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Report On

FCC Testing of the
Ericsson AB Radio 2205 B46 KRC 161 609/1
LAA (B46A and B46D) Remote Radio Unit In accordance with FCC
CFR 47 Part 15E

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161609-1

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DATED

07 July 2017

Document 75938768 Report 01 Issue 1

July 2017



Product Service

CONTENTS

Section	Page No
1	REPORT INFORMATION 2
1.1	Report Details 3
1.2	Brief Summary of Results 4
1.3	Configuration Description 5
1.4	Declaration of Build Status 6
1.5	Product Information 7
1.6	Test Setup 8
1.7	Test Conditions 10
1.8	Deviation From The Standard 10
1.9	Modification Record 10
1.10	Alternative Test Site 10
2	TEST DETAILS 11
2.1	Maximum Output Power and Outdoor Maximum E.I.R.P. – Conducted 12
2.2	Maximum Power Spectral Density 26
2.3	26 dB Bandwidth and 99% Occupied Bandwidth 80
2.4	Undesirable Emission – Conducted 116
2.5	Undesirable Emission at Band Edge 195
2.6	Undesirable Emission – Radiated 222
2.7	Frequency Stability 237
2.8	Conducted Emission 240
3	TEST EQUIPMENT USED 244
3.1	Test Equipment Used 245
3.2	Measurement Uncertainty 247
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 248
4.1	Accreditation, Disclaimers and Copyright 249

SECTION 1

REPORT INFORMATION



Product Service

1.1 REPORT DETAILS

The information contained in this report is intended to show verification of the Ericsson Radio 2205 B46 KRC 161 609/1 Remote Radio Unit to the requirements of FCC CFR 47 Part 15E.

Testing was carried out in support of an application for Grant of Radio 2205 B46 KRC 161 609/1 in LAA mode.

Manufacturer	Ericsson AB
Address	Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Product Name	Radio 2205 B46
Product Number	KRC 161 609/1
Serial Number(s)	D825784303 D825931354 D825796609
Software Version	CXP9033743/2 Rev R1C07
Hardware Version	R1B
Test Specification/Issue/Date	FCC CFR 47 Part 15: 2016
Start of Test	15 June 2017
Finish of Test	30 June 2017
Name of Engineer(s)	Lei Zhao
Related Document(s)	ANSI C63.4: 2014 ANSI/TIA-603-D:2010 FCC CFR 47 Part 2: 2016 3GPP TS 36.141 V13.6.0 (2017-01) KDB 789033 D02 v01r04 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 Part 15 is shown below.

Section	Spec Clause		Test Description	Result
	Part 2	Part 15E		
2.1	2.1046	15.407 (a)(1)(3)	Maximum Output Power and Outdoor Maximum Equivalent Isotropically Radiated Power (EIRP)	Pass
2.2	2.1046	15.407 (a)(5)	Maximum Power Spectral Density	Pass
2.3	2.1049(h)	15.407 (a) 15.407 (e)	26 dB Bandwidth and 99% Occupied Bandwidth	Pass
2.4	2.1051	15.407 (b) 15.209	Undesirable Emission – Conducted	Pass
2.5	2.1051	15.407 (b) 15.205 15.209	Undesirable Emission at Band Edge	Pass
2.6	2.1053	15.407 (b) 15.205 15.209	Undesirable Emission – Radiated	Pass
2.7	2.1055	15.407 (g)	Frequency Stability	Pass
2.8	2.1051	15.407 (b) 15.207	Conducted Emission	Pass



Product Service

1.3 CONFIGURATION DESCRIPTION

Configuration A

Configuration A1 - Maximum 20.5 dBm for ports equipped with directional 9.5dBi Antenna at Band B46A or UNII-1

Configuration A2 - Maximum 20.5 dBm for ports equipped with directional 9.5dBi Antenna at Band B46D or UNII-3

Configuration B

Configuration B1 - Maximum 25.0dBm for ports be equipped with directional 6dBi Antenna at Band B46A or UNII-1

Configuration B1 - Maximum 25.0dBm for ports be equipped with directional 6dBi Antenna at Band B46D or UNII-3

Configuration Code	Carrier(s)	Configuration Description
L-MIMO-SC	1C	LTE MIMO, Single Carrier
L-MIMO-MC 1	2C	LTE MIMO, Multi Carrier x2
L-MIMO-MC 2	3C	LTE MIMO, Multi Carrier x3

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations have been tested to find the worst case setting. The settings below were used for all measurements unless otherwise noted:

LTE:

MIMO mode single carrier: E-TM1.1

MIMO mode multi carrier (x2): E-TM1.1

MIMO mode multi carrier (x3): E-TM1.1

MIMO mode single carrier: E-TM3.2

MIMO mode multi carrier (x2): E-TM3.2

MIMO mode multi carrier (x3): E-TM3.2

MIMO mode single carrier: E-TM3.1

MIMO mode multi carrier (x2): E-TM3.1

MIMO mode multi carrier (x3): E-TM3.1

MIMO mode single carrier: E-TM3.1a

MIMO mode multi carrier (x2): E-TM3.1a

MIMO mode multi carrier (x3): E-TM3.1a

The EUT includes two TX ports and it can be configured to transmit in MIMO mode for LTE carriers, MIMO mode for LTE was used for measurements as the worst configuration.

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

For LAA (Radio Access Technology) MIMO mode, all the Maximum Output Power and Maximum Power Spectral Density was tested on all TX output connector RF A and B. All the other TX measurements of LAA MIMO mode, were performed on the combined TX output connector RF A of the EUT as the representative port.



Product Service

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Remote Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	Radio 2205 B46
PRODUCT NUMBER	KRC 161 609/1
TRANSMITTER OPERATING RANGE	TX: 5155.8 MHz - 5250 MHz, 5725 MHz – 5850 MHz
MODULATIONS	LTE: QPSK, 16QAM, 64QAM, 256QAM
ITU DESIGNATION OF EMISSION	LTE: 20M0F9W
NUMBER OF CARRIERS	Maximum 3 carriers
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	20 MHz
OUTPUT POWER (RMS) (W or dBm)	Maximum 20.5 dBm for ports be equipped with directional 10.5 dBi Antenna Gain Maximum 25.0 dBm for ports be equipped with directional 6.0 dBi Antenna Gain
INSTANTANEOUS BANDWIDTH	60 MHz
NUMBER OF ANTENNA PORTS	2 TX ports
FCC ID	TA8AKRC161609-1
Power source	36 V DC
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is the Remote Radio Part designed for use in LTE cellular telephone system and for LAA to extend benefits of LTE on unlicensed spectrum.

Signature

Date

15 June 2017

D of B S Serial No

75939386/01

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

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

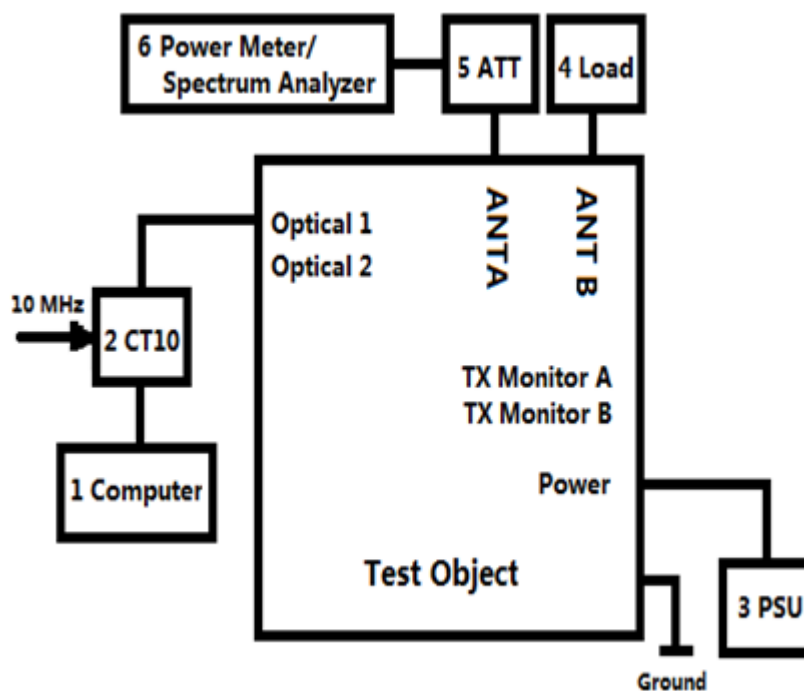
The Equipment Under Test (EUT) is shown in the photograph below. The Radio 2205 B46 KRC 161 609/1 operates from 36 V DC with PSU AC 10 or PSU 48 05. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test

1.6 TEST SETUP

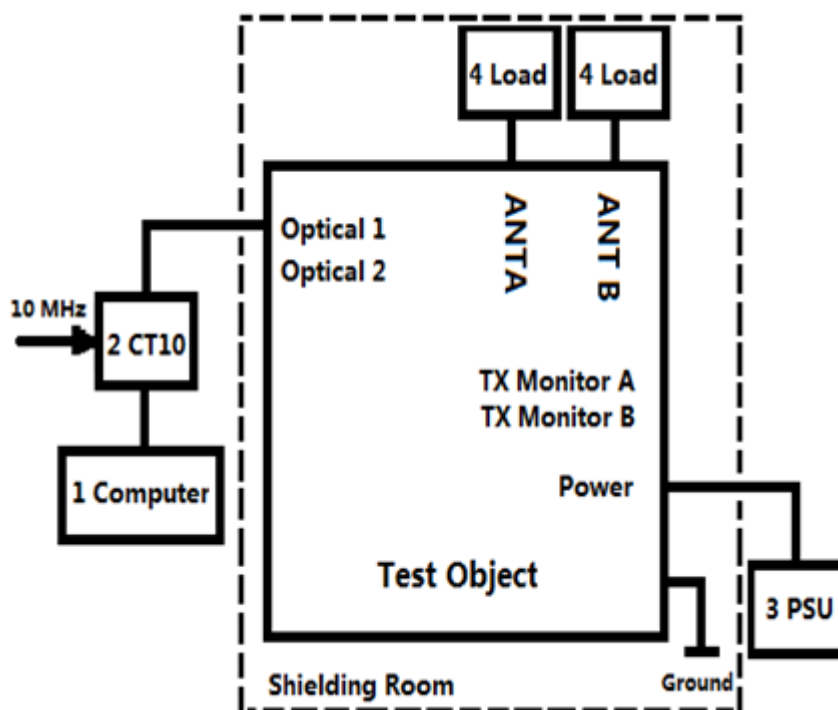
Test Setup, Conducted Measurement:



Product Name	Product Number	Version	Serial Number
Radio 2205 B46	KRC 161 609/1	R1B	D825784303 D825931354

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook 8540w	--	CND1234694
2	CT10	LPC 102 487/1	R1C	T01F410050
3	PSU	N5767A	--	BAMS-1001652011
4	Load	53K17R-005	--	--
5	20dB Attenuator	53AS102-K20	--	--
6	Spectrum Analyzer	N9030A	--	MY54490502
	Power Meter	NRP2	--	104221
	Power Sensor	NRP-Z11	--	121215
	Power Sensor	NRP-Z11	--	121220

Test Setup, Radiated Measurement:



Product Name	Product Number	Version	Serial Number
Radio 2205 B46	KRC 161 609/1	R1B	D825796609

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook Folio 9470m	--	AP538738
2	CT10	LPC 102 487/1	R1C	T01F262515
3	PSU	N5767A	--	BAMS-1001607355
4	Load	53K17R-005	--	--
	Load	53K17R-005	--	--

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.

All test cases were tested with the EUT supplied with 36 V DC via PSU AC 10 or PSU 48 05.

1.8 DEVIATION FROM THE STANDARD

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

1.9 MODIFICATION RECORD

Modification State 0 - 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 Beijing, China:

- Maximum Output Power and Outdoor Maximum E.I.R.P – Conducted
- Maximum Power Spectral Density
- 26 dB Bandwidth and 99% Occupied Bandwidth
- Undesirable Emission – Conducted
- Spurious Emission at Band Edge
- Frequency Stability

Testing listed below has been performed under the following site registrations:

- Undesirable Emission - Radiated
- Conducted Emissions

FCC Accreditation 910917:

The State Radio Monitoring Centre, No.80 Beilishi Road, Xicheng District, Beijing, China



Product Service

SECTION 2

TEST DETAILS



Product Service

2.1 MAXIMUM OUTPUT POWER AND OUTDOOR MAXIMUM E.I.R.P. – CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 15, Clause 15.407 (a)(1)(3)

2.1.2 Equipment Under Test

Radio 2205 B46, KRC 161 609/1, S/N: D825784303

2.1.3 Date of Test and Modification State

15 and 16 June 2017 - Modification State 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 4.1.

2.1.5 Environmental Conditions

Ambient Temperature	23.8 - 24.0°C
Relative Humidity	47.0 - 53.0%

2.1.6 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15, Clause 15.407 (a)(1)(3).

Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal in accordance with FCC KDB 789033 D02. The path loss between the EUT and the power sensor was measured and recorded for the test band. The path loss was entered as an offset into the Power Meter and Spectrum Analyzer.

The EUT was configured to transmit on maximum power on the configurations defined in the tables below. In case of the EUT was configured to MIMO mode, since the EUT transmits on two antennas simultaneously in the same frequency range for MIMO devices, i.e., TX MIMO mode, using the Measure-and-Sum approach, the output power at both antennas were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01.

Outdoor Maximum E.I.R.P was calculated in accordance with FCC CFR 47 Part 15, Clause 15.407 (a)(1)(3).

The RMS Power was measured and Outdoor Maximum E.I.R.P calculated and recorded with the results being compared with the limits.

2.1.7 Test Results

Configuration A1

L-MIMO-SC

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	QPSK / 20.0 MHz	20.81	20.86	20.84
B		20.81	20.91	20.76
Total		23.82	23.90	23.81

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	16QAM / 20.0 MHz	20.85	20.83	20.82
B		20.84	20.88	20.78
Total		23.86	23.87	23.81

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	64QAM / 20.0 MHz	20.90	20.89	20.80
B		20.89	20.87	20.76
Total		23.91	23.89	23.79

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	256QAM / 20.0 MHz	20.88	20.88	20.86
B		20.88	20.81	20.74
Total		23.89	23.86	23.81

L-MIMO-MC 1 (2C)

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	QPSK / 20.0 MHz	20.78	-	20.87
B		20.85	-	20.94
Total		23.83	-	23.92

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	16QAM / 20.0 MHz	20.80	-	20.90
B		20.90	-	20.84
Total		23.86	-	23.88

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	64QAM / 20.0 MHz	20.88	-	20.88
B		20.91	-	20.85
Total		23.91	-	23.88

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	256QAM / 20.0 MHz	20.82	-	20.93
B		20.89	-	20.85
Total		23.87	-	23.90



Product Service

Configuration L-MIMO-MC 3 (3C)

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	QPSK / 20.0 MHz	20.83	-	20.87
B		20.86	-	20.77
Total		23.86	-	23.83

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	16QAM / 20.0 MHz	20.91	-	20.88
B		20.79	-	20.83
Total		23.86	-	23.87

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	64QAM / 20.0 MHz	20.89	-	20.86
B		20.83	-	20.87
Total		23.87	-	23.88

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	256QAM / 20.0 MHz	20.80	-	20.91
B		20.85	-	20.83
Total		23.84	-	23.88

Configuration A2

L-MIMO-SC

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	QPSK / 20.0 MHz	20.28	20.45	20.50
B		20.24	20.38	20.40
Total		23.27	23.43	23.46

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	16QAM / 20.0 MHz	20.31	20.47	20.44
B		20.25	20.31	20.40
Total		23.29	23.40	23.43

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	64QAM / 20.0 MHz	20.26	20.40	20.40
B		20.33	20.32	20.39
Total		23.31	23.37	23.41

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	256QAM / 20.0 MHz	20.20	20.40	20.47
B		20.32	20.26	20.44
Total		23.27	23.34	23.47

L-MIMO-MC 1 (2C)

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	QPSK / 20.0 MHz	20.28	20.35	20.51
B		20.24	20.31	20.38
Total		23.27	23.34	23.46

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	16QAM / 20.0 MHz	20.34	20.38	20.41
B		20.28	20.31	20.33
Total		23.32	23.36	23.38

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	64QAM / 20.0 MHz	20.34	20.28	20.44
B		20.31	20.29	20.32
Total		23.34	23.30	23.39

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	256QAM / 20.0 MHz	20.35	20.35	20.42
B		20.20	20.30	20.23
Total		23.29	23.34	23.34

L-MIMO-MC 3 (3C)

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	QPSK / 20.0 MHz	20.27	20.37	20.46
B		20.17	20.31	20.35
Total		23.23	23.35	23.42

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	16QAM / 20.0 MHz	20.28	20.31	20.40
B		20.24	20.29	20.42
Total		23.27	23.31	23.42

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	64QAM / 20.0 MHz	20.31	20.35	20.44
B		20.21	20.30	20.40
Total		23.27	23.34	23.43

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	256QAM / 20.0 MHz	20.17	20.25	20.42
B		20.13	20.14	20.30
Total		23.16	23.21	23.37

Configuration B1

L-MIMO-SC

Maximum Output Power 25.0dBm per port

L-MIMO-MC 1 (2C)

Maximum Output Power 25.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	QPSK / 20.0 MHz	25.34	-	25.31
B		25.24	-	25.25
Total		28.30	-	28.29

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	16QAM / 20.0 MHz	25.24	-	25.35
B		25.30	-	25.29
Total		28.28	-	28.33

