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Report On

FCC and IC Testing of the
Ericsson WCDMA, LTE and GSM RRUS 32A B2 (1900 MHz)
Base Station Radio in accordance with FCC CFR 47 Part 2 and 24 and
Industry Canada RSS-133 and RSS-GEN

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161418-1
IC: 287AB-AS1614181

PREPARED BY

Neil Rousell
Senior Engineer (RF)

APPROVED BY

Nic Forsyth
Authorised Signatory

DATED

23 March 2016

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Product Service

SECTION 1

REPORT INFORMATION



Product Service

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	349 Terry Fox Drive Ottawa Ontario K2K 2V6 Canada
Product Name	RRUS 32A B2
Product Number	KRC 161 418/1
IC Model Name	AS1614181
Serial Number(s)	D16R536320
Software Version	CXP9017316/5_R60KM
Hardware Version	R1C
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	01 February 2016
Finish of Test	19 February 2016
Name of Engineer(s)	Neil Rousell
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	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 Emissions	Pass*
-	-	-	-	6.6	Receiver Spurious Emissions	Pass*

*- Reference Nemko Canada Inc. EMC Test Report: Reference Number 305068-1TRFWL-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 RRUS 32A B2 / KRC 161 418/1 supports single, dual, three and four carrier operation from either a single, dual or four 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 modes 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 RRUS 32A B2 / KRC 161 418/1 supports WCDMA, LTE and GSM carriers 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 (± 1 MHz) and Conducted Spurious Emissions measurements were performed on all RF Ports using a test limit accounting for MIMO operation with 4 ports. All RF ports were tested for RF Carrier Power and results recorded using the Measure and Sum approach to account for MIMO operation. The test limits shown are representative of the worst case. All testing was performed with the EUT transmitting at maximum RF output power unless otherwise stated.

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

Channel Configurations

WCDMA B2 (1930 MHz – 1990 MHz)

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
1	W	1	5 / 4.2	1932.4	1960	1987.6
2	W	2	5	1932.4 + 1967.6	1942.4 + 1977.6	1952.4 + 1987.6

Table 1

LTE B2 (1930 MHz – 1990 MHz)

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
3	L	1	1.4	1930.7	1960	1989.3
3	L	1	3	1931.5	1960	1988.5
3	L	1	5	1932.5	1960	1987.5
3	L	1	10	1935	1960	1985
3	L	1	15	1937.5	1960	1982.5
3	L	1	20	1940	1960	1980
4	L	2	1.4	1930.7 + 1969.3	1940.7 + 1979.3	1950.7 + 1989.3
4	L	2	3	1931.5 + 1968.5	1941.5 + 1978.5	1951.5 + 1988.5
4	L	2	5	1932.5 + 1967.5	1942.5 + 1977.5	1952.5 + 1987.5
4	L	2	10	1935 + 1965	1945 + 1975	1955 + 1985
4	L	2	15	1937.5 + 1962.5	1947.5 + 1972.5	1957.5 + 1982.5
4	L	2	20	1940 + 1960	1950 + 1970	1960 + 1980
5	L	3	1.4	1930.7 + 1932.1 + 1969.3	1940.7 + 1942.1 + 1979.3	1950.7 + 1952.1 + 1989.3
5	L	3	3	1931.5 + 1934.5 + 1968.5	1941.5 + 1944.5 + 1978.5	1951.5 + 1954.5 + 1988.5
5	L	3	5	1932.5 + 1937.5 + 1967.5	1942.5 + 1947.5 + 1977.5	1952.5 + 1957.5 + 1987.5
5	L	3	10	1935 + 1945 + 1965	1945 + 1955 + 1975	1955 + 1965 + 1985

Table 2

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

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				BRFBW	MRFBW	TRFBW
6	W + L	2	5 + 1.4	1932.4 + 1969.3	1942.4 + 1979.3	1952.4 + 1989.3
7	W + W + L + L	4	5 + 5 + 15 + 15	1932.4 + 1937.4 + 1947.5 + 1962.5	1942.4 + 1947.4 + 1957.5 + 1972.5	1952.4 + 1957.4 + 1967.5 + 1982.5

Table 3

GSM/WCDMA (MM) B2 (1930 MHz – 1990 MHz)

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				BRFBW	MRFBW	TRFBW
8	G + W	2	0.2 + 5	1930.4* + 1967.6	1940.2 + 1977.6	1950.2 + 1987.6
9	G + W + W + G	4	0.2 + 5 + 5 + 0.2	1930.4* + 1937.6 + 1942.4 + 1949.8	1950.2 + 1957.6 + 1962.4 + 1969.8	1970.2 + 1977.6 + 1982.4 + 1989.6*

Table 4

Note: * GSM carrier moved in-band by 200 KHz on band edge

GSM/LTE (MM) B2 (1930 MHz – 1990 MHz)

Configuration	RAT	No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				BRFBW	MRFBW	TRFBW
10	G + L	2	0.2 + 20	1930.4* + 1960	1940.2 + 1970	1950.2 + 1980
11	G + L + L + G	4	0.2 + 5 + 5 + 0.2	1930.4* + 1937.5 + 1942.5 + 1949.8	1950.2 + 1957.5 + 1962.5 + 1969.8	1970.2 + 1977.5 + 1982.5 + 1989.6*

Table 5

Note: * GSM carrier moved in-band by 200 KHz on band edge

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Antenna Radio Unit (Multi-standard)
MANUFACTURER	Ericsson
TYPE	Remote Radio Base Station
PART NUMBER	KRC 161 418/1
SERIAL NUMBER	D16R536320
HARDWARE VERSION	R1C
SOFTWARE VERSION	CXP9017316/5 R60KM
TRANSMITTER OPERATING RANGE	1930MHz – 1990MHz
RECEIVER OPERATING RANGE	1850MHz – 1910MHz
COUNTRY OF ORIGIN	Sweden
INTERMEDIATE FREQUENCIES	Tx: Direct Conversion, Rx: IF1=358.4MHz, IF2=80.64MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE 1M4D W7D 3M0D W7D 5M0D W7D 10M0 W7D 15M0 W7D 20M0 W7D WCDMA 5M0D F9W GSM 245KGXW EGPRS 245KG7W
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM, 64QAM WCDMA: QPSK, 16QAM, 64QAM GSM/EGPRS: GMSK, 8-PSK, AQPSK
HIGHEST INTERNALLY GENERATED FREQUENCY	2248.4MHz
OUTPUT POWER (W or dBm)	4 x 30W (44.77dBm)
FCC ID	TA8AKRC161418-1
INDUSTRY CANADA ID	287AB-AS1614181
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RRUS 32AB2 (KRC 161 418/1) is a multi-standard Antenna Radio Unit forming part of the Ericsson Radio Base Station (RBS) equipment. The RRUS provides radio access for mobile and fixed devices and is intended for the outdoor environment, designed to be co-located and directly mated with a compatible antenna. The radio operates over 4 Transmit ports in Single, Multi-Carrier, Mixed Mode and MIMO transmission with a maximum rated RF Output of 30W 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: 8 March 2016

Declaration of Build Status Serial Number: D16R536320

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 RRUS 32A B2 (KRC 161 418/1) is a multi-standard radio forming part of Ericsson's RBS 6000 series Radio Base Station (RBS) equipment. The Antenna Radio Unit product provides radio access for mobile and fixed devices and is intended for the outdoor environment. Classed under ITE (Information Technology Equipment), the RRUS is designed to be co-located and directly mated with a compatible antenna, specified for path loss optimization. A fibre optic interface provides the RRUS / RBS control and digital communications between the Radio and RBS. The location of the RRUS with respect to the RBS is limited to a distance dictated by the limitations of the fibre link.

The RRUS 32A B2 supports four (4) Transmit / Receive ports operating in the WCDMA / LTE / GSM Band 2 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 4 transmit ports in Single, Multi-Carrier, Mixed Mode, and MIMO transmission with a maximum rated RF output power of 30W per port over an operational temperature of -40° C to +55° C.

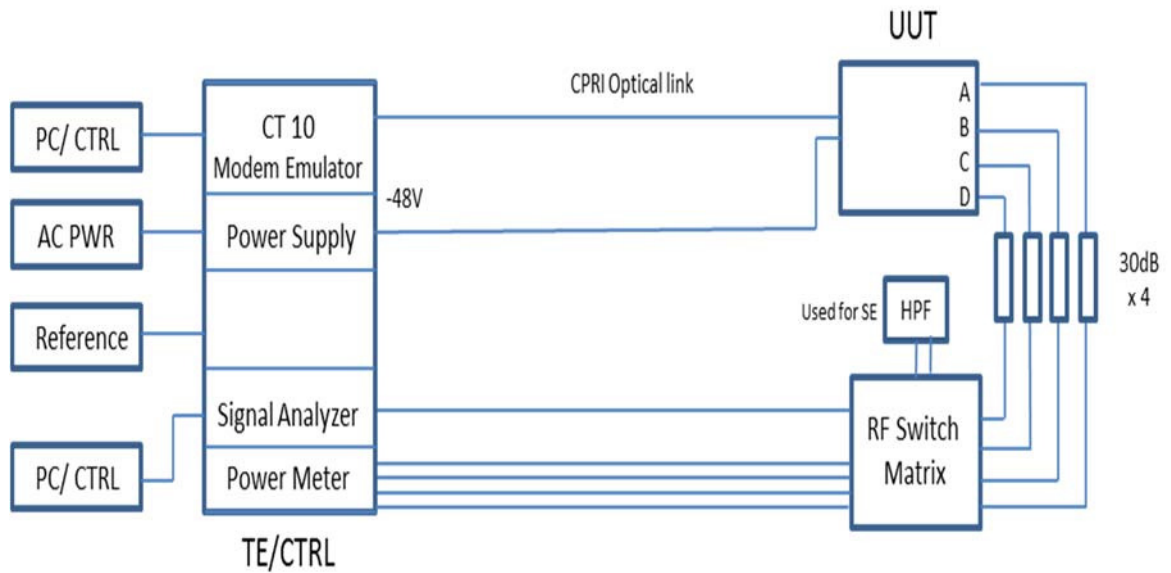
The RRUS is mounted directly behind a specified antenna along with a Fan Tray, which provides Forced Air Cooling for radio operation. The Fan Tray is powered and controlled from the RRUS via closed loop telemetry to maintain thermals through redundant variable speed fans to optimize air flow.

For directional optimization, the RRUS product has an active RET (Remote Electronic Tilt) function. Power for this option is provided via the RRUS RET interface (30V @ < 2A).

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

1.6 TEST SETUP

Test Setup, Conducted Measurement:



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

Test Setup, Radiated Measurement:

Reference Nemko Canada Inc. EMC Test Report: Reference Number 305068-1TRFWL-R1.

1.7 TEST CONDITIONS

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

The EUT was powered from a -48V DC supply.

1.8 DEVIATION FROM THE STANDARD

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

1.9 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.10 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV SÜD Product Service conducted the following tests at Ericsson in Ottawa, Canada.

1.11 ADDITIONAL INFORMATION

Testing performed in the presence of Mr Denis Lalonde and Mr Mark McMullin.

Prior to commencement of the test, measurements were made in different carrier configurations to determine the worst case operating mode. The results reported indicate the identified worst case operating modes of the BTS. In addition, tests were performed on all ports to confirm that each radio was electrically identical.



Product Service

SECTION 2

TEST DETAILS

2.1 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

02, 03, 04, 08, 09 and 10 February 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	22.9 - 26.6°C
Relative Humidity	20.4 - 25.4%

2.1.5 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 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.

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).

In order to confirm the Average Equivalent Isotropically Radiated Power (EIRP) a Power Spectral Density (PSD) measurement was made in a 1MHz bandwidth.

Testing was performed on all ports.

An antenna gain of 17.9 dBi was applied to all results.

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

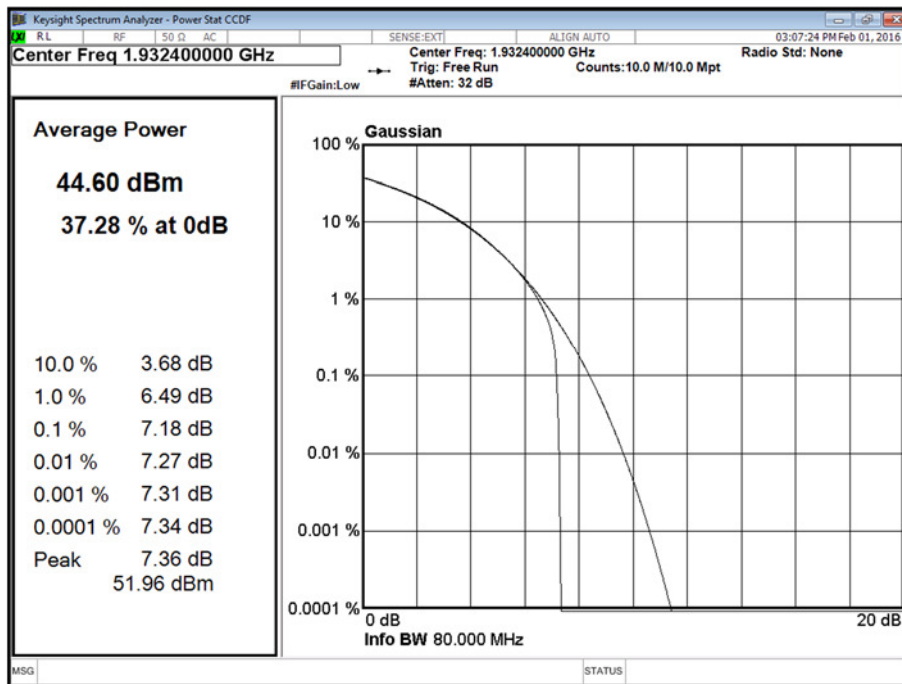
2.1.6 Test Results

Configuration 1

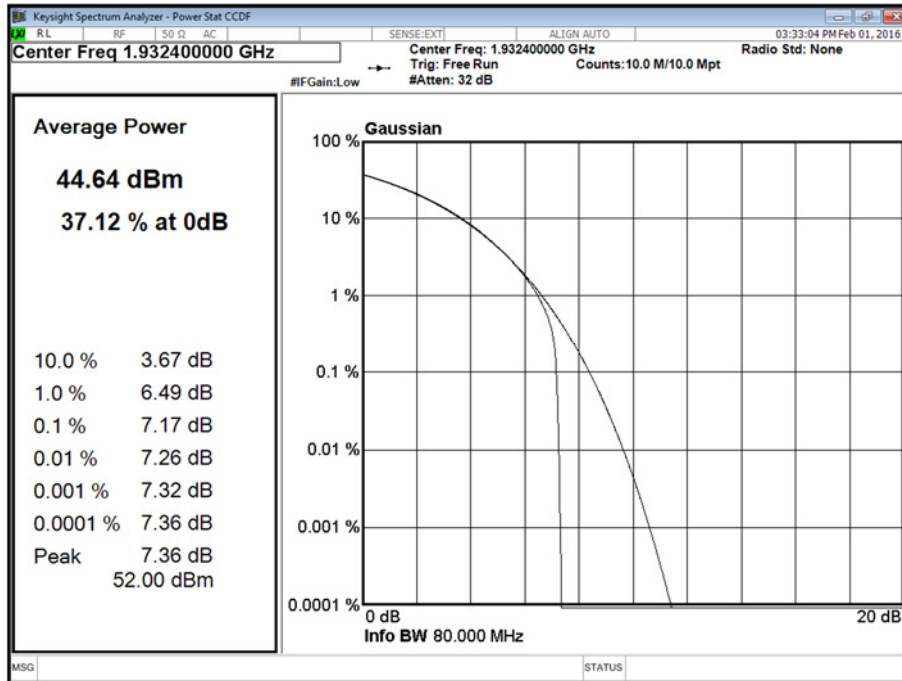
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position B						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
16QAM	5.00	A	7.18	44.72	39.61	62.62	57.51	1,828.1002	563.6377
		B	7.17	44.71	39.54	62.61	57.44	1,823.8957	554.6257
		C	7.19	44.71	39.56	62.61	57.46	1,823.8957	557.1857
		D	7.19	44.45	39.26	62.35	57.16	1,717.9084	519.9960
Total			-	47.60	42.45	65.50	60.35	3,546.0086	1,083.6337

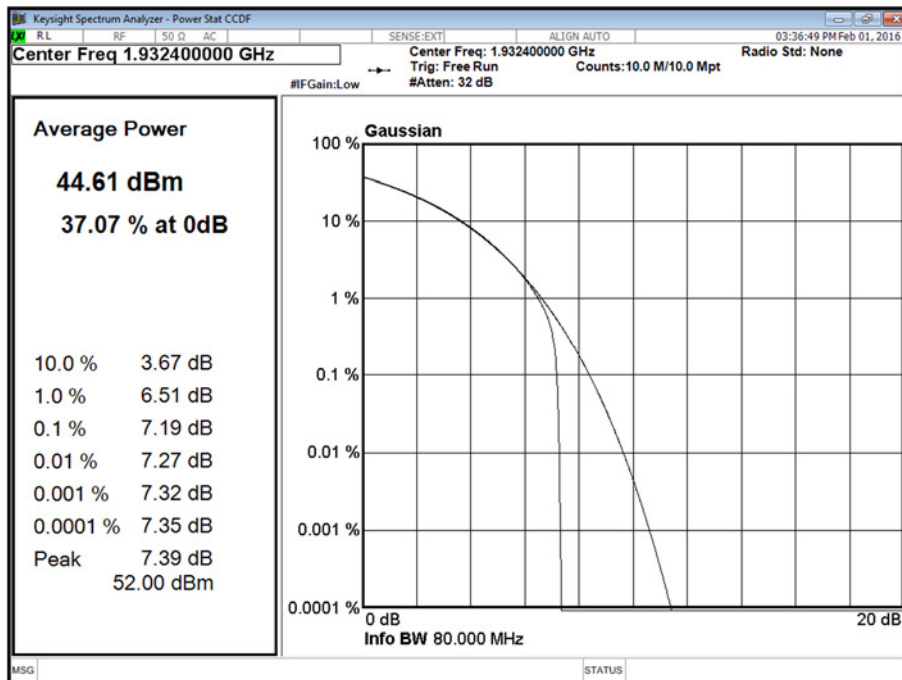
Channel Position B - Bandwidth 5.0 MHz - Antenna A



