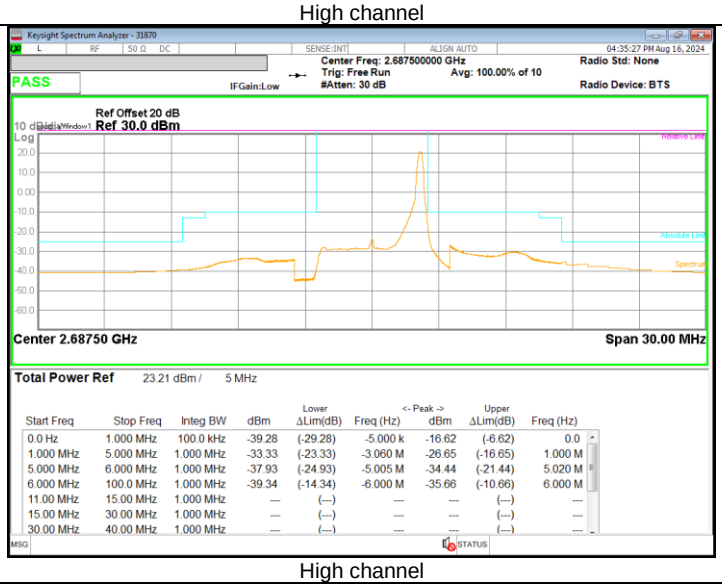
5 MHz QPSK 1RB Offset 0	 High channel
5 MHz QPSK 1RB Offset 24	 High channel

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8.5. CONDUCTED SPURIOUS EMISSIONS

RULE PART(S)

FCC: §27.53

LIMITS

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.

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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 = 100 kHz for emission below 1 GHz and 1 MHz for emissions above 1 GHz
(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), Max hold(LTE TDD);

NOTE1

UMTS: It was tested at REL 99 as worst case (the highst output power and density).
LTE: It was tested at 1RB QPSK as worst case (the highst output power and density).

NOTE2

Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

RESULTS

See the following pages.

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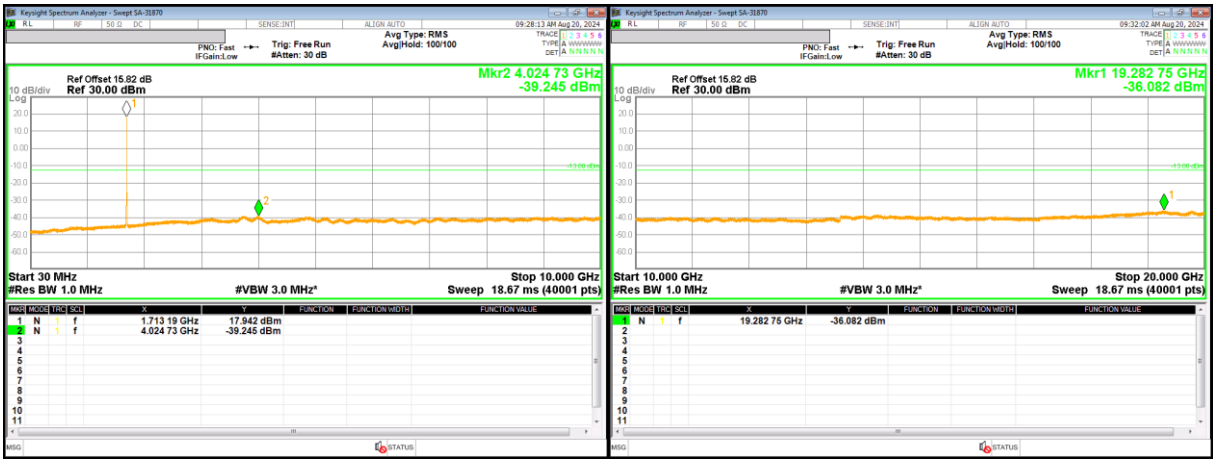
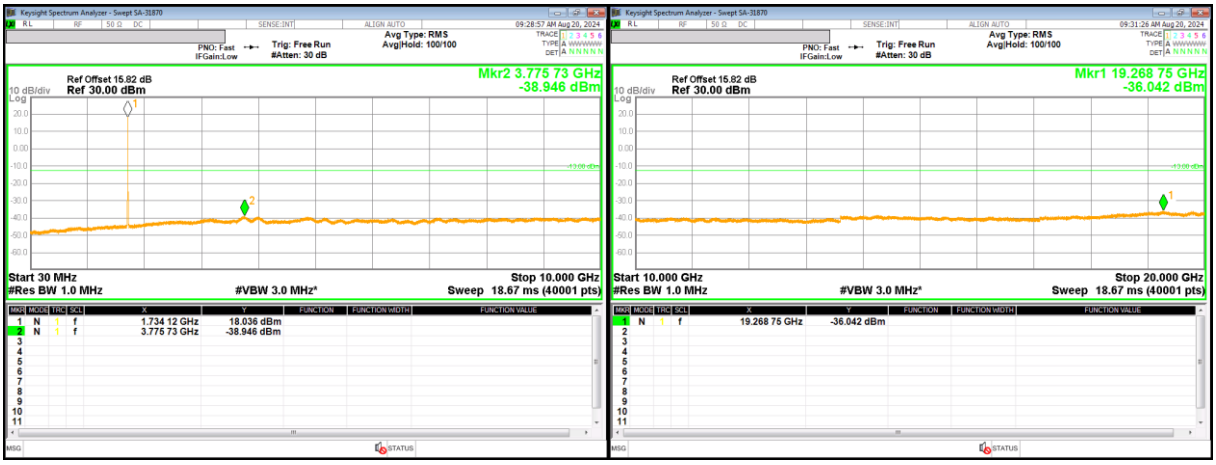
8.5.1. OUT OF BAND EMISSIONS RESULT

