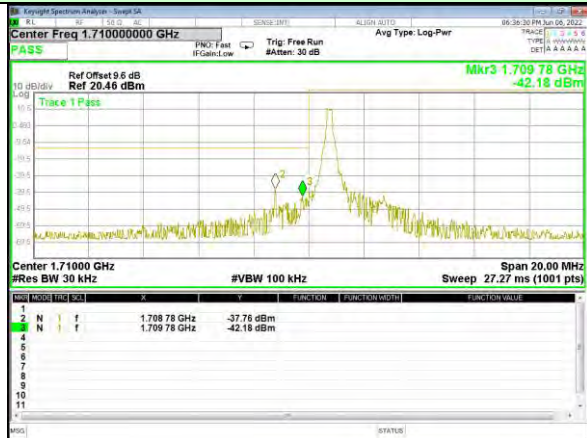
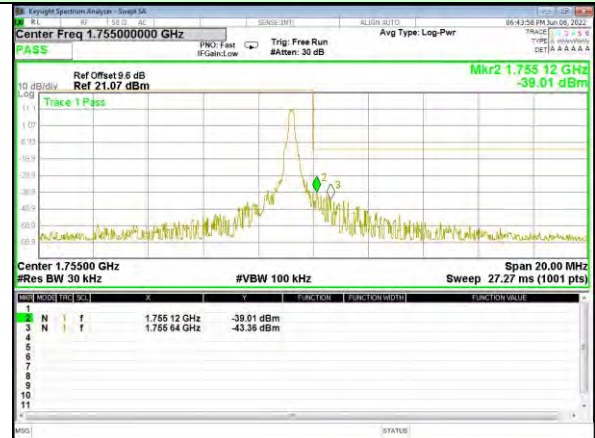


