



TEST REPORT

Product Name: SmartWatch
FCC ID: 2AKSA-MOBULAAATEL1
Trademark: MOBULAA
Model Number: MOBULAA TEL1, MOBULAA TEL2, MOBULAA TEL3, MOBULAA TEL4, MOBULAA TEL5, MOBULAA TEL6, MOBULAA TEL7, MOBULAA TEL8, MOBULAA TEL9, MOBULAA TEL10, MOBULAA KID1, MOBULAA KID2, MOBULAA KID3, MOBULAA KID4, MOBULAA KID5, MOBULAA KID6, MOBULAA KID7, MOBULAA KID8, MOBULAA KID9, MOBULAA KID10
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Sample Received Date: Nov. 06, 2023
Sample tested Date: Nov. 06, 2023 to Nov. 25, 2023
Issue Date: Nov. 25, 2023
Report No.: CTB231124043RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

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Approved by:



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Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB231124043RFX	Nov. 25, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

FCC Rules	Description of Test Item	Result
§1.1307, §2.1091	RF Exposure	Compliant
§22.913 (a), §24.232 (c)	RF Output Power	Compliant
§24.51	Peak-to-average Ratio(PAR) of Transmitter	Compliant
§22.917 (b), §24.238 (b)	Emission Bandwidth	Compliant
§22.917 (a), §24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§22.917 (a), §24.238 (a)	Spurious Radiation Emissions	Compliant
§22.917 (a), §24.238 (a)	Out of Band Emissions	Compliant
§22.355, §24.235	Frequency Stability	Compliant

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63°C
frequency	1×10 ⁻⁷

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	MOBULAA TEL1, MOBULAA TEL2, MOBULAA TEL3, MOBULAA TEL4, MOBULAA TEL5, MOBULAA TEL6, MOBULAA TEL7, MOBULAA TEL8, MOBULAA TEL9, MOBULAA TEL10, MOBULAA KID1, MOBULAA KID2, MOBULAA KID3, MOBULAA KID4, MOBULAA KID5, MOBULAA KID6, MOBULAA KID7, MOBULAA KID8, MOBULAA KID9, MOBULAA KID10
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: MOBULAA TEL1
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GSM/GPRS 850: 824~849MHz GSM/GPRS 1900: 1850~1910MHz WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 32.52dBm, GSM1900: 29.79dBm WCDMA Band 2: 22.70dBm, WCDMA Band 5: 22.84dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: 0.12dBi, GSM1900: 0.85dBi WCDMA Band 2: 0.85dBi WCDMA Band 5: 0.12dBi
Ratings:	DC 5V charging from adapter DC 3.85V by Battery

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
1	Adapter	JIYIN	JY-05100C	N/A	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538
Note: the transmitter has been tested on the communications mode of GSM, GPRS, EDGE, WCDMA, HSDPA. HSUPA compliance test and record the worst case.			

4.5 Test Mode

Test Mode List		
Test Mode	Description	Remark
TM1	GSM 850	Low, Middle, High Channels
TM2	GPRS 850	Low, Middle, High Channels
TM3	GSM 1900	Low, Middle, High Channels
TM4	GPRS 1900	Low, Middle, High Channels
TM5	WCDMA Band 5	Low, Middle, High Channels
TM6	HSDPA Band 5	Low, Middle, High Channels
TM7	HSUPA Band 5	Low, Middle, High Channels
TM8	WCDMA Band 2	Low, Middle, High Channels
TM9	HSDPA Band 2	Low, Middle, High Channels
TM10	HSUPA Band 2	Low, Middle, High Channels

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.85V
Normal Temperature(°C)	23
Low Temperature(°C)	0
High Temperature(°C)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinghe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2024.07.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2024.07.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2024.07.05
4	Communication test set	R&S	CMW500	108058	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.07.06
12	BT&WI-FI Automatic test software	Microwave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2024.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2024.07.05
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2024.07.05
18	Amplifier	HP	8447E	2945A02747	2024.07.05
19	Amplifier	Agilent	8449B	3008A01838	2024.07.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2024.07.08



21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2024.07.08
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2024.07.08
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.07.05

6. RF OUTPUT POWER

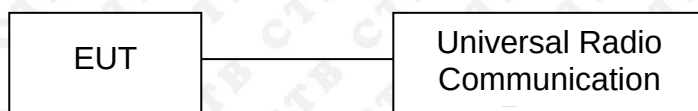
6.1 Standard Applicable

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

6.2 Test Procedure

Conducted output power test method:



Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

6.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

6.4 Summary of Test Results/Plots

Max. Radiated Power

ERP For GSM Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	31.71	1.5	0	H	1.5	1	31.21	38.45
824.2	32.10	1.5	0	V	1.5	1	31.60	38.45
Middle Channel								
836.6	31.21	1.5	0	H	1.5	1	30.71	38.45
836.6	31.21	1.5	0	V	1.5	1	30.71	38.45
High Channel								
848.8	31.82	1.5	0	H	1.5	1	31.32	38.45
848.8	32.14	1.5	0	V	1.5	1	31.64	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	28.96	1.5	0	H	1.9	1	28.06	33.00
1850.2	29.32	1.5	0	V	1.9	1	28.42	33.00
Middle Channel								
1880	29.13	1.5	0	H	1.9	1	28.23	33.00
1880	28.66	1.5	0	V	1.9	1	27.76	33.00
High Channel								
1909.8	28.72	1.5	0	H	1.9	1	27.82	33.00
1909.8	29.19	1.5	0	V	1.9	1	28.29	33.00

ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	32.19	1.5	0	H	1.5	1	31.69	38.45
824.2	31.32	1.5	0	V	1.5	1	30.82	38.45
Middle Channel								
836.6	31.21	1.5	0	H	1.5	1	30.71	38.45
836.6	31.20	1.5	0	V	1.5	1	30.70	38.45
High Channel								
848.8	31.94	1.5	0	H	1.5	1	31.44	38.45
848.8	31.93	1.5	0	V	1.5	1	31.43	38.45

EIRP For GPRS Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	28.83	1.5	0	H	1.9	1	27.93	33.00
1850.2	29.36	1.5	0	V	1.9	1	28.46	33.00
Middle Channel								
1880	29.01	1.5	0	H	1.9	1	28.11	33.00
1880	28.90	1.5	0	V	1.9	1	28.00	33.00
High Channel								
1909.8	29.01	1.5	0	H	1.9	1	28.11	33.00
1909.8	28.61	1.5	0	V	1.9	1	27.71	33.00

ERP For WCDMA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.27	1.5	0	H	1.5	1	21.77	38.45
826.4	21.67	1.5	0	V	1.5	1	21.17	38.45
Middle Channel								
836.6	21.92	1.5	0	H	1.5	1	21.42	38.45
836.6	21.85	1.5	0	V	1.5	1	21.35	38.45
High Channel								
846.6	22.10	1.5	0	H	1.5	1	21.60	38.45
846.6	22.33	1.5	0	V	1.5	1	21.83	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.39	1.5	0	H	1.5	1	21.89	38.45
826.4	21.84	1.5	0	V	1.5	1	21.34	38.45
Middle Channel								
836.6	21.78	1.5	0	H	1.5	1	21.28	38.45
836.6	21.76	1.5	0	V	1.5	1	21.26	38.45
High Channel								
846.6	22.01	1.5	0	H	1.5	1	21.51	38.45
846.6	21.55	1.5	0	V	1.5	1	21.05	38.45



ERP For HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.33	1.5	0	H	1.5	1	21.83	38.45
826.4	22.34	1.5	0	V	1.5	1	21.84	38.45
Middle Channel								
836.6	21.82	1.5	0	H	1.5	1	21.32	38.45
836.6	22.05	1.5	0	V	1.5	1	21.55	38.45
High Channel								
846.6	22.54	1.5	0	H	1.5	1	22.04	38.45
846.6	21.96	1.5	0	V	1.5	1	21.46	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	23.20	1.5	0	H	1.9	1	22.30	33
1852.4	23.29	1.5	0	V	1.9	1	22.39	33
Middle Channel								
1880	23.02	1.5	0	H	1.9	1	22.12	33
1880	22.51	1.5	0	V	1.9	1	21.61	33
High Channel								
1907.6	23.25	1.5	0	H	1.9	1	22.35	33
1907.6	21.82	1.5	0	V	1.9	1	20.92	33



EIRP For HSDPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	22.08	1.5	0	H	1.9	1	21.18	33
1852.4	20.47	1.5	0	V	1.9	1	19.57	33
Middle Channel								
1880	22.05	1.5	0	H	1.9	1	21.15	33
1880	22.17	1.5	0	V	1.9	1	21.27	33
High Channel								
1907.6	21.28	1.5	0	H	1.9	1	20.38	33
1907.6	21.69	1.5	0	V	1.9	1	20.79	33

EIRP For HSUPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	23.01	1.5	0	H	1.9	1	22.11	33
1852.4	21.88	1.5	0	V	1.9	1	20.98	33
Middle Channel								
1880	22.81	1.5	0	H	1.9	1	21.91	33
1880	21.60	1.5	0	V	1.9	1	20.70	33
High Channel								
1907.6	23.51	1.5	0	H	1.9	1	22.61	33
1907.6	21.86	1.5	0	V	1.9	1	20.96	33

Note: Result = Substitute - Cable loss + Antenna Gain

**Max. Conducted Output Power**

For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
GSM	Low Channel	824.2	32.20	38.45
	Middle Channel	836.6	32.13	38.45
	High Channel	848.8	32.43	38.45
GPRS(1 Slot)	Low Channel	824.2	32.26	38.45
	Middle Channel	836.6	32.18	38.45
	High Channel	848.8	32.52	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	29.79	33.0
	Middle Channel	1880.0	29.52	33.0
	High Channel	1909.8	29.34	33.0
GPRS(1 Slot)	Low Channel	1850.2	29.78	33.0
	Middle Channel	1880.0	29.49	33.0
	High Channel	1909.8	29.30	33.0

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	22.44	38.45
	Middle Channel	836.6	22.69	38.45
	High Channel	846.6	22.84	38.45
HSDPA	Low Channel	826.4	22.51	38.45
	Middle Channel	836.6	22.74	38.45
	High Channel	846.6	22.19	38.45
HSUPA	Low Channel	826.4	22.45	38.45
	Middle Channel	836.6	22.69	38.45
	High Channel	846.6	22.83	38.45

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	22.68	33.00
	Middle Channel	1880.0	22.53	33.00
	High Channel	1907.6	22.49	33.00
HSDPA	Low Channel	1852.4	21.37	33.00
	Middle Channel	1880.0	21.90	33.00
	High Channel	1907.6	21.55	33.00
HSUPA	Low Channel	1852.4	22.70	33.00
	Middle Channel	1880.0	22.58	33.00
	High Channel	1907.6	22.53	33.00

7. PEAK-TO-AVERAGE RATIO(PAR) OF TRANSMITTER

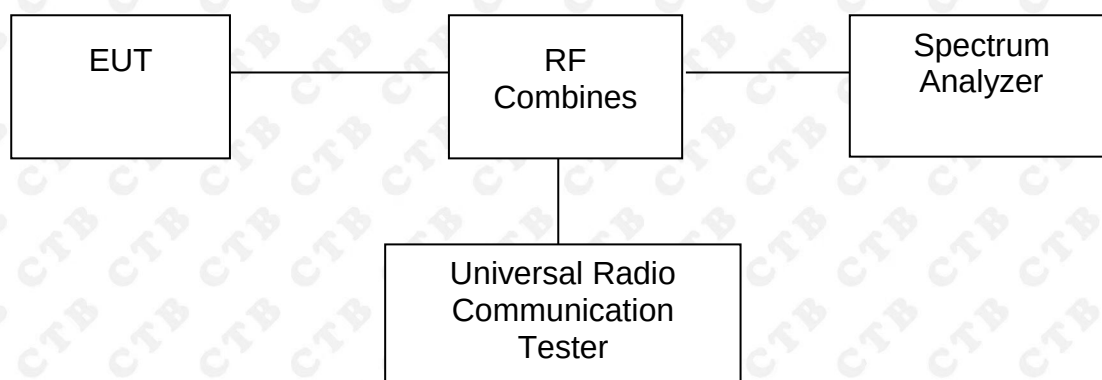
7.1 Standard Applicable

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

7.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

Test Configuration for the emission bandwidth testing:



7.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

7.4 Summary of Test Results

Only the worst case was selected to record
For GSM850

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	190	836.6	2.70	13
GPRS(1 Slot)	190	836.6	2.74	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.68	13
GPRS(1 Slot)	512	1850.2	2.72	13

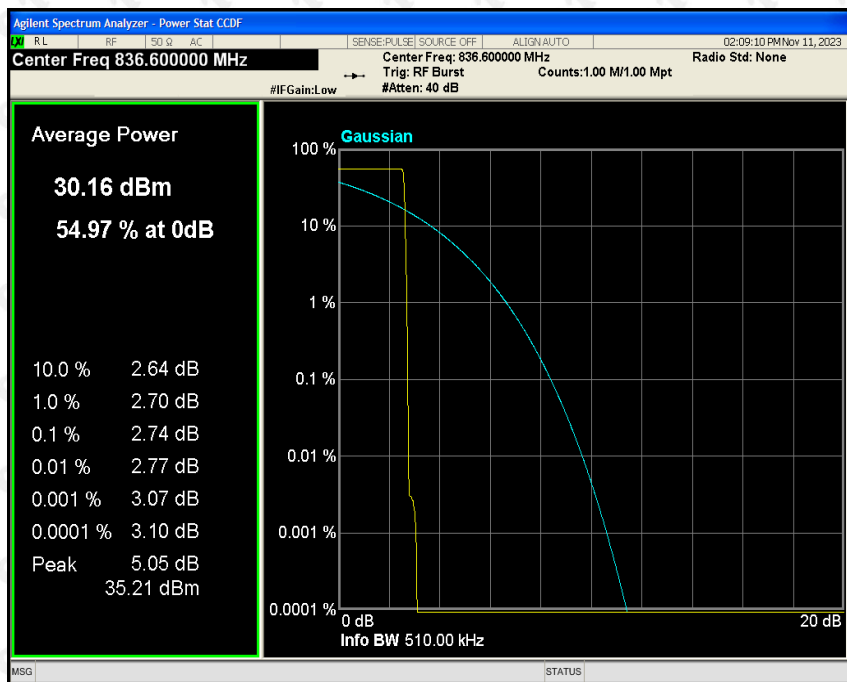
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	3.09	13
HSDPA	4182	836.4	3.14	13
HSUPA	4182	836.4	3.09	13

