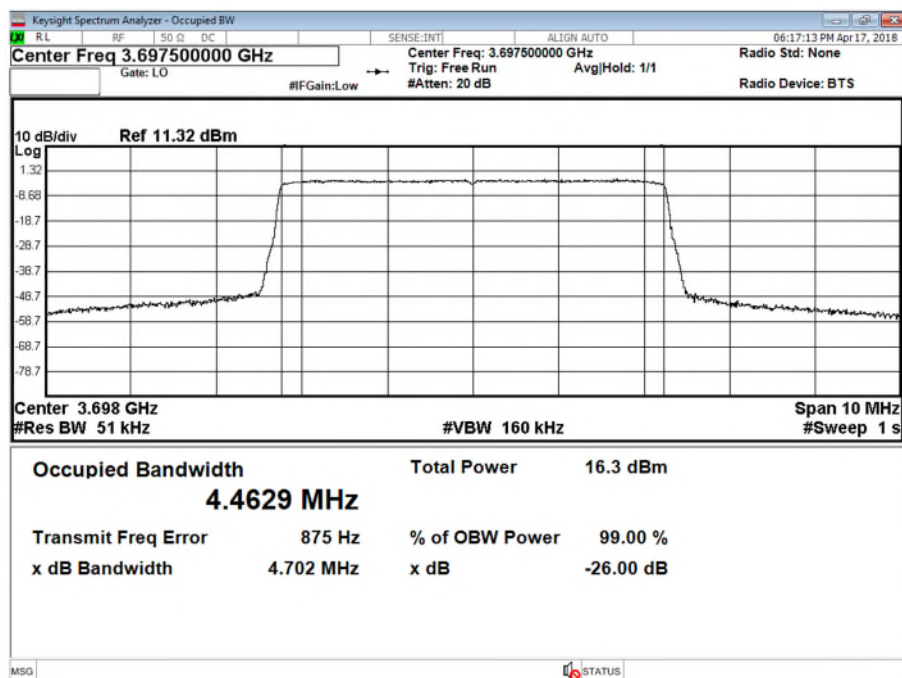
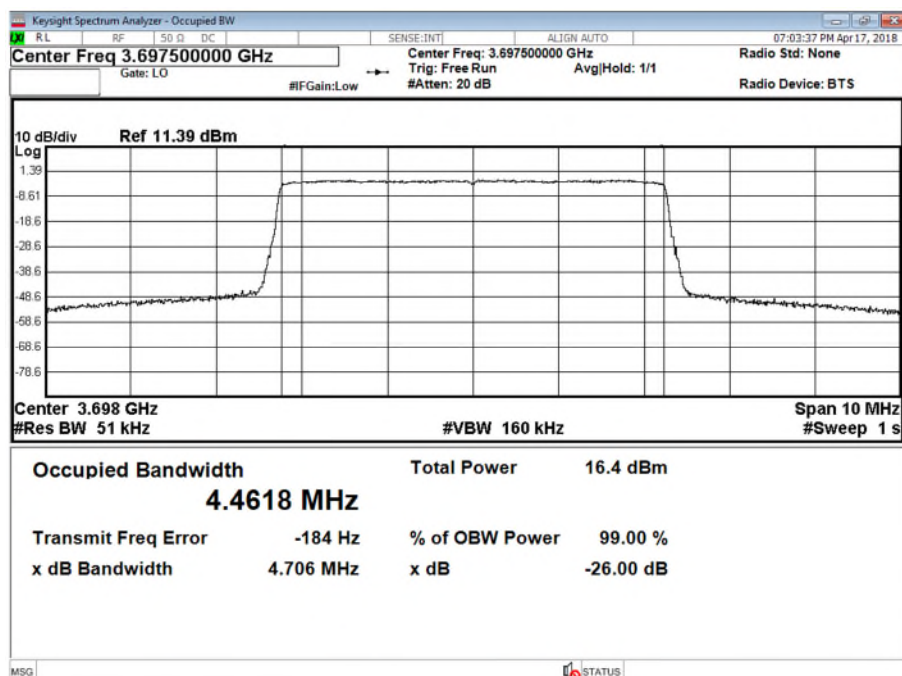


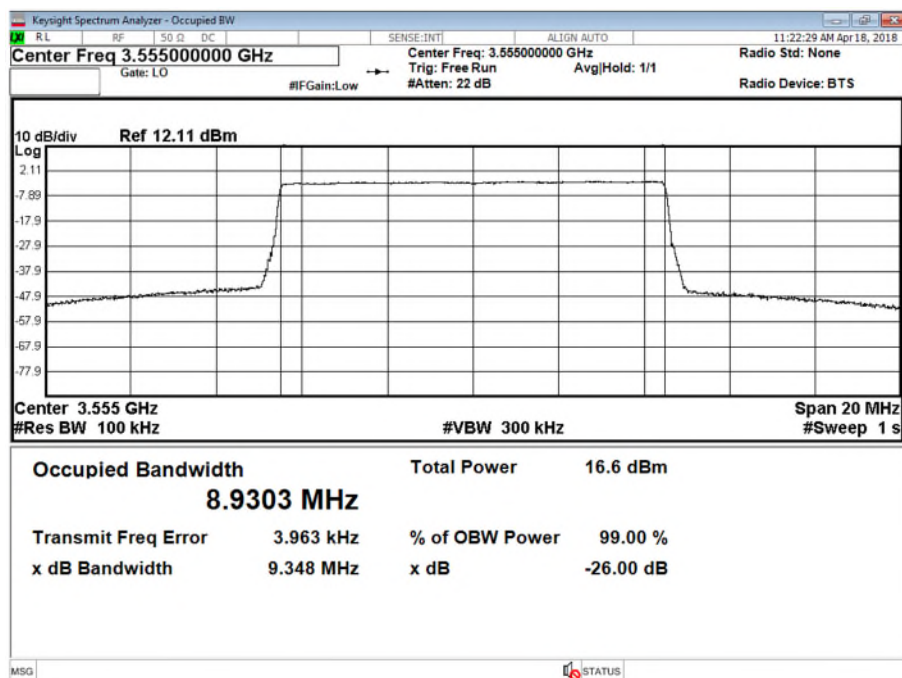
### Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



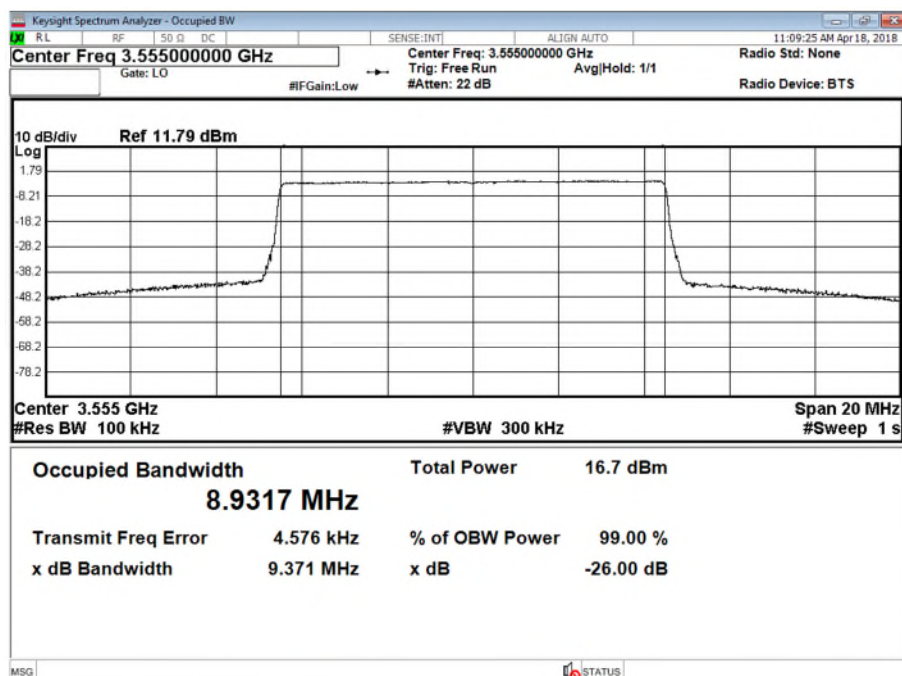
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



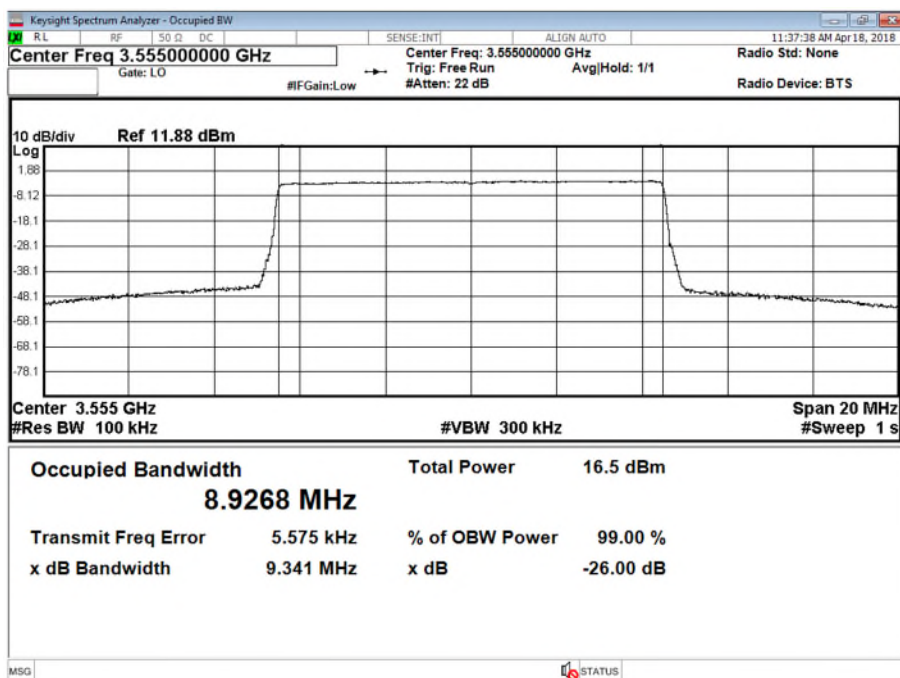
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



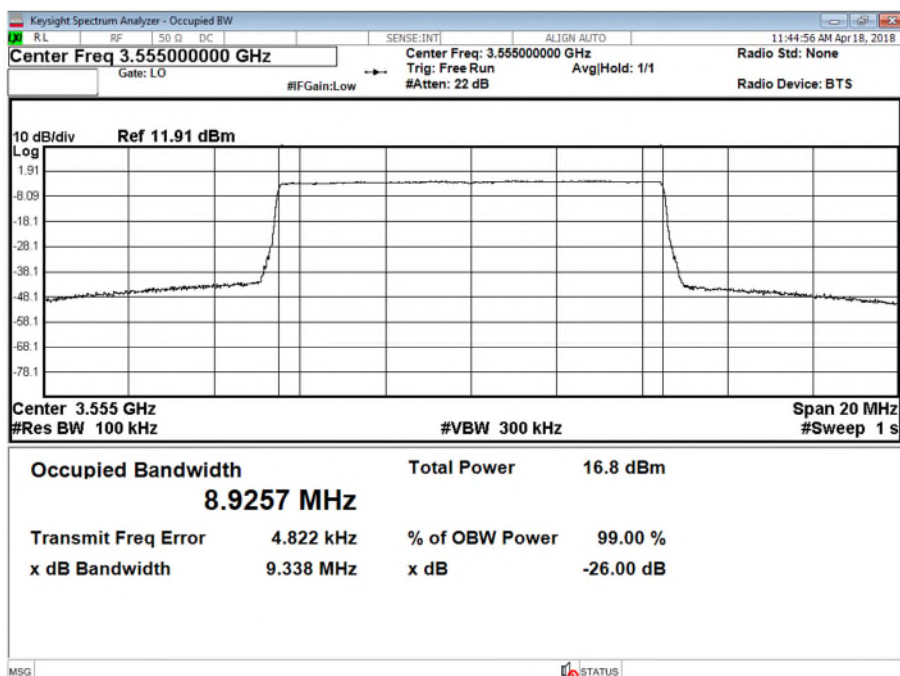
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



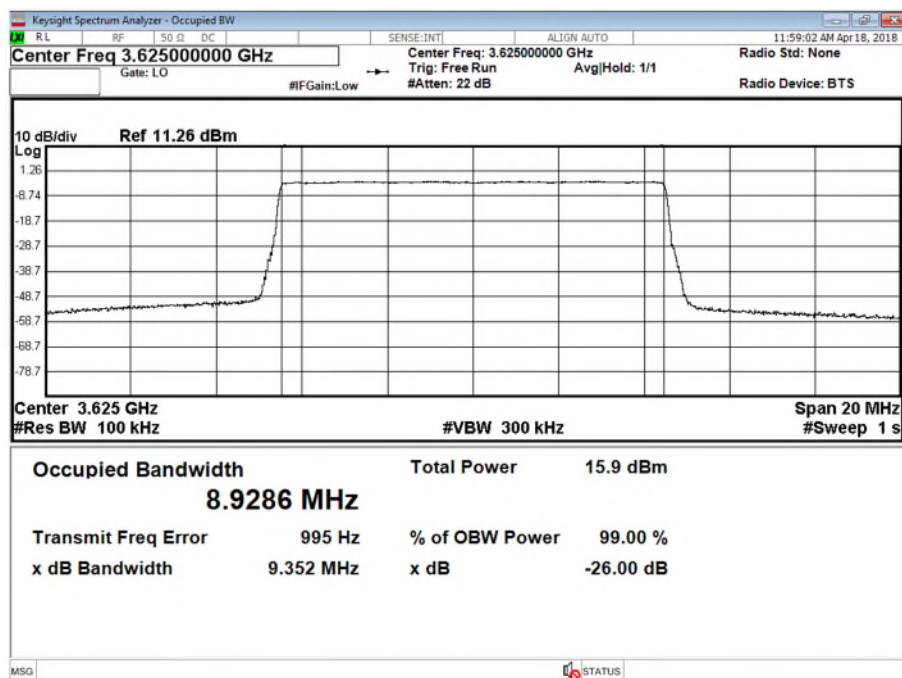
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



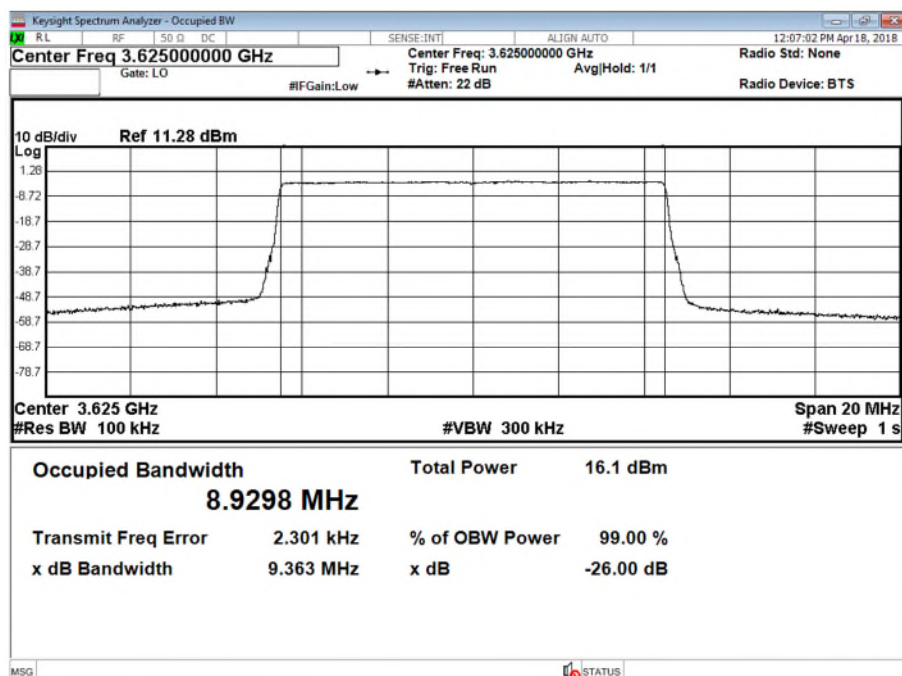
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



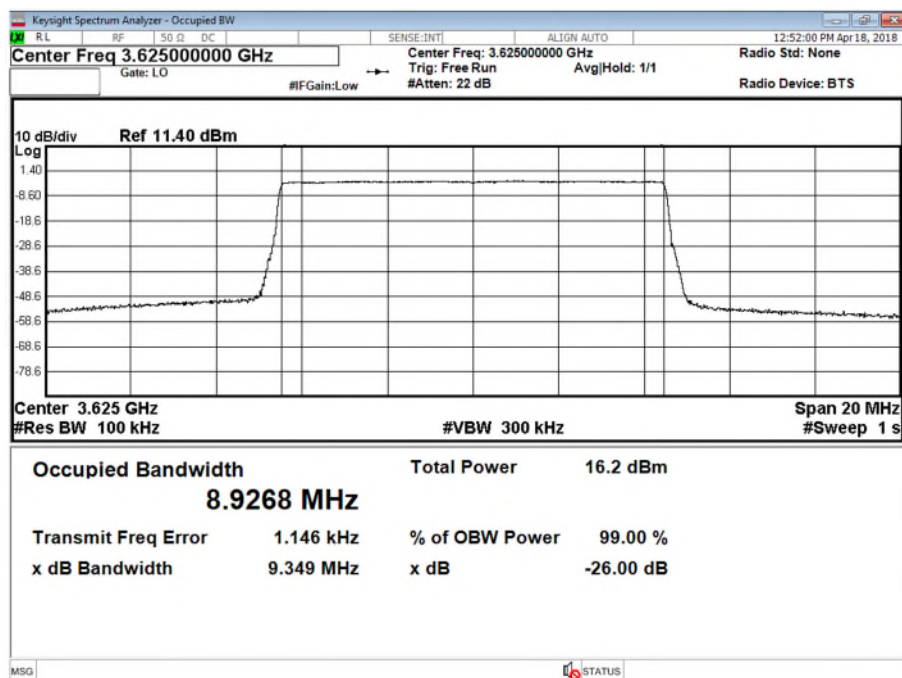
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



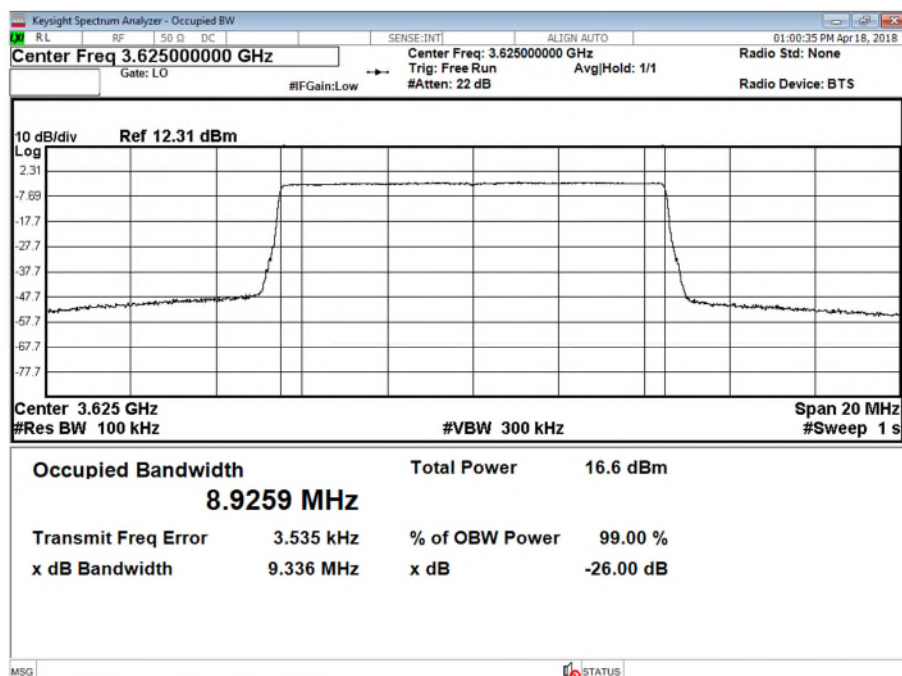
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M



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

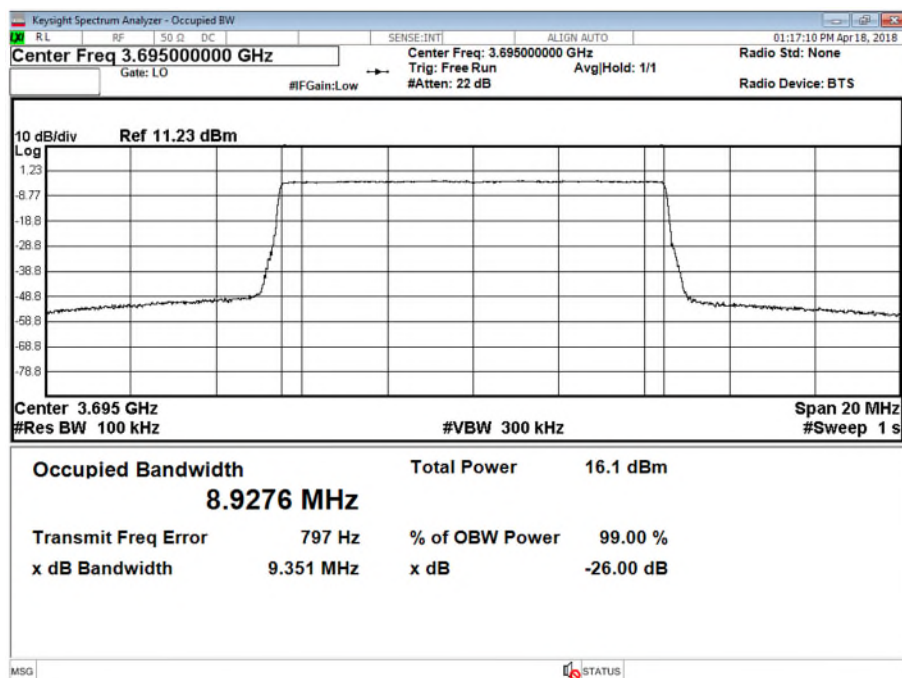




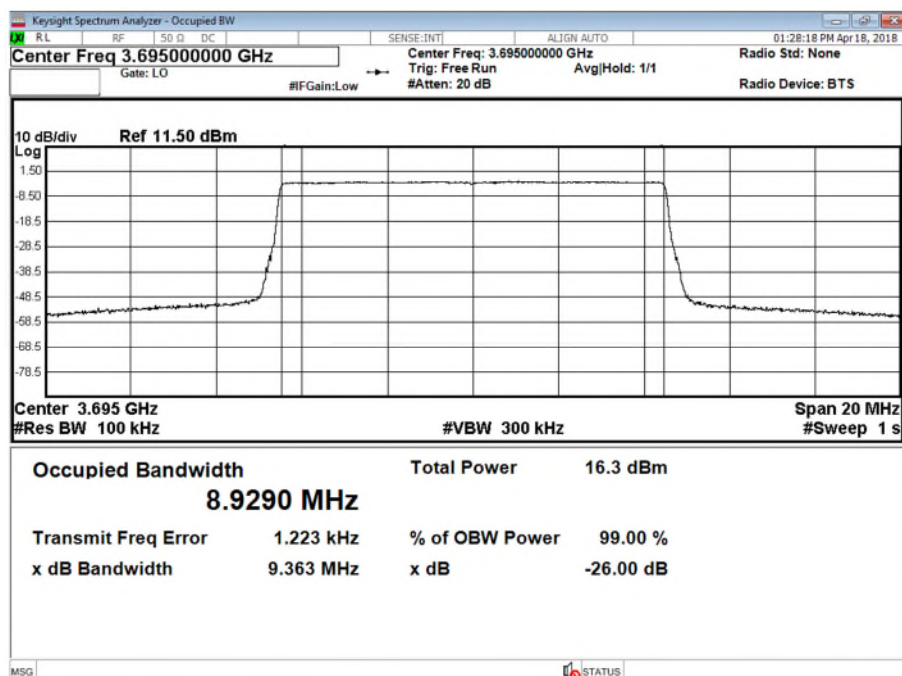


Product Service

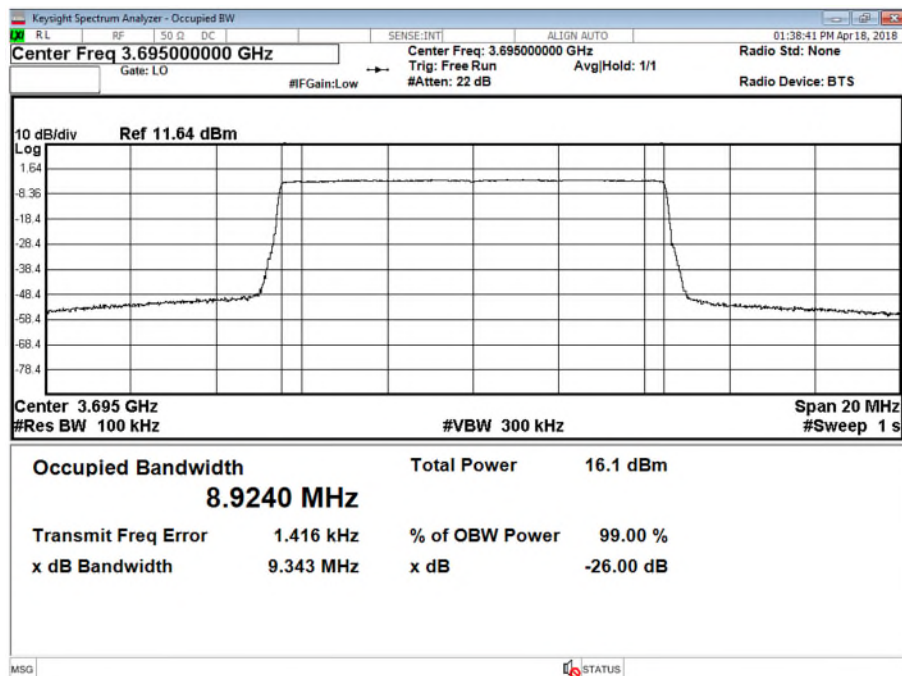
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



