



- Ci	8	Low channel	- 61	8
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2487	V	-41.95	-13	-28.95
1658	V	-42.42	-13	-29.42
512.2	V	-46.56	-13	-33.56
365.5	V	-46.55	-13	-33.55
2487	Н	-40.45	-13	-27.45
1658	H	-40.14	-13	-27.14
521.1	Н	-44.92	-13	-31.92
336.5	Н	-44.74	-13	-31.74

LTE Band 5 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2509.5	V	-42.47	-13	-29.47
1673	V	-42.49	-13	-29.49
725.8	V	-47.13	-13	-34.13
616.6	V	-46.79	-13	-33.79
2509.5	Н	-40.93	-13	-27.93
1673	Н	-42.17	-13	-29.17
705.5	Н	-45.88	-13	-32.88
558.9	Н	-45.88	-13	-32.88

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2532	V	-40.66	-13	-27.66
1688	V	-39.53	-13	-26.53
648.3	V	-46.76	-13	-33.76
482.7	V	-46.29	-13	-33.29
2532	Н	-40.33	-13	-27.33
1688	Н	-40.42	-13	-27.42
785.6	Н	-45.72	-13	-32.72
615.7	Н	-48.58	-13	-35.58

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		Low onamici		
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2112.0	V	-43.04	-13	-30.04
1408	V	-41.87	-13	-28.87
658.1	V	-50.52	-13	-37.52
516.9	V	-50.10	-13	-37.10
2112	Н	-42.37	-13	-29.37
1408	Н	-41.38	-13	-28.38
714.4	Н	-49.28	-13	-36.28
669.5	H o	-48.86	-13	-35.86

LTE Band 12 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2122.5	V	-44.86	-13	-31.86
1415	V	-43.56	-13	-30.56
651.5	V	-48.29	-13	-35.29
512.7	V	-50.68	-13	-37.68
2122.5	Н	-42.94	-13	-29.94
1415	Н	-43.19	-13	-30.19
525.4	Н	-48.62	-13	-35.62
498.7	Н	-50.60	-13	-37.60

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2133	V	-44.33	-13	-31.33
1422	V	-43.80	-13	-30.80
653.3	V	-47.83	-13	-34.83
592.7	V	-48.55	-13	-35.55
2133	Н	-44.62	-13	-31.62
1422	Н	-44.62	-13	-31.62
641.5	Н	-51.94	-13	-38.94
558.3	Н	-48.98	-13	-35.98

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		Low charmer		
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2338.5	V	-47.40	-13	-34.40
1559	V	-45.25	-13	-32.25
678.2	V	-48.33	-13	-35.33
423.6	V	-51.88	-13	-38.88
2338.5	H ®	-45.30	-13	-32.30
1559	Н	-44.65	-13	-31.65
577.3	Н	-52.83	-13	-39.83
345.9	Н	-49.02	-13	-36.02

LTE Band 13 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2346	V	-46.08	-13	-33.08
1564	V	-45.62	-13	-32.62
611.7	V	-51.69	-13	-38.69
444,8	V	-52.16	-13	-39.16
2346	Н	-43.83	-13	-30.83
1564	Н	-45.50	-13	-32.50
692.8	Н	-48.27	-13	-35.27
439.4	Н	-51.83	-13	-38.83

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2353.5	V	-45.52	-13	-32.52
1569	V	-44.99	-13	-31.99
572.8	V	-49.38	-13	-36.38
309.9	V	-51.81	-13	-38.81
2353.5	Н	-44.05	-13	-31.05
1569	Н	-43.18	-13	-30.18
602.7	Н	-49.80	-13	-36.80
413.6	Н	-49.55	-13	-36.55

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		Low channel		
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2371.5	V	-45.13	-13	-32.13
1581	V	-46.69	-13	-33.69
577.9	V	-48.13	-13	-35.13
415.6.6	V	-50.24	-13	-37.24
2371.5	Н	-44.36	-13	-31.36
1581	Н	-44.58	-13	-31.58
699.2	Н	-51.83	-13	-38.83
514.7	Н	-48.48	-13	-35.48

