

TEST REPORT

Product Name: Tablet PC
FCC ID: 2BB4G-VT102
Trademark: N/A
Model Number: VT10M2, VT10P2
Prepared For: Venturo Co.,Ltd.
Address: B-dong, 49, Bukhang-ro, Seo-gu Incheon, 22769 South Korea
Manufacturer: Venturo Co.,Ltd.
Address: B-dong, 49, Bukhang-ro, Seo-gu Incheon, 22769 South Korea
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
Address: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date: Aug. 26, 2023
Sample tested Date: Aug. 26, 2023 to Sep. 12, 2023
Issue Date: Sep. 12, 2023
Report No.: CTB230912049RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

Zhou Kui

Zhou Kui

Reviewed by:

Arron Liu

Arron Liu

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.

TABLE OF CONTENT

Test Report Declaration	Page
1. VERSION	3
2. TEST SUMMARY	4
3. MEASUREMENT UNCERTAINTY	5
4. PRODUCT INFORMATION AND TEST SETUP	6
4.1 Product Information	6
4.2 Test Setup Configuration	7
4.3 Support Equipment	7
4.4 Channel List	7
4.5 Test Mode	8
4.6 Test Environment	8
5. TEST FACILITY AND TEST INSTRUMENT USED	9
5.1 Test Facility	9
5.2 Test Instrument Used	9
6. RF OUTPUT POWER	11
6.1 Standard Applicable	11
6.2 Test Procedure	11
6.3 Environmental Conditions	11
6.4 Summary of Test Results/Plots	12
7. PEAK-TO-AVERAGE RATIO(PAR) OF TRANSMITTER	21
7.1 Standard Applicable	21
7.2 Test Procedure	21
7.3 Environmental Conditions	21
7.4 Summary of Test Results	22
8. EMISSION BANDWIDTH	24
8.1 Standard Applicable	24
8.2 Test Procedure	24
8.3 Environmental Conditions	24
8.4 Summary of Test Results/Plots	25
9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL	43
9.1 Standard Applicable	43
9.2 Test Procedure	43
9.3 Environmental Conditions	43
9.4 Summary of Test Results/Plots	44
10. SPURIOUS RADIATED EMISSIONS	74
10.1 Standard Applicable	74
10.2 Test Procedure	74
10.3 Environmental Conditions	74
10.4 Summary of Test Results/Plots	75
11. FREQUENCY STABILITY	80
11.1 Standard Applicable	80
11.2 Test Procedure	80
11.3 Environmental Conditions	80
11.4 Summary of Test Results/Plots	81
12. EUT TEST PHOTO	94

(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB230912049RFX	Sep. 12, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

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

3. MEASUREMENT UNCERTAINTY

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

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



4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	VT10M2, VT10P2
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: VT10M2
Hardware Version:	M863YA
Software Version:	M863YAR330.HY.918-MMI.T0.CEM3.3G.2023082114.74941BEB43.USERDEB UG
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 5: 824~849MHz WCDMA Band 4: 1710~1755MHz WCDMA Band 2: 1850~1910MHz
Max. RF output power:	GSM850: 32.59dBm, GSM1900: 28.94dBm WCDMA Band 5: 23.04dBm WCDMA Band 4: 23.12dBm, WCDMA Band 2: 21.93dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	FPC antenna
Antenna Gain:	GSM850: -7.64dBi, GSM1900: -1.06dBi WCDMA Band 5: -7.64dBi WCDMA Band 4: -0.1dBi WCDMA Band 2: -1.06dBi
Ratings:	DC 5V charging from adapter DC 3.8V 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
1	Adapter	JYIN	JY-05100C	/	/

Notes:

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

4.4 Channel List

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS/EDGE	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 4	WCDMA/HSDPA/HSUPA	1712.4 MHz	1312
		1740.0 MHz	1450
		1752.6 MHz	1513
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 4	Low, Middle, High Channels
TM11	HSDPA Band 4	Low, Middle, High Channels
TM12	HSUPA Band 4	Low, Middle, High Channels
TM13	WCDMA Band 2	Low, Middle, High Channels
TM14	HSDPA Band 2	Low, Middle, High Channels
TM15	HSUPA Band 2	Low, Middle, High Channels

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.8V
Normal Temperature(°C)	23
Low Temperature(°C)	0
High Temperature(°C)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