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	64QAM / 20.0 MHz	25.28	-	25.31
B		25.26	-	25.29
Total		28.28	-	28.31

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5240.0MHz
A	256QAM / 20.0 MHz	25.22	-	25.40
B		25.31	-	25.28
Total		28.28	-	28.35



Product Service

L-MIMO-MC 3 (3C)

Maximum Output Power 25.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	QPSK / 20.0 MHz	25.27	-	25.21
B		25.24	-	25.24
Total		28.27	-	28.24

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	16QAM / 20.0 MHz	25.31	-	25.31
B		25.23	-	25.19
Total		28.28	-	28.26

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	64QAM / 20.0 MHz	25.33	-	25.26
B		25.24	-	25.28
Total		28.30	-	28.28

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5180.0MHz + 5200.0MHz + 5220.0MHz	Channel Position MRFBW -	Channel Position TRFBW 5200.0MHz + 5220.0MHz + 5240.0MHz
A	256QAM / 20.0 MHz	25.25	-	25.23
B		25.19	-	25.27
Total		28.23	-	28.26

Configuration B2

L-MIMO-SC

Maximum Output Power 25.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	QPSK / 20.0 MHz	24.71	24.85	24.88
B		24.73	24.83	24.76
Total		27.73	27.85	27.83

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	16QAM / 20.0 MHz	24.69	24.82	24.91
B		24.74	24.79	24.80
Total		27.73	27.82	27.87

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	64QAM / 20.0 MHz	24.72	24.90	24.88
B		24.68	24.80	24.83
Total		27.71	27.86	27.87

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	256QAM / 20.0 MHz	24.72	24.81	24.95
B		24.67	24.79	24.84
Total		27.71	27.81	27.91



Product Service

L-MIMO-MC 1 (2C)

Maximum Output Power 25.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	QPSK / 20.0 MHz	24.73	24.82	24.82
B		24.65	24.70	24.75
Total		27.70	27.77	27.80

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	16QAM / 20.0 MHz	24.74	24.77	24.87
B		24.66	24.73	24.70
Total		27.71	27.76	27.80

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	64QAM / 20.0 MHz	24.78	24.79	24.88
B		24.60	24.77	24.68
Total		27.70	27.79	27.79

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position BRFBW 5745.0MHz + 5785.0MHz	Channel Position MRFBW 5765.0MHz + 5805.0MHz	Channel Position TRFBW 5785.0MHz + 5825.0MHz
A	256QAM / 20.0 MHz	24.71	24.78	24.90
B		24.66	24.70	24.75
Total		27.70	27.75	27.84

Configuration L-MIMO-MC 3 (3C)

Maximum Output Power 25.0dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	QPSK / 20.0 MHz	24.60	24.73	24.85
B		24.59	24.68	24.72
Total		27.61	27.72	27.80

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	16QAM / 20.0 MHz	24.68	24.69	24.88
B		24.64	24.73	24.78
Total		27.67	27.72	27.84

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	64QAM / 20.0 MHz	24.72	24.74	24.86
B		24.52	24.69	24.75
Total		27.63	27.73	27.82

Antenna	Modulation / Carrier Bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B _{RFBW} 5745.0MHz + 5765.0MHz + 5785.0MHz	Channel Position M _{RFBW} 5765.0MHz + 5785.0MHz + 5805.0MHz	Channel Position T _{RFBW} 5785.0MHz + 5805.0MHz + 5825.0MHz
A	256QAM / 20.0 MHz	24.67	24.81	24.84
B		24.61	24.67	24.76
Total		27.65	27.75	27.81



Product Service

Maximum Output Power and Maximum E.I.R.P.

	Configuration A1	Configuration A2	Configuration B1	Configuration B2
Maximum Total Output Power (dBm)	23.92	23.47	28.35	27.91
Maximum E.I.R.P. (dBm)	34.42	33.97	35.35	34.91
Outdoor Maximum E.I.R.P *	< 16.92	< 16.47	< 19.35	< 18.91

* The Maximum Gain at elevation angle above 30 degrees was less than -7dBi for Configuration A and less than -9dBi for Configuration B.

Limit	
Maximum Output Power and E.I.R.P.	≤1W (30 dBm) provided the maximum antenna gain does not exceed 6 dBi, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
Outdoor Maximum E.I.R.P	≤125mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon

Remarks

The Maximum Output Power and the Maximum E.I.R.P. of the EUT is sufficient to keep it within the range of the rated transmitter power and E.I.R.P. that the manufacture declared and the requirements of FCC standards.



Product Service

2.2 MAXIMUM POWER SPECTRAL DENSITY

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 15, Clause 15.407 (a)(5)

2.2.2 Equipment Under Test

Radio 2205 B46, KRC 161 609/1, S/N: D825784303

2.2.3 Date of Test and Modification State

16 and 19 June 2017 - Modification State 0

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 4.1.

2.2.5 Environmental Conditions

Ambient Temperature	23.8 - 24.9°C
Relative Humidity	53.0 - 53.0%

2.2.6 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15, Clause 15.407 (a)(5).

Using a Spectrum Analyzer and attenuator(s), the Power Spectral Density (PSD) of the EUT was measured at the antenna terminal. The path loss between the EUT and the Spectrum Analyzer was measured and recorded for the test band. The path loss was entered as an offset into the Spectrum Analyzer.

The EUT was configured to transmit on maximum power on the configurations defined in the tables below. Since the EUT transmits on two antennas simultaneously in the same frequency range for MIMO devices, i.e., TX MIMO mode, using the Measure-and-Sum approach, the PSD at both antennas were tested, and the total PSD were then summed mathematically in linear power units according to FCC KDB 662911 D01.

The PSD was measured and recorded with the results being compared with the limits.

2.2.8 Test Results

Configuration A1

L-MIMO-SC

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	QPSK / 20.0 MHz	7.941	8.143	8.432
B		8.080	8.087	8.694
Total		11.021	11.125	11.575

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	16QAM / 20.0 MHz	8.755	8.914	8.854
B		8.773	9.159	9.123
Total		11.754	12.049	12.001

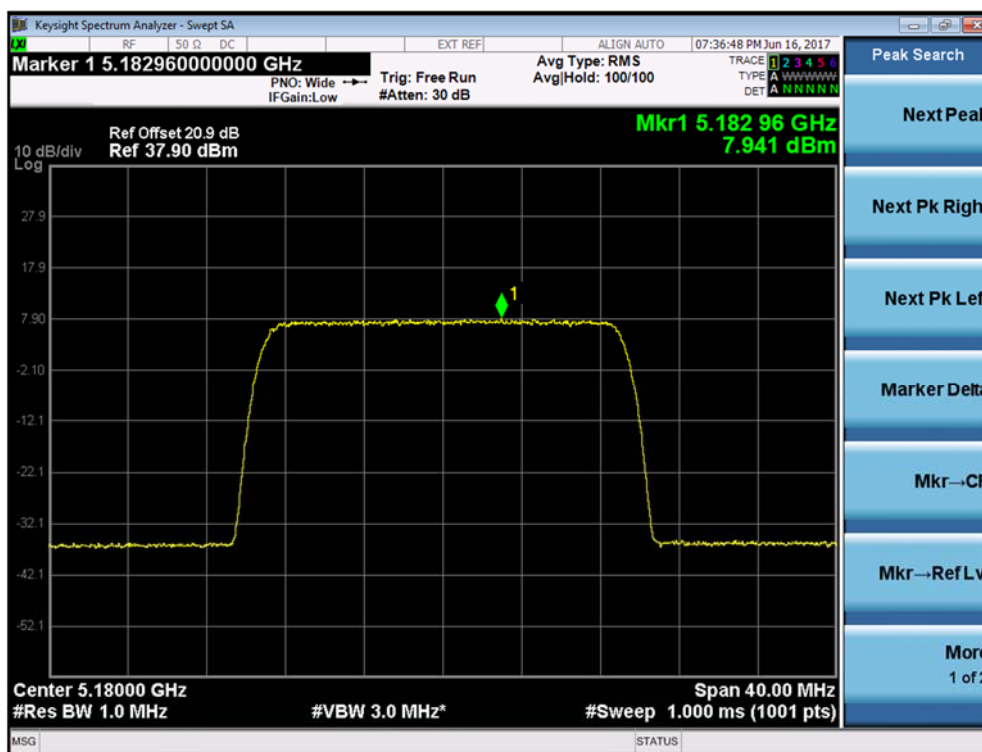
Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	64QAM / 20.0 MHz	7.877	7.974	8.207
B		7.970	8.250	8.333
Total		10.934	11.124	11.281

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5180.0MHz	Channel Position M 5220.0MHz	Channel Position T 5240.0MHz
A	256QAM / 20.0 MHz	7.917	7.995	8.255
B		8.168	8.180	7.993
Total		11.055	11.099	11.136

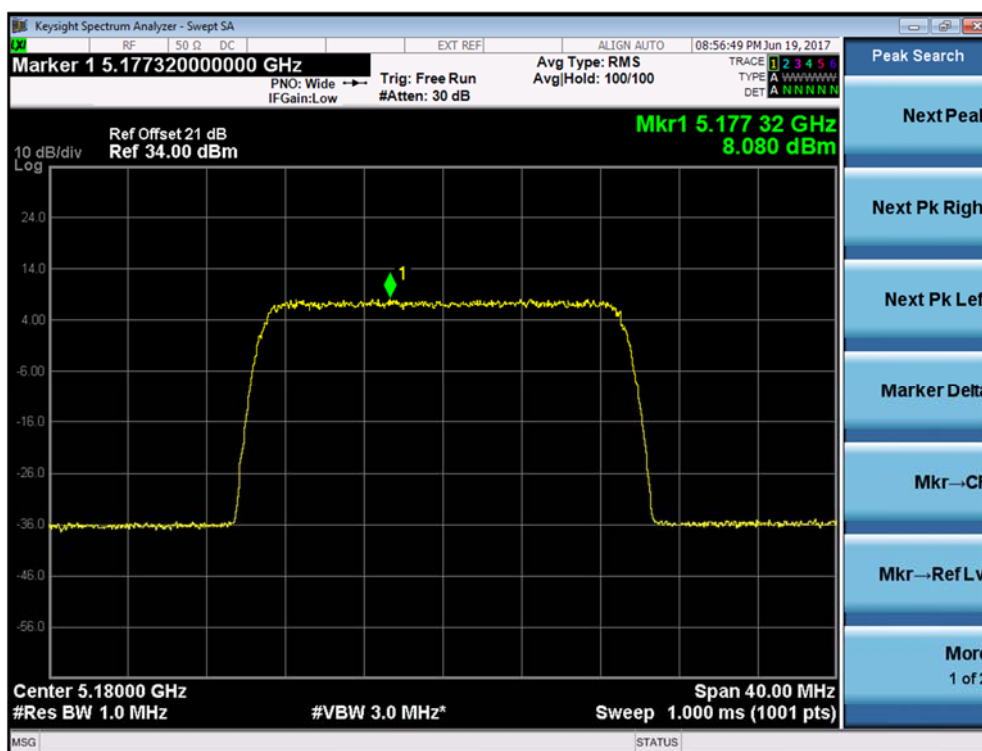


Product Service

Channel Position B - QPSK - Antenna A/ Bandwidth 20.0 MHz



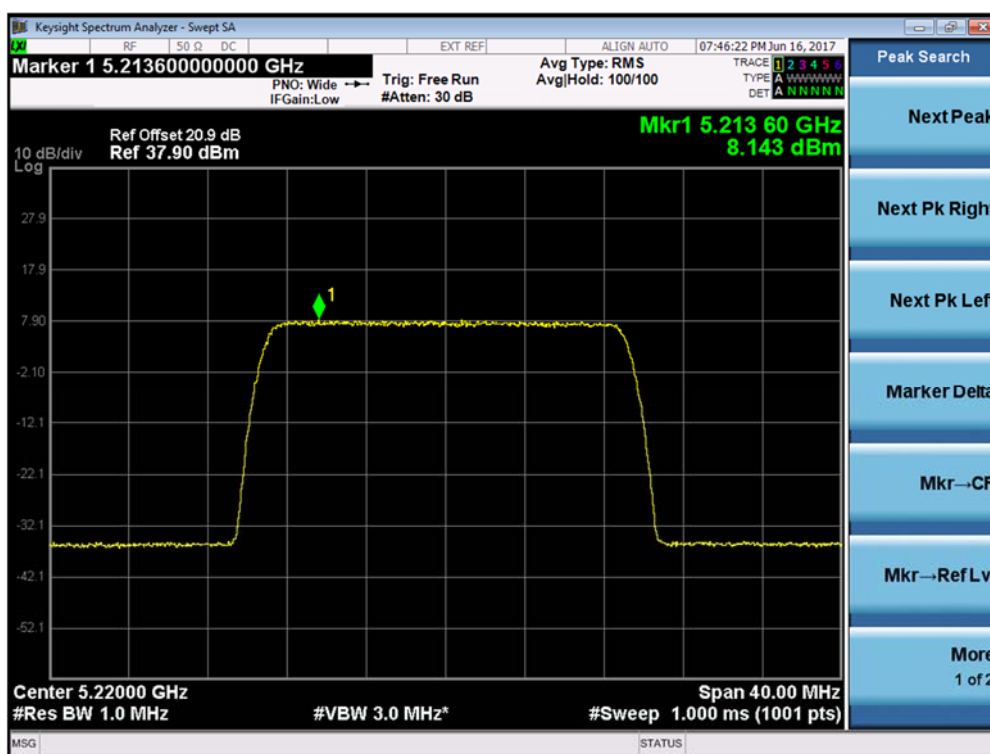
Channel Position B - QPSK - Antenna B/ Bandwidth 20.0 MHz



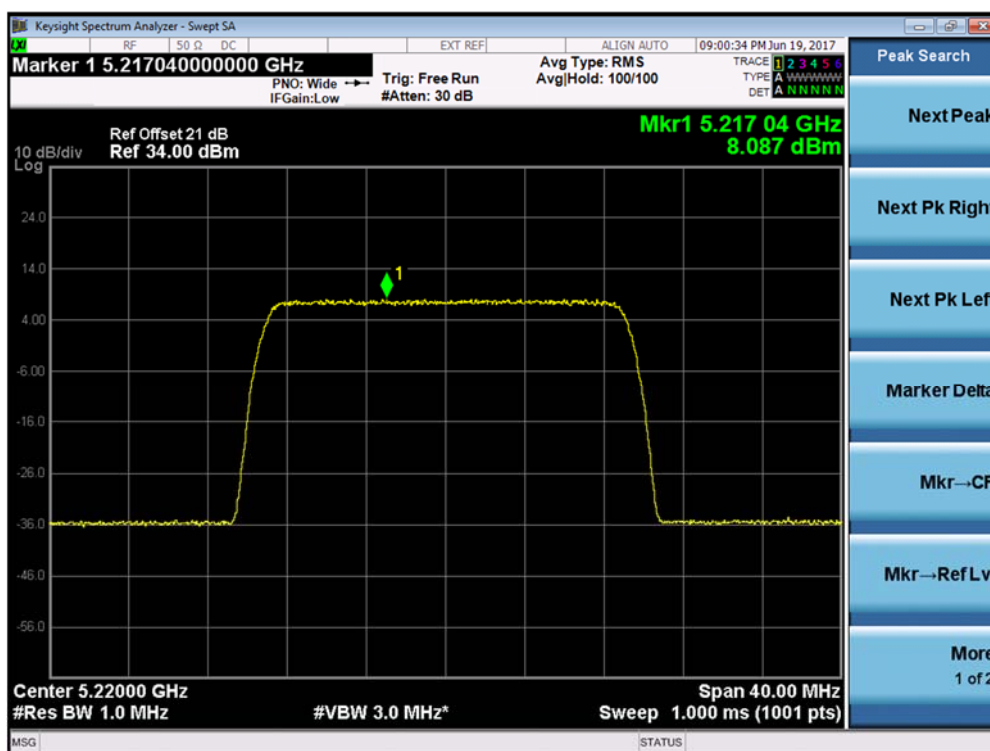


Product Service

Channel Position M - QPSK - Antenna A/ Bandwidth 20.0 MHz



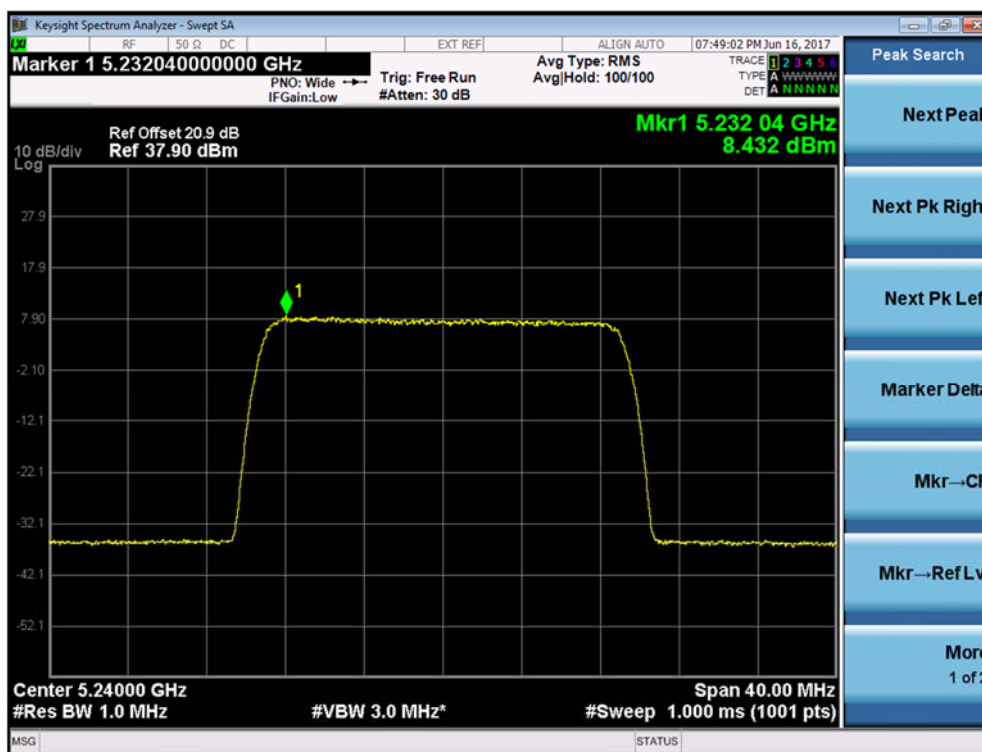
Channel Position M - QPSK - Antenna B/ Bandwidth 20.0 MHz



