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Report On

FCC and IC Testing of the Ericsson Radio 2217 B2 (KRC 161 563/1) WCDMA and LTE (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: TA8AKRC161563-1
IC: 287AB-AS1615631

PREPARED BY	APPROVED BY	DATED
Maggie Whiting Project Manager	Nic Forsyth Authorised Signatory	07 June 2016

Document 75934391 Report 01 Issue 1 **June 2016**

CONTENTS

SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	349 Terry Fox Drive Ottawa Ontario K2K 2V6
Product Name	Radio 2217 B2
Product Number	KRC 161 563/1
IC Model Name	AS1615631
Serial Number(s)	C82A451973
Software Version	CXP9017316/2 R62FB
Hardware Version	R1A
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2015 FCC CFR 47 Part 24: 2015 Industry Canada RSS-GEN: Issue 4: 2014 Industry Canada RSS-133: Issue 6: 2013
Start of Test	09 May 2016
Finish of Test	18 May 2016
Name of Engineer(s)	Mohamed Toubella
Related Document(s)	KDB 971168 D01

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	2.1055	24.235	-	6.3	Frequency Stability	Pass
-	2.1053	24.238 (a)	-	6.5	Transmitter Radiated Spurious Emissions	Pass*
-			-	6.5	Receiver Spurious Emissions	Pass*

* -Reference Nemko Canada Inc. EMC Test Report: Reference Number 308335-1TRFWL-R1

Nemko Canada Inc.
303 River Road
Ottawa, Ontario, K1V 1H2
Canada

Accreditations
Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation .

1.3 CONFIGURATION DESCRIPTION

The Radio 2217 B2 / KRC 161 563/1 supports single, dual, and up to 8 carrier operation from either a single or dual port configuration. Pre-test results were used to establish the worst case configuration of the EUT in the above mentioned operating modes. The reported results represent testing in the worst case mode of operation. Testing was also carried out on all antenna ports to confirm that each output was electrically identical. Results of these tests are available on request.

The Radio 2217 B2 / KRC 161 563/1 supports WCDMA and LTE in the 1930 to 1990 MHz frequency band.
Test Models as defined in 3GPP TS 25.141 and TS 36.141 were used to represent the required modulation for test.

TX Test Cases: Conducted Output Power, Spurious Emissions at Antenna Terminals (+/-1MHz) and Conducted Spurious Emissions measurements were performed on all 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 operation. All testing was performed with the EUT transmitting at maximum RF output power unless otherwise stated.

The EUT was powered by a -48V DC Power supply.

LTE B2 (1930 MHz – 1990 MHz) Channel Configurations

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	LTE Modulation	Carrier Frequency Configuration (MHz)		
					Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
1	L	1	1.4	QPSK	1930.7	1960	1989.3
1	L	1	3	QPSK	1931.5	1960	1988.5
1	L	1	5	QPSK	1932.5	1960	1987.5
1	L	1	10	QPSK	1935	1960	1985
1	L	1	15	QPSK	1937.5	1960	1982.5
1	L	1	20	QPSK	1940	1960	1980
2	L	2	1.4	QPSK	1930.7 + 1949.3	1950.7 + 1969.3	1970.7 + 1989.3
2	L	2	3	QPSK	1931.5 + 1948.5	1951.5 + 1968.5	1971.5 + 1988.5
2	L	2	5	QPSK	1932.5 + 1967.5	1942.5 + 1977.5	1952.5 + 1987.5
2	L	2	10	QPSK	1935 + 1965	1945 + 1975	1955 + 1985
2	L	2	15	QPSK	1937.5 + 1962.5	1947.5 + 1972.5	1957.5 + 1982.5
2	L	2	20	QPSK	1940 + 1960	1950 + 1970	1960 + 1980
3	L	3	1.4	QPSK	1930.7 + 1932.1 + 1949.3	1950.7 + 1952.1 + 1969.3	1970.7 + 1972.1 + 1989.3
3	L	3	3	QPSK	1931.5 + 1934.5 + 1948.5	1951.5 + 1954.5 + 1968.5	1971.5 + 1974.5 + 1988.5
3	L	3	5	QPSK	1932.5 + 1937.5 + 1967.5	1942.5 + 1947.5 + 1977.5	1952.5 + 1957.5 + 1987.5
3	L	3	10	QPSK	1935 + 1945 + 1965	1945 + 1955 + 1975	1955 + 1965 + 1985

Table 1

LTE Band Edge Emissions

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	LTE Modulation	Carrier Frequency Configuration (MHz)	
					BRFBW (Bottom Edge)	TRFBW (Top Edge)
4 (BE)	L	1	1.4	QPSK	1930.7	1989.3
4 (BE)	L	1	3	QPSK	1931.5	1988.5
4(BE)	L	1	5	QPSK	1932.5	1987.5
4(BE)	L	1	10	QPSK	1935	1985
4 (BE)	L	1	15	QPSK	1937.5	1982.5
4 (BE)	L	1	20	QPSK	1940	1980
5 (BE)	L	2	1.4	QPSK	1930.7 + 1932.1	1987.9 + 1989.3
5 (BE)	L	2	3	QPSK	1931.5 + 1934.5	1985.5 + 1988.5
5 (BE)	L	2	5	QPSK	1932.5 + 1937.5	1982.5 + 1987.5
5(BE)	L	2	10	QPSK	1935 + 1945	1975 + 1985
5(BE)	L	2	15	QPSK	1937.5 + 1952.5	1967.5 + 1982.5
5 (BE)	L	2	20	QPSK	1940 + 1960	1960 + 1980

Table 2

WCDMA B2 (1930 MHz – 1990 MHz) Channel Configurations

All tests except MC Band Edge Emissions

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
6	W	1	5 / 4.2	1932.4	1960	1987.6
7	W	2	5	1932.4 + 1967.6	1942.4 + 1977.6	1952.4 + 1987.6
8	W	3	5	1932.4 + 1937.4 + 1967.6	1942.4 + 1947.4 + 1977.6	1952.4 + 1957.4 + 1987.6
9	W	8	5	1932.4 + 1937.4 + 1942.4 + 1947.4 + 1952.6 + 1957.6 + 1962.6 + 1967.6	1942.4 + 1947.4 + 1952.4 + 1957.4 + 1962.6 + 1967.6 + 1972.6 + 1977.6	1952.4 + 1957.4 + 1962.4 + 1967.4 + 1972.6 + 1977.6 + 1982.6 + 1987.6

Table 3

WCDMA MC Band Edge Emissions

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)	
				BRFBW (Bottom Edge)	TRFBW (Top Edge)
10(BE)	W	1	5	1932.4	1987.6
11 (BE)	W	2	5	1932.4 + 1937.4	1982.6 + 1987.6

Table 4

WCDMA/LTE (MM) B2 (1930 MHz – 1990 MHz) Channel Configurations

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				BRFBW	MRFBW	TRFBW
12	L + W	2	5 + 15	1932.4 (W) + 1962.5 (L)	1942.4 (W) + 1972.5 (L)	1952.4 (W) + 1982.5 (L)
13	L + W + W	3	5 + 5 + 5	-	1942.4 (W) + 1947.4 (W) + 1977.5 (L)	-
14	W + W + W + W + W + L + L + L	8	5 + 5 + 5 + 5 + 5 + 5 + 5 + 5	1932.4 (W) + 1937.4 (W) + 1942.4 (W) + 1947.4 (W) + 1952.4 (W) +1957.5 (L) + 1962.5 (L) + 1967.5 (L)	1942.4 (W) + 1947.4 (W) + 1952.4 (W) + 1957.4 (W) + 1962.4 (W) +1976.5 (L) + 1977.9 (L) + 1979.3 (L)	1952.4 (W) + 1957.4 (W) + 1962.4 (W) + 1967.4 (W) + 1972.4 (W) +1977.5 (L) + 1982.5 (L) + 1987.5 (L) MHz

Table 5

Band Edge Emissions

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)	
				BRFBW (Bottom Edge)	TRFBW (Top Edge)
15 (BE)	W + L	2	5 + 5	1932.4 (W) + 1937.4 (L)	1982.6 (L) + 1987.6 (W)

Table 6

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio 2217 B2 (Multi-standard)
MANUFACTURER	Ericsson
TYPE	Remote Radio Base Station
PART NUMBER	KRC 161 563/1
SERIAL NUMBER	C82A451973
HARDWARE VERSION	R1A
SOFTWARE VERSION	CXP9017316/2 R62FB
TRANSMITTER OPERATING RANGE	1930MHz – 1990MHz
RECEIVER OPERATING RANGE	1850MHz – 1910MHz
COUNTRY OF ORIGIN	Sweden
INTERMEDIATE FREQUENCIES	Tx: Direct Conversion, Rx: IF1=180.8MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE 1M40 W7D 3M00 W7D 5M00 W7D 10M0 W7D 15M0 W7D 20M0 W7D WCDMA 5M00 F9W
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM, 64QAM, 256QAM WCDMA: QPSK, 16QAM, 64QAM
HIGHEST INTERNALLY GENERATED FREQUENCY	1990MHz
OUTPUT POWER (W or dBm)	2 x 40W (46.0dBm)
FCC ID	TA8AKRC161563-1
INDUSTRY CANADA ID	287AB-AS1615631
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Radio 2217 B2 (KRC 161 563/1) is a multi-standard Radio Unit forming part of the Ericsson Radio Base Station (RBS) equipment. The product provides radio access for mobile and fixed devices and is intended for the outdoor environment. The radio operates over 2 Transmit ports in Single, Multi-Carrier, Mixed Mode and MIMO transmission with a maximum rated RF Output of 40W per port over an operational temperature of -40°C to +55°C. The unit is designed to be mast, pole or building mounted. Altitude during operation: Below 3000.

Signature:

……

Denis Lalonde

Date: 20 May 2016

Declaration of Build Status Serial Number: C82A451973

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

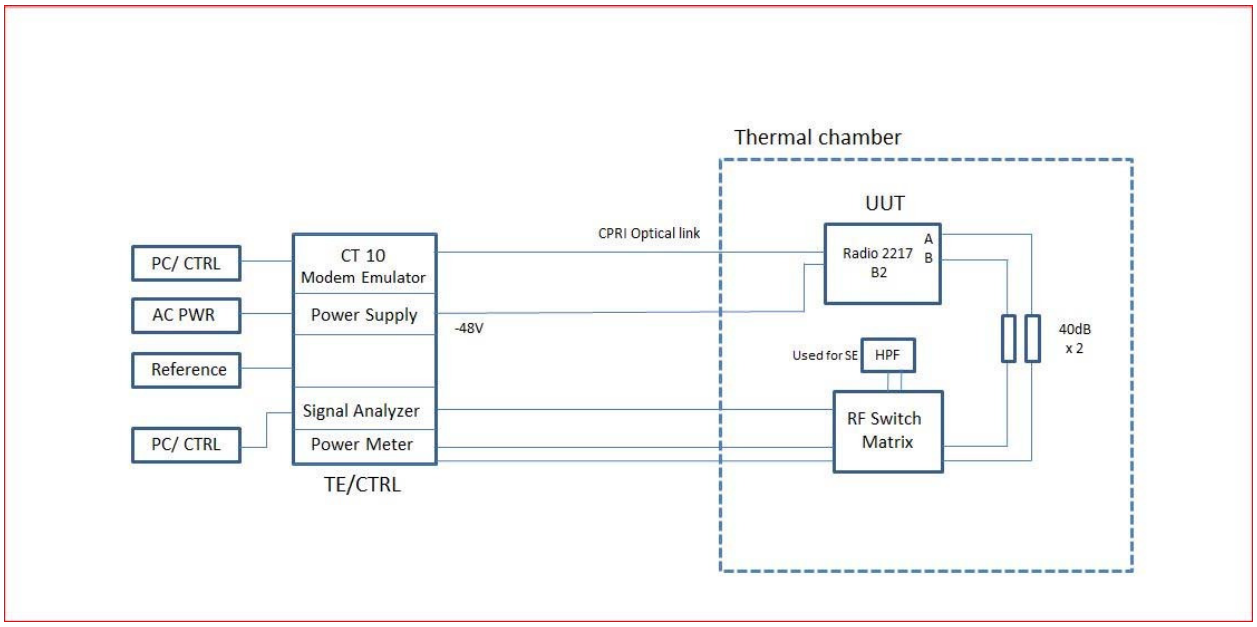
1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Radio 2217 B2 (KRC 161 563/1) is a multi-standard radio forming part of Ericsson's Radio System portfolio. The Remote Radio Unit product provides radio access for mobile and fixed devices and is intended for the outdoor environment.
The Radio 2217 should preferably be located near the antenna and can be located up to 40 km from the baseband unit. A fibre optic cable can be used to connect the Radio 2217 to the baseband unit.
The Radio 2217 B2 supports two (2) Transmit / Receive ports operating in the E-UTRA Band 2 (PCS) at a Downlink (transmit) frequency from 1930 MHz to 1990 MHz and an Uplink (receive) frequency from 1850 MHz to 1910 MHz. The radio operates in FDD (Frequency Division Duplex) with a duplex spacing of 80 MHz and supports operation on multi Radio Access Transmission Standards (RATS) at transmit bandwidths up to 20 MHz
The radio operates over 2 transmit ports in Single / Multi-Carrier, Mixed Mode, and MIMO transmission

A full technical description of the Equipment Under Test (EUT) can be found in the Manufacturer's documentation.

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.

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 tests at Ericsson in Ottawa, Canada.

1.11 ADDITIONAL INFORMATION

Testing was performed at Ericsson in Ottawa, Canada in the presence of Mr Denis Lalonde and Mark McMullin of Ericsson AB.

Measurements were performed in accordance with FCC KDB 971168 as per guidance stated in the ISED website - Acceptable Knowledge DataBase (KDB), Other Supplementary Procedures and Notices (https://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/h_tt00094.html)

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 24, Clause 24.232 (a)
Industry Canada RSS-133, Clause 6.4

2.1.2 Date of Test and Modification State

12, 16 and 18 May 2016 - 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	24.2°C
Relative Humidity	26.6%

2.1.5 Test Method

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

The EUT was connected to a Signal Analyser via attenuators and an RF switch. The path loss between the EUT and the Analyser was measured using a Network Analyser and entered as a Reference Level Offset.

The EUT was set to transmit at its maximum rated output power in the configurations described below.

Measurements were performed with the 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 Analyser with the RBW being set to 80MHz (In this case 40MHz was the maximum 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.

In order to confirm the Average Equivalent Isotropically Radiated Power (EIRP) an Average Power Spectral Density (PSD) measurement was made using a 1MHz bandwidth in accordance with FCC KDB 971168 D01 v02r02 clause 5.4.1.

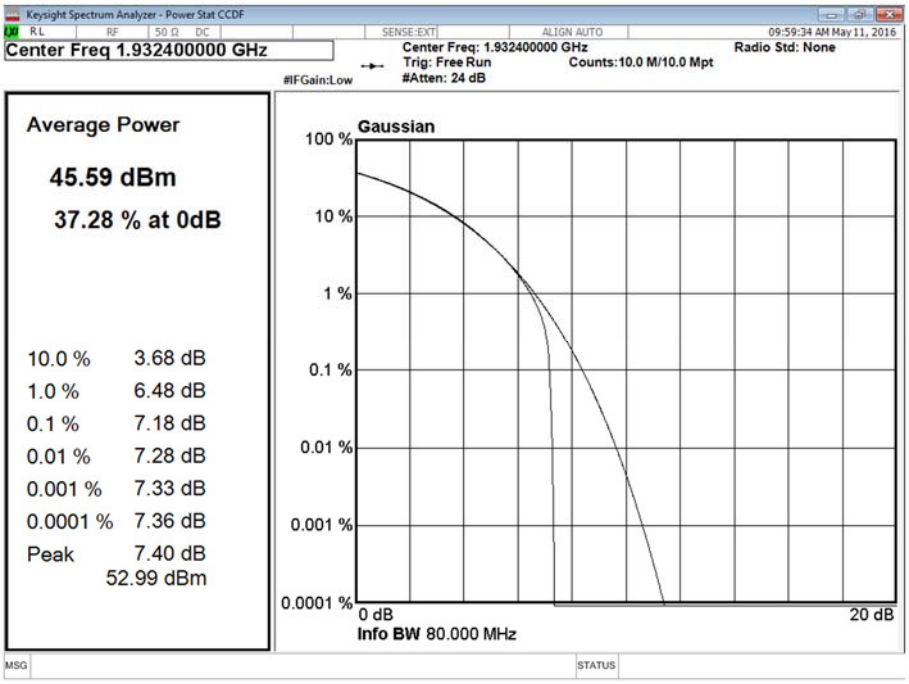
2.1.6 Test Results

Configuration 6

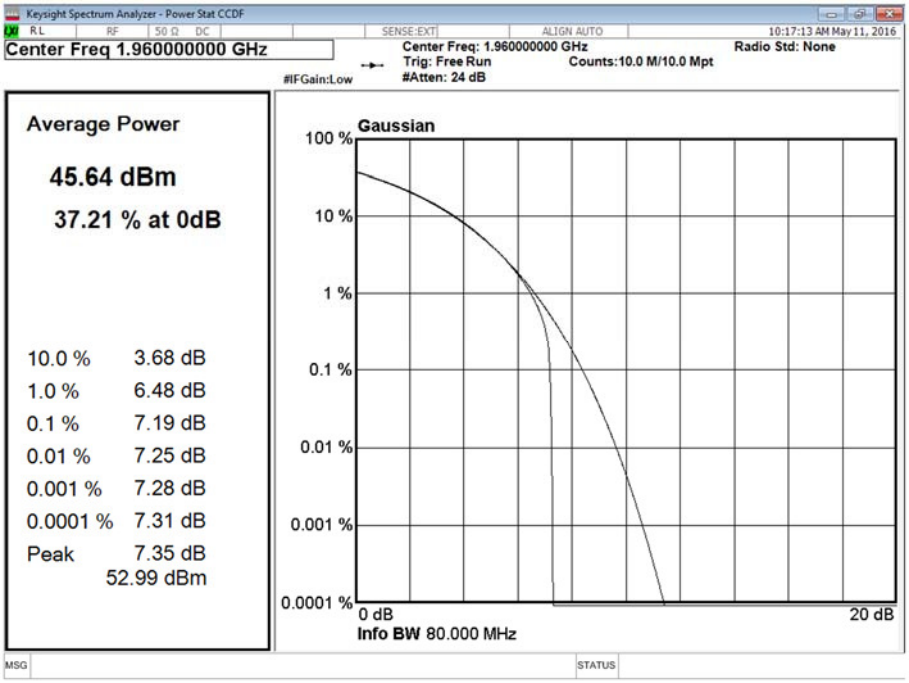
Maximum Output Power 46.0 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power								
			Channel Position B			Channel Position M			Channel Position T		
			PAR (dB)	Average Power		PAR (dB)	Average Power		PAR (dB)	Average Power	
				dBm	dBm/MHz		dBm	dBm/MHz		dBm	dBm/MHz
16QAM	5.0	A	7.18	45.47	40.22	7.19	45.58	40.32	7.18	45.46	40.32
	5.0	B	7.19	45.02	39.85	7.20	45.57	40.39	7.18	45.49	40.24
Total			-	48.26	43.05	-	48.59	43.37	-	48.49	43.29

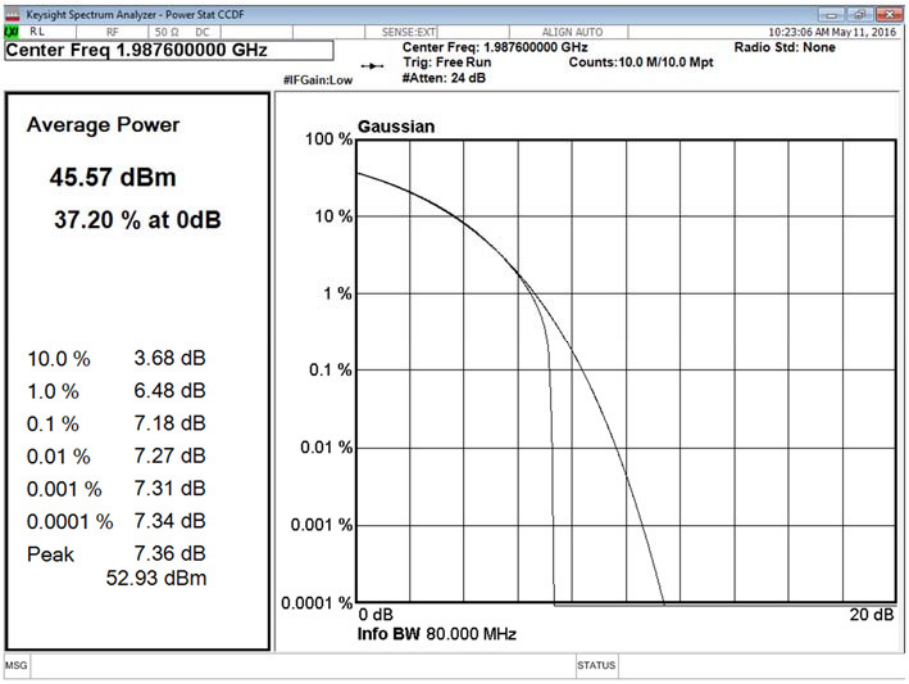
Channel Position B - Bandwidth 5.0 MHz - Antenna A



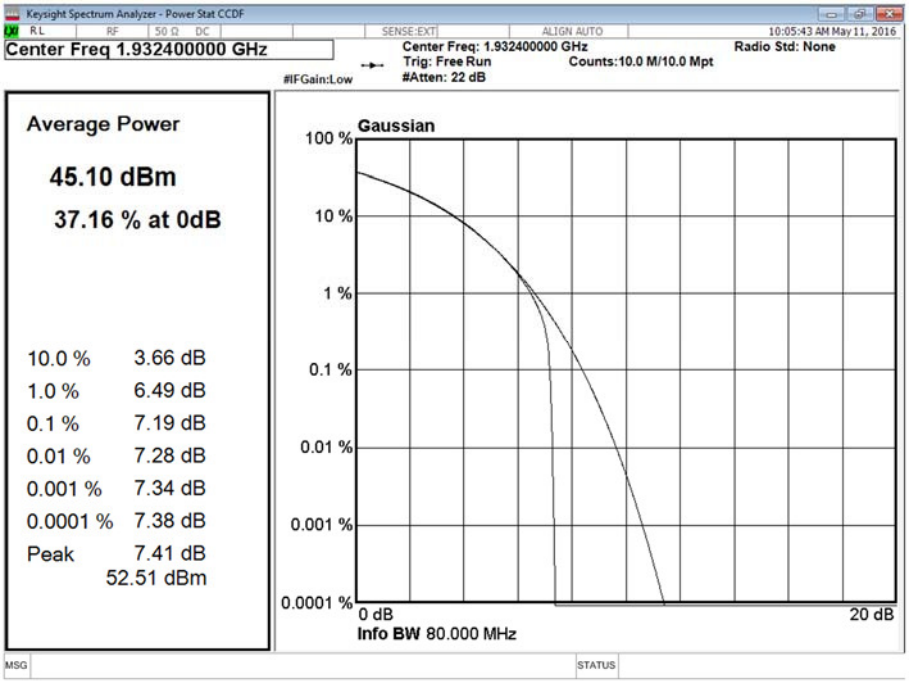
Channel Position M - Bandwidth 5.0 MHz - Antenna A



