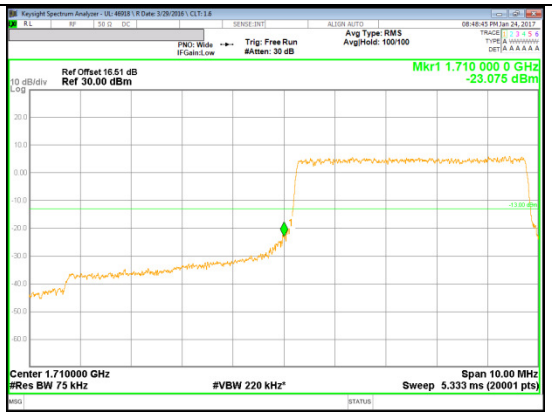
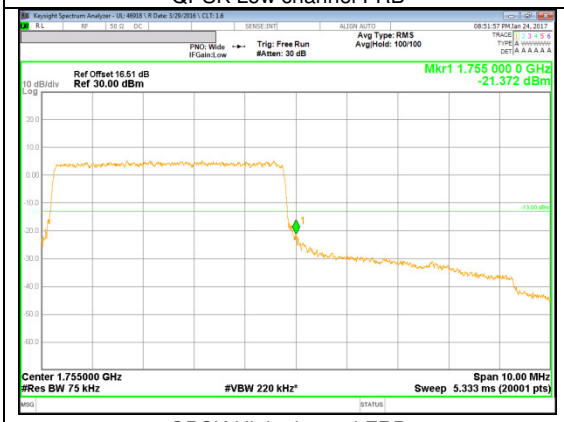
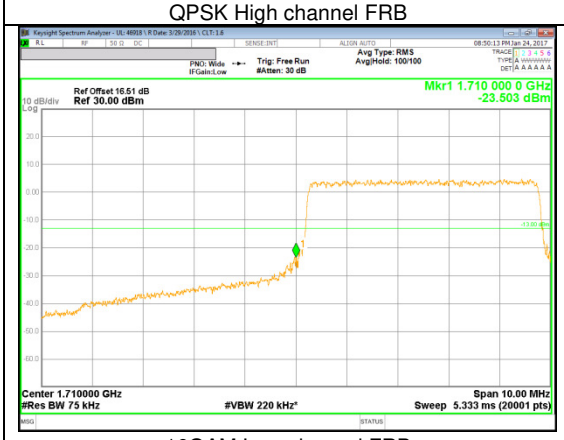
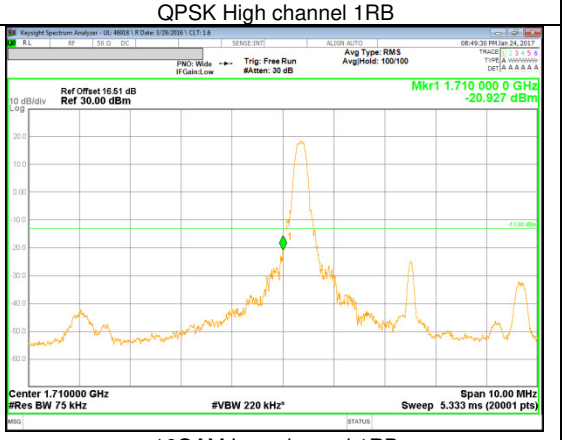
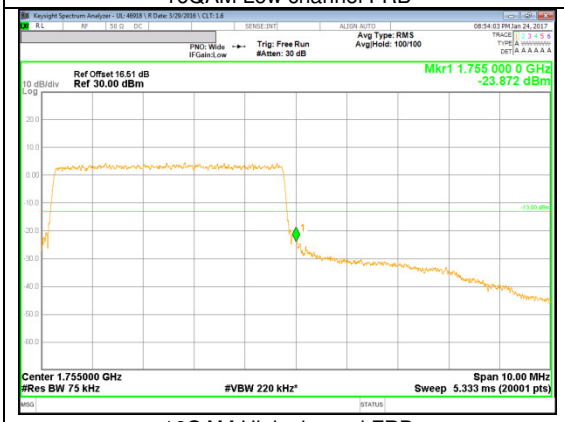
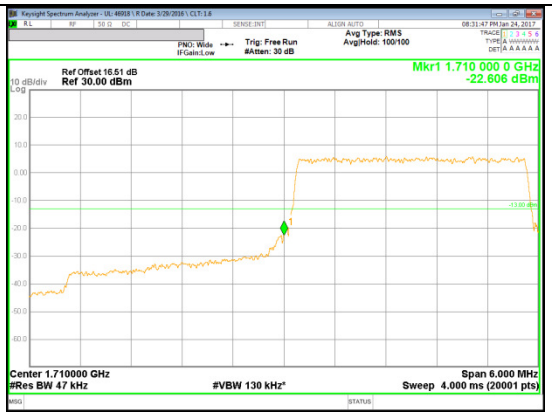
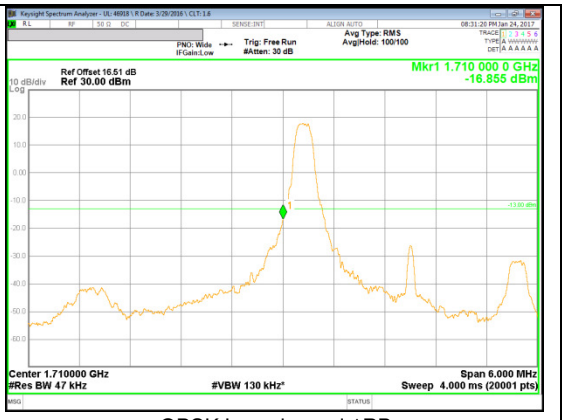
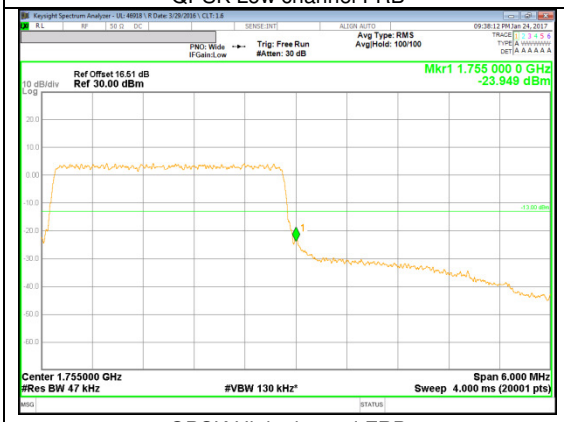
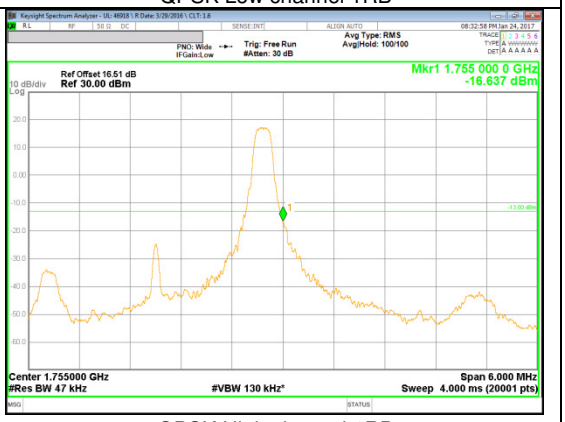
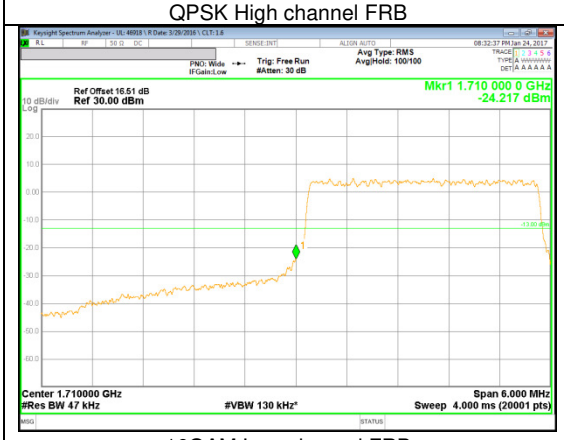
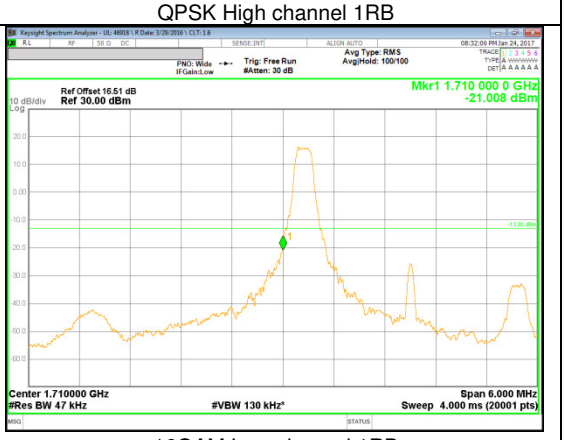
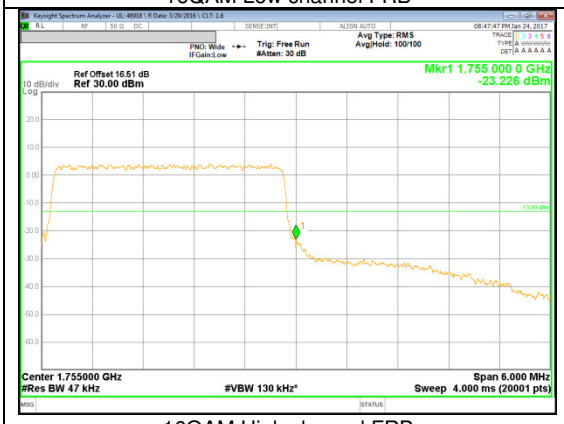
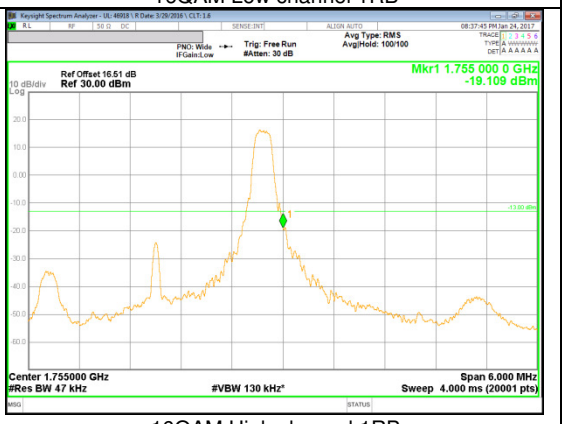
Band 4 5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