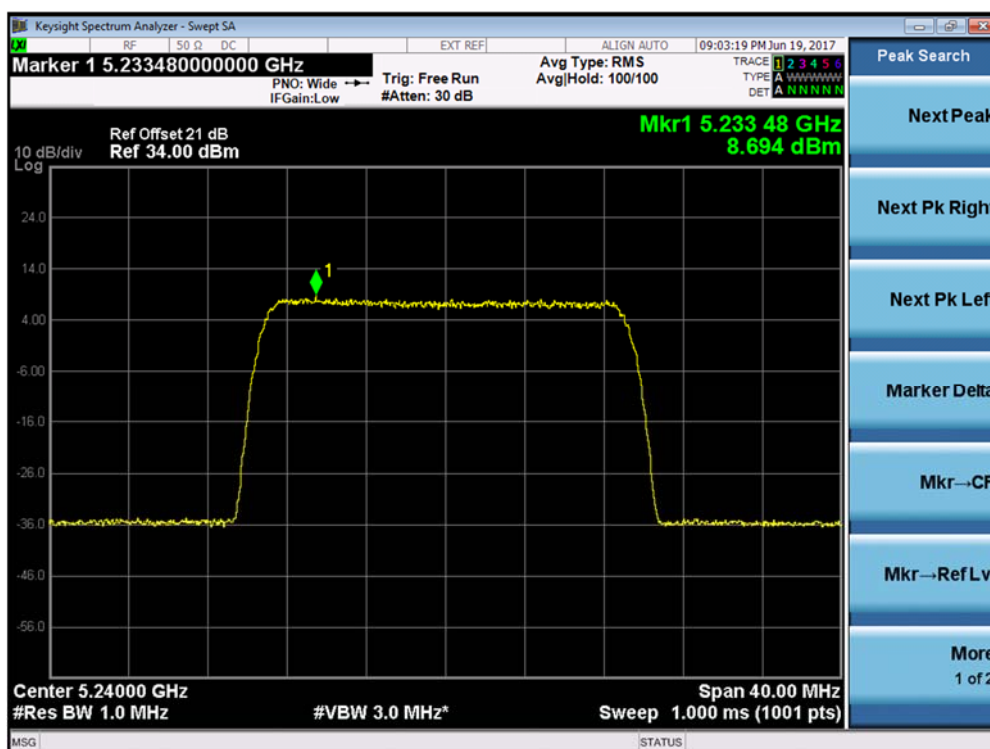


Product Service

Channel Position T - QPSK - Antenna A/ Bandwidth 20.0 MHz



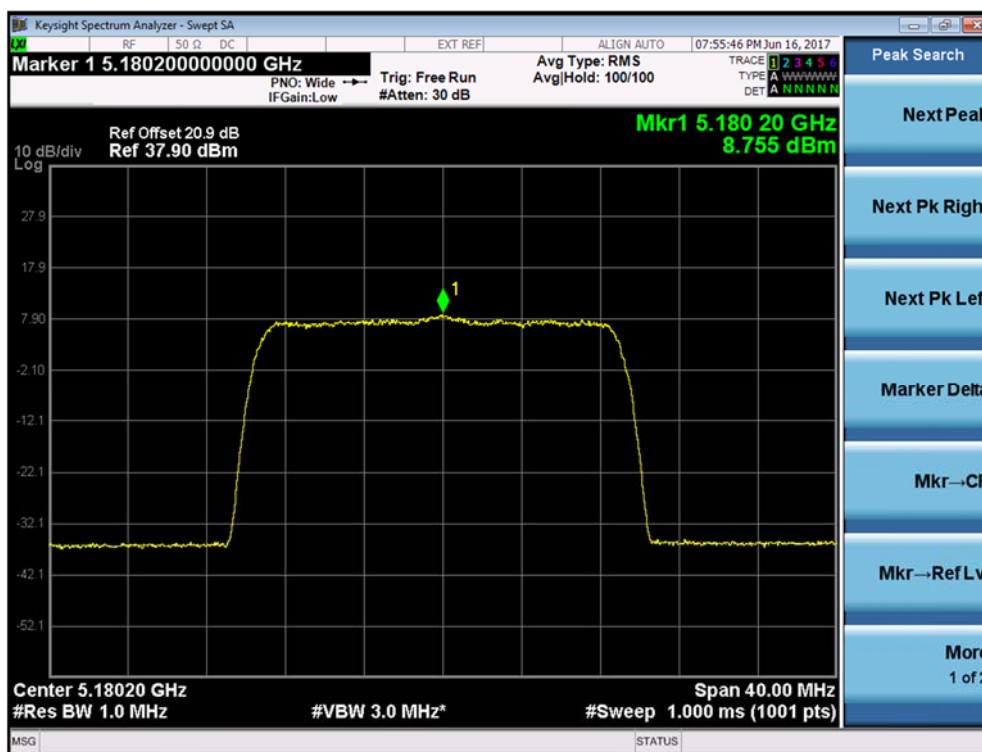
Channel Position T - QPSK - Antenna B/ Bandwidth 20.0 MHz



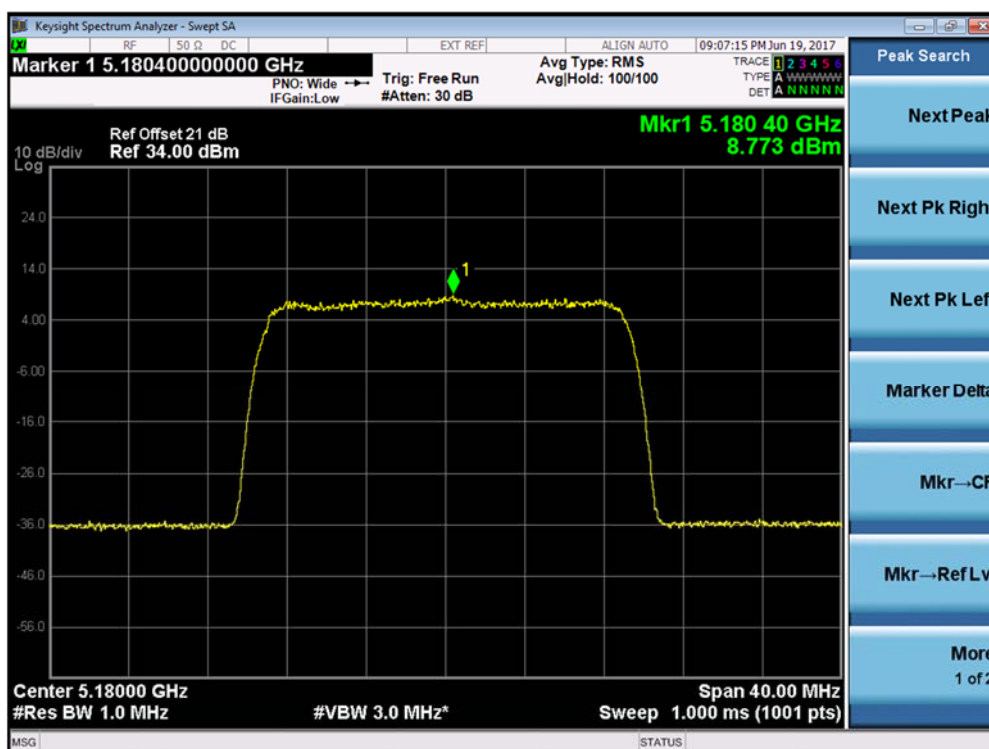


Product Service

Channel Position B - 16QAM - Antenna A/ Bandwidth 20.0 MHz



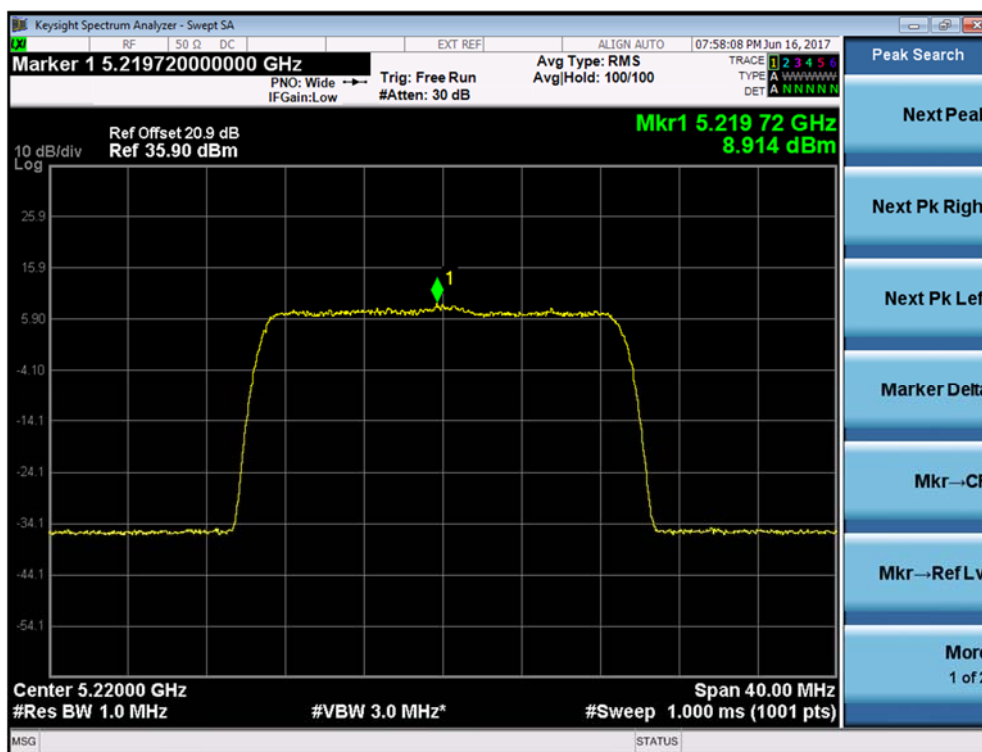
Channel Position B - 16QAM - Antenna B/ Bandwidth 20.0 MHz



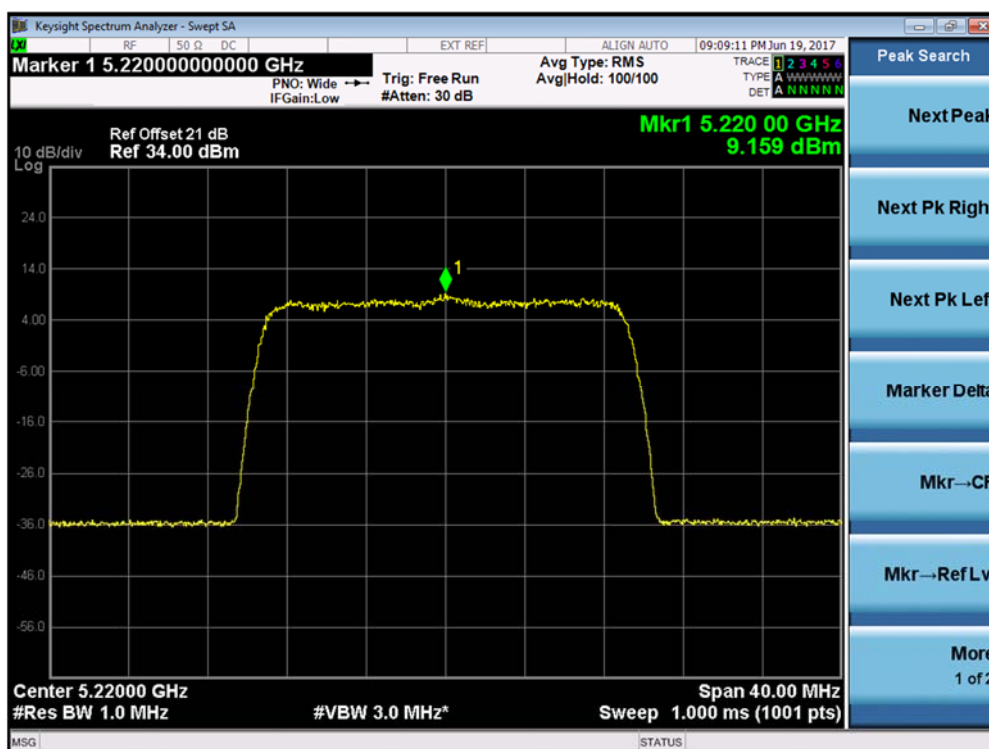


Product Service

Channel Position M - 16QAM - Antenna A/ Bandwidth 20.0 MHz



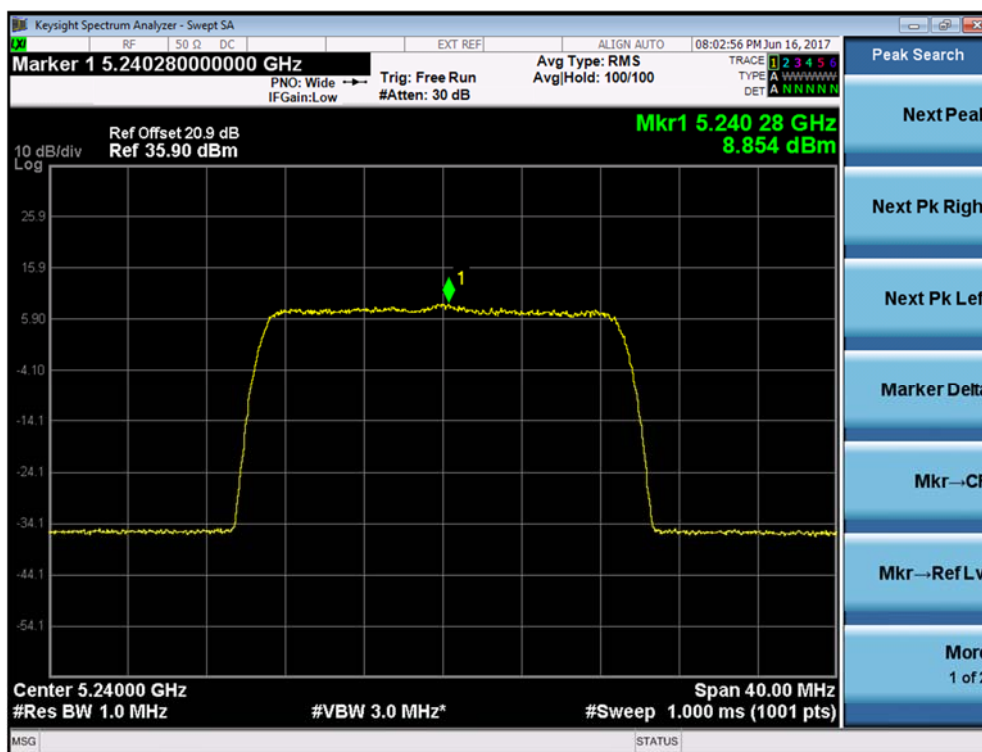
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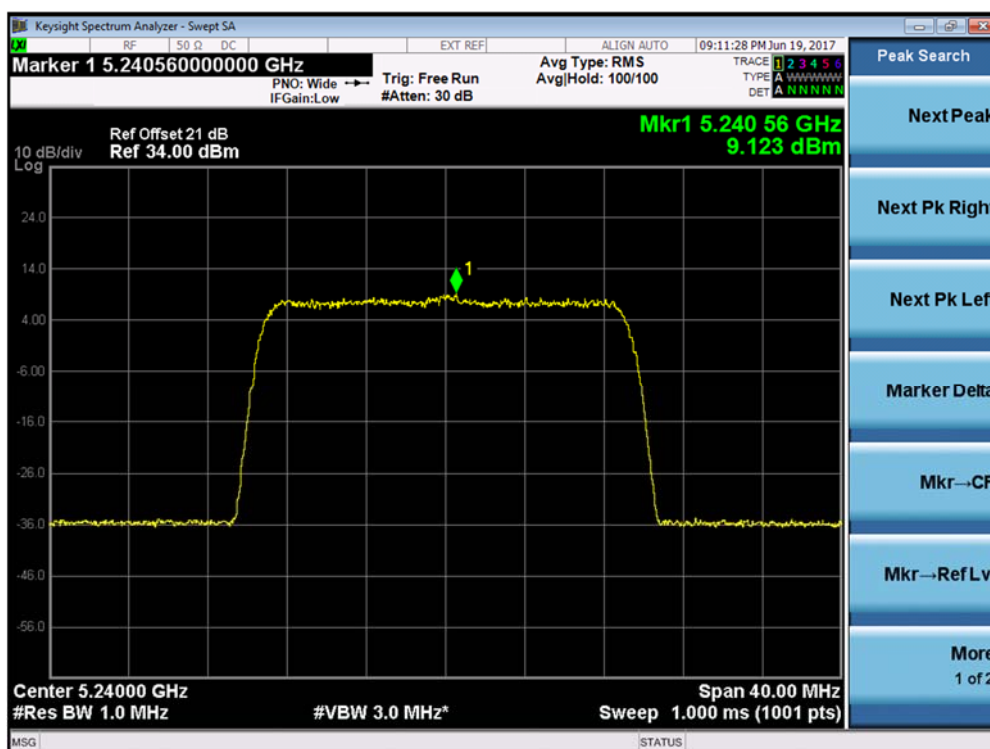