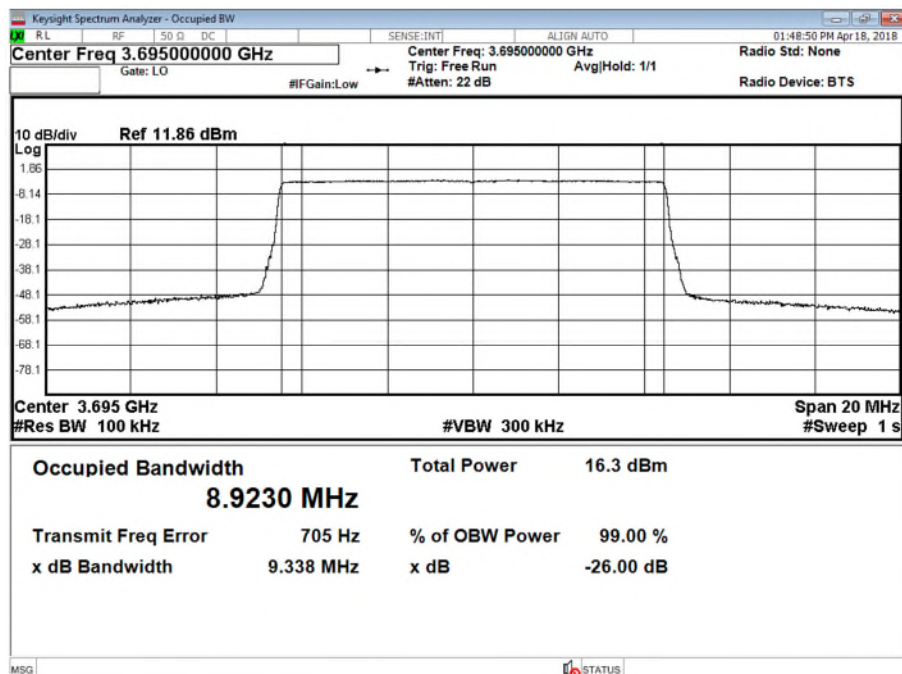
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



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



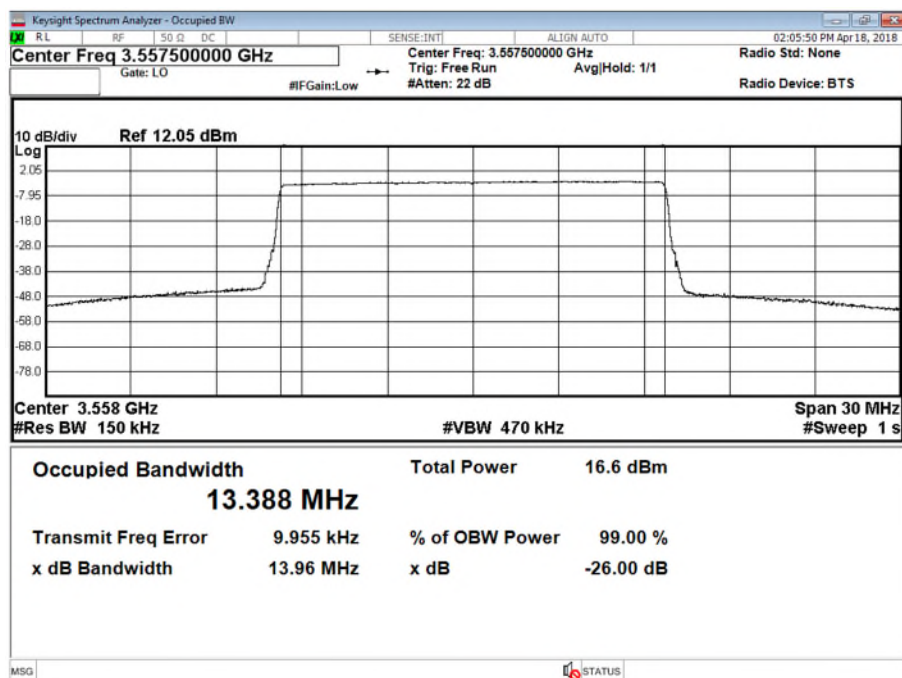
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



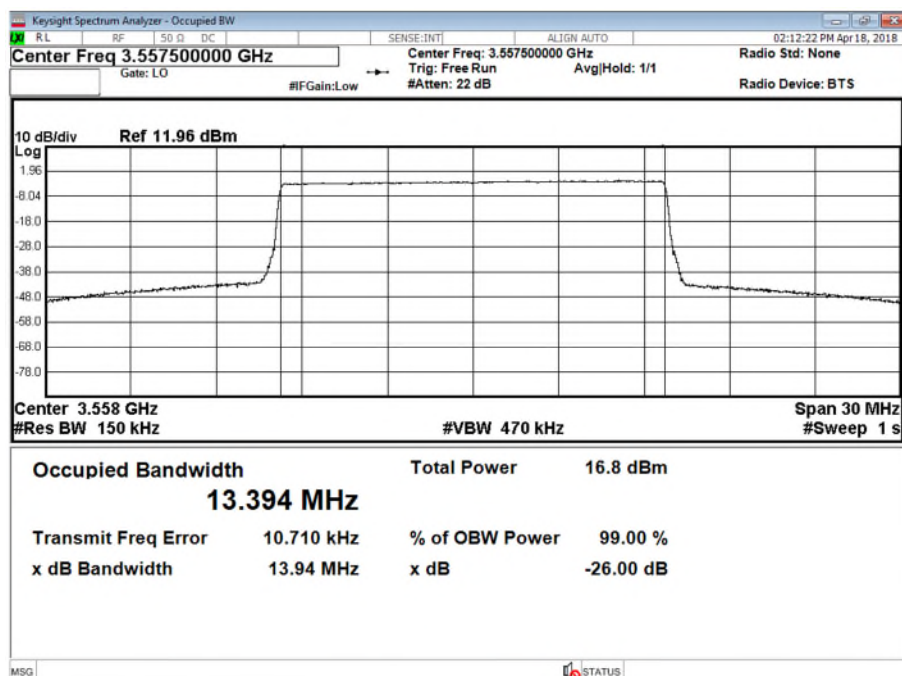


Product Service

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

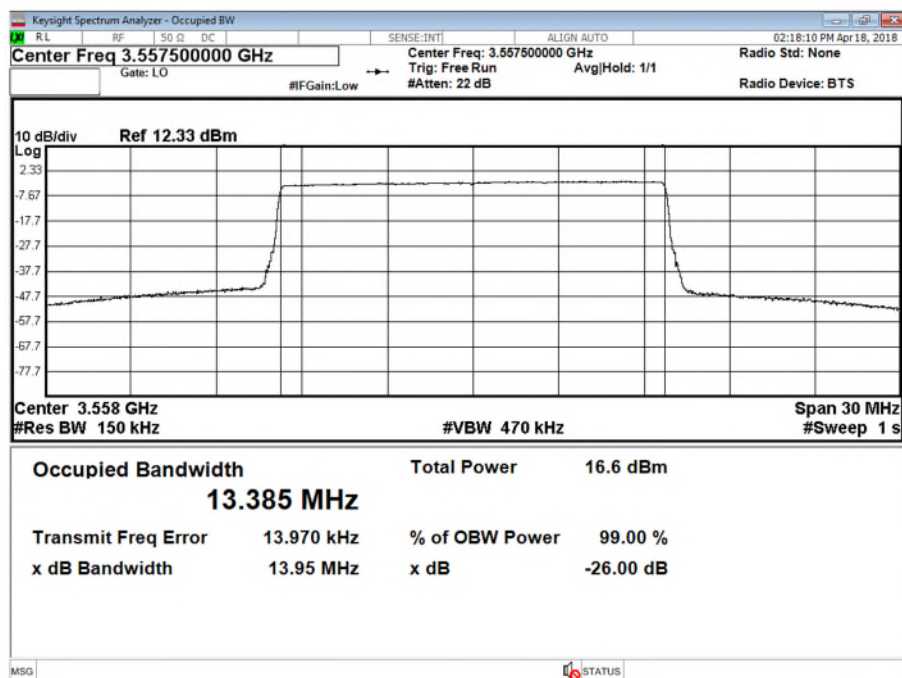


Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B

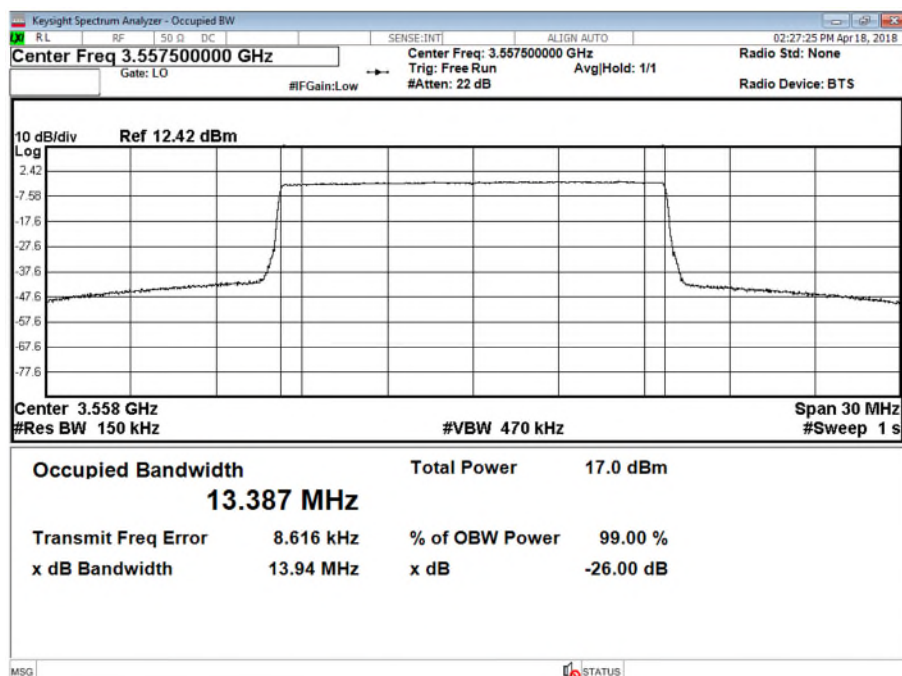




Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



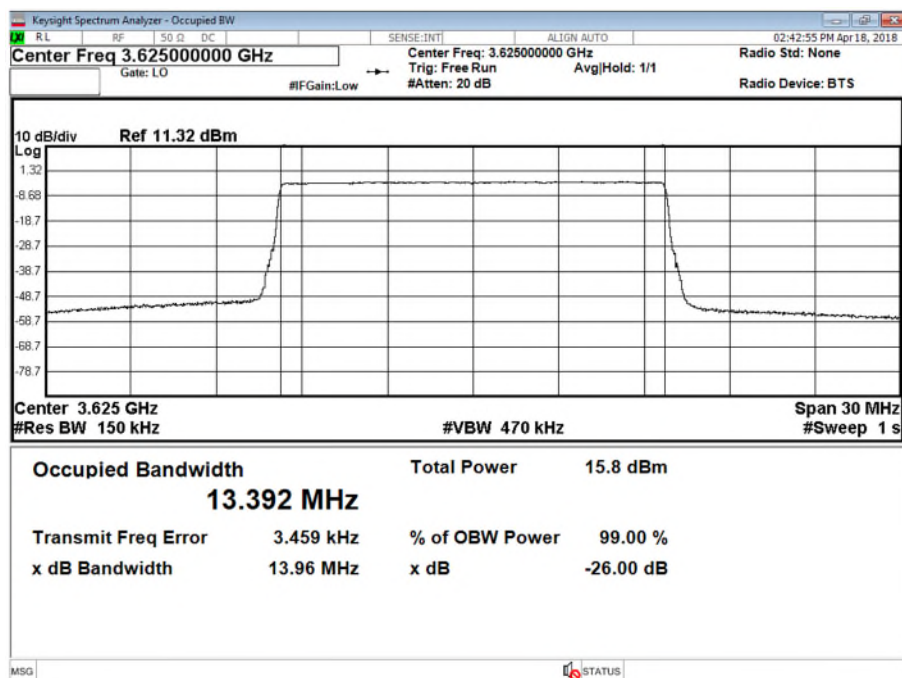
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



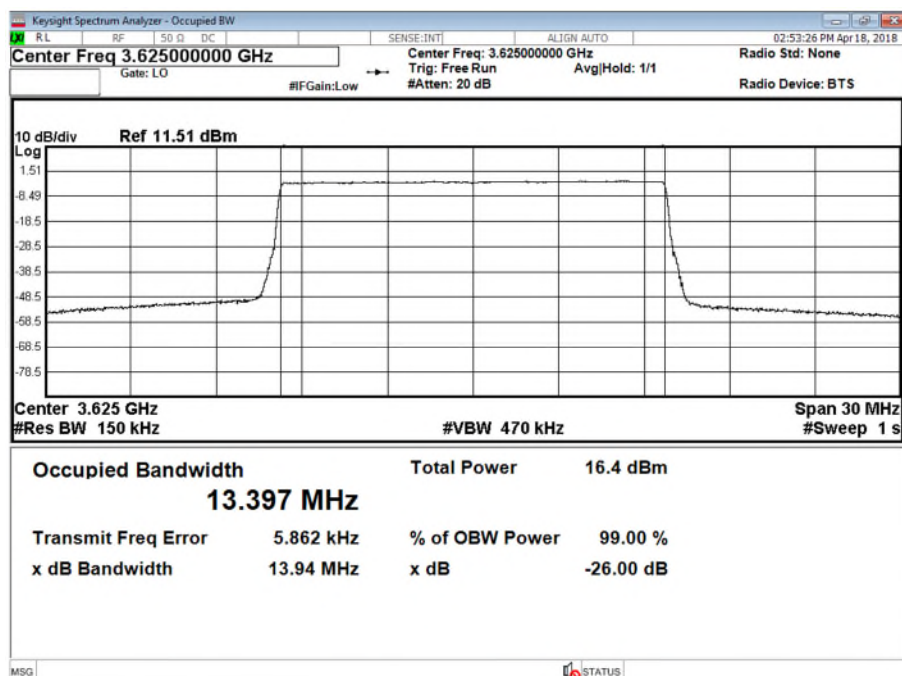


Product Service

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



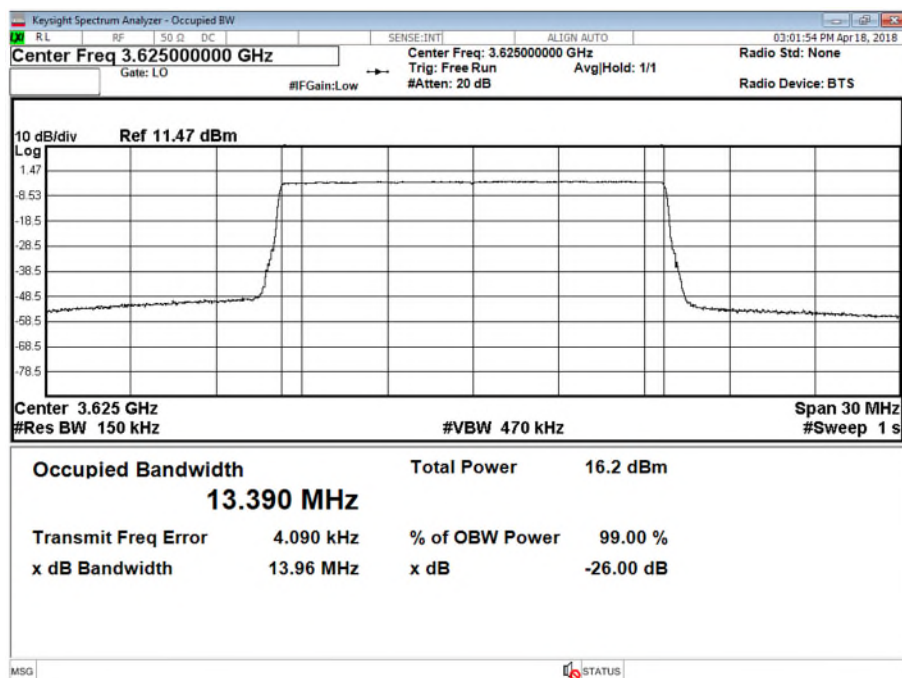
### Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



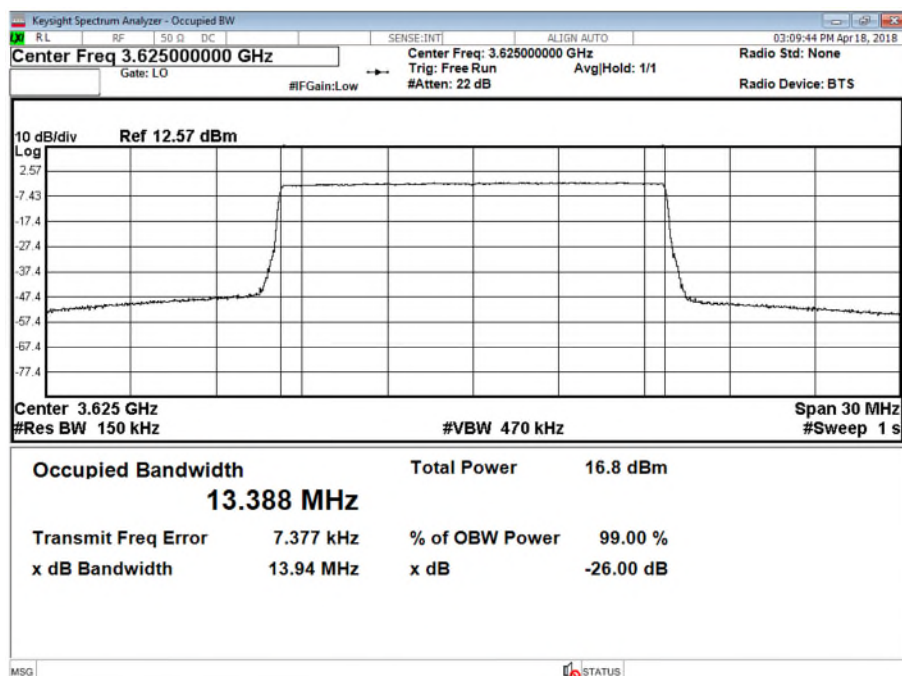


Product Service

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



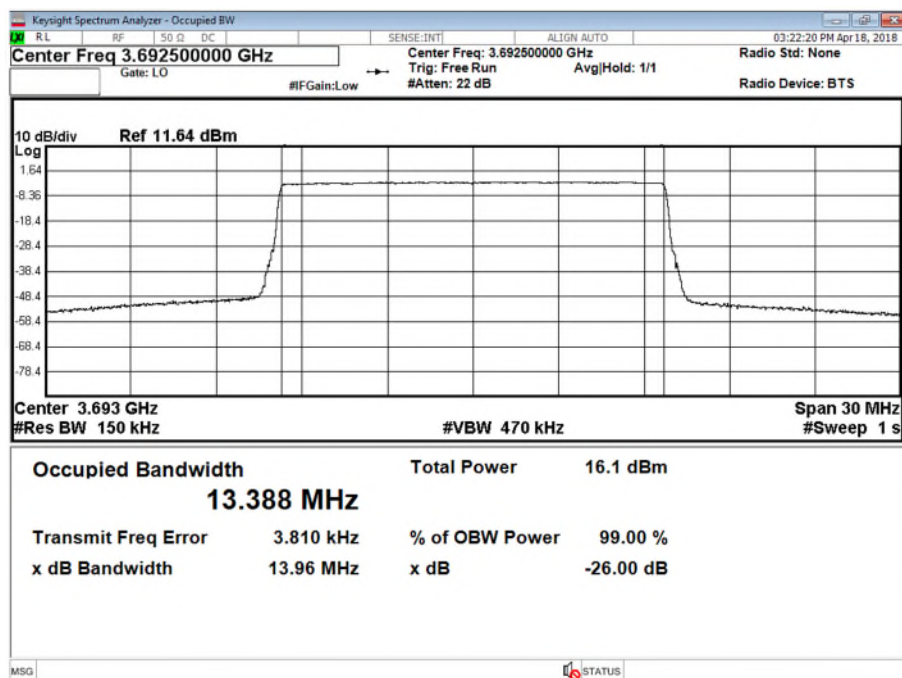
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M



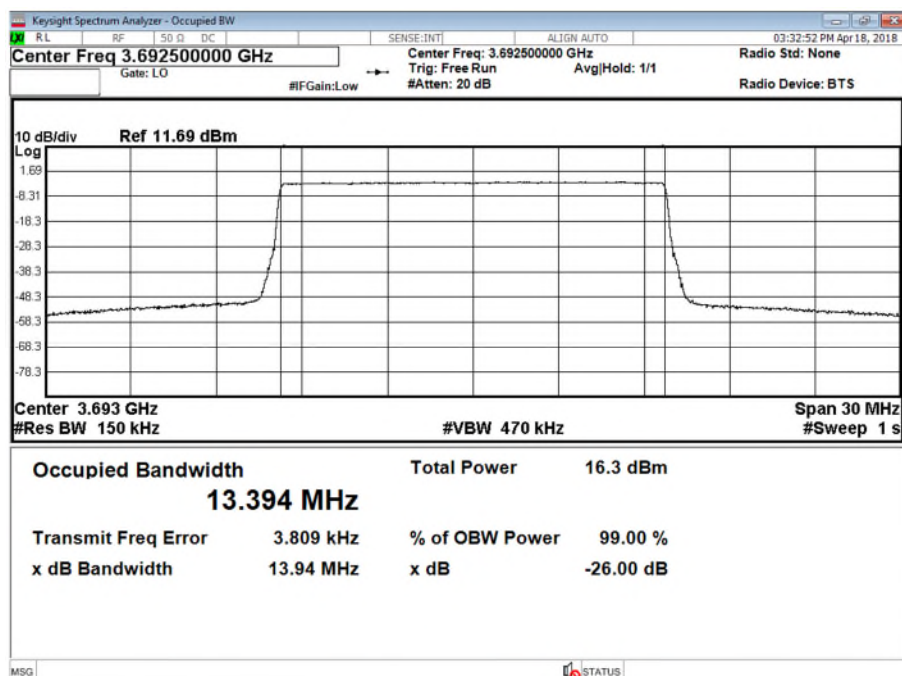


Product Service

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



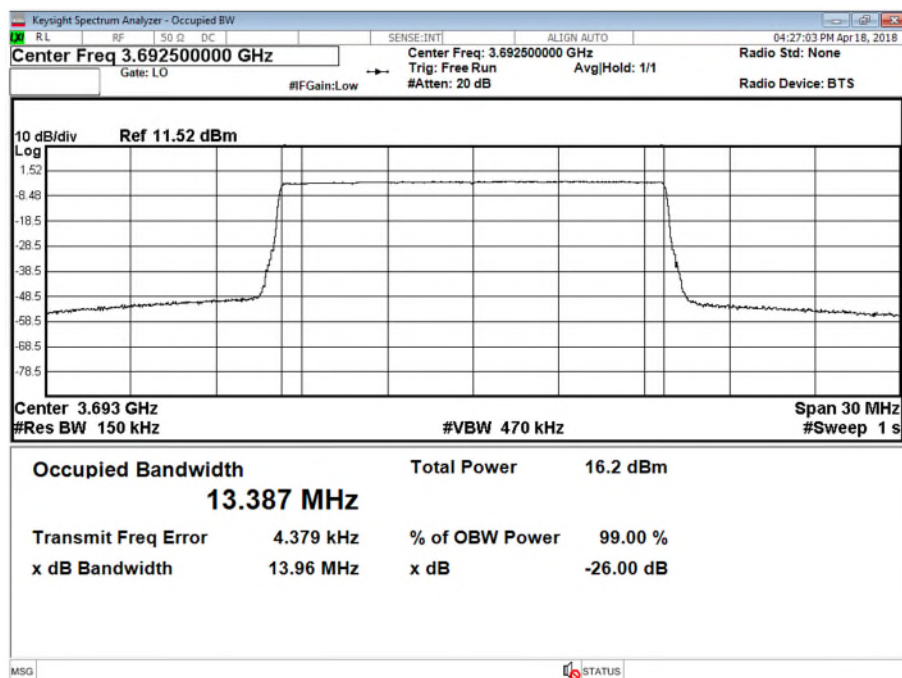
### Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



