



Product Service

Choose certainty.
Add value.



Report On

FCC and IC Testing of the
Ericsson AB (700MHz) RBS 6501 B12 KRD 901 112/X* Radio Base
Station In accordance with FCC CFR 47 Part 27 and Industry Canada
RSS-130: Issue 1

See Note* on page 3

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRD901112

IC: 287AB-AS901112

PREPARED BY

Yuanjie He
Project Engineer

APPROVED BY

Stephen Milliken
Authorised Signatory

DATED

26 June 2014

Document 75926997 Report 01 Issue 1

June 2014

CONTENTS

Section	Page No
1	REPORT INFORMATION 2
1.1	Report Details 3
1.2	Brief Summary of Results 4
1.3	Configuration Description 5
1.4	Declaration of Build Status 6
1.5	Product Information 7
1.6	Test Setup 8
1.7	Test Conditions 10
1.8	Deviation From The Standard 10
1.9	Modification Record 10
1.10	Alternative Test Site 10
2	TEST DETAILS 11
2.1	Maximum Peak Output Power and Peak to Average Ratio - Conducted 12
2.2	Maximum Peak Output Power - Radiated 16
2.3	Occupied Bandwidth 21
2.4	Spurious Emission at Band Edge 33
2.5	Radiated Spurious Emissions 43
2.6	Conducted Spurious Emissions 48
2.7	Frequency Stability 59
3	TEST EQUIPMENT USED 62
3.1	Test Equipment Used 63
3.2	Measurement Uncertainty 65
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 66
4.1	Accreditation, Disclaimers and Copyright 67



Product Service

SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

Testing was carried out in support of an application for Grant of RBS 6501 B12 KRD 901 112/X* in LTE mode.

Manufacturer	Ericsson AB
Address	Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Product Name	RBS 6501 B12
Product Number	KRD 901 112/X*
IC Model Number	AS901112X*
Serial Number(s)	CB4T811855 CB4T818585
Software Version	CXP 102 051/19 Rev R37AL
Hardware Version	R1A
Test Specification/Issue/Date	FCC CFR 47 Part 27: 2013 Industry Canada RSS-130 Issue 1: 2013
Start of Test	29 May 2014
Finish of Test	17 June 2014
Name of Engineer(s)	Yuanjie He
Related Document(s)	ANSI C63.4: 2009 FCC CFR 47 Part 2: 2013 Industry Canada RSS-GEN Issue 3: 2010 Industry Canada SRSP-518 Issue 1: 2013

Note*: X can be 1 to 4.

RBS 6501 B12 is available in the following four variants with the listed product numbers and descriptions. The differences between them are as follows:

Product Number	IC Model Number	Description
KRD 901 112/1	AS9011121	100 - 250 VAC power feed with integrated antenna
KRD 901 112/2	AS9011122	-48 VDC power feed with integrated antenna
KRD 901 112/3	AS9011123	100 - 250 VAC power feed without integrated antenna
KRD 901 112/4	AS9011124	-48 VDC power feed without integrated antenna

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2 , Part 27 and RSS-130 is shown below.

Section	Spec Clause			Test Description	Result
	Part 2	Part 27	RSS 130		
2.1	2.1046	27.50 (c) (i)	4.4	Maximum Peak Output Power and Peak to Average Ratio – Conducted	Pass
2.2	-	27.50 (c)	4.4	Maximum Peak Output Power – Radiated	Pass
2.3	2.1049	27.53 (g)	RSS-Gen 4.6.1	Occupied Bandwidth	Pass
2.4	2.1051	27.53 (g)	4.6	Spurious Emissions at Band Edge	Pass
2.5	2.1053	27.53 (g)	4.6	Radiated Spurious Emissions	Pass
2.6	2.1051	27.53 (g)	4.6	Conducted Spurious Emissions	Pass
2.7	2.1055	27.54	4.3	Frequency Stability	Pass

N/A – Not Applicable

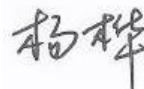
1.3 CONFIGURATION DESCRIPTION

Configuration Code	Carrier(s)	Configuration Description
L-MIMO-SC	1C	LTE MIMO, Single Carrier
L-MIMO-MC 1	2C	LTE MIMO, Multi Carrier x2

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Base Station
MANUFACTURER	Ericsson AB
PRODUCT NAME	RBS 6501 B12
PRODUCT NUMBER	KRD 901 112/1 KRD 901 112/2 KRD 901 112/3 KRD 901 112/4
IC MODLE NUMBER	AS9011121 AS9011122 AS9011123 AS9011124
TRANSMITTER OPERATING RANGE	TX: 729MHz - 745MHz RX: 699MHz - 715MHz
MODULATIONS	QPSK, 16QAM, 64QAM
INTERMEDIATE FREQUENCIES	-
ITU DESIGNATION OF EMISSION	1M40F9W, 3M00F9W, 5M00F9W, 10M0F9W, 15M0F9W
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
OUTPUT POWER (RMS) (W or dBm)	MIMO: 2 x 37dBm (2 x 5W)
Antenna Gain	Integrated antenna KRE 101 2134/1: >5dBi Semi-integrated Omni antenna KRE 101 2245/1: 2dBi
INSTANTANEOUS BANDWIDTH	16MHz
NUMBER OF CARRIERS	Maximum 2 carriers
FCC ID	TA8AKRD901112
IC ID	287AB-AS901112
AC Power source	100-250 V AC
DC Power source	-48V DC
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is a LTE Radio Base Station

Signature



Date

24 June 2014

D of B S Serial No

75926997/02

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) RBS 6501 B12 KRD 901 112/X is an Ericsson Radio Base Station working in the public mobile service 700 MHz band which provides communication connections to 700MHz network in LTE Modes. The RBS 6501 B12 Radio Base Station supports 100 - 250 VAC and -48 VDC power supply.

The RBS 6501 B12 KRD 901 112/X Radio Base Station is likely to use integrated wide Sector antenna or Semi-integrated Omni antenna.

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

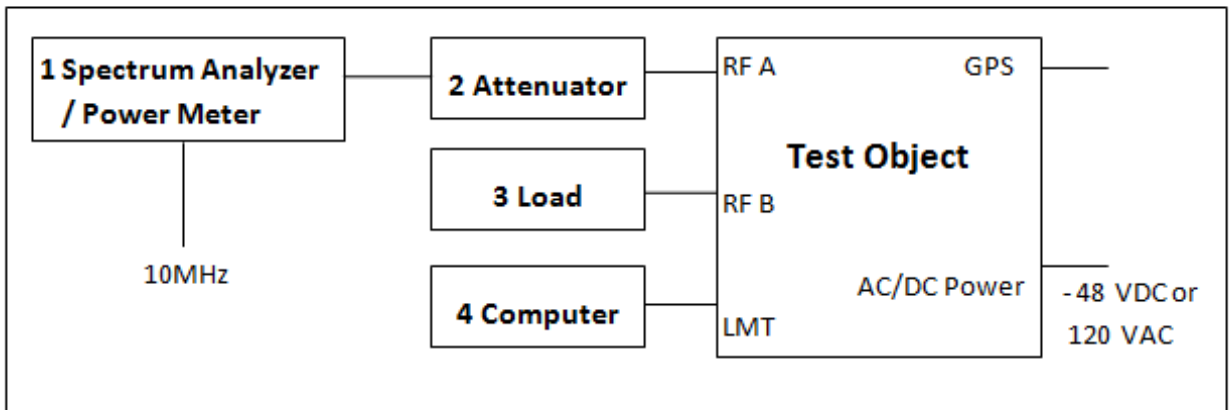


Equipment Under Test

1.6 TEST SETUP

Test Setup, Conducted Measurement:

Configuration setup:

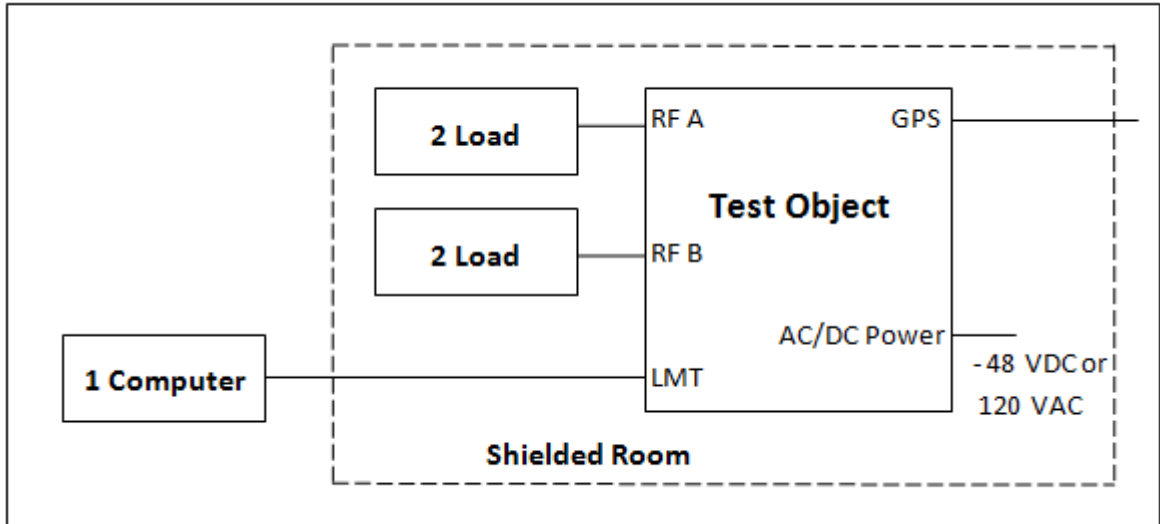


Product Name	Product Number	Version	Serial Number
RBS 6501 B12	KRD 901 112/2	R1A	CB4T811855
RBS 6501 B12	KRD 901 112/1	R1A	CB4T818585

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Spectrum Analyzer	FSQ26	--	101202
	Spectrum Analyzer	FSW	--	100615
	Power Meter	NRP	--	101285
	Power Sensor	NRP-Z51	--	102168
	Power Sensor	NRP-Z51	--	102121
2	Attenuator	48-40-43-LIM	--	BR5020
	Attenuator	DTS50-40dB-3G	--	09-1-711
3	Load	TFE100	--	09121647
4	Computer	Advantech-610H	--	ETD/L913

Test Setup, Radiated Measurement:

Base Station setup:



Product Name	Product Number	Version	Serial Number
RBS 6501 B12	KRD 901 112/2	R1A	CB4T811855

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Advantech-610H	--	ETD/L913
2	Load	TFE100	--	09121647
	Load	TFZ10-3R	--	20100908079

1.7 TEST CONDITIONS

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

All test cases were tested with the EUT supplied with -48V DC by an external power supply. Frequency stability measurements were tested using both -48V DC and 120V AC.

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

Radiated Spurious Emissions and Maximum Average Output Power Radiated testing have 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.



Product Service

SECTION 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 27, Clause 27.50 (c)(i)
Industry Canada RSS-130, Clause 4.4

2.1.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.1.3 Date of Test and Modification State

29 to 30 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	23.8 - 26.0°C
Relative Humidity	54.6 - 58.0%

2.1.6 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 27 and Industry Canada RSS-130.

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. Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal. A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) was used and 0.1% probability value recorded. A proper resolution bandwidth was used. 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 Multiple Transmitter Output v02r01.

2.1.7 Test Results

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

Antenna	Modulation / Carrier Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 729.7MHz			Channel Position M 737.0MHz			Channel Position T 744.3MHz		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	QPSK / 1.4MHz	36.80	35.87	6.99	36.95	36.02	7.02	36.86	35.93	6.99
B		36.73	35.80	6.95	36.90	35.97	7.01	36.73	35.80	7.03
Total		39.78	-	-	39.94	-	-	39.81	-	-
A	16QAM / 1.4MHz	-	-	-	36.94	36.01	6.96	-	-	-
B		-	-	-	36.89	35.96	7.02	-	-	-
Total		-	-	-	39.81	-	-	-	-	-
A	64QAM / 1.4MHz	-	-	-	36.91	35.98	7.00	-	-	-
B		-	-	-	36.88	35.95	7.03	-	-	-
Total		-	-	-	39.91	-	-	-	-	-

Note 1:

1 MHz Power for 1.4MHz BW=Output Power - 10lg(OBW/1)=Output Power - 10lg(1.24) =Output Power - 0.93

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	737.0MHz / 3.0MHz	37.04	32.48	6.80	37.01	32.45	6.81	37.03	32.47	6.84
B		36.97	32.41	6.81	36.94	32.38	6.84	36.97	32.41	6.84
Total		40.02	-	-	39.99	-	-	40.01	-	-

Note 1:

1 MHz Power for 3MHz BW=Output Power - 10lg(OBW/1)=Output Power - 10lg(2.86) =Output Power - 4.56

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	737.0MHz / 5.0MHz	37.05	30.31	6.85	36.98	30.24	6.79	37.02	30.28	6.84
B		36.97	30.23	6.83	36.92	30.18	6.90	37.01	30.27	6.79
Total		40.02	-	-	39.96	-	-	40.03	-	-

Note 1:

1 MHz Power for 5MHz BW=Output Power - 10lg(OBW/1)=Output Power - 10lg(4.72) =Output Power - 6.74

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	737.0MHz / 10.0MHz	37.00	27.30	6.88	36.97	27.30	6.95	37.01	27.31	6.98
B		36.96	27.26	6.98	36.92	27.26	6.99	36.94	27.24	6.96
Total		39.99	-	-	39.96	-	-	39.99	-	-

Note 1:

1 MHz Power for 10MHz BW=Output Power - 10lg(OBW/1)=Output Power - 10lg(9.33) =Output Power - 9.70

Antenna	Modulation / Carrier Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Channel Position B 736.5MHz			Channel Position M 737.0MHz			Channel Position T 737.5MHz		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	QPSK / 15.0MHz	36.98	25.54	7.38	36.96	25.52	7.25	36.98	25.54	7.18
B		36.91	25.47	7.50	36.89	25.45	7.27	36.90	25.46	7.13
Total		39.96	-	-	39.94	-	-	39.95	-	-
A	16QAM / 15.0MHz	-	-	-	36.95	25.51	7.31	-	-	-
B		-	-	-	36.85	25.41	7.31	-	-	-
Total		-	-	-	39.91	-	-	-	-	-
A	64QAM / 15.0MHz	-	-	-	36.95	25.51	7.23	-	-	-
B		-	-	-	36.89	25.45	7.26	-	-	-
Total		-	-	-	39.93	-	-	-	-	-

Note 1:

1 MHz Power for 15MHz BW=Output Power - 10lg(OBW/1)=Output Power - 10lg(13.92) =Output Power - 11.44

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 34.0dBm per carrier

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	729.7+744.3 MHz/ 1.4MHz	36.69	-	-	36.67	-	-	36.64	-	-
B		36.53	-	-	36.56	-	-	36.54	-	-
Total		39.62	-	-	39.63	-	-	39.60	-	-

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	730.5+743.5 MHz/ 3.0MHz	36.83	-	-	36.81	-	-	36.83	-	-
B		36.72	-	-	36.69	-	-	36.71	-	-
Total		39.79	-	-	39.76	-	-	39.78	-	-

Antenna	Channel Position M / Bandwidth (MHz)	Average Output Power / Peak to Average Ratio (PAR)								
		Modulation QPSK			Modulation 16QAM			Modulation 64QAM		
		Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)	Power (dBm)	Power (dBm/MHz ¹)	PAR (dB)
A	731.5+742.5	36.91	-	-	36.85	-	-	36.91	-	-
B	MHz/ 5.0MHz	36.79	-	-	36.74	-	-	36.80	-	-
Total		39.86	-	-	39.81	-	-	39.87	-	-

Limit	
Peak Power	FCC: ≤ 1000 W (ERP)/ MHz or ≤ +60 dBm/MHz IC: ≤ 1640 W (e.i.r.p)/ MHz or 62.15 dBm/MHz
Peak to Average Ratio	13 dB

2.2 MAXIMUM PEAK OUTPUT POWER - RADIATED

2.2.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.50 (c)
Industry Canada RSS-130, Clause 4.4

2.2.2 Equipment Under Test

RBS 6501 B12 , KRD 901 112/2, S/N: CB4T811855

2.2.3 Date of Test and Modification State

11 and 17 June 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	22.0 – 22.8°C
Relative Humidity	40.4 – 58.0%

2.2.6 Test Method

The test was applied in accordance with test method requirements of FCC CFR 47 Part 27, Industry Canada RSS-130 and TIA-603-C-2004.

The EUT was set to transmit at maximum power and testing was carried out on Bottom, Middle and Top Channels. The test of radiated emission was performed in a semi anechoic chamber. The measurements were performed with both horizontal and vertical polarizations of the antennas. The antenna distance was 3.0 m.

The fundamental was scanned with Peak detector with the antenna height was varied between 1-4 m and the turntable was rotated between 0-360 degrees for maximum response. The carrier power was measured with RMS detector activated with a RBW of 1MHz. The output power was verified with the substitution method. The antenna distance during the measurements was 3.0m.