WCDMA Band 4

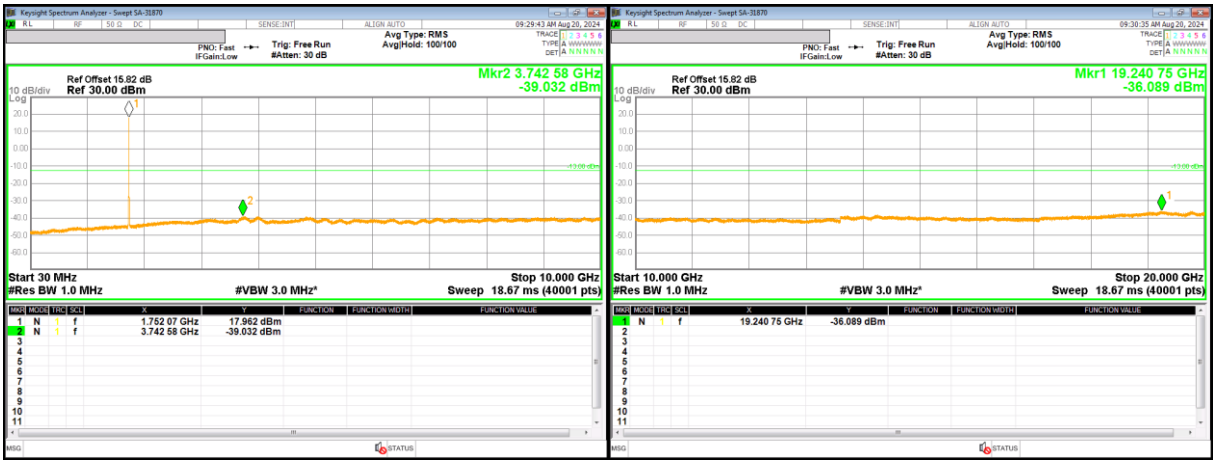
REL99



Low channel



Mid channel



High channel

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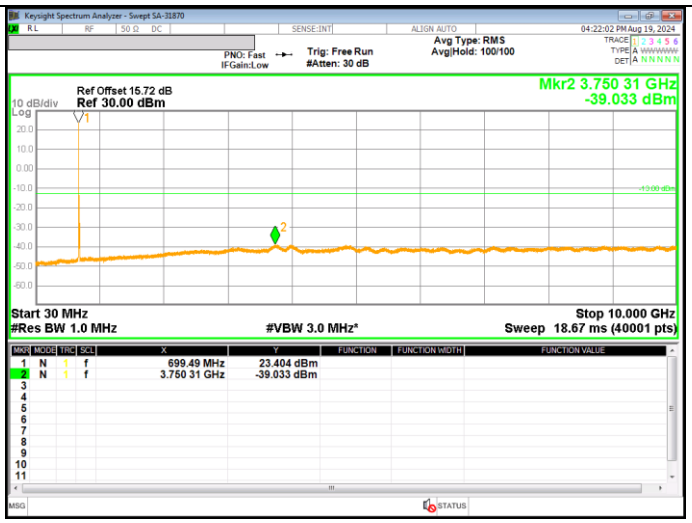
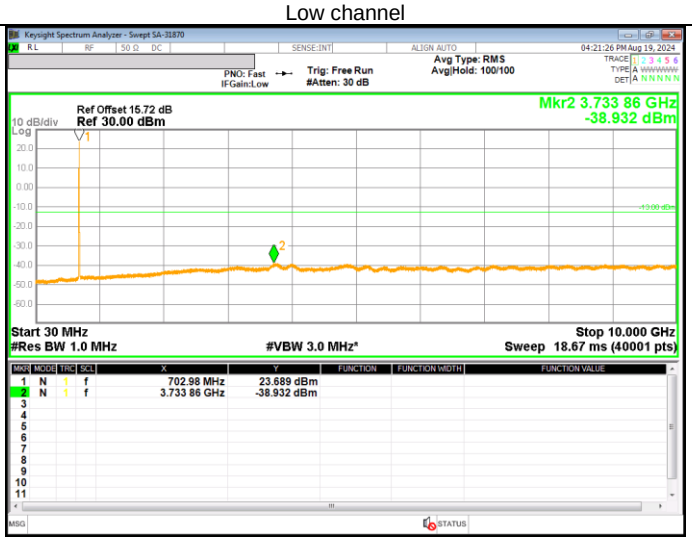
LTE Band 12

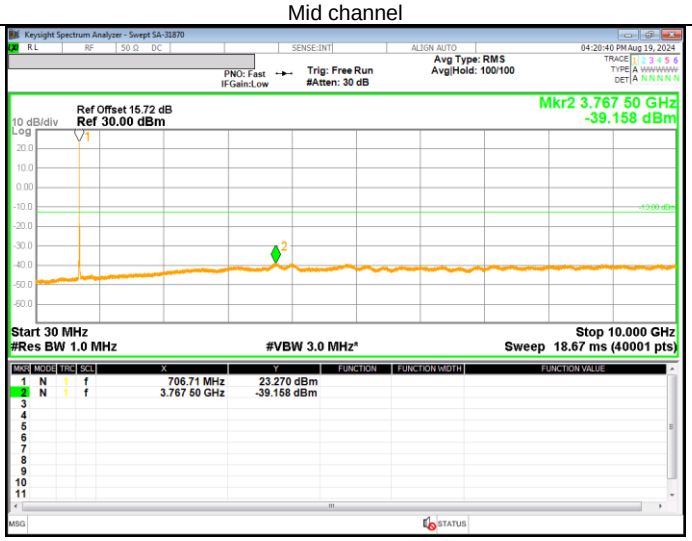
10 MHz QPSK



Low channel



Mid channel



High channel

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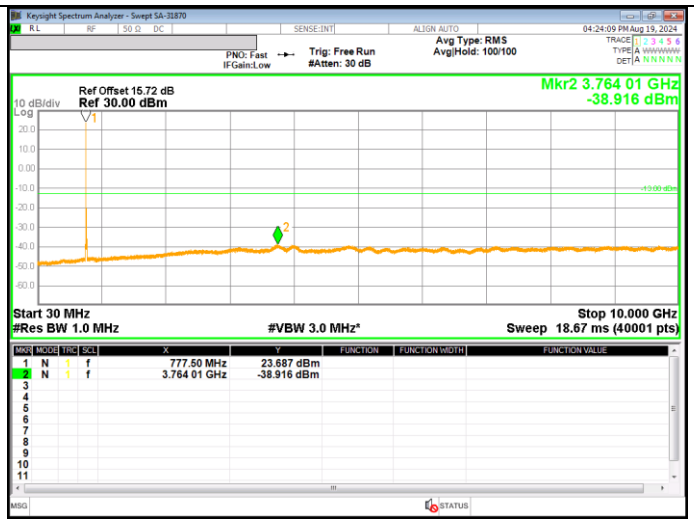
LTE Band 13

