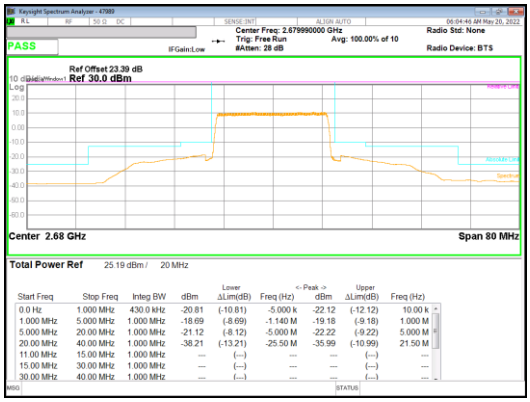
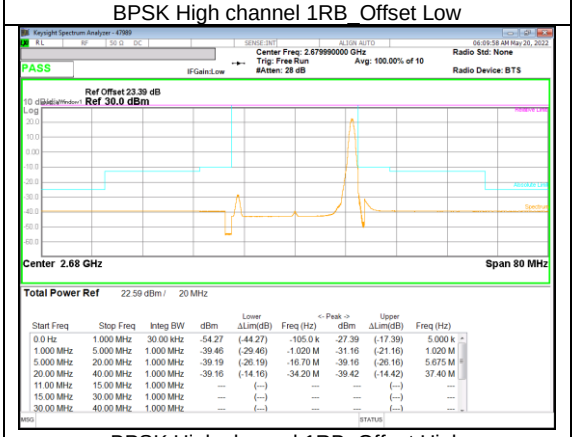
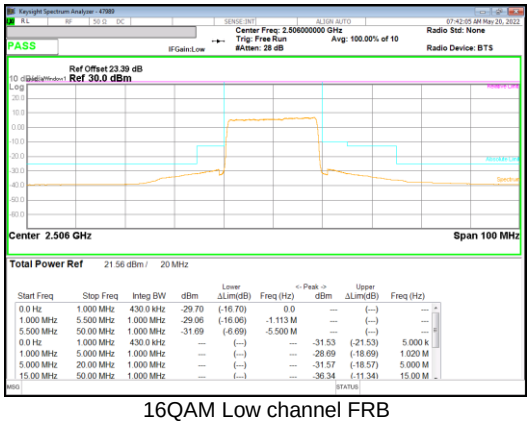
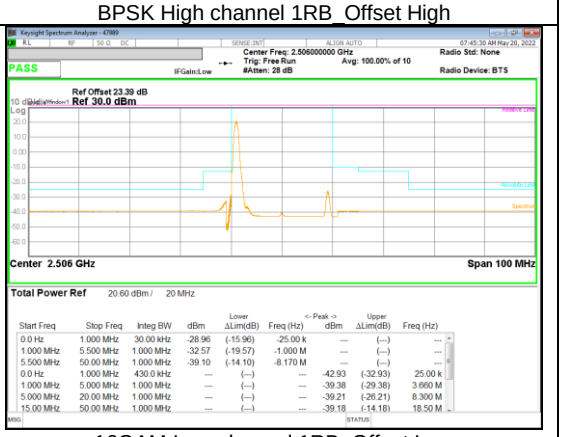
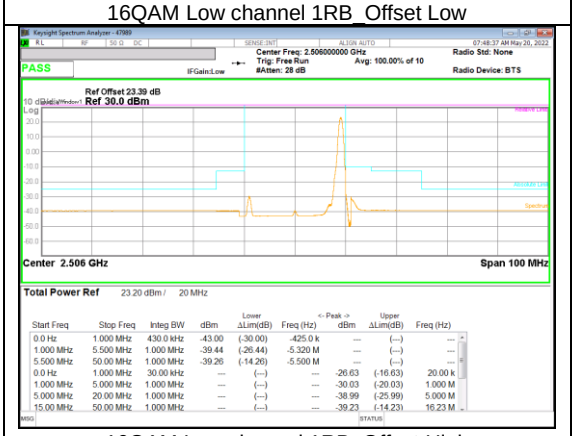
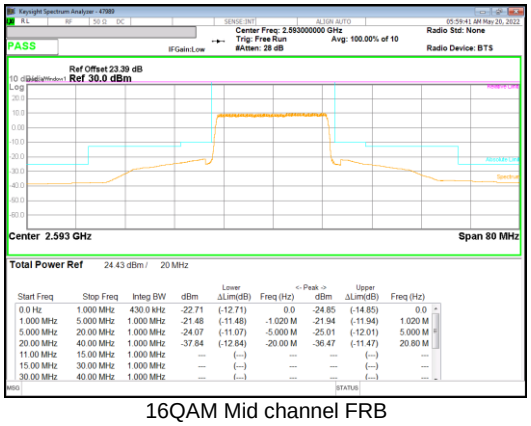
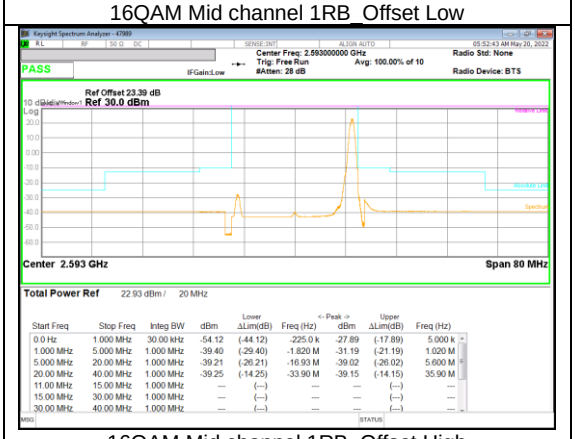
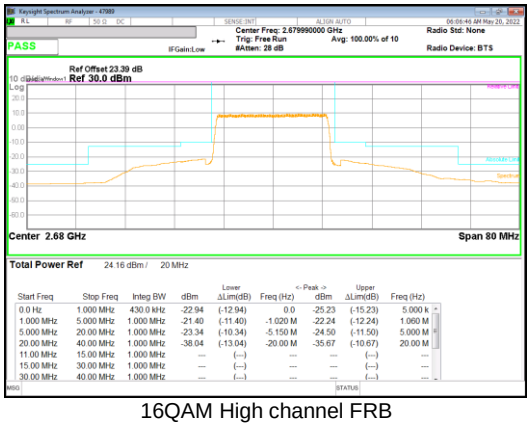
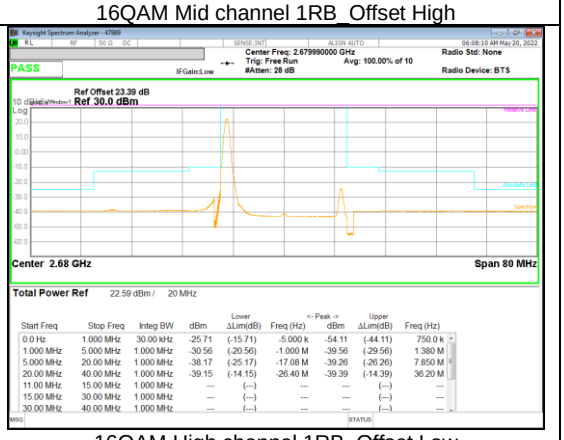
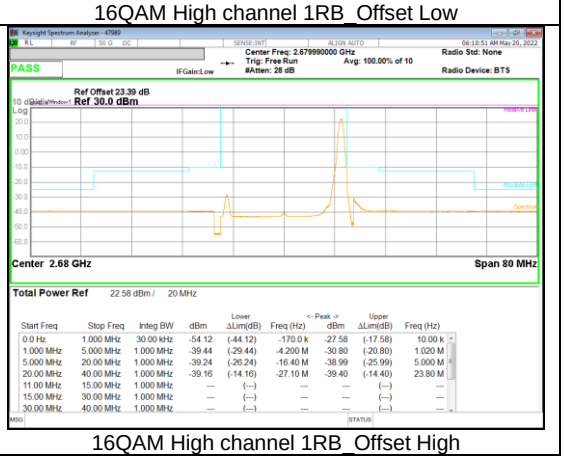
20MHz BPSK	 BPSK High channel FRB	 BPSK High channel 1RB_Offset Low
		 BPSK High channel 1RB_Offset High
20MHz 16QAM	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low
		 16QAM Low channel 1RB_Offset High

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

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.

(l)(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

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 $43 + 10\text{Log}_{10}(P)$ 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.

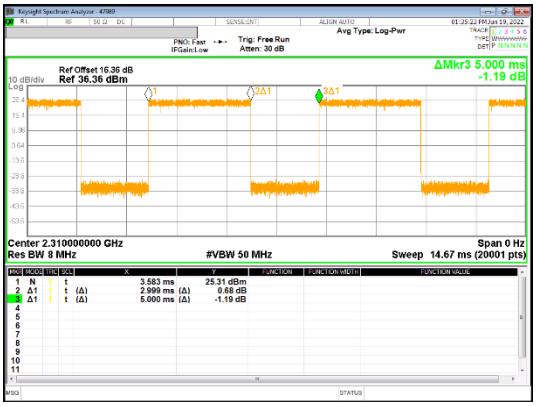
a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz
   (Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points = Max (40001);
g) Trace mode = average(WCDMA, LTE FDD, LTE B40, 5G NR FDD),
   Max hold(GSM, LTE TDD, 5G NR TDD);

NOTE1

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.

