



Product Service

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Report On

FCC and IC Testing of the
Ericsson LTE and NB-IoT GB and NB-IoT SA KRC 161 489/1 Radio
2203 B2 B25 (1900 MHz) Base Station in accordance with FCC CFR
47 Part 2, FCC CFR 47 Part 24, Industry Canada RSS-GEN and
Industry Canada RSS-133

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161489-1

IC ID: 287AB-AS1614891

PREPARED BY

Maggie Whiting
Key Account Manager

APPROVED BY

Steve Scarfe
Authorised Signatory

DATED

13 August 2018

Document 75942505 Report 05 Issue 2

August 2018



Product Service

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Product Service

SECTION 1

REPORT INFORMATION



Product Service

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name	Radio 2203 B2 B25
Product Number	KRC 161 489/1
IC Model Name	AS1614891
Serial Number(s)	D825085419
Software Version	CXP9013268%9_AM00
Hardware Version	R1F
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2017 FCC CFR 47 Part 24: 2017 Industry Canada RSS-GEN: Issue 4: 2014 Industry Canada RSS-133: Issue 6: 2013
Start of Test	03 July 2018
Finish of Test	25 July 2018
Name of Engineer(s)	Neil Rousell Graeme Lawler
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 ANSI C63.26:2015

ENGINEERING STATEMENT

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

Test Engineer(s);

N Rousell

G Lawler

This report has been up issued to Issue 2 and should be read in place of Issue 1. This report has been up issued to correct the wrong part number on the Title page and add a corrected Declaration of Conformity.



Product Service

1.2 BRIEF SUMMARY OF RESULTS

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

Section	Specification Clause				Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 24	RSS-GEN	RSS-133		
2.1	2.1046	24.232 (a)	-	6.4	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	24.238 (b)	6.6	-	Occupied Bandwidth	Pass
2.3	2.1051	24.238 (b)	-	6.5	Band Edge	Pass
2.4	2.1051	24.238 (a)	-	6.5	Transmitter Spurious Emissions	Pass
2.5	2.1053	24.238 (a)	-	6.5	Radiated Emissions	Pass



Product Service

1.3 CONFIGURATION DESCRIPTION

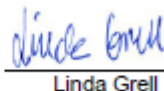
Configuration	RAT	No. Of carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
				Bottom	Middle	Top
A	LTE+NB IoT GB	1	10MHz	1935.0	-	1990.0
A	LTE+NB IoT GB	1	15MHz	1937.5	-	1987.5
A	LTE+NB IoT GB	1	20MHz	1940.0	-	1985.0
B	NB IoT SA	1	0.18 MHz	1930.2	1962.5	1994.8

1.4 DECLARATION OF BUILD STATUS

MANUFACTURING DESCRIPTION	Radio Unit		
MANUFACTURER	Ericsson AB		
TYPE	Radio 2203 B2 B25		
PART NUMBER	KRC 161 489/1		
SERIAL NUMBER	D825085419		
HARDWARE VERSION	R1F		
SOFTWARE VERSION	CXP9013268%9_AM00		
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	B2, TX DL: 1930-1990 MHz B25, TX DL: 1930-1995 MHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	B2, RX UL: 1850-1910 MHz B25, RX UL: 1850-1915 MHz		
COUNTRY OF ORIGIN	Sweden		
INTERMEDIATE FREQUENCIES	--		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	See below		
MODULATION TYPES: (i.e. phase mod, amplitude mod or comb thereof...)	Combination of phase and amplitude modulation		
HIGHEST INTERNALLY GENERATED FREQUENCY	Carrier frequency 1995 MHz CPRI 9.8 Gbps		
OUTPUT POWER (W or dBm)	2 ports, total 5 W (37 dBm) per port ¹ , SR L max 3 carriers (3x32.2 dBm) per port ¹ , SR W max 4 carriers (4x31 dBm) per port, MR (L+W) max 5 carriers (5x30 dBm) per port ¹ , NB-IoT SA max 1 carrier (1x5W) per port		
FCC ID	See below		
INDUSTRY CANADA ID	See below		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	See below		
MODULES (if applicable)			
MANUFACTURING DESCRIPTION	Radio Unit		
MANUFACTURER	Ericsson AB		
TYPE	Radio 2203 B2 B25		
POWER	36 VDC		
FCC ID	TA8AKRC161489-1		
COUNTRY OF ORIGIN	Sweden		
INDUSTRY CANADA ID	287AB-AS1614891		
EMISSION DESIGNATORS	FCC LTE: 1.4MHz 1M40W7D 3MHz 3M00W7D 5MHz 5M00W7D 10MHz 9M41W7D 15MHz 14M0W7D 20MHz 18M8W7D 200 kHz 210KW7D	WCDMA: 5MHz 5M00F9W	ISED LTE: 1.4MHz 1M10W7D 3MHz 2M89 W7D 5MHz 4M48 W7D 10MHz 9M41 W7D 15MHz 14M0 W7D 20MHz 18M8 W7D 200 kHz 210KW7D
			WCDMA: 5MHz 4M18F9W

¹ Including 2 NB-IoT GB carriers per port.

Signature



Linda Grell

Date

2018-08-13

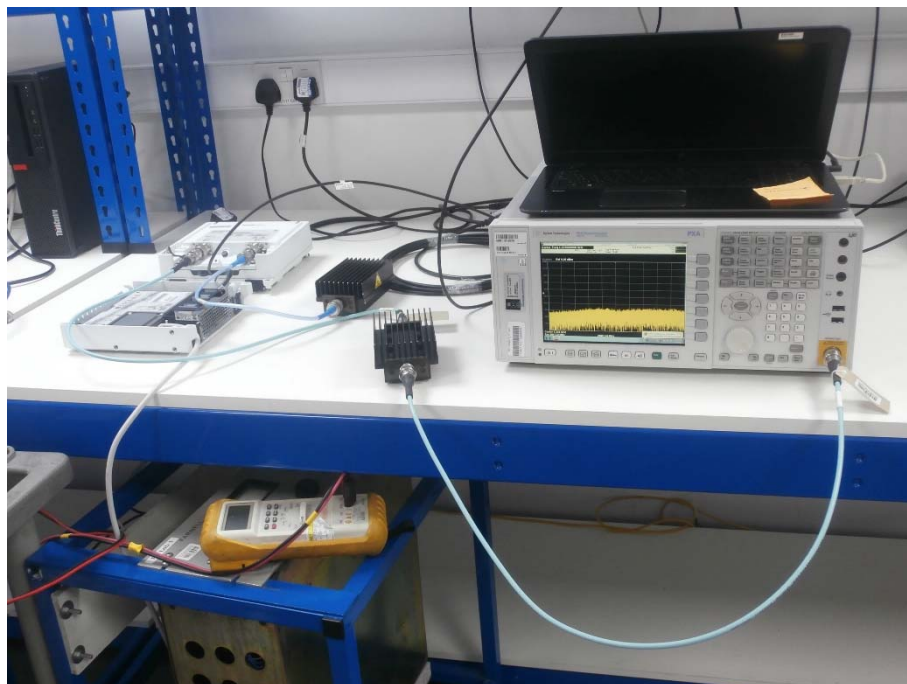
No responsibility will be accepted by TÜV SÜD Product Service UK Limited as to the accuracy of the information declared in this document by the manufacturer.

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

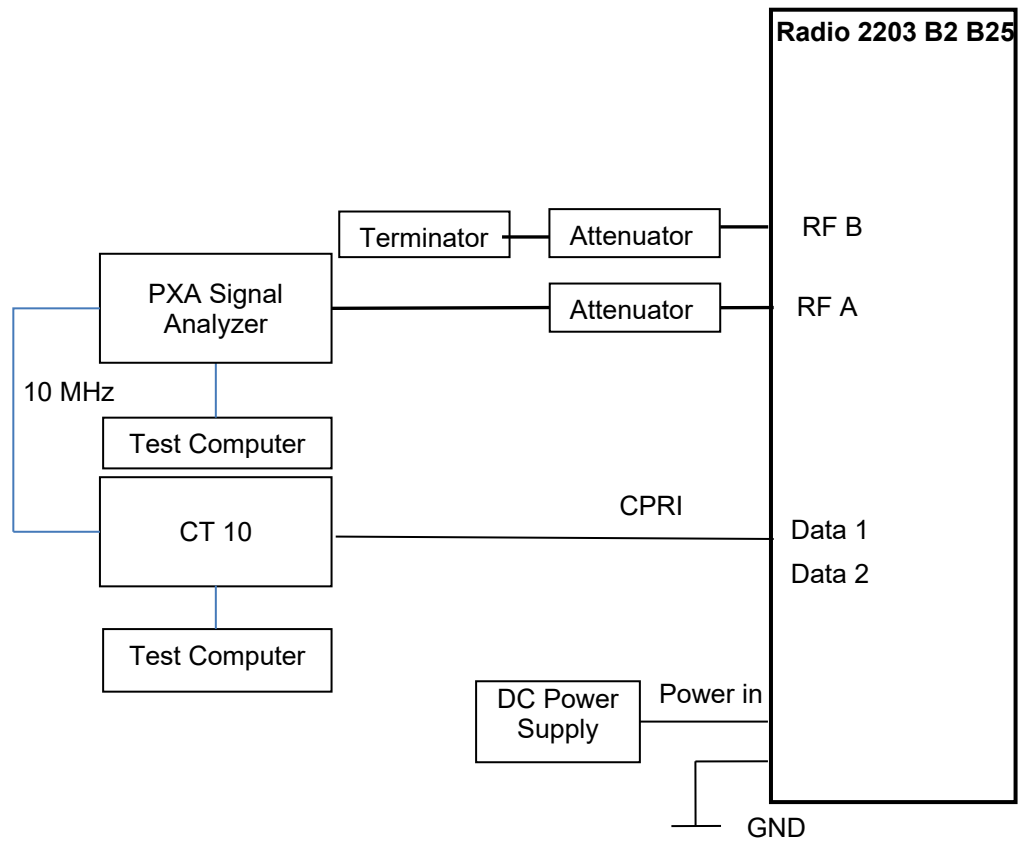
The Equipment Under Test (EUT) KRC 161 489/1 is an Ericsson AB Radio Unit working in the public mobile service (1900 MHz) band which provides communication connections to (1900 MHz) network. The KRC 161 489/1 operates from a -48V DC supply.

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



Equipment Under Test

1.6 TEST SETUP





Product Service

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.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

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 Fareham, UK.

Test Name	Name of Engineer(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Neil Rousell
Occupied Bandwidth	Neil Rousell
Band Edge	Neil Rousell
Transmitter Spurious Emissions	Neil Rousell
Transmitter Spurious Radiated Emissions	Graeme Lawler

1.11 ADDITIONAL INFORMATION

The Radio 2203 B2 B25 is a Dual Band Unit. The testing in this report refers only to the B25 capability of the unit.



Product Service

SECTION 2

TEST DETAILS



Product Service

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

2.1.1 Specification Reference

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

2.1.2 Date of Test and Modification State

04 July 2018 - 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 20.7°C
Relative Humidity 41.3%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01.

2.1.6 Test Results

Configuration A

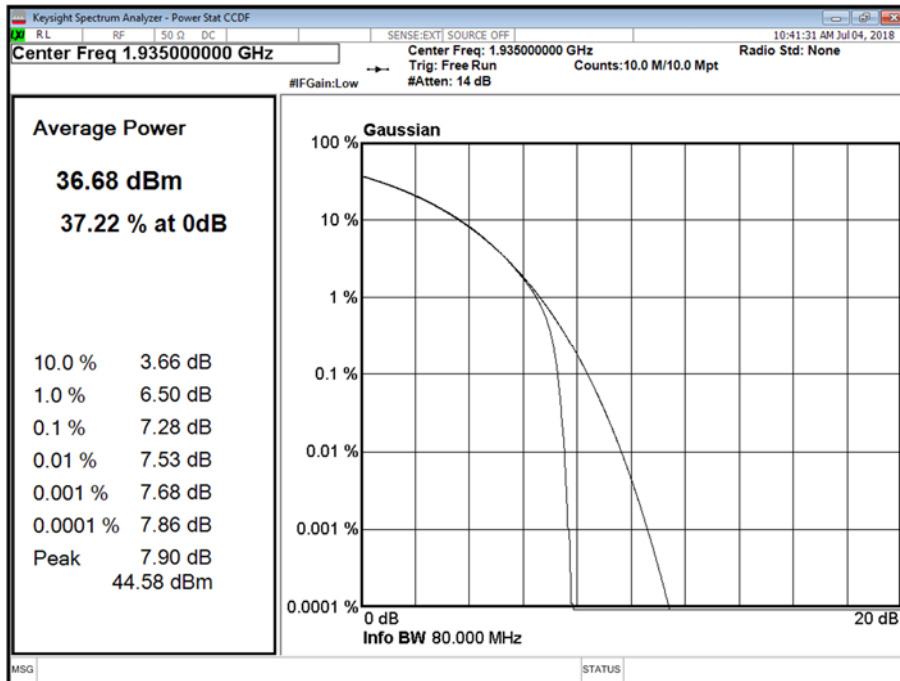
Maximum Output Power 37 dBm

Antenna	E-UTRA / NB-IoT GB Modulation	E-UTRA / NB-IoT GB Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B _{RFBW}		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	E:64QAM / N:QPSK	E:10.0 MHz / N:180 kHz	7.28	36.69	-
A	E:64QAM / N:QPSK	E:15.0 MHz / N:180 kHz	7.29	36.70	-
A	E:64QAM / N:QPSK	E:20.0 MHz / N:180 kHz	7.37	36.73	-

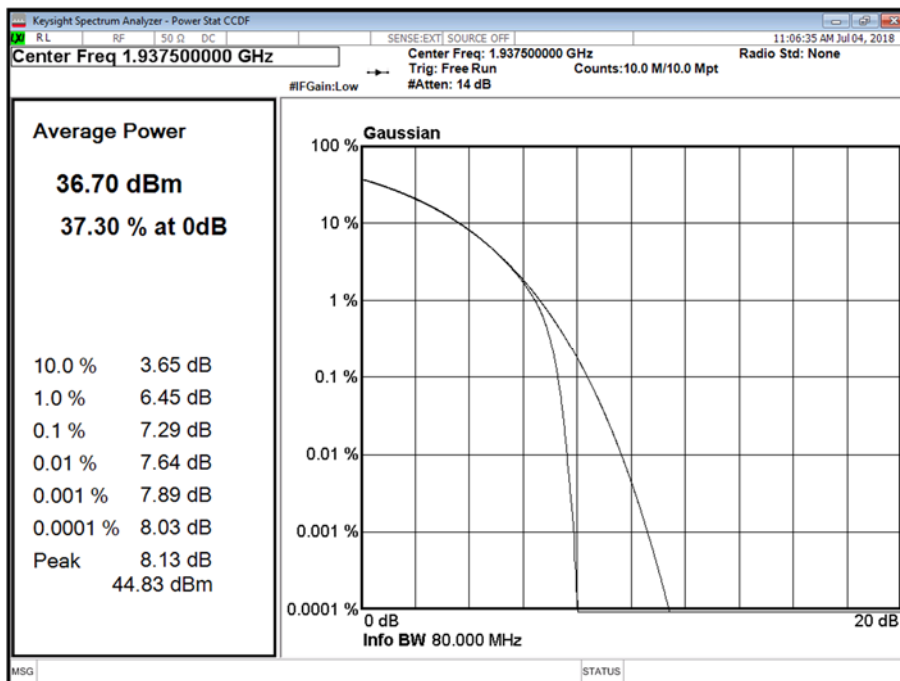


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW



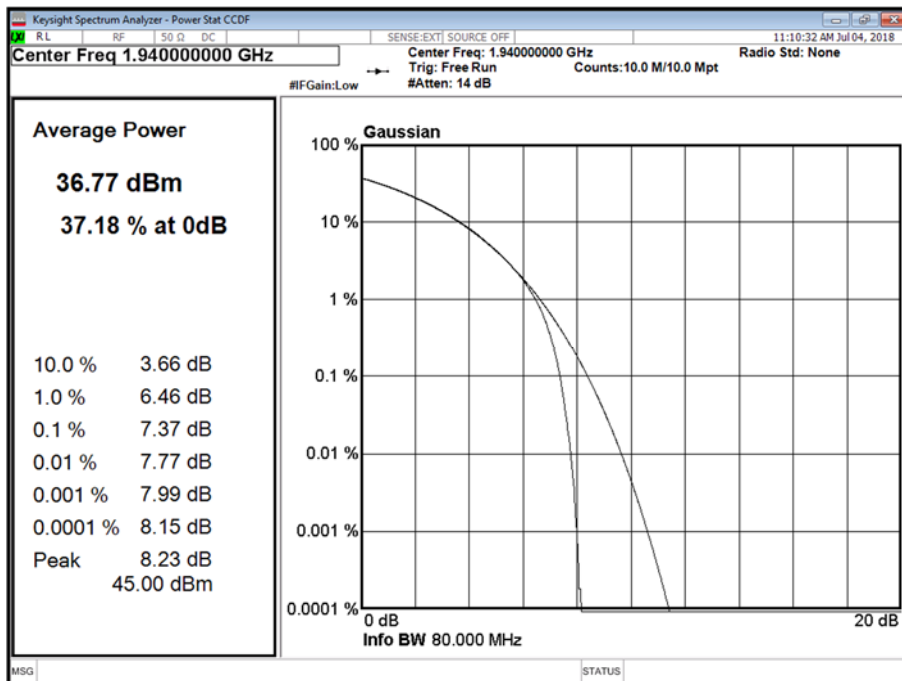
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position BRFBW





Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position BRFBW

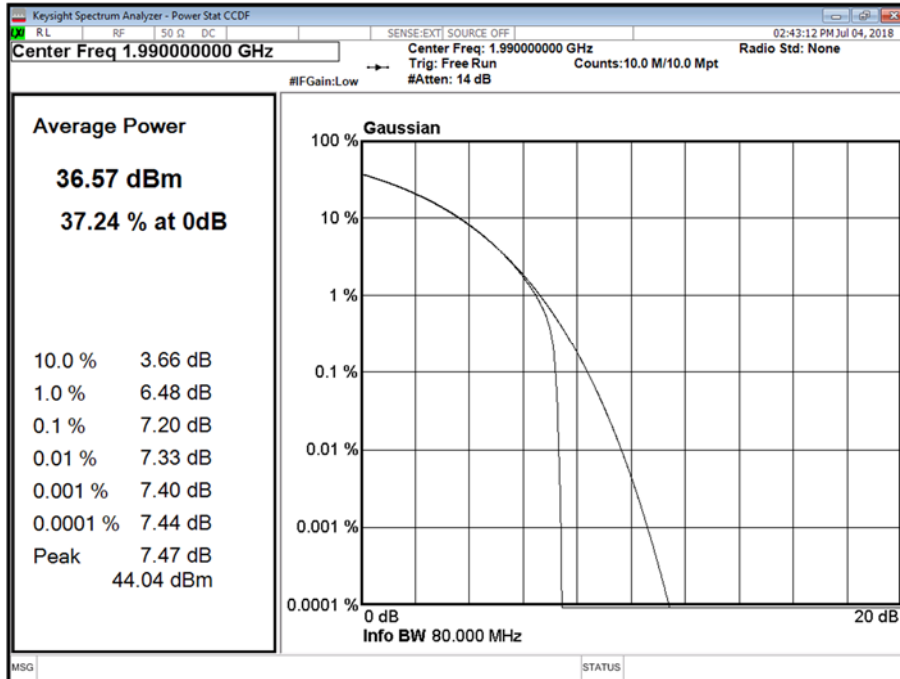


Configuration A

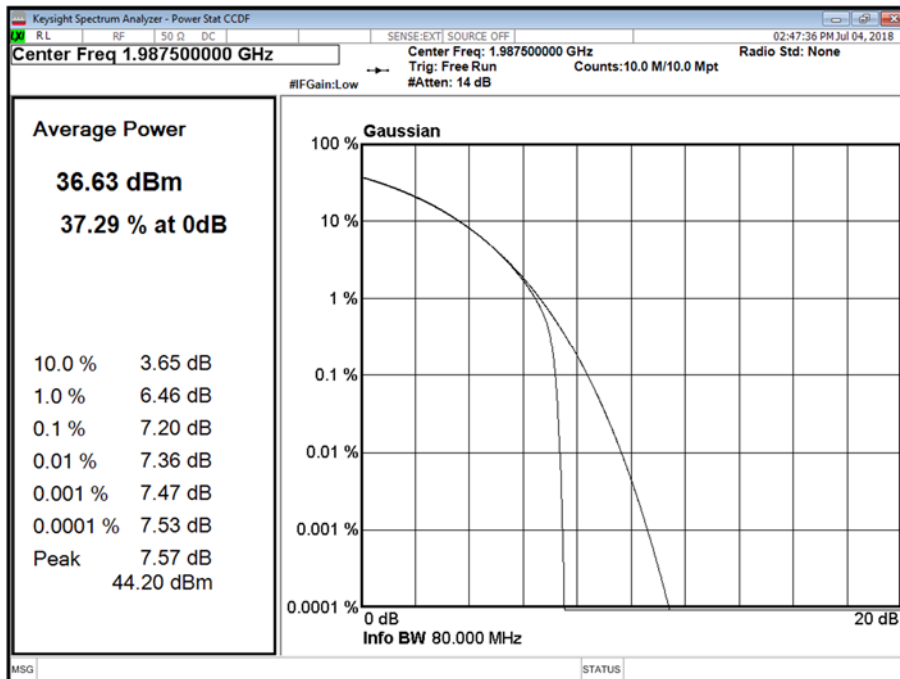
Maximum Output Power 37 dBm

Antenna	E-UTRA / NB-IoT GB Modulation	E-UTRA / NB-IoT GB Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T_{RFBW}		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	E:64QAM / N:QPSK	E:10.0 MHz / N:180 kHz	7.20	36.51	-
A	E:64QAM / N:QPSK	E:15.0 MHz / N:180 kHz	7.20	36.64	-
A	E:64QAM / N:QPSK	E:20.0 MHz / N:180 kHz	7.23	36.77	-

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW



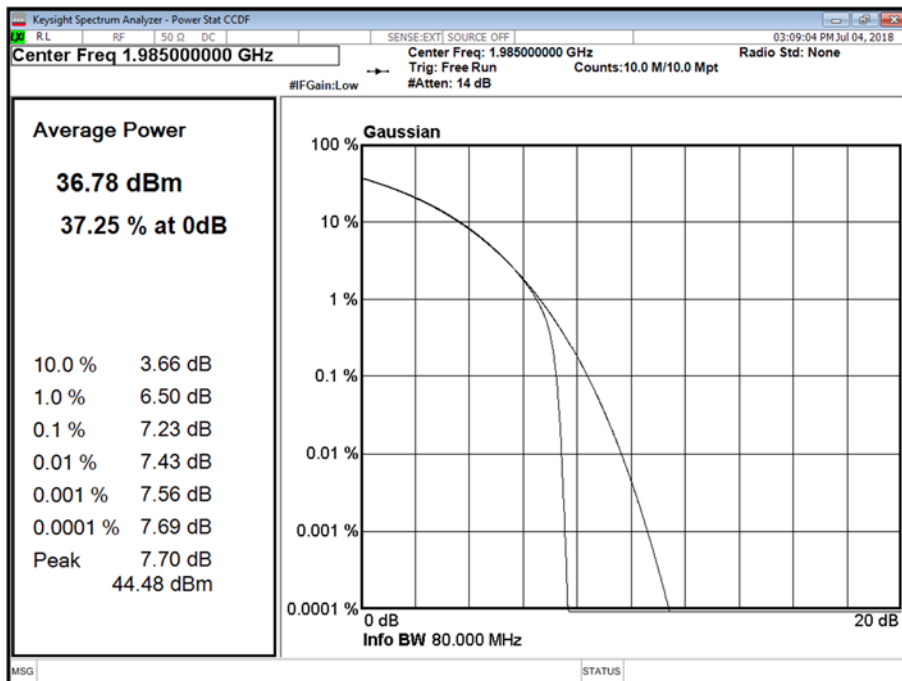
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position TRFBW





Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position TRFBW



Configuration B

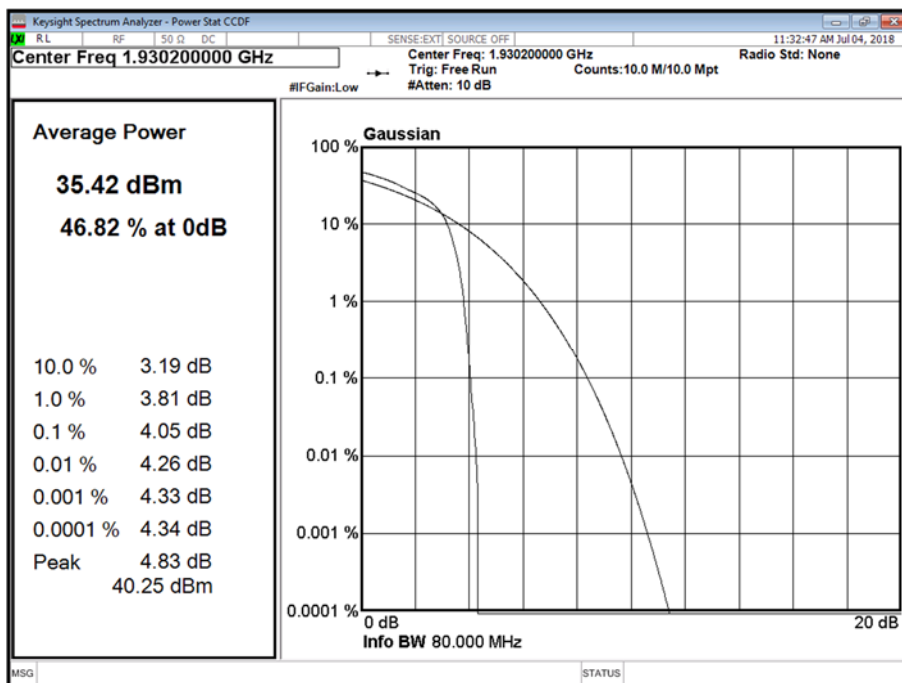
Maximum Output Power 37 dBm

Antenna	NB-IoT SA Modulation	NB-IoT SA Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	N:QPSK	N:180 kHz	4.05	35.38	-



Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position B



Configuration B

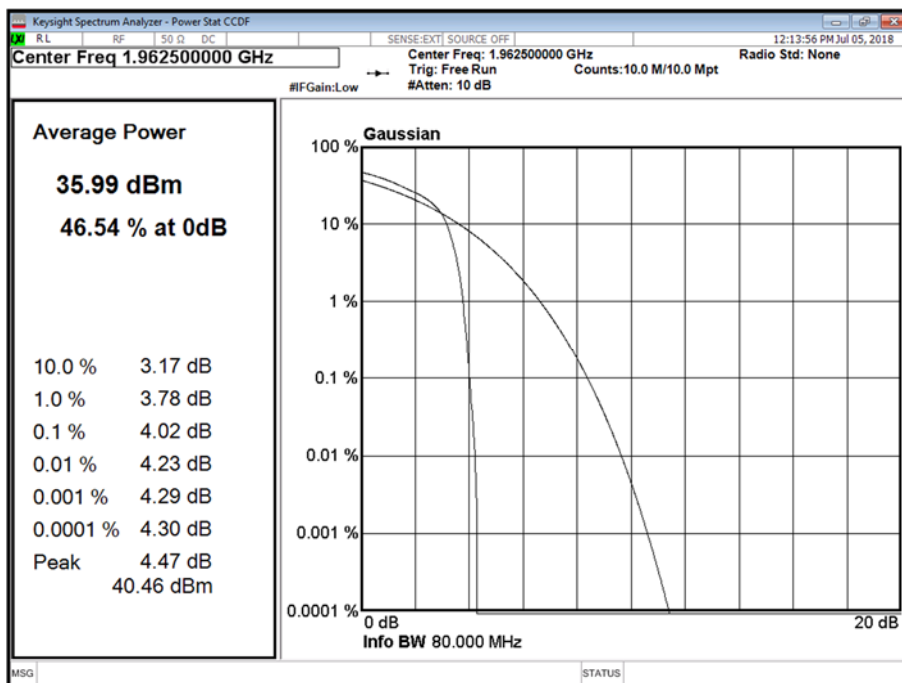
Maximum Output Power 37 dBm

Antenna	NB-IoT SA Modulation	NB-IoT SA Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	N:QPSK	N:180 kHz	4.02	35.89	-



Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position M



Configuration B

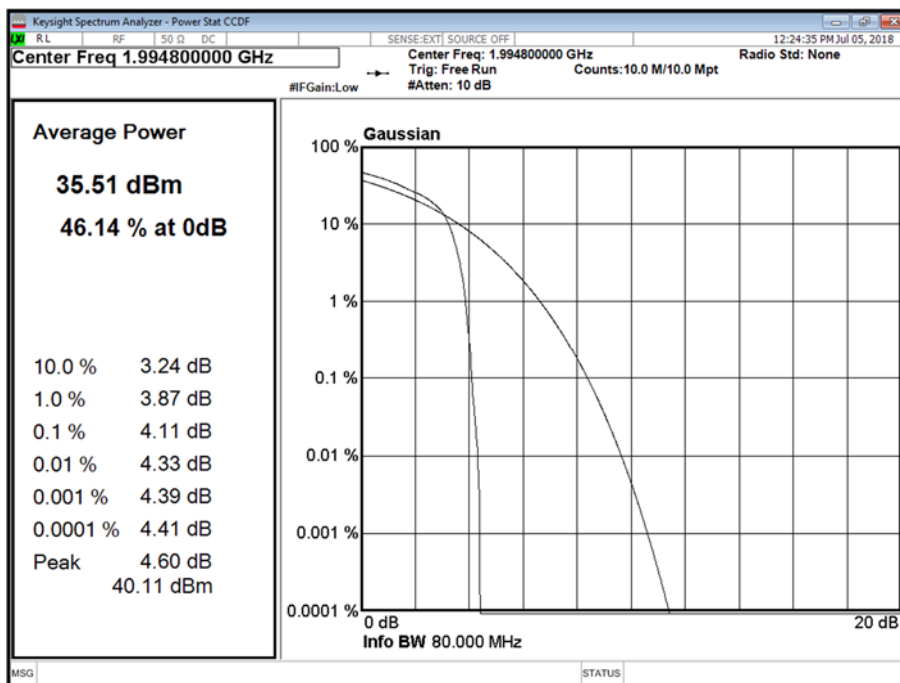
Maximum Output Power 37 dBm

Antenna	NB-IoT SA Modulation	NB-IoT SA Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	N:QPSK	N:180 kHz	4.11	35.58	-



Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T



Limit	
Peak Power	≤500 W or ≤+57 dBm
Peak to Average Ratio	13 dB



Product Service

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 24, Clause 24.238 (b)
Industry Canada RSS-GEN, Clause 6.6

2.2.2 Date of Test and Modification State

04 July 2018 - 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 20.7°C
Relative Humidity 41.3%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