Product Service

Channel Position T - 16QAM - Antenna A/ Bandwidth 20.0 MHz



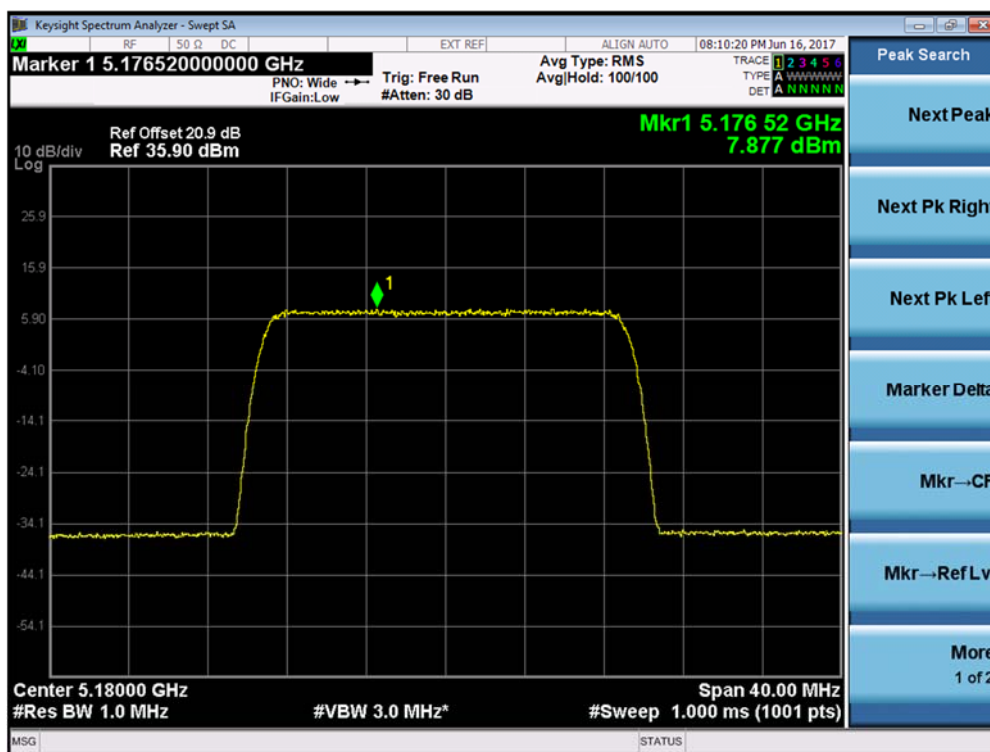
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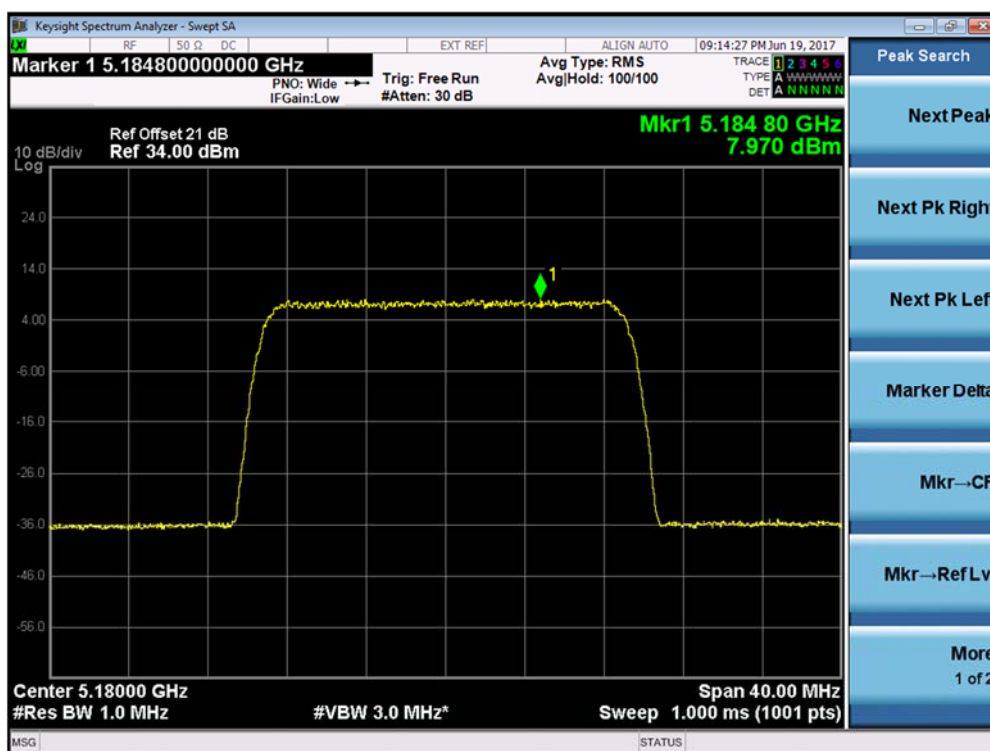


Product Service

Channel Position B - 64QAM - Antenna A/ Bandwidth 20.0 MHz



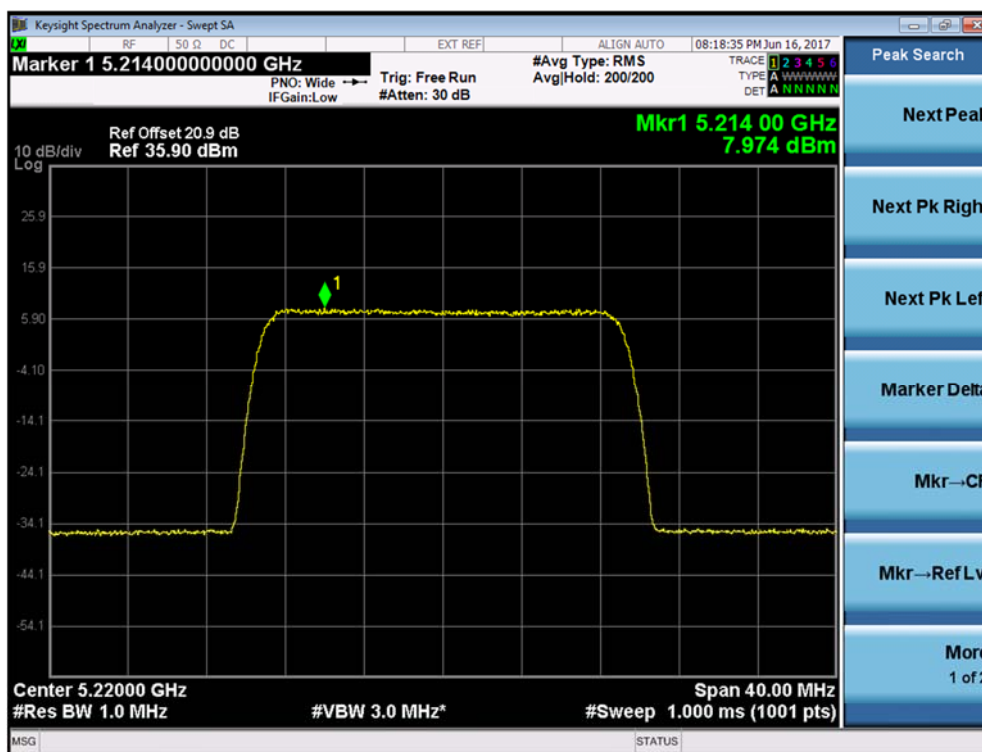
Channel Position B - 64QAM - Antenna B/ Bandwidth 20.0 MHz



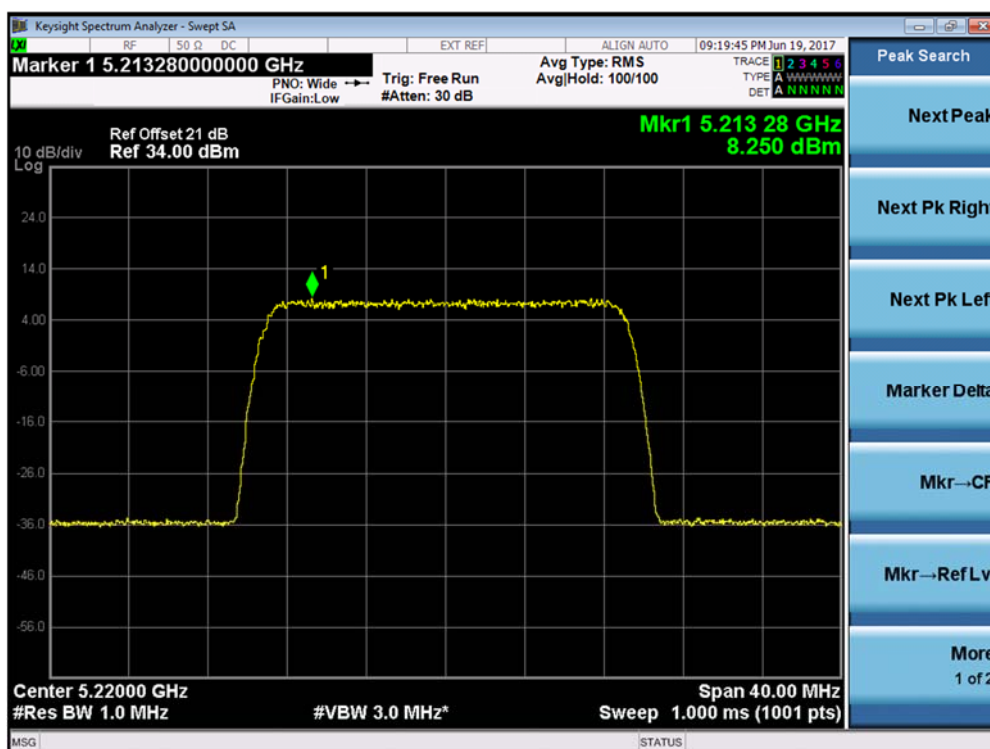


Product Service

Channel Position M - 64QAM - Antenna A/ Bandwidth 20.0 MHz



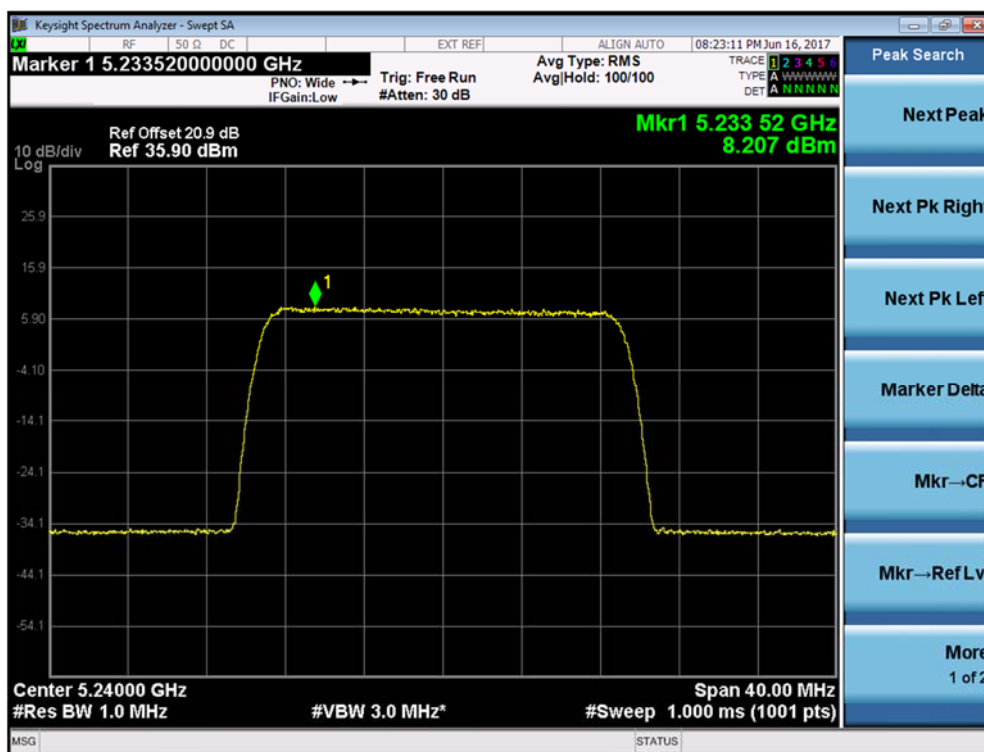
Channel Position M - 64QAM - Antenna B/ Bandwidth 20.0 MHz



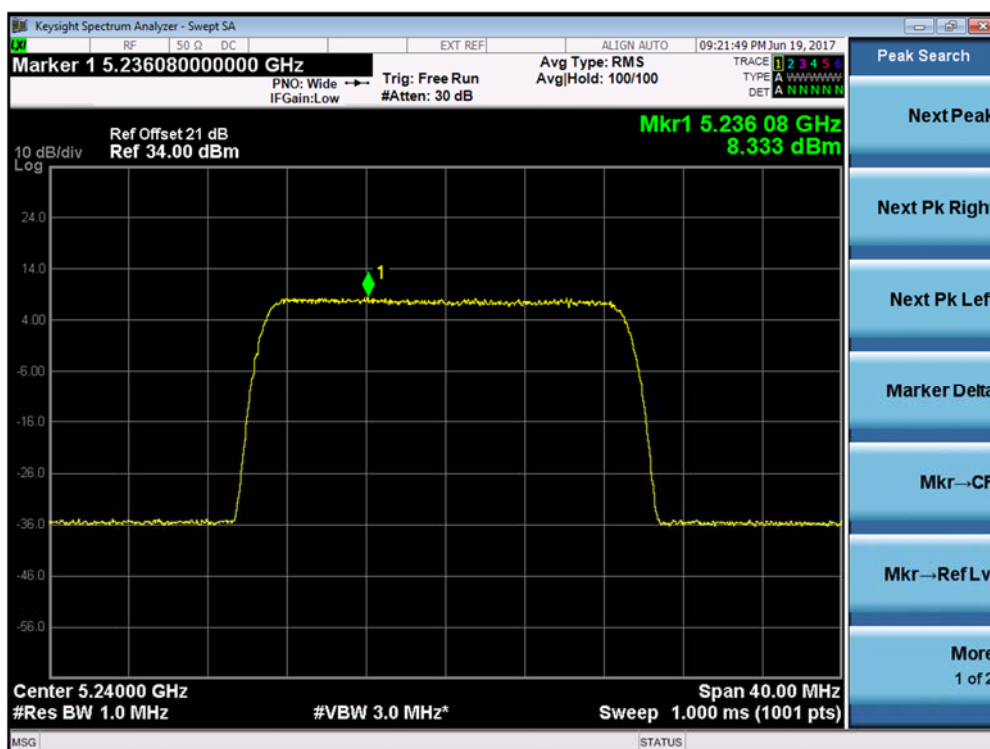


Product Service

Channel Position T - 64QAM - Antenna A/ Bandwidth 20.0 MHz



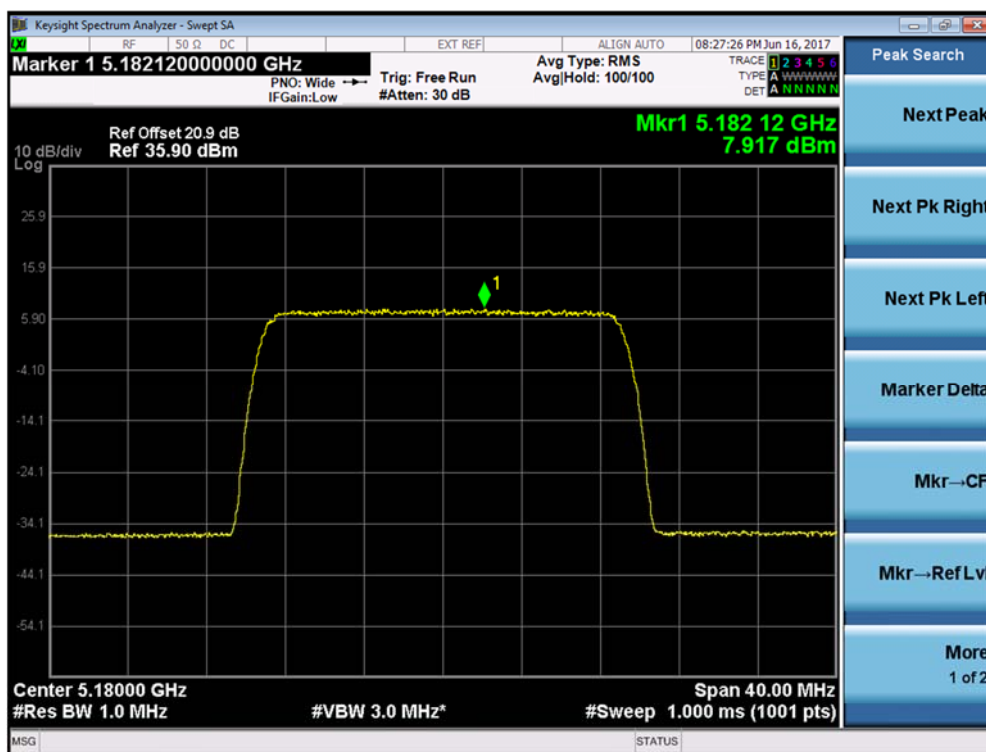
Channel Position T - 64QAM - Antenna B/ Bandwidth 20.0 MHz



