

# CERTIFICATION TEST REPORT

**Report Number.** : 4791082054-E3V3

**Applicant** : SAMSUNG ELECTRONICS CO., LTD.  
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,  
GYEONGGI-DO, 16677, KOREA

**Model** : SM-A556E, SM-A556E/DS

**FCC ID** : A3LSMA556E

**EUT Description** : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,  
and NFC.

**Test Standard(s)** : FCC 47 CFR PART 24 SUBPART E

**Date Of Issue:**  
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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.

**EUT DESCRIPTION:** GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and NFC.

**MODEL NUMBER:** SM-A556E, SM-A556E/DS

**SERIAL NUMBER:** R3CWA0H7NHA, R3CWB0FCVGV, R3CWB0A1AKR (CONDUCTED); R3CWB0A1A3B, R3CWB0A1DBF (RADIATED);

**DATE TESTED:** 2023-11-30 - 2024-01-18;

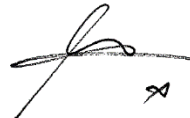
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 24E	Complies

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and Modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
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Tested By:



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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 24.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01
6. KDB 971168 D02 Misc Rev Approv License Devices v02r02
7. KDB 412172 D01 Determining ERP and EIRP v01r01

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 4(3m Full-anechoic chamber)
<input type="checkbox"/>	Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{EIRP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.80 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.06 dB
Radiated Disturbance, 18 GHz to 40 GHz	6.02 dB

Uncertainty figures are valid to a confidence level of 95%.

### 4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and NFC. This test report addresses the WWAN operational mode.

Representative model	Difference	Derivative model
		SM-A556E/DS
SM-A556E	Hardware	Different SIM tray SM-A556E/DS has dual sim tray
	Software	Same as SM-A556E

Thus, SM-A556E was set for final test.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average radiated EIRP output powers as follows: Radiated samples were set to a higher power than conducted resulting in radiated EIRP greater than conducted measurements.

#### GSM

FCC Part 24							
Band	ANT	Frequency Range [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
GSM 1900	Antenna A Main 1	1850.20 ~ 1909.80	GPRS	<b>29.32</b>	855.07	<b>29.70</b>	<b>933.25</b>
			EGPRS	24.81	302.69	27.34	542.00

#### WCDMA

FCC Part 24							
Band	ANT	Frequency Range [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	Antenna A Main 1	1852.40 ~ 1907.60	Rel. 99	<b>23.13</b>	205.59	<b>23.86</b>	<b>243.22</b>
			HSDPA	22.69	185.78	23.42	219.79

**LTE Band 25**

FCC Part 24								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	Antenna A Main 1	1860.00 ~ 1905.00	20	QPSK	23.12	205.12	20.67	116.68
				16QAM	22.29	169.43	19.91	97.95
				64QAM	21.30	134.90		
				256QAM	18.29	67.45		
		1857.50 ~ 1907.50	15	QPSK	23.41	219.28	20.85	121.62
				16QAM	22.42	174.58	20.02	100.46
				64QAM	21.75	149.62		
				256QAM	18.42	69.50		
		1855.00 ~ 1910.00	10	QPSK	23.49	223.36	20.84	121.34
				16QAM	22.46	176.20	20.07	101.62
				64QAM	21.37	137.09		
				256QAM	18.41	69.34		
		1852.50 ~ 1912.50	5	QPSK	23.48	222.84	20.82	120.78
				16QAM	22.57	180.72	19.66	92.47
				64QAM	21.63	145.55		
				256QAM	18.59	72.28		
		1851.50 ~ 1913.50	3	QPSK	<b>23.65</b>	<b>231.74</b>	<b>20.99</b>	<b>125.60</b>
				16QAM	22.57	180.72	19.95	98.86
				64QAM	21.63	145.55		
				256QAM	18.49	70.63		
		1850.70 ~ 1914.30	1.4	QPSK	23.59	228.56	20.95	124.45
				16QAM	22.77	189.23	19.86	96.83
				64QAM	21.61	144.88		
				256QAM	18.37	68.71		
FCC Part 24								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	Antenna F Sub 2	1860.00 ~ 1905.00	20	QPSK	23.43	220.29	19.69	93.11
				16QAM	22.45	175.79	18.59	72.28
				64QAM	21.48	140.60		
				256QAM	18.41	69.34		
		1857.50 ~ 1907.50	15	QPSK	23.44	220.80	19.04	80.17
				16QAM	22.51	178.24	18.47	70.31
				64QAM	21.32	135.52		
				256QAM	18.43	69.66		
		1855.00 ~ 1910.00	10	QPSK	<b>23.59</b>	<b>228.56</b>	<b>19.86</b>	<b>96.83</b>
				16QAM	22.47	176.60	18.53	71.29
				64QAM	21.34	136.14		
				256QAM	18.47	70.31		
		1852.50 ~ 1912.50	5	QPSK	23.48	222.84	19.73	93.97
				16QAM	22.51	178.24	18.55	71.61
				64QAM	21.68	147.23		
				256QAM	18.31	67.76		
		1851.50 ~ 1913.50	3	QPSK	<b>23.59</b>	<b>228.56</b>	19.85	96.61
				16QAM	22.51	178.24	18.50	70.79
				64QAM	21.68	147.23		
				256QAM	18.55	71.61		
		1850.70 ~ 1914.30	1.4	QPSK	23.53	225.42	19.81	95.72
				16QAM	22.39	173.38	18.46	70.15
				64QAM	21.52	141.91		
				256QAM	18.37	68.71		



### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the supported bands with a maximum peak gain as follow:

Frequency (MHz)	ANT	Peak Gain (dBi)
GSM1900 / WCDMA Band 2 / LTE Band 2, 25 1850 - 1915 MHz	Antenna A Main 1	-5.4
	Antenna F Sub 2	-6.1

### 5.4. WORST-CASE ORIENTATION

Following Modes should be considered as worst-case scenario for all other measurements.

- GSM GPRS/EGPRS
- UMTS REL 99/HSDPA

For LTE Band 25 the worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, 64QAM and 256QAM modulations. It was found QPSK and 16QAM results were worst case.

LTE B25 operates in Tx Hopping Mode. So the test case is as below.

Test Item	Test case antenna & port
Conducted output power	All
RF port test	Worst case
EIRP	All
Radiated Spurious Emissions	All

As for the conducted test, 'Main ANT' is the same or higher than 'Sub ANT', so we tested with 'Main ANT'.

Band	Main ANT	Tune-up Limit (dBm)	Sub ANT	Tune-up Limit (dBm)
GSM 1900	<u>Antenna A (Main 1)</u>	<u>31.0</u>		
WCDMA B2	<u>Antenna A (Main 1)</u>	<u>24.5</u>		
LTE B25	<u>Antenna A (Main 1)</u>	<u>24.0</u>	Antenna F (Sub 2)	24.0

#### 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.

● Conducted Spurious Emission

Highest conducted power setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	Antenna A Main 1	1851.50	3	1	14
		1882.50		1	14
		1913.50		1	8

● Radiated Spurious Emission

Highest EIRP setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	Antenna A Main 1	1857.50	3	1	14
		1882.50		1	14
		1907.50		1	8
	Antenna F Sub 2	1855.00	10	1	25
		1882.50		1	0
		1910.00		1	25

The fundamental and radiated spurious emission were investigated in three orthogonal orientations X, Y and Z, it was determined that below orientation was worst-case orientation for each band.

Band	ANT	EIRP			RSE		
		X	Y	Z	X	Y	Z
GSM 1900	Antenna A Main 1	O	-	-	O	-	-
WCDMA B2	Antenna A Main 1	O	-	-	O	-	-
LTE B25	Antenna A Main 1	O	-	-	-	O	-
	Antenna F Sub 2	O	-	-	-	O	-

Note : For the radiated spurious testing, the EUT attached with travel adapter for the worst case condition. The EUT is continuously communicated with the call box during the tests.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37W61WENTASEA	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02117A	N/A

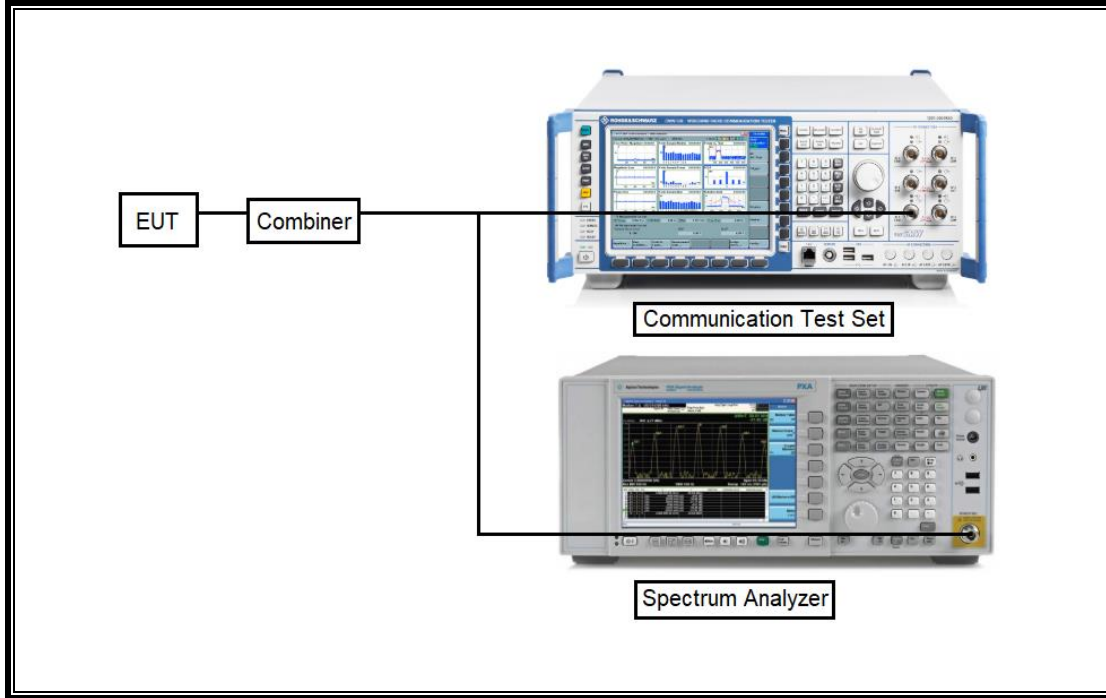
### I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

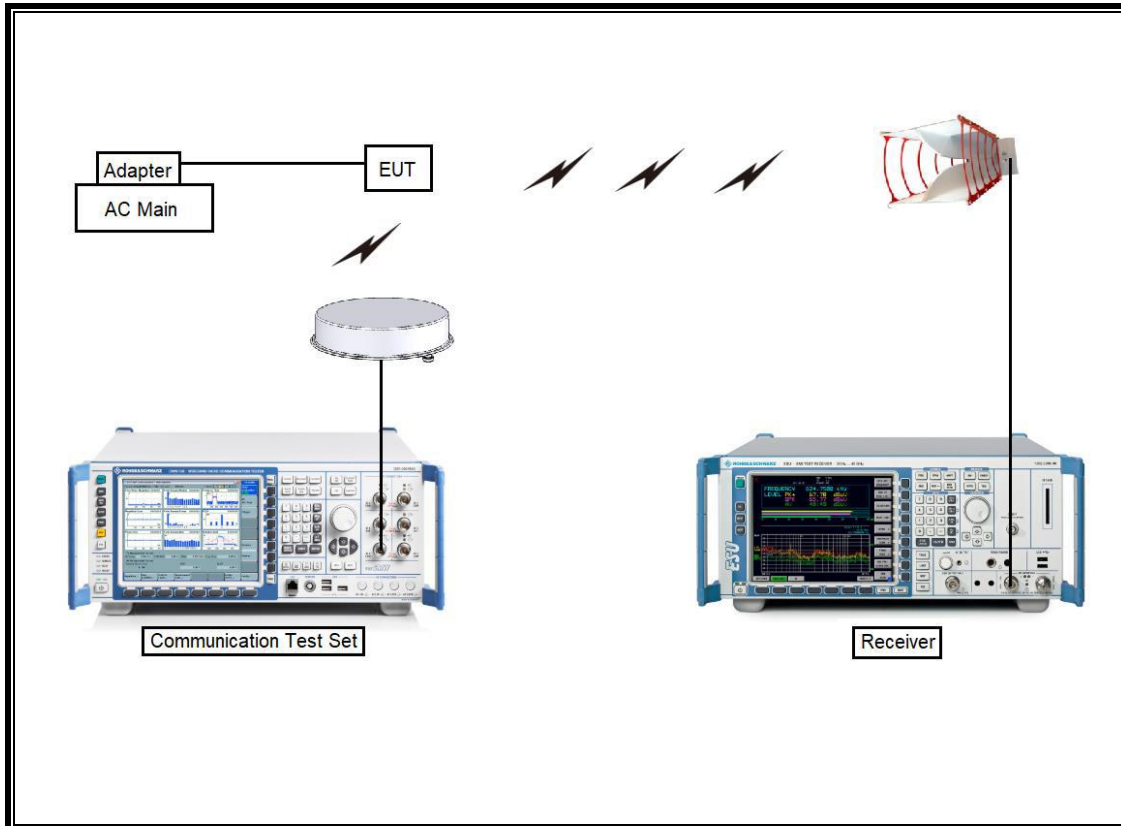
### TEST SETUP

The EUT is continuously communicated with the call box during the tests.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2025-01-17
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2024-08-02
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2025-10-05
Preamplifier	ETS	3115-PA	00167475	2024-07-25
Preamplifier	ETS	3116C-PA	00168841	2024-07-25
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Horn, 18 GHz	ETS	3115	00167211	2024-08-04
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168724	2024-08-04
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Communications Test Set	R&S	CMW500	169797	2024-07-23
DC Power Supply	Agilent / HP	E3640A	MY54226395	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	341282	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	370599	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	351741	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2024-07-24
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2024-07-24
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2024-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2024-07-24
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2024-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2024-07-23
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2024-07-24
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2024-07-24
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2024-07-24
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A009	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A001	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A008	2024-07-27
Attenuator	PASTERNAK	PE7004-10	2	2024-07-23
Attenuator	PASTERNAK	PE7395-10	A011	2024-07-25
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-06
Temperature Chamber	ESPEC	SH-642	93001109	2024-07-24
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2025-01-02
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2025-01-02
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY58010202	2024-01-27
UL Software				
Description	Manufacturer	Model	Version	
Antenna port test software	UL	CLT	Ver 3.4	
Radiated software	UL	UL EMC	Ver 9.5	
Antenna port test software (5G NR FR1)	UL	UL iM	Ver 1.06	

## 7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Results
2.1046	Conducted Output Power	N/A	Conducted	Pass
2.1049	Occupied Bandwidth (99%)	N/A		Pass
24.238(a)	Conducted Band Edge / Conducted Spurious Emission	-13 dBm		Pass
24.235	Frequency Stability	2.5 ppm	Radiated	Pass
24.232(c)	Effective Isotropic Radiated Power	33 dBm		Pass
24.238(a)	Radiated Spurious Emission	-13 dBm		Pass

## 8. CONDUCTED RESULTS

### 8.1. CONDUCTED OUTPUT POWER

#### Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to CMW500 Test Set and configured to operate at maximum power.

