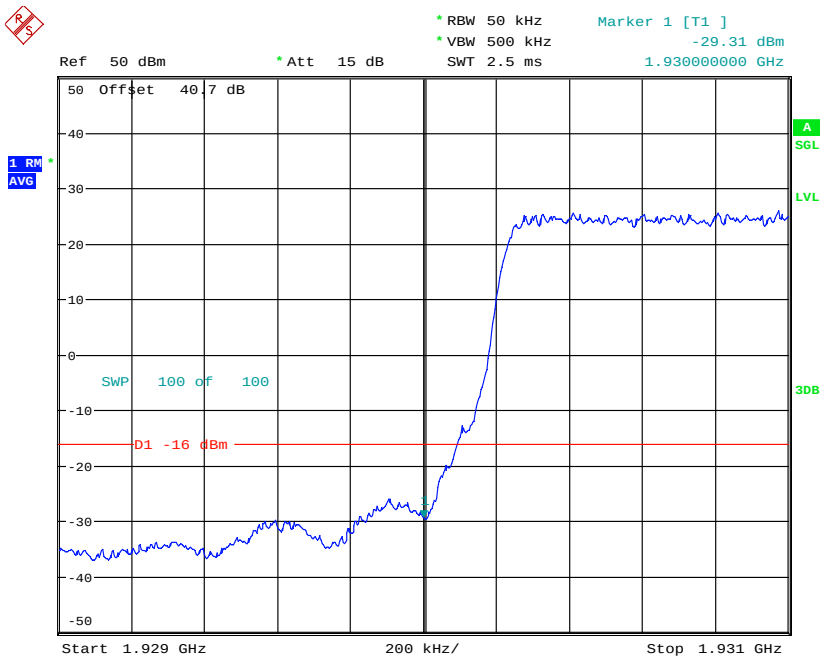


Date: 29.OCT.2014 13:55:20

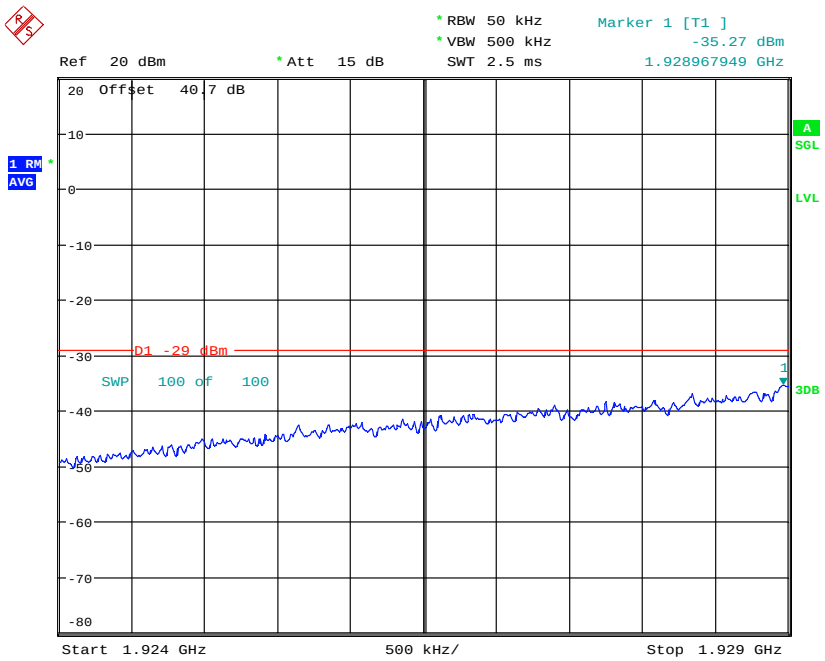


Date: 29.OCT.2014 13:57:03

Channel Position B - QPSK / Bandwidth 5.0 MHz

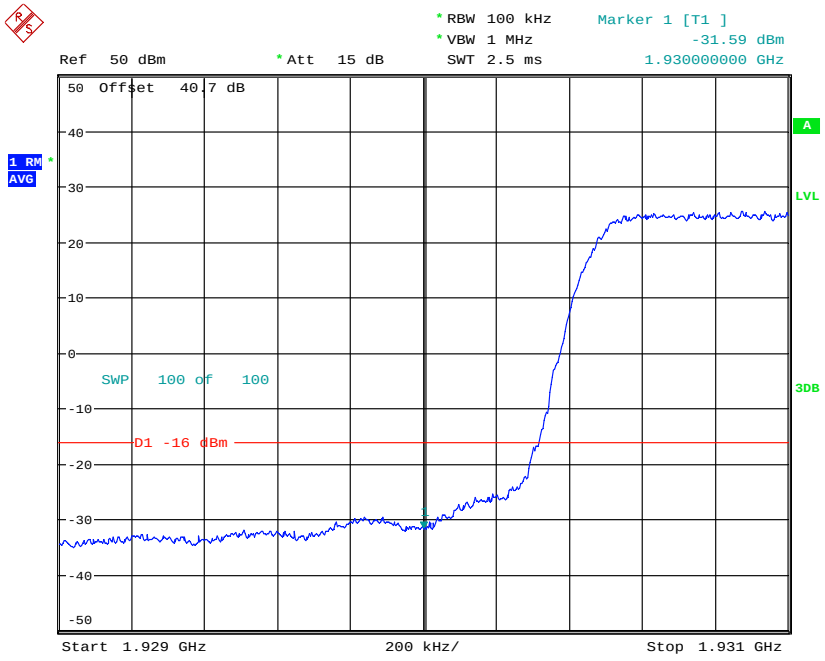


Date: 29.OCT.2014 14:03:00

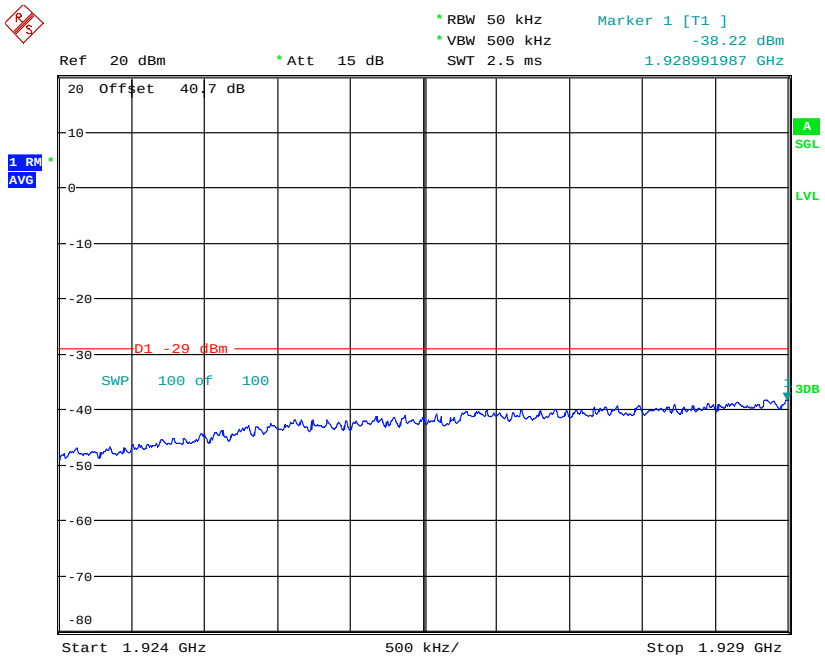


Date: 29.OCT.2014 14:05:03

Channel Position B - QPSK / Bandwidth 10.0 MHz

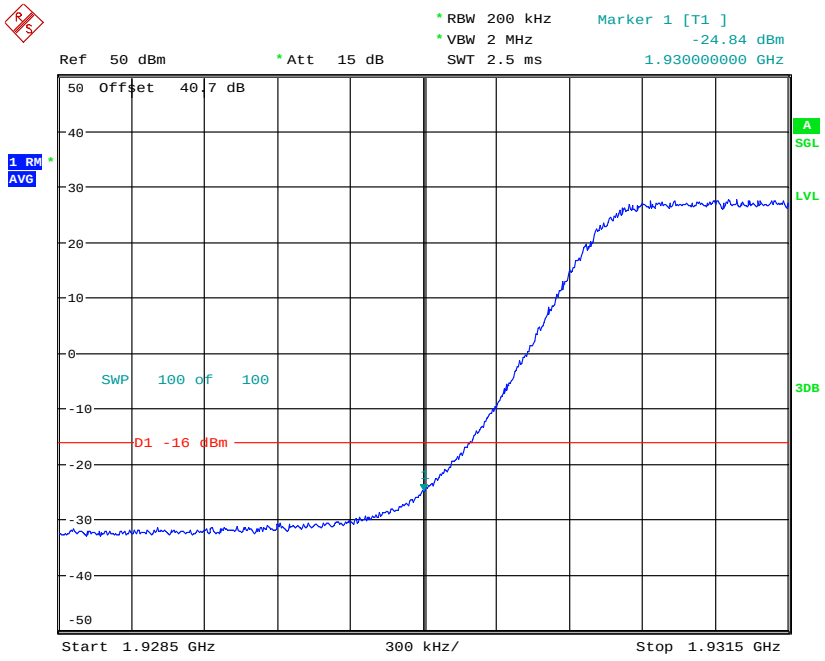


Date: 29.OCT.2014 14:09:49

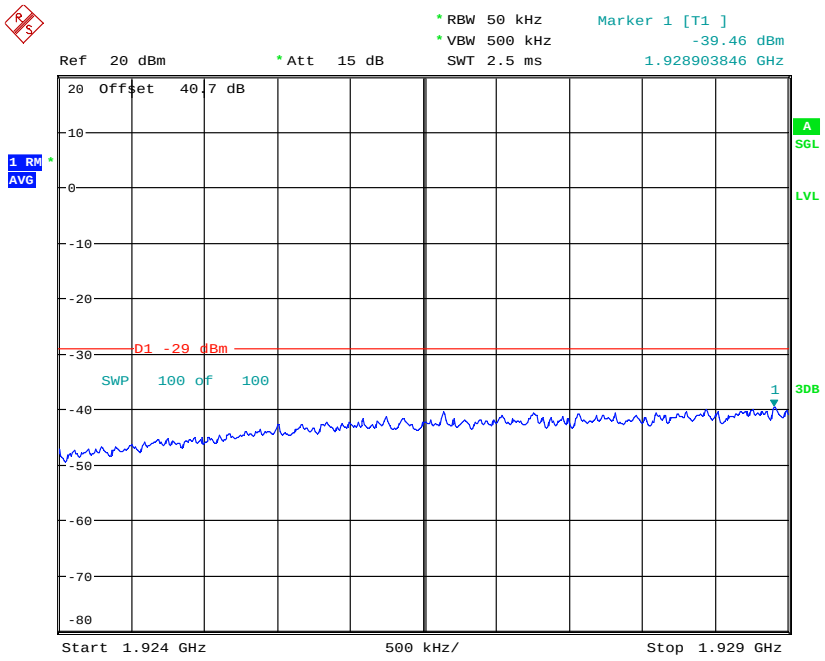


Date: 29.OCT.2014 14:13:07

Channel Position B - QPSK / Bandwidth 15.0 MHz

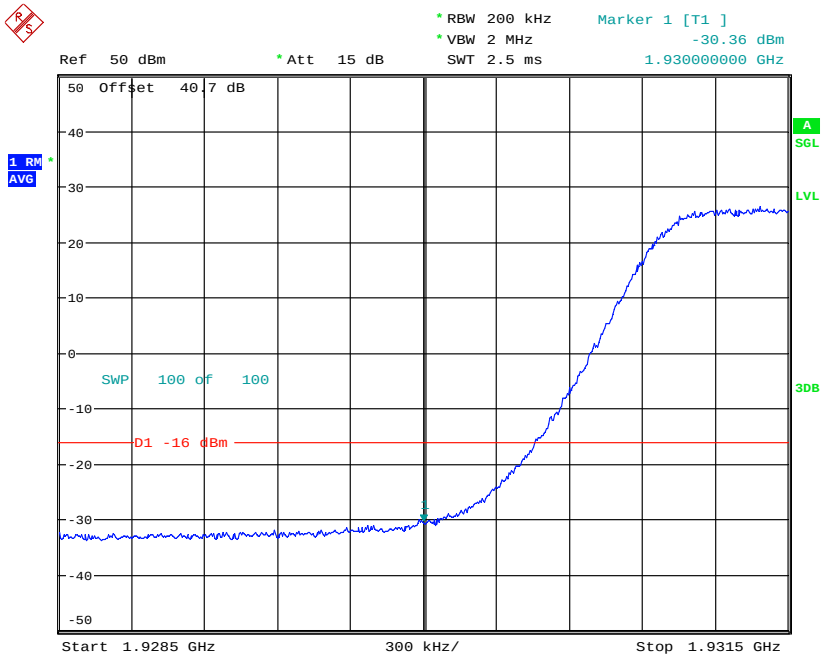


Date: 29.OCT.2014 14:19:34

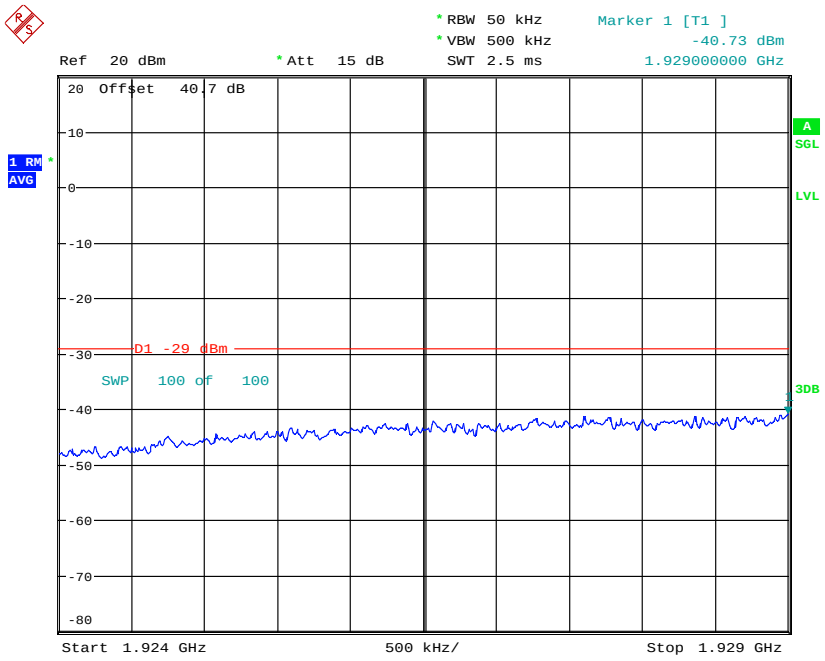


Date: 29.OCT.2014 14:20:51

Channel Position B - QPSK / Bandwidth 20.0 MHz

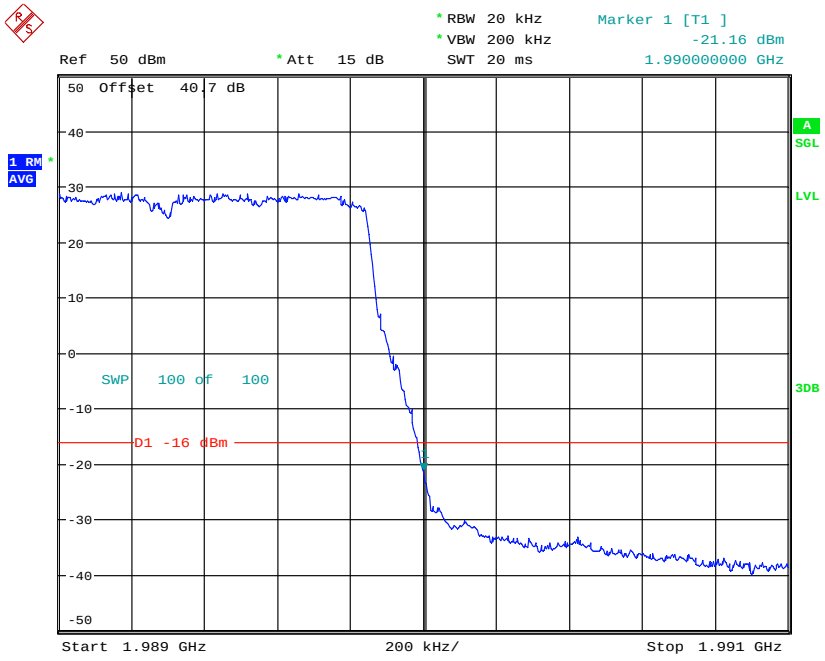


Date: 29.OCT.2014 14:39:08

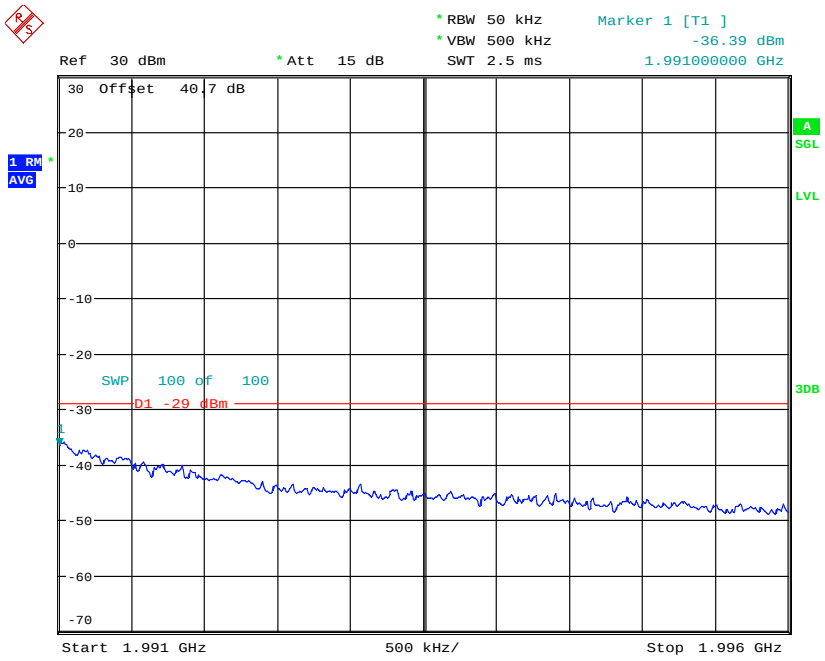


Date: 29.OCT.2014 14:37:59

Channel Position T - QPSK / Bandwidth 1.4 MHz

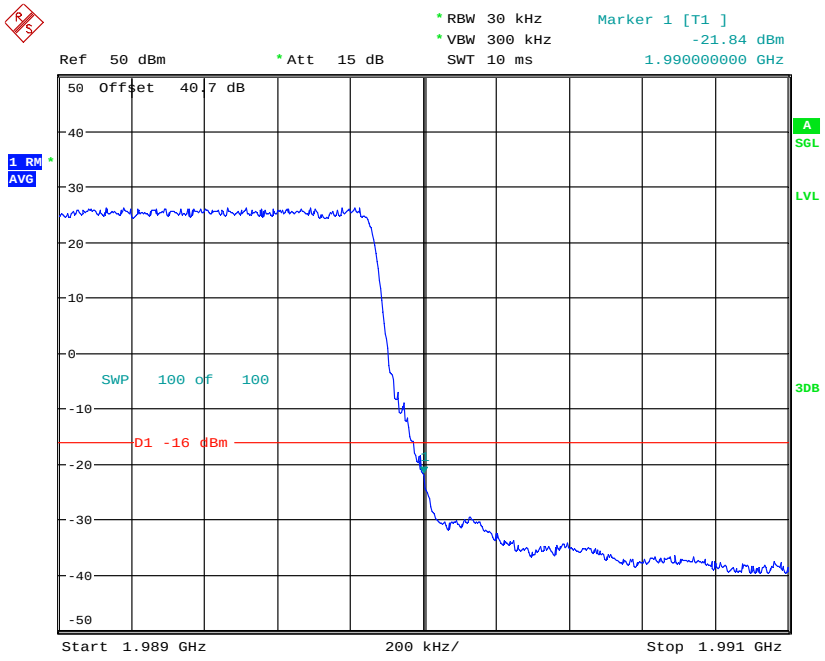


Date: 29.OCT.2014 10:28:32

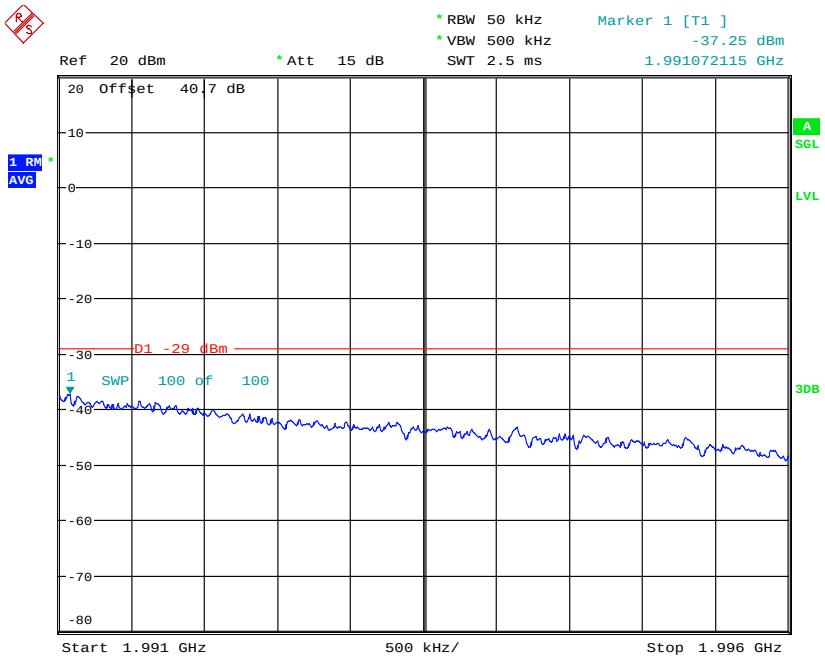


Date: 29.OCT.2014 10:31:04

Channel Position T - QPSK / Bandwidth 3.0 MHz

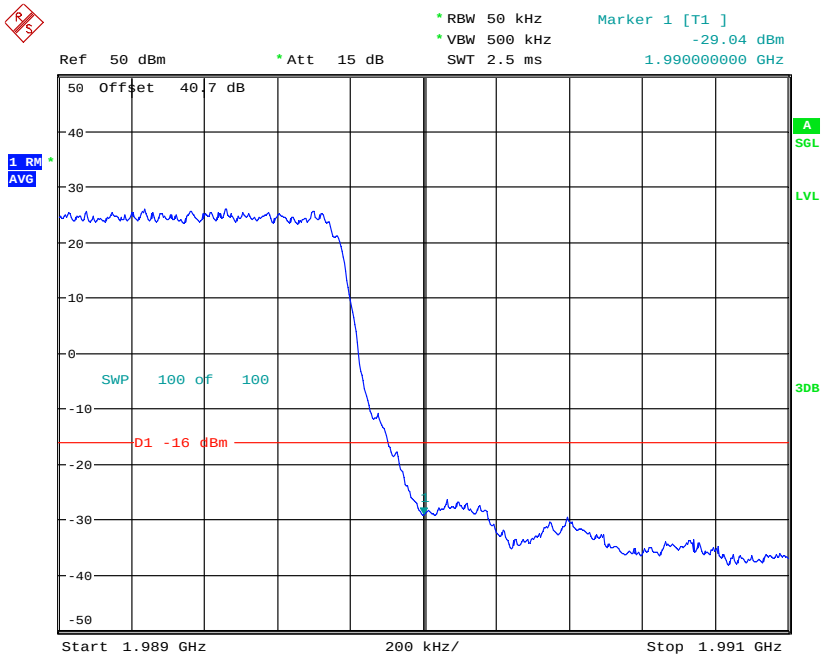


Date: 29.OCT.2014 14:00:09

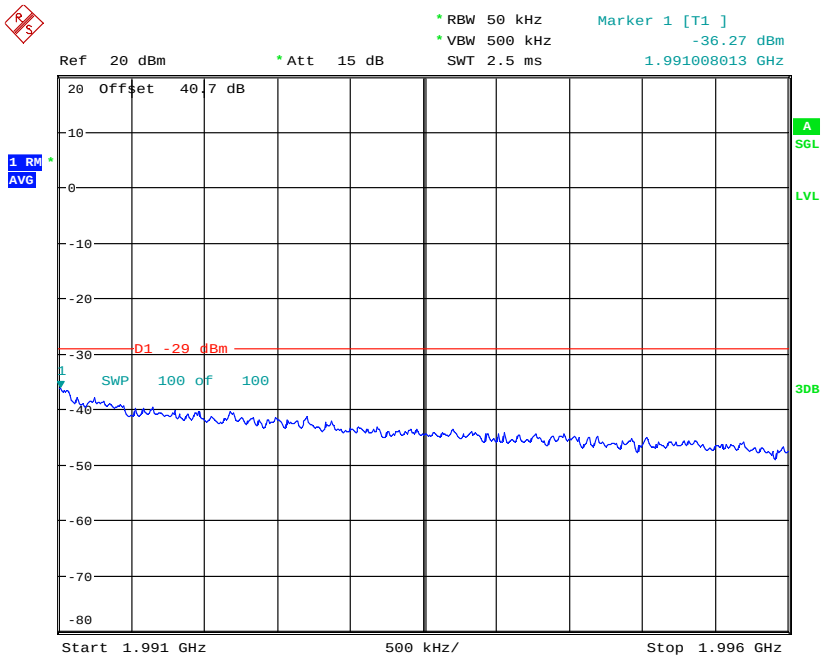


Date: 29.OCT.2014 13:59:13

Channel Position T - QPSK / Bandwidth 5.0 MHz

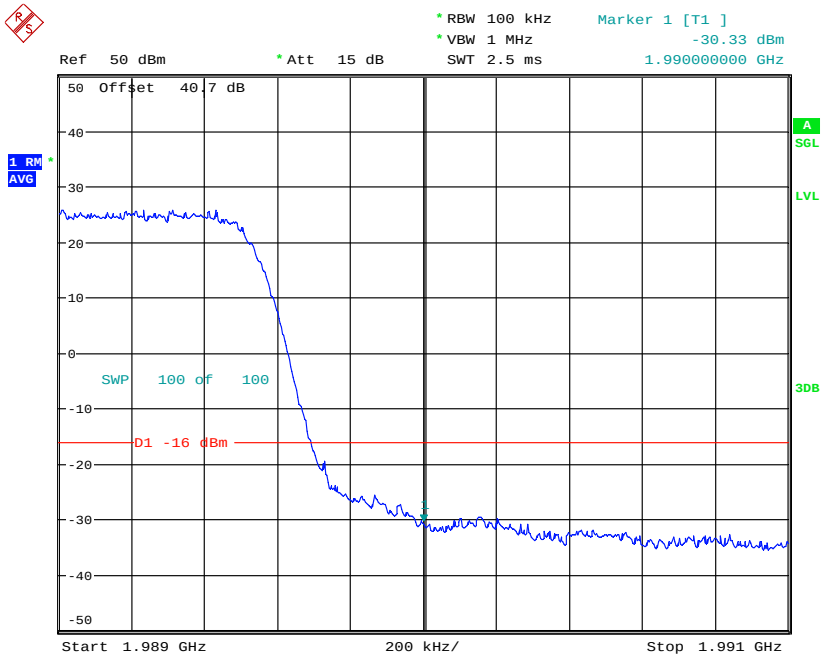


Date: 29.OCT.2014 14:07:53

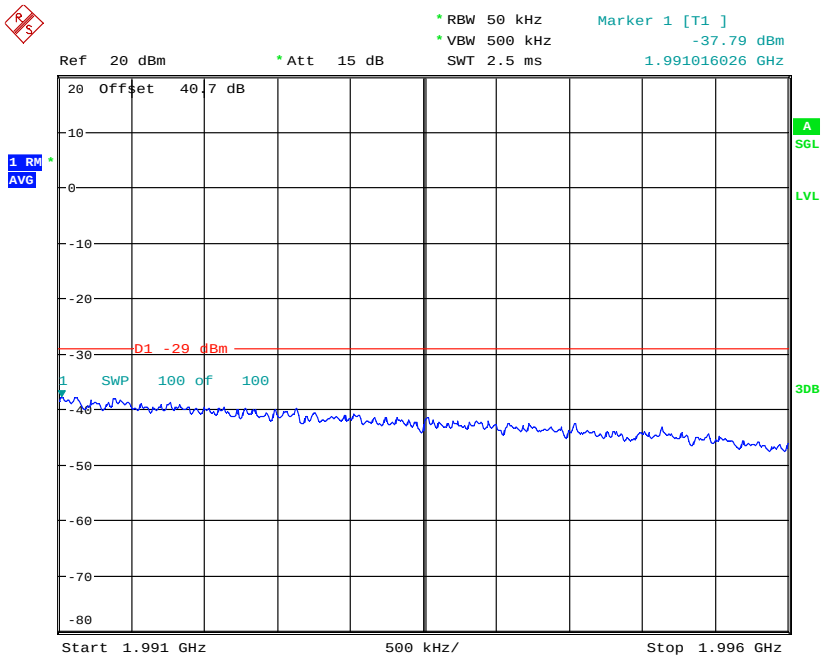


Date: 29.OCT.2014 14:07:05

Channel Position T - QPSK / Bandwidth 10.0 MHz

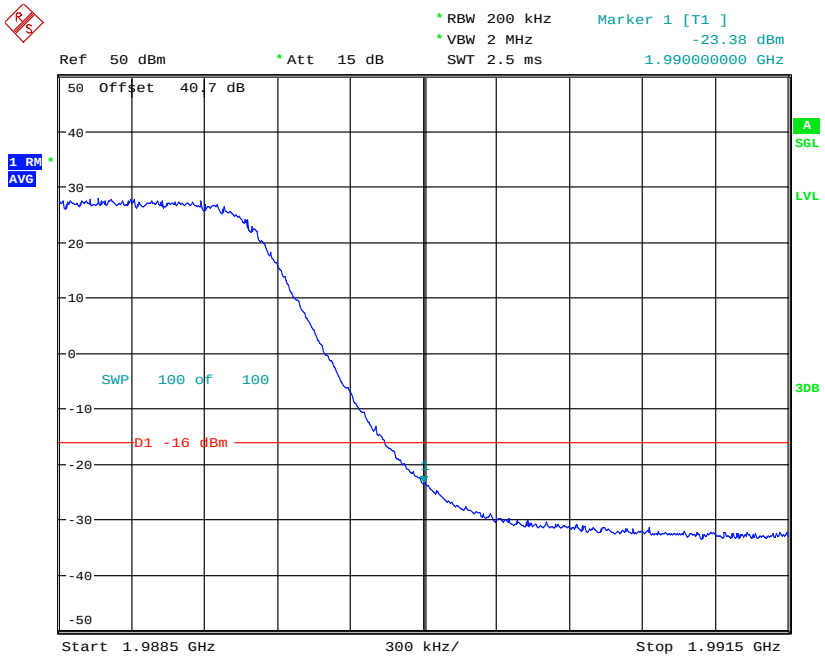


Date: 29.OCT.2014 14:15:12

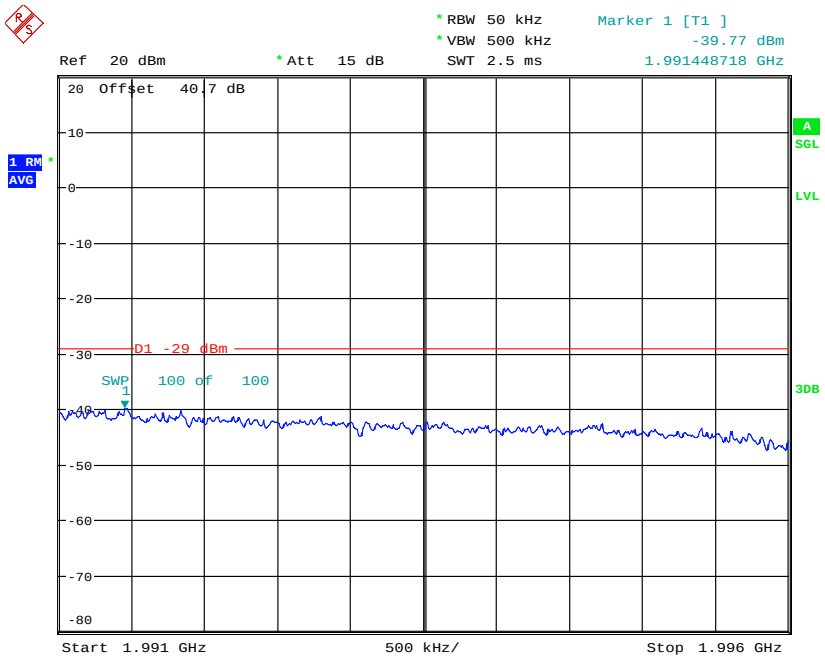


Date: 29.OCT.2014 14:14:02

Channel Position T - QPSK / Bandwidth 15.0 MHz

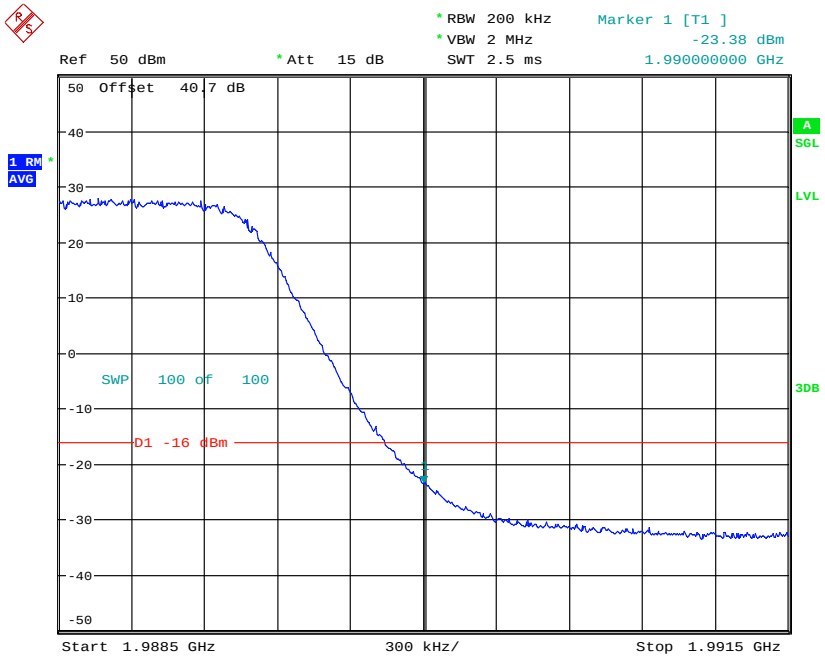


Date: 29.OCT.2014 14:24:54

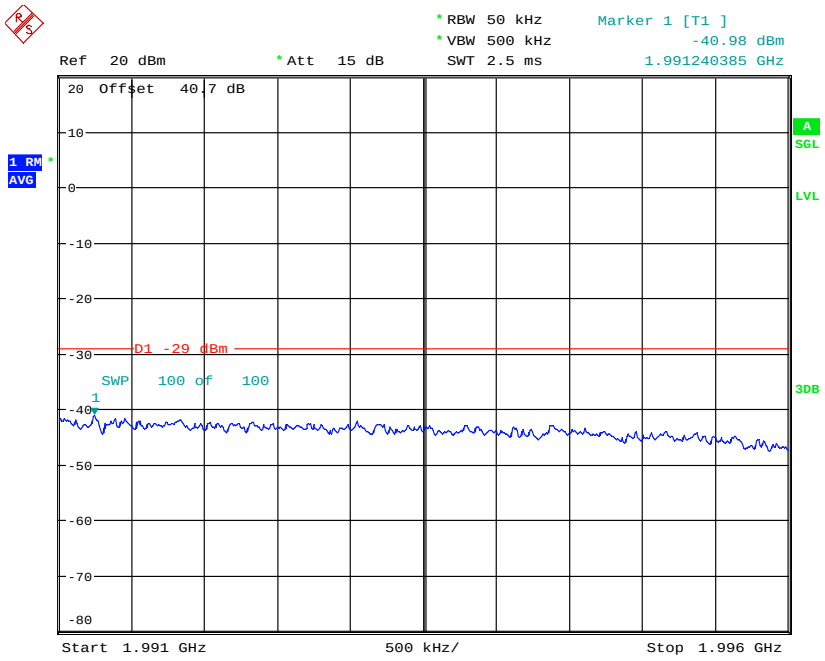


Date: 29.OCT.2014 14:23:26

Channel Position T - QPSK / Bandwidth 20.0 MHz



Date: 29.OCT.2014 14:32:58



Date: 29.OCT.2014 14:34:19

Configuration L-MIMO-MC 1 (2C)

