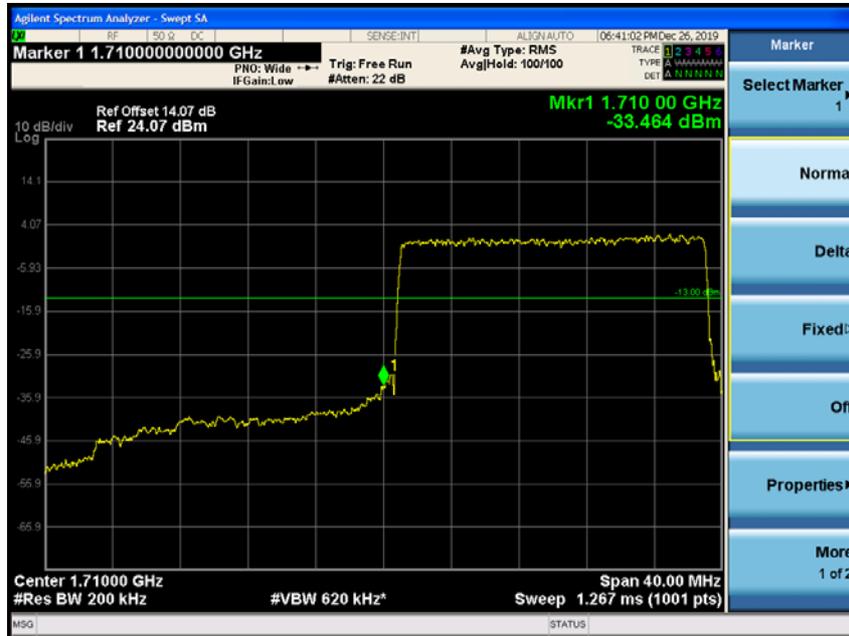


LTE band 4 (20 MHz - QPSK_RB 100, RB 1)

Low Channel



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LTE band 4 (20 MHz - QPSK_RB 100, RB 1)

High Channel



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LTE band 5 (1.4 MHz - QPSK_RB 6, RB 1)

Low Channel



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LTE band 5 (1.4 MHz - QPSK_RB 6, RB 1)

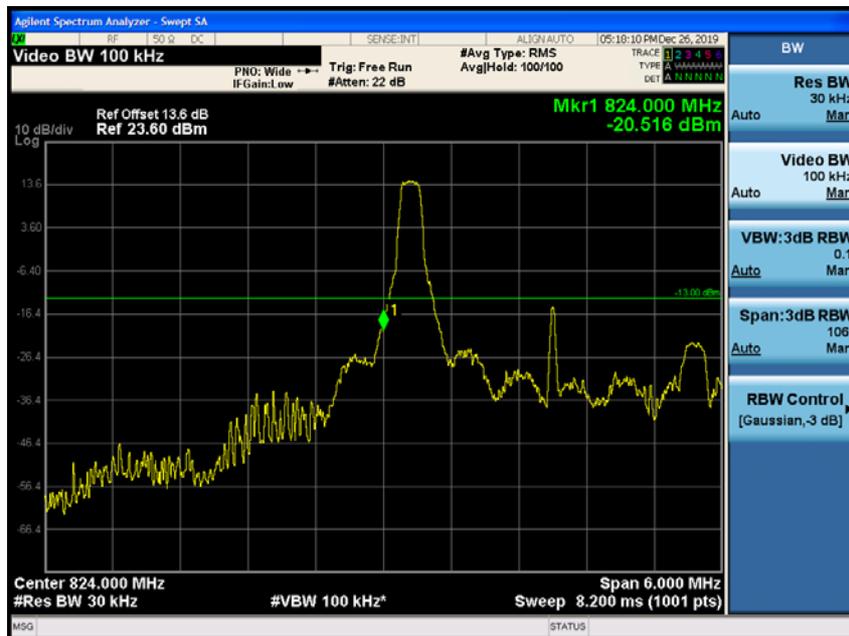
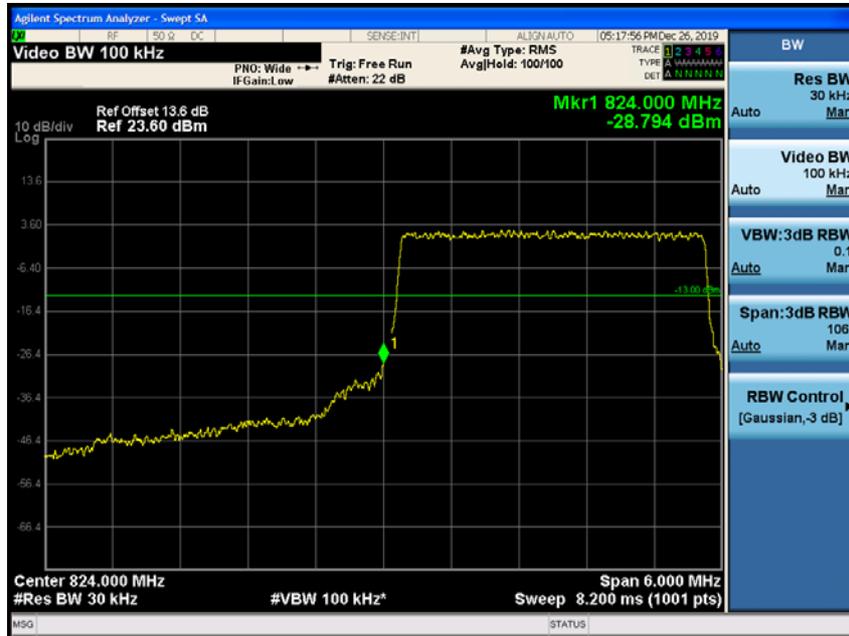
High Channel