#### RESULTS

See the following pages.

### 8.1.1. CONDUCTED AVERAGE OUTPUT POWER

#### GSM 1900 (Antenna A, Main 1)

Mode	Coding Scheme	Time Slots	Maximum Average Power (dBm)			
			Measured		Tune-up Limit	
			Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	28.86	19.67	31.0	22.0
			28.99	19.80		
			29.23	20.04		
GPRS (GMSK)	CS1	1	28.75	19.56	31.0	22.0
			28.81	19.62		
			29.32	20.13		
		2	26.71	20.53	27.0	21.0
			26.11	19.93		
			26.45	20.27		
		3	25.55	21.13	26.0	21.7
			25.62	21.20		
			25.83	21.41		
		4	24.10	20.93	25.5	22.5
			24.15	20.98		
			24.33	21.16		
EGPRS (8PSK)	MCS5	1	24.21	15.02	26.0	17.0
			24.22	15.03		
			24.81	15.62		
		2	22.89	16.71	23.0	17.0
			22.59	16.41		
			22.91	16.73		
		3	20.90	16.48	21.0	16.7
			20.37	15.95		
			20.92	16.50		
		4	20.72	17.55	21.5	18.5
			20.38	17.21		
			20.73	17.56		



**WCDMA B2 (Antenna A, Main 1)**

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	22.84	N/A	24.5
		9400	1880.0	22.82		
		9538	1907.6	23.13		
HSDPA	Subtest 1	9262	1852.4	22.30	0	23.5
		9400	1880.0	22.34		
		9538	1907.6	22.69		
	Subtest 2	9262	1852.4	21.27	0	23.5
		9400	1880.0	21.27		
		9538	1907.6	21.52		
	Subtest 3	9262	1852.4	20.51	0.5	23.0
		9400	1880.0	20.53		
		9538	1907.6	20.55		
	Subtest 4	9262	1852.4	20.51	0.5	23.0
		9400	1880.0	20.57		
		9538	1907.6	20.53		
HSUPA	Subtest 1	9262	1852.4	21.10	0	23.5
		9400	1880.0	21.12		
		9538	1907.6	21.38		
	Subtest 2	9262	1852.4	19.09	2	21.5
		9400	1880.0	19.12		
		9538	1907.6	19.42		
	Subtest 3	9262	1852.4	20.11	1	22.5
		9400	1880.0	20.11		
		9538	1907.6	20.34		
	Subtest 4	9262	1852.4	19.09	2	21.5
		9400	1880.0	19.10		
		9538	1907.6	19.42		
	Subtest 5	9262	1852.4	22.45	0	23.5
		9400	1880.0	22.37		
		9538	1907.6	22.69		
DC-HSDPA	Subtest 1	9262	1852.4	22.23	0	23.5
		9400	1880.0	22.47		
		9538	1907.6	22.71		
	Subtest 2	9262	1852.4	21.12	0	23.5
		9400	1880.0	21.34		
		9538	1907.6	21.55		
	Subtest 3	9262	1852.4	20.53	0.5	23.0
		9400	1880.0	20.51		
		9538	1907.6	20.51		
	Subtest 4	9262	1852.4	20.57	0.5	23.0
		9400	1880.0	20.56		
		9538	1907.6	20.51		

**LTE Band 25 (Antenna A, Main 1)**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140 1860.00 MHz	26365 1882.50 MHz	26590 1905.00 MHz		
20 MHz	QPSK	1	0	23.11	23.06	23.06	0.0	24.0
		1	49	23.10	23.09	23.12	0.0	24.0
		1	99	23.11	23.03	22.20	0.0	24.0
		50	0	22.17	22.11	22.18	1.0	23.0
		50	24	22.15	22.08	22.12	1.0	23.0
		50	50	22.17	22.07	22.11	1.0	23.0
	16QAM	100	0	22.17	22.08	22.10	1.0	23.0
		1	0	22.28	22.15	22.29	1.0	23.0
		1	49	22.25	22.17	22.29	1.0	23.0
		1	99	22.21	22.12	21.97	1.0	23.0
		50	0	21.17	21.04	21.05	2.0	22.0
		50	24	21.14	21.01	21.03	2.0	22.0
	64QAM	50	50	21.13	21.01	21.01	2.0	22.0
		100	0	21.15	21.01	21.03	2.0	22.0
		1	0	21.08	21.03	21.30	2.0	22.0
		1	49	21.11	21.15	21.18	2.0	22.0
		1	99	21.02	21.05	21.26	2.0	22.0
		50	0	20.05	20.13	20.23	3.0	21.0
	256QAM	50	24	20.04	20.12	20.19	3.0	21.0
		50	50	20.03	20.10	20.18	3.0	21.0
		100	0	20.01	20.06	20.15	3.0	21.0
		1	0	18.11	18.24	18.22	5.0	19.0
		1	49	18.14	18.18	18.29	5.0	19.0
		1	99	18.01	18.17	18.17	5.0	19.0
15 MHz	QPSK	50	0	17.97	17.99	18.13	5.0	19.0
		50	24	17.95	17.98	18.11	5.0	19.0
		50	50	17.94	17.98	18.09	5.0	19.0
		100	0	17.96	17.96	18.14	5.0	19.0
		1	0	23.41	23.24	23.13	0.0	24.0
		1	37	23.35	23.14	23.19	0.0	24.0
	16QAM	1	74	23.36	23.27	22.68	0.0	24.0
		36	0	22.53	22.37	22.33	1.0	23.0
		36	20	22.48	22.34	22.30	1.0	23.0
		36	39	22.48	22.35	22.30	1.0	23.0
		75	0	22.50	22.35	22.32	1.0	23.0
		1	0	22.42	22.38	22.24	1.0	23.0
	64QAM	1	37	22.11	22.23	22.29	1.0	23.0
		1	74	22.36	22.33	22.20	1.0	23.0
		36	0	21.40	21.24	21.27	2.0	22.0
		36	20	21.37	21.22	21.25	2.0	22.0
		36	39	21.35	21.22	21.22	2.0	22.0
		75	0	21.36	21.28	21.22	2.0	22.0
	256QAM	36	39	20.26	20.18	20.21	3.0	21.0
		75	0	20.34	20.20	20.19	3.0	21.0
		1	0	21.50	21.24	21.13	2.0	22.0
		1	37	21.75	21.31	21.08	2.0	22.0
		1	74	21.51	21.20	21.05	2.0	22.0
		36	0	20.31	20.21	20.23	3.0	21.0
256QAM	36	20	20.29	20.20	20.22	3.0	21.0	
	36	39	20.26	20.18	20.21	3.0	21.0	
	75	0	20.34	20.20	20.19	3.0	21.0	
	1	0	18.38	18.28	18.11	5.0	19.0	
	1	37	18.36	18.42	18.10	5.0	19.0	
	1	74	18.31	18.22	18.00	5.0	19.0	
256QAM	36	0	18.29	18.15	18.10	5.0	19.0	
	36	20	18.27	18.11	18.08	5.0	19.0	
	36	39	18.25	18.10	18.05	5.0	19.0	
	75	0	18.27	18.13	18.09	5.0	19.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855.00 MHz	1882.50 MHz	1910.00 MHz		
10 MHz	QPSK	1	0	23.39	23.25	23.08	0.0	24.0
		1	25	23.49	23.27	23.15	0.0	24.0
		1	49	23.42	23.23	23.15	0.0	24.0
		25	0	22.41	22.22	22.17	1.0	23.0
		25	12	22.39	22.22	22.14	1.0	23.0
		25	25	22.38	22.20	22.12	1.0	23.0
	16QAM	50	0	22.40	22.25	22.16	1.0	23.0
		1	0	22.44	22.46	22.38	1.0	23.0
		1	25	22.40	22.42	22.32	1.0	23.0
		1	49	22.37	22.45	22.23	1.0	23.0
		25	0	21.29	21.15	21.11	2.0	22.0
		25	12	21.28	21.14	21.09	2.0	22.0
	64QAM	25	25	21.28	21.13	21.03	2.0	22.0
		50	0	21.37	21.17	21.08	2.0	22.0
		1	0	21.37	21.28	20.93	2.0	22.0
		1	25	21.19	21.29	21.05	2.0	22.0
		1	49	21.29	21.33	20.96	2.0	22.0
		25	0	20.39	20.15	20.15	3.0	21.0
	256QAM	25	12	20.39	20.15	20.14	3.0	21.0
		25	25	20.39	20.15	20.11	3.0	21.0
		50	0	20.37	20.18	20.10	3.0	21.0
		1	0	18.37	18.33	18.15	5.0	19.0
		1	25	18.41	18.30	18.00	5.0	19.0
		1	49	18.33	18.26	18.04	5.0	19.0
	5 MHz	QPSK	25	0	18.39	18.15	18.06	5.0
25			12	18.38	18.14	18.04	5.0	19.0
25			25	18.36	18.13	18.01	5.0	19.0
50			0	18.31	18.10	18.02	5.0	19.0
1			0	23.36	23.10	22.46	0.0	24.0
1			12	23.48	23.12	22.25	0.0	24.0
16QAM		1	24	23.42	23.18	21.92	0.0	24.0
		12	0	22.38	22.21	21.81	1.0	23.0
		12	7	22.35	22.17	21.78	1.0	23.0
		12	13	22.37	22.18	21.70	1.0	23.0
		25	0	22.36	22.16	21.76	1.0	23.0
		1	0	22.50	22.25	21.95	1.0	23.0
64QAM		1	12	22.57	21.99	21.84	1.0	23.0
		1	24	22.45	22.18	21.54	1.0	23.0
		12	0	21.32	21.08	21.04	2.0	22.0
		12	7	21.29	21.06	21.01	2.0	22.0
		12	13	21.29	21.07	21.02	2.0	22.0
		25	0	21.28	21.07	20.98	2.0	22.0
256QAM		1	0	21.54	21.16	21.12	2.0	22.0
		1	12	21.63	21.46	21.17	2.0	22.0
		1	24	21.50	21.24	21.13	2.0	22.0
		12	0	20.35	20.17	20.01	3.0	21.0
		12	7	20.32	20.15	19.98	3.0	21.0
		12	13	20.33	20.15	19.98	3.0	21.0
256QAM		25	0	20.40	20.20	19.99	3.0	21.0
	1	0	18.59	18.19	18.00	5.0	19.0	
	1	12	18.48	18.24	18.14	5.0	19.0	
	1	24	18.56	18.20	17.93	5.0	19.0	
	12	0	18.35	18.11	17.97	5.0	19.0	
	12	7	18.31	18.09	17.95	5.0	19.0	
256QAM	12	13	18.36	18.10	17.95	5.0	19.0	
	25	0	18.30	18.17	17.96	5.0	19.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	
				26055	26365	26675			
				1851.50 MHz	1882.50 MHz	1913.50 MHz			
3 MHz	QPSK	1	0	23.59	23.24	23.19	0.0	24.0	
		1	8	23.60	23.20	23.26	0.0	24.0	
		1	14	23.65	23.25	23.18	0.0	24.0	
		8	0	22.62	22.36	22.28	1.0	23.0	
		8	4	22.48	22.31	22.24	1.0	23.0	
		8	7	22.55	22.32	22.25	1.0	23.0	
	16QAM	15	0	22.47	22.24	22.13	1.0	23.0	
		1	0	22.37	22.43	22.24	1.0	23.0	
		1	8	22.42	22.30	22.32	1.0	23.0	
		1	14	22.31	22.45	22.14	1.0	23.0	
		8	0	21.53	21.34	21.17	2.0	22.0	
		8	4	21.45	21.25	21.13	2.0	22.0	
	64QAM	8	7	21.47	21.28	21.11	2.0	22.0	
		15	0	21.38	21.17	21.07	2.0	22.0	
		1	0	21.12	21.34	21.05	2.0	22.0	
		1	8	21.40	21.35	21.04	2.0	22.0	
		1	14	21.05	21.40	21.13	2.0	22.0	
		8	0	20.44	20.22	20.09	3.0	21.0	
	256QAM	8	4	20.34	20.24	20.08	3.0	21.0	
		8	7	20.41	20.23	20.10	3.0	21.0	
		15	0	20.41	20.09	20.11	3.0	21.0	
		1	0	18.42	18.38	17.98	5.0	19.0	
		1	8	18.45	18.49	18.02	5.0	19.0	
		1	14	18.38	18.34	17.90	5.0	19.0	
1.4 MHz	QPSK	8	0	18.39	18.23	18.06	5.0	19.0	
		8	4	18.40	18.20	18.01	5.0	19.0	
		8	7	18.42	18.17	18.02	5.0	19.0	
		15	0	18.39	18.13	18.04	5.0	19.0	
		16QAM	1	0	23.59	23.34	22.56	0.0	24.0
			1	3	23.58	23.30	22.40	0.0	24.0
	1		5	23.57	23.35	22.30	0.0	24.0	
	3		0	23.59	23.23	22.33	0.0	24.0	
	3		1	23.55	23.29	22.32	0.0	24.0	
	3		3	23.51	23.36	22.29	0.0	24.0	
	64QAM	6	0	22.57	22.25	21.75	1.0	23.0	
		1	0	22.63	22.09	21.90	1.0	23.0	
		1	3	22.77	22.09	21.86	1.0	23.0	
		1	5	22.70	22.19	21.82	1.0	23.0	
		3	0	22.43	22.18	21.85	1.0	23.0	
		3	1	22.43	22.22	21.85	1.0	23.0	
	256QAM	3	3	22.38	22.31	21.83	1.0	23.0	
		6	0	21.45	21.17	21.02	2.0	22.0	
		1	0	21.52	21.19	20.62	2.0	22.0	
		1	3	21.61	21.15	20.71	2.0	22.0	
		1	5	21.48	21.12	20.69	2.0	22.0	
		3	0	21.34	21.14	20.85	2.0	22.0	
	256QAM	3	1	21.33	21.23	20.84	2.0	22.0	
		3	3	21.37	21.20	20.89	2.0	22.0	
6		0	20.39	20.23	19.95	3.0	21.0		
1		0	18.37	18.16	17.98	5.0	19.0		
1		3	18.31	18.05	18.00	5.0	19.0		
1		5	18.33	18.13	17.91	5.0	19.0		
256QAM	3	0	18.23	18.05	18.04	5.0	19.0		
	3	1	18.21	18.07	18.02	5.0	19.0		
	3	3	18.27	18.12	18.03	5.0	19.0		
	6	0	18.26	18.10	17.96	5.0	19.0		

