Product Service

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Report On

FCC Testing of the
Ericsson RD 2243 B41 DOT (2496-2690 MHz) LTE Base Station in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRY901405-1

PREPARED BY	APPROVED BY	DATED
		Sept 28 -2017
Maggie Whiting Key Account Manager	Scott Drysdale Authorised Signatory	

Report Issued: 9/28/2017

Report File #: 75940285-000

ACCREDITED
Testing Laboratory
Certificate #2955.02

Product Service

CONTENTS

Product Service

SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	349 Terry Fox Drive Ottawa Ontario K2K 2V6
Product Name	RD 2243 B41 DOT
Product Number	KRY 901 405/1
Serial Number(s)	TD3T305060
Software Version	CXP 901 3268/14 Rev R67BE
Hardware Version	R1A
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2016 FCC CFR 47 Part 27: 2016
Start of Test	11 September 2017
Finish of Test	13 September 2017
Name of Test Personnel	Scott Drysdale
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01

1.2 BRIEF SUMMARY OF RESULTS

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

Section	Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 27		
2.1	2.1046	27.50(h)	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	27.53(m)	Occupied Bandwidth	Pass
2.3	2.1051	27.53 (m)	Band Edge	Pass
2.4	2.1051	27.53 (m)	Transmitter Spurious Emissions	Pass
2.5	2.1055	27.54	Frequency Stability	Pass

1.3 CONFIGURATION DESCRIPTION

Configuration Code	Carrier(s)	Configuration Description
1	1C	LTE Single Carrier
2	2C	LTE Multi Carrier x2

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

LTE:
MIMO mode single carrier: E-TM1.1, E-TM3.2, E-TM3.1, E-TM3.1a
MIMO mode multi carrier (x2): E-TM1.1

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

The EUT consists of 2 antenna ports. All measurements were performed on the transmit antenna port A and B. Test result limits for Band Edge and Conducted Spurious were based on a 4 port MIMO system. This is due to the possibility of 2 DOT units being configured to operate as co-located devices. Therefore, a worst case limit accounting for an effective 4 port MIMO configuration was employed and corrected in accordance with FCC KDB 662911, (10log4).

The RDS B41– KRY 901 405/1supports LTE Band 41 – 2496 – 2690 MHz, (downlink and uplink) , frequency bands.

Test Models as defined in 3GPP TS 25.141 and TS 36.141 were used to represent the required modulation for test.

The EUT was powered by an external 48 V DC Supply.

Channel Configurations

LTE B41 (2496 MHz – 2690 MHz)

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
1	LTE	1	5	2498.5	2593	2687.5
1	LTE	1	10	2501	2593	2685
1	LTE	1	15	2503.5	2593	2682.5
1	LTE	1	20	2506	2593	2680
2	LTE	2	5 + 5	2498.5 + 2503.5	2590.5 + 2595.5	2682.5 + 2687.5
2	LTE	2	10 + 10	2501 + 2511	2588 + 2598	2675 + 2685
2	LTE	2	15 + 15	2503.5 + 2518.5	2585.5 + 2600.5	2667.5 + 2682.5
2	LTE	2	20 + 20	2506 + 2526	2583 + 2603	2660 + 2680

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	RD 2243 B41 DOT
PART NUMBER	KRY 901 405/1
IC Model Name	Not Applicable
SERIAL NUMBER	TD3T305060
HARDWARE VERSION	R1A
SOFTWARE VERSION	CXP 901 3268/14 Rev R67BE
TRANSMITTER OPERATING RANGE	2496 – 2690MHz
MODULATIONS	LTE: QPSK, 16QAM, 64QAM, 256QA
INTERMEDIATE FREQUENCIES	DL: 110 – 150MHz, UL: 40 – 80MHz
ITU DESIGNATION OF EMISSION	LTE 5M00 W7D 10M0 W7D 15M0 W7D 20M0 W7D
OUTPUT POWER (RMS) (W or dBm)	2 x 0.126W (21dBm)
OUTPUT POWER TOLERANCE	+/- 2 dB
FCC ID	TA8AKRY901405-1
IC ID	Not Applicable
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RD 2243 B41 (KRY 901 405/1) 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 SRO;Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.126W per port over an operational temperature of 5°C to +40°C.

I hereby declare that I am entitled to sign on behalf of the manufacturer and that the information supplied is correct and complete.

Signature : 

Name : Denis Lalonde

Position held : Developer Regulatory Approval Verification

Date : August 10th, 201

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

1.5 PRODUCT INFORMATION

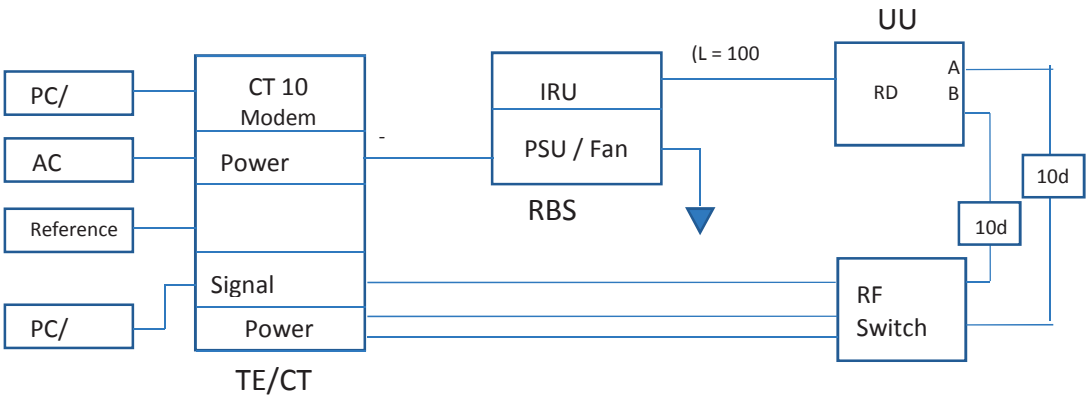
1.5.1 Technical Description

The Equipment Under Test RD 2243 B41 DOT is an Ericsson AB Radio Unit working in the public mobile service (2496-2690 MHz) band which provides communication connections to (2496-2690 MHz) network. The Radio Unit operates from a -48V DC supply.

The Equipment Under Test RD 2243 B41 DOT 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



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 Accreditation Designation Number: CA6845
TUV SUD Canada (Laval)

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 Accreditation, TÜV SÜD Canada, Laval conducted the following tests at Ericsson in Ottawa.

Test Name	Name of Test Personnel(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Scott Drysdale
Occupied Bandwidth	Scott Drysdale
Band Edge	Scott Drysdale
Transmitter Spurious Emissions	Scott Drysdale
Frequency Stability	Scott Drysdale

1.11 ADDITIONAL INFORMATION

Testing performed with Gavin Gan and Denis Lalonde of Ericsson - Ottawa.

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(h)(1)

2.1.2 Date of Test and Modification State

13 September 2017 - 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	22-25°C
Relative Humidity	35-45%

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 1

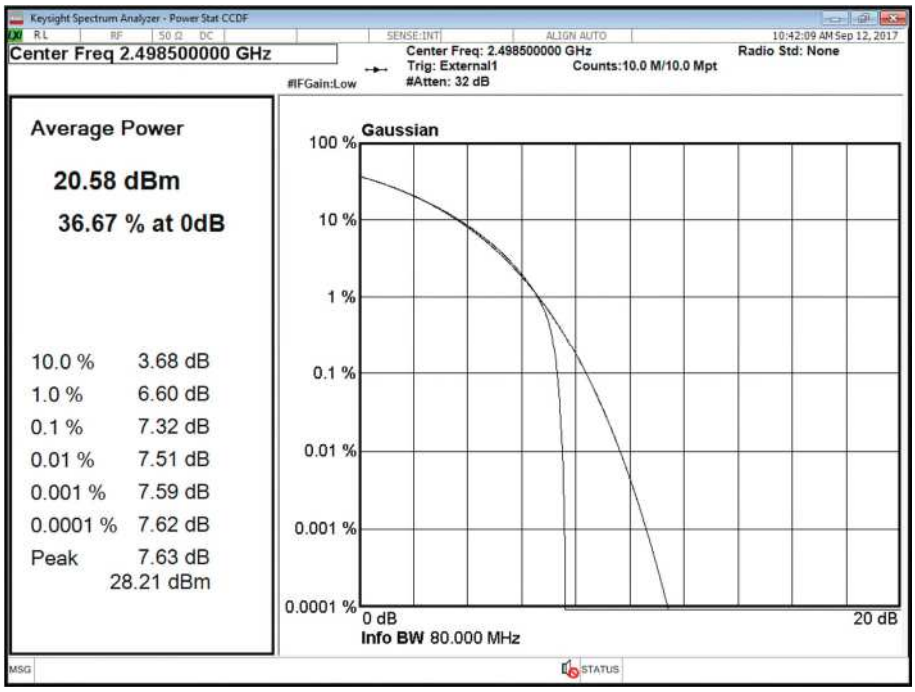
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.32	20.59	15.08
B	QPSK	5.0 MHz	7.32	20.21	14.69
Total			-	23.41	17.90
A	QPSK	10.0 MHz	7.32	20.59	12.46
B	QPSK	10.0 MHz	7.36	20.10	11.93
Total			-	23.36	15.21
A	QPSK	15.0 MHz	7.33	20.34	10.52
B	QPSK	15.0 MHz	7.35	20.20	10.55
Total			-	23.28	13.55
A	QPSK	20.0 MHz	7.29	20.53	9.36
B	QPSK	20.0 MHz	7.36	20.18	9.08
Total			-	23.37	12.23

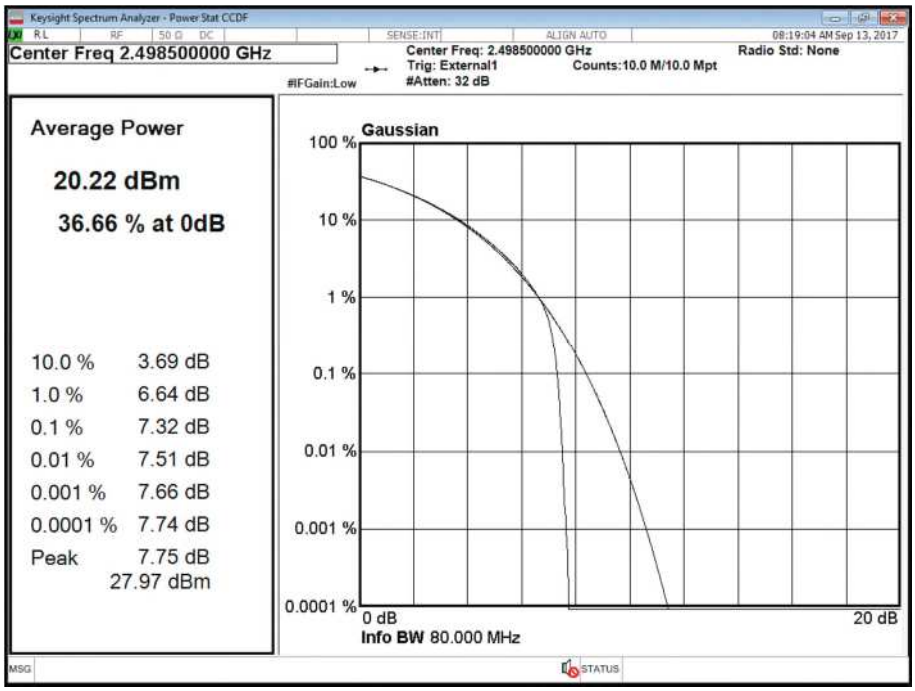
Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.32	24.39	18.88
B	QPSK	5.0 MHz	7.32	24.01	18.49
Total			-	27.21	21.70
A	QPSK	10.0 MHz	7.32	24.39	16.26
B	QPSK	10.0 MHz	7.36	23.90	15.73
Total			-	27.16	19.01
A	QPSK	15.0 MHz	7.33	24.14	14.32
B	QPSK	15.0 MHz	7.35	24.00	14.35
Total			-	27.08	17.35
A	QPSK	20.0 MHz	7.29	24.33	13.16
B	QPSK	20.0 MHz	7.36	23.98	12.88
Total			-	27.17	16.03

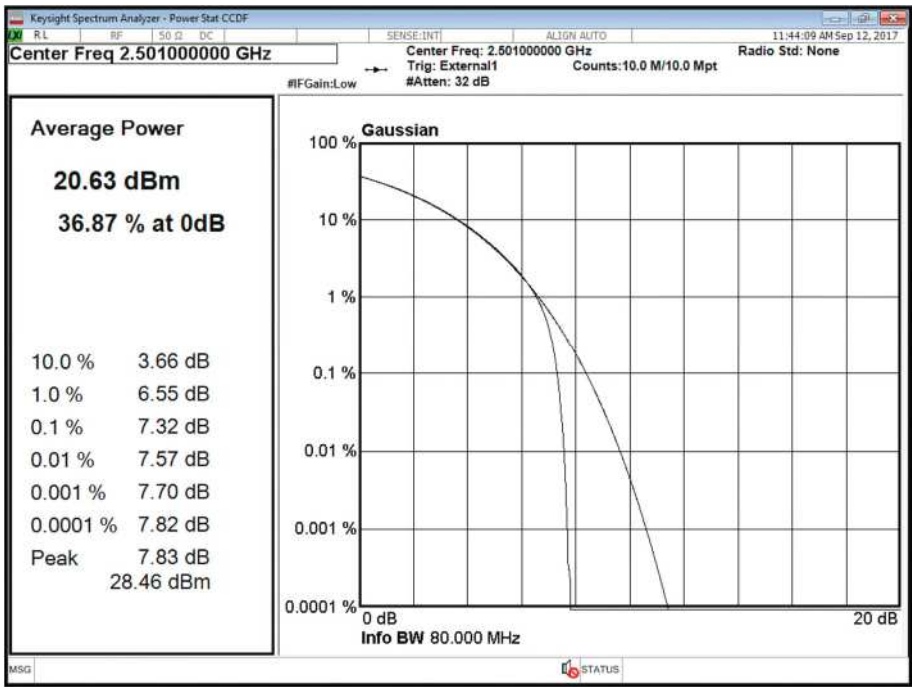
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



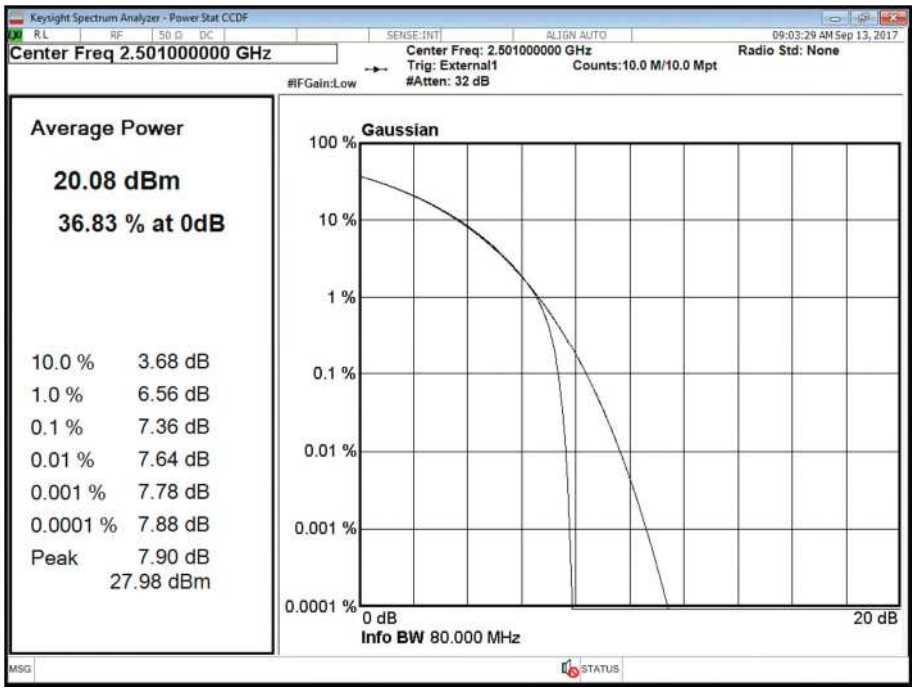
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



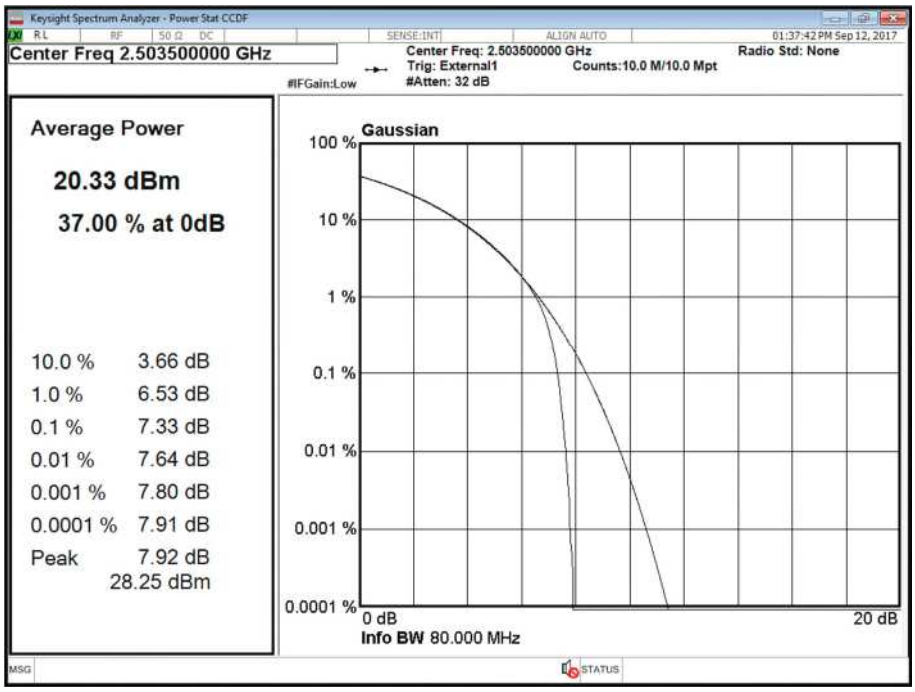
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



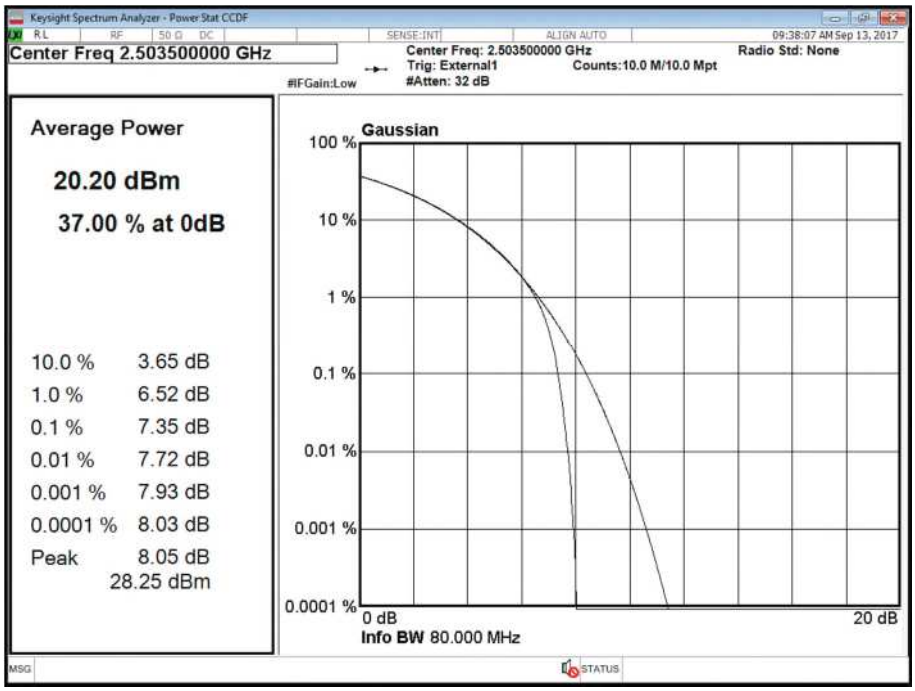
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



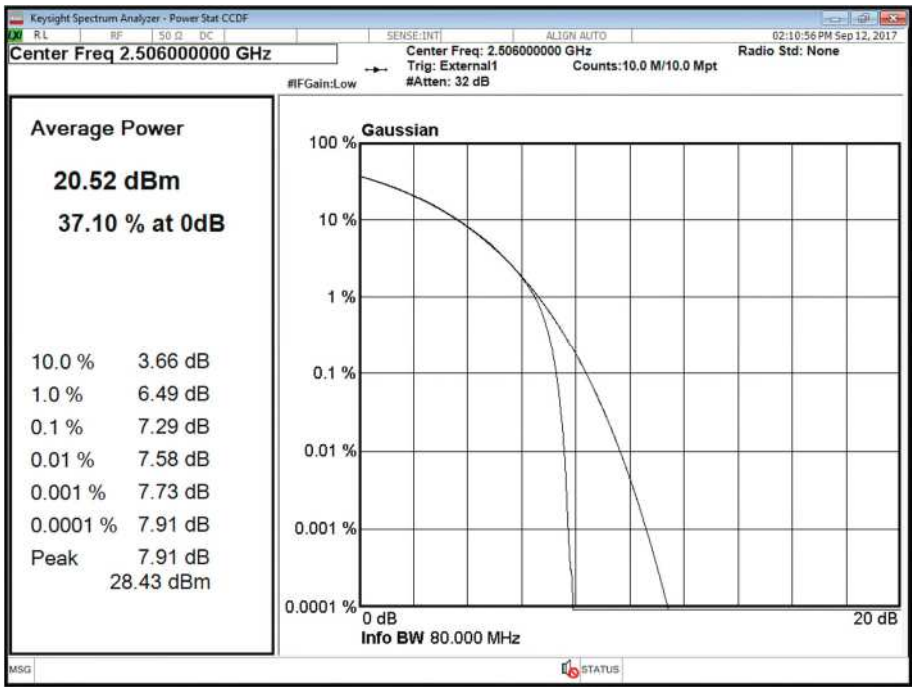
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



