

Band 41  
 10MHz  
 QPSK

Band 41  
 10MHz  
 QPSK



QPSK High channel FRB

Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	Upper ΔLim(dB)	Freq (Hz)
5.000 MHz	6.000 MHz	200.0 kHz	-22.40	(-12.40)	-5.015 M	-22.21	(-12.21)
6.000 MHz	10.00 MHz	1.000 MHz	-21.84	(-11.84)	-6.000 M	-20.04	(-10.04)
10.00 MHz	14.00 MHz	1.000 MHz	-22.08	(9.88)	-10.04 M	-22.36	(9.36)
14.00 MHz	20.00 MHz	1.000 MHz	-33.81	(-8.81)	-14.00 M	-34.75	(-8.75)
11.00 MHz	15.00 MHz	1.000 MHz	--	(--)	--	--	(--)
15.00 MHz	30.00 MHz	1.000 MHz	--	(--)	--	--	(--)
30.00 MHz	40.00 MHz	1.000 MHz	--	(--)	--	--	(--)



QPSK High channel 1RB\_Offset Low

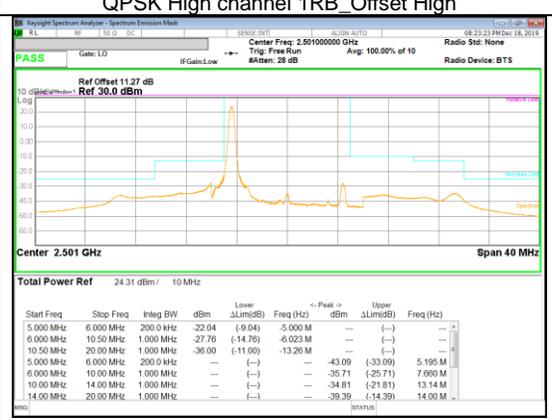
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	Upper ΔLim(dB)	Freq (Hz)
5.000 MHz	6.000 MHz	200.0 kHz	-21.46	(-11.46)	-5.015 M	-42.45	(-32.45)
6.000 MHz	10.00 MHz	1.000 MHz	-26.81	(-16.81)	-6.000 M	-35.32	(-25.32)
10.00 MHz	14.00 MHz	1.000 MHz	-34.83	(-21.83)	-10.00 M	-36.87	(-23.87)
14.00 MHz	20.00 MHz	1.000 MHz	-38.72	(-13.72)	-14.00 M	-41.79	(-16.79)
11.00 MHz	15.00 MHz	1.000 MHz	--	(--)	--	--	(--)
15.00 MHz	30.00 MHz	1.000 MHz	--	(--)	--	--	(--)
30.00 MHz	40.00 MHz	1.000 MHz	--	(--)	--	--	(--)

Band 41  
 10MHz  
 16QAM



16QAM Low channel FRB

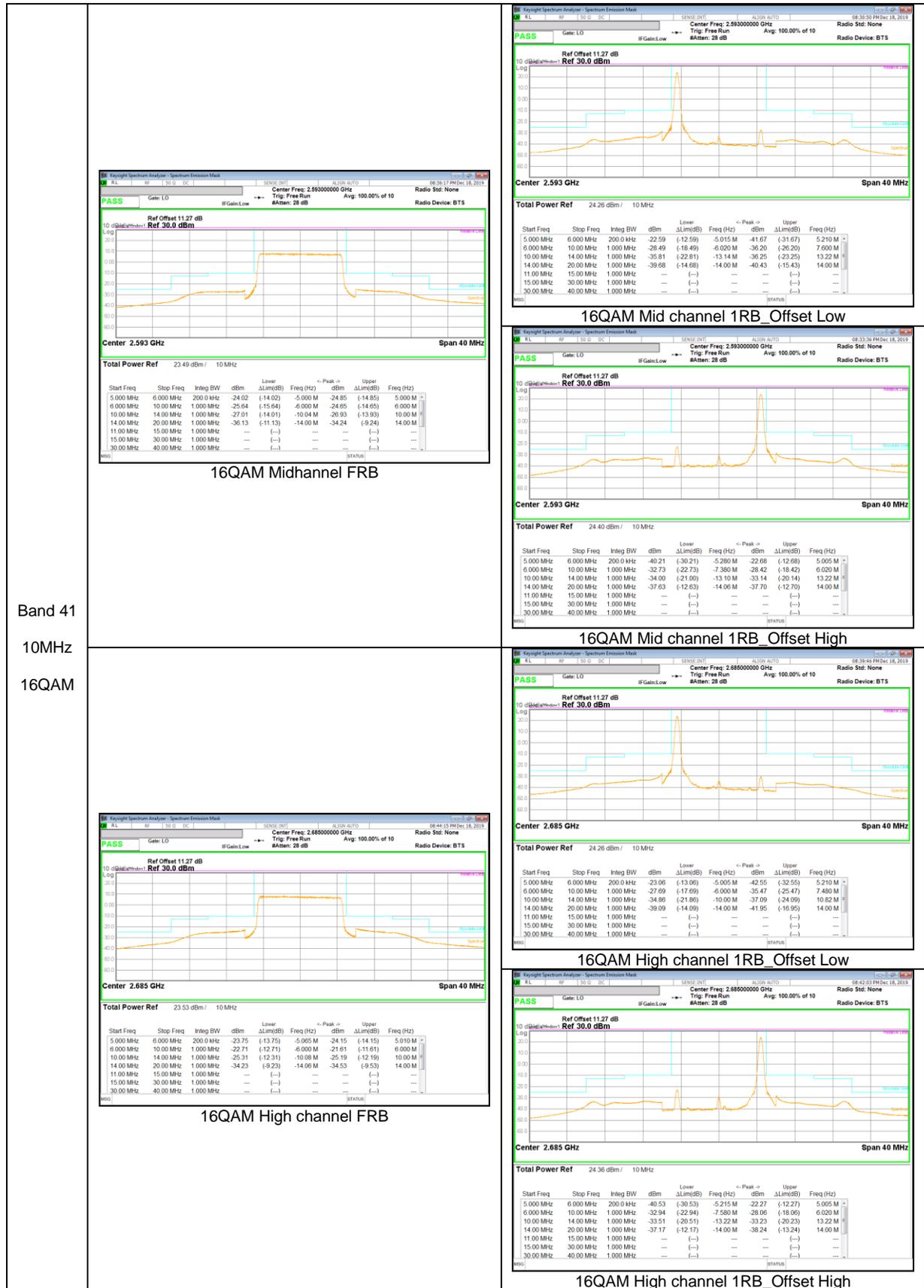
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	Upper ΔLim(dB)	Freq (Hz)
5.000 MHz	6.000 MHz	200.0 kHz	-24.32	(-11.32)	-5.000 M	--	(--)
6.000 MHz	10.50 MHz	1.000 MHz	-25.97	(-12.97)	-6.023 M	--	(--)
10.50 MHz	20.00 MHz	1.000 MHz	-28.51	(-3.51)	-10.00 M	--	(--)
5.000 MHz	6.000 MHz	200.0 kHz	--	(--)	-23.27	(-13.27)	5.015 M
6.000 MHz	10.00 MHz	1.000 MHz	--	(--)	-23.50	(-13.50)	6.020 M
10.00 MHz	14.00 MHz	1.000 MHz	--	(--)	-25.90	(-12.90)	10.00 M
14.00 MHz	20.00 MHz	1.000 MHz	--	(--)	-32.83	(-7.83)	14.00 M