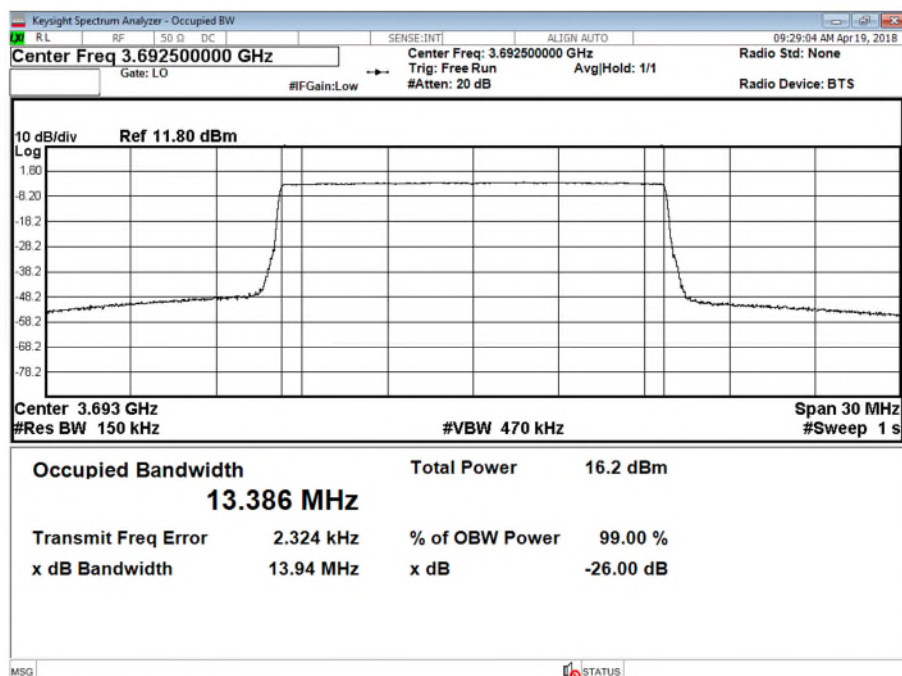


Product Service

### 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

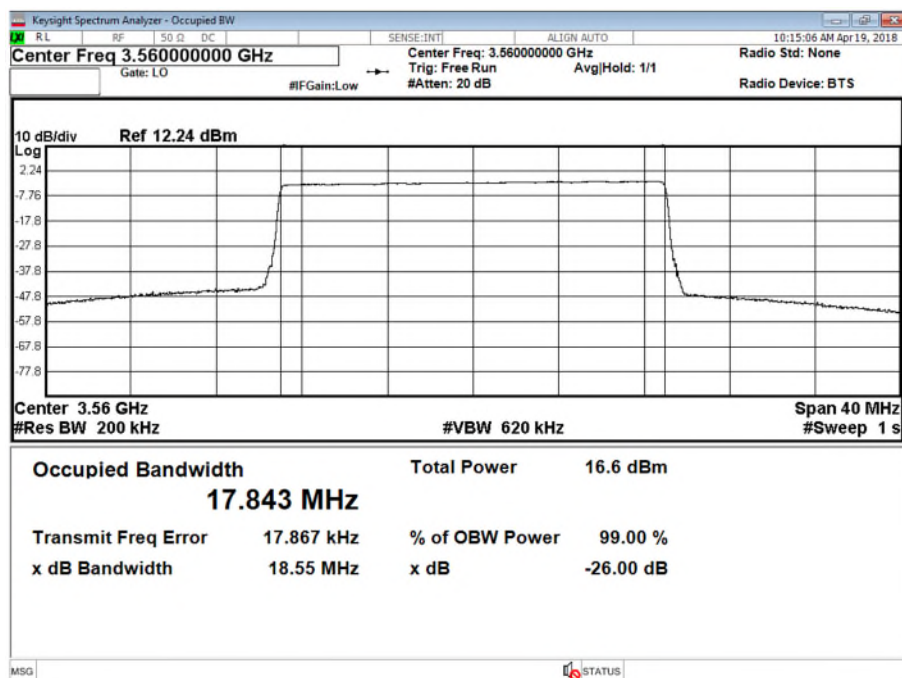




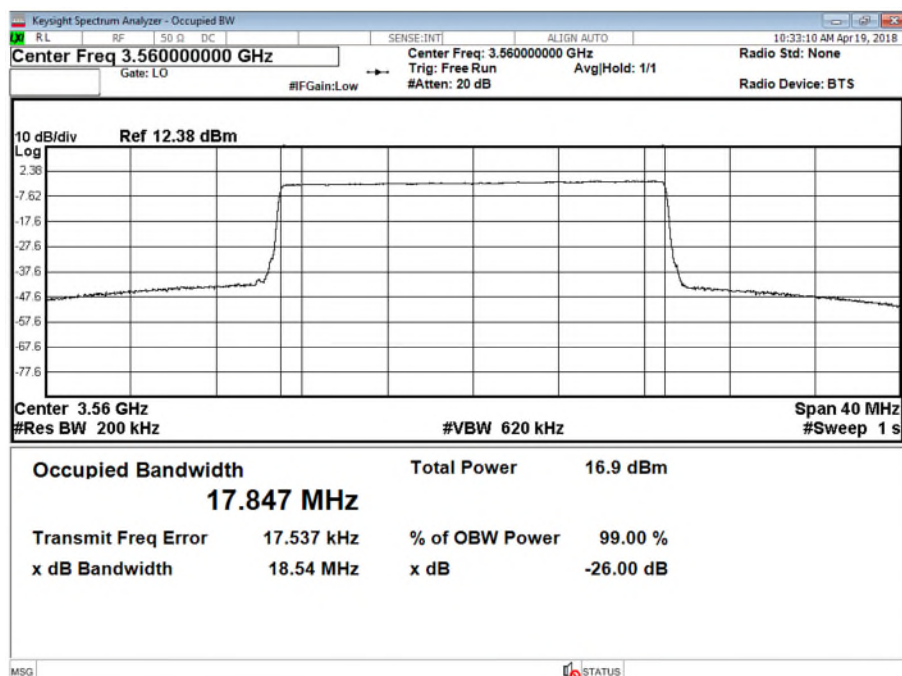


Product Service

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



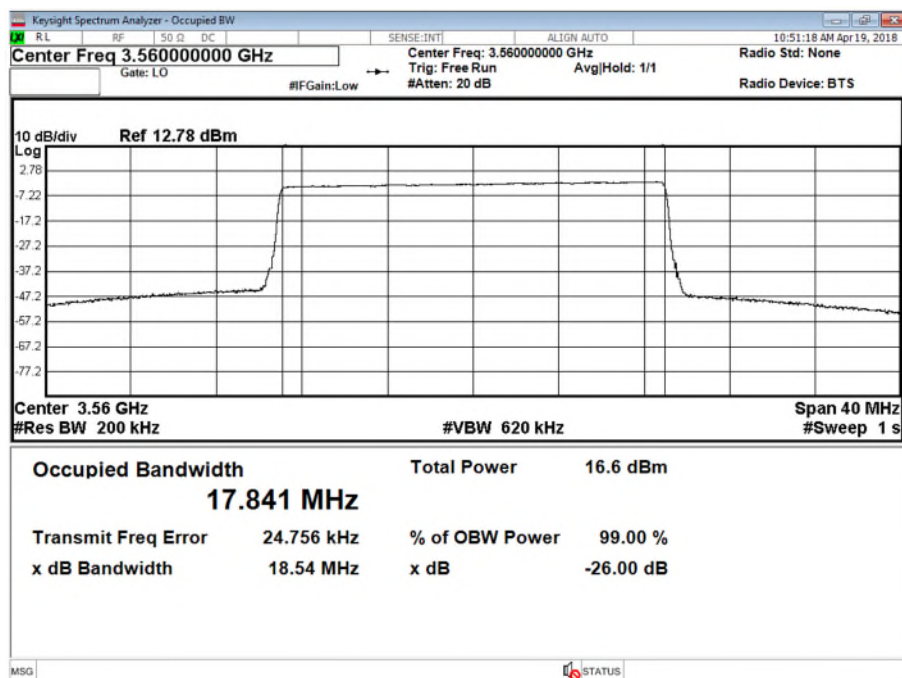
### Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



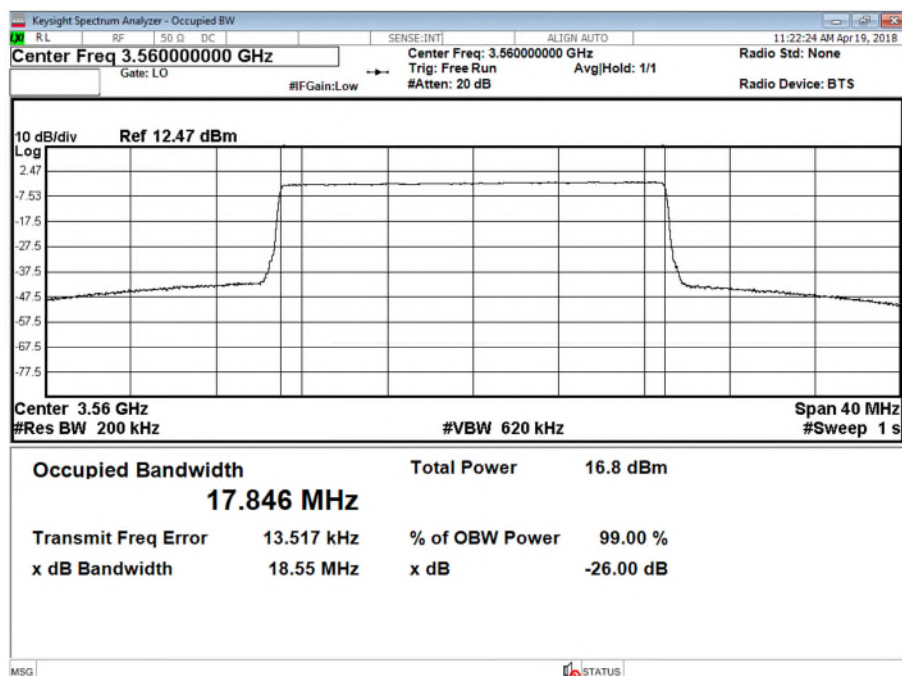


Product Service

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



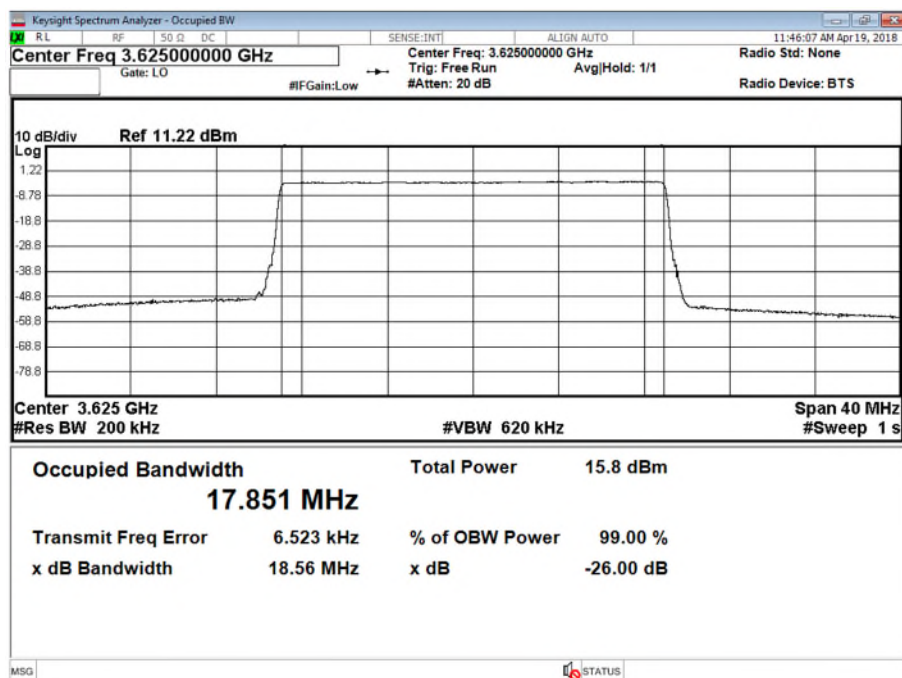
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



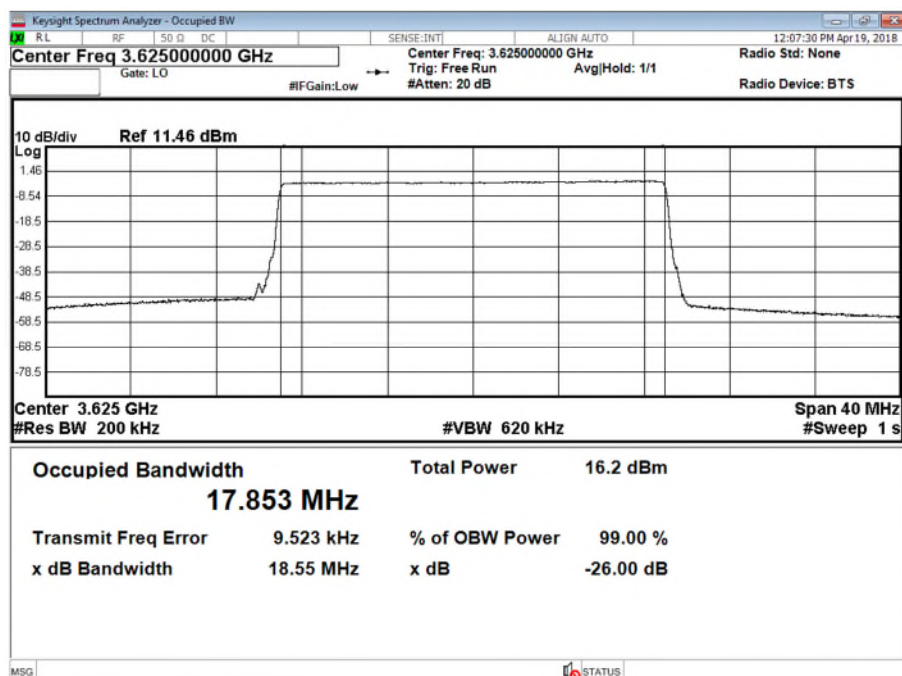


Product Service

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



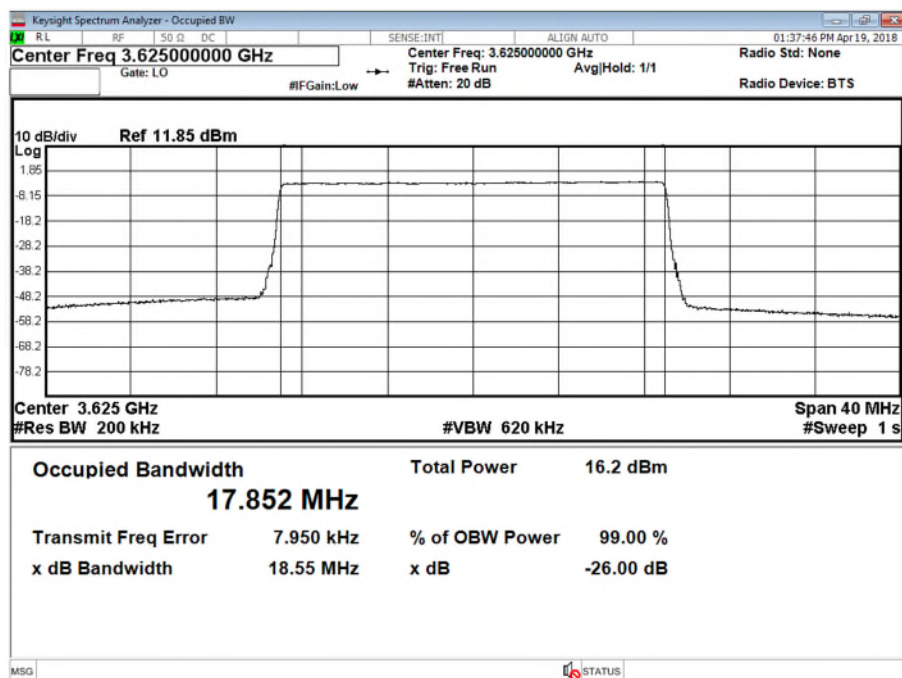
### Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



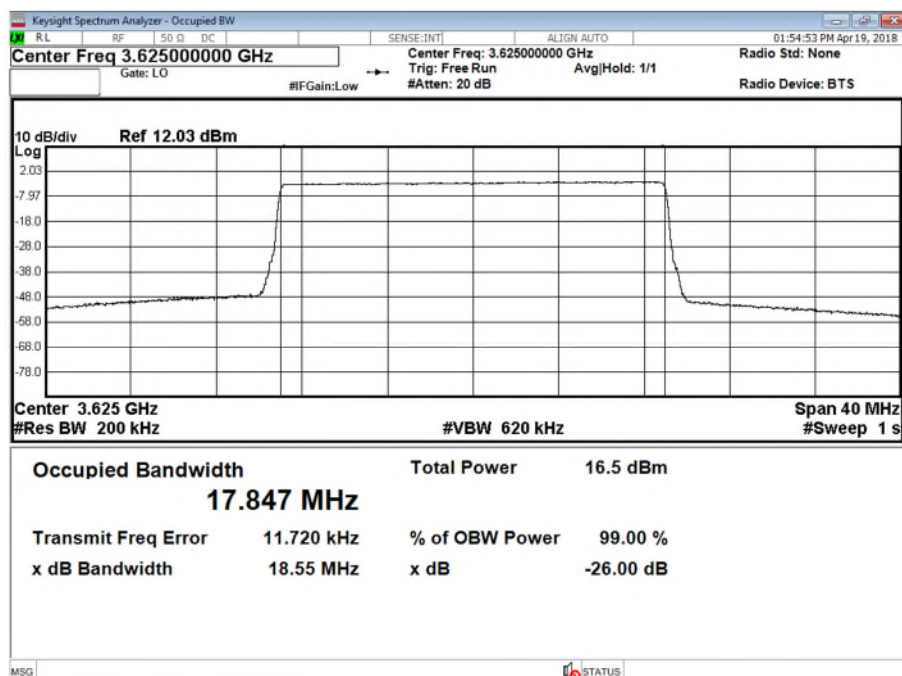


Product Service

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



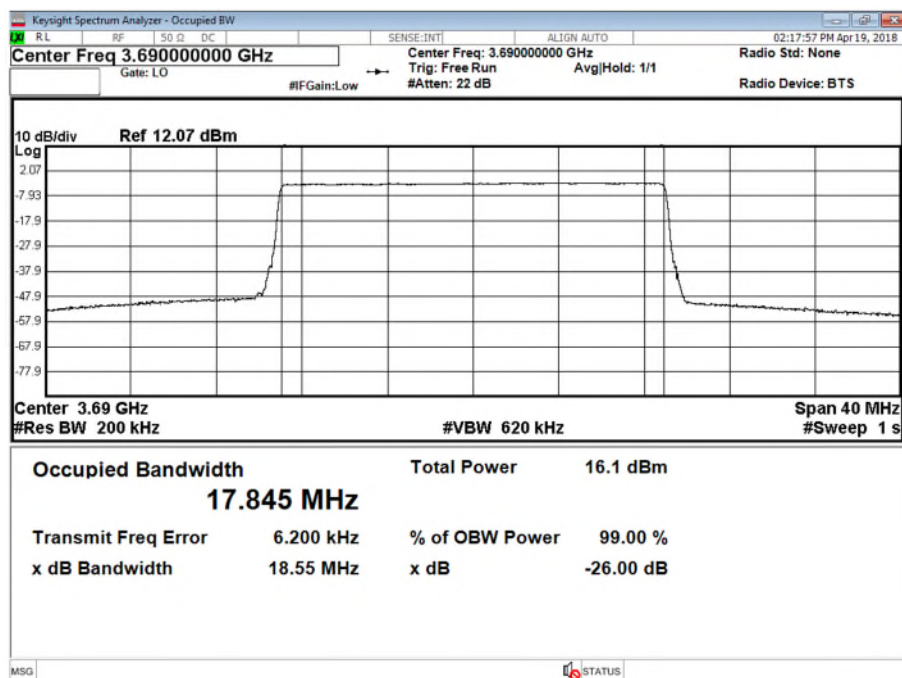
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M



