

#### LTE band 26/5 (10 Mb – QPSK\_Full RB)

Low Channel



## LTE band 26/5 (10 Mb – QPSK\_1 RB)

Low Channel





#### LTE band 26/5 (10 Mz – QPSK\_Full RB)

High Channel



# LTE band 26/5 (10 Mb – QPSK\_1 RB)

**High Channel** 





#### LTE band 26 (15 Mb – QPSK\_Full RB)

Low Channel



## LTE band 26 (15 Mb – QPSK\_1 RB)

Low Channel





#### LTE band 26 (15 Mb – QPSK\_Full RB)

High Channel



# LTE band 26 (15 Mb – QPSK\_1 RB)

**High Channel** 





## LTE band 41 (5 Mb – QPSK\_Full RB)

Low Channel



# LTE band 41 (5 Mb – QPSK\_1 RB)

Low Channel



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## LTE band 41 (5 Mb – QPSK\_Full RB)

High Channel



## LTE band 41 (5 Mb – QPSK\_1 RB)

**High Channel** 





### LTE band 41 (10 Mb – QPSK\_Full RB)

Low Channel



# LTE band 41 (10 Mb – QPSK\_1 RB)

Low Channel





### LTE band 41 (10 Mb – QPSK\_Full RB)

High Channel



# LTE band 41 (10 Mb – QPSK\_1 RB)

**High Channel** 





# LTE band 41 (15 Mb – QPSK\_Full RB)

Low Channel



## LTE band 41 (15 Mb – QPSK\_1 RB)

Low Channel

Ref Level     25.00 dB       SGL Count     100/100       1 AvgPwr     20 dbineSPURIOUS       10 dBm	n M	PASS PASS				
1 AvgPwr 20 dbm	S_LINE_ABS_	PASS PASS				
20 dbm	S_LINE_ABS_	PASS PASS				
10 dBm 0 dBm -10 dBm -20 dBm	S_LINE_ABS_	PASS				
10 dBm						
-10 dBm						
0 dBm						
-10 dBm			╪╢			
-10 dBm			╪╢╷			
-20 dBm					1 1	
-20 dBm					1 1	
				٨	h h	
SPURIOUS LINE ABS		9			1 11	
-30 uBIII	Δ.	an Antifi Id		4 11 11		
-40 dBm	and the second second	www.www.level	III Mala	humbered he	on spontherman have	for an and the fortunes to make a
10 dbiii			·**			
-50 dBm			_			
-60 dBm						
-70 dBm						
Start 2.47 GHz		40	04 pts			Stop 2.52 GHz
Spurious Emissions						
Range Low	Range Up	RBW	Freque	ncy	Power Abs	∆Limit
2.470 GHz	2.490 GHz	300.000 kHz	2.48	352 GHz	-32.16 dBm	-7.16 dB
2.490 GHz	2.495 GHz	300.000 kHz	2.49	421 GHz	-28.48 dBm	-15.48 dB
2.495 GHz	2.496 GHz	200.000 kHz	2.49	588 GHz	-23.37 dBm	-10.37 dB
2.496 GHz	2.520 GHz	300.000 kHz	2.49	680 GHz	18.40 dBm	-11.60 dB



### LTE band 41 (15 Mb – QPSK\_Full RB)

High Channel



# LTE band 41 (15 Mb – QPSK\_1 RB)

**High Channel** 





#### LTE band 41 (20 Mb – QPSK\_Full RB)

Low Channel



## LTE band 41 (20 Mb – QPSK\_1 RB)

Low Channel





### LTE band 41 (20 Mb – QPSK\_Full RB)

High Channel



# LTE band 41 (20 Mb – QPSK\_1 RB)

**High Channel** 





### LTE band 66/4 (1.4 Mb – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (1.4 Mb – QPSK\_1 RB)

Low Channel



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### LTE band 66/4 (1.4 Mb – QPSK\_Full RB)

High Channel



# LTE band 66/4 (1.4 Mb – QPSK\_1 RB)

**High Channel** 



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#### LTE band 66/4 (3 Mb – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (3 Mz – QPSK\_1 RB)

Low Channel



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#### LTE band 66/4 (3 Mb – QPSK\_Full RB)