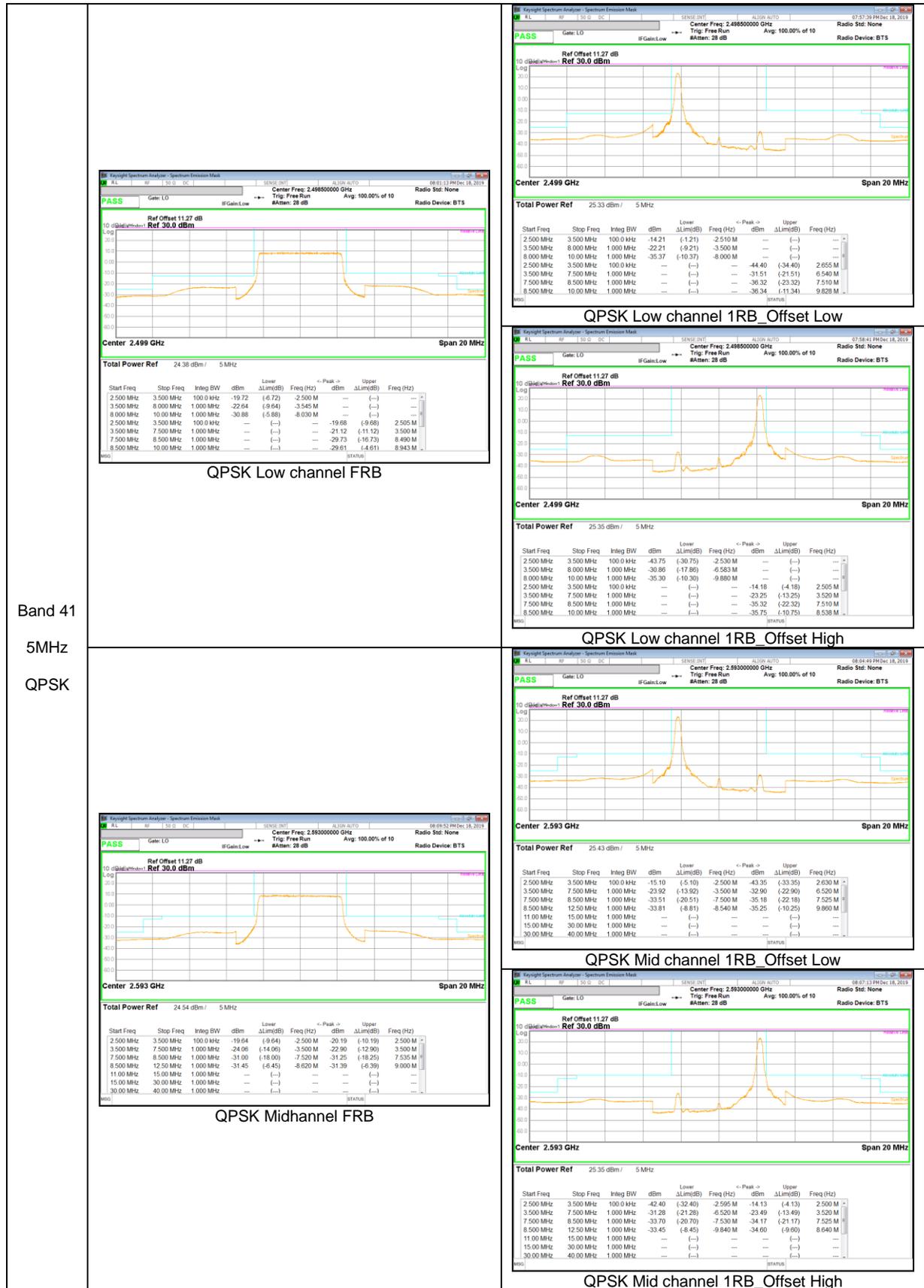
16QAM Low channel 1RB\_Offset High

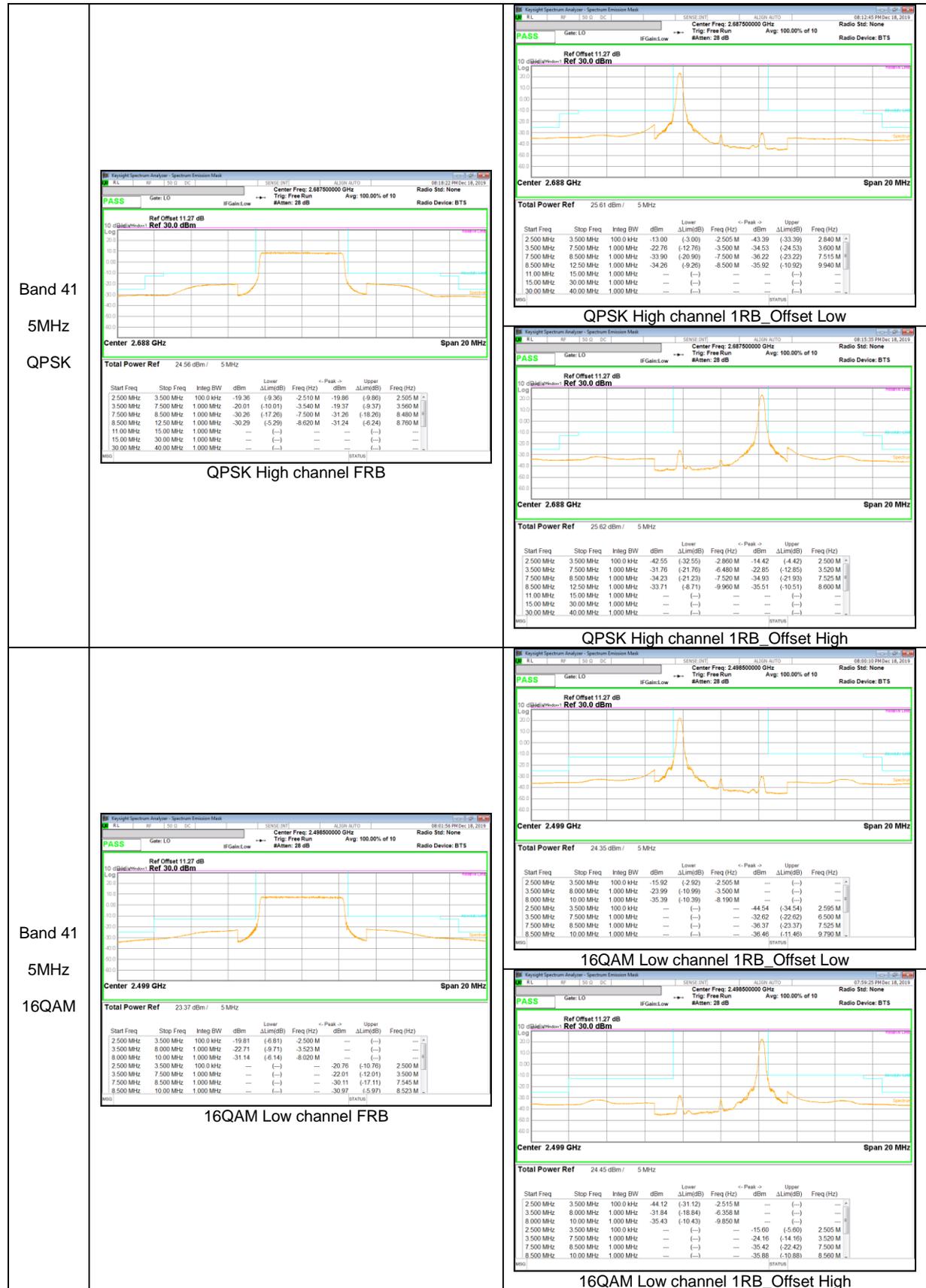
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	Upper ΔLim(dB)	Freq (Hz)
5.000 MHz	6.000 MHz	200.0 kHz	-22.04	(9.04)	-5.000 M	--	(--)
6.000 MHz	10.50 MHz	1.000 MHz	-27.76	(-14.76)	-6.023 M	--	(--)
10.50 MHz	20.00 MHz	1.000 MHz	-36.00	(-11.00)	-13.26 M	--	(--)
5.000 MHz	6.000 MHz	200.0 kHz	--	(--)	-43.09	(-33.09)	5.195 M
6.000 MHz	10.00 MHz	1.000 MHz	--	(--)	-35.71	(-25.71)	7.600 M
10.00 MHz	14.00 MHz	1.000 MHz	--	(--)	-34.81	(-21.81)	13.14 M
14.00 MHz	20.00 MHz	1.000 MHz	--	(--)	-39.39	(-14.39)	14.00 M

16QAM Low channel 1RB\_Offset High



Band 41  
 10MHz  
 16QAM







Band 41  
 5MHz  
 16QAM

**LTE Band 2**

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 4**

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 5**

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 17**

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band41(PC3)**

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

### 9.3. OUT OF BAND EMISSIONS

#### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §27.53 and 90.691

#### LIMITS

The 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.

Part 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 than  $43 + 10 \log (P)$  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.

Part 90.691(a):

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz. (NOTE : Use 100kHz reference bandwidth)

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

## **TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

- a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz  
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = average(WCDMA, LTE), Maxhold(GSM, LTE Band41);

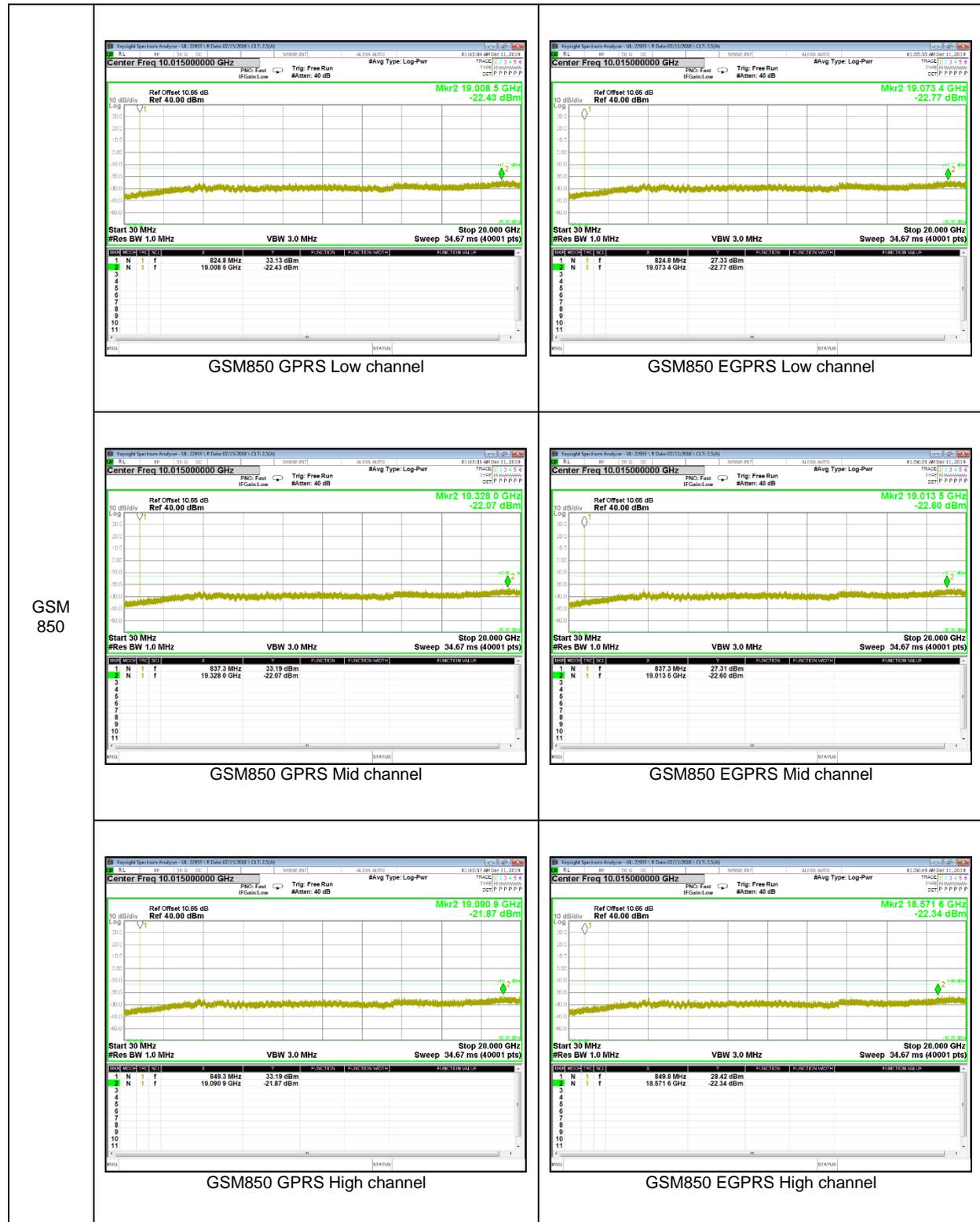
## **RESULTS**

See the following pages.

NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

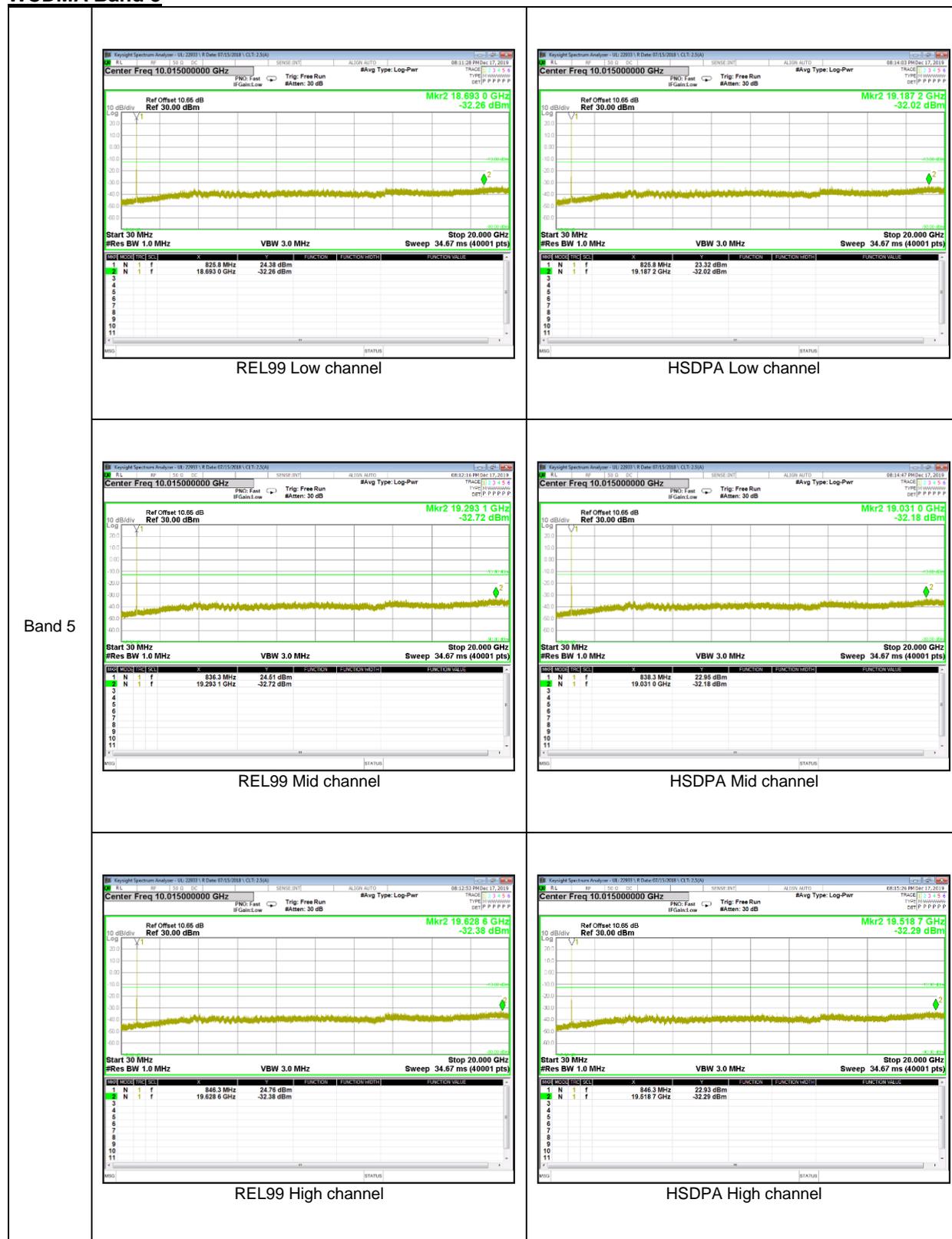
### 9.3.1. OUT OF BAND EMISSIONS RESULT

#### GSM 850



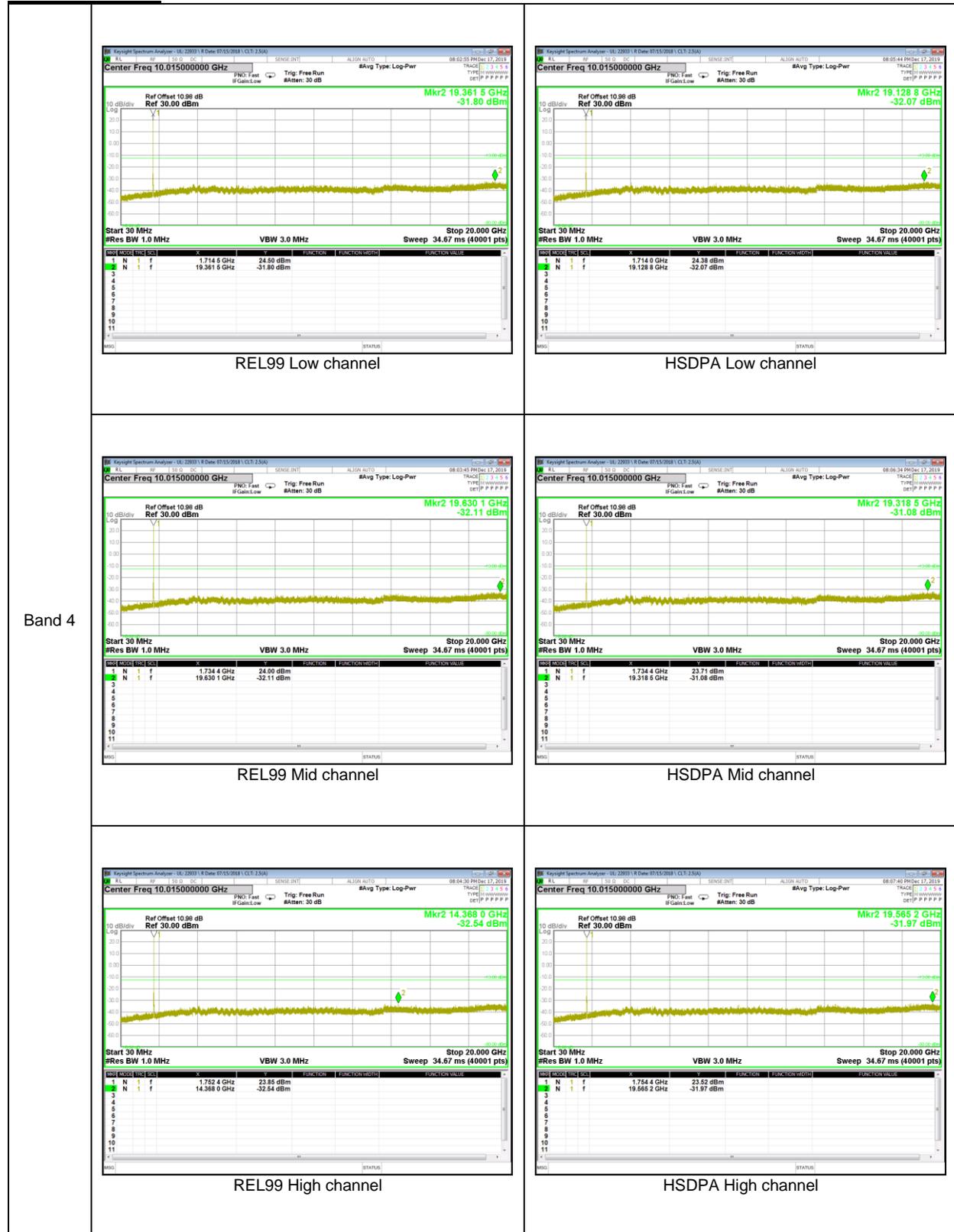


WCDMA Band 5

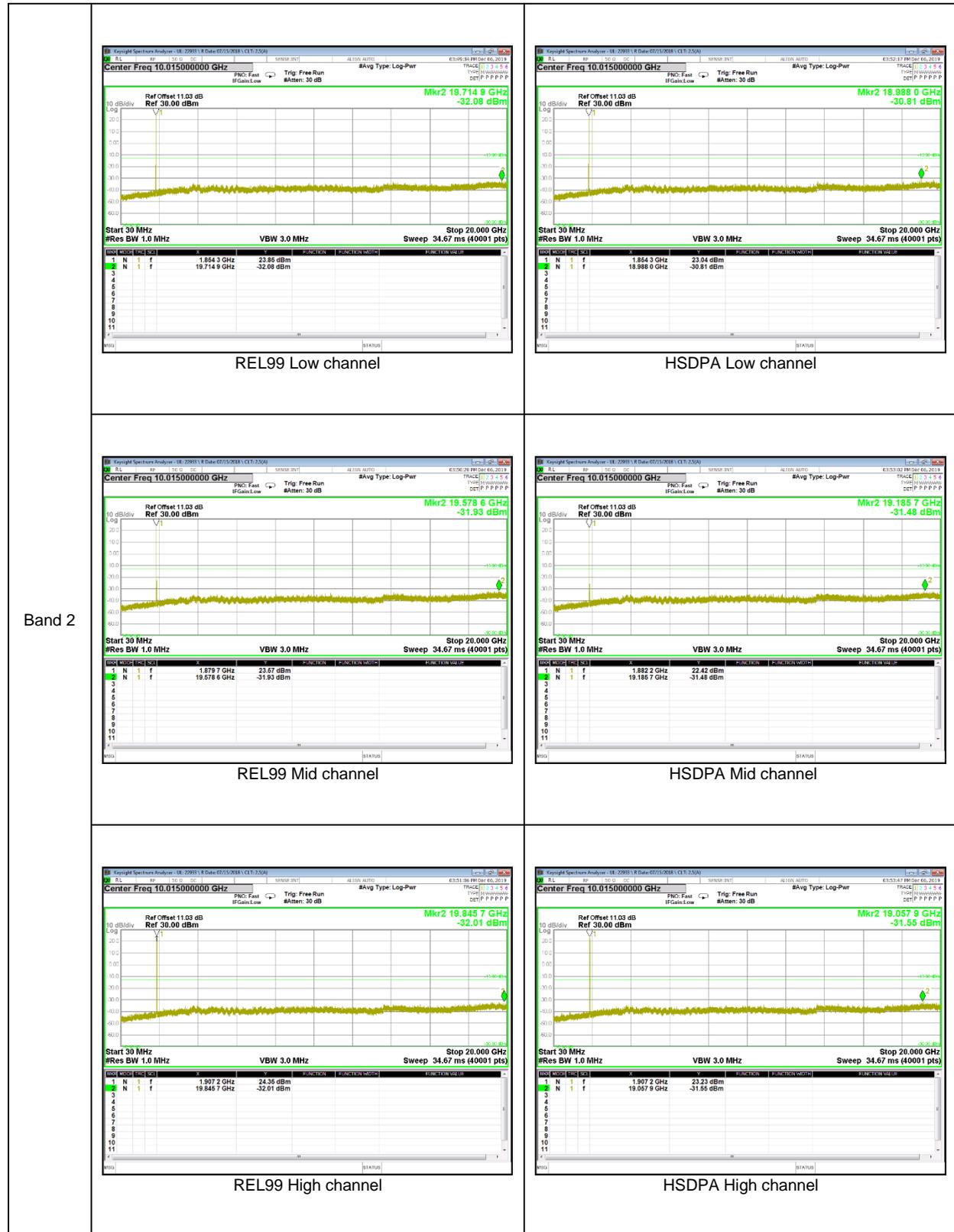


Band 5

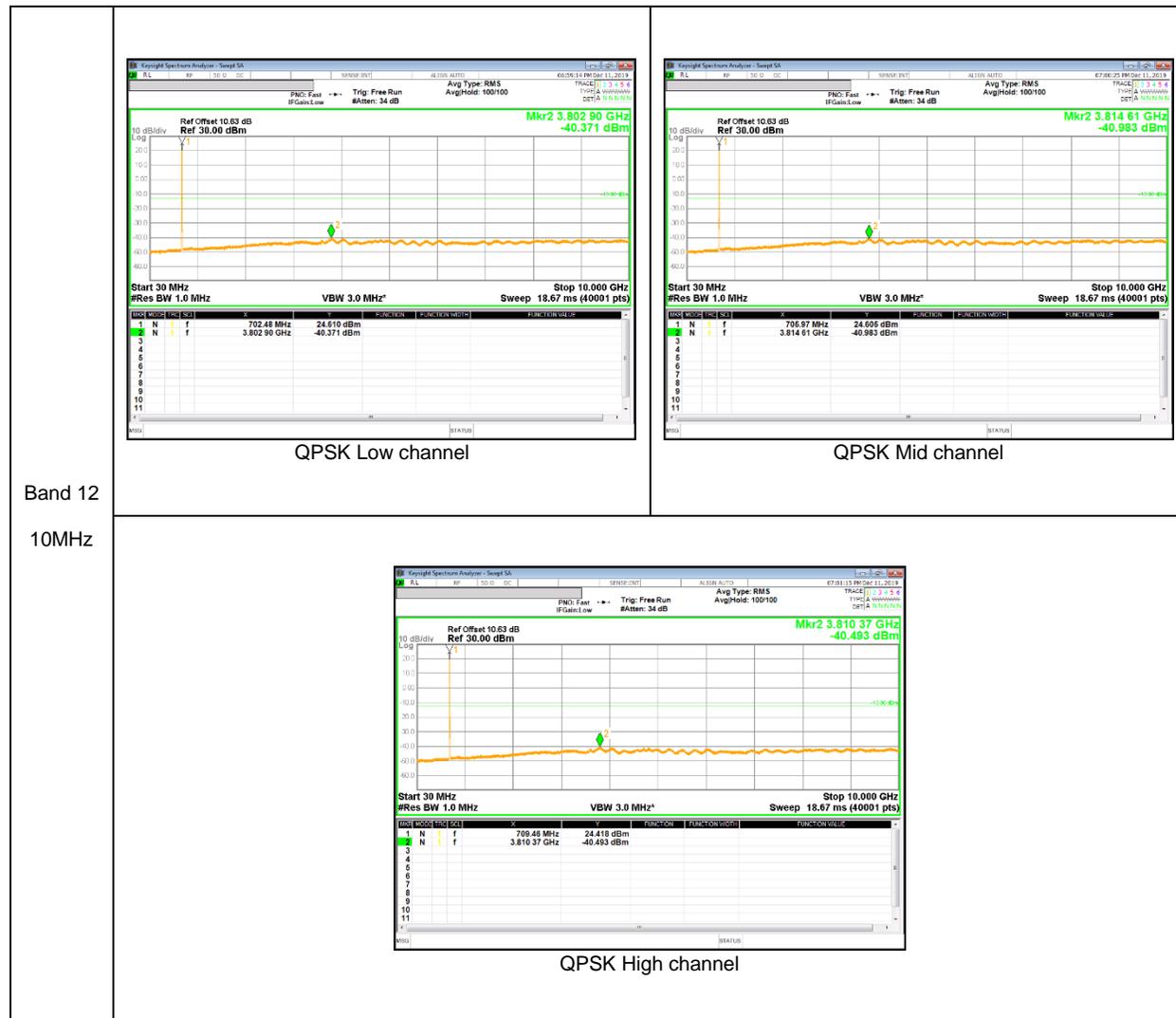
WCDMA Band 4



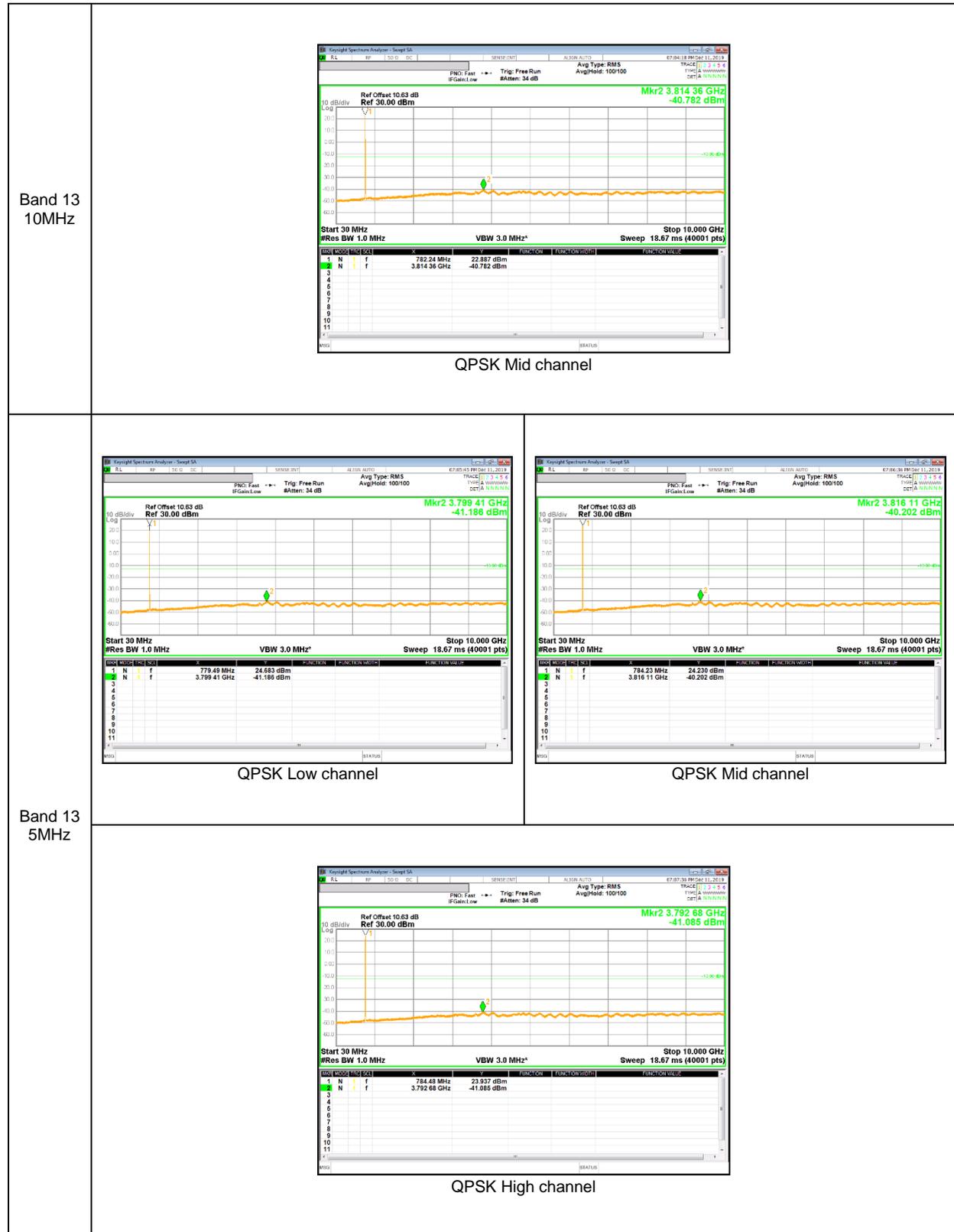
**WCDMA Band 2**



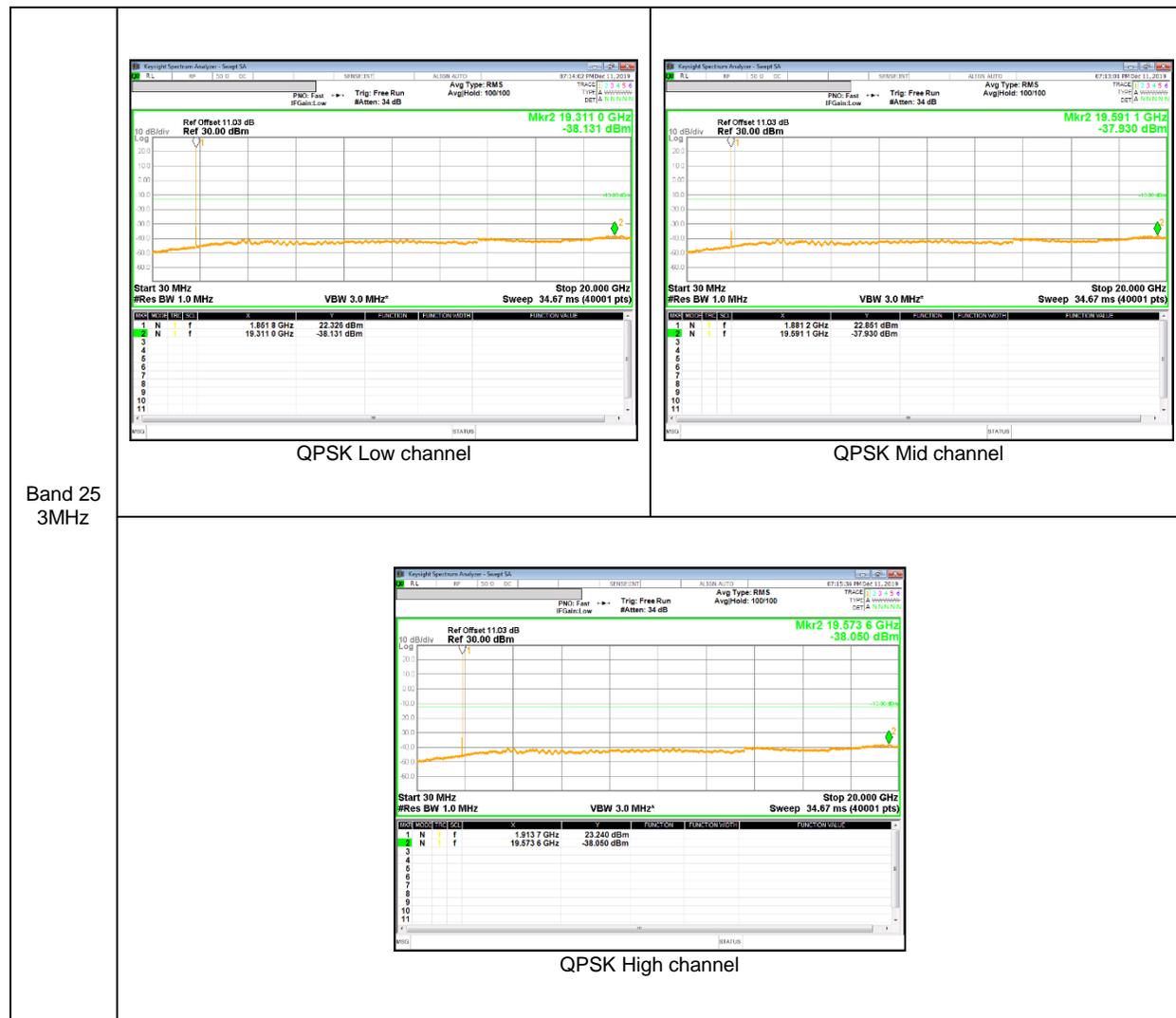
**LTE Band 12**



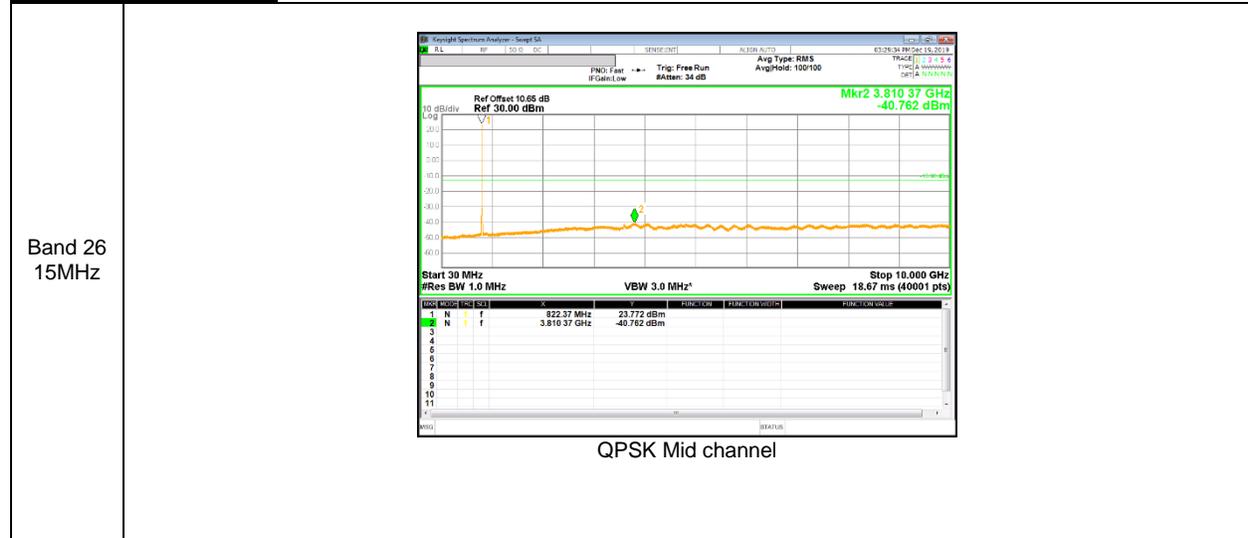
**LTE Band 13**



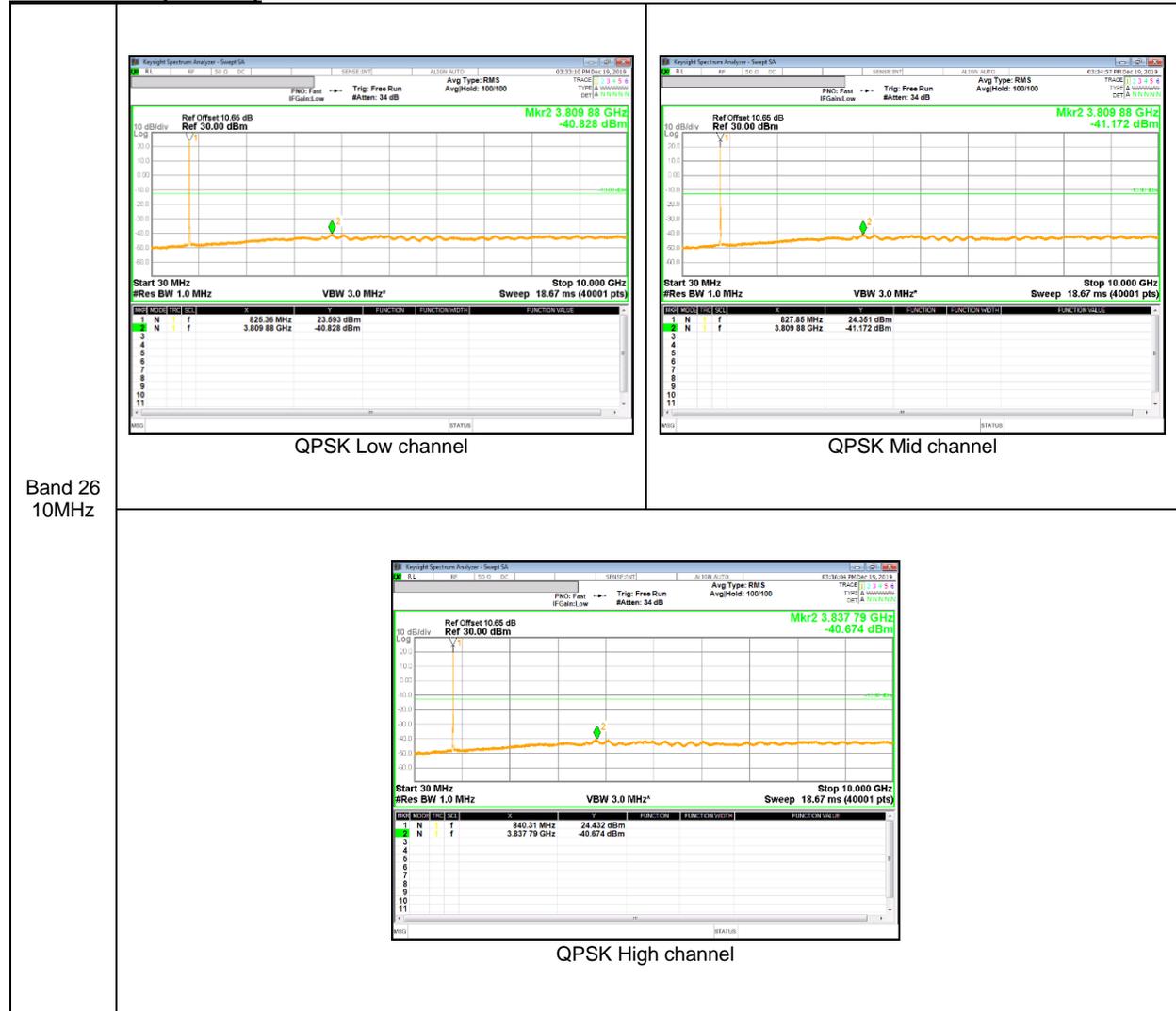
**LTE Band 25**



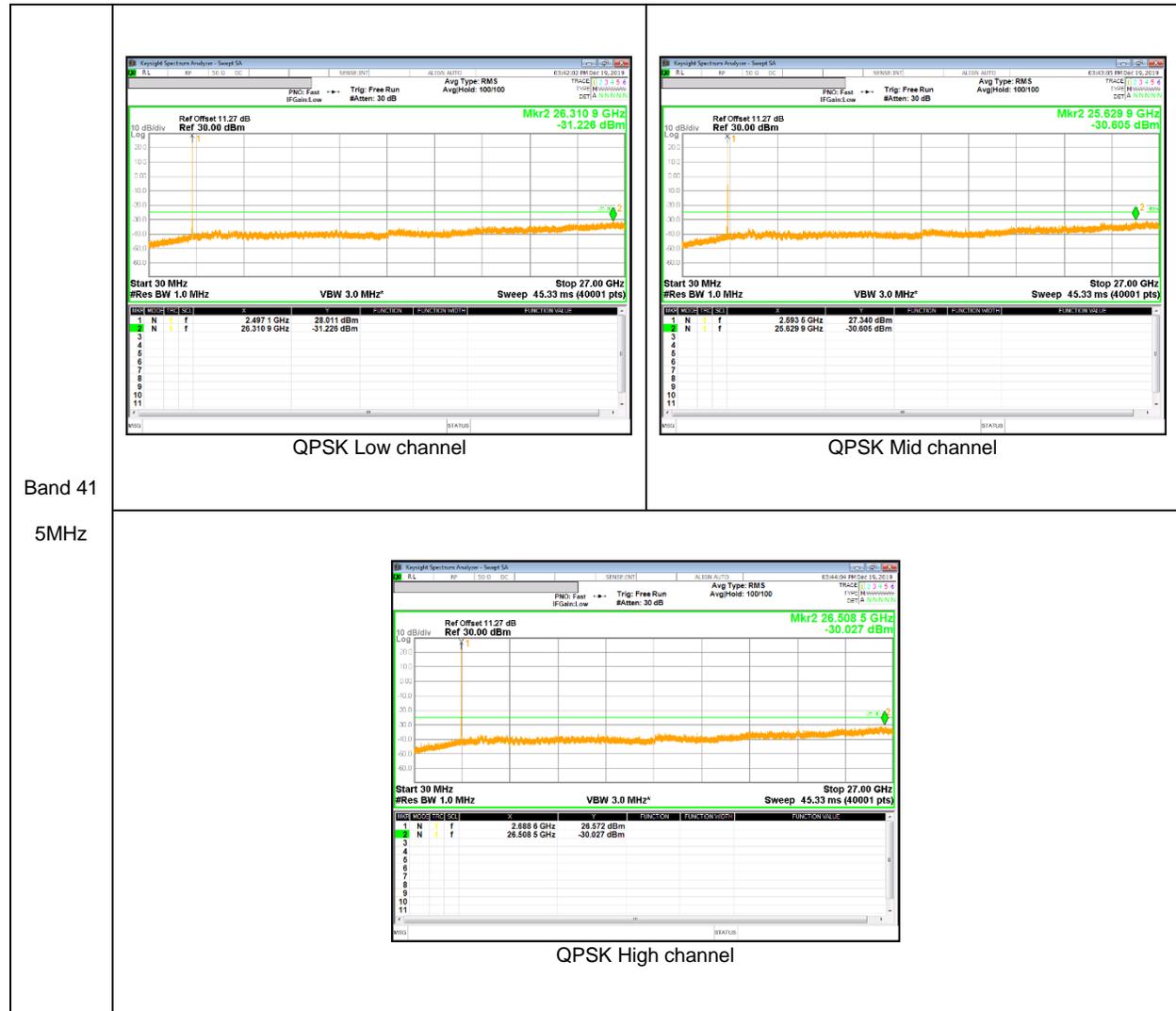
**LTE Band 26(Part 90)**



**LTE Band 26(Part 22)**



**LTE Band 41(PC2)**



**LTE Band 66**



**LTE Band 2**

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 4**

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 5**

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 17**

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band41(PC3)**

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

## 9.4. FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

§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.

§90.213 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

### TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

### RESULTS

See the following pages.

