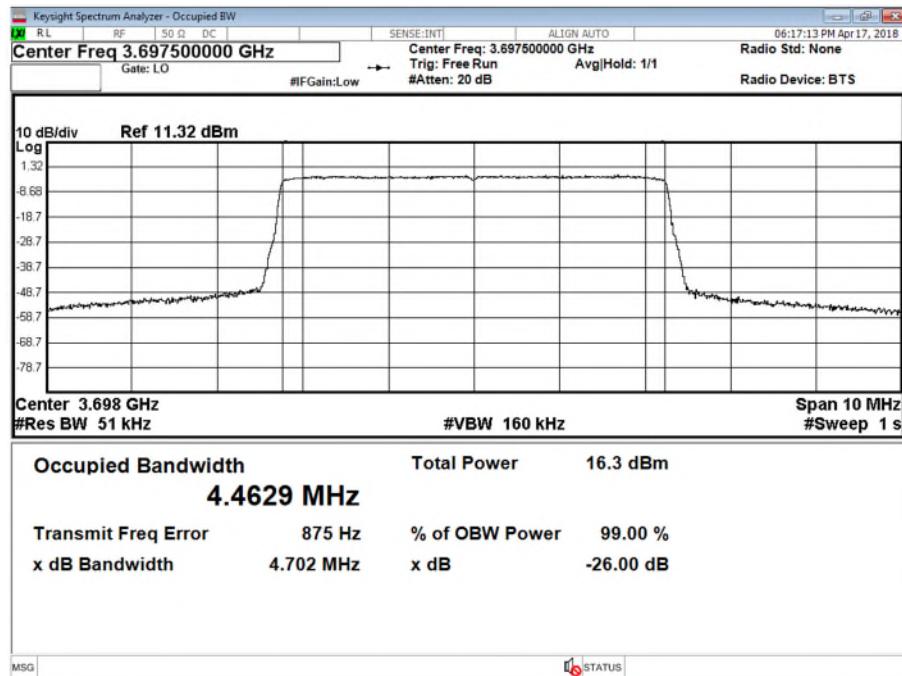


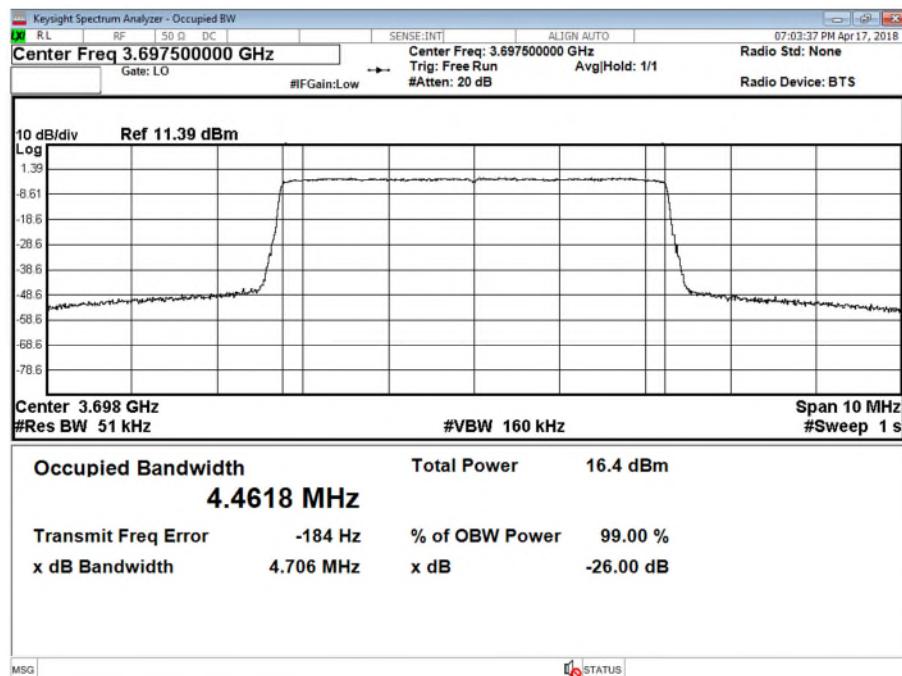


Product Service

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



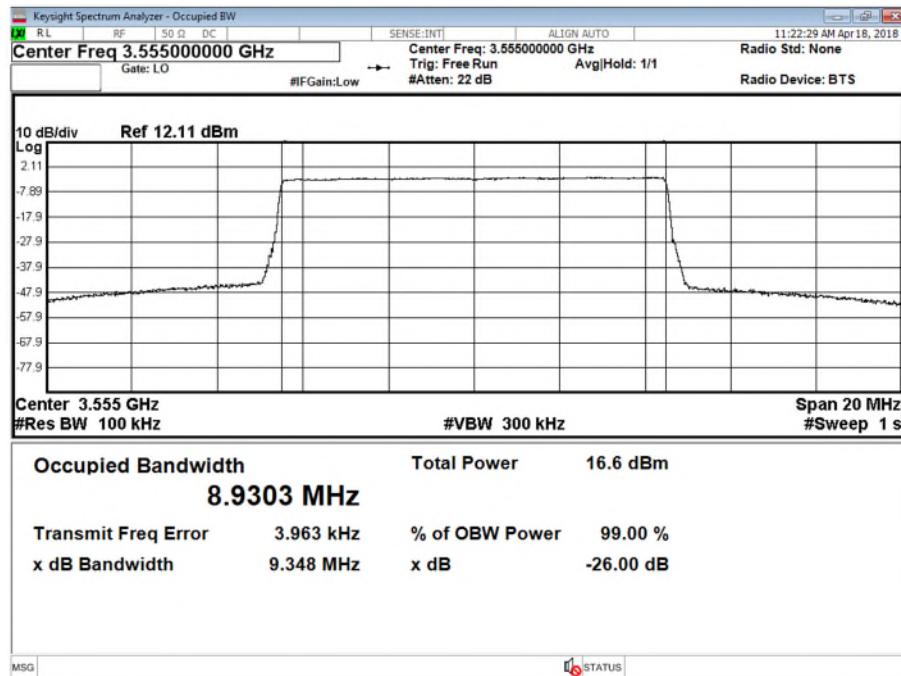
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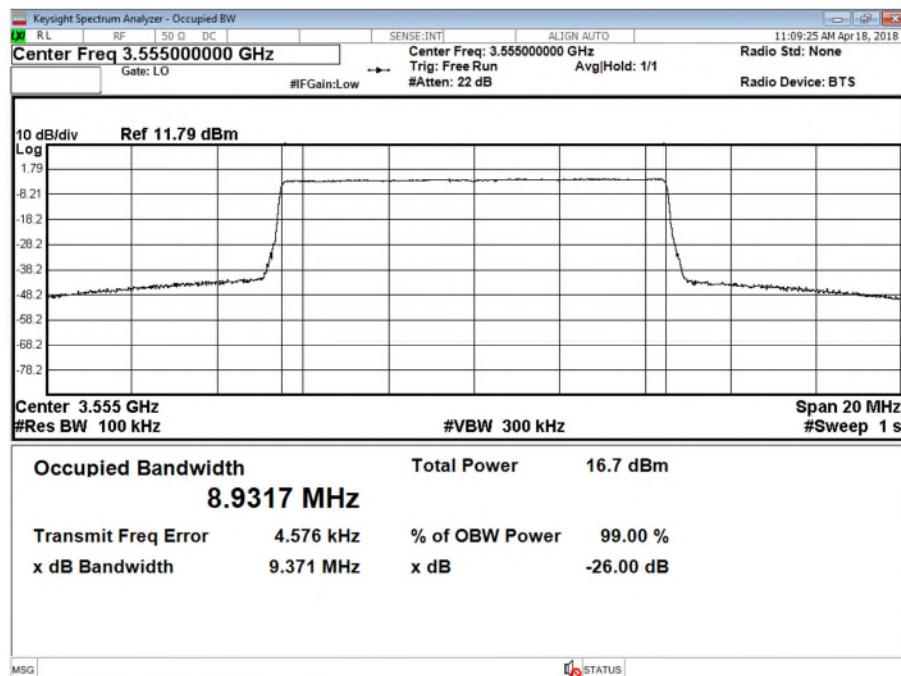


Product Service

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



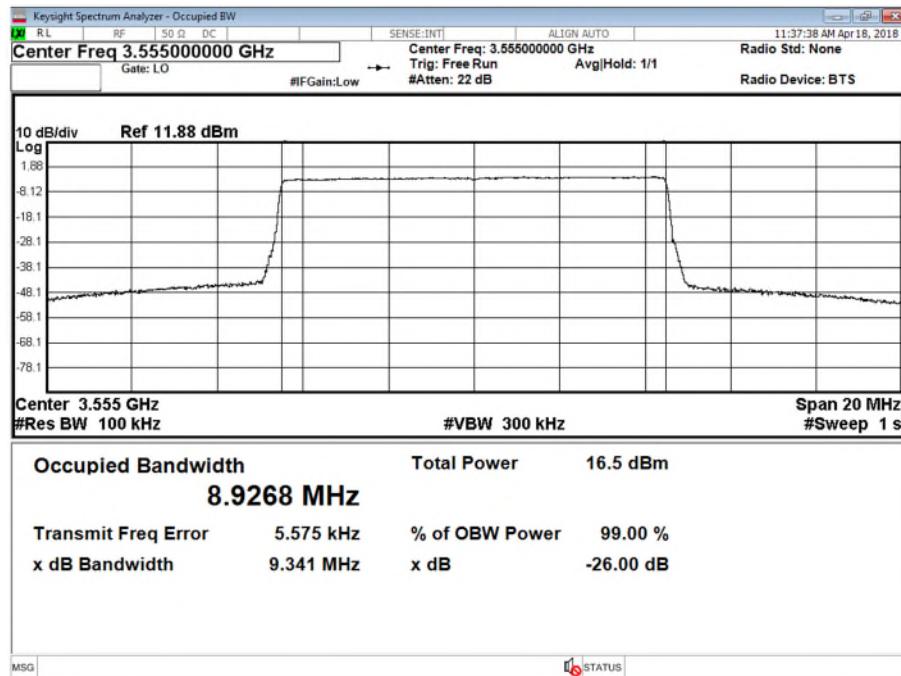
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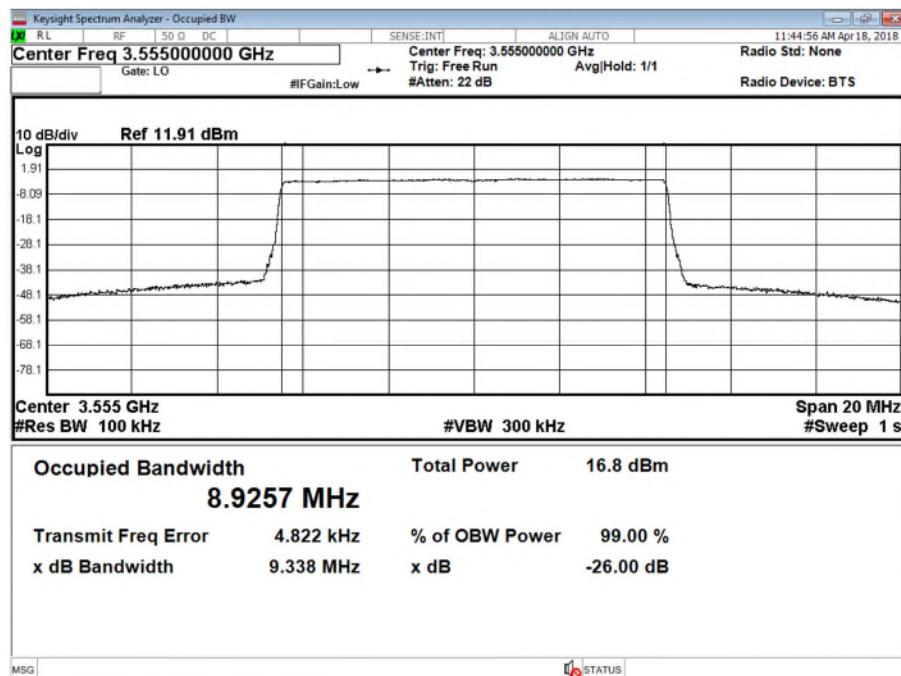


Product Service

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



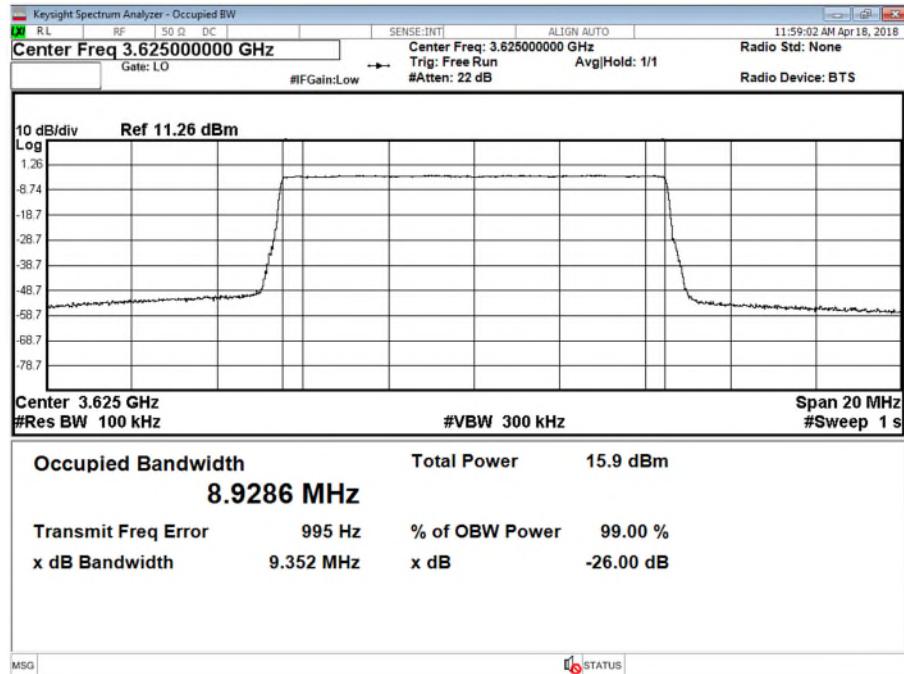
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



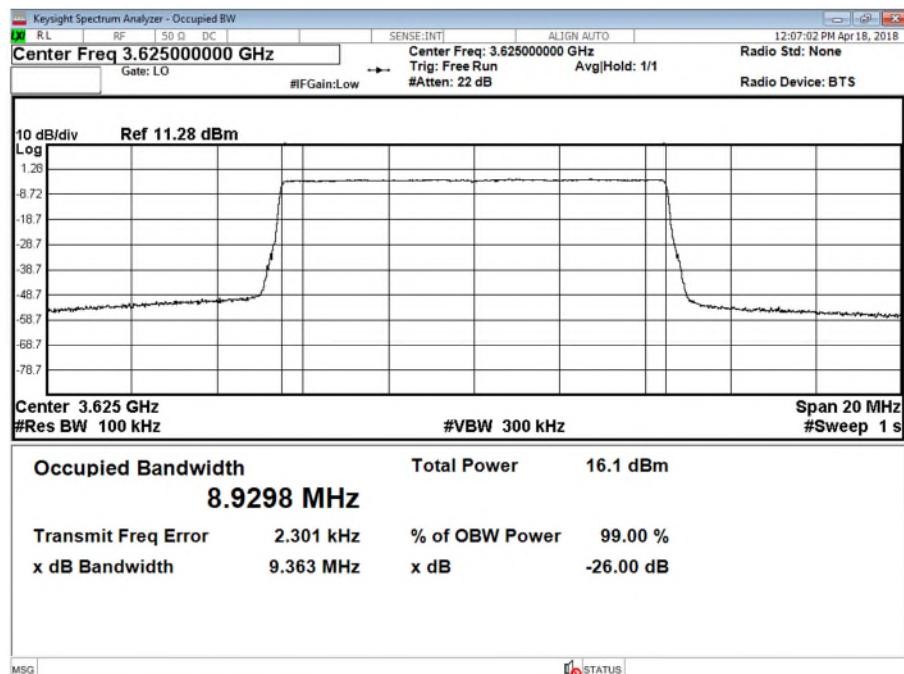


Product Service

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



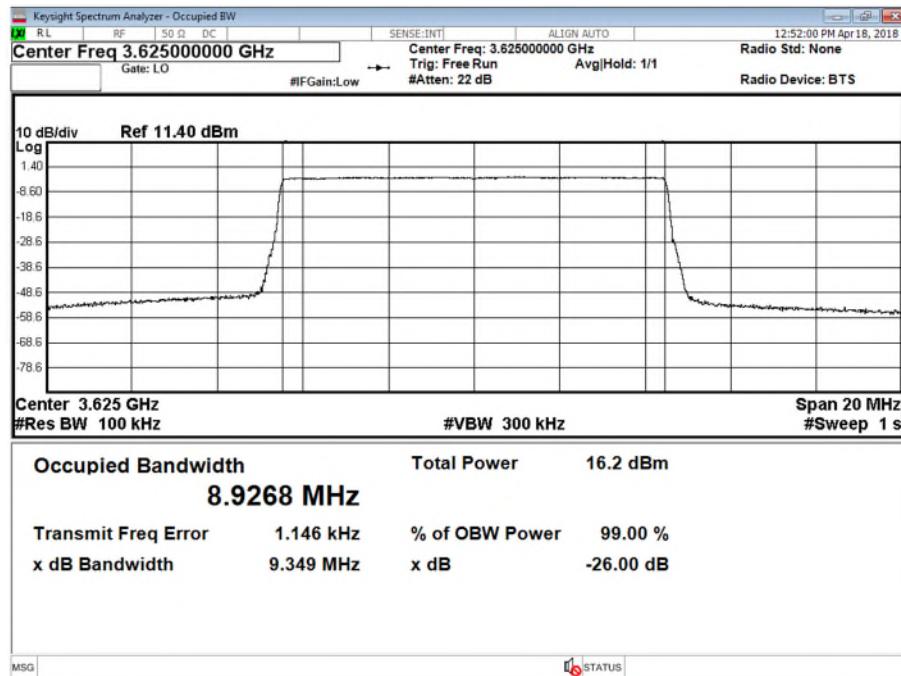
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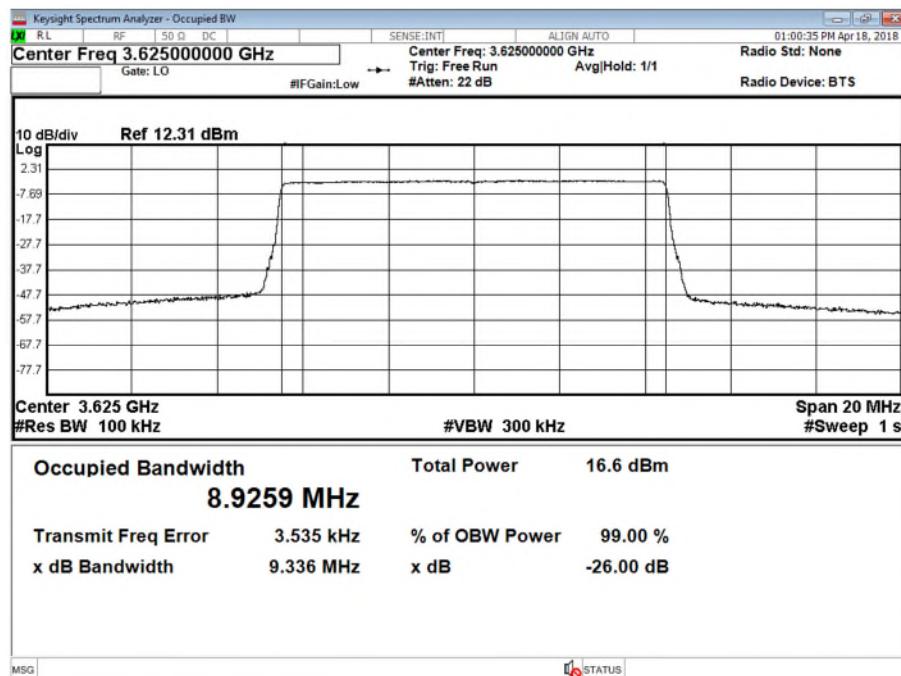


Product Service

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



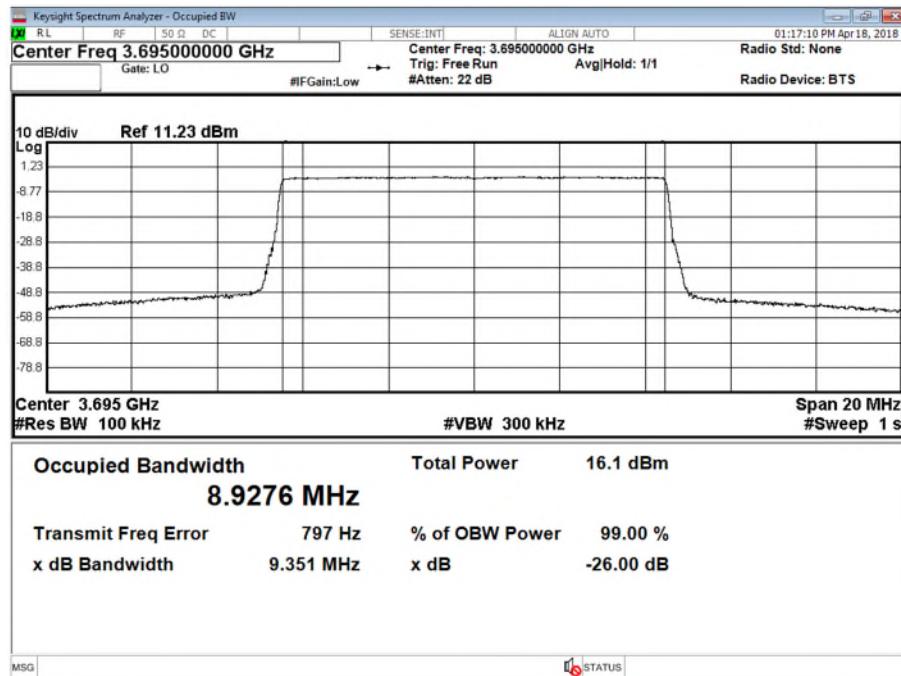
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