High Channel



## LTE band 66/4 (3 Mz – QPSK\_1 RB)

High Channel



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#### LTE band 66/4 (5 Mb – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (5 Mz – QPSK\_1 RB)

Low Channel



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#### LTE band 66/4 (5 Mb – QPSK\_Full RB)

High Channel



## LTE band 66/4 (5 Mz – QPSK\_1 RB)

High Channel



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#### LTE band 66/4 (10 Mb – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (10 Mb – QPSK\_1 RB)

Low Channel





#### LTE band 66/4 (10 Mb – QPSK\_Full RB)

High Channel



# LTE band 66/4 (10 Mb – QPSK\_1 RB)

**High Channel** 





#### LTE band 66/4 (15 Mb – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (15 Mb – QPSK\_1 RB)

Low Channel



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#### LTE band 66/4 (15 Mb – QPSK\_Full RB)

High Channel



## LTE band 66/4 (15 Mb – QPSK\_1 RB)

**High Channel** 



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#### LTE band 66/4 (20 Mz – QPSK\_Full RB)

Low Channel



## LTE band 66/4 (20 Mb – QPSK\_1 RB)

Low Channel



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#### LTE band 66/4 (20 Mb – QPSK\_Full RB)

High Channel



# LTE band 66/4 (20 Mb – QPSK\_1 RB)

**High Channel** 



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#### LTE band 71 (5 Mb – QPSK\_Full RB)

Low Channel



## LTE band 71 (5 Mb – QPSK\_1 RB)

Low Channel





## LTE band 71 (5 Mb – QPSK\_Full RB)

High Channel



# LTE band 71 (5 Mb – QPSK\_1 RB)

**High Channel** 



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#### LTE band 71 (10 Mb – QPSK\_Full RB)

Low Channel



## LTE band 71 (10 Mb – QPSK\_1 RB)

Low Channel



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#### LTE band 71 (10 Mb – QPSK\_Full RB)

High Channel



# LTE band 71 (10 Mb – QPSK\_1 RB)

**High Channel** 





#### LTE band 71 (15 Mb – QPSK\_Full RB)

Low Channel



## LTE band 71 (15 Mb – QPSK\_1 RB)

Low Channel





### LTE band 71 (15 Mb – QPSK\_Full RB)

High Channel



# LTE band 71 (15 Mb – QPSK\_1 RB)

**High Channel** 

![](_page_29_Figure_8.jpeg)

![](_page_30_Picture_0.jpeg)

#### LTE band 71 (20 Mz – QPSK\_Full RB)

Low Channel

![](_page_30_Figure_5.jpeg)

# LTE band 71 (20 Mb – QPSK\_1 RB)

Low Channel

![](_page_30_Figure_8.jpeg)

![](_page_31_Picture_0.jpeg)

#### LTE band 71 (20 Mb – QPSK\_Full RB)

High Channel

![](_page_31_Figure_5.jpeg)

# LTE band 71 (20 Mb – QPSK\_1 RB)

**High Channel** 

![](_page_31_Figure_8.jpeg)

![](_page_32_Picture_0.jpeg)

Report Number: F690501/RF-RTL014054-1

# 7. Frequency Stability

# 7.1. Limit

- § 2.1055(a), § 2.1055(d) & following:

- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.

For Mobile devices operating in the 824 to 849  $M_{2}$  band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

- §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

- §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

# 7.2. Test Procedure

- 1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Mobile Test Unit via feed-through attenuators.
- 2. The EUT was placed inside the temperature chamber.
- 3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from Mobile Test Unit.

![](_page_32_Figure_14.jpeg)

![](_page_33_Picture_0.jpeg)

Report Number: F690501/RF-RTL014054-1

# 7.3. Test Results

Ambient temperature	:	(23	± 1) °C
Relative humidity	:	47	% R.H.