NOTE2

For LTE B40 CSE (Gate trigger off):
RF Path Loss: 16.36 dB & DCF 2.2 dB: 10log(3/5)
Measure offset: 16.36 dB+2.2 dB = 18.58 dB



NOTE3

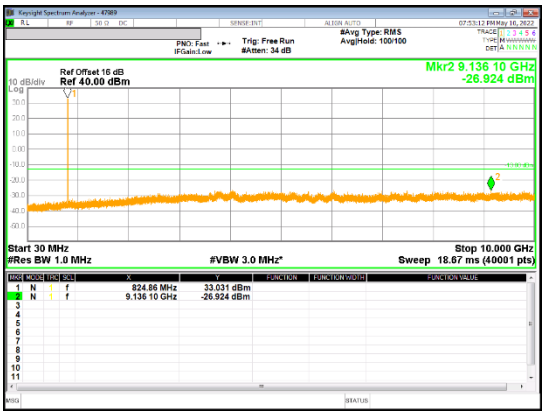
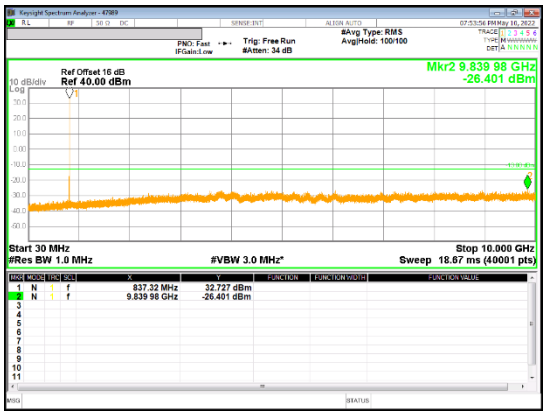
Please refer to section 5.4 for bandwidth and RB setting about LTE, 5G NR bands.

RESULTS

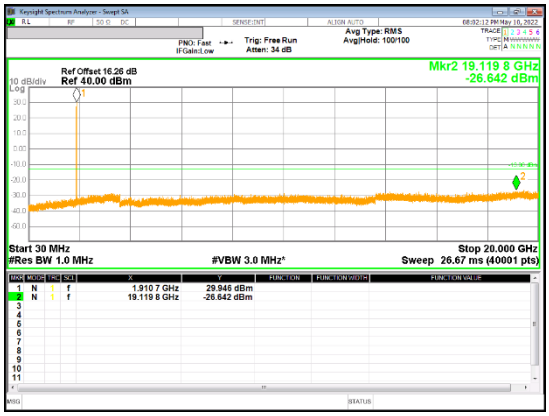
See the following pages.

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	

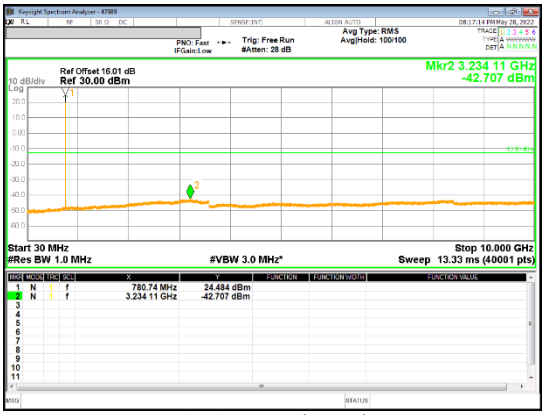
LTE Band 7

10 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 12

5 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

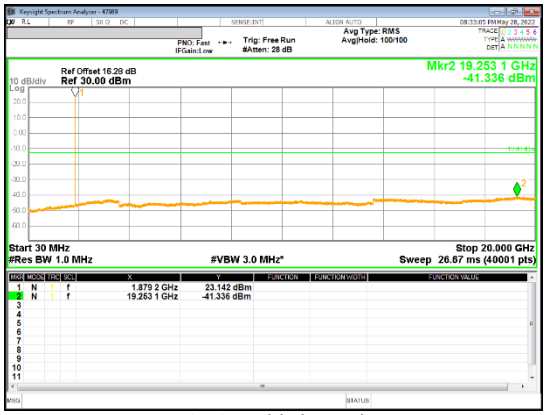
LTE Band 13

5 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 14

5 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 25

10 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

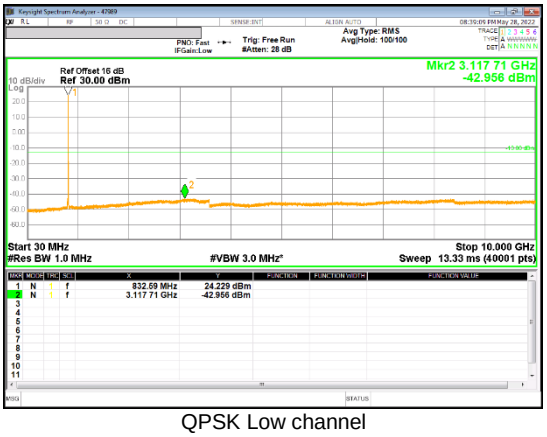
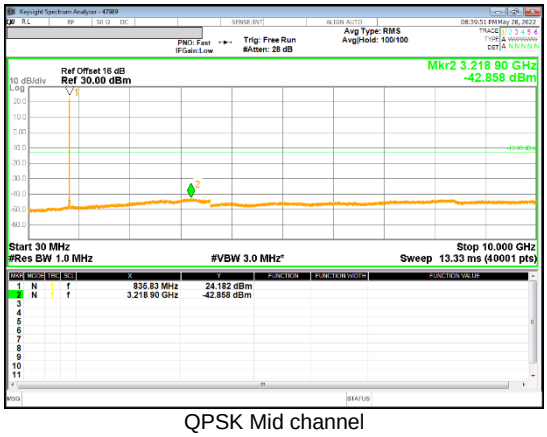
LTE Band 26(Part 90)

15 MHz	 QPSK Low channel

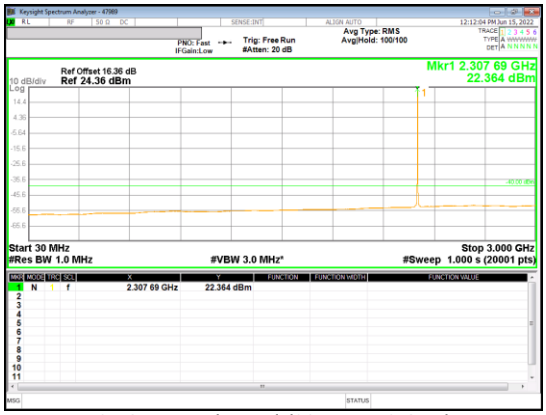
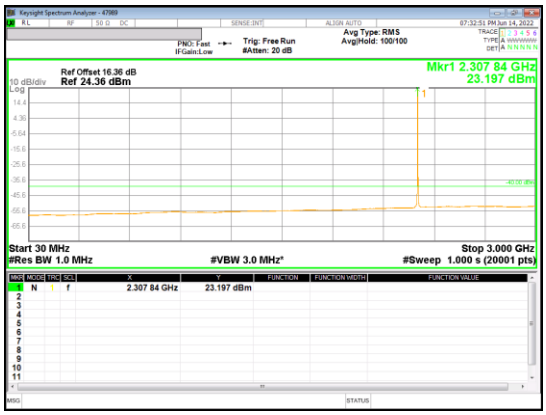
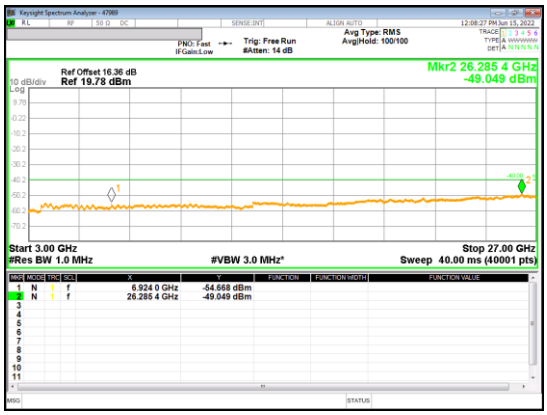
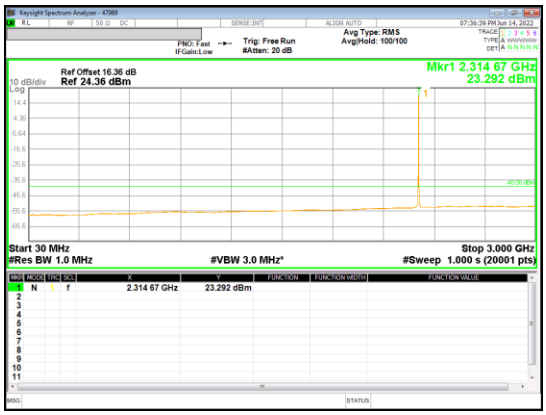
LTE Band 26 (Straddle)

