TEST REPORT

Product Name:	Smart Watch
FCC ID:	2BCNP-BS-SWMC
Trademark:	BLACK SHARK
Model Number:	BS-W2403, BS-W2401, BS-W2402, BS-W2404, BS-W2405, BS-W2406, BS-W2407, BS-W2408, BS-W2409, BS-W2410, BS-W2411, BS-W2412, BS-W2413, BS-W2414, BS-W2415, BS-W2416, BS-W2417, BS-W2418, BS-W2419, BS-W2420, BS-W2421, BS-W2422, BS-W2423, BS-W2424, BS-W2425, BS-W2426, BS-W2427, BS-W2428, BS-W2429, BS-W2430
Prepared For:	Blackshark Technologies (Nanchang) Co., Ltd
Address:	R1001, F10 of Floor 3-23, R201 of Building 8 and 9, No.528, Shuanggang West Street, Nanchang City, Jiangxi Province, China
Manufacturer:	Blackshark Technologies (Nanchang) Co., Ltd
Address:	R1001, F10 of Floor 3-23, R201 of Building 8 and 9, No.528, Shuanggang West Street, Nanchang City, Jiangxi Province, China
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	May. 13, 2024
Sample tested Date:	May. 13, 2024 to May. 25, 2024
Issue Date:	May. 25, 2024
Report No.:	CTB240530032RF
Test Standards	FCC Part 22H & 24E
Test Results	PASS
Remark:	This is GSM radio test report.

Compiled by:	Reviewed by:	Approved by:
Zhou Kui	Arron Liu	Bin Mei / Director

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.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB240530032RF	May. 25, 2024	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

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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℃
frequency	1×10-7

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	BS-W2403, BS-W2401, BS-W2402, BS-W2404, BS-W2405, BS-W2406, BS-W2407, BS-W2408, BS-W2409, BS-W2410, BS-W2411, BS-W2412, BS-W2413, BS-W2414, BS-W2415, BS-W2416, BS-W2417, BS-W2418, BS-W2419, BS-W2420, BS-W2421, BS-W2422, BS-W2423, BS-W2424, BS-W2425, BS-W2426, BS-W2427, BS-W2428, BS-W2429, BS-W2430
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: BS-W2403
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 30.97dBm GSM1900: 28.53dBm WCDMA Band 2: 21.66dBm WCDMA Band 5: 22.37dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: -2.45dBi, GSM1900: 1.36dBi WCDMA Band 2: 1.36dBi WCDMA Band 5: -2.45dBi
Ratings:	DC 5V charging from adapter DC 3.7V 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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	JIYIN	JY-05100C	/	/

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/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS/EDGE	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	EDGE 850	Low, Middle, High Channels
TM4	GSM 1900	Low, Middle, High Channels
TM5	GPRS 1900	Low, Middle, High Channels
TM6	EDGE 1900	Low, Middle, High Channels
TM7	WCDMA Band 5	Low, Middle, High Channels
TM8	HSDPA Band 5	Low, Middle, High Channels
TM9	HSUPA Band 5	Low, Middle, High Channels
TM10	WCDMA Band 2	Low, Middle, High Channels
TM11	HSDPA Band 2	Low, Middle, High Channels
TM12	HSUPA Band 2	Low, Middle, High Channels

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.7V
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	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, Xinhe 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

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	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	V3.5.80	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B ）	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	/	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850MS-1155	20181015001	/	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	/	2024.07.06
12	BT&WI-FI Automatic test software	Micowave	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	Micowave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2024.08.11
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 （104489/003）	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

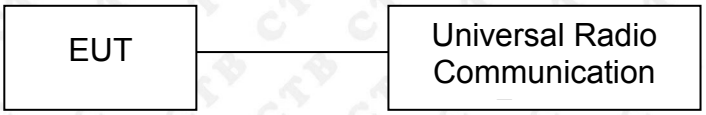
6.1 Standard Applicable

According to §22.913(a)(2),The ERP of mobileand 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	Substitude 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	30.01	1.5	0	H	1.5	-2.45	26.06	38.45
824.2	30.69	1.5	0	V	1.5	-2.45	26.74	38.45
Middle Channel								
836.6	30.38	1.5	0	H	1.5	-2.45	26.43	38.45
836.6	30.31	1.5	0	V	1.5	-2.45	26.36	38.45
High Channel								
848.8	30.53	1.5	0	H	1.5	-2.45	26.58	38.45
848.8	30.54	1.5	0	V	1.5	-2.45	26.59	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitude 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	27.62	1.5	0	H	1.9	1.36	27.08	33
1850.2	28.03	1.5	0	V	1.9	1.36	27.49	33
Middle Channel								
1880	27.44	1.5	0	H	1.9	1.36	26.90	33
1880	27.31	1.5	0	V	1.9	1.36	26.77	33
High Channel								
1909.8	27.75	1.5	0	H	1.9	1.36	27.21	33
1909.8	27.10	1.5	0	V	1.9	1.36	26.56	33

ERP For GPRS Mode GSM850

Frequency	Substitude 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	30.12	1.5	0	H	1.5	-2.45	26.17	38.45
824.2	30.26	1.5	0	V	1.5	-2.45	26.31	38.45
Middle Channel								
836.6	30.25	1.5	0	H	1.5	-2.45	26.30	38.45
836.6	30.76	1.5	0	V	1.5	-2.45	26.81	38.45
High Channel								
848.8	30.27	1.5	0	H	1.5	-2.45	26.32	38.45
848.8	30.03	1.5	0	V	1.5	-2.45	26.08	38.45

EIRP For GPRS Mode PCS1900

Frequency	Substitude 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	28.32	1.5	0	H	1.9	1.36	27.78	33
1850.2	27.66	1.5	0	V	1.9	1.36	27.12	33
Middle Channel								
1880	27.93	1.5	0	H	1.9	1.36	27.39	33
1880	27.37	1.5	0	V	1.9	1.36	26.83	33
High Channel								
1909.8	27.77	1.5	0	H	1.9	1.36	27.23	33
1909.8	26.90	1.5	0	V	1.9	1.36	26.36	33

ERP For EDGE Mode GSM850

Frequency	Substitude 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	30.81	1.5	0	H	1.5	-2.45	26.86	38.45
824.2	30.79	1.5	0	V	1.5	-2.45	26.84	38.45
Middle Channel								
836.6	30.74	1.5	0	H	1.5	-2.45	26.79	38.45
836.6	30.61	1.5	0	V	1.5	-2.45	26.66	38.45
High Channel								
848.8	30.85	1.5	0	H	1.5	-2.45	26.90	38.45
848.8	30.03	1.5	0	V	1.5	-2.45	26.08	38.45

EIRP For EDGE Mode PCS1900

Frequency	Substitude 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	27.73	1.5	0	H	1.9	1.36	27.19	33
1850.2	27.61	1.5	0	V	1.9	1.36	27.07	33
Middle Channel								
1880	27.61	1.5	0	H	1.9	1.36	27.07	33
1880	27.40	1.5	0	V	1.9	1.36	26.86	33
High Channel								
1909.8	27.08	1.5	0	H	1.9	1.36	26.54	33
1909.8	27.32	1.5	0	V	1.9	1.36	26.78	33

ERP For WCDMA Mode Band 5

Frequency	Substitude 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	21.51	1.5	0	H	1.5	-2.45	17.56	38.45
826.4	21.77	1.5	0	V	1.5	-2.45	17.82	38.45
Middle Channel								
836.6	21.77	1.5	0	H	1.5	-2.45	17.82	38.45
836.6	21.67	1.5	0	V	1.5	-2.45	17.72	38.45
High Channel								
846.6	22.06	1.5	0	H	1.5	-2.45	18.11	38.45
846.6	21.80	1.5	0	V	1.5	-2.45	17.85	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitude 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	21.59	1.5	0	H	1.5	-2.45	17.64	38.45
826.4	21.45	1.5	0	V	1.5	-2.45	17.50	38.45
Middle Channel								
836.6	21.53	1.5	0	H	1.5	-2.45	17.58	38.45
836.6	20.94	1.5	0	V	1.5	-2.45	16.99	38.45
High Channel								
846.6	20.63	1.5	0	H	1.5	-2.45	16.68	38.45
846.6	20.97	1.5	0	V	1.5	-2.45	17.02	38.45

ERP For HSUPA Mode Band 5

Frequency	Substitude 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	21.65	1.5	0	H	1.5	-2.45	17.70	38.45
826.4	21.74	1.5	0	V	1.5	-2.45	17.79	38.45
Middle Channel								
836.6	21.08	1.5	0	H	1.5	-2.45	17.13	38.45
836.6	21.21	1.5	0	V	1.5	-2.45	17.26	38.45
High Channel								
846.6	21.17	1.5	0	H	1.5	-2.45	17.22	38.45
846.6	20.44	1.5	0	V	1.5	-2.45	16.49	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitude 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	19.91	1.5	0	H	1.9	1.36	19.37	33
1852.4	20.01	1.5	0	V	1.9	1.36	19.47	33
Middle Channel								
1880	19.50	1.5	0	H	1.9	1.36	18.96	33
1880	19.03	1.5	0	V	1.9	1.36	18.49	33
High Channel								
1907.6	20.89	1.5	0	H	1.9	1.36	20.35	33
1907.6	19.16	1.5	0	V	1.9	1.36	18.62	33

EIRP For HSDPA Mode Band 2

Frequency	Substitude 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	1.36	21.54	33
1852.4	21.57	1.5	0	V	1.9	1.36	21.03	33
Middle Channel								
1880	21.34	1.5	0	H	1.9	1.36	20.80	33
1880	22.54	1.5	0	V	1.9	1.36	22.00	33
High Channel								
1907.6	21.23	1.5	0	H	1.9	1.36	20.69	33
1907.6	20.64	1.5	0	V	1.9	1.36	20.10	33

EIRP For HSUPA Mode Band 2

Frequency	Substitude 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	21.94	1.5	0	H	1.9	1.36	21.40	33
1852.4	21.19	1.5	0	V	1.9	1.36	20.65	33
Middle Channel								
1880	22.05	1.5	0	H	1.9	1.36	21.51	33
1880	22.47	1.5	0	V	1.9	1.36	21.93	33
High Channel								
1907.6	20.43	1.5	0	H	1.9	1.36	19.89	33
1907.6	21.30	1.5	0	V	1.9	1.36	20.76	33

Note: Result = Substitude - 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	30.97	38.45
	Middle Channel	836.6	30.82	38.45
	High Channel	848.8	30.81	38.45
GPRS(1 Slot)	Low Channel	824.2	30.96	38.45
	Middle Channel	836.6	30.80	38.45
	High Channel	848.8	30.80	38.45
EDGE(1 Slot)	Low Channel	824.2	30.97	38.45
	Middle Channel	836.6	30.83	38.45
	High Channel	848.8	30.85	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	28.46	33.0
	Middle Channel	1880.0	28.20	33.0
	High Channel	1909.8	27.80	33.0
GPRS(1 Slot)	Low Channel	1850.2	28.44	33.0
	Middle Channel	1880.0	28.23	33.0
	High Channel	1909.8	27.83	33.0
EDGE(1 Slot)	Low Channel	1850.2	28.53	33.0
	Middle Channel	1880.0	28.30	33.0
	High Channel	1909.8	27.89	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	22.06	38.45
	Middle Channel	836.6	22.18	38.45
	High Channel	846.6	22.37	38.45
HSDPA	Low Channel	826.4	21.99	38.45
	Middle Channel	836.6	21.78	38.45
	High Channel	846.6	21.61	38.45
HSUPA	Low Channel	826.4	21.81	38.45
	Middle Channel	836.6	21.57	38.45
	High Channel	846.6	21.31	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	21.65	33.00
	Middle Channel	1880.0	21.64	33.00
	High Channel	1907.6	21.45	33.00
HSDPA	Low Channel	1852.4	21.66	33.00
	Middle Channel	1880.0	21.58	33.00
	High Channel	1907.6	21.51	33.00
HSUPA	Low Channel	1852.4	21.49	33.00
	Middle Channel	1880.0	21.50	33.00
	High Channel	1907.6	21.36	33.00