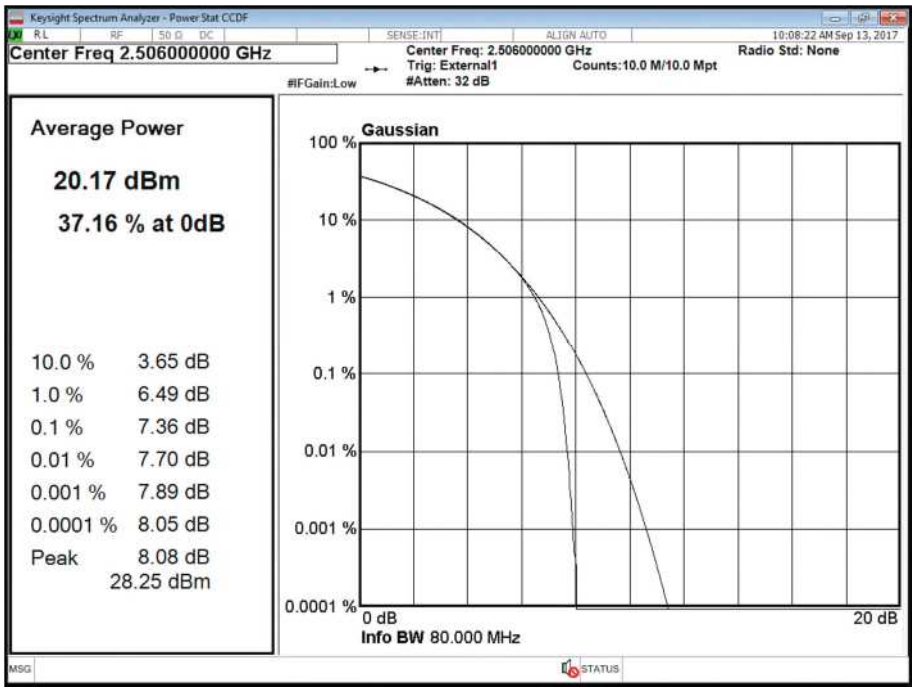
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



Configuration 1

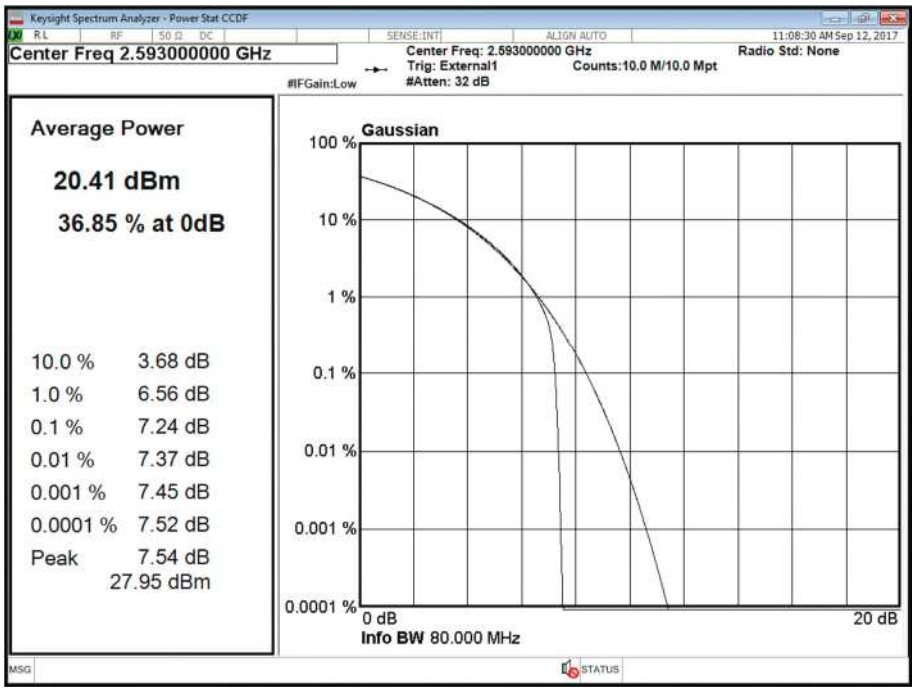
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.24	20.40	14.73
B	QPSK	5.0 MHz	7.28	19.82	14.22
Total			-	23.13	17.49
A	QPSK	10.0 MHz	7.27	20.24	11.60
B	QPSK	10.0 MHz	7.29	20.08	11.34
Total			-	23.17	14.48
A	QPSK	15.0 MHz	7.31	20.24	10.05
B	QPSK	15.0 MHz	7.30	20.08	9.85
Total			-	23.17	12.96
A	QPSK	20.0 MHz	7.28	20.31	8.93
B	QPSK	20.0 MHz	7.29	19.97	8.51
Total			-	23.15	11.74

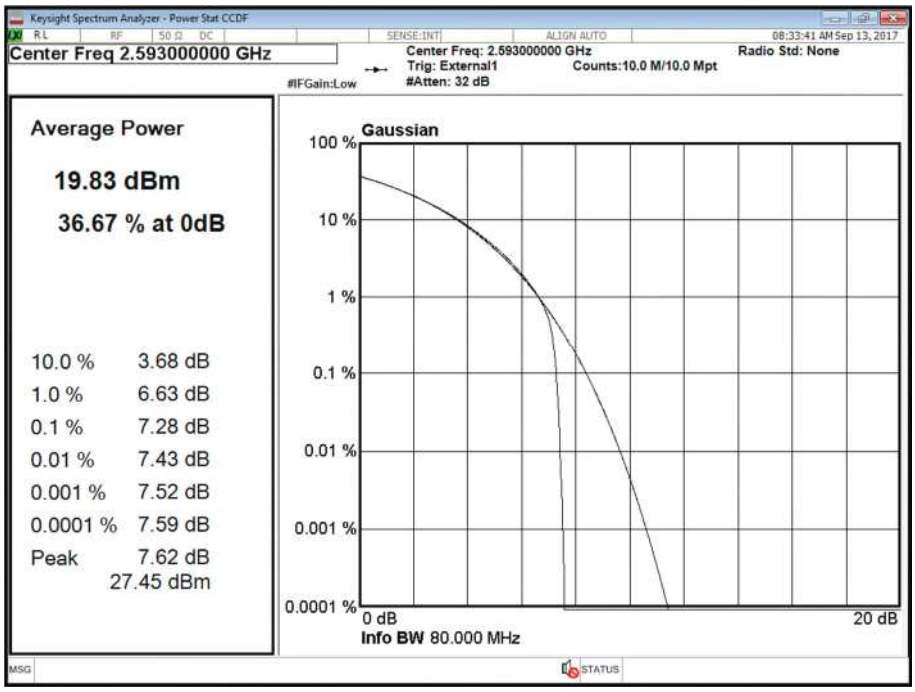
Maximum Output Power 24.8 dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.24	24.20	18.53
B	QPSK	5.0 MHz	7.28	23.62	18.02
Total			-	26.93	21.29
A	QPSK	10.0 MHz	7.27	24.04	15.40
B	QPSK	10.0 MHz	7.29	23.88	15.14
Total			-	26.97	18.28
A	QPSK	15.0 MHz	7.31	24.04	13.85
B	QPSK	15.0 MHz	7.30	23.88	13.65
Total			-	26.97	16.76
A	QPSK	20.0 MHz	7.28	24.11	12.73
B	QPSK	20.0 MHz	7.29	23.77	12.31
Total			-	26.95	15.54

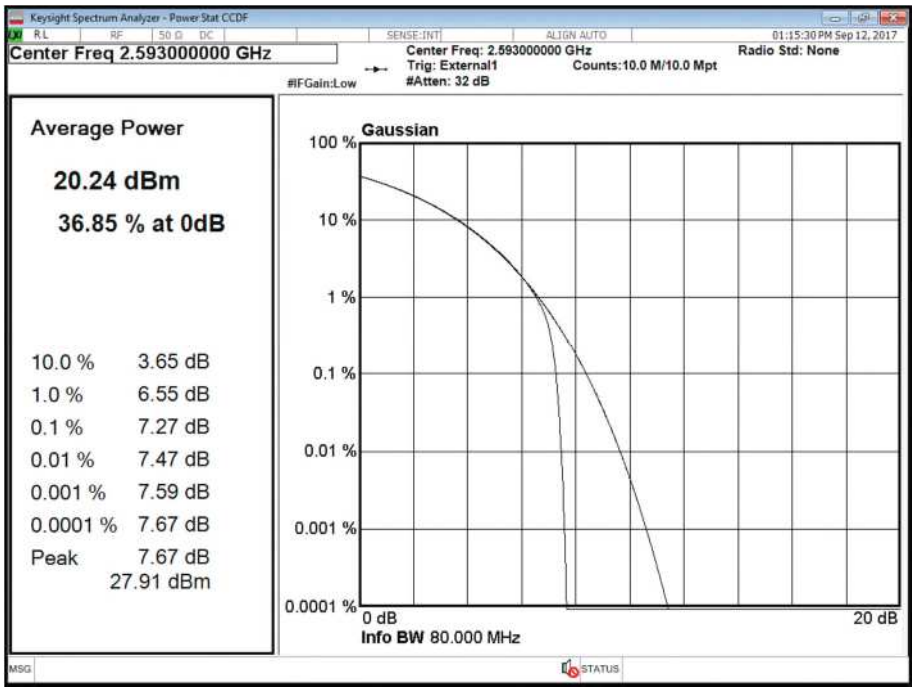
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M



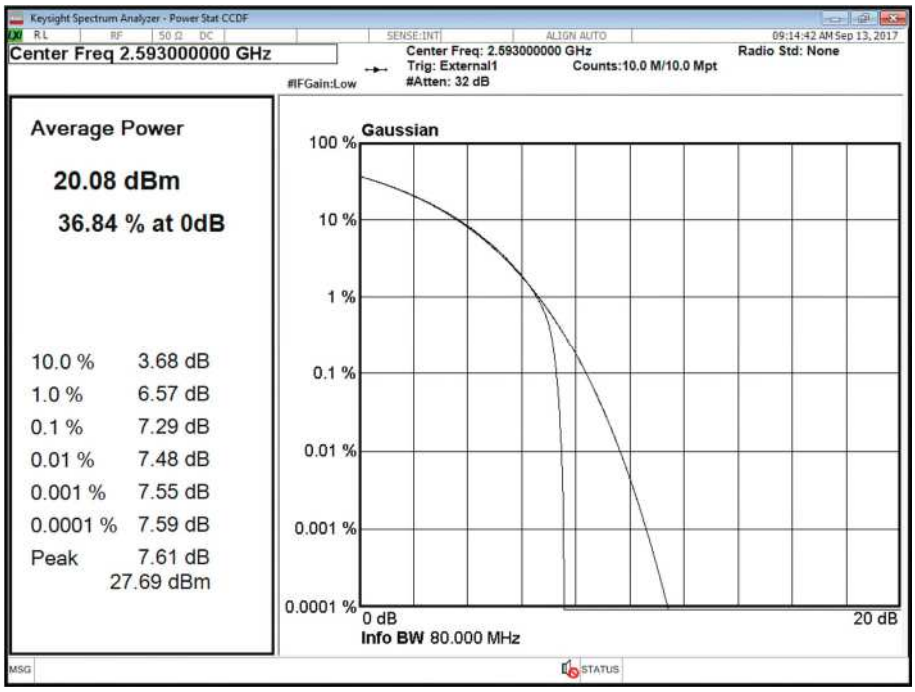
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M



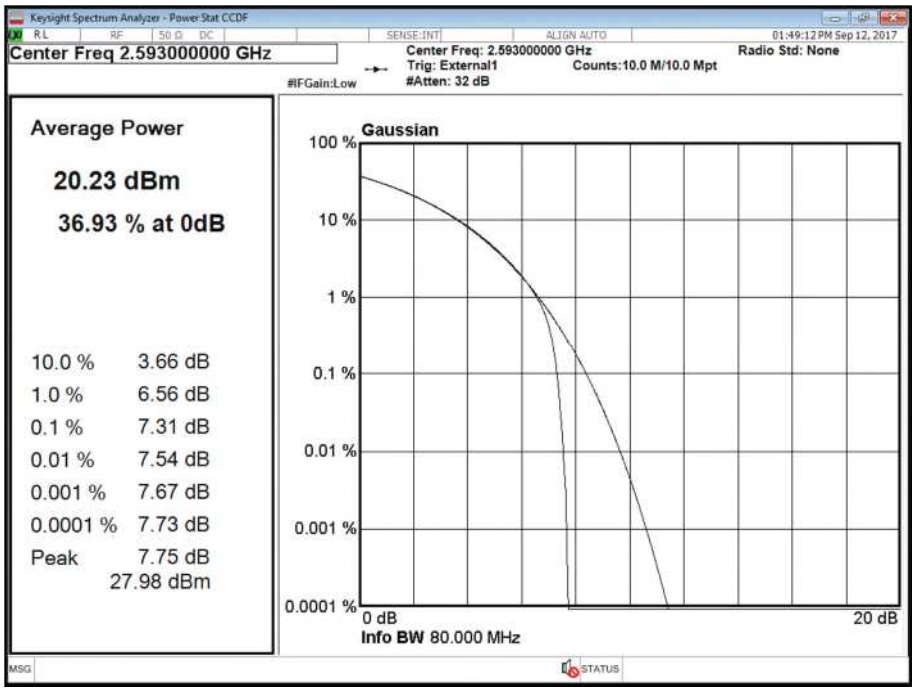
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



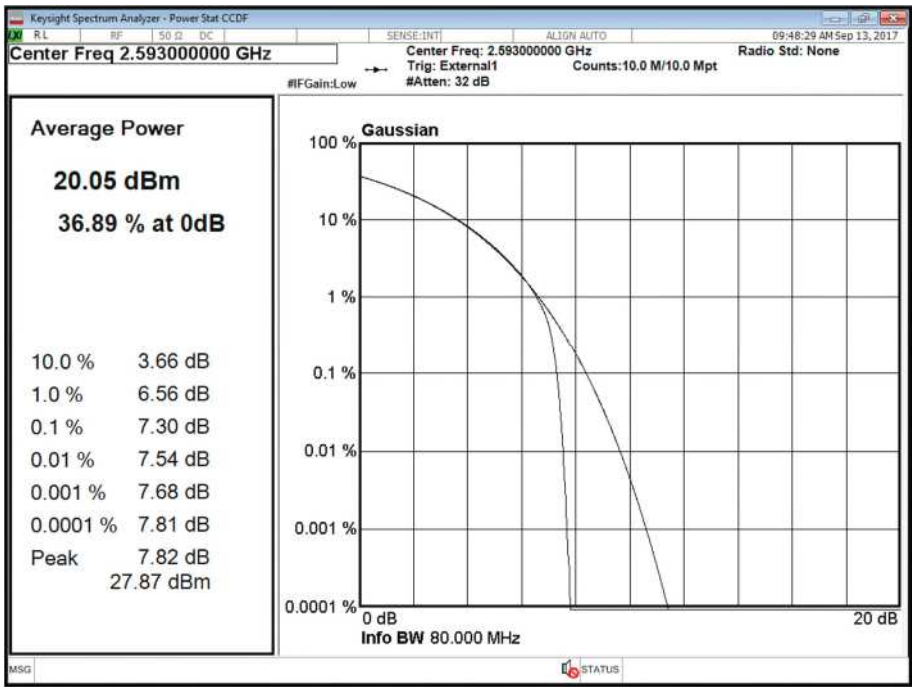
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



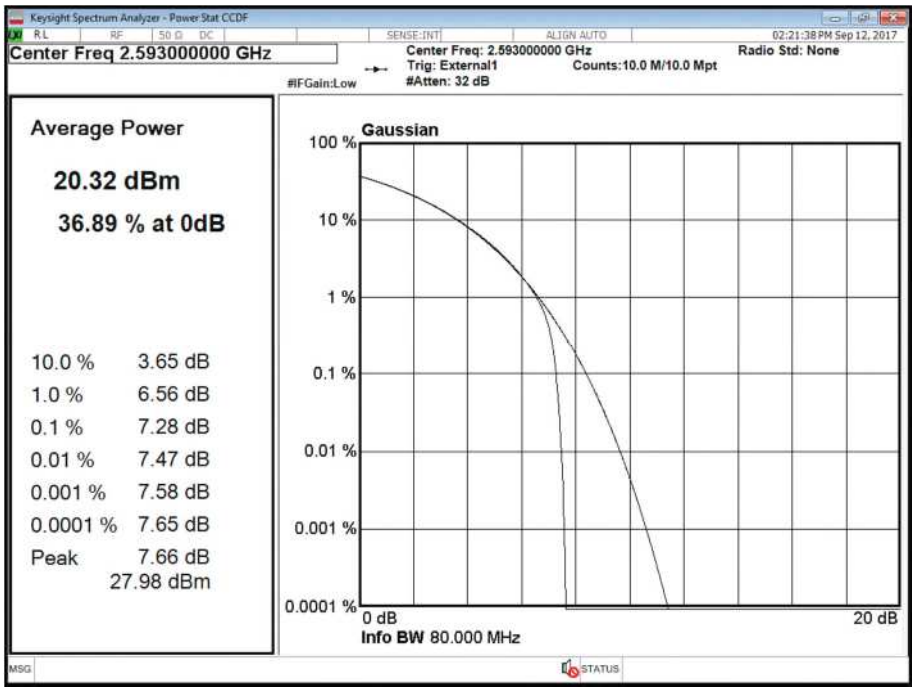
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



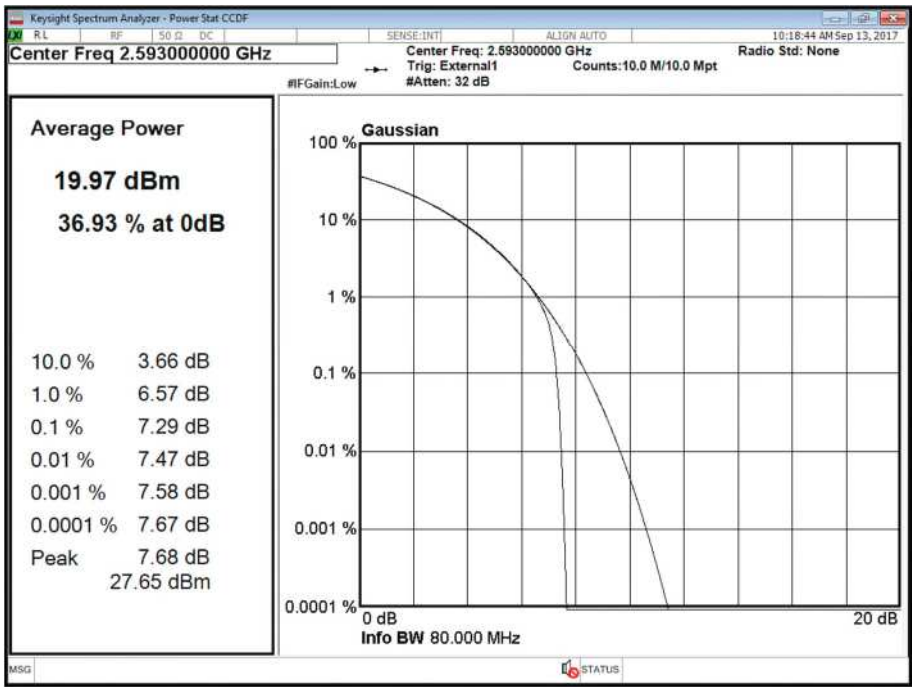
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



Configuration 1

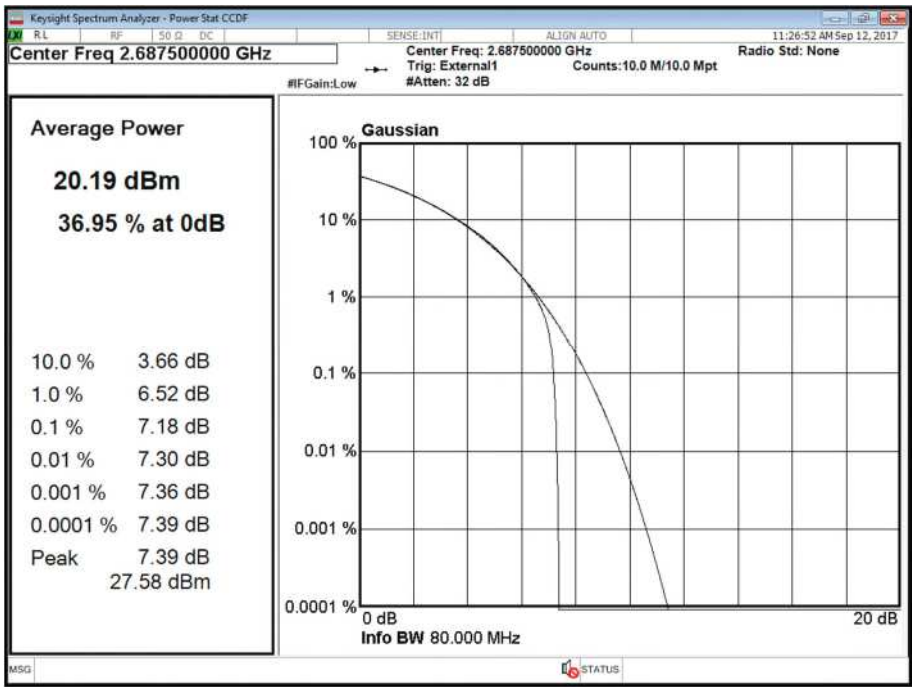
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.18	20.22	14.60
B	QPSK	5.0 MHz	7.20	19.88	14.05
Total			-	23.06	17.34
A	QPSK	10.0 MHz	7.23	20.11	11.46
B	QPSK	10.0 MHz	7.21	19.75	11.45
Total			-	22.94	14.47
A	QPSK	15.0 MHz	7.29	20.14	9.87
B	QPSK	15.0 MHz	7.24	20.03	9.48
Total			-	23.10	12.69
A	QPSK	20.0 MHz	7.25	20.11	8.39
B	QPSK	20.0 MHz	7.21	19.95	8.40
Total			-	23.04	11.41

