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Report On

FCC and IC Testing of the
Ericsson AB (1900 MHz) RUS 02 B2 KRC 161 298/1 Radio Unit
In accordance with FCC CFR 47 Part 24 and Industry Canada RSS-133: Issue 6

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161298-1
IC ID: 287AB-AS1612981

PREPARED BY	APPROVED BY	DATED
Yuanjie He Project Engineer	Nic Forsyth Authorised Signatory	27 May 2014

Document 75926540 Report 01 Issue 1 May 2014

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SECTION 1

1 REPORT INFORMATION

1.1 REPORT DETAILS

Testing was carried out in support of a C2PC application for Grant of RUS 02 B2 KRC 161 298/1 to to include LTE 3 Carriers configuration and Hardware update.

Manufacturer	Ericsson AB
Address	Isafjordsgatan 10 SE-16480 Stockholm Sweden
Product Name	RUS 02 B2
Product Number	KRC 161 298/1
IC Model Name	AS1612981
Serial Number(s)	CB4S640603, CB4S640592
Software Version	CXP 901 7316/2 Rev R51TB
Hardware Version	R1C
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2013 FCC CFR 47 Part 24: 2013 Industry Canada RSS-133 Issue 6: 2013
Start of Test	22 April 2014
Finish of Test	19 May 2014
Name of Engineer(s)	Yuanjie He
Related Document(s)	ANSI C63.4: 2009 Industry Canada RSS-GEN Issue 3: 2010

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 Peak Output Power and Peak to Average Ratio – Conducted	Pass
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

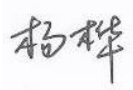
N/T – Not tested (due to C2PC)
N/A – Not Applicable

1.3 CONFIGURATION DESCRIPTION

Configuration Code	Carrier(s)	Configuration Description
G-SC	1C	GSM Single Antenna, Single Carrier
G-MC 1	2C	GSM Single Antenna, Multi Carrier x2
G-MC 2	3C	GSM Single Antenna, Multi Carrier x3
G-MC 3	8C	GSM Single Antenna, Multi Carrier x8
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
L-MIMO-MC 2	3C	LTE MIMO, Multi Carrier x3
G+W-MC 1	1G+1W	GSM+WCDMA Single Antenna, 1GSM+1WCDMA
G+W-MC 2	6G+2W	GSM+WCDMA Single Antenna, 6GSM+2WCDMA
G+W-MIMO-MC 1	1G+1W	GSM+WCDMA MIMO, 1GSM+1WCDMA
G+W-MIMO-MC 2	6G+2W	GSM+WCDMA MIMO, 6GSM+2WCDMA
G+W-MIMO-MC 3	2G+1W	GSM+WCDMA MIMO, 2GSM+1WCDMA
G+L-MIMO-MC 1	1G+1L	GSM+LTE MIMO, 1GSM+1LTE
G+L-MIMO-MC 2	6G+2L	GSM+LTE MIMO, 6GSM+2LTE
G+L-MIMO-MC 3	2G+1L	GSM+LTE MIMO, 2GSM+1LTE
W+L-MC 1	1W+1L	WCDMA+LTE Single Antenna, 1WCDMA+1LTE
W+L-MC 2	2W+2L	WCDMA+LTE Single Antenna, 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

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	RUS 02 B2
PART NUMBER	KRC 161 298/1
IC Model Name	AS1612981
TRANSMITTER OPERATING RANGE	TX: 1930MHz - 1990MHz RX: 1850MHz - 1910MHz
MODULATIONS	GSM: GMSK, 8-PSK, 16QAM, 32QAM, AQPSK WCDMA: QPSK, 16QAM, 64QAM LTE: QPSK, 16QAM, 64QAM
INTERMEDIATE FREQUENCIES	-
ITU DESIGNATION OF EMISSION	GSM: 245KGXW, 245KG7W WCDMA: 5M00F9W LTE: 1M40F9W, 3M00F9W, 5M00F9W, 10M0F9W, 15M0F9W, 20M0F9W
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	GSM: 250kHz 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)	Maximum 49.0dBm (80W) per port
INSTANTANEOUS BANDWIDTH	40MHz
FCC ID	TA8AKRC161298-1
IC ID	287AB-AS1612981
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is the Radio Part of GSM / WCDMA / LTE / GSM & WCDMA / GSM & LTE / WCDMA & LTE MSR Base Station

Signature 

Date 19 May 2014

D of B S Serial No 75926540/01

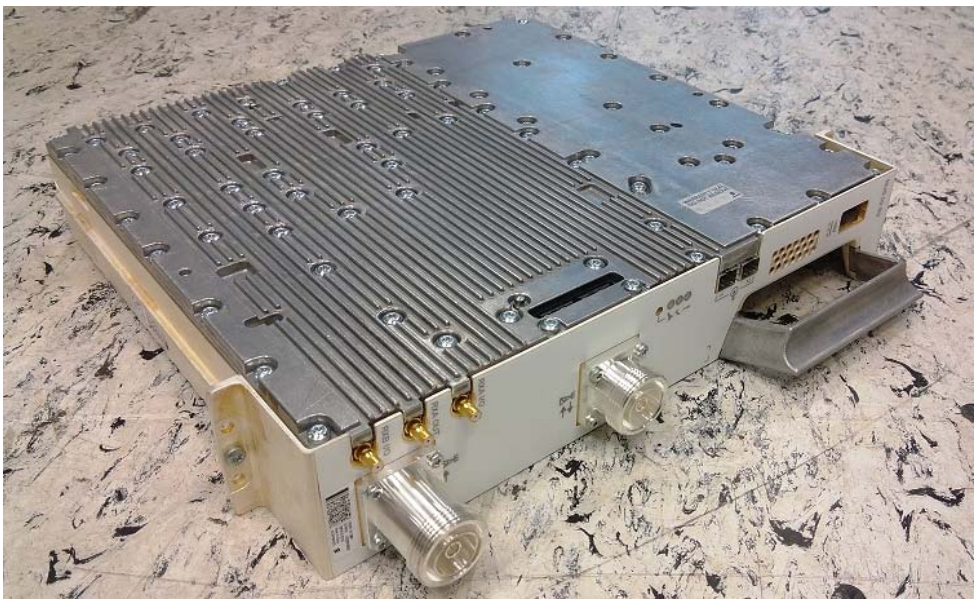
No responsibility will be accepted by TÜV SÜD Product Service as to the accuracy of the information declared in this document by the manufacturer.

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) RUS 02 B2, KRC 161 298/1 is an Ericsson AB Radio Unit working in the public mobile service 1900 band which provides communication connections to 1900 network in GSM / WCDMA / LTE Modes and GSM & WCMDA / GSM & LTE / WCDMA & LTE MSR modes. The RUS 02 B2, KRC 161 298/1 operates from a -48V DC supply.

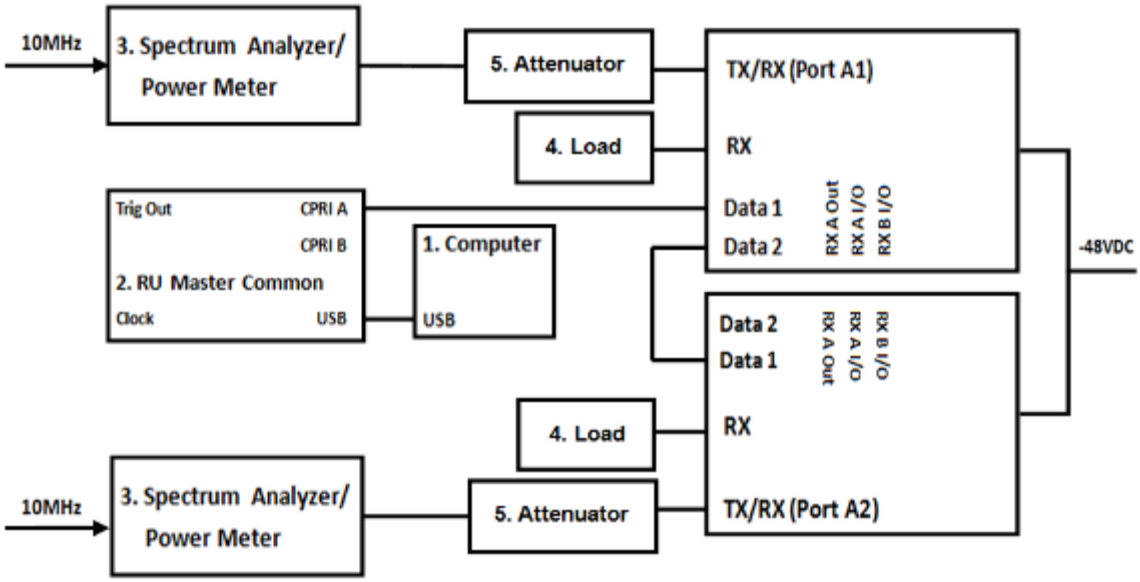
The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test

1.6 TEST SETUP

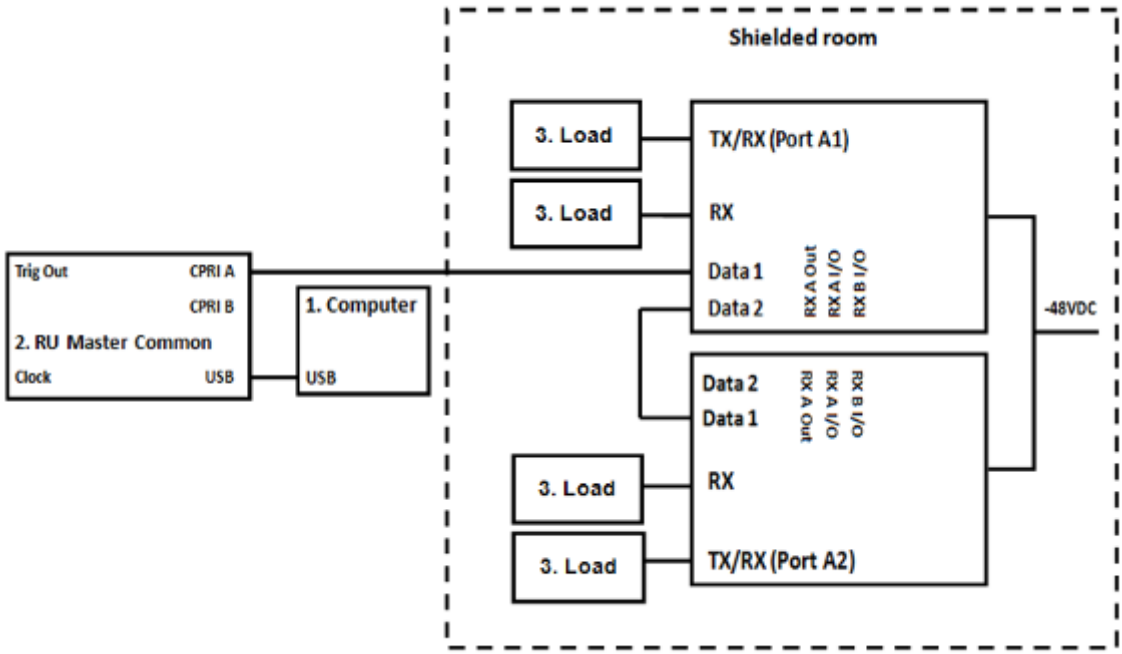
Test Setup, Conducted Measurement:



Product Name	Product Number	Version	Serial Number
RUS 02 B2	KRC 161 298/1	R1C	CB4S640603, CB4S640592

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook 8540w	--	CND1234642
2	RU Master Common	LPC 102 400/5	R1B	T01E368190
3	Spectrum Analyzer	FSQ26	--	BJ-01171/2014
	Spectrum Analyzer	FSQ26	--	BJ-01294/2014
	Spectrum Analyzer	N9020A	--	MY49100419
	Power Meter	NRP	--	101593
	Power Sensor	NRP-Z51	--	102310
	Power Sensor	NRP-Z51	--	102309
4	Load	TFE100	--	09121647
	Load	TFZ10-3R	--	20100908079
5	Attenuator	66-40-43	--	CE6211
		48-40-43-LIM	--	BR5020

Test Setup, Radiated Measurement:



Product Name	Product Number	Version	Serial Number
RUS 02 B2	KRC 161 298/1	R1C	CB4S640603, CB4S640592

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook 8540w	--	CND1234642
2	RU Master Common	LPC 102 400/5	R1B	T01E368190
3	Load	TFE100	--	09121647
	Load	TFE100	--	09032343
	Load	TFE100	--	09121614
	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.

The EUT was powered from a -48V DC 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 Peak Output Power and Peak to Average Ratio – Conducted
- Occupied Bandwidth
- Band Edge
- Conducted Spurious Emissions

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

FCC Accreditation 910917:
The State Radio Monitoring Centre, No.80 Beilishi Road, Xicheng District, Beijing, China.

Industry Canada Accreditation 7308A-1:
The State Radio Monitoring Centre, No.80 Beilishi Road, Xicheng District, Beijing, China.

SECTION 2

2 TEST DETAILS

2.1 MAXIMUM PEAK 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

RUS 02 B2, KRC 161 298/1, S/N: CB4S640603 and CB4S640592

2.1.3 Date of Test and Modification State

22 April to 19 May 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	21.5 – 24.5°C
Relative Humidity	65.8 – 66.6%

2.1.6 Test Method

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. The Average Power and Peak to Average Ratio was measured and recorded with the results being compared with the limits. In the case of MIMO devices, the power was measured from each antenna port and the results summed in accordance with FCC KDB 662911 D01.

2.1.7 Test Results

Configuration G-SC

Maximum Output Power 47.8dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1930.4MHz		Channel Position M 1960.0MHz		Channel Position T 1989.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
GMSK	47.58	0.26	47.59	0.31	47.26	0.26
8-PSK	47.54	3.47	47.53	3.37	47.21	3.51
AQPSK	47.57	2.62	47.56	2.66	47.24	2.50
16QAM	47.52	4.85	47.53	4.87	47.21	4.92
32QAM	47.57	5.04	47.58	5.22	47.24	5.16

Configuration G-MC 1 (2C)

Maximum Output Power 46.0dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1930.4MHz + 1969.8MHz		Channel Position M 1940.2MHz + 1979.8MHz		Channel Position T 1950.2MHz + 1989.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
GMSK	48.47	-	48.57	-	48.49	-
8-PSK	48.44	-	48.54	-	48.44	-
AQPSK	48.45	-	48.55	-	48.45	-
16QAM	47.34	-	47.46	-	47.37	-
32QAM	46.92	-	47.03	-	46.96	-

Configuration G-MC 3 (8C)

Maximum Output Power 38.0dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1930.4MHz + 1930.8MHz + 1931.2MHz + 1931.6MHz + 1968.6MHz + 1969.0MHz + 1969.4MHz + 1969.8MHz		Channel Position M 1940.2 MHz + 1940.6MHz + 1941.0MHz + 1941.4MHz + 1978.6MHz + 1979.0MHz + 1979.4MHz + 1979.8MHz		Channel Position T 1950.2MHz + 1950.6MHz + 1960.0MHz + 1960.4MHz 1988.4MHz + 1988.8MHz + 1989.2MHz + 1989.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
GMSK	46.52	-	46.62	-	46.55	-
8-PSK	43.24	-	43.32	-	43.25	-
AQPSK	44.64	-	44.73	-	44.66	-
16QAM	41.85	-	41.95	-	41.87	-
32QAM	41.45	-	41.54	-	41.48	-

Configuration W-SC

Maximum Output Power 49.0dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1932.4MHz		Channel Position M 1960.0MHz		Channel Position T 1987.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
QPSK	48.73	6.89	48.91	6.79	48.54	6.83

Configuration W-MC 1 (2C)

Maximum Output Power 45.8dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1932.4MHz + 1967.6MHz		Channel Position M 1942.4MHz + 1977.6MHz		Channel Position T 1952.4MHz + 1987.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
QPSK	48.50	-	48.57	-	48.58	-

Configuration W-MC 2 (4C)

Maximum Output Power 42.4dBm per carrier

Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B 1932.4MHz + 1937.4MHz + 1962.6MHz + 1967.6MHz		Channel Position M 1942.4MHz + 1947.4MHz + 1972.6MHz + 1977.6MHz		Channel Position T 1952.4MHz + 1957.4MHz + 1982.6MHz + 1987.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
QPSK	48.17	-	48.22	-	48.26	-

Configuration W-MIMO-SC

Maximum Output Power 47.0dBm per carrier

Antenna	Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1932.4MHz		Channel Position M 1960.0MHz		Channel Position T 1987.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	16QAM	47.12	7.57	47.09	7.49	46.91	7.47
A2		47.06	7.51	47.05	7.47	46.93	7.47
Total Power		50.10	-	50.08	-	49.93	-
A1	64QAM	47.13	7.55	47.09	7.44	46.94	7.47
A2		47.08	7.65	47.06	7.46	46.95	7.52
Total Power		50.11	-	50.09	-	49.96	-

Configuration W-MIMO-MC 1 (2C)

Maximum Output Power 45.8dBm per carrier

Antenna	Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1932.4MHz + 1967.6MHz		Channel Position M 1942.4MHz + 1977.6MHz		Channel Position T 1952.4MHz + 1987.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	16QAM	48.51	-	48.57	-	48.56	-
A2		48.44	-	48.58	-	48.59	-
Total Power		51.49	-	51.59	-	51.59	-
A1	64QAM	48.51	-	48.58	-	48.58	-
A2		48.49	-	48.63	-	48.62	-
Total Power		51.51	-	51.62	-	51.61	-

Configuration W-MIMO-MC 2 (4C)

Maximum Output Power 42.4dBm per carrier

Antenna	Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1932.4MHz + 1937.4MHz + 1962.6MHz + 1967.6MHz		Channel Position M 1942.4MHz + 1947.4MHz + 1972.6MHz + 1977.6MHz		Channel Position T 1952.4MHz + 1957.4MHz + 1982.6MHz + 1987.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	16QAM	48.19	-	48.20	-	48.27	-
A2		48.14	-	48.21	-	48.21	-
Total Power		51.18	-	51.22	-	51.25	-
A1	64QAM	48.20	-	48.21	-	48.26	-
A2		48.16	-	48.25	-	48.24	-
Total Power		51.19	-	51.24	-	51.26	-

Configuration L-MIMO-SC

Maximum Output Power 49.0dBm per carrier

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1930.7MHz		Channel Position M 1960.0MHz		Channel Position T 1989.3MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 1.4 MHz	48.63	6.89	48.86	6.87	48.32	6.88
A2		48.56	6.86	48.85	6.90	48.37	6.87
Total Power		51.61	-	51.87	-	51.36	-
A1	16QAM / 1.4 MHz	-	-	48.89	6.82	-	-
A2		-	-	48.91	6.95	-	-
Total Power		-	-	51.91	-	-	-
A1	64QAM / 1.4 MHz	-	-	48.76	6.98	-	-
A2		-	-	48.79	6.97	-	-
Total Power		-	-	51.79	-	-	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1960.0MHz / 3.0 MHz	48.88	6.76	48.90	6.75	48.86	6.76
A2		48.85	6.80	48.90	6.79	48.86	6.76
Total Power		51.88	-	51.91	-	51.87	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1960.0MHz / 5.0 MHz	48.89	6.82	48.90	6.75	48.89	6.73
A2		48.87	6.79	48.90	6.73	48.88	6.74
Total Power		51.89	-	51.91	-	51.90	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1960.0MHz / 10.0 MHz	48.88	6.75	48.89	6.70	48.88	6.76
A2		48.87	6.78	48.89	6.72	48.87	6.76
Total Power		51.88	-	51.90	-	51.89	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1960.0MHz / 15.0 MHz	48.88	6.83	48.88	6.79	48.89	6.85
A2		48.86	6.79	48.86	6.79	48.87	6.87
Total Power		51.89	-	51.88	-	51.89	-

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1940.0MHz		Channel Position M 1960.0MHz		Channel Position T 1980.0MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 20.0 MHz	48.92	7.82	48.90	6.72	48.86	7.14
A2		48.90	7.72	48.88	6.72	48.88	7.11
Total Power		51.92	-	51.90	-	51.88	-
A1	16QAM / 20.0 MHz	-	-	48.89	6.72	-	-
A2		-	-	48.87	6.73	-	-
Total Power		-	-	51.89	-	-	-
A1	64QAM / 20.0 MHz	-	-	48.87	6.70	-	-
A2		-	-	48.84	6.78	-	-
Total Power		-	-	51.87	-	-	-

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 45.8dBm per carrier

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1930.7MHz + 1969.3MHz		Channel Position M 1940.7MHz + 1979.3MHz		Channel Position T 1950.7MHz + 1989.3MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 1.4 MHz	48.44	-	48.52	-	48.47	-
A2		48.37	-	48.55	-	48.54	-
Total Power		51.42	-	51.55	-	51.52	-
A1	16QAM / 1.4 MHz	-	-	48.52	-	-	-
A2		-	-	48.55	-	-	-
Total Power		-	-	51.55	-	-	-
A1	64QAM / 1.4 MHz	-	-	48.49	-	-	-
A2		-	-	48.52	-	-	-
Total Power		-	-	51.52	-	-	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1931.5MHz + 1968.5MHz / 3.0 MHz	48.58	-	48.56	-	48.53	-
A2		48.58	-	48.59	-	48.57	-
Total Power		51.58	-	51.59	-	51.56	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1932.5MHz + 1967.5MHz / 5.0 MHz	48.28	-	48.28	-	48.29	-
A2		48.29	-	48.30	-	48.30	-
Total Power		51.29	-	51.30	-	51.31	-

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1935.0MHz + 1965.0MHz		Channel Position M 1945.0MHz + 1975.0MHz		Channel Position T 1955.0MHz + 1985.0MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 10.0 MHz	48.09	-	48.12	-	48.18	-
A2		48.05	-	48.14	-	48.11	-
Total Power		51.08	-	51.14	-	51.16	-
A1	16QAM / 10.0 MHz	-	-	48.14	-	-	-
A2		-	-	48.13	-	-	-
Total Power		-	-	51.16	-	-	-
A1	64QAM / 10.0 MHz	-	-	48.13	-	-	-
A2		-	-	48.14	-	-	-
Total Power		-	-	51.16	-	-	-

Configuration L-MIMO-MC 2 (3C)

Maximum Output Power 43.7dBm per carrier

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1930.7MHz + 1932.1MHz + 1969.3MHz		Channel Position M 1940.7MHz + 1942.1MHz + 1979.3MHz		Channel Position T 1950.7MHz + 1952.1MHz + 1989.3MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 1.4 MHz	47.61	-	47.75	-	47.77	-
A2		47.54	-	47.77	-	47.81	-
Total Power		50.59	-	50.77	-	50.80	-
A1	16QAM / 1.4 MHz	-	-	47.77	-	-	-
A2		-	-	47.79	-	-	-
Total Power		-	-	50.80	-	-	-
A1	64QAM / 1.4 MHz	-	-	47.72	-	-	-
A2		-	-	47.74	-	-	-
Total Power		-	-	50.74	-	-	-

Antenna	Channel Position M / Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Modulation QPSK		Modulation 16QAM		Modulation 64QAM	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	1931.5MHz + 1934.5MHz + 1968.5MHz / 3.0 MHz	47.77	-	47.78	-	47.78	-
A2		47.79	-	47.80	-	47.79	-
Total Power		50.79	-	50.80	-	50.80	-

Antenna	Modulation / Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B 1932.5MHz + 1937.5MHz + 1967.5MHz		Channel Position M 1942.5MHz + 1947.5MHz + 1977.5MHz		Channel Position T 1952.5MHz + 1957.5MHz + 1987.5MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	QPSK / 5.0 MHz	48.07	-	48.14	-	48.21	-
A2		48.06	-	48.19	-	48.20	-
Total Power		51.08	-	51.08	-	51.22	-
A1	16QAM / 5.0 MHz	-	-	48.15	-	-	-
A2		-	-	48.20	-	-	-
Total Power		-	-	51.19	-	-	-
A1	64QAM / 5.0 MHz	-	-	48.16	-	-	-
A2		-	-	48.22	-	-	-
Total Power		-	-	51.19	-	-	-

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

Maximum Output Power 44.8dBm per carrier

Modulation (GSM / WCDMA)	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B_{RFBW} (G) 1930.4MHz + (W)1967.6MHz		Channel Position M_{RFBW} (G) 1940.2MHz + (W) 1977.6MHz		Channel Position T_{RFBW} (G) 1950.2MHz + (W) 1987.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
GMSK / QPSK	47.32	-	47.45	-	47.45	-

Configuration G+W-MC 2 (6G + 2W)

Maximum Output Power 38.0dBm per carrier

Modulation (GSM / WCDMA)	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position B_{RFBW} (G) 1930.4MHz + 1931.0MHz + 1931.6MHz + (W) 1947.4MHz + 1952.4MHz + (G) 1968.6MHz + 1969.2MHz + 1969.8MHz		Channel Position M_{RFBW} (G) 1940.2MHz + 1940.8MHz + 1941.4MHz + (W) 1957.4MHz + 1962.4MHz + (G) 1978.6MHz + 1979.2MHz + 1979.8MHz		Channel Position T_{RFBW} (G) 1950.2MHz + 1950.8MHz + 1951.4MHz + (W) 1967.6MHz + 1972.6MHz + (G) 1988.4MHz + 1989.0MHz + 1989.6MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
GMSK / QPSK	46.56	-	46.65	-	46.57	-

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

Maximum Output Power 44.8dBm per carrier

Antenna	GSM Modulation / WCDMA Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1930.4MHz + (W)1967.6MHz		Channel Position MRFBW (G) 1940.2MHz + (W) 1977.6MHz		Channel Position TRFBW (G) 1950.2MHz + (W) 1987.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	GMSK / 16QAM	47.34	-	47.45	-	47.41	-
Antenna	GSM Modulation / WCDMA Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1931.0MHz + (W)1967.6MHz		Channel Position MRFBW (G) 1940.8MHz + (W) 1977.6MHz		Channel Position TRFBW (G) 1950.8MHz + (W) 1987.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A2	GMSK / 16QAM	47.33	-	47.50	-	47.50	-
Total		50.35	-	50.46	-	50.47	-

Configuration G+W-MIMO-MC 2 (6G +2W)

Maximum Output Power 38.0dBm per carrier

Antenna	GSM Modulation / WCDMA Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1930.4MHz + 1931.0MHz + 1931.6MHz + (W) 1947.4MHz + 1952.4MHz + (G) 1968.6MHz + 1969.2MHz + 1969.8MHz		Channel Position MRFBW (G) 1940.2MHz + 1940.8MHz + 1941.4MHz + (W) 1957.4MHz + 1962.4MHz + (G) 1978.6MHz + 1979.2MHz + 1979.8MHz		Channel Position TRFBW (G) 1950.2MHz + 1950.8MHz + 1951.4MHz + (W) 1967.6MHz + 1972.6MHz + (G) 1988.4MHz + 1989.0MHz + 1989.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	GMSK / 16QAM	46.55	-	46.63	-	46.59	-
Antenna	GSM Modulation / WCDMA Modulation	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1932.2MHz + 1932.8MHz + 1933.4MHz + (W) 1947.4MHz + 1952.4MHz + (G)1966.6MHz + 1967.2MHz + 1968.0MHz		Channel Position MRFBW (G) 1942.0MHz + 1942.6MHz + 1943.2MHz + (W) 1957.4MHz + 1962.4MHz + (G) 1976.8MHz + 1977.4MHz + 1978.0MHz		Channel Position TRFBW (G) 1952.0MHz + 1952.6MHz + 1953.2MHz + (W) 1967.6MHz + 1972.6MHz + (G) 1986.6MHz + 1987.2MHz + 1987.8MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A2	GMSK / 16QAM	46.54	-	46.62	-	46.64	-
Total		49.56	-	49.64	-	49.63	-

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

Maximum Output Power 45.6dBm per carrier

Antenna	GSM Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1930.4MHz + (L)1962.5MHz		Channel Position MRFBW (G) 1940.2MHz + (L) 1972.5MHz		Channel Position TRFBW (G) 1950.2MHz + (L) 1982.5MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	GMSK / QPSK 15.0 MHz	48.15	-	48.26	-	48.25	-
Antenna	GSM Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1931.0MHz + (L)1965.0MHz		Channel Position MRFBW (G) 1940.8MHz + (L) 1975.0MHz		Channel Position TRFBW (G) 1950.8MHz + (L) 1985.0MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A2	GMSK / QPSK 15.0 MHz	48.14	-	48.33	-	48.33	-
Total		51.16	-	51.31	-	51.30	-

Configuration G+L-MIMO-MC 2 (6G + 2L)

Maximum Output Power 40.0dBm per carrier

Antenna	GSM Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1930.4MHz + 1931.0MHz + 1931.6MHz + (L) 1948.5MHz + 1951.5MHz + (G) 1968.6MHz + 1969.2MHz + 1969.8MHz		Channel Position MRFBW (G) 1940.2MHz + 1940.8MHz + 1941.4MHz + (L) 1958.5MHz + 1961.5MHz + (G) 1978.6MHz + 1979.2MHz + 1979.8MHz		Channel Position TRFBW (G) 1950.2MHz + 1950.8MHz + 1951.4MHz + (L) 1968.5MHz + 1971.5MHz + (G) 1988.4MHz + 1989.0MHz + 1989.6MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A	GMSK / QPSK 3.0 MHz	48.63	-	48.60	-	48.63	-
Antenna	GSM Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (G) 1932.2MHz + 1932.8MHz + 1933.4MHz + (L) 1948.5MHz + 1951.5MHz + (G)1966.6MHz + 1967.2MHz + 1968.0MHz		Channel Position MRFBW (G) 1942.0MHz + 1942.6MHz + 1943.2MHz + (L) 1958.5MHz + 1961.5MHz + (G) 1976.8MHz + 1977.4MHz + 1978.0MHz		Channel Position TRFBW (G) 1952.0MHz + 1952.6MHz + 1953.2MHz + (L) 1968.5MHz + 1971.5MHz + (G) 1986.6MHz + 1987.2MHz + 1987.8MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
B	GMSK / QPSK 3.0 MHz	48.53	-	48.67	-	48.64	-
Total		51.59	-	51.65	-	51.65	-

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

Maximum Output Power 45.7dBm per carrier

WCDMA Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position BRFBW (W) 1932.4MHz + (L)1968.5MHz		Channel Position MRFBW (W) 1942.4MHz + (L)1978.5MHz		Channel Position TRFBW (W) 1952.4MHz + (L)1988.5MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
QPSK / QPSK 3.0 MHz	48.42	-	48.48	-	48.44	-

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

Maximum Output Power 42.2dm per carrier

WCDMA Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
	Channel Position BRFBW (W) 1932.4MHz + 1937.4MHz + (L) 1962.5MHz + 1967.5MHz		Channel Position MRFBW (W) 1942.4MHz +1947.4MHz + (L)1972.5MHz + 1977.5MHz		Channel Position TRFBW (W) 1952.4MHz + 1957.4MHz + (L)1982.5MHz + 1987.5MHz	
	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
QPSK / QPSK 5.0 MHz	48.00	-	48.03	-	48.08	-

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

Maximum Output Power 45.7dBm per carrier

Antenna	WCDMA Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (W) 1932.4MHz + (L)1968.5MHz		Channel Position MRFBW (W) 1942.4MHz + (L)1978.5MHz		Channel Position TRFBW (W) 1952.4MHz + (L)1988.5MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	16QAM / QPSK 3.0 MHz	48.38	-	48.42	-	48.41	-
A2	16QAM / QPSK 3.0 MHz	48.36	-	48.49	-	48.47	-
Total		51.38	-	51.47	-	51.45	-

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

Maximum Output Power 42.2dBm per carrier

Antenna	WCDMA Modulation / LTE Modulation Bandwidth	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position BRFBW (W) 1932.4MHz + 1937.4MHz + (L) 1962.5MHz + 1967.5MHz		Channel Position MRFBW (W) 1942.4MHz +1947.4MHz + (L)1972.5MHz + 1977.5MHz		Channel Position TRFBW (W) 1952.4MHz + 1957.4MHz + (L)1982.5MHz + 1987.5MHz	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A1	16QAM / QPSK 5.0 MHz	47.99	-	48.00	-	48.05	-
A2	16QAM / QPSK 5.0 MHz	47.96	-	48.03	-	48.03	-
Total		50.99	-	51.03	-	51.05	-

Limit	
Maximum Power	FCC: ≤1640 W or ≤+62.15dBm IC: ≤100 W or ≤+50dBm per transmitter
Peak to Average Ratio	13 dB

Remarks

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.

The EUT does not exceed 100W or 50dBm at the measured frequencies.

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 (h)
FCC CFR 47 Part 4, Clause 24.238 (b)
Industry Canada RSS-GEN, Clause 4.6.1

2.2.2 Equipment Under Test

RUS 02 B2, KRC 161 298/1, S/N: CB4S640603

2.2.3 Date of Test and Modification State

28 April to 19 May 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	22.8 – 24.5°C
Relative Humidity	45.0 – 67.5%

2.2.6 Test Method

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 99% Occupied Bandwidth and -26dBc Occupied Bandwidth were measured.

The results are shown in the plots below.

2.2.7 Test Results

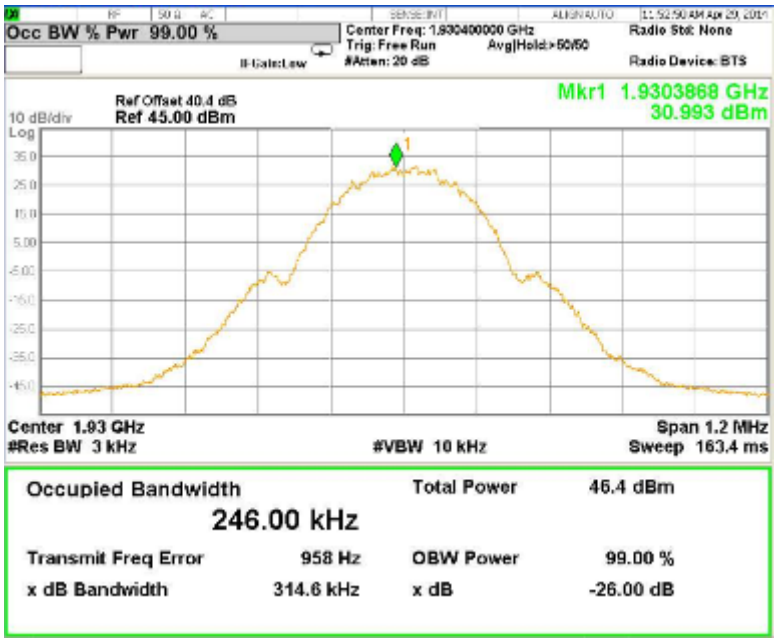
Configuration G-SC

Maximum Output Power 47.8dBm per carrier

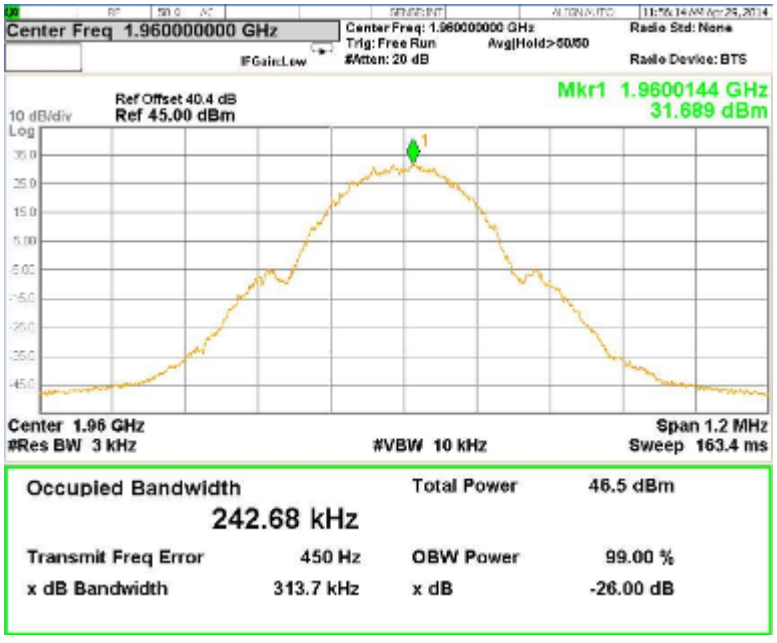
Modulation	99% Occupied Bandwidth (kHz)		
	Channel Position B 1930.4MHz	Channel Position M 1960.0MHz	Channel Position T 1989.6MHz
GMSK	246.00	242.68	245.39
8-PSK	244.55	242.20	244.97
AQPSK	243.37	242.79	242.98
16QAM	242.76	243.04	244.25
32QAM	243.70	242.01	242.07

Modulation	-26dBc Occupied Bandwidth (kHz)		
	Channel Position B 1930.4MHz	Channel Position M 1960.0MHz	Channel Position T 1989.6MHz
GMSK	314.6	313.7	312.1
8-PSK	309.1	304.1	309.4
AQPSK	314.9	314.3	309.8
16QAM	309.1	311.5	312.7
32QAM	309.5	311.9	310.8