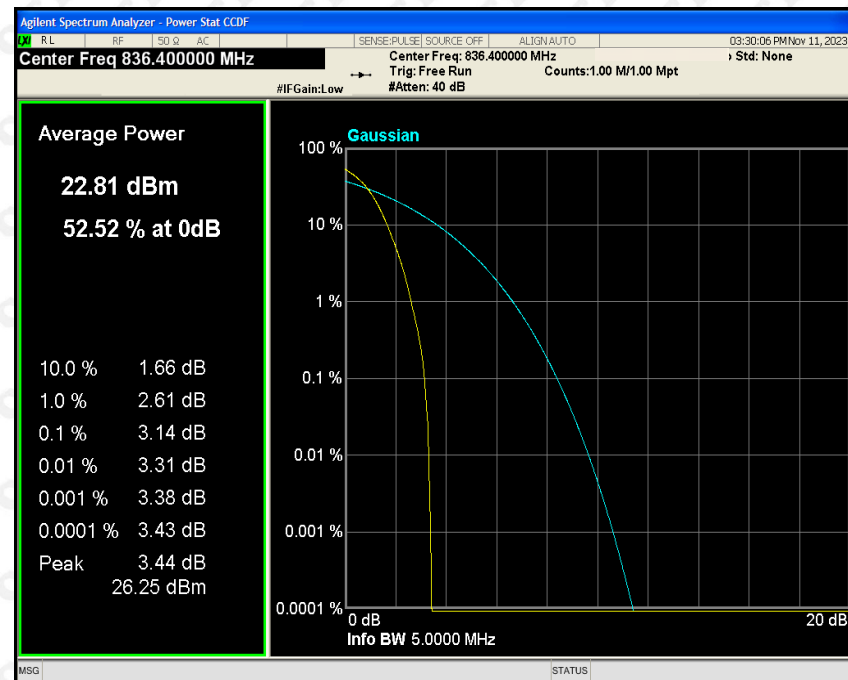
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	3.01	13
HSDPA	9400	1852.4	3.07	13
HSUPA	9400	1852.4	2.93	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

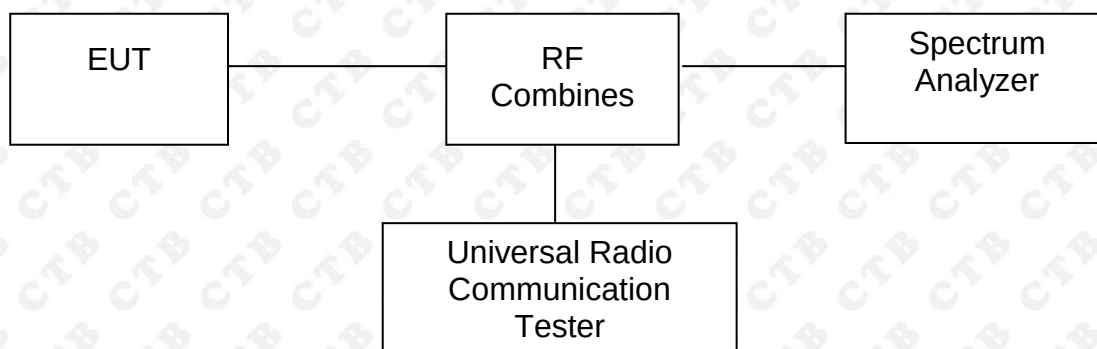
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

8.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 10kHz for GSM mode and 100kHz for WCDMA mode, VBW shall be at least 3 times the RBW, and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



8.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

8.4 Summary of Test Results/Plots

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	246.808	317.240
	190	836.6	247.725	322.480
	251	848.8	249.145	319.982
GPRS	128	824.2	245.779	329.503
	190	836.6	248.070	318.688
	251	848.8	248.283	314.641

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	246.663	314.361
	661	1880.0	249.551	313.670
	810	1909.8	245.474	311.430
GPRS	512	1850.2	250.385	324.412
	661	1880.0	246.577	324.769
	810	1909.8	245.834	306.464

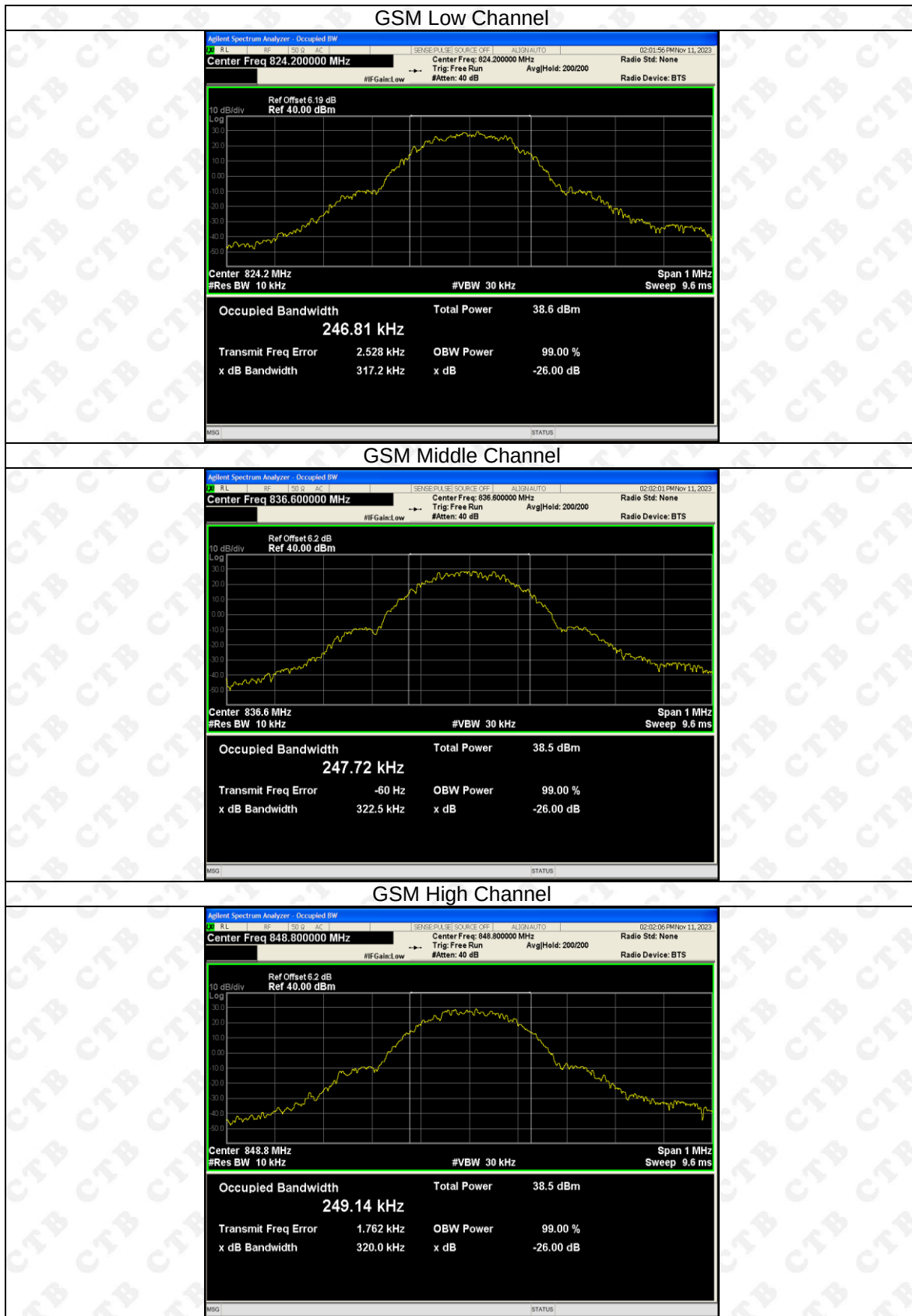
For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4144.644	4673.655
	4183	836.6	4155.667	4669.291
	4233	846.6	4143.406	4686.167
HSDPA	4132	826.4	4146.973	4652.026
	4183	836.6	4160.884	4655.469
	4233	846.6	4165.205	4650.376
HSUPA	4132	826.4	4140.585	4655.763
	4183	836.6	4157.749	4660.003
	4233	846.6	4143.656	4673.716

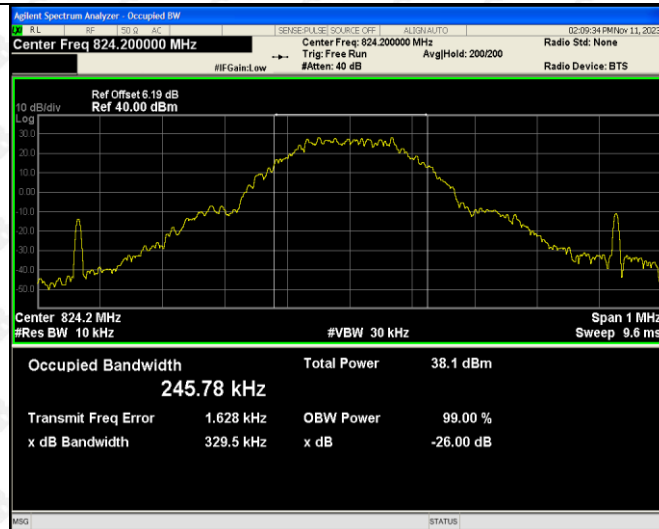
For Band 2

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4161.954	4706.725
	9400	1880.0	4150.540	4680.712
	9538	1907.6	4156.309	4684.276
HSDPA	9262	1852.4	4170.685	4670.426
	9400	1880.0	4154.816	4651.182
	9538	1907.6	4158.486	4655.227
HSUPA	9262	1852.4	4161.959	4709.653
	9400	1880.0	4151.114	4667.119
	9538	1907.6	4159.806	4684.314