10 MHz QPSK

Mid channel

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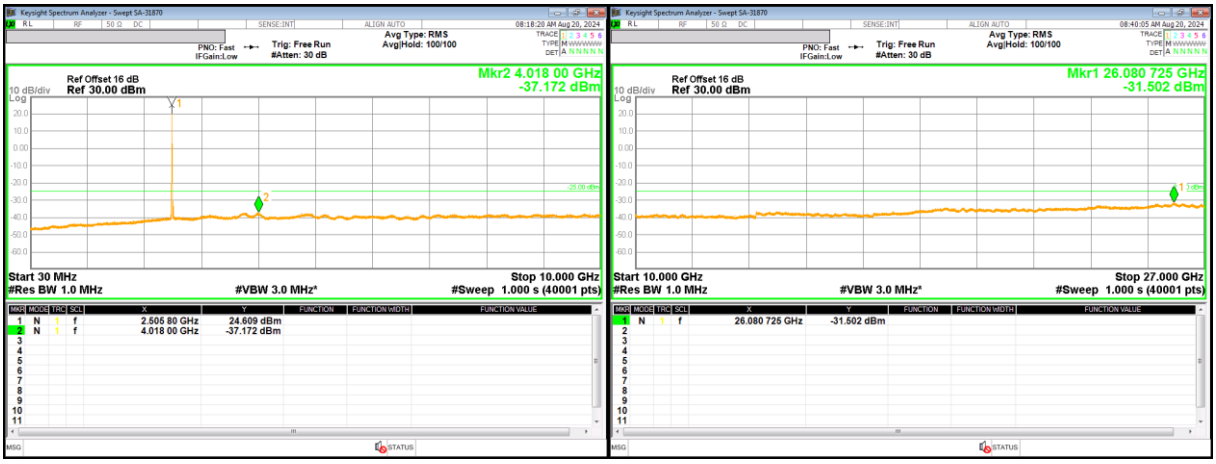
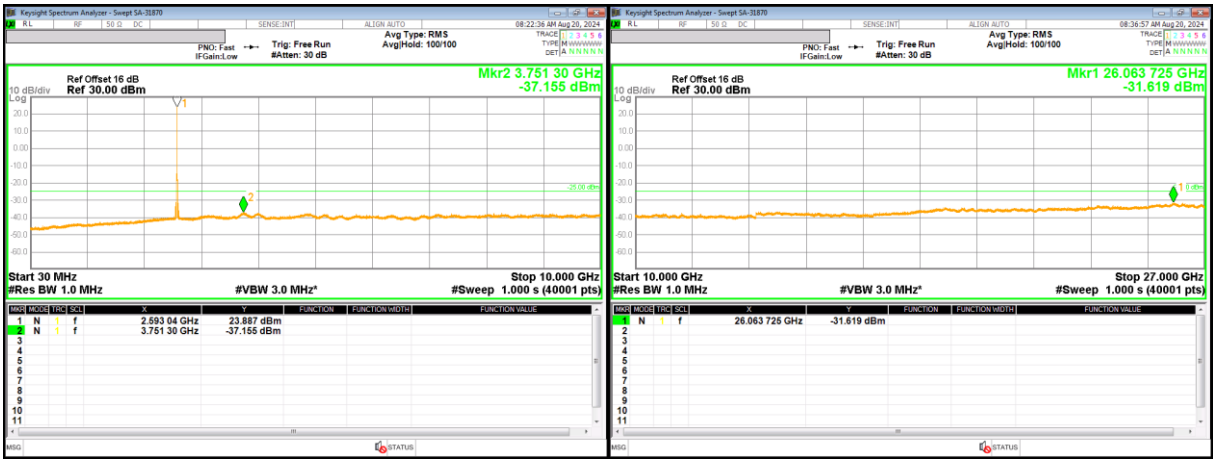
LTE Band 41

