

Bandwidth=20MHz – QPSK

ANT 1



Lowest channel

ANT 2



Lowest channel



Middle channel



Middle channel

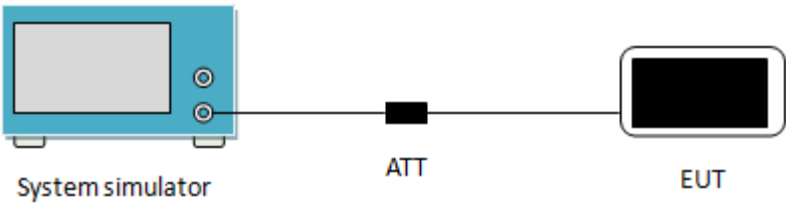


Highest channel



Highest channel

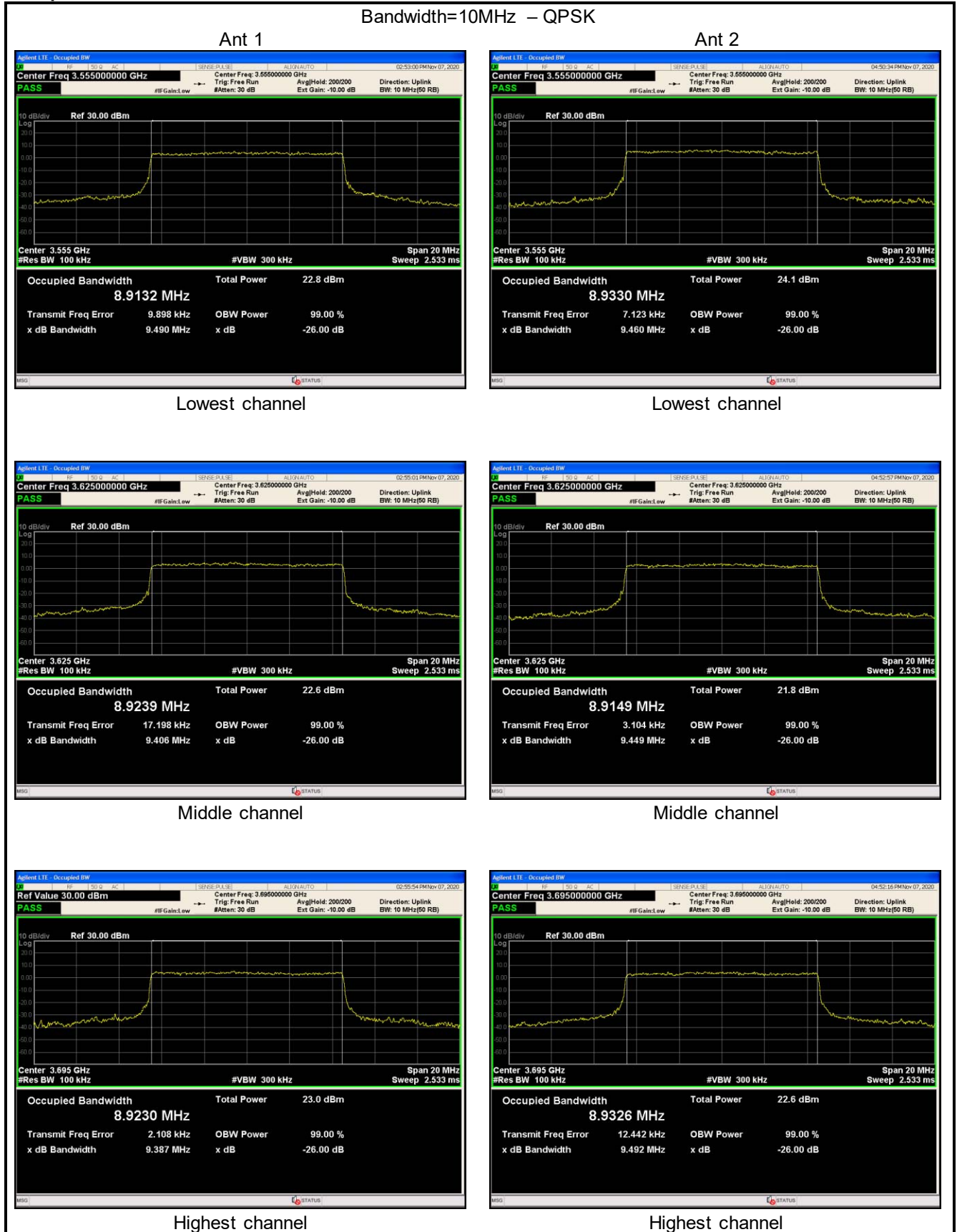
6.3 Occupy Bandwidth

Test Requirement:	FCC part 96.41(E)(3)
Test setup:	 The diagram illustrates the test setup. On the left is a blue 'System simulator' with two output ports. A cable connects one of these ports to a black 'ATT' (Attenuator). Another cable connects the 'ATT' to the input of a black 'EUT' (Equipment Under Test) on the right.
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. The transmitter shall be operated at its maximum carrier power measured under normal test conditions. 3. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. 4. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall About 3x RBW.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test Channel	Bandwidth (MHz)	Modulation	Ant. Port	26dB Occupy bandwidth (MHz)	99% Occupy bandwidth (MHz)
Lowest	10	QPSK	Ant 1	9.490	8.9132
			Ant 2	9.460	8.9330
		64QAM	Ant 1	9.500	8.9136
			Ant 2	9.345	8.9180
Middle	10	QPSK	Ant 1	9.406	8.9239
			Ant 2	9.449	8.9149
		64QAM	Ant 1	9.324	8.9269
			Ant 2	9.363	8.9258
Highest	10	QPSK	Ant 1	9.387	8.9230
			Ant 2	9.492	8.9326
		64QAM	Ant 1	9.353	8.9220
			Ant 2	9.354	8.9024
Lowest	15	QPSK	Ant 1	13.950	13.377
			Ant 2	13.960	13.368
		64QAM	Ant 1	14.060	13.368
			Ant 2	13.970	13.374
Middle	15	QPSK	Ant 1	13.920	13.382
			Ant 2	13.990	13.414
		64QAM	Ant 1	13.980	13.374
			Ant 2	13.970	13.369
Highest	15	QPSK	Ant 1	13.970	13.371
			Ant 2	13.970	13.365
		64QAM	Ant 1	13.940	13.365
			Ant 2	13.960	13.385
Lowest	20	QPSK	Ant 1	18.500	17.819
			Ant 2	18.510	17.818
		64QAM	Ant 1	18.510	17.854
			Ant 2	18.510	17.856
Middle	20	QPSK	Ant 1	18.550	17.829
			Ant 2	18.600	17.840
		64QAM	Ant 1	18.570	17.848
			Ant 2	18.560	17.833
Highest	20	QPSK	Ant 1	18.600	17.822
			Ant 2	18.550	17.840
		64QAM	Ant 1	18.510	17.838
			Ant 2	18.520	17.829

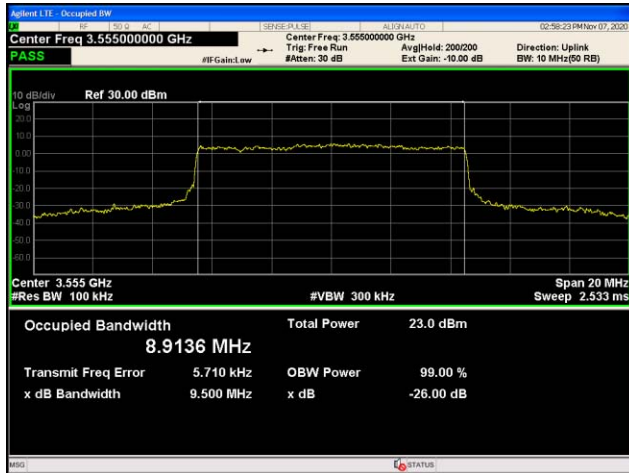
Test plot as follows:



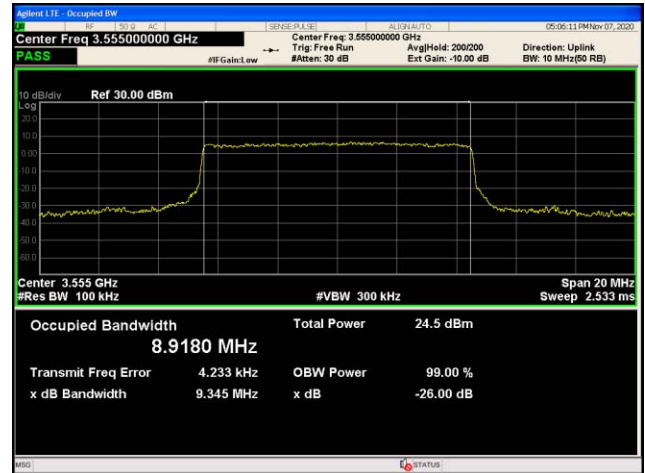
Bandwidth=10MHz – 64QAM

Ant 1

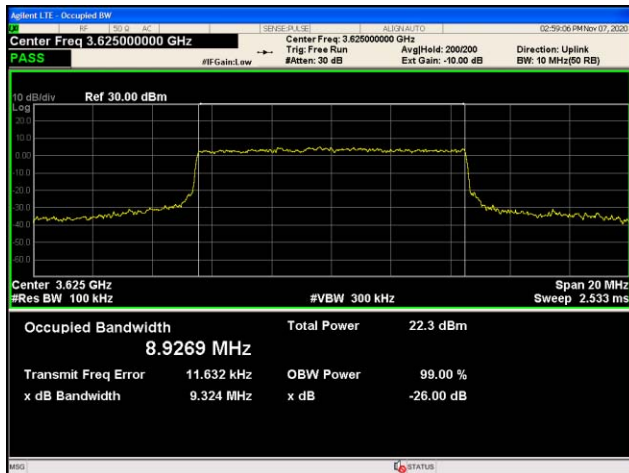
Ant 2



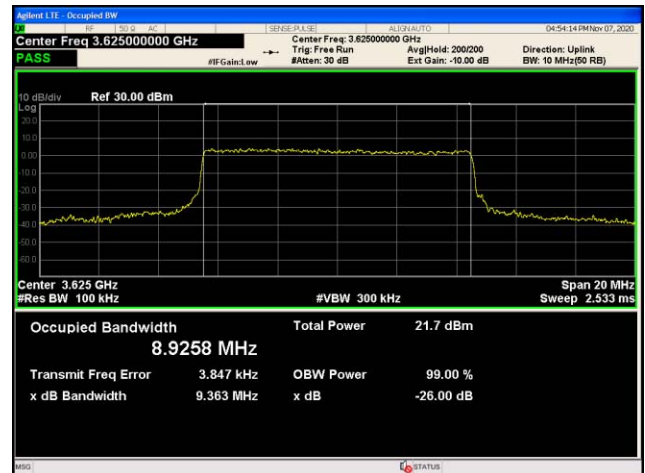
Lowest channel



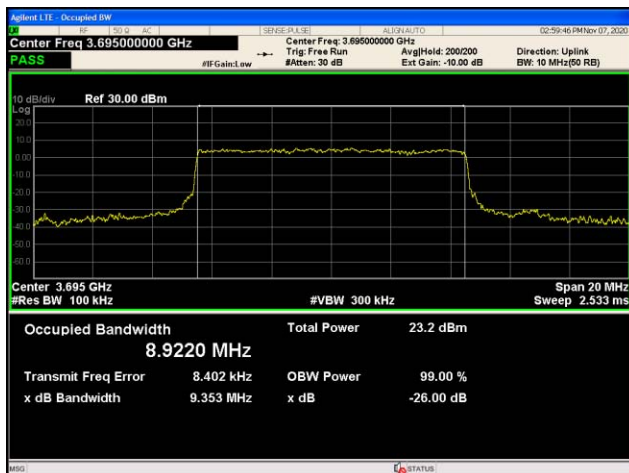
Lowest channel



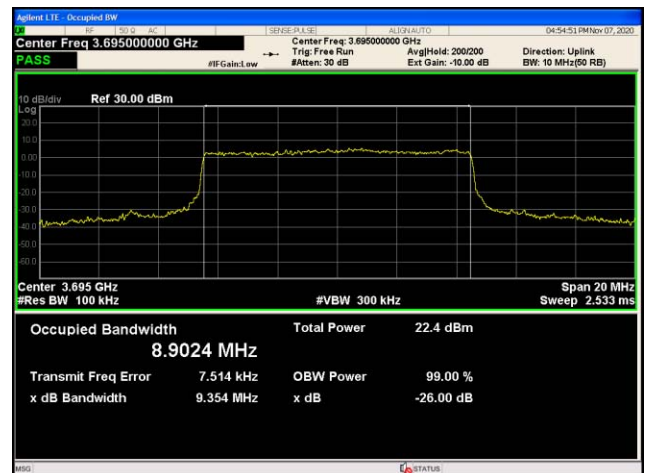
Middle channel



Middle channel



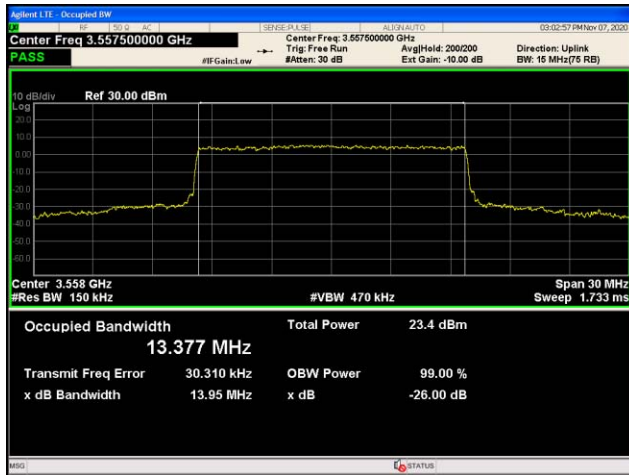
Highest channel



Highest channel

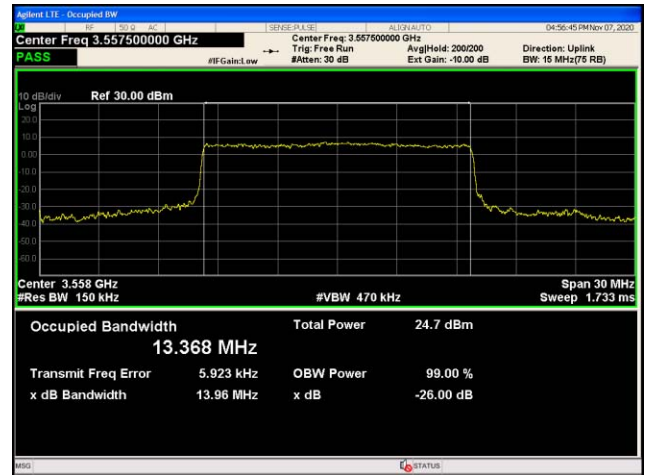
Bandwidth=15MHz – QPSK

Ant 1

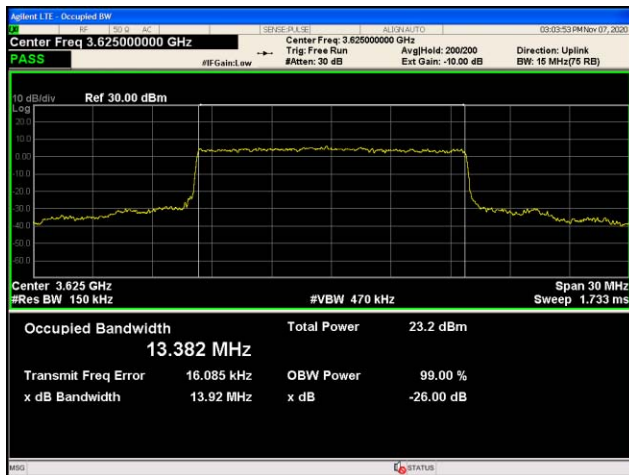


Lowest channel

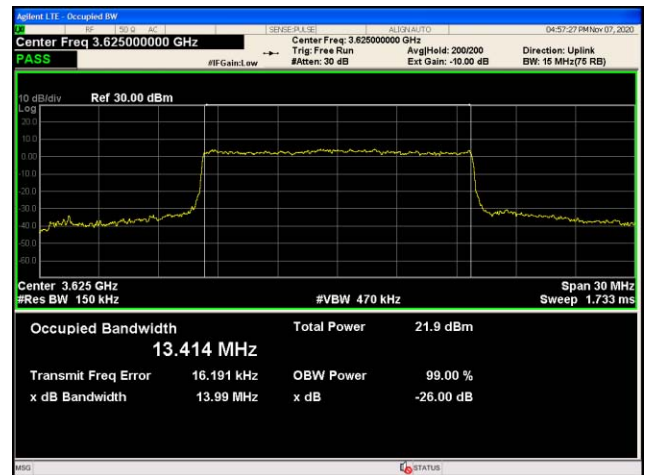
Ant 2



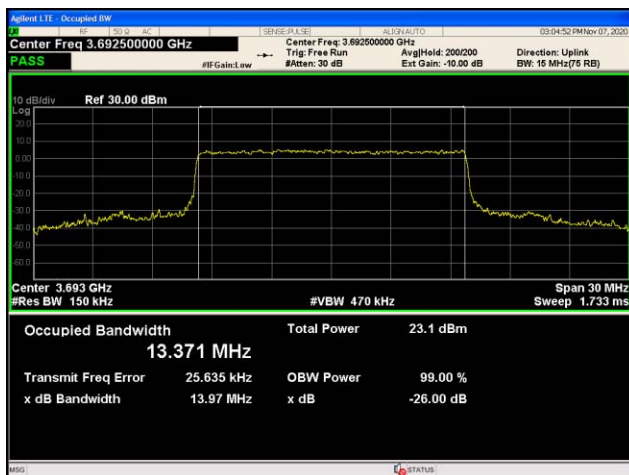
Lowest channel



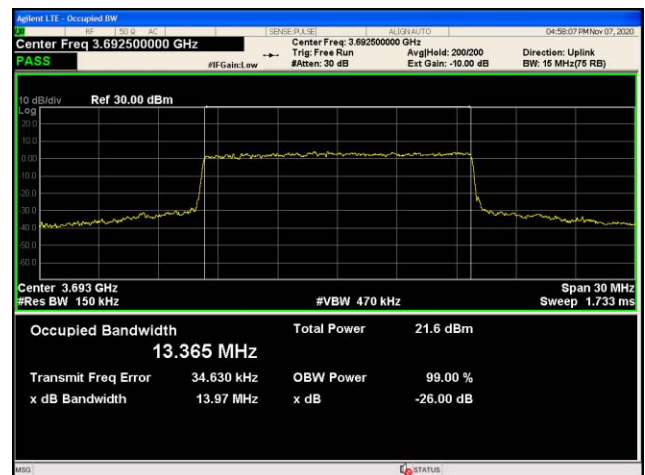
Middle channel



Middle channel



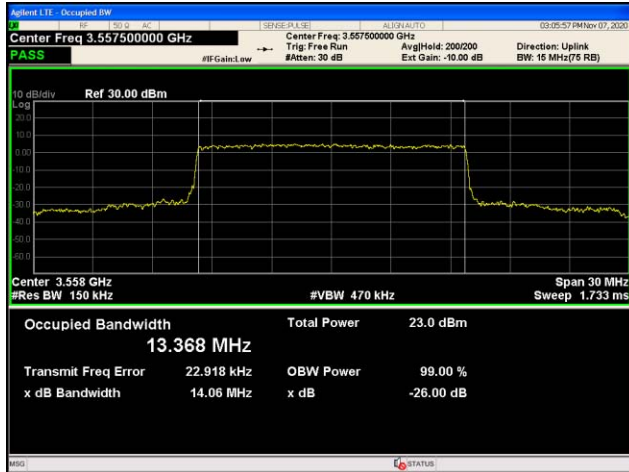
Highest channel