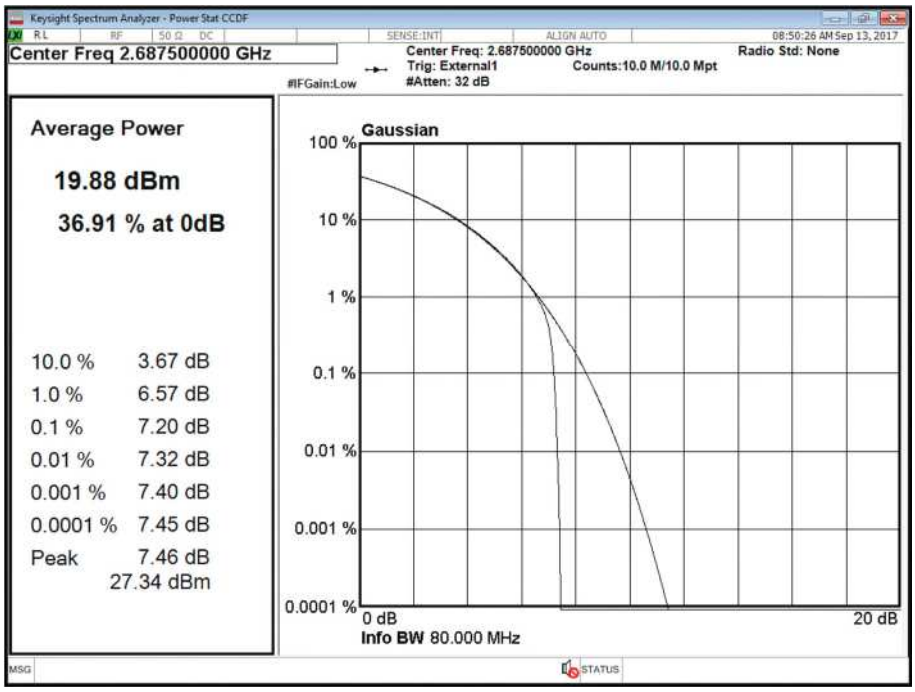
Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	7.18	24.02	18.40
B	QPSK	5.0 MHz	7.20	23.68	17.85
Total			-	26.86	21.14
A	QPSK	10.0 MHz	7.23	23.91	15.26
B	QPSK	10.0 MHz	7.21	23.55	15.25
Total			-	26.74	18.27
A	QPSK	15.0 MHz	7.29	23.94	13.67
B	QPSK	15.0 MHz	7.24	23.83	13.28
Total			-	26.90	16.49
A	QPSK	20.0 MHz	7.25	23.91	12.19
B	QPSK	20.0 MHz	7.21	23.75	12.20
Total			-	26.84	15.21

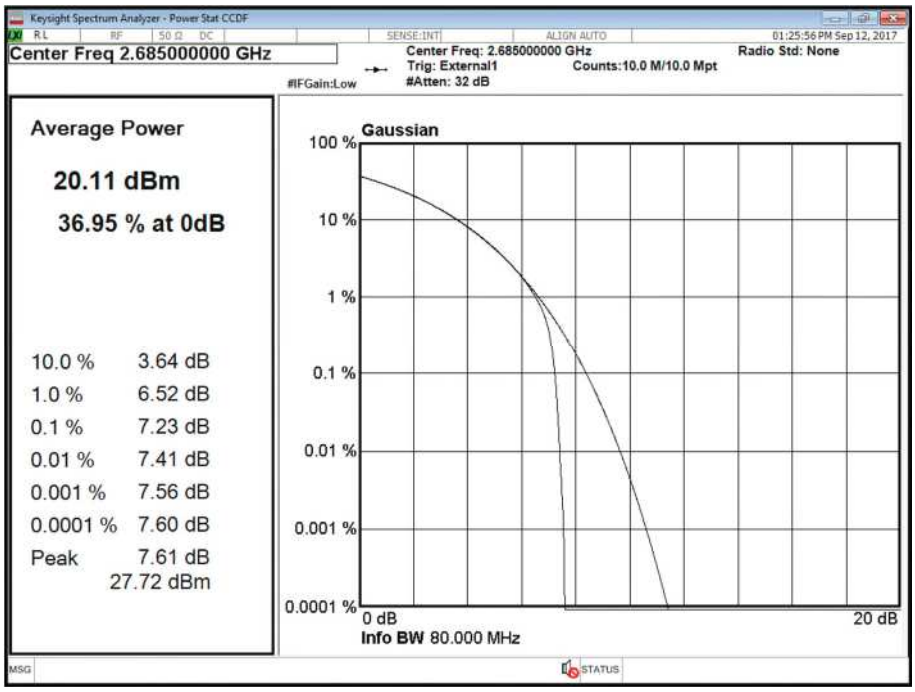
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



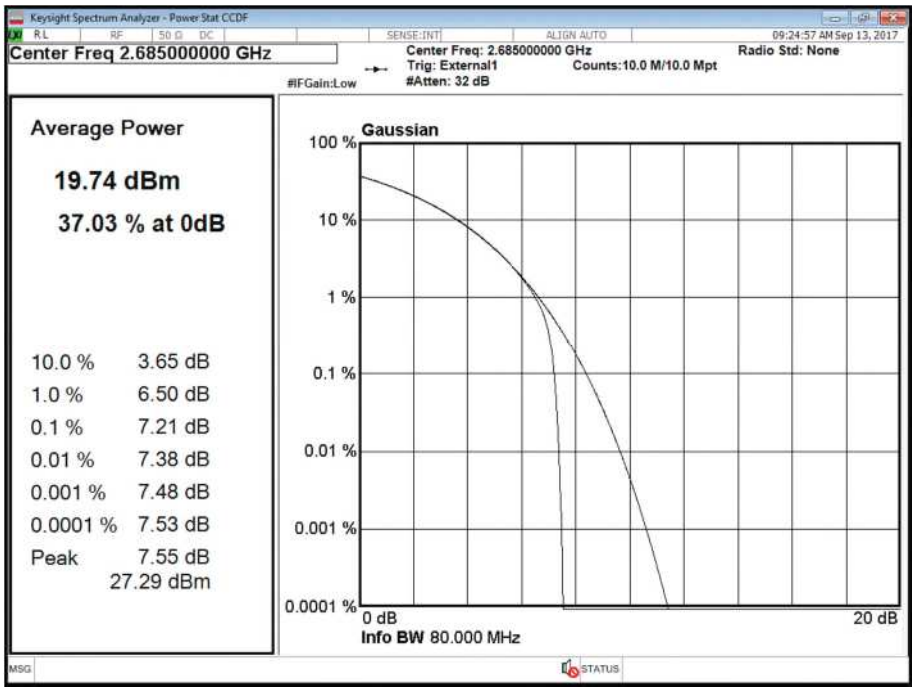
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



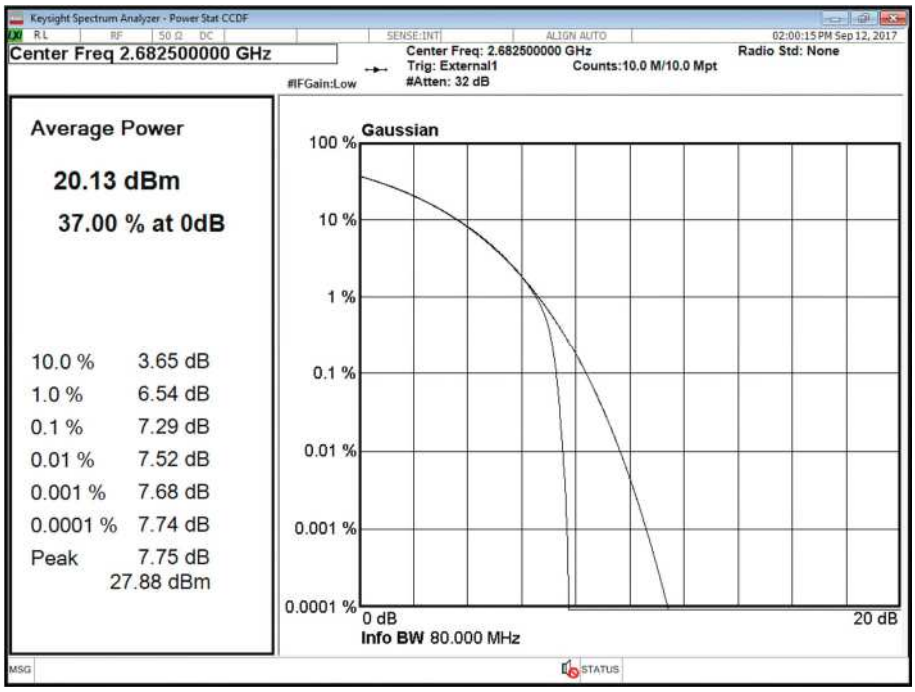
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



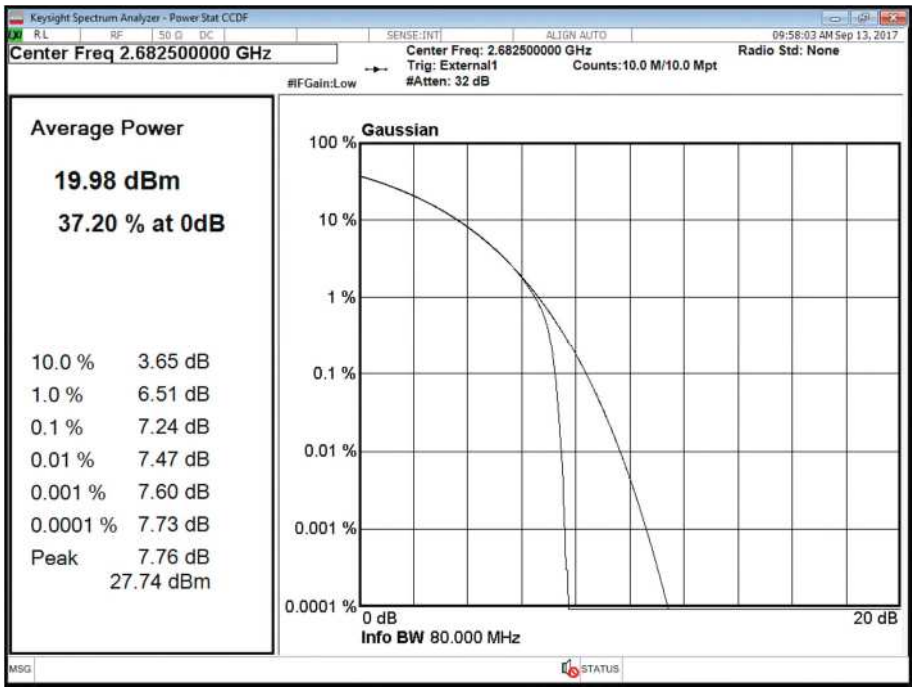
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



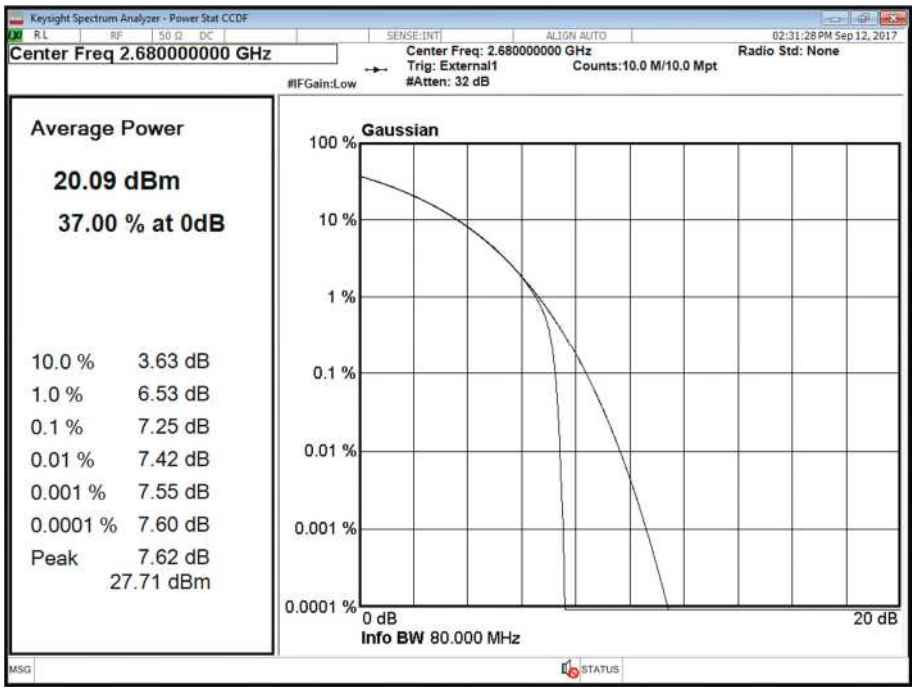
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



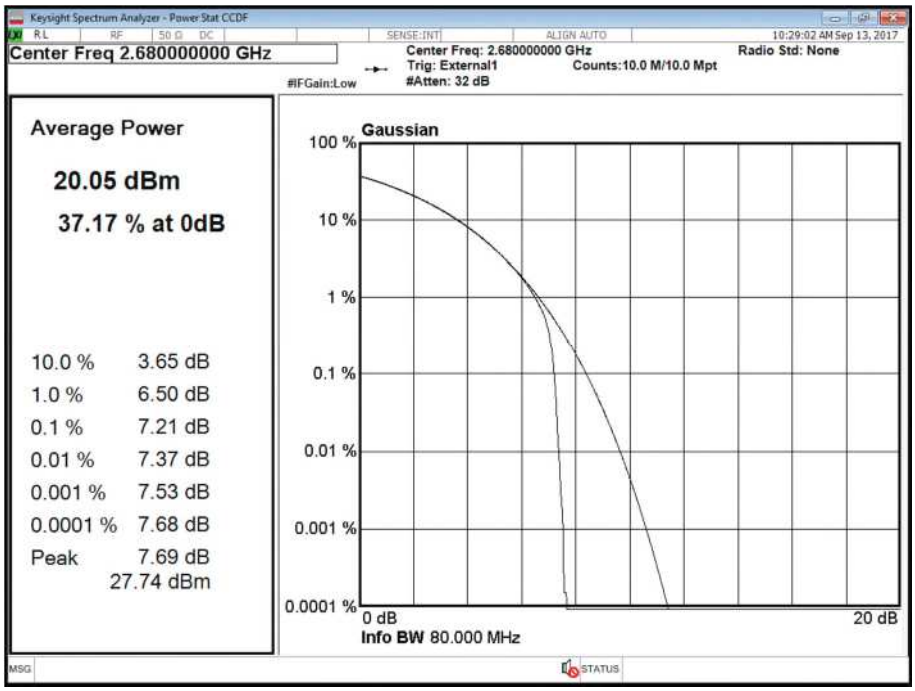
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Configuration 2

Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	20.52	12.31
B	QPSK	5.0 MHz	-	20.23	12.04
Total			-	23.39	15.19
A	QPSK	10.0 MHz	-	20.43	9.17
B	QPSK	10.0 MHz	-	20.34	9.49
Total			-	23.40	12.34
A	QPSK	15.0 MHz	-	20.31	7.13
B	QPSK	15.0 MHz	-	20.04	7.43
Total			-	23.19	10.29
A	QPSK	20.0 MHz	-	20.35	5.94
B	QPSK	20.0 MHz	-	20.20	5.78
Total			-	23.29	8.87

Maximum Output Power 24.8 dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	24.32	16.11
B	QPSK	5.0 MHz	-	24.03	15.84
Total			-	27.18	18.99
A	QPSK	10.0 MHz	-	24.23	12.97
B	QPSK	10.0 MHz	-	24.14	13.29
Total			-	27.20	16.14
A	QPSK	15.0 MHz	-	24.11	10.93
B	QPSK	15.0 MHz	-	23.84	11.23
Total			-	26.99	14.09
A	QPSK	20.0 MHz	-	24.15	9.74
B	QPSK	20.0 MHz	-	24.00	9.58
Total			-	27.09	12.67

Configuration 2

Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	20.26	11.58
B	QPSK	5.0 MHz	-	20.28	11.57
Total			-	23.28	14.59
A	QPSK	10.0 MHz	-	20.31	8.87
B	QPSK	10.0 MHz	-	19.91	8.84
Total			-	23.12	11.87
A	QPSK	15.0 MHz	-	20.22	7.13
B	QPSK	15.0 MHz	-	19.84	7.18
Total			-	23.04	10.17
A	QPSK	20.0 MHz	-	20.31	6.26
B	QPSK	20.0 MHz	-	19.91	5.79
Total			-	23.12	9.04

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	24.06	15.38
B	QPSK	5.0 MHz	-	24.08	15.37
Total			-	27.08	18.39
A	QPSK	10.0 MHz	-	24.11	12.67
B	QPSK	10.0 MHz	-	23.71	12.64
Total			-	26.92	15.67
A	QPSK	15.0 MHz	-	24.02	10.93
B	QPSK	15.0 MHz	-	23.64	10.98
Total			-	26.84	13.97
A	QPSK	20.0 MHz	-	24.11	10.06
B	QPSK	20.0 MHz	-	23.71	9.59
Total			-	26.92	12.84

Configuration 2

Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	20.22	11.45
B	QPSK	5.0 MHz	-	20.21	11.43
Total			-	23.23	14.45
A	QPSK	10.0 MHz	-	19.91	8.45
B	QPSK	10.0 MHz	-	19.89	8.34
Total			-	22.91	11.41
A	QPSK	15.0 MHz	-	20.14	7.01
B	QPSK	15.0 MHz	-	19.95	6.84
Total			-	23.06	9.94
A	QPSK	20.0 MHz	-	20.31	5.70
B	QPSK	20.0 MHz	-	20.09	5.57
Total			-	23.21	8.65

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

Antenna	LTE Modulation	LTE Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power (eirp)	
				dBm	dBm/MHz
A	QPSK	5.0 MHz	-	24.02	15.25
B	QPSK	5.0 MHz	-	24.01	15.23
Total			-	27.03	18.25
A	QPSK	10.0 MHz	-	23.71	12.25
B	QPSK	10.0 MHz	-	23.69	12.14
Total			-	26.71	15.21
A	QPSK	15.0 MHz	-	23.94	10.81
B	QPSK	15.0 MHz	-	23.75	10.64
Total			-	26.86	13.74
A	QPSK	20.0 MHz	-	24.11	9.50
B	QPSK	20.0 MHz	-	23.89	9.37
Total			-	27.01	12.45

Limit	
Peak Power	≤33 dBW + 10log(X/Y) Where: X = 5, 10, 15 or 20 Y = 5.5 5 MHz: 32.59 dBW / 62.59 dBm 10 MHz: 35.60 dBW / 65.60 dBm 15 MHz: 37.36 dBW / 67.36 dBm 20 MHz: 38.61 dBW / 68.61 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(m)(6)

2.2.2 Date of Test and Modification State

13 September 2017 - 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	25°C
Relative Humidity	36%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01 Clause 4.2.

The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

For 26dB Bandwidth, in accordance with KDB 971168 D01, a peak detector and a trace setting of Max Hold were used in conjunction with the Occupied Bandwidth/x dB Bandwidth measurement function. The trace was left to stabilise and the result was recorded.

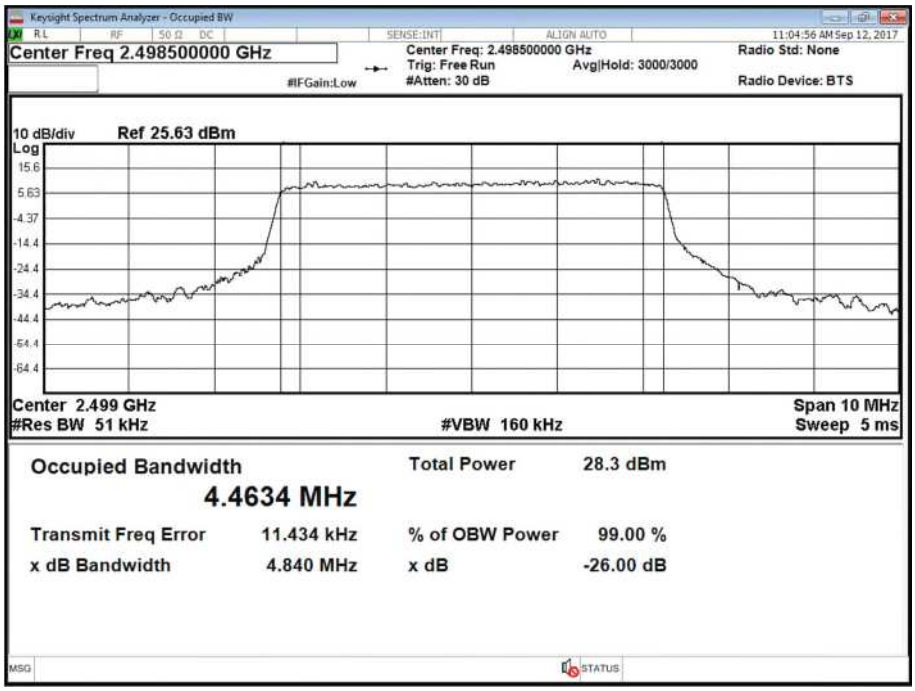
2.2.6 Test Results

Configuration 1

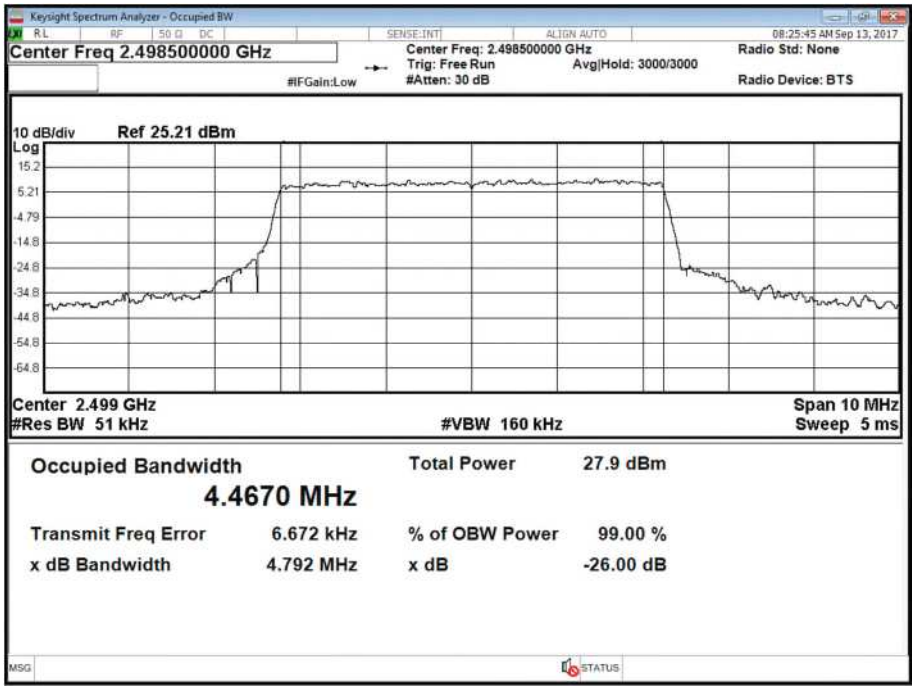
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE 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	QPSK	5.0 MHz	4,463.40	4,840.05	4,466.16	4,834.14	4,464.66	4,826.08
B	QPSK	5.0 MHz	4,467.04	4,792.43	4,466.83	4,818.85	4,468.99	4,808.10
A	QPSK	10.0 MHz	8,940.65	9,573.19	8,952.61	9,583.82	8,952.10	9,608.29
B	QPSK	10.0 MHz	8,932.17	9,587.21	8,937.99	9,595.98	8,936.92	9,612.46
A	QPSK	15.0 MHz	13,430.48	14,358.13	13,459.72	14,386.11	13,454.80	14,416.14
B	QPSK	15.0 MHz	13,373.15	14,295.39	13,400.81	14,303.70	13,402.76	14,309.16
A	QPSK	20.0 MHz	17,851.21	18,977.89	17,895.36	18,990.95	17,890.93	19,011.45
B	QPSK	20.0 MHz	17,827.08	19,031.86	17,880.09	19,081.59	17,851.42	19,070.20