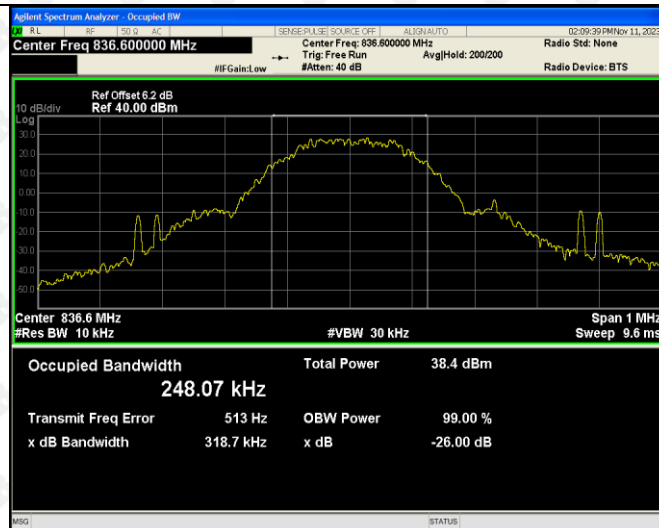
For Cellular Band



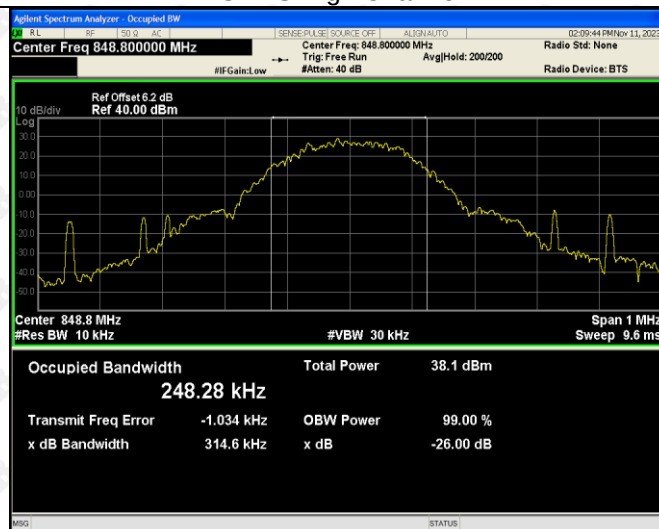
GPRS Low Channel



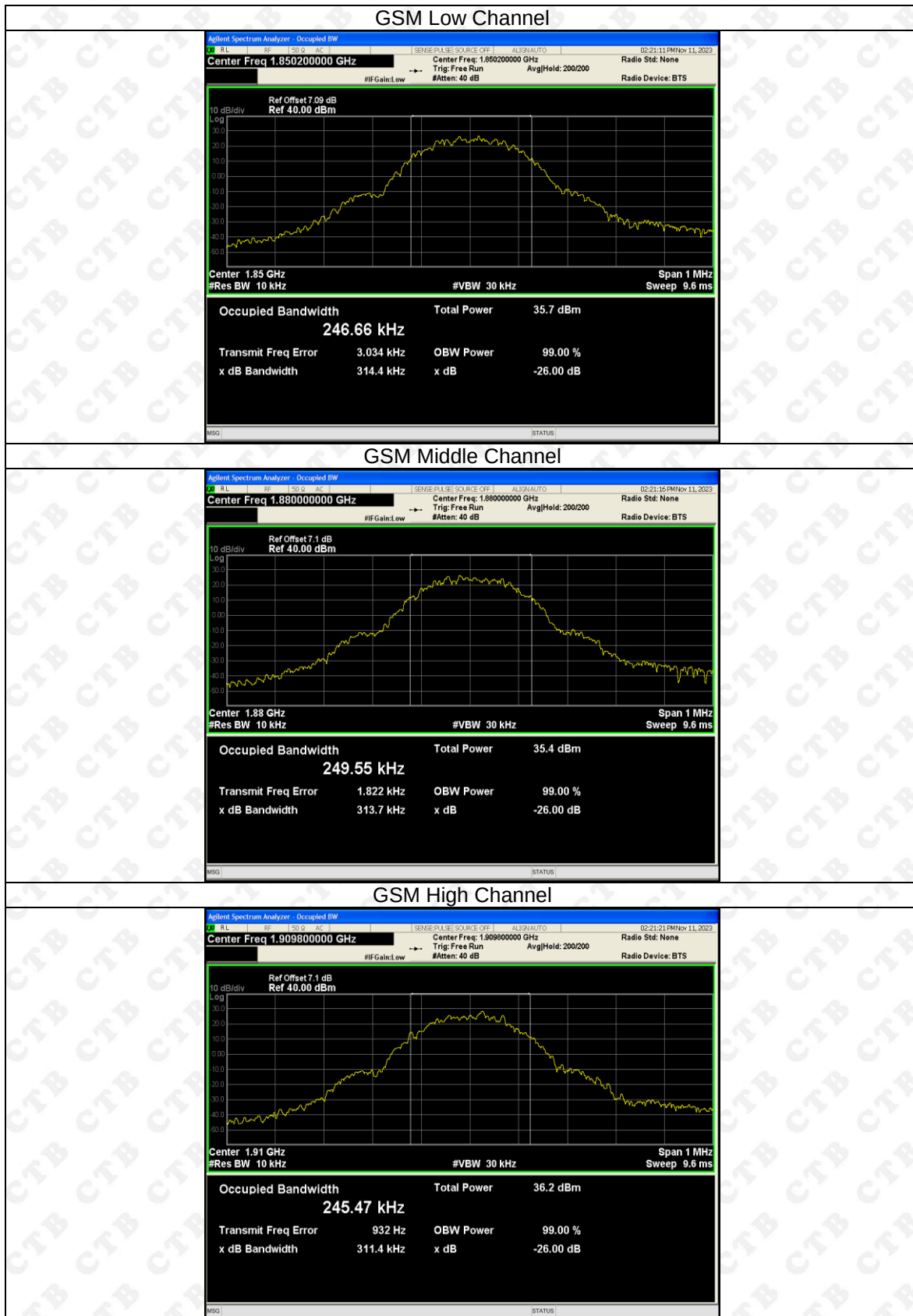
GPRS Middle Channel



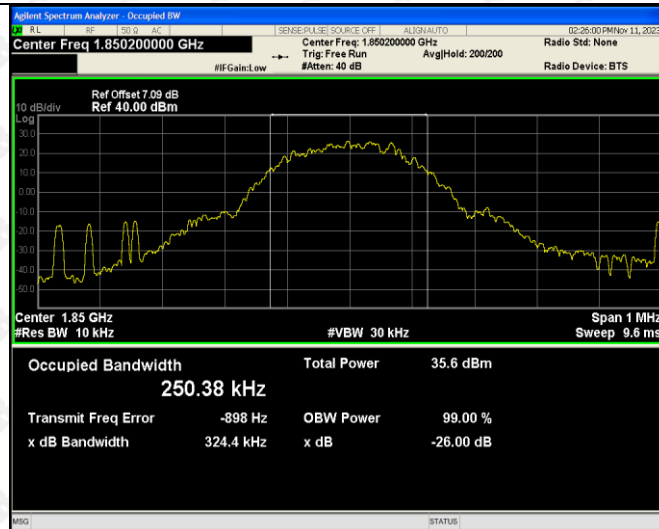
GPRS High Channel



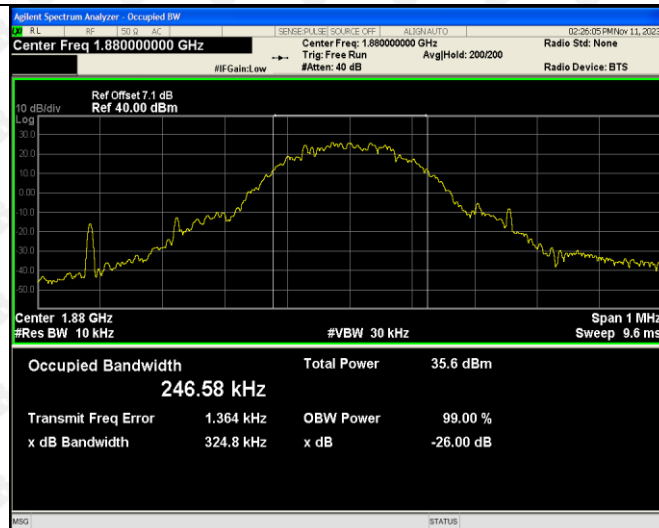
For PCS Band



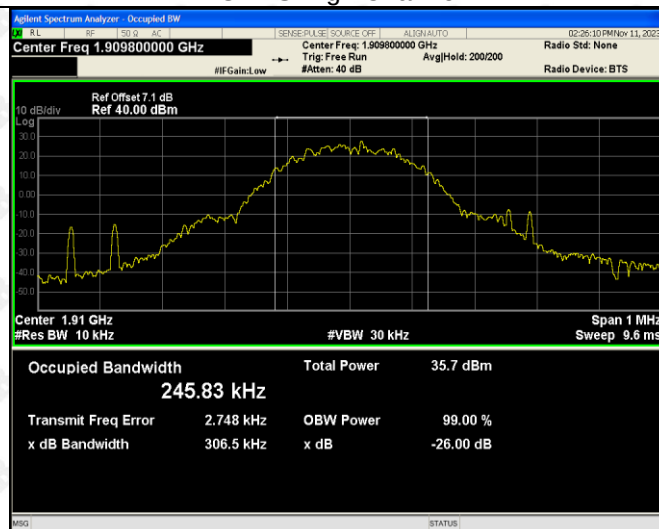
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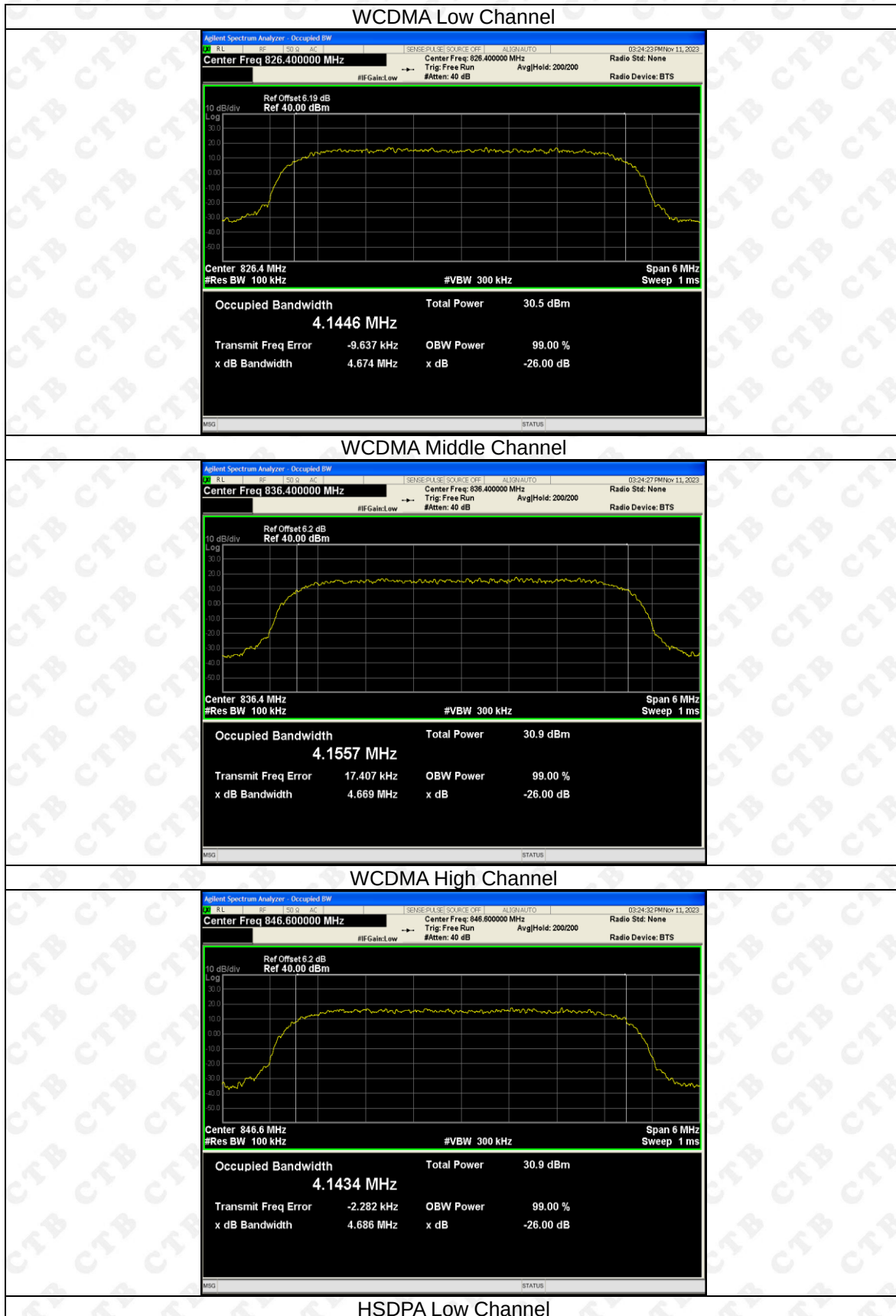
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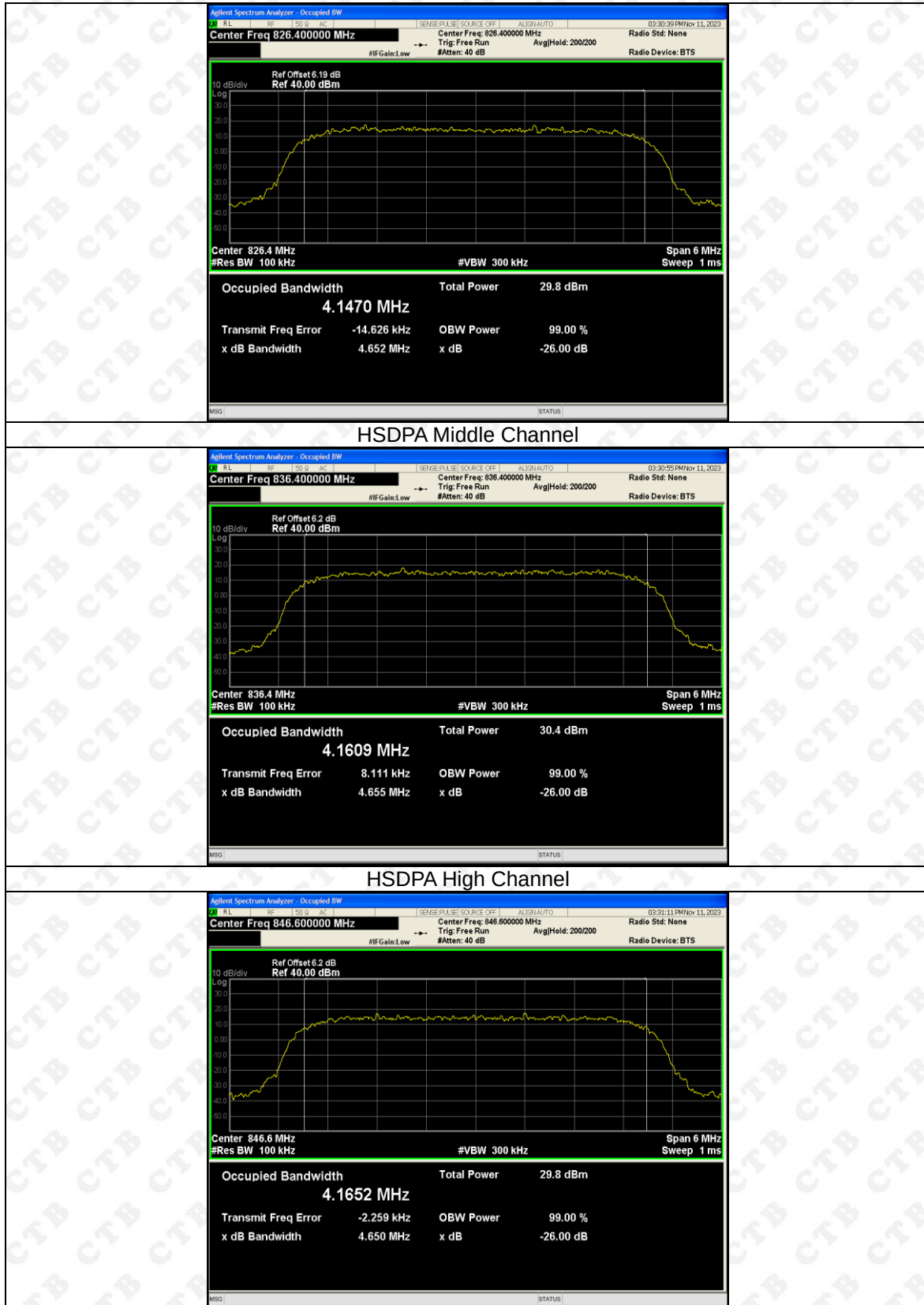


