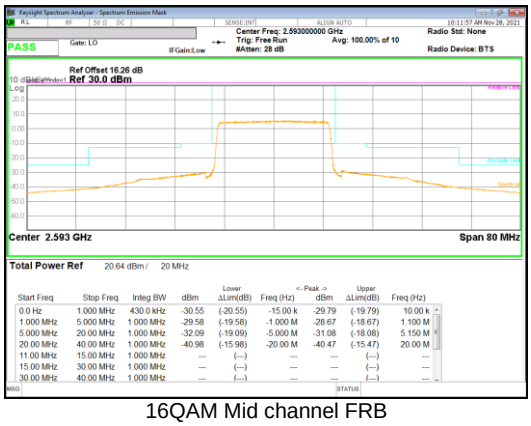
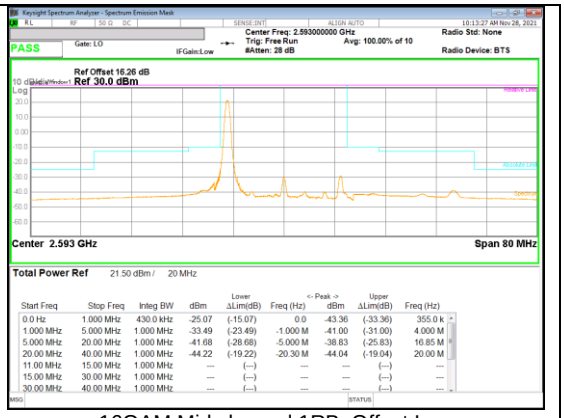
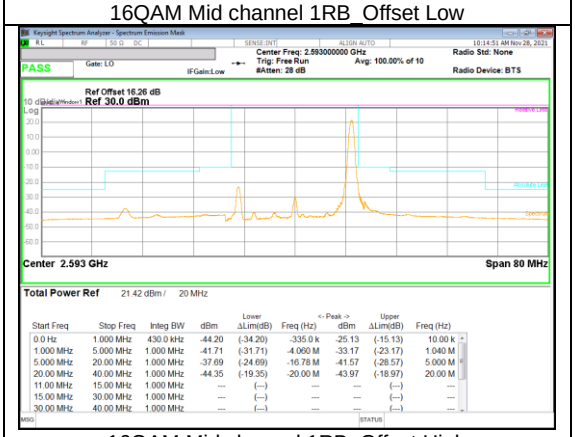
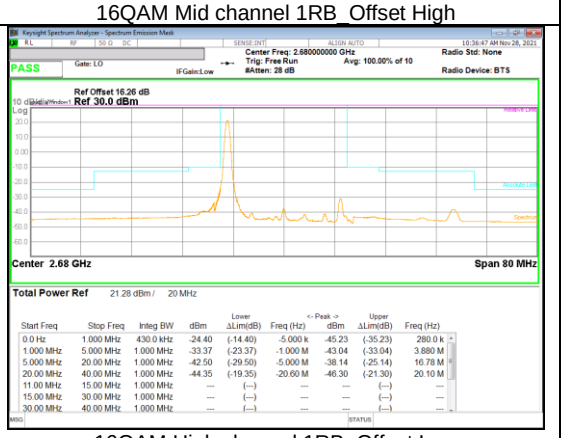
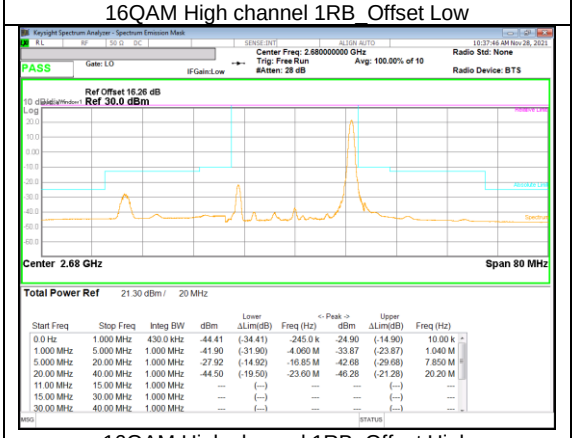
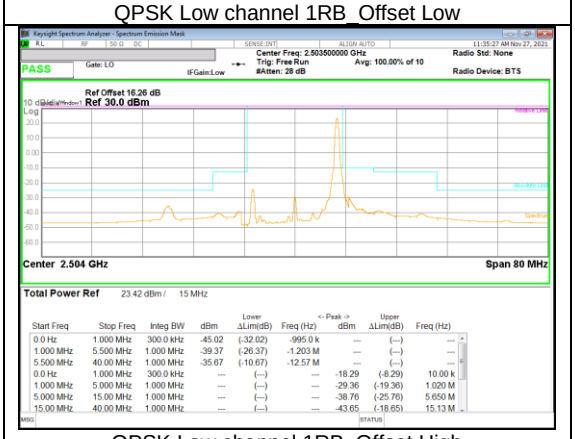
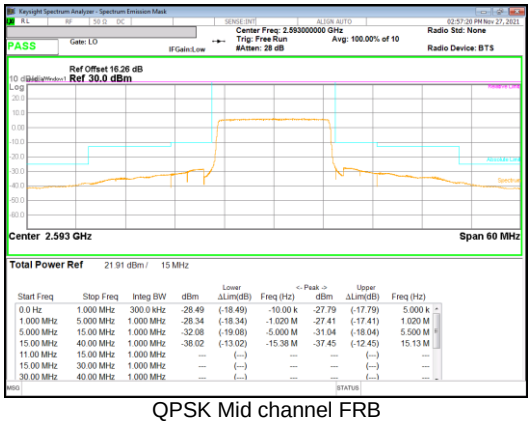
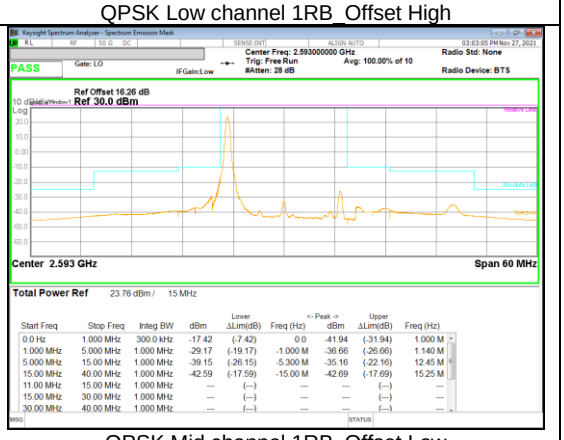
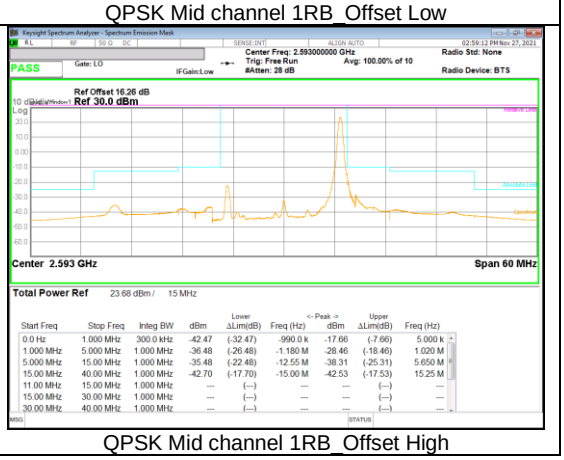
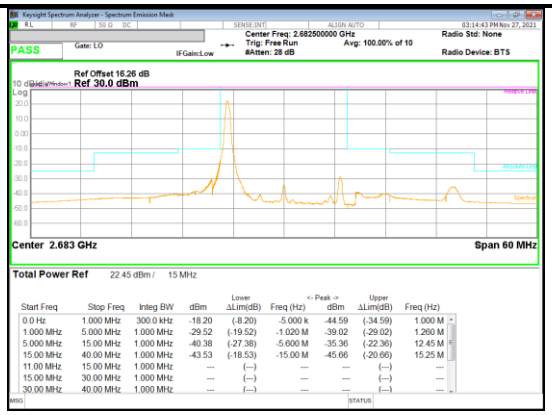
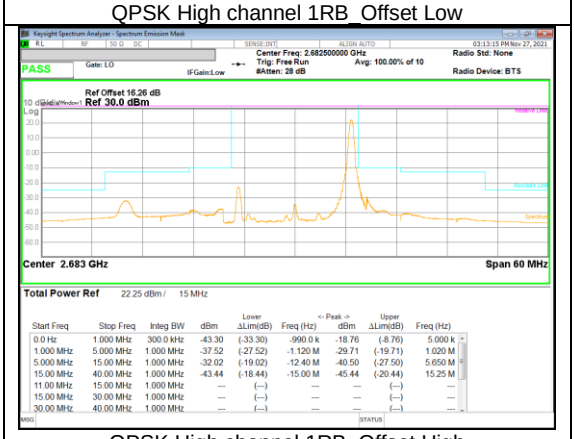
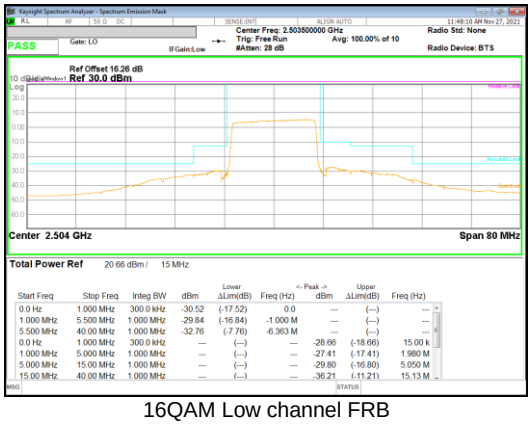
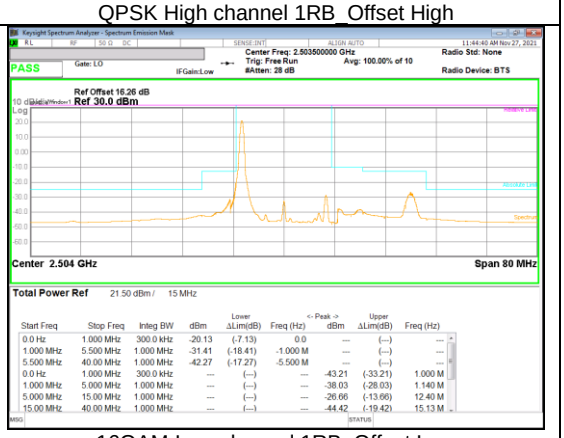
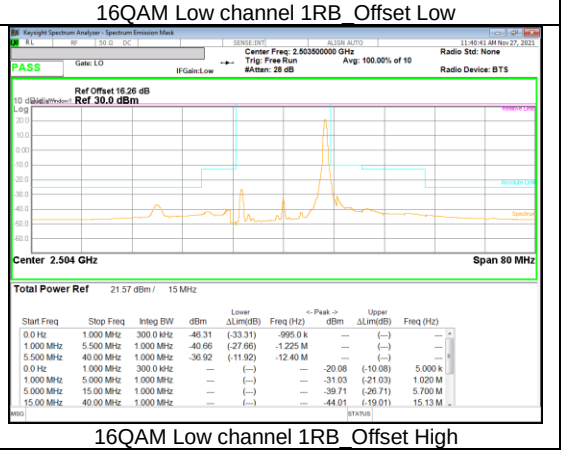
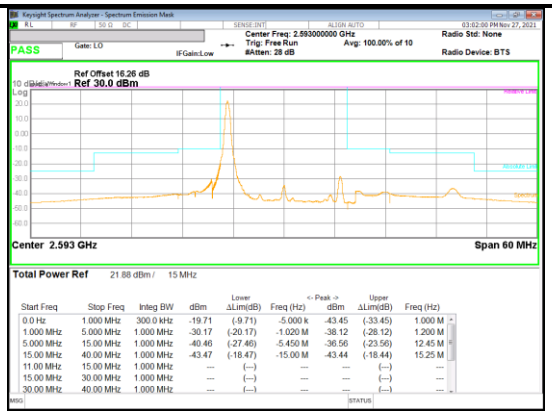
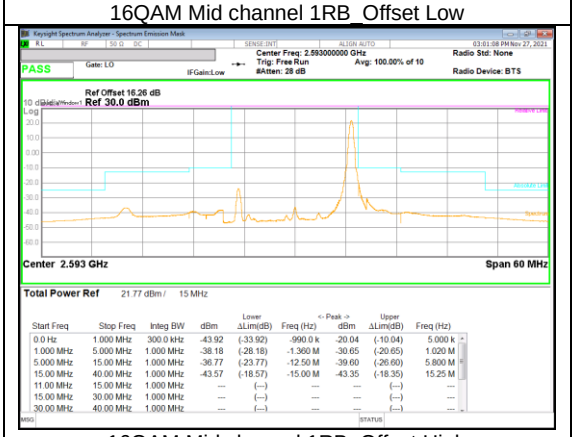
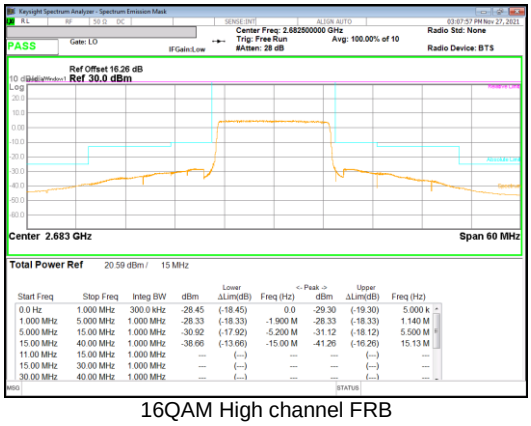