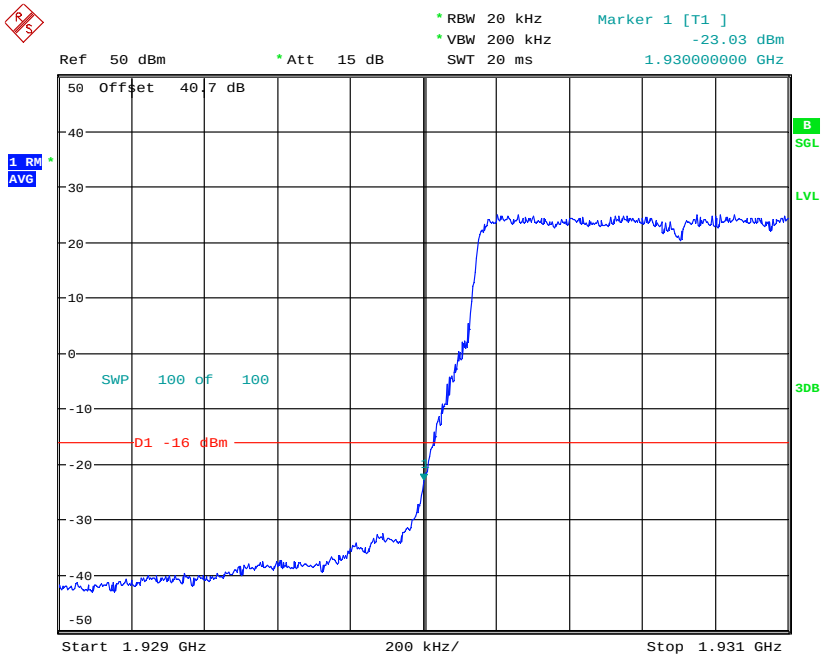
Maximum Output Power 45.5dBm per port LTE Bandwidth 1.4MHz, 3MHz and 5MHz

Maximum Output Power 46.0dBm per port LTE Bandwidth 10.0MHz

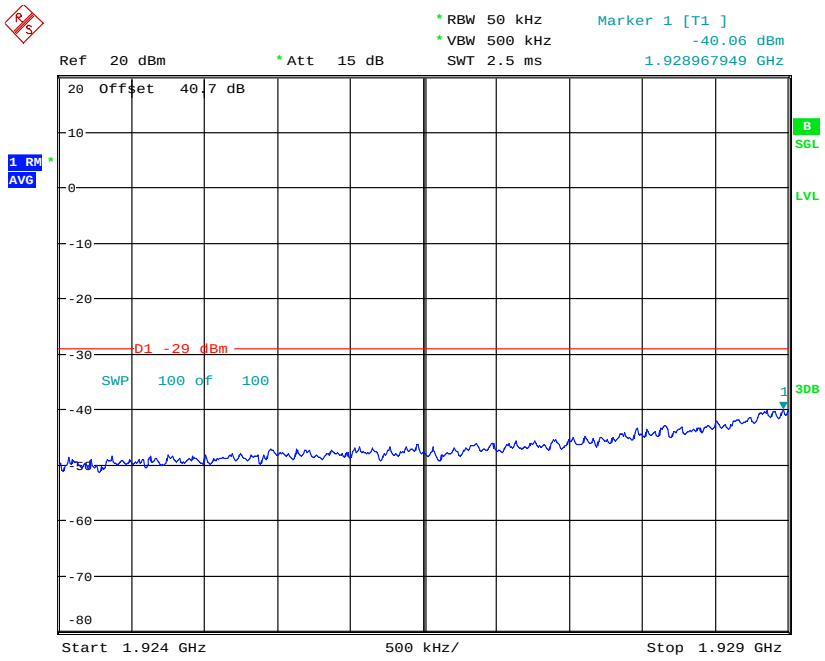
Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	1.4 MHz	1930.7MHz + 1932.1MHz
	3.0 MHz	1931.5MHz + 1934.5MHz
	5.0 MHz	1932.5MHz + 1937.5MHz
	10.0 MHz	1935.0MHz + 1945.0MHz
	15.0 MHz	-
	20.0 MHz	-
Channel Position T_{RFBW} 1990.0 MHz	1.4 MHz	1987.9MHz + 1989.3MHz
	3.0 MHz	1985.5MHz + 1988.5MHz
	5.0 MHz	1982.5MHz + 1987.5MHz
	10.0 MHz	1975.0MHz + 1985.0MHz
	15.0 MHz	-
	20.0 MHz	-

Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B_{RFBW} - QPSK / Bandwidth 1.4 MHz

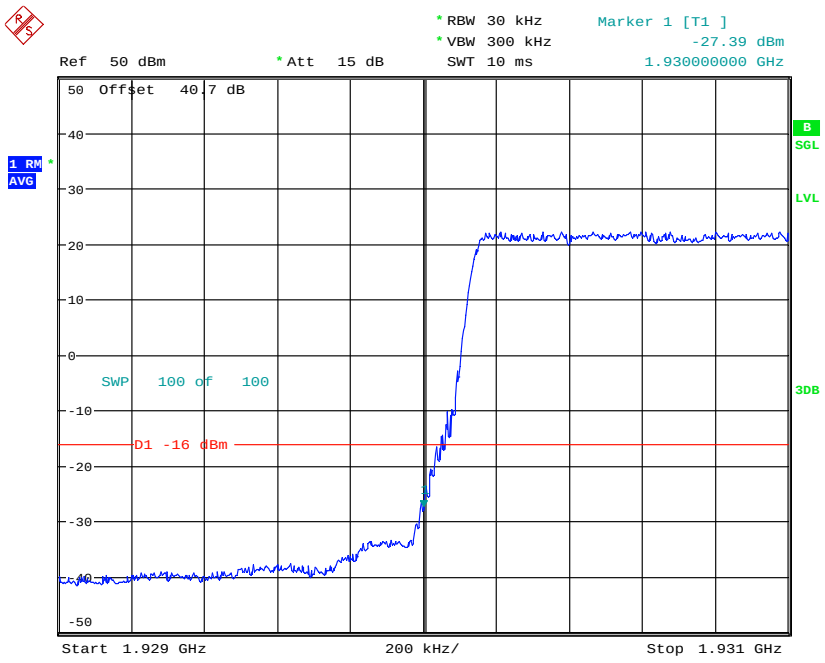


Date: 30.OCT.2014 09:37:17

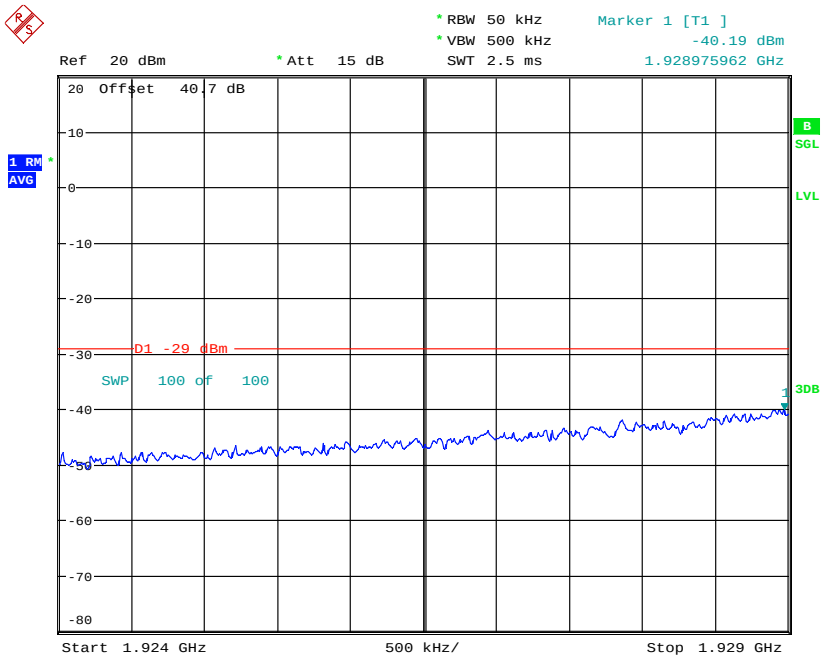


Date: 30.OCT.2014 09:39:01

Channel Position B_{RFBW} - QPSK / Bandwidth 3.0 MHz

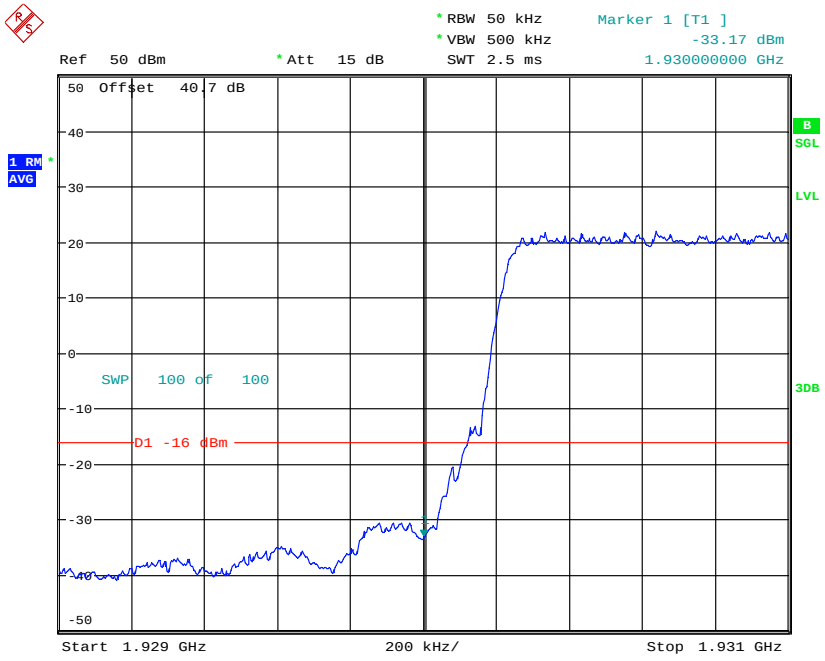


Date: 30.OCT.2014 10:02:06

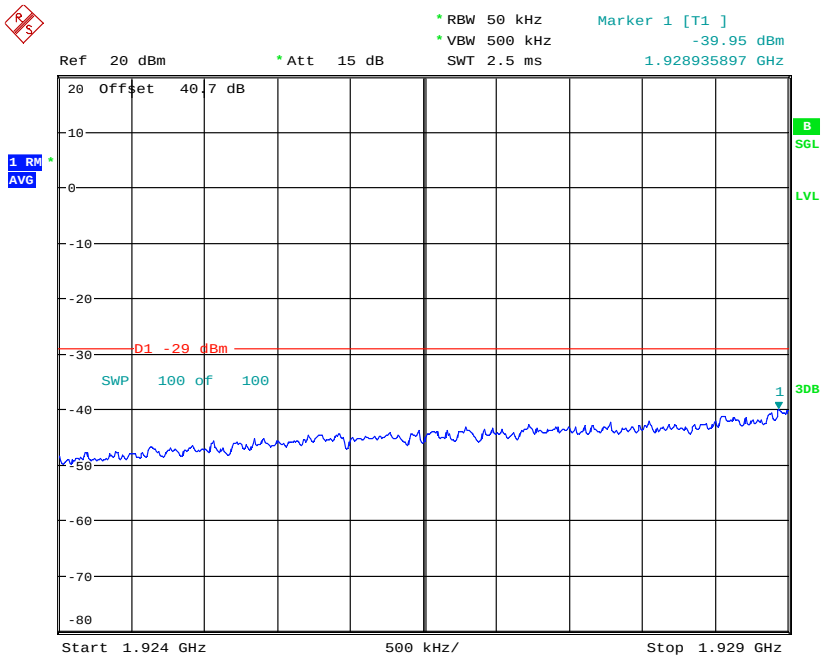


Date: 30.OCT.2014 10:03:40

Channel Position B_{RFBW} - QPSK / Bandwidth 5.0 MHz

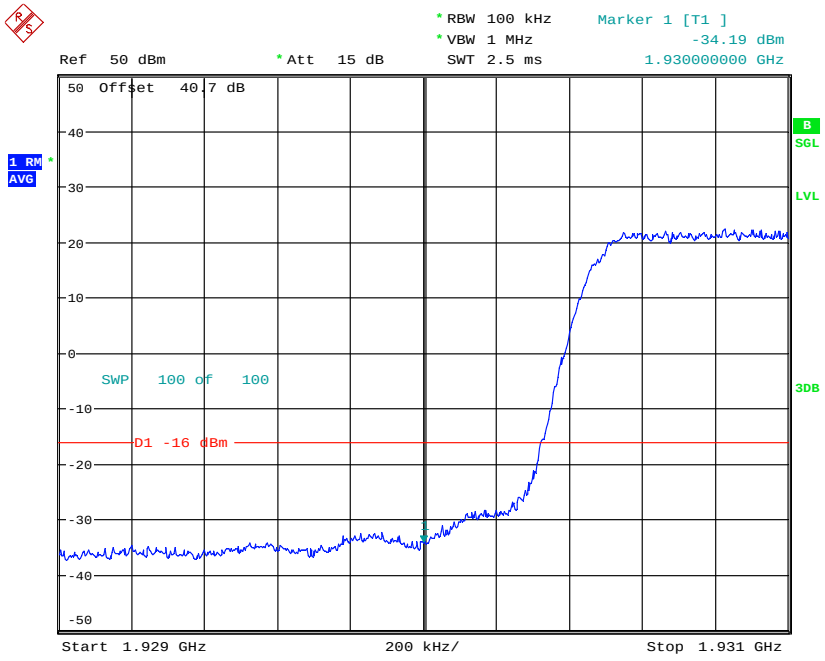


Date: 30.OCT.2014 10:14:42

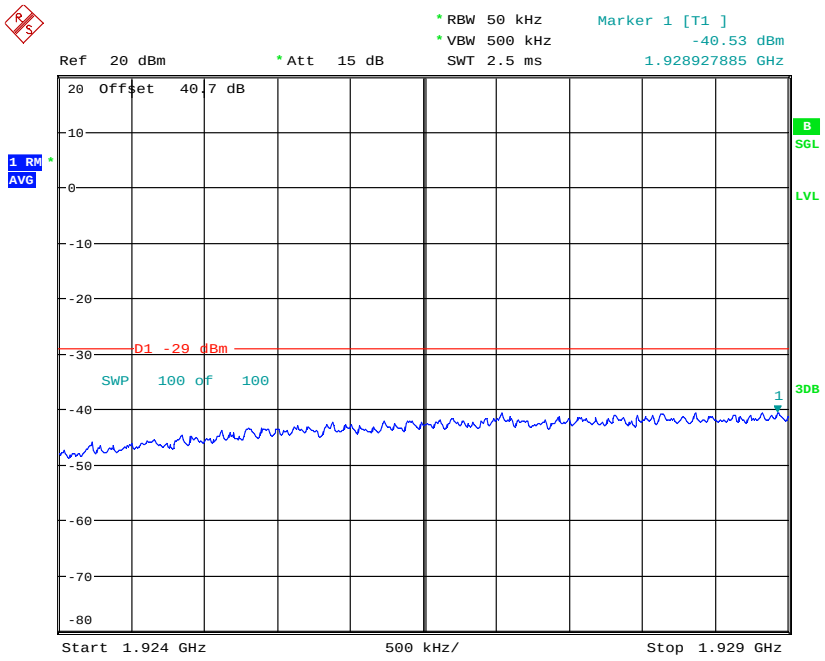


Date: 30.OCT.2014 10:13:51

Channel Position B_{RFBW} - QPSK / Bandwidth 10.0 MHz

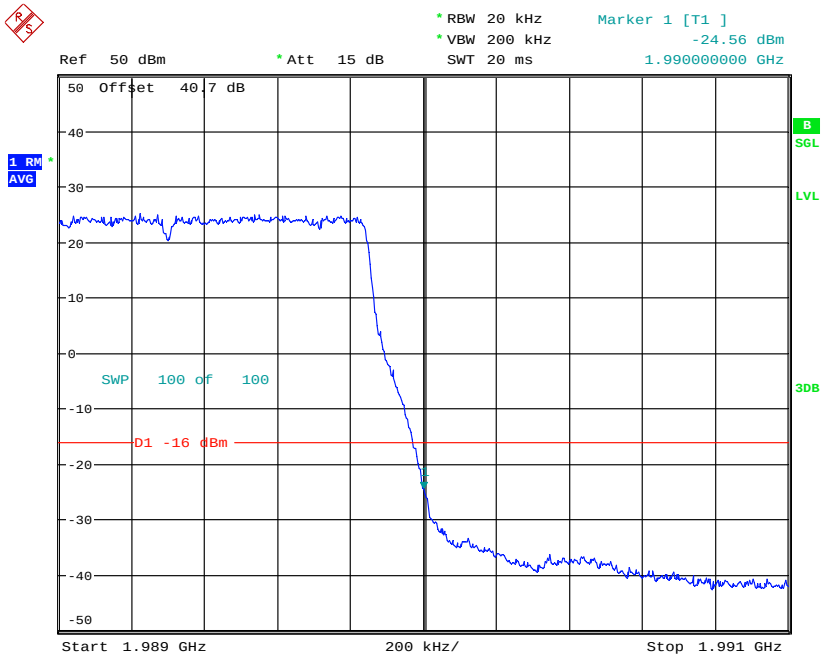


Date: 30.OCT.2014 10:16:53

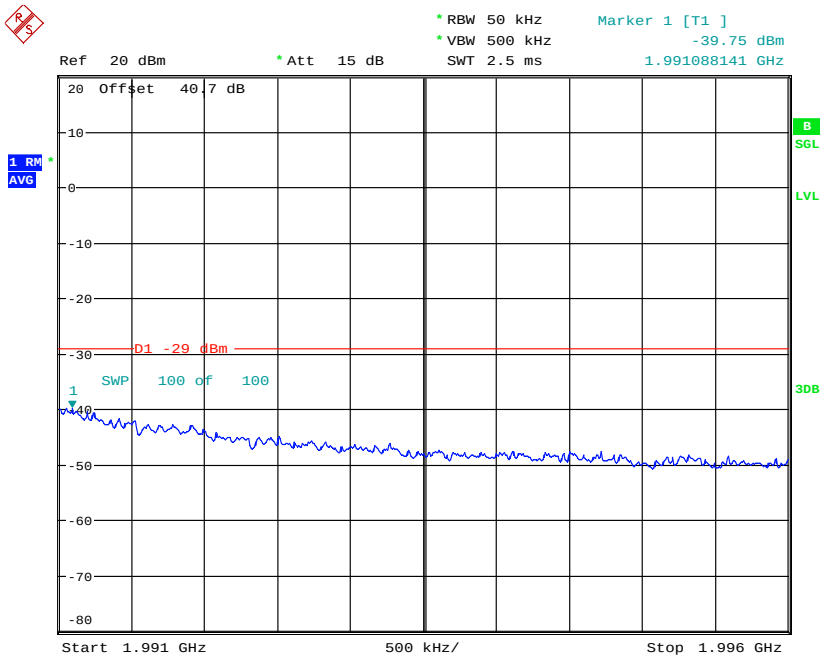


Date: 30.OCT.2014 10:18:08

Channel Position T_{RFBW} - QPSK / Bandwidth 1.4 MHz

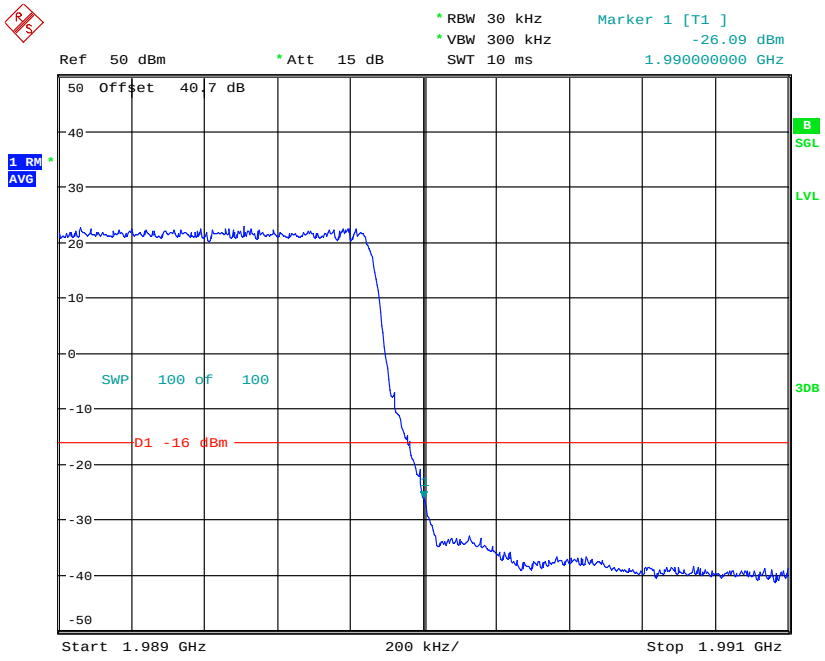


Date: 30.OCT.2014 09:57:24

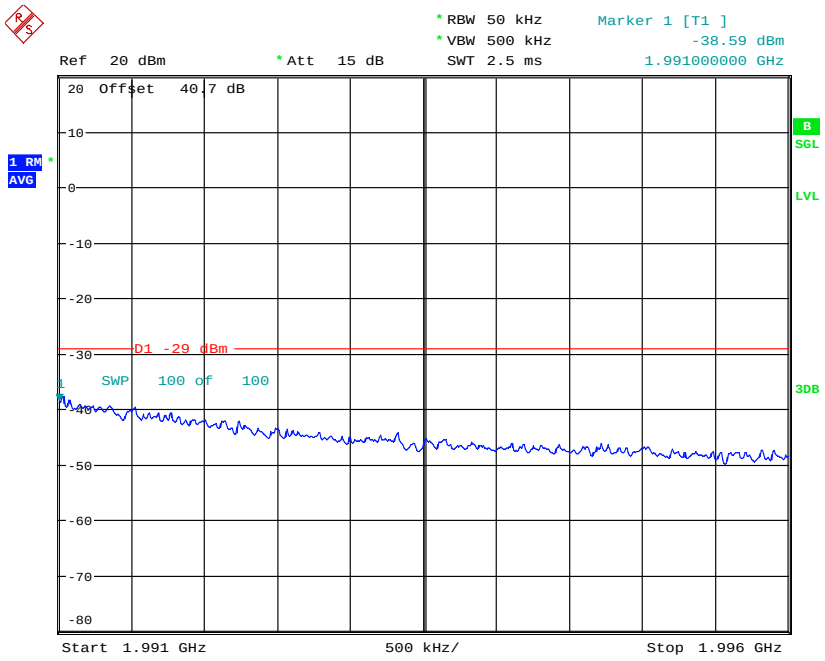


Date: 30.OCT.2014 09:56:24

Channel Position T_{RFBW} - QPSK / Bandwidth 3.0 MHz

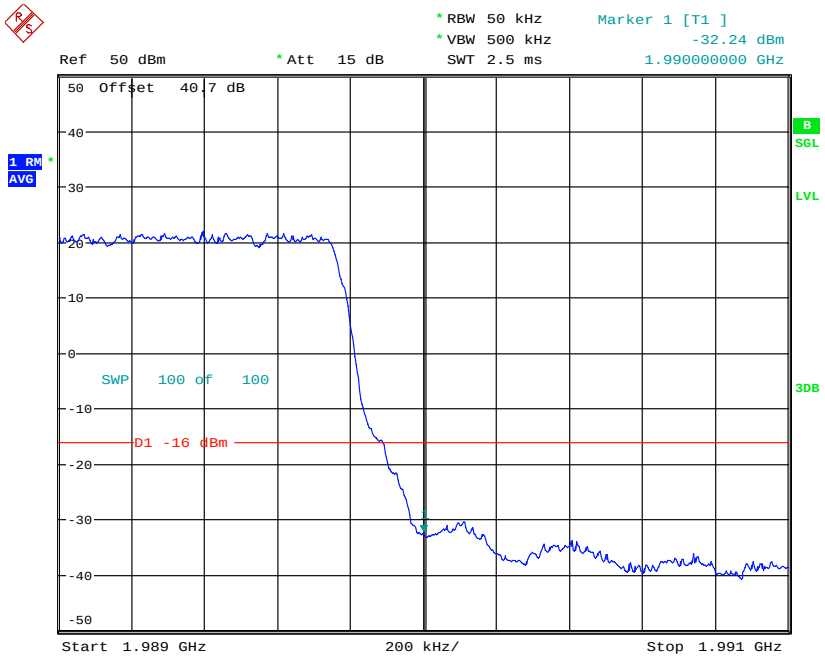


Date: 30.OCT.2014 10:08:07

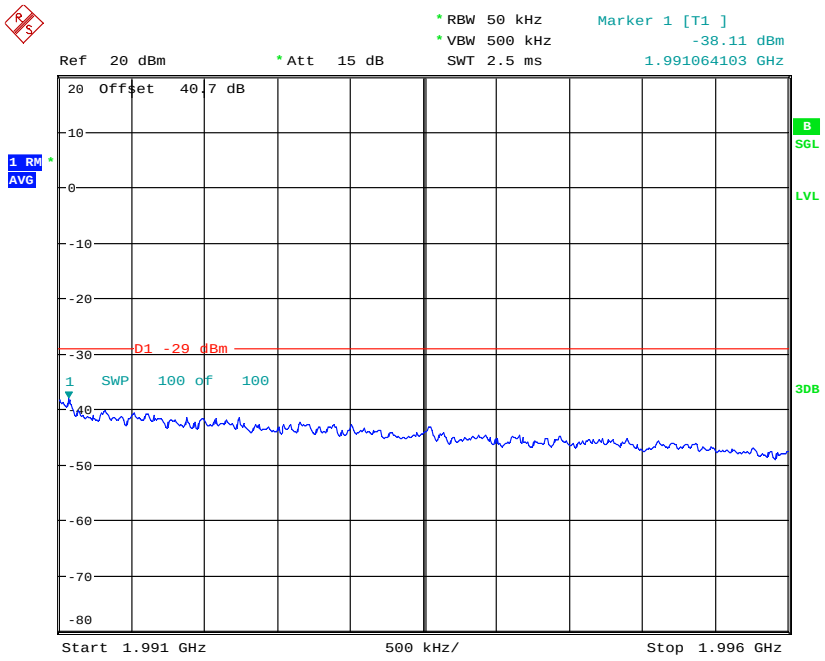


Date: 30.OCT.2014 10:07:11

Channel Position T_{RFBW} - QPSK / Bandwidth 5.0 MHz

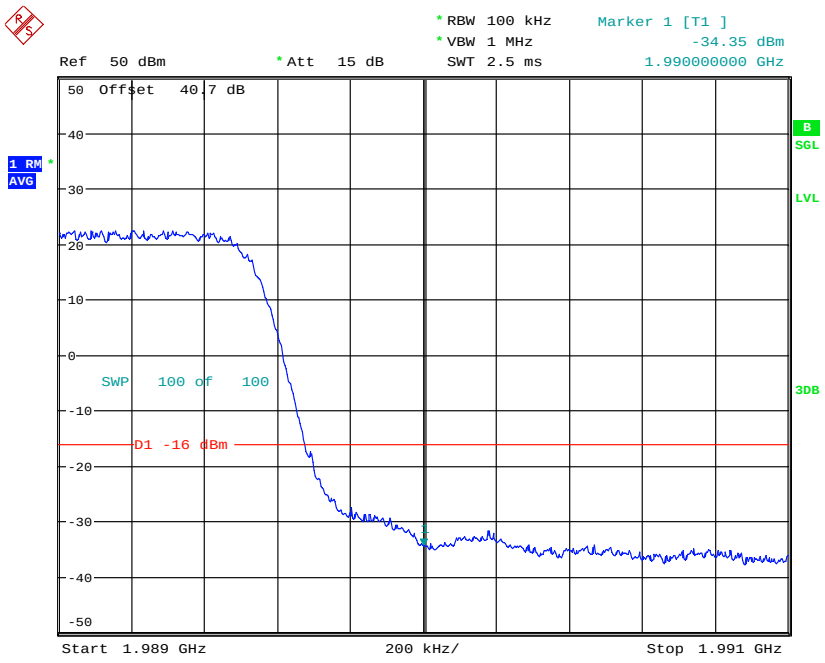


Date: 30.OCT.2014 10:11:51

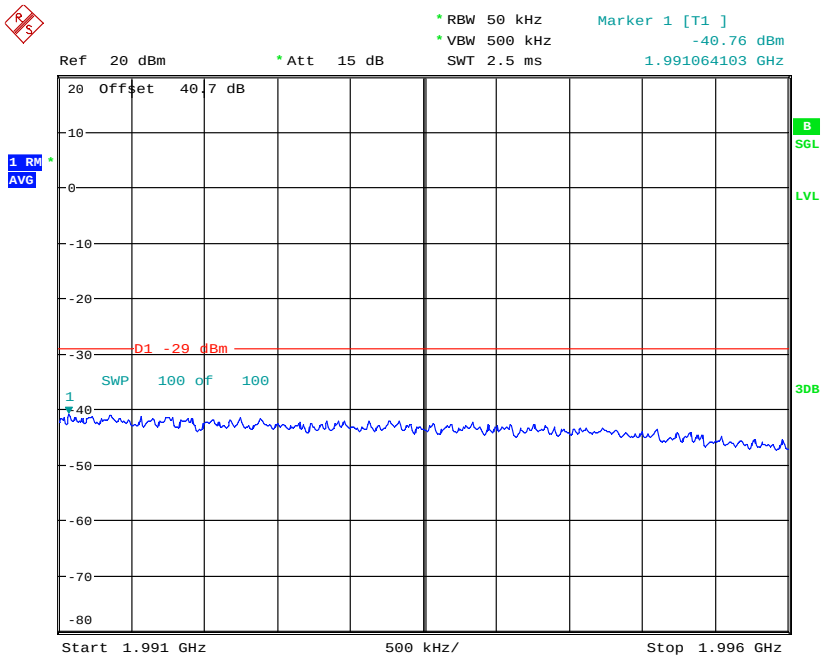


Date: 30.OCT.2014 10:12:47

Channel Position T_{RFBW} - QPSK / Bandwidth 10.0 MHz



Date: 30.OCT.2014 10:30:09



Date: 30.OCT.2014 10:29:29

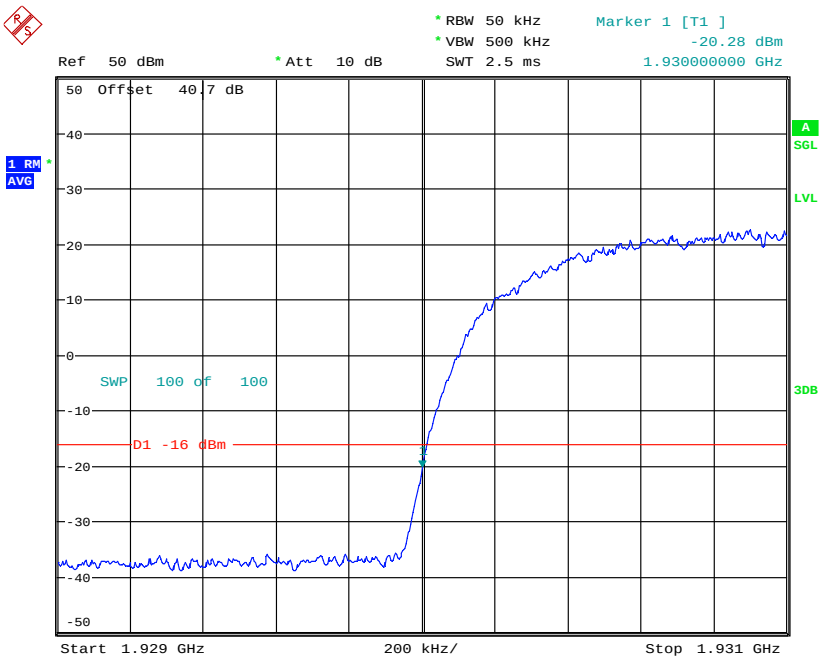
Configuration W+L-MIMO-MC 1 (1W + 1L)