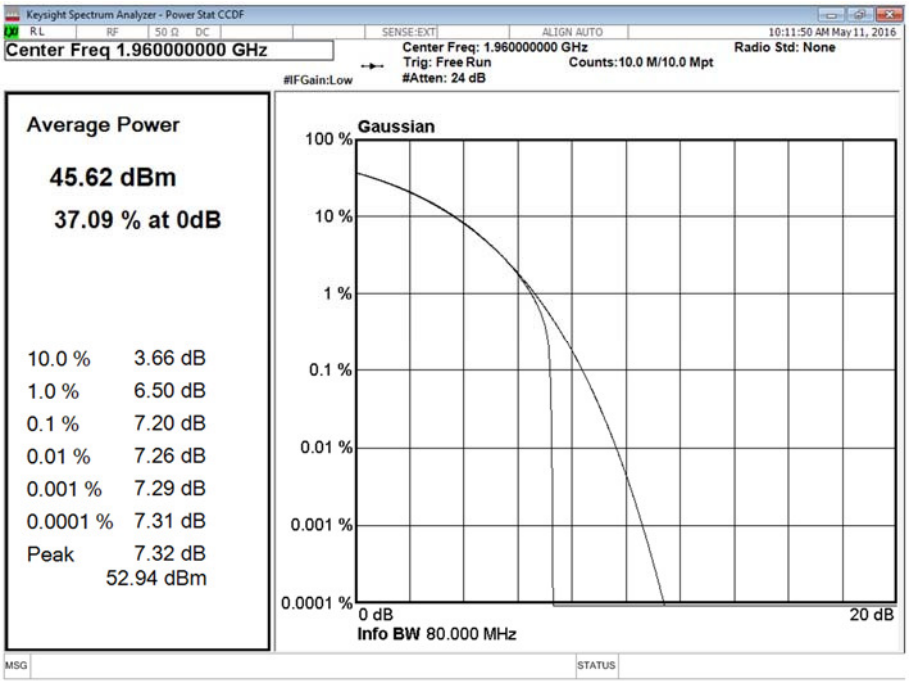
Channel Position T - Bandwidth 5.0 MHz - Antenna A



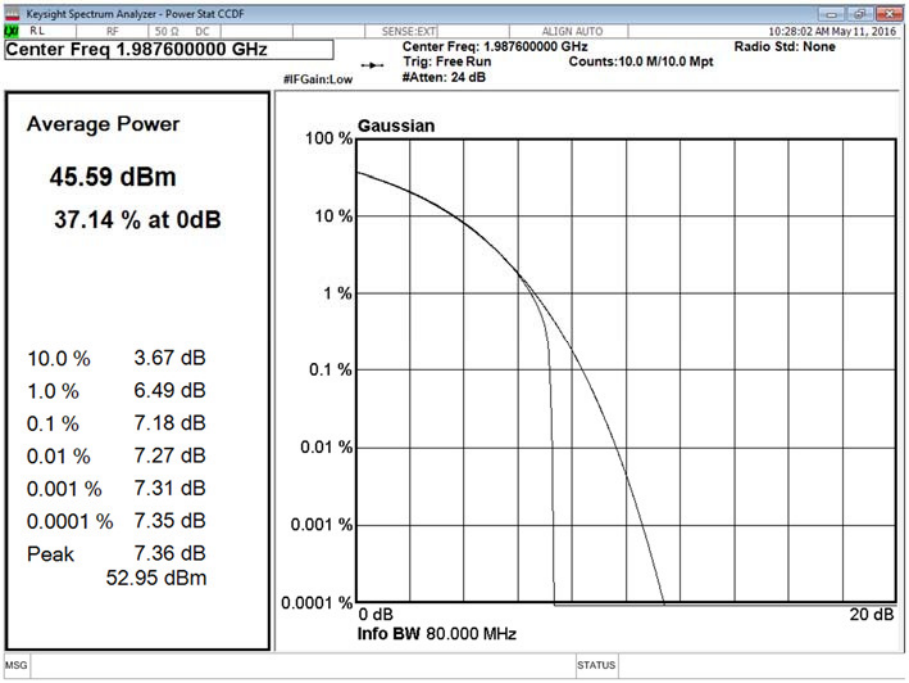
Channel Position B - Bandwidth 5.0 MHz - Antenna B



Channel Position M - Bandwidth 5.0 MHz - Antenna B



Channel Position T - Bandwidth 5.0 MHz - Antenna B



Configuration 7

Maximum Output Power 46.0 dBm

Modulation	Modulation	Antenna	Peak to Average Ratio (PAR) / Output Power					
			Channel Position B		Channel Position M		Channel Position T	
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
16QAM	5.0 MHz	A	45.70	37.50	45.58	37.46	45.70	37.63
	5.0 MHz	B	45.78	37.67	45.48	37.52	45.70	37.64
Total			48.75	40.60	48.54	40.50	48.71	40.65

Configuration 9

Maximum Output Power 46.0 dBm

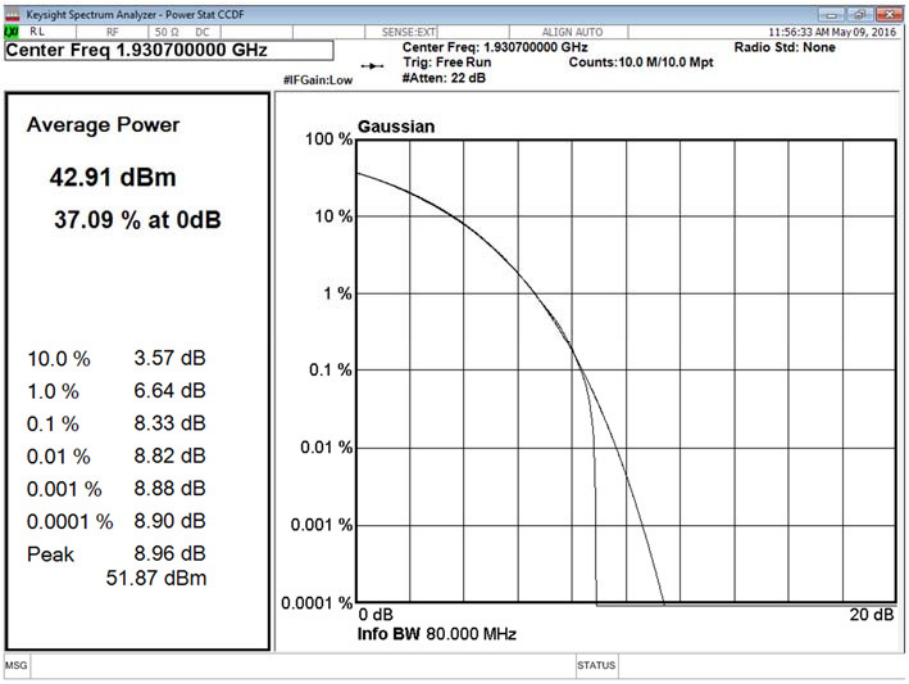
Modulation	Carrier Bandwidth (MHz)	Antenna						
			Channel Position B		Channel Position M		Channel Position T	
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
16QAM	5.0	A	45.91	31.95	45.69	31.61	45.67	31.67
	5.0	B	45.91	31.86	45.68	31.80	45.70	31.70
Total			48.92	34.92	48.70	34.72	48.70	34.70

Configuration 1

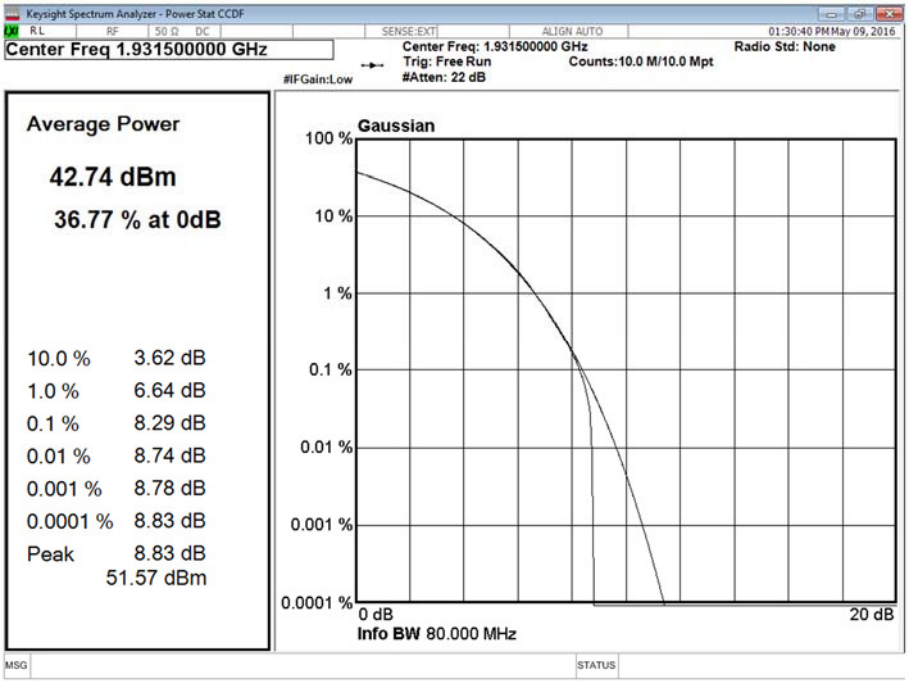
Maximum Output Power 43.0 dBm for 1.4 and 3 MHz bandwidths, 46.0 dBm for 5, 10, 15, and 20 MHz

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power								
			Channel Position B			Channel Position M			Channel Position T		
			PAR (dB)	Average Power		PAR (dB)	Average Power		PAR (dB)	Average Power	
				dBm	dBm/MHz		dBm	dBm/MHz		dBm	dBm/MHz
QPSK	1.4	A	8.33	42.90	42.32	8.30	42.73	42.29	8.26	42.58	42.14
	1.4	B	8.25	43.15	42.77	8.24	42.77	42.36	8.20	42.79	42.19
Total			-	46.04	45.56	-	45.76	45.34	-	45.70	45.18
QPSK	3.0	A	8.29	42.68	38.97	8.30	42.71	38.93	8.30	42.72	39.02
	3.0	B	8.16	42.90	39.22	8.14	42.74	39.05	8.11	42.61	38.77
Total			-	45.80	42.11	-	45.74	42.00	-	45.68	41.91
QPSK	5.0	A	7.10	45.35	39.50	7.11	45.48	39.59	7.09	45.69	39.73
	5.0	B	7.11	45.00	39.15	7.13	45.46	39.53	7.12	45.66	39.72
Total			-	48.19	42.34	-	48.48	42.57	-	48.69	42.74
QPSK	10.0	A	7.15	45.51	36.93	7.11	45.51	36.87	7.12	45.51	36.97
	10.0	B	7.16	45.55	36.90	7.11	45.48	36.88	7.13	45.44	36.80
Total			-	48.54	39.93	-	48.51	39.89	-	48.49	39.90
QPSK	15.0	A	7.21	45.50	35.14	7.11	45.56	35.12	7.17	45.41	35.11
	15.0	B	7.24	45.58	35.35	7.11	45.44	35.03	7.19	45.32	34.92
Total			-	48.55	38.26	-	48.51	38.09	-	48.38	38.03
QPSK	20.0	A	7.29	45.23	33.77	7.11	45.50	33.85	7.19	45.69	33.99
	20.0	B	7.29	45.50	34.13	7.10	45.43	33.78	7.22	45.66	34.17
Total			-	48.38	36.96	-	48.48	36.83	-	48.69	37.09

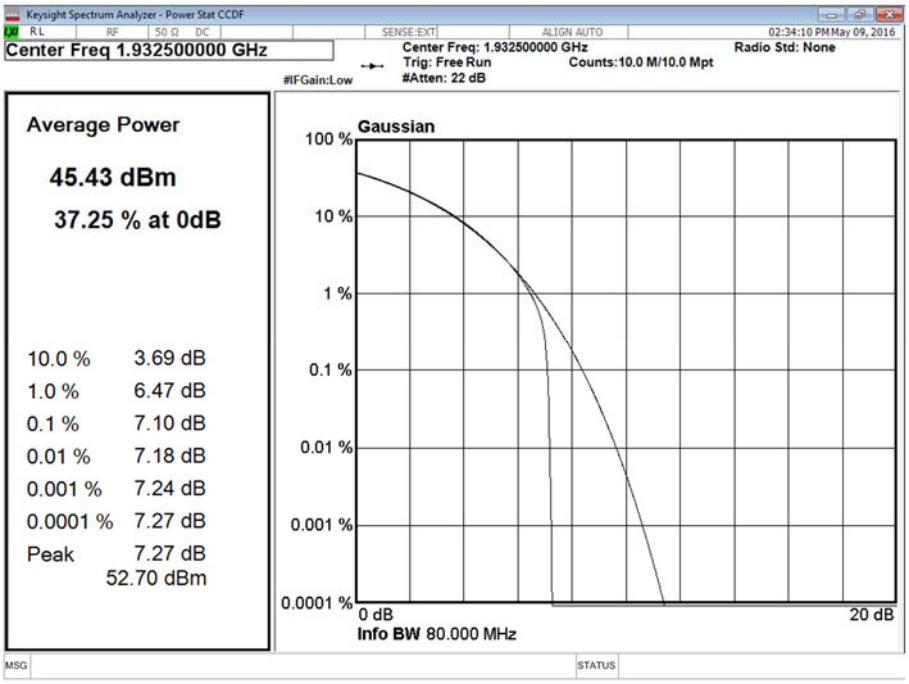
Channel Position B - Bandwidth 1.4 MHz - Antenna A



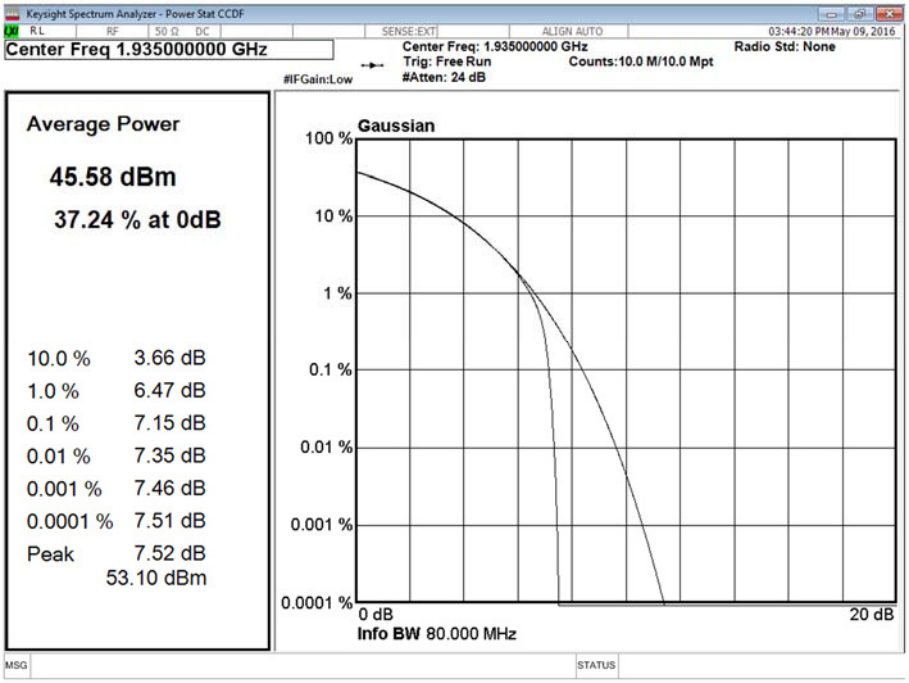
Channel Position B - Bandwidth 3.0 MHz - Antenna A



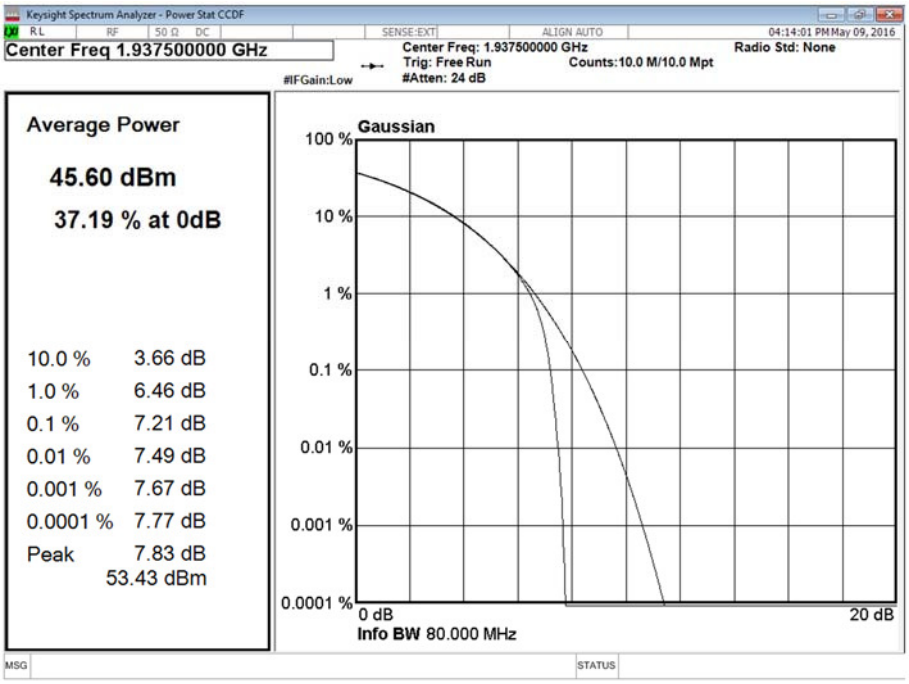
Channel Position B - Bandwidth 5.0 MHz - Antenna A



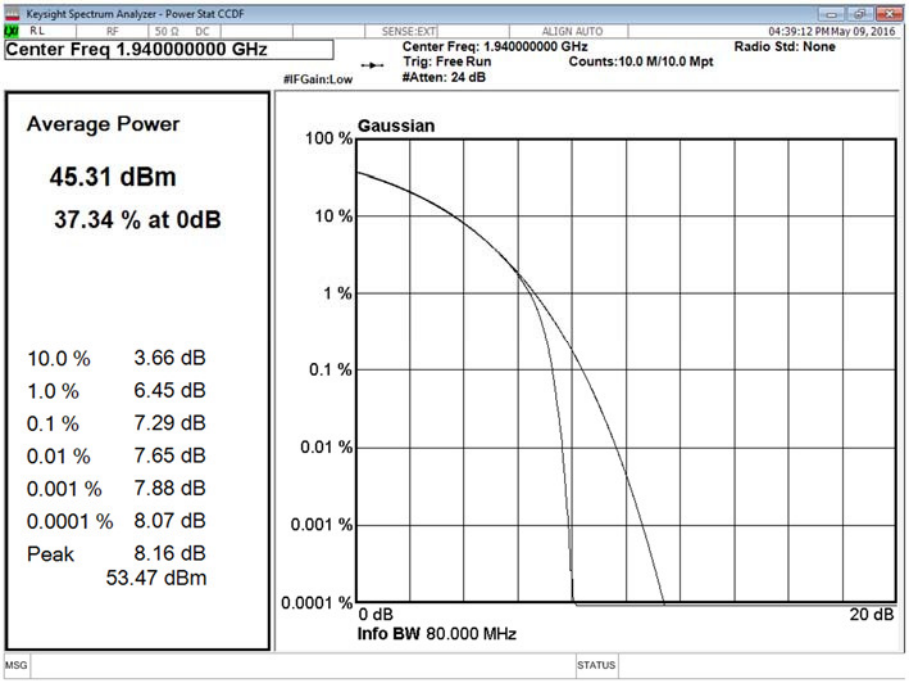
Channel Position B - Bandwidth 10.0 MHz - Antenna A



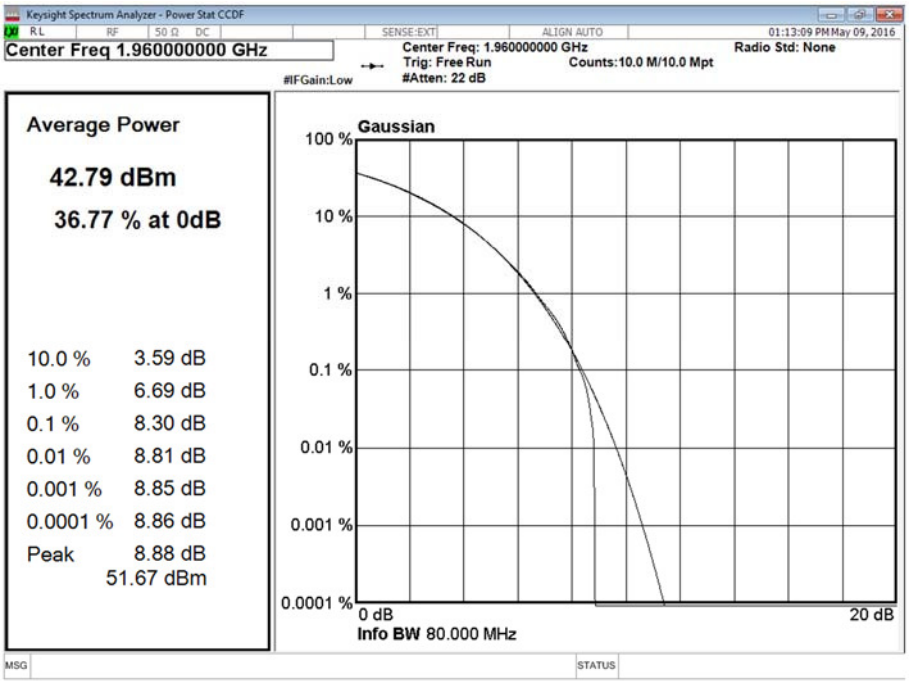
Channel Position B - Bandwidth 15.0 MHz - Antenna A



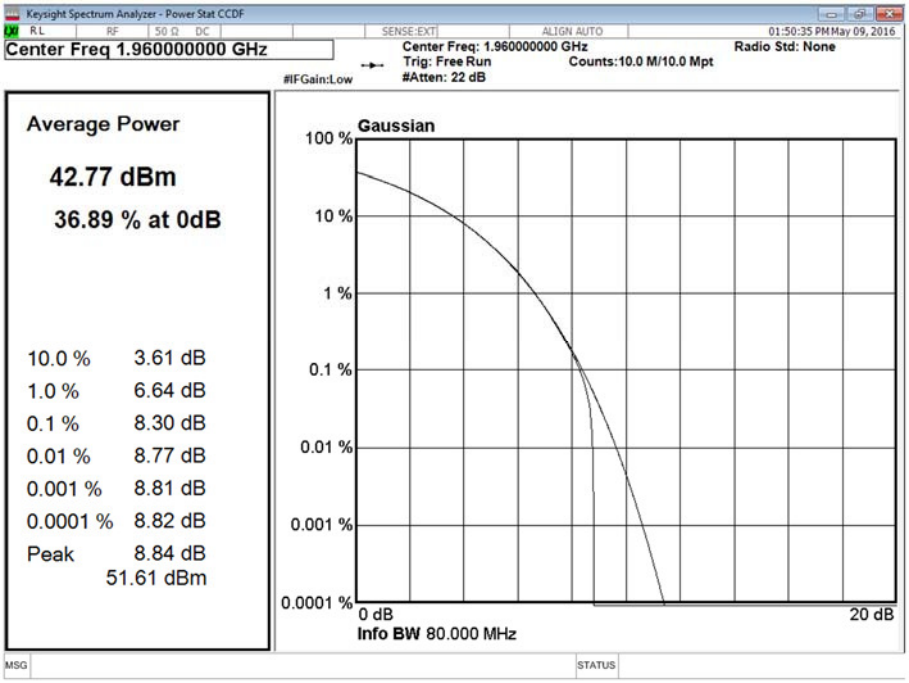
Channel Position B - Bandwidth 20.0 MHz - Antenna A