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

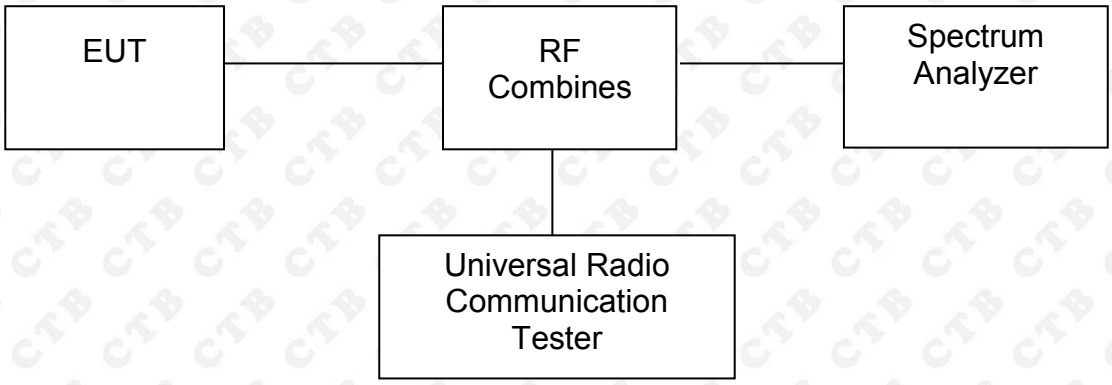
7.1 Standard Applicable

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	2.81	13
GPRS(1 Slot)	190	836.6	2.83	13
EDGE(1 Slot)	190	836.6	2.83	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.82	13
GPRS(1 Slot)	512	1850.2	2.86	13
EDGE(1 Slot)	512	1850.2	2.85	13

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.86	13
HSDPA	4182	836.4	4.42	13
HSUPA	4182	836.4	3.99	13

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1880	3.01	13
HSDPA	9400	1880	4.48	13
HSUPA	9400	1880	4.04	13

GSM :


Agilent Spectrum Analyzer - Power Stat CCDF
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: RF Burst
#Atten: 40 dB
Counts:1.00 M/1.00 Mpt
Radio Std: None
Average Power
26.55 dBm
54.63 % at 0dB
10.0 % 2.67 dB
1.0 % 2.77 dB
0.1 % 2.86 dB
0.01 % 2.89 dB
0.001 % 3.10 dB
0.0001 % 3.13 dB
Peak 3.14 dB
29.69 dBm
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0 dB
20 dB
Info BW 510.00 kHz

WCDMA:


Agilent Spectrum Analyzer - Power Stat CCDF
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
#Atten: 40 dB
Radio Std: None
Average Power
21.77 dBm
44.28 % at 0dB
10.0 % 3.08 dB
1.0 % 4.14 dB
0.1 % 4.48 dB
0.01 % 4.65 dB
0.001 % 5.13 dB
0.0001 % 5.34 dB
Peak 5.42 dB
27.19 dBm
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0 dB
20 dB
Info BW 5.0000 MHz

8. EMISSION BANDWIDTH

8.1 Standard Applicable

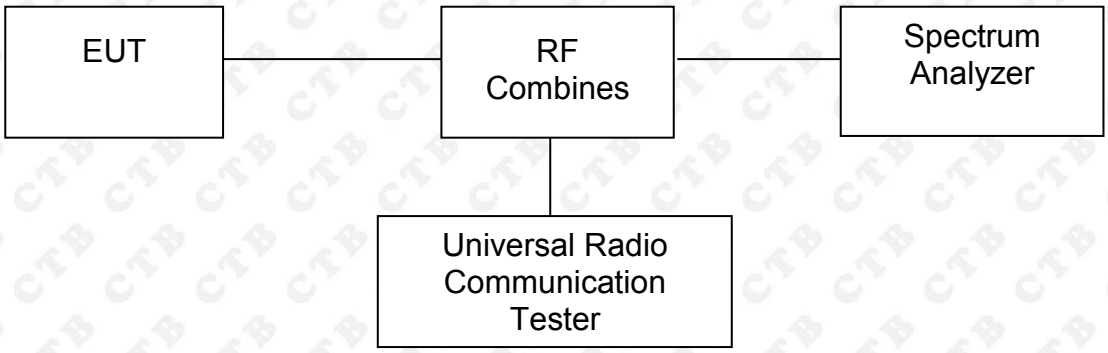
According to §22.917(b),The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	248.152	321.098
	190	836.6	247.029	303.658
	251	848.8	249.860	317.377
GPRS	128	824.2	239.124	304.036
	190	836.6	242.367	322.020
	251	848.8	239.664	322.041
EDGE	128	824.2	240.749	318.211
	190	836.6	243.921	314.498
	251	848.8	245.743	326.318

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	241.483	297.914
	661	1880.0	246.389	317.326
	810	1909.8	247.478	319.208
GPRS	512	1850.2	248.255	311.572
	661	1880.0	227.387	311.420
	810	1909.8	251.950	318.934
EDGE	512	1850.2	244.340	317.489
	661	1880.0	249.247	321.077
	810	1909.8	251.639	319.581

For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4148.701	4638.206
	4183	836.6	4159.215	4672.133
	4233	846.6	4153.296	4679.089
HSDPA	4132	826.4	4158.074	4659.264
	4183	836.6	4147.317	4664.471
	4233	846.6	4160.868	4650.901
HSUPA	4132	826.4	4158.269	4671.794
	4183	836.6	4159.228	4651.213
	4233	846.6	4149.142	4664.390

For Band 2

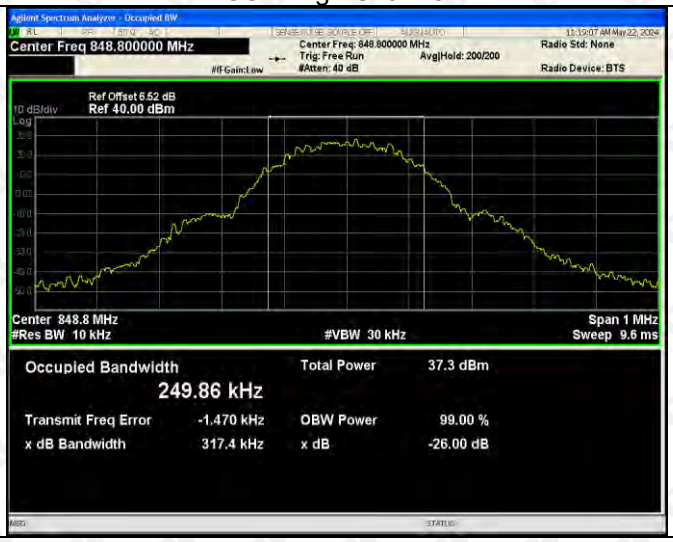
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4157.226	4652.647
	9400	1880.0	4163.276	4653.499
	9538	1907.6	4140.665	4678.794
HSDPA	9262	1852.4	4167.293	4667.309
	9400	1880.0	4183.760	4664.785
	9538	1907.6	4137.472	4648.842
HSUPA	9262	1852.4	4141.101	4686.406
	9400	1880.0	4160.187	4671.222
	9538	1907.6	4145.959	4668.403

