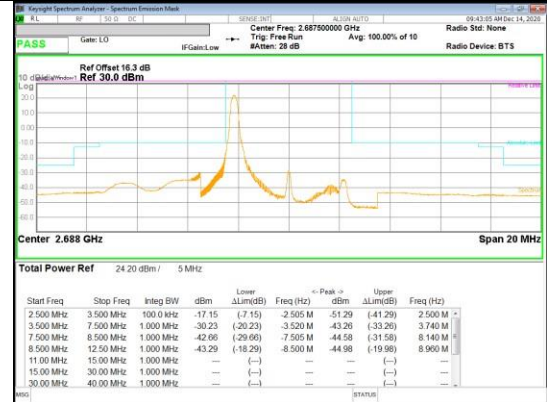


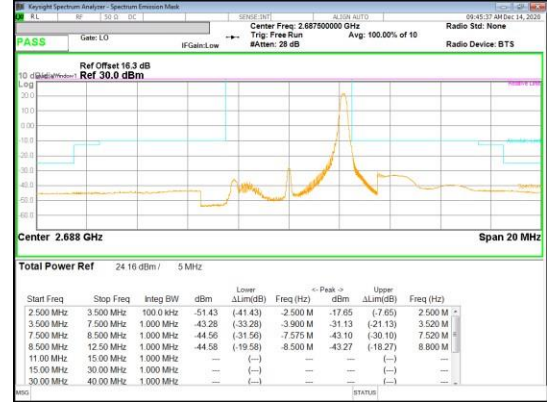
Band 41
 5MHz
 QPSK



QPSK High channel FRB



QPSK High channel 1RB_Offset Low

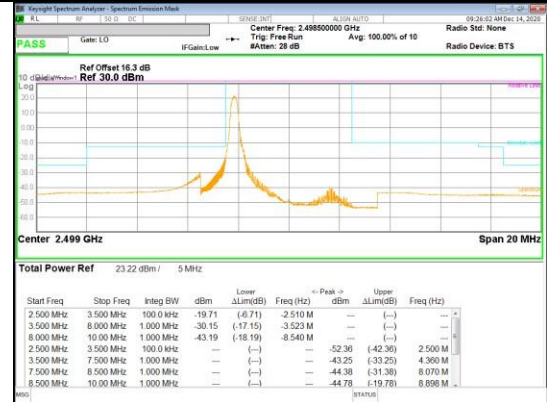


QPSK High channel 1RB_Offset High

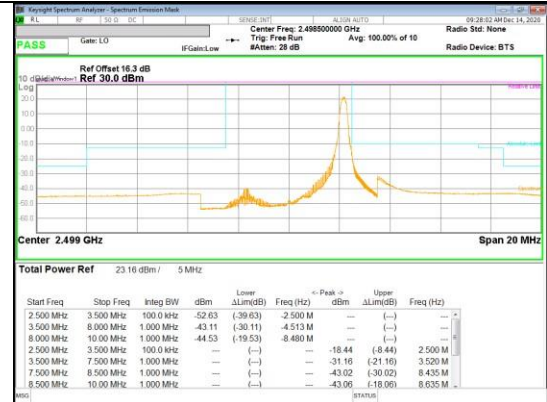
Band 41
 5MHz
 16QAM



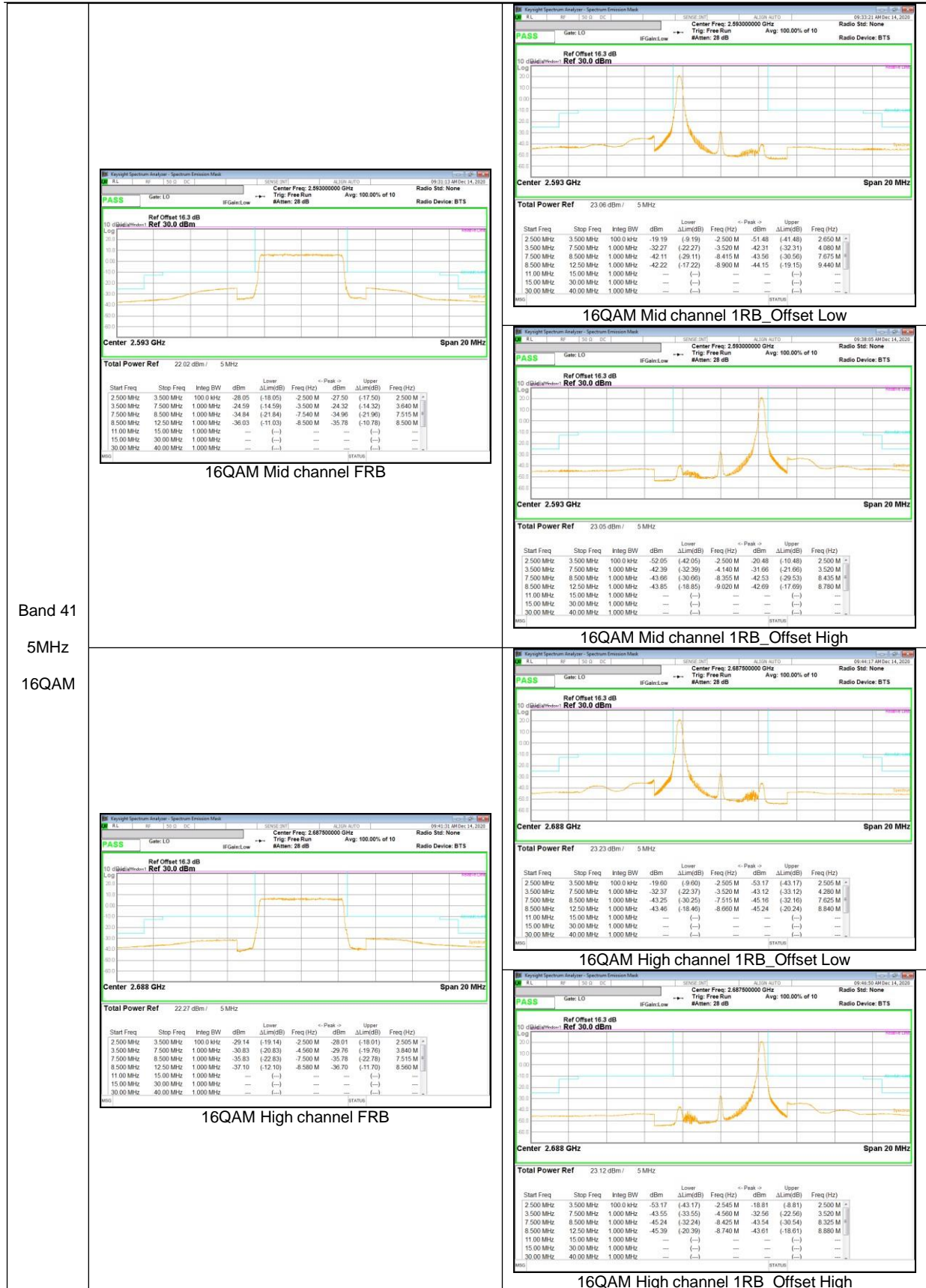
16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High



9.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

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.

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 ≥ 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 FDD), Max hold(GSM, LTE TDD);

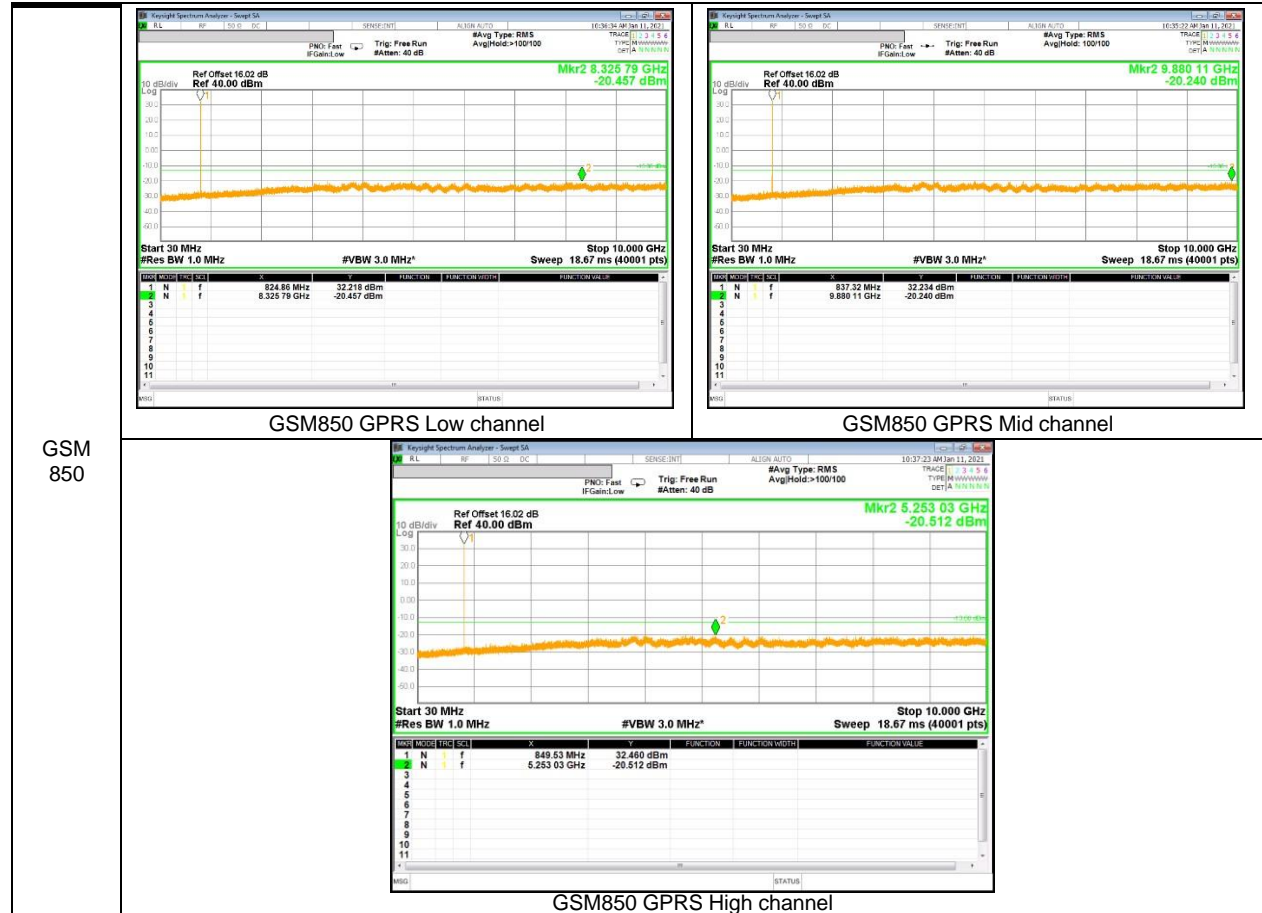
RESULTS

See the following pages.