Highest channel

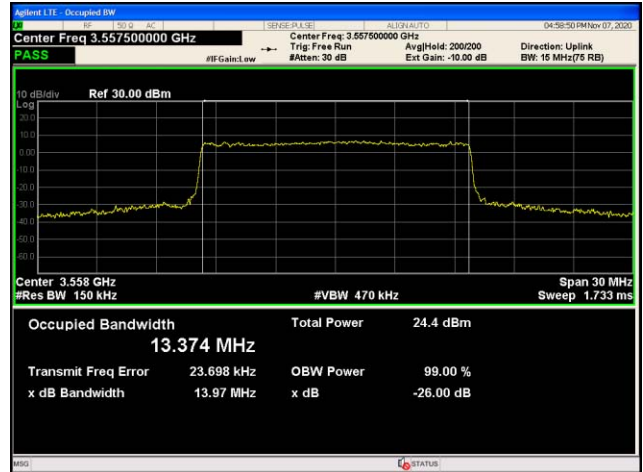
Bandwidth=15MHz – 64QAM

Ant 1

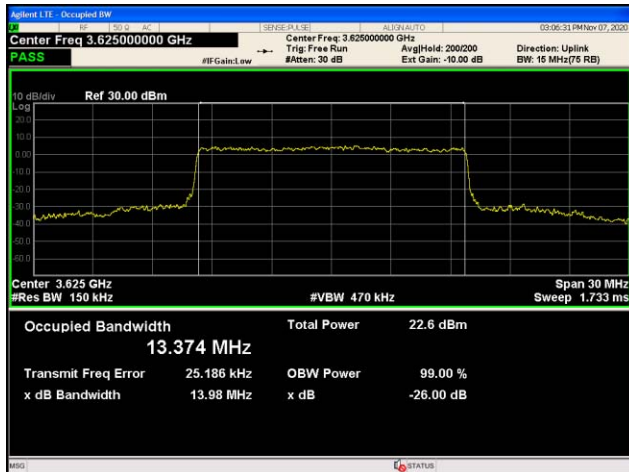


Lowest channel

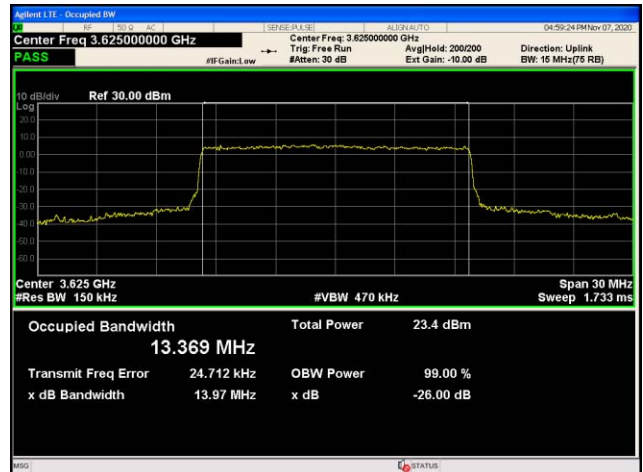
Ant 2



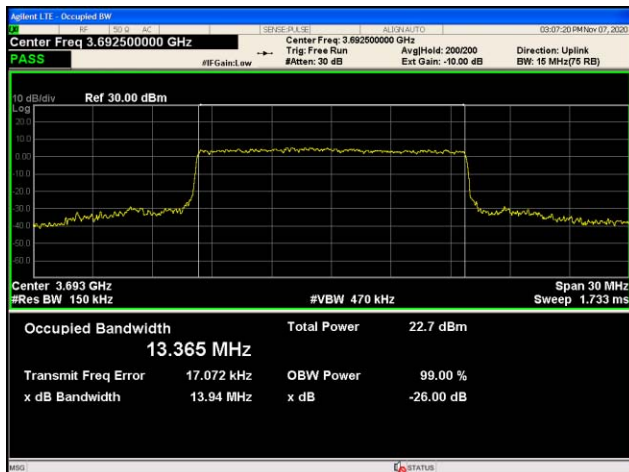
Lowest channel



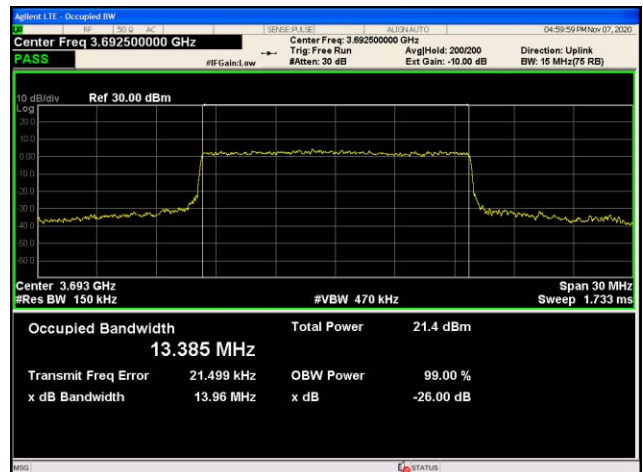
Middle channel



Middle channel



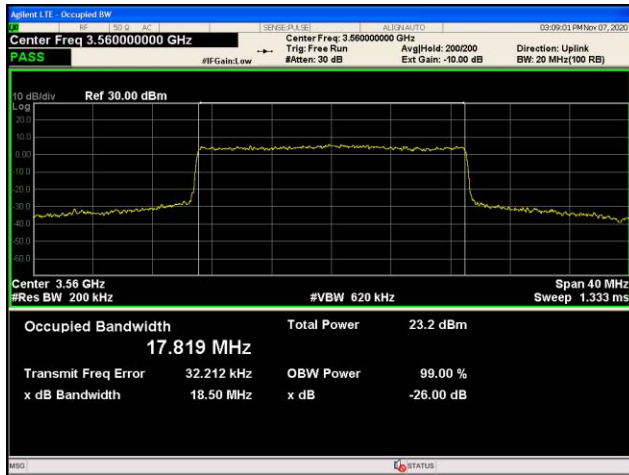
Highest channel



Highest channel

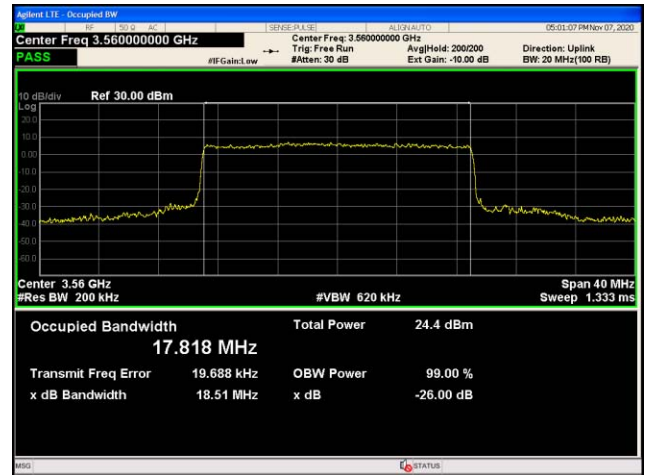
Bandwidth=20MHz – QPSK

Ant 1

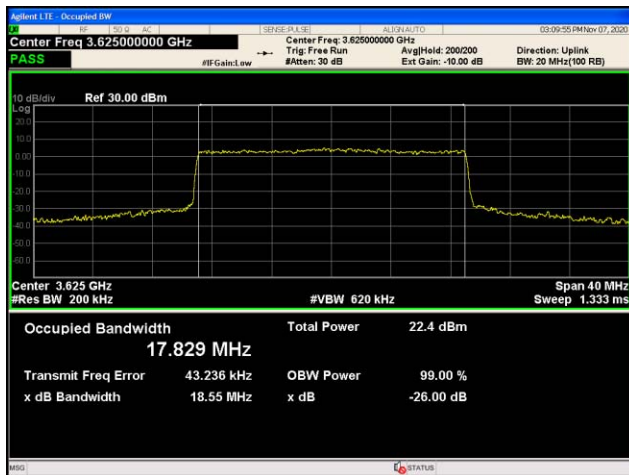


Lowest channel

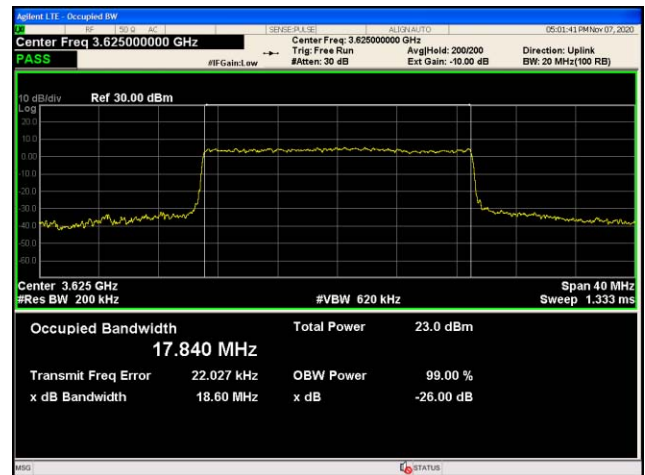
Ant 2



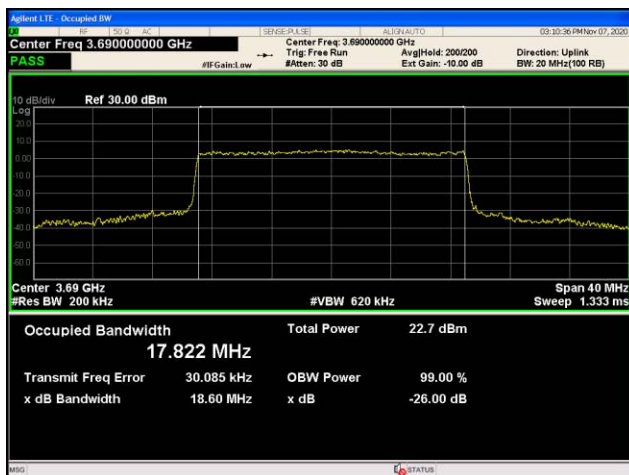
Lowest channel



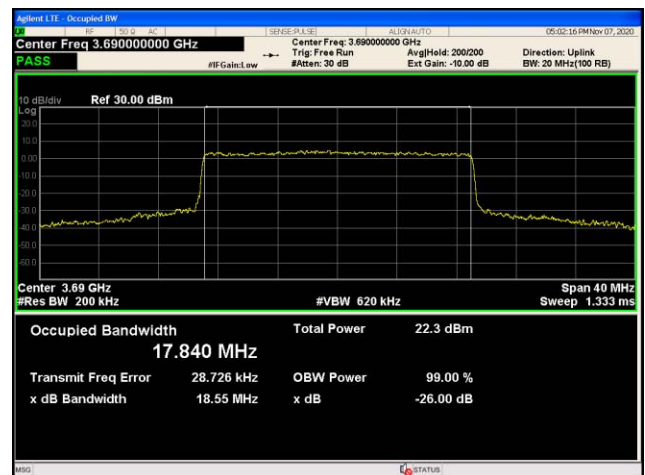
Middle channel



Middle channel



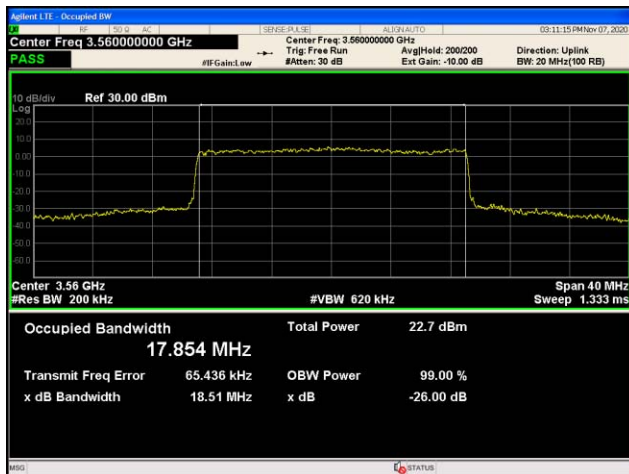