#### LTE band 12 at middle channel

Reference Frequency: 707.5 Mb				
Frequency Stability versus Temperature				
Environment Temperature (°C)	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
		Frequency Error (Hz)	ppm	
50		1	0.001 4	
40		-5	-0.007 1	
30		2	0.002 8	
23	3.8	-1	-0.001 4	
10		2	0.002 8	
0		-1	-0.001 4	
-10		3	0.004 2	
-20		2	0.002 8	
-30		-2	-0.002 8	
Frequency Stability versus Power Supply				
Environment	Power Supplied	Frequency Measure with Time Elapse		
(°C)	(V <sub>d.c</sub> )	Frequency Error (Hz)	ppm	
22	4.37	3	0.004 2	
23	3.23	-3	-0.004 2	

A4(210 mm × 297 mm)

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![](_page_34_Picture_0.jpeg)

### LTE band 25/2 at middle channel

Reference Frequency: 1 882.5 Mb				
Frequency Stability versus Temperature				
Environment Temperature (°C)	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
		Frequency Error (Hz)	ppm	
50		4	0.005 7	
40		-1	-0.001 4	
30		-3	-0.004 2	
23	3.8	5	0.007 1	
10		2	0.002 8	
0		-4	-0.005 7	
-10		-3	-0.004 2	
-20		5	0.007 1	
-30		-2	-0.002 8	
Frequency Stability versus Power Supply				
Environment Temperature	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
(°C)		Frequency Error (Hz)	ррт	
23	4.37	-3	-0.004 2	
23	3.23	4	0.005 7	

![](_page_35_Picture_0.jpeg)

# LTE band 26/5 at middle channel

Reference Frequency: 836.5 Mb				
Frequency Stability versus Temperature				
Environment Temperature (°C)	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
		Frequency Error (Hz)	ppm	
50		2	0.002 4	
40		-1	-0.001 2	
30		-4	-0.004 8	
23	3.8	3	0.003 6	
10		-2	-0.002 4	
0		4	0.004 8	
-10		5	0.006 0	
-20		2	0.002 4	
-30		-2	-0.002 4	
Frequency Stability versus Power Supply				
Environment Temperature	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
(°C)		Frequency Error (Hz)	ррт	
23	4.37	-3	-0.003 6	
23	3.23	-1	-0.001 2	

![](_page_36_Picture_0.jpeg)

# LTE band 41 at middle channel

Reference Frequency: 2593.0 Mz					
Frequency Stability versus Temperature					
Environment Temperature	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse			
(°C)		Frequency Error (Hz)	ppm		
50		2	0.000 8		
40		4	0.001 5		
30		-2	-0.000 8		
23	3.8	-2	-0.000 8		
10		4	0.001 5		
0		3	0.001 2		
-10		1	0.000 4		
-20		-5	-0.001 9		
-30		1	0.000 4		
	Frequency Stability versus Power Supply				
Environment Temperature	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse			
(°C)		Frequency Error (Hz)	ppm		
23	4.37	2	0.000 8		
23	3.23	-4	-0.001 5		

![](_page_37_Picture_0.jpeg)

# LTE band 66/4 at middle channel

Reference Frequency: 1745.0 Mz				
Frequency Stability versus Temperature				
Environment Temperature (°C)	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
		Frequency Error (Hz)	ppm	
50		-3	-0.001 7	
40		-2	-0.001 1	
30		5	0.002 9	
23	3.8	1	0.000 6	
10		-4	-0.002 3	
0		2	0.001 1	
-10		-2	-0.001 1	
-20		4	0.002 3	
-30		1	0.000 6	
Frequency Stability versus Power Supply				
Environment Temperature	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
(°C)		Frequency Error (Hz)	ppm	
23	4.37	4	0.002 3	
23	3.23	1	0.000 6	

![](_page_38_Picture_0.jpeg)

# LTE band 71 at middle channel

Reference Frequency: 680.5 Mb				
Frequency Stability versus Temperature				
Environment Temperature (°C)	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
		Frequency Error (Hz)	ppm	
50		-3	-0.004 4	
40		4	0.005 9	
30		2	0.002 9	
23	3.8	-2	-0.002 9	
10		-1	-0.001 5	
0		4	0.005 9	
-10		2	0.002 9	
-20		-3	-0.004 4	
-30		3	0.004 4	
Frequency Stability versus Power Supply				
Environment	Power Supplied (V <sub>d.c</sub> )	Frequency Measure with Time Elapse		
(°C)		Frequency Error (Hz)	ppm	
23	4.37	3	0.004 4	
23	3.23	-2	-0.002 9	

# - End of the Test Report -

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