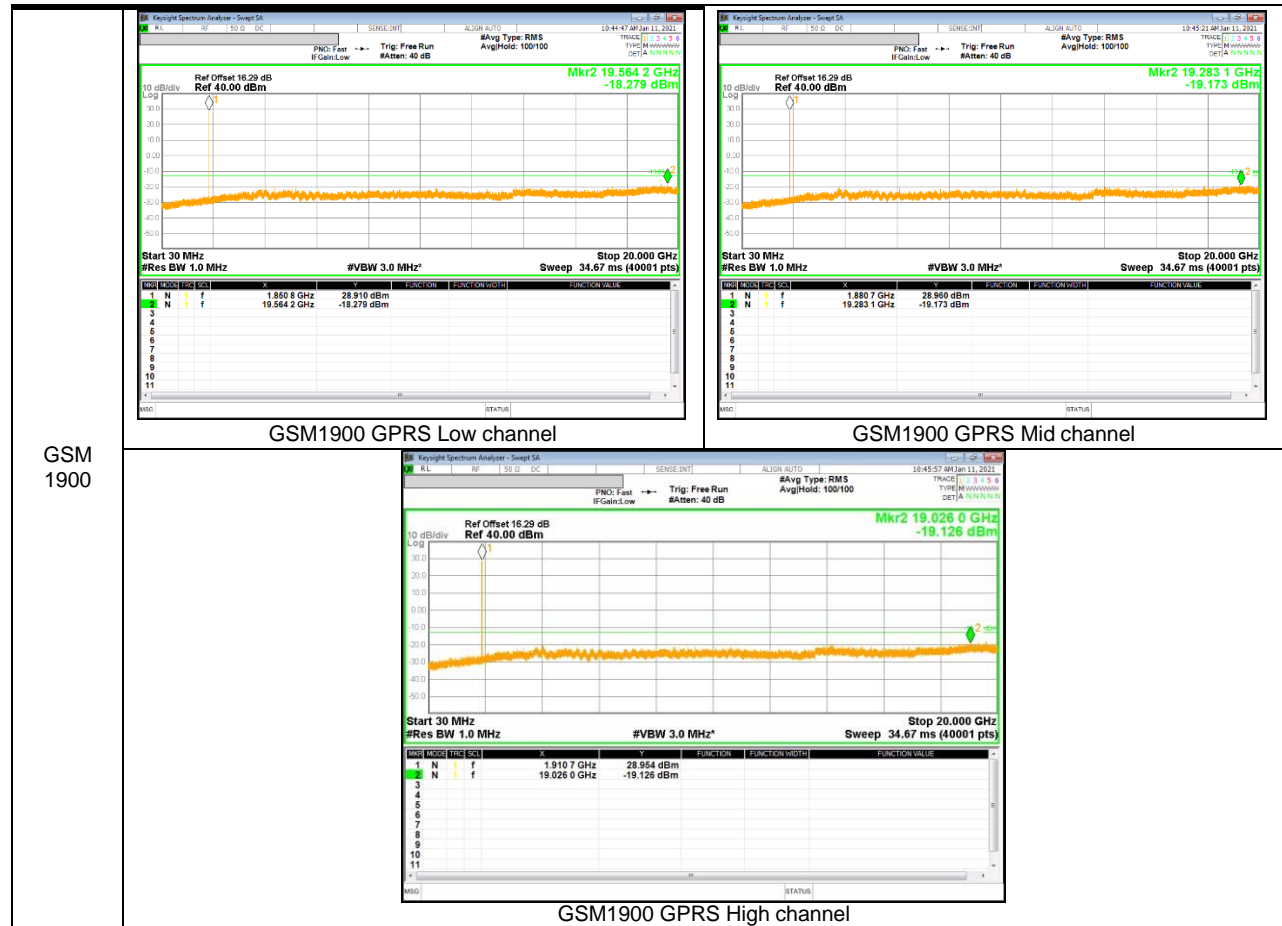
NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