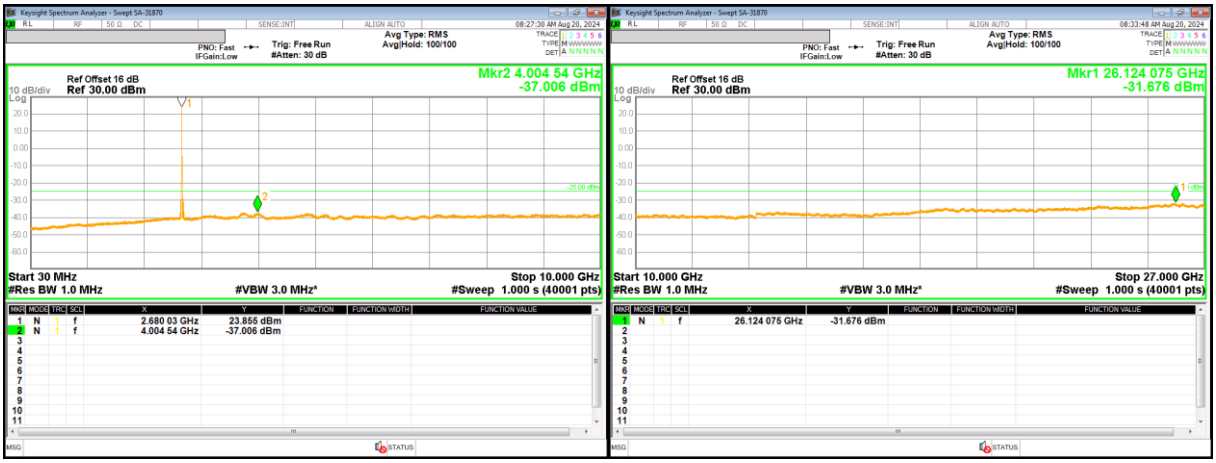
20 MHz QPSK



Low channel



Mid channel



High channel

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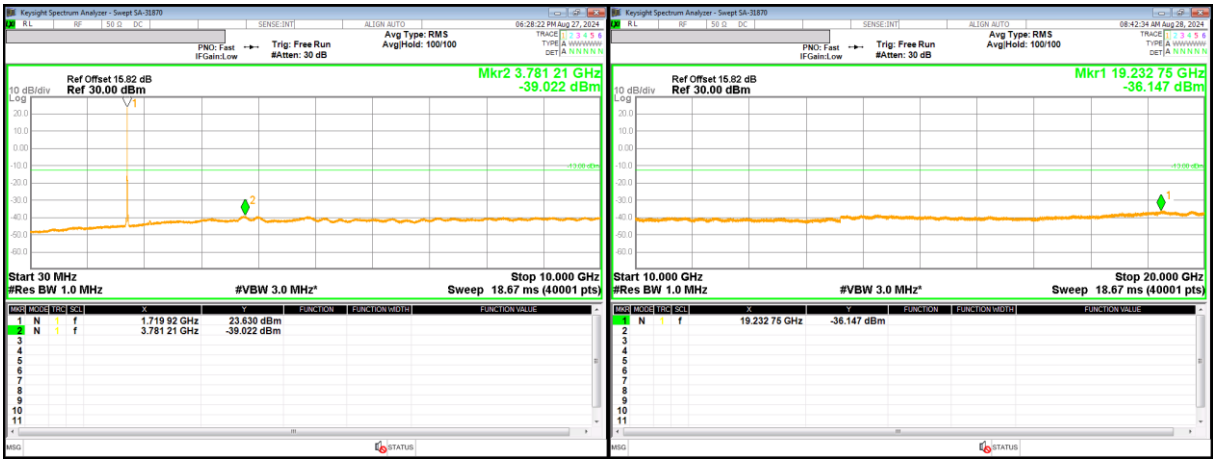
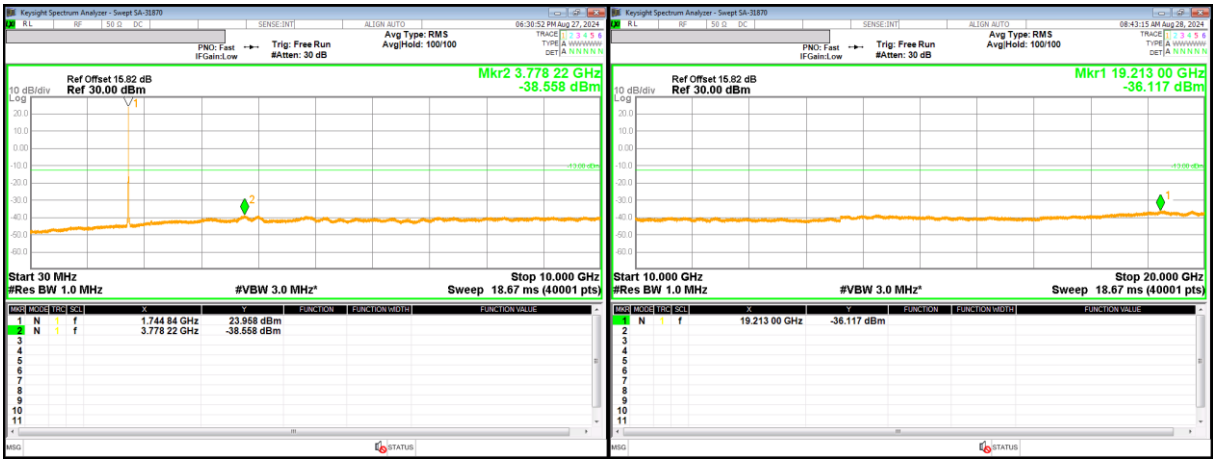
LTE Band 66

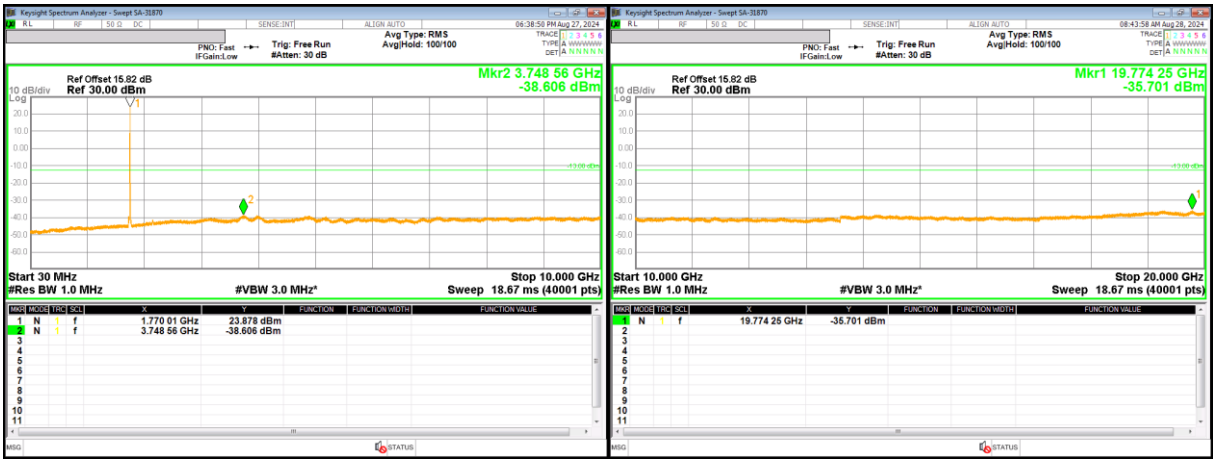
20 MHz QPSK



Low channel



Mid channel



High channel

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8.6. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §27.54

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

NOTE

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

RESULTS

See the following pages.

