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Report On

FCC and IC Testing of the
Ericsson RD 2242 B13 (746-756 MHz) LTE Base Station in accordance
with FCC CFR 47 Part 2 and 27 and Industry Canada RSS-130 and
RSS-Gen

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRY901334-1

IC: 287AB-AS9013341

PREPARED BY

Neil Rousell
Senior Engineer (RF)

APPROVED BY

Ryan Henley
Authorised Signatory

DATED

27 February 2015

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February 2015

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SECTION 1

REPORT INFORMATION



Product Service

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	349 Terry Fox Drive Ottawa Ontario K2K 2V6
Product Name	RD 2242 B13
Product Number	KRY 901 334/1
IC Model Name	AS9013341
Serial Number(s)	C829198777
Software Version	CXP9013268/14_R59FJ
Hardware Version	R1B
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2014 FCC CFR 47 Part 27: 2014 Industry Canada RSS-130 Issue 1: Oct 2013
Start of Test	28 January 2015
Finish of Test	02 February 2015
Name of Engineer(s)	Neil Rousell
Related Document(s)	Industry Canada RSS-GEN Issue 4: Nov 2014

1.2 BRIEF SUMMARY OF RESULTS

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

Section	Spec Clause			Test Description	Result
	Part 2	Part 27	RSS 130 / RSS-Gen		
2.1	2.1046	27.50(b)	4.4	Maximum Peak Output Power – Conducted	Pass
2.2	2.1049(h)	27.53(c)(1)	RSS-Gen 6.6	Occupied Bandwidth	Pass
2.3	2.1051	27.53(c)	4.6 / 6.13	Spurious Emissions at Band Edge	Pass
2.4	2.1051	27.53(c)	4.6 / 6.13	Conducted Spurious Emissions	Pass
2.5	2.1055	27.54	4.3 / 6.11	Frequency Stability Under Temperature Variations	Pass
2.6	2.1055	27.54	4.3 / 6.11	Frequency Stability Under Voltage Variations	Pass
-	-	-	RSS-Gen 7.1	Receiver Spurious Emissions	Pass*
-	2.1053	27.53	RSS-Gen 6.13	Transmitter Radiated Emissions	Pass*

N/A – Not Applicable.

* - Reference Flextronics Design Validation Centre, Canada EMC Test Report: Reference Number K002569-TR-EMC-03-R1.

Flextronics Canada Design Services Inc.

1280 Teron Side Road
Kanata, Ontario, K2K 2C1
Canada

Accreditations (Flextronics)

The Design Validation Centre (DVC) test facilities are accredited by the Standards Council of Canada (SCC) to ISO/IEC 17025 in accordance with the scope of accreditation outlined at the web site http://palcan.scc.ca/Specs/PDF/95_e.pdf. The SCC is a signatory of the APLAC [4] and ILAC [14] Mutual Recognition Arrangements. The SCC's Laboratory Accreditation Program has been evaluated and has demonstrated its competence to operate according to the requirements of ISO/IEC 17011.

- 4) APLAC, Asia Pacific Laboratory Accreditation Cooperation, Website (<http://www.aplac.org>).
14) ILAC, International Laboratory Accreditation Cooperation, Website (<http://www.ilac.org/>)

1.3 CONFIGURATION DESCRIPTION

The RD 2242 B13 / KRY 901 334/1 supports Single and Dual Carrier operation from either a single or dual port configuration.

The RD 2242 B13 / KRY 901 334/1 supports LTE Test Models E-TM1.1, E-TM3.1 and E-TM3.2 in Band 13 (746 MHz – 756 MHz). The following test models were used as defined in 3GPP TS 36.141. Test Model E-TM1.1 was used to represent QPSK modulation, Test Model E-TM3.1 was used to represent 64QAM modulation, and Test Model E-TM3.2 was used to represent 16QAM modulation.

The RD 2242 B13 has been tested and authorized for LTE Transmission SC, MC. The LTE Test Model used, unless otherwise stated was E-TM1.1.

For TX test cases: Maximum Conducted Output Power, Spurious Emissions at Antenna Terminals (± 1 MHz) and Conducted Spurious Emissions, measurements were performed on both RF Ports using a test limit accounting for MIMO operation with 2 ports. All RF ports were tested for RF Carrier Power and results recorded using the Measure and Sum approach to account for MIMO operation. The test limits shown are representative of the worst case. All testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

The EUT was powered via POE (Power Over Ethernet) from the IRU 2242 using a -48V DC Power supply.

Channel Configurations LTE B13

746 MHz – 756 MHz

All tests

Mode Description	RAT	Number of Carriers	Bandwidth	Carrier Frequency Configuration (MHz)		
				Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
LTE-SC	LTE	1	5 MHz	748.5	751	753.5
LTE-SC	LTE	1	10 MHz		751	
LTE-MC	LTE	2	5 MHz	-	748.5 + 753.5	-

Table 1

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Dot
MANUFACTURER	Ericsson
TYPE	Remote Radio Base Station
PART NUMBER	KRY 901 334/1
SERIAL NUMBER	C829198777
HARDWARE VERSION	R1B
SOFTWARE VERSION	R59FJ
TRANSMITTER OPERATING RANGE	746MHz – 756MHz
RECEIVER OPERATING RANGE	777MHz – 787MHz
COUNTRY OF ORIGIN	Sweden
INTERMEDIATE FREQUENCIES	DL 140MHz – 150 MHz, UL 70MHz – 80MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE 5M00 W7D 10M0 W7D
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM, 64QAM
HIGHEST INTERNALLY GENERATED FREQUENCY	787MHz
OUTPUT POWER (W or dBm)	2 x 0.05W (17dBm)
FCC ID	TA8AKRY901334-1
INDUSTRY CANADA ID	287AB-AS9013341
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RD 2242 B13 (KRY 901 334/1) is a Remote Radio Unit forming part of the Ericsson Radio Base Station (RBS) equipment. The RD provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 2 Transmit ports in Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.05W per port over an operational temperature of 5°C to +40°C. The unit is designed to be ceiling mounted.

Signature:



David Bolzon

Date: 09 February 2015

Declaration of Build Status Serial Number: C829198777

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 RD 2242 B13 (KRY 901 334/1) is a multi-standard radio forming part of Ericsson's RBS 6000 series Radio Base Station (RBS) equipment. The RD 2242 (Radio Dot System) product provides radio access for mobile and fixed devices and is intended for the indoor environment.

An ethernet interface provides the RD 2242 with a power, control and digital communications between the RD 2242 and RBS. The location of the RD 2242 with respect to the RBS is limited to a distance of 100 metres.

The RD 2242 B13 supports two (2) Transmit / Receive ports operating in the E-UTRA Band 13 at a Downlink (transmit) frequency from 746 MHz to 756 MHz and an Uplink (receive) frequency from 777 MHz to 787 MHz. The radio operates in FDD (Frequency Division Duplex) with a duplex spacing of 31 MHz and supports operation on LTE Radio Access Transmission Standard (RAT) at transmit bandwidths up to 10 MHz.

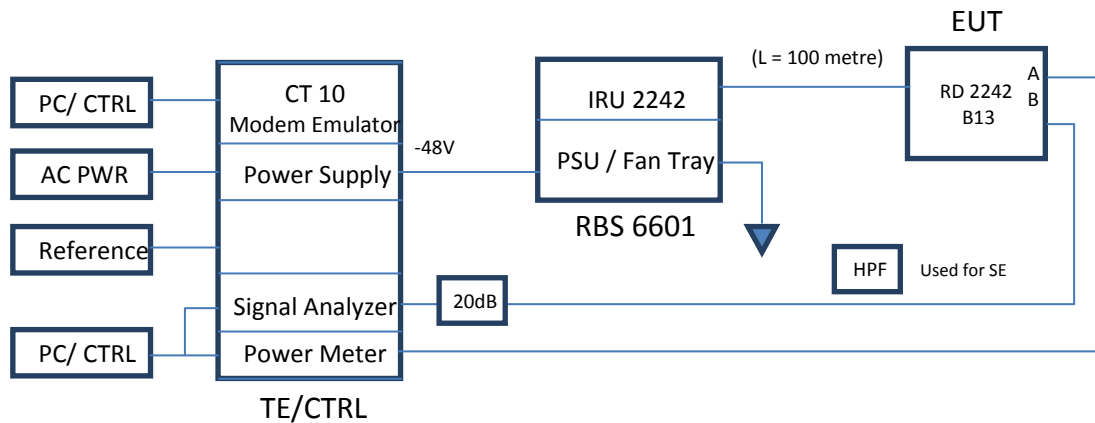
The radio operates over 2 transmit ports in Single, Multi-Carrier, and MIMO transmission with a maximum rated RF output power of 50mW per port over an operational temperature of +5° C to +40° C.

A full technical description can be found in the Manufacturer's documentation.

1.6 TEST SETUP

Test Setup, Conducted Measurement:

RD 2242 RU Radio Compliance Set-Up



See Section 3 for a list of the test equipment used in the test.

Test Setup, Radiated Measurement:

Reference: Flextronics Design Validation Centre, Canada Report Reference Number K002569-TR-EMC-03-R1.

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 via POE (Power Over Ethernet).

1.8 DEVIATION FROM THE STANDARD

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

1.9 MODIFICATION RECORD

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 Ottawa, Canada.

1.11 ADDITIONAL INFORMATION

Testing performed in the presence of Mr Denis Lalonde.



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(b)
Industry Canada RSS-130, Clause 4.4

2.1.2 Date of Test and Modification State

30 January 2015 - Modification State 0

2.1.3 Test Equipment Used

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

2.1.4 Environmental Conditions

Ambient Temperature	27.5°C
Relative Humidity	16.6%

2.1.5 Test Method

The EUT was connected to a Spectrum Analyser via 20dB of attenuation. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser.

Measurements were performed with the Spectrum Analyser Band Power measurement function in accordance with FCC KDB 971168 D01 v02r02. The detector was set to RMS with a RBW of at least 1% of the theoretical signal bandwidth and a VBW of 3 times the RBW. The detection bandwidth was configured to be wider than the total bandwidth of the carrier or combinations of carriers, (multi-carrier). The sweep time was set to Auto and 200 averages were performed before the result was recorded. Prior to testing, comparative measurements were made with an Average Power sensor and Power Meter to confirm correlation with the method used.

Due to Average measurements being recorded, an additional Peak to Average measurement was made in all single carrier configurations. This was achieved using the CCDF function of the Spectrum Analyser with the RBW being set to 80MHz (In this case 10MHz was the total RF Bandwidth in single and multi-carrier mode). A comparison was made with a wide band Power Meter capable of measuring Peak to Average ratio to confirm correlation with the method used.

Testing was performed on both ports.

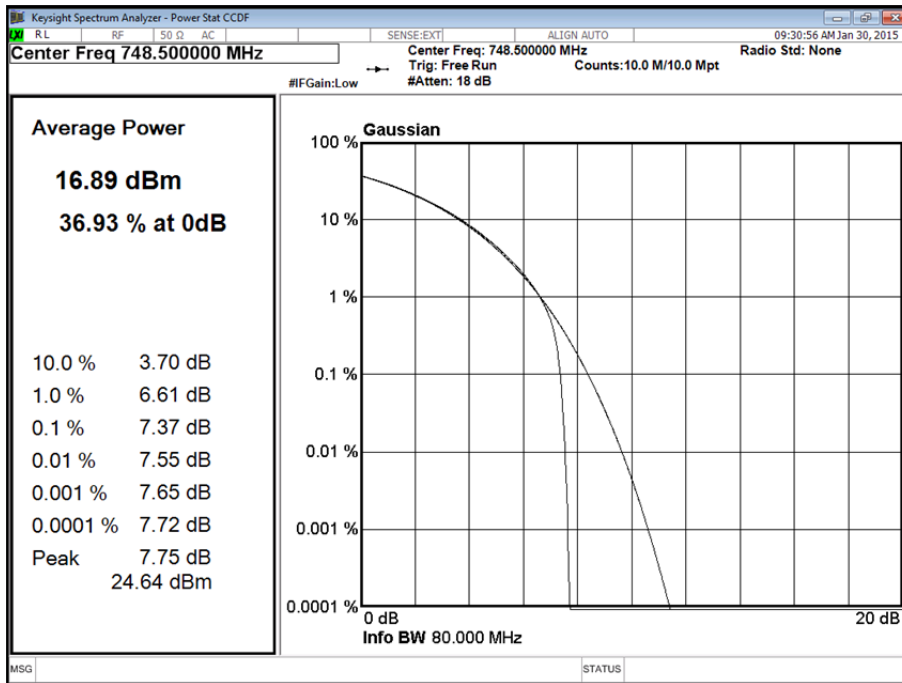
2.1.6 Test Results

Configuration 1 LTE SC (see Table 1 for carrier frequency)

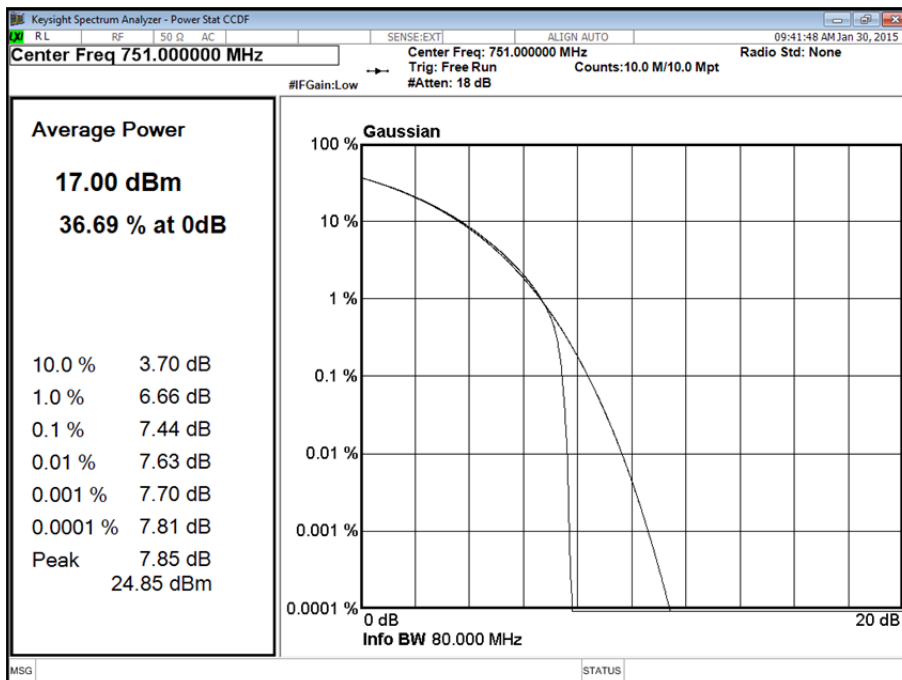
Maximum Output Power 17 dBm per Carrier, E-TM1.1

Antenna	Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B		Channel Position M		Channel Position T	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A	5.0 MHz	17.07	7.37	17.16	7.44	17.58	7.41
B		16.14	7.30	16.38	7.37	16.66	7.33
Total		19.64	-	19.80	-	20.16	-
A	10.0 MHz	-	-	17.11	7.40	-	-
B		-	-	16.37	7.34	-	-
Total		-	-	19.76	-	-	-