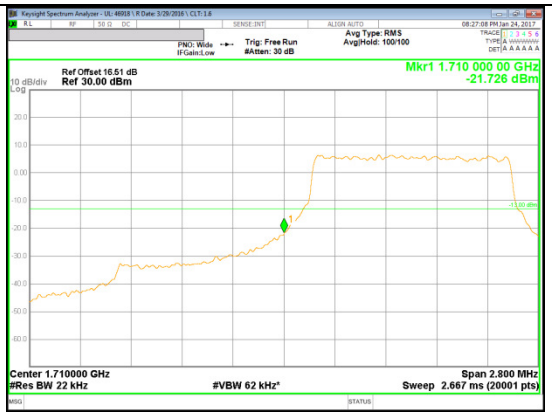
Band 4 3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

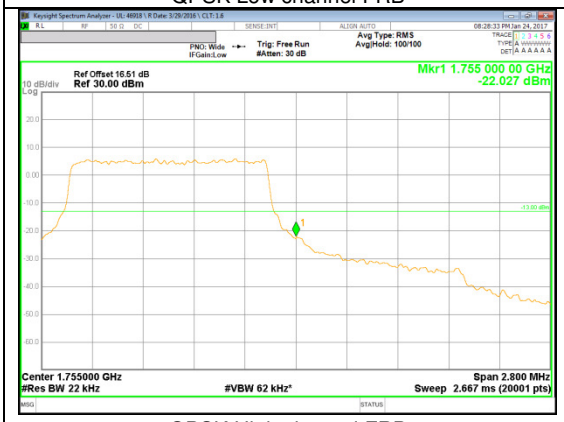
Band 4

1.4MHz



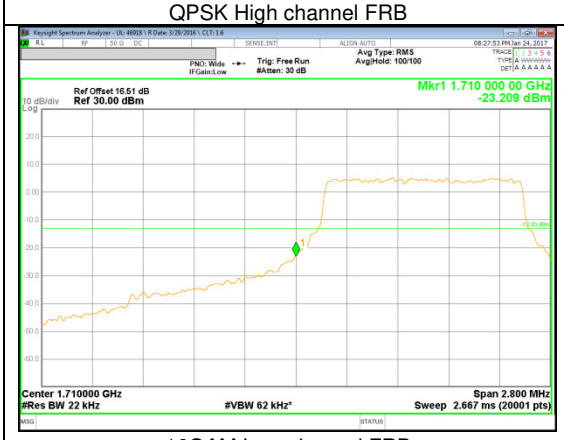
QPSK Low channel FRB

QPSK Low channel 1RB

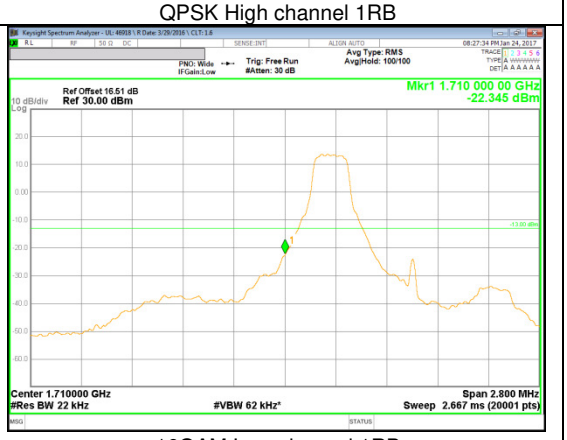


QPSK High channel FRB

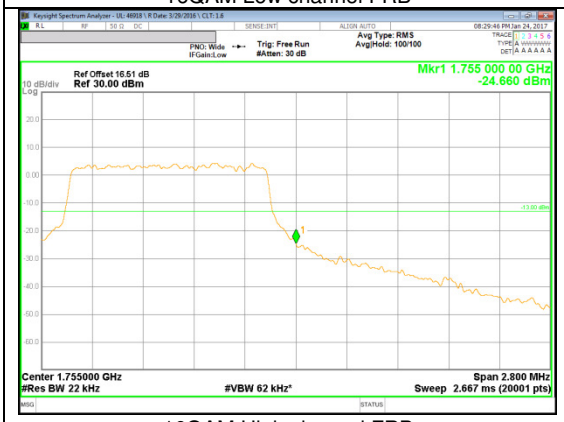
QPSK High channel 1RB



16QAM Low channel FRB



16QAM Low channel 1RB



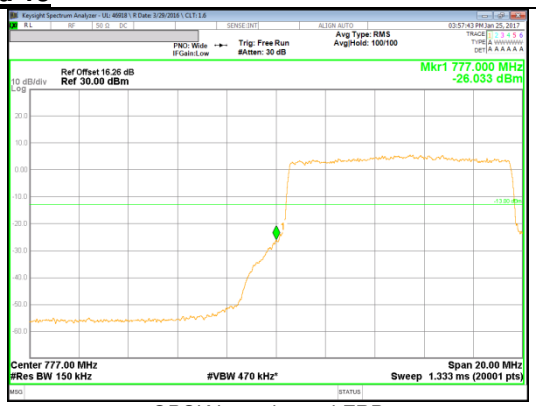
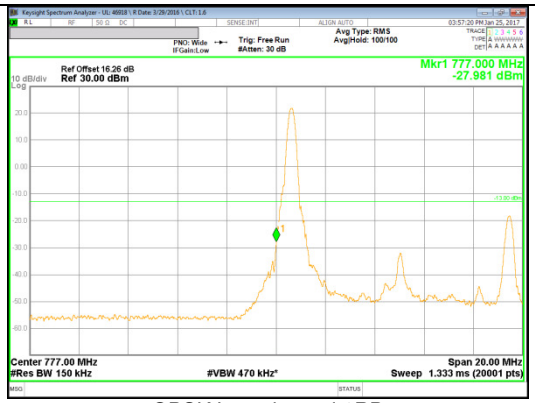
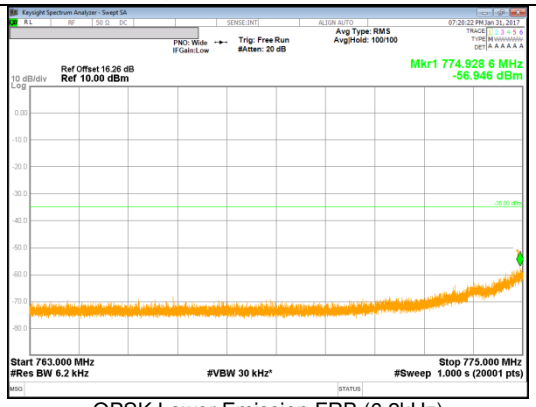
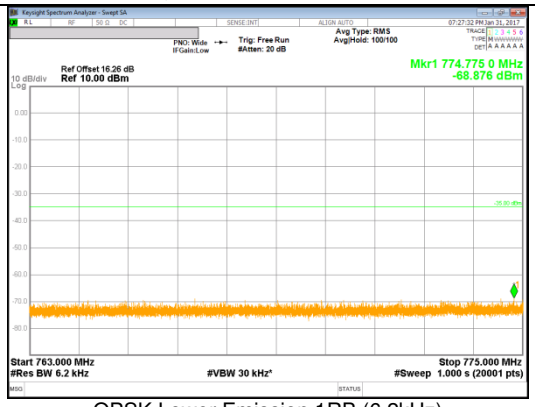
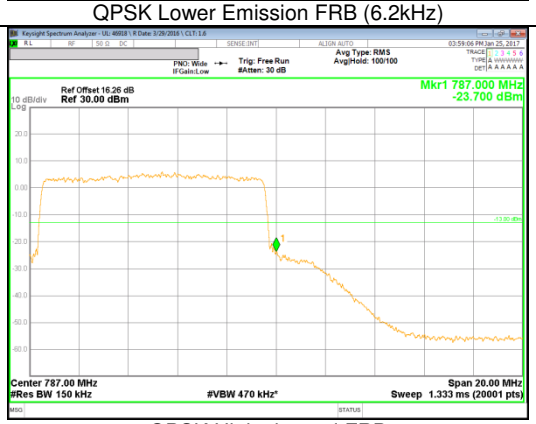
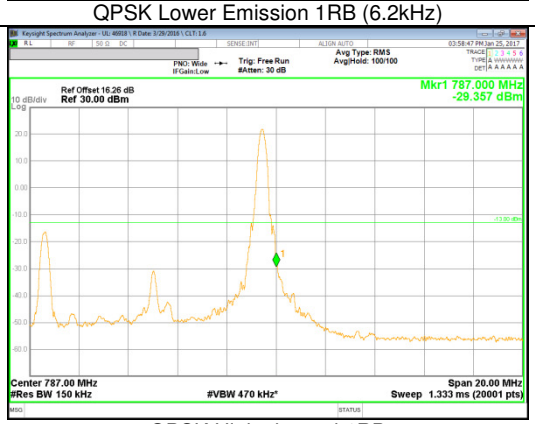
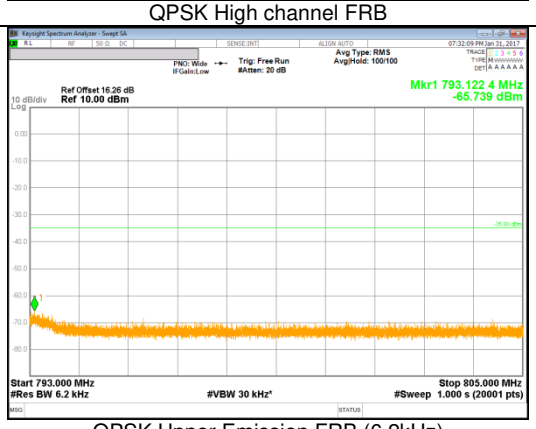
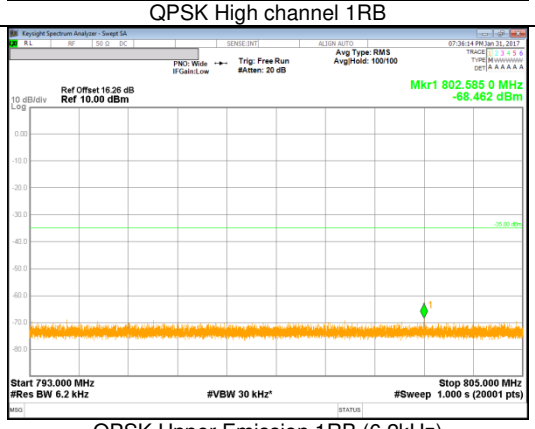
16QAM High channel FRB

16QAM High channel 1RB