Test Mode: LTE Band 4 / 10MHz / 1RB / 16-QAM



Lowest channel



Highest channel

Test Mode: LTE Band 4 / 10MHz / 50RB / 16-QAM



Lowest channel

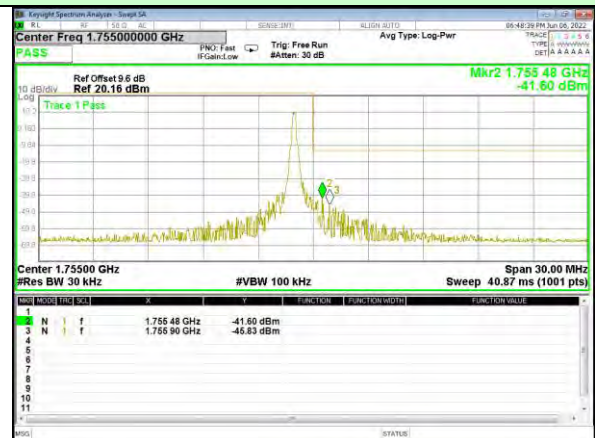


Highest channel

Test Mode: LTE Band 4 / 15MHz / 1RB / 16-QAM

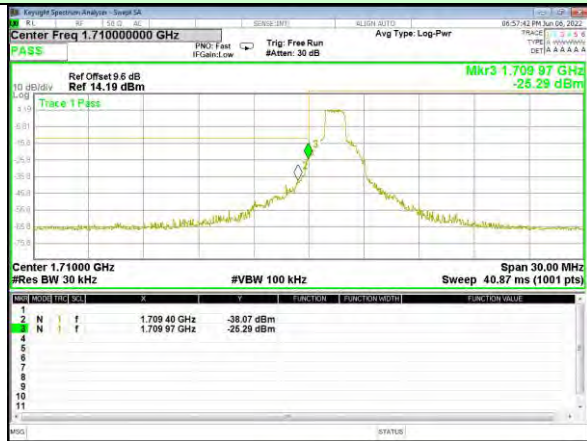


Lowest channel

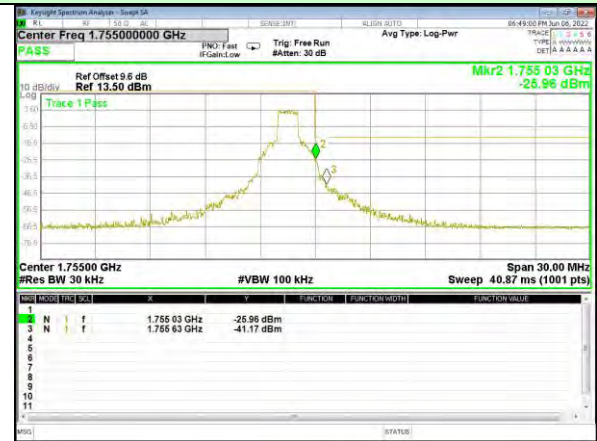


Highest channel

Test Mode: LTE Band 4 / 15MHz / 75RB / 16-QAM

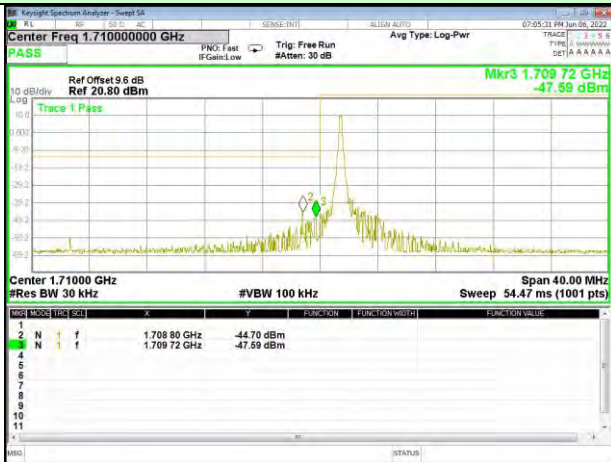


Lowest channel

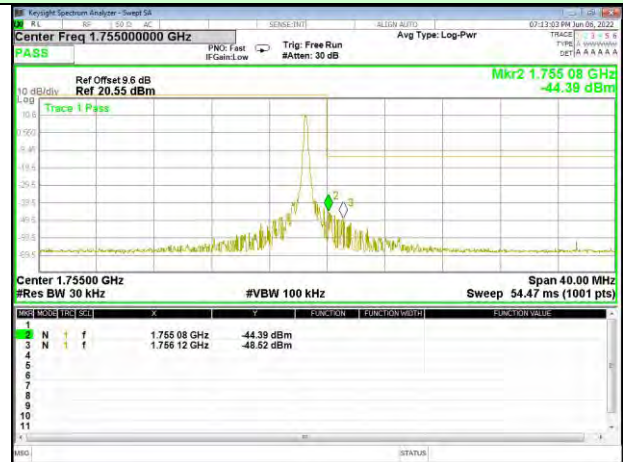


Highest channel

Test Mode: LTE Band 4 / 20MHz / 1RB / 16-QAM

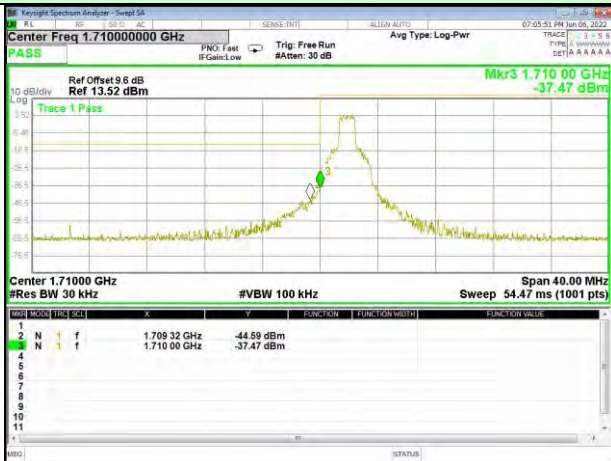


Lowest channel

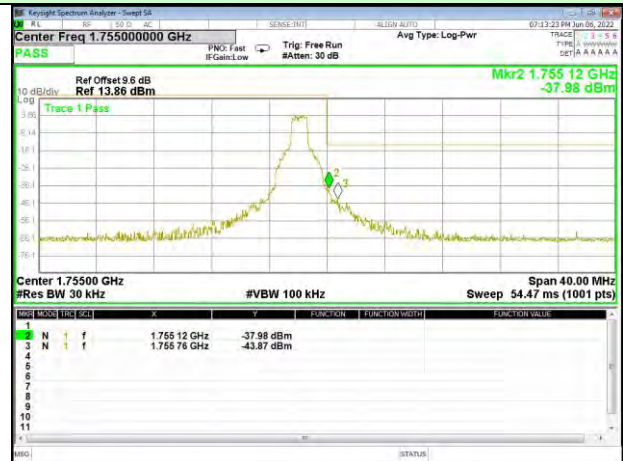


Highest channel

Test Mode: LTE Band 4 / 20MHz / 100RB / 16-QAM

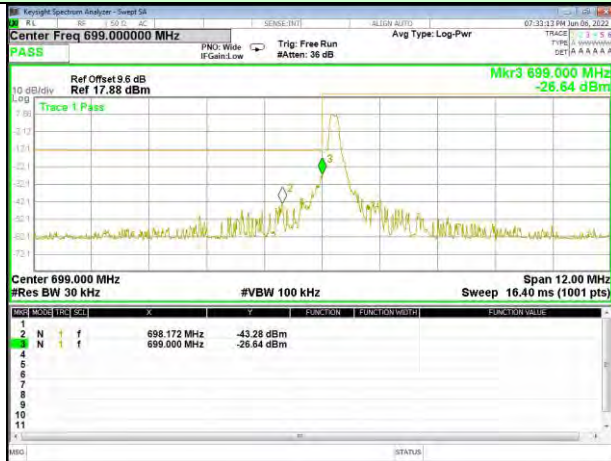


Lowest channel

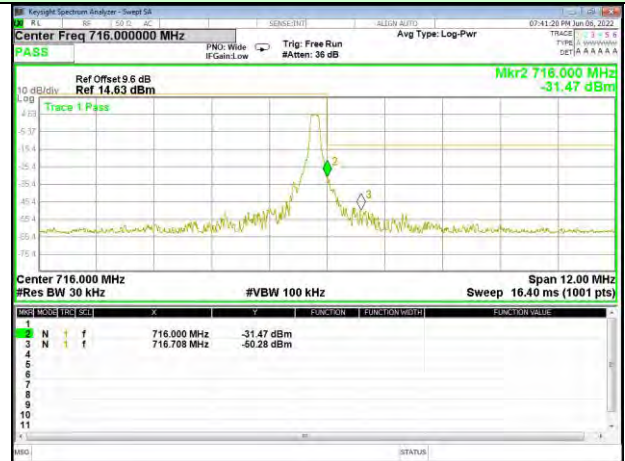


Highest channel

Test Mode: LTE Band 12 / 1.4MHz / 1RB / QPSK

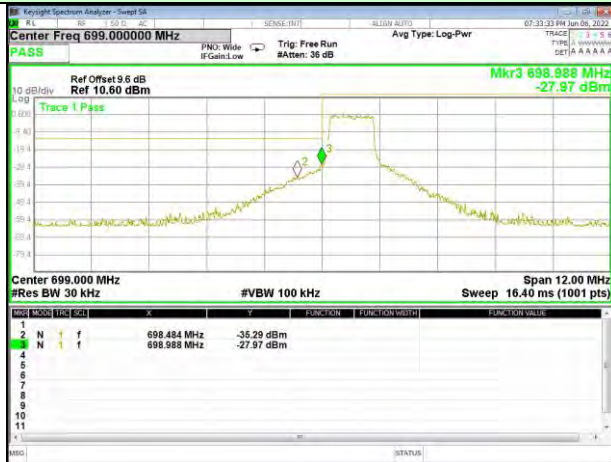


Lowest channel

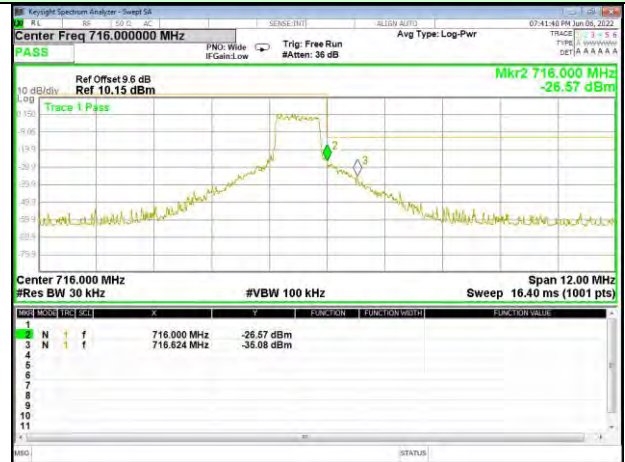


Highest channel

Test Mode: LTE Band 12 / 1.4MHz / Full RB / QPSK

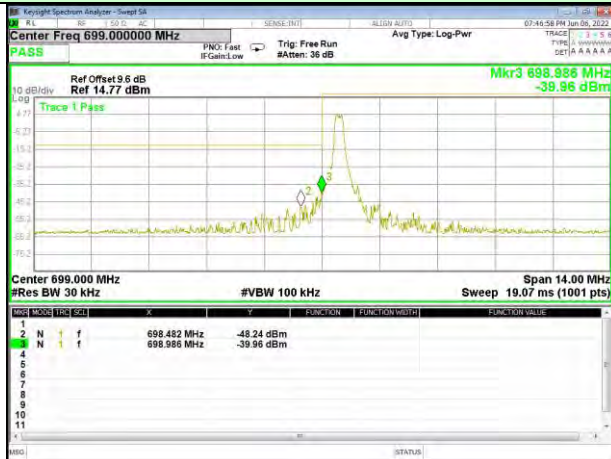


Lowest channel