Maximum Output Power 46.0dBm per port

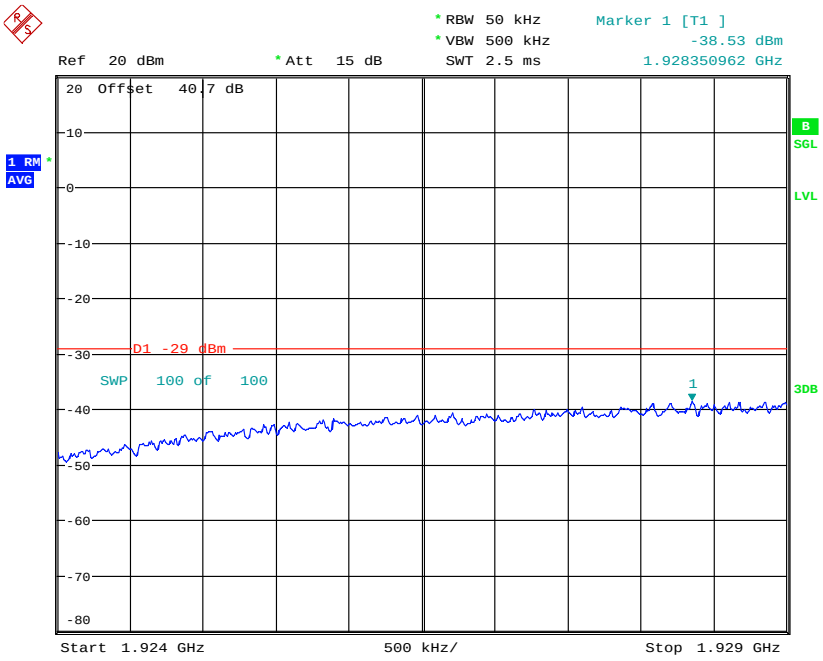
Band Edge Frequency	Edge Test with modulation (L) QPSK / 5.0MHz Bandwidth + (W) 16QAM Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A: (W) 1932.4MHz + (L) 1937.4MHz Port B: (W) 1932.4MHz + (L) 1937.4MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A: (W) 1987.6MHz + (L) 1982.6MHz Port B: (W) 1987.6MHz + (L) 1982.6MHz

Note: For WCDMA, the channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B_{RFBW} - LTE QPSK: Bandwidth 5.0MHz / WCDMA 16QAM

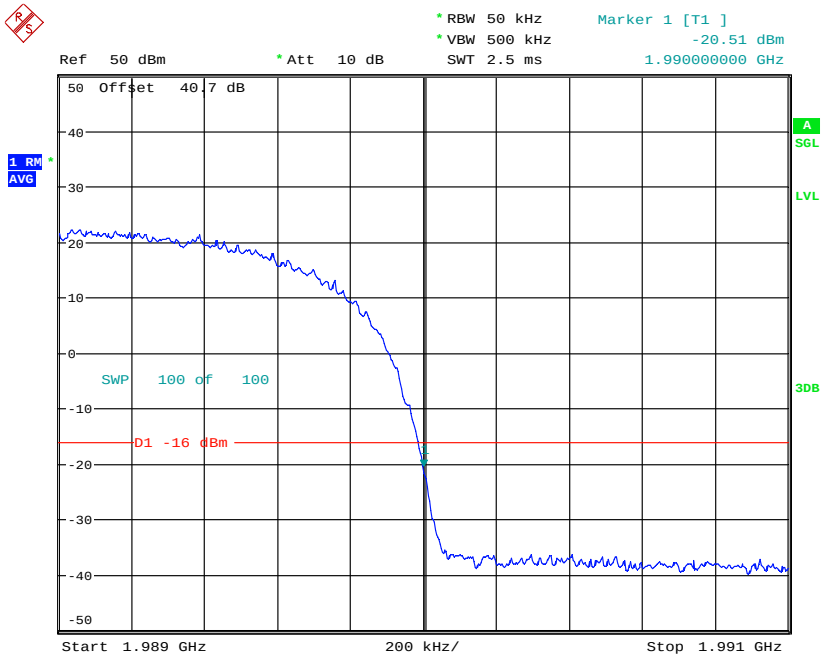


Date: 3.NOV.2014 09:58:49

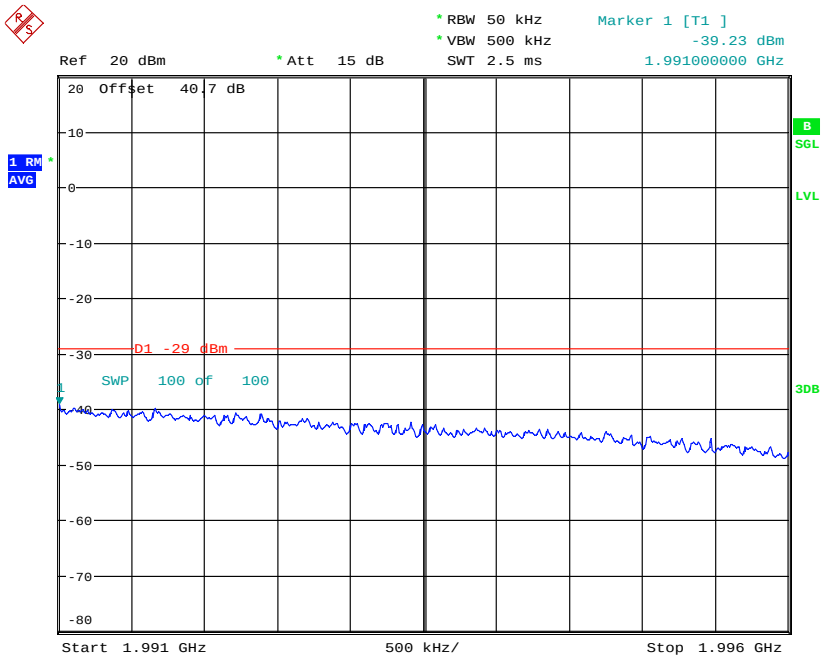


Date: 3.NOV.2014 10:00:38

Channel Position T_{RFBW} - LTE QPSK: Bandwidth 5.0MHz / WCDMA 16QAM



Date: 3.NOV.2014 10:13:08



Date: 3.NOV.2014 10:13:54

Limit	-13 dBm

2.4 RADIATED SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 24, Clause 24.238(a)
Industry Canada RSS-133, Clause 6.5

2.4.2 Equipment Under Test

RRUS 11 B2, KRC 161 276/2, S/N: CF82089083

2.4.3 Date of Test and Modification State

10 to 12 November 2014 - Modification State 0

2.4.4 Test Equipment Used

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

2.4.5 Environmental Conditions

Ambient Temperature	23.2 – 23.5°C
Relative Humidity	32.0 – 32.5%

2.4.6 Test Method

The test was applied in accordance with test method requirements of FCC Part 24 and RSS-133 and ANSI/TIA-603-C-2004.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations.

Emissions identified within the range 30MHz – 20GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz – 20GHz, the measurement was performed with a resolution bandwidth of 1MHz.

The measurements were performed at a 3m distance unless otherwise stated.

The limits for Spurious Emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - (43 + 10Log (P)) dB

Where:
Field Strength is measured in dBµV/m
P is measured Transmitter Power in Watts

Determination of Spurious Emission Limit

As the EUT have an integral antenna, the field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipoles as per 2.1053 (a).

$E_{(v/m)}=(30 \times G_i \times P_o)^{0.5} / d$

Where G_i is the antenna gain of ideal half-wave dipoles,
P_o is the power out of the transceiver in W,
d is the measurement distance in meter.

Therefore at 3m measurement distance the field strength using the lowest transceiver output power would be:

$E_{(v/m)}=(30 \times 1.64 \times 34.36)^{0.5} / 3 = 13.71V/m = 142.74dB\mu V/m$

As per 24.238(a) the spurious emission must be attenuated by 43 + 10log (P_o) dB this gives:

43 + 10log(34.36) = 58.36dB

Therefore the limit at 3m measurement distance is:

142.74 – 58.36 = 84.4 dBµV/m

This limit has been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

The results are shown in the plots below.

2.4.7 Test Results

Note: Only the worst case results plots have been included as all of the emissions are greater than 20dB below the limit. A set of plots have been included to show the measurement system noise floor.

Configuration W- SC (1C)

Maximum Output Power 46.0dBm per port

Channel Position	Channel Frequencies
Channel Position M	1960.0MHz

Channel Position M - QPSK

No emissions were detected within 20dB of the limit.

Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Channel Position	Channel Frequencies
Channel Position M	1960.0MHz

Channel Position M – 16QAM

No emissions were detected within 20dB of the limit.

Configuration W-MIMO-MC1 (2C)

Maximum Output Power 43.0dBm per carrier, WCDMA Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position M_{RFBW}	1952.4MHz + 1967.6MHz

Channel Position M_{RFBW} – 16QAM

No emissions were detected within 20dB of the limit.

Configuration W-MIMO-MC2 (4C)

Maximum Output Power 46.0dBm per port

Channel Position	Channel Frequencies
Channel Position M_{RFBW}	1952.4MHz + 1957.4MHz+ 1962.6MHz+ 1967.6MHz

Channel Position M_{RFBW} – 16QAM

No emissions were detected within 20dB of the limit.

Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port, LTE Bandwidth 1.4MHz

Channel Position	Channel Frequencies
Channel Position B	1930.7MHz
Channel Position M	1960.0MHz
Channel Position T	1989.3MHz

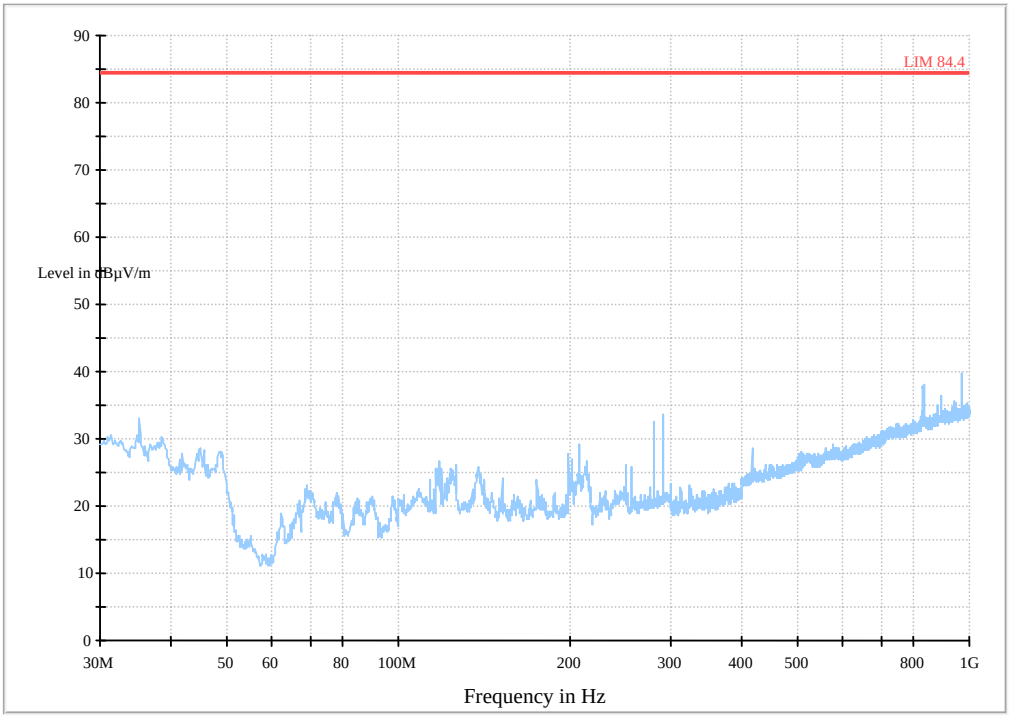
Channel Position B – 16QAM

No emissions were detected within 20dB of the limit.

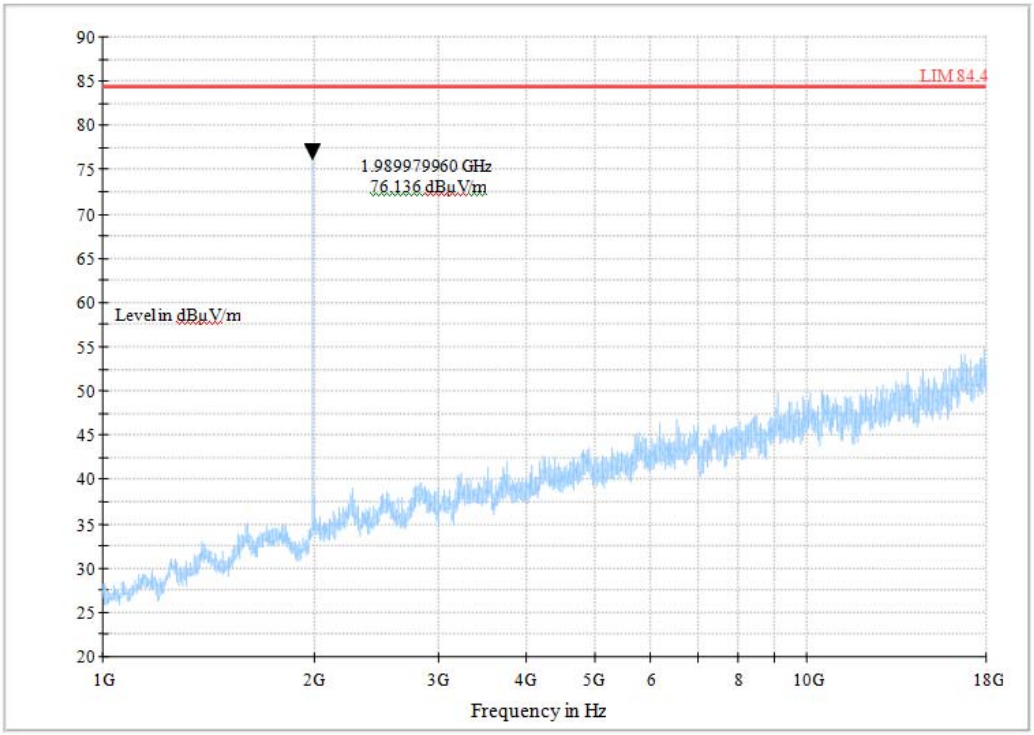
Channel Position M – 16QAM

No emissions were detected within 20dB of the limit.

Channel Position T – 16QAM / Bandwidth 1.4MHz - 30MHz – 1GHz

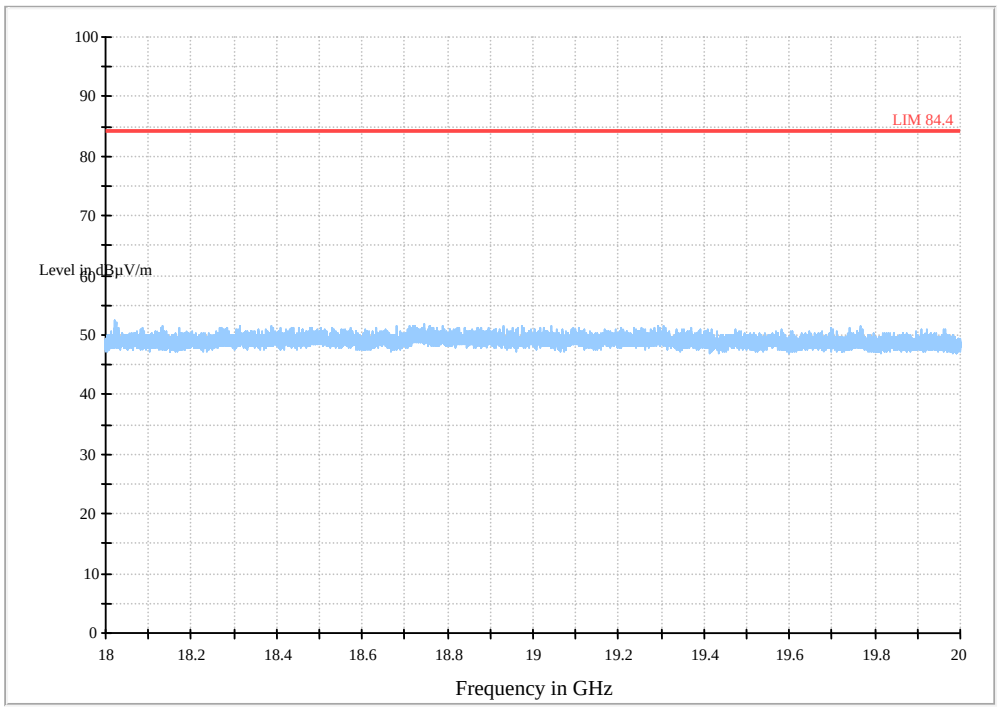


Channel Position T – 16QAM / Bandwidth 1.4MHz - 1GHz – 18GHz



Note: The frequency marked is the carrier.

Channel Position T – 16QAM / Bandwidth 1.4MHz - 18GHz – 20GHz



Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port, LTE Bandwidth 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20.0MHz

Channel Position	Channel Frequencies
Channel Position M	1960.0MHz

Channel Position M – QPSK

No emissions were detected within 20dB of the limit.

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 45.5dBm per port, LTE Bandwidth 1.4MHz

Channel Position	Channel Frequencies
Channel Position T_{RFBW}	1970.7MHz + 1989.3MHz

Channel Position T_{RFBW} – QPSK

No emissions were detected within 20dB of the limit.

Configuration W+L-MIMO-MC1 (1W+1L)

Maximum Output Power 46.0dBm per port,

WCDMA Bandwidth 5.0MHz, LTE Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position M_{RFBW}	(W)1952.4MHz + (L)1967.5MHz

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK

No emissions were detected within 20dB of the limit.

Configuration W+L-MIMO-MC2 (2W+2L)

Maximum Output Power 46.0dBm per port,

WCDMA Bandwidth 5.0MHz, LTE Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position M_{RFBW}	(W)1952.4MHz +(W)1957.4MHz +(L)1962.5MHz +(L)1967.5MHz

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK

No emissions were detected within 20dB of the limit

Configuration W+L-MIMO-MC3 (2W+1L)

Maximum Output Power 46.0dBm per port, LTE Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position M_{RFBW}	(W)1952.4MHz + (W)1957.4MHz + (L)1967.5MHz

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK

No emissions were detected within 20dB of the limit

Remarks

Limit	-13dBm / 84.4dBµV/m

The EUT does not exceed -13dBm / 84.4dBµV/m at the measured frequencies.

2.5 CONDUCTED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238(a)
Industry Canada RSS-133, Clause 6.5

2.5.2 Equipment Under Test

RRUS 11 B2, KRC 161 276/2, S/N: CF82089083

2.5.3 Date of Test and Modification State

28 October to 03 November 2014 - Modification State 0

2.5.4 Test Equipment Used

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

2.5.5 Environmental Conditions

Ambient Temperature	23.2 - 25.5 °C
Relative Humidity	26.5 - 28.6 %

2.5.6 Test Method

The test was applied in accordance with test method requirements of FCC Part 24 and RSS-133.

In accordance with FCC CFR 47 Part 2, Clause 2.1051, the spurious emissions from the antenna terminal were measured. In accordance with FCC CFR 47 Part 24, Clause 24.238(a) and Industry Canada RSS-133, Clause 6.5, any emissions outside of the block edges shall be attenuated by at least 43 + 10 log (P).

The EUT was set to transmit at its maximum rated output power. The path loss between the Spectrum Analyser and the EUT was measured with the worst case level being entered as a Reference Level Offset. In accordance with 24.238(a), the RBW was set to 1MHz and a Peak detector with the trace set to Max Hold was used. The frequency spectrum was then investigated between 9kHz and 20GHz. Testing was carried out on the Bottom, Middle and Top channels.

For MIMO mode configurations, the limit was adjusted with a correction of -3dB [10Log2] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 accounting for simultaneous transmission from antenna ports RF A and RF B.

The measurements were performed on the output connector RF A. Limited complementary measurement were done at output conector RF B to verify identical performance for both transmitter chains in MIMO mode

The results are shown in the plots below.

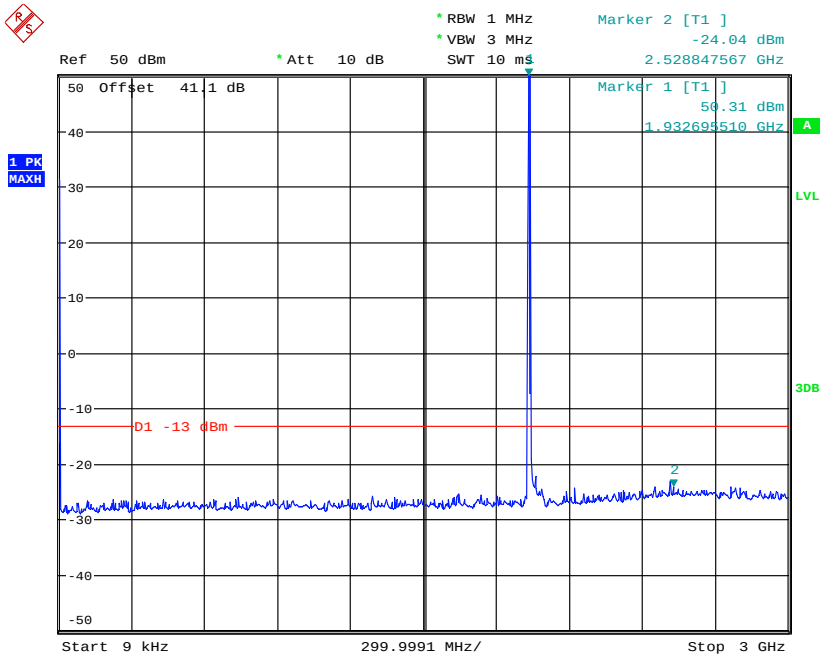
2.5.7 Test Results

Configuration W-SC (1C)

Maximum Output Power 46.0dBm per port

Channel Position	Bandwidth	Channel Frequency
Channel Position B	5.0MHz	1932.4MHz
Channel Position M	5.0MHz	1960.0MHz
Channel Position T	5.0MHz	1987.6MHz

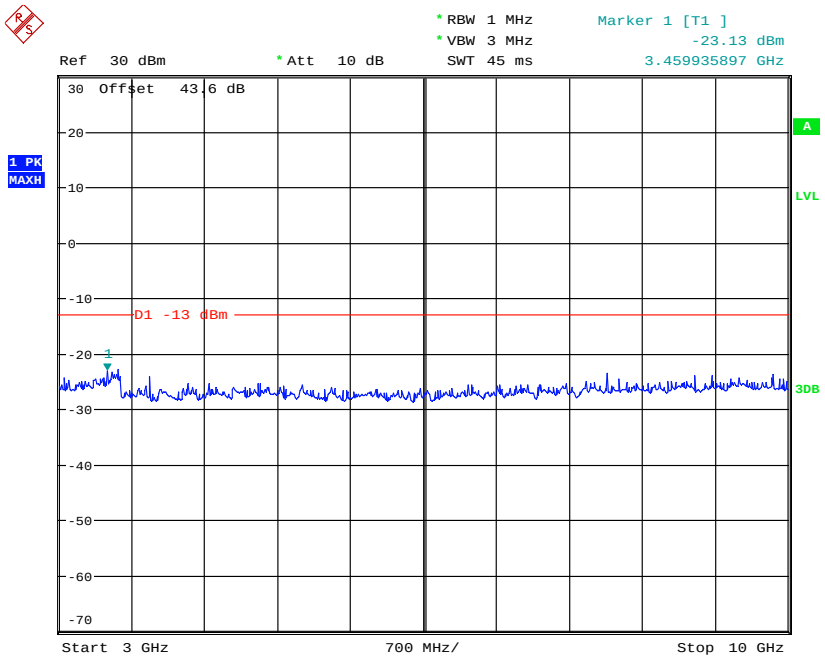
Channel Position B - QPSK - 9kHz – 3GHz



Date: 28.OCT.2014 15:11:22

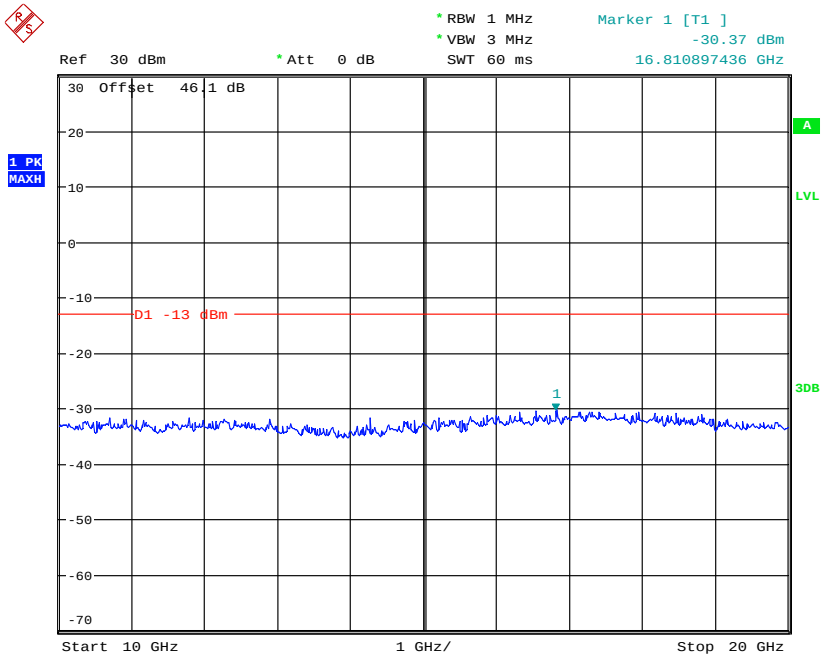
Note: The emission beyond the limit is within the operating frequency.

Channel Position B - QPSK - 3GHz – 10GHz



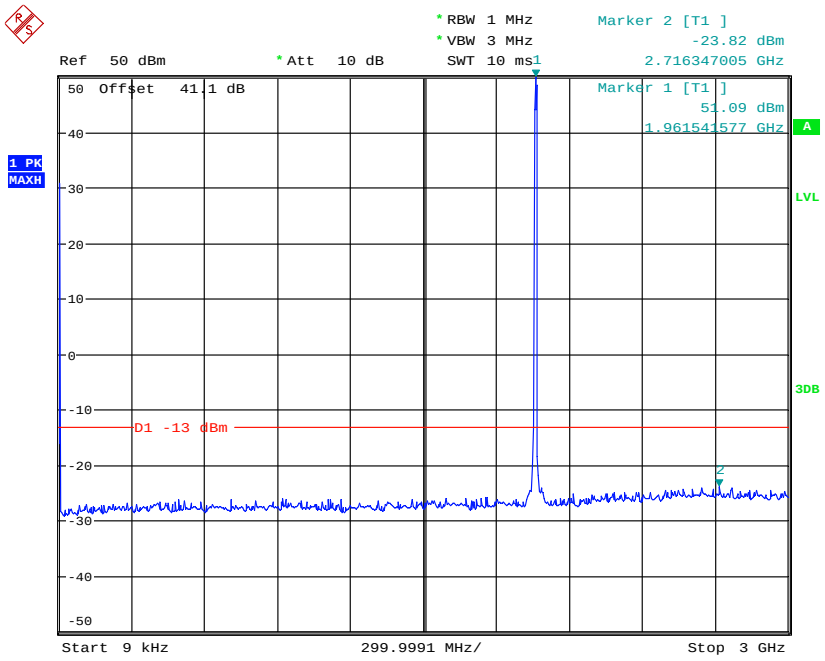
Date: 28.OCT.2014 15:12:07

Channel Position B - QPSK - 10GHz – 20GHz



Date: 28.OCT.2014 15:12:38

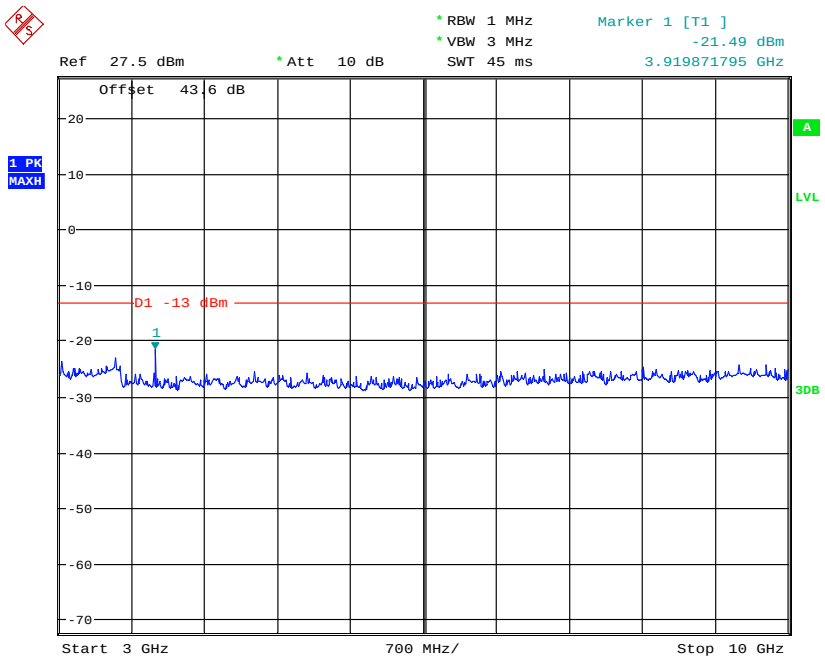
Channel Position M - QPSK - 9kHz – 3GHz



Date: 28.OCT.2014 15:46:16

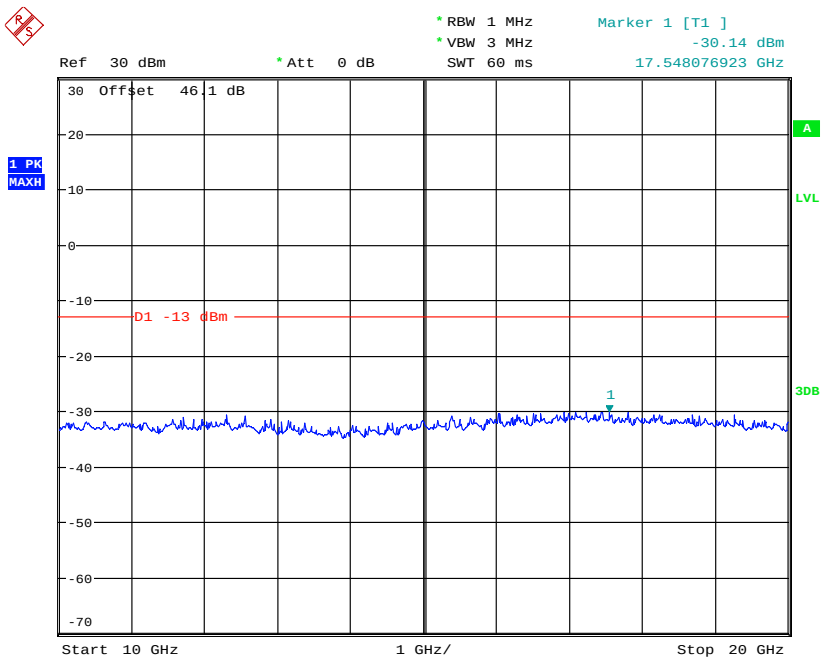
Note: The emission beyond the limit is within the operating frequency.