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

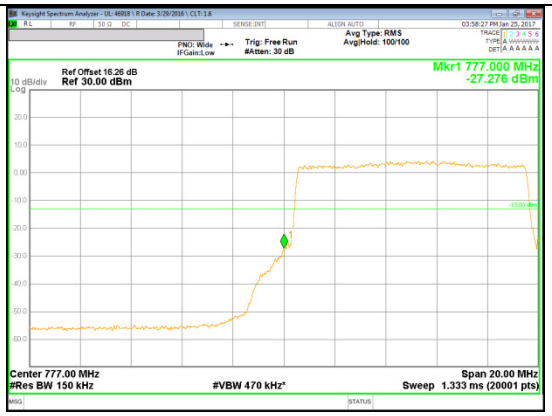
LTE Band 13

Band 13 10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK Lower Emission FRB (6.2kHz)	 QPSK Lower Emission 1RB (6.2kHz)
	 QPSK High channel FRB	 QPSK High channel 1RB
	 QPSK Upper Emission FRB (6.2kHz)	 QPSK Upper Emission 1RB (6.2kHz)

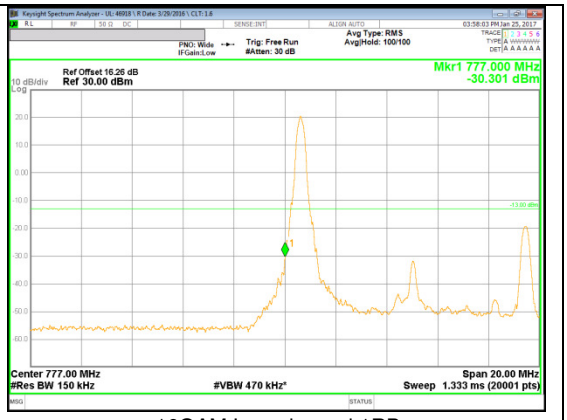
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 13

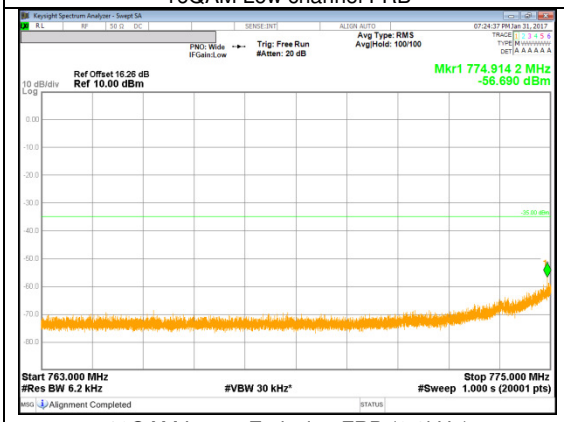
10MHz



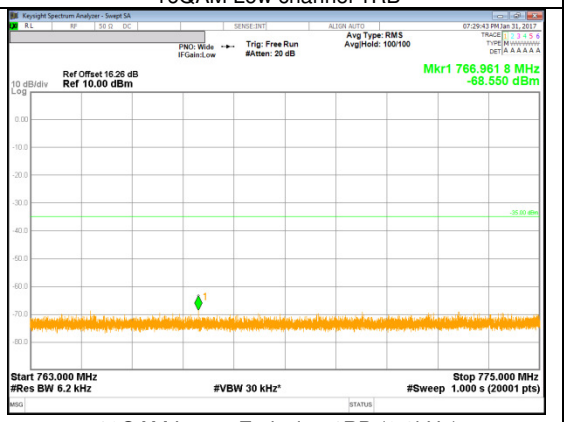
16QAM Low channel FRB



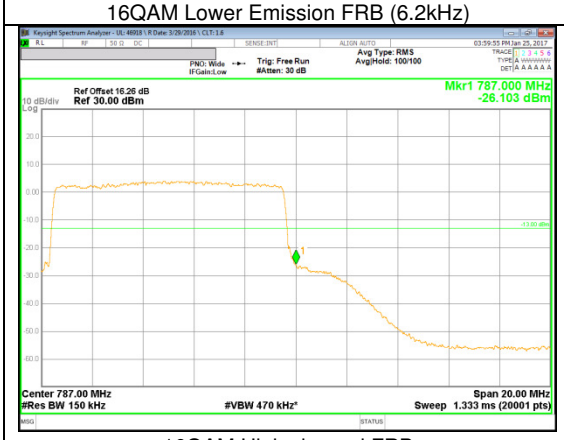
16QAM Low channel 1RB



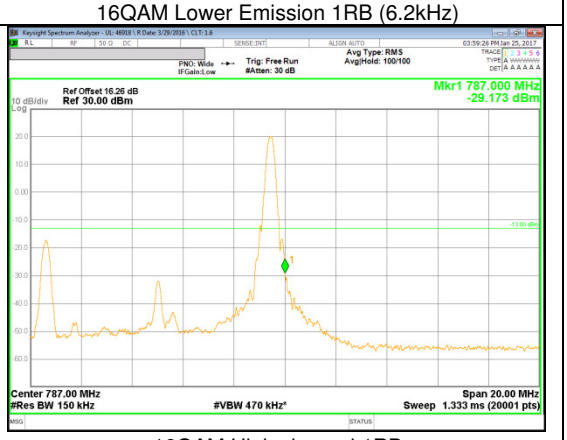
16QAM Lower Emission FRB (6.2kHz)



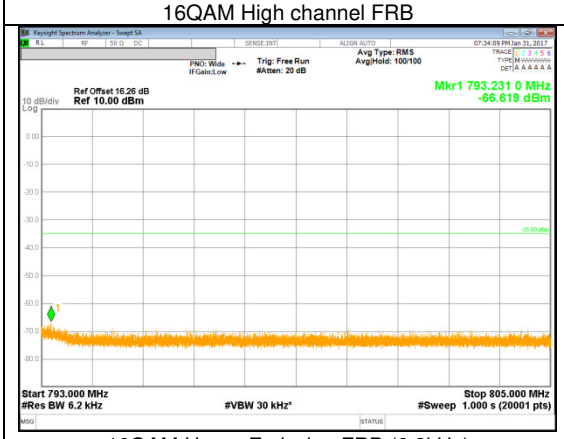
16QAM Lower Emission 1RB (6.2kHz)