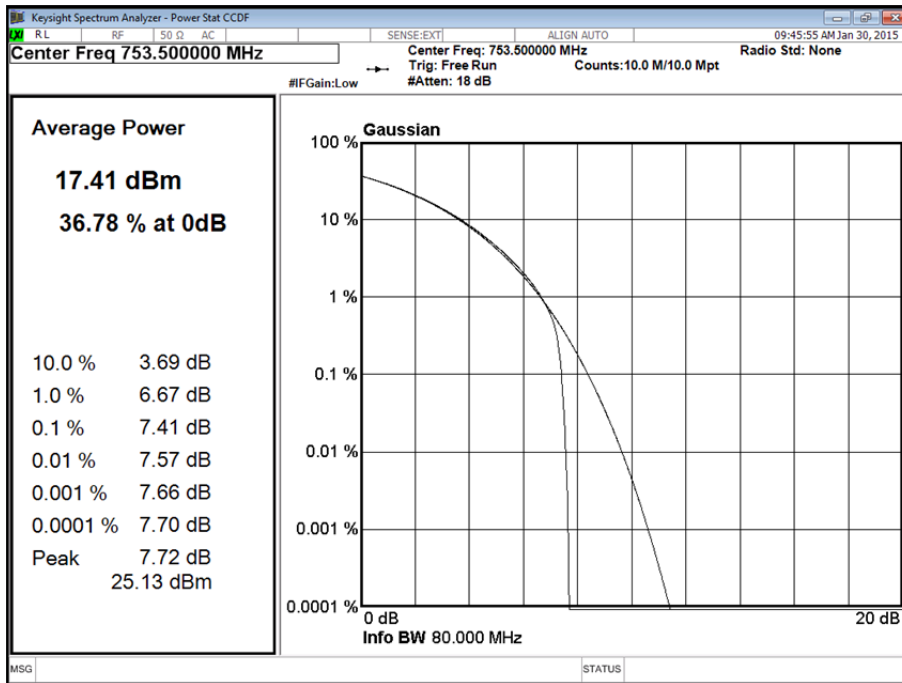
Channel Position B – Bandwidth 5.0 MHz – Antenna A



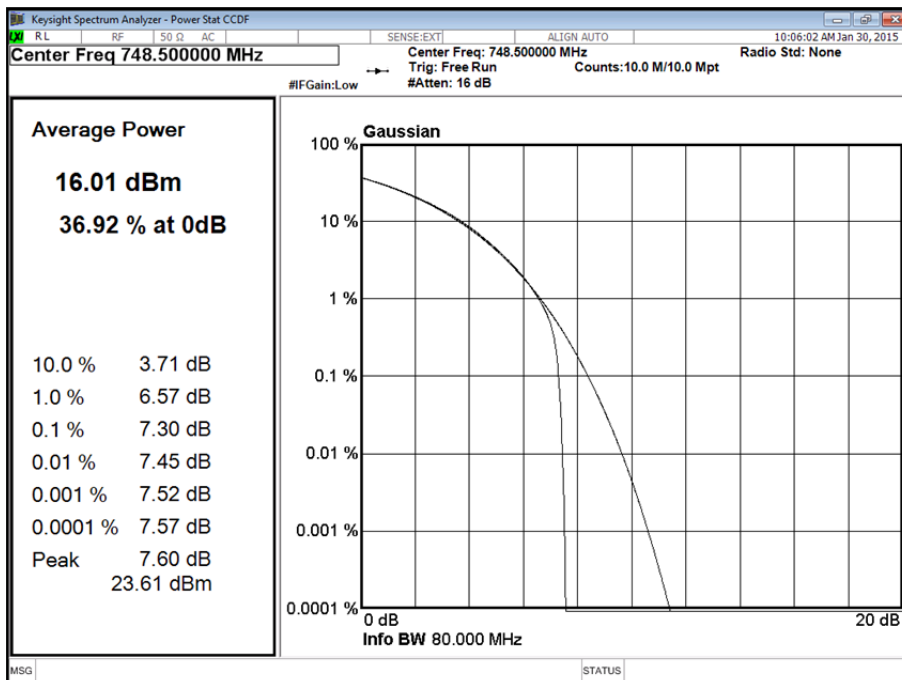
Channel Position M – Bandwidth 5.0 MHz – Antenna A



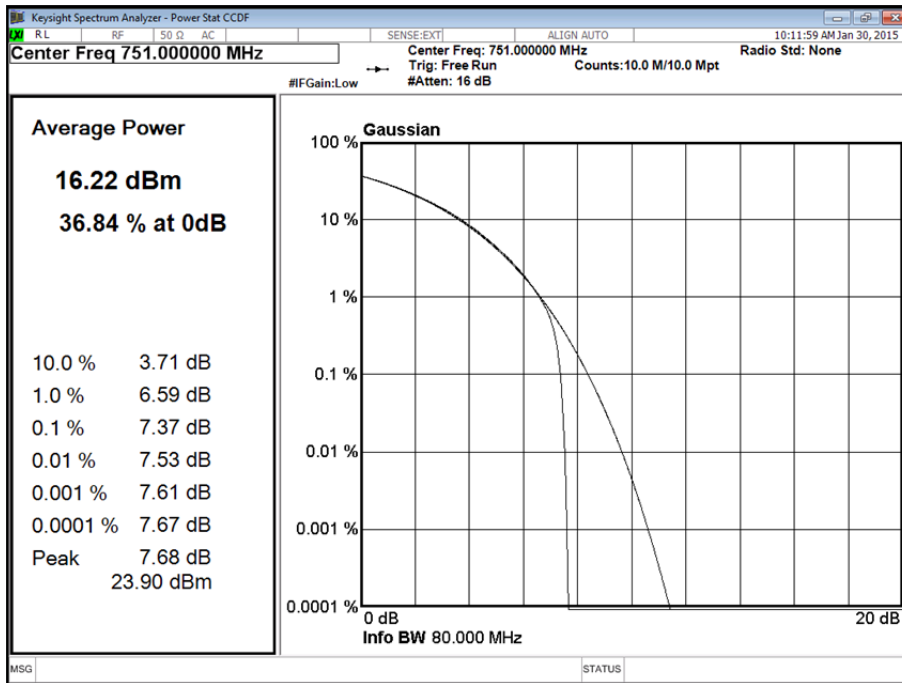
Channel Position T – Bandwidth 5.0 MHz – Antenna A



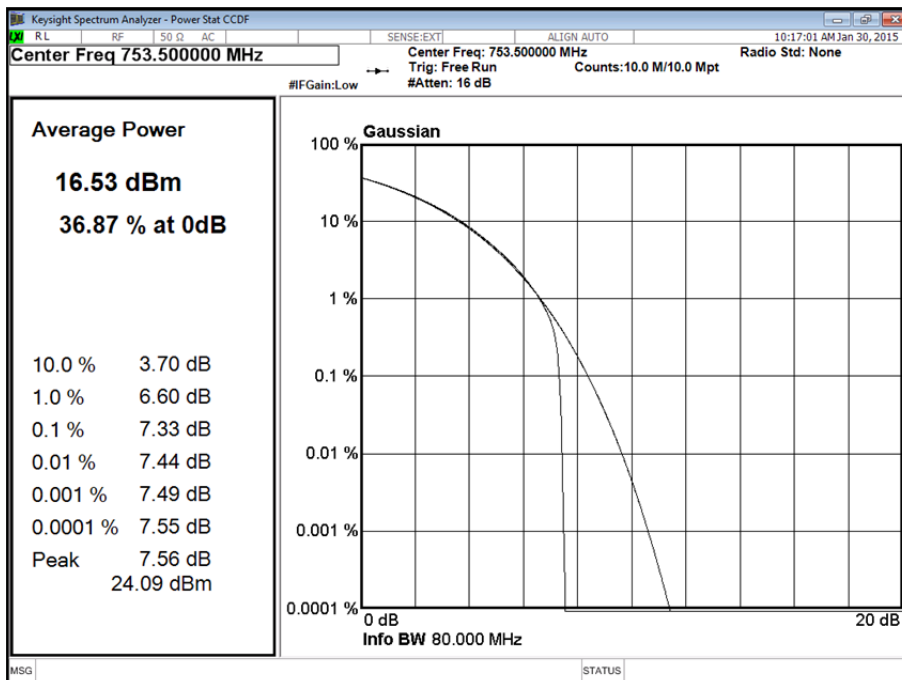
Channel Position B – Bandwidth 5.0 MHz – Antenna B



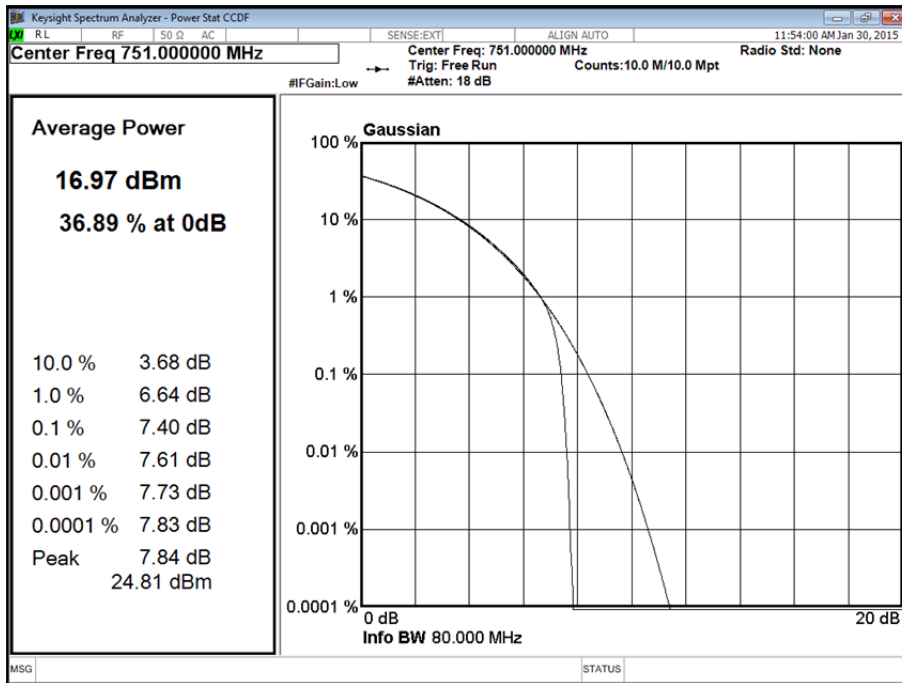
Channel Position M – Bandwidth 5.0 MHz – Antenna B



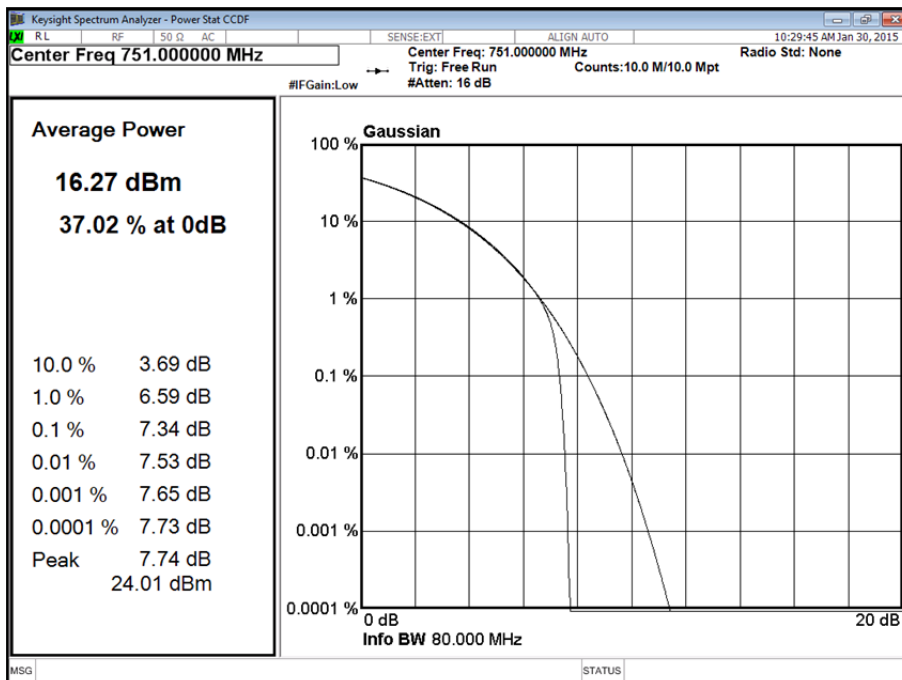
Channel Position T – Bandwidth 5.0 MHz – Antenna B



Channel Position M – Bandwidth 10.0 MHz – Antenna A



Channel Position M – Bandwidth 10.0 MHz – Antenna B



Configuration 2 LTE-MC (See Table 1 for carrier frequency)

Maximum Output Power 14 dBm per Carrier (17 dBm per Port), E-TM1.1

Antenna	Carrier Bandwidth (MHz)	Peak Output Power / Peak to Average Ratio (PAR)					
		Channel Position B		Channel Position M		Channel Position T	
		Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)	Power (dBm)	PAR (dB)
A	5.0 MHz	-	-	17.08	-	-	-
B		-	-	16.48	-	-	-
Total		-	-	19.80	-	-	-

Limit	
Peak Power	≤1000 W or ≤+60 dBm
Peak to Average Ratio	13 dB

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 27, Clause 27.53(c)(1)
Industry Canada RSS-Gen, Clause 6.6

2.2.2 Date of Test and Modification State

30 January 2015 - Modification State 0

2.2.3 Test Equipment Used

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

2.2.4 Environmental Conditions

Ambient Temperature 27.5°C
Relative Humidity 16.6%

2.2.5 Test Method

The EUT was connected to a Spectrum Analyser via 20dB of attenuation. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser.

Measurements were performed with the Spectrum Analyser Occupied Band Width measurement function in accordance with FCC KDB 971168 D01 v02r02.

The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured and its OBW measurement mode used in conjunction with an RMS detector and a long sweep time (as described in the operating manual for the test equipment) for the 26dB and 99% Occupied Bandwidth measurements on Bottom, Middle and Top Channels. Testing was performed on both ports.

The results are shown in the plots below.