LTE Band 14 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2379	V	-45.97	-13	-32.97
1586	V	-45.31	-13	-32.31
611.7	V	-50.02	-13	-37.02
444,8	V	-51.49	-13	-38.49
2379	Н	-44.46	-13	-31.46
1586	Н	-44.18	-13	-31.18
692.8	Н	-47.73	-13	-34.73
439.4	Н	-52.30	-13	-39.30

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2386.5	V	-46.80	-13	-33.80
1591	V	-45.32	-13	-32.32
572.8	V	-49.36	-13	-36.36
309.9	V	-50.87	-13	-37.87
2386.6	Н	-42.66	-13	-29.66
1591	Н	-43.99	-13	-30.99
602.7	н	-51.71	-13	-38.71
413.6	Н	-49.45	-13	-36.45

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Operating Frequency (MHz)	Measured Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm/MHz)	Margin (dB)
779.5	1559	V	-43.53	-40	-3.53
782.0	1564	V	-44.94	-40	-4.94
784.5	1569	V	-42.38	-40	-2.38
779.5	1559	Н	-44.14	-40	-4.14
782.0	1564	Н	-45.09	-40 💿	-5.09
784.5	1569	В	-43.55	-40	-3.55

LTE Band 13 (1559 MHz ~ 1610 MHz Wideband Band)

LTE Band 14 (1559 MHz ~ 1610 MHz Wideband Band)

Operating Frequency (MHz)	Measured Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm/MHz)	Margin (dB)
790.5	1581	V	-44.31	-40	-4.31
793.0	1586	V	-44.29	-40	-4.29
795.5	1591	V	-42.22	-40	-2.22
790.5	1581	СН	-43.60	-40	-3.60
793.0	1586	н	-42.96	-40	-2.96
795.5	1591	Н	-43.22	-40	-3.22

Note: The spurious emissions found in the frequency band 1559-1610MHz meet the stricter Wideband limits.

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		Low channel		
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5132.1	V	-44.52	-13	-31.52
3421.4	V	-42.08	-13	-29.08
698.3	V	-47.56	-13	-34.56
417.5	V	-49.17	-13	-36.17
5132.1	Н	-43.07	-13	-30.07
3421.4	НС	-43.78	-13	-30.78
504.9	Н	-51.05	-13	-38.05
431.9	Н	-47.80	-13	-34.80

LTE Band 66 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5235	V	-42.86	-13	-29.86
3490	V	-43.31	-13	-30.31
578.2	V	-48.77	-13	-35.77
345.7	V	-50.13	-13	-37.13
5235	Н	-43.25	-13	-30.25
3490	Н	-42.20	-13	-29.20
634.8	Н	-46.74	-13	-33.74
412.9	Н	-51.59	-13	-38.59

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5337.9	V	-41.93	-13	-28.93
3558.6	V	-41.31	-13	-28.31
752.6	V	-47.02	-13	-34.02
546.1	V	-49.03	-13	-36.03
5337.9	Н	-43.00	-13	-30.00
3558.6	Н	-41.25	-13	-28.25
687.3	Н	-48.40	-13	-35.40
436.6	Н	-47.28	-13	-34.28

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		Low channel		
Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1996.5	V	-42.09	-13	-29.09
1331	V	-42.93	-13	-29.93
511.2	V	-45.35	-13	-32.35
375.4	V	-48.59	-13	-35.59
1996.5	H $_{\odot}$	-42.58	-13	-29.58
1331	Н	-43.07	-13	-30.07
577.1	Н	-51.83	-13	-38.83
309.6	H 🔊	-48.26	-13	-35.26

LTE Band 71 Low channel

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2041.5	V	-43.35	-13	-30.35
1361	V	-43.62	-13	-30.62
515.1	V	-49.43	-13	-36.43
345.7	V	-51.10	-13	-38.10
2041.5	Н	-43.65	-13	-30.65
1361	Н	-43.22	-13	-30.22
564.5	Н	-46.92	-13	-33.92
315.9	Н	-52.32	-13	-39.32