2.2.7 Test Results

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

Integrated antenna KRE 101 2134/1, upright mounted

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	39.69	42.59	39.79	42.49	39.59	42.29
W/1MHz	9.31	18.16	9.53	17.74	9.10	16.94

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	41.84	44.74	41.94	44.64	41.74	44.44
W/1MHz	15.28	29.79	15.63	29.11	14.93	27.80

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 730.5MHz		Channel Position M 737.0MHz		Channel Position T 743.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 3.0 MHz						
dBm/1MHz	-	-	37.39	40.19	-	-
W/1MHz	-	-	5.48	10.45	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 730.5MHz		Channel Position M 737.0MHz		Channel Position T 743.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 3.0 MHz						
dBm/1MHz	-	-	39.54	42.34	-	-
W/1MHz	-	-	8.99	17.14	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 731.5MHz		Channel Position M 737.0MHz		Channel Position T 742.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 5.0 MHz						
dBm/1MHz	-	-	35.29	38.19	-	-
W/1MHz	-	-	3.38	6.59	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 731.5MHz		Channel Position M 737.0MHz		Channel Position T 742.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 5.0 MHz						
dBm/1MHz	-	-	37.44	40.34	-	-
W/1MHz	-	-	5.55	10.81	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 734.0MHz		Channel Position M 737.0MHz		Channel Position T 740.0MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 10.0 MHz						
dBm/1MHz	-	-	32.09	35.09	-	-
W/1MHz	-	-	1.62	3.23	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 734.0MHz		Channel Position M 737.0MHz		Channel Position T 740.0MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 10.0 MHz						
dBm/1MHz	-	-	34.24	37.24	-	-
W/1MHz	-	-	2.65	5.30	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 736.5MHz		Channel Position M 737.0MHz		Channel Position T 737.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 15.0 MHz						
dBm/1MHz	-	-	30.29	33.39	-	-
W/1MHz	-	-	1.07	2.18	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 736.5MHz		Channel Position M 737.0MHz		Channel Position T 737.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 15.0 MHz						
dBm/1MHz	-	-	32.44	35.54	-	-
W/1MHz	-	-	1.75	3.58	-	-

Integrated antenna KRE 101 2134/1, side mounted

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	-	-	42.29	41.29	-	-
W/1MHz	-	-	16.94	13.46	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	-	-	44.44	43.44	-	-
W/1MHz	-	-	27.80	22.08	-	-

Semi-integrated Omni antenna KRE 101 2245/1, upright mounted

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	37.59	30.59	37.89	30.69	36.89	30.79
W/1MHz	5.74	1.15	6.15	1.17	4.89	1.20

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	39.74	32.74	40.04	32.84	39.04	32.94
W/1MHz	9.42	1.88	10.09	1.92	8.02	1.97

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 730.5MHz		Channel Position M 737.0MHz		Channel Position T 743.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 3.0 MHz						
dBm/1MHz	-	-	35.29	27.89	-	-
W/1MHz	-	-	3.38	0.62	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 730.5MHz		Channel Position M 737.0MHz		Channel Position T 743.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 3.0 MHz						
dBm/1MHz	-	-	37.44	30.04	-	-
W/1MHz	-	-	5.55	1.01	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 731.5MHz		Channel Position M 737.0MHz		Channel Position T 742.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 5.0 MHz						
dBm/1MHz	-	-	33.09	25.89	-	-
W/1MHz	-	-	2.04	0.39	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 731.5MHz		Channel Position M 737.0MHz		Channel Position T 742.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 5.0 MHz						
dBm/1MHz	-	-	35.24	28.04	-	-
W/1MHz	-	-	3.34	0.64	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 734.0MHz		Channel Position M 737.0MHz		Channel Position T 740.0MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 10.0 MHz						
dBm/1MHz	-	-	30.09	19.69	-	-
W/1MHz	-	-	1.02	0.09	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 734.0MHz		Channel Position M 737.0MHz		Channel Position T 740.0MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 10.0 MHz						
dBm/1MHz	-	-	32.24	21.84	-	-
W/1MHz	-	-	1.67	0.15	-	-

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 736.5MHz		Channel Position M 737.0MHz		Channel Position T 737.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 15.0 MHz						
dBm/1MHz	-	-	28.19	20.49	-	-
W/1MHz	-	-	0.66	0.11	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 736.5MHz		Channel Position M 737.0MHz		Channel Position T 737.5MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 15.0 MHz						
dBm/1MHz	-	-	30.34	22.64	-	-
W/1MHz	-	-	1.08	0.18	-	-

Semi-integrated Omni antenna KRE 101 2245/1, side mounted

Modulation / Carrier Bandwidth	E.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	-	-	39.09	30.79	-	-
W/1MHz	-	-	8.11	1.20	-	-

Modulation / Carrier Bandwidth	E.I.R.P					
	Channel Position B 729.7MHz		Channel Position M 737.0MHz		Channel Position T 744.3MHz	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
QPSK / 1.4 MHz						
dBm/1MHz	-	-	41.24	32.94	-	-
W/1MHz	-	-	13.30	1.97	-	-

Limit	
E.R.P	FCC: ≤ 1000 W / MHz or ≤ +60 dBm/MHz
E.I.R.P	IC: ≤ 1640 W (e.i.r.p)/ MHz or 62.15 dBm/MHz

2.3 OCCUPIED BANDWIDTH

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 (h)
FCC CFR 47 Part 27, Clause 27.53 (g)
Industry Canada RSS-GEN, Clause 4.6.1

2.3.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.3.3 Date of Test and Modification State

29 to 30 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	23.8 - 26.0°C
Relative Humidity	54.6 - 58.0%

2.3.6 Test Method

The test was applied in accordance with test method requirements of FCC CFR 47 Part 27 and Industry Canada RSS-130.

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, measurements were made in accordance with FCC KDB 971168 D01 V0201 Clause 4.2. In addition, the 26dB bandwidth was measured in accordance with FCC KDB 971168 D01 V0201 Clause 4.1. The RBW was configured to 1% of the theoretical channel bandwidth, meeting the requirement of being between 1 to 5% of the Occupied Bandwidth described in the KDB aforementioned.

The results are shown in the plots below.

2.3.7 Test Results

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

Modulation / Bandwidth	99% Occupied Bandwidth (MHz)		
	Channel Position B 729.7MHz	Channel Position M 737.0MHz	Channel Position T 744.3MHz
QPSK / 1.4 MHz	1.09	1.09	1.09

Modulation / Bandwidth	26 dB Occupied Bandwidth (MHz)		
	Channel Position B 729.7MHz	Channel Position M 737.0MHz	Channel Position T 744.3MHz
QPSK / 1.4 MHz	1.23	1.24	1.23

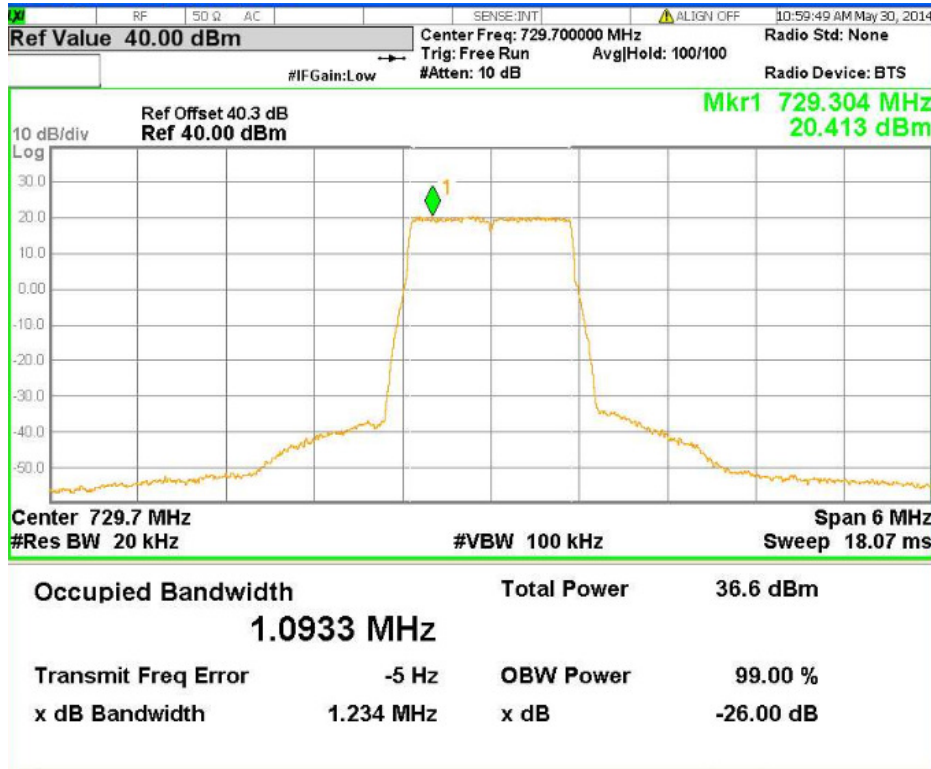
Channel Position M 737.0MHz / Bandwidth	99% Occupied Bandwidth (MHz)		
	Modulation QPSK	Modulation 16QAM	Modulation 64QAM
1.4 MHz	-	1.09	1.09
3.0 MHz	2.69	2.70	2.69
5.0 MHz	4.48	4.46	4.48
10.0 MHz	8.94	8.92	8.93
15.0 MHz	-	13.39	13.41

Channel Position M 737.0MHz / Bandwidth	26dB Occupied Bandwidth (MHz)		
	Modulation QPSK	Modulation 16QAM	Modulation 64QAM
1.4 MHz	-	1.22	1.24
3.0 MHz	2.85	2.84	2.86
5.0 MHz	4.71	4.70	4.72
10.0 MHz	9.33	9.31	9.31
15.0 MHz	-	13.91	13.93

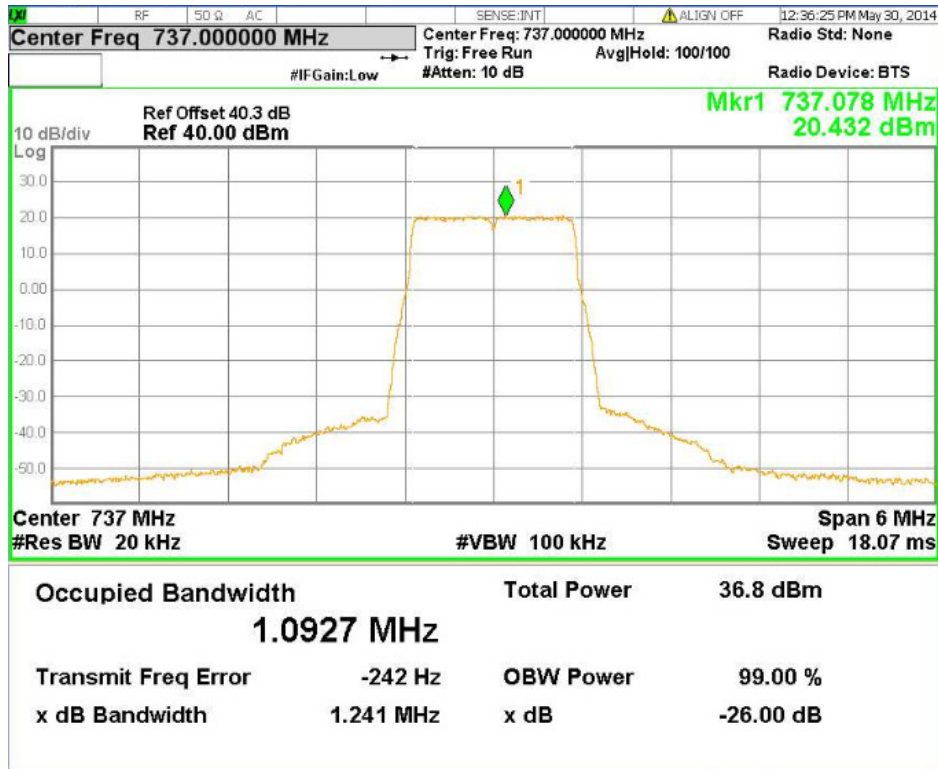
Modulation / Bandwidth	99% Occupied Bandwidth (MHz)		
	Channel Position B 736.5MHz	Channel Position M 737.0MHz	Channel Position T 737.5MHz
QPSK / 15.0 MHz	13.39	13.40	13.39

Modulation / Bandwidth	26dB Occupied Bandwidth (MHz)		
	Channel Position B 736.5MHz	Channel Position M 737.0MHz	Channel Position T 737.5MHz
QPSK / 15.0 MHz	13.92	13.92	13.92

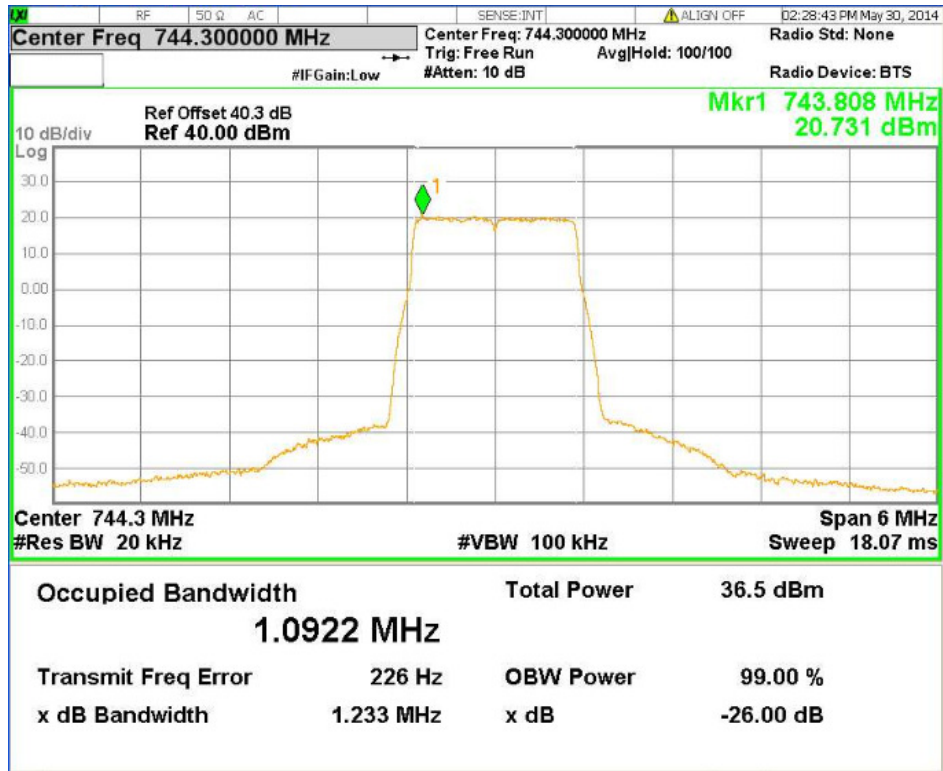
Channel Position B - QPSK / Bandwidth 1.4 MHz



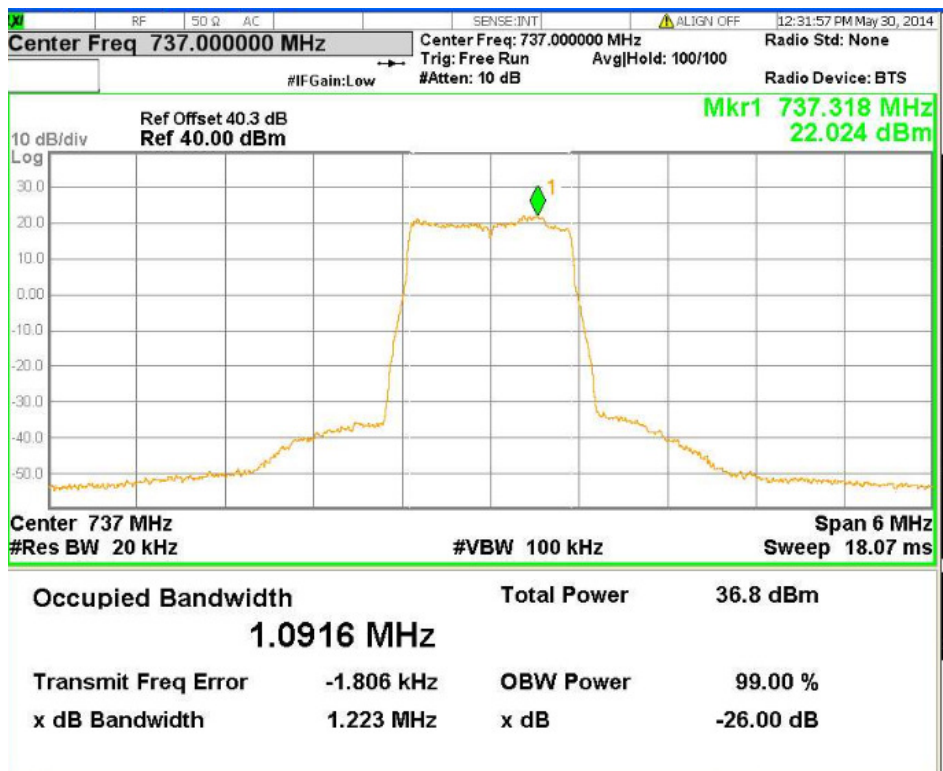
Channel Position M - QPSK / Bandwidth 1.4 MHz



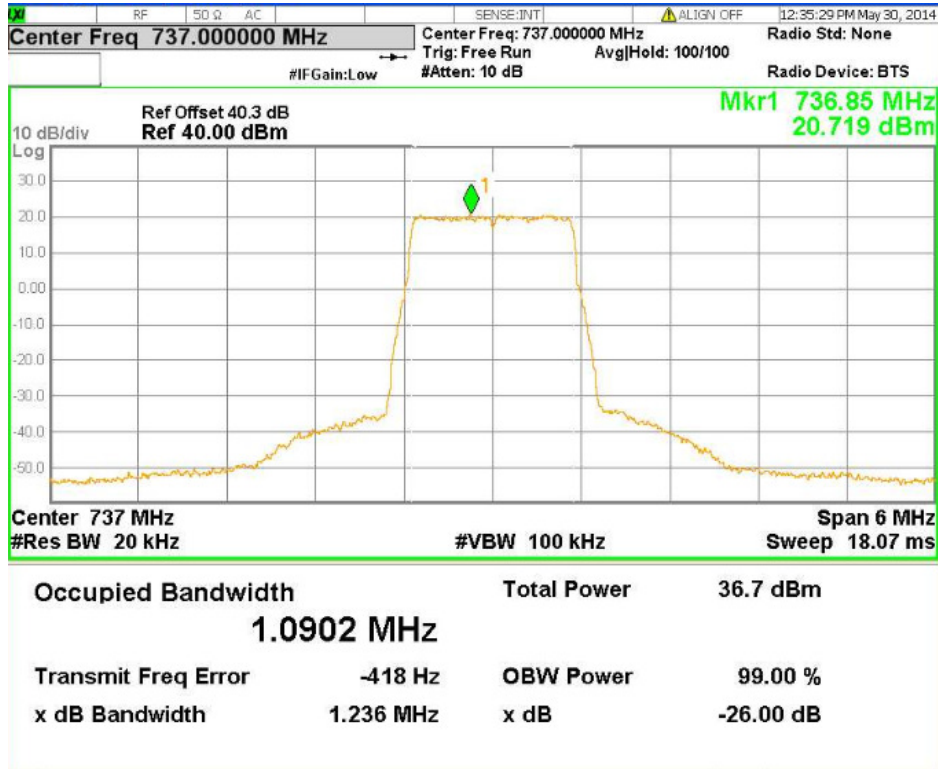
Channel Position T - QPSK / Bandwidth 1.4 MHz