Highest channel



Highest channel

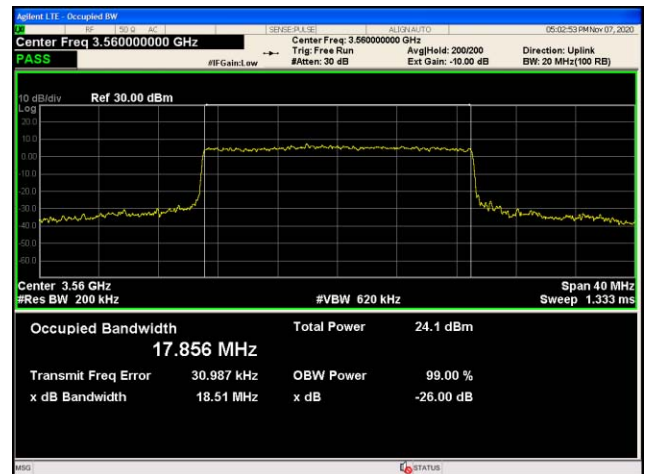
Bandwidth=20MHz – 64QAM

Ant 1

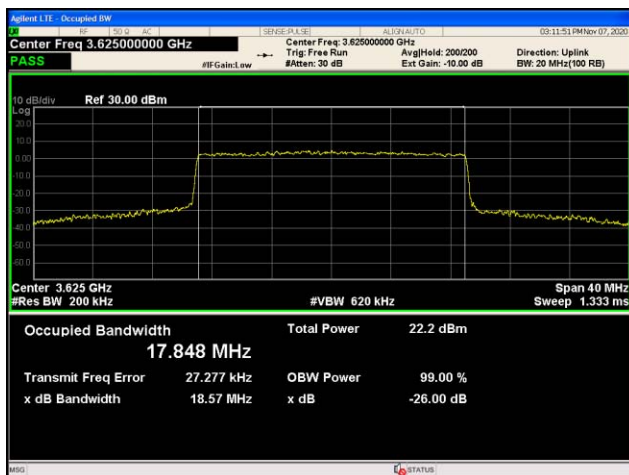


Lowest channel

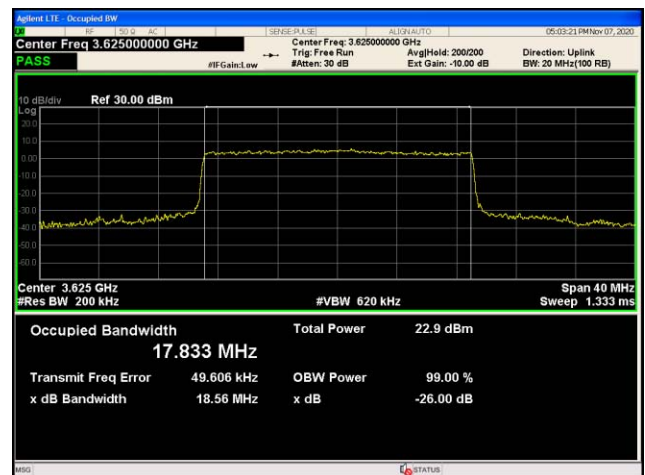
Ant 2



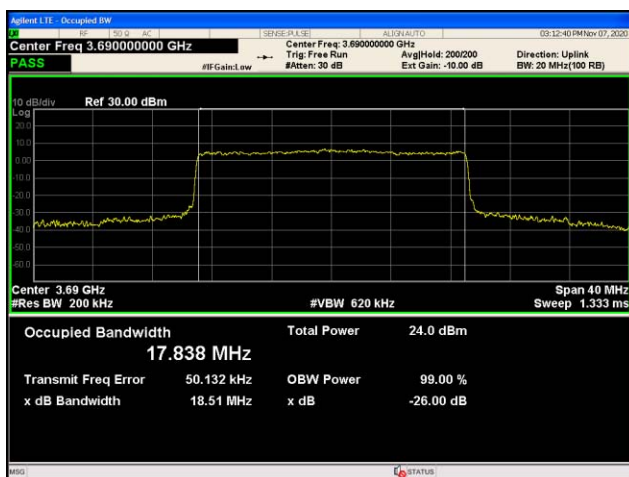
Lowest channel



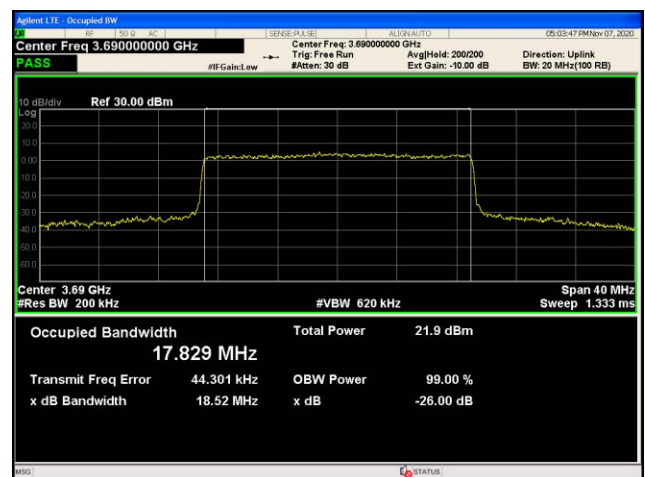
Middle channel



Middle channel



Highest channel



Highest channel

6.4 Emission Mask

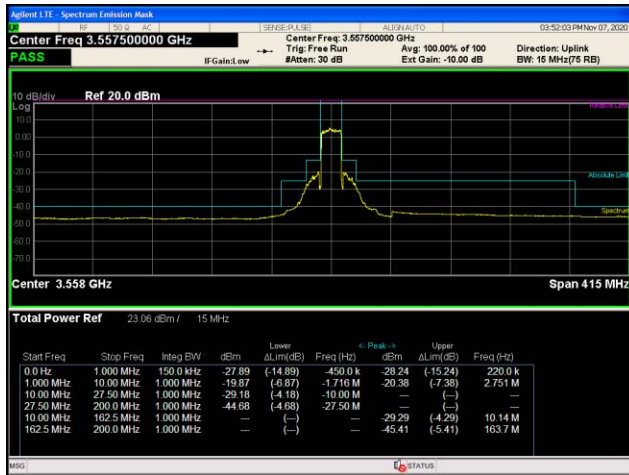
Test Requirement:	FCC part 96.41(e)(1)(2)
Limit:	
Test setup:	System simulator ATT EUT
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 RBW=1MHz, VBW=3MHz, Detector mode= RMS, Trace mode: Power averaging over 100 sweeps
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	PASS

Test plots as below:

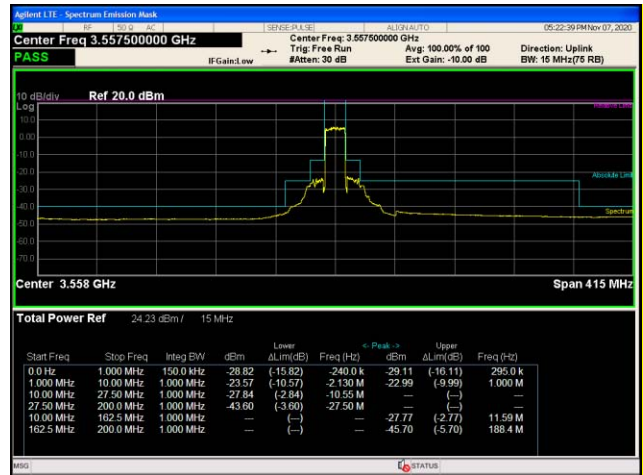


15MHz bandwidth

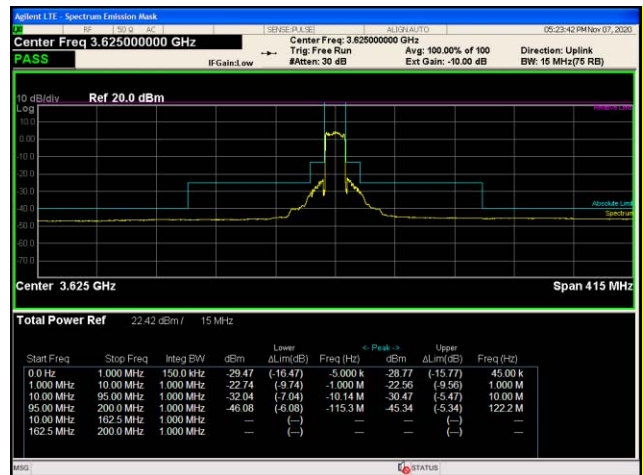
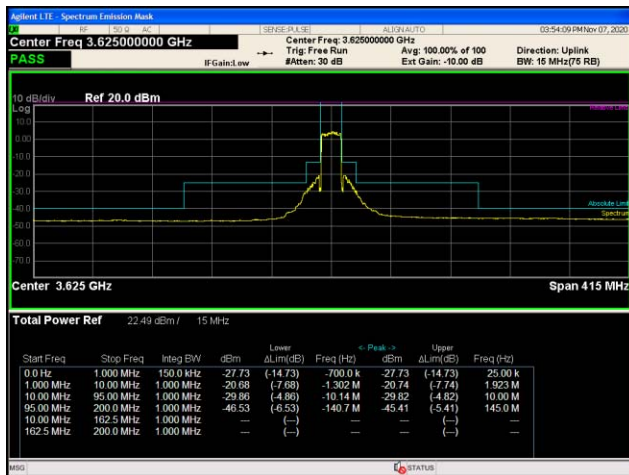
ANT 1



ANT 2



Lowest channel



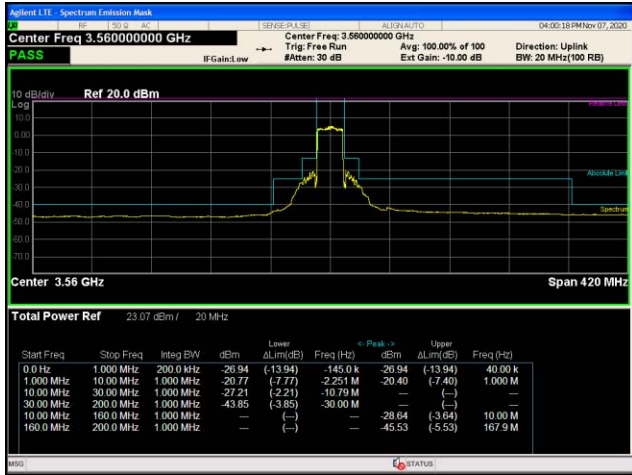
Middle channel



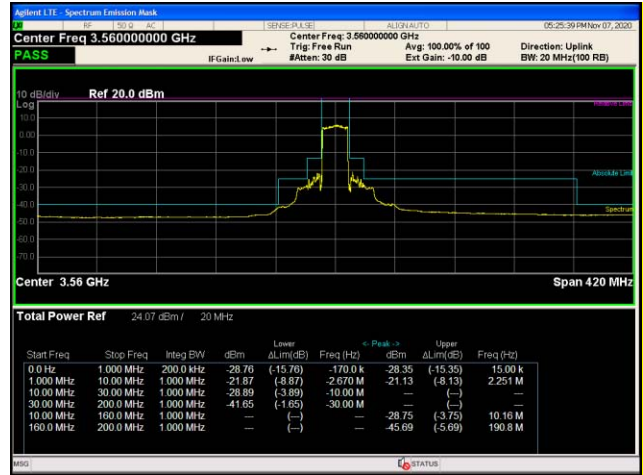
Highest channel

20MHz bandwidth

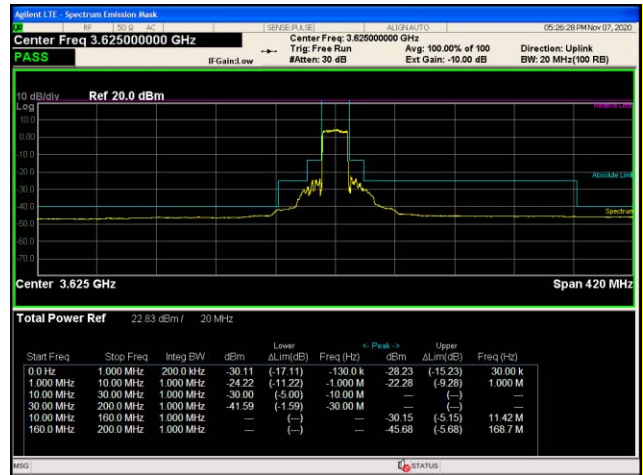
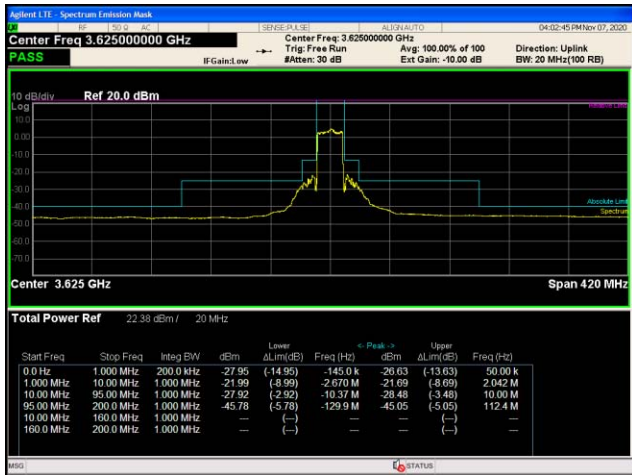
ANT 1



ANT 2



Lowest channel

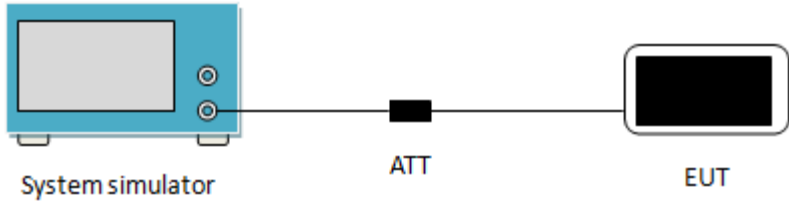


Middle channel



Highest channel

6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part 96.41(e)(1)(2)(3)
Limit:	-40 dBm/MHz
	 System simulator ATT EUT
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: RBW =1 MHz, VBW=3 MHz, Start=30MHz, Stop=10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	The emission evaluation for MIMO mode is exempted because all the emissions on SISO mode are lower (at least) by 3.0dB than the limit masks.

Test plots as follows (worst case):
Spurious emission

10MHz bandwidth-ANT 1

QPKS

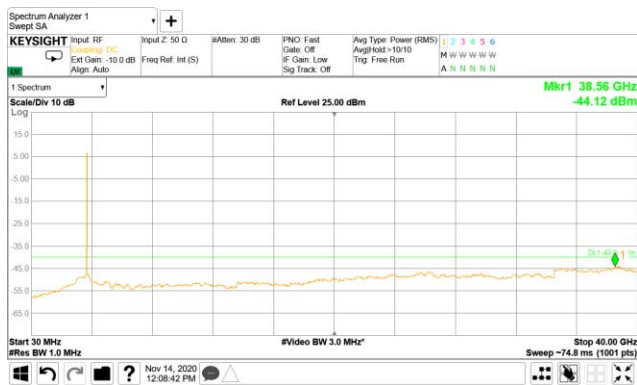
64QAM



Lowest channel



Middle channel

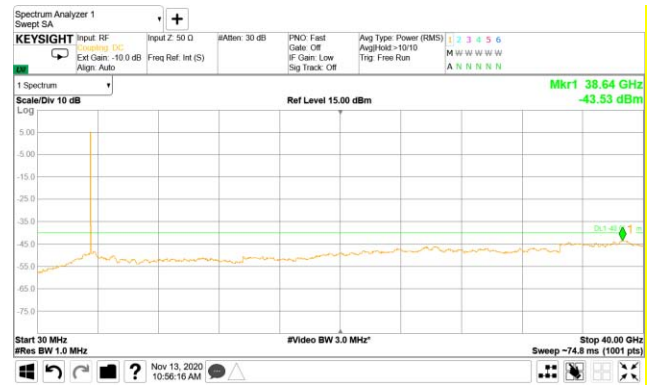
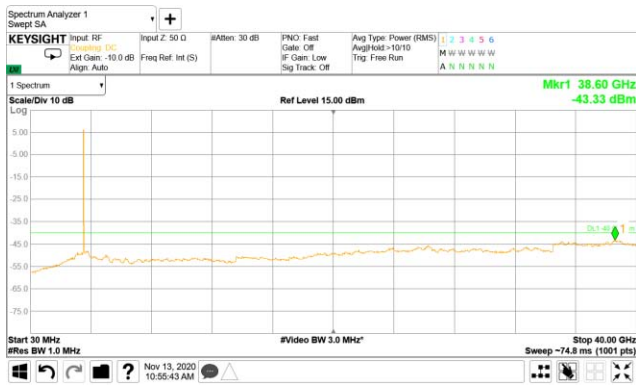


Highest channel

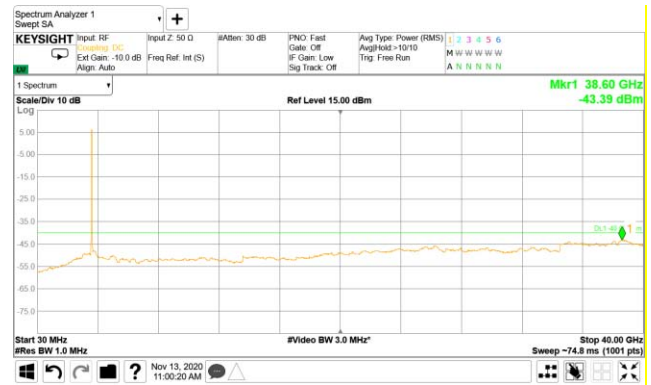
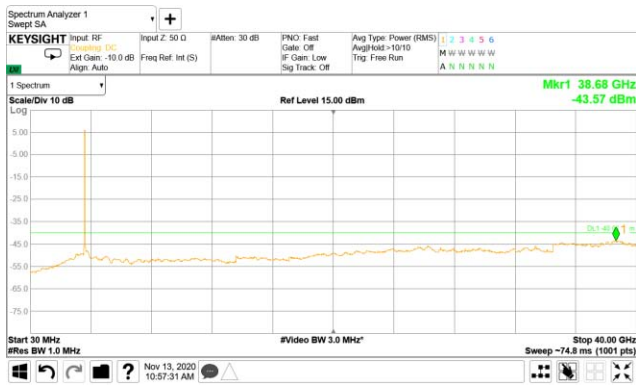
QPKS