15 MHz	 QPSK High channel

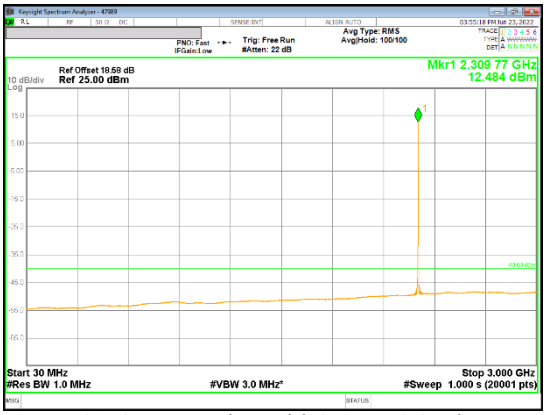
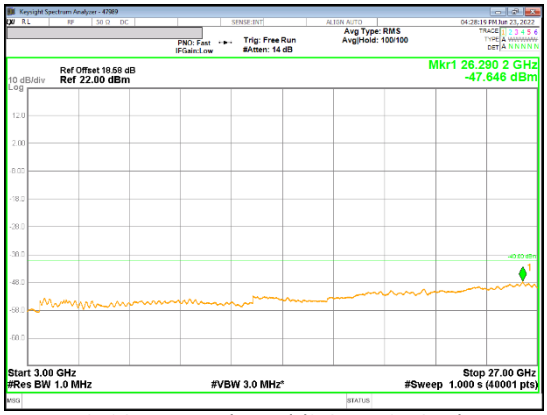
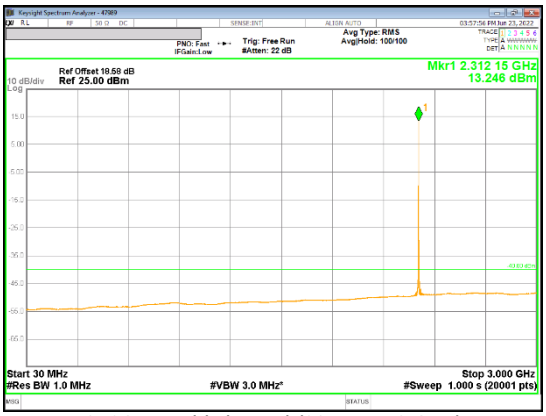
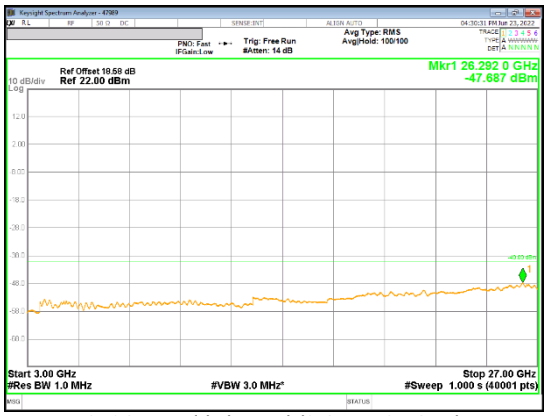
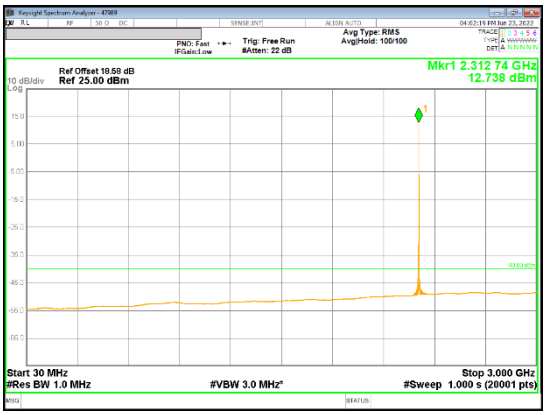
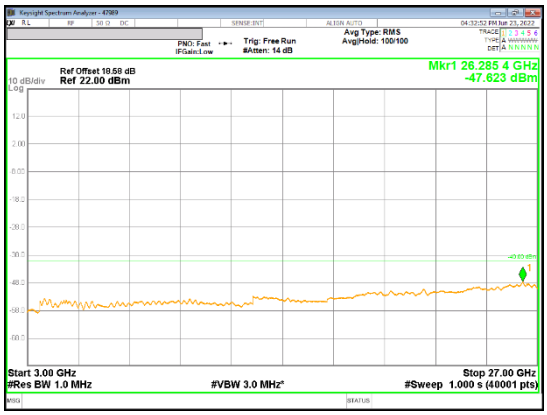
LTE Band 26 (Part 22)

15 MHz	 QPSK Low channel	 QPSK Mid channel

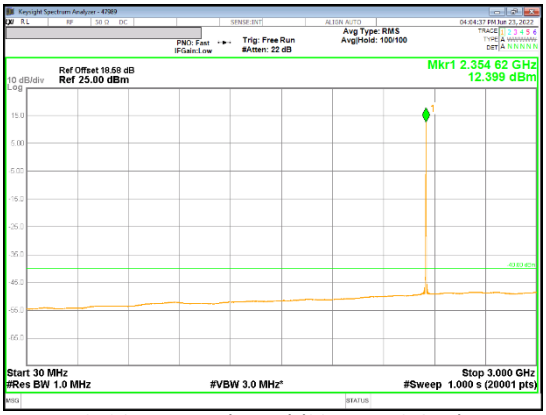
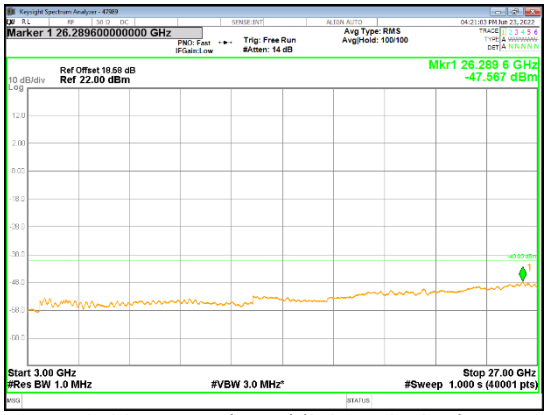
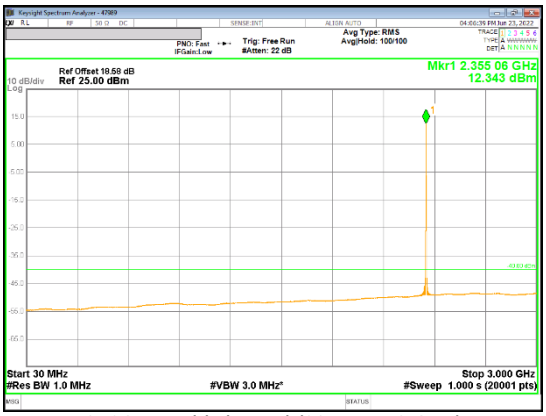
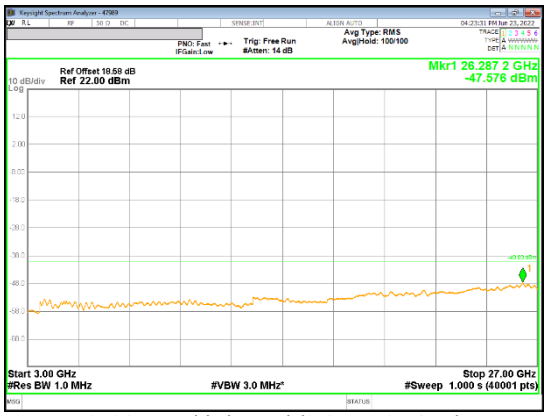
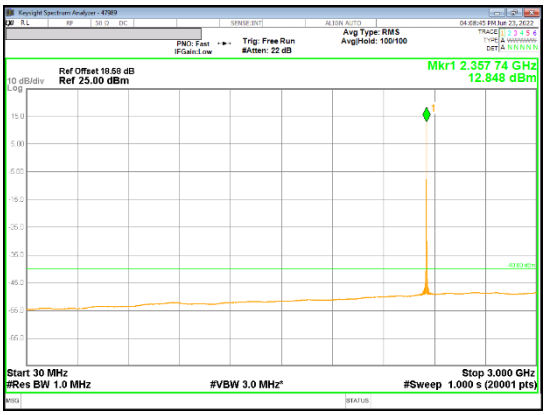
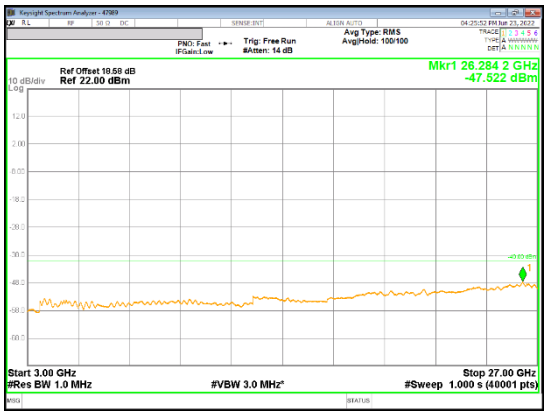
LTE Band 30

5 MHz	 QPSK Low channel (30 MHz - 3 GHz)	 QPSK Low channel (3 GHz - 27 GHz)
	 QPSK Mid channel (30 MHz - 3 GHz)	 QPSK Mid channel (3 GHz - 27 GHz)
	 QPSK High channel (30 MHz - 3 GHz)	 QPSK High channel (3 GHz - 27 GHz)

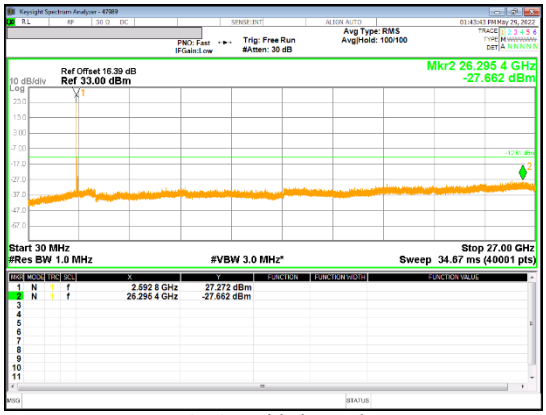
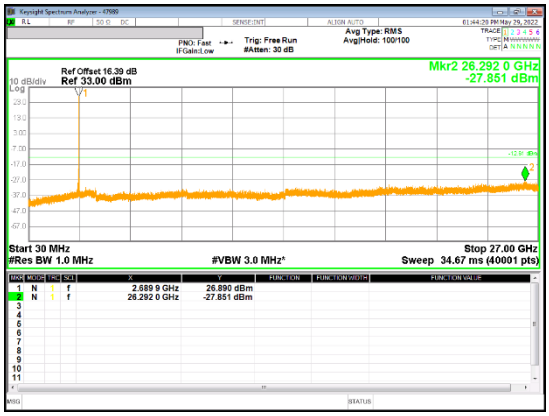
LTE Band 40 (2307.5 - 2312.5 MHz)