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8.6.1. FREQUENCY STABILITY RESULT

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

Test Date	2024-08-29
Test Engineer	47989

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.3180	1754.6861		
Extreme (50C)		1710.3180	1754.6861	10.5	0.006
Extreme (40C)		1710.3180	1754.6861	12.1	0.007
Extreme (30C)		1710.3180	1754.6861	12.5	0.007
Extreme (10C)		1710.3180	1754.6861	12.1	0.007
Extreme (0C)		1710.3180	1754.6861	10.7	0.006
Extreme (-10C)		1710.3180	1754.6861	9.0	0.005
Extreme (-20C)		1710.3180	1754.6861	8.6	0.005
Extreme (-30C)		1710.3180	1754.6861	9.4	0.005
20C	15%	1710.3180	1754.6861	12.3	0.007
	-15%	1710.3180	1754.6861	12.5	0.007
	End Point	1710.3180	1754.6861	10.9	0.006

LTE Band 12 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Test Date	2024-09-02
Test Engineer	47989

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	699.1528	715.8435		
Extreme (50C)		699.1528	715.8435	14.4	0.020
Extreme (40C)		699.1528	715.8435	11.7	0.016
Extreme (30C)		699.1528	715.8435	11.3	0.016
Extreme (10C)		699.1528	715.8435	7.9	0.011
Extreme (0C)		699.1528	715.8435	10.4	0.015
Extreme (-10C)		699.1528	715.8435	15.4	0.022
Extreme (-20C)		699.1528	715.8435	12.8	0.018
Extreme (-30C)		699.1528	715.8435	17.1	0.024
20C	15%	699.1528	715.8435	8.6	0.012
	-15%	699.1528	715.8435	12.7	0.018
	End Point	699.1528	715.8435	8.9	0.013

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

Test Date	2024-09-03
Test Engineer	47989

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	777.2599	786.7423		
Extreme (50C)		777.2599	786.7423	12.2	0.016
Extreme (40C)		777.2599	786.7423	12.4	0.016
Extreme (30C)		777.2599	786.7423	9.9	0.013
Extreme (10C)		777.2599	786.7423	8.8	0.011
Extreme (0C)		777.2599	786.7423	9.5	0.012
Extreme (-10C)		777.2599	786.7423	10.4	0.013
Extreme (-20C)		777.2599	786.7423	14.4	0.018
Extreme (-30C)		777.2599	786.7423	18.9	0.024
20C	15%	777.2599	786.7423	9.5	0.012
	-15%	777.2599	786.7423	7.8	0.010
	End Point	777.2599	786.7423	8.8	0.011

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

Test Date	2024-09-05
Test Engineer	47989

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	2496.2623	2689.7429		
Extreme (50C)		2496.2623	2689.7429	34.0	0.013
Extreme (40C)		2496.2623	2689.7429	23.7	0.009
Extreme (30C)		2496.2623	2689.7429	24.0	0.009
Extreme (10C)		2496.2623	2689.7429	23.1	0.009
Extreme (0C)		2496.2623	2689.7429	24.2	0.009
Extreme (-10C)		2496.2623	2689.7429	44.0	0.017
Extreme (-20C)		2496.2623	2689.7429	48.6	0.019
Extreme (-30C)		2496.2623	2689.7429	48.7	0.019
20C	15%	2496.2623	2689.7429	21.0	0.008
	-15%	2496.2623	2689.7429	25.0	0.010
	End Point	2496.2623	2689.7429	21.8	0.008

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

Test Date	2024-09-09
Test Engineer	47989

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	1710.1522	1779.8448		
Extreme (50C)		1710.1522	1779.8448	18.2	0.010
Extreme (40C)		1710.1522	1779.8448	18.4	0.011
Extreme (30C)		1710.1522	1779.8448	13.1	0.008
Extreme (10C)		1710.1522	1779.8448	14.1	0.008
Extreme (0C)		1710.1522	1779.8448	27.9	0.016
Extreme (-10C)		1710.1522	1779.8448	24.4	0.014
Extreme (-20C)		1710.1522	1779.8448	22.8	0.013
Extreme (-30C)		1710.1522	1779.8448	24.6	0.014
20C	15%	1710.1522	1779.8448	14.6	0.008
	-15%	1710.1522	1779.8448	22.0	0.013
	End Point	1710.1522	1779.8448	13.8	0.008

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9. RADIATED RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §27.50

LIMITS

Part 27.50:

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

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

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

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

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

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(WCDMA), average(LTE);

TEST RESULTS

See the following pages.

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9.1.1. ERP/EIRP RESULT

WCDMA

Band	Mode	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
Band 4	REL99	1712.40	13.04	H	4.31	9.51	18.24	66.68	30.00	-11.76
		1732.60	13.22	H	4.33	9.60	18.50	70.79	30.00	-11.50
		1752.60	14.06	H	4.36	9.68	19.39	86.90	30.00	-10.61
	HSDPA	1712.40	12.03	H	4.31	9.51	17.23	52.84	30.00	-12.77
		1732.60	12.23	H	4.33	9.60	17.51	56.36	30.00	-12.49
		1752.60	13.05	H	4.36	9.68	18.38	68.87	30.00	-11.62

LTE Band 12

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)	RB
10	QPSK	704.00	23.27	H	2.79	-1.34	19.14	82.04	34.77	-15.63	1/0
		707.50	23.29	H	2.79	-1.34	19.17	82.60	34.77	-15.60	1/0
		711.00	23.38	H	2.80	-1.33	19.25	84.14	34.77	-15.52	1/0
	16-QAM	704.00	22.26	H	2.79	-1.34	18.13	65.01	34.77	-16.64	1/25
		707.50	22.29	H	2.79	-1.34	18.17	65.61	34.77	-16.60	1/0
		711.00	22.35	H	2.80	-1.33	18.22	66.37	34.77	-16.55	1/0
5	QPSK	701.50	23.03	H	2.78	-1.35	18.90	77.62	34.77	-15.87	1/24
		707.50	23.15	H	2.79	-1.34	19.03	79.98	34.77	-15.74	1/12
		713.50	23.12	H	2.81	-1.32	18.99	79.25	34.77	-15.78	1/12
	16-QAM	701.50	22.04	H	2.78	-1.35	17.91	61.80	34.77	-16.86	1/0
		707.50	22.14	H	2.79	-1.34	18.02	63.39	34.77	-16.75	1/12
		713.50	22.02	H	2.81	-1.32	17.89	61.52	34.77	-16.88	1/0
3	QPSK	700.50	22.74	H	2.78	-1.35	18.61	72.61	34.77	-16.16	1/8
		707.50	23.07	H	2.79	-1.34	18.95	78.52	34.77	-15.82	1/8
		714.50	23.09	H	2.81	-1.32	18.97	78.89	34.77	-15.80	1/14
	16-QAM	700.50	21.59	H	2.78	-1.35	17.46	55.72	34.77	-17.31	1/8
		707.50	21.90	H	2.79	-1.34	17.78	59.98	34.77	-16.99	1/0
		714.50	21.99	H	2.81	-1.32	17.87	61.24	34.77	-16.90	1/14
1.4	QPSK	699.70	22.73	H	2.78	-1.35	18.60	72.44	34.77	-16.17	1/3
		707.50	23.13	H	2.79	-1.34	19.01	79.62	34.77	-15.76	1/3
		715.30	22.97	H	2.81	-1.32	18.84	76.56	34.77	-15.93	1/3
	16-QAM	699.70	21.68	H	2.78	-1.35	17.55	56.89	34.77	-17.22	1/5
		707.50	21.98	H	2.79	-1.34	17.86	61.09	34.77	-16.91	1/0
		715.30	21.70	H	2.81	-1.32	17.57	57.15	34.77	-17.20	1/5