15MHz bandwidth-ANT 1

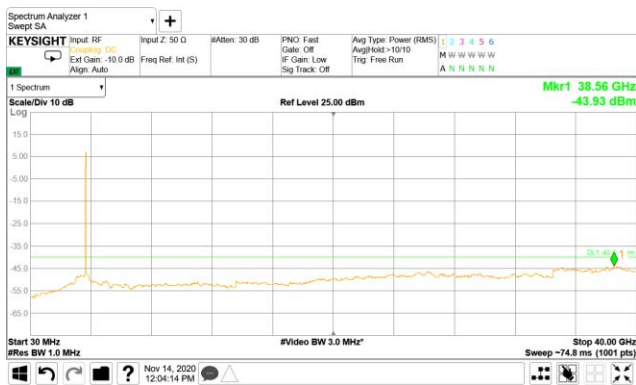
64QAM



Lowest channel



Middle channel

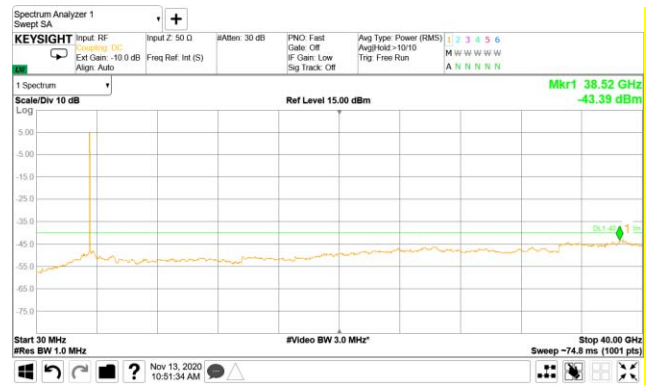
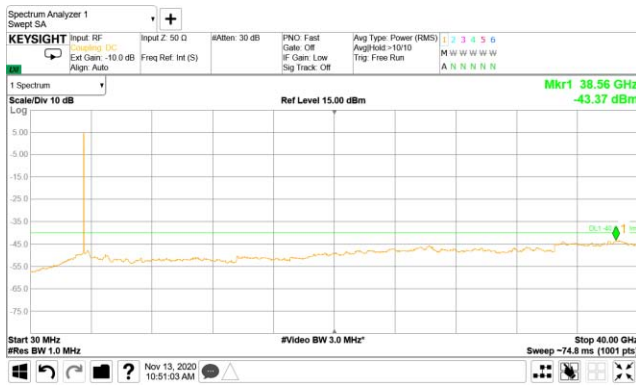


Highest channel

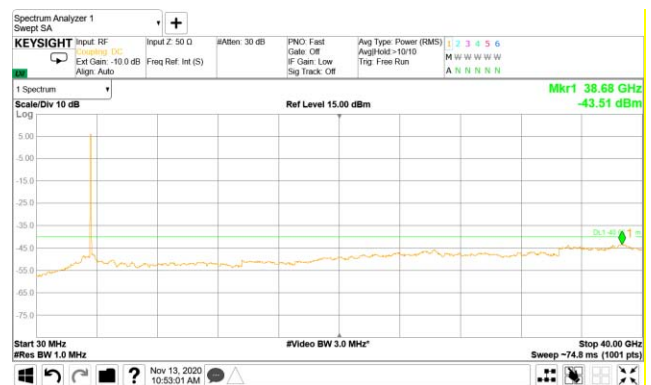
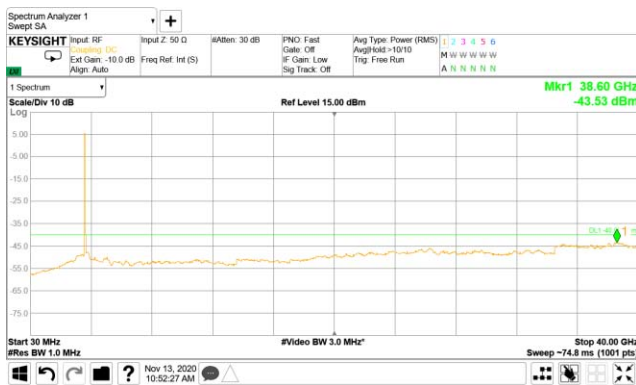
20MHz bandwidth-ANT 1

QPKS

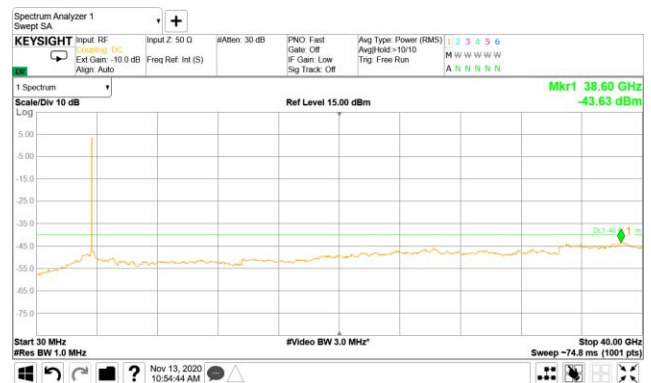
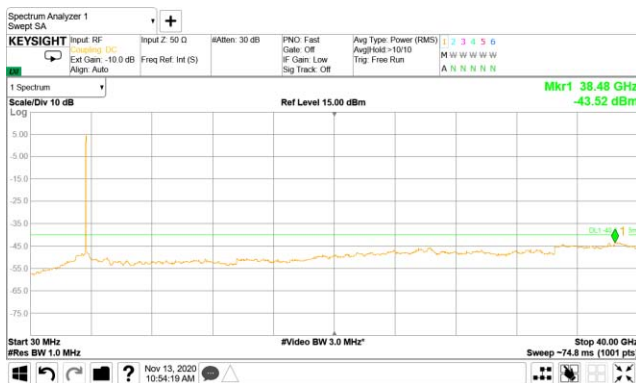
64QAM



Lowest channel



Middle channel



Highest channel

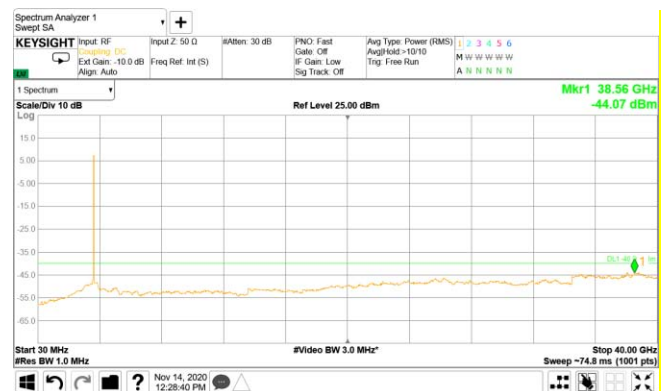
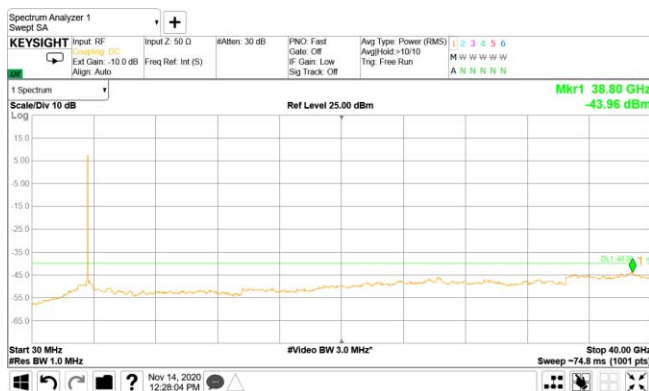
QPKS

10MHz bandwidth-ANT 2

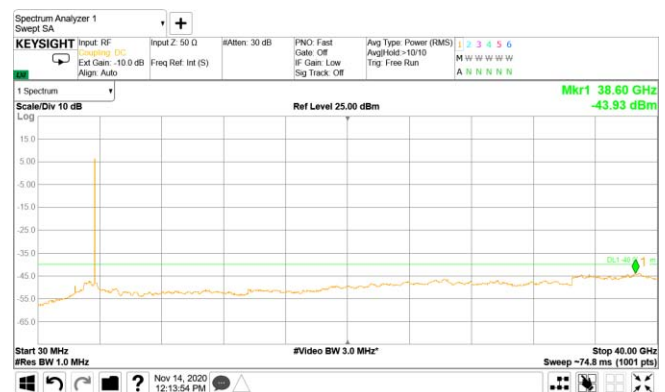
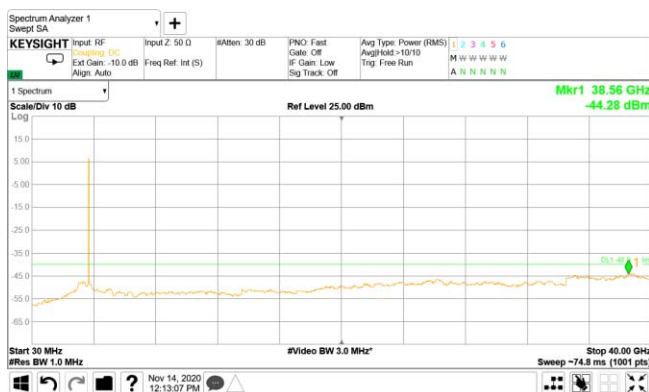
64QAM