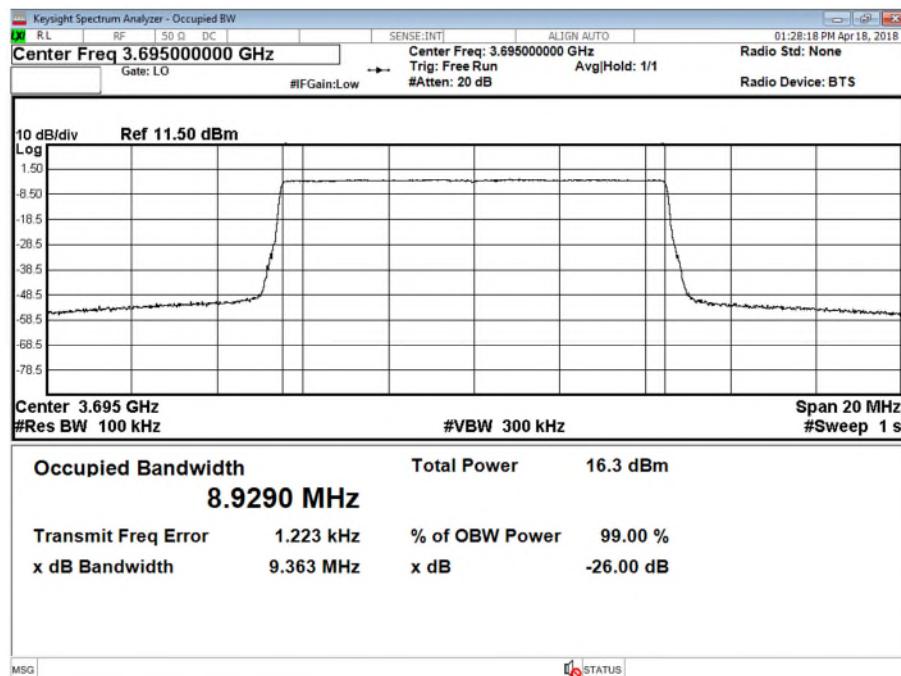


Product Service

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



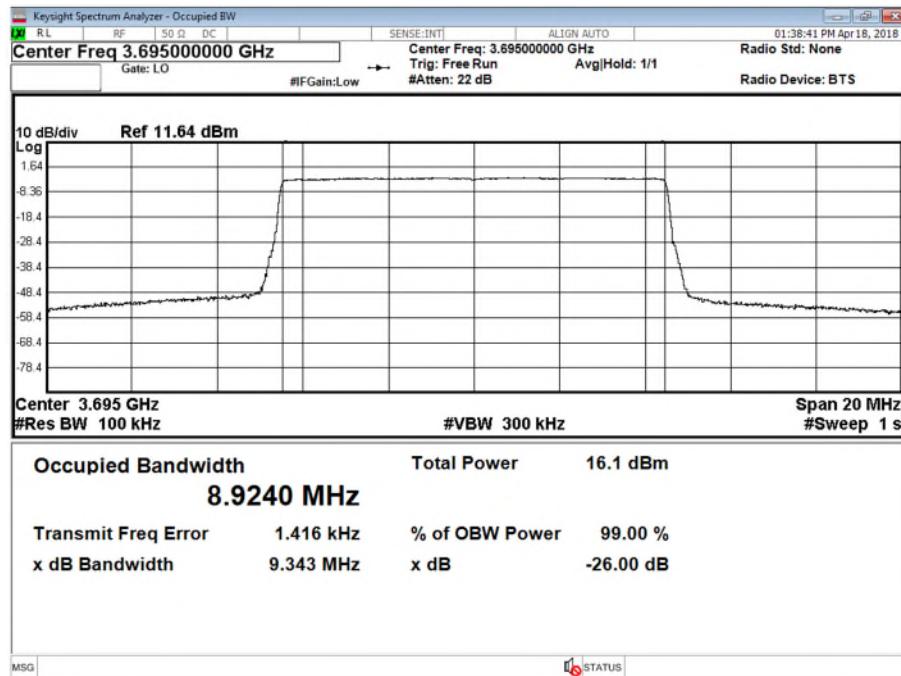
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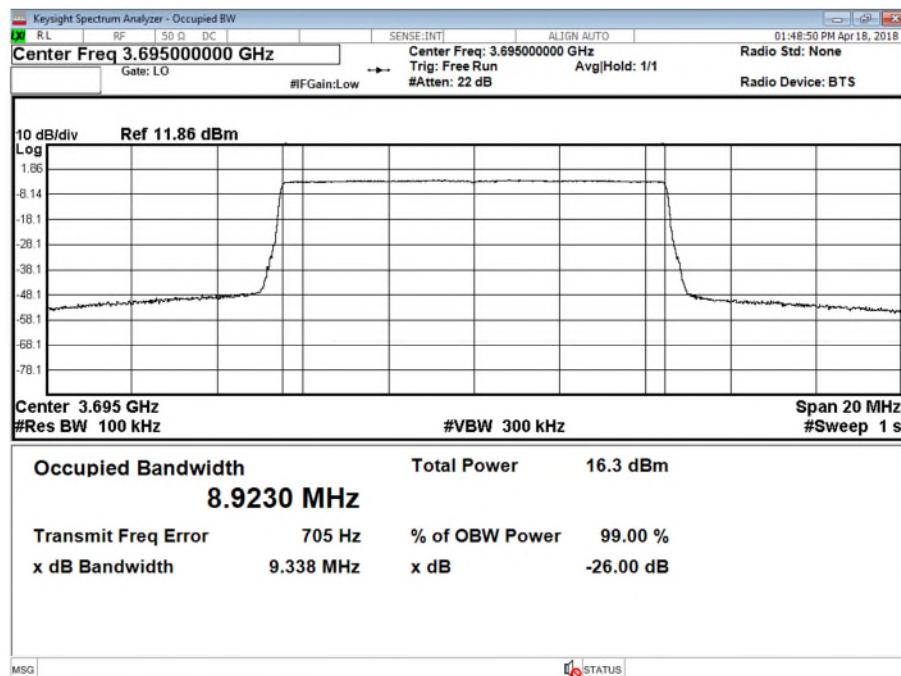


Product Service

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



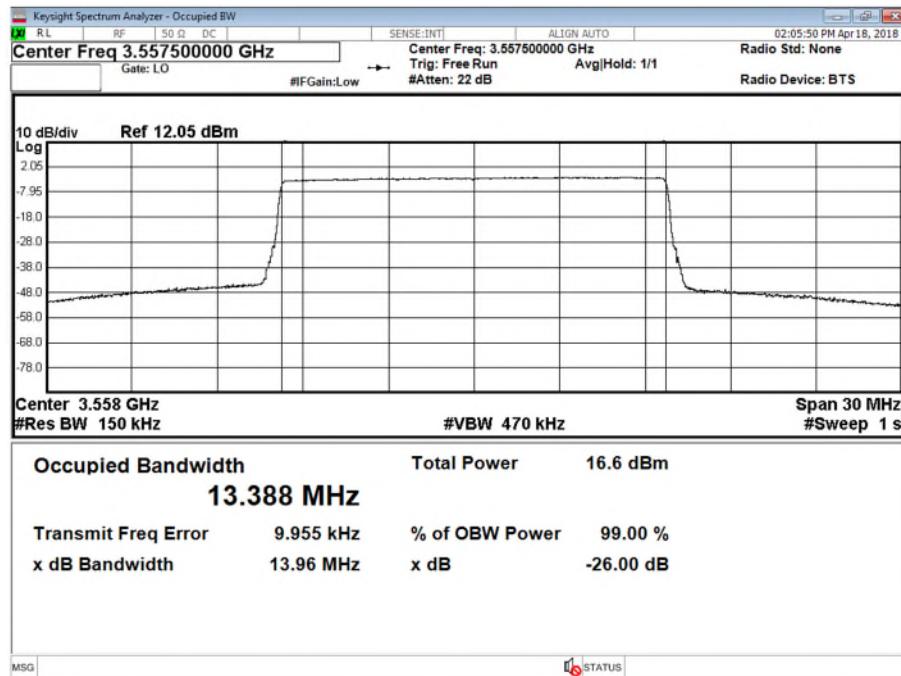
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



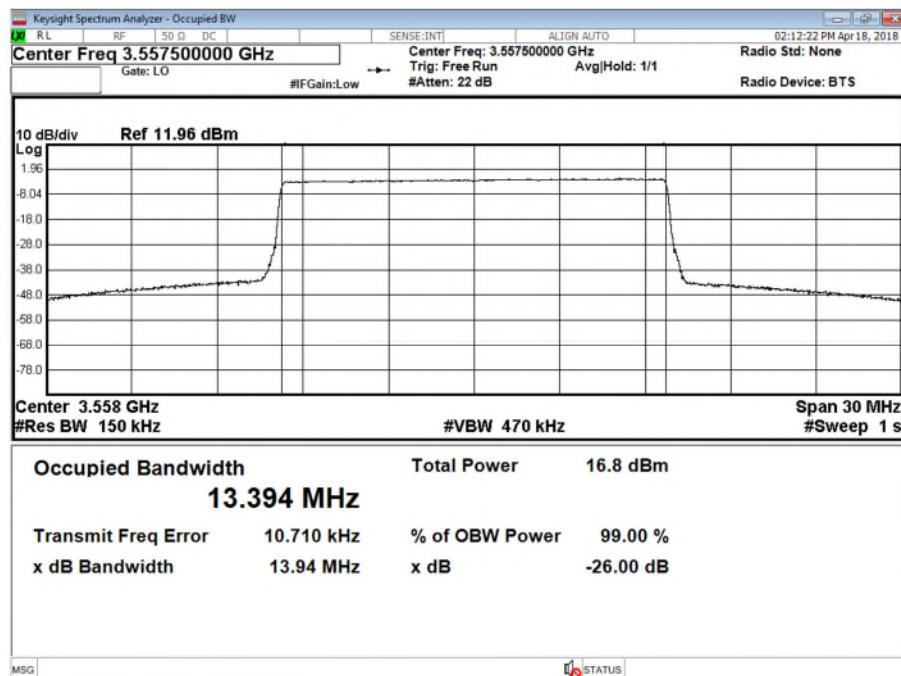


Product Service

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



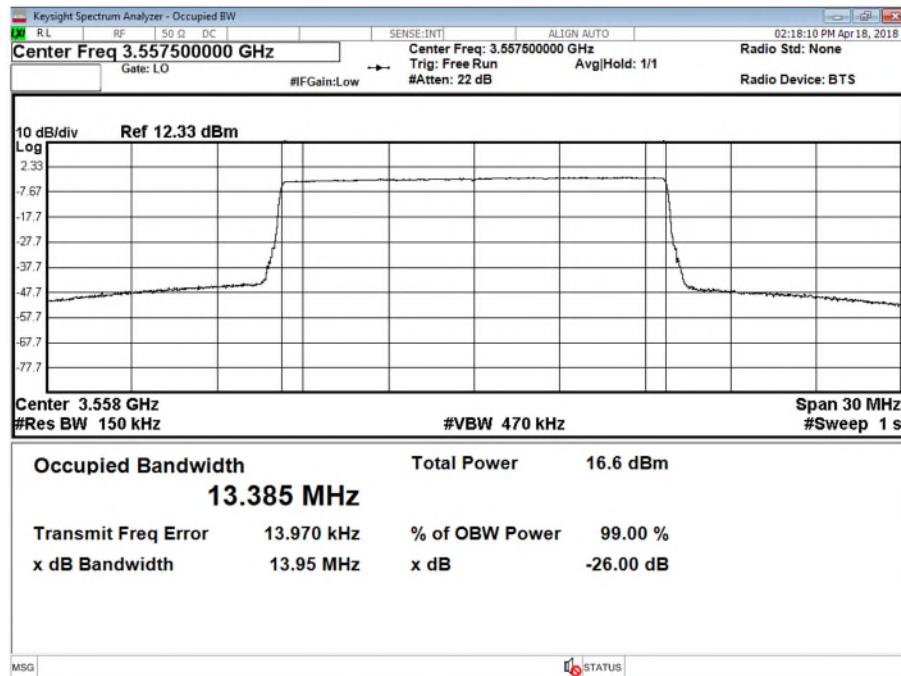
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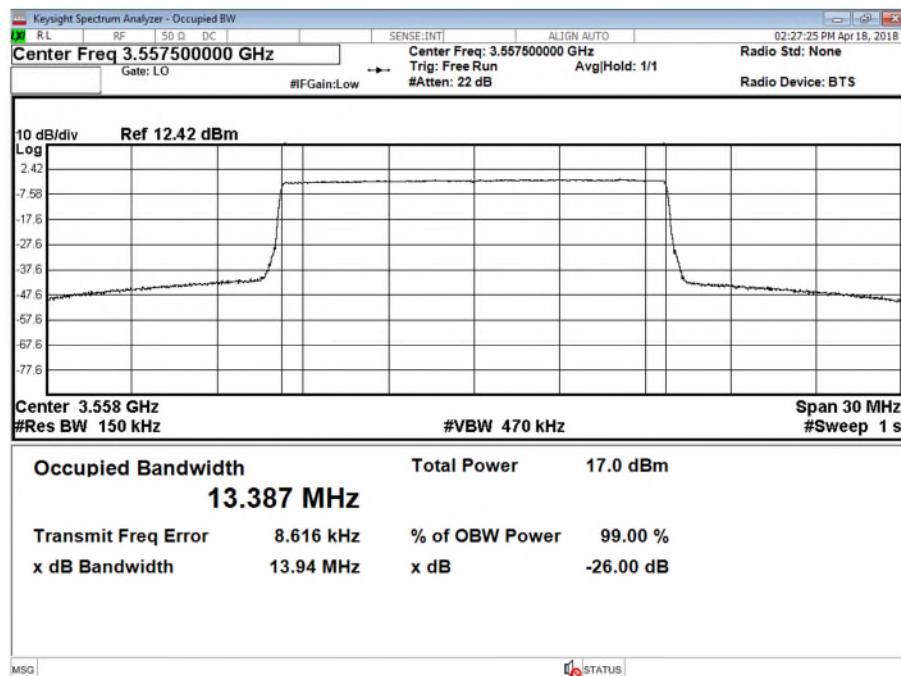


Product Service

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



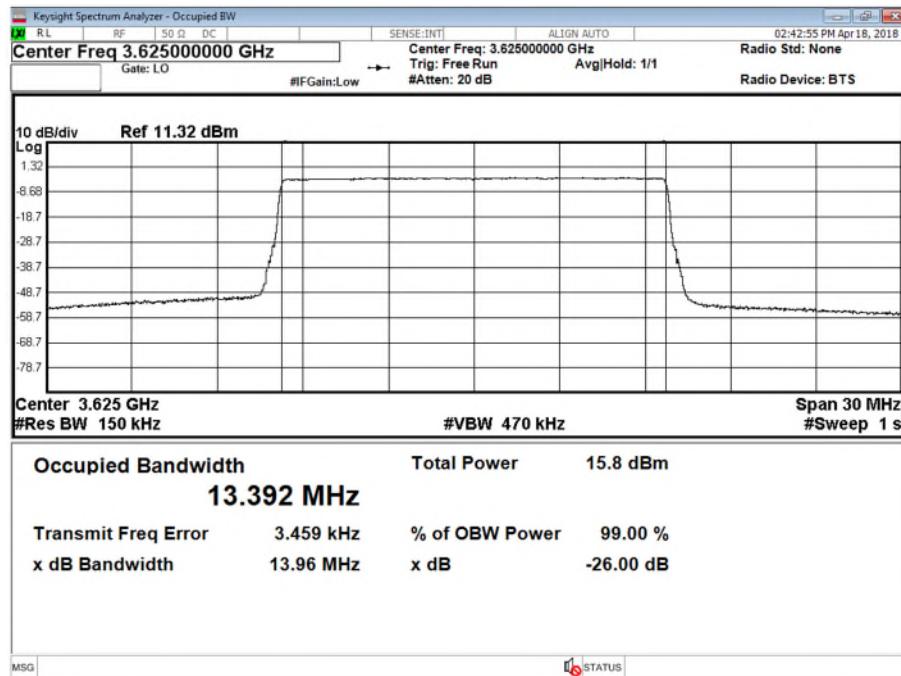
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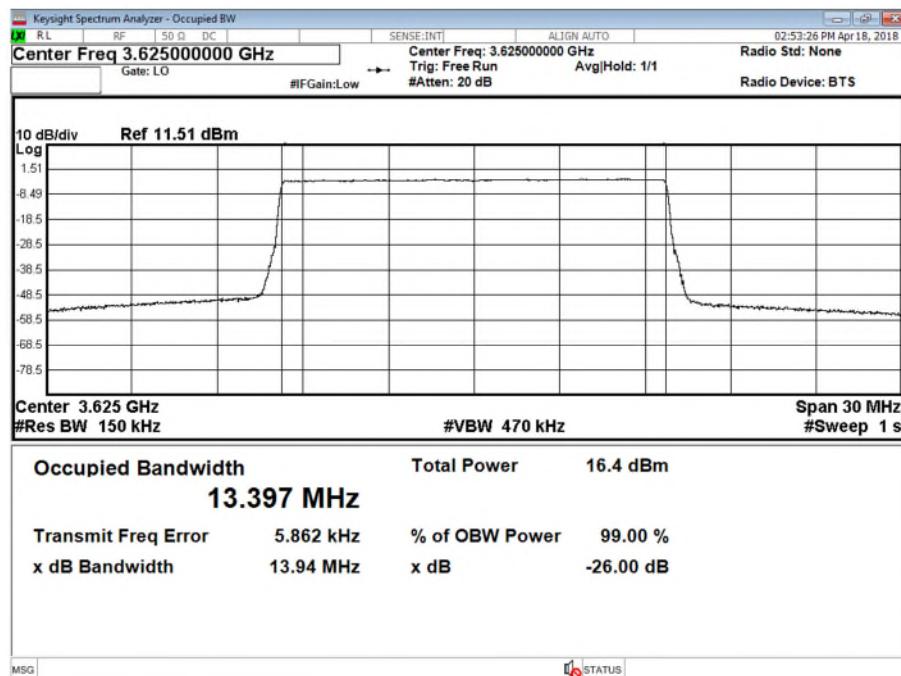


Product Service

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



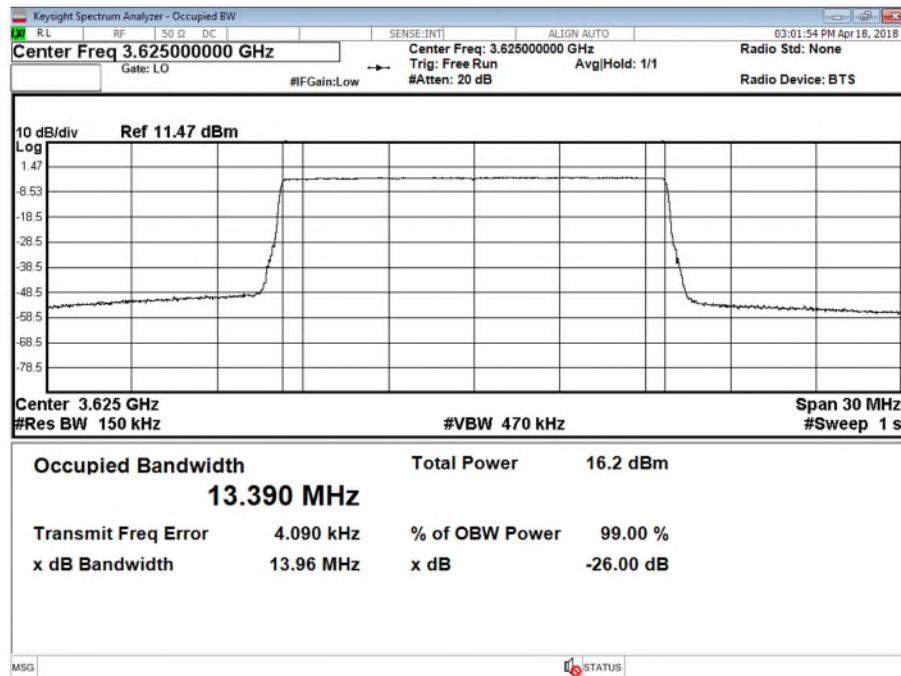
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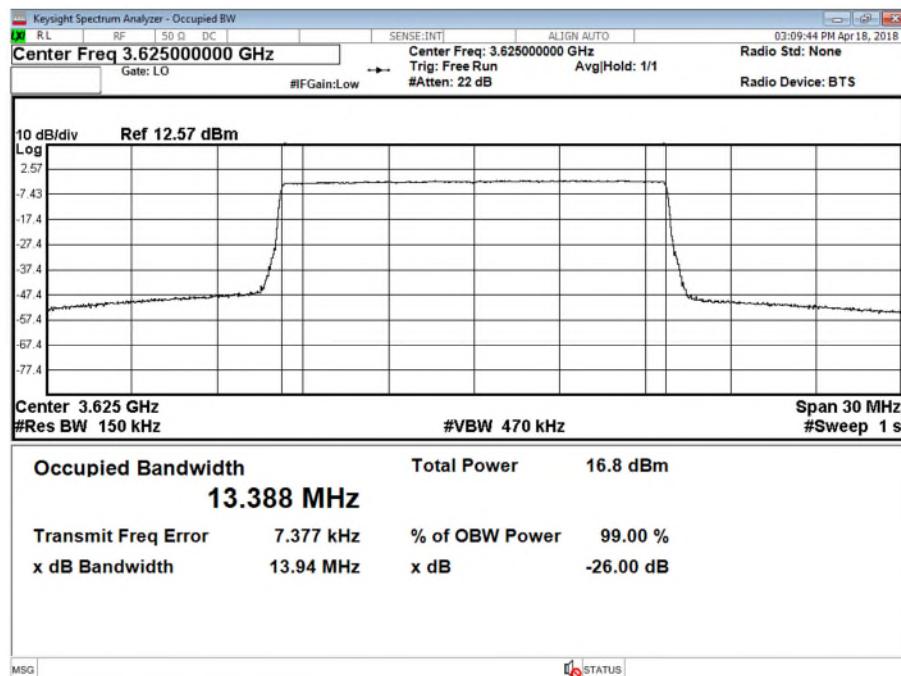


Product Service

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



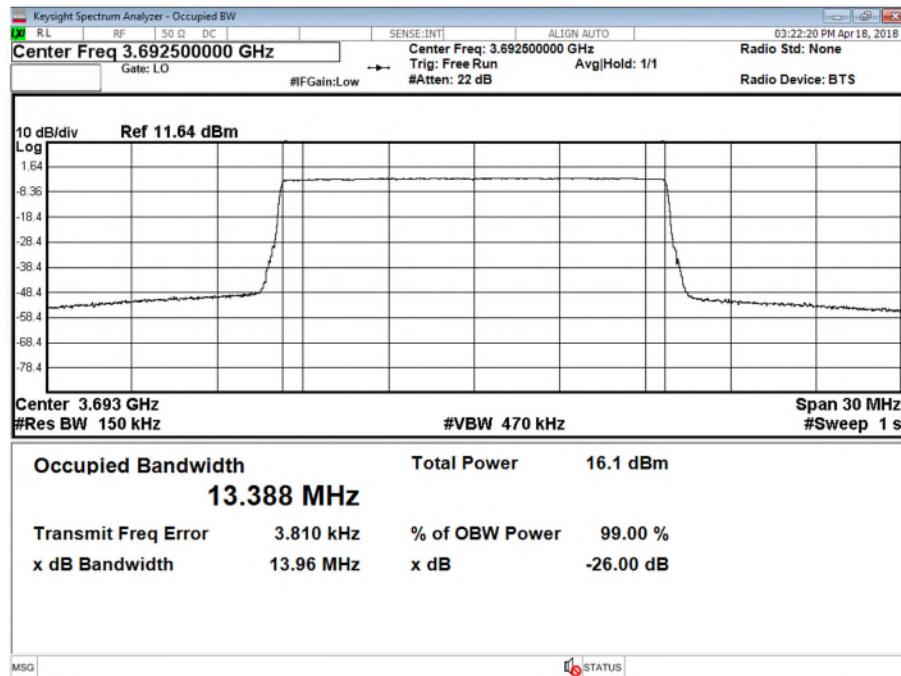
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