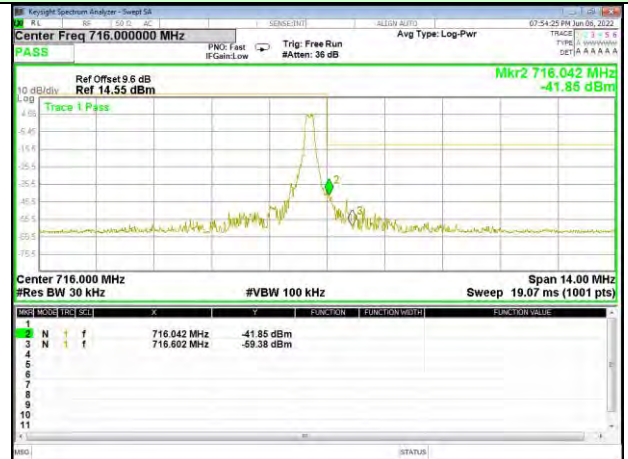


Highest channel

Test Mode: LTE Band 12 / 3MHz / 1RB / QPSK

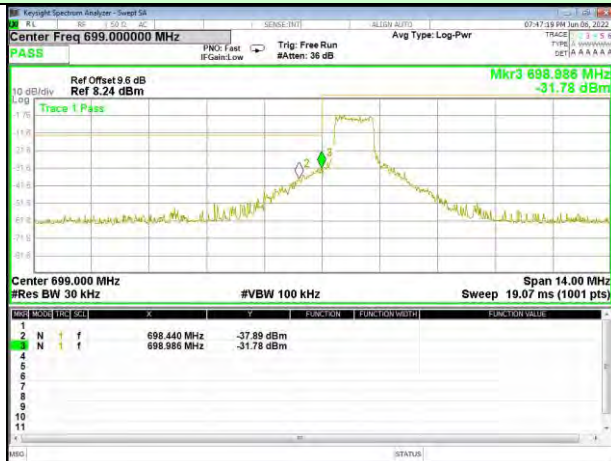


Lowest channel

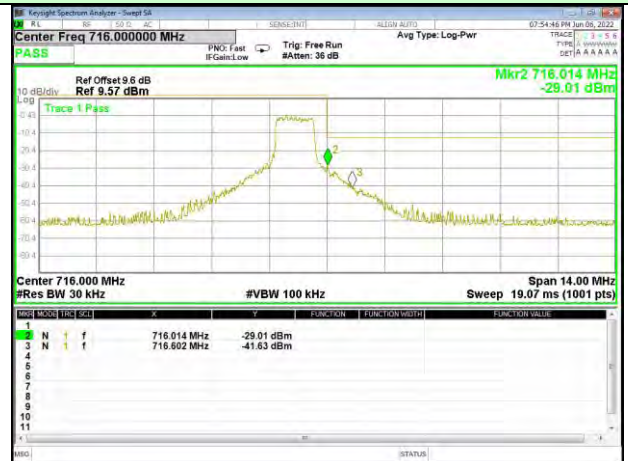


Highest channel

Test Mode: LTE Band 12 / 3MHz / Full RB / QPSK



Lowest channel



Highest channel

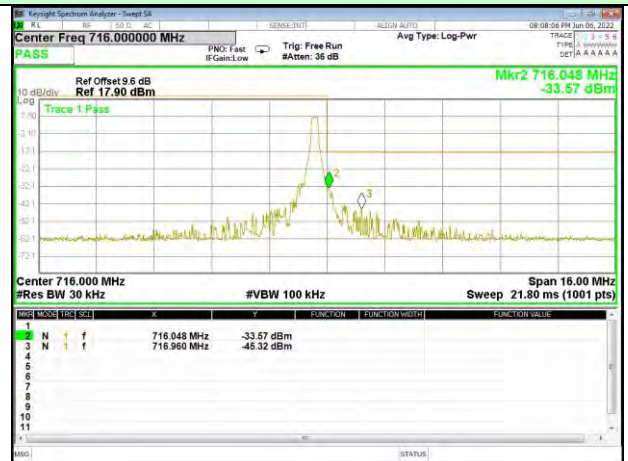
Center Freq 699.000000 MHz
 PASS
 Ref Offset 9.5 dB
 Ref 18.35 dBm
 Mkr3 699.000 MHz
 -33.89 dBm

Trace 1 Pass

Center 699.00 MHz
 #Res BW 30 kHz
 #VBW 100 kHz
 Span 16.00 MHz
 Sweep 21.80 ms (1001 pts)

Line	Mkrc	Freq	Power	Power/Hz	Power/Hz (dBm)	Power/Hz (dBm)
2	N	f	698.216 MHz	-48.98 dBm		
3	N	f	699.000 MHz	-33.89 dBm		
4						
5						
6						
7						
8						
9						
10						
11						

Highest channel



Keysight Spectrum Analyzer - Sample 5b

Center Freq 699.000000 MHz

Span 16.00 MHz

Res BW 30 kHz

#VBW 100 kHz

Sweep 21.80 ms (1001 pts)

Ref Offset 9.6 dB

Ref 11.31 dBm

Mkr3 698.984 MHz

-26.73 dBm

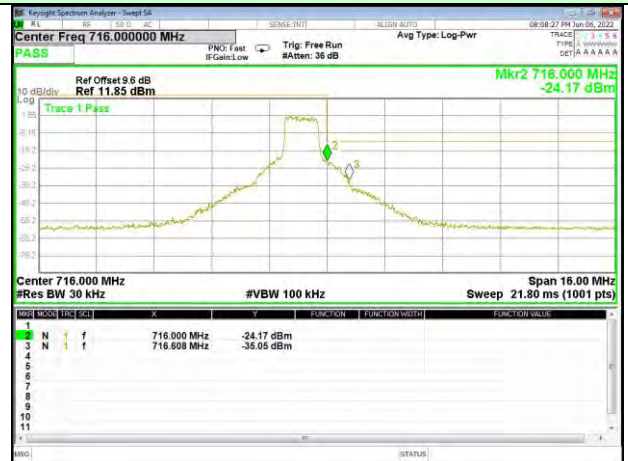
Trace 1 Pass

698.984 MHz

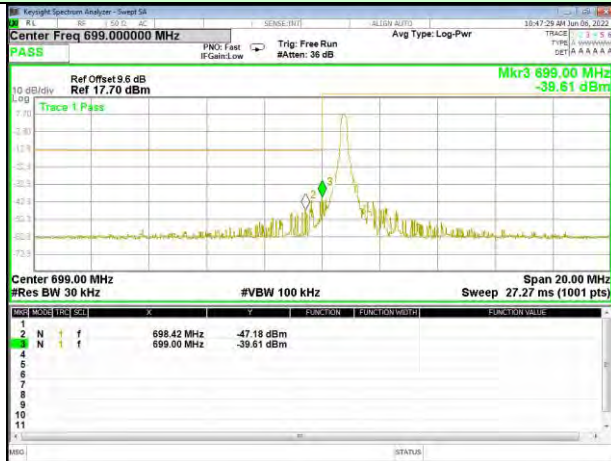
-26.73 dBm

Line	Marker	Frequency	Amplitude
2	N	698.488 MHz	-33.60 dBm
3	N	698.984 MHz	-26.73 dBm