2.2.6 Test Results

Configuration A

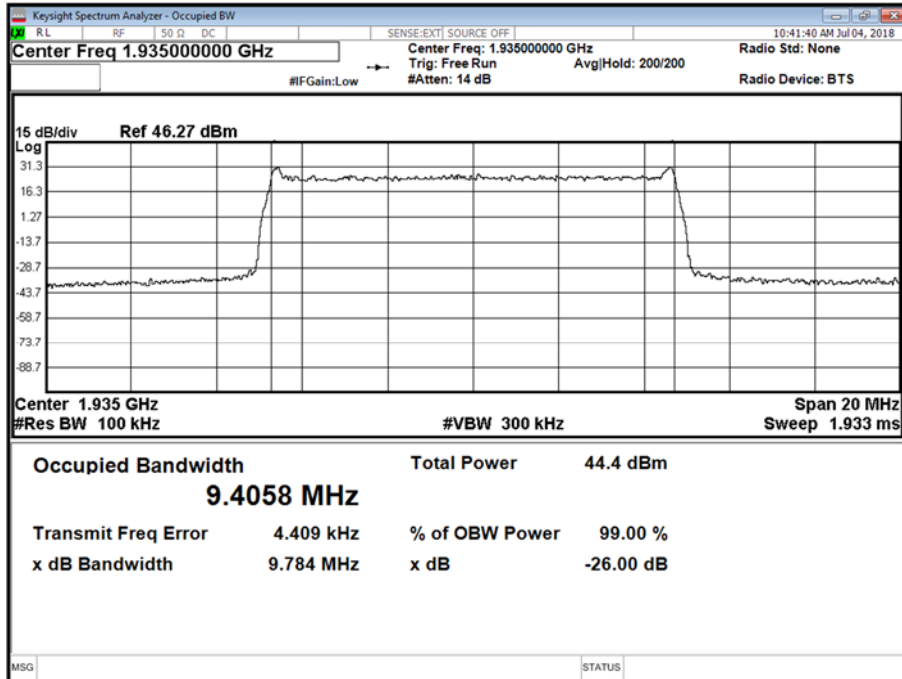
Maximum Output Power 37 dBm

Antenna	E-UTRA / NB-IoT GB Modulation	E-UTRA / NB-IoT GB Carrier Bandwidth	Result (KHz)			
			Channel Position BRFBW		Channel Position TRFBW	
			Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
A	E:64QAM / N:QPSK	E:10.0 MHz / N:180 kHz	9,405.80	9,783.53	9,394.76	9,708.87
A	E:64QAM / N:QPSK	E:15.0 MHz / N:180 kHz	14,008.27	14,558.21	14,015.25	14,652.27
A	E:64QAM / N:QPSK	E:20.0 MHz / N:180 kHz	18,480.06	19,296.13	18,427.74	19,375.46

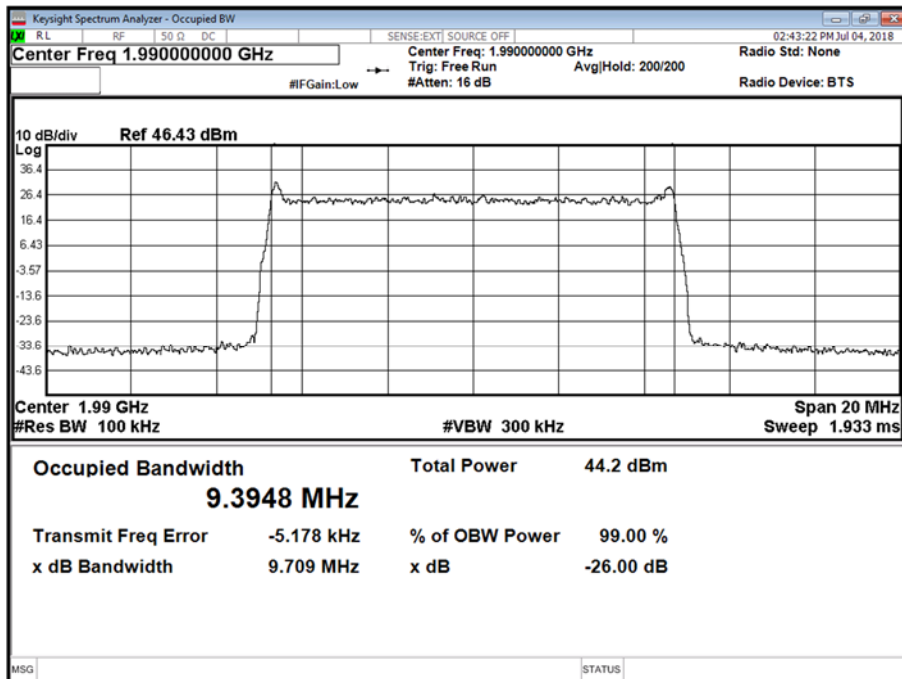


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW



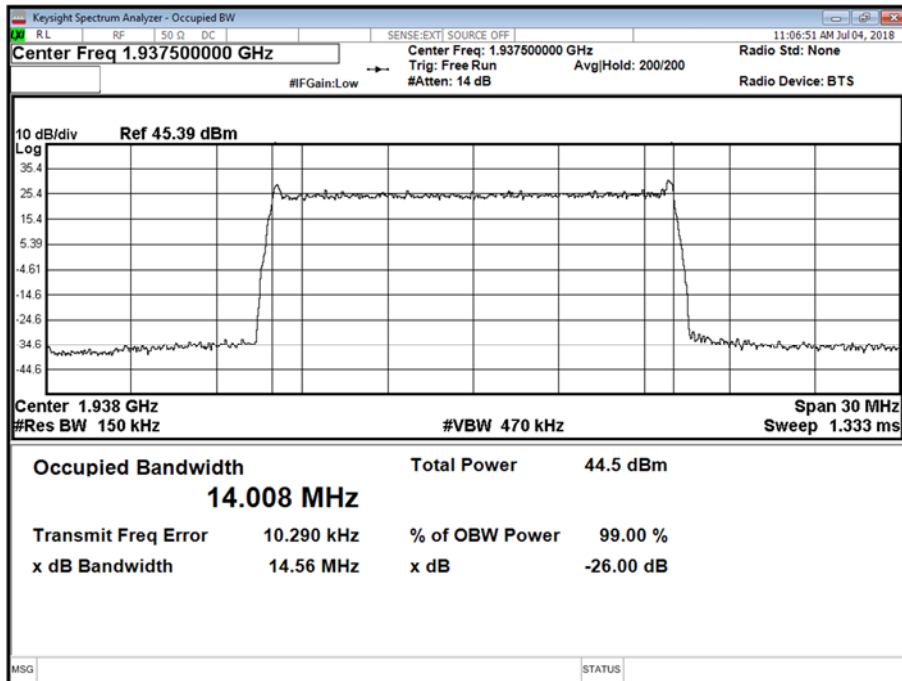
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW



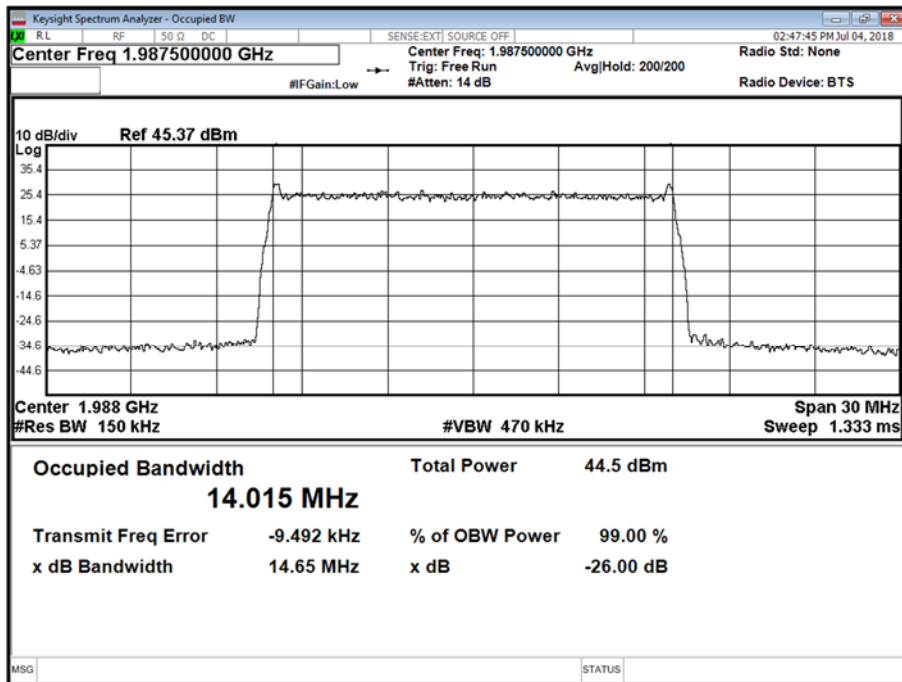


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position BRFBW



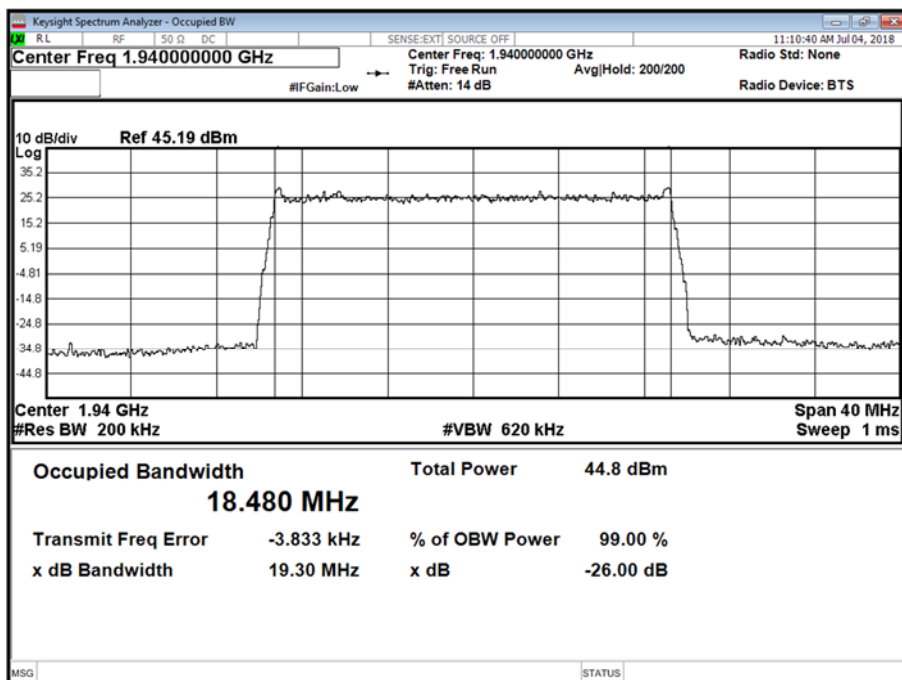
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position TRFBW



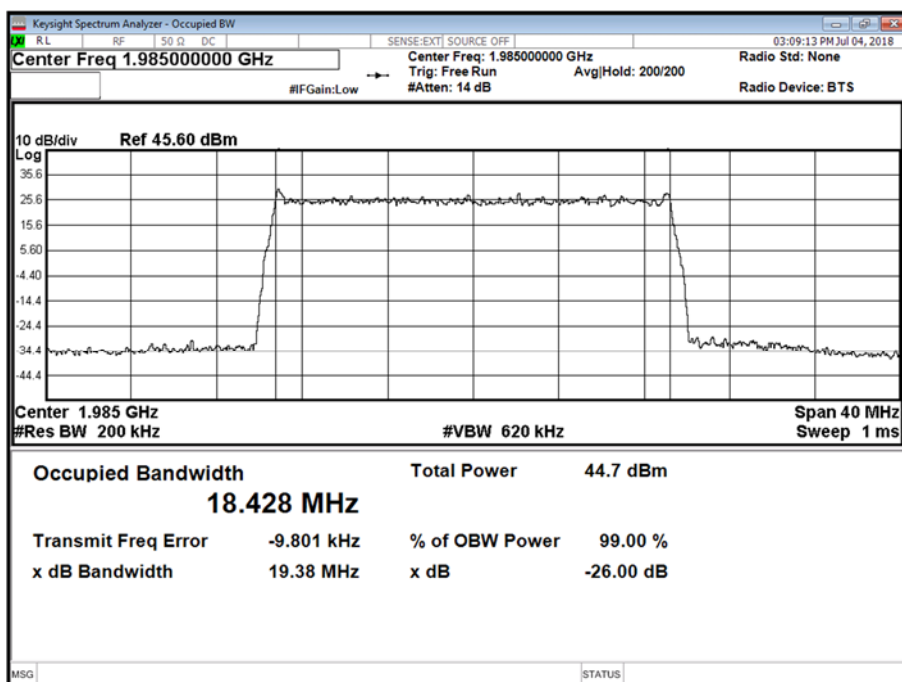


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position BRFBW



Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position TRFBW





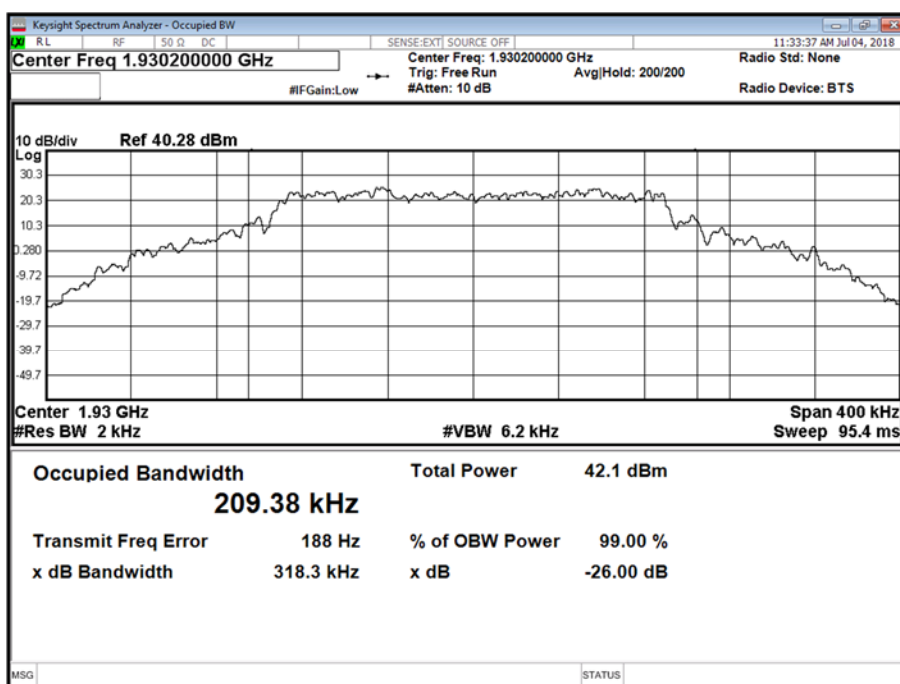
Product Service

Configuration B

Maximum Output Power 37 dBm

Antenna	NB-IoT SA Modulation	NB-IoT SA Carrier Bandwidth	Result (KHz)					
			Channel Position B		Channel Position M		Channel Position T	
			Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
A	N:QPSK	N:180 kHz	209.38	318.25	209.41	318.29	209.45	318.33

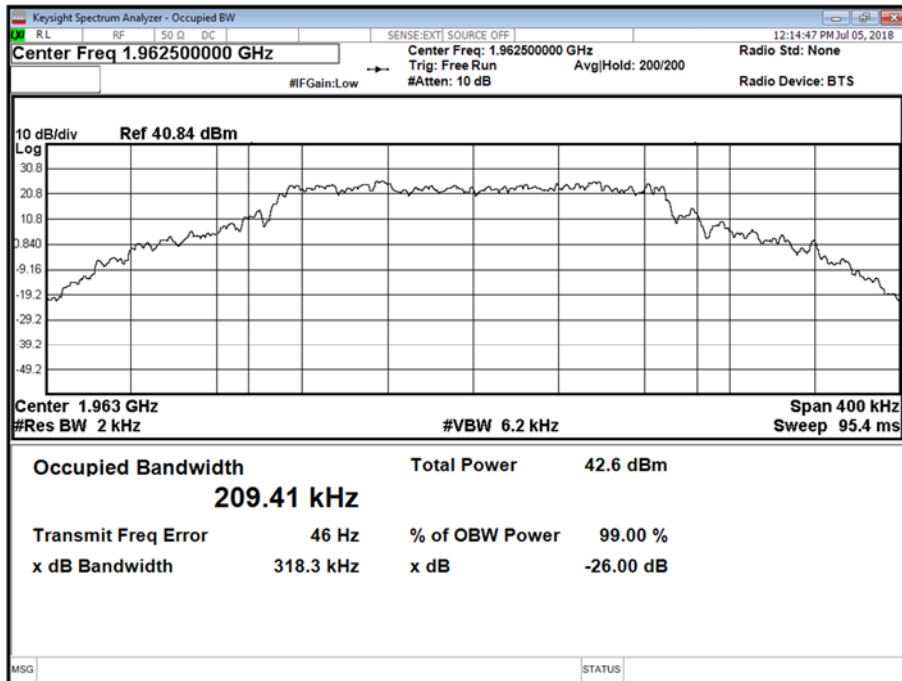
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position B