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LTE band 5 (3 MHz - QPSK_RB 15, RB 1)

Low Channel



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LTE band 5 (3 MHz - QPSK_RB 15, RB 1)

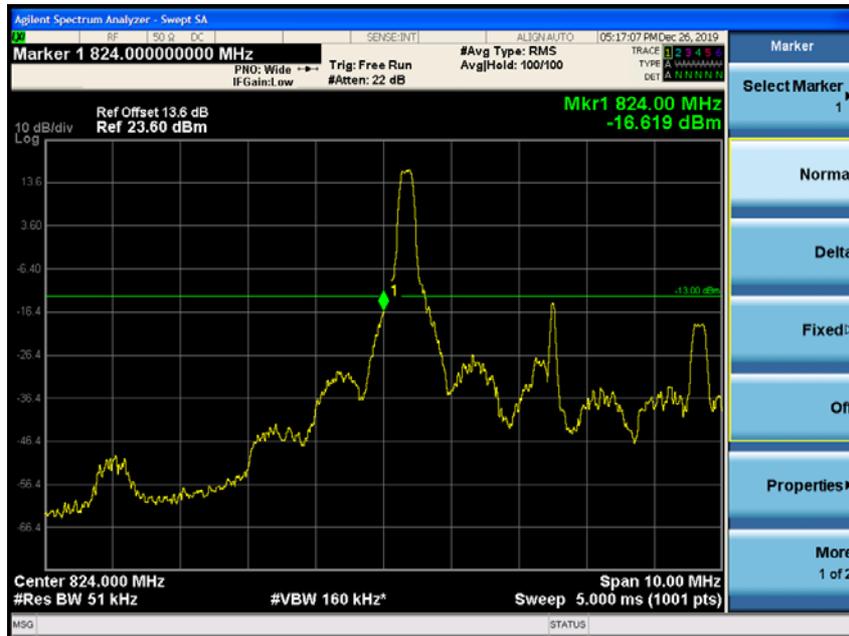
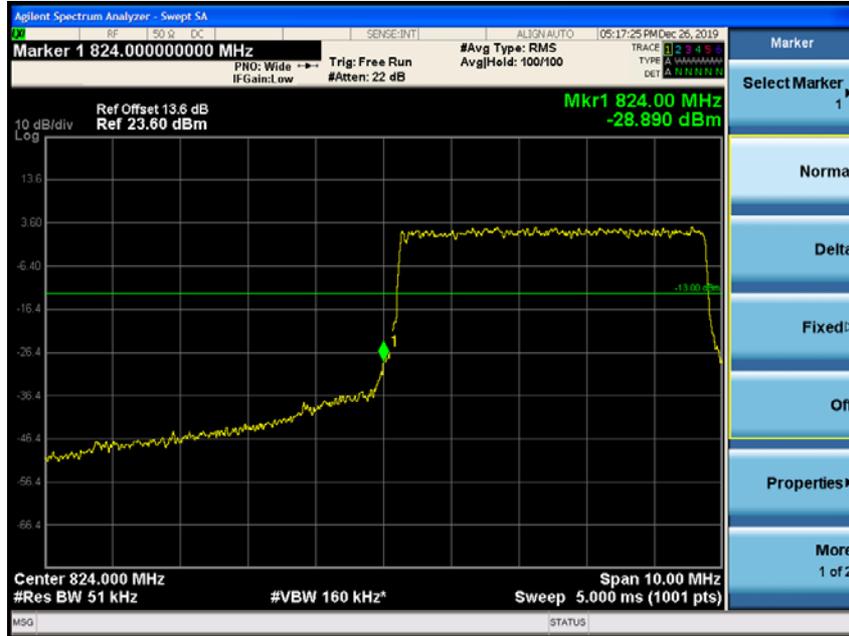
High Channel