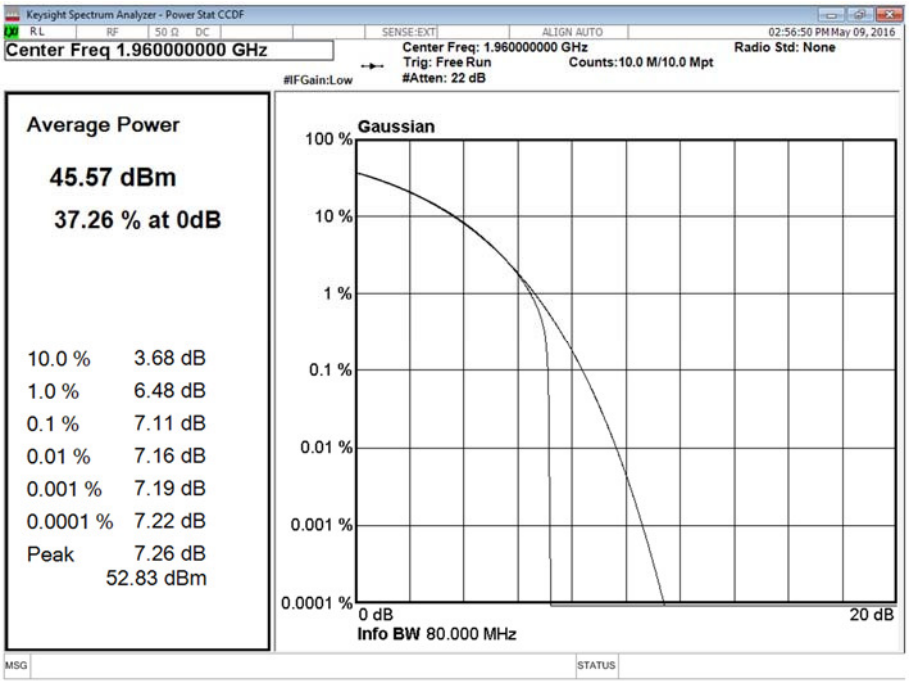
Channel Position M - Bandwidth 1.4 MHz - Antenna A



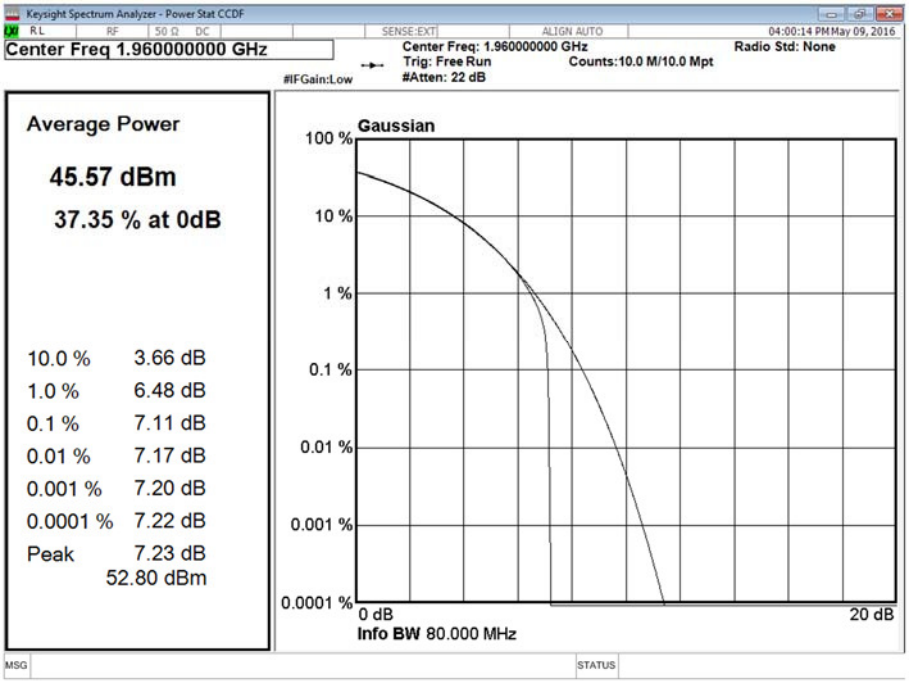
Channel Position M - Bandwidth 3.0 MHz - Antenna A



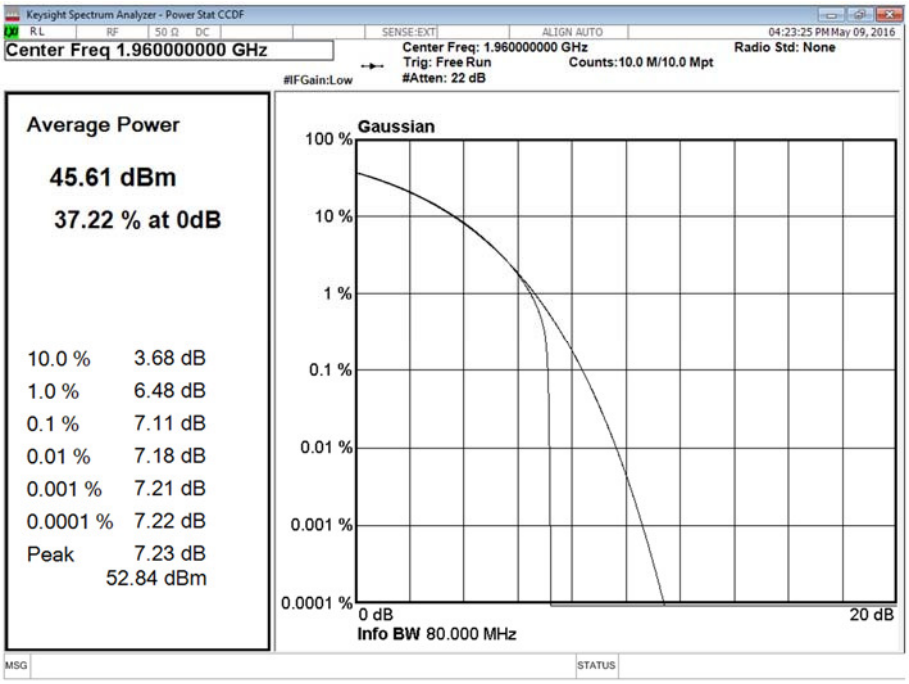
Channel Position M - Bandwidth 5.0 MHz - Antenna A



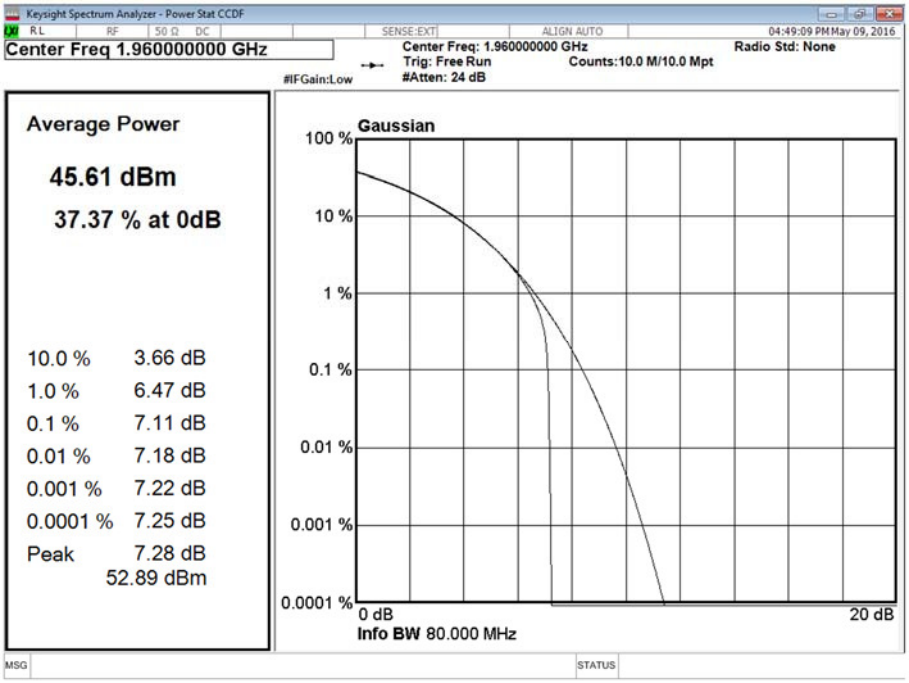
Channel Position M - Bandwidth 10.0 MHz - Antenna A



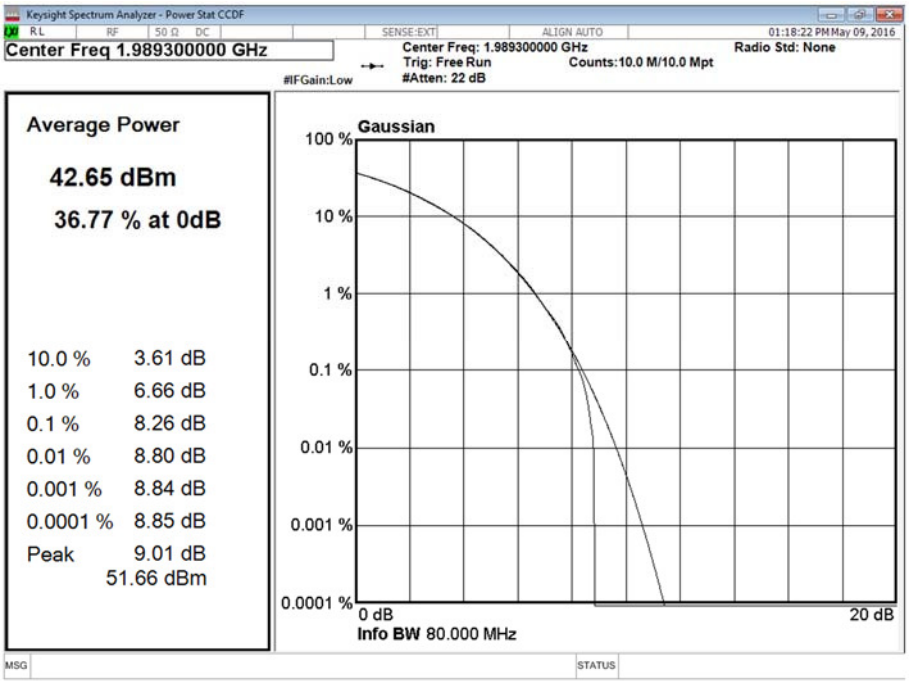
Channel Position M - Bandwidth 15.0 MHz - Antenna A



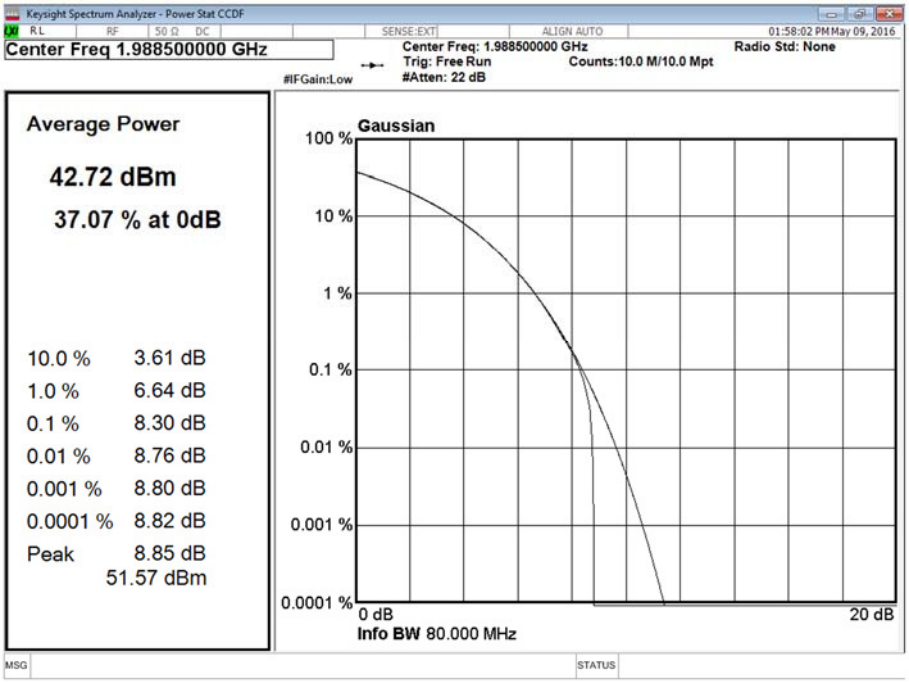
Channel Position M - Bandwidth 20.0 MHz - Antenna A



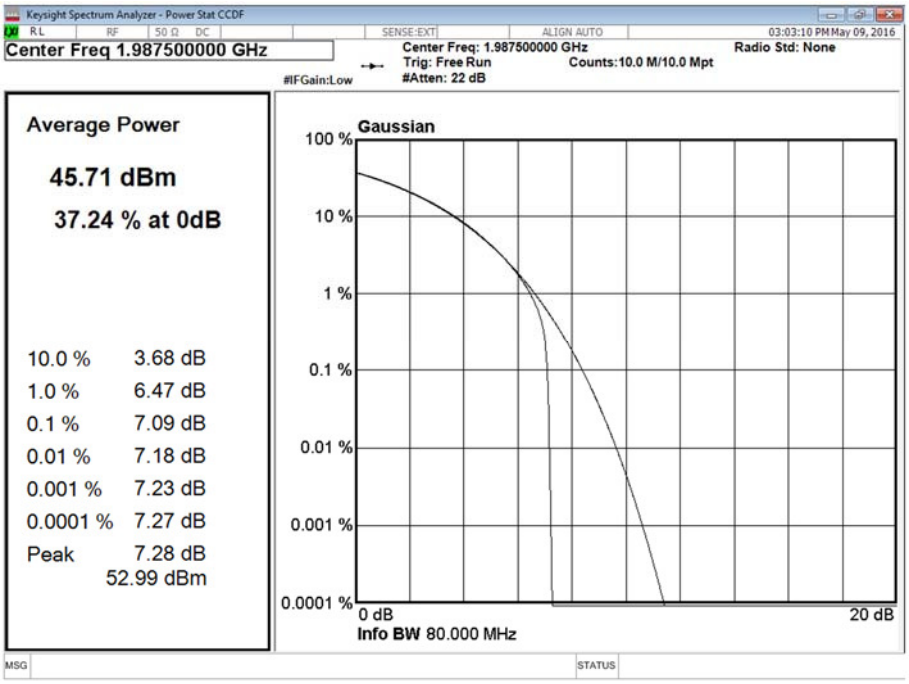
Channel Position T - Bandwidth 1.4 MHz - Antenna A



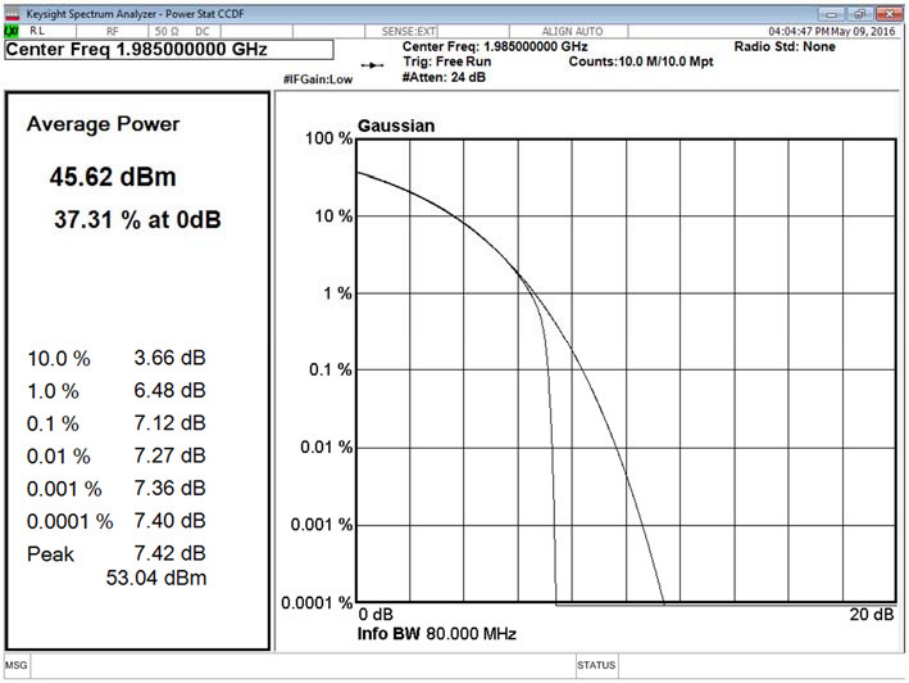
Channel Position T - Bandwidth 3.0 MHz - Antenna A



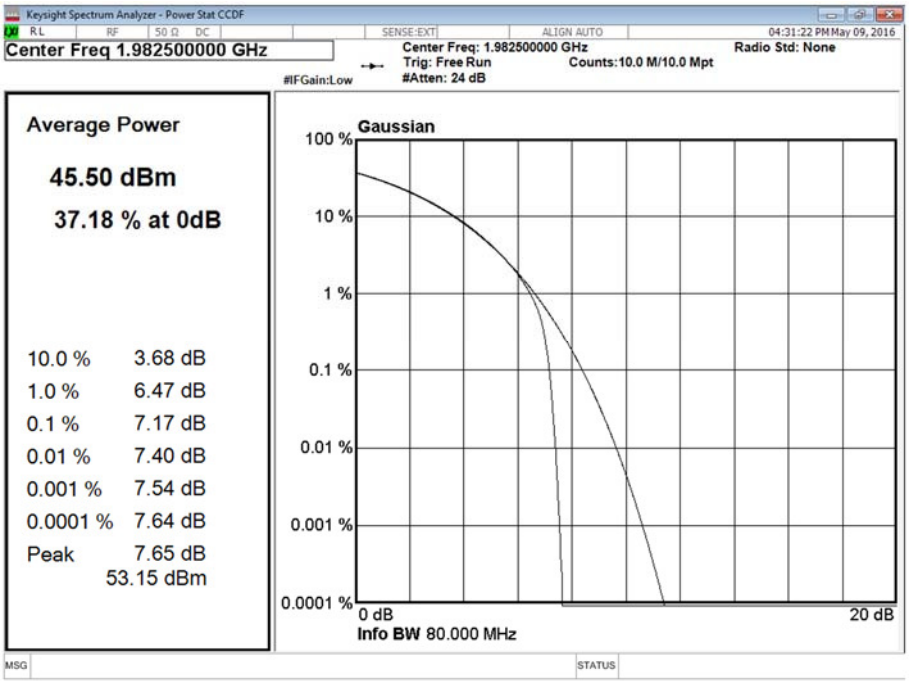
Channel Position T - Bandwidth 5.0 MHz - Antenna A



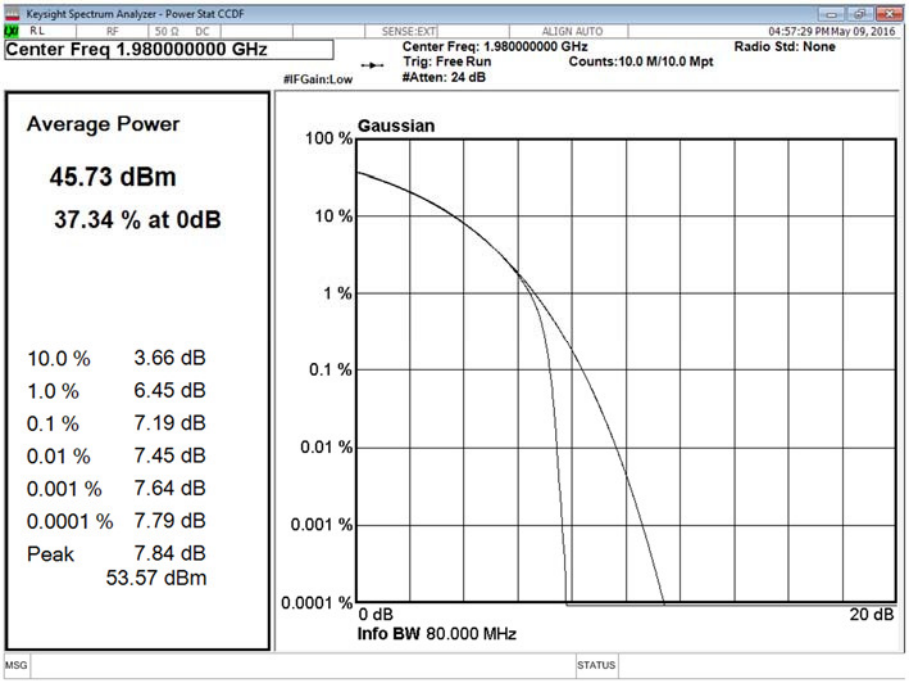
Channel Position T - Bandwidth 10.0 MHz - Antenna A



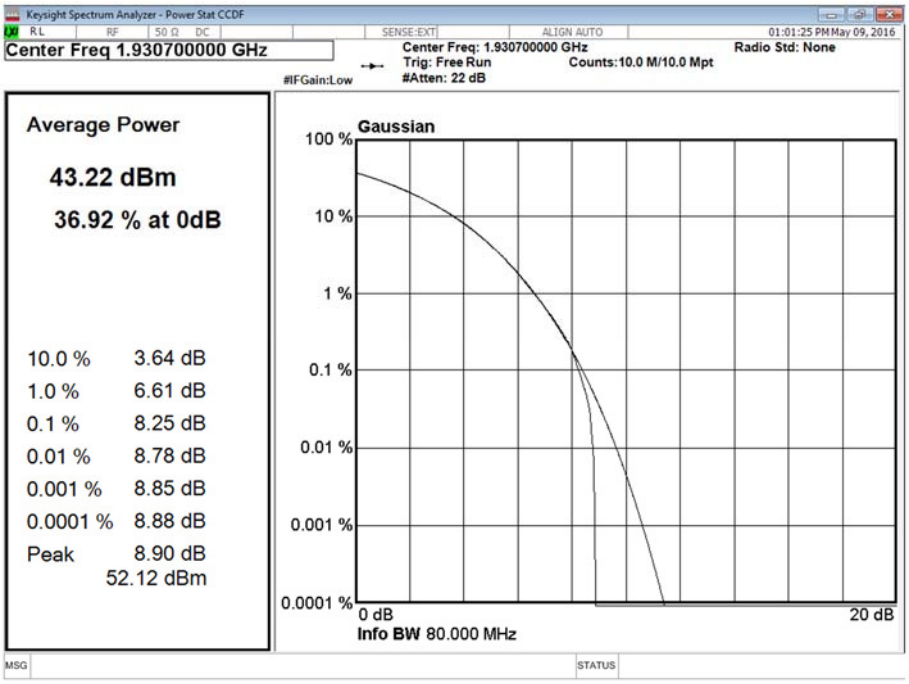
Channel Position T - Bandwidth 15.0 MHz - Antenna A



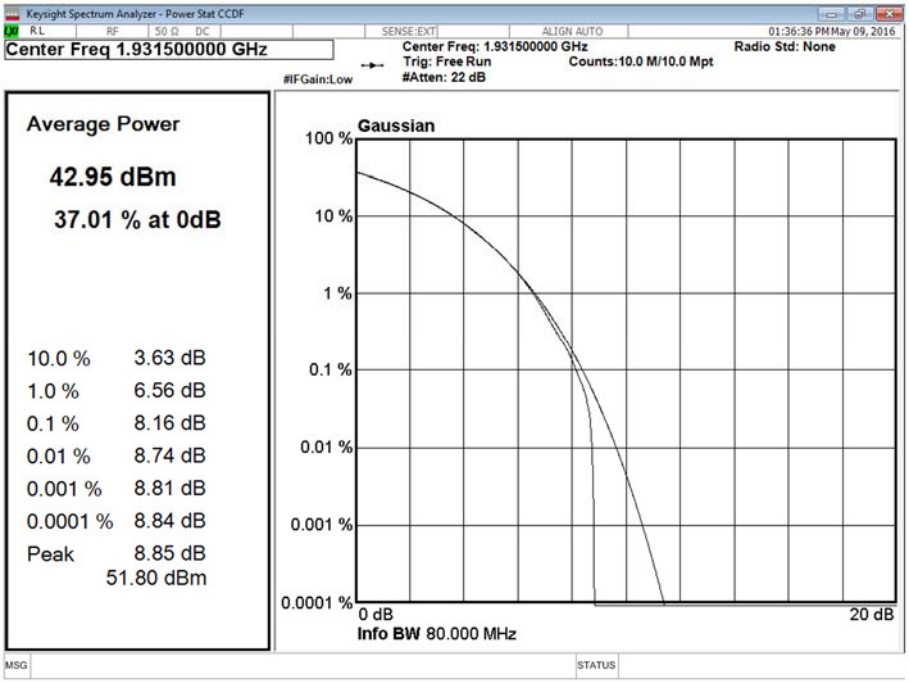
Channel Position T - Bandwidth 20.0 MHz - Antenna A