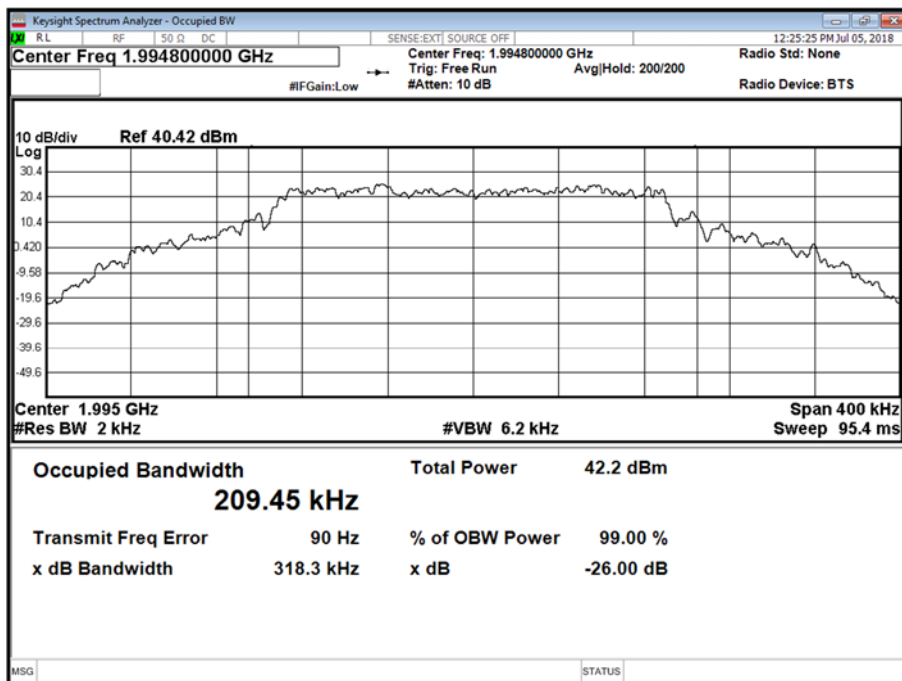


Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position M



Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position T





Product Service

2.3 BAND EDGE

2.3.1 Specification Reference

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

2.3.2 Date of Test and Modification State

04 July 2018 - 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 20.7°C
Relative Humidity 41.3%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \log(N)$, where N is equal to the number of MIMO antenna ports.

For Four ports, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(4) = -19 \text{ dBm}$.

For dual ports, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(2) = -16 \text{ dBm}$.

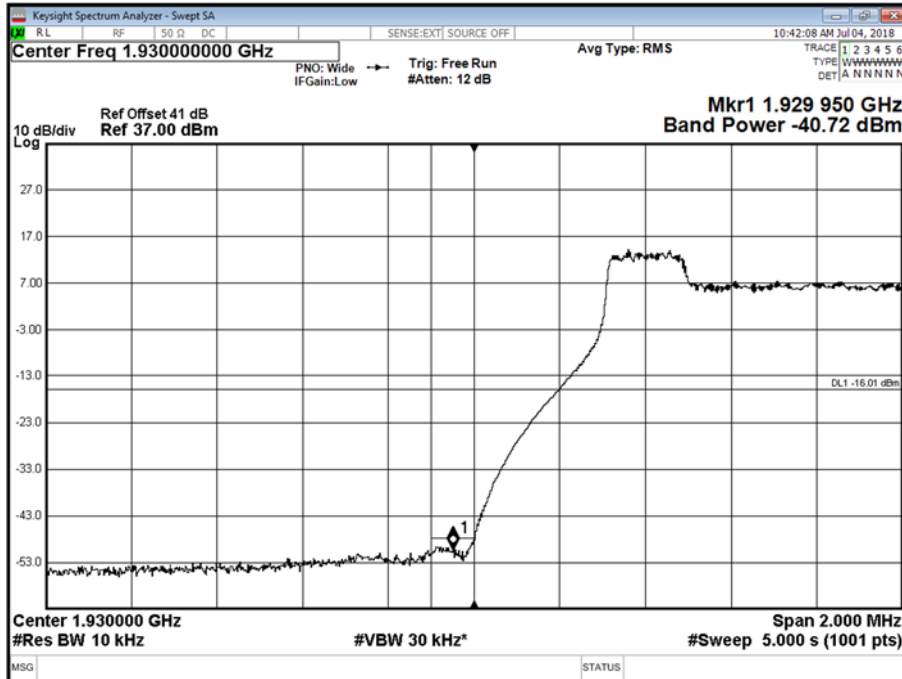
2.3.6 Test Results

Configuration A

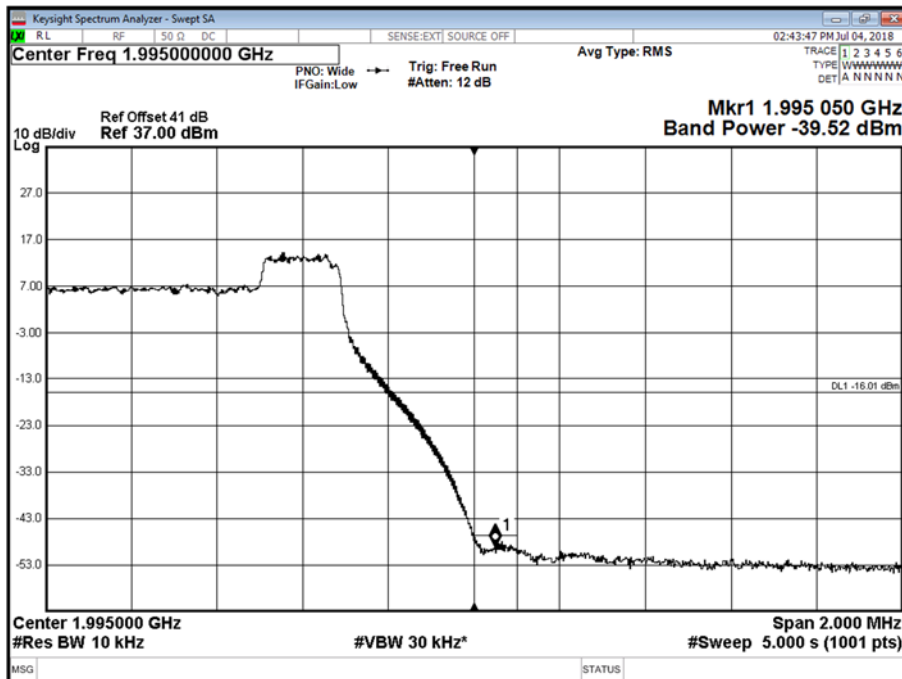
Maximum Output Power 37 dBm

Antenna	E-UTRA / NB-IoT GB Modulation	E-UTRA / NB-IoT GB Carrier Bandwidth	Band Edge (MHz)	
			Channel Position BRBW	Channel Position TRBW
A	E:64QAM / N:QPSK	E:10.0 MHz / N:180 kHz	2,115.0	2,190.0
A	E:64QAM / N:QPSK	E:15.0 MHz / N:180 kHz	2,117.5	2,187.5
A	E:64QAM / N:QPSK	E:20.0 MHz / N:180 kHz	2,120.0	2,185.0

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW



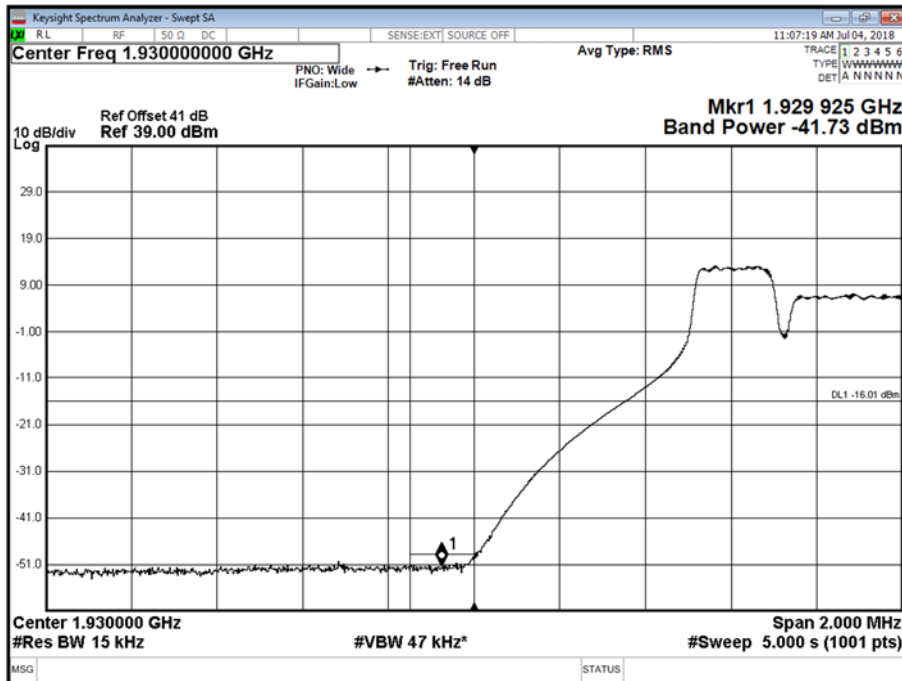
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW



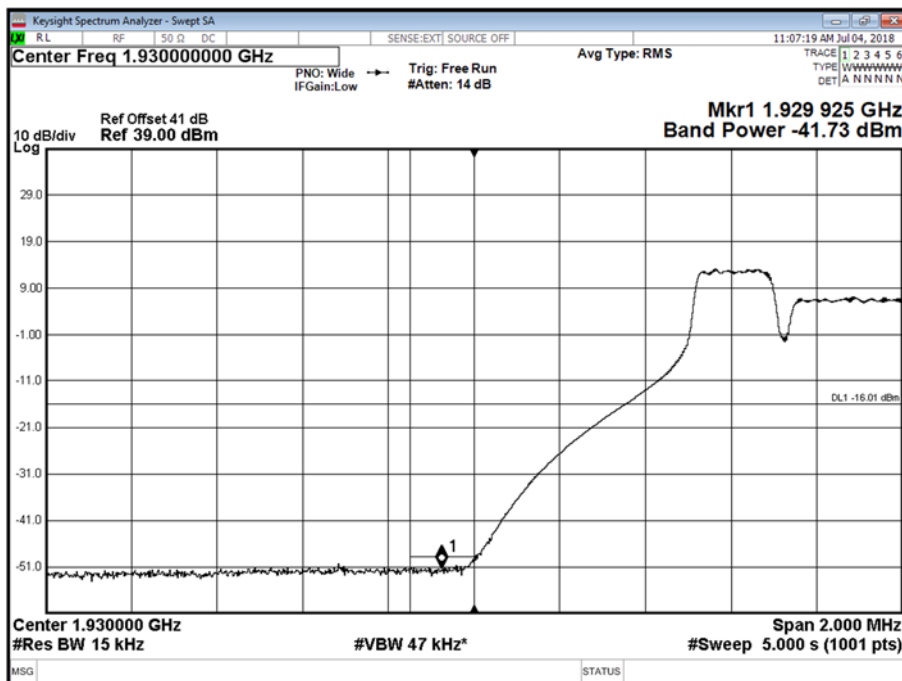


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position BRFBW



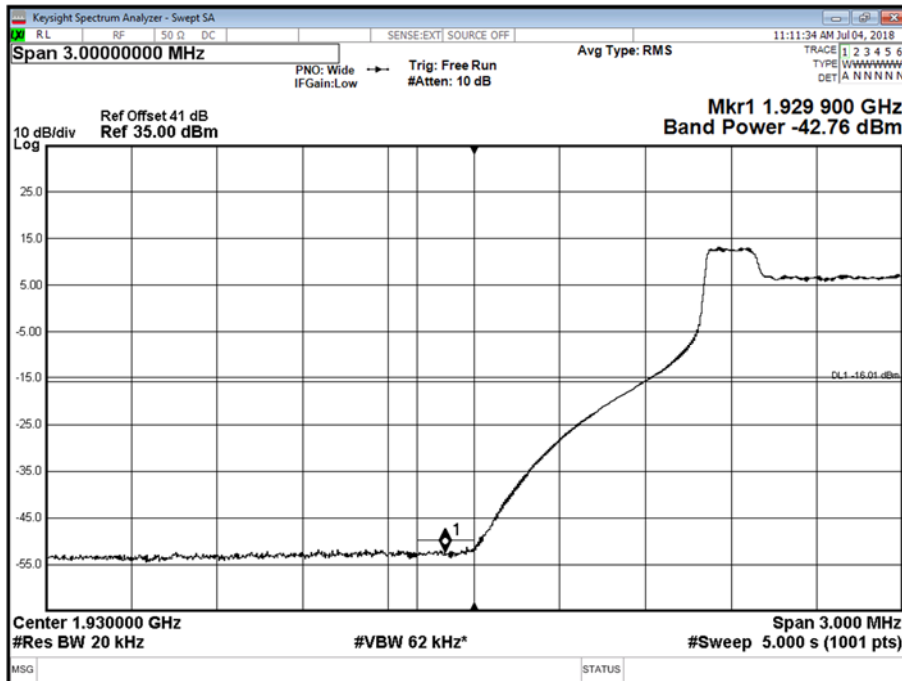
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position TRFBW



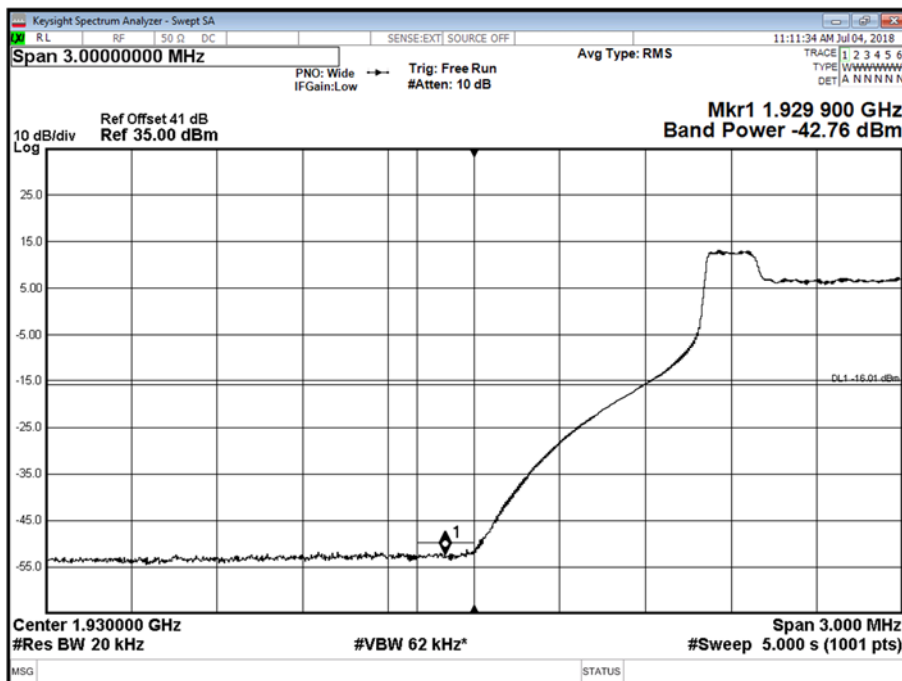


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position BRFBW



Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:20.0 MHz / N:180 kHz - Channel Position TRFBW