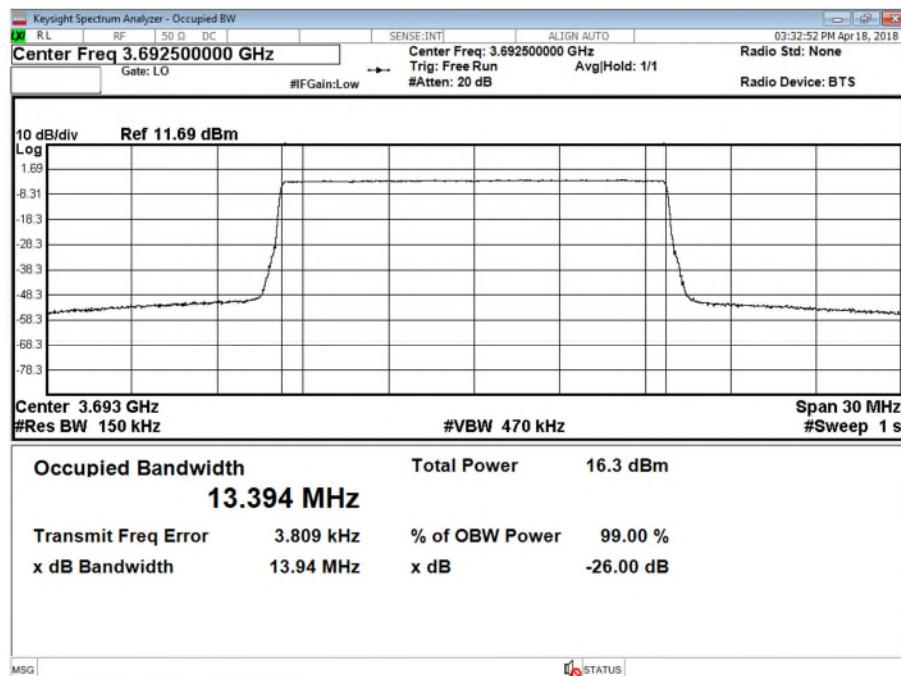


Product Service

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



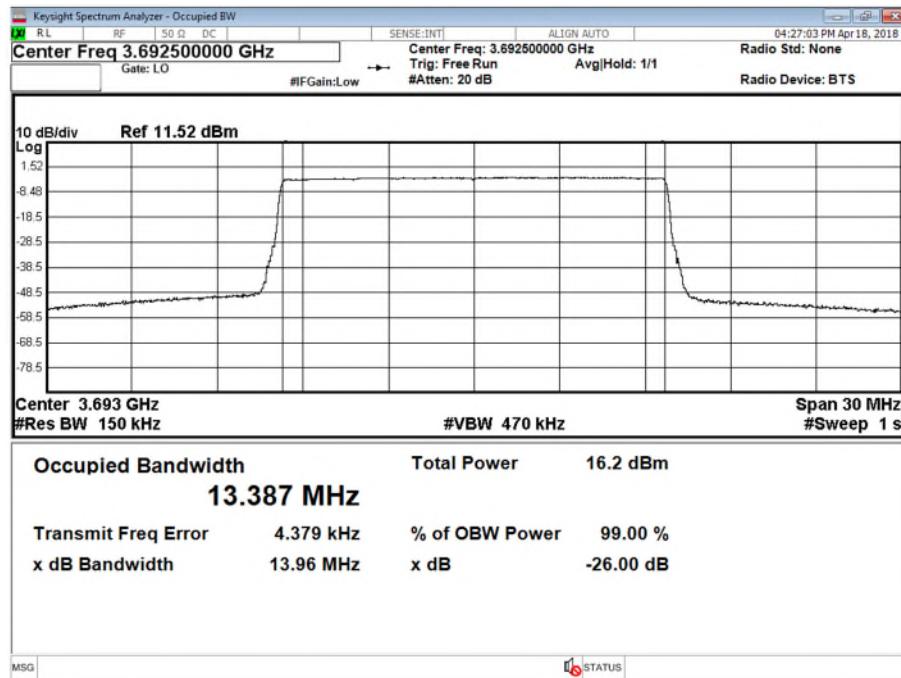
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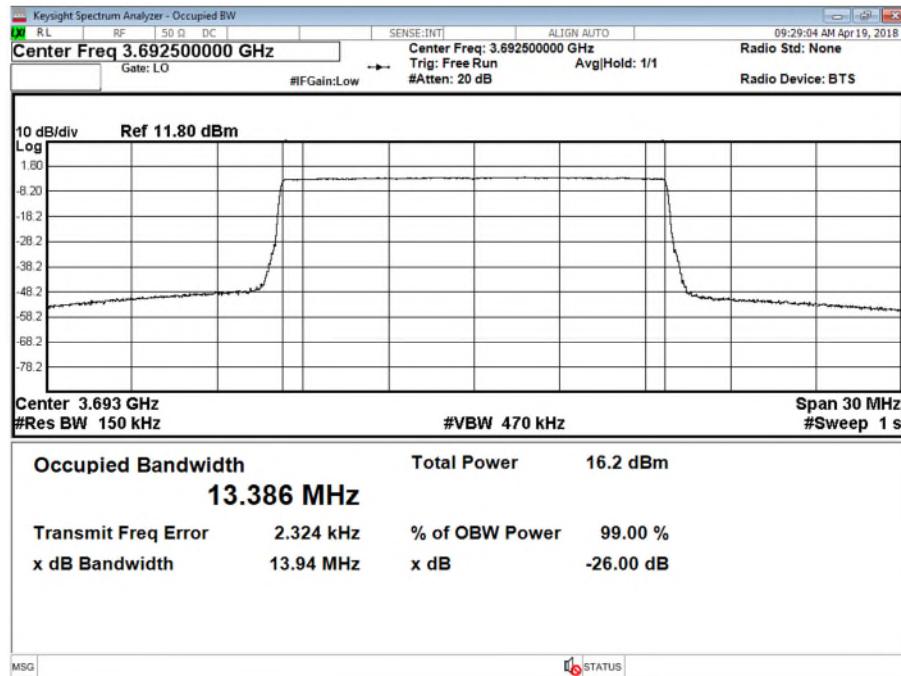


Product Service

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



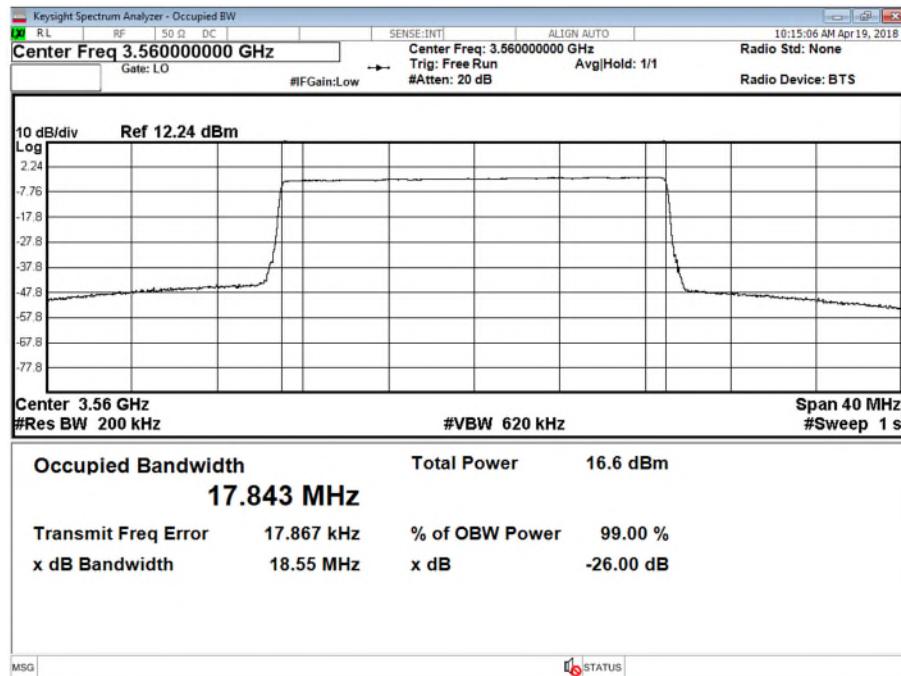
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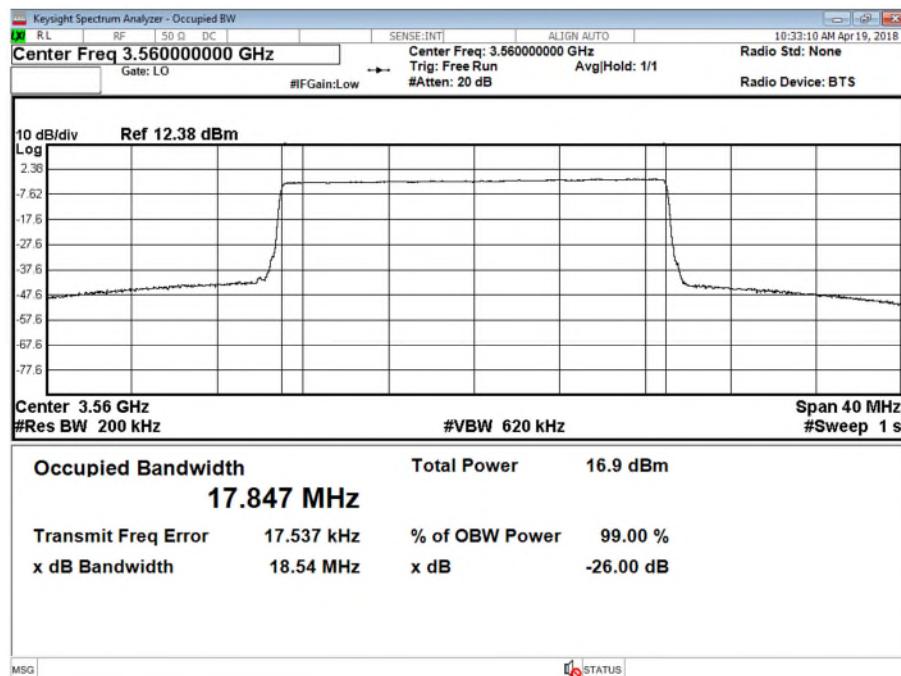


Product Service

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



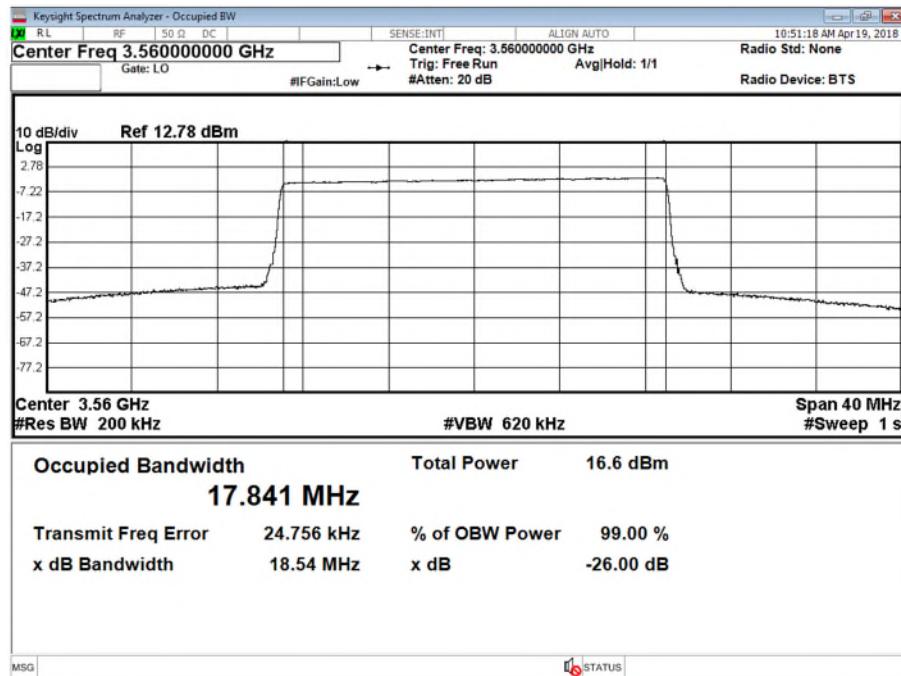
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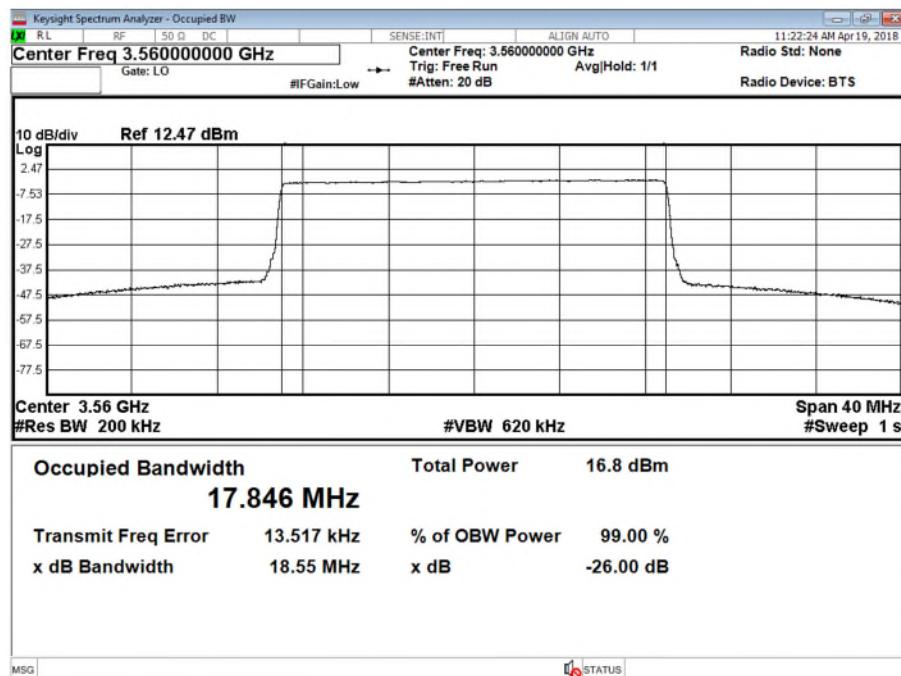


Product Service

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



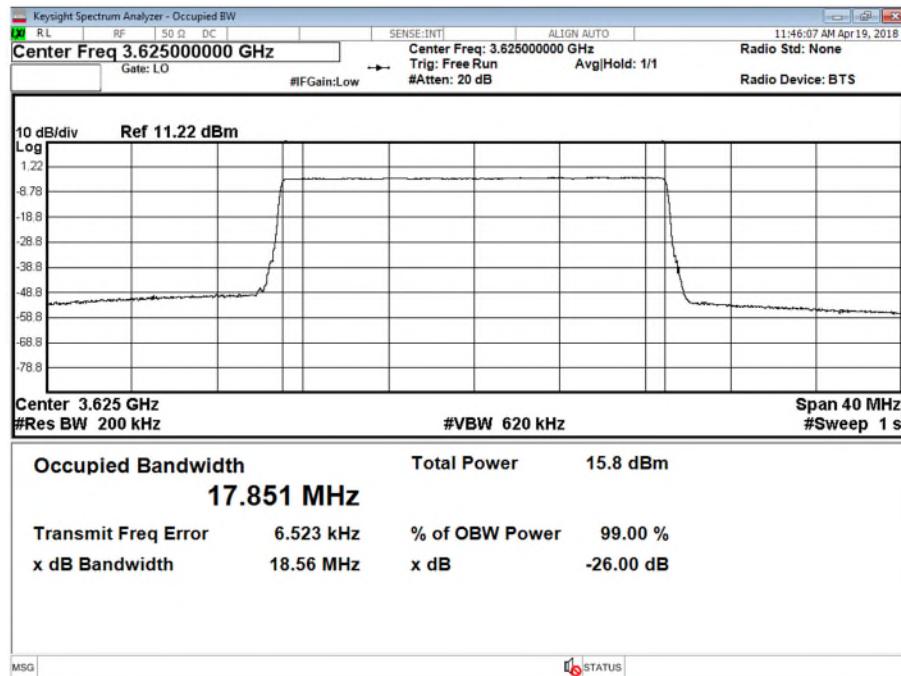
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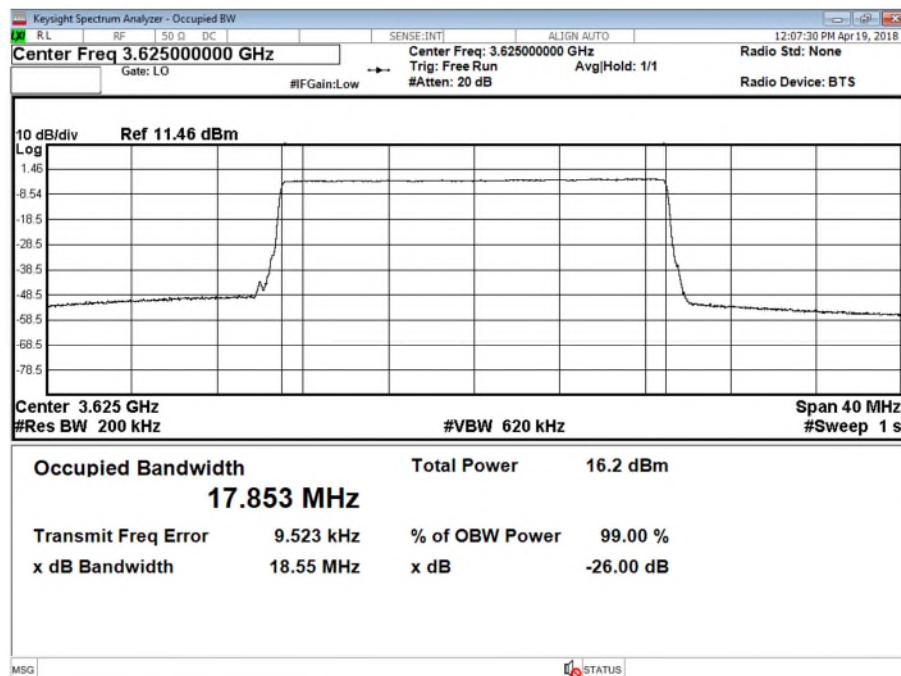


Product Service

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



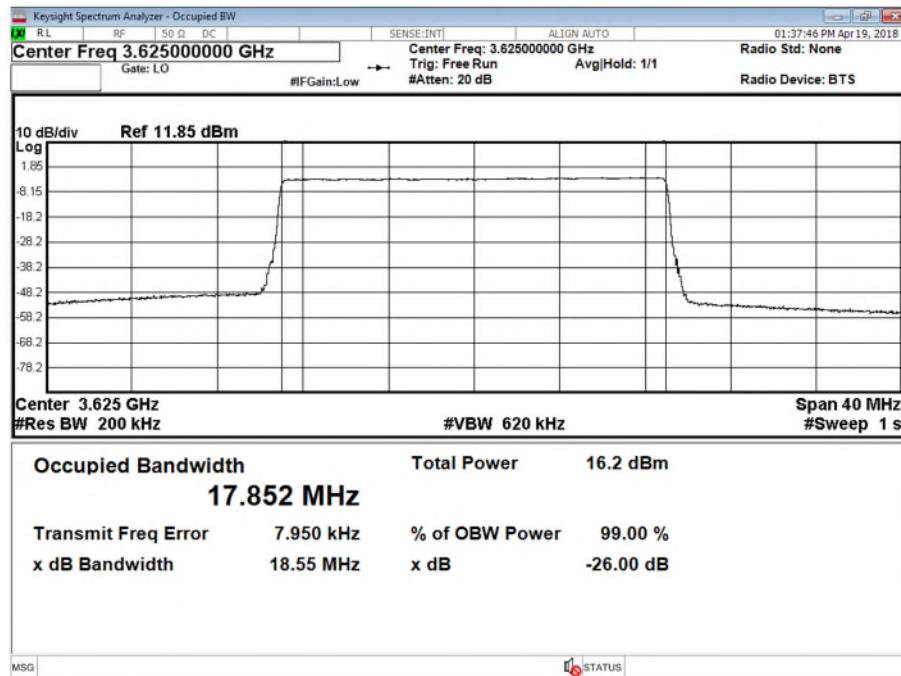
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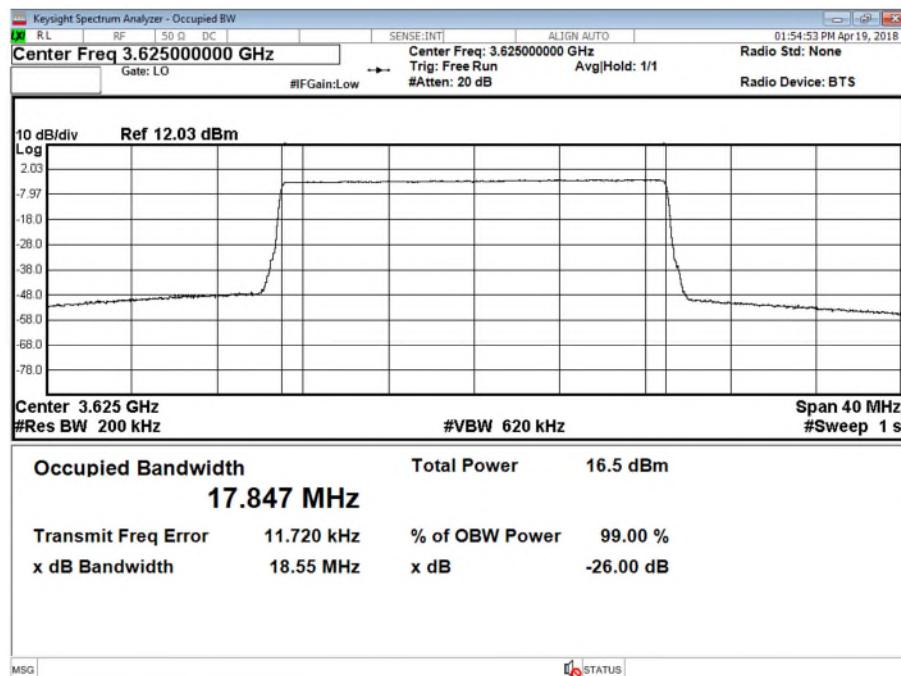


Product Service

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



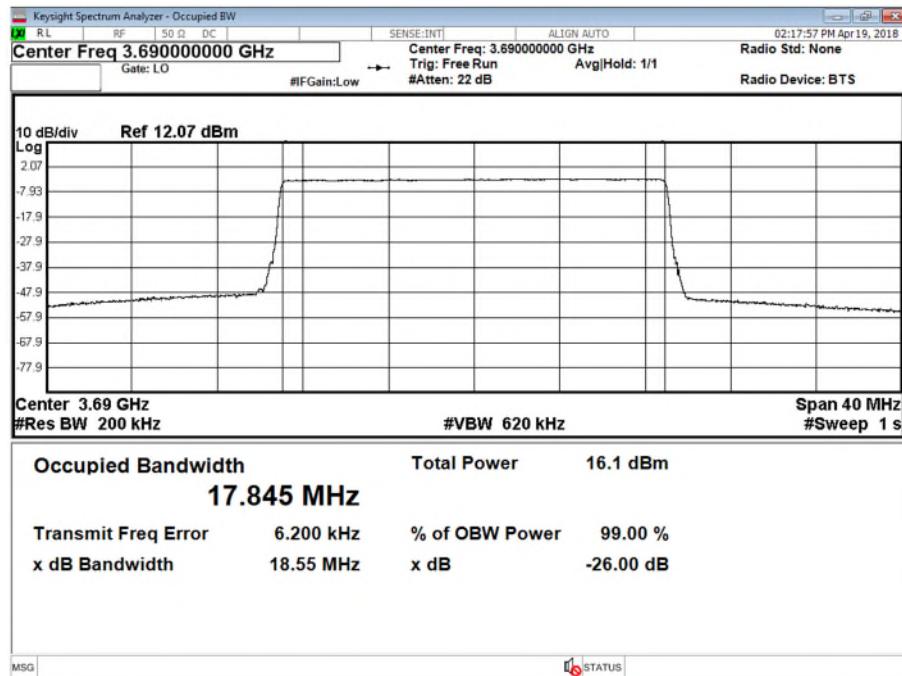
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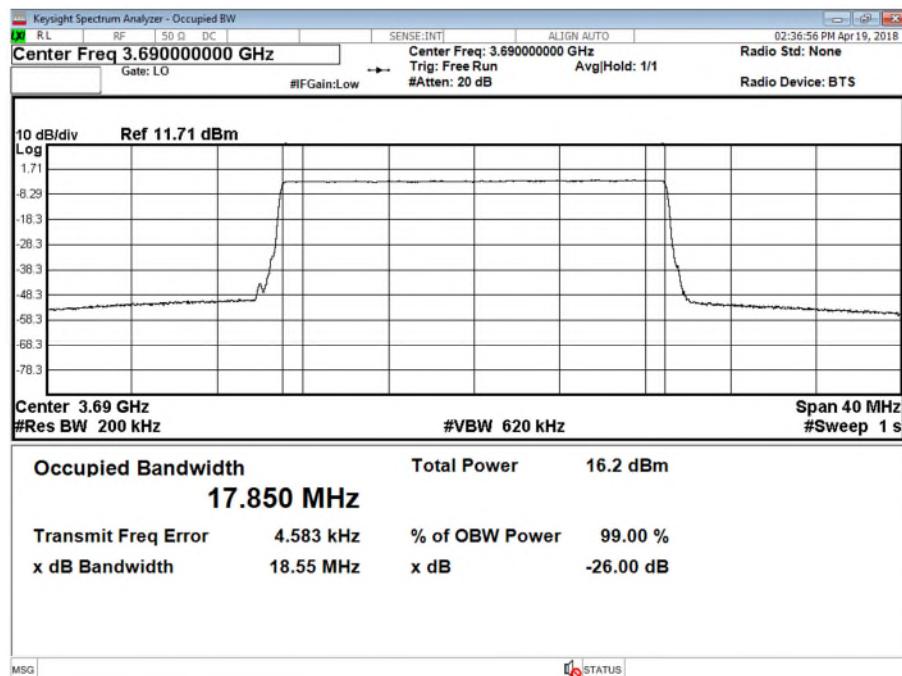