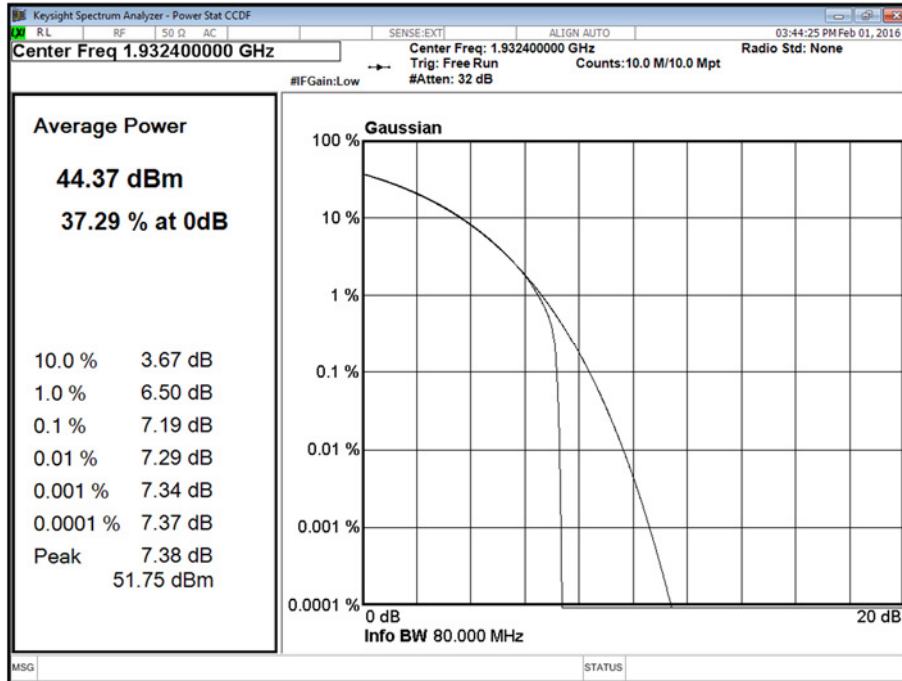
Channel Position B - Bandwidth 5.0 MHz - Antenna B



Channel Position B - Bandwidth 5.0 MHz - Antenna C



Channel Position B - Bandwidth 5.0 MHz - Antenna D

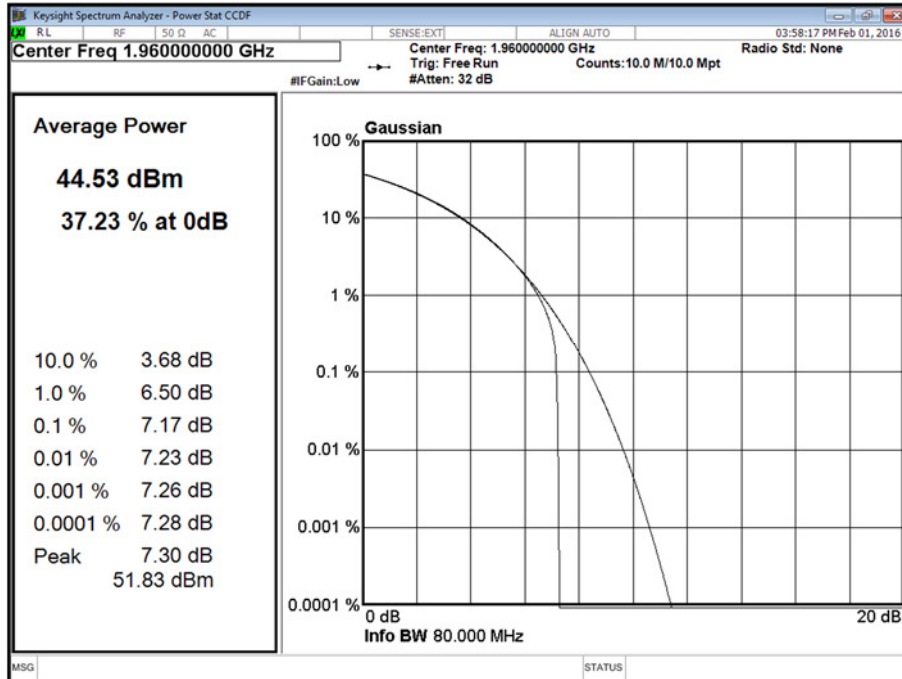


Configuration 1

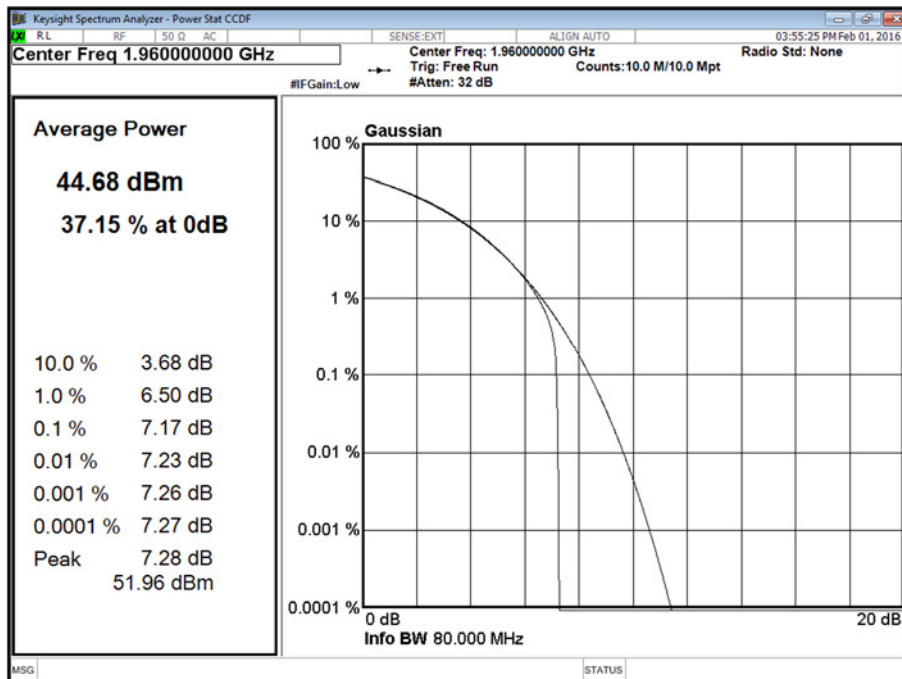
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position M						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
16QAM	5.00	A	7.17	44.62	39.40	62.52	57.30	1,786.4876	537.0318
		B	7.17	44.76	39.52	62.66	57.42	1,845.0154	552.0774
		C	7.17	44.82	39.56	62.72	57.46	1,870.6821	557.1857
		D	7.17	44.43	39.20	62.33	57.10	1,710.0153	512.8614
Total			-	47.54	42.31	65.44	60.21	3,496.5029	1,049.8932

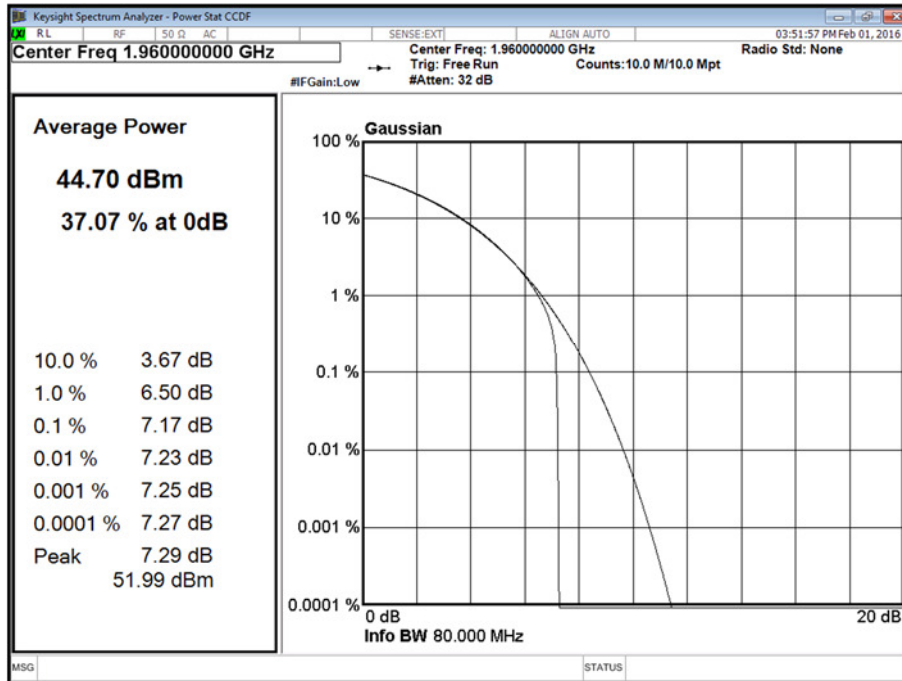
Channel Position M - Bandwidth 5.0 MHz - Antenna A



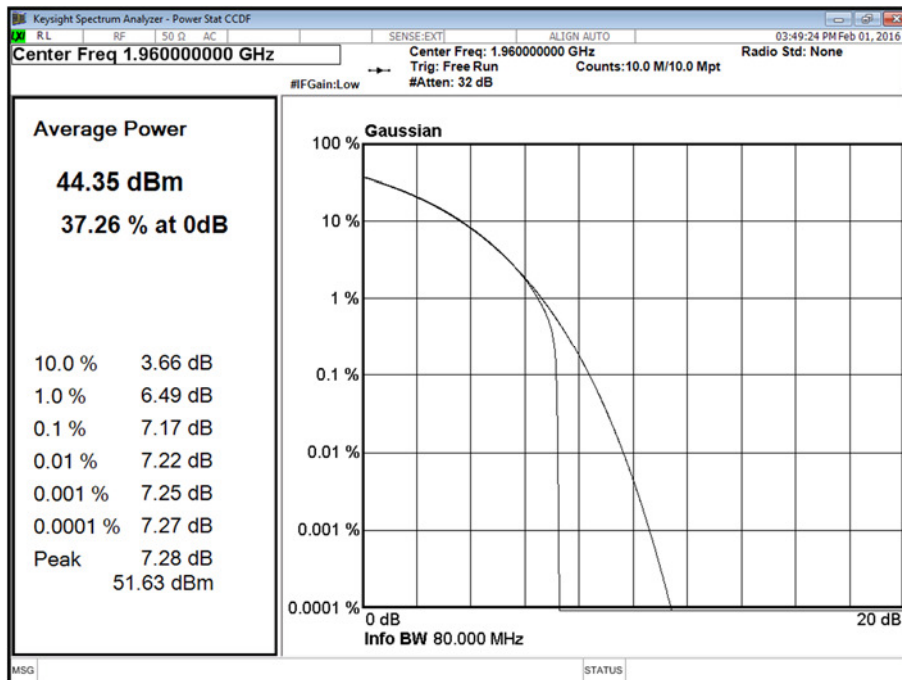
Channel Position M - Bandwidth 5.0 MHz - Antenna B



Channel Position M - Bandwidth 5.0 MHz - Antenna C



Channel Position M - Bandwidth 5.0 MHz - Antenna D

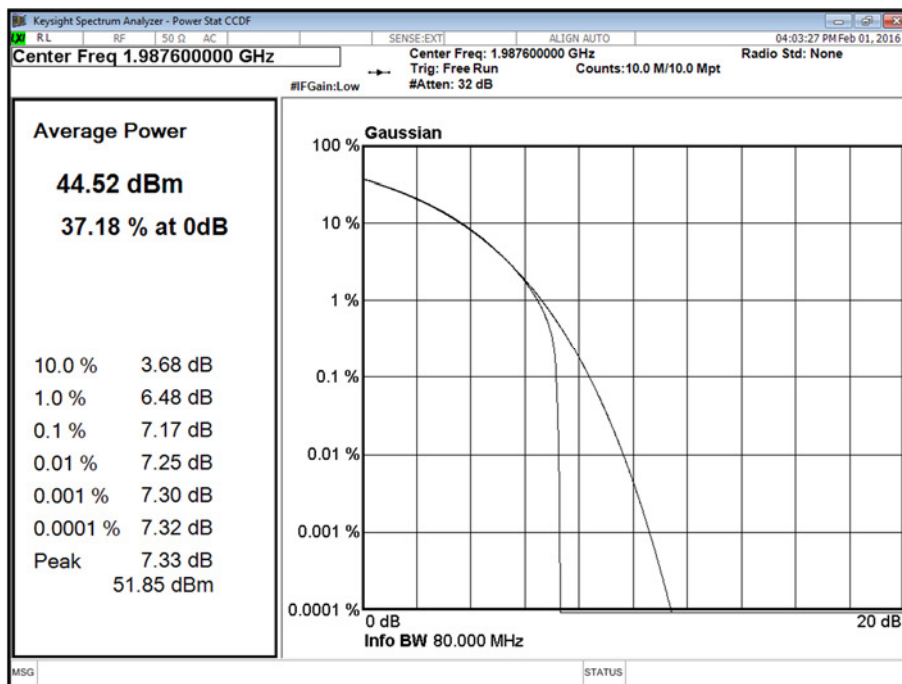


Configuration 1

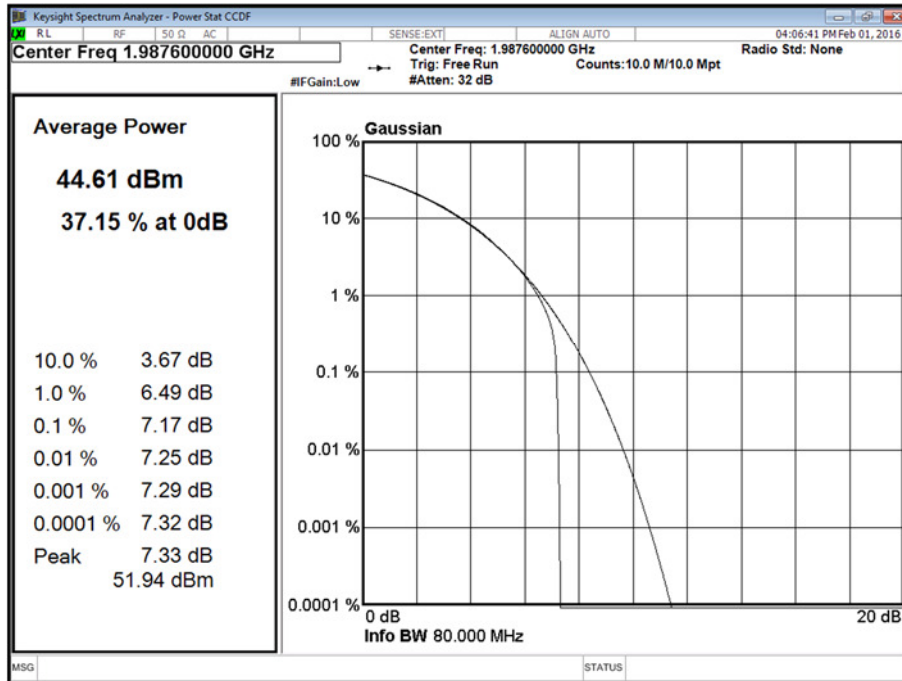
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position T						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
16QAM	5.00	A	7.17	44.49	39.48	62.39	57.38	1,733.8040	547.0160
		B	7.17	44.63	39.66	62.53	57.56	1,790.6059	570.1643
		C	7.16	44.62	39.60	62.52	57.50	1,786.4876	562.3413
		D	7.16	44.38	39.28	62.28	57.18	1,690.4409	522.3962
Total			-	47.45	42.39	65.35	60.29	3,424.2449	1,069.4122

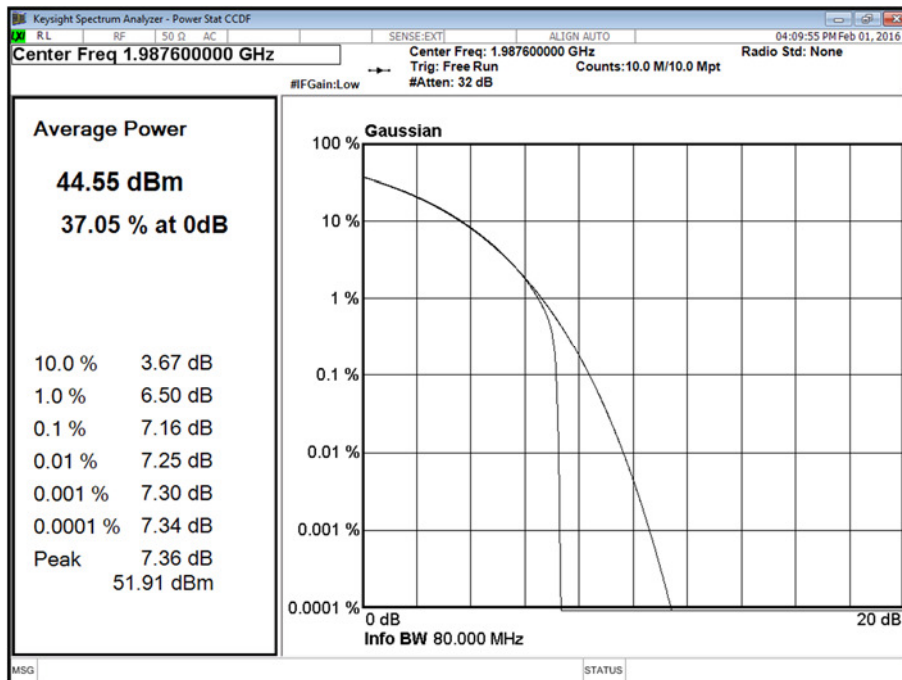
Channel Position T - Bandwidth 5.0 MHz - Antenna A



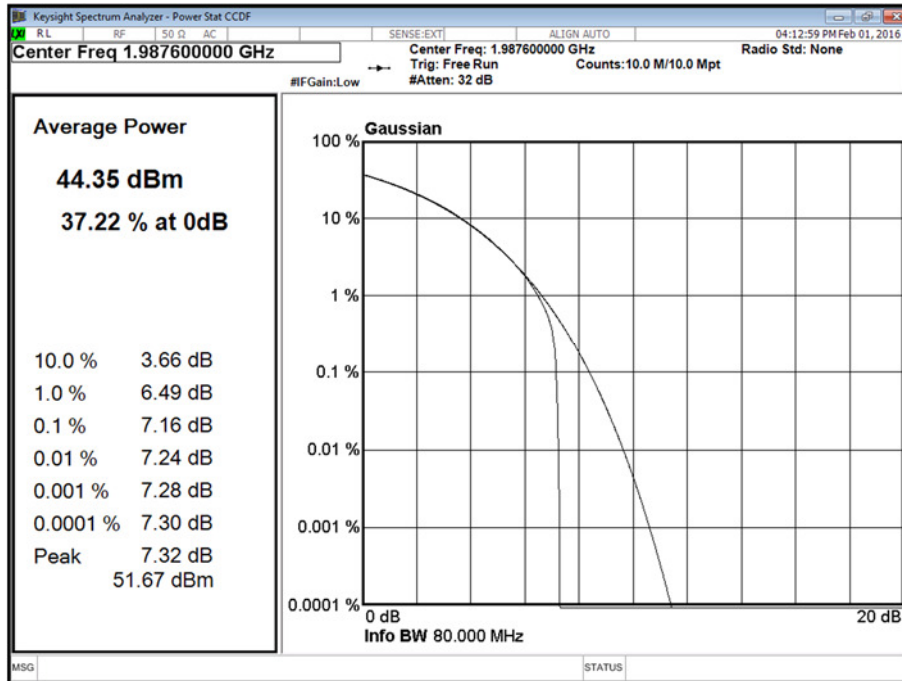
Channel Position T - Bandwidth 5.0 MHz - Antenna B



Channel Position T - Bandwidth 5.0 MHz - Antenna C



Channel Position T - Bandwidth 5.0 MHz - Antenna D



Configuration 2

Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position B						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
16QAM	5.00	A	-	44.58	36.53	62.48	54.43	1,770.1090	277.3320
		B	-	44.56	36.59	62.46	54.49	1,761.9760	281.1901
		C	-	44.49	36.55	62.39	54.45	1,733.8040	278.6121
		D	-	44.27	36.46	62.17	54.36	1,648.1624	272.8978
Total			-	47.44	39.51	65.34	57.41	3,418.2713	550.2298