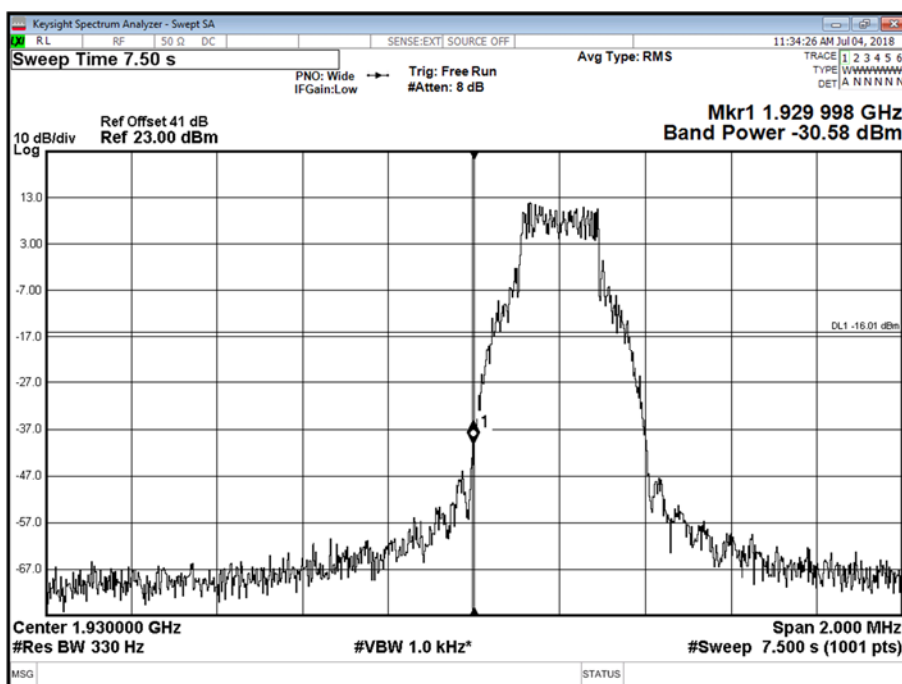
Product Service

Configuration B

Maximum Output Power 37 dBm

Antenna	NB-IoT SA Modulation	NB-IoT SA Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	N:QPSK	N:180 kHz	1,930.2	1,994.8

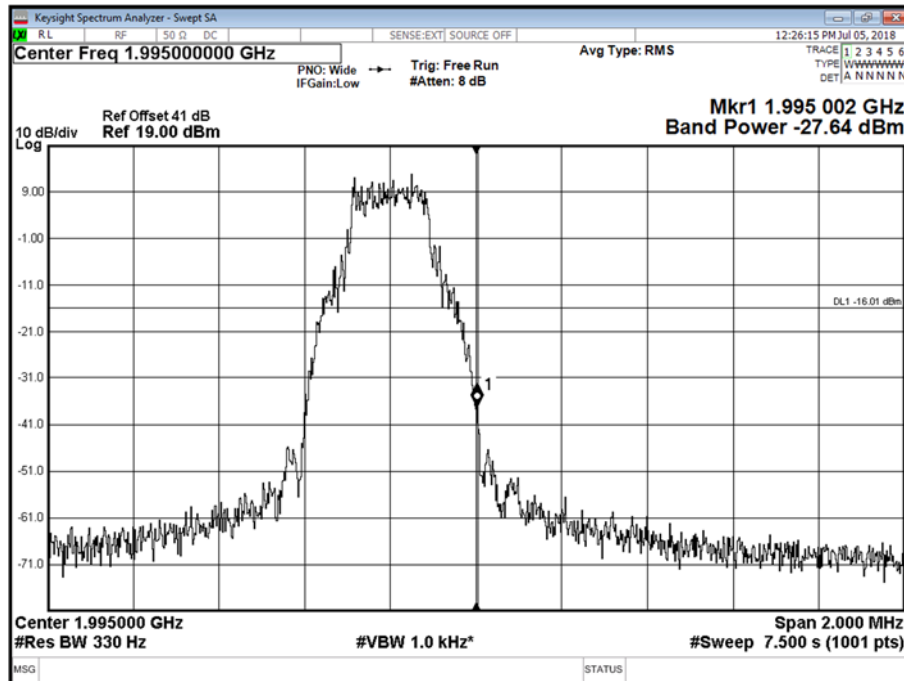
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz - Channel Position B





Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T



Limit	-16 dBm
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Product Service

2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

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

2.4.2 Date of Test and Modification State

04 July 2018 - 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	20.7°C
Relative Humidity	41.3%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \text{Log}(N)$, where N is equal to the number of MIMO antenna ports.

For single carrier, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(4) = -19 \text{ dBm}$.

For dual carrier, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(2) = -16 \text{ dBm}$.

2.4.6 Test Results

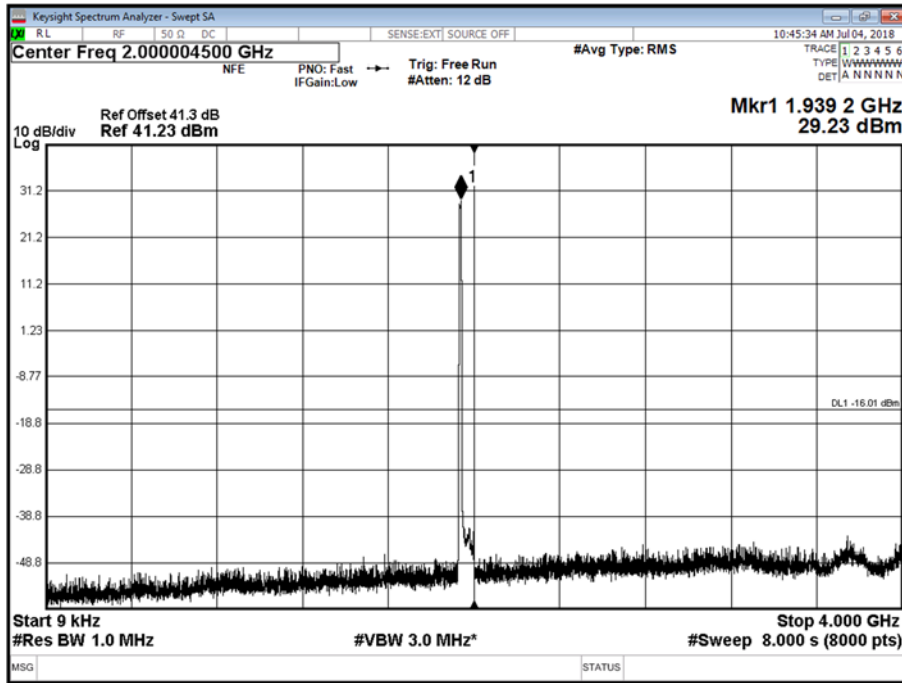
Configuration A

Maximum Output Power 37 dBm

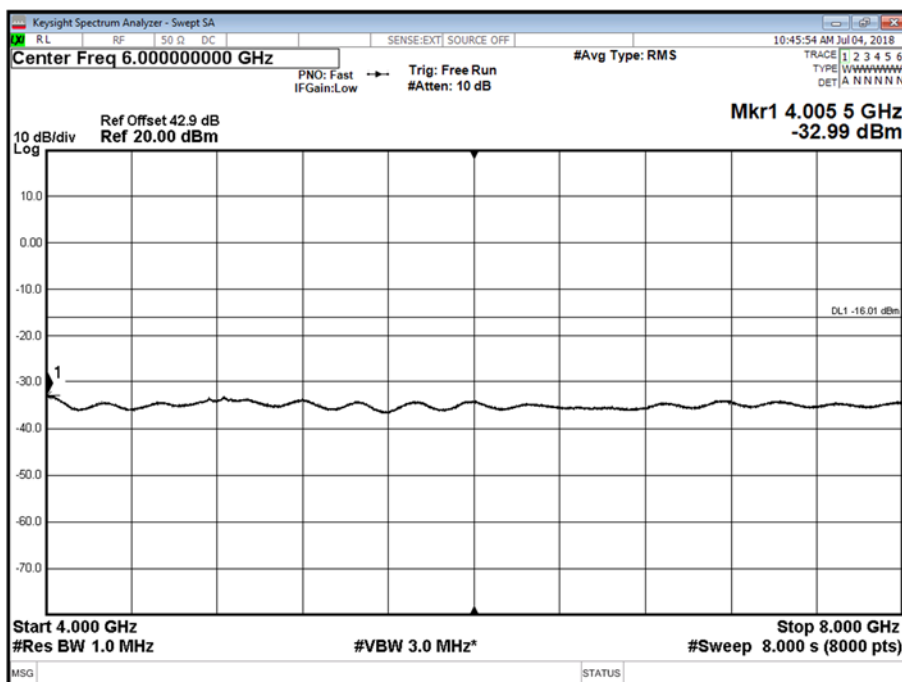


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 1 - Range 0.009
to 4000 MHz



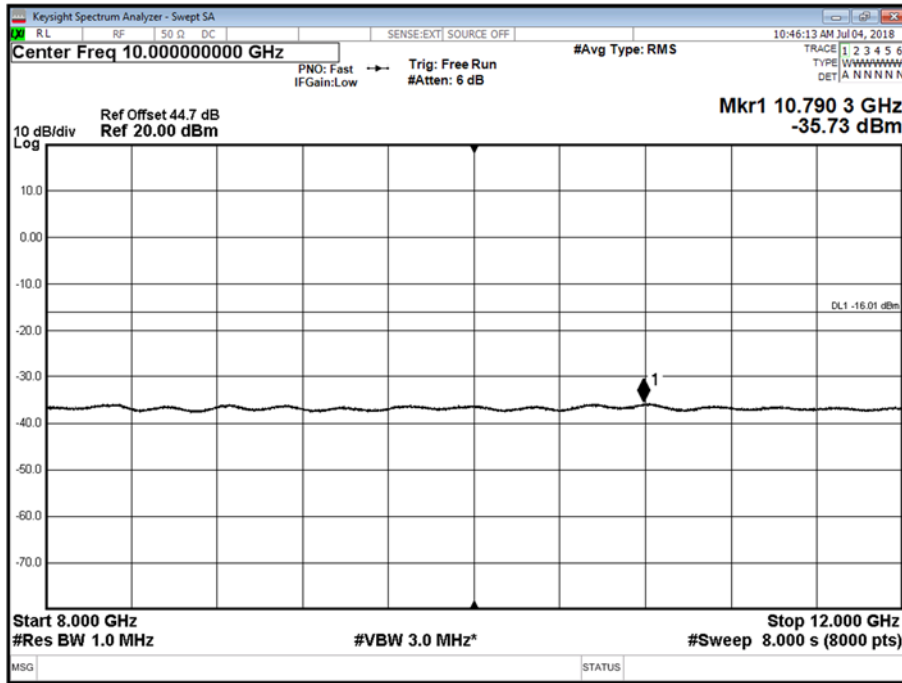
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 2 - Range 4000
to 8000 MHz



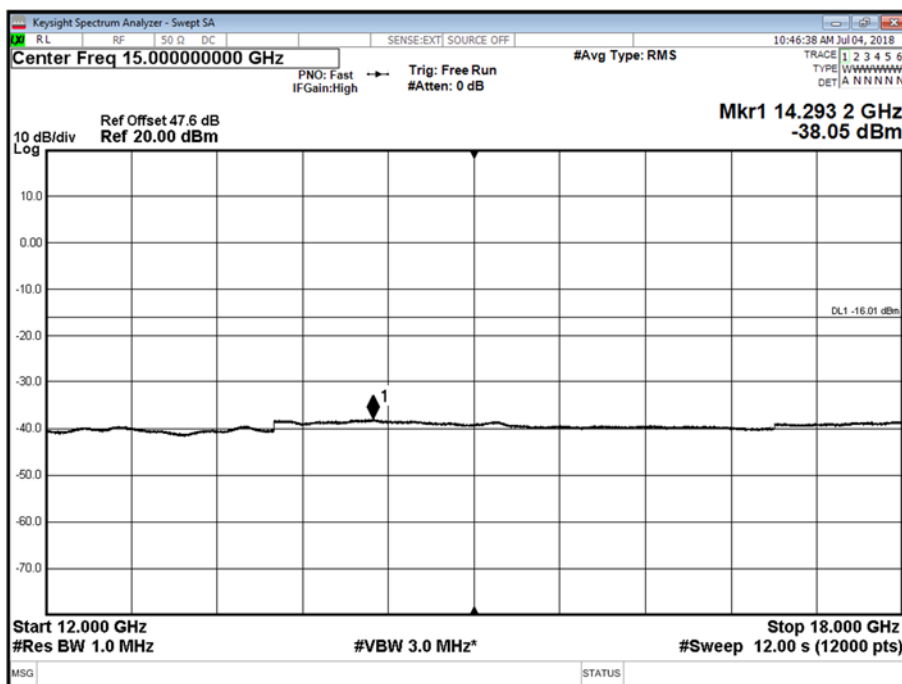


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 3 - Range 8000
to 12000 MHz



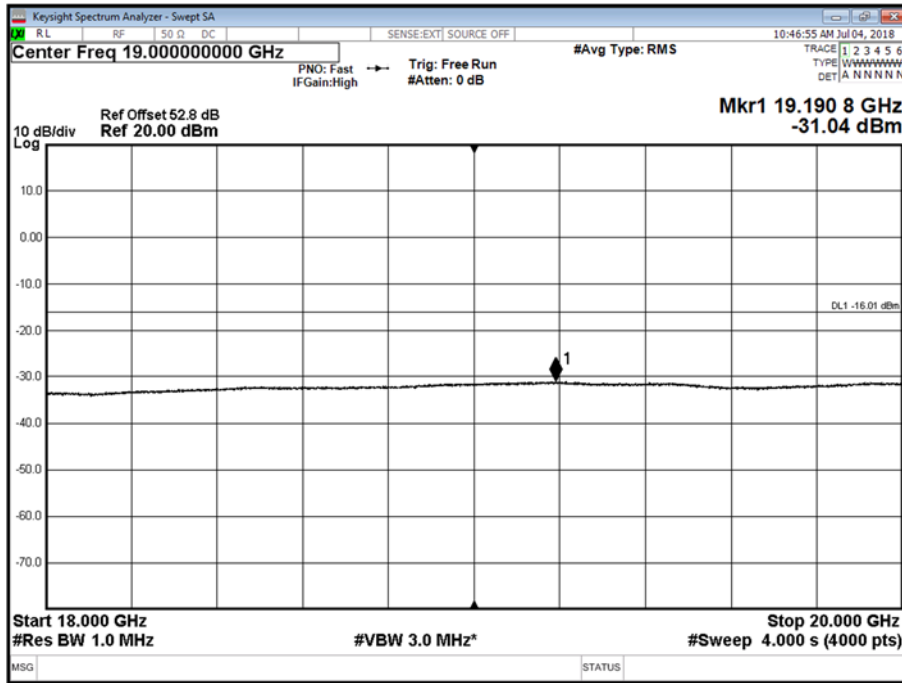
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 4 - Range 12000
to 18000 MHz



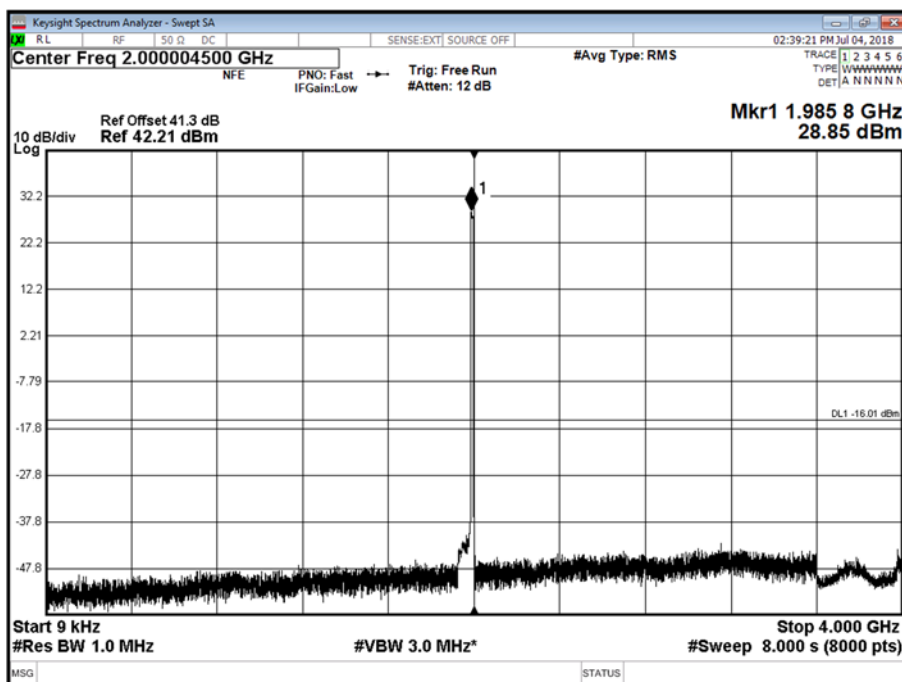


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 5 - Range 18000
to 20000 MHz