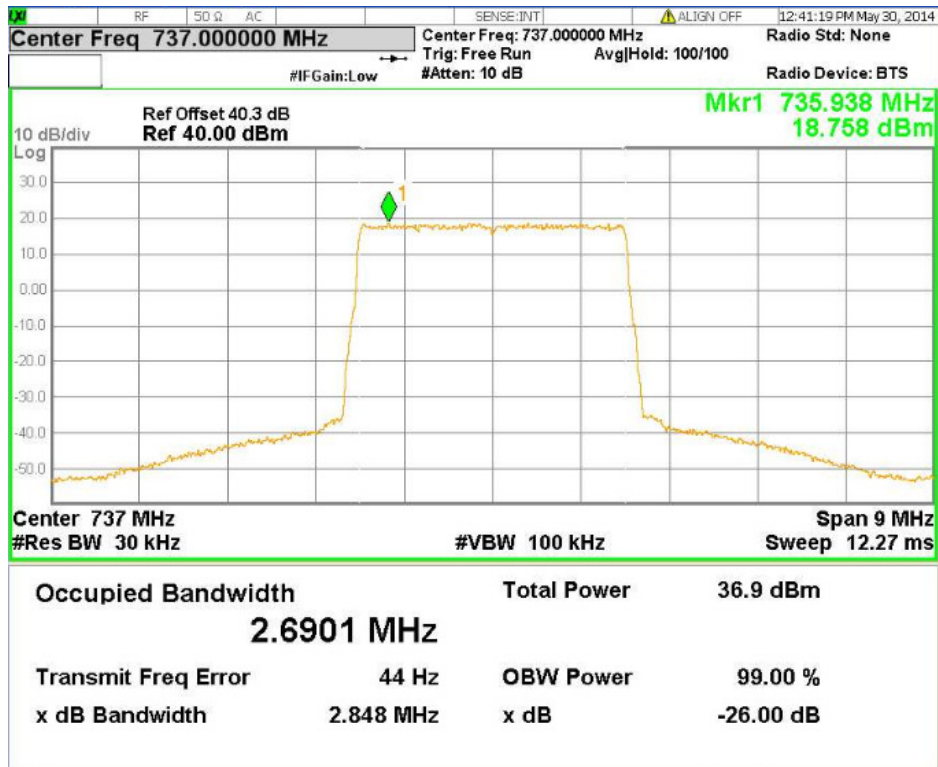
Channel Position M - 16QAM / Bandwidth 1.4 MHz



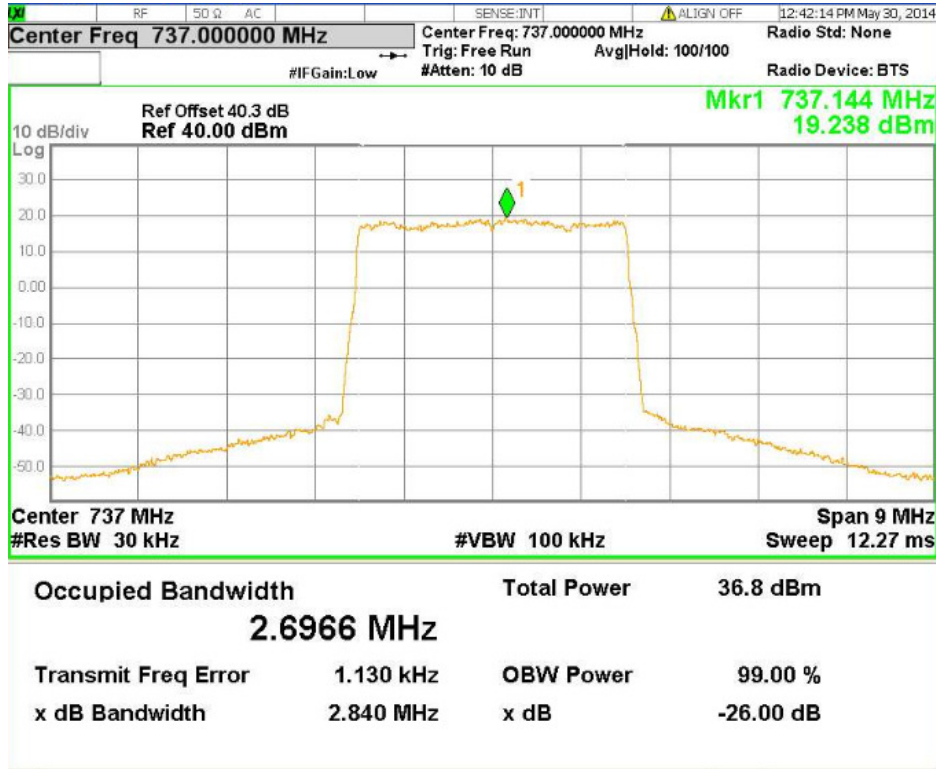
Channel Position M - 64QAM / Bandwidth 1.4 MHz



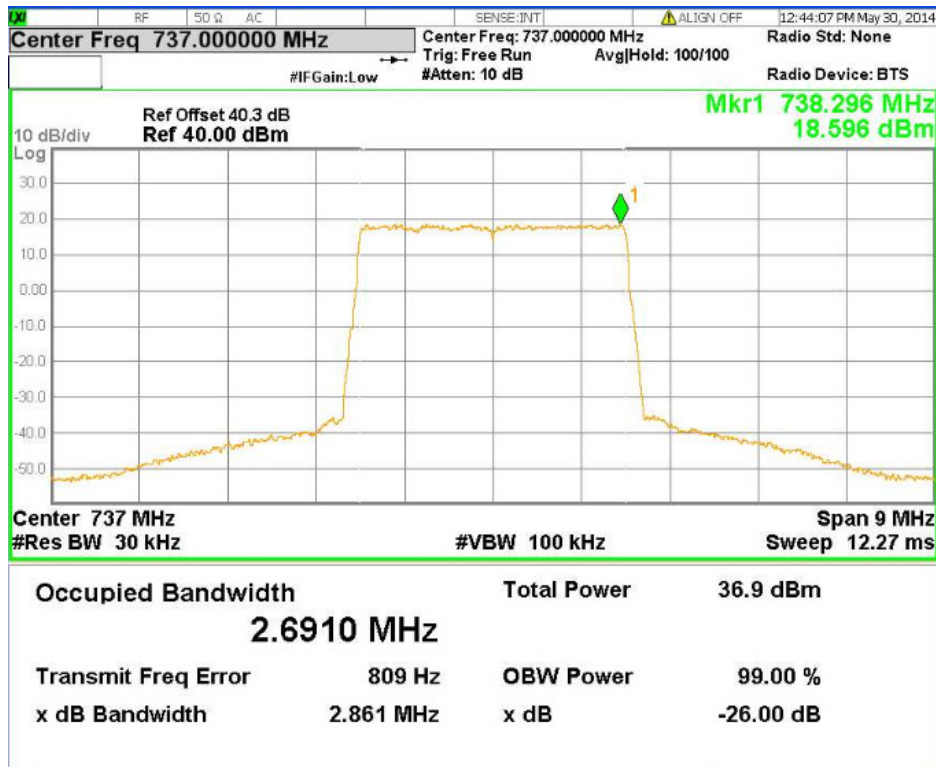
Channel Position M - QPSK / Bandwidth 3.0 MHz



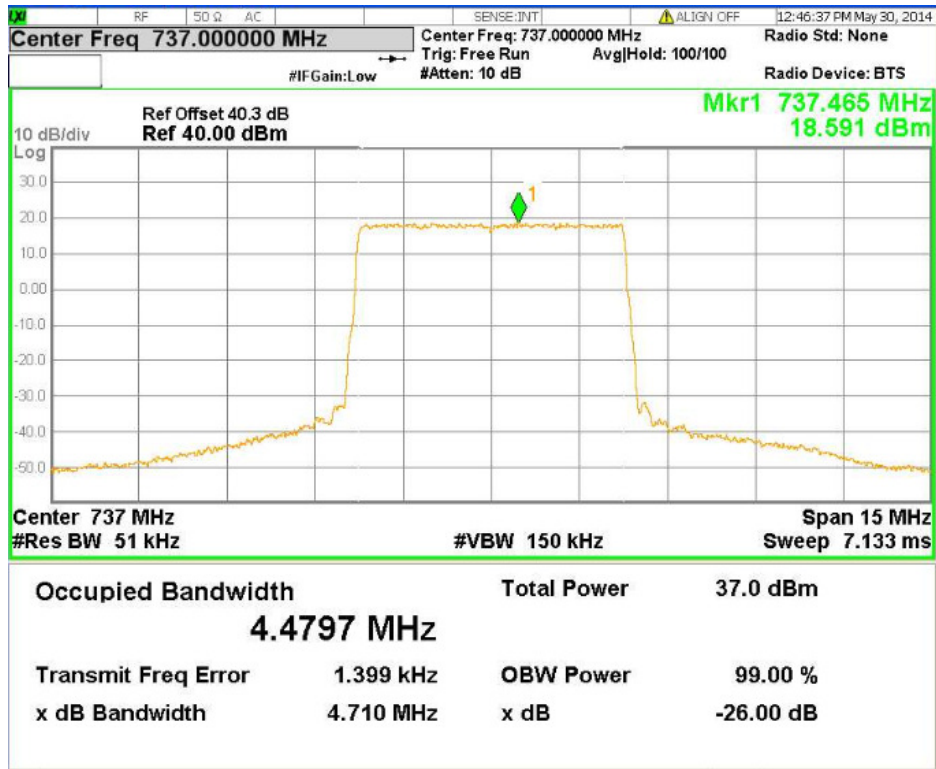
Channel Position M - 16QAM / Bandwidth 3.0 MHz



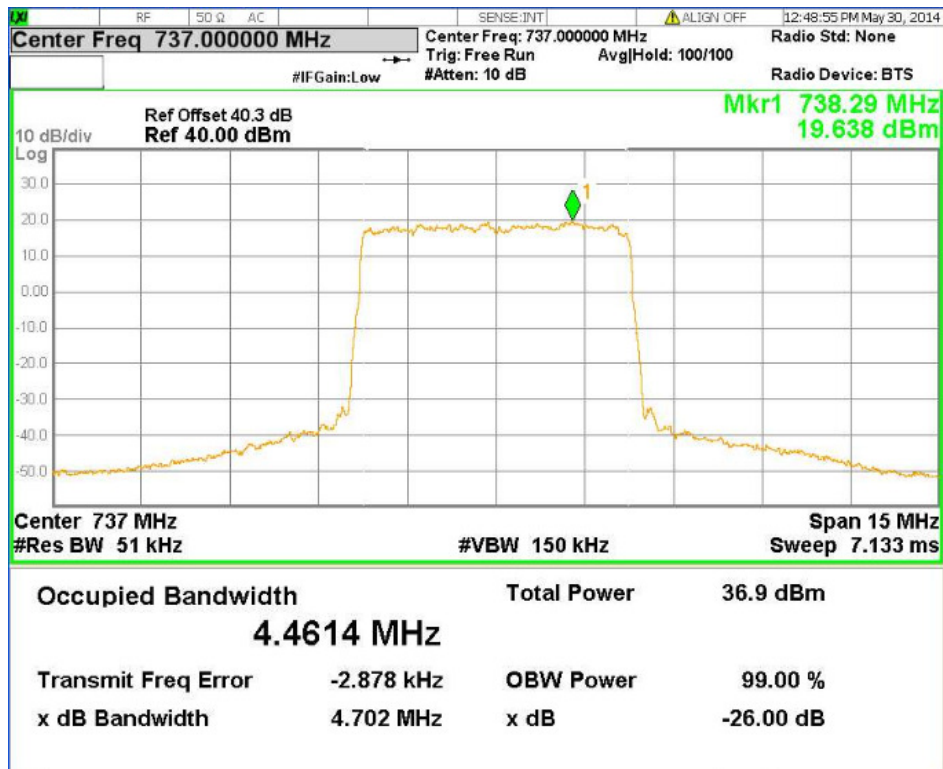
Channel Position M - 64QAM / Bandwidth 3.0 MHz



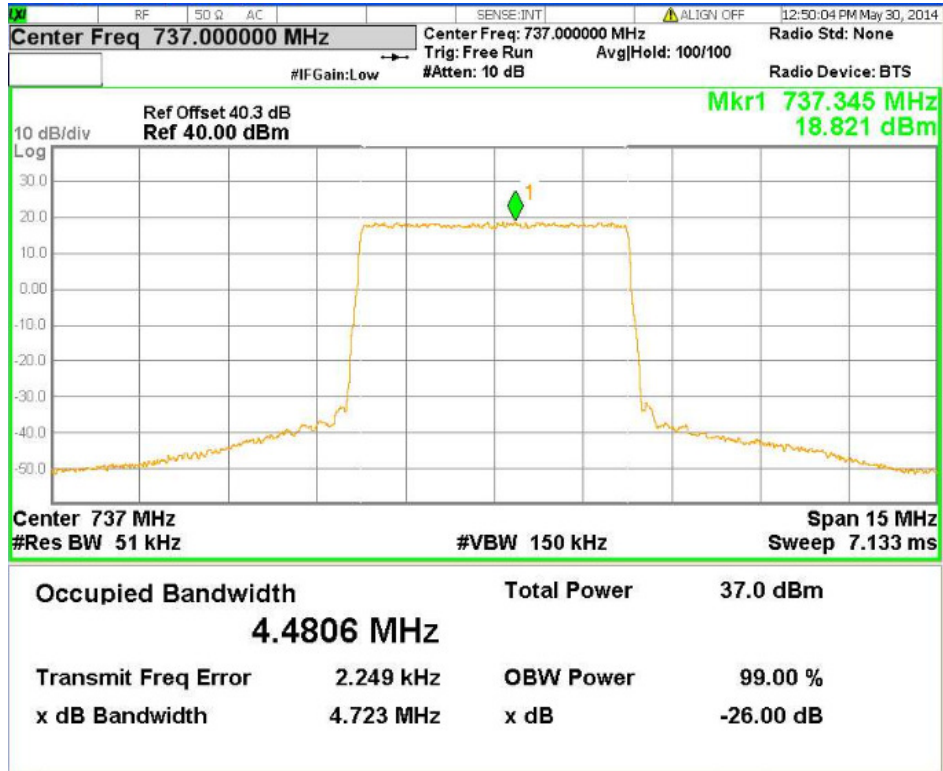
Channel Position M - QPSK / Bandwidth 5.0 MHz



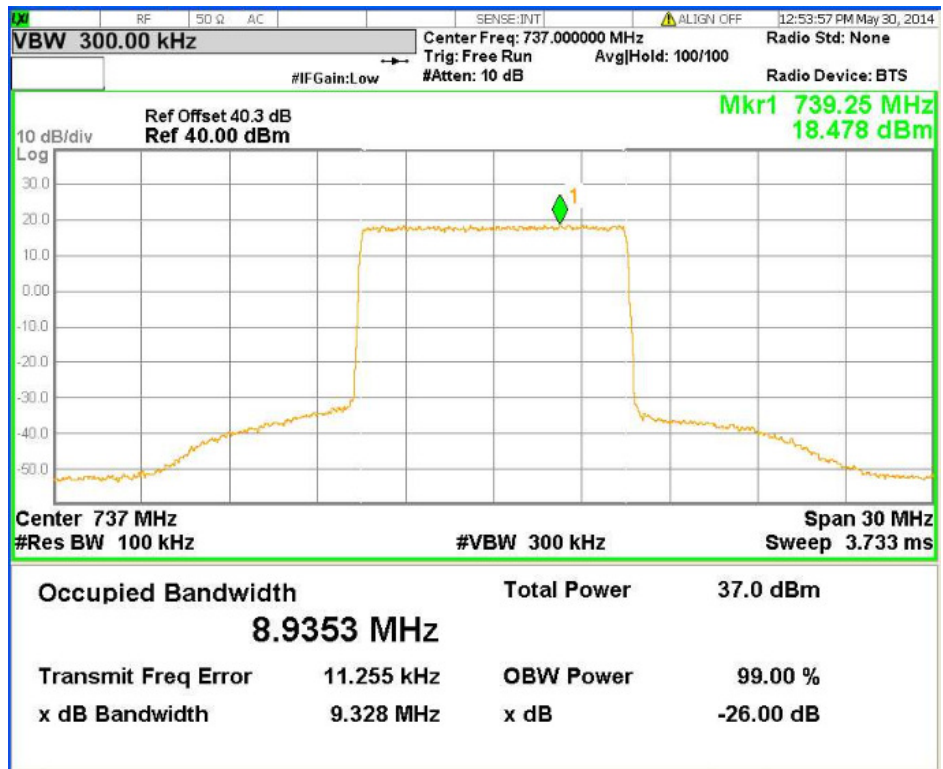
Channel Position M - 16QAM / Bandwidth 5.0 MHz