Product Service

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



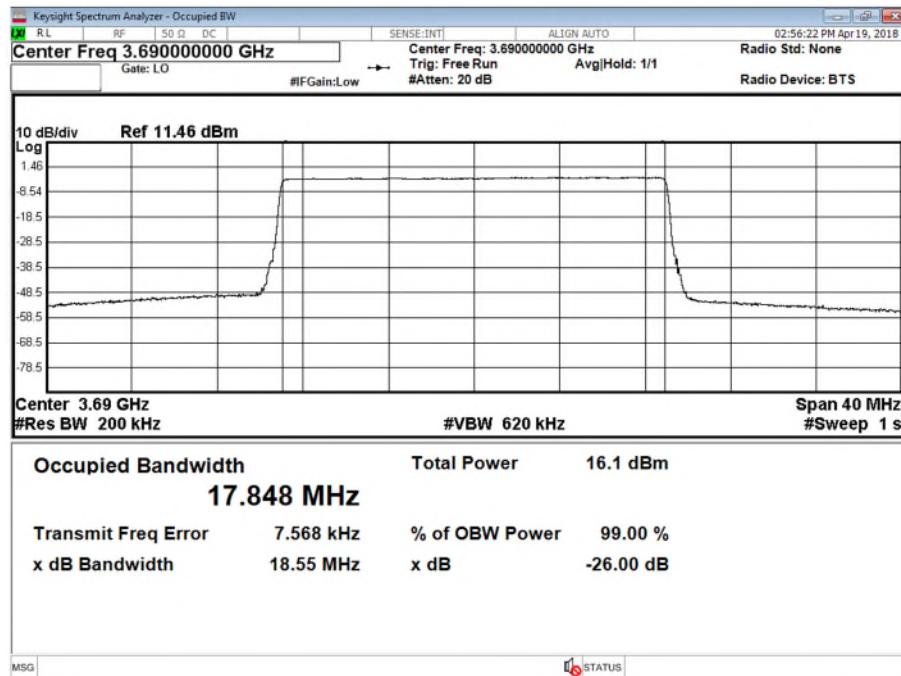
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



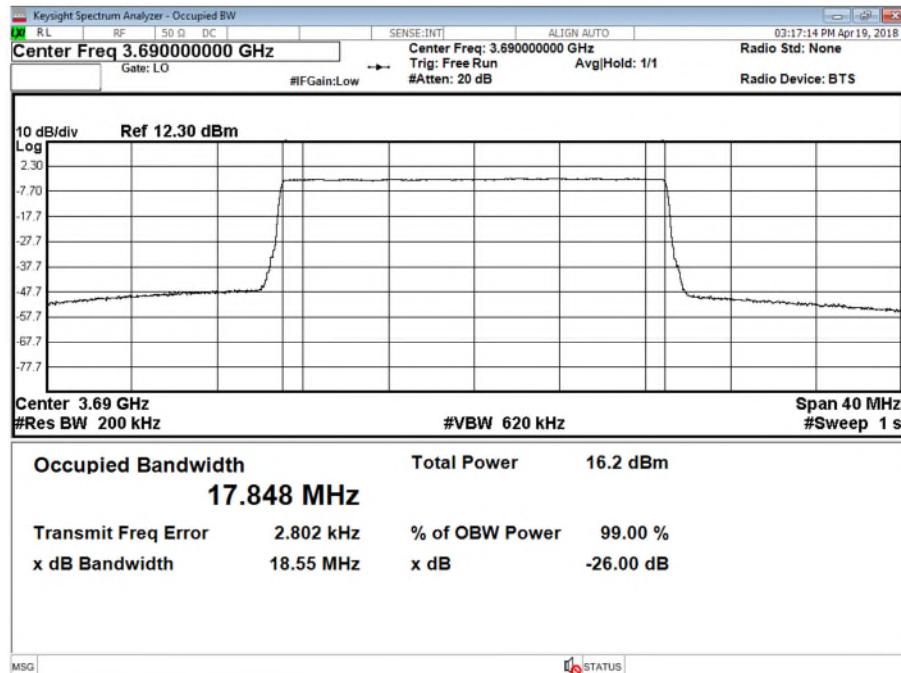


Product Service

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



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





Product Service

2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 96, Clause 96.41 (e)(3)

2.3.2 Date of Test and Modification State

19 and 23 April 2018 - Modification State 0

2.3.3 Test Equipment Used

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

2.3.4 Environmental Conditions

Ambient Temperature	23°C
Relative Humidity	35%

2.3.5 Test Method

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

The EUT was connected to a Spectrum Analyser via an attenuator and switching box. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser. The Spectrum Analyser RBW was adjusted to be at least 1% of the measured 26dB Bandwidth. Using an RMS detector, the frequency spectrum up to 1MHz away from the Band Edge was investigated. The B48 EUT has 2 radios, each with 2 transmit ports.

Therefore, the test limits used were calculated on a worst-case basis accounting for an effective 4 port MIMO configuration. Testing was performed on these ports with a test limit of $43+10\log(P) - 10\log(4) = -19$ dBm.

2.3.6 Test Results



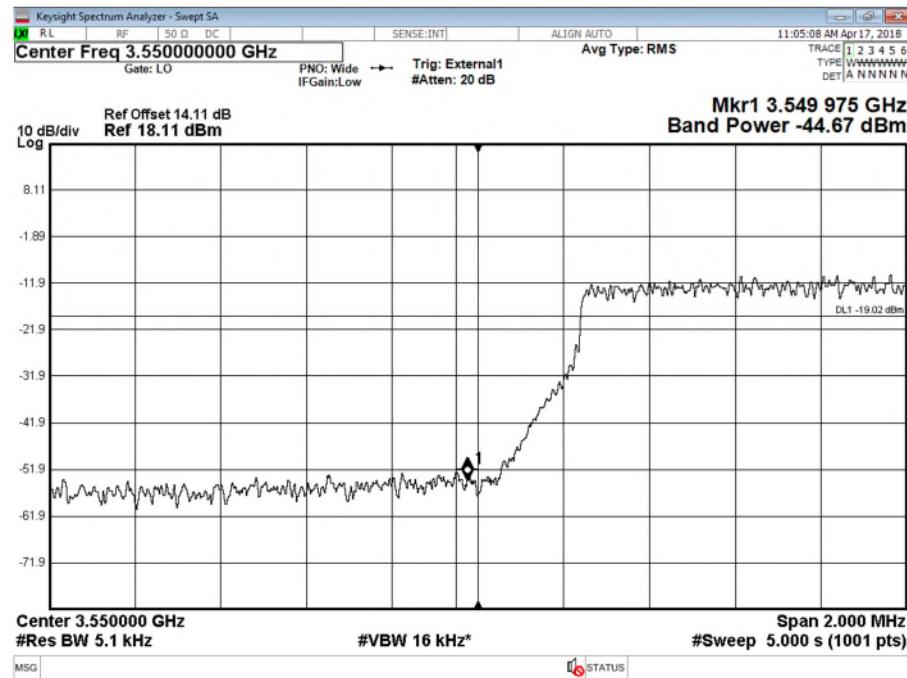
Product Service

Configuration A

Maximum Output Power 17 dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	5.0 MHz	3,552.5	3,697.5
B	QPSK	5.0 MHz	3,552.5	3,697.5
C	QPSK	5.0 MHz	3,552.5	3,697.5
D	QPSK	5.0 MHz	3,552.5	3,697.5
A	QPSK	10.0 MHz	3,555.0	3,695.0
B	QPSK	10.0 MHz	3,555.0	3,695.0
C	QPSK	10.0 MHz	3,555.0	3,695.0
D	QPSK	10.0 MHz	3,555.0	3,695.0
A	QPSK	15.0 MHz	3,557.5	3,692.5
B	QPSK	15.0 MHz	3,557.5	3,692.5
C	QPSK	15.0 MHz	3,557.5	3,692.5
D	QPSK	15.0 MHz	3,557.5	3,692.5
A	QPSK	20.0 MHz	3,560.0	3,690.0
B	QPSK	20.0 MHz	3,560.0	3,690.0
C	QPSK	20.0 MHz	3,560.0	3,690.0
D	QPSK	20.0 MHz	3,560.0	3,690.0

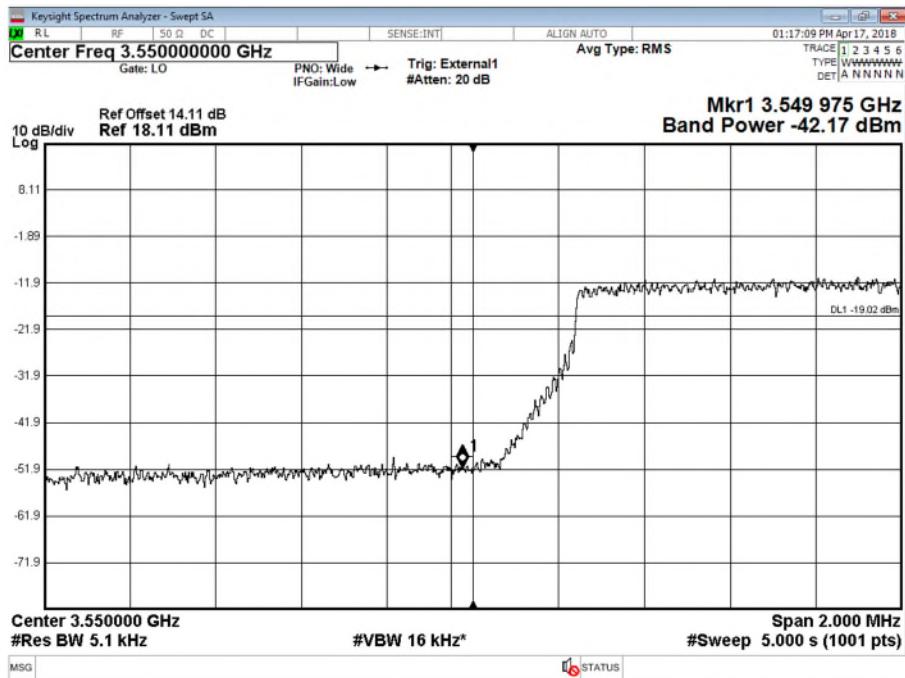
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



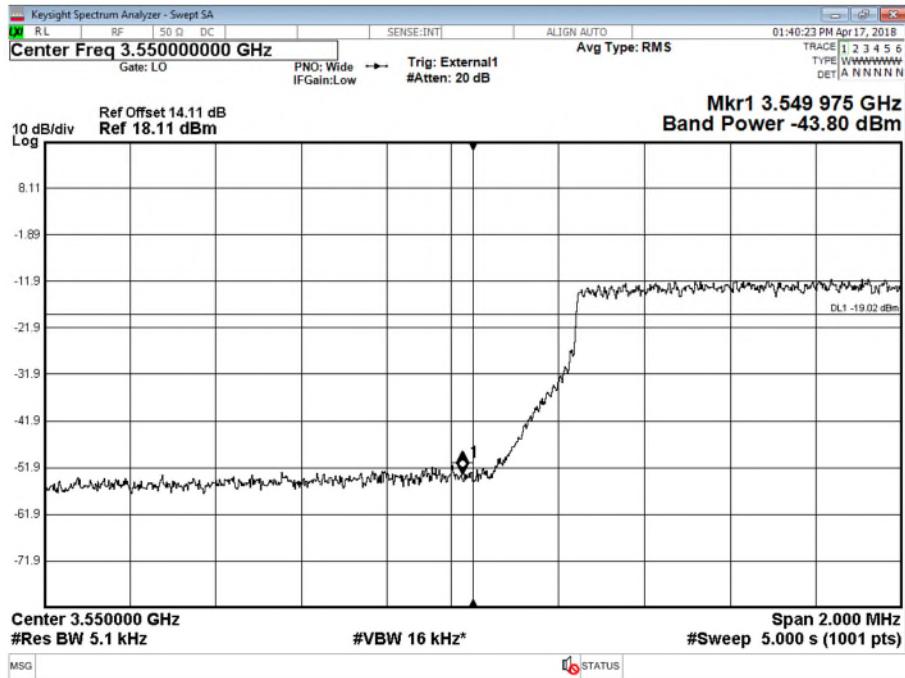


Product Service

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



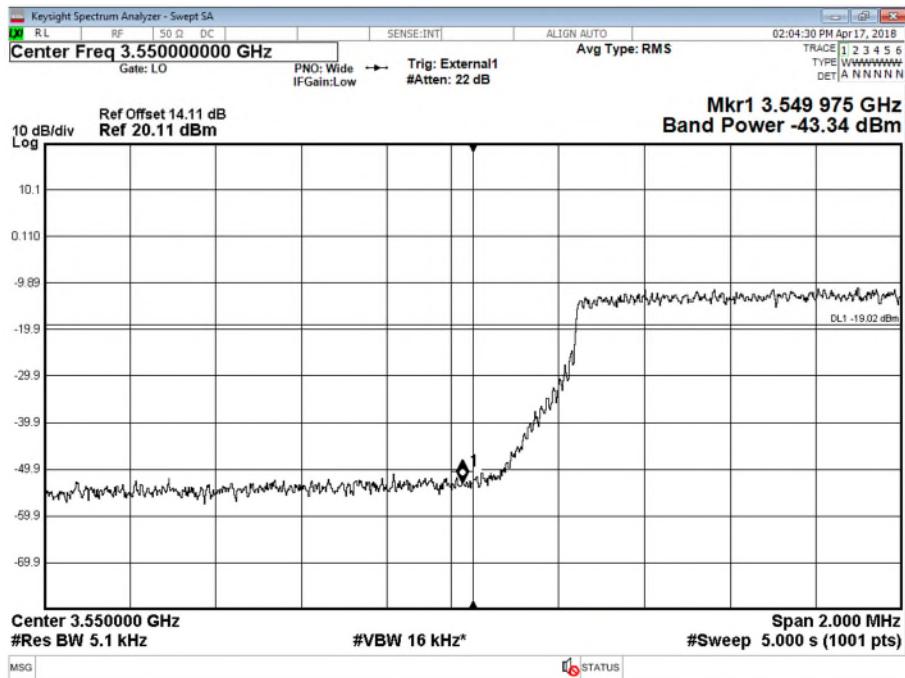
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



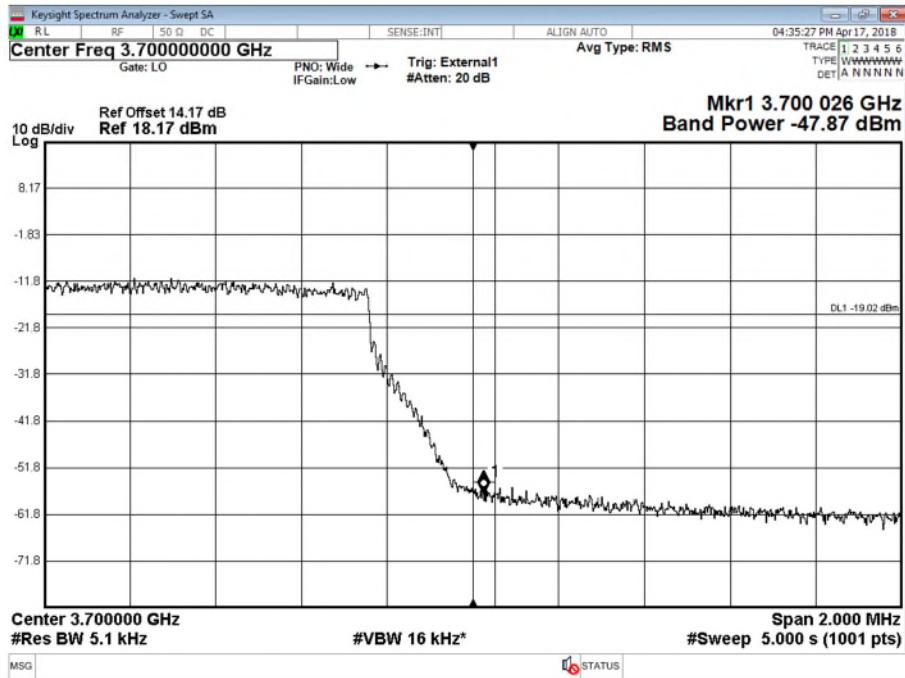


Product Service

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



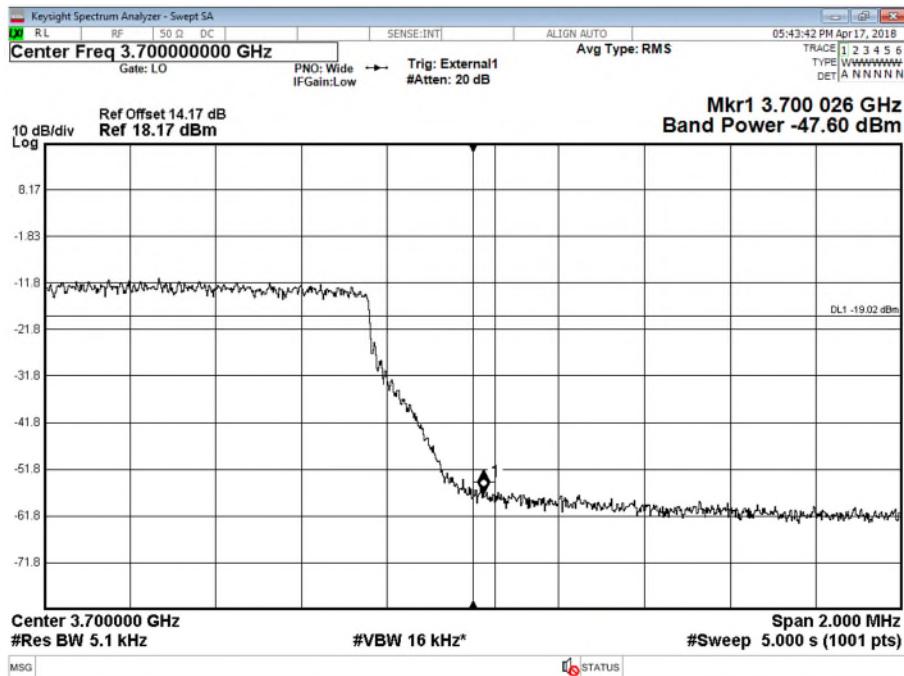
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



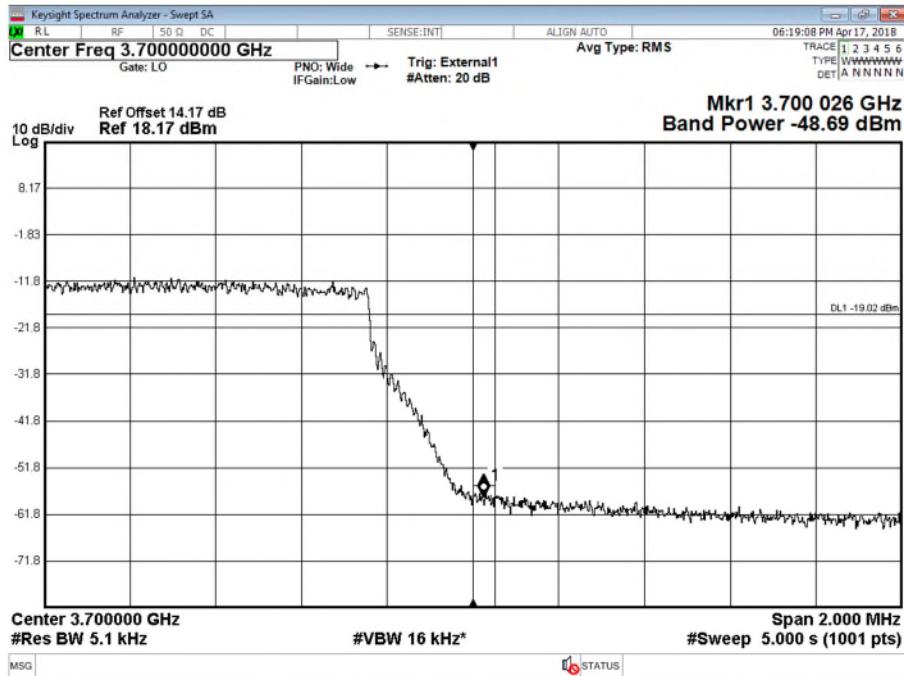


Product Service

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



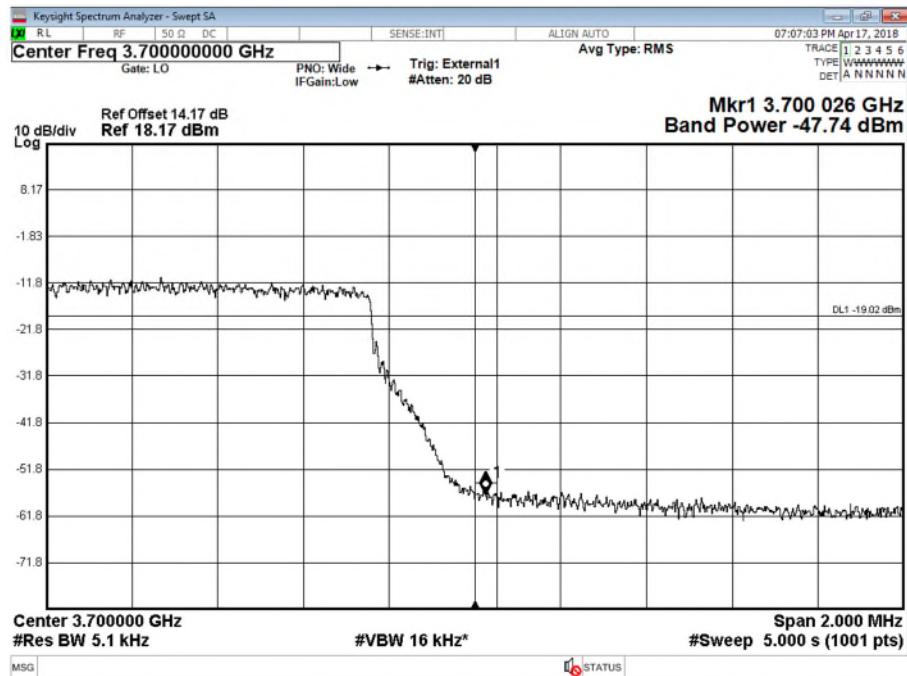
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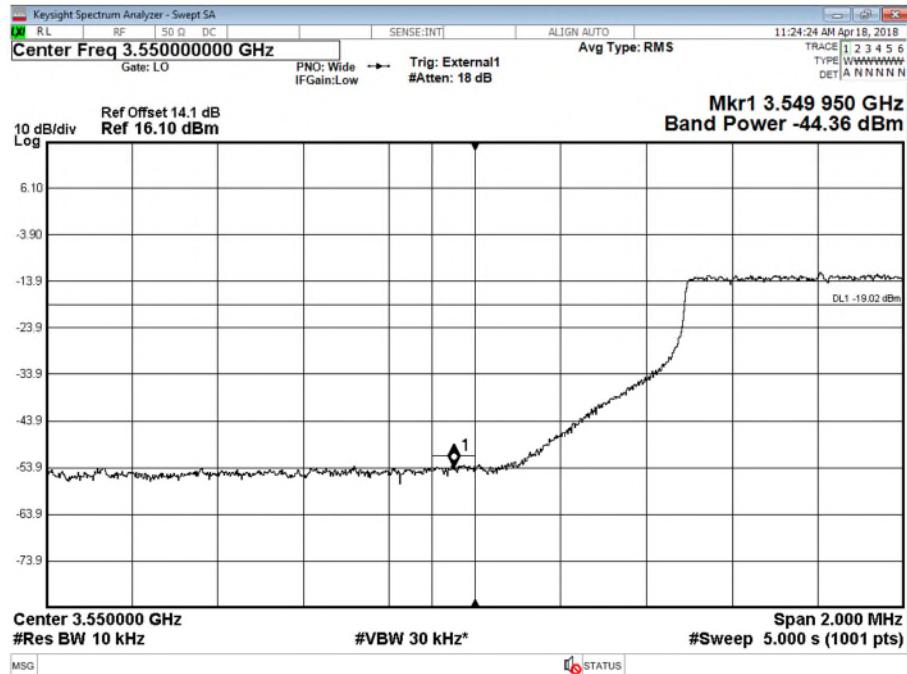