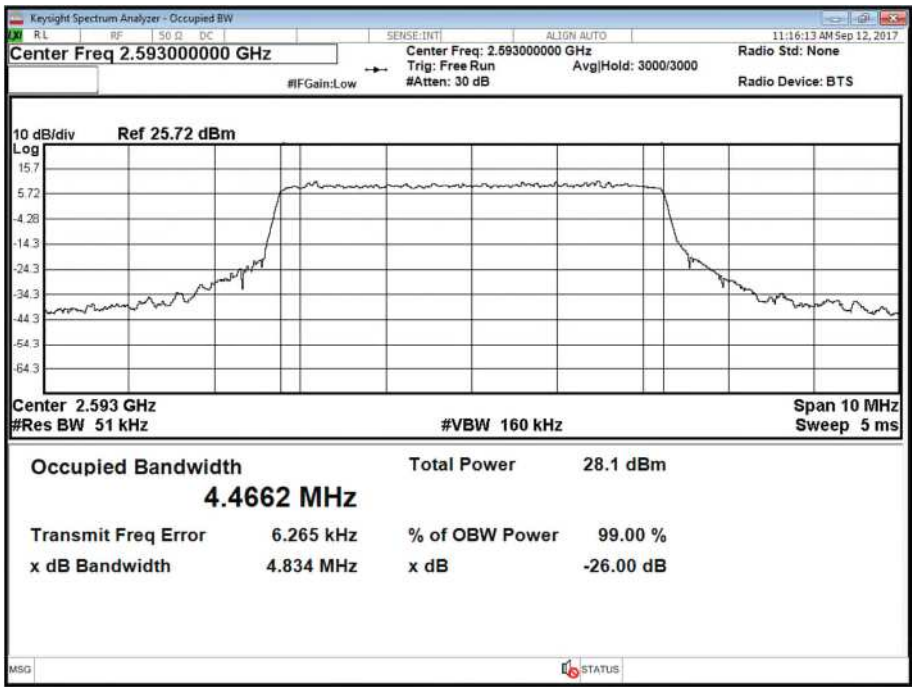
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



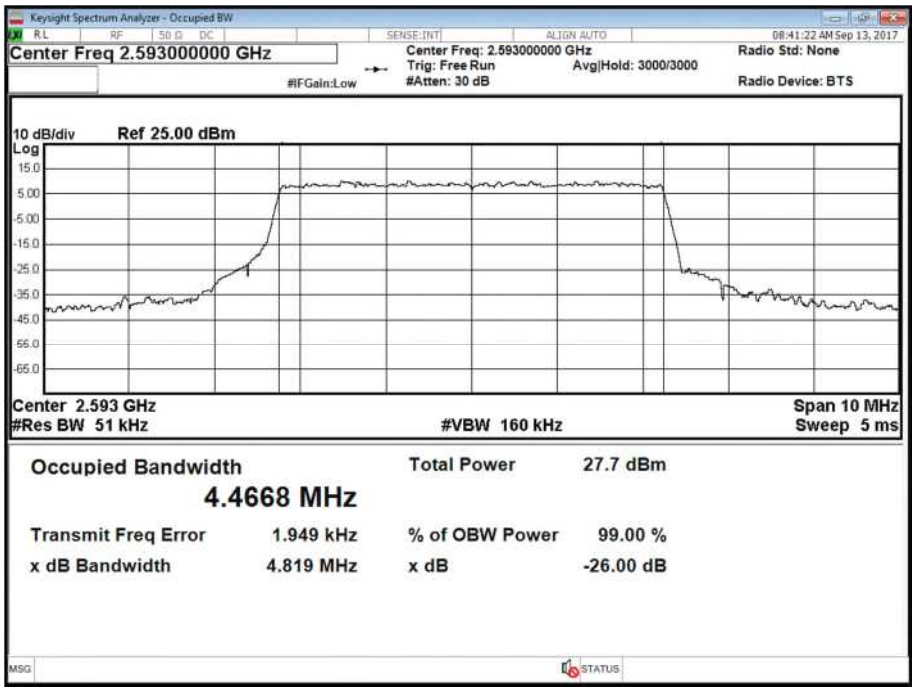
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



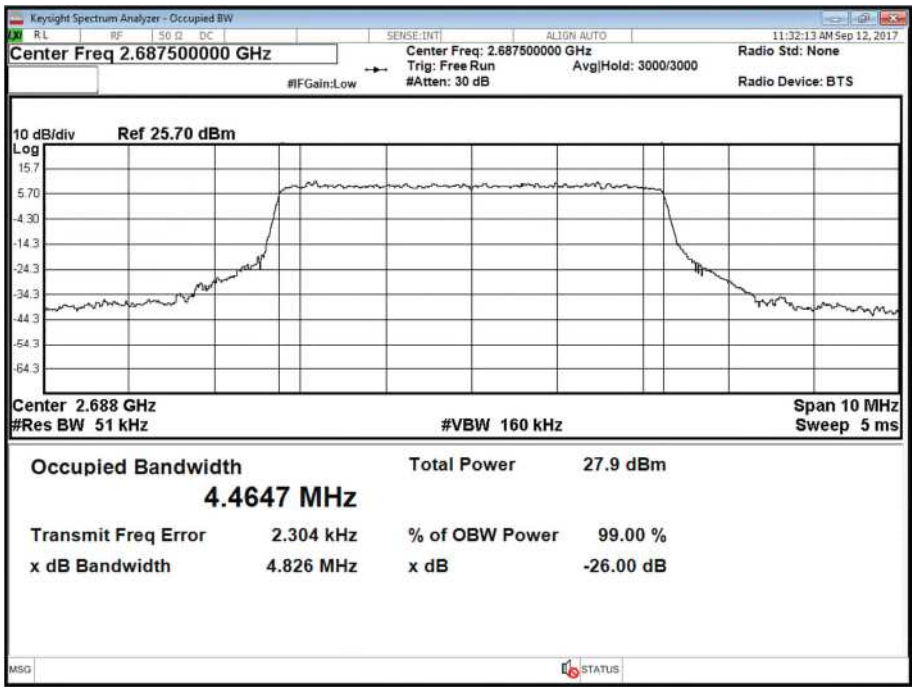
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M



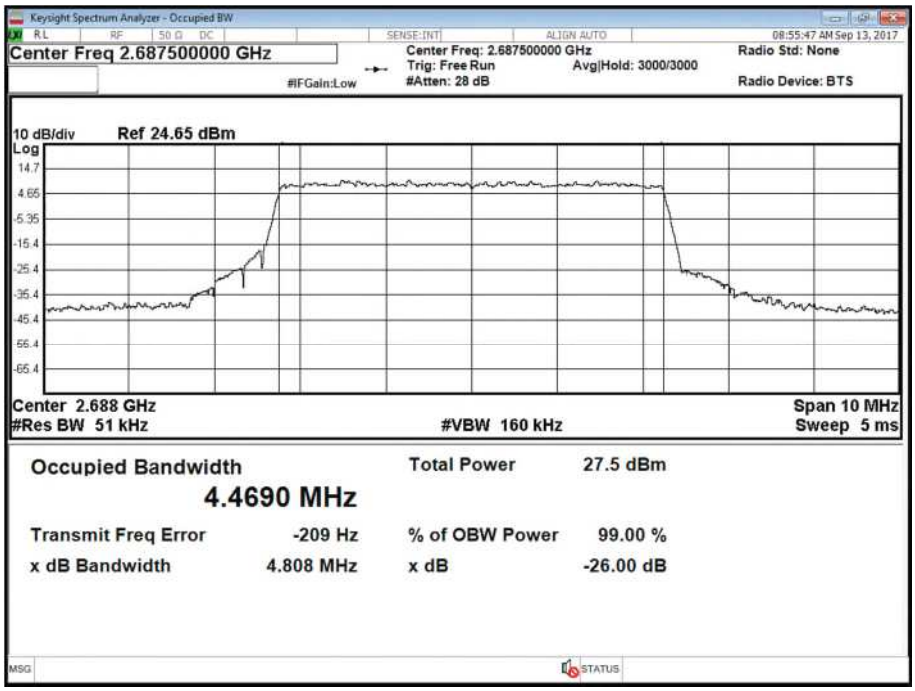
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M



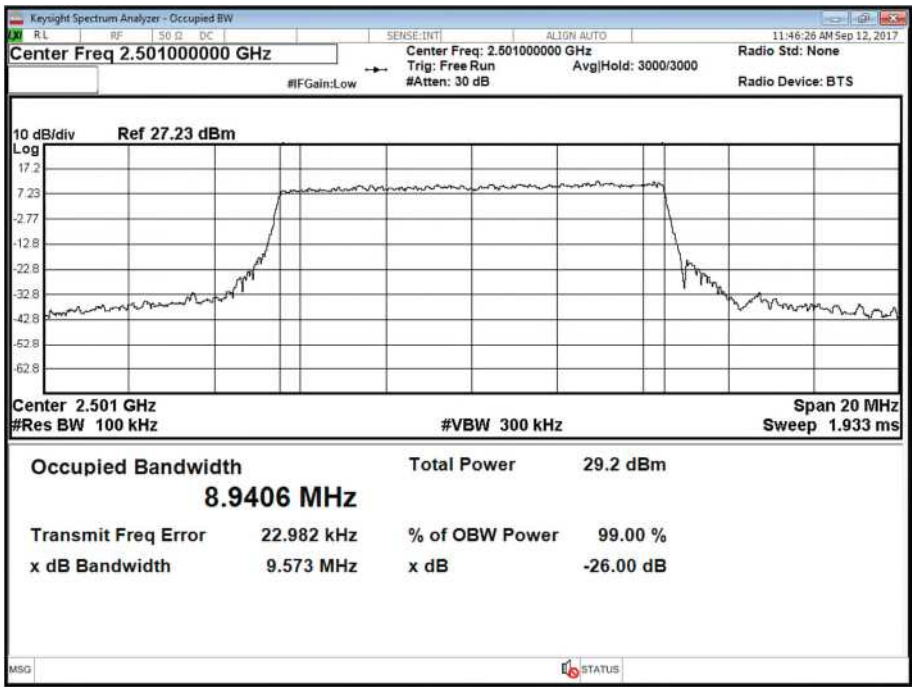
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



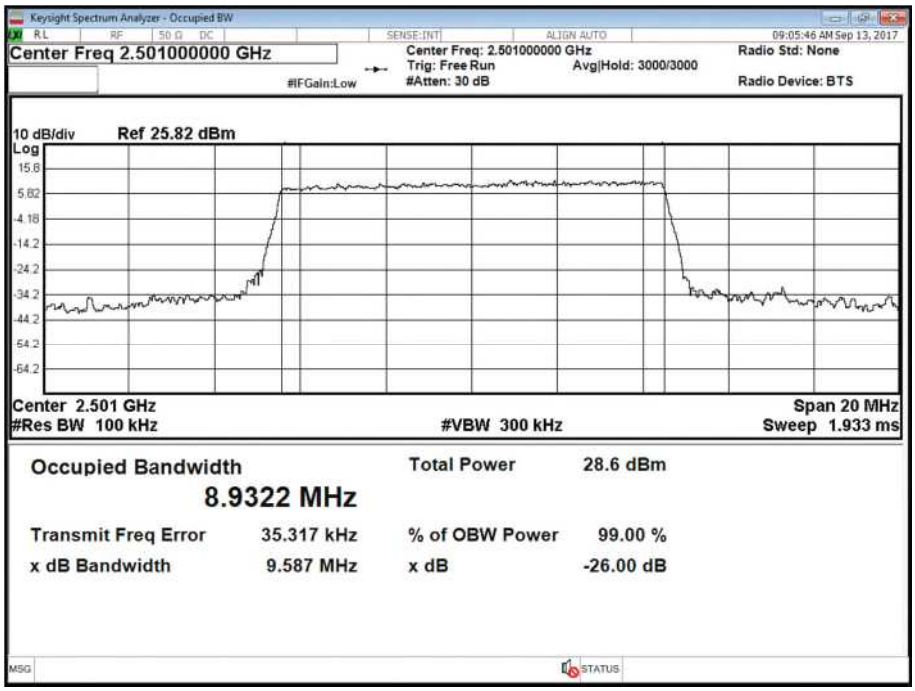
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



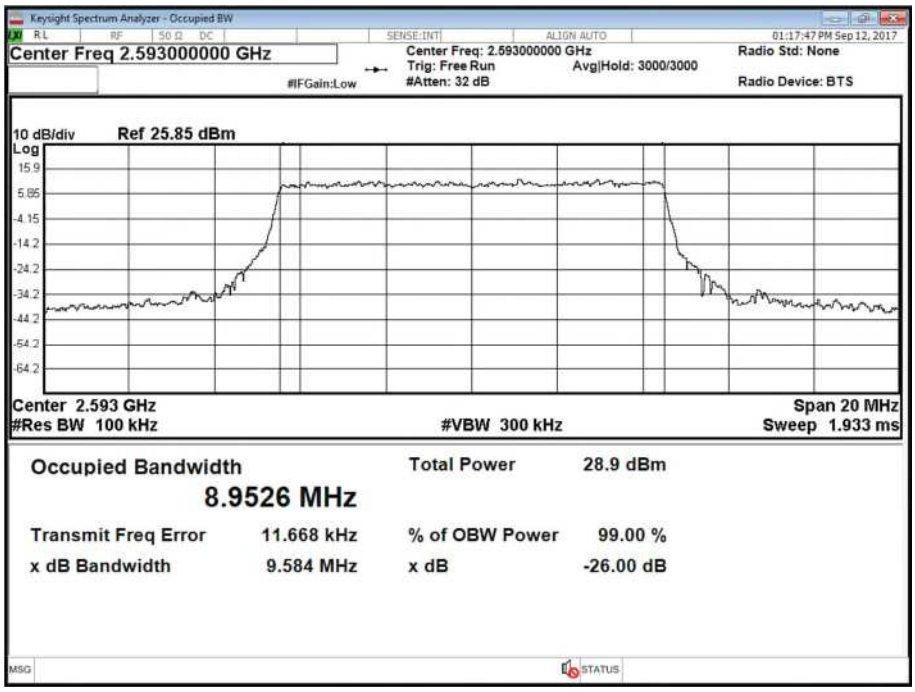
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



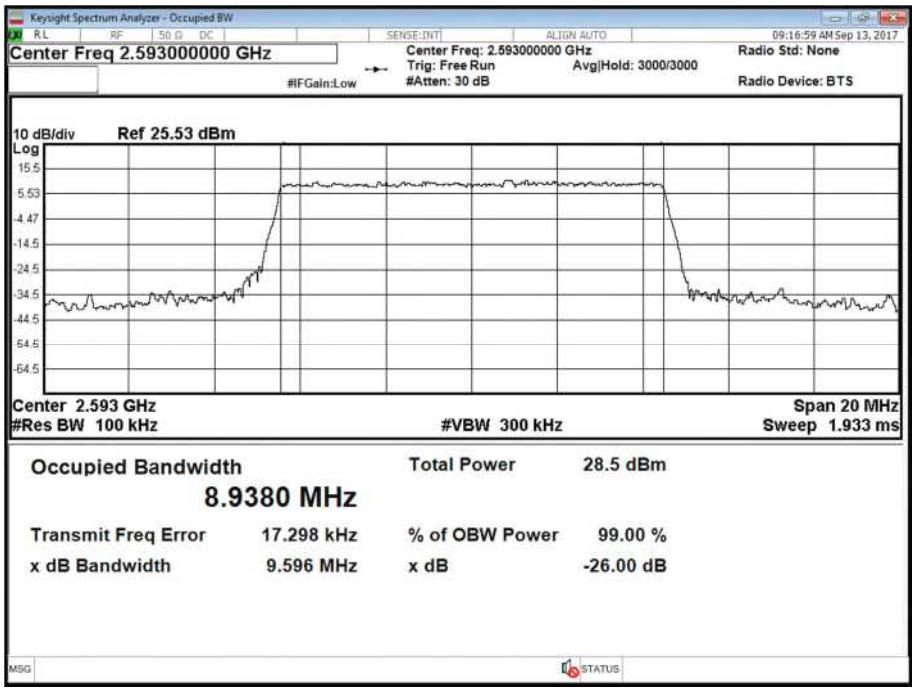
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



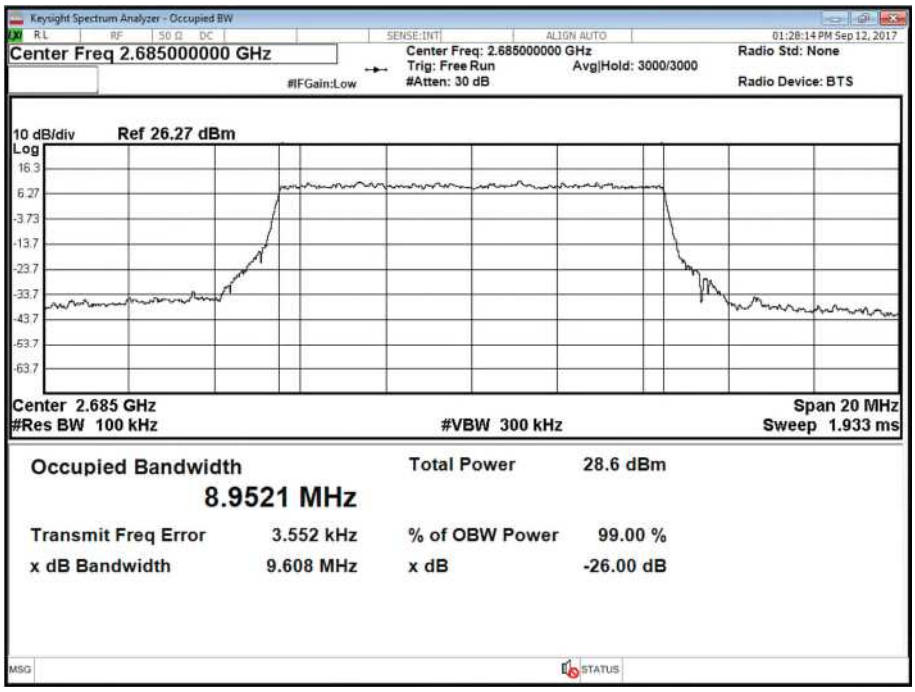
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



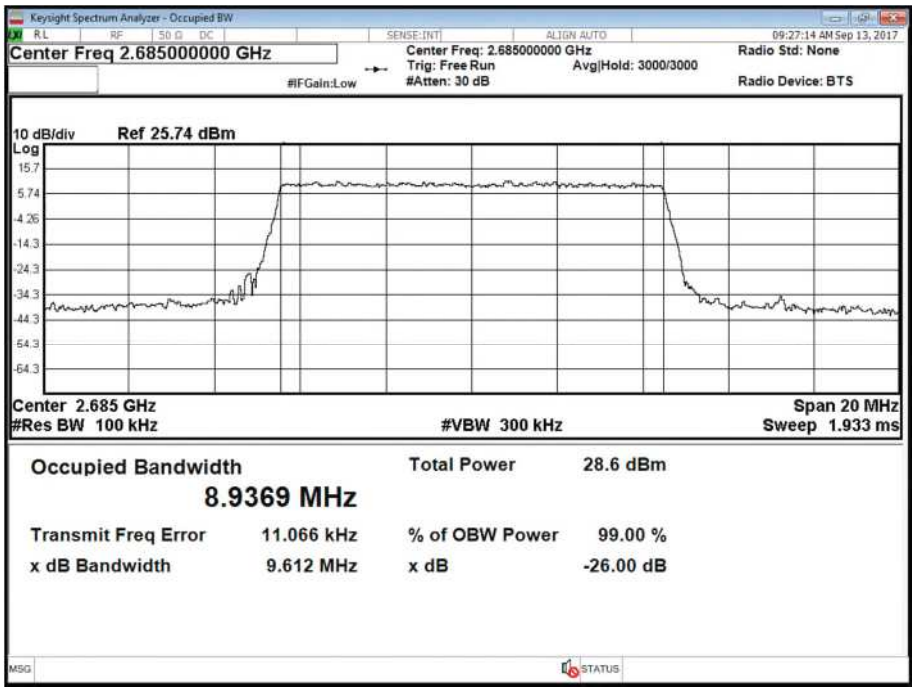
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