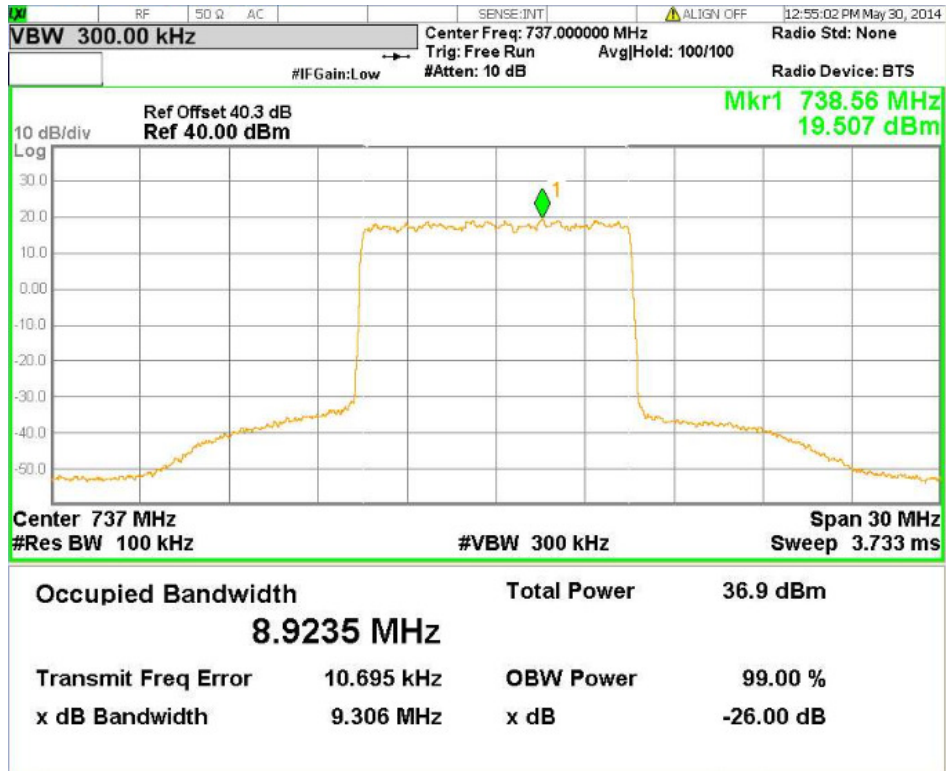
Channel Position M - 64QAM / Bandwidth 5.0 MHz



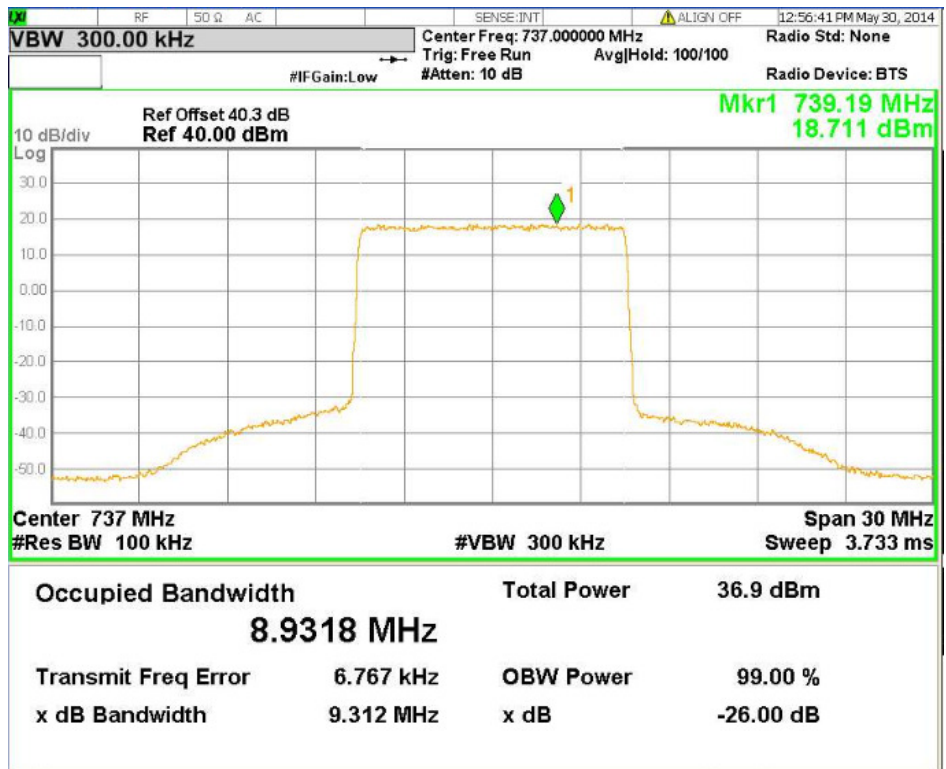
Channel Position M - QPSK / Bandwidth 10.0 MHz



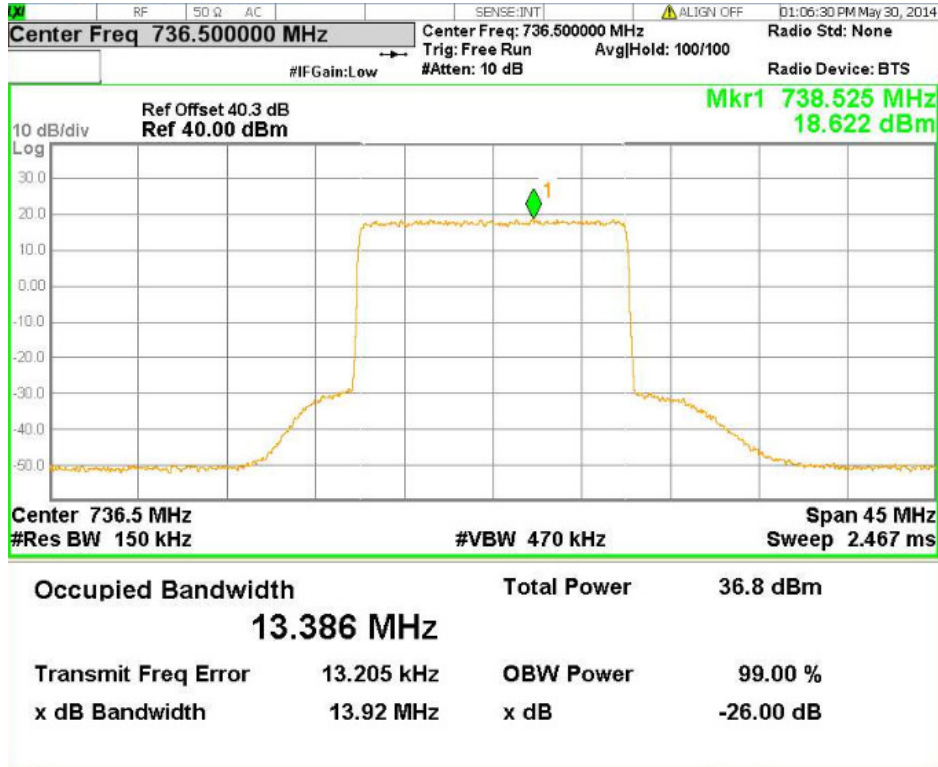
Channel Position M - 16QAM / Bandwidth 10.0 MHz



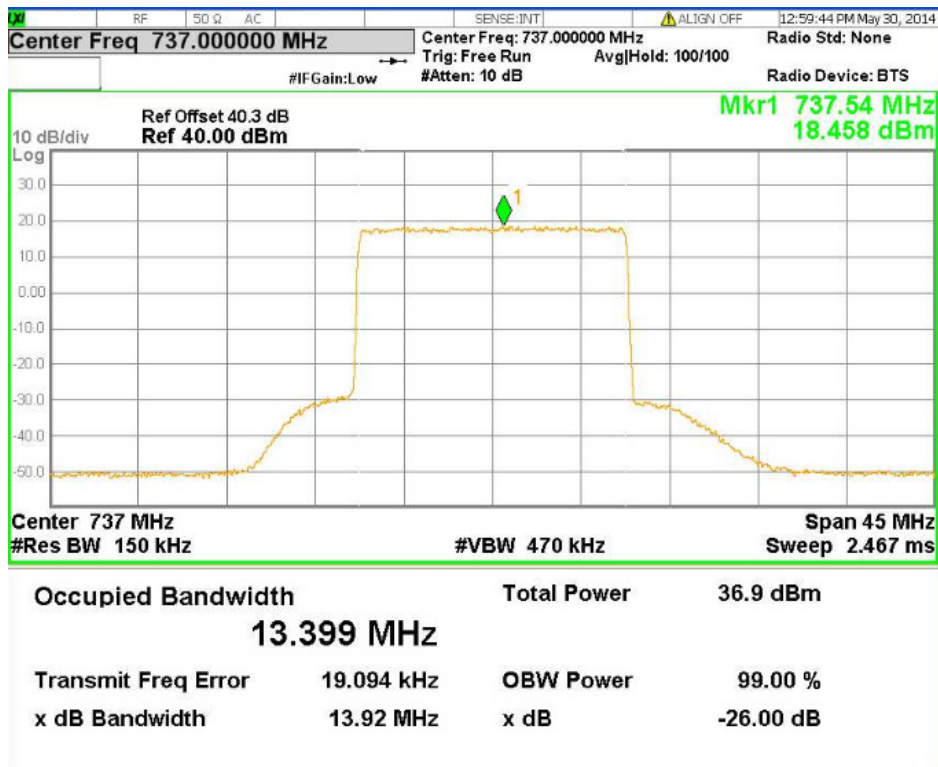
Channel Position M - 64QAM / Bandwidth 10.0 MHz



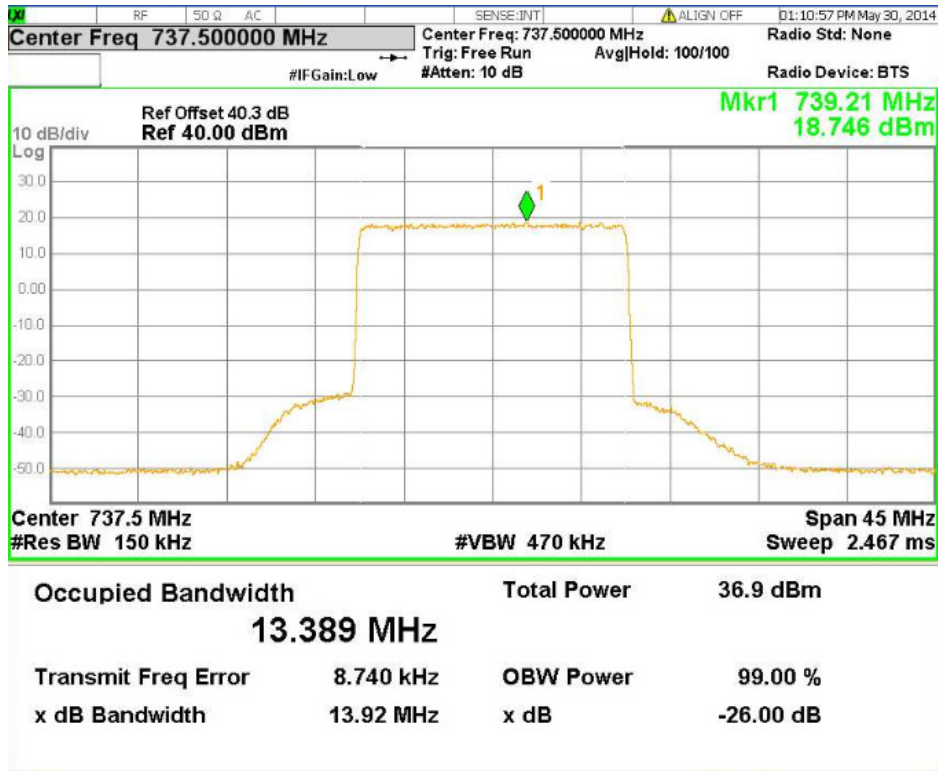
Channel Position B - QPSK / Bandwidth 15.0 MHz



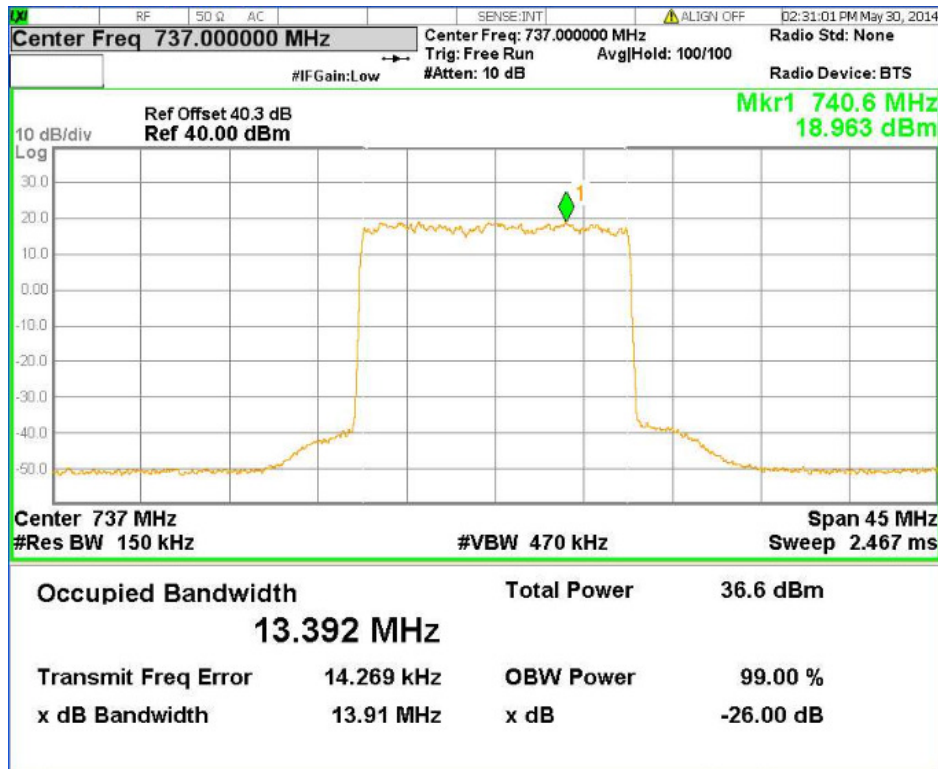
Channel Position M - QPSK / Bandwidth 15.0 MHz



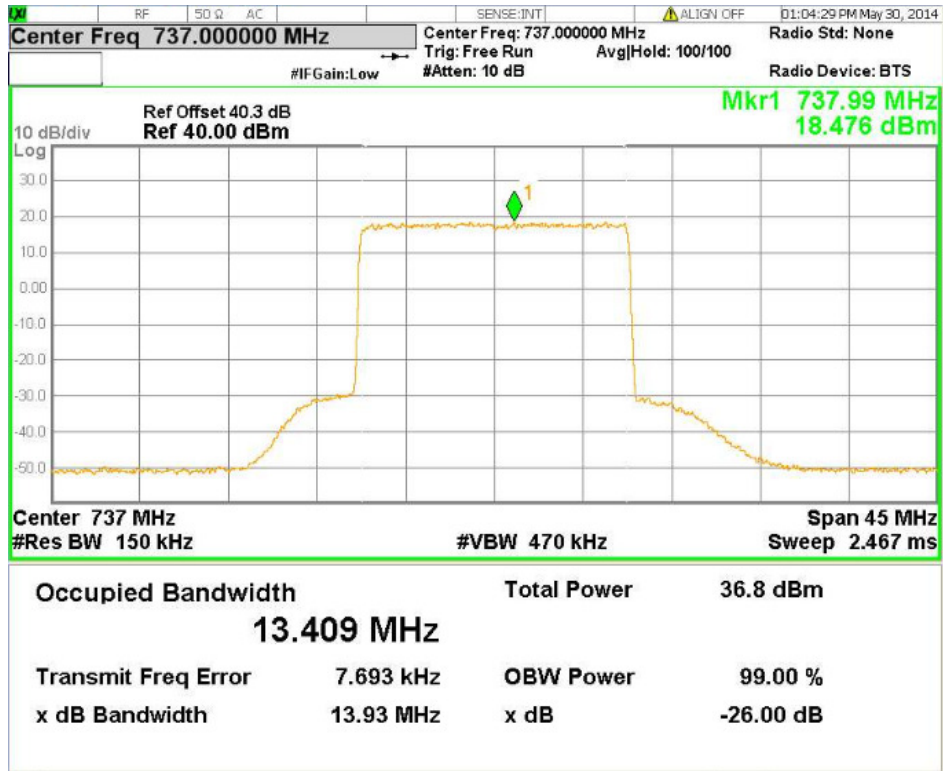
Channel Position T - QPSK / Bandwidth 15.0 MHz



Channel Position M - 16QAM / Bandwidth 15.0 MHz



Channel Position M - 64QAM / Bandwidth 15.0 MHz



2.4 SPURIOUS EMISSION AT BAND EDGE

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 27, Clause 27.53 (g)
Industry Canada RSS-130, Clause 4.6

2.4.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.4.3 Date of Test and Modification State

29 to 30 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	23.8 - 26.0°C
Relative Humidity	54.6 - 58.0%

2.4.6 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 27 and Industry Canada RSS-130.

In accordance with FCC CFR 47 Part 27, Clause 27.53 (g), any emissions outside of the block edges shall be attenuated by at least $43 + 10 \log(P)$. In the 100kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30kHz was used

For measurements of emissions > 100kHz away from the band edges, a RBW 30 kHz was used. As FCC rules specify a RBW 100kHz for measurements of emissions > 100kHz away from the band edges, to compensate for the reduced measurement bandwidth, the limit was adjusted from -13dBm to -18.2dBm.

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

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

The results are shown in the plots below.

