

8.4. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §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 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.

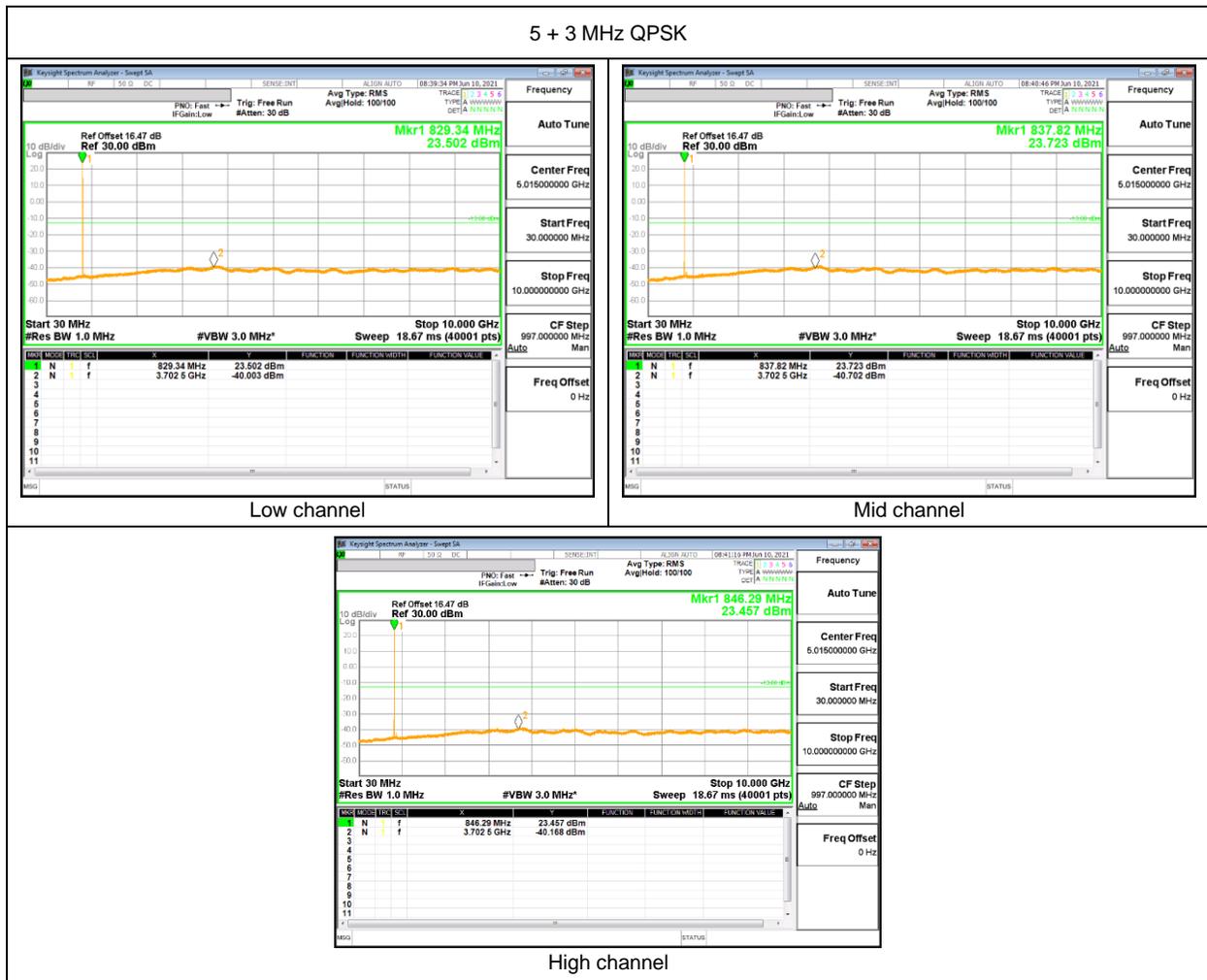
- a) Set the RBW = 100kHz for emission below 1GHz and 1MHz for emissions above 1GHz
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW
- c) Sweep time = auto couple;
- d) Detector = RMS;
- e) Ensure that the number of measurement points = Max (40001);
- f) Trace mode = Average(FDD), Max hold(TDD);