For Cellular Band

GSM Low Channel

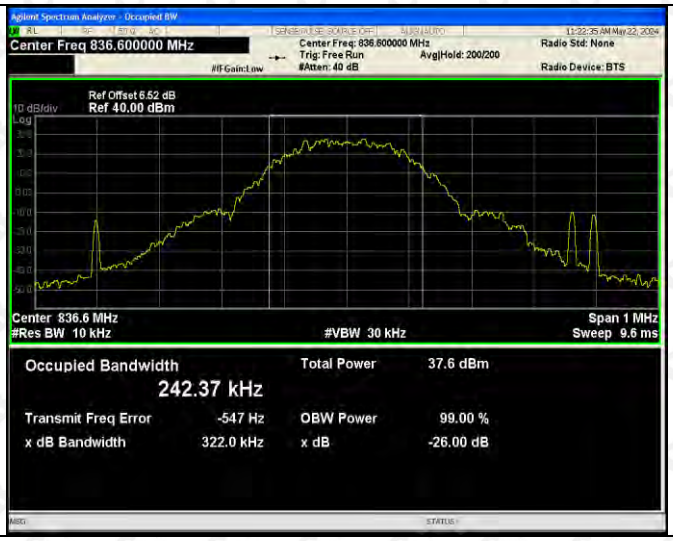
GSM Middle Channel

GSM High Channel

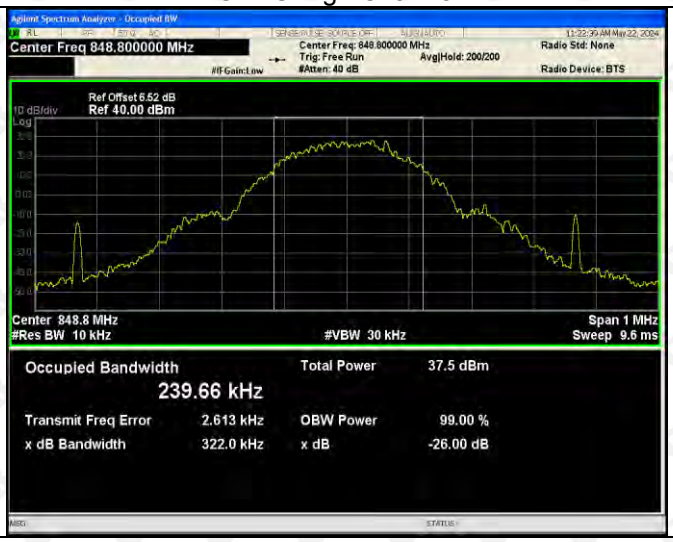


GPRS Low Channel

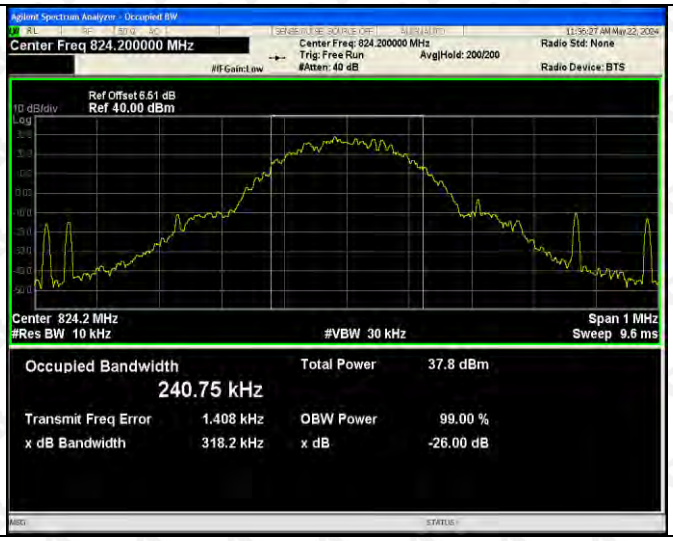
GPRS Middle Channel



GPRS High Channel



EDGE Low Channel



EDGE Middle Channel

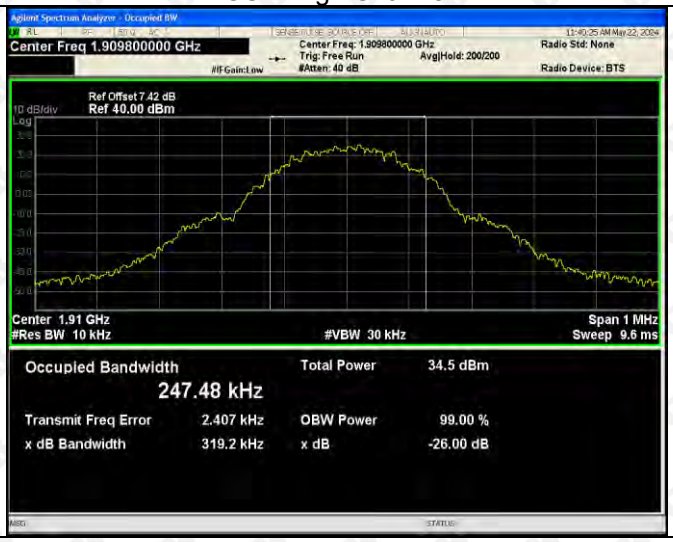
EDGE High Channel

For PCS Band

GSM Low Channel

GSM Middle Channel

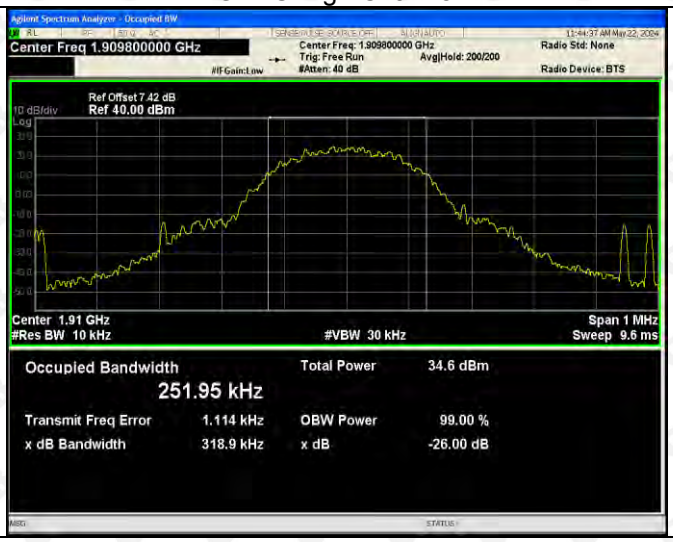
GSM High Channel



GPRS Low Channel

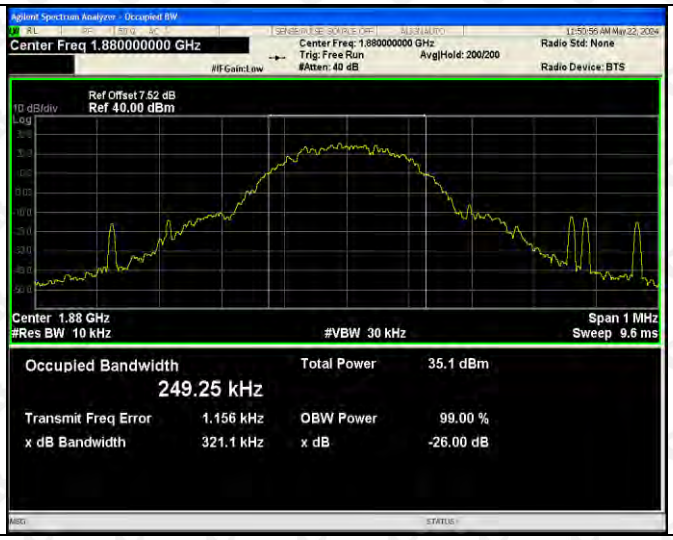
GPRS Middle Channel

GPRS High Channel



EDGE Low Channel

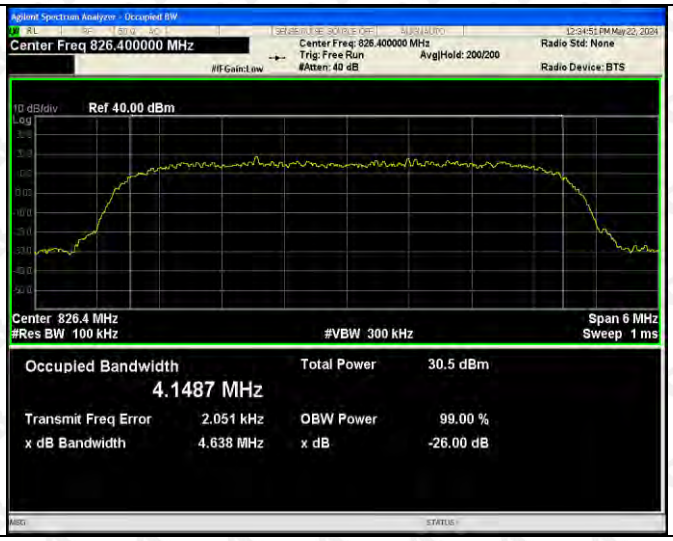
EDGE Middle Channel



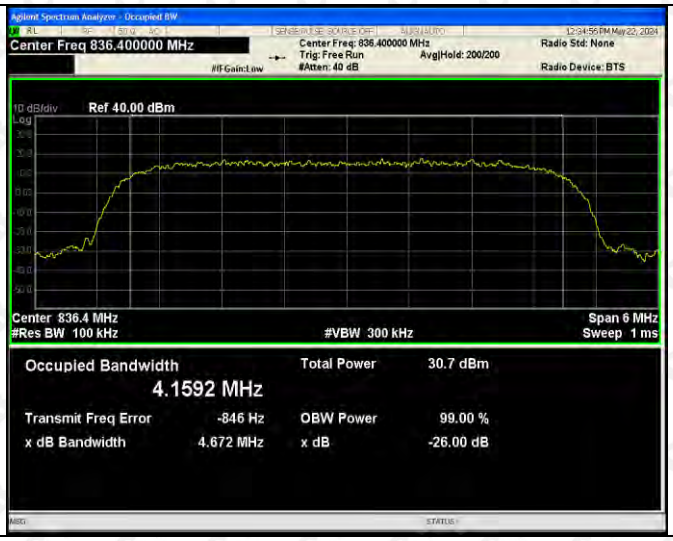
EDGE High Channel

For Band V

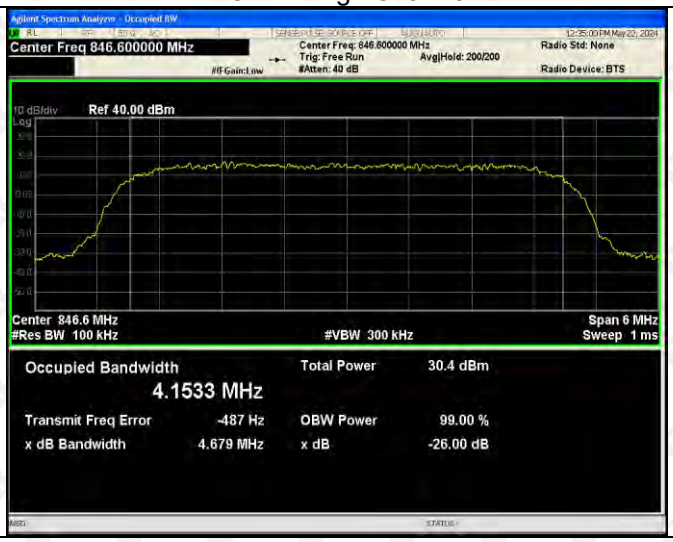
WCDMA Low Channel

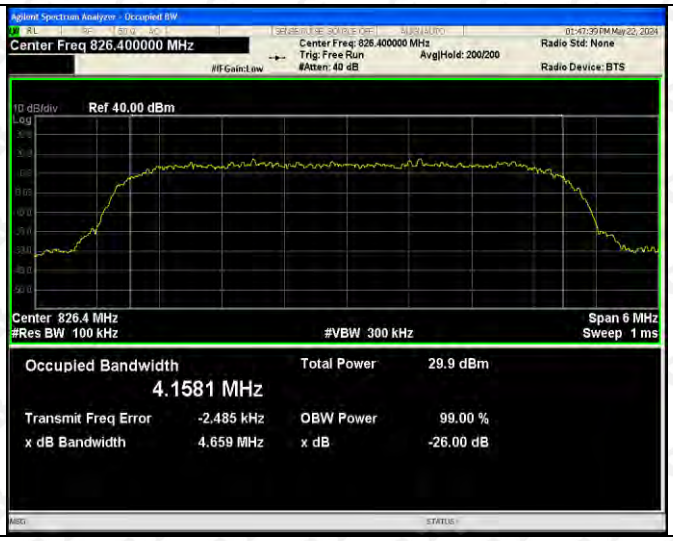
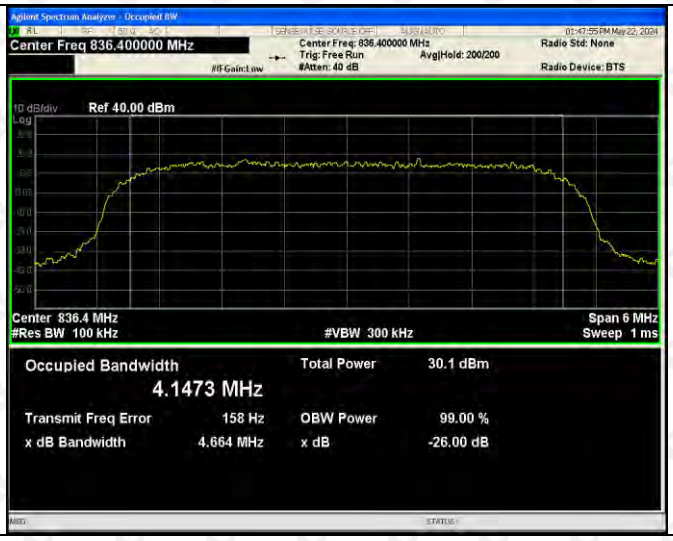