**NOTE** : Test were performed each lowest or highest frequency on the modulation condition of more wide bandwidth.(Please refer to section 9.1.1 OBW results)

### 9.4.1. FREQUENCY STABILITY RESULTS

#### GSM 850, Channel 128/251, Frequency 824.2/848.8 MHz

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse					Limit [ppm]
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.86	50	824.19998735	0.007	848.79998836	0.005	2.5	
3.86	40	824.19999113	0.002	848.79999066	0.003	2.5	
3.86	30	824.19999350	0.000	848.79999229	0.001	2.5	
<b>3.86</b>	<b>20</b>	<b>824.19999312</b>	<b>0.000</b>	<b>848.79999294</b>	<b>0.000</b>	<b>2.5</b>	
3.86	10	824.19999366	-0.001	848.79999433	-0.002	2.5	
3.86	0	824.19999850	-0.007	848.79999797	-0.006	2.5	
3.86	-10	824.19999556	-0.003	848.79999419	-0.001	2.5	
3.86	-20	824.19999337	0.000	848.79999550	-0.003	2.5	
3.86	-30	824.19999181	0.002	848.79999531	-0.003	2.5	

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse					Limit [ppm]
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.86	20	824.19999312	0	848.79999294	0	2.5	
4.43	20	824.19999261	0.001	848.79999199	0.001	2.5	
3.60	20	824.19999365	-0.001	848.79999303	0.000	2.5	

#### GSM 1900, Channel 512/810, Frequency 1850.0/1910.0 MHz (Lowest Frequency:EGPRS / Highest Frequency: EGPRS)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0786	1909.9240		
Extreme (50C)		1850.0786	1909.9240	16.9	0.009
Extreme (40C)		1850.0786	1909.9240	14.3	0.008
Extreme (30C)		1850.0786	1909.9240	18.7	0.010
Extreme (10C)		1850.0786	1909.9240	19.3	0.010
Extreme (0C)		1850.0786	1909.9240	20.6	0.011
Extreme (-10C)		1850.0786	1909.9240	16.0	0.008
Extreme (-20C)		1850.0786	1909.9240	17.7	0.009
Extreme (-30C)		1850.0786	1909.9240	18.1	0.010
20C		15%	1850.0786	1909.9240	21.7
	-15%	1850.0786	1909.9240	20.5	0.011
	End Point	1850.0786	1909.9240	18.7	0.010

**WCDMA Band 5**

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.86	50	826.39998895	0.002	846.59998764	0.004	2.5	
3.86	40	826.39999085	-0.001	846.59998926	0.002	2.5	
3.86	30	826.39999369	-0.004	846.59999470	-0.004	2.5	
<b>3.86</b>	<b>20</b>	<b>826.39999036</b>	<b>0.000</b>	<b>846.59999111</b>	<b>0.000</b>	<b>2.5</b>	
3.86	10	826.39998653	0.005	846.59998988	0.001	2.5	
3.86	0	826.39998946	0.001	846.59999137	0.000	2.5	
3.86	-10	826.39999361	-0.004	846.59999303	-0.002	2.5	
3.86	-20	826.39999515	-0.006	846.59999594	-0.006	2.5	
3.86	-30	826.39999112	-0.001	846.59999046	0.001	2.5	

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
<b>3.86</b>	<b>20</b>	<b>826.39999036</b>	<b>0</b>	<b>846.59999111</b>	<b>0</b>	<b>2.5</b>	
4.43	20	826.39998946	0.001	846.59998864	0.003	2.5	
3.60	20	826.39998897	0.002	846.59999066	0.001	2.5	

**WCDMA Band 4 (Lowest Frequency:HSDPA / Highest Frequency: Rel99)**

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.3120	1754.9625		
Extreme (50C)		1710.3120	1754.9625	16.9	0.010
Extreme (40C)		1710.3120	1754.9625	23.5	0.014
Extreme (30C)		1710.3120	1754.9625	17.7	0.010
Extreme (10C)		1710.3120	1754.9625	18.3	0.011
Extreme (0C)		1710.3120	1754.9625	15.6	0.009
Extreme (-10C)		1710.3120	1754.9625	17.0	0.010
Extreme (-20C)		1710.3120	1754.9625	17.3	0.010
Extreme (-30C)		1710.3120	1754.9625	20.6	0.012
20C		15%	1710.3120	1754.9625	21.5
	-15%	1710.3120	1754.9625	20.3	0.012
	End Point	1710.3120	1754.9625	19.7	0.011

**WCDMA Band 2 (HSDPA)**

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	1850.3107	1909.6909		
Extreme (50C)		1850.3107	1909.6909	16.4	0.009
Extreme (40C)		1850.3107	1909.6909	18.7	0.010
Extreme (30C)		1850.3107	1909.6909	20.7	0.011
Extreme (10C)		1850.3107	1909.6909	13.6	0.007
Extreme (0C)		1850.3107	1909.6909	15.5	0.008
Extreme (-10C)		1850.3107	1909.6909	17.1	0.009
Extreme (-20C)		1850.3107	1909.6909	23.3	0.012
Extreme (-30C)		1850.3107	1909.6909	19.6	0.010
20C	15%	1850.3107	1909.6909	18.9	0.010
	-15%	1850.3107	1909.6909	20.6	0.011
	End Point	1850.3107	1909.6909	19.2	0.010

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

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	699.1546	715.8444		
Extreme (50C)		699.1546	715.8444	3.5	0.005
Extreme (40C)		699.1546	715.8444	5.8	0.008
Extreme (30C)		699.1546	715.8444	1.1	0.002
Extreme (10C)		699.1546	715.8444	4.6	0.006
Extreme (0C)		699.1546	715.8444	6.1	0.009
Extreme (-10C)		699.1546	715.8444	3.5	0.005
Extreme (-20C)		699.1546	715.8444	2.8	0.004
Extreme (-30C)		699.1546	715.8444	5.6	0.008
20C		15%	699.1546	715.8444	3.0
	-15%	699.1546	715.8444	4.6	0.006
	End Point	699.1546	715.8444	6.6	0.009

**LTE Band 13 (QPSK)**

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	777.2563	786.7487		
Extreme (50C)		777.2563	786.7487	2.3	0.003
Extreme (40C)		777.2563	786.7487	2.0	0.003
Extreme (30C)		777.2563	786.7487	0.9	0.001
Extreme (10C)		777.2563	786.7487	2.1	0.003
Extreme (0C)		777.2563	786.7487	1.6	0.002
Extreme (-10C)		777.2563	786.7487	4.1	0.005
Extreme (-20C)		777.2563	786.7487	3.3	0.004
Extreme (-30C)		777.2563	786.7487	1.6	0.002
20C		15%	777.2563	786.7487	1.3
	-15%	777.2563	786.7487	0.4	0.000
	End Point	777.2563	786.7487	1.8	0.002

**LTE Band 25 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)**

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.1571	1914.8446		
Extreme (50C)		1850.1571	1914.8446	9.5	0.005
Extreme (40C)		1850.1571	1914.8446	10.7	0.006
Extreme (30C)		1850.1571	1914.8446	8.4	0.004
Extreme (10C)		1850.1571	1914.8446	12.3	0.007
Extreme (0C)		1850.1571	1914.8446	14.8	0.008
Extreme (-10C)		1850.1571	1914.8446	8.8	0.005
Extreme (-20C)		1850.1571	1914.8446	6.9	0.004
Extreme (-30C)		1850.1571	1914.8446	10.3	0.005
20C		15%	1850.1571	1914.8446	10.7
	-15%	1850.1571	1914.8446	6.5	0.003
	End Point	1850.1571	1914.8446	7.4	0.004

**LTE Band 26**

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +- 2.5 ppm =		Low Channel	2036.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.86	50	814.70001034	-0.004	848.30000961	-0.006	2.5	
3.86	40	814.70000564	0.002	848.30000617	-0.002	2.5	
3.86	30	814.70000485	0.003	848.30000438	0.000	2.5	
<b>3.86</b>	<b>20</b>	<b>814.70000695</b>	<b>0.000</b>	<b>848.30000421</b>	<b>0.000</b>	<b>2.5</b>	
3.86	10	814.70000705	0.000	848.30000936	-0.006	2.5	
3.86	0	814.70001133	-0.005	848.30001230	-0.010	2.5	
3.86	-10	814.70000485	0.003	848.30000611	-0.002	2.5	
3.86	-20	814.70000659	0.000	848.30000718	-0.004	2.5	
3.86	-30	814.70000834	-0.002	848.30000598	-0.002	2.5	

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +- 2.5 ppm =		Low Channel	2036.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
<b>3.86</b>	<b>20</b>	<b>814.70000695</b>	<b>0</b>	<b>848.30000421</b>	<b>0</b>	<b>2.5</b>	
4.43	20	814.70000887	-0.002	848.30000912	-0.006	2.5	
3.60	20	814.70000448	0.003	848.30000597	-0.002	2.5	

**LTE Band 41 PC2 (Lowest Frequency:16QAM / Highest Frequency: QPSK)**

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.2518	2689.7506		
Extreme (50C)		2496.2518	2689.7506	17.5	0.007
Extreme (40C)		2496.2518	2689.7506	20.7	0.008
Extreme (30C)		2496.2518	2689.7506	18.9	0.007
Extreme (10C)		2496.2518	2689.7506	17.6	0.007
Extreme (0C)		2496.2518	2689.7506	21.5	0.008
Extreme (-10C)		2496.2518	2689.7506	20.6	0.008
Extreme (-20C)		2496.2518	2689.7506	17.7	0.007
Extreme (-30C)		2496.2518	2689.7506	18.4	0.007
20C		15%	2496.2518	2689.7506	18.6
	-15%	2496.2518	2689.7506	18.1	0.007
	End Point	2496.2518	2689.7506	17.2	0.007

**LTE Band 66 (QPSK)**

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	1710.1552	1779.8446		
Extreme (50C)		1710.1552	1779.8446	7.6	0.004
Extreme (40C)		1710.1552	1779.8446	9.6	0.006
Extreme (30C)		1710.1552	1779.8446	8.8	0.005
Extreme (10C)		1710.1552	1779.8446	10.2	0.006
Extreme (0C)		1710.1552	1779.8446	6.3	0.004
Extreme (-10C)		1710.1552	1779.8446	5.9	0.003
Extreme (-20C)		1710.1552	1779.8446	5.6	0.003
Extreme (-30C)		1710.1552	1779.8446	5.7	0.003
20C		15%	1710.1552	1779.8446	10.6
	-15%	1710.1552	1779.8446	4.6	0.003
	End Point	1710.1552	1779.8446	7.0	0.004

**LTE Band 2**

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 4**

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 5**

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 17**

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band41(PC3)**

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

## 10. RADIATED TEST RESULTS

### 10.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and §27.53

#### LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

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.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

#### 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  $\geq$  OBW; b) Set VBW  $\geq 3 \times$  RBW; c) Set span  $\geq 2 \times$  RBW; d) Sweep time = auto couple; e) Detector = rms; f) Ensure that the number of measurement points  $\geq$  span/RBW; g) Trace mode = max hold(GSM, WCDMA), average(LTE);

#### TEST RESULTS

### 10.1.1. ERP/EIRP Results

#### GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	512	824.2	30.59	1145.51
		661	836.6	30.72	1180.32
		810	848.8	<b>30.85</b>	<b>1216.19</b>
	EGPRS	512	824.2	24.97	314.05
		661	836.6	25.04	319.15
		810	848.8	<b>25.41</b>	<b>347.54</b>
GSM1900	GPRS	512	1850.2	27.74	594.29
		661	1880	28.80	758.58
		810	1909.8	<b>29.07</b>	<b>807.24</b>
	EGPRS	512	1850.2	23.83	241.55
		661	1880	23.98	250.03
		810	1909.8	<b>26.08</b>	<b>405.51</b>

#### WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	17.00	50.12
		4183	836.6	18.10	64.57
		4233	846.6	<b>18.16</b>	<b>65.46</b>
	HSDPA	4132	826.4	15.51	35.56
		4183	836.6	<b>16.35</b>	<b>43.15</b>
		4233	846.6	16.28	42.46
Band 4	REL99	1312	1712.4	24.00	251.19
		1413	1732.6	<b>24.68</b>	<b>293.76</b>
		1513	1752.6	22.79	190.11
	HSDPA	1312	1712.4	<b>23.76</b>	<b>237.68</b>
		1413	1732.6	23.65	231.74
		1513	1752.6	22.57	180.72
Band 2	REL99	9262	1852.4	22.36	172.19
		9400	1880.0	23.47	222.33
		9538	1907.6	<b>24.88</b>	<b>307.61</b>
	HSDPA	9262	1852.4	21.61	144.88
		9400	1880.0	22.29	169.43
		9538	1907.6	<b>23.85</b>	<b>242.66</b>

**LTE Band 12**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 12	10	QPSK	1 / 0	704.0	16.88	48.75
			1 / 0	707.5	16.98	49.89
			1 / 0	711.0	<b>17.21</b>	<b>52.60</b>
		16QAM	1 / 0	704.0	15.68	36.98
			1 / 0	707.5	15.92	39.08
			1 / 0	711.0	<b>16.19</b>	<b>41.59</b>
	5	QPSK	1 / 12	701.5	16.81	47.97
			1 / 12	707.5	16.96	49.66
			1 / 12	713.5	<b>17.70</b>	<b>58.88</b>
		16QAM	1 / 12	701.5	15.63	36.56
			1 / 12	707.5	15.78	37.84
			1 / 0	713.5	<b>16.33</b>	<b>42.95</b>
	3	QPSK	1 / 0	700.5	16.52	44.87
			1 / 0	707.5	16.90	48.98
			1 / 8	714.5	<b>17.26</b>	<b>53.21</b>
		16QAM	1 / 8	700.5	15.53	35.73
			1 / 8	707.5	15.16	32.81
			1 / 8	714.5	<b>16.26</b>	<b>42.27</b>
	1.4	QPSK	1 / 0	699.7	16.44	44.06
			1 / 0	707.5	16.97	49.77
			1 / 0	715.3	<b>17.33</b>	<b>54.08</b>
		16QAM	1 / 0	699.7	15.62	36.48
			1 / 0	707.5	15.84	38.37
			1 / 0	715.3	<b>16.17</b>	<b>41.40</b>