RESULTS

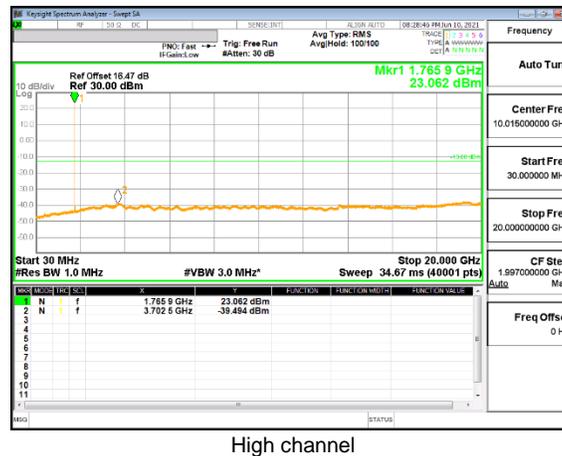
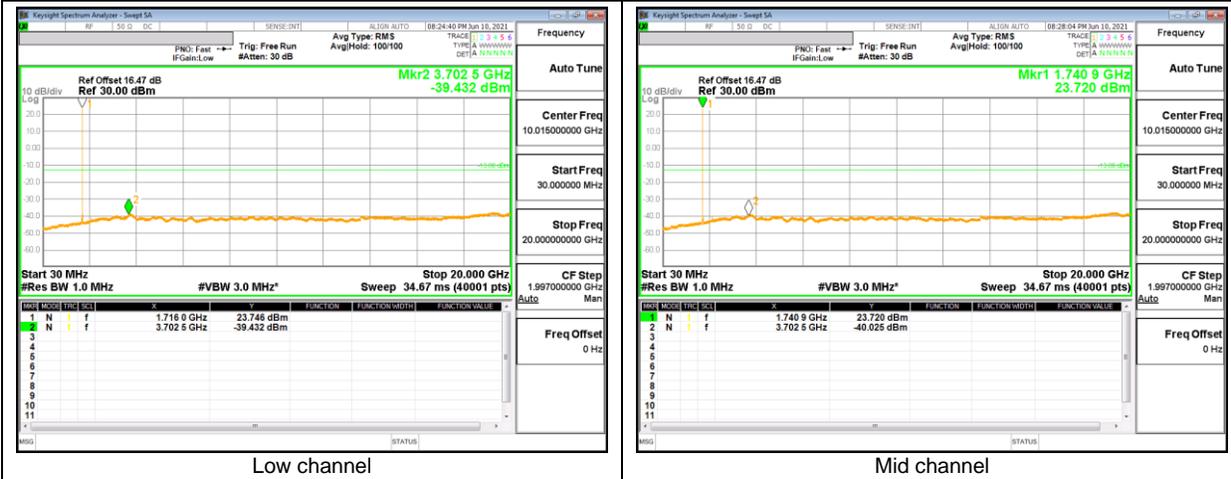
See the following pages.

8.4.1. OUT OF BAND EMISSIONS RESULT

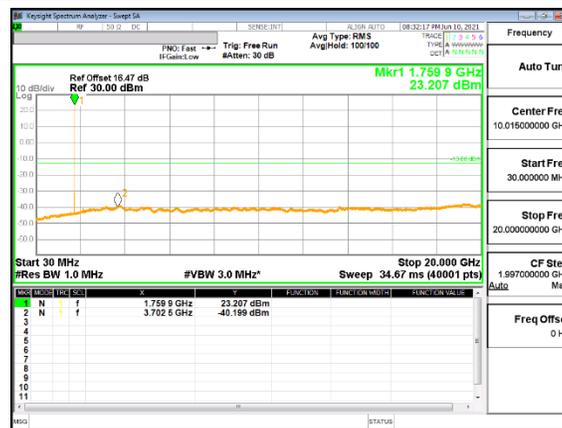
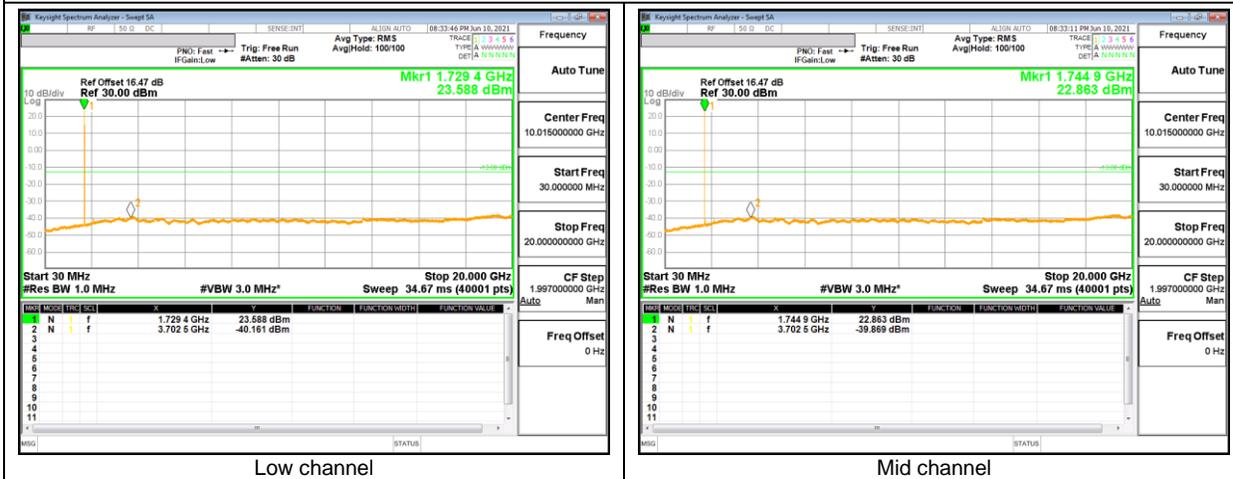
LTE Band 5B (UL CA)