9.3.1. OUT OF BAND EMISSIONS RESULT

GSM 850

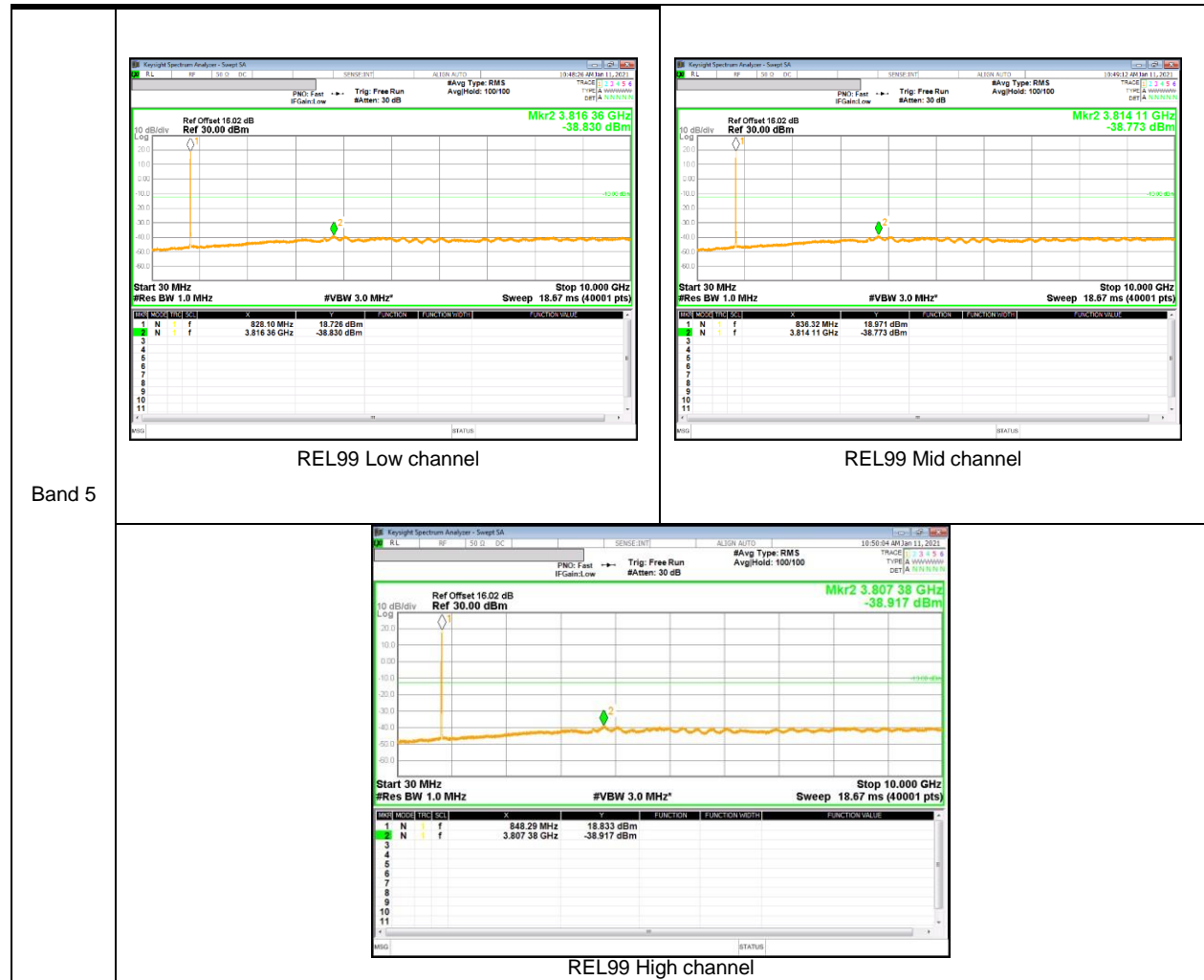


GSM 1900

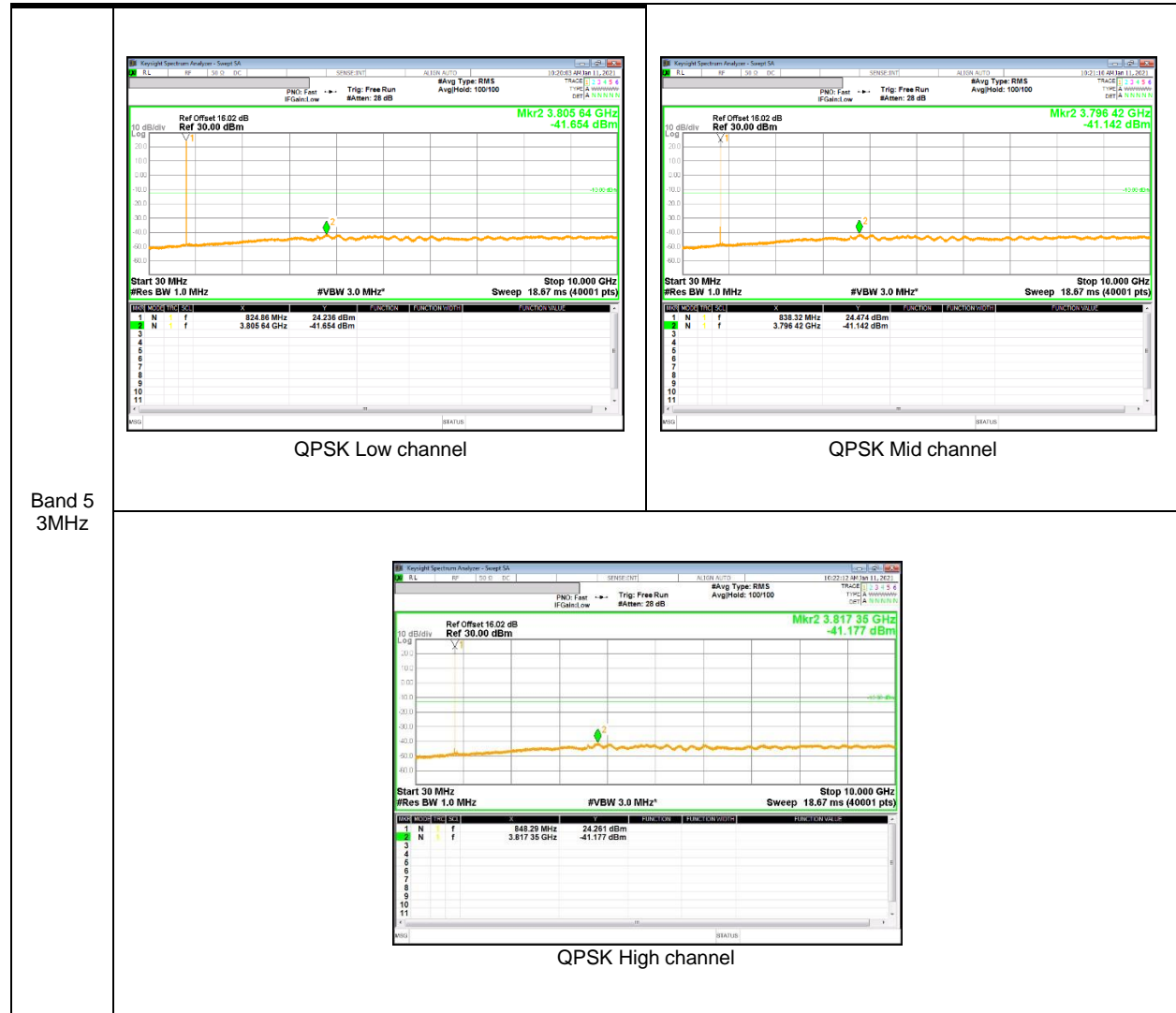


GSM
1900

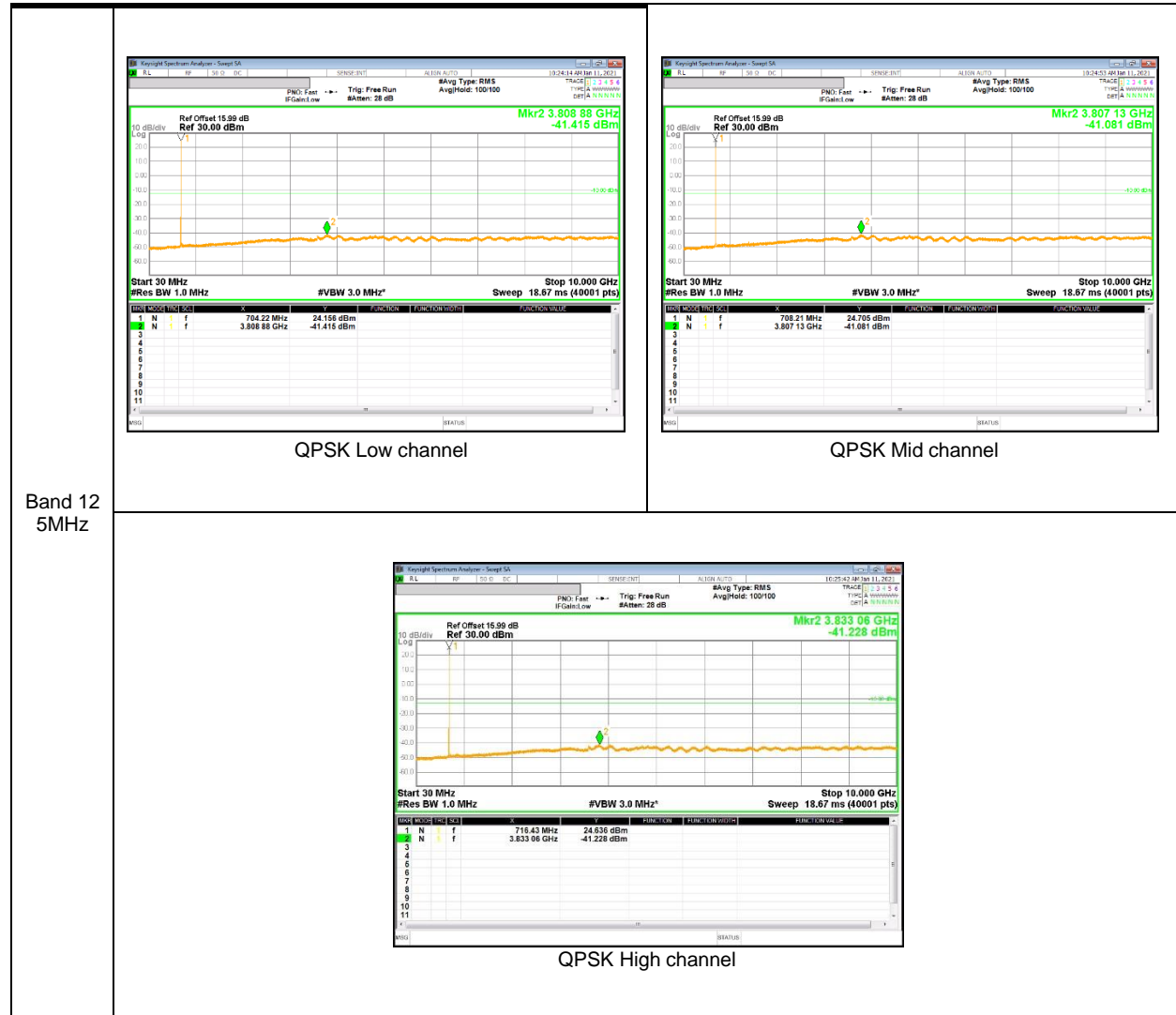
WCDMA Band 5



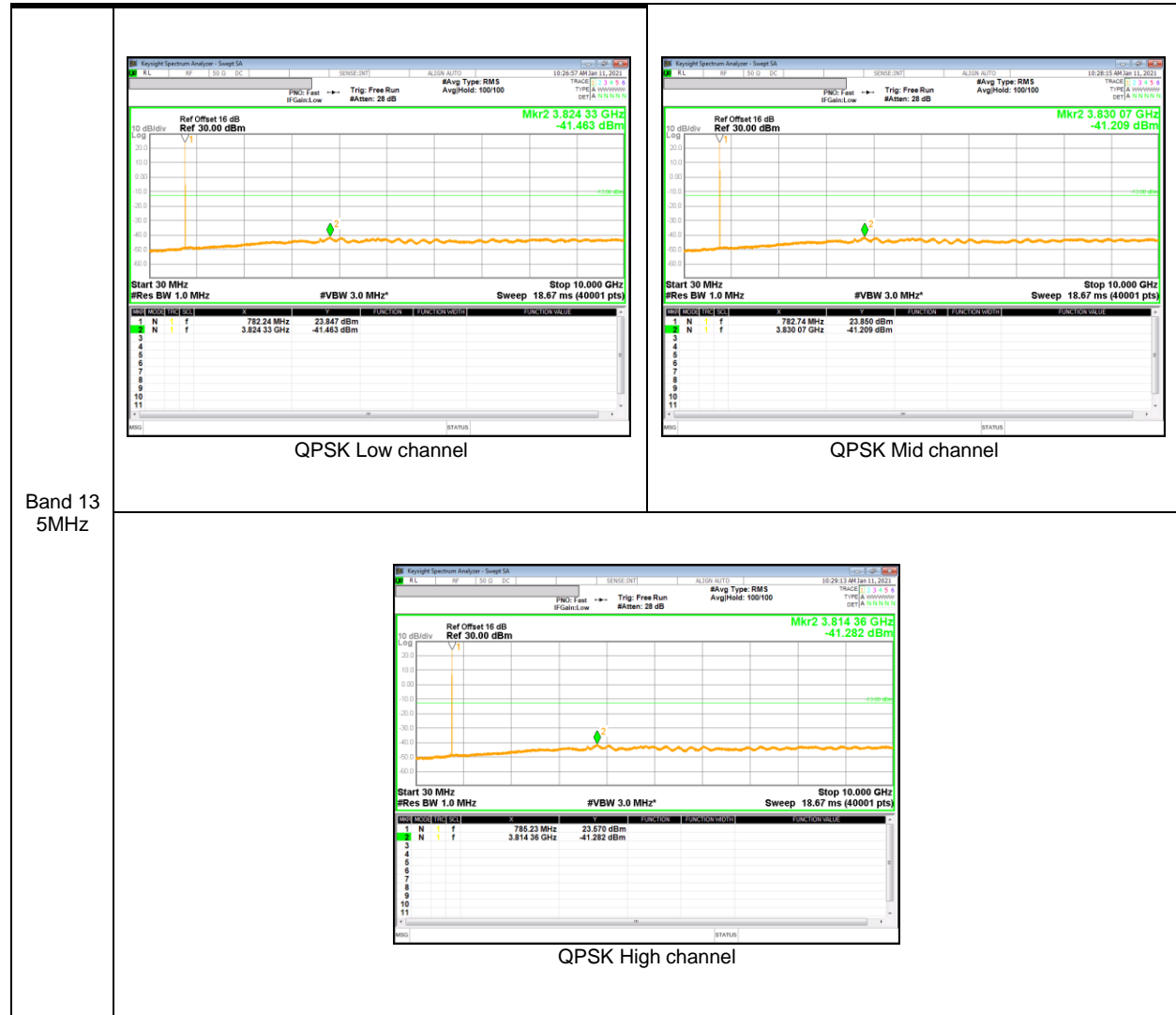
LTE Band 5



LTE Band 12

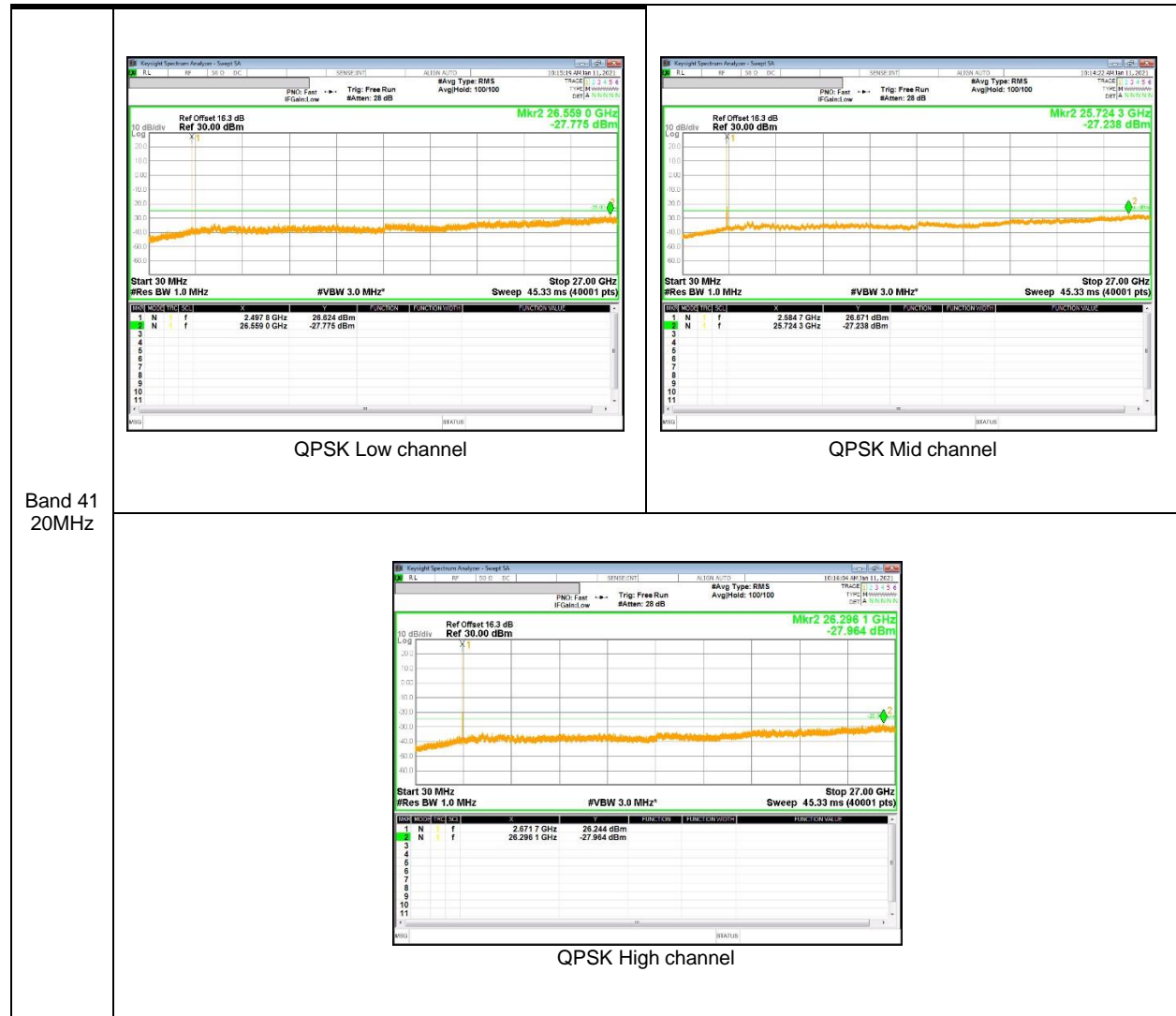


LTE Band 13



Band 13
5MHz

LTE Band 41



9.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 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.

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]		
3.88	50	824.20003913	0.011	848.80003755	0.002	2.5	
3.88	40	824.20003548	0.015	848.80003332	0.007	2.5	
3.88	30	824.20003513	0.016	848.80003451	0.005	2.5	
3.88	20	824.20004798	0.000	848.80003887	0.000	2.5	
3.88	10	824.20004759	0.000	848.80004326	-0.005	2.5	
3.88	0	824.20004333	0.006	848.80003516	0.004	2.5	
3.88	-10	824.20004284	0.006	848.80003661	0.003	2.5	
3.88	-20	824.20004339	0.006	848.80003861	0.000	2.5	
3.88	-30	824.20005606	-0.010	848.80005560	-0.020	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]		
3.88	20	824.20004798	0	848.80003887	0	2.5	
4.40	20	824.20003468	0.016	848.80003629	0.003	2.5	
3.65	20	824.20003426	0.017	848.80003577	0.004	2.5	

GSM 1900, Channel 512/810, Frequency 1850.0/1910.0 MHz
 (Lowest Frequency:GPRS / 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	1850.0759	1909.9262		
Extreme (50C)		1850.0760	1909.9262	62.9	0.033
Extreme (40C)		1850.0760	1909.9262	48.1	0.026
Extreme (30C)		1850.0760	1909.9262	46.9	0.025
Extreme (10C)		1850.0760	1909.9262	60.4	0.032
Extreme (0C)		1850.0760	1909.9262	53.0	0.028
Extreme (-10C)		1850.0760	1909.9262	53.6	0.028
Extreme (-20C)		1850.0760	1909.9262	56.7	0.030
Extreme (-30C)		1850.0760	1909.9262	80.9	0.043
20C		15%	1850.0760	1909.9262	38.2
	-15%	1850.0760	1909.9262	36.8	0.020
	End Point	1850.0760	1909.9262	35.9	0.019

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]		
3.88	50	826.40003035	-0.027	846.60002162	-0.019	2.5	
3.88	40	826.40000668	0.001	846.60000570	-0.001	2.5	
3.88	30	826.40000268	0.006	846.60000472	0.001	2.5	
3.88	20	826.40000781	0.000	846.60000518	0.000	2.5	
3.88	10	826.40000851	-0.001	846.60000739	-0.003	2.5	
3.88	0	826.40000888	-0.001	846.60001104	-0.007	2.5	
3.88	-10	826.40001174	-0.005	846.60001040	-0.006	2.5	
3.88	-20	826.40003237	-0.030	846.60000844	-0.004	2.5	
3.88	-30	826.40003560	-0.034	846.60000946	-0.005	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]		
3.88	20	826.40000781	0	846.60000518	0	2.5	
4.40	20	826.40000369	0.005	846.60000311	0.002	2.5	
3.65	20	826.40000230	0.007	846.60000339	0.002	2.5	

LTE Band 5

