



TEST REPORT

Product Name: Smart phone
FCC ID: 2ANMU-WP38
Trademark: OUKITEL
Model Number: WP38, WP38 S, WP38 Pro, WP38 Ultra
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Sample Received Date: Dec. 21, 2023
Sample tested Date: Dec. 21, 2023 to Feb. 23, 2024
Issue Date: Feb. 23, 2024
Report No.: CTB240222007RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

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Reviewed by:

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Approved by:



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.

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB240222007RFX	Feb. 23, 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

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 chamber 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):	WP38, WP38 S, WP38 Pro, WP38 Ultra
Model Description:	All the model are the same circuit and RF module, only different for model name .Test sample model: WP38
Hardware Version:	E358_MAIN_PCB_V1.0
Software Version:	OUKITELE_WP38_EEA_V03
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: 32.93dBm GSM1900: 29.85dBm WCDMA Band 2: 22.89dBm WCDMA Band 5: 23.09dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: -2.33dBi GSM1900: -1.02dBi WCDMA Band 2: -1.02dBi WCDMA Band 5: -2.33dBi
Ratings:	DC 5V charging from adapter DC 3.7V from 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

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):	3.7
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, 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

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

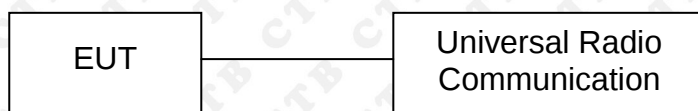
6.1 Standard Applicable

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	31.96	1.5	0	H	1.5	1	31.46	38.45
824.2	31.95	1.5	0	V	1.5	1	31.45	38.45
Middle Channel								
836.6	31.74	1.5	0	H	1.5	1	31.24	38.45
836.6	31.79	1.5	0	V	1.5	1	31.29	38.45
High Channel								
848.8	31.93	1.5	0	H	1.5	1	31.43	38.45
848.8	32.31	1.5	0	V	1.5	1	31.81	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	29.29	1.5	0	H	1.9	1	28.39	33
1850.2	28.65	1.5	0	V	1.9	1	27.75	33
Middle Channel								
1880	29.59	1.5	0	H	1.9	1	28.69	33
1880	29.24	1.5	0	V	1.9	1	28.34	33
High Channel								
1909.8	29.22	1.5	0	H	1.9	1	28.32	33
1909.8	29.39	1.5	0	V	1.9	1	28.49	33



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	32.16	1.5	0	H	1.5	1	31.66	38.45
824.2	32.75	1.5	0	V	1.5	1	32.25	38.45
Middle Channel								
836.6	31.85	1.5	0	H	1.5	1	31.35	38.45
836.6	31.90	1.5	0	V	1.5	1	31.40	38.45
High Channel								
848.8	31.98	1.5	0	H	1.5	1	31.48	38.45
848.8	32.34	1.5	0	V	1.5	1	31.84	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	28.61	1.5	0	H	1.9	1	27.71	33
1850.2	28.86	1.5	0	V	1.9	1	27.96	33
Middle Channel								
1880	29.20	1.5	0	H	1.9	1	28.30	33
1880	29.09	1.5	0	V	1.9	1	28.19	33
High Channel								
1909.8	29.01	1.5	0	H	1.9	1	28.11	33
1909.8	29.03	1.5	0	V	1.9	1	28.13	33



ERP For EDGE 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	25.95	1.5	0	H	1.5	1	25.45	38.45
824.2	25.62	1.5	0	V	1.5	1	25.12	38.45
Middle Channel								
836.6	25.33	1.5	0	H	1.5	1	24.83	38.45
836.6	25.29	1.5	0	V	1.5	1	24.79	38.45
High Channel								
848.8	25.31	1.5	0	H	1.5	1	24.81	38.45
848.8	25.47	1.5	0	V	1.5	1	24.97	38.45

EIRP For EDGE 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	25.67	1.5	0	H	1.9	1	24.77	33
1850.2	25.73	1.5	0	V	1.9	1	24.83	33
Middle Channel								
1880	25.82	1.5	0	H	1.9	1	24.92	33
1880	25.73	1.5	0	V	1.9	1	24.83	33
High Channel								
1909.8	25.27	1.5	0	H	1.9	1	24.37	33
1909.8	25.09	1.5	0	V	1.9	1	24.19	33

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	22.57	1.5	0	H	1.5	1	22.07	38.45
826.4	23.01	1.5	0	V	1.5	1	22.51	38.45
Middle Channel								
836.6	22.92	1.5	0	H	1.5	1	22.42	38.45
836.6	22.08	1.5	0	V	1.5	1	21.58	38.45
High Channel								
846.6	22.34	1.5	0	H	1.5	1	21.84	38.45
846.6	22.30	1.5	0	V	1.5	1	21.80	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	22.12	1.5	0	H	1.5	1	21.62	38.45
826.4	21.94	1.5	0	V	1.5	1	21.44	38.45
Middle Channel								
836.6	21.76	1.5	0	H	1.5	1	21.26	38.45
836.6	21.35	1.5	0	V	1.5	1	20.85	38.45
High Channel								
846.6	21.35	1.5	0	H	1.5	1	20.85	38.45
846.6	21.35	1.5	0	H	1.5	1	20.85	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	20.51	1.5	0	H	1.5	1	20.01	38.45
826.4	20.61	1.5	0	V	1.5	1	20.11	38.45
Middle Channel								
836.6	21.18	1.5	0	H	1.5	1	20.68	38.45
836.6	21.84	1.5	0	V	1.5	1	21.34	38.45
High Channel								
846.6	21.21	1.5	0	H	1.5	1	20.71	38.45
846.6	20.98	1.5	0	V	1.5	1	20.48	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	22.68	1.5	0	H	1.9	1	21.78	33
1852.4	21.98	1.5	0	V	1.9	1	21.08	33
Middle Channel								
1880	23.50	1.5	0	H	1.9	1	22.60	33
1880	22.54	1.5	0	V	1.9	1	21.64	33
High Channel								
1907.6	21.96	1.5	0	H	1.9	1	21.06	33
1907.6	21.96	1.5	0	V	1.9	1	21.06	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	22.52	1.5	0	H	1.9	1	21.62	33
1852.4	22.75	1.5	0	V	1.9	1	21.85	33
Middle Channel								
1880	22.27	1.5	0	H	1.9	1	21.37	33
1880	21.55	1.5	0	V	1.9	1	20.65	33
High Channel								
1907.6	20.78	1.5	0	H	1.9	1	19.88	33
1907.6	20.98	1.5	0	V	1.9	1	20.08	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	21.04	1.5	0	H	1.9	1	20.14	33
1852.4	22.02	1.5	0	V	1.9	1	21.12	33
Middle Channel								
1880	22.35	1.5	0	H	1.9	1	21.45	33
1880	22.22	1.5	0	V	1.9	1	21.32	33
High Channel								
1907.6	20.69	1.5	0	H	1.9	1	19.79	33
1907.6	22.06	1.5	0	V	1.9	1	21.16	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	32.92	38.45
	Middle Channel	836.6	32.70	38.45
	High Channel	848.8	32.93	38.45
GPRS(1 Slot)	Low Channel	824.2	32.91	38.45
	Middle Channel	836.6	32.67	38.45
	High Channel	848.8	32.91	38.45
EDGE(1 Slot)	Low Channel	824.2	26.03	38.45
	Middle Channel	836.6	25.34	38.45
	High Channel	848.8	25.65	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	29.56	33.0
	Middle Channel	1880.0	29.85	33.0
	High Channel	1909.8	29.63	33.0
GPRS(1 Slot)	Low Channel	1850.2	29.55	33.0
	Middle Channel	1880.0	29.85	33.0
	High Channel	1909.8	29.61	33.0
EDGE(1 Slot)	Low Channel	1850.2	25.89	33.0
	Middle Channel	1880.0	26.47	33.0
	High Channel	1909.8	25.38	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	23.09	38.45
	Middle Channel	836.6	23.01	38.45
	High Channel	846.6	23.07	38.45
HSDPA	Low Channel	826.4	22.14	38.45
	Middle Channel	836.6	22.07	38.45
	High Channel	846.6	22.13	38.45
HSUPA	Low Channel	826.4	21.08	38.45
	Middle Channel	836.6	21.89	38.45
	High Channel	846.6	21.84	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	22.89	33.00
	Middle Channel	1880.0	22.87	33.00
	High Channel	1907.6	22.63	33.00
HSDPA	Low Channel	1852.4	21.92	33.00
	Middle Channel	1880.0	21.94	33.00
	High Channel	1907.6	21.67	33.00
HSUPA	Low Channel	1852.4	21.35	33.00
	Middle Channel	1880.0	21.76	33.00
	High Channel	1907.6	21.47	33.00

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

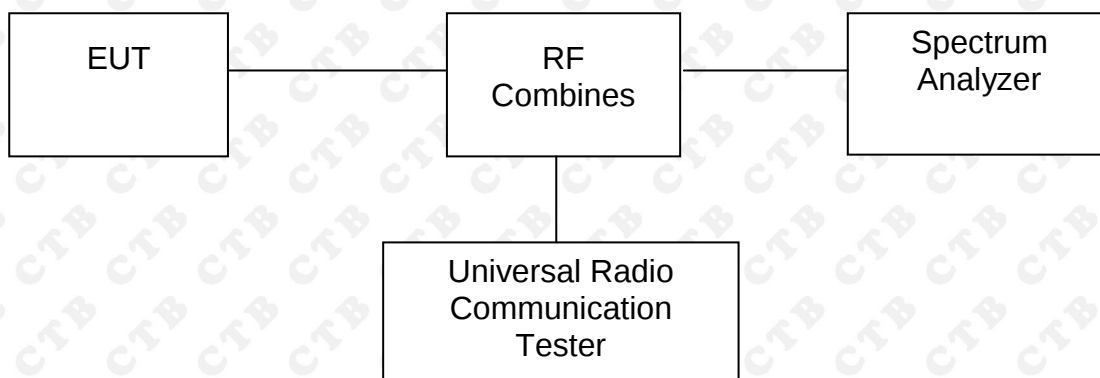
7.1 Standard Applicable

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	2.68	13
GPRS(1 Slot)	190	836.6	2.71	13
EDGE(1 Slot)	190	836.6	9.58	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.65	13
GPRS(1 Slot)	512	1850.2	2.68	13
EDGE(1 Slot)	512	1850.2	6.29	13