GPRS High Channel

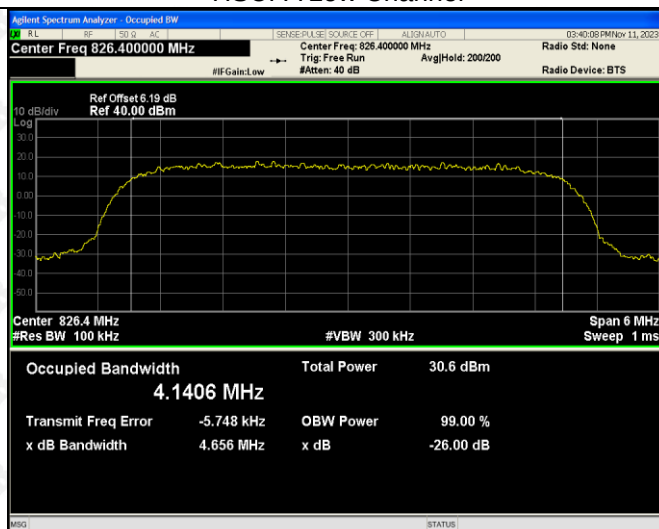


For Band V

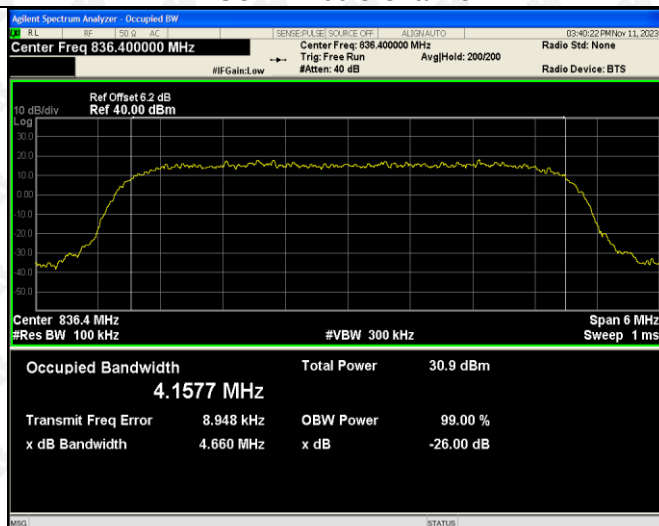




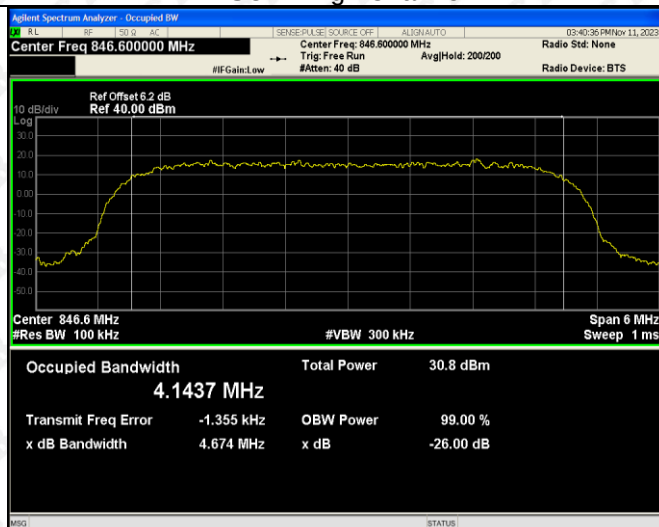
HSUPA Low Channel



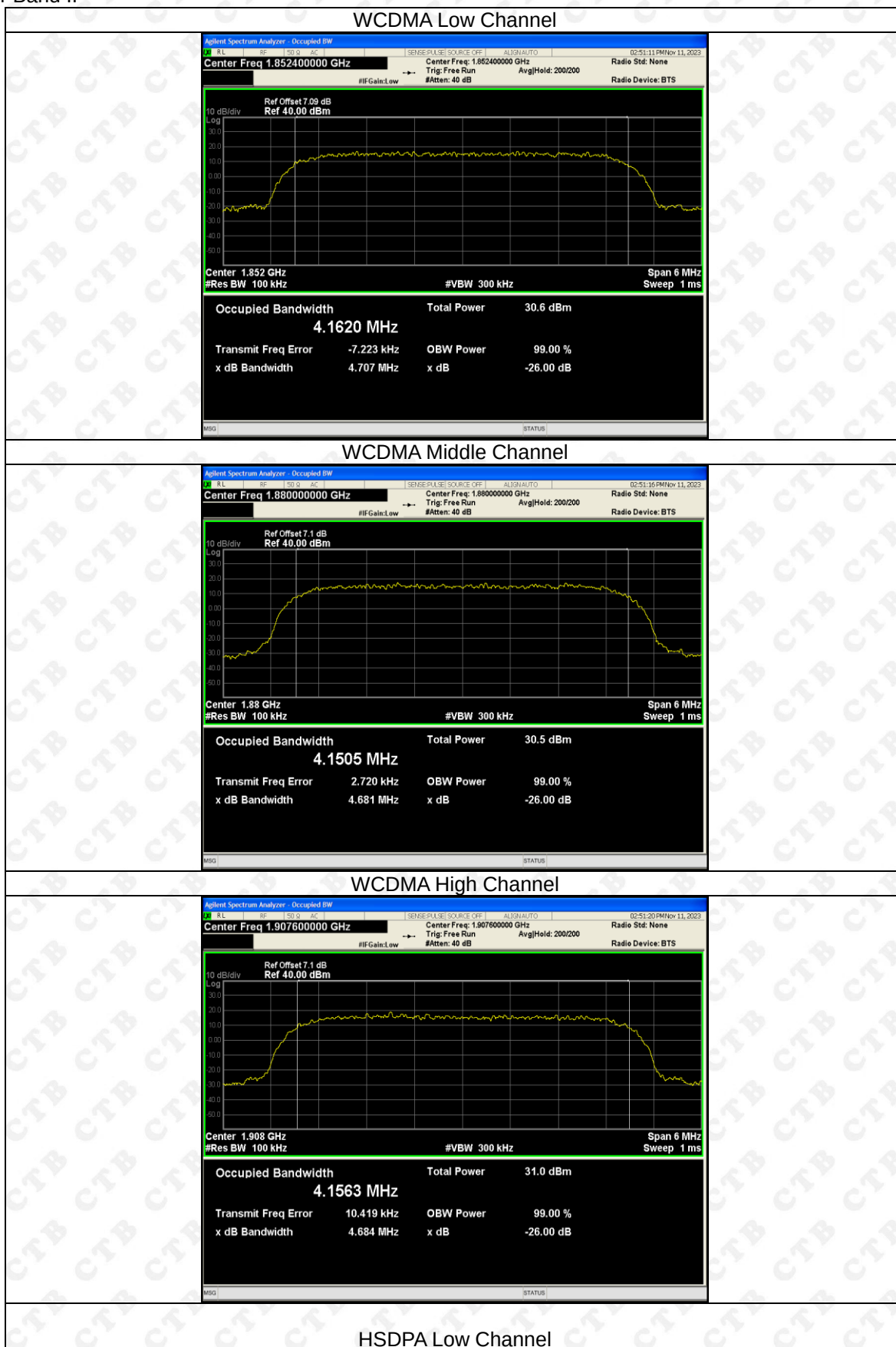
HSUPA Middle Channel

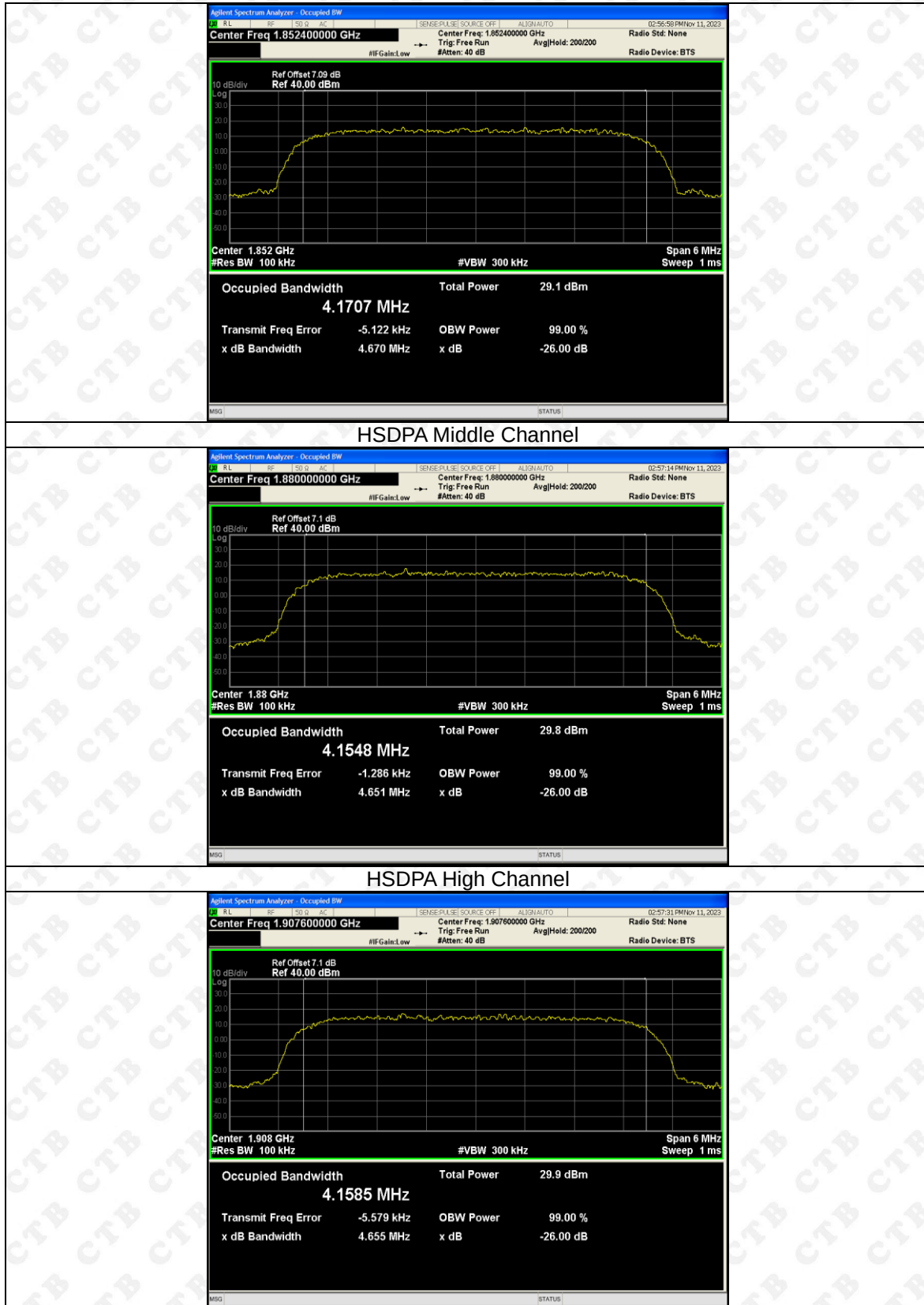


HSUPA High Channel

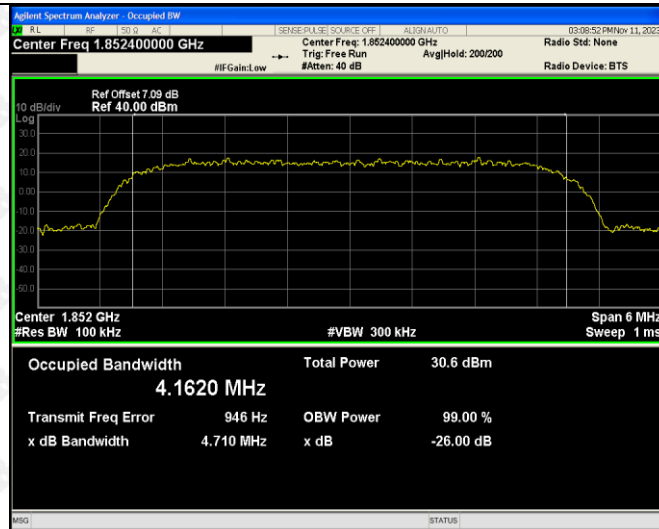


For Band II

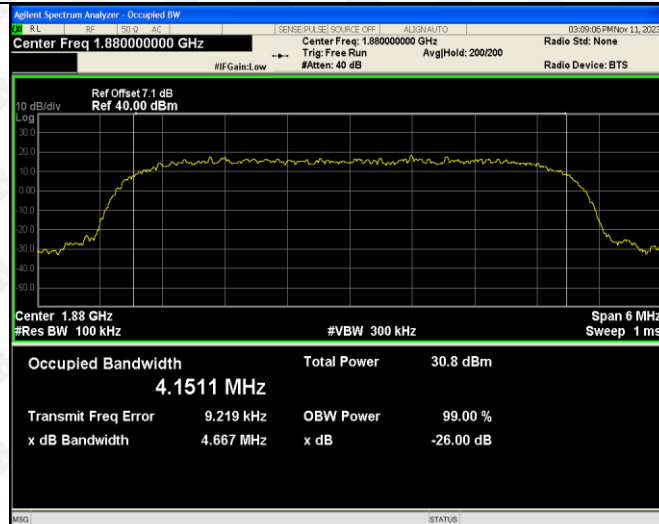




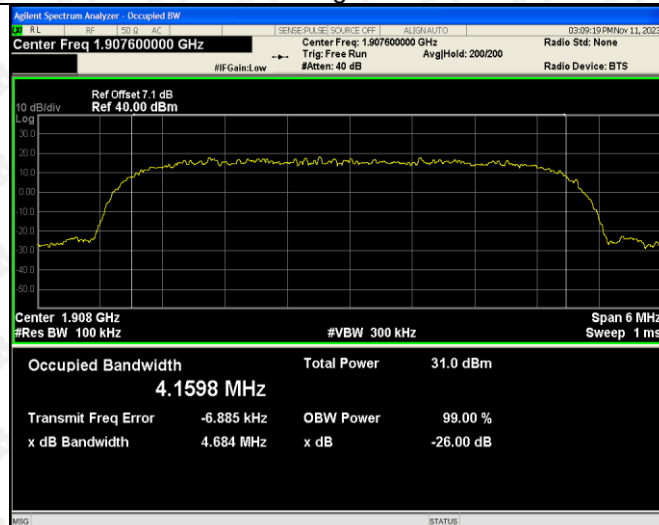
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

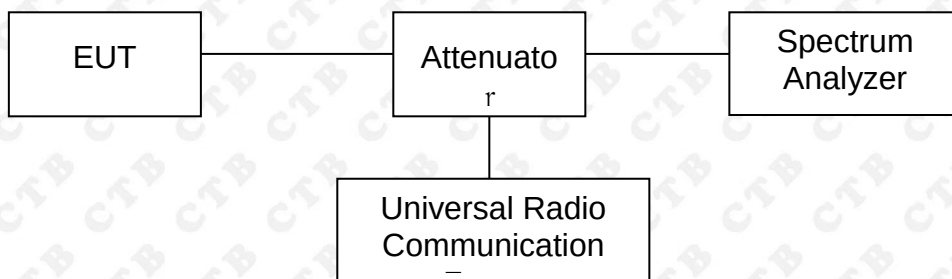
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions 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.

