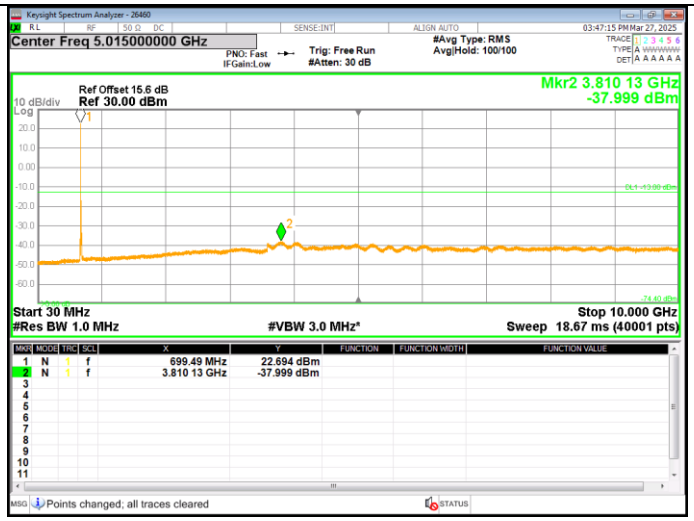
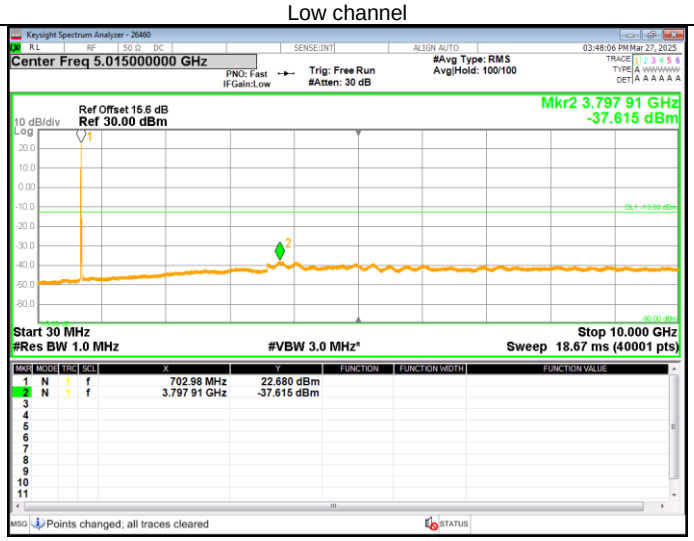
LTE Band 12