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2061.750	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]		
3.85	50	824.70004459	-0.041	848.30003287	-0.008	2.5	
3.85	40	824.70003563	-0.030	848.30002257	0.004	2.5	
3.85	30	824.70002714	-0.019	848.30002096	0.006	2.5	
3.85	20	824.70001109	0.000	848.30002568	0.000	2.5	
3.85	10	824.70001250	-0.002	848.30002159	0.005	2.5	
3.85	0	824.70001459	-0.004	848.30002260	0.004	2.5	
3.85	-10	824.70002511	-0.017	848.30002458	0.001	2.5	
3.85	-20	824.70004239	-0.038	848.30004034	-0.017	2.5	
3.85	-30	824.70004090	-0.036	848.30004353	-0.021	2.5	

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2061.750	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]		
3.88	20	824.70001109	0	848.30002568	0	2.5	
4.40	20	824.70003207	-0.025	848.30002435	0.002	2.5	
3.65	20	824.70002237	-0.014	848.30003171	-0.007	2.5	

LTE Band 12 (Lowest Frequency:QPSK / 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	699.1556	715.8447	9.8	0.014
Extreme (50C)		699.1556	715.8447		
Extreme (40C)		699.1556	715.8447		
Extreme (30C)		699.1556	715.8447		
Extreme (10C)		699.1556	715.8447		
Extreme (0C)		699.1556	715.8447		
Extreme (-10C)		699.1556	715.8447		
Extreme (-20C)		699.1556	715.8447		
Extreme (-30C)		699.1556	715.8447		
20C		15%	699.1556		
	-15%	699.1556	715.8447	25.4	0.036
	End Point	699.1556	715.8447	24.5	0.035

LTE Band 13 (Lowest Frequency:16QAM / Highest Frequency: 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	777.2614	786.7495	20.4	0.026
Extreme (50C)		777.2614	786.7495		
Extreme (40C)		777.2614	786.7495		
Extreme (30C)		777.2614	786.7495		
Extreme (10C)		777.2614	786.7495		
Extreme (0C)		777.2614	786.7495		
Extreme (-10C)		777.2614	786.7495		
Extreme (-20C)		777.2614	786.7495		
Extreme (-30C)		777.2614	786.7495		
20C		15%	777.2614		
	-15%	777.2614	786.7495	8.8	0.011
	End Point	777.2614	786.7495	8.9	0.011

LTE Band 41 (Lowest Frequency:QPSK / 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	2494.0082	2691.9911		
Extreme (50C)		2494.0083	2691.9912	57.5	0.022
Extreme (40C)		2494.0082	2691.9911	20.3	0.008
Extreme (30C)		2494.0082	2691.9911	21.6	0.008
Extreme (10C)		2494.0082	2691.9911	48.7	0.019
Extreme (0C)		2494.0083	2691.9912	51.1	0.020
Extreme (-10C)		2494.0082	2691.9911	36.4	0.014
Extreme (-20C)		2494.0082	2691.9911	32.5	0.013
Extreme (-30C)		2494.0082	2691.9911	34.4	0.013
20C	15%	2494.0083	2691.9912	78.5	0.030
	-15%	2494.0082	2691.9912	80.1	0.031
	End Point	2494.0082	2691.9912	79.8	0.031

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

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.