Configuration 2

Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position M						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
16QAM	5.00	A	-	44.45	36.71	62.35	54.61	1,717.9084	289.0680
		B	-	44.61	36.67	62.51	54.57	1,782.3788	286.4178
		C	-	44.61	36.65	62.51	54.55	1,782.3788	285.1018
		D	-	44.28	36.23	62.18	54.13	1,651.9618	258.8213
Total			-	47.38	39.49	65.28	57.39	3,369.8702	547.8893

Configuration 2

Maximum Output Power 44.77 dBm

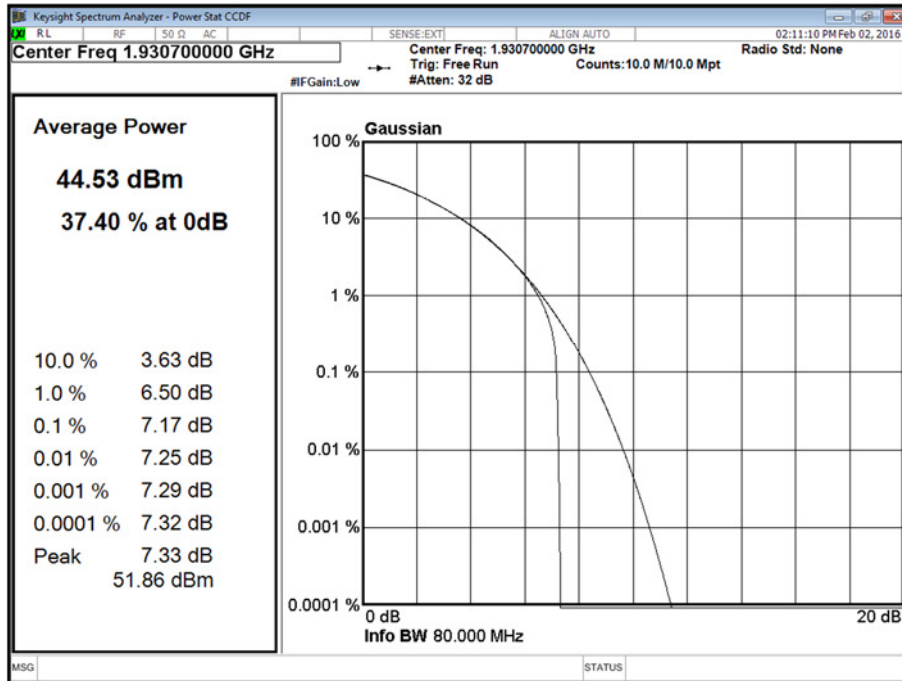
Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position T						
			PAR (dB)	Average Power		Average EIRP			
dBm	dBm/MHz	dBm		dBm/MHz	W	W/MHz			
16QAM	5.00	A	-	44.66	36.55	62.56	54.45	1,803.0177	278.6121
		B	-	44.69	36.46	62.59	54.36	1,815.5157	272.8978
		C	-	44.71	36.82	62.61	54.72	1,823.8957	296.4831
		D	-	44.39	36.57	62.29	54.47	1,694.3378	279.8981
Total			-	47.54	39.57	65.44	57.47	3,497.3555	558.5102

Configuration 3

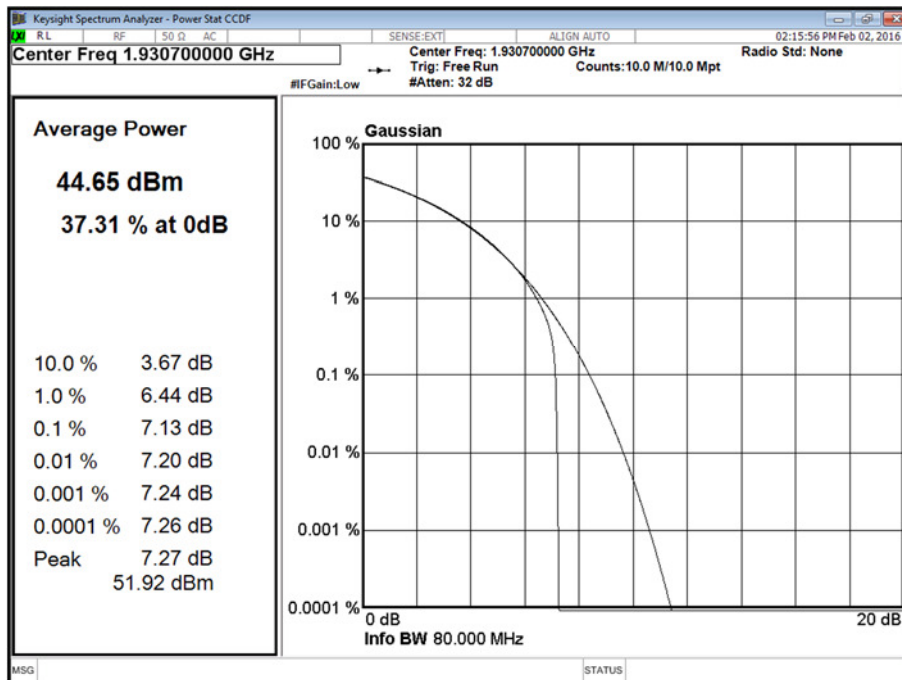
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position B						
			PAR (dB)	Average Power		Average EIRP			
dBm	dBm/MHz	dBm		dBm/MHz	W	W/MHz			
QPSK	1.4	A	7.17	44.61	43.92	62.51	61.82	1,782.3788	1,520.5475
		B	7.13	44.67	43.99	62.57	61.89	1,807.1741	1,545.2544
		C	7.17	44.39	43.74	62.29	61.64	1,694.3378	1,458.8143
		D	7.15	44.35	43.70	62.25	61.60	1,678.8040	1,445.4398
Total			-	47.49	46.82	65.39	64.72	3,461.1828	2,965.9873
QPSK	3.0	A	7.11	44.50	40.70	62.40	58.60	1,737.8008	724.4360
		B	7.07	44.64	40.85	62.54	58.75	1,794.7336	749.8942
		C	7.10	44.36	40.56	62.26	58.46	1,682.6741	701.4553
		D	7.12	44.30	40.49	62.20	58.39	1,659.5869	690.2398
Total			-	47.41	43.61	65.31	61.51	3,397.3877	1,414.6758
QPSK	5.0	A	7.09	44.61	38.57	62.51	56.47	1,782.3788	443.6086
		B	7.11	44.66	38.64	62.56	56.54	1,803.0177	450.8167
		C	7.11	44.56	38.63	62.46	56.53	1,761.9760	449.7799
		D	7.10	44.34	38.38	62.24	56.28	1,674.9429	424.6196
Total			-	47.49	41.49	65.39	59.39	3,457.3216	868.2282
QPSK	10.0	A	7.15	44.43	35.65	62.33	53.55	1,710.0153	226.4644
		B	7.14	44.63	35.83	62.53	53.73	1,790.6059	236.0478
		C	7.14	44.61	36.00	62.51	53.90	1,782.3788	245.4709
		D	7.13	44.49	35.85	62.39	53.75	1,733.8040	237.1374
Total			-	47.47	38.76	65.37	56.66	3,443.8193	463.6018
QPSK	15.0	A	7.21	44.55	33.95	62.45	51.85	1,757.9236	153.1087
		B	7.23	44.60	34.07	62.50	51.97	1,778.2794	157.3983
		C	7.21	44.58	34.17	62.48	52.07	1,770.1090	161.0646
		D	7.20	44.38	33.88	62.28	51.78	1,690.4409	150.6607
Total			-	47.48	36.93	65.38	54.83	3,448.3645	303.7695
QPSK	20.0	A	7.29	44.52	32.81	62.42	50.71	1,745.8222	117.7606
		B	7.28	44.60	33.11	62.50	51.01	1,778.2794	126.1828
		C	7.28	44.70	33.06	62.60	50.96	1,819.7009	124.7384
		D	7.27	44.47	32.95	62.37	50.85	1,725.8379	121.6186
Total			-	47.51	35.89	65.41	53.79	3,471.6600	239.3792

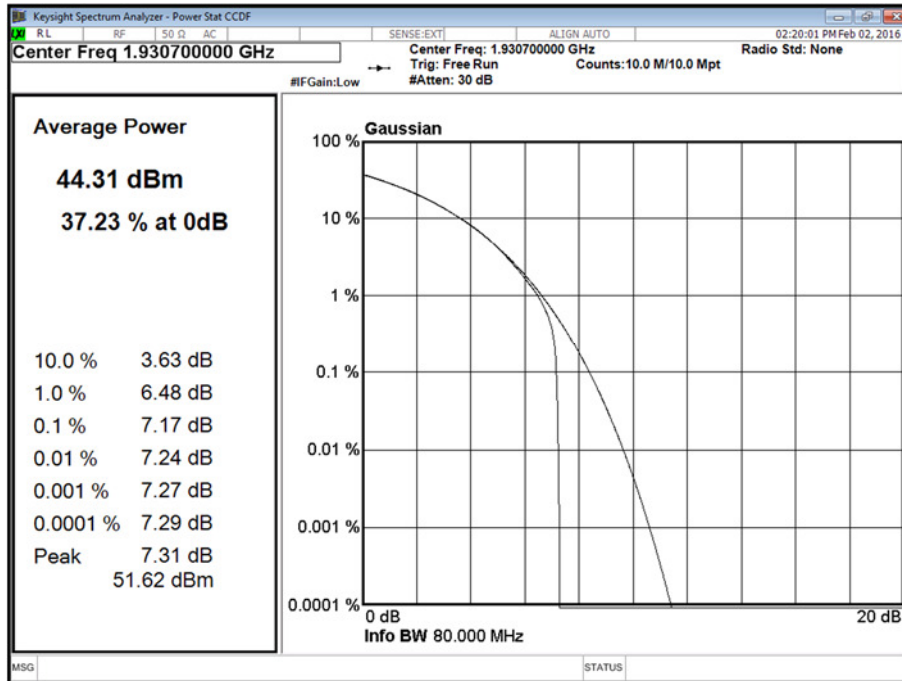
Channel Position B - Bandwidth 1.4 MHz - Antenna A



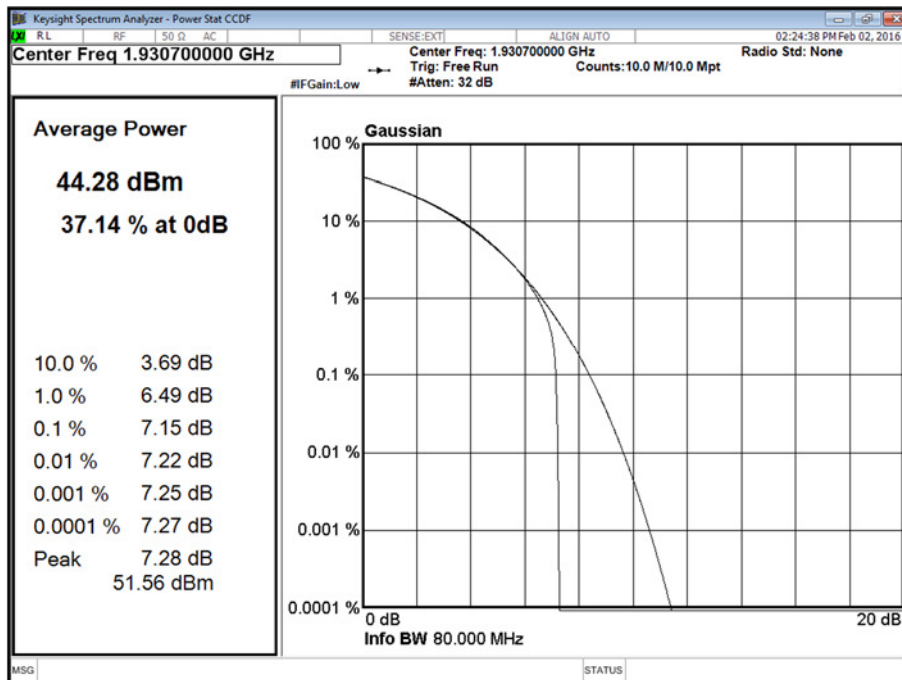
Channel Position B - Bandwidth 1.4 MHz - Antenna B



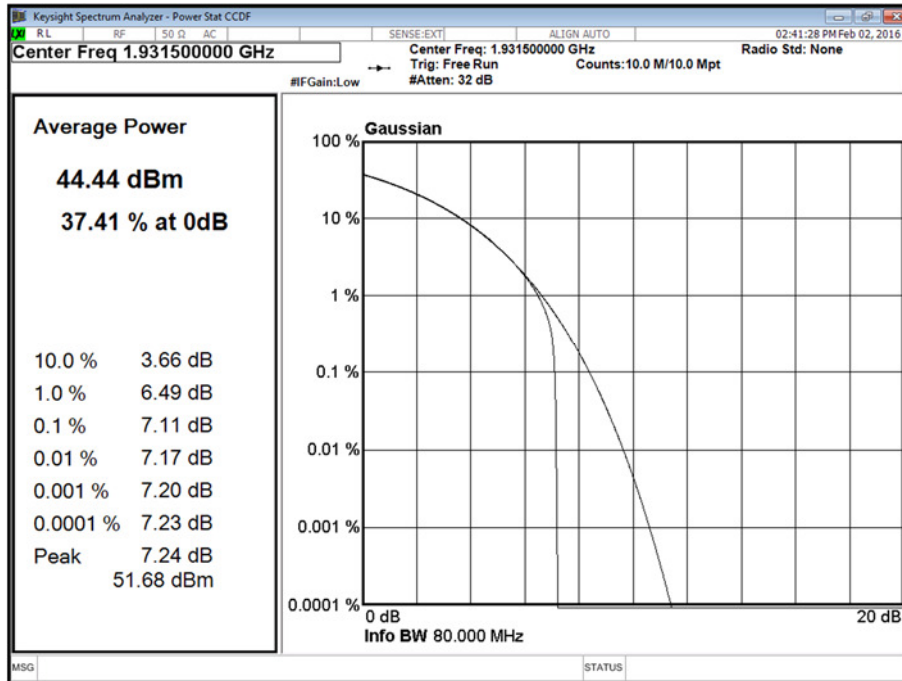
Channel Position B - Bandwidth 1.4 MHz - Antenna C



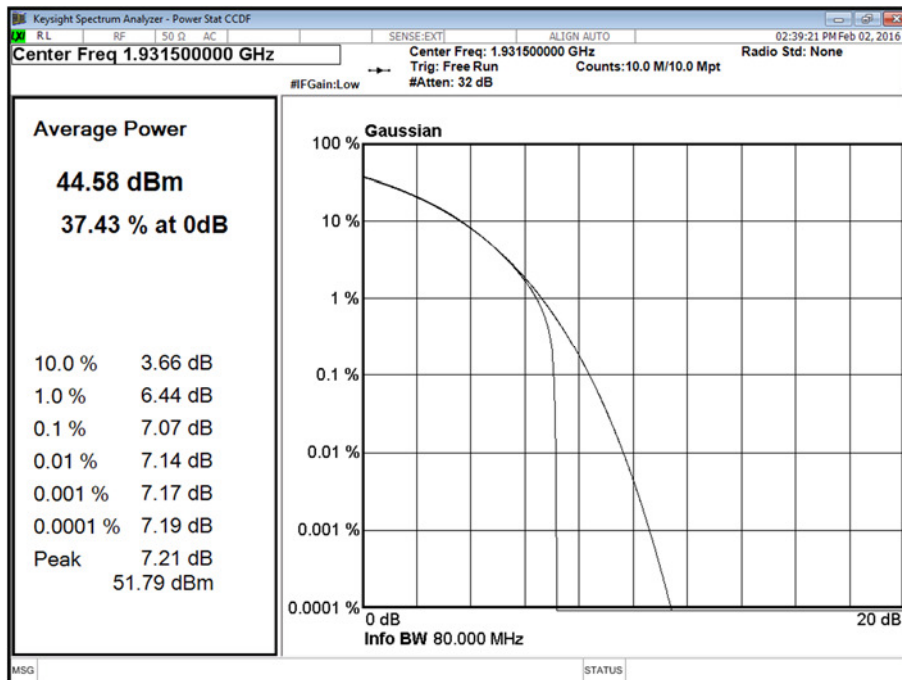
Channel Position B - Bandwidth 1.4 MHz - Antenna D



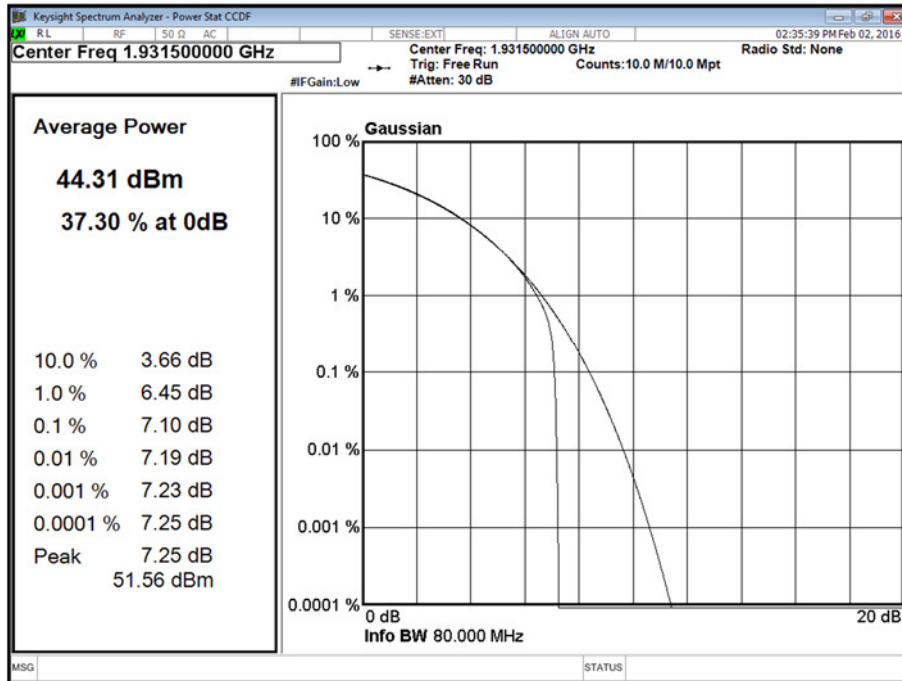
Channel Position B - Bandwidth 3.0 MHz - Antenna A