9.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

Test Configuration for the out of band emissions testing:



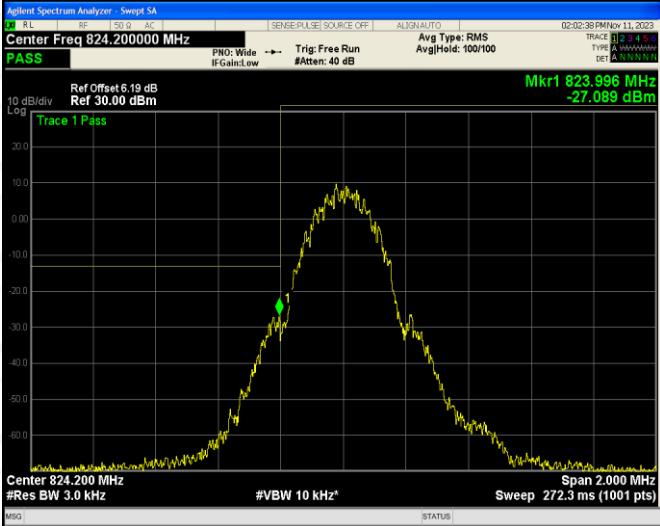
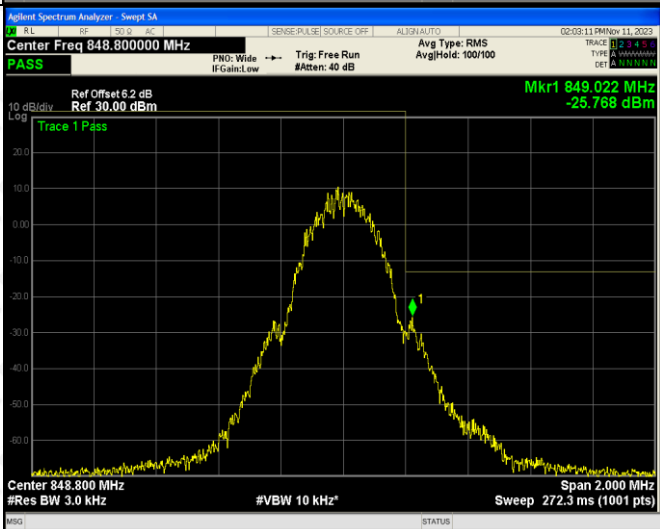
9.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

9.4 Summary of Test Results/Plots

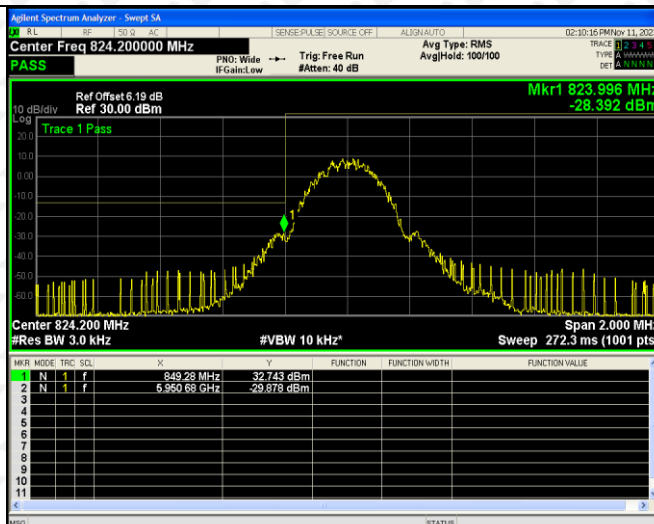
Please refer to the following test plots
For Cellular Band

GSM Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 824.86 MHz 32.542 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.86 MHz</td><td>32.542 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>1.648.63 GHz</td><td>-30.339 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.86 MHz	32.542 dBm				2	N	1	f	1.648.63 GHz	-30.339 dBm			
MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.86 MHz	32.542 dBm																							
2	N	1	f	1.648.63 GHz	-30.339 dBm																							
GSM Middle Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.07 MHz 32.783 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>32.783 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.122.42 GHz</td><td>-30.734 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	32.783 dBm				2	N	1	f	6.122.42 GHz	-30.734 dBm			
MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	32.783 dBm																							
2	N	1	f	6.122.42 GHz	-30.734 dBm																							
GSM High Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 32.743 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>32.743 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.950.68 GHz</td><td>-29.878 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	32.743 dBm				2	N	1	f	6.950.68 GHz	-29.878 dBm			
MR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.28 MHz	32.743 dBm																							
2	N	1	f	6.950.68 GHz	-29.878 dBm																							

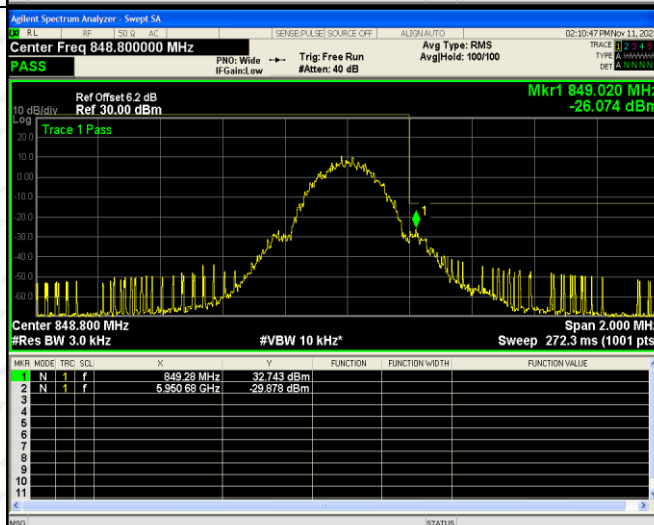
GSM Low Band Emission	
GSM High Band Emission	

GPRS Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 824.86 MHz 32.538 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.86 MHz</td><td>32.538 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.06793 GHz</td><td>-29.722 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.86 MHz	32.538 dBm				2	N	1	f	6.06793 GHz	-29.722 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.86 MHz	32.538 dBm																							
2	N	1	f	6.06793 GHz	-29.722 dBm																							
GPRS Middle Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.07 MHz 32.807 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>32.807 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.94620 GHz</td><td>-30.073 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	32.807 dBm				2	N	1	f	5.94620 GHz	-30.073 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	32.807 dBm																							
2	N	1	f	5.94620 GHz	-30.073 dBm																							
GPRS High Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 32.741 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>32.741 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.70994 GHz</td><td>-30.473 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	32.741 dBm				2	N	1	f	2.70994 GHz	-30.473 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.28 MHz	32.741 dBm																							
2	N	1	f	2.70994 GHz	-30.473 dBm																							

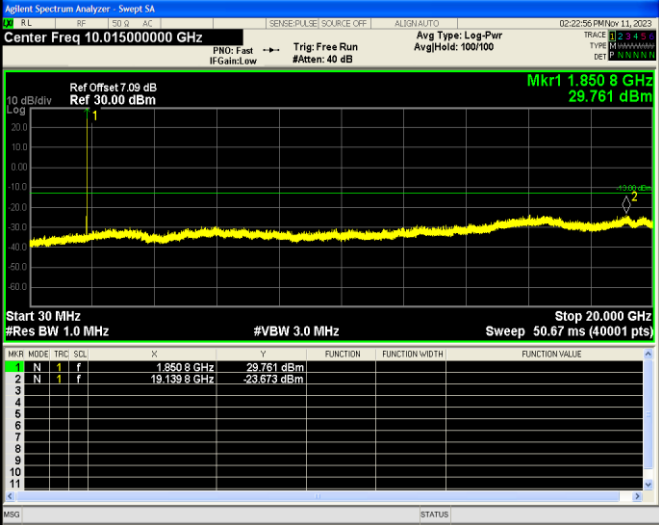
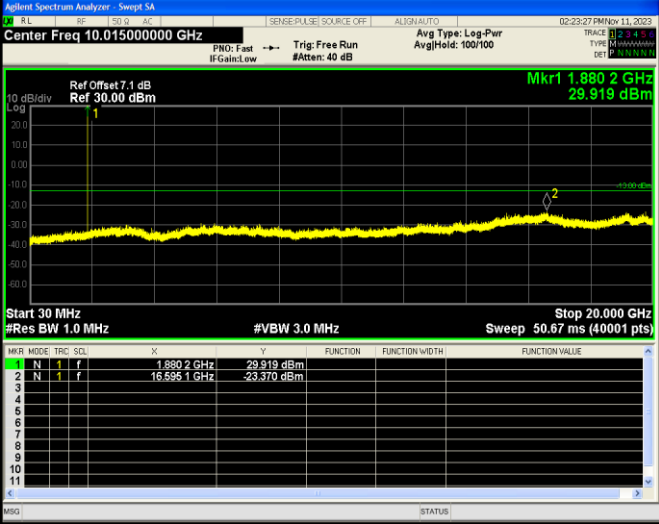
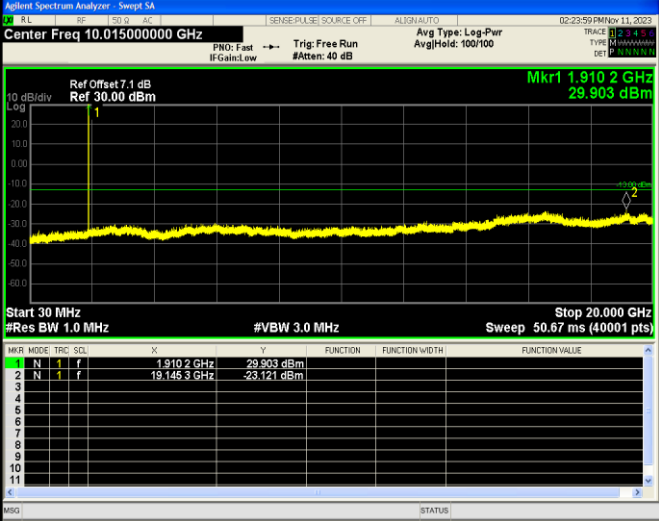
GPRS
Low
Band
Emission

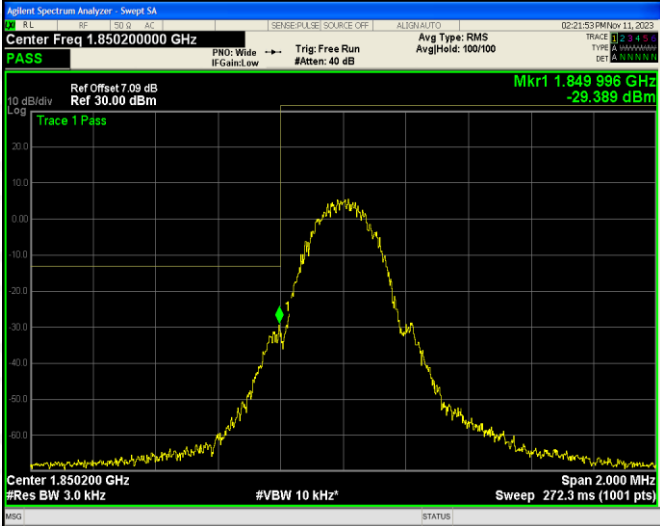
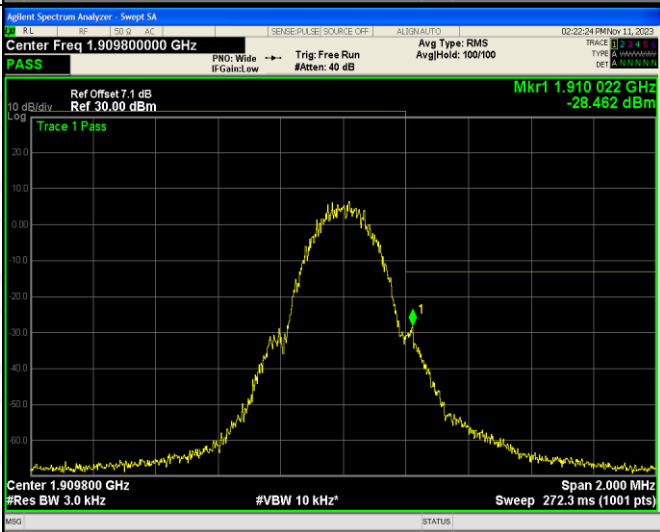


GPRS
High
Band
Emission

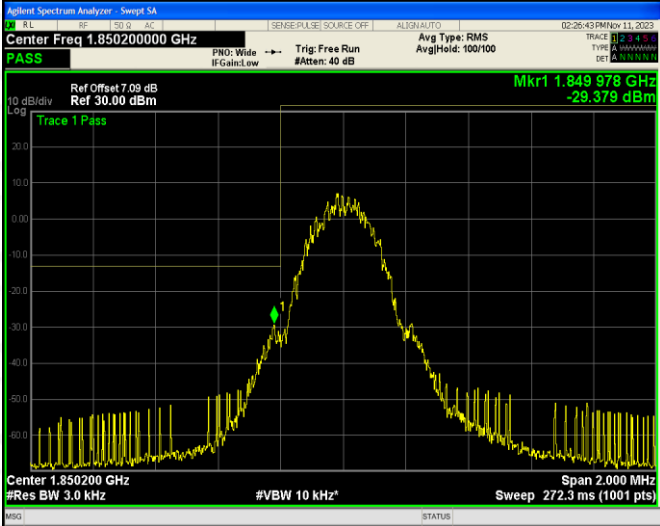
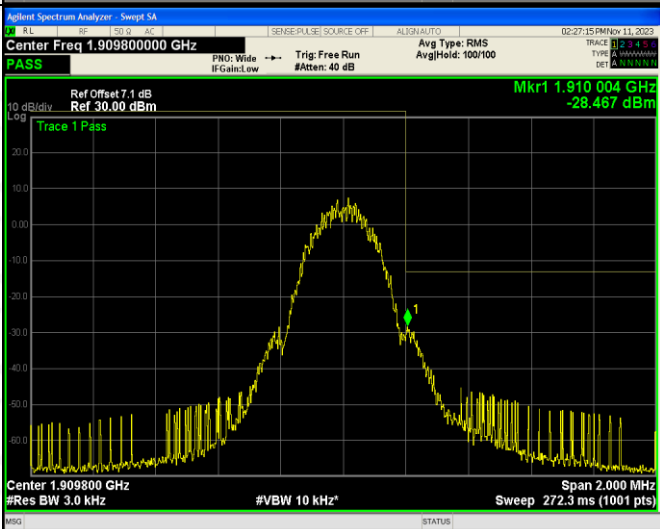