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LTE band 5 (5 MHz - QPSK_RB 25, RB 1)

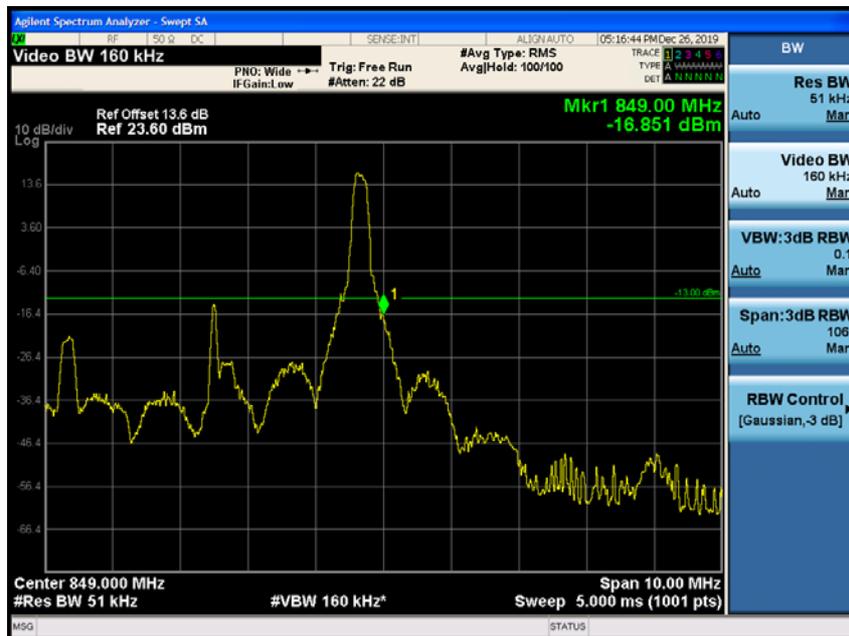
Low Channel



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LTE band 5 (5 MHz - QPSK_RB 25, RB 1)

High Channel



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LTE band 5 (10 MHz - QPSK_RB 50, RB 1)

