



TEST REPORT

Test item description: Handheld data terminal
FCC ID: 2ANBW-HY830
Trademark(s): HOPELAND
Model/Type reference: HY830
Applicant's name: Shenzhen Hopeland Technologies CO., Ltd.
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Manufacturer: Shenzhen Hopeland Technologies CO., Ltd.
Address: 701, Building C, Coolpad Bldg., No.2 Mengxi Road, Xili Street Nanshan District, 518057, Shenzhen China
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Sample Received Date: Oct. 11, 2025
Sample tested Date: Oct. 11, 2025 to Dec. 08, 2025
Issue Date: Dec. 08, 2025
Report No.: CTB25101112401RF06
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

Reviewed by:

Approved by:

Kai Chen

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Kai ChenMartin FengBin 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
CTB25101112401RF06	Dec. 08, 2025	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

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

3. MEASUREMENT UNCERTAINTY

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

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

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model/Type reference:	HY830
Model Difference:	N/A
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: 31.39dBm GSM1900: 27.69dBm WCDMA Band 2: 19.73dBm WCDMA Band 5: 22.19dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: 1.41dBi GSM1900: 3.29dBi WCDMA Band 2: 3.29dBi WCDMA Band 5: 1.41dBi
Ratings:	INPUT:100-240V 50-60Hz 0.8A OUTPUT: 5V 3A, 9V 2.25A, 12V 1.67A DC 7.7V 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	Shenzhen Hopeland Technologies Co., Ltd.	SDC-20W	/	AE

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(°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, Xinh 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.

FCC Test Firm Registration Number: CN1276

5.2 Test Instrument Used

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2025/5/23	2026/5/22
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2025/5/23	2026/5/22
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2025/5/23	2026/5/22
4	Communication test set	R&S	CMW500	108058	V3.5.80	2025/5/23	2026/5/22
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/5/23	2026/5/22
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2025/5/22	2026/5/21
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2025/5/22	2026/5/21
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/22	2026/5/21
9	2.4 GHz Filter	Shenxiang	MSF2400-2483. 5MS-1154	20181015001	/	2025/6/18	2026/6/17
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	/	2025/6/18	2026/6/17
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	/	2025/5/24	2026/5/23
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2025/10/20	2026/10/19
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2025/5/22	2026/5/21
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/	/
16	966 chamber	C.R.T.	966	/	/	2024/6/23	2027/6/22
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2025/5/23	2026/5/22
18	Amplifier	HP	8447E	2945A02747	/	2025/5/23	2026/5/22

19	Amplifier	Agilent	8449B	3008A01838	/	2025/6/2	2026/6/1
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/29	2026/6/28
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2025/6/1	2026/5/31
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/2	2026/6/1
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2025/6/2	2026/6/1
26	Amplifier	AEROFLEX	Aeroflex	097	/	2025/6/2	2026/6/1
27	Power Metter	KEYSIGHT	N1912AP	N/A	A.05.00	2025/6/2	2026/6/1

6. RF OUTPUT POWER

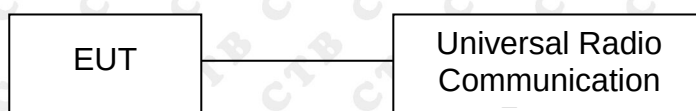
6.1 Standard Applicable

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	29.80	1.5	0	H	1.5	1.41	29.71	38.45
824.2	30.28	1.5	0	V	1.5	1.41	30.19	38.45
Middle Channel								
836.6	30.18	1.5	0	H	1.5	1.41	30.09	38.45
836.6	30.74	1.5	0	V	1.5	1.41	30.65	38.45
High Channel								
848.8	31.14	1.5	0	H	1.5	1.41	31.05	38.45
848.8	30.50	1.5	0	V	1.5	1.41	30.41	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	27.62	1.5	0	H	1.9	3.29	29.01	33
1850.2	27.13	1.5	0	V	1.9	3.29	28.52	33
Middle Channel								
1880	26.48	1.5	0	H	1.9	3.29	27.87	33
1880	26.29	1.5	0	V	1.9	3.29	27.68	33
High Channel								
1909.8	25.98	1.5	0	H	1.9	3.29	27.37	33
1909.8	25.81	1.5	0	V	1.9	3.29	27.20	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	30.45	1.5	0	H	1.5	1.41	30.36	38.45
824.2	30.30	1.5	0	V	1.5	1.41	30.21	38.45
Middle Channel								
836.6	29.88	1.5	0	H	1.5	1.41	29.79	38.45
836.6	30.52	1.5	0	V	1.5	1.41	30.43	38.45
High Channel								
848.8	31.13	1.5	0	H	1.5	1.41	31.04	38.45
848.8	30.94	1.5	0	V	1.5	1.41	30.85	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	26.88	1.5	0	H	1.9	3.29	28.27	33
1850.2	27.06	1.5	0	V	1.9	3.29	28.45	33
Middle Channel								
1880	26.50	1.5	0	H	1.9	3.29	27.89	33
1880	26.42	1.5	0	V	1.9	3.29	27.81	33
High Channel								
1909.8	25.82	1.5	0	H	1.9	3.29	27.21	33
1909.8	26.08	1.5	0	V	1.9	3.29	27.47	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	29.87	1.5	0	H	1.5	1.41	29.78	38.45
824.2	29.64	1.5	0	V	1.5	1.41	29.55	38.45
Middle Channel								
836.6	30.11	1.5	0	H	1.5	1.41	30.02	38.45
836.6	30.27	1.5	0	V	1.5	1.41	30.18	38.45
High Channel								
848.8	30.59	1.5	0	H	1.5	1.41	30.50	38.45
848.8	31.28	1.5	0	V	1.5	1.41	31.19	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	26.55	1.5	0	H	1.9	3.29	27.94	33
1850.2	27.09	1.5	0	V	1.9	3.29	28.48	33
Middle Channel								
1880	26.36	1.5	0	H	1.9	3.29	27.75	33
1880	26.60	1.5	0	V	1.9	3.29	27.99	33
High Channel								
1909.8	25.95	1.5	0	H	1.9	3.29	27.34	33
1909.8	25.77	1.5	0	V	1.9	3.29	27.16	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	21.25	1.5	0	H	1.5	1.41	21.16	38.45
826.4	21.90	1.5	0	V	1.5	1.41	21.81	38.45
Middle Channel								
836.6	22.03	1.5	0	H	1.5	1.41	21.94	38.45
836.6	21.17	1.5	0	V	1.5	1.41	21.08	38.45
High Channel								
846.6	21.19	1.5	0	H	1.5	1.41	21.10	38.45
846.6	21.29	1.5	0	V	1.5	1.41	21.20	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	21.55	1.5	0	H	1.5	1.41	21.46	38.45
826.4	21.24	1.5	0	V	1.5	1.41	21.15	38.45
Middle Channel								
836.6	21.20	1.5	0	H	1.5	1.41	21.11	38.45
836.6	21.80	1.5	0	V	1.5	1.41	21.71	38.45
High Channel								
846.6	21.30	1.5	0	H	1.5	1.41	21.21	38.45
846.6	21.31	1.5	0	V	1.5	1.41	21.22	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	21.60	1.5	0	H	1.5	1.41	21.51	38.45
826.4	21.64	1.5	0	V	1.5	1.41	21.55	38.45
Middle Channel								
836.6	21.73	1.5	0	H	1.5	1.41	21.64	38.45
836.6	21.67	1.5	0	V	1.5	1.41	21.58	38.45
High Channel								
846.6	21.22	1.5	0	H	1.5	1.41	21.13	38.45
846.6	21.81	1.5	0	V	1.5	1.41	21.72	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	18.88	1.5	0	H	1.9	3.29	20.27	33
1852.4	19.06	1.5	0	V	1.9	3.29	20.45	33
Middle Channel								
1880	20.24	1.5	0	H	1.9	3.29	21.63	33
1880	19.31	1.5	0	V	1.9	3.29	20.70	33
High Channel								
1907.6	19.48	1.5	0	H	1.9	3.29	20.87	33
1907.6	19.01	1.5	0	V	1.9	3.29	20.40	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	18.70	1.5	0	H	1.9	3.29	20.09	33
1852.4	19.42	1.5	0	V	1.9	3.29	20.81	33
Middle Channel								
1880	19.83	1.5	0	H	1.9	3.29	21.22	33
1880	18.89	1.5	0	V	1.9	3.29	20.28	33
High Channel								
1907.6	19.84	1.5	0	H	1.9	3.29	21.23	33
1907.6	20.59	1.5	0	V	1.9	3.29	21.98	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	19.29	1.5	0	H	1.9	3.29	20.68	33
1852.4	19.14	1.5	0	V	1.9	3.29	20.53	33
Middle Channel								
1880	19.28	1.5	0	H	1.9	3.29	20.67	33
1880	18.75	1.5	0	V	1.9	3.29	20.14	33
High Channel								
1907.6	19.13	1.5	0	H	1.9	3.29	20.52	33
1907.6	19.12	1.5	0	V	1.9	3.29	20.51	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	30.8	38.45
	Middle Channel	836.6	30.85	38.45
	High Channel	848.8	31.39	38.45
GPRS(1 Slot)	Low Channel	824.2	30.83	38.45
	Middle Channel	836.6	30.85	38.45
	High Channel	848.8	31.39	38.45
EDGE(1 Slot)	Low Channel	824.2	30.62	38.45
	Middle Channel	836.6	30.79	38.45
	High Channel	848.8	31.35	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	27.69	33.0
	Middle Channel	1880.0	26.92	33.0
	High Channel	1909.8	26.49	33.0
GPRS(1 Slot)	Low Channel	1850.2	27.62	33.0
	Middle Channel	1880.0	26.9	33.0
	High Channel	1909.8	26.41	33.0
EDGE(1 Slot)	Low Channel	1850.2	27.49	33.0
	Middle Channel	1880.0	26.84	33.0
	High Channel	1909.8	26.43	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	22.19	38.45
	Middle Channel	836.6	22.11	38.45
	High Channel	846.6	22.09	38.45
HSDPA	Low Channel	826.4	22.19	38.45
	Middle Channel	836.6	22.13	38.45
	High Channel	846.6	22.09	38.45
HSUPA	Low Channel	826.4	22.19	38.45
	Middle Channel	836.6	22.11	38.45
	High Channel	846.6	22.12	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	19.59	33.00
	Middle Channel	1880.0	19.72	33.00
	High Channel	1907.6	19.62	33.00
HSDPA	Low Channel	1852.4	19.59	33.00
	Middle Channel	1880.0	19.73	33.00
	High Channel	1907.6	19.64	33.00
HSUPA	Low Channel	1852.4	19.59	33.00
	Middle Channel	1880.0	19.72	33.00
	High Channel	1907.6	19.64	33.00

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

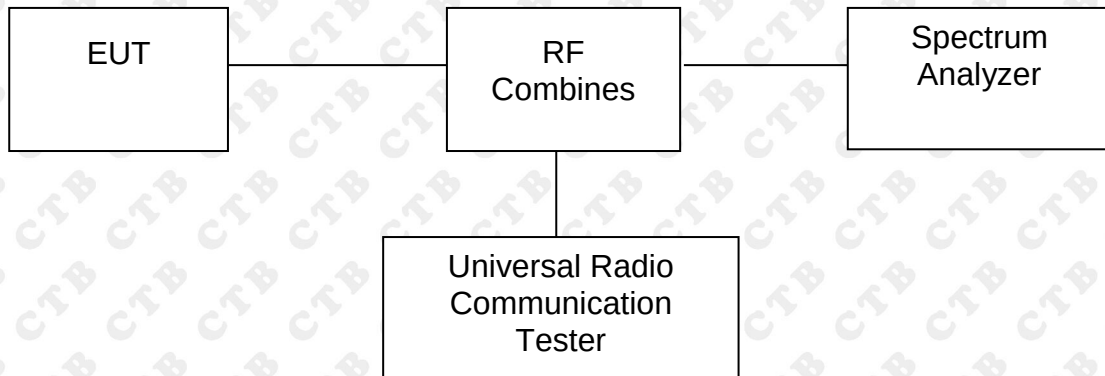
7.1 Standard Applicable

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	2.77	13
GPRS(1 Slot)	190	836.6	2.77	13
EDGE(1 Slot)	190	836.6	2.77	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.73	13
GPRS(1 Slot)	512	1850.2	2.73	13
EDGE(1 Slot)	512	1850.2	2.73	13