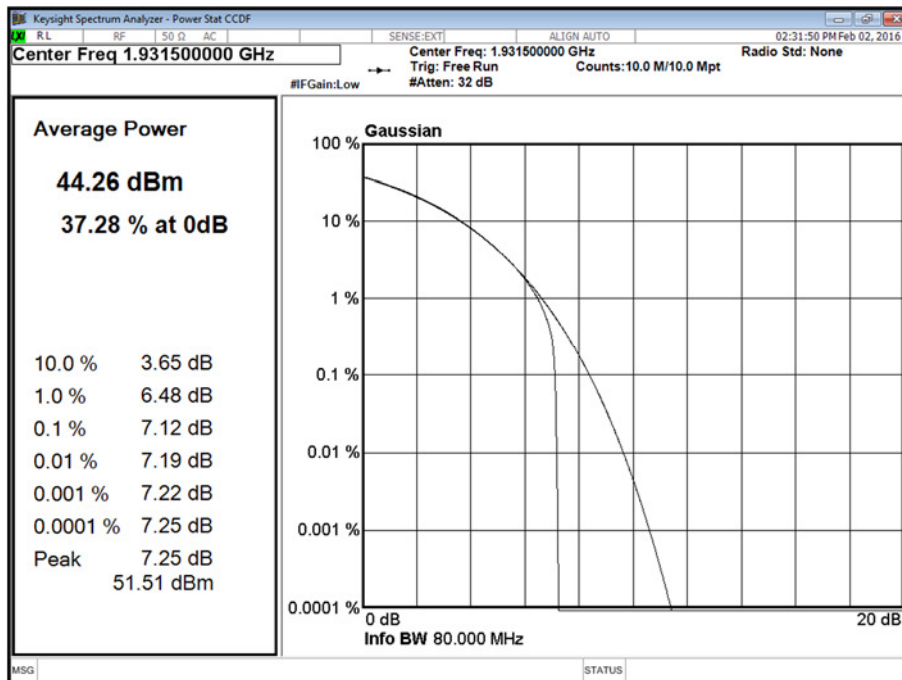
Channel Position B - Bandwidth 3.0 MHz - Antenna B



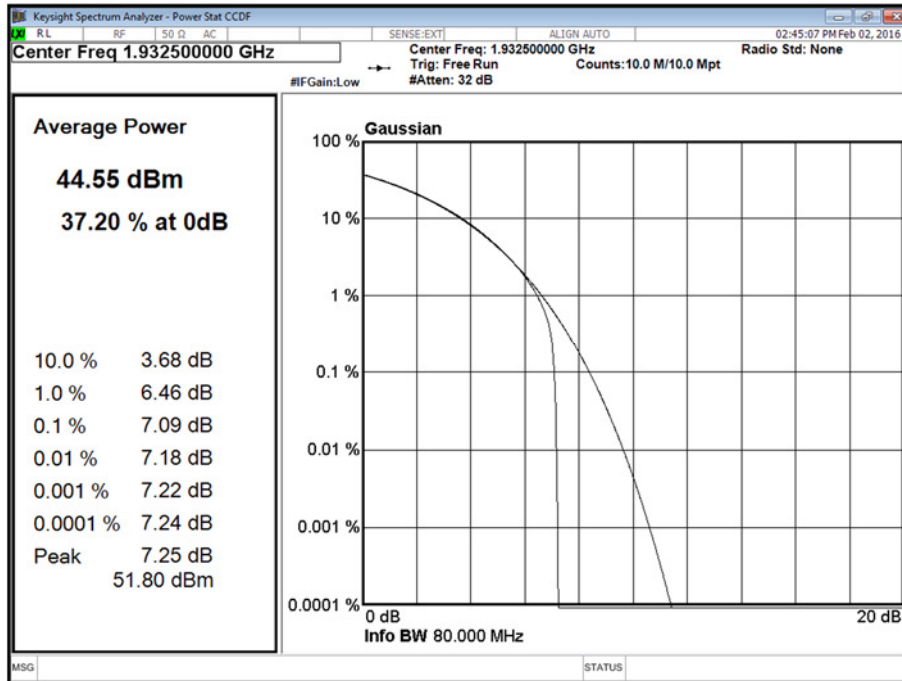
Channel Position B - Bandwidth 3.0 MHz - Antenna C



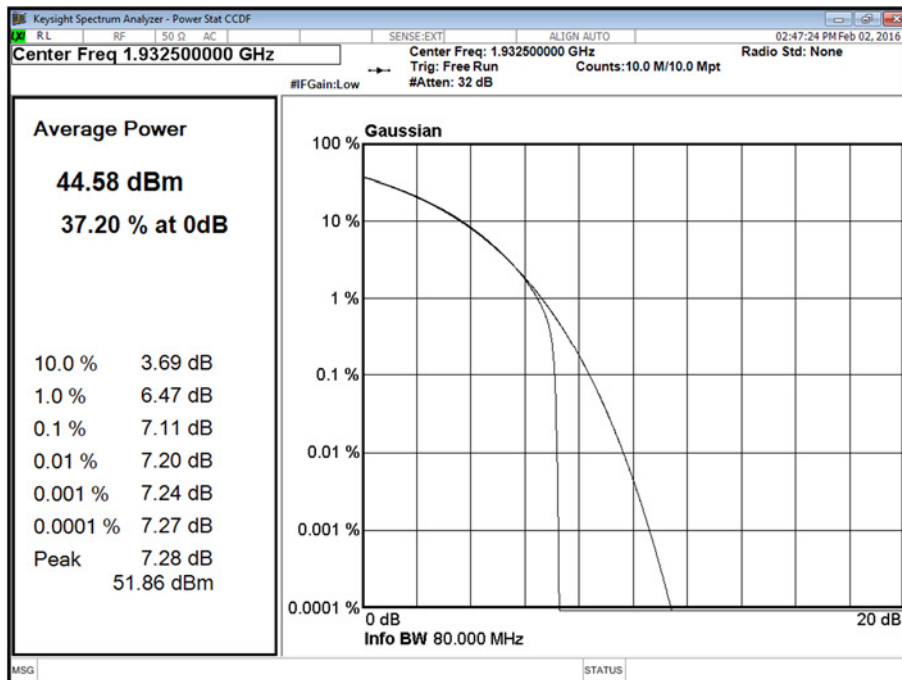
Channel Position B - Bandwidth 3.0 MHz - Antenna D



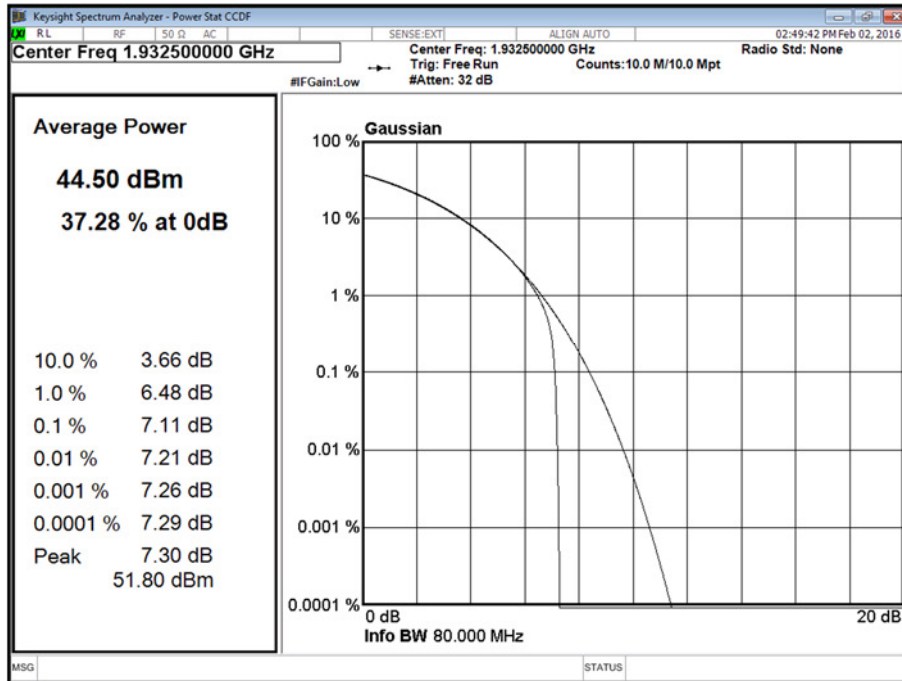
Channel Position B - Bandwidth 5.0 MHz - Antenna A



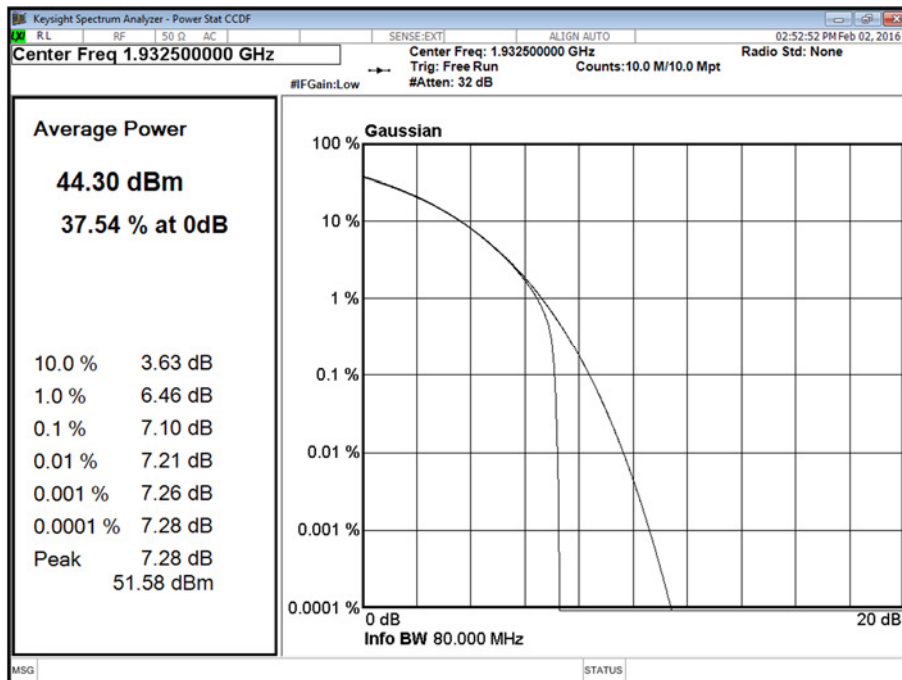
Channel Position B - Bandwidth 5.0 MHz - Antenna B



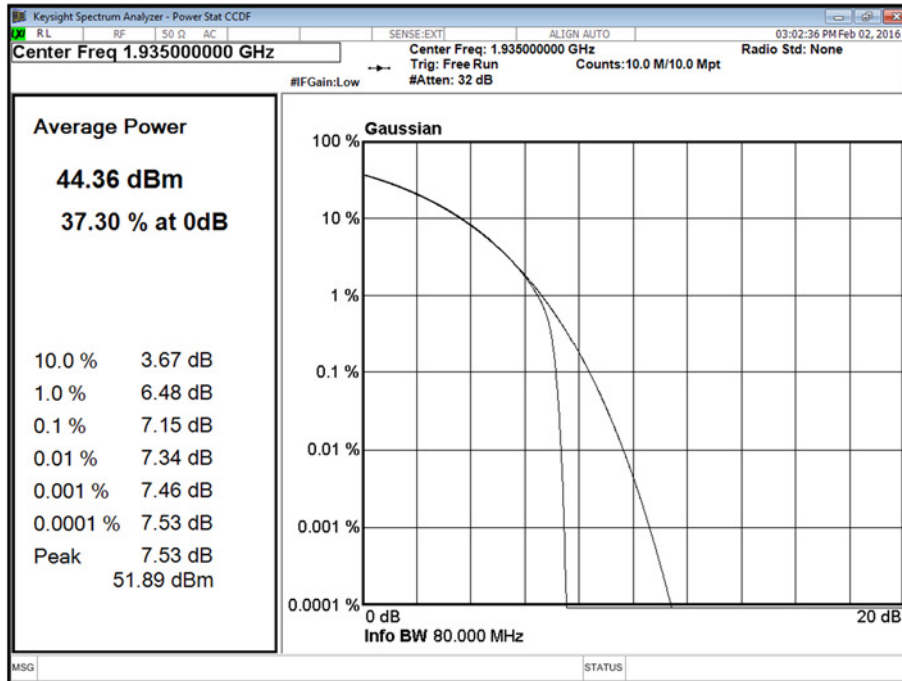
Channel Position B - Bandwidth 5.0 MHz - Antenna C



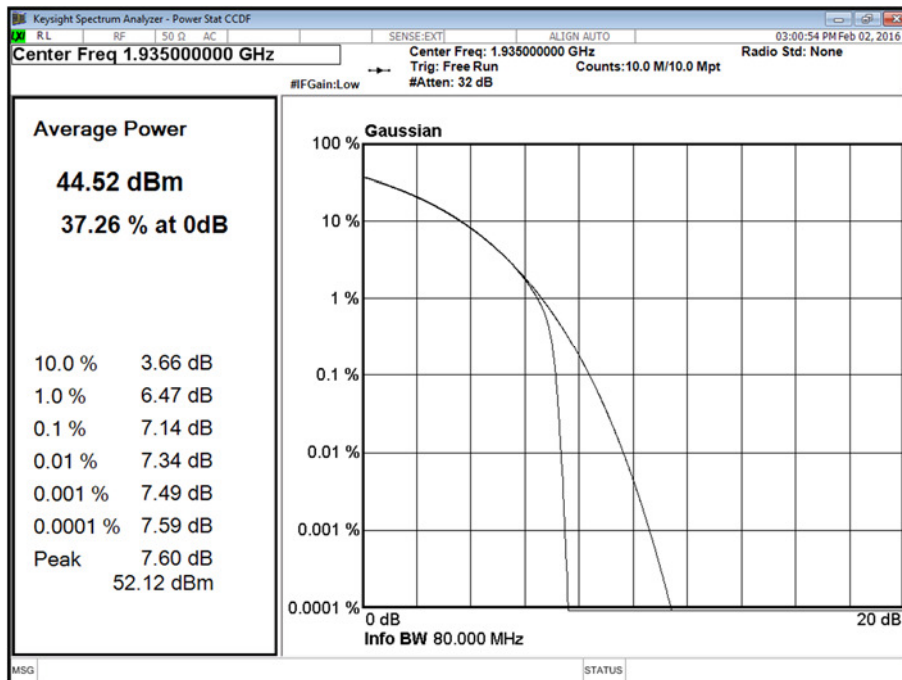
Channel Position B - Bandwidth 5.0 MHz - Antenna D



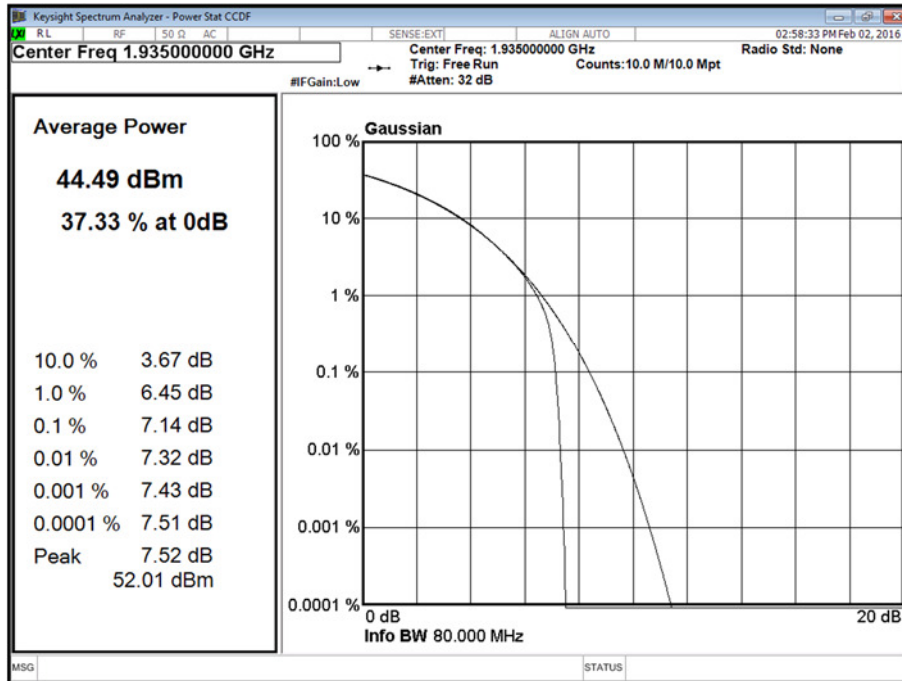
Channel Position B - Bandwidth 10.0 MHz - Antenna A



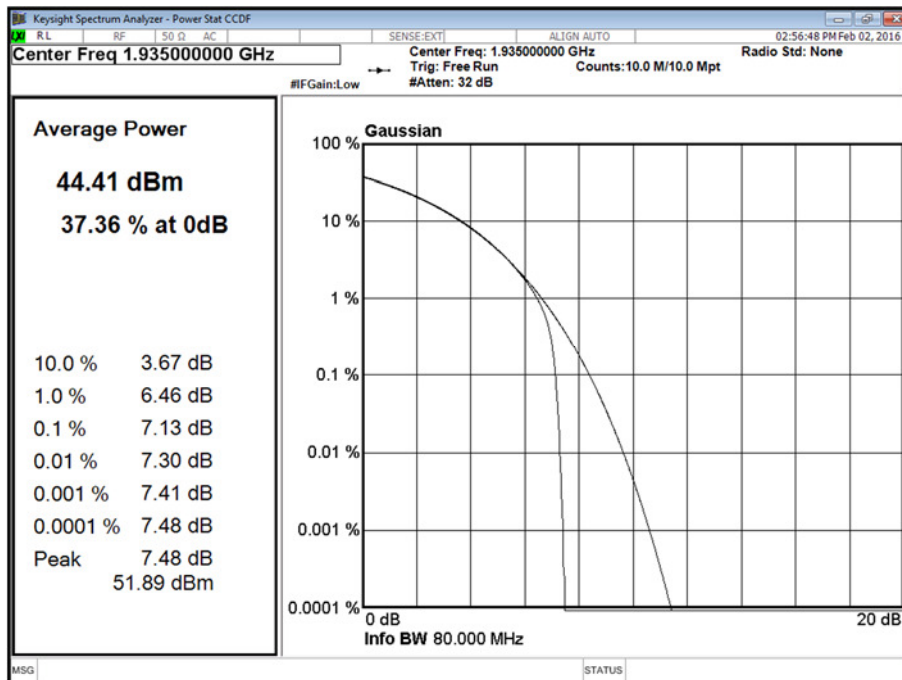
Channel Position B - Bandwidth 10.0 MHz - Antenna B



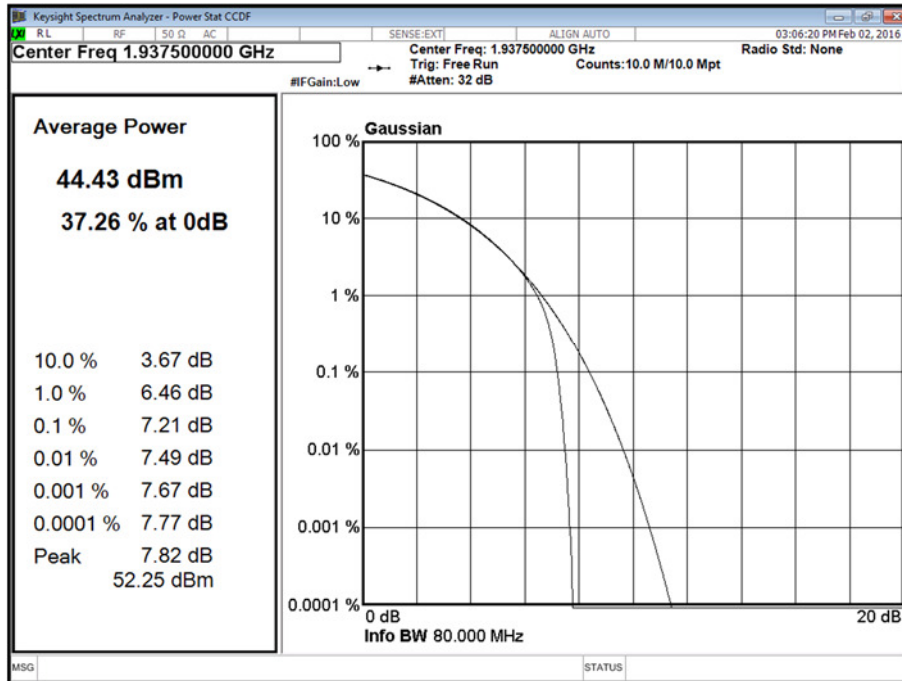
Channel Position B - Bandwidth 10.0 MHz - Antenna C