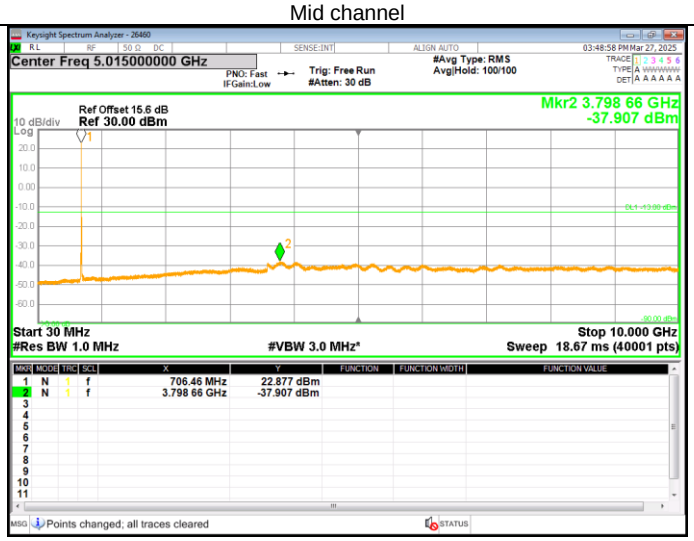
10 MHz QPSK



Low channel

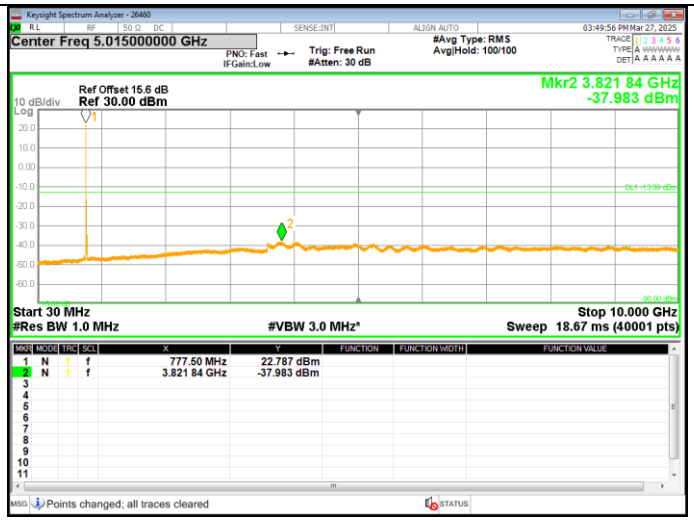


Mid channel

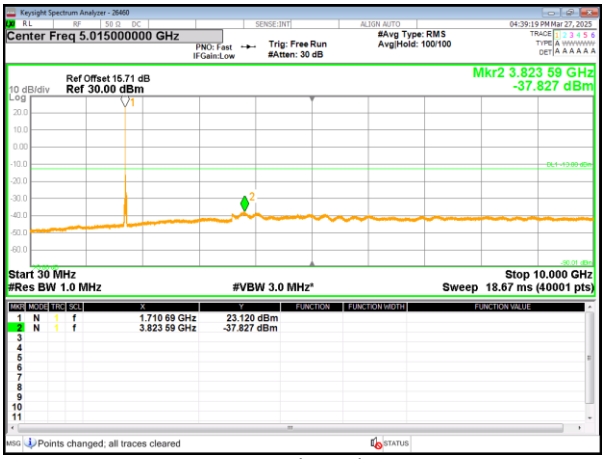
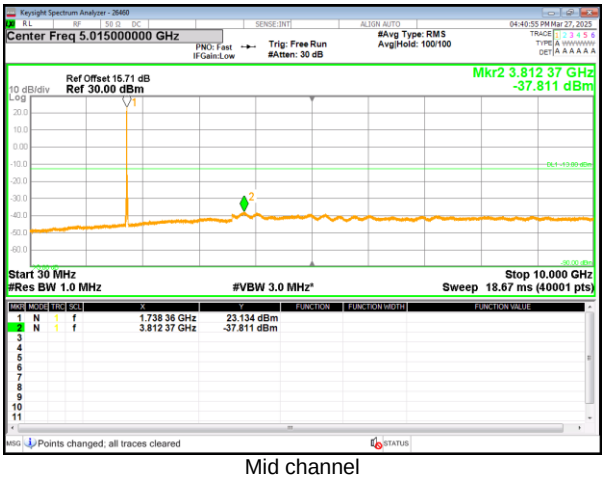
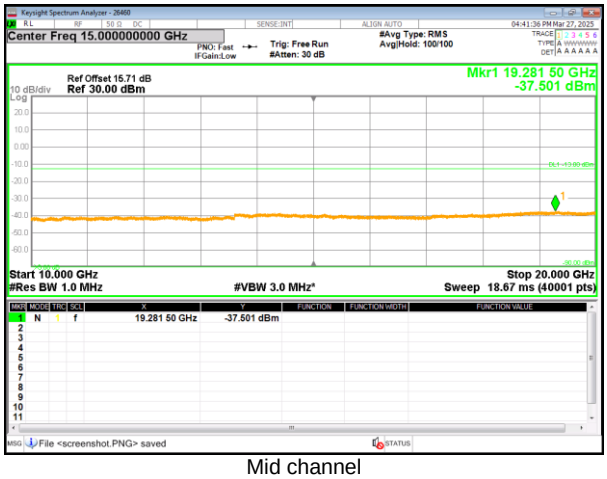
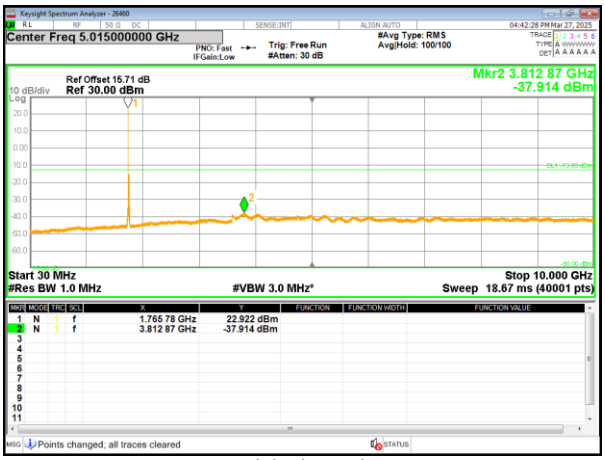
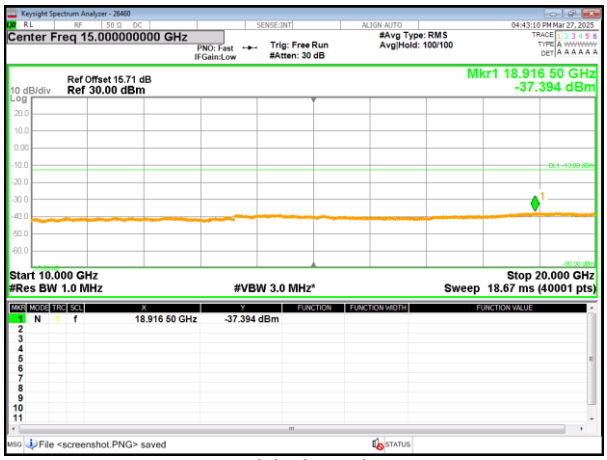


High channel

LTE Band 13

10 MHz QPSK

Mid channel

LTE Band 66

15 MHz QPSK	
 Low channel	 Low channel
 Mid channel	 Mid channel
 High channel	 High channel

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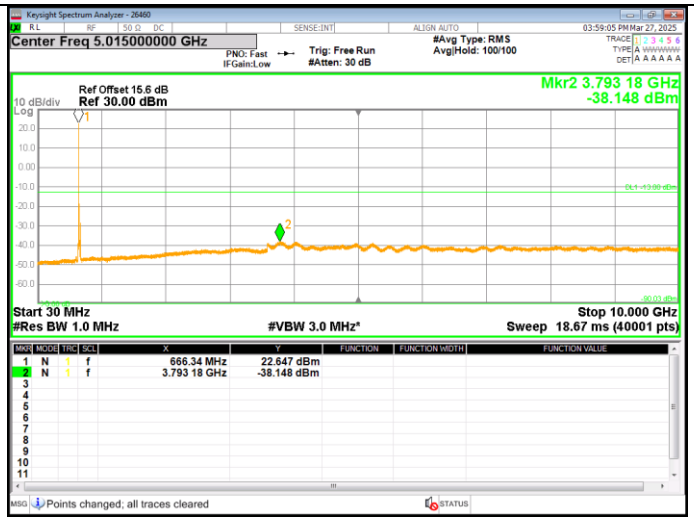
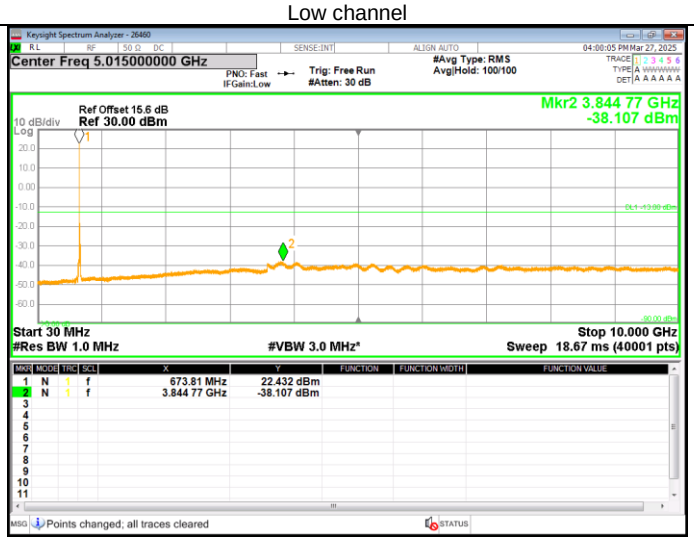
LTE Band 71