**LTE Band 13**

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 13	10	QPSK	1 / 25	782.0	<b>20.44</b>	<b>110.66</b>
		16QAM	1 / 25	782.0	19.80	95.50
	5	QPSK	1 / 12	779.5	20.49	111.94
			1 / 24	782.0	<b>20.73</b>	<b>118.30</b>
			1 / 12	784.5	20.31	107.40
	16QAM	1 / 12	779.5	19.25	84.14	
		1 / 24	782.0	<b>20.06</b>	<b>101.39</b>	
		1 / 12	784.5	19.54	89.95	

**LTE Band 25**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 25	20	QPSK	1 / 0	1860.0	21.48	140.60
			1 / 0	1882.5	22.13	163.31
			1 / 99	1905.0	<b>22.59</b>	<b>181.55</b>
		16QAM	1 / 0	1860.0	20.21	104.95
			1 / 0	1882.5	<b>20.90</b>	<b>123.03</b>
			1 / 0	1905.0	20.70	117.49
	15	QPSK	1 / 37	1857.5	21.52	141.91
			1 / 0	1882.5	22.21	166.34
			1 / 37	1907.5	<b>22.83</b>	<b>191.87</b>
		16QAM	1 / 37	1857.5	20.15	103.51
			1 / 37	1882.5	20.67	116.68
			1 / 37	1907.5	<b>21.15</b>	<b>130.32</b>
	10	QPSK	1 / 0	1855.0	21.83	152.41
			1 / 0	1882.5	22.50	177.83
			1 / 49	1910.0	<b>22.79</b>	<b>190.11</b>
		16QAM	1 / 0	1855.0	20.31	107.40
			1 / 0	1882.5	20.82	120.78
			1 / 0	1910.0	<b>21.08</b>	<b>128.23</b>
	5	QPSK	1 / 12	1852.5	21.66	146.55
			1 / 24	1882.5	22.02	159.22
			1 / 12	1912.5	<b>22.99</b>	<b>199.07</b>
		16QAM	1 / 12	1852.5	19.95	98.86
			1 / 12	1882.5	20.59	114.55
			1 / 12	1912.5	<b>21.45</b>	<b>139.64</b>
	3	QPSK	1 / 8	1851.5	21.60	144.54
			1 / 0	1882.5	21.98	157.76
			1 / 8	1913.5	<b>22.40</b>	<b>173.78</b>
		16QAM	1 / 8	1851.5	19.67	92.68
			1 / 0	1882.5	20.40	109.65
			1 / 8	1913.5	<b>20.76</b>	<b>119.12</b>
1.4	QPSK	1 / 5	1850.7	20.90	123.03	
		1 / 5	1882.5	22.35	171.79	
		1 / 5	1914.3	<b>22.62</b>	<b>182.81</b>	
	16QAM	1 / 0	1850.7	20.24	105.68	
		1 / 0	1882.5	20.60	114.82	
		1 / 0	1914.3	<b>20.96</b>	<b>124.74</b>	

**LTE Band 26**

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP		
					[dBm]	[mW]	
Band 26	15	QPSK	1 / 37	821.5	20.75	118.85	
			1 / 0	831.5	20.83	121.06	
			1 / 0	841.5	<b>20.85</b>	<b>121.62</b>	
		16QAM	1 / 37	821.5	18.20	66.07	
			1 / 37	831.5	17.69	58.75	
			1 / 0	841.5	<b>18.28</b>	<b>67.30</b>	
	10	QPSK	1 / 49	819.0	20.45	110.92	
			1 / 0	829.0	20.61	115.08	
			1 / 0	831.5	20.56	113.76	
			1 / 0	844.0	<b>20.82</b>	<b>120.78</b>	
			16QAM	1 / 49	819.0	18.04	63.68
				1 / 0	829.0	18.17	65.61
		1 / 0		831.5	17.94	62.23	
		5	QPSK	1 / 49	844.0	<b>18.25</b>	<b>66.83</b>
				1 / 12	816.5	<b>20.87</b>	<b>122.18</b>
				1 / 12	821.5	20.58	114.29
				1 / 12	826.5	20.24	105.68
				1 / 12	831.5	20.21	104.95
	1 / 12			846.5	20.67	116.68	
	16QAM		1 / 24	816.5	<b>18.47</b>	<b>70.31</b>	
			1 / 24	821.5	18.11	64.71	
			1 / 24	826.5	17.65	58.21	
			1 / 24	831.5	17.71	59.02	
			1 / 24	846.5	18.40	69.18	
			3	QPSK	1 / 24	846.5	18.40
	1 / 8	815.5			21.04	127.06	
	1 / 8	822.5			<b>21.05</b>	<b>127.35</b>	
	1 / 14	825.5			20.33	107.89	
	1 / 14	831.5			20.00	100.00	
	1 / 8	847.5			20.44	110.66	
	16QAM	1 / 8		815.5	<b>18.25</b>	<b>66.83</b>	
		1 / 14		822.5	18.17	65.61	
		1 / 14		825.5	17.79	60.12	
		1 / 0		831.5	18.10	64.57	
		1 / 8		847.5	17.88	61.38	
		1.4		QPSK	1 / 8	847.5	17.88
	1 / 0		814.7		<b>20.95</b>	<b>124.45</b>	
	1 / 3		823.3		20.61	115.08	
	1 / 0		824.7		20.22	105.20	
	1 / 3		831.5		20.35	108.39	
	1 / 5		848.3		20.26	106.17	
	16QAM		1 / 5	814.7	<b>18.36</b>	<b>68.55</b>	
			1 / 5	823.3	17.95	62.37	
			1 / 3	824.7	18.14	65.16	
			1 / 3	831.5	17.85	60.95	
			1 / 0	848.3	17.47	55.85	

**LTE Band 41(PC2)**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 41	20	QPSK	1 / 99	2506.0	<b>26.74</b>	<b>472.06</b>
			1 / 0	2593.0	24.58	287.08
			1 / 0	2680.0	25.53	357.27
		16QAM	1 / 99	2506.0	<b>26.58</b>	<b>454.99</b>
			1 / 0	2593.0	24.38	274.16
			1 / 0	2680.0	23.97	249.46
	15	QPSK	1 / 37	2503.5	<b>26.34</b>	<b>430.53</b>
			1 / 37	2593.0	24.54	284.45
			1 / 0	2682.5	24.77	299.92
		16QAM	1 / 0	2503.5	<b>26.37</b>	<b>433.51</b>
			1 / 37	2593.0	23.39	218.27
			1 / 0	2682.5	25.12	325.09
	10	QPSK	1 / 0	2501.0	<b>26.60</b>	<b>457.09</b>
			1 / 0	2593.0	24.03	252.93
			1 / 0	2685.0	25.21	331.89
		16QAM	1 / 0	2501.0	<b>26.81</b>	<b>479.73</b>
			1 / 25	2593.0	23.68	233.35
			1 / 0	2685.0	24.94	311.89
	5	QPSK	1 / 12	2498.5	<b>26.03</b>	<b>400.87</b>
			1 / 12	2593.0	24.16	260.62
			1 / 12	2687.5	25.64	366.44
		16QAM	1 / 0	2498.5	<b>26.63</b>	<b>460.26</b>
			1 / 12	2593.0	25.95	393.55
			1 / 12	2687.5	25.99	397.19

**LTE Band 66**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 66	20	QPSK	1 / 99	1720.0	22.47	176.60
			1 / 0	1745.0	<b>22.89</b>	<b>194.54</b>
			1 / 0	1770.0	21.63	145.55
		16QAM	1 / 99	1720.0	21.31	135.21
			1 / 0	1745.0	<b>21.73</b>	<b>148.94</b>
			1 / 99	1770.0	19.39	86.90
	15	QPSK	1 / 37	1717.5	<b>22.20</b>	<b>165.96</b>
			1 / 74	1747.5	21.92	155.60
			1 / 37	1772.5	20.10	102.33
		16QAM	1 / 37	1717.5	20.96	124.74
			1 / 74	1747.5	<b>21.05</b>	<b>127.35</b>
			1 / 37	1772.5	19.16	82.41
	10	QPSK	1 / 49	1715.0	<b>22.95</b>	<b>197.24</b>
			1 / 0	1745.0	22.90	194.98
			1 / 49	1775.0	20.94	124.17
		16QAM	1 / 49	1715.0	<b>22.03</b>	<b>159.59</b>
			1 / 0	1745.0	21.85	153.11
			1 / 49	1775.0	19.91	97.95
	5	QPSK	1 / 24	1712.5	<b>22.06</b>	<b>160.69</b>
			1 / 24	1745.0	21.59	144.21
			1 / 12	1777.5	21.48	140.60
		16QAM	1 / 12	1712.5	<b>21.06</b>	<b>127.64</b>
			1 / 12	1745.0	20.61	115.08
			1 / 24	1777.5	19.72	93.76
	3	QPSK	1 / 8	1711.5	21.79	151.01
			1 / 0	1745.0	<b>21.97</b>	<b>157.40</b>
			1 / 8	1778.5	19.45	88.10
		16QAM	1 / 14	1711.5	<b>20.84</b>	<b>121.34</b>
			1 / 0	1745.0	20.70	117.49
			1 / 8	1778.5	18.41	69.34
1.4	QPSK	1 / 5	1710.7	21.44	139.32	
		1 / 0	1745.0	<b>21.67</b>	<b>146.89</b>	
		1 / 5	1779.3	21.61	144.88	
	16QAM	1 / 0	1710.7	20.49	111.94	
		1 / 5	1745.0	<b>20.60</b>	<b>114.82</b>	
		1 / 0	1779.3	17.77	59.84	

**LTE Band 2**

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 4**

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 5**

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band 17**

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

**LTE Band41(PC3)**

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

**10.1.2. ERP/EIRP DATA**

**GSM850**

GSM850  GPRS	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-11-20  <b>Test Engineer:</b> 20896  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> GPRS 850 MHz Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-749, and Chamber 2 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>824.20</td> <td>34.55</td> <td>V</td> <td>3.0</td> <td>-1.0</td> <td>30.59</td> <td>38.5</td> <td>-7.9</td> <td></td> </tr> <tr> <td>824.20</td> <td>22.10</td> <td>H</td> <td>3.0</td> <td>-1.0</td> <td>18.14</td> <td>38.5</td> <td>-20.4</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>836.60</td> <td>34.66</td> <td>V</td> <td>3.0</td> <td>-0.9</td> <td>30.72</td> <td>38.5</td> <td>-7.8</td> <td></td> </tr> <tr> <td>836.60</td> <td>21.80</td> <td>H</td> <td>3.0</td> <td>-0.9</td> <td>17.86</td> <td>38.5</td> <td>-20.6</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>848.80</td> <td>34.76</td> <td>V</td> <td>3.1</td> <td>-0.9</td> <td>30.85</td> <td>38.5</td> <td>-7.6</td> <td></td> </tr> <tr> <td>848.80</td> <td>21.78</td> <td>H</td> <td>3.1</td> <td>-0.9</td> <td>17.87</td> <td>38.5</td> <td>-20.6</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									824.20	34.55	V	3.0	-1.0	30.59	38.5	-7.9		824.20	22.10	H	3.0	-1.0	18.14	38.5	-20.4		Mid Ch									836.60	34.66	V	3.0	-0.9	30.72	38.5	-7.8		836.60	21.80	H	3.0	-0.9	17.86	38.5	-20.6		High Ch									848.80	34.76	V	3.1	-0.9	30.85	38.5	-7.6		848.80	21.78	H	3.1	-0.9	17.87	38.5	-20.6
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**GSM1900**

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**WCDMA Band 5**

WCDMA Band 5 REL99	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																	
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-11-20  <b>Test Engineer:</b> 20881  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> Rel99 Band 5 Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-750, and Chamber 1 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>826.40</td> <td>20.96</td> <td>V</td> <td>3.0</td> <td>-0.9</td> <td>17.00</td> <td>38.5</td> <td>-21.5</td> <td></td> </tr> <tr> <td>826.40</td> <td>9.76</td> <td>H</td> <td>3.0</td> <td>-0.9</td> <td>5.80</td> <td>38.5</td> <td>-32.7</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.60</td> <td>22.04</td> <td>V</td> <td>3.0</td> <td>-0.9</td> <td>18.10</td> <td>38.5</td> <td>-20.4</td> <td></td> </tr> <tr> <td>836.60</td> <td>11.11</td> <td>H</td> <td>3.0</td> <td>-0.9</td> <td>7.17</td> <td>38.5</td> <td>-31.3</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>846.60</td> <td>22.08</td> <td>V</td> <td>3.1</td> <td>-0.9</td> <td>18.16</td> <td>38.5</td> <td>-20.3</td> <td></td> </tr> <tr> <td>846.60</td> <td>10.69</td> <td>H</td> <td>3.1</td> <td>-0.9</td> <td>6.78</td> <td>38.5</td> <td>-31.7</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									826.40	20.96	V	3.0	-0.9	17.00	38.5	-21.5		826.40	9.76	H	3.0	-0.9	5.80	38.5	-32.7		Mid Ch									836.60	22.04	V	3.0	-0.9	18.10	38.5	-20.4		836.60	11.11	H	3.0	-0.9	7.17	38.5	-31.3		High Ch									846.60	22.08	V	3.1	-0.9	18.16	38.5	-20.3		846.60	10.69	H	3.1	-0.9	6.78	38.5	-31.7
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**WCDMA Band 4**