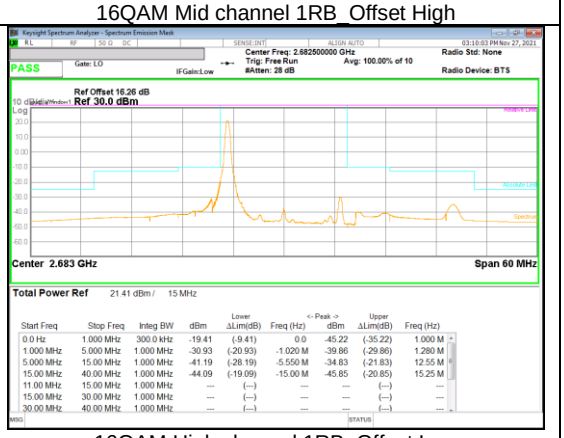
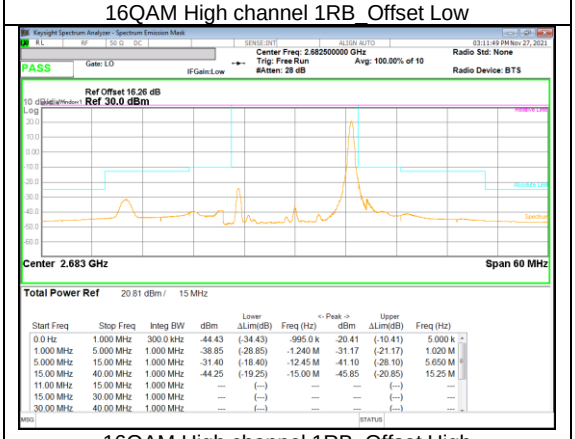
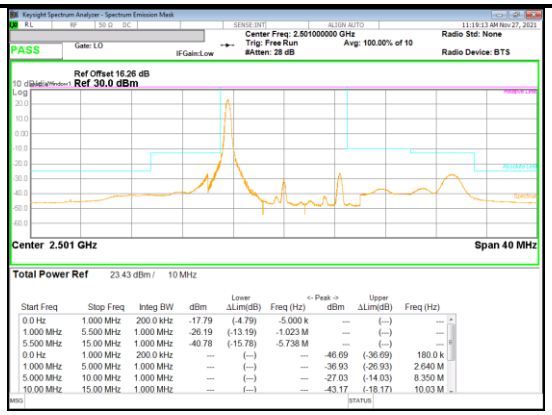
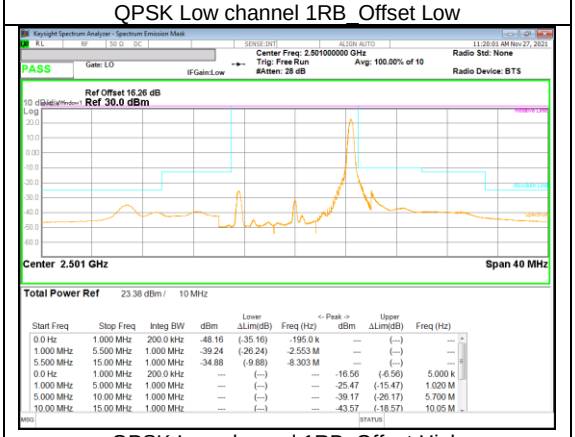
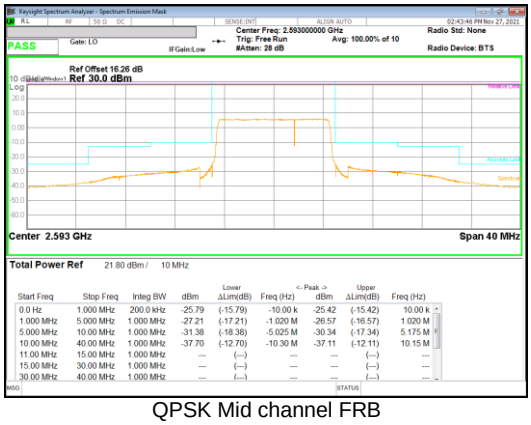
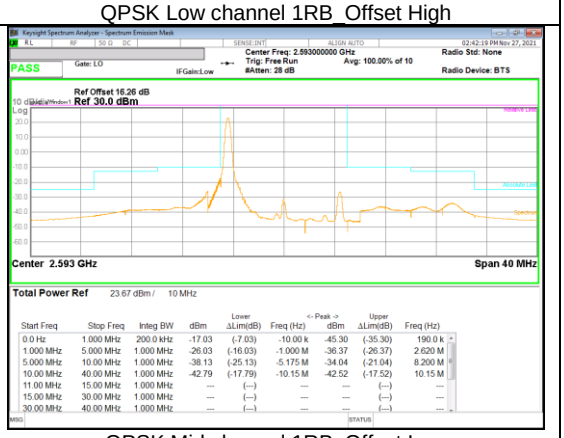
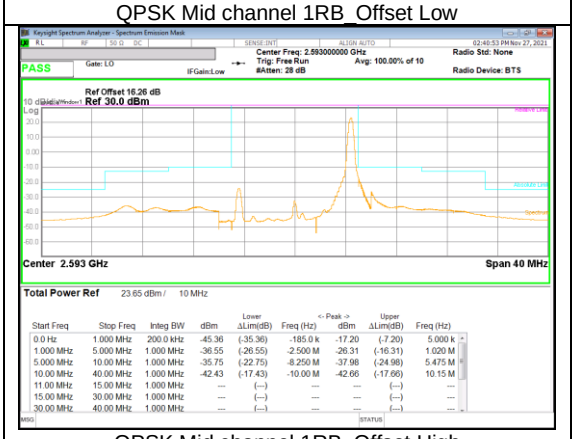
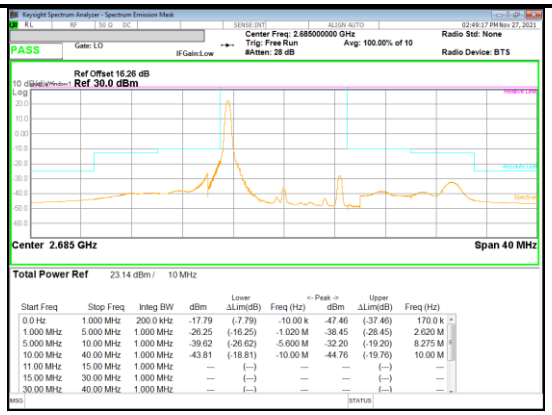
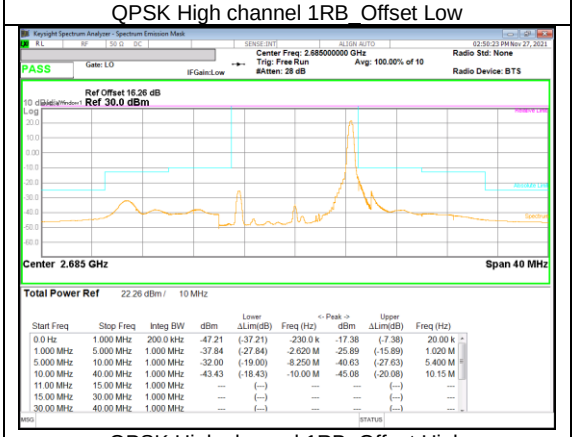
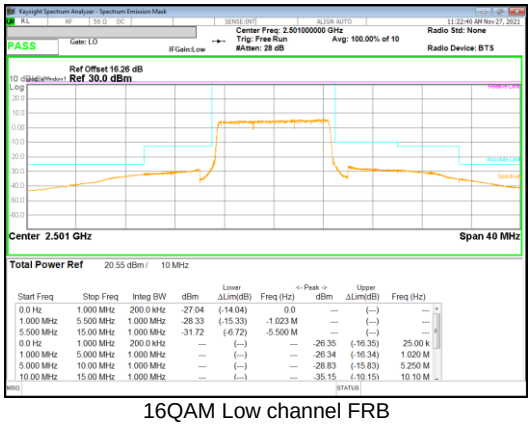
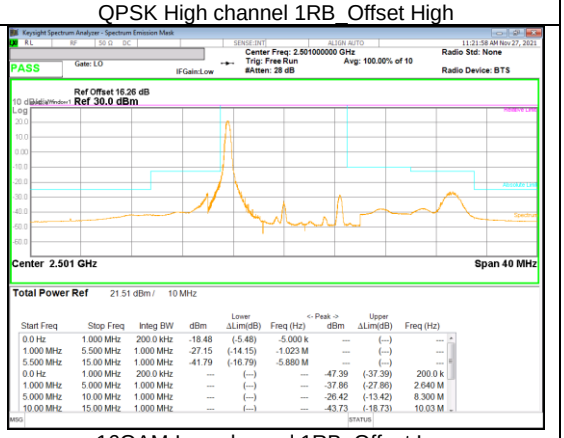
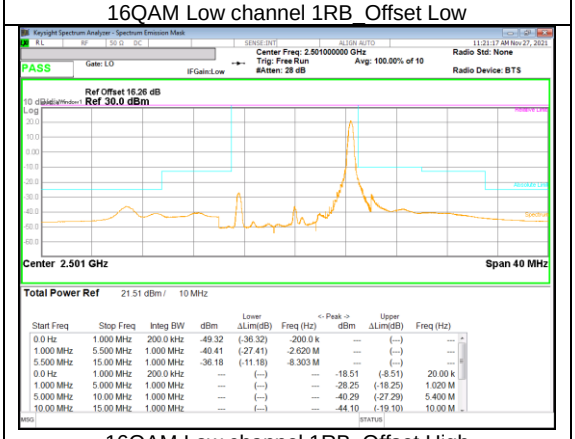
LTE Band 41 20MHz 16QAM	 16QAM Mid channel FRB	 16QAM Mid channel 1RB_Offset Low
		 16QAM Mid channel 1RB_Offset High
	 16QAM High channel FRB	 16QAM High channel 1RB_Offset Low
		 16QAM High channel 1RB_Offset High