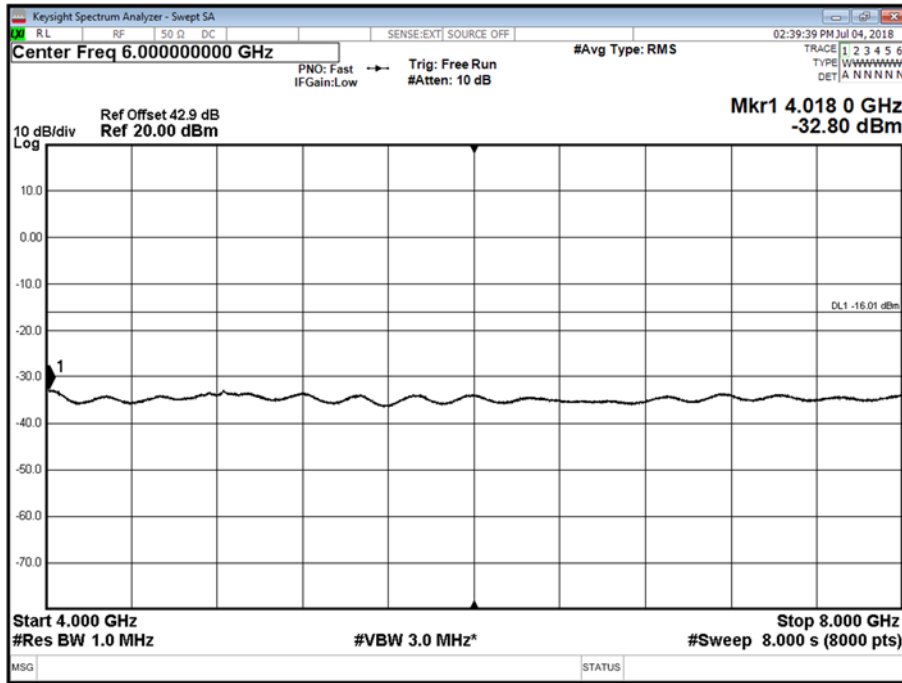
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW - Band 1 - Range 0.009
to 4000 MHz



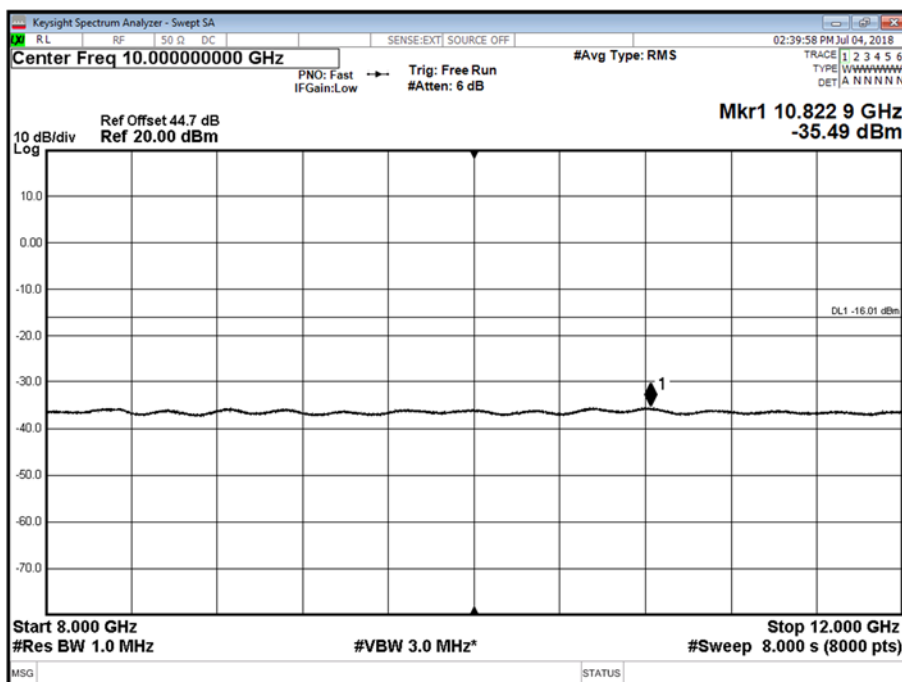


Product Service

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW - Band 2 - Range 4000
to 8000 MHz



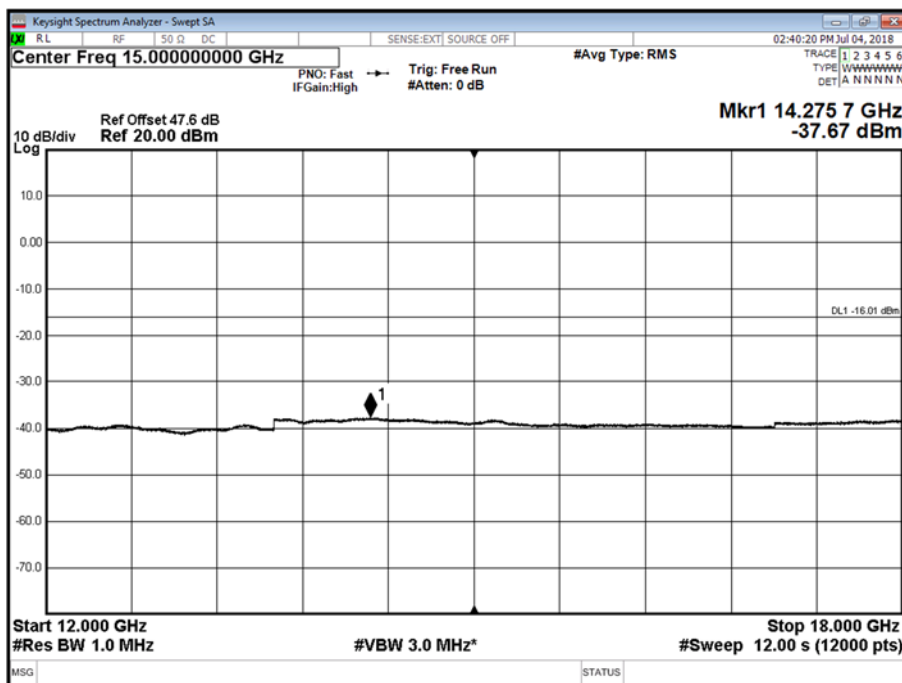
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW - Band 3 - Range 8000
to 12000 MHz



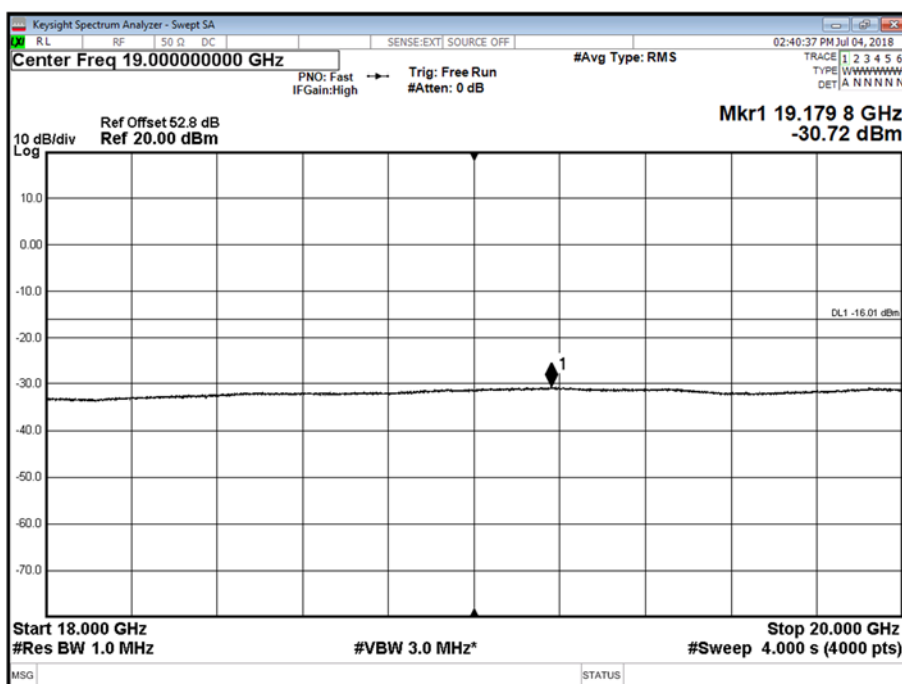


Product Service

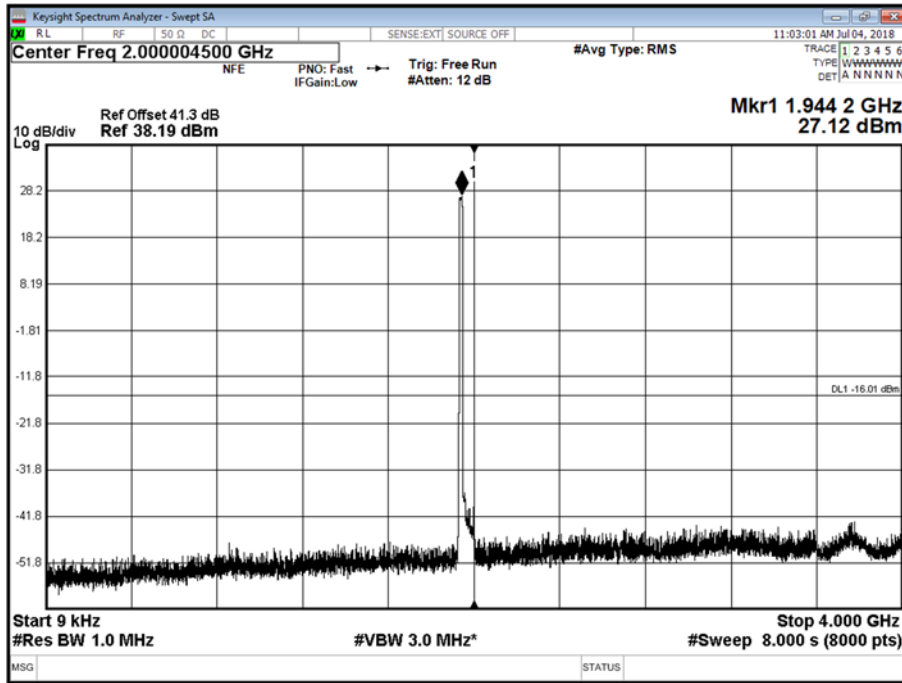
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW - Band 4 - Range 12000
to 18000 MHz



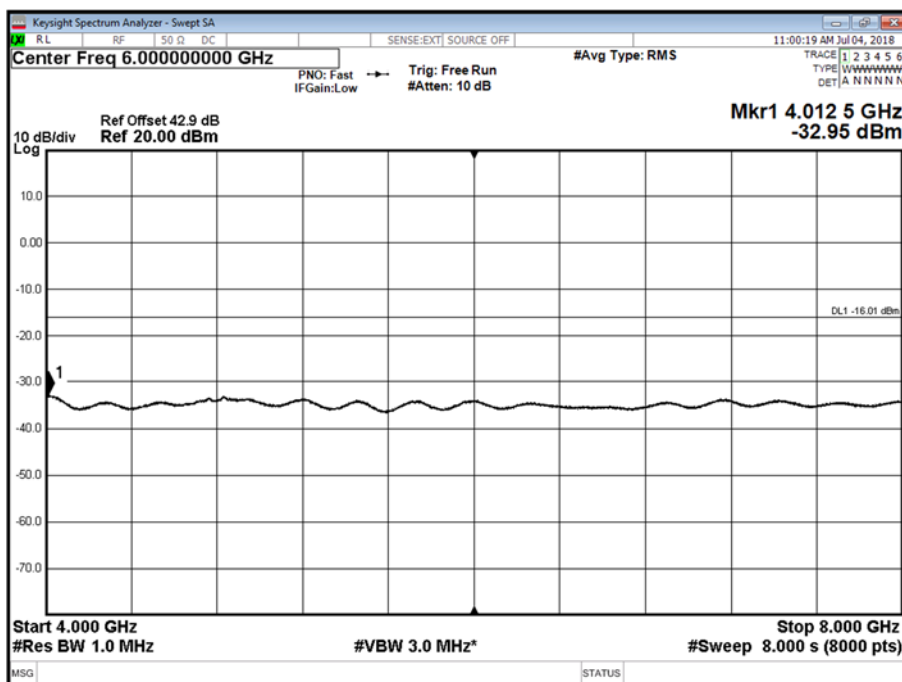
Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position TRFBW - Band 5 - Range 18000
to 20000 MHz



Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position BRFBW - Band 1 - Range 0.009
to 4000 MHz



Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:15.0 MHz / N:180 kHz - Channel Position BRFBW - Band 2 - Range 4000
to 8000 MHz