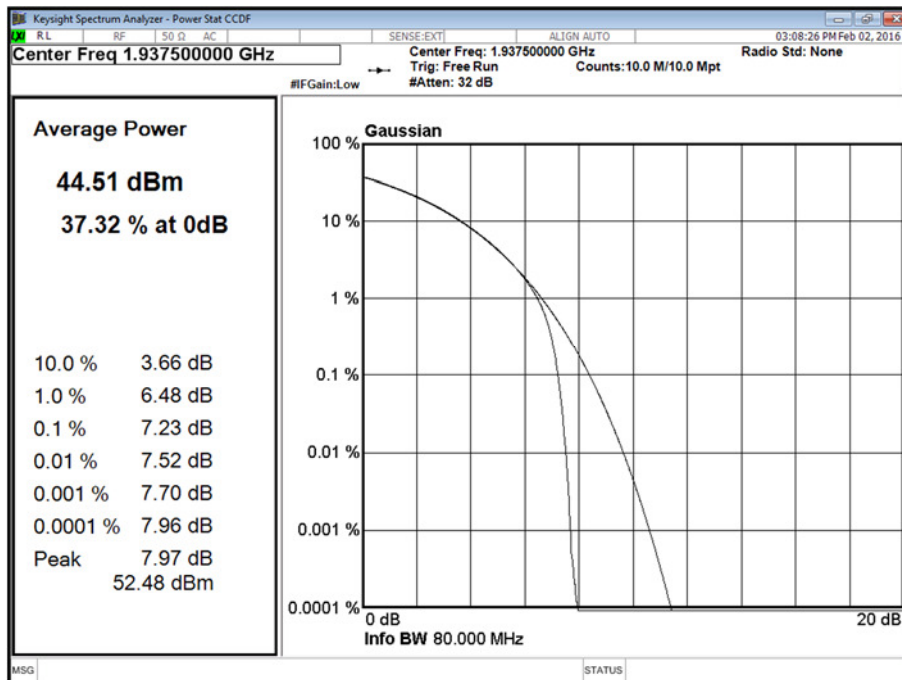
Channel Position B - Bandwidth 10.0 MHz - Antenna D



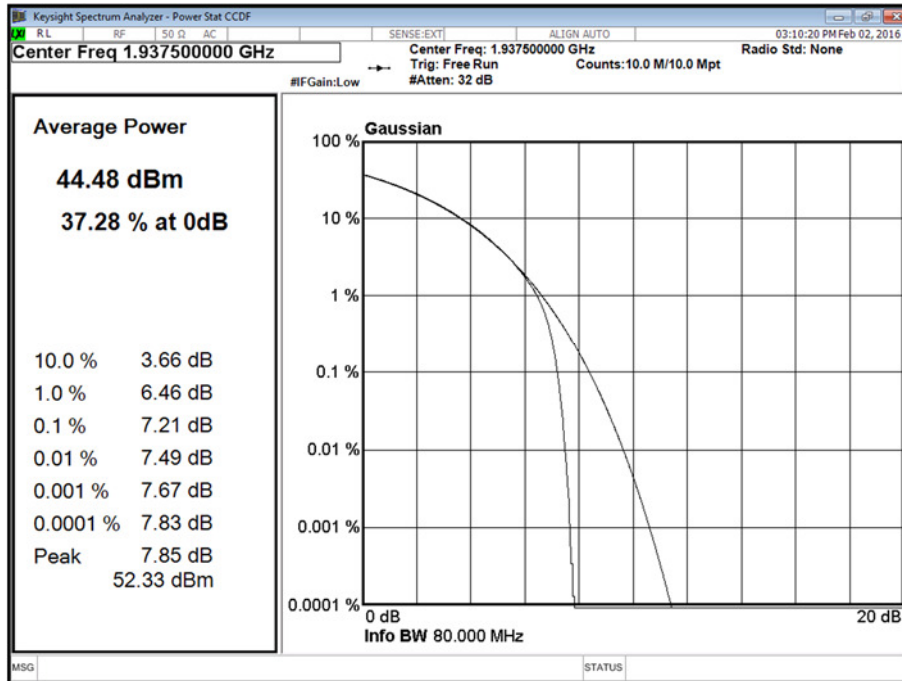
Channel Position B - Bandwidth 15.0 MHz - Antenna A



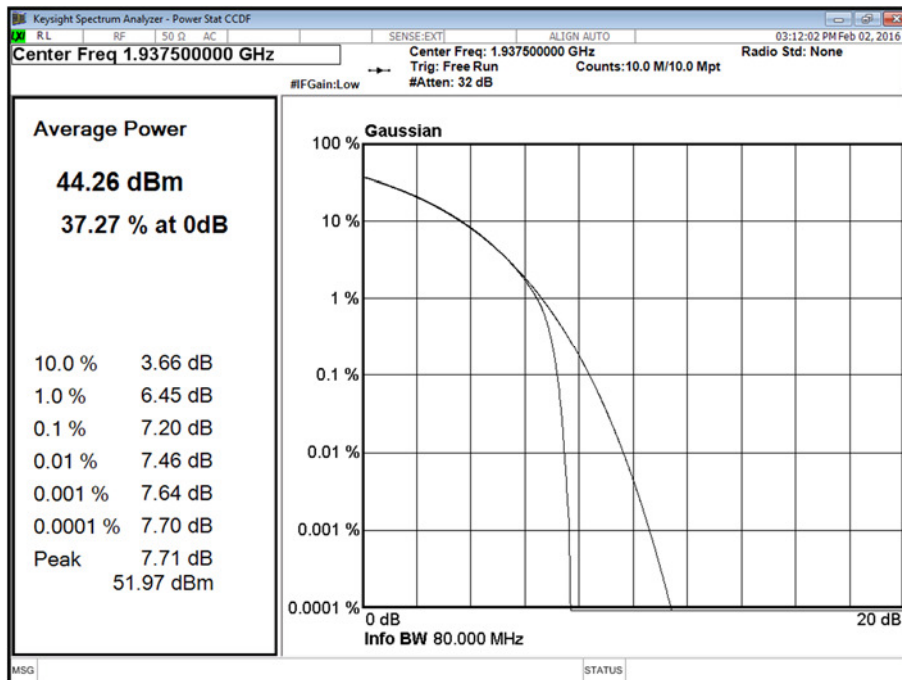
Channel Position B - Bandwidth 15.0 MHz - Antenna B



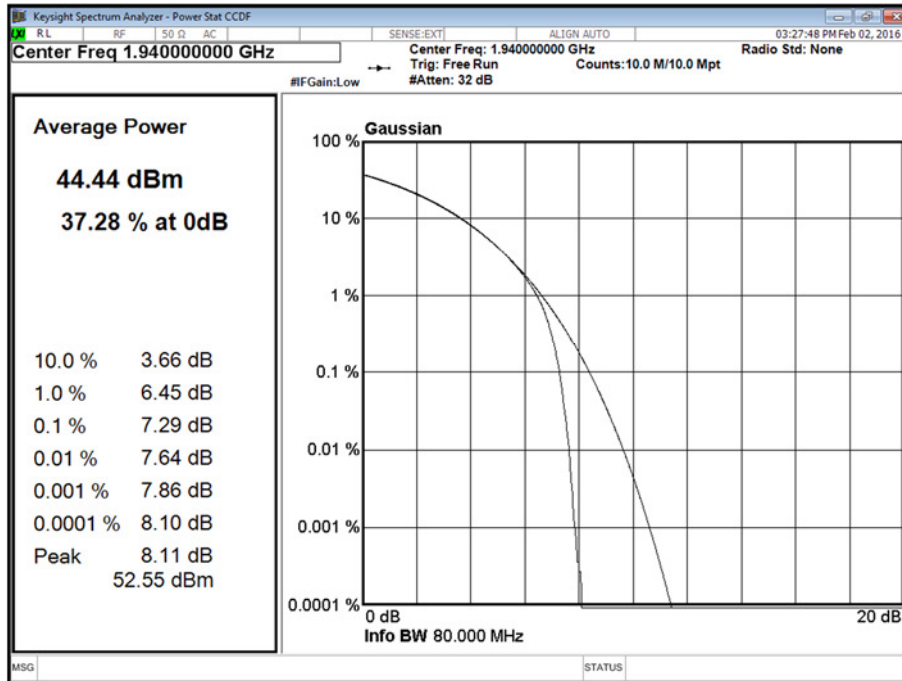
Channel Position B - Bandwidth 15.0 MHz - Antenna C



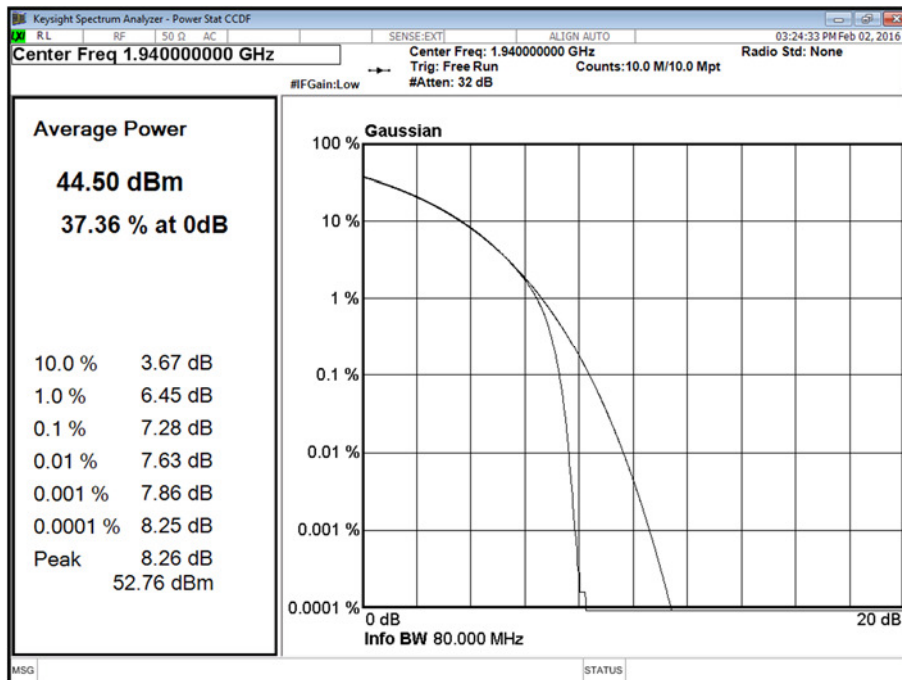
Channel Position B - Bandwidth 15.0 MHz - Antenna D



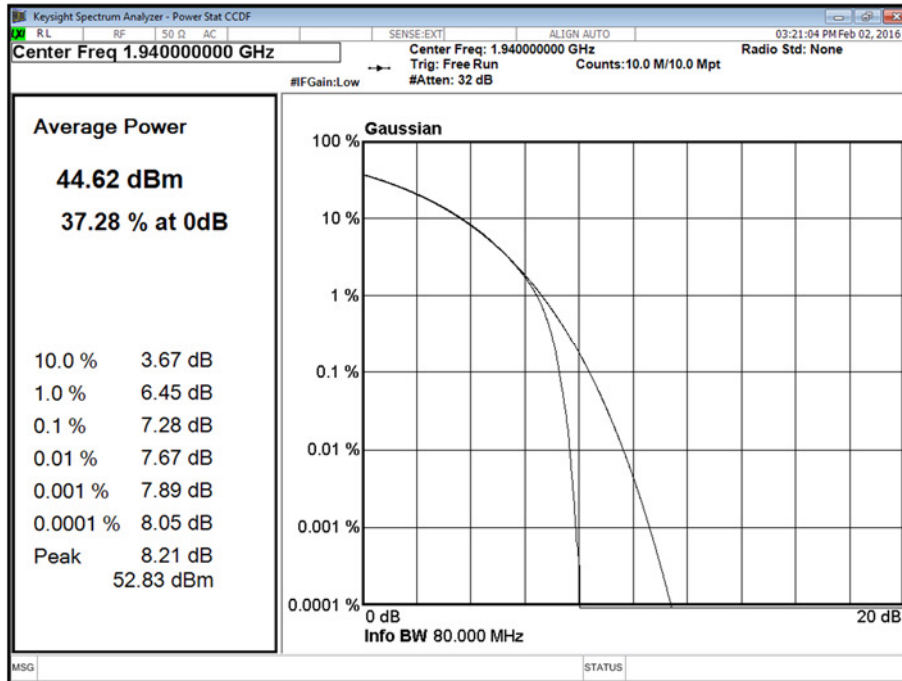
Channel Position B - Bandwidth 20.0 MHz - Antenna A



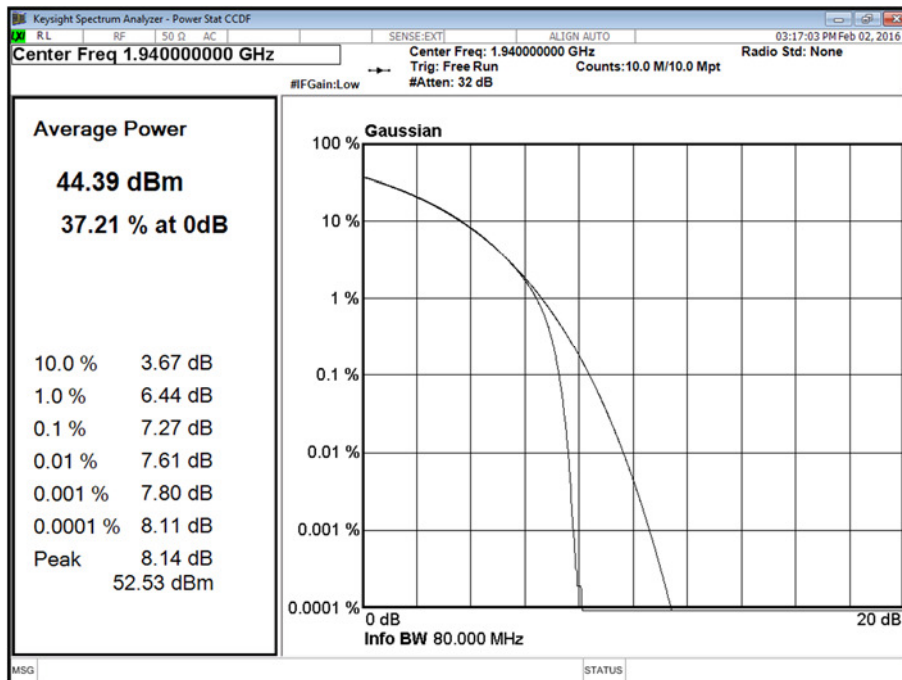
Channel Position B - Bandwidth 20.0 MHz - Antenna B



Channel Position B - Bandwidth 20.0 MHz - Antenna C



Channel Position B - Bandwidth 20.0 MHz - Antenna D

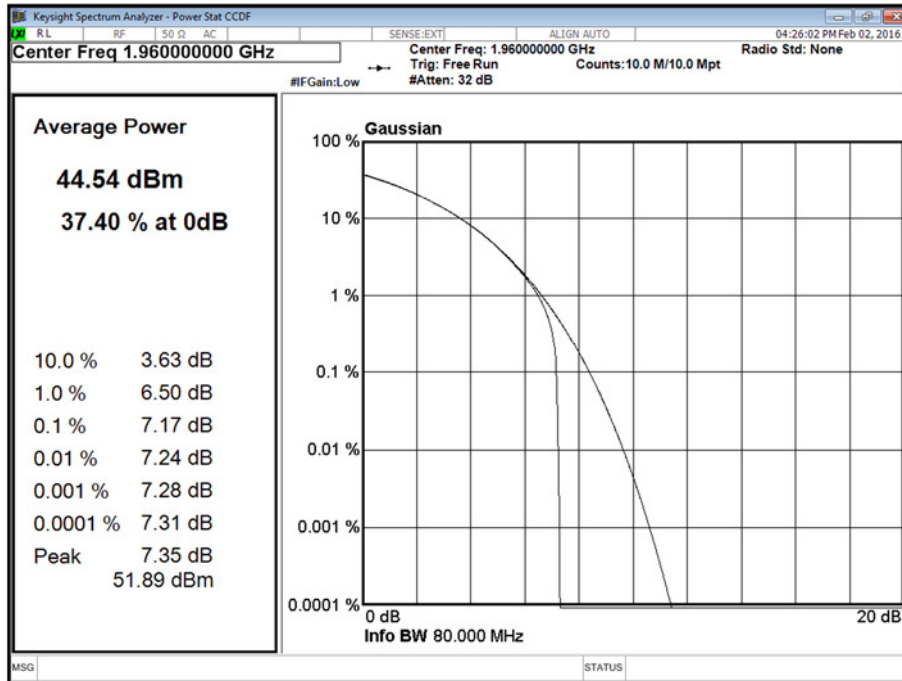


Configuration 3

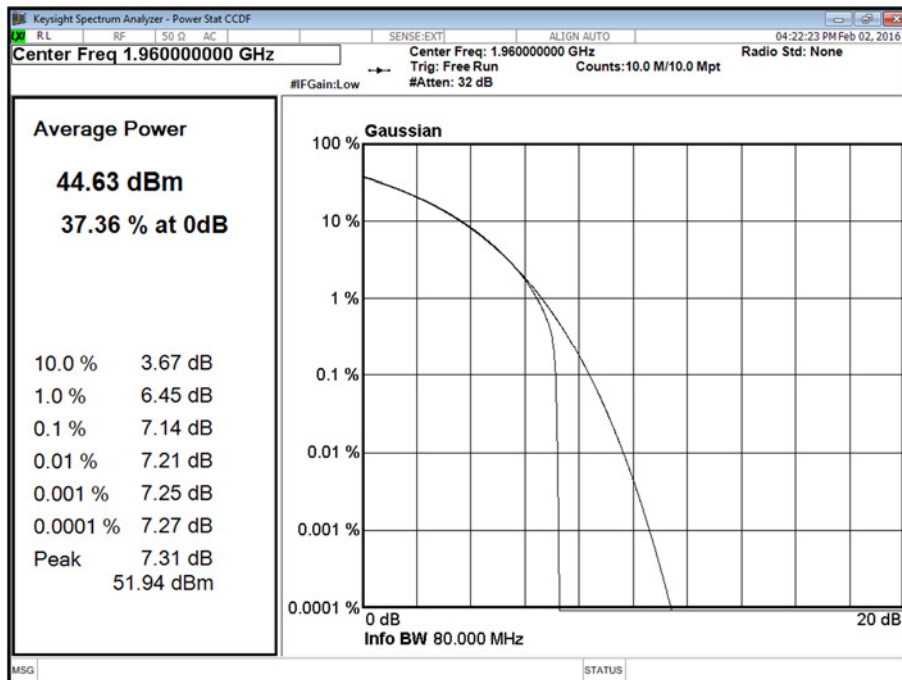
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position M						
			PAR (dB)	Average Power		Average EIRP			
				dBm	dBm/MHz	dBm	dBm/MHz	W	W/MHz
QPSK	1.4	A	7.17	44.64	44.10	62.54	62.00	1,794.7336	1,584.8932
		B	7.14	44.69	43.99	62.59	61.89	1,815.5157	1,545.2544
		C	7.16	44.72	44.28	62.62	62.18	1,828.1002	1,651.9618
		D	7.15	44.30	43.74	62.20	61.64	1,659.5869	1,458.8143
Total			-	47.48	46.93	65.38	64.83	3,454.3205	3,043.7075
QPSK	3.0	A	7.11	44.60	40.70	62.50	58.60	1,778.2794	724.4360
		B	7.08	44.65	40.88	62.55	58.78	1,798.8709	755.0922
		C	7.11	44.69	40.91	62.59	58.81	1,815.5157	760.3263
		D	7.11	44.30	40.49	62.20	58.39	1,659.5869	690.2398
Total			-	47.46	43.61	65.36	61.51	3,437.8663	1,414.6758
QPSK	5.0	A	7.09	44.60	38.55	62.50	56.45	1,778.2794	441.5704
		B	7.10	44.64	38.61	62.54	56.51	1,794.7336	447.7133
		C	7.09	44.66	38.64	62.56	56.54	1,803.0177	450.8167
		D	7.10	44.30	38.22	62.20	56.12	1,659.5869	409.2607
Total			-	47.46	41.40	65.36	59.30	3,437.8663	850.8311
QPSK	10.0	A	7.10	44.58	35.80	62.48	53.70	1,770.1090	234.4229
		B	7.11	44.65	35.93	62.55	53.83	1,798.8709	241.5461
		C	7.09	44.66	35.93	62.56	53.83	1,803.0177	241.5461
		D	7.10	44.33	35.63	62.23	53.53	1,671.0906	225.4239
Total			-	47.47	38.73	65.37	56.63	3,441.1996	459.8468
QPSK	15.0	A	7.11	44.51	34.04	62.41	51.94	1,741.8069	156.3148
		B	7.12	44.60	34.11	62.50	52.01	1,778.2794	158.8547
		C	7.12	44.62	34.11	62.52	52.01	1,786.4876	158.8547
		D	7.11	44.23	33.81	62.13	51.71	1,633.0519	148.2518
Total			-	47.38	36.94	65.28	54.84	3,374.8588	304.5666
QPSK	20.0	A	7.12	44.56	32.89	62.46	50.79	1,761.9760	119.9499
		B	7.11	44.61	32.91	62.51	50.81	1,782.3788	120.5036
		C	7.11	44.66	32.91	62.56	50.81	1,803.0177	120.5036
		D	7.11	44.22	32.45	62.12	50.35	1,629.2960	108.3927
Total			-	47.40	35.69	65.30	53.59	3,391.2721	228.3426