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.98	13
HSDPA	4182	836.4	3.07	13
HSUPA	4182	836.4	3.39	13

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1880	2.98	13
HSDPA	9400	1880	3.06	13
HSUPA	9400	1880	3.48	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

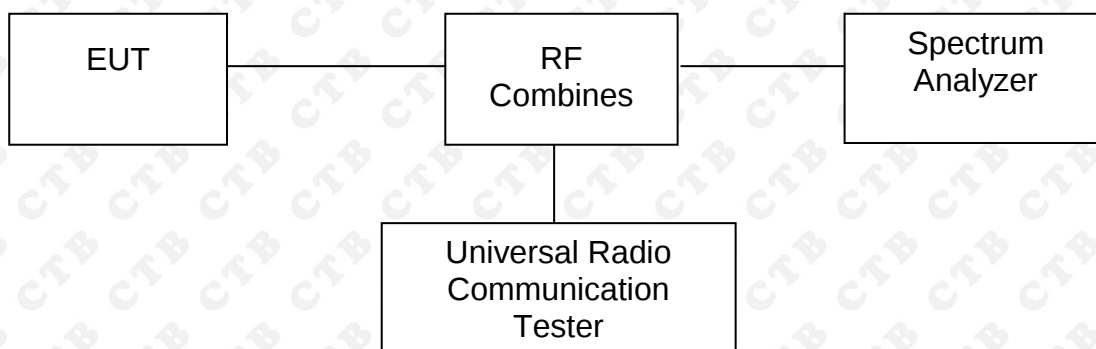
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	246.677	311.450
	190	836.6	246.301	318.898
	251	848.8	246.369	319.934
GPRS	128	824.2	251.347	327.691
	190	836.6	249.269	314.202
	251	848.8	244.727	317.894
EDGE	128	824.2	248.737	300.137
	190	836.6	246.625	308.714
	251	848.8	252.692	330.209

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	243.317	316.494
	661	1880.0	250.993	322.371
	810	1909.8	240.312	313.169
GPRS	512	1850.2	240.762	312.025
	661	1880.0	246.893	307.735
	810	1909.8	248.946	327.640
EDGE	512	1850.2	247.298	318.347
	661	1880.0	247.598	315.453
	810	1909.8	247.723	313.895

For Band 5

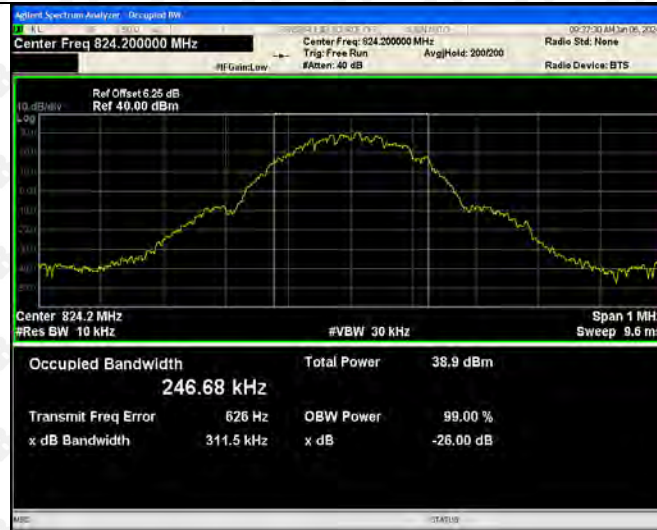
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4185.718	4719.698
	4183	836.6	4185.420	4715.627
	4233	846.6	4171.092	4719.124
HSDPA	4132	826.4	4206.320	4689.311
	4183	836.6	4164.580	4692.731
	4233	846.6	4183.195	4705.642
HSUPA	4132	826.4	4193.433	4718.457
	4183	836.6	4181.511	4701.214
	4233	846.6	4179.916	4700.148

For Band 2

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4185.393	4694.941
	9400	1880.0	4171.711	4713.051
	9538	1907.6	4143.209	4710.217
HSDPA	9262	1852.4	4170.005	4706.787
	9400	1880.0	4162.059	4712.840
	9538	1907.6	4177.480	4694.907
HSUPA	9262	1852.4	4192.970	4732.464
	9400	1880.0	4189.310	4700.876
	9538	1907.6	4160.196	4683.713