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2086.5	V o	-41.29	-13	-28.29
1391	V	-41.21	-13	-28.21
546.6	V	-47.35	-13	-34.35
345.1	V	-50.07	-13	-37.07
2086.5	Н	-42.41	-13	-29.41
1391	Н	-41.71	-13	-28.71
534.2	Н	-49.33	-13	-36.33
322.9	Н	-48.08	-13	-35.08

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Note: 1. Margin (dB) = Emission Level(dBm) -Limit(dBm)

Emission Level(dBm)= Measurement Reading(dBm)+Factor(dB)

Factor(dB) = ANT Gain -Cable Loss + Power Splitter

- 2. The test refers to the value of Factor, please refer to the results listed in the test method in this section of the report.
- 3. Radiated Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0.
- 4. Below 30MHz, no spurious emission was found, and only the worst mode data above 30MHz is recorded in the report.

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12. FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

12.1 PROVISIONS APPLICABLE

12.1.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is varied from -20°C to +50°C in 10°C increments using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

12.1.2 For equipment powered by primary supply voltage

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -20°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

12.2 MEASUREMENT METHOD

- In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.
- 1 Measure the carrier frequency at room temperature.
- Subject the EUT to overnight soak at -20 $^{\circ}$ C. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
- 3 Repeat the above measurements at 10° C increments from -20° C to $+50^{\circ}$ C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

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5 Subject the EUT to overnight soak at $+50^{\circ}$ C.

6 With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 Repeat the above measurements at 10° C increments from $+50^{\circ}$ C to -20° C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 At all temperature levels hold the temperature to +/- 0.5 °C during the measurement procedure.

12.3 MEASUREMENT SETUP



12.4 MEASUREMENT RESULT

LTE Band 2

Middle Channel, fo = 1880 MHz					
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)		
-20	©	-7.28	-0.003934		
-10	C °	-5.78	-0.003123		
0	0.70	-8.96	-0.004841		
10		-7.81	-0.004154		
20	3.70	-8.97	-0.004771		
30	e.C	-7.42	-0.003947		
40	NO	3.28	0.001718		
50		-3.22	-0.001686		
05	4.20	5.66	0.002964		
25	3.15	-5.19	-0.002804		

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the

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-C	8	LTE Band 4	e.G	0		
	Middle Channel, fo = 1732.5 MHz					
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Temperature (℃)		
-20		-2.73	-0.001596	±2.5		
-10		6.02	0.003519	±2.5		
0		3.30	0.001929	±2.5		
10	2 70	-3.78	-0.002182	±2.5		
20	3.70	-3.25	-0.001876	±2.5		
30		5.42	0.003128	±2.5		
40		-5.85	-0.003335	±2.5		
50		-5.52	-0.003147	±2.5		
25	4.20	-5.06	-0.002884	±2.5		
25	3.15	-3.28	-0.001917	±2.5		

device is detemined to remain operating in band over the temperature and voltage range as tested.

LTE Band 5

Middle Channel, fo = 836.5 MHz				
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Temperature (℃)
-20		-3.22	-0.003904	±2.5
-10	0	-4.59	-0.005566	0
0	3.70	-2.46	-0.002983	±2.5
10		-4.09	-0.004889	±2.5
20		-3.19	-0.003814	±2.5
30		-4.56	-0.005451	±2.5
40		-1.85	-0.002181	±2.5
50		2.33	0.002747	
05	4.20	-1.87	-0.002204	±2.5
25	3.15	-3.22	-0.003904	±2.5

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Middle Channel, fo = 707.5 MHz					
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)		
-20		-2.15	-0.003073		
-10	3.70	-3.10	-0.004430		
0		-2.83	-0.004045		
10		-3.48	-0.004919		
20		-2.75	-0.003887		
30		-2.76	-0.003901		
40		-4.29	-0.005997		
50		-3.36	-0.004697		
25	4.20	-3.38	-0.004725		
	3.15	-2.98	-0.004259		

LTE Band 12

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

TE Band 13

		- Danu 15	
	Middle Chan	nel, fo = 782.0MHz	
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20		-3.82	-0.004901
-10		-3.65	-0.004682
0		-2.55	-0.003271
10		-3.52	-0.004501
20	3.70	-2.90	-0.003708
30		-3.16	-0.004041
40		-2.36	-0.003008
50		1.79	0.002282
6	4.20	1.80	0.002294
25	3 15	-3.28	-0.004208