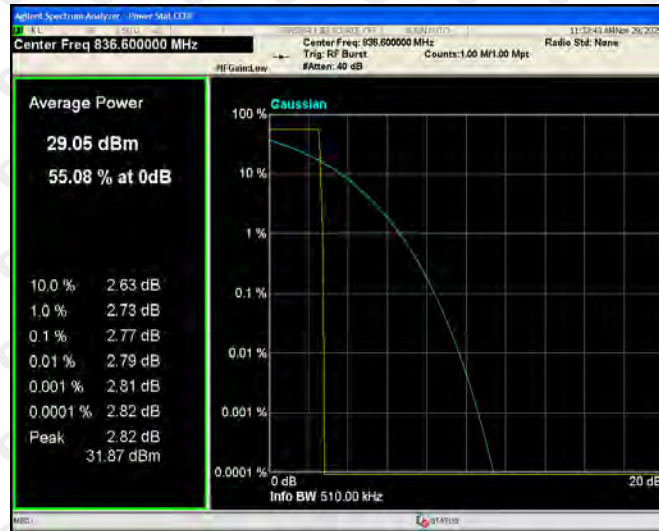
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.81	13
HSDPA	4182	836.4	2.82	13
HSUPA	4182	836.4	2.82	13

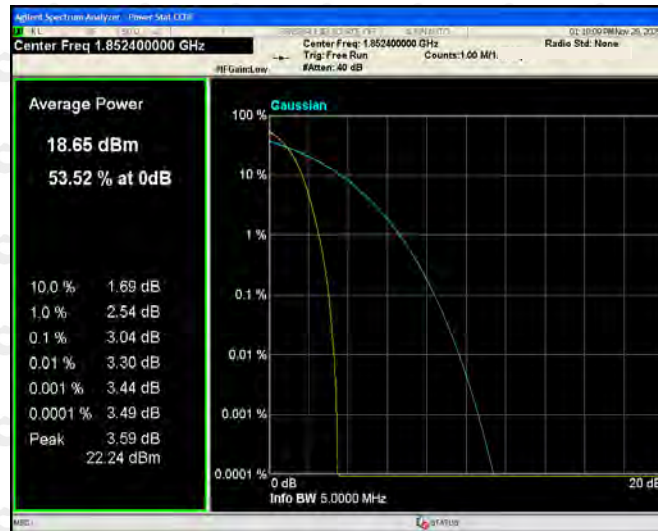
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	3.01	13
HSDPA	9400	1852.4	3.03	13
HSUPA	9400	1852.4	3.04	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

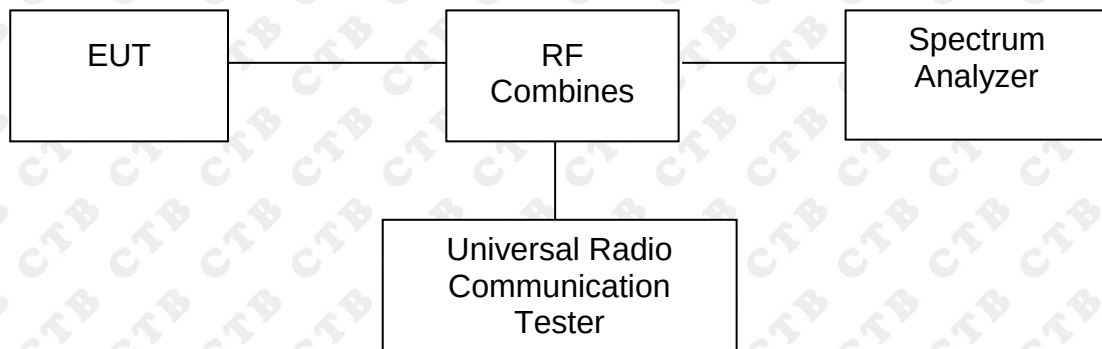
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	246.268	321.038
	190	836.6	242.493	296.313
	251	848.8	235.061	310.003
GPRS	128	824.2	247.183	312.919
	190	836.6	248.140	323.550
	251	848.8	245.200	317.790
EDGE	128	824.2	242.160	314.182
	190	836.6	244.883	326.203
	251	848.8	245.587	308.405

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	250.483	315.263
	661	1880.0	248.791	317.878
	810	1909.8	247.354	310.789
GPRS	512	1850.2	250.476	304.830
	661	1880.0	244.479	315.070
	810	1909.8	242.939	300.439
EDGE	512	1850.2	249.063	318.041
	661	1880.0	251.801	312.285
	810	1909.8	241.448	309.313

For Band 5

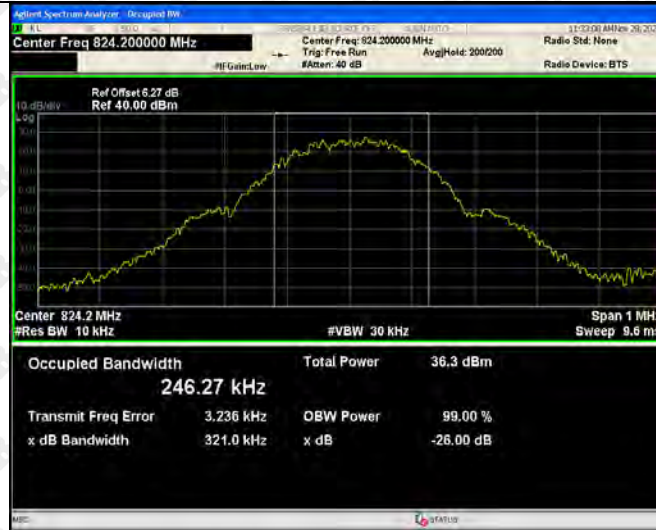
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4182.416	4726.007
	4183	836.6	4189.302	4726.892
	4233	846.6	4187.670	4720.838
HSDPA	4132	826.4	4171.095	4734.556
	4183	836.6	4189.596	4726.758
	4233	846.6	4187.844	4679.692
HSUPA	4132	826.4	4189.601	4713.307
	4183	836.6	4177.790	4729.127
	4233	846.6	4169.525	4708.111

For Band 2

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4185.989	4701.318
	9400	1880.0	4172.758	4701.176
	9538	1907.6	4163.569	4697.113
HSDPA	9262	1852.4	4165.876	4708.039
	9400	1880.0	4173.864	4728.275
	9538	1907.6	4181.433	4702.408
HSUPA	9262	1852.4	4175.372	4694.567
	9400	1880.0	4173.731	4706.857
	9538	1907.6	4167.063	4702.881

