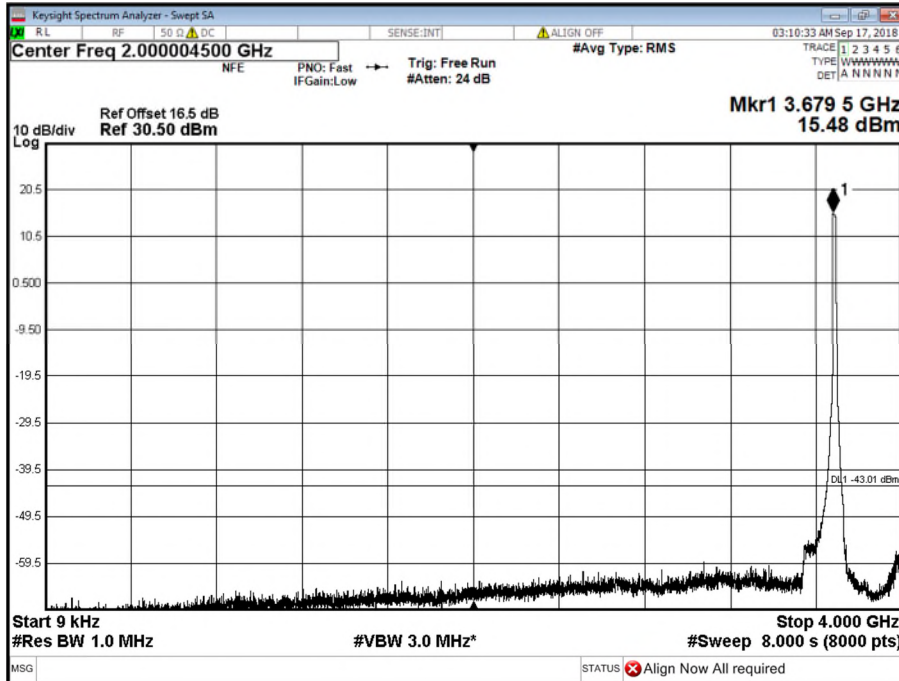


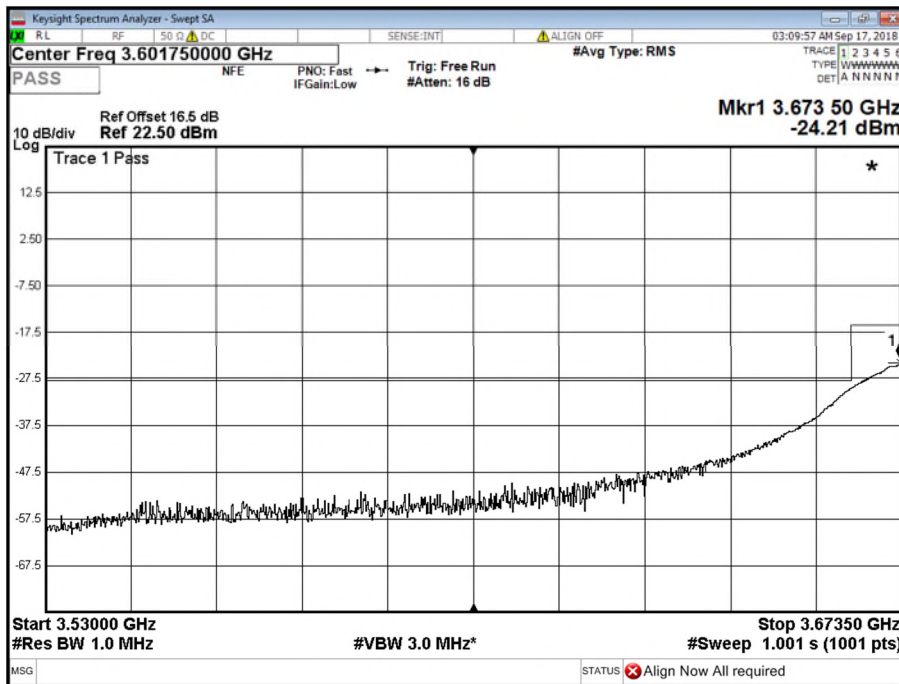


Product Service

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 4000 MHz



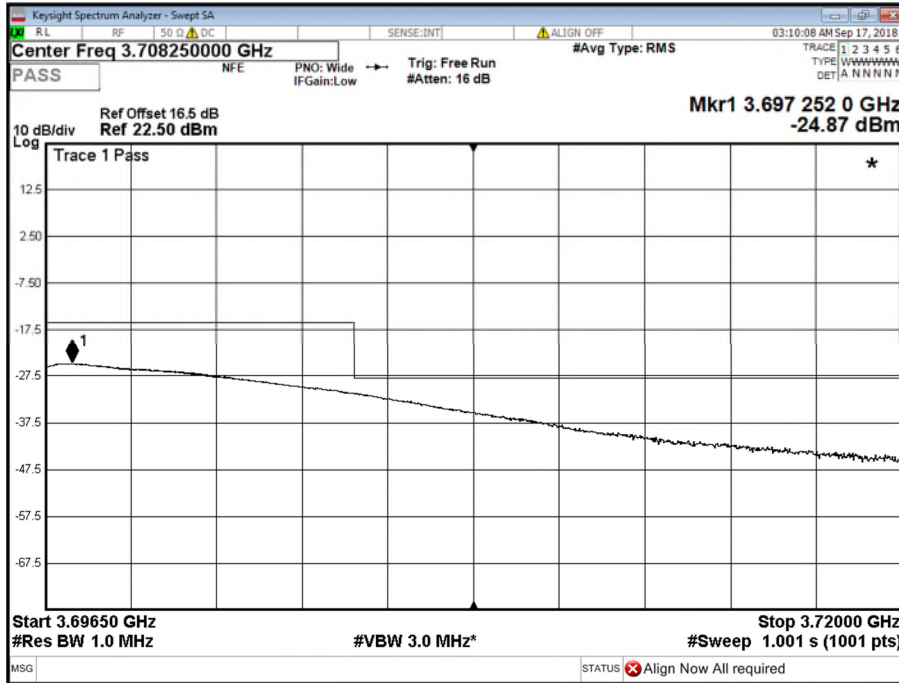
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask Low 1 - Range Mask Low 1



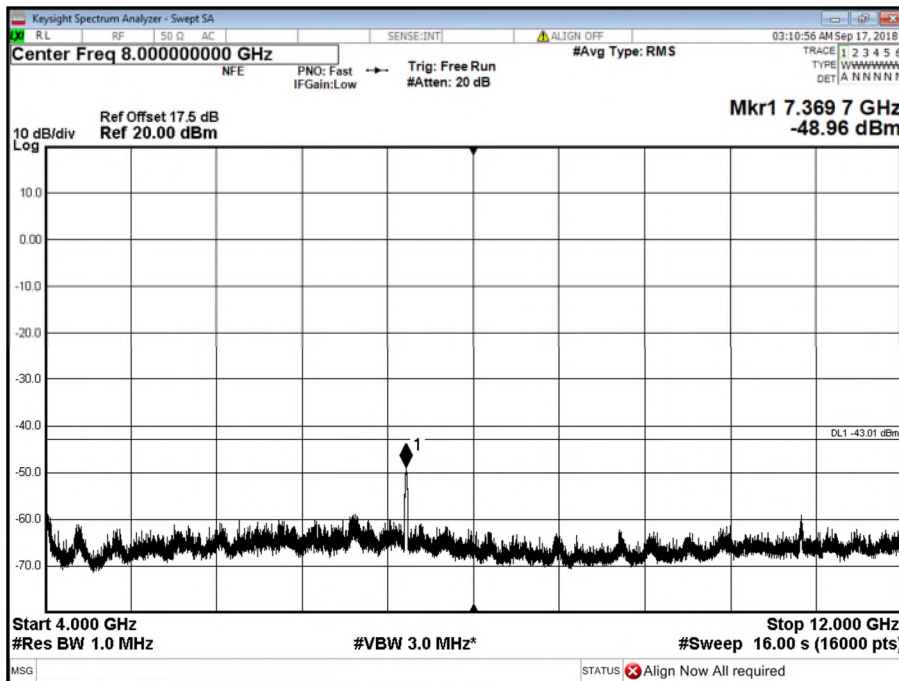


Product Service

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask High 1 - Range Mask High 1



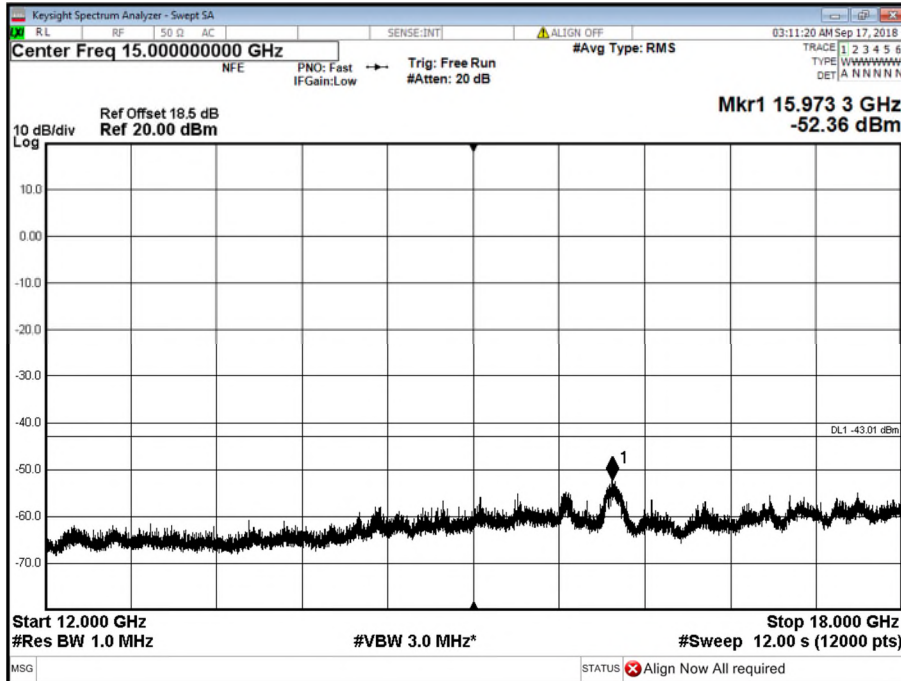
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz





Product Service

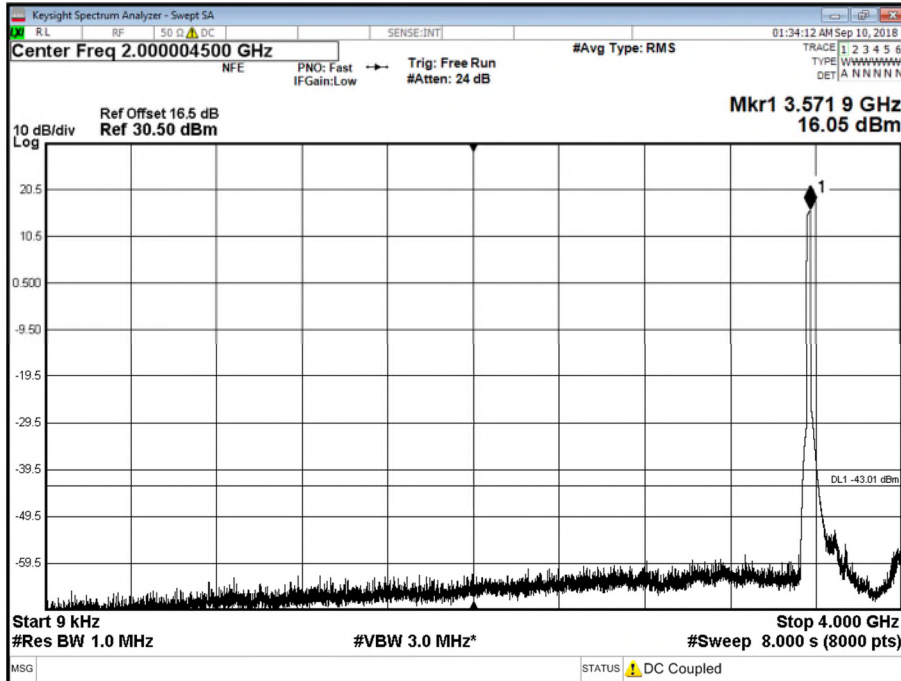
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 12000 to 18000 MHz



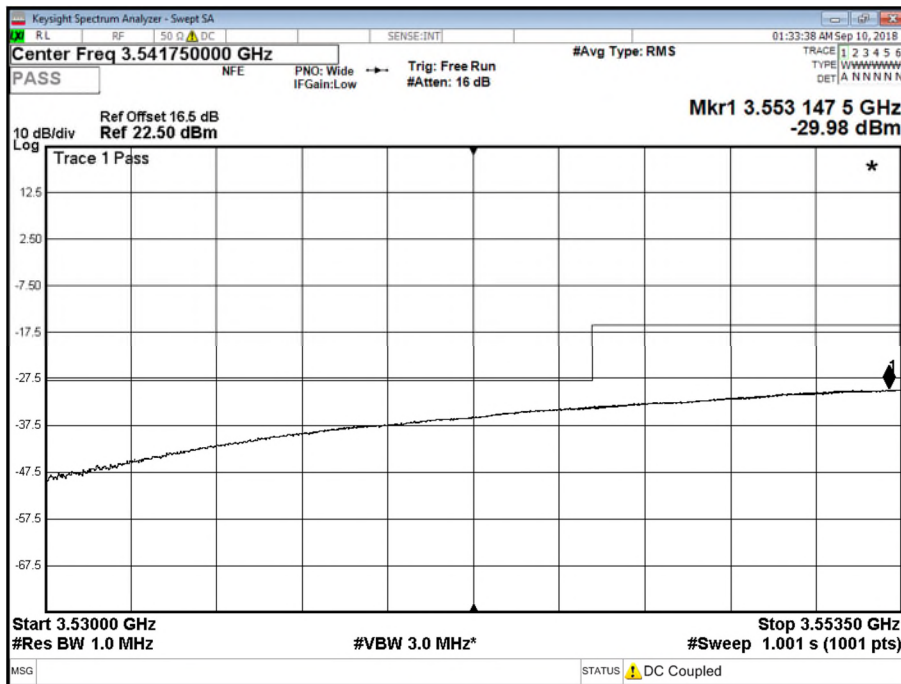


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



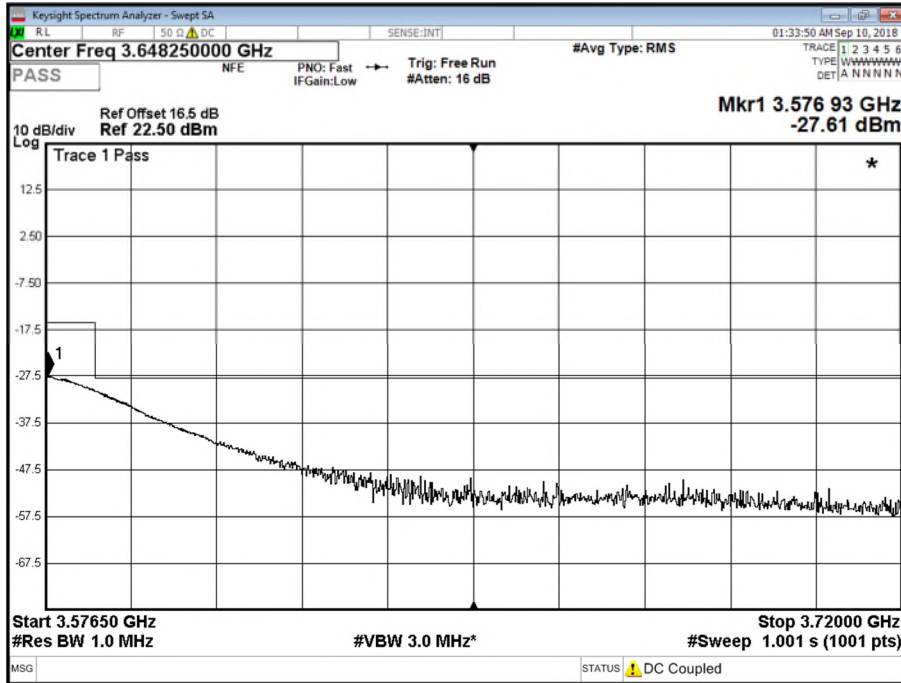
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask Low 1 - Range Mask Low 1