2.4.7 Test Results

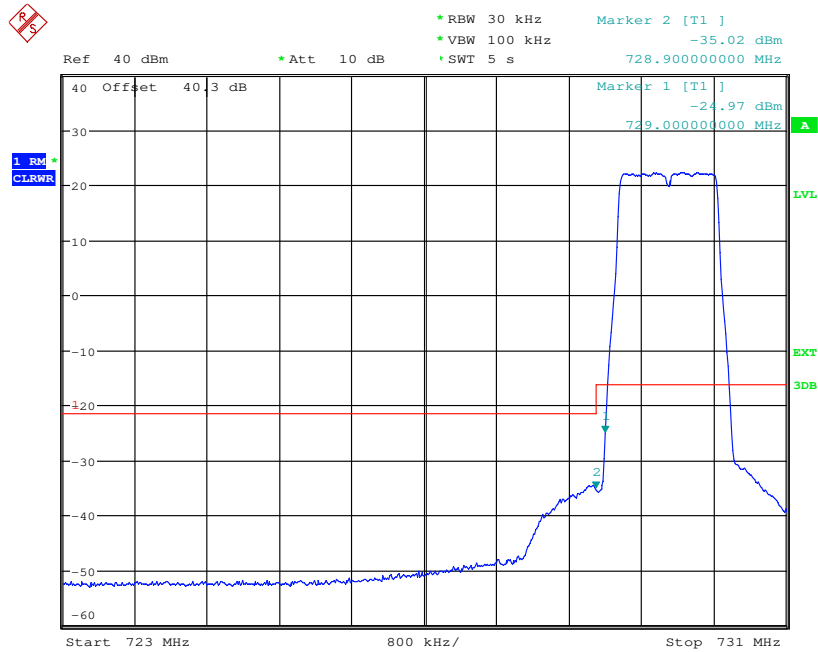
Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B 729.0 MHz	1.4 MHz	729.7MHz
	3.0 MHz	730.5MHz
	5.0 MHz	731.5MHz
	10.0 MHz	734.0MHz
	15.0 MHz	736.5MHz
Channel Position T 745.0 MHz	1.4 MHz	744.3MHz
	3.0 MHz	743.5MHz
	5.0 MHz	742.5MHz
	10.0 MHz	740.0MHz
	15.0 MHz	737.5MHz

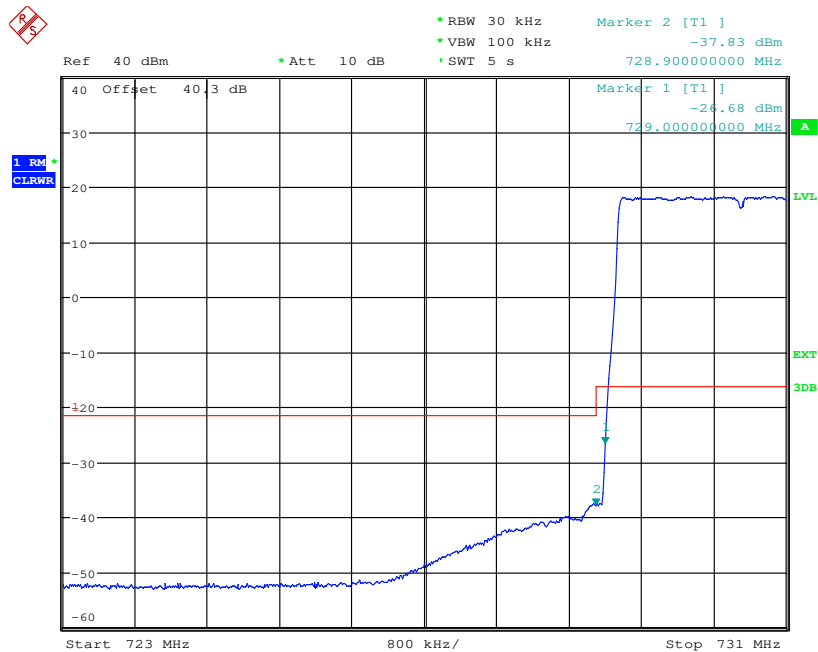
Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

Channel Position B - QPSK / Bandwidth 1.4 MHz



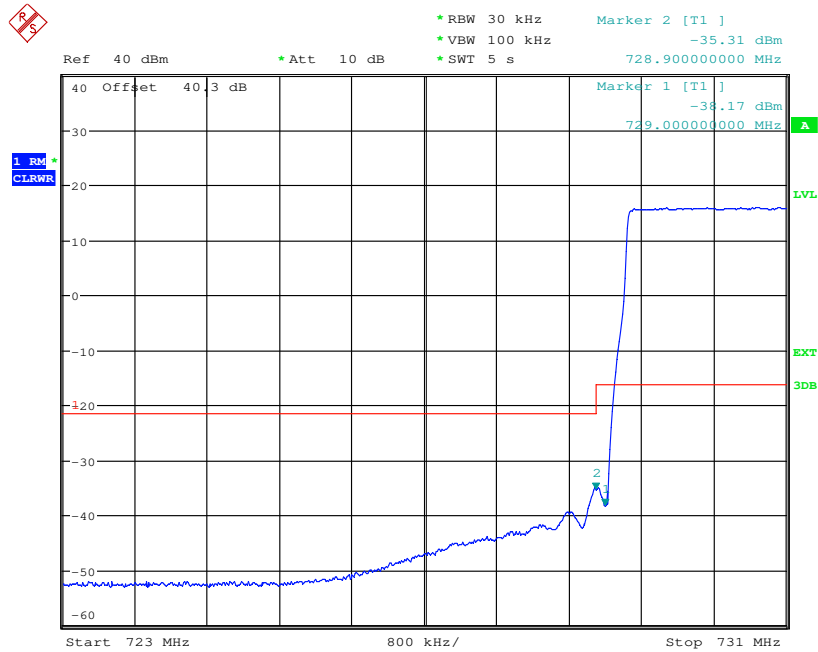
Date: 29.MAY.2014 10:46:03

Channel Position B - QPSK / Bandwidth 3.0 MHz



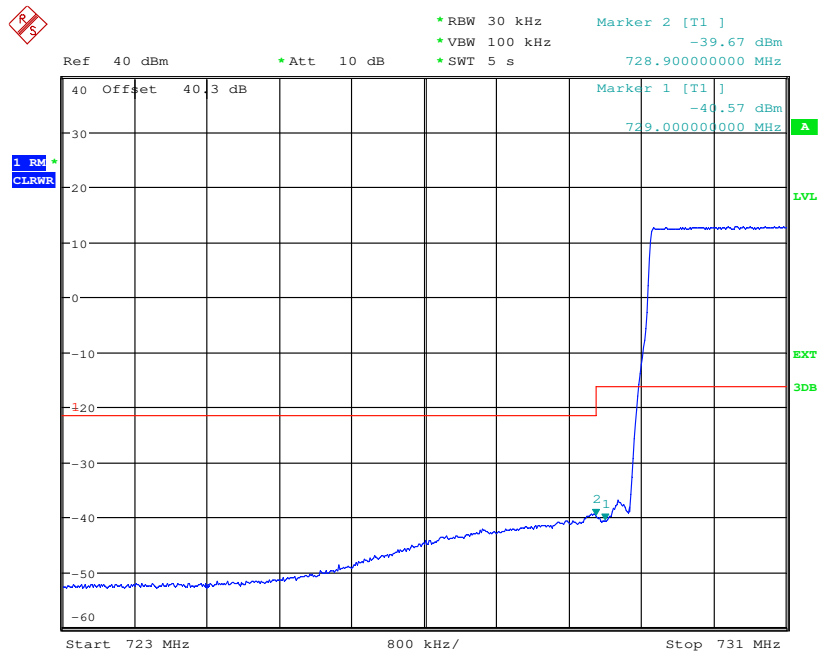
Date: 30.MAY.2014 05:12:49

Channel Position B - QPSK / Bandwidth 5.0 MHz



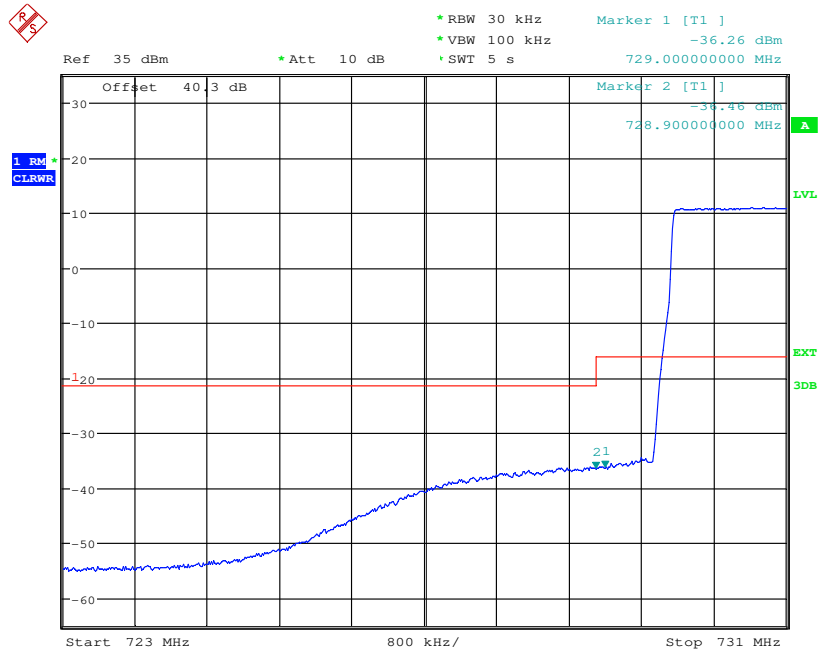
Date: 30.MAY.2014 05:29:09

Channel Position B - QPSK / Bandwidth 10.0 MHz



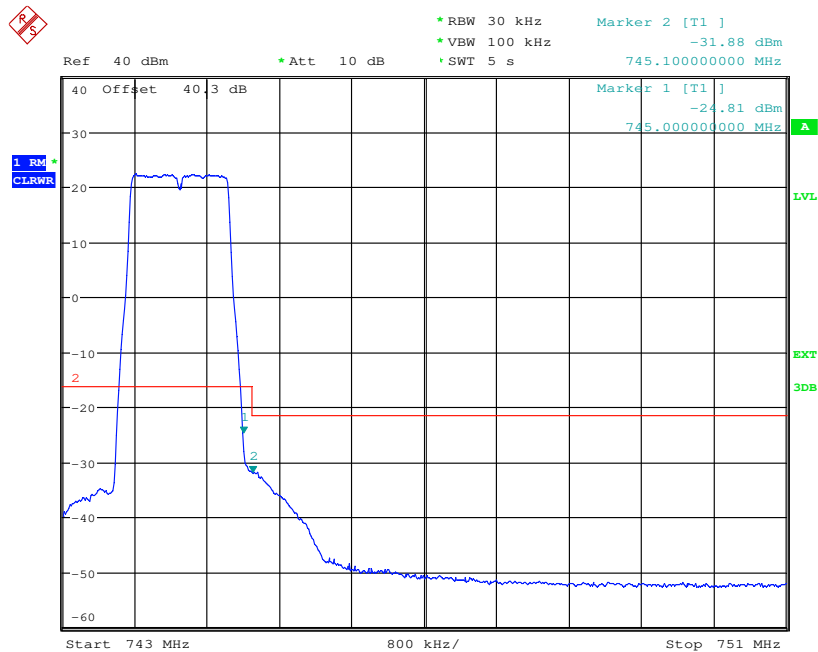
Date: 30.MAY.2014 05:27:10

Channel Position B - QPSK / Bandwidth 15.0 MHz



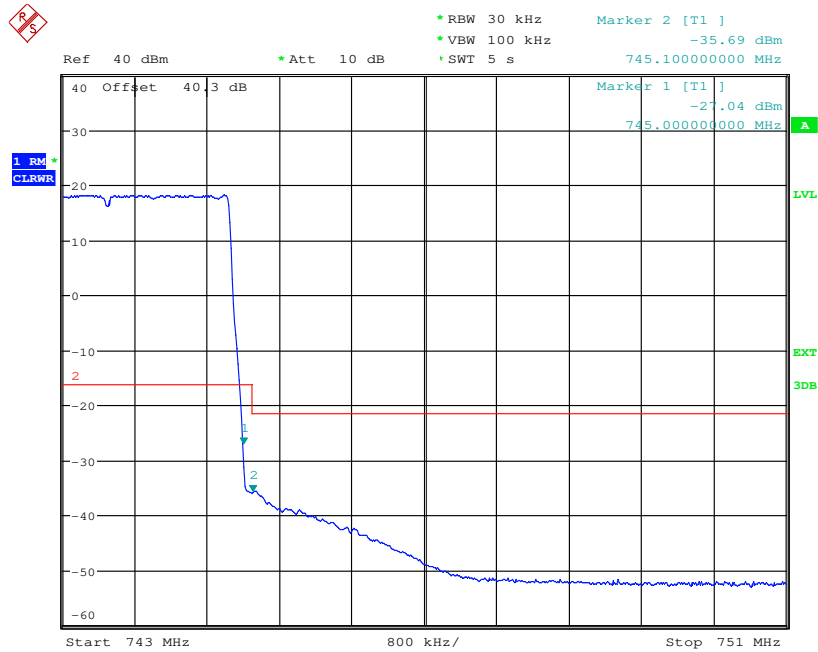
Date: 30.MAY.2014 04:55:20

Channel Position T - QPSK / Bandwidth 1.4 MHz



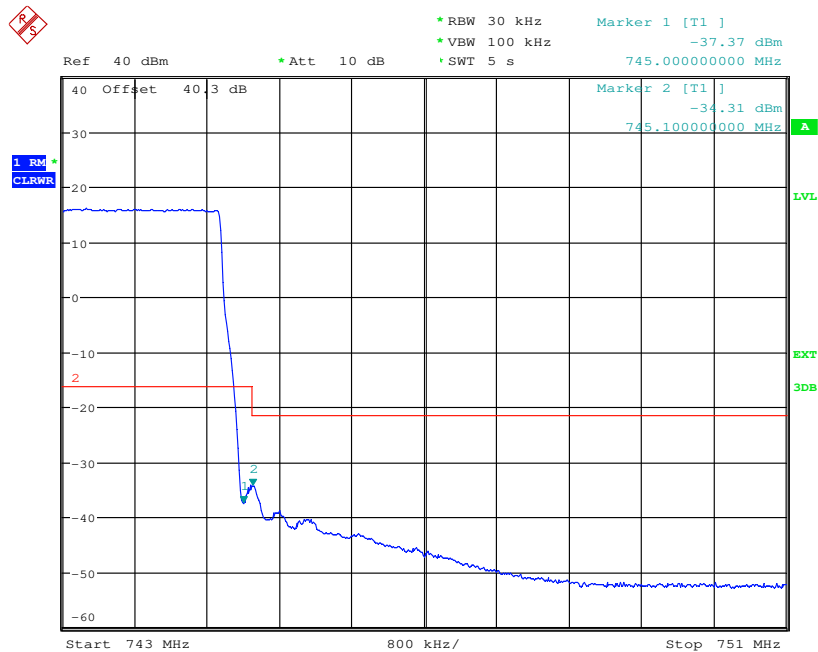
Date: 29.MAY.2014 11:18:37

Channel Position T - QPSK / Bandwidth 3.0 MHz



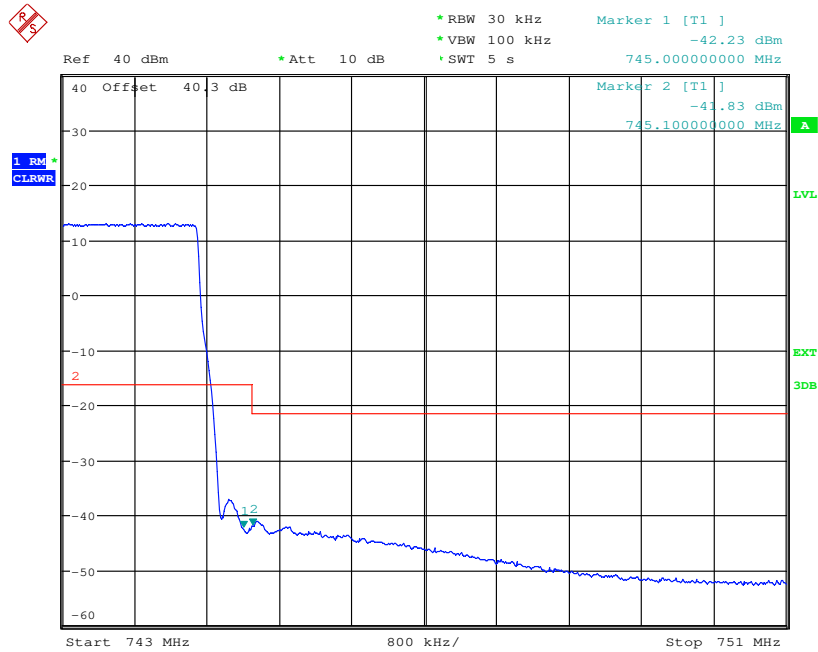
Date: 30.MAY.2014 05:20:19

Channel Position T - QPSK / Bandwidth 5.0 MHz



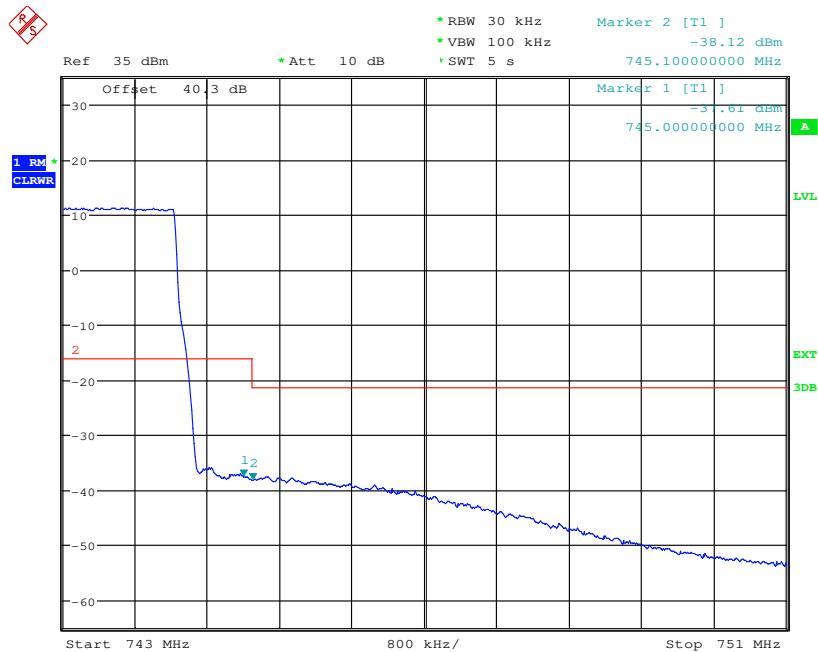
Date: 30.MAY.2014 05:23:22

Channel Position T - QPSK / Bandwidth 10.0 MHz



Date: 30.MAY.2014 05:25:36

Channel Position T - QPSK / Bandwidth 15.0 MHz



Date: 30.MAY.2014 05:00:10

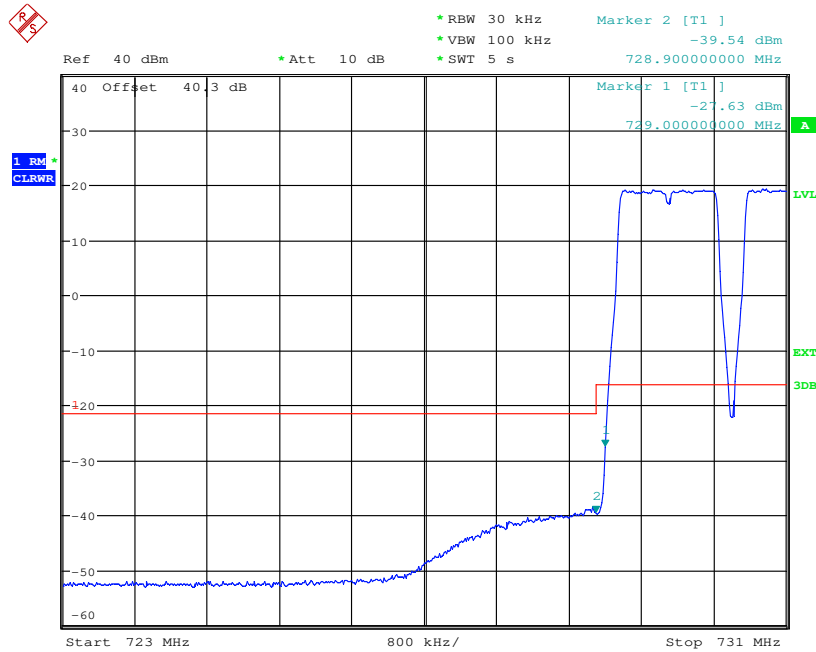
Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 34.0dBm per carrier