For Cellular Band

GSM Low Channel



GPRS Middle Channel



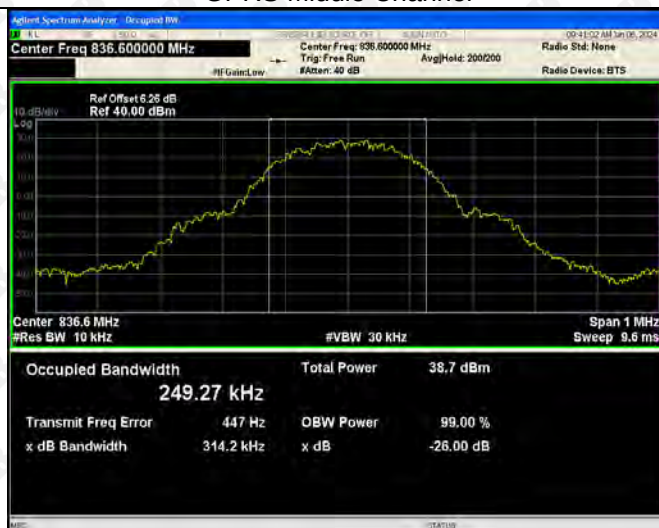
GPRS High Channel



GPRS Low Channel



GPRS Middle Channel



GPRS High Channel



EDGE Low Channel



EDGE Middle Channel



EDGE High Channel



For PCS Band



GPRS Low Channel



GPRS Middle Channel



GPRS High Channel



EDGE Low Channel



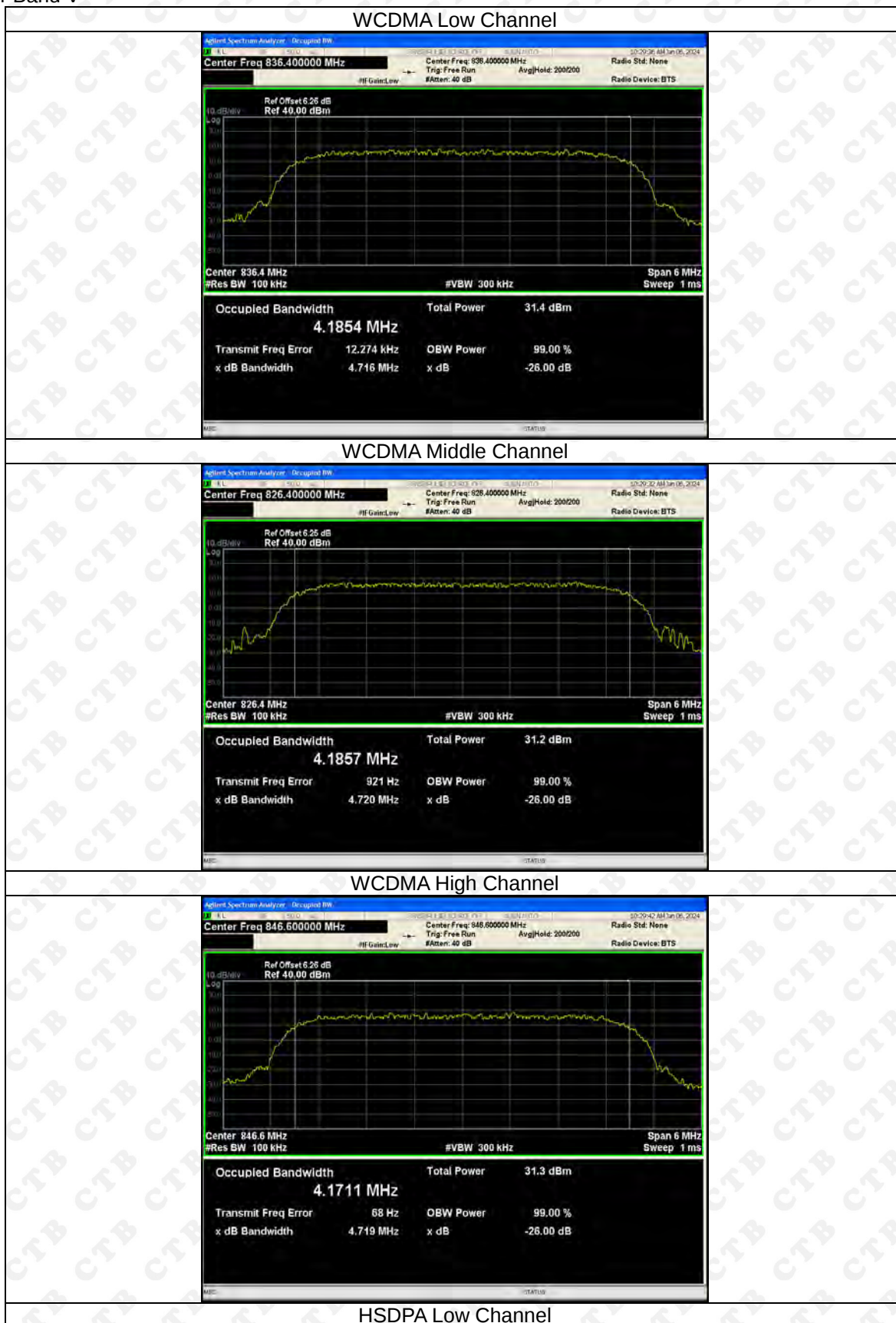
EDGE Middle Channel



EDGE High Channel

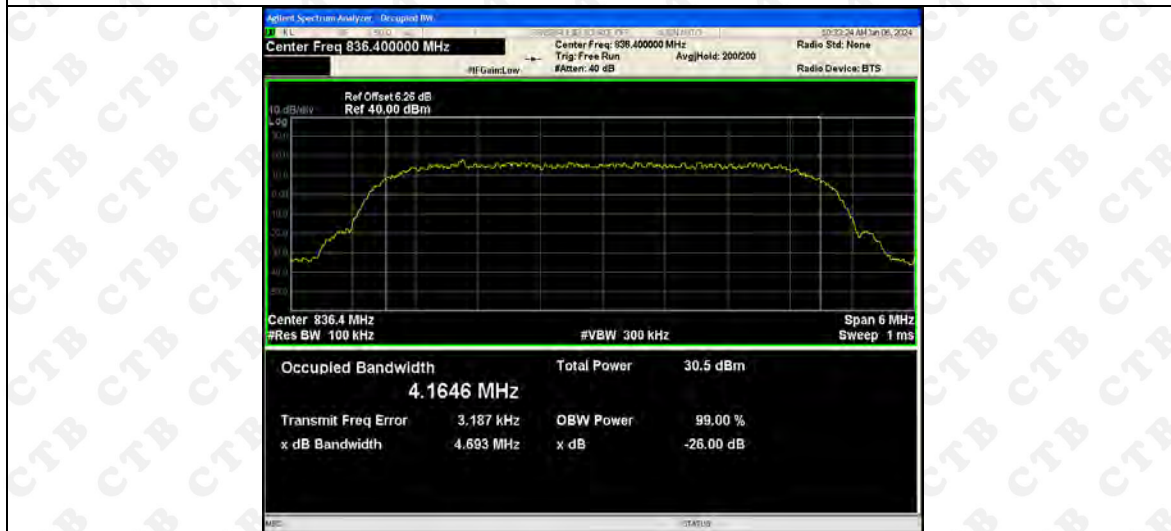


For Band V

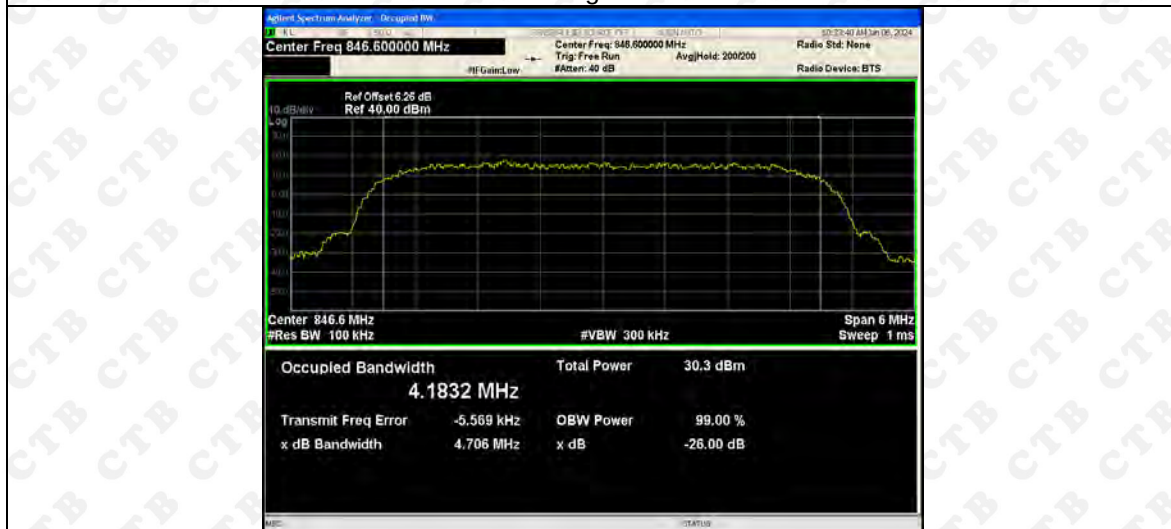




HSDPA Middle Channel



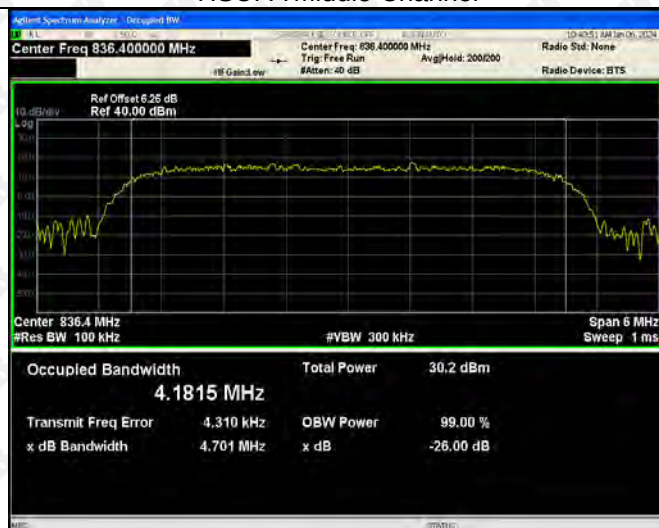
HSDPA High Channel