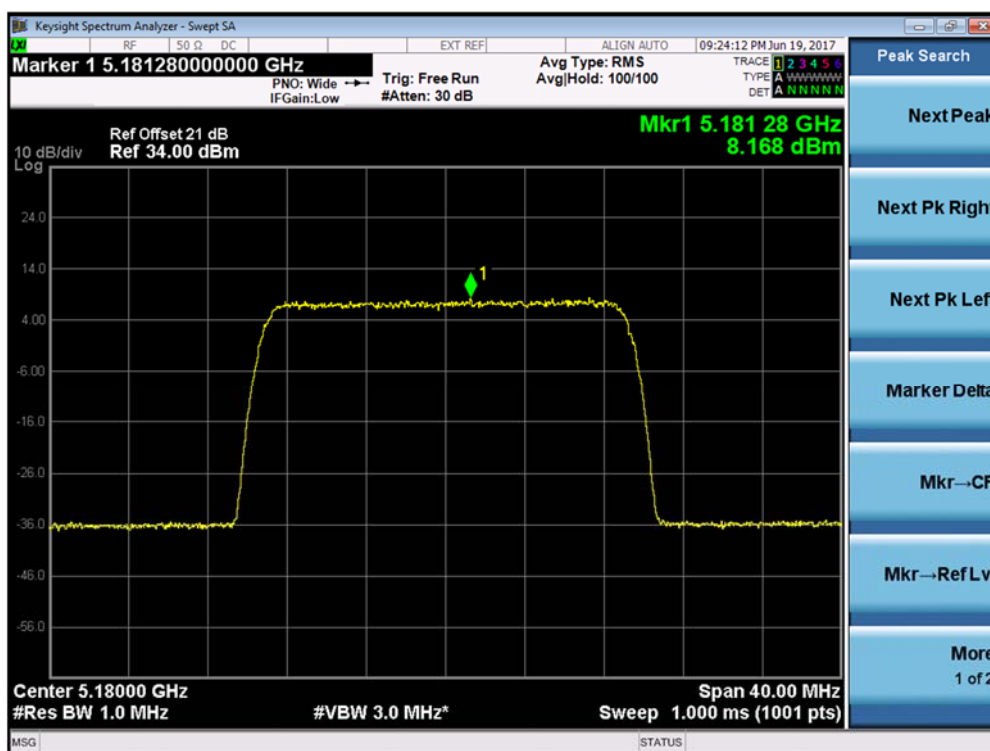


Product Service

Channel Position B - 256QAM - Antenna A/ Bandwidth 20.0 MHz



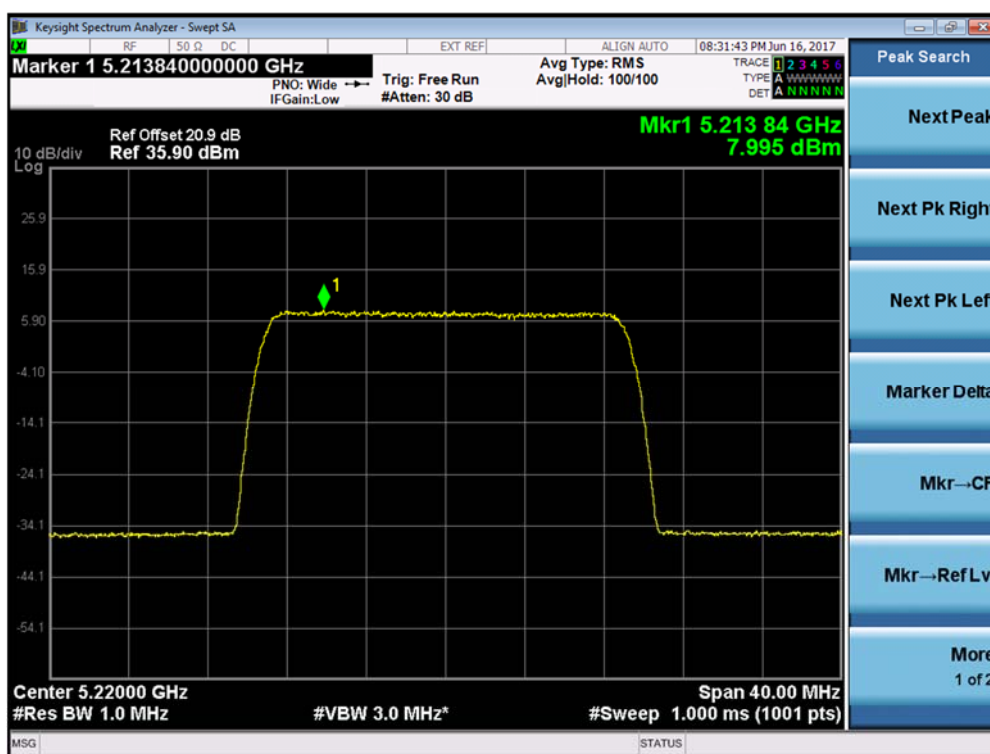
Channel Position B - 256QAM - Antenna B/ Bandwidth 20.0 MHz



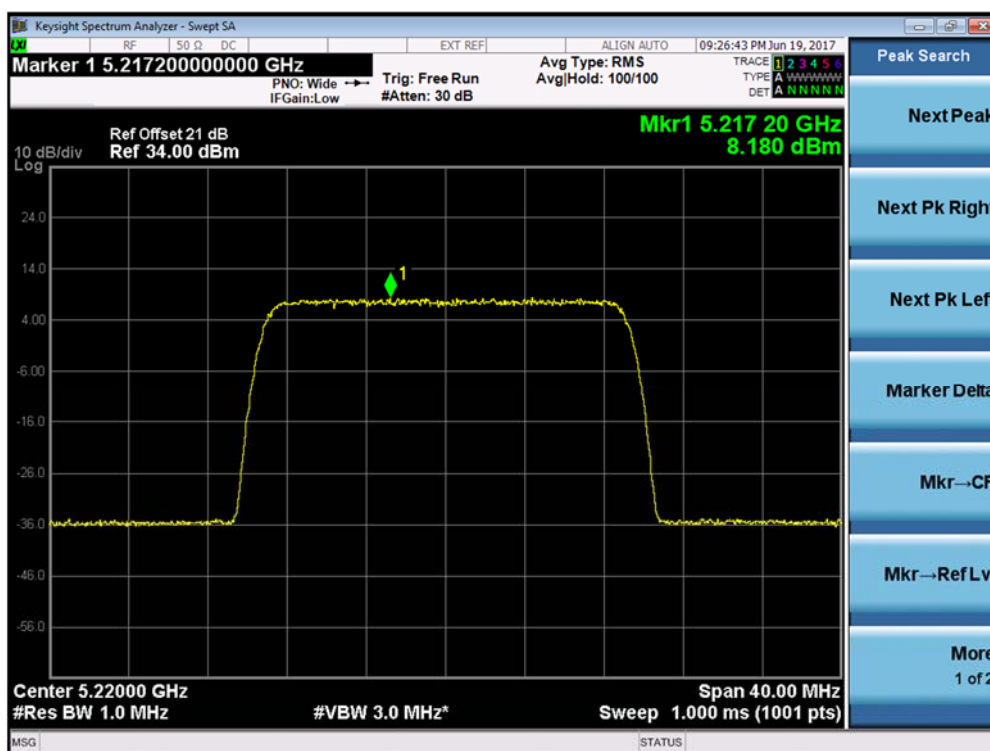


Product Service

Channel Position M - 256QAM - Antenna A/ Bandwidth 20.0 MHz



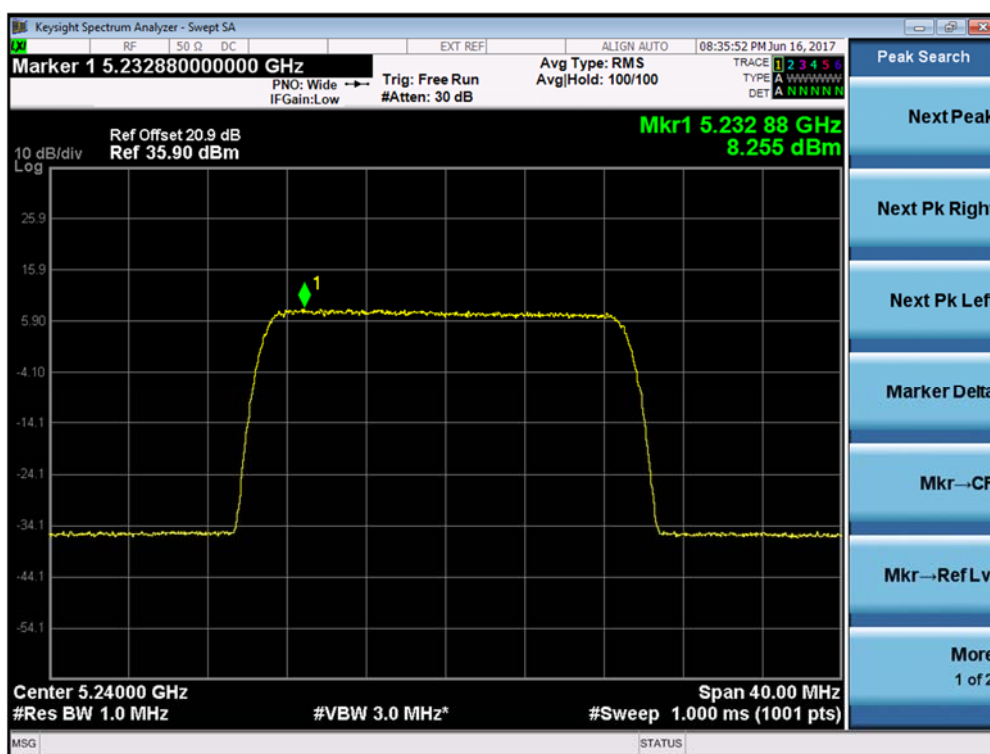
Channel Position M - 256QAM - Antenna B/ Bandwidth 20.0 MHz



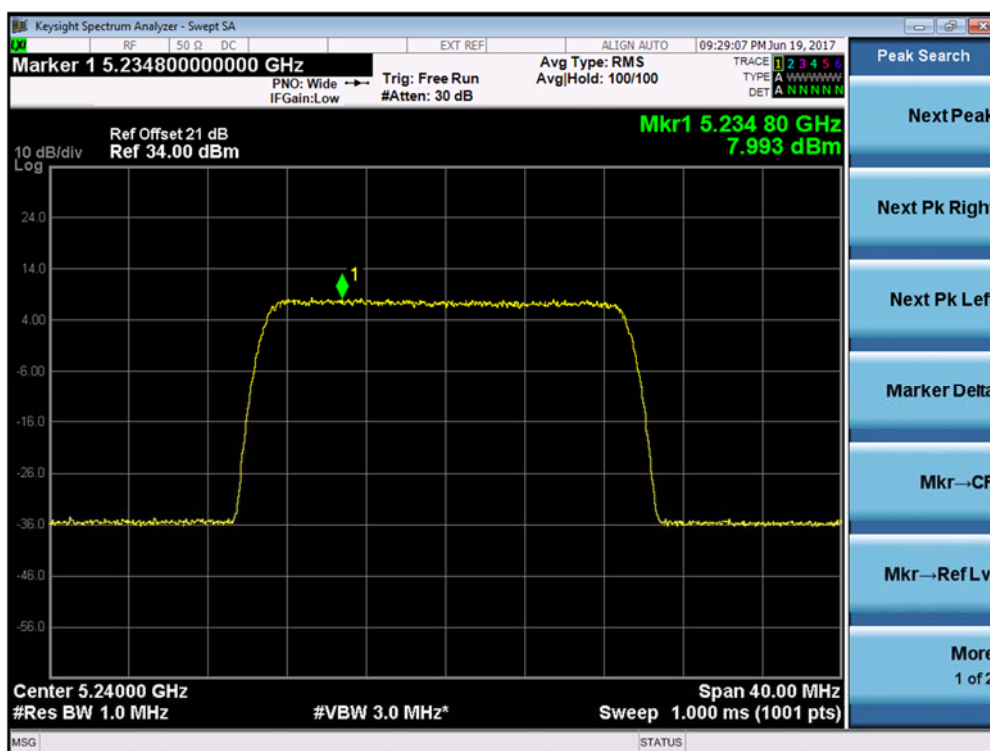


Product Service

Channel Position T - 256QAM - Antenna A/ Bandwidth 20.0 MHz



Channel Position T - 256QAM - Antenna B/ Bandwidth 20.0 MHz



Configuration A2

L-MIMO-SC

Maximum Output Power 20.5dBm per port

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	QPSK / 20.0 MHz	5.161	5.122	4.816
B		5.249	5.083	4.819
Total		8.216	8.113	7.828

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	16QAM / 20.0 MHz	5.889	5.345	5.507
B		5.891	5.473	5.560
Total		8.900	8.420	8.544

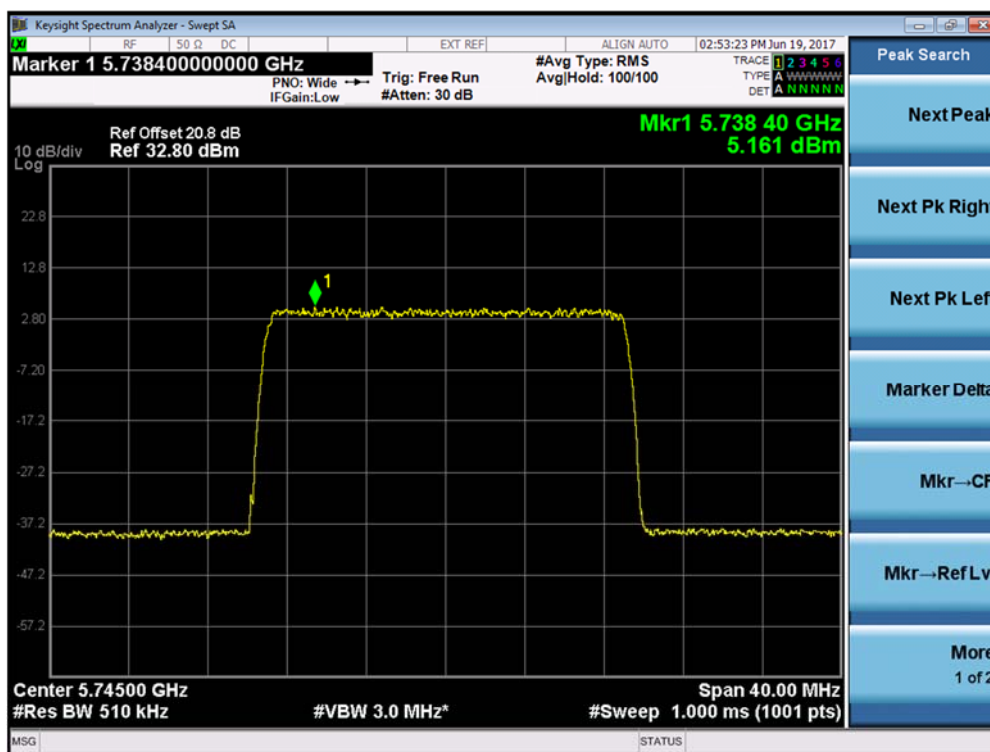
Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	64QAM / 20.0 MHz	5.351	5.206	4.818
B		5.570	5.102	4.851
Total		8.472	8.165	7.845

Antenna	Modulation / Carrier Bandwidth (MHz)	Power Spectral Density (dBm)		
		Channel Position B 5745.0MHz	Channel Position M 5785.0MHz	Channel Position T 5825.0MHz
A	256QAM / 20.0 MHz	5.484	5.098	4.864
B		5.294	5.124	4.918
Total		8.400	8.121	7.901