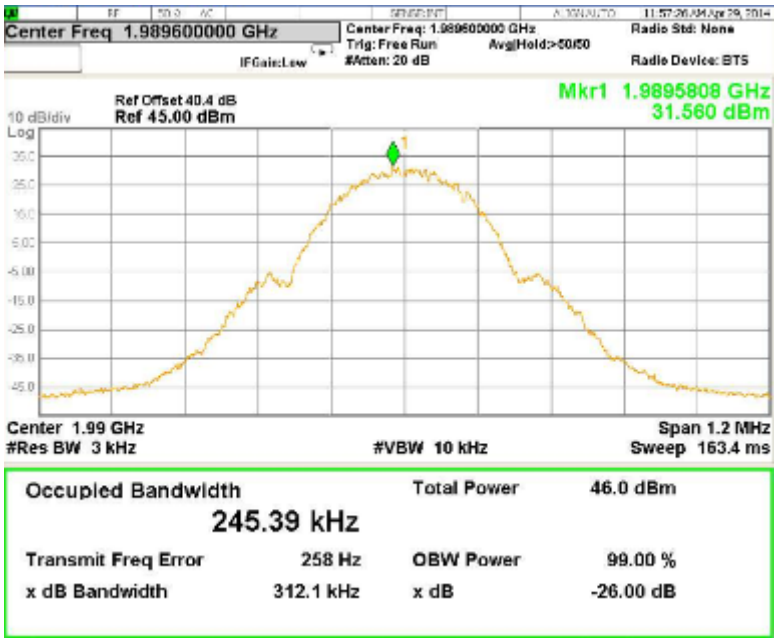
Channel Position B - GMSK



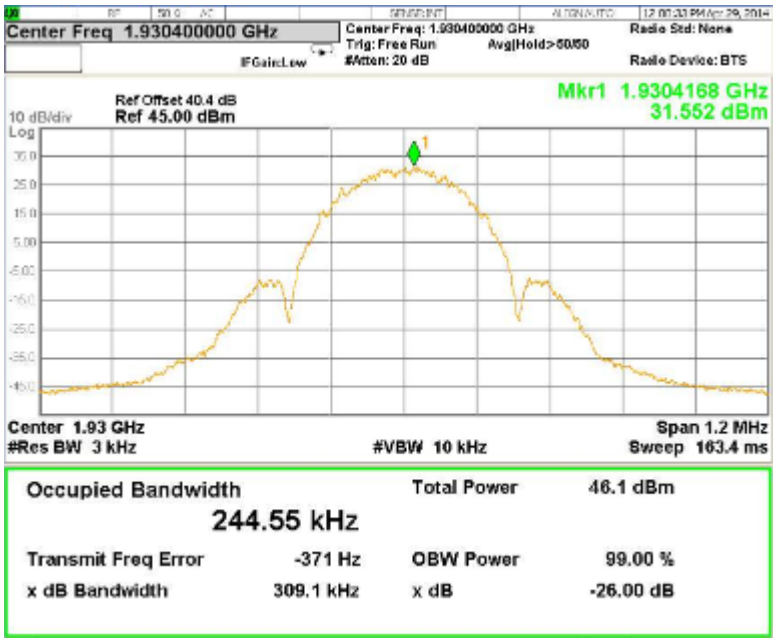
Channel Position M - GMSK



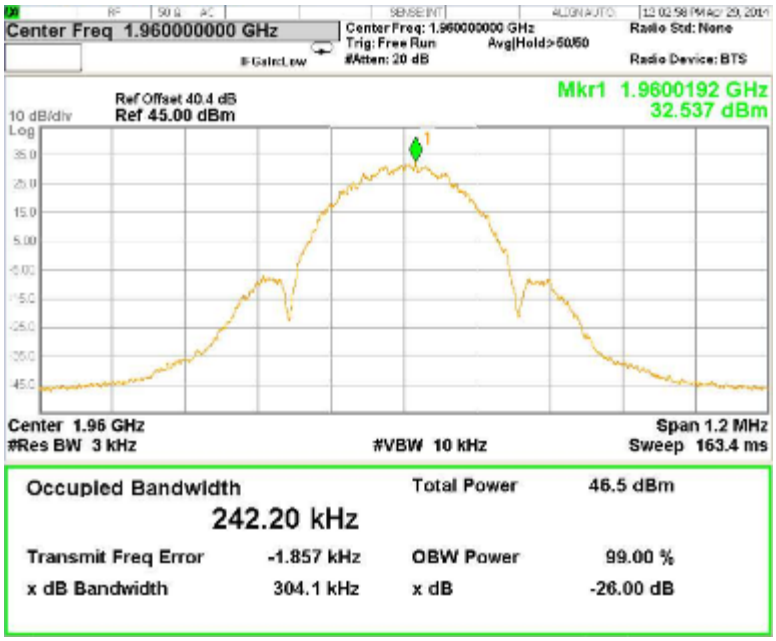
Channel Position T - GMSK



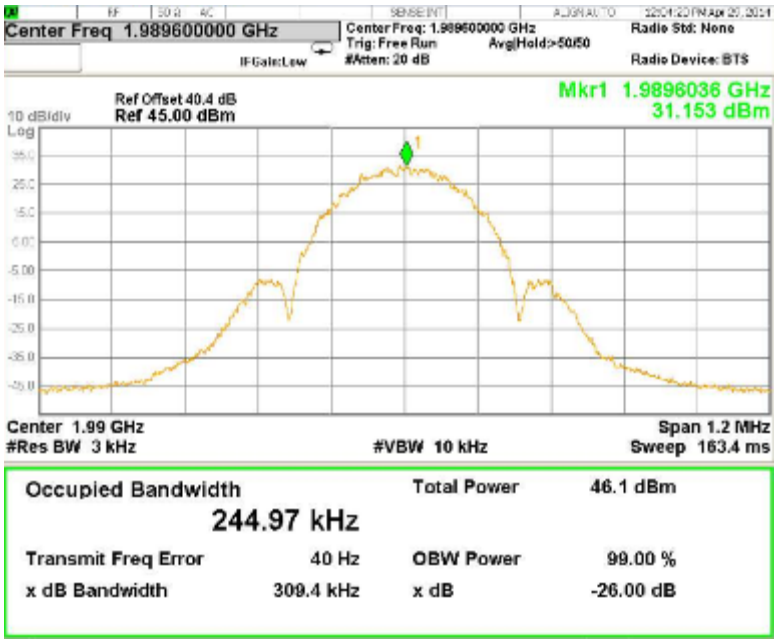
Channel Position B - 8-PSK



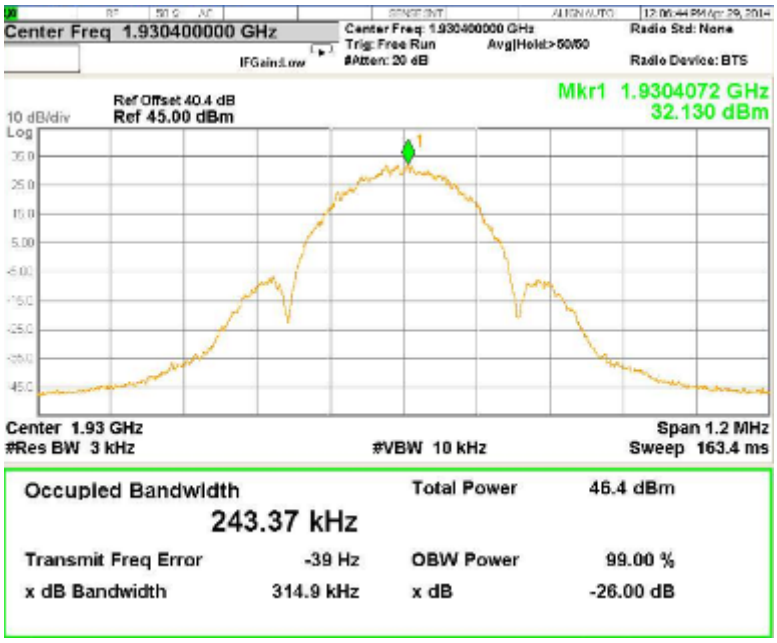
Channel Position M - 8-PSK



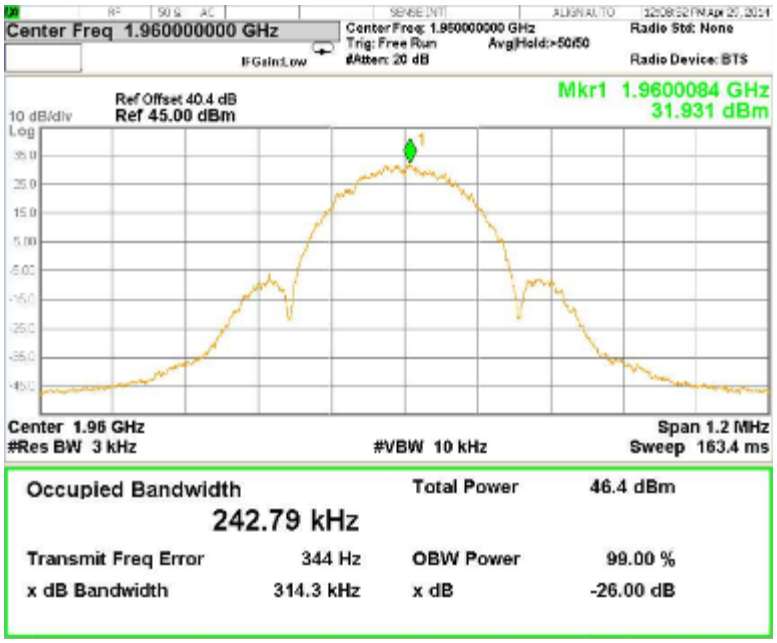
Channel Position T - 8-PSK



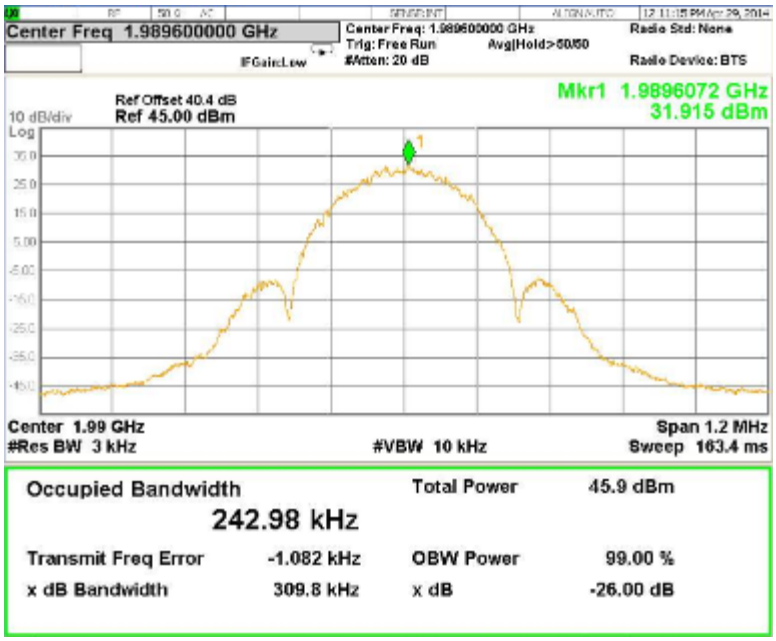
Channel Position B - AQPSK



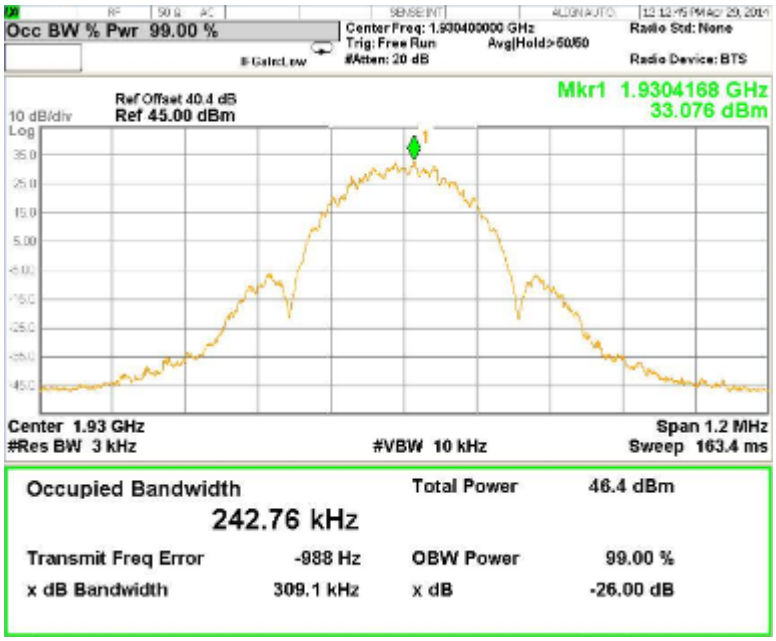
Channel Position M - AQPSK



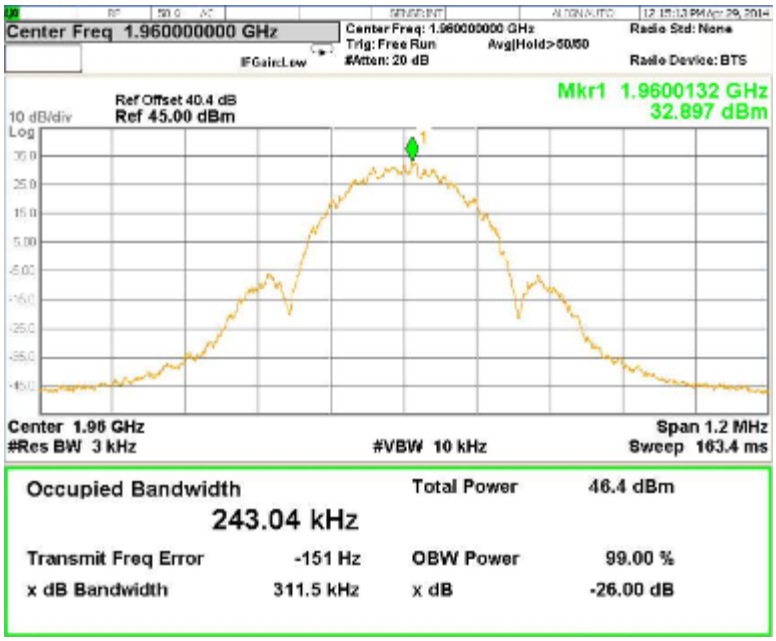
Channel Position T - AQPSK



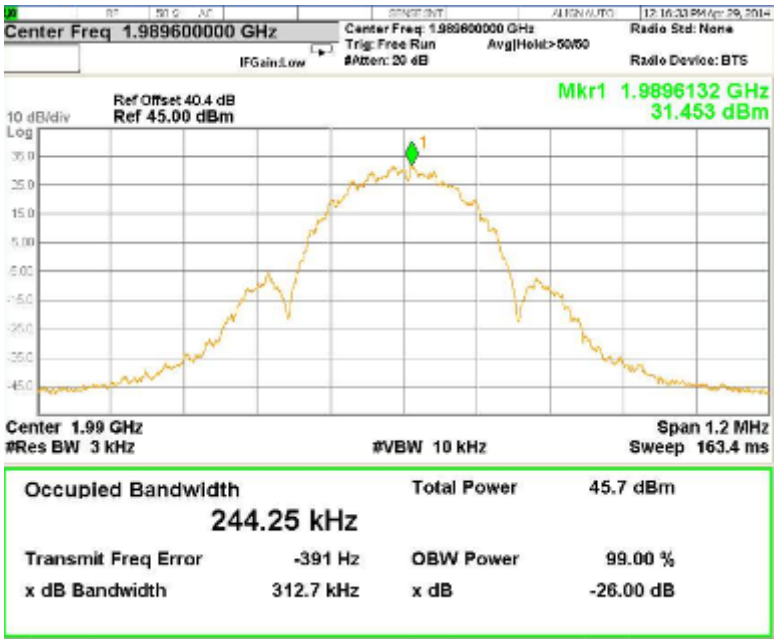
Channel Position B - 16QAM



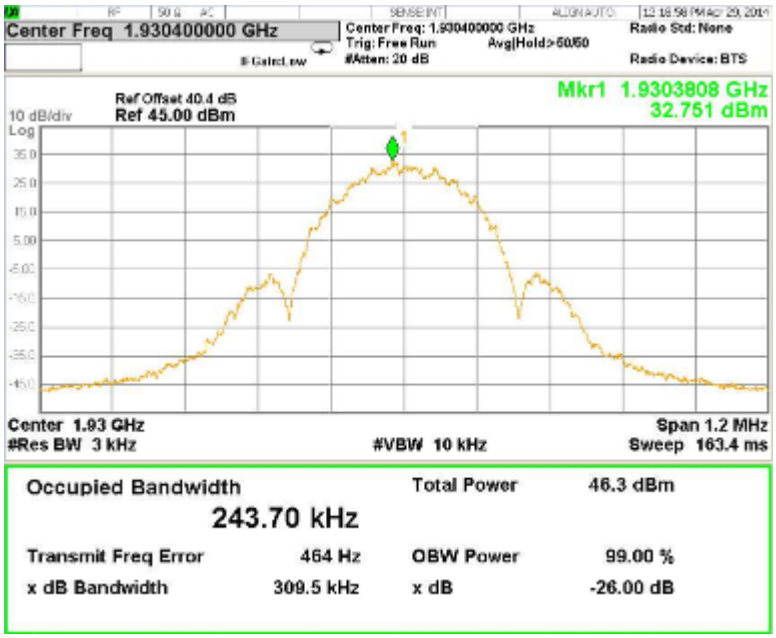
Channel Position M – 16QAM



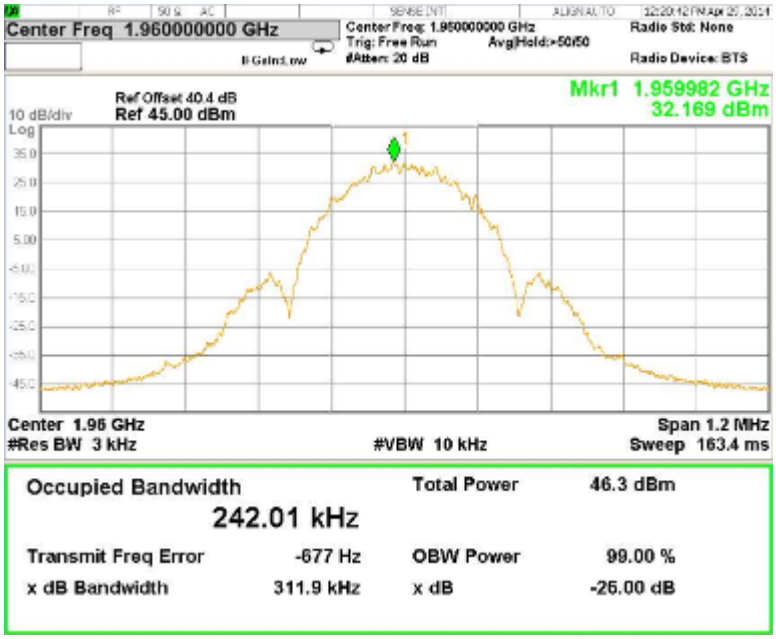
Channel Position T – 16QAM



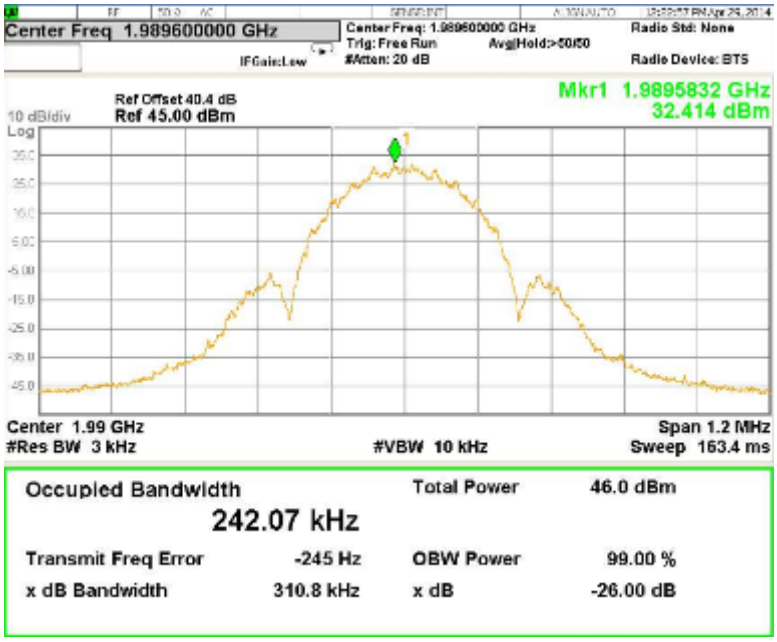
Channel Position B – 32QAM



Channel Position M – 32QAM



Channel Position T - 32QAM

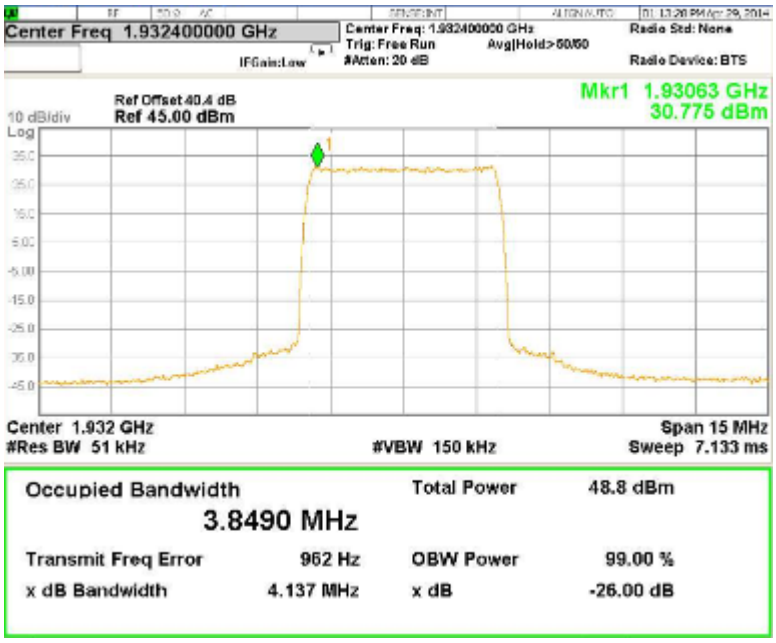


Configuration W-SC

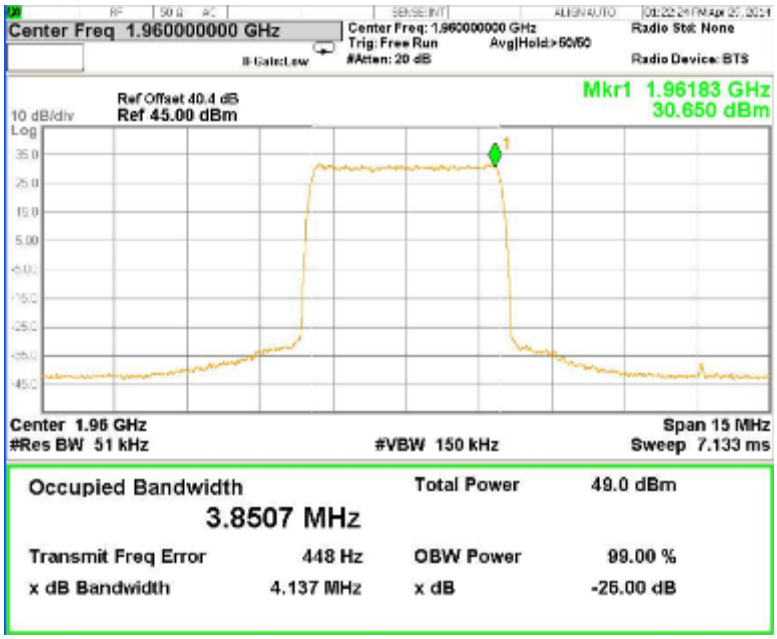
Maximum Output Power 49.0dBm per carrier

Modulation / Bandwidth	99% 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	3.86
QPSK / 5.0 MHz	4.18	4.18	4.17
Modulation / Bandwidth	26 dB Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
QPSK / 4.2 MHz	4.14	4.14	4.14
QPSK / 5.0 MHz	4.67	4.67	4.68

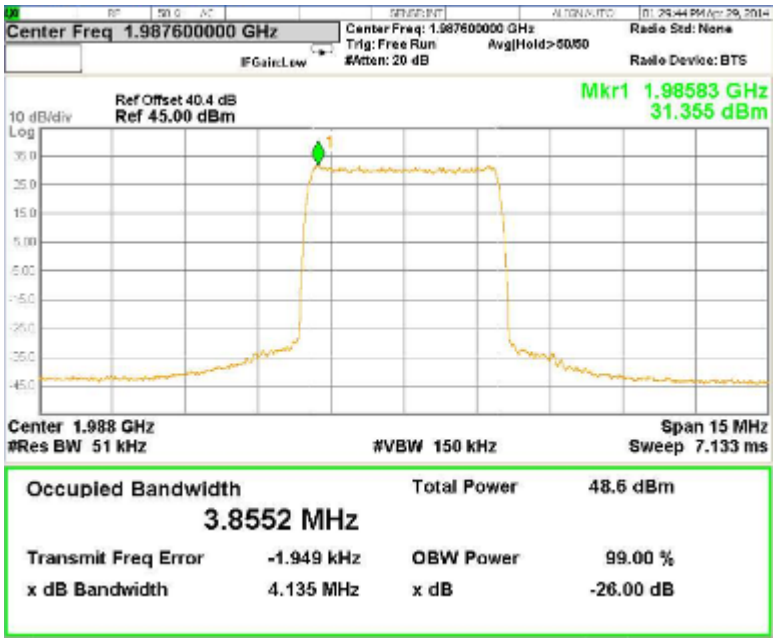
Channel Position B - QPSK / Bandwidth 4.2 MHz



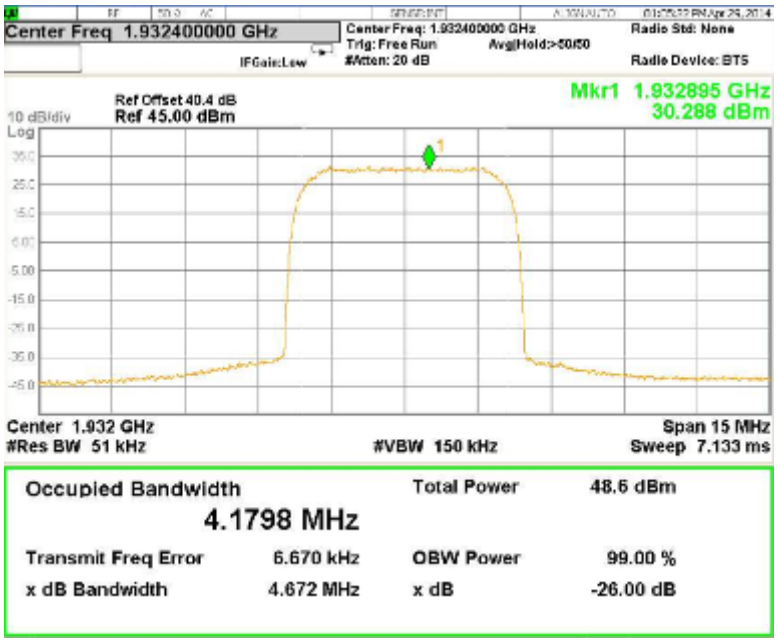
Channel Position M - QPSK / Bandwidth 4.2 MHz



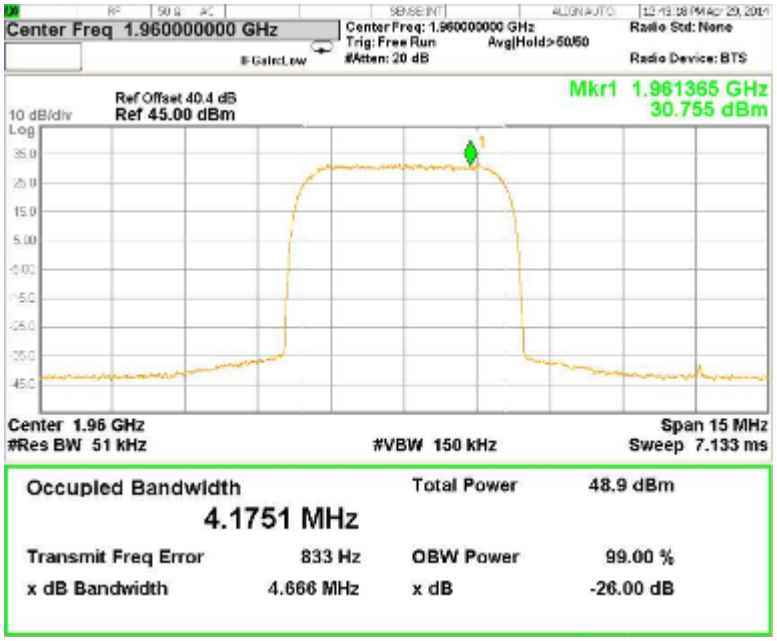
Channel Position T - QPSK / Bandwidth 4.2 MHz



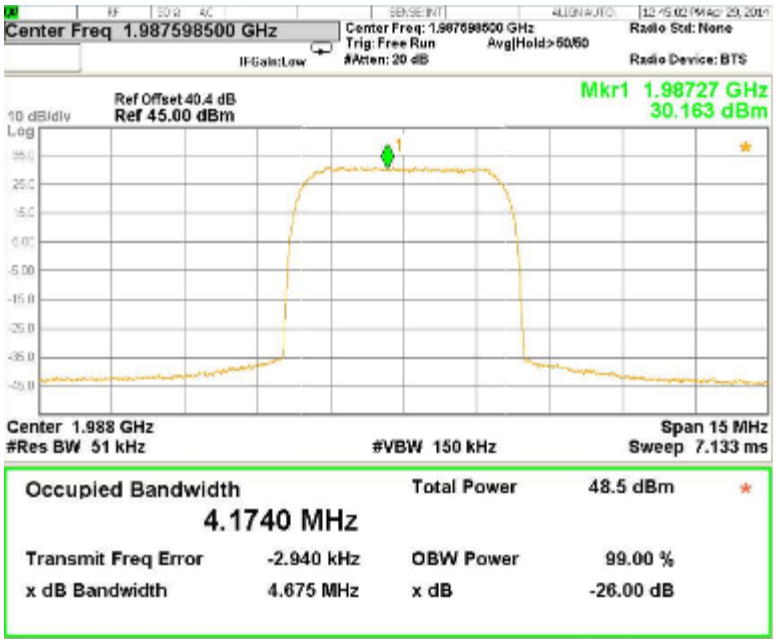
Channel Position B - QPSK / Bandwidth 5.0 MHz



Channel Position M - QPSK / Bandwidth 5.0 MHz



Channel Position T - QPSK / Bandwidth 5.0 MHz



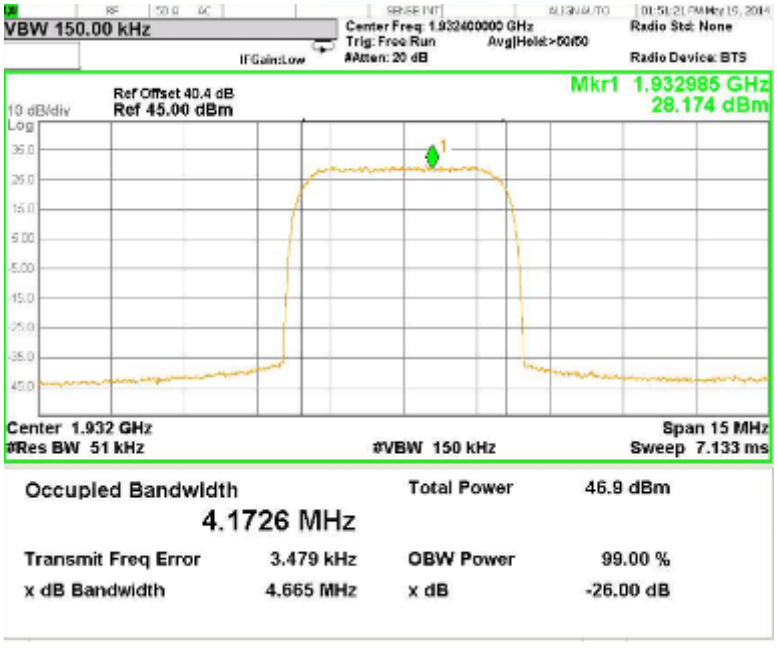
Configuration W-MIMO-SC

Maximum Output Power 49.0dBm per carrier

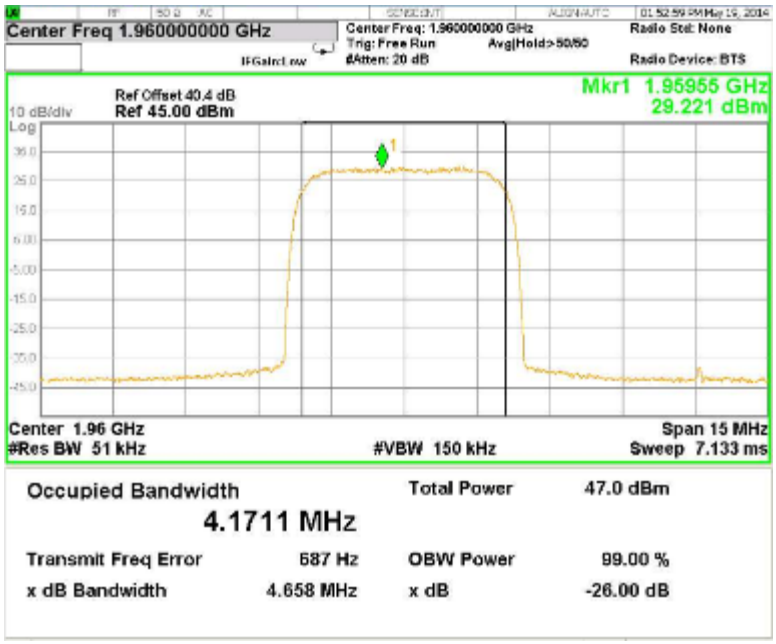
Modulation / Bandwidth	99% Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
16QAM / 5.0 MHz	4.17	4.17	4.16
Modulation / Bandwidth	-26dBc Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
16QAM / 5.0 MHz	4.67	4.66	4.66

Modulation / Bandwidth	99% Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
64QAM / 5.0 MHz	4.17	4.17	4.16
Modulation / Bandwidth	-26dBc Occupied Bandwidth (MHz)		
	Channel Position B 1932.4MHz	Channel Position M 1960.0MHz	Channel Position T 1987.6MHz
64QAM / 5.0 MHz	4.67	4.67	4.66

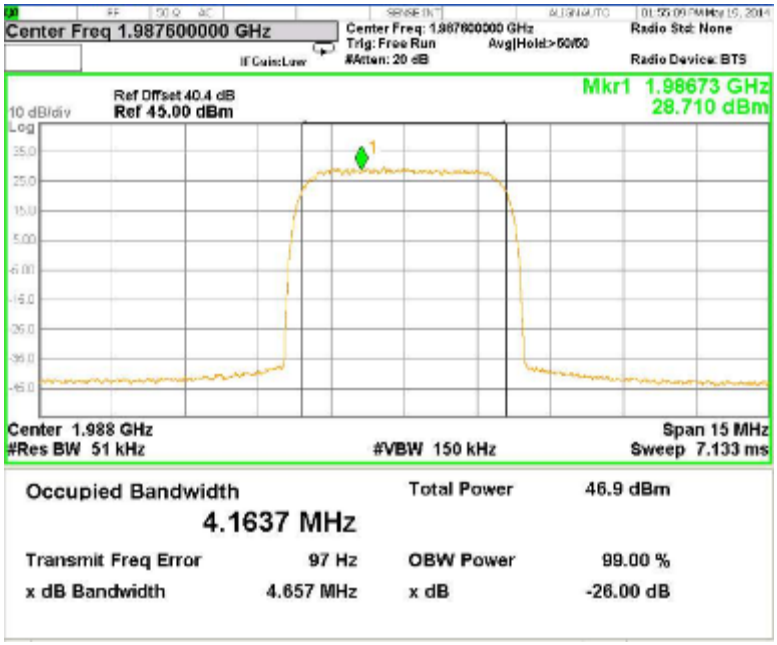
Channel Position B - 16QAM / Bandwidth 5.0 MHz



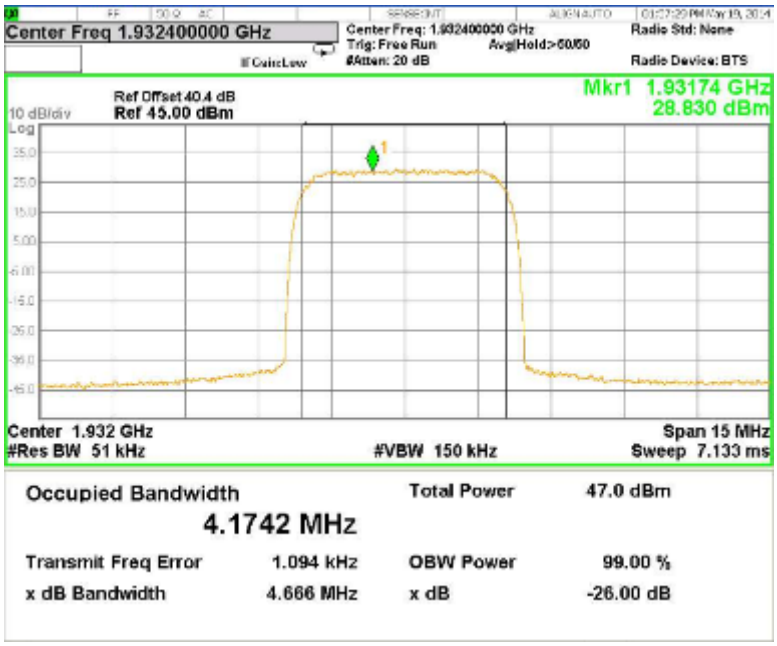
Channel Position M - 16QAM / Bandwidth 5.0 MHz



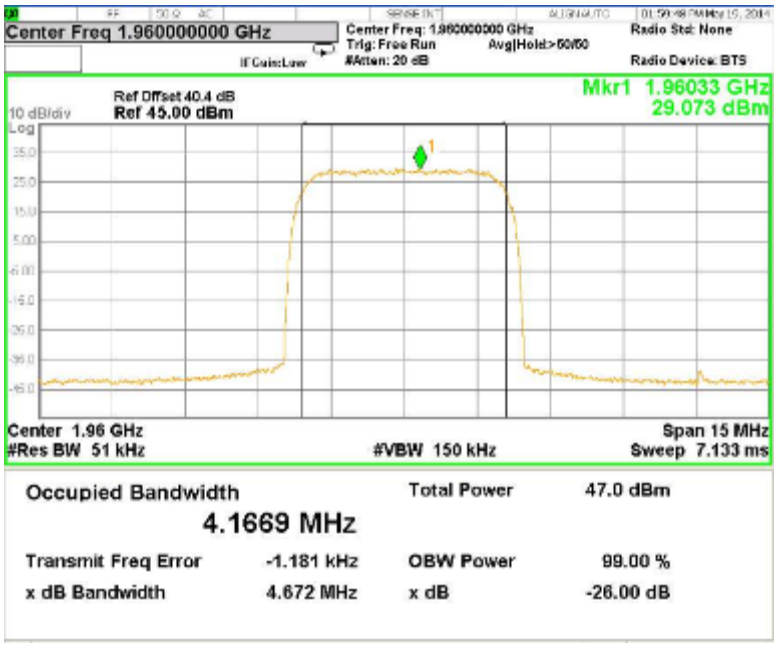
Channel Position T - 16QAM / Bandwidth 5.0 MHz



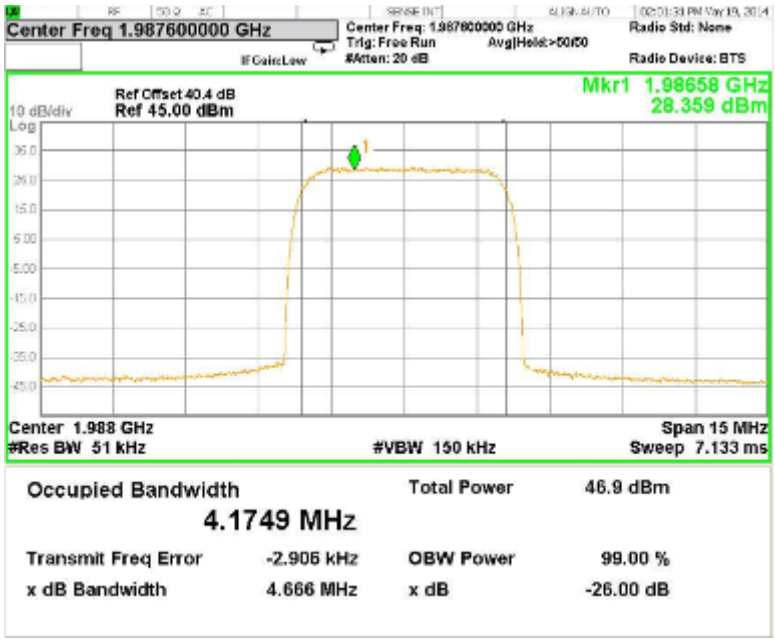
Channel Position B - 64QAM / Bandwidth 5.0 MHz