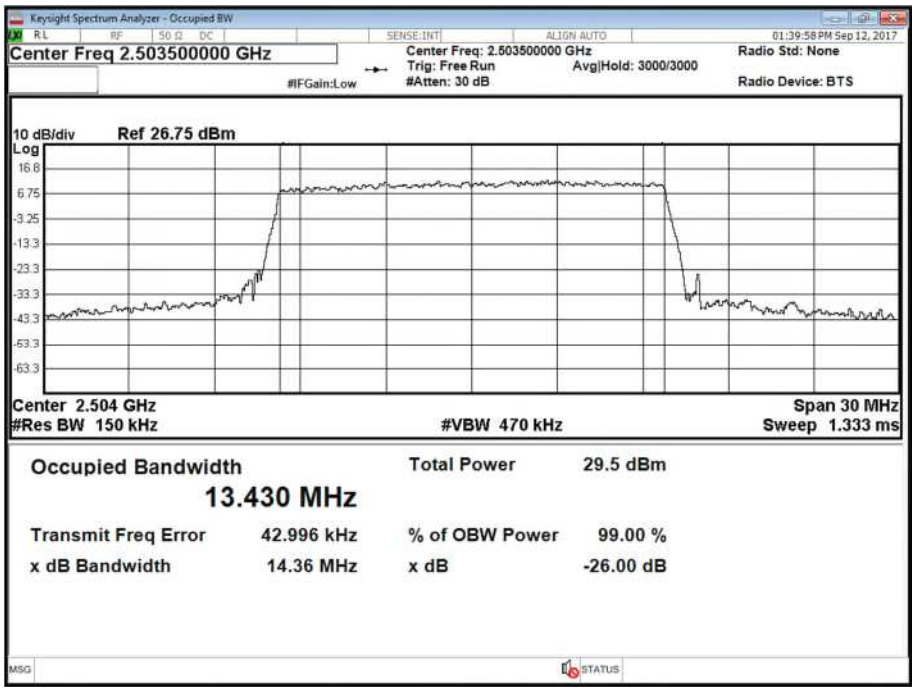
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



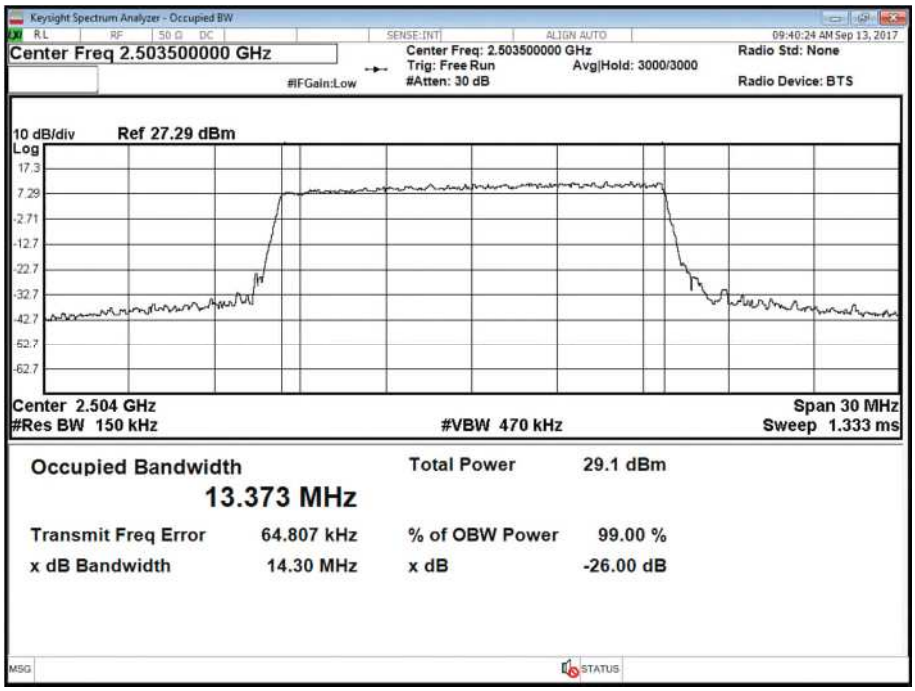
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



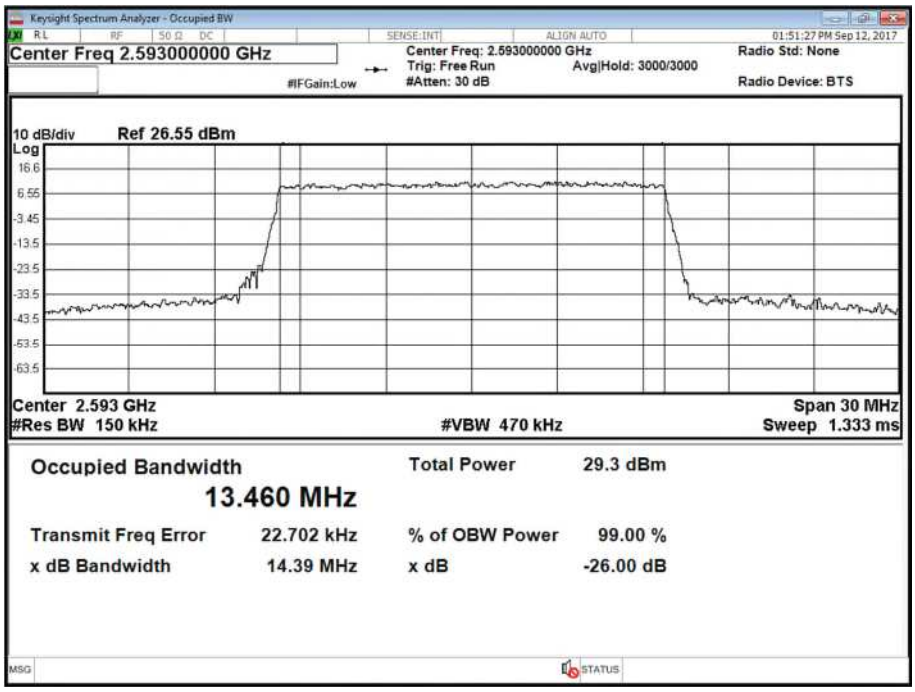
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



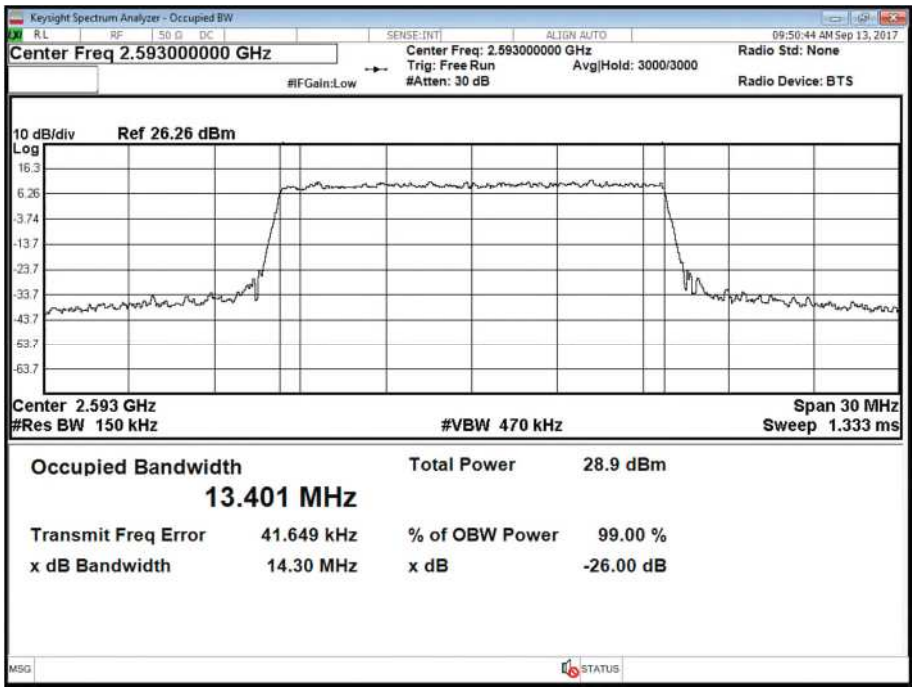
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



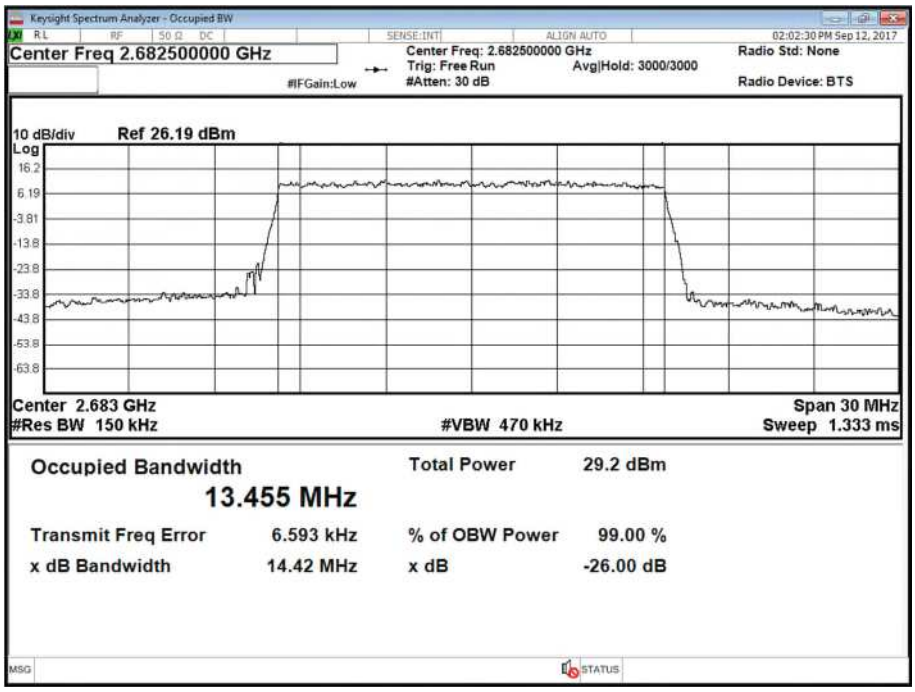
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



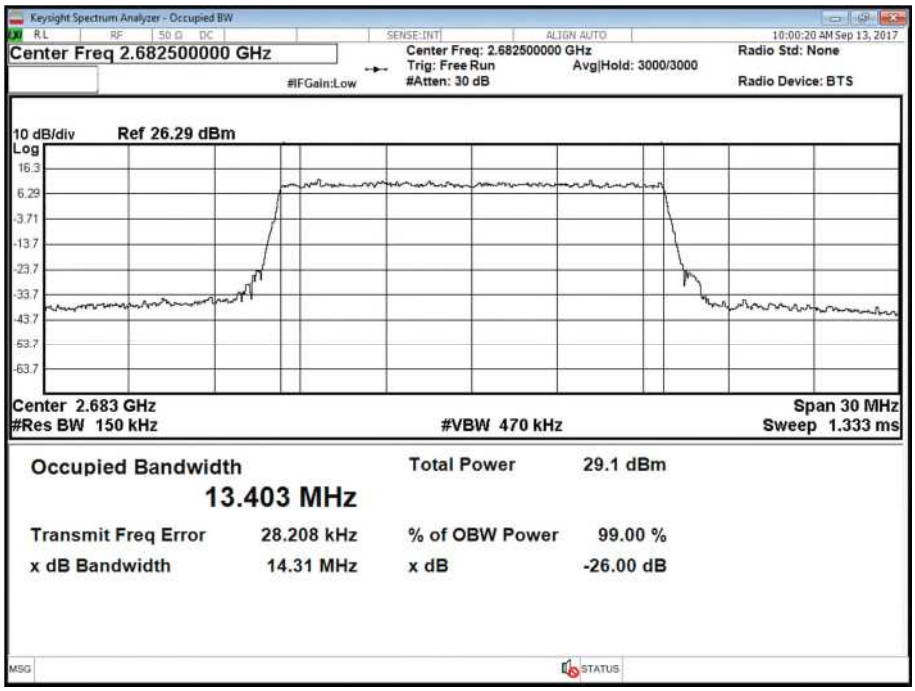
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



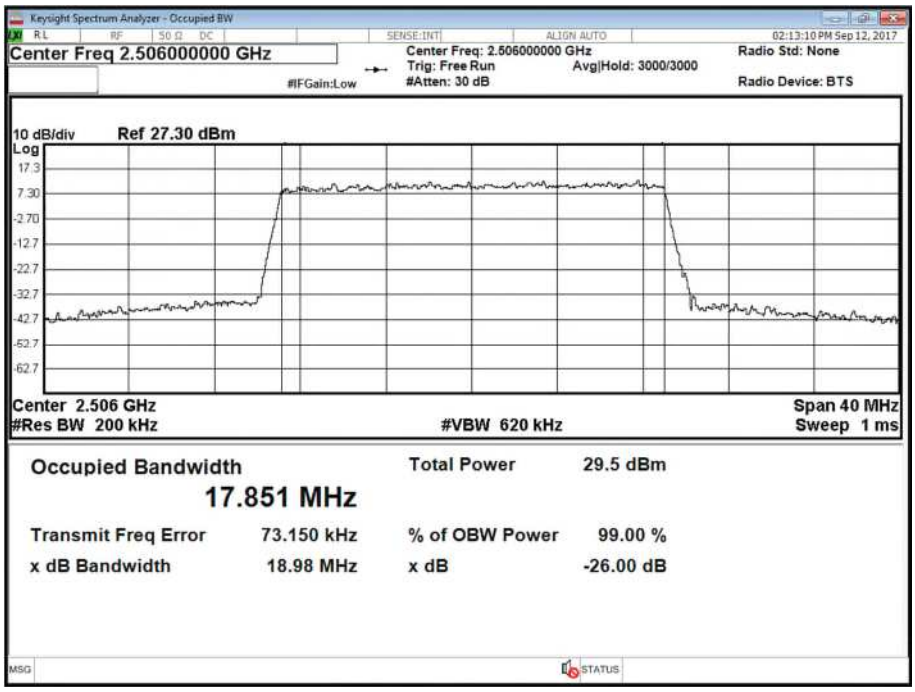
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



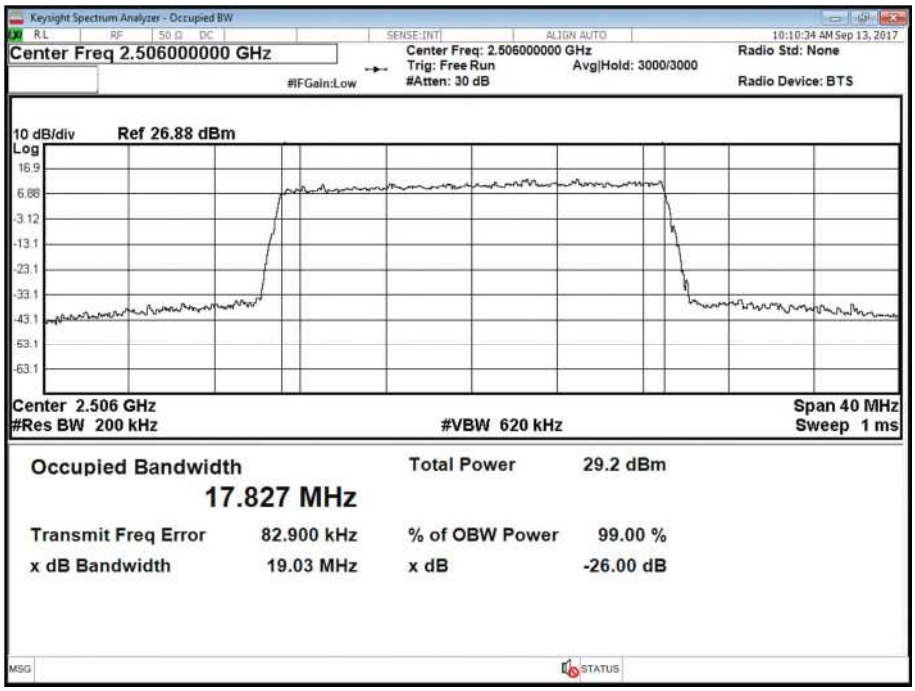
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



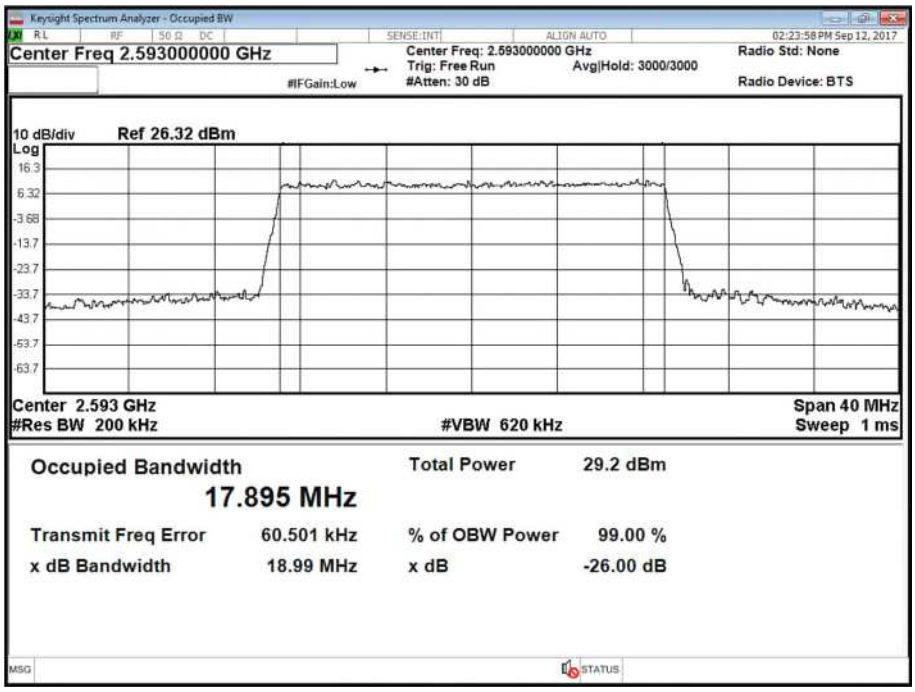
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



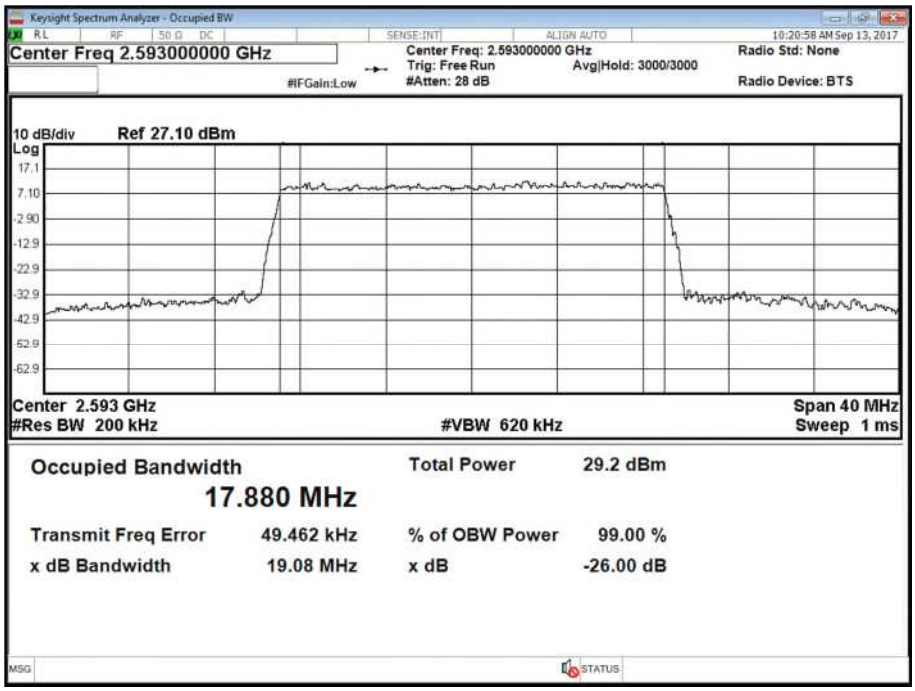
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



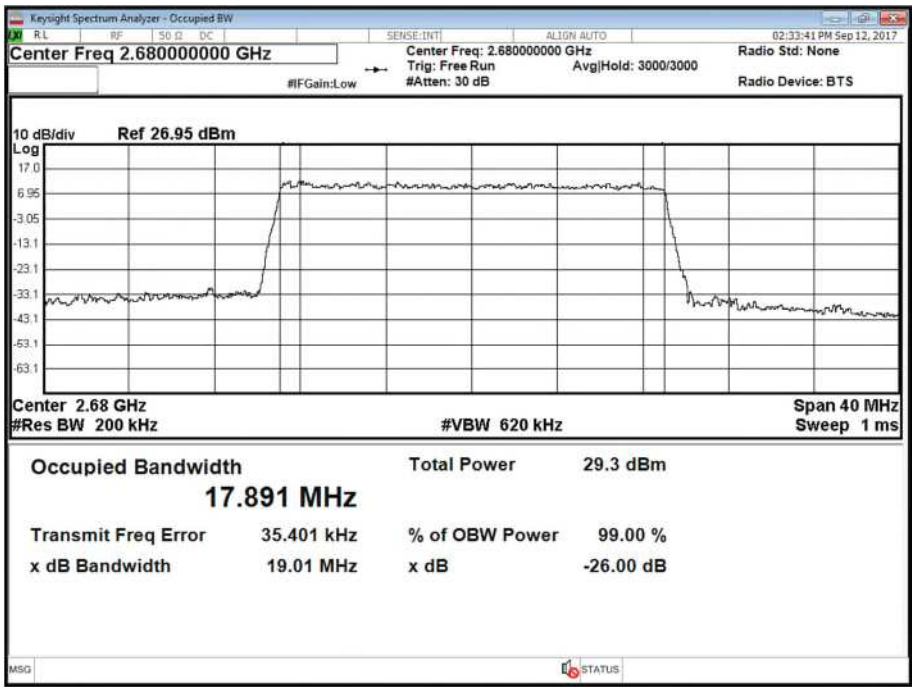
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



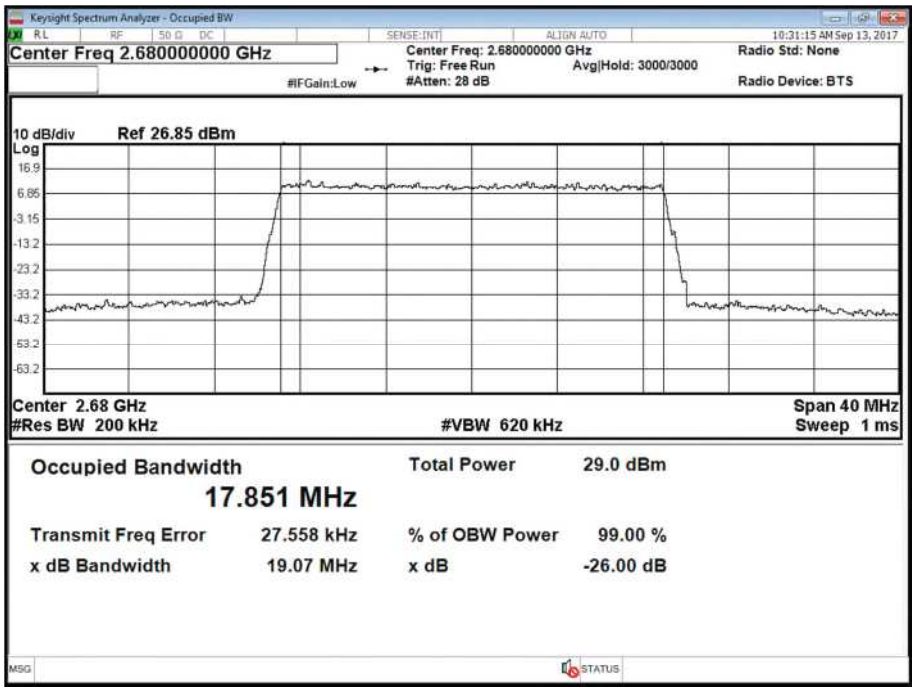
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 27, Clause 27.53 (m)(2)(6)

2.3.2 Date of Test and Modification State

13 September 2017 - 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	25°C
Relative Humidity	36%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01 Clause 6.
The EUT was connected to a Spectrum Analyser via an attenuator and switching box. 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 EUT has 2 transmit ports, but can be configured to operate with 2 devices co-located. Therefore, the test limits used were calculated on a worst case basis accounting for an effective 4 port MIMO configuration. Testing was performed on this port with a test limit of 43+10log(P) - 10log(4) = -19 dBm.