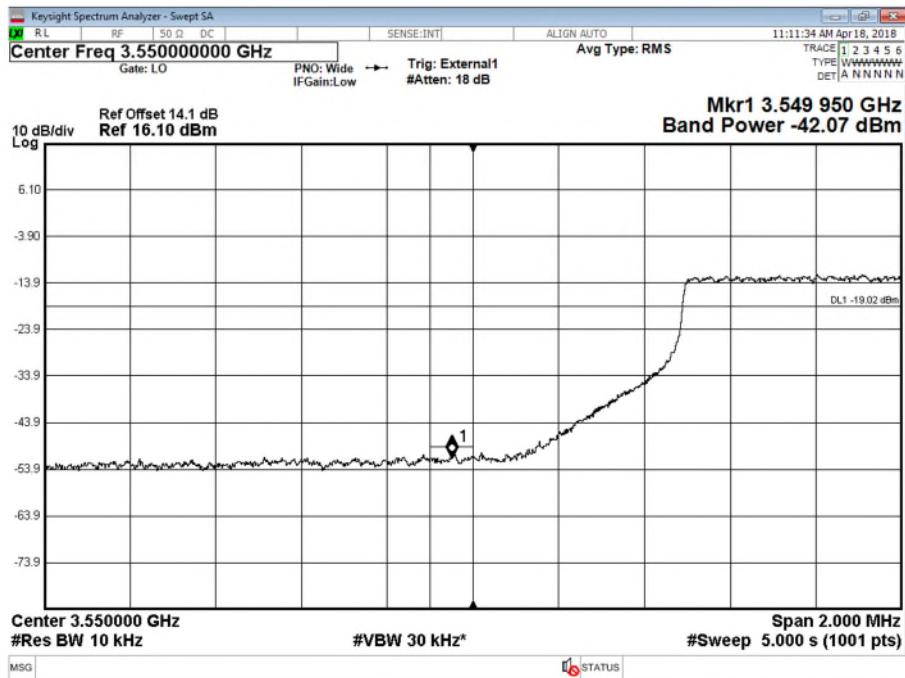
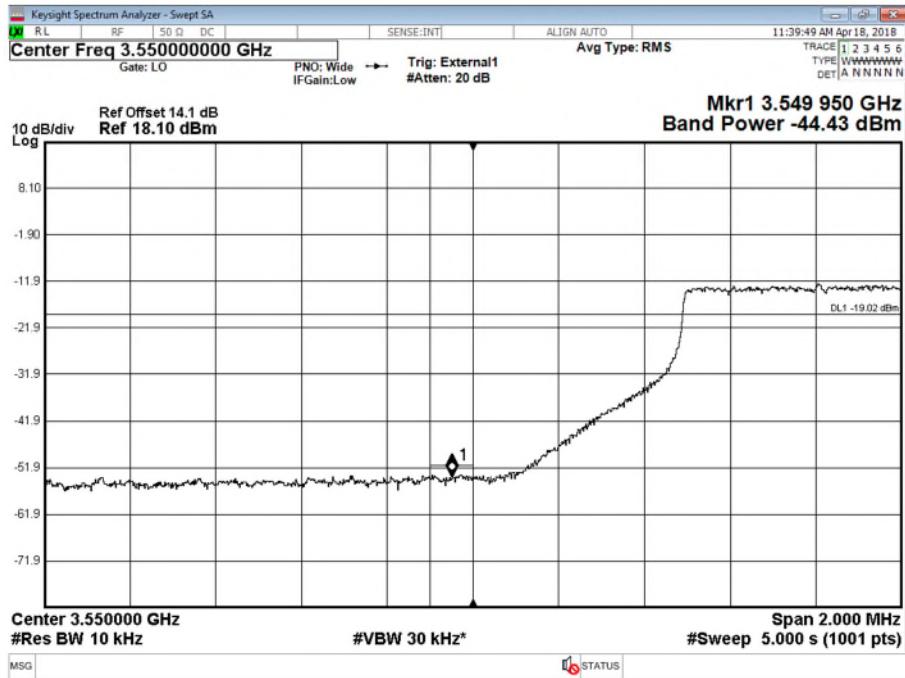
Product Service

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

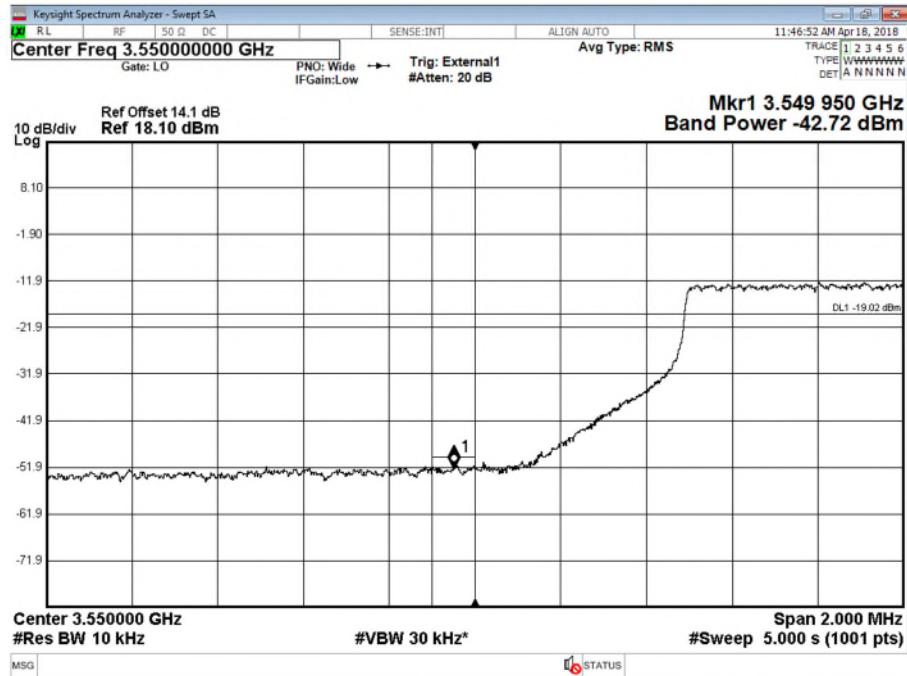


Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B

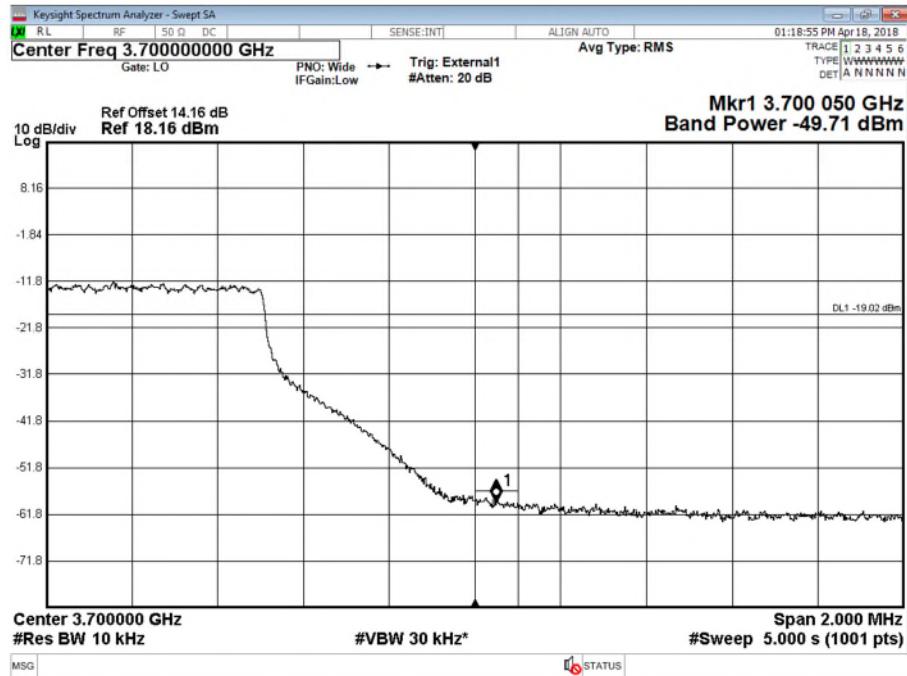


Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B

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


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



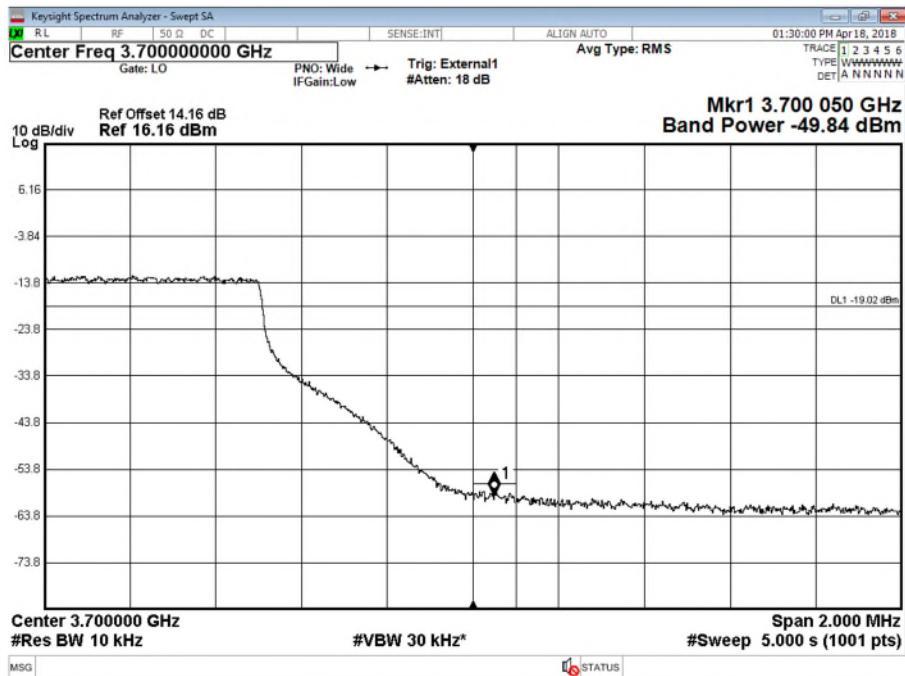
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T





Product Service

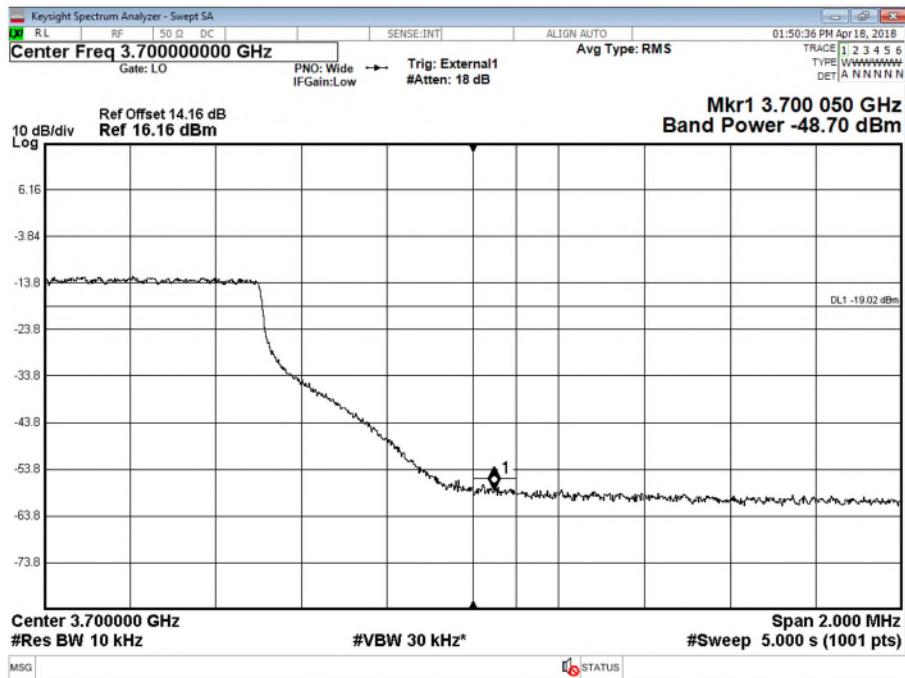
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



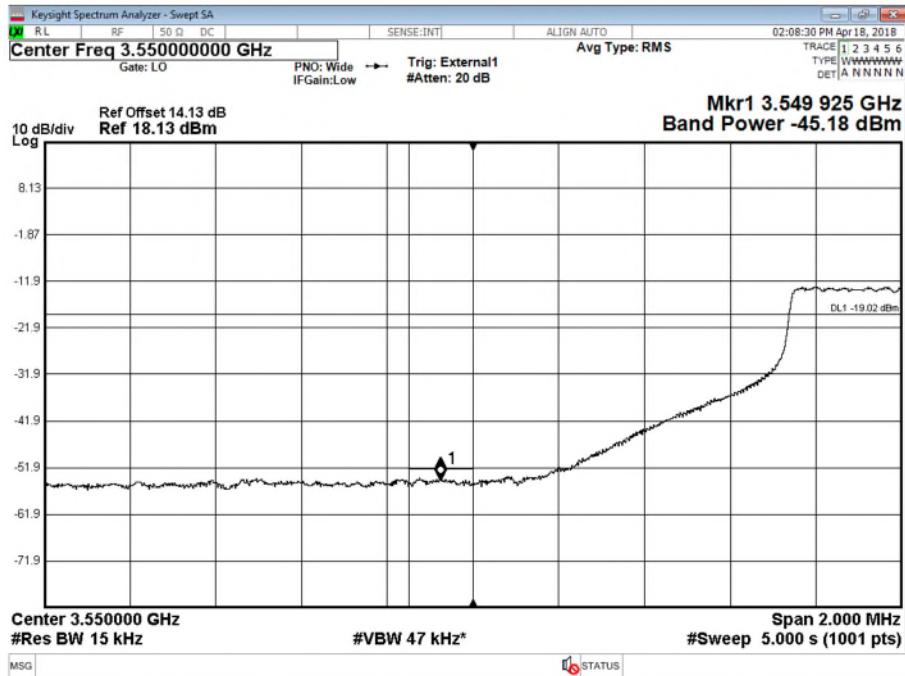
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T

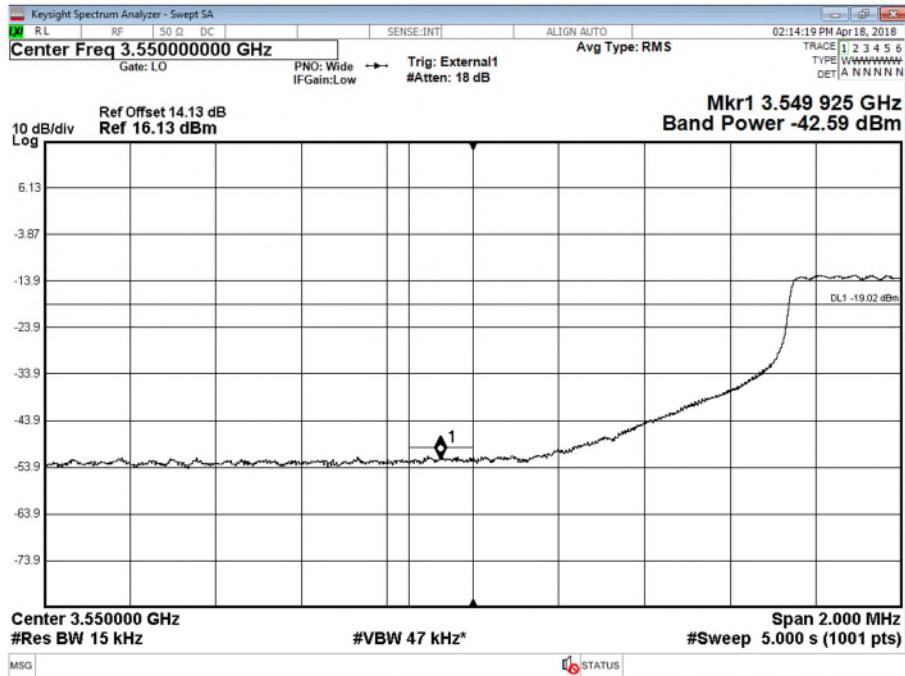
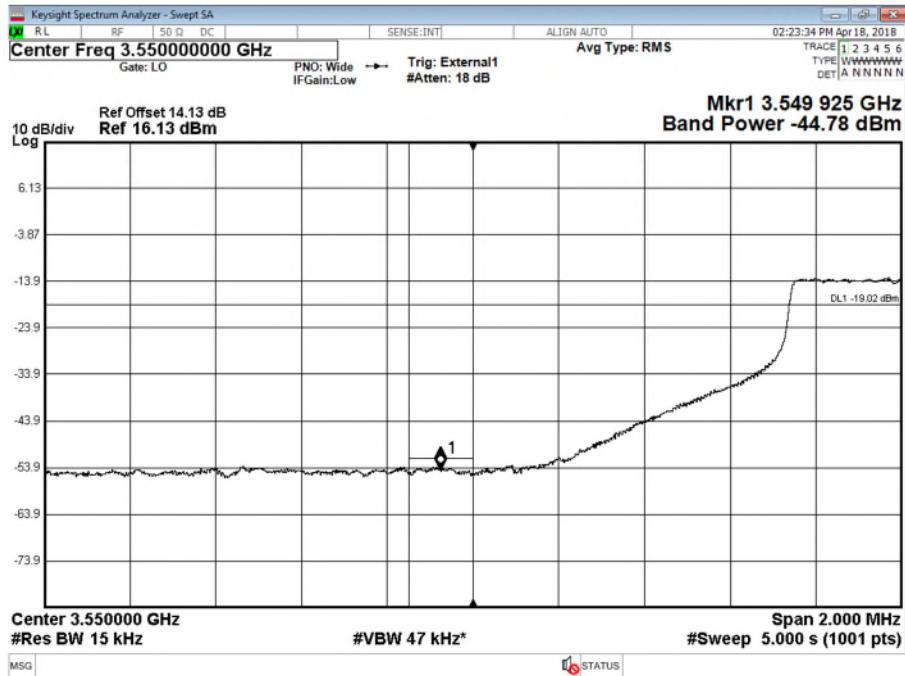


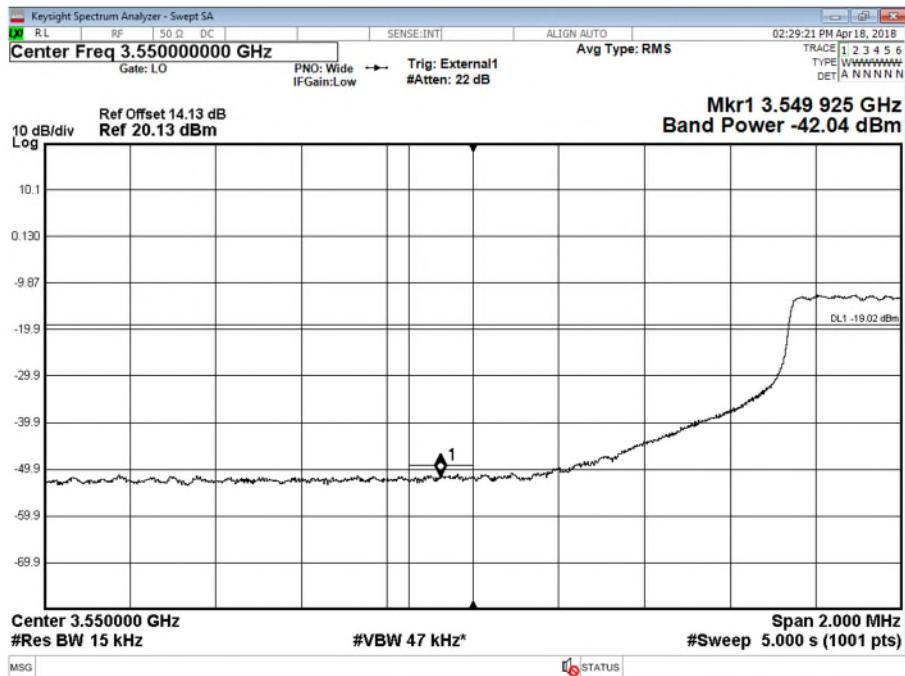
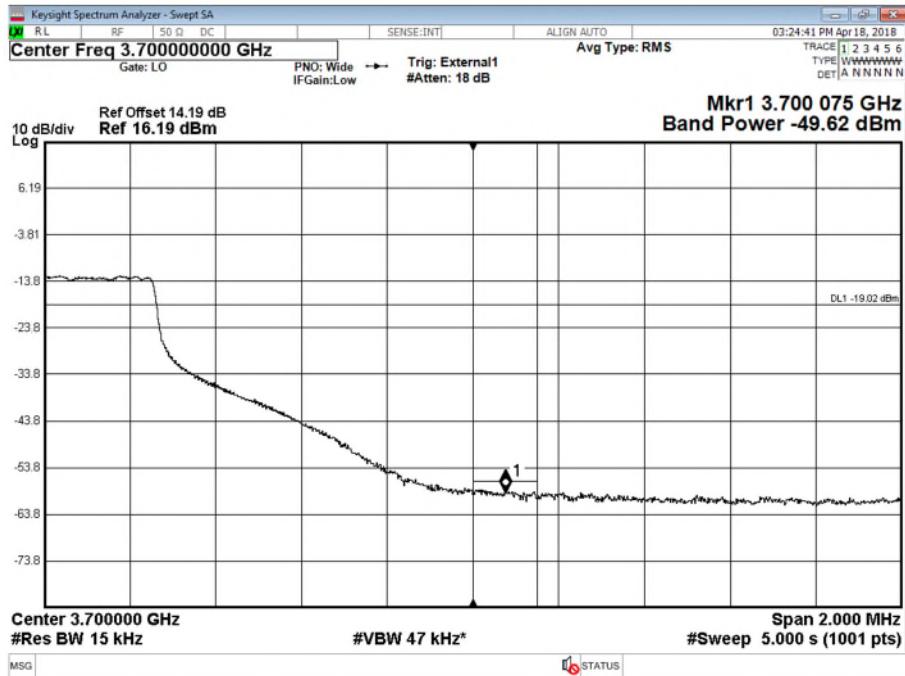
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