WCDMA Middle Channel

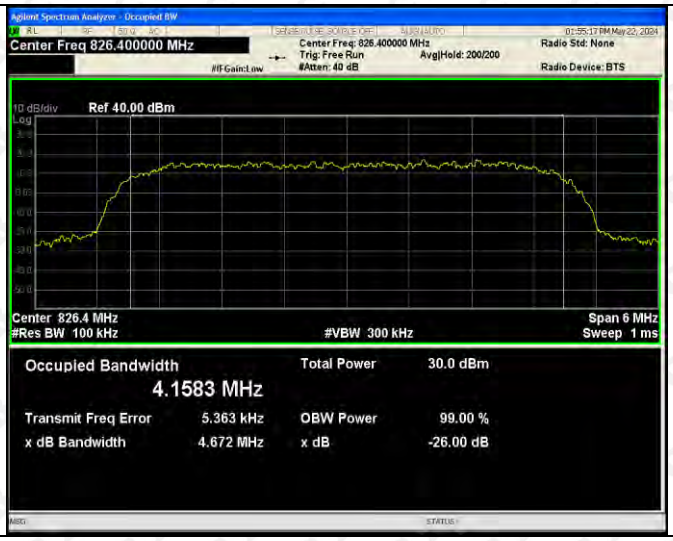


WCDMA High Channel

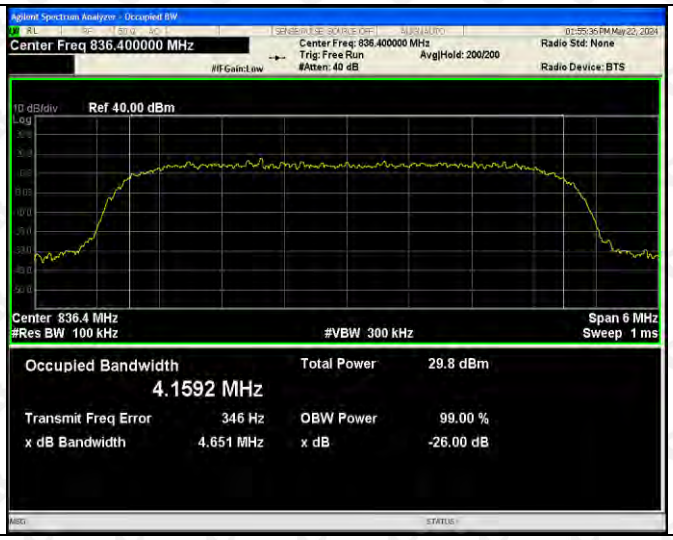


HSDPA Low Channel

HSDPA Middle Channel

HSDPA High Channel

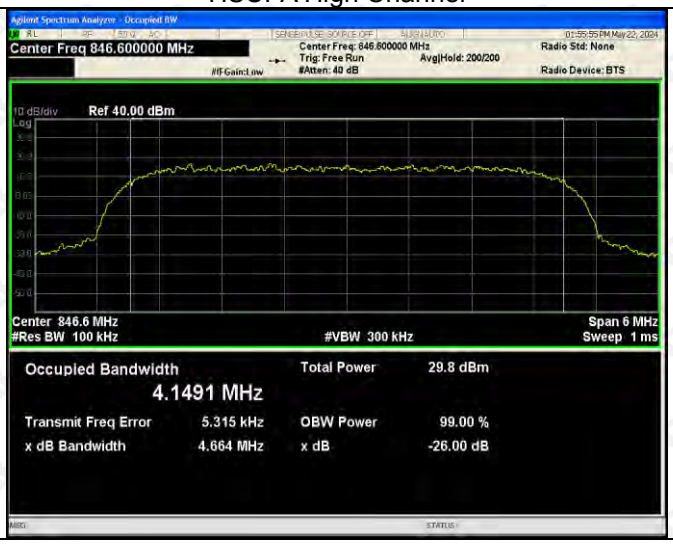

HSUPA Low Channel



HSUPA Middle Channel

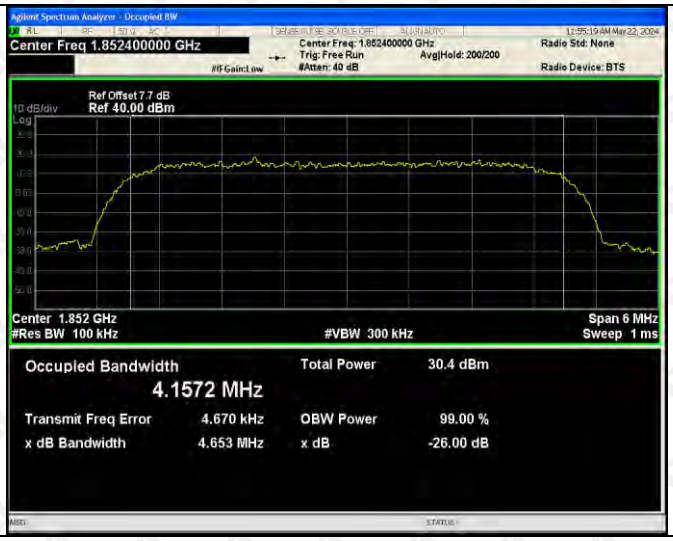


HSUPA High Channel

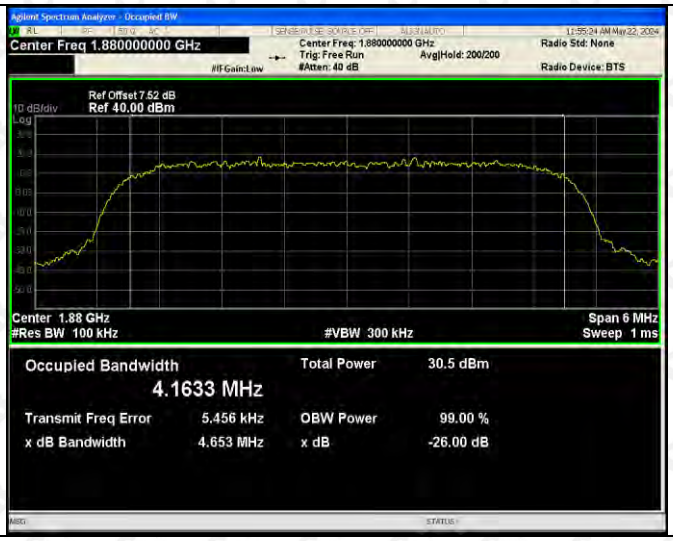


For Band II

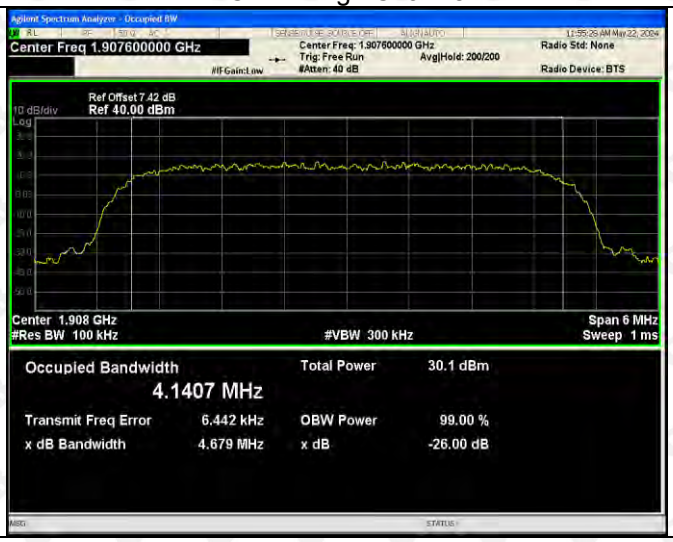
WCDMA Low Channel



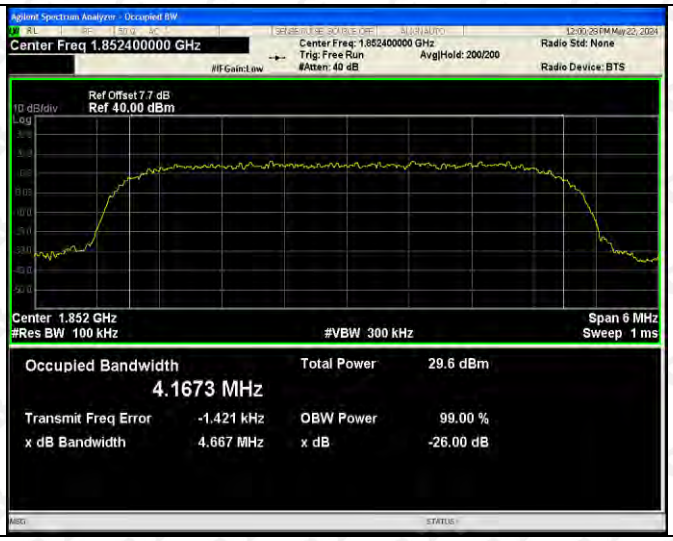
WCDMA Middle Channel



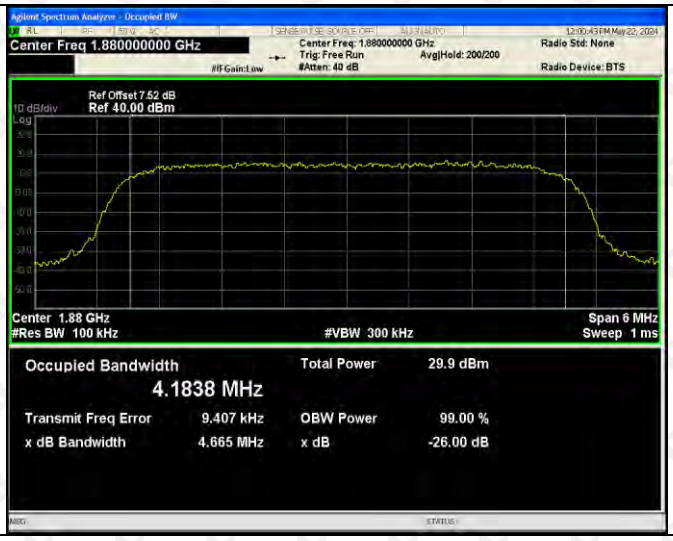
WCDMA High Channel



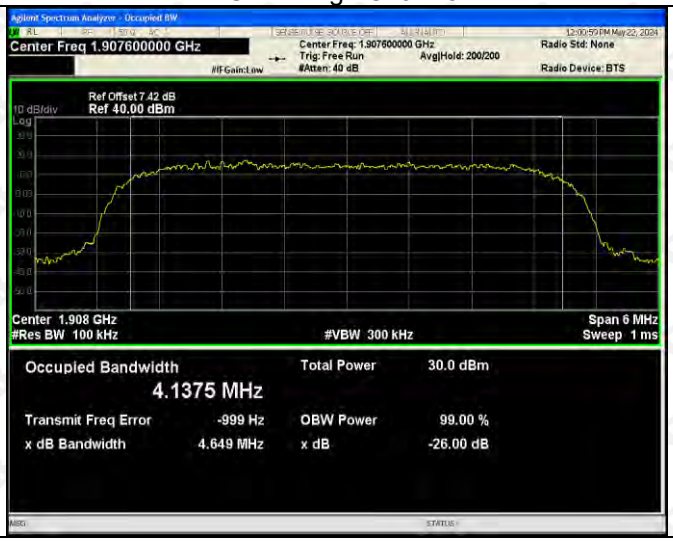
HSDPA Low Channel



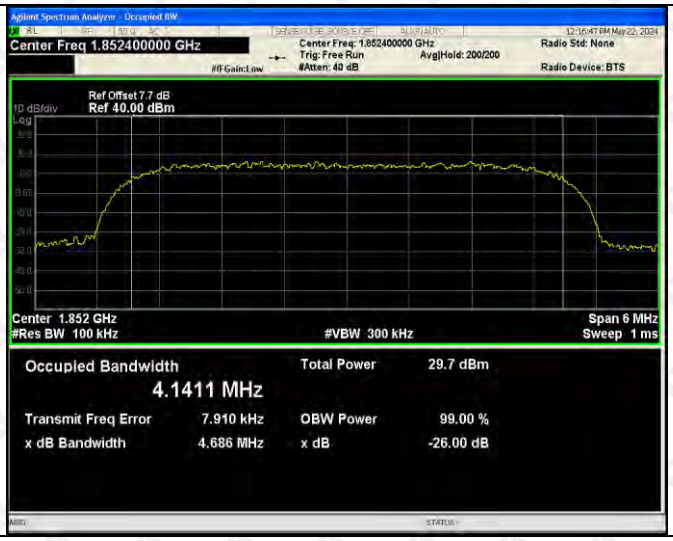
HSDPA Middle Channel



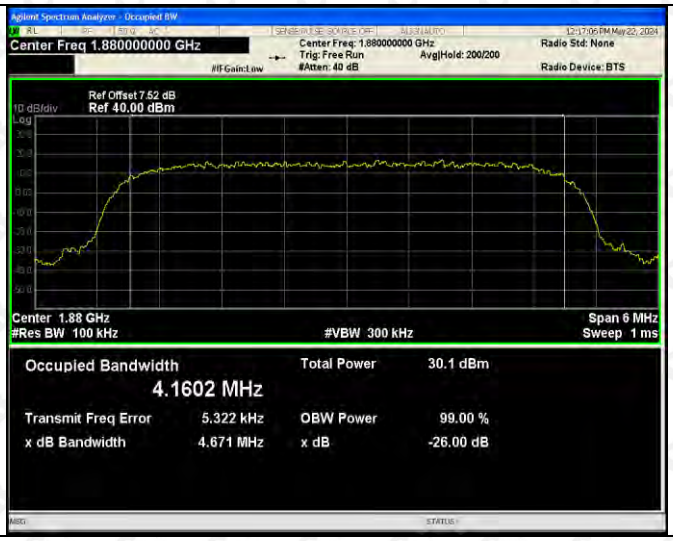
HSDPA High Channel



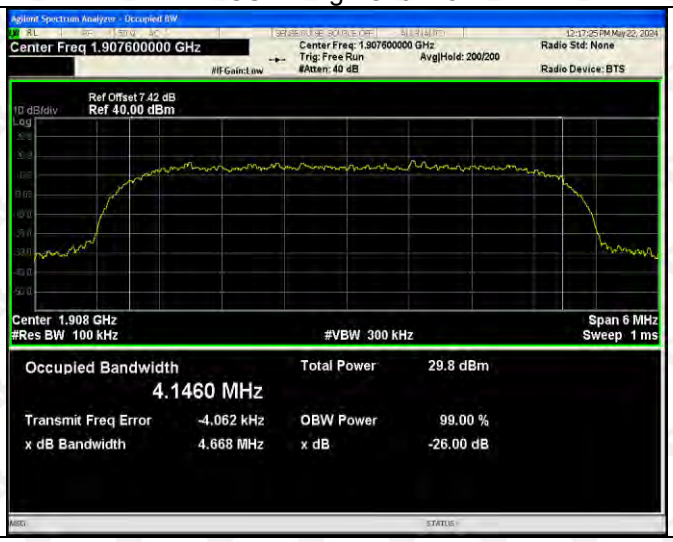
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

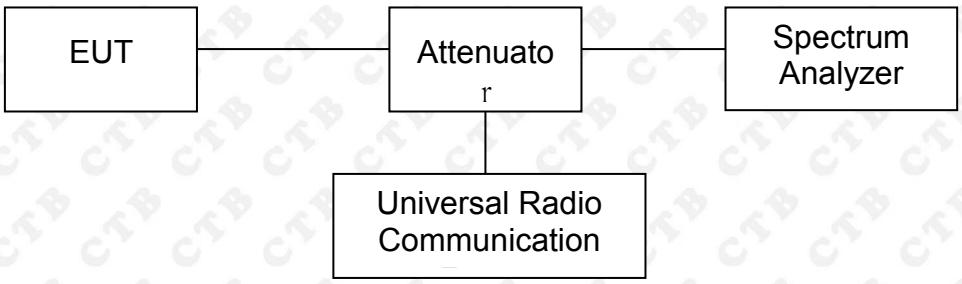
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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:



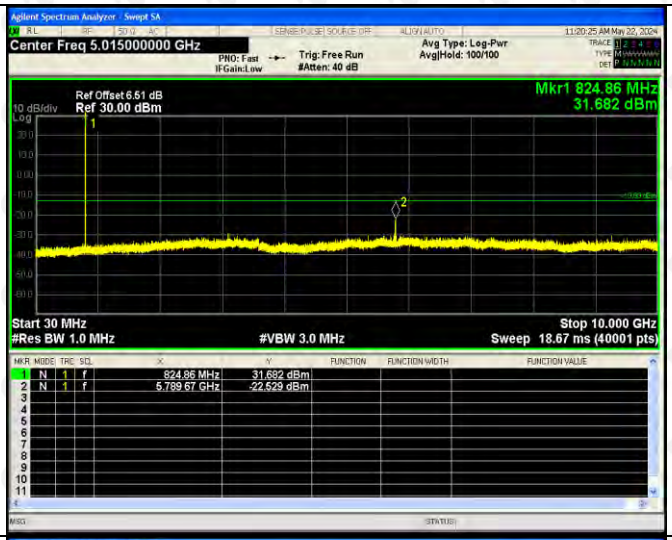
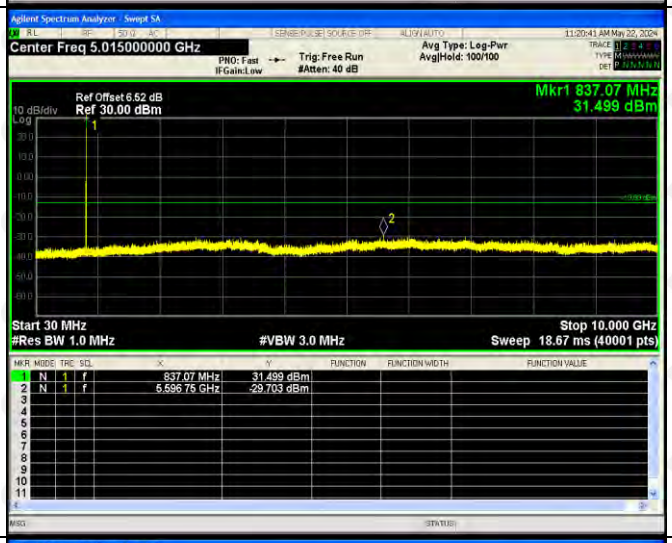
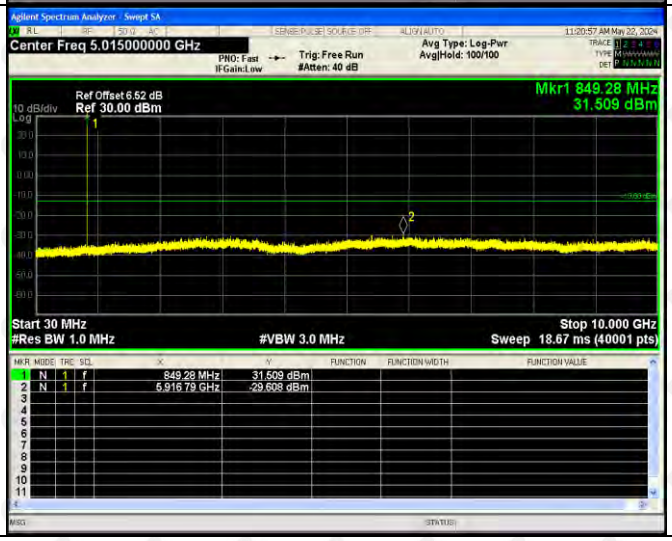
9.3 Environmental Conditions

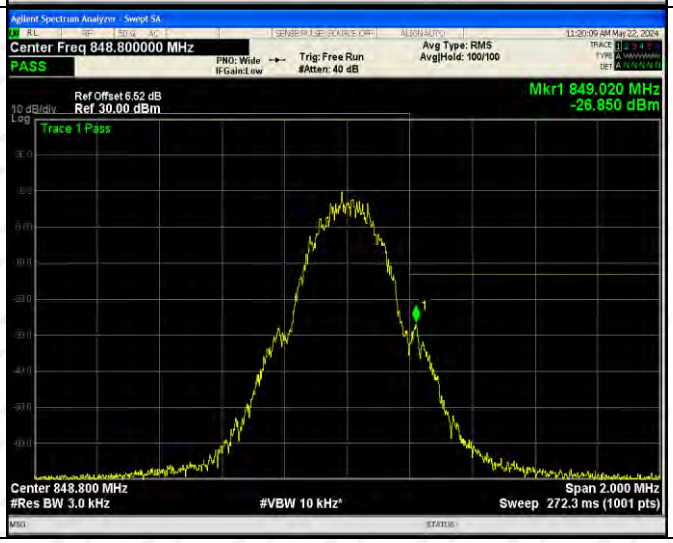
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

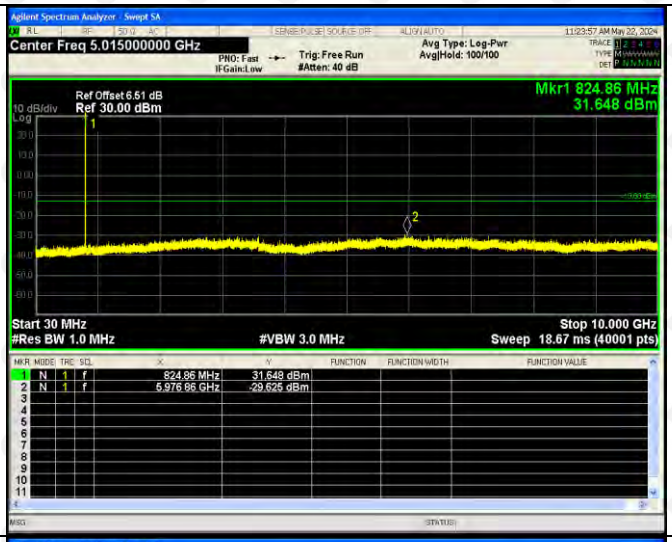
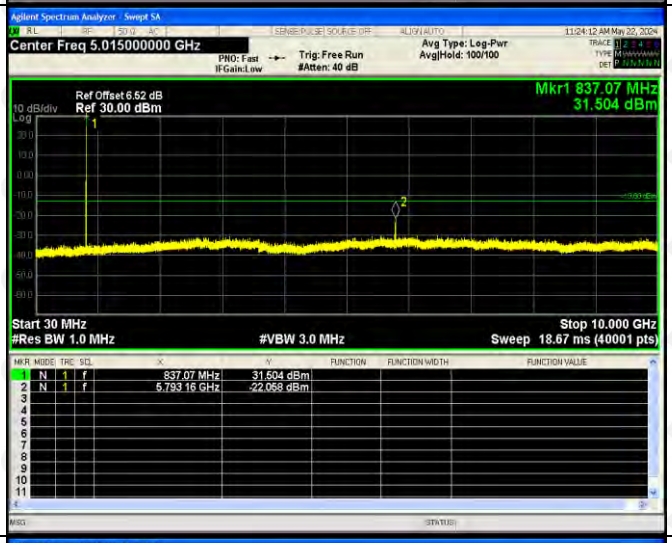
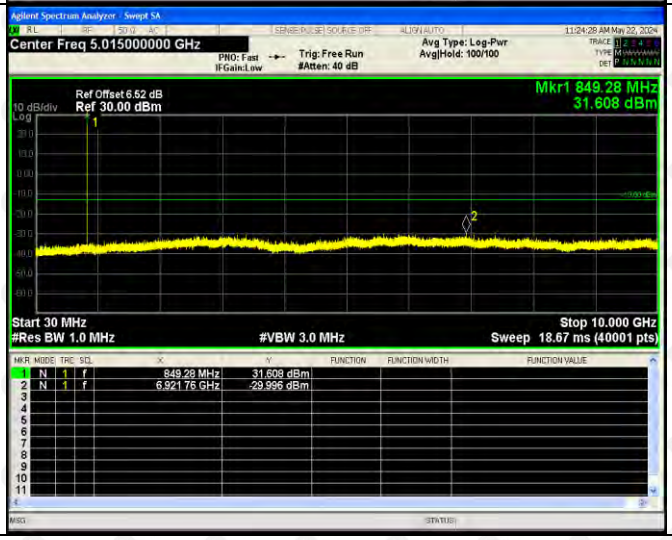
9.4 Summary of Test Results/Plots

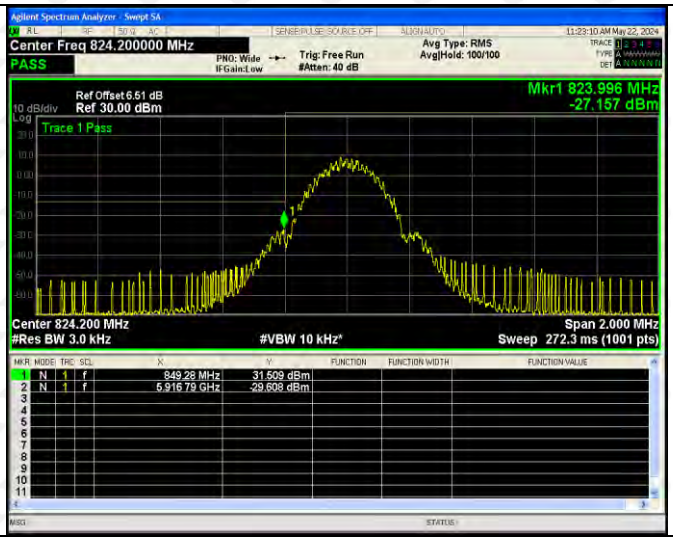
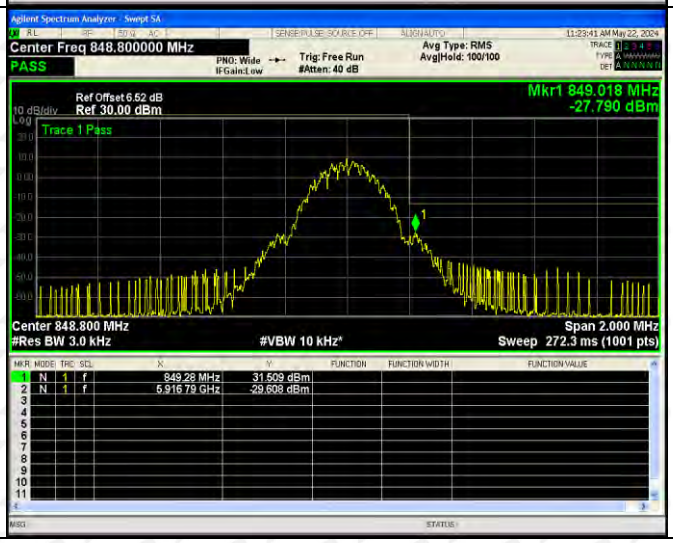
Please refer to the following test plots

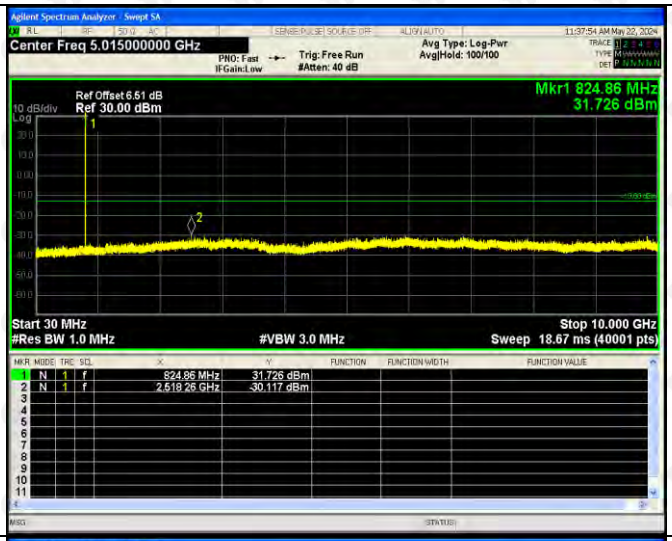
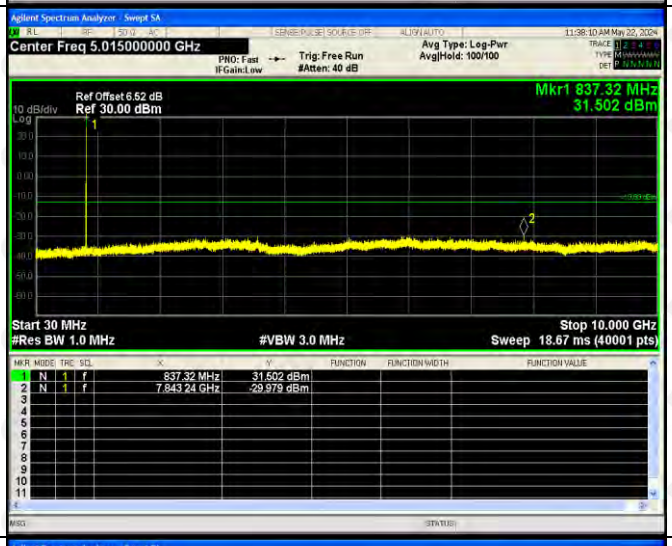
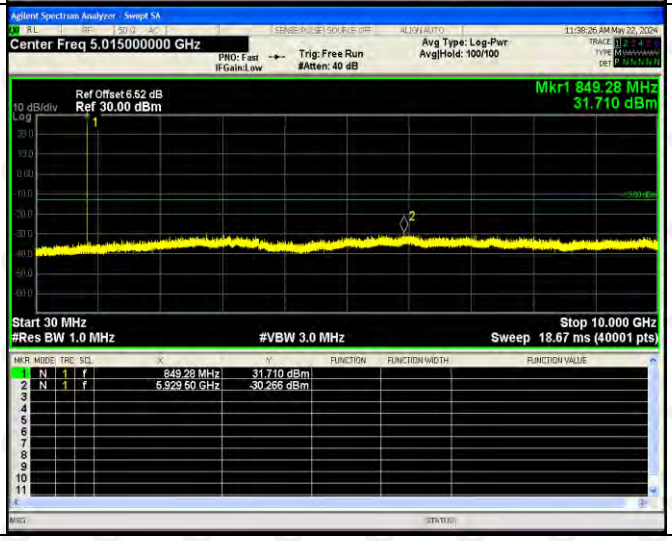
For Cellular Band