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Middle Channel, fo = 793.0MHz									
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)						
-20		-4.19	-0.005300						
-10		-4.71	-0.005958						
0	G aG	-3.68	-0.004655						
10	0.70	-3.00	-0.003783						
20	3.70	-1.73	-0.002182						
30		2.12	0.002673						
40		-2.26	-0.002841						
50		-2.36	-0.002967						
25	4.20	1.47	0.001848						
	3.15	-5.26	-0.006654						

LTE Band 14

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

		- Ballu 00	
	Middle Chanr	nel, fo = 1745.0MHz	
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20		4.39	0.002566
-10		6.25	0.003653
0	6	5.04	0.002946
10		-7.54	-0.004321
20	3.70	-4.75	-0.002722
30		-9.51	-0.005450
40		-3.91	-0.002197
50		4.31	0.002422
0	4.20	6.29	0.003535
25	3 15	4.02	0.002350

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Middle Channel for = 680 5MHz								
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)					
-20		1.93	0.002900					
-10	0	-1.86	-0.002795					
0	6 20	-2.60	-0.003907					
10	0.70	2.29	0.003365					
20	3.70	-3.35	-0.004923					
30		-2.12	-0.003115					
40		-2.07	-0.002976					
50		-5.41	-0.007779					
25	4.20	-2.80	-0.004026					
	3.15	-2.88	-0.004328					

LTE Band 71

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

- **Note:**1. The device under test maintains the minimum and maximum operating temperature and the required limit voltage according to the manufacturer's requirements.
 - 2. Only the worst working mode data is recorded in the report.

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13. OCCUPIED BANDWIDTH

13.1 PROVISIONS APPLICABLE

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission. The EUT makes a call to the communication simulator.

The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

13.2 MEASUREMENT METHOD

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within 1 5% of the 99% occupied bandwidth observed in Step 7

13.3 MEASUREMENT SETUP



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13.4 MEASUREMENT RESULT

				LIE Band Z		
			Channel Ba	ndwidth: 1.4 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict
	LCH	6	0	1.0911	1.266	PASS
QPSK	MCH	6	0	1.0922	1.268	PASS
60 -	НСН	6	0	1.0908	1.275	PASS
16QAM	LCH	6	0	1.0911	1.268	PASS
	MCH	6	0	1.0875	1.276	PASS
	HCH	6	0	1.0898	1.254	PASS

Channel Bandwidth: 3 MHz										
		RB Conf	iguration	Occupied	-26dB					
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict				
		5126	Oliset	(MHz)	(MHz)					
60	LCH	15	0	2.6889	2.890	PASS				
QPSK	MCH	15	0	2.6977	2.921	PASS				
C	HCH	15	0	2.6955	2.900	PASS				
16QAM	LCH	15	0	2.6884	2.918	PASS				
	MCH	15	0	2.6917	2.926	PASS				
	HCH	15	0	2.6938	2.907	PASS				

			Channel E	Bandwidth: 5 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict
0	LCH	25	0	4.5035	4.904	PASS
QPSK	MCH	25	0	4.4986	4.875	PASS
	НСН	25	0	4.5034	4.867	PASS
	LCH	25	0	4.5069	4.854	PASS
16QAM	MCH	25	0	4.4977	4.907	PASS
^C	HCH	25	0	4.5103	4.863	PASS

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Channel Bandwidth: 10 MHz										
		RB Confi	guration	Occupied	-26dB					
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict				
		3126	Oliset	(MHz)	(MHz)					
	LCH	50	0	8.9636	9.563	PASS				
QPSK	MCH	50	0	8.9699	9.533	PASS				
6	HCH	50	0	8.9355	9.530	PASS				
	LCH	50	0	8.9585	9.568	PASS				
16QAM	MCH	50	0	8.9591	9.530	PASS				
0	HCH	50	0	8.9322	9.488	PASS				