Channel Position M - 64QAM / Bandwidth 5.0 MHz



Channel Position T - 64QAM / Bandwidth 5.0 MHz



Configuration LTE-SC

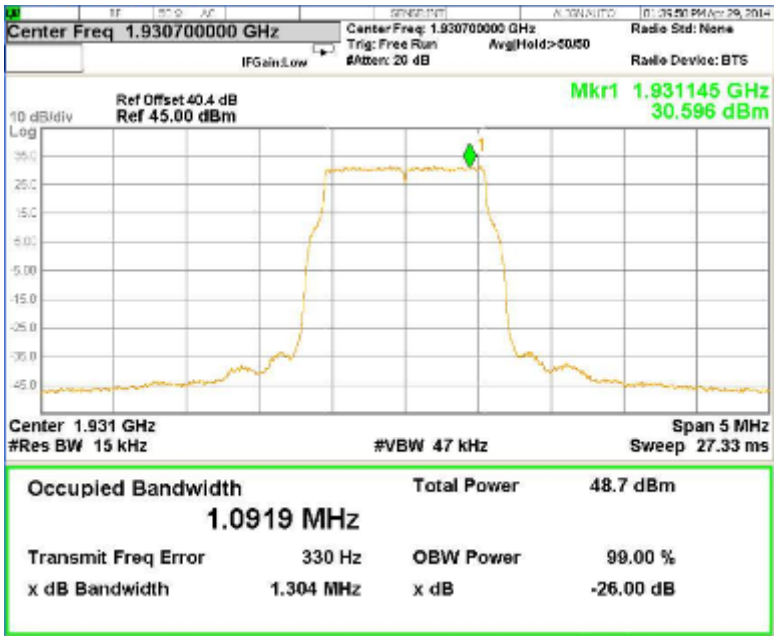
Maximum Output Power 49.0dBm per carrier

Modulation / Bandwidth	99% 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
Modulation / Bandwidth	-26dBc Occupied Bandwidth (MHz)		
	Channel Position B 1930.7MHz	Channel Position M 1960.0MHz	Channel Position T 1989.3MHz
QPSK / 1.4 MHz	1.30	1.30	1.31

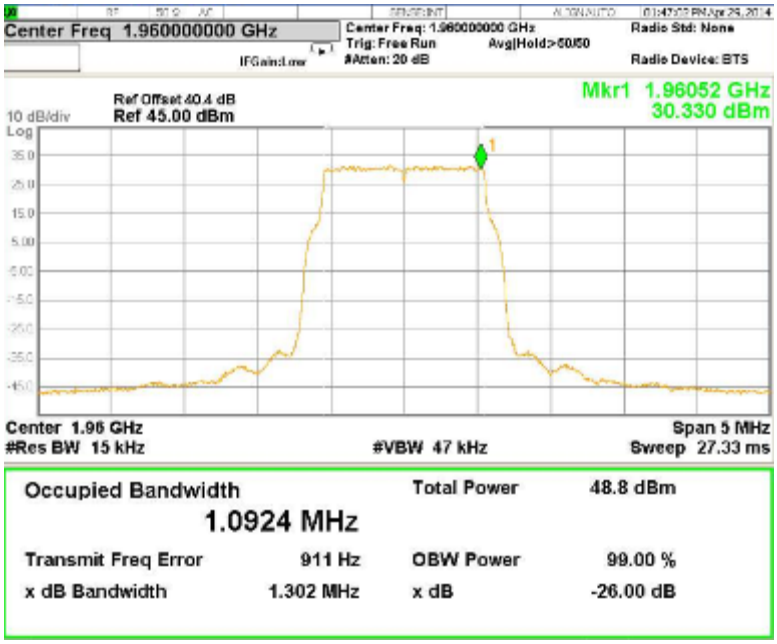
Channel Position M 1960.0MHz / Bandwidth	99% Occupied Bandwidth (MHz)		
	Modulation QPSK	Modulation 16QAM	Modulation 64QAM
1.4 MHz	-	1.09	1.09
3.0 MHz	2.70	2.70	2.69
5.0 MHz	4.48	4.45	4.48
10.0 MHz	8.94	8.93	8.94
15.0 MHz	13.41	13.41	13.40
20.0 MHz	-	17.84	17.85
Channel Position M 1960.0MHz / Bandwidth	-26dBc Occupied Bandwidth (MHz)		
	Modulation QPSK	Modulation 16QAM	Modulation 64QAM
1.4 MHz	-	1.29	1.30
3.0 MHz	2.93	2.93	2.92
5.0 MHz	4.73	4.70	4.73
10.0 MHz	9.39	9.39	9.38
15.0 MHz	13.97	13.95	13.97
20.0 MHz	-	18.62	18.58

Modulation / Bandwidth	99% Occupied Bandwidth (MHz)		
	Channel Position B 1940.0MHz	Channel Position M 1960.0MHz	Channel Position T 1980.0MHz
QPSK / 20.0 MHz	17.87	17.87	17.84
Modulation / Bandwidth	-26dBc Occupied Bandwidth (MHz)		
	Channel Position B 1940.0MHz	Channel Position M 1960.0MHz	Channel Position T 1980.0MHz
QPSK / 20.0 MHz	18.63	18.56	18.58

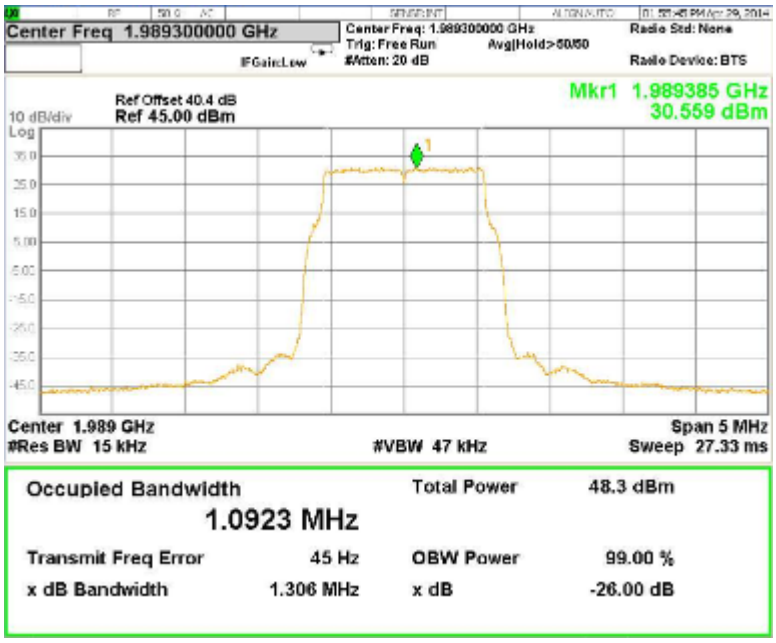
Channel Position B - QPSK / Bandwidth 1.4 MHz



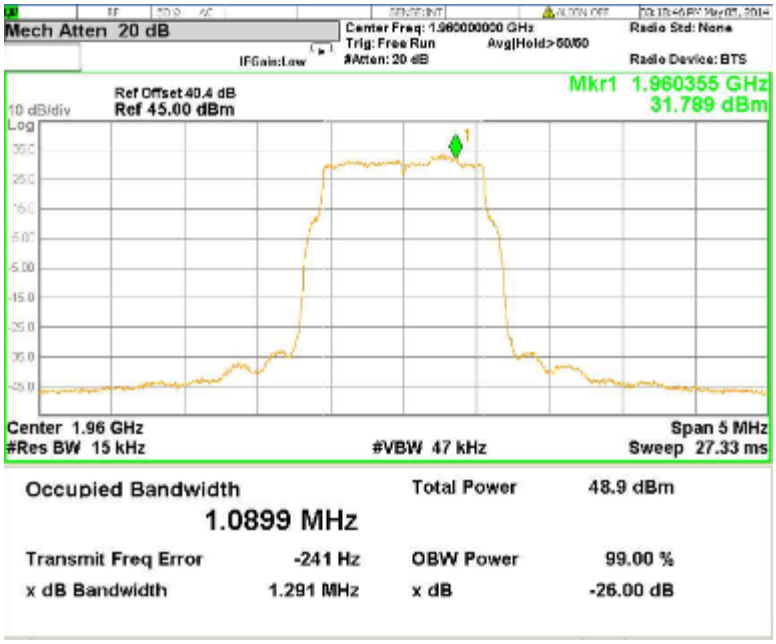
Channel Position M - QPSK / Bandwidth 1.4 MHz



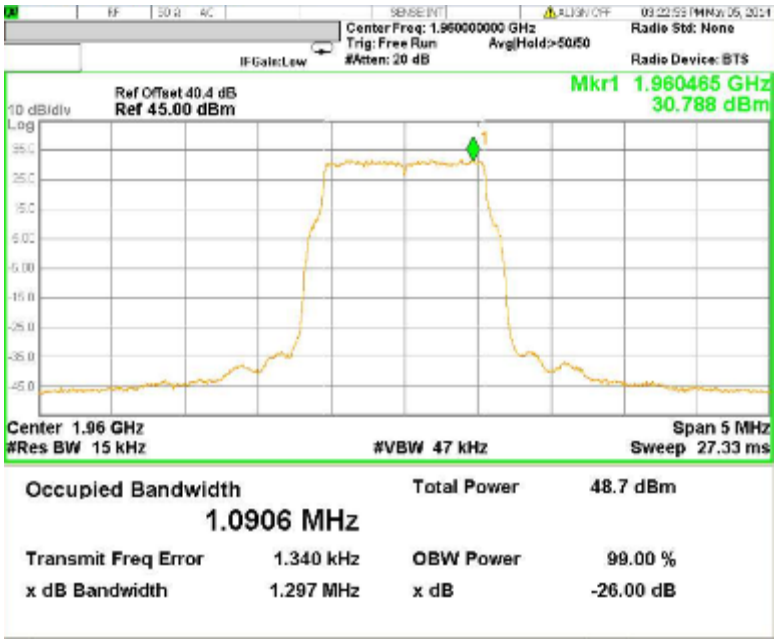
Channel Position T - QPSK / Bandwidth 1.4 MHz



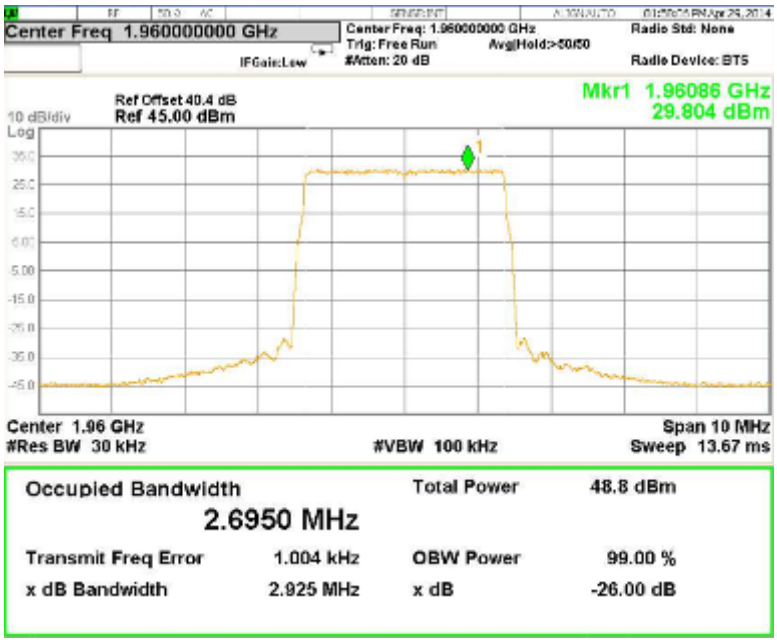
Channel Position M - 16QAM / Bandwidth 1.4 MHz



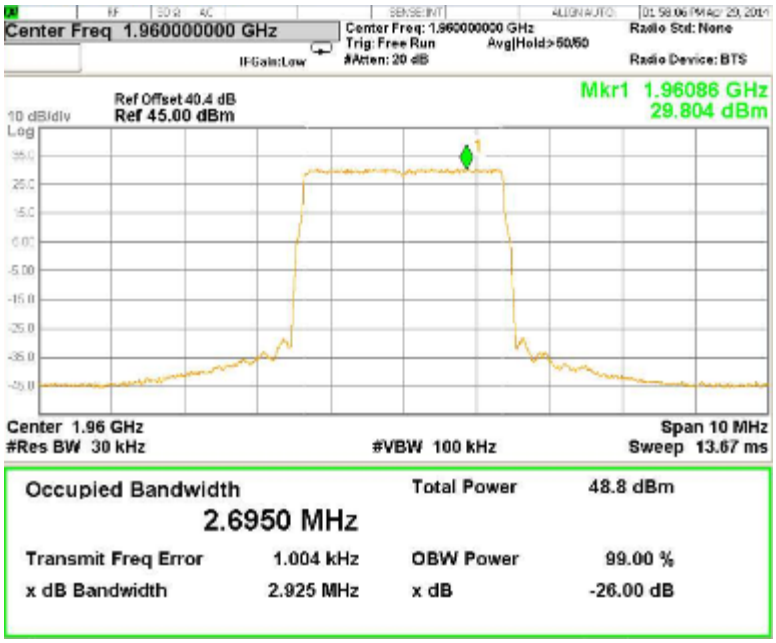
Channel Position M - 64QAM / Bandwidth 1.4 MHz



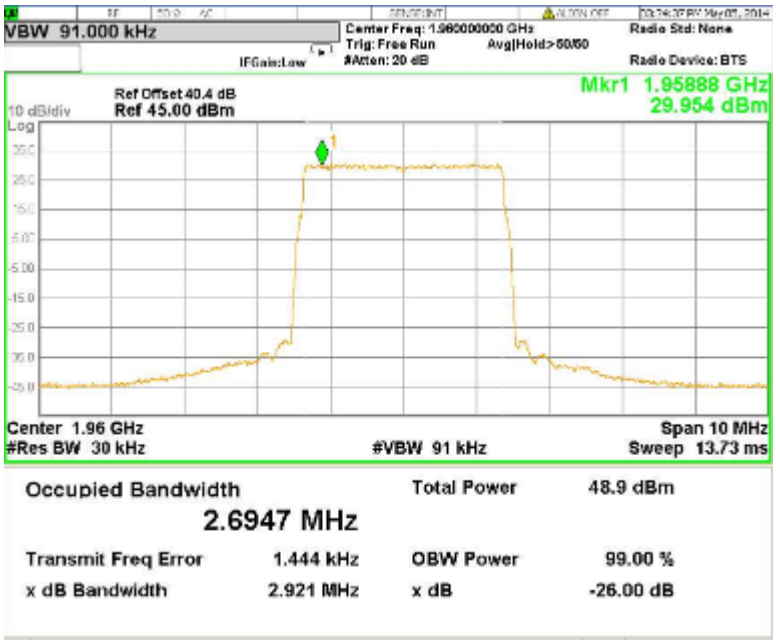
Channel Position M - QPSK / Bandwidth 3.0 MHz



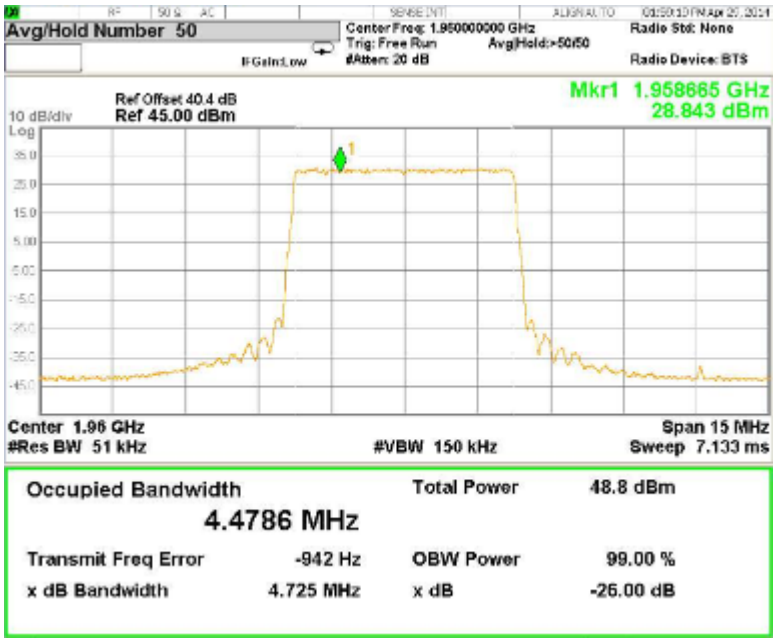
Channel Position M - 16QAM / Bandwidth 3.0 MHz



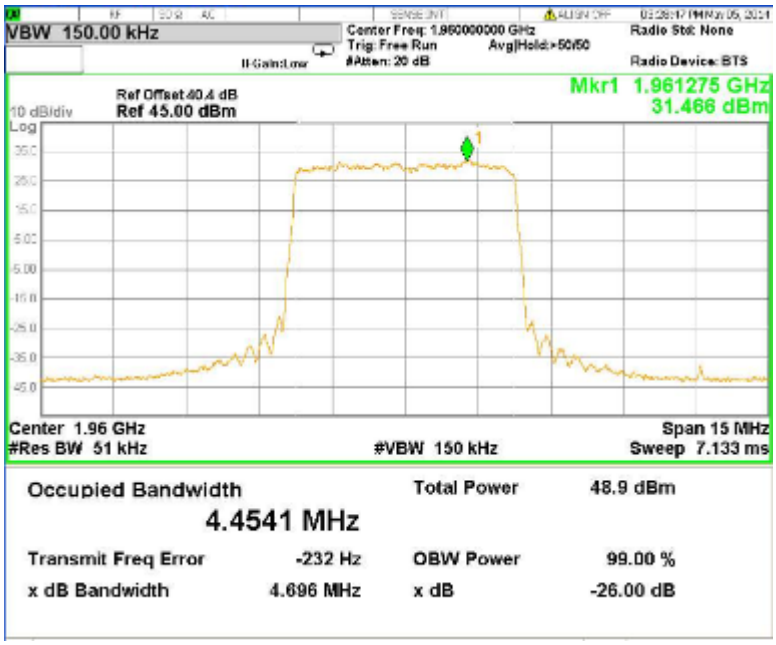
Channel Position M - 64QAM / Bandwidth 3.0 MHz



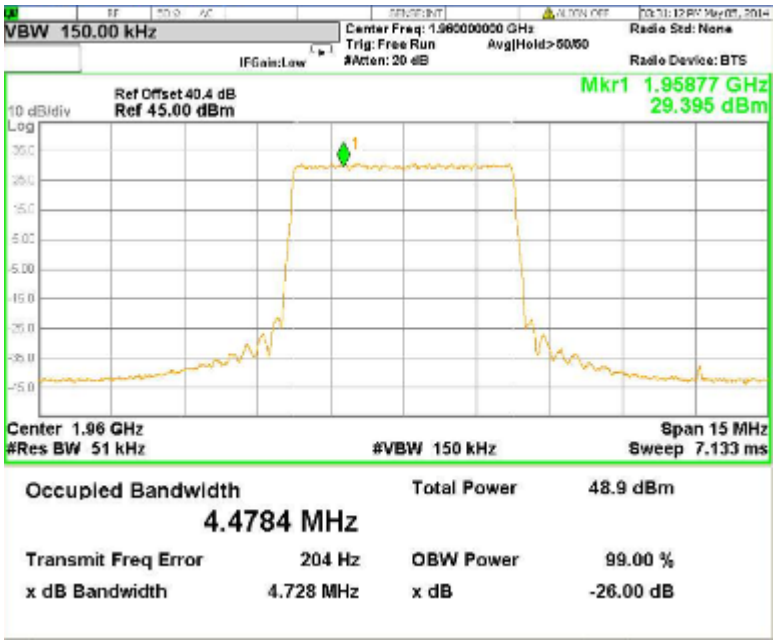
Channel Position M - QPSK / Bandwidth 5.0 MHz



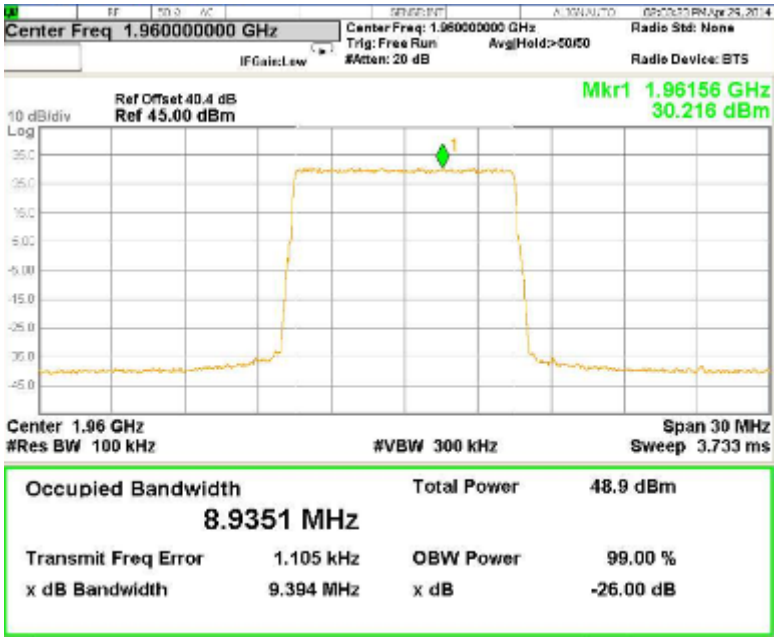
Channel Position M - 16QAM / Bandwidth 5.0 MHz



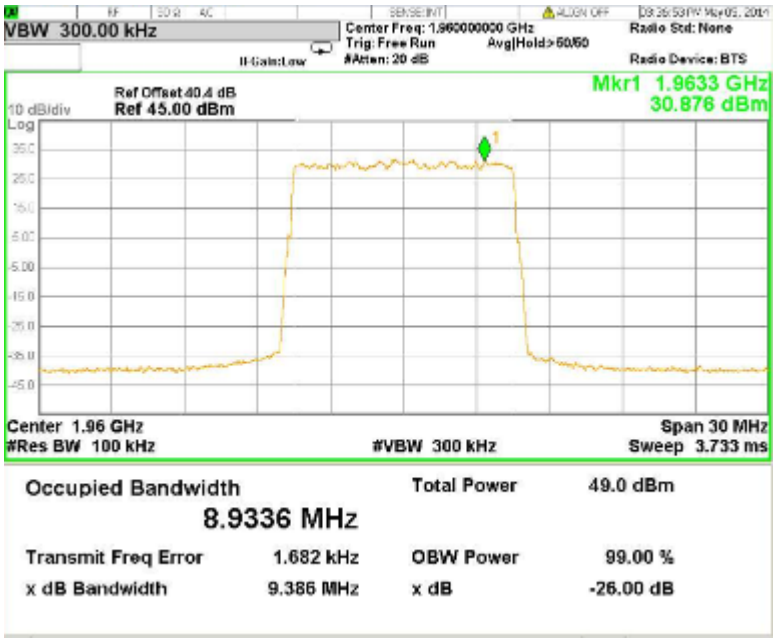
Channel Position M - 64QAM / Bandwidth 5.0 MHz



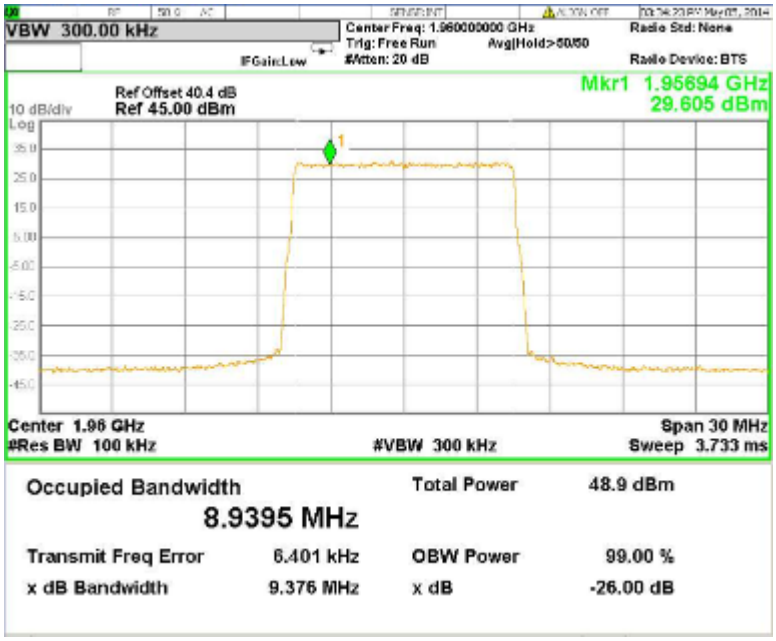
Channel Position M - QPSK / Bandwidth 10.0 MHz



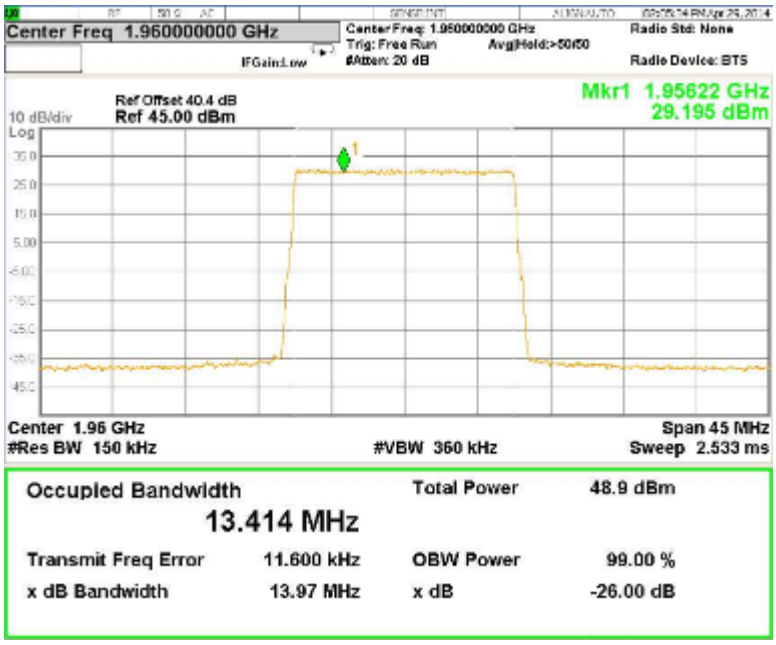
Channel Position M - 16QAM / Bandwidth 10.0 MHz



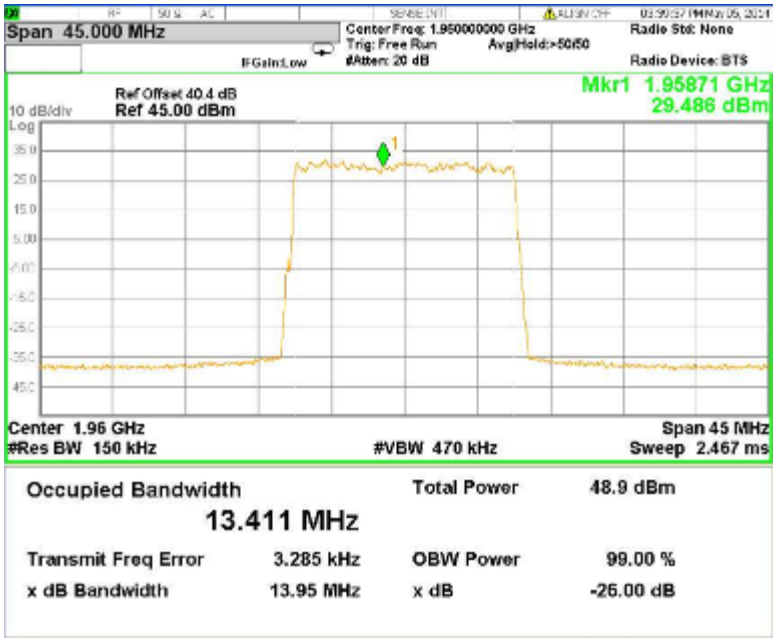
Channel Position M - 64QAM / Bandwidth 10.0 MHz



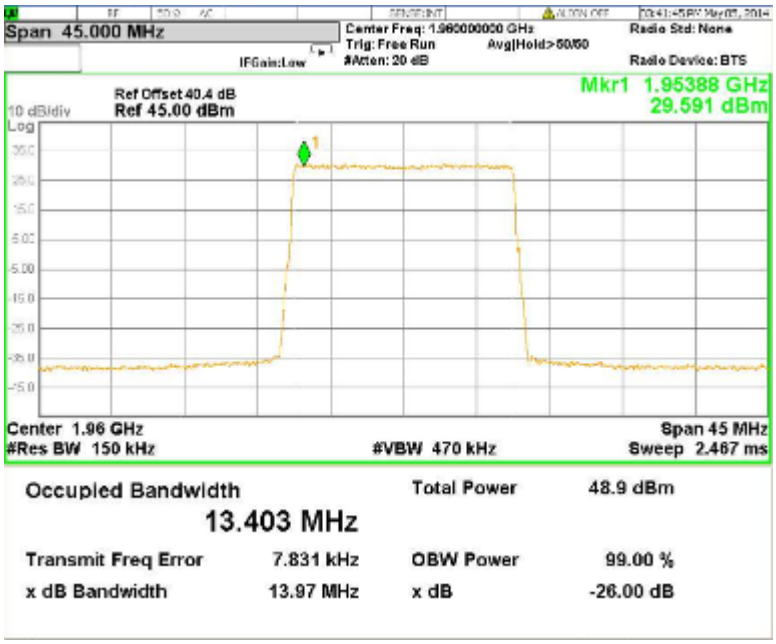
Channel Position M - QPSK / Bandwidth 15.0 MHz



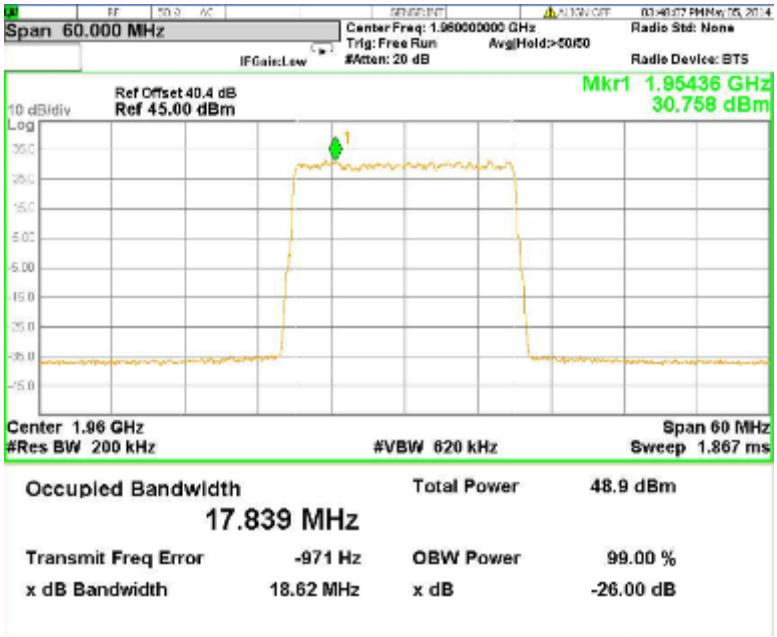
Channel Position M - 16QAM / Bandwidth 15.0 MHz



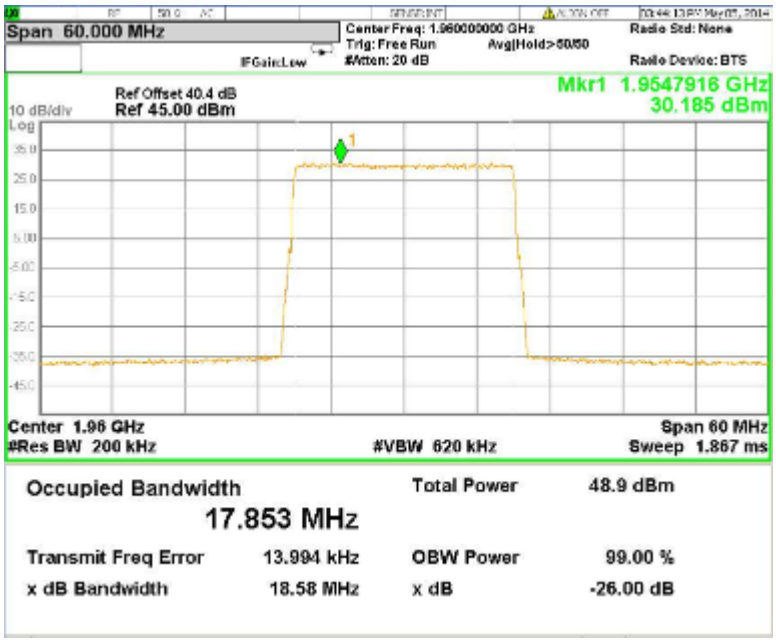
Channel Position M - 64QAM / Bandwidth 15.0 MHz



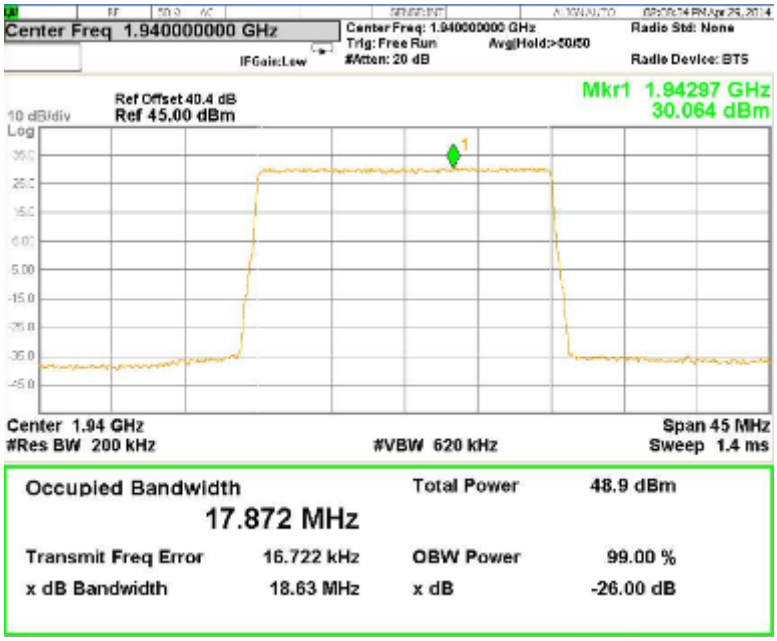
Channel Position M - 16QAM / Bandwidth 20.0 MHz



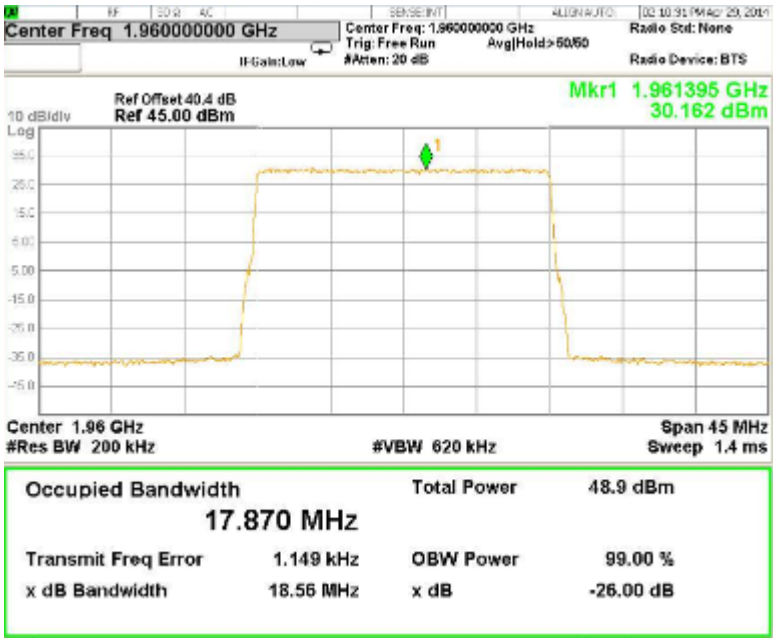
Channel Position M - 64QAM / Bandwidth 20.0 MHz



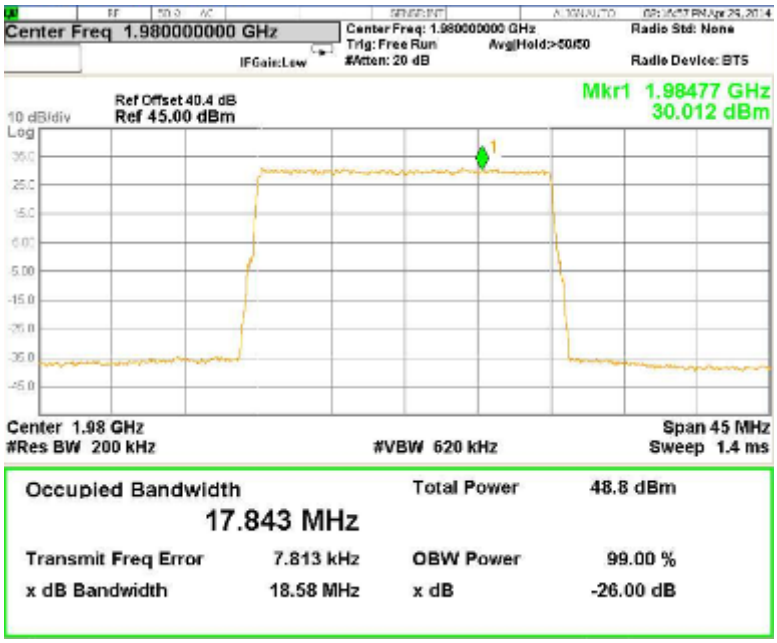
Channel Position B - QPSK / Bandwidth 20.0 MHz



Channel Position M - QPSK / Bandwidth 20.0 MHz



Channel Position T - QPSK / Bandwidth 20.0 MHz



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 6.5.1

2.3.2 Equipment Under Test

RUS 02 B2, KRC 161 298/1, S/N: CB4S640603，CB4S640592

2.3.3 Date of Test and Modification State

28 Arpil to 19 May 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	22.8 – 24.5°C
Relative Humidity	45.0 – 67.5%

2.3.6 Test Method

In accordance with FCC CFR 47 Part 24, Clause 24.238 and Industry Canada RSS-133, Clause 6.5.1, any emissions outside of the block edges shall be attenuated by at least 43 + 10 log (P). In the 1MHz bands immediatedly 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 of 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, then added -13dB[10Log(1/0.05)] to the limit.

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 A1 and RF A2.