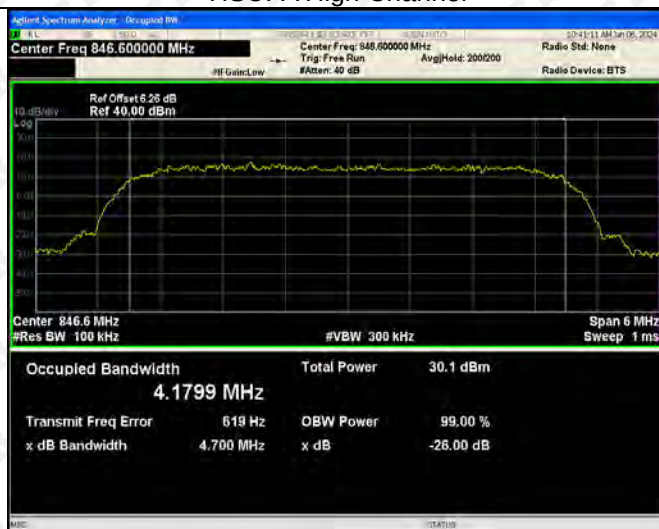
HSUPA Low Channel



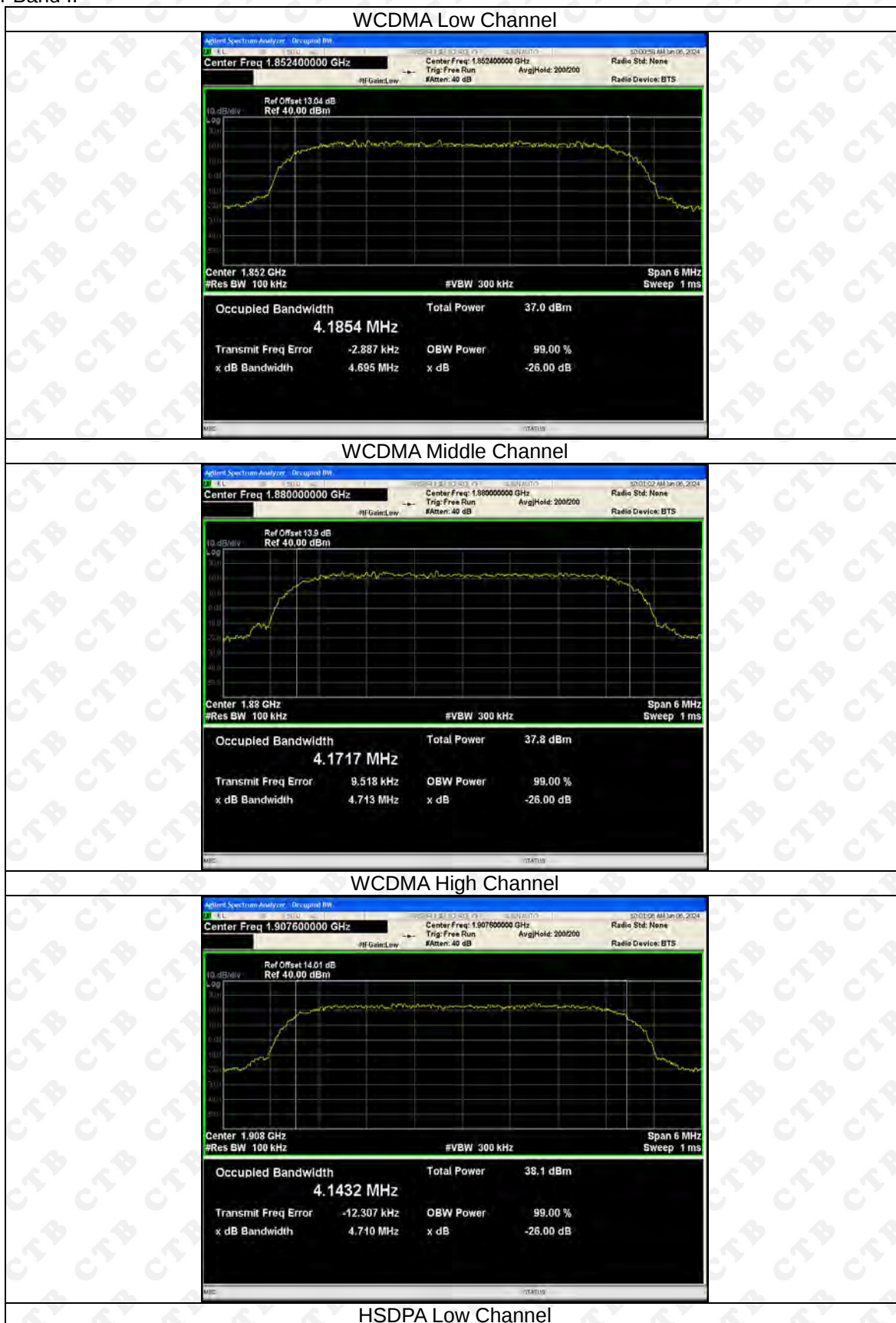
HSUPA Middle Channel

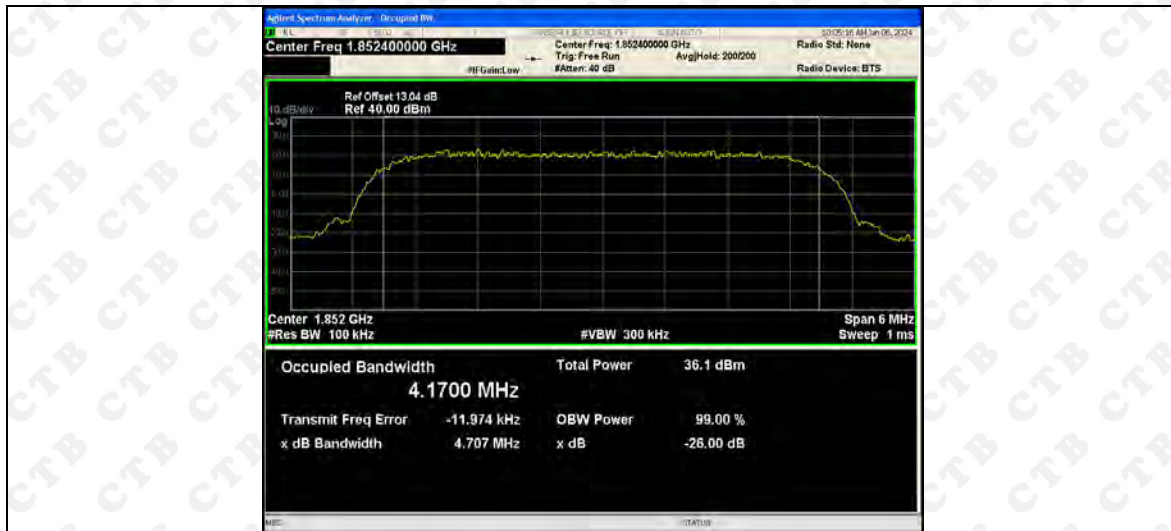


HSUPA High Channel



For Band II

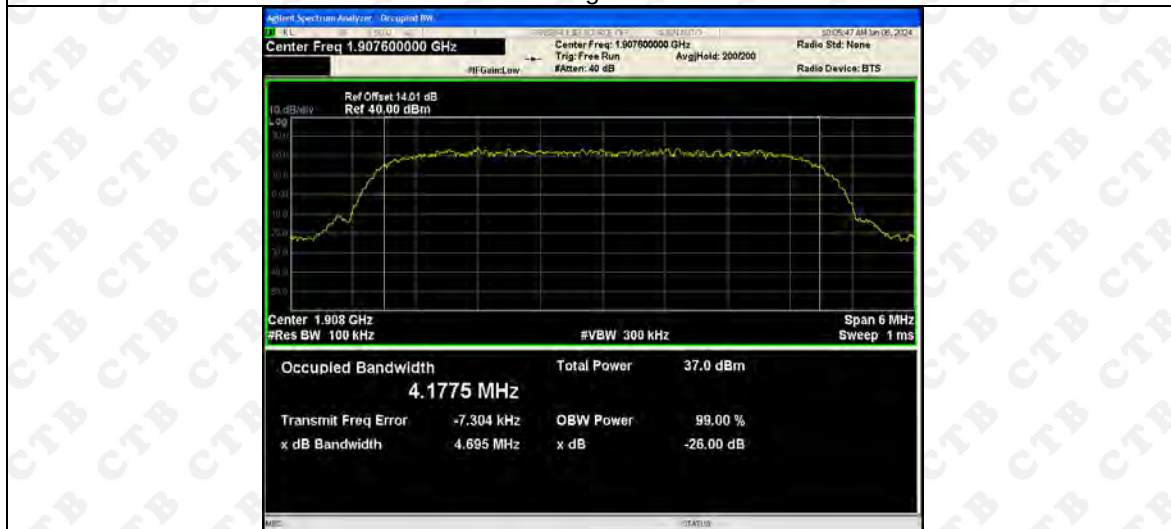




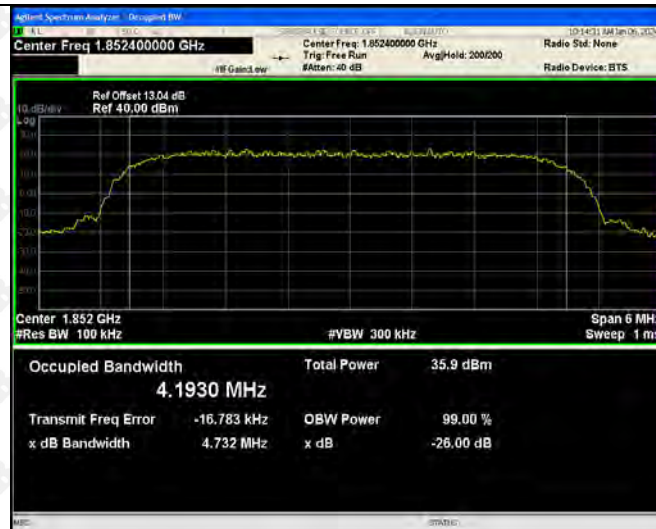
HSDPA Middle Channel



HSDPA High Channel



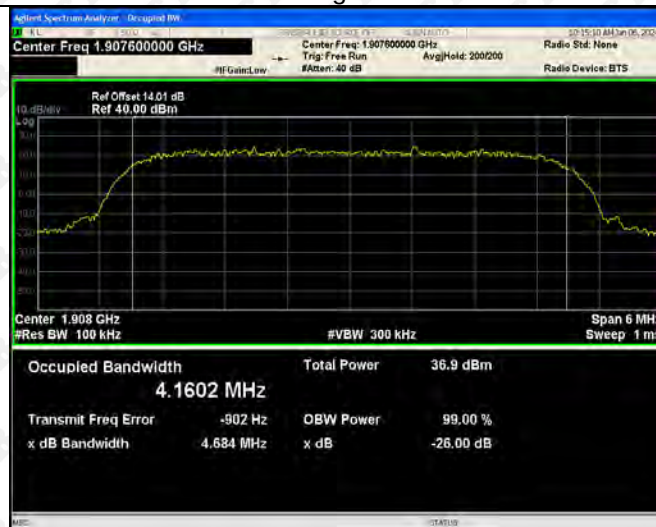
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

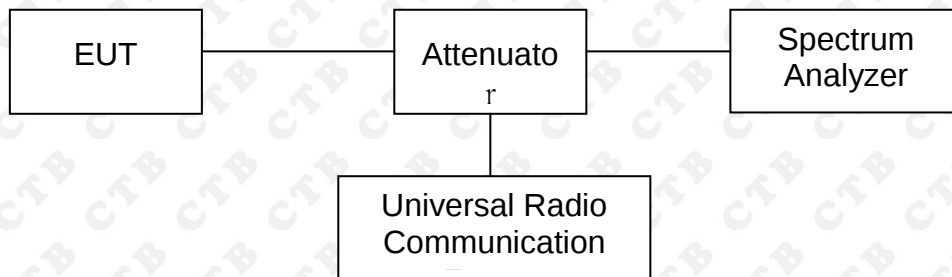
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:

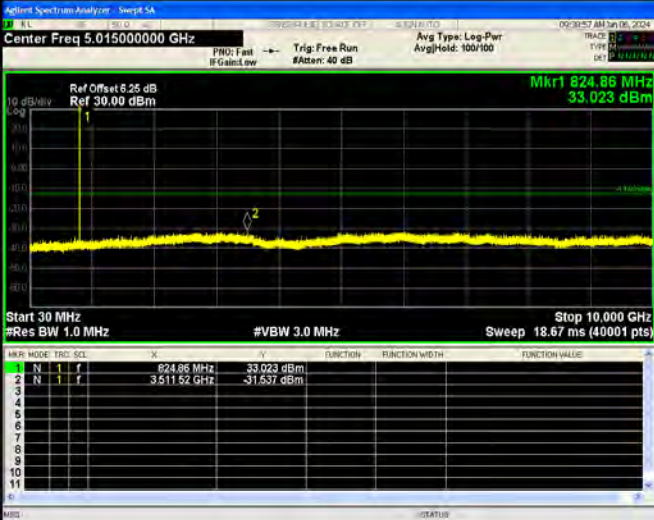
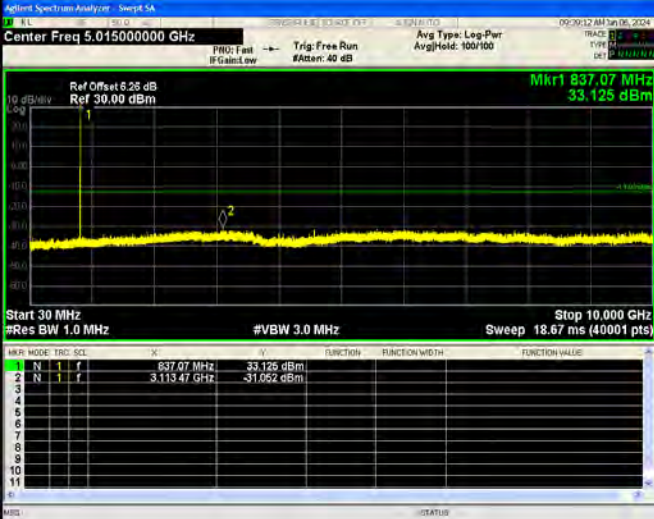
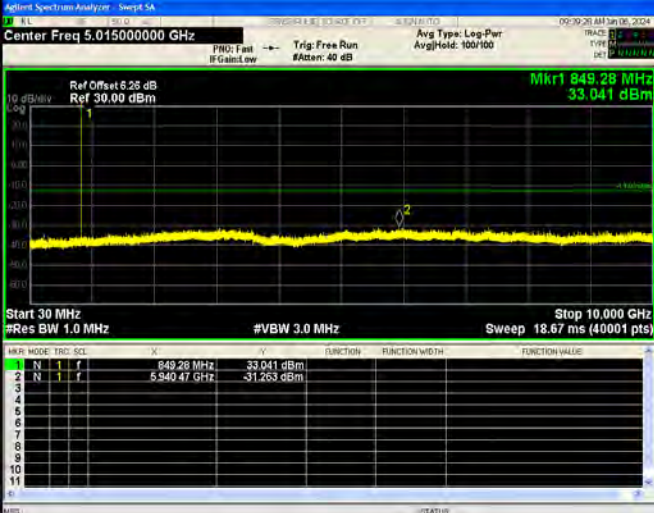