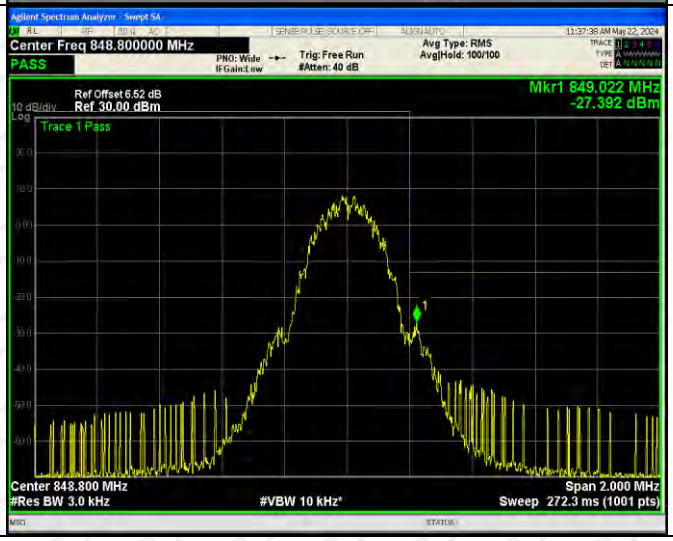
GSM Low Channel			
GSM Middle Channel			
GSM High Channel			

GSM Low Band Emission			
GSM High Band Emission			

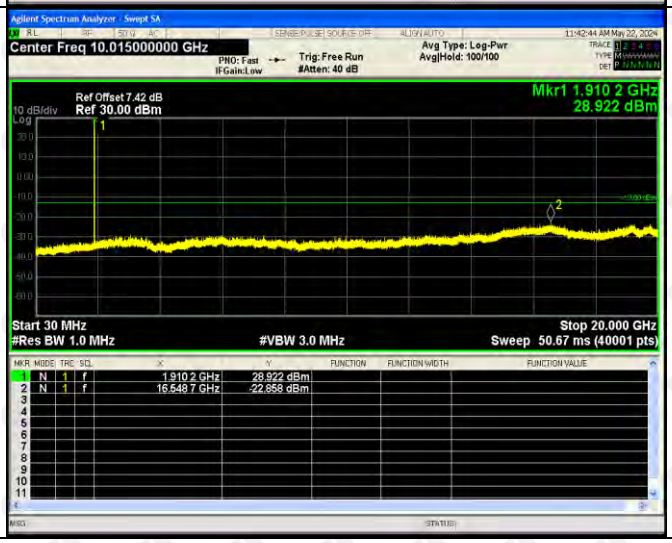
GPRS Low Channel			
GPRS Middle Channel			
GPRS High Channel			

GPRS Low Band Emission			
GPRS High Band Emission			

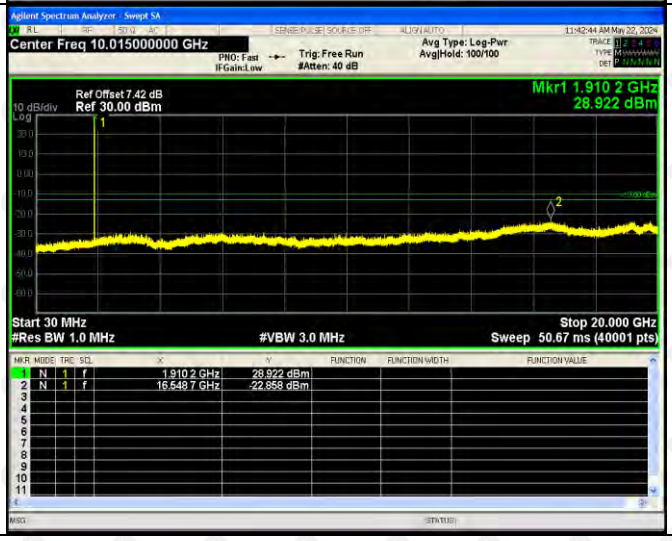
EDGE Low Channel			
EDGE Middle Channel			
EDGE High Channel			

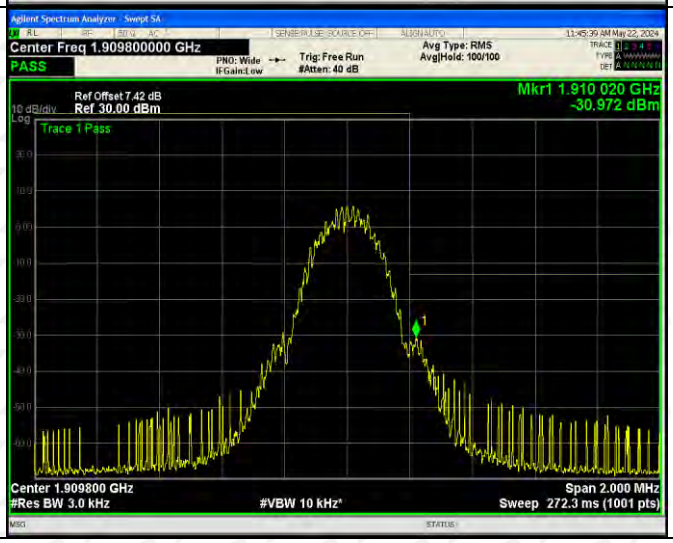
EDGE Low Band Emission			
EDGE High Band Emission			

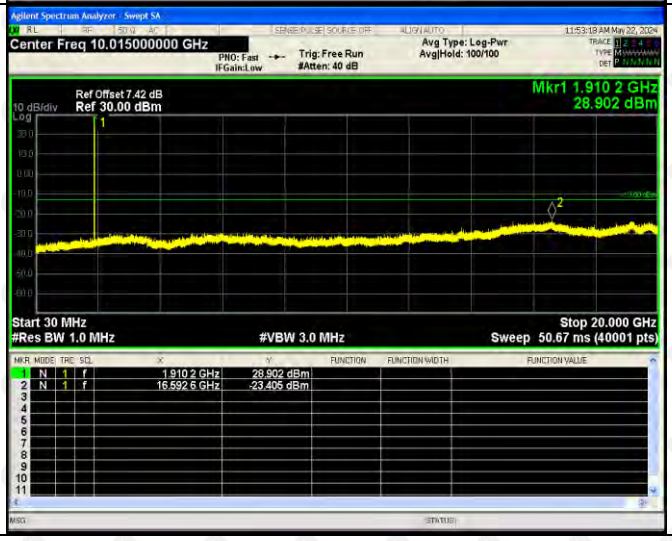
For PCS Band

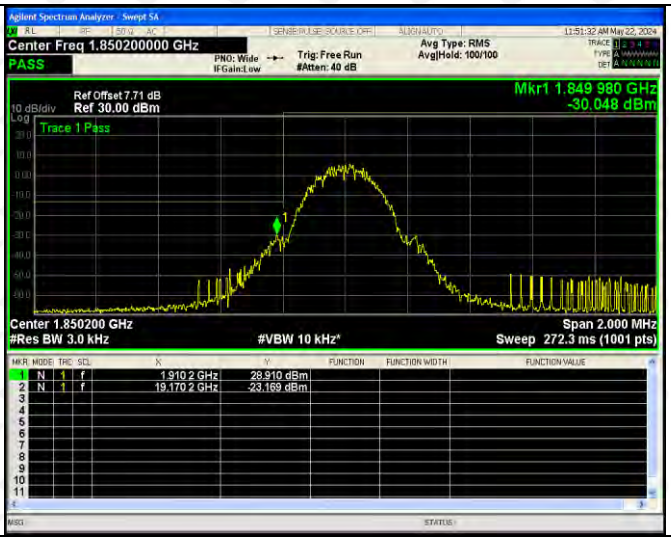
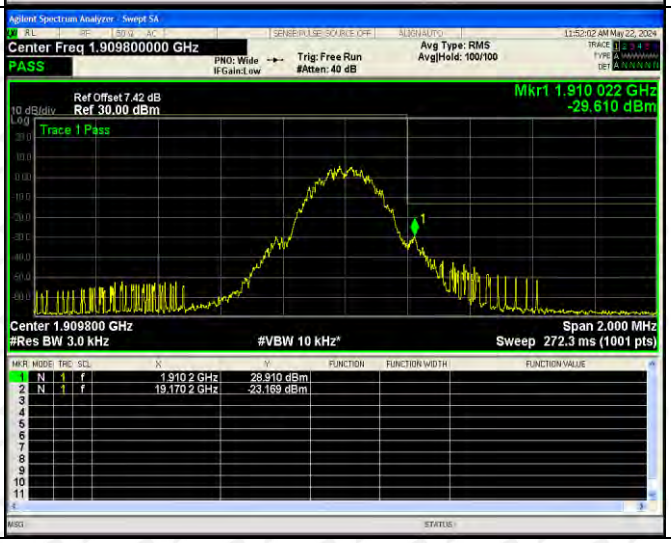
GSM Low Channel			
GSM Middle Channel			
GSM High Channel			

GSM Low Band Emission			
GSM High Band Emission			

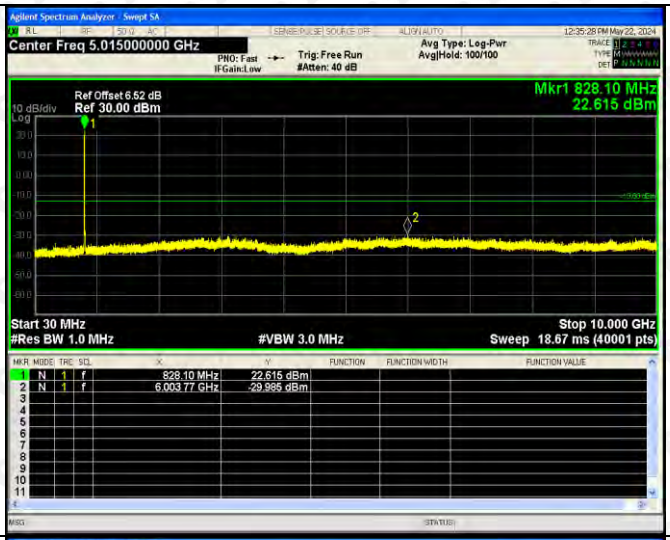
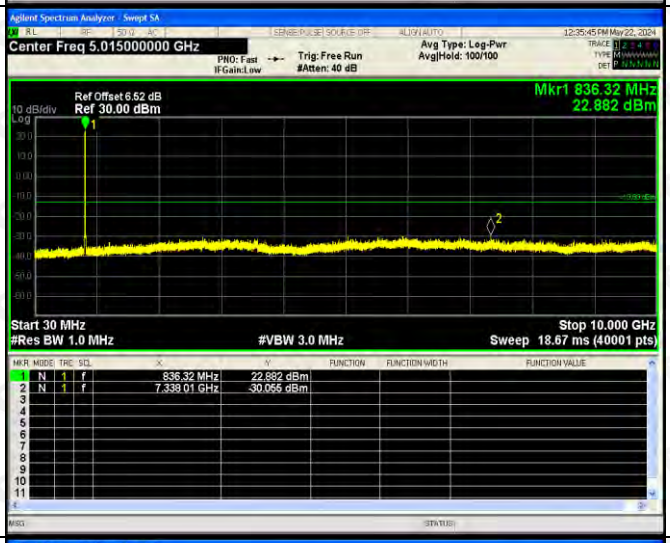
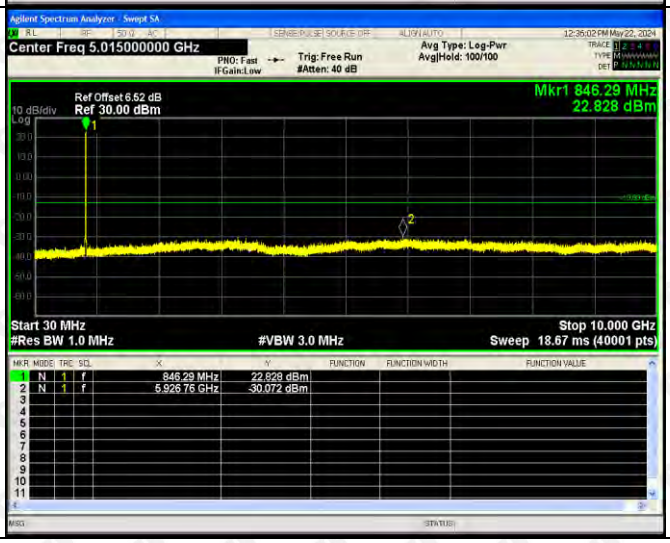
GPRS Low Channel			
GPRS Middle Channel			
GPRS High Channel			