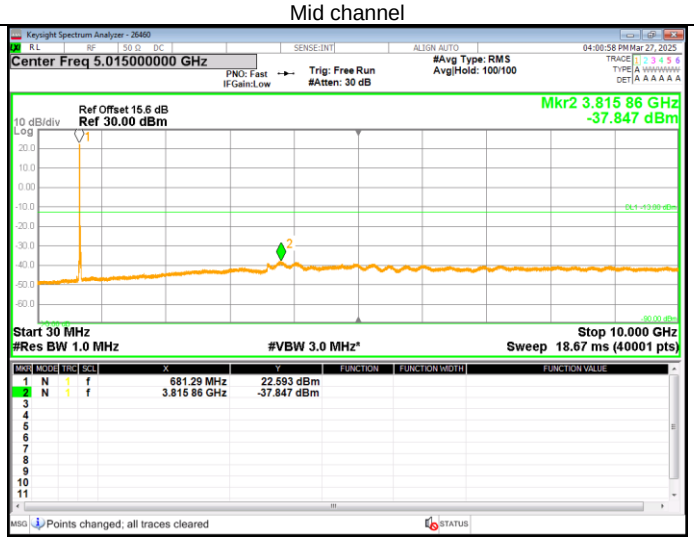
15 MHz QPSK



Low channel



Mid channel



High channel

8.6. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §27.54

LIMITS

§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 B2 (Lowest Frequency: HSDPA / Highest Frequency: HSDPA)

Test Date	2025-04-10
Test Engineer	26460

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	1850.3079	1909.6878		
Extreme (50C)		1850.3079	1909.6878	41.8	0.022
Extreme (40C)		1850.3079	1909.6878	39.5	0.021
Extreme (30C)		1850.3079	1909.6878	33.1	0.018
Extreme (10C)		1850.3079	1909.6878	25.6	0.014
Extreme (0C)		1850.3079	1909.6878	28.4	0.015
Extreme (-10C)		1850.3079	1909.6878	24.3	0.013
Extreme (-20C)		1850.3079	1909.6878	23.4	0.012
Extreme (-30C)		1850.3079	1909.6878	21.5	0.011
20C	15%	1850.3079	1909.6878	29.4	0.016
	-15%	1850.3079	1909.6878	13.6	0.007
	End Point	1850.3079	1909.6878	15.1	0.008

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

Test Date	2025-04-14
Test Engineer	26460

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	2500.2514	2569.7473		
Extreme (50C)		2500.2514	2569.7473	19.3	0.008
Extreme (40C)		2500.2514	2569.7473	20.4	0.008
Extreme (30C)		2500.2514	2569.7473	21.3	0.008
Extreme (10C)		2500.2514	2569.7473	17.5	0.007
Extreme (0C)		2500.2514	2569.7473	16.4	0.006
Extreme (-10C)		2500.2514	2569.7473	18.3	0.007
Extreme (-20C)		2500.2514	2569.7473	19.5	0.008
Extreme (-30C)		2500.2514	2569.7473	20.4	0.008
20C	15%	2500.2514	2569.7473	5.9	0.002
	-15%	2500.2514	2569.7473	5.7	0.002
	End Point	2500.2514	2569.7473	5.6	0.002

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

Test Date	2025-04-10
Test Engineer	26460

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	699.1548	715.8460		
Extreme (50C)		699.1548	715.8460	12.2	0.017
Extreme (40C)		699.1548	715.8460	11.7	0.017
Extreme (30C)		699.1548	715.8460	10.1	0.014
Extreme (10C)		699.1548	715.8460	9.1	0.013
Extreme (0C)		699.1548	715.8460	8.5	0.012
Extreme (-10C)		699.1548	715.8460	9.4	0.013
Extreme (-20C)		699.1548	715.8460	9.5	0.013
Extreme (-30C)		699.1548	715.8460	9.2	0.013
20C	15%	699.1548	715.8460	3.1	0.004
	-15%	699.1548	715.8460	3.5	0.005
	End Point	699.1548	715.8460	5.5	0.008

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

Test Date	2025-04-10
Test Engineer	26460

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	777.2533	786.7582		
Extreme (50C)		777.2533	786.7582	52.6	0.067
Extreme (40C)		777.2533	786.7582	48.5	0.062
Extreme (30C)		777.2533	786.7582	41.2	0.053
Extreme (10C)		777.2533	786.7582	38.5	0.049
Extreme (0C)		777.2533	786.7582	36.3	0.046
Extreme (-10C)		777.2533	786.7582	31.5	0.040
Extreme (-20C)		777.2533	786.7582	28.5	0.036
Extreme (-30C)		777.2533	786.7582	29.3	0.037
20C	15%	777.2533	786.7582	43.6	0.056
	-15%	777.2533	786.7582	21.3	0.027
	End Point	777.2533	786.7582	20.5	0.026

LTE Band 66 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Test Date	2025-04-10
Test Engineer	26460

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	1710.1529	1779.8471		
Extreme (50C)		1710.1529	1779.8471	21.6	0.012
Extreme (40C)		1710.1529	1779.8471	20.6	0.012
Extreme (30C)		1710.1529	1779.8471	21.6	0.012
Extreme (10C)		1710.1529	1779.8471	21.7	0.012
Extreme (0C)		1710.1529	1779.8471	20.7	0.012
Extreme (-10C)		1710.1529	1779.8471	22.7	0.013
Extreme (-20C)		1710.1529	1779.8471	12.7	0.007
Extreme (-30C)		1710.1529	1779.8471	13.7	0.008
20C	15%	1710.1529	1779.8471	5.5	0.003
	-15%	1710.1529	1779.8471	5.9	0.003
	End Point	1710.1529	1779.8471	6.0	0.003