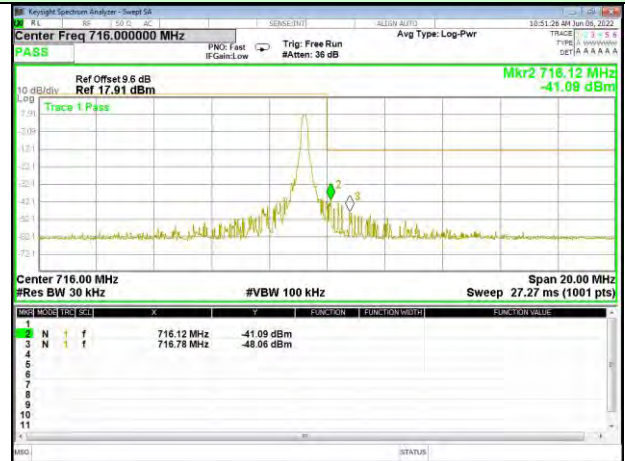
Highest channel



Test Mode: LTE Band 12 / 10MHz / 1RB / QPSK

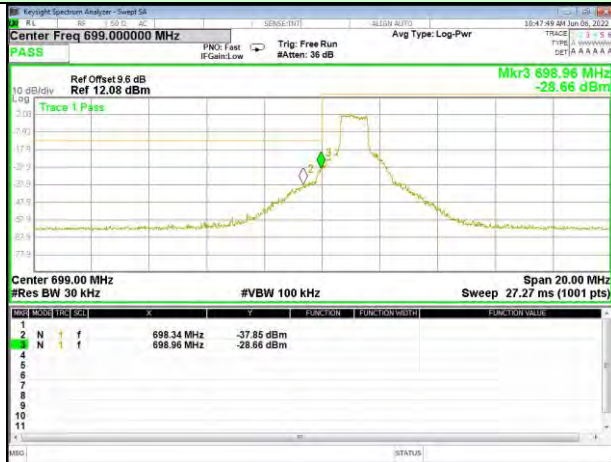


Lowest channel

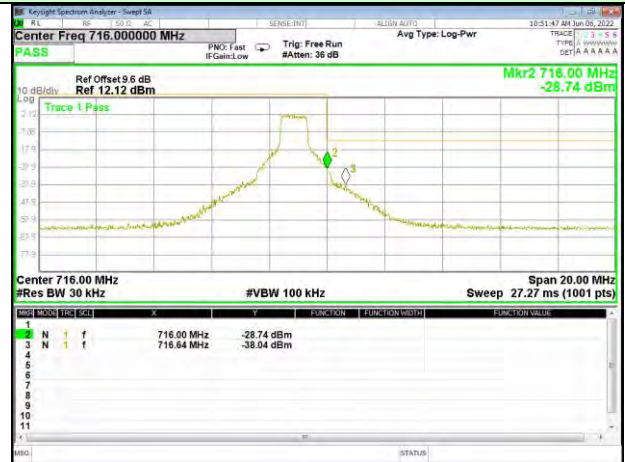


Highest channel

Test Mode: LTE Band 12 / 10MHz / Full RB / QPSK

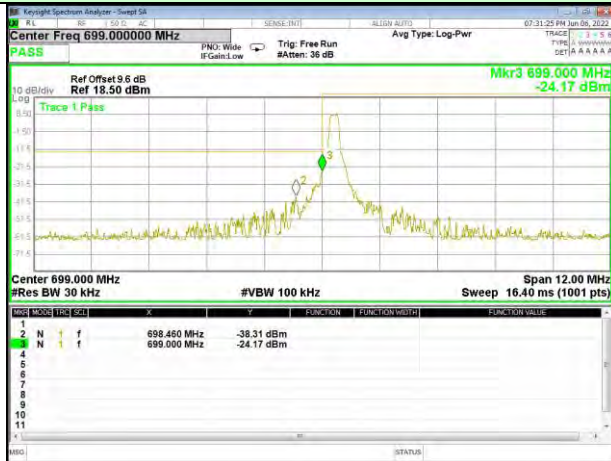


Lowest channel

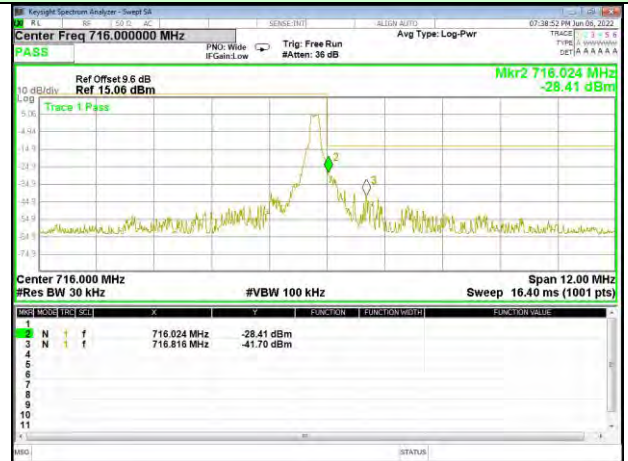


Highest channel

Test Mode: LTE Band 12 / 1.4MHz / 1RB / 16-QAM

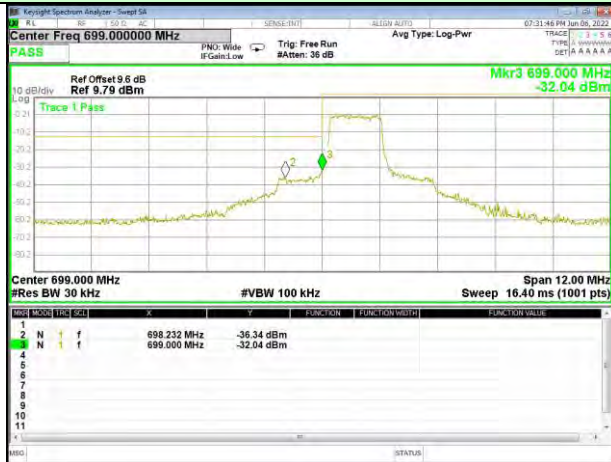


Lowest channel



Highest channel

Test Mode: LTE Band 12 / 1.4MHz / Full RB / 16-QAM

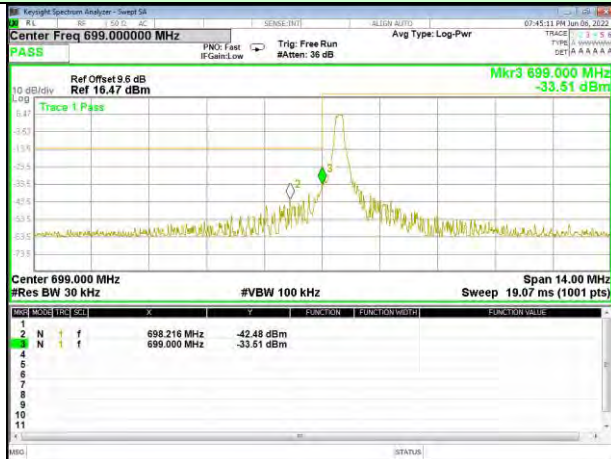


Lowest channel

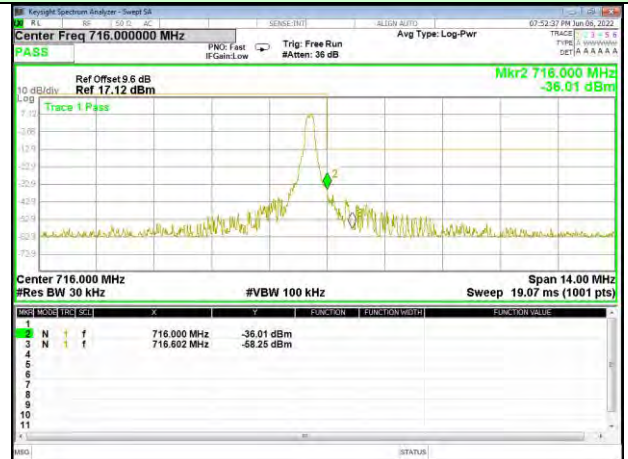


Highest channel

Test Mode: LTE Band 12 / 3MHz / 1 RB / 16-QAM

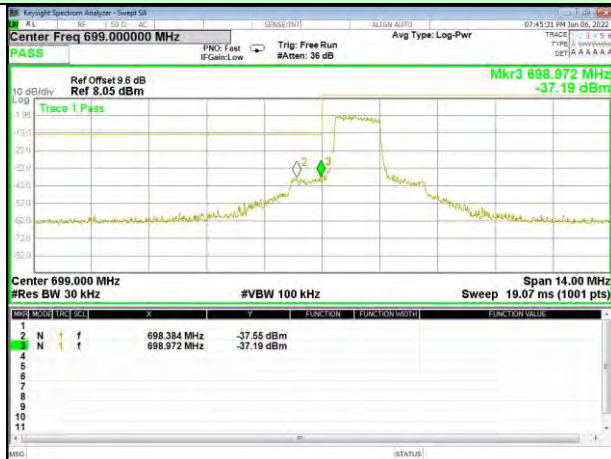


Lowest channel

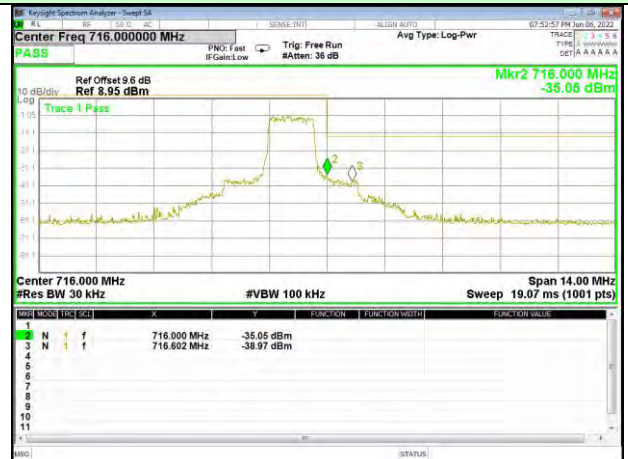


Highest channel

Test Mode: LTE Band 12 / 3MHz / Full RB / 16-QAM

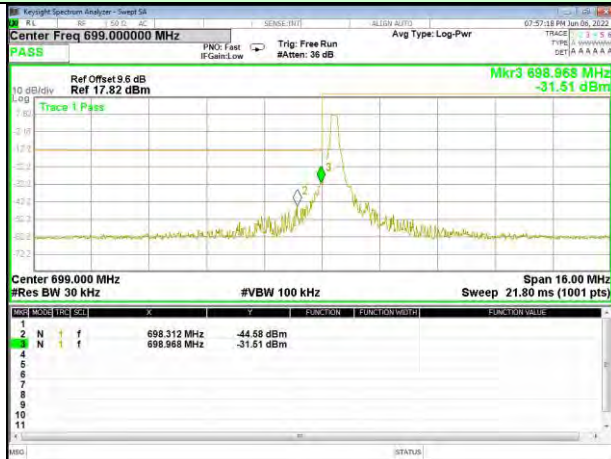


Lowest channel

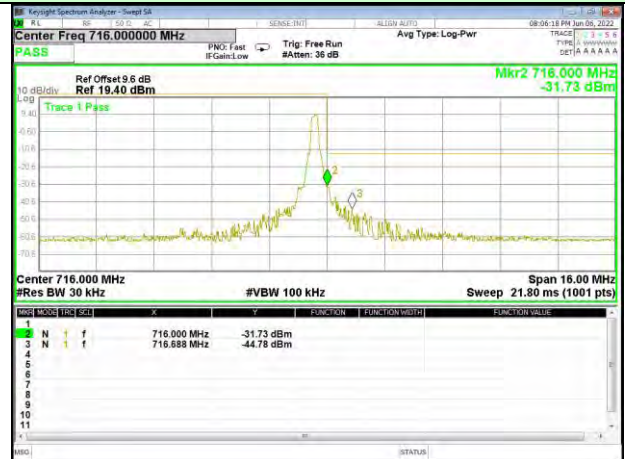


Highest channel

Test Mode: LTE Band 12 / 5MHz / 1RB / 16-QAM

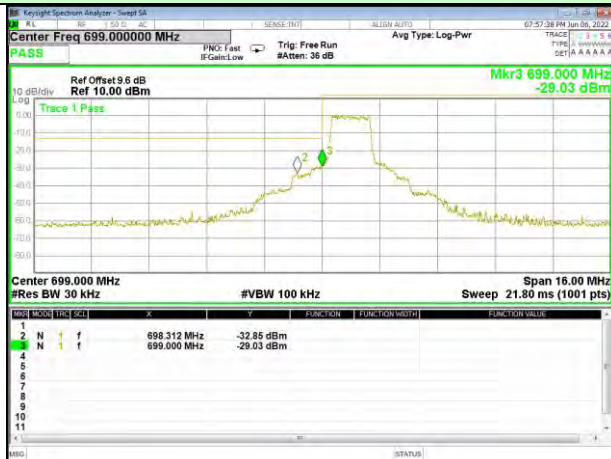


Lowest channel

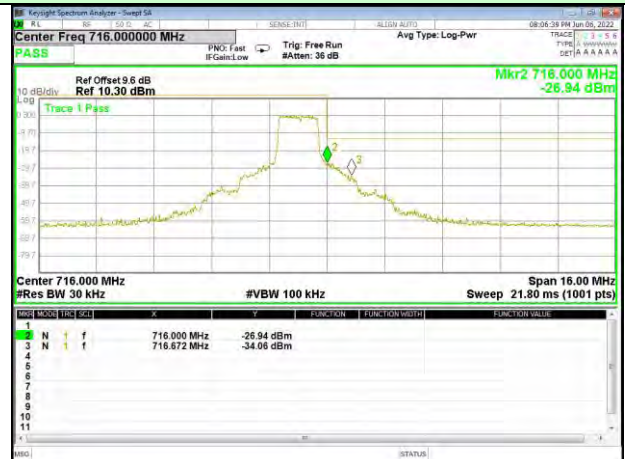


Highest channel

Test Mode: LTE Band 12 / 5MHz / Full RB / 16-QAM

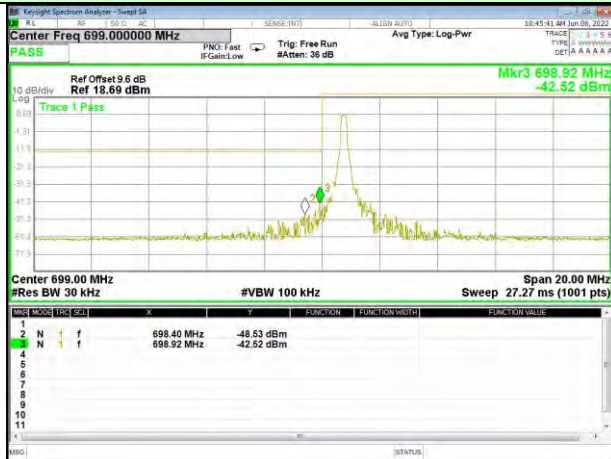


Lowest channel

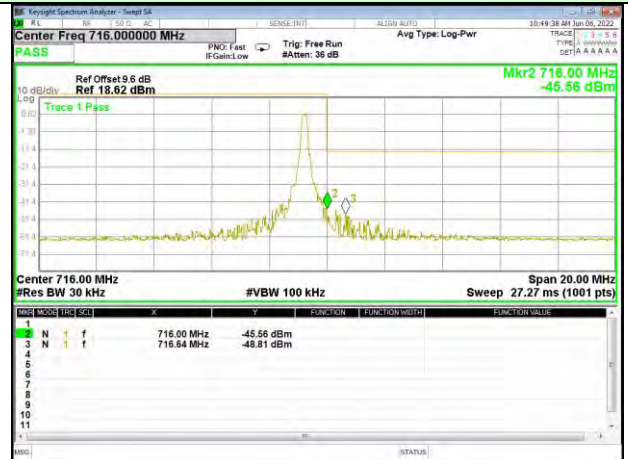


Highest channel

Test Mode: LTE Band 12 / 10MHz / 1RB / 16-QAM

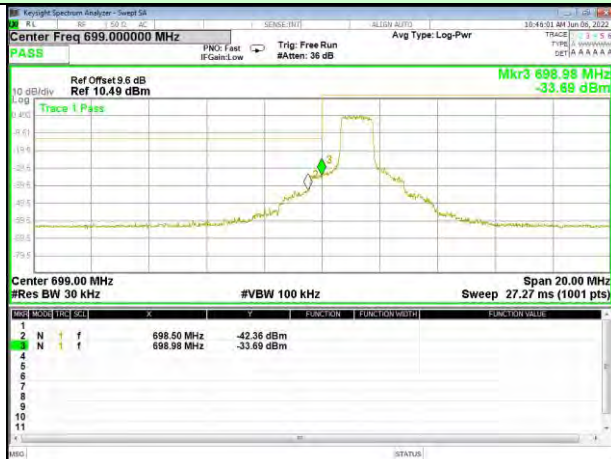


Lowest channel

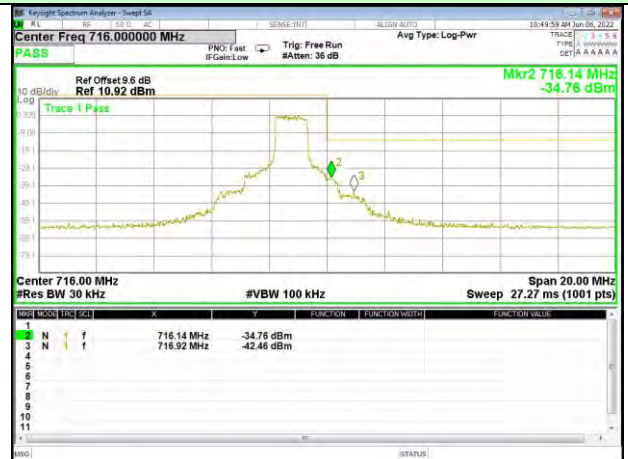


Highest channel

Test Mode: LTE Band 12 / 10MHz / Full RB / 16-QAM

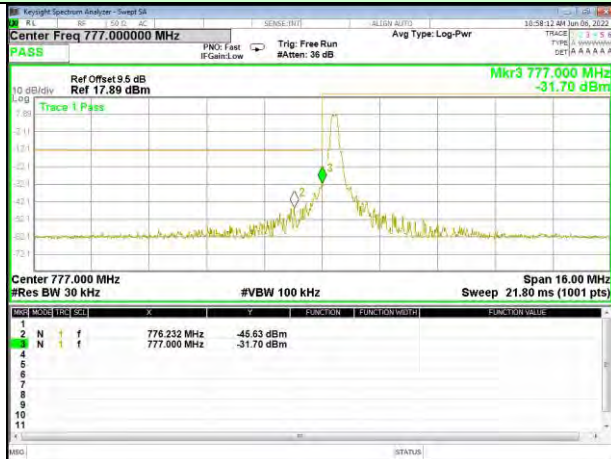


Lowest channel

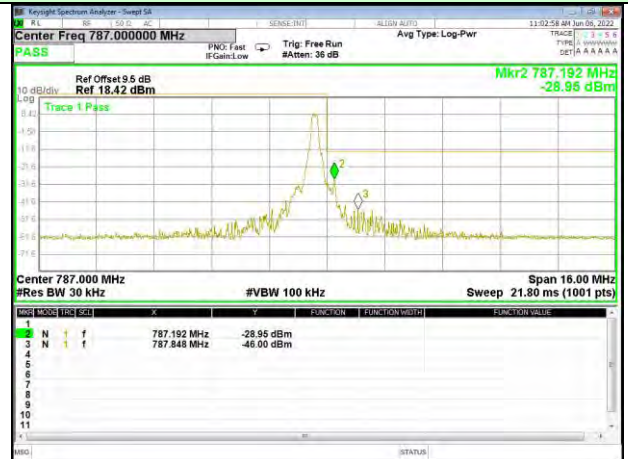


Highest channel

Test Mode: LTE Band 13 / 5MHz / 1RB / QPSK

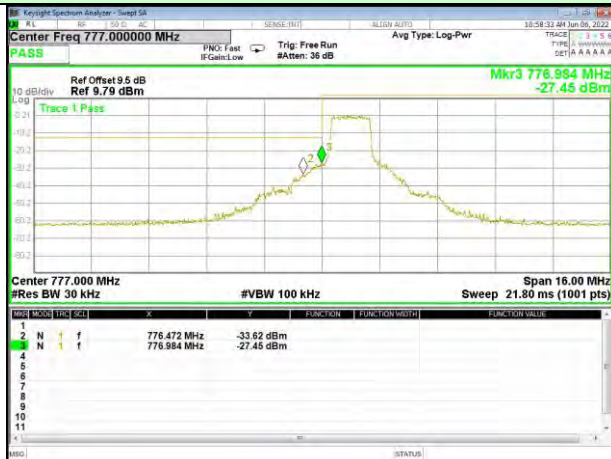


Lowest channel

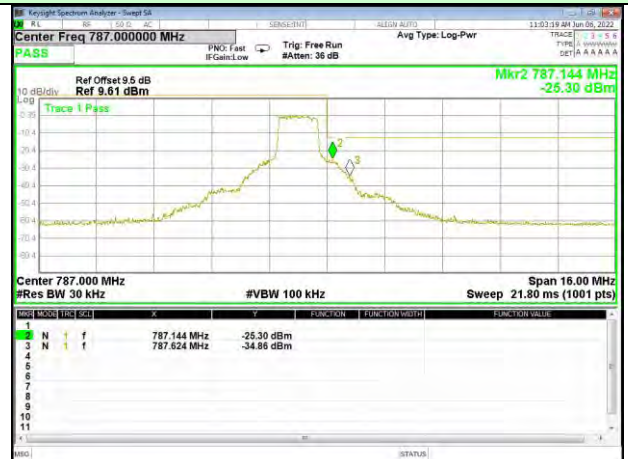


Highest channel

Test Mode: LTE Band 13 / 5MHz / 25RB / QPSK

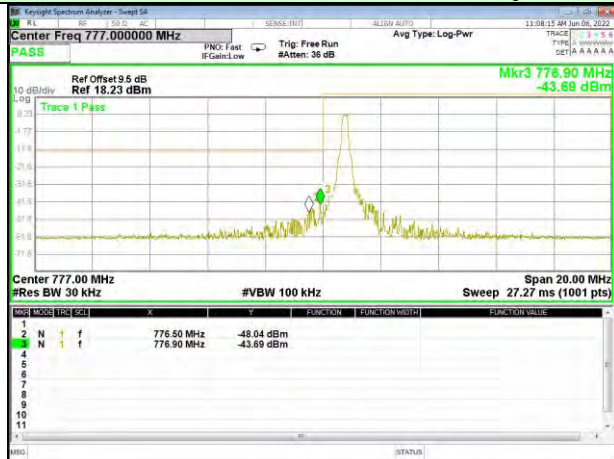


Lowest channel