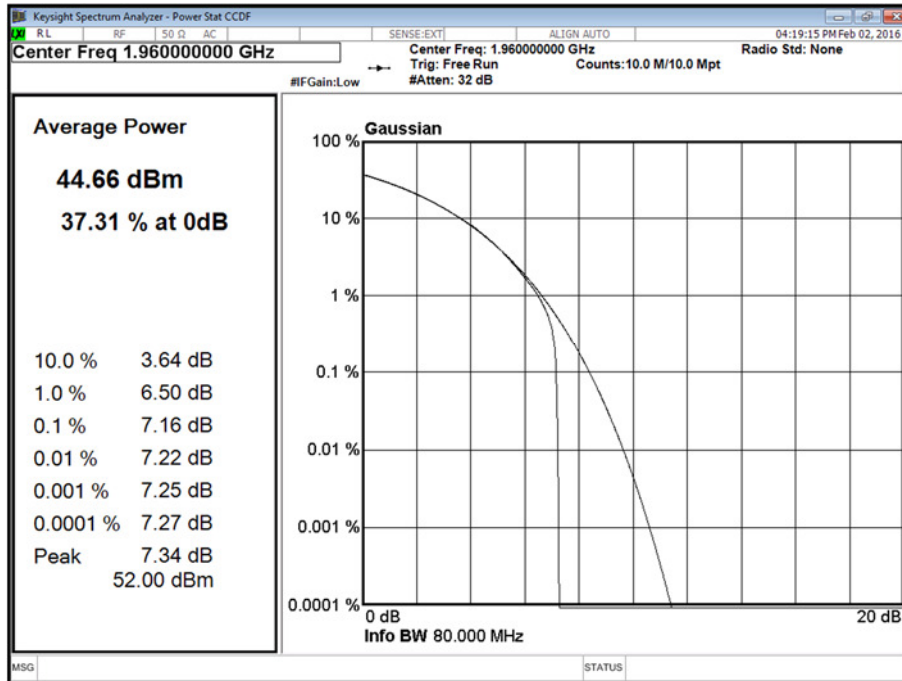
Channel Position M - Bandwidth 1.4 MHz - Antenna A



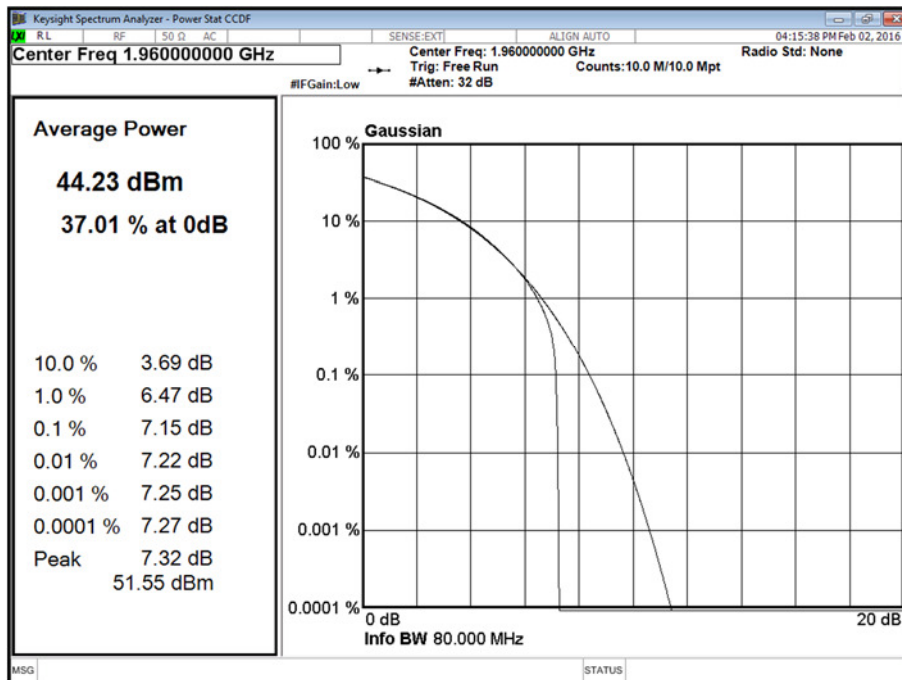
Channel Position M - Bandwidth 1.4 MHz - Antenna B



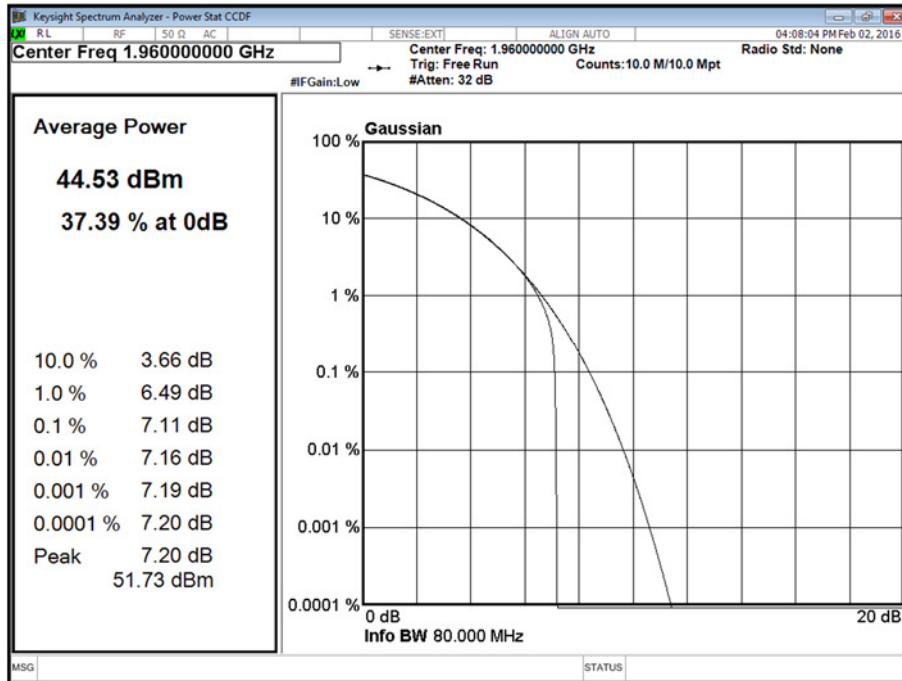
Channel Position M - Bandwidth 1.4 MHz - Antenna C



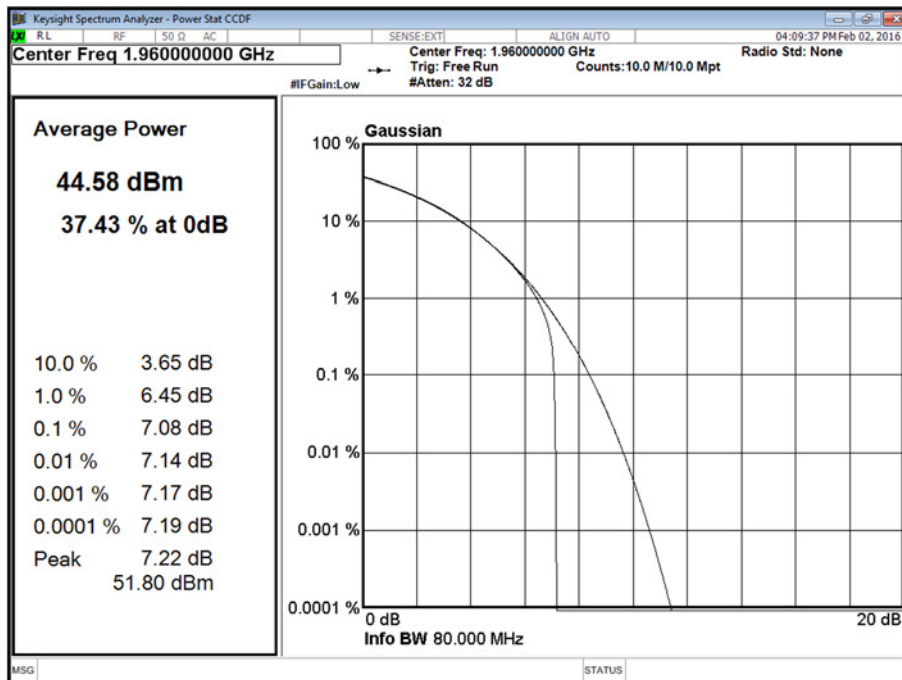
Channel Position M - Bandwidth 1.4 MHz - Antenna D



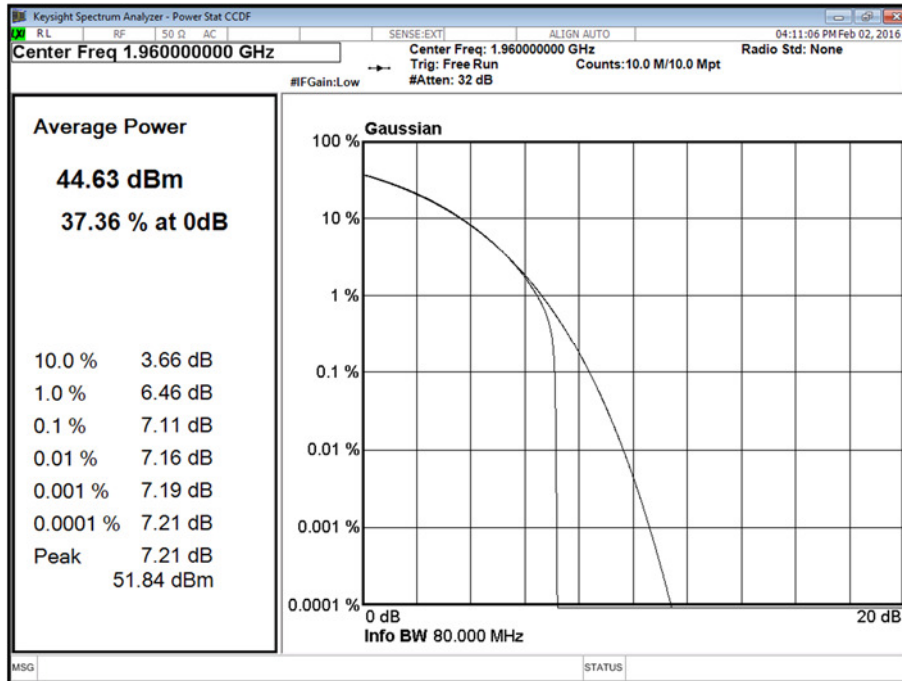
Channel Position M - Bandwidth 3.0 MHz - Antenna A



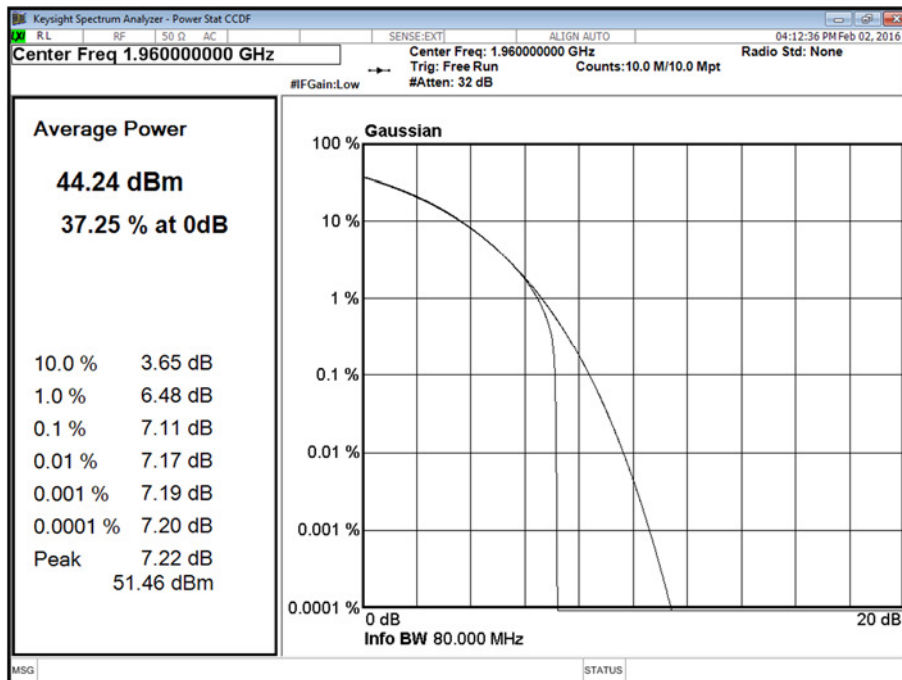
Channel Position M - Bandwidth 3.0 MHz - Antenna B



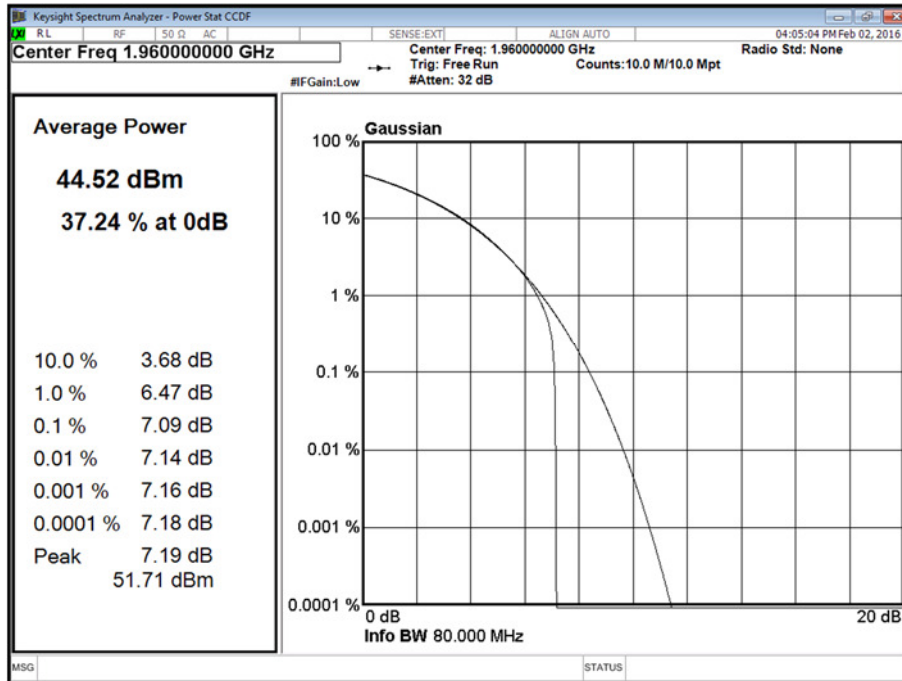
Channel Position M - Bandwidth 3.0 MHz - Antenna C



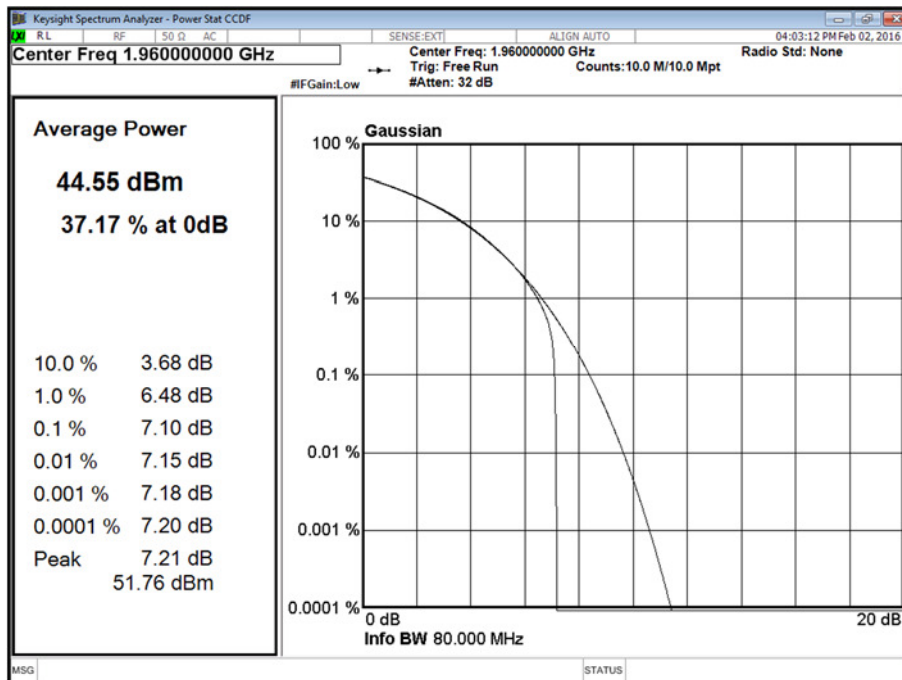
Channel Position M - Bandwidth 3.0 MHz - Antenna D