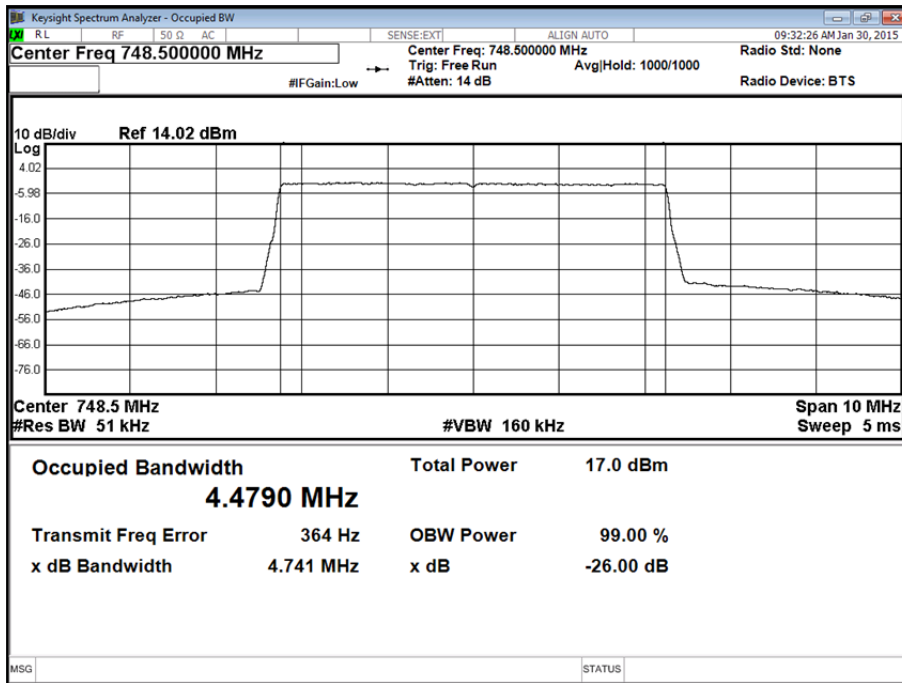
2.2.6 Test Results

Configuration 1 LTE SC (see Table 1 for carrier frequency)

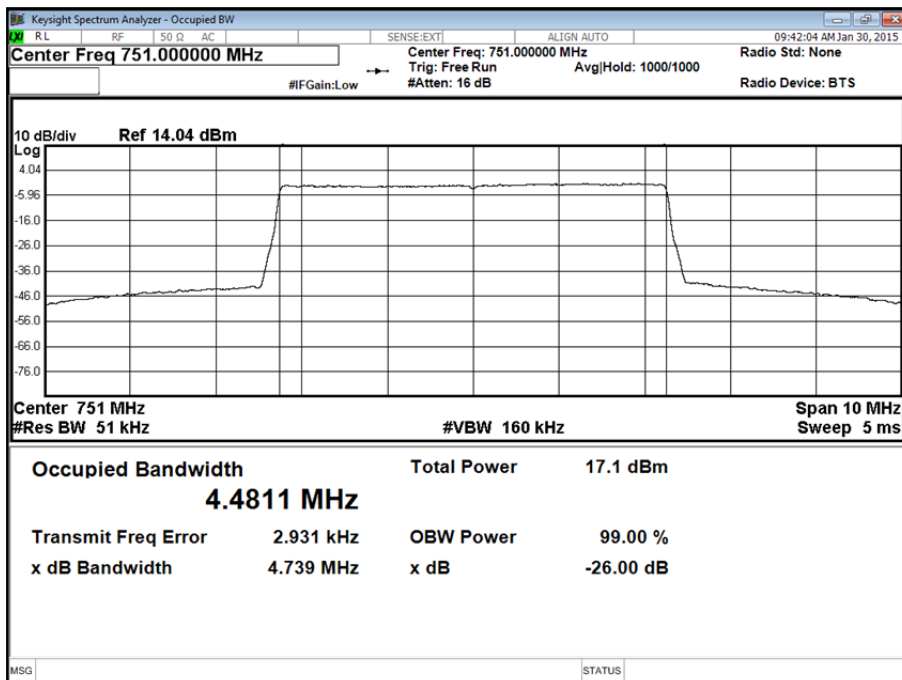
Maximum Output Power 17 dBm per carrier, Antenna A, E-TM1.1

Carrier Bandwidth	Result (MHz)					
	Channel Position B		Channel Position M		Channel Position T	
	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
5.0 MHz	4,479.03	4,740.64	4,481.08	4,738.88	4,474.75	4,732.58
10.0 MHz	-	-	8,944.03	9,380.59	-	-

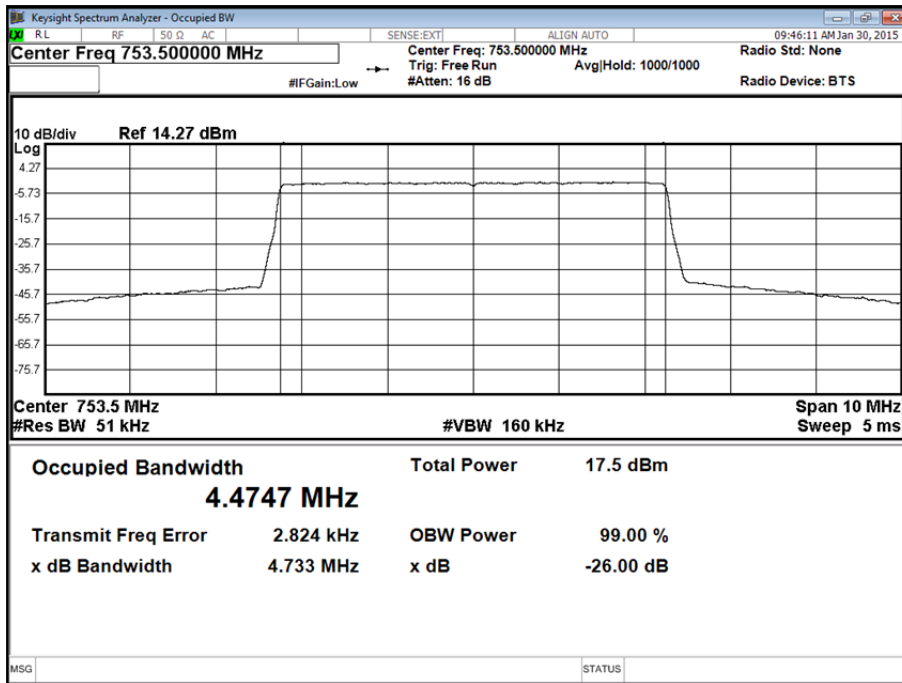
Channel Position B – Bandwidth 5.0 MHz – Antenna A



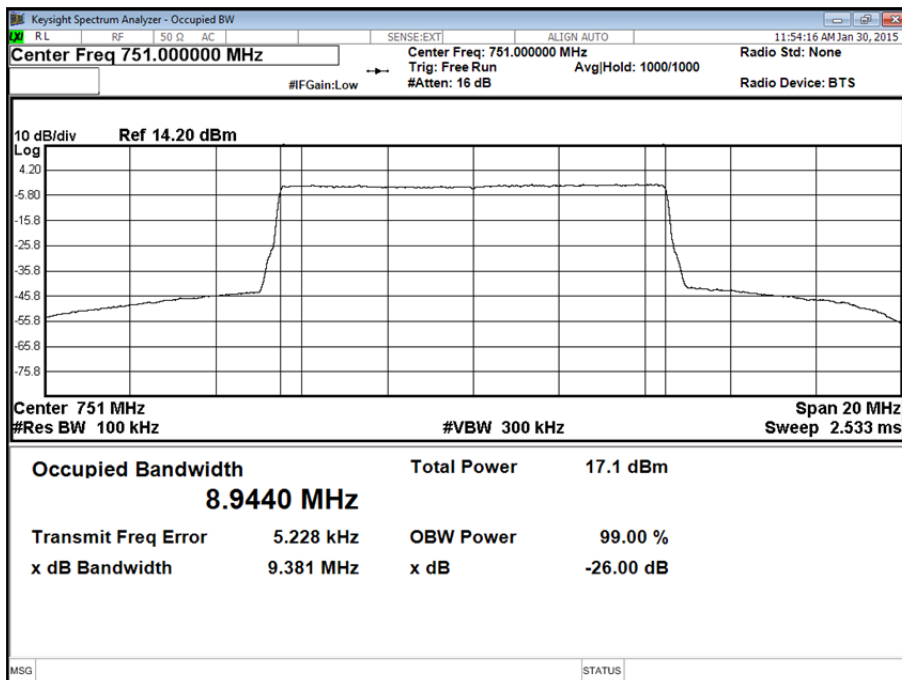
Channel Position M – Bandwidth 5.0 MHz – Antenna A



Channel Position T – Bandwidth 5.0 MHz – Antenna A



Channel Position M – Bandwidth 10.0 MHz – Antenna A

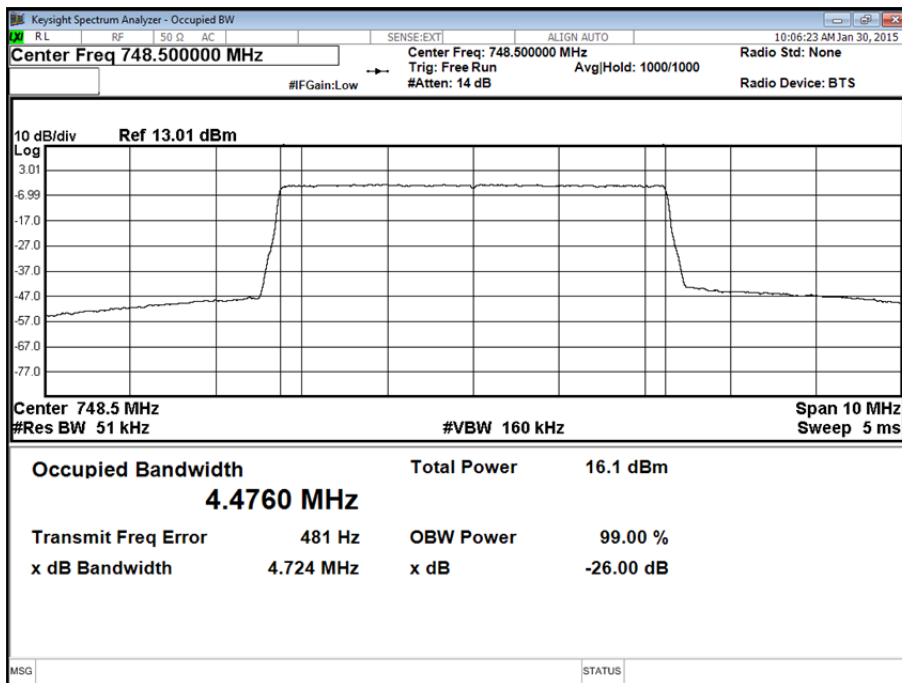


Configuration 1 LTE SC (see Table 1 for carrier frequency)

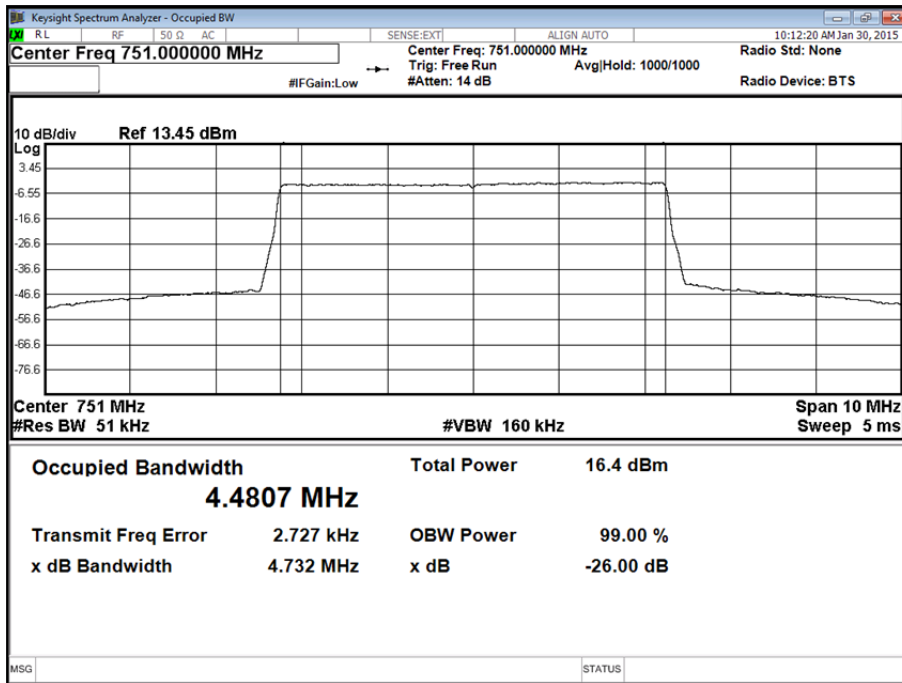
Maximum Output Power 17 dBm per carrier, Antenna B, E-TM1.1

Carrier Bandwidth	Result (MHz)					
	Channel Position B		Channel Position M		Channel Position T	
	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
5.0 MHz	4,475.98	4,724.37	4,480.75	4,732.36	4,474.63	4,726.62
10.0 MHz	-	-	8,935.78	9,365.85	-	-

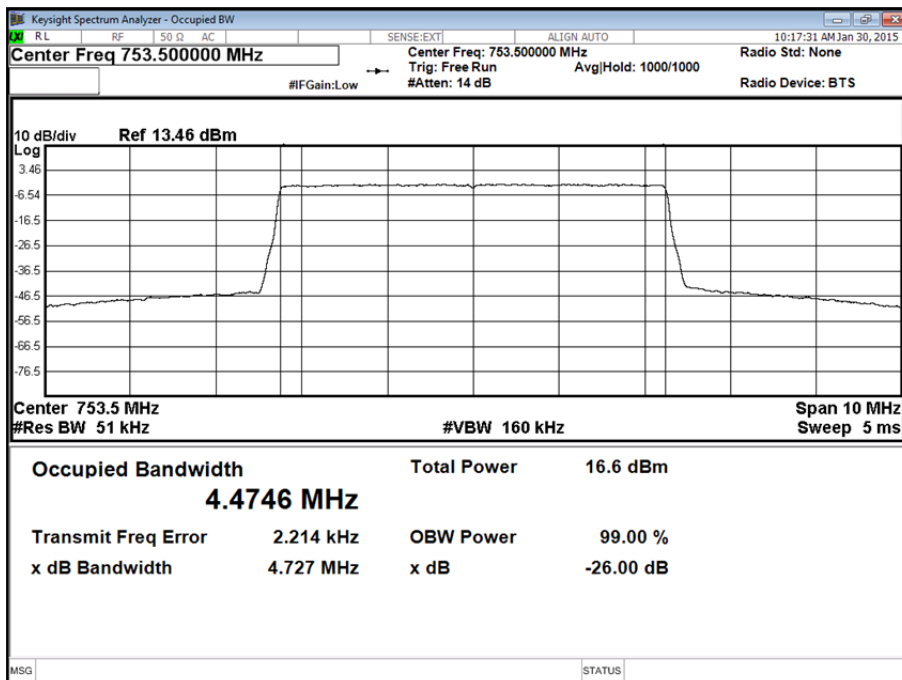
Channel Position B – Bandwidth 5.0 MHz – Antenna B



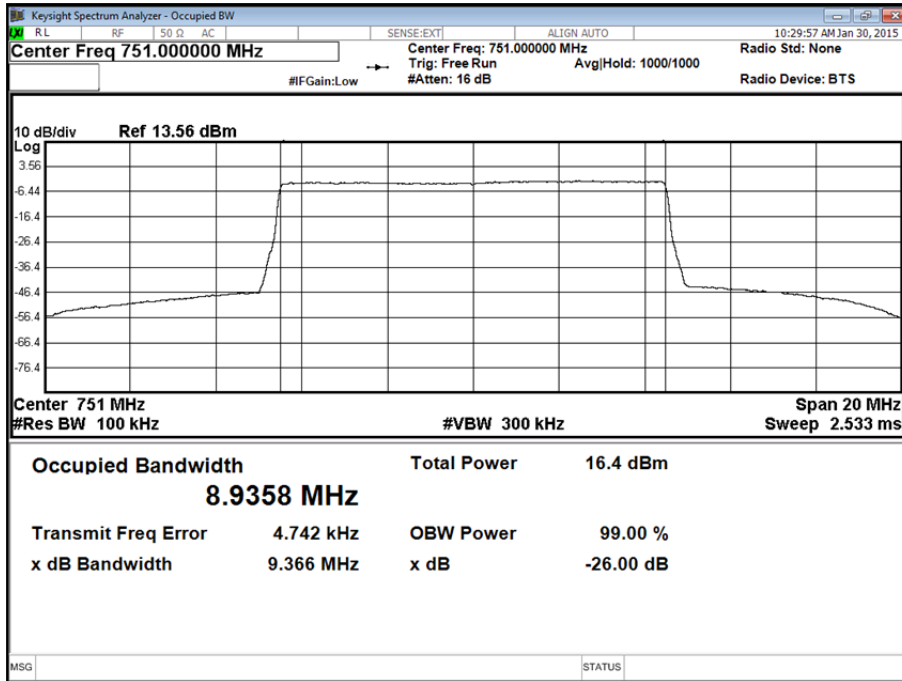
Channel Position M – Bandwidth 5.0 MHz – Antenna B



Channel Position T – Bandwidth 5.0 MHz – Antenna B



Channel Position M – Bandwidth 10.0 MHz – Antenna B



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 27, Clause 27.53(c)(1)
Industry Canada RSS-Gen, Clause 6.13
Industry Canada RSS-130, Clause 4.6

2.3.2 Date of Test and Modification State

30 January 2015 - Modification State 0

2.3.3 Test Equipment Used

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

2.3.4 Environmental Conditions

Ambient Temperature 27.5°C
Relative Humidity 16.6%

2.3.5 Test Method

The EUT was connected to a Spectrum Analyser via 20dB of attenuation. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser.