Channel Position M - QPSK - 3GHz – 10GHz



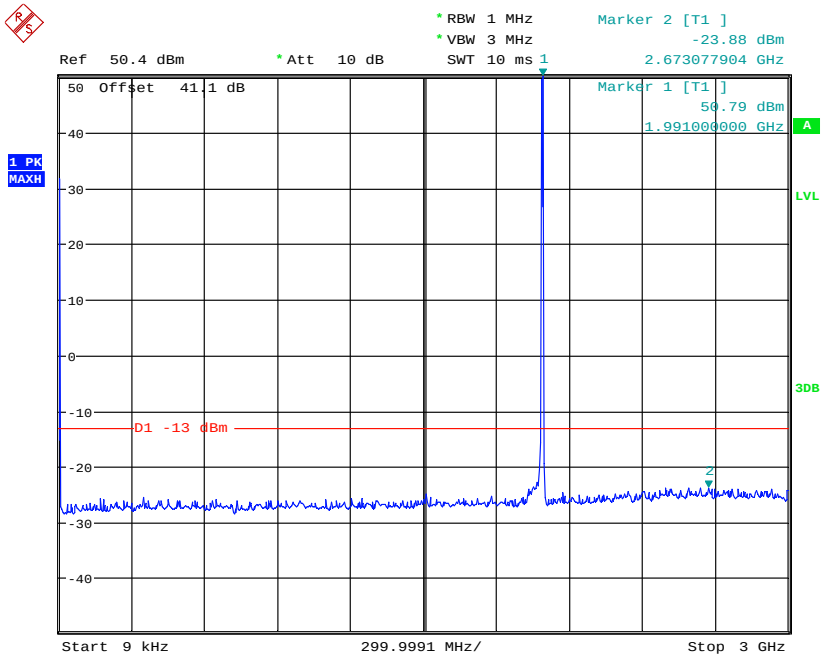
Date: 28.OCT.2014 15:45:36

Channel Position M - QPSK - 10GHz – 20GHz



Date: 28.OCT.2014 15:44:59

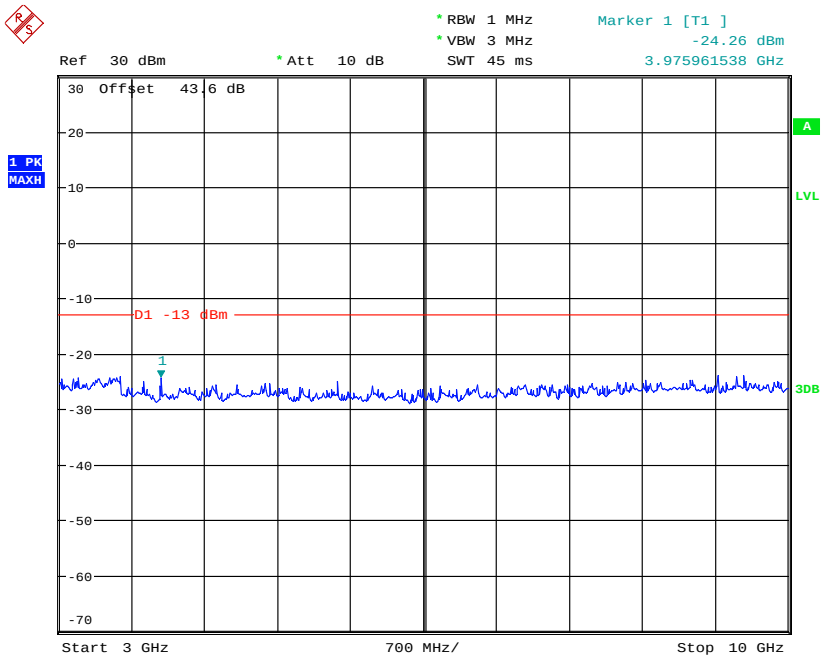
Channel Position T - QPSK - 9kHz – 3GHz



Date: 28.OCT.2014 15:37:39

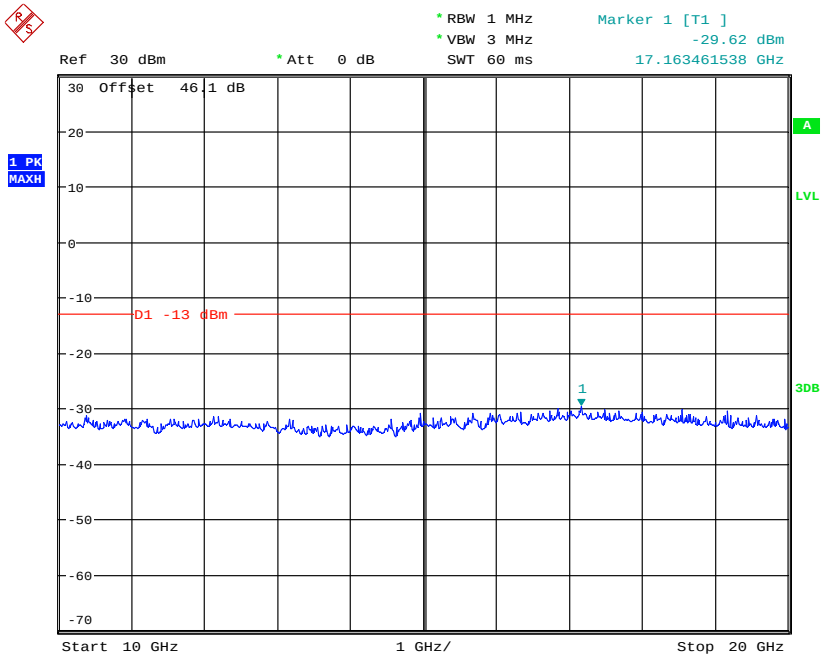
Note: The emission beyond the limit is within the operating frequency.

Channel Position T - QPSK - 3GHz – 10GHz



Date: 28.OCT.2014 15:38:25

Channel Position T - QPSK - 10GHz – 20GHz



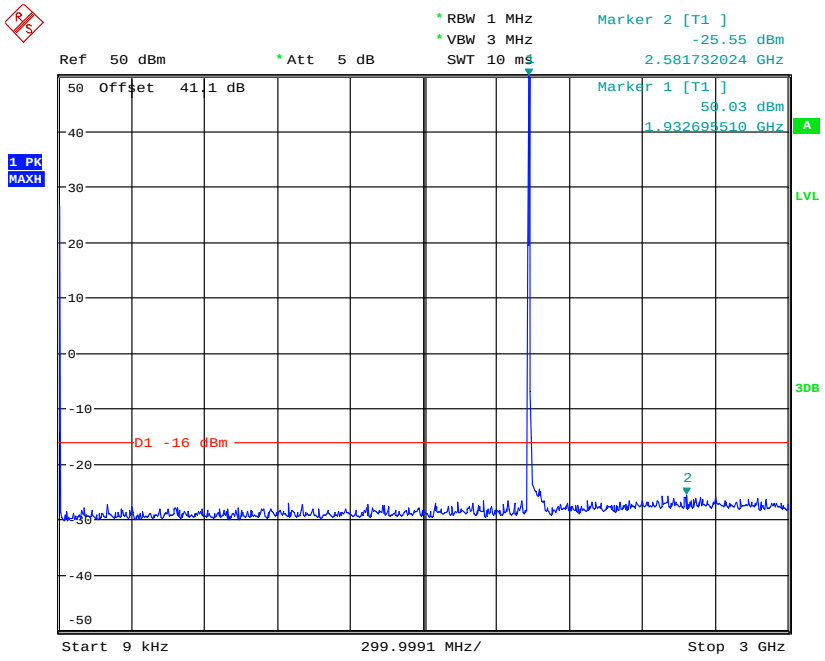
Date: 28.OCT.2014 15:39:07

Configuration W-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Channel Position	Bandwidth	Channel Frequency
Channel Position B	5.0MHz	1932.4MHz
Channel Position M	5.0MHz	1960.0MHz
Channel Position T	5.0MHz	1987.6MHz

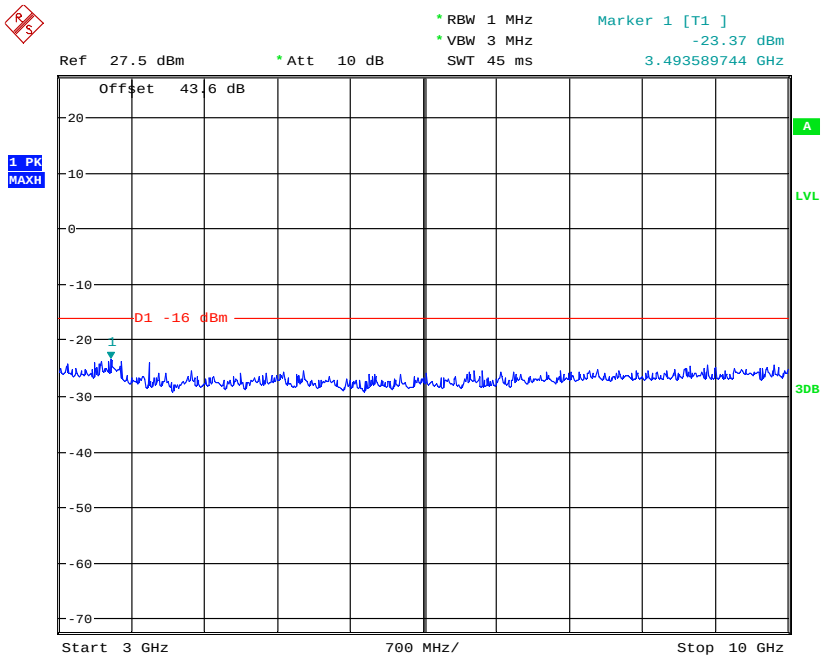
Channel Position B – 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 14:49:34

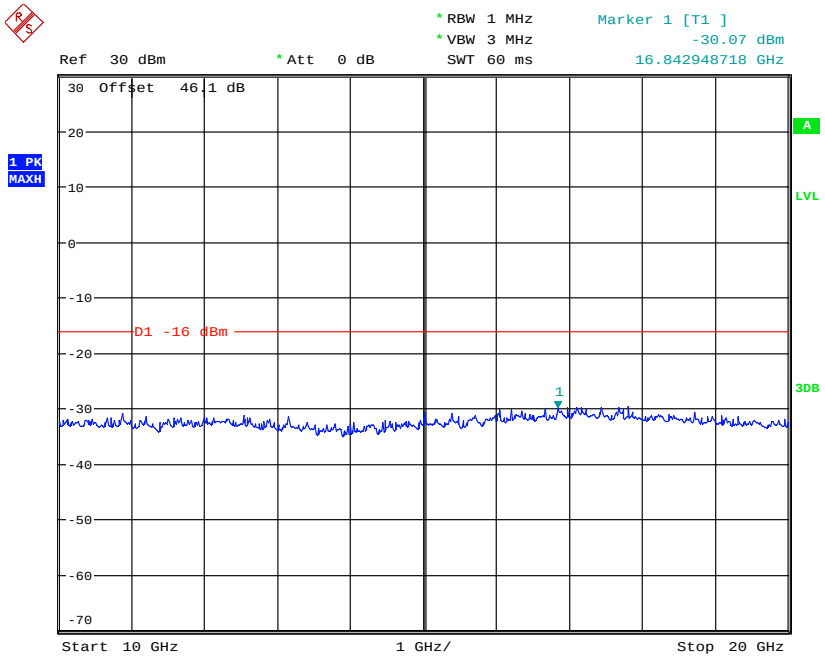
Note: The emission beyond the limit is within the operating frequency.

Channel Position B - 16QAM - 3GHz – 10GHz



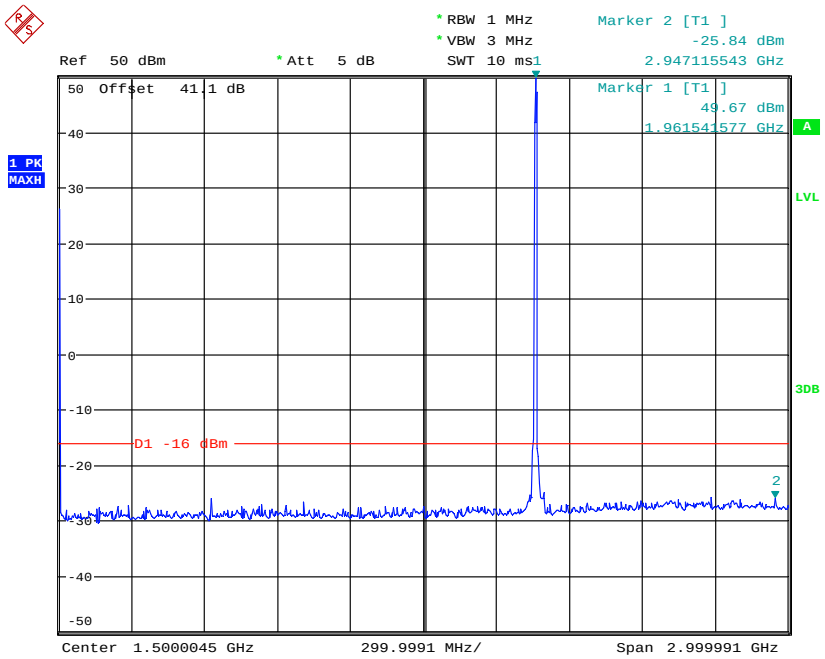
Date: 28.OCT.2014 14:48:55

Channel Position B - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 14:48:08

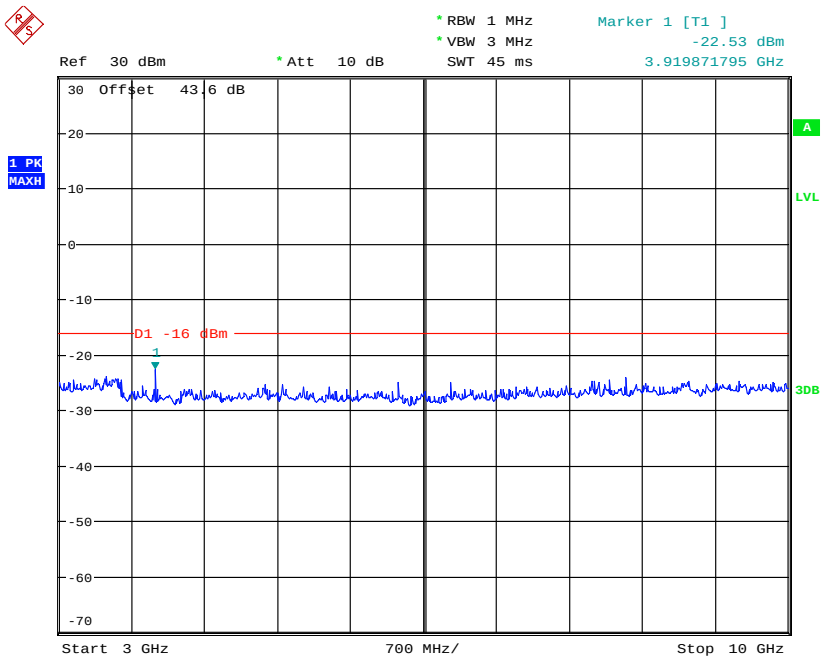
Channel Position M - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 16:06:51

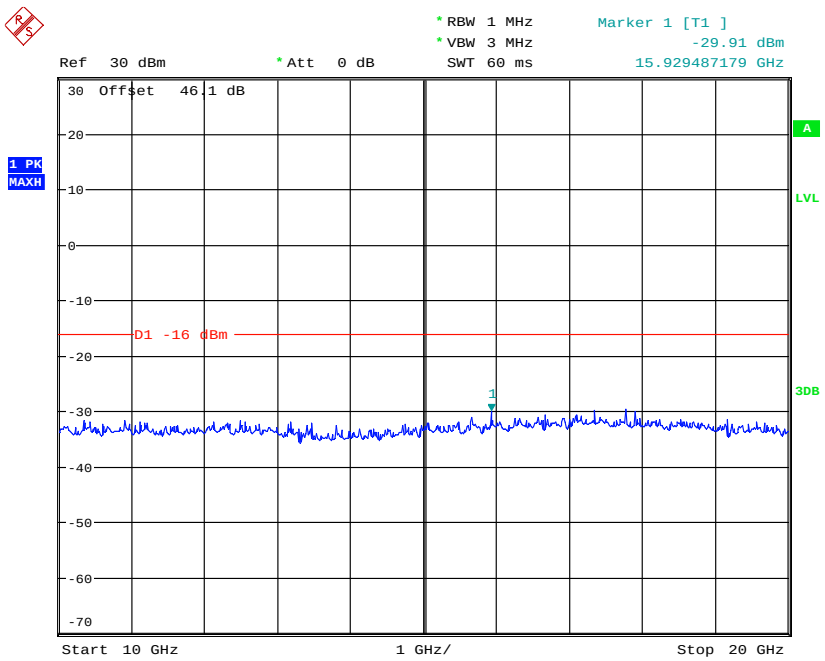
Note: The emission beyond the limit is within the operating frequency.

Channel Position M - 16QAM - 3GHz – 10GHz



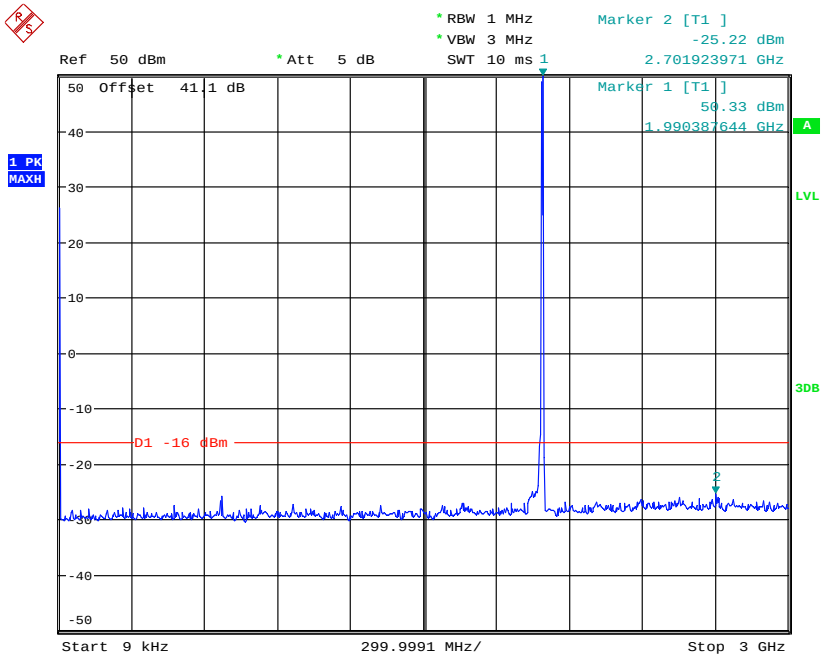
Date: 28.OCT.2014 16:07:34

Channel Position M - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 16:08:12

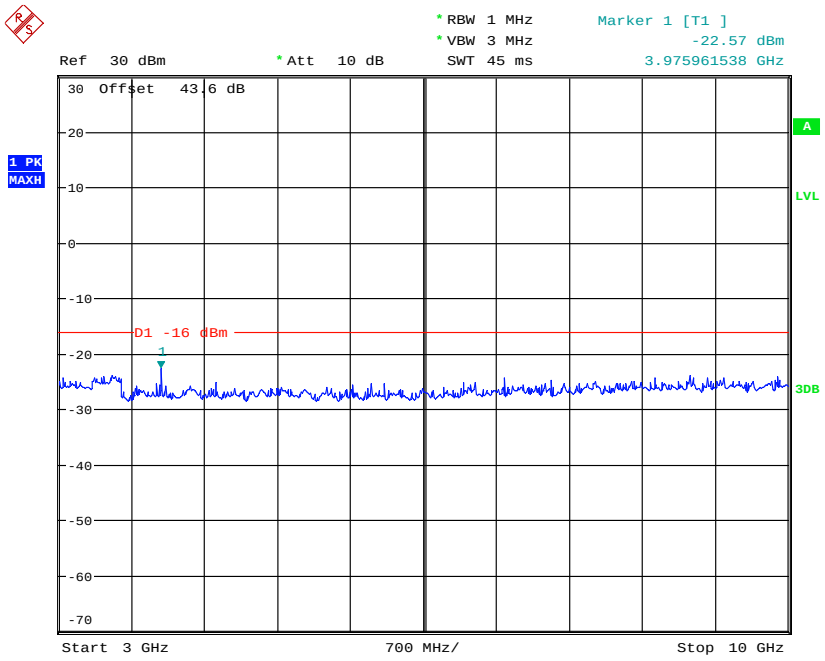
Channel Position T - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 16:13:50

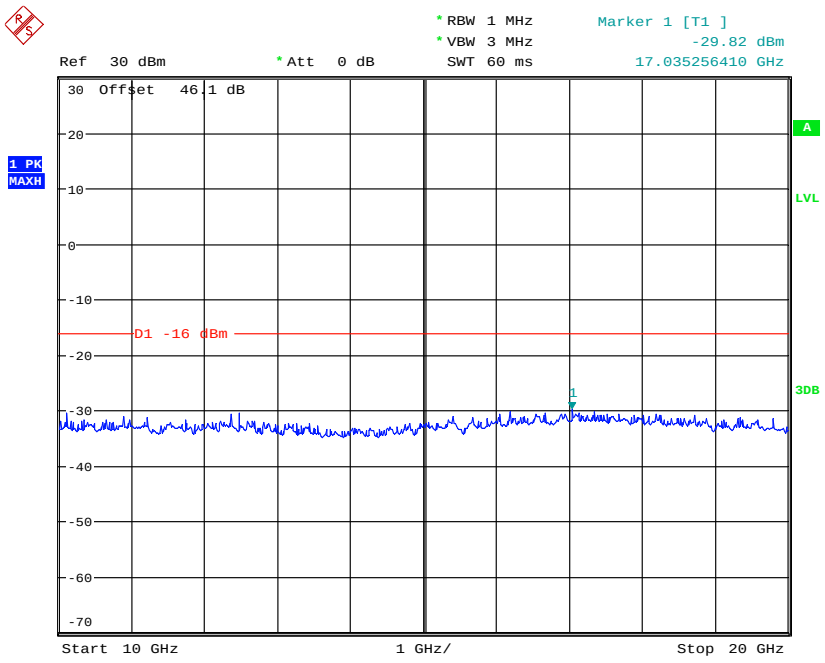
Note: The emission beyond the limit is within the operating frequency.

Channel Position T - 16QAM - 3GHz – 10GHz



Date: 28.OCT.2014 16:13:08

Channel Position T - 16QAM - 10GHz – 20GHz



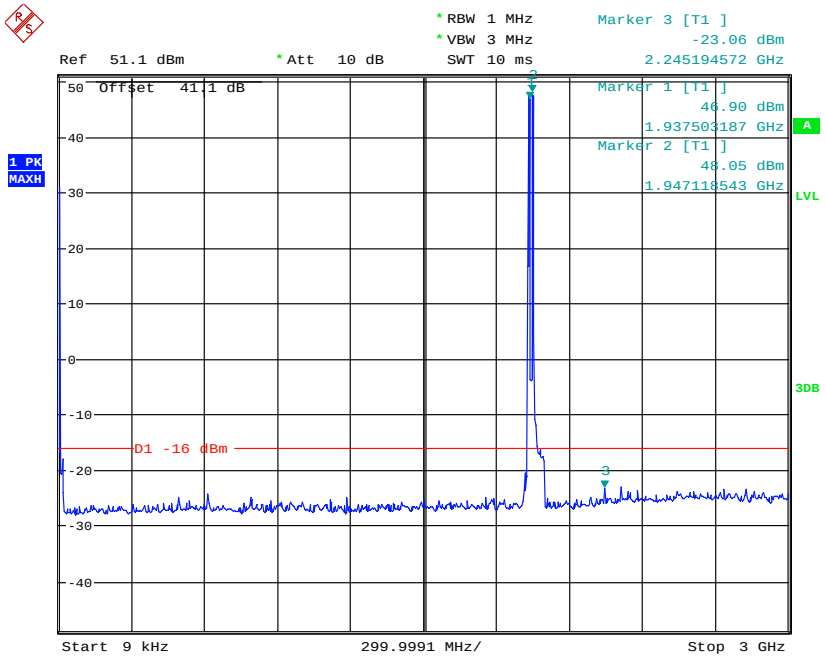
Date: 28.OCT.2014 16:12:20

Configuration W-MIMO-MC 1 (2C)

Maximum Output Power 46.0dBm per port

Channel Position	Bandwidth	Channel Frequency
Channel Position B_{RFBW}	5.0MHz	1932.4MHz + 1947.6MHz
Channel Position M_{RFBW}	5.0MHz	1952.4MHz + 1967.6MHz
Channel Position T_{RFBW}	5.0MHz	1972.4MHz + 1987.6MHz

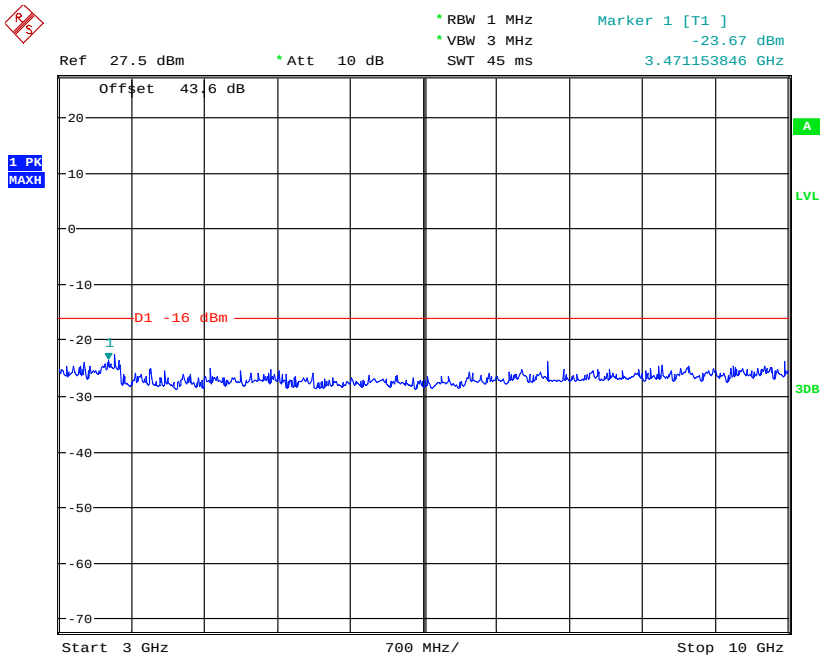
Channel Position B_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 12:54:10

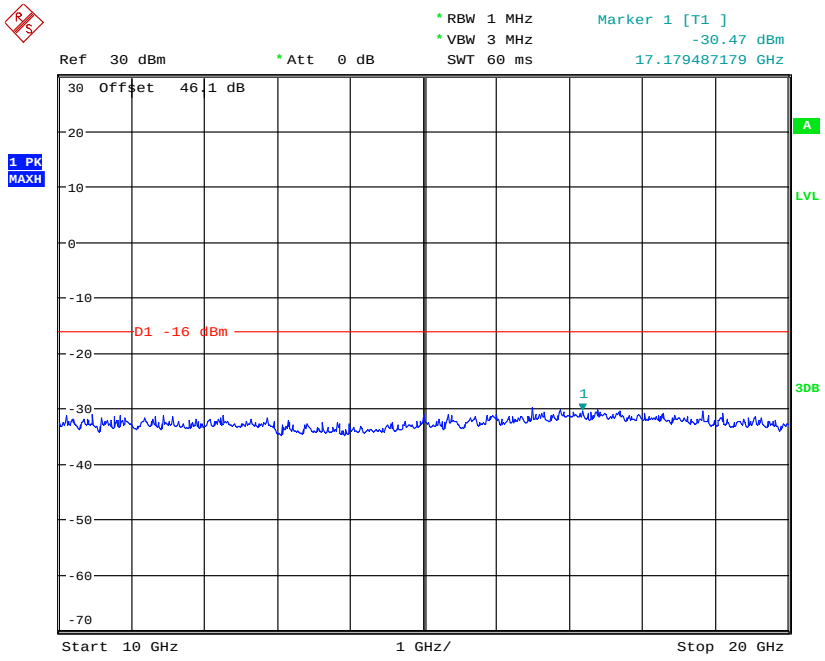
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - 16QAM - 3GHz – 10GHz



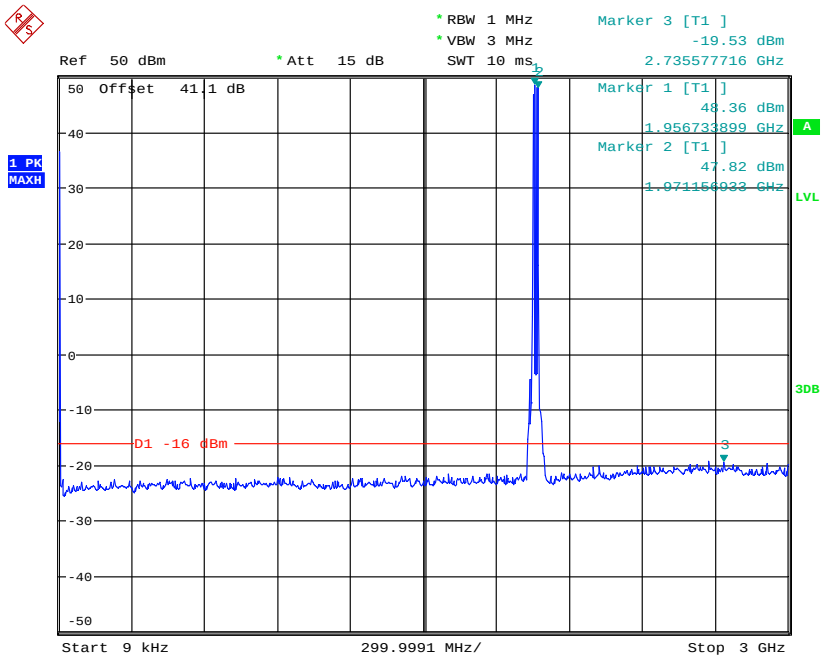
Date: 28.OCT.2014 12:53:10

Channel Position B_{RFBW} - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 12:52:30

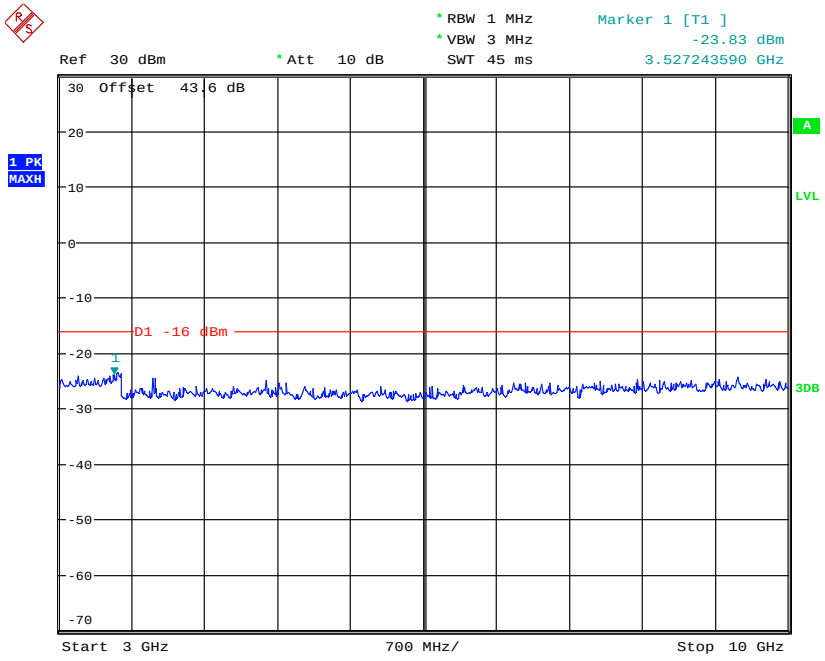
Channel Position M_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 10:38:47

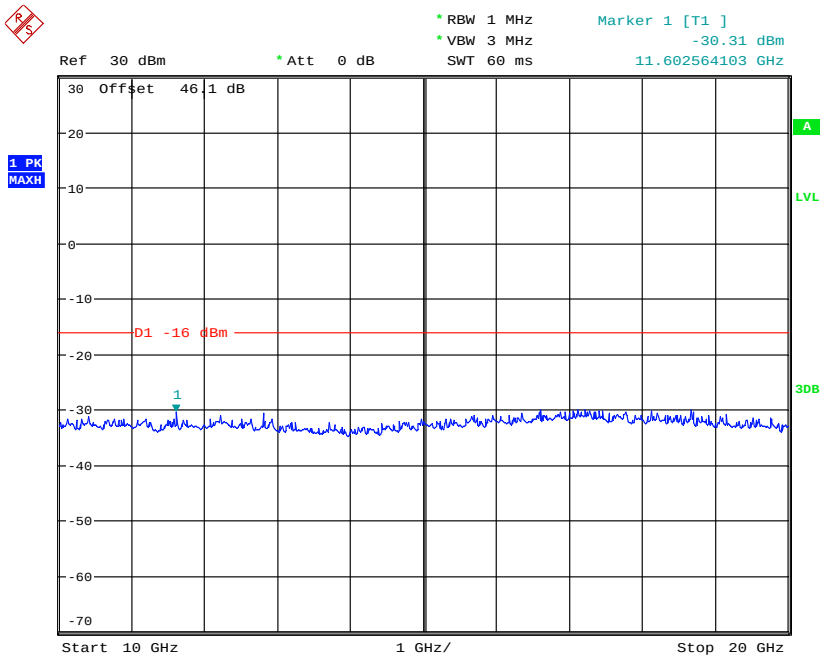
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - 16QAM - 3GHz – 10GHz