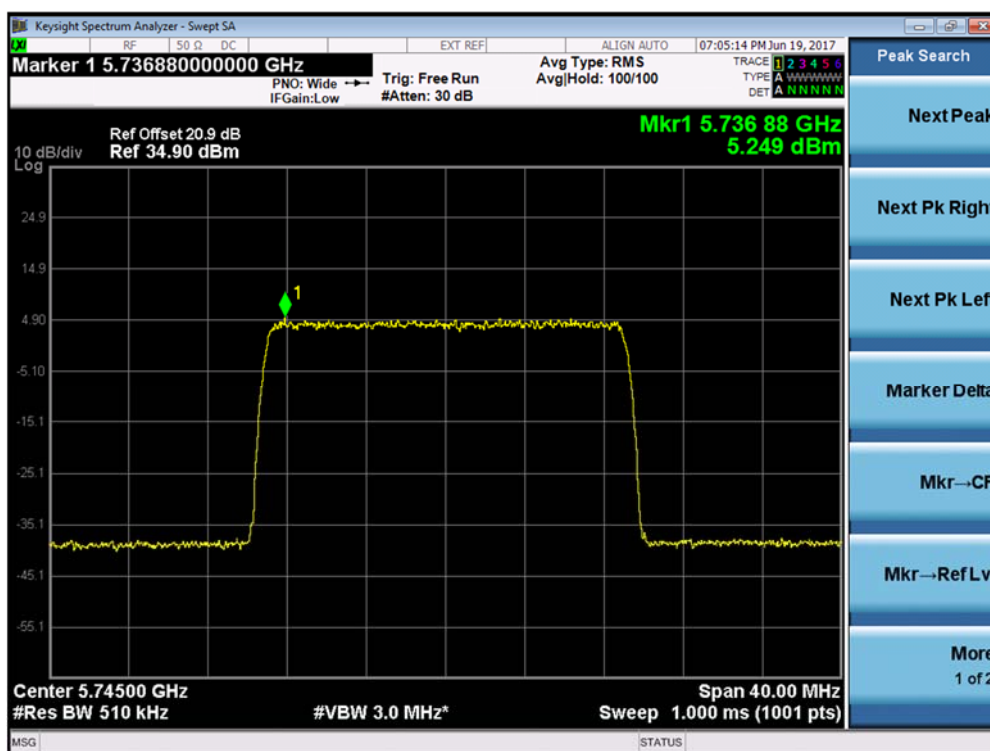


Product Service

Channel Position B - QPSK - Antenna A/ Bandwidth 20.0 MHz



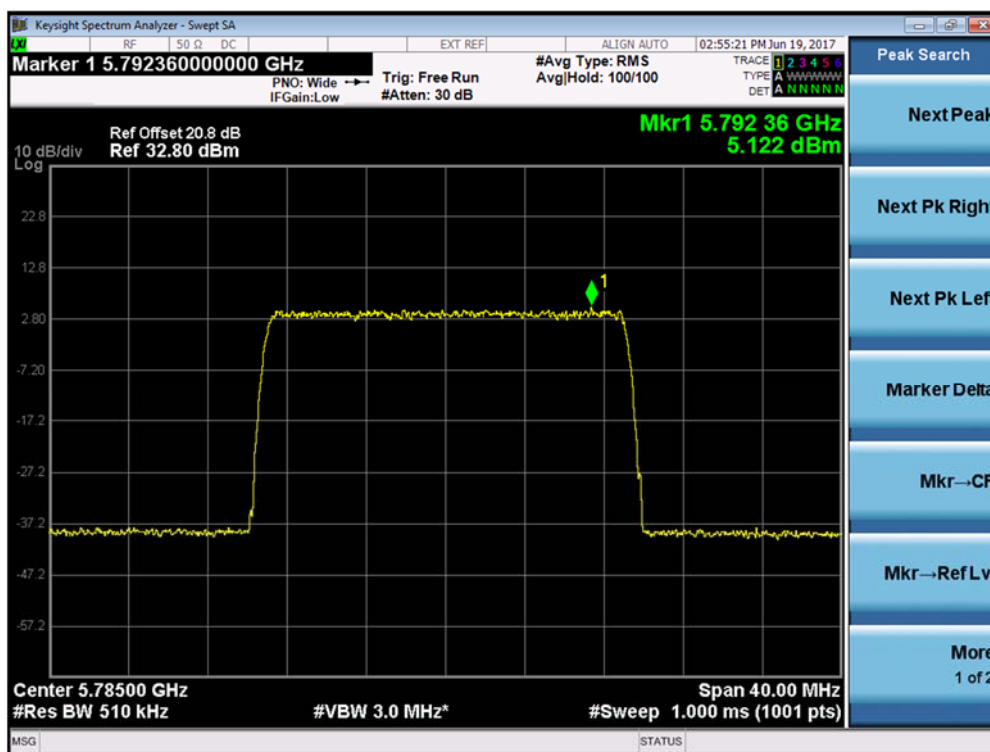
Channel Position B - QPSK - Antenna B/ Bandwidth 20.0 MHz



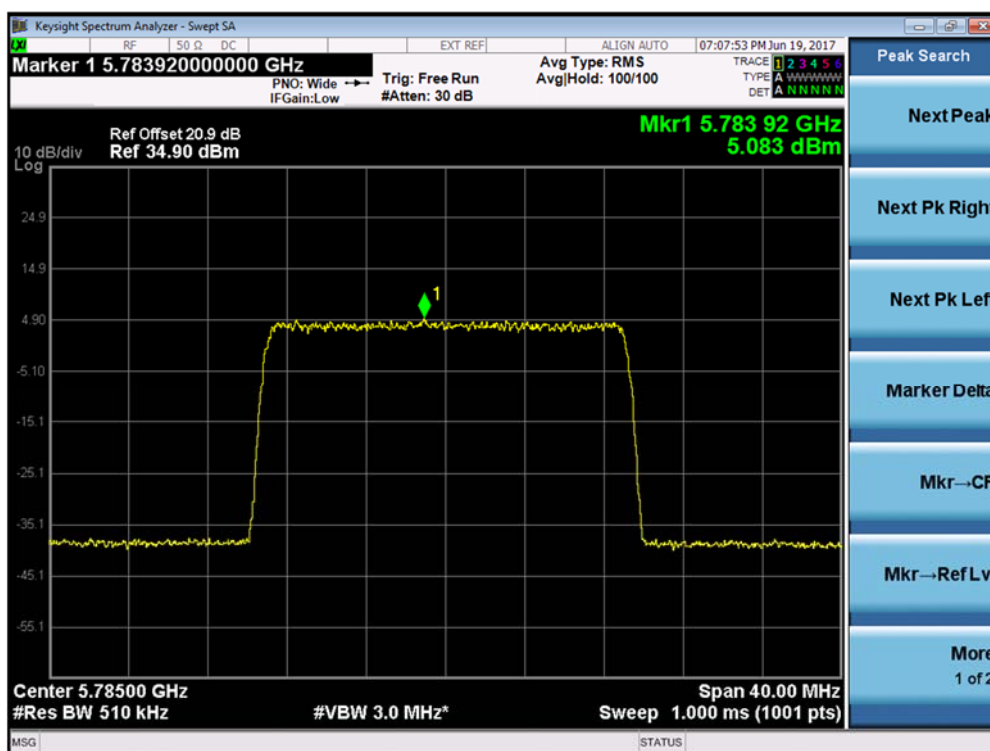


Product Service

Channel Position M - QPSK - Antenna A/ Bandwidth 20.0 MHz



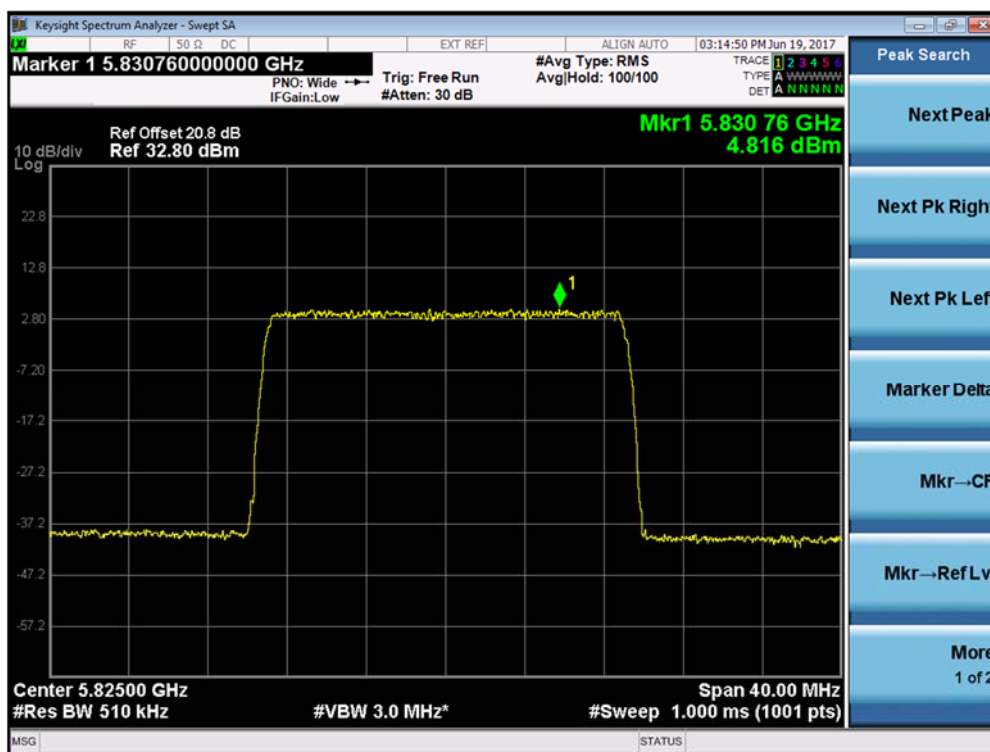
Channel Position M - QPSK - Antenna B/ Bandwidth 20.0 MHz



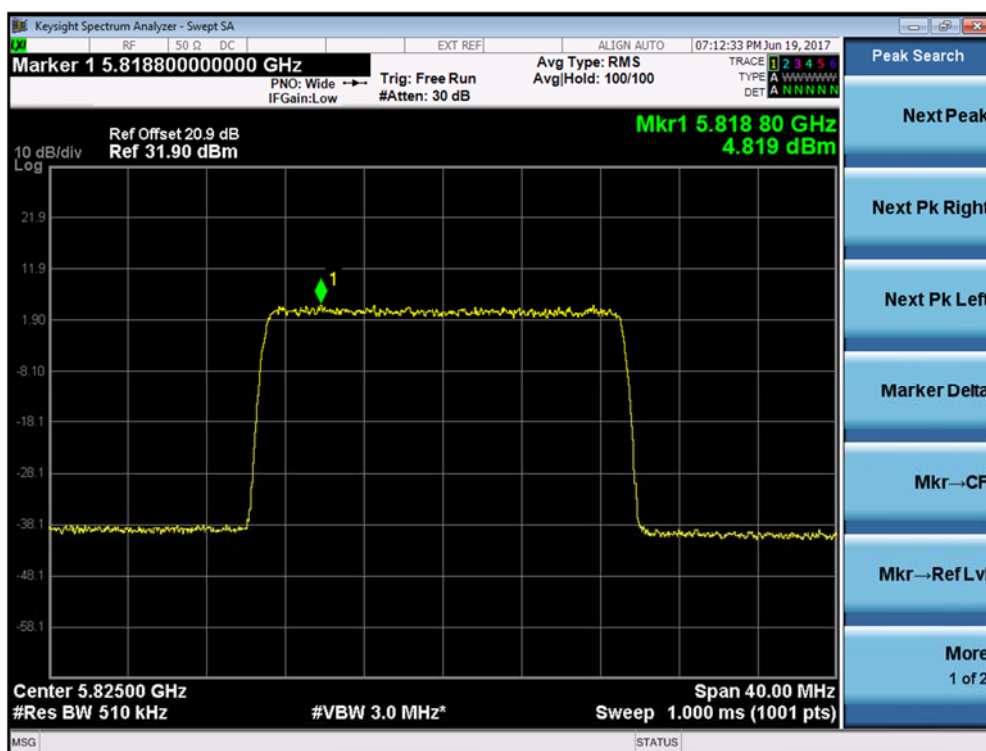


Product Service

Channel Position T - QPSK - Antenna A/ Bandwidth 20.0 MHz



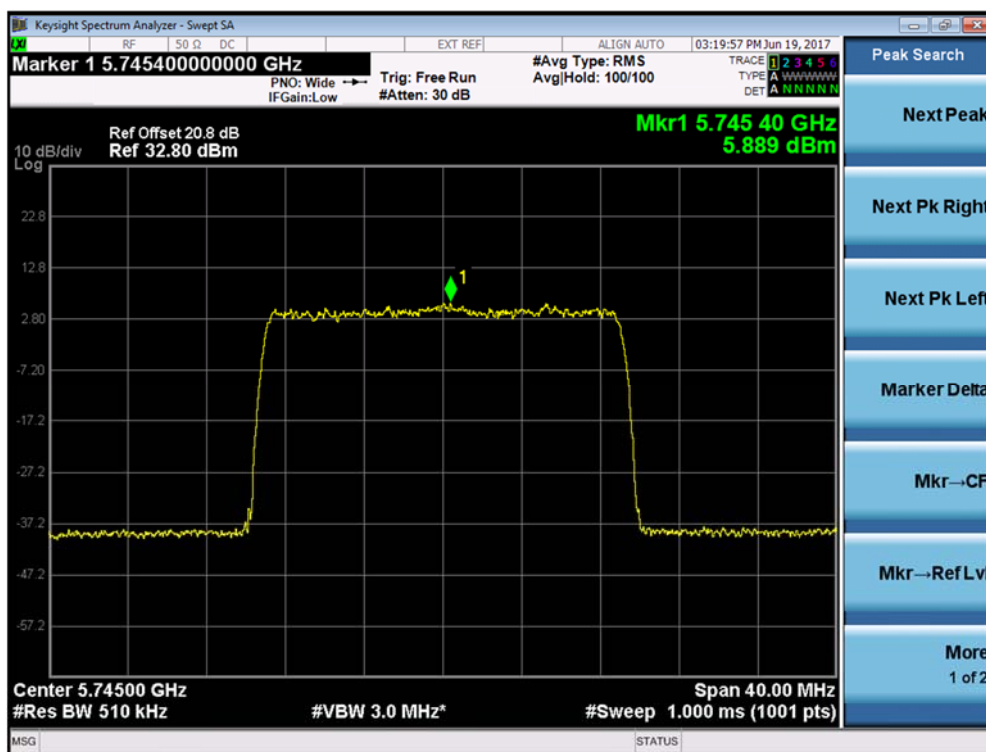
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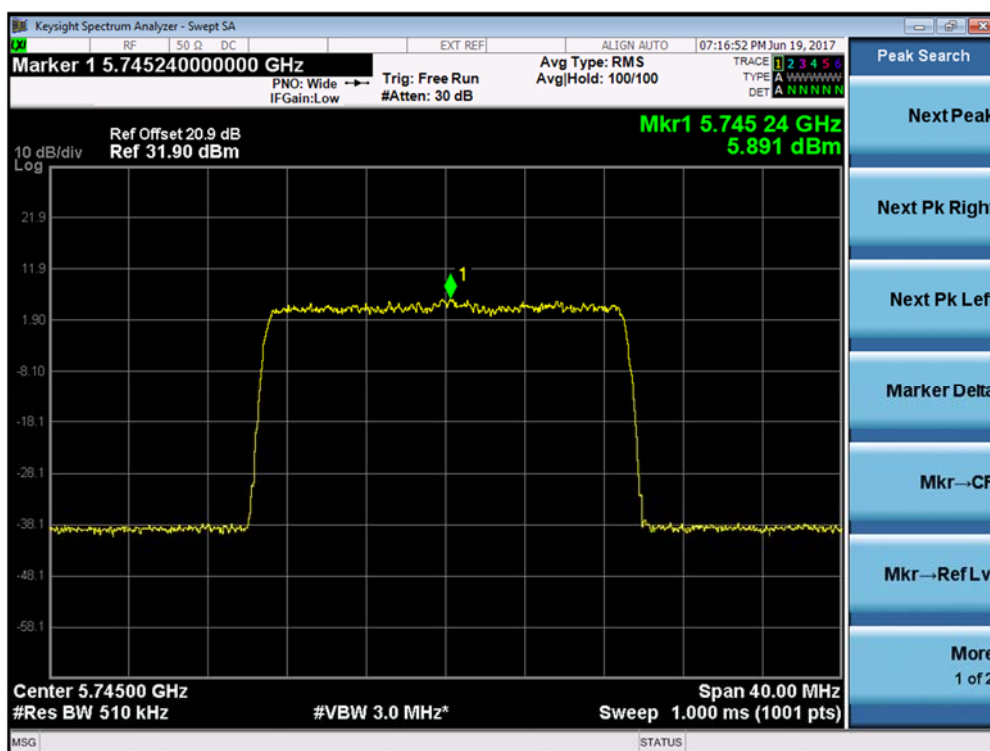


Product Service

Channel Position B - 16QAM - Antenna A/ Bandwidth 20.0 MHz



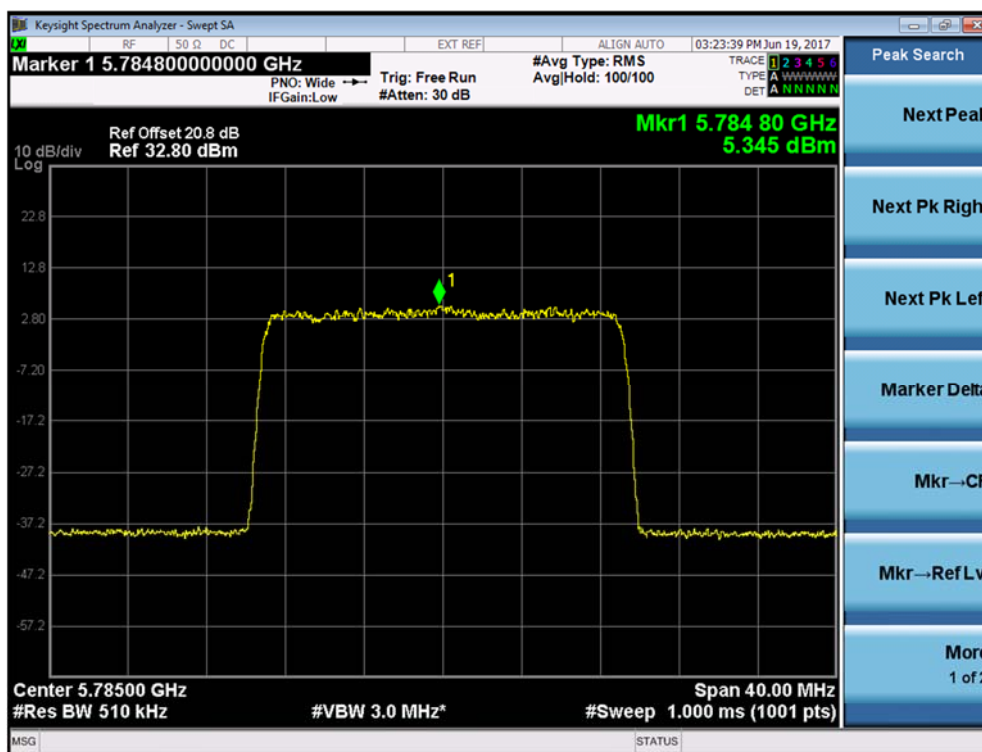
Channel Position B - 16QAM - Antenna B/ Bandwidth 20.0 MHz