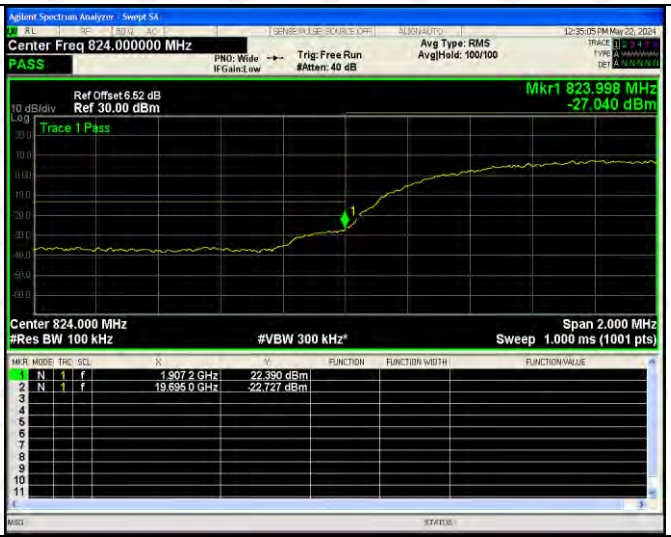
GPRS Low Band Emission			
GPRS High Band Emission			

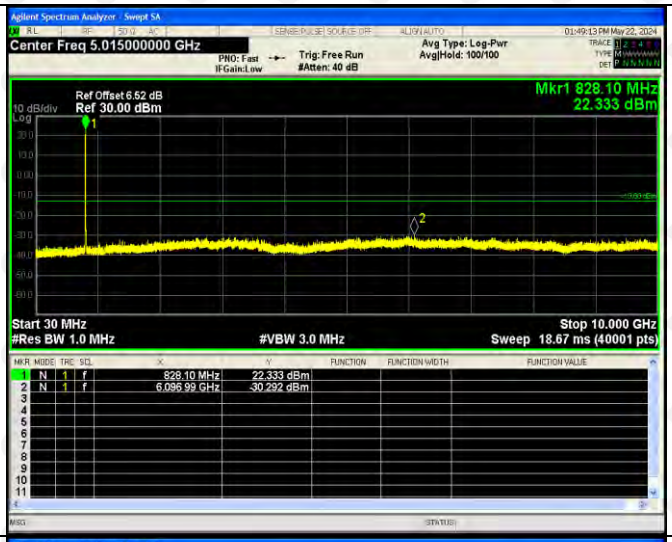
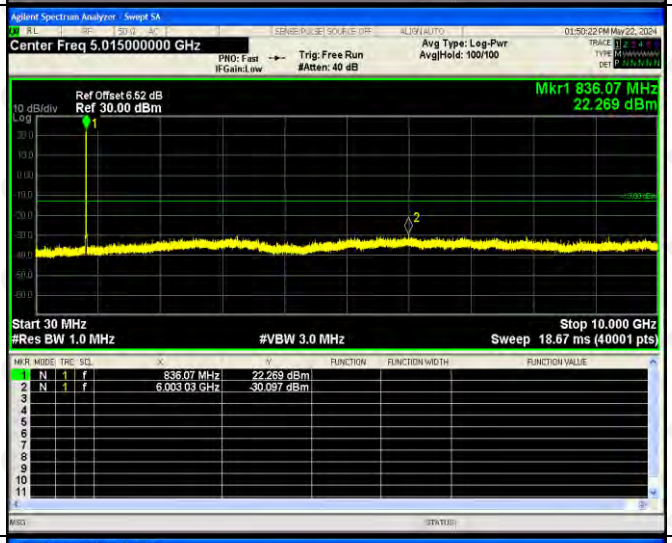
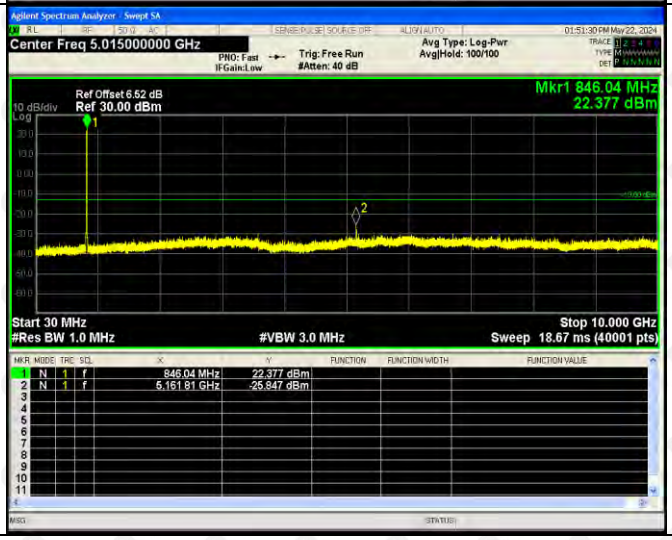
EDGE Low Channel			
EDGE Middle Channel			
EDGE High Channel			

EDGE Low Band Emission			
EDGE High Band Emission			

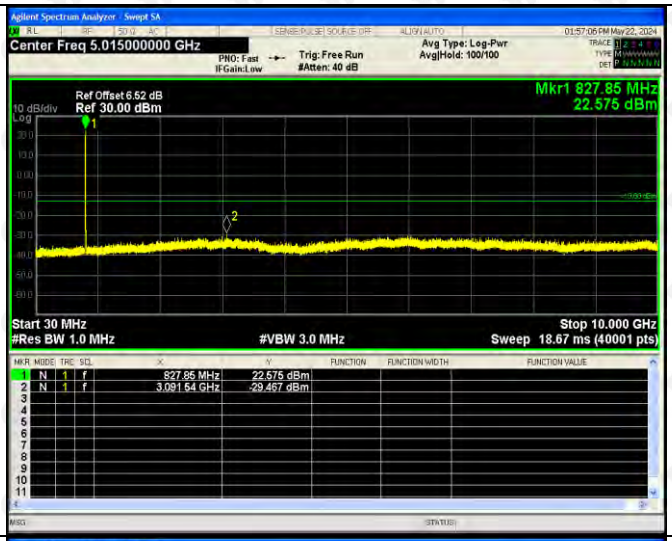
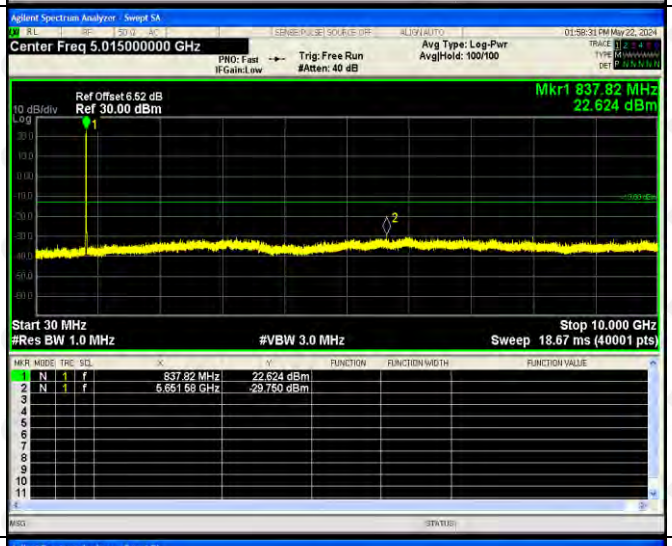
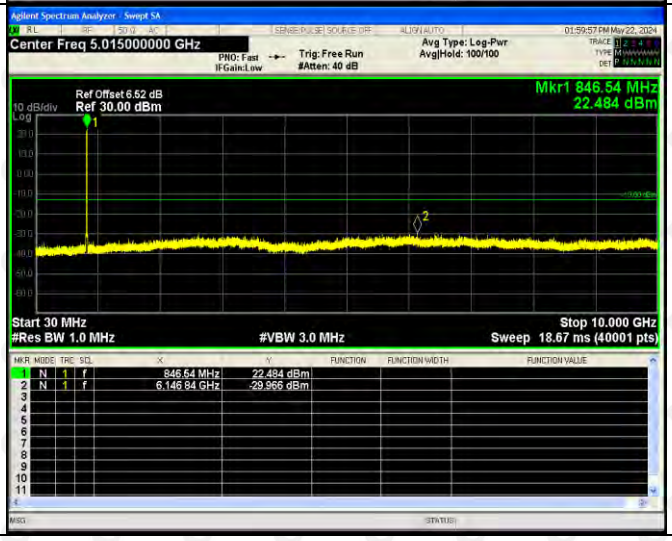
For Band V

WCDMA Low Channel			
WCDMA Middle Channel			
WCDMA High Channel			

WCDMA Low Band Spurious Emission			
WCDMA High Band Spurious Emission			

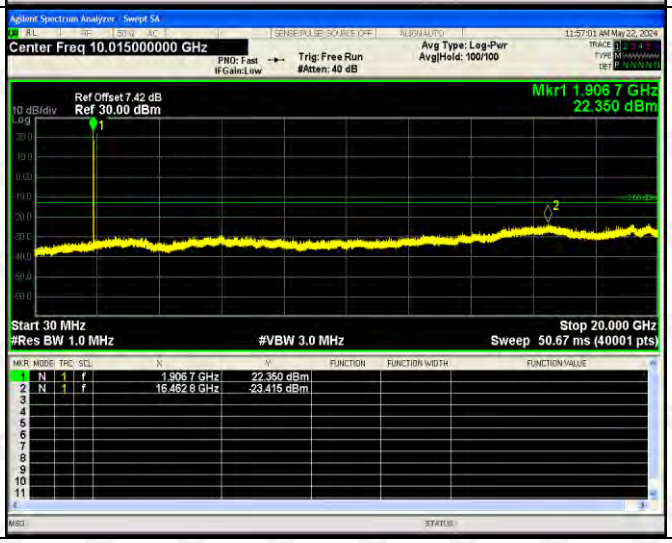
HSDPA Low Channel			
HSDPA Middle Channel			
HSDPA High Channel			

HSDPA Low Band Spurious Emission	
HSDPA High Band Spurious Emission	

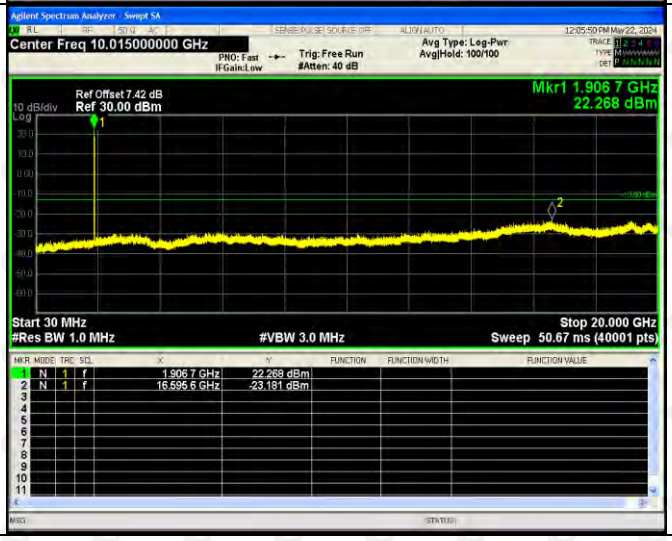
HSUPA Low Channel			
HSUPA Middle Channel			
HSUPA High Channel			