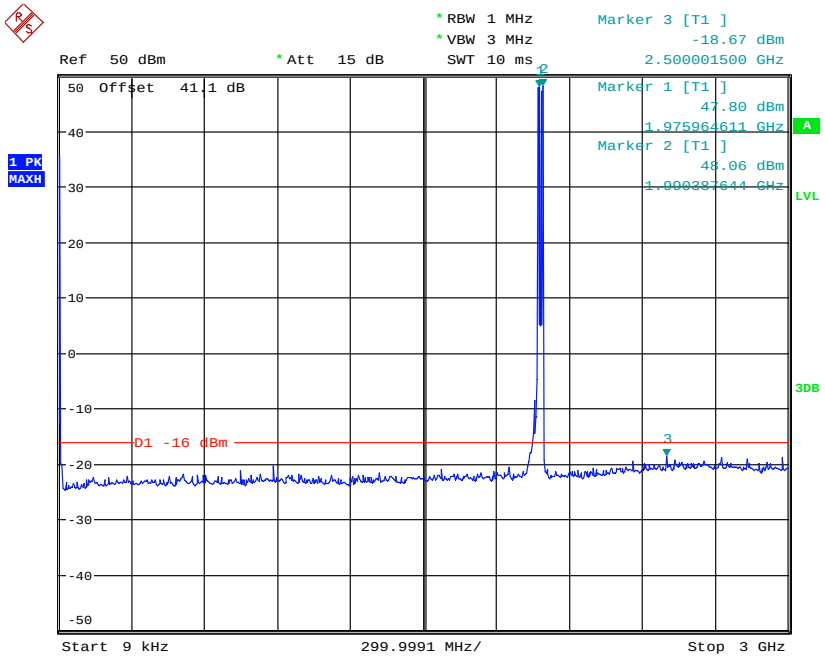
Date: 28.OCT.2014 10:40:02

Channel Position M_{RFBW} - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 10:41:24

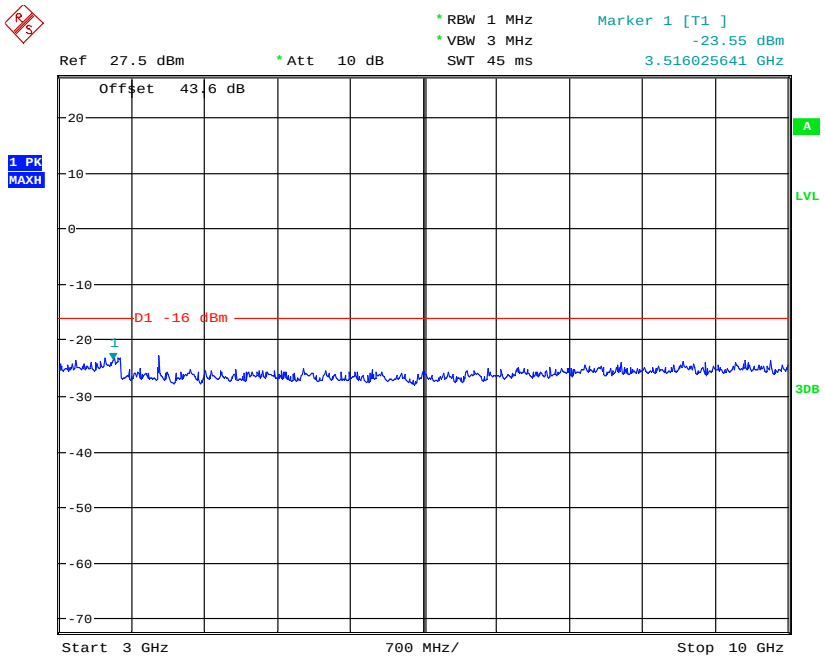
Channel Position T_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 10:24:52

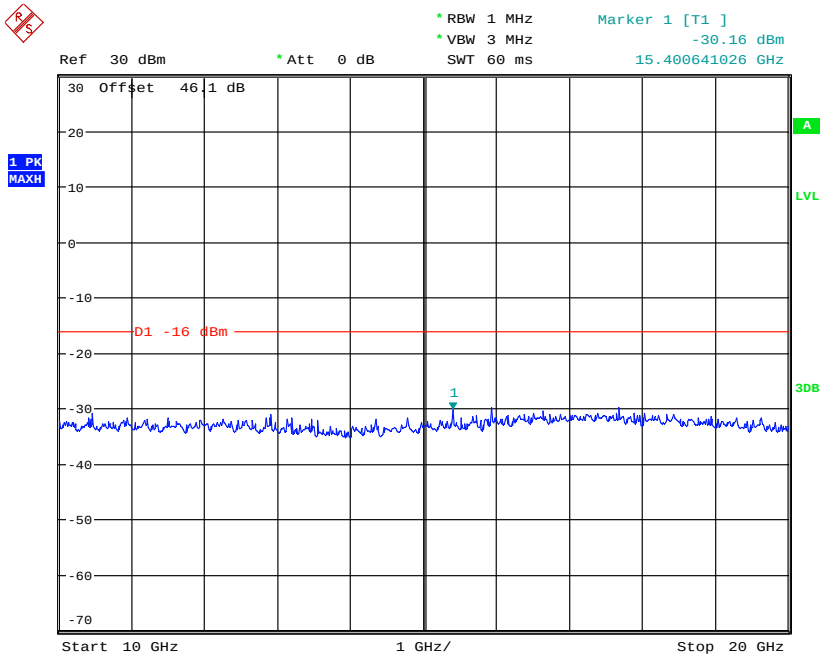
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - 16QAM - 3GHz – 10GHz



Date: 28.OCT.2014 10:27:59

Channel Position T_{RFBW} - 16QAM - 10GHz – 20GHz



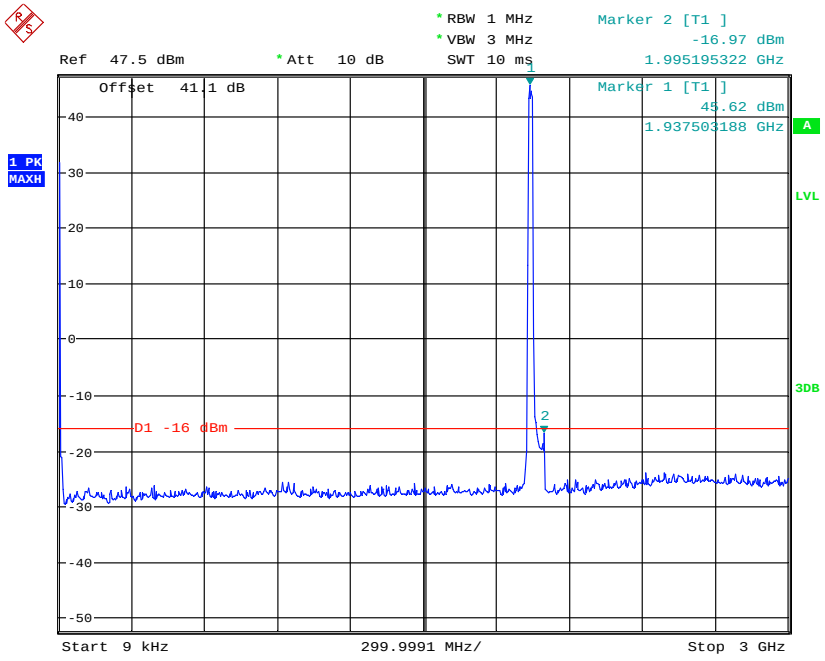
Date: 28.OCT.2014 10:29:05

Configuration W-MIMO-MC 2 (4C)

Maximum Output Power 46.0dBm per port

Channel Position	Bandwidth	Channel Frequency
Channel Position B_{RFBW}	5.0MHz	1932.4MHz + 1937.4MHz + 1942.6MHz + 1947.6MHz
Channel Position M_{RFBW}	5.0MHz	1952.4MHz + 1957.4MHz + 1962.6MHz + 1967.6MHz
Channel Position T_{RFBW}	5.0MHz	1972.4MHz + 1977.4MHz + 1982.6MHz + 1987.6MHz

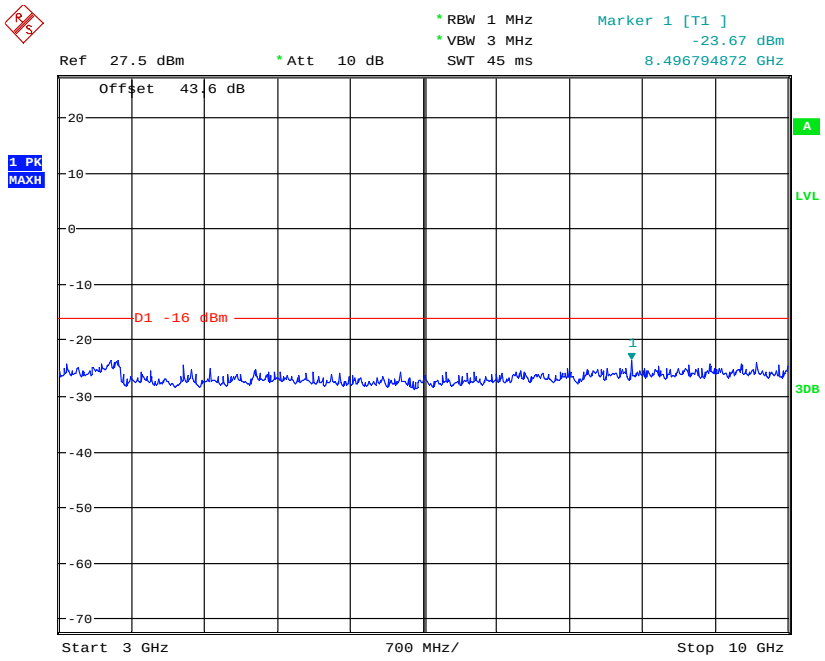
Channel Position B_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 14:16:27

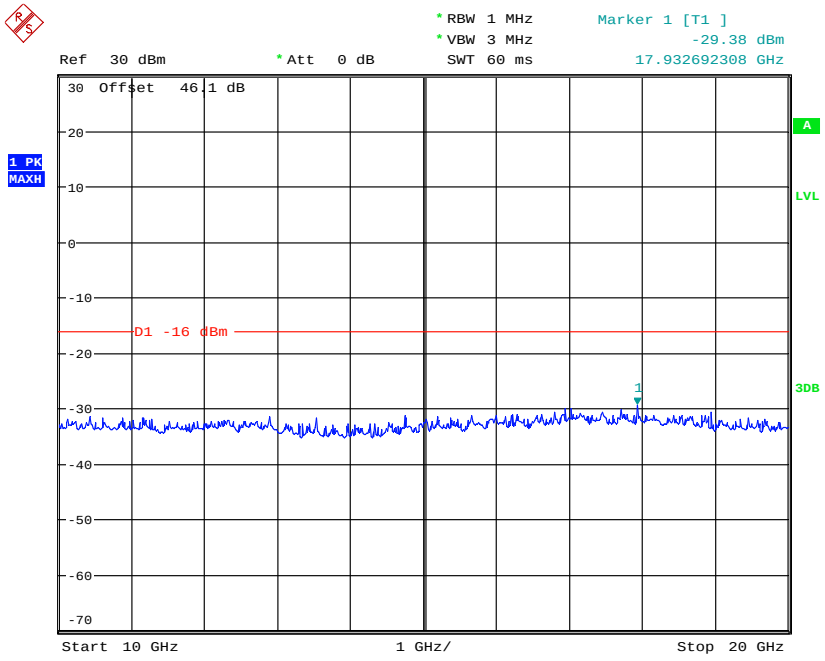
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - 16QAM - 3GHz – 10GHz



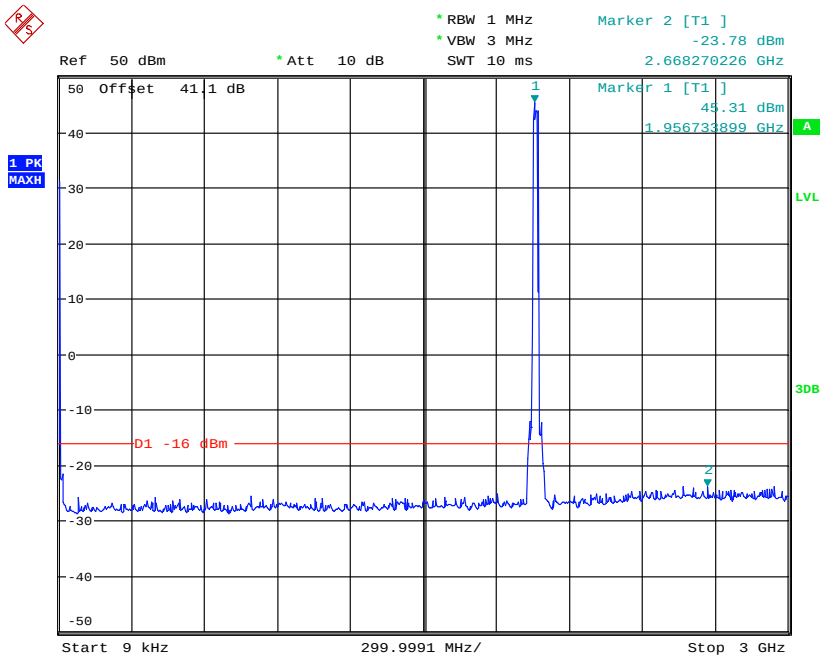
Date: 28.OCT.2014 14:15:27

Channel Position B_{RFBW} - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 14:14:41

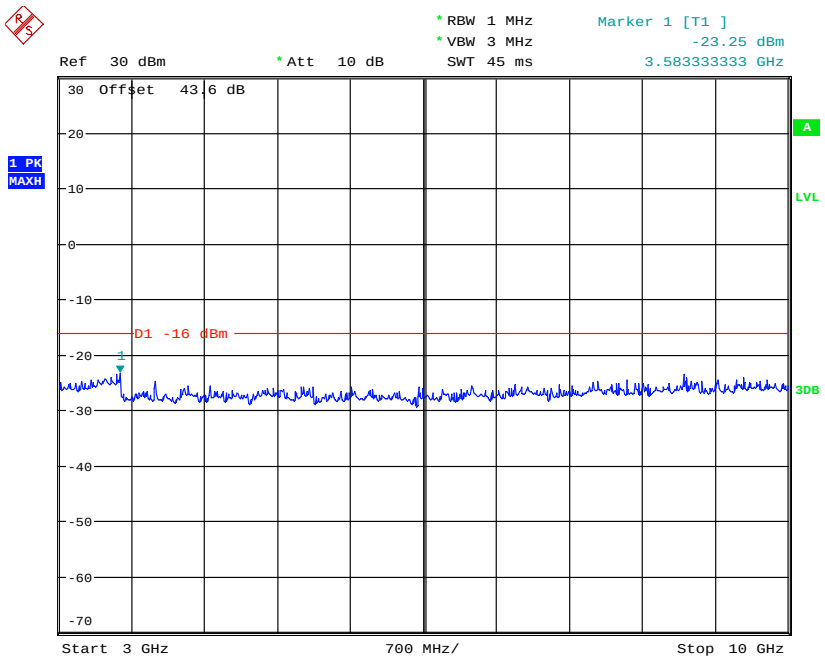
Channel Position M_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 14:23:36

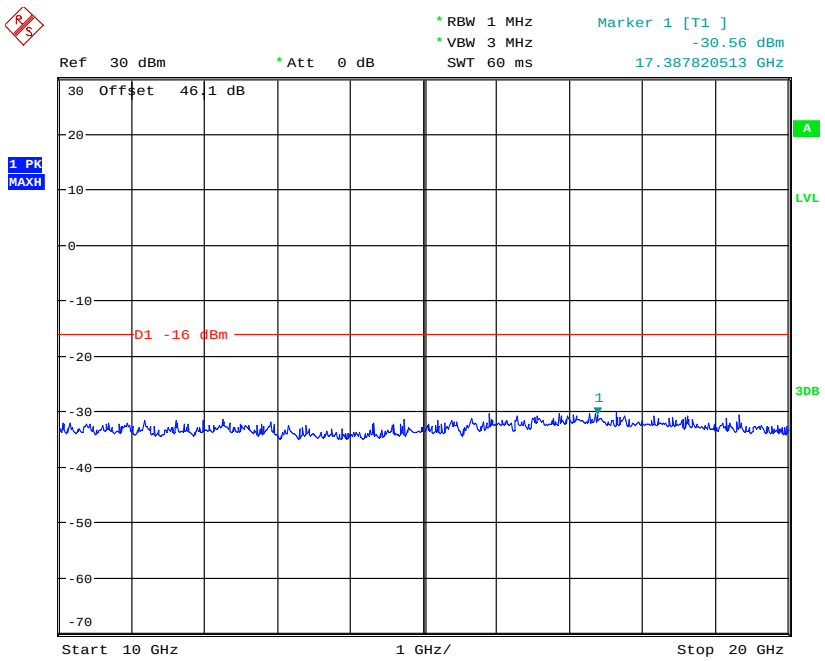
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - 16QAM - 3GHz – 10GHz



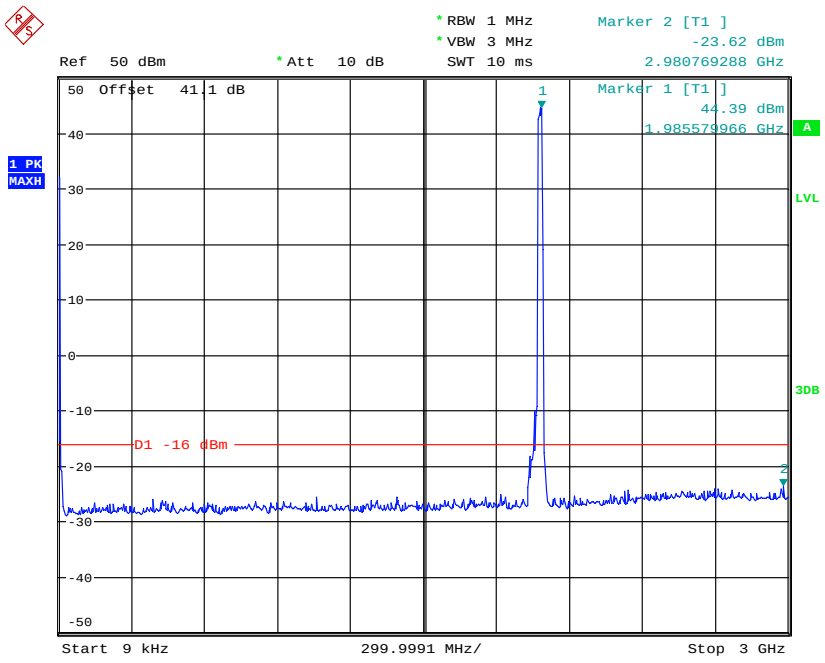
Date: 28.OCT.2014 14:24:11

Channel Position M_{RFBW} - 16QAM - 10GHz – 20GHz



Date: 28.OCT.2014 14:24:53

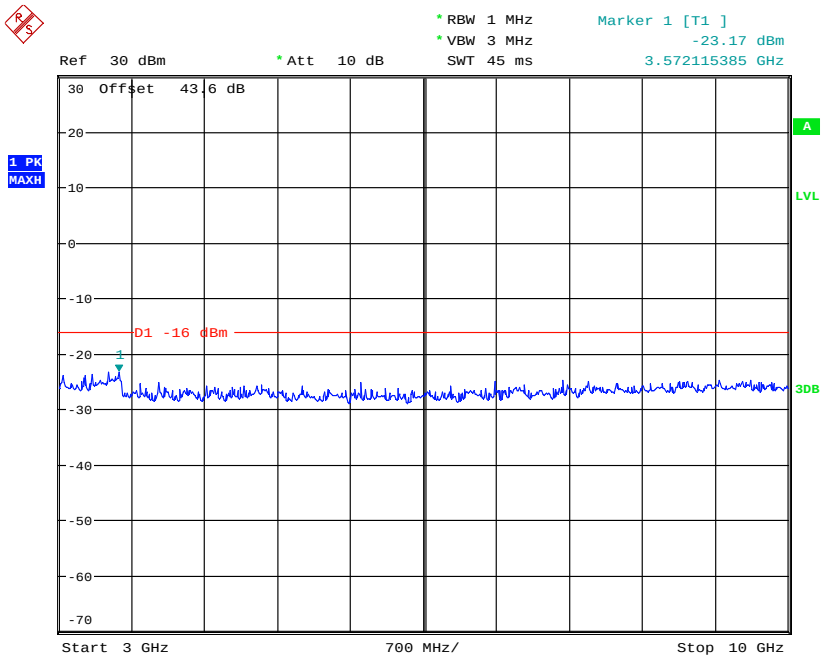
Channel Position T_{RFBW} - 16QAM - 9kHz – 3GHz



Date: 28.OCT.2014 14:33:45

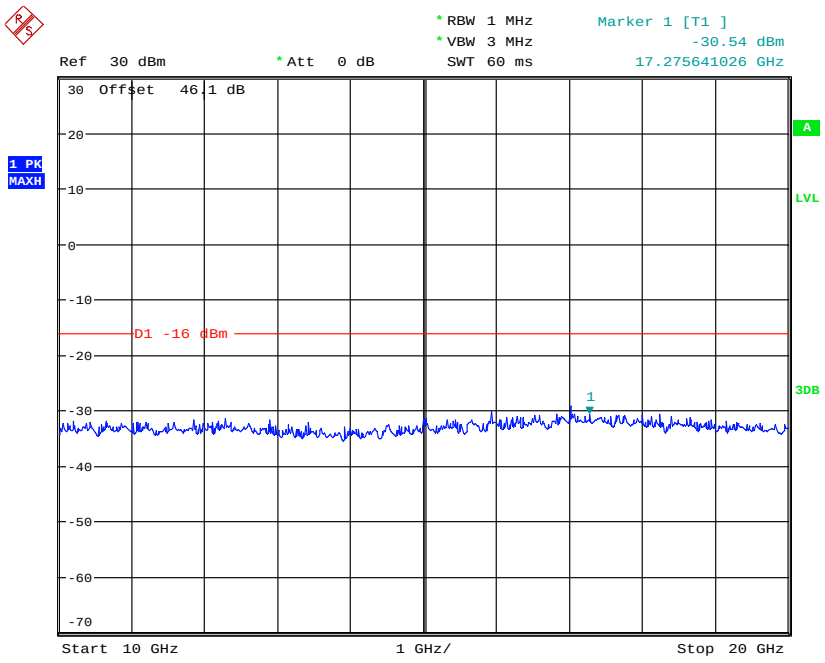
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - 16QAM - 3GHz – 10GHz



Date: 28.OCT.2014 14:34:45

Channel Position T_{RFBW} - 16QAM - 10GHz – 20GHz



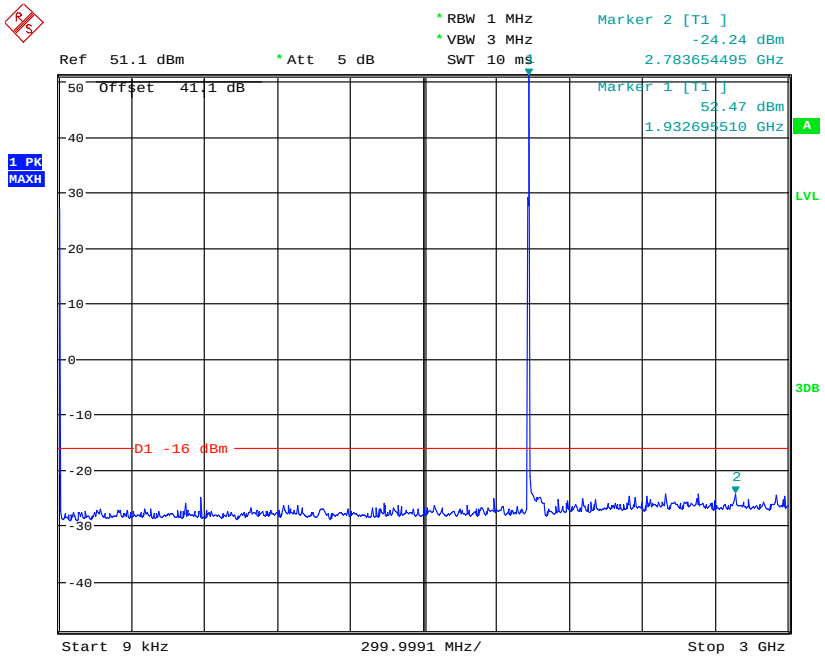
Date: 28.OCT.2014 14:35:12

Configuration L-MIMO-SC (1C)

Maximum Output Power 46.0dBm per port

Channel Position	Bandwidth	Channel Frequency
Channel Position B	1.4MHz	1930.7MHz
	20.0MHz	1940.0MHz
Channel Position M	1.4MHz	1960.0MHz
	20.0MHz	1960.0MHz
Channel Position T	1.4MHz	1989.3MHz
	20.0MHz	1980.0MHz

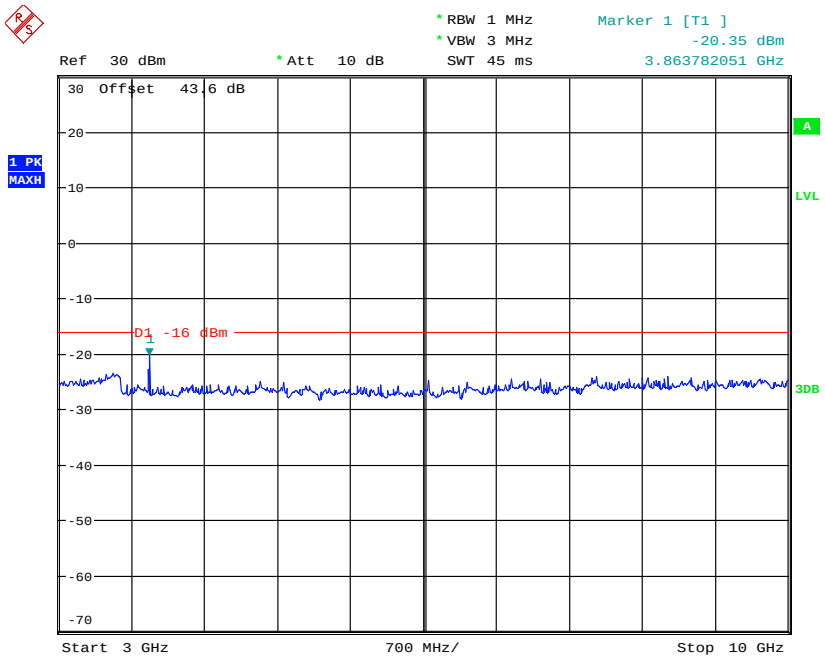
Channel Position B - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



Date: 29.OCT.2014 10:05:47

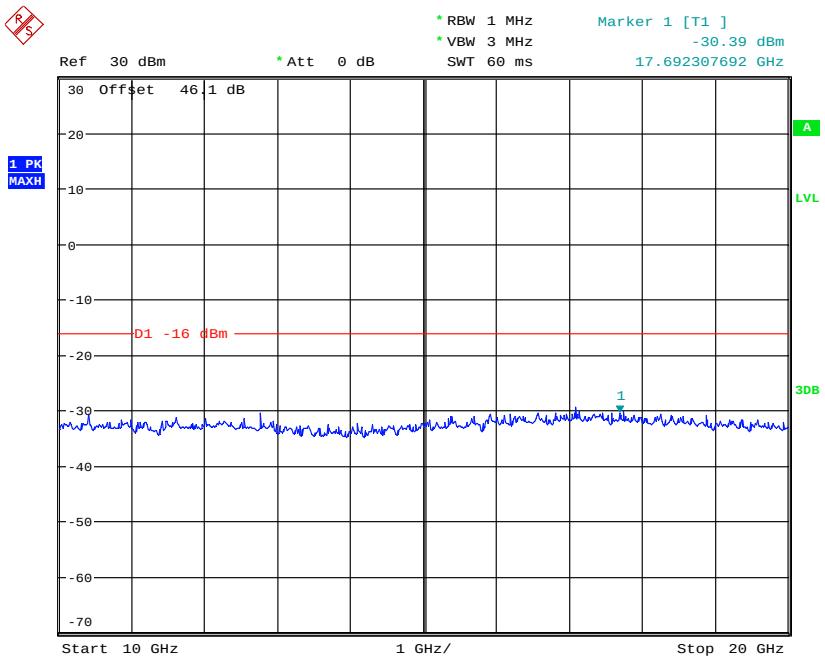
Note: The emission beyond the limit is within the operating frequency.

Channel Position B - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



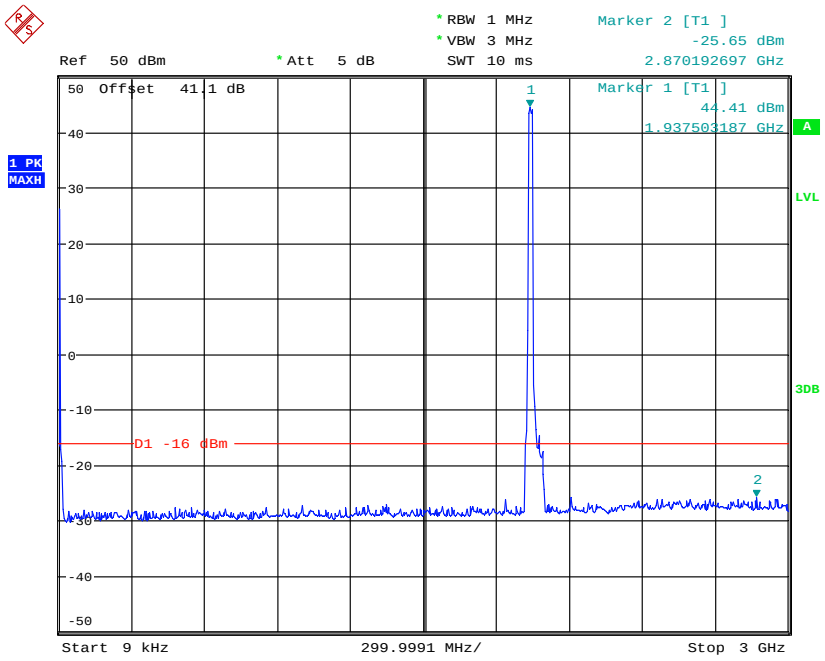
Date: 29.OCT.2014 10:06:48

Channel Position B - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 29.OCT.2014 10:12:51

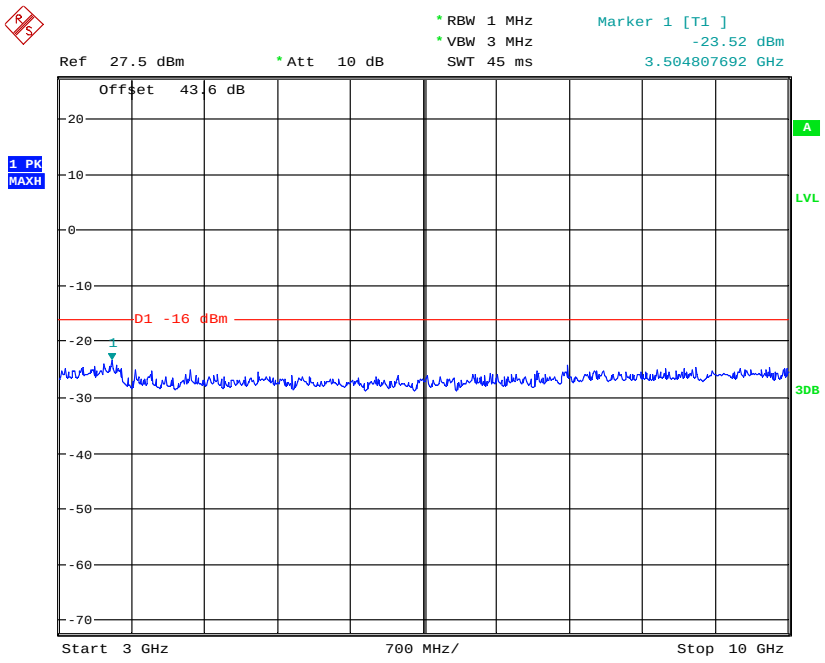
Channel Position B - QPSK / Bandwidth 20.0MHz - 9kHz – 3GHz



Date: 29.OCT.2014 16:20:07

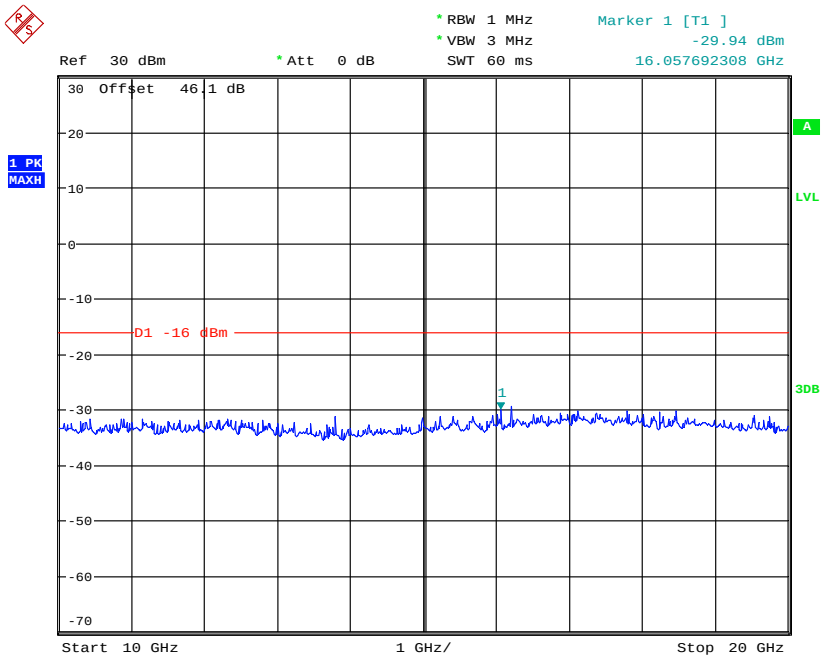
Note: The emission beyond the limit is within the operating frequency.