LTE Band 71 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

Test Date	2025-04-14
Test Engineer	26460

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	663.2451	697.7603		
Extreme (50C)		663.2451	697.7603	9.2	0.013
Extreme (40C)		663.2451	697.7603	10.2	0.015
Extreme (30C)		663.2451	697.7603	9.6	0.014
Extreme (10C)		663.2451	697.7603	9.3	0.014
Extreme (0C)		663.2451	697.7603	10.5	0.015
Extreme (-10C)		663.2451	697.7603	10.3	0.015
Extreme (-20C)		663.2451	697.7603	9.5	0.014
Extreme (-30C)		663.2451	697.7603	9.3	0.014
20C	15%	663.2451	697.7603	5.0	0.007
	-15%	663.2451	697.7603	5.3	0.008
	End Point	663.2451	697.7603	5.5	0.008

9. RADIATED RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §27.50

LIMITS

§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 ≥ 1% to 5% of the OBW;
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 2 × to 3 × the OBW.;
d) Sweep time = auto couple or Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ 2 x span/RBW;
g) Trace mode = average;
h) If the EUT can be configured to transmit continuously, then set the trigger to free run.
i) If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).
j) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.
k) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

NOTE

LTE: The OBW value corresponding to the total channel bandwidth is the OBW of FullRB.
Measurements were made with a 1RB configuration (Worst case) over the entire channel bandwidth, and FRB configurations were also reported for the worst BW.

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	6.42	H	4.32	9.47	11.57	14.35	30.00	-18.43
		1732.60	7.69	H	4.35	9.54	12.88	19.41	30.00	-17.12
		1752.60	7.96	H	4.37	9.60	13.19	20.84	30.00	-16.81
	HSDPA	1712.40	5.28	H	4.32	9.47	10.43	11.04	30.00	-19.57
		1732.60	6.84	H	4.35	9.54	12.03	15.96	30.00	-17.97
		1752.60	7.30	H	4.37	9.60	12.53	17.91	30.00	-17.47

LTE Band 7

BW (MHz)	MoHulation	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	2510.00	3.97	H	5.25	10.04	8.76	7.52	33.00	-24.24	1/0
		2535.00	4.21	H	5.28	9.99	8.91	7.78	33.00	-24.09	1/0
		2560.00	3.99	H	5.31	9.95	8.62	7.28	33.00	-24.38	1/0
	16-QAM	2510.00	3.01	H	5.25	10.04	7.80	6.03	33.00	-25.20	1/0
		2535.00	3.28	H	5.28	9.99	7.98	6.28	33.00	-25.02	1/0
		2560.00	3.07	H	5.31	9.95	7.70	5.89	33.00	-25.30	1/0
15	QPSK	2507.50	3.85	H	5.25	10.04	8.64	7.31	33.00	-24.36	1/0
		2535.00	4.27	H	5.28	9.99	8.97	7.89	33.00	-24.03	1/0
		2562.50	3.70	H	5.31	9.94	8.33	6.81	33.00	-24.67	1/0
	16-QAM	2507.50	3.11	H	5.25	10.04	7.90	6.17	33.00	-25.10	1/0
		2535.00	3.18	H	5.28	9.99	7.89	6.15	33.00	-25.11	1/0
		2562.50	2.87	H	5.31	9.94	7.50	5.62	33.00	-25.50	1/0
10	QPSK	2505.00	3.77	H	5.25	10.05	8.57	7.19	33.00	-24.43	1/0
		2535.00	4.27	H	5.28	9.99	8.97	7.89	33.00	-24.03	1/0
		2565.00	4.06	H	5.32	9.94	8.69	7.40	33.00	-24.31	1/0
	16-QAM	2505.00	2.84	H	5.25	10.05	7.63	5.79	33.00	-25.37	1/0
		2535.00	3.32	H	5.28	9.99	8.03	6.35	33.00	-24.97	1/0
		2565.00	3.21	H	5.32	9.94	7.84	6.08	33.00	-25.16	1/0
5	QPSK	2502.50	3.89	H	5.25	10.05	8.69	7.40	33.00	-24.31	1/0
		2535.00	4.49	H	5.28	9.99	9.19	8.30	33.00	-23.81	1/0
		2567.50	4.08	H	5.32	9.94	8.70	7.41	33.00	-24.30	1/0
	16-QAM	2502.50	2.88	H	5.25	10.05	7.68	5.86	33.00	-25.32	1/0
		2535.00	3.61	H	5.28	9.99	8.31	6.78	33.00	-24.69	1/0
		2567.50	3.24	H	5.32	9.94	7.85	6.10	33.00	-25.15	1/0
5	QPSK	2502.50	2.41	H	5.25	10.05	7.21	5.26	33.00	-25.79	50/0
		2535.00	3.19	H	5.28	9.99	7.89	6.15	33.00	-25.11	50/0
		2567.50	2.94	H	5.32	9.94	7.56	5.70	33.00	-25.44	50/0
	16-QAM	2502.50	2.07	H	5.25	10.05	6.87	4.86	33.00	-26.13	50/0
		2535.00	2.51	H	5.28	9.99	7.21	5.26	33.00	-25.79	50/0
		2567.50	1.90	H	5.32	9.94	6.52	4.49	33.00	-26.48	50/0