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



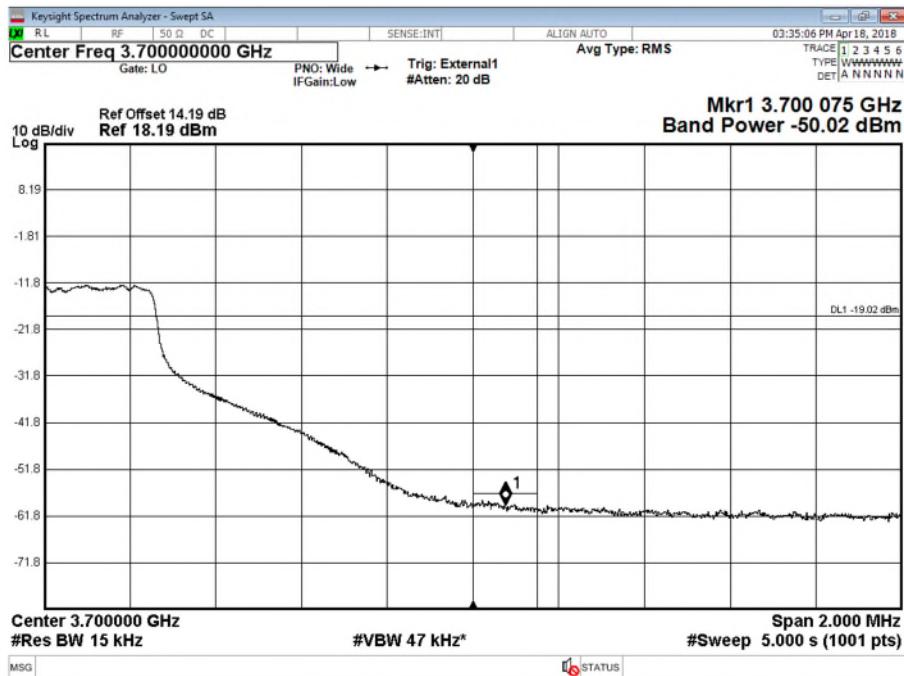
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B

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


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

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




Product Service

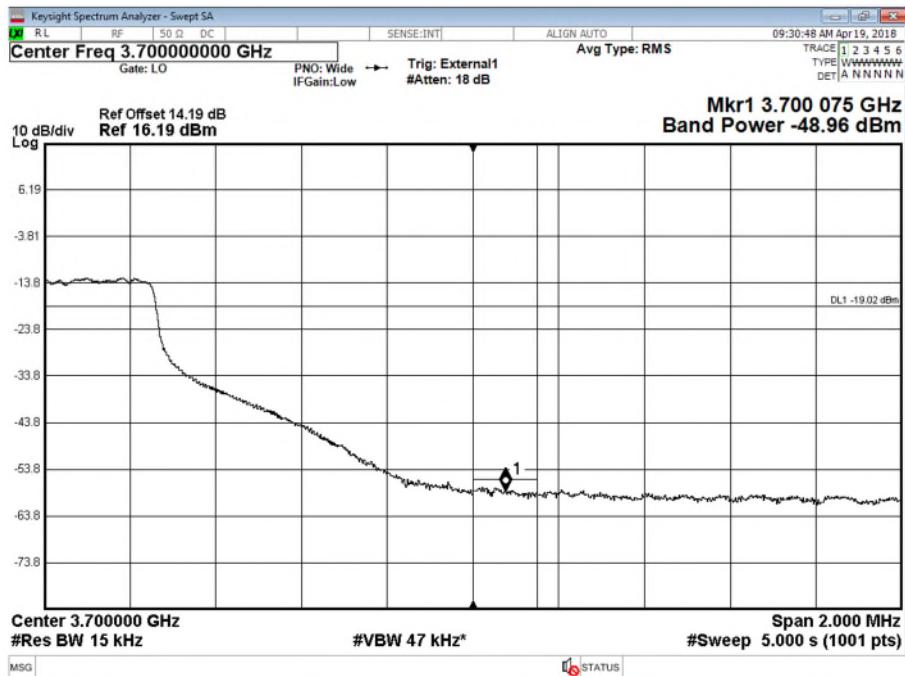
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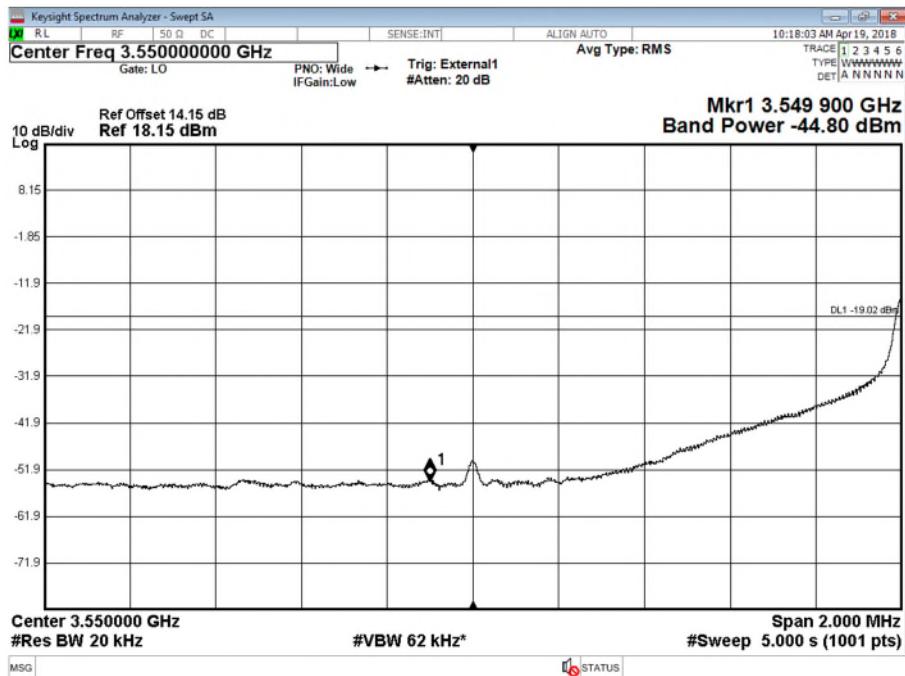
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



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



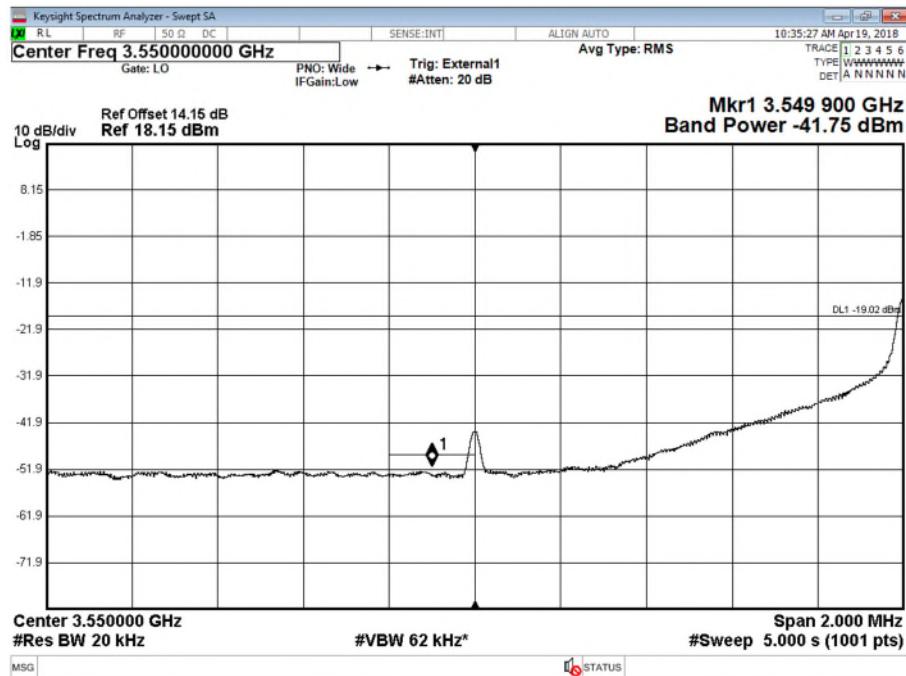
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



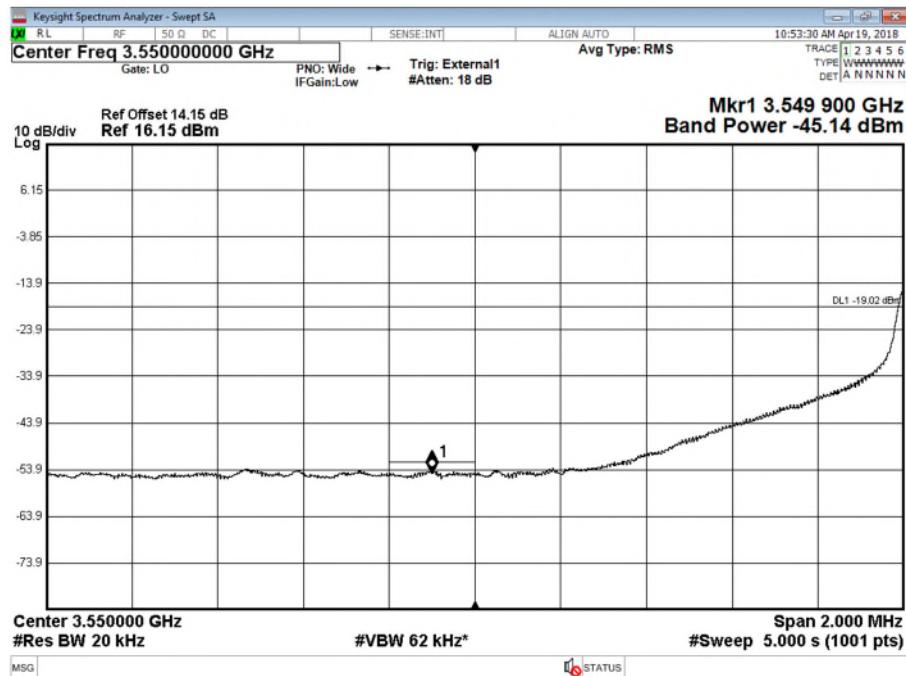


Product Service

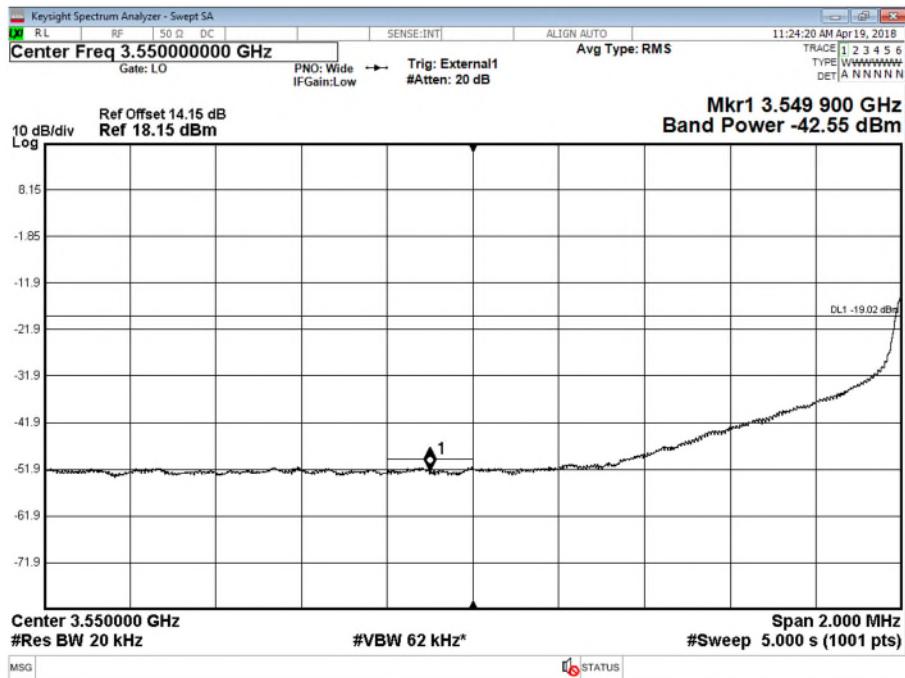
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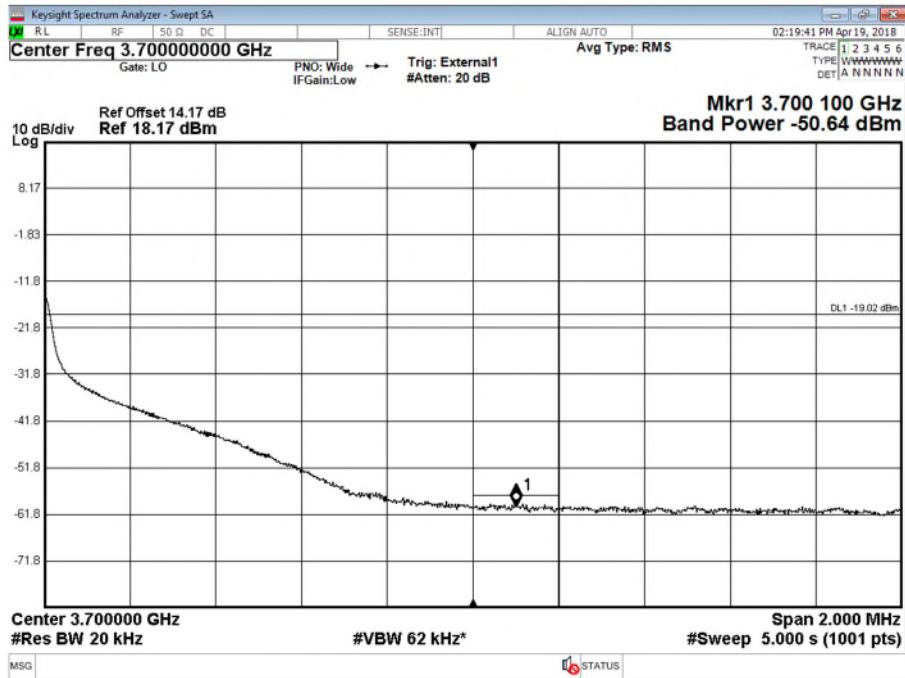
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



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



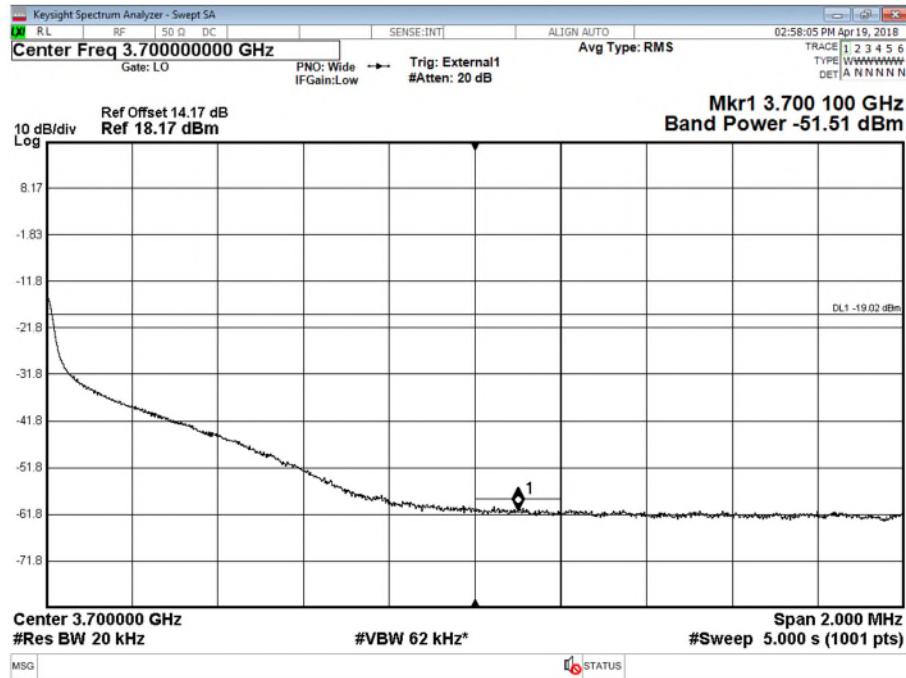
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



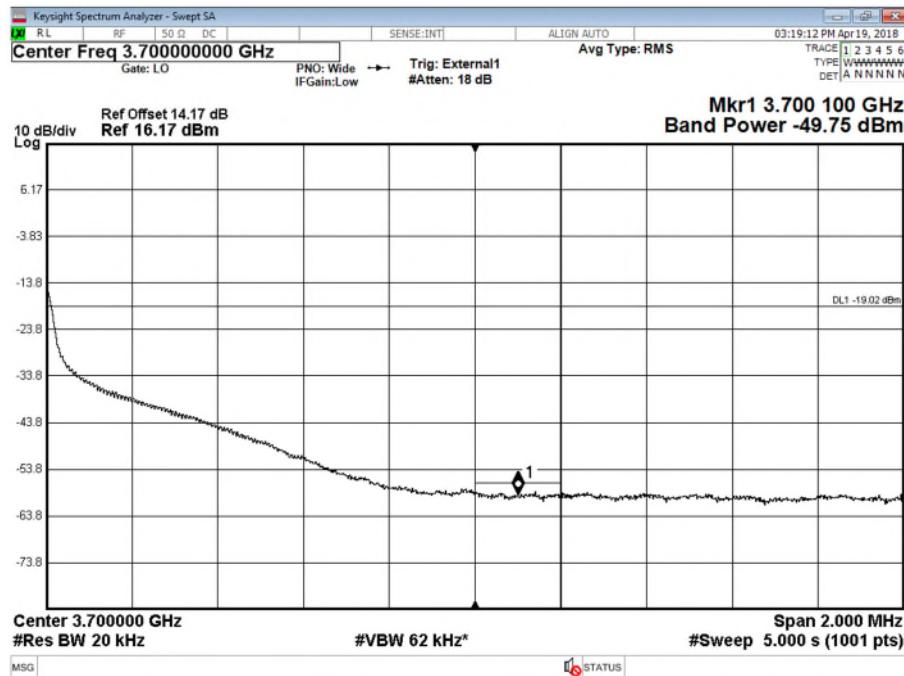
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



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



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



Configuration B

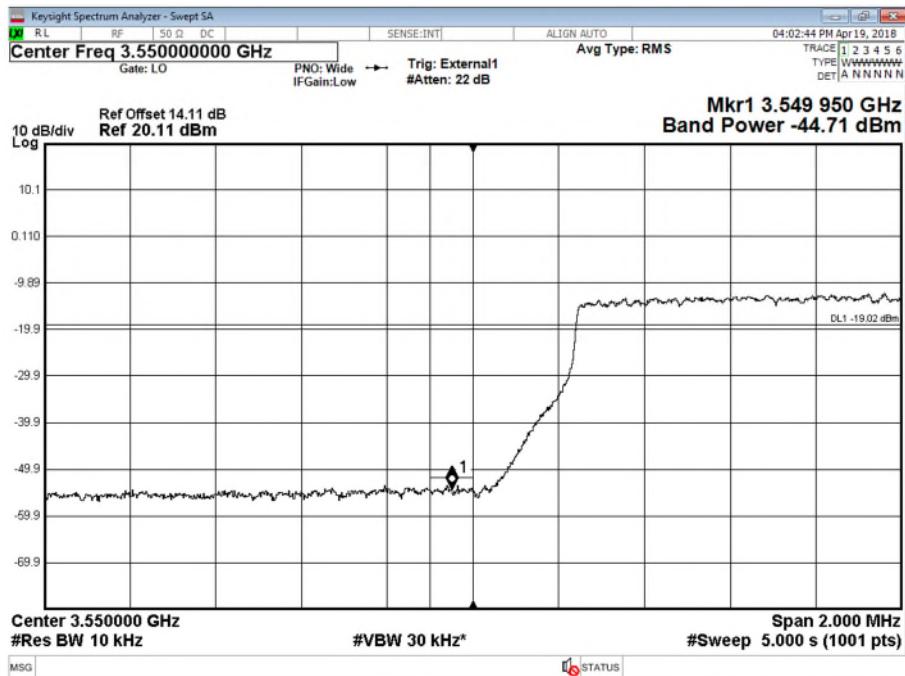
Maximum Output Power 17 dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	5.0 MHz	3552.5 + 3557.5	3692.5 + 3697.5
B	QPSK	5.0 MHz	3552.5 + 3557.5	3692.5 + 3697.5
C	QPSK	5.0 MHz	3552.5 + 3557.5	3692.5 + 3697.5
D	QPSK	5.0 MHz	3552.5 + 3557.5	3692.5 + 3697.5
A	QPSK	10.0 MHz	3555 + 3565	
B	QPSK	10.0 MHz	3555 + 3565	3685 + 3695
C	QPSK	10.0 MHz	3555 + 3565	3685 + 3695
A	QPSK	15.0 MHz	3557.5 + 3572.5	3677.5 + 3692.5
B	QPSK	15.0 MHz	3557.5 + 3572.5	3677.5 + 3692.5
C	QPSK	15.0 MHz	3557.5 + 3572.5	3677.5 + 3692.5
D	QPSK	15.0 MHz	3557.5 + 3572.5	3677.5 + 3692.5
A	QPSK	20.0 MHz	3560 + 3580	3670 + 3690
B	QPSK	20.0 MHz	3560 + 3580	3670 + 3690
C	QPSK	20.0 MHz	3560 + 3580	3670 + 3690
D	QPSK	20.0 MHz	3560 + 3580	3670 + 3690

