

5.8.5 LTE Band 12

LTE Band 12_ 10 MHz_ QPSK_ Below 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	30.425	-88.81	38.49	-50.32	-13.00	-37.32	Horizontal
2	240.144	-81.22	36.38	-44.84	-13.00	-31.84	Horizontal
3	965.474	-85.67	51.80	-33.87	-13.00	-20.87	Horizontal
4	30.212	-86.47	39.20	-47.27	-13.00	-34.27	Vertical
5	106.281	-86.74	32.15	-54.59	-13.00	-41.59	Vertical
6	992.997	-87.40	52.79	-34.61	-13.00	-21.61	Vertical
Middle Channel							
1	33.335	-90.04	36.66	-53.38	-13.00	-40.38	Horizontal
2	240.144	-83.30	36.38	-46.92	-13.00	-33.92	Horizontal
3	558.079	-87.69	44.64	-43.05	-13.00	-30.05	Horizontal
4	30.212	-86.57	39.20	-47.37	-13.00	-34.37	Vertical
5	498.730	-84.92	43.34	-41.58	-13.00	-28.58	Vertical
6	965.474	-86.78	51.75	-35.03	-13.00	-22.03	Vertical
Highest Channel							
1	31.073	-89.85	38.07	-51.78	-13.00	-38.78	Horizontal
2	240.144	-84.51	36.38	-48.13	-13.00	-35.13	Horizontal
3	992.997	-86.20	52.85	-33.35	-13.00	-20.35	Horizontal
4	31.073	-88.28	38.60	-49.68	-13.00	-36.68	Vertical
5	502.247	-84.80	43.49	-41.31	-13.00	-28.31	Vertical
6	992.997	-86.20	52.79	-33.41	-13.00	-20.41	Vertical

LTE Band 12_ 10 MHz_ QPSK_ Above 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	1408.000	-67.20	3.39	-63.81	-13.00	-50.81	Horizontal
2	2112.000	-70.31	7.64	-62.67	-13.00	-49.67	Horizontal
3	1408.000	-68.01	2.62	-65.39	-13.00	-52.39	Vertical
4	2112.000	-71.26	7.16	-64.10	-13.00	-51.10	Vertical
Middle Channel							
1	1415.000	-69.29	3.40	-65.89	-13.00	-52.89	Horizontal
2	2122.500	-74.05	7.68	-66.37	-13.00	-53.37	Horizontal
3	1415.000	-67.61	2.62	-64.99	-13.00	-51.99	Vertical
4	2122.500	-73.61	7.21	-66.40	-13.00	-53.40	Vertical
Highest Channel							
1	1422.000	-69.16	3.41	-65.75	-13.00	-52.75	Horizontal
2	2133.000	-72.47	7.74	-64.73	-13.00	-51.73	Horizontal
3	1422.000	-68.56	2.62	-65.94	-13.00	-52.94	Vertical
4	2133.000	-72.71	7.26	-65.45	-13.00	-52.45	Vertical

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5.8.6 LTE Band 17

LTE Band 17_ 10 MHz_ QPSK_ Below 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	30.212	-90.19	38.61	-51.58	-13.00	-38.58	Horizontal
2	240.144	-82.97	36.38	-46.59	-13.00	-33.59	Horizontal
3	1000.000	-87.20	53.15	-34.05	-13.00	-21.05	Horizontal
4	41.158	-80.67	32.10	-48.57	-13.00	-35.57	Vertical
5	222.281	-89.61	35.32	-54.29	-13.00	-41.29	Vertical
6	442.572	-88.20	41.50	-46.70	-13.00	-33.70	Vertical
Middle Channel							
1	30.212	-90.19	38.61	-51.58	-13.00	-38.58	Horizontal
2	159.759	-83.75	33.24	-50.51	-13.00	-37.51	Horizontal
3	240.144	-81.19	36.38	-44.81	-13.00	-31.81	Horizontal
4	30.000	-86.25	39.35	-46.90	-13.00	-33.90	Vertical
5	132.149	-87.33	32.72	-54.61	-13.00	-41.61	Vertical
6	952.000	-86.86	51.61	-35.25	-13.00	-22.25	Vertical
Highest Channel							
1	30.855	-90.14	38.21	-51.93	-13.00	-38.93	Horizontal
2	240.144	-84.52	36.38	-48.14	-13.00	-35.14	Horizontal
3	620.117	-87.72	46.06	-41.66	-13.00	-28.66	Horizontal
4	30.212	-88.51	39.20	-49.31	-13.00	-36.31	Vertical
5	130.305	-87.64	32.73	-54.91	-13.00	-41.91	Vertical
6	502.247	-83.94	43.49	-40.45	-13.00	-27.45	Vertical

LTE Band 17_ 10 MHz_ QPSK_ Above 1G							
No.	Frequency	SA Reading	Correction factor	EIRP Result	Limit	Margin	Ant. Pol.
	(MHz)	(dBm)	(dB/m)	(dBm)	(dBm)	(dB)	
Lowest Channel							
1	1418.000	-68.72	3.40	-65.32	-13.00	-52.32	Horizontal
2	2127.000	-72.14	7.70	-64.44	-13.00	-51.44	Horizontal
3	1418.000	-68.49	2.62	-65.87	-13.00	-52.87	Vertical
4	2127.000	-72.03	7.22	-64.81	-13.00	-51.81	Vertical
Middle Channel							
1	1420.000	-70.66	3.40	-67.26	-13.00	-54.26	Horizontal
2	2130.000	-75.41	7.71	-67.70	-13.00	-54.70	Horizontal
3	1420.000	-68.86	2.61	-66.25	-13.00	-53.25	Vertical
4	2130.000	-72.31	7.24	-65.07	-13.00	-52.07	Vertical
Highest Channel							
1	1422.000	-70.01	3.41	-66.60	-13.00	-53.60	Horizontal
2	2133.000	-75.34	7.74	-67.60	-13.00	-54.60	Horizontal
3	1422.000	-69.28	2.62	-66.66	-13.00	-53.66	Vertical
4	2133.000	-73.52	7.26	-66.26	-13.00	-53.26	Vertical

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Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. All the above radiation data, the fundamental frequency is not marked, it may exceed the limit, please ignore it.