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**WCDMA Band 2**

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	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-03  <b>Test Engineer:</b> 20890  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> Rel99 Band 2 Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                      Substitution: Horn 3115[00167211], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1852.40</td> <td>11.41</td> <td>V</td> <td>4.5</td> <td>9.5</td> <td>16.40</td> <td>33.0</td> <td>-16.6</td> <td></td> </tr> <tr> <td>1852.40</td> <td>17.38</td> <td>H</td> <td>4.5</td> <td>9.5</td> <td>22.36</td> <td>33.0</td> <td>-10.6</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1880.00</td> <td>13.19</td> <td>V</td> <td>4.5</td> <td>9.3</td> <td>17.96</td> <td>33.0</td> <td>-15.0</td> <td></td> </tr> <tr> <td>1880.00</td> <td>18.70</td> <td>H</td> <td>4.5</td> <td>9.3</td> <td>23.47</td> <td>33.0</td> <td>-9.5</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1907.60</td> <td>15.00</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>19.52</td> <td>33.0</td> <td>-13.5</td> <td></td> </tr> <tr> <td>1907.60</td> <td>20.36</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>24.88</td> <td>33.0</td> <td>-8.1</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1852.40	11.41	V	4.5	9.5	16.40	33.0	-16.6		1852.40	17.38	H	4.5	9.5	22.36	33.0	-10.6		Mid Ch									1880.00	13.19	V	4.5	9.3	17.96	33.0	-15.0		1880.00	18.70	H	4.5	9.3	23.47	33.0	-9.5		High Ch									1907.60	15.00	V	4.6	9.1	19.52	33.0	-13.5		1907.60	20.36	H	4.6	9.1	24.88	33.0	-8.1
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<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-03  <b>Test Engineer:</b> 20896  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> HSDPA Band 2 Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                      Substitution: Horn 3115[00167211], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1852.40</td> <td>10.23</td> <td>V</td> <td>4.5</td> <td>9.5</td> <td>15.22</td> <td>33.0</td> <td>-17.8</td> <td></td> </tr> <tr> <td>1852.40</td> <td>16.63</td> <td>H</td> <td>4.5</td> <td>9.5</td> <td>21.61</td> <td>33.0</td> <td>-11.4</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1880.00</td> <td>12.55</td> <td>V</td> <td>4.5</td> <td>9.3</td> <td>17.32</td> <td>33.0</td> <td>-15.7</td> <td></td> </tr> <tr> <td>1880.00</td> <td>17.52</td> <td>H</td> <td>4.5</td> <td>9.3</td> <td>22.29</td> <td>33.0</td> <td>-10.7</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1907.60</td> <td>13.01</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>17.53</td> <td>33.0</td> <td>-15.5</td> <td></td> </tr> <tr> <td>1907.60</td> <td>19.33</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>23.85</td> <td>33.0</td> <td>-9.2</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1852.40	10.23	V	4.5	9.5	15.22	33.0	-17.8		1852.40	16.63	H	4.5	9.5	21.61	33.0	-11.4		Mid Ch									1880.00	12.55	V	4.5	9.3	17.32	33.0	-15.7		1880.00	17.52	H	4.5	9.3	22.29	33.0	-10.7		High Ch									1907.60	13.01	V	4.6	9.1	17.53	33.0	-15.5		1907.60	19.33	H	4.6	9.1	23.85	33.0	-9.2	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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1852.40	10.23	V	4.5	9.5	15.22	33.0	-17.8																																																																																											
1852.40	16.63	H	4.5	9.5	21.61	33.0	-11.4																																																																																											
Mid Ch																																																																																																		
1880.00	12.55	V	4.5	9.3	17.32	33.0	-15.7																																																																																											
1880.00	17.52	H	4.5	9.3	22.29	33.0	-10.7																																																																																											
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**LTE Band 12**

LTE Band 12 10MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	704.00	14.33	V	2.8	-1.1	10.49	34.8	-24.3	
	704.00	20.72	H	2.8	-1.1	16.88	34.8	-17.9	
	Mid Ch								
	707.50	14.29	V	2.8	-1.1	10.45	34.8	-24.4	
	707.50	20.83	H	2.8	-1.1	16.98	34.8	-17.8	
High Ch									
711.00	14.71	V	2.8	-1.1	10.85	34.8	-23.9		
711.00	21.07	H	2.8	-1.1	17.21	34.8	-17.6		
LTE Band 12 10MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	704.00	13.23	V	2.8	-1.1	9.39	34.8	-25.4	
	704.00	19.52	H	2.8	-1.1	15.68	34.8	-19.1	
	Mid Ch								
	707.50	13.54	V	2.8	-1.1	9.70	34.8	-25.1	
	707.50	19.77	H	2.8	-1.1	15.92	34.8	-18.9	
High Ch									
711.00	13.76	V	2.8	-1.1	9.90	34.8	-24.9		
711.00	20.05	H	2.8	-1.1	16.19	34.8	-18.6		

LTE Band 12 5MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	701.50	14.54	V	2.8	-1.1	10.71	34.8	-24.1	
	701.50	20.65	H	2.8	-1.1	16.81	34.8	-18.0	
	<b>Mid Ch</b>								
	707.50	14.63	V	2.8	-1.1	10.79	34.8	-24.0	
	707.50	20.81	H	2.8	-1.1	16.96	34.8	-17.8	
<b>High Ch</b>									
713.50	14.83	V	2.8	-1.1	10.96	34.8	-23.8		
713.50	21.56	H	2.8	-1.1	17.70	34.8	-17.1		
LTE Band 12 5MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	701.50	13.25	V	2.8	-1.1	9.42	34.8	-25.4	
	701.50	19.47	H	2.8	-1.1	15.63	34.8	-19.2	
	<b>Mid Ch</b>								
	707.50	13.20	V	2.8	-1.1	9.36	34.8	-25.4	
	707.50	19.63	H	2.8	-1.1	15.78	34.8	-19.0	
<b>High Ch</b>									
713.50	13.74	V	2.8	-1.1	9.87	34.8	-24.9		
713.50	20.19	H	2.8	-1.1	16.33	34.8	-18.5		

LTE Band 12 3MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	700.50	14.13	V	2.8	-1.1	10.30	34.8	-24.5	
	700.50	20.35	H	2.8	-1.1	16.52	34.8	-18.3	
	Mid Ch								
	707.50	14.00	V	2.8	-1.1	10.16	34.8	-24.6	
	707.50	20.75	H	2.8	-1.1	16.90	34.8	-17.9	
High Ch									
714.50	14.20	V	2.8	-1.1	10.34	34.8	-24.5		
714.50	21.12	H	2.8	-1.1	17.26	34.8	-17.5		
LTE Band 12 3MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	700.50	13.00	V	2.8	-1.1	9.17	34.8	-25.6	
	700.50	19.36	H	2.8	-1.1	15.53	34.8	-19.3	
	Mid Ch								
	707.50	13.46	V	2.8	-1.1	9.62	34.8	-25.2	
	707.50	19.01	H	2.8	-1.1	15.16	34.8	-19.6	
High Ch									
714.50	13.12	V	2.8	-1.1	9.26	34.8	-25.5		
714.50	20.12	H	2.8	-1.1	16.26	34.8	-18.5		

LTE Band 12 1.4MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	699.70	14.15	V	2.8	-1.1	10.32	34.8	-24.5	
	699.70	20.28	H	2.8	-1.1	16.44	34.8	-18.4	
	Mid Ch								
	707.50	14.55	V	2.8	-1.1	10.71	34.8	-24.1	
	707.50	20.82	H	2.8	-1.1	16.97	34.8	-17.8	
High Ch									
715.30	14.44	V	2.8	-1.1	10.58	34.8	-24.2		
715.30	21.19	H	2.8	-1.1	17.33	34.8	-17.5		
LTE Band 12 1.4MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-02 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	699.70	12.86	V	2.8	-1.1	9.03	34.8	-25.8	
	699.70	19.46	H	2.8	-1.1	15.62	34.8	-19.2	
	Mid Ch								
	707.50	13.50	V	2.8	-1.1	9.66	34.8	-25.1	
	707.50	19.69	H	2.8	-1.1	15.84	34.8	-19.0	
High Ch									
715.30	13.00	V	2.8	-1.1	9.14	34.8	-25.7		
715.30	20.03	H	2.8	-1.1	16.17	34.8	-18.6		

**LTE Band 13**

LTE Band 13 10MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																			
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-03  <b>Test Engineer:</b> 20882  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-750, and Chamber 1 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>24.43</td> <td>V</td> <td>2.9</td> <td>-1.1</td> <td>20.44</td> <td>34.8</td> <td>-14.3</td> <td></td> </tr> <tr> <td>782.00</td> <td>10.31</td> <td>H</td> <td>2.9</td> <td>-1.1</td> <td>6.32</td> <td>34.8</td> <td>-28.5</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	24.43	V	2.9	-1.1	20.44	34.8	-14.3		782.00	10.31	H	2.9	-1.1	6.32	34.8	-28.5
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																												
Mid Ch																																				
782.00	24.43	V	2.9	-1.1	20.44	34.8	-14.3																													
782.00	10.31	H	2.9	-1.1	6.32	34.8	-28.5																													
LTE Band 13 10MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																			
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-03  <b>Test Engineer:</b> 20882  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-750, and Chamber 1 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>23.79</td> <td>V</td> <td>2.9</td> <td>-1.1</td> <td>19.80</td> <td>34.8</td> <td>-15.0</td> <td></td> </tr> <tr> <td>782.00</td> <td>9.38</td> <td>H</td> <td>2.9</td> <td>-1.1</td> <td>5.39</td> <td>34.8</td> <td>-29.4</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	23.79	V	2.9	-1.1	19.80	34.8	-15.0		782.00	9.38	H	2.9	-1.1	5.39	34.8	-29.4
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																												
Mid Ch																																				
782.00	23.79	V	2.9	-1.1	19.80	34.8	-15.0																													
782.00	9.38	H	2.9	-1.1	5.39	34.8	-29.4																													

LTE Band 13 5MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-03 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	779.50	24.47	V	2.9	-1.1	20.49	34.8	-14.3	
	779.50	10.23	H	2.9	-1.1	6.25	34.8	-28.5	
	Mid Ch								
	782.00	24.72	V	2.9	-1.1	20.73	34.8	-14.0	
	782.00	9.91	H	2.9	-1.1	5.92	34.8	-28.9	
High Ch									
784.50	24.30	V	2.9	-1.1	20.31	34.8	-14.5		
784.50	10.52	H	2.9	-1.1	6.53	34.8	-28.2		
LTE Band 13 5MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-03 <b>Test Engineer:</b> 20882 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	779.50	23.23	V	2.9	-1.1	19.25	34.8	-15.5	
	779.50	9.25	H	2.9	-1.1	5.27	34.8	-29.5	
	Mid Ch								
	782.00	24.05	V	2.9	-1.1	20.06	34.8	-14.7	
	782.00	8.94	H	2.9	-1.1	4.95	34.8	-29.8	
High Ch									
784.50	23.53	V	2.9	-1.1	19.54	34.8	-15.2		
784.50	9.54	H	2.9	-1.1	5.55	34.8	-29.2		