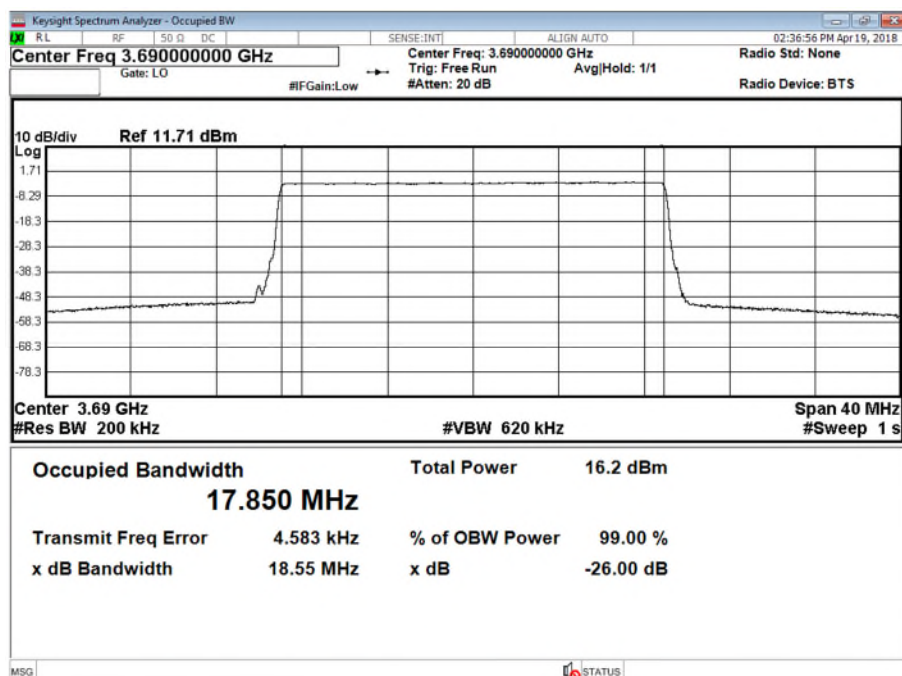


Product Service

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

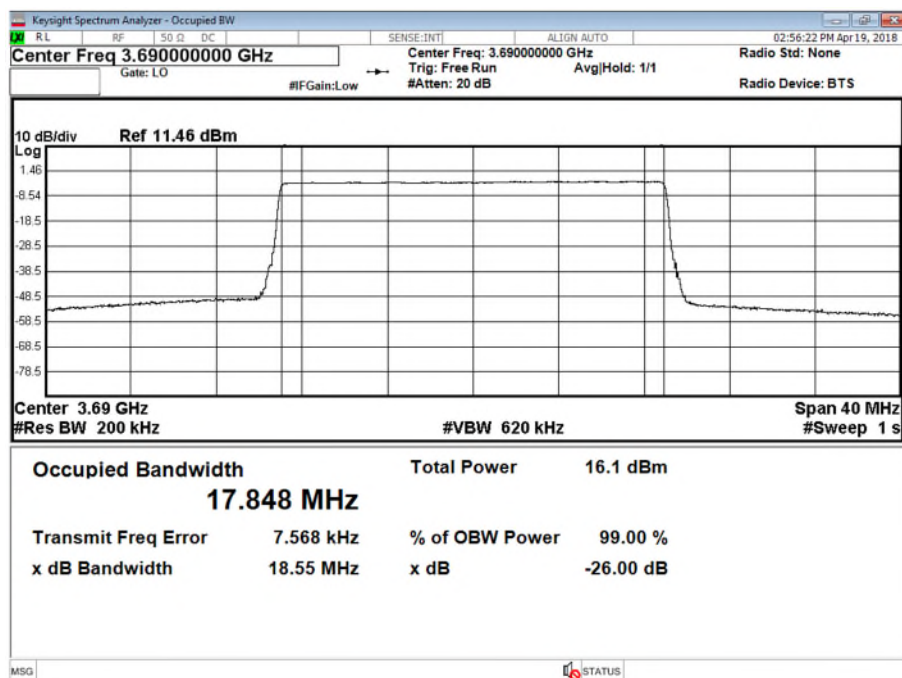




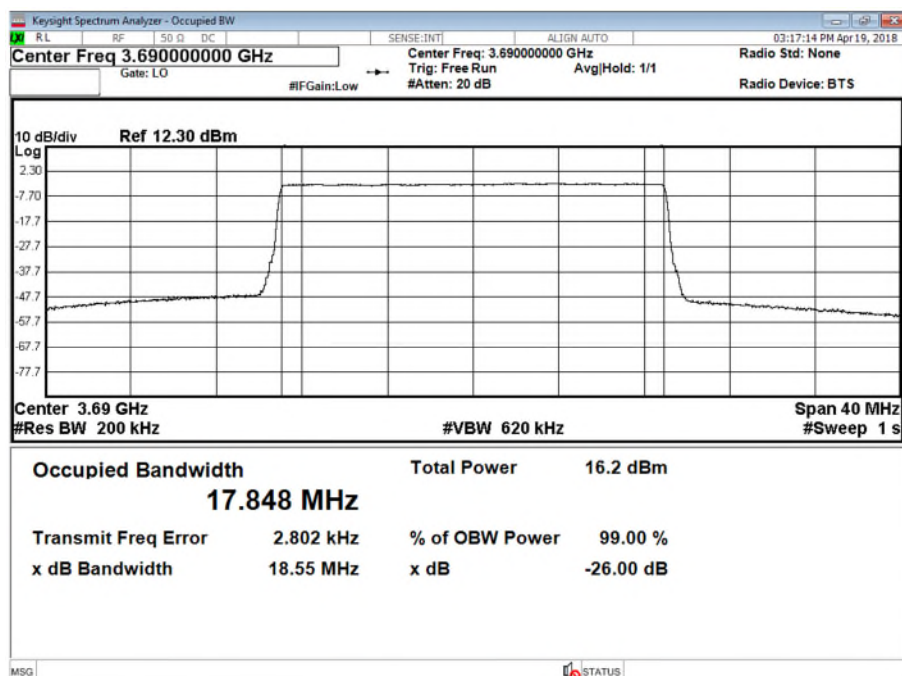


Product Service

### 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**



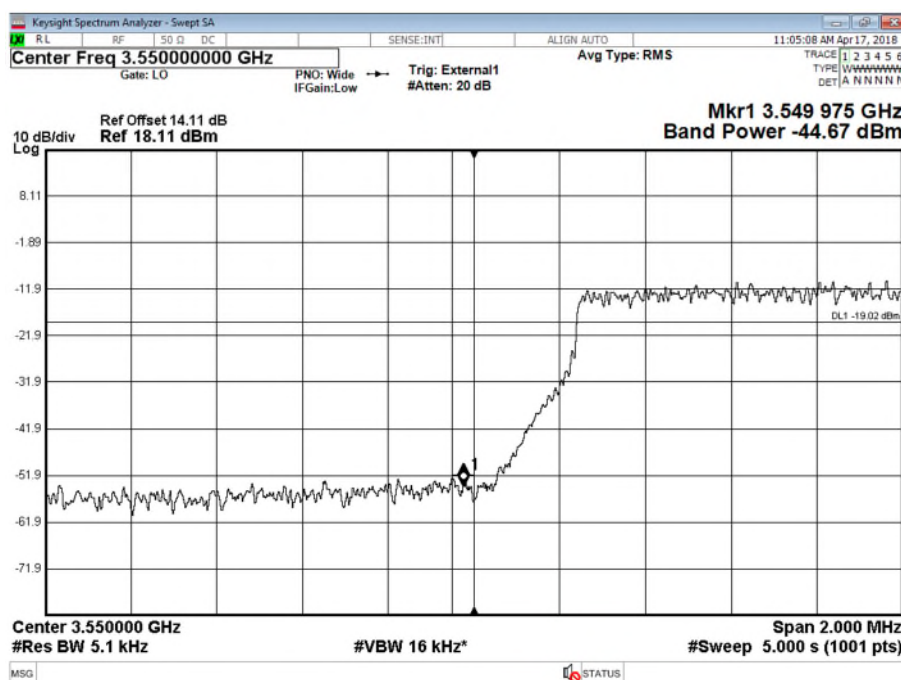
Product Service

## 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

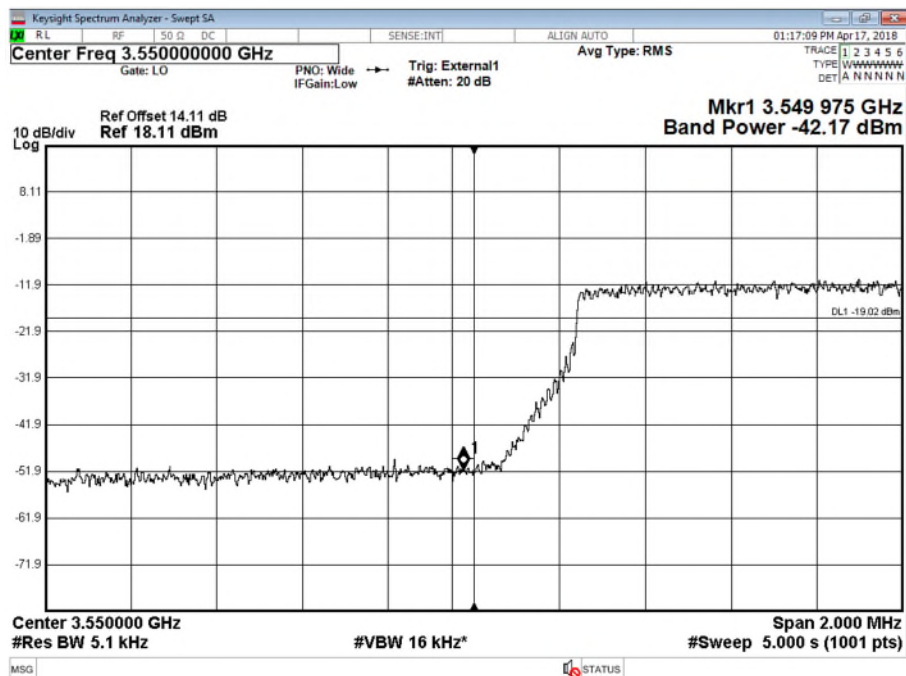
## Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



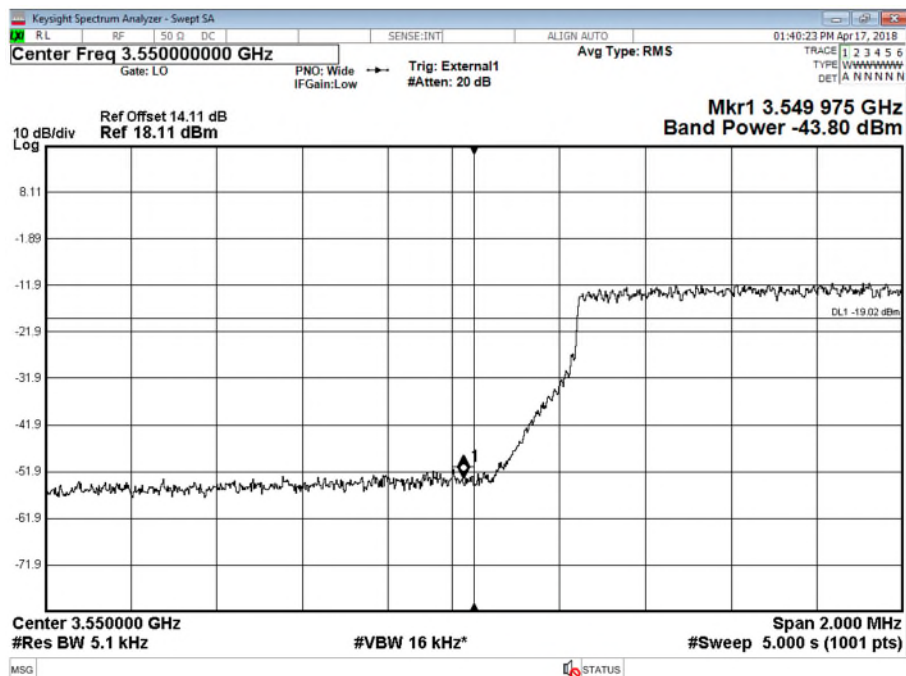


Product Service

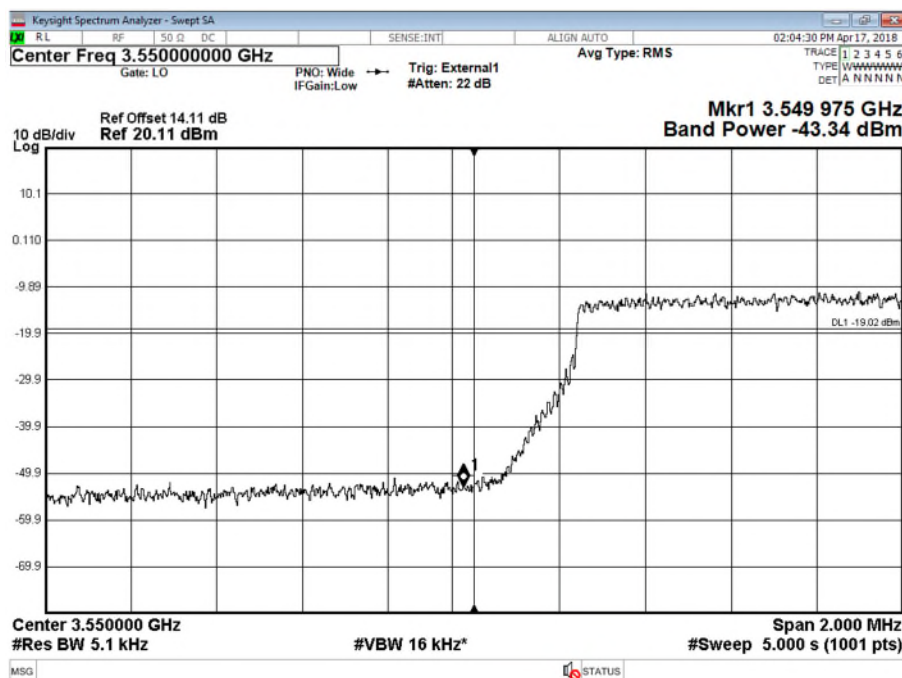
### Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



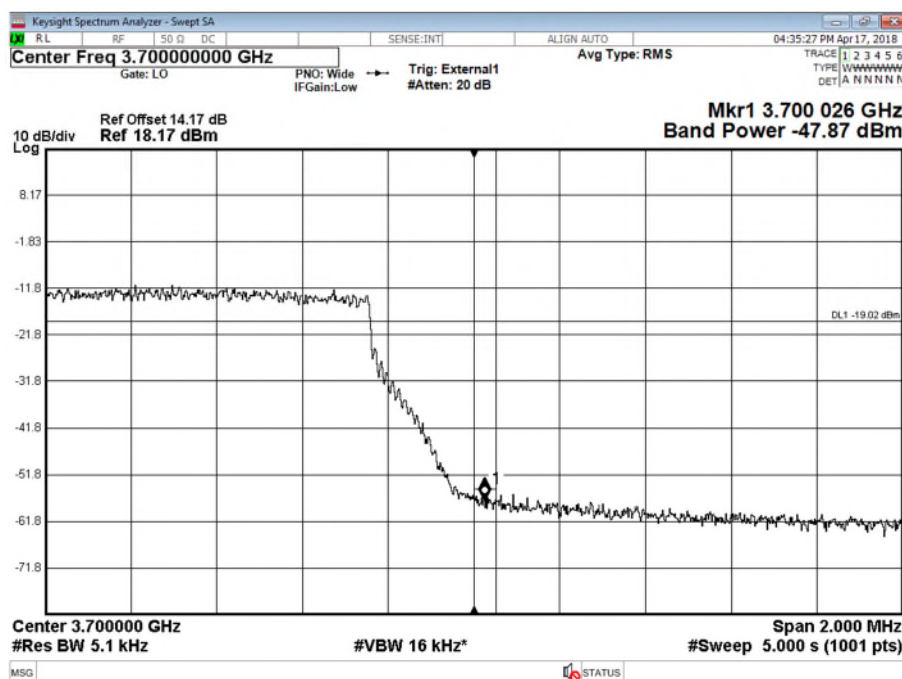
### Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



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

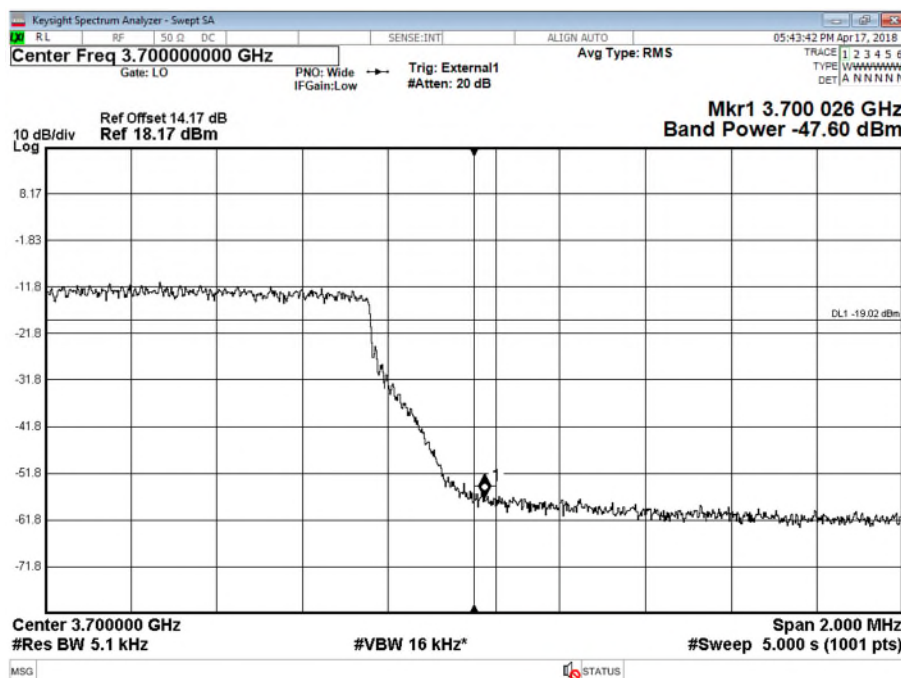


### Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T

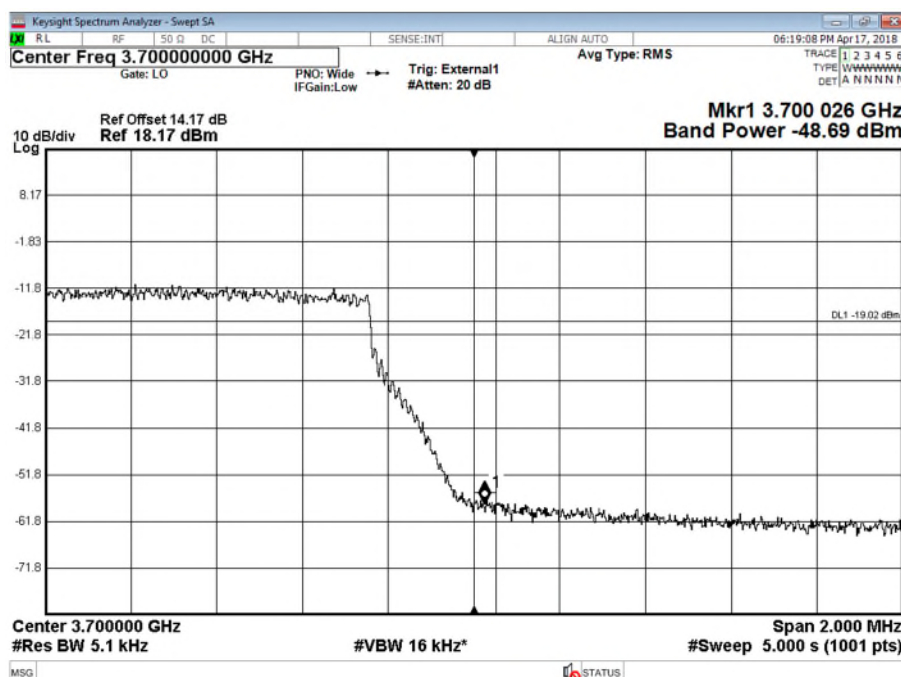




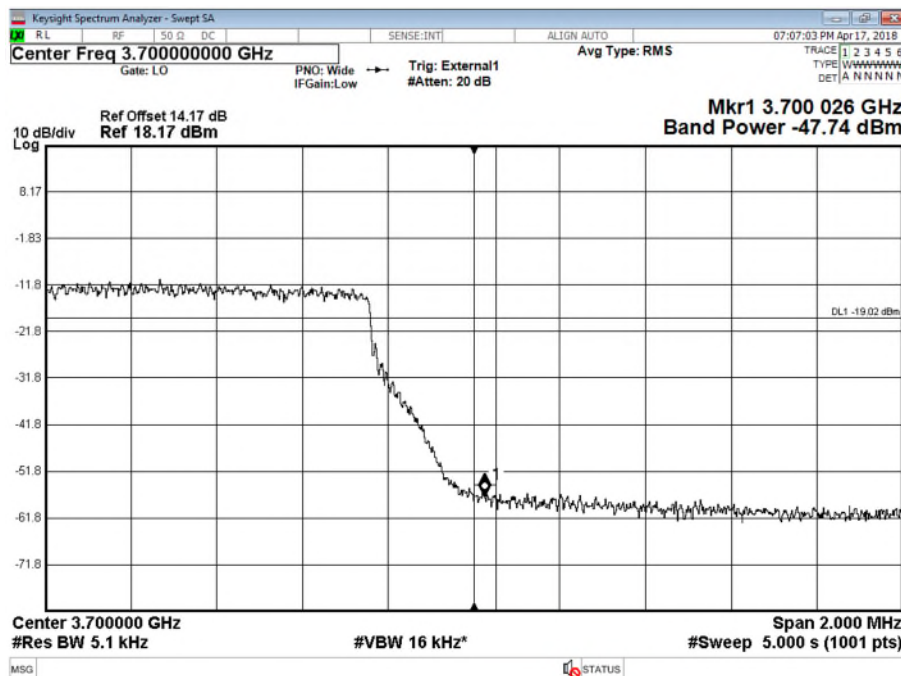
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



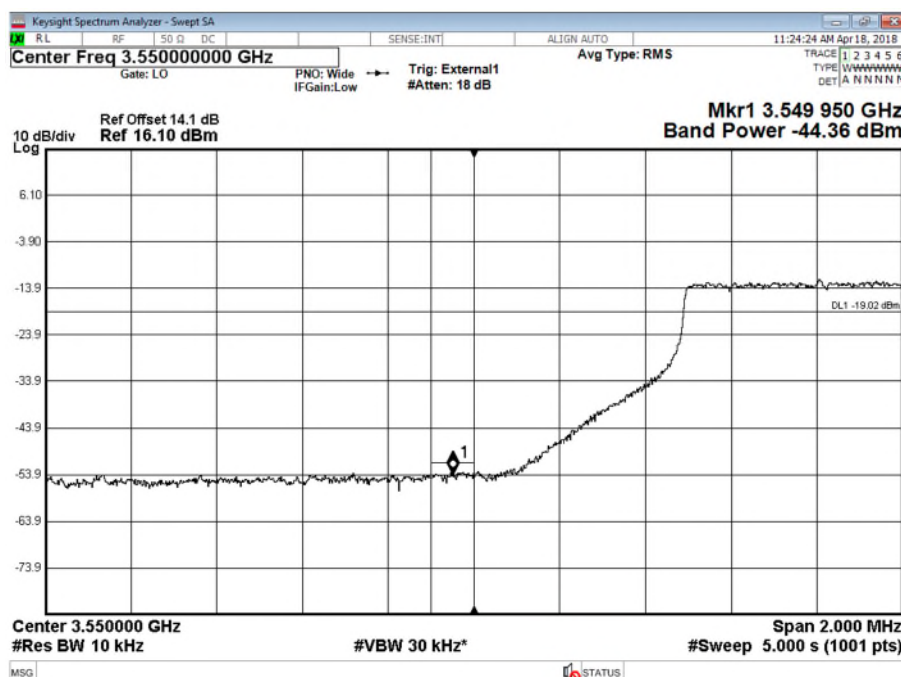
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



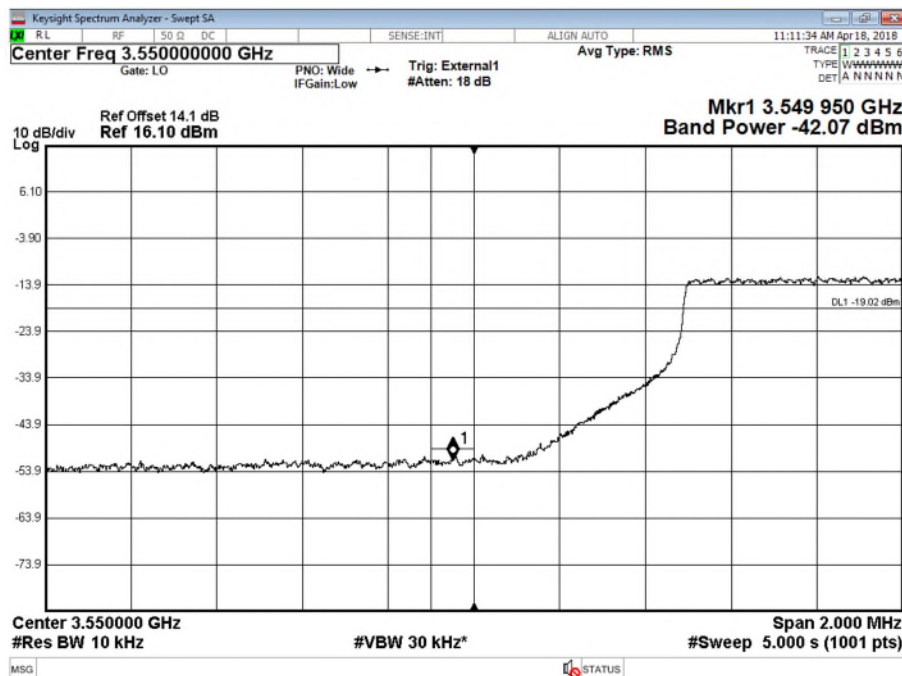
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



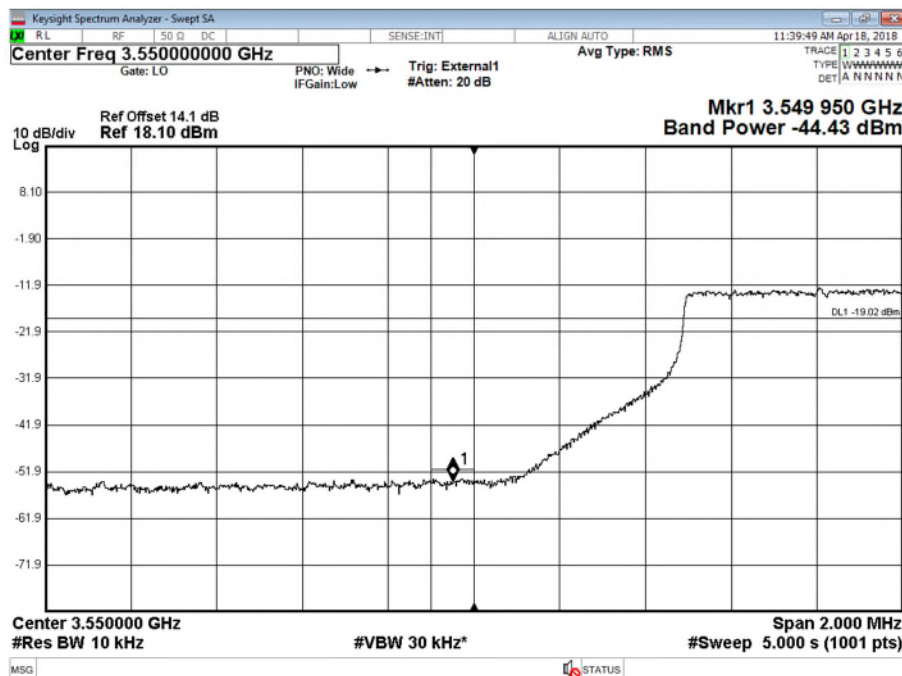
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



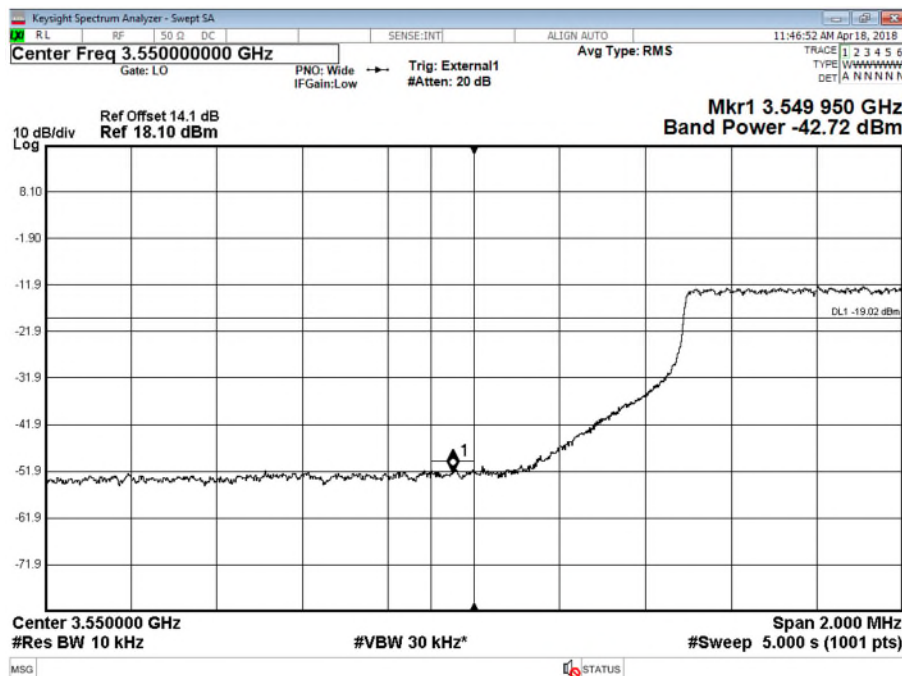
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