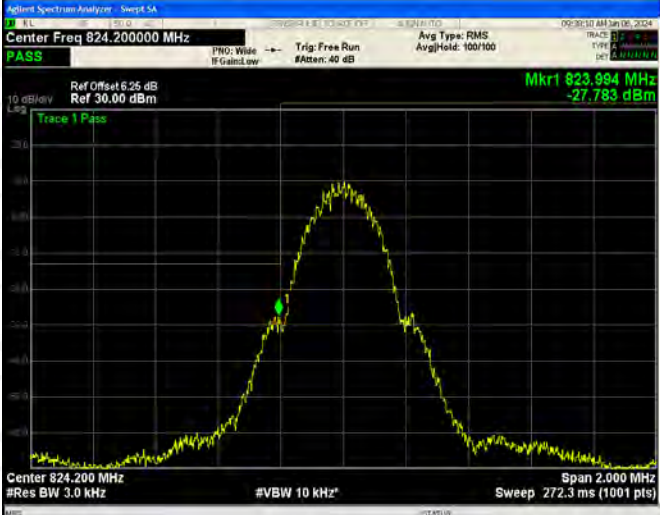
9.3 Environmental Conditions

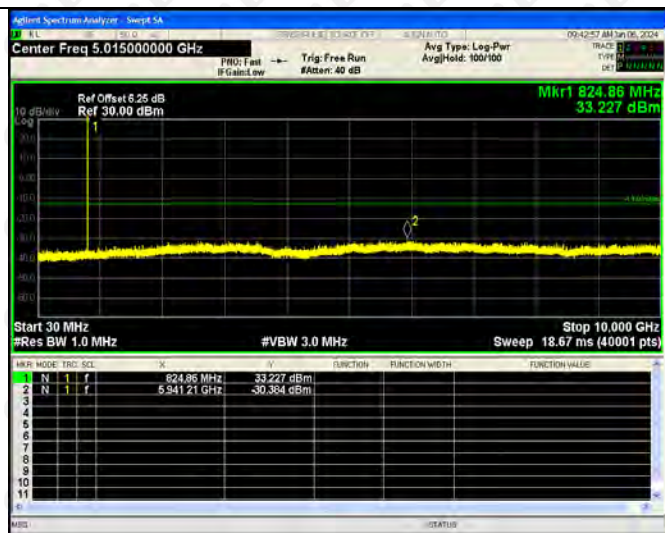
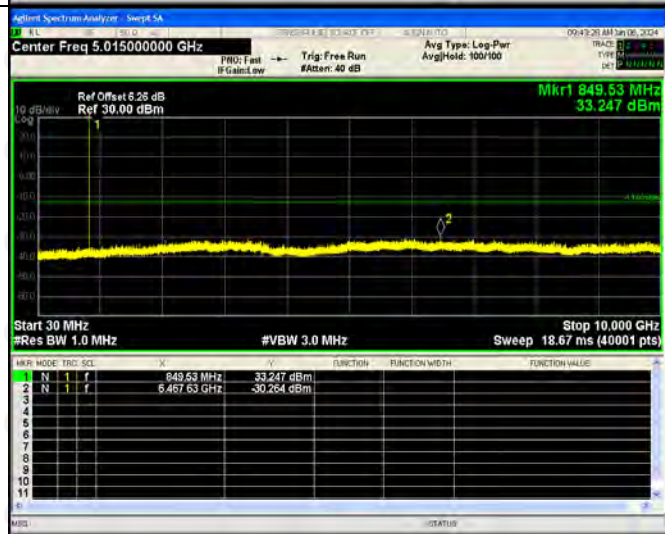
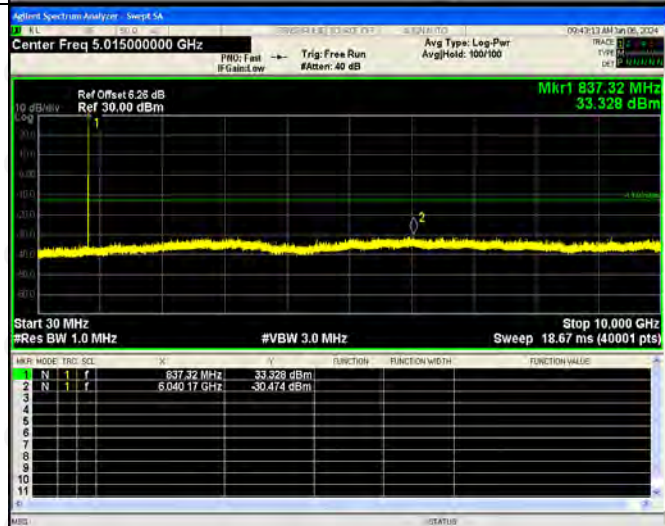
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

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	

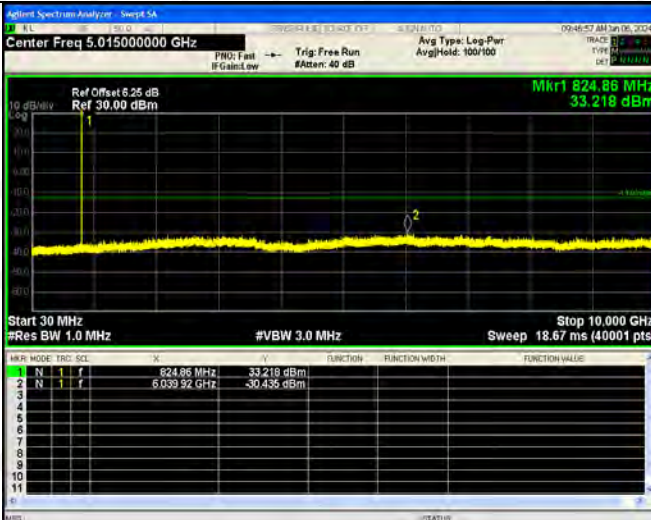
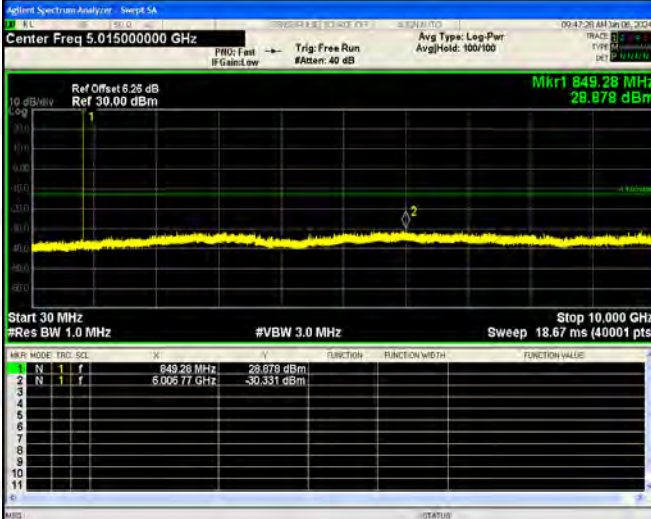
GPRS Low Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 824.86 MHz 33.227 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</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>824.86 MHz</td><td>33.227 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.94121 GHz</td><td>-30.384 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	824.86 MHz	33.227 dBm				2	N	1	f	5.94121 GHz	-30.384 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	824.86 MHz	33.227 dBm																								
2	N	1	f	5.94121 GHz	-30.384 dBm																								
GPRS Middle Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 849.53 MHz 33.247 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>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>849.53 MHz</td><td>33.247 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.46763 GHz</td><td>-30.264 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	849.53 MHz	33.247 dBm				2	N	1	f	5.46763 GHz	-30.264 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	849.53 MHz	33.247 dBm																								
2	N	1	f	5.46763 GHz	-30.264 dBm																								
GPRS High Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 837.32 MHz 33.328 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>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>837.32 MHz</td><td>33.328 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.04017 GHz</td><td>-30.474 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	837.32 MHz	33.328 dBm				2	N	1	f	6.04017 GHz	-30.474 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	837.32 MHz	33.328 dBm																								
2	N	1	f	6.04017 GHz	-30.474 dBm																								

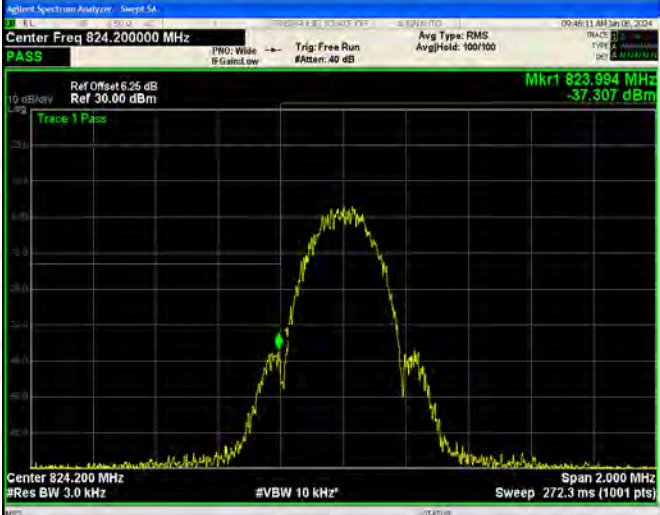
GPRS
Low
Band
Emission



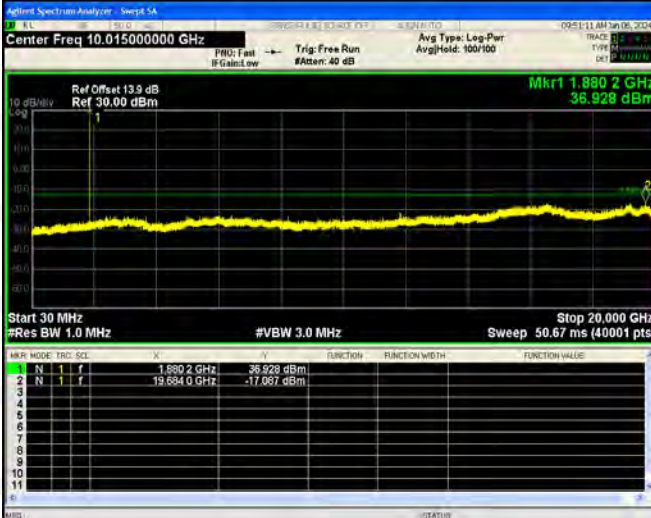
GPRS
High
Band
Emission



EDGE Low Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 824.86 MHz 33.218 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>MARK</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>F</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>824.86 MHz</td><td>33.218 dBm</td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.039 92 GHz</td><td>-30.436 dBm</td><td></td><td></td></tr></table>	MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.86 MHz	33.218 dBm			2	N	1	f	6.039 92 GHz	-30.436 dBm			
MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																			
1	N	1	f	824.86 MHz	33.218 dBm																					
2	N	1	f	6.039 92 GHz	-30.436 dBm																					
EDGE Middle Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 837.32 MHz 33.320 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>MARK</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>F</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>837.32 MHz</td><td>33.320 dBm</td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.929 00 GHz</td><td>-30.172 dBm</td><td></td><td></td></tr></table>	MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.32 MHz	33.320 dBm			2	N	1	f	5.929 00 GHz	-30.172 dBm			
MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																			
1	N	1	f	837.32 MHz	33.320 dBm																					
2	N	1	f	5.929 00 GHz	-30.172 dBm																					
EDGE High Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 849.28 MHz 28.978 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>MARK</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>F</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>849.28 MHz</td><td>28.978 dBm</td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.006 77 GHz</td><td>-30.331 dBm</td><td></td><td></td></tr></table>	MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	28.978 dBm			2	N	1	f	6.006 77 GHz	-30.331 dBm			
MARK	MODE	TRIG	SCL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																			
1	N	1	f	849.28 MHz	28.978 dBm																					
2	N	1	f	6.006 77 GHz	-30.331 dBm																					