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



GPRS Low Channel



GPRS Middle Channel



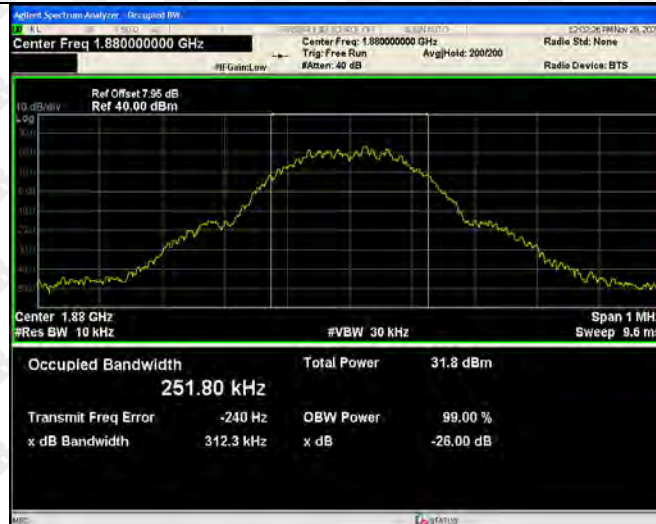
GPRS High Channel



EDGE Low Channel



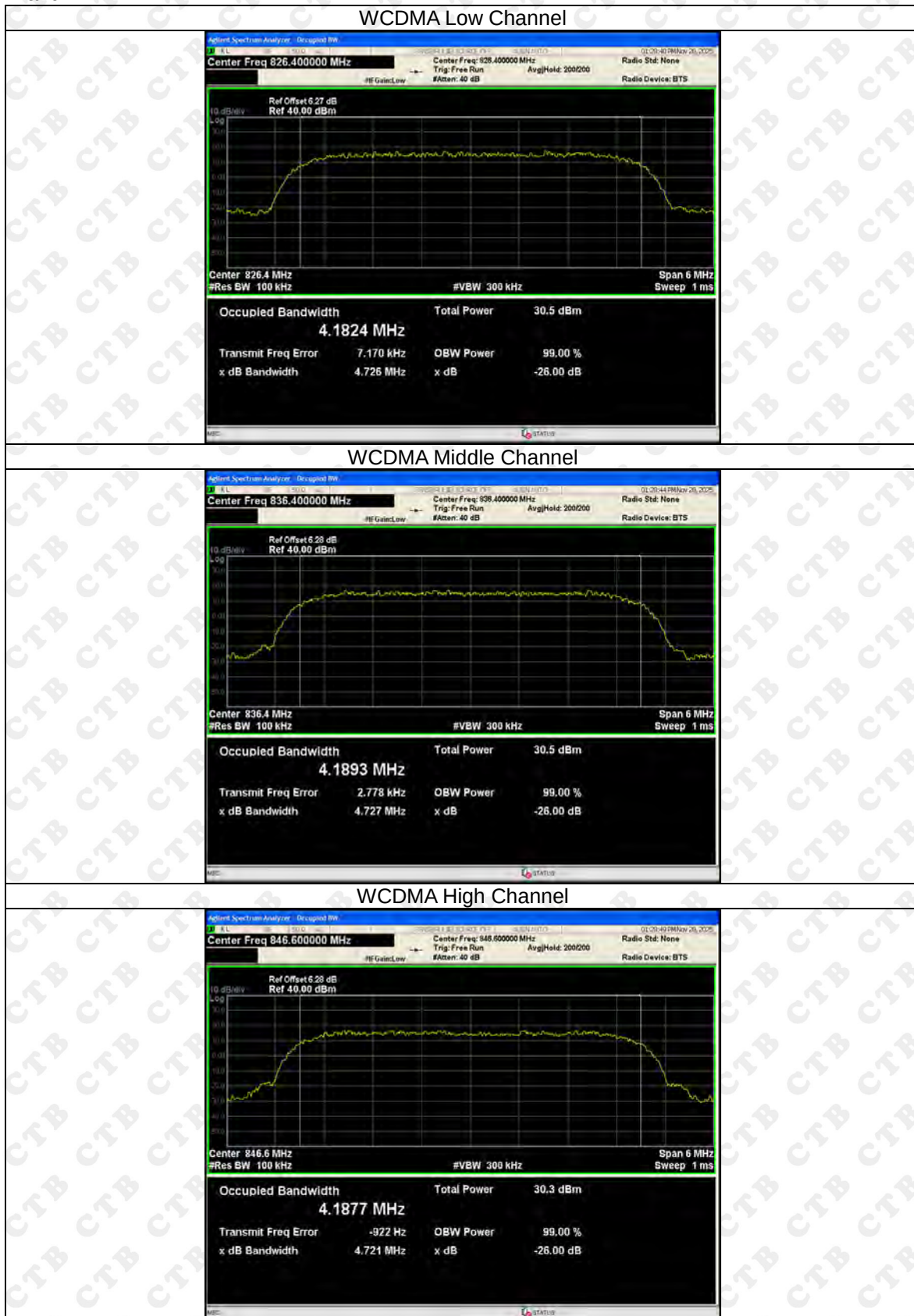
EDGE Middle Channel



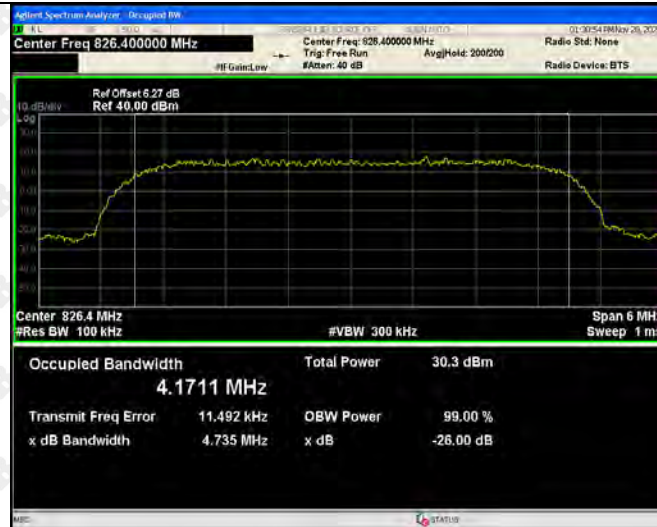
EDGE High Channel



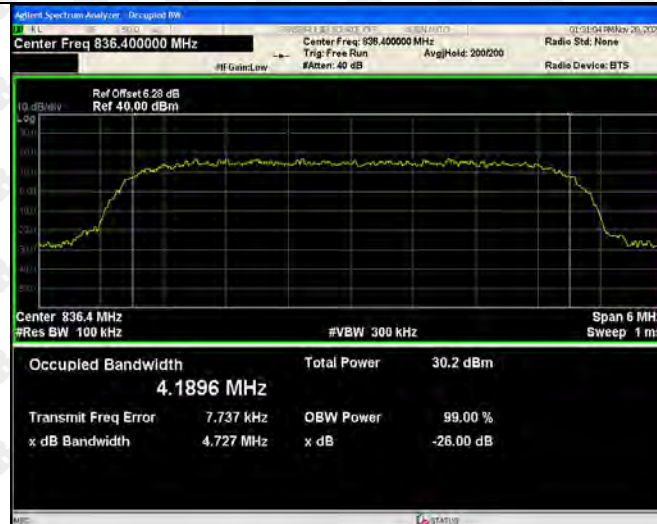
For Band V



HSDPA Low Channel



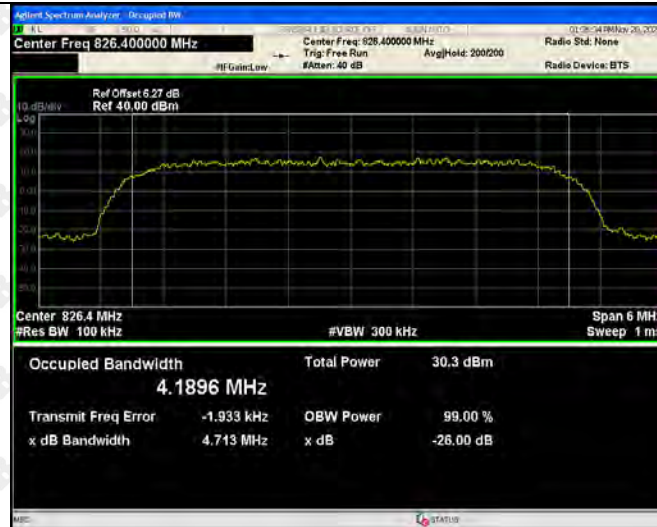
HSDPA Middle Channel



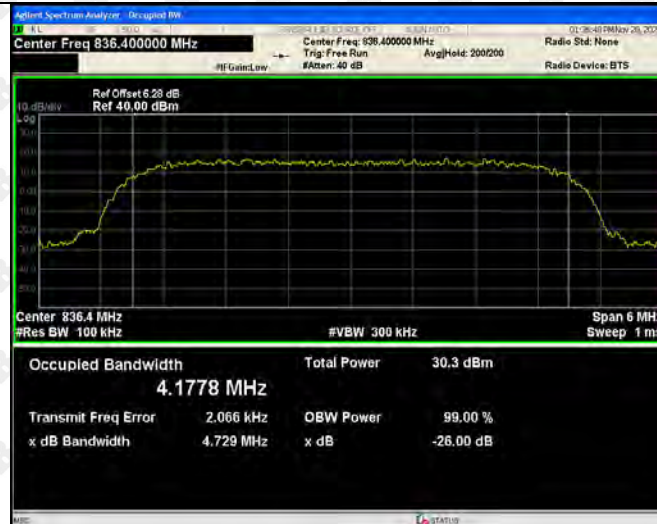
HSDPA High Channel



HSUPA Low Channel



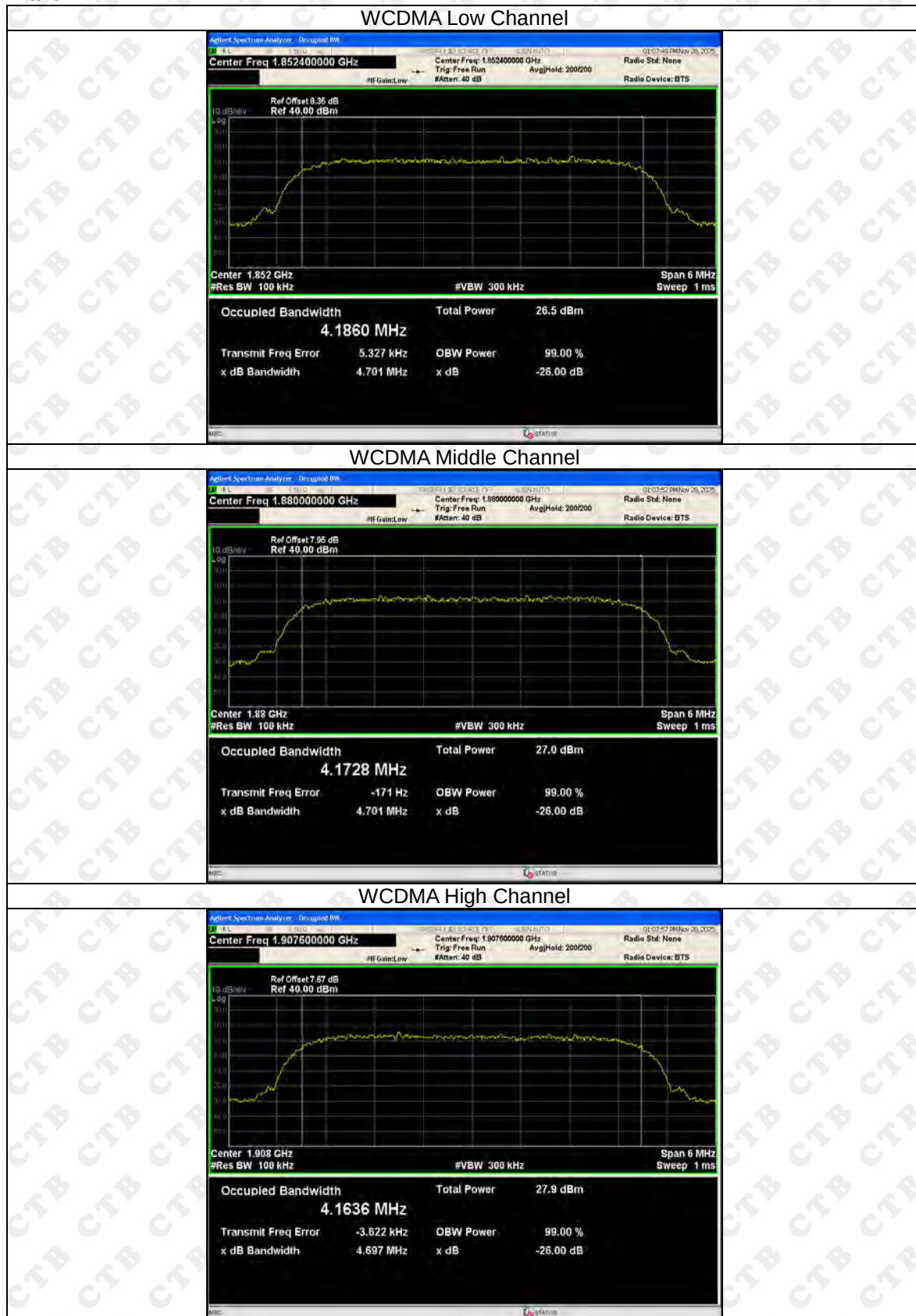
HSUPA Middle Channel



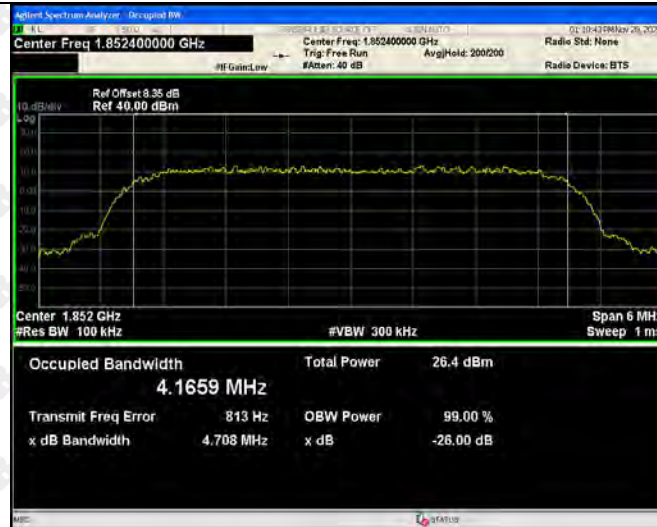
HSUPA High Channel



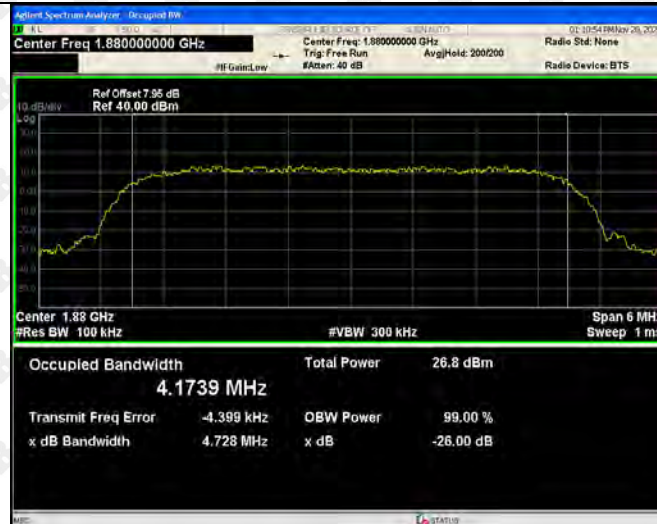
For Band II



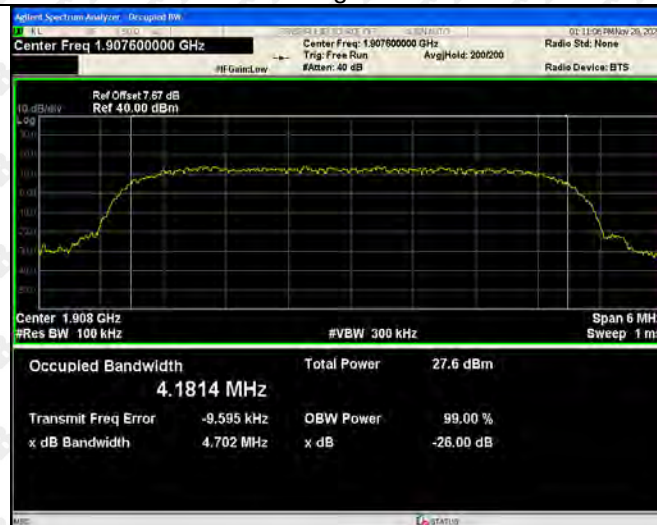
HSDPA Low Channel



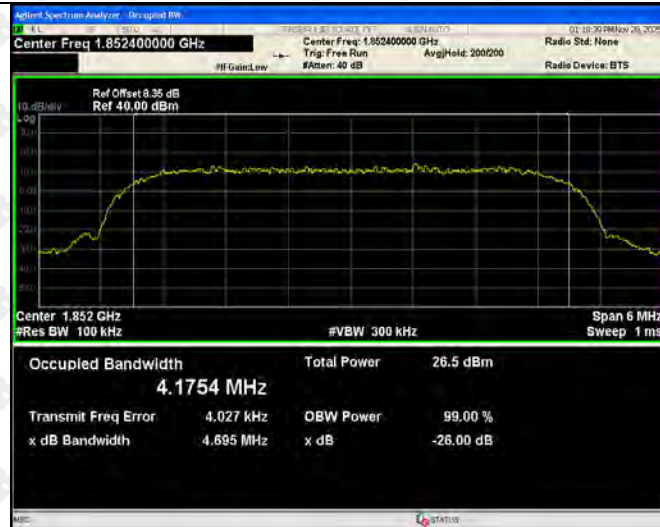
HSDPA Middle Channel



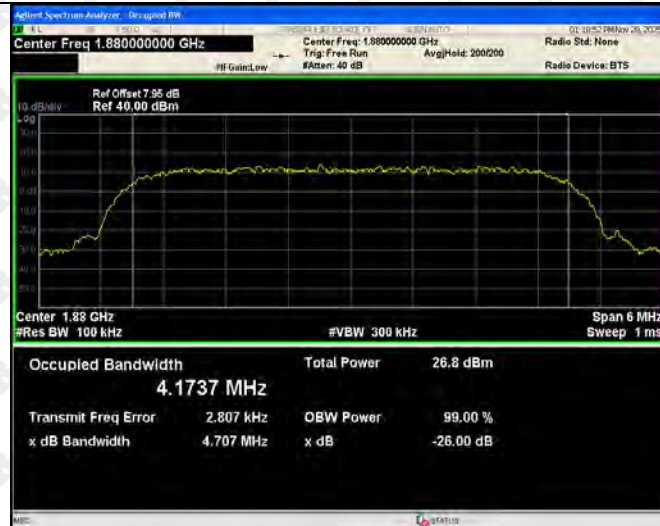
HSDPA High Channel



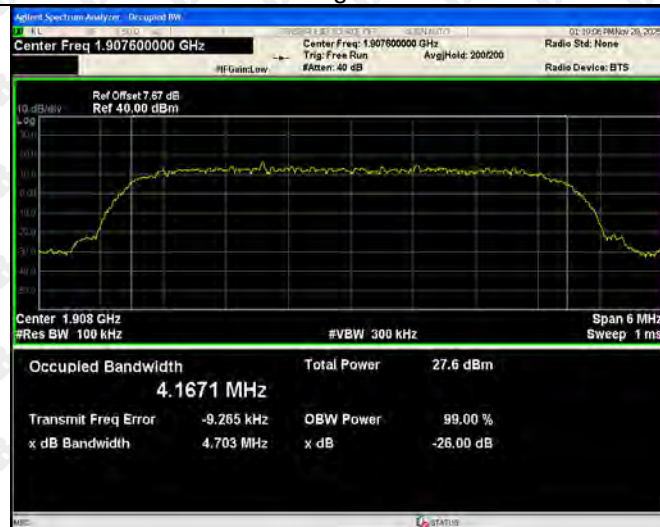
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

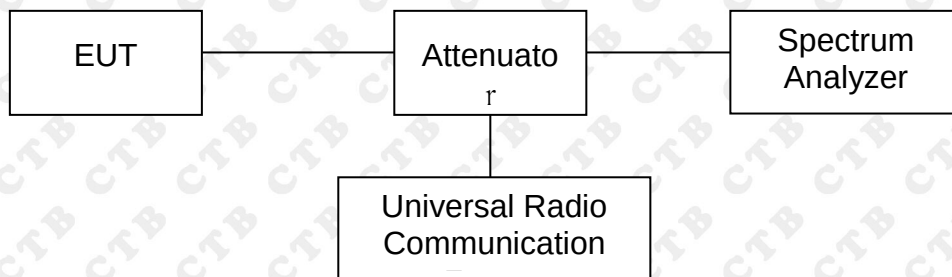
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:



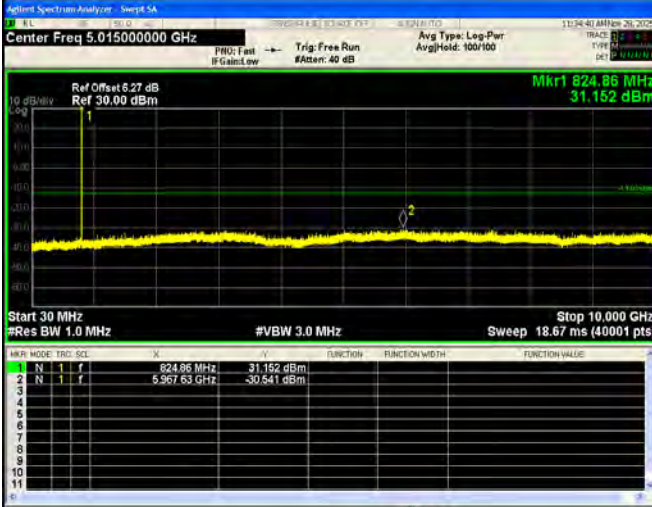
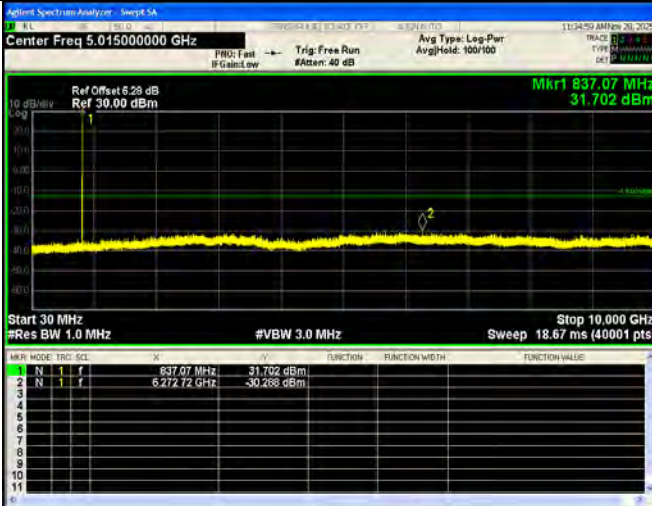
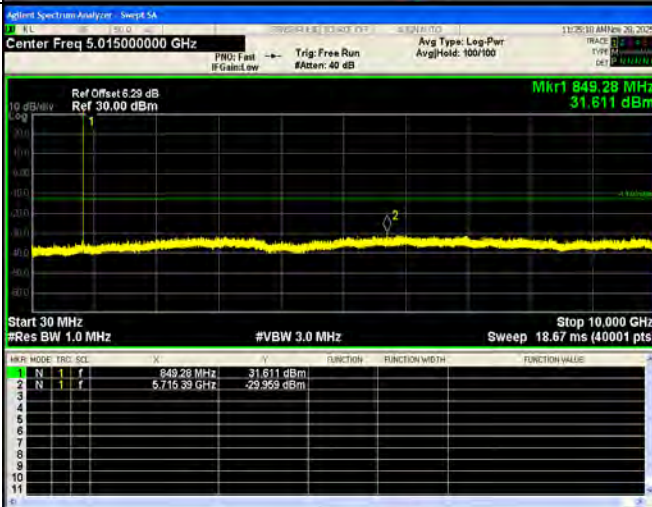
9.3 Environmental Conditions

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

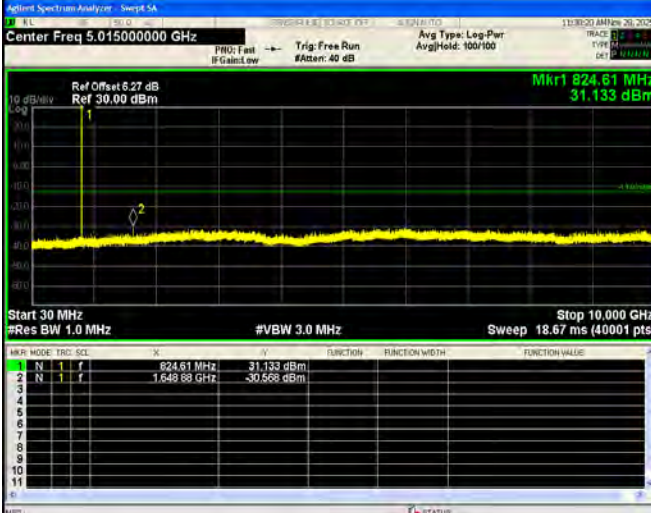
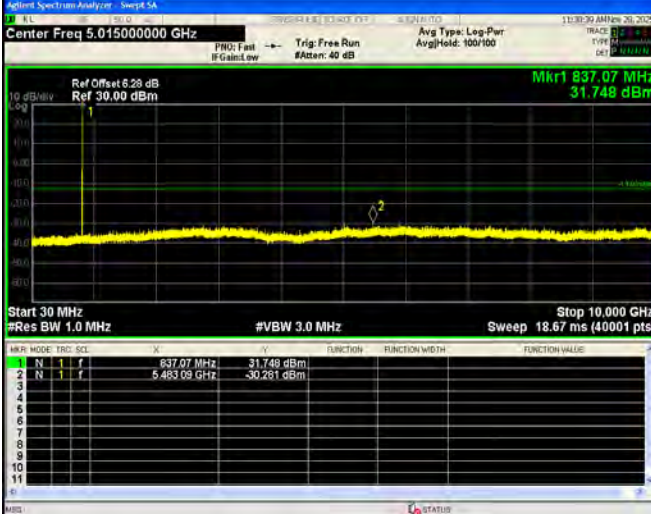
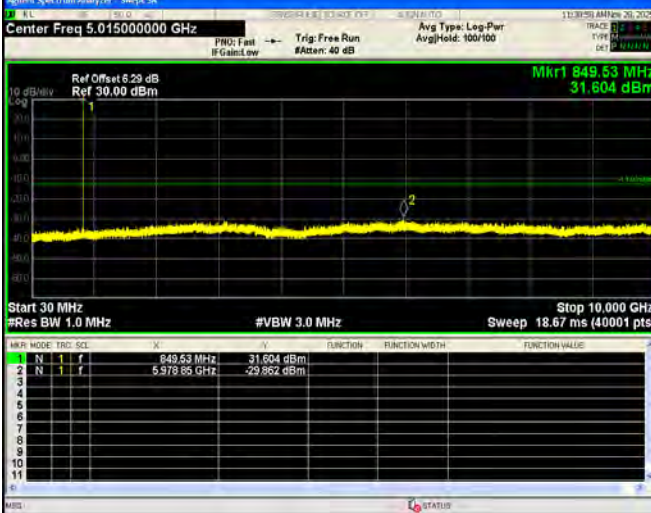