5 + 15 MHz QPSK



20 + 20 MHz QPSK



High channel

9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917 and §27.53

LIMITS

Part 22.917(a) & Part 27.53(h) 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 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 $\geq 3 \times$ RBW
- c) Sweep time = auto couple;
- d) Detector = RMS;
- e) Ensure that the number of measurement points = Max (40001);
- f) Trace mode = Average(FDD), Max hold(TDD);

9.1.1. SPURIOUS RADIATION

LTE Band 5B (UL CA)

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
5MHz + 3MHz QPSK	Company: Samsung										
	Project #: 4789893923										
	Date: 2021-06-11										
	Test Engineer: 20882										
	Configuration: EUT / AC Adapter, X-Position										
	Location: Chamber 1										
	Mode: LTE_QPSK Band 5 Uplink CA Harmonics, 5MHz_3MHz Bandwidth										
	Test Voltage: AC 120 V, 60 Hz										
	Low Ch, PCC : 826.5MHz SCC : 830.4MHz										
		1657.90	-15.4	V	3.0	45.3	1.0	-59.7	-13.0	-46.7	
		2486.85	-23.0	V	3.0	45.1	1.0	-67.1	-13.0	-54.1	
		3315.80	-22.6	V	3.0	45.3	1.0	-66.9	-13.0	-53.9	
		1657.90	-22.6	H	3.0	45.3	1.0	-66.9	-13.0	-53.9	
		2486.85	-23.8	H	3.0	45.1	1.0	-67.9	-13.0	-54.9	
		3315.80	-22.2	H	3.0	45.3	1.0	-66.6	-13.0	-53.6	
	High Ch, PCC : 835.0MHz SCC : 838.9MHz										
		1674.90	-16.9	V	3.0	45.3	1.0	-61.2	-13.0	-48.2	
		2512.35	-22.9	V	3.0	45.1	1.0	-67.0	-13.0	-54.0	
		3349.80	-23.0	V	3.0	45.3	1.0	-67.3	-13.0	-54.3	
		1674.90	-22.0	H	3.0	45.3	1.0	-66.3	-13.0	-53.3	
		2512.35	-23.6	H	3.0	45.1	1.0	-67.7	-13.0	-54.7	
		3349.80	-22.9	H	3.0	45.3	1.0	-67.2	-13.0	-54.2	
	High Ch, PCC : 843.5MHz SCC : 847.4MHz										
		1690.10	-17.6	V	3.0	45.2	1.0	-61.8	-13.0	-48.8	
	2535.15	-22.8	V	3.0	45.1	1.0	-66.9	-13.0	-53.9		
	3380.20	-23.5	V	3.0	45.3	1.0	-67.9	-13.0	-54.9		
	1690.10	-22.7	H	3.0	45.2	1.0	-66.9	-13.0	-53.9		
	2535.15	-23.7	H	3.0	45.1	1.0	-67.8	-13.0	-54.8		
	3380.20	-23.3	H	3.0	45.3	1.0	-67.6	-13.0	-54.6		

LTE Band 66B (UL CA)