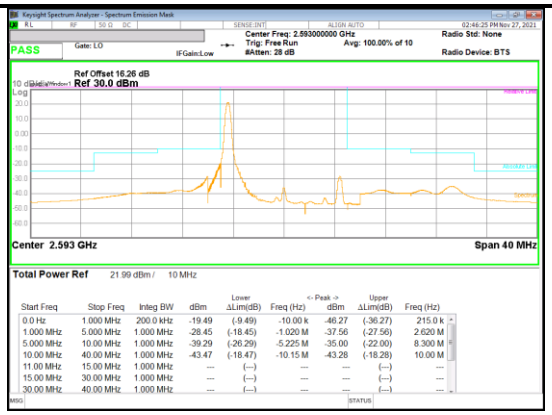
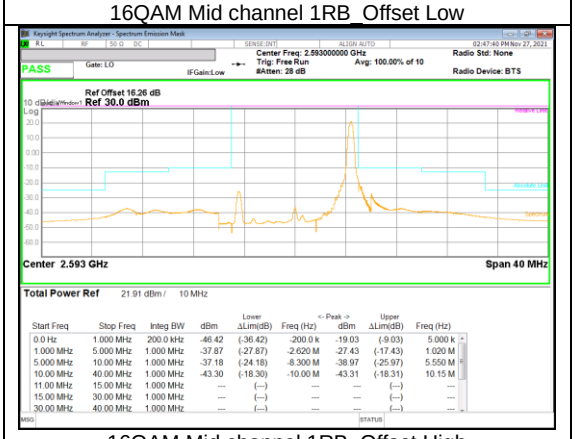
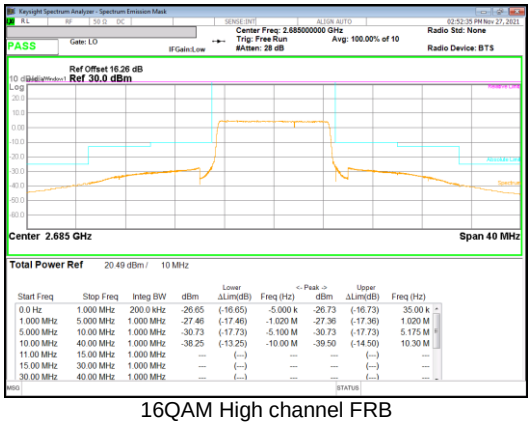
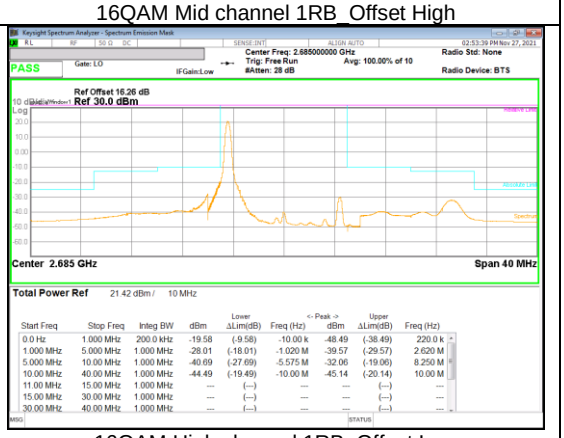
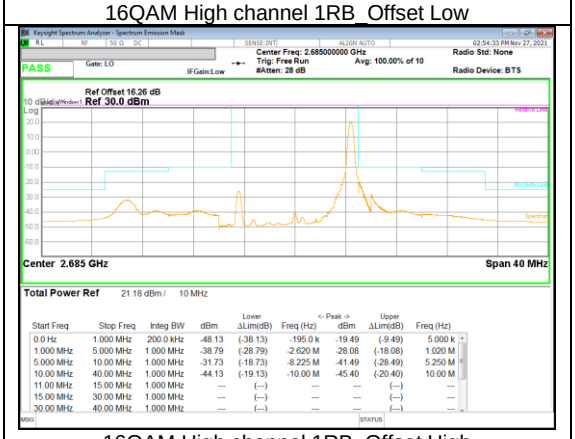
LTE Band 41 15MHz QPSK	 QPSK Low channel FRB	 QPSK Low channel 1RB_Offset Low
		 QPSK Low channel 1RB_Offset High
	 QPSK Mid channel FRB	 QPSK Mid channel 1RB_Offset Low
		 QPSK Mid channel 1RB_Offset High