GSM Low Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 824.85 MHz 31.152 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>NR</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.85 MHz</td><td>31.152 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.967.63 GHz</td><td>-30.541 dBm</td><td></td><td></td><td></td></tr></tbody></table>	NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.85 MHz	31.152 dBm				2	N	1	f	5.967.63 GHz	-30.541 dBm			
NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.85 MHz	31.152 dBm																							
2	N	1	f	5.967.63 GHz	-30.541 dBm																							
GSM Middle Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 837.07 MHz 31.702 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>NR</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>31.702 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.272.72 GHz</td><td>-30.288 dBm</td><td></td><td></td><td></td></tr></tbody></table>	NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	31.702 dBm				2	N	1	f	6.272.72 GHz	-30.288 dBm			
NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	31.702 dBm																							
2	N	1	f	6.272.72 GHz	-30.288 dBm																							
GSM High Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 849.28 MHz 31.611 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>NR</th><th>MODE</th><th>TRIG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>31.611 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.716.39 GHz</td><td>-29.959 dBm</td><td></td><td></td><td></td></tr></tbody></table>	NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	31.611 dBm				2	N	1	f	5.716.39 GHz	-29.959 dBm			
NR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.28 MHz	31.611 dBm																							
2	N	1	f	5.716.39 GHz	-29.959 dBm																							