Lowest channel



Middle channel



Highest channel

QPKS

15MHz bandwidth-ANT 2

64QAM



Lowest channel



Middle channel

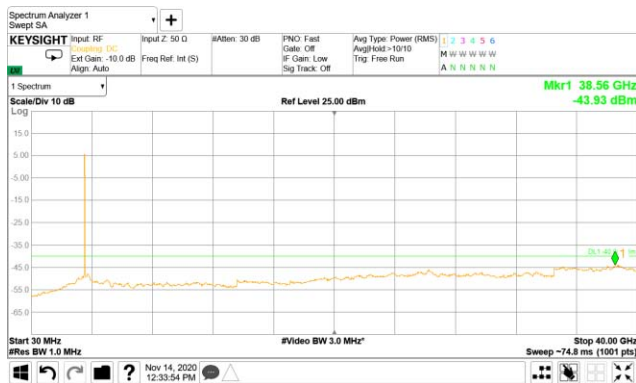


Highest channel

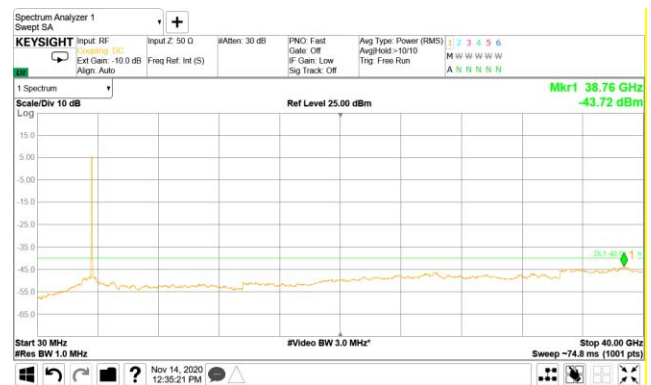
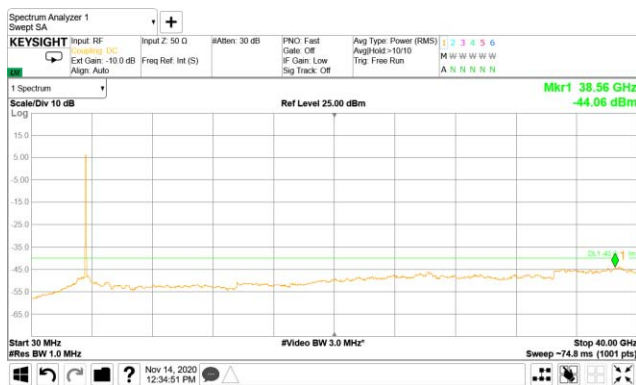
QPKS

20MHz bandwidth-ANT 2

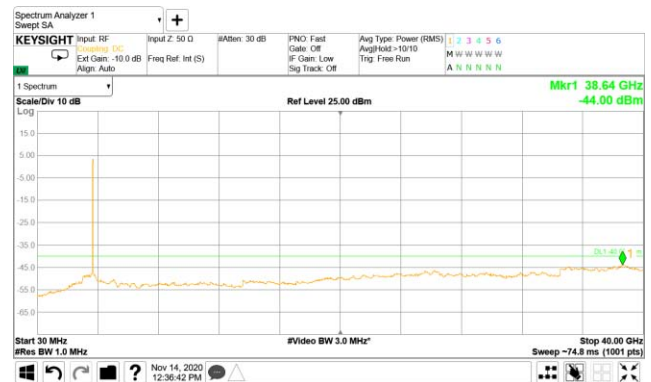
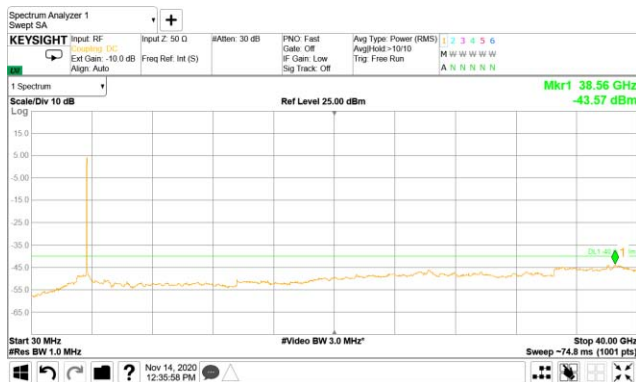
64QAM



Lowest channel

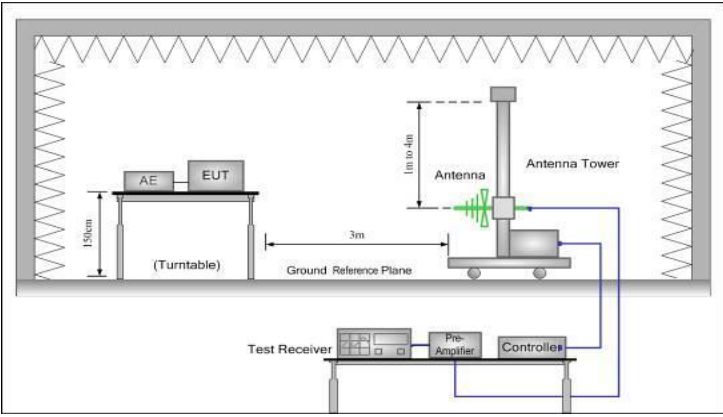
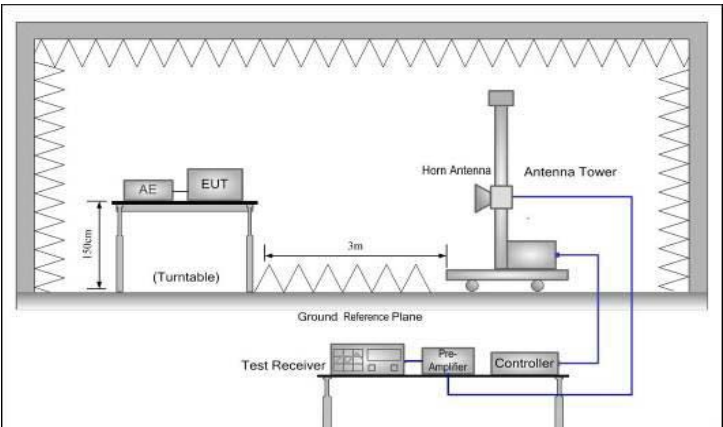
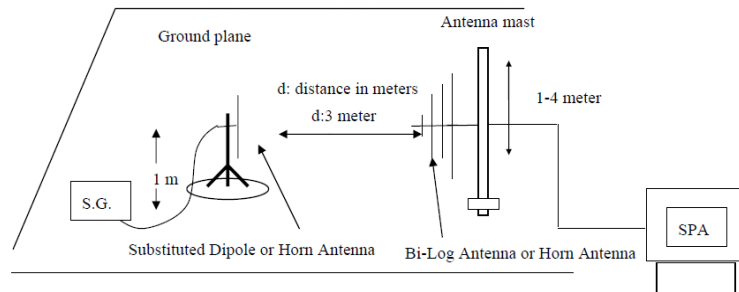


Middle channel



Highest channel

6.6 Field strength of spurious radiation measurement

Test Requirement:	Part 96.41(e)(1)(2)
Limit:	-40 dBm/MHz
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 
Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

	4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Uncertainty:	± 4.88 dB
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed
Remark:	During the test, pre-scan the QPSK, 64QAM modulation, and found the QPSK modulation is the worst case.

Measurement Data (worst case):

Band 48 (10MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7110.00	-58.26	11.27	1.60	-48.59	-40.00	-8.59	Vertical
10665.00	-54.21	11.30	1.94	-44.85	-40.00	-4.85	Vertical
14220.00	-52.23	11.63	2.16	-42.76	-40.00	-2.76	Vertical
7110.00	-59.60	11.27	1.60	-49.93	-40.00	-9.93	Horizontal
10665.00	-53.93	11.30	1.94	-44.57	-40.00	-4.57	Horizontal
14220.00	-50.69	11.63	2.16	-41.22	-40.00	-1.22	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7250.00	-58.98	11.35	1.61	-49.24	-40.00	-9.24	Vertical
10875.00	-52.94	11.18	1.95	-43.71	-40.00	-3.71	Vertical
14500.00	-51.52	12.05	2.17	-41.64	-40.00	-1.64	Vertical
7250.00	-58.38	11.35	1.61	-48.64	-40.00	-8.64	Horizontal
10875.00	-52.44	11.18	1.95	-43.21	-40.00	-3.21	Horizontal
14500.00	-51.01	12.05	2.17	-41.13	-40.00	-1.13	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7390.00	-58.50	11.43	1.62	-48.69	-40.00	-8.69	Vertical
11085.00	-53.53	11.23	1.96	-44.26	-40.00	-4.26	Vertical
14780.00	-51.32	12.47	2.17	-41.02	-40.00	-1.02	Vertical
7390.00	-57.95	11.43	1.62	-48.14	-40.00	-8.14	Horizontal
11085.00	-53.36	11.23	1.96	-44.09	-40.00	-4.09	Horizontal
14780.00	-52.19	12.47	2.17	-41.89	-40.00	-1.89	Horizontal
Remark: <i>The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.</i>							

Band 2 (20MHz)							
Lowest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7120.00	-58.84	11.27	1.60	-49.17	-40.00	-9.17	Vertical
10680.00	-53.61	11.29	1.94	-44.26	-40.00	-4.26	Vertical
14240.00	-51.54	11.66	2.16	-42.04	-40.00	-2.04	Vertical
7120.00	-59.42	11.27	1.60	-49.75	-40.00	-9.75	Horizontal
10680.00	-53.27	11.29	1.94	-43.92	-40.00	-3.92	Horizontal
14240.00	-51.84	11.66	2.16	-42.34	-40.00	-2.34	Horizontal
Middle channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7250.00	-58.38	11.35	1.61	-48.64	-40.00	-8.64	Vertical
10875.00	-52.11	11.18	1.95	-42.88	-40.00	-2.88	Vertical
14500.00	-51.69	12.05	2.17	-41.81	-40.00	-1.81	Vertical
7250.00	-59.72	11.35	1.61	-49.98	-40.00	-9.98	Horizontal
10875.00	-53.15	11.18	1.95	-43.92	-40.00	-3.92	Horizontal
14500.00	-51.73	12.05	2.17	-41.85	-40.00	-1.85	Horizontal
Highest channel							
Frequency (MHz)	Level at antenna terminals (dBm)	Substitute antenna gain (dBi)	Cable Loss (dBi)	Spurious Emission level (dBm)	Limit Line (dBm)	Over Limit (dBm)	Polarization
7380.00	-58.47	11.43	1.62	-48.66	-40.00	-8.66	Vertical
11070.00	-53.29	11.21	1.96	-44.04	-40.00	-4.04	Vertical
14760.00	-52.42	12.44	2.17	-42.15	-40.00	-2.15	Vertical
7380.00	-59.00	11.43	1.62	-49.19	-40.00	-9.19	Horizontal
11070.00	-44.17	11.21	1.96	-34.92	-40.00	5.08	Horizontal
14760.00	-51.90	12.44	2.17	-41.63	-40.00	-1.63	Horizontal
Remark: The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.							