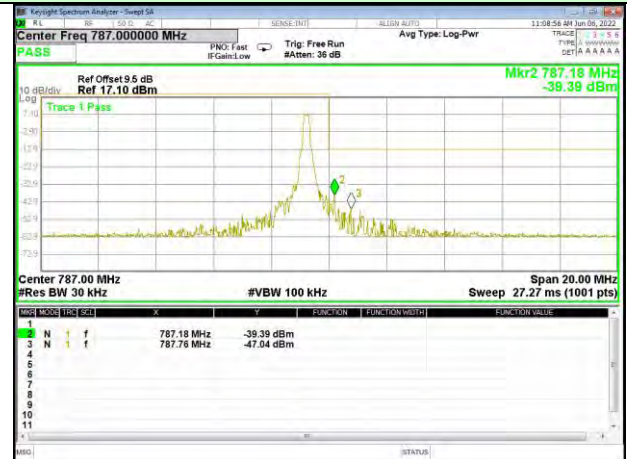


Highest channel

Test Mode: LTE Band 13 / 10MHz / 1RB / QPSK

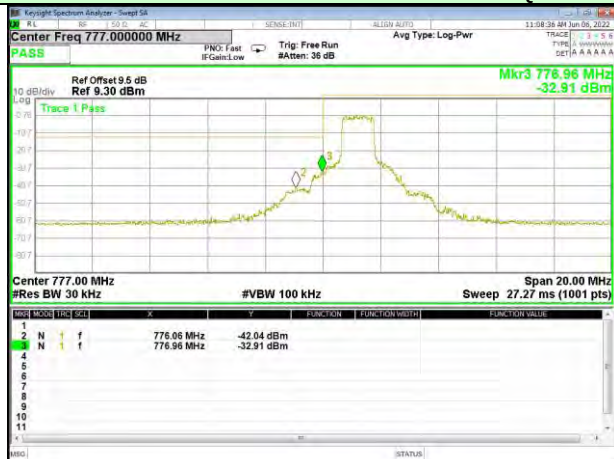


Lowest channel

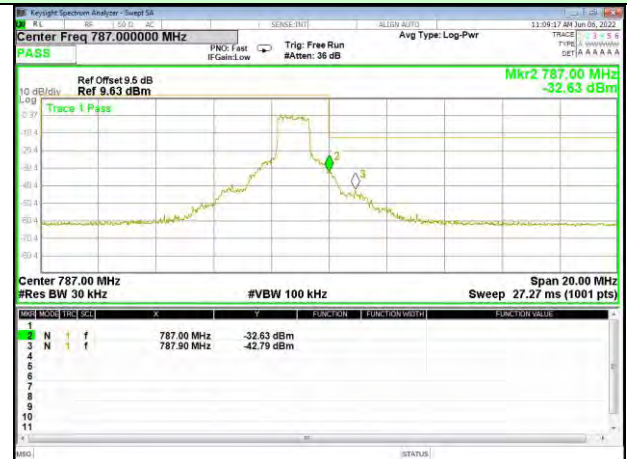


Highest channel

Test Mode: LTE Band 13 / 10MHz / 25RB / QPSK



Lowest channel

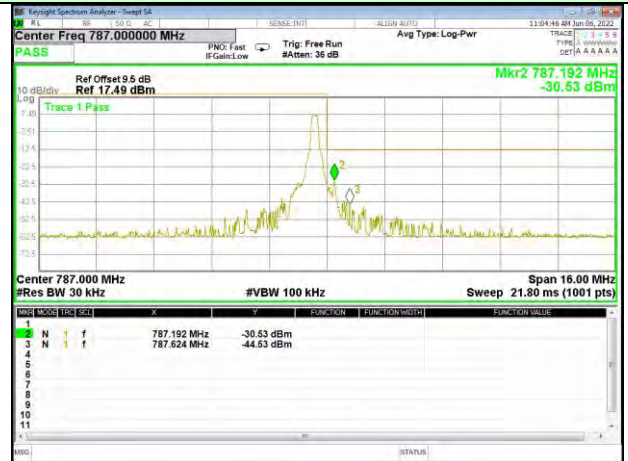


Highest channel

Test Mode: LTE Band 13 / 5MHz / 1RB / 16-QAM

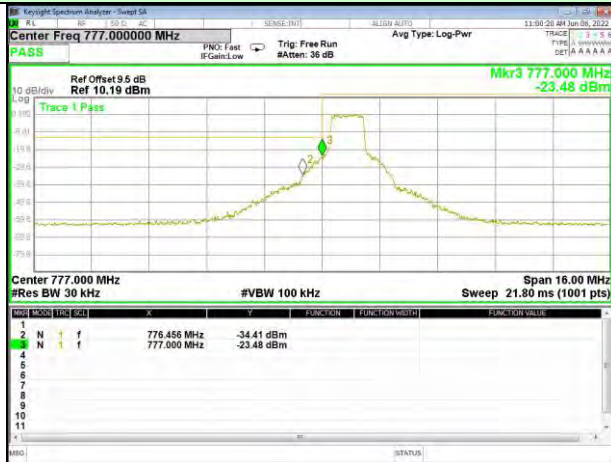


Lowest channel



Highest channel

Test Mode: LTE Band 13 / 5MHz / 25RB / 16-QAM

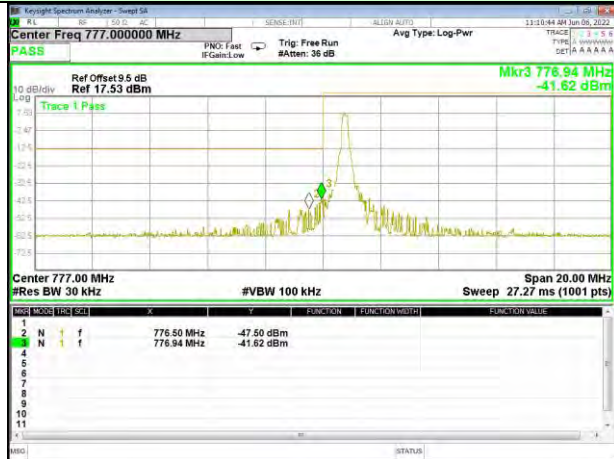


Lowest channel

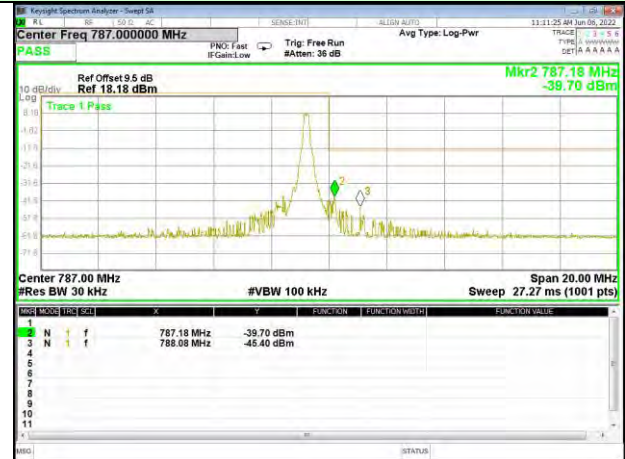


Highest channel

Test Mode: LTE Band 13 / 10MHz / 1RB / 16-QAM

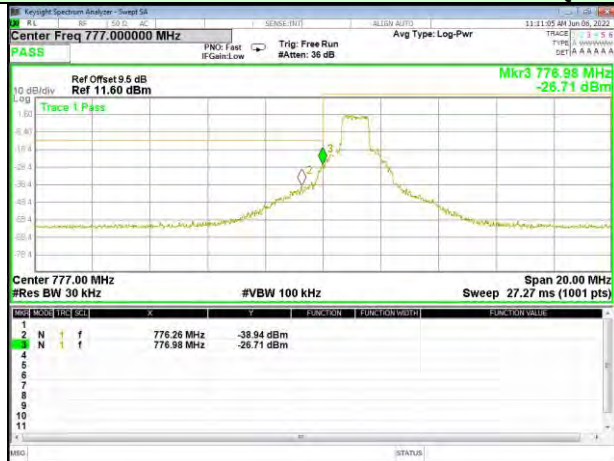


Lowest channel

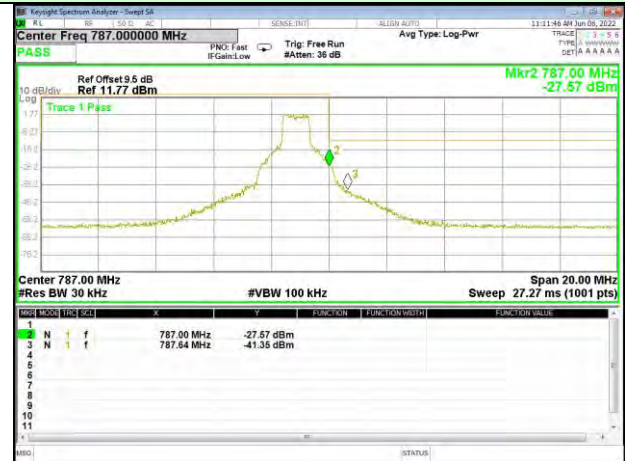


Highest channel

Test Mode: LTE Band 13 / 10MHz / 25RB / 16-QAM



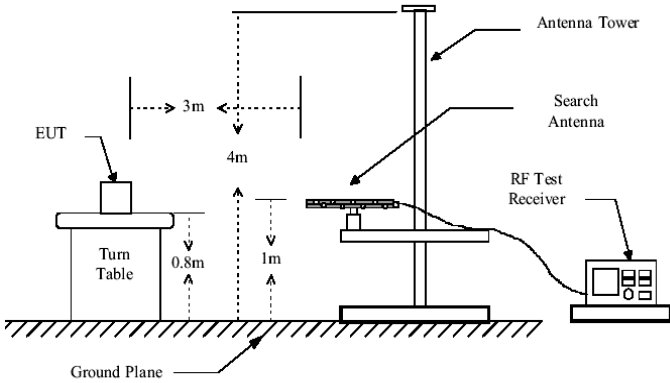
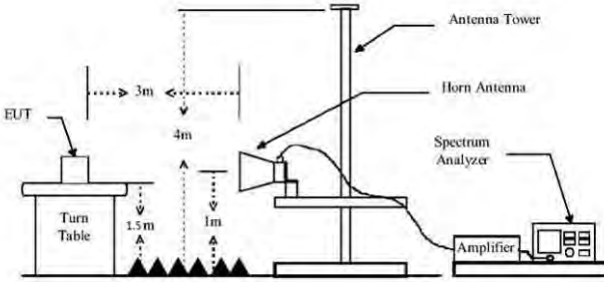
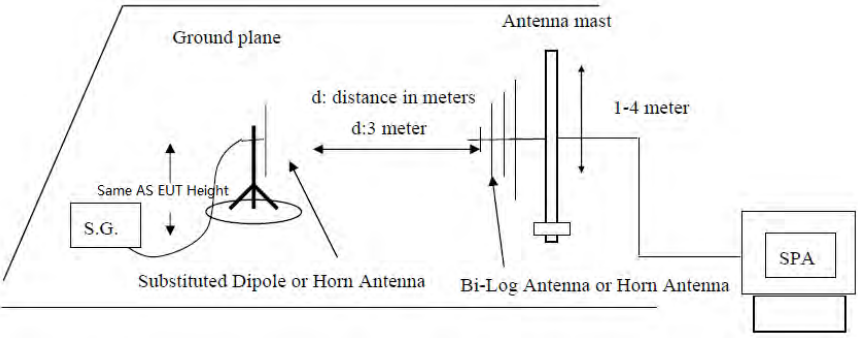
Lowest channel



Highest channel

Note: All bandwidth and modulation are tested, only the worst result is reported.

4.8 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a), FCC part24.232(b) and FCC part 27.50
Test Method:	ANSI C63.26:2015
Limit:	LTE Band 2: 2W (EIRP) LTE Band 4: 1W (EIRP) LTE Band 12: 3W (EIRP) LTE Band 13: 3W (EIRP)
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 measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. 3. ERP were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows: $\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$ 4. EIRP were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: $\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

LTE BAND 2 QPSK-5MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1852.5	-13.02	-29.30	-	8.10	24.38	33	H	-8.62
	1880	-13.30	-29.40	-	8.10	24.20	33	H	-8.80
	1907.5	-13.25	-29.30	-	8.10	24.15	33	H	-8.85
LTE BAND 2 QPSK-10MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1855	-13.24	-29.30	-	8.10	24.16	33	H	-8.84