Channel Bandwidth: 15 MHz										
		RB Conf	iguration	Occupied	-26dB					
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict				
®	LCH	75	0	13.442	14.26	PASS				
QPSK	MCH	75	0	13.421	14.26	PASS				
	HCH	75	0	13.376	14.19	PASS				
0	LCH	75	0	13.452	14.26	PASS				
16QAM	MCH	75	0	13.419	14.23	PASS				
S	HCH	75	0	13.369	14.23	PASS				

			Channel Ba	andwidth: 20 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict
		0120	Onoot	(MHz)	(MHz)	
	LCH	100	0	17.913	18.97	PASS
QPSK	MCH	100	0	17.871	18.95	PASS
C)	HCH	100	0	17.824	18.90	PASS
16QAM	LCH	100	0	17.912	18.95	PASS
	MCH	100	0	17.880	18.92	PASS
8	HCH	100	0	17.821	18.91	PASS

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Channel Bandwidth: 1.4 MHz											
		RB Confi	iguration	Occupied	-26dB						
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict					
		3126	Oliset	(MHz)	(MHz)						
0	LCH	6	0	1.0900	1.258	PASS					
QPSK	MCH	6	0	1.0929	1.259	PASS					
G	HCH	6	0	1.0927	1.252	PASS					
	LCH	6	0	1.0898	1.268	PASS					
16QAM	MCH	6	0	1.0886	1.264	PASS					
0	HCH	6	0	1.0927	1.261	PASS					

LTE Band 4

Channel Bandwidth: 3 MHz										
		RB Conf	iguration	Occupied	-26dB					
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict				
		5120	Oliset	(MHz)	(MHz)					
©	LCH	15	0	2.6937	2.902	PASS				
QPSK	MCH	15	0	2.6937	2.921	PASS				
	HCH	15	0	2.6985	2.913	PASS				
0	LCH	15	0	2.6956	2.910	PASS				
16QAM	MCH	15	0	2.6888	2.918	PASS				
	HCH	15	0	2.6931	2.934	PASS				

			Channel Ba	andwidth: 5 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict
				(MHz)	(MHz)	
	LCH	25	0	4.5016	4.896	PASS
QPSK	MCH	25	0	4.5014	4.918	PASS
S	HCH	25	0	4.4995	4.878	PASS
16QAM	LCH	25	0	4.5056	4.869	PASS
	MCH	25	0	4.5034	4.868	PASS
	HCH	25	0	4.5014	4.892	PASS

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Channel Bandwidth: 10 MHz								
		RB Confi	guration	Occupied	-26dB			
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict		
		3126	Oliset	(MHz)	(MHz)			
	LCH	50	0	8.9844	9.550	PASS		
QPSK	MCH	50	0	8.9674	9.560	PASS		
8	HCH	50	0	8.9517	9.528	PASS		
GU ,	LCH	50	0	8.9675	9.538	PASS		
16QAM	MCH	50	0	8.9484	9.540	PASS		
0	HCH	50	0	8.9622	9.535	PASS		

Channel Bandwidth: 15 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict		
®	LCH	75	0	13.469	14.27	PASS		
QPSK	MCH	75	0	13.421	14.26	PASS		
	HCH	75	0	13.442	14.25	PASS		
8	LCH	75	0	13.455	14.27	PASS		
16QAM	MCH	75	0	13.419	14.27	PASS		
	HCH	75	0	13.434	14.28	PASS		

			Channel Ba	andwidth: 20 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict
		0120	Chicot	(MHz)	(MHz)	
	LCH	100	0	17.905	18.94	PASS
QPSK	MCH	100	0	17.890	18.96	PASS
C	HCH	100	0	17.917	18.99	PASS
16QAM	LCH	100	0	17.903	18.94	PASS
	MCH	100	0	17.876	18.93	PASS
	HCH	100	0	17.919	18.96	PASS