**LTE Band 25**

LTE Band 25 20MHz QPSK	<p><b>8.83</b></p> <p><b>UL Verification Services, Inc.</b>  <b>High Frequency Substitution Measurement</b></p> <p><b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-20  <b>Test Engineer:</b> 20890  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 20MHz Bandwidth</p> <p><b>Test Equipment:</b>                  Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                  Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1860.00</td> <td>10.21</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>15.14</td> <td>33.0</td> <td>-17.9</td> <td></td> </tr> <tr> <td>1860.00</td> <td>16.56</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>21.48</td> <td>33.0</td> <td>-11.5</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1882.50</td> <td>11.02</td> <td>V</td> <td>4.5</td> <td>9.3</td> <td>15.77</td> <td>33.0</td> <td>-17.2</td> <td></td> </tr> <tr> <td>1882.50</td> <td>17.38</td> <td>H</td> <td>4.5</td> <td>9.3</td> <td>22.13</td> <td>33.0</td> <td>-10.9</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1905.00</td> <td>8.18</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>12.73</td> <td>33.0</td> <td>-20.3</td> <td></td> </tr> <tr> <td>1905.00</td> <td>18.04</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>22.59</td> <td>33.0</td> <td>-10.4</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1860.00	10.21	V	4.5	9.4	15.14	33.0	-17.9		1860.00	16.56	H	4.5	9.4	21.48	33.0	-11.5		Mid Ch									1882.50	11.02	V	4.5	9.3	15.77	33.0	-17.2		1882.50	17.38	H	4.5	9.3	22.13	33.0	-10.9		High Ch									1905.00	8.18	V	4.6	9.1	12.73	33.0	-20.3		1905.00	18.04	H	4.6	9.1	22.59	33.0	-10.4	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																		
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LTE Band 25 20MHz 16QAM	<p><b>UL Verification Services, Inc.</b>  <b>High Frequency Substitution Measurement</b></p> <p><b>Company:</b> Samsung  <b>Project #:</b> 4789230288  <b>Date:</b> 2019-12-20  <b>Test Engineer:</b> 20890  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 20MHz Bandwidth</p> <p><b>Test Equipment:</b>                  Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                  Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1860.00</td> <td>9.12</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>14.05</td> <td>33.0</td> <td>-19.0</td> <td></td> </tr> <tr> <td>1860.00</td> <td>15.29</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>20.21</td> <td>33.0</td> <td>-12.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1882.50</td> <td>10.00</td> <td>V</td> <td>4.5</td> <td>9.3</td> <td>14.75</td> <td>33.0</td> <td>-18.2</td> <td></td> </tr> <tr> <td>1882.50</td> <td>16.15</td> <td>H</td> <td>4.5</td> <td>9.3</td> <td>20.90</td> <td>33.0</td> <td>-12.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1905.00</td> <td>11.58</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>16.13</td> <td>33.0</td> <td>-16.9</td> <td></td> </tr> <tr> <td>1905.00</td> <td>16.15</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>20.70</td> <td>33.0</td> <td>-12.3</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1860.00	9.12	V	4.5	9.4	14.05	33.0	-19.0		1860.00	15.29	H	4.5	9.4	20.21	33.0	-12.8		Mid Ch									1882.50	10.00	V	4.5	9.3	14.75	33.0	-18.2		1882.50	16.15	H	4.5	9.3	20.90	33.0	-12.1		High Ch									1905.00	11.58	V	4.6	9.1	16.13	33.0	-16.9		1905.00	16.15	H	4.6	9.1	20.70	33.0	-12.3	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																			
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LTE Band 25 15MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1857.50	10.07	V	4.5	9.5	15.02	33.0	-18.0	
	1857.50	16.57	H	4.5	9.5	21.52	33.0	-11.5	
	<b>Mid Ch</b>								
	1882.50	10.67	V	4.5	9.3	15.42	33.0	-17.6	
	1882.50	17.46	H	4.5	9.3	22.21	33.0	-10.8	
<b>High Ch</b>									
1907.50	7.39	V	4.6	9.1	11.91	33.0	-21.1		
1907.50	18.31	H	4.6	9.1	22.83	33.0	-10.2		
LTE Band 25 15MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1857.50	8.61	V	4.5	9.5	13.56	33.0	-19.4	
	1857.50	15.20	H	4.5	9.5	20.15	33.0	-12.9	
	<b>Mid Ch</b>								
	1882.50	11.53	V	4.5	9.3	16.28	33.0	-16.7	
	1882.50	15.92	H	4.5	9.3	20.67	33.0	-12.3	
<b>High Ch</b>									
1907.50	6.02	V	4.6	9.1	10.54	33.0	-22.5		
1907.50	16.63	H	4.6	9.1	21.15	33.0	-11.9		

LTE Band 25 10MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1855.00	12.12	V	4.5	9.5	17.09	33.0	-15.9	
	1855.00	16.86	H	4.5	9.5	21.83	33.0	-11.2	
	<b>Mid Ch</b>								
	1882.50	12.60	V	4.5	9.3	17.35	33.0	-15.6	
	1882.50	17.75	H	4.5	9.3	22.50	33.0	-10.5	
<b>High Ch</b>									
1910.00	12.15	V	4.6	9.1	16.63	33.0	-16.4		
1910.00	18.30	H	4.6	9.1	22.79	33.0	-10.2		
LTE Band 25 10MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1855.00	10.45	V	4.5	9.5	15.42	33.0	-17.6	
	1855.00	15.34	H	4.5	9.5	20.31	33.0	-12.7	
	<b>Mid Ch</b>								
	1882.50	10.83	V	4.5	9.3	15.58	33.0	-17.4	
	1882.50	16.07	H	4.5	9.3	20.82	33.0	-12.2	
<b>High Ch</b>									
1910.00	9.74	V	4.6	9.1	14.22	33.0	-18.8		
1910.00	16.59	H	4.6	9.1	21.08	33.0	-11.9		

LTE Band 25 5MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1852.50	10.20	V	4.5	9.5	15.19	33.0	-17.8	
	1852.50	16.67	H	4.5	9.5	21.66	33.0	-11.3	
	<b>Mid Ch</b>								
	1882.50	10.82	V	4.5	9.3	15.57	33.0	-17.4	
	1882.50	17.27	H	4.5	9.3	22.02	33.0	-11.0	
<b>High Ch</b>									
1912.50	7.33	V	4.6	9.0	11.79	33.0	-21.2		
1912.50	18.53	H	4.6	9.0	22.99	33.0	-10.0		
LTE Band 25 5MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1852.50	8.32	V	4.5	9.5	13.31	33.0	-19.7	
	1852.50	14.96	H	4.5	9.5	19.95	33.0	-13.1	
	<b>Mid Ch</b>								
	1882.50	11.39	V	4.5	9.3	16.14	33.0	-16.9	
	1882.50	15.84	H	4.5	9.3	20.59	33.0	-12.4	
<b>High Ch</b>									
1912.50	5.81	V	4.6	9.0	10.27	33.0	-22.7		
1912.50	16.99	H	4.6	9.0	21.45	33.0	-11.6		

LTE Band 25 3MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 3MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1851.50	11.51	V	4.5	9.5	16.51	33.0	-16.5	
	1851.50	16.60	H	4.5	9.5	21.60	33.0	-11.4	
	Mid Ch								
	1882.50	12.89	V	4.5	9.3	17.64	33.0	-15.4	
	1882.50	17.23	H	4.5	9.3	21.98	33.0	-11.0	
High Ch									
1913.50	11.72	V	4.6	9.0	16.16	33.0	-16.8		
1913.50	17.96	H	4.6	9.0	22.40	33.0	-10.6		
LTE Band 25 3MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 3MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1851.50	9.93	V	4.5	9.5	14.93	33.0	-18.1	
	1851.50	14.67	H	4.5	9.5	19.67	33.0	-13.3	
	Mid Ch								
	1882.50	11.20	V	4.5	9.3	15.95	33.0	-17.0	
	1882.50	15.65	H	4.5	9.3	20.40	33.0	-12.6	
High Ch									
1913.50	9.96	V	4.6	9.0	14.40	33.0	-18.6		
1913.50	16.32	H	4.6	9.0	20.76	33.0	-12.2		

LTE Band 25 1.4MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 25 Fundamentals, 1.4MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1850.70	9.91	V	4.5	9.5	14.91	33.0	-18.1	
	1850.70	15.90	H	4.5	9.5	20.90	33.0	-12.1	
	<b>Mid Ch</b>								
	1882.50	13.53	V	4.5	9.3	18.28	33.0	-14.7	
	1882.50	17.60	H	4.5	9.3	22.35	33.0	-10.7	
<b>High Ch</b>									
1914.30	12.14	V	4.6	9.0	16.57	33.0	-16.4		
1914.30	18.19	H	4.6	9.0	22.62	33.0	-10.4		
LTE Band 25 1.4MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4789230288 <b>Date:</b> 2019-12-20 <b>Test Engineer:</b> 20890 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 25 Fundamentals, 1.4MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Low Ch</b>								
	1850.70	8.49	V	4.5	9.5	13.49	33.0	-19.5	
	1850.70	15.24	H	4.5	9.5	20.24	33.0	-12.8	
	<b>Mid Ch</b>								
	1882.50	11.66	V	4.5	9.3	16.41	33.0	-16.6	
	1882.50	15.85	H	4.5	9.3	20.60	33.0	-12.4	
<b>High Ch</b>									
1914.30	10.48	V	4.6	9.0	14.91	33.0	-18.1		
1914.30	16.53	H	4.6	9.0	20.96	33.0	-12.0		

**LTE Band 26**

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26 15MHz QPSK		<b>Company:</b>		Samsung					
		<b>Project #:</b>		4789230288					
		<b>Date:</b>		2019-12-17					
		<b>Test Engineer:</b>		20881					
		<b>Configuration:</b>		EUT, Z-Position					
		<b>Location:</b>		Chamber 2					
		<b>Mode:</b>		LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth					
		<b>Test Equipment:</b>							
		Receiving: VULB9163-749, and Chamber 2 SMA Cables							
		Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes	
MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)		
Low Ch									
821.50	24.72	V	3.0	-1.0	20.75	50.0	-29.3	Part 90	
821.50	13.98	H	3.0	-1.0	10.01	50.0	-40.0	Part 90	
		UL Verification Services, Inc. High Frequency Substitution Measurement							
		<b>Company:</b>		Samsung					
		<b>Project #:</b>		4789230288					
		<b>Date:</b>		2019-12-17					
		<b>Test Engineer:</b>		20881					
		<b>Configuration:</b>		EUT, Z-Position					
		<b>Location:</b>		Chamber 2					
		<b>Mode:</b>		LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth					
		<b>Test Equipment:</b>							
		Receiving: VULB9163-749, and Chamber 2 SMA Cables							
		Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes	
MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)		
Mid Ch									
831.50	24.78	V	3.0	-0.9	20.83	38.5	-17.7		
831.50	14.12	H	3.0	-0.9	10.17	38.5	-28.3		
High Ch									
841.50	24.78	V	3.0	-0.9	20.85	38.5	-17.6		
841.50	13.99	H	3.0	-0.9	10.07	38.5	-28.4		

LTE  Band 26  15MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																						
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		<b>Test Engineer:</b>	20881						
		<b>Configuration:</b>	EUT, Z-Position						
		<b>Location:</b>	Chamber 2						
		<b>Mode:</b>	LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth						
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f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes	
MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)		
Low Ch									
819.00	24.43	V	3.0	-1.0	20.45	50.0	-29.5	Part 90	
819.00	13.95	H	3.0	-1.0	9.97	50.0	-40.0	Part 90	
LTE									
Band 26									
10MHz									
QPSK									
		UL Verification Services, Inc. High Frequency Substitution Measurement							
		<b>Company:</b>	Samsung						
		<b>Project #:</b>	4789230288						
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		<b>Test Engineer:</b>	20881						
		<b>Configuration:</b>	EUT, Z-Position						
		<b>Location:</b>	Chamber 2						
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MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)		
Low Ch									
829.00	24.57	V	3.0	-0.9	20.61	38.5	-17.9		
829.00	14.09	H	3.0	-0.9	10.14	38.5	-28.4		
Mid Ch									
831.50	24.51	V	3.0	-0.9	20.56	38.5	-17.9		
831.50	13.98	H	3.0	-0.9	10.03	38.5	-28.5		
High Ch									
844.00	24.74	V	3.0	-0.9	20.82	38.5	-17.7		
844.00	13.83	H	3.0	-0.9	9.91	38.5	-28.6		

LTE Band 26 10MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																	
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<b>Project #:</b>		4789230288						
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<b>Configuration:</b>		EUT, Z-Position						
<b>Location:</b>		Chamber 2						
<b>Mode:</b>		LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth						
<b>Test Equipment:</b>								
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Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	24.85	V	3.0	-1.0	20.87	50.0	-29.1	Part 90
816.50	13.64	H	3.0	-1.0	9.66	50.0	-40.3	Part 90
Mid Ch								
821.50	24.55	V	3.0	-1.0	20.58	50.0	-29.4	Part 90
821.50	13.96	H	3.0	-1.0	9.99	50.0	-40.0	Part 90
LTE Band 26 5MHz QPSK								
UL Verification Services, Inc. High Frequency Substitution Measurement								
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<b>Project #:</b>		4789230288						
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Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	24.20	V	3.0	-0.9	20.24	38.5	-18.3	
826.50	13.99	H	3.0	-0.9	10.03	38.5	-28.5	
Mid Ch								
831.50	24.16	V	3.0	-0.9	20.21	38.5	-18.3	
831.50	13.94	H	3.0	-0.9	9.99	38.5	-28.5	
High Ch								
846.50	24.58	V	3.0	-0.9	20.67	38.5	-17.8	
846.50	13.64	H	3.0	-0.9	9.72	38.5	-28.8	

LTE Band 26 5MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																	
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<b>Test Engineer:</b>		20881																																																																																																
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Project #:		4789230288						
Date:		2019-12-18						
Test Engineer:		20896						
Configuration:		EUT						
Location:		Chamber 2						
Mode:		LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth						
<b>Test Equipment:</b>								
Receiving: VULB9163-749, and Chamber 2 SMA Cables								
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
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Low Ch								
815.50	25.03	V	3.0	-1.0	21.04	50.0	-29.0	Part 90
815.50	13.21	H	3.0	-1.0	9.22	50.0	-40.8	Part 90
Mid Ch								
822.50	25.01	V	3.0	-1.0	21.05	50.0	-29.0	Part 90
822.50	13.65	H	3.0	-1.0	9.69	50.0	-40.3	Part 90
LTE Band 26 3MHz QPSK								
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f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	24.29	V	3.0	-0.9	20.33	38.5	-18.2	
825.50	13.90	H	3.0	-0.9	9.94	38.5	-28.6	
Mid Ch								
831.50	23.95	V	3.0	-0.9	20.00	38.5	-18.5	
831.50	13.77	H	3.0	-0.9	9.82	38.5	-28.7	
High Ch								
847.50	24.36	V	3.1	-0.9	20.44	38.5	-18.1	
847.50	13.73	H	3.1	-0.9	9.81	38.5	-28.7	

LTE Band 26 3MHz 16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																	
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