	1880	-14.43	-29.40	-	8.10	23.07	33	H	-9.93
	1905	-14.44	-29.30	-	8.10	22.96	33	H	-10.04
LTE BAND 2 QPSK-15MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1857.5	-13.21	-29.30	-	8.10	24.19	33	H	-8.81
	1880	-14.34	-29.40	-	8.10	23.16	33	H	-9.84
	1902.5	-13.66	-29.30	-	8.10	23.74	33	H	-9.26
LTE BAND 2 QPSK-20MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1860	-13.65	-29.30	-	8.10	23.75	33	H	-9.25
	1880	-14.76	-29.40	-	8.10	22.74	33	H	-10.26
	1900	-13.76	-29.30	-	8.10	23.64	33	H	-9.36

LTE BAND 2 16QAM- 5MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1852.5	-13.09	-29.30	-	8.10	24.31	33	H	-8.69
	1880	-14.77	-29.40	-	8.10	22.73	33	H	-10.27
	1907.5	-14.22	-29.30	-	8.10	23.18	33	H	-9.82
LTE BAND 2 16QAM- 10MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1855	-12.63	-29.30	-	8.10	24.77	33	H	-8.23
	1880	-12.43	-29.40	-	8.10	25.07	33	H	-7.93
	1905	-12.55	-29.30	-	8.10	24.85	33	H	-8.15
LTE BAND 2 16QAM- 15MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1857.5	-13.40	-29.30	-	8.10	24.00	33	H	-9.00
	1880	-14.46	-29.40	-	8.10	23.04	33	H	-9.96
	1902.5	-13.72	-29.30	-	8.10	23.68	33	H	-9.32
LTE BAND 2 16QAM- 20MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1860	-12.97	-29.30	-	8.10	24.43	33	H	-8.57
	1880	-14.35	-29.40	-	8.10	23.15	33	H	-9.85
	1900	-14.32	-29.30	-	8.10	23.08	33	H	-9.92

LTE BAND 4 QPSK-5MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1712.5	-14.64	-29.60	-	8.10	23.06	30	H	-6.94
	1732.5	-14.91	-29.60	-	8.10	22.79	30	H	-7.21
	1752.5	-14.55	-29.50	-	8.10	23.05	30	H	-6.95
LTE BAND 4 QPSK- 10MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1715	-14.76	-29.60	-	8.10	22.94	30	H	-7.06
	1732.5	-14.73	-29.60	-	8.10	22.97	30	H	-7.03
	1750	-14.50	-29.50	-	8.10	23.10	30	H	-6.90
LTE BAND 4 QPSK- 15MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1717.5	-15.17	-29.60	-	8.10	22.53	30	H	-7.47
	1732.5	-15.20	-29.60	-	8.10	22.50	30	H	-7.50
	1747.5	-15.25	-29.50	-	8.10	22.35	30	H	-7.65