Band Edge Frequency	Channel Bandwidth	Edge Test with modulation QPSK Channel Frequencies
Channel Position B_{RFBW} 729.0 MHz	1.4 MHz	729.7MHz + 731.1MHz
	5.0 MHz	731.5MHz + 736.5MHz
Channel Position T_{RFBW} 745.0 MHz	1.4 MHz	742.9MHz + 744.3MHz
	5.0 MHz	737.5MHz + 742.5MHz

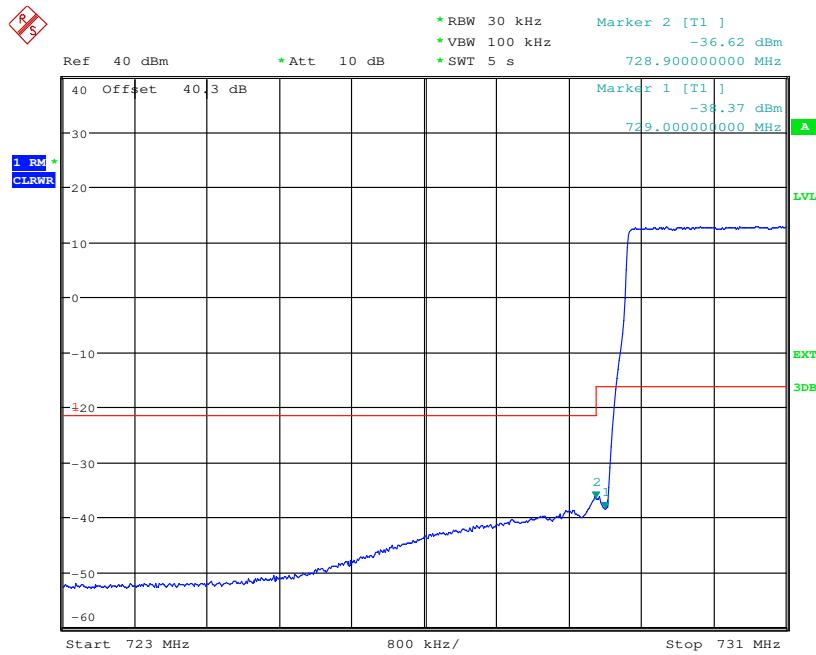
Note: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be made available to the end user.

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



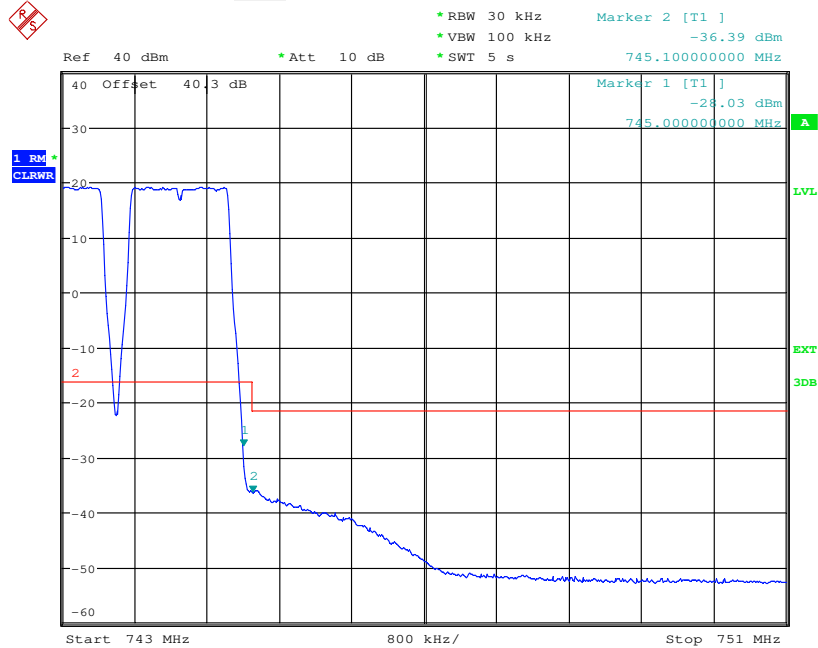
Date: 30.MAY.2014 05:33:31

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



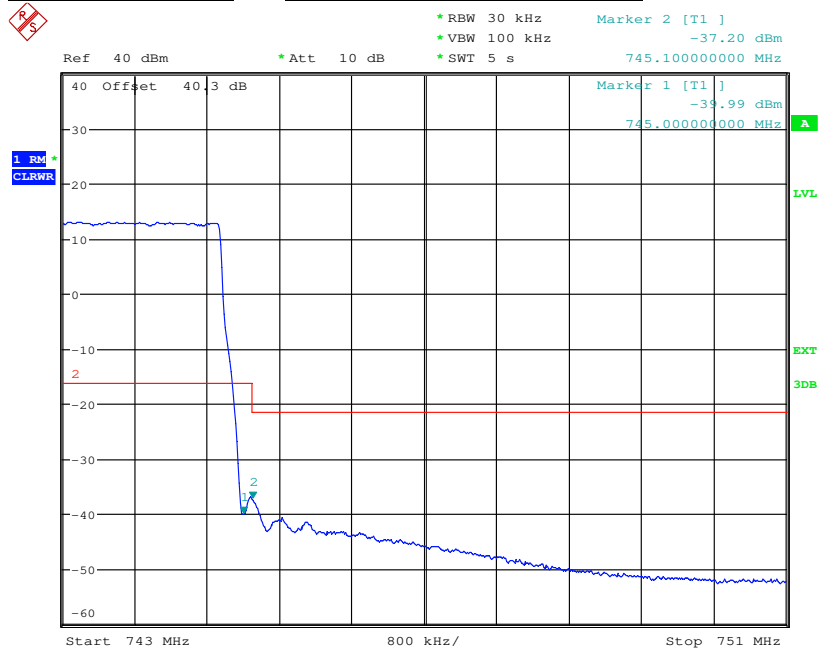
Date: 30.MAY.2014 05:38:23

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



Date: 30.MAY.2014 05:47:45

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



Date: 30.MAY.2014 05:42:16

Limit	-13 dBm
-------	---------

2.5 RADIATED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 27, Clause 27.53 (g)
Industry Canada RSS-130, Clause 4.6

2.5.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.5.3 Date of Test and Modification State

11 and 17 June 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	22.0 – 22.8°C
Relative Humidity	40.4 – 58.0%

2.5.6 Test Method

The test was applied in accordance with test method requirements of FCC CFR 47 Part 27, Industry Canada RSS-130 and TIA-603-C-2004.

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

Emissions identified within the range 30MHz – 10GHz were then formally measured using a Peak detector as the worst case.

The measurement of the outside a licensee's frequency band(s) of operation was performed with a resolution bandwidth of 100kHz.

The EUT was measured with the antenna height varied between 1 and 4m with the turntable rotated between 0 and 360 degrees. The emission of any outside a licensee's frequencies within 10dB of the limit were measured with the substitution method used according to the standard. The limits for outside a licensee's frequency band(s) of operation the power of the Spurious Emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - $(43 + 10\text{Log}(P))$ dB

Where:

Field Strength is measured in dB μ V/m

P is measured Transmitter Power in Watts

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

Determination of Spurious Emission Limit

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 dipole,
 P_o is the power out of the transceiver in W,
 d is the measurement distance in meters.

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

$$E_{(v/m)} = (30 \times 1.64 \times 4.50)^{0.5} / 3 = 4.96V/m = 133.91 \text{ dB}\mu V/m$$

The spurious emission must be attenuated by $43 + 10\log(P_o)$ dB this gives:

$$43 + 10\log(4.50) = 49.53 \text{ dB}$$

Therefore the limit at 3m measurement distance is:

$$133.91 - 49.53 = 84.4 \text{ dB}\mu V/m$$

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.

2.5.7 Test Results

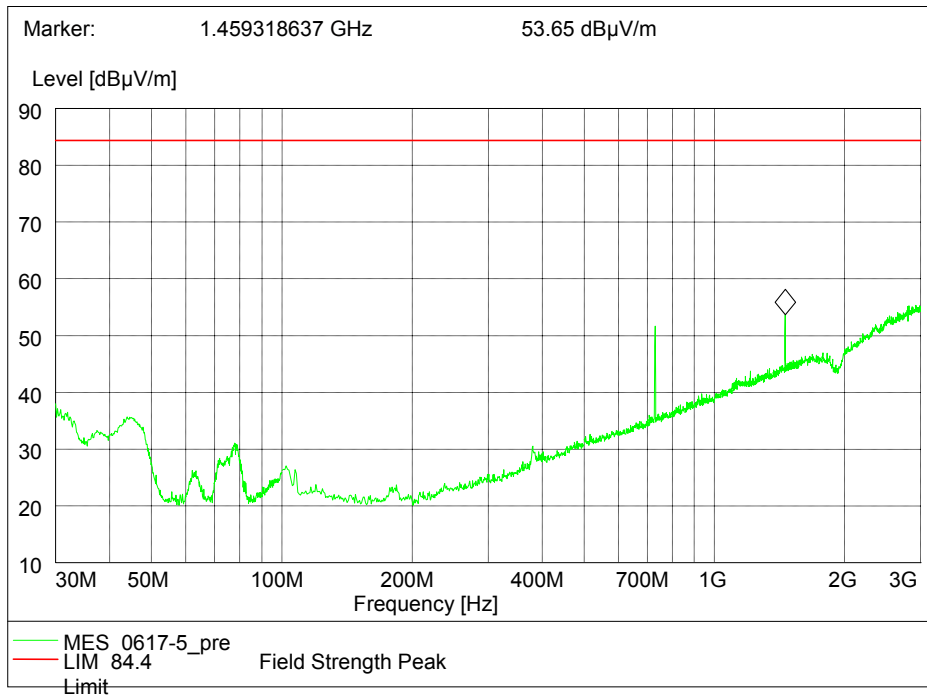
Note: Only the worst case results plots have been included as all of the emissions are greater than 20dB below the limit. A set of plots have been included to show the measurement system noise floor.

Configuration L-MIMO-SC

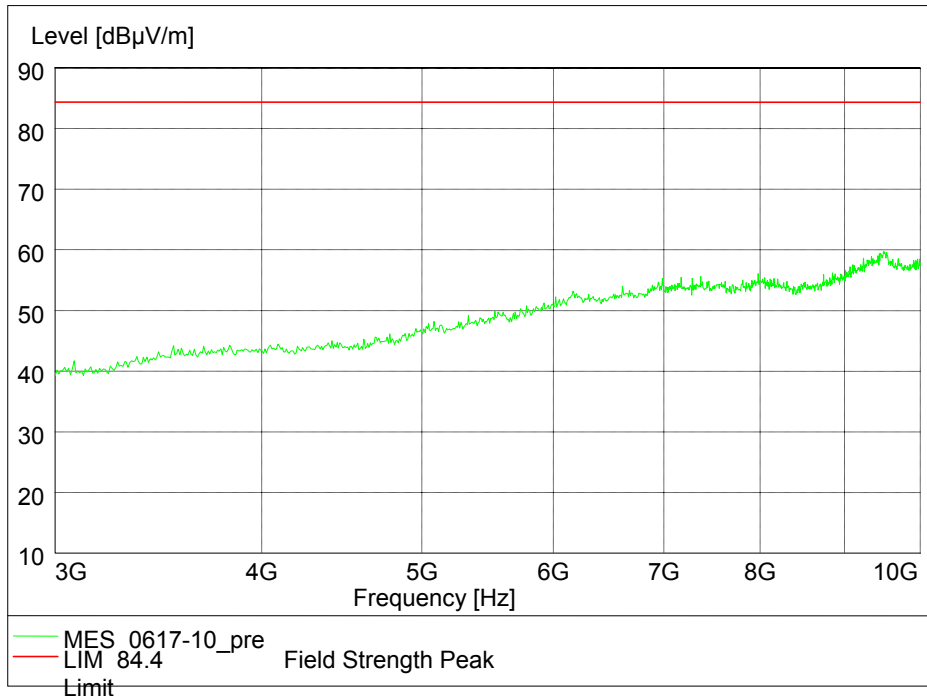
Maximum Output Power 37.0dBm per carrier, LTE Bandwidth 1.4MHz

Channel Position	Channel Frequencies
Channel Position B	729.7MHz
Channel Position M	737.0MHz
Channel Position T	744.3MHz

Channel Position B - QPSK / Bandwidth 1.4MHz - 30MHz – 3GHz



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



Channel Position M - QPSK / Bandwidth 1.4MHz

No emissions were detected within 20dB of the limit.

Channel Position M - 16QAM / Bandwidth 1.4MHz

No emissions were detected within 20dB of the limit.

Channel Position M - 64QAM / Bandwidth 1.4MHz

No emissions were detected within 20dB of the limit.

Channel Position T - QPSK / Bandwidth 1.4MHz

No emissions were detected within 20dB of the limit.

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

LTE Bandwidth 3.0MHz, 5.0MHz, 10.0MHz and 15.0MHz

Channel Position	Channel Frequencies
Channel Position M	737.0MHz

Channel Position M - QPSK / Bandwidth 3.0MHz

No emissions were detected within 20dB of the limit.

Channel Position M - QPSK / Bandwidth 5.0MHz

No emissions were detected within 20dB of the limit.

Channel Position M - QPSK / Bandwidth 10.0MHz

No emissions were detected within 20dB of the limit.

Channel Position M - QPSK / Bandwidth 15.0MHz

No emissions were detected within 20dB of the limit.

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 34.0dBm per carrier, LTE Bandwidth 1.4MHz

Channel Position	Channel Frequencies
Channel Position M _{RFBW}	729.7MHz + 744.3MHz

Channel Position M_{RFBW} - QPSK

No emissions were detected within 20dB of the limit.

Limit	-13dBm / 84.4dB μ V/m
-------	---------------------------

Remarks

The EUT does not exceed -13dBm / 84.4dB μ V/m.

2.6 CONDUCTED SPURIOUS EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 27, Clause 27.53 (g)
Industry Canada RSS-130, Clause 4.6

2.6.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.6.3 Date of Test and Modification State

29 to 30 June 2014 - Modification State 0

2.6.4 Test Equipment Used

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

2.6.5 Environmental Conditions

Ambient Temperature	23.8 - 26.0°C
Relative Humidity	54.6 - 58.0%

2.6.6 Test Method

The test was applied in accordance with test method requirements of FCC CFR 47 Part 27 and Industry Canada RSS-130.

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 27, Clause 27.53(g), any emissions outside a licensee's frequency band(s) of operation shall be attenuated by at least $43 + 10 \log (P)$, and the measurement was performed with a resolution bandwidth of 100 kHz.

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 27.53 (g), Peak detector with the trace set to Max Hold was used. The frequency spectrum was then investigated between 9kHz and 10GHz. Testing was carried out on the Bottom, Middle and Top channels.