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	12.17	H	2.79	-1.34	8.03	6.35	34.77	-26.74	1/0
		707.50	12.37	H	2.80	-1.34	8.24	6.67	34.77	-26.53	1/0
		711.00	12.78	H	2.81	-1.33	8.65	7.33	34.77	-26.12	1/0
	16-QAM	704.00	11.06	H	2.79	-1.34	6.92	4.92	34.77	-27.85	1/0
		707.50	11.25	H	2.80	-1.34	7.12	5.15	34.77	-27.65	1/0
		711.00	11.41	H	2.81	-1.33	7.28	5.35	34.77	-27.49	1/0
5	QPSK	701.50	12.19	H	2.79	-1.35	8.05	6.38	34.77	-26.72	1/0
		707.50	12.34	H	2.80	-1.34	8.21	6.62	34.77	-26.56	1/0
		713.50	12.75	H	2.81	-1.32	8.62	7.28	34.77	-26.15	1/0
	16-QAM	701.50	10.99	H	2.79	-1.35	6.85	4.84	34.77	-27.92	1/0
		707.50	11.41	H	2.80	-1.34	7.28	5.35	34.77	-27.49	1/0
		713.50	11.50	H	2.81	-1.32	7.37	5.46	34.77	-27.40	1/0
3	QPSK	700.50	12.17	H	2.79	-1.35	8.03	6.35	34.77	-26.74	1/0
		707.50	12.38	H	2.80	-1.34	8.25	6.68	34.77	-26.52	1/0
		714.50	12.94	H	2.82	-1.32	8.80	7.59	34.77	-25.97	1/0
	16-QAM	700.50	11.12	H	2.79	-1.35	6.98	4.99	34.77	-27.79	1/0
		707.50	11.16	H	2.80	-1.34	7.03	5.05	34.77	-27.74	1/0
		714.50	11.47	H	2.82	-1.32	7.33	5.41	34.77	-27.44	1/0
1.4	QPSK	699.70	11.88	H	2.78	-1.35	7.74	5.94	34.77	-27.03	1/5
		707.50	12.24	H	2.80	-1.34	8.11	6.47	34.77	-26.66	1/0
		715.30	12.82	H	2.82	-1.32	8.69	7.40	34.77	-26.08	1/0
	16-QAM	699.70	10.78	H	2.78	-1.35	6.64	4.61	34.77	-28.13	1/5
		707.50	10.98	H	2.80	-1.34	6.85	4.84	34.77	-27.92	1/5
		715.30	11.34	H	2.82	-1.32	7.21	5.26	34.77	-27.56	1/0
3	QPSK	700.50	11.05	H	2.79	-1.35	6.91	4.91	34.77	-27.86	15/0
		707.50	11.21	H	2.80	-1.34	7.08	5.11	34.77	-27.69	15/0
		714.50	11.68	H	2.82	-1.32	7.54	5.68	34.77	-27.23	15/0
5	16-QAM	701.50	9.98	H	2.79	-1.35	5.84	3.84	34.77	-28.93	25/0
		707.50	10.10	H	2.80	-1.34	5.97	3.95	34.77	-28.80	25/0
		713.50	10.21	H	2.81	-1.32	6.08	4.06	34.77	-28.69	25/0

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	17.54	H	2.94	-1.19	13.42	21.96	34.77	-21.35	1/0
	16-QAM	782.00	16.46	H	2.94	-1.19	12.34	17.12	34.77	-22.43	1/0
5	QPSK	779.50	17.70	H	2.94	-1.19	13.58	22.79	34.77	-21.19	1/0
		782.00	17.60	H	2.94	-1.19	13.48	22.26	34.77	-21.29	1/0
		784.50	17.26	H	2.95	-1.18	13.13	20.56	34.77	-21.64	1/0
	16-QAM	779.50	16.39	H	2.94	-1.19	12.27	16.85	34.77	-22.50	1/0
		782.00	16.37	H	2.94	-1.19	12.25	16.77	34.77	-22.52	1/0
		784.50	15.99	H	2.95	-1.18	11.86	15.34	34.77	-22.91	1/0
5	QPSK	779.50	16.59	H	2.94	-1.19	12.47	17.66	34.77	-22.30	25/0
		782.00	16.54	H	2.94	-1.19	12.42	17.46	34.77	-22.35	25/0
		784.50	16.15	H	2.95	-1.18	12.02	15.92	34.77	-22.75	25/0
10	16-QAM	782.00	15.47	H	2.94	-1.19	11.35	13.65	34.77	-23.42	50/0

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	7.45	H	4.33	9.50	12.62	18.28	30.00	-17.38	1/0
		1745.00	8.11	H	4.37	9.58	13.33	21.53	30.00	-16.67	1/0
		1770.00	8.92	H	4.40	9.62	14.15	26.00	30.00	-15.85	1/0
	16-QAM	1720.00	6.10	H	4.33	9.50	11.27	13.40	30.00	-18.73	1/0
		1745.00	7.17	H	4.37	9.58	12.39	17.34	30.00	-17.61	1/0
		1770.00	8.11	H	4.40	9.62	13.34	21.58	30.00	-16.66	1/0
15	QPSK	1717.50	7.48	H	4.32	9.49	12.65	18.41	30.00	-17.35	1/0
		1745.00	8.35	H	4.37	9.58	13.57	22.75	30.00	-16.43	1/0
		1772.50	9.37	H	4.40	9.63	14.60	28.84	30.00	-15.40	1/0
	16-QAM	1717.50	6.42	H	4.32	9.49	11.59	14.42	30.00	-18.41	1/37
		1745.00	7.34	H	4.37	9.58	12.56	18.03	30.00	-17.44	1/0
		1772.50	8.19	H	4.40	9.63	13.41	21.93	30.00	-16.59	1/0
10	QPSK	1715.00	7.15	H	4.32	9.48	12.31	17.02	30.00	-17.69	1/0
		1745.00	8.48	H	4.37	9.58	13.70	23.44	30.00	-16.30	1/0
		1775.00	9.22	H	4.40	9.63	14.45	27.86	30.00	-15.55	1/0
	16-QAM	1715.00	6.12	H	4.32	9.48	11.28	13.43	30.00	-18.72	1/0
		1745.00	7.34	H	4.37	9.58	12.56	18.03	30.00	-17.44	1/0
		1775.00	8.30	H	4.40	9.63	13.53	22.54	30.00	-16.47	1/0
5	QPSK	1712.50	7.03	H	4.32	9.47	12.18	16.52	30.00	-17.82	1/0
		1745.00	8.37	H	4.37	9.58	13.59	22.86	30.00	-16.41	1/0
		1777.50	9.22	H	4.40	9.63	14.45	27.86	30.00	-15.55	1/0
	16-QAM	1712.50	6.16	H	4.32	9.47	11.31	13.52	30.00	-18.69	1/0
		1745.00	7.57	H	4.37	9.58	12.79	19.01	30.00	-17.21	1/0
		1777.50	8.27	H	4.40	9.63	13.50	22.39	30.00	-16.50	1/0
3	QPSK	1711.50	6.98	H	4.31	9.47	12.13	16.33	30.00	-17.87	1/0
		1745.00	8.28	H	4.37	9.58	13.50	22.39	30.00	-16.50	1/0
		1778.50	9.04	H	4.40	9.63	14.27	26.73	30.00	-15.73	1/0
	16-QAM	1711.50	6.12	H	4.31	9.47	11.27	13.40	30.00	-18.73	1/0
		1745.00	7.52	H	4.37	9.58	12.74	18.79	30.00	-17.26	1/0
		1778.50	8.10	H	4.40	9.63	13.33	21.53	30.00	-16.67	1/8
1.4	QPSK	1710.70	6.98	H	4.31	9.47	12.13	16.33	30.00	-17.87	1/3
		1745.00	8.39	H	4.37	9.58	13.61	22.96	30.00	-16.39	1/0
		1779.30	9.11	H	4.40	9.63	14.35	27.23	30.00	-15.65	1/0
	16-QAM	1710.70	6.13	H	4.31	9.47	11.29	13.46	30.00	-18.71	1/5
		1745.00	7.42	H	4.37	9.58	12.64	18.37	30.00	-17.36	1/0
		1779.30	8.15	H	4.40	9.63	13.38	21.78	30.00	-16.62	1/5
15	QPSK	1717.50	6.67	H	4.32	9.49	11.84	15.28	30.00	-18.16	75/0
		1745.00	7.23	H	4.37	9.58	12.45	17.58	30.00	-17.55	75/0
		1772.50	8.02	H	4.40	9.63	13.25	21.13	30.00	-16.75	75/0
10	16-QAM	1715.00	4.89	H	4.32	9.48	10.05	10.12	30.00	-19.95	50/0
		1745.00	5.83	H	4.37	9.58	11.05	12.74	30.00	-18.95	50/0
		1775.00	7.19	H	4.40	9.63	12.42	17.46	30.00	-17.58	50/0