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

9.5.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	28.88	772.68
		190	836.6	29.51	893.31
		251	848.8	28.64	731.14
	EGPRS	128	824.2	23.56	226.99
		190	836.6	24.02	252.35
		251	848.8	23.62	230.14
GSM1900	GPRS	512	1850.2	30.26	1061.70
		661	1880	30.02	1004.62
		810	1909.8	28.98	790.68
	EGPRS	512	1850.2	26.91	490.91
		661	1880	26.09	406.44
		810	1909.8	25.89	388.15

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	20.33	107.89
		4183	836.6	20.93	123.88
		4233	846.6	20.31	107.40
	HSDPA	4132	826.4	17.94	62.23
		4183	836.6	18.51	70.96
		4233	846.6	17.95	62.37

LTE Band 5

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 5	10	QPSK	1/49	829.0	21.83	152.41
			1/49	836.5	21.97	157.40
			1/49	844.0	21.70	147.91
		16QAM	1/49	829.0	20.90	123.03
			1/49	836.5	20.79	119.95
			1/49	844.0	20.33	107.89
	5	QPSK	1/24	826.5	21.57	143.55
			1/12	836.5	22.12	162.93
			1/12	846.5	21.02	126.47
		16QAM	1/24	826.5	20.46	111.17
			1/24	836.5	21.25	133.35
			1/12	846.5	20.09	102.09
	3	QPSK	1/0	825.5	21.35	136.46
			1/14	836.5	22.27	168.66
			1/8	847.5	21.10	128.82
		16QAM	1/0	825.5	20.25	105.93
			1/14	836.5	21.24	133.05
			1/8	847.5	20.07	101.62
	1.4	QPSK	1/5	824.7	21.33	135.83
			1/5	836.5	22.31	170.22
			1/5	848.3	21.27	133.97
16QAM		1/5	824.7	20.24	105.71	
		1/5	836.5	21.12	129.42	
		1/5	848.3	20.08	101.86	

LTE Band 12

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 12	10	QPSK	1/49	704.0	17.67	58.48
			1/49	707.5	18.16	65.46
			1/49	711.0	17.98	62.81
		16QAM	1/49	704.0	16.63	46.03
			1/49	707.5	16.90	48.98
			1/0	711.0	16.92	49.20
	5	QPSK	1/24	701.5	16.99	50.00
			1/12	707.5	18.71	74.30
			1/24	713.5	19.18	82.79
		16QAM	1/24	701.5	16.08	40.55
			1/24	707.5	17.06	50.82
			1/12	713.5	17.56	57.02
	3	QPSK	1/0	700.5	17.42	55.21
			1/14	707.5	18.03	63.53
			1/14	714.5	18.21	66.22
		16QAM	1/0	700.5	16.21	41.78
			1/14	707.5	16.78	47.64
			1/0	714.5	17.18	52.24
	1.4	QPSK	1/3	699.7	17.27	53.33
			1/5	707.5	18.05	63.83
			1/3	715.3	18.37	68.71
		16QAM	1/3	699.7	16.06	40.36
			1/5	707.5	16.95	49.55
			1/3	715.3	17.52	56.49

LTE Band 13

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 13	10	QPSK	1/0	782.0	20.71	117.76
		16QAM	1/0	782.0	19.58	90.78
	5	QPSK	1/24	779.5	20.43	110.41
			1/12	782.0	20.52	112.72
			1/12	784.5	20.82	120.78
	16QAM	1/12	779.5	19.53	89.74	
		1/0	782.0	19.51	89.33	
		1/24	784.5	19.87	97.05	

LTE Band 41

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 41	20	QPSK	1/0	2506.0	21.72	148.59
			1/0	2593.0	22.45	175.79
			1/0	2680.0	22.80	190.55
		16QAM	1/49	2506.0	20.35	108.39
			1/49	2593.0	21.65	146.22
			1/49	2680.0	22.71	186.64
	15	QPSK	1/0	2503.5	21.32	135.52
			1/37	2593.0	22.18	165.20
			1/37	2682.5	23.66	232.27
		16QAM	1/0	2503.5	21.06	127.64
			1/37	2593.0	21.82	152.05
			1/37	2682.5	23.58	228.03
	10	QPSK	1/25	2501.0	21.31	135.21
			1/25	2593.0	22.36	172.19
			1/25	2685.0	23.52	224.91
		16QAM	1/0	2501.0	21.19	131.52
			1/25	2593.0	21.95	156.68
			1/25	2685.0	23.10	204.17
	5	QPSK	1/0	2498.5	21.46	139.96
			1/24	2593.0	22.42	174.58
			1/12	2687.5	23.62	230.14
		16QAM	1/0	2498.5	21.25	133.35
			1/0	2593.0	22.21	166.34
			1/12	2687.5	23.11	204.64

9.5.2. ERP/EIRP DATA

GSM850

		UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																								
GSM850 GPRS	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20896 Configuration: EUT / Z-Position Location: Chamber 1 Mode: GPRS 850 MHz Fundamentals Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable																																																																																									
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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																																																																																		
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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																																																																																		
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GSM1900

GSM1900 GPRS		UL Verification Services, Inc. High Frequency Substitution Measurement							
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)
		Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: GPRS 1900 MHz Fundamentals							
		Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable							
		Low Ch							
		1850.20	21.35	V	4.5	9.6	26.42	33.0	-6.6
		1850.20	25.19	H	4.5	9.6	30.26	33.0	-2.7
		Mid Ch							
		1880.00	21.66	V	4.6	9.4	26.47	33.0	-6.5
		1880.00	25.21	H	4.6	9.4	30.02	33.0	-3.0
		High Ch							
		1909.80	22.19	V	4.6	9.1	26.71	33.0	-6.3
		1909.80	24.46	H	4.6	9.1	28.98	33.0	-4.0

GSM1900 EGPRS		UL Verification Services, Inc. High Frequency Substitution Measurement							
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)
		Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: EGPRS 1900 MHz Fundamentals							
		Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable							
		Low Ch							
		1850.20	18.83	V	4.5	9.6	23.90	33.0	-9.1
		1850.20	21.84	H	4.5	9.6	26.91	33.0	-6.1
		Mid Ch							
		1880.00	18.80	V	4.6	9.4	23.61	33.0	-9.4
		1880.00	21.28	H	4.6	9.4	26.09	33.0	-6.9
		High Ch							
		1909.80	19.45	V	4.6	9.1	23.97	33.0	-9.0
		1909.80	21.37	H	4.6	9.1	25.89	33.0	-7.1

WCDMA Band 5

WCDMA Band 5 REL99	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: Rel99 Band 5 Fundamentals								
	Test Equipment: 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								
	826.40	24.32	V	3.0	-0.9	20.33	38.5	-18.2	
	826.40	13.17	H	3.0	-0.9	9.18	38.5	-29.3	
	Mid Ch								
	836.60	24.90	V	3.1	-0.9	20.93	38.5	-17.6	
	836.60	13.93	H	3.1	-0.9	9.97	38.5	-28.5	
	High Ch								
	846.60	24.26	V	3.1	-0.9	20.31	38.5	-18.2	
	846.60	13.69	H	3.1	-0.9	9.74	38.5	-28.8	

WCDMA Band 5 HSDPA	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: HSDPA Band 5 Fundamentals								
	Test Equipment: 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								
	826.40	21.93	V	3.0	-0.9	17.94	38.5	-20.6	
	826.40	11.33	H	3.0	-0.9	7.34	38.5	-31.2	
	Mid Ch								
	836.60	22.48	V	3.1	-0.9	18.51	38.5	-20.0	
	836.60	9.78	H	3.1	-0.9	5.82	38.5	-32.7	
	High Ch								
	846.60	21.90	V	3.1	-0.9	17.95	38.5	-20.6	
	846.60	8.73	H	3.1	-0.9	4.78	38.5	-33.7	

LTE Band 5

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 5 10MHz QPSK	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth								
	Test Equipment: 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								
	829.00	25.81	V	3.1	-0.9	21.83	38.5	-16.7	
	829.00	14.69	H	3.1	-0.9	10.70	38.5	-27.8	
	Mid Ch								
	836.50	25.94	V	3.1	-0.9	21.97	38.5	-16.5	
	836.50	14.85	H	3.1	-0.9	10.88	38.5	-27.6	
	High Ch								
844.00	25.65	V	3.1	-0.9	21.70	38.5	-16.8		
844.00	13.82	H	3.1	-0.9	9.87	38.5	-28.6		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 5 10MHz 16QAM	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth								
	Test Equipment: 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								
	829.00	24.88	V	3.1	-0.9	20.90	38.5	-17.6	
	829.00	13.81	H	3.1	-0.9	9.82	38.5	-28.7	
	Mid Ch								
	836.50	24.76	V	3.1	-0.9	20.79	38.5	-17.7	
	836.50	13.82	H	3.1	-0.9	9.85	38.5	-28.7	
	High Ch								
844.00	24.28	V	3.1	-0.9	20.33	38.5	-18.2		
844.00	12.74	H	3.1	-0.9	8.79	38.5	-29.7		

LTE Band 5 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	826.50	25.56	V	3.0	-0.9	21.57	38.5	-16.9	
	826.50	14.73	H	3.0	-0.9	10.73	38.5	-27.8	
	Mid Ch								
	836.50	26.09	V	3.1	-0.9	22.12	38.5	-16.4	
	836.50	15.36	H	3.1	-0.9	11.39	38.5	-27.1	
High Ch									
846.50	24.96	V	3.1	-0.9	21.02	38.5	-17.5		
846.50	14.47	H	3.1	-0.9	10.52	38.5	-28.0		
LTE Band 5 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	826.50	24.45	V	3.0	-0.9	20.46	38.5	-18.0	
	826.50	13.77	H	3.0	-0.9	9.77	38.5	-28.7	
	Mid Ch								
	836.50	25.22	V	3.1	-0.9	21.25	38.5	-17.2	
	836.50	14.33	H	3.1	-0.9	10.36	38.5	-28.1	
High Ch									
846.50	24.03	V	3.1	-0.9	20.09	38.5	-18.4		
846.50	13.85	H	3.1	-0.9	9.90	38.5	-28.6		

LTE Band 5 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth								
	Test Equipment: 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								
	825.50	25.34	V	3.0	-0.9	21.35	38.5	-17.1	
	825.50	14.43	H	3.0	-0.9	10.44	38.5	-28.1	
	Mid Ch								
	836.50	26.24	V	3.1	-0.9	22.27	38.5	-16.2	
	836.50	15.09	H	3.1	-0.9	11.12	38.5	-27.4	
High Ch									
847.50	25.04	V	3.1	-0.9	21.10	38.5	-17.4		
847.50	13.71	H	3.1	-0.9	9.77	38.5	-28.7		
LTE Band 5 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth								
	Test Equipment: 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								
	825.50	24.24	V	3.0	-0.9	20.25	38.5	-18.2	
	825.50	13.44	H	3.0	-0.9	9.45	38.5	-29.0	
	Mid Ch								
	836.50	25.21	V	3.1	-0.9	21.24	38.5	-17.3	
	836.50	14.42	H	3.1	-0.9	10.45	38.5	-28.1	
High Ch									
847.50	24.01	V	3.1	-0.9	20.07	38.5	-18.4		
847.50	12.56	H	3.1	-0.9	8.62	38.5	-29.9		