HSUPA Low Band Spurious Emission			
HSUPA High Band Spurious Emission			

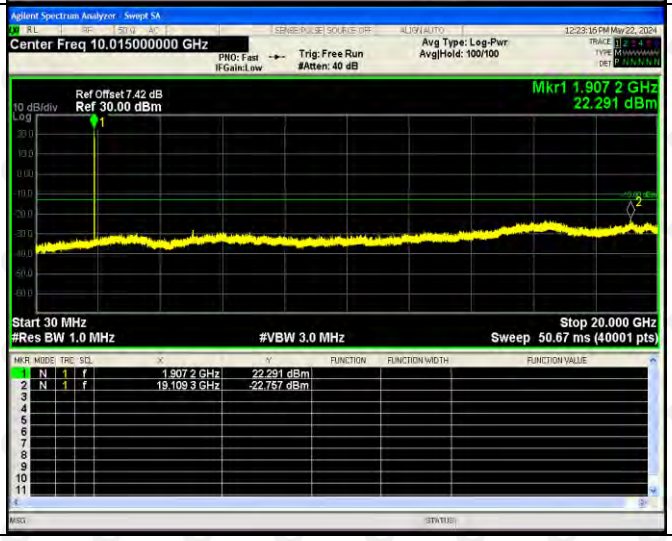
For Band II

WCDMA Low Channel			
WCDMA Middle Channel			
WCDMA High Channel			

WCDMA Low Band Spurious Emission			
WCDMA High Band Spurious Emission			

HSDPA Low Channel			
HSDPA Middle Channel			
HSDPA High Channel			

HSDPA Low Band Spurious Emission			
HSDPA High Band Spurious Emission			

HSUPA Low Channel			
HSUPA Middle Channel			
HSUPA High Channel			

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} (power out in Watts)

10.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	101 kPa
Test Voltage	DC6.4V

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)						
45.36	-73.14	3.9	-69.24	-13	-56.24	H
1647.91	-56.67	4.83	-51.84	-13	-38.84	H
2465.39	-53.85	8.08	-45.77	-13	-32.77	H
42.78	-75.00	4.02	-70.98	-13	-57.98	V
1646.51	-54.32	4.48	-49.84	-13	-36.84	V
2469.97	-48.01	8.2	-39.81	-13	-26.81	V
Middle Channel (836.6MHz)						
38.49	-72.31	3.84	-68.47	-13	-55.47	H
1670.82	-56.81	4.62	-52.19	-13	-39.19	H
2505.19	-54.84	8.25	-46.59	-13	-33.59	H
43.67	-73.32	4.25	-69.07	-13	-56.07	V
1666.21	-52.53	4.54	-47.99	-13	-34.99	V
2505.35	-50.34	8.35	-41.99	-13	-29.75	V
High Channel (848.8MHz)						
42.60	-66.69	4.22	-70.91	-13	-57.91	H
1697.51	-53.80	4.87	-58.67	-13	-45.67	H
2543.92	-57.30	8.38	-65.68	-13	-52.68	H
44.68	-70.49	4.02	-74.51	-13	-61.51	V
1688.84	-50.51	4.56	-55.07	-13	-42.07	V
2543.71	-56.12	8.41	-64.53	-13	-51.53	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)						
39.80	-69.68	4.34	-65.34	-13	-52.34	H
3694.85	-57.04	10.54	-46.50	-13	-33.50	H
5542.79	-58.07	13.37	-44.70	-13	-31.70	H
41.82	-71.31	4.34	-66.97	-13	-53.97	V
3696.01	-52.04	10.54	-41.50	-13	-28.50	V
5545.82	-54.81	13.37	-41.44	-13	-28.44	V
Middle Channel (1880MHz)						
42.37	-68.30	4.02	-64.28	-13	-51.28	H
3757.73	-58.59	10.71	-47.88	-13	-34.88	H
5634.59	-58.13	13.73	-44.40	-13	-31.40	H
43.78	-68.78	4.14	-64.64	-13	-51.64	V
3750.29	-51.38	10.22	-41.16	-13	-28.16	V
5639.37	-56.32	13.16	-43.16	-13	-30.16	V
High Channel (1909.8MHz)						
43.64	-72.58	4.02	-68.56	-13	-55.56	H
3818.92	-55.49	4.9	-50.59	-13	-37.59	H
5721.88	-45.19	8.09	-37.10	-13	-24.10	H
37.51	-56.47	4.25	-52.22	-13	-39.22	V
3818.97	-56.65	4.93	-51.72	-13	-38.72	V
5727.70	-59.92	8.43	-51.49	-13	-38.49	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
37.69	-71.19	3.91	-67.28	-13	-54.28	H
1647.37	-55.76	10.56	-45.20	-13	-32.20	H
2471.81	-56.04	13.5	-42.54	-13	-29.54	H
37.72	-74.39	3.93	-70.46	-13	-57.46	V
1649.78	-56.75	10.41	-46.34	-13	-33.34	V
2474.81	-53.54	13.16	-40.38	-13	-27.38	V
Middle Channel (836.6MHz)						
42.72	-70.33	4.02	-66.31	-13	-53.31	H
1667.28	-60.90	4.66	-56.24	-13	-43.24	H
2508.62	-41.82	8.34	-33.48	-13	-20.48	H
36.62	-54.80	4.17	-50.63	-13	-37.63	V
1663.85	-56.62	4.94	-51.68	-13	-38.68	V
2508.96	-59.81	8.19	-51.62	-13	-38.62	V
High Channel (846.6MHz)						
38.40	-74.27	3.87	-70.40	-13	-57.40	H
1684.84	-62.91	4.89	-58.02	-13	-45.02	H
2530.49	-42.77	8.42	-34.35	-13	-21.35	H
41.47	-59.15	3.95	-55.20	-13	-42.20	V
1691.66	-59.59	4.99	-54.60	-13	-41.60	V
2537.25	-65.05	8.12	-56.93	-13	-43.93	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
42.43	-69.71	3.91	-65.80	-13	-52.80	H
1645.46	-50.70	10.56	-40.14	-13	-27.14	H
2471.12	-56.08	13.5	-42.58	-13	-29.58	H
42.81	-71.34	3.93	-67.41	-13	-54.41	V
1652.78	-57.75	10.41	-47.34	-13	-34.34	V
2469.97	-53.48	13.16	-40.32	-13	-27.32	V
Middle Channel (1880MHz)						
40.19	-74.53	4.02	-70.51	-13	-57.51	H
1662.99	-60.25	4.66	-55.59	-13	-42.59	H
2503.73	-42.90	8.34	-34.56	-13	-21.56	H
40.12	-62.78	4.17	-58.61	-13	-45.61	V
1668.90	-56.77	4.94	-51.83	-13	-38.83	V
2508.31	-55.99	8.19	-47.80	-13	-34.80	V
High Channel (1907.6MHz)						
41.27	-66.02	4.02	-62.00	-13	-49.00	H
1689.38	-56.32	4.66	-51.66	-13	-38.66	H
2534.48	-43.47	8.34	-35.13	-13	-22.13	H
44.51	-58.56	4.17	-54.39	-13	-41.39	V
1690.73	-56.29	4.94	-51.35	-13	-38.35	V
2535.80	-56.02	8.19	-47.83	-13	-34.83	V

Note: Result=Reading+ Correct, Margin= Result- Limit
Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listedin 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	8.93	0.01067
40	NV	9.30	0.01112
30	NV	9.75	0.01165
20	NV	9.17	0.01096
10	NV	10.41	0.01244
0	NV	10.76	0.01286
-10	NV	10.16	0.01215
-20	NV	10.96	0.01310
-30	NV	10.99	0.01313

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	12.79	0.00680
40	NV	13.05	0.00694
30	NV	12.54	0.00667
20	NV	12.40	0.00660
10	NV	12.89	0.00686
0	NV	13.87	0.00738
-10	NV	13.60	0.00723
-20	NV	14.42	0.00767
-30	NV	14.90	0.00792

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	8.76	0.01047
40	NV	9.41	0.01125
30	NV	9.87	0.01179
20	NV	9.84	0.01177
10	NV	10.10	0.01207
0	NV	10.07	0.01204
-10	NV	10.70	0.01279
-20	NV	11.10	0.01327
-30	NV	11.35	0.01357

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	12.18	0.00648
40	NV	13.10	0.00697
30	NV	12.78	0.00680
20	NV	12.62	0.00671
10	NV	13.38	0.00712
0	NV	13.61	0.00724
-10	NV	14.21	0.00756
-20	NV	13.94	0.00741
-30	NV	14.22	0.00756

For Cellular Band EDGE 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	11.12	0.01330
40	NV	11.50	0.01374
30	NV	11.78	0.01408
20	NV	11.75	0.01404
10	NV	12.06	0.01442
0	NV	11.90	0.01422
-10	NV	12.48	0.01491
-20	NV	12.63	0.01510
-30	NV	13.18	0.01576

For PCS Band EDGE 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	-10.39	-0.00553
40	NV	-9.73	-0.00518
30	NV	-10.02	-0.00533
20	NV	-9.30	-0.00495
10	NV	-9.14	-0.00486
0	NV	-9.24	-0.00491
-10	NV	-9.07	-0.00482
-20	NV	-8.58	-0.00456
-30	NV	-8.19	-0.00436

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	0.43	0.00052
40	NV	0.24	0.00028
30	NV	-0.07	-0.00009
20	NV	0.29	0.00035
10	NV	0.37	0.00045
0	NV	0.42	0.00050
-10	NV	0.78	0.00093
-20	NV	0.80	0.00095
-30	NV	1.58	0.00189

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	-0.48	-0.00057
40	NV	-0.32	-0.00038
30	NV	0.37	0.00044
20	NV	0.59	0.00070
10	NV	0.83	0.00099
0	NV	0.54	0.00065
-10	NV	1.35	0.00162
-20	NV	1.66	0.00198
-30	NV	1.49	0.00178

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	0.28	0.00034
40	NV	0.60	0.00072
30	NV	0.70	0.00084
20	NV	0.58	0.00069
10	NV	1.01	0.00121
0	NV	2.02	0.00241
-10	NV	2.04	0.00243
-20	NV	1.61	0.00193
-30	NV	2.47	0.00295

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	4.74	0.00252
40	NV	4.91	0.00261
30	NV	5.63	0.00299
20	NV	5.86	0.00312
10	NV	5.92	0.00315
0	NV	6.87	0.00365
-10	NV	6.88	0.00366
-20	NV	6.49	0.00345
-30	NV	6.51	0.00346

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	0.89	0.00047
40	NV	0.35	0.00018
30	NV	0.40	0.00021
20	NV	1.01	0.00054
10	NV	1.49	0.00079
0	NV	1.90	0.00101
-10	NV	1.96	0.00104
-20	NV	2.47	0.00131
-30	NV	2.88	0.00153

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	6.37	0.00339
40	NV	6.86	0.00365
30	NV	7.40	0.00393
20	NV	7.63	0.00406
10	NV	7.11	0.00378
0	NV	8.48	0.00451
-10	NV	8.06	0.00429
-20	NV	8.72	0.00464
-30	NV	8.42	0.00448

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	11.36	0.01358
	NV	10.96	0.01310
	HV	11.83	0.01415
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	14.54	0.00774
	NV	14.60	0.00777
	HV	14.78	0.00786

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	10.96	0.01310
	NV	11.78	0.01408
	HV	11.63	0.01390
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	14.48	0.00770
	NV	14.48	0.00770
	HV	14.37	0.00764

Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	12.42	0.01485
	NV	12.70	0.01518
	HV	13.47	0.01611
Reference Frequency(Middle Channel): EDGE 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	-7.73	-0.00411
	NV	-7.76	-0.00413
	HV	-7.21	-0.00384
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	1.03	0.00123
	NV	1.48	0.00177
	HV	1.46	0.00175
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	1.60	0.00092
	NV	0.43	0.00025
	HV	1.20	0.00069
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	2.41	0.00128
	NV	2.06	0.00109
	HV	3.36	0.00179

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	2.06	0.00246
	NV	2.22	0.00265
	HV	2.40	0.00287
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	6.02	0.00347
	NV	5.83	0.00336
	HV	6.24	0.00360
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	6.41	0.00341
	NV	6.83	0.00364
	HV	6.92	0.00368
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	2.26	0.00270
	NV	2.68	0.00321
	HV	2.83	0.00338
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	5.80	0.00335
	NV	5.61	0.00324
	HV	6.34	0.00366

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	8.52	0.00453
	NV	8.83	0.00470
	HV	9.40	0.00500

12. EUT TEST PHOTO

Radiated Emission

Below 1G

Above 1G

※※※※※ **END OF REPORT** ※※※※※