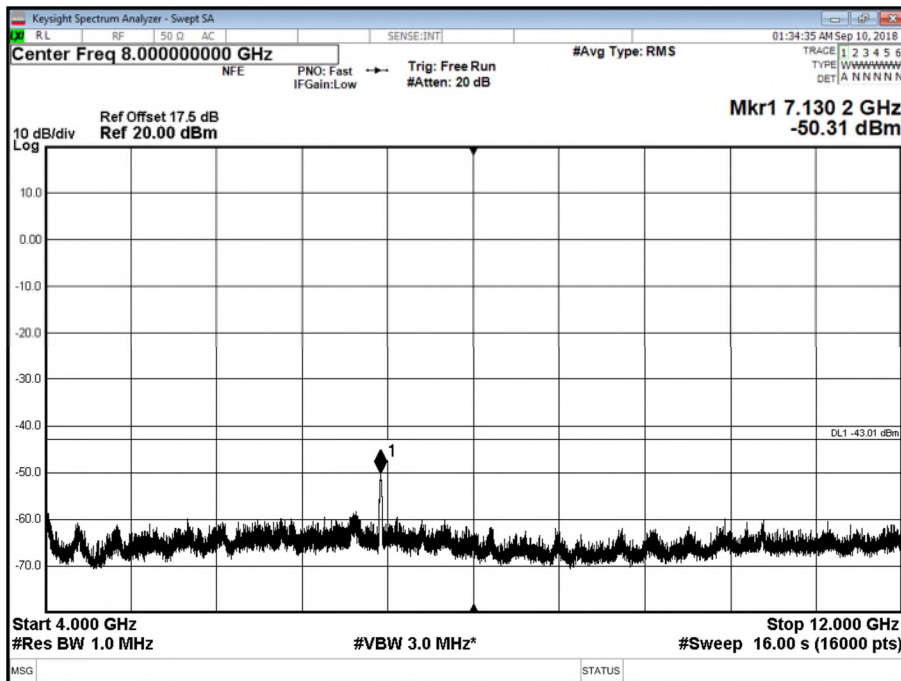


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask High 1 - Range Mask High 1



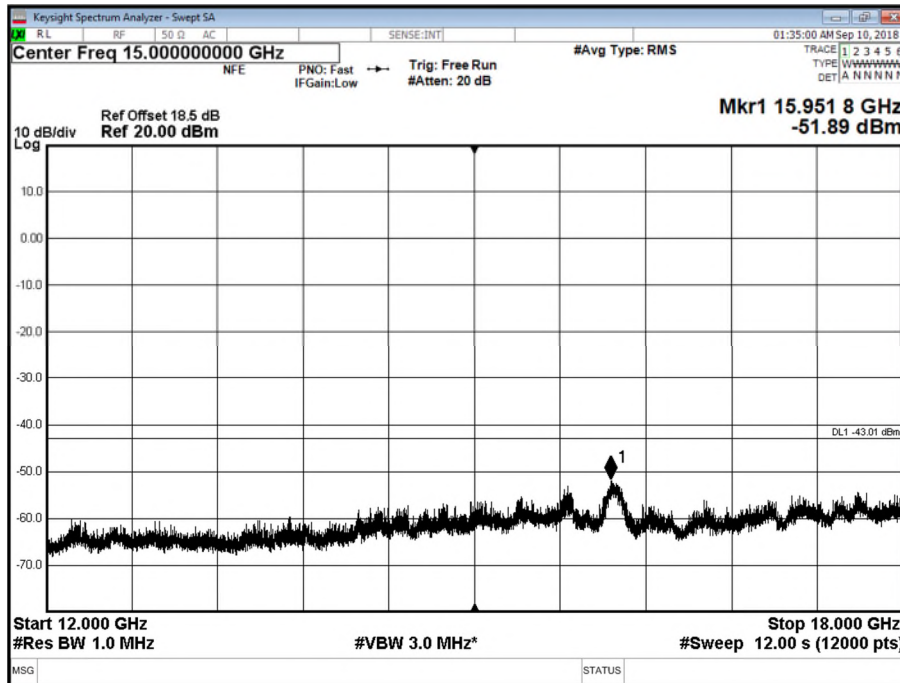
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Product Service

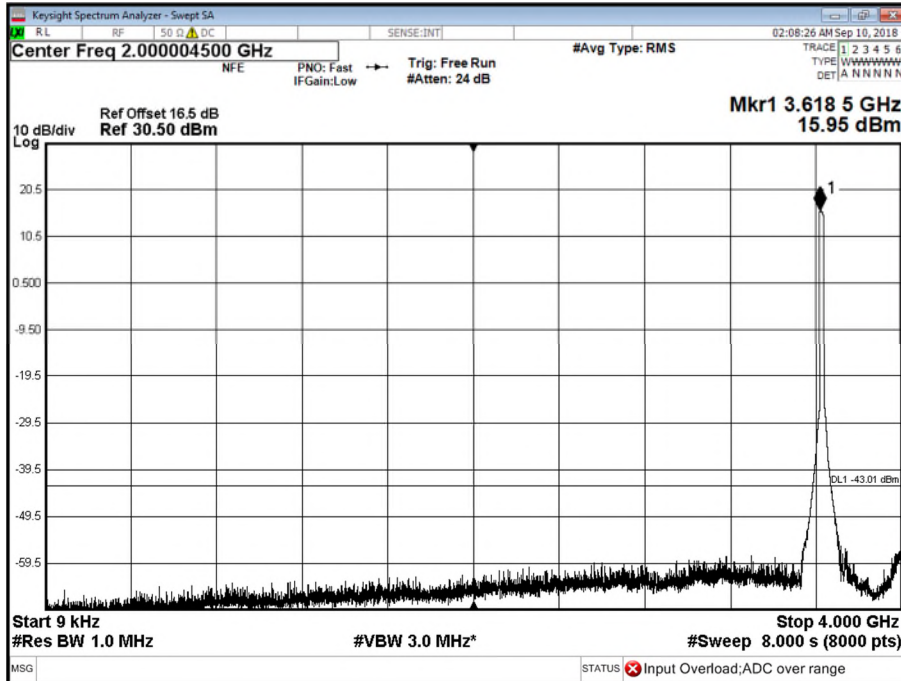
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 12000 to 18000 MHz



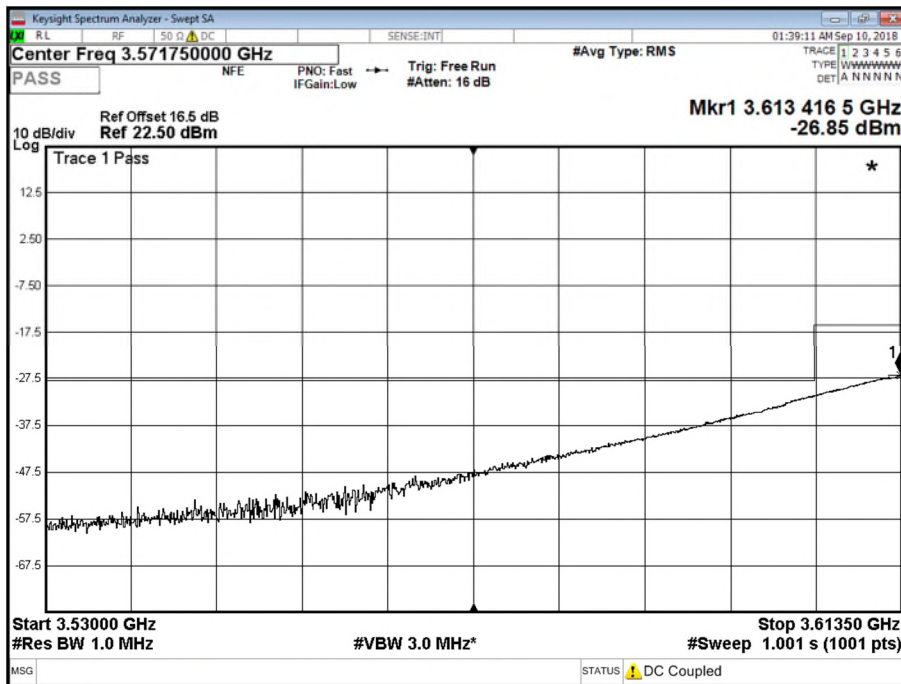


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 1 - Range 0.009 to 4000 MHz



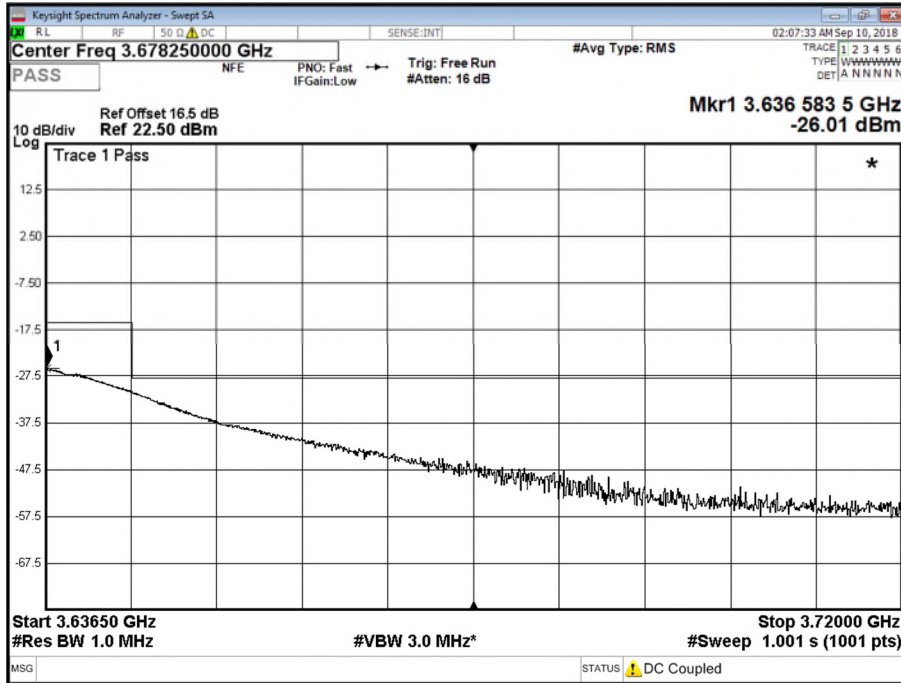
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask Low 1 - Range Mask Low 1



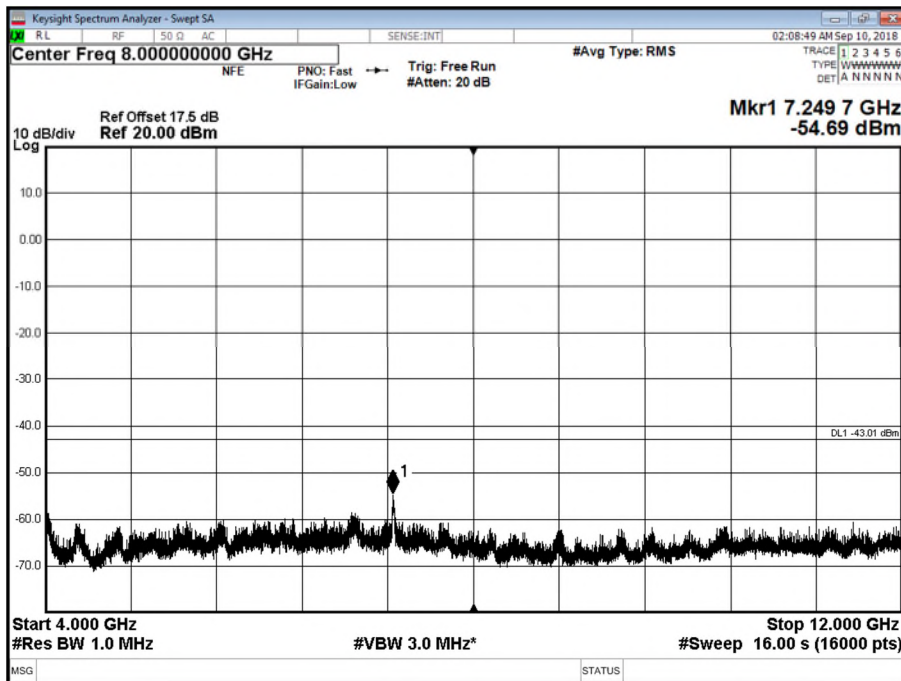


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask High 1 - Range Mask High 1



Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 2 - Range 4000 to 12000 MHz

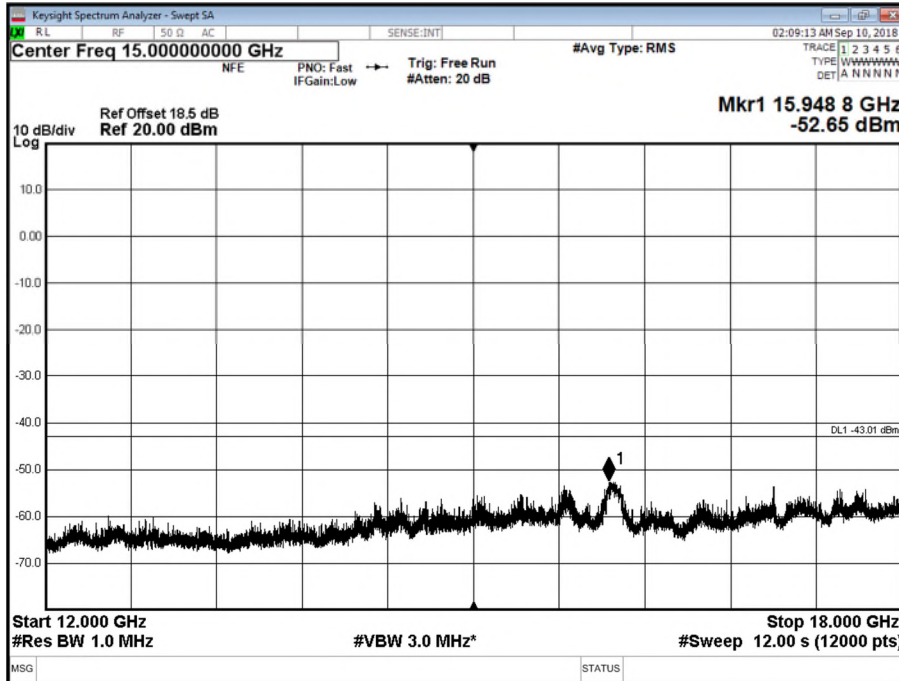






Product Service

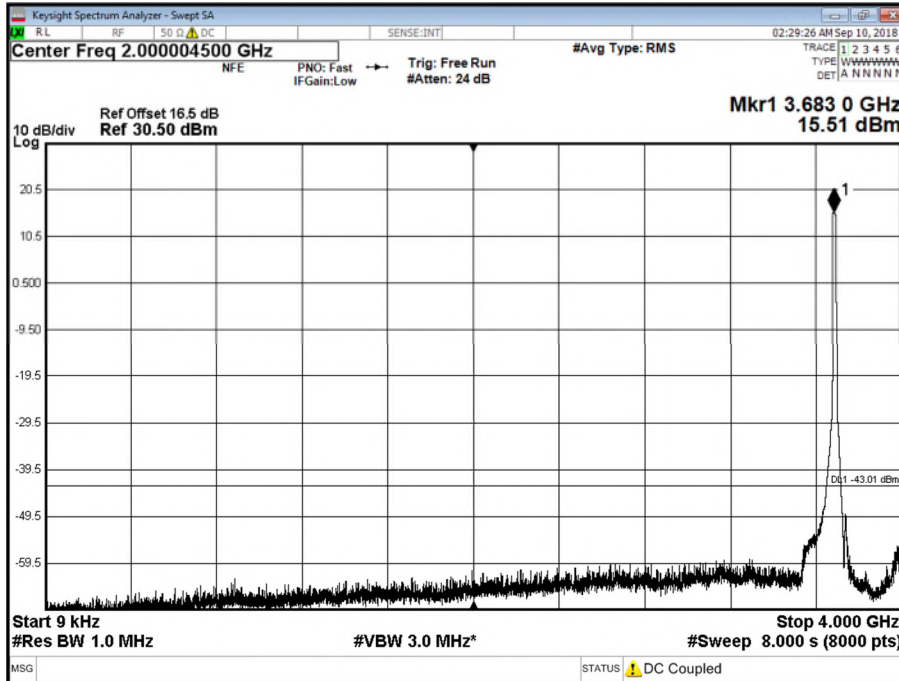
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