LTE Band 5 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: 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								
	824.70	25.32	V	3.0	-1.0	21.33	38.5	-17.2	
	824.70	14.52	H	3.0	-1.0	10.52	38.5	-28.0	
	Mid Ch								
	836.50	26.28	V	3.1	-0.9	22.31	38.5	-16.2	
	836.50	15.35	H	3.1	-0.9	11.38	38.5	-27.1	
High Ch									
848.30	25.21	V	3.1	-0.9	21.27	38.5	-17.2		
848.30	13.69	H	3.1	-0.9	9.75	38.5	-28.8		
LTE Band 5 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2020-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: 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								
	824.70	24.23	V	3.0	-1.0	20.24	38.5	-18.3	
	824.70	13.35	H	3.0	-1.0	9.35	38.5	-29.1	
	Mid Ch								
	836.50	25.09	V	3.1	-0.9	21.12	38.5	-17.4	
	836.50	14.12	H	3.1	-0.9	10.15	38.5	-28.4	
High Ch									
848.30	24.02	V	3.1	-0.9	20.08	38.5	-18.4		
848.30	12.29	H	3.1	-0.9	8.35	38.5	-30.2		

LTE Band 12

LTE Band 12 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
	Company: Samsung																																																																																																	
	Project #: 4789754188																																																																																																	
	Date: 2021-01-11																																																																																																	
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LTE Band 12 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	701.50	20.85	V	2.8	-1.1	16.99	34.8	-17.8	
	701.50	2.95	H	2.8	-1.1	-0.91	34.8	-35.7	
	Mid Ch								
	707.50	22.58	V	2.8	-1.1	18.71	34.8	-16.1	
	707.50	4.96	H	2.8	-1.1	1.09	34.8	-33.7	
High Ch									
713.50	23.06	V	2.8	-1.1	19.18	34.8	-15.6		
713.50	6.70	H	2.8	-1.1	2.81	34.8	-32.0		
LTE Band 12 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-08 Test Engineer: 20882 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	701.50	19.94	V	2.8	-1.1	16.08	34.8	-18.7	
	701.50	2.10	H	2.8	-1.1	-1.76	34.8	-36.5	
	Mid Ch								
	707.50	20.93	V	2.8	-1.1	17.06	34.8	-17.7	
	707.50	4.80	H	2.8	-1.1	0.93	34.8	-33.8	
High Ch									
713.50	21.44	V	2.8	-1.1	17.56	34.8	-17.2		
713.50	4.15	H	2.8	-1.1	0.26	34.8	-34.5		

LTE Band 12 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: 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	21.27	V	2.8	-1.1	17.42	34.8	-17.4	
	700.50	3.36	H	2.8	-1.1	-0.49	34.8	-35.3	
	Mid Ch								
	707.50	21.90	V	2.8	-1.1	18.03	34.8	-16.7	
	707.50	4.42	H	2.8	-1.1	0.55	34.8	-34.2	
High Ch									
714.50	22.10	V	2.8	-1.1	18.21	34.8	-16.6		
714.50	4.13	H	2.8	-1.1	0.24	34.8	-34.5		
LTE Band 12 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: 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	20.06	V	2.8	-1.1	16.21	34.8	-18.6	
	700.50	2.15	H	2.8	-1.1	-1.70	34.8	-36.5	
	Mid Ch								
	707.50	20.65	V	2.8	-1.1	16.78	34.8	-18.0	
	707.50	3.19	H	2.8	-1.1	-0.68	34.8	-35.5	
High Ch									
714.50	21.07	V	2.8	-1.1	17.18	34.8	-17.6		
714.50	3.50	H	2.8	-1.1	-0.39	34.8	-35.2		

LTE Band 12 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: 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	21.13	V	2.8	-1.1	17.27	34.8	-17.5	
	699.70	2.91	H	2.8	-1.1	-0.95	34.8	-35.7	
	Mid Ch								
	707.50	21.92	V	2.8	-1.1	18.05	34.8	-16.7	
	707.50	6.56	H	2.8	-1.1	2.69	34.8	-32.1	
High Ch									
715.30	22.26	V	2.8	-1.1	18.37	34.8	-16.4		
715.30	6.05	H	2.8	-1.1	2.16	34.8	-32.6		
LTE Band 12 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: 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	19.92	V	2.8	-1.1	16.06	34.8	-18.7	
	699.70	1.76	H	2.8	-1.1	-2.10	34.8	-36.9	
	Mid Ch								
	707.50	20.82	V	2.8	-1.1	16.95	34.8	-17.8	
	707.50	5.50	H	2.8	-1.1	1.63	34.8	-33.1	
High Ch									
715.30	21.41	V	2.8	-1.1	17.52	34.8	-17.3		
715.30	4.88	H	2.8	-1.1	0.99	34.8	-33.8		

LTE Band 13

LTE Band 13 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																										
	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 22943 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth																																										
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable																																										
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	Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 22943 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth																																										
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LTE Band 41

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	Date: 2021-01-11								
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	Configuration: EUT, X-Position								
	Location: Chamber 1								
	Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth								
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	Low Ch								
	2503.50	13.44	V	5.3	10.2	18.33	33.0	-14.7	
	2503.50	16.44	H	5.3	10.2	21.32	33.0	-11.7	
	Mid Ch								
	2593.00	13.46	V	5.4	10.0	18.12	33.0	-14.9	
2593.00	17.53	H	5.4	10.0	22.18	33.0	-10.8		
High Ch									
2682.50	18.14	V	5.5	10.1	22.70	33.0	-10.3		
2682.50	19.09	H	5.5	10.1	23.66	33.0	-9.3		
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	Low Ch								
	2503.50	12.80	V	5.3	10.2	17.69	33.0	-15.3	
	2503.50	16.18	H	5.3	10.2	21.06	33.0	-11.9	
	Mid Ch								
	2593.00	13.24	V	5.4	10.0	17.90	33.0	-15.1	
2593.00	17.17	H	5.4	10.0	21.82	33.0	-11.2		
High Ch									
2682.50	18.13	V	5.5	10.1	22.69	33.0	-10.3		
2682.50	19.01	H	5.5	10.1	23.58	33.0	-9.4		

LTE Band 41 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung								
	Project #: 4789754188								
	Date: 2021-01-11								
	Test Engineer: 20881								
	Configuration: EUT, X-Position								
	Location: Chamber 1								
	Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth								
	Test Equipment: 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								
	2501.00	13.04	V	5.3	10.2	17.93	33.0	-15.1	
	2501.00	16.43	H	5.3	10.2	21.31	33.0	-11.7	
	Mid Ch								
	2593.00	13.87	V	5.4	10.0	18.53	33.0	-14.5	
2593.00	17.71	H	5.4	10.0	22.36	33.0	-10.6		
High Ch									
2685.00	18.43	V	5.5	10.1	22.99	33.0	-10.0		
2685.00	18.96	H	5.5	10.1	23.52	33.0	-9.5		
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	Low Ch								
	2501.00	12.88	V	5.3	10.2	17.77	33.0	-15.2	
	2501.00	16.31	H	5.3	10.2	21.19	33.0	-11.8	
	Mid Ch								
	2593.00	13.43	V	5.4	10.0	18.09	33.0	-14.9	
2593.00	17.30	H	5.4	10.0	21.95	33.0	-11.0		
High Ch									
2685.00	18.03	V	5.5	10.1	22.59	33.0	-10.4		
2685.00	18.54	H	5.5	10.1	23.10	33.0	-9.9		

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	Project #: 4789754188								
	Date: 2021-01-11								
	Test Engineer: 20881								
	Configuration: EUT, X-Position								
	Location: Chamber 1								
	Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	2498.50	14.11	V	5.3	10.2	19.01	33.0	-14.0	
	2498.50	16.56	H	5.3	10.2	21.46	33.0	-11.5	
	Mid Ch								
	2593.00	13.90	V	5.4	10.0	18.56	33.0	-14.4	
2593.00	17.77	H	5.4	10.0	22.42	33.0	-10.6		
High Ch									
2687.50	18.24	V	5.5	10.1	22.80	33.0	-10.2		
2687.50	19.06	H	5.5	10.1	23.62	33.0	-9.4		
LTE Band 41 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung								
	Project #: 4789754188								
	Date: 2021-01-11								
	Test Engineer: 20881								
	Configuration: EUT, X-Position								
	Location: Chamber 1								
	Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth								
	Test Equipment: 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								
	2498.50	13.59	V	5.3	10.2	18.49	33.0	-14.5	
	2498.50	16.35	H	5.3	10.2	21.25	33.0	-11.8	
	Mid Ch								
	2593.00	13.63	V	5.4	10.0	18.29	33.0	-14.7	
2593.00	17.56	H	5.4	10.0	22.21	33.0	-10.8		
High Ch									
2687.50	0.00	V	5.5	10.1	0.00	33.0	0.0		
2687.50	18.55	H	5.5	10.1	23.11	33.0	-9.9		

9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(h) 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.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

(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.

(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.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

For peak power measurement with a ESU40:

- a) Set the RBW = 100 kHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points \geq span/RBW;
- g) Trace mode = average(WCDMA, LTE), Max hold(GSM, LTE Band41);;

RESULTS

See the following pages.