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

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2024.07.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2024.07.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2024.07.05
4	Communication test set	R&S	CMW500	108058	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.07.06
12	BT&WI-FI Automatic test software	Microwave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
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	2023.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2023.10.30

6. RF OUTPUT POWER

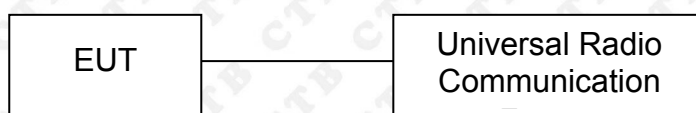
6.1 Standard Applicable

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	31.63	1.5	0	H	1.5	-7.64	22.49	38.45
824.2	32.57	1.5	0	V	1.5	-7.64	23.43	38.45
Middle Channel								
836.6	32.12	1.5	0	H	1.5	-7.64	22.98	38.45
836.6	31.87	1.5	0	V	1.5	-7.64	22.73	38.45
High Channel								
848.8	31.77	1.5	0	H	1.5	-7.64	22.63	38.45
848.8	32.39	1.5	0	V	1.5	-7.64	23.25	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	28.54	1.5	0	H	1.9	-1.06	25.58	33.00
1850.2	28.90	1.5	0	V	1.9	-1.06	25.94	33.00
Middle Channel								
1880	28.11	1.5	0	H	1.9	-1.06	25.15	33.00
1880	28.11	1.5	0	H	1.9	-1.06	25.15	33.00
High Channel								
1909.8	28.10	1.5	0	H	1.9	-1.06	25.14	33.00
1909.8	27.63	1.5	0	V	1.9	-1.06	24.67	33.00



ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	31.75	1.5	0	H	1.5	-7.64	22.61	38.45
824.2	31.86	1.5	0	V	1.5	-7.64	22.72	38.45
Middle Channel								
836.6	32.14	1.5	0	H	1.5	-7.64	23.00	38.45
836.6	31.60	1.5	0	V	1.5	-7.64	22.46	38.45
High Channel								
848.8	32.24	1.5	0	H	1.5	-7.64	23.10	38.45
848.8	32.00	1.5	0	V	1.5	-7.64	22.86	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	28.58	1.5	0	H	1.9	-1.06	25.62	33.00
1850.2	28.30	1.5	0	V	1.9	-1.06	25.34	33.00
Middle Channel								
1880	27.84	1.5	0	H	1.9	-1.06	24.88	33.00
1880	27.90	1.5	0	V	1.9	-1.06	24.94	33.00
High Channel								
1909.8	28.02	1.5	0	H	1.9	-1.06	25.06	33.00
1909.8	27.24	1.5	0	V	1.9	-1.06	24.28	33.00



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	28.38	1.5	0	H	1.5	-7.64	19.24	38.45
824.2	27.82	1.5	0	V	1.5	-7.64	18.68	38.45
Middle Channel								
836.6	28.45	1.5	0	H	1.5	-7.64	19.31	38.45
836.6	28.19	1.5	0	V	1.5	-7.64	19.05	38.45
High Channel								
848.8	27.75	1.5	0	H	1.5	-7.64	18.61	38.45
848.8	28.18	1.5	0	V	1.5	-7.64	19.04	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	26.07	1.5	0	H	1.9	-1.06	23.11	33.00
1850.2	26.57	1.5	0	V	1.9	-1.06	23.61	33.00
Middle Channel								
1880	26.61	1.5	0	H	1.9	-1.06	23.65	33.00
1880	26.33	1.5	0	V	1.9	-1.06	23.37	33.00
High Channel								
1909.8	26.53	1.5	0	H	1.9	-1.06	23.57	33.00
1909.8	25.90	1.5	0	V	1.9	-1.06	22.94	33.00