LTE Band 41 15MHz QPSK	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
LTE Band 41 15MHz 16QAM	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High

LTE Band 41 15MHz 16QAM	 16QAM Mid channel FRB	 16QAM Mid channel 1RB_Offset Low  16QAM Mid channel 1RB_Offset High
	 16QAM High channel FRB	 16QAM High channel 1RB_Offset Low  16QAM High channel 1RB_Offset High

LTE Band 41 10MHz QPSK	 QPSK Low channel FRB	 QPSK Low channel 1RB_Offset Low
		 QPSK Low channel 1RB_Offset High
	 QPSK Mid channel FRB	 QPSK Mid channel 1RB_Offset Low
		 QPSK Mid channel 1RB_Offset High

LTE Band 41 10MHz QPSK	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
LTE Band 41 10MHz 16QAM	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High

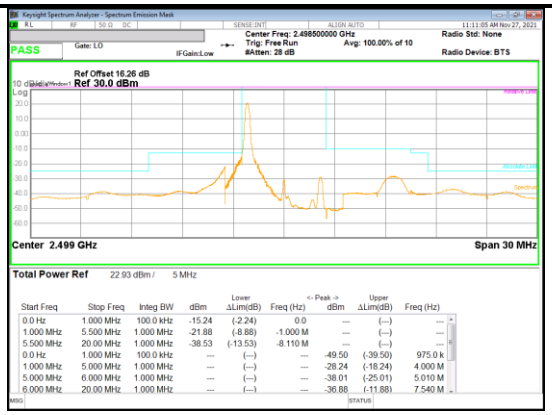
LTE Band 41 10MHz 16QAM	 16QAM Mid channel FRB	 16QAM Mid channel 1RB_Offset Low
		 16QAM Mid channel 1RB_Offset High
	 16QAM High channel FRB	 16QAM High channel 1RB_Offset Low
		 16QAM High channel 1RB_Offset High