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

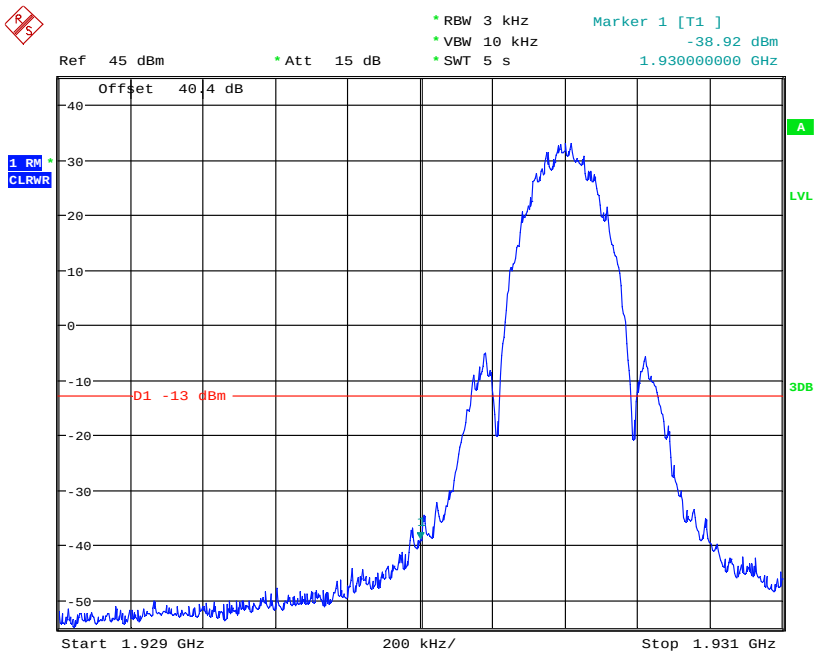
Configuration G-SC

Maximum Output Power 47.8dBm per carrier

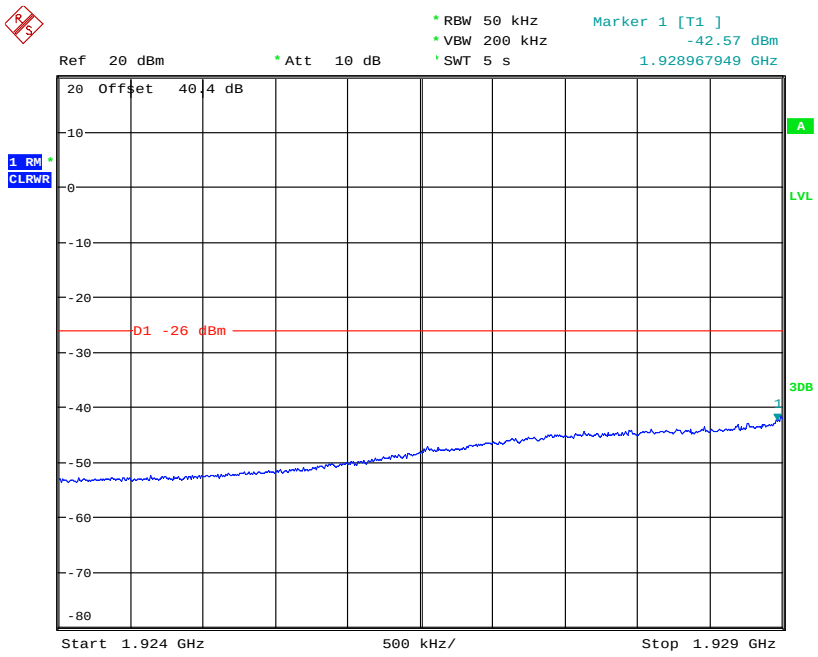
Band Edge Frequency	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	1930.4MHz*
Channel Position T 1990.0 MHz	1989.6MHz*

Note*: For GSM, 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.

Channel Position B – 16QAM

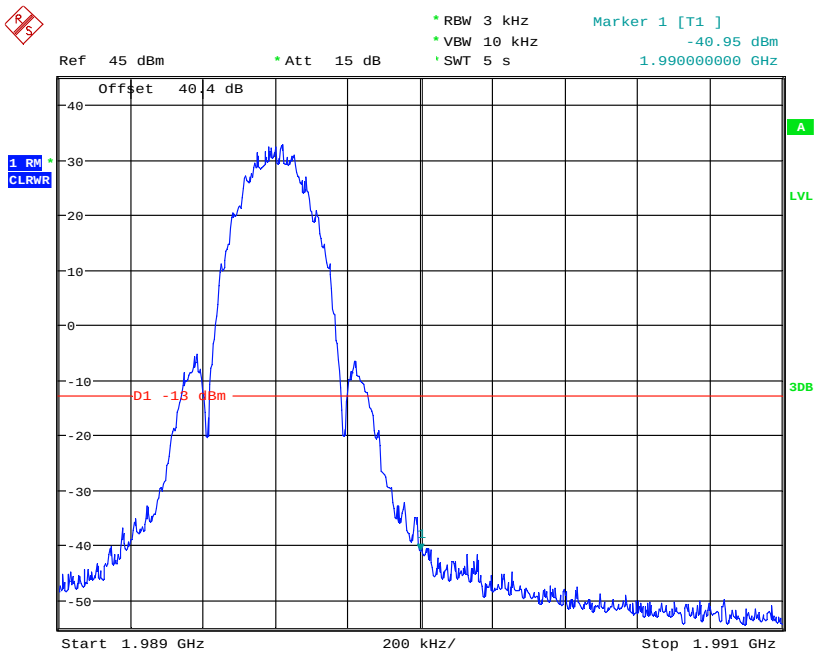


Date: 25.APR.2014 14:51:33

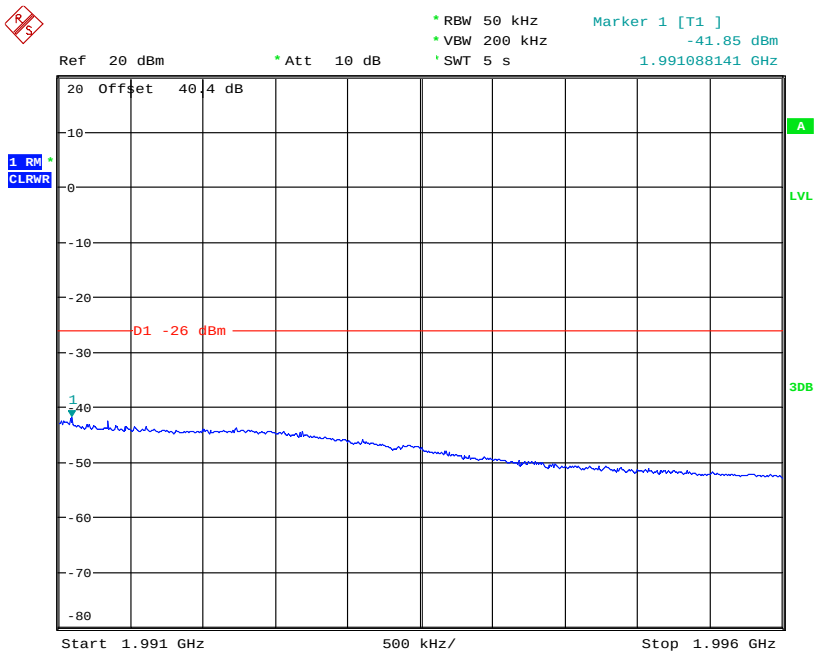


Date: 25.APR.2014 14:53:57

Channel Position T – 16QAM



Date: 25.APR.2014 14:37:04



Date: 25.APR.2014 14:35:30

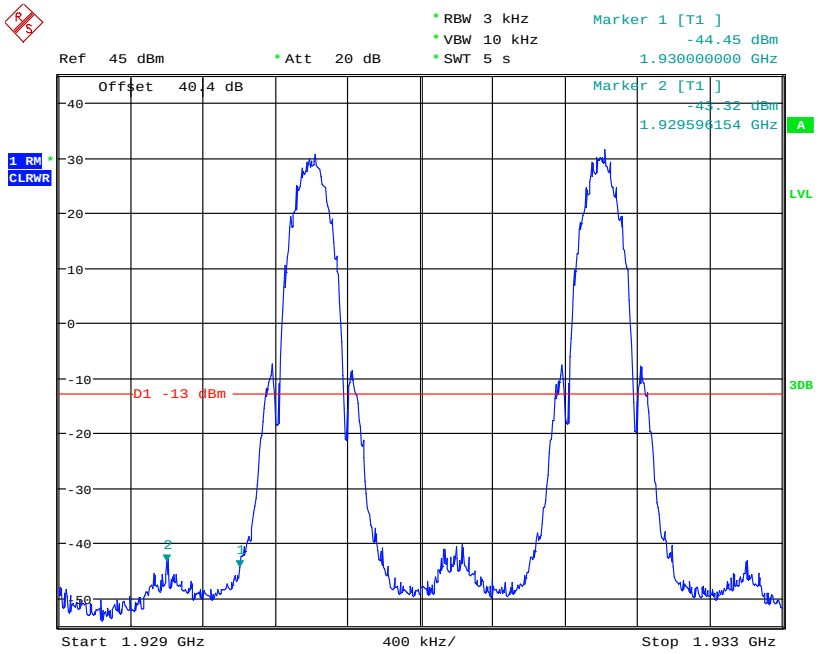
Configuration G-MC 1 (2C)

Maximum Output Power 46.0dBm per carrier

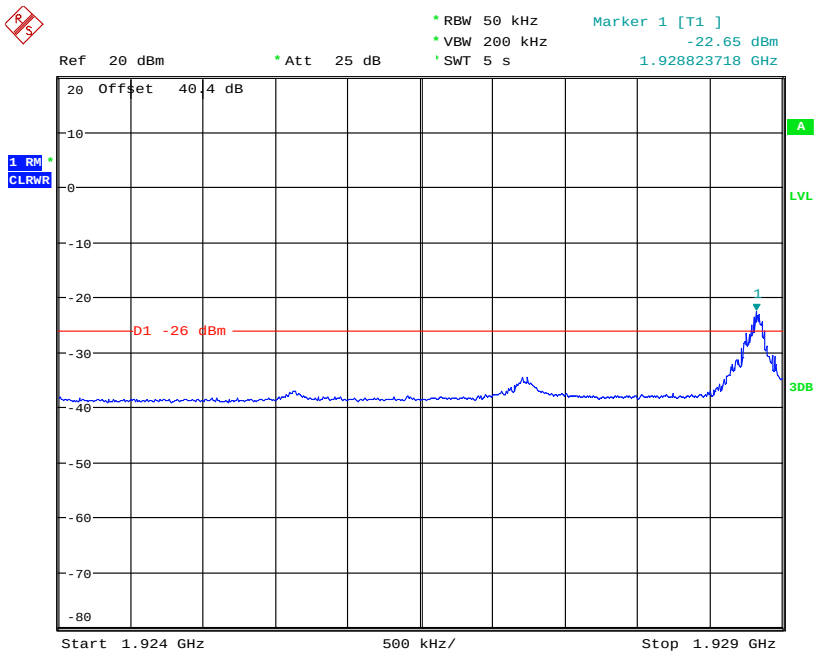
Band Edge Frequency	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	1930.4MHz* + 1932.0MHz
Channel Position T 1990.0 MHz	1989.6MHz* + 1988.0MHz

Note*: For GSM, 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.

Channel Position B – 16QAM

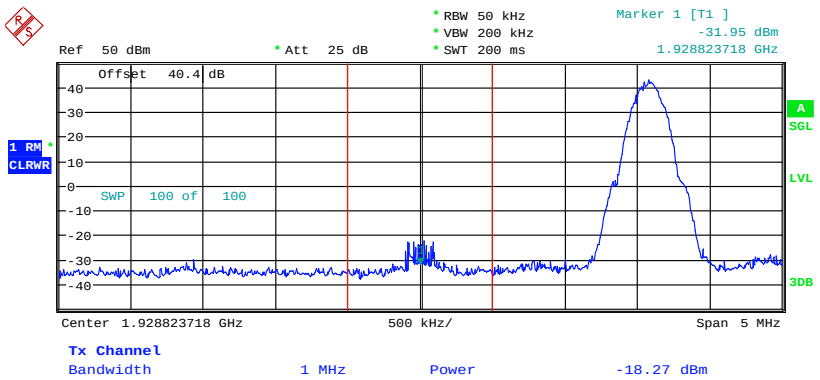


Date: 25.APR.2014 16:30:29



Date: 28.APR.2014 10:27:48

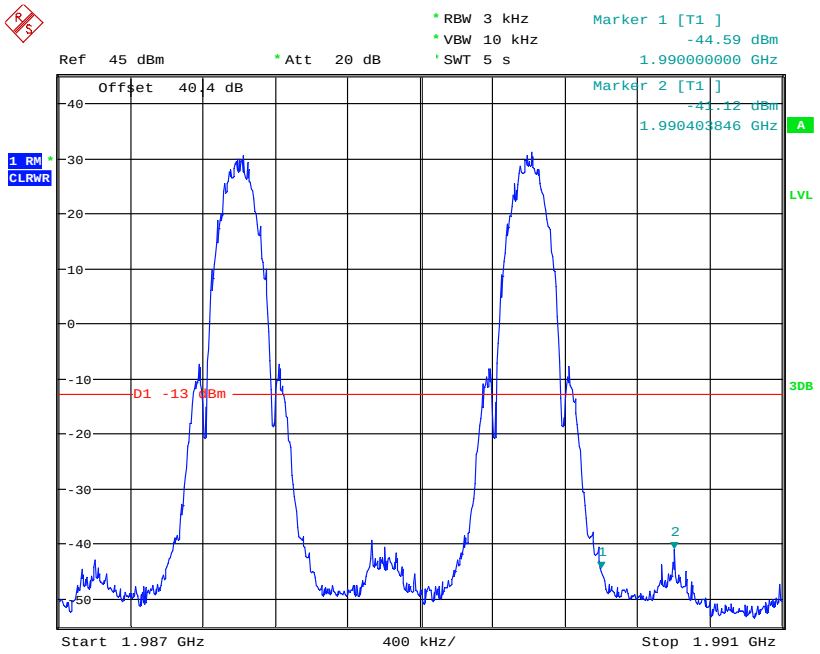
Note: Pre-sweep between 1MHz to 5MHz away from the band edge.



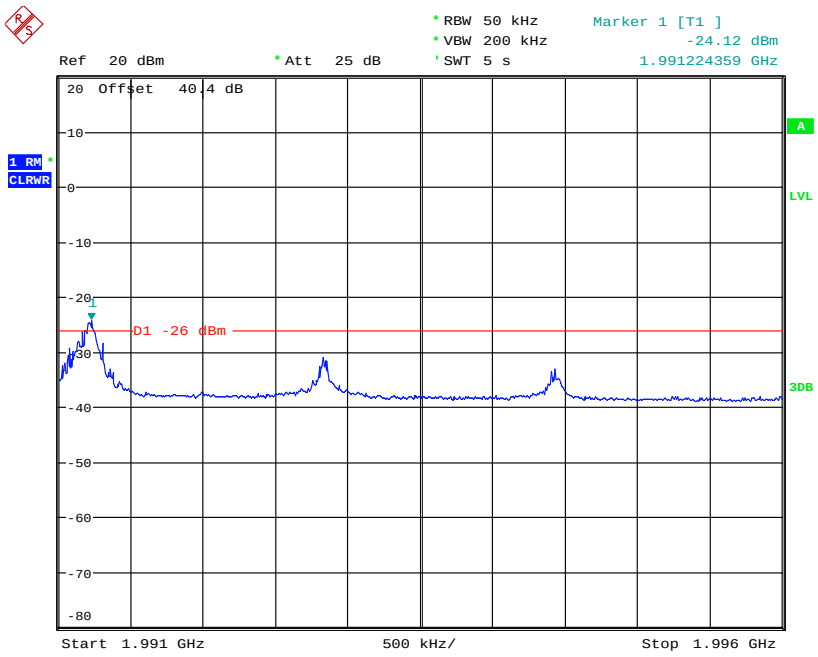
Date: 28.APR.2014 10:31:09

Note: Verification for the 1MHz channel power between 1MHz to 5MHz away from the band edge.The limitation is -13dBm/1MHz.

Channel Position T – 16QAM

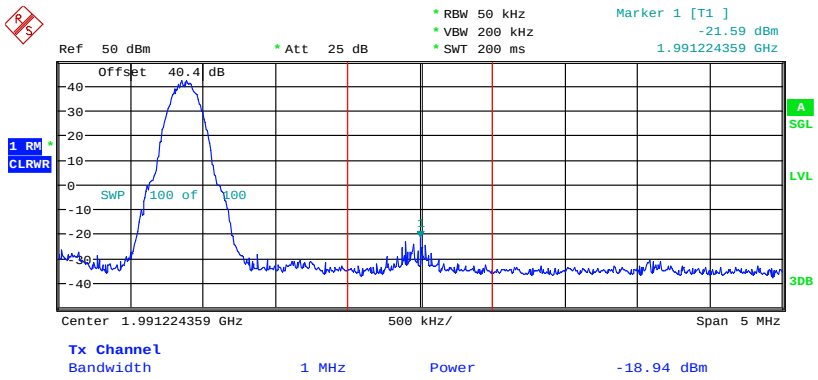


Date: 28.APR.2014 10:52:21



Date: 28.APR.2014 10:48:37

Note: Pre-sweep between 1MHz to 5MHz away from the band edge.



Date: 28.APR.2014 10:50:21

Note: Verification for the 1MHz channel power between 1MHz to 5MHz away from the band edge.The limitation is -13dBm/1MHz.

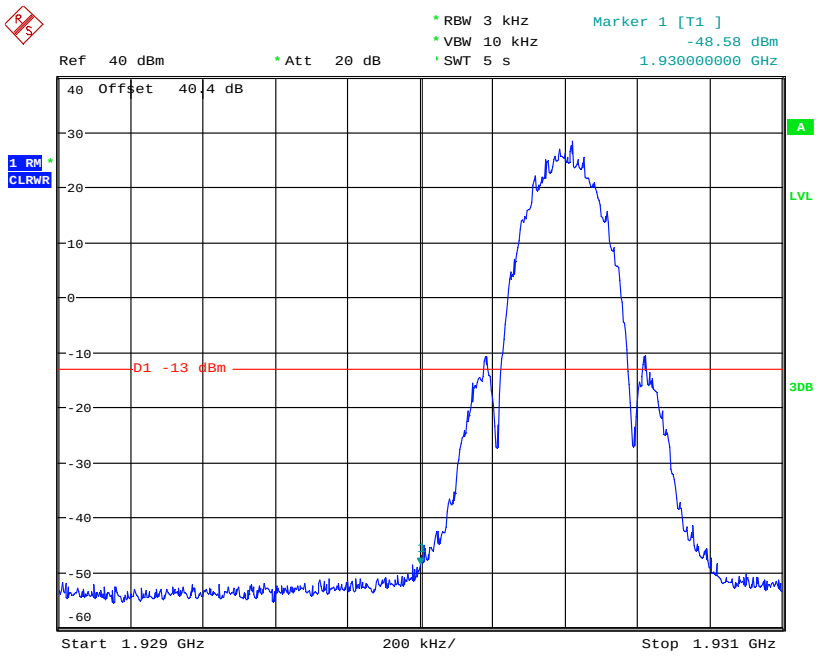
Configuration G-MC 2 (3C)

Maximum Output Power 42.3dBm per carrier

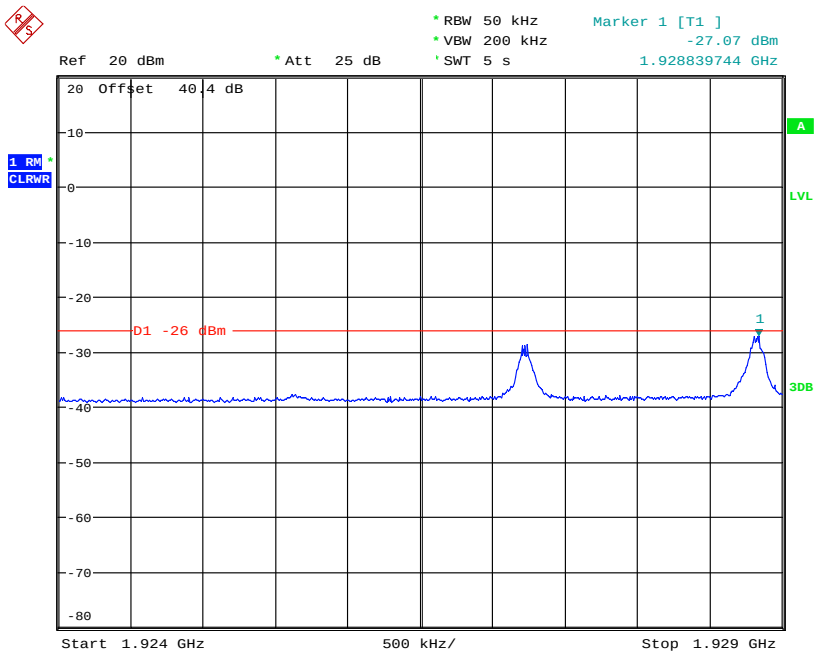
Band Edge Frequency	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	1930.4MHz* + 1932.0MHz + 1933.6MHz
Channel Position T 1990.0 MHz	1989.6MHz* + 1988.0MHz + 1987.6MHz

Note*: For GSM, 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.

Channel Position B – 16QAM

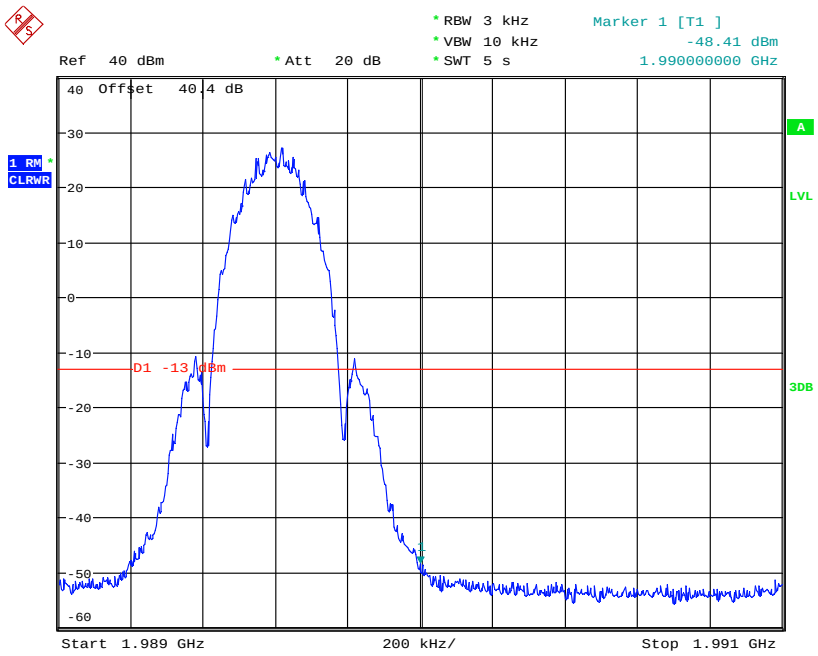


Date: 28.APR.2014 13:05:59

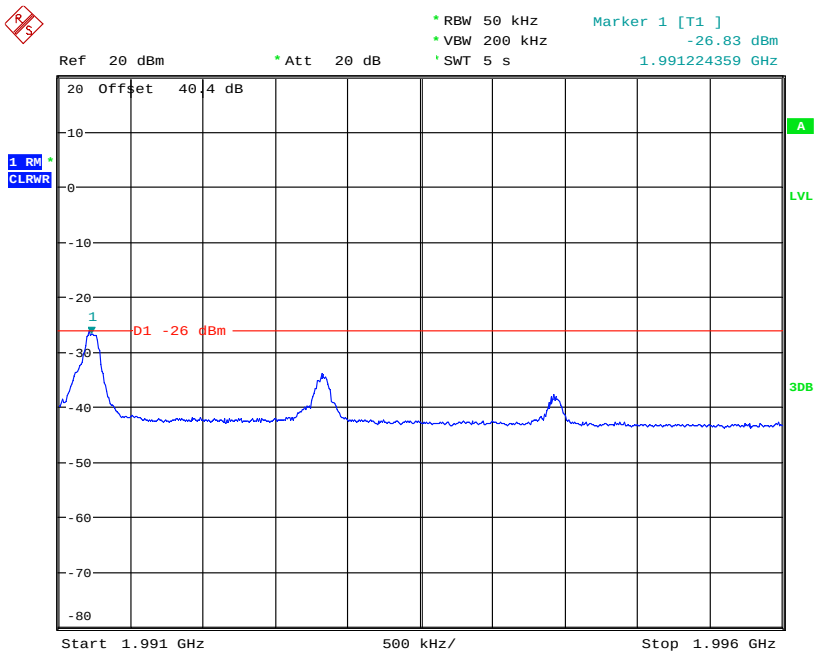


Date: 28.APR.2014 13:04:35

Channel Position T – 16QAM



Date: 28.APR.2014 13:59:00



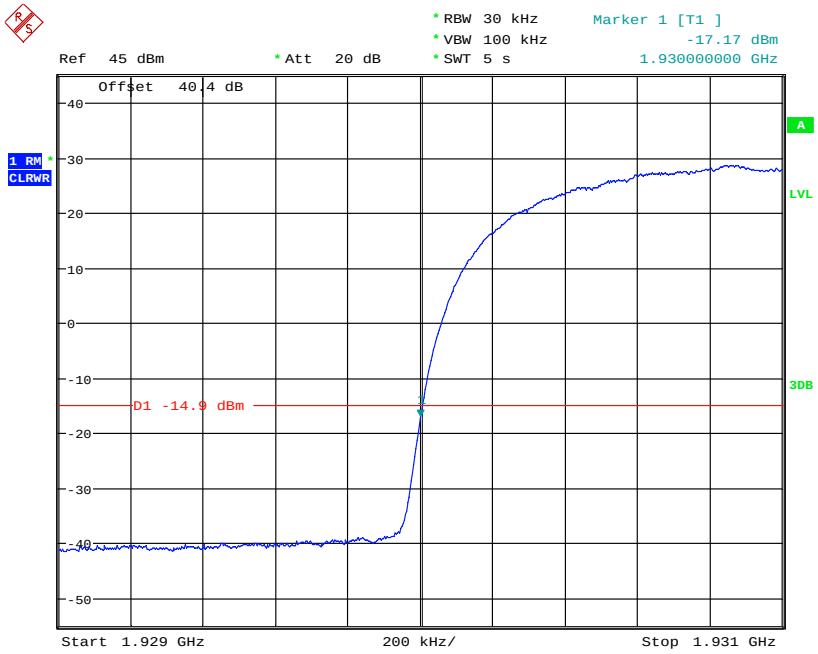
Date: 28.APR.2014 14:00:51

Configuration W-SC

Maximum Output Power 49.0dBm per carrier

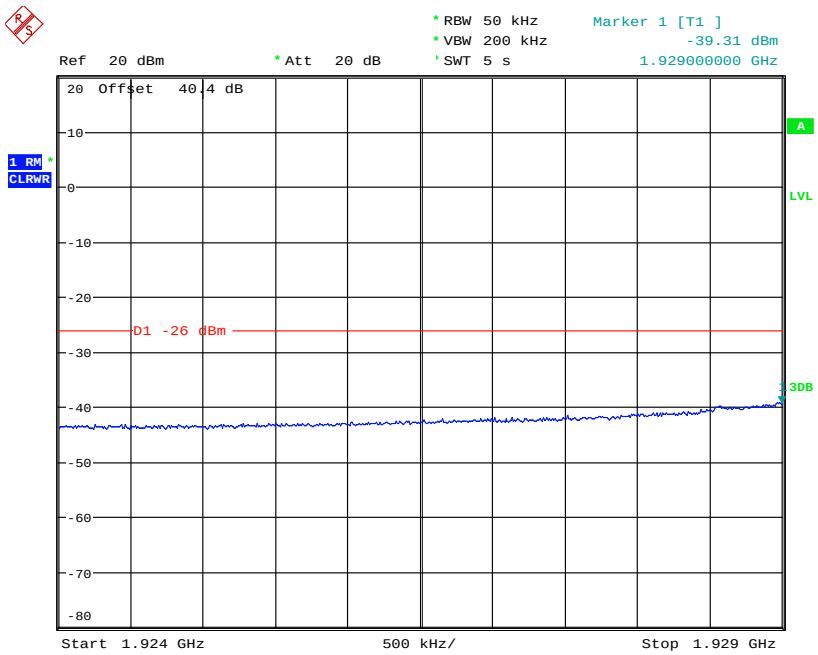
Band Edge Frequency	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 1930.0 MHz	1932.4MHz
Channel Position T 1990.0 MHz	1987.6MHz

Channel Position B - QPSK



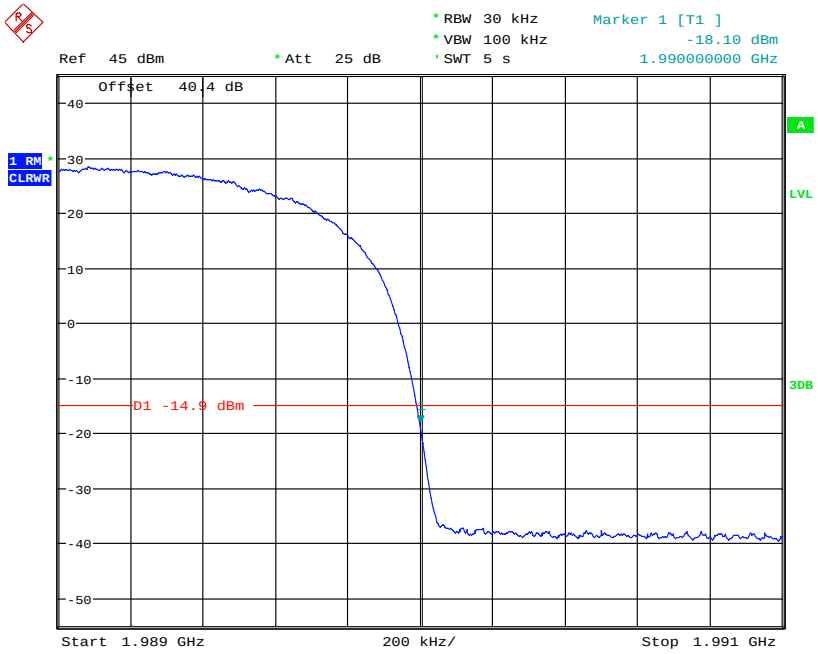
Date: 29.APR.2014 16:20:27

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -13dB to -14.9dB.



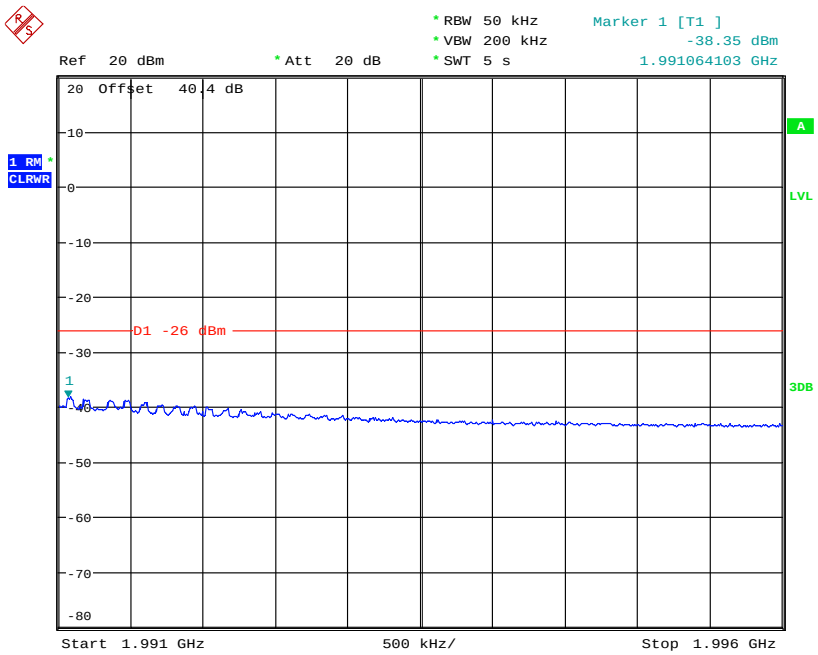
Date: 29.APR.2014 16:21:34

Channel Position T - QPSK



Date: 29.APR.2014 16:24:49

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -13dB to -14.9dB.



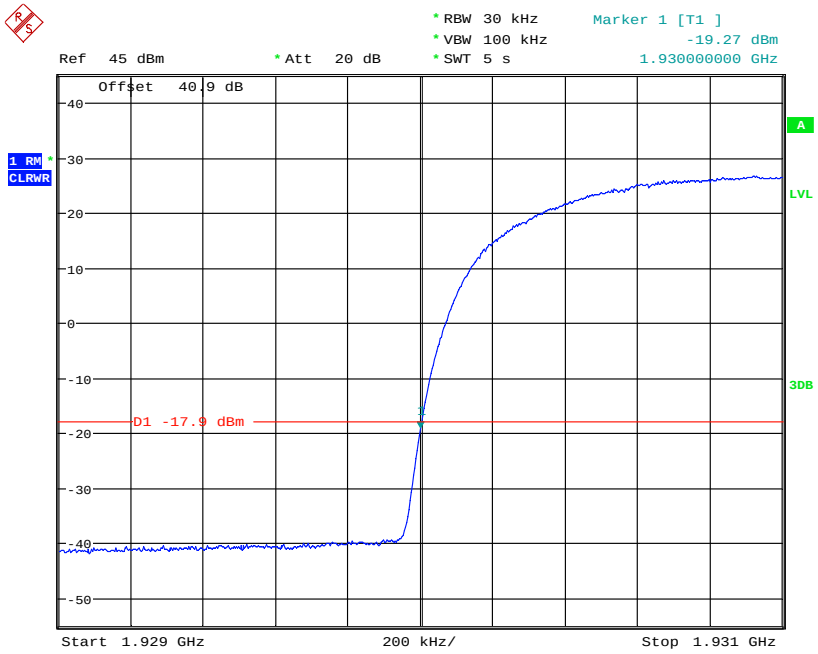
Date: 29.APR.2014 16:23:17

Configuration W-MIMO-SC

Maximum Output Power 47.0dBm per carrier

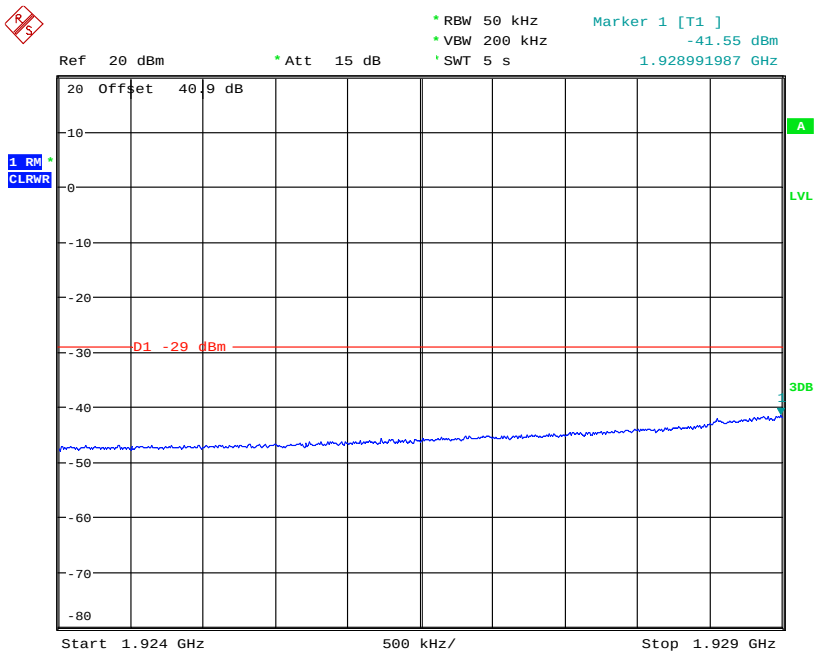
Band Edge Frequency	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	Port A1: 1932.4MHz
Channel Position T 1990.0 MHz	Port A1: 1987.6MHz

Channel Position B - 16QAM



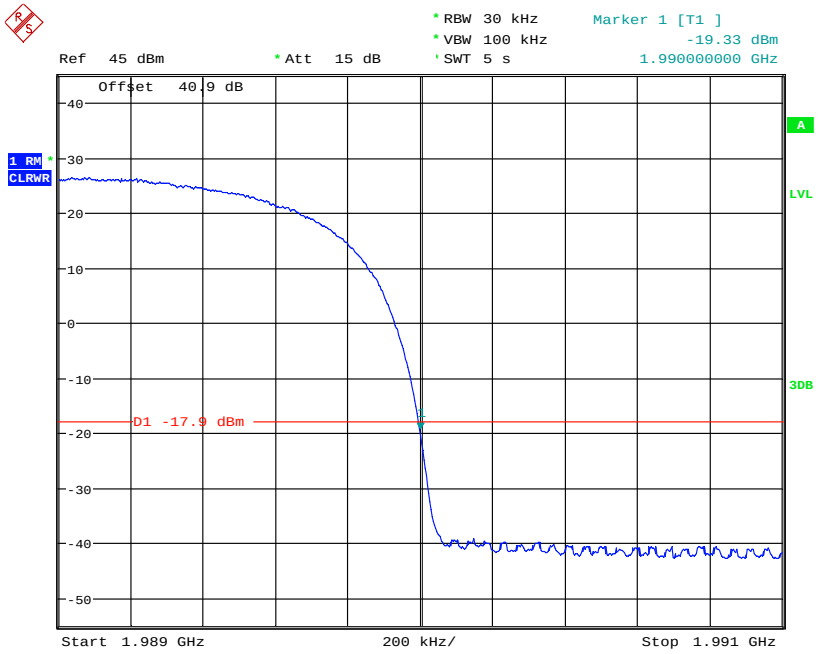
Date: 19.MAY.2014 04:50:22

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



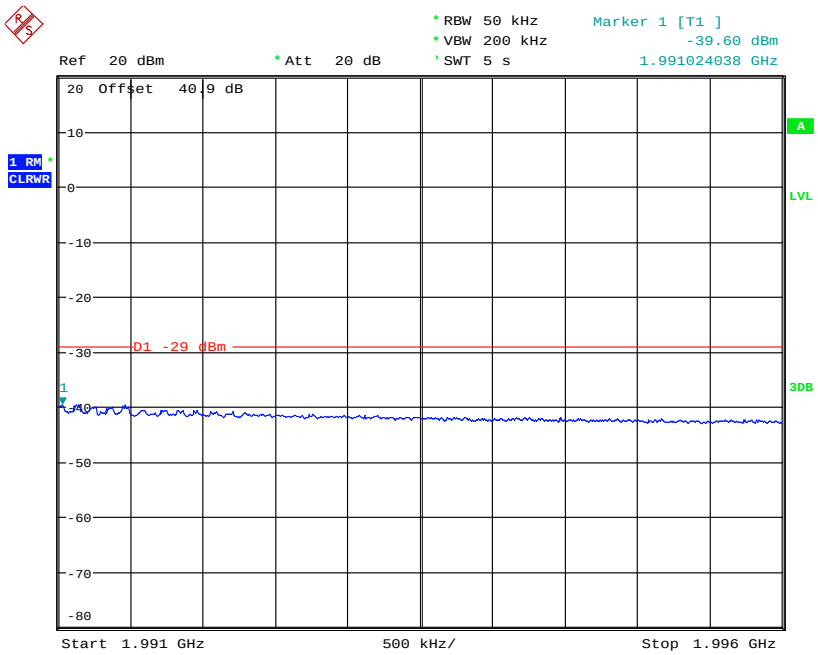
Date: 19.MAY.2014 04:51:47

Channel Position T - 16QAM



Date: 19.MAY.2014 05:06:30

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate .for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



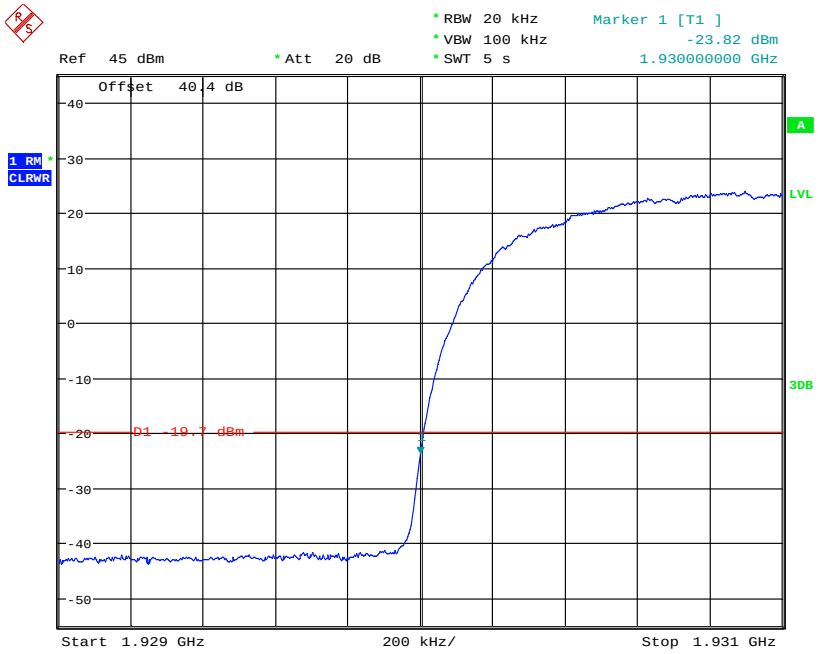
Date: 19.MAY.2014 05:07:12

Configuration W-MIMO-MC 1 (2C)

Maximum Output Power 45.8dBm per carrier

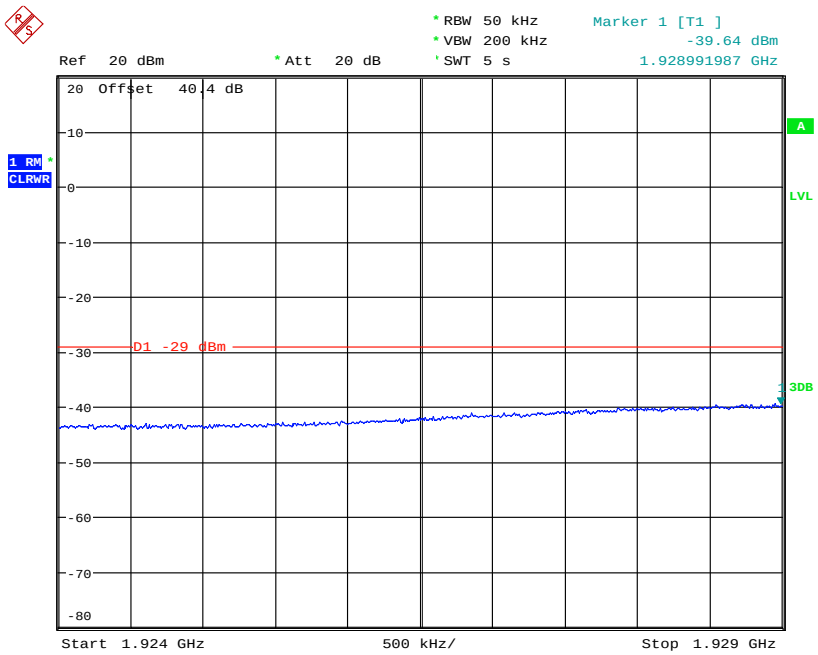
Band Edge Frequency	Edge Test with modulation 16QAM Channel Frequencies
Channel Position B 1930.0 MHz	Port A1: 1932.4MHz + 1937.4MHz
Channel Position T 1990.0 MHz	Port A1: 1987.6MHz + 1982.6MHz

Channel Position B - 16QAM



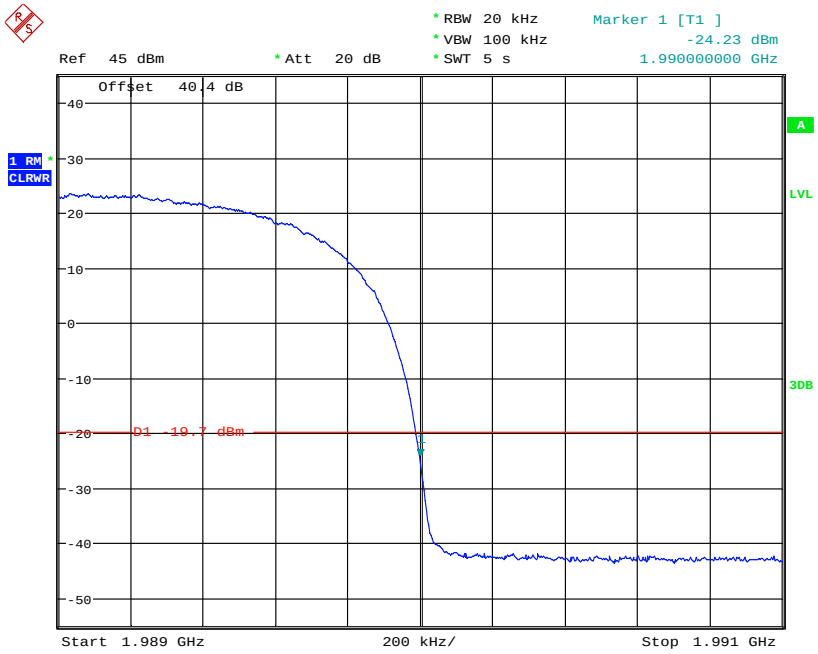
Date: 30.APR.2014 13:07:09

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -19.7dBm.