The Spectrum Analyser RBW was adjusted to be at least 1% of the measured 26dB Bandwidth. Using an RMS detector, the frequency spectrum up to 1MHz away from the Band Edge was investigated. The Band Power measurement function of the Spectrum Analyser was used. The Band Power span was configured to be at least 1% of the 26dB Bandwidth and was positioned in the 1MHz region which gave the worst case result.

Testing was performed on both ports. The test limits were set to a worst case value of -16dBm.

The results are shown in the plots below.

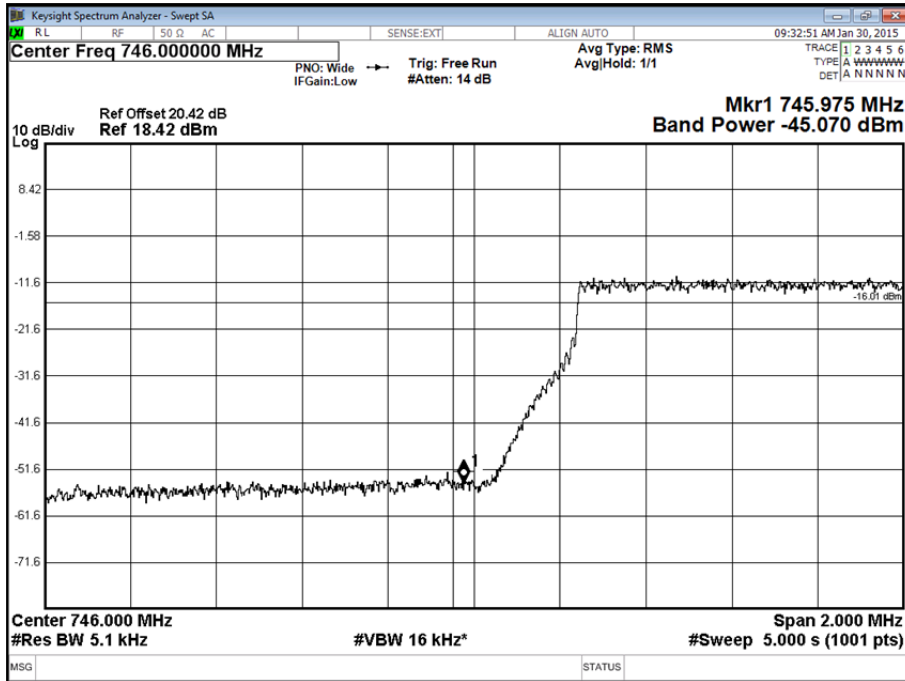
2.3.6 Test Results

Configuration 1 LTE SC (see Table 1 for carrier frequency)

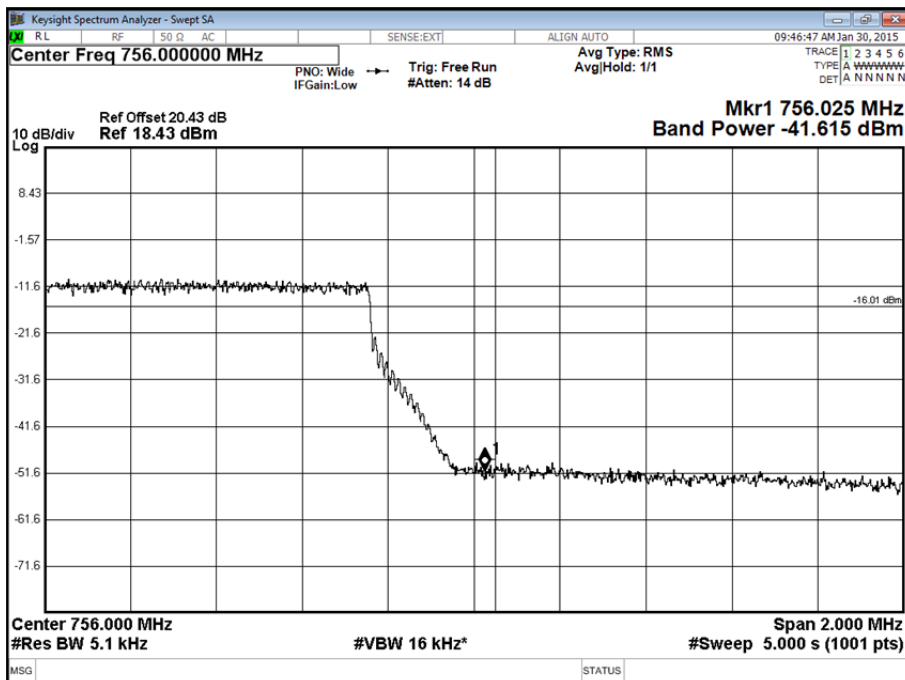
Maximum Output Power 17 dBm per carrier, Antenna A, E-TM1.1

Carrier Bandwidth	Modulation	Band Edge (MHz)	
		Channel Position B	Channel Position T
5.0 MHz	QPSK	748.50	753.50
10.0 MHz	QPSK	751.00	751.00

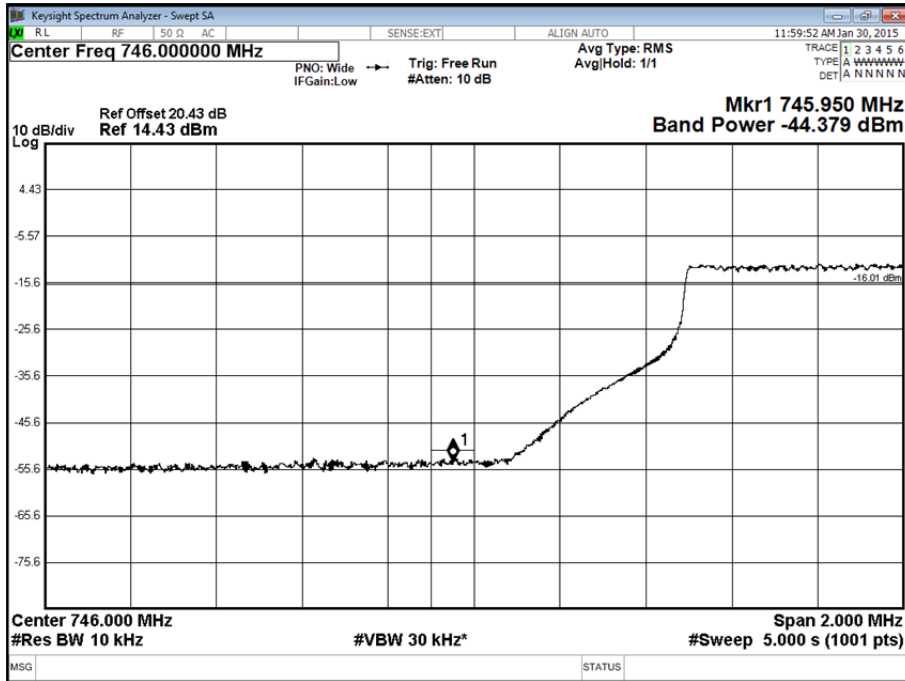
Channel Position B – Bandwidth 5.0 MHz – Antenna A



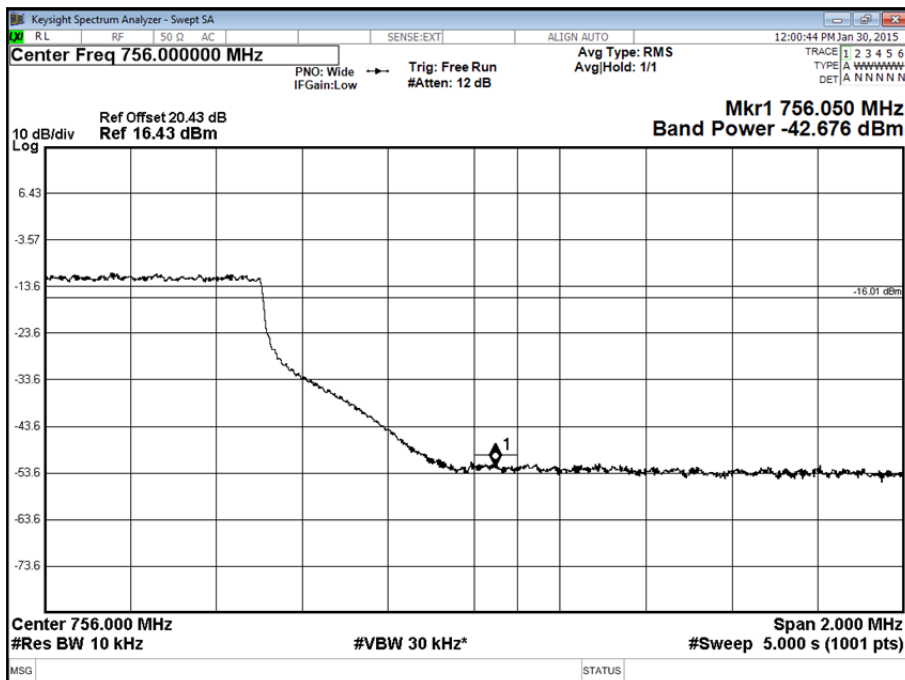
Channel Position T – Bandwidth 5.0 MHz – Antenna A



Channel Position B – Bandwidth 10.0 MHz – Antenna A



Channel Position T – Bandwidth 10.0 MHz – Antenna A

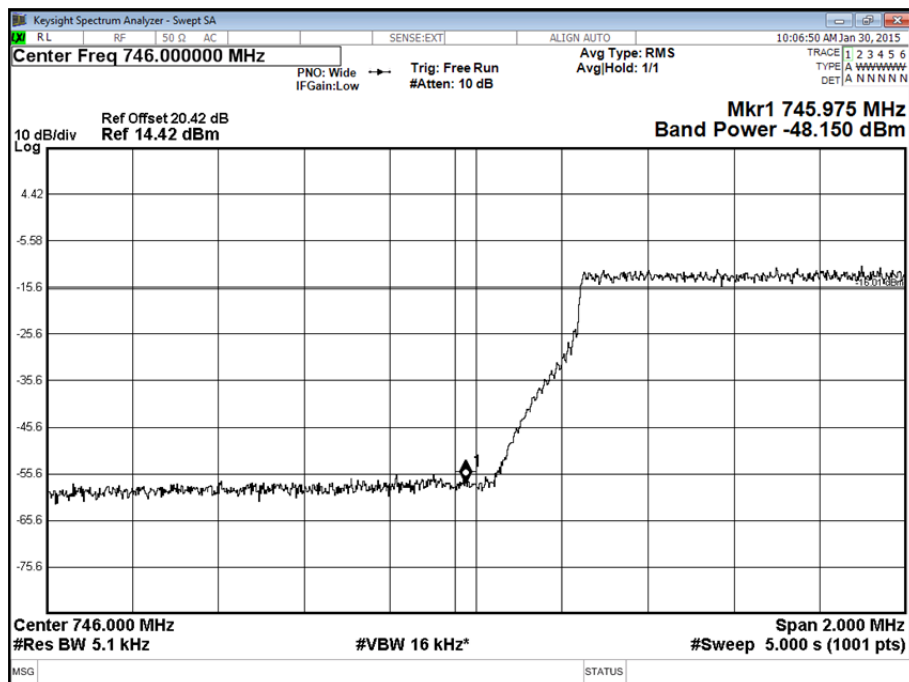


Configuration 1 LTE SC (see Table 1 for carrier frequency)

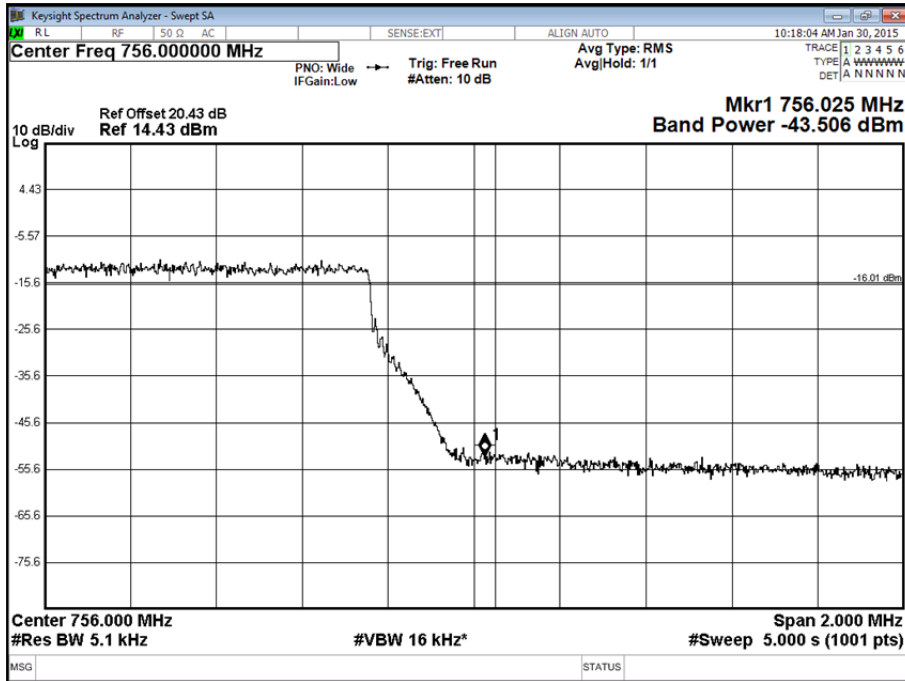
Maximum Output Power 17 dBm per carrier, Antenna B, E-TM1.1

Carrier Bandwidth	Modulation	Band Edge (MHz)	
		Channel Position B	Channel Position T
5.0 MHz	QPSK	748.50	753.50
10.0 MHz	QPSK	751.00	751.00

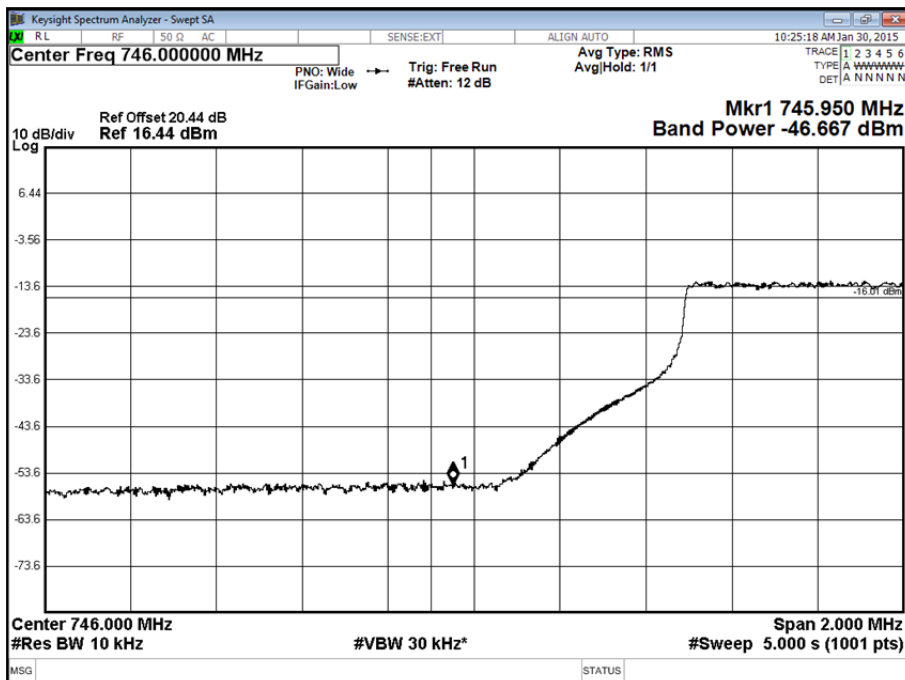
Channel Position B – Bandwidth 5.0 MHz – Antenna B