LTE Band 71

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
20	QPSK	673.00	10.59	H	2.74	-1.43	6.42	4.39	34.77	2.03	1/0
		680.50	11.65	H	2.75	-1.41	7.49	5.61	34.77	1.88	1/0
		688.00	11.41	H	2.76	-1.39	7.26	5.32	34.77	1.94	1/0
	16-QAM	673.00	9.42	H	2.74	-1.43	5.25	3.35	34.77	1.90	1/0
		680.50	10.50	H	2.75	-1.41	6.34	4.31	34.77	2.03	1/0
		688.00	10.18	H	2.76	-1.39	6.03	4.01	34.77	2.02	1/0
15	QPSK	670.50	10.03	H	2.73	-1.44	5.86	3.85	34.77	2.01	1/0
		680.50	11.37	H	2.75	-1.41	7.21	5.26	34.77	1.95	1/0
		690.50	11.15	H	2.77	-1.38	7.01	5.02	34.77	1.99	1/0
	16-QAM	670.50	8.93	H	2.73	-1.44	4.76	2.99	34.77	1.77	1/0
		680.50	10.29	H	2.75	-1.41	6.13	4.10	34.77	2.03	1/0
		690.50	10.16	H	2.77	-1.38	6.02	4.00	34.77	2.02	1/0
10	QPSK	668.00	9.20	H	2.73	-1.45	5.03	3.18	34.77	1.85	1/0
		680.50	11.38	H	2.75	-1.41	7.22	5.27	34.77	1.95	1/0
		693.00	11.23	H	2.77	-1.37	7.09	5.12	34.77	1.97	1/0
	16-QAM	668.00	8.04	H	2.73	-1.45	3.87	2.44	34.77	1.43	1/0
		680.50	10.21	H	2.75	-1.41	6.05	4.03	34.77	2.02	1/0
		693.00	10.11	H	2.77	-1.37	5.97	3.95	34.77	2.02	1/0
5	QPSK	665.50	10.65	H	2.72	-1.45	6.48	4.45	34.77	2.03	1/0
		680.50	12.25	H	2.75	-1.41	8.09	6.44	34.77	1.65	1/0
		695.50	12.01	H	2.78	-1.36	7.87	6.12	34.77	1.75	1/0
	16-QAM	665.50	9.56	H	2.72	-1.45	5.39	3.46	34.77	1.93	1/0
		680.50	11.13	H	2.75	-1.41	6.97	4.98	34.77	1.99	1/0
		695.50	10.87	H	2.78	-1.36	6.73	4.71	34.77	2.02	1/0
5	QPSK	665.50	9.56	H	2.72	-1.45	5.39	3.46	34.77	1.93	25/0
		680.50	11.13	H	2.75	-1.41	6.97	4.98	34.77	1.99	25/0
		695.50	10.89	H	2.78	-1.36	6.75	4.73	34.77	2.02	25/0
	16-QAM	665.50	8.40	H	2.72	-1.45	4.23	2.65	34.77	1.58	25/0
		680.50	10.02	H	2.75	-1.41	5.86	3.85	34.77	2.01	25/0
		695.50	9.87	H	2.78	-1.36	5.73	3.74	34.77	1.99	25/0

9.2. RADIATIED SPURIOUS EMISSION

RULE PART(S)

FCC: §2.1053, §27. 53

LIMIT

§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.

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_27(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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 ≥ 2 x span/RBW;
g) Trace Mode = average(WCDMA, LTE);

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.