EDGE Low Band Emission	
EDGE High Band Emission	

For PCS Band

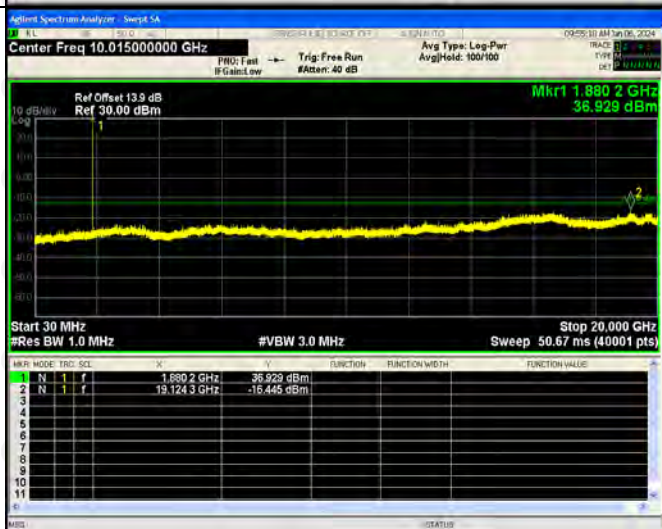
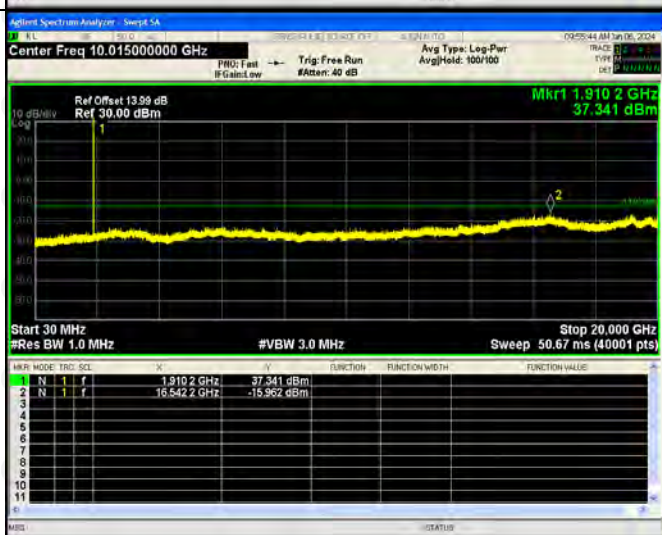
GSM Low Channel		
GSM Middle Channel		
GSM High Channel		

GSM
Low
Band
Emission



GSM
High
Band
Emission



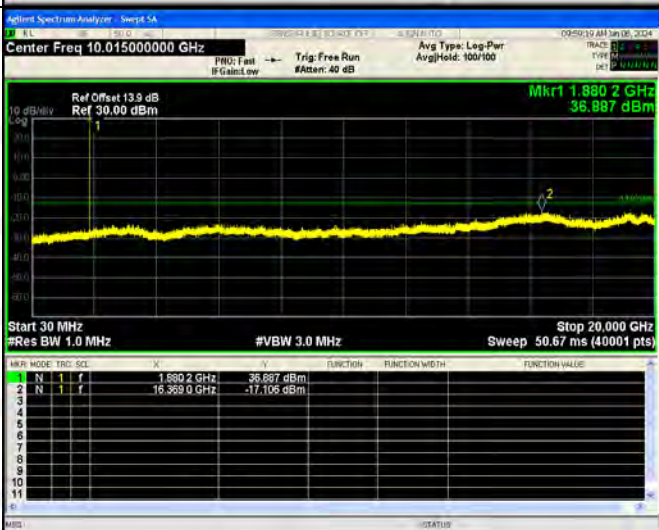
GPRS Low Channel	
GPRS Middle Channel	
GPRS High Channel	

GPRS
Low
Band
Emission



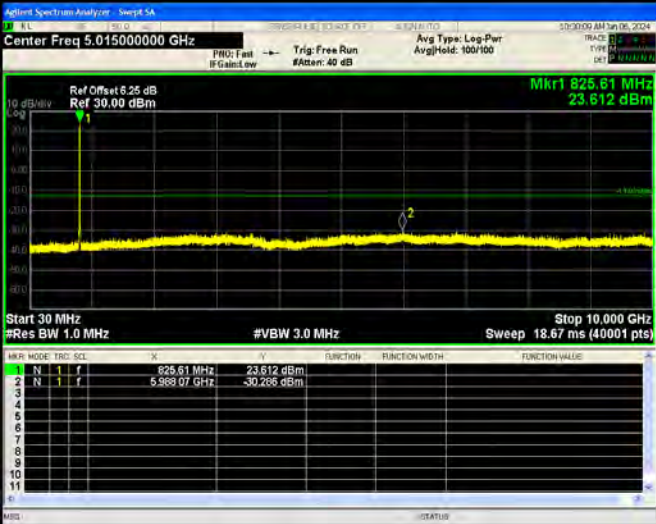
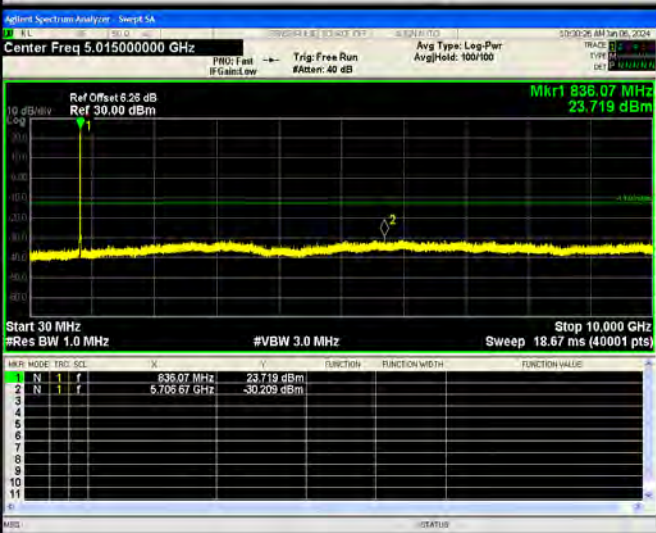
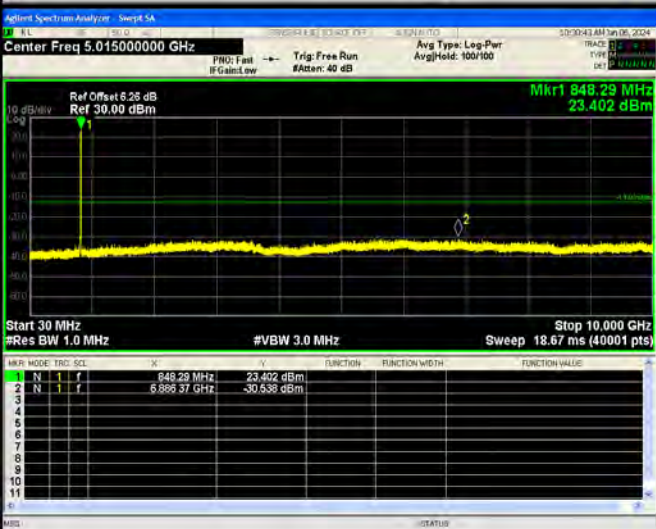
GPRS
High
Band
Emission



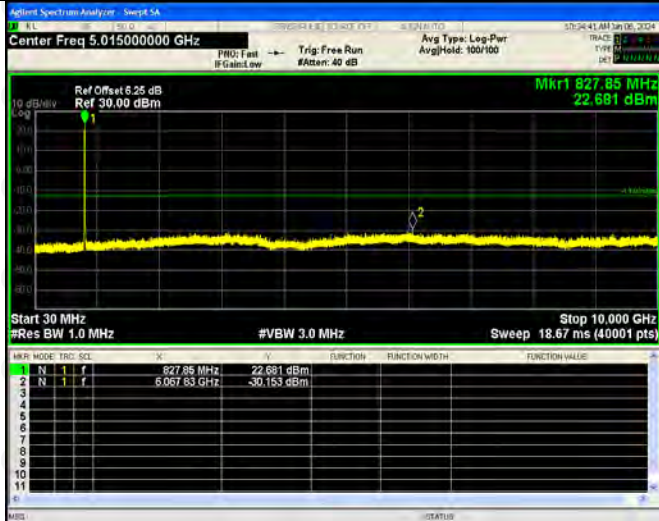
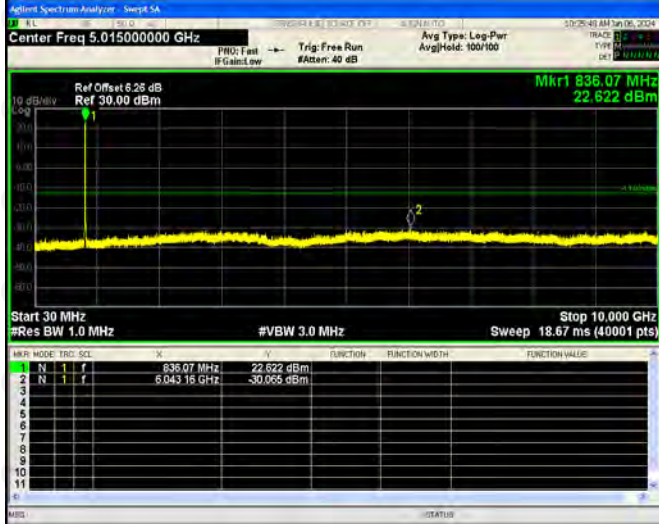
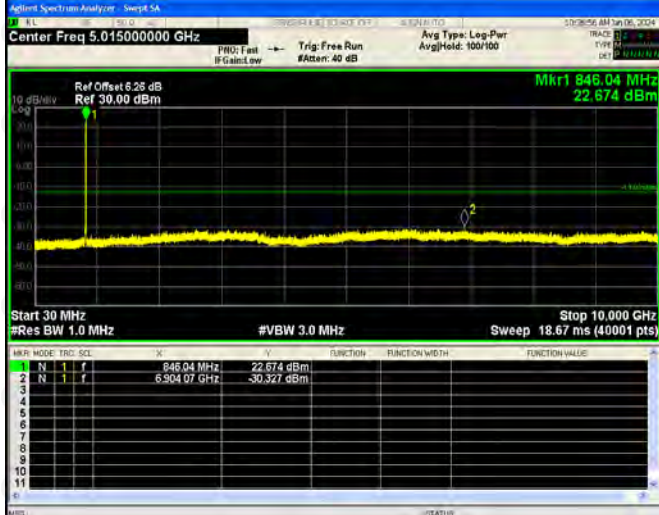
EDGE Low Channel	
EDGE Middle Channel	
EDGE High Channel	