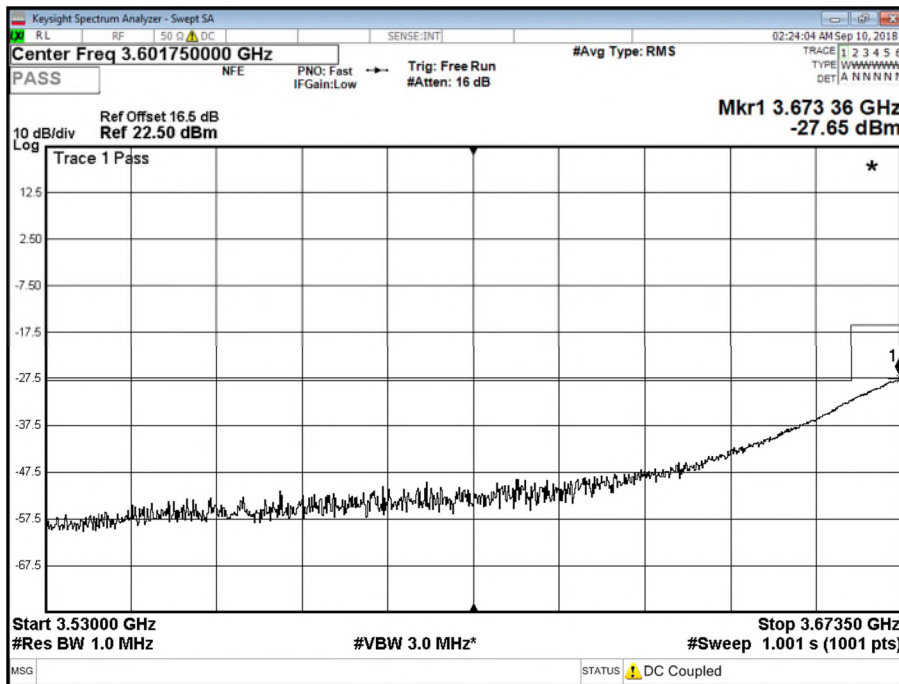


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 4000 MHz



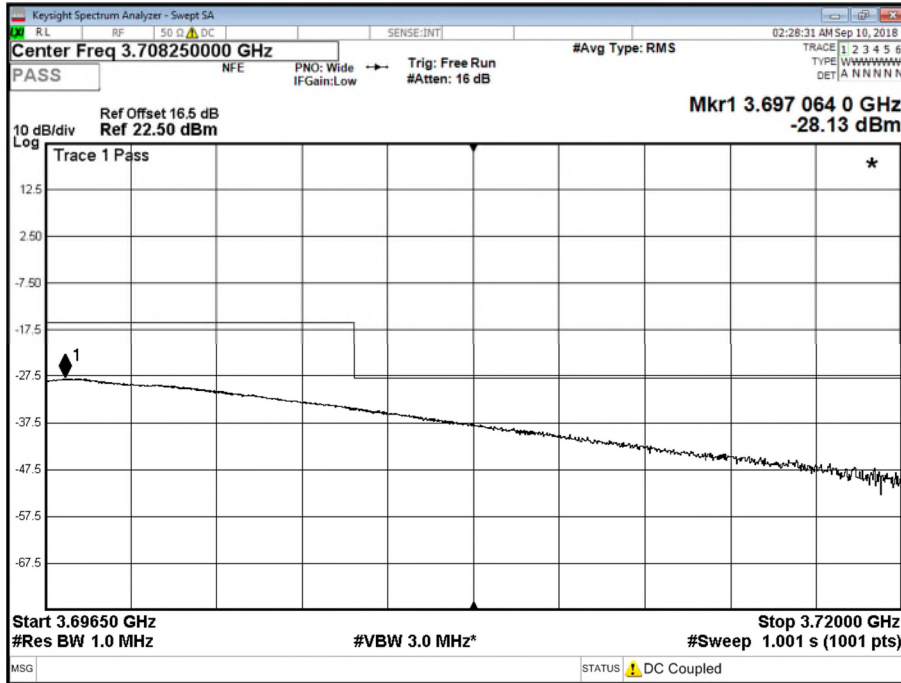
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask Low 1 - Range Mask Low 1



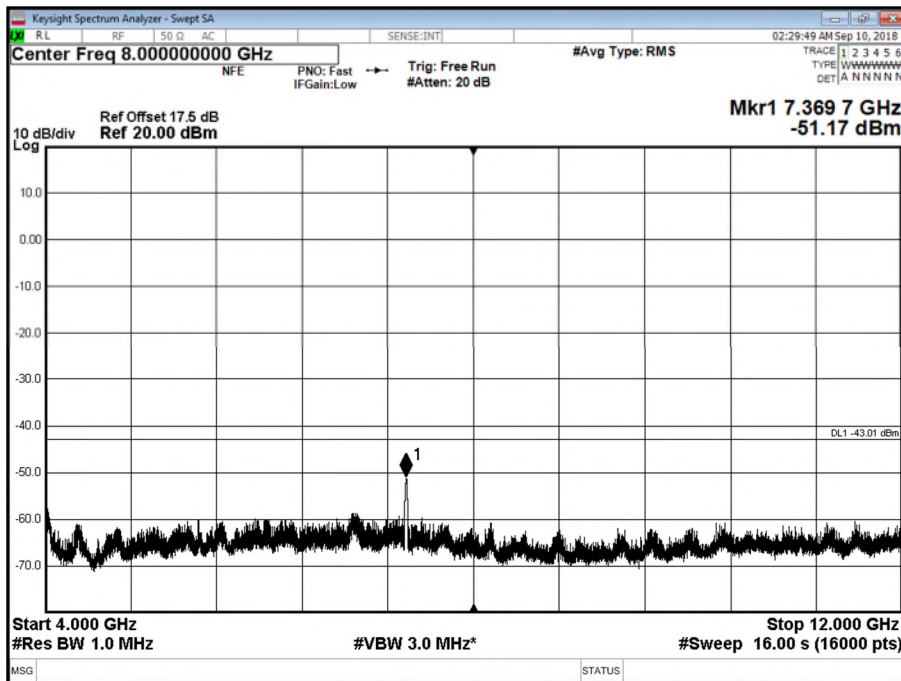


Product Service

Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask High 1 - Range Mask High 1



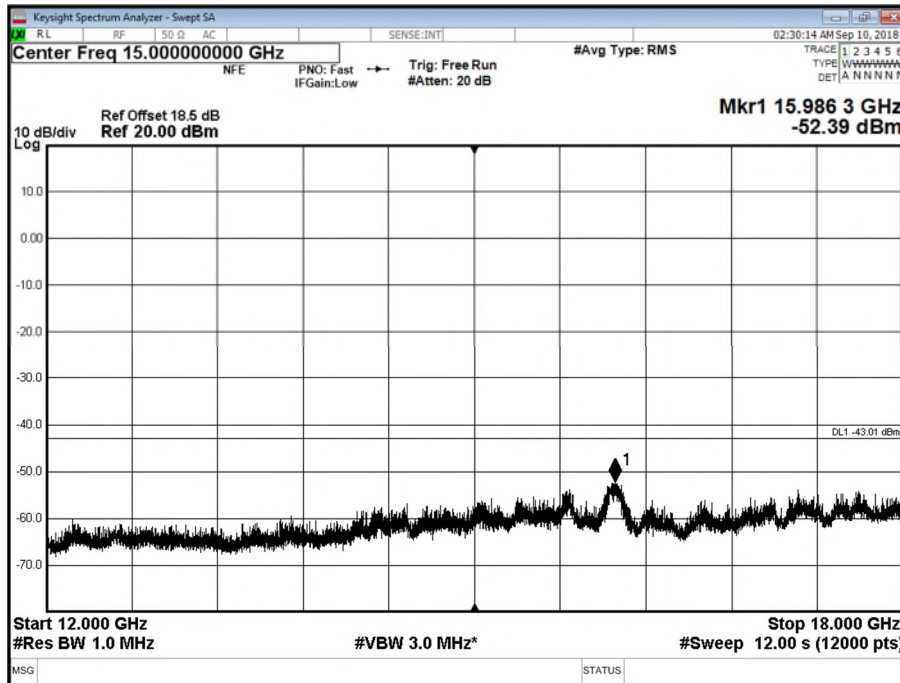
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz





Product Service

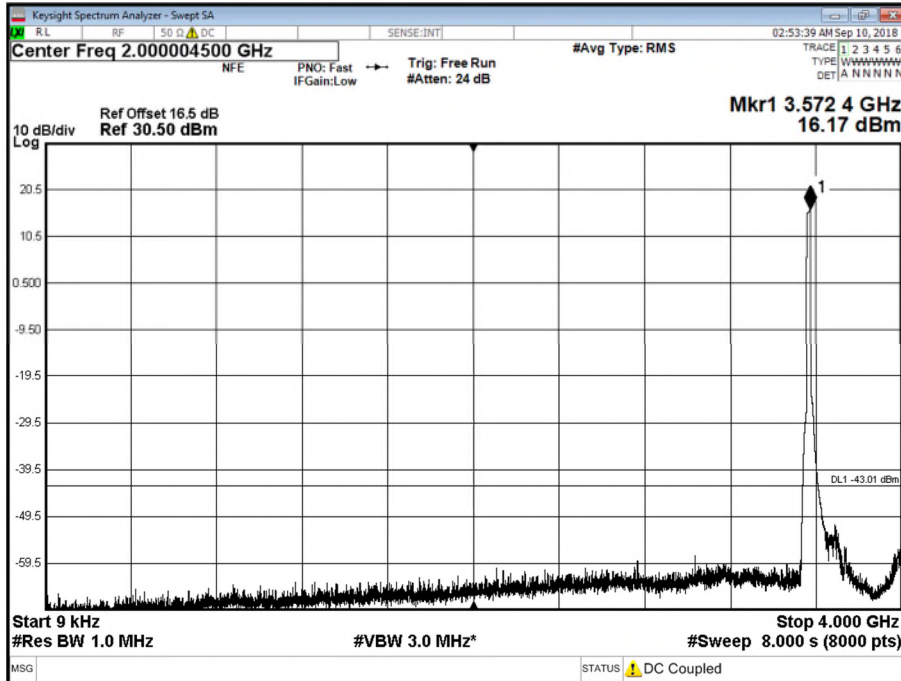
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 12000 to 18000 MHz



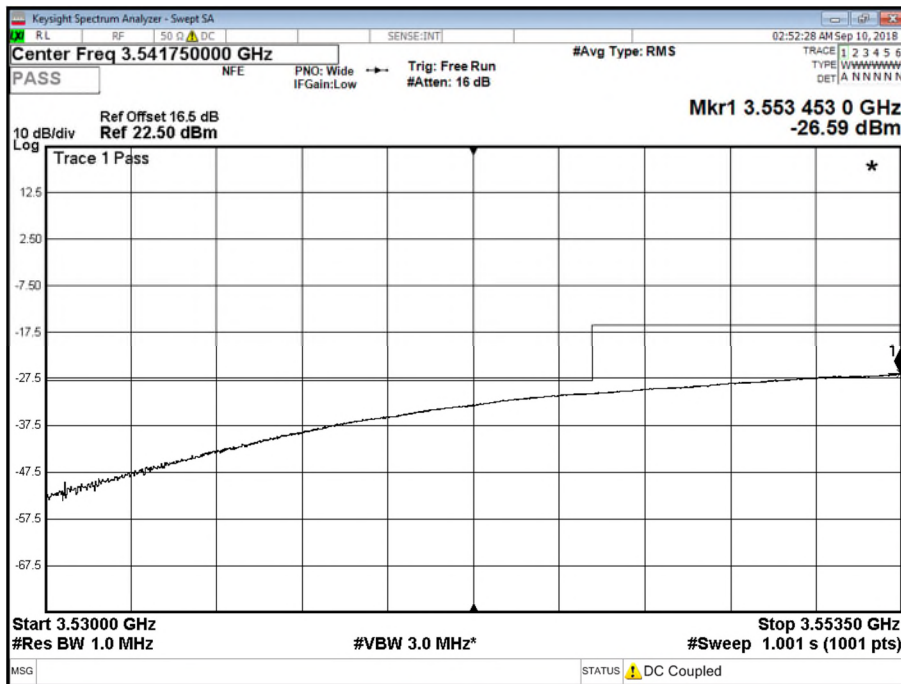


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



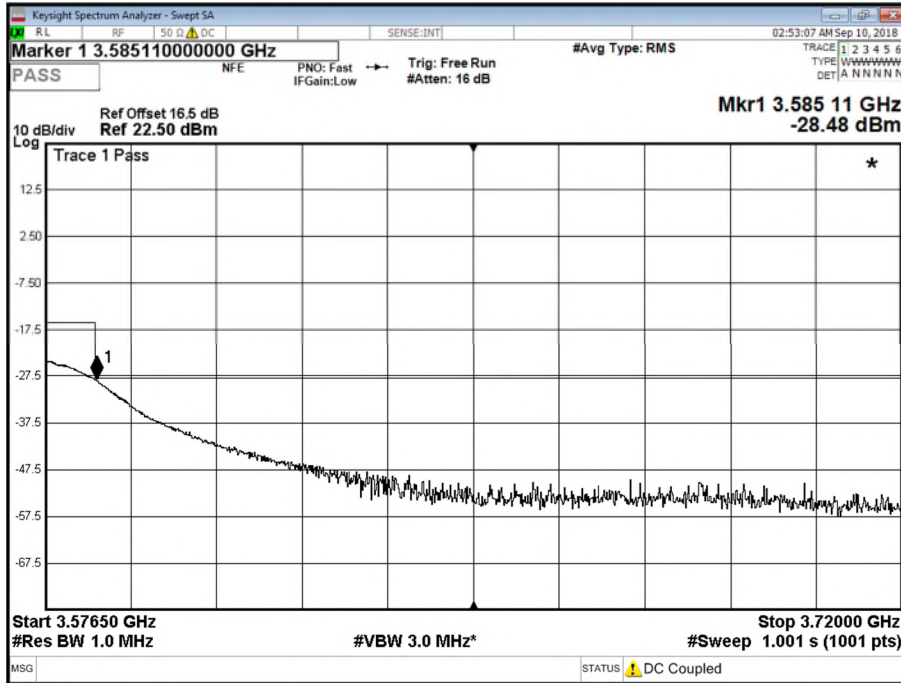
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask Low 1 - Range Mask Low 1



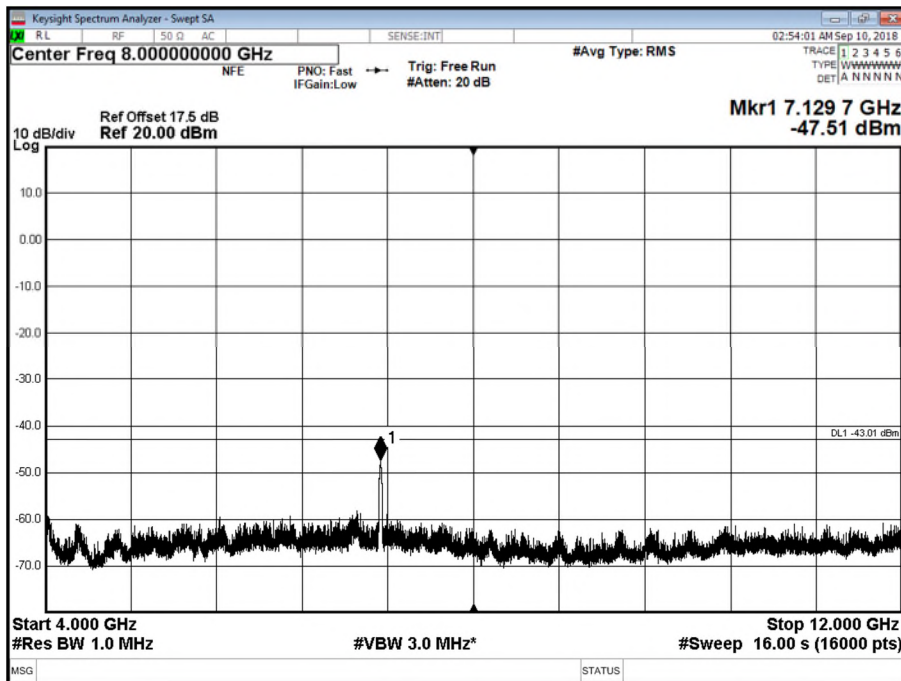


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask High 1 - Range Mask High 1



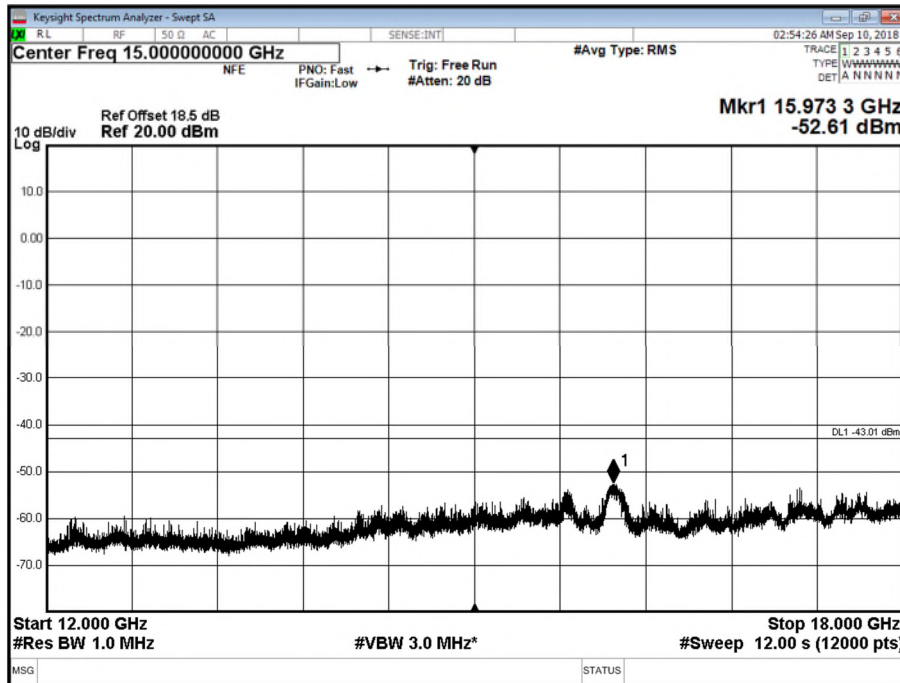
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Product Service