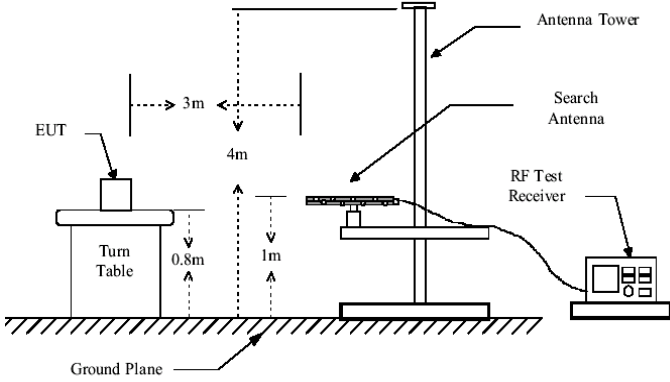
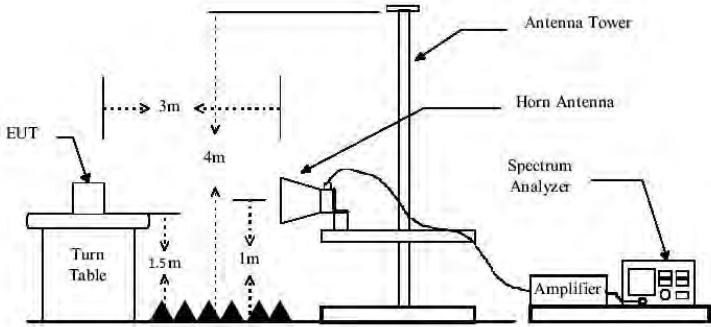
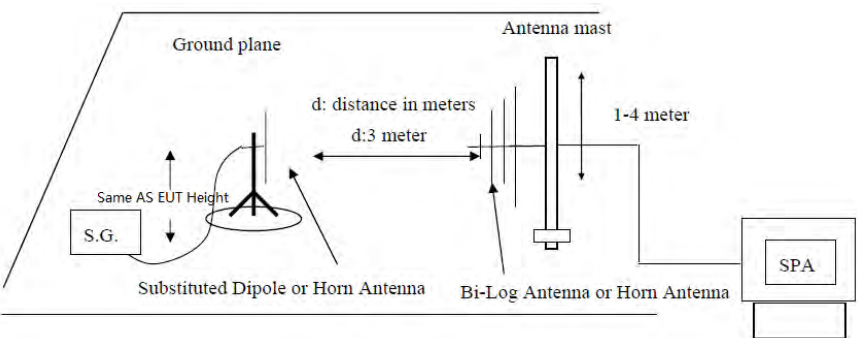
LTE BAND 4 QPSK- 20MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1720	-15.26	-29.60	-	8.10	22.44	30	H	-7.56
	1732.5	-14.57	-29.60	-	8.10	23.13	30	H	-6.87
	1745	-14.62	-29.50	-	8.10	22.98	30	H	-7.02
LTE BAND 4 16QAM- 5MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1712.5	-15.47	-29.60	-	8.10	22.23	30	H	-7.77
	1732.5	-14.75	-29.60	-	8.10	22.95	30	H	-7.05
	1752.5	-15.21	-29.50	-	8.10	22.39	30	H	-7.61
LTE BAND 4 16QAM- 10MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1715	-14.66	-29.60	-	8.10	23.04	30	H	-6.96
	1732.5	-15.02	-29.60	-	8.10	22.68	30	H	-7.32
	1750	-14.88	-29.50	-	8.10	22.72	30	H	-7.28
LTE BAND 4 16QAM- 15MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1717.5	-14.67	-29.60	-	8.10	23.03	30	H	-6.97
	1732.5	-14.96	-29.60	-	8.10	22.74	30	H	-7.26
	1747.5	-14.65	-29.50	-	8.10	22.95	30	H	-7.05
LTE BAND 4 16QAM- 20MHz	Frequency (MHz)	PMea (dBm)	Pcl(dB)+PAg(dB)		Ga Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	1720	-14.57	-29.60	-	8.10	23.13	30	H	-6.87
	1732.5	-14.63	-29.60	-	8.10	23.07	30	H	-6.93
	1745	-15.00	-29.50	-	8.10	22.60	30	H	-7.40

LTE BAND 12 QPSK- 1.4MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	699.7	-9.82	-34.80 -	-0.93	2.15	21.90	34.77	H	-12.87
	707.5	-10.25	-34.70 -	-0.91	2.15	21.40	34.77	H	-13.37
	715.3	-10.16	-34.70 -	-0.68	2.15	21.71	34.77	H	-13.06
LTE BAND 12 QPSK- 3MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	700.5	-10.01	-34.80 -	-0.97	2.15	21.67	34.77	H	-13.10
	707.5	-9.68	-34.70 -	-0.91	2.15	21.97	34.77	H	-12.80
	714.5	-10.81	-34.70 -	-0.64	2.15	21.10	34.77	H	-13.67
LTE BAND 12 QPSK- 5MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	701.5	-9.73	-34.80 -	-0.97	2.15	21.95	34.77	H	-12.82
	707.5	-10.59	-34.70 -	-0.91	2.15	21.06	34.77	H	-13.71
	713.5	-10.22	-34.70 -	-0.64	2.15	21.69	34.77	H	-13.08
LTE BAND 12 QPSK- 10MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	704	-10.60	-34.80 -	-0.97	2.15	21.08	34.77	H	-13.69
	707.5	-10.35	-34.70 -	-0.91	2.15	21.30	34.77	H	-13.47
	711	-9.97	-34.70 -	-0.64	2.15	21.94	34.77	H	-12.83
LTE BAND 12 16QAM- 1.4MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	699.7	-9.87	-34.80 -	-0.93	2.15	21.85	34.77	H	-12.92
	707.5	-9.87	-34.70 -	-0.91	2.15	21.77	34.77	H	-13.00
	715.3	-10.29	-34.70 -	-0.68	2.15	21.58	34.77	H	-13.19
LTE BAND 12 16QAM- 3MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	700.5	-9.81	-34.80 -	-0.97	2.15	21.87	34.77	H	-12.90
	707.5	-10.07	-34.70 -	-0.91	2.15	21.57	34.77	H	-13.20
	714.5	-10.77	-34.70 -	-0.64	2.15	21.14	34.77	H	-13.63
LTE BAND 12 16QAM- 5MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	701.5	-10.57	-34.80 -	-0.97	2.15	21.11	34.77	H	-13.66
	707.5	-10.22	-34.70 -	-0.91	2.15	21.43	34.77	H	-13.34
	713.5	-10.83	-34.70 -	-0.64	2.15	21.07	34.77	H	-13.70

LTE BAND 12 16QAM- 10MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	704	-10.22	-34.80 -	-0.97	2.15	21.46	34.77	H	-13.31
	707.5	-10.22	-34.70 -	-0.91	2.15	21.43	34.77	H	-13.34
	711	-10.35	-34.70 -	-0.64	2.15	21.56	34.77	H	-13.21

LTE BAND 13 QPSK- 5MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	779.5	-10.23	-34.00 -	-0.08	2.15	21.54	34.77	H	-13.23
	782	-10.31	-34.00 -	-0.13	2.15	21.41	34.77	H	-13.36
	784.5	-10.23	-34.00 -	-0.13	2.15	21.49	34.77	H	-13.28
LTE BAND 13 QPSK- 10MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	782	-11.12	-34.00 -	-0.13	2.15	20.60	34.77	H	-14.17
LTE BAND 13 16QAM- 5MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	779.5	-10.23	-34.00 -	-0.08	2.15	21.54	34.77	H	-13.23
	782	-10.31	-34.00 -	-0.13	2.15	21.41	34.77	H	-13.36
	784.5	-10.23	-34.00 -	-0.13	2.15	21.49	34.77	H	-13.28
LTE BAND 13 16QAM- 10MHz	Frequency	PMea	Pcl(dB)+PAg(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Polarity	Margin (dB)
	(MHz)	(dBm)							
	782	-11.05	-34.00 -	-0.13	2.15	20.67	34.77	H	-14.10

4.9 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.913(a), FCC part24.238(a) and FCC part27.53
Test Method:	ANSI C63.26:2015
Limit:	Band 2/4/5/12:-13dBm Band 13: Limit out of the band 1559-1610MHz(-13dBm) Limit in the band 1559-1610MHz(-40dBm)
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. $\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

QPSK Mode:

Test mode:	LTE Band 2(1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-36.95	-13.00	Pass
5552.10	V	-39.82		
7402.80	V	-38.22		
9253.50	V	-43.37		
11104.20	V	---		
3701.40	Horizontal	-39.16	-13.00	Pass
5552.10	H	-42.94		
7402.80	H	-44.77		
9253.50	H	-45.65		
11104.20	H	---		
Test mode:	LTE Band 2(1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-37.20	-13.00	Pass
5640.00	V	-39.48		
7520.00	V	-37.98		
9400.00	V	-43.43		
11280.00	V	---		
3760.00	Horizontal	-38.74	-13.00	Pass
5640.00	H	-42.27		
7520.00	H	-44.39		
9400.00	H	-46.26		
11280.00	H	---		
Test mode:	LTE Band 2(1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-36.59	-13.00	Pass
5727.90	V	-39.74		
7637.20	V	-37.93		
9546.50	V	-43.36		
11455.80	V	---		
3818.60	Horizontal	-39.39	-13.00	Pass
5727.90	H	-42.99		
7637.20	H	-44.73		
9546.50	H	-45.98		
11455.80	H	---		

Remark :

1. The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
2. Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
3. The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 4(1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3421.40	Vertical	-37.06	-13.00	Pass
5132.10	V	-39.47		
6842.80	V	-37.88		
8553.50	V	-43.26		
10264.20	V	---		
3421.40	Horizontal	-38.79	-13.00	Pass
5132.10	H	-42.96		
6842.80	H	-45.01		
8553.50	H	-46.26		
10264.20	H	---		
Test mode:	LTE Band 4(1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3465.00	Vertical	-37.01	-13.00	Pass
5197.50	V	-39.04		
6930.00	V	-38.20		
8662.50	V	-43.50		
10395.00	V	---		
3465.00	Horizontal	-39.20	-13.00	Pass
5197.50	H	-42.44		
6930.00	H	-44.96		
8662.50	H	-45.57		
10395.00	H	---		
Test mode:	LTE Band 4(1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3508.60	Vertical	-37.19	-13.00	Pass
5262.90	V	-39.31		
7017.20	V	-38.41		
8771.50	V	-43.14		
10525.80	V	---		
3508.60	Horizontal	-38.83	-13.00	Pass
5262.90	H	-42.16		
7017.20	H	-44.91		
8771.50	H	-46.13		
10525.80	H	---		

Remark:

1. The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
2. Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
3. The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 12(1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5005.00	Vertical	-37.14	-13.00	Pass
7507.50	V	-39.29		
10010.00	V	-38.33		
12512.50	V	-42.92		
15015.00	V	---		
5005.00	Horizontal	-39.27	-13.00	Pass
7507.50	H	-42.19		
10010.00	H	-45.09		
12512.50	H	-45.59		
15015.00	H	---		
Test mode:	LTE Band 12(1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5070.00	Vertical	-37.05	-13.00	Pass
7605.00	V	-38.96		
10140.00	V	-37.65		
12675.00	V	-43.29		
15210.00	V	---		
5070.00	Horizontal	-39.10	-13.00	Pass
7605.00	H	-42.69		
10140.00	H	-44.75		
12675.00	H	-46.18		
15210.00	H	---		
Test mode:	LTE Band 12(1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5135.00	Vertical	-36.56	-13.00	Pass
7702.50	V	-39.73		
10270.00	V	-38.49		
12837.50	V	-43.30		
15405.00	V	---		
5135.00	Horizontal	-39.30	-13.00	Pass
7702.50	H	-42.11		
10270.00	H	-44.96		
12837.50	H	-45.87		
15405.00	H	---		