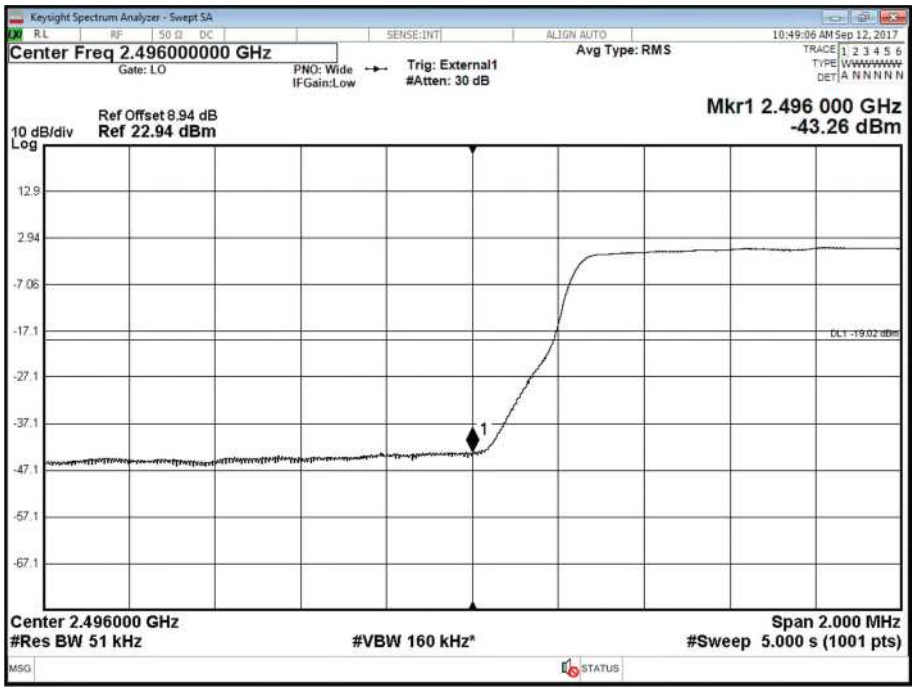
2.3.6 Test Results

Configuration 1

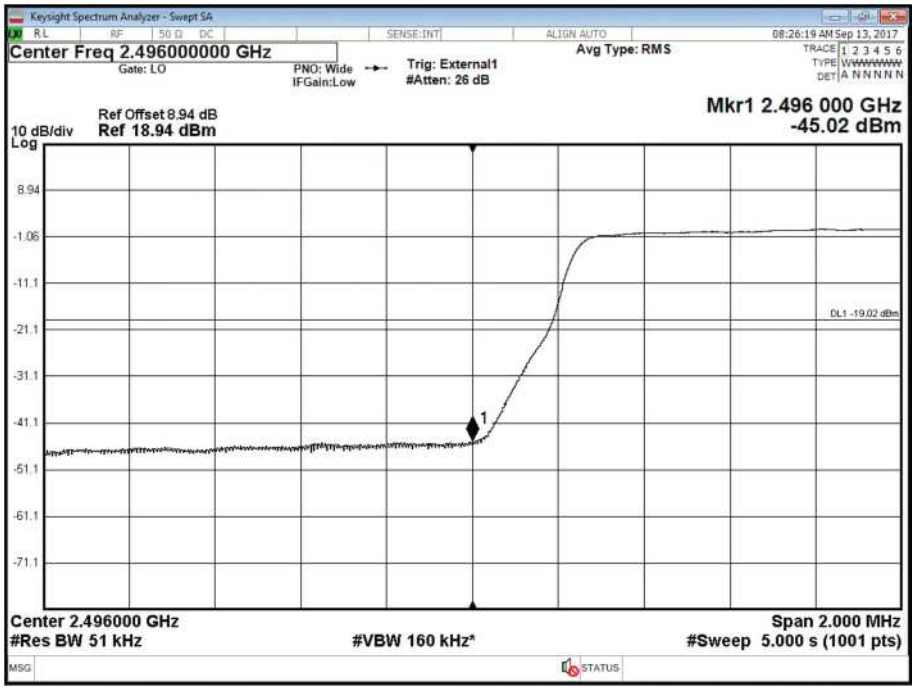
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	5.0 MHz	2,498.5	2,687.5
B	QPSK	5.0 MHz	2,498.5	2,687.5
A	QPSK	10.0 MHz	2,501.0	2,685.0
B	QPSK	10.0 MHz	2,501.0	2,685.0
A	QPSK	15.0 MHz	2,503.5	2,682.5
B	QPSK	15.0 MHz	2,503.5	2,682.5
A	QPSK	20.0 MHz	2,506.0	2,680.0
B	QPSK	20.0 MHz	2,506.0	2,680.0

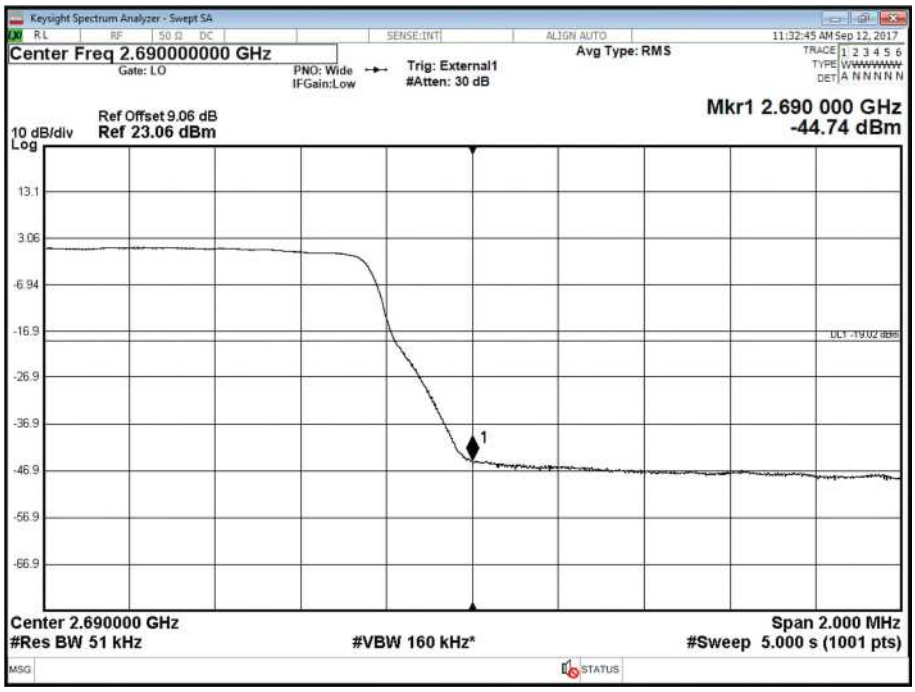
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



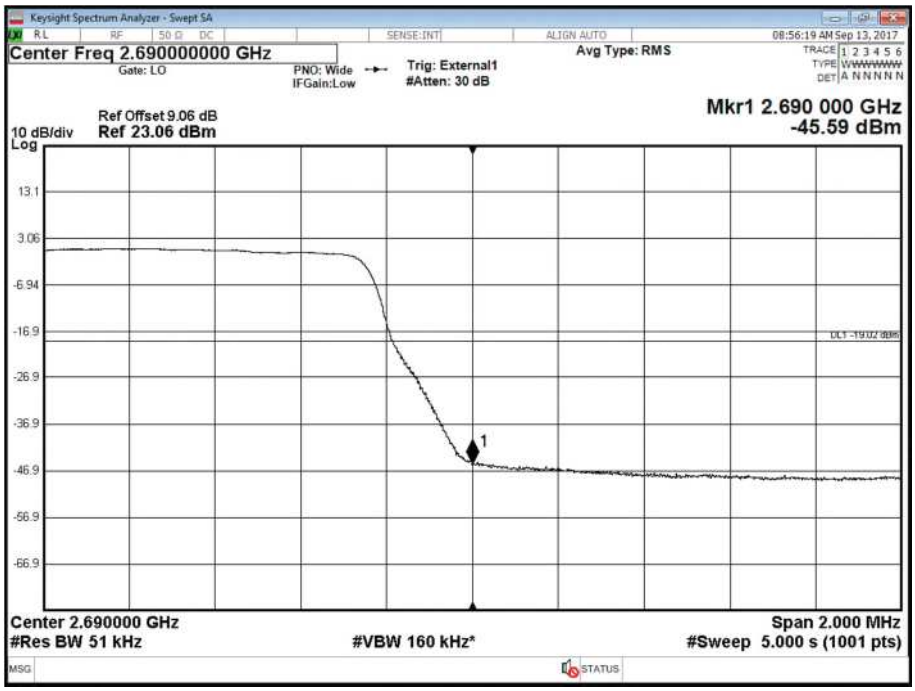
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



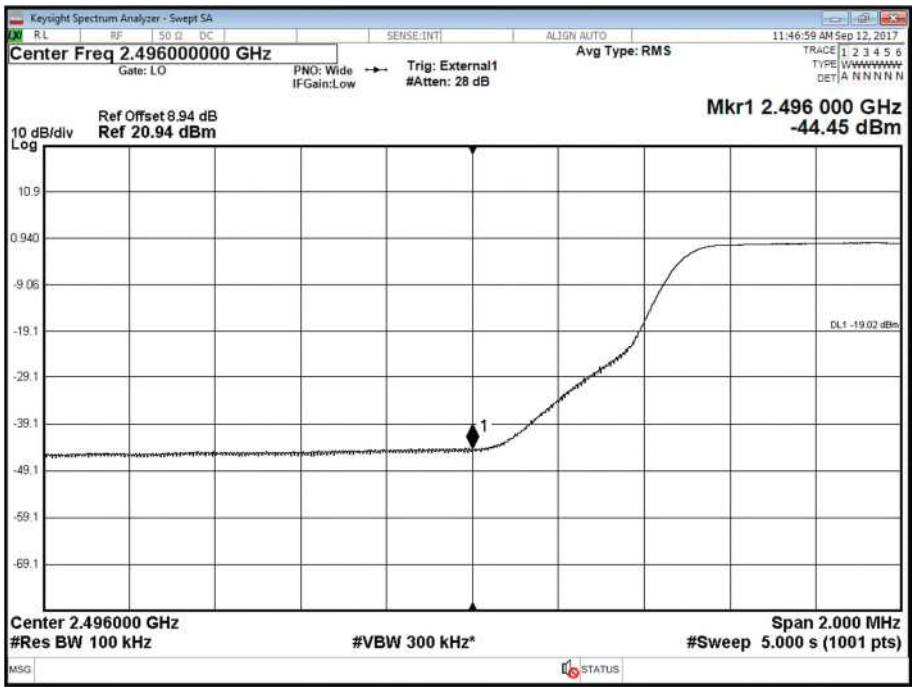
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



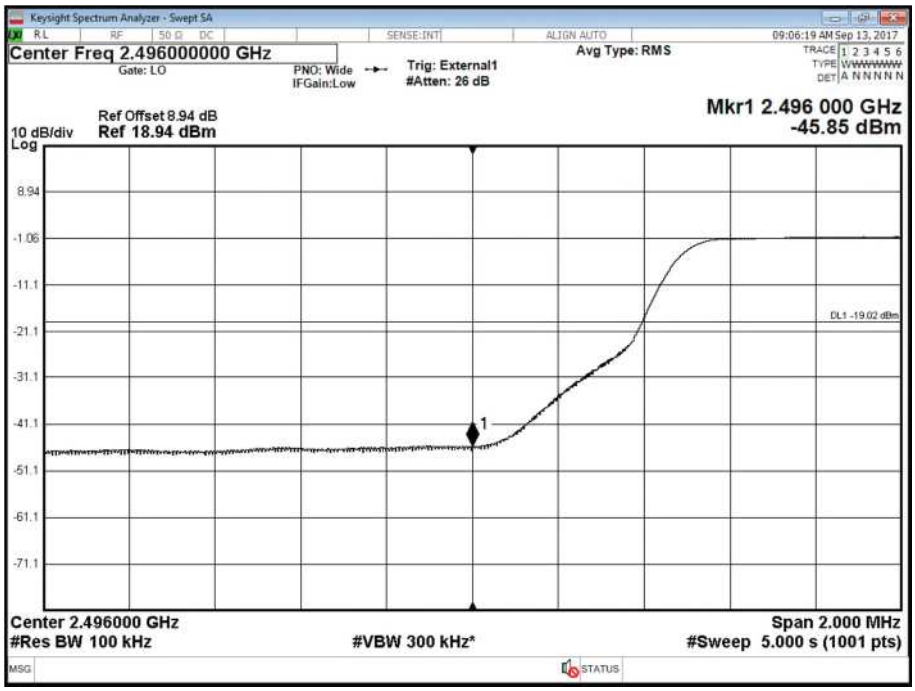
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



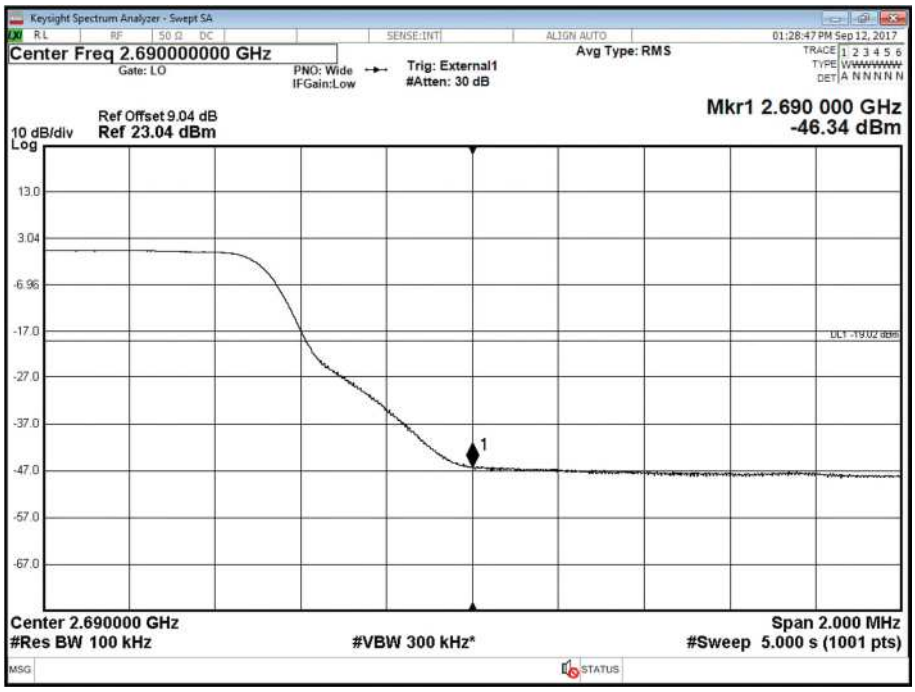
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



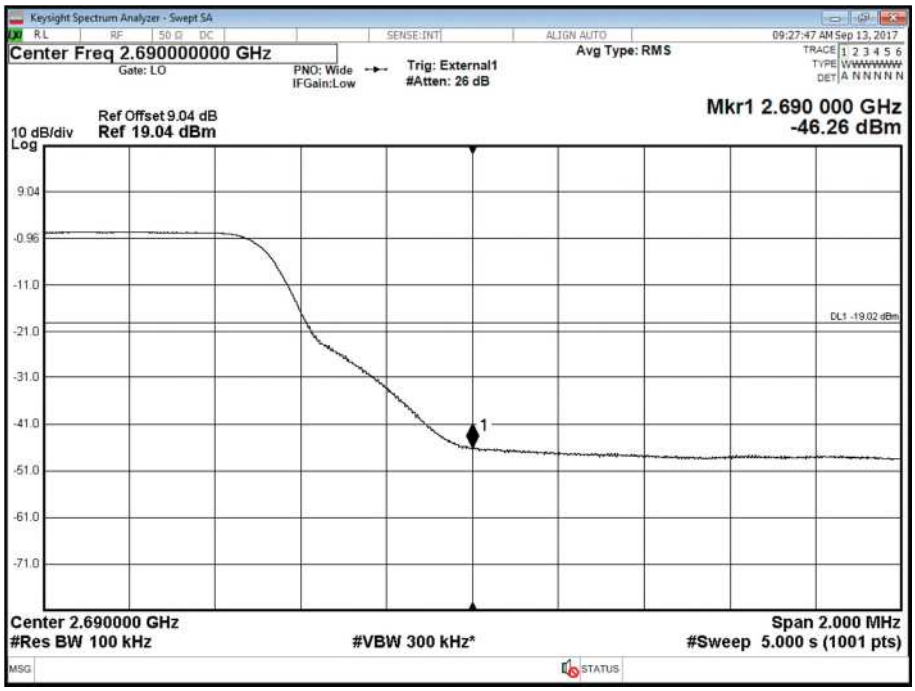
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



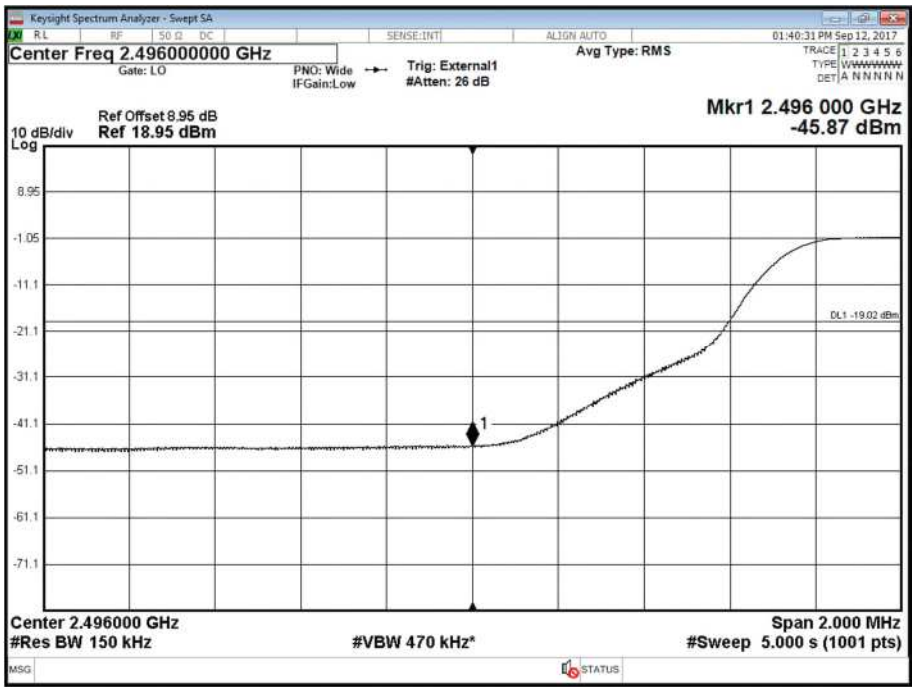
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



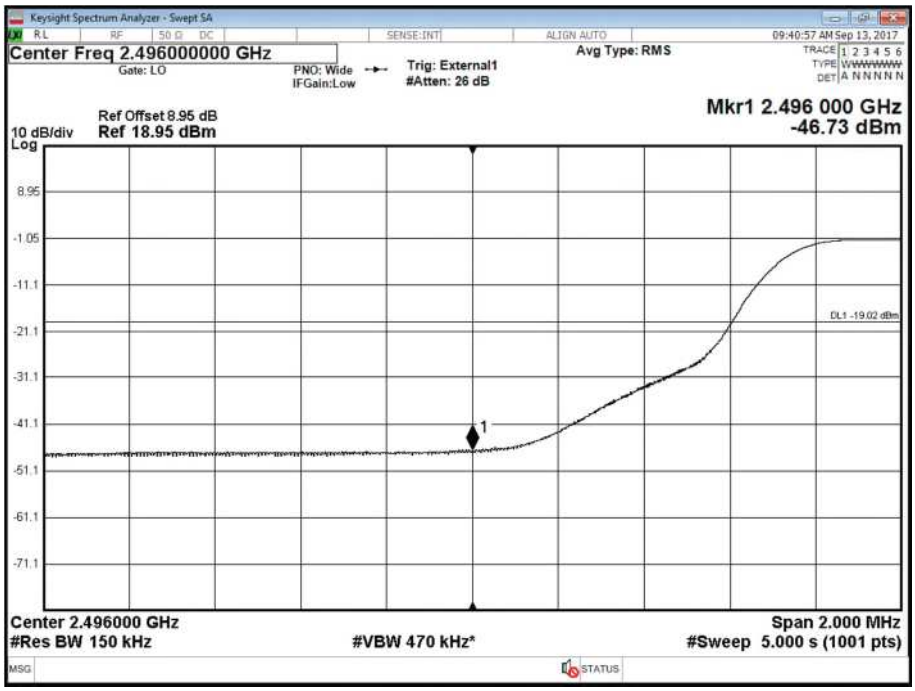
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