5 MHz	 256QAM Low channel (30 MHz - 3 GHz)	 256QAM Low channel (3 GHz - 27 GHz)
	 256QAM Mid channel (30 MHz - 3 GHz)	 256QAM Mid channel (3 GHz - 27 GHz)
	 256QAM High channel (30 MHz - 3 GHz)	 256QAM High channel (3 GHz - 27 GHz)

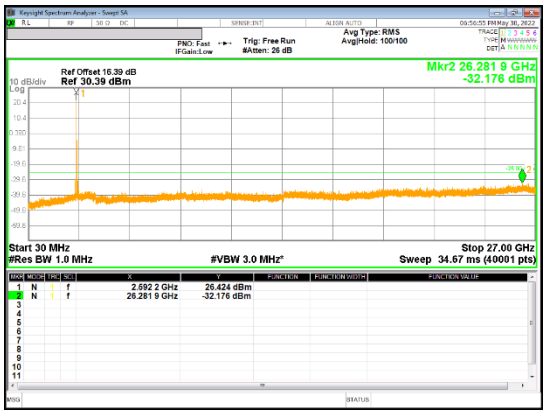
LTE Band 40 (2357.5 - 2357.5 MHz)

5 MHz	 256QAM Low channel (30 MHz - 3 GHz)	 256QAM Low channel (3 GHz - 27 GHz)
	 256QAM Mid channel (30 MHz - 3 GHz)	 256QAM Mid channel (3 GHz - 27 GHz)
	 256QAM High channel (30 MHz - 3 GHz)	 256QAM High channel (3 GHz - 27 GHz)

LTE Band 41(PC2)

5 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

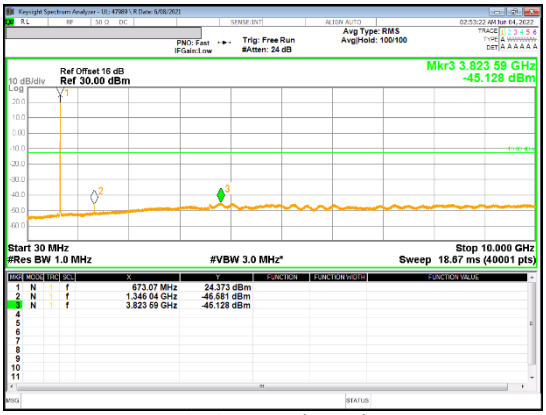
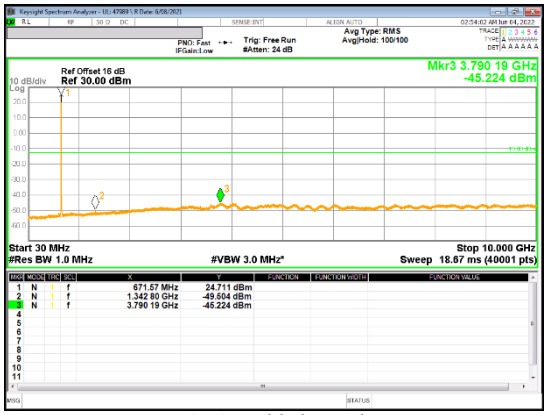
LTE Band 41(UL CA)

20+20 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

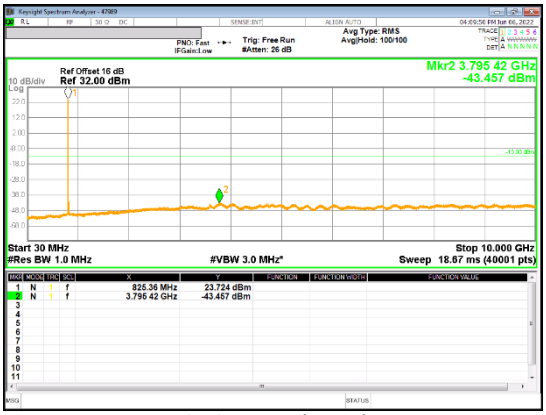
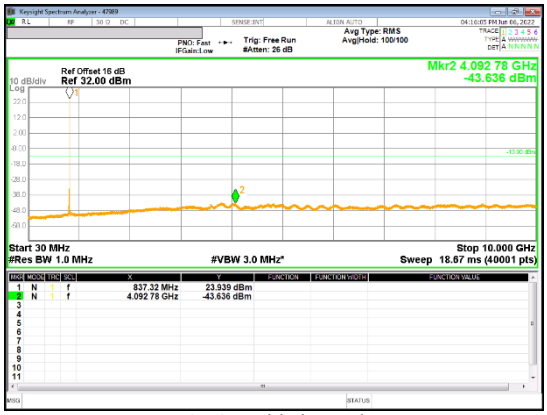
LTE Band 66

5 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

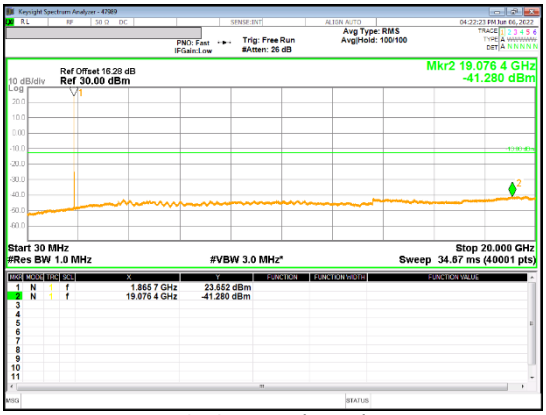
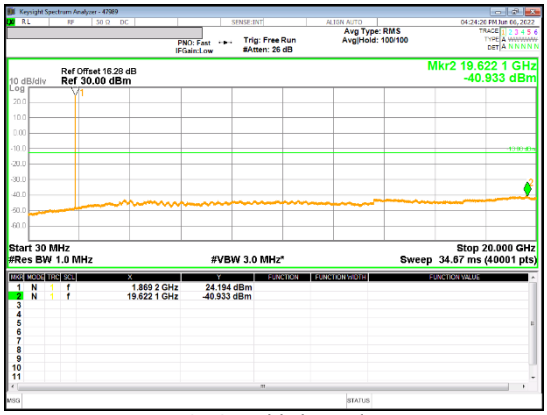
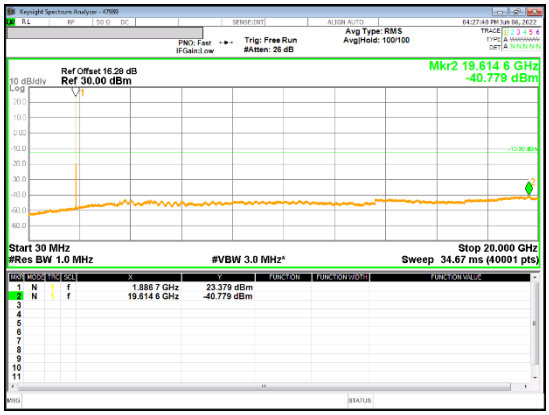
LTE Band 71

20 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

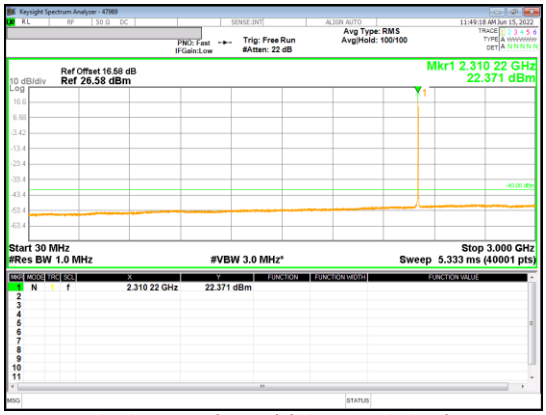
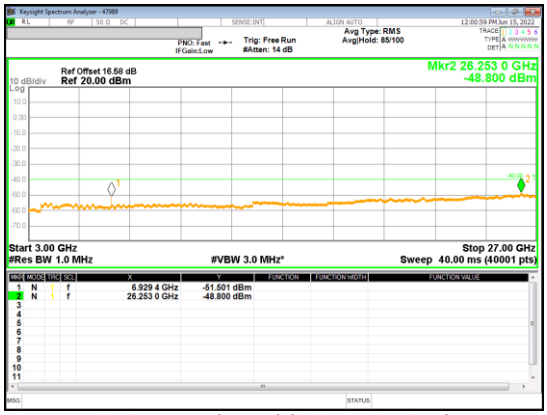
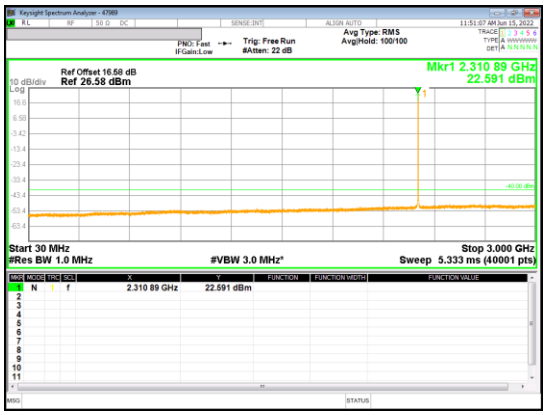
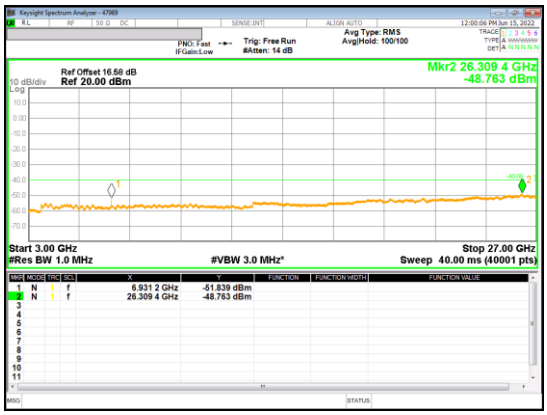
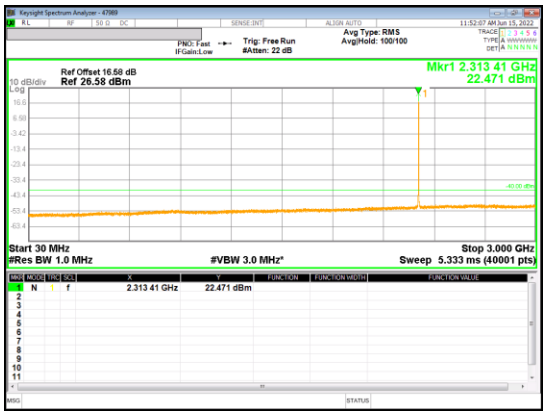
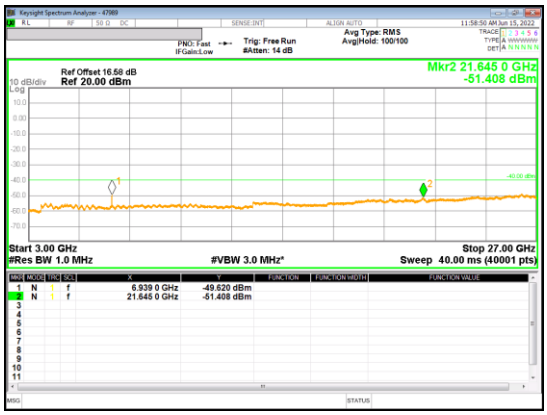
NR Band n5