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	3)				(8)				
Channel Bandwidth: 1.4 MHz									
		RB Confi	iguration	Occupied	-26dB				
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict			
		0126	Oliset	(MHz)	(MHz)				
	LCH	6	0	1.0900	1.257	PASS			
QPSK	MCH	6	0	1.0901	1.259	PASS			
G	HCH	6	0	1.0932	1.255	PASS			
	LCH	6	0	1.0904	1.259	PASS			
16QAM	MCH	6	0	1.0919	1.264	PASS			
	HCH	6	0	1.0883	1.267	PASS			

LTE Band 5

Channel Bandwidth: 3 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict		
		5126	Onset	(MHz)	(MHz)			
^I C	LCH	15	0	2.6945	2.906	PASS		
QPSK	MCH	15	0	2.6937	2.890	PASS		
	HCH	15	0	2.6965	2.905	PASS		
8	LCH	15	0	2.6916	2.903	PASS		
16QAM	MCH	15	0	2.6910	2.928	PASS		
	НСН	15	0	2.6954	2.905	PASS		

Channel Bandwidth: 5 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict		
-0	LCH	25	0	4.4972	4.865	PASS		
QPSK	MCH	25	0	4.4996	4.900	PASS		
8	HCH	25	0	4.5036	4.873	PASS		
16QAM	LCH	25	0	4.4992	4.853	PASS		
	MCH	25	0	4.5016	4.849	PASS		
	HCH	25	0	4.5044	4.897	PASS		

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Channel Bandwidth: 10 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict		
0	LCH	50	0	8.9885	9.548	PASS		
QPSK	MCH	50	0	8.9593	9.534	PASS		
0	HCH	50	0	8.9618	9.529	PASS		
60	LCH	50	0	8.9649	9.517	PASS		
16QAM	MCH	50	0	8.9588	9.517	PASS		
8	HCH	50	0	8.9595	9.551	PASS		

LTE Band 12

Channel Bandwidth: 1.4 MHz									
		RB Conf	iguration	Occupied	-26dB				
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict			
0	LCH	6	0	1.0890	1.258	PASS			
QPSK	MCH	6	0	1.0913	1.255	PASS			
	НСН	6	0	1.0916	1.242	PASS			
8	LCH	6	0	1.0897	1.275	PASS			
16QAM	MCH	6	0	1.0924	1.269	PASS			
	HCH	6	0	1.0927	1.269	PASS			

Channel Bandwidth: 3 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Sizo	Offset	Bandwidth	Bandwidth	Verdict		
		Size	Oliset	(MHz)	(MHz)			
	LCH	15	0	2.6925	2.926	PASS		
QPSK	MCH	15	0	2.6957	2.913	PASS		
C	HCH	15	0	2.6987	2.904	PASS		
16QAM	LCH	15	0	2.6870	2.914	PASS		
	MCH	15	0 💿	2.6931	2.925	PASS		
	HCH	15	0	2.7011	2.909	PASS		

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Channel Bandwidth: 5 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict		
		3126	Oliset	(MHz)	(MHz)			
	LCH	25	0	4.4936	4.886	PASS		
QPSK	MCH	25	0	4.4974	4.868	PASS		
6	HCH	25	0	4.5078	4.858	PASS		
GU ,	LCH	25	0	4.4982	4.862	PASS		
16QAM	MCH	25	0	4.4922	4.879	PASS		
0	HCH	25	0	4.5087	4.890	PASS		

Channel Bandwidth: 10 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Sizo	Offset	Bandwidth	Bandwidth	Verdict		
		5126	Oliset	(MHz)	(MHz)			
	LCH	50	0	8.9399	9.522	PASS		
QPSK	MCH	50	0	8.9435	9.510	PASS		
GO .	HCH	50	0	8.9329	9.518	PASS		
16QAM	LCH	50	0	8.9317	9.496	PASS		
	MCH	50	0	8.9338	9.527	PASS		
	HCH	50	0	8.9349	9.506	PASS		

LTE Band 13

Channel Bandwidth: 5 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict		
		0120	01301	(MHz)	(MHz)			
C. O	LCH	25	0	4.4981	4.880	PASS		
QPSK	MCH	25	0	4.4954	4.856	PASS		
œ.	HCH	25	0	4.5010	4.881	PASS		
16QAM	LCH	25	0	4.5013	4.862	PASS		
	MCH	25	0	4.5015	4.874	PASS		
	HCH	25	0 ©	4.5084	4.877	PASS		