**LTE Band 25 (Antenna F, Sub 2)**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140 1860.00 MHz	26365 1882.50 MHz	26590 1905.00 MHz		
20 MHz	QPSK	1	0	23.32	23.43	23.42	0.0	24.0
		1	49	23.18	23.27	23.42	0.0	24.0
		1	99	23.34	23.27	23.18	0.0	24.0
		50	0	22.26	22.32	22.22	1.0	23.0
		50	24	22.22	22.30	22.18	1.0	23.0
		50	50	22.19	22.26	22.16	1.0	23.0
	16QAM	100	0	22.23	22.29	22.21	1.0	23.0
		1	0	22.45	22.36	22.32	1.0	23.0
		1	49	22.32	22.28	22.30	1.0	23.0
		1	99	22.27	22.29	22.17	1.0	23.0
		50	0	21.20	21.28	21.06	2.0	22.0
		50	24	21.12	21.28	21.06	2.0	22.0
	64QAM	50	50	21.09	21.22	21.05	2.0	22.0
		100	0	21.15	21.23	21.09	2.0	22.0
		1	0	21.48	21.23	21.37	2.0	22.0
		1	49	21.30	21.36	21.33	2.0	22.0
		1	99	21.30	21.15	21.23	2.0	22.0
		50	0	20.20	20.25	20.07	3.0	21.0
	256QAM	50	24	20.12	20.25	20.07	3.0	21.0
		50	50	20.07	20.17	20.08	3.0	21.0
		100	0	20.08	20.19	20.04	3.0	21.0
		1	0	18.35	18.31	18.12	5.0	19.0
		1	49	18.27	18.41	18.05	5.0	19.0
		1	99	18.19	18.18	17.97	5.0	19.0
15 MHz	QPSK	50	0	18.08	18.13	17.96	5.0	19.0
		50	24	18.01	18.12	17.96	5.0	19.0
		50	50	17.94	18.07	17.96	5.0	19.0
		100	0	18.04	18.08	17.98	5.0	19.0
		1	0	23.41	23.40	23.37	0.0	24.0
		1	37	23.44	23.42	23.32	0.0	24.0
	16QAM	1	74	23.43	23.32	23.15	0.0	24.0
		36	0	22.57	22.52	22.43	1.0	23.0
		36	20	22.56	22.47	22.37	1.0	23.0
		36	39	22.56	22.47	22.33	1.0	23.0
		75	0	22.54	22.49	22.36	1.0	23.0
		1	0	22.33	22.51	22.09	1.0	23.0
	64QAM	1	37	22.11	22.32	22.13	1.0	23.0
		1	74	22.19	22.40	21.99	1.0	23.0
		36	0	21.33	21.38	21.31	2.0	22.0
		36	20	21.31	21.35	21.26	2.0	22.0
		36	39	21.29	21.34	21.23	2.0	22.0
		75	0	21.34	21.39	21.23	2.0	22.0
	256QAM	1	0	21.10	21.31	20.98	2.0	22.0
		1	37	21.14	21.32	21.13	2.0	22.0
		1	74	20.98	21.22	20.84	2.0	22.0
		36	0	20.19	20.28	20.17	3.0	21.0
		36	20	20.16	20.24	20.15	3.0	21.0
		36	39	20.12	20.22	20.12	3.0	21.0
256QAM	75	0	20.20	20.24	20.11	3.0	21.0	
	1	0	18.01	18.28	17.91	5.0	19.0	
	1	37	17.98	18.43	18.08	5.0	19.0	
	1	74	17.88	18.17	17.79	5.0	19.0	
	36	0	18.18	18.22	18.09	5.0	19.0	
	36	20	18.14	18.20	18.06	5.0	19.0	
36	39	18.11	18.14	18.00	5.0	19.0		
75	0	18.16	18.18	18.03	5.0	19.0		

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	
				26090	26365	26640			
				1855.00 MHz	1882.50 MHz	1910.00 MHz			
10 MHz	QPSK	1	0	23.44	23.41	23.18	0.0	24.0	
		1	25	23.59	23.40	23.22	0.0	24.0	
		1	49	23.51	23.32	23.12	0.0	24.0	
		25	0	22.42	22.37	22.17	1.0	23.0	
		25	12	22.38	22.33	22.13	1.0	23.0	
		25	25	22.36	22.33	22.12	1.0	23.0	
	16QAM	50	0	22.39	22.36	22.16	1.0	23.0	
		1	0	22.47	22.31	22.14	1.0	23.0	
		1	25	22.36	22.19	22.13	1.0	23.0	
		1	49	22.29	22.29	21.98	1.0	23.0	
		25	0	21.32	21.28	21.11	2.0	22.0	
		25	12	21.25	21.26	21.08	2.0	22.0	
	64QAM	25	25	21.25	21.24	21.04	2.0	22.0	
		50	0	21.31	21.28	21.08	2.0	22.0	
		1	0	21.34	21.24	21.07	2.0	22.0	
		1	25	21.25	21.30	21.10	2.0	22.0	
		1	49	21.18	21.22	21.17	2.0	22.0	
		25	0	20.26	20.07	19.99	3.0	21.0	
	256QAM	25	12	20.22	20.06	19.99	3.0	21.0	
		25	25	20.18	20.05	20.00	3.0	21.0	
		50	0	20.20	20.13	19.97	3.0	21.0	
		1	0	18.34	18.37	18.13	5.0	19.0	
		1	25	18.15	18.41	18.13	5.0	19.0	
		1	49	18.16	18.47	18.20	5.0	19.0	
5 MHz	QPSK	25	0	18.19	18.03	17.89	5.0	19.0	
		25	12	18.15	18.02	17.90	5.0	19.0	
		25	25	18.11	18.04	17.92	5.0	19.0	
		50	0	18.15	18.02	17.86	5.0	19.0	
		16QAM	1	0	23.43	23.35	23.21	0.0	24.0
			1	12	23.44	23.34	23.30	0.0	24.0
	1		24	23.48	23.35	23.27	0.0	24.0	
	12		0	22.43	22.38	22.25	1.0	23.0	
	12		7	22.42	22.36	22.23	1.0	23.0	
	12		13	22.41	22.37	22.20	1.0	23.0	
	64QAM	25	0	22.40	22.32	22.19	1.0	23.0	
		1	0	22.51	22.38	22.34	1.0	23.0	
		1	12	22.46	22.08	22.31	1.0	23.0	
		1	24	22.41	22.27	22.31	1.0	23.0	
		12	0	21.32	21.26	21.16	2.0	22.0	
		12	7	21.30	21.24	21.13	2.0	22.0	
	256QAM	12	13	21.28	21.23	21.10	2.0	22.0	
		25	0	21.29	21.27	21.11	2.0	22.0	
		1	0	21.62	21.17	21.22	2.0	22.0	
		1	12	21.68	21.43	21.32	2.0	22.0	
		1	24	21.50	21.22	21.21	2.0	22.0	
		12	0	20.26	20.19	19.98	3.0	21.0	
	256QAM	12	7	20.22	20.17	19.96	3.0	21.0	
		12	13	20.22	20.14	19.95	3.0	21.0	
25		0	20.28	20.13	19.97	3.0	21.0		
1		0	18.31	18.10	17.90	5.0	19.0		
1		12	18.31	18.08	17.97	5.0	19.0		
1		24	18.26	18.07	17.73	5.0	19.0		
12		0	18.29	18.07	17.99	5.0	19.0		
12		7	18.23	18.06	17.96	5.0	19.0		
12		13	18.26	18.05	17.93	5.0	19.0		
25	0	18.13	18.08	17.91	5.0	19.0			

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit		
				26055	26365	26675				
				1851.50 MHz	1882.50 MHz	1913.50 MHz				
3 MHz	QPSK	1	0	23.52	23.37	23.30	0.0	24.0		
		1	8	23.58	23.35	23.36	0.0	24.0		
		1	14	23.59	23.32	23.39	0.0	24.0		
		8	0	22.58	22.47	22.32	1.0	23.0		
		8	4	22.47	22.43	22.32	1.0	23.0		
		8	7	22.52	22.45	22.31	1.0	23.0		
	16QAM	15	0	22.42	22.37	22.21	1.0	23.0		
		1	0	22.45	22.56	22.24	1.0	23.0		
		1	8	22.41	22.39	22.34	1.0	23.0		
		1	14	22.33	22.59	22.12	1.0	23.0		
		8	0	21.54	21.49	21.25	2.0	22.0		
		8	4	21.46	21.44	21.22	2.0	22.0		
	64QAM	8	7	21.46	21.43	21.21	2.0	22.0		
		15	0	21.35	21.32	21.10	2.0	22.0		
		1	0	21.35	21.59	21.15	2.0	22.0		
		1	8	21.62	21.63	21.18	2.0	22.0		
		1	14	21.24	21.65	21.19	2.0	22.0		
		8	0	20.35	20.35	20.07	3.0	21.0		
	256QAM	8	4	20.28	20.26	20.02	3.0	21.0		
		8	7	20.28	20.31	20.06	3.0	21.0		
		15	0	20.29	20.18	20.04	3.0	21.0		
		1	0	18.49	18.28	18.09	5.0	19.0		
		1	8	18.55	18.48	18.25	5.0	19.0		
		1	14	18.43	18.21	18.05	5.0	19.0		
	1.4 MHz	QPSK	8	0	18.31	18.28	18.02	5.0	19.0	
			8	4	18.34	18.24	17.98	5.0	19.0	
			8	7	18.32	18.24	18.00	5.0	19.0	
			15	0	18.29	18.13	17.99	5.0	19.0	
			16QAM	1	0	23.52	23.42	23.28	0.0	24.0
				1	3	23.53	23.38	23.28	0.0	24.0
1		5		23.47	23.38	23.28	0.0	24.0		
3		0		23.27	23.37	23.21	0.0	24.0		
3		1		23.31	23.35	23.18	0.0	24.0		
3		3		23.36	23.31	23.15	0.0	24.0		
6		0		22.45	22.41	22.38	1.0	23.0		
64QAM		1		0	22.27	22.19	22.00	1.0	23.0	
		1		3	22.39	22.20	22.14	1.0	23.0	
		1		5	22.34	22.27	22.04	1.0	23.0	
		3		0	22.27	22.32	22.06	1.0	23.0	
		3		1	22.27	22.34	22.07	1.0	23.0	
		3	3	22.36	22.25	22.02	1.0	23.0		
256QAM		6	0	21.44	21.27	21.18	2.0	22.0		
		1	0	21.52	21.22	21.00	2.0	22.0		
		1	3	21.51	21.18	21.16	2.0	22.0		
		1	5	21.43	21.15	21.10	2.0	22.0		
		3	0	21.46	21.11	21.07	2.0	22.0		
		3	1	21.36	21.14	20.99	2.0	22.0		
16QAM		3	3	21.40	21.23	21.19	2.0	22.0		
		6	0	20.29	20.39	20.04	3.0	21.0		
		1	0	18.12	18.32	18.27	5.0	19.0		
		1	3	17.97	18.37	18.10	5.0	19.0		
		1	5	18.06	18.29	18.22	5.0	19.0		
		3	0	18.24	18.22	18.03	5.0	19.0		
		256QAM	3	1	18.17	18.25	17.94	5.0	19.0	
	3		3	18.28	18.27	17.93	5.0	19.0		
	6		0	18.29	18.15	18.08	5.0	19.0		

## 8.2. PEAK TO AVERAGE RATIO

### Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

### Test Spec

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

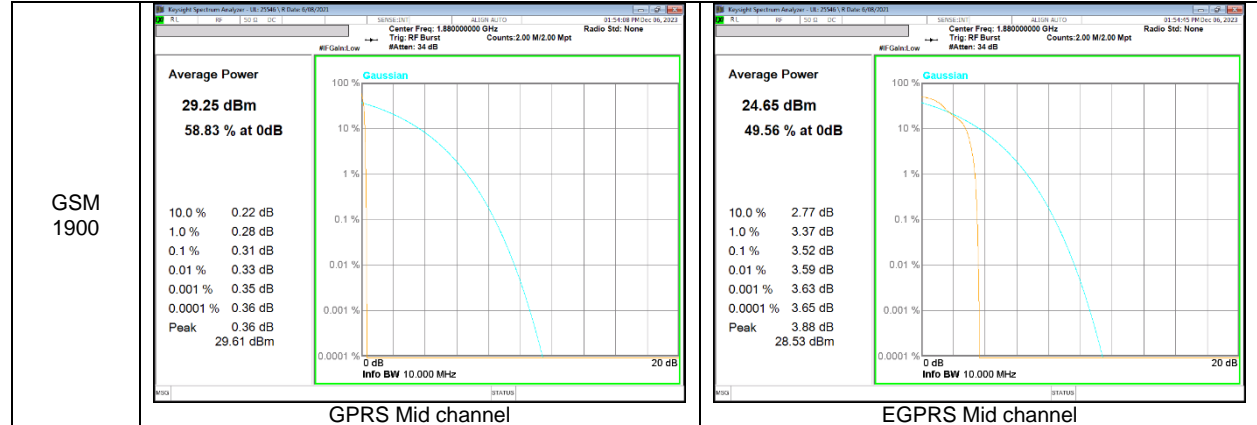
### RESULTS

See the following pages.