LTE Band 41

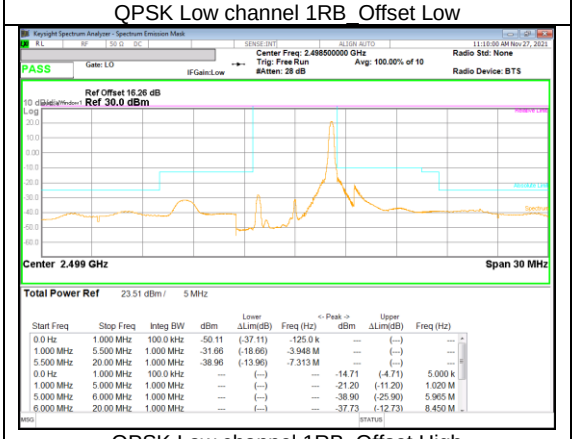
5MHz

QPSK

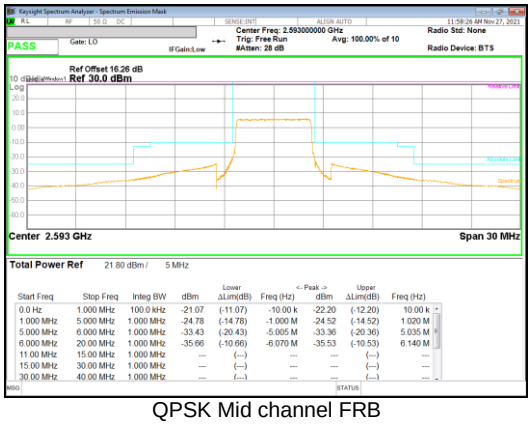
QPSK Low channel FRB



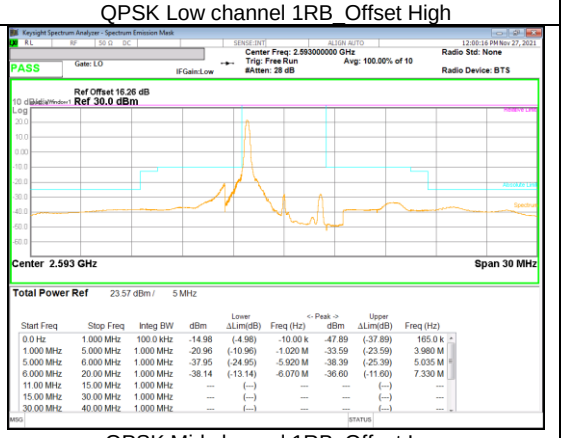
QPSK Low channel 1RB_Offset Low



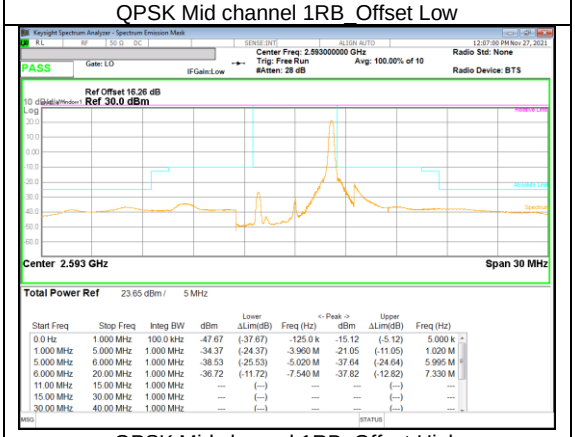
QPSK Low channel 1RB_Offset High



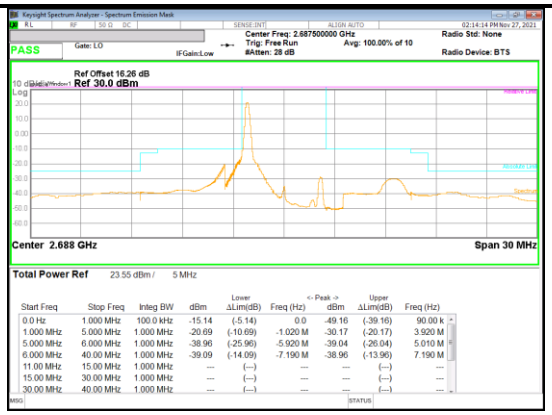
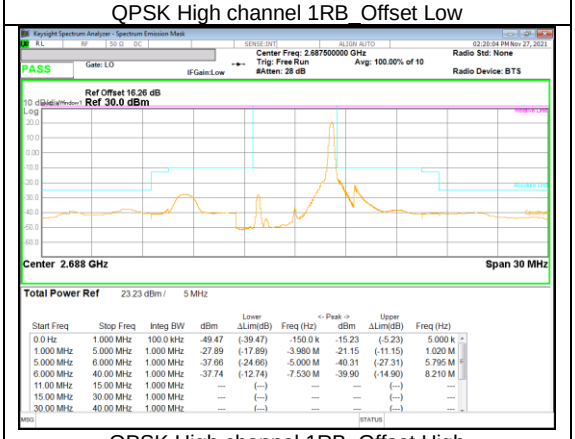
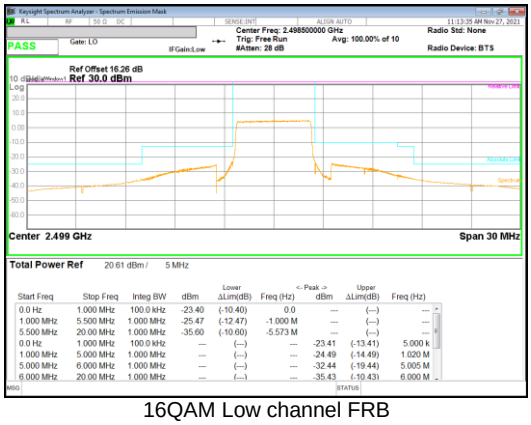
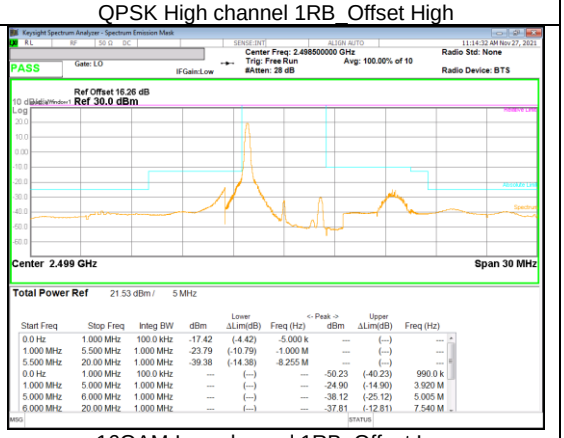
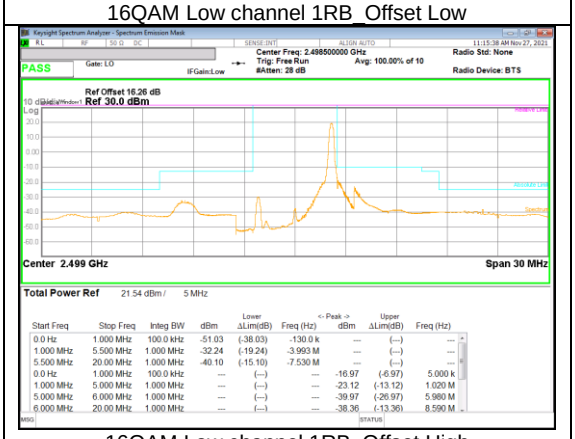
QPSK Mid channel FRB

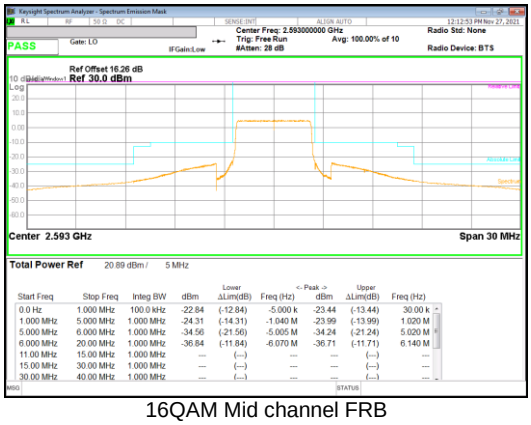
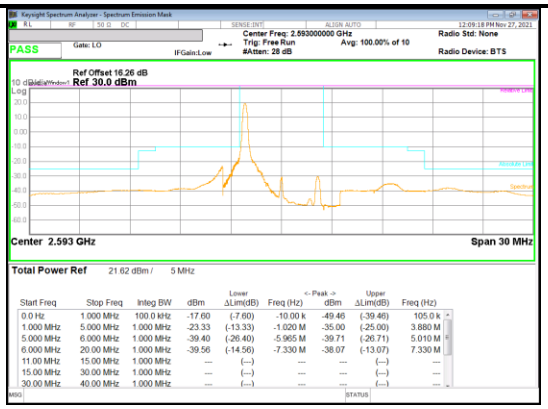
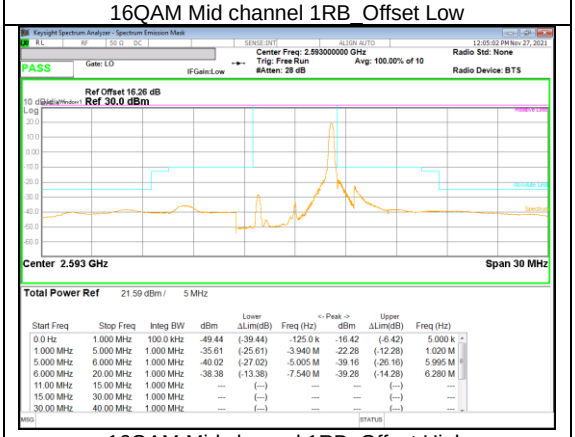
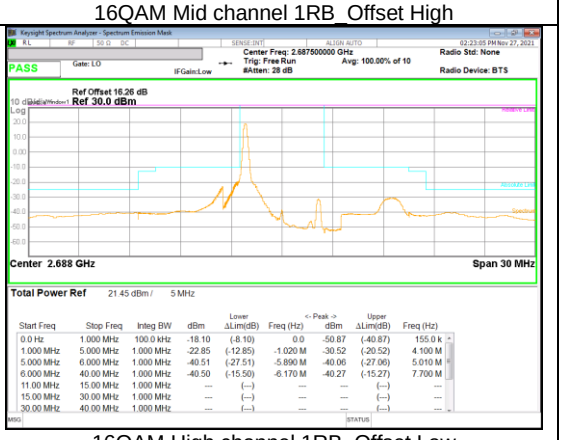
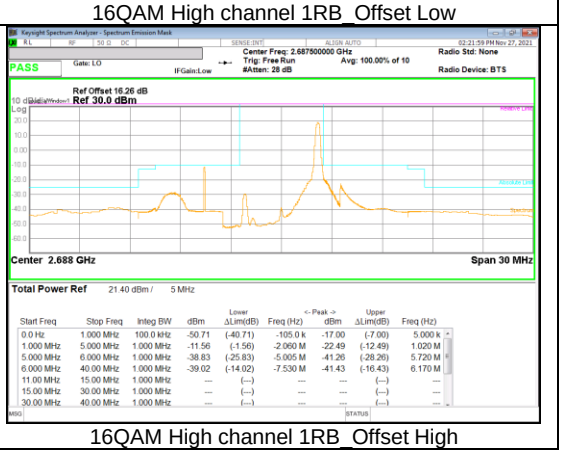


QPSK Mid channel 1RB_Offset Low



QPSK Mid channel 1RB_Offset High

LTE Band 41 5MHz QPSK	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
LTE Band 41 5MHz 16QAM	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High

LTE Band 41 5MHz 16QAM	 16QAM Mid channel FRB	 16QAM Mid channel 1RB_Offset Low
		 16QAM Mid channel 1RB_Offset High
	 16QAM High channel FRB	 16QAM High channel 1RB_Offset Low
		 16QAM High channel 1RB_Offset High

9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §27.53 and 90.691

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Part 27.53:
(c)(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

(h) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

(m) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 90.691(a):
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.(NOTE : Use 100kHz reference bandwidth)

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz (Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)

b) Set VBW ≥ 3 × RBW;

c) Set span ≥ 1.5 times the OBW;

d) Sweep time = auto couple;

e) Detector = rms;

f) Ensure that the number of measurement points = Max (40001);

g) Trace mode = average(WCDMA, LTE FDD, NR), Maxhold(GSM, LTE TDD);

NOTE

5G NR: All Waveforms (CP-OFDM vs DFT-s OFDM) and modulations (π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

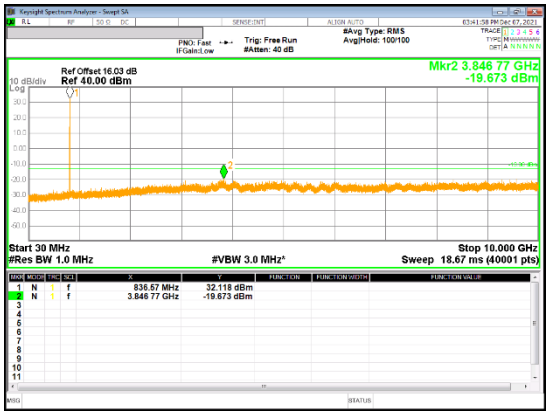
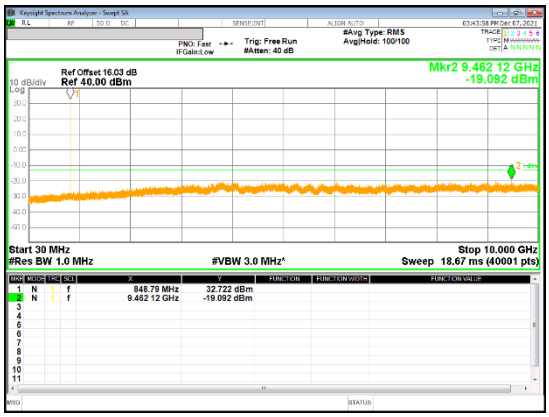
RESULTS

See the following pages.