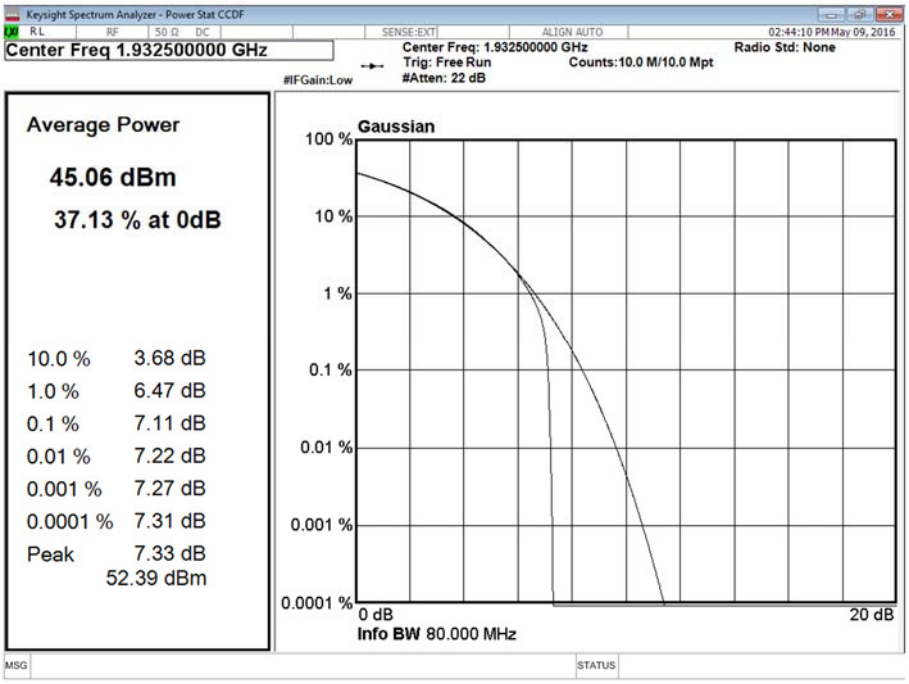
Channel Position B - Bandwidth 1.4 MHz - Antenna B



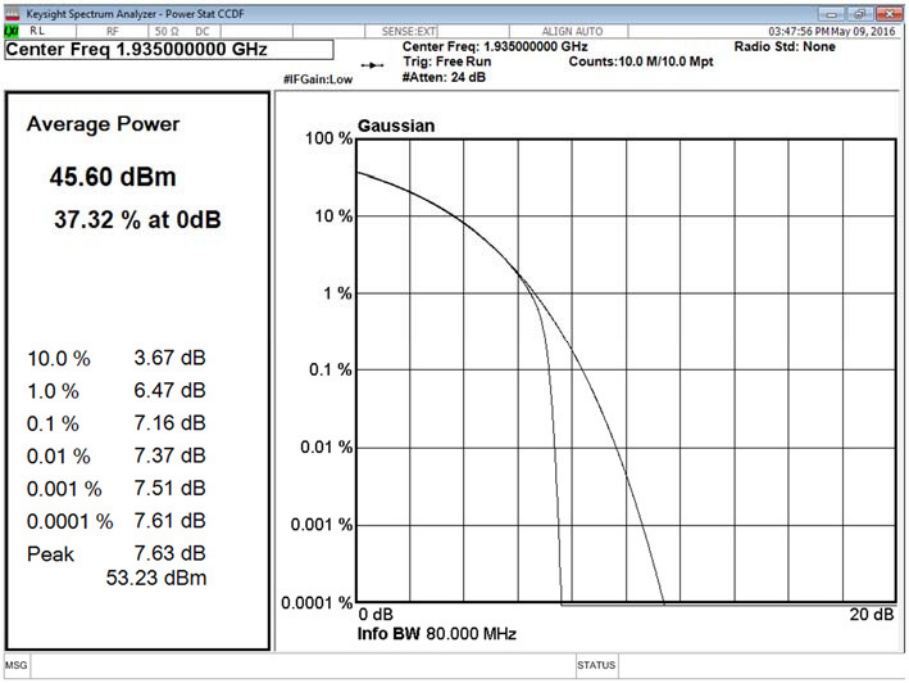
Channel Position B - Bandwidth 3.0 MHz - Antenna B



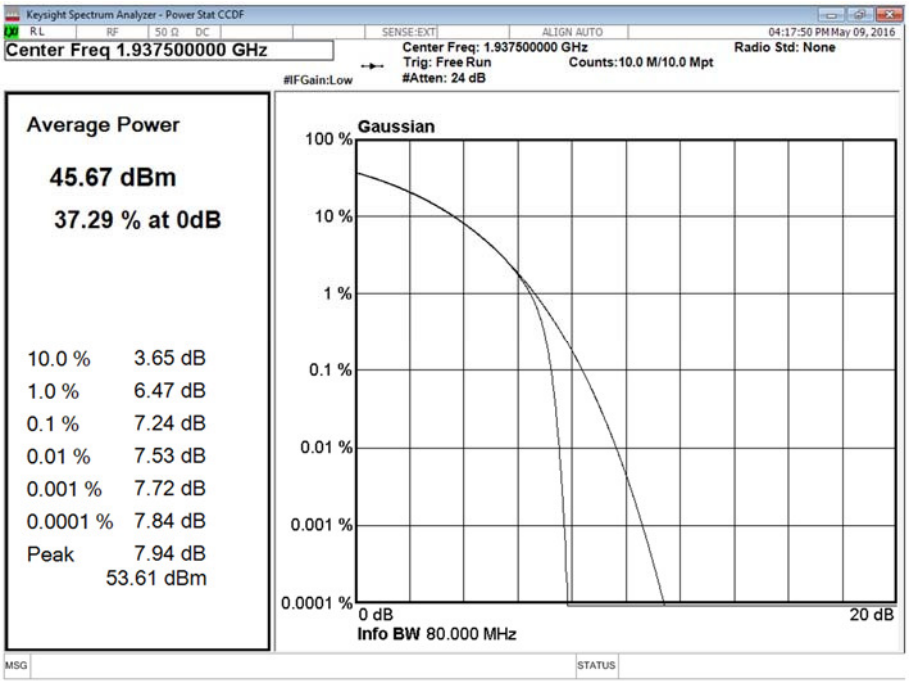
Channel Position B - Bandwidth 5.0 MHz - Antenna B



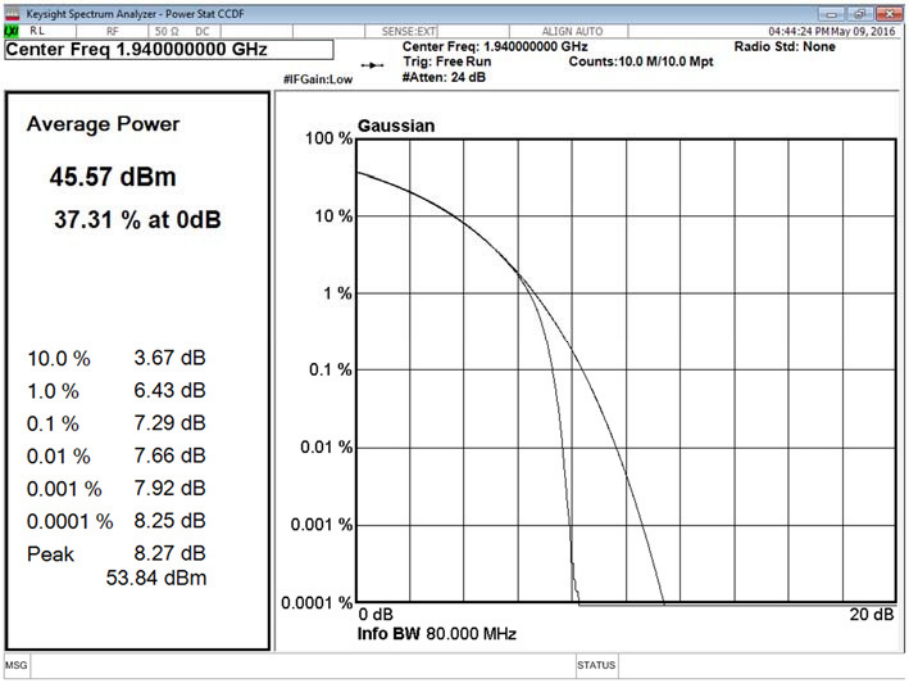
Channel Position B - Bandwidth 10.0 MHz - Antenna B



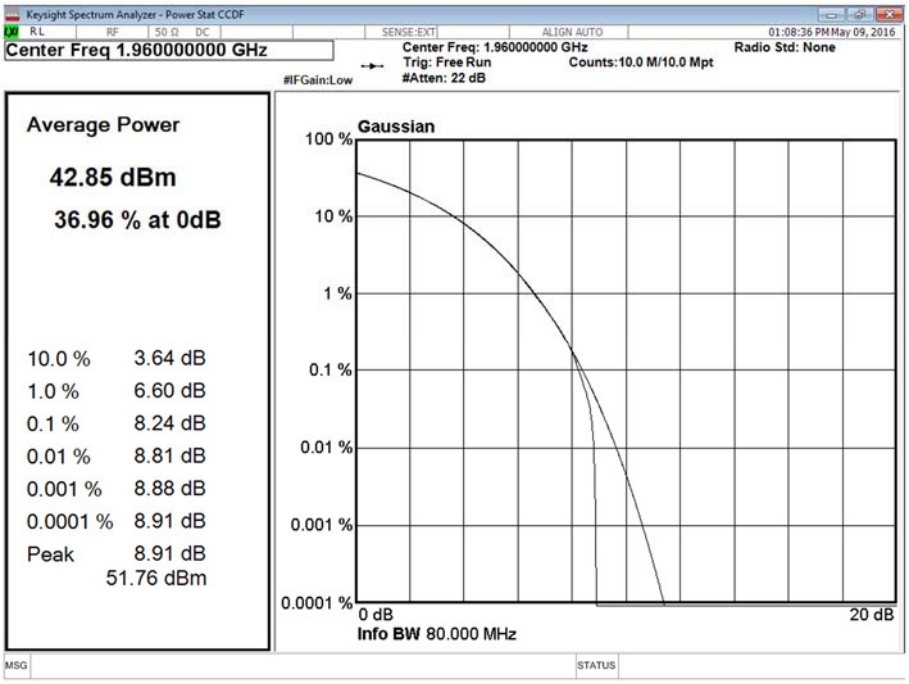
Channel Position B - Bandwidth 15.0 MHz - Antenna B



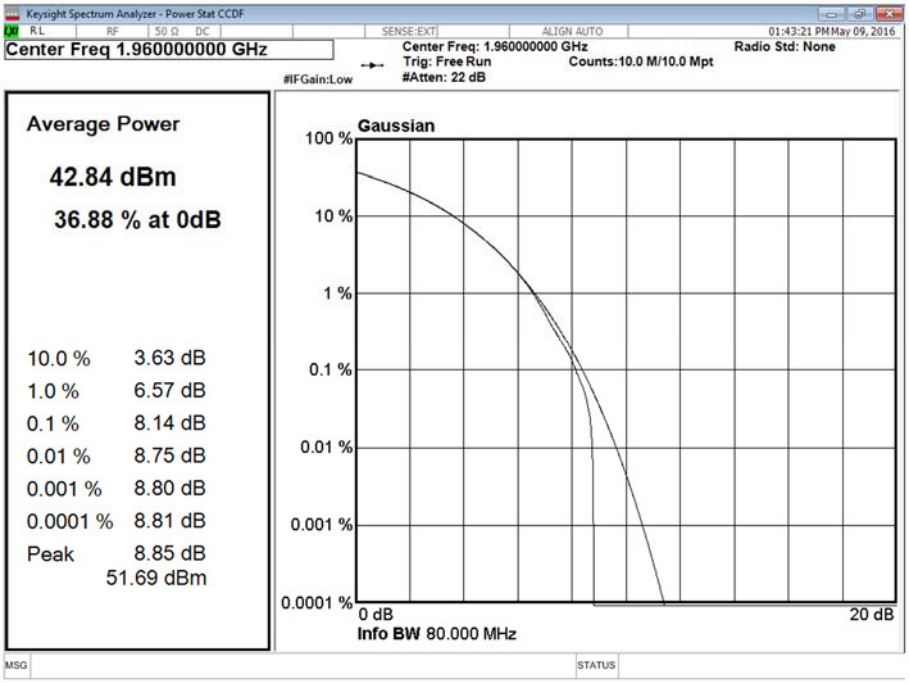
Channel Position B - Bandwidth 20.0 MHz - Antenna B



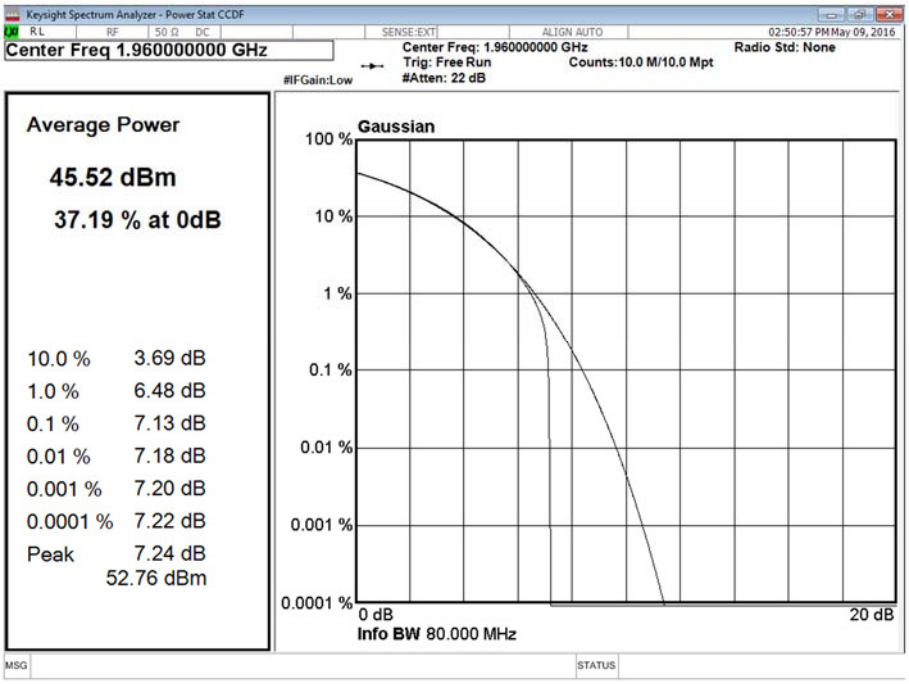
Channel Position M - Bandwidth 1.4 MHz - Antenna B



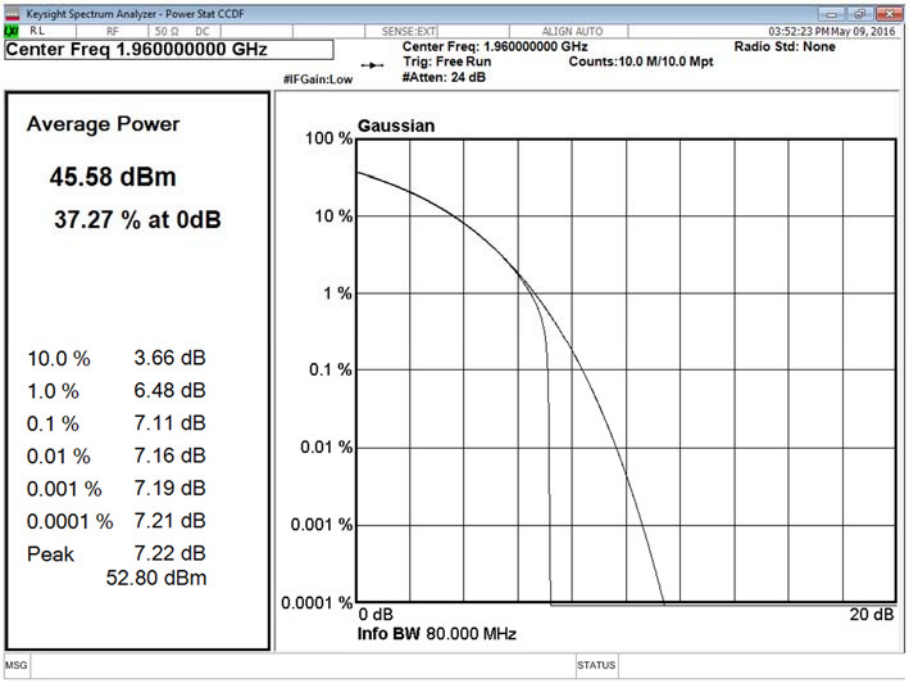
Channel Position M - Bandwidth 3.0 MHz - Antenna B



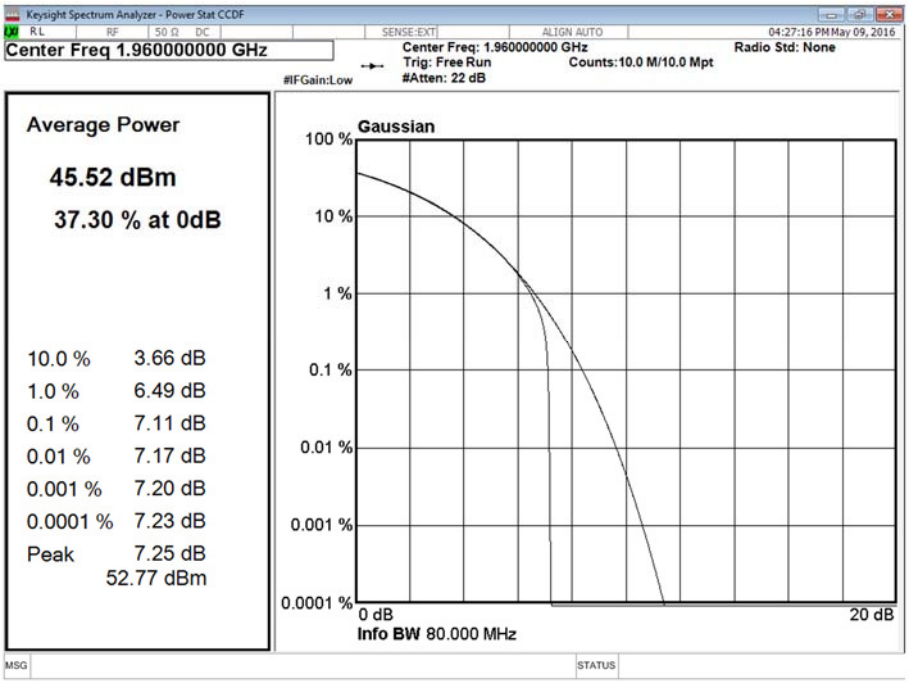
Channel Position M - Bandwidth 5.0 MHz - Antenna B



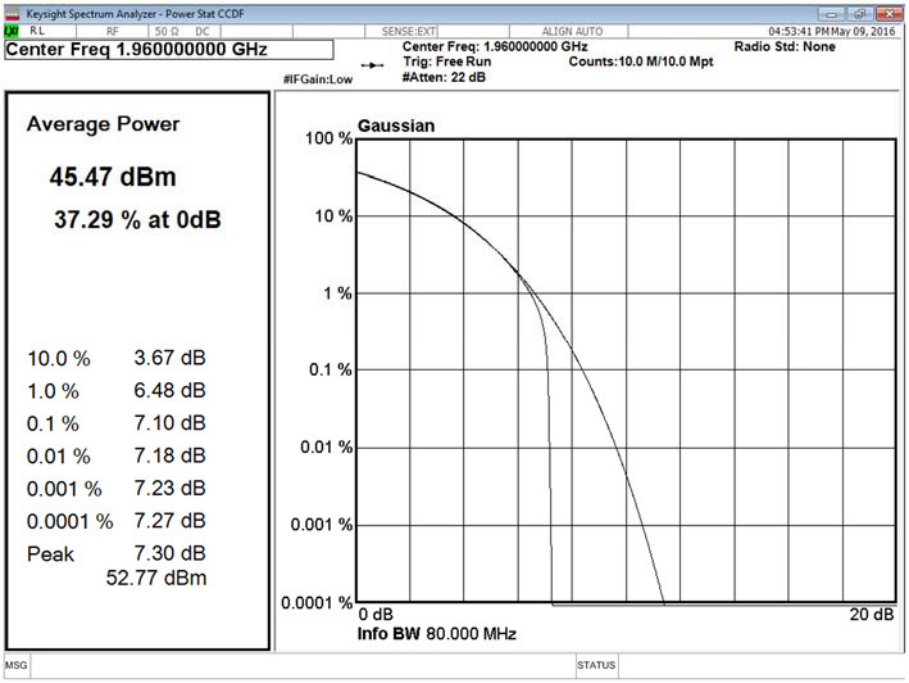
Channel Position M - Bandwidth 10.0 MHz - Antenna B



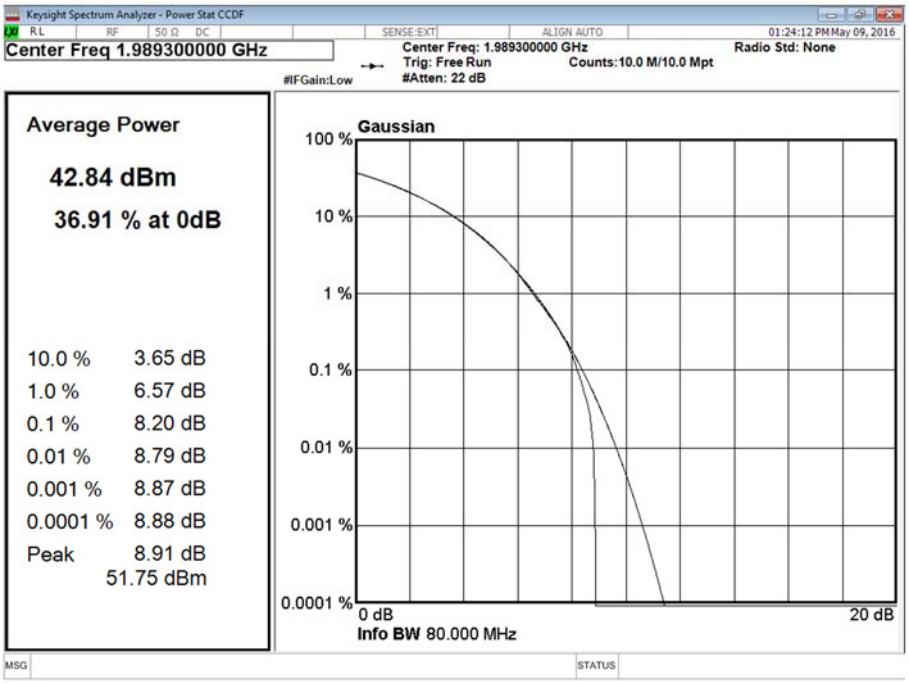
Channel Position M - Bandwidth 15.0 MHz - Antenna B