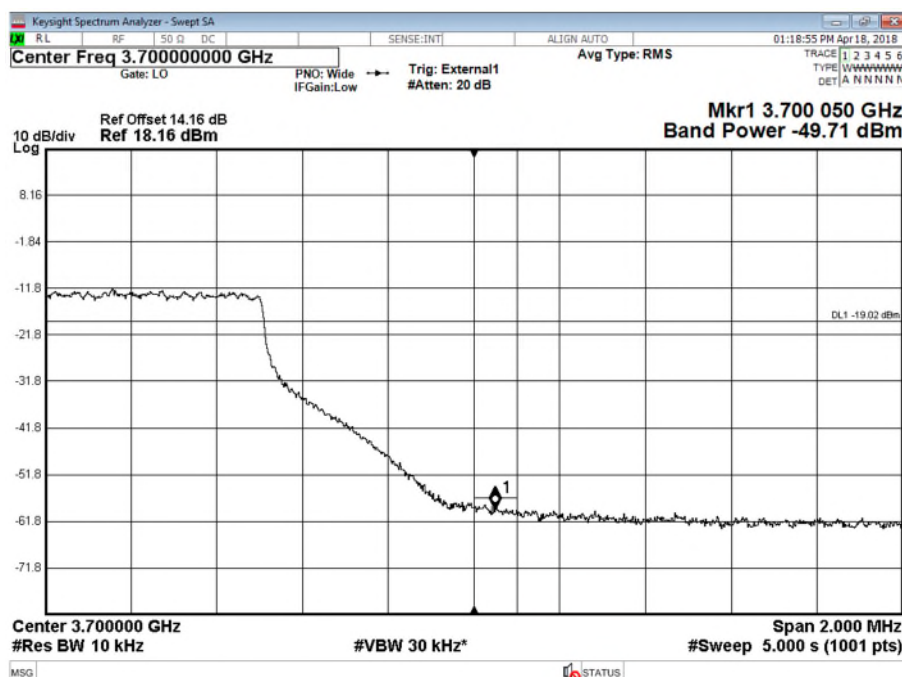
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



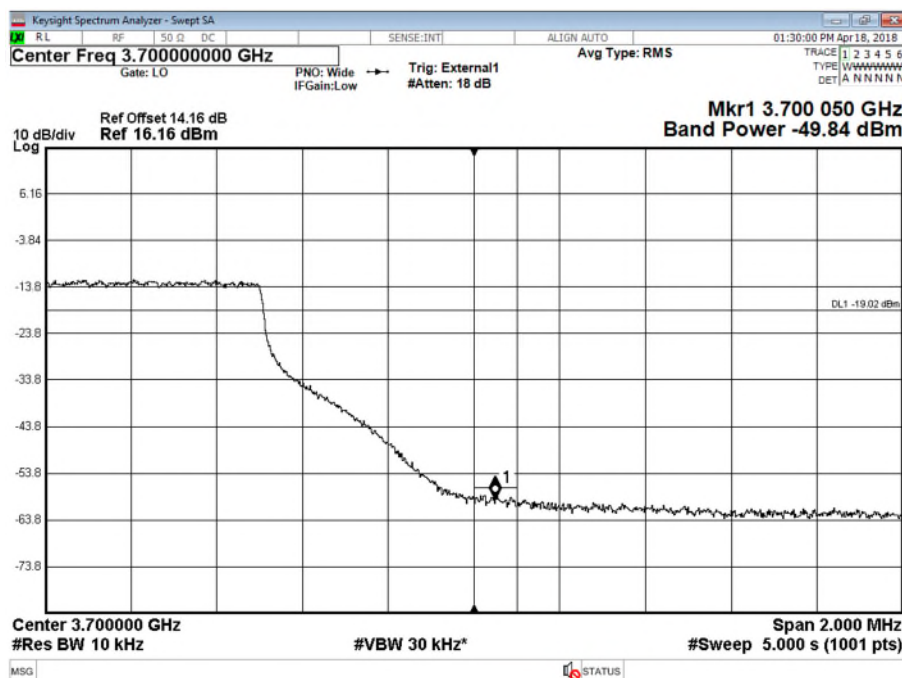
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



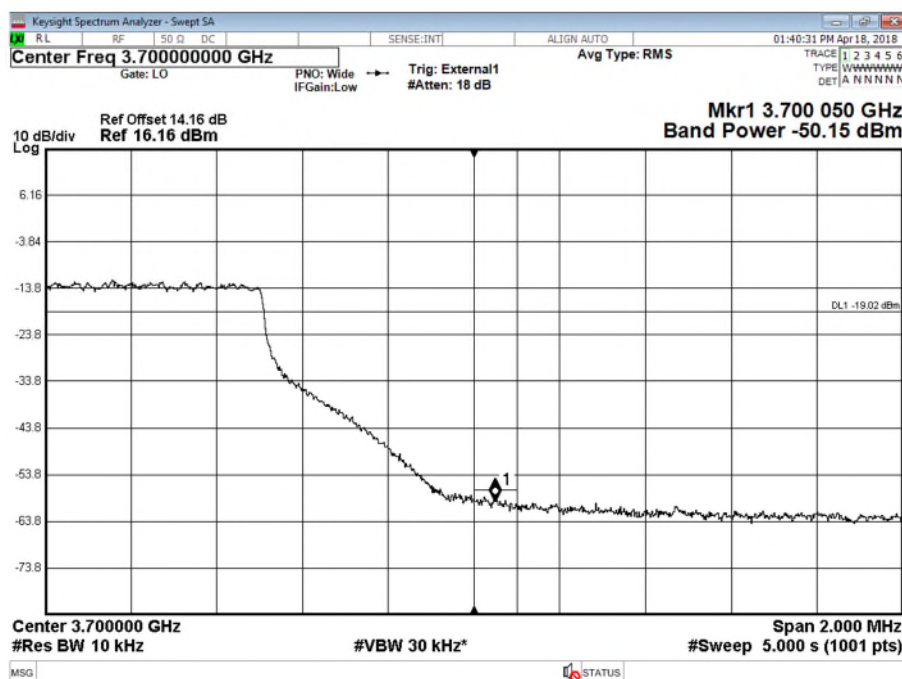
### Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



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

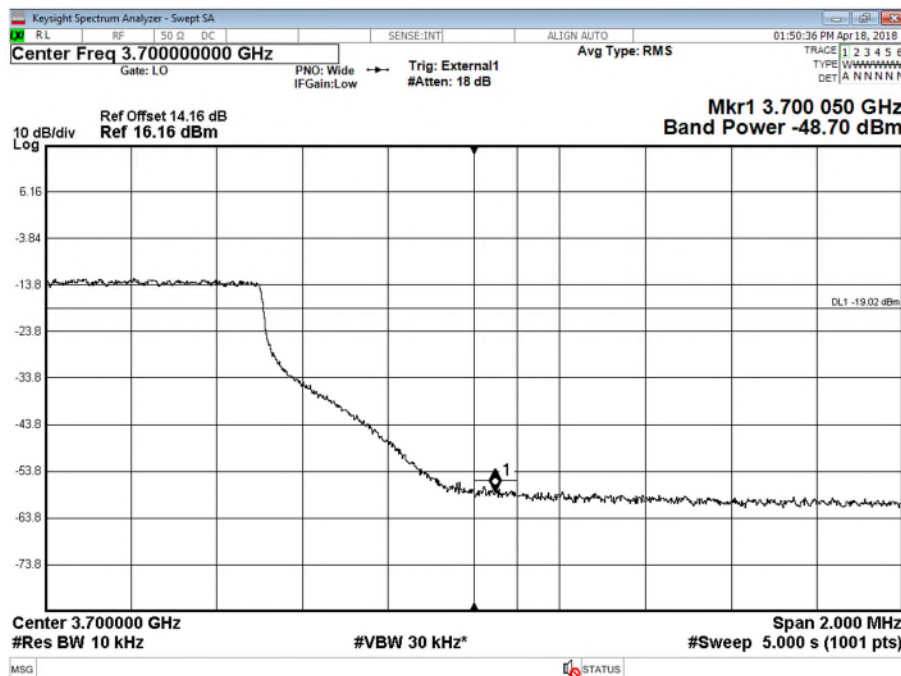


Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T

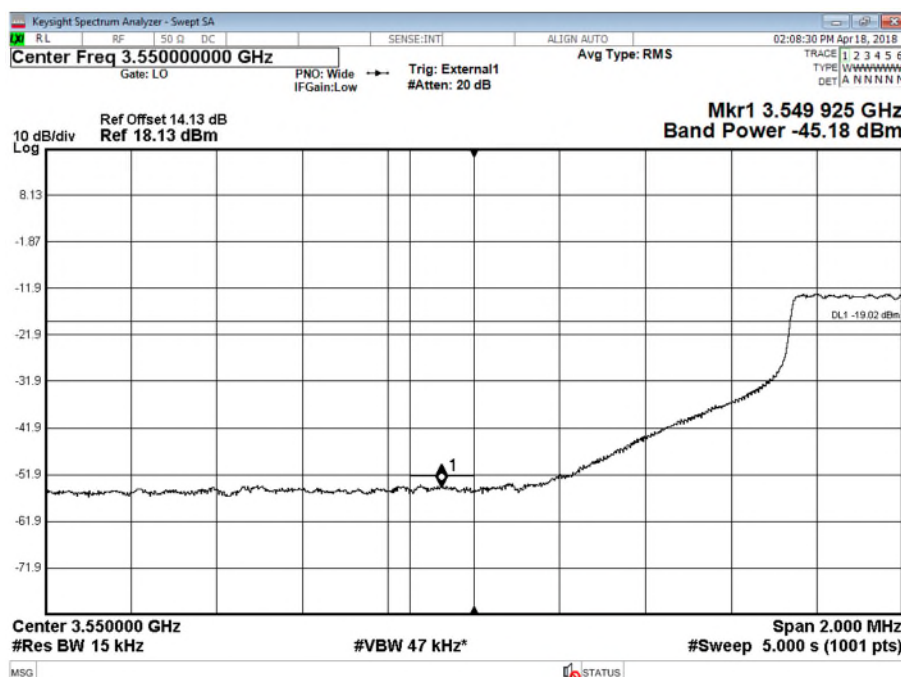




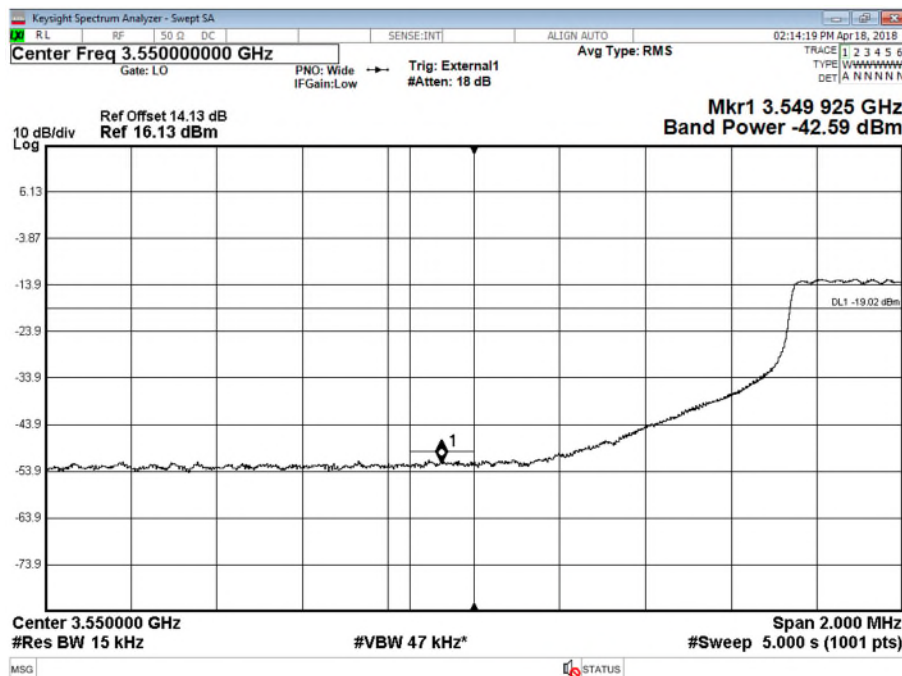
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



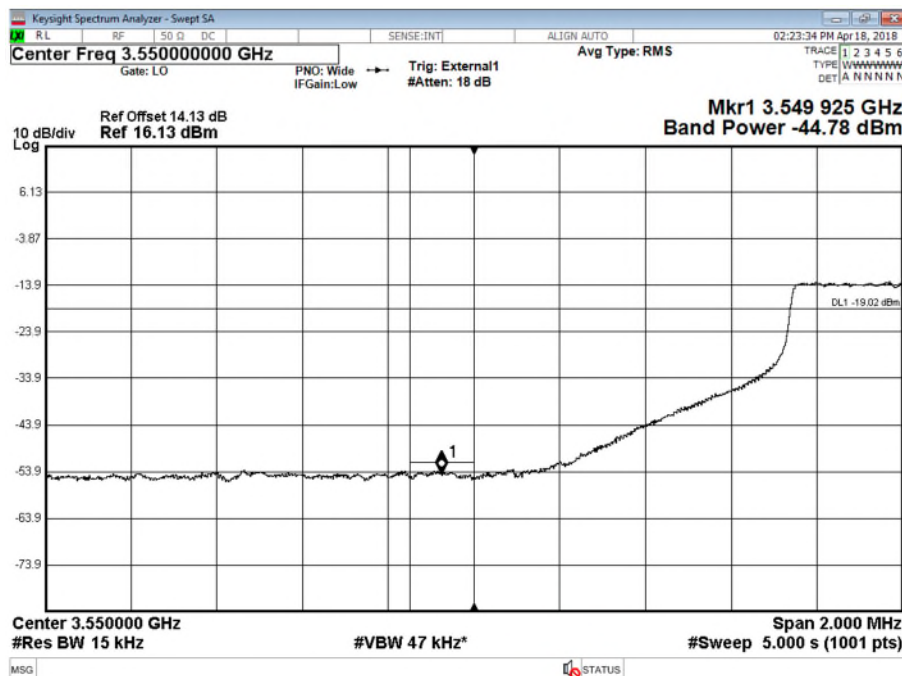
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



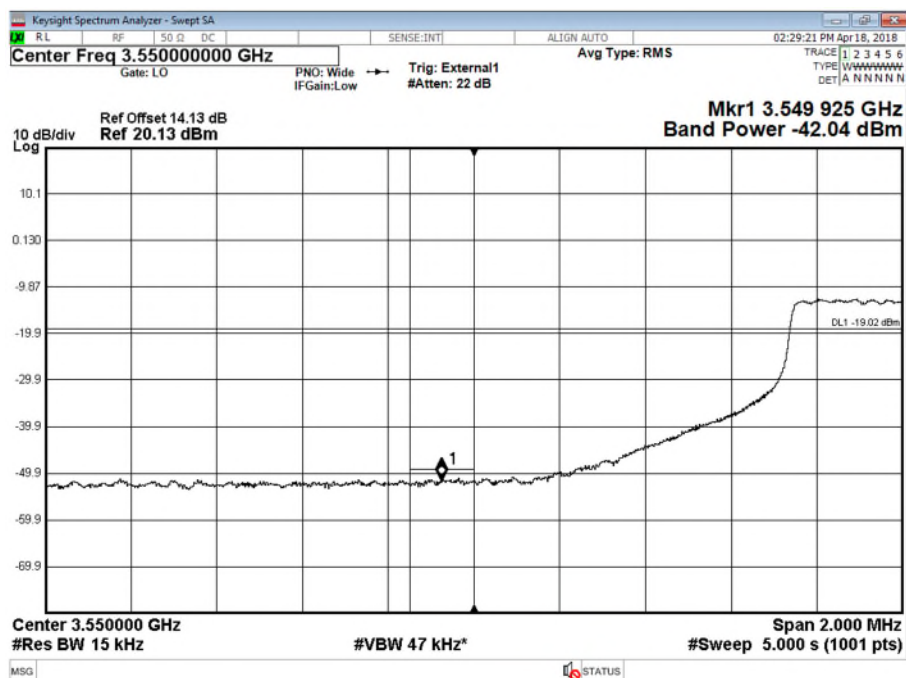
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



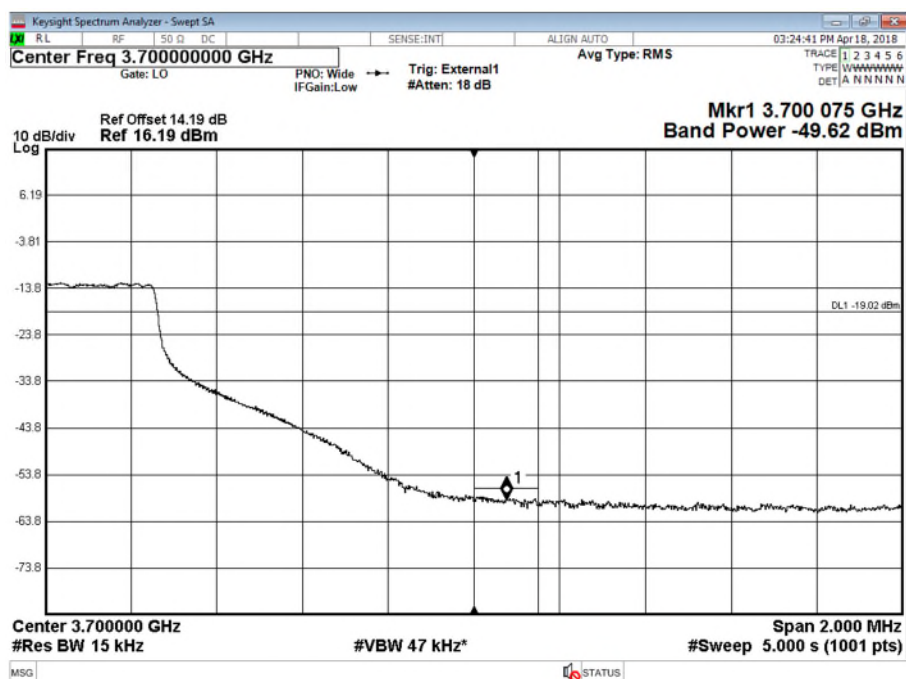
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



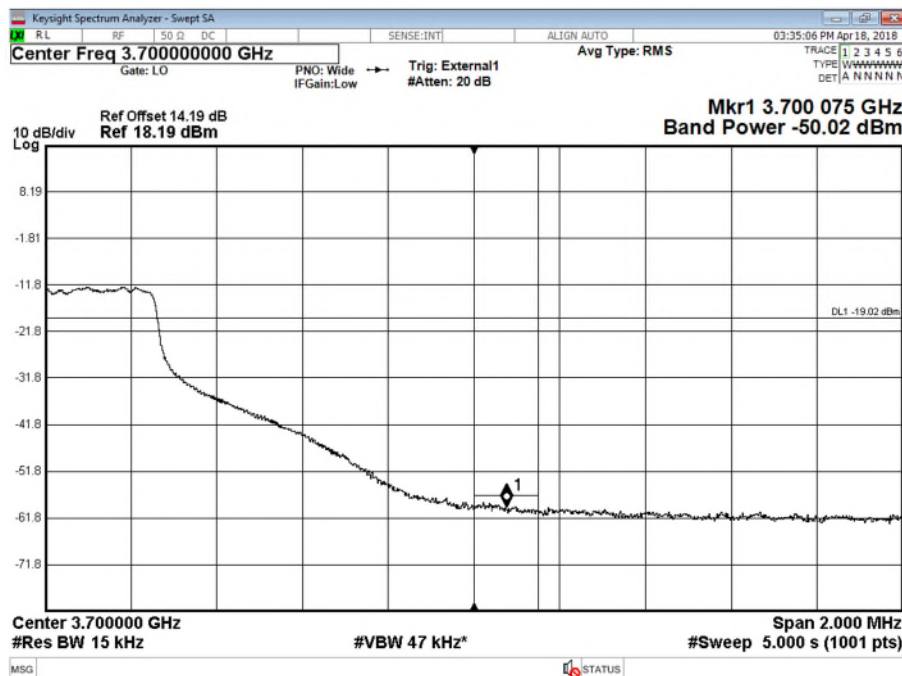
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



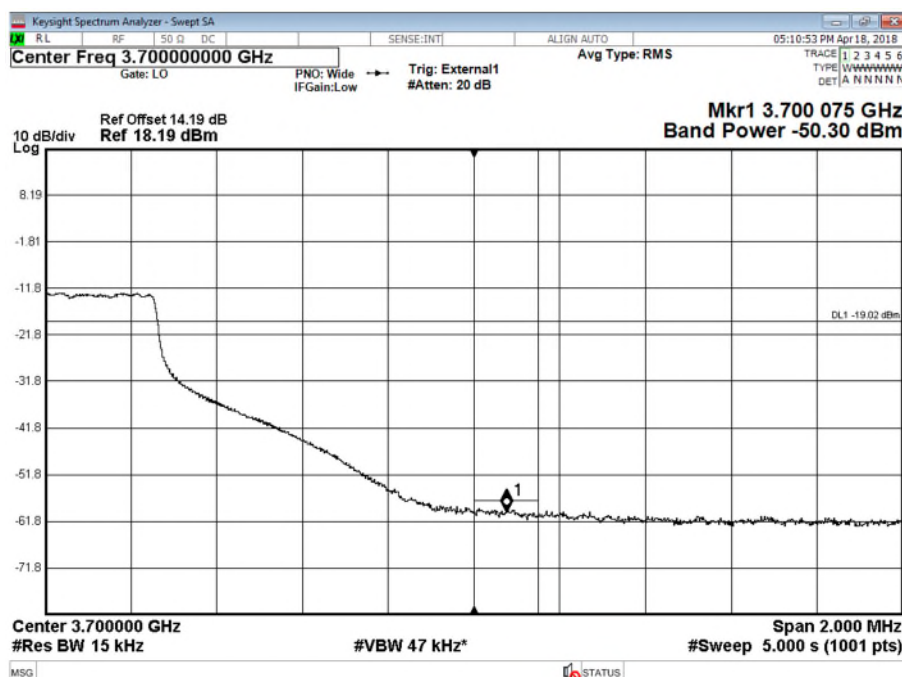
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



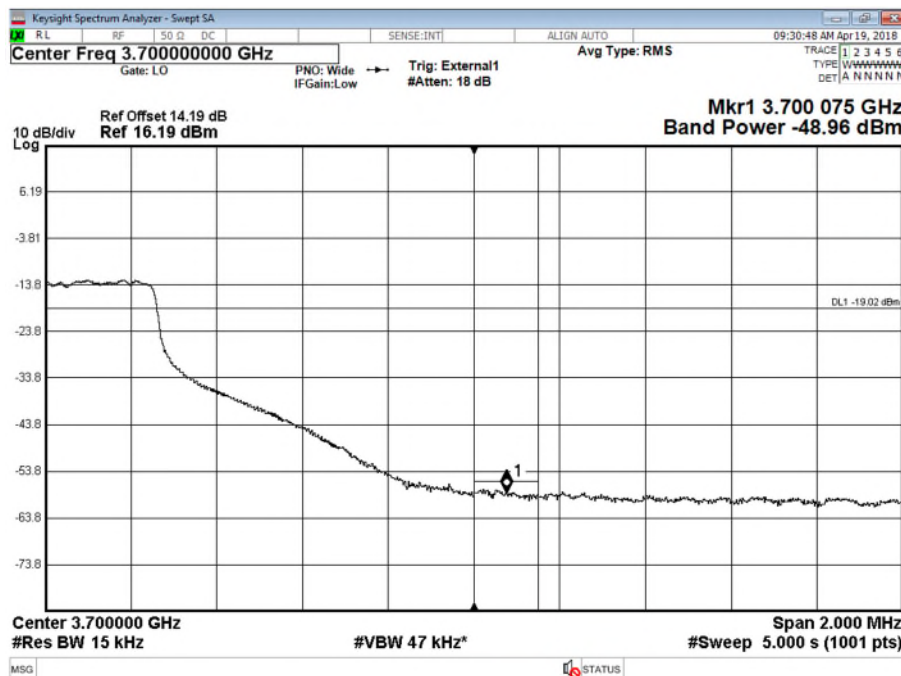
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



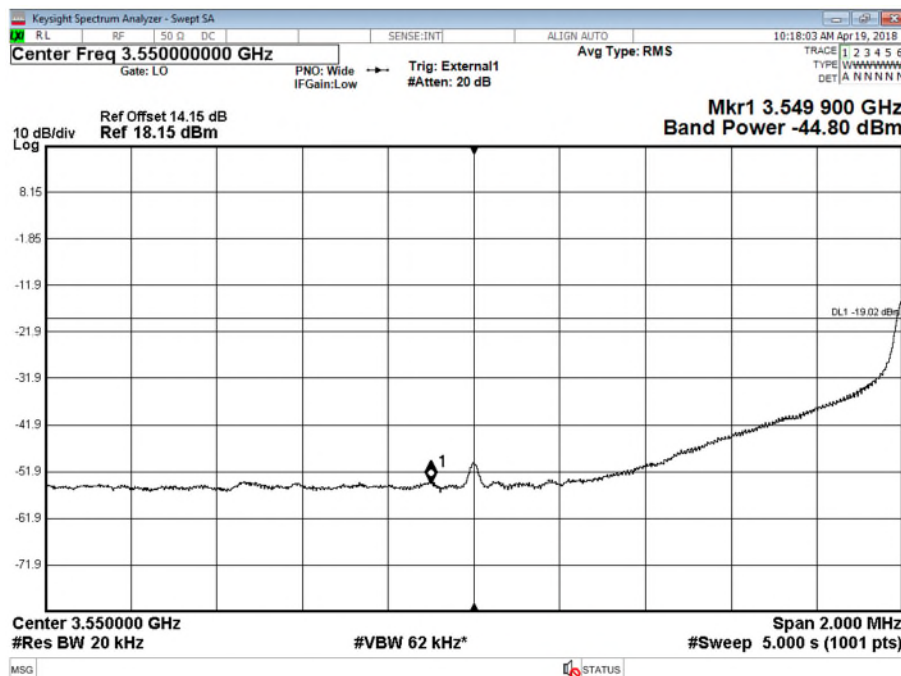
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