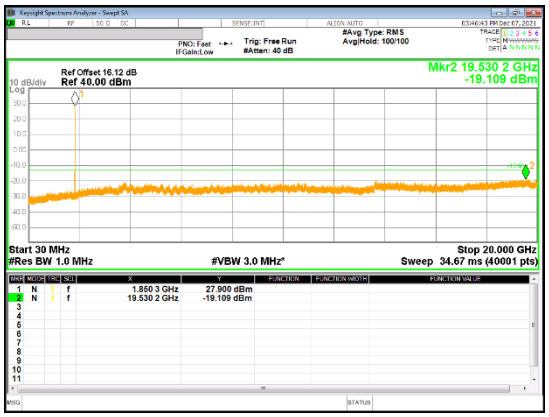
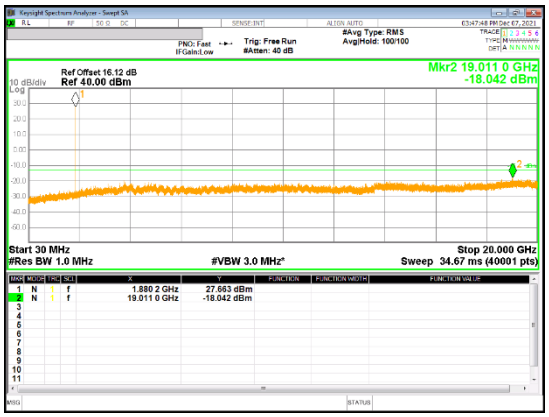
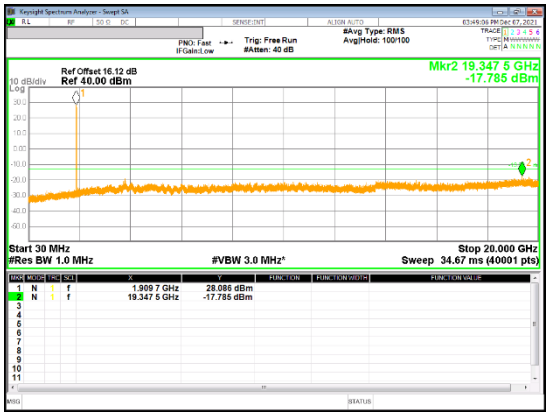
NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE,NR bands.

9.3.1. OUT OF BAND EMISSIONS RESULT

GSM 850

GSM 850	 GPRS Low channel	 GPRS Mid channel
	 GPRS High channel	

GSM 1900

GSM 1900	 GPRS Low channel	 GPRS Mid channel
	 GPRS High channel	

WCDMA Band 5

Band 5

REL99 Low channel

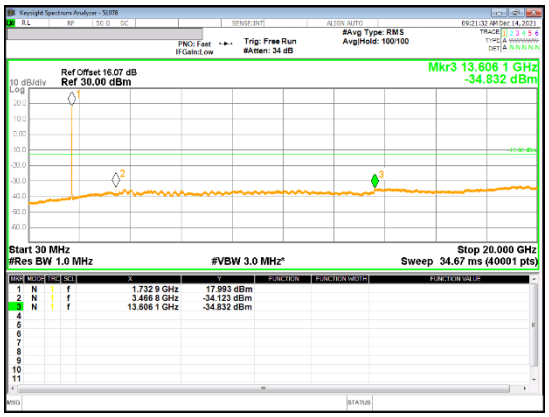
REL99 Mid channel

REL99 High channel

WCDMA Band 4

Band 4

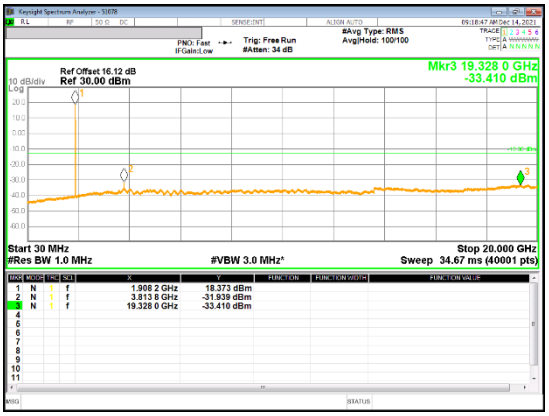
REL99 Low channel



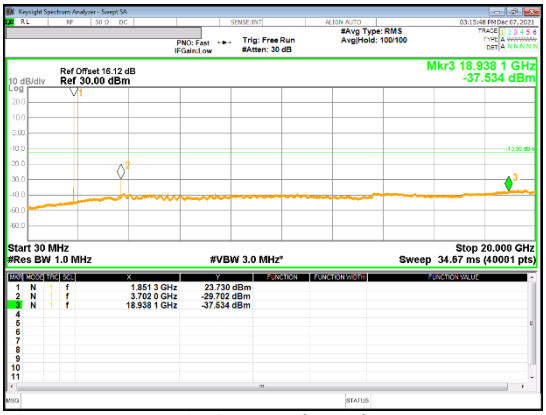
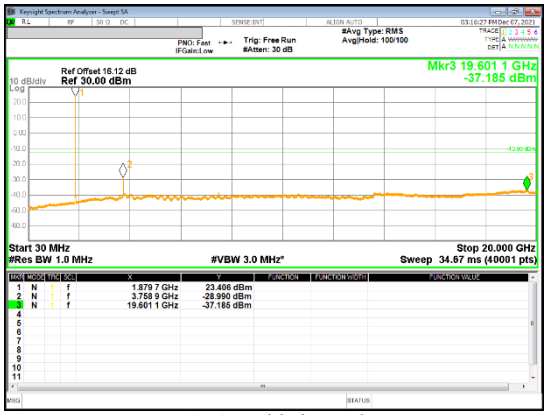
REL99 Mid channel

REL99 High channel

WCDMA Band 2

Band 2	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

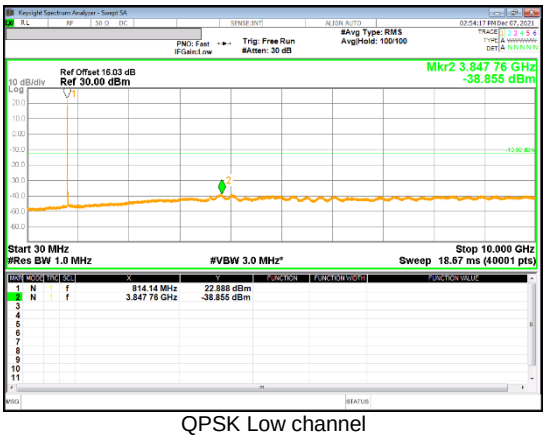
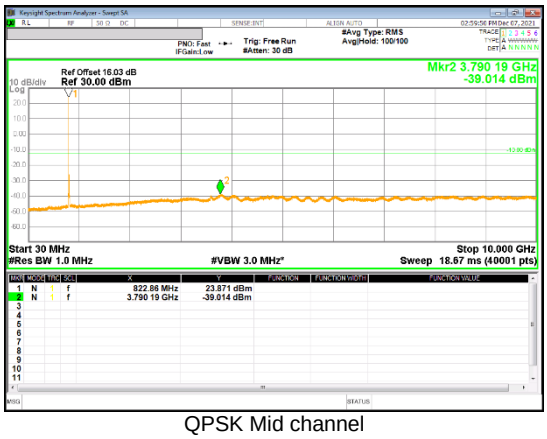
LTE Band 2

LTE Band 2 1.4MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 12

LTE Band 12 1.4MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

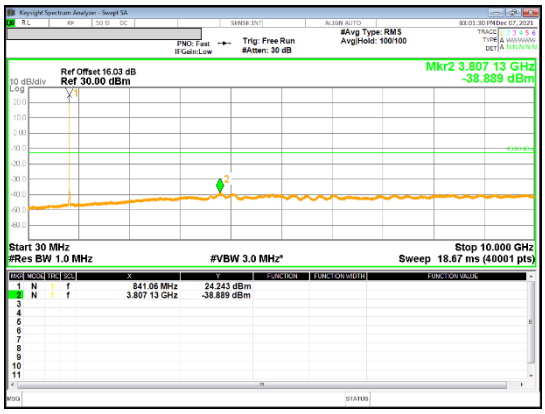
LTE Band 26(Part 90)