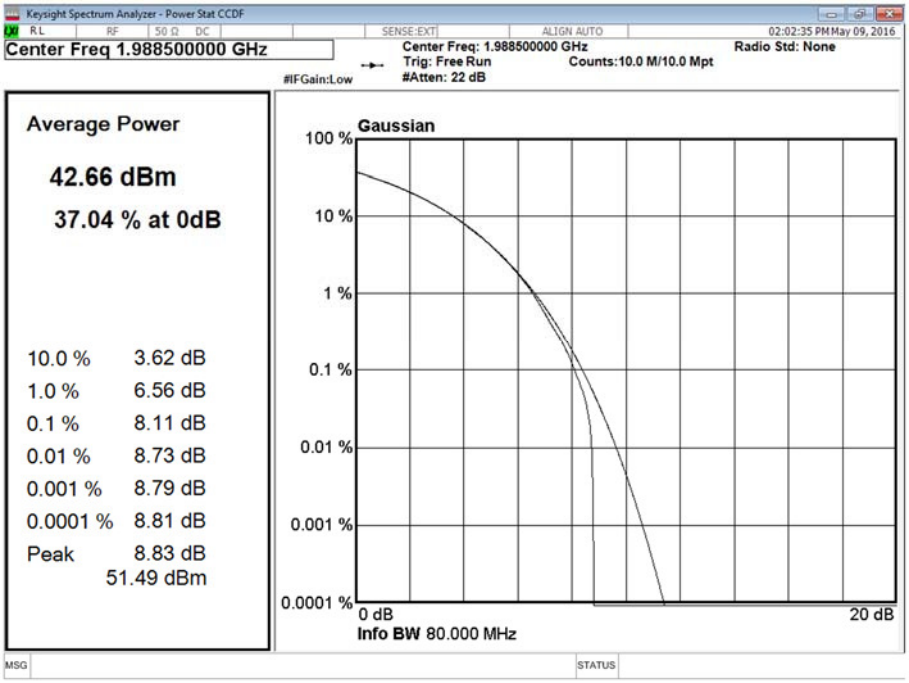
Channel Position M - Bandwidth 20.0 MHz - Antenna B



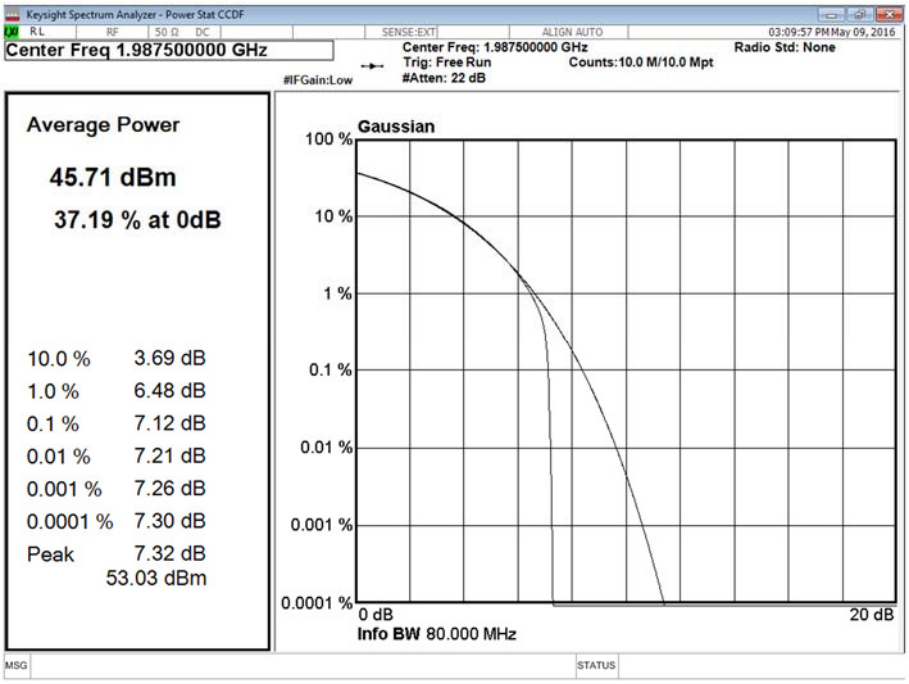
Channel Position T - Bandwidth 1.4 MHz - Antenna B



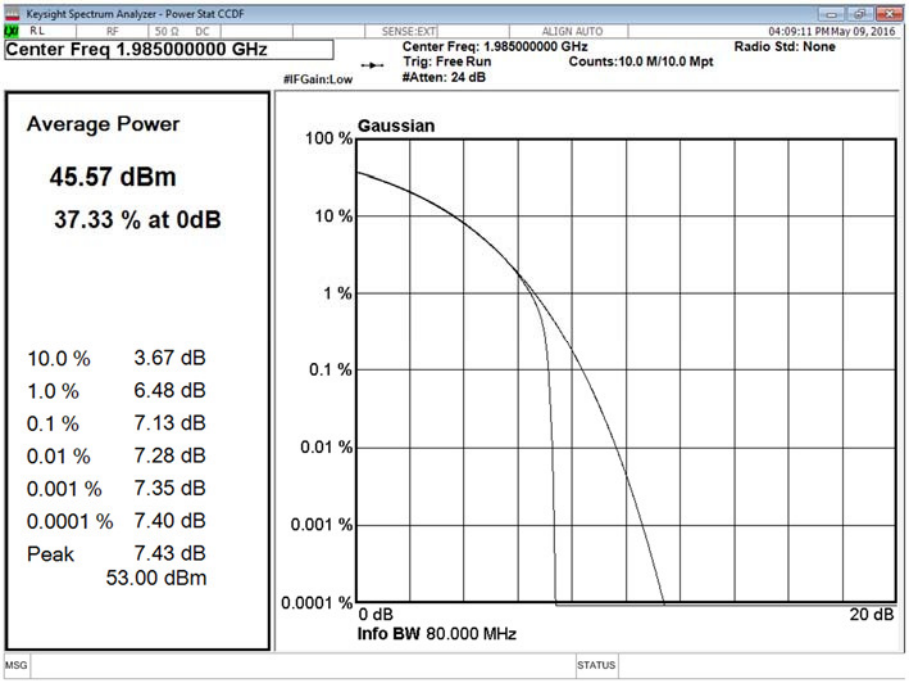
Channel Position T - Bandwidth 3.0 MHz - Antenna B



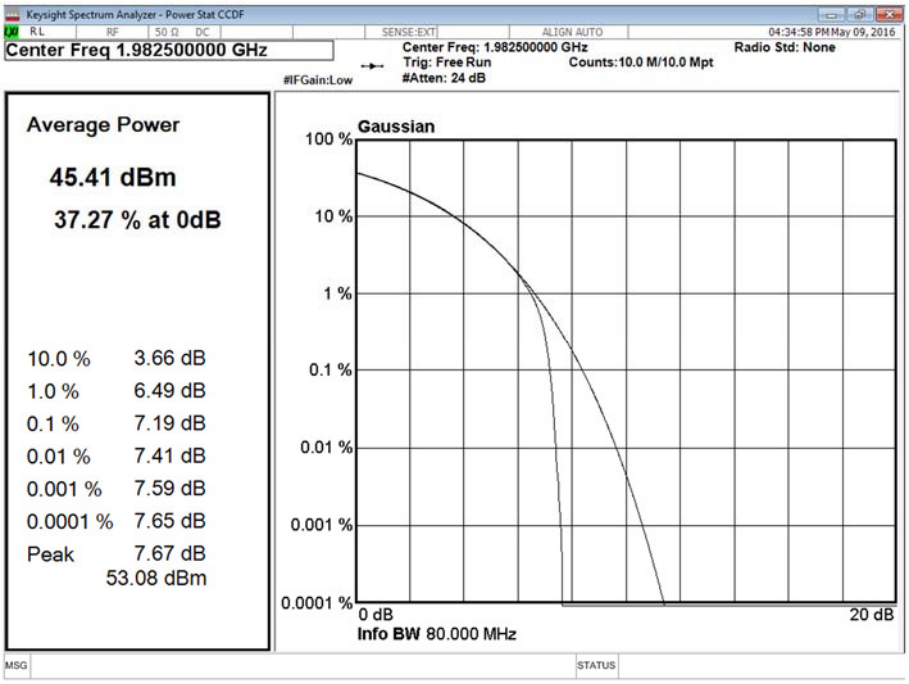
Channel Position T - Bandwidth 5.0 MHz - Antenna B



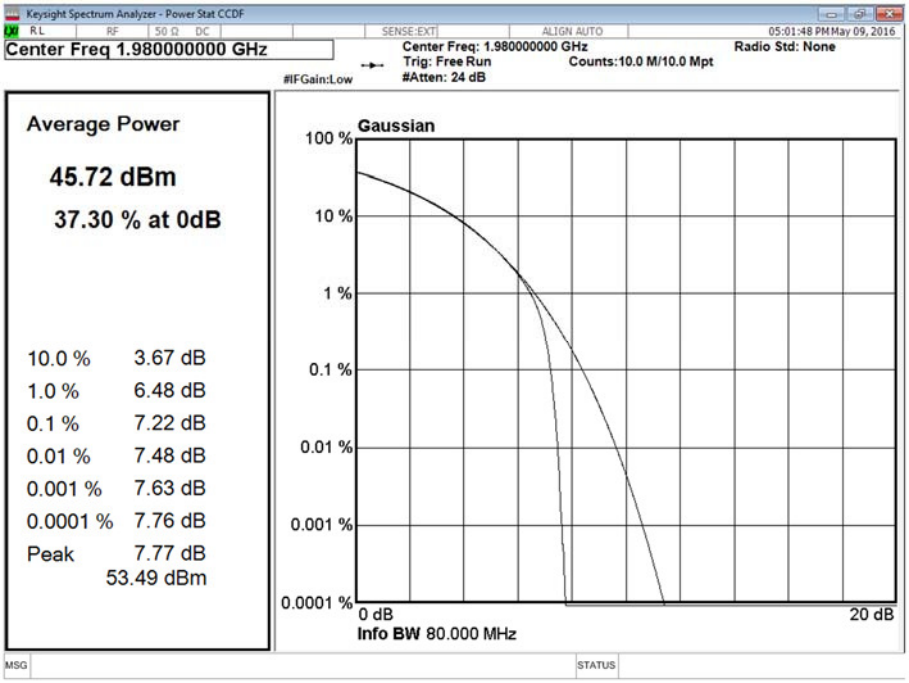
Channel Position T - Bandwidth 10.0 MHz - Antenna B



Channel Position T - Bandwidth 15.0 MHz - Antenna B



Channel Position T - Bandwidth 20.0 MHz - Antenna B



Configuration 2

Maximum Output Power
44.8 dBm for 1.4 and 3 MHz bandwidths, 46.0 dBm for 5, 10, 15, and 20 MHz

Modulation	Carrier Bandwidth (MHz)	Antenna						
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
QPSK	1.4	A	44.10	40.43	44.32	40.42	44.54	40.59
	1.4	B	44.46	41.04	44.27	40.55	44.50	40.55
Total			47.29	43.76	47.31	43.50	47.53	43.58
QPSK	3.0	A	44.05	37.57	44.32	37.71	44.57	37.88
	3.0	B	44.42	37.86	44.30	37.92	44.49	37.91
Total			47.25	40.73	47.32	40.83	47.54	40.91
QPSK	5.0	A	45.59	36.85	45.45	37.01	45.50	36.64
	5.0	B	45.69	37.10	45.34	36.80	45.62	36.93
Total			48.65	39.99	48.41	39.92	48.57	39.80
QPSK	10.0	A	45.62	34.05	45.38	33.62	45.52	33.90
	10.0	B	45.66	33.97	45.38	33.71	45.63	33.95
Total			48.65	37.02	48.39	36.68	48.59	36.94
QPSK	15.0	A	45.60	32.24	45.46	31.93	45.52	32.10
	15.0	B	45.74	32.31	45.48	31.86	45.65	32.23
Total			48.68	35.29	48.48	34.91	48.60	35.18
QPSK	20.0	A	45.78	31.25	45.48	30.80	45.51	30.96
	20.0	B	45.86	31.12	45.52	30.83	45.57	30.88
Total			48.83	34.20	48.51	33.83	48.55	33.93

Configuration 3

Maximum Output Power
44.8 dBm for 1.4 and 3 MHz bandwidths, 46.0 dBm for 5, 10, 15, and 20 MHz

Modulation	Carrier Bandwidth (MHz)	Antenna						
			Channel Position B		Channel Position M		Channel Position T	
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
QPSK	1.4	A	44.09	38.64	44.30	39.03	44.60	39.34
	1.4	B	44.46	39.00	44.35	39.06	44.54	39.25
Total			47.29	41.83	47.34	42.06	47.58	42.31
QPSK	3.0	A	44.22	35.89	44.50	36.31	44.57	36.02
	3.0	B	44.57	36.12	44.39	35.90	44.61	36.13
Total			47.41	39.02	47.46	39.12	47.60	39.09
QPSK	5.0	A	45.71	35.13	45.46	34.87	45.58	35.09
	5.0	B	45.78	35.36	45.47	34.96	45.66	35.03
Total			48.76	38.26	48.48	37.93	48.63	38.07
QPSK	10.0	A	45.65	32.15	45.49	32.04	45.55	32.42
	10.0	B	45.70	32.19	45.48	31.96	45.58	32.22
Total			48.69	35.18	48.50	35.01	48.58	35.33

Configuration 12

Maximum Output Power 46.0 dBm

WCDMA Modulation	LTE Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power					
			Channel Position BRFBW		Channel Position MRFBW		Channel Position TRFBW	
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
16QAM	15.0	A	45.79	37.83	45.73	37.62	45.80	37.68
	15.0	B	45.74	37.56	45.59	37.51	45.80	37.60
Total			48.78	40.71	48.67	40.58	48.81	40.65

Configuration 14

Maximum Output Power 46.0 dBm

WCDMA Modulation	LTE Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power					
			Channel Position BRFBW		Channel Position MRFBW		Channel Position TRFBW	
			Average Power		Average Power		Average Power	
			dBm	dBm/MHz	dBm	dBm/MHz	dBm	dBm/MHz
16QAM	5.0	A	45.51	31.44	45.29	31.42	45.38	31.46
	5.0	B	45.25	31.38	45.41	31.37	45.18	31.19
Total			48.39	34.42	48.36	34.41	48.29	34.34

Limit	
Peak Power	≤500 W or ≤+57 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 24, Clause 24.238 (b)
Industry Canada RSS-GEN, Clause 6.6

2.2.2 Date of Test and Modification State

16 and 18 May 2016 - 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	24.2°C
Relative Humidity	26.6%

2.2.5 Test Method

The EUT was connected to a Signal Analyser via attenuators and an RF switch. The path loss between the EUT and the Analyser was measured using a Network Analyser and entered as a Reference Level Offset.

The EUT was set to transmit at its maximum rated output power in the configurations described below.

Measurements were performed using the Analyser Occupied Bandwidth measurement mode function in accordance with FCC KDB 971168 D01 v02r02.

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

Testing was performed on both ports.

2.2.6 Test Results

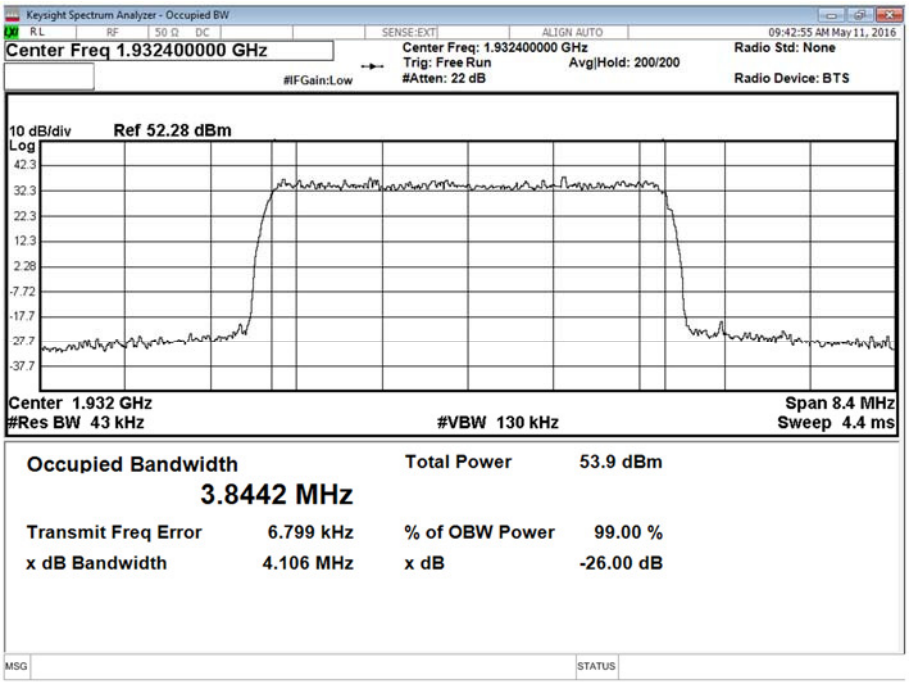
Configuration 6

WCDMA SC, Antenna A

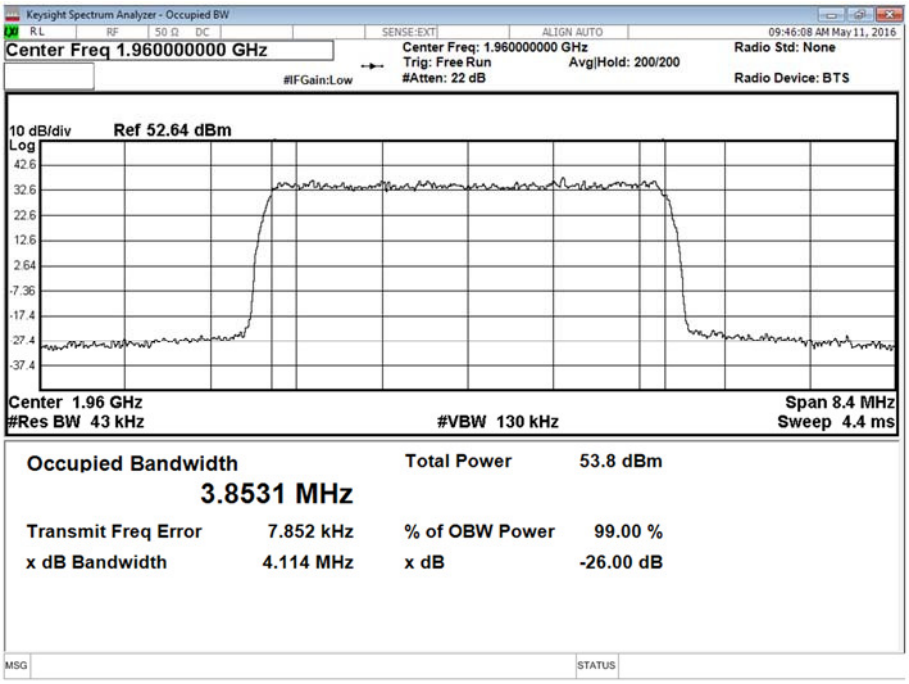
Maximum Output 46.0 dBm

Carrier Bandwidth / Modulation	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
4.2 MHz / QPSK	3,844.18	4,105.68	3,853.08	4,114.29	3,855.27	4,119.47

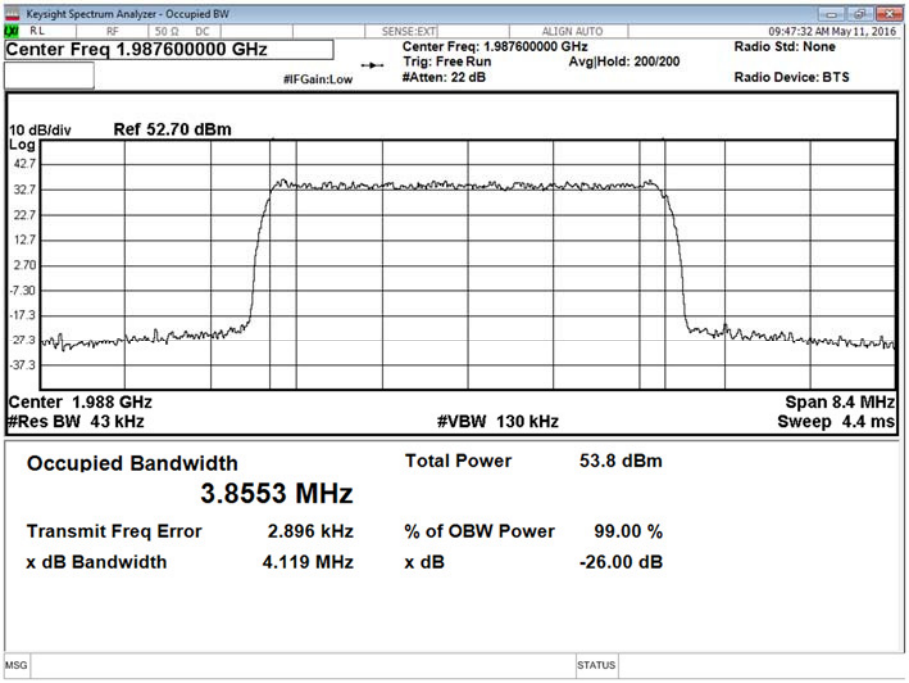
Channel Position B - Bandwidth 4.2 MHz - Antenna A



Channel Position M - Bandwidth 4.2 MHz - Antenna A



Channel Position T - Bandwidth 4.2 MHz - Antenna A

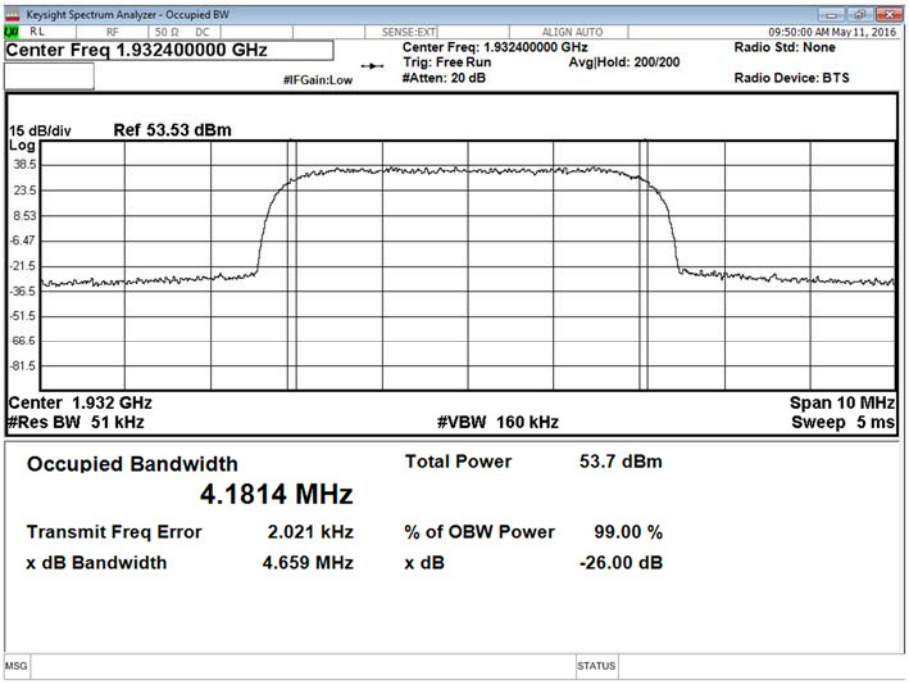


Configuration 6

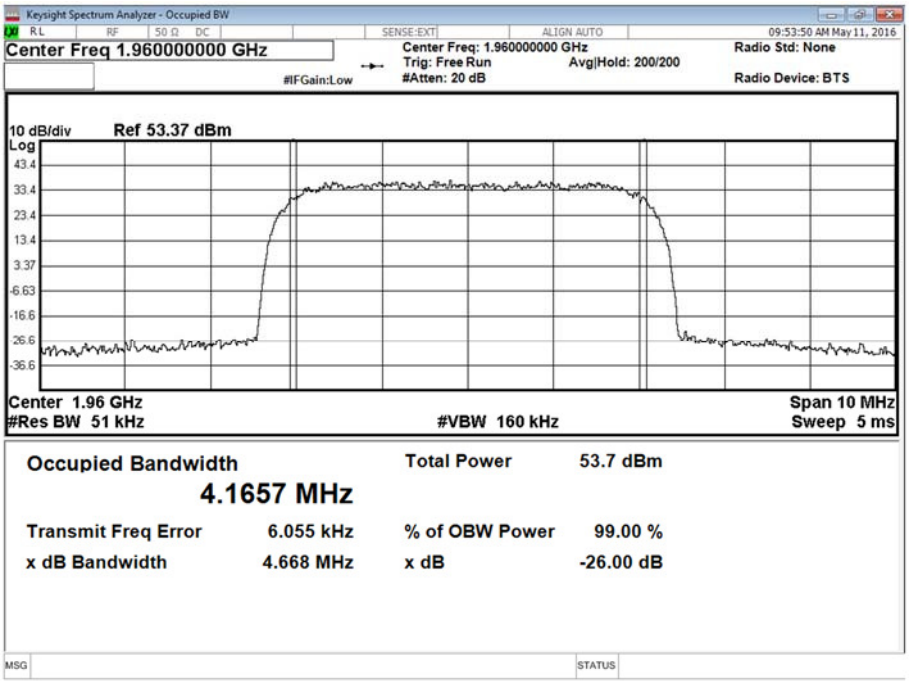
Maximum Output Power 46.0 dBm

Carrier Bandwidth / Modulation	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
5.0 MHz / QPSK	4,181.43	4,659.16	4,165.70	4,668.24	4,162.64	4,646.84