For PCS Band

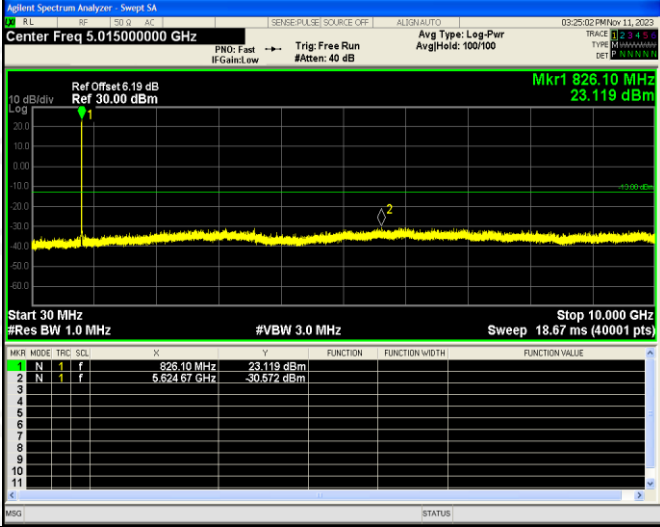
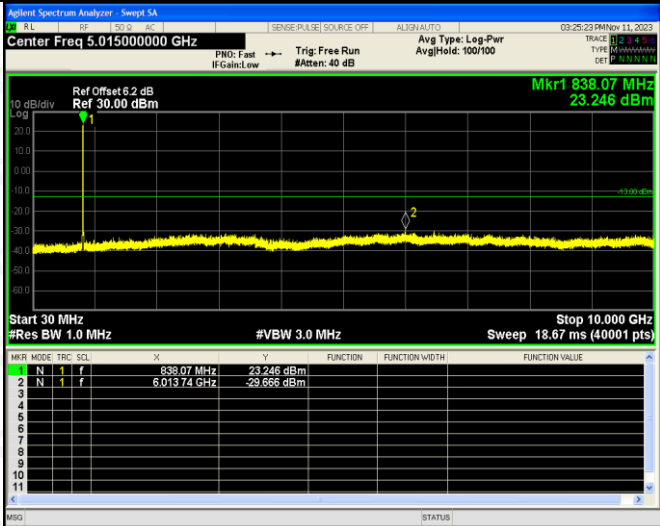
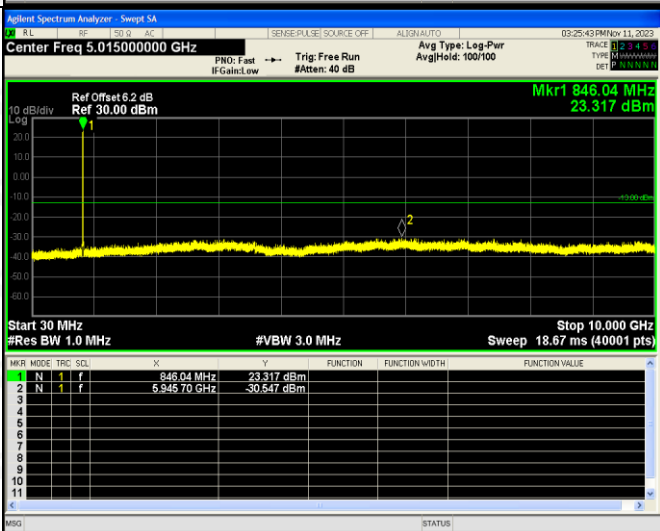
GSM Low Channel	
GSM Middle Channel	
GSM High Channel	

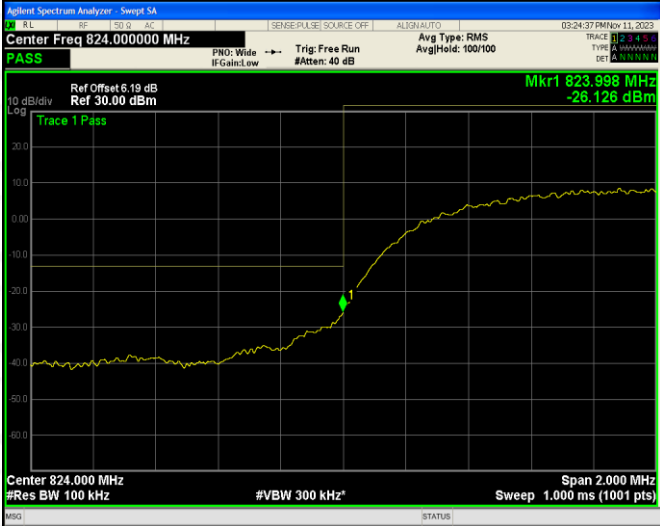
GSM Low Band Emission	
GSM High Band Emission	

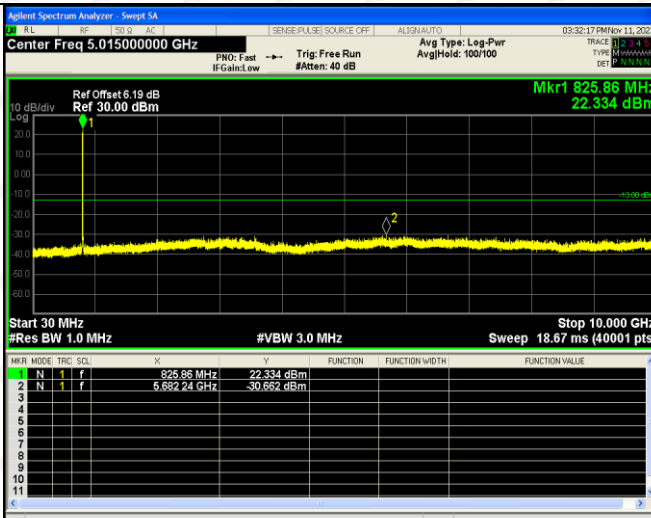
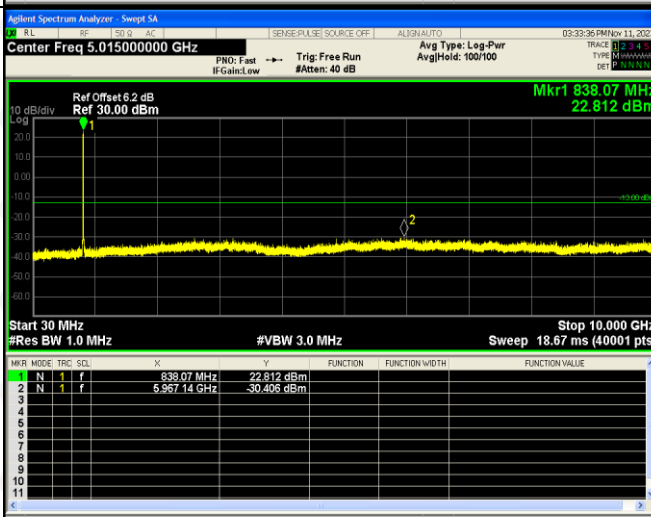
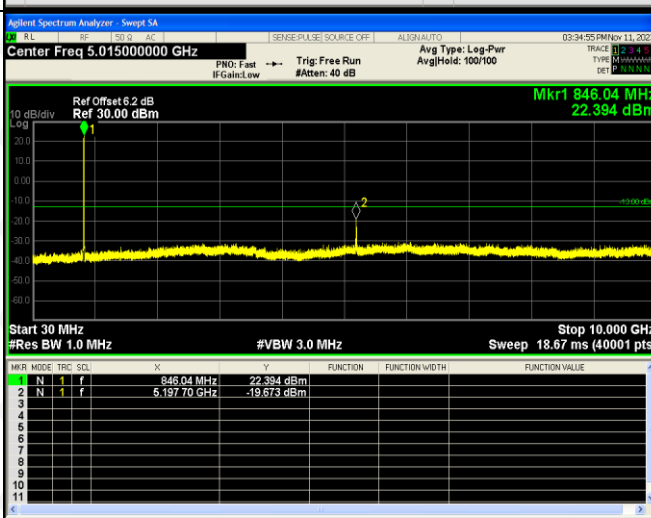
GPRS Low Channel	Agilent Spectrum Analyzer - Swept SA Center Freq 10.015000000 GHz PN0: Fast IF Gain: Low Trig: Free Run #Atten: 40 dB Avg Type: Log-Pwr Avg/Hold: 100/100 02:28:05 PM Nov 11, 2023 TRACE 1 2 3 4 5 TYPE M W W W W W W W W DEF 1 1 1 1 1 1 1 1 1 10 dB/div Log Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.850 8 GHz 29.732 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts) <table><tr><th>Mkr</th><th>Mode</th><th>Trig</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.850 8 GHz</td><td>29.732 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.492 8 GHz</td><td>-23.669 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSG (STATUS)	Mkr	Mode	Trig	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.850 8 GHz	29.732 dBm				2	N	1	f	16.492 8 GHz	-23.669 dBm				3									4									5									6									7									8									9									10									11								
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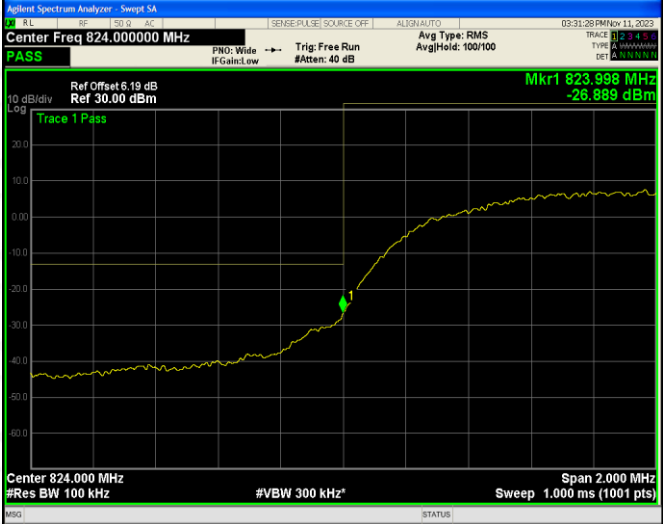
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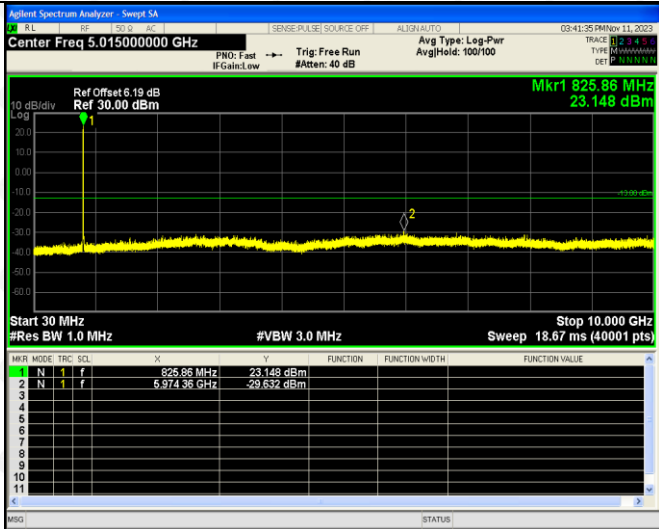
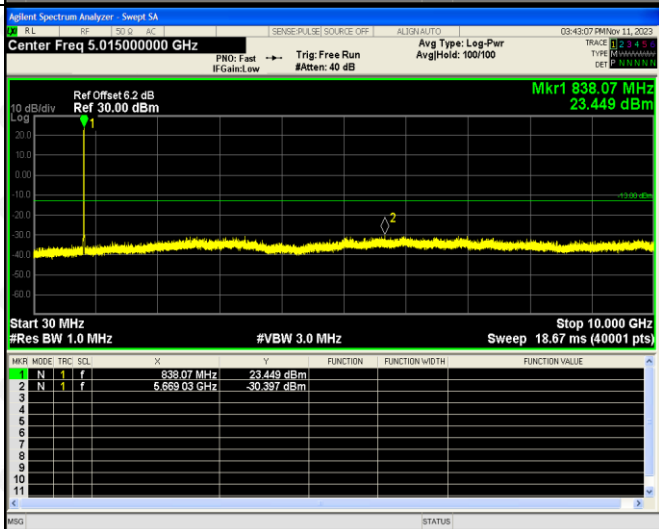
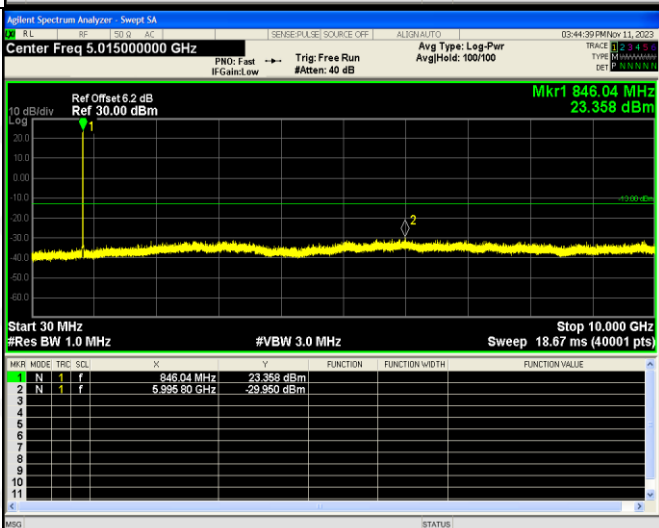
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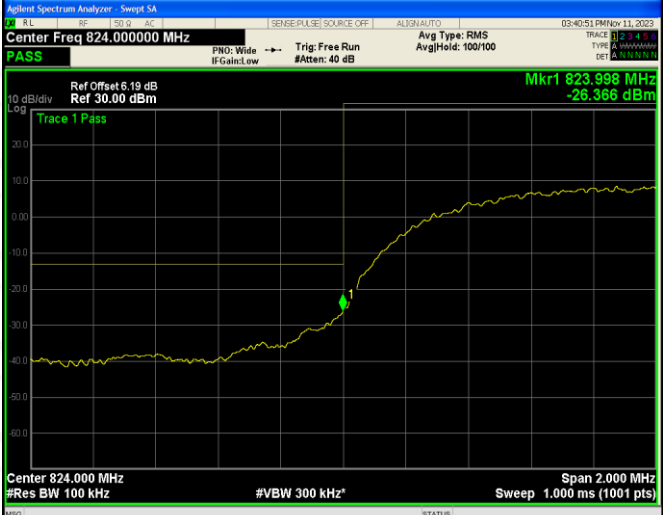
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WCDMA Middle Channel	
WCDMA High Channel	