Channel Position B - QPSK / Bandwidth 20.0MHz - 3GHz – 10GHz



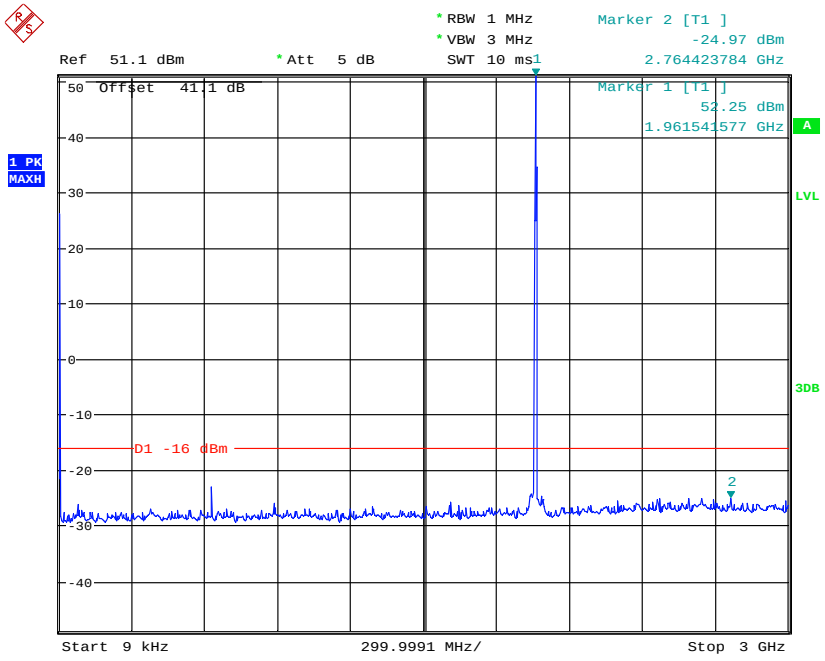
Date: 29.OCT.2014 16:19:10

Channel Position B - QPSK / Bandwidth 20.0MHz - 10GHz – 20GHz



Date: 29.OCT.2014 16:18:33

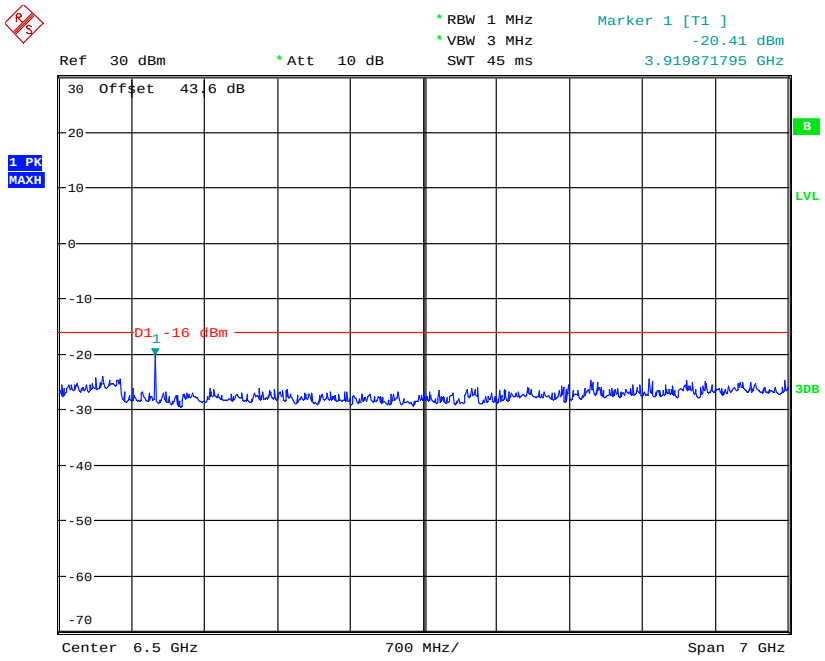
Channel Position M - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



Date: 29.OCT.2014 10:15:16

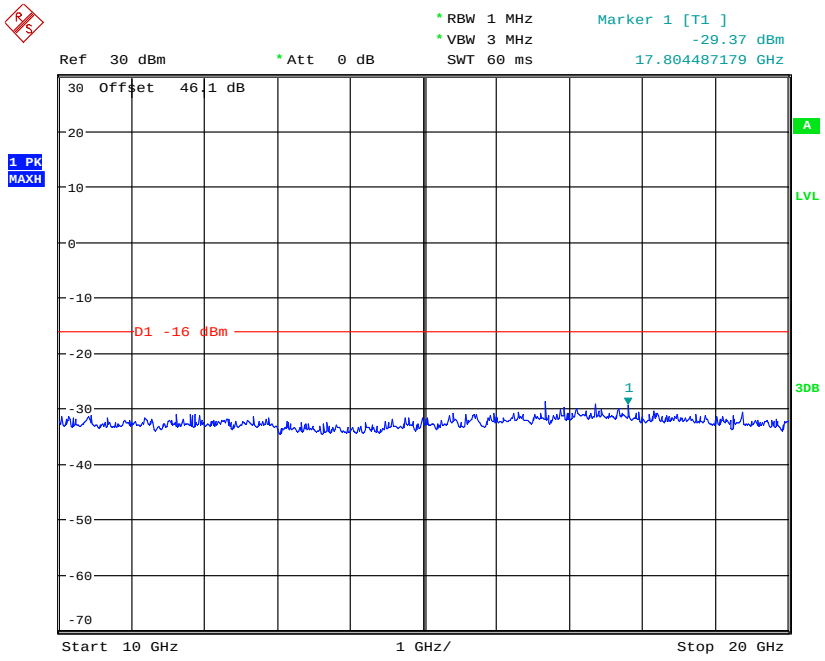
Note: The emission beyond the limit is within the operating frequency.

Channel Position M - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



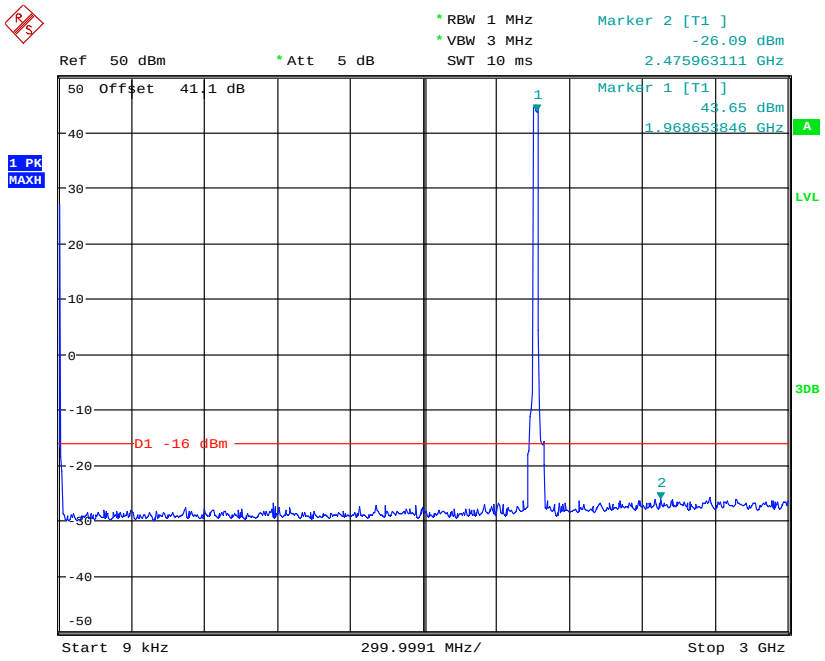
Date: 3.NOV.2014 14:15:57

Channel Position M - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 29.OCT.2014 10:13:14

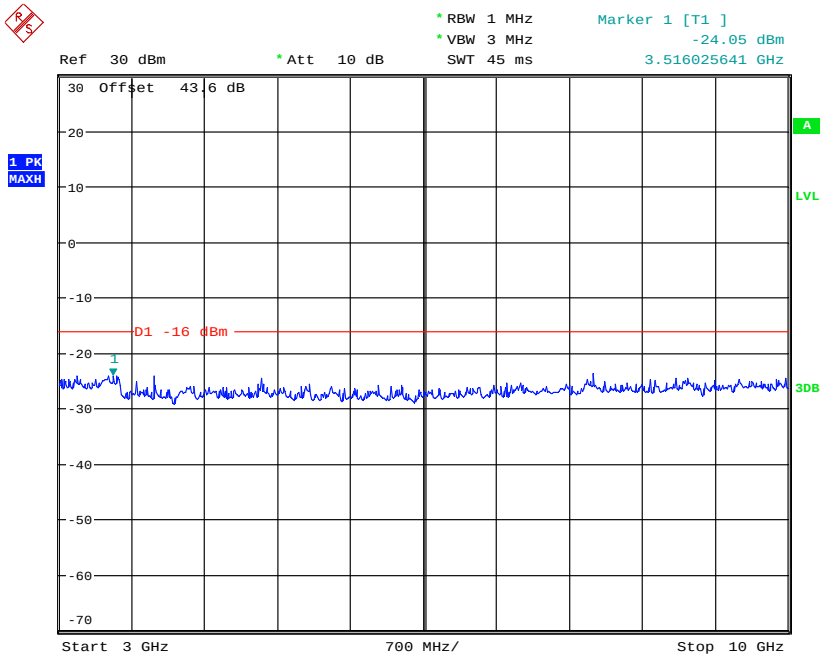
Channel Position M - QPSK / Bandwidth 20.0MHz - 9kHz – 3GHz



Date: 29.OCT.2014 16:15:02

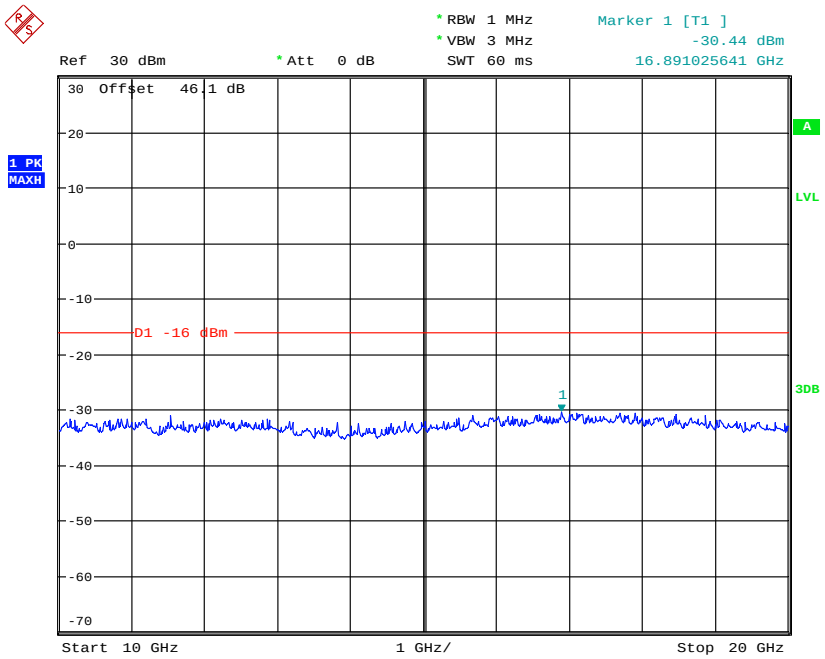
Note: The emission beyond the limit is within the operating frequency.

Channel Position M - QPSK / Bandwidth 20.0MHz - 3GHz – 10GHz



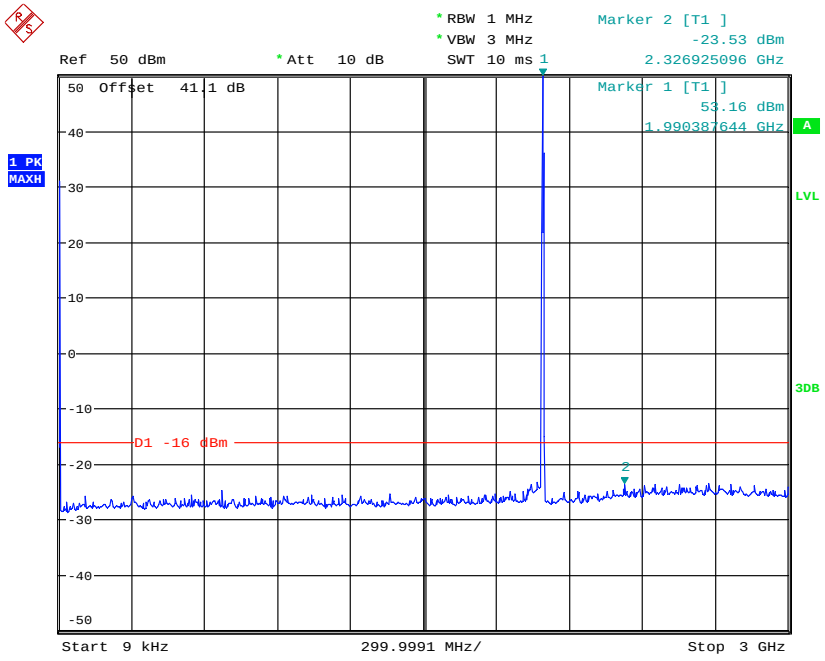
Date: 29.OCT.2014 16:16:01

Channel Position M - QPSK / Bandwidth 20.0MHz - 10GHz – 20GHz



Date: 29.OCT.2014 16:16:48

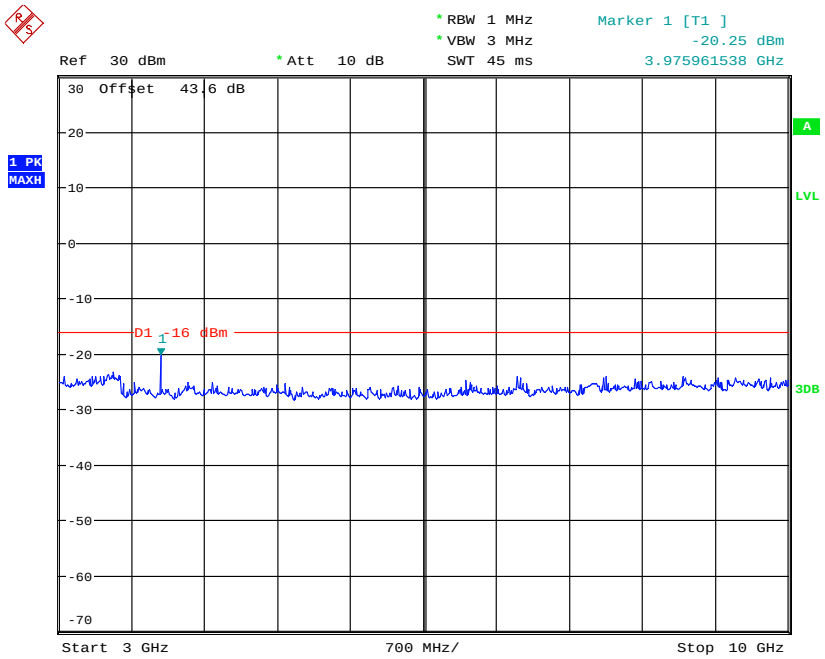
Channel Position T - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



Date: 29.OCT.2014 10:35:06

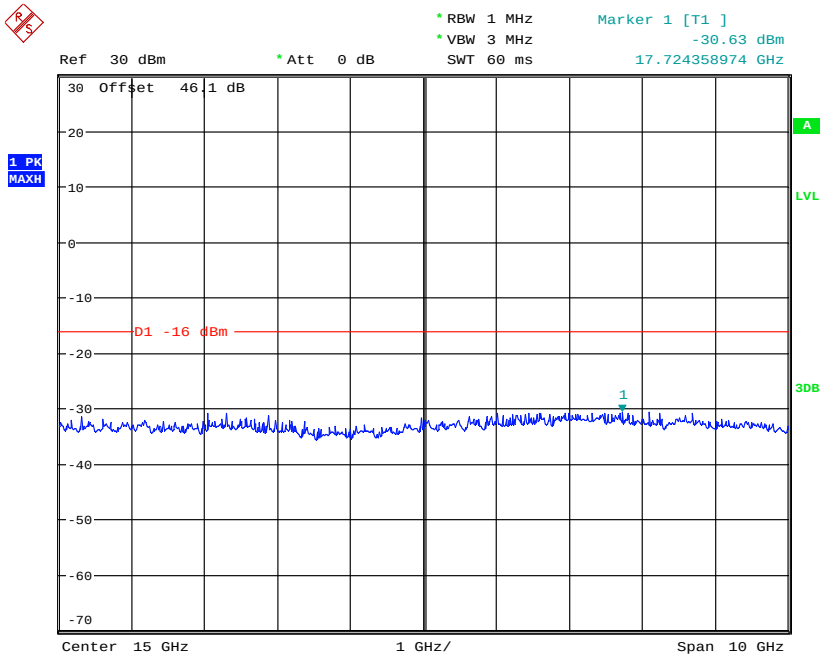
Note: The emission beyond the limit is within the operating frequency.

Channel Position T - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



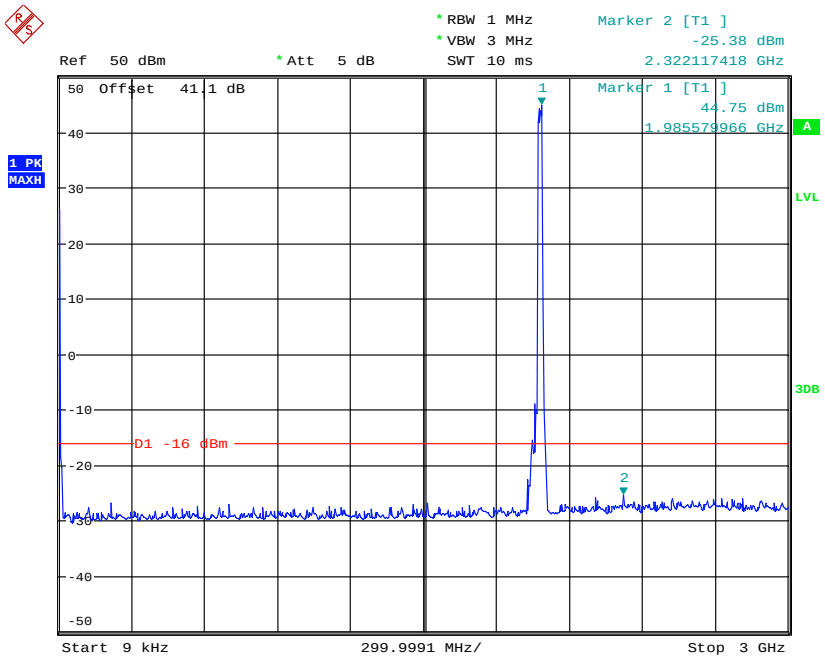
Date: 29.OCT.2014 10:33:31

Channel Position T - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 29.OCT.2014 10:34:04

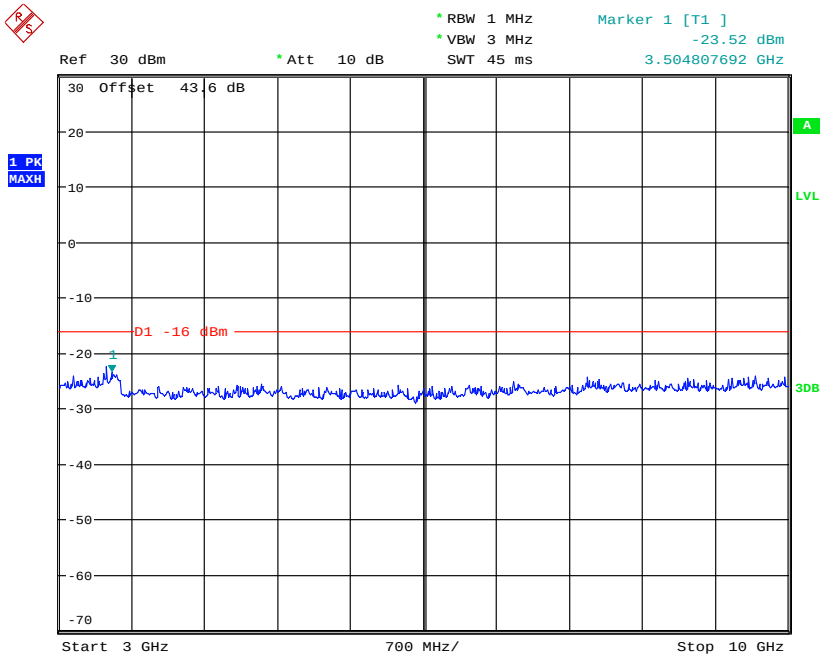
Channel Position T - QPSK / Bandwidth 20.0MHz - 9kHz – 3GHz



Date: 29.OCT.2014 16:21:01

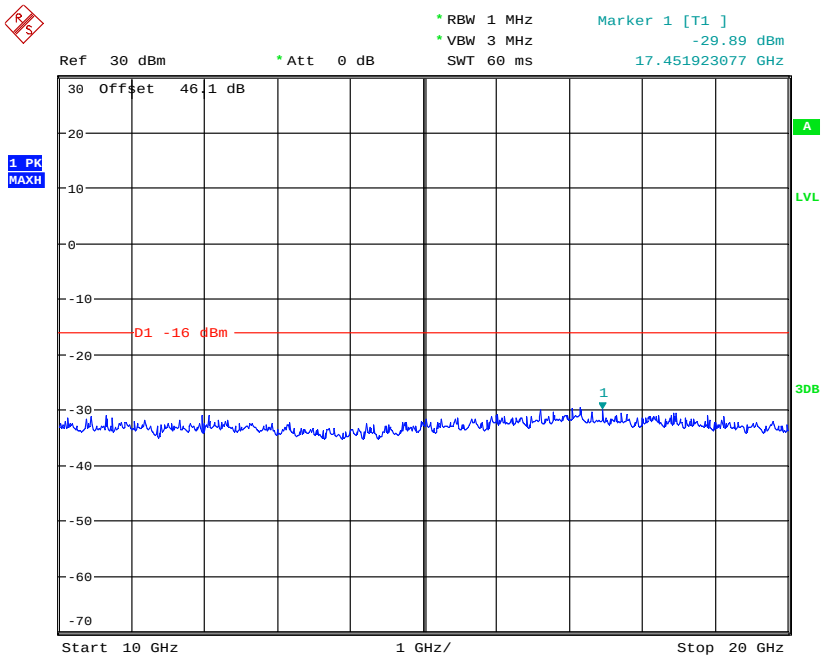
Note: The emission beyond the limit is within the operating frequency.

Channel Position T - QPSK / Bandwidth 20.0MHz - 3GHz – 10GHz



Date: 29.OCT.2014 16:21:37

Channel Position T - QPSK / Bandwidth 20.0MHz - 10GHz – 20GHz



Date: 29.OCT.2014 16:22:11

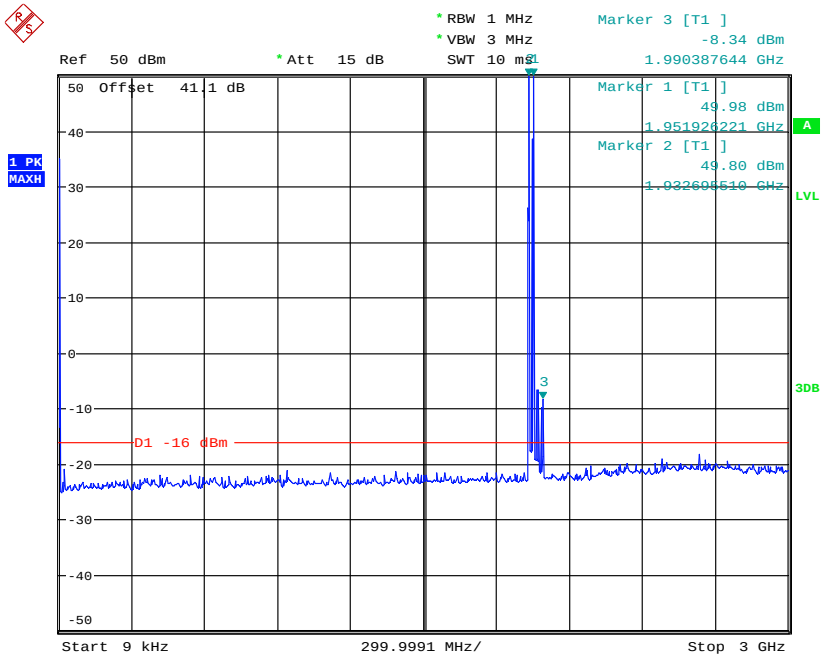
Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 45.5dBm per port for LTE Bandwidth 1.4MHz

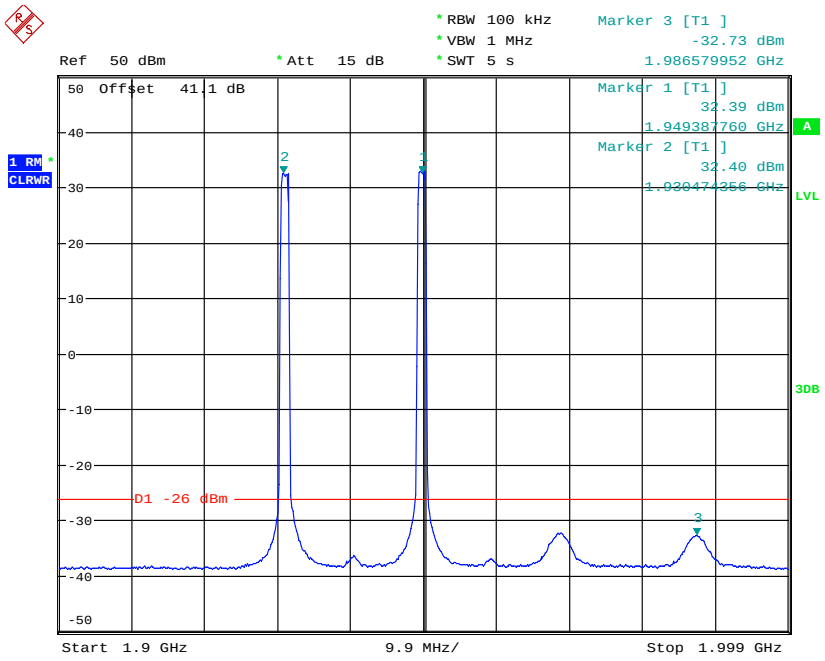
Maximum Output Power 46.0dBm per port for LTE Bandwidth 10.0MHz

Channel Position	Bandwidth	Channel Frequency
Channel Position B_{RFBW}	1.4MHz	1930.7MHz + 1949.3MHz
	10.0MHz	1935.0MHz + 1945.0MHz
Channel Position M_{RFBW}	1.4MHz	1950.7MHz + 1969.3MHz
	10.0MHz	1955.0MHz + 1965.0MHz
Channel Position T_{RFBW}	1.4MHz	1970.7MHz + 1989.3MHz
	10.0MHz	1975.0MHz + 1985.0MHz

Channel Position B_{RFBW} - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



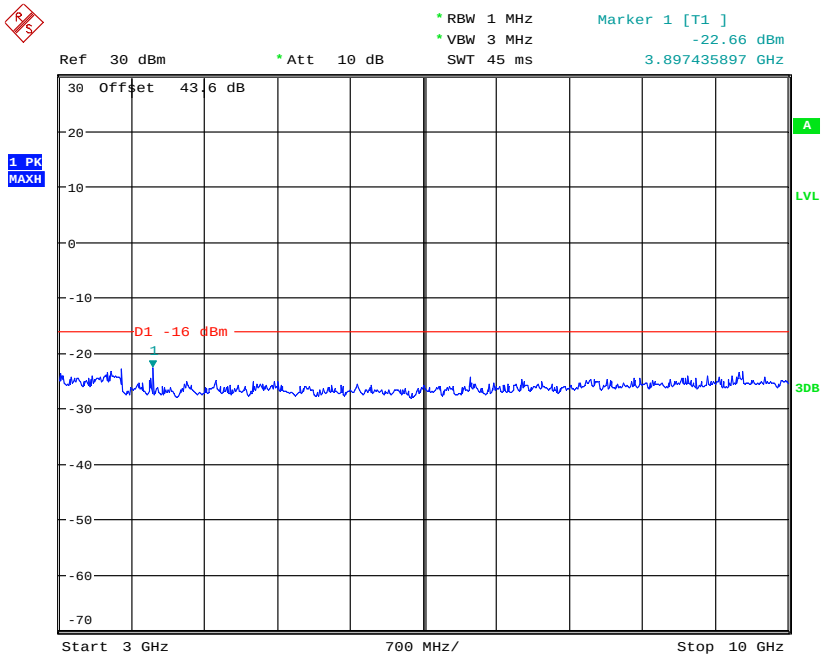
Date: 30.OCT.2014 08:52:46



Date: 30.OCT.2014 08:56:04

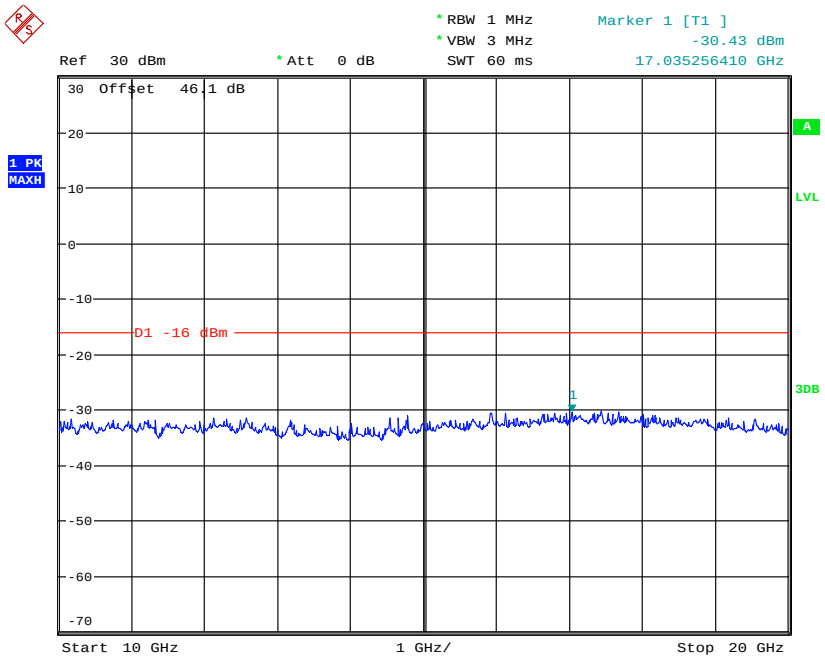
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



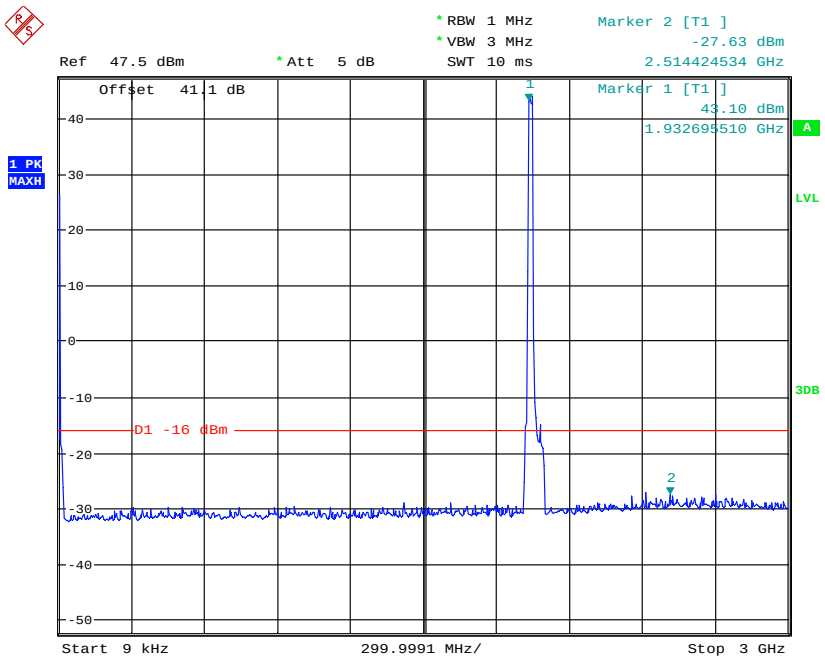
Date: 30.OCT.2014 09:31:37

Channel Position B_{RFBW} - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 30.OCT.2014 09:32:56

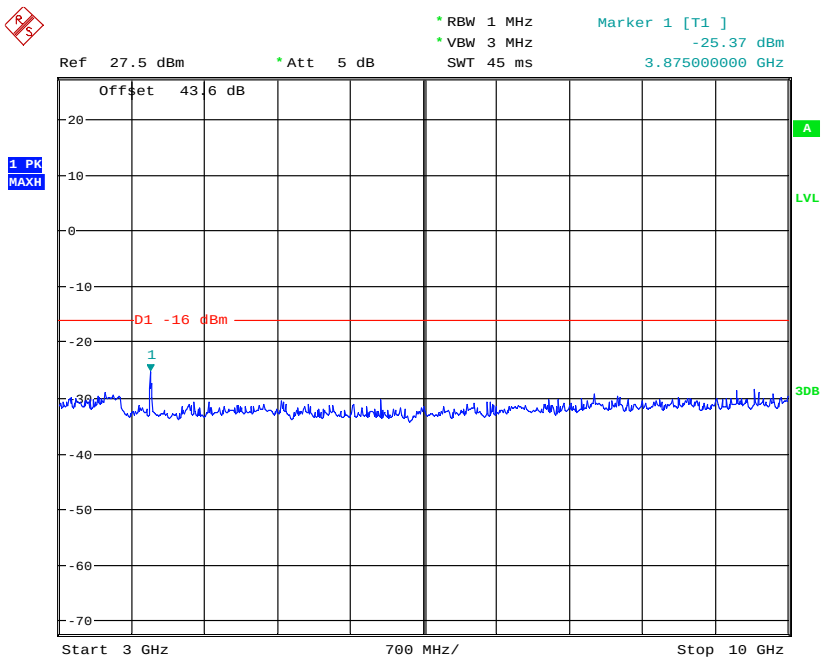
Channel Position B_{RFBW} - QPSK / Bandwidth 10.0MHz - 9kHz – 3GHz