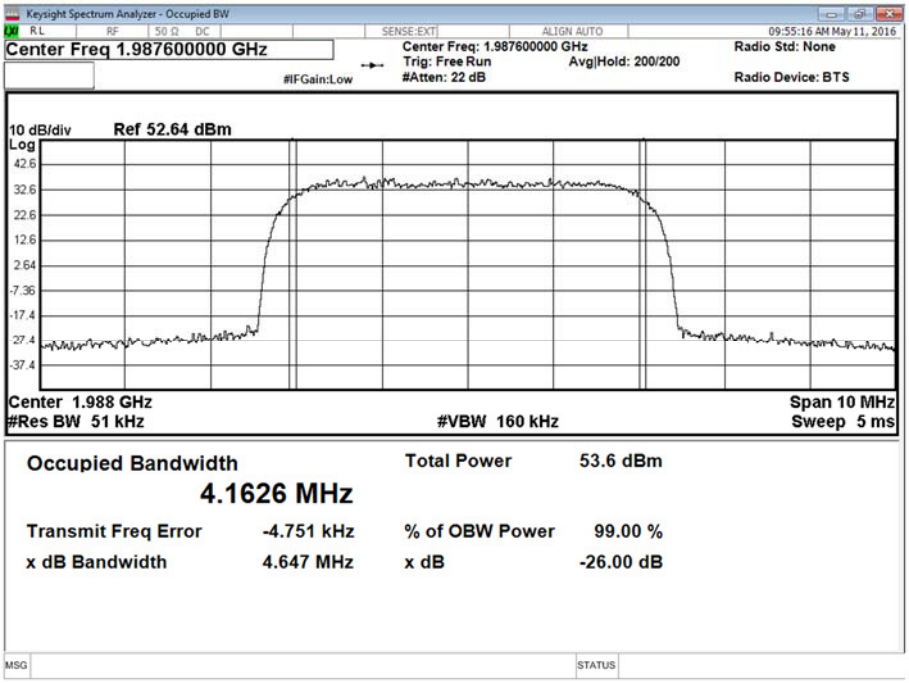
Channel Position B - Bandwidth 5.0 MHz - Antenna A



Channel Position M - Bandwidth 5.0 MHz - Antenna A



Channel Position T - Bandwidth 5.0 MHz - Antenna A



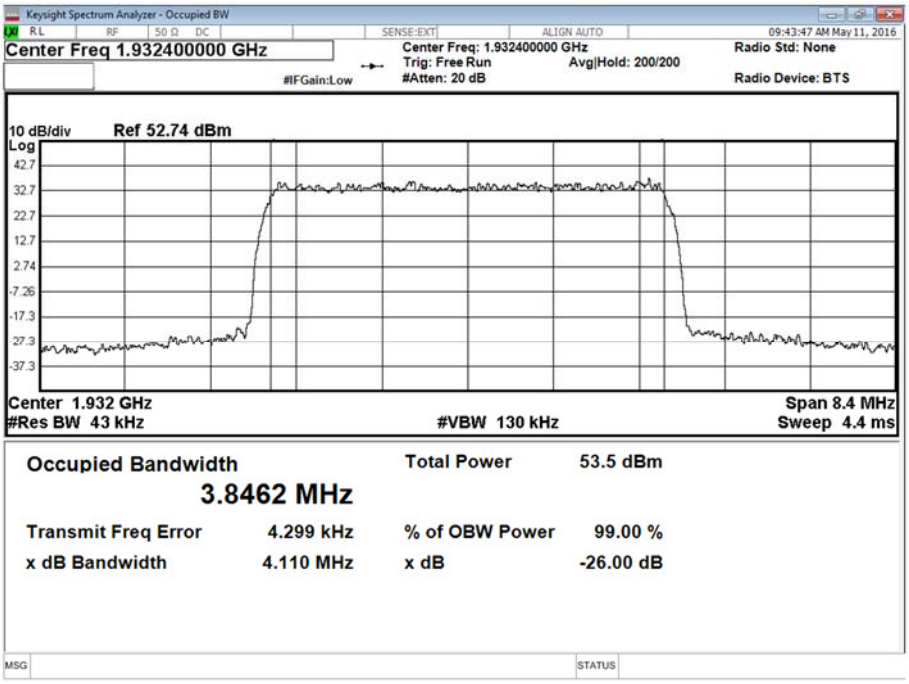
Configuration 6

WCDMA SC, Antenna B

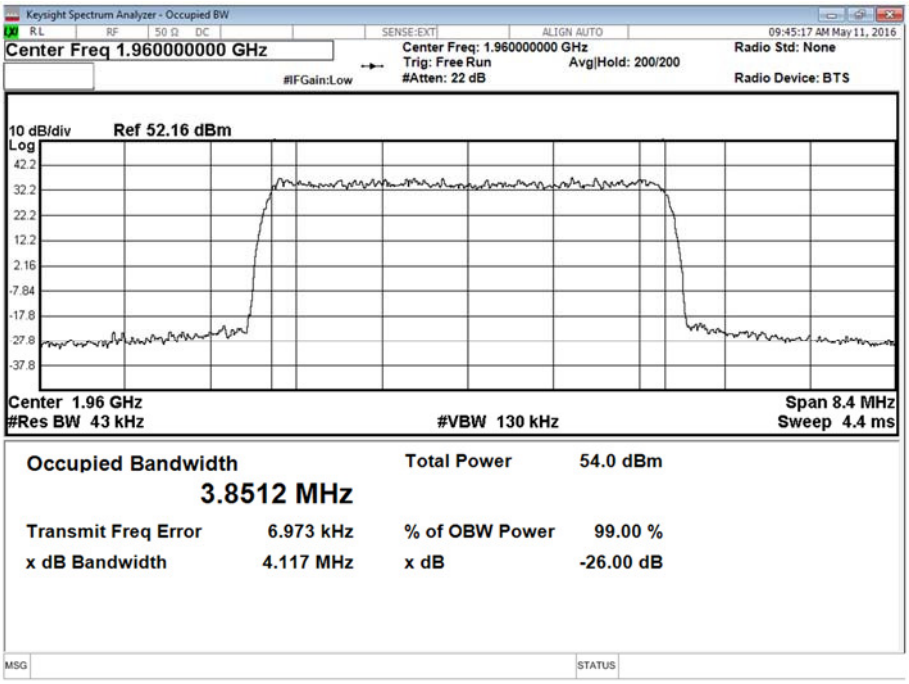
Maximum Output Power 46.0 dBm

Carrier Bandwidth / Modulation	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
4.2 MHz / QPSK	3,846.23	4,109.64	3,851.17	4,116.56	3,856.09	4,121.39

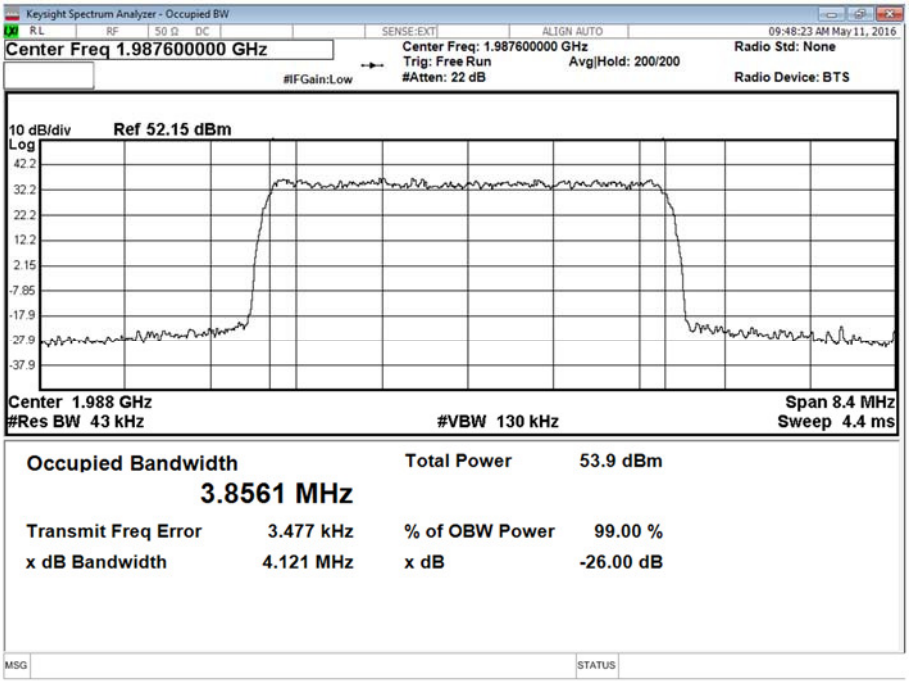
Channel Position B - Bandwidth 4.2 MHz - Antenna B



Channel Position M - Bandwidth 4.2 MHz - Antenna B



Channel Position T - Bandwidth 4.2 MHz - Antenna B



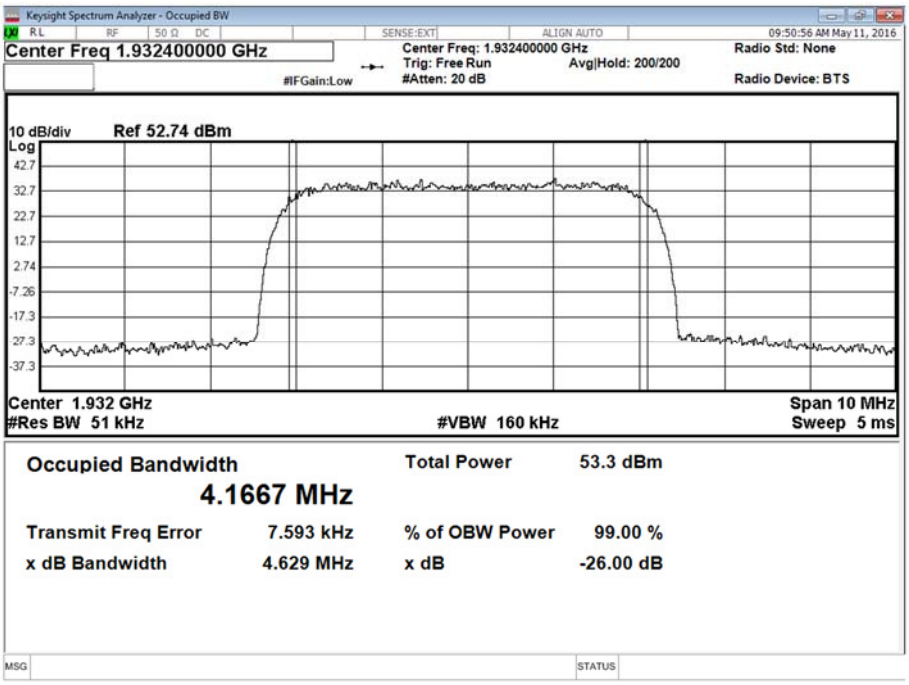
Configuration 6

WCDMA SC, Antenna B

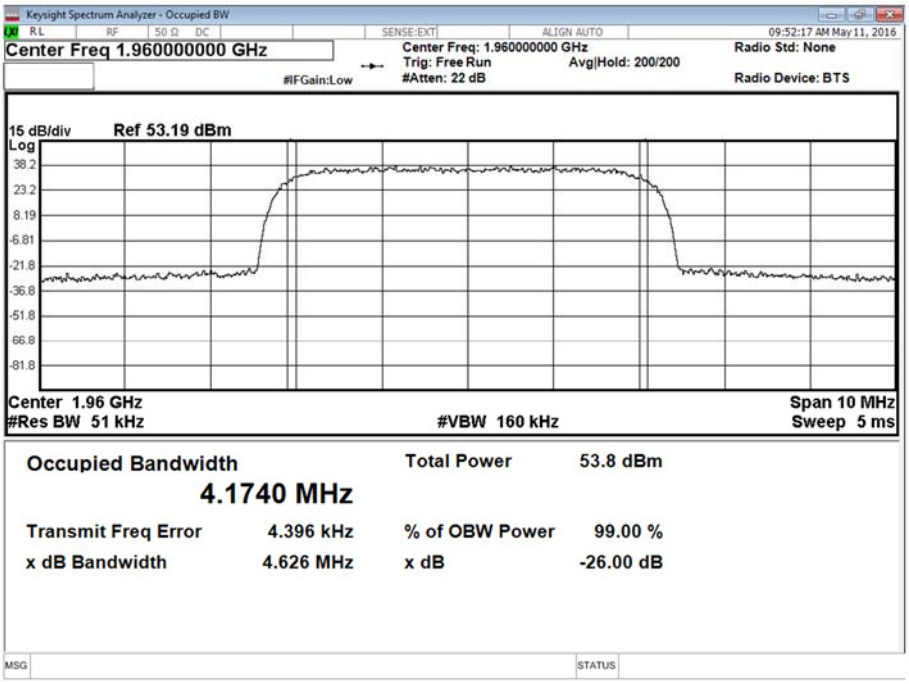
Maximum Output Power 46.0 dBm

Carrier Bandwidth / Modulation	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
5.0 MHz / QPSK	4,166.70	4,629.14	4,174.01	4,625.74	4,166.73	4,629.76

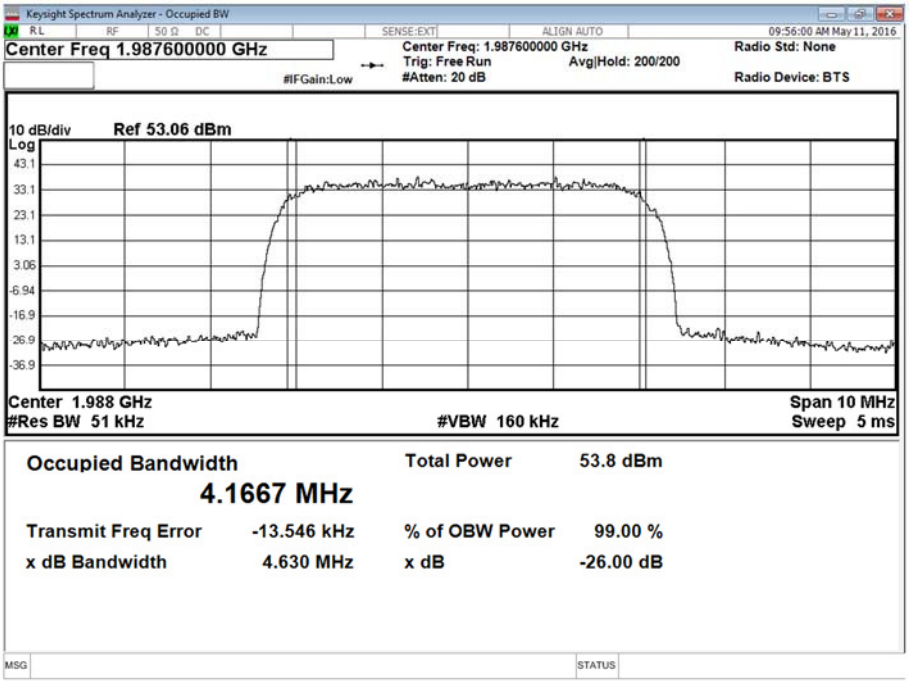
Channel Position B - Bandwidth 5.0 MHz - Antenna B



Channel Position M - Bandwidth 5.0 MHz - Antenna B



Channel Position T - Bandwidth 5.0 MHz - Antenna B



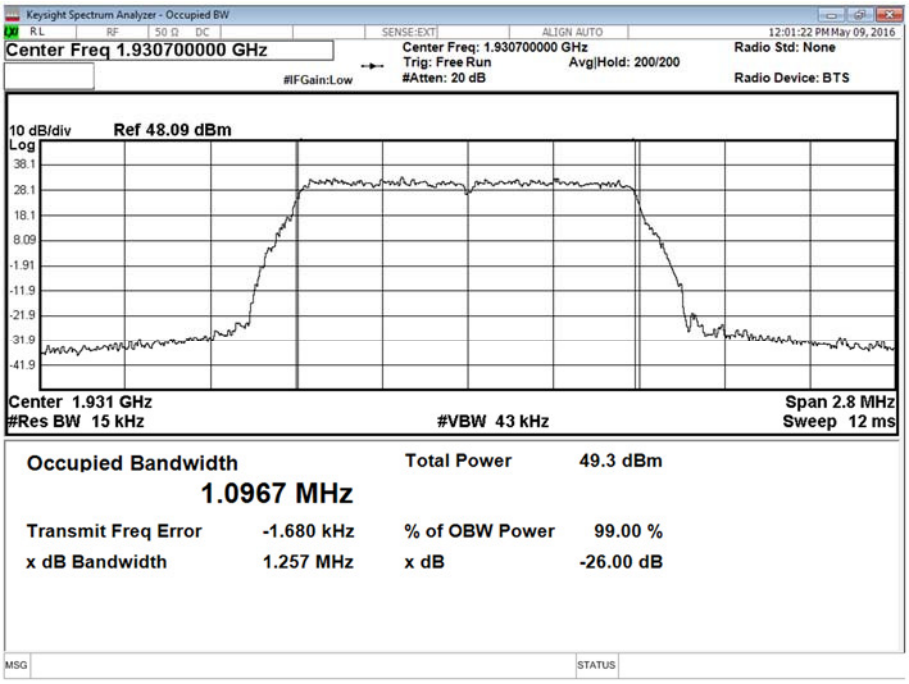
Configuration 1

LTE SC, Antenna A

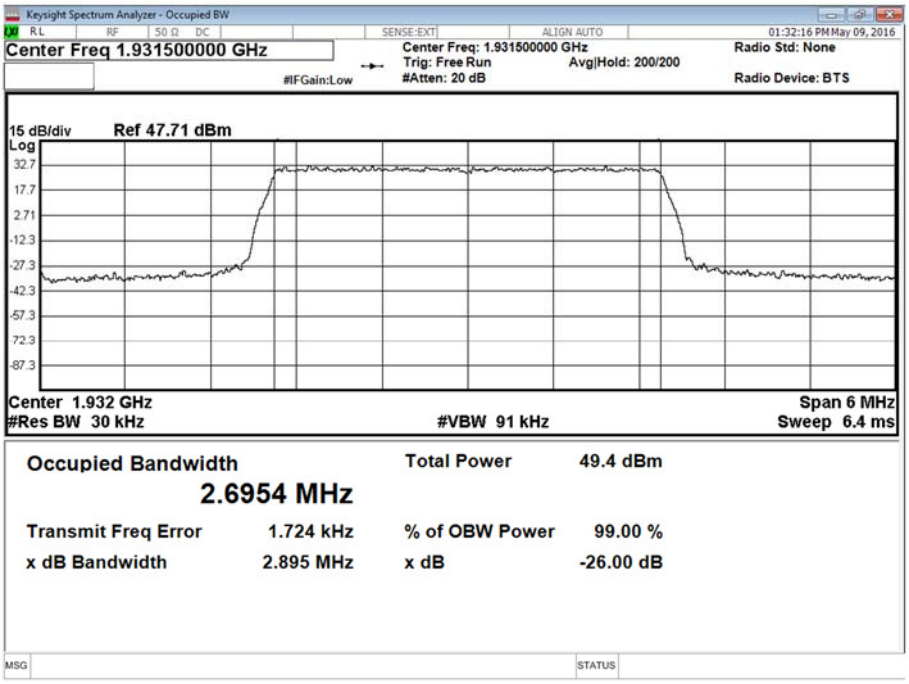
Maximum Output Power 43.0 dBm for 1.4 and 3 MHz bandwidths, 46.0 dBm for 5, 10, 15, and 20 MHz

Carrier Bandwidth / Modulation	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
1.4 MHz / QPSK	1,096.74	1,257.31	1,098.69	1,275.89	1,096.22	1,258.28
3.0 MHz / QPSK	2,695.35	2,894.86	2,695.29	2,899.76	2,692.48	2,901.93
5.0 MHz / QPSK	4,478.00	4,787.07	4,484.11	4,811.22	4,475.98	4,809.08
10.0 MHz / QPSK	8,950.78	9,575.78	8,962.96	9,568.72	8,953.66	9,610.14
15.0 MHz / QPSK	13,432.16	14,359.95	13,441.42	14,379.74	13,416.71	14,342.87
20.0 MHz / QPSK	17,850.78	19,111.04	17,896.38	19,057.09	17,886.60	19,085.75

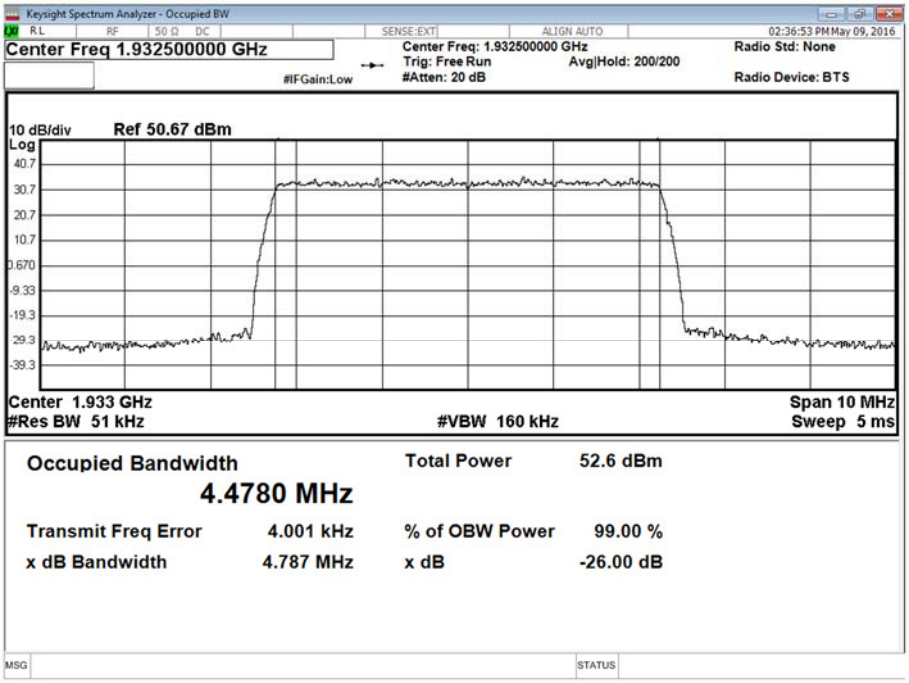
Channel Position B - Bandwidth 1.4 MHz - Antenna A