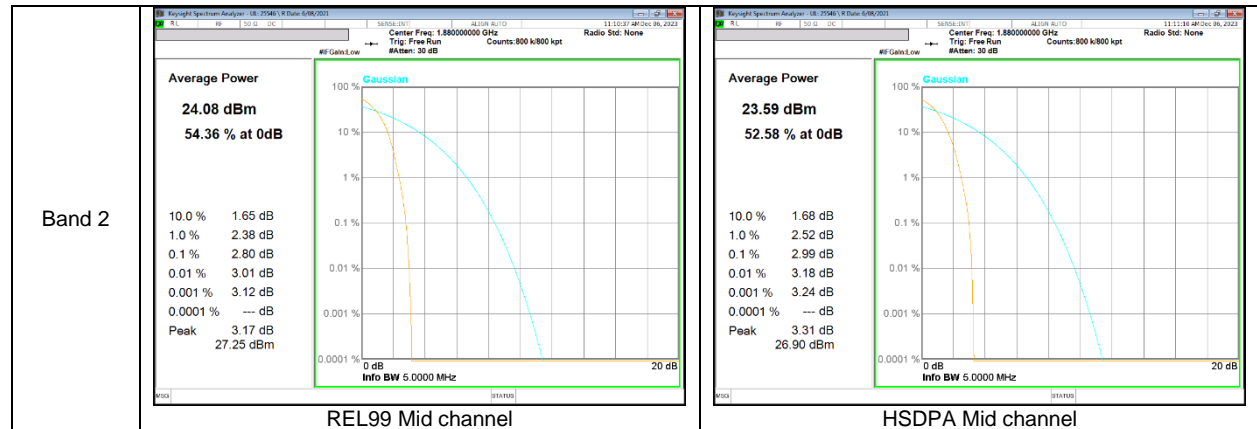


## 8.2.1. CONDUCTED PEAK TO AVERAGE RESULTS

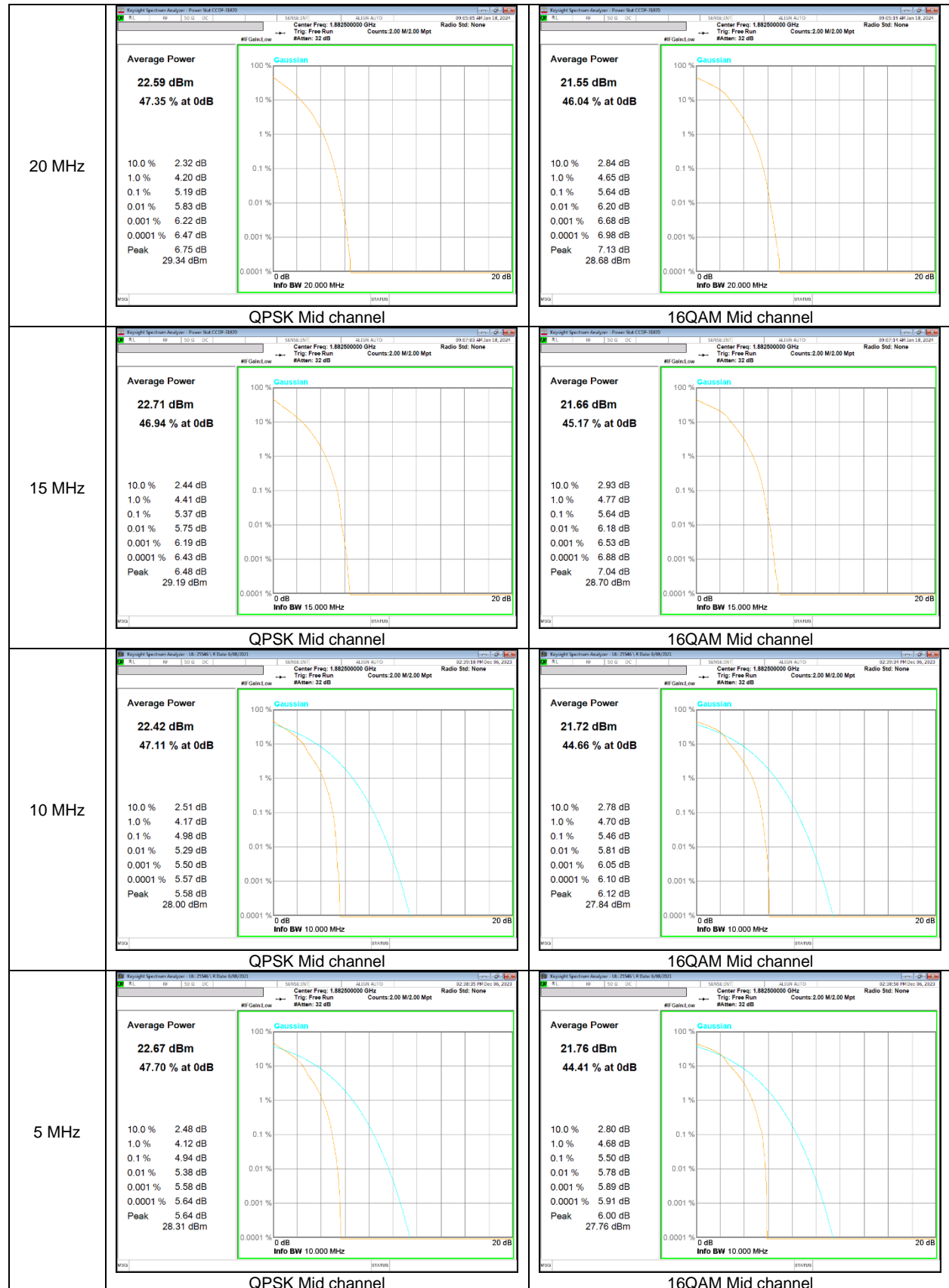
### GSM

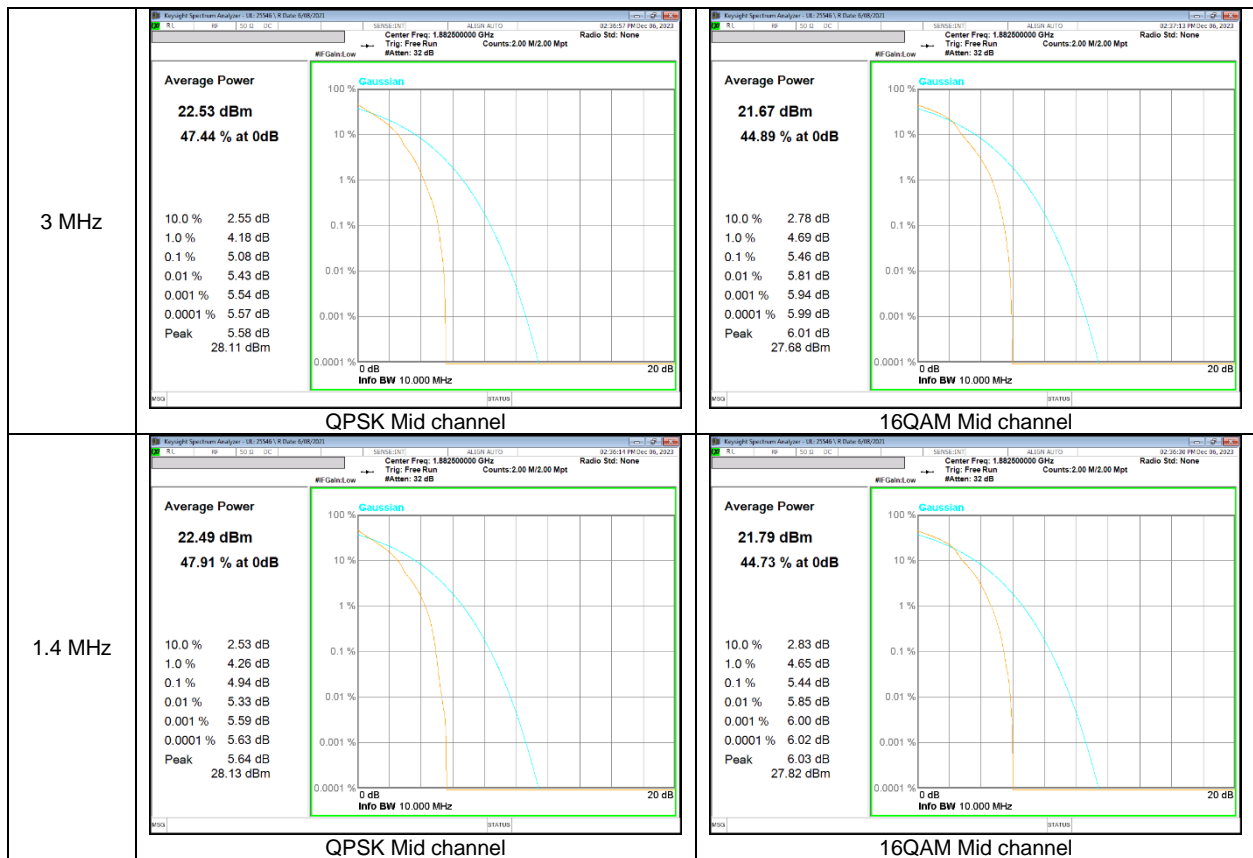


### WCDMA



**LTE Band 25**





### **8.3. OCCUPIED BANDWIDTH**

#### **RULE PART(S)**

FCC: §2.1049

#### **LIMITS**

For reporting purposes only

#### **TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at middle channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

#### **RESULTS**

See the following pages.

**- GSM**

Band	Modulation	f [MHz]	99% BW (kHz)	-26dB BW (kHz)
1900	GPRS	1880.0	245.38	317.5
	EGPRS		239.14	307.9

**- WCDMA**

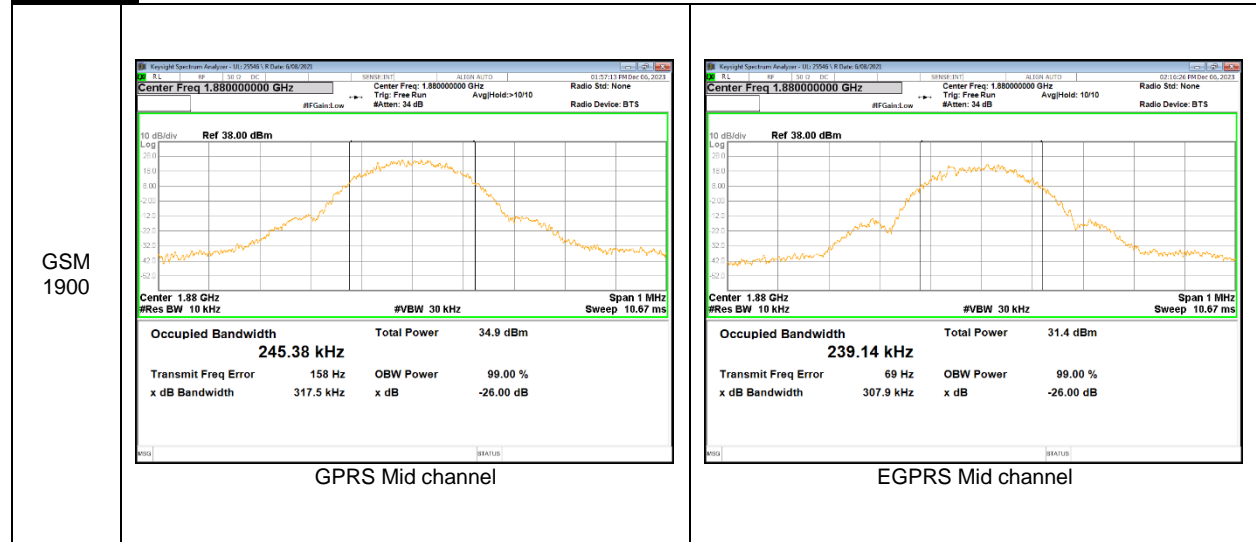
Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.0	4.163	4.723
	HSDPA		4.176	4.728

**- LTE Band 25**

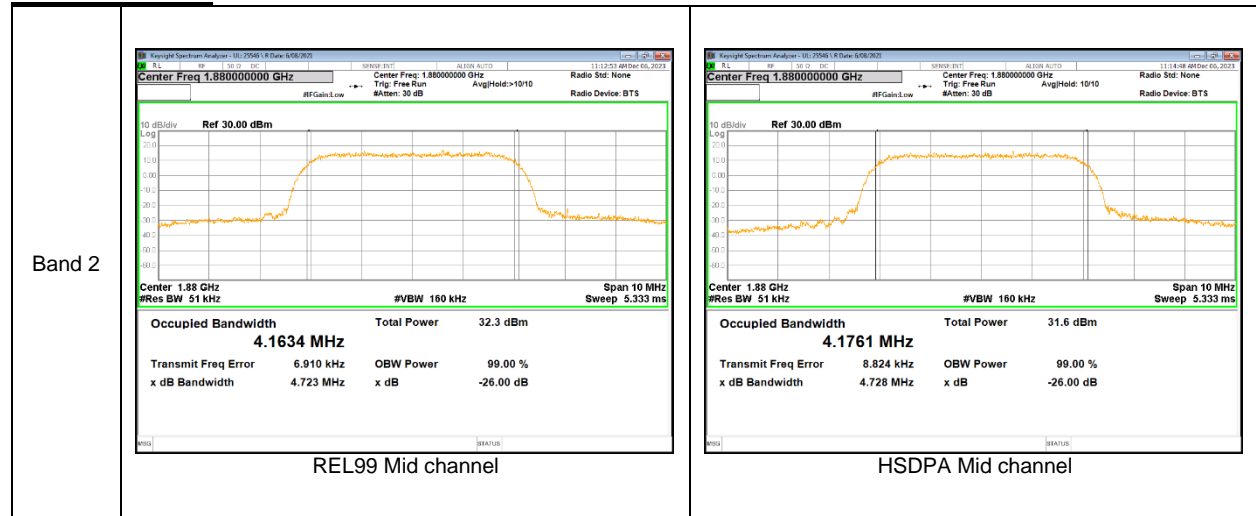
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.898	19.670
		16QAM		17.882	19.670
	15M	QPSK		13.452	15.080
		16QAM		13.420	15.110
	10M	QPSK		8.986	10.230
		16QAM		8.970	10.350
	5M	QPSK		4.488	5.214
		16QAM		4.497	5.139
	3M	QPSK		2.699	3.095
		16QAM		2.700	3.100
	1.4M	QPSK		1.084	1.299
		16QAM		1.088	1.329

### 8.3.1. OCCUPIED BANDWIDTH RESULTS

#### GSM 1900



#### WCDMA Band 2



**LTE Band 25**







## 8.4. BAND EDGE EMISSIONS

### RULE PART(S)

FCC: §24.238

### 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.

### TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The transmitter output was connected to CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

### GSM

- a) Set the RBW = 1 - 5% of OBW(GSM1900 – 9.1kHz)
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = 1S ;
- e) Detector = RMS;
- f) Ensure that the number of measurement points  $\geq 2 \times$  Span/RBW;
- g) Trace Mode = Average(100);
- h) Add duty cycle correction factor (9dB)

### WCDMA/LTE

- a) Set the RBW = 1 - 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points  $\geq 2 \times$  Span/RBW;
- g) Trace Mode = Average (100);

**NOTE1**

Note that the spurious emissions outside of the channel include narrowband signals. These signals are all below the -13dBm limits. Although the measurement bandwidth is less than the reference bandwidth of 1MHz no addental correction is applied as ANSI C63.26 section 4.2.3 only requires the correction to be applied when the OBW of the emission being measured is wider than the measurement bandwidth (Where the OBW of the signal under measurement is less than the RBW of the measuring instrument, no bandwidth correction or integration will be required.) Plots for low and high channels show the level of the emission measured with the reduced bandwidth and the level of the same emission measured using the integration method over the 1MHz reference bandwidth are very close, indicating the emissions are narrowband.