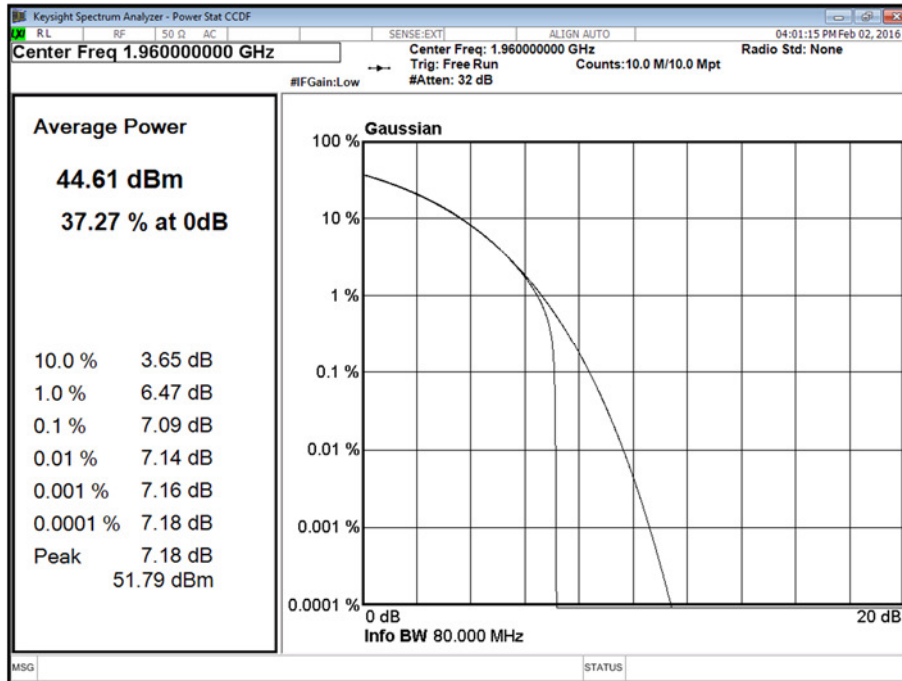
Channel Position M - Bandwidth 5.0 MHz - Antenna A



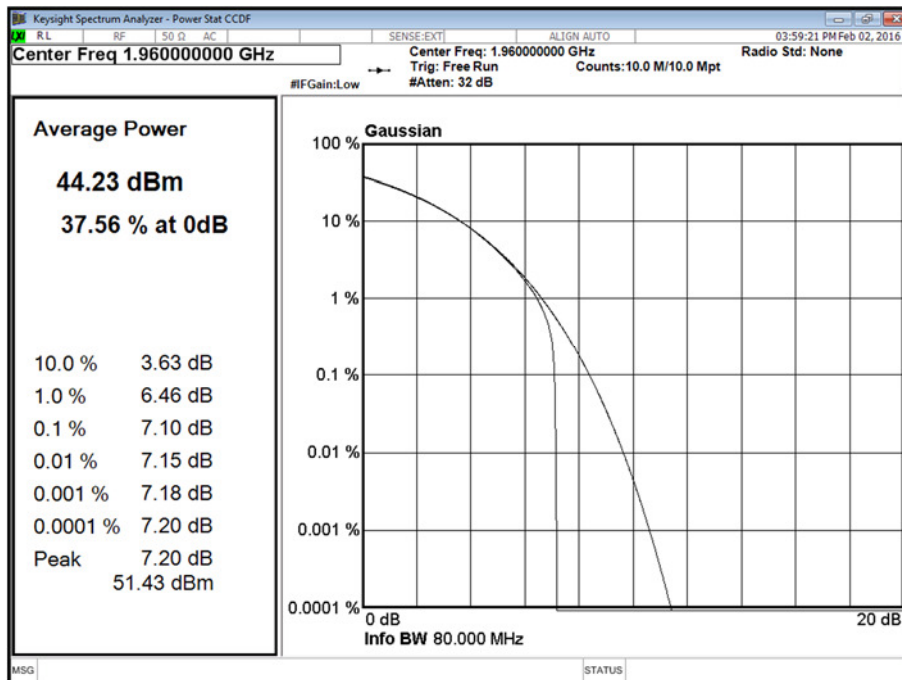
Channel Position M - Bandwidth 5.0 MHz - Antenna B



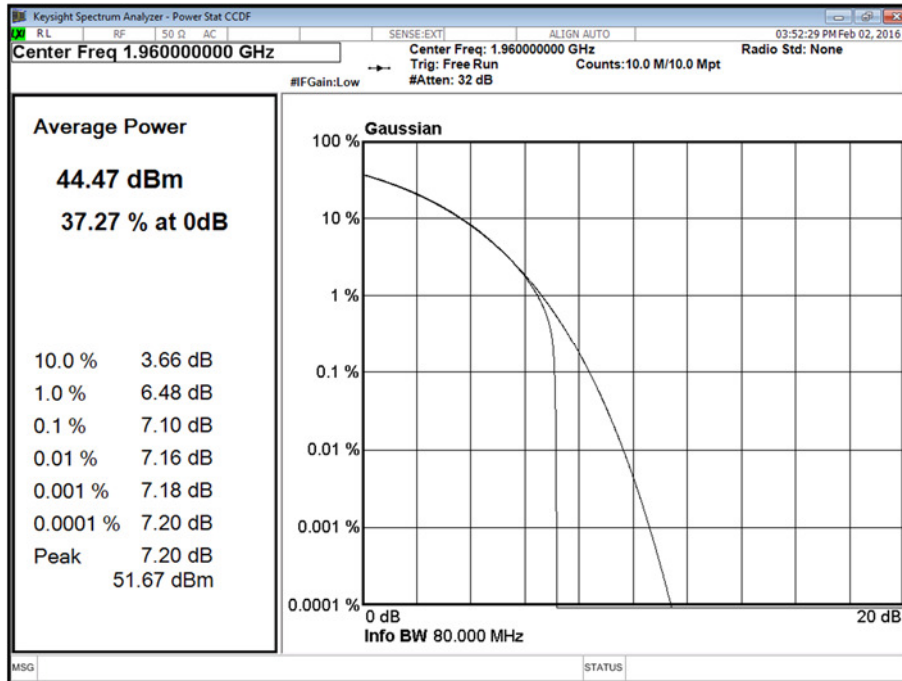
Channel Position M - Bandwidth 5.0 MHz - Antenna C



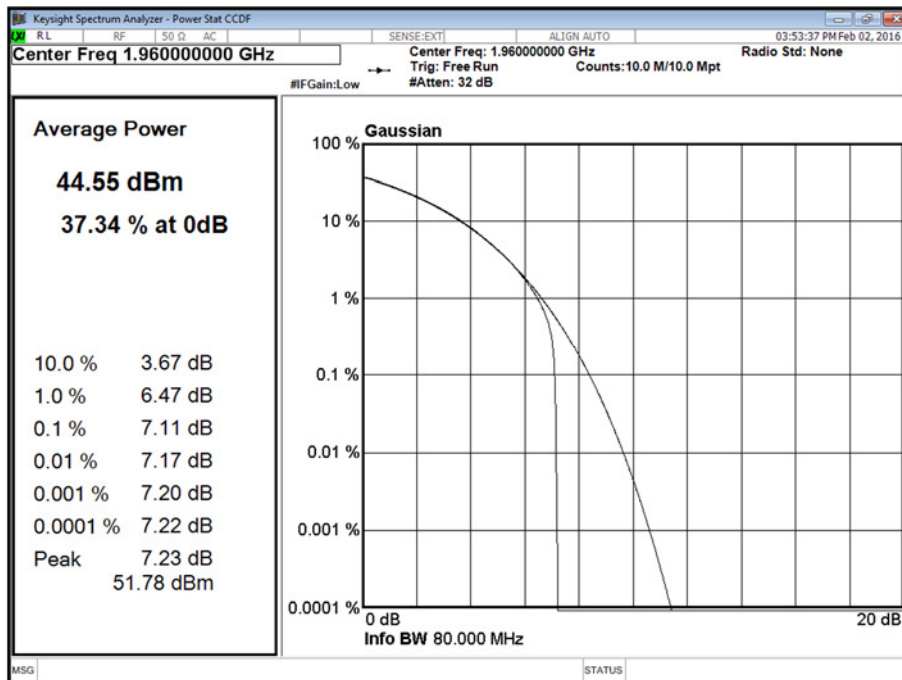
Channel Position M - Bandwidth 5.0 MHz - Antenna D



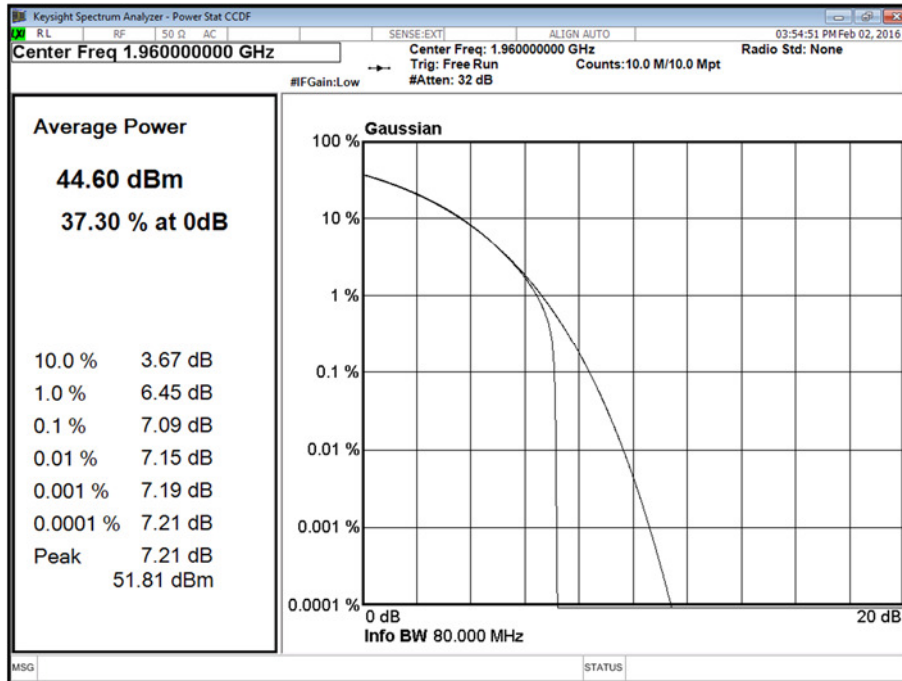
Channel Position M - Bandwidth 10.0 MHz - Antenna A



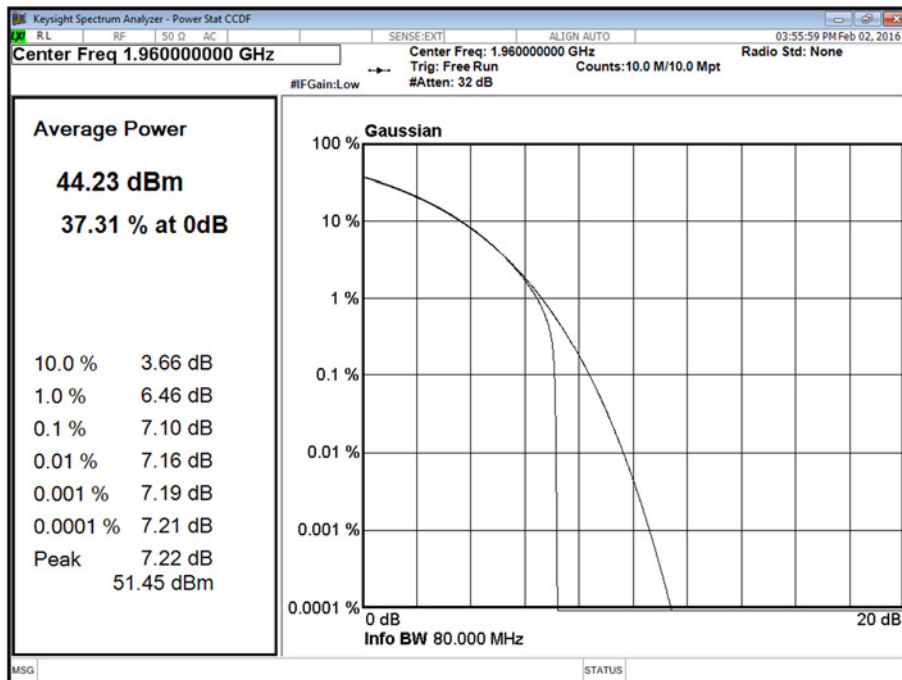
Channel Position M - Bandwidth 10.0 MHz - Antenna B



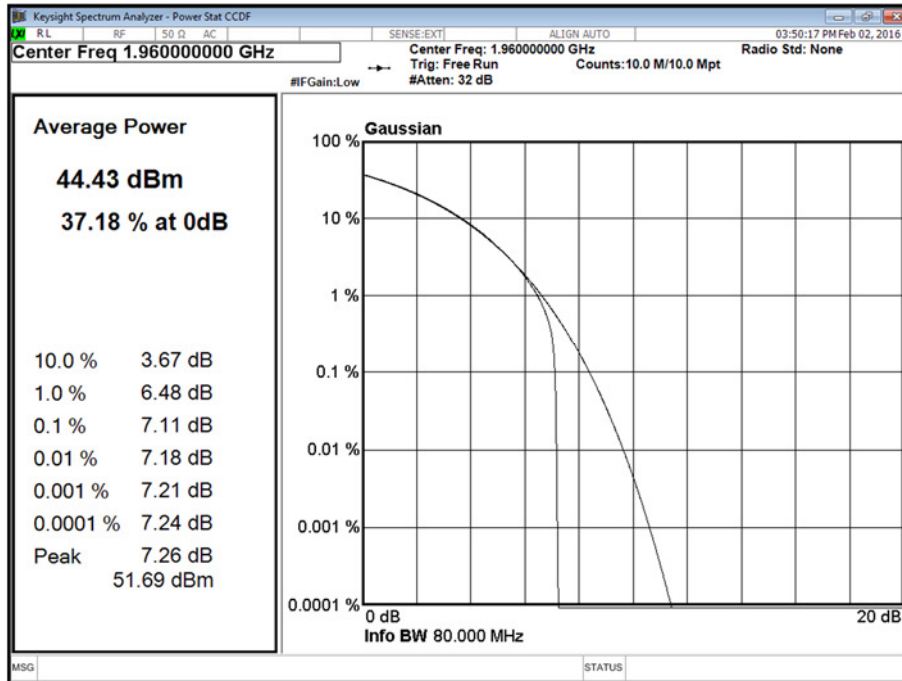
Channel Position M - Bandwidth 10.0 MHz - Antenna C



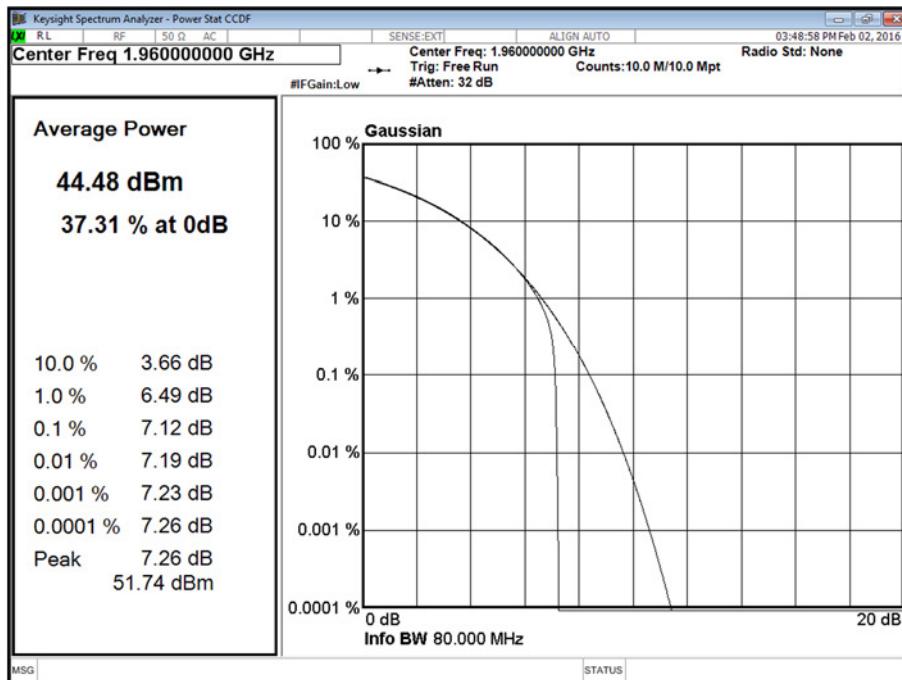
Channel Position M - Bandwidth 10.0 MHz - Antenna D



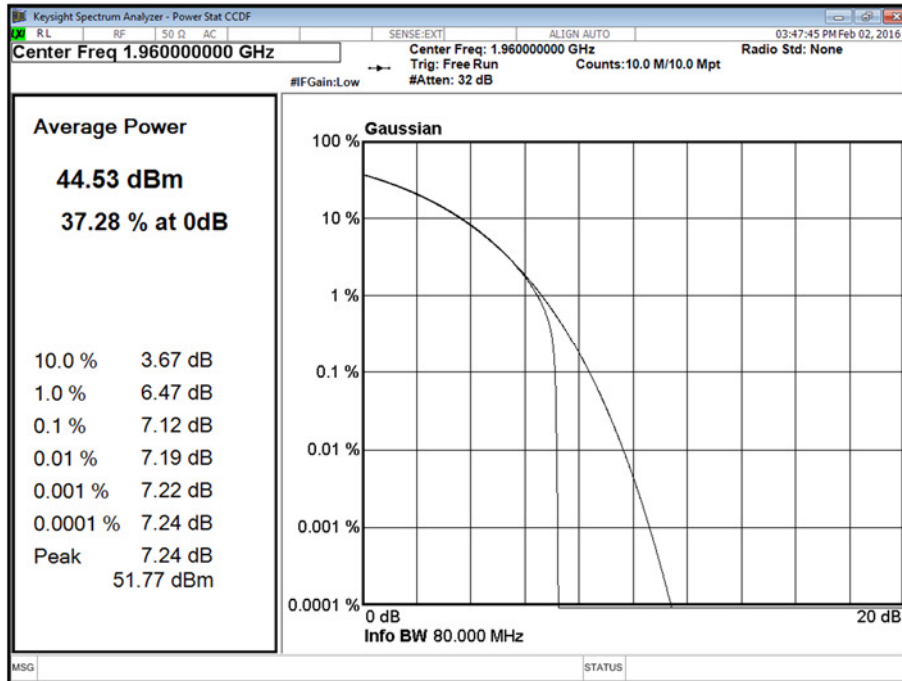
Channel Position M - Bandwidth 15.0 MHz - Antenna A