6.7 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 2.1055(a)(b)																																																																														
Limit:	FCC: <table><thead><tr><th rowspan="2">Frequency range (MHz)</th><th rowspan="2">Fixed and base stations (±ppm)</th><th colspan="2">Mobile stations (±ppm)</th></tr><tr><th>Over 2 watts output power</th><th>2 watts or less output power</th></tr></thead><tbody><tr><td>Below 25</td><td>100</td><td>100</td><td>200</td></tr><tr><td>25-50</td><td>20</td><td>20</td><td>50</td></tr><tr><td>72-76</td><td>5</td><td></td><td>50</td></tr><tr><td>150-174</td><td>5</td><td>5</td><td>50</td></tr><tr><td>216-220</td><td>1.0</td><td></td><td>1.0</td></tr><tr><td>220-222</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>421-512</td><td>2.5</td><td>5</td><td>5</td></tr><tr><td>806-809</td><td>1.0</td><td>1.5</td><td>1.5</td></tr><tr><td>809-824</td><td>1.5</td><td>2.5</td><td>2.5</td></tr><tr><td>851-854</td><td>1.0</td><td>1.5</td><td>1.5</td></tr><tr><td>854-869</td><td>1.5</td><td>2.5</td><td>2.5</td></tr><tr><td>896-901</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>902-928</td><td>2.5</td><td>2.5</td><td>2.5</td></tr><tr><td>902-928</td><td>2.5</td><td>2.5</td><td>2.5</td></tr><tr><td>929-930</td><td>1.5</td><td></td><td></td></tr><tr><td>935-940</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>1427-1435</td><td>300</td><td>300</td><td>300</td></tr><tr><td>Above 2450</td><td></td><td></td><td></td></tr></tbody></table>	Frequency range (MHz)	Fixed and base stations (±ppm)	Mobile stations (±ppm)		Over 2 watts output power	2 watts or less output power	Below 25	100	100	200	25-50	20	20	50	72-76	5		50	150-174	5	5	50	216-220	1.0		1.0	220-222	0.1	1.5	1.5	421-512	2.5	5	5	806-809	1.0	1.5	1.5	809-824	1.5	2.5	2.5	851-854	1.0	1.5	1.5	854-869	1.5	2.5	2.5	896-901	0.1	1.5	1.5	902-928	2.5	2.5	2.5	902-928	2.5	2.5	2.5	929-930	1.5			935-940	0.1	1.5	1.5	1427-1435	300	300	300	Above 2450			
Frequency range (MHz)	Fixed and base stations (±ppm)			Mobile stations (±ppm)																																																																											
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935-940	0.1	1.5	1.5																																																																												
1427-1435	300	300	300																																																																												
Above 2450																																																																															
Test setup:	Spectrum analyzer Att. Temperature Chamber EUT Note : Measurement setup for testing on Antenna connector																																																																														
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached																																																																														
Test Instruments:	Refer to section 5.10 for details																																																																														
Test mode:	Refer to section 5.3 for details																																																																														
Test results:	Passed																																																																														
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.																																																																														

Measurement Data (the worst channel):

Reference Frequency: Lowest channel=3555.0MHz(10MHz for QPSK)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	187	0.052602
	-20	176	0.049508
	-10	180	0.050633
	0	144	0.040506
	10	150	0.042194
	20	132	0.037131
	30	126	0.035443
	40	120	0.033755
	55	113	0.031786

Reference Frequency: Lowest channel=3557.5MHz(15MHz for QPSK)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	188	0.052846
	-20	151	0.042446
	-10	123	0.034575
	0	165	0.046381
	10	144	0.040478
	20	175	0.049192
	30	121	0.034013
	40	106	0.029796
	55	111	0.031202

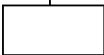
Reference Frequency: Lowest channel=3560.0MHz(20MHz for QPSK)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	186	0.052247
	-20	165	0.046348
	-10	174	0.048876
	0	123	0.034551
	10	160	0.044944
	20	144	0.040449
	30	150	0.042135
	40	108	0.030337
	55	133	0.037360

Reference Frequency: Lowest channel=3555.0MHz(10MHz for 64QAM)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	199	0.055977
	-20	181	0.050914
	-10	165	0.046414
	0	171	0.048101
	10	123	0.034599
	20	132	0.037131
	30	136	0.038256
	40	128	0.036006
	55	144	0.040506

Reference Frequency: Lowest channel=3557.5MHz(15MHz for 64QAM)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	197	0.055376
	-20	121	0.034013
	-10	154	0.043289
	0	166	0.046662
	10	133	0.037386
	20	144	0.040478
	30	102	0.028672
	40	115	0.032326
	55	118	0.033169

Reference Frequency: Lowest channel=3560.0MHz(20MHz for 64QAM)			
Power supplied (Vdc)	Temperature (°C)	Frequency error	
		Hz	ppm
24.00	-40	198	0.055618
	-20	180	0.050562
	-10	156	0.043820
	0	132	0.037079
	10	144	0.040449
	20	171	0.048034
	30	105	0.029494
	40	116	0.032584
	55	128	0.035955

6.8 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 2.1055(b)																																																																										
Limit:	FCC: <table><thead><tr><th rowspan="2">Frequency range (MHz)</th><th rowspan="2">Fixed and base stations (±ppm)</th><th colspan="2">Mobile stations (±ppm)</th></tr><tr><th>Over 2 watts output power</th><th>2 watts or less output power</th></tr></thead><tbody><tr><td>Below 25</td><td>100</td><td>100</td><td>200</td></tr><tr><td>25-50</td><td>20</td><td>20</td><td>50</td></tr><tr><td>72-76</td><td>5</td><td></td><td>50</td></tr><tr><td>150-174</td><td>5</td><td>5</td><td>50</td></tr><tr><td>216-220</td><td>1.0</td><td></td><td>1.0</td></tr><tr><td>220-222</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>421-512</td><td>2.5</td><td>5</td><td>5</td></tr><tr><td>806-809</td><td>1.0</td><td>1.5</td><td>1.5</td></tr><tr><td>809-824</td><td>1.5</td><td>2.5</td><td>2.5</td></tr><tr><td>851-854</td><td>1.0</td><td>1.5</td><td>1.5</td></tr><tr><td>854-869</td><td>1.5</td><td>2.5</td><td>2.5</td></tr><tr><td>896-901</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>902-928</td><td>2.5</td><td>2.5</td><td>2.5</td></tr><tr><td>929-930</td><td>1.5</td><td></td><td></td></tr><tr><td>935-940</td><td>0.1</td><td>1.5</td><td>1.5</td></tr><tr><td>1427-1435</td><td>300</td><td>300</td><td>300</td></tr><tr><td>Above 2450</td><td></td><td></td><td></td></tr></tbody></table>	Frequency range (MHz)	Fixed and base stations (±ppm)	Mobile stations (±ppm)		Over 2 watts output power	2 watts or less output power	Below 25	100	100	200	25-50	20	20	50	72-76	5		50	150-174	5	5	50	216-220	1.0		1.0	220-222	0.1	1.5	1.5	421-512	2.5	5	5	806-809	1.0	1.5	1.5	809-824	1.5	2.5	2.5	851-854	1.0	1.5	1.5	854-869	1.5	2.5	2.5	896-901	0.1	1.5	1.5	902-928	2.5	2.5	2.5	929-930	1.5			935-940	0.1	1.5	1.5	1427-1435	300	300	300	Above 2450			
Frequency range (MHz)	Fixed and base stations (±ppm)			Mobile stations (±ppm)																																																																							
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Above 2450																																																																											
Test setup:	Spectrum analyzer  Att. Temperature Chamber EUT  Variable Power Supply Note : Measurement setup for testing on Antenna connector																																																																										
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.																																																																										
Test Instruments:	Refer to section 5.10 for details																																																																										
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.																																																																										
Test results:	Passed																																																																										
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.																																																																										

Measurement Data (the worst channel):

Reference Frequency: Lowest channel=3555.0MHz(10MHz for QPSK)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	89	0.025035
	24.0	78	0.021941
	20.4	90	0.025316
Reference Frequency: Lowest channel=3557.5MHz(15MHz for QPSK)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	99	0.027829
	24.0	80	0.022488
	20.4	76	0.021363
Reference Frequency: Lowest channel=3560.0MHz(20MHz for QPSK)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	99	0.027809
	24.0	71	0.019944
	20.4	80	0.022472

Reference Frequency: Lowest channel=3555.0MHz(10MHz for 64QAM)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	84	0.023629
	24.0	96	0.027004
	20.4	73	0.020534
Reference Frequency: Lowest channel=3557.5MHz(15MHz for 64QAM)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	96	0.026985
	24.0	84	0.023612
	20.4	70	0.019677
Reference Frequency: Lowest channel=3560.0MHz(20MHz for 64QAM)			
Temperature (°C)	Power supplied (Vdc)	Frequency error	
		Hz	ppm
25	27.6	98	0.027528
	24.0	85	0.023876
	20.4	60	0.016854