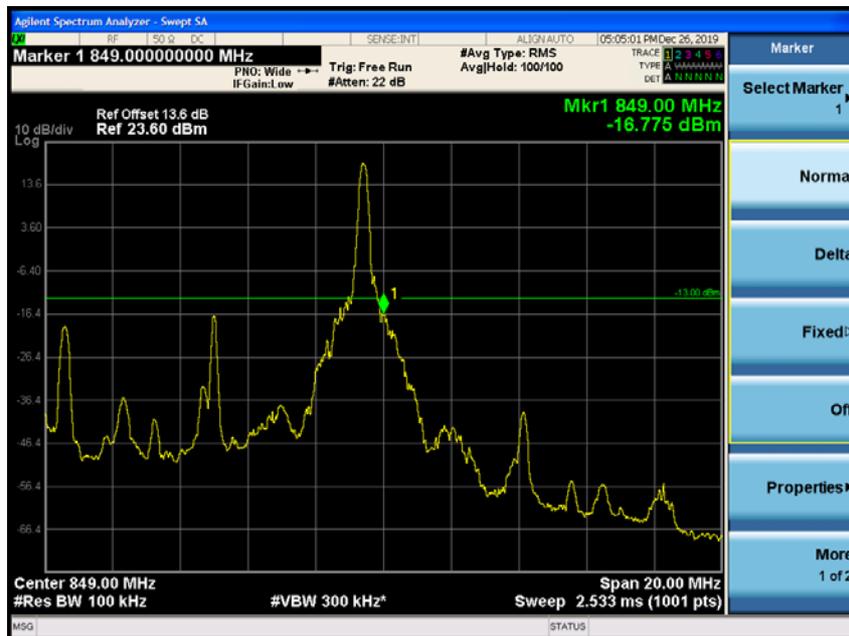
Low Channel



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LTE band 5 (10 MHz - QPSK_RB 50, RB 1)

High Channel



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LTE band 12 (1.4 MHz - QPSK_RB 6, RB 1)

Low Channel



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LTE band 12 (1.4 MHz - QPSK_RB 6, RB 1)

High Channel



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LTE band 12 (3 MHz - QPSK_RB 15, RB 1)

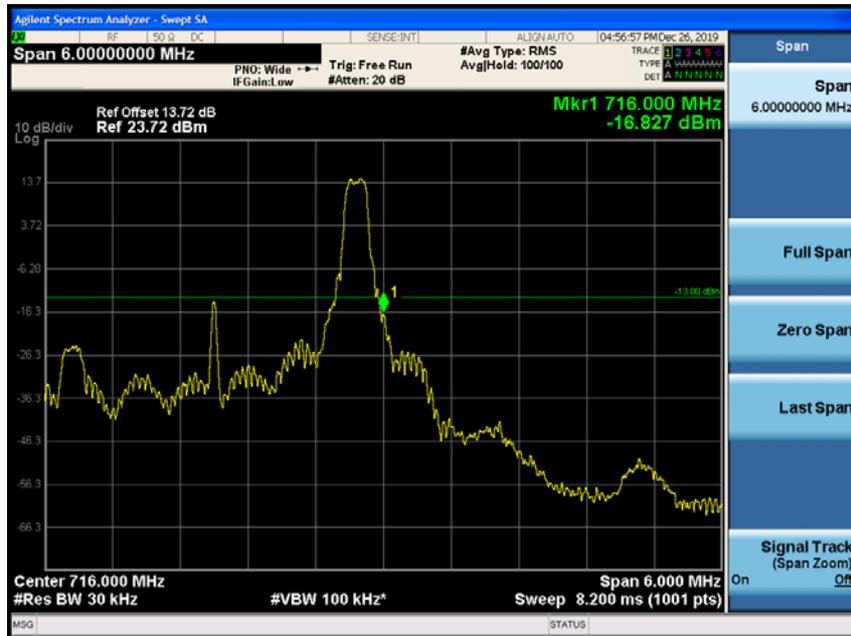
Low Channel



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LTE band 12 (3 MHz - QPSK_RB 15, RB 1)