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	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 824.000000 MHz PASS Ref Offset 8.25 dB Ref 30.00 dBm Mkr1 823.998 MHz -23.049 dBm Trace 1 Pass Center 824.000 MHz #Res BW 100 kHz #VBW 300 kHz Span 2.000 MHz Sweep 1.000 ms (1001 pts) <table><tr><th>MNR</th><th>MODE</th><th>TRIG</th><th>SCN</th><th>X1</th><th>X2</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>29.573 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.4973 GHz</td><td>-16.726 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRIG	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.9072 GHz	29.573 dBm				2	N	1	f	16.4973 GHz	-16.726 dBm			
MNR	MODE	TRIG	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.9072 GHz	29.573 dBm																							
2	N	1	f	16.4973 GHz	-16.726 dBm																							
WCDMA High Band Spurious Emission	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 849.000000 MHz PASS Ref Offset 8.25 dB Ref 30.00 dBm Mkr1 849.002 MHz -21.776 dBm Trace 1 Pass Center 849.000 MHz #Res BW 100 kHz #VBW 300 kHz Span 2.000 MHz Sweep 1.000 ms (1001 pts) <table><tr><th>MNR</th><th>MODE</th><th>TRIG</th><th>SCN</th><th>X1</th><th>X2</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>29.573 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.4973 GHz</td><td>-16.726 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRIG	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.9072 GHz	29.573 dBm				2	N	1	f	16.4973 GHz	-16.726 dBm			
MNR	MODE	TRIG	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.9072 GHz	29.573 dBm																							
2	N	1	f	16.4973 GHz	-16.726 dBm																							

HSDPA Low Channel		
HSDPA Middle Channel		
HSDPA High Channel		

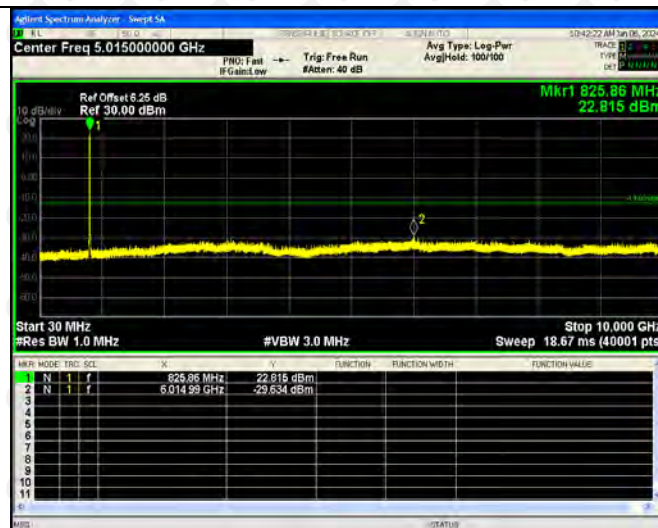
HSDPA
Low
Band
Spurious
Emission

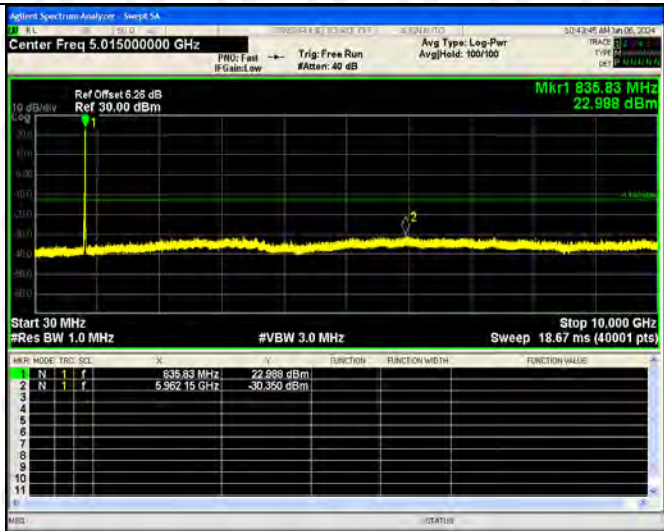
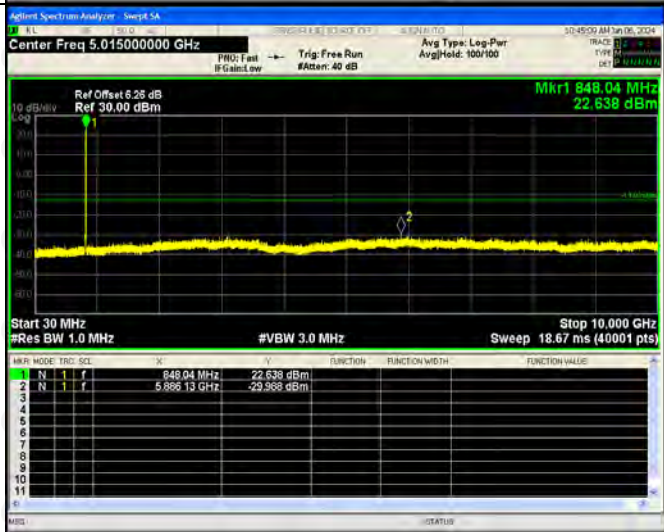