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

9.6.1. SPURIOUS RADIATION PLOTS

GSM850

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4789754188							
		Date:	2021-01-08							
		Test Engineer:	20896							
		Configuration:	EUT / Z-Position							
		Location:	Chamber 1							
		Mode:	GPRS 850 MHz Harmonics							
		Test Voltage:	AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch, 824.2MHz										
1648.40	-8.4	V	3.0	45.3	1.0	-52.6	-13.0	-39.6		
2472.60	-1.4	V	3.0	45.1	1.0	-45.5	-13.0	-32.5		
3296.80	-4.6	V	3.0	45.3	1.0	-48.9	-13.0	-35.9		
1648.40	-8.6	H	3.0	45.3	1.0	-52.9	-13.0	-39.9		
2472.60	-0.5	H	3.0	45.1	1.0	-44.6	-13.0	-31.6		
3296.80	-4.5	H	3.0	45.3	1.0	-48.8	-13.0	-35.8		
Mid Ch, 836.6MHz										
1673.20	-8.2	V	3.0	45.3	1.0	-52.5	-13.0	-39.5		
2509.80	-0.1	V	3.0	45.1	1.0	-44.2	-13.0	-31.2		
3346.40	-4.3	V	3.0	45.3	1.0	-48.6	-13.0	-35.6		
1673.20	-9.7	H	3.0	45.3	1.0	-53.9	-13.0	-40.9		
2509.80	1.5	H	3.0	45.1	1.0	-42.6	-13.0	-29.6		
3346.40	-4.1	H	3.0	45.3	1.0	-48.4	-13.0	-35.4		
High Ch, 848.8MHz										
1697.60	-8.4	V	3.0	45.2	1.0	-52.7	-13.0	-39.7		
2546.40	-1.1	V	3.0	45.1	1.0	-45.2	-13.0	-32.2		
3395.20	-3.9	V	3.0	45.3	1.0	-48.3	-13.0	-35.3		
1697.60	-8.3	H	3.0	45.2	1.0	-52.6	-13.0	-39.6		
2546.40	-0.4	H	3.0	45.1	1.0	-44.5	-13.0	-31.5		
3395.20	-3.8	H	3.0	45.3	1.0	-48.1	-13.0	-35.1		
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4789754188							
		Date:	2021-01-08							
		Test Engineer:	20896							
		Configuration:	EUT / Z-Position							
		Location:	Chamber 1							
		Mode:	EGPRS 850 MHz Harmonics							
		Test Voltage:	AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch, 824.2MHz										
1648.40	-13.0	V	3.0	45.3	1.0	-57.3	-13.0	-44.3		
2472.60	-7.7	V	3.0	45.1	1.0	-51.8	-13.0	-38.8		
3296.80	-9.4	V	3.0	45.3	1.0	-53.8	-13.0	-40.8		
1648.40	-14.5	H	3.0	45.3	1.0	-58.8	-13.0	-45.8		
2472.60	-6.2	H	3.0	45.1	1.0	-50.3	-13.0	-37.3		
3296.80	-9.3	H	3.0	45.3	1.0	-53.6	-13.0	-40.6		
Mid Ch, 836.6MHz										
1673.20	-13.1	V	3.0	45.3	1.0	-57.3	-13.0	-44.3		
2509.80	-7.7	V	3.0	45.1	1.0	-51.8	-13.0	-38.8		
3346.40	-9.0	V	3.0	45.3	1.0	-53.3	-13.0	-40.3		
1673.20	-14.6	H	3.0	45.3	1.0	-58.9	-13.0	-45.9		
2509.80	-6.2	H	3.0	45.1	1.0	-50.3	-13.0	-37.3		
3346.40	-8.8	H	3.0	45.3	1.0	-53.2	-13.0	-40.2		
High Ch, 848.8MHz										
1697.60	-9.4	V	3.0	45.2	1.0	-53.6	-13.0	-40.6		
2546.40	-8.0	V	3.0	45.1	1.0	-52.1	-13.0	-39.1		
3395.20	-8.4	V	3.0	45.3	1.0	-52.8	-13.0	-39.8		
1697.60	-13.2	H	3.0	45.2	1.0	-57.5	-13.0	-44.5		
2546.40	-7.0	H	3.0	45.1	1.0	-51.2	-13.0	-38.2		
3395.20	-9.2	H	3.0	45.3	1.0	-53.5	-13.0	-40.5		

GSM1900

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789754188							
Date:		2021-01-12							
Test Engineer:		20890							
Configuration:		EUT / AC Adapter, Z-Position							
Location:		Chamber 1							
Mode:		GPRS 1900 MHz Harmonics							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.1	V	3.0	45.5	1.0	-54.6	-13.0	-41.6	
5550.60	-7.8	V	3.0	45.4	1.0	-52.2	-13.0	-39.2	
7400.80	-5.0	V	3.0	44.2	1.0	-48.2	-13.0	-35.2	
3700.40	-10.1	H	3.0	45.5	1.0	-54.5	-13.0	-41.5	
5550.60	-7.7	H	3.0	45.4	1.0	-52.1	-13.0	-39.1	
7400.80	-4.8	H	3.0	44.2	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1880MHz									
3760.00	-10.1	V	3.0	45.5	1.0	-54.6	-13.0	-41.6	
5640.00	-7.4	V	3.0	45.4	1.0	-51.8	-13.0	-38.8	
7520.00	-4.9	V	3.0	44.1	1.0	-48.1	-13.0	-35.1	
3760.00	-10.0	H	3.0	45.5	1.0	-54.5	-13.0	-41.5	
5640.00	-7.2	H	3.0	45.4	1.0	-51.6	-13.0	-38.6	
7520.00	-4.8	H	3.0	44.1	1.0	-47.9	-13.0	-34.9	
High Ch, 1909.8MHz									
3819.60	-10.2	V	3.0	45.5	1.0	-54.7	-13.0	-41.7	
5729.40	-7.6	V	3.0	45.4	1.0	-51.9	-13.0	-38.9	
7639.20	-4.5	V	3.0	44.1	1.0	-47.6	-13.0	-34.6	
3819.60	-10.0	H	3.0	45.5	1.0	-54.5	-13.0	-41.5	
5729.40	-7.5	H	3.0	45.4	1.0	-51.9	-13.0	-38.9	
7639.20	-4.7	H	3.0	44.1	1.0	-47.7	-13.0	-34.7	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789754188							
Date:		2021-01-12							
Test Engineer:		20890							
Configuration:		EUT / AC Adapter, Z-Position							
Location:		Chamber 1							
Mode:		EGPRS 1900 MHz Harmonics							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.3	V	3.0	45.5	1.0	-54.8	-13.0	-41.8	
5550.60	-7.7	V	3.0	45.4	1.0	-52.1	-13.0	-39.1	
7400.80	-4.9	V	3.0	44.2	1.0	-48.1	-13.0	-35.1	
3700.40	-9.9	H	3.0	45.5	1.0	-54.3	-13.0	-41.3	
5550.60	-7.4	H	3.0	45.4	1.0	-51.8	-13.0	-38.8	
7400.80	-4.7	H	3.0	44.2	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1880MHz									
3760.00	-10.2	V	3.0	45.5	1.0	-54.7	-13.0	-41.7	
5640.00	-7.4	V	3.0	45.4	1.0	-51.7	-13.0	-38.7	
7520.00	-4.9	V	3.0	44.1	1.0	-48.0	-13.0	-35.0	
3760.00	-10.0	H	3.0	45.5	1.0	-54.5	-13.0	-41.5	
5640.00	-7.3	H	3.0	45.4	1.0	-51.7	-13.0	-38.7	
7520.00	-4.7	H	3.0	44.1	1.0	-47.8	-13.0	-34.8	
High Ch, 1909.8MHz									
3819.60	-10.4	V	3.0	45.5	1.0	-54.9	-13.0	-41.9	
5729.40	-7.2	V	3.0	45.4	1.0	-51.5	-13.0	-38.5	
7639.20	-4.7	V	3.0	44.1	1.0	-47.8	-13.0	-34.8	
3819.60	-10.1	H	3.0	45.5	1.0	-54.5	-13.0	-41.5	
5729.40	-7.5	H	3.0	45.4	1.0	-51.9	-13.0	-38.9	
7639.20	-4.6	H	3.0	44.1	1.0	-47.7	-13.0	-34.7	

WCDMA Band 5

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
WCDMA Band 5 REL99	Company:		Samsung									
	Project #:		4789754188									
	Date:		2021-01-12									
	Test Engineer:		20890									
	Configuration:		EUT / AC Adapter, Z-Position									
	Location:		Chamber 1									
	Mode:		Rel99 Band 5 Harmonics									
	Test Voltage:		AC 120 V, 60 Hz									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
	Low Ch, 826.4MHz											
	1652.80	-13.8	V	3.0	45.3	1.0	-58.1	-13.0	-45.1			
	2479.20	-11.0	V	3.0	45.1	1.0	-55.1	-13.0	-42.1			
	3305.60	-10.3	V	3.0	45.3	1.0	-54.6	-13.0	-41.6			
	1652.80	-15.3	H	3.0	45.3	1.0	-59.6	-13.0	-46.6			
	2479.20	-11.9	H	3.0	45.1	1.0	-56.0	-13.0	-43.0			
	3305.60	-10.1	H	3.0	45.3	1.0	-54.5	-13.0	-41.5			
	Mid Ch, 836.6MHz											
	1673.20	-13.9	V	3.0	45.3	1.0	-58.1	-13.0	-45.1			
	2509.80	-11.2	V	3.0	45.1	1.0	-55.3	-13.0	-42.3			
	3346.40	-9.8	V	3.0	45.3	1.0	-54.1	-13.0	-41.1			
	1673.20	-15.4	H	3.0	45.3	1.0	-59.7	-13.0	-46.7			
	2509.80	-11.9	H	3.0	45.1	1.0	-56.0	-13.0	-43.0			
	3346.40	-9.5	H	3.0	45.3	1.0	-53.9	-13.0	-40.9			
	High Ch, 846.6MHz											
	1693.20	-13.7	V	3.0	45.2	1.0	-57.9	-13.0	-44.9			
2539.80	-11.1	V	3.0	45.1	1.0	-55.2	-13.0	-42.2				
3386.40	-9.5	V	3.0	45.3	1.0	-53.8	-13.0	-40.8				
1693.20	-15.2	H	3.0	45.2	1.0	-59.5	-13.0	-46.5				
2539.80	-11.9	H	3.0	45.1	1.0	-56.0	-13.0	-43.0				
3386.40	-9.5	H	3.0	45.3	1.0	-53.8	-13.0	-40.8				
UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement												
WCDMA Band 5 HSDPA	Company:		Samsung									
	Project #:		4789754188									
	Date:		2021-01-12									
	Test Engineer:		20890									
	Configuration:		EUT / AC Adapter, Z-Position									
	Location:		Chamber 1									
	Mode:		HSDPA Band 5 Harmonics									
	Test Voltage:		AC 120 V, 60 Hz									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
	Low Ch, 826.4MHz											
	1652.80	-13.8	V	3.0	45.3	1.0	-58.1	-13.0	-45.1			
	2479.20	-11.1	V	3.0	45.1	1.0	-55.2	-13.0	-42.2			
	3305.60	-10.4	V	3.0	45.3	1.0	-54.7	-13.0	-41.7			
	1652.80	-15.4	H	3.0	45.3	1.0	-59.7	-13.0	-46.7			
	2479.20	-11.8	H	3.0	45.1	1.0	-55.9	-13.0	-42.9			
	3305.60	-10.2	H	3.0	45.3	1.0	-54.5	-13.0	-41.5			
	Mid Ch, 836.6MHz											
	1673.20	-13.8	V	3.0	45.3	1.0	-58.1	-13.0	-45.1			
	2509.80	-11.1	V	3.0	45.1	1.0	-55.2	-13.0	-42.2			
	3346.40	-9.7	V	3.0	45.3	1.0	-54.1	-13.0	-41.1			
	1673.20	-15.4	H	3.0	45.3	1.0	-59.6	-13.0	-46.6			
	2509.80	-12.0	H	3.0	45.1	1.0	-56.1	-13.0	-43.1			
	3346.40	-9.6	H	3.0	45.3	1.0	-53.9	-13.0	-40.9			
	High Ch, 846.6MHz											
	1693.20	-13.6	V	3.0	45.2	1.0	-57.9	-13.0	-44.9			
2539.80	-11.2	V	3.0	45.1	1.0	-55.3	-13.0	-42.3				
3386.40	-9.6	V	3.0	45.3	1.0	-54.0	-13.0	-41.0				
1693.20	-15.2	H	3.0	45.2	1.0	-59.4	-13.0	-46.4				
2539.80	-11.9	H	3.0	45.1	1.0	-56.0	-13.0	-43.0				
3386.40	-9.4	H	3.0	45.3	1.0	-53.8	-13.0	-40.8				