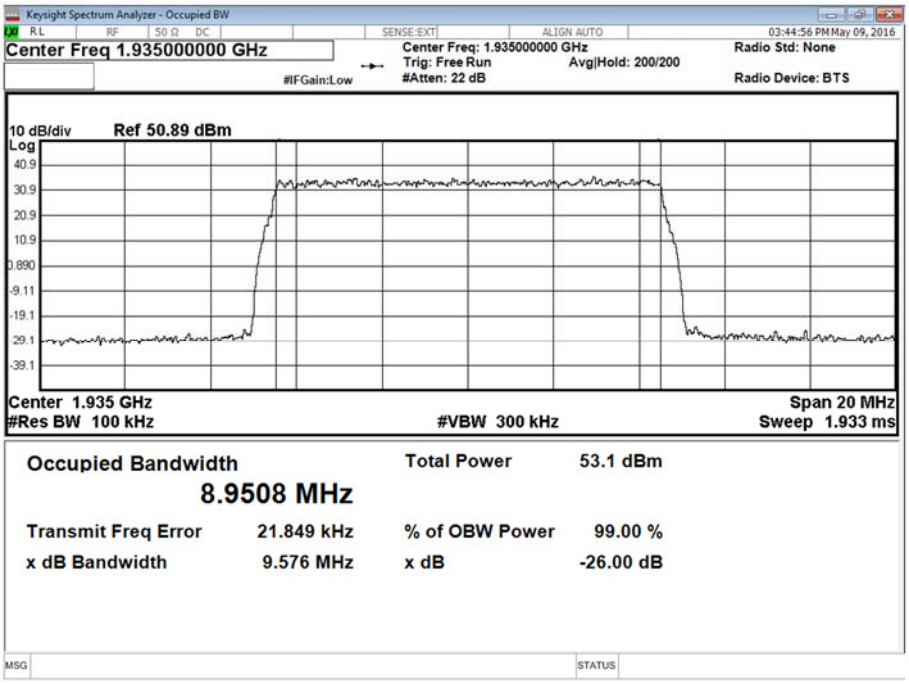
Channel Position B - Bandwidth 3.0 MHz - Antenna A



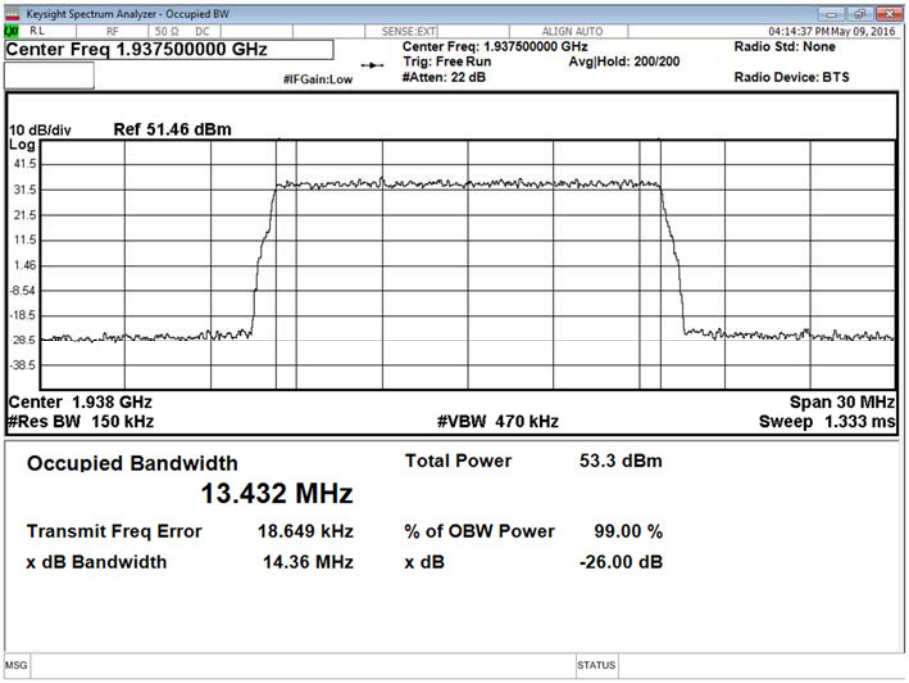
Channel Position B - Bandwidth 5.0 MHz - Antenna A



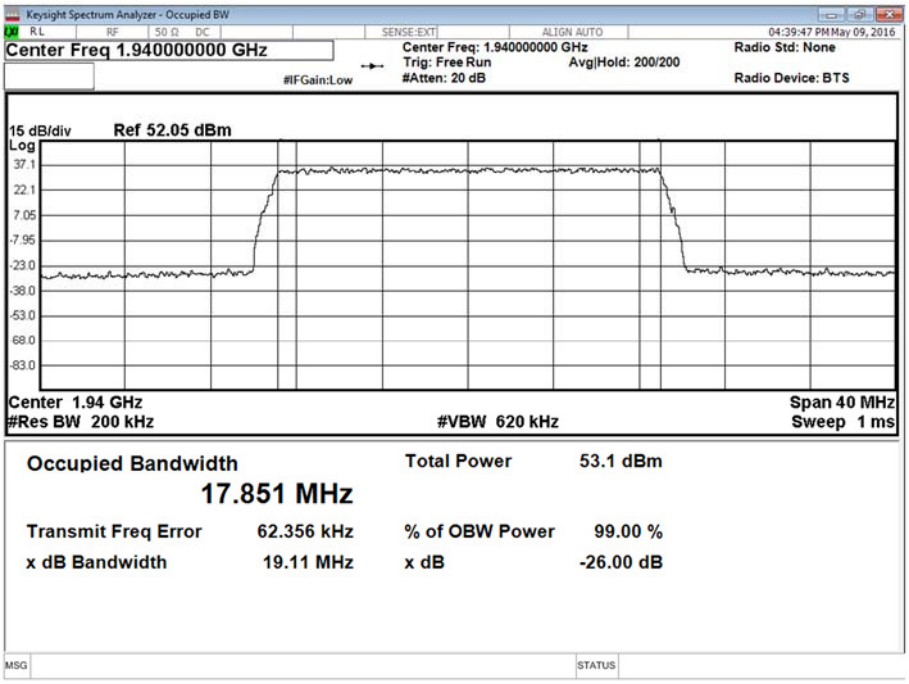
Channel Position B - Bandwidth 10.0 MHz - Antenna A



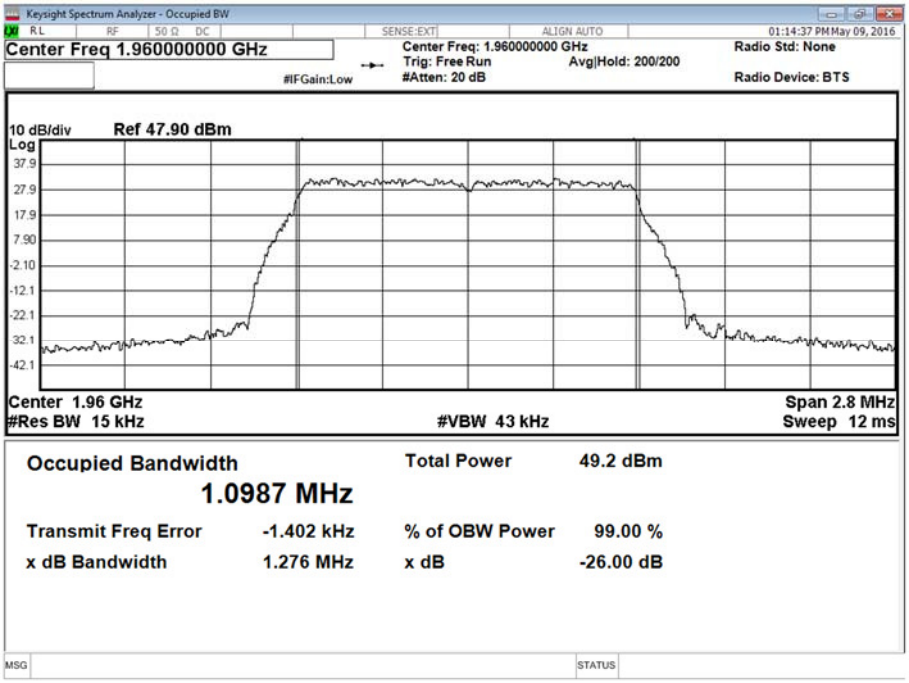
Channel Position B - Bandwidth 15.0 MHz - Antenna A



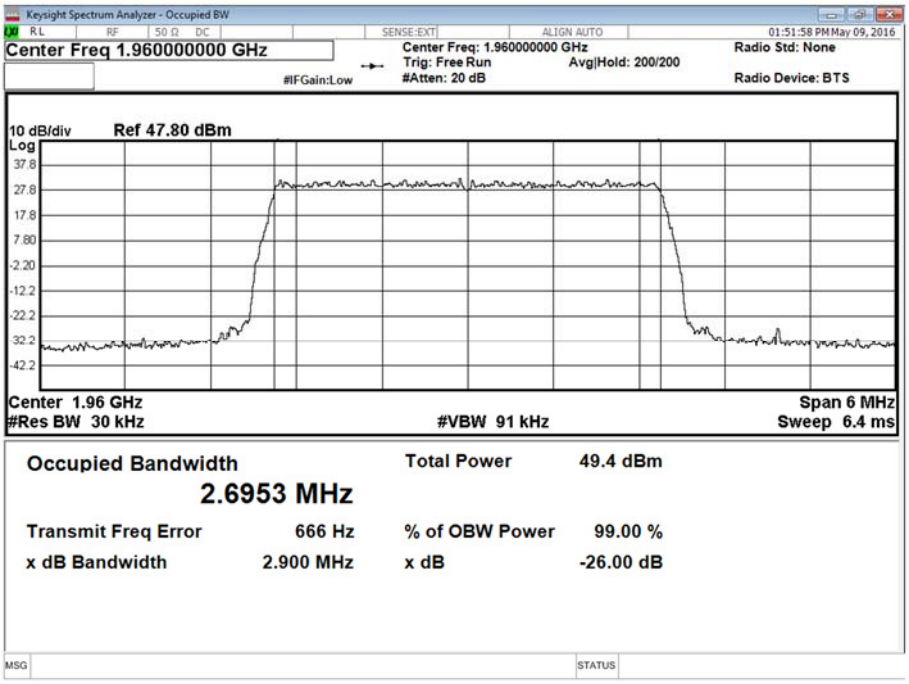
Channel Position B - Bandwidth 20.0 MHz - Antenna A



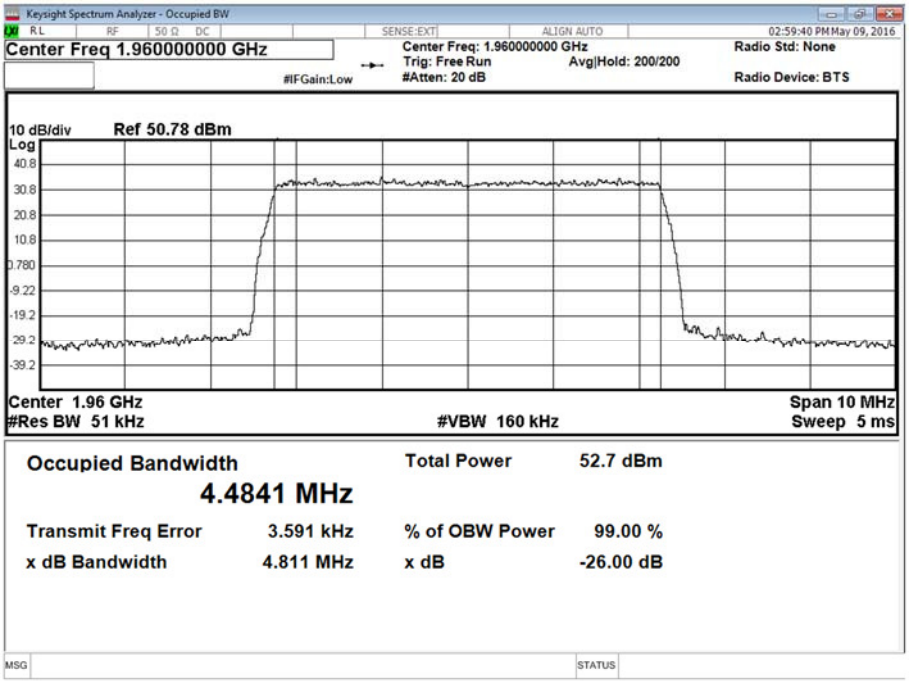
Channel Position M - Bandwidth 1.4 MHz - Antenna A



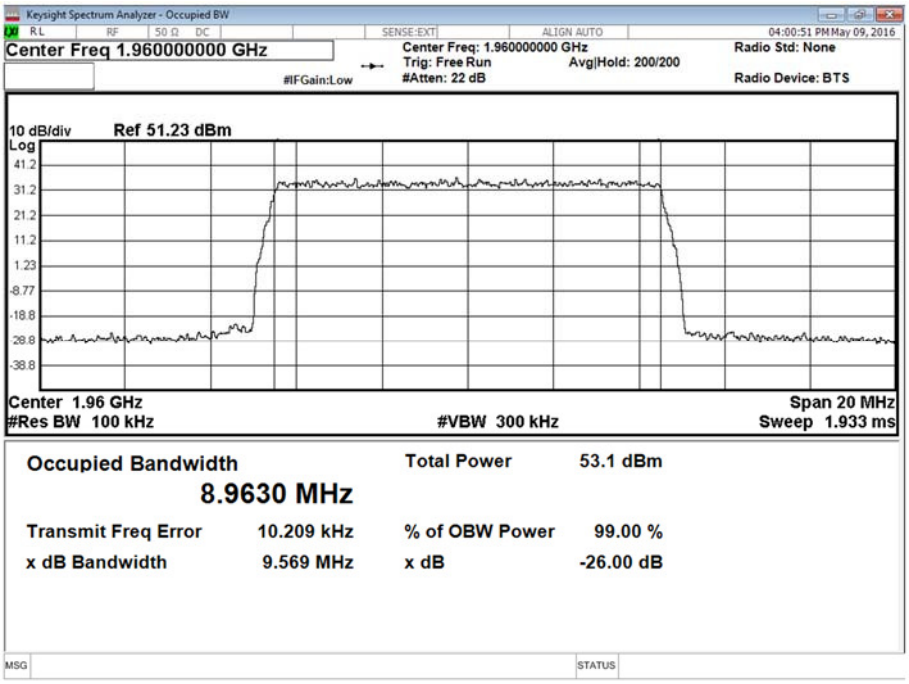
Channel Position M - Bandwidth 3.0 MHz - Antenna A



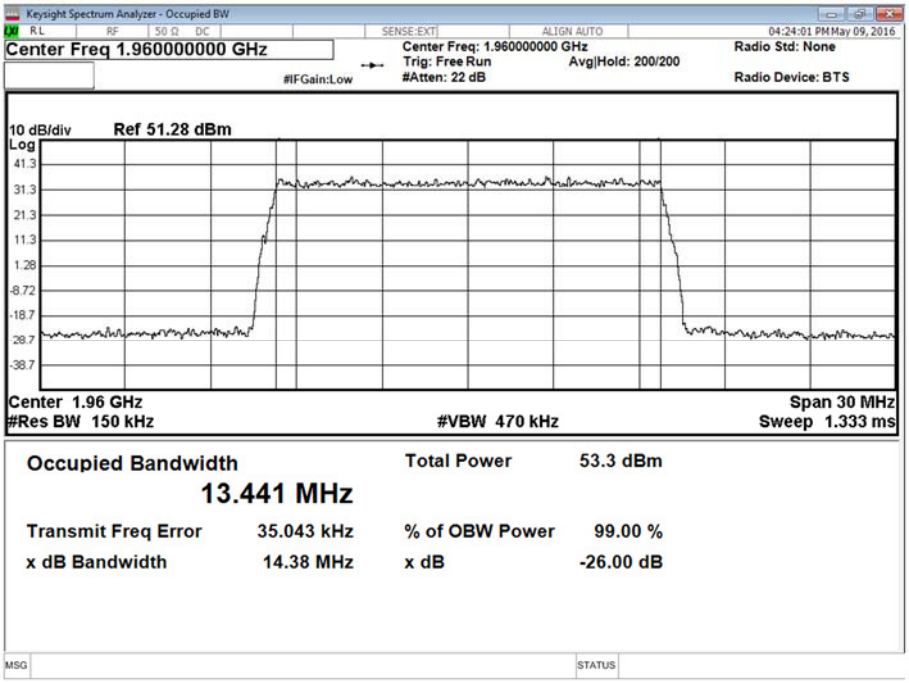
Channel Position M - Bandwidth 5.0 MHz - Antenna A



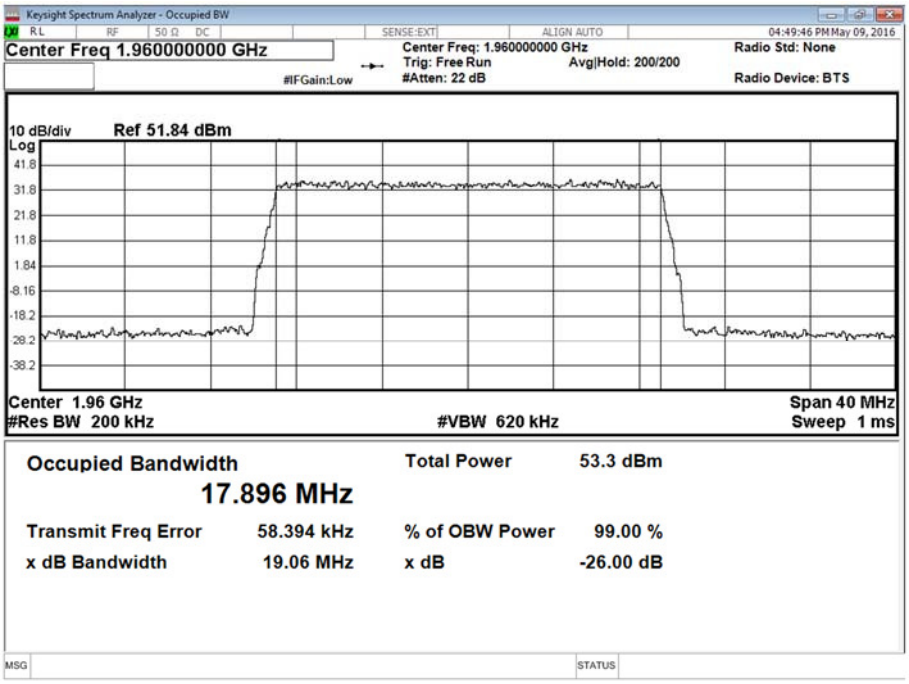
Channel Position M - Bandwidth 10.0 MHz - Antenna A



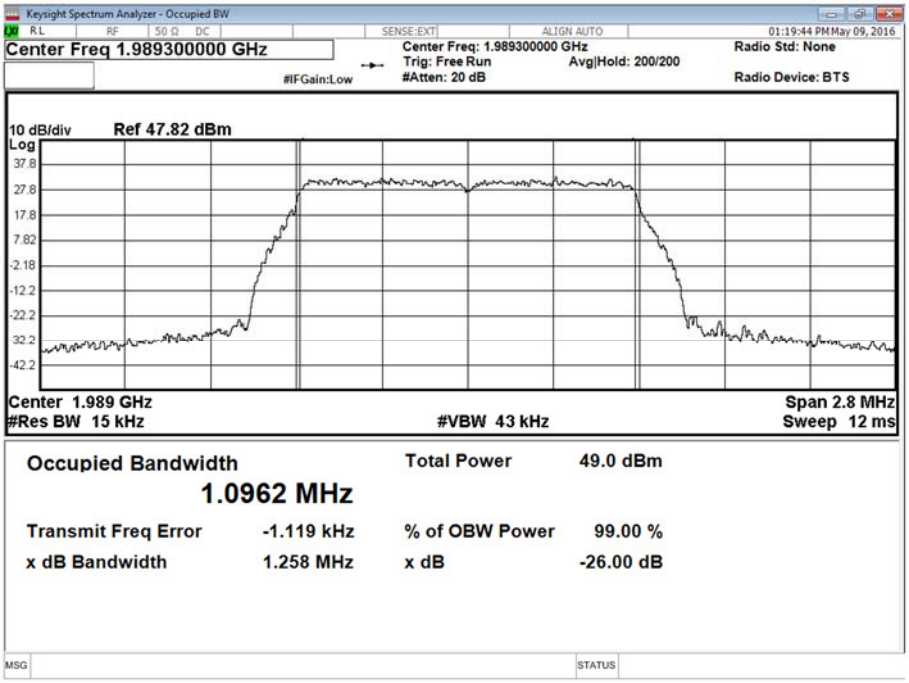
Channel Position M - Bandwidth 15.0 MHz - Antenna A



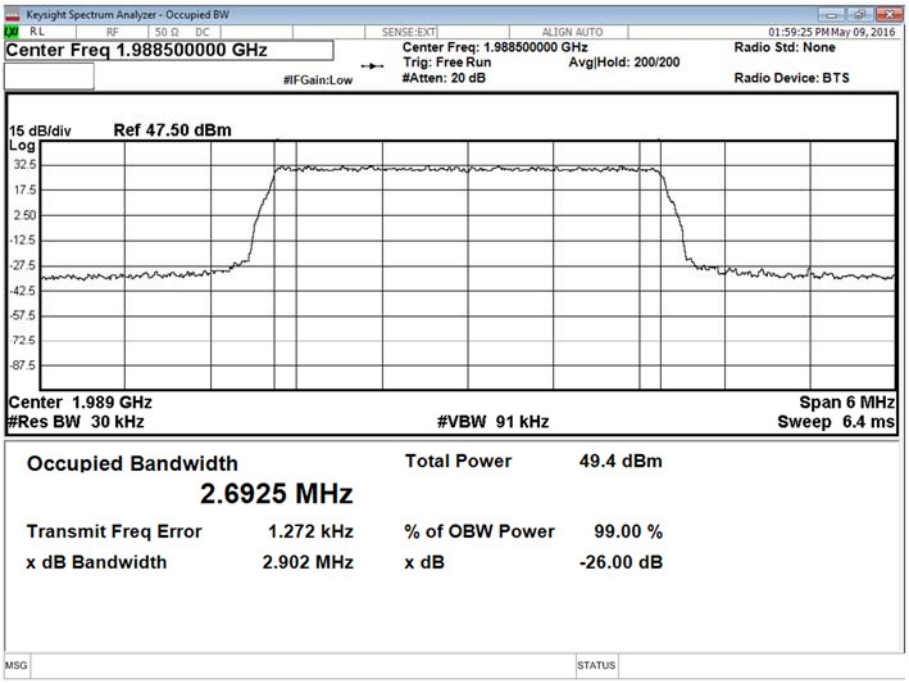
Channel Position M - Bandwidth 20.0 MHz - Antenna A