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_27(05)
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9.2.1. SPURIOUS RADIATION RESULT

WCDMA

REL99

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

Company: Samsung
Project #: 4791706372
Date: 2025-04-09
Test Engineer: 26087
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
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	-8.6	V	3.0	42.9	1.0	-50.6	-13.0	-37.6	
5137.20	-8.1	V	3.0	43.3	1.0	-50.4	-13.0	-37.4	
6849.60	-5.4	V	3.0	43.3	1.0	-47.8	-13.0	-34.8	
3424.80	-8.5	H	3.0	42.9	1.0	-50.4	-13.0	-37.4	
5137.20	-8.1	H	3.0	43.3	1.0	-50.3	-13.0	-37.3	
6849.60	-4.5	H	3.0	43.3	1.0	-46.8	-13.0	-33.8	
Mid Ch, 1732.6MHz									
3465.20	-8.3	V	3.0	43.0	1.0	-50.2	-13.0	-37.2	
5197.80	-7.9	V	3.0	43.3	1.0	-50.2	-13.0	-37.2	
6930.40	-5.4	V	3.0	43.3	1.0	-47.7	-13.0	-34.7	
3465.20	-8.1	H	3.0	43.0	1.0	-50.0	-13.0	-37.0	
5197.80	-7.9	H	3.0	43.3	1.0	-50.2	-13.0	-37.2	
6930.40	-5.4	H	3.0	43.3	1.0	-47.7	-13.0	-34.7	
High Ch, 1752.6MHz									
3505.20	-7.8	V	3.0	43.0	1.0	-49.8	-13.0	-36.8	
5257.80	-8.0	V	3.0	43.3	1.0	-50.3	-13.0	-37.3	
7010.40	-5.1	V	3.0	43.3	1.0	-47.4	-13.0	-34.4	
3505.20	-7.6	H	3.0	43.0	1.0	-49.6	-13.0	-36.6	
5257.80	-8.0	H	3.0	43.3	1.0	-50.3	-13.0	-37.3	
7010.40	-5.1	H	3.0	43.3	1.0	-47.4	-13.0	-34.4	

LTE Band 7

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

Company: Samsung
Project #: 4791706372
Date: 2025-04-10
Test Engineer: 24542
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 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, 2502.5MHz									
5005.00	-18.3	V	3.0	44.6	1.0	-61.8	-25.0	-36.8	
7507.50	-15.5	V	3.0	44.7	1.0	-59.2	-25.0	-34.2	
10010.00	-13.2	V	3.0	42.9	1.0	-55.1	-25.0	-30.1	
5005.00	-18.1	H	3.0	44.6	1.0	-61.7	-25.0	-36.7	
7507.50	-15.5	H	3.0	44.7	1.0	-59.2	-25.0	-34.2	
10010.00	-13.3	H	3.0	42.9	1.0	-55.2	-25.0	-30.2	
Mid Ch, 2535MHz									
5070.00	-17.9	V	3.0	44.6	1.0	-61.5	-25.0	-36.5	
7605.00	-15.1	V	3.0	44.7	1.0	-58.8	-25.0	-33.8	
10140.00	-13.3	V	3.0	42.9	1.0	-55.2	-25.0	-30.2	
5070.00	-18.0	H	3.0	44.6	1.0	-61.5	-25.0	-36.5	
7605.00	-15.2	H	3.0	44.7	1.0	-58.9	-25.0	-33.9	
10140.00	-13.3	H	3.0	42.9	1.0	-55.1	-25.0	-30.1	
High Ch, 2567.5MHz									
5135.00	-18.1	V	3.0	44.6	1.0	-61.6	-25.0	-36.6	
7702.50	-15.3	V	3.0	44.6	1.0	-58.9	-25.0	-33.9	
10270.00	-13.4	V	3.0	42.9	1.0	-55.2	-25.0	-30.2	
5135.00	-18.3	H	3.0	44.6	1.0	-61.8	-25.0	-36.8	
7702.50	-15.3	H	3.0	44.6	1.0	-58.9	-25.0	-33.9	
10270.00	-13.3	H	3.0	42.9	1.0	-55.1	-25.0	-30.1	

LTE Band 12

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

Company:	Samsung
Project #:	4791706372
Date:	2025-04-08
Test Engineer:	24542
Configuration:	EUT / AC Adapter, Y-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 12 Harmonics, 3MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

3 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, 700.5MHz									
1401.00	-16.2	V	3.0	43.0	1.0	-58.2	-13.0	-45.2	
2101.50	-13.1	V	3.0	44.0	1.0	-56.1	-13.0	-43.1	
2802.00	-10.5	V	3.0	43.5	1.0	-53.0	-13.0	-40.0	
1401.00	-17.7	H	3.0	43.0	1.0	-59.6	-13.0	-46.6	
2101.50	-13.8	H	3.0	44.0	1.0	-56.9	-13.0	-43.9	
2802.00	-10.8	H	3.0	43.5	1.0	-53.4	-13.0	-40.4	
Mid Ch, 707.5MHz									
1415.00	-16.2	V	3.0	43.0	1.0	-58.2	-13.0	-45.2	
2122.50	-12.9	V	3.0	44.0	1.0	-55.9	-13.0	-42.9	
2830.00	-10.4	V	3.0	43.5	1.0	-52.9	-13.0	-39.9	
1415.00	-17.5	H	3.0	43.0	1.0	-59.5	-13.0	-46.5	
2122.50	-13.6	H	3.0	44.0	1.0	-56.7	-13.0	-43.7	
2830.00	-10.5	H	3.0	43.5	1.0	-53.0	-13.0	-40.0	
High Ch, 714.5MHz									
1429.00	-16.1	V	3.0	43.0	1.0	-58.2	-13.0	-45.2	
2143.50	-12.9	V	3.0	44.0	1.0	-55.9	-13.0	-42.9	
2858.00	-10.4	V	3.0	43.5	1.0	-52.8	-13.0	-39.8	
1429.00	-17.1	H	3.0	43.0	1.0	-59.2	-13.0	-46.2	
2143.50	-13.6	H	3.0	44.0	1.0	-56.6	-13.0	-43.6	
2858.00	-10.5	H	3.0	43.5	1.0	-52.9	-13.0	-39.9	