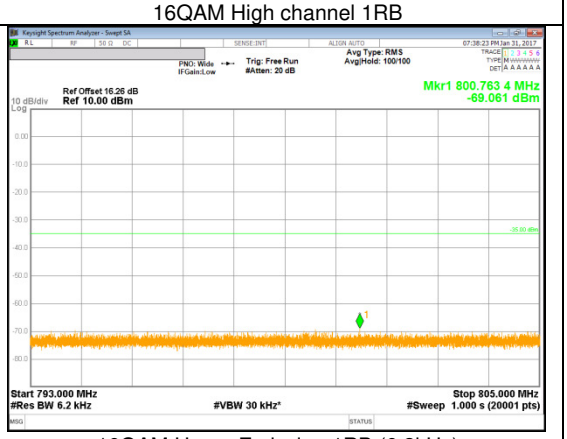
16QAM High channel FRB



16QAM High channel 1RB



16QAM Upper Emission FRB (6.2kHz)



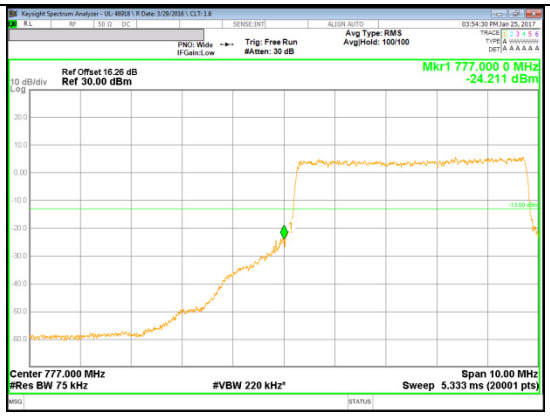
16QAM Upper Emission 1RB (6.2kHz)

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

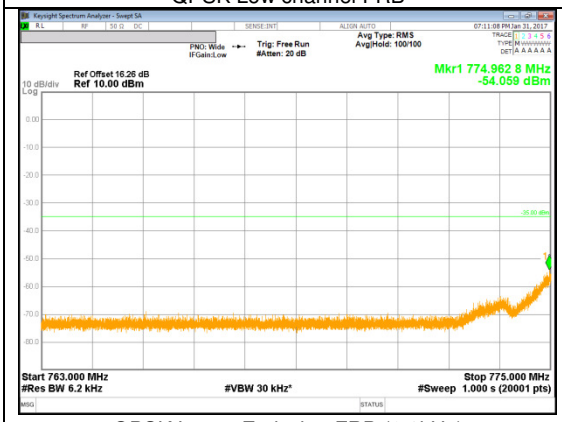
Band 13

5MHz

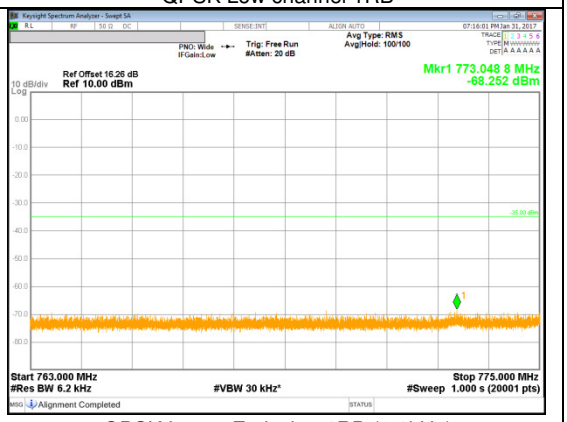


QPSK Low channel FRB

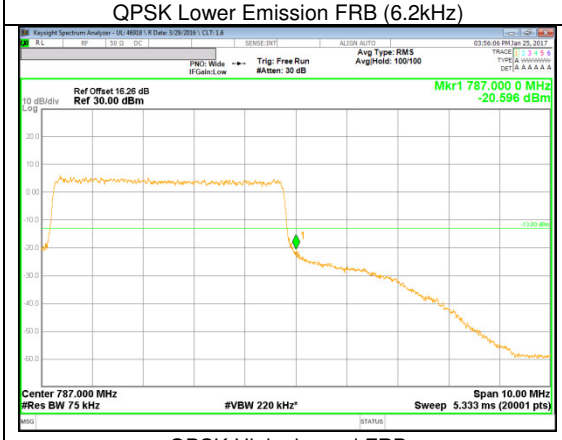
QPSK Low channel 1RB



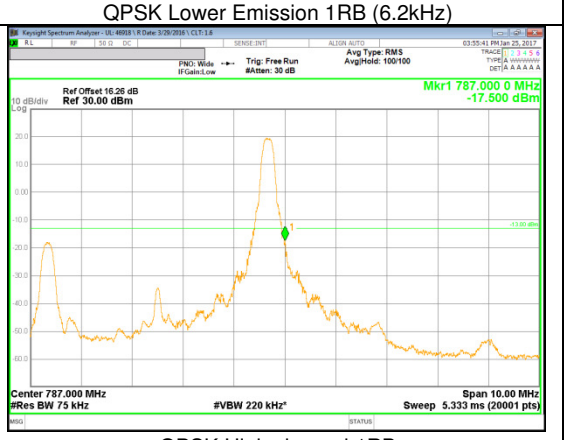
QPSK Lower Emission FRB (6.2kHz)



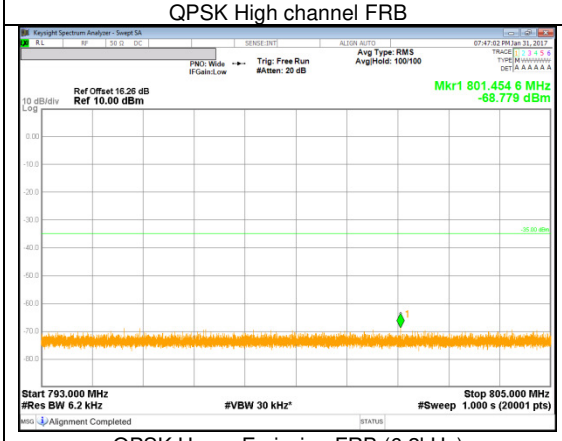
QPSK Lower Emission 1RB (6.2kHz)