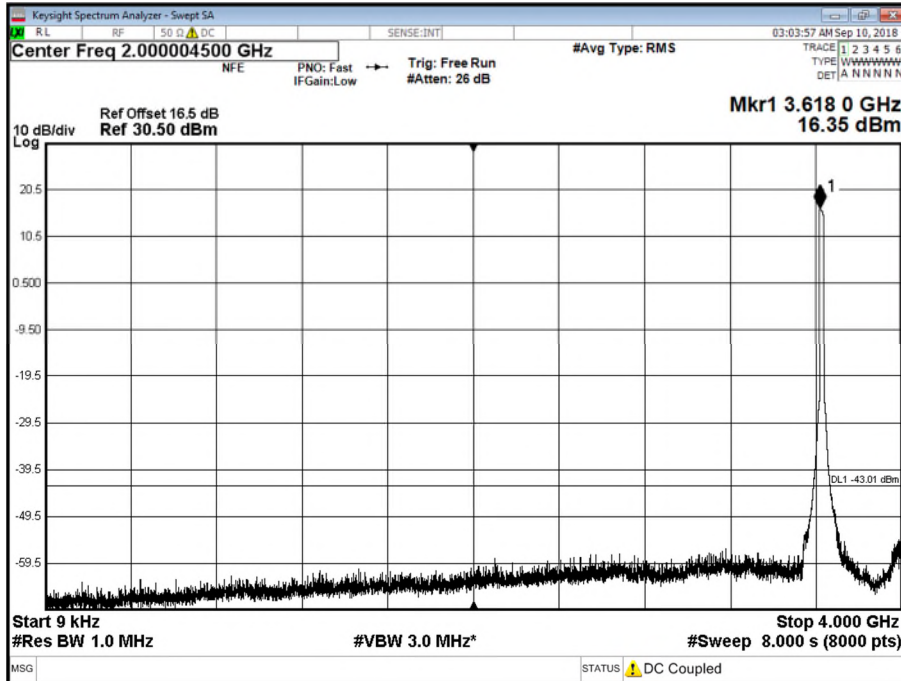
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 12000 to 18000 MHz



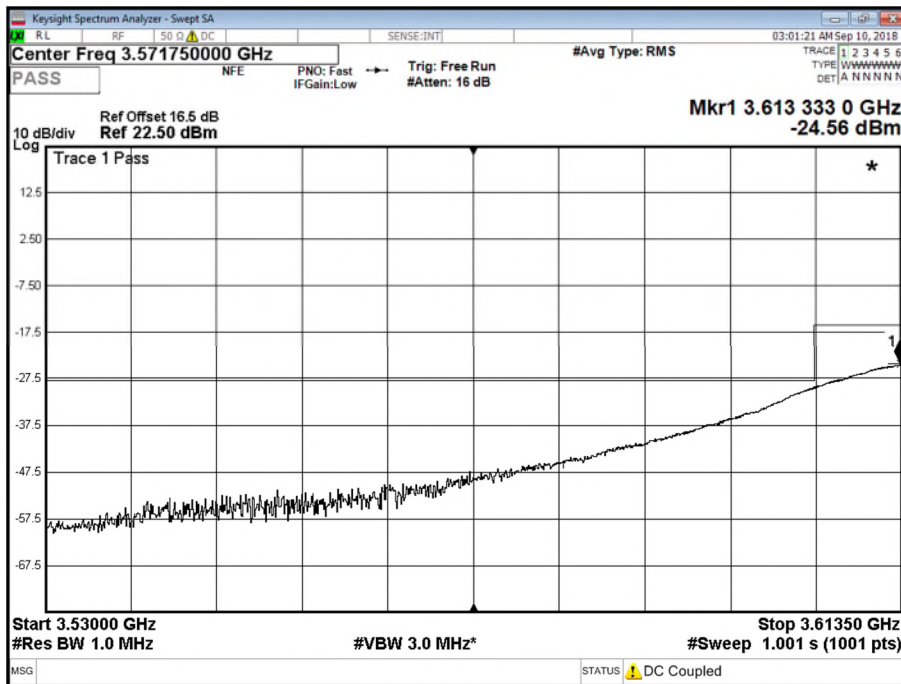


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 1 - Range 0.009 to 4000 MHz



Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask Low 1 - Range Mask Low 1

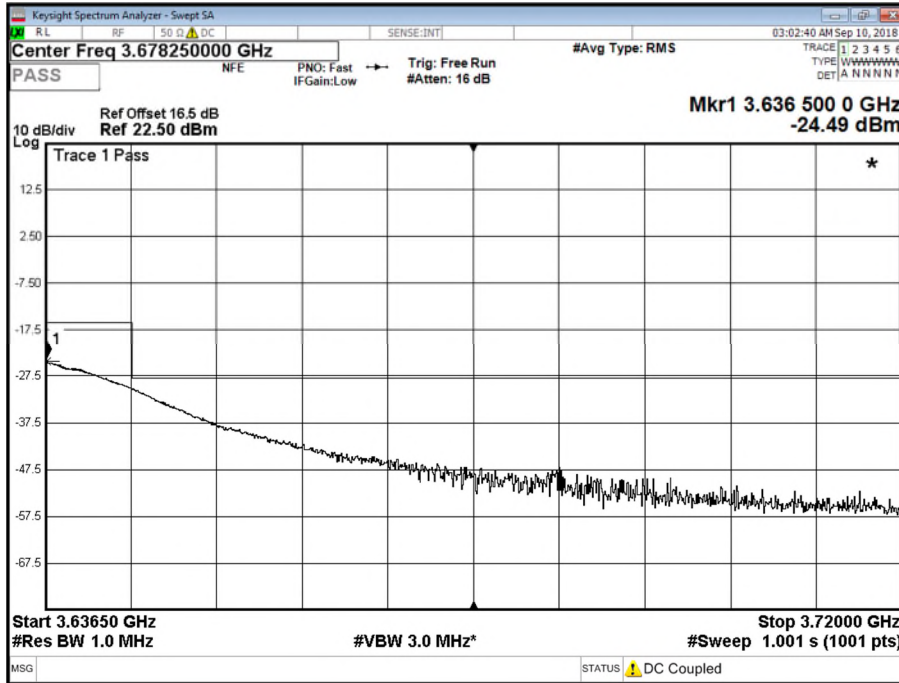




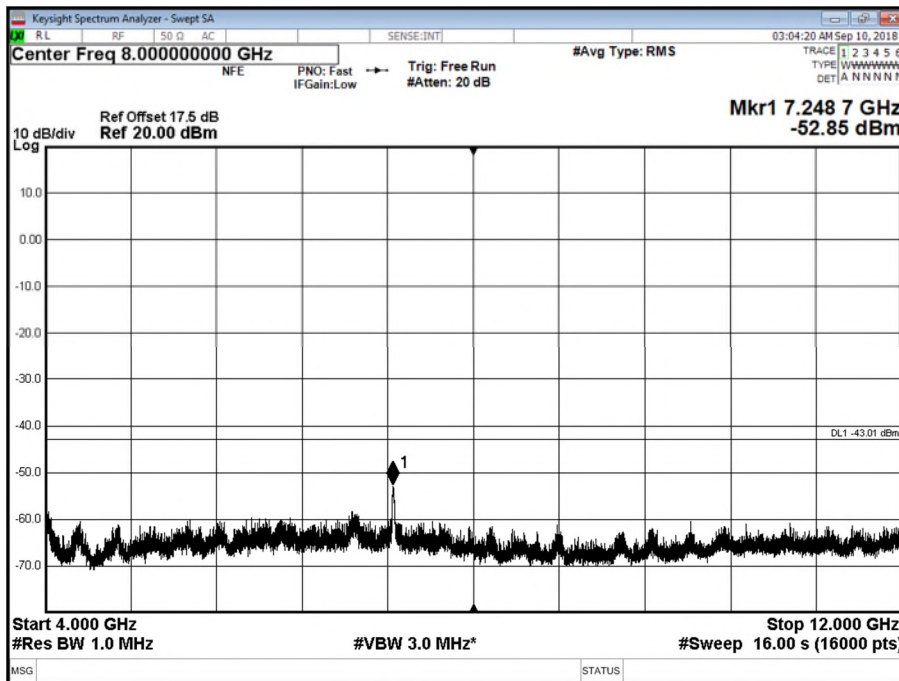


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask High 1 - Range Mask High 1



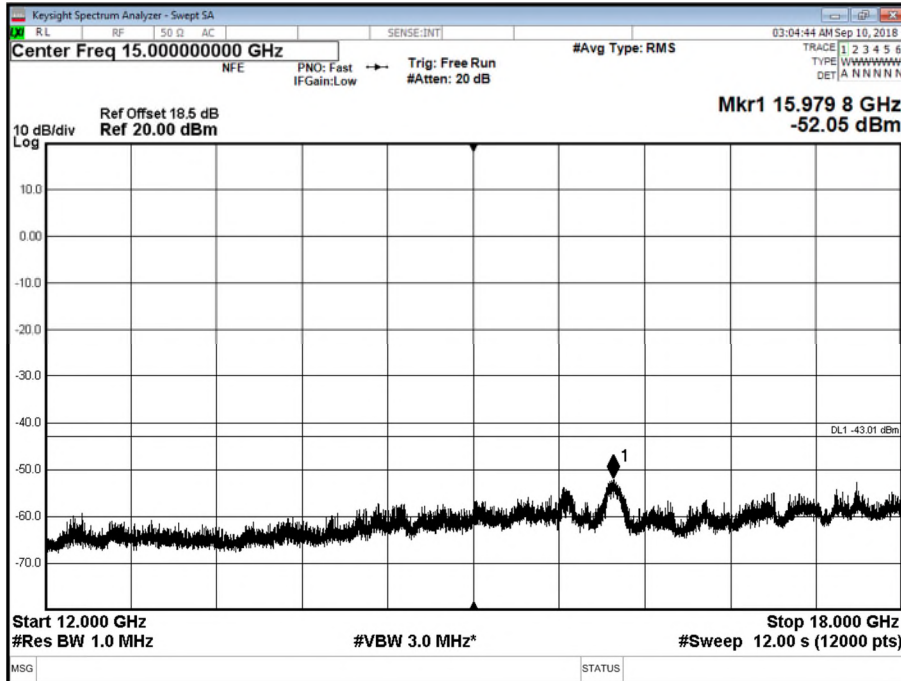
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 2 - Range 4000 to 12000 MHz





Product Service

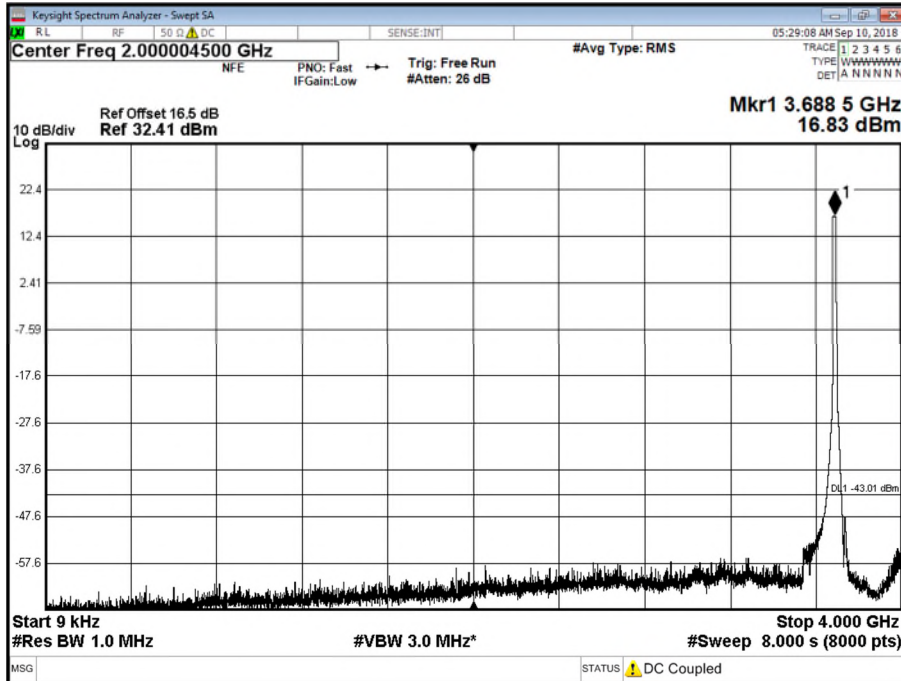
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



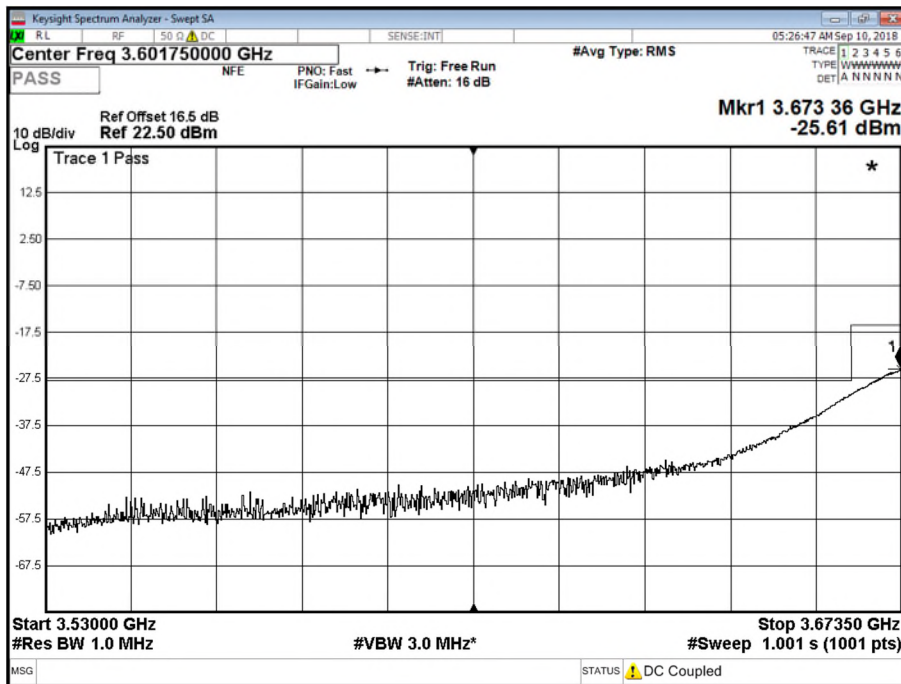


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 4000 MHz



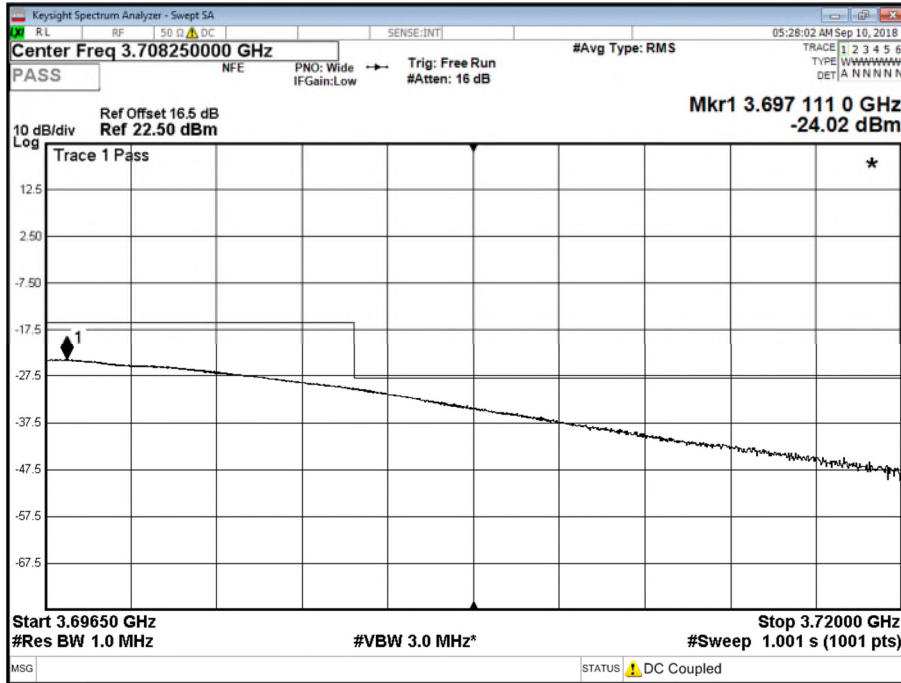
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask Low 1 - Range Mask Low 1



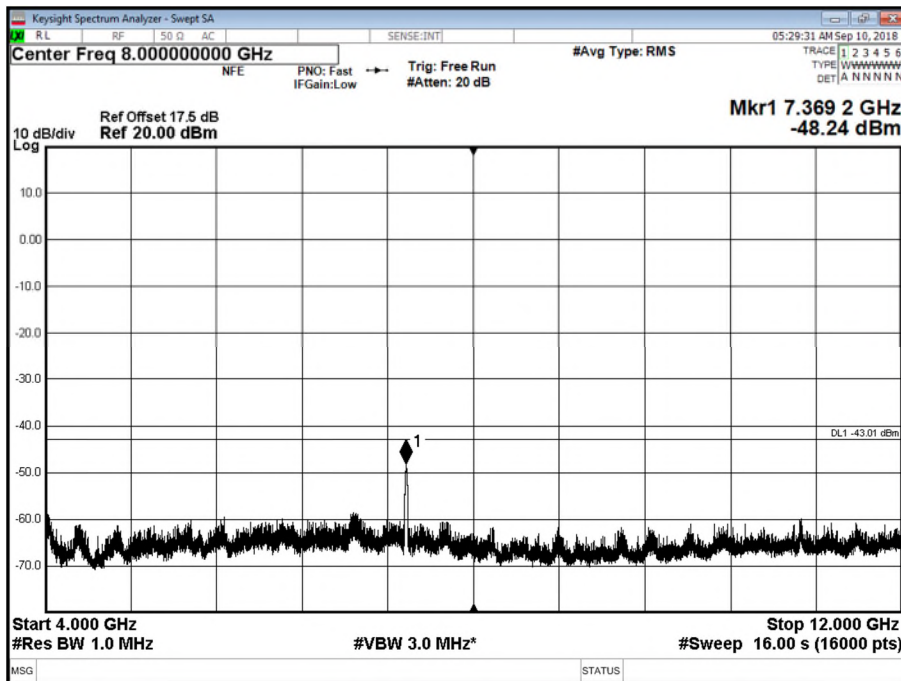


Product Service

Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask High 1 - Range Mask High 1