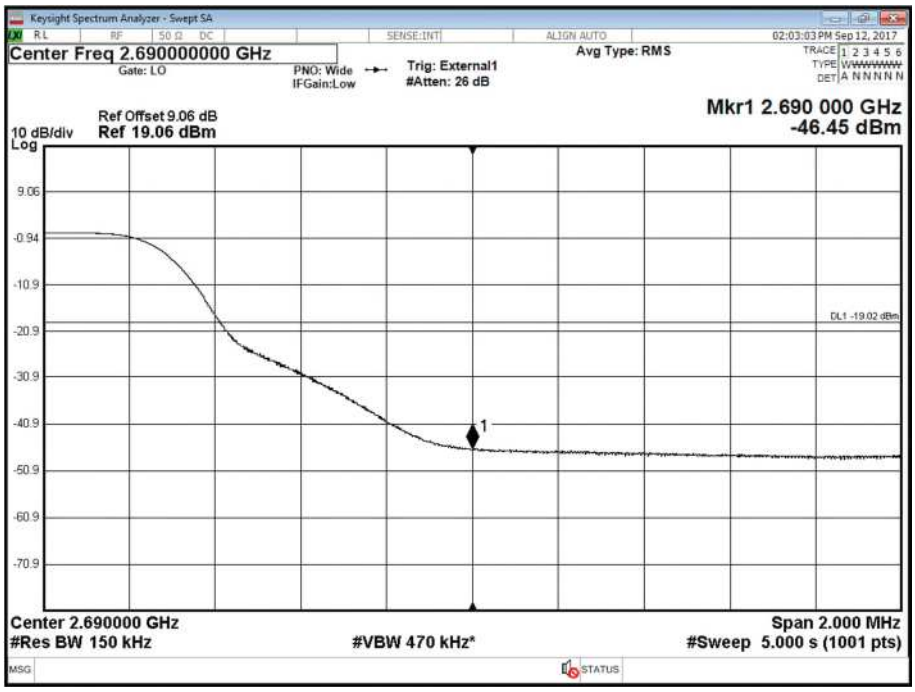
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



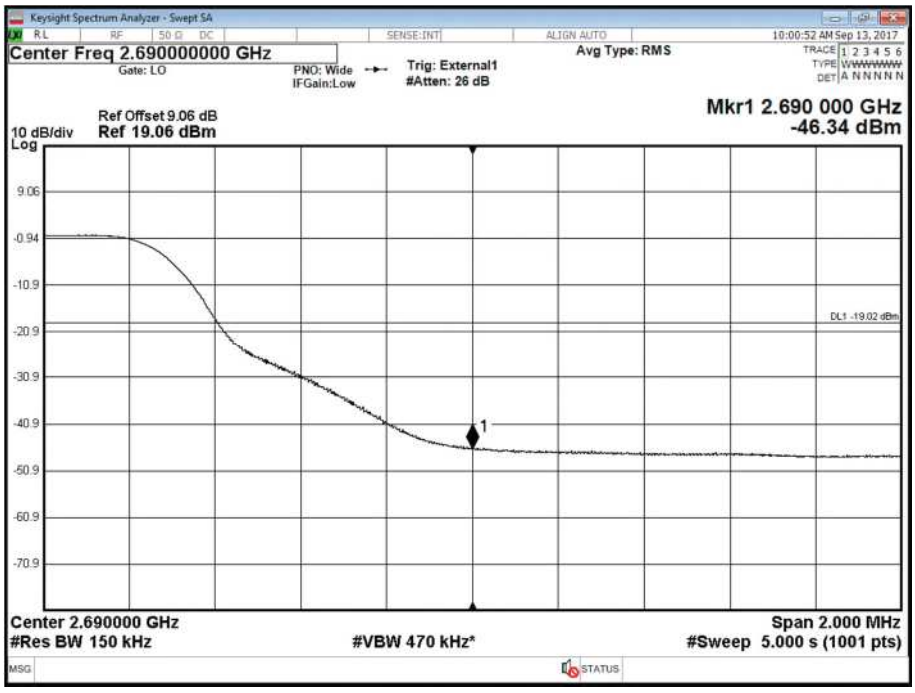
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



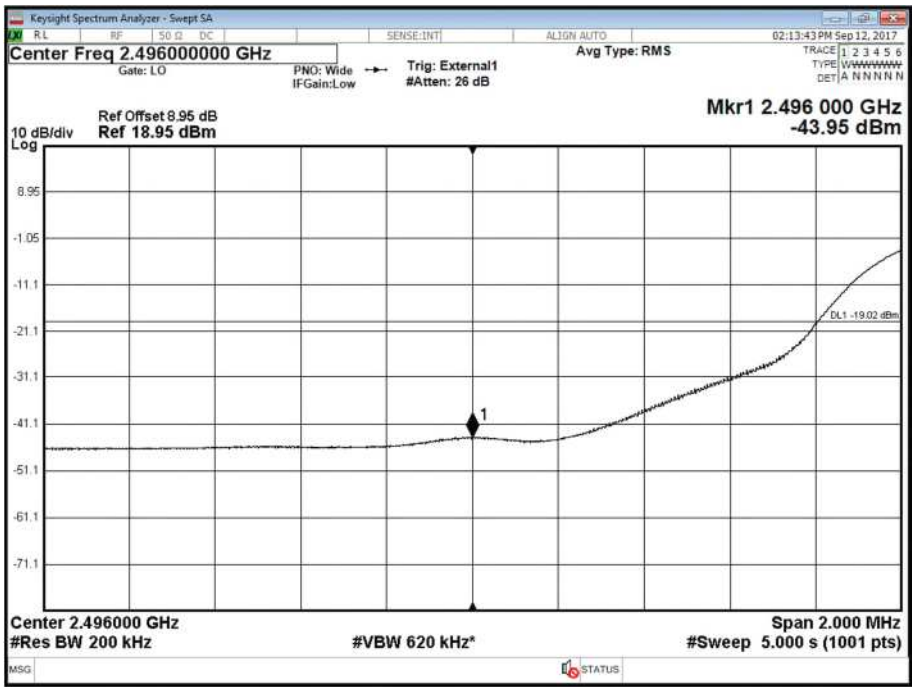
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



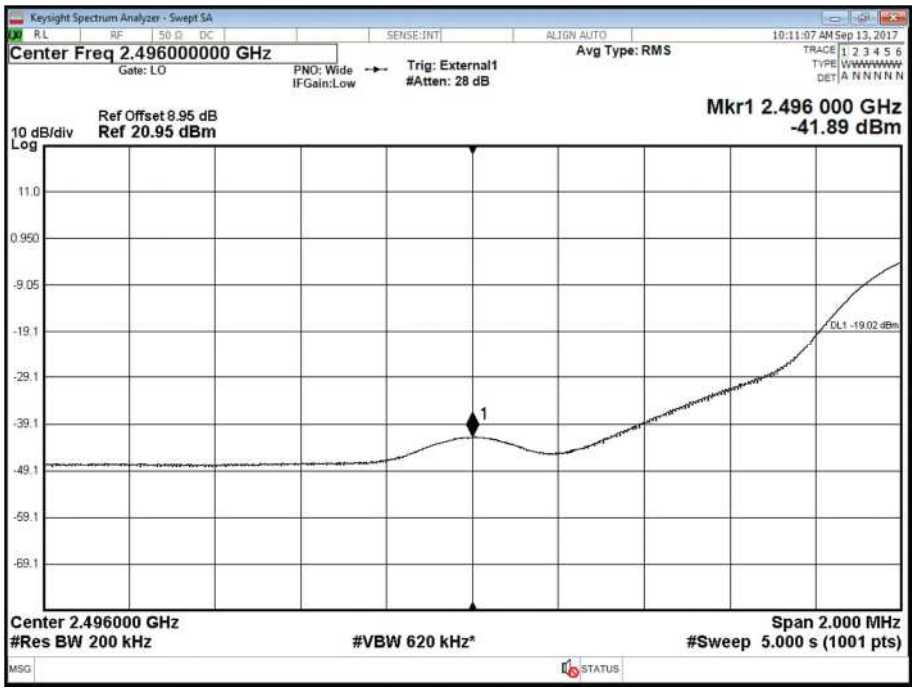
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



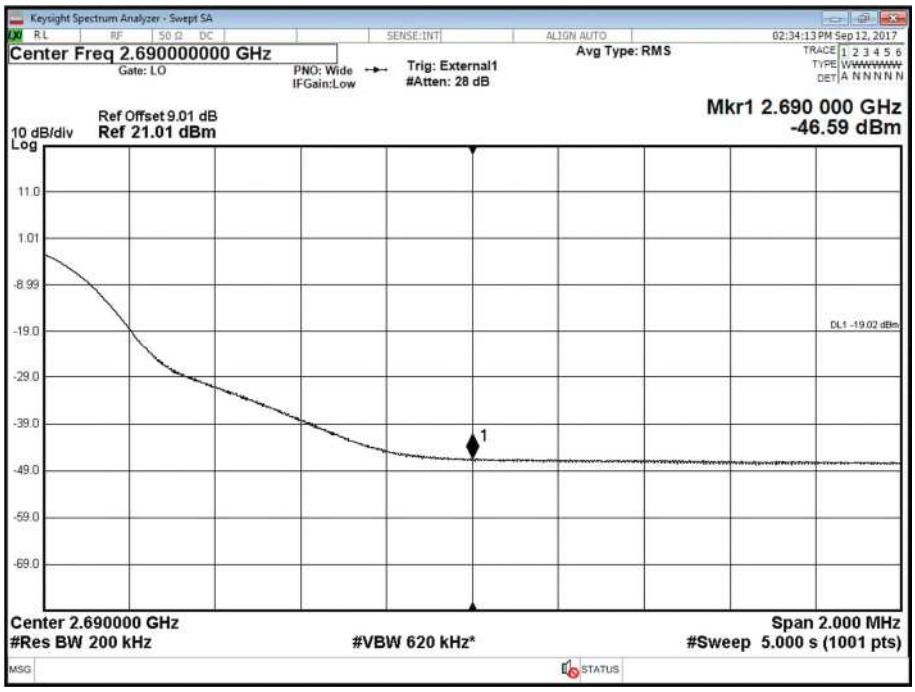
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



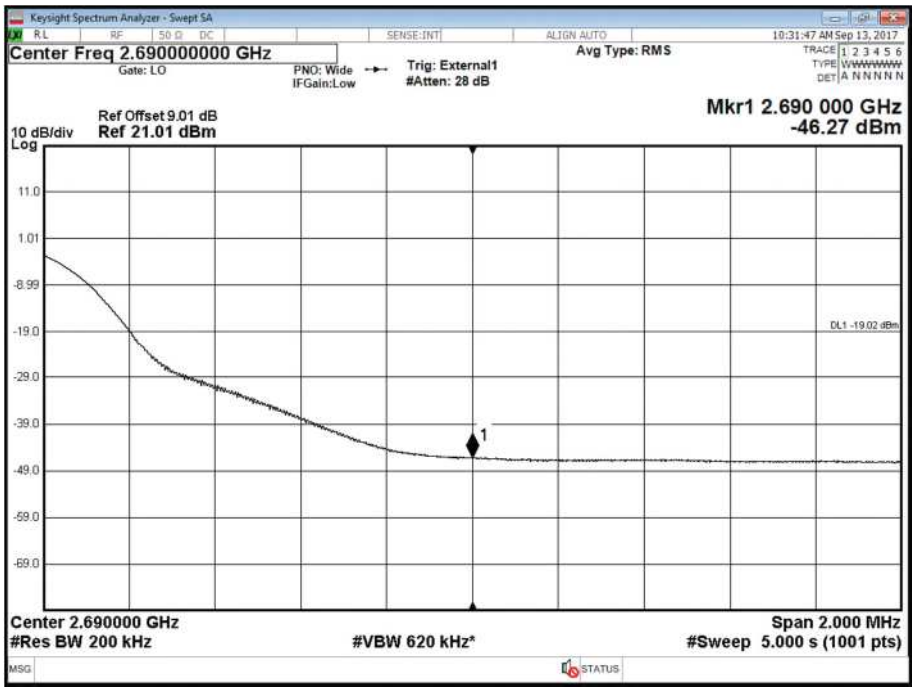
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T

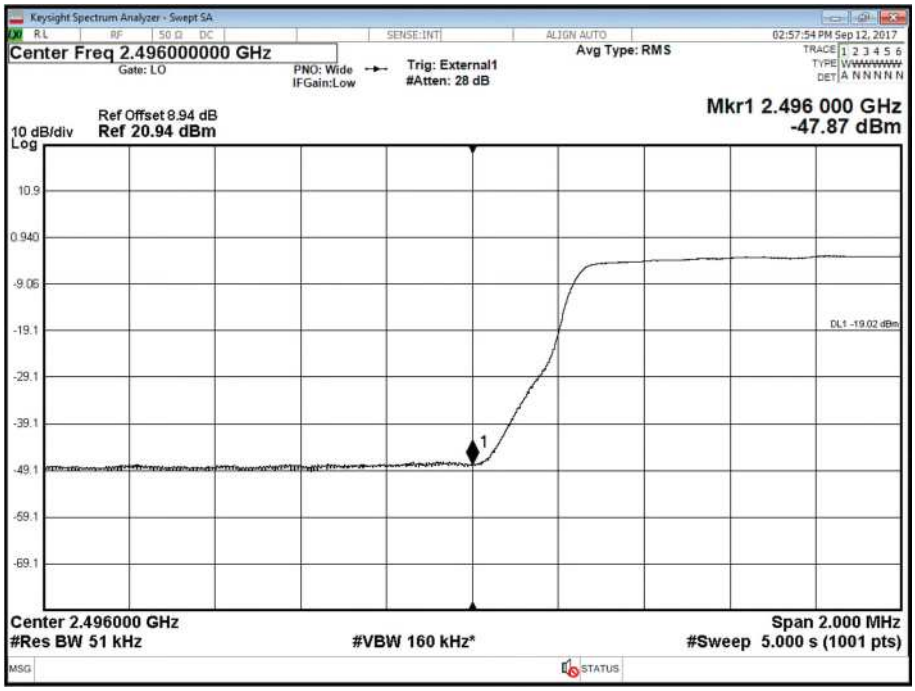


Configuration 2

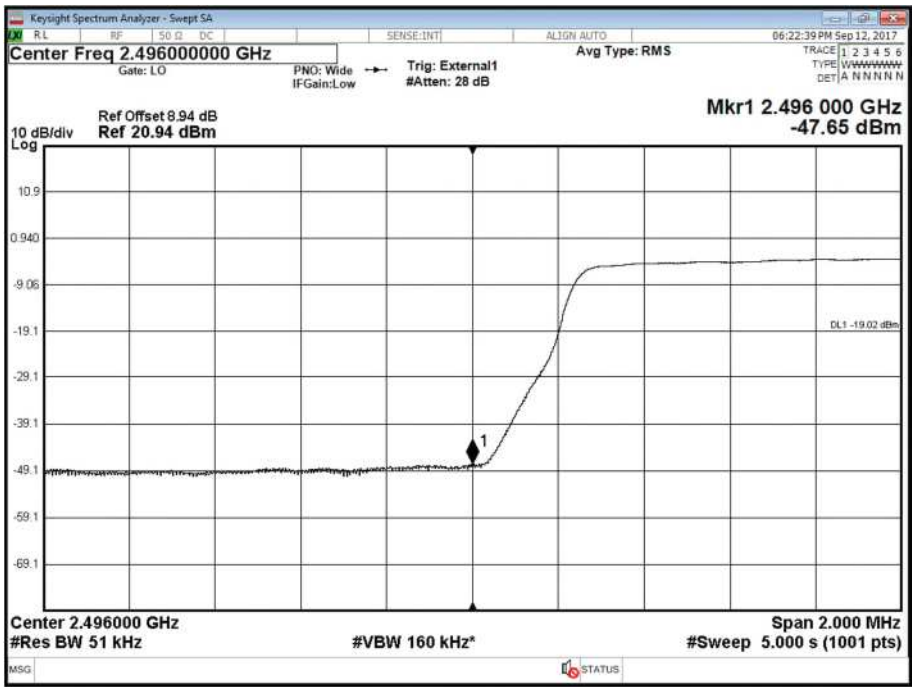
Maximum Output Power 21dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	5.0 MHz	2498.5 + 2503.5	2682.5 + 2687.5
B	QPSK	5.0 MHz	2498.5 + 2503.5	2682.5 + 2687.5
A	QPSK	10.0 MHz	2501 + 2511	2675 + 2685
B	QPSK	10.0 MHz	2501 + 2511	2675 + 2685
A	QPSK	15.0 MHz	2503.5 + 2518.5	2667.5 + 2682.5
B	QPSK	15.0 MHz	2503.5 + 2518.5	2667.5 + 2682.5
A	QPSK	20.0 MHz	2506 + 2526	2660 + 2680
B	QPSK	20.0 MHz	2506 + 2526	2660 + 2680

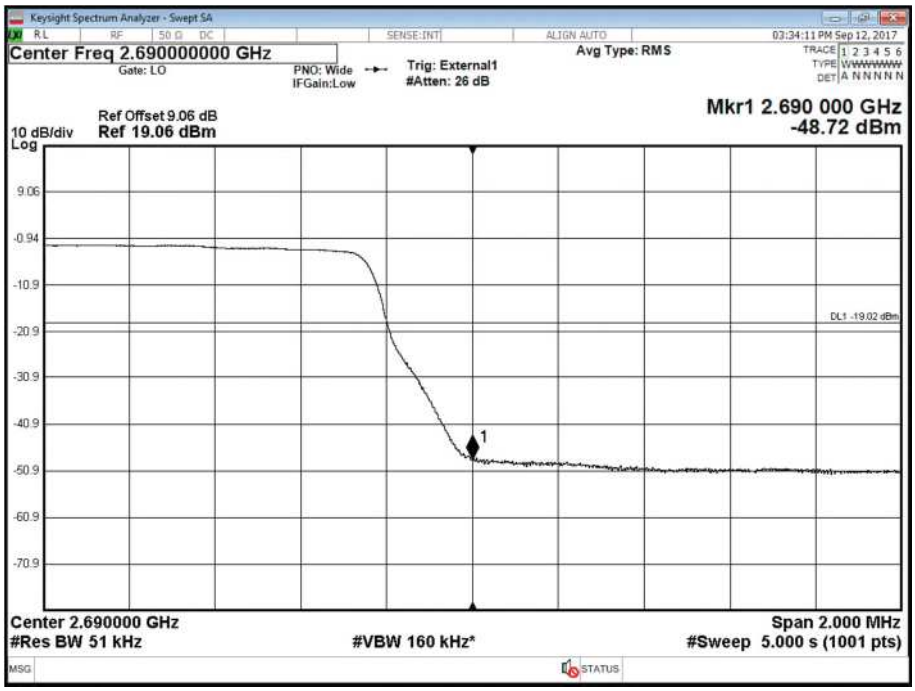
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



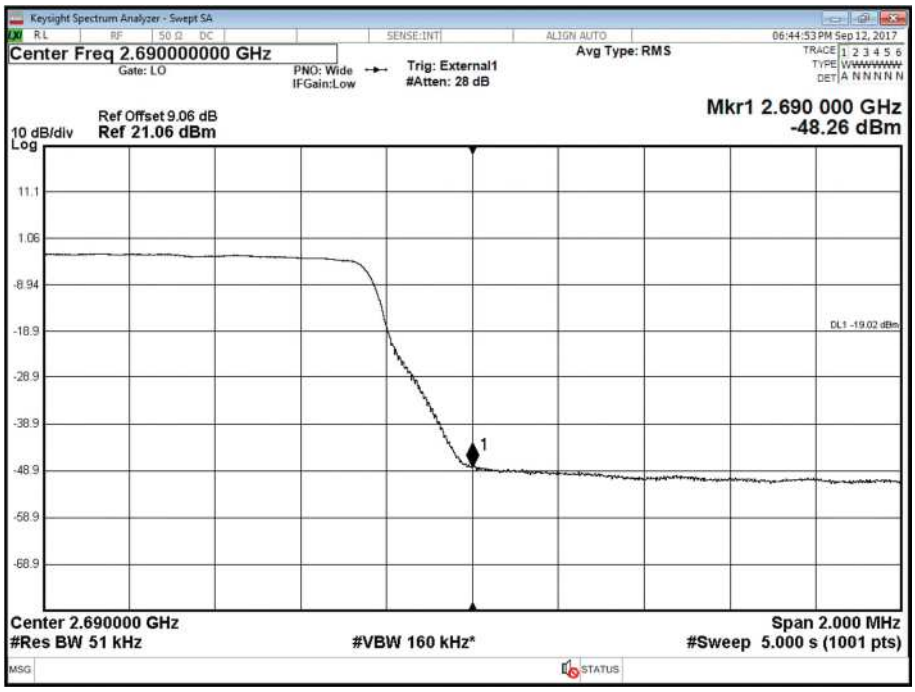
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



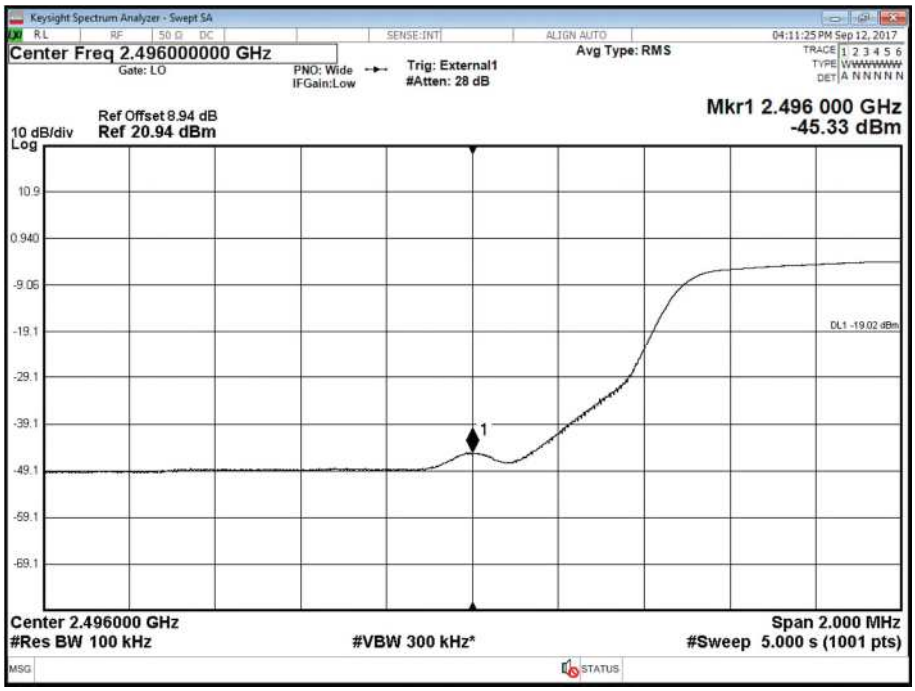
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