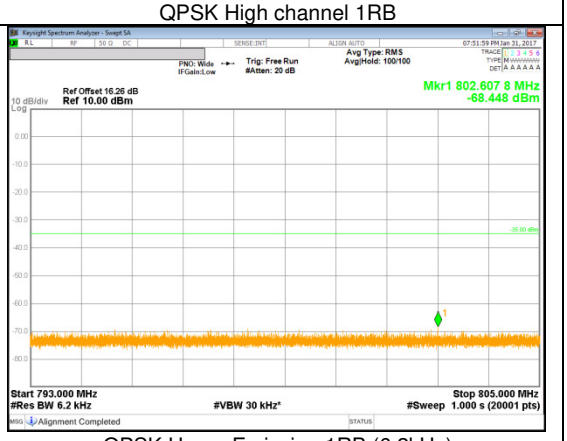
QPSK High channel FRB



QPSK High channel 1RB



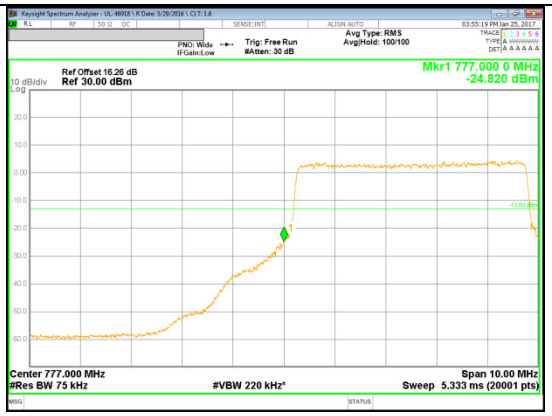
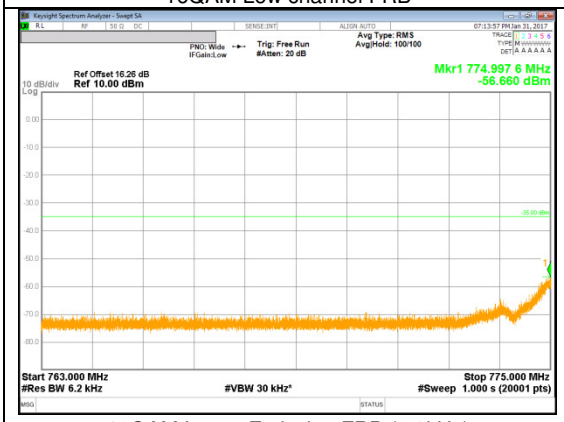
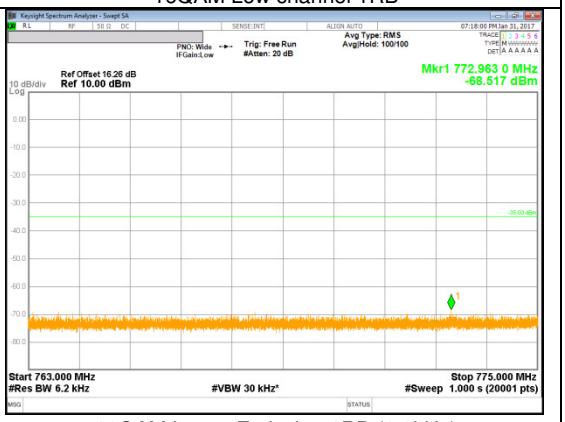
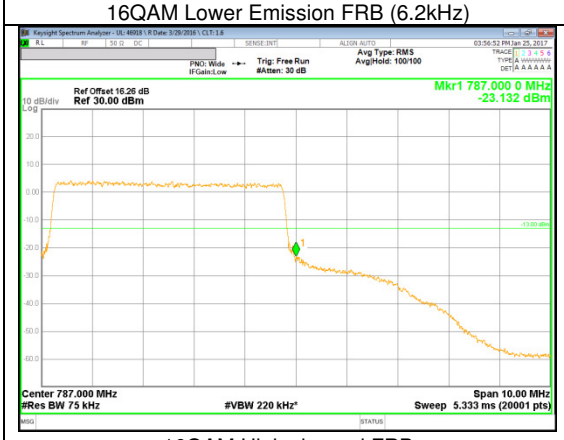
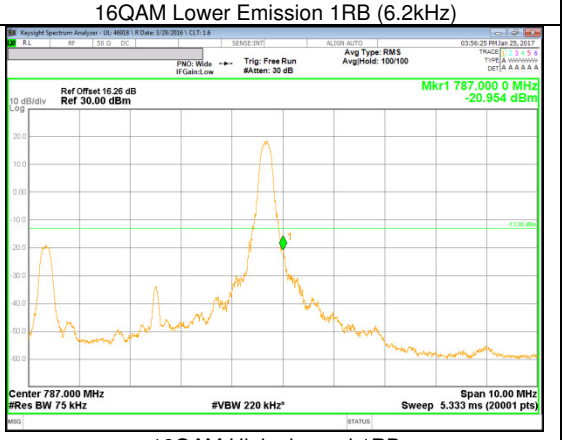
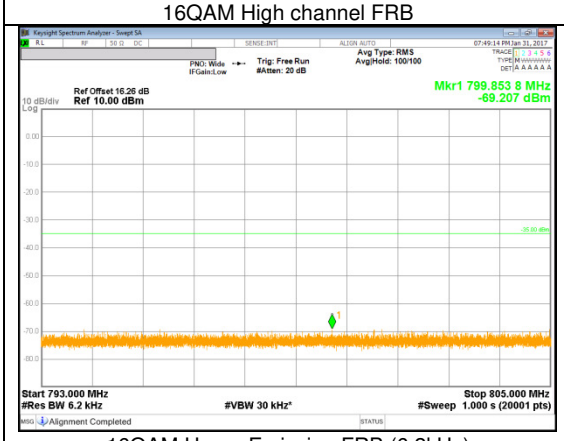
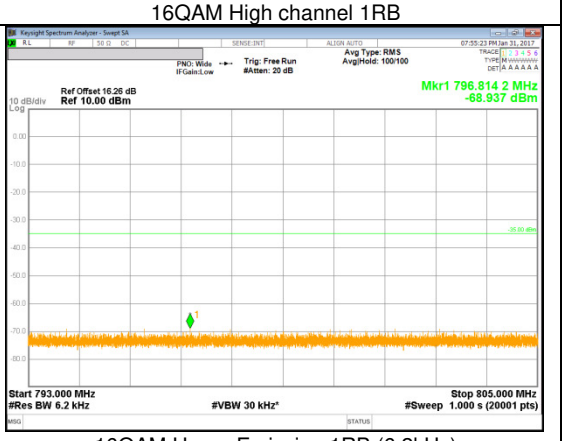
QPSK Upper Emission FRB (6.2kHz)



QPSK Upper Emission 1RB (6.2kHz)

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 13 5MHz	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM Lower Emission FRB (6.2kHz)	 16QAM Lower Emission 1RB (6.2kHz)
	 16QAM High channel FRB	 16QAM High channel 1RB
	 16QAM Upper Emission FRB (6.2kHz)	 16QAM Upper Emission 1RB (6.2kHz)

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

10.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §27.53

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.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
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 = peak;

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

g) Trace mode = max hold;

RESULTS

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

10.3.1. OUT OF BAND EMISSIONS RESULT

LTE 4

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
20 MHz	QPSK	1720.0	-26.85	-13.00
		1732.5	-26.23	
		1745.0	-26.68	
	16QAM	1720.0	-26.43	
		1732.5	-25.25	
		1745.0	-27.14	
15 MHz	QPSK	1717.5	-26.60	
		1732.5	-25.79	
		1747.5	-26.91	
	16QAM	1717.5	-26.91	
		1732.5	-26.19	
		1747.5	-26.33	
10 MHz	QPSK	1715.0	-26.61	
		1732.5	-25.99	
		1750.0	-26.29	
	16QAM	1715.0	-27.04	
		1732.5	-26.09	
		1750.0	-26.73	
5 MHz	QPSK	1712.5	-26.76	
		1732.5	-26.34	
		1752.5	-27.50	
	16QAM	1712.5	-27.28	
		1732.5	-26.95	
		1752.5	-26.51	
3 MHz	QPSK	1711.5	-26.73	
		1732.5	-27.01	
		1753.5	-27.12	
	16QAM	1711.5	-26.83	
		1732.5	-27.32	
		1753.5	-26.52	
1.4 MHz	QPSK	1710.7	-27.08	
		1732.5	-26.55	
		1754.3	-26.29	
	16QAM	1710.7	-26.98	
		1732.5	-26.50	
		1754.3	-27.55	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

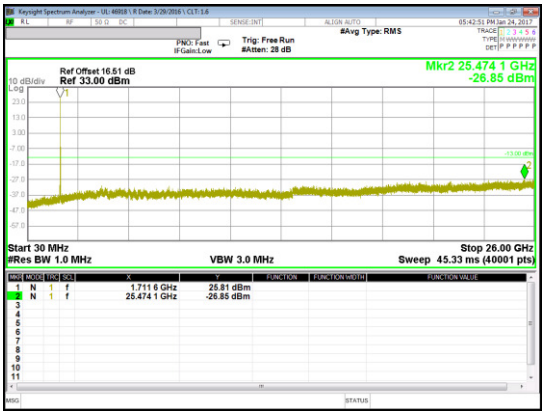
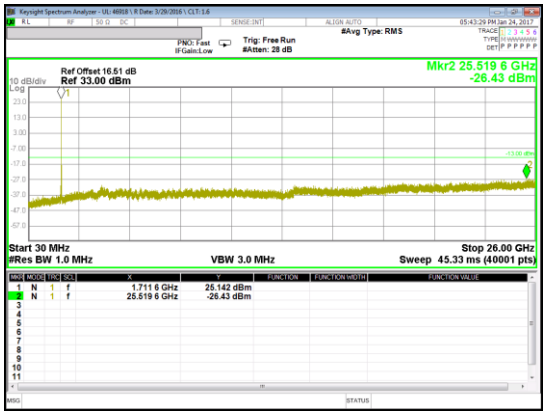
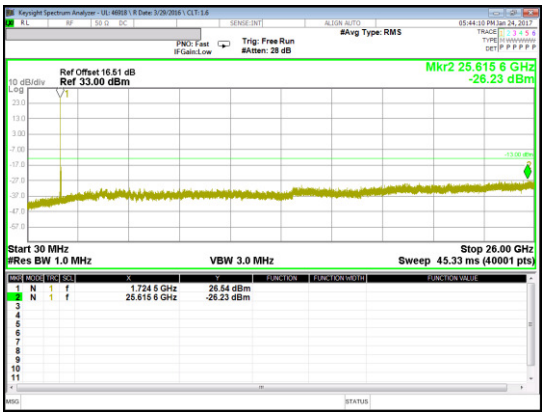
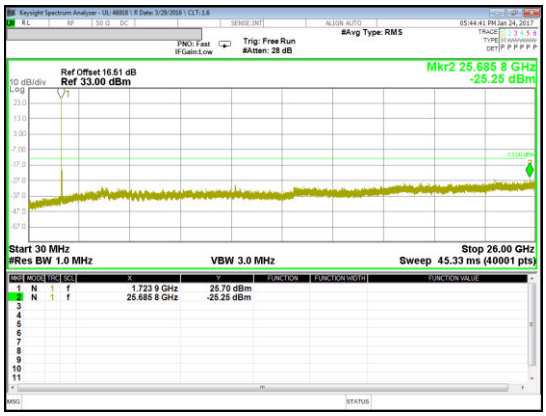
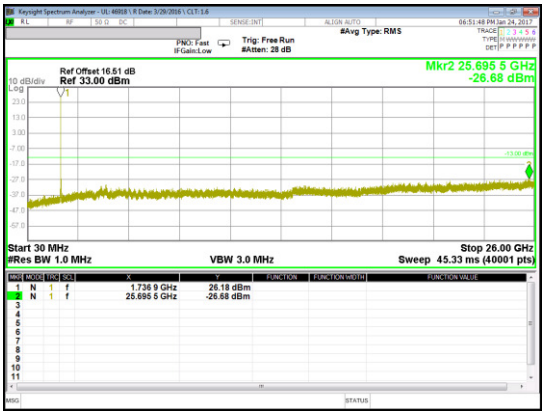
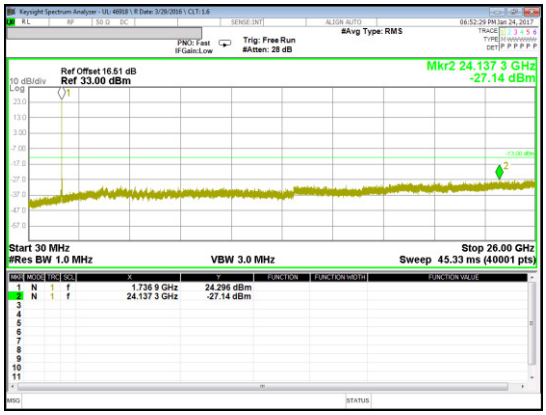
LTE 13