LTE Band 13

5 MHz

QPSK

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

Company: Samsung
Project #: 4791706372
Date: 2025-04-08
Test Engineer: 24542
Configuration: EUT / AC Adapter,Strap,Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Harmonics, 5MHz 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, 779.5MHz									
1559.00	-11.5	V	3.0	43.3	1.0	-53.8	-40.0	-13.8	
2338.50	-11.9	V	3.0	43.9	1.0	-54.8	-13.0	-41.8	
3118.00	-9.9	V	3.0	43.5	1.0	-52.5	-13.0	-39.5	
1559.00	-12.2	H	3.0	43.3	1.0	-54.5	-40.0	-14.5	
2338.50	-12.5	H	3.0	43.9	1.0	-55.3	-13.0	-42.3	
3118.00	-10.1	H	3.0	43.5	1.0	-52.7	-13.0	-39.7	
Mid Ch, 782MHz									
1564.00	-13.1	V	3.0	43.3	1.0	-55.4	-40.0	-15.4	
2346.00	-12.2	V	3.0	43.9	1.0	-55.1	-13.0	-42.1	
3128.00	-9.7	V	3.0	43.5	1.0	-52.2	-13.0	-39.2	
1564.00	-14.7	H	3.0	43.3	1.0	-57.0	-40.0	-17.0	
2346.00	-13.2	H	3.0	43.9	1.0	-56.1	-13.0	-43.1	
3128.00	-9.9	H	3.0	43.5	1.0	-52.5	-13.0	-39.5	
High Ch, 784.5MHz									
1569.00	-10.0	V	3.0	43.3	1.0	-52.3	-40.0	-12.3	
2353.50	-11.9	V	3.0	43.9	1.0	-54.8	-13.0	-41.8	
3138.00	-9.7	V	3.0	43.6	1.0	-52.3	-13.0	-39.3	
1569.00	-16.9	H	3.0	43.3	1.0	-59.2	-40.0	-19.2	
2353.50	-12.8	H	3.0	43.9	1.0	-55.7	-13.0	-42.7	
3138.00	-9.7	H	3.0	43.6	1.0	-52.2	-13.0	-39.2	

LTE Band 66

15 MHz

QPSK

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

Company: Samsung
Project #: 4791706372
Date: 2025-04-07
Test Engineer: 24542
Configuration: EUT / AC Adapter, Strap, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Harmonics, 15MHz 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, 1717.5MHz									
3435.00	-8.9	V	3.0	43.9	1.0	-51.8	-13.0	-38.8	
5152.50	-7.5	V	3.0	44.6	1.0	-51.1	-13.0	-38.1	
6870.00	-4.7	V	3.0	45.1	1.0	-48.8	-13.0	-35.8	
3435.00	-8.9	H	3.0	43.9	1.0	-51.9	-13.0	-38.9	
5152.50	-7.6	H	3.0	44.6	1.0	-51.2	-13.0	-38.2	
6870.00	-4.6	H	3.0	45.1	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1745MHz									
3490.00	-8.3	V	3.0	44.0	1.0	-51.3	-13.0	-38.3	
5235.00	-7.2	V	3.0	44.6	1.0	-50.8	-13.0	-37.8	
6980.00	-4.4	V	3.0	45.1	1.0	-48.5	-13.0	-35.5	
3490.00	-8.6	H	3.0	44.0	1.0	-51.6	-13.0	-38.6	
5235.00	-7.3	H	3.0	44.6	1.0	-50.8	-13.0	-37.8	
6980.00	-4.4	H	3.0	45.1	1.0	-48.5	-13.0	-35.5	
High Ch, 1772.5MHz									
3545.00	-8.4	V	3.0	44.1	1.0	-51.4	-13.0	-38.4	
5317.50	-7.2	V	3.0	44.6	1.0	-50.8	-13.0	-37.8	
7090.00	-4.3	V	3.0	45.0	1.0	-48.3	-13.0	-35.3	
3545.00	-8.4	H	3.0	44.1	1.0	-51.4	-13.0	-38.4	
5317.50	-7.2	H	3.0	44.6	1.0	-50.8	-13.0	-37.8	
7090.00	-4.1	H	3.0	45.0	1.0	-48.2	-13.0	-35.2	

LTE Band 71

5 MHz

QPSK

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

Company:	Samsung
Project #:	4791706372
Date:	2025-04-09
Test Engineer:	24542
Configuration:	EUT / AC Adapter, Y-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 71 Harmonics, 5MHz 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, 665.5MHz									
1331.00	-16.6	V	3.0	42.9	1.0	-58.4	-13.0	-45.4	
1996.50	-13.7	V	3.0	44.1	1.0	-56.8	-13.0	-43.8	
2662.00	-11.3	V	3.0	43.6	1.0	-53.9	-13.0	-40.9	
1331.00	-17.7	H	3.0	42.9	1.0	-59.5	-13.0	-46.5	
1996.50	-14.4	H	3.0	44.1	1.0	-57.5	-13.0	-44.5	
2662.00	-11.3	H	3.0	43.6	1.0	-53.9	-13.0	-40.9	
Mid Ch, 680.5MHz									
1361.00	-16.4	V	3.0	42.9	1.0	-58.3	-13.0	-45.3	
2041.50	-13.4	V	3.0	44.1	1.0	-56.5	-13.0	-43.5	
2722.00	-10.8	V	3.0	43.6	1.0	-53.4	-13.0	-40.4	
1361.00	-17.3	H	3.0	42.9	1.0	-59.2	-13.0	-46.2	
2041.50	-14.3	H	3.0	44.1	1.0	-57.3	-13.0	-44.3	
2722.00	-11.1	H	3.0	43.6	1.0	-53.7	-13.0	-40.7	
High Ch, 695.5MHz									
1391.00	-13.1	V	3.0	43.0	1.0	-55.1	-13.0	-42.1	
2086.50	-13.2	V	3.0	44.1	1.0	-56.2	-13.0	-43.2	
2782.00	-10.3	V	3.0	43.5	1.0	-52.9	-13.0	-39.9	
1391.00	-17.3	H	3.0	43.0	1.0	-59.3	-13.0	-46.3	
2086.50	-13.9	H	3.0	44.1	1.0	-57.0	-13.0	-44.0	
2782.00	-10.7	H	3.0	43.5	1.0	-53.3	-13.0	-40.3	

END OF REPORT

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