LTE Band 13

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)	RB
10	QPSK	782.00	24.37	H	2.93	-1.19	20.25	105.93	34.77	-14.52	1/0
	16-QAM	782.00	23.62	H	2.93	-1.19	19.50	89.13	34.77	-15.27	1/49
5	QPSK	779.50	24.10	H	2.93	-1.19	19.98	99.54	34.77	-14.79	1/12
		782.00	24.42	H	2.93	-1.19	20.30	107.15	34.77	-14.47	1/12
		784.50	24.31	H	2.94	-1.18	20.19	104.47	34.77	-14.58	1/12
	16-QAM	779.50	23.31	H	2.93	-1.19	19.19	82.99	34.77	-15.58	1/0
		782.00	23.37	H	2.93	-1.19	19.25	84.14	34.77	-15.52	1/0
		784.50	23.51	H	2.94	-1.18	19.39	86.90	34.77	-15.38	1/24

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LTE Band 41

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
20	QPSK	2506.00	21.07	H	5.25	9.99	25.81	381.07	33.00	-7.19	1/49
		2593.00	21.51	H	5.34	9.91	26.09	406.44	33.00	-6.91	1/49
		2680.00	20.44	H	5.43	9.87	24.88	307.61	33.00	-8.12	1/49
	16-QAM	2506.00	20.07	H	5.25	9.99	24.81	302.69	33.00	-8.19	1/49
		2593.00	20.56	H	5.34	9.91	25.13	325.84	33.00	-7.87	1/49
		2680.00	19.63	H	5.43	9.87	24.07	255.27	33.00	-8.93	1/49
15	QPSK	2503.50	20.92	H	5.24	9.99	25.67	368.98	33.00	-7.33	1/37
		2593.00	21.31	H	5.34	9.91	25.89	388.15	33.00	-7.11	1/37
		2682.50	20.19	H	5.43	9.87	24.63	290.40	33.00	-8.37	1/37
	16-QAM	2503.50	19.98	H	5.24	9.99	24.73	297.17	33.00	-8.27	1/37
		2593.00	20.34	H	5.34	9.91	24.92	310.46	33.00	-8.08	1/37
		2682.50	19.79	H	5.43	9.87	24.23	264.85	33.00	-8.77	1/37
10	QPSK	2501.00	21.02	H	5.24	10.00	25.78	378.44	33.00	-7.22	1/25
		2593.00	21.41	H	5.34	9.91	25.99	397.19	33.00	-7.01	1/25
		2685.00	20.30	H	5.43	9.87	24.74	297.85	33.00	-8.26	1/25
	16-QAM	2501.00	20.26	H	5.24	10.00	25.01	316.96	33.00	-7.99	1/25
		2593.00	20.55	H	5.34	9.91	25.13	325.84	33.00	-7.87	1/25
		2685.00	19.99	H	5.43	9.87	24.43	277.33	33.00	-8.57	1/25
5	QPSK	2498.50	21.04	H	5.23	10.00	25.81	381.07	33.00	-7.19	1/12
		2593.00	21.49	H	5.34	9.91	26.06	403.65	33.00	-6.94	1/12
		2687.50	20.45	H	5.44	9.87	24.89	308.32	33.00	-8.11	1/12
	16-QAM	2498.50	20.23	H	5.23	10.00	24.99	315.50	33.00	-8.01	1/12
		2593.00	20.75	H	5.34	9.91	25.32	340.41	33.00	-7.68	1/12
		2687.50	20.00	H	5.44	9.87	24.43	277.33	33.00	-8.57	1/12

LTE Band 66

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
20	QPSK	1720.00	13.28	H	4.32	9.55	18.51	70.96	30.00	-11.49	1/49
		1745.00	14.08	H	4.35	9.66	19.39	86.90	30.00	-10.61	1/49
		1770.00	14.79	H	4.38	9.68	20.09	102.09	30.00	-9.91	1/49
	16-QAM	1720.00	12.51	H	4.32	9.55	17.73	59.29	30.00	-12.27	1/99
		1745.00	13.26	H	4.35	9.66	18.58	72.11	30.00	-11.42	1/49
		1770.00	13.91	H	4.38	9.68	19.22	83.56	30.00	-10.78	1/49
15	QPSK	1717.50	13.53	H	4.31	9.53	18.75	74.99	30.00	-11.25	1/0
		1745.00	14.31	H	4.35	9.66	19.63	91.83	30.00	-10.37	1/37
		1772.50	15.09	H	4.38	9.68	20.39	109.40	30.00	-9.61	1/37
	16-QAM	1717.50	12.60	H	4.31	9.53	17.82	60.53	30.00	-12.18	1/37
		1745.00	13.64	H	4.35	9.66	18.95	78.52	30.00	-11.05	1/74
		1772.50	14.21	H	4.38	9.68	19.51	89.33	30.00	-10.49	1/37
10	QPSK	1715.00	13.19	H	4.31	9.52	18.40	69.18	30.00	-11.60	1/25
		1745.00	14.04	H	4.35	9.66	19.36	86.30	30.00	-10.64	1/25
		1775.00	14.73	H	4.38	9.68	20.03	100.69	30.00	-9.97	1/25
	16-QAM	1715.00	12.57	H	4.31	9.52	17.78	59.98	30.00	-12.22	1/25
		1745.00	13.15	H	4.35	9.66	18.46	70.15	30.00	-11.54	1/25
		1775.00	13.77	H	4.38	9.68	19.07	80.72	30.00	-10.93	1/25
5	QPSK	1712.50	13.15	H	4.31	9.51	18.35	68.39	30.00	-11.65	1/12
		1745.00	13.85	H	4.35	9.66	19.16	82.41	30.00	-10.84	1/12
		1777.50	14.87	H	4.39	9.68	20.16	103.75	30.00	-9.84	1/0
	16-QAM	1712.50	12.54	H	4.31	9.51	17.74	59.43	30.00	-12.26	1/12
		1745.00	13.05	H	4.35	9.66	18.36	68.55	30.00	-11.64	1/12
		1777.50	14.06	H	4.39	9.68	19.36	86.30	30.00	-10.64	1/0
3	QPSK	1711.50	13.26	H	4.31	9.51	18.46	70.15	30.00	-11.54	1/14
		1745.00	13.95	H	4.35	9.66	19.27	84.53	30.00	-10.73	1/14
		1778.50	14.72	H	4.39	9.68	20.01	100.23	30.00	-9.99	1/14
	16-QAM	1711.50	12.58	H	4.31	9.51	17.78	59.98	30.00	-12.22	1/0
		1745.00	12.72	H	4.35	9.66	18.03	63.53	30.00	-11.97	1/0
		1778.50	13.68	H	4.39	9.68	18.97	78.89	30.00	-11.03	1/8
1.4	QPSK	1710.70	13.14	H	4.31	9.50	18.34	68.23	30.00	-11.66	1/3
		1745.00	13.51	H	4.35	9.66	18.83	76.38	30.00	-11.17	1/3
		1779.30	14.84	H	4.39	9.68	20.13	103.04	30.00	-9.87	1/3
	16-QAM	1710.70	12.31	H	4.31	9.50	17.51	56.36	30.00	-12.49	1/5
		1745.00	12.72	H	4.35	9.66	18.03	63.53	30.00	-11.97	1/5
		1779.30	13.94	H	4.39	9.68	19.22	83.56	30.00	-10.78	1/5