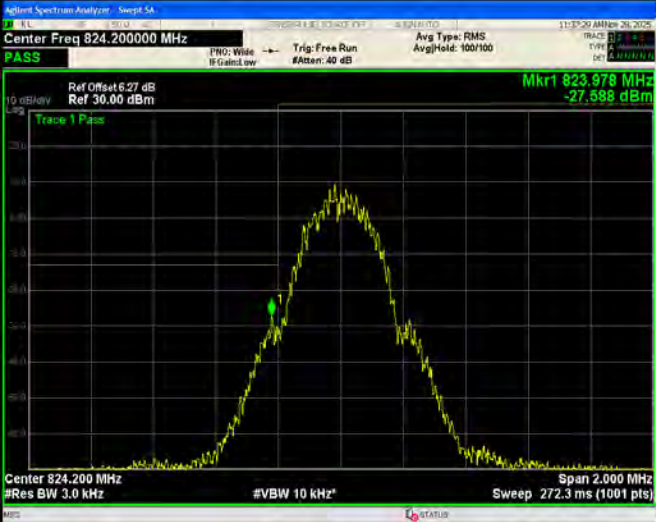
GSM
Low
Band
Emission

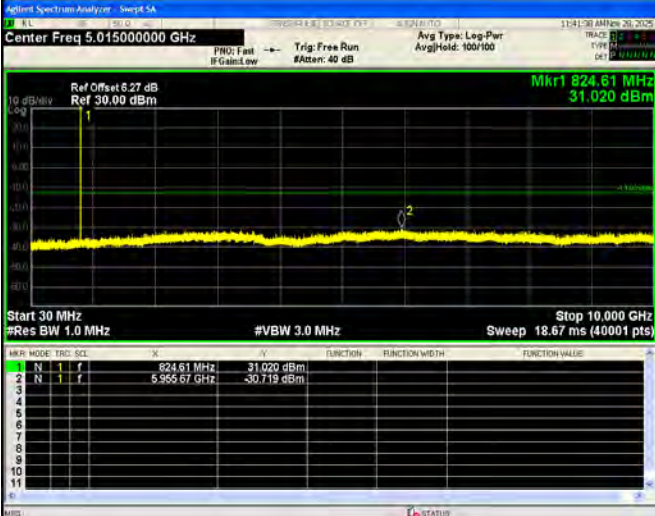
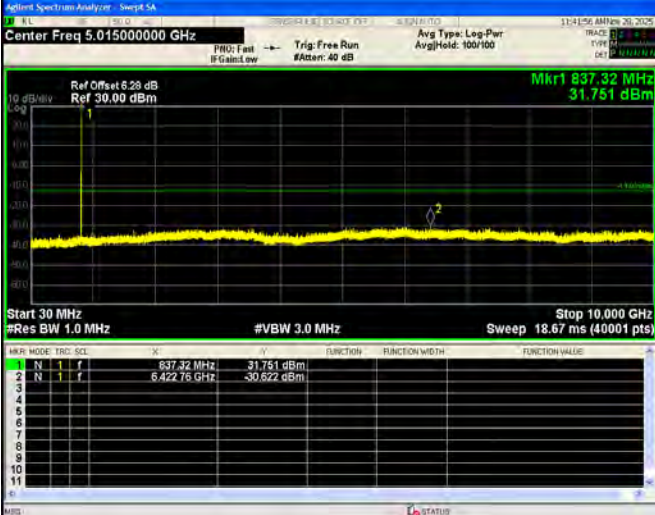
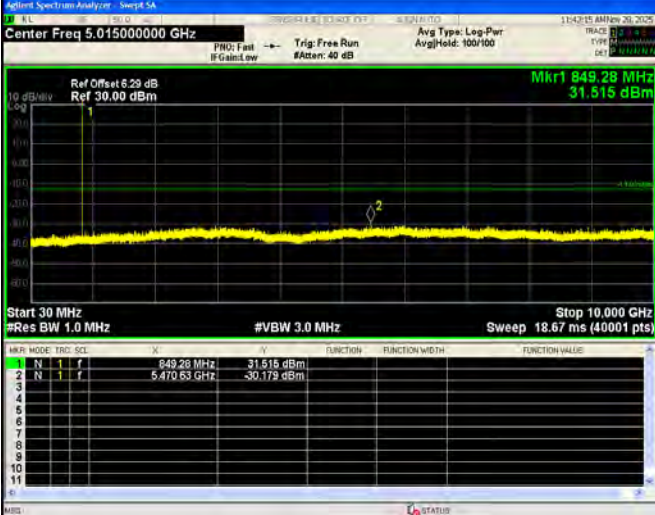


GSM
High
Band
Emission



GPRS Low Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.27 dB Ref 30.00 dBm Mkr1 824.61 MHz 31.133 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>HRP MODE</th><th>TRG SCL</th><th>F</th><th>P</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRP MODE	TRG SCL	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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GPRS Middle Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 837.07 MHz 31.748 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>HRP MODE</th><th>TRG SCL</th><th>F</th><th>P</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRP MODE	TRG SCL	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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GPRS High Channel	 Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.29 dB Ref 30.00 dBm Mkr1 849.53 MHz 31.604 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>HRP MODE</th><th>TRG SCL</th><th>F</th><th>P</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRP MODE	TRG SCL	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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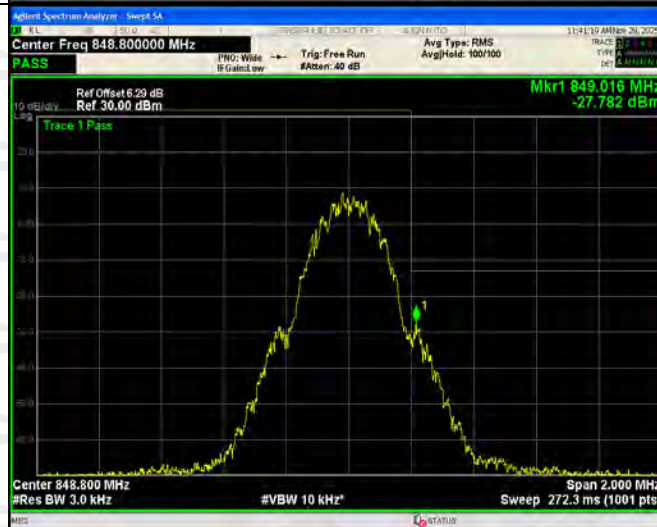
GPRS Low Band Emission	
GPRS High Band Emission	

EDGE Low Channel		
EDGE Middle Channel		
EDGE High Channel		

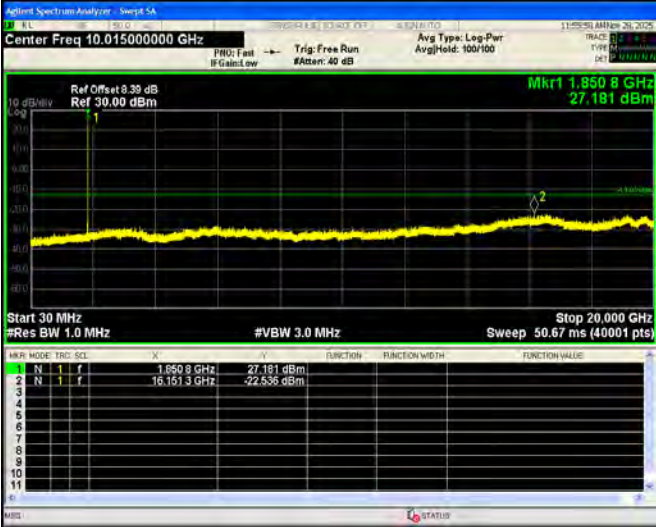
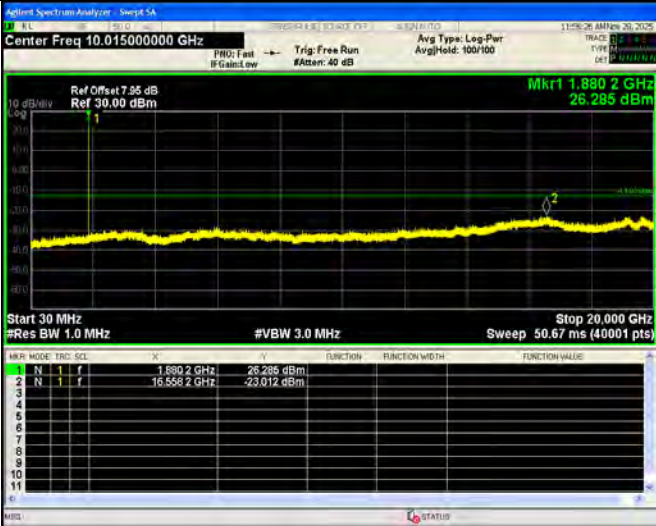
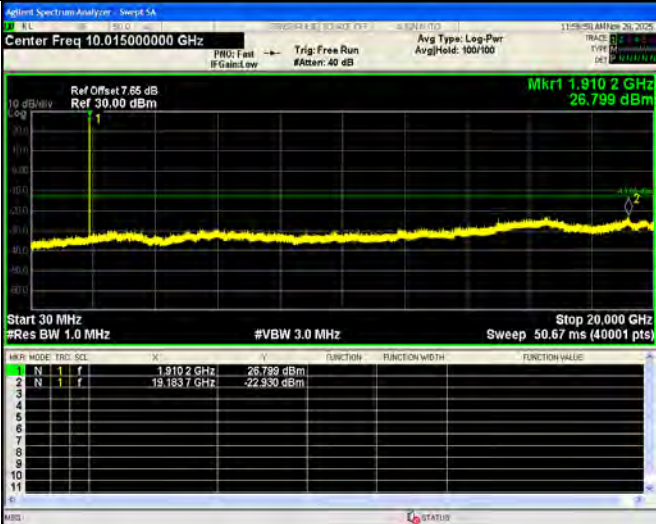
EDGE
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EDGE
High
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Emission



For PCS Band

GSM Low Channel	
GSM Middle Channel	
GSM High Channel	

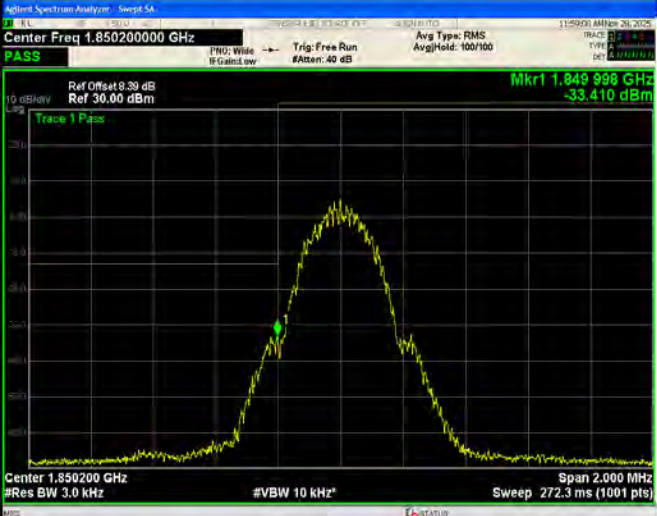
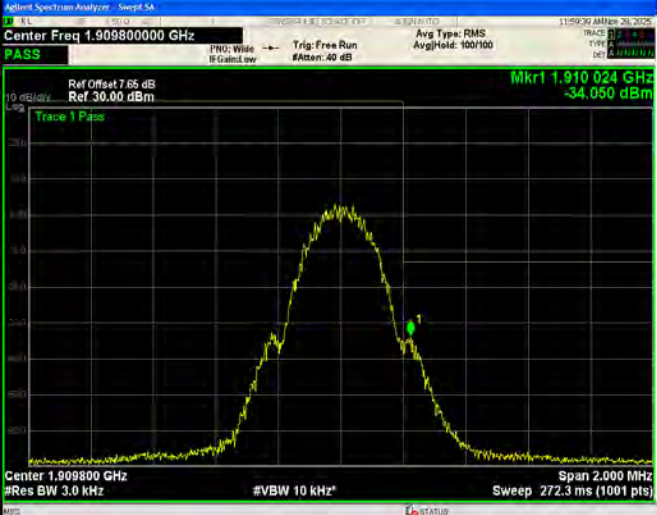
GSM
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Emission