WCDMA Low Band Spurious Emission	
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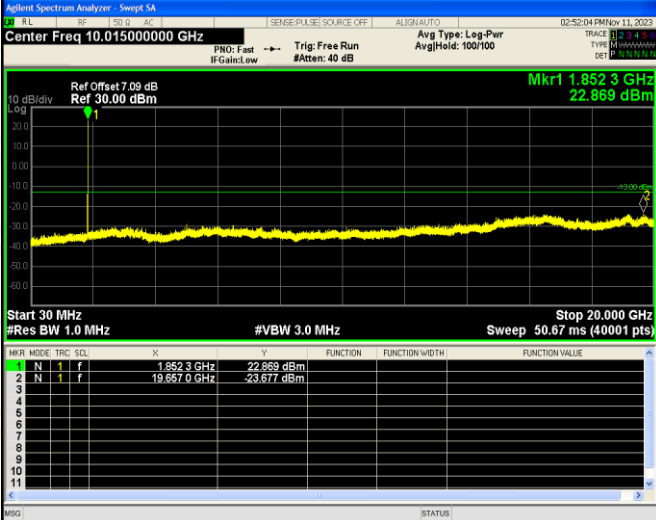
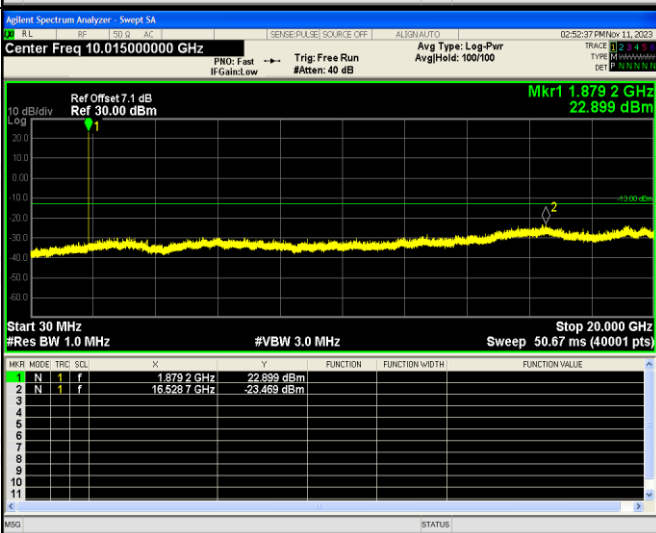
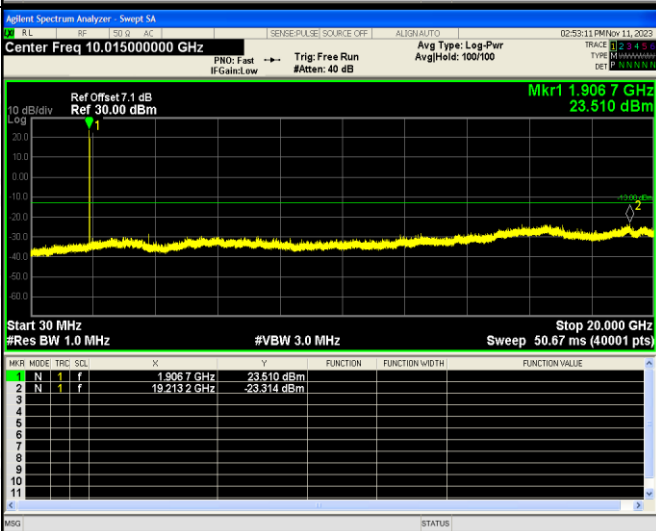
HSDPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 825.86 MHz 22.334 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>825.86 MHz</td><td>22.334 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.69224 GHz</td><td>-30.662 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	825.86 MHz	22.334 dBm				2	N	1	f	5.69224 GHz	-30.662 dBm			
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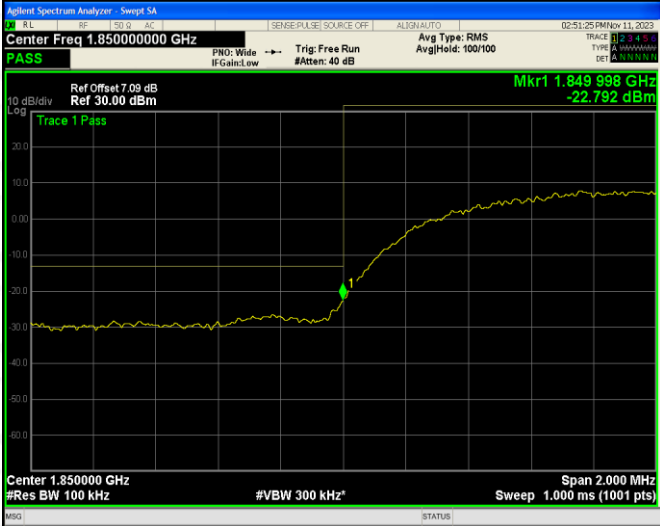
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HSDPA High Band Spurious Emission	

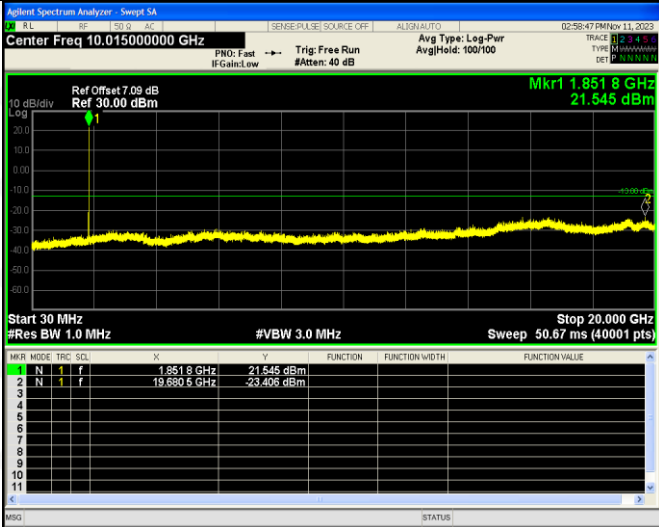
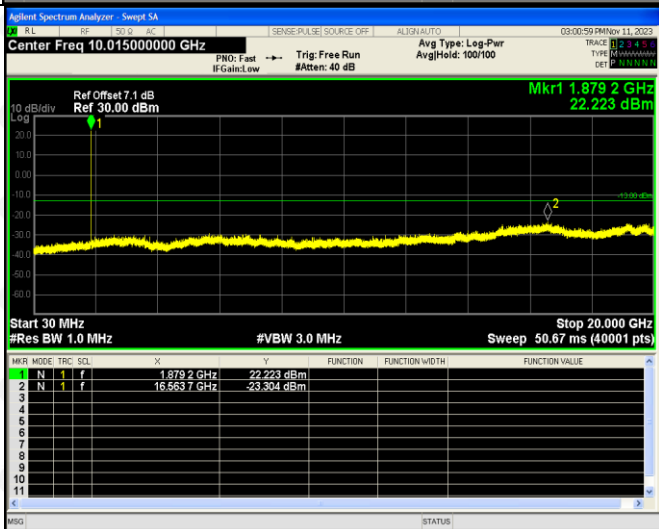
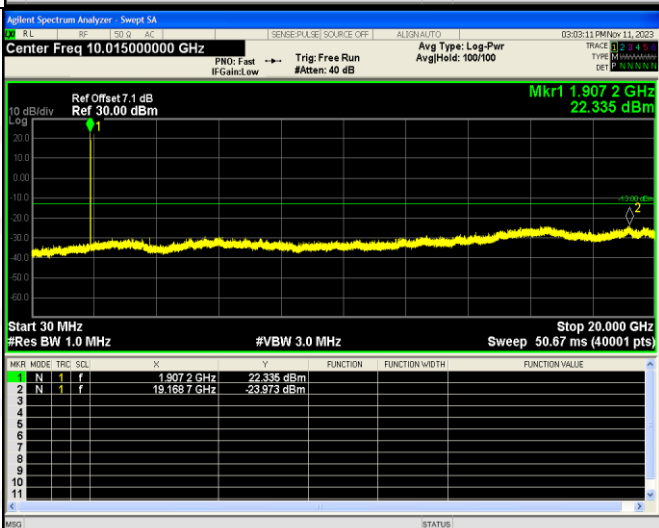
HSUPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.18 dB Ref 30.00 dBm Mkr1 825.86 MHz 23.148 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>825.86 MHz</td><td>23.148 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.97438 GHz</td><td>-29.632 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	825.86 MHz	23.148 dBm				2	N	1	f	5.97438 GHz	-29.632 dBm			
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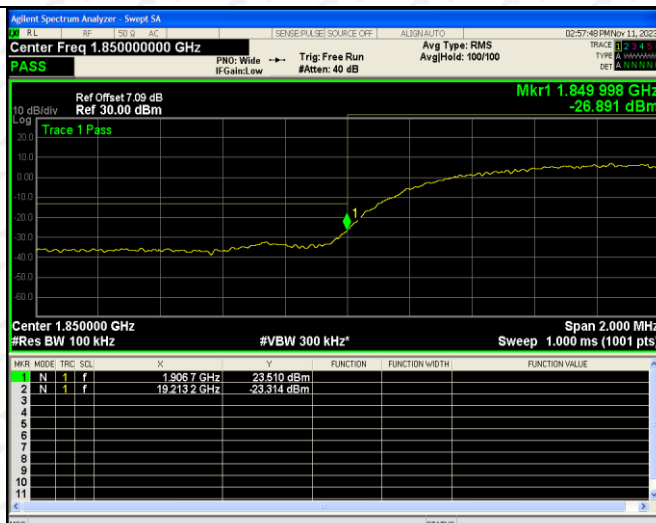
For Band II

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WCDMA High Channel	

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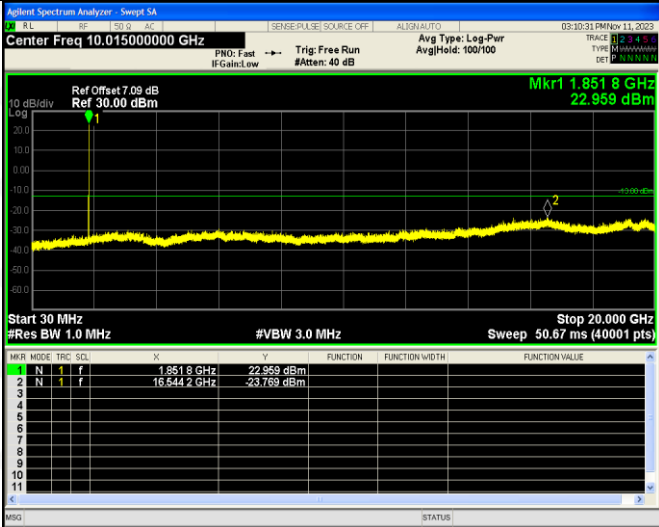
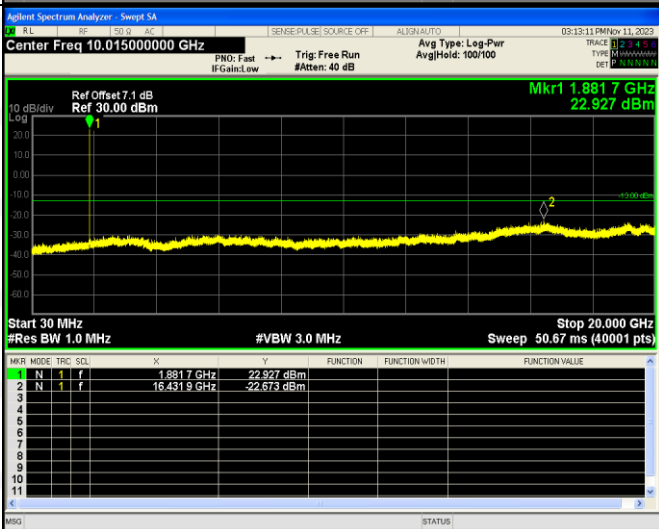
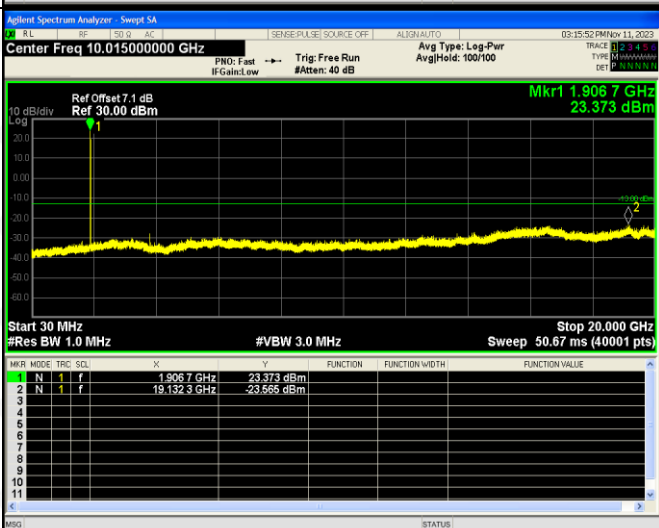
HSDPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.8518 GHz 21.545 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.8518 GHz</td><td>21.545 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>19.6806 GHz</td><td>-23.406 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.8518 GHz	21.545 dBm				2	N	1	f	19.6806 GHz	-23.406 dBm			
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HSDPA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.8792 GHz 22.223 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.8792 GHz</td><td>22.223 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.5637 GHz</td><td>-23.304 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.8792 GHz	22.223 dBm				2	N	1	f	16.5637 GHz	-23.304 dBm			
MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.8792 GHz	22.223 dBm																							
2	N	1	f	16.5637 GHz	-23.304 dBm																							
HSDPA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.9072 GHz 22.335 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.9072 GHz</td><td>22.335 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>19.1687 GHz</td><td>-23.973 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.9072 GHz	22.335 dBm				2	N	1	f	19.1687 GHz	-23.973 dBm			
MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.9072 GHz	22.335 dBm																							
2	N	1	f	19.1687 GHz	-23.973 dBm																							