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9.2. RADIATIED SPURIOUS EMISSION

RULE PART(S)

FCC: §2.1053, §27. 53

LIMIT

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.

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TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

For peak power measurement with a ESU40:

a) Set the RBW = 100 kHz for emission below 1 GHz and 1 MHz for emissions above 1 GHz
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 ≥ span/RBW;
g) Trace Mode = average(WCDMA, LTE FDD), Maxhold(LTE TDD);

NOTE1
UMTS: It was tested at REL 99 as worst case (the highst output power and density).
LTE: It was tested at 1RB QPSK as worst case (the highst output power and density).

NOTE2
Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

RESULTS
See the following pages.

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9.2.1. SPURIOUS RADIATION RESULT

WCDMA Band 4

REL99

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4791427005
Date: 2024-08-16
Test Engineer: 24542
Configuration: EUT / X-Position
Location: Chamber 1
Mode: Rel99 Band 4 Harmonics
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3424.80	-8.5	V	3.0	44.0	1.0	-51.5	-13.0	-38.5	
5137.20	-6.6	V	3.0	44.8	1.0	-50.4	-13.0	-37.4	
6849.60	-3.8	V	3.0	45.1	1.0	-48.0	-13.0	-35.0	
3424.80	-7.9	H	3.0	44.0	1.0	-50.9	-13.0	-37.9	
5137.20	-6.6	H	3.0	44.8	1.0	-50.4	-13.0	-37.4	
6849.60	-3.7	H	3.0	45.1	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1732.6MHz									
3465.20	-8.1	V	3.0	44.0	1.0	-51.1	-13.0	-38.1	
5197.80	-6.4	V	3.0	44.8	1.0	-50.2	-13.0	-37.2	
6930.40	-3.8	V	3.0	45.1	1.0	-47.9	-13.0	-34.9	
3465.20	-7.9	H	3.0	44.0	1.0	-50.9	-13.0	-37.9	
5197.80	-6.4	H	3.0	44.8	1.0	-50.2	-13.0	-37.2	
6930.40	-3.7	H	3.0	45.1	1.0	-47.8	-13.0	-34.8	
High Ch, 1752.6MHz									
3505.20	-8.1	V	3.0	44.0	1.0	-51.1	-13.0	-38.1	
5257.80	-6.1	V	3.0	44.9	1.0	-50.0	-13.0	-37.0	
7010.40	-3.5	V	3.0	45.1	1.0	-47.7	-13.0	-34.7	
3505.20	-7.6	H	3.0	44.0	1.0	-50.6	-13.0	-37.6	
5257.80	-6.1	H	3.0	44.9	1.0	-50.0	-13.0	-37.0	
7010.40	-3.4	H	3.0	45.1	1.0	-47.5	-13.0	-34.5	

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LTE Band 12

10 MHz

QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4791427005
Date: 2024-08-26
Test Engineer: 24542
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704MHz									
1408.00	-15.4	V	3.0	40.9	1.0	-55.2	-13.0	-42.2	
2112.00	-12.8	V	3.0	40.9	1.0	-52.7	-13.0	-39.7	
2816.00	-10.6	V	3.0	41.9	1.0	-51.5	-13.0	-38.5	
1408.00	-17.0	H	3.0	40.9	1.0	-56.8	-13.0	-43.8	
2112.00	-13.3	H	3.0	40.9	1.0	-53.2	-13.0	-40.2	
2816.00	-10.0	H	3.0	41.9	1.0	-50.9	-13.0	-37.9	
Mid Ch, 707.5MHz									
1415.00	-15.1	V	3.0	40.9	1.0	-54.9	-13.0	-41.9	
2122.50	-12.5	V	3.0	40.9	1.0	-52.5	-13.0	-39.5	
2830.00	-10.9	V	3.0	41.9	1.0	-51.9	-13.0	-38.9	
1415.00	-16.5	H	3.0	40.9	1.0	-56.3	-13.0	-43.3	
2122.50	-13.1	H	3.0	40.9	1.0	-53.0	-13.0	-40.0	
2830.00	-10.2	H	3.0	41.9	1.0	-51.1	-13.0	-38.1	
High Ch, 711MHz									
1422.00	-15.3	V	3.0	40.9	1.0	-55.2	-13.0	-42.2	
2133.00	-12.7	V	3.0	40.9	1.0	-52.7	-13.0	-39.7	
2844.00	-10.4	V	3.0	42.0	1.0	-51.3	-13.0	-38.3	
1422.00	-16.2	H	3.0	40.9	1.0	-56.1	-13.0	-43.1	
2133.00	-13.2	H	3.0	40.9	1.0	-53.1	-13.0	-40.1	
2844.00	-9.5	H	3.0	42.0	1.0	-50.5	-13.0	-37.5	