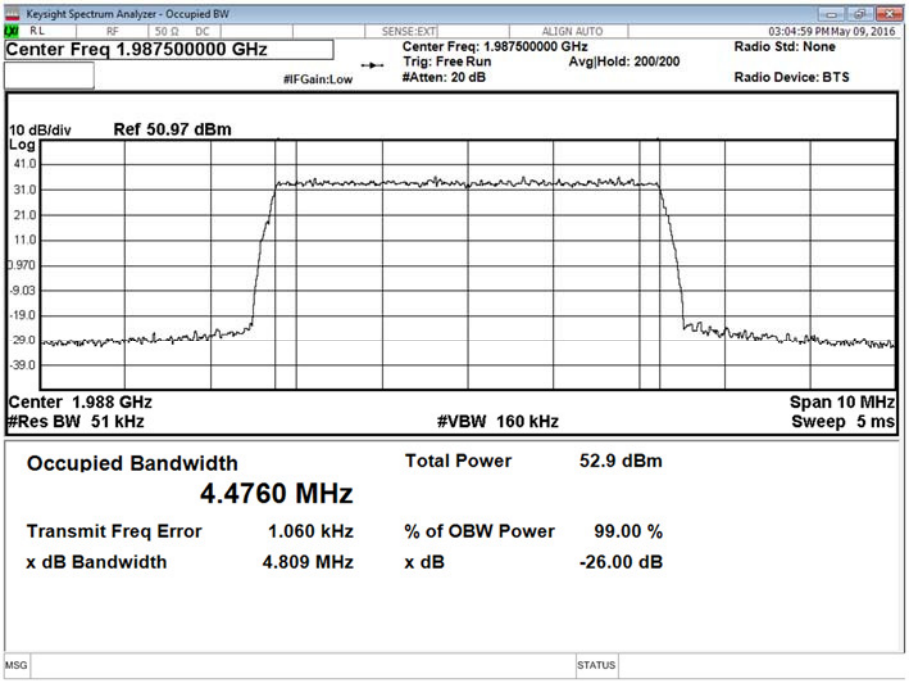
Channel Position T - Bandwidth 1.4 MHz - Antenna A



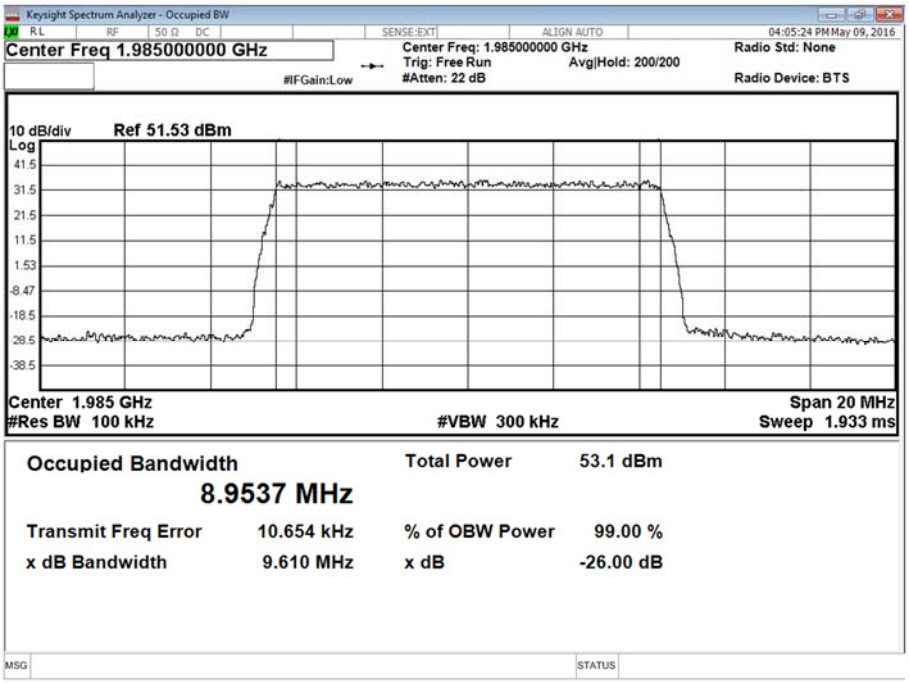
Channel Position T - Bandwidth 3.0 MHz - Antenna A



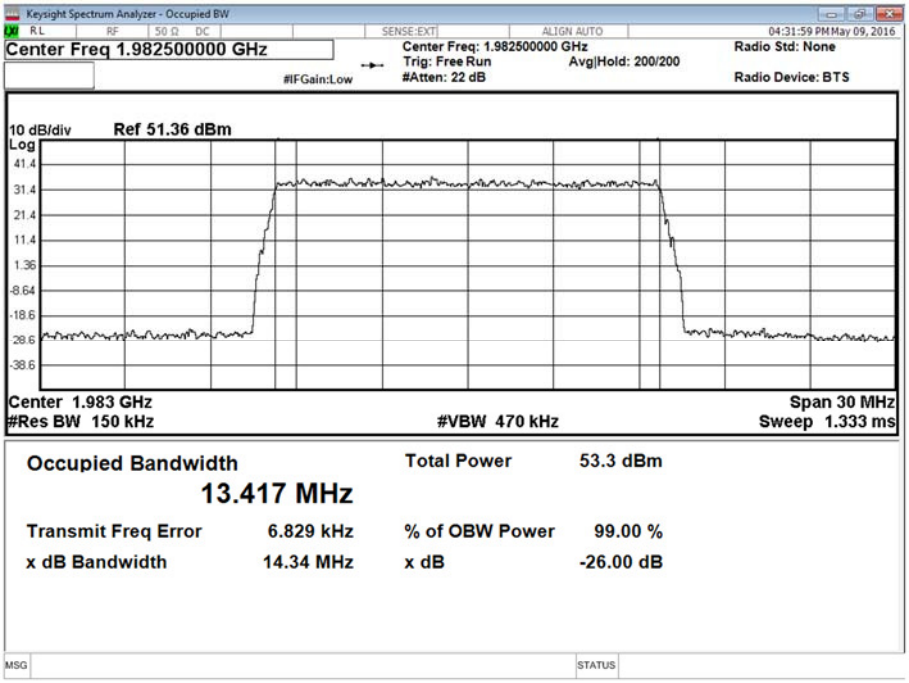
Channel Position T - Bandwidth 5.0 MHz - Antenna A



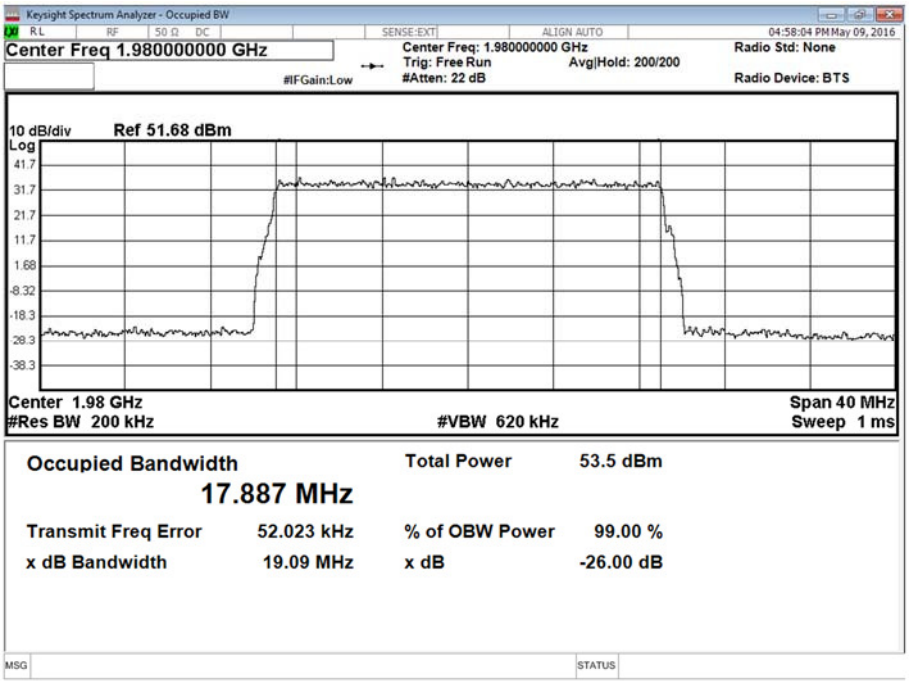
Channel Position T - Bandwidth 10.0 MHz - Antenna A



Channel Position T - Bandwidth 15.0 MHz - Antenna A



Channel Position T - Bandwidth 20.0 MHz - Antenna A



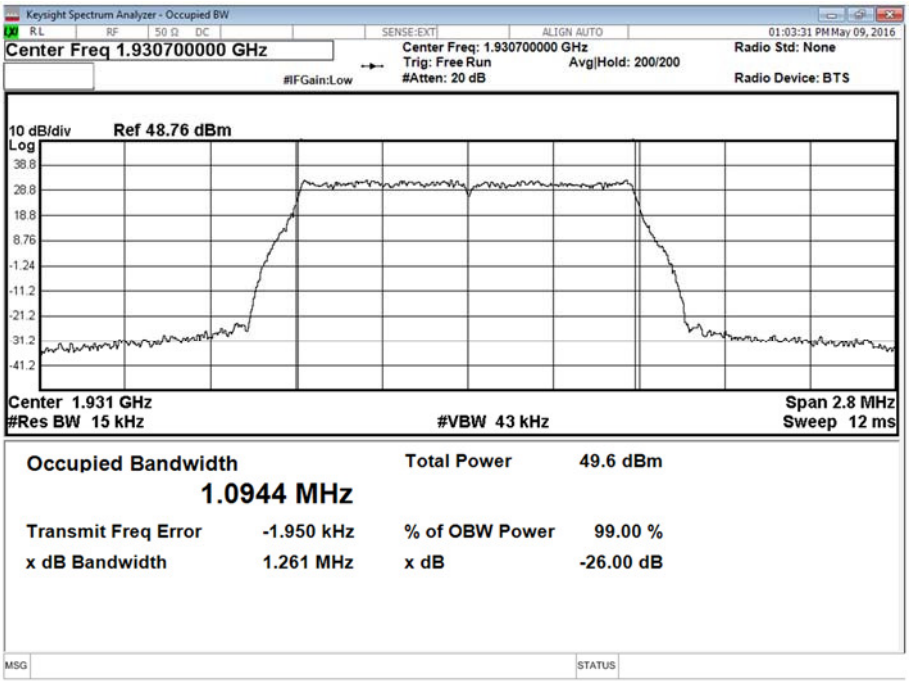
Configuration 1

LTE SC, Antenna B

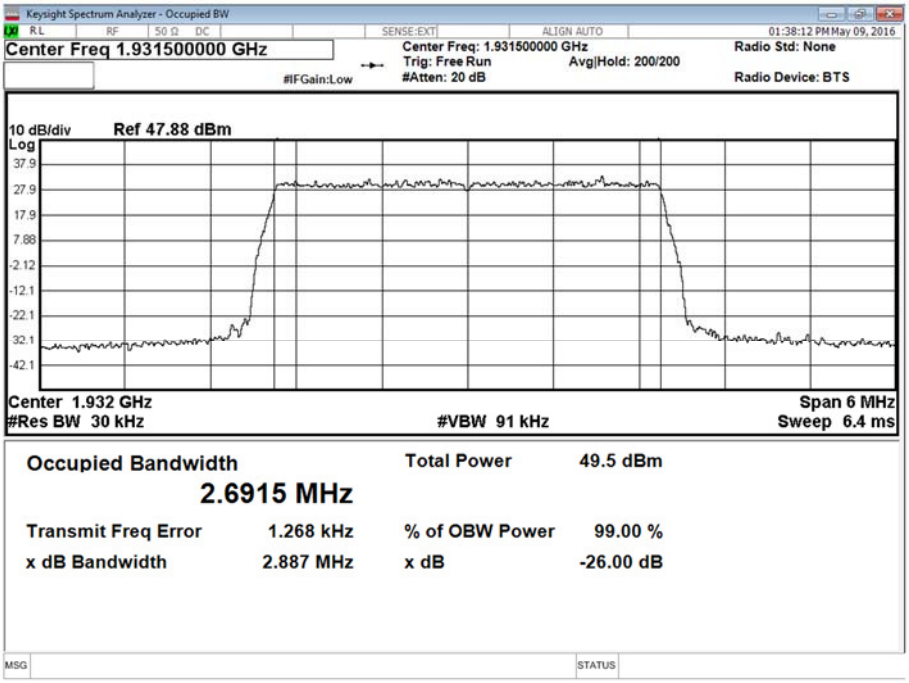
Maximum Output Power 43.0 dBm for 1.4 and 3 MHz bandwidths, 46.0 dBm for 5, 10, 15, and 20 MHz

Carrier Bandwidth / Modulation	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
1.4 MHz / QPSK	1,094.42	1,261.31	1,095.15	1,267.83	1,094.17	1,266.91
3.0 MHz / QPSK	2,691.50	2,887.20	2,692.98	2,895.06	2,694.60	2,898.41
5.0 MHz / QPSK	4,484.18	4,803.00	4,482.29	4,807.06	4,482.73	4,794.72
10.0 MHz / QPSK	8,949.62	9,589.41	8,950.49	9,574.30	8,949.66	9,549.50
15.0 MHz / QPSK	13,427.04	14,380.50	13,432.11	14,273.14	13,411.05	14,345.27
20.0 MHz / QPSK	17,849.96	19,207.72	17,869.35	19,122.51	17,890.85	19,144.63

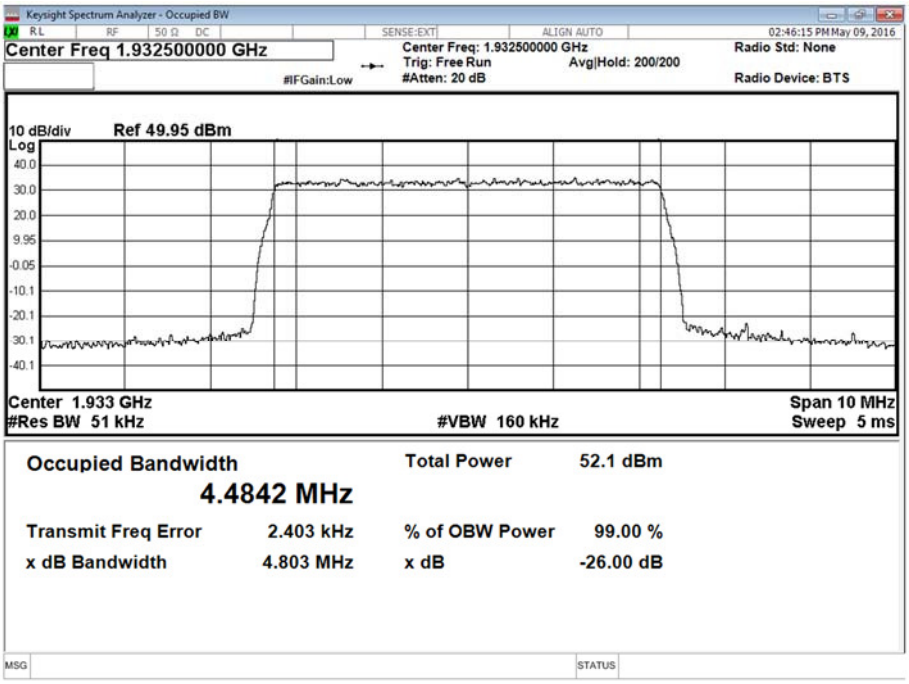
Channel Position B - Bandwidth 1.4 MHz - Antenna B



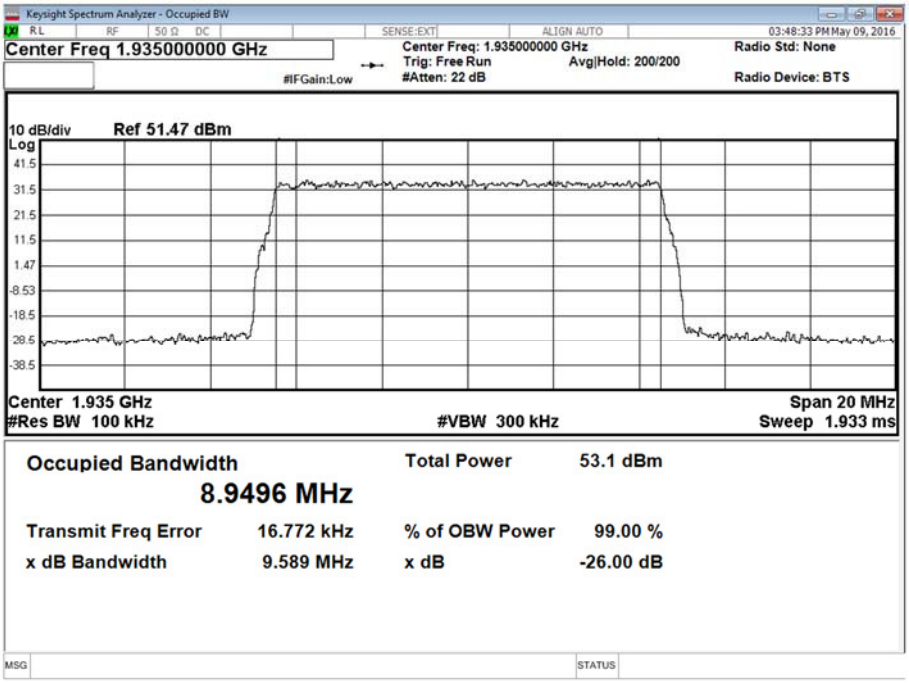
Channel Position B - Bandwidth 3.0 MHz - Antenna B



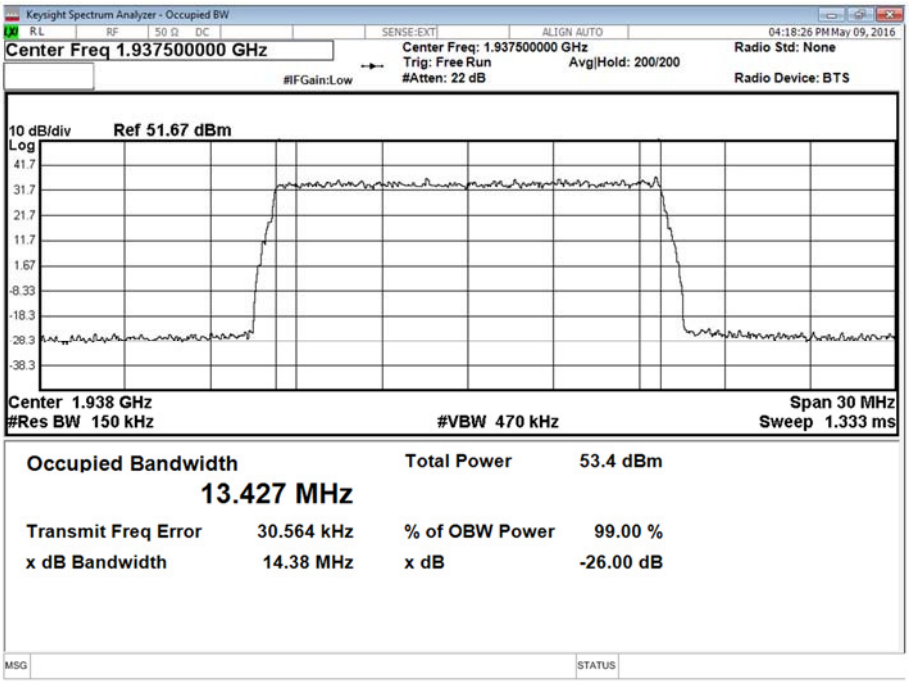
Channel Position B - Bandwidth 5.0 MHz - Antenna B



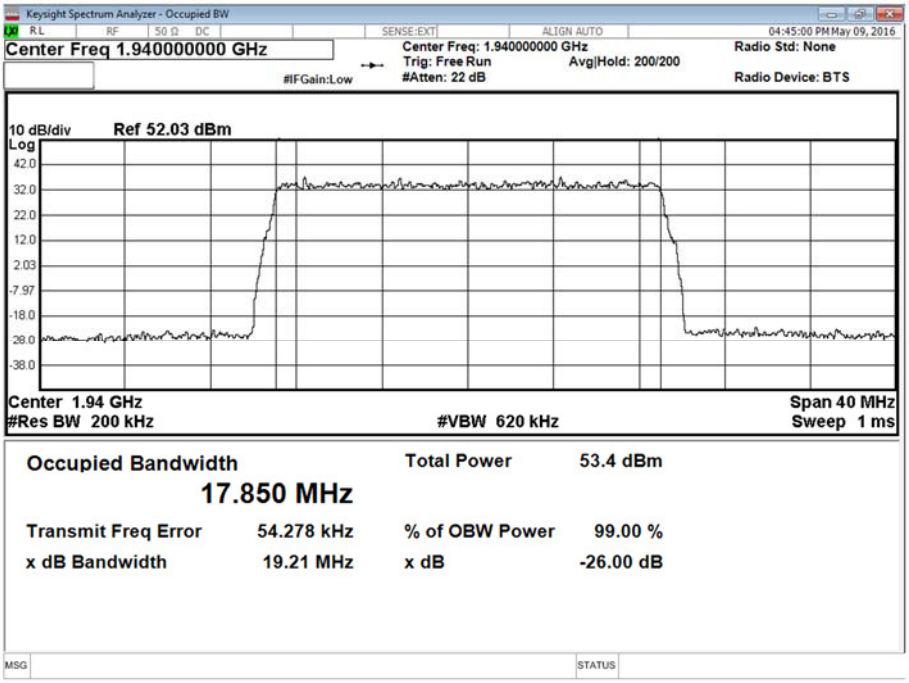
Channel Position B - Bandwidth 10.0 MHz - Antenna B



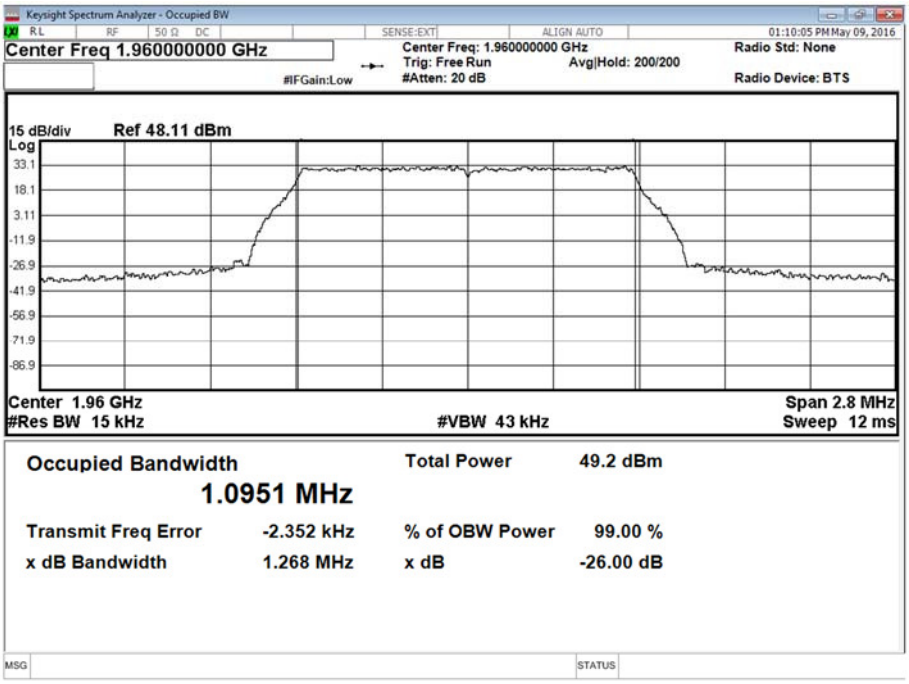
Channel Position B - Bandwidth 15.0 MHz - Antenna B



Channel Position B - Bandwidth 20.0 MHz - Antenna B



Channel Position M - Bandwidth 1.4 MHz - Antenna B



Channel Position M - Bandwidth 3.0 MHz - Antenna B