Date: 30.OCT.2014 10:21:48

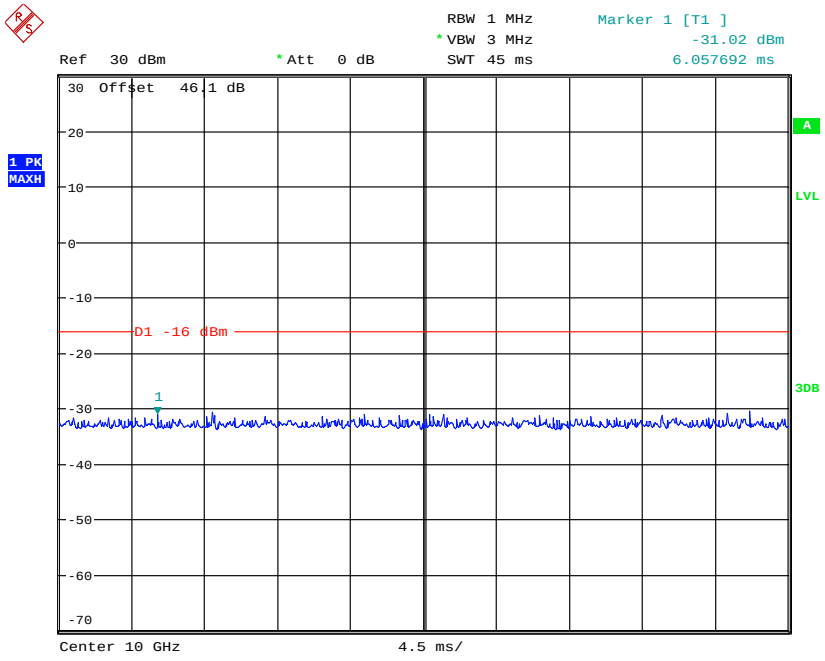
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - QPSK / Bandwidth 10.0MHz - 3GHz – 10GHz



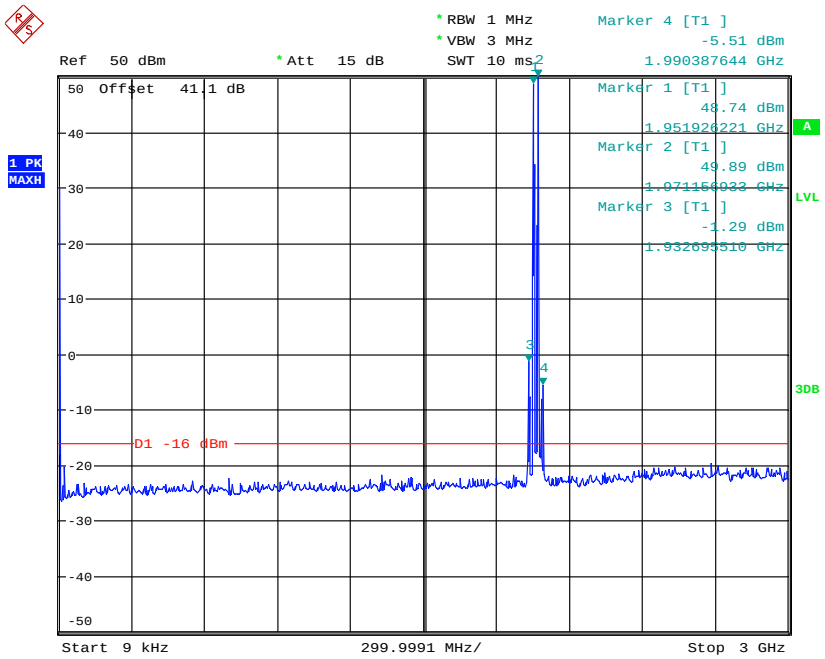
Date: 30.OCT.2014 10:19:38

Channel Position B_{RFBW} - QPSK / Bandwidth 10.0MHz - 10GHz – 20GHz

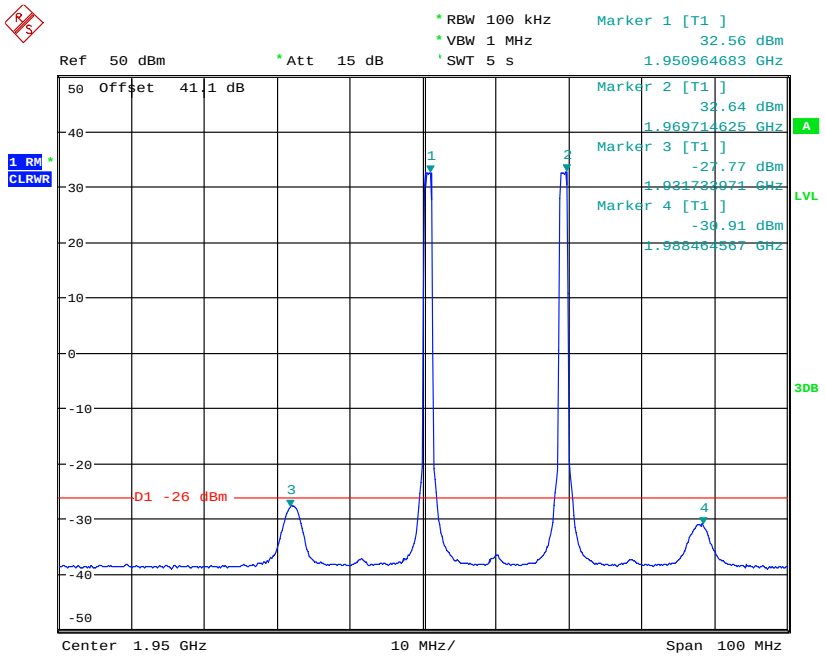


Date: 30.OCT.2014 10:18:29

Channel Position M_{RFBW} - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



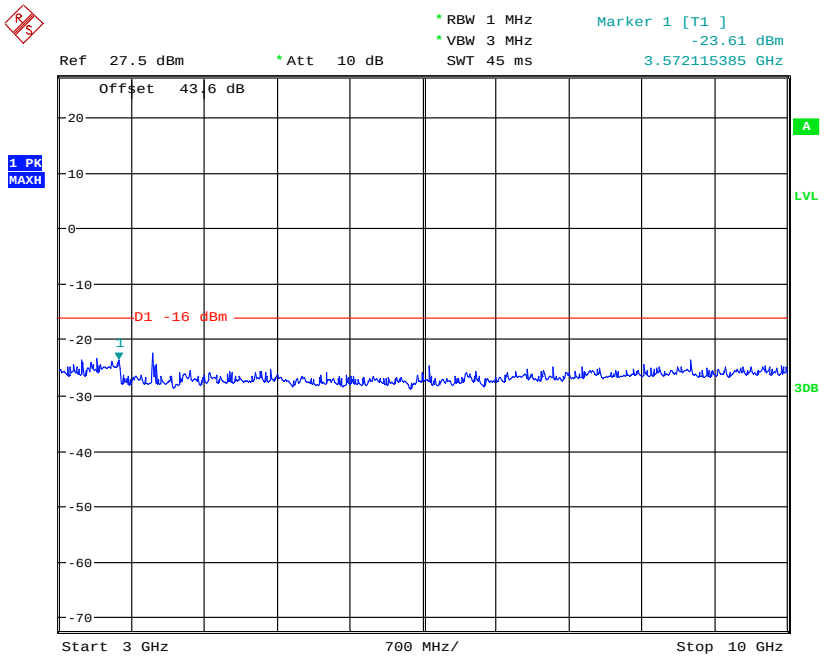
Date: 30.OCT.2014 09:44:26



Date: 30.OCT.2014 09:46:18

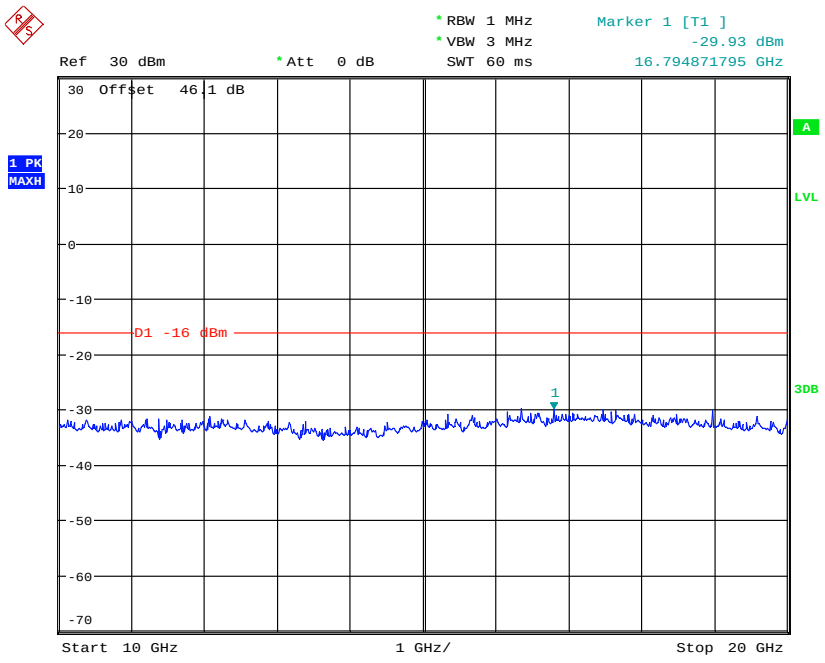
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



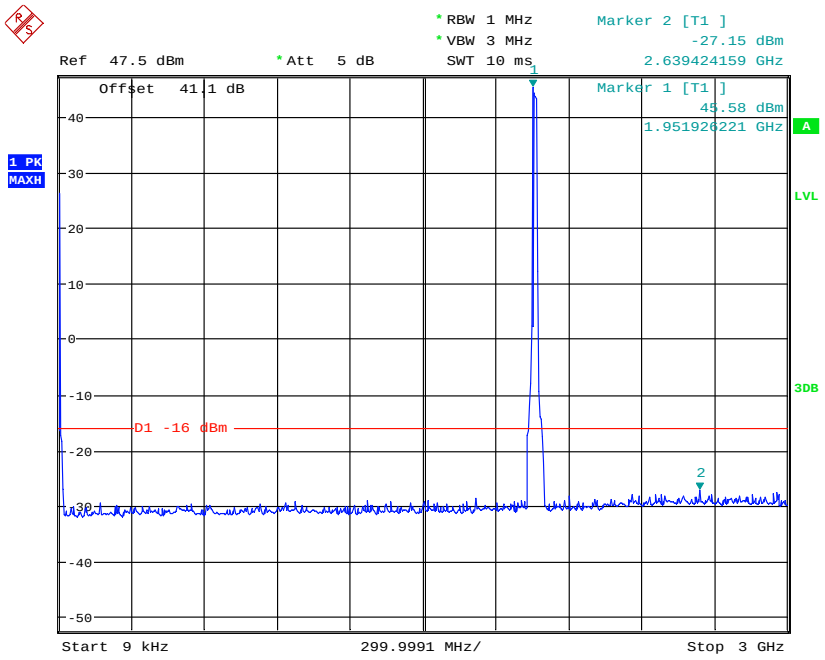
Date: 30.OCT.2014 09:42:37

Channel Position M_{RFBW} - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 30.OCT.2014 09:41:45

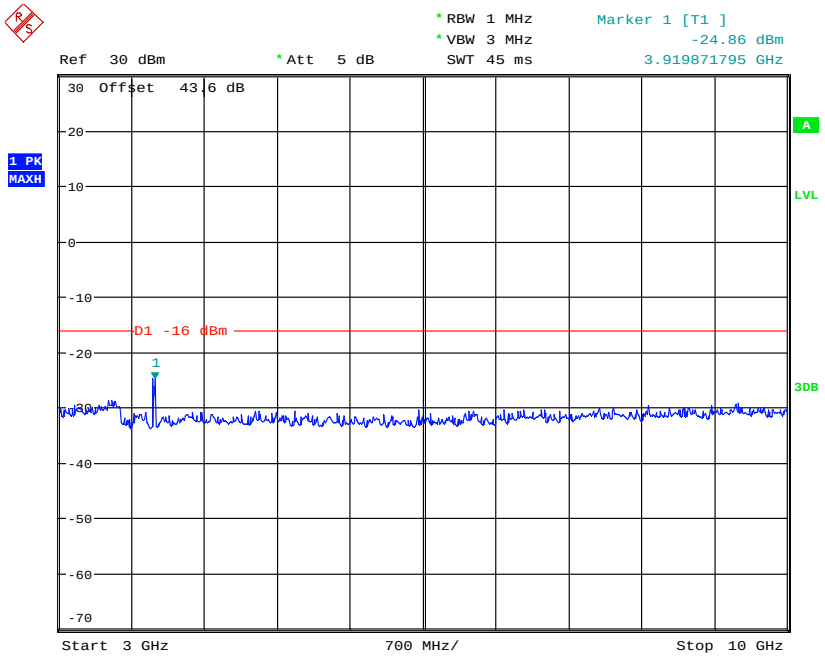
Channel Position M_{RFBW} - QPSK / Bandwidth 10.0MHz - 9kHz – 3GHz



Date: 30.OCT.2014 10:23:47

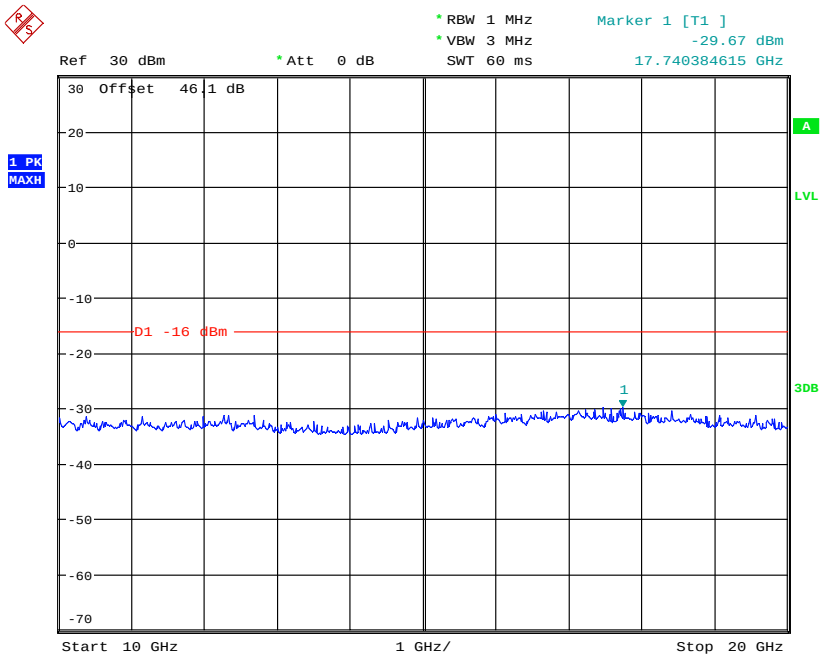
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - QPSK / Bandwidth 10.0MHz - 3GHz – 10GHz



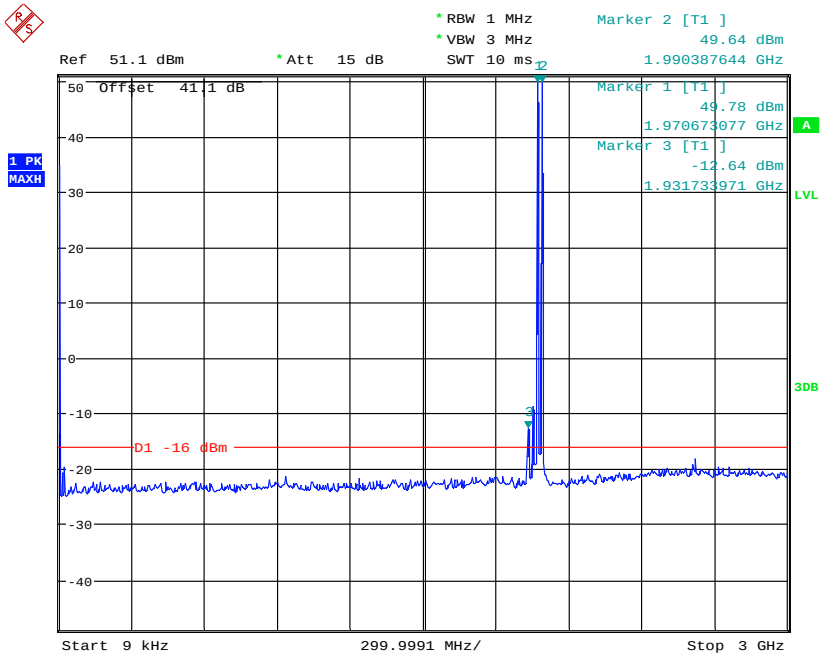
Date: 30.OCT.2014 10:24:22

Channel Position M_{RFBW} - QPSK / Bandwidth 10.0MHz - 10GHz – 20GHz

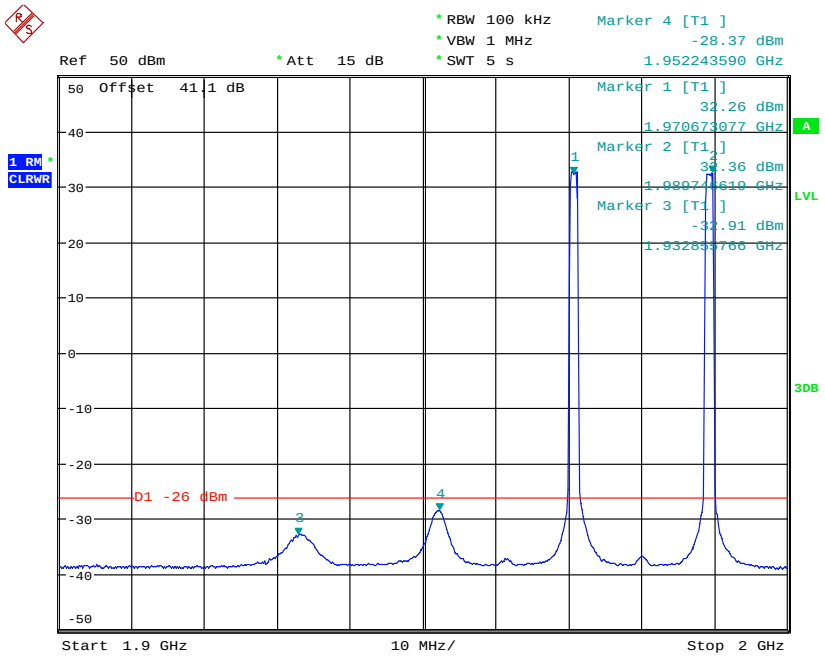


Date: 30.OCT.2014 10:27:06

Channel Position T_{RFBW} - QPSK / Bandwidth 1.4MHz - 9kHz – 3GHz



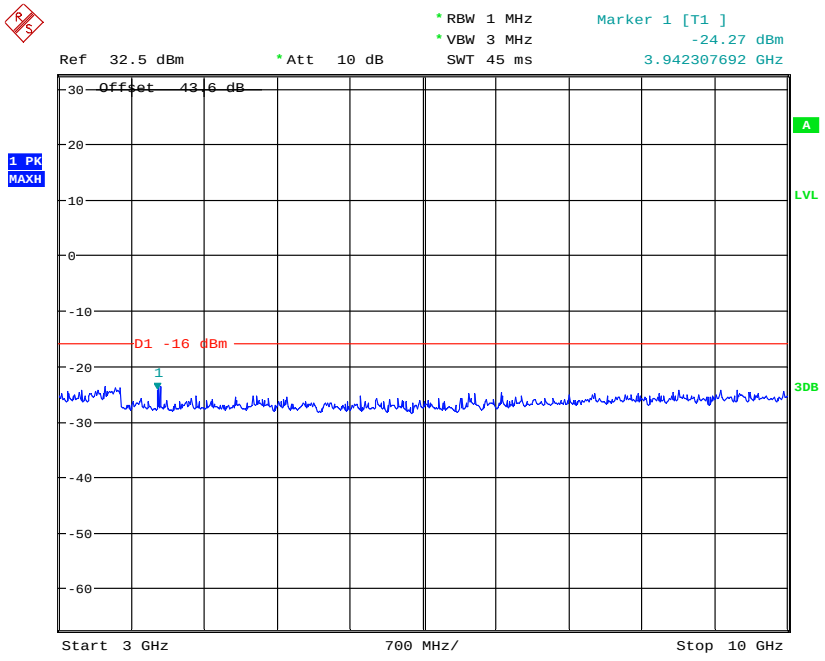
Date: 30.OCT.2014 09:49:07



Date: 30.OCT.2014 09:50:43

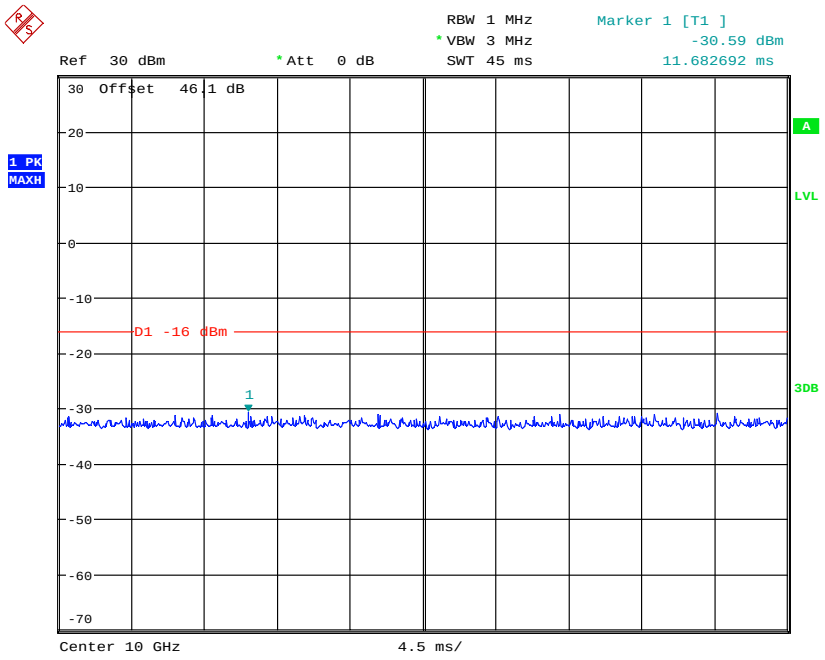
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - QPSK / Bandwidth 1.4MHz - 3GHz – 10GHz



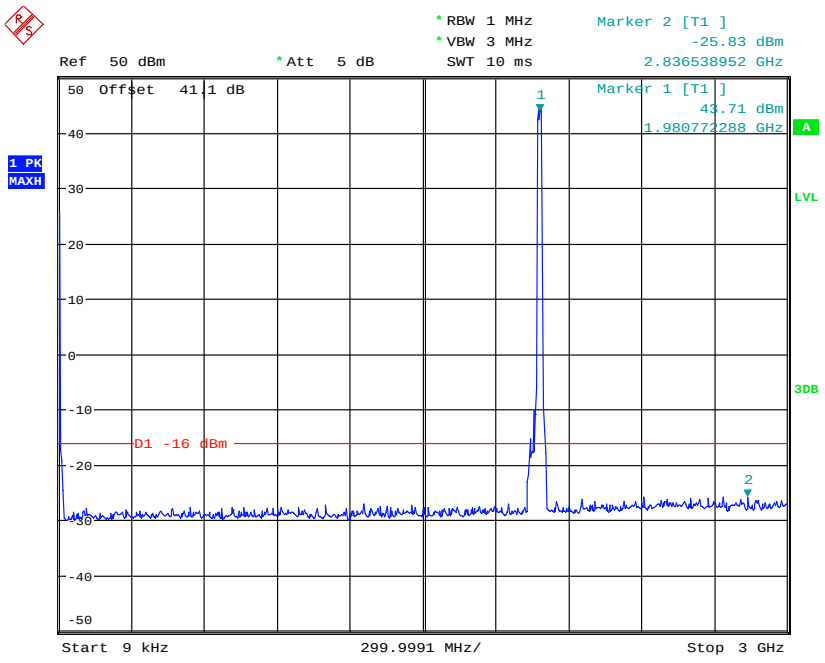
Date: 30.OCT.2014 09:52:58

Channel Position T_{RFBW} - QPSK / Bandwidth 1.4MHz - 10GHz – 20GHz



Date: 30.OCT.2014 09:54:44

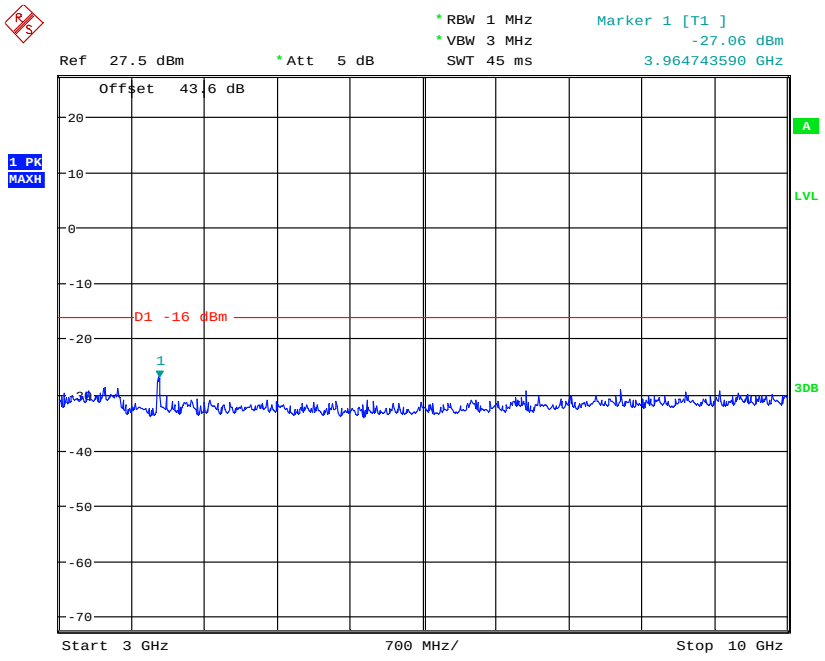
Channel Position T_{RFBW} - QPSK / Bandwidth 10.0MHz - 9kHz – 3GHz



Date: 30.OCT.2014 10:28:57

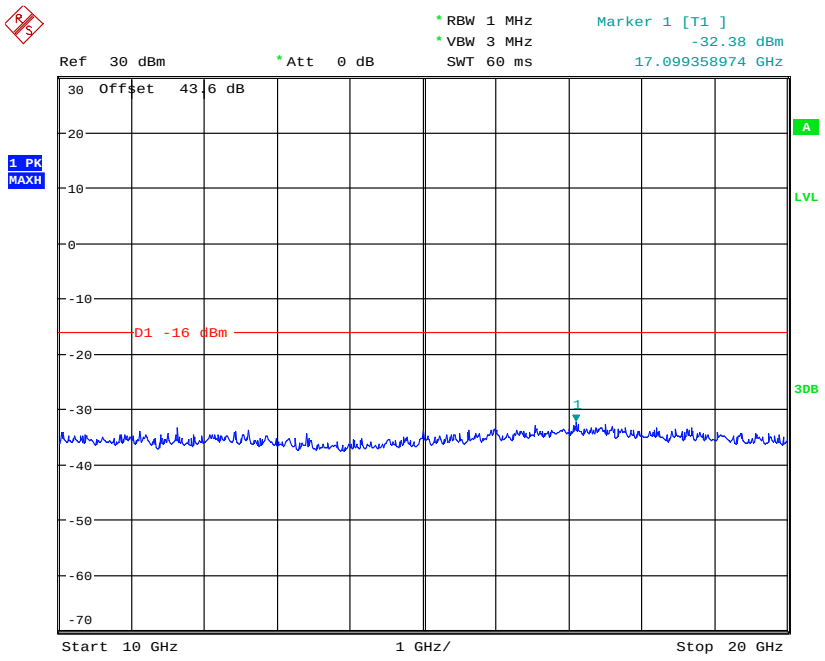
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - QPSK / Bandwidth 10.0MHz - 3GHz – 10GHz



Date: 30.OCT.2014 10:28:12

Channel Position T_{RFBW} - QPSK / Bandwidth 10.0MHz - 10GHz – 20GHz



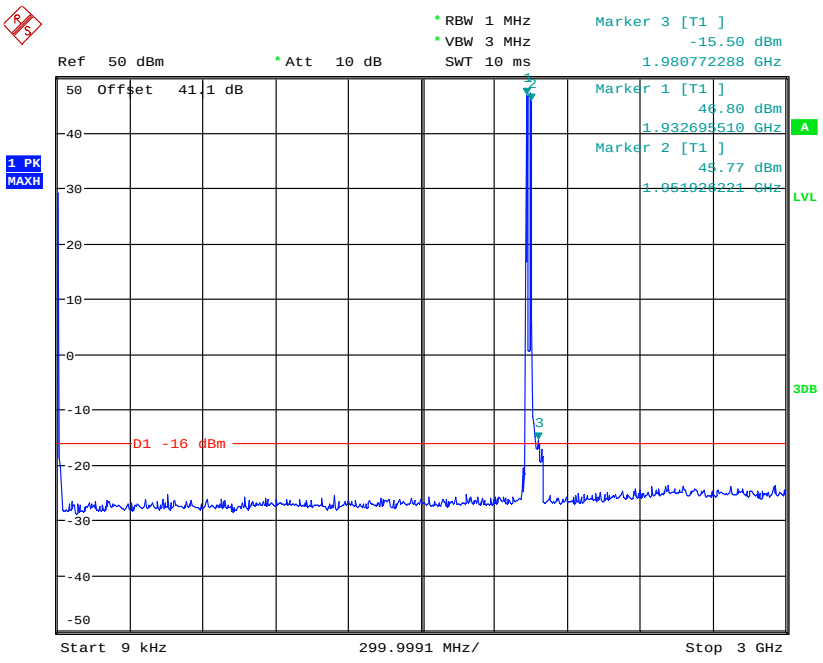
Date: 30.OCT.2014 10:26:13

Configuration W+L-MIMO-MC 1 (1W + 1L)

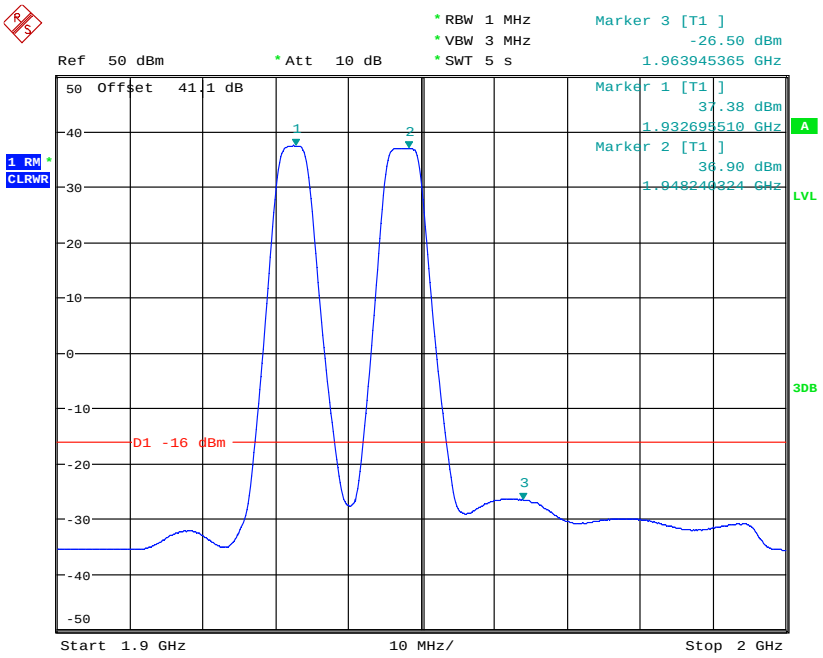
Maximum Output Power 46.0dBm per port, LTE Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position B_{RFBW}	(W) 1932.4MHz + (L)1947.5MHz
Channel Position M_{RFBW}	(W) 1952.4MHz + (L)1967.5MHz
Channel Position T_{RFBW}	(W) 1972.4MHz + (L)1987.5MHz