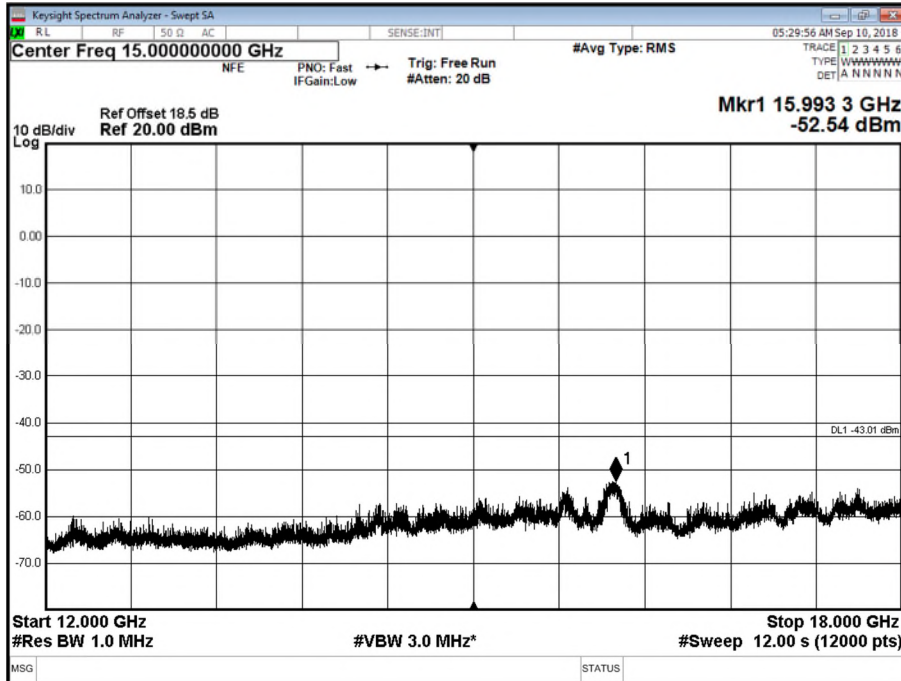
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz





Product Service

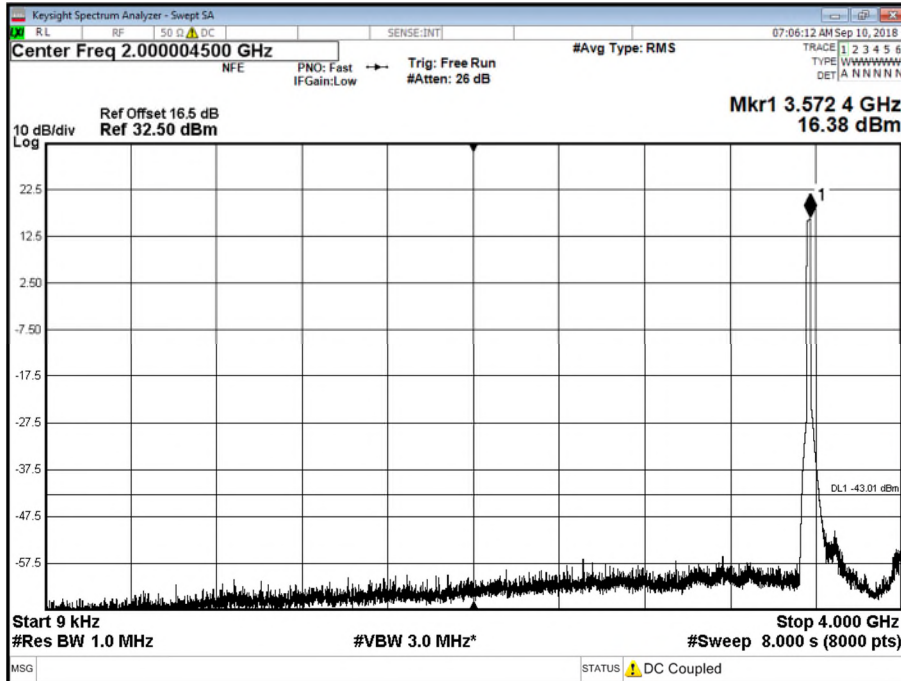
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 12000 to 18000 MHz



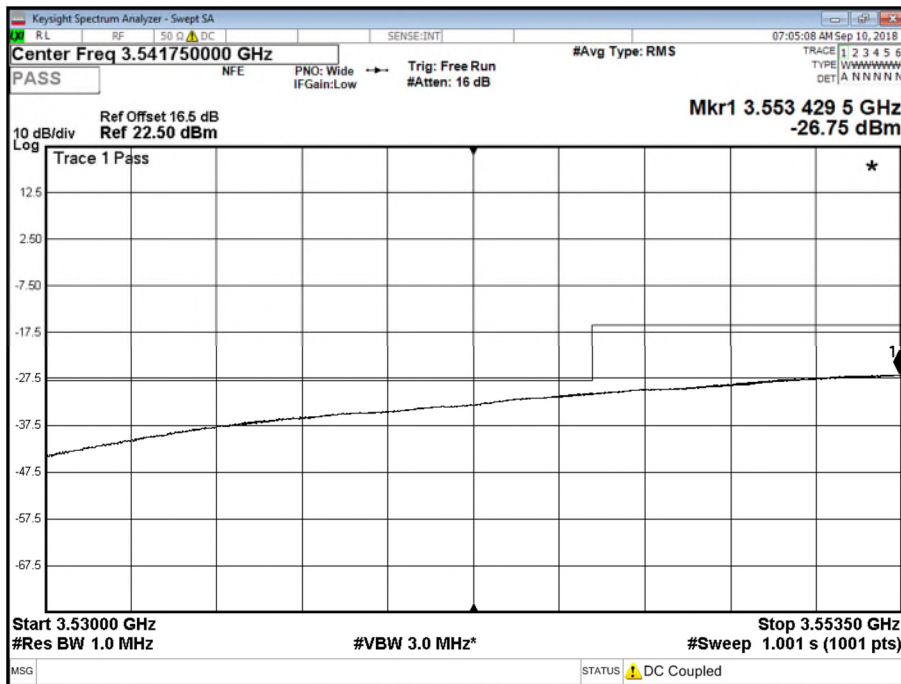


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



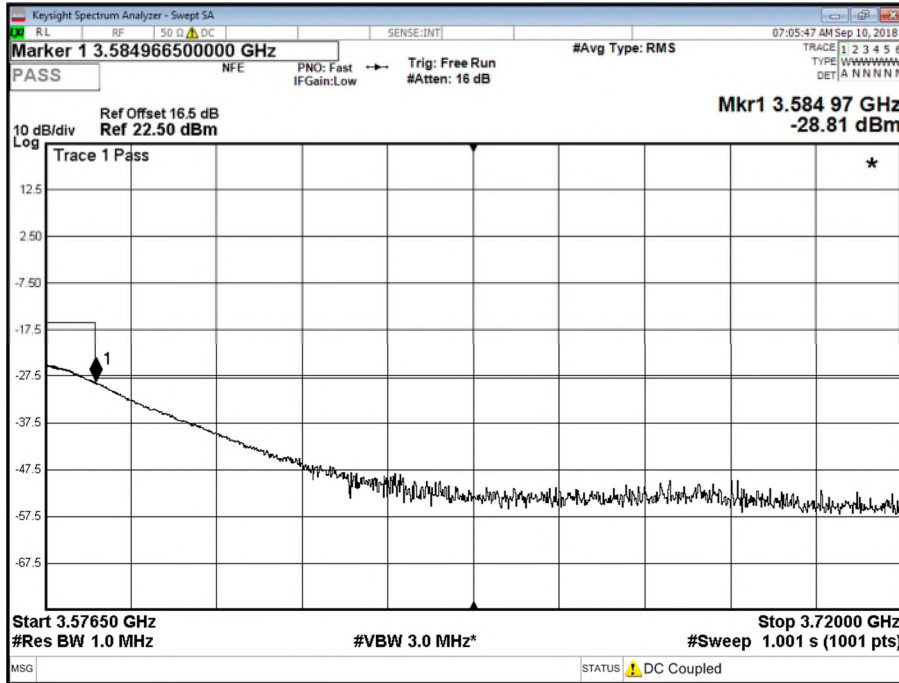
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask Low 1 - Range Mask Low 1



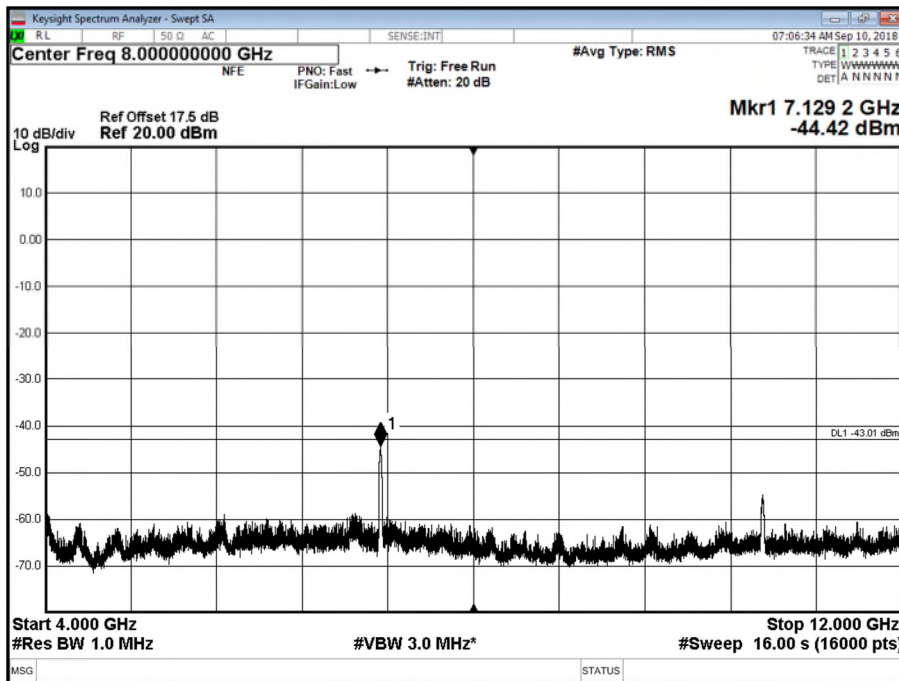


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask High 1 - Range Mask High 1



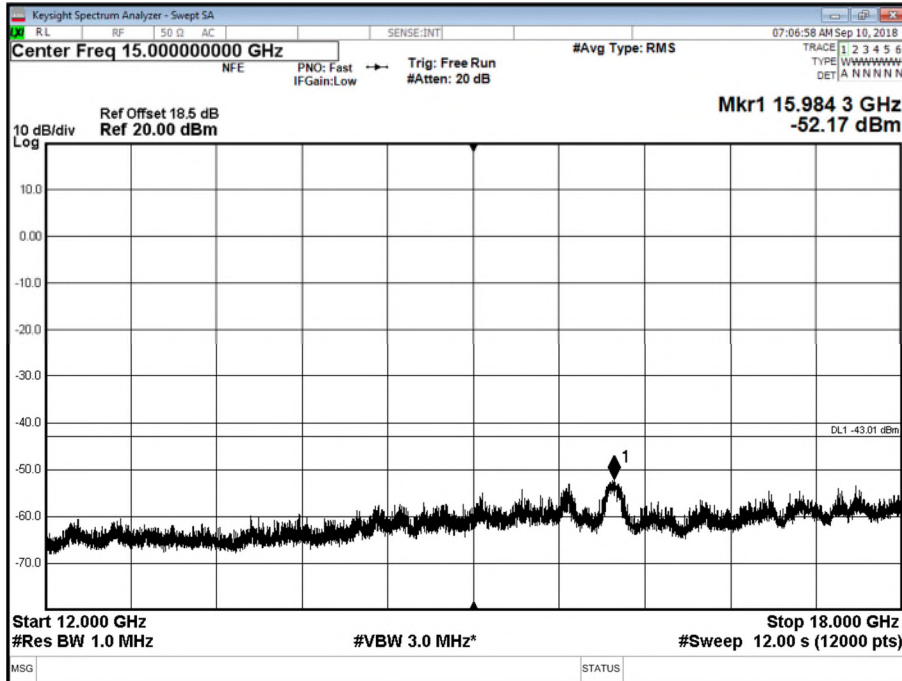
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 12000 to 18000 MHz

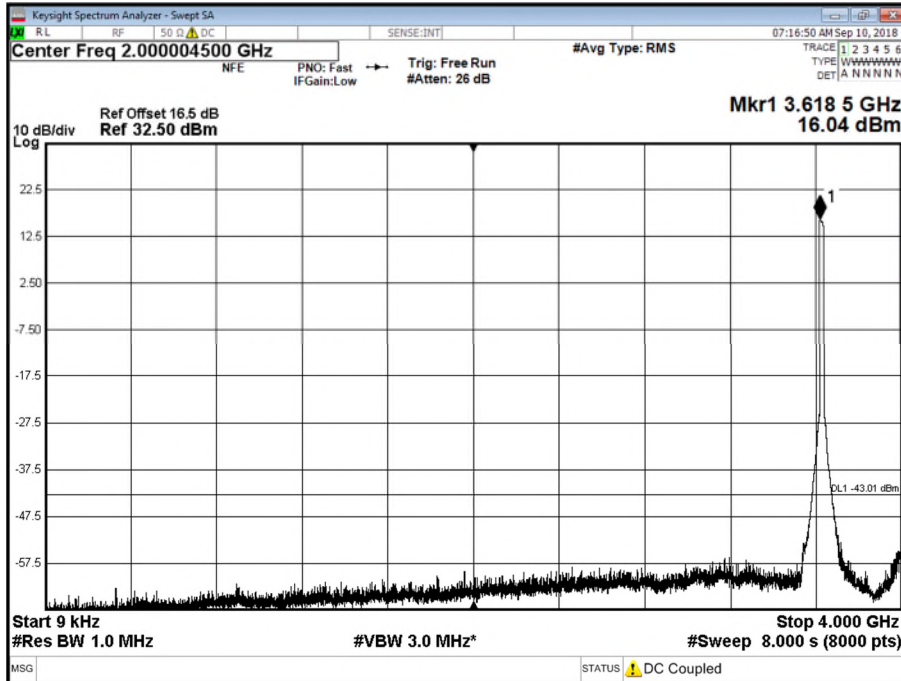




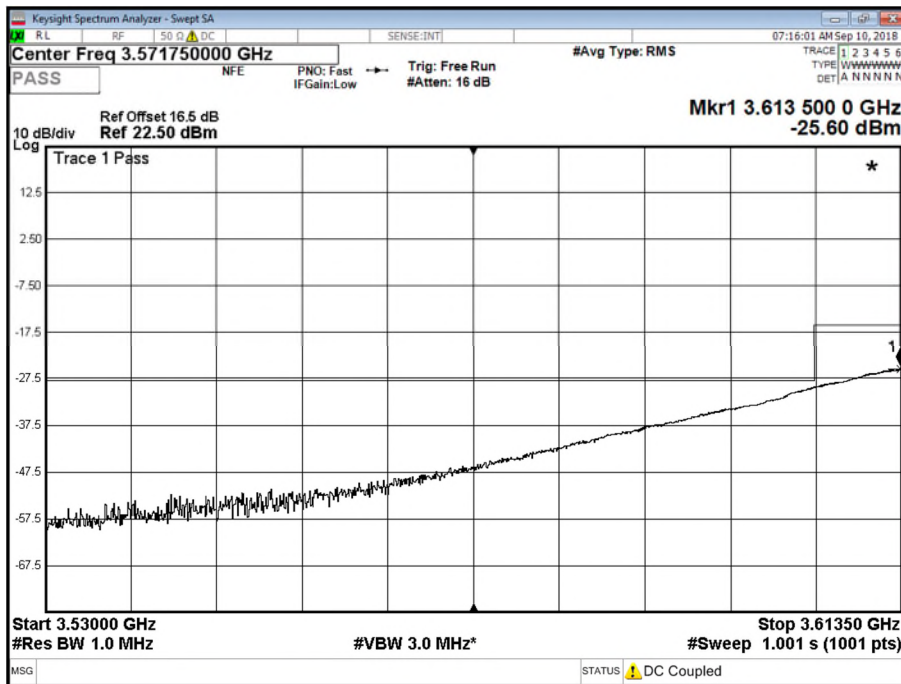


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 1 - Range 0.009 to 4000 MHz