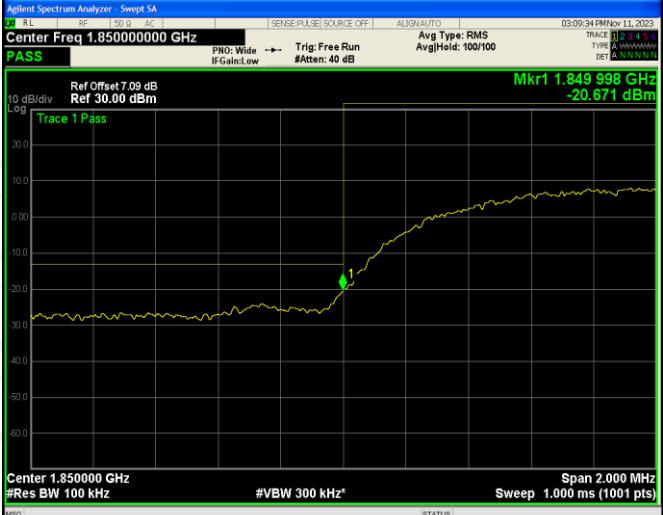
HSDPA
Low
Band
Spurious
Emission



HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.8518 GHz 22.959 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.8518 GHz</td><td>22.959 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.5442 GHz</td><td>-23.769 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.8518 GHz	22.959 dBm				2	N	1	f	16.5442 GHz	-23.769 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.8518 GHz	22.959 dBm																							
2	N	1	f	16.5442 GHz	-23.769 dBm																							
HSUPA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.8817 GHz 22.927 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.8817 GHz</td><td>22.927 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.4319 GHz</td><td>-22.673 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.8817 GHz	22.927 dBm				2	N	1	f	16.4319 GHz	-22.673 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.8817 GHz	22.927 dBm																							
2	N	1	f	16.4319 GHz	-22.673 dBm																							
HSUPA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.9067 GHz 23.373 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.9067 GHz</td><td>23.373 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>19.1323 GHz</td><td>-23.555 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.9067 GHz	23.373 dBm				2	N	1	f	19.1323 GHz	-23.555 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.9067 GHz	23.373 dBm																							
2	N	1	f	19.1323 GHz	-23.555 dBm																							

HSUPA Low Band Spurious Emission	
HSUPA High Band Spurious Emission	

10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

According to §22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

10.2 Test Procedure

- 1.The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 measurement procedure.
- 2.The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
- 3.The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 4.Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB $= 43 + 10 \log_{10}(\text{power out in Watts})$

10.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	101 kPa
Test Voltage	DC 3.85V

10.4 Summary of Test Results/Plots

According to the data below, the FCC Part22.917 and 24.238 standards, and had the worst margin of:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

All test modes are performed, but only the worst case is recorded in this report.

For Cellular Band GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
40.60	-69.28	3.9	-65.38	-13	-52.38	H
1641.12	-51.75	4.83	-46.92	-13	-33.92	H
2467.51	-50.65	8.08	-42.57	-13	-29.57	H
42.43	-69.29	4.02	-65.27	-13	-52.27	V
1646.36	-52.93	4.48	-48.45	-13	-35.45	V
2463.94	-47.63	8.2	-39.43	-13	-26.43	V
Middle Channel (836.6MHz)						
36.34	-70.66	3.84	-66.82	-13	-53.82	H
1666.00	-56.96	4.62	-52.34	-13	-39.34	H
2502.79	-49.27	8.25	-41.02	-13	-28.02	H
43.67	-74.44	4.25	-70.19	-13	-57.19	V
1670.20	-56.28	4.54	-51.74	-13	-38.74	V
2500.13	-55.80	8.35	-47.45	-13	-29.75	V
High Channel (848.8MHz)						
44.44	-71.06	4.22	-75.28	-13	-62.28	H
1693.07	-53.91	4.87	-58.78	-13	-45.78	H
2538.69	-53.40	8.38	-61.78	-13	-48.78	H
39.35	-68.97	4.02	-72.99	-13	-59.99	V
1691.21	-56.28	4.56	-60.84	-13	-47.84	V
2543.77	-56.28	8.41	-64.69	-13	-51.69	V

For PCS Band GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
45.29	-71.89	4.34	-67.55	-13	-54.55	H
3699.57	-51.98	10.54	-41.44	-13	-28.44	H
5550.57	-57.10	13.37	-43.73	-13	-30.73	H
38.13	-72.76	4.34	-68.42	-13	-55.42	V
3691.04	-56.25	10.54	-45.71	-13	-32.71	V
5545.93	-58.46	13.37	-45.09	-13	-32.09	V
Middle Channel (1880MHz)						
37.04	-74.52	4.02	-70.50	-13	-57.50	H
3754.80	-52.96	10.71	-42.25	-13	-29.25	H
5638.78	-56.34	13.73	-42.61	-13	-29.61	H
46.32	-68.84	4.14	-64.70	-13	-51.70	V
3754.52	-55.96	10.22	-45.74	-13	-32.74	V
5630.31	-54.33	13.16	-41.17	-13	-28.17	V
High Channel (1909.8MHz)						
40.55	-69.65	4.02	-65.63	-13	-52.63	H
3814.43	-56.93	4.9	-52.03	-13	-39.03	H
5722.25	-43.47	8.09	-35.38	-13	-22.38	H
40.47	-57.75	4.25	-53.50	-13	-40.50	V
3813.28	-56.81	4.93	-51.88	-13	-38.88	V
5721.46	-65.05	8.43	-56.62	-13	-43.62	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
36.73	-65.91	3.91	-62.00	-13	-49.00	H
1650.41	-54.48	10.56	-43.92	-13	-30.92	H
2473.77	-60.55	13.5	-47.05	-13	-34.05	H
43.07	-73.58	3.93	-69.65	-13	-56.65	V
1647.79	-56.46	10.41	-46.05	-13	-33.05	V
2478.13	-62.35	13.16	-49.19	-13	-36.19	V
Middle Channel (836.6MHz)						
39.28	-74.75	4.02	-70.73	-13	-57.73	H
1669.44	-57.24	4.66	-52.58	-13	-39.58	H
2506.54	-48.36	8.34	-40.02	-13	-27.02	H
40.98	-54.29	4.17	-50.12	-13	-37.12	V
1664.53	-58.75	4.94	-53.81	-13	-40.81	V
2499.47	-63.24	8.19	-55.05	-13	-42.05	V
High Channel (846.6MHz)						
44.52	-72.50	3.87	-68.63	-13	-55.63	H
1691.68	-58.58	4.89	-53.69	-13	-40.69	H
2539.17	-45.08	8.42	-36.66	-13	-23.66	H
41.83	-62.00	3.95	-58.05	-13	-45.05	V
1687.84	-63.22	4.99	-58.23	-13	-45.23	V
2537.89	-64.03	8.12	-55.91	-13	-42.91	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
38.04	-75.38	4.22	-71.16	-13	-58.16	H
1646.34	-52.07	10.7	-41.37	-13	-28.37	H
2475.89	-59.30	13.73	-45.57	-13	-32.57	H
44.37	-74.53	3.93	-70.60	-13	-57.60	V
1651.22	-53.57	10.09	-43.48	-13	-30.48	V
2476.15	-57.51	13.11	-44.40	-13	-31.40	V
Middle Channel (1880MHz)						
42.19	-69.60	4.26	-65.34	-13	-52.34	H
1668.62	-59.60	4.76	-54.84	-13	-41.84	H
2500.39	-45.71	8.37	-37.34	-13	-24.34	H
43.71	-54.05	3.96	-50.09	-13	-37.09	V
1666.68	-55.25	4.63	-50.62	-13	-37.62	V
2502.66	-57.87	8.1	-49.77	-13	-36.77	V
High Channel (1907.6MHz)						
42.59	-71.20	4.26	-66.94	-13	-53.94	H
1685.46	-62.04	4.76	-57.28	-13	-44.28	H
2532.22	-42.03	8.37	-33.66	-13	-20.66	H
39.57	-55.33	3.96	-51.37	-13	-38.37	V
1683.69	-60.66	4.63	-56.03	-13	-43.03	V
2539.42	-59.13	8.1	-51.03	-13	-38.03	V

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

11. FREQUENCY STABILITY

11.1 Standard Applicable

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Cellular Band

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

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

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

11.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

11.3 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	101kPa

11.4 Summary of Test Results/Plots

For Cellular Band GSM Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.04	0.0108
40	NV	9.58	0.0114
30	NV	9.41	0.0112
20	NV	9.37	0.0112
10	NV	9.73	0.0116
0	NV	10.62	0.0127
-10	NV	9.87	0.0118
-20	NV	10.54	0.0126
-30	NV	10.45	0.0125

For PCS Band GSM Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.08	0.0109
40	NV	9.43	0.0113
30	NV	9.90	0.0118
20	NV	9.33	0.0111
10	NV	10.39	0.0124
0	NV	10.43	0.0125
-10	NV	10.18	0.0122
-20	NV	10.96	0.0131
-30	NV	11.28	0.0135

For Cellular Band GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.12	0.0109
40	NV	8.75	0.0105
30	NV	9.07	0.0108
20	NV	9.48	0.0113
10	NV	9.55	0.0114
0	NV	9.91	0.0118
-10	NV	10.43	0.0125
-20	NV	10.29	0.0123
-30	NV	10.92	0.0131

For PCS Band GPRS Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	12.58	0.0067
40	NV	12.64	0.0067
30	NV	12.60	0.0067
20	NV	13.13	0.0070
10	NV	12.79	0.0068
0	NV	13.85	0.0074
-10	NV	13.80	0.0073
-20	NV	13.85	0.0074
-30	NV	14.26	0.0076

For WCDMA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.29	-0.0003
40	NV	0.20	0.0002
30	NV	0.12	0.0001
20	NV	0.89	0.0011
10	NV	0.66	0.0008
0	NV	0.71	0.0009
-10	NV	0.92	0.0011
-20	NV	1.37	0.0016
-30	NV	1.24	0.0015

For WCDMA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.29	0.0004
40	NV	-0.36	-0.0004
30	NV	0.14	0.0002
20	NV	0.77	0.0009
10	NV	1.26	0.0015
0	NV	1.37	0.0016
-10	NV	0.84	0.0010
-20	NV	0.59	0.0007
-30	NV	1.03	0.0012

For HSDPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.34	0.0004
40	NV	-0.23	-0.0003
30	NV	0.56	0.0007
20	NV	0.46	0.0005
10	NV	1.08	0.0013
0	NV	0.42	0.0005
-10	NV	1.24	0.0015
-20	NV	0.69	0.0008
-30	NV	1.32	0.0016

For HSDPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	5.14	0.0061
40	NV	4.31	0.0052
30	NV	5.08	0.0061
20	NV	5.33	0.0064
10	NV	6.32	0.0076
0	NV	6.34	0.0076
-10	NV	6.51	0.0078
-20	NV	6.70	0.0080
-30	NV	6.56	0.0078

For HSUPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.42	0.0005
40	NV	0.91	0.0011
30	NV	1.01	0.0012
20	NV	0.83	0.0010
10	NV	1.20	0.0014
0	NV	1.61	0.0019
-10	NV	1.28	0.0015
-20	NV	2.27	0.0027
-30	NV	2.14	0.0026

For HSUPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	6.55	0.0078
40	NV	6.26	0.0075
30	NV	7.38	0.0088
20	NV	7.78	0.0093
10	NV	7.97	0.0095
0	NV	8.36	0.0100
-10	NV	7.70	0.0092
-20	NV	8.53	0.0102
-30	NV	9.05	0.0108

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): GSM 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	10.49	0.0125
	NV	10.95	0.0131
	HV	11.21	0.0134
Reference Frequency(Middle Channel): GSM 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	14.52	0.0077
	NV	14.32	0.0076
	HV	15.13	0.0080

Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	10.91	0.0130
	NV	11.76	0.0141
	HV	11.20	0.0134
Reference Frequency(Middle Channel): GPRS 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	14.93	0.0079
	NV	14.97	0.0080
	HV	14.91	0.0079

Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	0.61	0.0007
	NV	1.41	0.0017
	HV	1.21	0.0015
Reference Frequency(Middle Channel): WCDMA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.78	0.0021
	NV	1.60	0.0019
	HV	1.95	0.0023
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.38	0.0028
	NV	2.52	0.0030
	HV	3.54	0.0042

Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	0.94	0.0011
	NV	1.37	0.0016
	HV	1.53	0.0018
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.96	0.0023
	NV	1.40	0.0017
	HV	1.98	0.0024
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.33	0.0028
	NV	3.11	0.0037
	HV	3.31	0.0040
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.28	0.0015
	NV	1.10	0.0013
	HV	1.49	0.0018
Reference Frequency(Middle Channel): HSUPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.00	0.0024
	NV	2.15	0.0026
	HV	1.66	0.0020
Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.59	0.0031
	NV	2.48	0.0030
	HV	3.32	0.0040

12. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



Conducted Emission



***** END OF REPORT *****