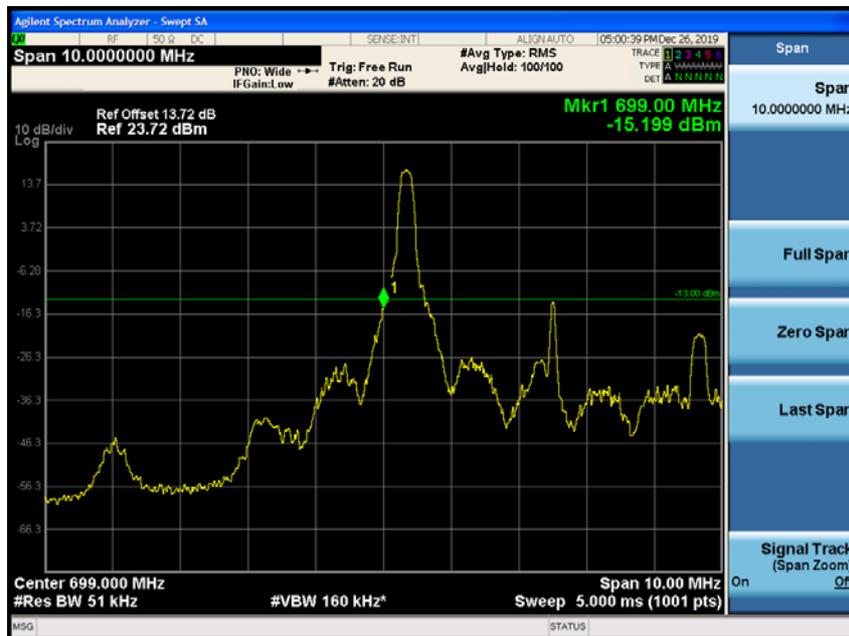
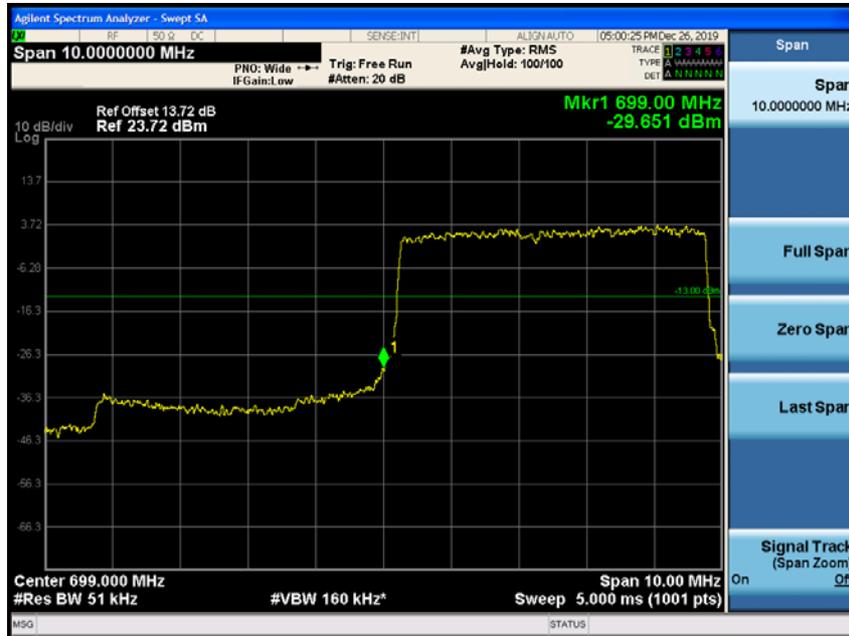
High Channel



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LTE band 12 (5 MHz - QPSK_RB 25, RB 1)

Low Channel



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LTE band 12 (5 MHz - QPSK_RB 25, RB 1)

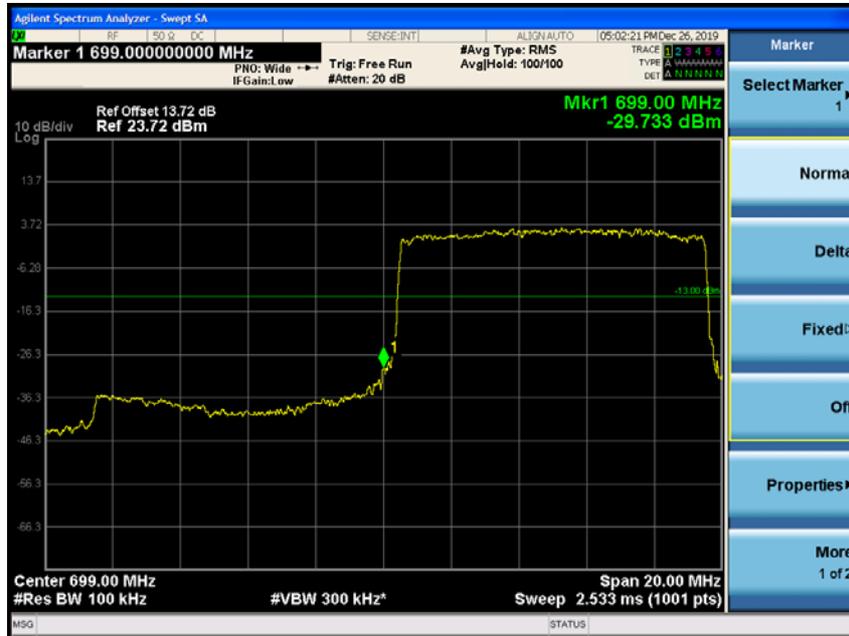
High Channel



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LTE band 12 (10 MHz - QPSK_RB 50, RB 1)