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

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

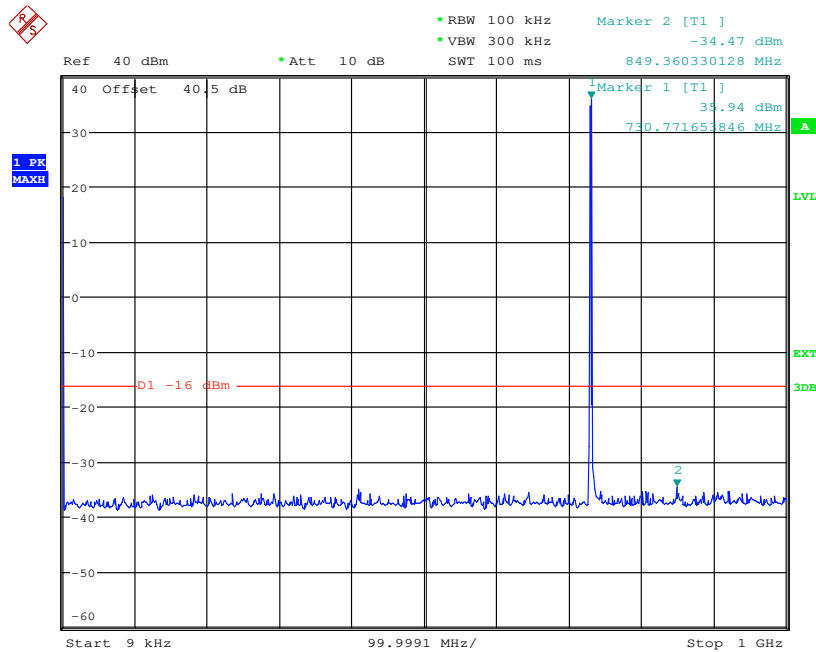
2.6.7 Test Results

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier

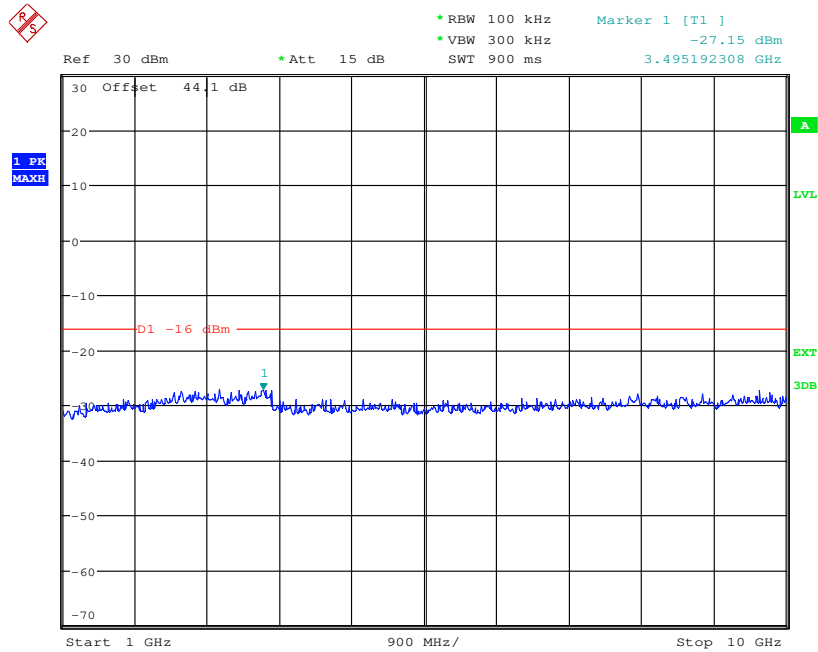
Channel Position	Bandwidth	Channel Frequency
Channel Position B	1.4MHz	729.7MHz
	15.0MHz	736.5MHz
Channel Position M	1.4MHz	737.0MHz
	15.0MHz	
Channel Position T	1.4MHz	744.3MHz
	15.0MHz	737.5MHz