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	782.0	-27.42	-13.00
	16QAM	782.0	-26.80	
5 MHz	QPSK	779.5	-27.80	
		782.0	-26.69	
		784.5	-27.25	
	16QAM	779.5	-27.99	
		782.0	-27.89	
		784.5	-27.43	

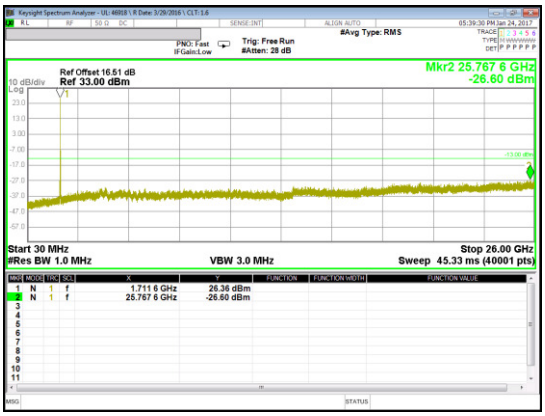
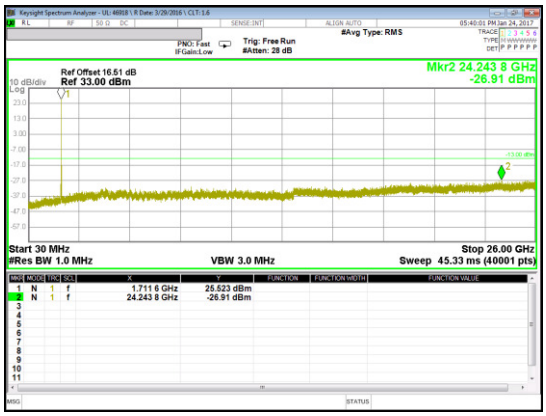
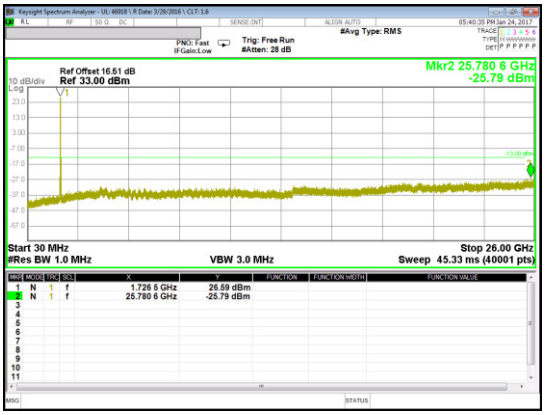
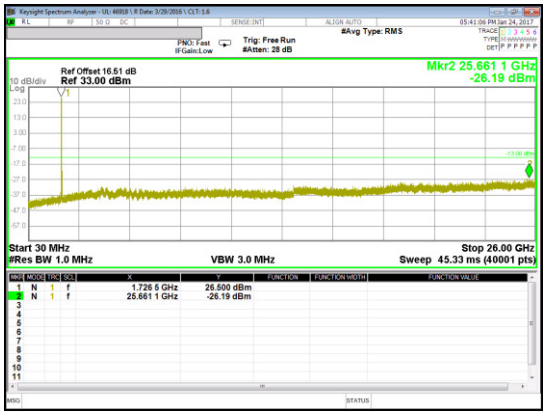
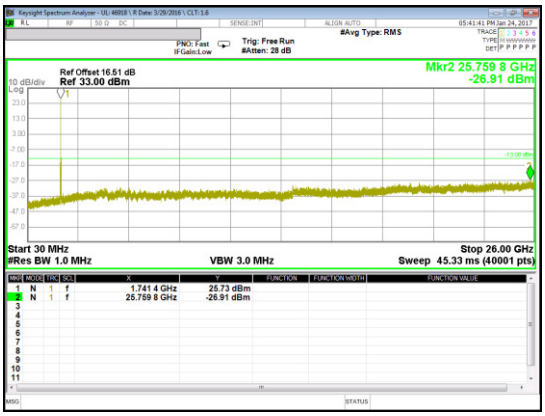
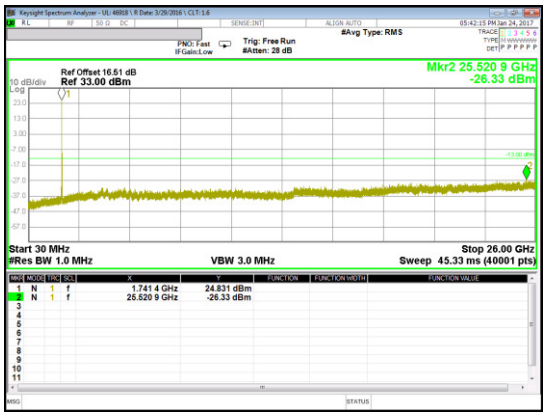
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

10.3.2. OUT OF BAND EMISSIONS PLOTS

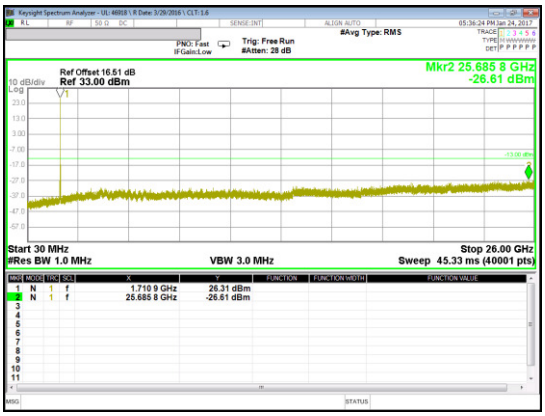
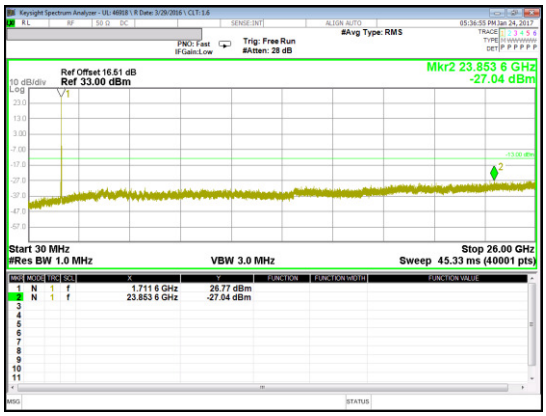
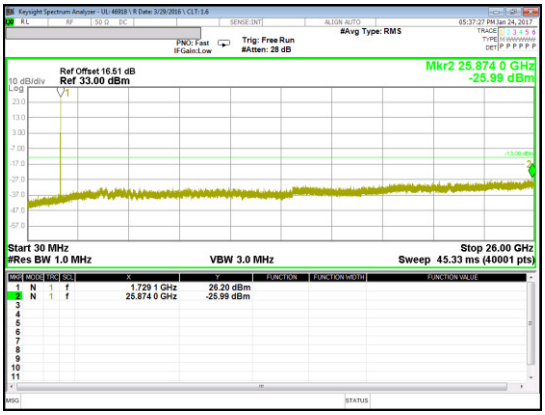
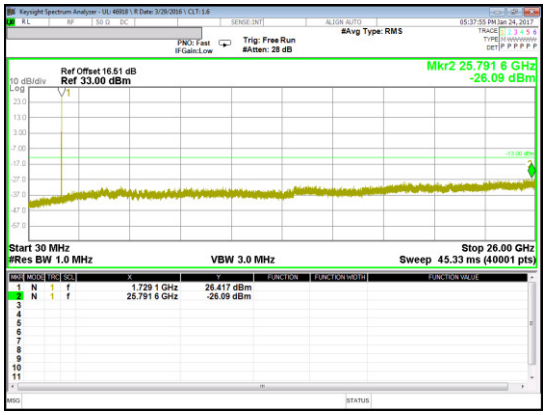
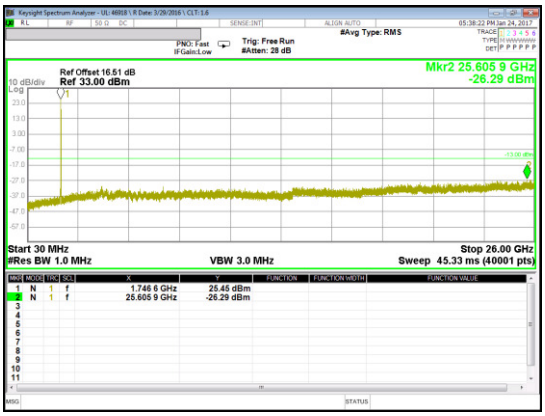
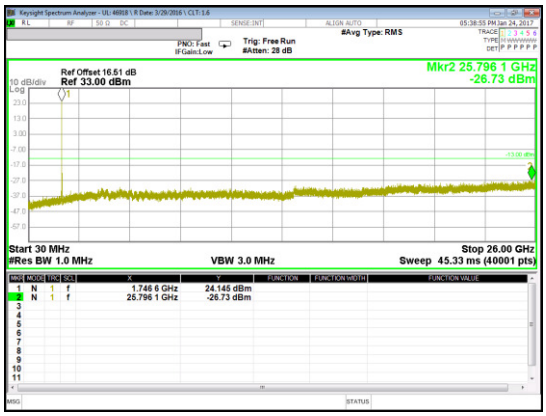
LTE Band 4