LTE Band 26 (Part90) 1.4MHz	 QPSK Low channel	 QPSK Mid channel

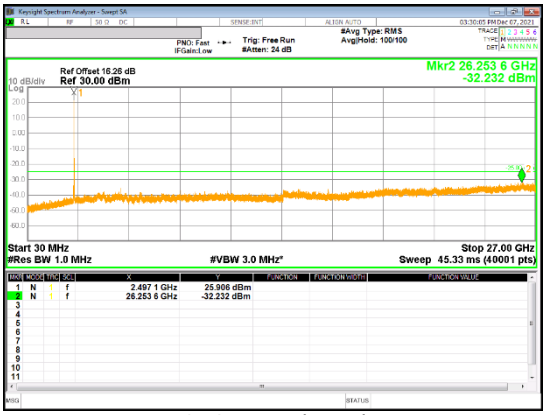
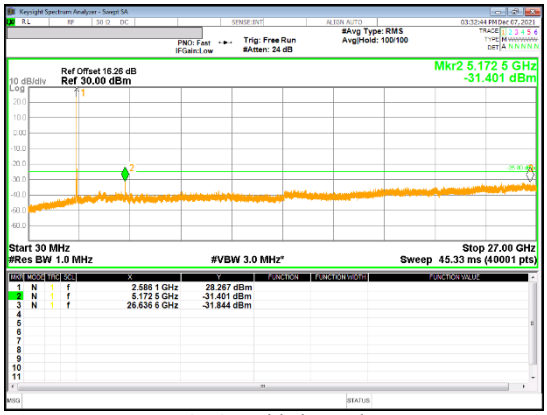
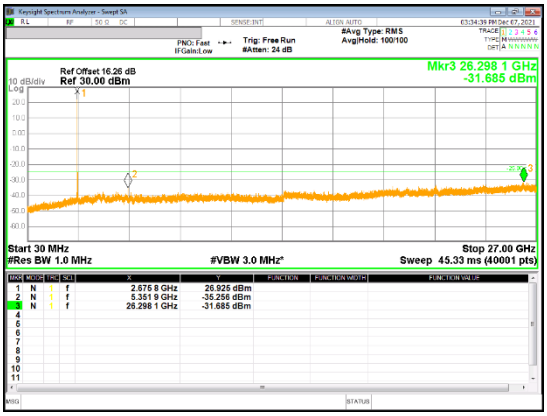
LTE Band 26 (Straddle)

LTE Band 26 (Straddle) 1.4MHz	 QPSK High channel

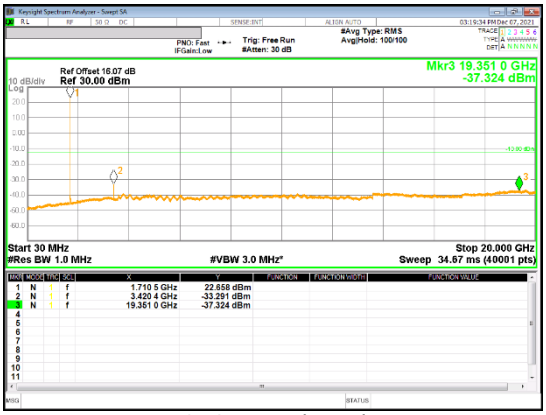
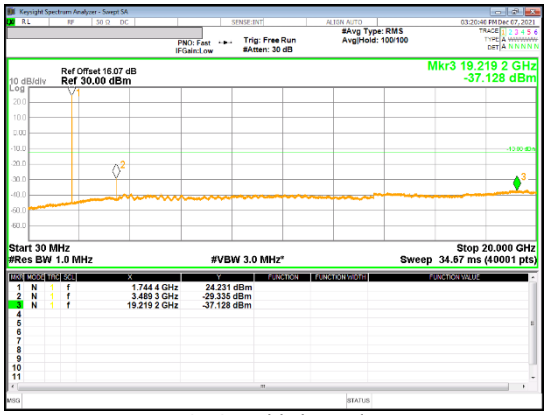
LTE Band 26 (Part 22)

LTE Band 26 (Part22) 15MHz	 QPSK Low channel	 QPSK Mid channel

LTE Band 41

LTE Band 41 15MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 66

LTE Band 66 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235,§27.54 and §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

§90.213 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

NOTE : Test were performed each lowest or highest frequency on the modulation condition of more wide bandwidth.(Please refer to section 9.1.1 OBW results)

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27/90(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.4.1. FREQUENCY STABILITY RESULTS

GSM 850, Channel 128/251, Frequency 824.2/848.8 MHz

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2060.500	Hz	High Channel	2122.000	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
4.20	50	824.20001050	-0.005	848.80001261	-0.002	2.5
4.20	40	824.20001160	-0.007	848.80001284	-0.002	2.5
4.20	30	824.20000639	0.000	848.80001137	-0.001	2.5
4.20	***20***	***824.20000605***	***0.000***	***848.80001080***	***0.000***	***2.5***
4.20	10	824.20000660	-0.001	848.80001273	-0.002	2.5
4.20	0	824.20000664	-0.001	848.80001143	-0.001	2.5
4.20	-10	824.20000866	-0.003	848.80001007	0.001	2.5
4.20	-20	824.20000895	-0.004	848.80001180	-0.001	2.5
4.20	-30	824.20000913	-0.004	848.80001258	-0.002	2.5

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2060.500	Hz	High Channel	2122.000	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
4.20	***20***	**824.20000605**	***0***	**848.80001080**	***0***	***2.5***
4.40	20	824.20001757	-0.014	848.80001421	-0.004	2.5
3.80	20	824.20001247	-0.008	848.80001580	-0.006	2.5

GSM 1900, Channel 512/810, Frequency 1850.0/1910.0 MHz (Lowest Frequency:GPRS / Highest Frequency: EGPRS)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0740	1909.9230		
Extreme (50C)		1850.0741	1909.9230	22.8	0.012
Extreme (40C)		1850.0741	1909.9230	23.5	0.013
Extreme (30C)		1850.0741	1909.9230	24.2	0.013
Extreme (10C)		1850.0741	1909.9230	15.8	0.008
Extreme (0C)		1850.0741	1909.9230	22.3	0.012
Extreme (-10C)		1850.0741	1909.9230	29.2	0.016
Extreme (-20C)		1850.0741	1909.9230	25.9	0.014
Extreme (-30C)		1850.0741	1909.9230	24.9	0.013
20C	15%	1850.0741	1909.9230	34.1	0.018
	-15%	1850.0741	1909.9230	31.8	0.017
	End Point	1850.0741	1909.9230	15.0	0.008

WCDMA Band 5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
4.20	50	826.40000413	0.000	846.60000468	-0.001	2.5
4.20	40	826.40000428	0.000	846.60000471	-0.001	2.5
4.20	30	826.40000495	-0.001	846.60000458	0.000	2.5
4.20	***20***	***826.40000403***	***0.000***	***846.60000421***	***0.000***	***2.5***
4.20	10	826.40000418	0.000	846.60000416	0.000	2.5
4.20	0	826.40000436	0.000	846.60000492	-0.001	2.5
4.20	-10	826.40000425	0.000	846.60000463	0.000	2.5
4.20	-20	826.40000413	0.000	846.60000406	0.000	2.5
4.20	-30	826.40000408	0.000	846.60000385	0.000	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
4.20	***20***	**826.40000403**	***0***	**846.60000421**	***0***	***2.5***
4.40	20	826.40000297	0.001	846.60000288	0.002	2.5
3.80	20	826.40000348	0.001	846.60000316	0.001	2.5

WCDMA Band 4 (Lowest Frequency: Rel99 / Highest Frequency: HSDPA)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.3102	1754.6869		
Extreme (50C)		1710.3102	1754.6869	5.2	0.003
Extreme (40C)		1710.3102	1754.6869	6.4	0.004
Extreme (30C)		1710.3102	1754.6869	6.8	0.004
Extreme (10C)		1710.3102	1754.6869	6.3	0.004
Extreme (0C)		1710.3102	1754.6869	6.5	0.004
Extreme (-10C)		1710.3102	1754.6869	5.7	0.003
Extreme (-20C)		1710.3102	1754.6869	6.1	0.004
Extreme (-30C)		1710.3102	1754.6869	5.8	0.003
20C	15%	1710.3102	1754.6869	6.3	0.004
	-15%	1710.3102	1754.6869	6.1	0.004
	End Point	1710.3102	1754.6869	5.8	0.003

WCDMA Band 2 (Lowest Frequency: Rel99 / Highest Frequency: Rel99)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.3146	1909.6855		
Extreme (50C)		1850.3146	1909.6855	7.5	0.004
Extreme (40C)		1850.3146	1909.6855	6.9	0.004
Extreme (30C)		1850.3146	1909.6855	5.8	0.003
Extreme (10C)		1850.3146	1909.6855	6.2	0.003
Extreme (0C)		1850.3146	1909.6855	5.9	0.003
Extreme (-10C)		1850.3146	1909.6855	5.9	0.003
Extreme (-20C)		1850.3146	1909.6855	5.7	0.003
Extreme (-30C)		1850.3146	1909.6855	6.1	0.003
20C	15%	1850.3146	1909.6855	6.7	0.004
	-15%	1850.3146	1909.6855	8.7	0.005
	End Point	1850.3146	1909.6855	8.2	0.004