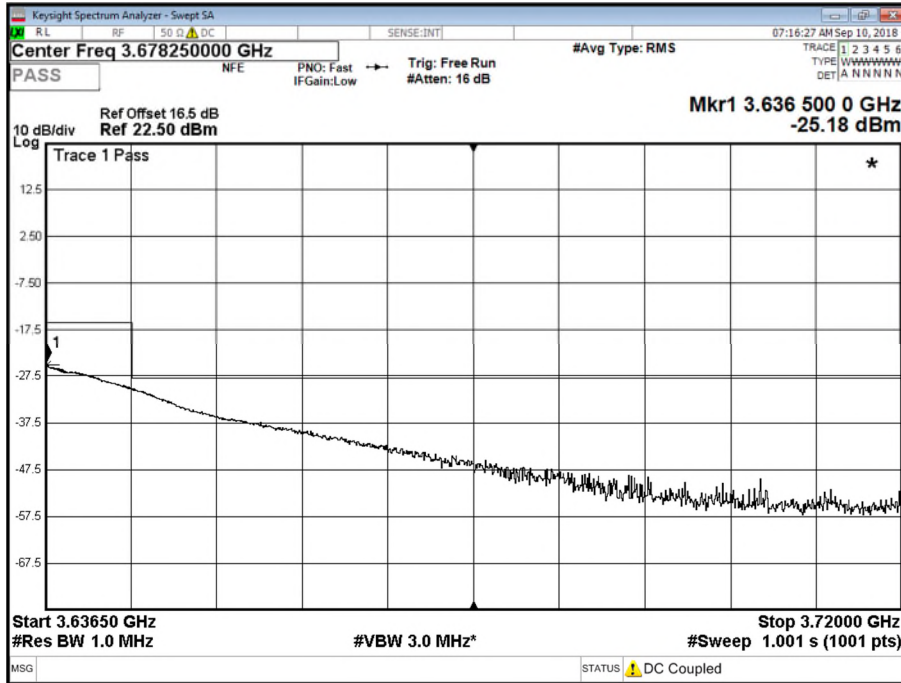
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask Low 1 - Range Mask Low 1



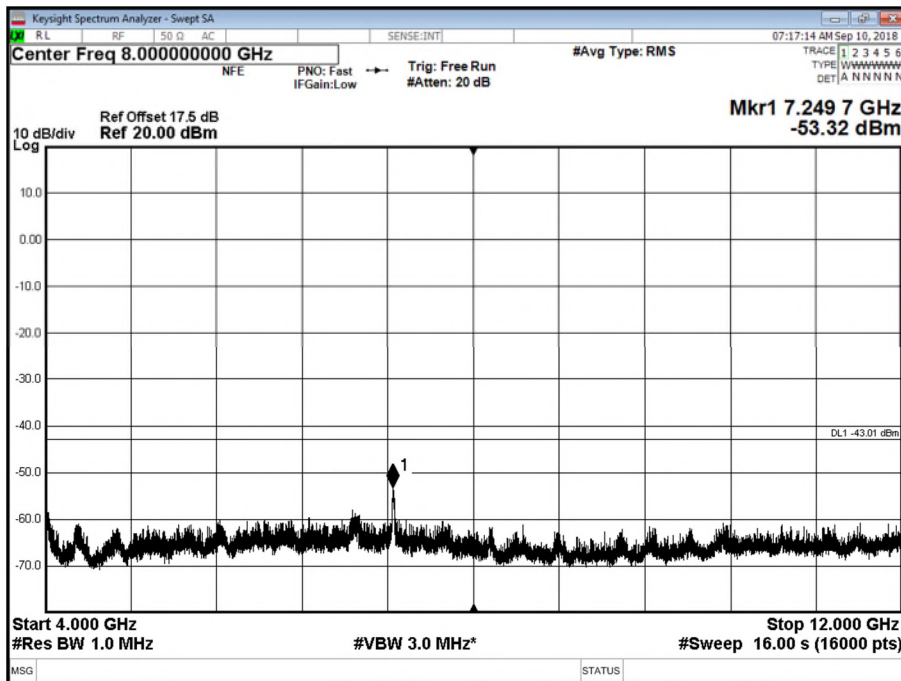


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask High 1 - Range Mask High 1



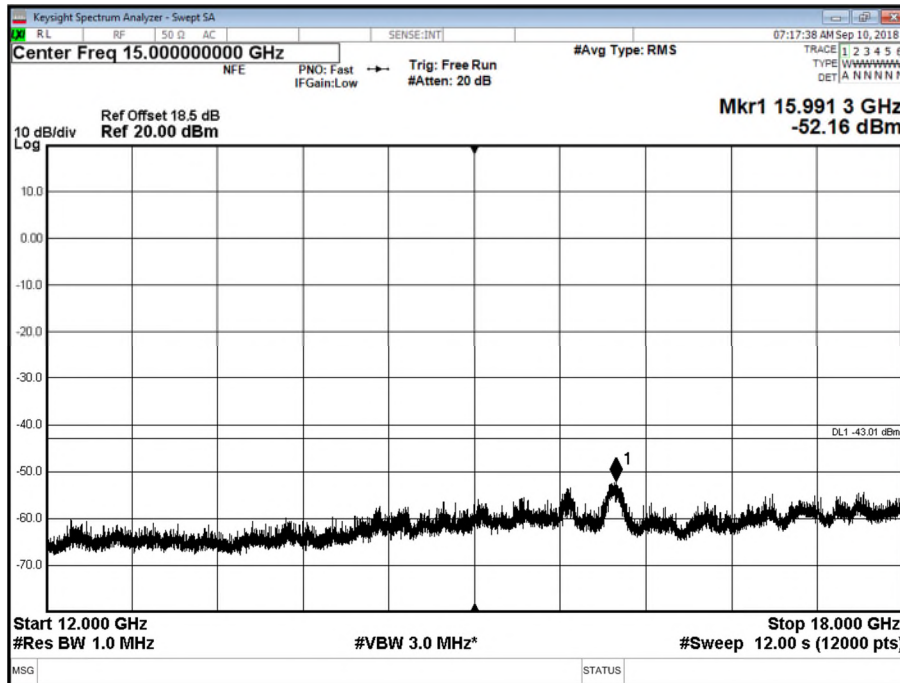
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 2 - Range 4000 to 12000 MHz





Product Service

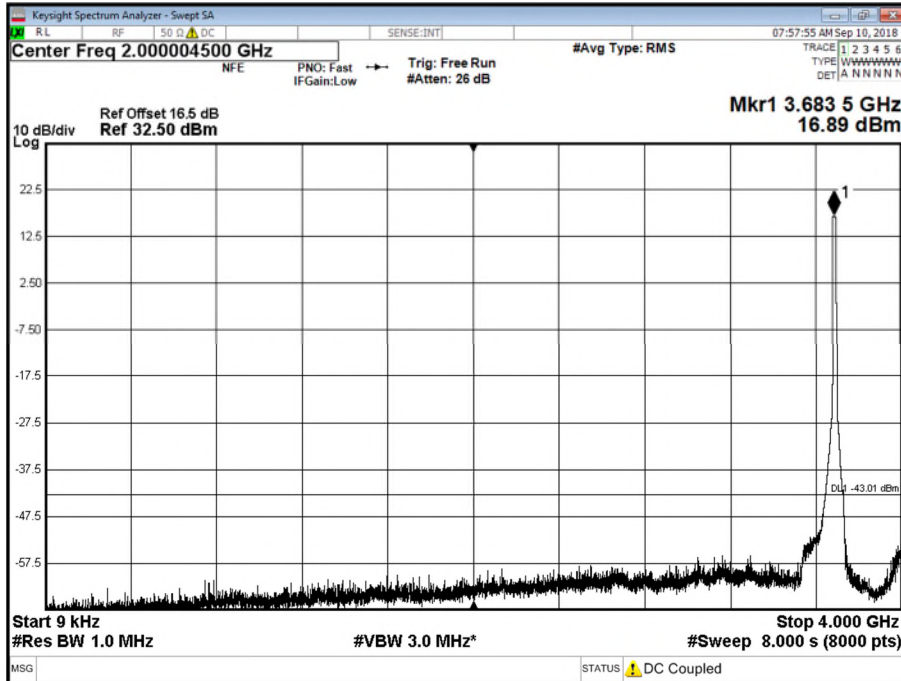
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



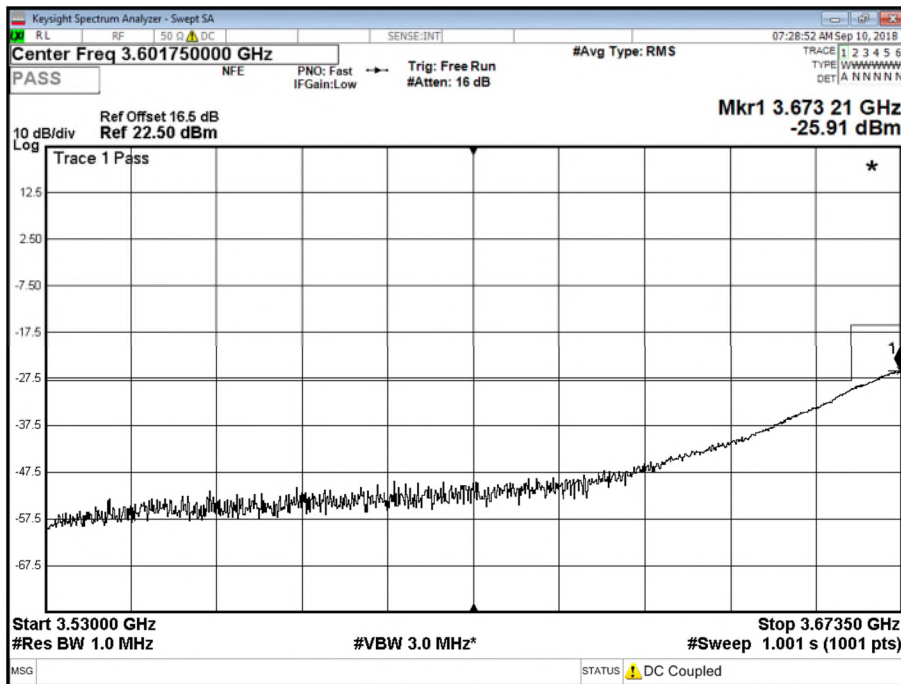


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 4000 MHz



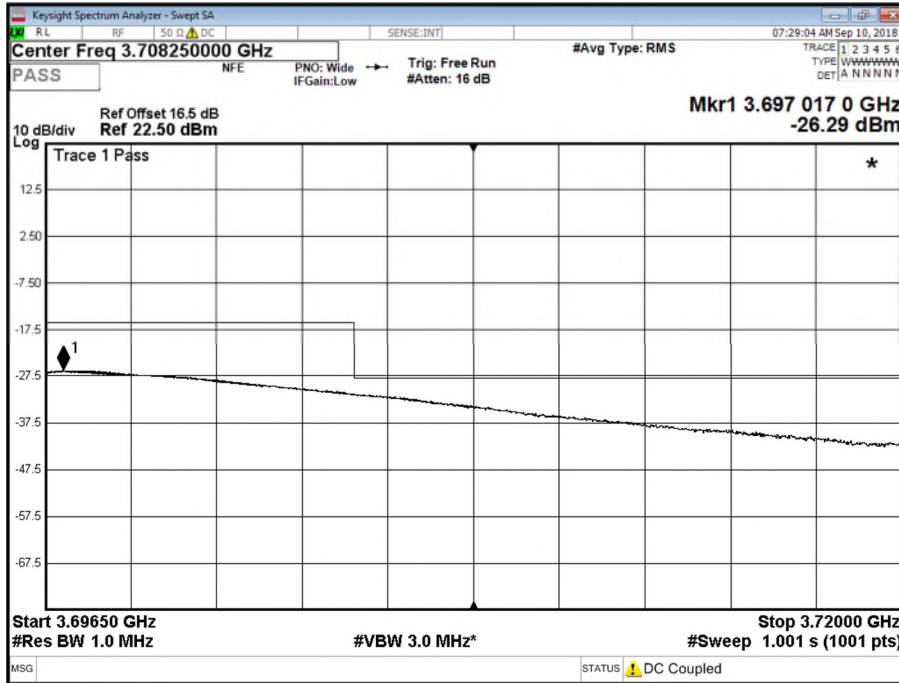
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask Low 1 - Range Mask Low 1



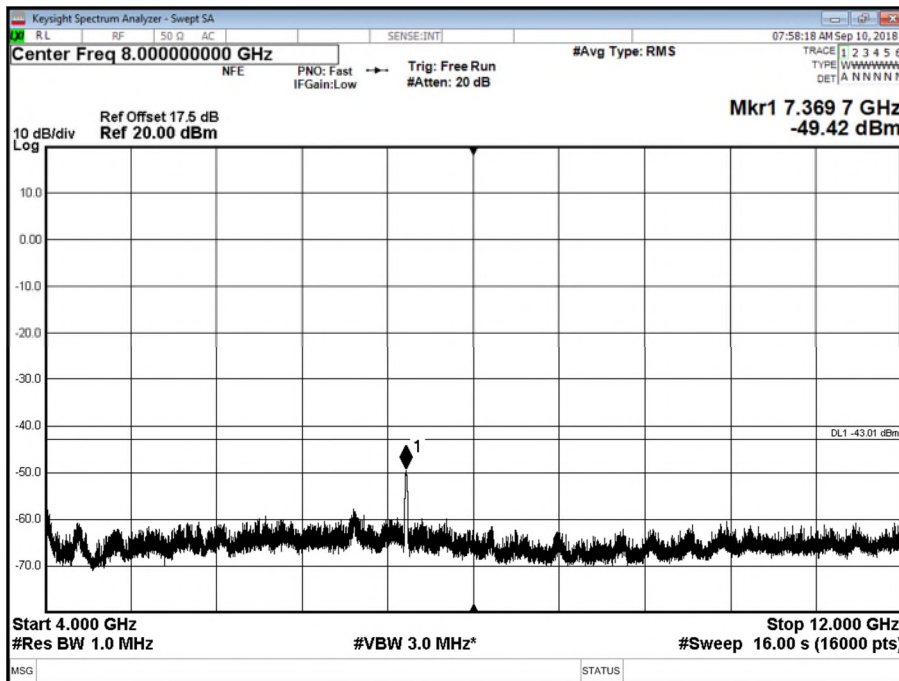


Product Service

Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask High 1 - Range Mask High 1



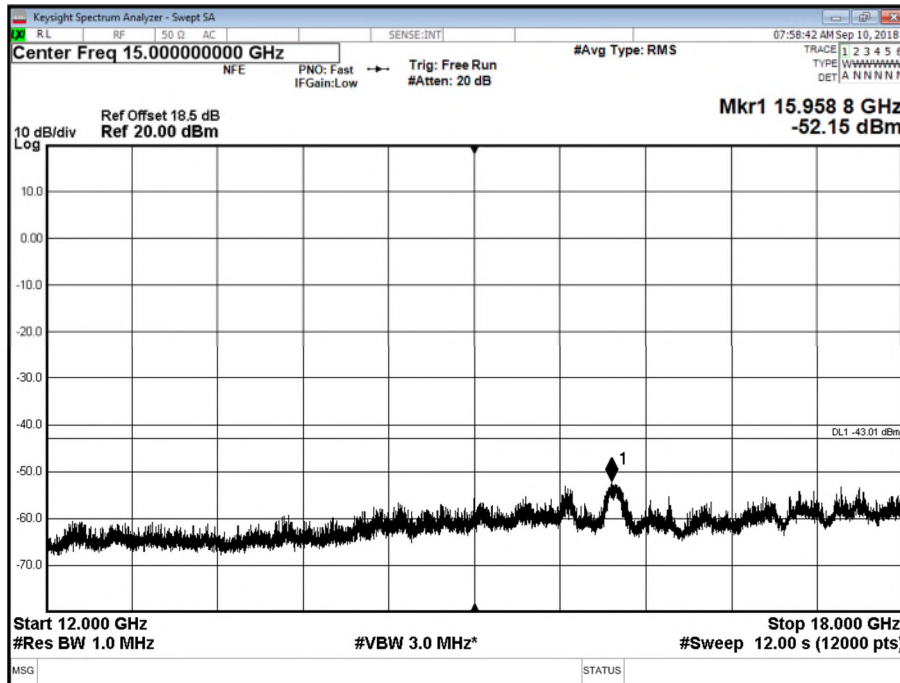
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz





Product Service

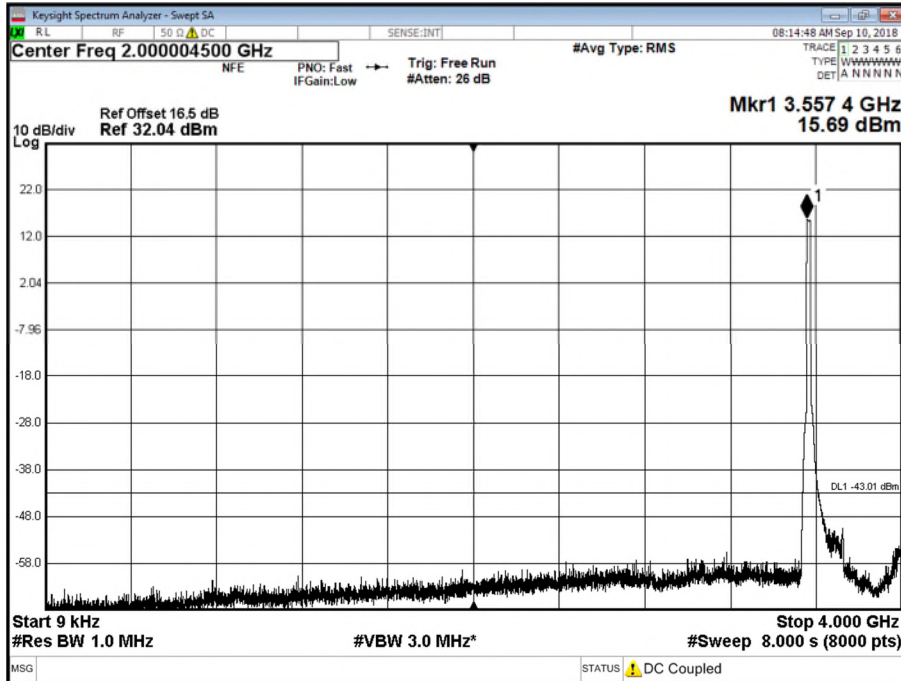
Antenna E - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 12000 to 18000 MHz