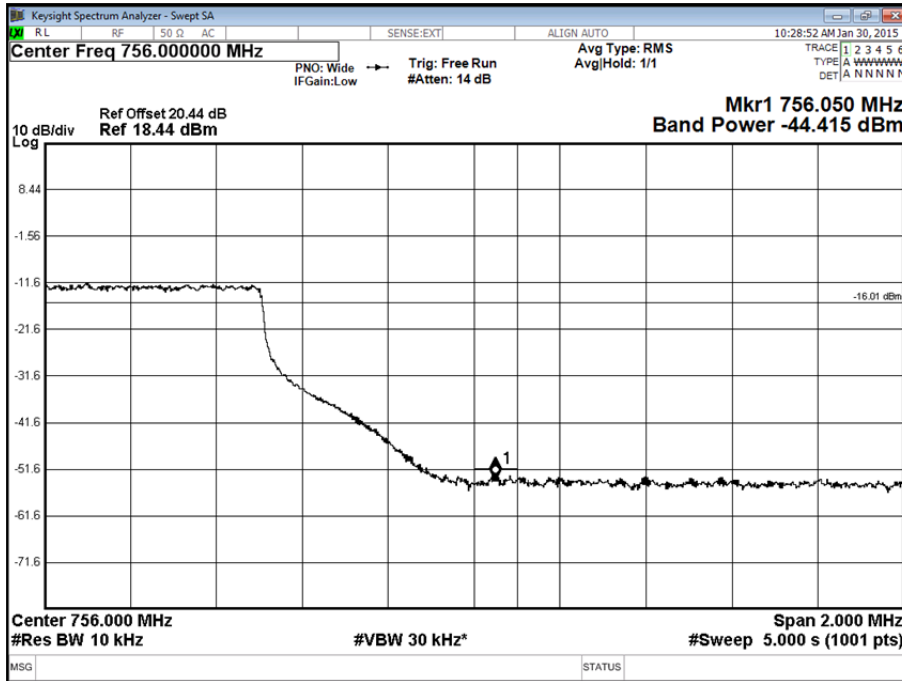
Channel Position T – Bandwidth 5.0 MHz – Antenna B



Channel Position B – Bandwidth 10.0 MHz – Antenna B



Channel Position T – Bandwidth 10.0 MHz – Antenna B

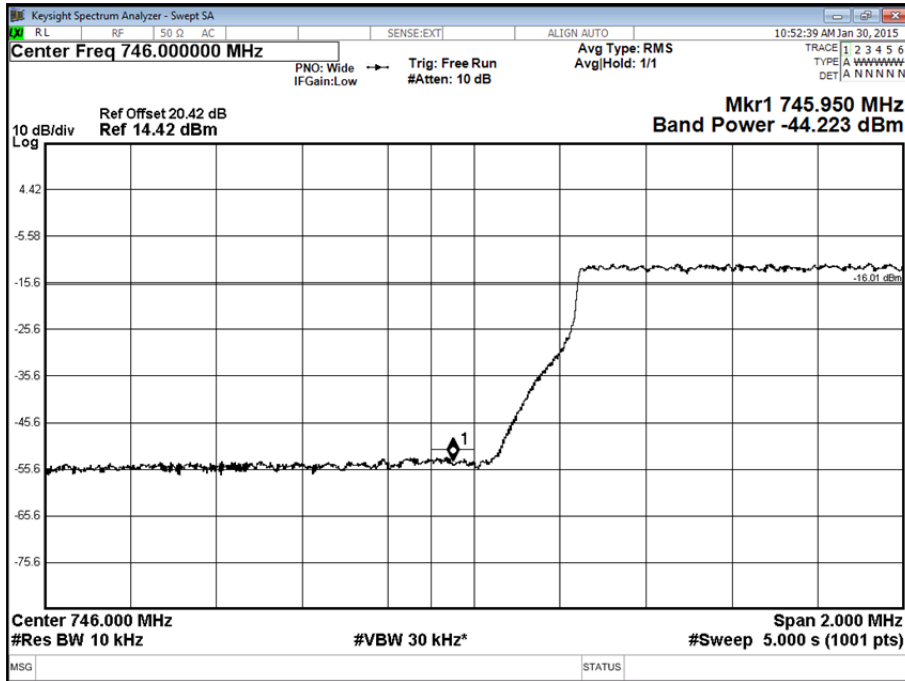


Configuration 2 LTE MC (see Table 1 for carrier frequency)

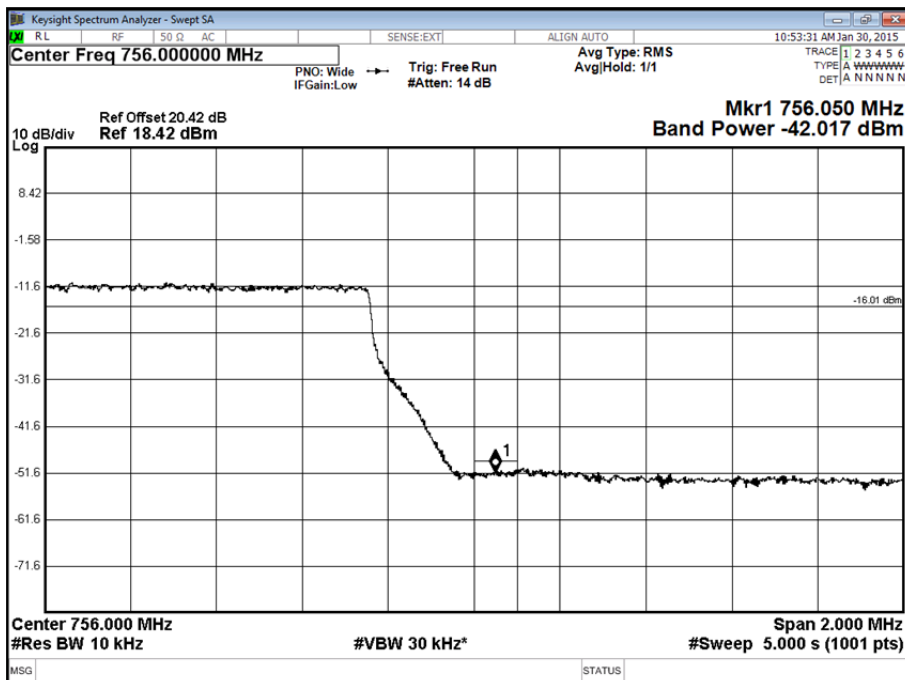
Maximum Output Power 14 dBm per Carrier (17 dBm per Port), Antenna A, E-TM1.1

Carrier Bandwidth	Modulation	Band Edge (MHz)	
		Channel Position B	Channel Position T
5.0 MHz	QPSK	748.5 + 753.5	748.5 + 753.5

Channel Position B - Antenna A



Channel Position T - Antenna A

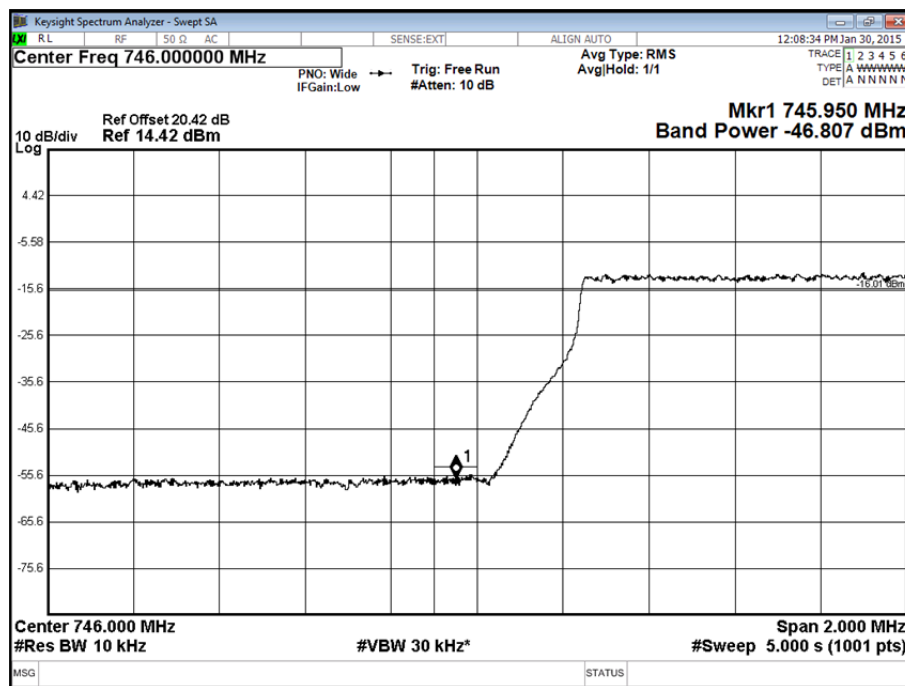


Configuration 2 LTE MC (see Table 1 for carrier frequency)

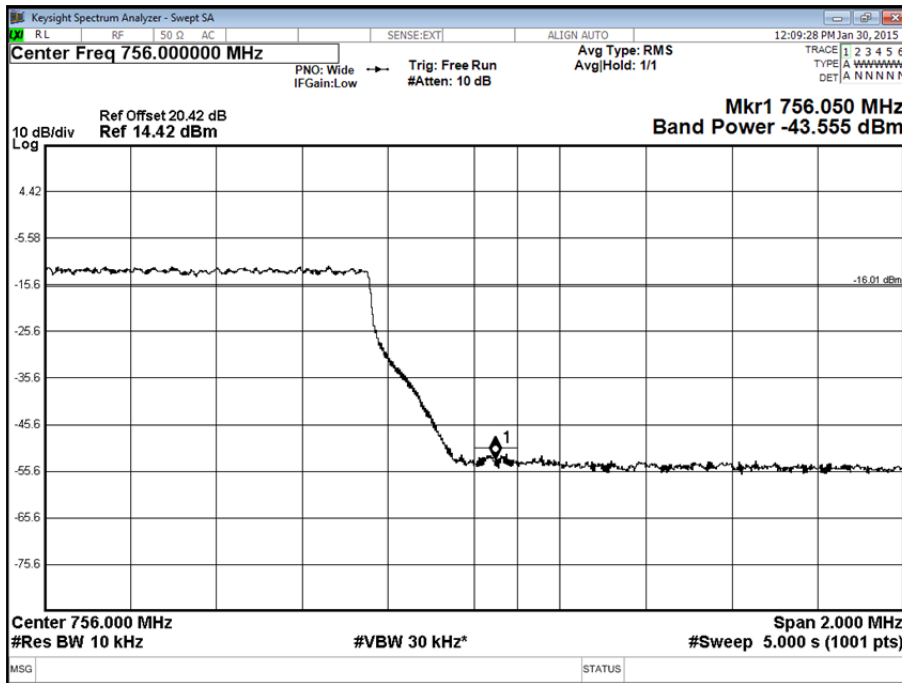
Maximum Output Power 14 dBm per Carrier (17 dBm per Port), Antenna B, E-TM1.1

Carrier Bandwidth	Modulation	Band Edge (MHz)	
		Channel Position B	Channel Position T
5.0 MHz	QPSK	748.5 + 753.5	748.5 + 753.5

Channel Position B - Antenna B



Channel Position T - Antenna B



Limit	-16 dBm (-13 dBm - 10log(NANT) where N = 2)
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2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 27, Clause 27.53(c)
Industry Canada RSS-Gen, Clause 6.13
Industry Canada RSS-130, Clause 4.6

2.4.2 Date of Test and Modification State

30 January 2015 - Modification State 0

2.4.3 Test Equipment Used

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

2.4.4 Environmental Conditions

Ambient Temperature	27.5°C
Relative Humidity	16.6%

2.4.5 Test Method

The EUT was connected to a Spectrum Analyser via 20dB of attenuation for measurements below 1.34GHz and 20dB of attenuation and a high pass filter for measurements from 1.34GHz to 8GHz.

A Network Analyser was used to calibrate the path loss between the EUT and the Spectrum Analyser and the worst case path loss in the measured ranges was entered as a reference level offset.

Measurements were performed in accordance with FCC KDB 971168 D01 v02r02. Over the measured ranges, the analyser RBW was set to 1MHz, VBW 3MHz with an RMS detector used in conjunction with a trace Max Hold to give the required average result.

Testing was performed on both ports in configurations of the EUT as reported below. The test limits were set to a worst case value of -16dBm.

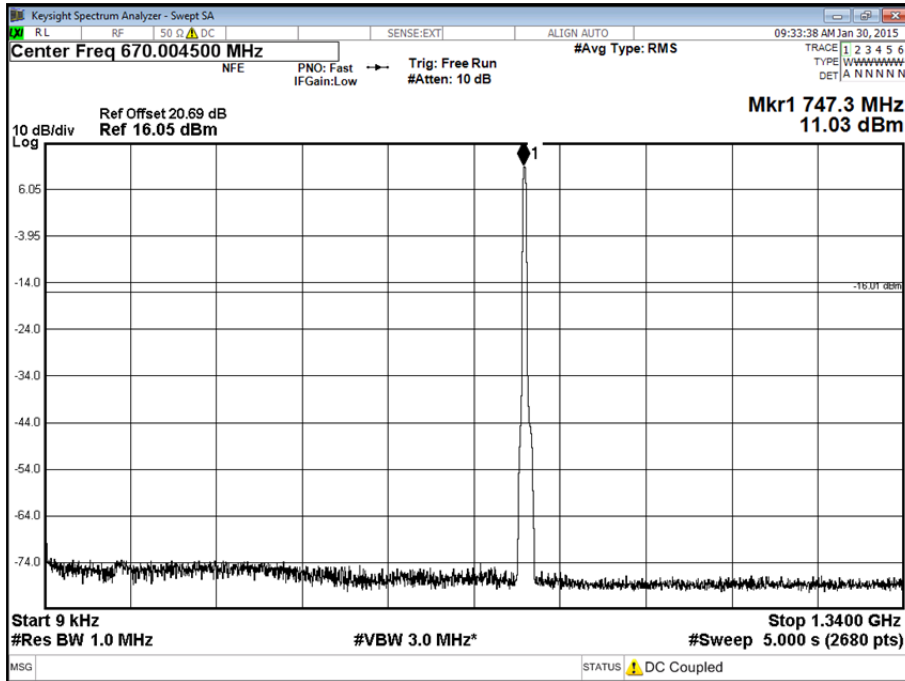
The results are shown in the plots below.