**NOTE2**

For Band-Edge extended:

CH BW (MHz)	RB Used (kHz)	CF for emissions more than 100kHz	CF for emissions more than 1MHz
1.4	15	+8.2 dB	+18.2 dB
3	30	+5.2 dB	+15.2 dB
5	51	+2.9 dB	+12.9 dB
10	100	N/A	+10.0 dB
15	150	N/A	+8.2 dB
20	200	N/A	+7.0 dB

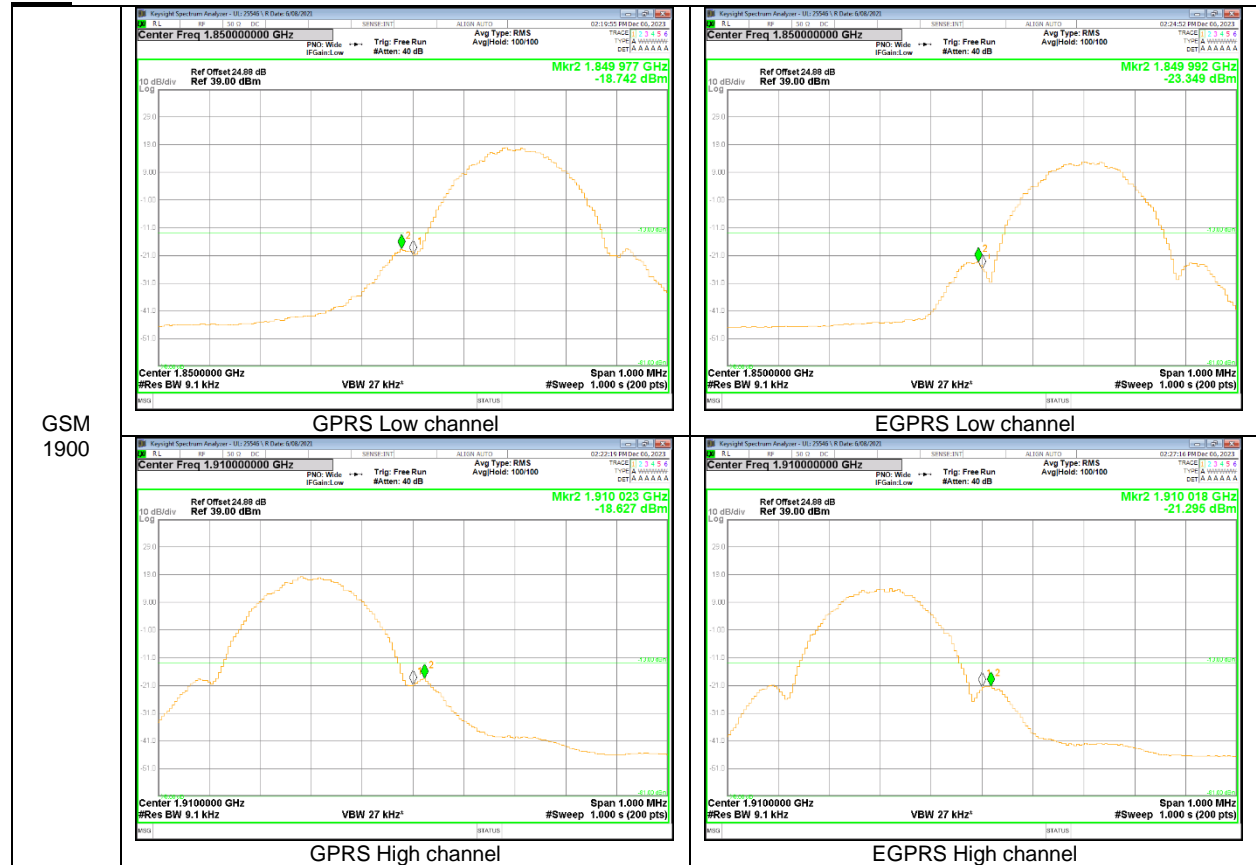
For the band edge value measured in [RB Used], even if [CF for emissions reference bandwidth 100kHz/1MHz] is applied, it is below -13dBm.

**RESULTS**

See the following pages.