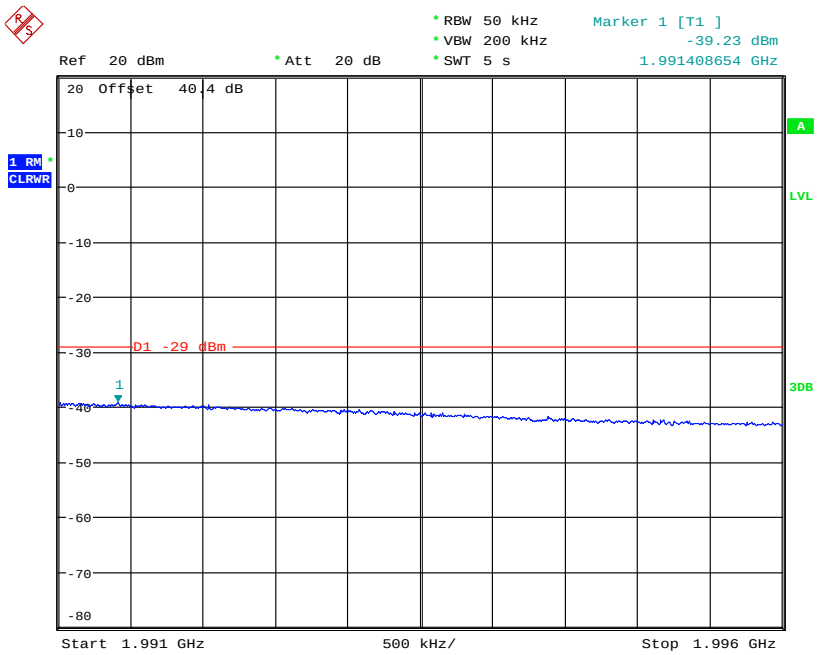
Date: 30.APR.2014 13:08:16

Channel Position T - 16QAM



Date: 30.APR.2014 13:12:50

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -19.7dBm.



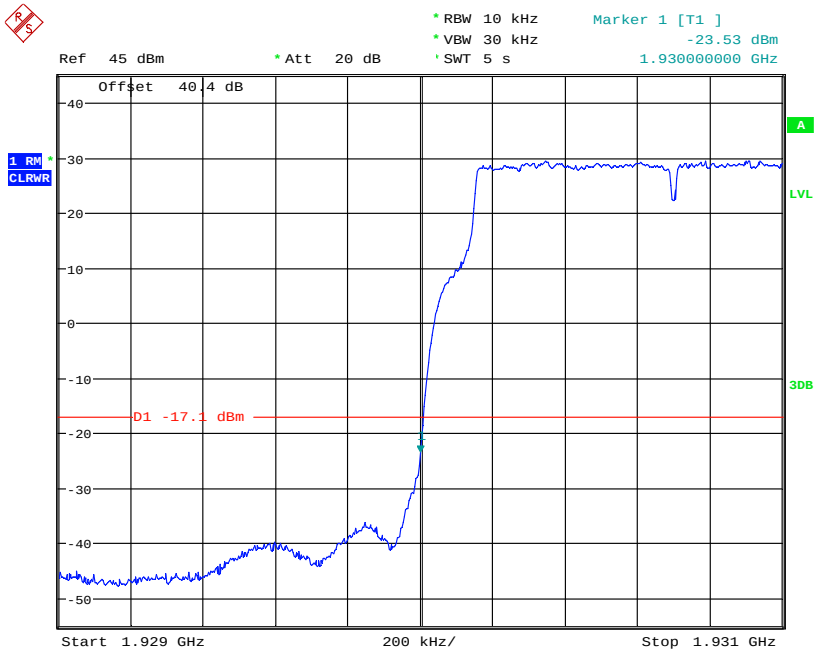
Date: 30.APR.2014 13:11:26

Configuration L-MIMO-SC

Maximum Output Power 49.0dBm per carrier

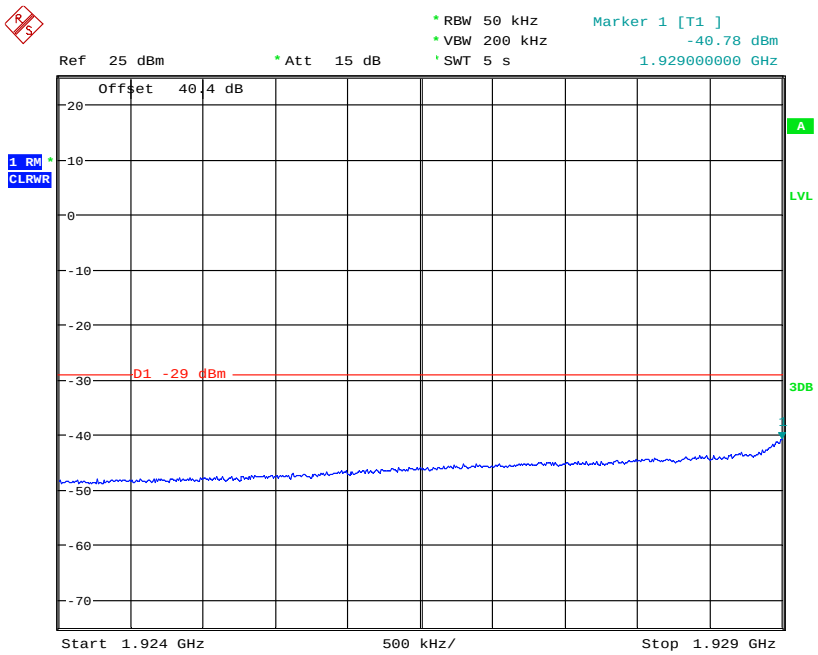
Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 1930.0 MHz	1.4 MHz	Port A1: 1930.7MHz
	3.0 MHz	Port A1: 1931.5MHz
	5.0 MHz	Port A1: 1932.5MHz
	10.0 MHz	Port A1: 1935.0MHz
	15.0 MHz	Port A1: 1937.5MHz
	20.0 MHz	Port A1: 1940.0MHz
Channel Position T 1990.0 MHz	1.4 MHz	Port A1: 1989.3MHz
	3.0 MHz	Port A1: 1988.5MHz
	5.0 MHz	Port A1: 1987.5MHz
	10.0 MHz	Port A1: 1985.0MHz
	15.0 MHz	Port A1: 1982.5MHz
	20.0 MHz	Port A1: 1980.0MHz

Channel Position B - QPSK / Bandwidth 1.4 MHz



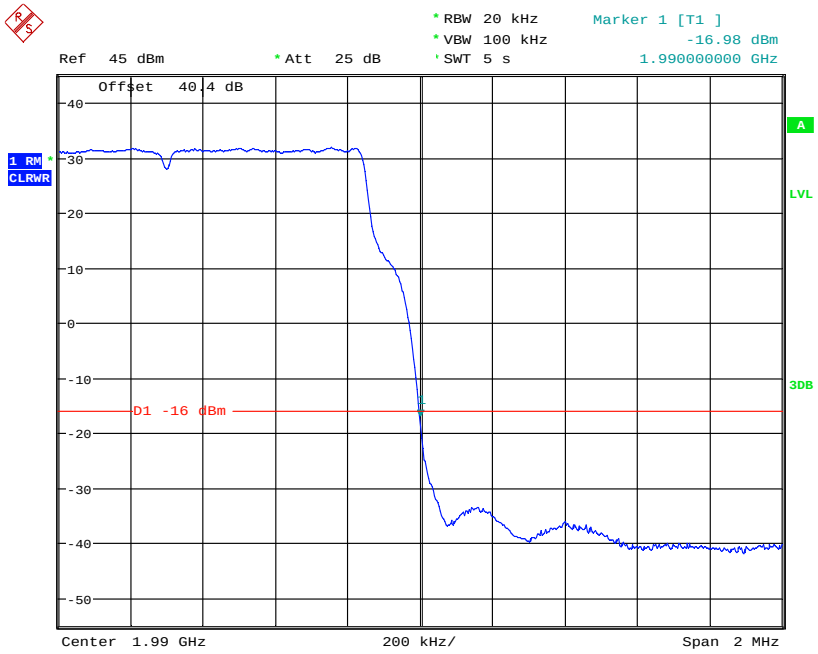
Date: 30.APR.2014 10:03:04

Note: A resolution bandwidth of 10kHz was used. 10kHz is <1% of the Emission Bandwidth of LTE (1.3MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.1dBm.

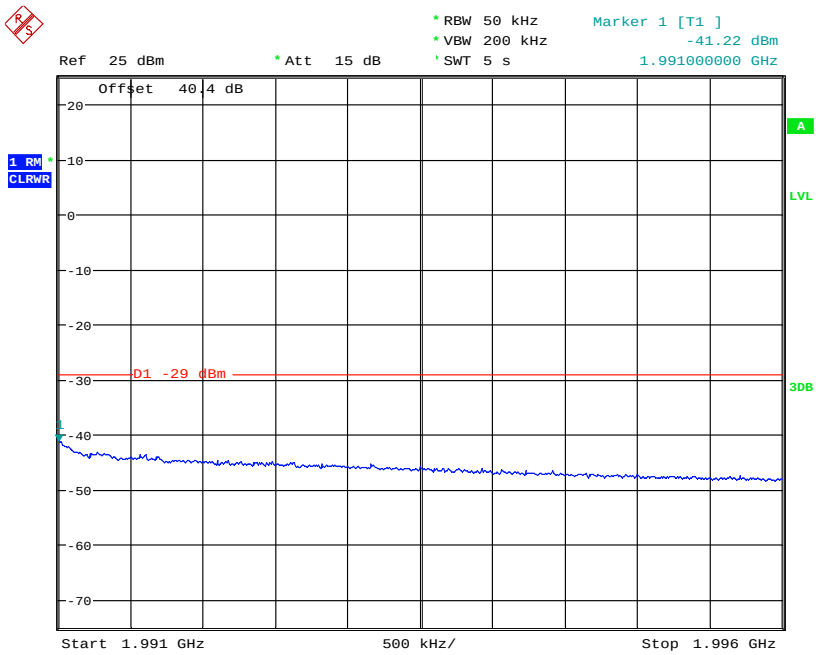


Date: 30.APR.2014 10:04:38

Channel Position T - QPSK / Bandwidth 1.4 MHz

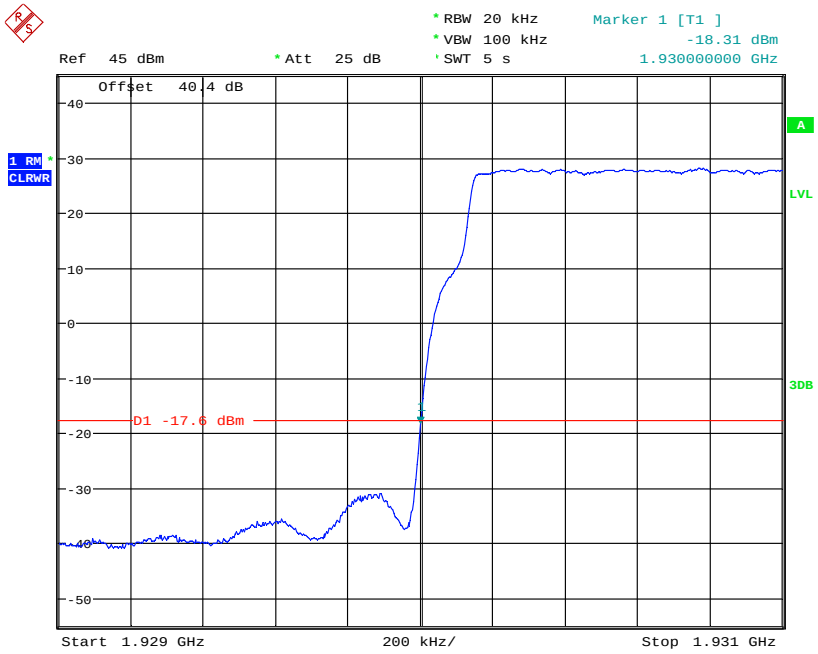


Date: 30.APR.2014 10:11:41



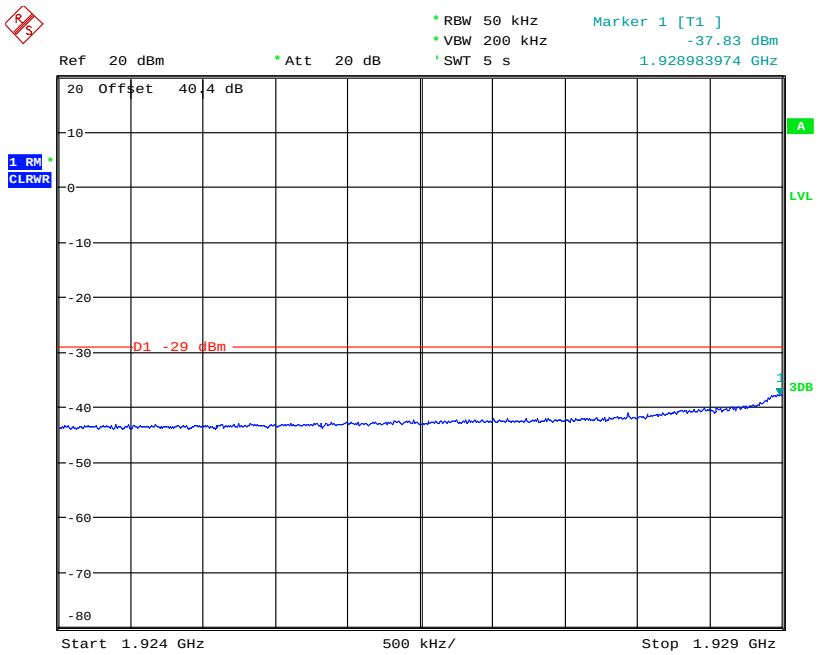
Date: 30.APR.2014 10:12:43

Channel Position B - QPSK / Bandwidth 3.0 MHz



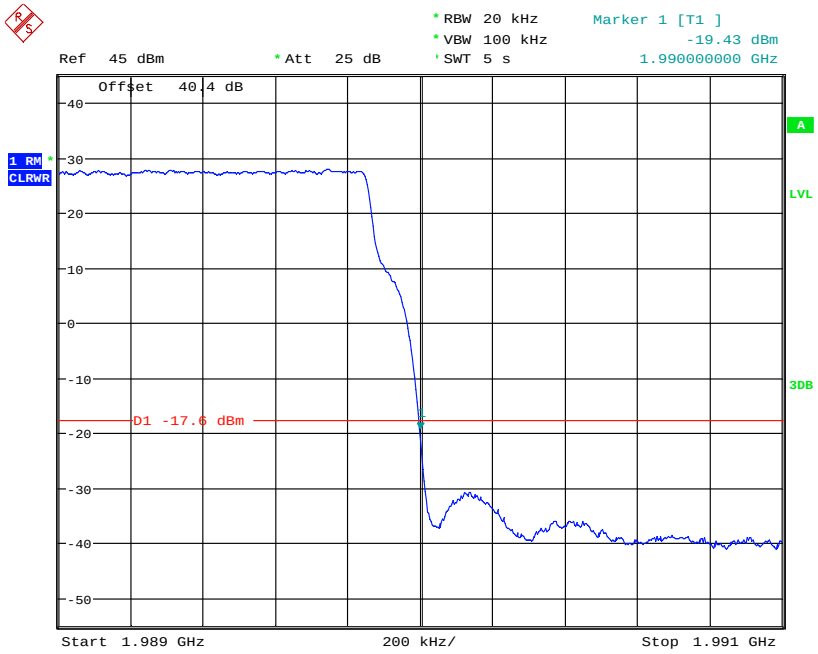
Date: 30.APR.2014 10:39:52

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.



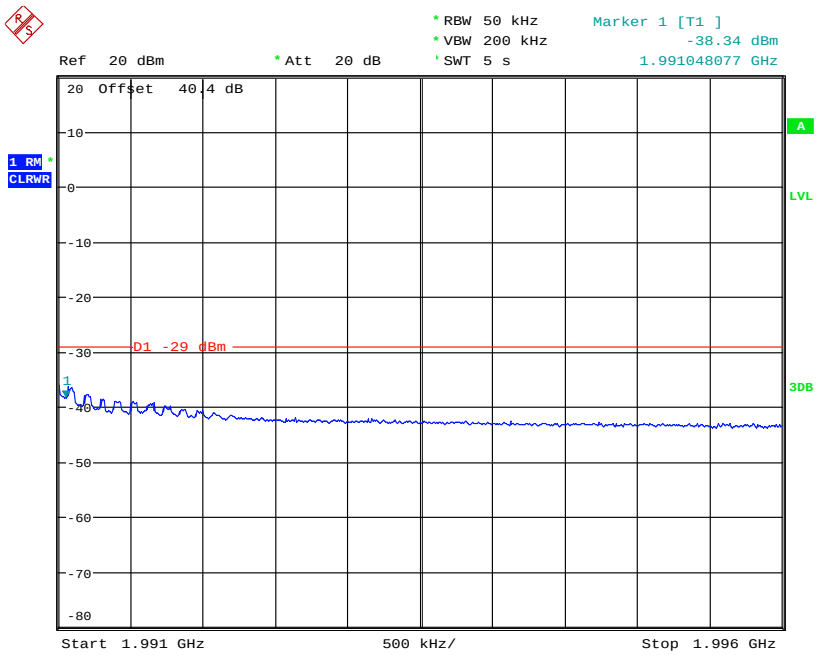
Date: 30.APR.2014 10:40:49

Channel Position T - QPSK / Bandwidth 3.0 MHz



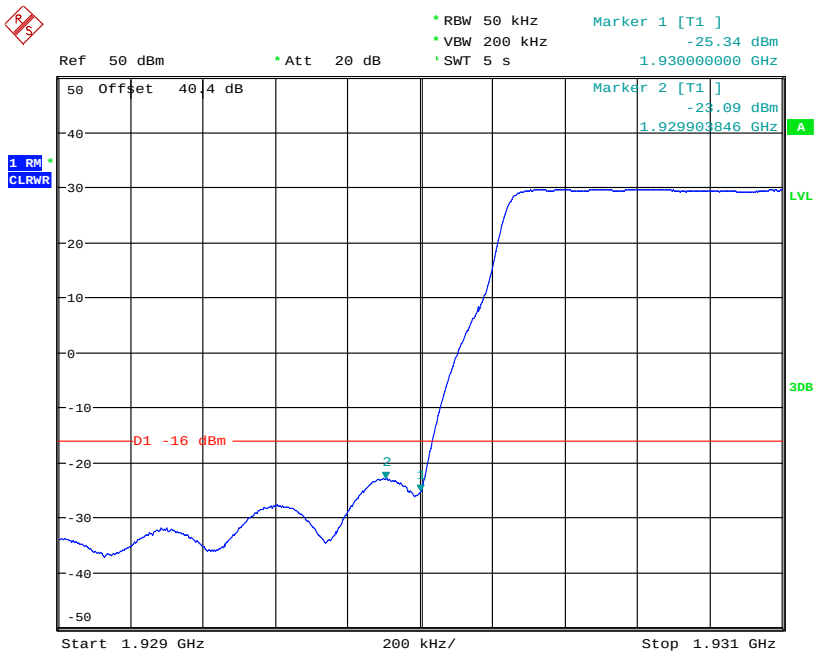
Date: 30.APR.2014 10:46:18

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.