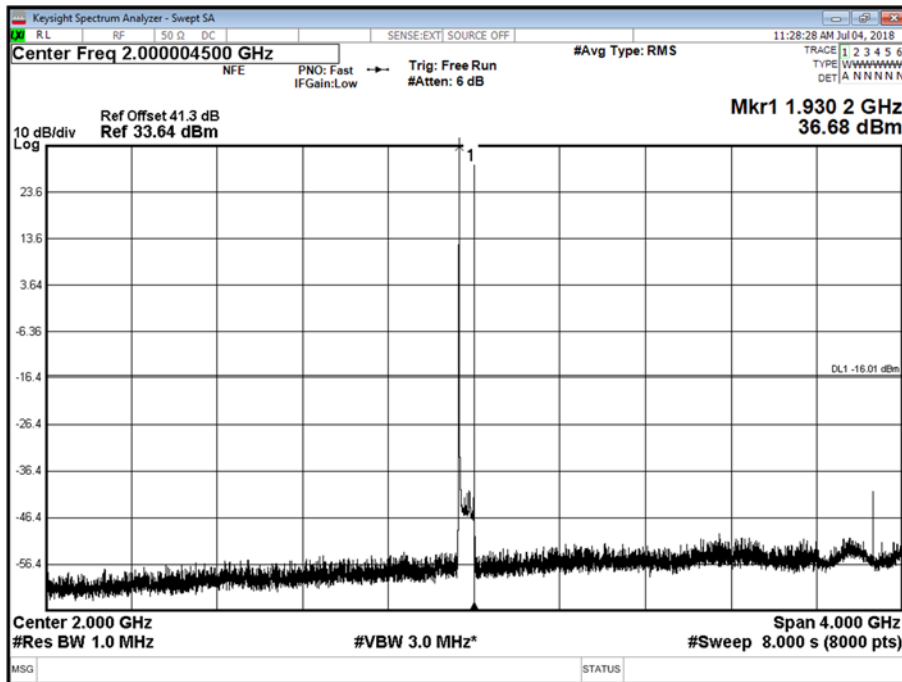


Product Service

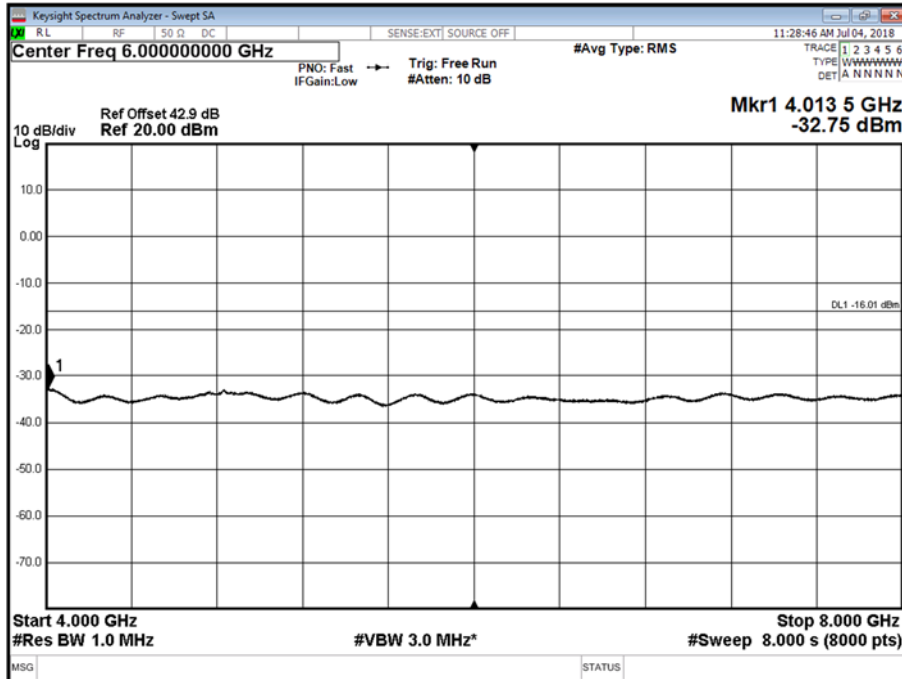
Configuration B

Maximum Output Power 37 dBm

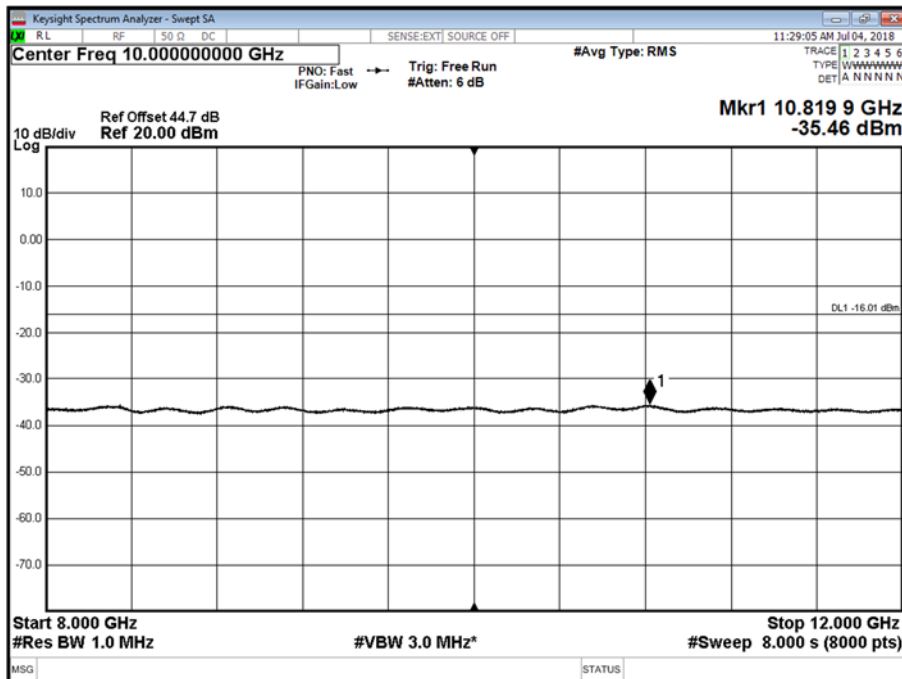
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position B - Band 1 - Range 0.009 to 4000 MHz



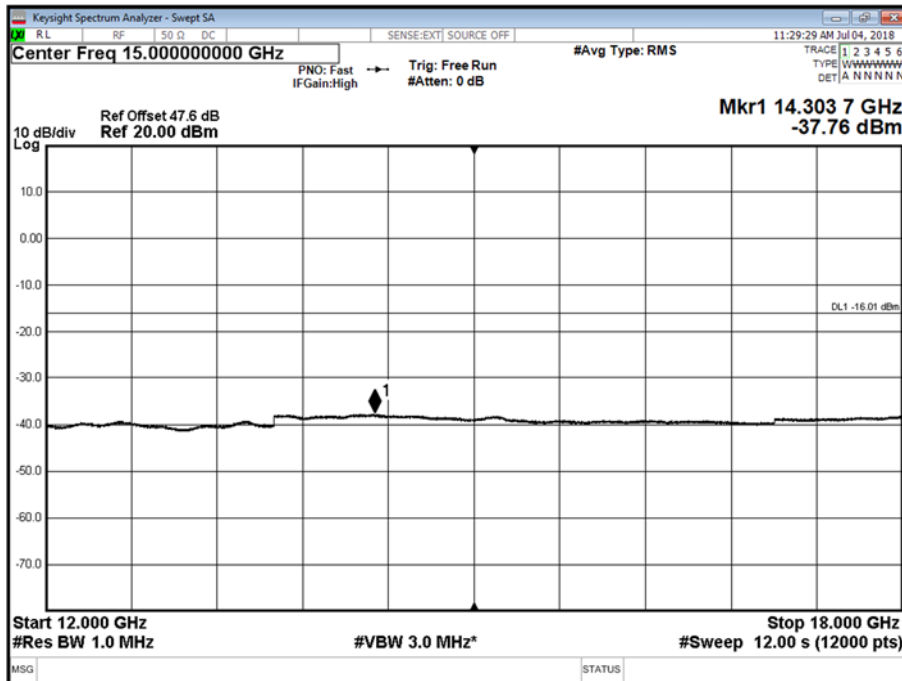
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position B - Band 2 - Range 4000 to 8000 MHz



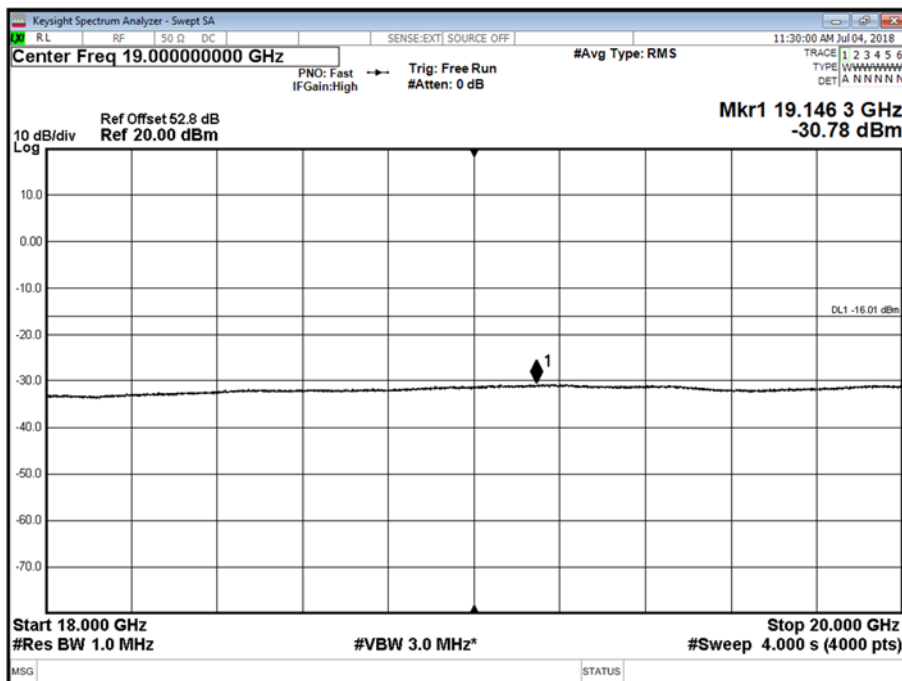
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position B - Band 3 - Range 8000 to 12000 MHz



Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position B - Band 4 - Range 12000 to 18000 MHz



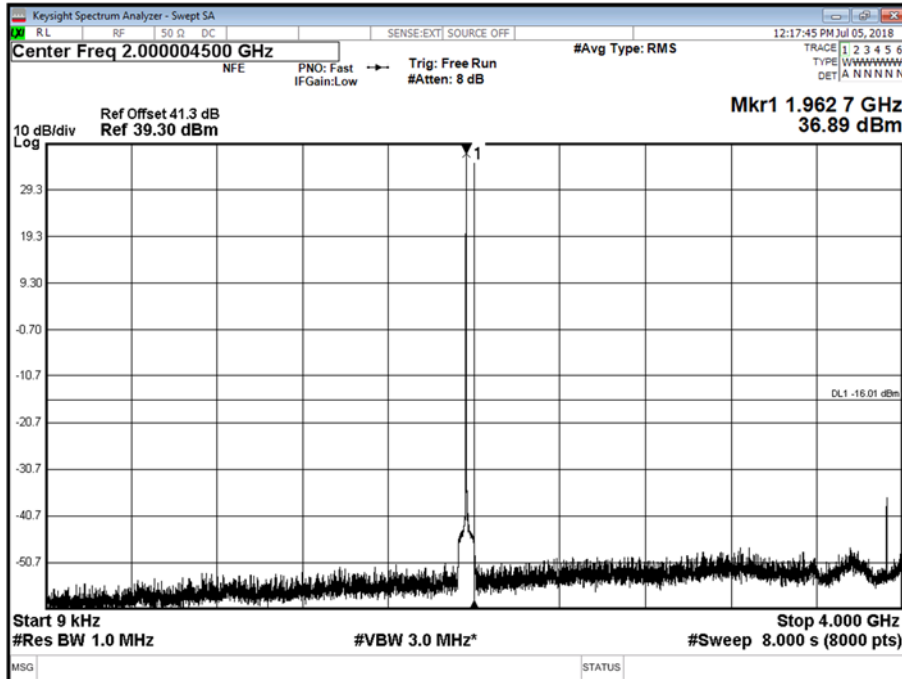
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position B - Band 5 - Range 18000 to 20000 MHz



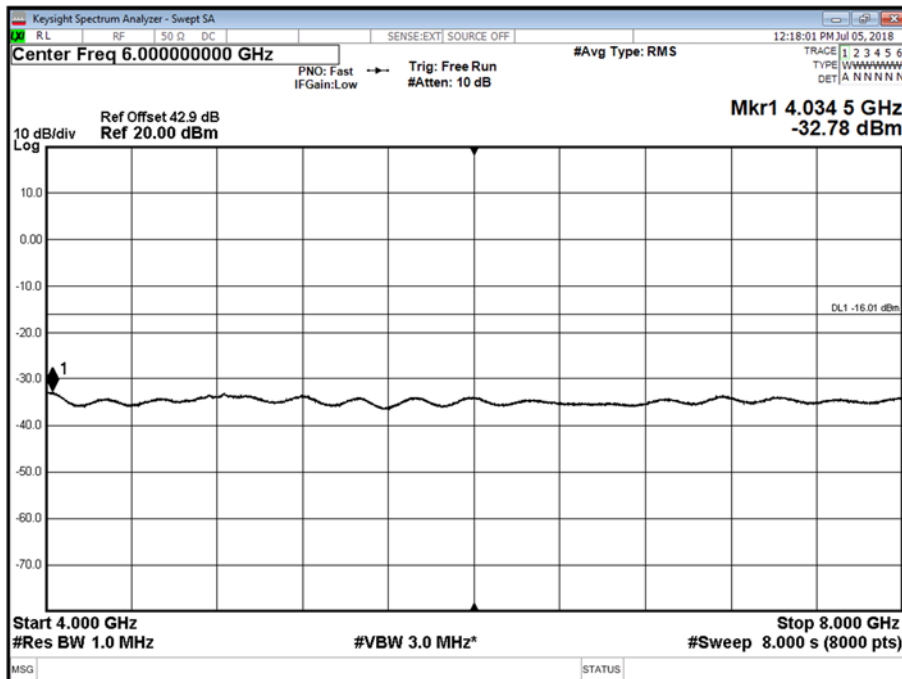


Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position M - Band 1 - Range 0.009 to 4000 MHz



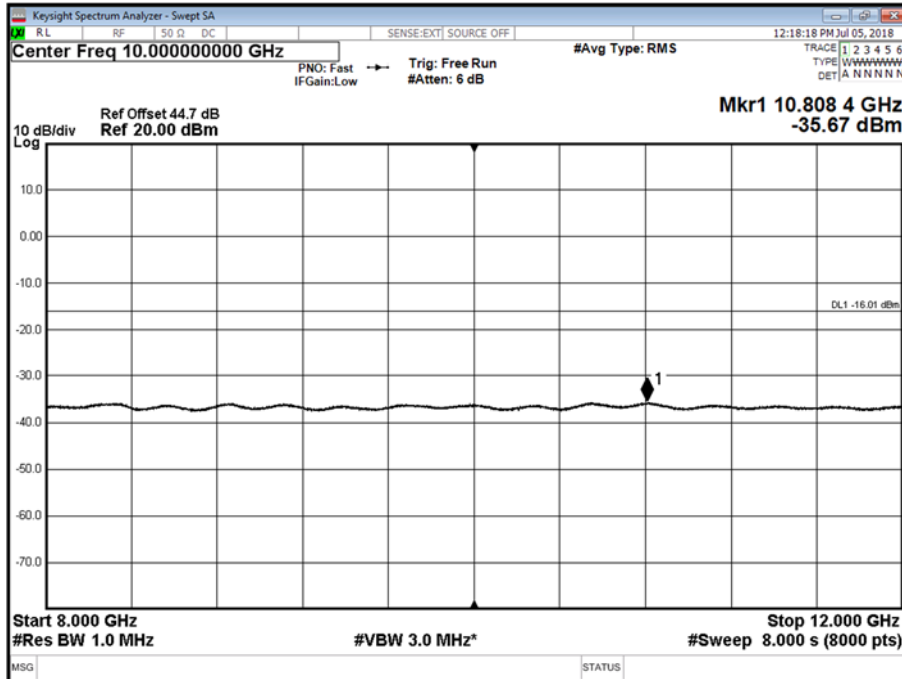
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position M - Band 2 - Range 4000 to 8000 MHz