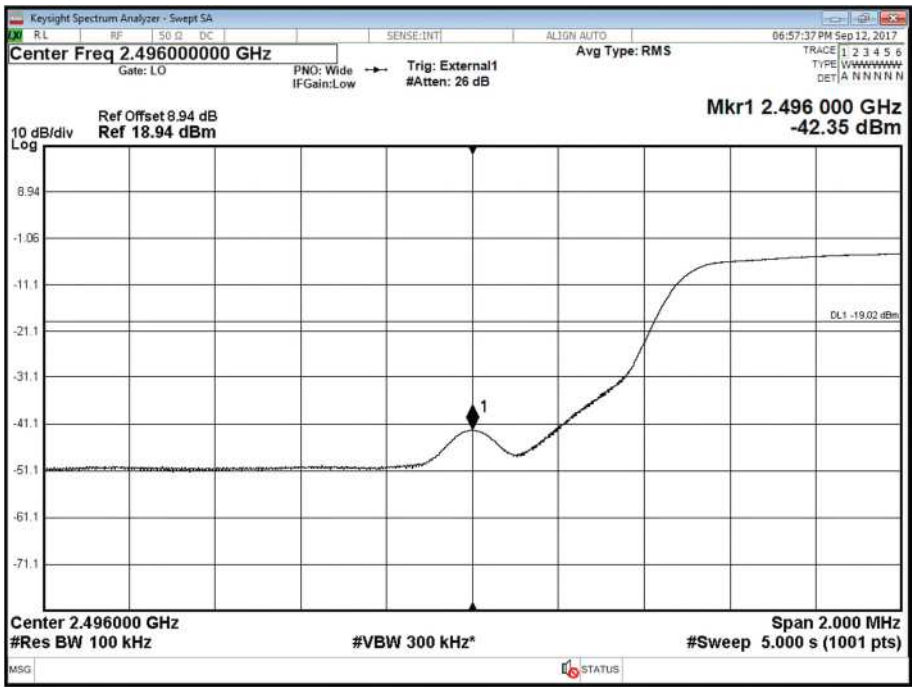
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



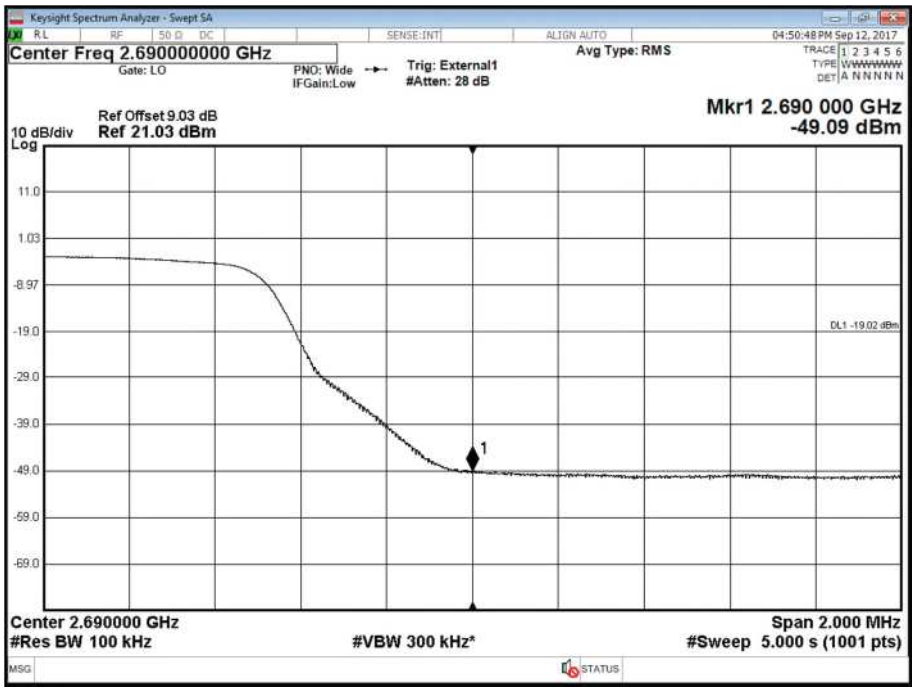
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



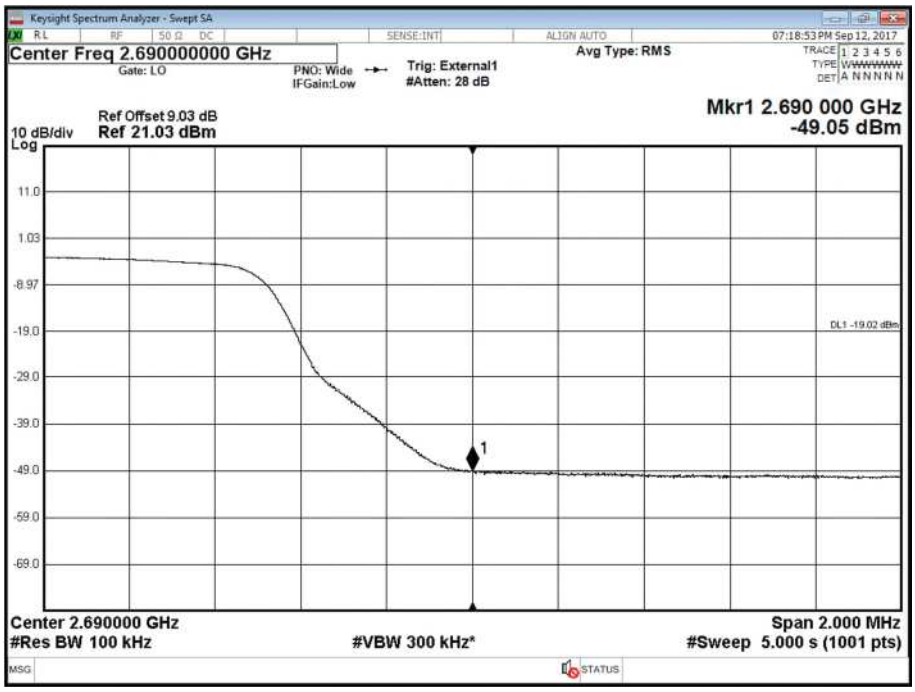
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



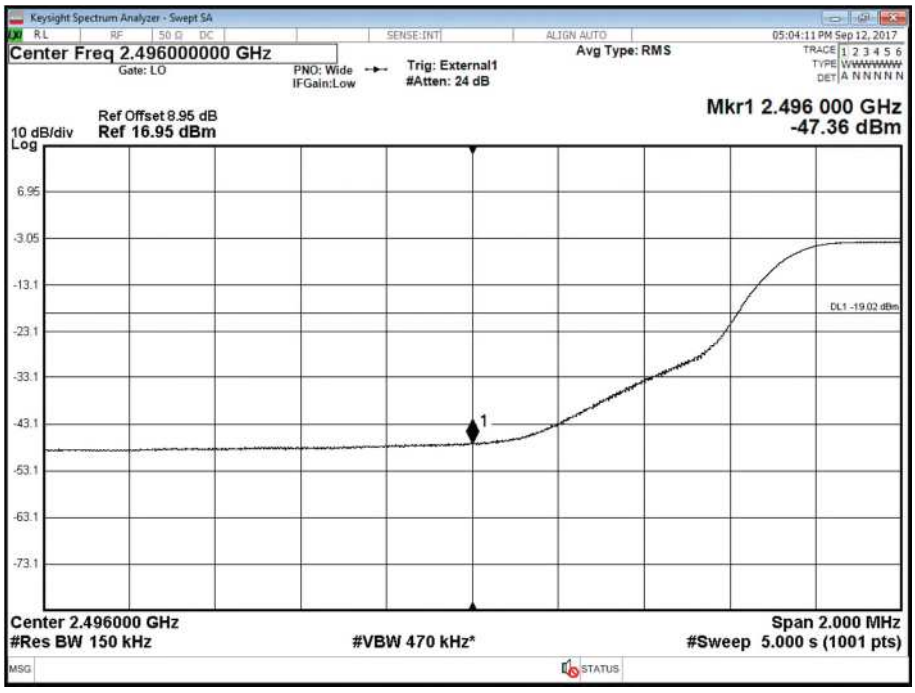
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



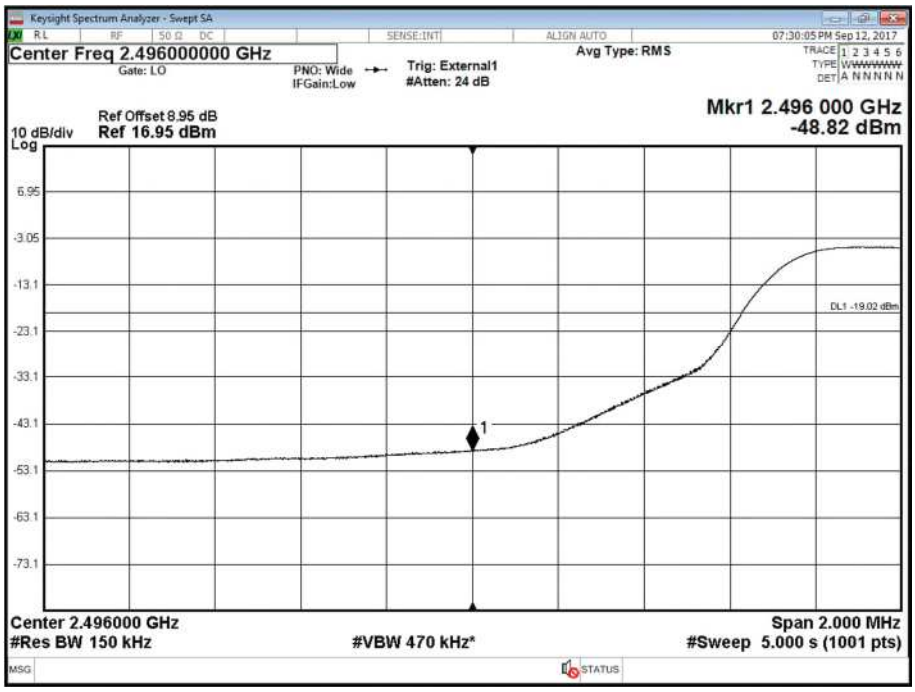
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



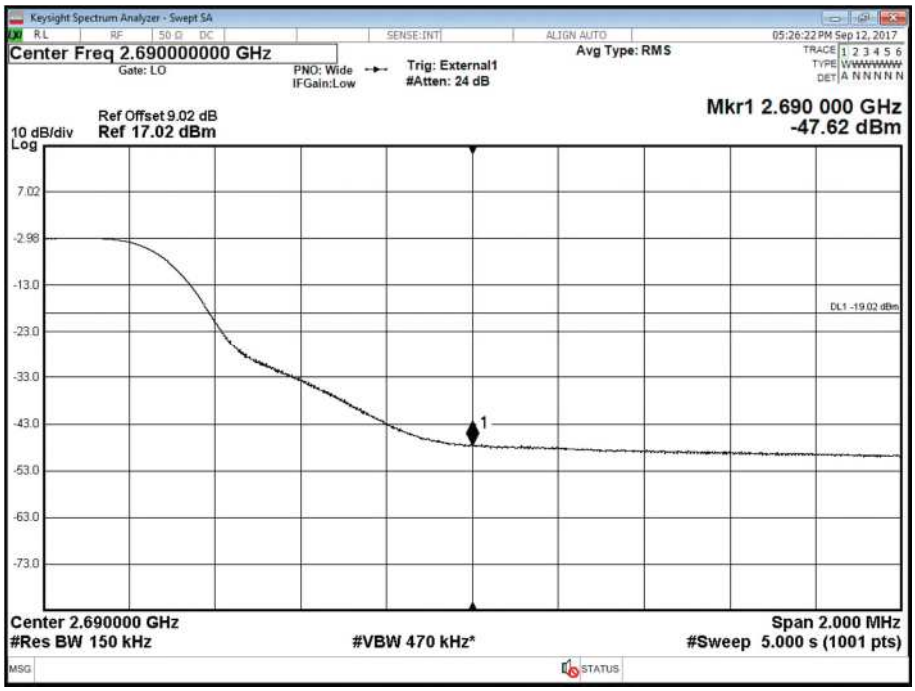
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



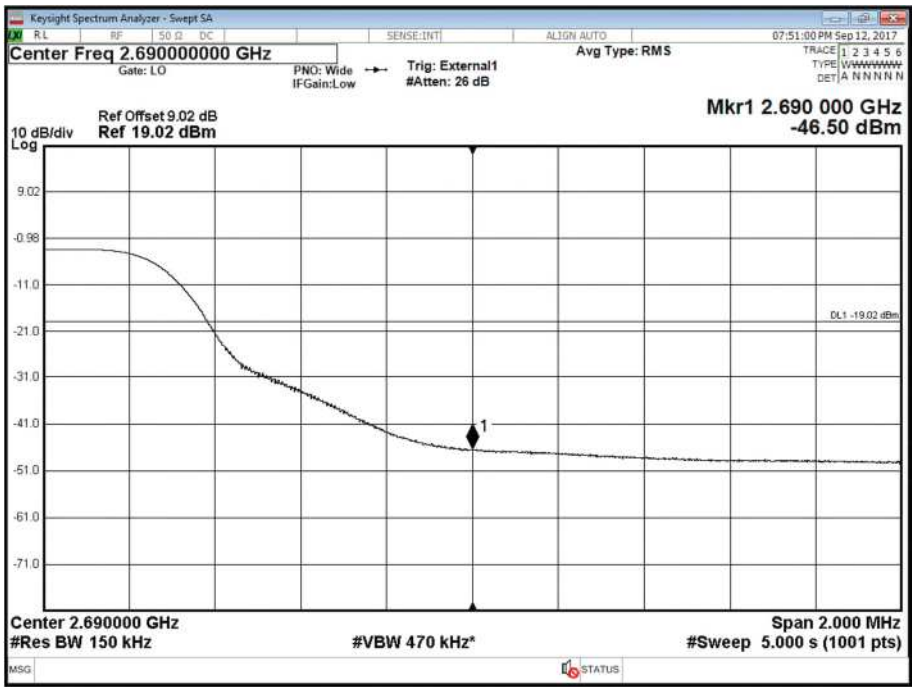
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



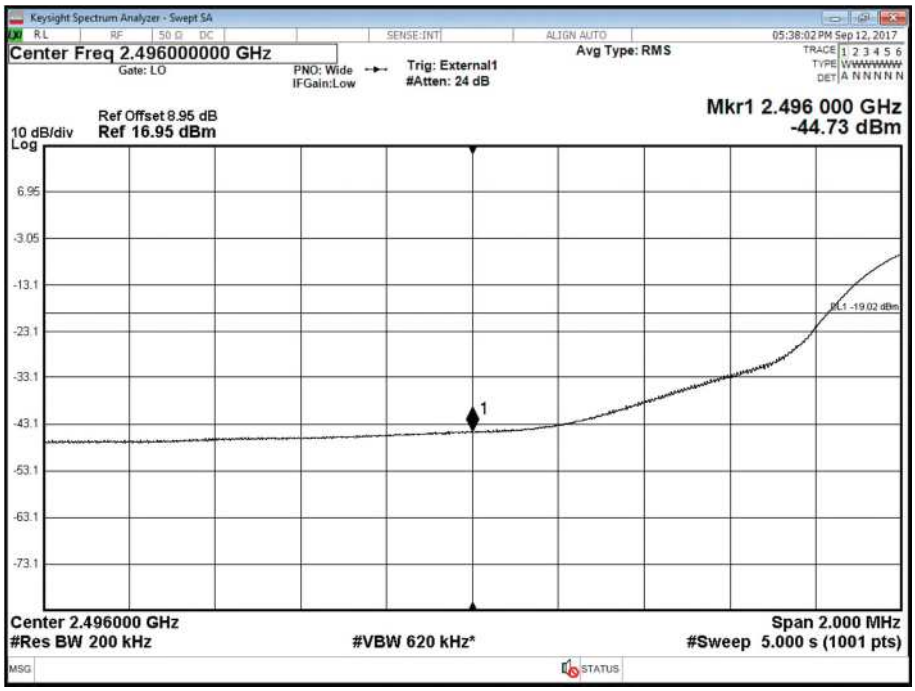
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



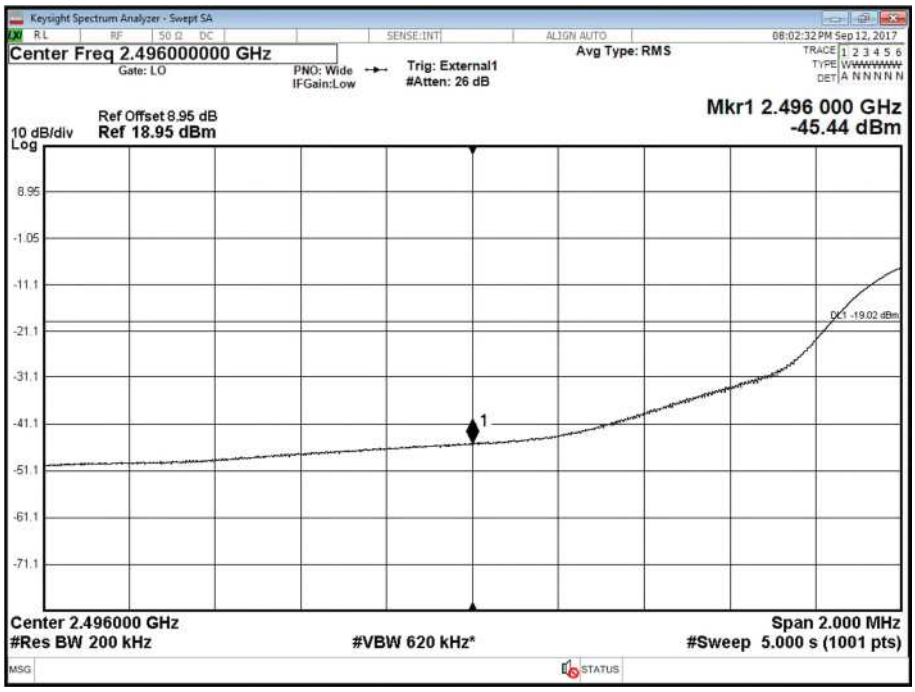
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



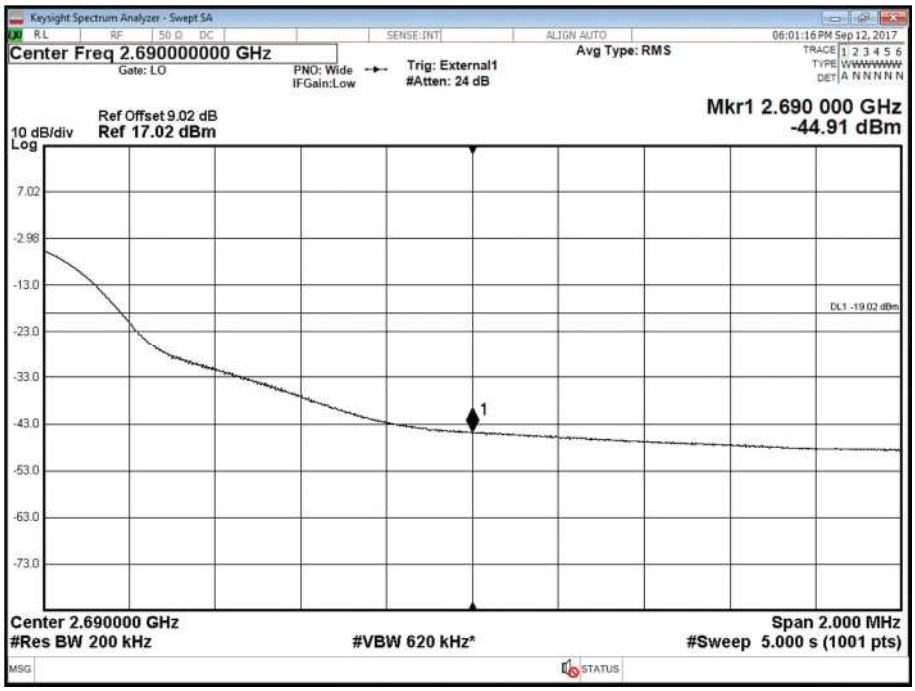
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



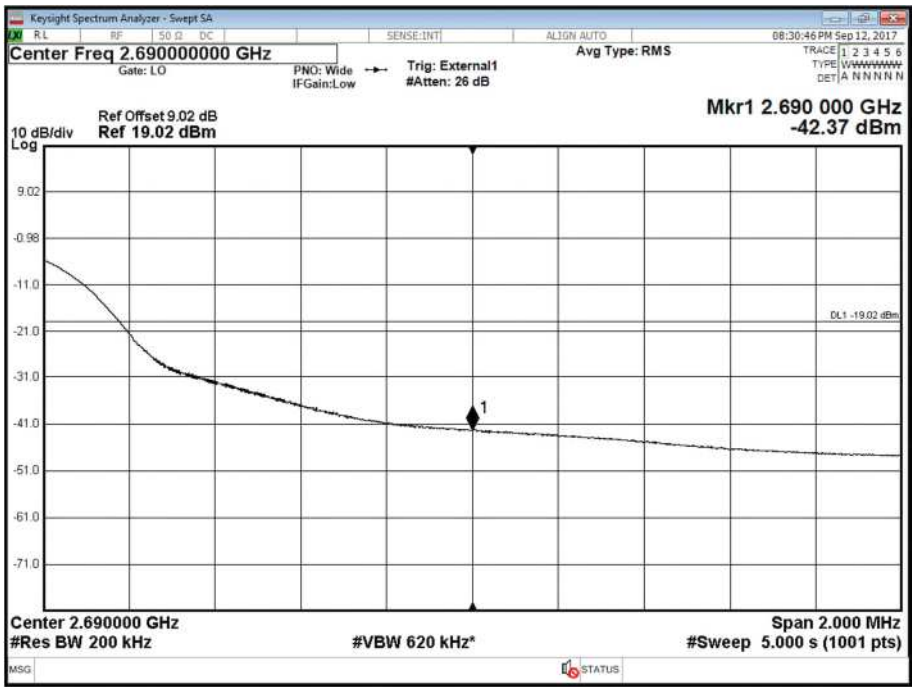
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Limit	-19 dBm