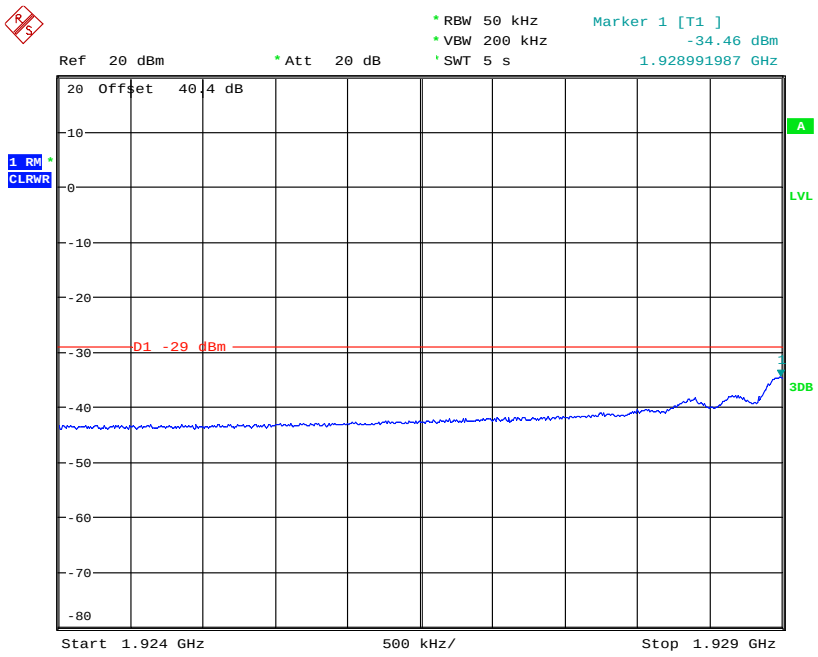


Date: 30.APR.2014 10:47:11

Channel Position B - QPSK / Bandwidth 5.0 MHz

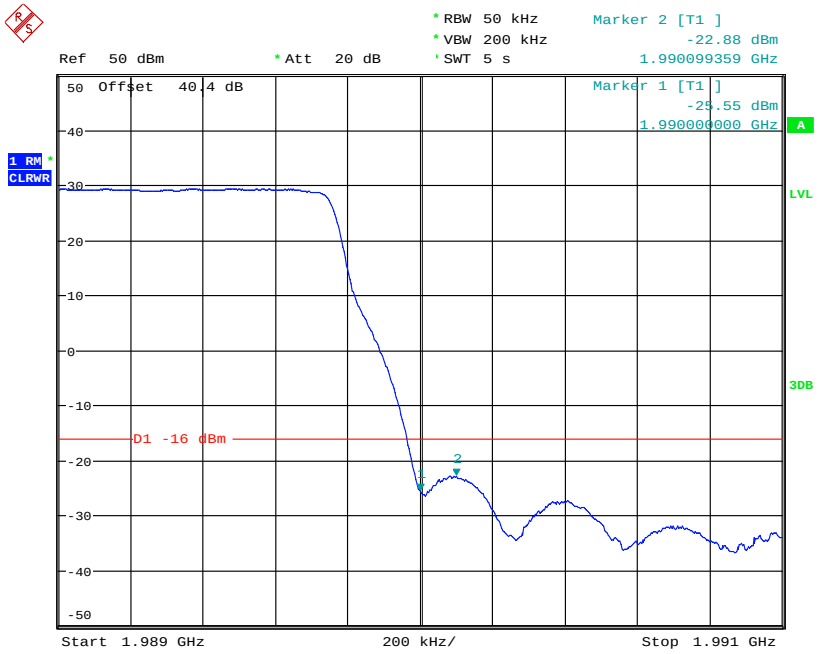


Date: 30.APR.2014 10:51:25

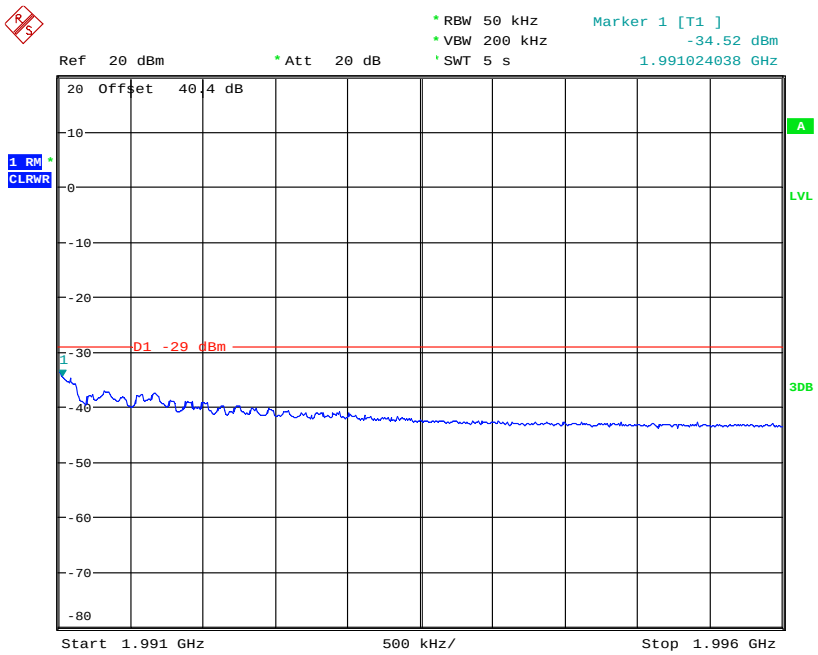


Date: 30.APR.2014 10:49:32

Channel Position T - QPSK / Bandwidth 5.0 MHz

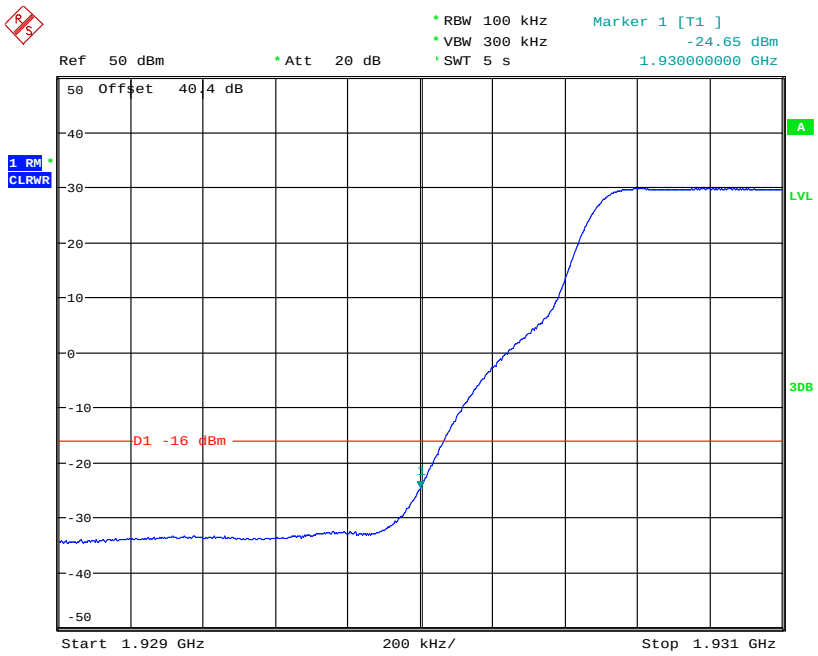


Date: 30.APR.2014 10:53:12

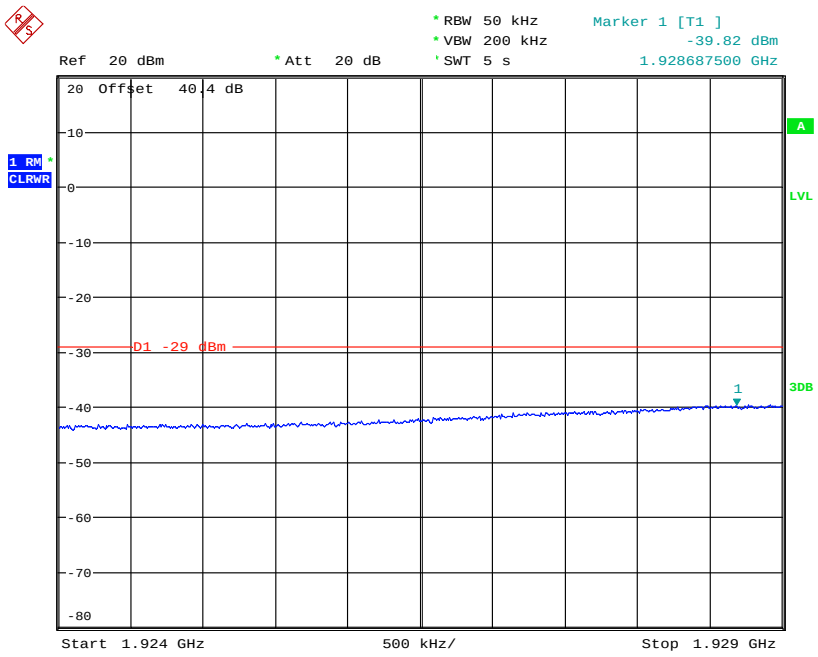


Date: 30.APR.2014 10:54:26

Channel Position B - QPSK / Bandwidth 10.0 MHz

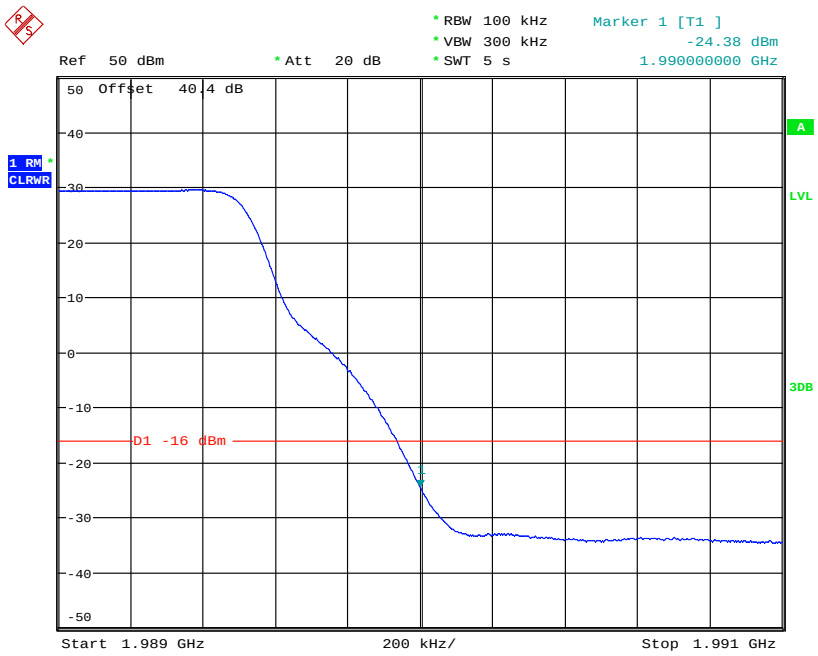


Date: 30.APR.2014 12:25:23

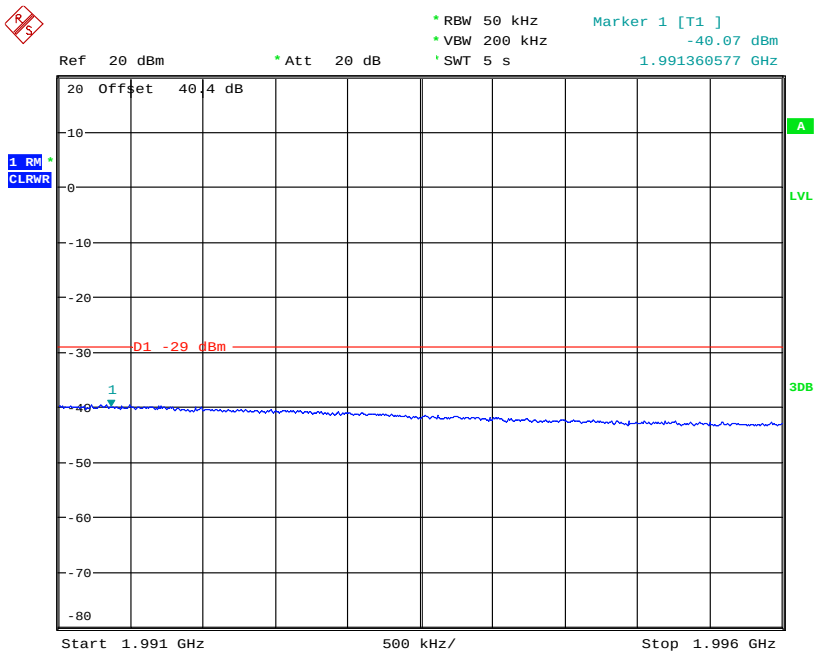


Date: 30.APR.2014 12:26:16

Channel Position T - QPSK / Bandwidth 10.0 MHz

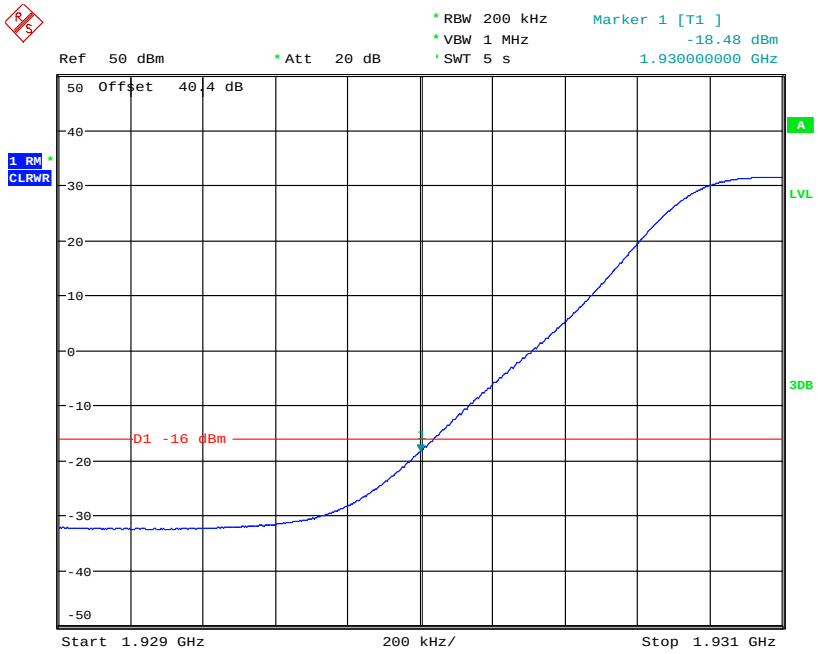


Date: 30.APR.2014 12:29:08

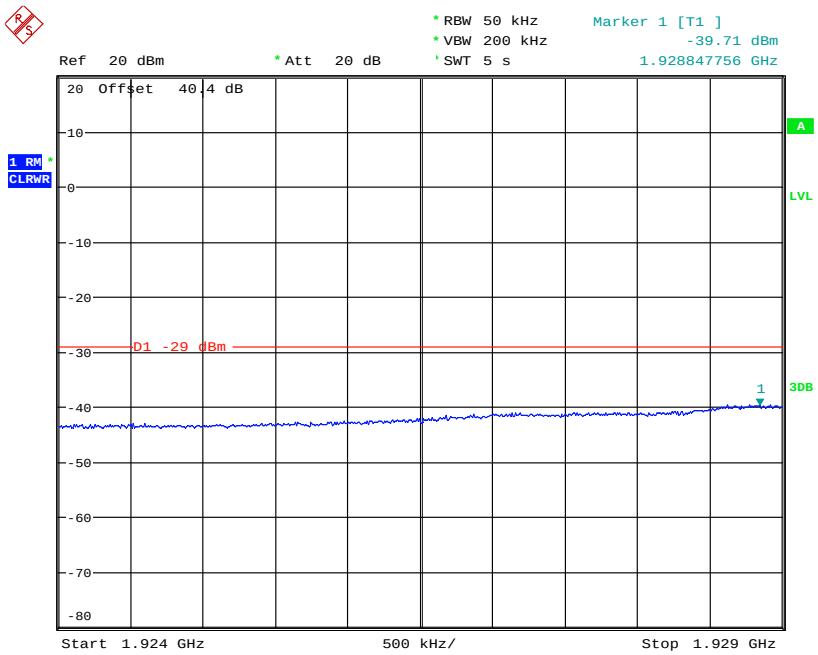


Date: 30.APR.2014 12:27:59

Channel Position B - QPSK / Bandwidth 15.0 MHz

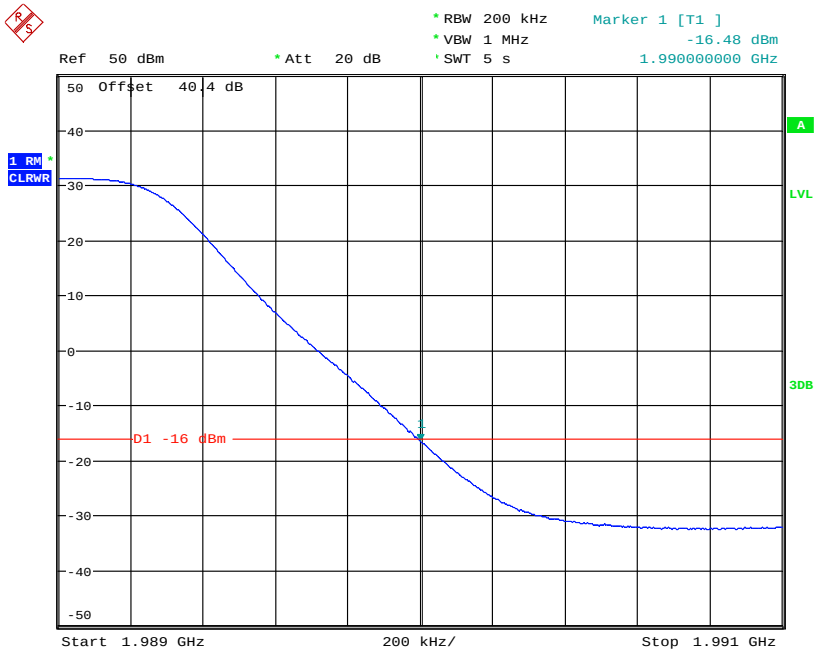


Date: 30.APR.2014 12:33:00

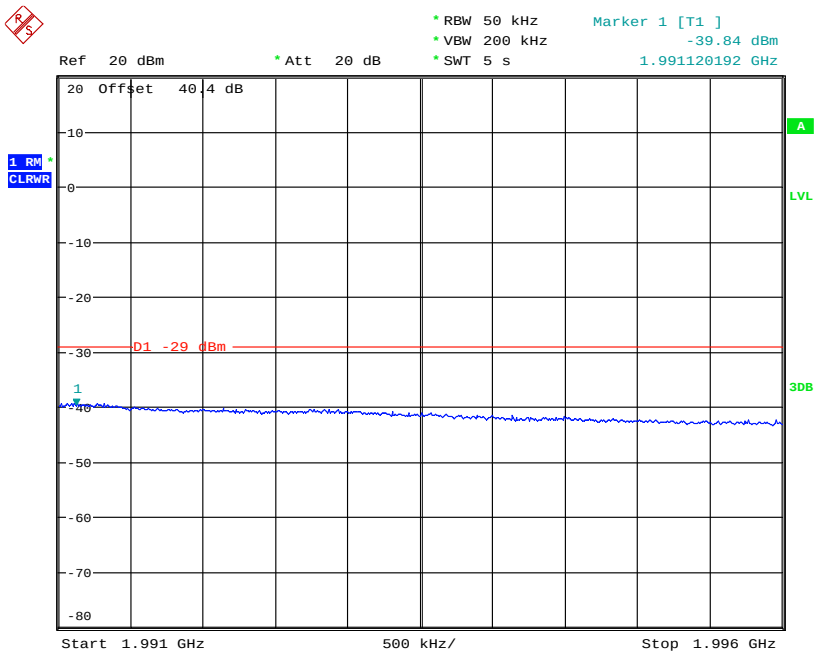


Date: 30.APR.2014 12:33:57

Channel Position T - QPSK / Bandwidth 15.0 MHz

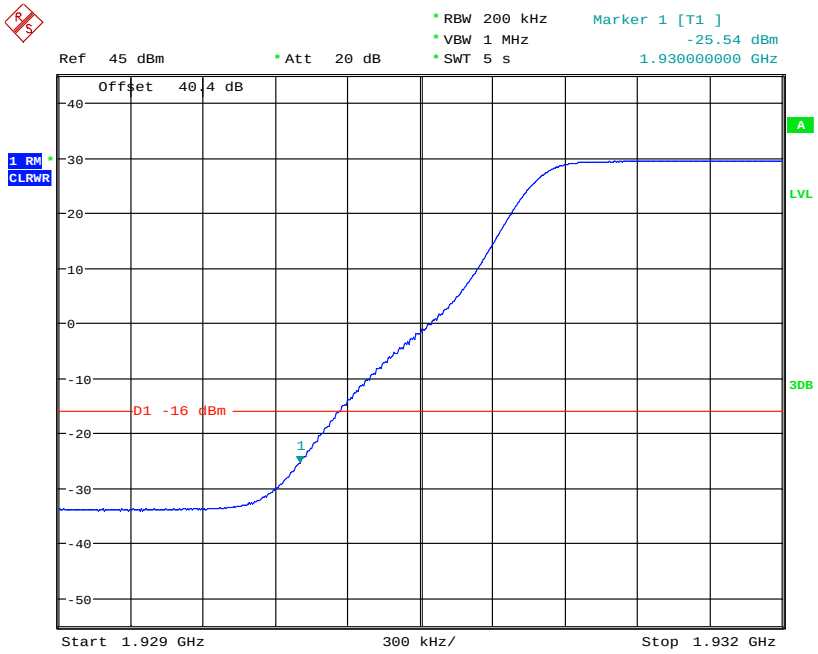


Date: 30.APR.2014 12:37:14

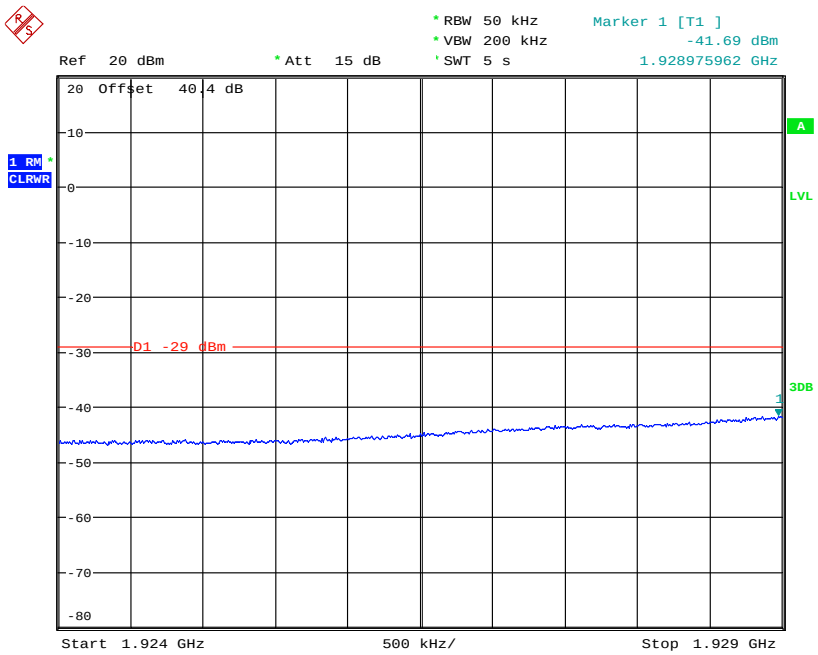


Date: 30.APR.2014 12:35:19

Channel Position B - QPSK / Bandwidth 20.0 MHz

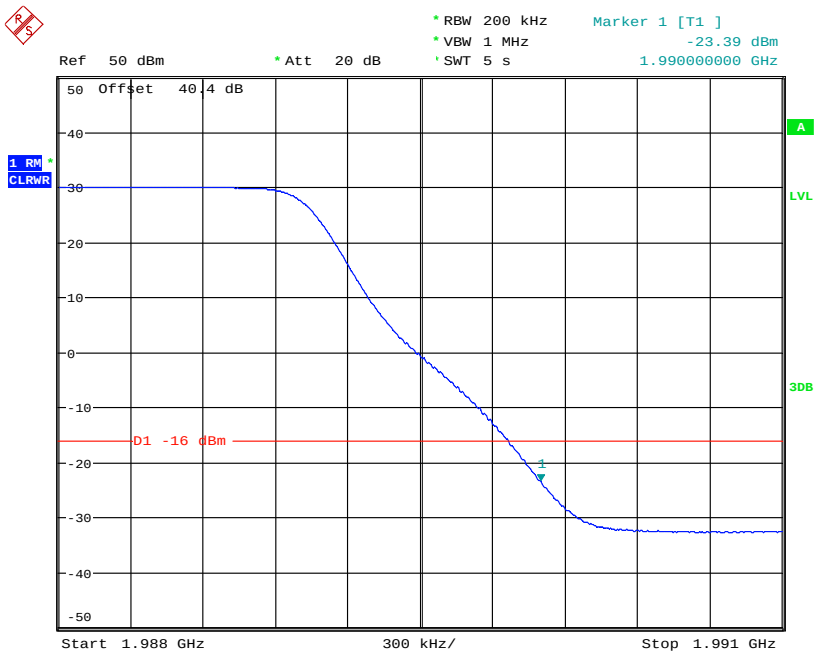


Date: 4.MAY.2014 04:06:39

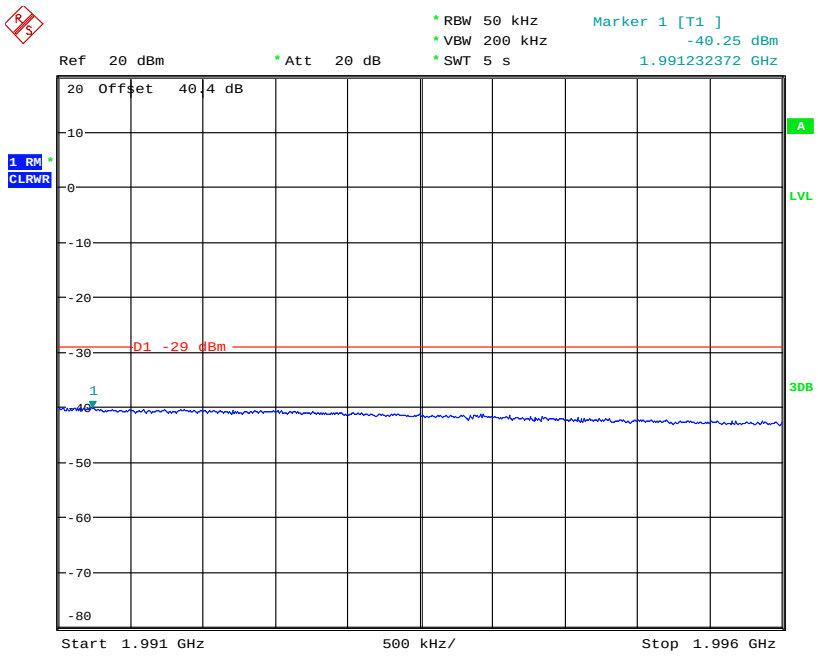


Date: 4.MAY.2014 04:07:31

Channel Position T - QPSK / Bandwidth 20.0 MHz



Date: 30.APR.2014 12:49:34



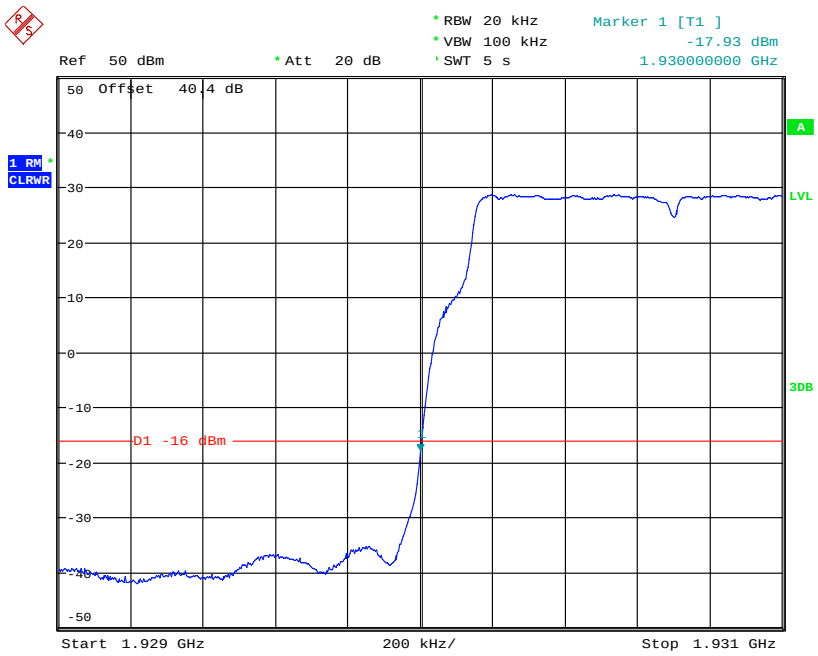
Date: 30.APR.2014 12:48:18

Configuration L-MIMO-MC 1 (2C)

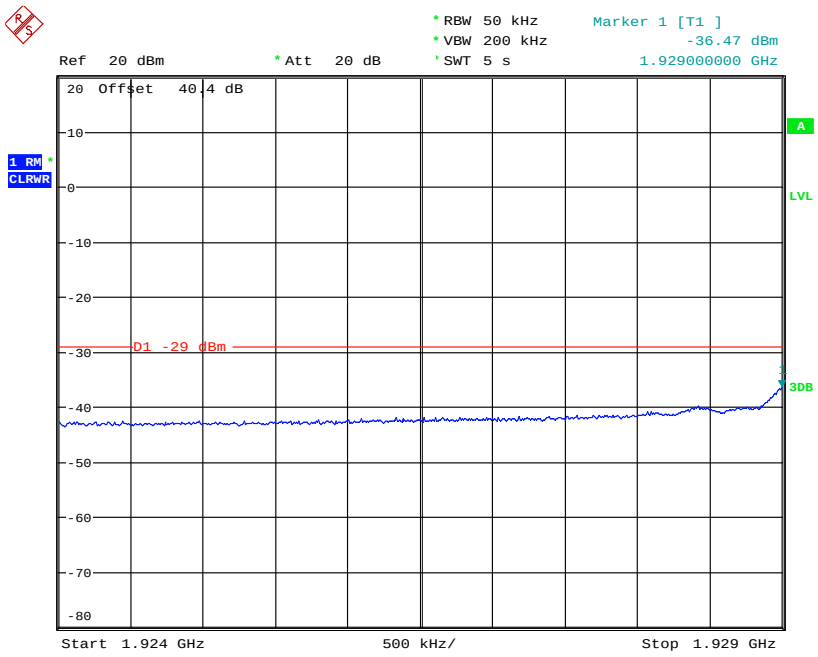
Maximum Output Power 45.8dBm per carrier

Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 1930.0 MHz	1.4 MHz	Port A1: 1930.7MHz + 1932.1MHz
	3.0 MHz	Port A1: 1931.5MHz + 1934.5MHz
	5.0 MHz	Port A1: 1932.5MHz + 1937.5MHz
	10.0 MHz	Port A1: 1935.0MHz + 1945.0MHz
	15.0 MHz	-
	20.0 MHz	-
Channel Position T 1990.0 MHz	1.4 MHz	Port A1: 1989.3MHz + 1987.9MHz
	3.0 MHz	Port A1: 1988.5MHz + 1985.5MHz
	5.0 MHz	Port A1: 1987.5MHz + 1982.5MHz
	10.0 MHz	Port A1: 1985.0MHz + 1975.0MHz
	15.0 MHz	-
	20.0 MHz	-

Channel Position B - QPSK / Bandwidth 1.4 MHz

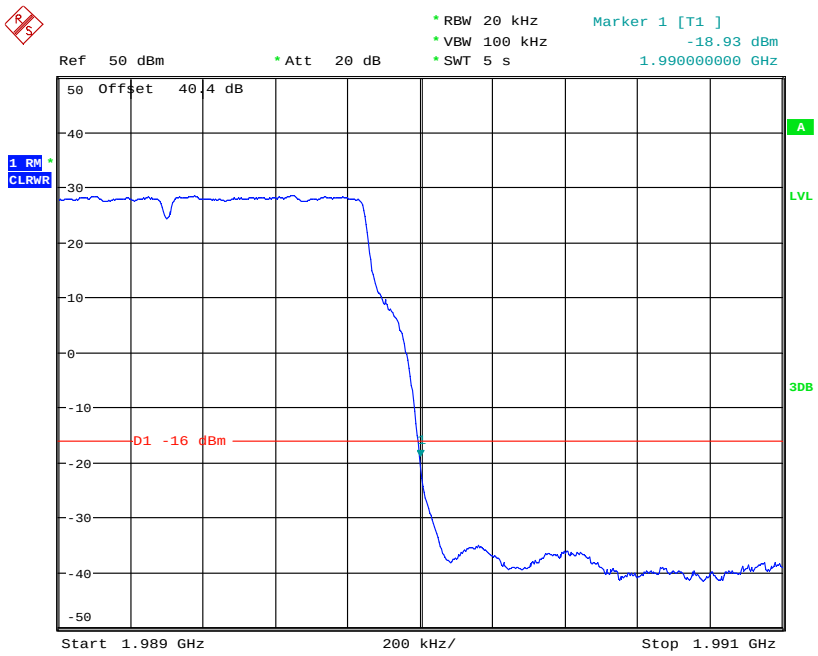


Date: 30.APR.2014 10:56:45

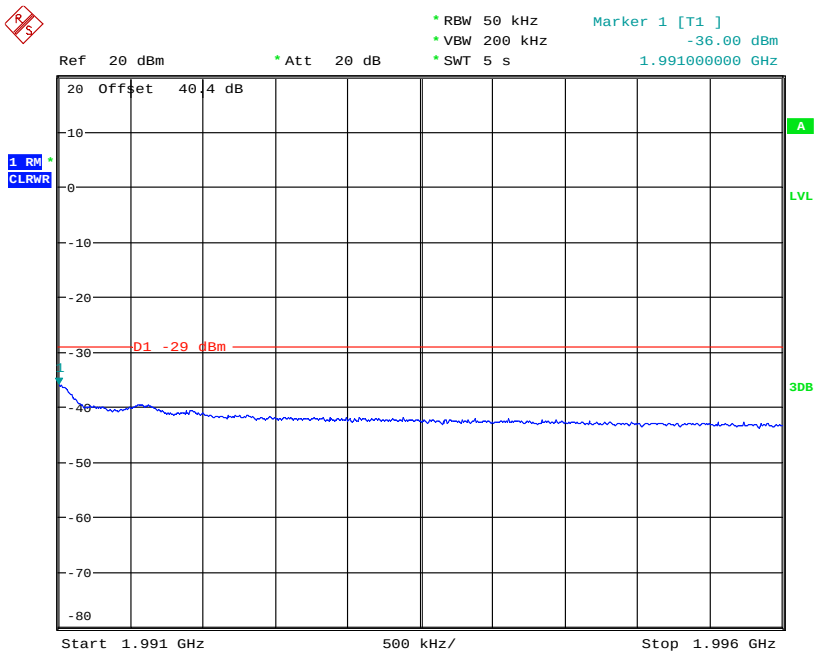


Date: 30.APR.2014 10:57:38

Channel Position T - QPSK / Bandwidth 1.4 MHz

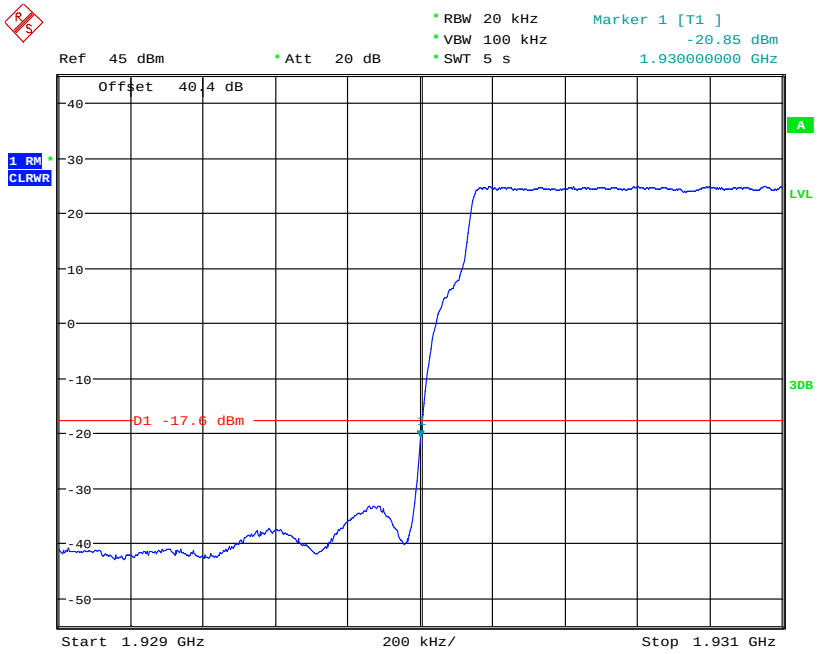


Date: 30.APR.2014 11:01:27



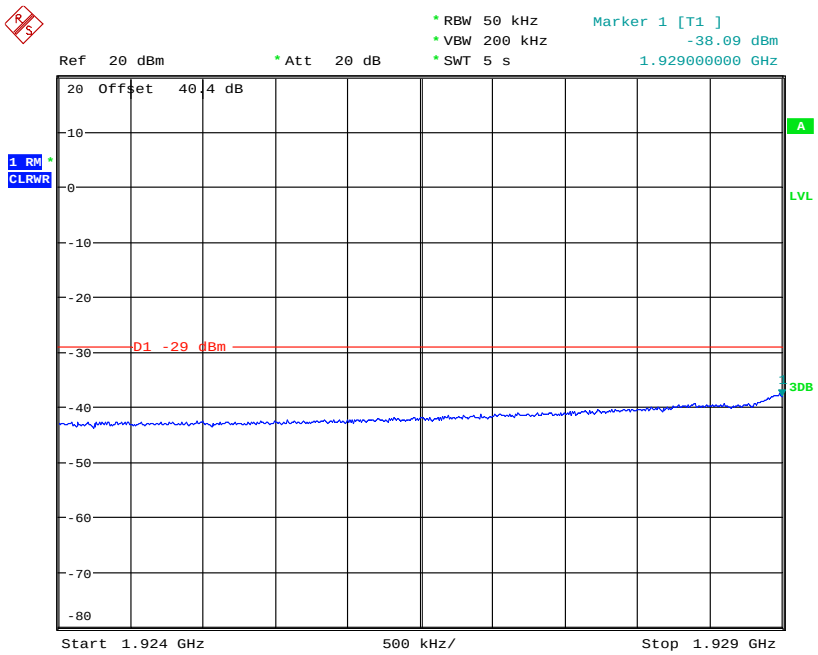
Date: 30.APR.2014 11:00:03

Channel Position B - QPSK / Bandwidth 3.0 MHz



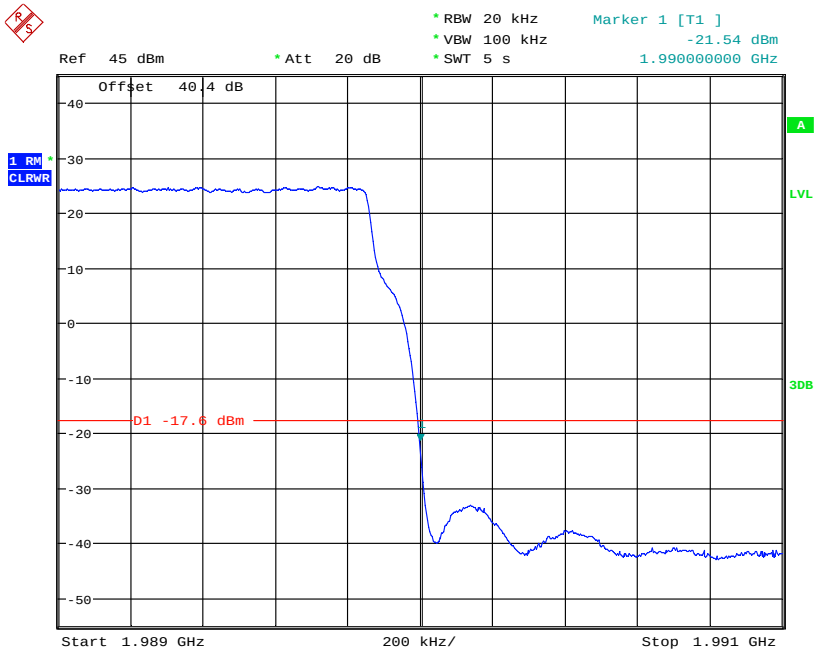
Date: 30.APR.2014 11:09:19

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.



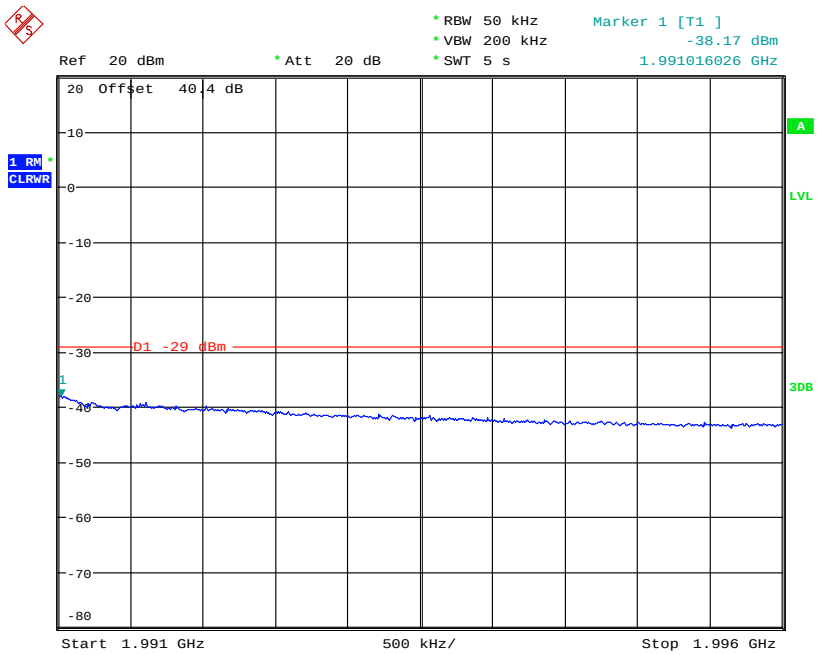
Date: 30.APR.2014 11:10:00

Channel Position T - QPSK / Bandwidth 3.0 MHz



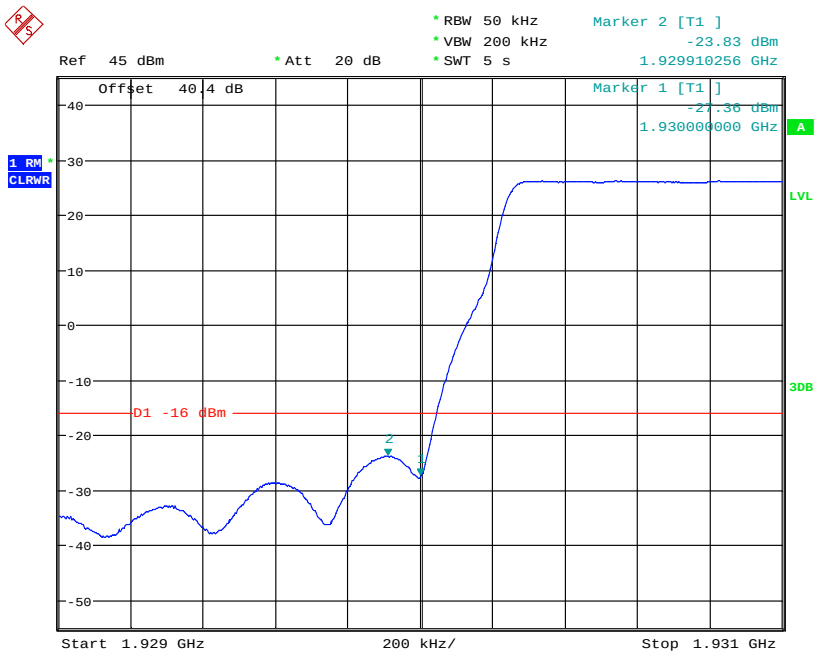
Date: 30.APR.2014 11:12:10

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.