Remark :

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 13(5MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5005.00	Vertical	-36.41	-13.00	Pass
7507.50	V	-39.31		
10010.00	V	-38.19		
12512.50	V	-42.82		
15015.00	V	---		
5005.00	Horizontal	-39.52	-13.00	Pass
7507.50	H	-42.38		
10010.00	H	-44.59		
12512.50	H	-46.31		
15015.00	H	---		
Test mode:	LTE Band 13(5MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5070.00	Vertical	-37.21	-13.00	Pass
7605.00	V	-39.63		
10140.00	V	-38.26		
12675.00	V	-43.25		
15210.00	V	---		
5070.00	Horizontal	-38.63	-13.00	Pass
7605.00	H	-43.05		
10140.00	H	-45.26		
12675.00	H	-45.89		
15210.00	H	---		
Test mode:	LTE Band 13(5MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
5135.00	Vertical	-36.48	-13.00	Pass
7702.50	V	-38.97		
10270.00	V	-37.91		
12837.50	V	-42.85		
15405.00	V	---		
5135.00	Horizontal	-38.88	-13.00	Pass
7702.50	H	-42.89		
10270.00	H	-44.85		
12837.50	H	-46.02		
15405.00	H	---		

Remark :

- 4 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 5 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 6 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

16 QAM Mode:

Test mode:	LTE Band 2 (1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-37.14	-13.00	Pass
5552.10	V	-39.94		
7402.80	V	-37.86		
9253.50	V	-43.26		
11104.20	V	---		
3701.40	Horizontal	-38.80	-13.00	Pass
5552.10	H	-42.32		
7402.80	H	-45.12		
9253.50	H	-45.76		
11104.20	H	---		
Test mode:	LTE Band 2 (1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-36.92	-13.00	Pass
5640.00	V	-39.23		
7520.00	V	-38.04		
9400.00	V	-43.30		
11280.00	V	---		
3760.00	Horizontal	-38.89	-13.00	Pass
5640.00	H	-42.96		
7520.00	H	-45.05		
9400.00	H	-46.02		
11280.00	H	---		
Test mode:	LTE Band 2 (1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-37.25	-13.00	Pass
5727.90	V	-39.75		
7637.20	V	-38.39		
9546.50	V	-43.60		
11455.80	V	---		
3818.60	Horizontal	-38.86	-13.00	Pass
5727.90	H	-42.54		
7637.20	H	-44.81		
9546.50	H	-45.96		
11455.80	H	---		

Remark :

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 4(1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3421.40	Vertical	-36.85	-13.00	Pass
5132.10	V	-39.30		
6842.80	V	-37.60		
8553.50	V	-42.93		
10264.20	V	---		
3421.40	Horizontal	-39.01	-13.00	Pass
5132.10	H	-42.57		
6842.80	H	-44.38		
8553.50	H	-45.85		
10264.20	H	---		
Test mode:	LTE Band 4(1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3465.00	Vertical	-36.39	-13.00	Pass
5197.50	V	-39.68		
6930.00	V	-37.93		
8662.50	V	-43.42		
10395.00	V	---		
3465.00	Horizontal	-39.45	-13.00	Pass
5197.50	H	-42.92		
6930.00	H	-45.13		
8662.50	H	-46.49		
10395.00	H	---		
Test mode:	LTE Band 4(1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3508.60	Vertical	-36.48	-13.00	Pass
5262.90	V	-39.28		
7017.20	V	-38.01		
8771.50	V	-43.10		
10525.80	V	---		
3508.60	Horizontal	-39.34	-13.00	Pass
5262.90	H	-42.16		
7017.20	H	-44.97		
8771.50	H	-45.56		
10525.80	H	---		

Remark:

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-36.35	-13.00	Pass
5552.10	V	-39.79		
7402.80	V	-38.01		
9253.50	V	-43.58		
11104.20	V	---		
3701.40	Horizontal	-39.24	-13.00	Pass
5552.10	H	-42.20		
7402.80	H	-44.59		
9253.50	H	-45.57		
11104.20	H	---		
Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-36.86	-13.00	Pass
5640.00	V	-38.99		
7520.00	V	-37.97		
9400.00	V	-43.45		
11280.00	V	---		
3760.00	Horizontal	-38.77	-13.00	Pass
5640.00	H	-42.36		
7520.00	H	-44.82		
9400.00	H	-46.09		
11280.00	H	---		
Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-36.97	-13.00	Pass
5727.90	V	-39.68		
7637.20	V	-37.84		
9546.50	V	-43.49		
11455.80	V	---		
3818.60	Horizontal	-39.10	-13.00	Pass
5727.90	H	-42.80		
7637.20	H	-45.31		
9546.50	H	-46.30		
11455.80	H	---		

Remark :

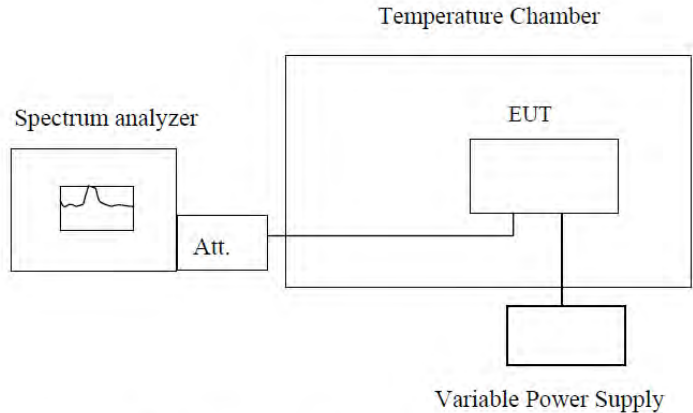
- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 13 (5MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-36.38	-13.00	Pass
5552.10	V	-39.78		
7402.80	V	-38.12		
9253.50	V	-43.01		
11104.20	V	---		
3701.40	Horizontal	-39.07	-13.00	Pass
5552.10	H	-42.71		
7402.80	H	-44.91		
9253.50	H	-46.27		
11104.20	H	---		
Test mode:	LTE Band 13 (5MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-37.27	-13.00	Pass
5640.00	V	-39.30		
7520.00	V	-38.40		
9400.00	V	-42.92		
11280.00	V	---		
3760.00	Horizontal	-39.49	-13.00	Pass
5640.00	H	-42.40		
7520.00	H	-44.94		
9400.00	H	-45.70		
11280.00	H	---		
Test mode:	LTE Band 13 (5MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-36.60	-13.00	Pass
5727.90	V	-39.75		
7637.20	V	-38.08		
9546.50	V	-43.40		
11455.80	V	---		
3818.60	Horizontal	-38.92	-13.00	Pass
5727.90	H	-42.35		
7637.20	H	-45.35		
9546.50	H	-45.83		
11455.80	H	---		

Remark :

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

4.10 Frequency stability V.S. Temperature measurement

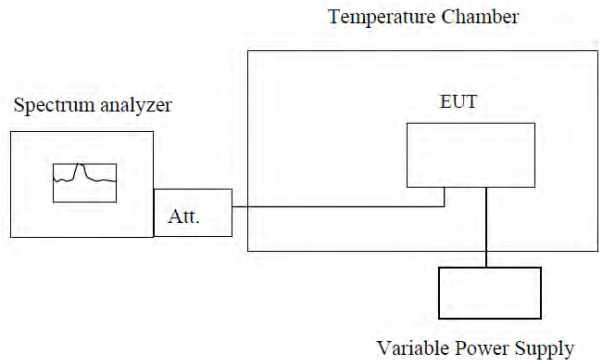
Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	ANSI C63.26:2015
Limit:	2.5ppm(Part 22) Within the authorized bands of operation(Part 24, Part 27)
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC 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 –20°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 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass
Remark:	If all frequencies stability are comply with the lower limit, then all results can be considered qualified

Measurement Data

Reference Frequency: LTE Band 2 Middle channel=18900 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	59	0.0312	Within the authorized bands	Pass
	-10	23	0.0122		
	0	71	0.0376		
	10	34	0.0181		
	20	30	0.0160		
	30	25	0.0132		
	40	31	0.0167		
	50	33	0.0177		
	55	35	0.0188		
Reference Frequency: LTE Band 4 Middle channel=20175 channel=1732.5MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	56	0.0321	2.5	Pass
	-10	23	0.0133		
	0	71	0.0409		
	10	34	0.0194		
	20	30	0.0171		
	30	24	0.0141		
	40	33	0.0190		
	50	35	0.0201		
	55	35	0.0203		
Reference Frequency: LTE Band 12 Middle channel=23095 channel=707.5MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	54	0.0760	2.5	Pass
	-10	23	0.0325		
	0	69	0.0978		
	10	32	0.0456		
	20	28	0.0400		
	30	21	0.0292		
	40	30	0.0423		
	50	31	0.0445		
	55	33	0.0461		

Reference Frequency: LTE Band 13 Middle channel=5279 channel=782MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	59	0.0751	2.5	Pass
	-10	23	0.0294		
	0	67	0.0862		
	10	32	0.0403		
	20	33	0.0421		
	30	21	0.0266		
	40	30	0.0386		
	50	30	0.0386		
	55	33	0.0428		

4.11 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	ANSI C63.26:2015
Limit:	2.5ppm Band II & Band VII should be within authorized band.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 20°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 specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass
Remark:	1. Manufacturer specified the battery operating end point voltage is 3.32VDC, max voltage is 4.37VDC. 2. If all frequencies stability are comply with the lower limit, then all results can be considered qualified

Measurement Data

Reference Frequency: LTE Band 2 Middle channel=18900 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	57	0.0302	within authorized band	Pass
	3.70	23	0.0122		
	3.33	70	0.0373		
Reference Frequency: LTE Band 4 Middle channel=20175 channel=1732.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	58	0.0334	2.5	Pass
	3.70	23	0.0133		
	3.33	69	0.0401		
Reference Frequency: LTE Band 12 Middle channel=23095 channel=707.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	55	0.0782	within authorized band	Pass
	3.70	23	0.0325		
	3.33	68	0.0964		
Reference Frequency: LTE Band 13 Middle channel=5279 channel=782MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	59	0.0752	2.5	Pass
	3.70	23	0.0294		
	3.33	66	0.0848		