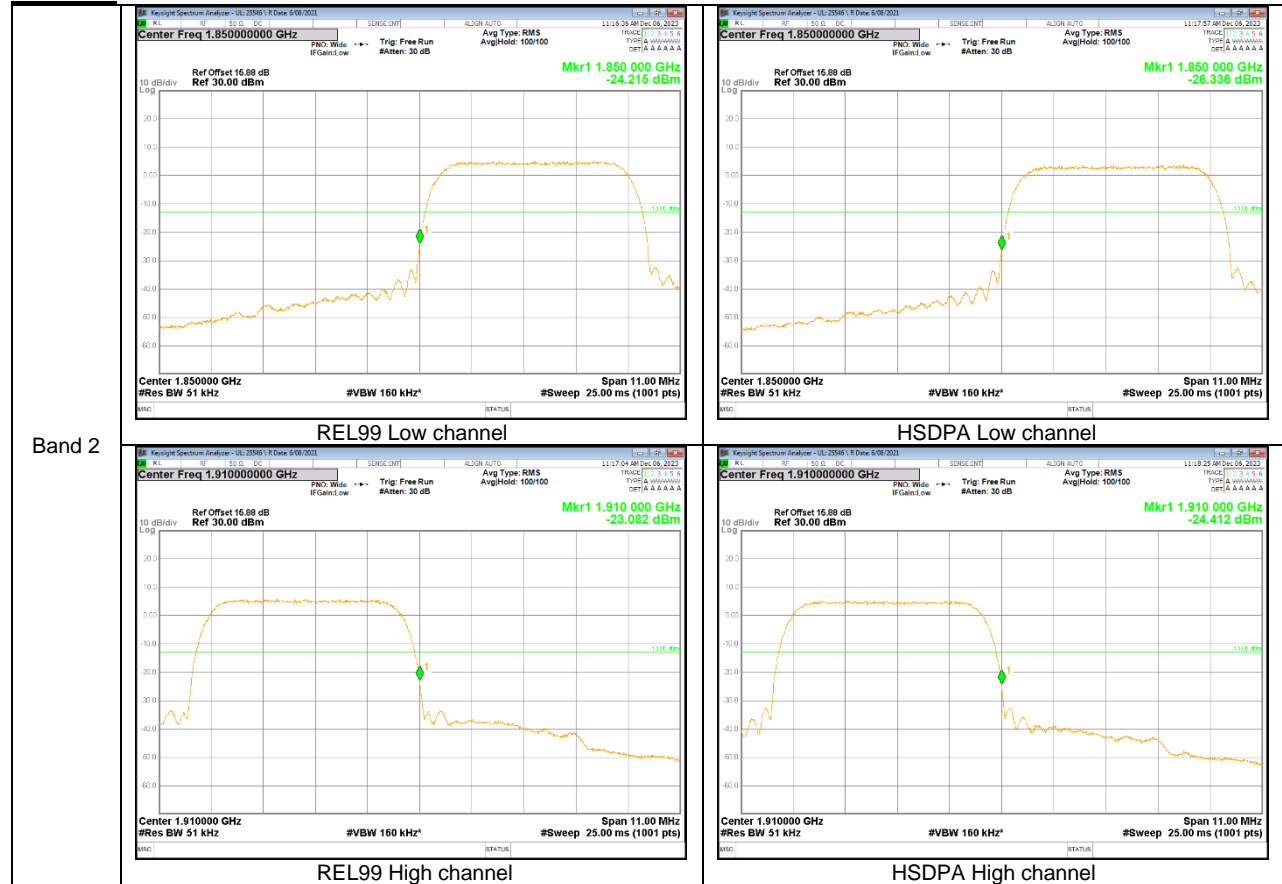
### 8.4.1. BAND EDGE RESULTS

GSM

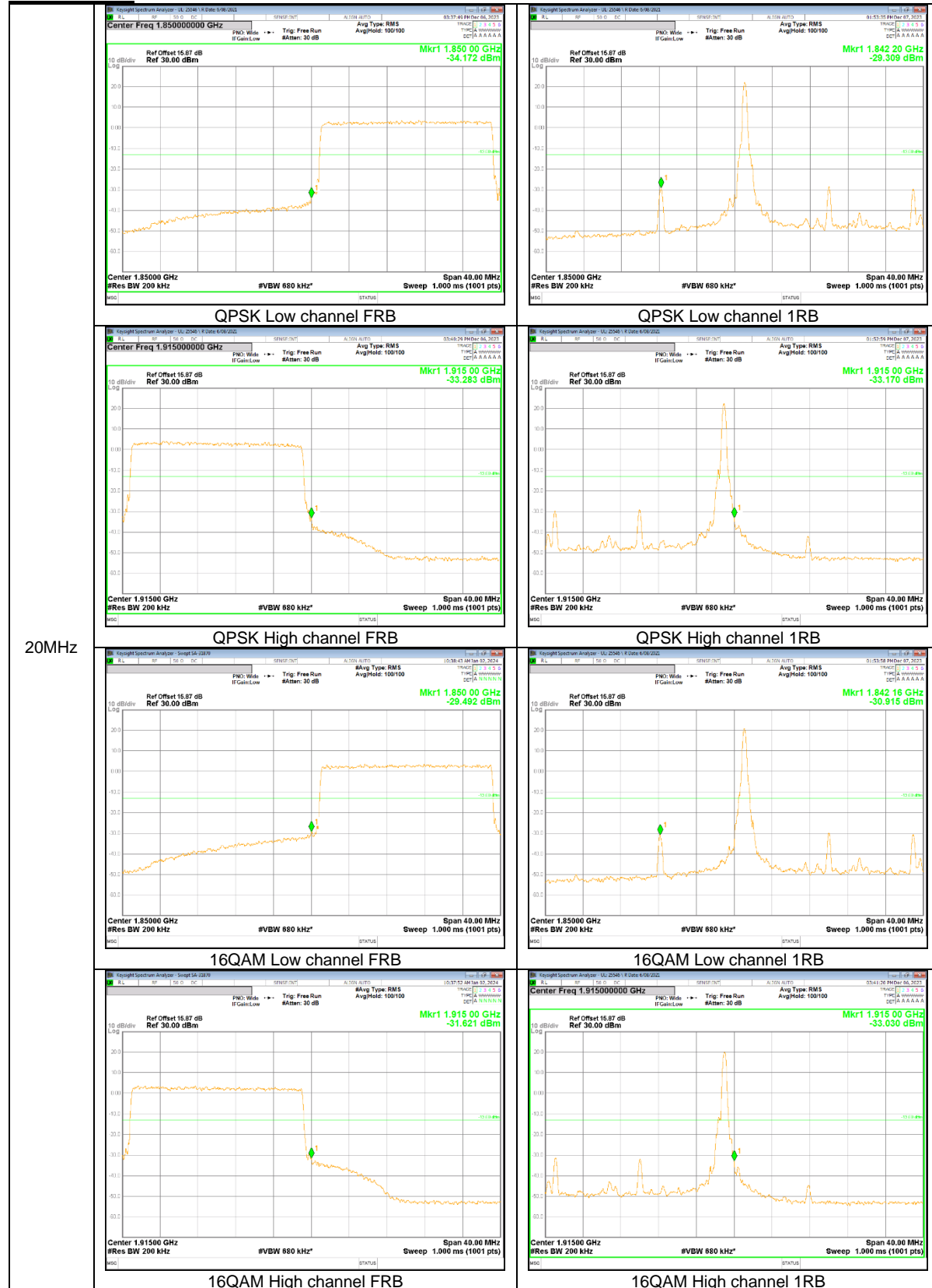


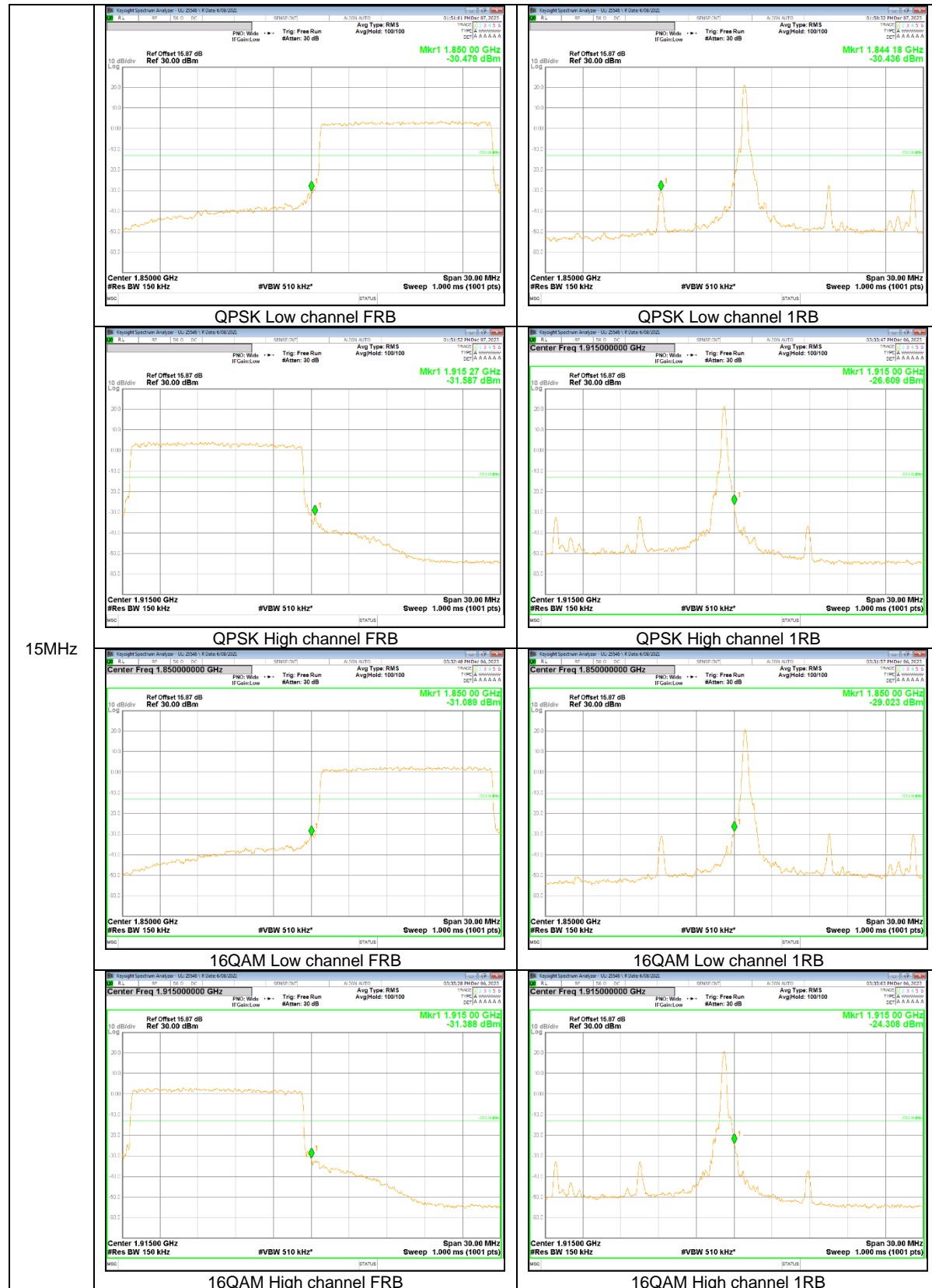
GSM  
1900

**WCDMA**

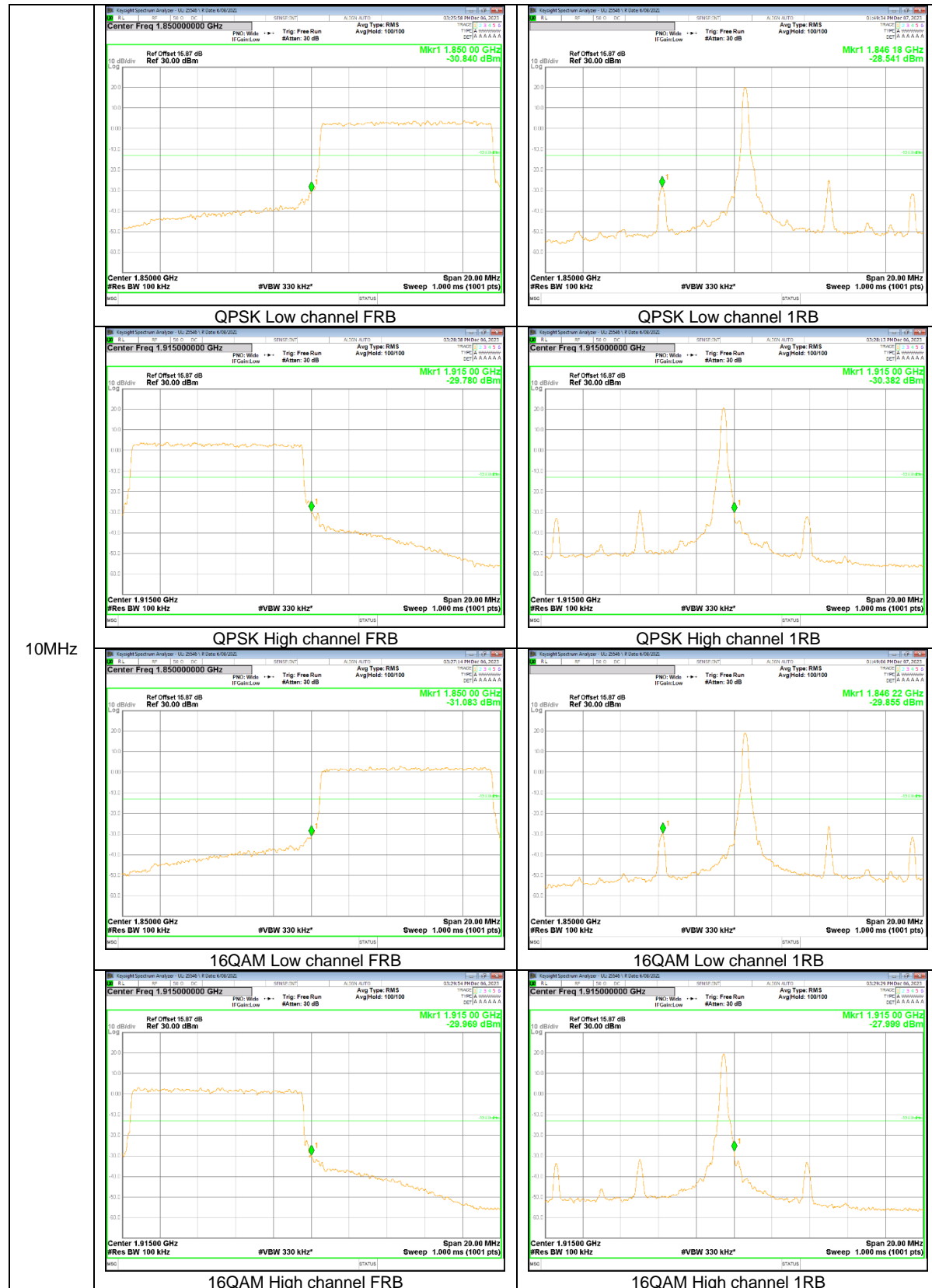


LTE Band 25

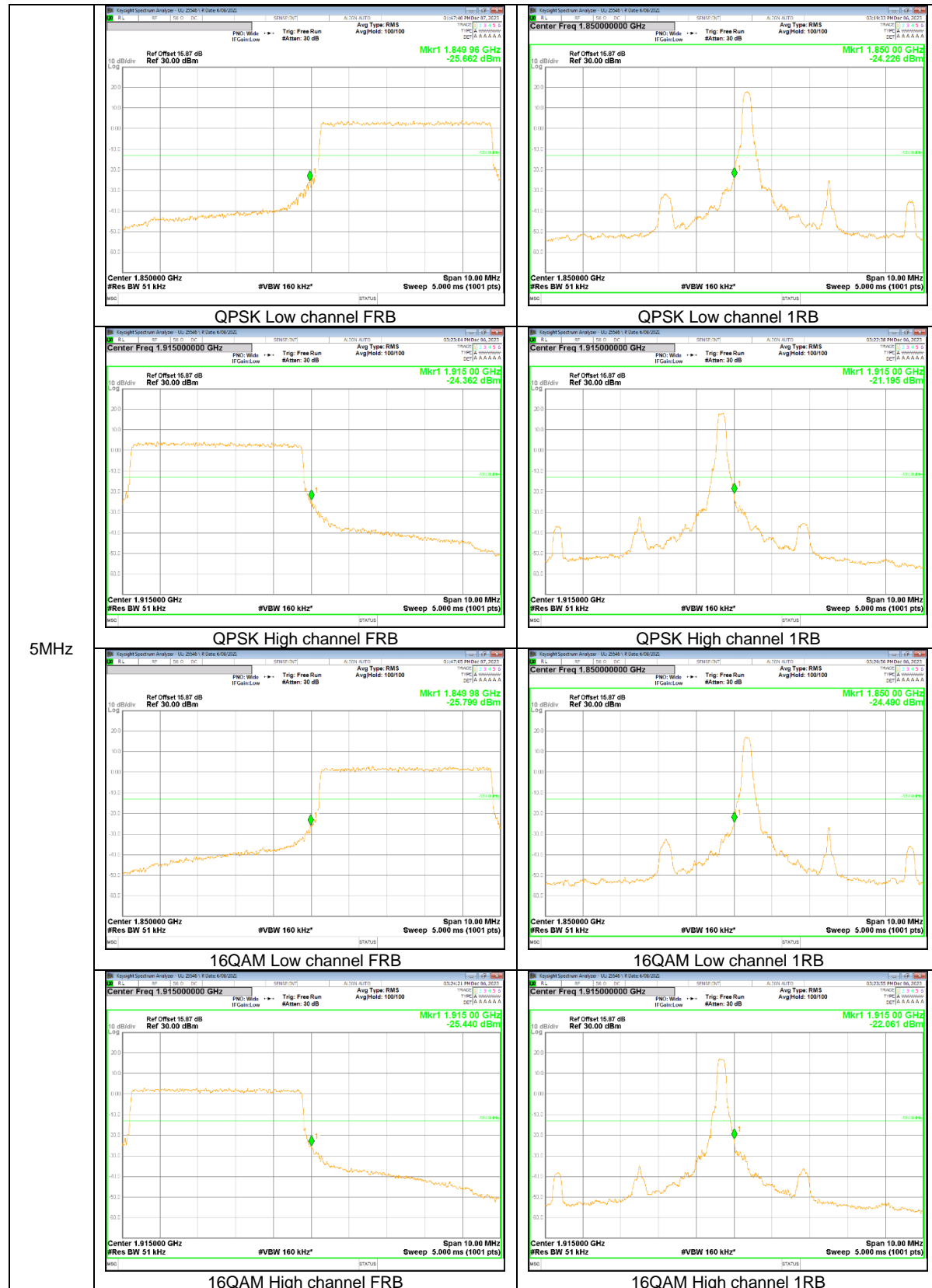




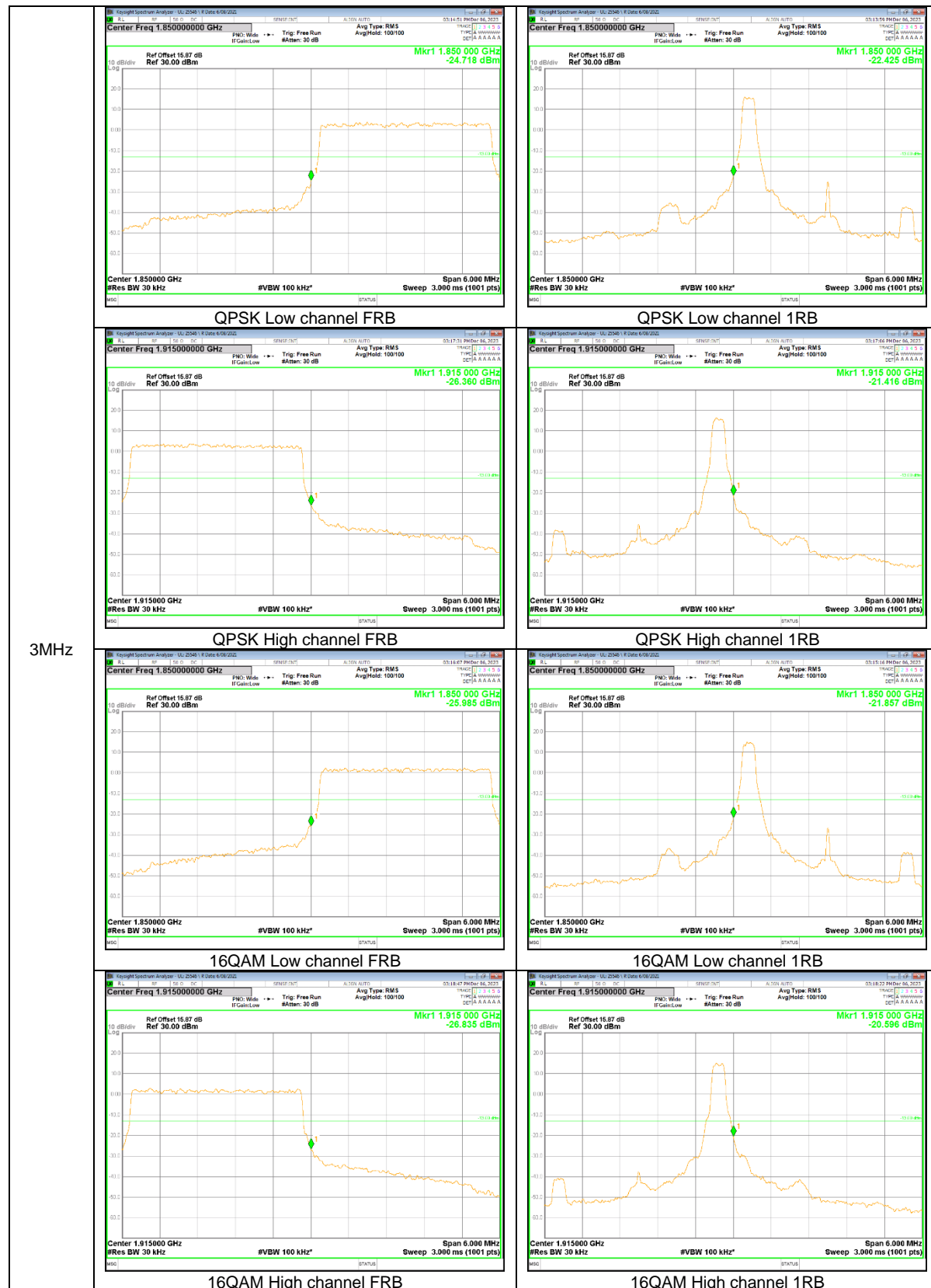
15MHz

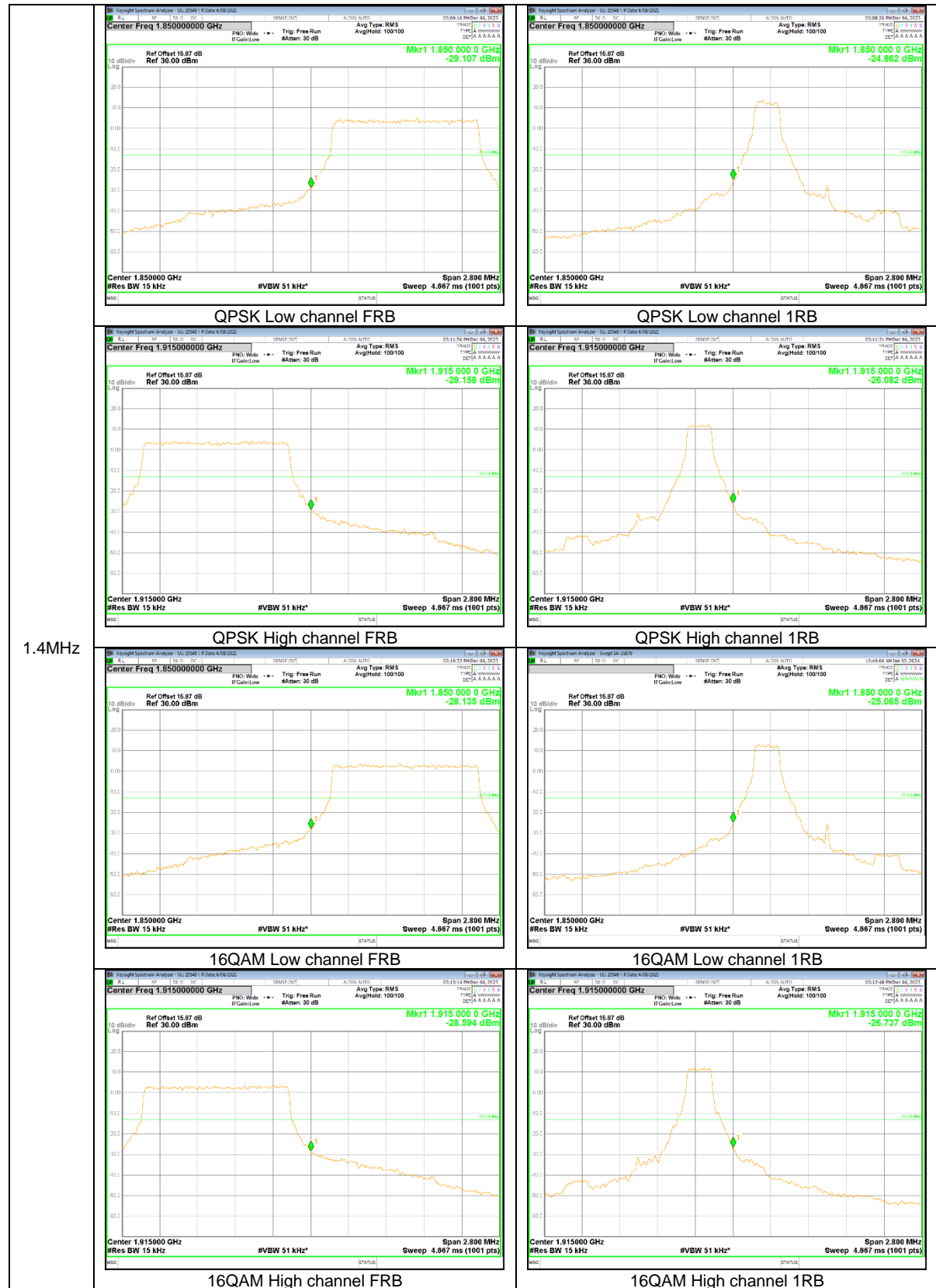


10MHz









## 8.5. CONDUCTED SPURIOUS EMISSIONS

### RULE PART(S)

FCC: §2.1051, §24.238

### 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.

### 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 = 1 MHz for emissions above 1 GHz  
(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), Max hold(GSM);

### NOTE1

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

### RESULTS

See the following pages.