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

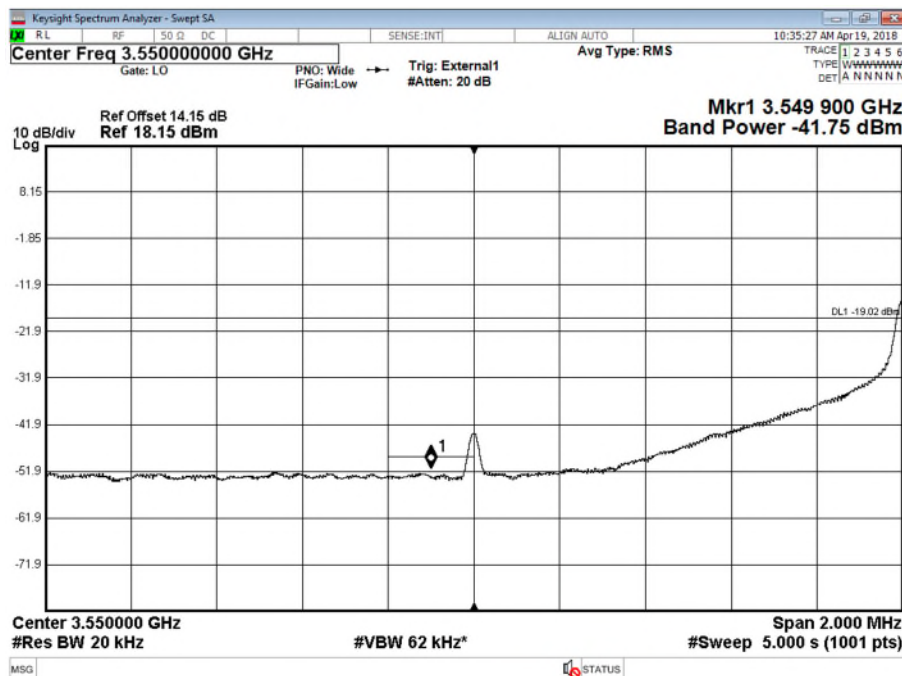


Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B

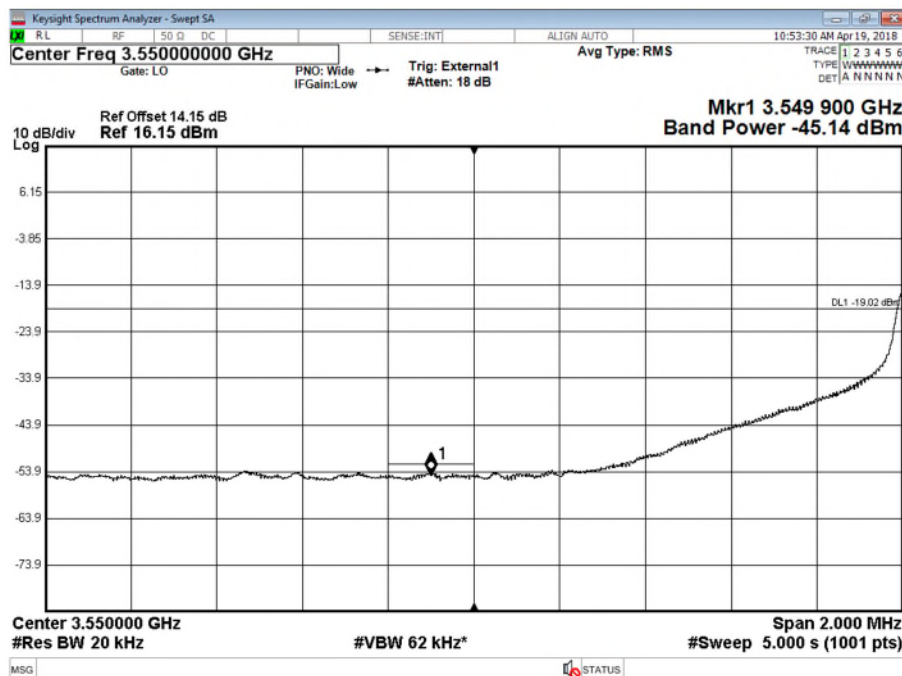




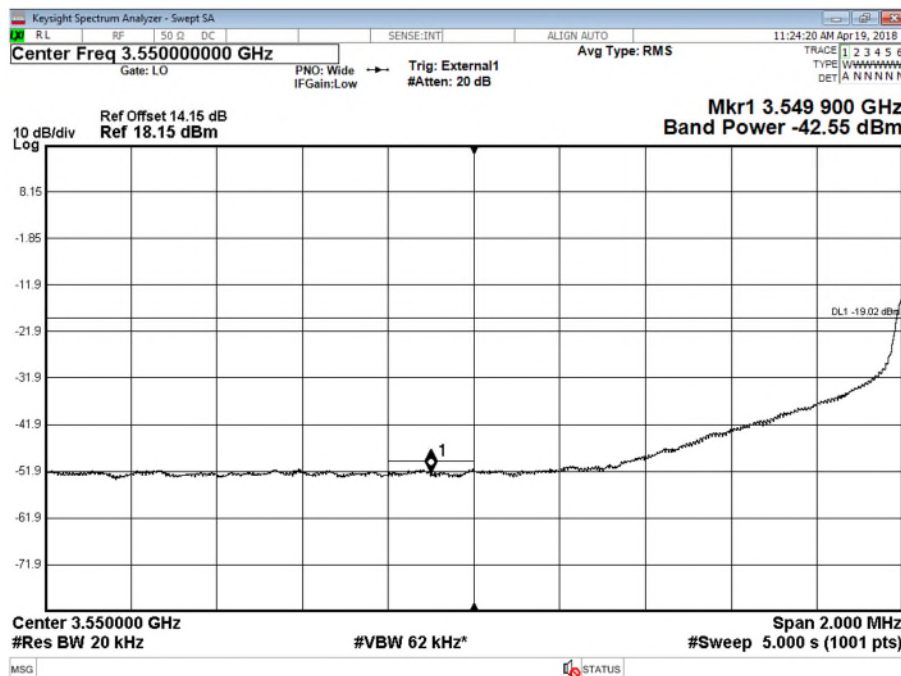
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



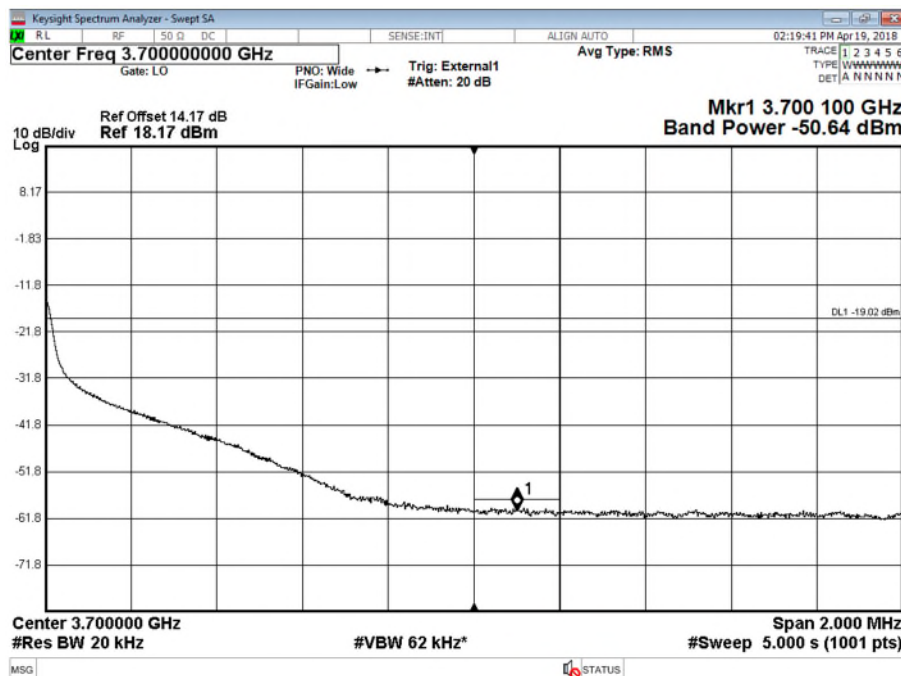
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



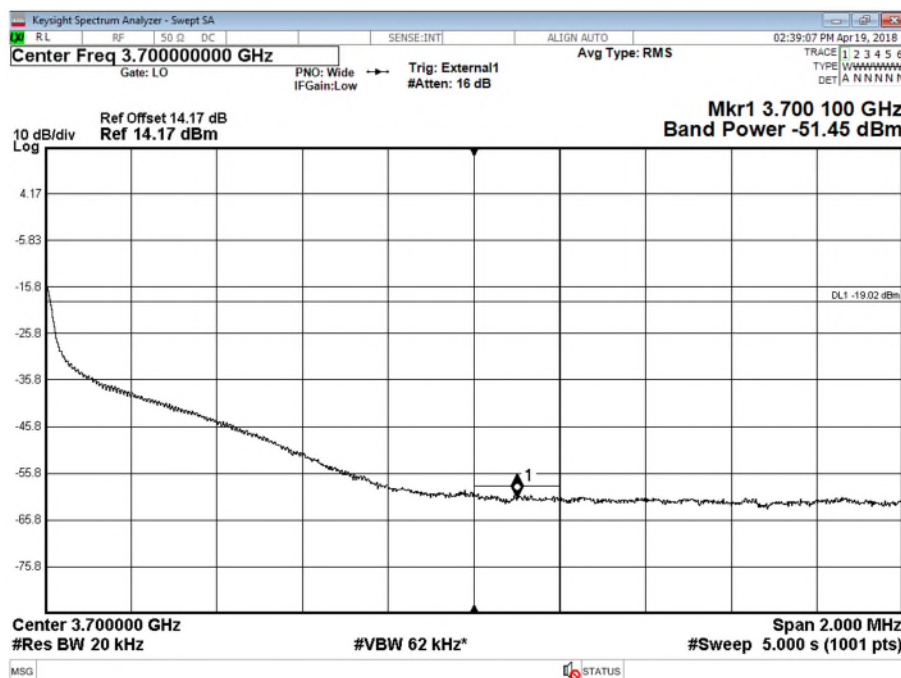
# Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



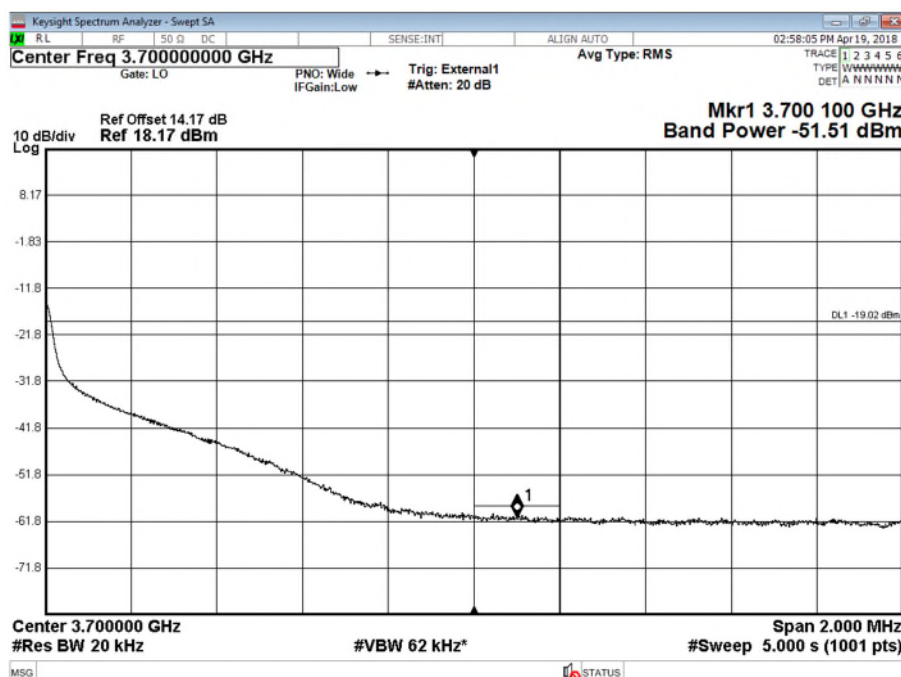
# Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



# 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





Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN AUTO 03:19:12 PM Apr 19, 2018

Center Freq 3.700000000 GHz Avg Type: RMS

Gate: LO PNO: Wide IFGain: Low Trig: External1 #Atten: 18 dB

TRACE 1 2 3 4 5 TYPE: Waveform DET: A N N N N

Ref Offset 14.17 dB Ref 16.17 dBm

Mkr1 3.700 100 GHz Band Power -49.75 dBm

10 dB/div Log

6.17 -3.83 -13.8 -23.8 -33.8 -43.8 -53.8 -63.8 -73.8

DL1 -19.02 dBm

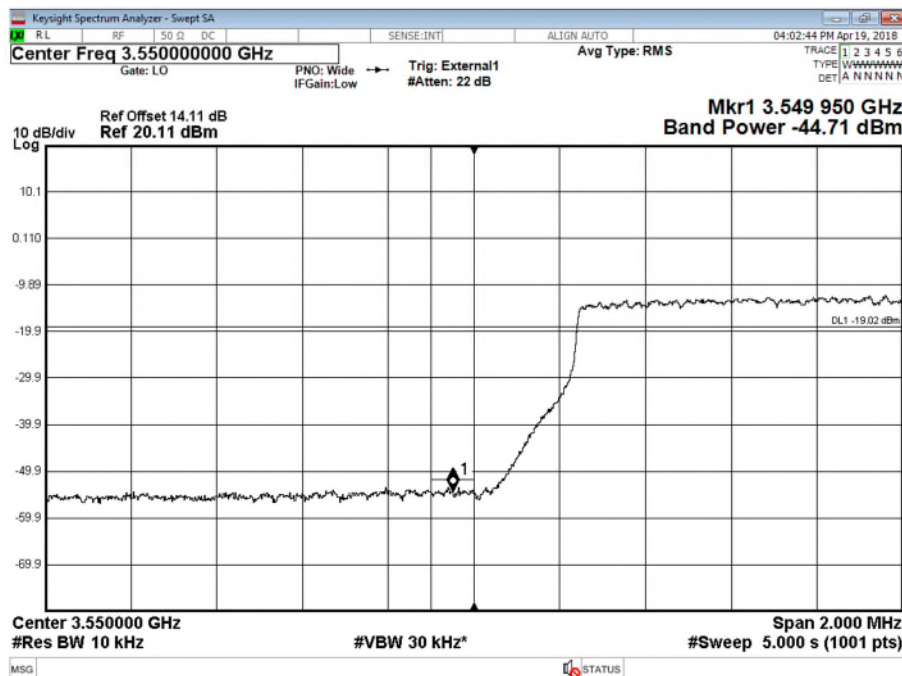
Center 3.700000 GHz #Res BW 20 kHz #VBW 62 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts)

MSG STATUS

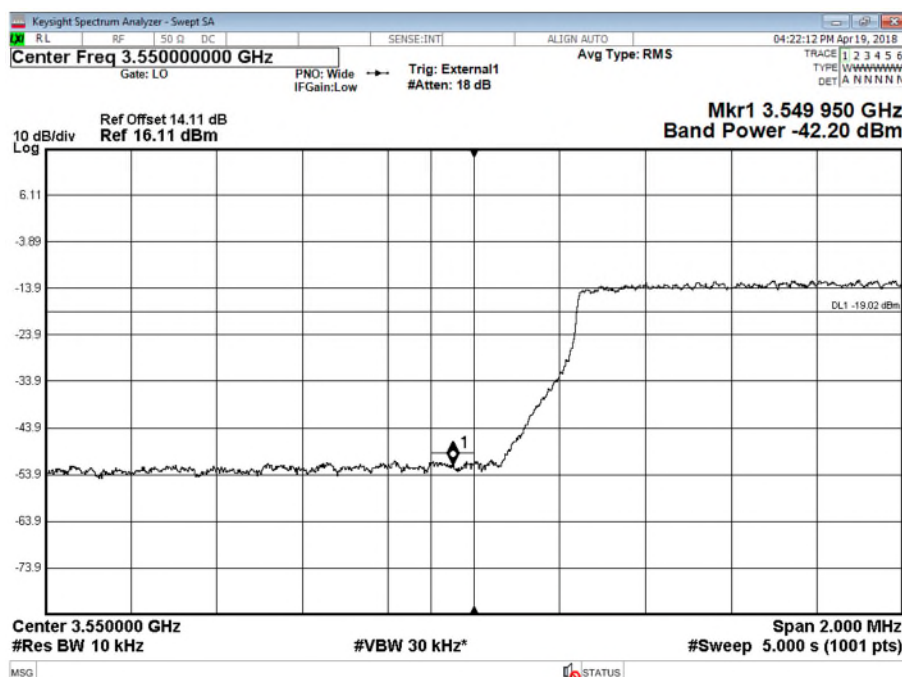
Maximum Output Power 17 dBm

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

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

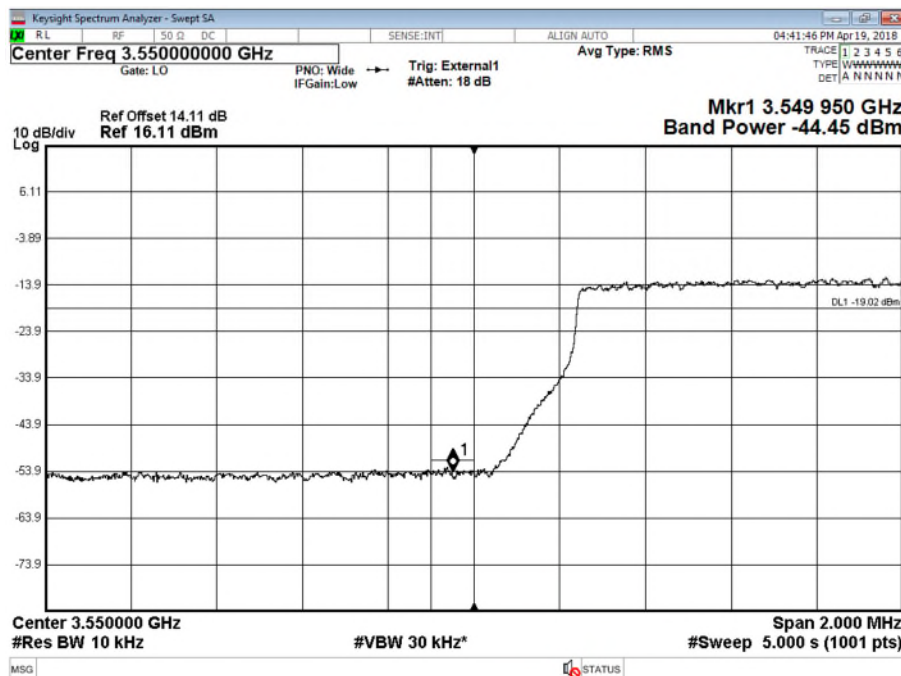


Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B

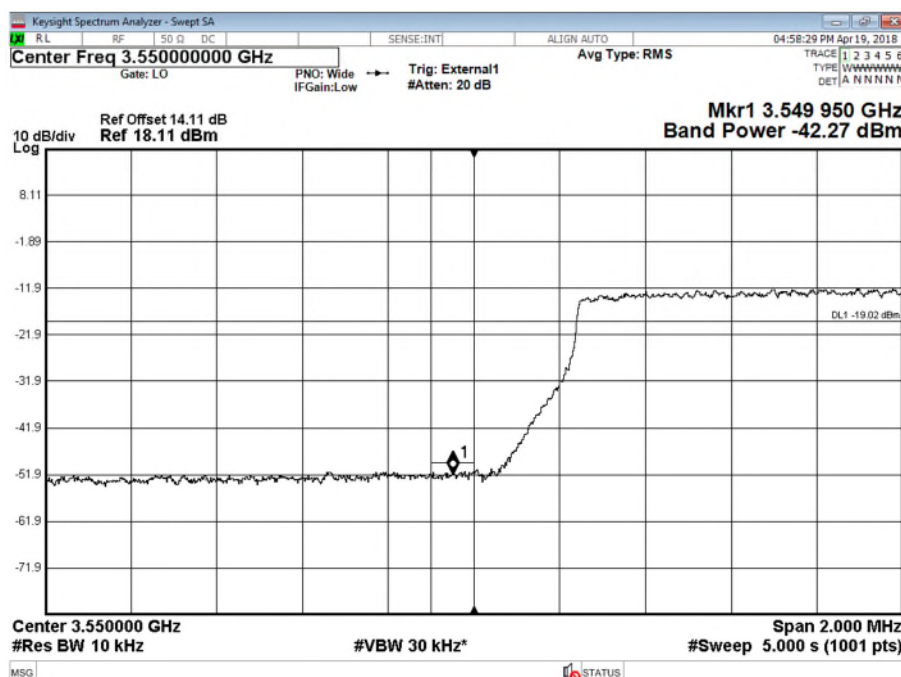




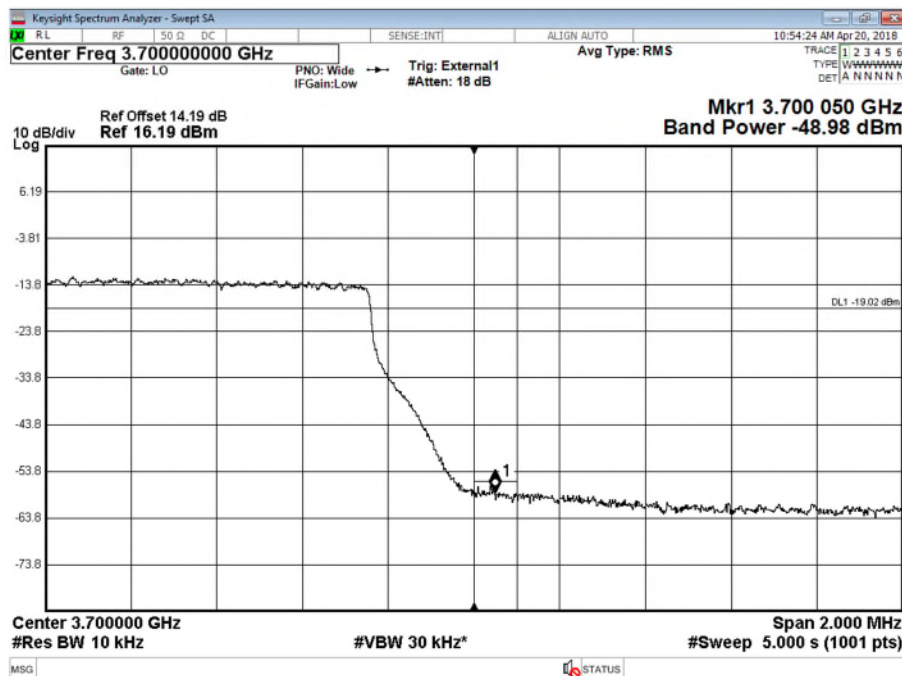
### Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



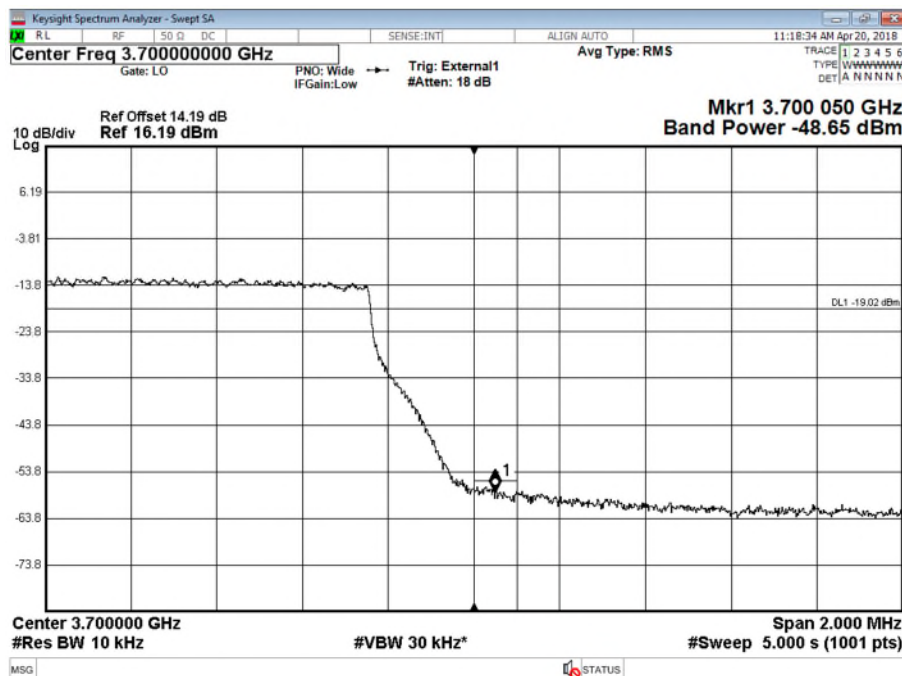
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B