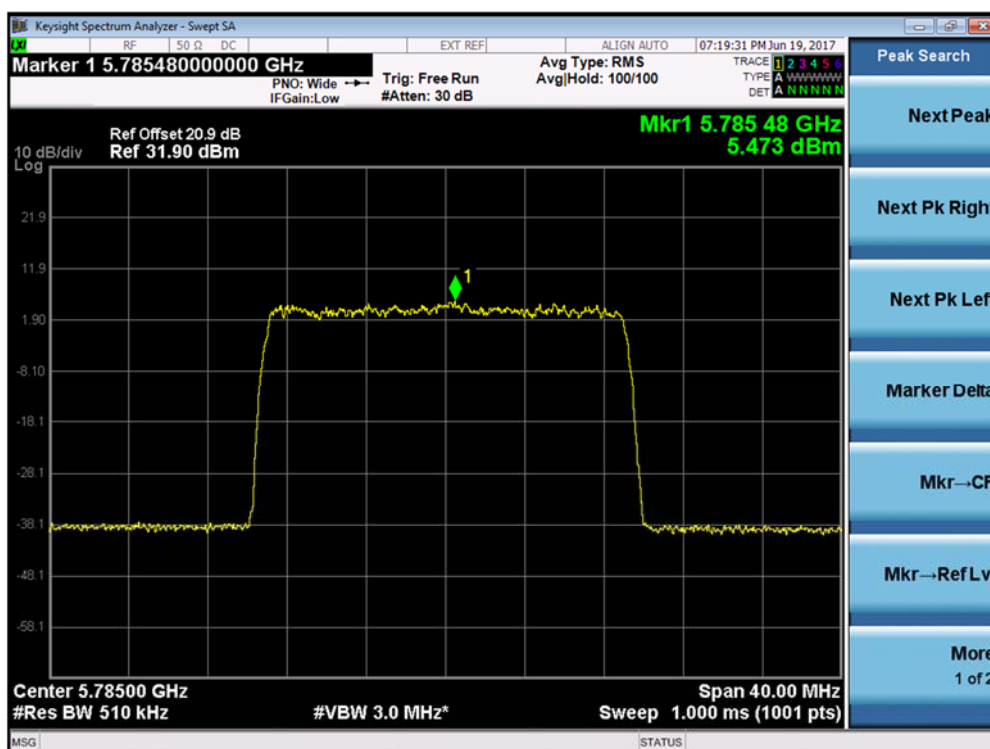


Product Service

Channel Position M - 16QAM - Antenna A/ Bandwidth 20.0 MHz



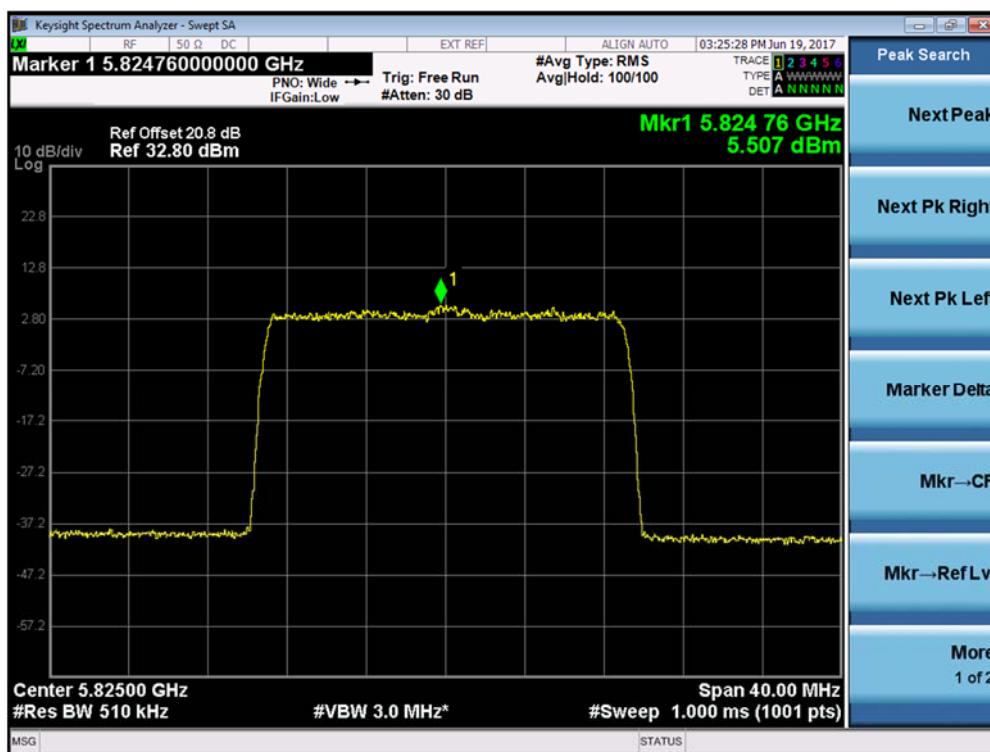
Channel Position M - 16QAM - Antenna B/ Bandwidth 20.0 MHz



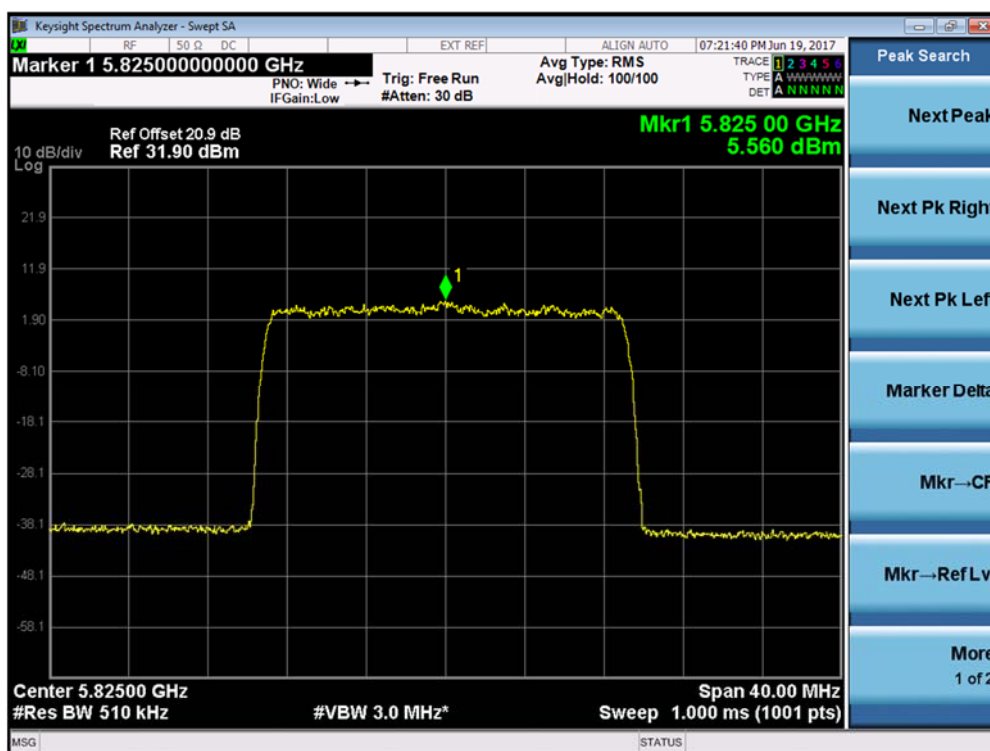


Product Service

Channel Position T - 16QAM - Antenna A/ Bandwidth 20.0 MHz



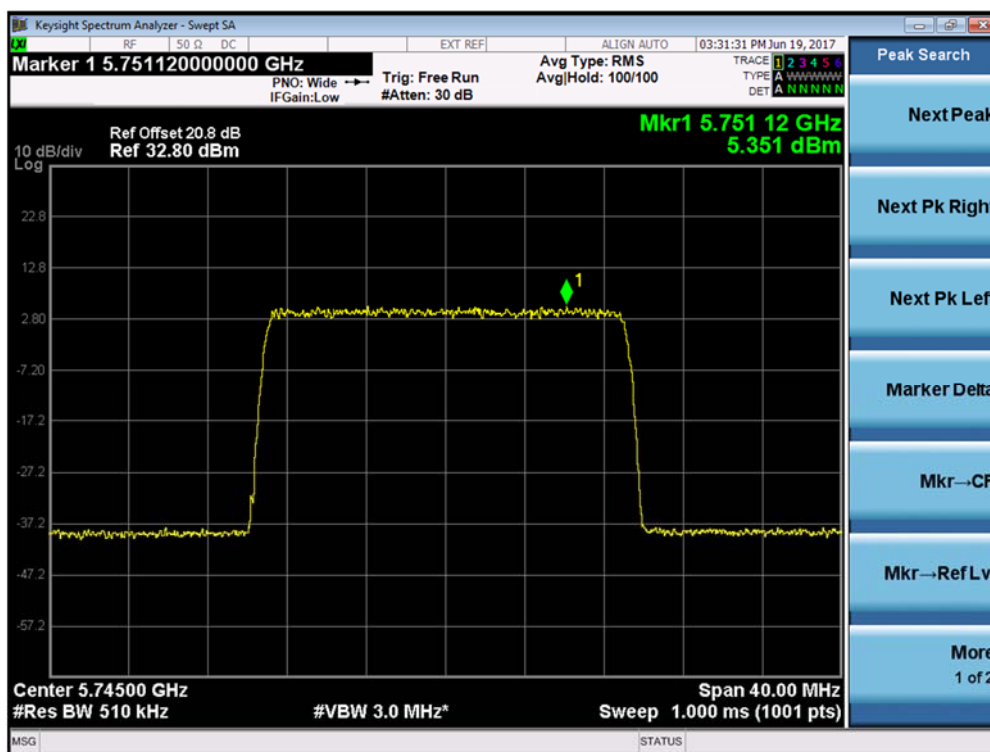
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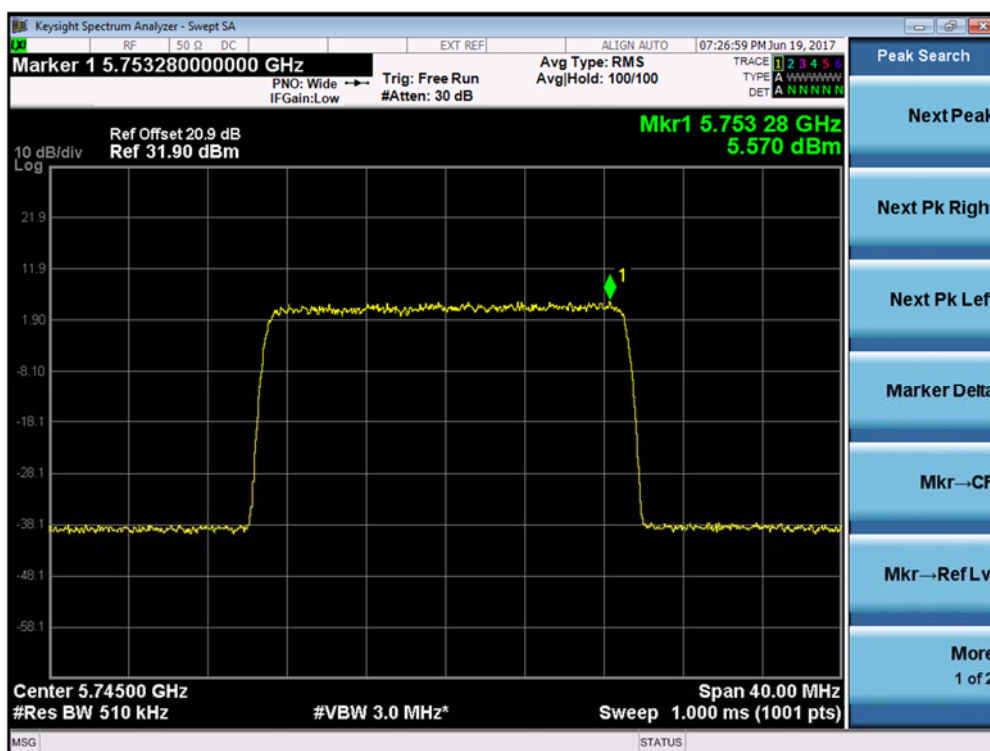


Product Service

Channel Position B - 64QAM - Antenna A/ Bandwidth 20.0 MHz



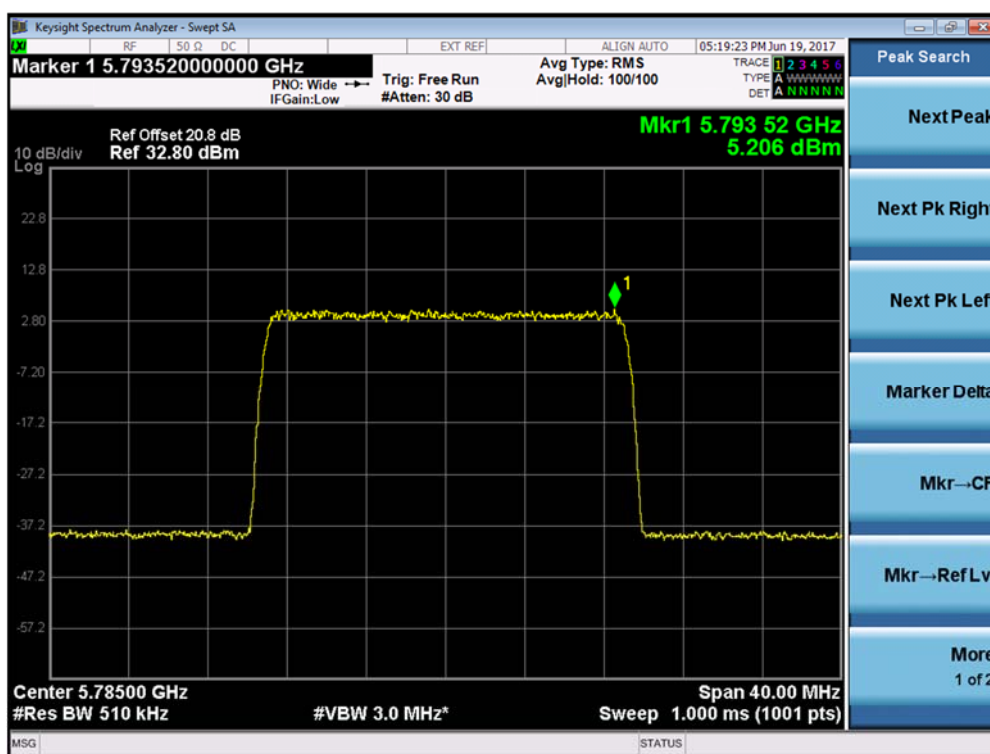
Channel Position B - 64QAM - Antenna B/ Bandwidth 20.0 MHz