GSM
High
Band
Emission



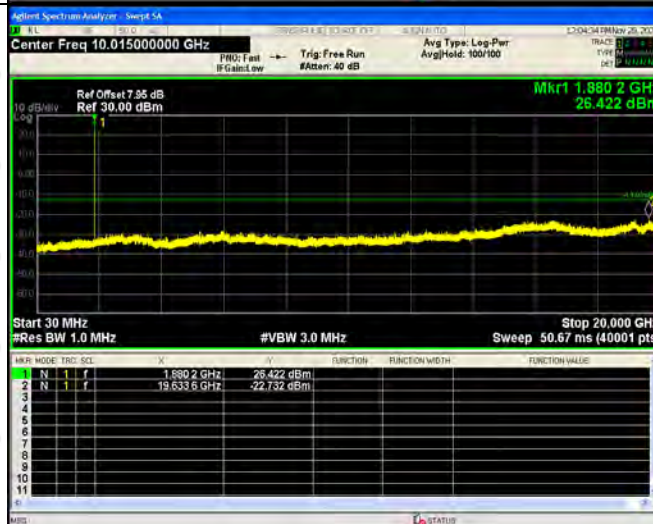
GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

GPRS Low Band Emission	 Agilent Spectrum Analyzer - Sweep SA Center Freq 1.85020000 GHz PASS Ref Offset 8.39 dB Ref 30.00 dBm Mkr1 1.849 998 GHz -33.410 dBm Center 1.850200 GHz #Res BW 3.0 kHz #VBW 10 kHz* Span 2.000 MHz Sweep 272.3 ms (1001 pts)
GPRS High Band Emission	 Agilent Spectrum Analyzer - Sweep SA Center Freq 1.90980000 GHz PASS Ref Offset 7.65 dB Ref 30.00 dBm Mkr1 1.910 024 GHz -34.050 dBm Center 1.909800 GHz #Res BW 3.0 kHz #VBW 10 kHz* Span 2.000 MHz Sweep 272.3 ms (1001 pts)

EDGE
Low
Channel



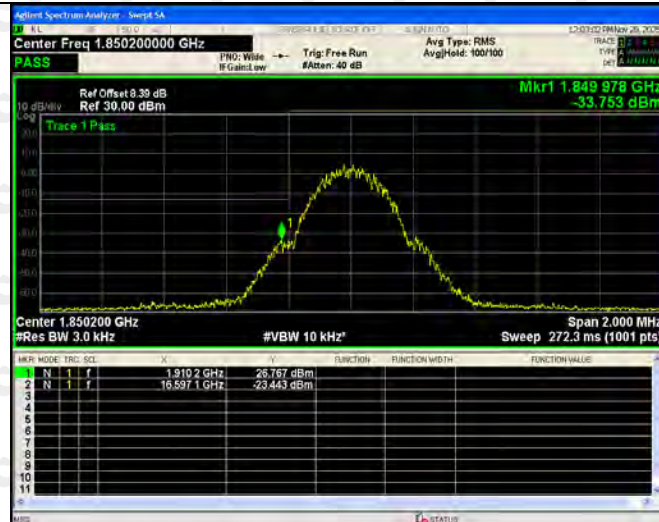
EDGE
Middle
Channel



EDGE
High
Channel



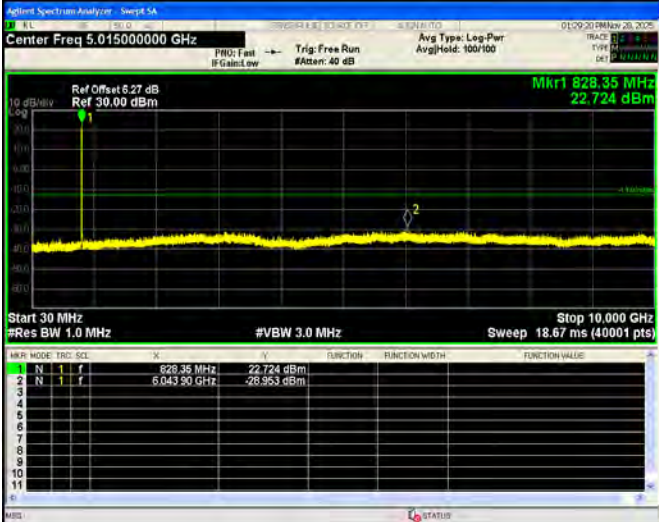
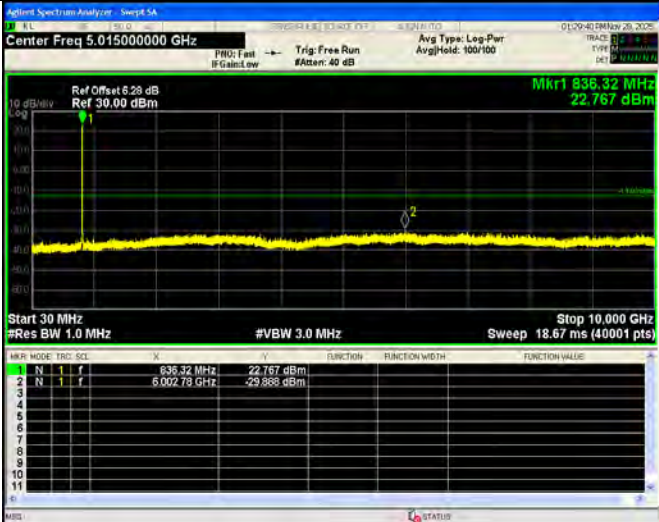
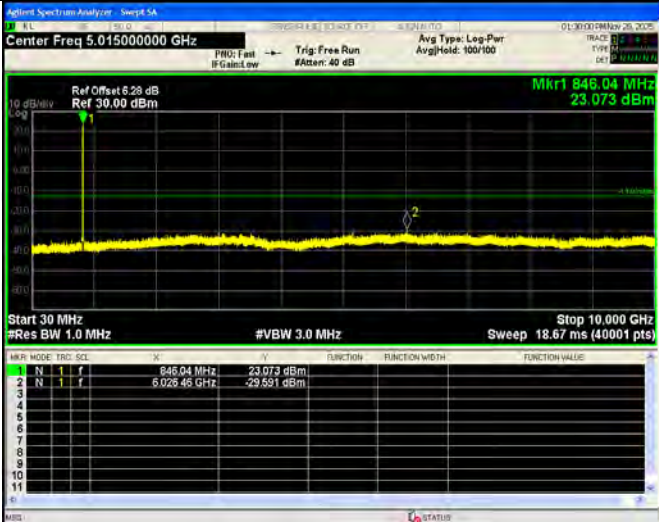
EDGE
Low
Band
Emission



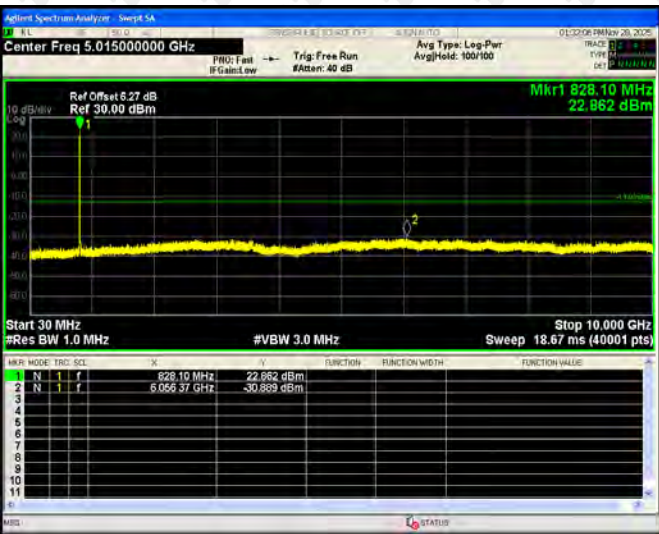
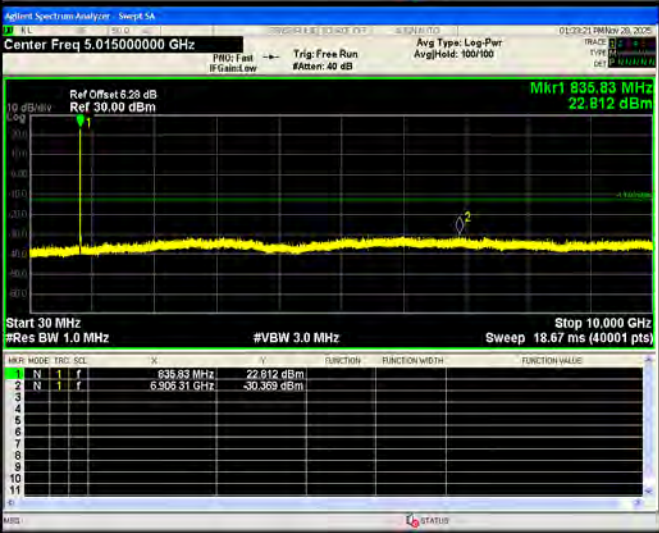
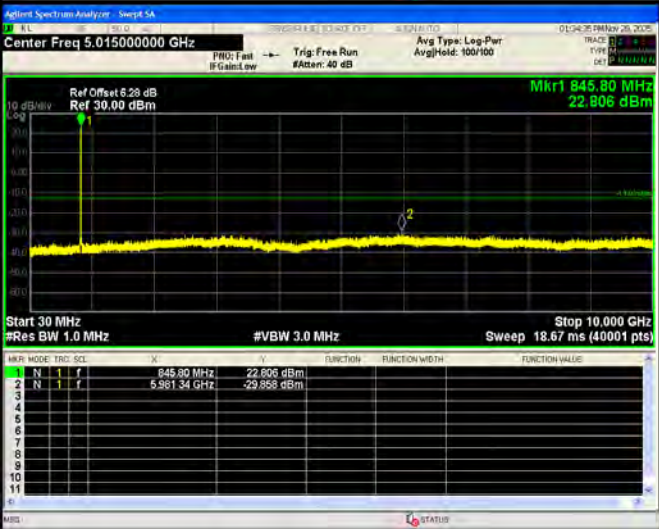
EDGE
High
Band
Emission



For Band V

WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

WCDMA Low Band Spurious Emission	
WCDMA High Band Spurious Emission	

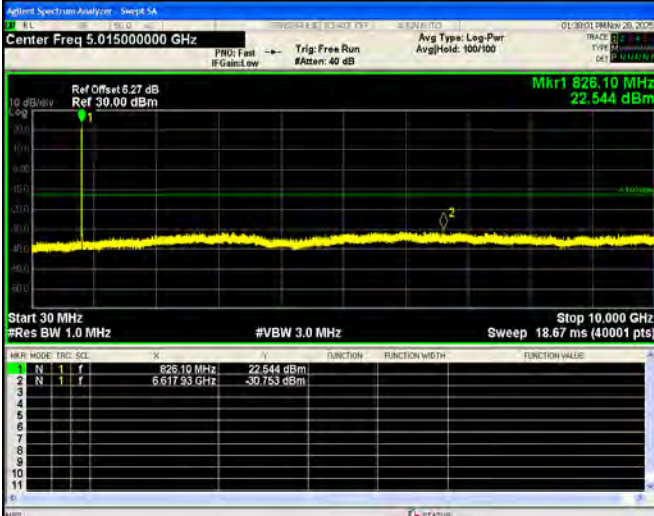
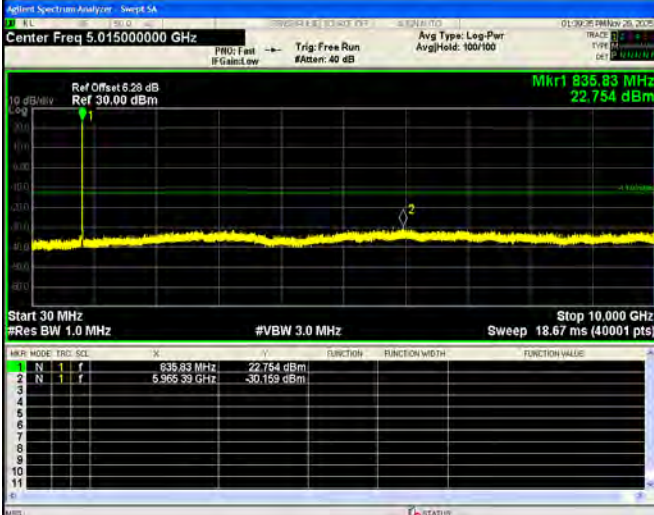
HSDPA Low Channel	
HSDPA Middle Channel	
HSDPA High Channel	