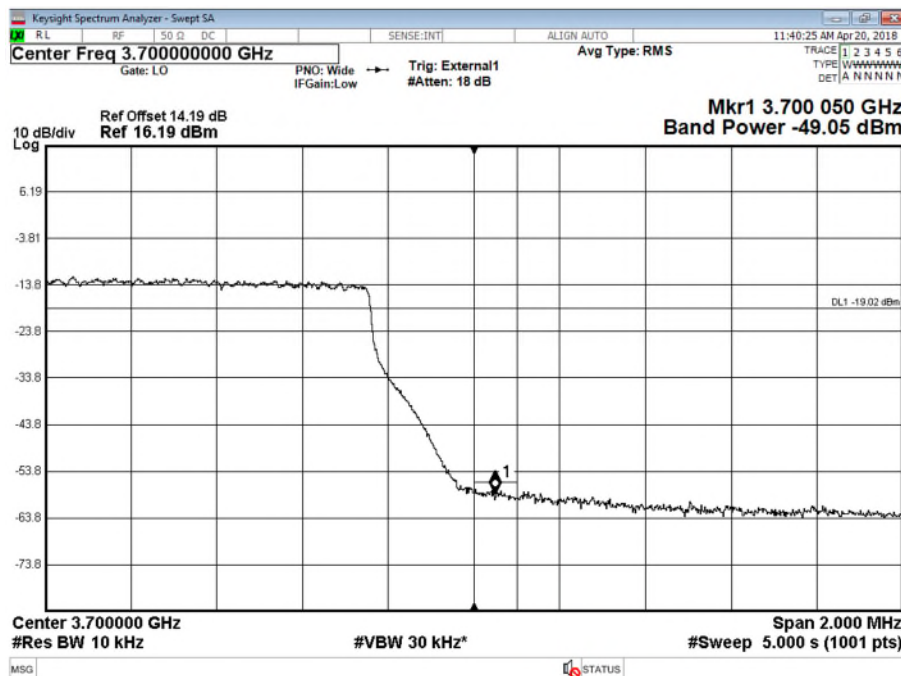
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



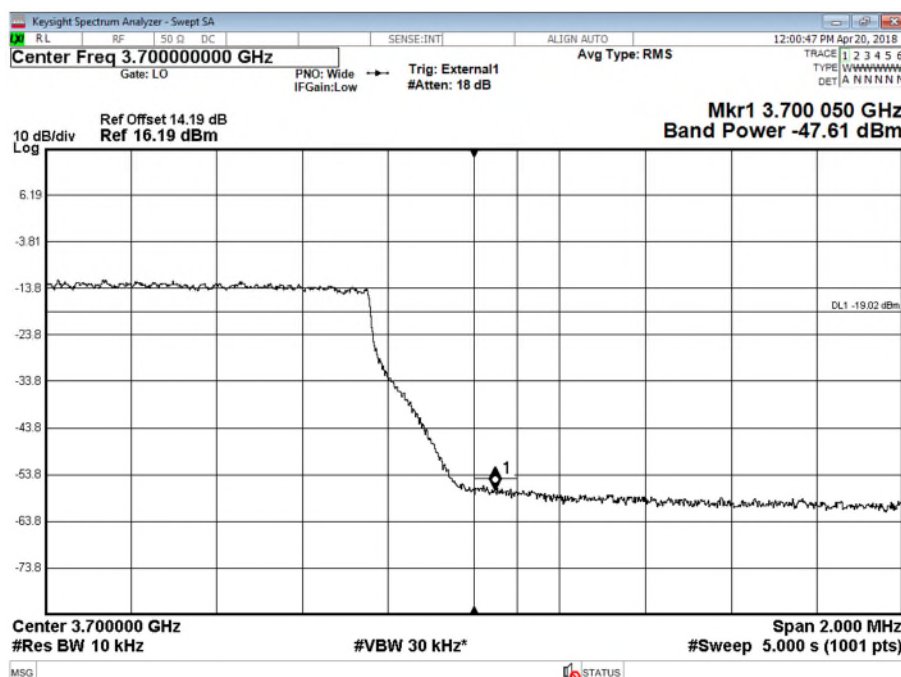
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



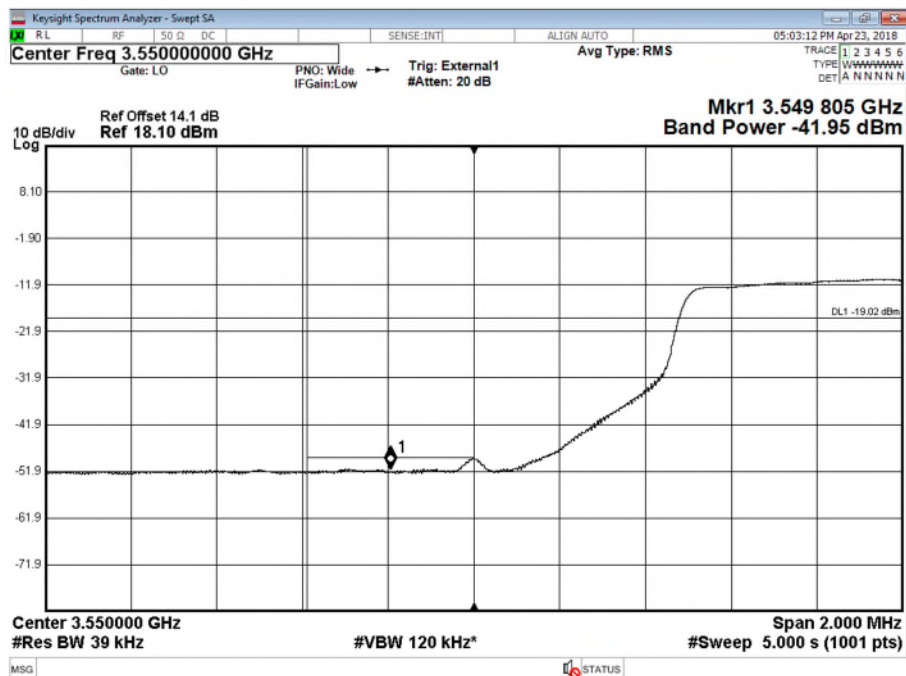
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



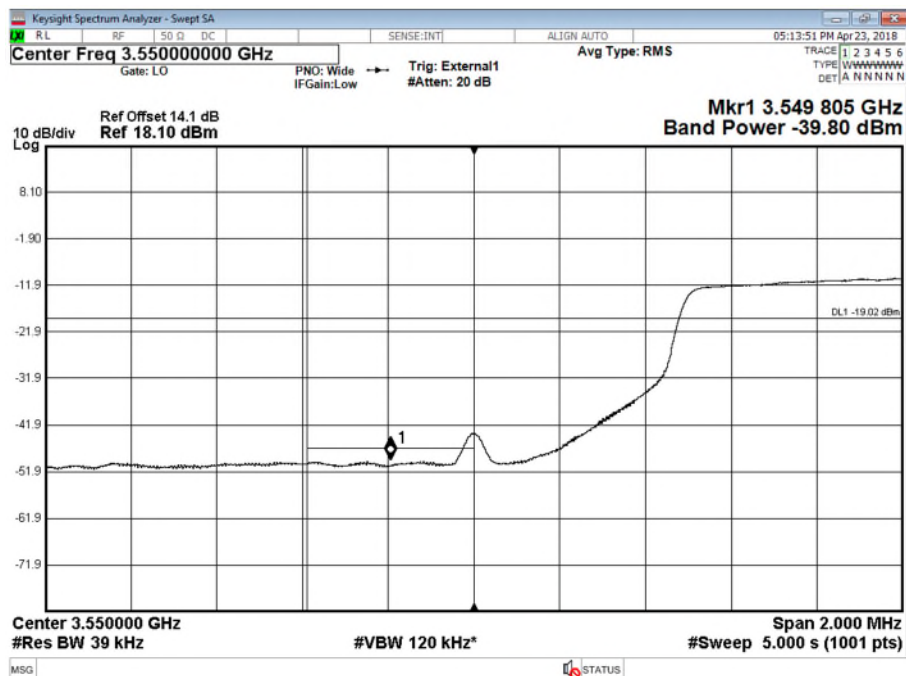
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T



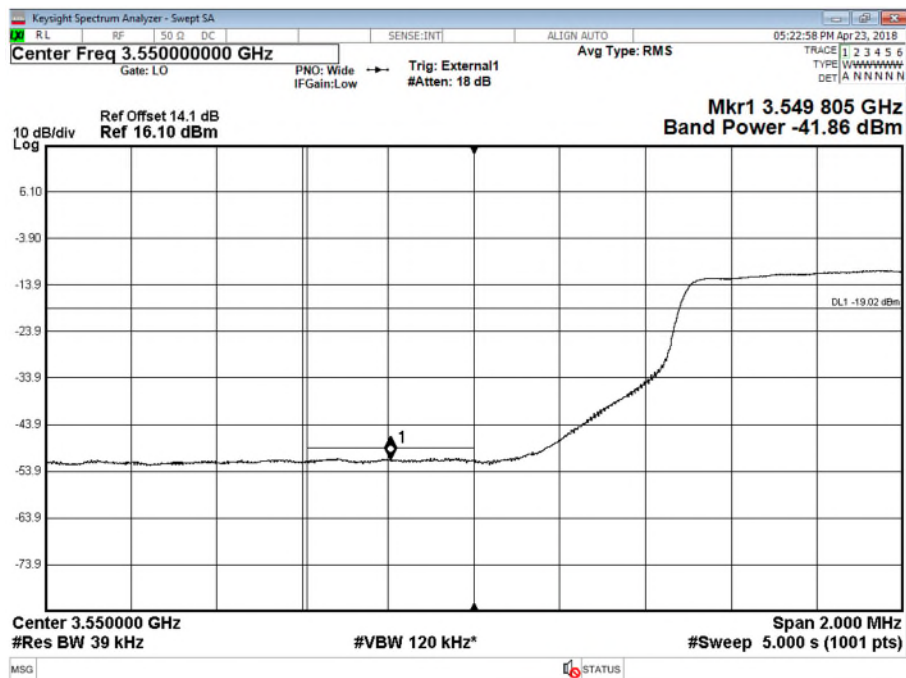
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B



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

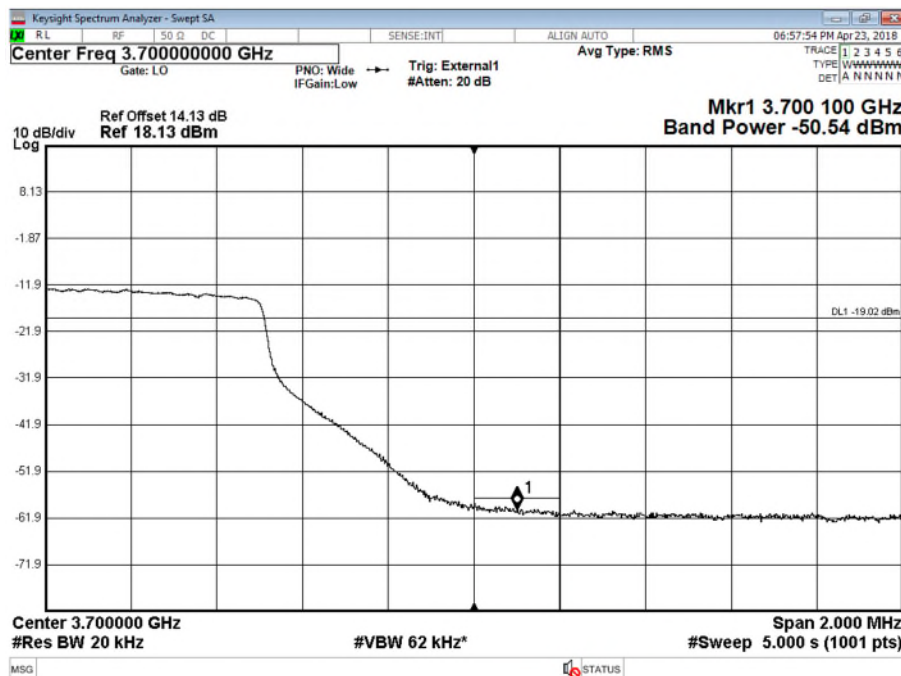


Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T

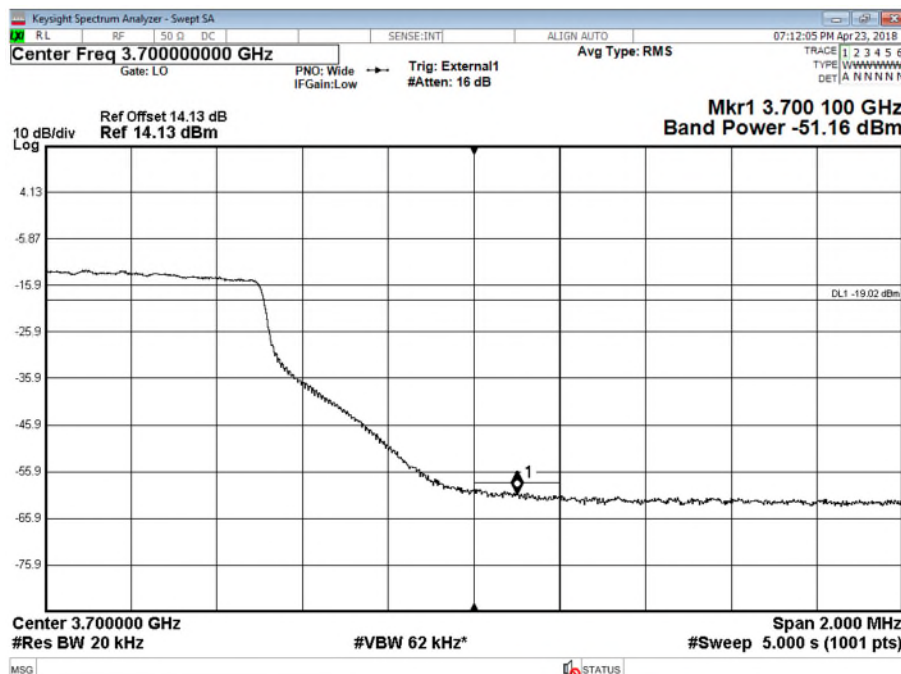
Note: Antenna B is shown as worst case/representative



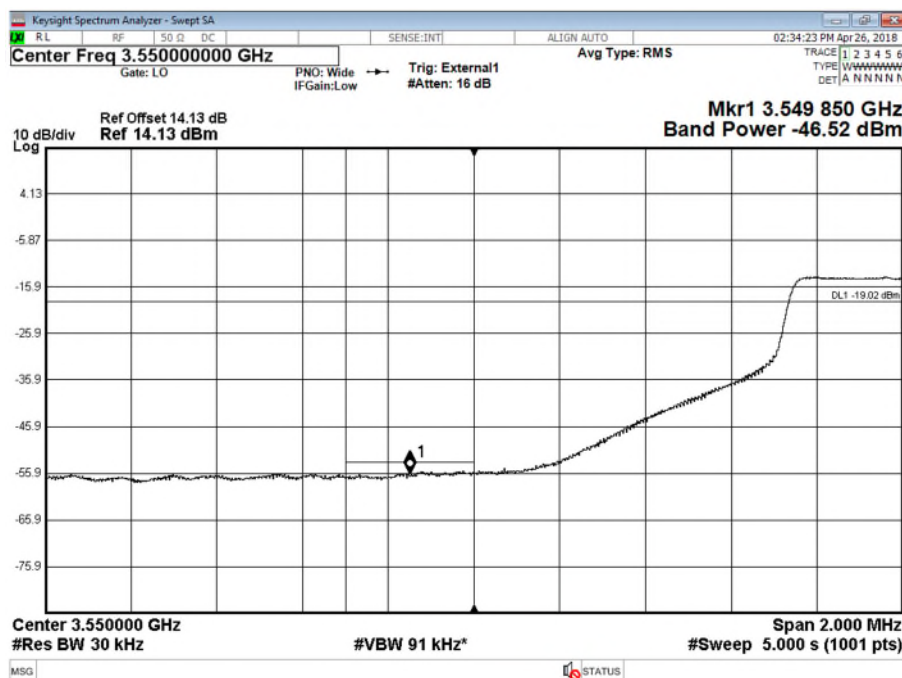
# Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



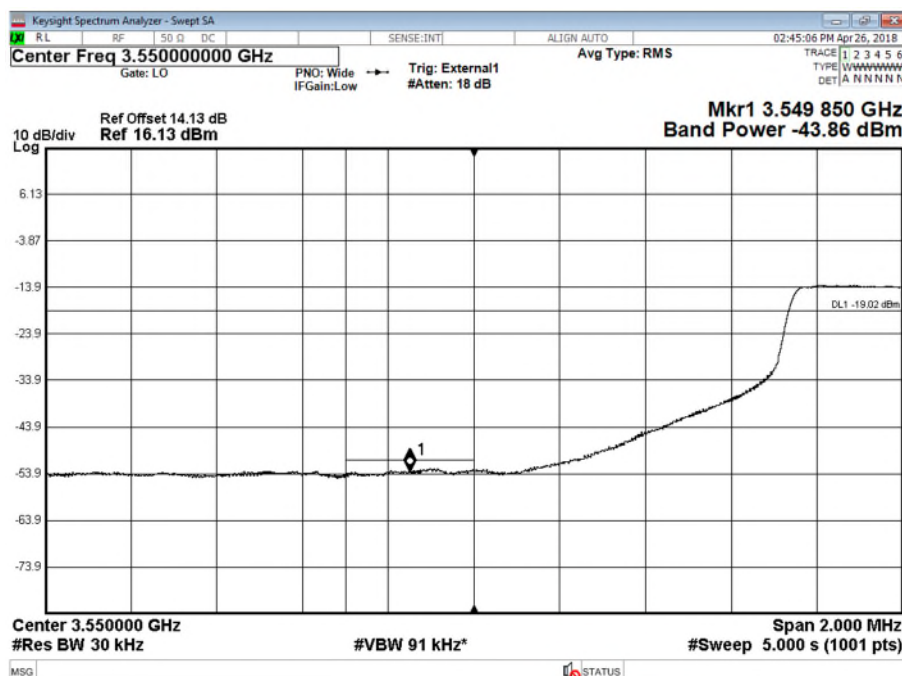
# Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T



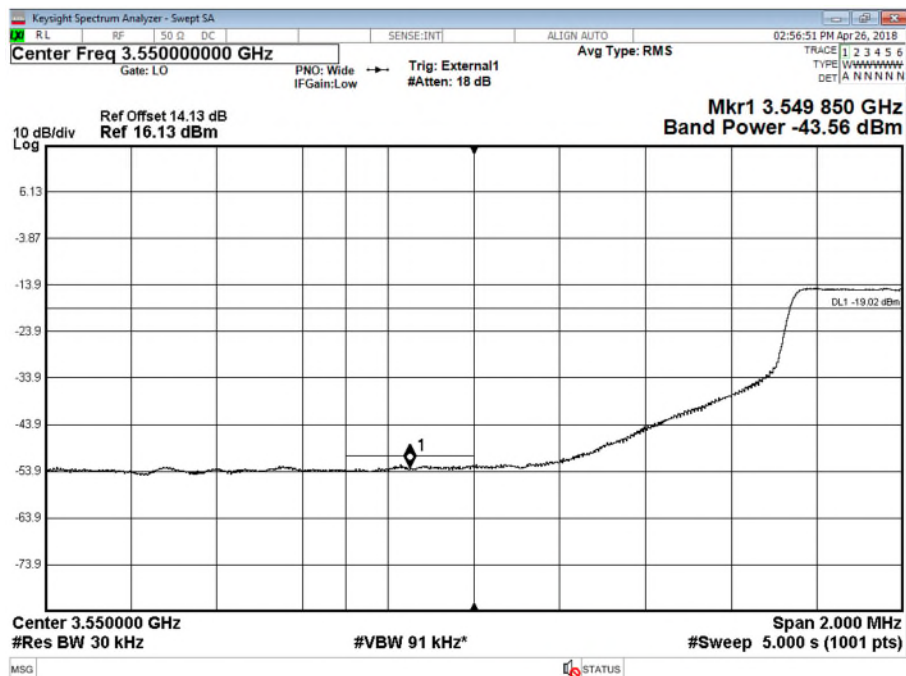
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



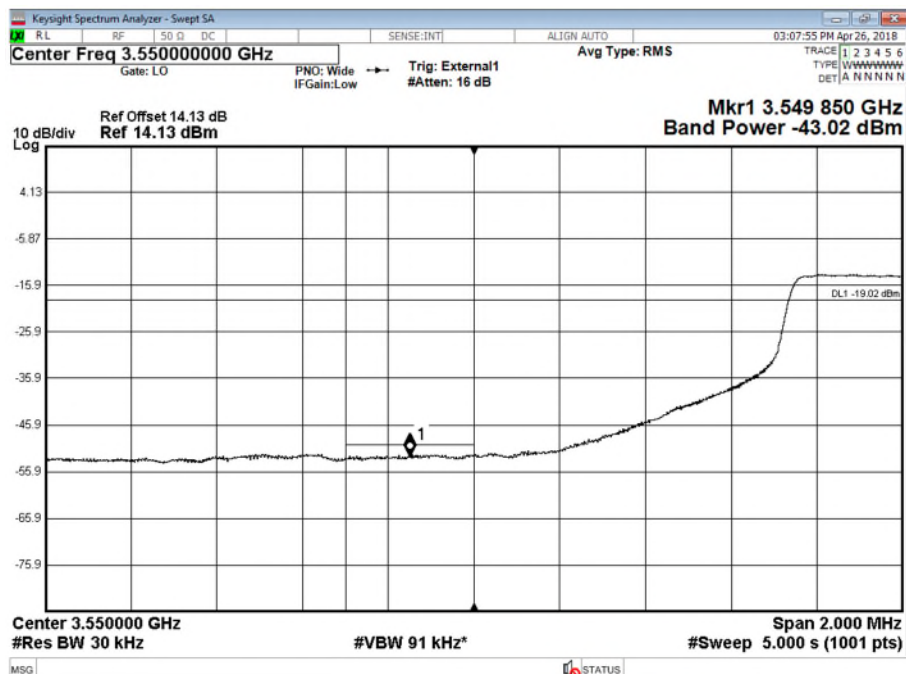
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



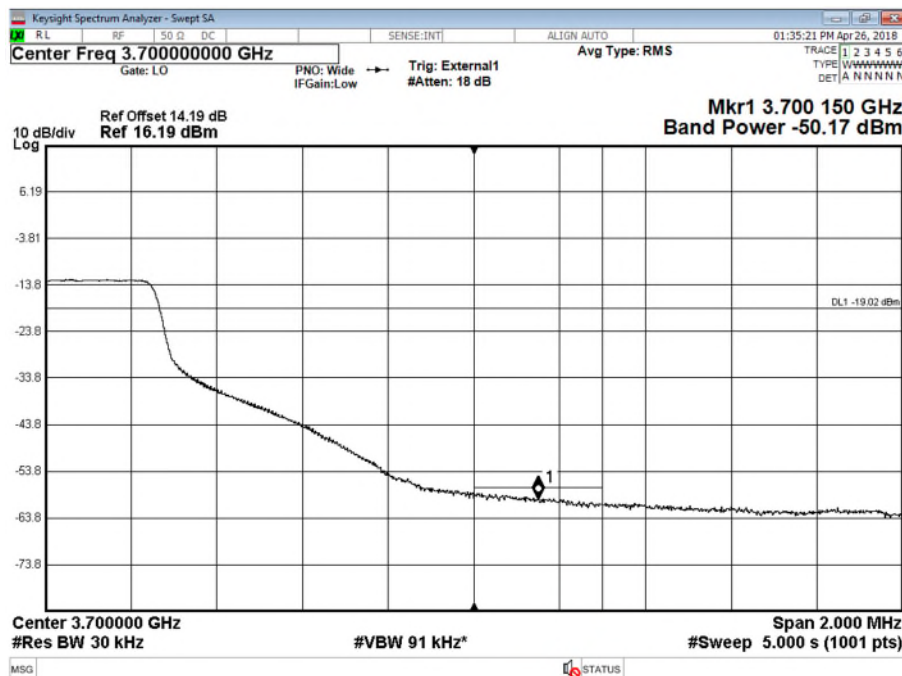
### Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



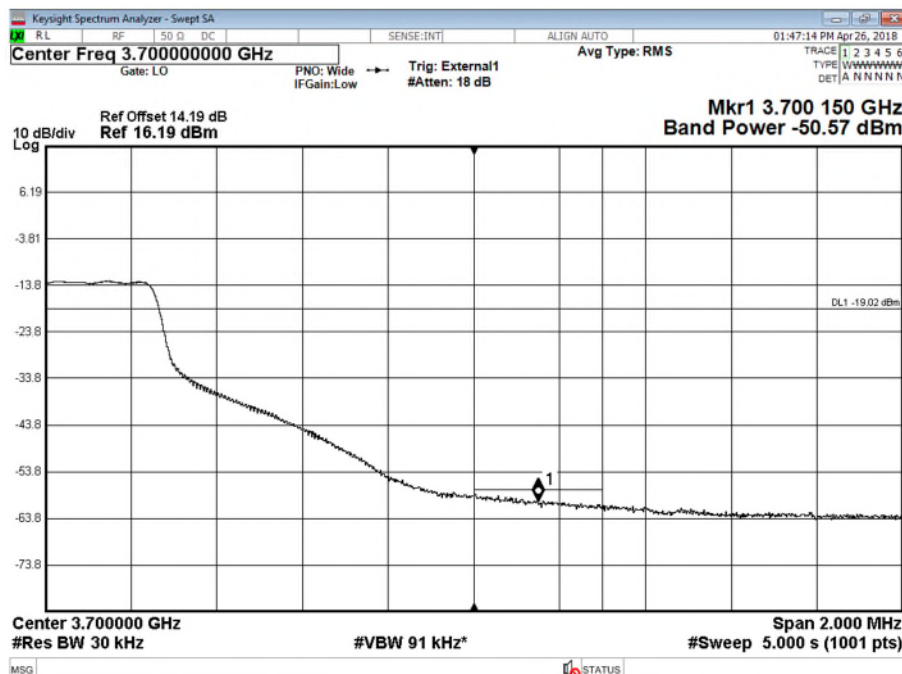
### Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B