HSDPA
High
Band
Spurious
Emission



HSUPA
Low
Channel

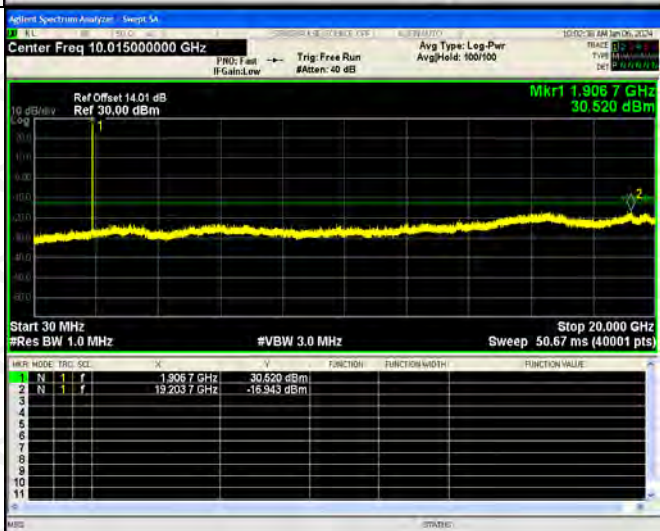


HSUPA Middle Channel		
HSUPA High Channel		
HSUPA Low Band Spurious Emission		

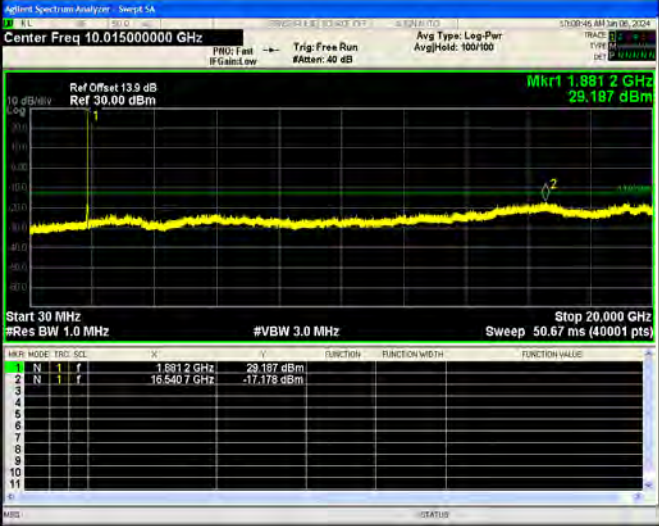
HSUPA
High
Band
Spurious
Emission



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

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)						
42.83	-73.85	3.9	-69.95	-13	-56.95	H
1644.83	-57.52	4.83	-52.69	-13	-39.69	H
2462.68	-54.14	8.08	-46.06	-13	-33.06	H
40.21	-66.92	4.02	-62.90	-13	-49.90	V
1647.35	-48.93	4.48	-44.45	-13	-31.45	V
2464.48	-55.72	8.2	-47.52	-13	-34.52	V
Middle Channel (836.6MHz)						
39.56	-68.93	3.84	-65.09	-13	-52.09	H
1664.51	-60.40	4.62	-55.78	-13	-42.78	H
2501.36	-56.11	8.25	-47.86	-13	-34.86	H
42.43	-68.40	4.25	-64.15	-13	-51.15	V
1666.57	-46.53	4.54	-41.99	-13	-28.99	V
2501.51	-52.11	8.35	-43.76	-13	-29.75	V
High Channel (848.8MHz)						
38.25	-67.07	4.22	-71.29	-13	-58.29	H
1694.00	-52.91	4.87	-57.78	-13	-44.78	H
2536.90	-49.95	8.38	-58.33	-13	-45.33	H
43.69	-72.18	4.02	-76.20	-13	-63.20	V
1689.52	-55.62	4.56	-60.18	-13	-47.18	V
2543.47	-52.27	8.41	-60.68	-13	-47.68	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)						
42.26	-71.36	4.34	-67.02	-13	-54.02	H
3694.59	-56.55	10.54	-46.01	-13	-33.01	H
5541.04	-59.22	13.37	-45.85	-13	-32.85	H
37.23	-68.04	4.34	-63.70	-13	-50.70	V
3692.37	-53.20	10.54	-42.66	-13	-29.66	V
5548.61	-53.20	13.37	-39.83	-13	-26.83	V
Middle Channel (1880MHz)						
41.68	-71.24	4.02	-67.22	-13	-54.22	H
3755.75	-58.11	10.71	-47.40	-13	-34.40	H
5630.05	-61.09	13.73	-47.36	-13	-34.36	H
40.82	-64.94	4.14	-60.80	-13	-47.80	V
3752.55	-54.77	10.22	-44.55	-13	-31.55	V
5639.60	-57.85	13.16	-44.69	-13	-31.69	V
High Channel (1909.8MHz)						
42.74	-67.73	4.02	-63.71	-13	-50.71	H
3811.94	-60.73	4.9	-55.83	-13	-42.83	H
5729.22	-44.27	8.09	-36.18	-13	-23.18	H
37.95	-62.26	4.25	-58.01	-13	-45.01	V
3819.23	-63.94	4.93	-59.01	-13	-46.01	V
5727.68	-62.59	8.43	-54.16	-13	-41.16	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
37.32	-67.67	3.91	-63.76	-13	-50.76	H
1647.06	-52.33	10.56	-41.77	-13	-28.77	H
2469.20	-56.67	13.5	-43.17	-13	-30.17	H
43.73	-67.58	3.93	-63.65	-13	-50.65	V
1645.51	-57.22	10.41	-46.81	-13	-33.81	V
2473.24	-57.61	13.16	-44.45	-13	-31.45	V
Middle Channel (836.6MHz)						
44.68	-72.41	4.02	-68.39	-13	-55.39	H
1672.55	-55.09	4.66	-50.43	-13	-37.43	H
2499.20	-44.67	8.34	-36.33	-13	-23.33	H
36.59	-54.89	4.17	-50.72	-13	-37.72	V
1671.69	-64.01	4.94	-59.07	-13	-46.07	V
2505.53	-65.78	8.19	-57.59	-13	-44.59	V
High Channel (846.6MHz)						
42.81	-66.24	3.87	-62.37	-13	-49.37	H
1688.44	-63.66	4.89	-58.77	-13	-45.77	H
2536.03	-50.72	8.42	-42.30	-13	-29.30	H
45.70	-57.71	3.95	-53.76	-13	-40.76	V
1686.94	-56.82	4.99	-51.83	-13	-38.83	V
2533.86	-61.84	8.12	-53.72	-13	-40.72	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
36.84	-70.82	4.22	-66.91	-13	-53.91	H
1647.26	-49.71	10.70	-39.15	-13	-26.15	H
2473.52	-59.99	13.73	-46.49	-13	-33.49	H
44.53	-70.29	3.93	-66.36	-13	-53.36	V
1647.79	-50.24	10.09	-39.83	-13	-26.83	V
2478.55	-57.14	13.11	-43.98	-13	-30.98	V
Middle Channel (1880MHz)						
40.83	-75.51	4.26	-71.49	-13	-58.49	H
1669.62	-57.15	4.76	-52.49	-13	-39.49	H
2501.77	-47.93	8.37	-39.59	-13	-26.59	H
45.83	-63.13	3.96	-58.96	-13	-45.96	V
1672.44	-55.52	4.63	-50.58	-13	-37.58	V
2502.64	-62.24	8.10	-54.05	-13	-41.05	V
High Channel (1907.6MHz)						
41.24	-72.04	4.26	-68.17	-13	-55.17	H
1689.78	-62.96	4.76	-58.07	-13	-45.07	H
2538.79	-40.78	8.37	-32.36	-13	-19.36	H
43.79	-54.30	3.96	-50.35	-13	-37.35	V
1689.24	-64.39	4.63	-59.40	-13	-46.40	V
2534.86	-64.76	8.10	-56.64	-13	-43.64	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	8.71	0.01041
40	NV	9.63	0.01151
30	NV	8.94	0.01069
20	NV	9.16	0.01095
10	NV	10.11	0.01208
0	NV	10.27	0.01227
-10	NV	9.95	0.01189
-20	NV	11.02	0.01318
-30	NV	11.06	0.01321

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	12.53	0.00666
40	NV	12.63	0.00672
30	NV	12.39	0.00659
20	NV	12.62	0.00671
10	NV	13.31	0.00708
0	NV	13.70	0.00729
-10	NV	13.89	0.00739
-20	NV	14.29	0.00760
-30	NV	14.35	0.00763

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	9.24	0.01104
40	NV	8.97	0.01072
30	NV	9.06	0.01083
20	NV	9.35	0.01118
10	NV	9.95	0.01190
0	NV	10.05	0.01201
-10	NV	10.42	0.01246
-20	NV	10.51	0.01257
-30	NV	11.07	0.01324

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	12.25	0.00651
40	NV	12.99	0.00691
30	NV	12.41	0.00660
20	NV	12.42	0.00661
10	NV	13.59	0.00723
0	NV	13.72	0.00730
-10	NV	14.34	0.00763
-20	NV	14.43	0.00767
-30	NV	14.26	0.00759

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	11.23	0.01342
40	NV	11.87	0.01419
30	NV	11.93	0.01426
20	NV	12.14	0.01451
10	NV	11.66	0.01394
0	NV	12.07	0.01443
-10	NV	11.69	0.01398
-20	NV	12.49	0.01493
-30	NV	13.28	0.01587

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	-10.77	-0.00573
40	NV	-9.97	-0.00530
30	NV	-9.41	-0.00501
20	NV	-9.71	-0.00517
10	NV	-9.38	-0.00499
0	NV	-8.79	-0.00467
-10	NV	-9.03	-0.00480
-20	NV	-7.79	-0.00414
-30	NV	-7.84	-0.00417

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	0.40	0.00048
40	NV	-0.25	-0.00029
30	NV	0.20	0.00024
20	NV	0.45	0.00053
10	NV	1.21	0.00144
0	NV	0.64	0.00076
-10	NV	1.26	0.00150
-20	NV	0.78	0.00093
-30	NV	1.27	0.00152

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	0.21	0.00025
40	NV	0.20	0.00024
30	NV	0.59	0.00071
20	NV	0.78	0.00093
10	NV	0.42	0.00050
0	NV	0.92	0.00109
-10	NV	0.91	0.00109
-20	NV	1.72	0.00206
-30	NV	1.85	0.00221

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	-0.35	-0.00042
40	NV	-0.15	-0.00018
30	NV	0.72	0.00086
20	NV	-0.10	-0.00012
10	NV	0.50	0.00060
0	NV	1.06	0.00126
-10	NV	0.93	0.00111
-20	NV	1.46	0.00175
-30	NV	1.40	0.00167

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	5.08	0.00608
40	NV	4.76	0.00569
30	NV	5.56	0.00664
20	NV	5.98	0.00715
10	NV	6.16	0.00736
0	NV	6.26	0.00749
-10	NV	6.64	0.00794
-20	NV	6.40	0.00765
-30	NV	7.23	0.00864

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	0.81	0.00097
40	NV	0.59	0.00071
30	NV	1.28	0.00153
20	NV	1.34	0.00160
10	NV	0.85	0.00101
0	NV	2.06	0.00247
-10	NV	1.35	0.00161
-20	NV	2.49	0.00297
-30	NV	1.98	0.00237

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	6.57	0.00785
40	NV	7.02	0.00839
30	NV	7.39	0.00883
20	NV	7.51	0.00898
10	NV	7.15	0.00855
0	NV	8.26	0.00987
-10	NV	8.04	0.00960
-20	NV	8.05	0.00963
-30	NV	9.07	0.01084

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	11.16	0.01334
	NV	11.75	0.01405
	HV	11.14	0.01332
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	14.50	0.00771
	NV	14.21	0.00756
	HV	14.59	0.00776

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	11.15	0.01332
	NV	11.44	0.01367
	HV	11.48	0.01373
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	14.41	0.00766
	NV	14.30	0.00760
	HV	14.72	0.00783

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	13.23	0.01581
	NV	12.99	0.01552
	HV	13.04	0.01559
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	-7.89	-0.00943
	NV	-7.21	-0.00862
	HV	-7.58	-0.00906
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	0.88	0.00105
	NV	1.48	0.00177
	HV	1.52	0.00182
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	2.19	0.00262
	NV	1.81	0.00216
	HV	2.01	0.00240
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	2.67	0.00319
	NV	3.00	0.00359
	HV	3.47	0.00414

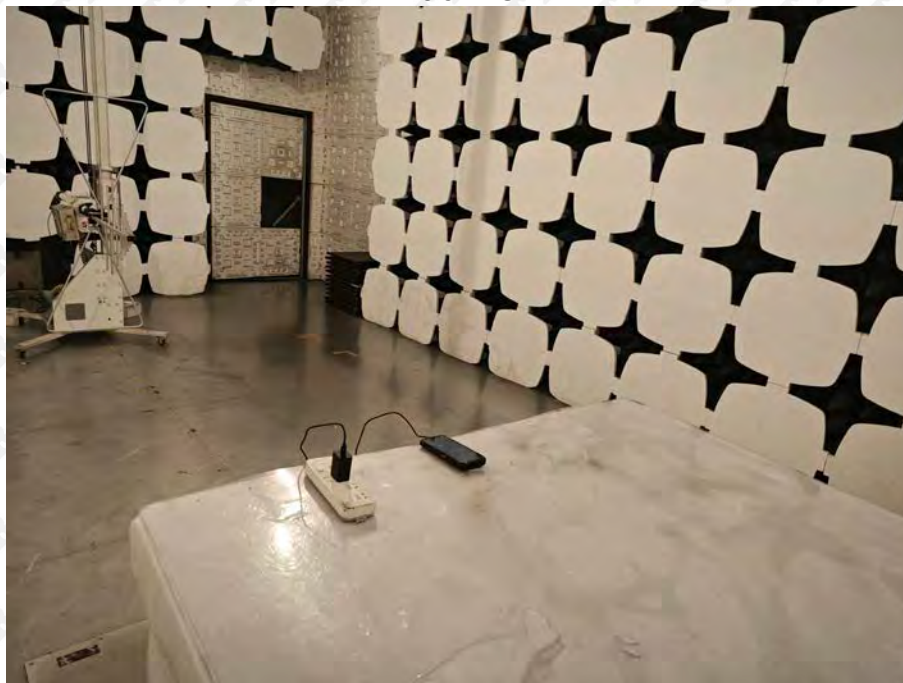
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.12	0.00254
	NV	1.89	0.00226
	HV	1.93	0.00231
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.78	0.00213
	NV	1.43	0.00171
	HV	1.99	0.00238
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	6.90	0.00825
	NV	7.02	0.00840
	HV	7.55	0.00903
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	2.35	0.00281
	NV	3.33	0.00398
	HV	3.27	0.00391
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	6.60	0.00788
	NV	6.99	0.00835
	HV	7.63	0.00912

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	8.44	0.01009
	NV	9.01	0.01077
	HV	8.91	0.01064

12. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



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