15 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

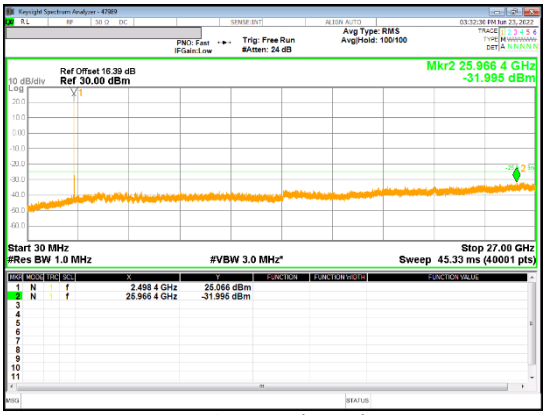
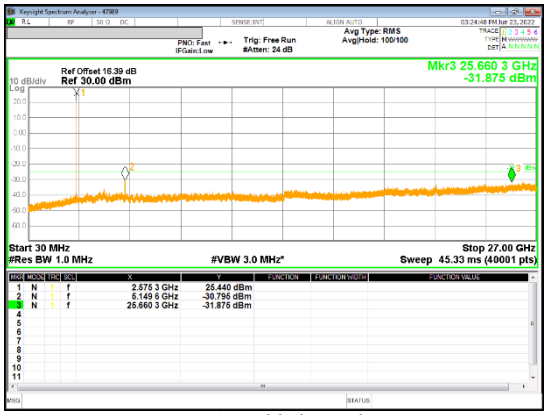
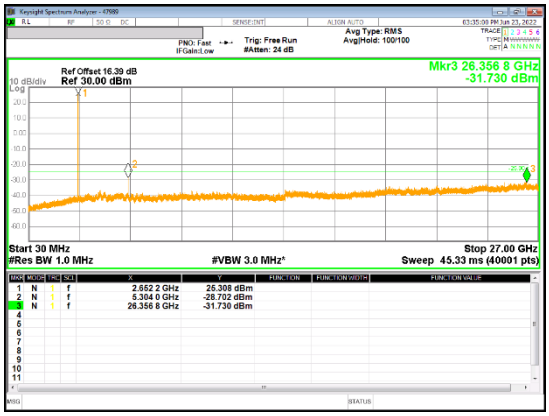
NR Band n25

30MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

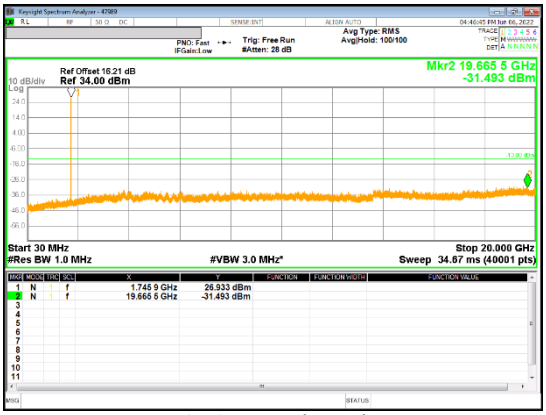
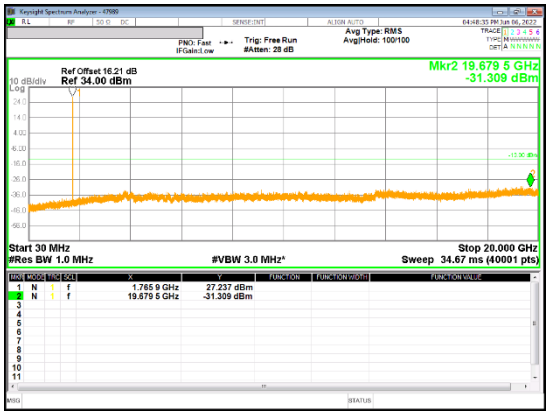
NR Band n30

5 MHz	 QPSK Low channel (30 MHz - 3 GHz)	 QPSK Low channel (3 GHz - 27 GHz)
	 QPSK Mid channel (30 MHz - 3 GHz)	 QPSK Mid channel (3 GHz - 27 GHz)
	 QPSK High channel (30 MHz - 3 GHz)	 QPSK High channel (3 GHz - 27 GHz)

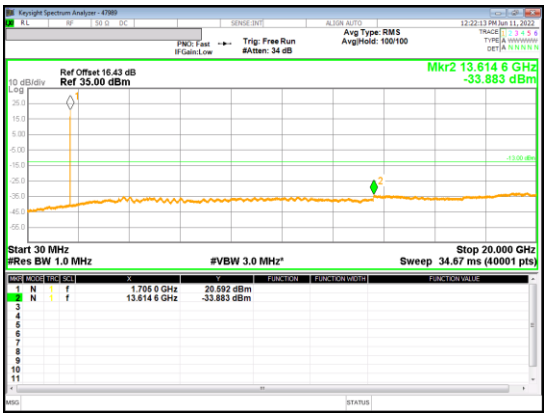
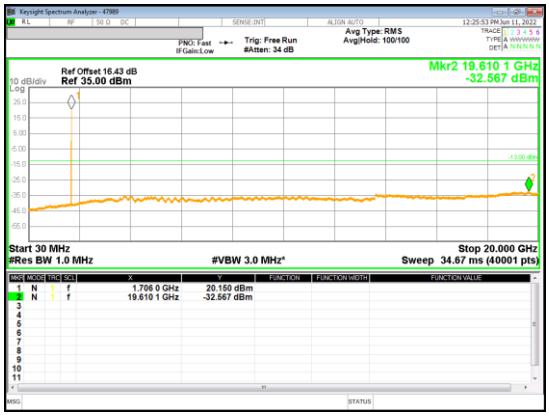
NR Band n41(PC2)

30MHz	 BPSK Low channel	 BPSK Mid channel
	 BPSK High channel	

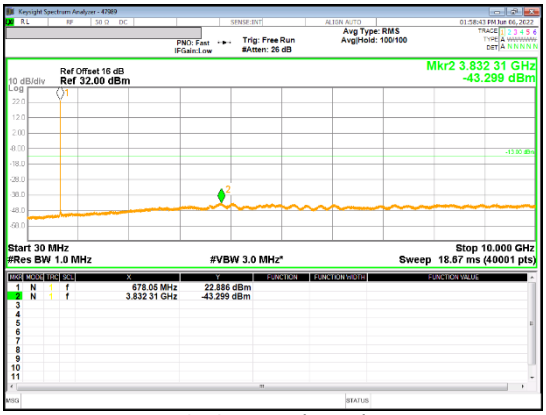
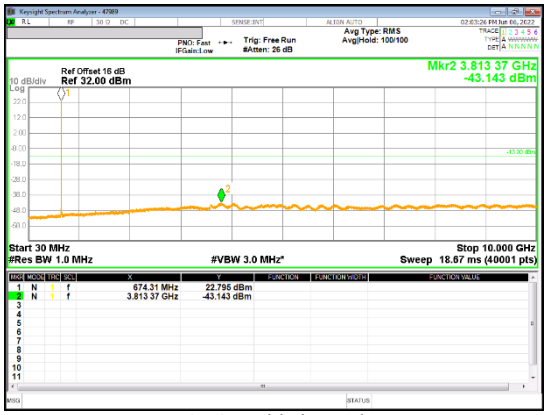
NR Band n66

30MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

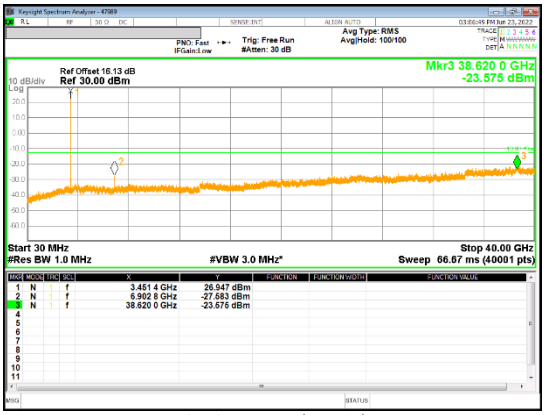
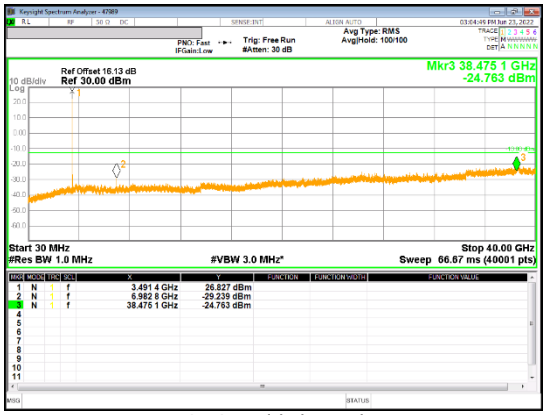
NR Band n70

10 MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

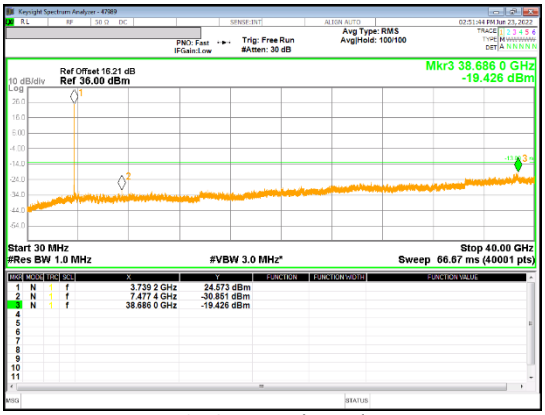
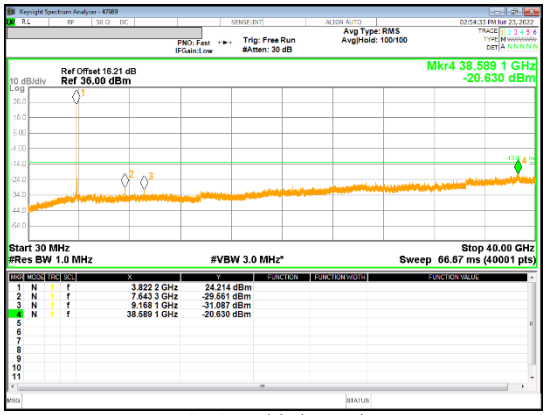
NR Band n71

5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

NR Band n77(PC2) (3450 – 3550 MHz)

20MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

NR Band n77(PC2) (3700 – 3980 MHz)

40MHz	 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 [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.86	50	824.20003365	-0.001	848.80003158	0.001	2.5
3.86	40	824.20003410	-0.002	848.80003050	0.002	2.5
3.86	30	824.20003277	0.000	848.80003001	0.002	2.5
3.86	***20***	***824.20003257***	***0.000***	***848.80003210***	***0.000***	***2.5***
3.86	10	824.20003350	-0.001	848.80003127	0.001	2.5
3.86	0	824.20003313	-0.001	848.80003068	0.002	2.5
3.86	-10	824.20003613	-0.004	848.80003349	-0.002	2.5
3.86	-20	824.20003104	0.002	848.80003182	0.000	2.5
3.86	-30	824.20003270	0.000	848.80003071	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 [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**824.20003257**	***0***	**848.80003210**	***0***	***2.5***
4.47	20	824.20003203	0.001	848.80003052	0.002	2.5
3.65	20	824.20002952	0.004	848.80003018	0.002	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	1850.0802	1909.9231		
Extreme (50C)		1850.0802	1909.9231	33.3	0.018
Extreme (40C)		1850.0802	1909.9231	34.1	0.018
Extreme (30C)		1850.0802	1909.9231	30.3	0.016
Extreme (10C)		1850.0802	1909.9231	31.3	0.017
Extreme (0C)		1850.0802	1909.9231	39.2	0.021
Extreme (-10C)		1850.0802	1909.9231	38.5	0.020
Extreme (-20C)		1850.0802	1909.9231	36.1	0.019
Extreme (-30C)		1850.0802	1909.9231	37.2	0.020
20C	15%	1850.0802	1909.9231	35.4	0.019
	-15%	1850.0802	1909.9231	34.0	0.018
	End Point	1850.0802	1909.9231	38.9	0.021

WCDMA Band 5

Limit: +- 2.5 ppm =	Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
	Low Channel	2066.000	Hz		High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse					
		Low Channel		High Channel			Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.86	50	826.40000350	-0.001	846.60000557	-0.003		2.5
3.86	40	826.40000384	-0.001	846.60000536	-0.003		2.5
3.86	30	826.40000346	-0.001	846.60000399	-0.001		2.5
3.86	***20***	***826.40000303***	***0.000***	***846.60000317***	***0.000***		***2.5***
3.86	10	826.40000214	0.001	846.60000280	0.000		2.5
3.86	0	826.40000298	0.000	846.60000501	-0.002		2.5
3.86	-10	826.40000396	-0.001	846.60000543	-0.003		2.5
3.86	-20	826.40000431	-0.002	846.60000632	-0.004		2.5
3.86	-30	826.40000366	-0.001	846.60000515	-0.002		2.5

Limit: +- 2.5 ppm =	Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
	Low Channel	2066.000	Hz		High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse					
		Low Channel		High Channel			Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.88	***20***	***826.40000303***	***0***	***846.60000317***	***0***		***2.5***
4.47	20	826.40000340	0.000	846.60000378	-0.001		2.5
3.65	20	826.40000160	0.002	846.60000442	-0.001		2.5

WCDMA Band 4 (Lowest Frequency: HSDPA/ 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	1712.4000	1754.6819		
Extreme (50C)		1712.4000	1754.6819	16.4	0.009
Extreme (40C)		1712.4000	1754.6819	17.0	0.010
Extreme (30C)		1712.4000	1754.6819	17.3	0.010
Extreme (10C)		1712.4000	1754.6819	17.6	0.010
Extreme (0C)		1712.4000	1754.6819	18.0	0.010
Extreme (-10C)		1712.4000	1754.6819	18.5	0.011
Extreme (-20C)		1712.4000	1754.6819	18.3	0.011
Extreme (-30C)		1712.4000	1754.6819	19.0	0.011
20C	15%	1712.4000	1754.6819	13.3	0.008
	-15%	1712.4000	1754.6819	14.4	0.008
	End Point	1712.4000	1754.6819	14.0	0.008

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	1850.3178	1909.6840		
Extreme (50C)		1850.3178	1909.6840	7.1	0.004
Extreme (40C)		1850.3178	1909.6840	7.0	0.004
Extreme (30C)		1850.3178	1909.6840	7.5	0.004
Extreme (10C)		1850.3178	1909.6840	7.1	0.004
Extreme (0C)		1850.3178	1909.6840	8.0	0.004
Extreme (-10C)		1850.3178	1909.6840	9.1	0.005
Extreme (-20C)		1850.3178	1909.6840	9.0	0.005
Extreme (-30C)		1850.3178	1909.6840	9.3	0.005
20C	15%	1850.3178	1909.6840	7.5	0.004
	-15%	1850.3178	1909.6840	7.7	0.004
	End Point	1850.3178	1909.6840	8.2	0.004

LTE Band 7 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2500.2528	2569.7439		
Extreme (50C)		2500.2528	2569.7439	10.3	0.004
Extreme (40C)		2500.2528	2569.7439	11.5	0.005
Extreme (30C)		2500.2528	2569.7439	10.7	0.004
Extreme (10C)		2500.2528	2569.7439	14.4	0.006
Extreme (0C)		2500.2528	2569.7439	13.2	0.005
Extreme (-10C)		2500.2528	2569.7439	14.4	0.006
Extreme (-20C)		2500.2528	2569.7439	14.1	0.006
Extreme (-30C)		2500.2528	2569.7439	13.6	0.005
20C	15%	2500.2528	2569.7439	7.2	0.003
	-15%	2500.2528	2569.7439	6.2	0.002
	End Point	2500.2528	2569.7439	7.0	0.003

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

LTE Band 12 (Lowest Frequency: QPSK / 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	699.1531	715.8464		
Extreme (50C)		699.1531	715.8464	5.1	0.007
Extreme (40C)		699.1531	715.8464	24.9	0.035
Extreme (30C)		699.1531	715.8464	30.0	0.042
Extreme (10C)		699.1531	715.8464	6.3	0.009
Extreme (0C)		699.1531	715.8464	13.4	0.019
Extreme (-10C)		699.1531	715.8464	13.4	0.019
Extreme (-20C)		699.1531	715.8464	13.5	0.019
Extreme (-30C)		699.1531	715.8464	13.3	0.019
20C	15%	699.1531	715.8464	3.8	0.005
	-15%	699.1531	715.8464	5.2	0.007
	End Point	699.1531	715.8464	6.8	0.010

LTE Band 13 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	777.2590	786.7433		
Extreme (50C)		777.2590	786.7433	6.8	0.009
Extreme (40C)		777.2590	786.7433	6.4	0.008
Extreme (30C)		777.2590	786.7433	7.1	0.009
Extreme (10C)		777.2590	786.7433	7.4	0.009
Extreme (0C)		777.2590	786.7433	7.6	0.010
Extreme (-10C)		777.2590	786.7433	7.6	0.010
Extreme (-20C)		777.2590	786.7433	7.0	0.009
Extreme (-30C)		777.2590	786.7433	8.6	0.011
20C	15%	777.2590	786.7433	6.9	0.009
	-15%	777.2590	786.7433	5.7	0.007
	End Point	777.2590	786.7433	5.4	0.007