HSDPA
Low
Band
Spurious
Emission



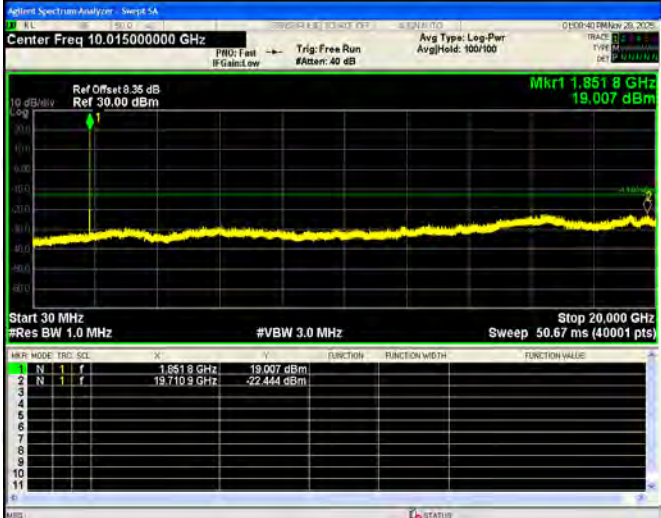
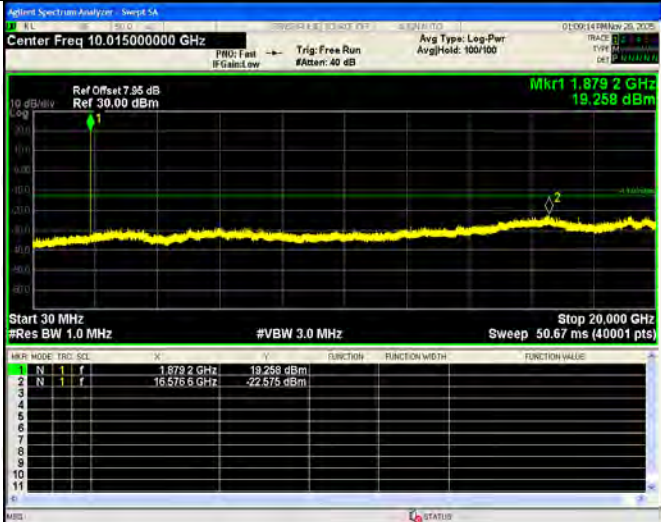
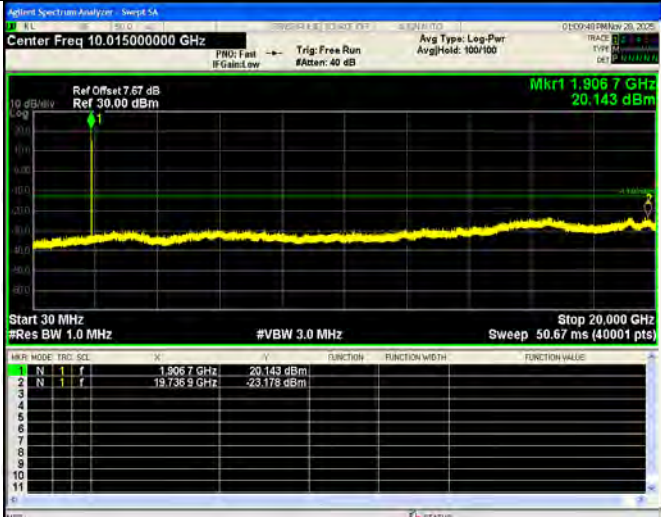
HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.27 dB Ref 30.00 dBm Mkr1 826.10 MHz 22.544 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>FREQ</th><th>POWER</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>826.10 MHz</td><td>22.544 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>6.617.93 GHz</td><td>-30.753 dBm</td><td></td><td></td><td></td></tr></table>	MARK	MODE	FREQ	POWER	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	826.10 MHz	22.544 dBm				2	N	6.617.93 GHz	-30.753 dBm			
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2	N	6.617.93 GHz	-30.753 dBm																			
HSUPA Middle Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 836.83 MHz 22.754 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>FREQ</th><th>POWER</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>836.83 MHz</td><td>22.754 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>5.965.39 GHz</td><td>-30.159 dBm</td><td></td><td></td><td></td></tr></table>	MARK	MODE	FREQ	POWER	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	836.83 MHz	22.754 dBm				2	N	5.965.39 GHz	-30.159 dBm			
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HSUPA High Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.28 dB Ref 30.00 dBm Mkr1 846.29 MHz 22.671 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>FREQ</th><th>POWER</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>846.29 MHz</td><td>22.671 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>6.016.74 GHz</td><td>-29.848 dBm</td><td></td><td></td><td></td></tr></table>	MARK	MODE	FREQ	POWER	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	846.29 MHz	22.671 dBm				2	N	6.016.74 GHz	-29.848 dBm			
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2	N	6.016.74 GHz	-29.848 dBm																			

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



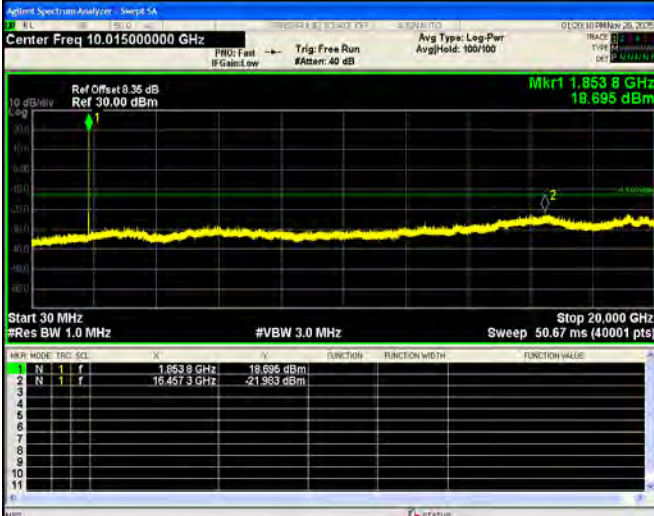
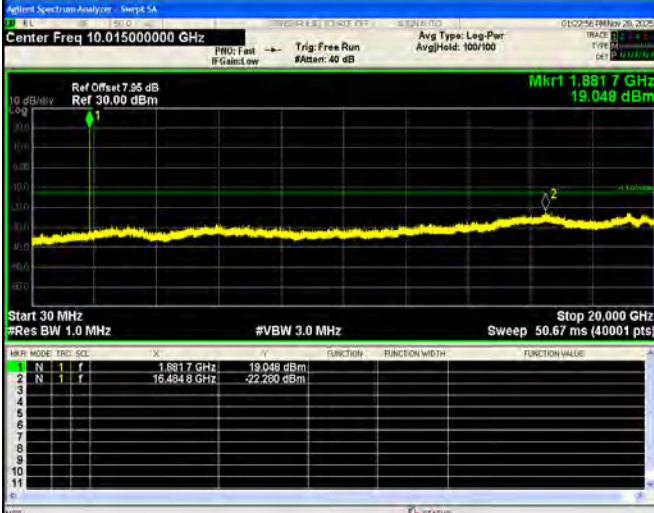
HSDPA Low Channel		
HSDPA Middle Channel		
HSDPA High Channel		

HSDPA
Low
Band
Spurious
Emission



HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Ref Offset 9.35 dB Ref 30.00 dBm Mkr1 1.853 8 GHz 18.695 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20,000 GHz Sweep 50.67 ms (40001 pts) <table><tr><th>HRF MODE</th><th>TRG</th><th>SCF</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRF MODE	TRG	SCF	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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HSUPA Middle Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Ref Offset 7.55 dB Ref 30.00 dBm Mkr1 1.881 7 GHz 19.048 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20,000 GHz Sweep 50.67 ms (40001 pts) <table><tr><th>HRF MODE</th><th>TRG</th><th>SCF</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRF MODE	TRG	SCF	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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HSUPA High Channel	 Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Ref Offset 7.57 dB Ref 30.00 dBm Mkr1 1.906 7 GHz 20.097 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20,000 GHz Sweep 50.67 ms (40001 pts) <table><tr><th>HRF MODE</th><th>TRG</th><th>SCF</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></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	HRF MODE	TRG	SCF	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f				2	N	1	f				3							4							5							6							7							8							9							10							11						
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HSUPA Low Band Spurious Emission	
HSUPA High Band Spurious Emission	

10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

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

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

10.2 Test Procedure

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

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

10.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	101 kPa
Test Voltage	DC 3.7V

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)						
41.13	-74.79	3.9	-70.89	-13	-57.89	H
1643.76	-51.97	4.83	-47.14	-13	-34.14	H
2468.57	-50.74	8.08	-42.66	-13	-29.66	H
42.68	-67.75	4.02	-63.73	-13	-50.73	V
1640.47	-46.88	4.48	-42.40	-13	-29.40	V
2467.93	-56.28	8.2	-48.08	-13	-35.08	V
Middle Channel (836.6MHz)						
36.78	-73.29	3.84	-69.45	-13	-56.45	H
1668.66	-58.07	4.62	-53.45	-13	-40.45	H
2501.83	-55.92	8.25	-47.67	-13	-34.67	H
45.61	-69.57	4.25	-65.32	-13	-52.32	V
1669.76	-52.80	4.54	-48.26	-13	-35.26	V
2509.31	-52.31	8.35	-43.96	-13	-29.75	V
High Channel (848.8MHz)						
39.73	-70.94	4.22	-75.16	-13	-62.16	H
1696.83	-58.69	4.87	-63.56	-13	-50.56	H
2539.89	-52.40	8.38	-60.78	-13	-47.78	H
41.35	-69.19	4.02	-73.21	-13	-60.21	V
1695.23	-55.13	4.56	-59.69	-13	-46.69	V
2540.78	-56.61	8.41	-65.02	-13	-52.02	V