2.4.6 Test Results

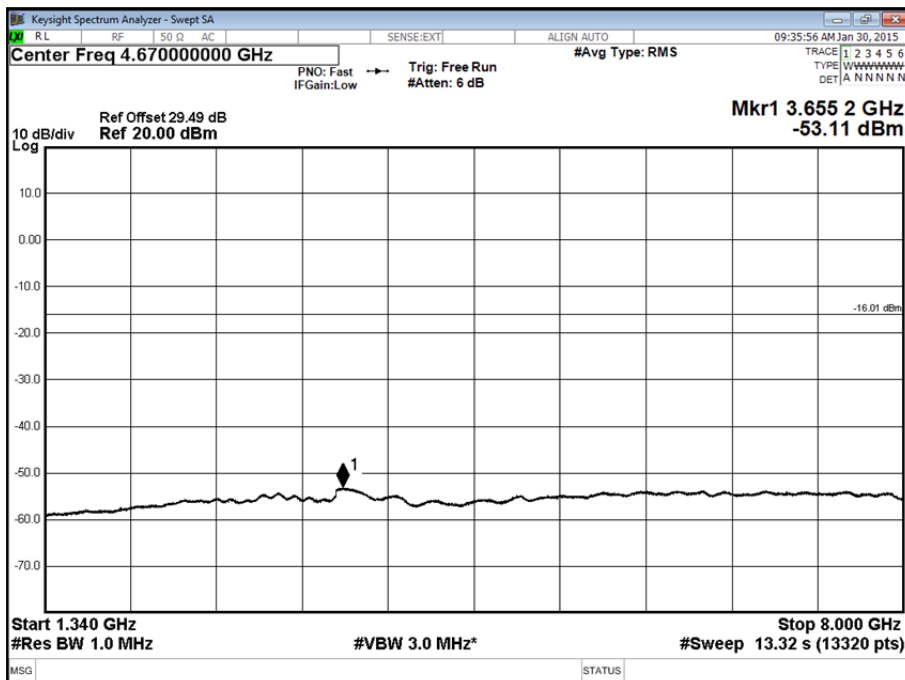
Configuration 1 LTE SC (see Table 1 for carrier frequency)

Maximum Output Power 17 dBm per carrier, Antenna A, E-TM1.1

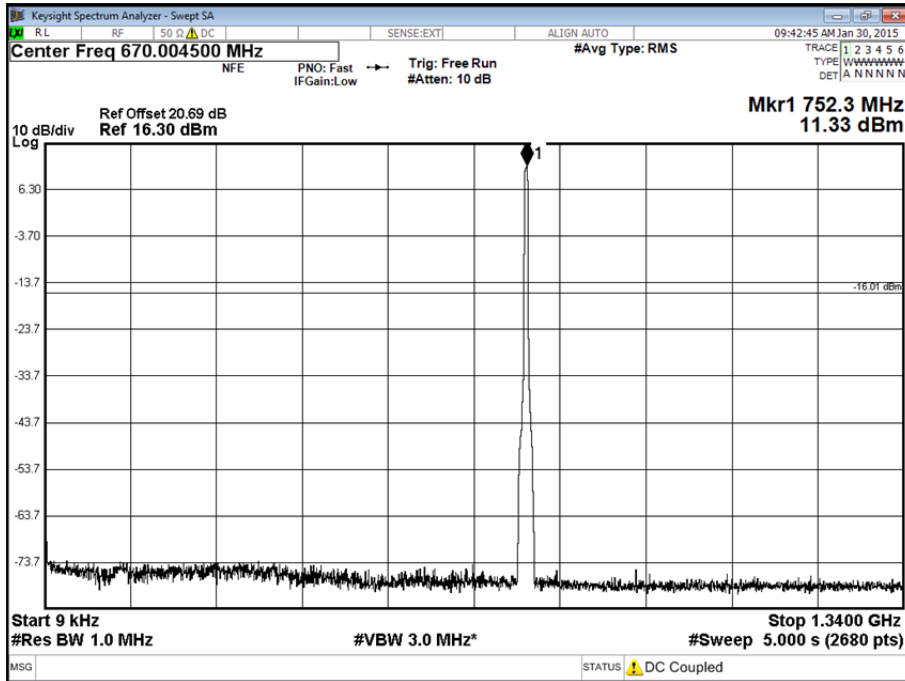
Channel Position B – Bandwidth 5.0 MHz – Antenna A



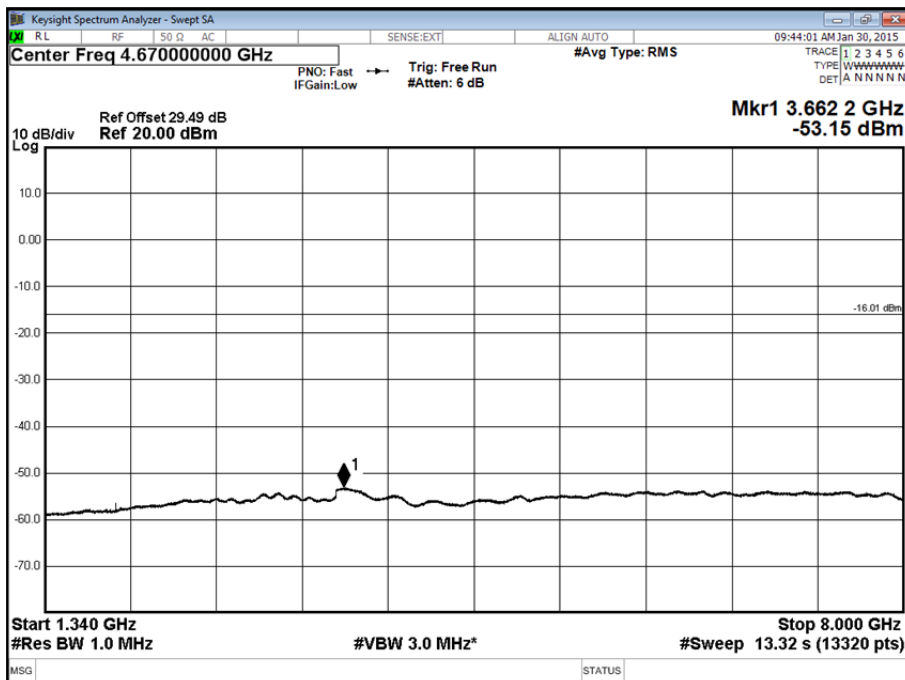
Channel Position B – Bandwidth 5.0 MHz – Antenna A



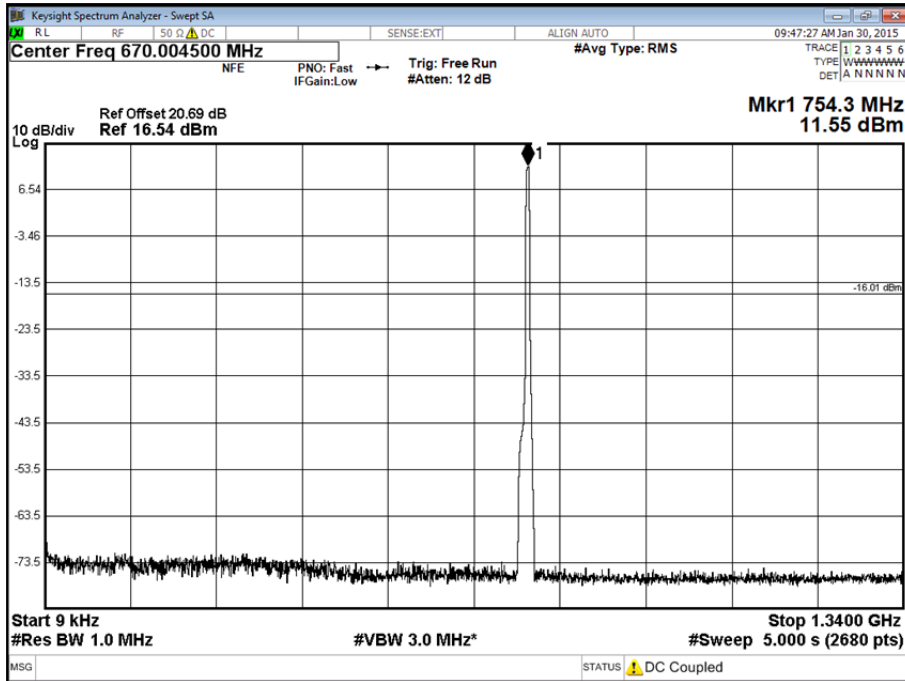
Channel Position M – Bandwidth 5.0 MHz – Antenna A



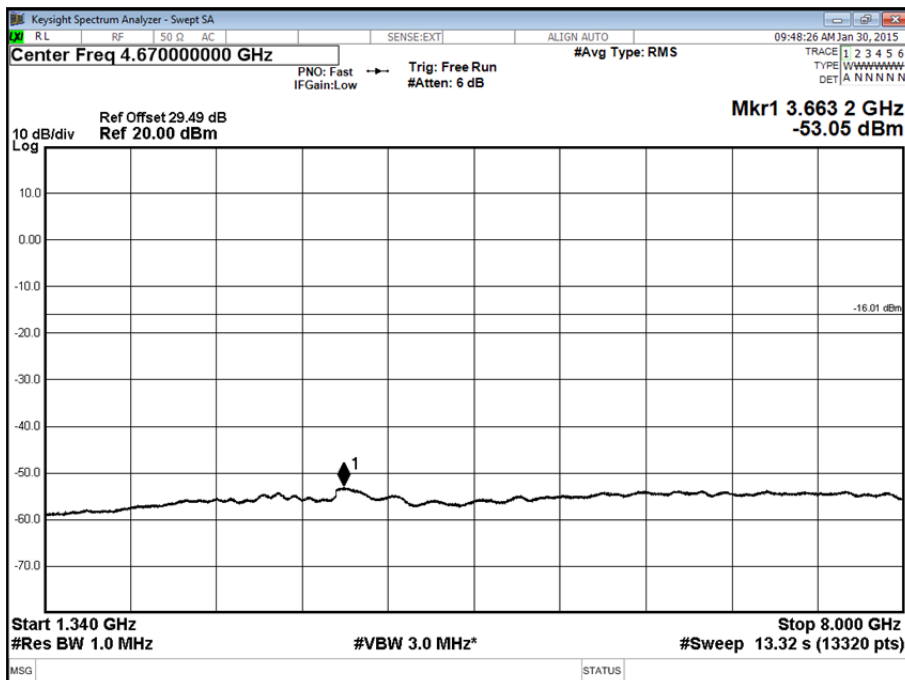
Channel Position M – Bandwidth 5.0 MHz – Antenna A



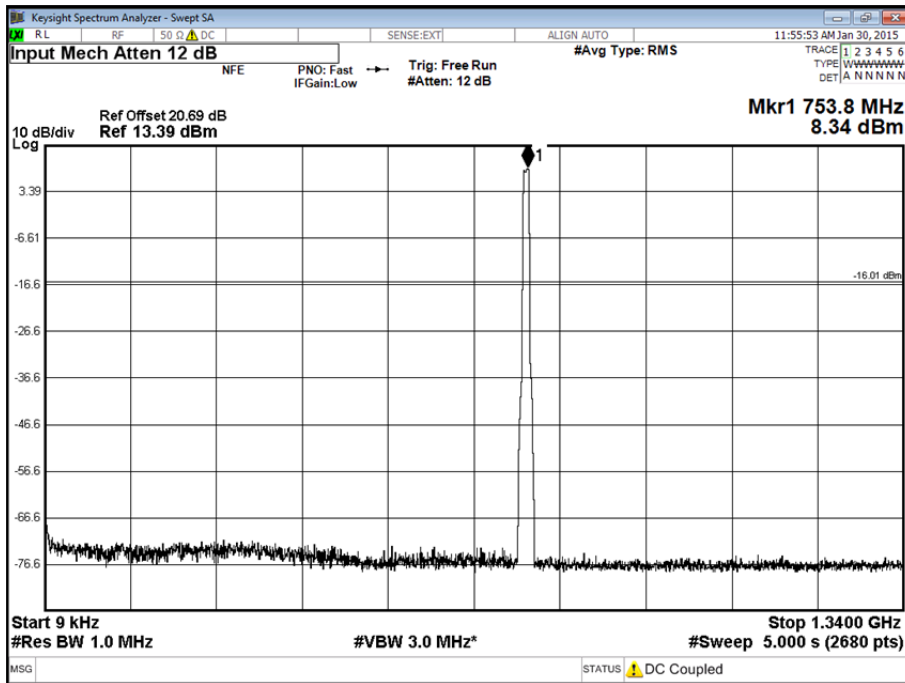
Channel Position T – Bandwidth 5.0 MHz – Antenna A



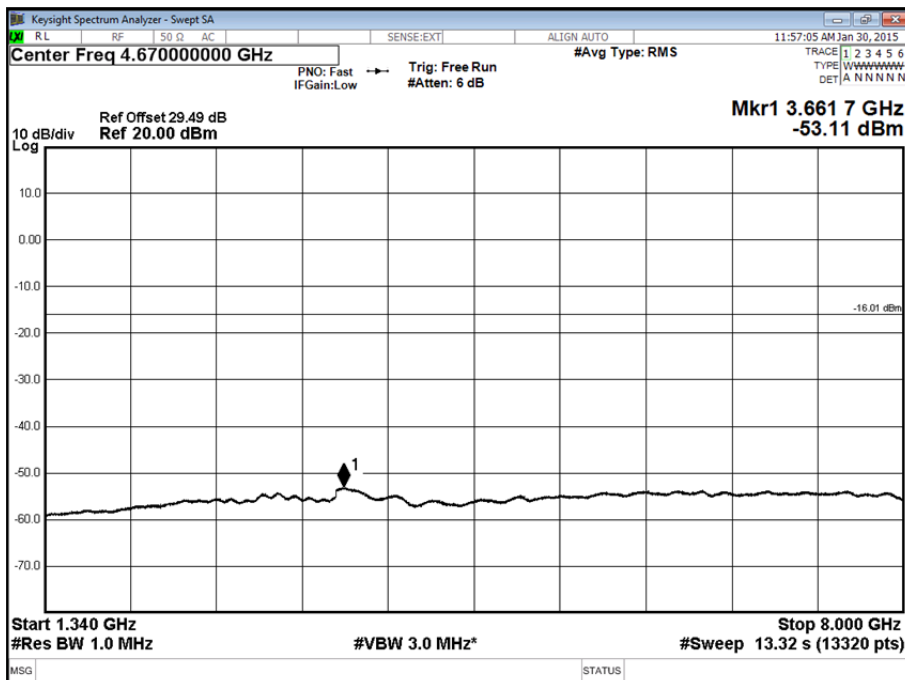
Channel Position T – Bandwidth 5.0 MHz – Antenna A



Channel Position M – Bandwidth 10.0 MHz – Antenna A



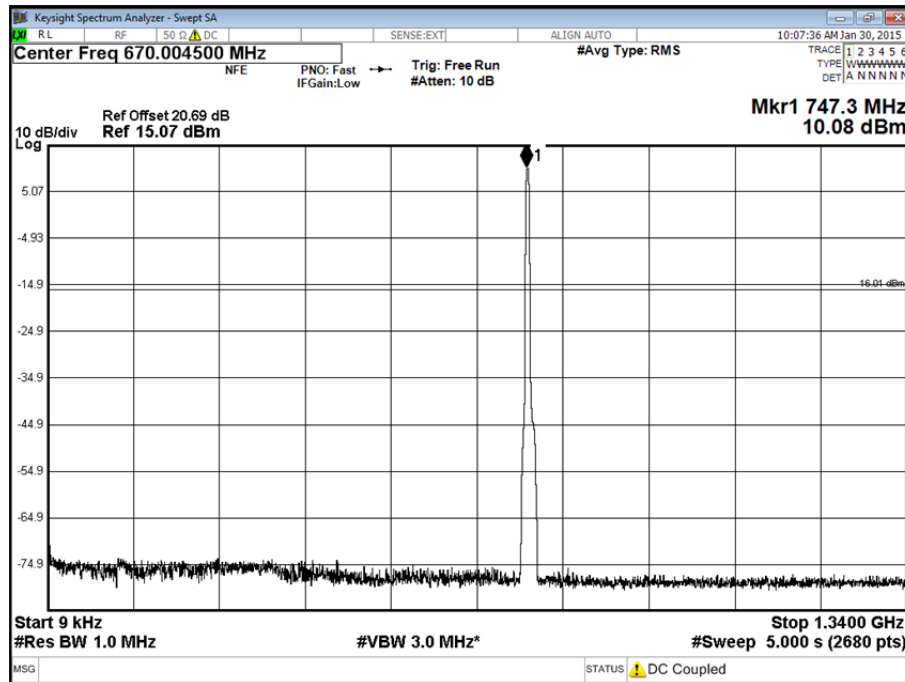
Channel Position M – Bandwidth 10.0 MHz – Antenna A