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Channel Bandwidth: 10 MHz								
Modulation	Channel	RB Configuration		Occupied	-26dB			
		Size	Offset	Bandwidth	Bandwidth	Verdict		
				(MHz)	(MHz)			
QPSK	MCH	50	0	8.9537	9.541	PASS		
16QAM	MCH	50	0	8.9394	9.510	PASS		

LTE Band 14

Channel Bandwidth: 5 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offect	Bandwidth	Bandwidth	Verdict		
		Size	Oliset	(MHz)	(MHz)			
	LCH	25	0	4.4983	4.902	PASS		
QPSK	MCH	25	0	4.4962	4.861	PASS		
	HCH	25	0	4.5030	4.870	PASS		
	LCH	25	0	4.5014	4.862	PASS		
16QAM	MCH	25	0	4.4988	4.894	PASS		
	НСН	25	0	4.5054	4.892	PASS		

Channel Bandwidth: 10 MHz								
Modulation	Channel	RB Configuration		Occupied	-26dB			
		Size	Offset	Bandwidth	Bandwidth	Verdict		
				(MHz)	(MHz)			
QPSK	MCH	50	0	8.9389	9.539	PASS		
16QAM	MCH	50	0	8.9311	9.509	PASS		

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	3)				(8)				
Channel Bandwidth: 1.4 MHz									
		RB Confi	guration	Occupied	-26dB				
Modulation	Channel	Sizo	Offset	Bandwidth	Bandwidth	Verdict			
		0126	Oliset	(MHz)	(MHz)				
	LCH	6	0	1.0922	1.259	PASS			
QPSK	MCH	6	0	1.0906	1.262	PASS			
G	HCH	6	0	1.0906	1.264	PASS			
	LCH	6	0	1.0908	1.276	PASS			
16QAM	MCH	6	0	1.0892	1.266	PASS			
0	HCH	6	0	1.0931	1.269	PASS			

LTE Band 66

Channel Bandwidth: 3 MHz									
		RB Conf	iguration	Occupied	-26dB				
Modulation	Channel	Size	Offset	Bandwidth	Bandwidth	Verdict			
		5126	Oliset	(MHz)	(MHz)				
^I C	LCH	15	0	2.6977	2.891	PASS			
QPSK	MCH	15	0	2.6880	2.911	PASS			
	НСН	15	0	2.6968	2.932	PASS			
8	LCH	15	0	2.6876	2.895	PASS			
16QAM	MCH	15	0	2.6899	2.927	PASS			
S	HCH	15	0	2.6932	2.931	PASS			

Channel Bandwidth: 5 MHz								
		RB Confi	guration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict		
	LCH	25	0	4.5032	4.928	PASS		
QPSK	MCH	25	0	4.5038	4.901	PASS		
C)	HCH	25	0	4.4974	4.884	PASS		
S	LCH	25	0	4.5061	4.864	PASS		
16QAM	MCH	25	0 ◎	4.5066	4.880	PASS		
®	HCH	25	0	4.5063	4.883	PASS		

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Channel Bandwidth: 10 MHz									
		RB Confi	iguration	Occupied	-26dB				
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict			
		3126	Oliset	(MHz)	(MHz)				
	LCH	50	0	8.9814	9.555	PASS			
QPSK	MCH	50	0	8.9570	9.570	PASS			
8	HCH	50	0	8.9726	9.533	PASS			
	LCH	50	0	8.9720	9.541	PASS			
16QAM	MCH	50	0	8.9586	9.522	PASS			
0	HCH	50	0	8.9684	9.539	PASS			

Channel Bandwidth: 15 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict		
0	LCH	75	0	8.9814	9.555	PASS		
QPSK	MCH	75	0	8.9570	9.570	PASS		
	НСН	75	0	8.9726	9.533	PASS		
8	LCH	75	0	8.9720	9.541	PASS		
16QAM	MCH	75	0	8.9586	9.522	PASS		
S	HCH	75	0	8.9684	9.539	PASS		