LTE Band 14 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)

Limit		788	798	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	788.2534	797.7442		
Extreme (50C)		788.2534	797.7442	5.5	0.007
Extreme (40C)		788.2534	797.7442	5.7	0.007
Extreme (30C)		788.2534	797.7442	6.0	0.008
Extreme (10C)		788.2534	797.7442	7.6	0.010
Extreme (0C)		788.2534	797.7442	6.8	0.009
Extreme (-10C)		788.2534	797.7442	7.7	0.010
Extreme (-20C)		788.2534	797.7442	6.3	0.008
Extreme (-30C)		788.2534	797.7442	7.1	0.009
20C	15%	788.2534	797.7442	4.8	0.006
	-15%	788.2534	797.7442	4.0	0.005
	End Point	788.2534	797.7442	5.5	0.007

LTE Band 25 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.1542	1914.8460		
Extreme (50C)		1850.1542	1914.8460	35.5	0.019
Extreme (40C)		1850.1542	1914.8460	26.7	0.014
Extreme (30C)		1850.1542	1914.8460	16.2	0.009
Extreme (10C)		1850.1542	1914.8460	12.6	0.007
Extreme (0C)		1850.1542	1914.8460	12.6	0.007
Extreme (-10C)		1850.1542	1914.8460	35.6	0.019
Extreme (-20C)		1850.1542	1914.8460	34.1	0.018
Extreme (-30C)		1850.1542	1914.8460	39.1	0.021
20C	15%	1850.1542	1914.8460	6.3	0.003
	-15%	1850.1542	1914.8460	5.7	0.003
	End Point	1850.1542	1914.8460	7.5	0.004

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 [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.86	50	814.70000705	0.001	848.30000579	0.008	2.5
3.86	40	814.70000699	0.001	848.30000642	0.007	2.5
3.86	30	814.70000694	0.001	848.30000778	0.006	2.5
3.86	***20***	***814.70000789***	***0.000***	***848.30001278***	***0.000***	***2.5***
3.86	10	814.70000761	0.000	848.30000785	0.006	2.5
3.86	0	814.70001102	-0.004	848.30000921	0.004	2.5
3.86	-10	814.70000746	0.001	848.30000638	0.008	2.5
3.86	-20	814.70001881	-0.013	848.30000810	0.006	2.5
3.86	-30	814.70000668	0.001	848.30001806	-0.006	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 [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**814.70000789**	***0***	**848.30001278**	***0***	***2.5***
4.47	20	814.70000521	0.003	848.30001132	0.002	2.5
3.65	20	814.70000735	0.001	848.30001311	0.000	2.5

LTE Band 30 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.2520	2314.7427		
Extreme (50C)		2305.2520	2314.7427	9.2	0.004
Extreme (40C)		2305.2520	2314.7427	8.8	0.004
Extreme (30C)		2305.2520	2314.7427	7.5	0.003
Extreme (10C)		2305.2520	2314.7427	8.5	0.004
Extreme (0C)		2305.2520	2314.7427	8.7	0.004
Extreme (-10C)		2305.2520	2314.7427	9.5	0.004
Extreme (-20C)		2305.2520	2314.7427	10.3	0.004
Extreme (-30C)		2305.2520	2314.7427	9.6	0.004
20C	15%	2305.2520	2314.7427	7.3	0.003
	-15%	2305.2520	2314.7427	9.5	0.004
	End Point	2305.2520	2314.7427	7.5	0.003

LTE Band 40 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.2617	2314.7412		
Extreme (50C)		2305.2617	2314.7412	13.6	0.006
Extreme (40C)		2305.2617	2314.7412	16.1	0.007
Extreme (30C)		2305.2617	2314.7412	15.9	0.007
Extreme (10C)		2305.2617	2314.7412	17.1	0.007
Extreme (0C)		2305.2617	2314.7412	11.1	0.005
Extreme (-10C)		2305.2617	2314.7412	10.7	0.005
Extreme (-20C)		2305.2617	2314.7412	13.8	0.006
Extreme (-30C)		2305.2617	2314.7412	14.2	0.006
20C	15%	2305.2617	2314.7412	9.8	0.004
	-15%	2305.2617	2314.7412	10.3	0.004
	End Point	2305.2617	2314.7412	11.3	0.005

Limit		2350	2360	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2350.2516	2359.7436		
Extreme (50C)		2350.2516	2359.7436	16.1	0.007
Extreme (40C)		2350.2516	2359.7436	13.9	0.006
Extreme (30C)		2350.2516	2359.7436	13.3	0.006
Extreme (10C)		2350.2516	2359.7436	15.4	0.007
Extreme (0C)		2350.2516	2359.7436	14.8	0.006
Extreme (-10C)		2350.2516	2359.7436	13.6	0.006
Extreme (-20C)		2350.2516	2359.7436	17.1	0.007
Extreme (-30C)		2350.2516	2359.7436	12.4	0.005
20C	15%	2350.2516	2359.7436	9.8	0.004
	-15%	2350.2516	2359.7436	10.3	0.004
	End Point	2350.2516	2359.7436	11.3	0.005

LTE Band 41(PC2) (Lowest Frequency: QPSK / 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	2496.2509	2689.7391		
Extreme (50C)		2496.2509	2689.7391	13.4	0.005
Extreme (40C)		2496.2509	2689.7391	12.5	0.005
Extreme (30C)		2496.2509	2689.7391	12.3	0.005
Extreme (10C)		2496.2509	2689.7391	13.2	0.005
Extreme (0C)		2496.2509	2689.7391	14.0	0.005
Extreme (-10C)		2496.2509	2689.7391	15.1	0.006
Extreme (-20C)		2496.2509	2689.7391	13.1	0.005
Extreme (-30C)		2496.2509	2689.7391	12.9	0.005
20C	15%	2496.2509	2689.7391	9.1	0.004
	-15%	2496.2509	2689.7391	9.4	0.004
	End Point	2496.2509	2689.7391	10.0	0.004

LTE Band 66 (Lowest Frequency: 16QAM / 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	1710.1585	1779.8438		
Extreme (50C)		1710.1585	1779.8438	14.8	0.008
Extreme (40C)		1710.1585	1779.8438	10.7	0.006
Extreme (30C)		1710.1585	1779.8438	17.2	0.010
Extreme (10C)		1710.1585	1779.8438	8.6	0.005
Extreme (0C)		1710.1585	1779.8438	29.0	0.017
Extreme (-10C)		1710.1585	1779.8438	21.4	0.012
Extreme (-20C)		1710.1585	1779.8438	18.9	0.011
Extreme (-30C)		1710.1585	1779.8438	20.3	0.012
20C	15%	1710.1585	1779.8438	10.1	0.006
	-15%	1710.1585	1779.8438	6.8	0.004
	End Point	1710.1585	1779.8438	5.6	0.003

LTE Band 71 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	663.2489	697.7447		
Extreme (50C)		663.2489	697.7447	5.1	0.008
Extreme (40C)		663.2489	697.7447	7.3	0.011
Extreme (30C)		663.2489	697.7447	6.5	0.010
Extreme (10C)		663.2489	697.7447	6.9	0.010
Extreme (0C)		663.2489	697.7447	7.0	0.010
Extreme (-10C)		663.2489	697.7447	6.2	0.009
Extreme (-20C)		663.2489	697.7447	7.4	0.011
Extreme (-30C)		663.2489	697.7447	5.7	0.008
20C	15%	663.2489	697.7447	2.9	0.004
	-15%	663.2489	697.7447	3.0	0.004
	End Point	663.2489	697.7447	3.6	0.005

5G NR Band n5

Reference Frequency : n5 Low Channel 826.5 MHz / High Channel 846.5 MHz @ 20ºC

Limit: +- 2.5 ppm = Low Channel 2066.250 Hz High Channel 2116.250 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]	
3.80	50	826.50001191	0.002	846.50002238	-0.008	2.5
3.80	40	826.50001240	0.001	846.50002150	-0.007	2.5
3.80	30	826.50001682	-0.004	846.50001908	-0.005	2.5
3.80	***20***	***826.50001328***	***0.000***	***846.50001525***	***0.000***	***2.5***
3.80	10	826.50001610	-0.003	846.50001477	0.001	2.5
3.80	0	826.50001351	0.000	846.50001610	-0.001	2.5
3.80	-10	826.50001710	-0.005	846.50001721	-0.002	2.5
3.80	-20	826.50002080	-0.009	846.50001385	0.002	2.5
3.80	-30	826.50001910	-0.007	846.50001438	0.001	2.5

Reference Frequency : n5 Low Channel 826.5 MHz / High Channel 846.5 MHz @ 20ºC

Limit: +- 2.5 ppm = Low Channel 2066.250 Hz High Channel 2116.250 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]	
3.88	***20***	**826.50001328**	***0***	**846.50001525**	***0***	***2.5***
4.47	20	826.50001013	0.004	846.50000928	0.007	2.5
3.65	20	826.50000985	0.004	846.50001131	0.005	2.5

5G NR Band n25 (Lowest Frequency:16QAM / Highest Frequency: QPSK)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.2541	1914.7403		
Extreme (50C)		1850.2541	1914.7403	34.3	0.018
Extreme (40C)		1850.2541	1914.7403	33.7	0.018
Extreme (30C)		1850.2541	1914.7403	30.8	0.016
Extreme (10C)		1850.2541	1914.7403	19.1	0.010
Extreme (0C)		1850.2541	1914.7403	18.3	0.010
Extreme (-10C)		1850.2541	1914.7403	17.3	0.009
Extreme (-20C)		1850.2541	1914.7403	33.1	0.018
Extreme (-30C)		1850.2541	1914.7403	30.5	0.016
20C	15%	1850.2541	1914.7403	10.2	0.005
	-15%	1850.2541	1914.7403	11.4	0.006
	End Point	1850.2541	1914.7403	13.8	0.007