Band 4 20MHz	 20MHz QPSK Low channel	 20MHz 16QAM Low channel
	 20MHz QPSK Mid channel	 20MHz 16QAM Mid channel
	 20MHz QPSK High channel	 20MHz 16QAM High channel

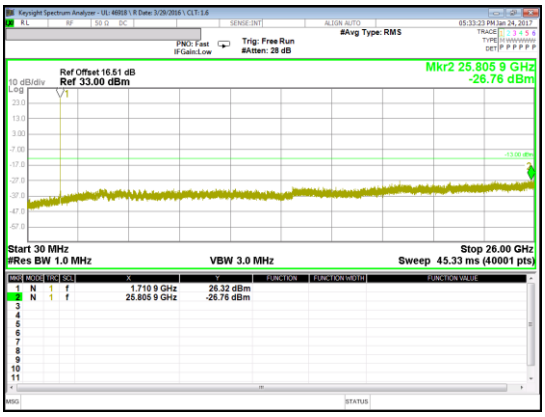
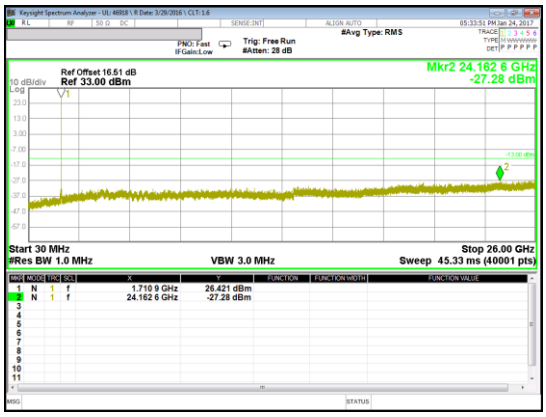
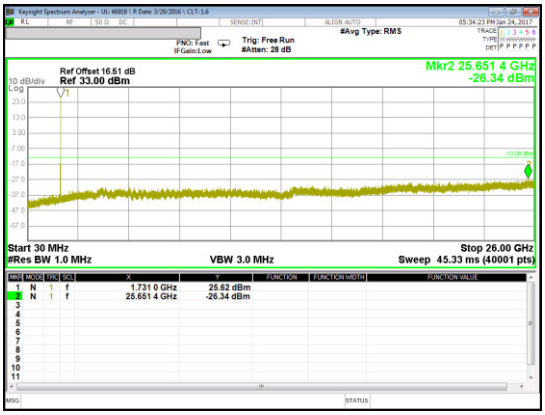
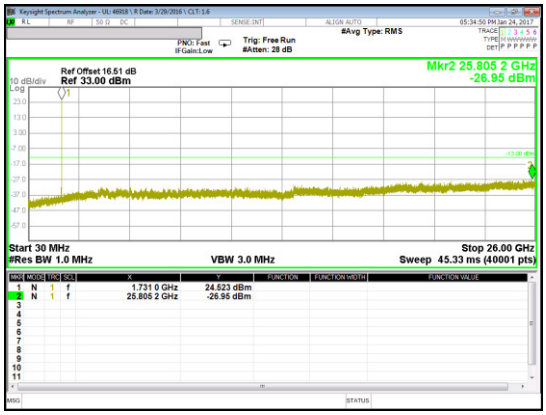
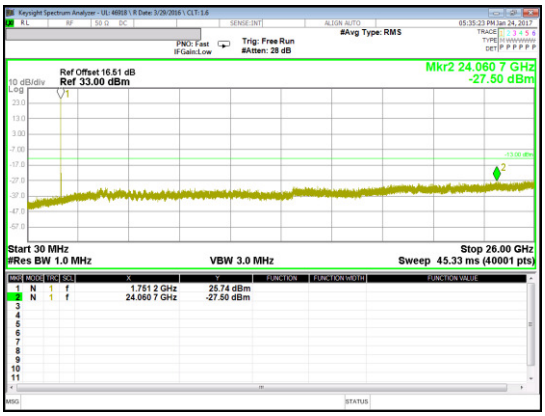
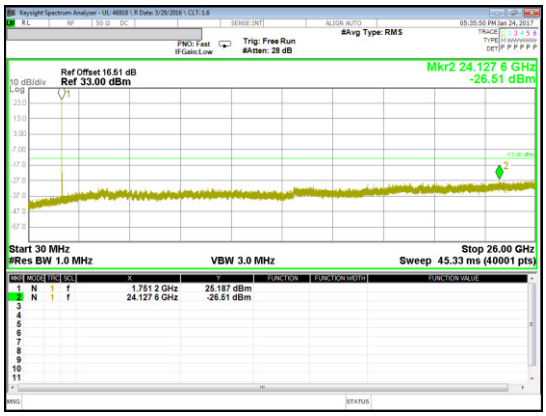
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 4 15MHz	 15MHz QPSK Low channel	 15MHz 16QAM Low channel
	 15MHz QPSK Mid channel	 15MHz 16QAM Mid channel
	 15MHz QPSK High channel	 15MHz 16QAM High channel