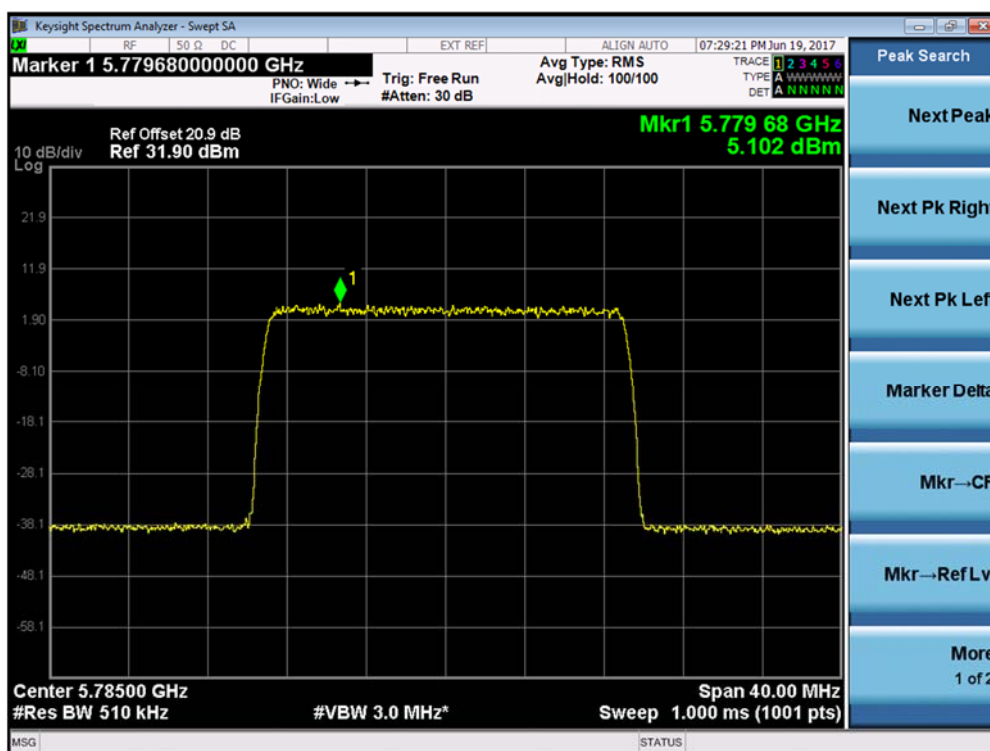


Product Service

Channel Position M - 64QAM - Antenna A/ Bandwidth 20.0 MHz



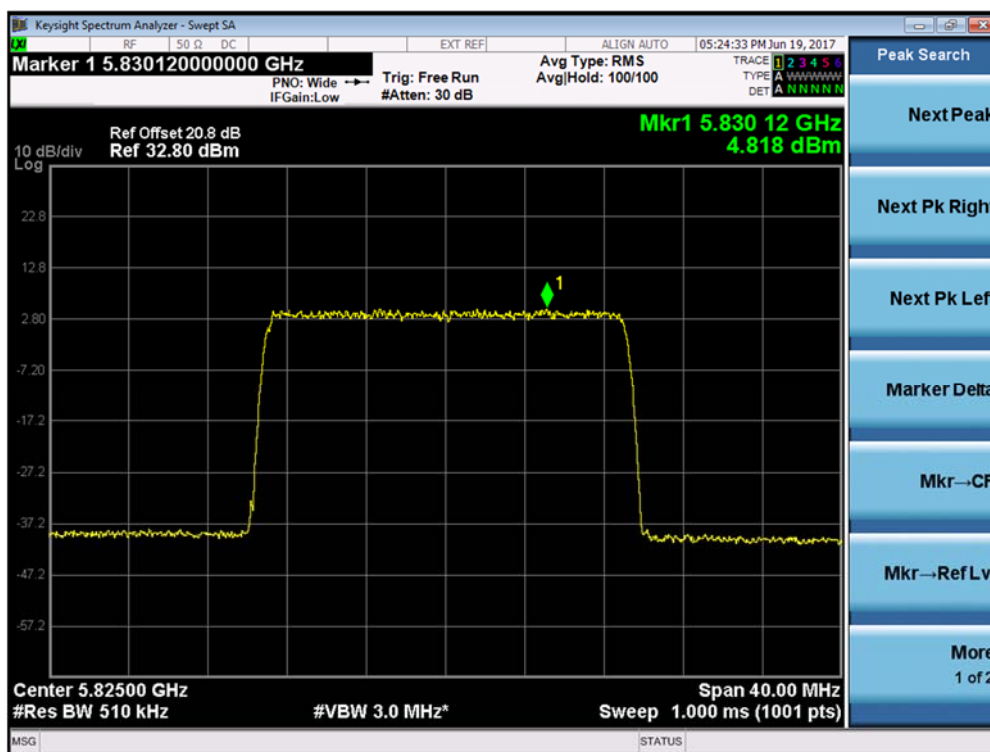
Channel Position M - 64QAM - Antenna B/ Bandwidth 20.0 MHz



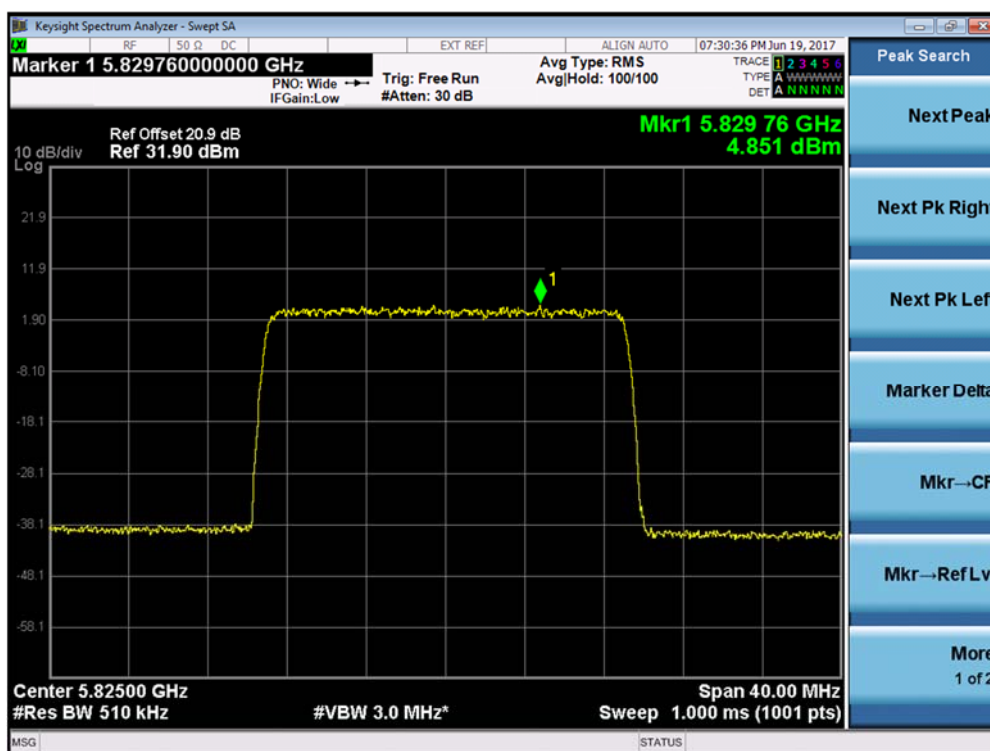


Product Service

Channel Position T - 64QAM - Antenna A/ Bandwidth 20.0 MHz



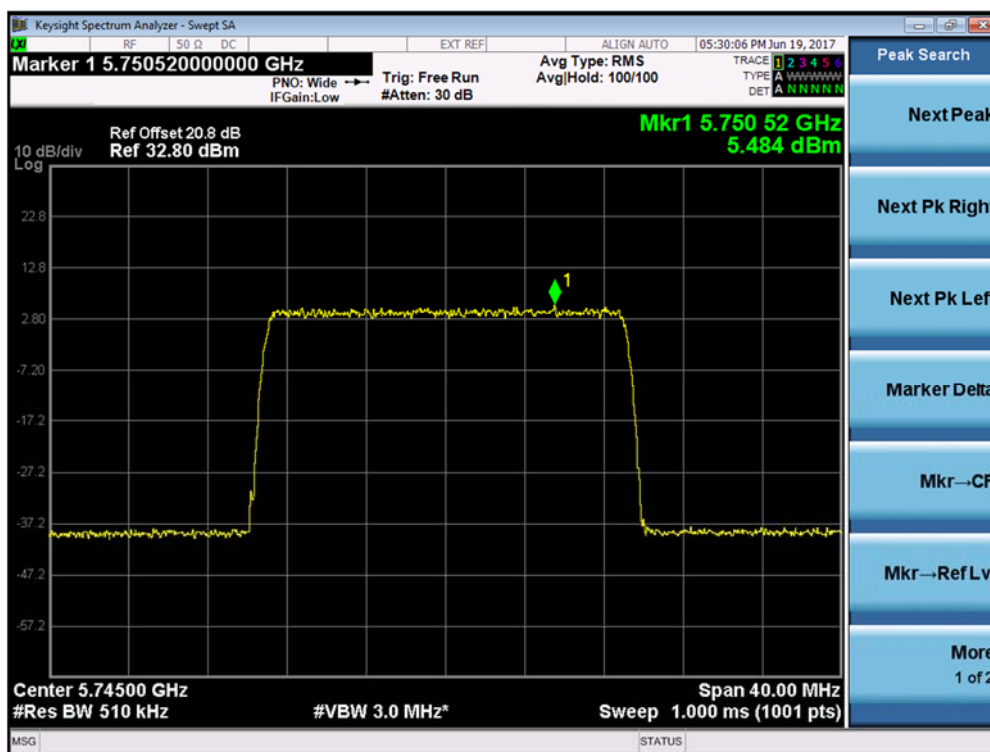
Channel Position T - 64QAM - Antenna B/ Bandwidth 20.0 MHz



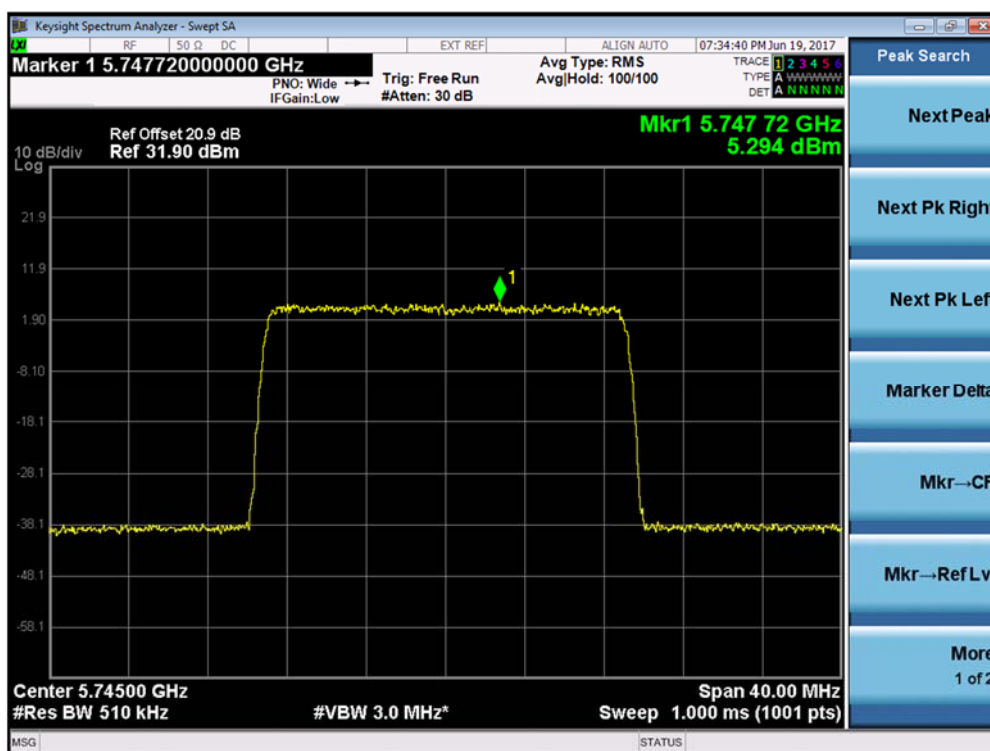


Product Service

Channel Position B - 256QAM - Antenna A/ Bandwidth 20.0 MHz



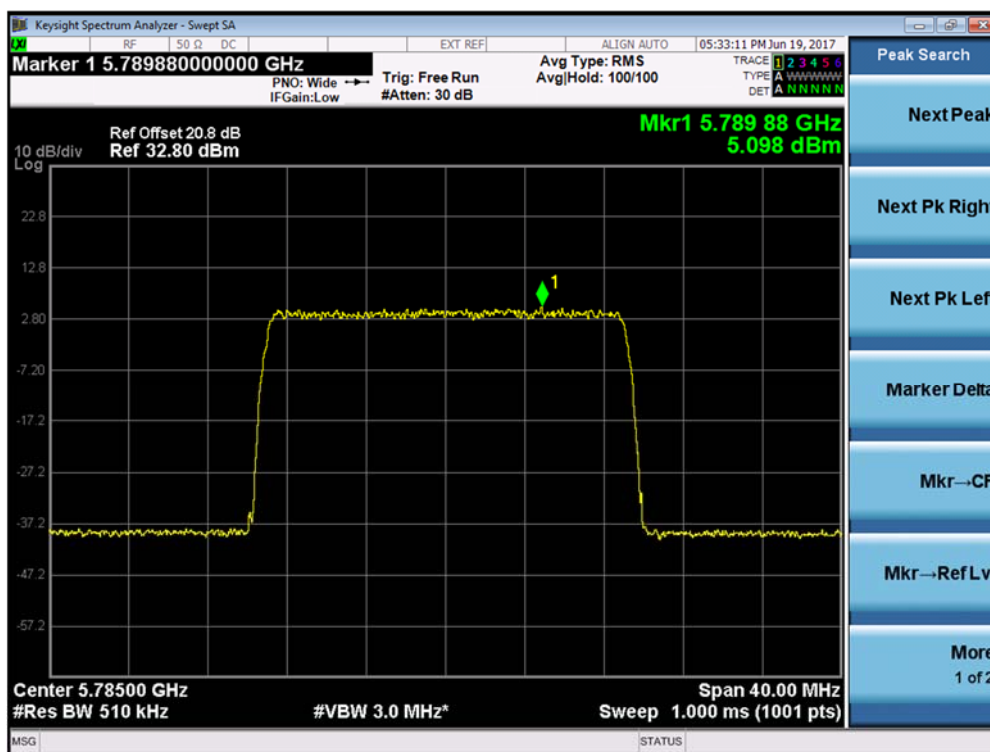
Channel Position B - 256QAM - Antenna B/ Bandwidth 20.0 MHz



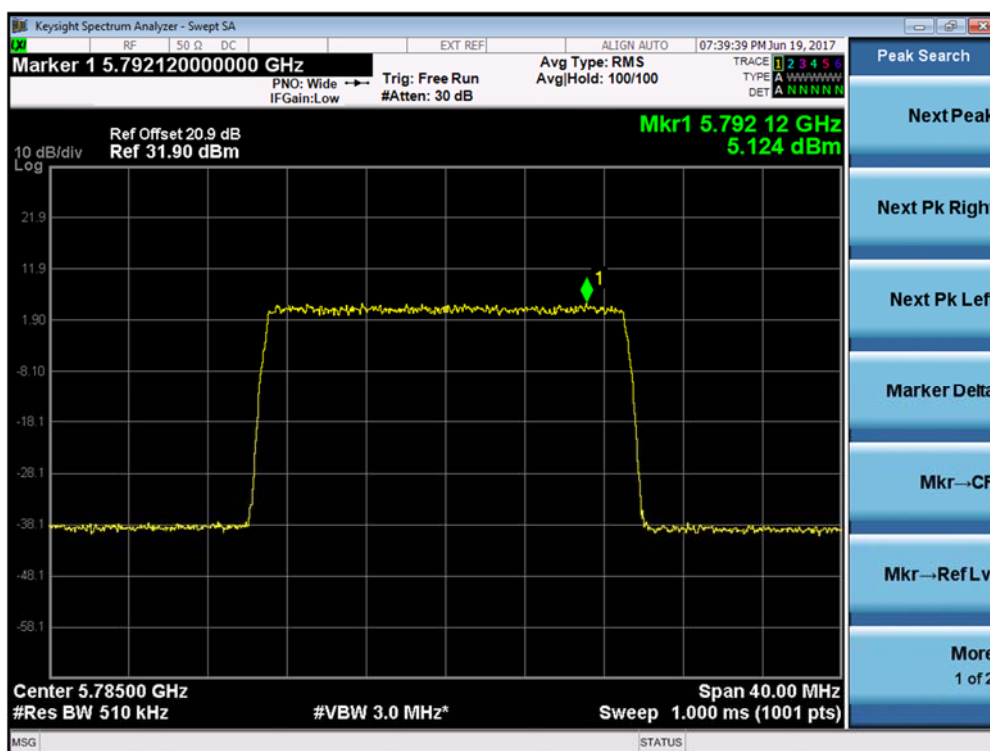


Product Service

Channel Position M - 256QAM - Antenna A/ Bandwidth 20.0 MHz



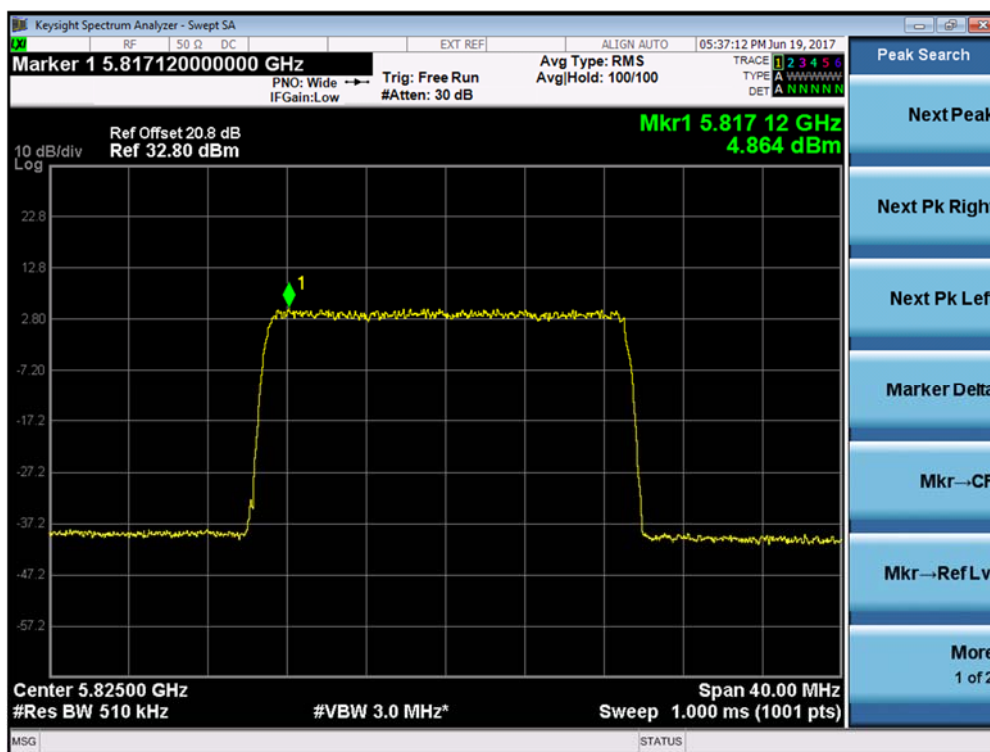
Channel Position M - 256QAM - Antenna B/ Bandwidth 20.0 MHz





Product Service

Channel Position T - 256QAM - Antenna A/ Bandwidth 20.0 MHz



Channel Position T - 256QAM - Antenna B/ Bandwidth 20.0 MHz