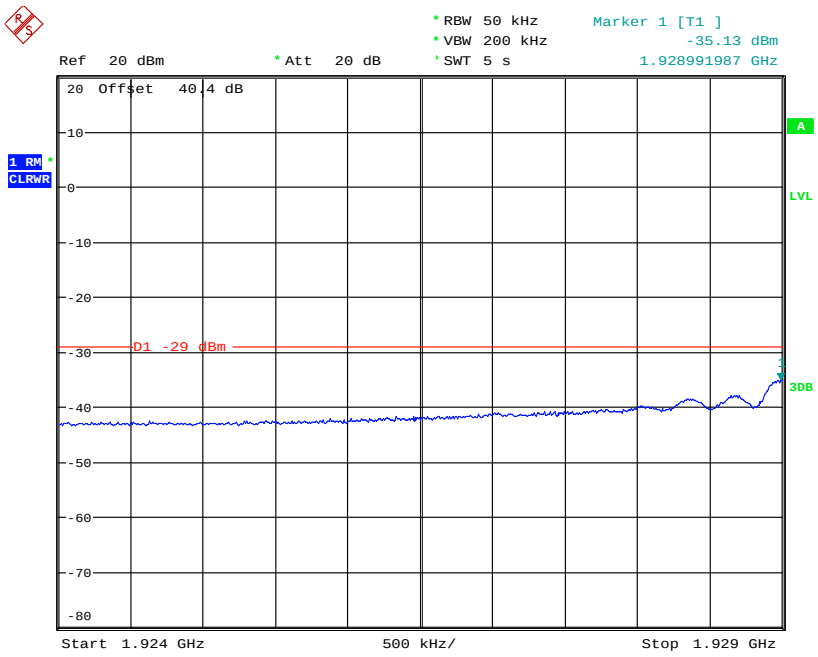


Date: 30.APR.2014 11:11:21

Channel Position B - QPSK / Bandwidth 5.0 MHz

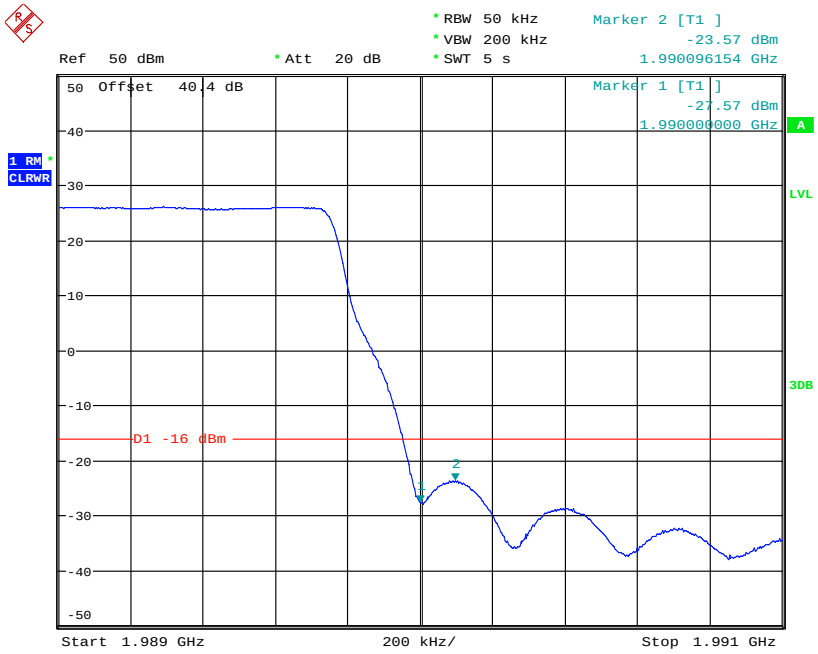


Date: 30.APR.2014 11:16:20

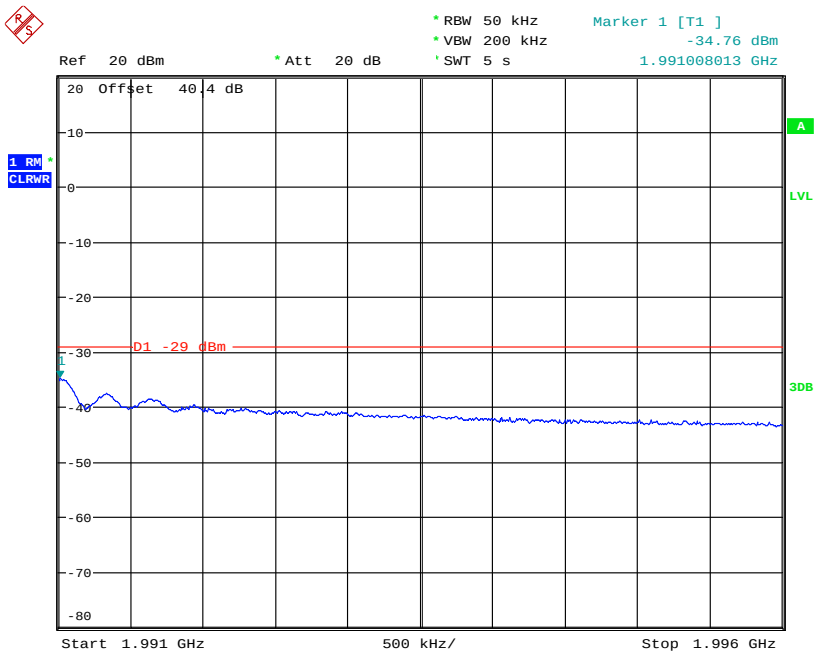


Date: 30.APR.2014 11:17:22

Channel Position T - QPSK / Bandwidth 5.0 MHz

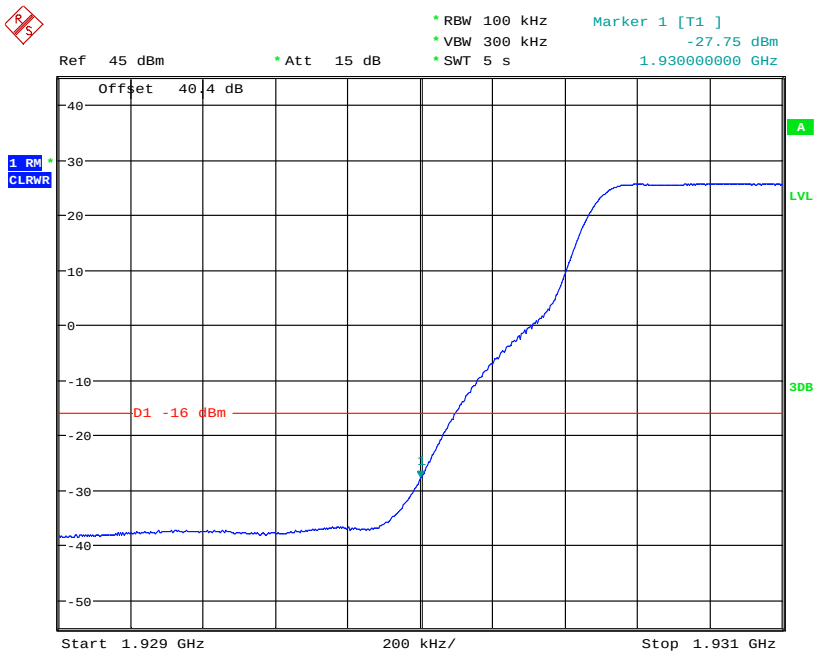


Date: 30.APR.2014 11:20:44

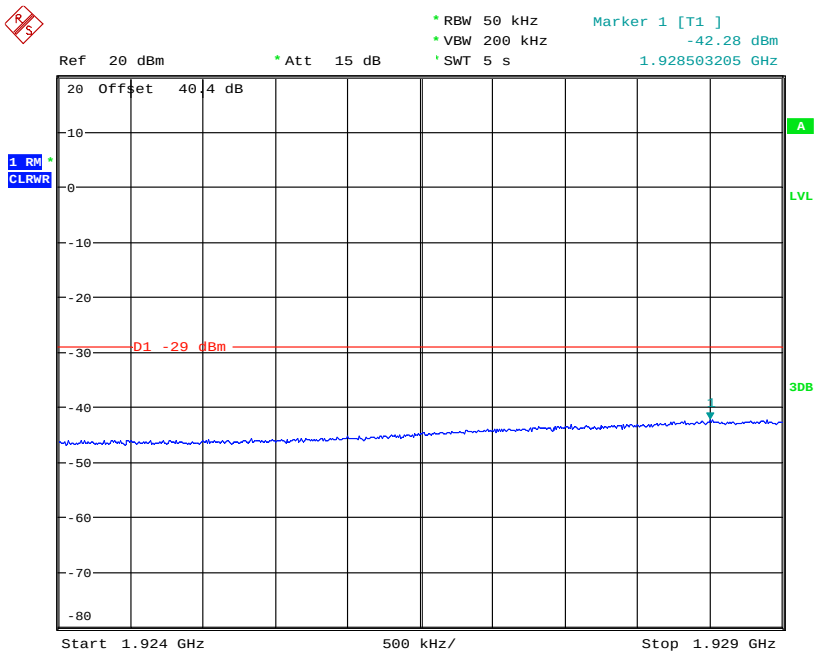


Date: 30.APR.2014 11:21:38

Channel Position B - QPSK / Bandwidth 10.0 MHz

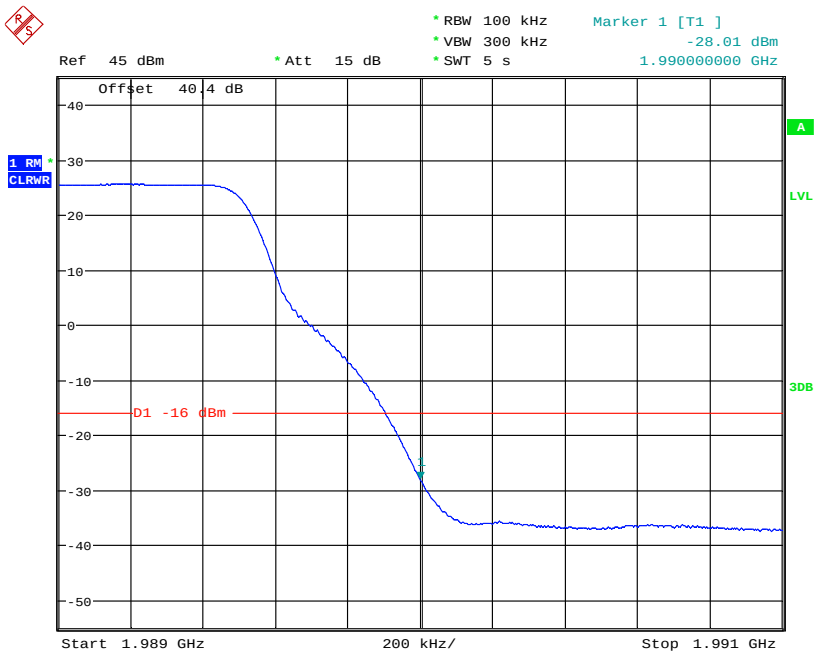


Date: 30.APR.2014 11:25:11

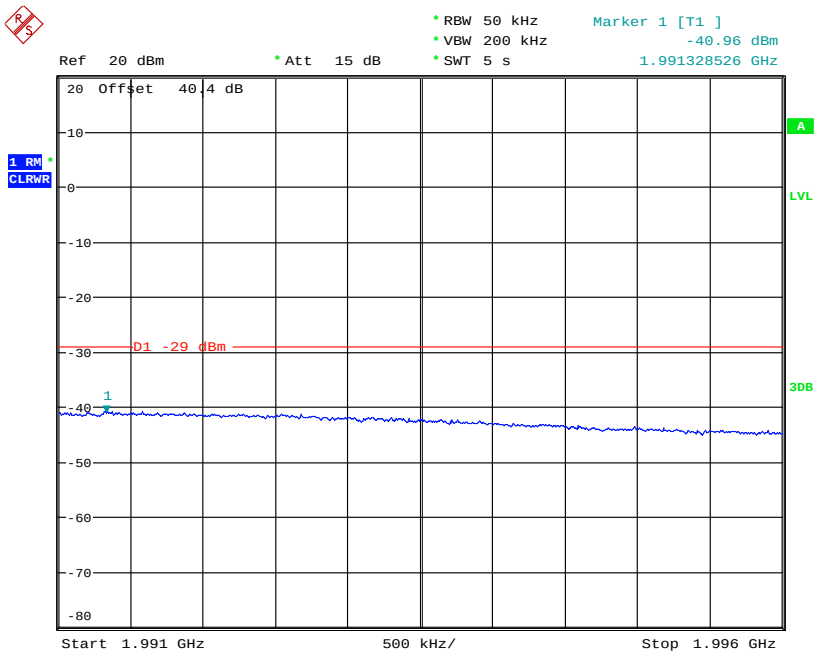


Date: 30.APR.2014 11:23:56

Channel Position T - QPSK / Bandwidth 10.0 MHz



Date: 30.APR.2014 11:27:35



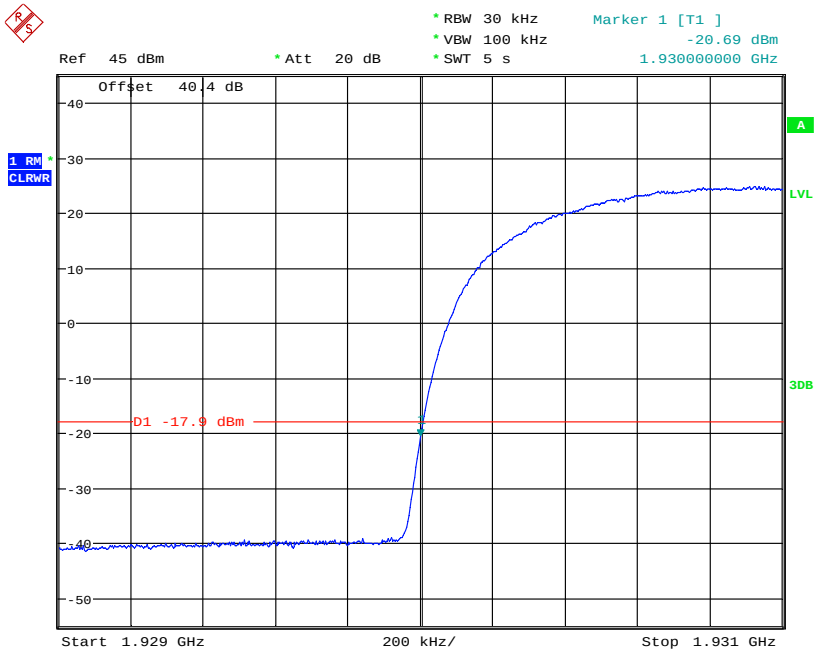
Date: 30.APR.2014 11:28:16

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

Maximum Output Power 44.8dBm per carrier

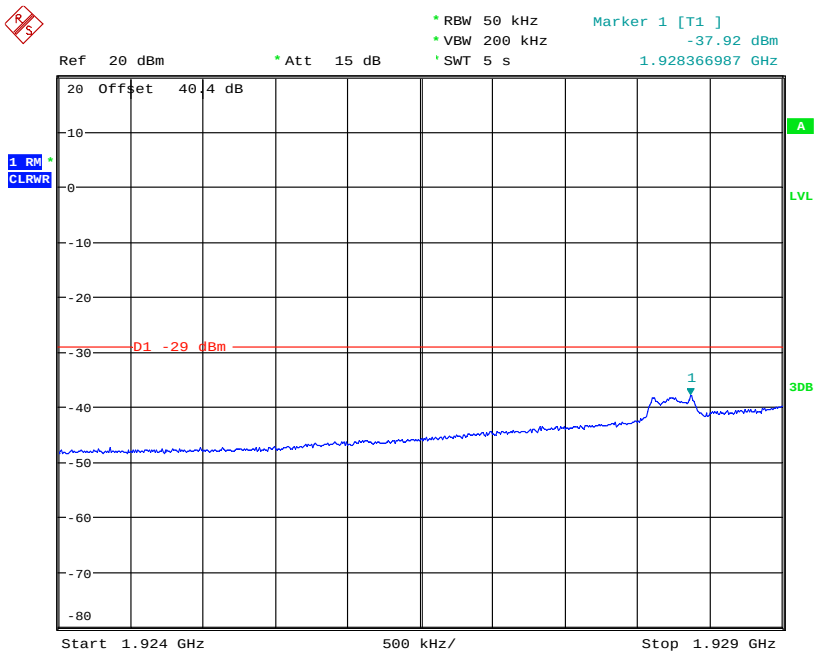
Band Edge Frequency	Edge Test with modulation (W) 16QAM + (G) GMSK Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A1: (W) 1932.4MHz + (G) 1935.2MHz Port A2: (W) 1932.4MHz + (G) 1935.8MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A1: (W) 1987.6MHz + (G) 1984.8MHz Port A2: (W) 1987.6MHz + (G) 1984.2MHz

Channel Position B_{RFBW} - WCDMA 16QAM / GSM GMSK



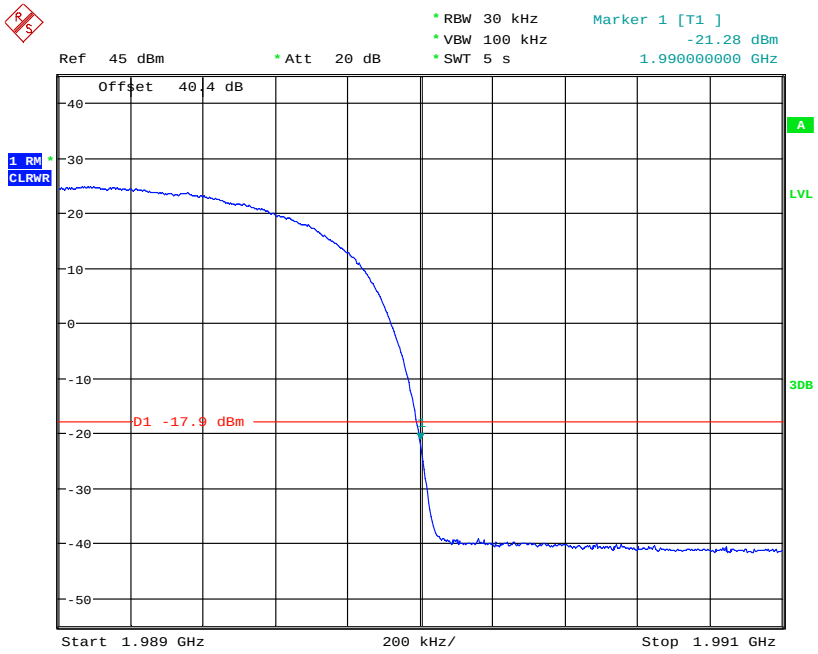
Date: 4.MAY.2014 08:47:10

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



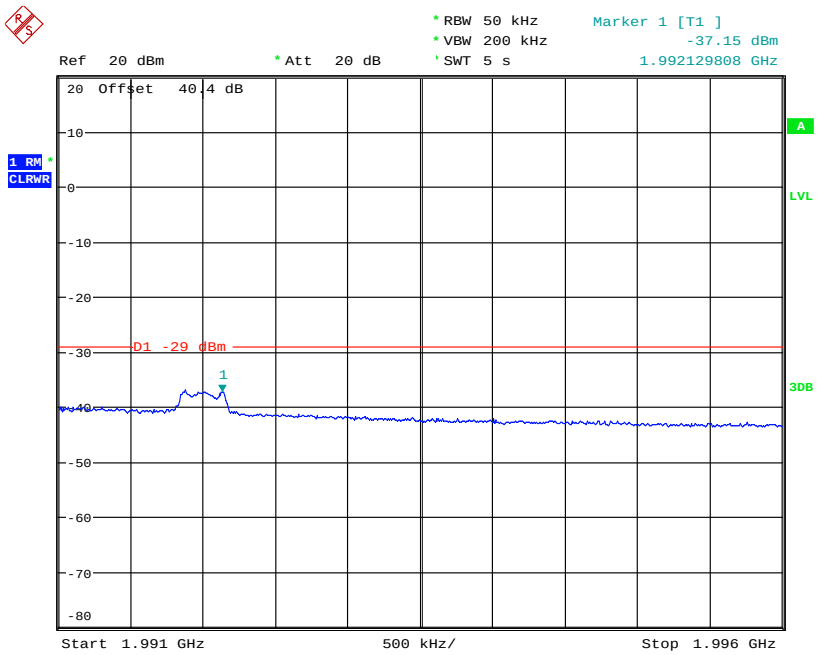
Date: 4.MAY.2014 08:48:47

Channel Position T_{RFBW} - WCDMA 16QAM / GSM GMSK



Date: 4.MAY.2014 08:53:32

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



Date: 4.MAY.2014 08:52:15

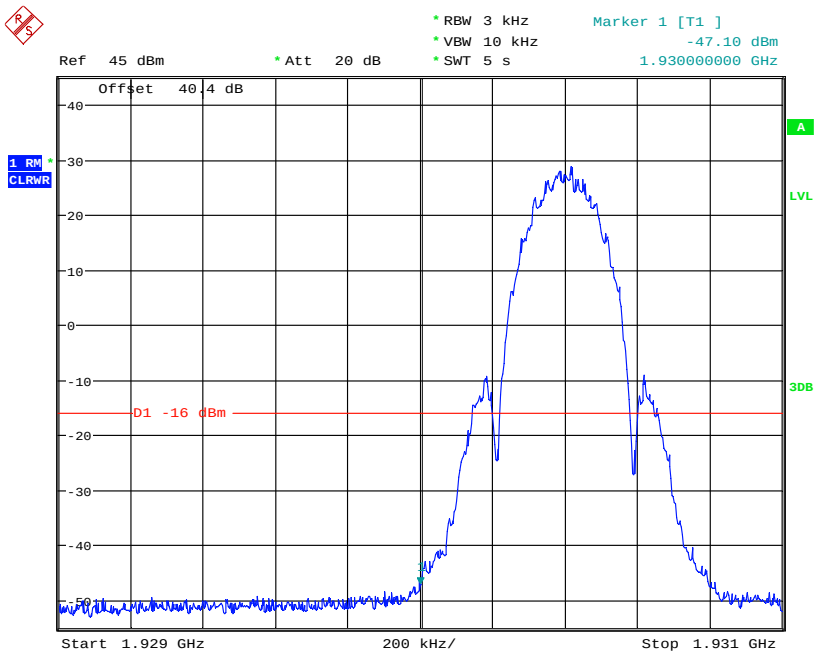
Configuration G+W-MIMO-MC 3 (2G + 1W)

Maximum Output Power 43.8dBm per carrier

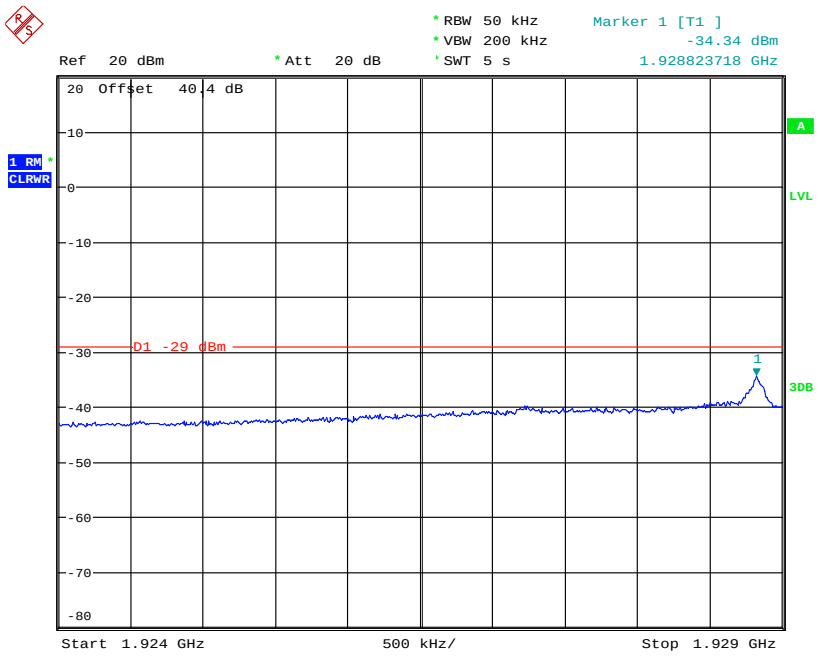
Band Edge Frequency	Edge Test with modulation (G) 16QAM + (W) 16QAM Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A1: (G) 1930.4MHz* + (G) 1932.0MHz + (W) 1935.4MHz Port A2: (G) 1931.0MHz + (G) 1932.6MHz + (W) 1935.4MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A1: (G) 1989.6MHz* + (G) 1988.0MHz + (W) 1984.6MHz Port A2: (G) 1989.0MHz + (G) 1987.4MHz + (W) 1984.6MHz

Note*: For GSM, 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.

Channel Position B_{RFBW} - GSM 16QAM / WCDMA 16QAM

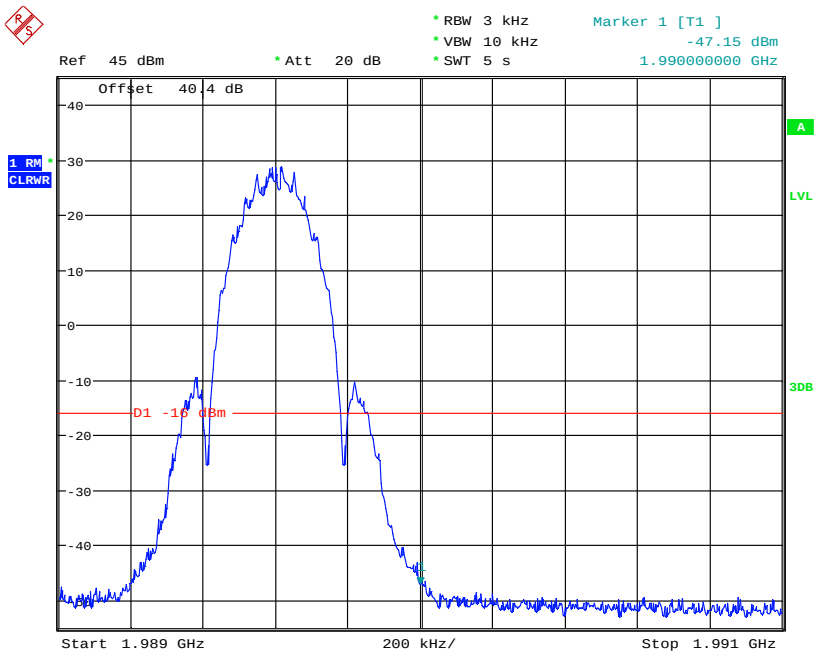


Date: 4.MAY.2014 09:06:49

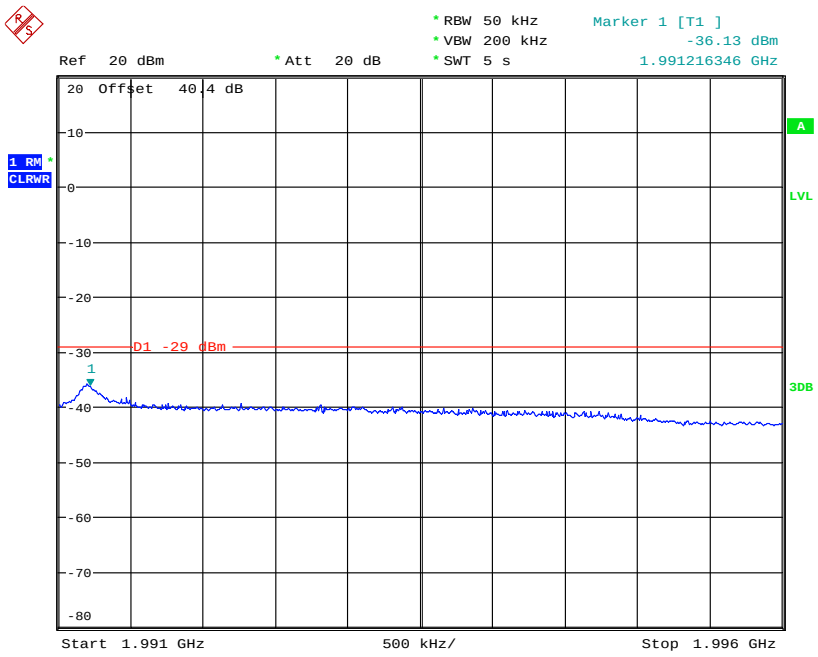


Date: 4.MAY.2014 09:07:51

Channel Position T_{RFBW} - GSM 16QAM / WCDMA 16QAM



Date: 4.MAY.2014 09:17:31



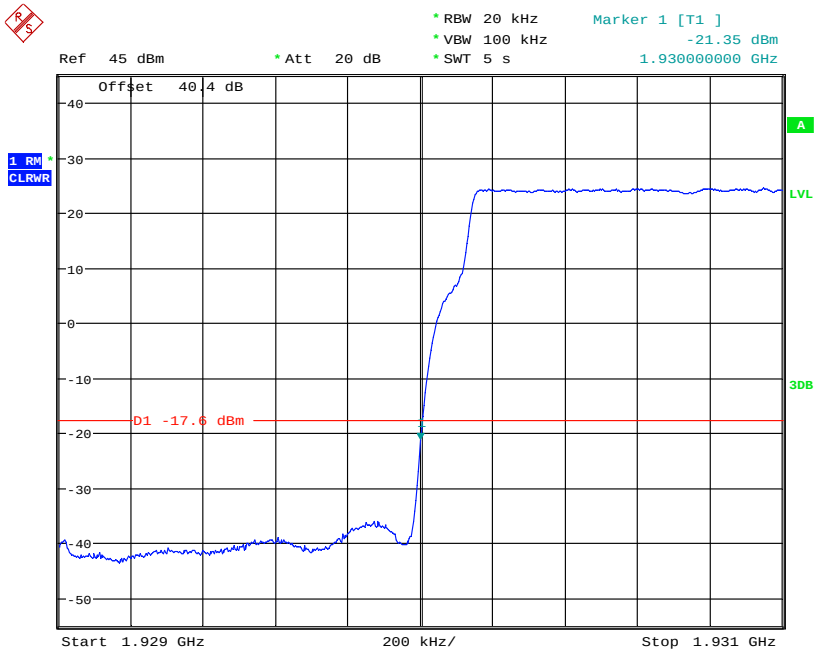
Date: 4.MAY.2014 09:12:06

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

Maximum Output Power 44.4dBm per carrier

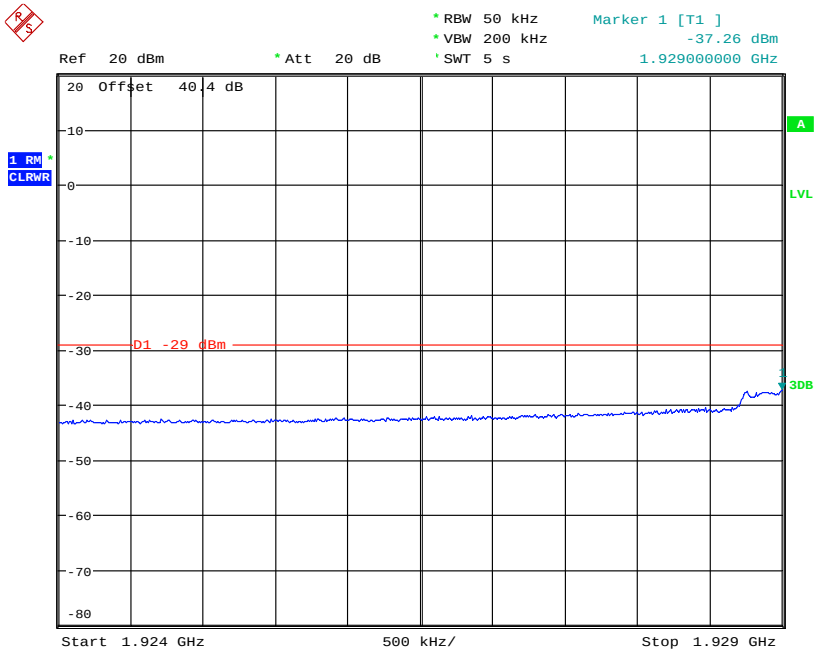
Band Edge Frequency	Edge Test with modulation (L) QPSK / 3.0MHz Bandwidth + (G) GMSK Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A1: (L) 1931.5MHz + (G) 1933.2MHz Port A2: (L) 1931.5MHz + (G) 1933.8MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A1: (L) 1988.5MHz + (G) 1986.8MHz Port A2: (L) 1988.5MHz + (G) 1986.2MHz

Channel Position B_{RFBW} - LTE QPSK: Bandwidth 3.0MHz / GSM GMSK



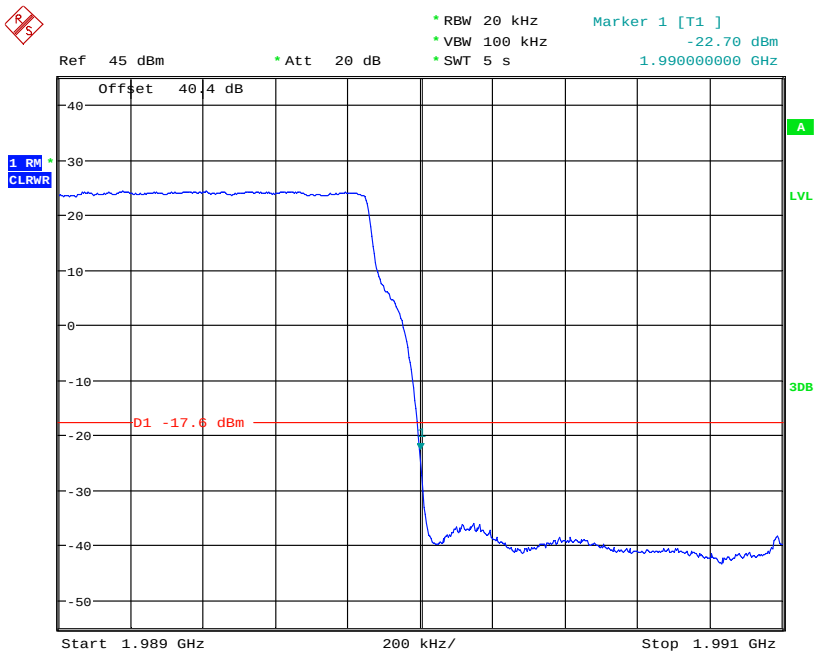
Date: 4.MAY.2014 11:11:18

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.



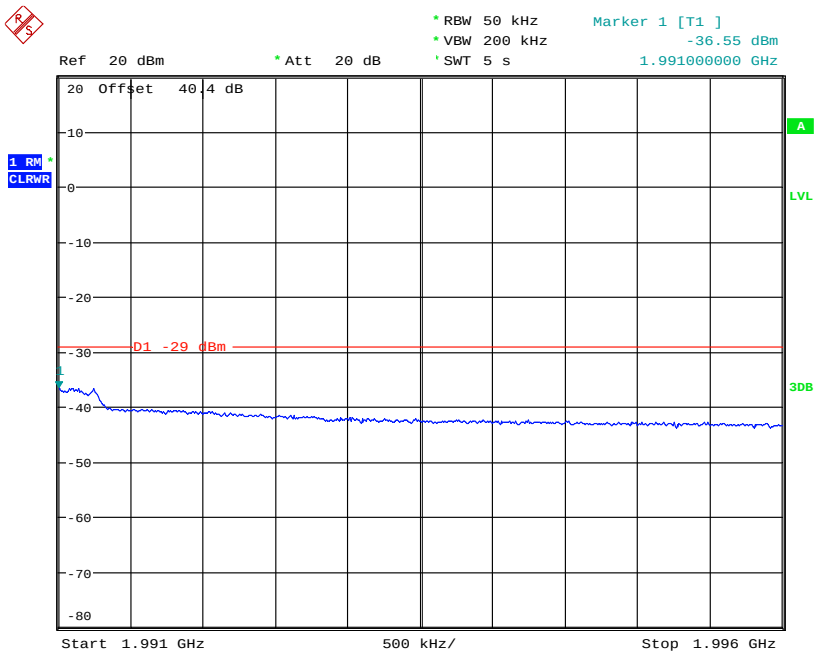
Date: 4.MAY.2014 11:12:00

Channel Position T_{RFBW} - LTE QPSK: Bandwidth 3.0MHz / GSM GMSK



Date: 4.MAY.2014 11:40:41

Note: A resolution bandwidth of 20kHz was used. 20kHz is <1% of the Emission Bandwidth of LTE (2.9MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.6dBm.



Date: 4.MAY.2014 11:39:22

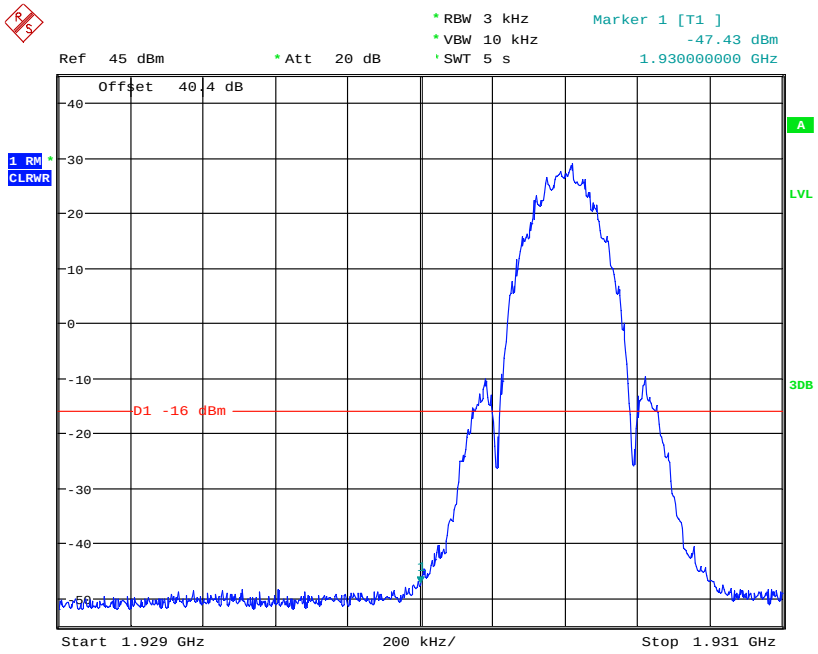
Configuration G+L-MIMO-MC 3 (2G + 1L)

Maximum Output Power 43.3dBm per carrier

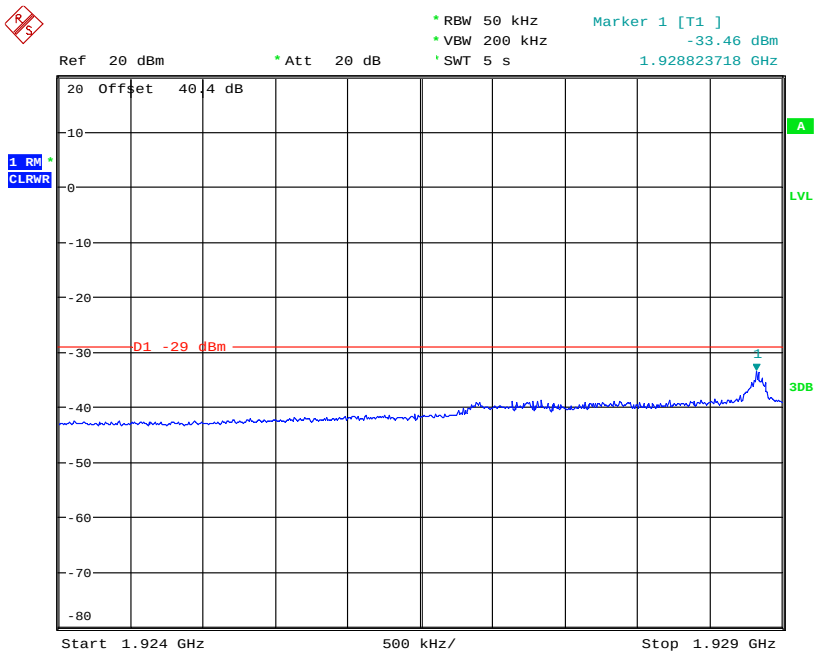
Band Edge Frequency	Edge Test with modulation (G) 16QAM + (L) QPSK / 3.0MHz Bandwidth Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A1: (G) 1930.4MHz* + (G) 1932.0MHz + (L) 1934.3MHz Port A2: (G) 1931.0MHz + (G) 1932.6MHz + (L) 1934.3MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A1: (G) 1989.6MHz* + (G) 1988.0MHz + (L) 1985.7MHz Port A2: (G) 1989.0MHz + (G) 1987.4MHz + (L) 1985.7MHz

Note*: For GSM, 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.

Channel Position B_{RFBW} - GSM 16QAM / LTE QPSK: Bandwidth 3.0MHz

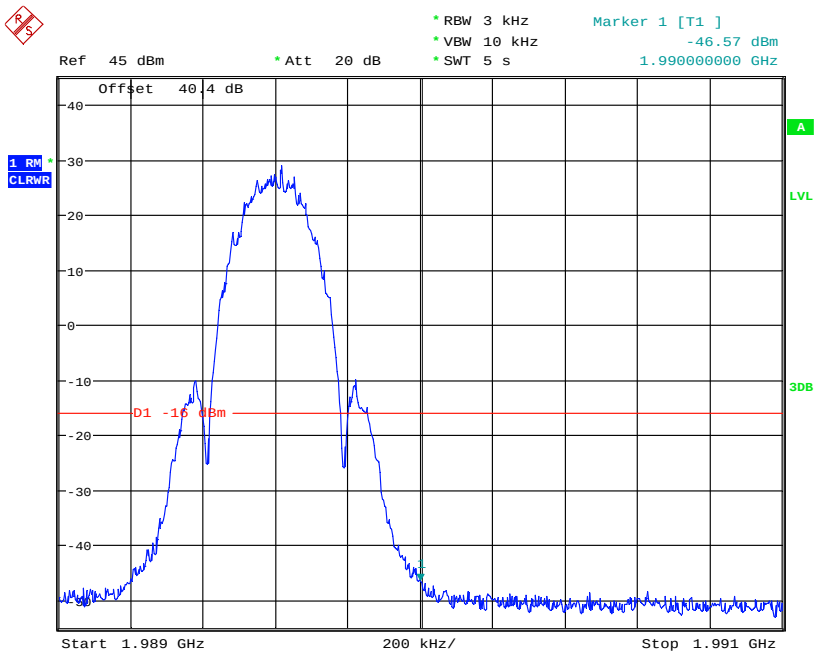


Date: 5.MAY.2014 04:13:27

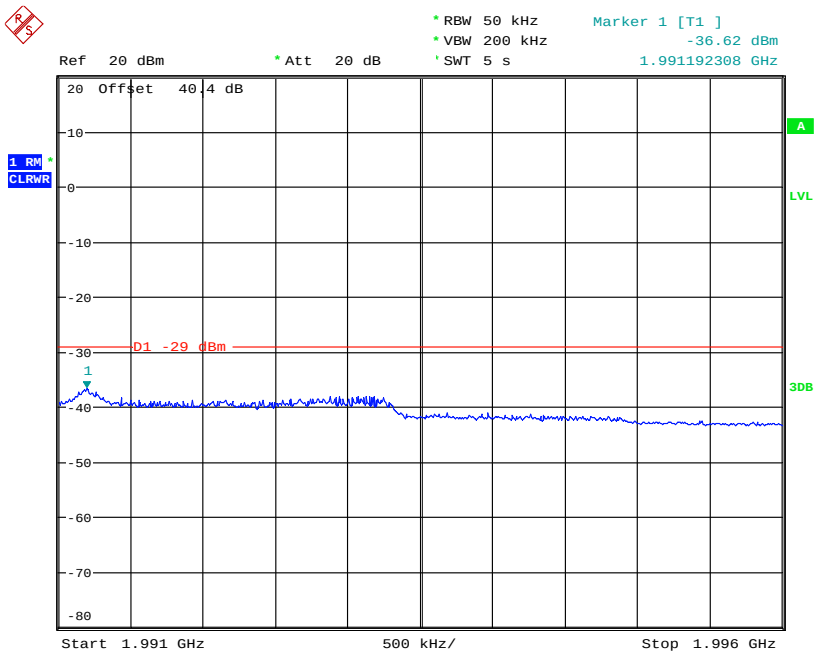


Date: 5.MAY.2014 04:14:11

Channel Position T_{RFBW} - GSM 16QAM / LTE QPSK: Bandwidth 3.0MHz



Date: 5.MAY.2014 04:27:03



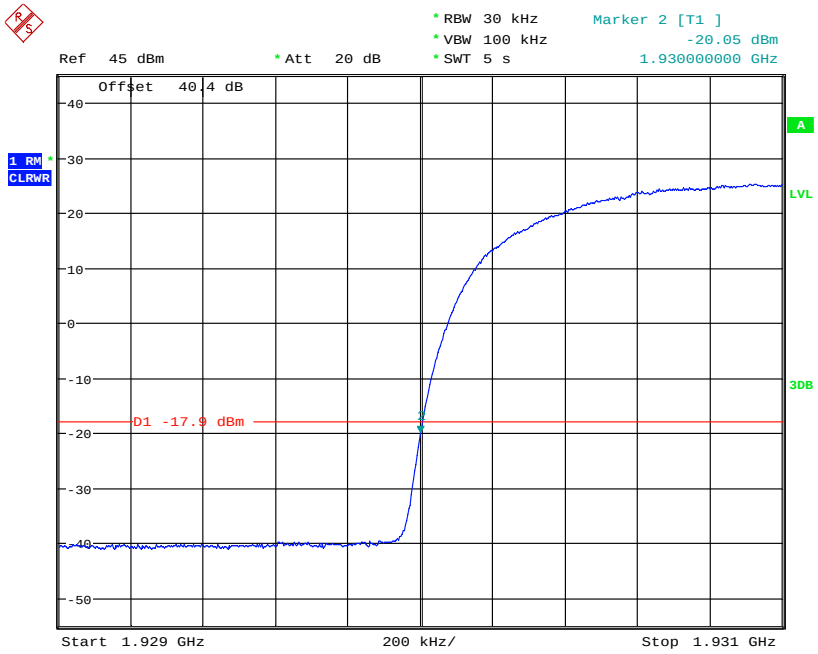
Date: 5.MAY.2014 04:27:55

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

Maximum Output Power 45.7dBm per carrier

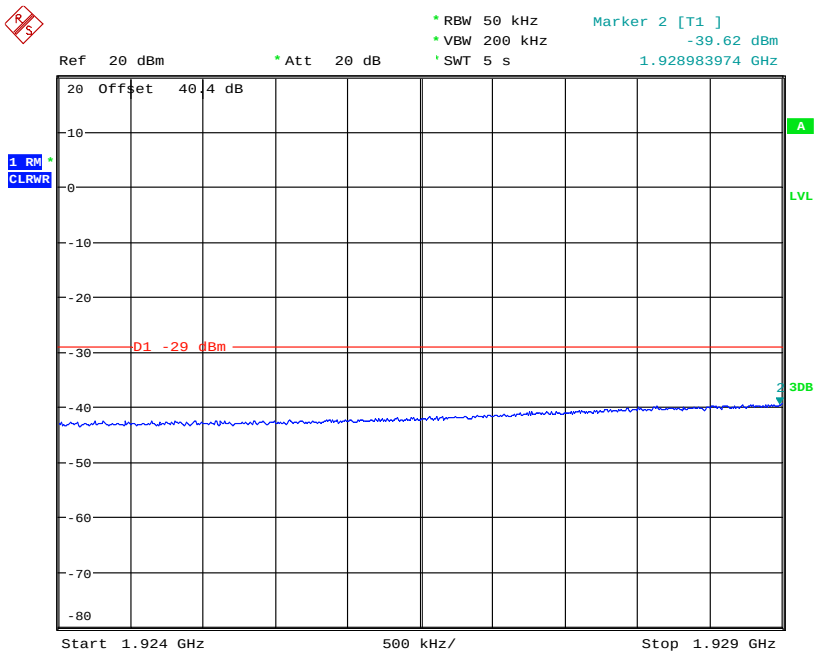
Band Edge Frequency	Edge Test with modulation (W) 16QAM + (L) QPSK / 3.0MHz Bandwidth Channel Frequencies
Channel Position B_{RFBW} 1930.0 MHz	Port A1: (W) 1932.4MHz + (L) 1936.5MHz Port A2: (W) 1932.4MHz + (L) 1936.5MHz
Channel Position T_{RFBW} 1990.0 MHz	Port A1: (W) 1987.6MHz + (L) 1983.5MHz Port A2: (W) 1987.6MHz + (L) 1983.5MHz

Channel Position B_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 3.0MHz



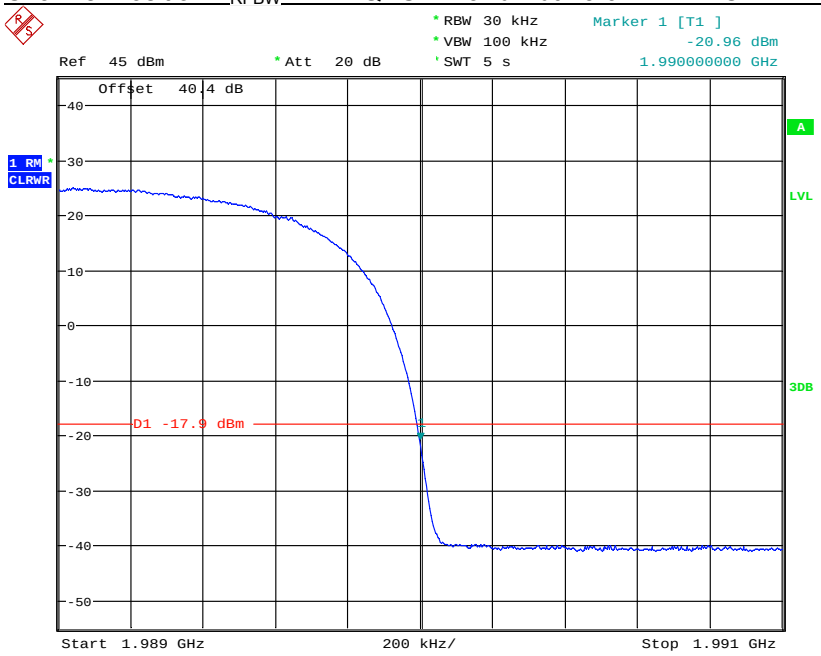
Date: 5.MAY.2014 08:08:39

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



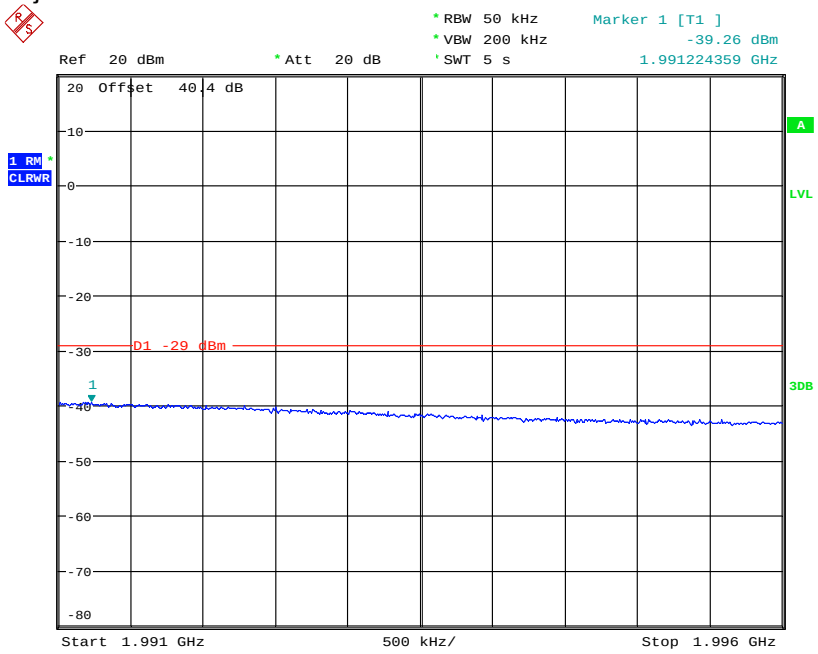
Date: 5.MAY.2014 08:09:36

Channel Position T_{RFBW} - LTE QPSK: Bandwidth 3.0MHz / WCDMA 16QAM



Date: 5.MAY.2014 09:08:03

Note: A resolution bandwidth of 30kHz was used. 30kHz is <1% of the Emission Bandwidth of WCDMA (4.7MHz), to compensate for the reduced measurement bandwidth, the limit was adjusted from -16dBm to -17.9dBm.