			Channel Ba	ndwidth: 20 MHz		
		RB Conf	iguration	Occupied	-26dB	
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict
2.0	LCH	100	0	13.465	14.34	PASS
QPSK	MCH	100	0	13.456	14.32	PASS
S	HCH	100	0	13.445	14.29	PASS
16QAM	LCH	100	0	13.459	14.27	PASS
	MCH	100	0	13.441	14.26	PASS
	HCH	100	0	13.442	14.27	PASS

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Channel Bandwidth: 5 MHz									
		RB Confi	iguration	Occupied	-26dB				
Modulation	Channel	Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict			
200	LCH	25	0	4.4928	4.897	PASS			
QPSK	MCH	25	0	4.4894	4.841	PASS			
C	HCH	25	0	4.4953	4.878	PASS			
60	LCH	25	0	4.4990	4.884	PASS			
16QAM	MCH	25	0	4.4938	4.884	PASS			
0	HCH	25	0	4.4997	4.856	PASS			

LTE Band 71

Channel Bandwidth: 10 MHz								
		RB Conf	iguration	Occupied	-26dB			
Modulation	Channel	Sizo	Offect	Bandwidth	Bandwidth	Verdict		
		5126	Oliset	(MHz)	(MHz)			
	LCH	50	0	8.9693	9.556	PASS		
QPSK	MCH	50	0	8.9318	9.498	PASS		
GO	HCH	50	0	8.9601	9.537	PASS		
2	LCH	50	0	8.9447	9.549	PASS		
16QAM	MCH	50	0	8.9179	9.504	PASS		
	HCH	50	0	8.9475	9.548	PASS		

Channel Bandwidth: 15 MHz										
Modulation	Channel	RB Configuration		Occupied	-26dB					
		Size	Offset	Bandwidth	Bandwidth	Verdict				
				(MHz)	(MHz)					
QPSK	LCH	75	0	13.467	14.24	PASS				
	MCH	75	0	13.366	14.23	PASS				
	HCH	75	0	13.473	14.27	PASS				
16QAM	LCH	75	0	13.447	14.23	PASS				
	MCH	75	0	13.361	14.21	PASS				
	HCH	75	0	13.464	14.26	PASS				

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Channel Bandwidth: 20 MHz											
Modulation	Channel	RB Configuration		Occupied	-26dB						
		Size	Offset	Bandwidth (MHz)	Bandwidth (MHz)	Verdict					
QPSK	LCH	100	0	17.861	18.91	PASS					
	MCH	100	0	17.820	18.90	PASS					
	HCH	100	0	17.916	18.96	PASS					
16QAM	LCH	100	0	17.861	18.90	PASS					
	MCH	100	0	17.808	18.87	PASS					
	HCH	100	0	17.920	18.96	PASS					

Note: Please refers to Appendix B for compliance test plots for Occupied Bandwidth & Emission Bandwidth.

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14. BAND EDGE

14.1 PROVISIONS APPLICABLE

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

14.2 MEASUREMENT METHOD

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW > $3 \times RBW$
- 5. Detector = RMS
- 6. Number of sweep points \geq 2 x Span/RBW
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

TEST NOTE

§90.543(e)

1. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

2. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

3. On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

4. Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measure ment instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to i ndicate spectral energy in a 6.25 kHz segment.

5. Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwid th of 30kHz may be employed.

§27.53(m)

Equipment shall comply with the following unwanted emission limits:

a) for base station and fixed subscriber equipment, the power of any unwanted emissions

measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p

b) for mobile subscriber equipment, the power of any unwanted emissions measured as above

shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:40 + 10 log10 p from the channel

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edges to 5 MHz away 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and 55 + 10 log10 p at X MHz and beyond from the channel edges In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

According to FCC 22.917, 24.238, 27.53 specified that 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.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels(low and high operational frequency range.) The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

14.3 MEASUREMENT METHOD



14.4 MEASUREMENT RESULT

NOTE: Please refers to Appendix C for compliance test plots for band edge

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APPENDIX A TEST PLOTS FOR SPURIOUS EMISSIONS AT ANTENNA TERMINALS LTE BAND 2



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