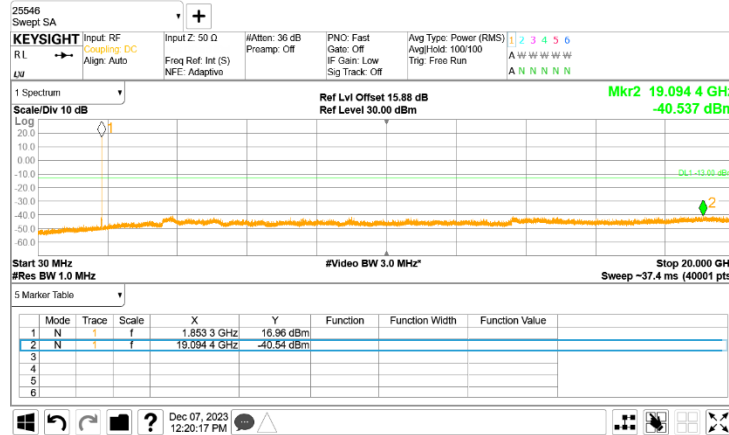
### 8.5.1. OUT OF BAND EMISSIONS RESULTS

#### GSM 1900

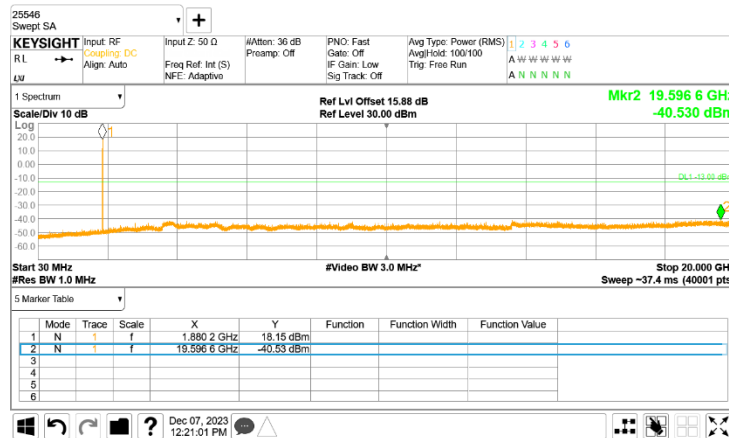


**WCDMA Band 2**

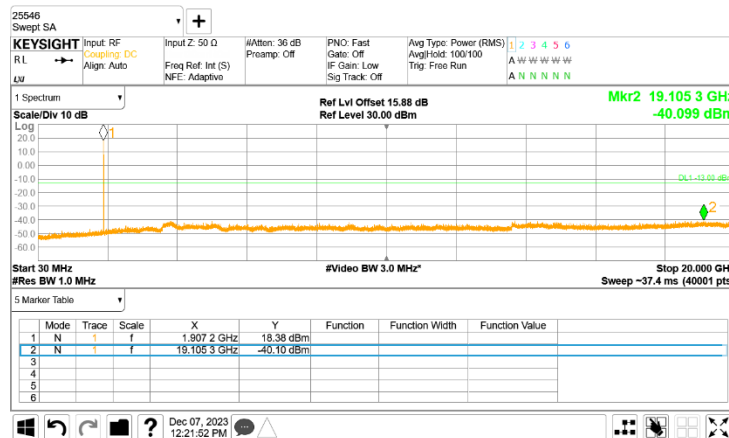
REL99



Low channel



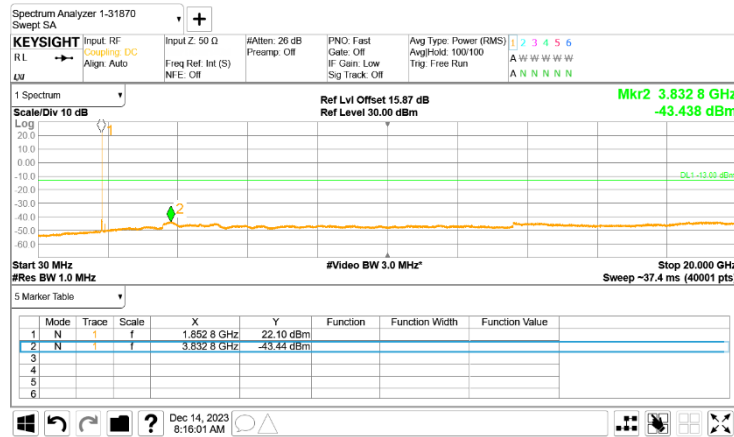
Mid channel



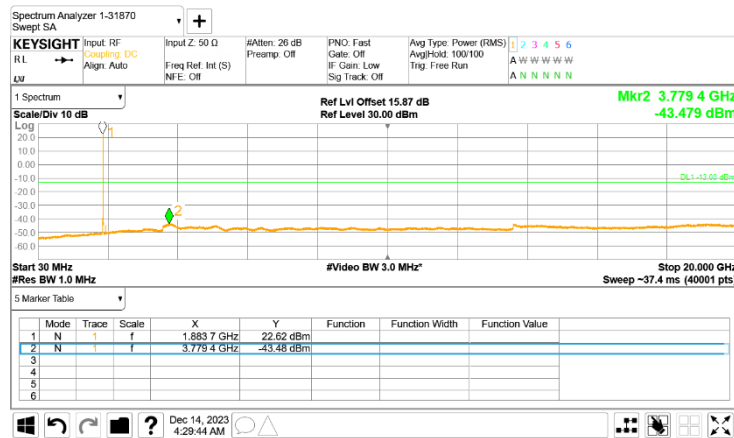
High channel

**LTE Band 25**

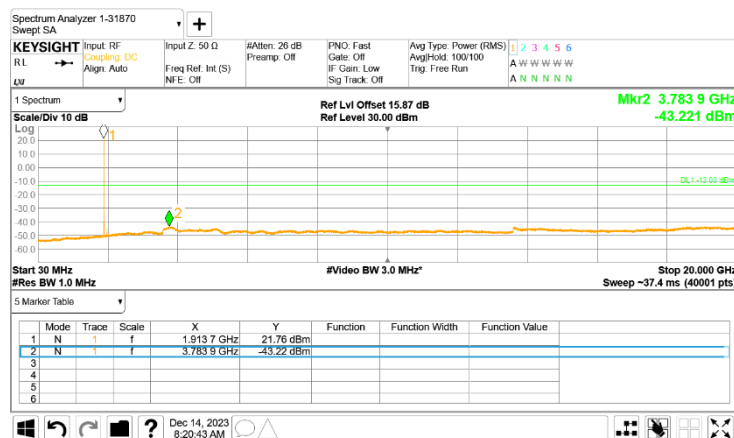
**3MHz QPSK**



Low channel



Mid channel



High channel

## **8.6. FREQUENCY STABILITY**

### **RULE PART(S)**

FCC: §2.1055, §24.235

### **LIMITS**

24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### **TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

### **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)

### **RESULTS**

See the following pages.

### 8.6.1. FREQUENCY STABILITY RESULTS

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

Test Date	2023-12-05
Test Engineer	47989

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	1850.0763	1909.9232		
Extreme (50C)		1850.0764	1909.9234	142.9	0.076
Extreme (40C)		1850.0764	1909.9234	128.5	0.068
Extreme (30C)		1850.0765	1909.9234	152.6	0.081
Extreme (10C)		1850.0765	1909.9234	169.3	0.090
Extreme (0C)		1850.0764	1909.9234	137.7	0.073
Extreme (-10C)		1850.0764	1909.9233	91.3	0.049
Extreme (-20C)		1850.0764	1909.9233	78.0	0.041
Extreme (-30C)		1850.0764	1909.9233	59.2	0.031
20C	15%	1850.0764	1909.9234	154.9	0.082
	-15%	1850.0764	1909.9233	70.8	0.038
	End Point	1850.0765	1909.9234	170.9	0.091

**WCDMA Band 2 (Lowest Frequency: HSDPA / Highest Frequency: HSDPA)**

Test Date	2023-12-05
Test Engineer	47989

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	1850.3112	1909.6851		
Extreme (50C)		1850.3112	1909.6851	9.7	0.005
Extreme (40C)		1850.3112	1909.6851	10.9	0.006
Extreme (30C)		1850.3112	1909.6851	9.3	0.005
Extreme (10C)		1850.3112	1909.6851	14.1	0.007
Extreme (0C)		1850.3112	1909.6851	18.3	0.010
Extreme (-10C)		1850.3112	1909.6851	22.1	0.012
Extreme (-20C)		1850.3112	1909.6851	21.1	0.011
Extreme (-30C)		1850.3112	1909.6851	19.6	0.010
20C	15%	1850.3112	1909.6851	4.4	0.002
	-15%	1850.3112	1909.6851	9.5	0.005
	End Point	1850.3112	1909.6851	6.5	0.003



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

Test Date	2023-12-08
Test Engineer	25546

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.1553	1914.8440		
Extreme (50C)		1850.1553	1914.8440	35.5	0.019
Extreme (40C)		1850.1553	1914.8440	10.1	0.005
Extreme (30C)		1850.1553	1914.8440	10.4	0.006
Extreme (10C)		1850.1553	1914.8440	12.9	0.007
Extreme (0C)		1850.1553	1914.8440	12.3	0.007
Extreme (-10C)		1850.1553	1914.8440	30.8	0.016
Extreme (-20C)		1850.1553	1914.8440	28.9	0.015
Extreme (-30C)		1850.1553	1914.8440	27.3	0.015
20C	15%	1850.1553	1914.8440	19.9	0.011
	-15%	1850.1553	1914.8440	18.5	0.010
	End Point	1850.1553	1914.8440	21.3	0.011

## 9. RADIATED RESULTS

### 9.1. RADIATED POWER (EIRP)

#### RULE PART(S)

FCC: §2.1046, §24.232

#### LIMITS

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.

#### 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  $\geq 2 \times$  OBW;
- d) Sweep time = auto couple or 1 second;
- 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

See the following pages.

### 9.1.1. EIRP RESULTS

#### GSM (Antenna A, Main 1)

Band	Mode	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
GSM 1900	GPRS	1850.20	22.19	H	4.48	9.52	27.23	528.45	33.00	-5.77
		1880.00	24.07	H	4.52	9.29	28.83	763.84	33.00	-4.17
		1909.80	25.25	H	4.55	9.00	29.70	933.25	33.00	-3.30
	EGPRS	1850.20	19.21	H	4.48	9.52	24.25	266.07	33.00	-8.75
		1880.00	21.05	H	4.52	9.29	25.81	381.07	33.00	-7.19
		1909.80	22.89	H	4.55	9.00	27.34	542.00	33.00	-5.66

#### WCDMA (Antenna A, Main 1)

Band	Mode	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
Band 5	REL99	1852.40	15.38	H	4.49	9.51	20.39	109.40	33.00	-12.61
		1880.00	18.31	H	4.52	9.29	23.07	202.77	33.00	-9.93
		1907.60	19.38	H	4.55	9.03	23.86	243.22	33.00	-9.14
	HSDPA	1852.40	14.89	H	4.49	9.51	19.90	97.72	33.00	-13.10
		1880.00	17.78	H	4.52	9.29	22.54	179.47	33.00	-10.46
		1907.60	18.94	H	4.55	9.03	23.42	219.79	33.00	-9.58

#### LTE Band 25 (Antenna A, Main 1)

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
20	QPSK	1860.00	15.58	H	4.49	9.45	20.54	113.24	33.00	-12.46	1/0
		1882.50	15.45	H	4.52	9.27	20.20	104.71	33.00	-12.80	1/49
		1905.00	16.15	H	4.55	9.06	20.67	116.68	33.00	-12.33	1/49
	16-QAM	1860.00	14.48	H	4.49	9.45	19.44	87.90	33.00	-13.56	1/0
		1882.50	14.58	H	4.52	9.27	19.33	85.70	33.00	-13.67	1/49
		1905.00	15.39	H	4.55	9.06	19.91	97.95	33.00	-13.09	1/49
15	QPSK	1857.50	15.43	H	4.49	9.47	20.41	109.90	33.00	-12.59	1/0
		1882.50	15.63	H	4.52	9.27	20.38	109.14	33.00	-12.62	1/74
		1907.50	16.37	H	4.55	9.03	20.85	121.62	33.00	-12.15	1/37
	16-QAM	1857.50	14.60	H	4.49	9.47	19.58	90.78	33.00	-13.42	1/0
		1882.50	14.79	H	4.52	9.27	19.54	89.95	33.00	-13.46	1/0
		1907.50	15.54	H	4.55	9.03	20.02	100.46	33.00	-12.98	1/37
10	QPSK	1855.00	15.84	H	4.49	9.48	20.84	121.34	33.00	-12.16	1/25
		1882.50	15.63	H	4.52	9.27	20.38	109.14	33.00	-12.62	1/25
		1910.00	16.33	H	4.55	8.99	20.77	119.40	33.00	-12.23	1/25
	16-QAM	1855.00	14.52	H	4.49	9.48	19.52	89.54	33.00	-13.48	1/0
		1882.50	14.87	H	4.52	9.27	19.62	91.62	33.00	-13.38	1/0
		1910.00	15.63	H	4.55	8.99	20.07	101.62	33.00	-12.93	1/
5	QPSK	1852.50	15.79	H	4.49	9.50	20.81	120.50	33.00	-12.19	1/12
		1882.50	15.54	H	4.52	9.27	20.29	106.91	33.00	-12.71	1/24
		1912.50	16.41	H	4.56	8.96	20.82	120.78	33.00	-12.18	1/0
	16-QAM	1852.50	14.61	H	4.49	9.50	19.63	91.83	33.00	-13.37	1/12
		1882.50	14.66	H	4.52	9.27	19.41	87.30	33.00	-13.59	1/0
		1912.50	15.25	H	4.56	8.96	19.66	92.47	33.00	-13.34	1/0
3	QPSK	1851.50	15.96	H	4.49	9.51	20.99	125.60	33.00	-12.01	1/14
		1882.50	15.54	H	4.52	9.27	20.28	106.66	33.00	-12.72	1/14
		1913.50	16.43	H	4.56	8.95	20.82	120.78	33.00	-12.18	1/8
	16-QAM	1851.50	14.46	H	4.49	9.51	19.49	88.92	33.00	-13.51	1/8
		1882.50	14.79	H	4.52	9.27	19.53	89.74	33.00	-13.47	1/14
		1913.50	15.56	H	4.56	8.95	19.95	98.86	33.00	-13.05	1/8
1.4	QPSK	1850.70	15.91	H	4.48	9.52	20.95	124.45	33.00	-12.05	1/0
		1882.50	15.65	H	4.52	9.27	20.39	109.40	33.00	-12.61	1/5
		1914.30	15.71	H	4.56	8.94	20.09	102.09	33.00	-12.91	1/0
	16-QAM	1850.70	14.82	H	4.48	9.52	19.86	96.83	33.00	-13.14	1/3
		1882.50	14.65	H	4.52	9.27	19.39	86.90	33.00	-13.61	1/5
		1914.30	15.12	H	4.56	8.94	19.50	89.13	33.00	-13.50	1/0