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
5MHz + 15MHz QPSK	Company: Samsung										
	Project #: 4789893923										
	Date: 2021-06-10										
	Test Engineer: 19568										
	Configuration: EUT / AC Adapter, Y-Position										
	Location: Chamber 1										
	Mode: LTE_QPSK Band 66 Uplink CA Harmonics, 5MHz_15MHz Bandwidth										
	Test Voltage: AC 120 V, 60 Hz										
	Low Ch, PCC : 1713.0MHz SCC : 1722.3MHz										
		3430.30	-8.8	V	3.0	45.4	1.0	-53.1	-13.0	-40.1	
		5145.45	-9.5	V	3.0	45.5	1.0	-54.0	-13.0	-41.0	
		6860.60	-6.6	V	3.0	44.5	1.0	-50.2	-13.0	-37.2	
		3430.30	-8.6	H	3.0	45.4	1.0	-53.0	-13.0	-40.0	
		5145.45	-9.1	H	3.0	45.5	1.0	-53.6	-13.0	-40.6	
		6860.60	-6.4	H	3.0	44.5	1.0	-49.9	-13.0	-36.9	
	Mid Ch, PCC : 1738.1MHz SCC : 1747.4MHz										
		3480.50	-8.8	V	3.0	45.4	1.0	-53.1	-13.0	-40.1	
		5220.75	-6.3	V	3.0	45.4	1.0	-50.7	-13.0	-37.7	
		6961.00	-6.6	V	3.0	44.4	1.0	-50.0	-13.0	-37.0	
		3480.50	-8.5	H	3.0	45.4	1.0	-52.9	-13.0	-39.9	
		5220.75	1.8	H	3.0	45.4	1.0	-42.6	-13.0	-29.6	
		6961.00	-6.3	H	3.0	44.4	1.0	-49.7	-13.0	-36.7	
	High Ch, PCC : 1763.2MHz SCC : 1772.5MHz										
		3530.70	-8.5	V	3.0	45.4	1.0	-52.9	-13.0	-39.9	
	5296.05	-9.1	V	3.0	45.4	1.0	-53.5	-13.0	-40.5		
	7061.40	-6.3	V	3.0	44.4	1.0	-49.7	-13.0	-36.7		
	3530.70	-8.2	H	3.0	45.4	1.0	-52.6	-13.0	-39.6		
	5296.05	-8.9	H	3.0	45.4	1.0	-53.4	-13.0	-40.4		
	7061.40	-6.1	H	3.0	44.4	1.0	-49.4	-13.0	-36.4		

LTE Band 66C (UL CA)

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
20MHz + 20MHz QPSK	Company: Samsung										
	Project #: 4789893923										
	Date: 2021-06-11										
	Test Engineer: 19568										
	Configuration: EUT / AC Adapter, X-Position										
	Location: Chamber 1										
	Mode: LTE_QPSK Band 66 Uplink CA Harmonics, 20MHz_20MHz Bandwidth										
	Test Voltage: AC 120 V, 60 Hz										
	Low Ch, PCC : 1720.0MHz SCC : 1739.8MHz										
		3459.80	-8.9	V	3.0	45.4	1.0	-53.2	-13.0	-40.2	
		5189.70	-7.1	V	3.0	45.4	1.0	-51.5	-13.0	-38.5	
		6919.60	-6.5	V	3.0	44.5	1.0	-50.0	-13.0	-37.0	
		3459.80	-8.6	H	3.0	45.4	1.0	-52.9	-13.0	-39.9	
		5189.70	-9.0	H	3.0	45.4	1.0	-53.4	-13.0	-40.4	
		6919.60	-6.3	H	3.0	44.5	1.0	-49.8	-13.0	-36.8	
	Mid Ch, PCC : 1735.1MHz SCC : 1754.9MHz										
		3490.00	-8.8	V	3.0	45.4	1.0	-53.2	-13.0	-40.2	
		5235.00	-9.3	V	3.0	45.4	1.0	-53.8	-13.0	-40.8	
		6980.00	-6.6	V	3.0	44.4	1.0	-50.0	-13.0	-37.0	
		3490.00	-8.5	H	3.0	45.4	1.0	-52.9	-13.0	-39.9	
		5235.00	-9.0	H	3.0	45.4	1.0	-53.5	-13.0	-40.5	
		6980.00	-6.3	H	3.0	44.4	1.0	-49.7	-13.0	-36.7	
	High Ch, PCC : 1750.2MHz SCC : 1770.0MHz										
		3520.20	-8.6	V	3.0	45.4	1.0	-53.0	-13.0	-40.0	
	5280.30	-8.3	V	3.0	45.4	1.0	-52.8	-13.0	-39.8		
	7040.40	-6.2	V	3.0	44.4	1.0	-49.6	-13.0	-36.6		
	3520.20	-8.4	H	3.0	45.4	1.0	-52.7	-13.0	-39.7		
	5280.30	-9.1	H	3.0	45.4	1.0	-53.5	-13.0	-40.5		
	7040.40	-6.0	H	3.0	44.4	1.0	-49.4	-13.0	-36.4		

END OF TEST REPORT