Low Channel



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LTE band 12 (10 MHz - QPSK_RB 50, RB 1)

High Channel



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8. Frequency Stability

8.1. Limit

FCC

- § 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 MHz 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.

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RTT5041-19(2019.04.24)(1)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

IC- RSS-Gen Issue 5

6.11, for licensed devices, the following measurement conditions apply:

a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage

- RSS-130 Issue 2

4.5, the transmitter frequency stability limit shall be determined as follows:

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – internet of things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

- RSS-132 Issue 3

5.3, The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations and ± 1.5 ppm for base stations.

- RSS-133 Issue 6

6.3, the carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

- RSS-139 Issue 3

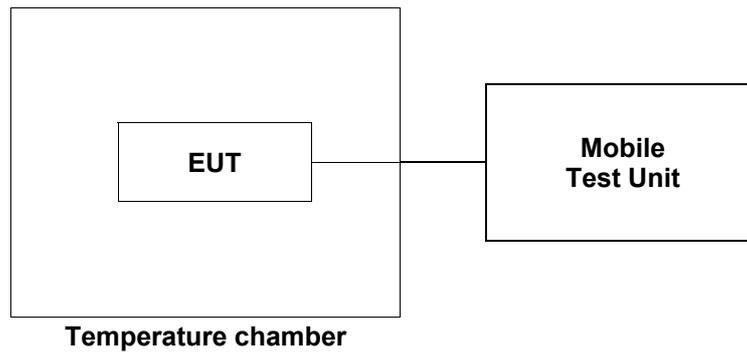
6.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

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8.2. 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.



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RTT5041-19(2019.04.24)(1)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

8.3. Test Results

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

LTE band 2 at middle channel

Reference Frequency: 1 880.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	5.0	8.2	0.004 4
40		7.6	0.004 0
30		-6.6	-0.003 5
23		1.5	0.000 8
10		-1.0	-0.000 5
0		2.1	0.001 1
-10		-5.5	-0.002 9
-20		-6.7	-0.003 6
-30		-9.2	-0.004 9
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
23	5.75	6.7	0.003 6
	4.25	5.3	0.002 8

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LTE band 4 at middle channel

Reference Frequency: 1 732.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	5.0	6.6	0.003 8
40		4.3	0.002 5
30		7.5	0.004 3
23		2.3	0.001 3
10		2.0	0.001 2
0		-3.6	-0.002 1
-10		-5.2	-0.003 0
-20		-6.3	-0.003 6
-30		-7.5	-0.004 3
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
23	5.75	-5.5	-0.003 2
	4.25	-6.6	-0.003 8

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LTE band 5 at middle channel

Reference Frequency: 836.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	5.0	4.6	0.005 5
40		7.2	0.008 6
30		4.6	0.005 5
23		2.3	0.002 7
10		1.1	0.001 3
0		3.6	0.004 3
-10		5.5	0.006 6
-20		7.2	0.008 6
-30		10.5	0.012 6
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
23	5.75	-2.5	-0.003 0
	4.25	-4.7	-0.005 6

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LTE band 12 at middle channel

Reference Frequency: 707.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	5.0	-3.6	-0.005 1
40		10.3	0.014 6
30		3.6	0.005 1
23		-2.1	-0.003 0
10		-1.0	-0.001 4
0		3.5	0.004 9
-10		4.2	0.005 9
-20		7.6	0.010 7
-30		8.5	0.012 0
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V _{dc})	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
23	5.75	-3.1	-0.004 4
	4.25	-2.5	-0.003 5

- End of the Test Report -

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