Date: 5.MAY.2014 09:08:43

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 6.5.1

2.4.2 Equipment Under Test

RUS 02 B2, KRC 161 298/1, S/N: CB4S640603, CB4S640592

2.4.3 Date of Test and Modification State

06 to 09 May 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	22.5 – 23.5°C
Relative Humidity	45.5 – 50.4%

2.4.6 Test Method

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 does not 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:

$E_{(v/m)}=(30 \times 1.64 \times 13.96)^{0.5} / 3 = 8.74V/m = 138.83dB\mu V/m$

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

43 + 10log(13.96) = 54.45dB

Therefore the limit at 3m measurement distance is:

138.83 - 54.45 = 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 G-SC

Maximum Output Power 47.8dBm per carrier

Channel Position M	1960.0MHz

Channel Position M - GMSK - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

Configuration W-SC

Maximum Output Power 49.0dBm per carrier

Channel Position M	1960.0MHz

Channel Position M - QPSK - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

Configuration W-MIMO-SC

Maximum Output Power 47.0dBm per carrier

Channel Position M	Port A1: 1960.0MHz
	Port A2: 1960.0MHz

Channel Position M - 16QAM - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

Configuration L-MIMO-SC

Maximum Output Power 49.0dBm per carrier

Channel Position	Channel Frequencies
Channel Position B	Port A1: 1930.7MHz
	Port A2: 1930.7MHz
Channel Position M	Port A1: 1960.0MHz
	Port A2: 1960.0MHz
Channel Position T	Port A1: 1989.3MHz
	Port A2: 1989.3MHz

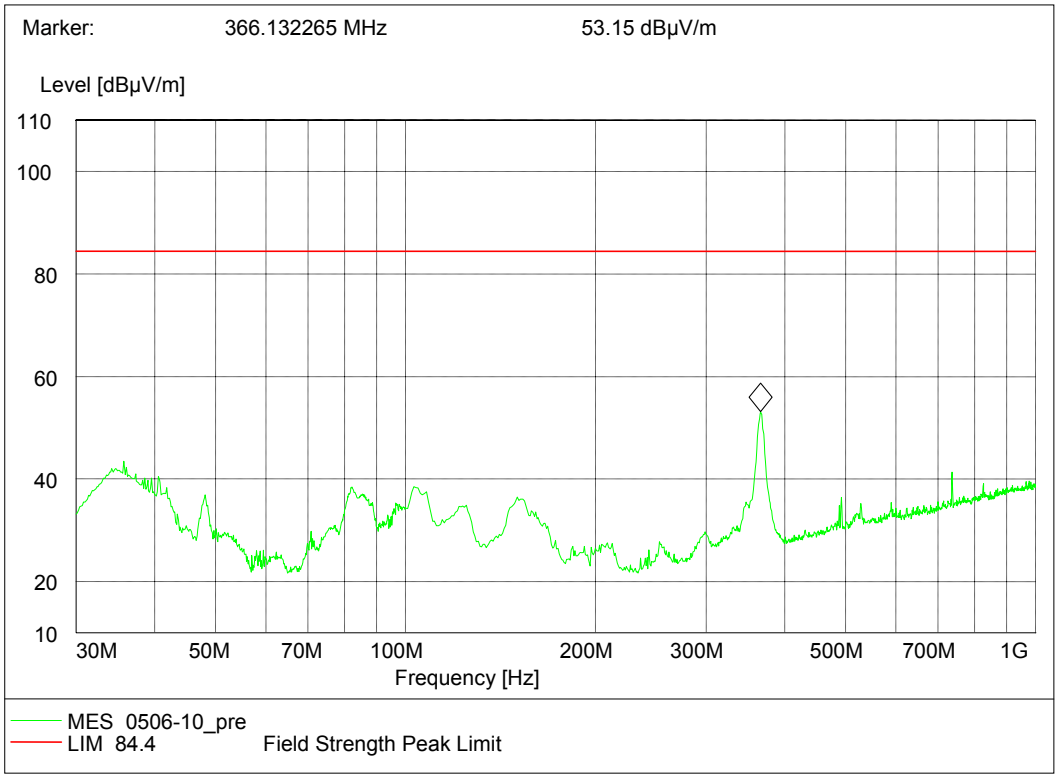
Channel Position B - LTE QPSK: Bandwidth 1.4MHz - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

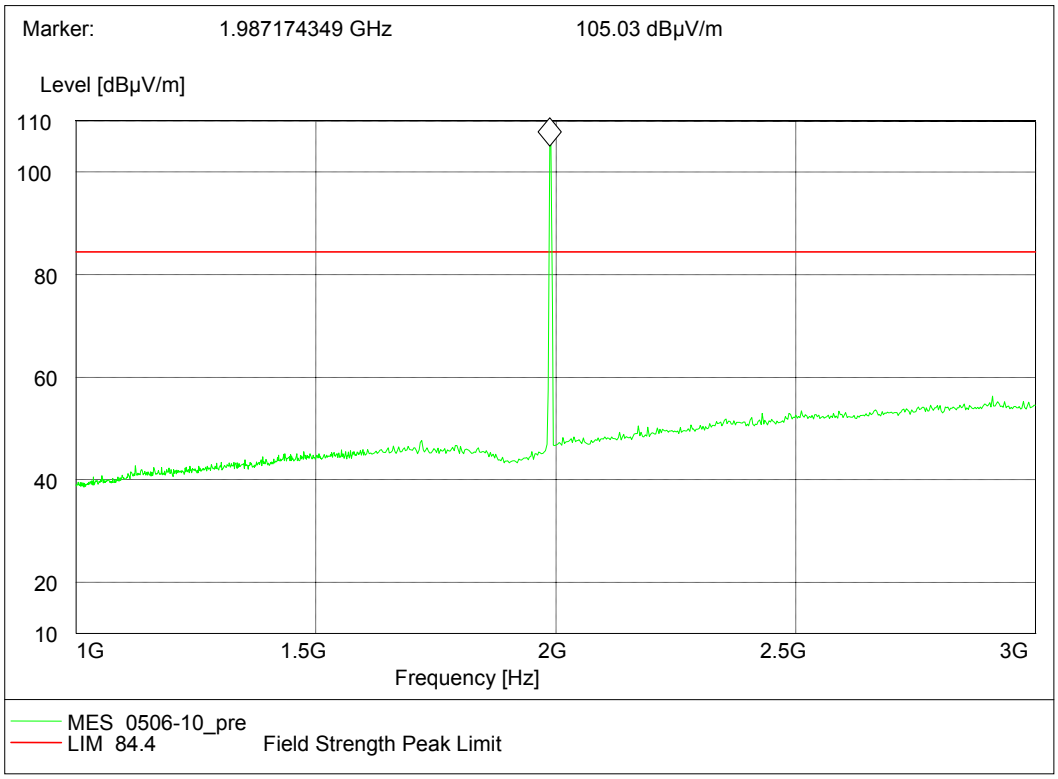
Channel Position M - LTE QPSK: Bandwidth 1.4MHz - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

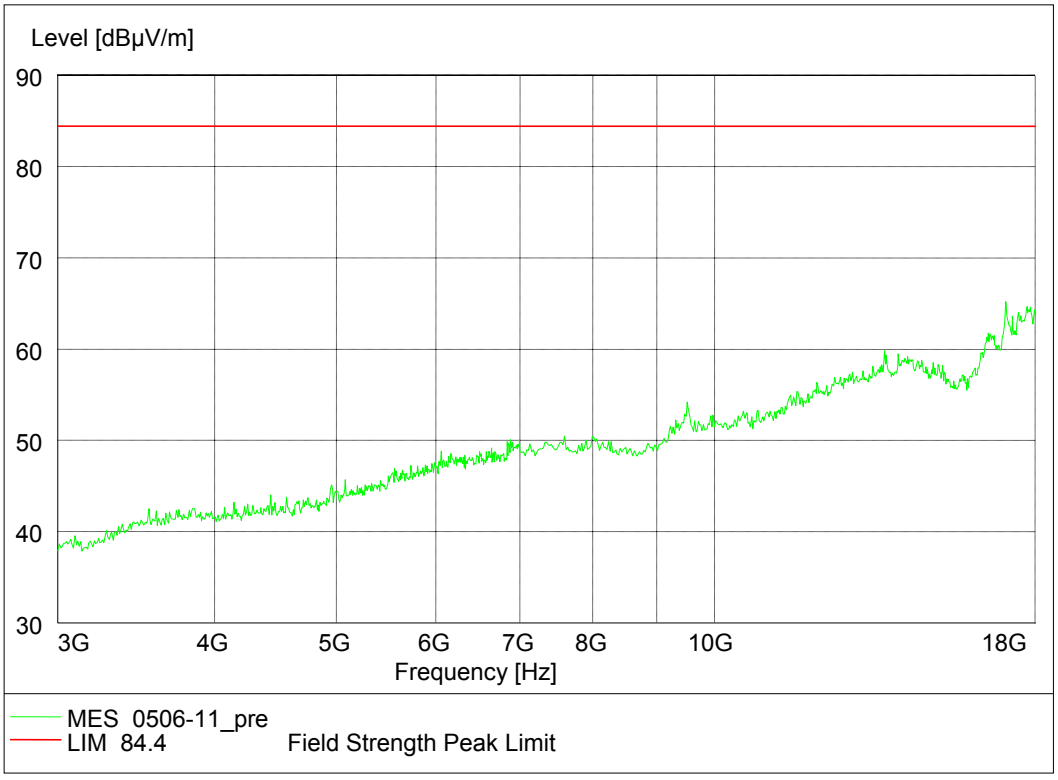
Channel Position T - LTE QPSK: Bandwidth 1.4MHz - 30MHz - 1GHz



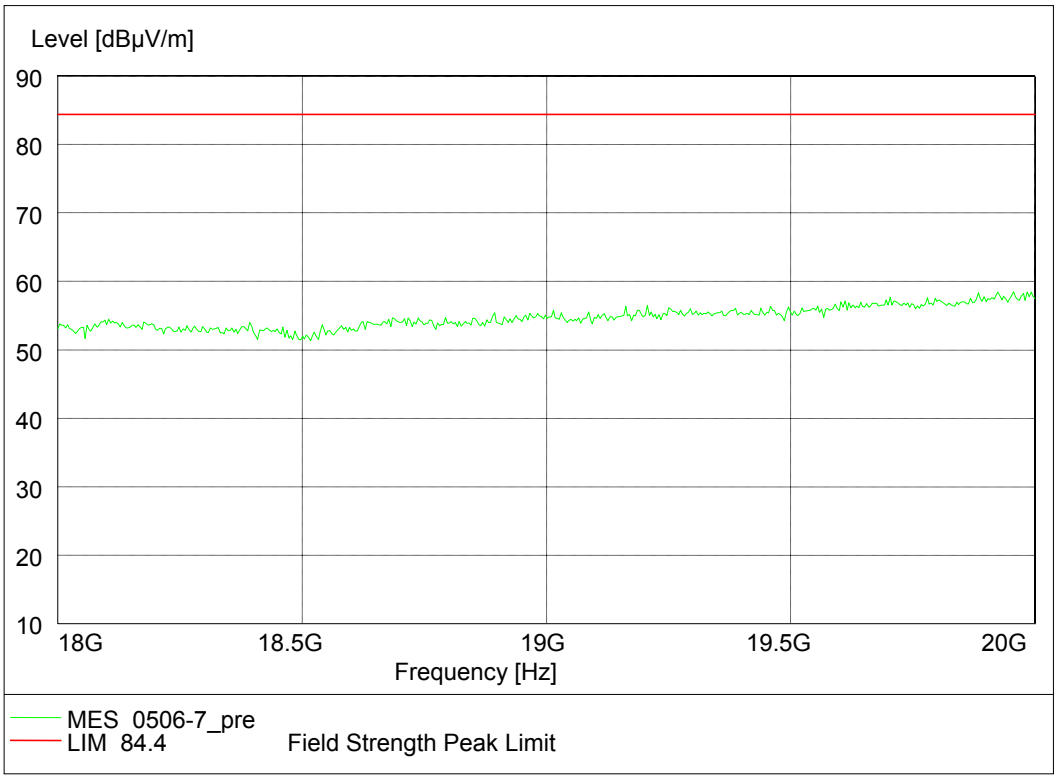
Channel Position T - LTE QPSK: Bandwidth 1.4MHz - 1GHz - 3GHz



Channel Position T - LTE QPSK: Bandwidth 1.4MHz - 3GHz -18GHz



Channel Position T - LTE QPSK: Bandwidth 1.4MHz - 18GHz -20GHz



Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 45.8dBm per carrier

Channel Position M	Port A1: 1940.7MHz + 1979.3MHz
	Port A2: 1940.7MHz + 1979.3MHz

Channel Position M - LTE QPSK: Bandwidth 1.4MHz - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

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

Maximum Output Power 44.8dBm per carrier

Channel Position M_{RFBW}	Port A1: (G) 1940.2MHz + (W) 1977.6MHz
	Port A2: (G) 1940.8MHz + (W) 1977.6MHz

Channel Position M_{RFBW} - GSM GMSK / WCDMA 16QAM - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

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

Maximum Output Power 45.6dBm per carrier

Channel Position M_{RFBW}	Port A1: (G) 1940.2MHz + (L) 1978.5MHz
	Port A2: (G) 1940.8MHz + (L) 1978.5MHz

Channel Position M_{RFBW} - GSM GMSK / LTE QPSK: Bandwidth 3.0MHz - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

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

Maximum Output Power 45.7dBm per carrier

Channel Position M_{RFBW}	Port A1: (W) 1942.4MHz + (L) 1978.5MHz
	Port A2: (W) 1942.4MHz + (L) 1978.5MHz

Channel Position M_{RFBW} - WCDMA 16QAM / LTE QPSK: Bandwidth 3.0MHz - 30MHz – 20GHz

No emissions were detected within 20dB of the limit.

Limit	-13dBm / 84.4dBµV/m

Remarks

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 6.5.1

2.5.2 Equipment Under Test

RUS 02 B2, KRC 161 298/1, S/N: CB4S640603, CB4S640592

2.5.3 Date of Test and Modification State

28 April to 19 May 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	22.8 – 24.5°C
Relative Humidity	45.0 – 67.5%

2.5.6 Test Method

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 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 (b), 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 A1 and RF A2.

The measurements were performed on the output connector RF A1. Limited complementary measurements were done at output conector RF A2 to verify identical performance for both transmitter chains in MIMO mode.

The results are shown in the plots below.

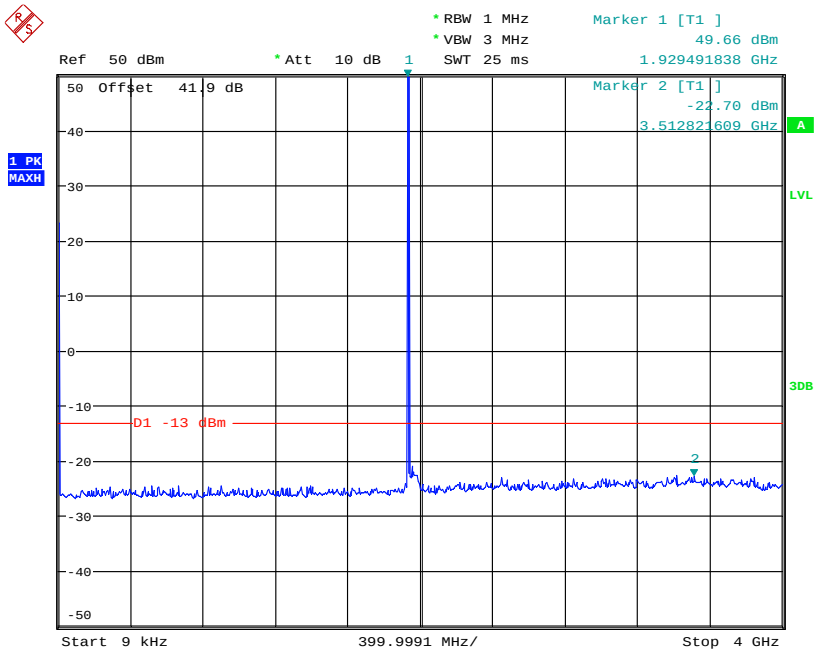
2.5.7 Test Results

Configuration G-SC

Maximum Output Power 47.8dBm per carrier

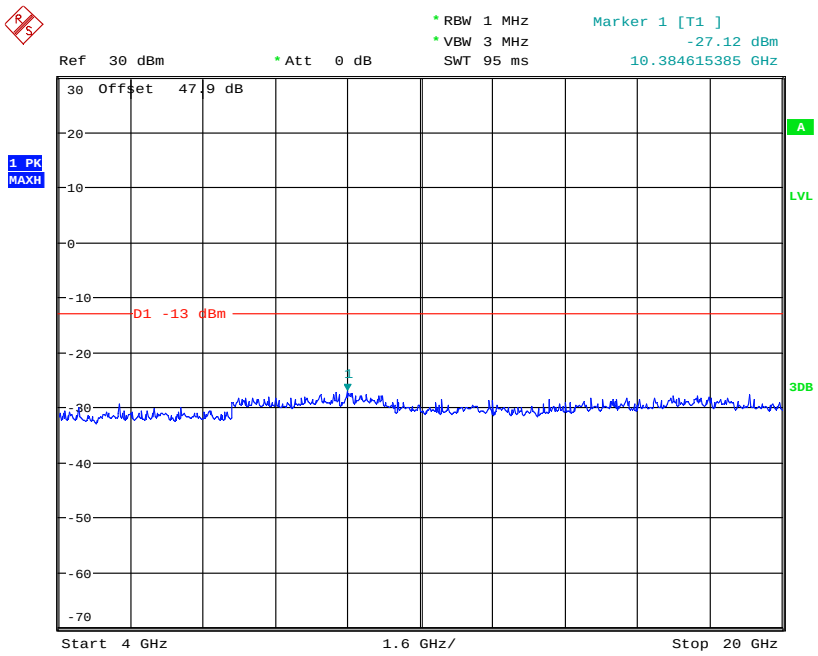
Channel Position	Channel Frequencies
Channel Position B	Port A1: 1930.4MHz
Channel Position M	Port A1: 1960.0MHz
Channel Position T	Port A1: 1989.6MHz

Channel Position B - GMSK - 9kHz – 4GHz



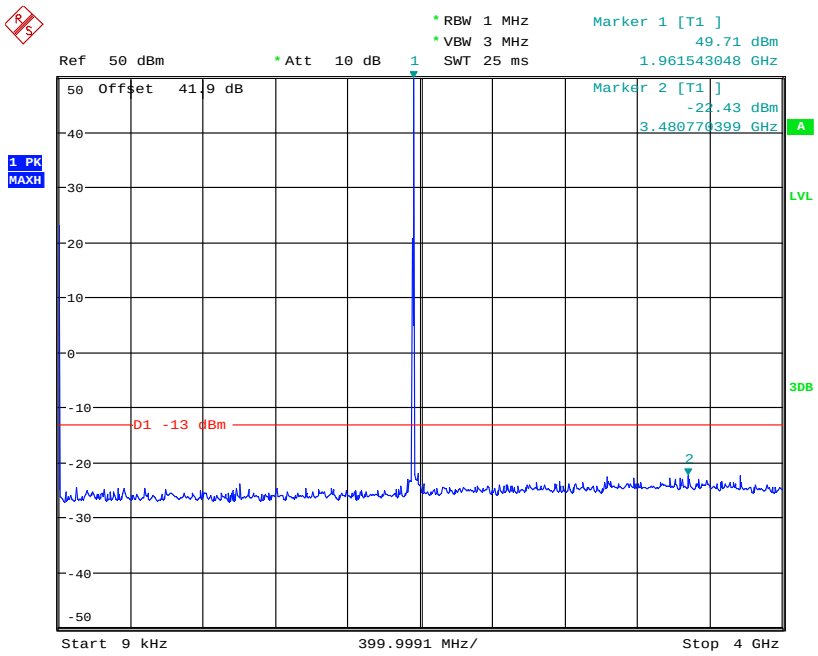
Date: 25.APR.2014 13:58:19

Channel Position B - GMSK - 4GHz – 20GHz



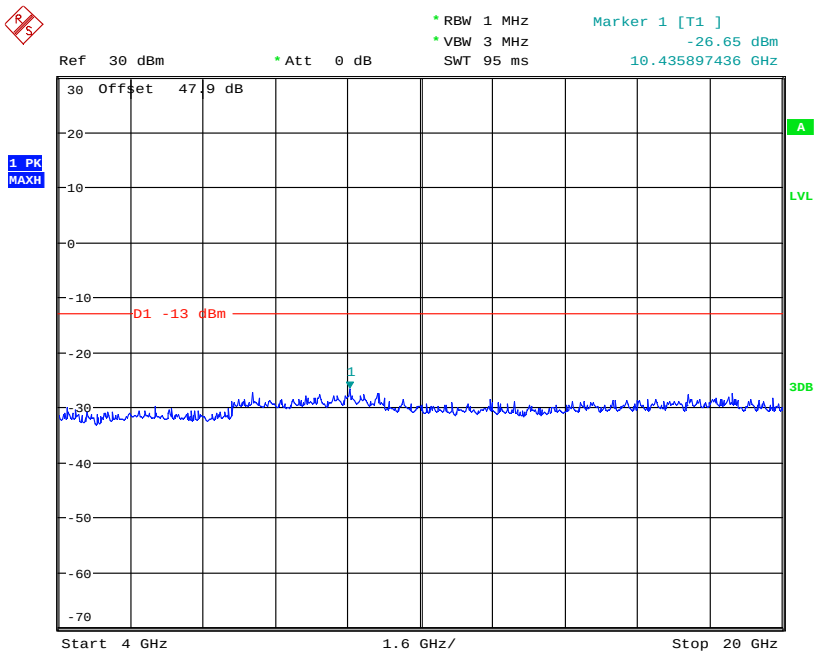
Date: 25.APR.2014 13:59:40

Channel Position M - GMSK - 9kHz – 4GHz



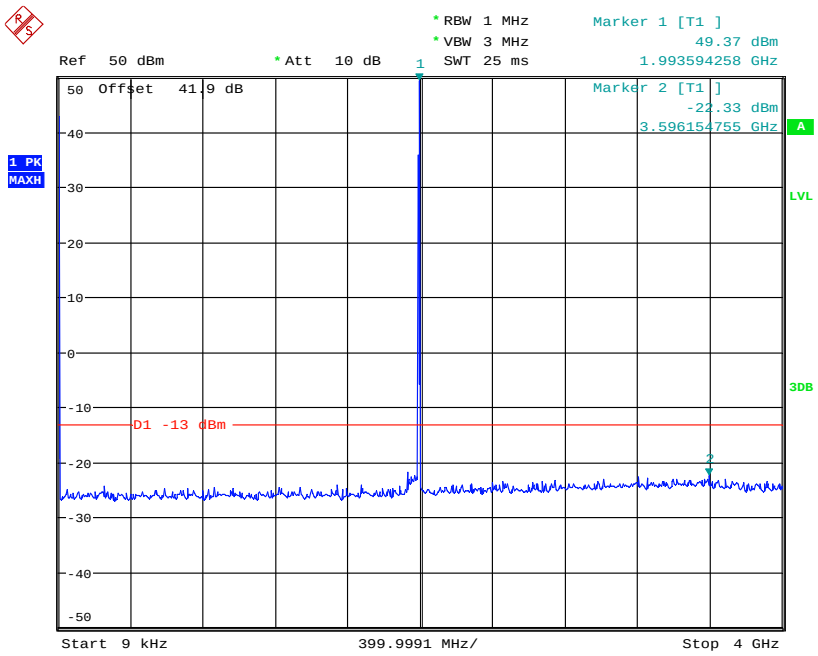
Date: 25.APR.2014 14:02:05

Channel Position M - GMSK - 4GHz – 20GHz



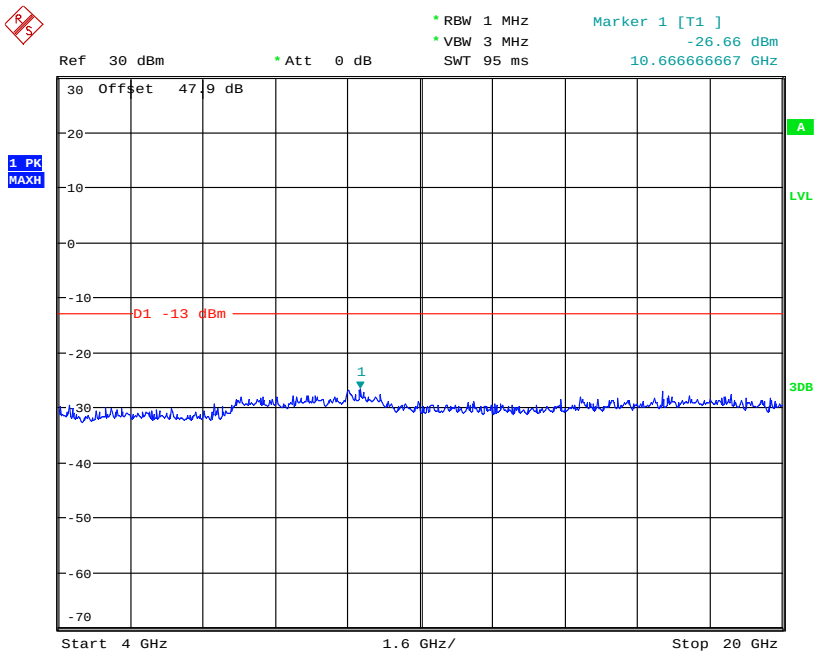
Date: 25.APR.2014 14:01:05

Channel Position T - GMSK - 9kHz – 4GHz



Date: 25.APR.2014 14:12:24

Channel Position T - GMSK - 4GHz – 20GHz



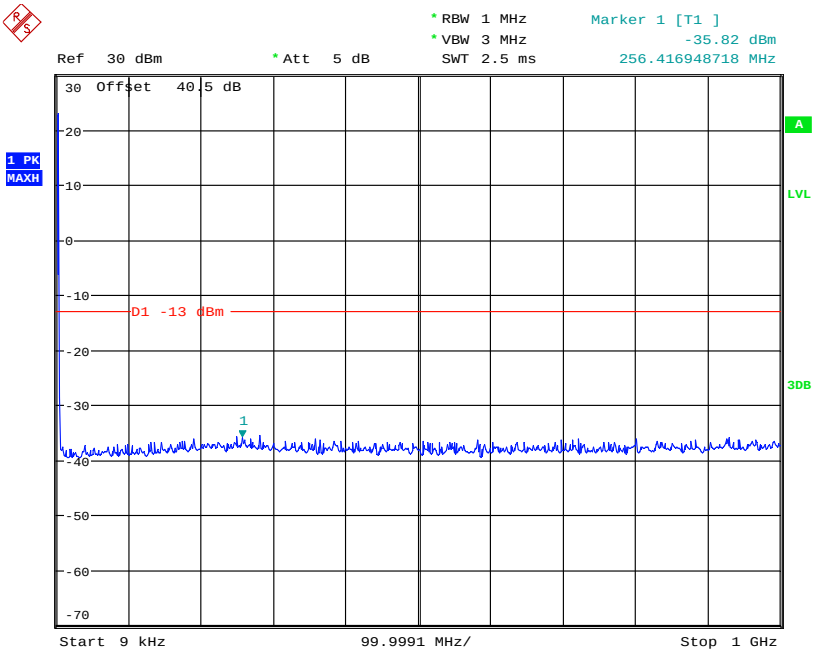
Date: 25.APR.2014 14:13:12

Configuration G-MC 1 (2C)

Maximum Output Power 46.0dBm per carrier

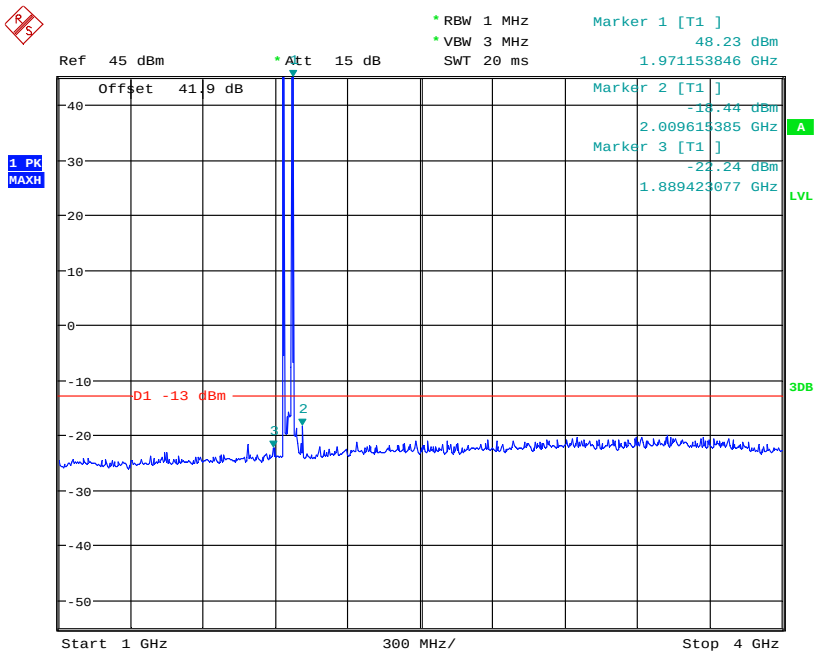
Channel Position	Channel Frequencies
Channel Position B	Port A1: 1930.4MHz + 1969.8MHz
Channel Position M	Port A1: 1940.2MHz + 1979.8MHz
Channel Position T	Port A1: 1950.2MHz + 1989.6MHz

Channel Position B - GMSK - 9kHz – 1GHz



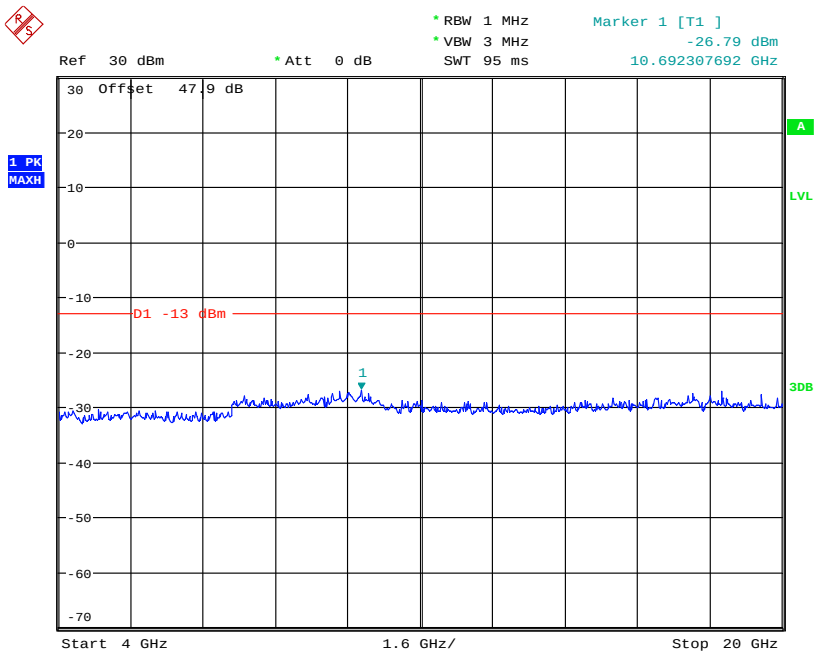
Date: 28.APR.2014 16:42:05

Channel Position B - GMSK - 1GHz – 4GHz



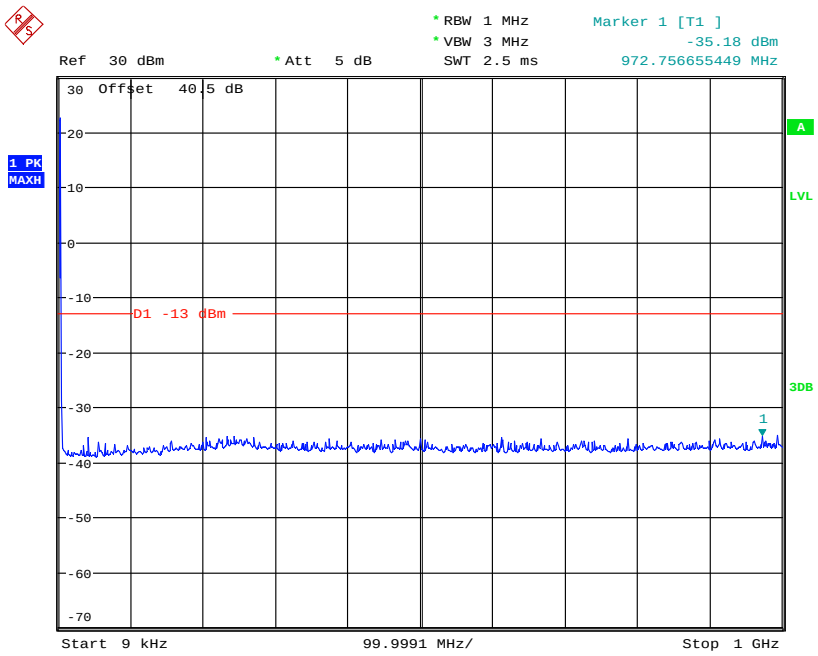
Date: 29.APR.2014 09:40:05

Channel Position B - GMSK - 4GHz – 20GHz



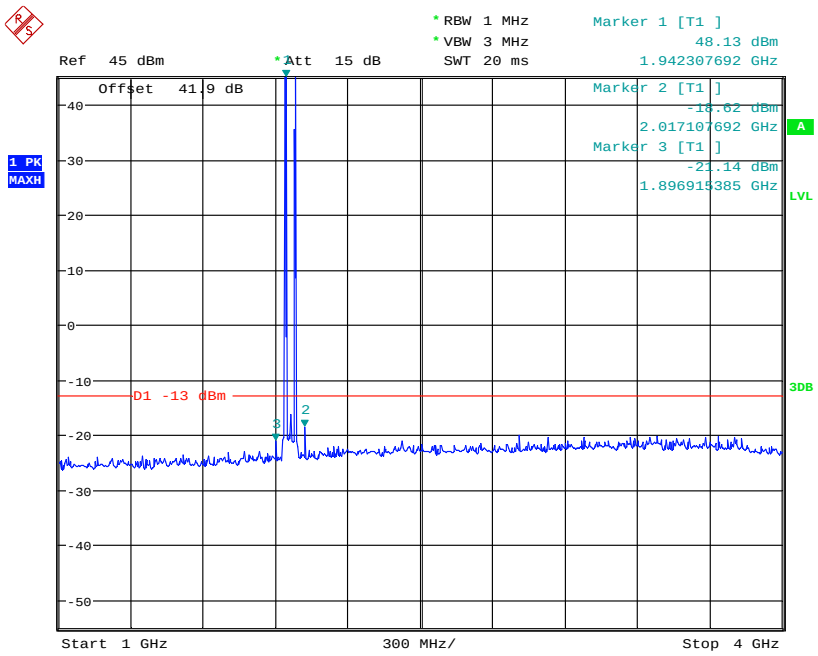
Date: 29.APR.2014 09:35:19

Channel Position M - GMSK - 9kHz – 1GHz



Date: 28.APR.2014 16:38:11

Channel Position M - GMSK - 1GHz – 4GHz



Date: 29.APR.2014 09:32:53