For PCS Band GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
45.68	-73.62	4.34	-69.28	-13	-56.28	H
3694.06	-58.61	10.54	-48.07	-13	-35.07	H
5544.16	-54.92	13.37	-41.55	-13	-28.55	H
42.40	-66.90	4.34	-62.56	-13	-49.56	V
3693.86	-54.32	10.54	-43.78	-13	-30.78	V
5546.00	-55.81	13.37	-42.44	-13	-29.44	V
Middle Channel (1880MHz)						
37.11	-71.59	4.02	-67.57	-13	-54.57	H
3755.18	-55.57	10.71	-44.86	-13	-31.86	H
5637.96	-57.16	13.73	-43.43	-13	-30.43	H
37.14	-69.13	4.14	-64.99	-13	-51.99	V
3759.16	-49.57	10.22	-39.35	-13	-26.35	V
5633.73	-53.65	13.16	-40.49	-13	-27.49	V
High Channel (1909.8MHz)						
43.87	-68.53	4.02	-64.51	-13	-51.51	H
3816.31	-54.28	4.9	-49.38	-13	-36.38	H
5725.00	-45.72	8.09	-37.63	-13	-24.63	H
38.41	-54.19	4.25	-49.94	-13	-36.94	V
3817.85	-59.72	4.93	-54.79	-13	-41.79	V
5728.04	-58.09	8.43	-49.66	-13	-36.66	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
41.58	-72.97	3.91	-69.06	-13	-56.06	H
1643.63	-52.08	10.56	-41.52	-13	-28.52	H
2473.28	-57.12	13.5	-43.62	-13	-30.62	H
40.60	-65.21	3.93	-61.28	-13	-48.28	V
1649.06	-54.28	10.41	-43.87	-13	-30.87	V
2476.32	-61.12	13.16	-47.96	-13	-34.96	V
Middle Channel (836.6MHz)						
45.98	-66.13	4.02	-62.11	-13	-49.11	H
1671.97	-54.96	4.66	-50.30	-13	-37.30	H
2506.11	-42.94	8.34	-34.60	-13	-21.60	H
42.61	-61.55	4.17	-57.38	-13	-44.38	V
1668.27	-60.32	4.94	-55.38	-13	-42.38	V
2500.80	-59.01	8.19	-50.82	-13	-37.82	V
High Channel (846.6MHz)						
36.63	-75.57	3.87	-71.70	-13	-58.70	H
1692.06	-56.85	4.89	-51.96	-13	-38.96	H
2537.44	-45.26	8.42	-36.84	-13	-23.84	H
39.72	-58.00	3.95	-54.05	-13	-41.05	V
1688.99	-64.07	4.99	-59.08	-13	-46.08	V
2537.74	-56.62	8.12	-48.50	-13	-35.50	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
44.96	-72.43	3.91	-68.52	-13	-55.52	H
1651.60	-58.07	10.56	-47.51	-13	-34.51	H
2473.13	-55.38	13.5	-41.88	-13	-28.88	H
39.71	-69.54	3.93	-65.61	-13	-52.61	V
1645.88	-50.66	10.41	-40.25	-13	-27.25	V
2478.81	-60.51	13.16	-47.35	-13	-34.35	V
Middle Channel (1880MHz)						
41.62	-73.16	4.02	-69.14	-13	-56.14	H
1666.95	-58.94	4.66	-54.28	-13	-41.28	H
2505.42	-43.00	8.34	-34.66	-13	-21.66	H
38.56	-59.51	4.17	-55.34	-13	-42.34	V
1668.85	-54.81	4.94	-49.87	-13	-36.87	V
2506.41	-62.39	8.19	-54.20	-13	-41.20	V
High Channel (1907.6MHz)						
45.94	-72.06	3.87	-68.19	-13	-55.19	H
1683.90	-56.98	4.89	-52.09	-13	-39.09	H
2538.19	-48.05	8.42	-39.63	-13	-26.63	H
43.95	-62.22	3.95	-58.27	-13	-45.27	V
1691.83	-56.39	4.99	-51.40	-13	-38.40	V
2532.45	-60.33	8.12	-52.21	-13	-39.21	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	8.86	0.01059
40	NV	9.66	0.01155
30	NV	9.71	0.01161
20	NV	9.58	0.01145
10	NV	10.11	0.01209
0	NV	9.94	0.01188
-10	NV	10.32	0.01233
-20	NV	11.05	0.01321
-30	NV	10.71	0.01280

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	12.19	0.00649
40	NV	12.28	0.00653
30	NV	12.45	0.00662
20	NV	12.39	0.00659
10	NV	13.06	0.00695
0	NV	13.69	0.00728
-10	NV	14.29	0.00760
-20	NV	13.69	0.00728
-30	NV	14.52	0.00772

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	8.47	0.01012
40	NV	9.26	0.01107
30	NV	9.20	0.01100
20	NV	9.48	0.01134
10	NV	10.07	0.01204
0	NV	9.98	0.01193
-10	NV	10.06	0.01202
-20	NV	10.48	0.01253
-30	NV	10.76	0.01286

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	12.15	0.00646
40	NV	12.47	0.00663
30	NV	12.82	0.00682
20	NV	12.56	0.00668
10	NV	13.25	0.00705
0	NV	13.46	0.00716
-10	NV	14.15	0.00753
-20	NV	13.73	0.00730
-30	NV	14.82	0.00788

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	11.21	0.01340
40	NV	11.17	0.01336
30	NV	11.60	0.01387
20	NV	12.06	0.01442
10	NV	12.00	0.01434
0	NV	11.31	0.01352
-10	NV	11.85	0.01417
-20	NV	12.91	0.01543
-30	NV	13.25	0.01583

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	-10.52	-0.00560
40	NV	-9.95	-0.00530
30	NV	-9.62	-0.00512
20	NV	-9.68	-0.00515
10	NV	-9.10	-0.00484
0	NV	-8.70	-0.00463
-10	NV	-8.19	-0.00436
-20	NV	-8.01	-0.00426
-30	NV	-7.74	-0.00412

For WCDMA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.29	-0.00035
40	NV	0.27	0.00033
30	NV	0.63	0.00075
20	NV	0.79	0.00094
10	NV	1.02	0.00122
0	NV	1.30	0.00155
-10	NV	1.32	0.00157
-20	NV	1.15	0.00138
-30	NV	0.84	0.00100

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	-0.47	-0.00025
40	NV	0.53	0.00028
30	NV	-0.10	-0.00005
20	NV	0.79	0.00042
10	NV	0.88	0.00047
0	NV	0.46	0.00024
-10	NV	1.32	0.00070
-20	NV	0.77	0.00041
-30	NV	0.74	0.00039

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	-0.31	-0.00037
40	NV	0.17	0.00020
30	NV	0.76	0.00091
20	NV	0.71	0.00085
10	NV	1.07	0.00128
0	NV	1.07	0.00128
-10	NV	0.93	0.00112
-20	NV	1.35	0.00162
-30	NV	1.58	0.00189

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	-0.51	-0.00027
40	NV	-0.14	-0.00008
30	NV	0.29	0.00016
20	NV	0.54	0.00029
10	NV	0.76	0.00040
0	NV	1.26	0.00067
-10	NV	1.08	0.00057
-20	NV	1.46	0.00078
-30	NV	2.18	0.00116

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	0.12	0.00014
40	NV	0.53	0.00063
30	NV	0.63	0.00075
20	NV	0.95	0.00113
10	NV	1.25	0.00149
0	NV	1.48	0.00177
-10	NV	1.93	0.00231
-20	NV	2.55	0.00305
-30	NV	2.79	0.00334

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	4.65	0.00247
40	NV	5.08	0.00270
30	NV	5.53	0.00294
20	NV	5.38	0.00286
10	NV	5.68	0.00302
0	NV	6.81	0.00362
-10	NV	6.52	0.00347
-20	NV	7.14	0.00380
-30	NV	7.10	0.00378

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): GSM 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	10.97	0.01311
	NV	11.08	0.01324
	HV	12.05	0.01441
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	15.06	0.00801
	NV	14.96	0.00796
	HV	14.53	0.00773
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	10.63	0.01271
	NV	11.26	0.01346
	HV	11.48	0.01372
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	14.92	0.00793
	NV	15.04	0.00800
	HV	14.84	0.00789
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	12.75	0.01525
	NV	13.16	0.01574
	HV	13.58	0.01624
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	-7.51	-0.00399
	NV	-7.30	-0.00388
	HV	-7.19	-0.00382

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	1.40	0.00167
	NV	1.02	0.00122
	HV	1.57	0.00188
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	1.25	0.00072
	NV	0.50	0.00029
	HV	1.61	0.00093
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	2.35	0.00125
	NV	2.36	0.00282
	HV	3.26	0.00389

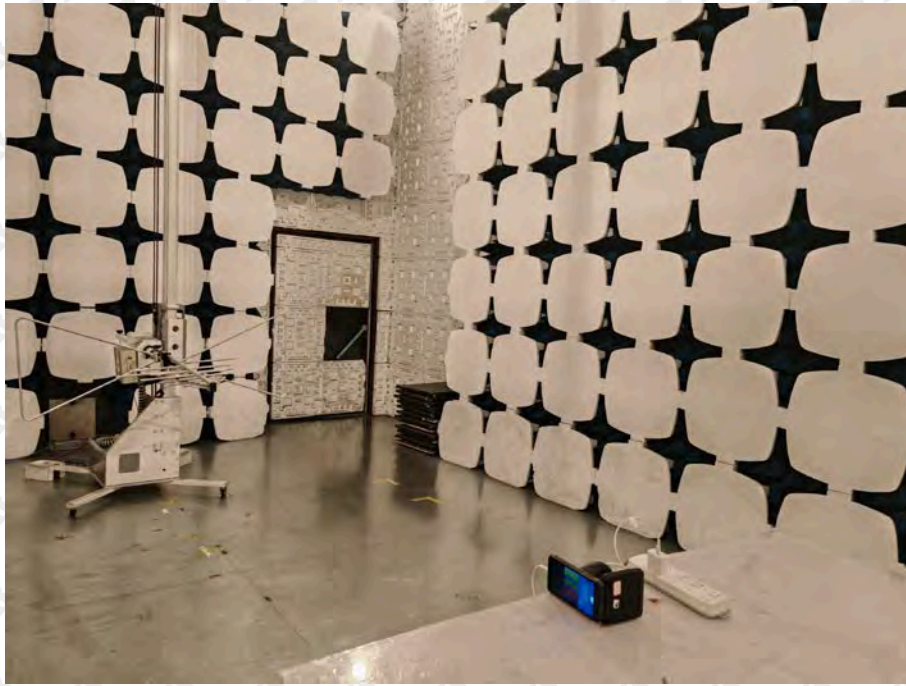
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.73	0.00207
	NV	2.32	0.00278
	HV	2.04	0.00244
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	5.65	0.00326
	NV	6.72	0.00388
	HV	6.40	0.00369
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	7.12	0.00379
	NV	6.80	0.00361
	HV	7.04	0.00374

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	2.25	0.00269
	NV	2.95	0.00353
	HV	3.46	0.00413
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	5.94	0.00343
	NV	5.67	0.00327
	HV	6.08	0.00351
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	8.62	0.00458
	NV	9.04	0.00481
	HV	9.18	0.00488

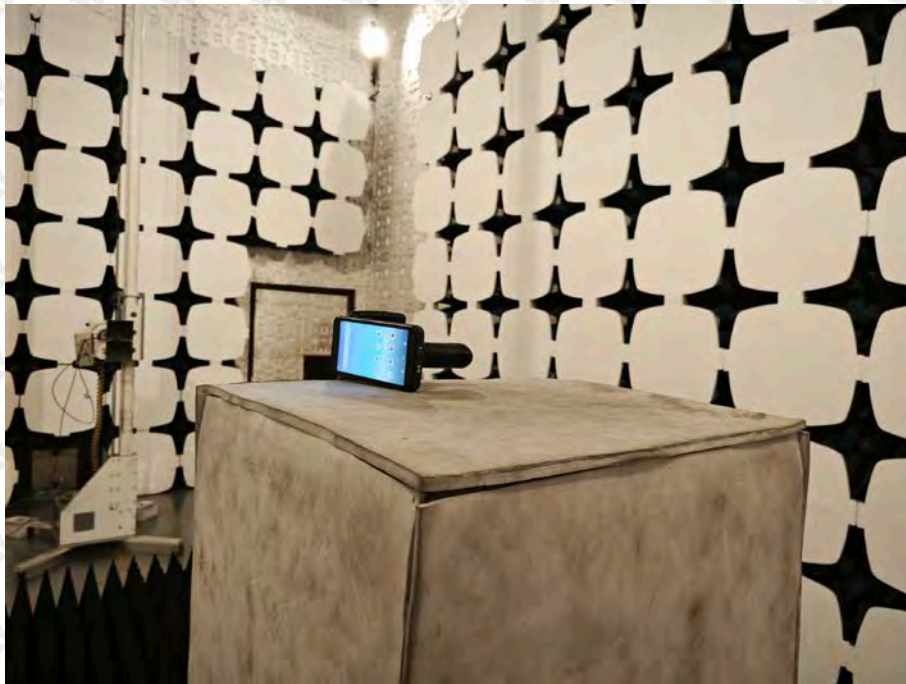
12. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



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