**LTE Band 25 (Antenna F, Sub2)**

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
20	QPSK	1860.00	14.73	H	4.49	9.45	19.69	93.11	33.00	-13.31	1/99
		1882.50	14.19	H	4.52	9.27	18.94	78.34	33.00	-14.06	1/0
		1905.00	14.46	H	4.55	9.06	18.98	79.07	33.00	-14.02	1/0
	16-QAM	1860.00	13.63	H	4.49	9.45	18.59	72.28	33.00	-14.41	1/0
		1882.50	13.24	H	4.52	9.27	17.99	62.95	33.00	-15.01	1/0
		1905.00	13.64	H	4.55	9.06	18.16	65.46	33.00	-14.84	1/0
15	QPSK	1857.50	13.97	H	4.49	9.47	18.95	78.52	33.00	-14.05	1/37
		1882.50	14.18	H	4.52	9.27	18.93	78.16	33.00	-14.07	1/37
		1907.50	14.56	H	4.55	9.03	19.04	80.17	33.00	-13.96	1/0
	16-QAM	1857.50	13.49	H	4.49	9.47	18.47	70.31	33.00	-14.53	1/0
		1882.50	13.39	H	4.52	9.27	18.14	65.16	33.00	-14.86	1/0
		1907.50	13.60	H	4.55	9.03	18.08	64.27	33.00	-14.92	1/37
10	QPSK	1855.00	14.86	H	4.49	9.48	19.86	96.83	33.00	-13.14	1/25
		1882.50	14.17	H	4.52	9.27	18.92	77.98	33.00	-14.08	1/0
		1910.00	14.41	H	4.55	8.99	18.85	76.74	33.00	-14.15	1/25
	16-QAM	1855.00	13.53	H	4.49	9.48	18.53	71.29	33.00	-14.47	1/0
		1882.50	13.19	H	4.52	9.27	17.94	62.23	33.00	-15.06	1/0
		1910.00	13.61	H	4.55	8.99	18.05	63.83	33.00	-14.95	1/0
5	QPSK	1852.50	14.71	H	4.49	9.50	19.73	93.97	33.00	-13.27	1/24
		1882.50	14.11	H	4.52	9.27	18.86	76.91	33.00	-14.14	1/24
		1912.50	14.59	H	4.56	8.96	19.00	79.43	33.00	-14.00	1/12
	16-QAM	1852.50	13.53	H	4.49	9.50	18.55	71.61	33.00	-14.45	1/0
		1882.50	13.26	H	4.52	9.27	18.01	63.24	33.00	-14.99	1/0
		1912.50	13.86	H	4.56	8.96	18.27	67.14	33.00	-14.73	1/0
3	QPSK	1851.50	14.82	H	4.49	9.51	19.85	96.61	33.00	-13.15	1/14
		1882.50	14.06	H	4.52	9.27	18.80	75.86	33.00	-14.20	1/0
		1913.50	14.57	H	4.56	8.95	18.96	78.70	33.00	-14.04	1/14
	16-QAM	1851.50	13.47	H	4.49	9.51	18.50	70.79	33.00	-14.50	1/0
		1882.50	13.40	H	4.52	9.27	18.14	65.16	33.00	-14.86	1/14
		1913.50	13.80	H	4.56	8.95	18.19	65.92	33.00	-14.81	1/8
1.4	QPSK	1850.70	14.77	H	4.48	9.52	19.81	95.72	33.00	-13.19	1/3
		1882.50	14.11	H	4.52	9.27	18.85	76.74	33.00	-14.15	1/0
		1914.30	14.44	H	4.56	8.94	18.82	76.21	33.00	-14.18	1/0
	16-QAM	1850.70	13.42	H	4.48	9.52	18.46	70.15	33.00	-14.54	1/3
		1882.50	13.15	H	4.52	9.27	17.89	61.52	33.00	-15.11	1/5
		1914.30	13.58	H	4.56	8.94	17.96	62.52	33.00	-15.04	1/3

## 9.2. RADIATED SPURIOUS EMISSION

### RULE PART(S)

FCC: §2.1053, §24.238

### LIMIT

24.238(a)

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.

### 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 = 1 MHz for emissions above 1 GHz
- 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  $\geq$  span/RBW;
- g) Trace Mode = average(WCDMA, LTE), Maxhold(GSM);

### NOTE

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

### RESULTS

See the following pages.

### 9.2.1. SPURIOUS RADIATION RESULTS

#### GSM1900

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4791082054							
<b>Date:</b>		2023-12-01							
<b>Test Engineer:</b>		28183							
<b>Configuration:</b>		EUT / AC Adapter, X-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		GPRS 1900 MHz Harmonics							
<b>Test Votage:</b>		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
GPRS									
Antenna A									
Main 1									
Low Ch, 1850.2MHz									
3700.40	-6.2	V	3.0	42.2	1.0	-47.4	-13.0	-34.4	
5550.60	-2.6	V	3.0	43.0	1.0	-44.6	-13.0	-31.6	
7400.80	-2.7	V	3.0	42.6	1.0	-44.4	-13.0	-31.4	
3700.40	-3.6	H	3.0	42.2	1.0	-44.8	-13.0	-31.8	
5550.60	-3.5	H	3.0	43.0	1.0	-45.6	-13.0	-32.6	
7400.80	-3.2	H	3.0	42.6	1.0	-44.8	-13.0	-31.8	
Mid Ch, 1880MHz									
3760.00	-4.9	V	3.0	42.2	1.0	-46.1	-13.0	-33.1	
5640.00	-2.1	V	3.0	43.1	1.0	-44.2	-13.0	-31.2	
7520.00	-2.7	V	3.0	42.6	1.0	-44.3	-13.0	-31.3	
3760.00	-1.2	H	3.0	42.2	1.0	-42.4	-13.0	-29.4	
5640.00	-3.9	H	3.0	43.1	1.0	-46.0	-13.0	-33.0	
7520.00	-3.4	H	3.0	42.6	1.0	-44.9	-13.0	-31.9	
High Ch, 1909.8MHz									
3819.60	-4.6	V	3.0	42.2	1.0	-45.8	-13.0	-32.8	
5729.40	-4.3	V	3.0	43.1	1.0	-46.3	-13.0	-33.3	
7639.20	-2.8	V	3.0	42.5	1.0	-44.3	-13.0	-31.3	
3819.60	-2.2	H	3.0	42.2	1.0	-43.4	-13.0	-30.4	
5729.40	-3.9	H	3.0	43.1	1.0	-46.0	-13.0	-33.0	
7639.20	-3.2	H	3.0	42.5	1.0	-44.7	-13.0	-31.7	

**WCDMA Band 2**

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
REL99 Antenna A Main 1	<b>Company:</b> Samsung										
	<b>Project #:</b> 4791082054										
	<b>Date:</b> 2023-12-05										
	<b>Test Engineer:</b> 28183										
	<b>Configuration:</b> EUT / AC Adapter, X-Position										
	<b>Location:</b> Chamber 2										
	<b>Mode:</b> Rel99 Band 2 Harmonics										
	<b>Test Voltage:</b> AC 120 V, 60 Hz										
	<b>Low Ch, 1852.4MHz</b>										
		3704.80	-10.6	V	3.0	42.2	1.0	-51.8	-13.0	-38.8	
		5557.20	-7.8	V	3.0	43.0	1.0	-49.9	-13.0	-36.9	
		7409.60	-5.3	V	3.0	42.6	1.0	-47.0	-13.0	-34.0	
		3704.80	-10.7	H	3.0	42.2	1.0	-51.9	-13.0	-38.9	
		5557.20	-8.1	H	3.0	43.0	1.0	-50.1	-13.0	-37.1	
		7409.60	-6.0	H	3.0	42.6	1.0	-47.6	-13.0	-34.6	
	<b>Mid Ch, 1880MHz</b>										
		3760.00	-9.8	V	3.0	42.2	1.0	-51.0	-13.0	-38.0	
		5640.00	-7.5	V	3.0	43.1	1.0	-49.6	-13.0	-36.6	
		7520.00	-5.3	V	3.0	42.6	1.0	-46.9	-13.0	-33.9	
		3760.00	-8.6	H	3.0	42.2	1.0	-49.8	-13.0	-36.8	
		5640.00	-7.8	H	3.0	43.1	1.0	-49.9	-13.0	-36.9	
		7520.00	-5.8	H	3.0	42.6	1.0	-47.4	-13.0	-34.4	
	<b>High Ch, 1907.6MHz</b>										
		3815.20	-10.1	V	3.0	42.2	1.0	-51.3	-13.0	-38.3	
		5722.80	-7.5	V	3.0	43.1	1.0	-49.6	-13.0	-36.6	
		7630.40	-5.2	V	3.0	42.5	1.0	-46.7	-13.0	-33.7	
		3815.20	-8.6	H	3.0	42.2	1.0	-49.8	-13.0	-36.8	
		5722.80	-7.9	H	3.0	43.1	1.0	-49.9	-13.0	-36.9	
		7630.40	-5.8	H	3.0	42.5	1.0	-47.3	-13.0	-34.3	

**LTE Band 25**

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company: Samsung Project #: 4791082054 Date: 2024-01-04 Test Engineer: 28775 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 25 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	
3 MHz										
QPSK										
Antenna A Main 1										
Low Ch, 1851.5MHz										
3703.00	-7.2	V	3.0	44.1	1.0	-50.4	-13.0	-37.4		
5554.50	-5.8	V	3.0	45.0	1.0	-49.8	-13.0	-36.8		
7406.00	-3.5	V	3.0	45.0	1.0	-47.5	-13.0	-34.5		
3703.00	-7.4	H	3.0	44.1	1.0	-50.6	-13.0	-37.6		
5554.50	-5.4	H	3.0	45.0	1.0	-49.3	-13.0	-36.3		
7406.00	-3.4	H	3.0	45.0	1.0	-47.4	-13.0	-34.4		
Mid Ch, 1882.5MHz										
3765.00	-5.4	V	3.0	44.1	1.0	-48.5	-13.0	-35.5		
5647.50	-5.8	V	3.0	45.0	1.0	-49.8	-13.0	-36.8		
7530.00	-3.6	V	3.0	44.9	1.0	-47.5	-13.0	-34.5		
3765.00	-4.4	H	3.0	44.1	1.0	-47.6	-13.0	-34.6		
5647.50	-5.3	H	3.0	45.0	1.0	-49.3	-13.0	-36.3		
7530.00	-3.4	H	3.0	44.9	1.0	-47.4	-13.0	-34.4		
High Ch, 1913.5MHz										
3827.00	-6.0	V	3.0	44.2	1.0	-49.1	-13.0	-36.1		
5740.50	-5.8	V	3.0	45.0	1.0	-49.8	-13.0	-36.8		
7654.00	-3.3	V	3.0	44.9	1.0	-47.2	-13.0	-34.2		
3827.00	-5.7	H	3.0	44.2	1.0	-48.9	-13.0	-35.9		
5740.50	-5.3	H	3.0	45.0	1.0	-49.3	-13.0	-36.3		
7654.00	-3.1	H	3.0	44.9	1.0	-47.0	-13.0	-34.0		
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company: Samsung Project #: 4791082054 Date: 2024-01-04 Test Engineer: 28775 Configuration: EUT / AC Adapter, Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 25 Harmonics, 10MHz 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	
10 MHz										
QPSK										
Antenna F Sub 2										
Low Ch, 1855.0MHz										
3710.00	-9.1	V	3.0	44.1	1.0	-52.2	-13.0	-39.2		
5565.00	-6.1	V	3.0	45.0	1.0	-50.0	-13.0	-37.0		
7420.00	-3.5	V	3.0	45.0	1.0	-47.5	-13.0	-34.5		
3710.00	-8.8	H	3.0	44.1	1.0	-51.9	-13.0	-38.9		
5565.00	-6.0	H	3.0	45.0	1.0	-50.0	-13.0	-37.0		
7420.00	-3.5	H	3.0	45.0	1.0	-47.4	-13.0	-34.4		
Mid Ch, 1882.5MHz										
3765.00	-8.8	V	3.0	44.1	1.0	-51.9	-13.0	-38.9		
5647.50	-6.2	V	3.0	45.0	1.0	-50.2	-13.0	-37.2		
7530.00	-3.5	V	3.0	44.9	1.0	-47.5	-13.0	-34.5		
3765.00	-8.6	H	3.0	44.1	1.0	-51.7	-13.0	-38.7		
5647.50	-6.1	H	3.0	45.0	1.0	-50.1	-13.0	-37.1		
7530.00	-3.4	H	3.0	44.9	1.0	-47.4	-13.0	-34.4		
High Ch, 1910MHz										
3820.00	-8.8	V	3.0	44.2	1.0	-52.0	-13.0	-39.0		
5730.00	-6.1	V	3.0	45.0	1.0	-50.1	-13.0	-37.1		
7640.00	-3.3	V	3.0	44.9	1.0	-47.2	-13.0	-34.2		
3820.00	-8.6	H	3.0	44.2	1.0	-51.8	-13.0	-38.8		
5730.00	-6.0	H	3.0	45.0	1.0	-50.0	-13.0	-37.0		
7640.00	-3.2	H	3.0	44.9	1.0	-47.1	-13.0	-34.1		

**END OF REPORT**