LTE Band 2 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.1543	1909.8444		
Extreme (50C)		1850.1543	1909.8444	8.4	0.004
Extreme (40C)		1850.1543	1909.8444	8.9	0.005
Extreme (30C)		1850.1543	1909.8444	6.3	0.003
Extreme (10C)		1850.1543	1909.8444	6.1	0.003
Extreme (0C)		1850.1543	1909.8444	7.6	0.004
Extreme (-10C)		1850.1543	1909.8444	7.7	0.004
Extreme (-20C)		1850.1543	1909.8444	7.7	0.004
Extreme (-30C)		1850.1543	1909.8444	8.7	0.005
20C	15%	1850.1543	1909.8444	8.3	0.004
	-15%	1850.1543	1909.8444	7.6	0.004
	End Point	1850.1543	1909.8444	7.6	0.004

LTE Band 12 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.1555	715.8435		
Extreme (50C)		699.1555	715.8435	5.3	0.007
Extreme (40C)		699.1555	715.8435	5.1	0.007
Extreme (30C)		699.1555	715.8435	5.1	0.007
Extreme (10C)		699.1555	715.8435	5.2	0.007
Extreme (0C)		699.1555	715.8435	5.0	0.007
Extreme (-10C)		699.1555	715.8435	4.2	0.006
Extreme (-20C)		699.1555	715.8435	4.9	0.007
Extreme (-30C)		699.1555	715.8435	4.8	0.007
20C	15%	699.1555	715.8435	4.8	0.007
	-15%	699.1555	715.8435	4.6	0.007
	End Point	699.1555	715.8435	4.7	0.007

LTE Band 26

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2036.750 Hz		High Channel	2120.750 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	50	814.70000508	-0.001	848.30000503	-0.001	2.5
3.85	40	814.70000513	-0.001	848.30000426	0.000	2.5
3.85	30	814.70000482	0.000	848.30000413	0.000	2.5
3.85	***20***	***814.70000461***	***0.000***	***848.30000398***	***0.000***	***2.5***
3.85	10	814.70000463	0.000	848.30000462	-0.001	2.5
3.85	0	814.70000404	0.001	848.30000443	-0.001	2.5
3.85	-10	814.70000329	0.002	848.30000373	0.000	2.5
3.85	-20	814.70000443	0.000	848.30000457	-0.001	2.5
3.85	-30	814.70000438	0.000	848.30000523	-0.001	2.5

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2036.750 Hz		High Channel	2120.750 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
4.20	***20***	**814.70000461**	***0***	**848.30000398**	***0***	***2.5***
4.40	20	814.70000614	-0.002	848.30000617	-0.003	2.5
3.80	20	814.70000593	-0.002	848.30000608	-0.002	2.5

LTE Band 41 (Lowest Frequency:16QAM / Highest Frequency: QPSK)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.2529	2689.7425		
Extreme (50C)		2496.2529	2689.7425	12.1	0.005
Extreme (40C)		2496.2529	2689.7425	13.2	0.005
Extreme (30C)		2496.2529	2689.7425	12.6	0.005
Extreme (10C)		2496.2529	2689.7425	12.1	0.005
Extreme (0C)		2496.2529	2689.7425	13.0	0.005
Extreme (-10C)		2496.2529	2689.7425	12.3	0.005
Extreme (-20C)		2496.2529	2689.7425	12.4	0.005
Extreme (-30C)		2496.2529	2689.7425	12.1	0.005
20C	15%	2496.2529	2689.7425	9.4	0.004
	-15%	2496.2529	2689.7425	10.5	0.004
	End Point	2496.2529	2689.7425	10.6	0.004

LTE Band 66 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.6995	1779.3005		
Extreme (50C)		1710.6995	1779.3006	7.3	0.004
Extreme (40C)		1710.6995	1779.3006	6.9	0.004
Extreme (30C)		1710.6995	1779.3006	7.1	0.004
Extreme (10C)		1710.6995	1779.3006	7.3	0.004
Extreme (0C)		1710.6995	1779.3006	6.8	0.004
Extreme (-10C)		1710.6995	1779.3006	6.2	0.004
Extreme (-20C)		1710.6995	1779.3006	6.5	0.004
Extreme (-30C)		1710.6995	1779.3006	7.6	0.004
20C	15%	1710.6995	1779.3006	7.3	0.004
	-15%	1710.6995	1779.3006	6.2	0.004
	End Point	1710.6995	1779.3006	7.8	0.004

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §27.53 and §90.635

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50:

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) - Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d) (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

(h) The following power limits shall apply in the BRS and EBS:

(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

90.635(b) – The maximum output power of the transmitter for mobile stations is 100 watts (20dBw).

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03r01

For radiated output power measurement with a ESU40:

a) Set the RBW ≥ OBW;

b) Set VBW ≥ 3 × RBW;

c) Set span ≥ 2 x RBW;

d) Sweep time = auto couple;

e) Detector = rms;

f) Ensure that the number of measurement points ≥ span/RBW;

g) Trace mode = max hold(GSM, WCDMA), average(LTE,NR);

TEST RESULTS

9.5.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	29.83	961.61
		190	836.6	30.91	1233.10
		251	848.8	**31.03**	**1267.65**
	EGPRS	128	824.2	25.91	389.94
		190	836.6	**26.72**	**469.89**
		251	848.8	25.84	383.71
GSM1900	GPRS	512	1850.2	27.87	612.35
		661	1880	**28.62**	**727.78**
		810	1909.8	27.51	563.64
	EGPRS	512	1850.2	25.82	381.94
		661	1880	**26.58**	**454.99**
		810	1909.8	25.26	335.74

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	20.55	113.50
		4183	836.6	**21.21**	**132.13**
		4233	846.6	20.05	101.16
	HSDPA	4132	826.4	19.48	88.72
		4183	836.6	**20.02**	**100.46**
		4233	846.6	19.55	90.16
Band 4	REL99	1312	1712.4	21.88	154.17
		1413	1732.6	21.98	157.76
		1513	1752.6	**22.74**	**187.93**
	HSDPA	1312	1712.4	21.72	148.59
		1413	1732.6	21.95	156.68
		1513	1752.6	**22.73**	**187.50**
Band 2	REL99	9262	1852.4	**21.22**	**132.43**
		9400	1880.0	**21.22**	**132.43**
		9538	1907.6	19.51	89.33
	HSDPA	9262	1852.4	21.24	133.05
		9400	1880.0	**21.30**	**134.90**
		9538	1907.6	20.38	109.14

LTE Band 2 (Main ANT)

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 2	20	QPSK	1/49	1860.0	**21.78**	**150.66**
			1/49	1880.0	21.34	136.14
			1/99	1900.0	20.13	103.04
		16QAM	1/49	1860.0	19.59	90.99
			1/49	1880.0	19.11	81.47
			1/49	1900.0	**19.83**	**96.16**
	15	QPSK	1/74	1857.5	21.03	126.77
			1/74	1880.0	21.72	148.59
			1/74	1902.5	**21.90**	**154.88**
		16QAM	1/74	1857.5	19.18	82.79
			1/0	1880.0	19.47	88.51
			1/74	1902.5	**19.56**	**90.36**
	10	QPSK	1/49	1855.0	21.32	135.52
			1/25	1880.0	**21.63**	**145.55**
			1/49	1905.0	20.38	109.14
		16QAM	1/25	1855.0	18.51	70.96
			1/25	1880.0	**19.59**	**90.99**
			1/0	1905.0	19.50	89.13
	5	QPSK	1/24	1852.5	20.44	110.66
			1/24	1880.0	**21.00**	**125.89**
			1/24	1907.5	20.92	123.59
		16QAM	1/24	1852.5	18.57	71.94
			1/0	1880.0	19.65	92.26
			1/24	1907.5	**19.66**	**92.47**
	3	QPSK	1/14	1851.5	20.80	120.23
			1/0	1880.0	**21.56**	**143.22**
			1/14	1908.5	21.15	130.32
		16QAM	1/0	1851.5	18.66	73.45
			1/0	1880.0	**19.80**	**95.50**
			1/14	1908.5	19.53	89.74
	1.4	QPSK	1/5	1850.7	20.60	114.82
			1/0	1880.0	21.84	152.76
			1/0	1909.3	**22.40**	**173.78**
		16QAM	1/5	1850.7	18.55	71.61
			1/3	1880.0	19.62	91.62
			1/3	1909.3	**19.63**	**91.83**