5G NR Band n30 (Lowest Frequency:16QAM / Highest Frequency: 16QAM)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.2493	2314.7395		
Extreme (50C)		2305.2493	2314.7395	20.2	0.009
Extreme (40C)		2305.2493	2314.7395	19.2	0.008
Extreme (30C)		2305.2493	2314.7395	18.4	0.008
Extreme (10C)		2305.2493	2314.7395	19.3	0.008
Extreme (0C)		2305.2493	2314.7395	21.5	0.009
Extreme (-10C)		2305.2493	2314.7395	22.1	0.010
Extreme (-20C)		2305.2493	2314.7395	20.8	0.009
Extreme (-30C)		2305.2493	2314.7395	19.7	0.009
20C	15%	2305.2493	2314.7395	11.5	0.005
	-15%	2305.2493	2314.7395	15.0	0.006
	End Point	2305.2493	2314.7395	16.4	0.007

5G NR Band n41(PC2) (Lowest Frequency: QPSK / 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	2496.8820	2689.1260		
Extreme (50C)		2496.8820	2689.1260	11.2	0.004
Extreme (40C)		2496.8820	2689.1260	12.3	0.005
Extreme (30C)		2496.8820	2689.1260	13.2	0.005
Extreme (10C)		2496.8820	2689.1260	12.1	0.005
Extreme (0C)		2496.8820	2689.1260	11.8	0.005
Extreme (-10C)		2496.8820	2689.1260	10.8	0.004
Extreme (-20C)		2496.8820	2689.1260	11.3	0.004
Extreme (-30C)		2496.8821	2689.1261	134.1	0.052
20C	15%	2496.8820	2689.1260	10.3	0.004
	-15%	2496.8820	2689.1260	9.4	0.004
	End Point	2496.8820	2689.1260	9.4	0.004

5G NR Band n66 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

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	1710.2555	1779.7400		
Extreme (50C)		1710.2555	1779.7400	7.2	0.004
Extreme (40C)		1710.2555	1779.7400	9.2	0.005
Extreme (30C)		1710.2555	1779.7400	10.6	0.006
Extreme (10C)		1710.2555	1779.7400	8.9	0.005
Extreme (0C)		1710.2555	1779.7400	11.3	0.006
Extreme (-10C)		1710.2555	1779.7400	11.8	0.007
Extreme (-20C)		1710.2555	1779.7400	14.2	0.008
Extreme (-30C)		1710.2555	1779.7400	15.1	0.009
20C	15%	1710.2555	1779.7400	7.2	0.004
	-15%	1710.2555	1779.7400	9.9	0.006
	End Point	1710.2555	1779.7400	11.0	0.006

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

5G NR Band n70 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		1695	1710	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1695.2576	1709.7442		
Extreme (50C)		1695.2576	1709.7442	9.8	0.006
Extreme (40C)		1695.2576	1709.7442	8.2	0.005
Extreme (30C)		1695.2576	1709.7442	9.5	0.006
Extreme (10C)		1695.2576	1709.7442	7.6	0.004
Extreme (0C)		1695.2576	1709.7442	8.4	0.005
Extreme (-10C)		1695.2576	1709.7442	9.9	0.006
Extreme (-20C)		1695.2576	1709.7442	9.4	0.006
Extreme (-30C)		1695.2576	1709.7442	6.8	0.004
20C	15%	1695.2576	1709.7442	5.9	0.003
	-15%	1695.2576	1709.7442	6.8	0.004
	End Point	1695.2576	1709.7442	7.2	0.004

5G NR Band n71 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	663.2627	697.7397		
Extreme (50C)		663.2627	697.7397	10.3	0.015
Extreme (40C)		663.2627	697.7397	10.9	0.016
Extreme (30C)		663.2627	697.7397	10.9	0.016
Extreme (10C)		663.2627	697.7397	10.7	0.016
Extreme (0C)		663.2627	697.7397	11.2	0.016
Extreme (-10C)		663.2627	697.7397	8.2	0.012
Extreme (-20C)		663.2627	697.7397	9.4	0.014
Extreme (-30C)		663.2627	697.7397	9.7	0.014
20C	15%	663.2627	697.7397	5.9	0.009
	-15%	663.2627	697.7397	5.8	0.009
	End Point	663.2627	697.7397	8.1	0.012

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

NR Band n77(PC2) (Lowest Frequency:16QAM / Highest Frequency: QPSK)

Limit		3450	3550	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3450.8785	3549.1085		
Extreme (50C)		3450.8785	3549.1085	13.3	0.004
Extreme (40C)		3450.8785	3549.1085	14.1	0.004
Extreme (30C)		3450.8785	3549.1085	13.5	0.004
Extreme (10C)		3450.8785	3549.1085	14.1	0.004
Extreme (0C)		3450.8785	3549.1085	10.9	0.003
Extreme (-10C)		3450.8785	3549.1085	12.0	0.003
Extreme (-20C)		3450.8785	3549.1085	12.0	0.003
Extreme (-30C)		3450.8785	3549.1085	10.3	0.003
20C	15%	3450.8785	3549.1085	8.9	0.003
	-15%	3450.8785	3549.1085	9.2	0.003
	End Point	3450.8785	3549.1085	10.1	0.003

Limit		3700	3980	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3700.8735	3979.1260		
Extreme (50C)		3700.8735	3979.1260	26.9	0.007
Extreme (40C)		3700.8735	3979.1260	24.4	0.006
Extreme (30C)		3700.8735	3979.1260	21.4	0.006
Extreme (10C)		3700.8735	3979.1260	20.9	0.005
Extreme (0C)		3700.8735	3979.1260	22.6	0.006
Extreme (-10C)		3700.8735	3979.1260	29.2	0.008
Extreme (-20C)		3700.8735	3979.1260	28.4	0.007
Extreme (-30C)		3700.8735	3979.1260	22.0	0.006
20C	15%	3700.8735	3979.1260	8.5	0.002
	-15%	3700.8735	3979.1260	4.9	0.001
	End Point	3700.8735	3979.1260	5.5	0.001

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §90.542 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:

(a)(3) Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

(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.

(j)(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(k)(3) Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

90.542(a)(7) - Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

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 or 1 second;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = max hold(GSM, WCDMA), average(LTE, 5G NR);

TEST RESULTS

See the following pages.

NOTE1

LTE Band 41(PC2) A-MPR is implemented in this EUT when operating on HPUE per the A-MPR specification in 3GPP TS 36.101 (Table 6.2.4-4a). Conducted output power verification data are shown Appendix A. Also only Emission mask test item were performd A-MPR condition (Especially low channel side).

LTE Band 41C(PC2) A-MPR is implemented in this EUT when operating on HPUE per the A-MPR specification in 3GPP TS 36.101 (Table 6.2.4A,10-1, Table 6.2.4A,10-2). Conducted output power verification data are shown Appendix A. Also only Emission mask test item were performd A-MPR condition (Especially low channel side).

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

9.5.1. ERP/EIRP Results

GSM

Band	Mode	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)
GSM 850	GPRS	824.20	23.18	V	3.11	-0.82	19.26	84.33	38.50	-19.24
		824.20	30.72	H	3.11	-0.82	26.79	477.53	38.50	-11.71
		836.60	24.52	V	3.13	-0.93	20.46	111.17	38.50	-18.04
		836.60	31.08	H	3.13	-0.93	27.02	503.50	38.50	-11.48
		848.80	23.80	V	3.15	-1.04	19.61	91.41	38.50	-18.89
		848.80	30.94	H	3.15	-1.04	26.75	473.15	38.50	-11.75
	EGPRS	824.20	20.80	V	3.11	-0.82	16.88	48.75	38.50	-21.62
		824.20	27.28	H	3.11	-0.82	23.35	216.27	38.50	-15.15
		836.60	21.41	V	3.13	-0.93	17.35	54.33	38.50	-21.15
		836.60	27.81	H	3.13	-0.93	23.75	237.14	38.50	-14.75
		848.80	21.42	V	3.15	-1.04	17.23	52.84	38.50	-21.27
		848.80	27.68	H	3.15	-1.04	23.49	223.36	38.50	-15.01

Band	Mode	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
GSM 1900	GPRS	1850.20	24.20	V	4.62	9.60	29.18	827.94	33.00	-3.82
		1850.20	17.58	H	4.62	9.60	22.56	180.30	33.00	-10.44
		1880.00	25.00	V	4.65	9.39	29.73	939.72	33.00	-3.27
		1880.00	19.23	H	4.65	9.39	23.97	249.46	33.00	-9.03
		1909.80	24.23	V	4.68	9.13	28.68	737.90	33.00	-4.32
		1909.80	21.02	H	4.68	9.13	25.46	351.56	33.00	-7.54
	EGPRS	1850.20	23.98	V	4.62	9.60	28.96	787.05	33.00	-4.04
		1850.20	17.77	H	4.62	9.60	22.75	188.36	33.00	-10.25
		1880.00	24.86	V	4.65	9.39	29.59	909.91	33.00	-3.41
		1880.00	19.47	H	4.65	9.39	24.21	263.63	33.00	-8.79
		1909.80	24.12	V	4.68	9.13	28.57	719.45	33.00	-4.43
		1909.80	20.99	H	4.68	9.13	25.43	349.14	33.00	-7.57