Channel Position B - QPSK / Bandwidth 1.4MHz - 9kHz – 1GHz



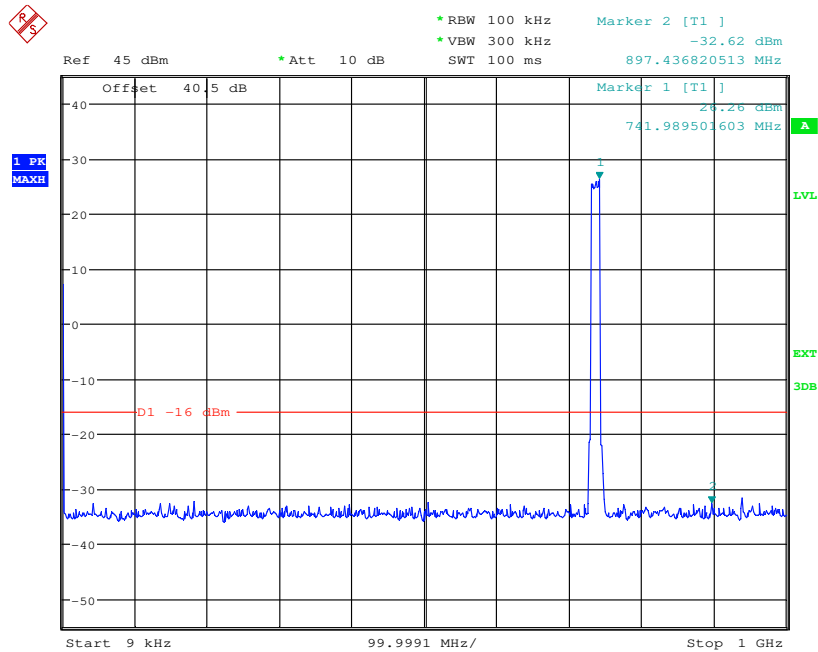
Date: 29.MAY.2014 11:01:16

Channel Position B - QPSK / Bandwidth 1.4MHz - 1GHz – 10GHz



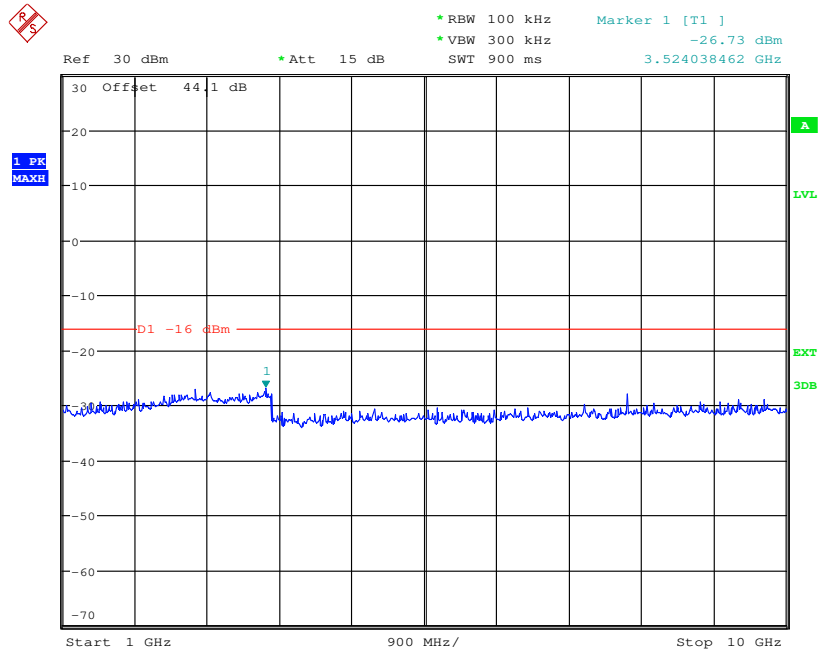
Date: 29.MAY.2014 11:02:41

Channel Position B - QPSK / Bandwidth 15.0MHz - 9kHz – 1GHz



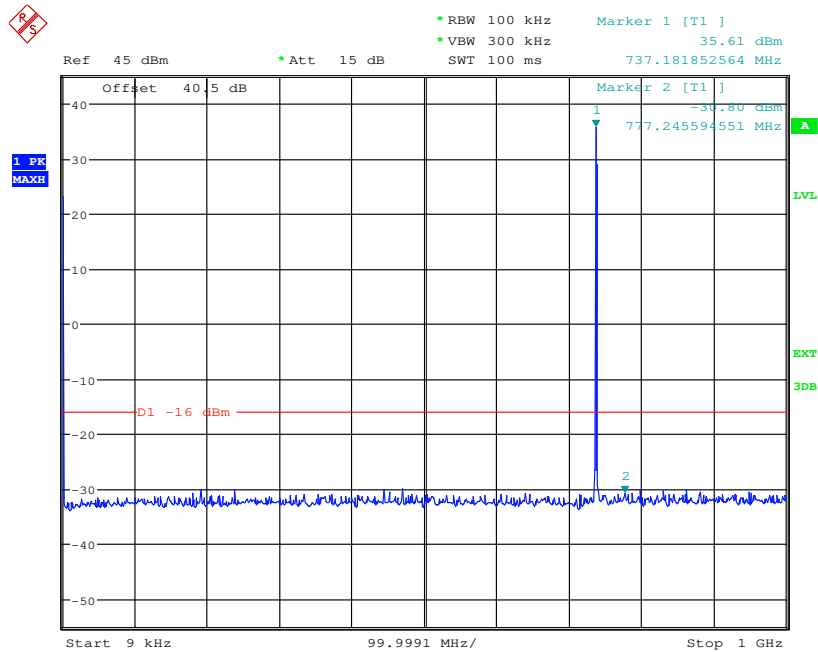
Date: 30.MAY.2014 04:50:28

Channel Position B - QPSK / Bandwidth 15.0MHz - 1GHz – 10GHz



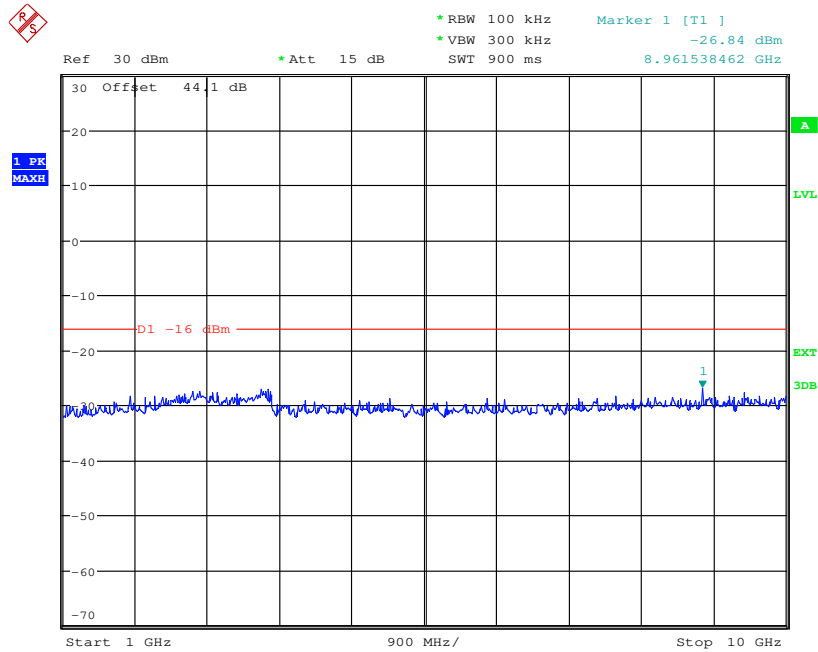
Date: 30.MAY.2014 04:49:44

Channel Position M - QPSK / Bandwidth 1.4MHz - 9kHz – 1GHz



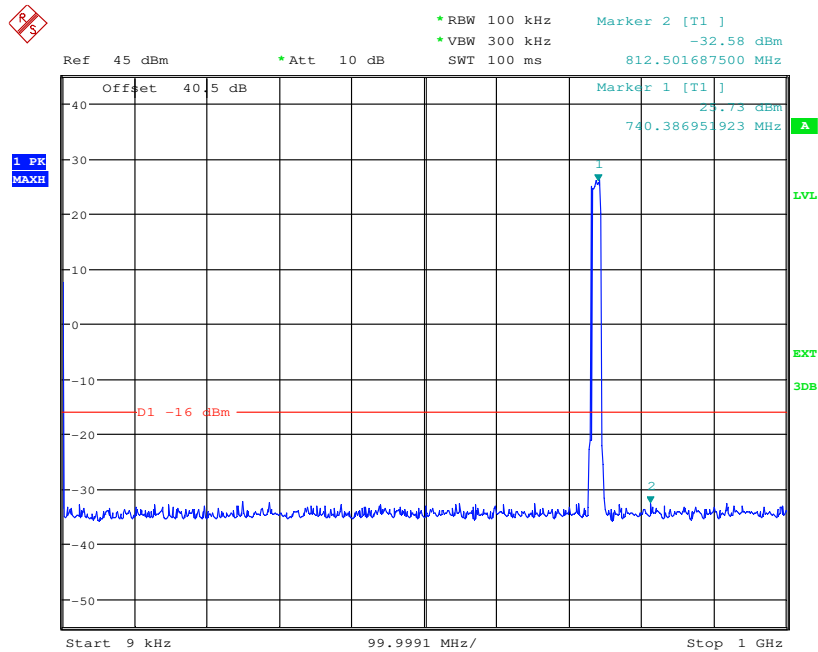
Date: 29.MAY.2014 11:08:14

Channel Position M - QPSK / Bandwidth 1.4MHz - 1GHz – 10GHz



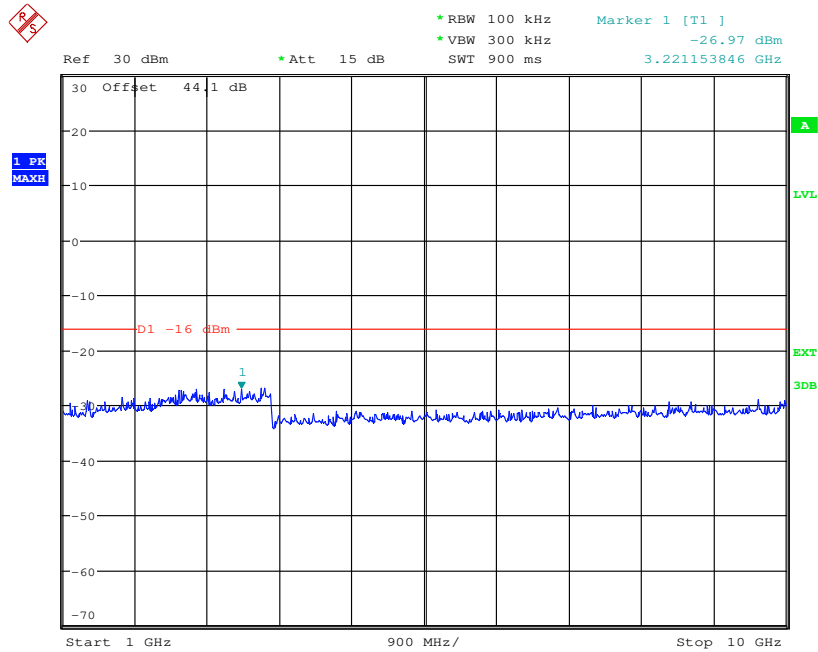
Date: 29.MAY.2014 11:06:35

Channel Position M - QPSK / Bandwidth 15.0MHz - 9kHz – 1GHz



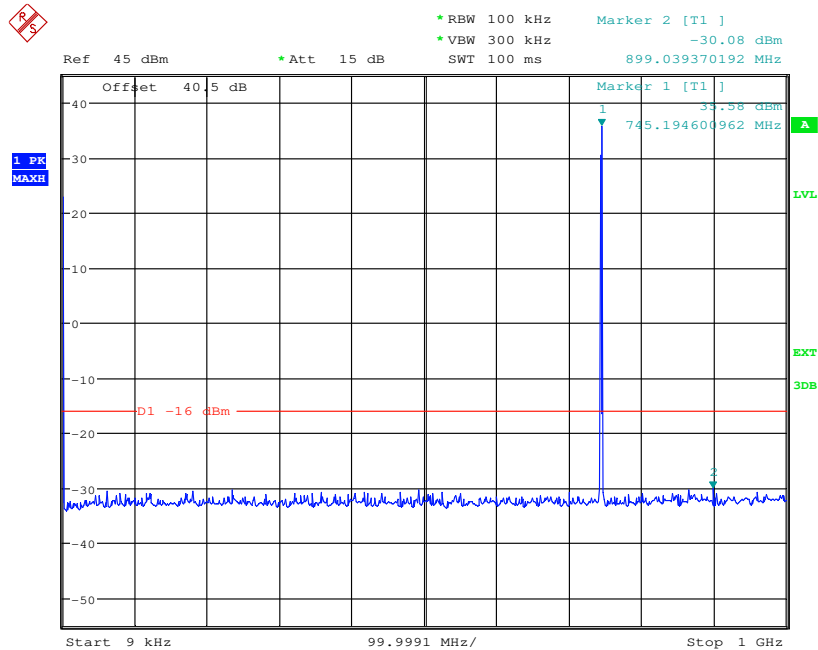
Date: 30.MAY.2014 04:41:45

Channel Position M - QPSK / Bandwidth 15.0MHz - 1GHz – 10GHz



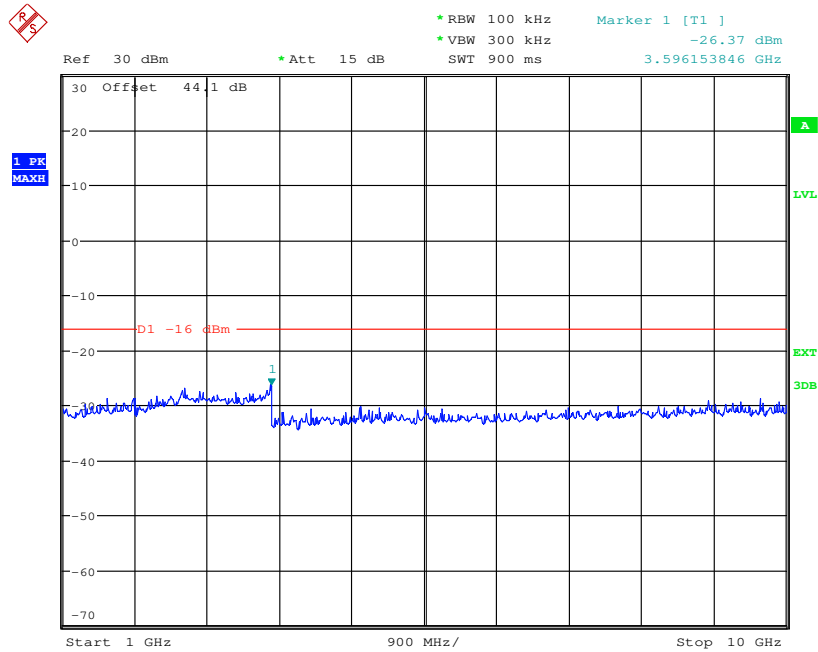
Date: 30.MAY.2014 04:42:35

Channel Position T - QPSK / Bandwidth 1.4MHz - 9kHz – 1GHz



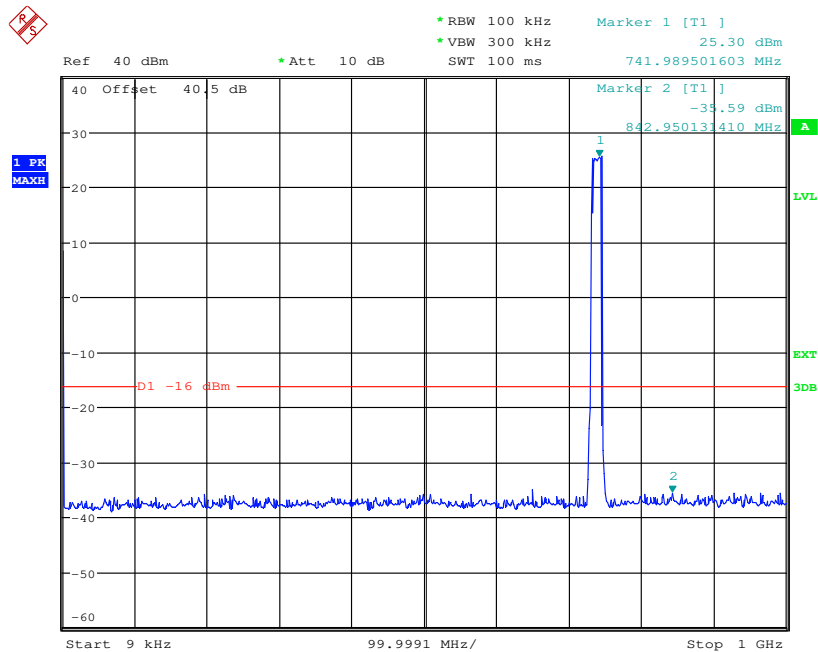
Date: 29.MAY.2014 11:19:46

Channel Position T - QPSK / Bandwidth 1.4MHz - 1GHz – 10GHz



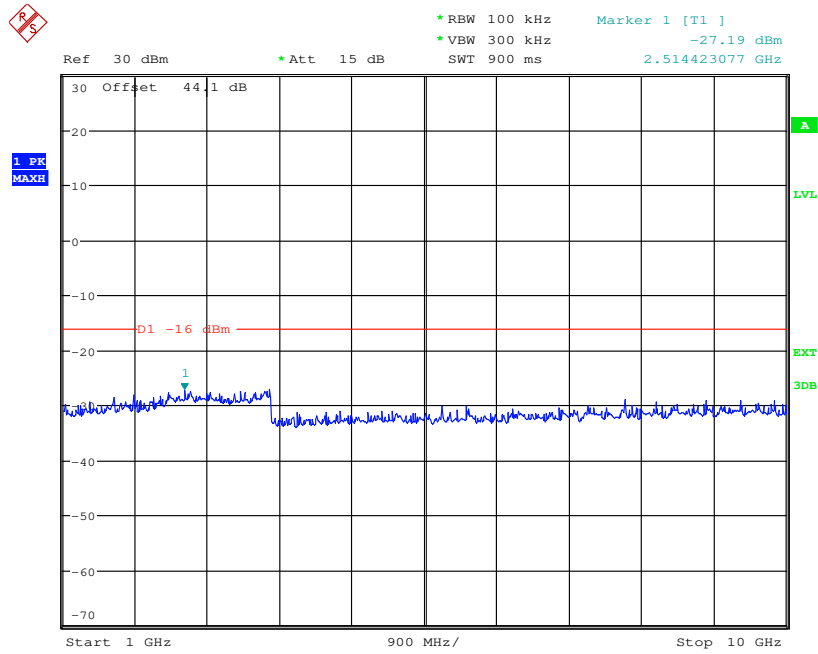
Date: 29.MAY.2014 11:20:27

Channel Position T - QPSK / Bandwidth 15.0MHz - 9kHz – 1GHz



Date: 30.MAY.2014 05:01:55

Channel Position T - QPSK / Bandwidth 15.0MHz - 1GHz – 10GHz



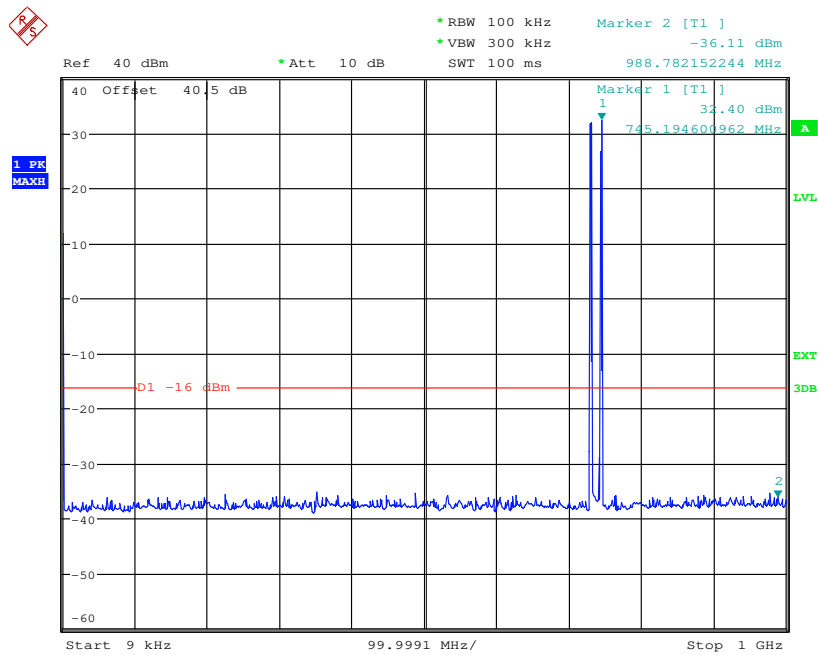
Date: 30.MAY.2014 05:02:37

Configuration L-MIMO-MC 1 (2C)

Maximum Output Power 34.0dBm per carrier

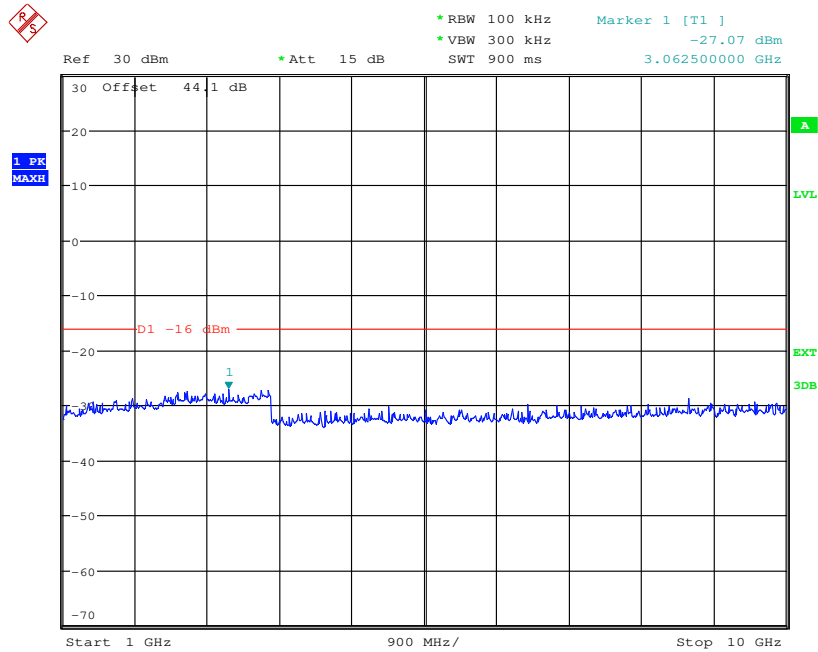
Channel Position	Bandwidth	Channel Frequency
Channel Position M _{RFBW}	1.4MHz	729.7MHz + 744.3MHz
	5.0MHz	731.5MHz + 742.5MHz

Channel Position M_{RFBW} - QPSK / Bandwidth 1.4MHz - 9kHz – 1GHz



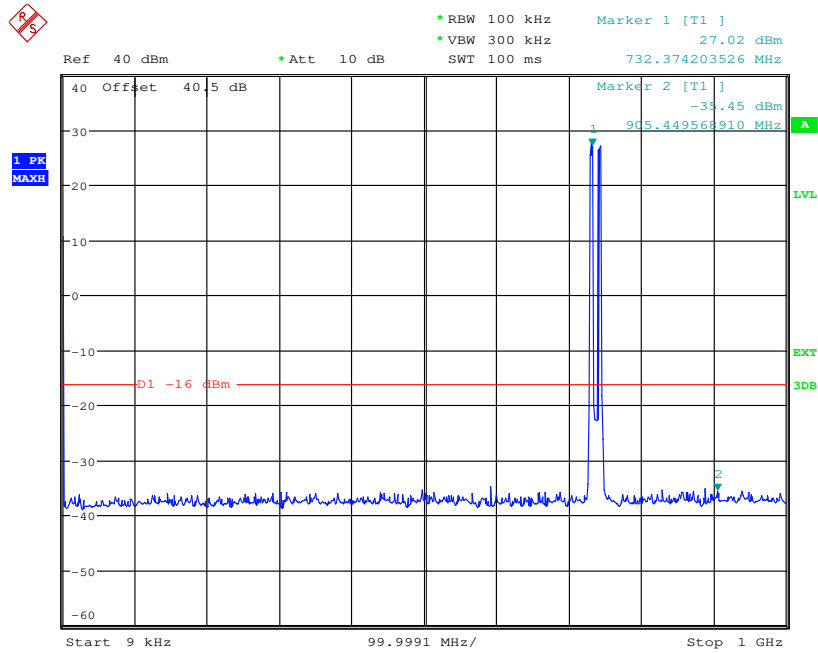
Date: 30.MAY.2014 05:50:01

Channel Position M_{RFBW} - QPSK / Bandwidth 1.4MHz - 1GHz – 10GHz



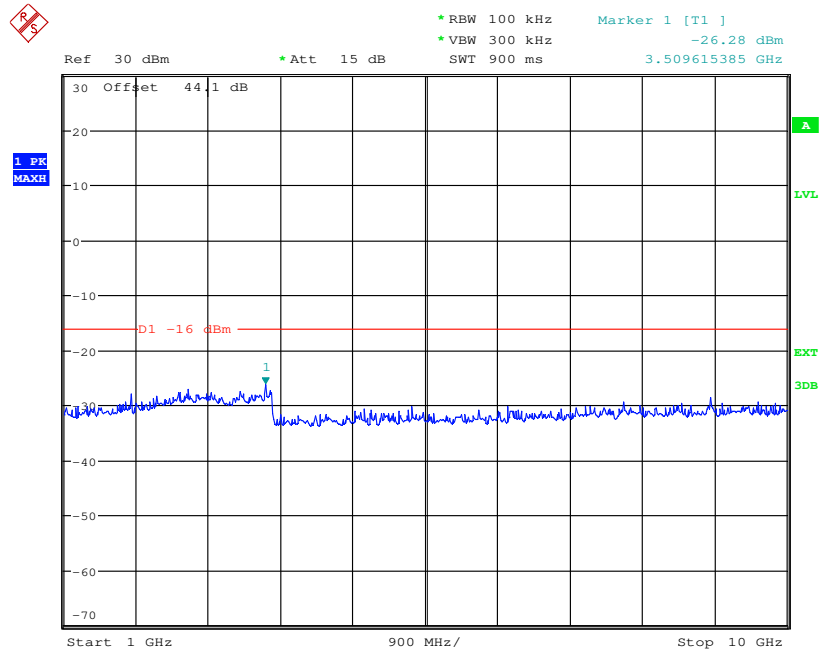
Date: 30.MAY.2014 05:50:51

Channel Position M_{RFBW} - QPSK / Bandwidth 5.0MHz - 9kHz – 1GHz



Date: 30.MAY.2014 05:54:27

Channel Position M_{RFBW} - QPSK / Bandwidth 5.0MHz - 1GHz – 10GHz



Date: 30.MAY.2014 05:53:30

Limit	-13dBm
-------	--------

2.7 FREQUENCY STABILITY

2.7.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 27, Clause 27.54
Industry Canada RSS-130, Clause 4.3

2.7.2 Equipment Under Test

RBS 6501 B12, KRD 901 112/1, S/N: CB4T818585
RBS 6501 B12, KRD 901 112/2, S/N: CB4T811855

2.7.3 Date of Test and Modification State

22 January and 21 June 2014 - Modification State 0

2.7.4 Test Equipment Used

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

2.7.5 Environmental Conditions

Ambient Temperature	22.5 - 23.5°C
Relative Humidity	23.5 - 25.5%

2.7.6 Test Method

The test was applied in accordance with test method requirements of FCC CFR 47 Part 27 and Industry Canada RSS-130.

Frequency Error – Temperature Variation

The EUT was tested over the temperature range -30°C to +50°C in 10°C steps with -48 VDC Power Supply. At each temperature step, the Base Station was configured to transmit an [RAT]* at maximum power on the middle channel of the operating band. After achieving thermal balance, the averages of 200 transmission bursts were measured and the result recorded.

Frequency Error – Voltage Variation

The EUT was tested at the supplied voltages varied from 85 to 115 percent of the nominal values of both -48 VDC and 120 VAC power supplies. At +20°C, the Base Station was configured to transmit an [RAT]* at maximum power on the middle channel of the operating band. The average of 200 transmission bursts was measured and the result recorded.

Frequency range

Using a resolution bandwidth of 1% of the occupied bandwidth, a reference point at the unwanted emission level which complies with the attenuation of $43 + 10 \log_{10} p$ (watts) on the emission mask of the lowest and highest channel shall be selected, and the frequency at these points shall be recorded as F_L and F_H respectively.

[RAT]* LTE (3.0 MHz OBW) – Single Carrier with QPSK modulation

Test Results

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier, Channel Bandwidth 3MHz

Supply Voltage DC (V)	Temperature	Frequency Stability (Hz)
		Channel Position M (737.0MHz)
-48.0	-30°C	+9.87
	-20°C	+10.69
	-10°C	+12.77
	0°C	+9.71
	+10°C	+9.60
	+20°C	+9.63
	+30°C	+10.60
	+40°C	+11.86
	+50°C	+11.37

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier, Channel Bandwidth 3MHz

Supply Voltage DC (V)	Temperature	Frequency Stability (Hz)
		Channel Position M (737.0MHz)
-40.8 V	+20°C	+9.11
-48.0 V		+9.63
-55.2 V		+10.35

Supply Voltage AC (V)	Temperature	Frequency Stability (Hz)
		Channel Position M (751.0MHz)
102.0 V	+20°C	-6.34
120.0 V		+7.05
138.0 V		+6.40

Configuration L-MIMO-SC

Maximum Output Power 37.0dBm per carrier, Channel Bandwidth 3MHz

Supply Voltage DC (V)	Channel Position B	Temperature	Frequency offset (Hz)	F _L (MHz)	Frequency Stability (MHz)
-48.0	730.5MHz	-30°C	8.59	729.025641026	729.025632436
		+20°C	8.02	729.025641026	729.025633006
		+50°C	8.22	729.025641026	729.025632806

Supply Voltage DC (V)	Channel Position T	Temperature	Frequency offset (Hz)	F _H (MHz)	Frequency Stability (MHz)
-48.0	743.5MHz	-30°C	10.37	744.974358974	744.974369344
		+20°C	8.81	744.974358974	744.974367784
		+50°C	8.30	744.974358974	744.974367274

Limit	Frequency Stability :± (0.05ppm or +12 Hz) or ±48.85 Hz ¹
	IC: F _L minus the frequency offset and F _H plus the frequency offset shall be within the frequency range in which the equipment is designed to operate.

Remarks

¹ Limit according to 3GPP TS 36.141 V10.10.0.

The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges at any temperature and voltage interval across the measured range.



Product Service

SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Maximum Peak Output Power and Peal to Average Ratio - Conducted					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Power Meter	Rohde & Schwarz	NRP2	101285	12	15-Apr-2015
Power Sensor	Rohde & Schwarz	NRP-Z51	102168	12	15-Apr-2015
Power Sensor	Rohde & Schwarz	NRP-Z51	102121	12	15-Apr-2015
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
40dB Attenuator	Shanghai Huaxiang	DTS50-40dB-3G	14012126	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Maximum Peak Output Power - Radiated					
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2014
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2014
Double-Ridged Wave-guide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2014
Antenna master	Frankonia	MA 260	-	-	19-Aug-2014
Semi Anechoic Chamber	Frankonia	23.18m×16.88m×9.60m	-	12	19-Aug-2014
Single Generator	Rohde & Schwarz	SMR40	100152	12	19-Aug-2014
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
DC Power Supply	Dahua	DH1716-5D	2007060047	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151655	12	12-Dec-2014
Occupied Bandwidth					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101202	12	04-Aug-2014
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Spurious Emissions at Band Edge					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101202	12	04-Aug-2014
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
Conducted Spurious Emission					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101202	12	04-Aug-2014
Spectrum Analyser	Rohde & Schwarz	FSW	100615	12	31-Jul-2014
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Radiated Spurious Emissions					
Load	Shanghai Huaxiang	TF150-3	06081410	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121614	-	O/P MON
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2014
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2014
Double-Ridged Wave-guide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2014
Pyramidal Horn Antenna	EMCO	3160-09	760840	12	19-Aug-2014
Pyramidal Horn Antenna	EMCO	3160-10	808234	12	19-Aug-2014
Antenna master	Frankonia	MA 260	-	-	19-Aug-2014
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	-	TU
Semi Anechoic Chamber	Frankonia	23.18m×16.88m×9.60m	-	12	19-Aug-2014
DC Power Supply	Dahua	DH1716-5D	2007060047	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151655	12	12-Dec-2014
Frequency Stability					
Network Analyzer	Agilent	8720D	US36140166	12	17-Nov-2014
Spectrum Analyser	Rohde & Schwarz	FSQ26	101202	12	04-Aug-2014
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Climate Chamber	Shang Hai Zenda	ZTH100U	10080065	-	O/P MON
Load	Shanghai Huaxiang	TFE100	09121647	-	O/P MON
DC Power Supply	Dahua	DH1716A-10	1000303181	-	O/P MON
AC Power Supply	Chroma	6530	ETD/L710	12	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151655	12	12-Dec-2014

N/A – Not Applicable

OP MON – Output Monitored with Calibrated Equipment

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30MHz to 10GHz Amplitude	0.5dB*
ERP	30MHz to 18GHz Amplitude	2.6dB
Conducted Emissions	30MHz to 40GHz Amplitude	3.0dB*
Frequency stability	30MHz to 2GHz	$<\pm 1 \times 10^{-7}$
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Worst case error for both Time and Frequency measurement 12 parts in 10^6		

* In accordance with CISPR 16-4



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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

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

© 2014 TÜV SÜD Product Service