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



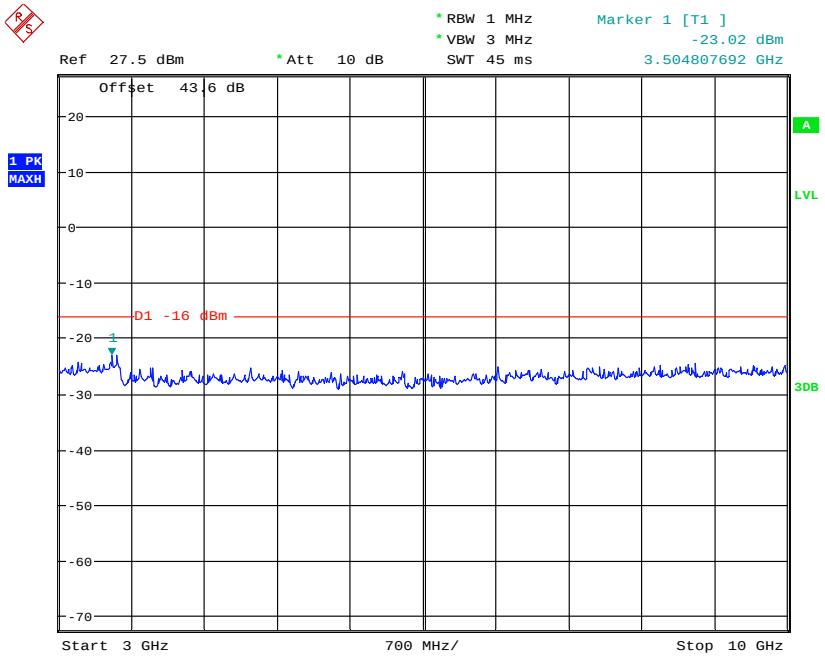
Date: 3.NOV.2014 09:34:21



Date: 3.NOV.2014 09:35:21

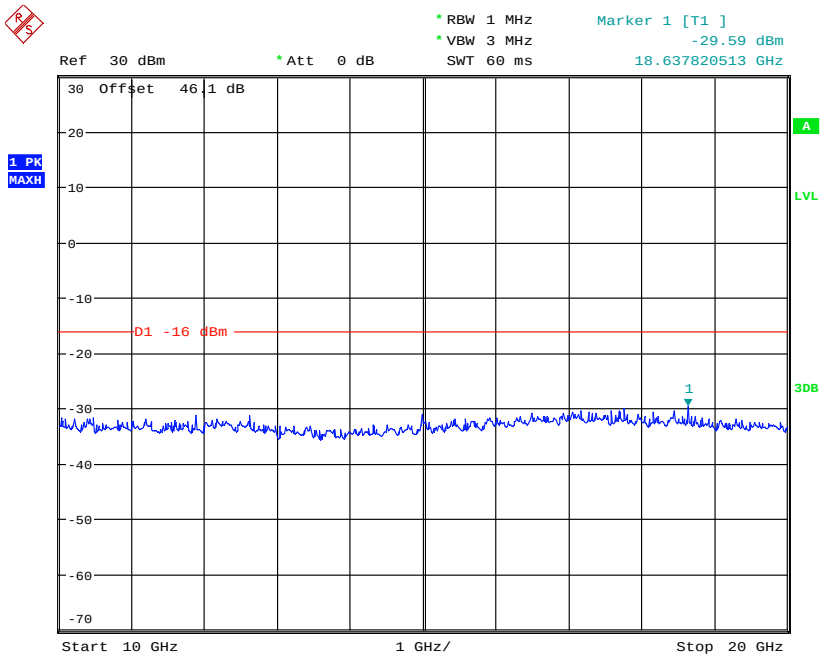
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



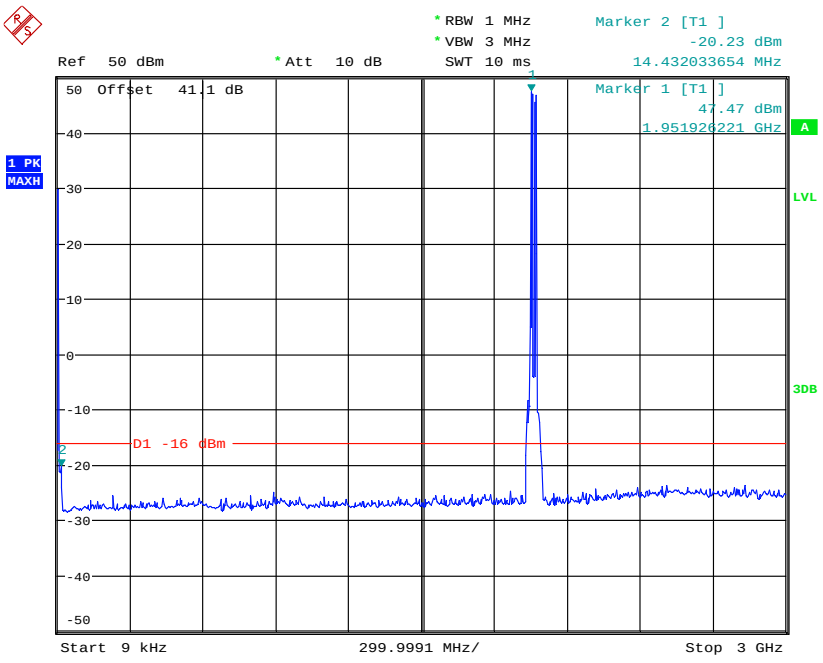
Date: 3.NOV.2014 09:32:21

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



Date: 3.NOV.2014 09:30:23

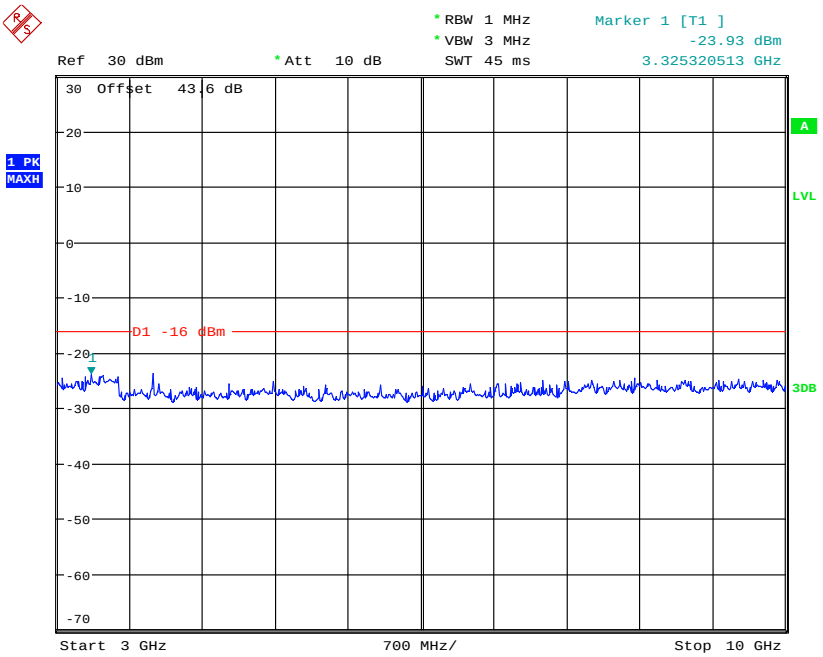
Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



Date: 31.OCT.2014 09:53:18

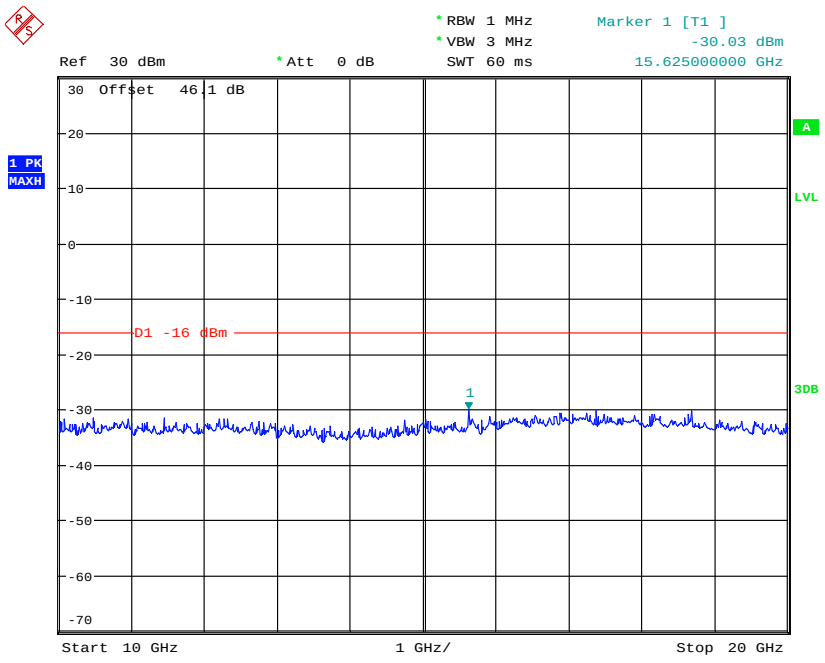
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



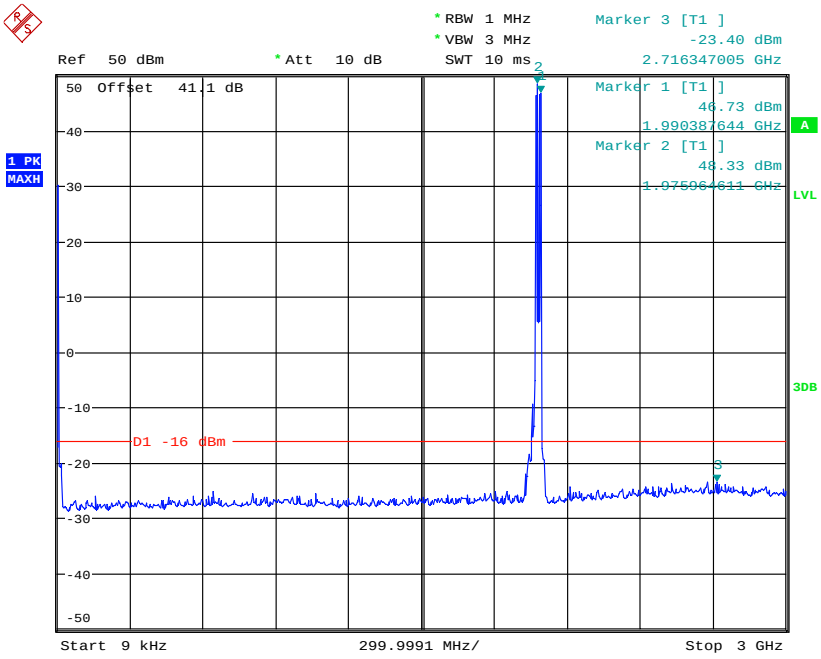
Date: 31.OCT.2014 09:50:36

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



Date: 31.OCT.2014 09:51:56

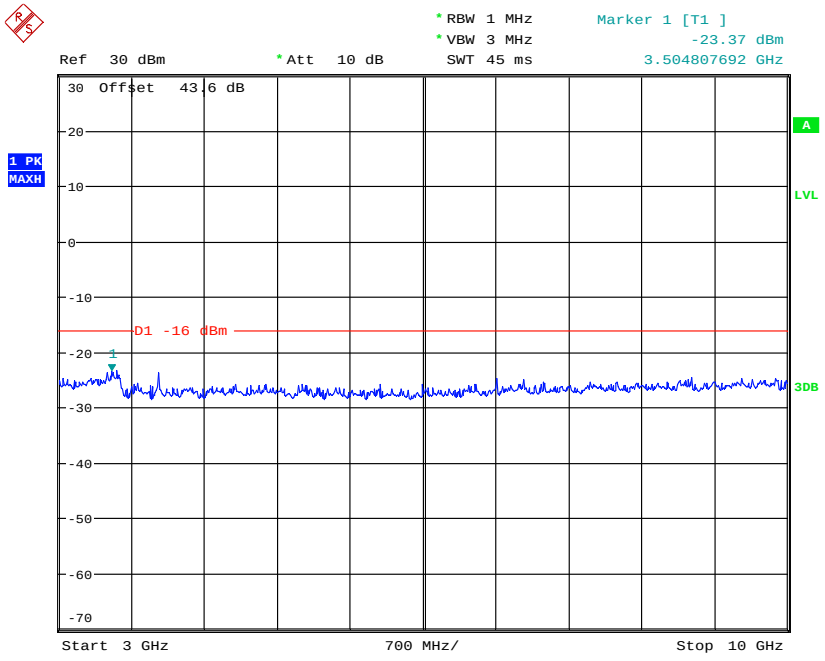
Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



Date: 3.NOV.2014 09:47:15

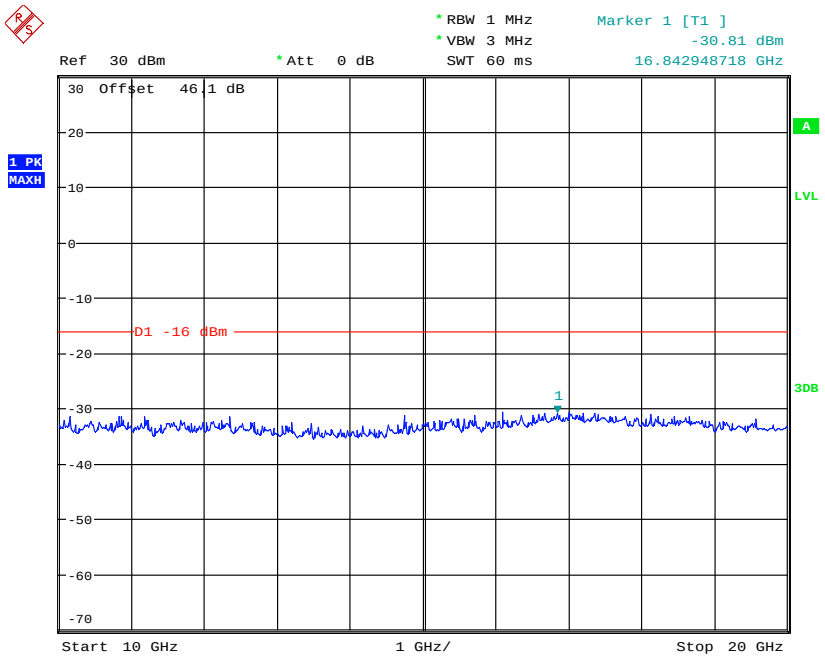
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



Date: 3.NOV.2014 09:48:26

Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



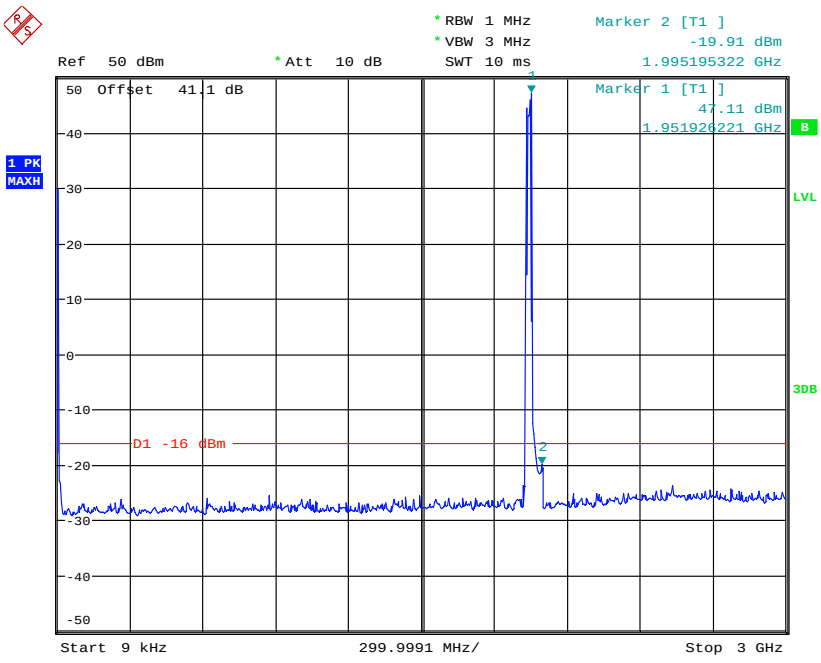
Date: 3.NOV.2014 09:49:10

Configuration W+L-MIMO-MC 3 (2W + 1L)

Maximum Output Power 46.0dBm per port, LTE Bandwidth 5.0MHz

Channel Position	Channel Frequencies
Channel Position B_{RFBW}	(W) 1932.4MHz + (W) 1937.4MHz +(L)1947.5MHz
Channel Position M_{RFBW}	(W) 1952.4MHz + (W) 1957.4MHz + (L)1967.5MHz
Channel Position T_{RFBW}	(W) 1972.4MHz + (W) 1977.4MHz + (L)1987.5MHz

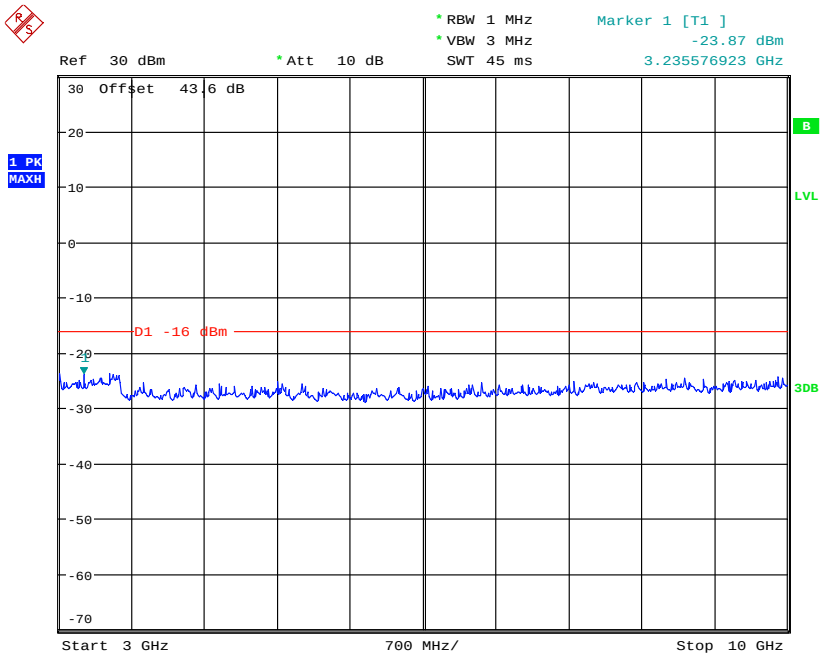
Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



Date: 3.NOV.2014 13:03:25

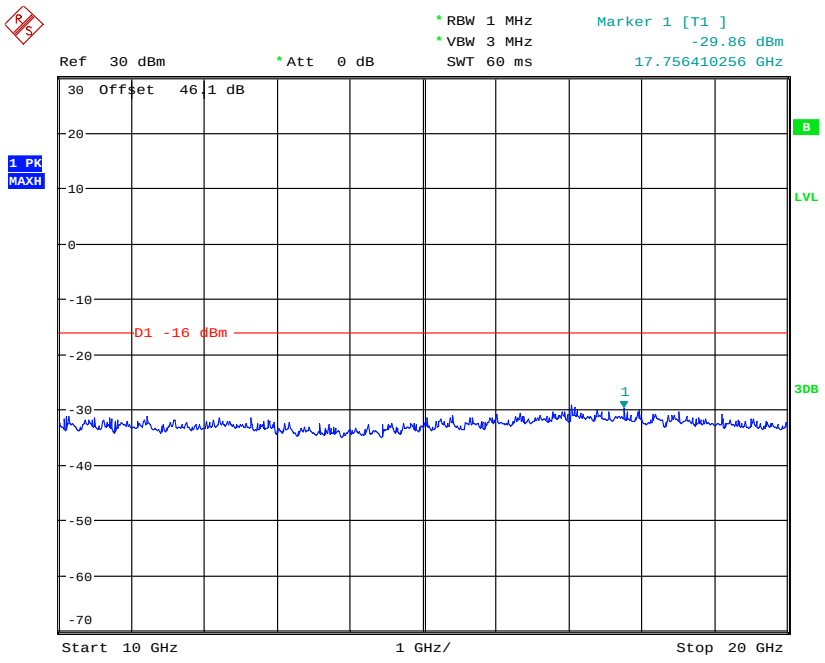
Note: The emission beyond the limit is within the operating frequency.

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



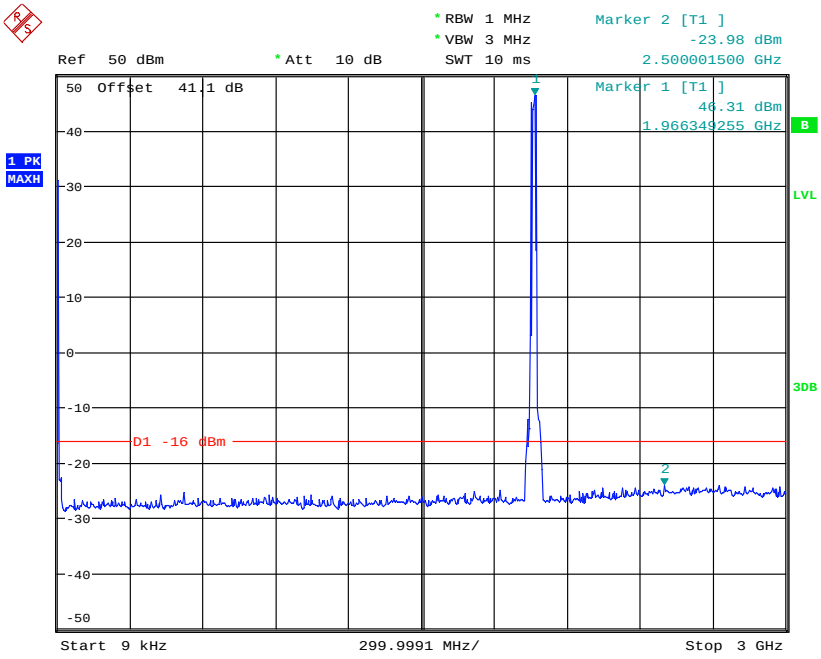
Date: 3.NOV.2014 13:04:00

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



Date: 3.NOV.2014 13:05:08

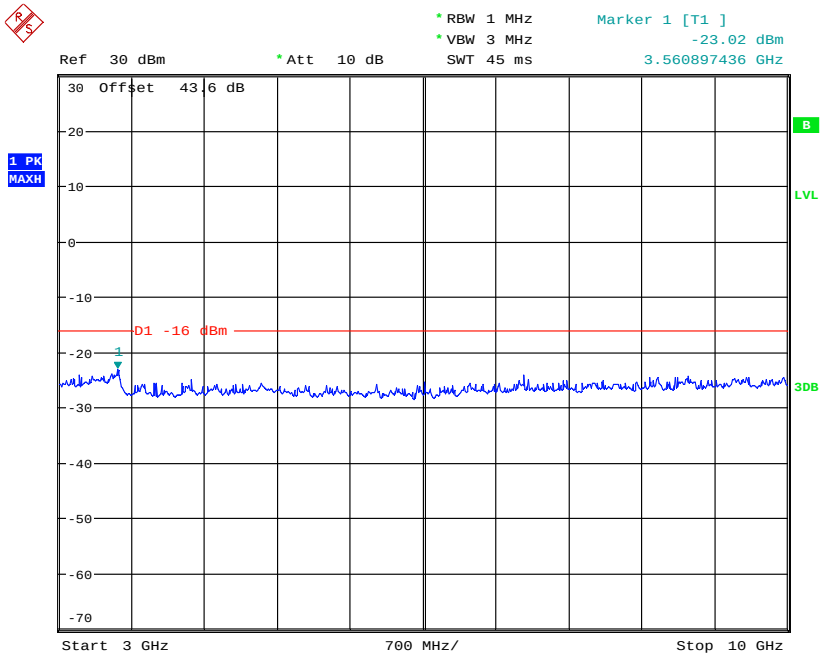
Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



Date: 3.NOV.2014 10:30:30

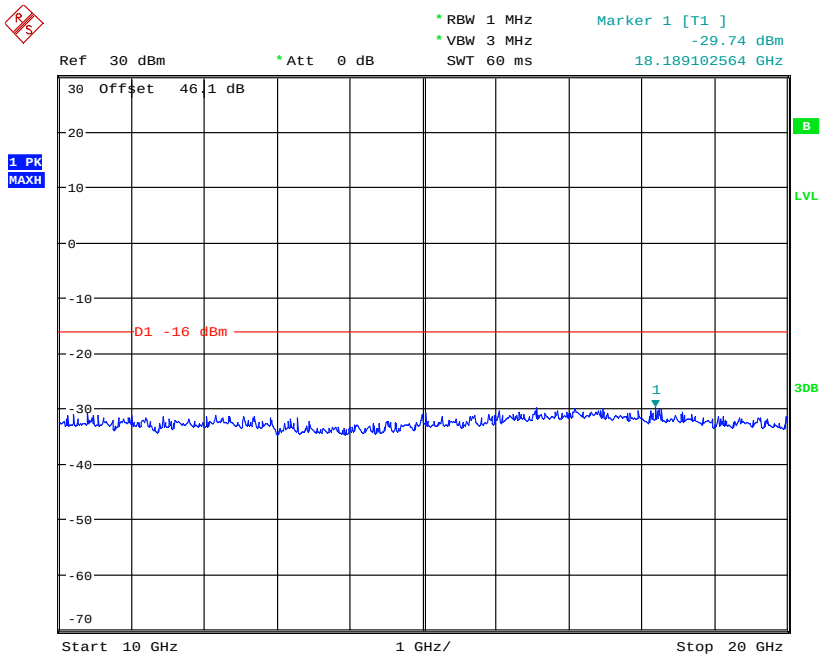
Note: The emission beyond the limit is within the operating frequency.

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



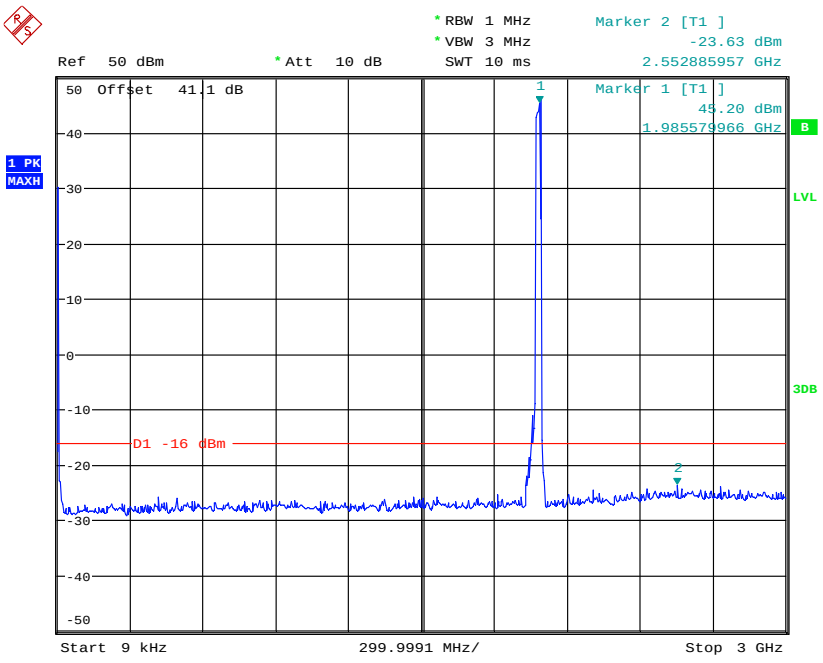
Date: 3.NOV.2014 10:31:56

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



Date: 3.NOV.2014 10:32:38

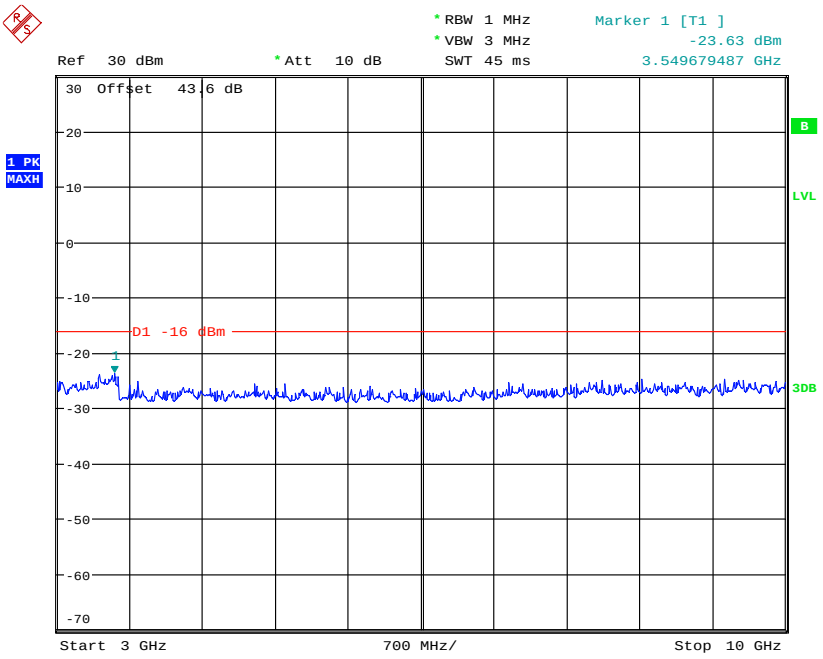
Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 9kHz – 3GHz



Date: 3.NOV.2014 13:14:35

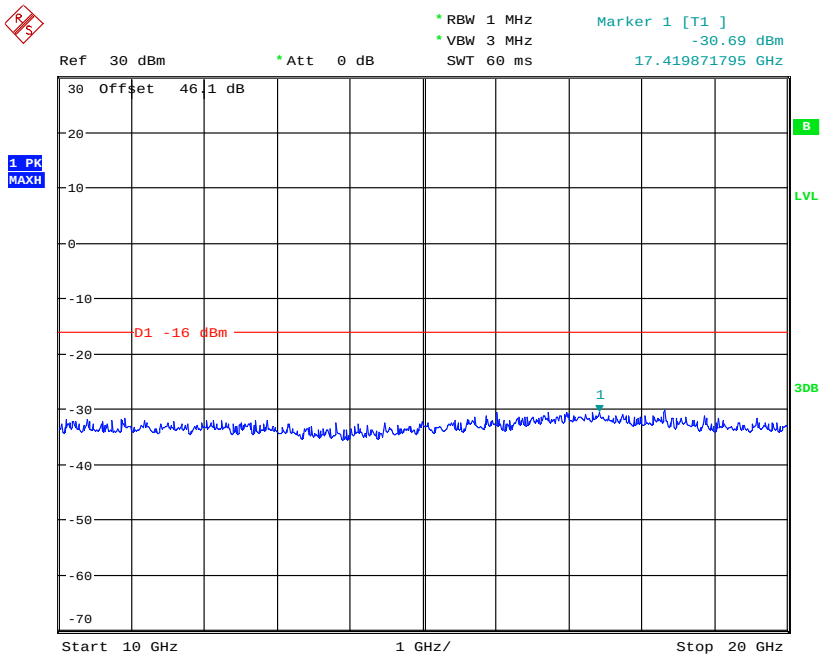
Note: The emission beyond the limit is within the operating frequency.

Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 3GHz – 10GHz



Date: 3.NOV.2014 13:13:40

Channel Position T_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 5.0MHz - 10GHz – 20GHz



Date: 3.NOV.2014 13:12:57

Limit	-13 dBm

SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Maximum Average Output Power and Peak to Average Ratio - Conducted					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Power Meter	Rohde & Schwarz	NRP	101593	12	10-Aug-2015
Power Sensor	Rohde & Schwarz	NRP-Z51	102311	12	15-Apr-2015
Spectrum Analyser	Rohde & Schwarz	FSQ26	101140	12	24-Apr-2015
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014
Occupied Bandwidth					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101140	12	24-Apr-2015
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014
Band Edge					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101140	12	24-Apr-2015
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014
Conducted Spurious Emission					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101140	12	24-Apr-2015
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Pass Filter	K & L	ULK 904 240/n	35	-	O/P MON
Pass Filter	Ericsson	ULK 904 193	-	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014

Radiated Spurious Emissions					
Load	Shanghai Huaxiang	TF150	11081905	-	O/P MON
Load	Shanghai Huaxiang	TF150	06081413	-	O/P MON
EMI Receiver	Rohde & Schwarz	ESIB26	100301	12	27-Mar-2015
BiLog Antenna	Rohde & Schwarz	HL562	100488	12	15-Feb-2015
Double Ridge Guide Horn Antenna	ETS-Lindgren	EMCO 3117	00056645	12	15-Feb-2015
Double Ridge Guide Horn Antenna	ETS-Lindgren	EMCO 3117	00056662	12	15-Feb-2015
Semi Anechoic Chamber	ETS-Lindgren	9.6m×6.72m×5.98m	-	12	18-Mar-2015
30MHz~3GHz Pre-amplifier	Rohde & Schwarz	SCU03	10005	-	O/P MON
3GHz~18GHz Pre-amplifier	Rohde & Schwarz	AFS42-00101800-25-S-42	1078388		O/P MON
Filters Array	Rohde & Schwarz	TS-Filt	-	-	O/P MON
Switches Array	Rohde & Schwarz	TS-RSP	100241	-	O/P MON
Multi-Device Controller	ETS-Lindgren	2090	00049393	-	O/P MON
Viedo monitoring system	ETS-Lindgren	Y21953A	2501103	-	O/P MON
DC Power Supply	Dahua	DH1716-5D	2007060032	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014

N/A – Not Applicable
OP MON – Output Monitored with Calibrated Equipment

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30MHz to 10GHz Amplitude	0.5dB*
EIRP	30MHz to 20GHz Amplitude	2.6dB
Conducted Emissions	30MHz to 40GHz Amplitude	3.0dB*
Frequency stability	30MHz to 2GHz	$<\pm 1x10^{-7}$
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Worst case error for both Time and Frequency measurement 12 parts in 10^6		

* In accordance with CISPR 16-4

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).