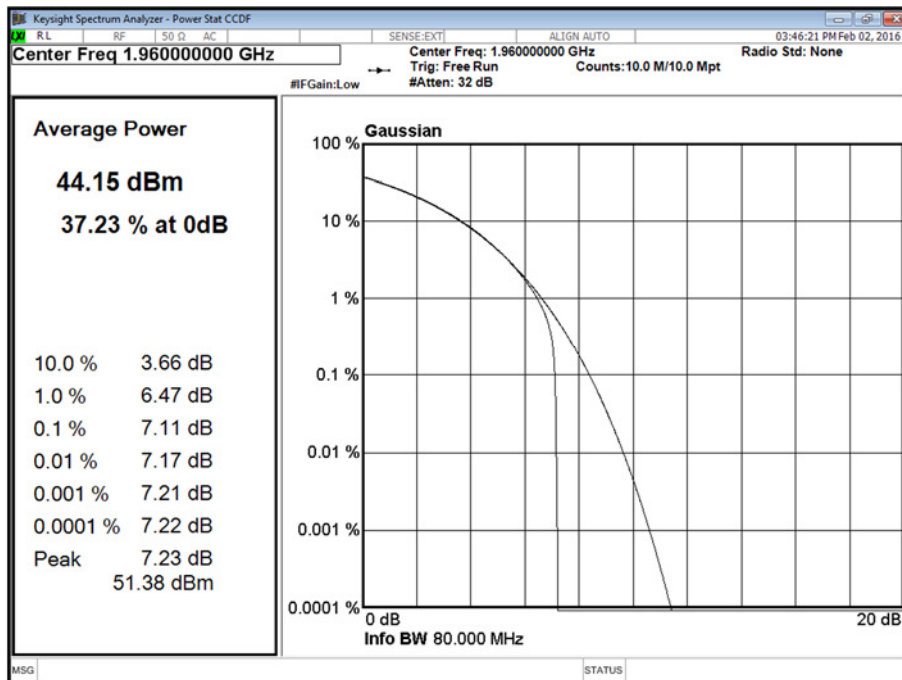
Channel Position M - Bandwidth 15.0 MHz - Antenna B



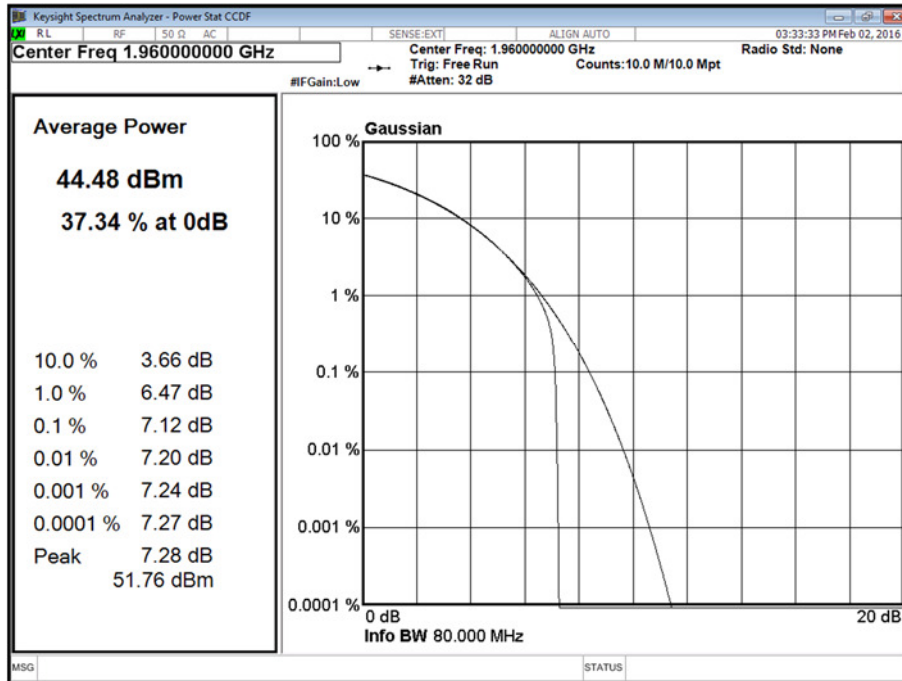
Channel Position M - Bandwidth 15.0 MHz - Antenna C



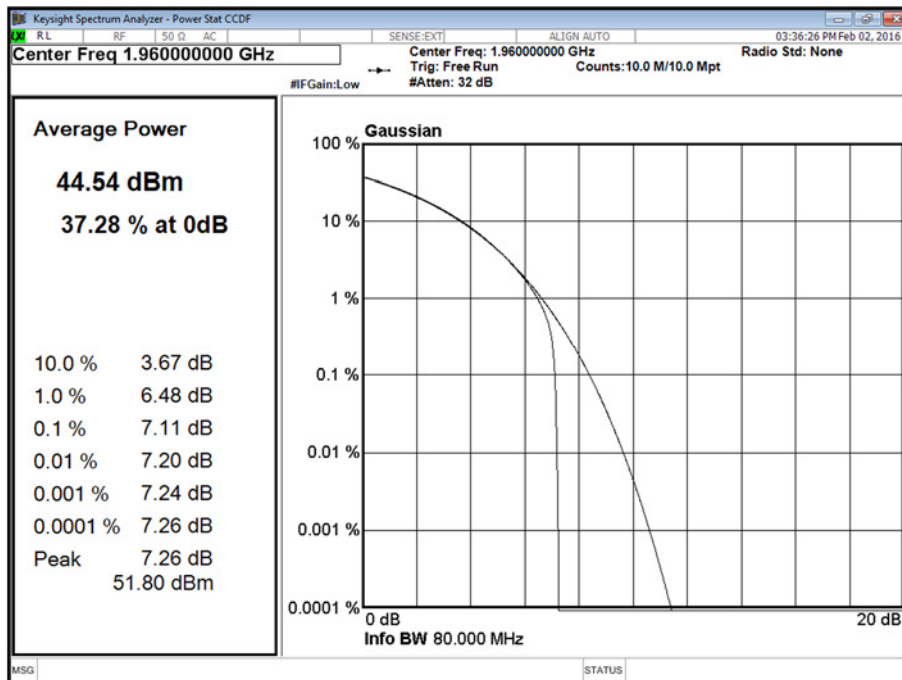
Channel Position M - Bandwidth 15.0 MHz - Antenna D



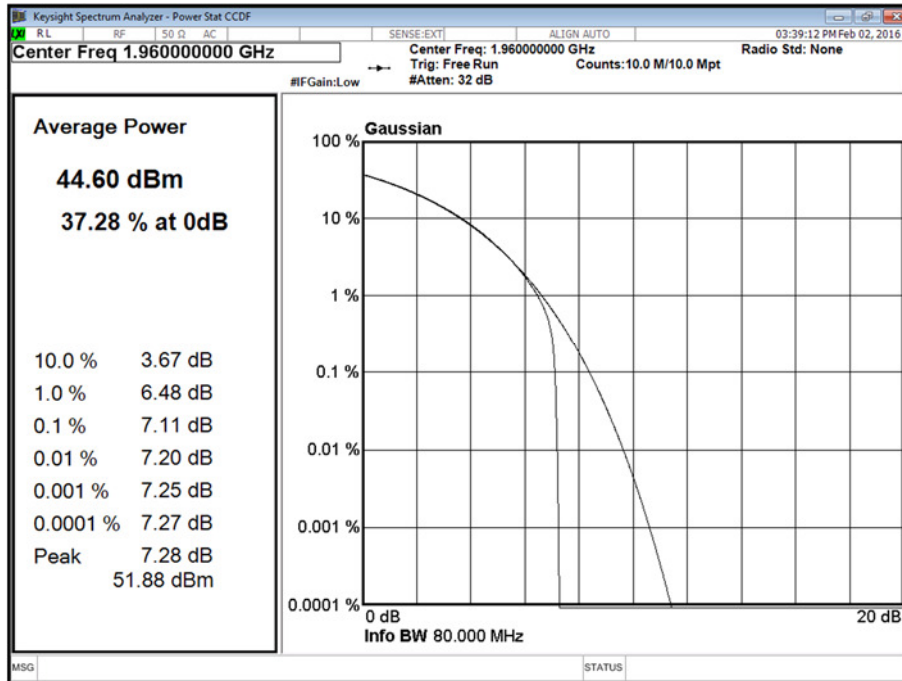
Channel Position M - Bandwidth 20.0 MHz - Antenna A



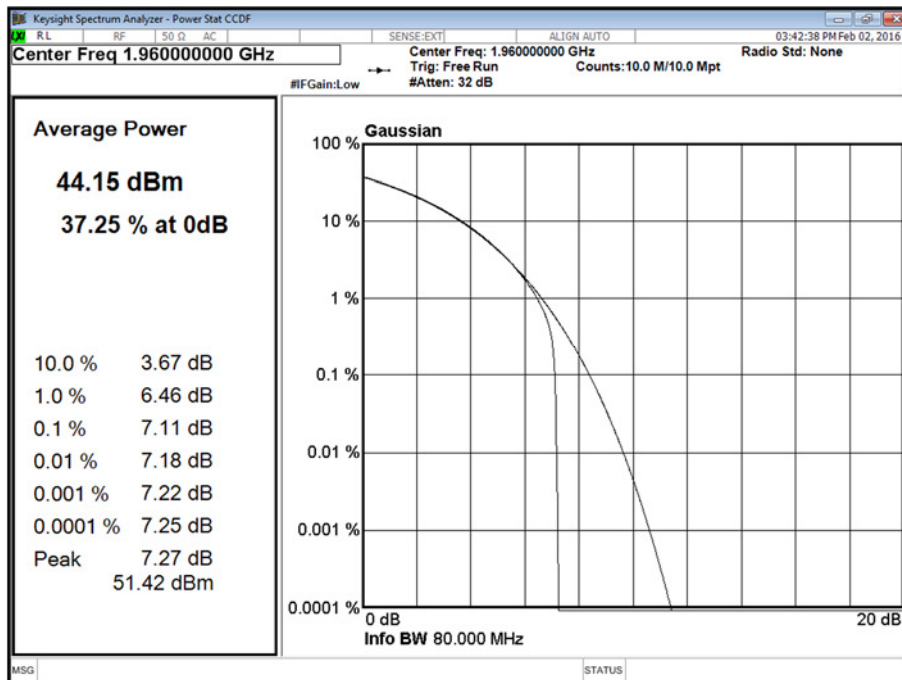
Channel Position M - Bandwidth 20.0 MHz - Antenna B



Channel Position M - Bandwidth 20.0 MHz - Antenna C



Channel Position M - Bandwidth 20.0 MHz - Antenna D

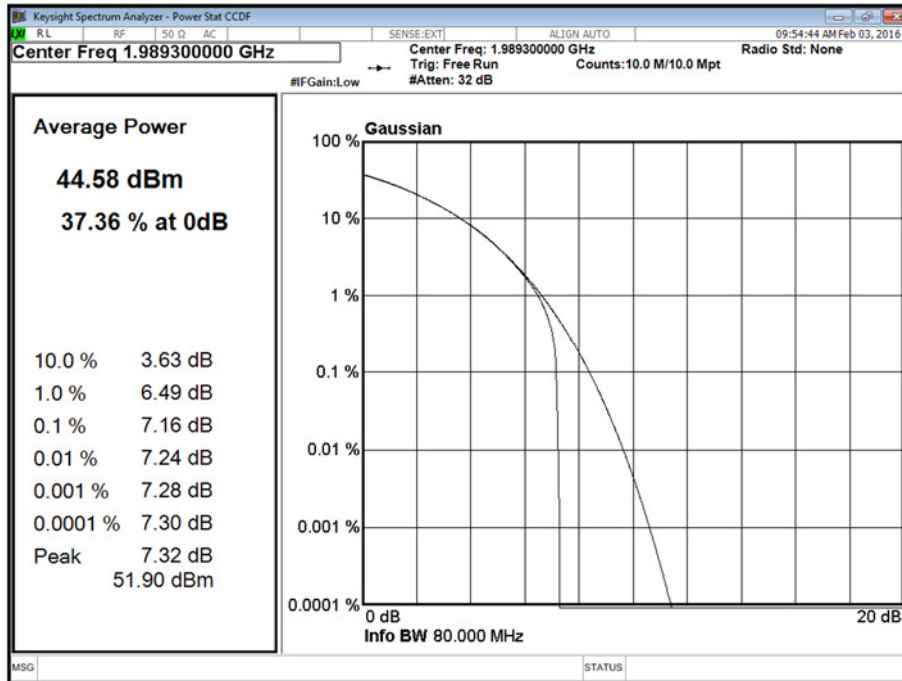


Configuration 3

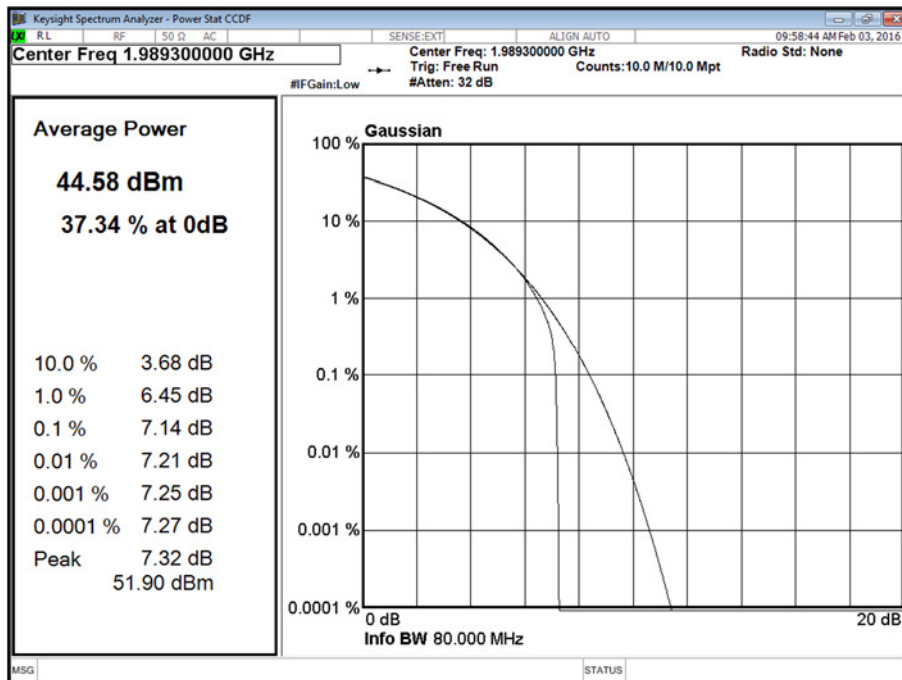
Maximum Output Power 44.77 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Peak to Average Ratio (PAR) / Output Power						
			Channel Position T						
			PAR (dB)	Average Power		Average EIRP			
dBm	dBm/MHz	dBm		dBm/MHz	W	W/MHz			
QPSK	1.4	A	7.16	44.59	43.95	62.49	61.85	1,774.1895	1,531.0875
		B	7.14	44.54	44.19	62.44	62.09	1,753.8805	1,618.0800
		C	7.17	44.36	43.73	62.26	61.63	1,682.6741	1,455.4591
		D	7.15	44.25	43.67	62.15	61.57	1,640.5898	1,435.4894
Total			-	47.43	46.82	65.33	64.72	3,414.7793	2,966.5769
QPSK	3.0	A	7.09	44.38	40.54	62.28	58.44	1,690.4409	698.2324
		B	7.08	44.44	40.85	62.34	58.75	1,713.9573	749.8942
		C	7.10	44.48	40.77	62.38	58.67	1,729.8164	736.2071
		D	7.11	44.41	40.61	62.31	58.51	1,702.1585	709.5778
Total			-	47.41	43.59	65.31	61.49	3,392.5994	1,407.8102
QPSK	5.0	A	7.09	44.44	38.44	62.34	56.34	1,713.9573	430.5266
		B	7.11	44.42	38.41	62.32	56.31	1,706.0824	427.5629
		C	7.09	44.56	38.66	62.46	56.56	1,761.9760	452.8976
		D	7.09	44.27	38.35	62.17	56.25	1,648.1624	421.6965
Total			-	47.37	41.41	65.27	59.31	3,362.1197	852.2231
QPSK	10.0	A	7.13	44.42	35.72	62.32	53.62	1,706.0824	230.1442
		B	7.13	44.67	35.88	62.57	53.78	1,807.1741	238.7811
		C	7.12	44.57	35.80	62.47	53.70	1,766.0378	234.4229
		D	7.13	44.34	35.51	62.24	53.41	1,674.9429	219.2805
Total			-	47.39	38.63	65.29	56.53	3,381.0253	449.4247
QPSK	15.0	A	7.16	44.52	34.06	62.42	51.96	1,745.8222	157.0363
		B	7.17	44.57	34.19	62.47	52.09	1,766.0378	161.8080
		C	7.20	44.61	34.31	62.51	52.21	1,782.3788	166.3413
		D	7.17	44.31	33.82	62.21	51.72	1,663.4127	148.5936
Total			-	47.43	36.95	65.33	54.85	3,409.2348	305.6298
QPSK	20.0	A	7.19	44.51	32.77	62.41	50.67	1,741.8069	116.6810
		B	7.20	44.47	32.77	62.37	50.67	1,725.8379	116.6810
		C	7.20	44.53	32.93	62.43	50.83	1,749.8467	121.0598
		D	7.17	44.39	32.73	62.29	50.63	1,694.3378	115.6112
Total			-	47.46	35.76	65.36	53.66	3,436.1447	232.2922

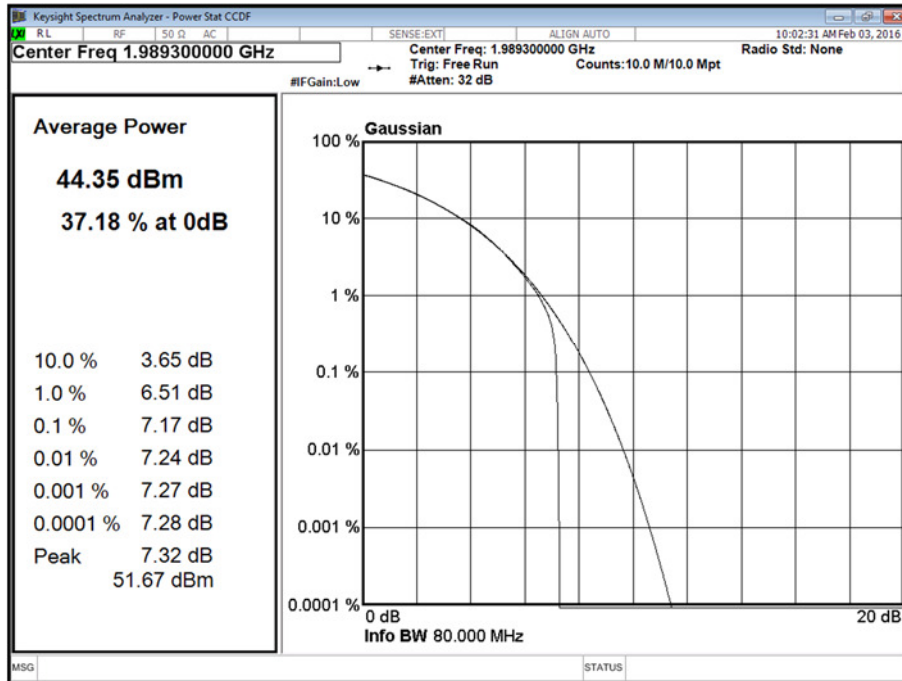
Channel Position T - Bandwidth 1.4 MHz - Antenna A



Channel Position T - Bandwidth 1.4 MHz - Antenna B



Channel Position T - Bandwidth 1.4 MHz - Antenna C



Channel Position T - Bandwidth 1.4 MHz - Antenna D