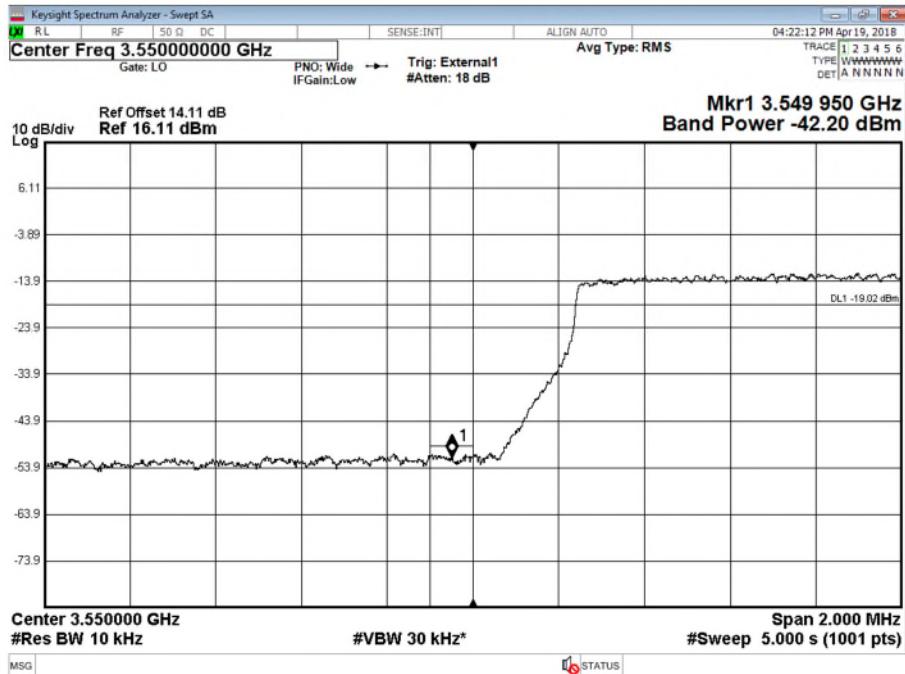


Product Service

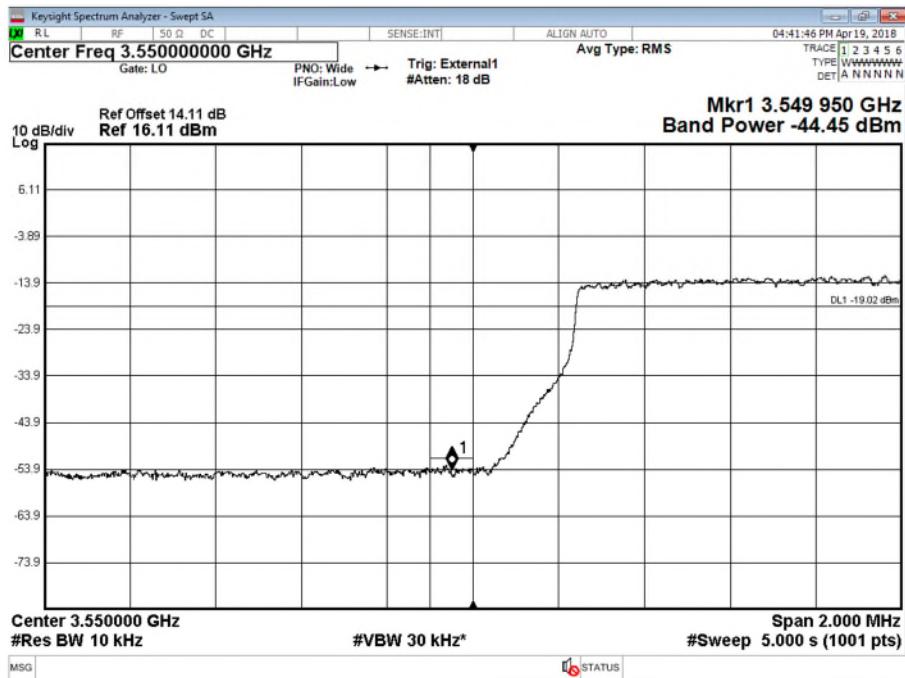
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



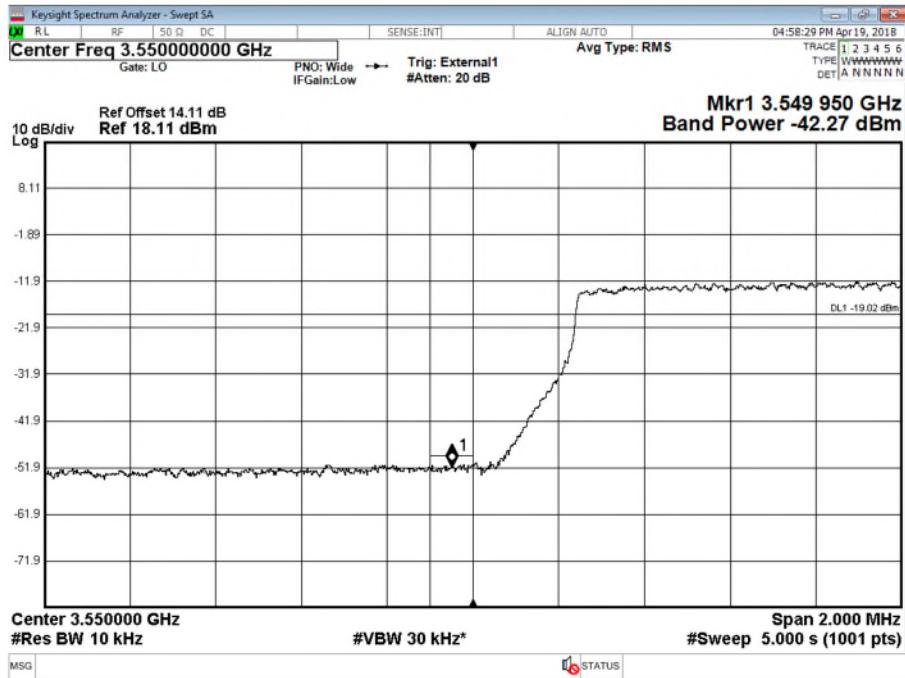
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



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



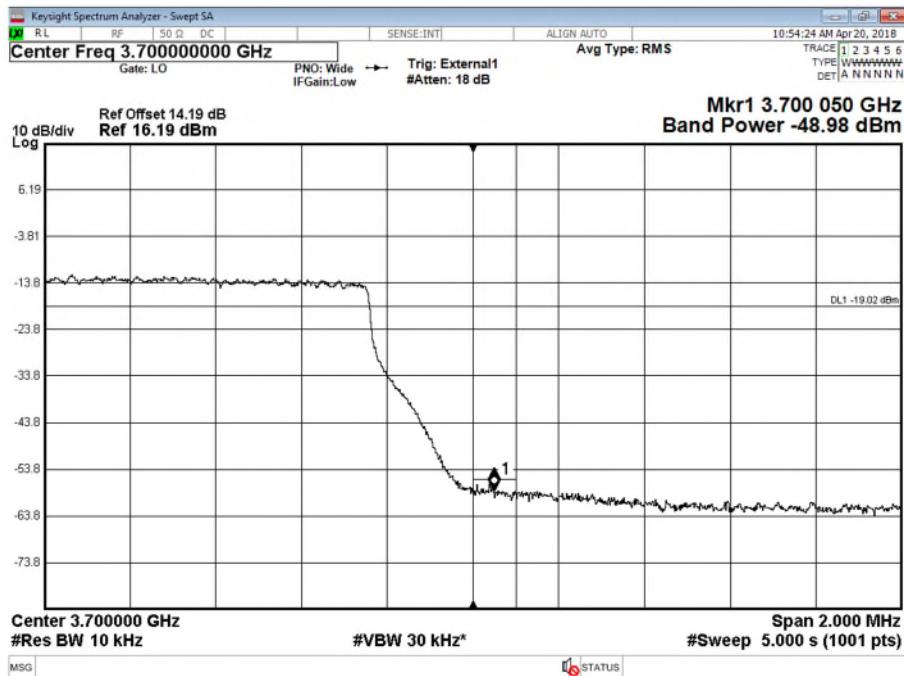
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



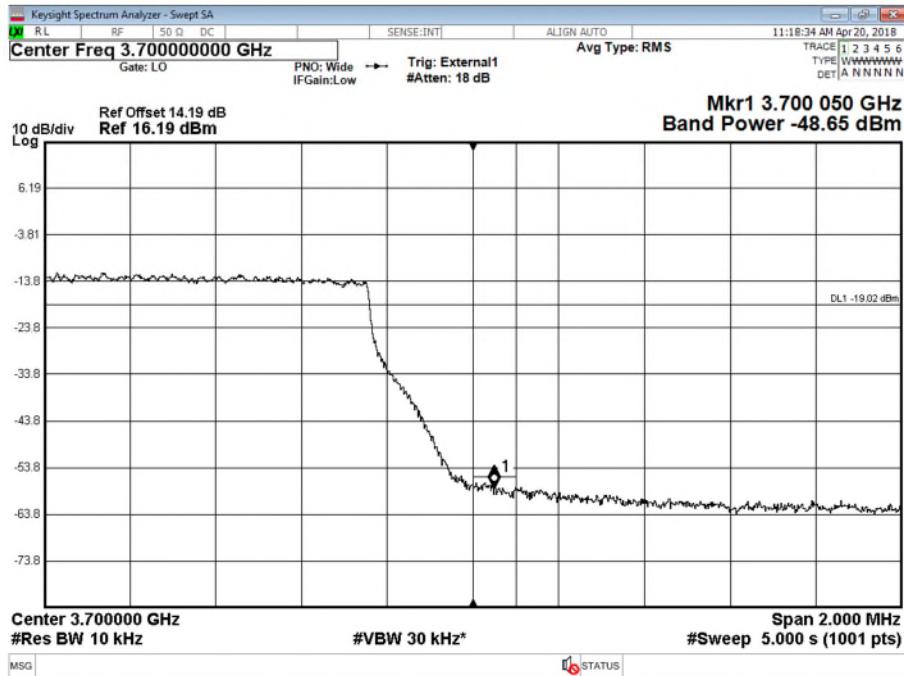


Product Service

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



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



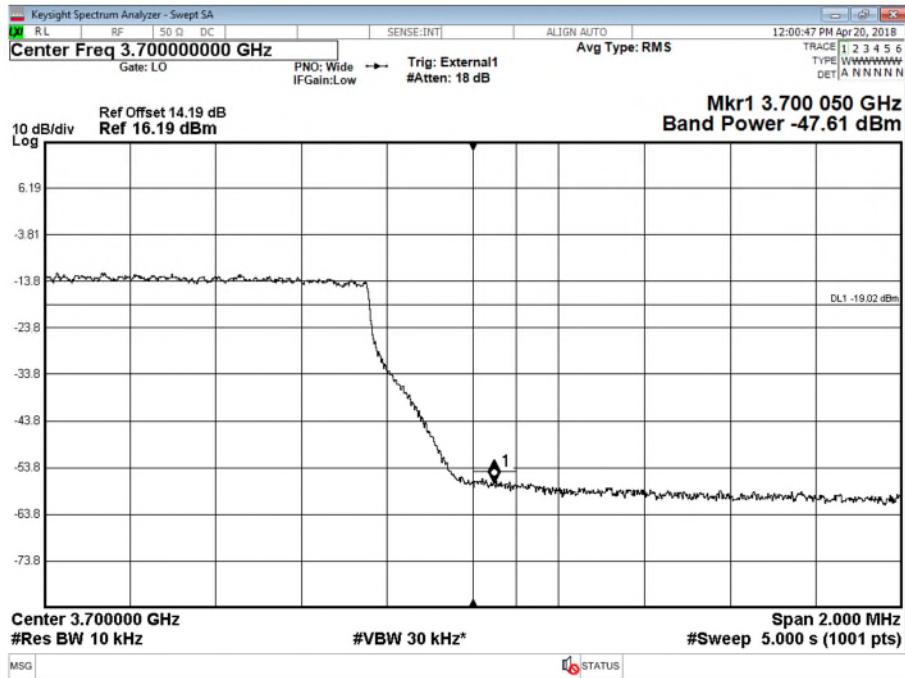


Product Service

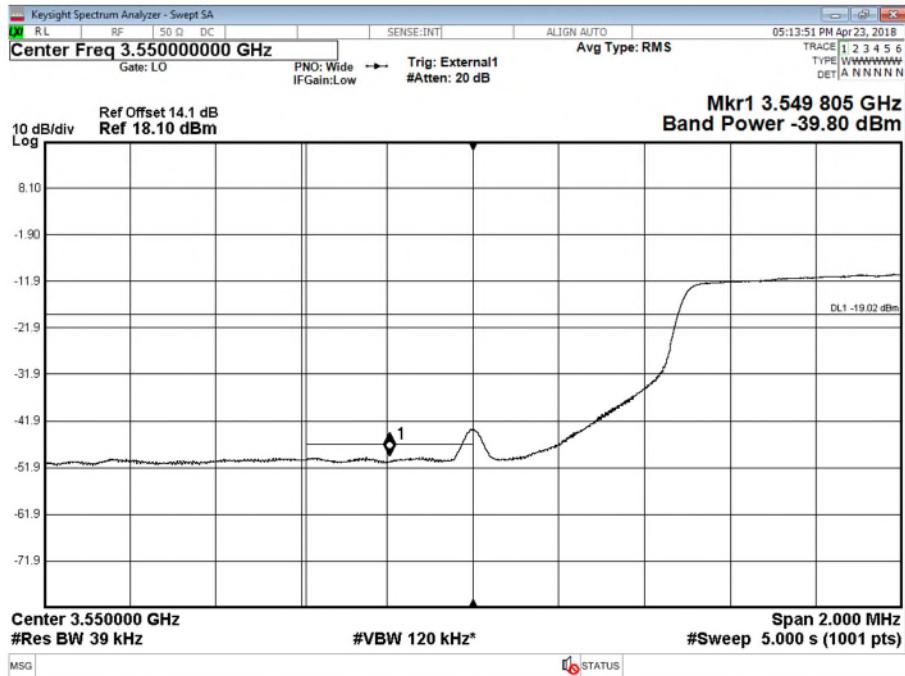
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T

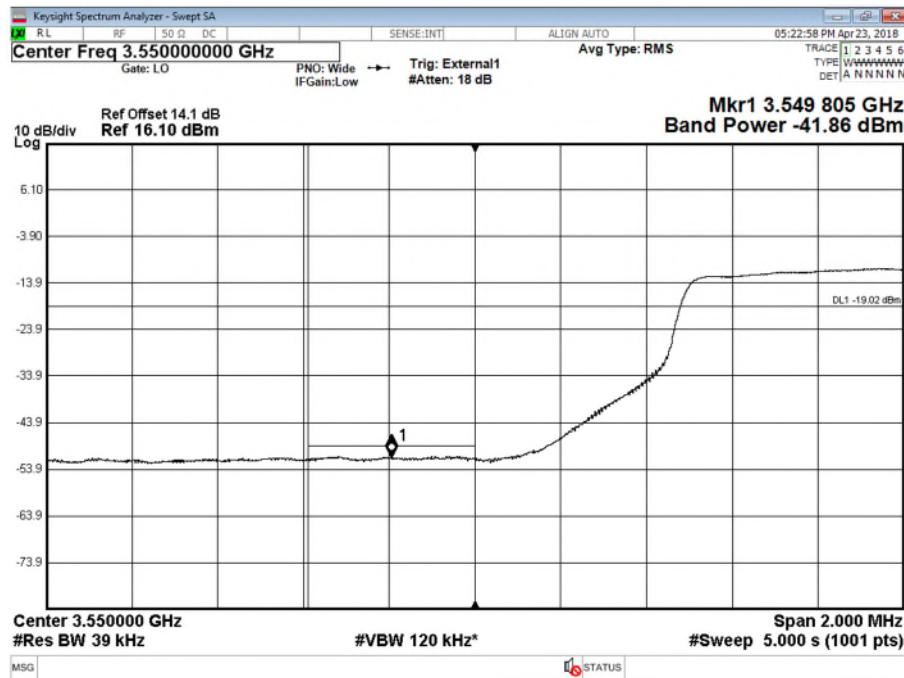


Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



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

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


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

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

Note: Antenna B is shown as worst case/representative



Product Service

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



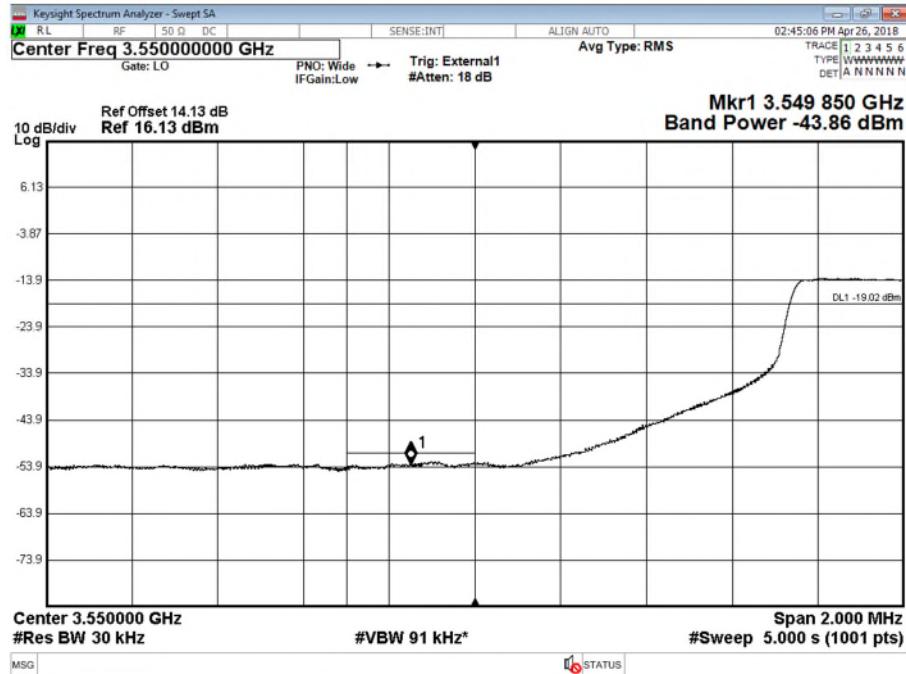
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



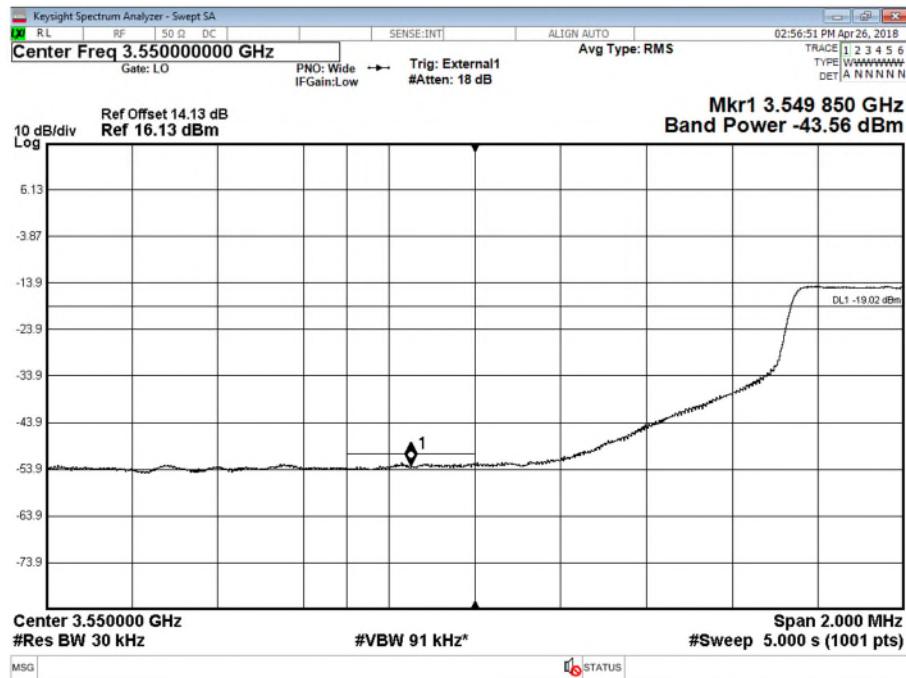
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



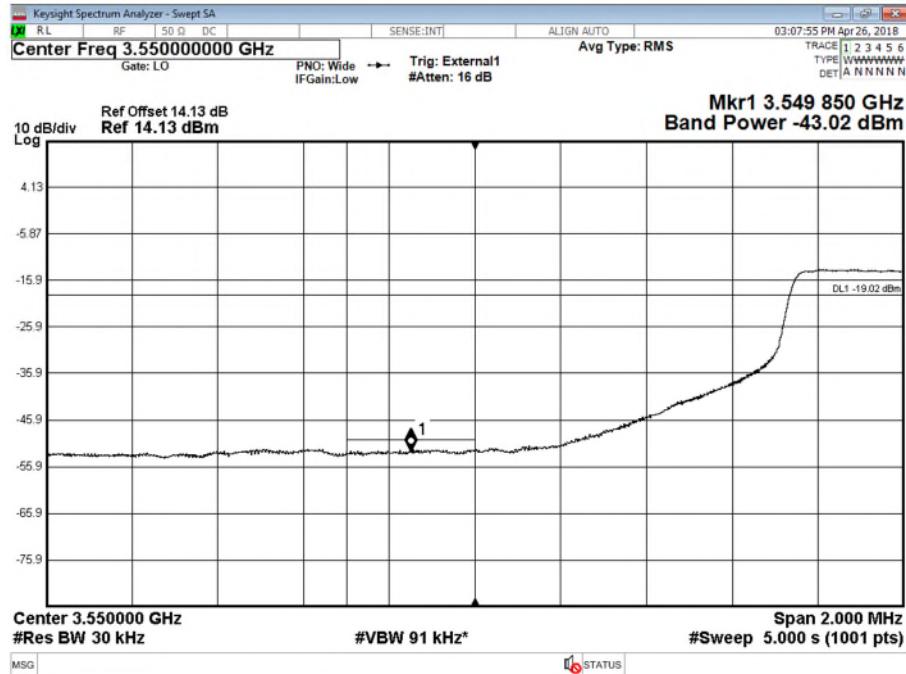
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



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



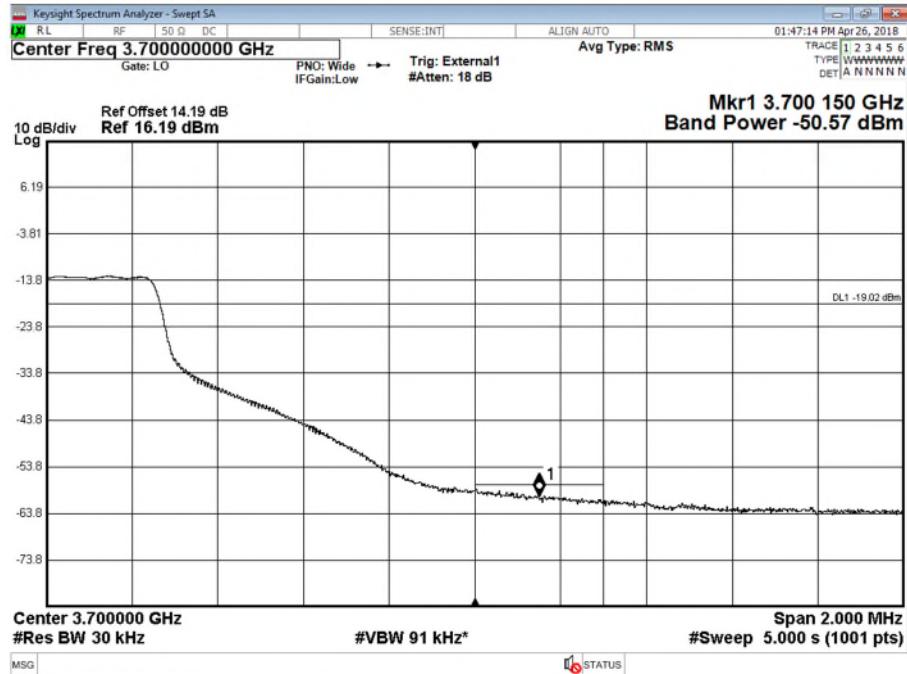
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