5.9 FREQUENCY STABILITY

Test Requirement: FCC 47 CFR Part 2.1055 &
 FCC 47 CFR Part 22.355 &
 FCC 47 CFR Part 24.235 &
 FCC 47 CFR Part 27.54,

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limits:

FCC 47 CFR Part 22.355, FCC 47 CFR Par 90.213

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

- 1) Use CMW 500 or CMU 200 with Frequency Error measurement capability.
 - a) Temp. = -30° to $+50^{\circ}\text{C}$
 - b) Voltage = low voltage, 3.6 Vdc, Normal, 3.85 Vdc and High voltage, 4.3 Vdc.

2) Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

Equipment Used: Refer to section 3 for details.

Test Result: Pass

5.9.1 LTE Band 2

Modulation	Channel/ Frequency (MHz)	Voltage	Temperature	Deviation	Deviation	Limit	Pass/ Fail
		(Vdc)	($^{\circ}\text{C}$)	(Hz)	(ppm)	(ppm)	
LTE Band 2 / 20MHz / Full RB							
QPSK	18900 / 1880.0	VL	TN	27	0.0144	N/A	Pass
		VN		24	0.0128		Pass
		VH		26	0.0138		Pass
		VN	50	31	0.0165		Pass
			40	27	0.0144		Pass
			30	31	0.0165		Pass
			20	33	0.0176		Pass
			10	24	0.0128		Pass
			0	33	0.0176		Pass
			-10	28	0.0149		Pass
			-20	35	0.0186		Pass
			-30	31	0.0165		Pass

5.9.2 LTE Band 4

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Pass/ Fail
LTE Band 4 / 20MHz / Full RB							
QPSK	20175 / 1732.5	VL	TN	24	0.0139	N/A	Pass
		VN		27	0.0156		Pass
		VH		33	0.0190		Pass
		VN	50	32	0.0185		Pass
			40	29	0.0167		Pass
			30	25	0.0144		Pass
			20	31	0.0179		Pass
			10	24	0.0139		Pass
			0	33	0.0190		Pass
			-10	28	0.0162		Pass
			-20	23	0.0133		Pass
			-30	31	0.0179		Pass

5.9.3 LTE Band 5

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 5 / 10MHz / Full RB							
QPSK	20525 / 836.5	VL	TN	23	0.0275	± 2.5	Pass
		VN		21	0.0251	± 2.5	Pass
		VH		21	0.0251	± 2.5	Pass
		VN	50	27	0.0323	± 2.5	Pass
			40	25	0.0299	± 2.5	Pass
			30	21	0.0251	± 2.5	Pass
			20	19	0.0227	± 2.5	Pass
			10	23	0.0275	± 2.5	Pass
			0	17	0.0203	± 2.5	Pass
			-10	26	0.0311	± 2.5	Pass
			-20	23	0.0275	± 2.5	Pass
			-30	21	0.0251	± 2.5	Pass

5.9.4 LTE Band 7

Modulation	Channel/ Frequency (MHz)	Voltage	Temperature	Deviation	Deviation	Limit	Result
		(Vdc)	(°C)	(Hz)	(ppm)	(ppm)	
LTE Band 7 / 20MHz / Full RB							
QPSK	21100 / 2535	VL	TN	26	0.0103	N/A	Pass
		VN		31	0.0122		Pass
		VH		29	0.0114		Pass
		VN	50	38	0.0150		Pass
			40	33	0.0130		Pass
			30	33	0.0130		Pass
			20	33	0.0130		Pass
			10	28	0.0110		Pass
			0	21	0.0083		Pass
			-10	23	0.0091		Pass
			-20	28	0.0110		Pass
			-30	34	0.0134		Pass

5.9.5 LTE Band 12

Modulation	Channel/ Frequency (MHz)	Voltage	Temperature	Deviation	Deviation	Limit	Result
		(Vdc)	(°C)	(Hz)	(ppm)	(ppm)	
LTE Band 12 / 10MHz / Full RB							
QPSK	23095 / 707.5	VL	TN	28	0.0396	N/A	Pass
		VN		22	0.0311		Pass
		VH		25	0.0353		Pass
		VN	50	31	0.0438		Pass
			40	32	0.0452		Pass
			30	26	0.0367		Pass
			20	26	0.0367		Pass
			10	28	0.0396		Pass
			0	33	0.0466		Pass
			-10	29	0.0410		Pass
			-20	31	0.0438		Pass
			-30	26	0.0367		Pass

5.9.6 LTE Band 17

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 17 / 10MHz / Full RB							
QPSK	23790 / 710	VL	TN	-27	-0.0345	N/A	Pass
		VN		-32	-0.0409		Pass
		VH		-34	-0.0435		Pass
		VN	50	-26	-0.0332		Pass
			40	-31	-0.0396		Pass
			30	-33	-0.0422		Pass
			20	-24	-0.0307		Pass
			10	-33	-0.0422		Pass
			0	-27	-0.0345		Pass
			-10	-32	-0.0409		Pass
			-20	-33	-0.0422		Pass
			-30	-24	-0.0307		Pass

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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