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LTE Band 13

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4791427005
Date: 2024-08-26
Test Engineer: 24542
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

5 MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-16.6	V	3.0	40.8	1.0	-56.4	-40.0	-16.4	
2338.50	-12.0	V	3.0	41.2	1.0	-52.3	-13.0	-39.3	
3118.00	-9.4	V	3.0	42.2	1.0	-50.6	-13.0	-37.6	
1559.00	-16.0	H	3.0	40.8	1.0	-55.9	-40.0	-15.9	
2338.50	-12.3	H	3.0	41.2	1.0	-52.5	-13.0	-39.5	
3118.00	-8.4	H	3.0	42.2	1.0	-49.6	-13.0	-36.6	
Mid Ch, 782MHz									
1564.00	-11.8	V	3.0	40.8	1.0	-51.7	-40.0	-11.7	
2346.00	-12.0	V	3.0	41.2	1.0	-52.3	-13.0	-39.3	
3128.00	-9.2	V	3.0	42.2	1.0	-50.4	-13.0	-37.4	
1564.00	-16.4	H	3.0	40.8	1.0	-56.2	-40.0	-16.2	
2346.00	-12.3	H	3.0	41.2	1.0	-52.6	-13.0	-39.6	
3128.00	-8.6	H	3.0	42.2	1.0	-49.8	-13.0	-36.8	
High Ch, 784.5MHz									
1569.00	-11.8	V	3.0	40.8	1.0	-51.6	-40.0	-11.6	
2353.50	-12.0	V	3.0	41.3	1.0	-52.2	-13.0	-39.2	
3138.00	-9.2	V	3.0	42.2	1.0	-50.4	-13.0	-37.4	
1569.00	-14.1	H	3.0	40.8	1.0	-53.9	-40.0	-13.9	
2353.50	-12.2	H	3.0	41.3	1.0	-52.4	-13.0	-39.4	
3138.00	-8.5	H	3.0	42.2	1.0	-49.7	-13.0	-36.7	

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LTE Band 41

20 MHz

QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company:	Samsung
Project #:	4791427005
Date:	2024-08-19
Test Engineer:	28775
Configuration:	EUT / AC Adapter, X-Position
Location:	Chamber 2
Mode:	LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2506MHz									
5012.00	-16.4	V	3.0	43.3	1.0	-58.7	-25.0	-33.7	
7518.00	-13.3	V	3.0	42.9	1.0	-55.3	-25.0	-30.3	
10024.00	-12.8	V	3.0	41.5	1.0	-53.4	-25.0	-28.4	
5012.00	-16.5	H	3.0	43.3	1.0	-58.8	-25.0	-33.8	
7518.00	-14.6	H	3.0	42.9	1.0	-56.5	-25.0	-31.5	
10024.00	-13.6	H	3.0	41.5	1.0	-54.1	-25.0	-29.1	
Mid Ch, 2593MHz									
5186.00	-15.8	V	3.0	43.3	1.0	-58.1	-25.0	-33.1	
7779.00	-10.6	V	3.0	42.8	1.0	-52.4	-25.0	-27.4	
10372.00	-12.3	V	3.0	41.3	1.0	-52.5	-25.0	-27.5	
5186.00	-15.8	H	3.0	43.3	1.0	-58.1	-25.0	-33.1	
7779.00	-12.7	H	3.0	42.8	1.0	-54.5	-25.0	-29.5	
10372.00	-13.0	H	3.0	41.3	1.0	-53.3	-25.0	-28.3	
High Ch, 2680MHz									
5360.00	-14.7	V	3.0	43.4	1.0	-57.0	-25.0	-32.0	
8040.00	-10.5	V	3.0	42.6	1.0	-52.1	-25.0	-27.1	
10720.00	-11.2	V	3.0	41.0	1.0	-51.2	-25.0	-26.2	
5360.00	-15.0	H	3.0	43.4	1.0	-57.4	-25.0	-32.4	
8040.00	-13.0	H	3.0	42.6	1.0	-54.6	-25.0	-29.6	
10720.00	-12.0	H	3.0	41.0	1.0	-52.0	-25.0	-27.0	

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LTE Band 66

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4791427005
Date: 2024-08-19
Test Engineer: 28775
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Harmonics, 15MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

15 MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5MHz									
3435.00	-10.4	V	3.0	43.0	1.0	-52.4	-13.0	-39.4	
5152.50	-9.7	V	3.0	43.3	1.0	-52.0	-13.0	-39.0	
6870.00	-7.1	V	3.0	43.3	1.0	-49.4	-13.0	-36.4	
3435.00	-8.2	H	3.0	43.0	1.0	-50.2	-13.0	-37.2	
5152.50	-9.1	H	3.0	43.3	1.0	-51.4	-13.0	-38.4	
6870.00	-6.1	H	3.0	43.3	1.0	-48.4	-13.0	-35.4	
Mid Ch, 1745MHz									
3490.00	-9.9	V	3.0	43.0	1.0	-51.9	-13.0	-38.9	
5235.00	-8.5	V	3.0	43.3	1.0	-50.8	-13.0	-37.8	
6980.00	-7.2	V	3.0	43.3	1.0	-49.5	-13.0	-36.5	
3490.00	-9.7	H	3.0	43.0	1.0	-51.7	-13.0	-38.7	
5235.00	-7.4	H	3.0	43.3	1.0	-49.7	-13.0	-36.7	
6980.00	-7.6	H	3.0	43.3	1.0	-49.9	-13.0	-36.9	
High Ch, 1772.5MHz									
3545.00	-7.0	V	3.0	43.0	1.0	-49.0	-13.0	-36.0	
5317.50	-8.1	V	3.0	43.3	1.0	-50.5	-13.0	-37.5	
7090.00	-5.5	V	3.0	43.2	1.0	-47.7	-13.0	-34.7	
3545.00	-6.9	H	3.0	43.0	1.0	-48.9	-13.0	-35.9	
5317.50	-8.2	H	3.0	43.3	1.0	-50.5	-13.0	-37.5	
7090.00	-6.0	H	3.0	43.2	1.0	-48.2	-13.0	-35.2	

END OF REPORT

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