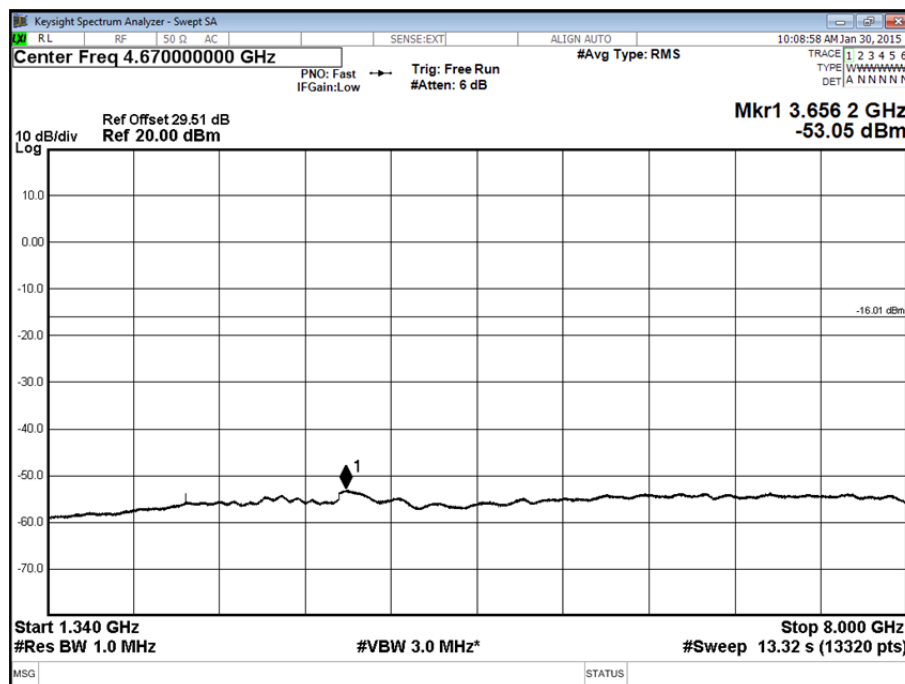
Configuration 1 LTE SC (see Table 1 for carrier frequency)

Maximum Output Power 17 dBm per carrier, Antenna B, E-TM1.1

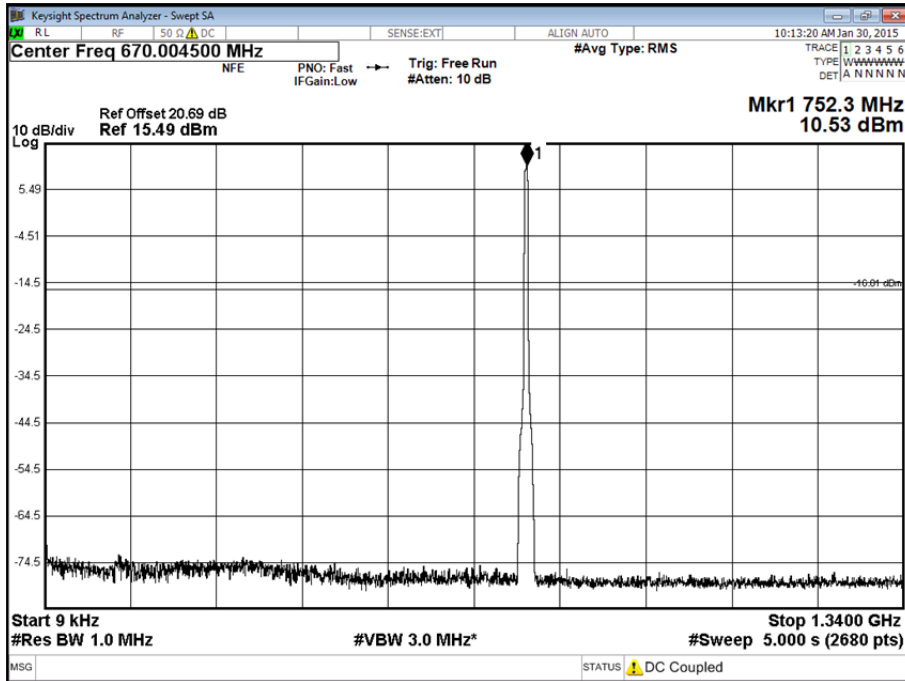
Channel Position B – Bandwidth 5.0 MHz – Antenna B



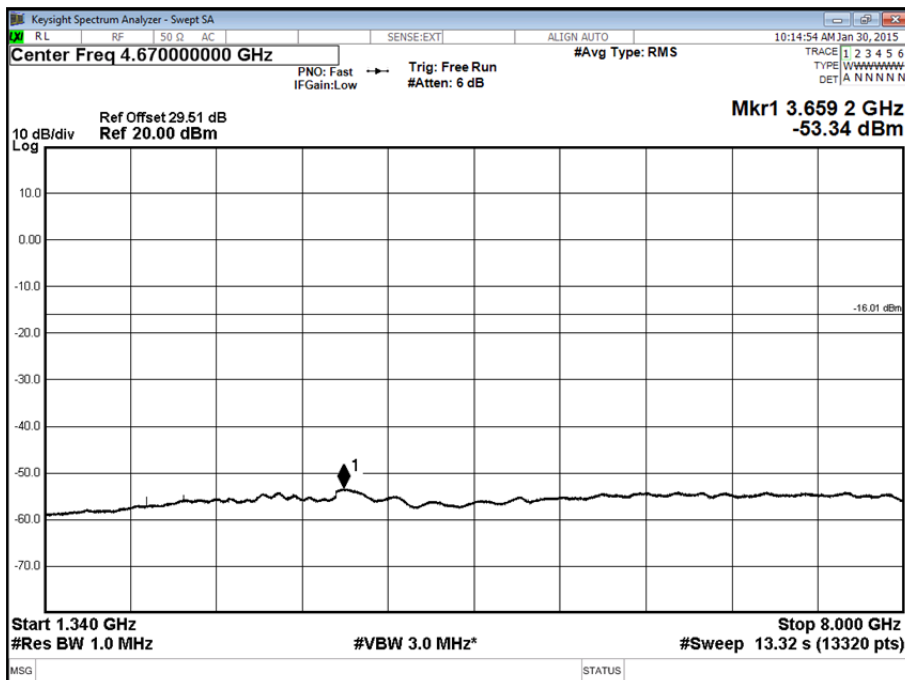
Channel Position B – Bandwidth 5.0 MHz – Antenna B



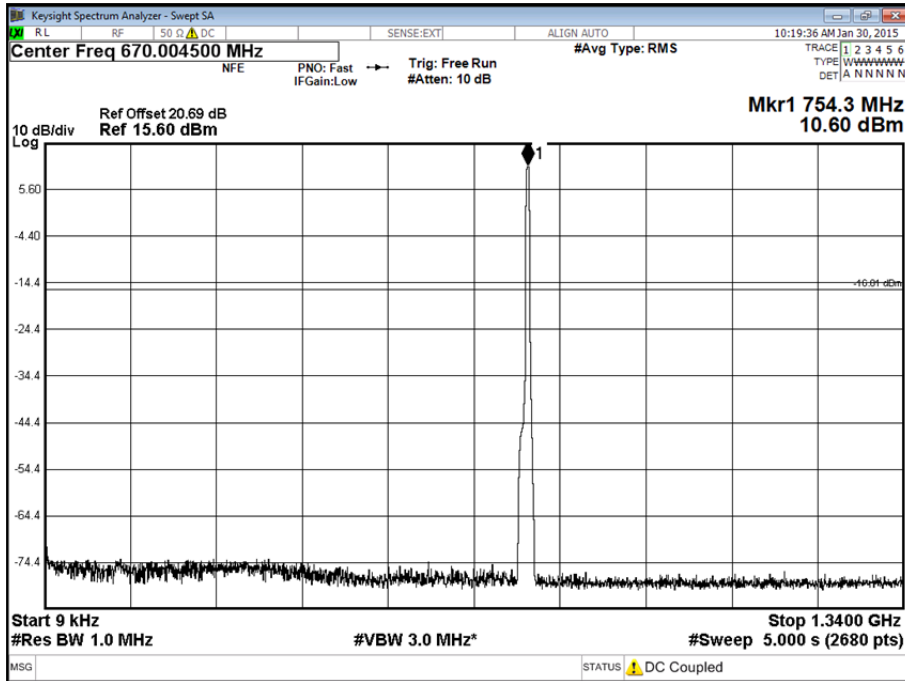
Channel Position M – Bandwidth 5.0 MHz – Antenna B



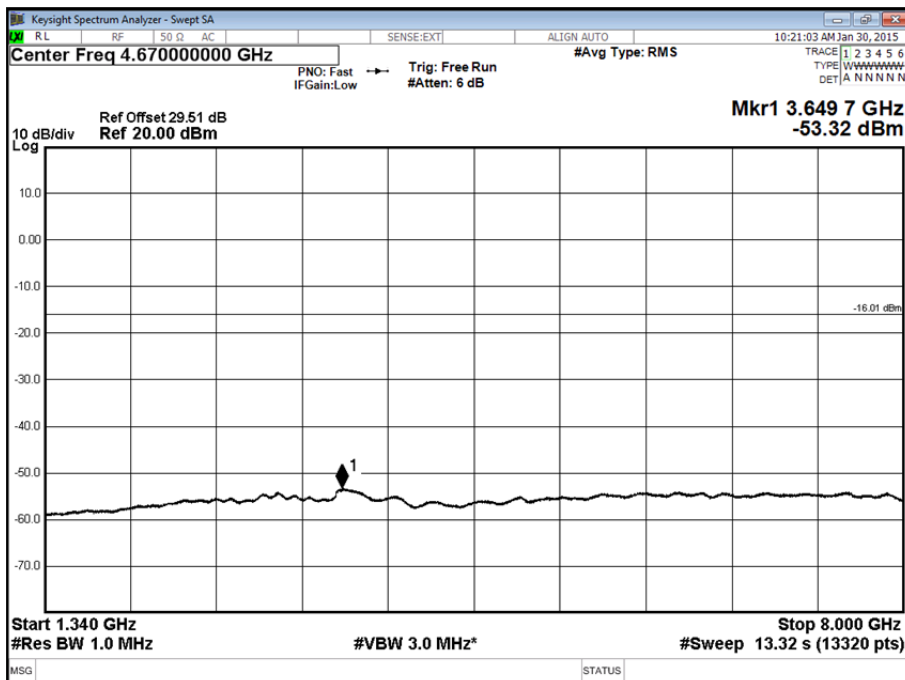
Channel Position M – Bandwidth 5.0 MHz – Antenna B



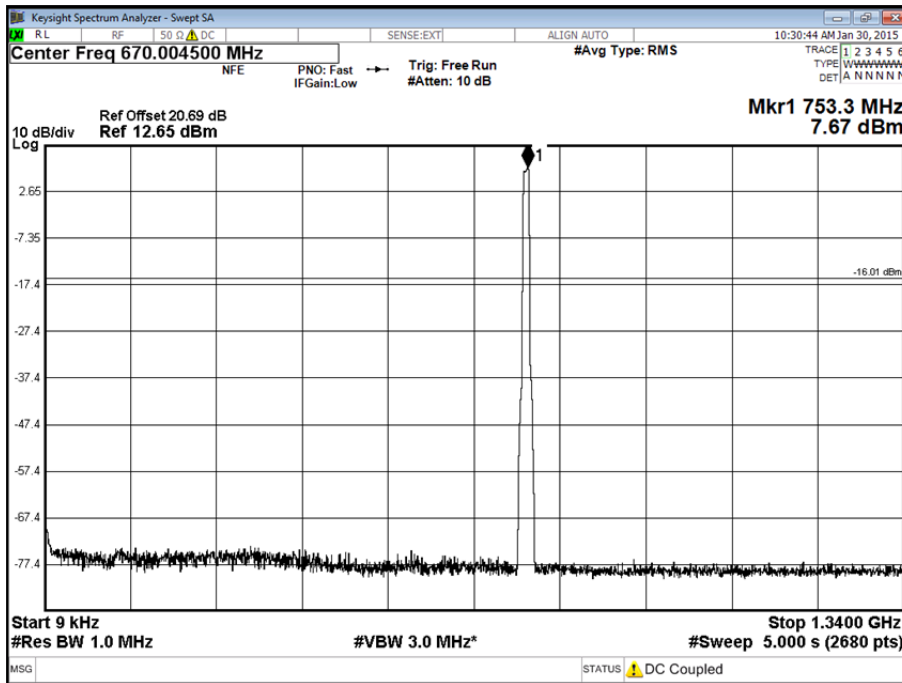
Channel Position T – Bandwidth 5.0 MHz – Antenna B



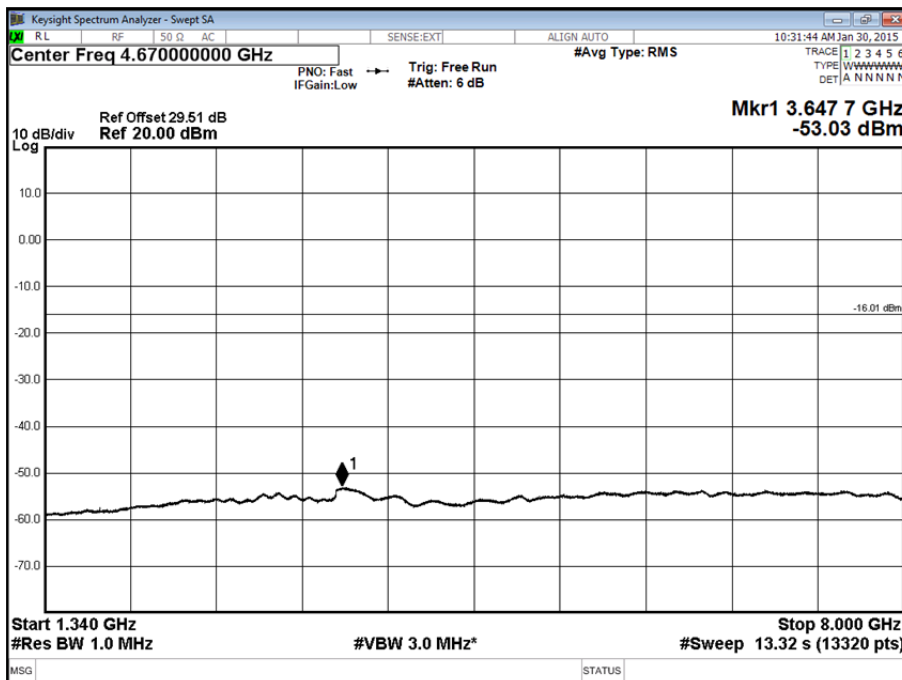
Channel Position T – Bandwidth 5.0 MHz – Antenna B



Channel Position M – Bandwidth 10.0 MHz – Antenna B



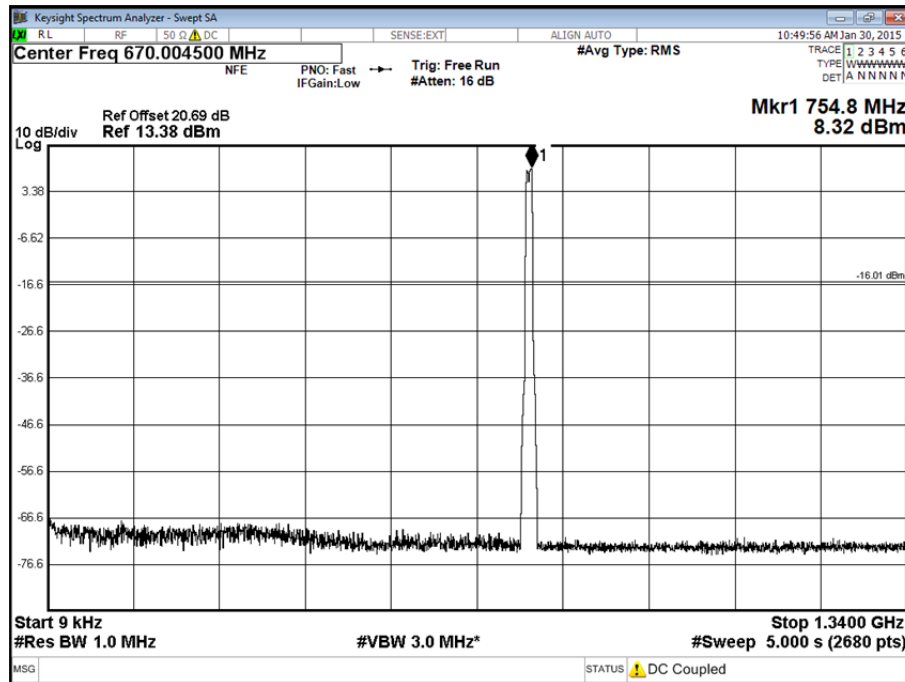
Channel Position M – Bandwidth 10.0 MHz – Antenna B