LTE Band 5

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement												
LTE Band 5 3MHz QPSK		Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / AC Adapter, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth Test Voltage: AC 120 V, 60 Hz										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 825.5MHz										
		1651.00	-13.3	V	3.0	45.3	1.0	-57.6	-13.0	-44.6		
		2476.50	-10.2	V	3.0	45.1	1.0	-54.3	-13.0	-41.3		
		3302.00	-9.7	V	3.0	45.3	1.0	-54.0	-13.0	-41.0		
		1651.00	-14.9	H	3.0	45.3	1.0	-59.1	-13.0	-46.1		
		2476.50	-11.1	H	3.0	45.1	1.0	-55.2	-13.0	-42.2		
		3302.00	-9.5	H	3.0	45.3	1.0	-53.8	-13.0	-40.8		
		Mid Ch, 836.5MHz										
1673.00	-13.0	V	3.0	45.3	1.0	-57.3	-13.0	-44.3				
2509.50	-10.7	V	3.0	45.1	1.0	-54.8	-13.0	-41.8				
3346.00	-9.0	V	3.0	45.3	1.0	-53.3	-13.0	-40.3				
1673.00	-15.0	H	3.0	45.3	1.0	-59.2	-13.0	-46.2				
2509.50	-11.2	H	3.0	45.1	1.0	-55.3	-13.0	-42.3				
3346.00	-9.2	H	3.0	45.3	1.0	-53.5	-13.0	-40.5				
High Ch, 847.5MHz												
1695.00	-12.9	V	3.0	45.2	1.0	-57.1	-13.0	-44.1				
2542.50	-10.3	V	3.0	45.1	1.0	-54.4	-13.0	-41.4				
3390.00	-8.9	V	3.0	45.3	1.0	-53.2	-13.0	-40.2				
1695.00	-14.6	H	3.0	45.2	1.0	-58.9	-13.0	-45.9				
2542.50	-11.1	H	3.0	45.1	1.0	-55.2	-13.0	-42.2				
3390.00	-8.6	H	3.0	45.3	1.0	-53.0	-13.0	-40.0				

LTE Band 99

UL Verification Services, Inc.										
Above 1GHz High Frequency Substitution Measurement										
LTE Band 12 5MHz QPSK			Company:		Samsung					
			Project #:		4789754188					
			Date:		2021-01-11					
			Test Engineer:		20890					
			Configuration:		EUT / AC Adapter, Z-Position					
			Location:		Chamber 1					
			Mode:		LTE_QPSK Band 12 Harmonics, 5MHz Bandwidth					
			Test Voltage:		AC 120 V, 60 Hz					
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch, 701.5MHz										
1403.00	-14.7	V	3.0	45.5	1.0	-59.2	-13.0	-46.2		
2104.50	-10.9	V	3.0	45.0	1.0	-54.9	-13.0	-41.9		
2806.00	-10.3	V	3.0	45.2	1.0	-54.5	-13.0	-41.5		
1403.00	-16.5	H	3.0	45.5	1.0	-61.0	-13.0	-48.0		
2104.50	-12.6	H	3.0	45.0	1.0	-56.6	-13.0	-43.6		
2806.00	-10.4	H	3.0	45.2	1.0	-54.6	-13.0	-41.6		
Mid Ch, 707.5MHz										
1415.00	-14.6	V	3.0	45.5	1.0	-59.0	-13.0	-46.0		
2122.50	-10.8	V	3.0	45.0	1.0	-54.8	-13.0	-41.8		
2830.00	-10.1	V	3.0	45.2	1.0	-54.2	-13.0	-41.2		
1415.00	-16.0	H	3.0	45.5	1.0	-60.4	-13.0	-47.4		
2122.50	-12.5	H	3.0	45.0	1.0	-56.5	-13.0	-43.5		
2830.00	-10.3	H	3.0	45.2	1.0	-54.5	-13.0	-41.5		
High Ch, 713.5MHz										
1427.00	-14.4	V	3.0	45.4	1.0	-58.9	-13.0	-45.9		
2140.50	-11.0	V	3.0	45.0	1.0	-55.1	-13.0	-42.1		
2854.00	-10.0	V	3.0	45.2	1.0	-54.2	-13.0	-41.2		
1427.00	-15.9	H	3.0	45.4	1.0	-60.4	-13.0	-47.4		
2140.50	-12.6	H	3.0	45.0	1.0	-56.6	-13.0	-43.6		
2854.00	-10.1	H	3.0	45.2	1.0	-54.3	-13.0	-41.3		

LTE Band 100

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement												
LTE Band 13 5MHz QPSK		Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 20890 Configuration: EUT / AC Adapter Location: Chamber 1 Mode: LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth Test Voltage: AC 120 V, 60 Hz										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 779.5MHz										
		1559.00	-23.6	V	3.0	45.3	1.0	-68.0	-40.0	-28.0		
		2338.50	-11.5	V	3.0	45.1	1.0	-55.5	-13.0	-42.5		
		3118.00	-10.4	V	3.0	45.3	1.0	-54.6	-13.0	-41.6		
		1559.00	-25.2	H	3.0	45.3	1.0	-69.6	-40.0	-29.6		
		2338.50	-12.5	H	3.0	45.1	1.0	-56.5	-13.0	-43.5		
		3118.00	-10.3	H	3.0	45.3	1.0	-54.5	-13.0	-41.5		
		Mid Ch, 782MHz										
1564.00	-14.2	V	3.0	45.3	1.0	-58.5	-40.0	-18.5				
2346.00	-11.4	V	3.0	45.1	1.0	-55.5	-13.0	-42.5				
3128.00	-10.3	V	3.0	45.3	1.0	-54.6	-13.0	-41.6				
1564.00	-25.3	H	3.0	45.3	1.0	-69.6	-40.0	-29.6				
2346.00	-12.4	H	3.0	45.1	1.0	-56.5	-13.0	-43.5				
3128.00	-10.1	H	3.0	45.3	1.0	-54.4	-13.0	-41.4				
High Ch, 784.5MHz												
1569.00	-23.7	V	3.0	45.3	1.0	-68.1	-40.0	-28.1				
2353.50	-11.5	V	3.0	45.1	1.0	-55.5	-13.0	-42.5				
3138.00	-10.2	V	3.0	45.3	1.0	-54.4	-13.0	-41.4				
1569.00	-25.3	H	3.0	45.3	1.0	-69.7	-40.0	-29.7				
2353.50	-12.5	H	3.0	45.1	1.0	-56.6	-13.0	-43.6				
3138.00	-10.1	H	3.0	45.3	1.0	-54.3	-13.0	-41.3				

Note : No narrowband emissions so only applied the -70dBW/MHz (-40dBm/MHz) wideband emission limit for the 1559-1610 MHz band

LTE Band 41

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement												
LTE Band 41 5MHz QPSK		Company: Samsung Project #: 4789754188 Date: 2021-01-11 Test Engineer: 22943 Configuration: EUT / AC Adapter, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth Test Voltage: AC 120 V, 60 Hz										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 2506MHz										
		5012.00	-15.2	V	3.0	45.5	1.0	-59.7	-25.0	-34.7		
		7518.00	-15.2	V	3.0	44.1	1.0	-58.3	-25.0	-33.3		
		10024.00	-12.6	V	3.0	42.2	1.0	-53.8	-25.0	-28.8		
		5012.00	-15.1	H	3.0	45.5	1.0	-59.6	-25.0	-34.6		
		7518.00	-15.3	H	3.0	44.1	1.0	-58.4	-25.0	-33.4		
		10024.00	-12.5	H	3.0	42.2	1.0	-53.7	-25.0	-28.7		
		Mid Ch, 2593MHz										
5186.00	-14.5	V	3.0	45.4	1.0	-59.0	-25.0	-34.0				
7779.00	-15.1	V	3.0	44.0	1.0	-58.1	-25.0	-33.1				
10372.00	-12.2	V	3.0	42.4	1.0	-53.5	-25.0	-28.5				
5186.00	-15.1	H	3.0	45.4	1.0	-59.6	-25.0	-34.6				
7779.00	-15.2	H	3.0	44.0	1.0	-58.3	-25.0	-33.3				
10372.00	-12.0	H	3.0	42.4	1.0	-53.4	-25.0	-28.4				
High Ch, 2680MHz												
5360.00	-13.4	V	3.0	45.4	1.0	-57.8	-25.0	-32.8				
8040.00	-15.5	V	3.0	43.9	1.0	-58.4	-25.0	-33.4				
10720.00	-12.3	V	3.0	42.5	1.0	-53.8	-25.0	-28.8				
5360.00	-15.4	H	3.0	45.4	1.0	-59.8	-25.0	-34.8				
8040.00	-15.5	H	3.0	43.9	1.0	-58.4	-25.0	-33.4				
10720.00	-11.9	H	3.0	42.5	1.0	-53.3	-25.0	-28.3				

END OF TEST REPORT