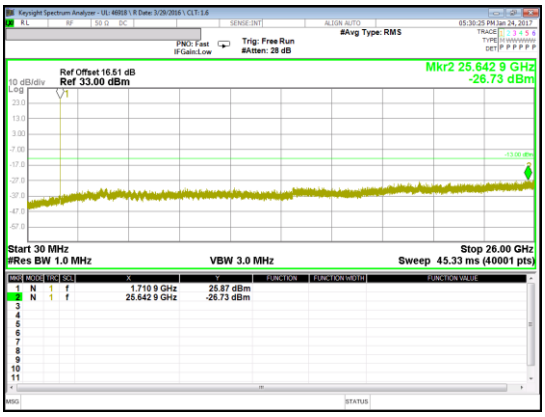
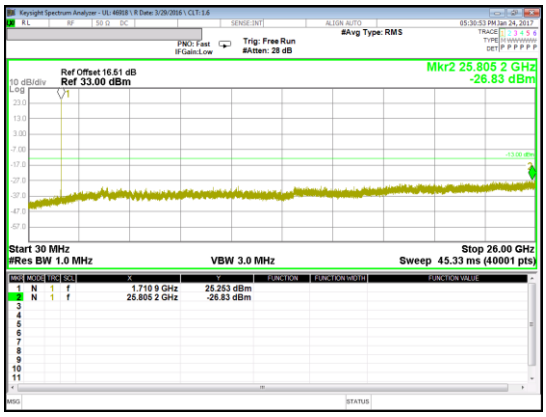
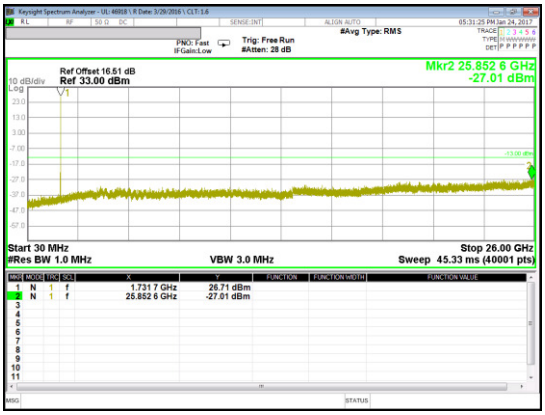
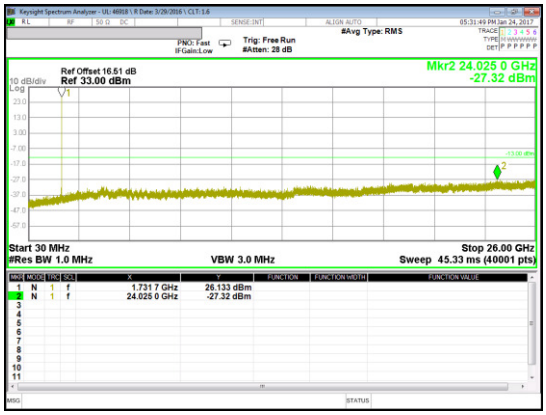
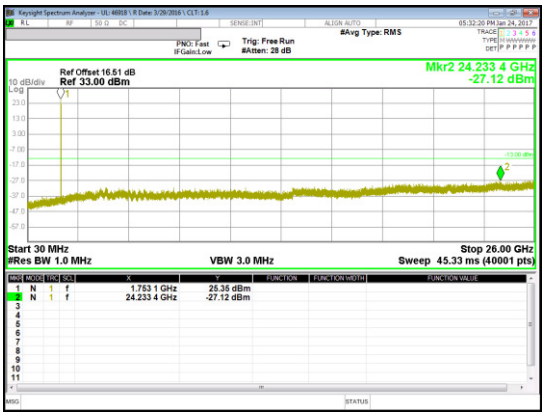
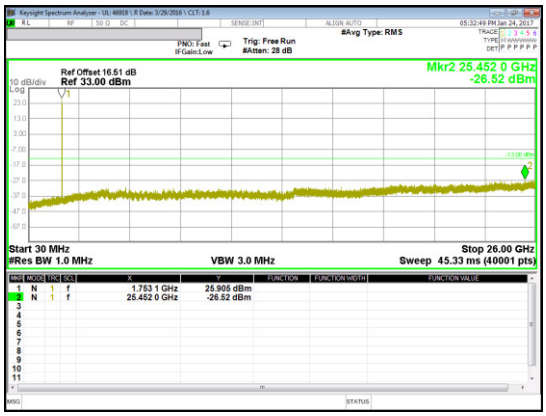
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 4 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel
	 10MHz QPSK Mid channel	 10MHz 16QAM Mid channel
	 10MHz QPSK High channel	 10MHz 16QAM High channel

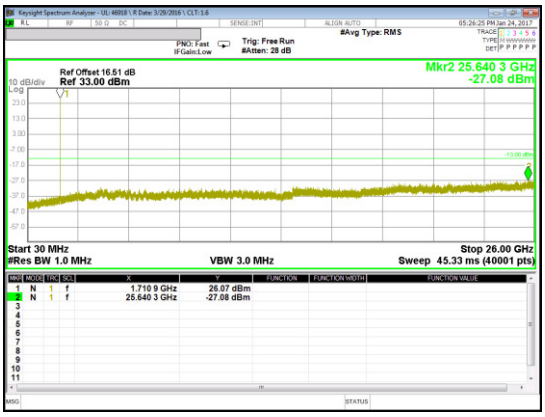
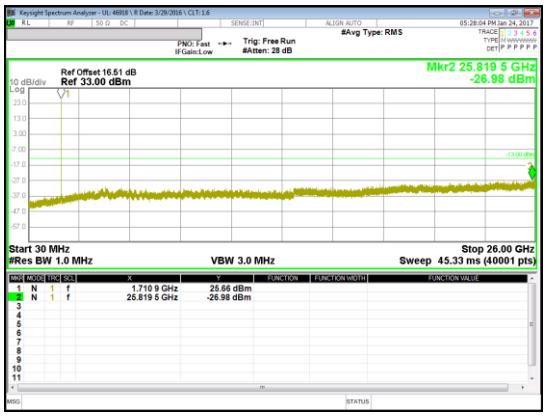
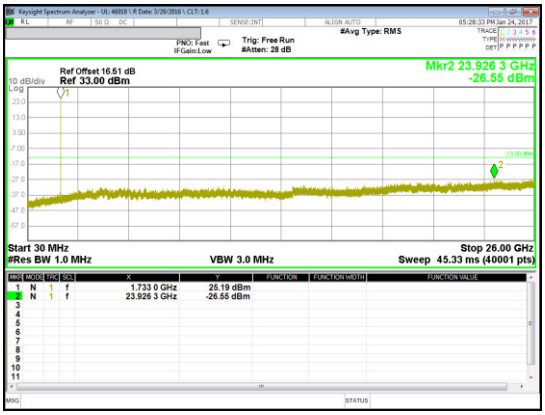
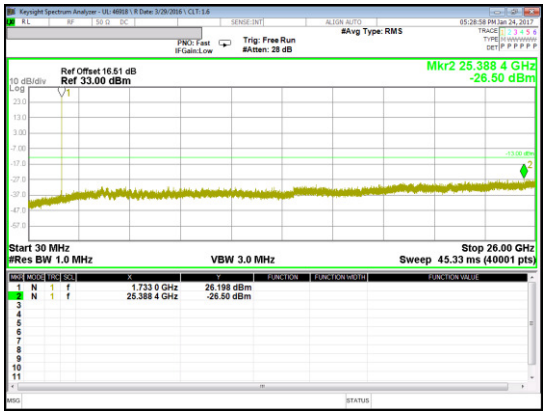
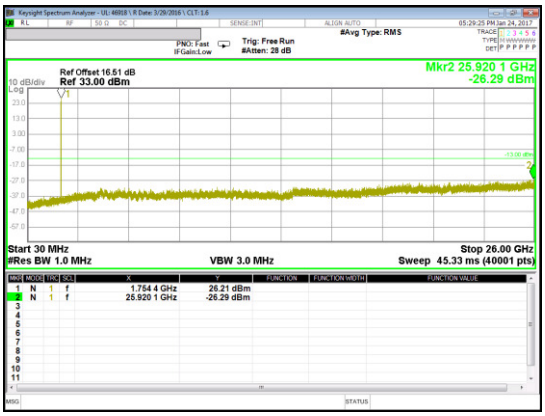
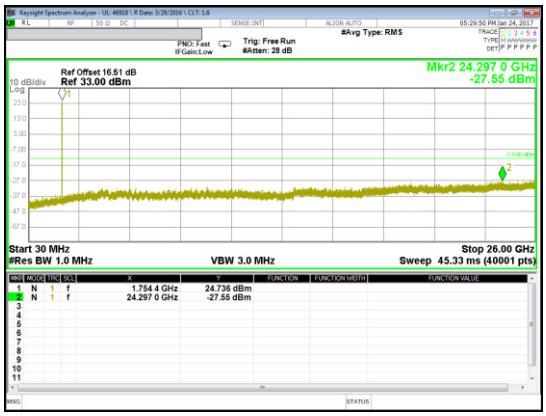
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 4 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

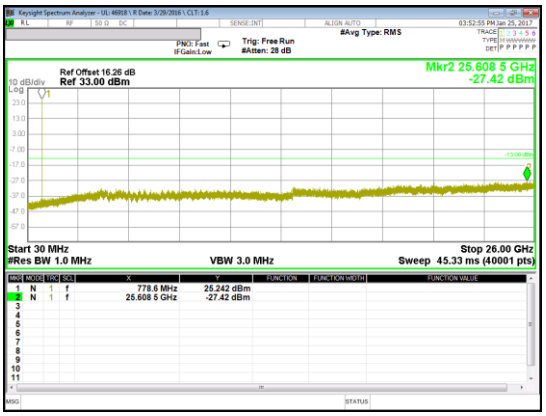
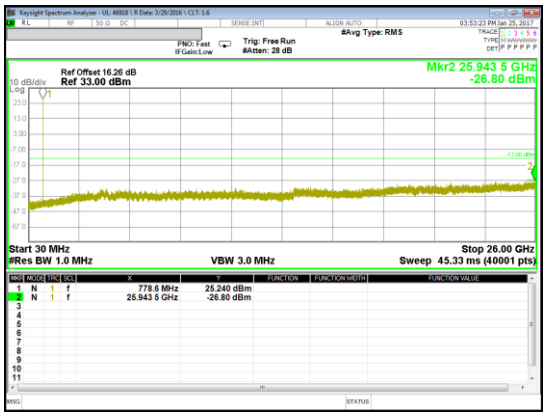
Band 4 3MHz	 3MHz QPSK Low channel	 3MHz 16QAM Low channel
	 3MHz QPSK Mid channel	 3MHz 16QAM Mid channel
	 3MHz QPSK High channel	 3MHz 16QAM High channel

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 4 1.4MHz	 1.4MHz QPSK Low channel	 1.4MHz 16QAM Low channel
	 1.4MHz QPSK Mid channel	 1.4MHz 16QAM Mid channel
	 1.4MHz QPSK High channel	 1.4MHz 16QAM High channel

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 13

Band 13 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675 , Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.