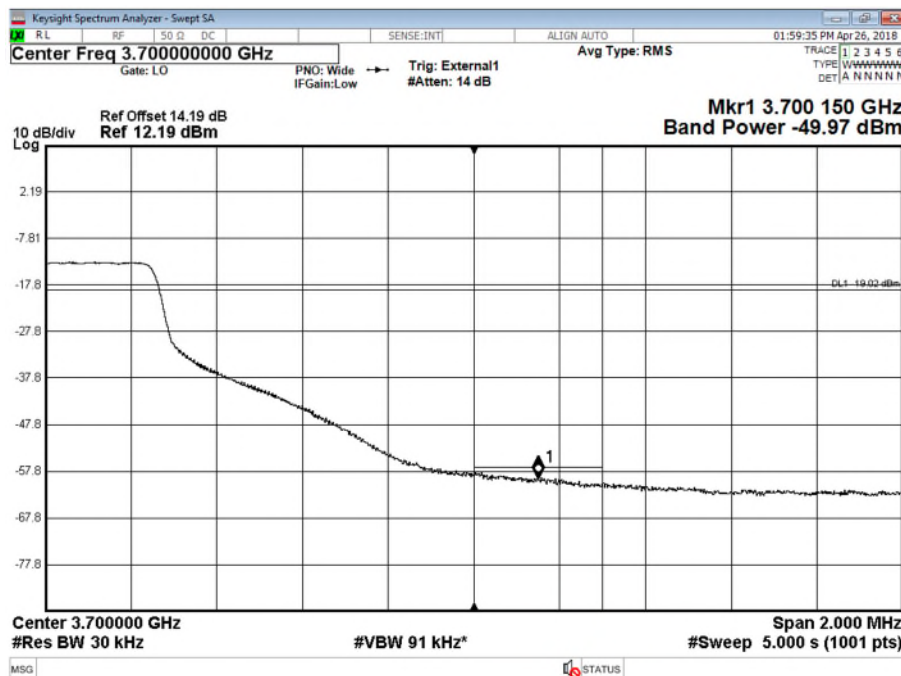
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



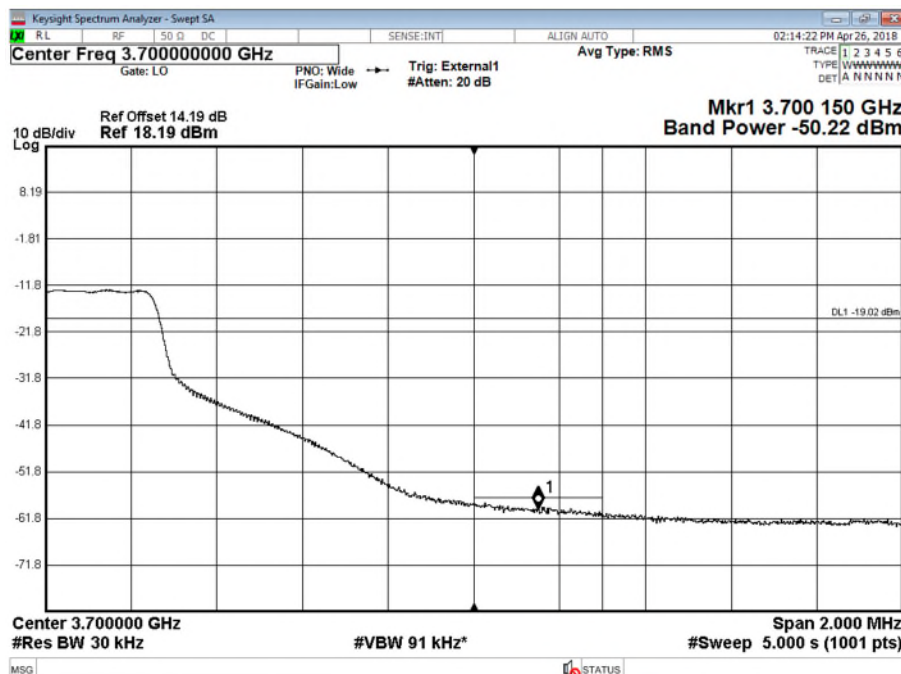
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T



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

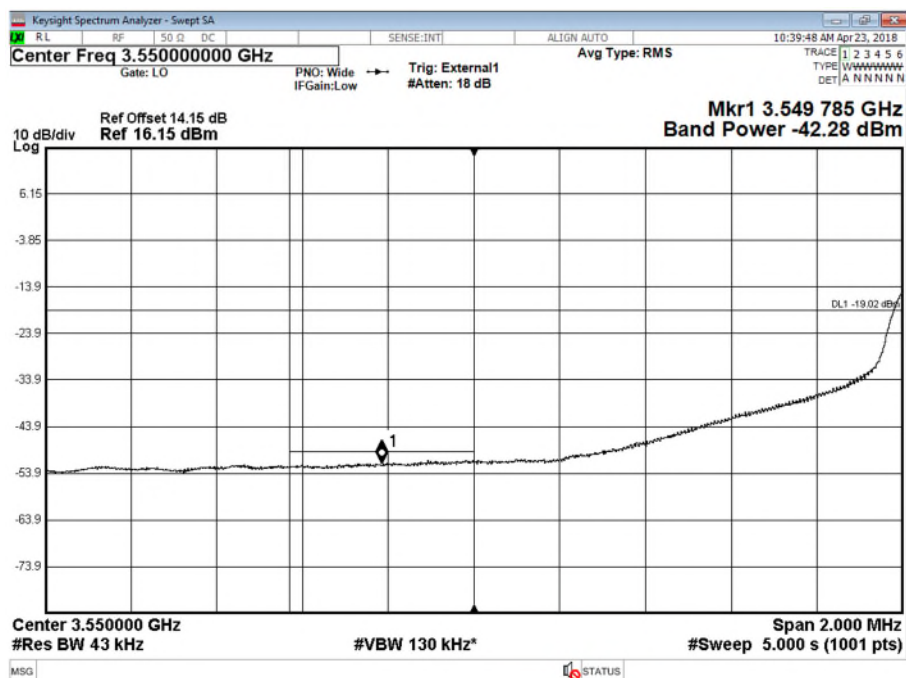


Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T

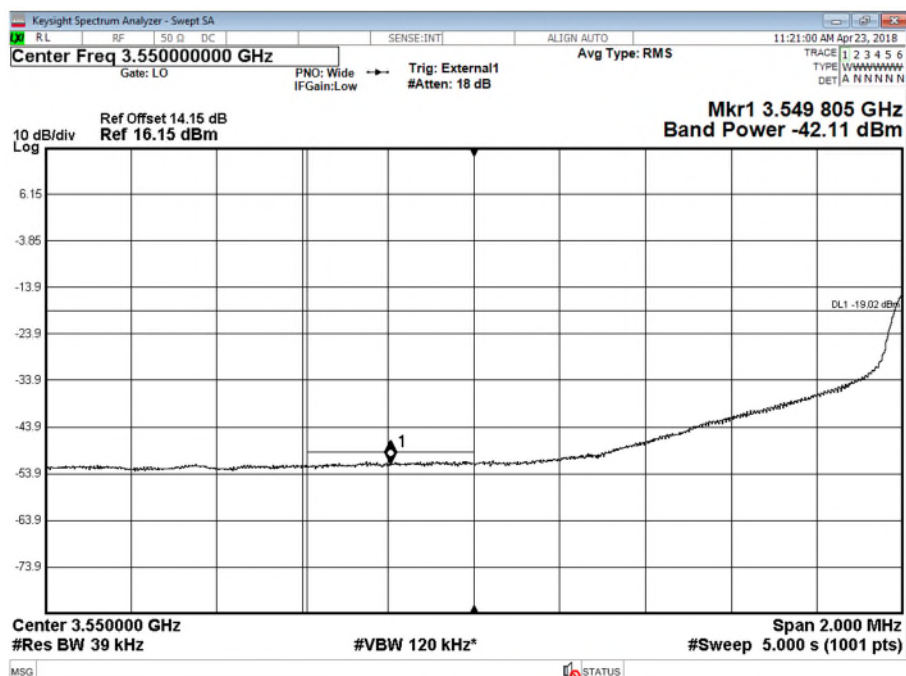




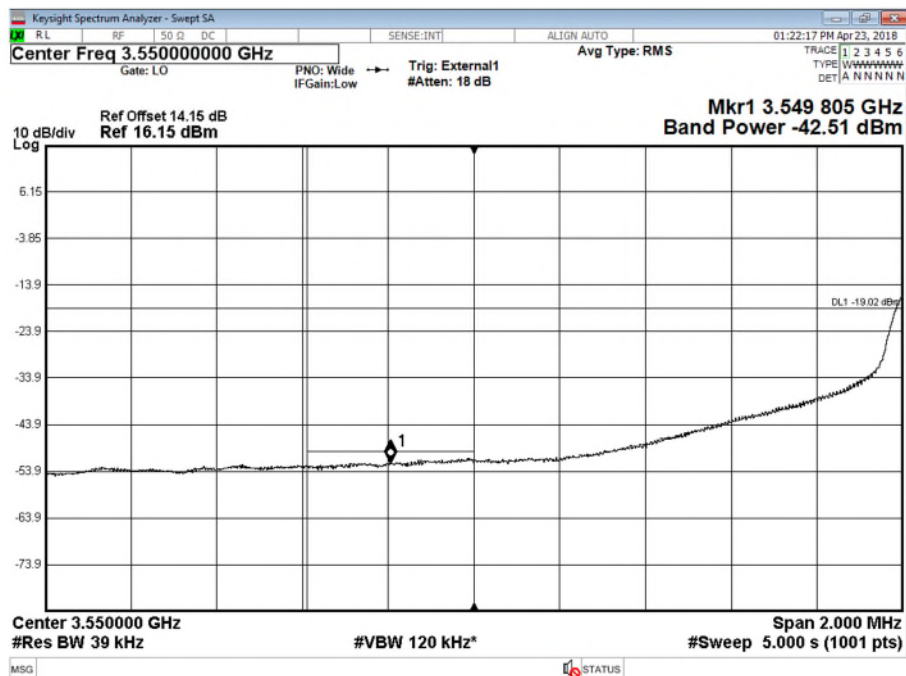
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



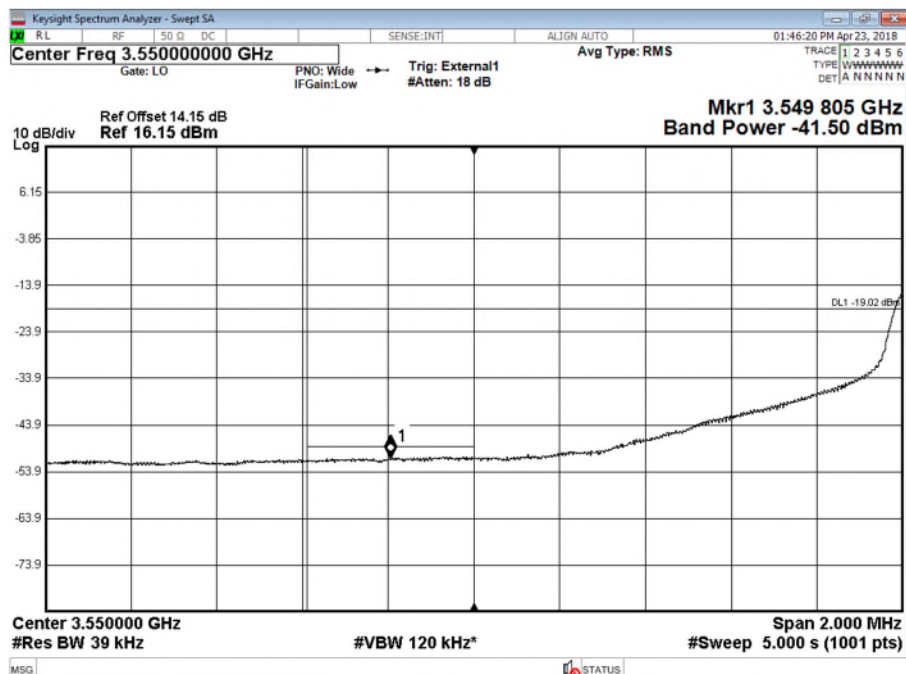
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



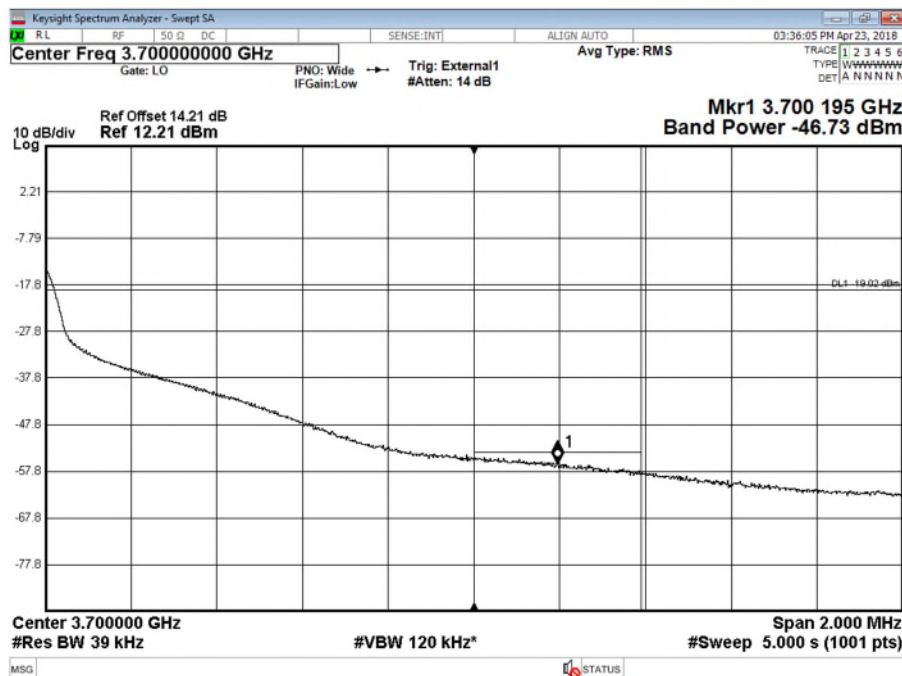
Antenna C - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



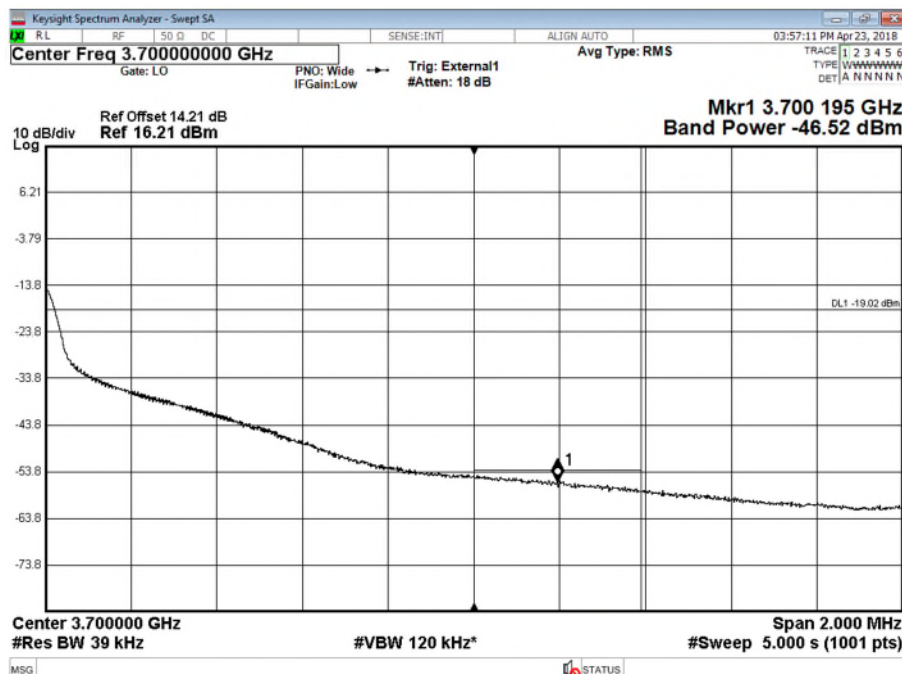
Antenna D - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B



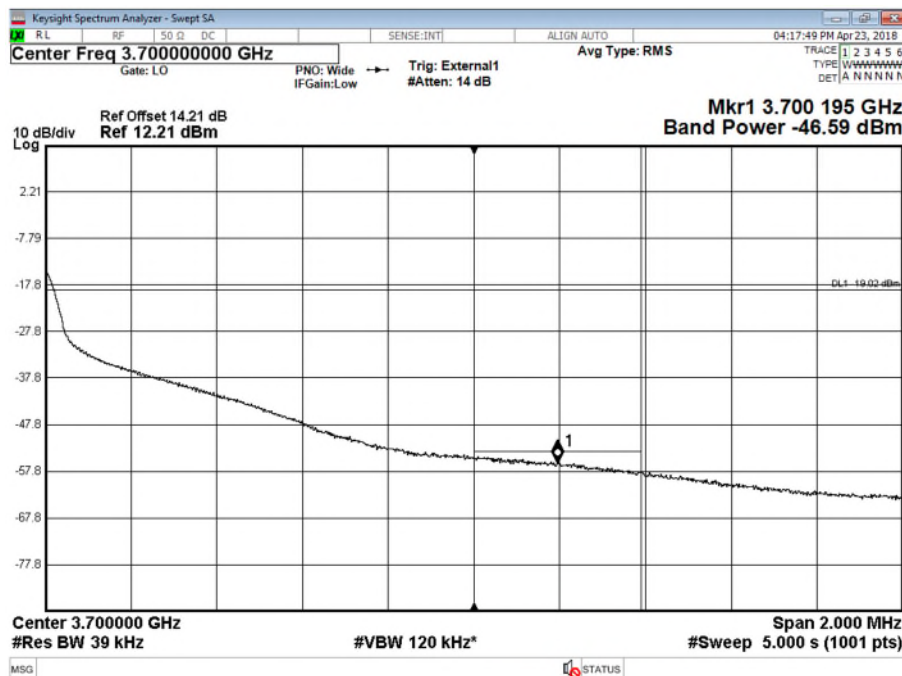
Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



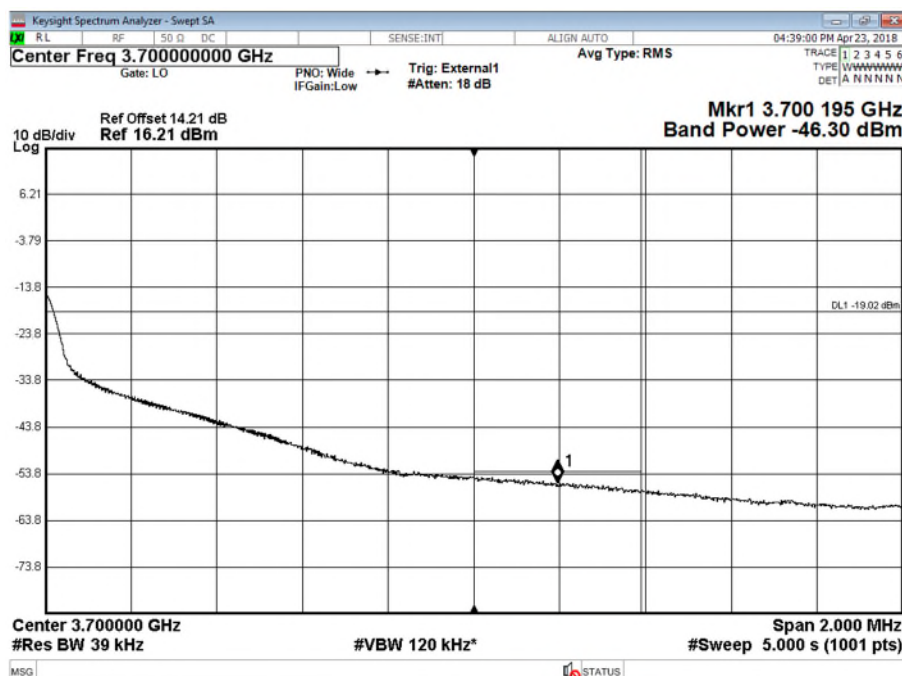
Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



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
-------	---------



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  $-40 \text{ dBm/MHz} - 10\log(4) = -46 \text{ dBm}$  (for emissions  $< 3530 \text{ MHz}$  and  $> 3720 \text{ MHz}$ ).

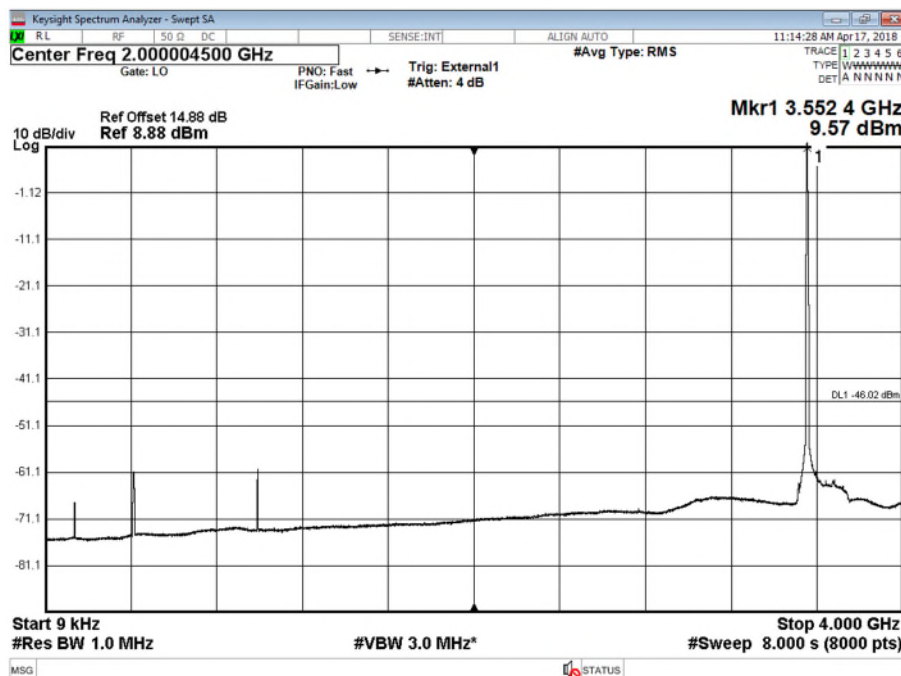
Testing was performed on this port with a test limit of  $-25 \text{ dBm/MHz} - 10\log(4) = -31 \text{ dBm}$  (for emissions within 10 MHz of the carrier).

### **2.4.6 Test Results**

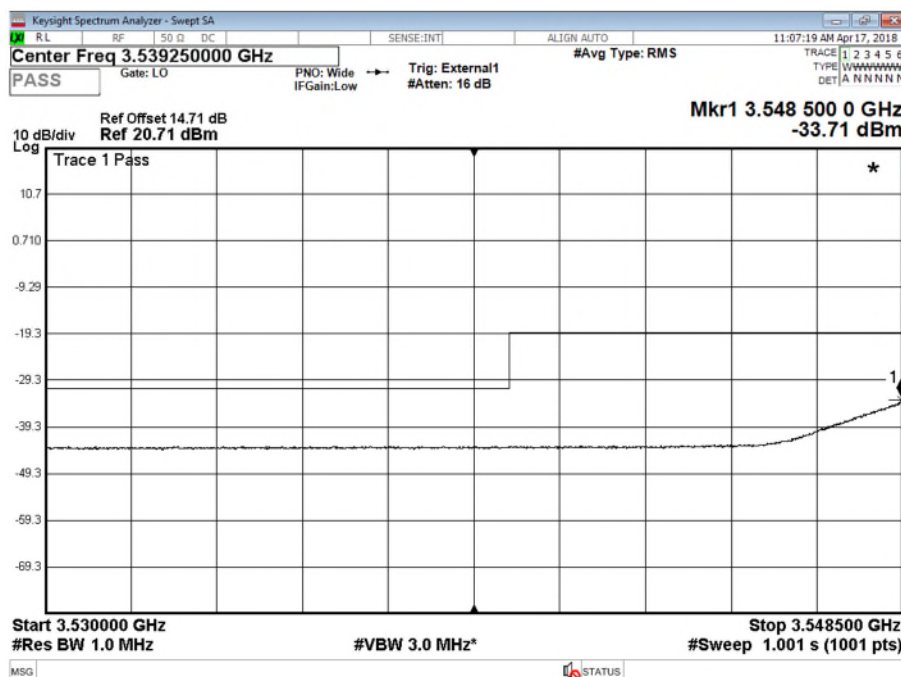
Configuration A

Maximum Output Power 17 dBm

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





Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B -  
Band Mask\_High\_1 - Range Mask\_High\_1