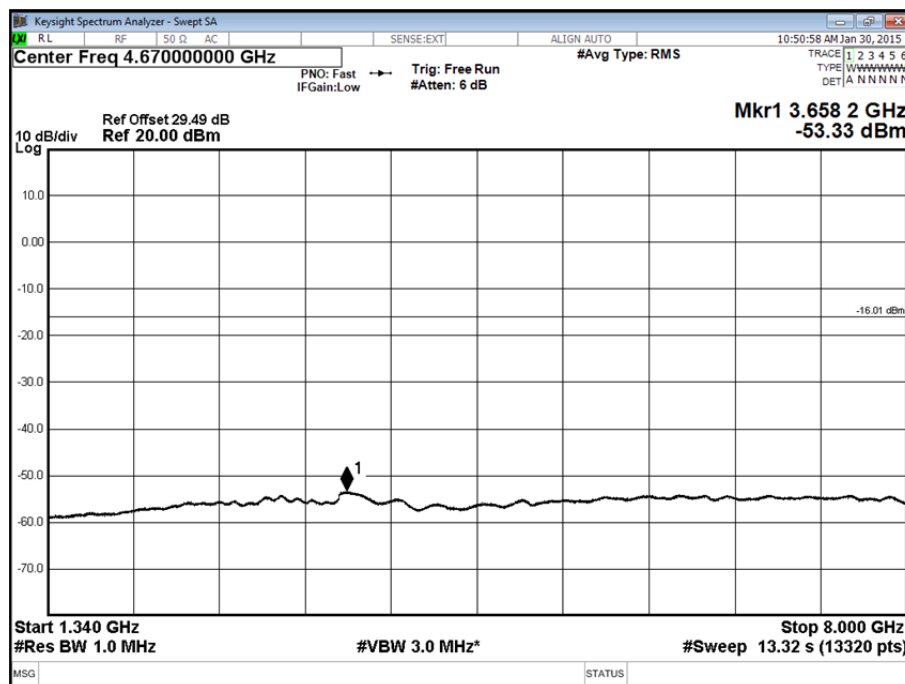
Configuration 2 LTE MC (see Table 1 for carrier frequency)

Maximum Output Power 14 dBm per Carrier (17 dBm per Port), Antenna A, E-TM1.1

Channel Position M - Antenna A



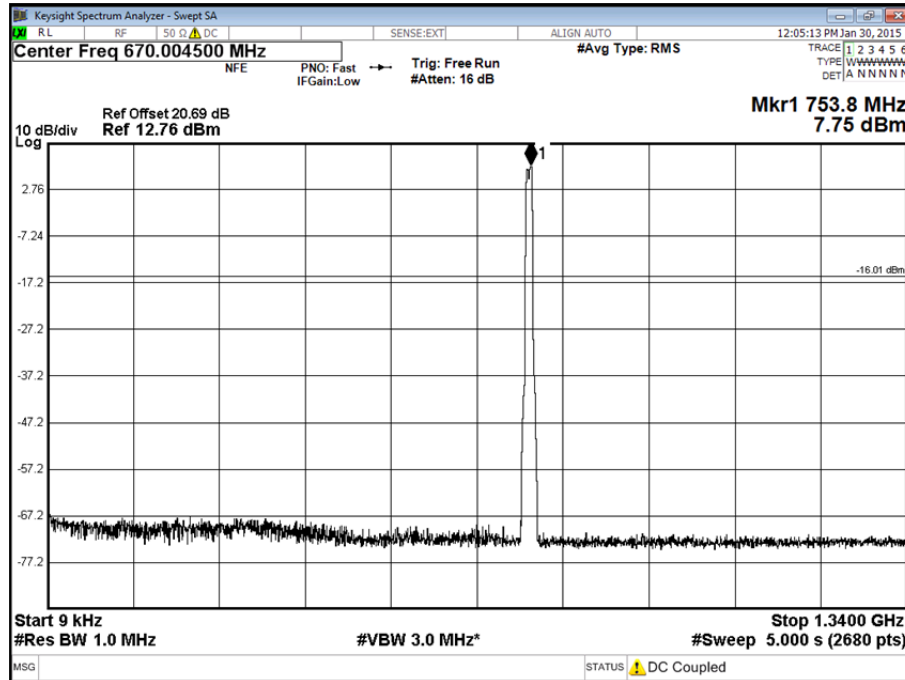
Channel Position M - Antenna A



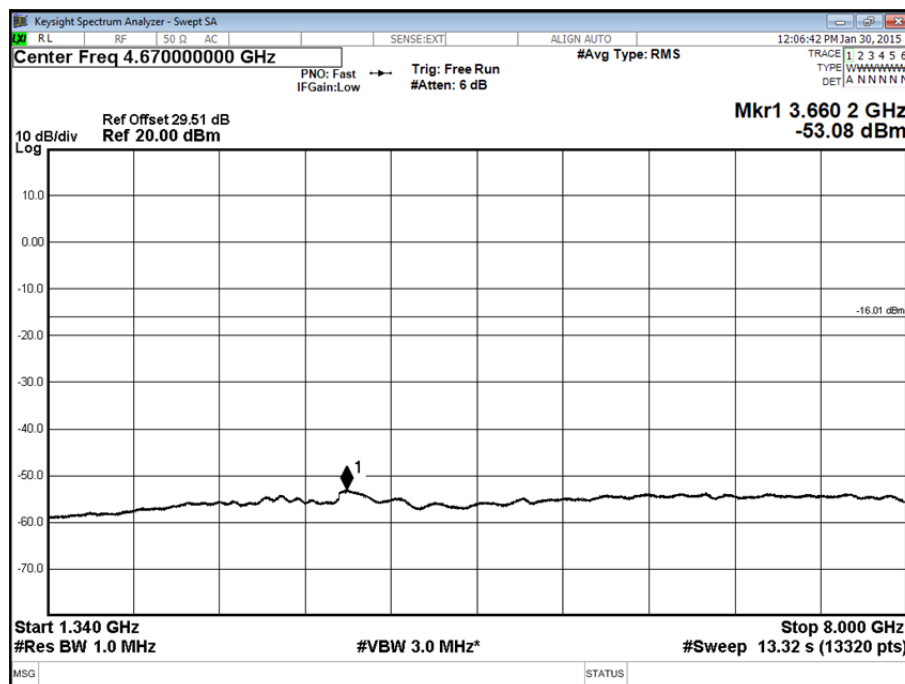
Configuration 2 LTE MC (see Table 1 for carrier frequency)

Maximum Output Power 14 dBm per Carrier (17 dBm per Port), Antenna B, E-TM1.1

Channel Position M - Antenna B



Channel Position M - Antenna B



Limit	-16dBm For IC: 4.6.2 In addition to the limit outlined in Section 4.6.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions: (a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least: (i) $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment. (b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz. Summary: <table> <tr> <td>9 kHz to 8 GHz :</td><td>-16 dBm</td></tr> <tr> <td>763 to 775 MHz : $-46 \text{ dBm} - 10 \log (N) =$</td><td>-49 dBm</td></tr> <tr> <td>793 to 806 MHz : $-46 \text{ dBm} - 10 \log (N) =$</td><td>-49 dBm</td></tr> <tr> <td>1559 to 1610 MHz : $-50 \text{ dBm} - 10 \log (N) =$</td><td>-53 dBm</td></tr> </table>	9 kHz to 8 GHz :	-16 dBm	763 to 775 MHz : $-46 \text{ dBm} - 10 \log (N) =$	-49 dBm	793 to 806 MHz : $-46 \text{ dBm} - 10 \log (N) =$	-49 dBm	1559 to 1610 MHz : $-50 \text{ dBm} - 10 \log (N) =$	-53 dBm
9 kHz to 8 GHz :	-16 dBm								
763 to 775 MHz : $-46 \text{ dBm} - 10 \log (N) =$	-49 dBm								
793 to 806 MHz : $-46 \text{ dBm} - 10 \log (N) =$	-49 dBm								
1559 to 1610 MHz : $-50 \text{ dBm} - 10 \log (N) =$	-53 dBm								

2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 27, Clause 27.54
Industry Canada RSS-Gen, Clause 6.11
Industry Canada RSS-130 Clause 4.3

2.5.2 Date of Test and Modification State

30 January 2015 - Modification State 0

2.5.3 Test Equipment Used

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

2.5.4 Environmental Conditions

Ambient Temperature 27.5°C
Relative Humidity 16.6%

2.5.5 Test Method

The EUT was placed in a Climatic Chamber and connected to a Vector Signal Analyser via an attenuator. The temperature was varied over the range -30°C to +50°C in 10°C steps. At each temperature interval, the EUT was left to stabilise. After this period of time, the mean Frequency Error was measured and recorded on the Middle channel.

At 20°C, the voltage was varied between 85% and 115% of the nominal declared voltage. At each extreme voltage, the mean Frequency Error was measured and recorded on the Middle channel.

2.5.6 Test Results

Configuration 1 LTE SC (see Table 1 for carrier frequency)

Maximum Output Power 17 dBm per carrier, Antenna A, E-TM1.1

Temperature	Frequency Stability (Hz)
	Channel Position M
-30°C	NPD
-20°C	NPD
-10°C	2.00
0°C	-1.54
+5°C	1.70
+10°C	1.83
+20°C	1.98
+30°C	2.01
+40°C	-2.77
+50°C	1.45

Remarks

IRU 2242 was placed outside climatic chamber at ambient temperature. NPD = No Power Detected.

Configuration 1 LTE SC (see Table 1 for carrier frequency)

Maximum Output Power 17 dBm per carrier, Antenna A, E-TM1.1

Voltage	Frequency Stability (Hz)
	Channel Position M
-40.8 V	1.50
-48.0 V	1.98
-55.2 V	-1.88

Limit	$\pm 1.5 \text{ ppm or } 1126.5 \text{ kHz} = 1.5 \text{ ppm} \times 751 \text{ MHz}$
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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 Peak to Average Ratio - Conducted					
Hygrometer	RS	1260	4300	12	01-May-2015
DMM	Fluke	179	4007	12	31-Jul-2015
Spectrum Analyser	Agilent	PXA N9030A	US49230391	12	22-Sep-2015
Network Analyser	Agilent	8722ES	US39175387	12	15-Oct-2015
Power Meter	Agilent	1912A	MY45101348	24	22-Jul-2016
Power Sensor	Agilent	1921A	MY52410016	12	22-Jul-2015
PSU	Xantrex	XKW60-50	1001425551	-	O/P Mon
Attenuator (20dB)	Hewlett Packard	8491A	-	-	O/P Mon
Occupied Bandwidth					
Hygrometer	RS	1260	4300	12	01-May-2015
DMM	Fluke	179	4007	12	31-Jul-2015
Spectrum Analyser	Agilent	PXA N9030A	US49230391	12	22-Sep-2015
Network Analyser	Agilent	8722ES	US39175387	12	15-Oct-2015
Power Meter	Agilent	1912A	MY45101348	24	22-Jul-2016
Power Sensor	Agilent	1921A	MY52410016	12	22-Jul-2015
PSU	Xantrex	XKW60-50	1001425551	-	O/P Mon
Attenuator (20dB)	Hewlett Packard	8491A	-	-	O/P Mon
Band Edge					
Hygrometer	RS	1260	4300	12	01-May-2015
DMM	Fluke	179	4007	12	31-Jul-2015
Spectrum Analyser	Agilent	PXA N9030A	US49230391	12	22-Sep-2015
Network Analyser	Agilent	8722ES	US39175387	12	15-Oct-2015
Power Meter	Agilent	1912A	MY45101348	24	22-Jul-2016
Power Sensor	Agilent	1921A	MY52410016	12	22-Jul-2015
PSU	Xantrex	XKW60-50	1001425551	-	O/P Mon
Attenuator (20dB)	Hewlett Packard	8491A	-	-	O/P Mon
Transmitter Spurious Emissions					
Hygrometer	RS	1260	4300	12	01-May-2015
DMM	Fluke	179	4007	12	31-Jul-2015
Spectrum Analyser	Agilent	PXA N9030A	US49230391	12	22-Sep-2015
Network Analyser	Agilent	8722ES	US39175387	12	15-Oct-2015
Power Meter	Agilent	1912A	MY45101348	24	22-Jul-2016
Power Sensor	Agilent	1921A	MY52410016	12	22-Jul-2015
PSU	Xantrex	XKW60-50	1001425551	-	O/P Mon
Attenuator (20dB)	Hewlett Packard	8491A	-	-	O/P Mon
HPF	Mini-Circuits	1340-4000	-	-	O/P Mon

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Frequency Stability					
Hygrometer	RS	1260	4300	12	01-May-2015
DMM	Fluke	179	4007	12	31-Jul-2015
Thermometer	Fluke	51	3174	12	01-Dec-2015
Spectrum Analyser	Agilent	PXA N9030A	US49230391	12	22-Sep-2015
Network Analyser	Agilent	8722ES	US39175387	12	15-Oct-2015
PSU	Xantrex	XKW60-50	1001425551	-	O/P Mon
Attenuator (20dB)	Hewlett Packard	8491A	-	-	O/P Mon
Climatic chamber	Burnsco	RTC-37P-3-3	07-07	-	O/P Mon

O/P 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
Operating band unwanted emissions		± 0.9 dB
Adjacent Channel Leakage power Ratio (ACLR)	ACLR	± 0.6 dB
	Absolute power	± 0.9 dB
Transmitter spurious emissions	For "Spurious emissions"	
	9 kHz < f $\leq$ 4 GHz	± 1.6 dB
	4 GHz < f $\leq$ 12,75 GHz	± 1.9 dB
	For co-existence requirements (> -60 dBm)	± 0.9 dB
	For co-existence requirements ($\leq$ -60 dBm)	± 1.1 dB
	For protection of the BS receiver	± 1.1 dB
Base Station maximum output power		± 0.1 dB
Transmitter intermodulation	For Operating band unwanted emissions	± 0.9 dB
	For ACLR	± 0.6 dB
	For "Spurious emissions":	
	f $\leq$ 2,2 GHz	± 0.9 dB
	2,2 GHz < f $\leq$ 4 GHz	± 1.6 dB
	f > 4 GHz	± 1.9 dB
Receiver spurious emissions	30 MHz $\leq$ f $\leq$ 4 GHz	± 1.6 dB
	4 GHz < f $\leq$ 12,75 GHz	± 1.9 dB
Blocking characteristics	In-band blocking, using modulated interferer	± 0.3 dB
	Out of band blocking, using CW interferer:	
	1 MHz < finterferer $\leq$ 3 GHz	± 0.4 dB
Receiver intermodulation characteristics	3 GHz < finterferer $\leq$ 12,75 GHz	± 0.5 dB
		± 0.9 dB
Adjacent Channel Selectivity (ACS) and narrow-band blocking		± 0.9 dB



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).

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Product Service

ANNEX A

MODULE LIST



Product Service

Configuration			
Product	Product No	R-State	Serial No
RD 2242 B13	KRY 901 334/1	R1B	C829198777
IRU 2242	KRC 161 444/1	R1C	C828840931
RBS 6601	BFL 901 009/1	R3B	BR81278870
Software Version:	CXP9013268/14	Revision:	R59FJ