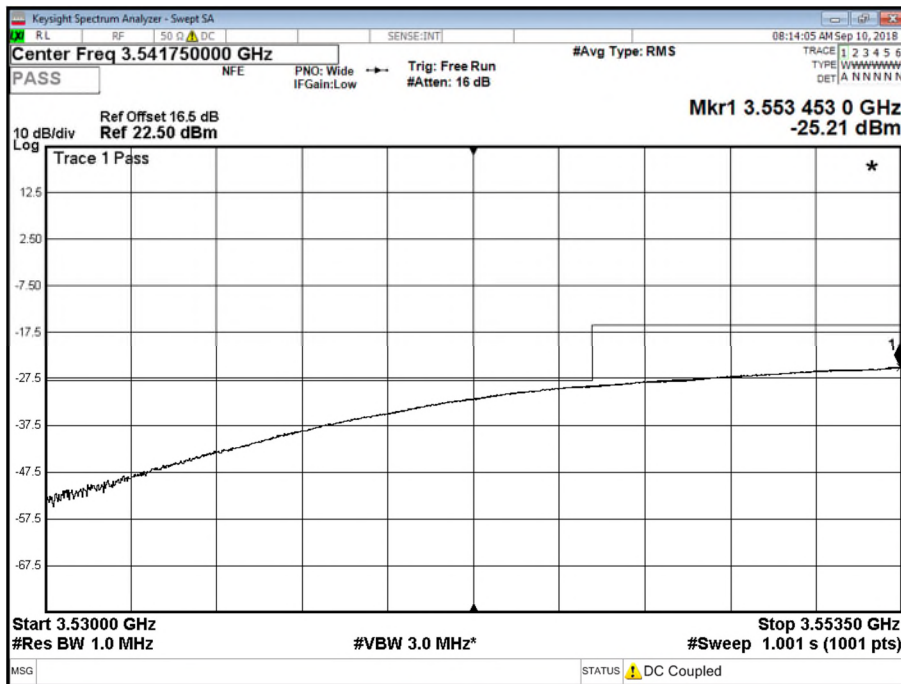


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



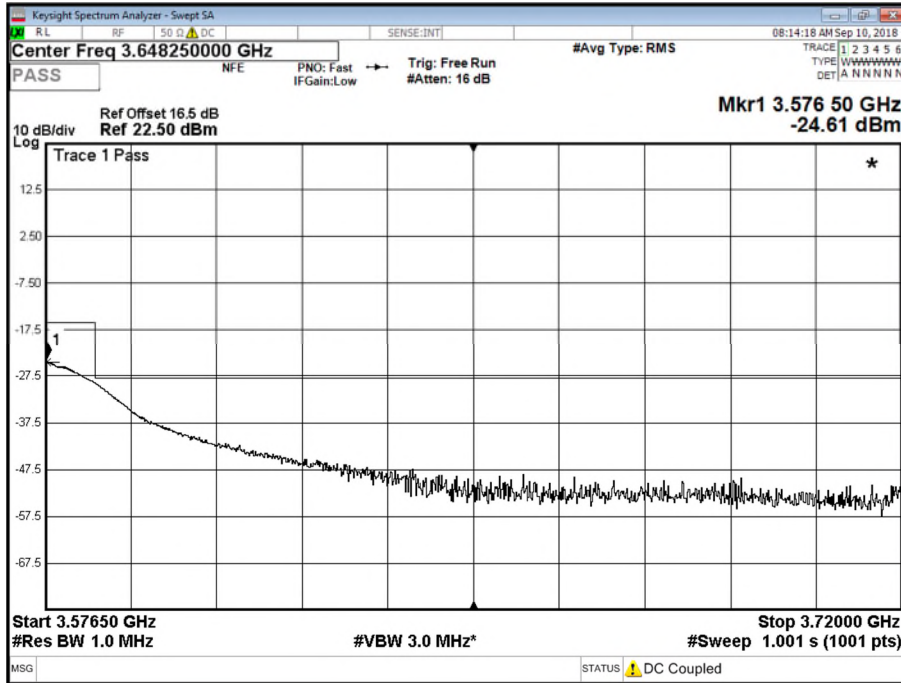
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask Low 1 - Range Mask Low 1



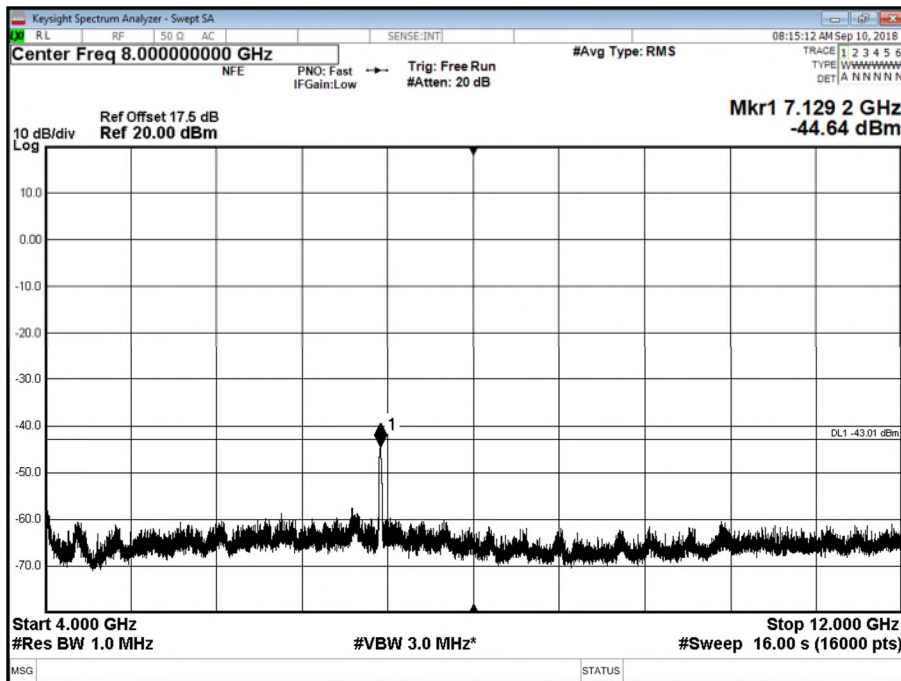


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band Mask High 1 - Range Mask High 1



Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz

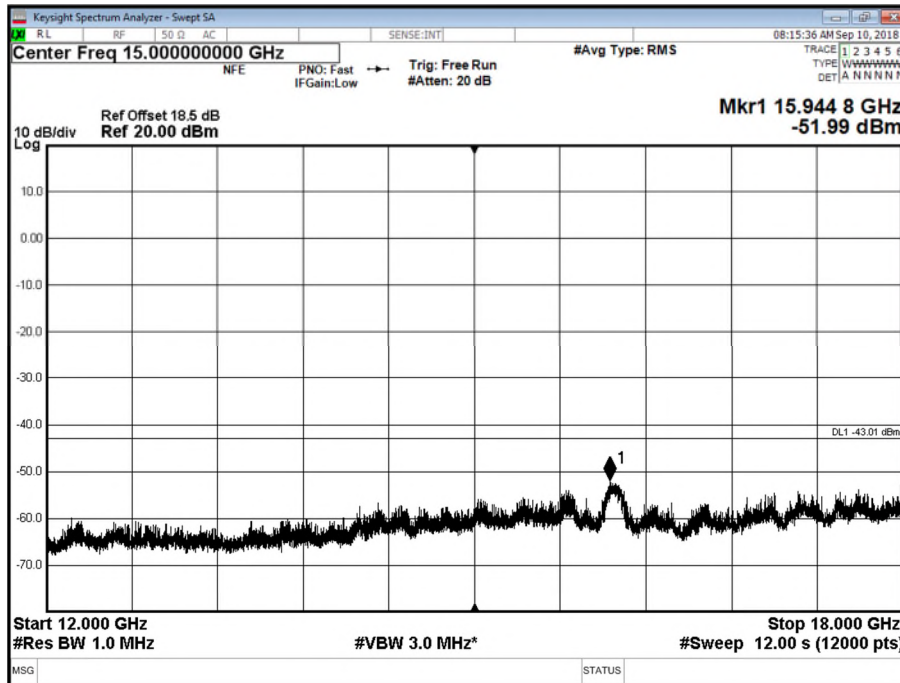






Product Service

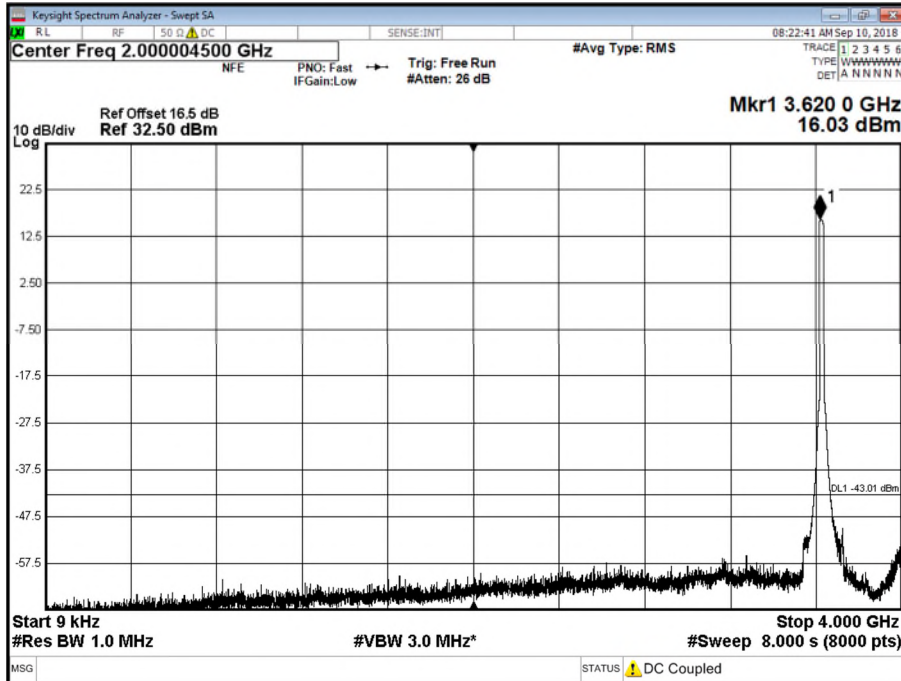
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 12000 to 18000 MHz



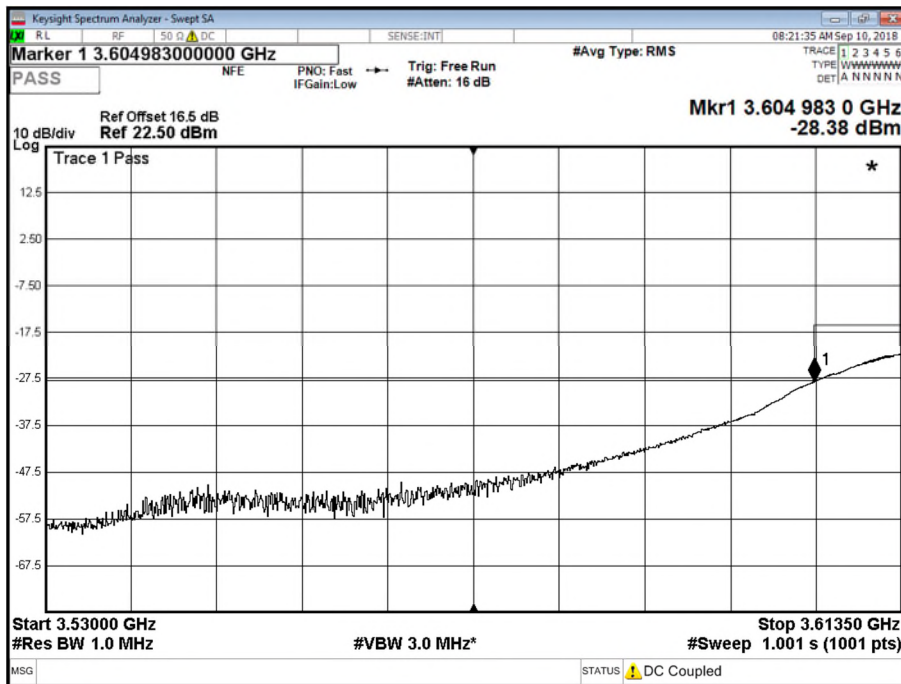


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 1 - Range 0.009 to 4000 MHz



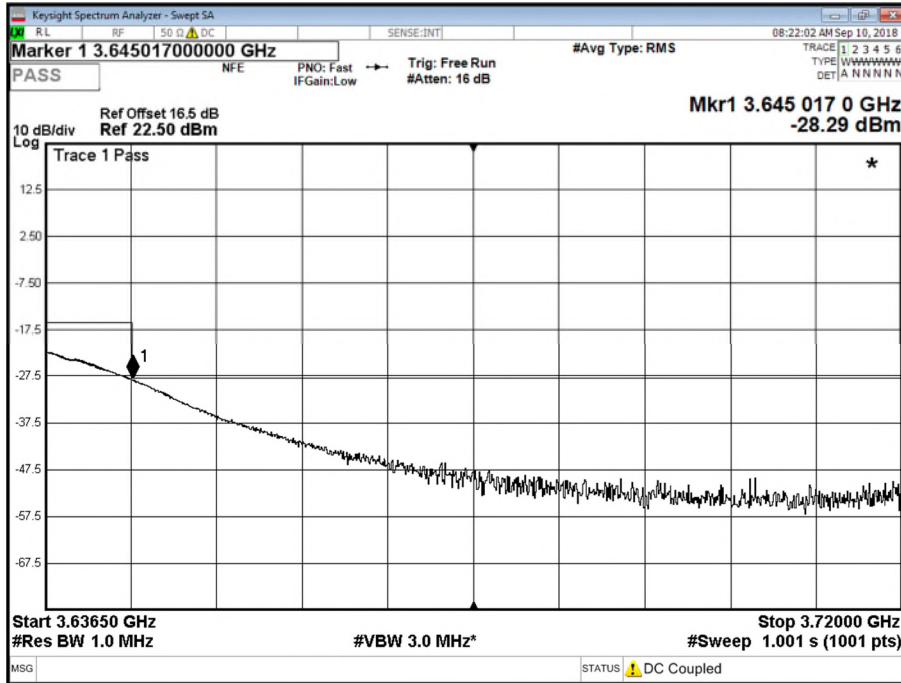
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask Low 1 - Range Mask Low 1



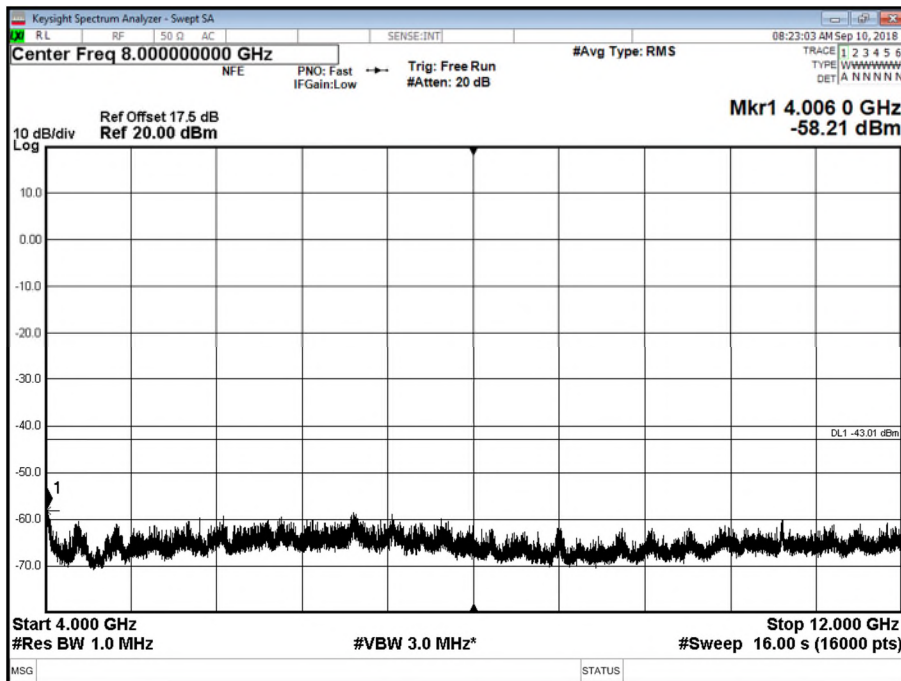


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band Mask High 1 - Range Mask High 1