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



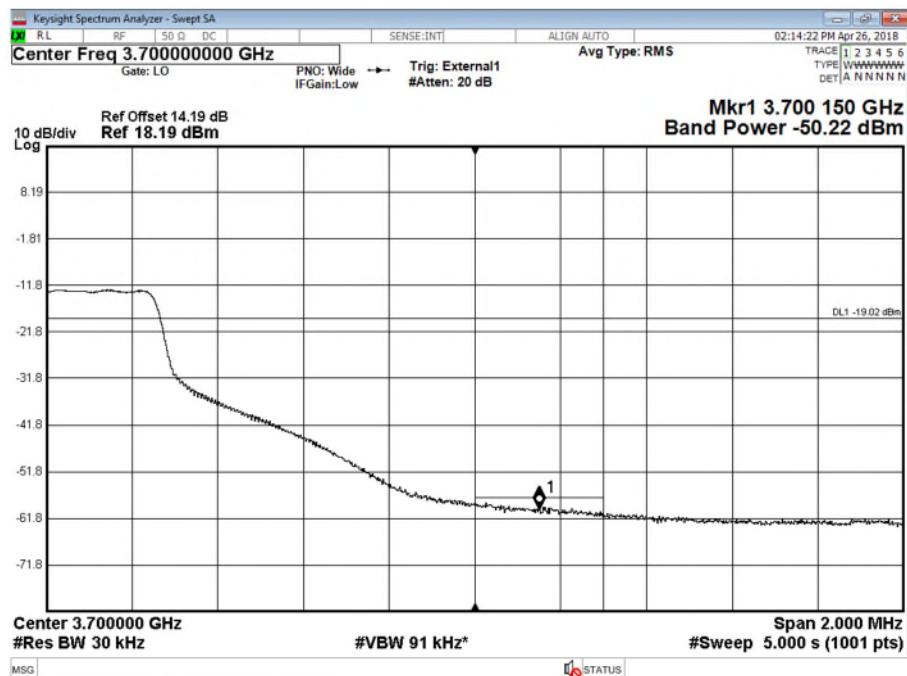
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



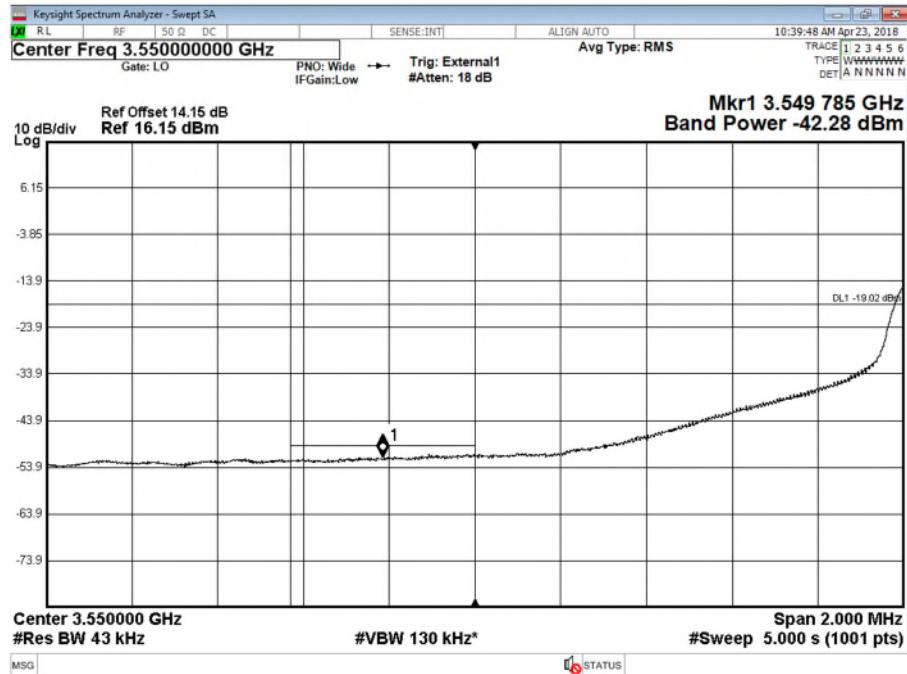
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



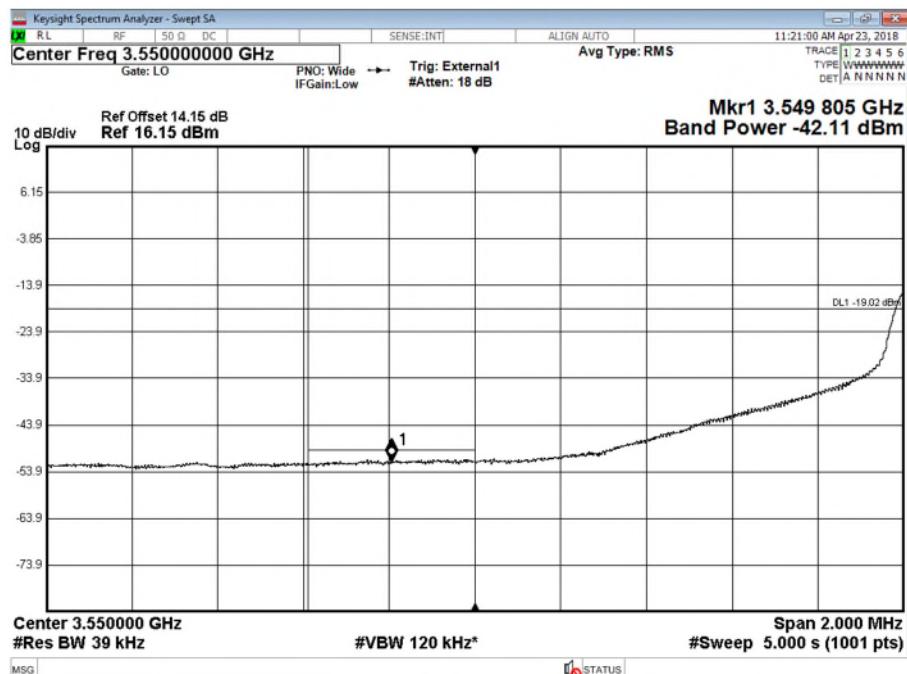
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



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



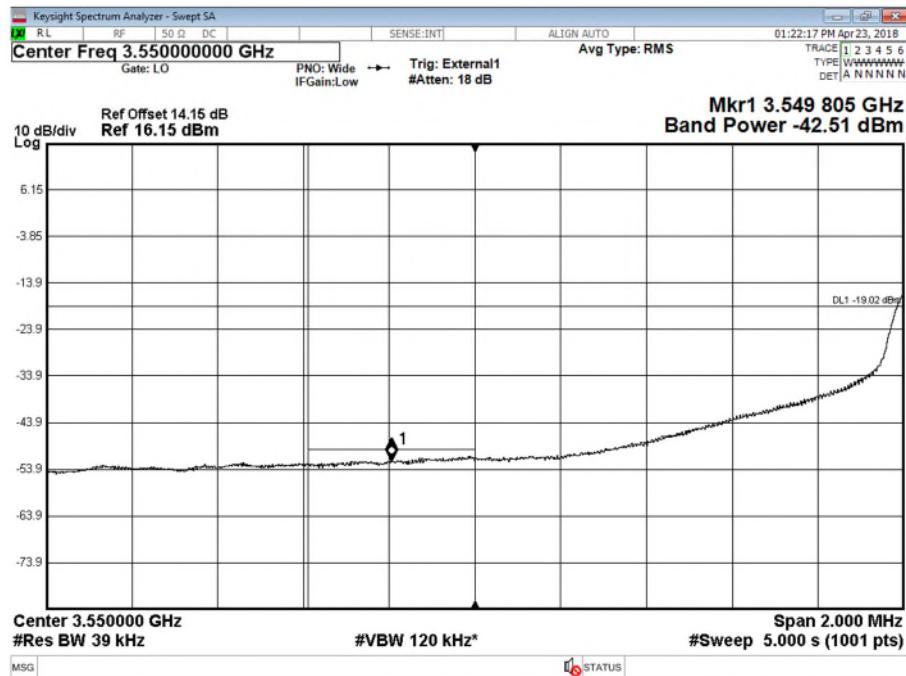
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



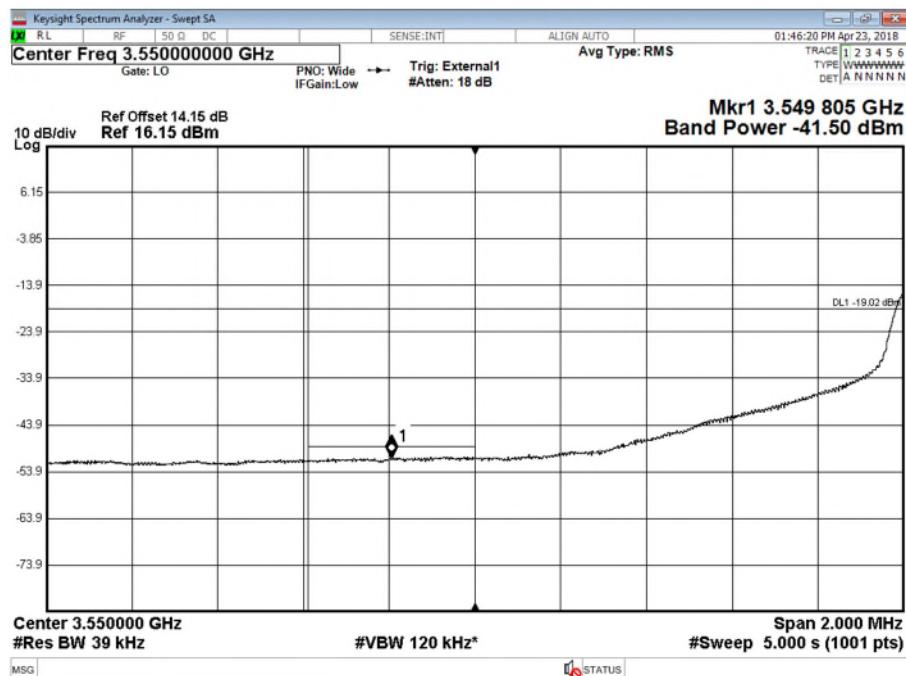


Product Service

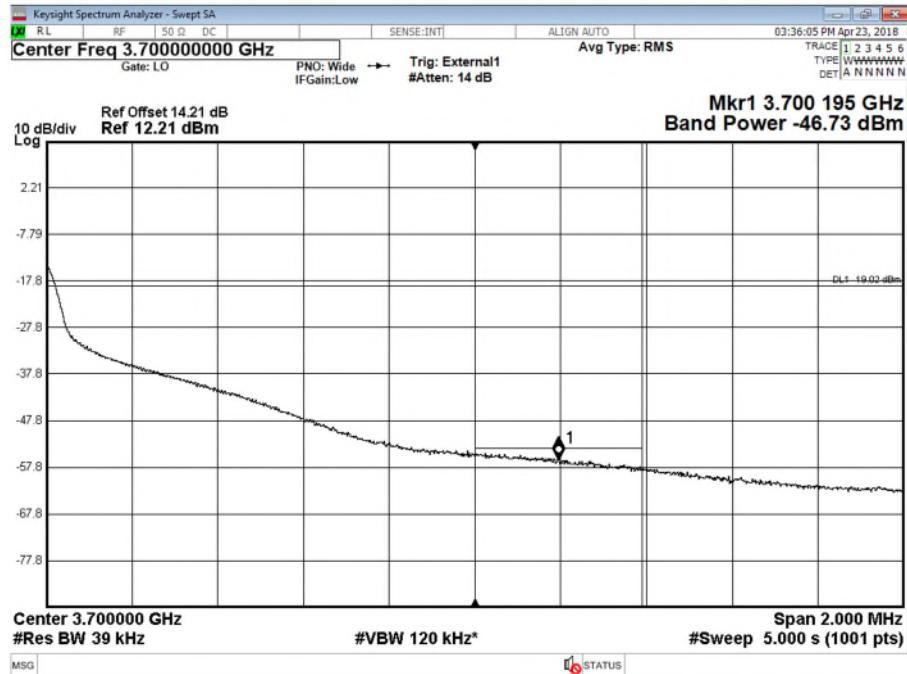
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



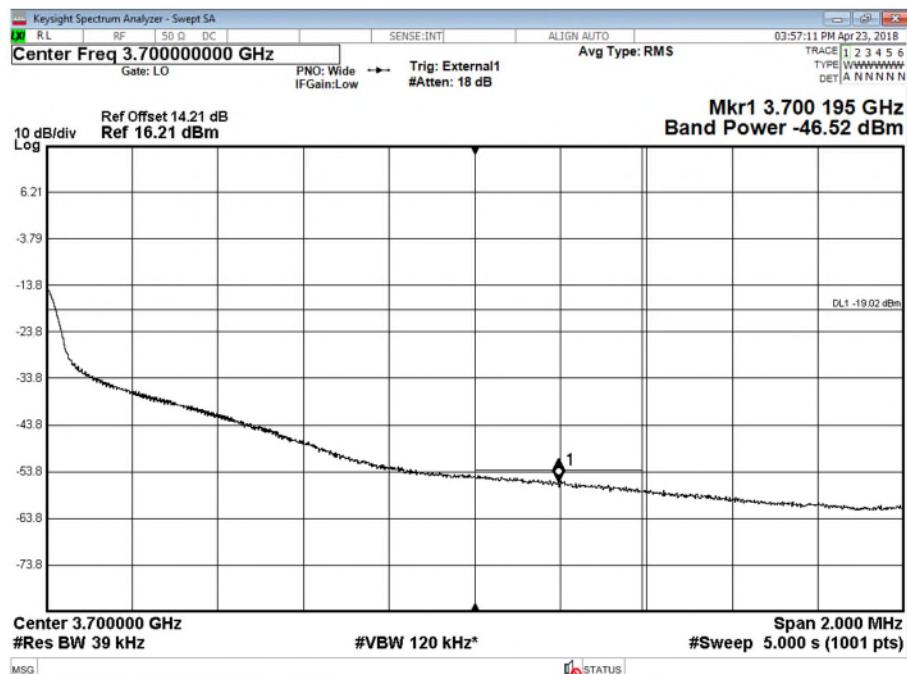
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



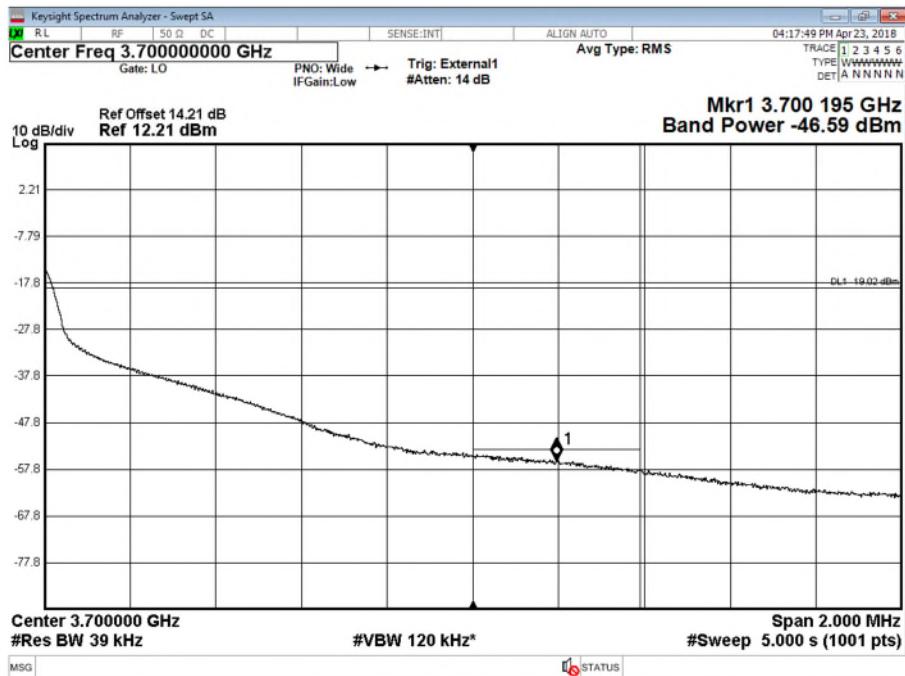
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



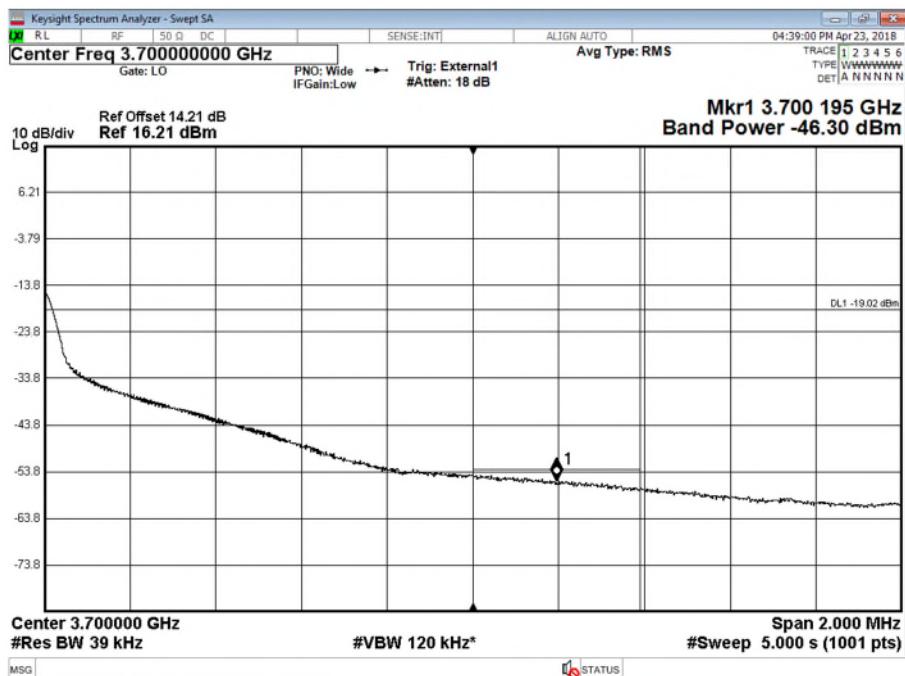
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



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



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



Limit	-19 dBm
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Product Service

2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 96, Clause 96.41 (e)(1)

2.4.2 Date of Test and Modification State

19, 23 and 27 April 2018 - Modification State 0

2.4.3 Test Equipment Used

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

2.4.4 Environmental Conditions

Ambient Temperature	23°C
Relative Humidity	35%

2.4.5 Test Method

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

The EUT was connected to a Spectrum Analyser via an attenuator and switching box. Prior to testing, a Network Analyser was used to calibrate the path loss between the EUT and the Spectrum Analyser. The worst case path loss in the measured ranges was entered as a reference level offset. Over the measured ranges, the RBW was set to 1MHz with a VBW of 3MHz. All measurement results are specified as average with an RMS detector being used in conjunction with a trace setting of Max Hold. Measurements were performed in configurations of the EUT as reported below.

The B48 EUT has 2 radios, each with 2 transmit ports.

Therefore, the test limits used were calculated on a worst case basis accounting for an effective 4 port MIMO configuration.

Testing was performed on this port with a test limit of $-40 \text{ dBm}/\text{MHz} - 10\log(4) = -46 \text{ dBm}$ (for emissions $< 3530 \text{ MHz}$ and $> 3720 \text{ MHz}$).

Testing was performed on this port with a test limit of $-25 \text{ dBm}/\text{MHz} - 10\log(4) = -31 \text{ dBm}$ (for emissions within 10 MHz of the carrier).

2.4.6 Test Results

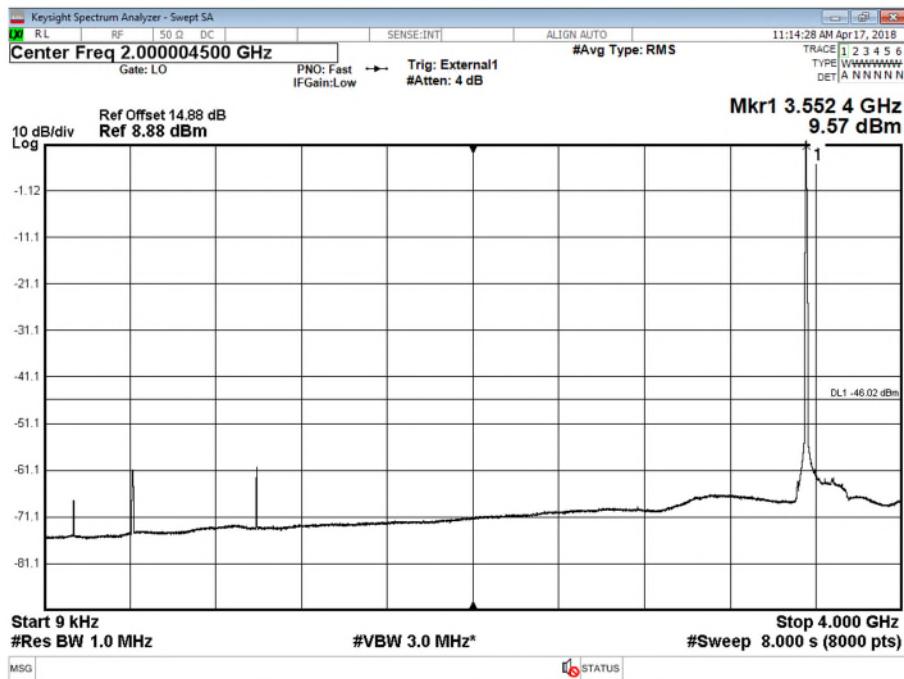
Configuration A

Maximum Output Power 17 dBm

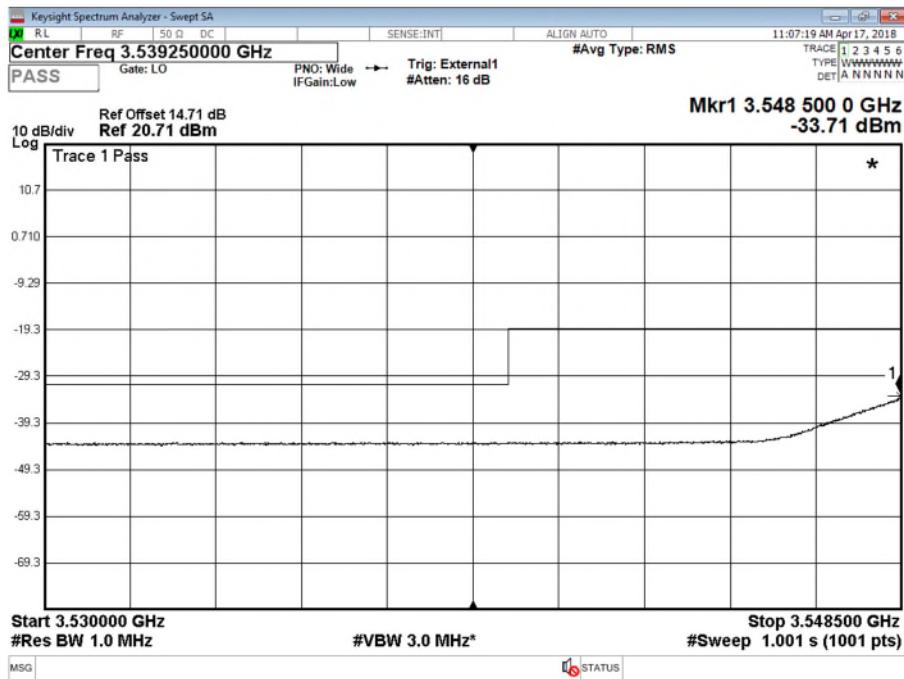


Product Service

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B - Band Mask Low 1 - Range Mask Low 1





Product Service

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B -
Band Mask High_1 - Range Mask High_1