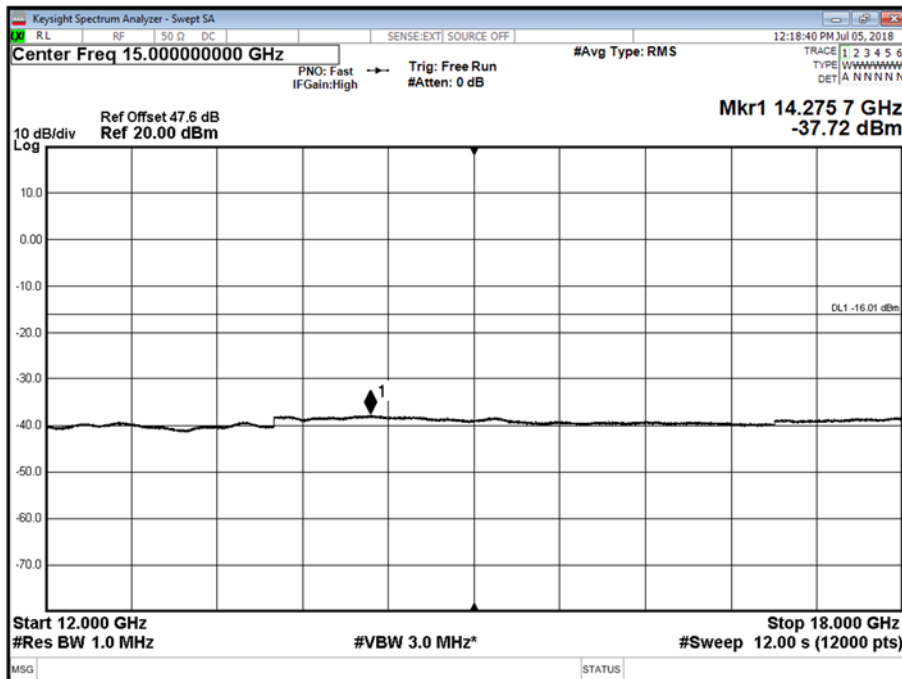


Product Service

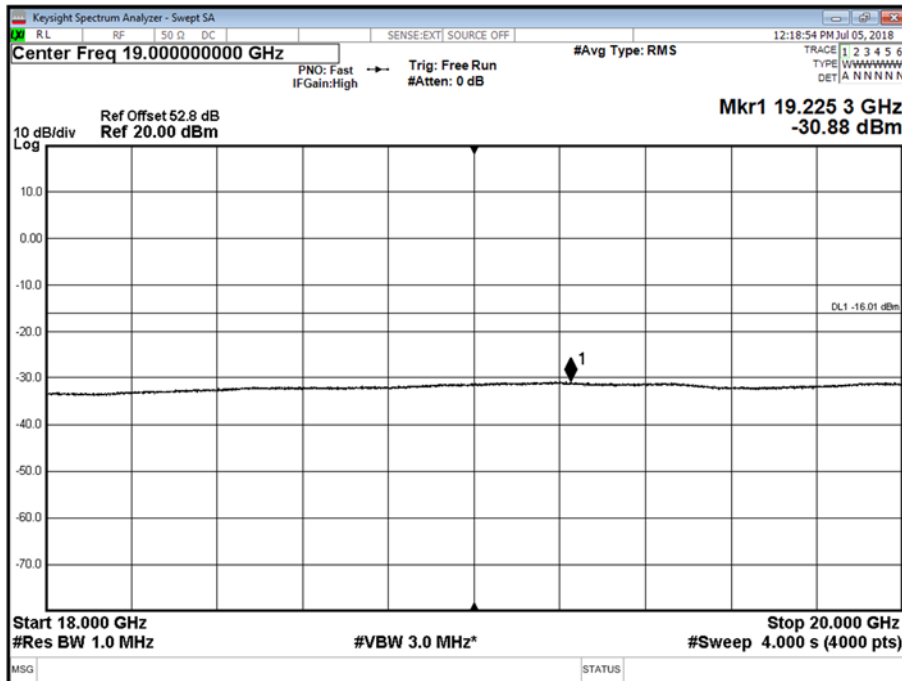
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position M - Band 3 - Range 8000 to 12000 MHz



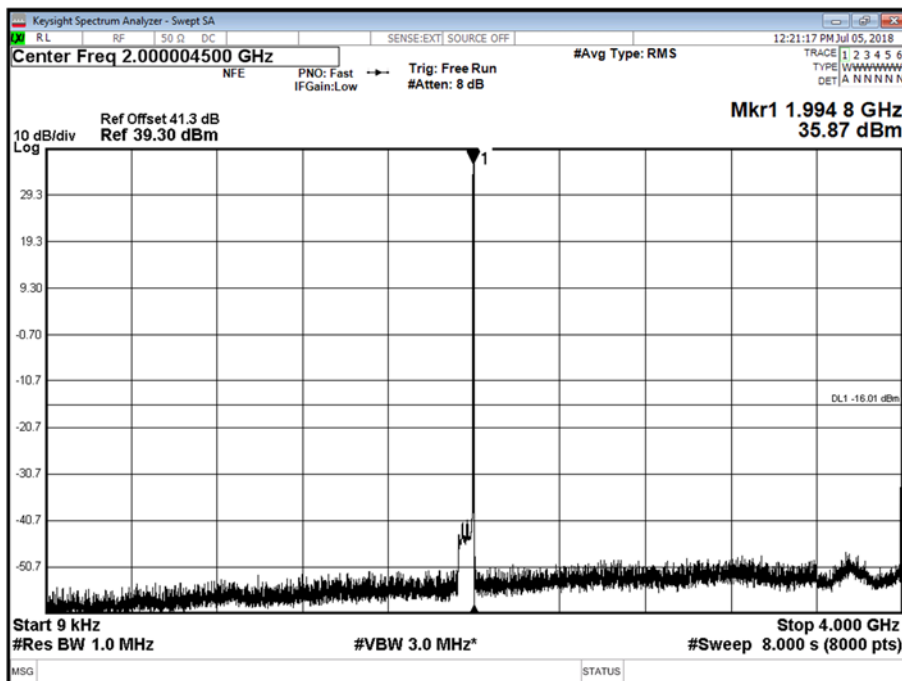
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position M - Band 4 - Range 12000 to 18000 MHz



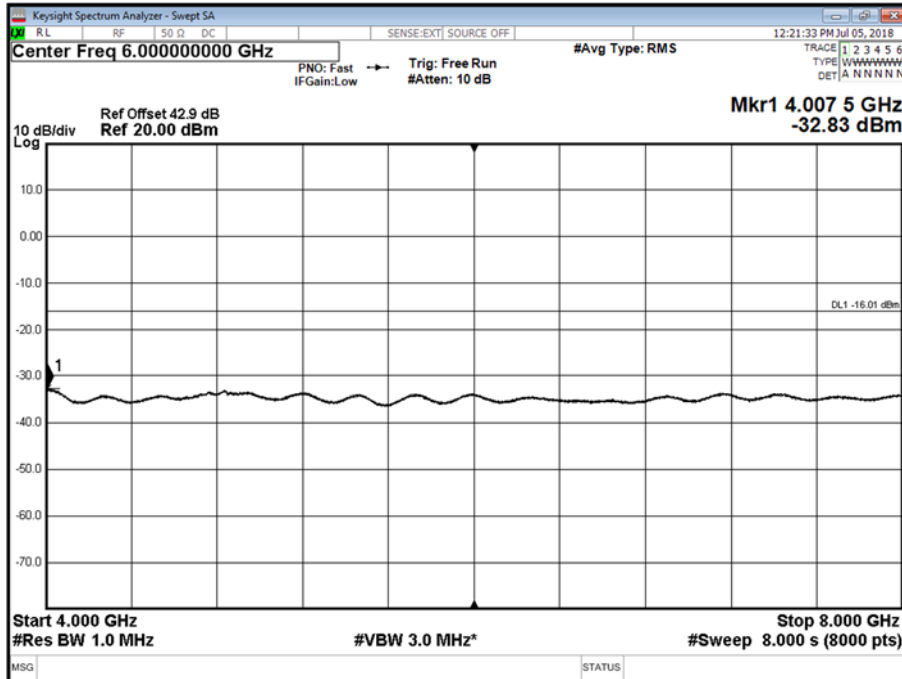
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position M - Band 5 - Range 18000 to 20000 MHz



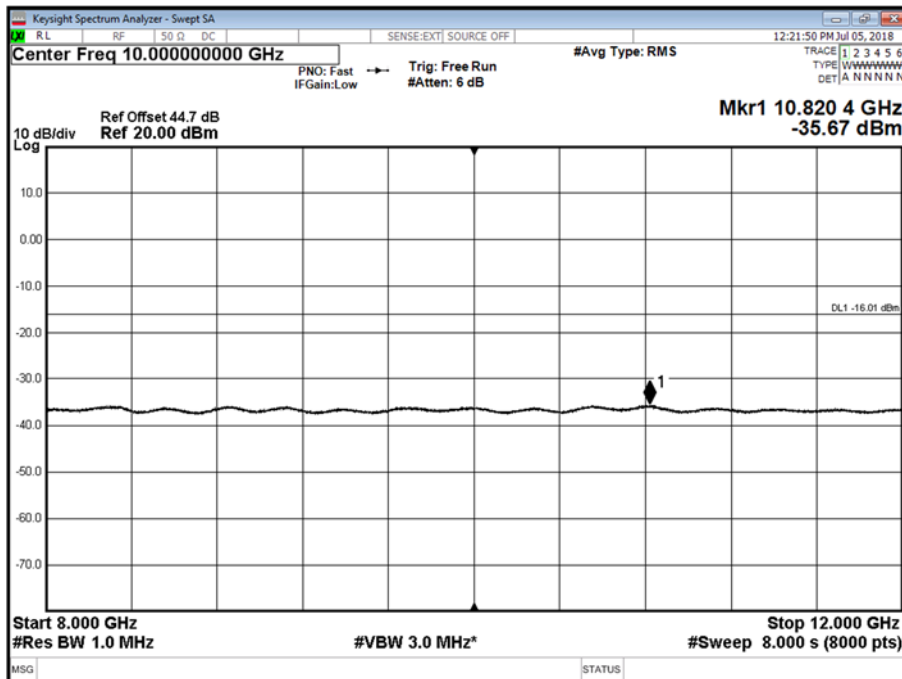
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T - Band 1 - Range 0.009 to 4000 MHz



Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T - Band 2 - Range 4000 to 8000 MHz



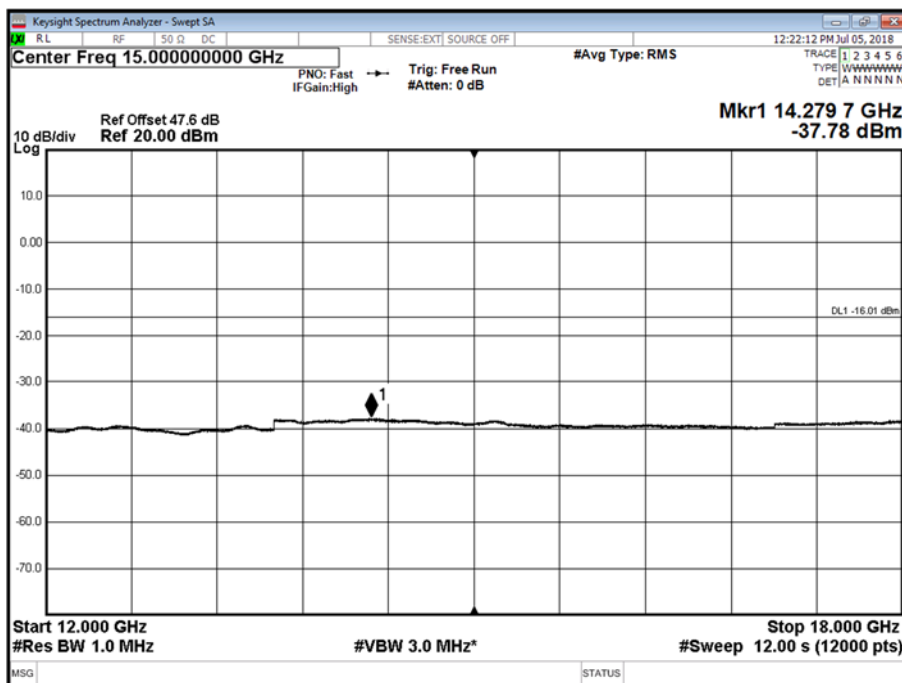
Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T - Band 3 - Range 8000 to 12000 MHz



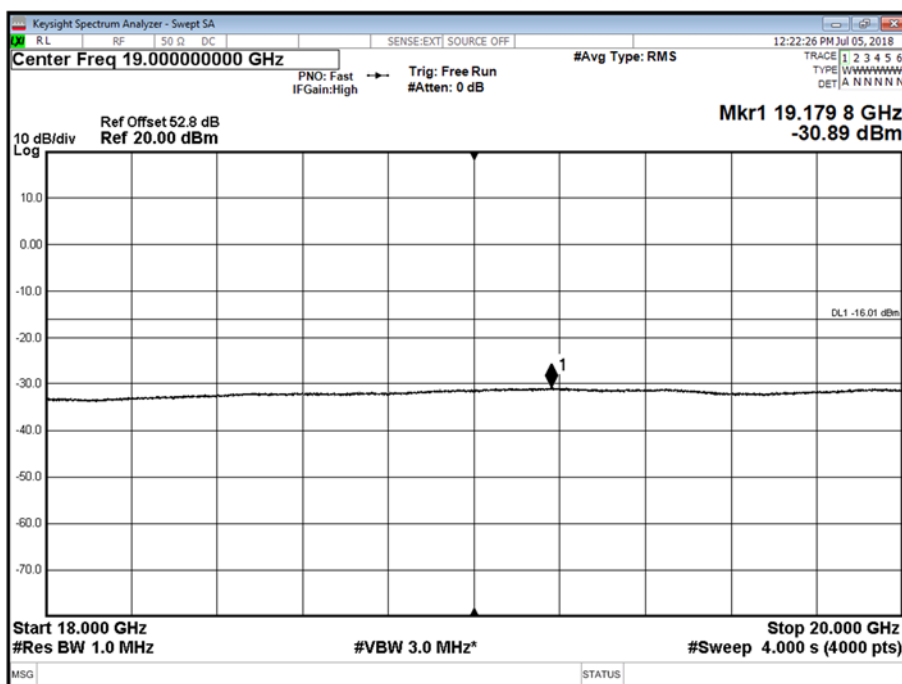


Product Service

Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T - Band 4 - Range 12000 to 18000 MHz



Antenna A - NB-IoT SA Modulation N:QPSK - NB-IoT SA Carrier Bandwidth N:180 kHz -
Channel Position T - Band 5 - Range 18000 to 20000 MHz



Limit	-16dBm
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Product Service

2.5 RADIATED EMISSIONS

2.5.1 Specification Reference

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

2.5.2 Date of Test and Modification State

24 and 25 July - 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	19.4°C
Relative Humidity	59.2%

2.5.5 Test Method

The test was applied in accordance with test method requirements of ANSI/TIA-603-C-2004.

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

The Applicant declared that the highest internally generated frequency would be up to 2000MHz and so the upper limit for measurement was calculated at 10 times this, which is 20GHz.

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

In the frequency Range 30MHz – 1GHz, the measurement was performed with a resolution bandwidth of 100kHz.

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

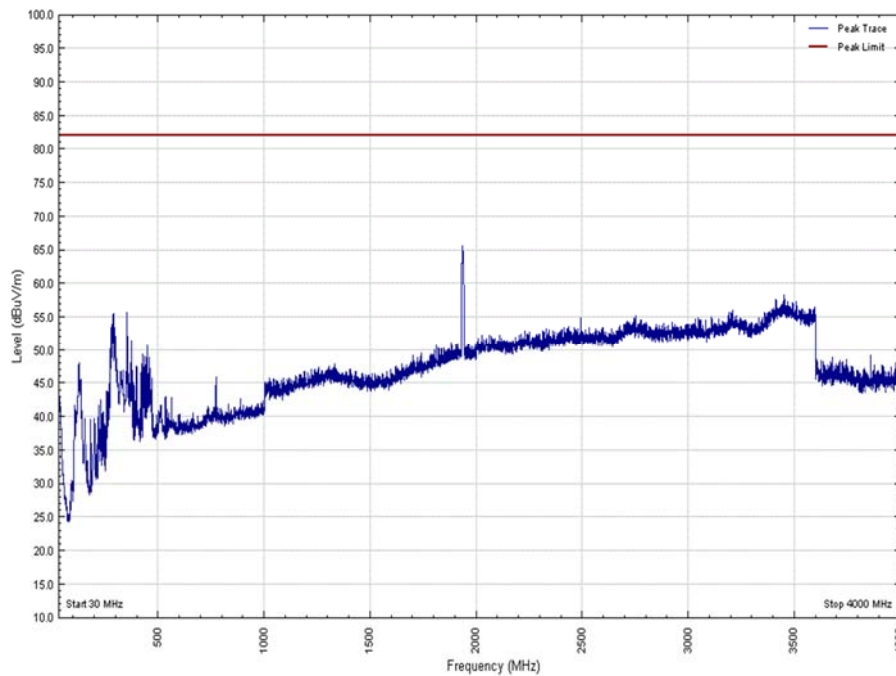
The measurements were performed at a 3m distance unless otherwise stated.

2.5.6 Test Results

Configuration A

Maximum Output Power 37 dBm

Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 1 - Range 30 to
4000 MHz - Horizontal



Antenna A - E-UTRA / NB-IoT GB Modulation E:64QAM / N:QPSK - E-UTRA / NB-IoT GB
Carrier Bandwidth E:10.0 MHz / N:180 kHz - Channel Position BRFBW - Band 2 - Range 4000
to 8000 MHz - Horizontal