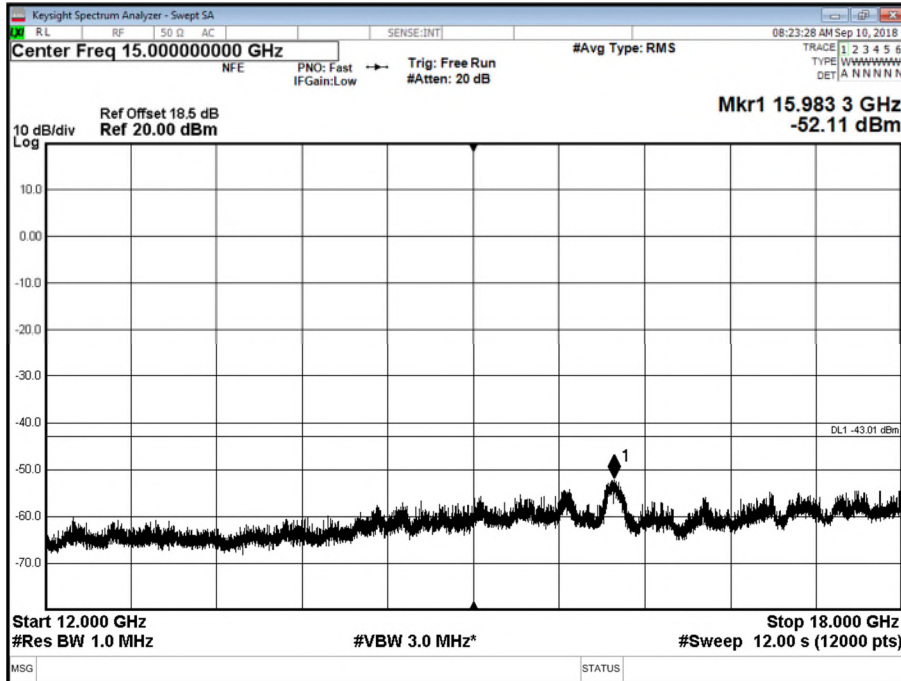
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 2 - Range 4000 to 12000 MHz





Product Service

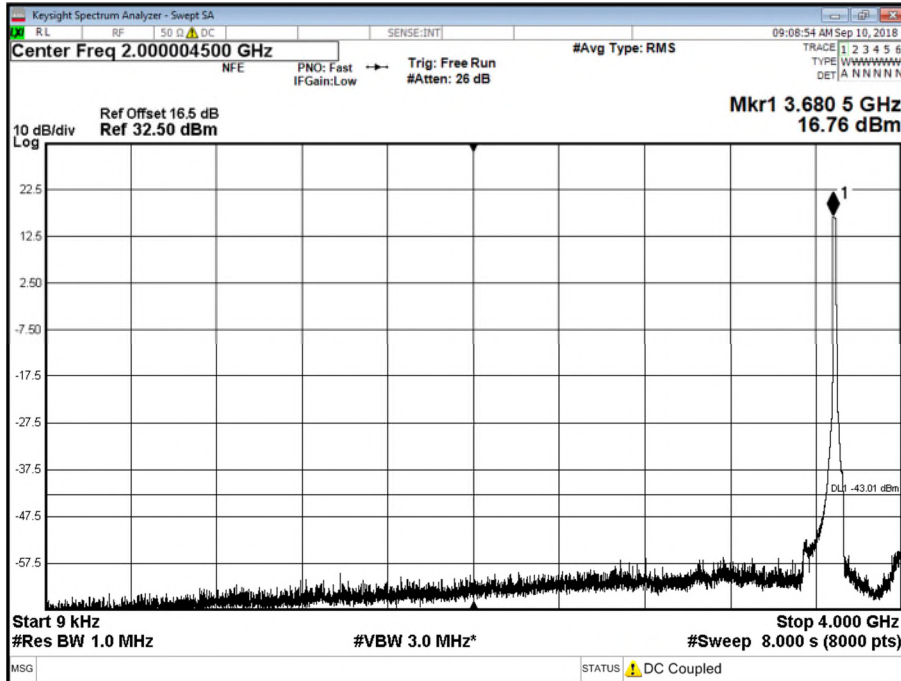
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



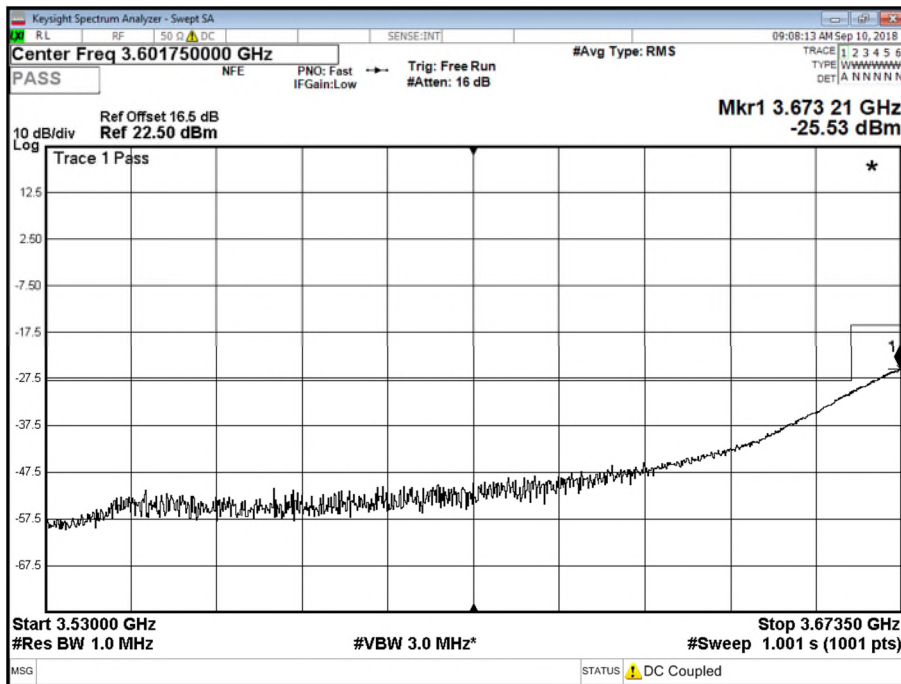


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 4000 MHz



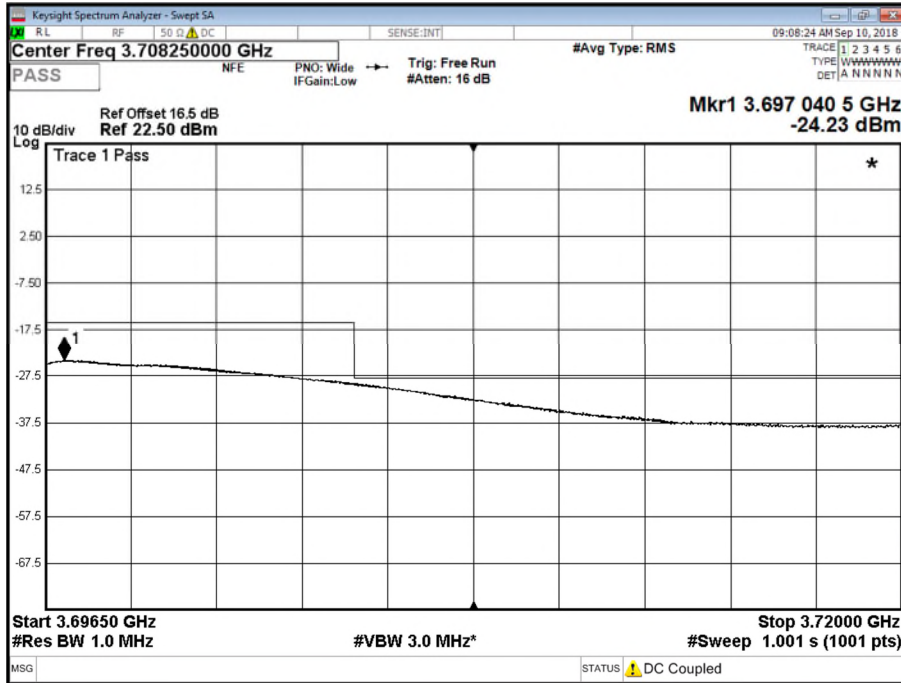
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask Low 1 - Range Mask Low 1



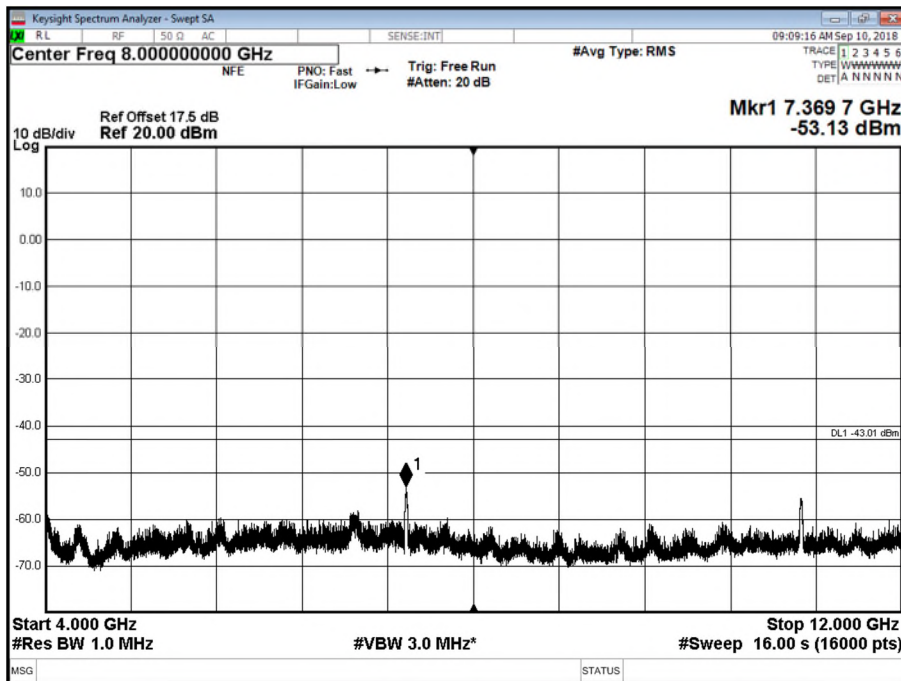


Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band Mask High 1 - Range Mask High 1



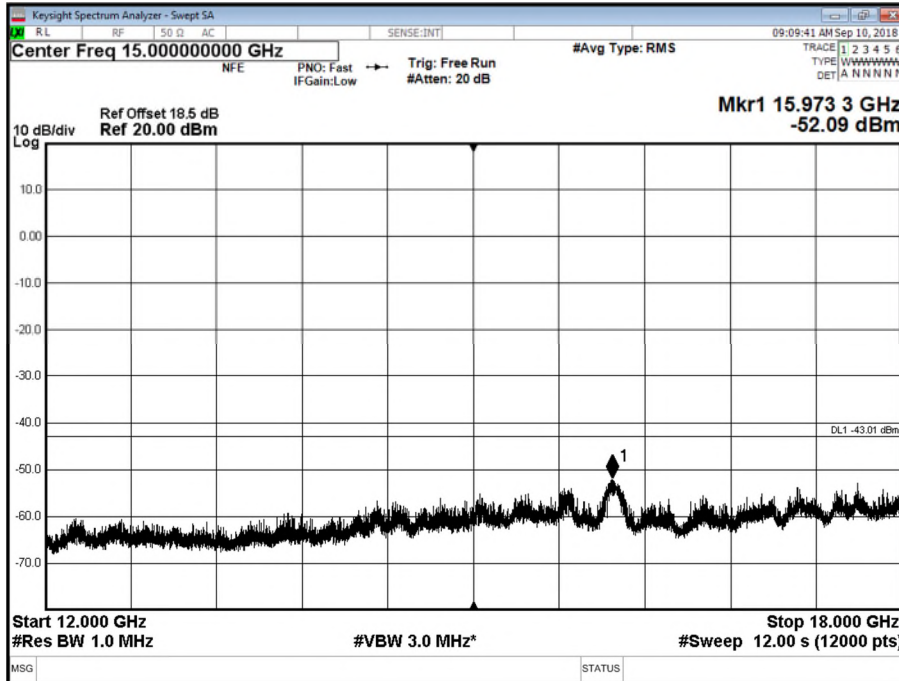
Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz





Product Service

Antenna F - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 12000 to 18000 MHz



Limit	<p>&lt;3530 MHz and &gt;3720 MHz: -40 dBm/MHz  <math>\pm 0 - 10</math> MHz Assigned Channel Edge: -13 dBm/MHz          3530 MHz to -10 MHz Assigned Channel Edge: -25 dBm/MHz          +10 MHz Assigned Channel Edge to 3720 MHz: -25 dBm/MHz          Note: Limits shown in the test plots have been reduced by <math>10\log(2)</math> to account for 2 Port MIMO operation</p>
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**2.5 FREQUENCY STABILITY**

**2.5.1 Specification Reference**

FCC CFR 47 Part 2, Clause 2.1055  
FCC CFR 47 Part 96, Clause 27.54

**2.5.2 Date of Test and Modification State**

September 11, 2018 - Modification State 0

**2.5.3 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.5.4 Environmental Conditions**

Ambient Temperature 23°C  
Relative Humidity 40%

**2.5.5 Test Method**

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

**2.5.6 Test Results**

Maximum Output Power 17 dBm

Temperature	Voltage	Frequency Error (Hz)
		Channel Position M
-30°C	115 Vac, 60 Hz	100
-20°C	115 Vac, 60 Hz	60
-10°C	115 Vac, 60 Hz	80
0°C	115 Vac, 60 Hz	399
+10°C	115 Vac, 60 Hz	419
+20°C	115 Vac, 60 Hz	0
+20°C	115 Vac, 60 Hz	0
+20°C	115 Vac, 60 Hz	0
+30°C	115 Vac, 60 Hz	20
+40°C	115 Vac, 60 Hz	220
+50°C	115 Vac, 60 Hz	299





Product Service

Limit	$\pm 1.5$ ppm or $\pm 1.322$ kHz
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Product Service

## **SECTION 3**

### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	Serial No	Calibration Period (months)	Calibration Due
<b>Maximum Peak Output Power and Peak to Average Ratio - Conducted</b>					
THG	Fluke	77 IV	34770264	12	18-Apr-2019
DVM	VWR	61161-378	170120564	24	17-Feb-2019
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Spectrum Analyser	Keysight	N9030A	MY55410202	12	26-Sep-2019
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Switching Control Unit	Hewlett Packard	11713A	3748A060876	O/P Mon	-
RF Switch Unit	Burnsco	RARFSW 4x1	001	O/P Mon	-
Power Supply	Leader	730-3D	9801135	O/P Mon	-
Receiver	Rohde & Schwarz	ESU40	1001162	24	20-Apr-2019
<b>Occupied Bandwidth</b>					
THG	Fluke	77 IV	34770264	12	18-Apr-2019
DVM	VWR	61161-378	170120564	24	17-Feb-2019
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Spectrum Analyser	Keysight	N9030A	MY55410202	12	26-Sep-2019
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Switching Control Unit	Hewlett Packard	11713A	3748A060876	O/P Mon	-
RF Switch Unit	Ericsson	RARFSW 4x1	001	O/P Mon	-
Power Supply	Leader	730-3D	9801135	O/P Mon	-
Receiver	Rohde & Schwarz	ESU40	1001162	24	20-Apr-2019
<b>Band Edge</b>					
THG	Fluke	77 IV	34770264	12	18-Apr-2019
DVM	VWR	61161-378	170120564	24	17-Feb-2019
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Spectrum Analyser	Keysight	N9030A	MY55410202	12	26-Sep-2019
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Switching Control Unit	Hewlett Packard	11713A	3748A060876	O/P Mon	-
RF Switch Unit	Ericsson	RARFSW 4x1	001	O/P Mon	-
Power Supply	Leader	730-3D	9801135	O/P Mon	-
Receiver	Rohde & Schwarz	ESU40	1001162	24	20-Apr-2019
<b>Transmitter Spurious Emissions</b>					
THG	Fluke	77 IV	34770264	12	18-Apr-2019
DVM	VWR	61161-378	170120564	24	17-Feb-2019
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Signal Generator	Agilent	E8257D	MY45140527	24	28 Sep 2019
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Receiver	Rohde & Schwarz	ESU40	1001162	24	20-Apr-2019



Product Service

Instrument	Manufacturer	Type No.	Serial No	Calibration Period (months)	Calibration Due
Frequency Stability					
THG	Fluke	77 IV	34770264	12	18-Apr-2019
DVM	VWR	61161-378	170120564	24	17-Feb-2019
Power Supply	Xantrex	XKW 60-50	E00109863	O/P Mon	-
Spectrum Analyser	Keysight	N9030A	MY55410202	12	26-Sep-2019
Attenuator	Pasternack	PE7004-10	N/S	O/P Mon	-
Receiver	Rohde & Schwarz	ESU40	1001162	24	20-Apr-2019
Climatic Chamber	Burnsco	RTC-37P-3-3	07-07	O/P Mon	-

N/A – Not Applicable

O/P Mon – Output Monitored with Calibrated Equipment



Product Service

### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	$\pm 0.1$ dB
Conducted Emissions	30 MHz to 20 GHz Amplitude	$\pm 2.3$ dB
Frequency Stability	30 MHz to 2 GHz	$\pm 5.0$ Hz
Occupied Bandwidth	Up to 20 MHz Bandwidth	$\pm 1.1$ Hz
Band Edge	30 MHz to 20 GHz Amplitude	$\pm 2.3$ dB



Product Service

## **SECTION 5**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

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