ERP For WCDMA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.74	1.5	0	H	1.5	-7.64	13.60	38.45
826.4	22.77	1.5	0	V	1.5	-7.64	13.63	38.45
Middle Channel								
836.6	22.93	1.5	0	H	1.5	-7.64	13.79	38.45
836.6	22.89	1.5	0	V	1.5	-7.64	13.75	38.45
High Channel								
846.6	22.15	1.5	0	H	1.5	-7.64	13.01	38.45
846.6	22.61	1.5	0	V	1.5	-7.64	13.47	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	21.82	1.5	0	H	1.5	-7.64	12.68	38.45
826.4	21.41	1.5	0	V	1.5	-7.64	12.27	38.45
Middle Channel								
836.6	21.62	1.5	0	H	1.5	-7.64	12.48	38.45
836.6	21.26	1.5	0	V	1.5	-7.64	12.12	38.45
High Channel								
846.6	21.10	1.5	0	H	1.5	-7.64	11.96	38.45
846.6	21.37	1.5	0	V	1.5	-7.64	12.23	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	20.17	1.5	0	H	1.5	-7.64	11.03	38.45
826.4	19.77	1.5	0	V	1.5	-7.64	10.63	38.45
Middle Channel								
836.6	20.81	1.5	0	H	1.5	-7.64	11.67	38.45
836.6	20.82	1.5	0	V	1.5	-7.64	11.68	38.45
High Channel								
846.6	21.05	1.5	0	H	1.5	-7.64	11.91	38.45
846.6	21.50	1.5	0	V	1.5	-7.64	12.36	38.45

ERP For WCDMA Mode Band 4

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								
1712.4	22.69	1.5	0	H	1.5	-0.1	21.09	38.45
1712.4	22.24	1.5	0	V	1.5	-0.1	20.64	38.45
Middle Channel								
1740	21.67	1.5	0	H	1.5	-0.1	20.07	38.45
1740	21.62	1.5	0	V	1.5	-0.1	20.02	38.45
High Channel								
1752.6	22.26	1.5	0	H	1.5	-0.1	20.66	38.45
1752.6	22.23	1.5	0	V	1.5	-0.1	20.63	38.45

ERP For HSDPA Mode Band 4

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								
1712.4	21.52	1.5	0	H	1.5	-0.1	19.92	38.45
1712.4	22.00	1.5	0	V	1.5	-0.1	20.40	38.45
Middle Channel								
1740	20.97	1.5	0	H	1.5	-0.1	19.37	38.45
1740	21.55	1.5	0	V	1.5	-0.1	19.95	38.45
High Channel								
1752.6	20.95	1.5	0	H	1.5	-0.1	19.35	38.45
1752.6	21.43	1.5	0	V	1.5	-0.1	19.83	38.45

ERP For HSUPA Mode Band 4

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								
1712.4	20.11	1.5	0	H	1.5	-0.1	18.51	38.45
1712.4	20.42	1.5	0	V	1.5	-0.1	18.82	38.45
Middle Channel								
1740	20.86	1.5	0	H	1.5	-0.1	19.26	38.45
1740	20.71	1.5	0	V	1.5	-0.1	19.11	38.45
High Channel								
1752.6	21.12	1.5	0	H	1.5	-0.1	19.52	38.45
1752.6	21.00	1.5	0	V	1.5	-0.1	19.40	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	21.52	1.5	0	H	1.9	-1.06	18.56	33
1852.4	22.08	1.5	0	V	1.9	-1.06	19.12	33
Middle Channel								
1880	21.27	1.5	0	H	1.9	-1.06	18.31	33
1880	21.75	1.5	0	V	1.9	-1.06	18.79	33
High Channel								
1907.6	21.41	1.5	0	H	1.9	-1.06	18.45	33
1907.6	21.60	1.5	0	V	1.9	-1.06	18.64	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	20.94	1.5	0	H	1.9	-1.06	17.98	33
1852.4	20.34	1.5	0	V	1.9	-1.06	17.38	33
Middle Channel								
1880	21.24	1.5	0	H	1.9	-1.06	18.28	33
1880	21.30	1.5	0	V	1.9	-1.06	18.34	33
High Channel								
1907.6	21.46	1.5	0	H	1.9	-1.06	18.50	33
1907.6	20.76	1.5	0	V	1.9	-1.06	17.80	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	20.12	1.5	0	H	1.9	-1.06	17.16	33
1852.4	19.70	1.5	0	V	1.9	-1.06	16.74	33
Middle Channel								
1880	21.56	1.5	0	H	1.9	-1.06	18.60	33
1880	20.80	1.5	0	V	1.9	-1.06	17.84	33
High Channel								
1907.6	19.82	1.5	0	H	1.9	-1.06	16.86	33
1907.6	20.13	1.5	0	V	1.9	-1.06	17.17	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	32.59	38.45
	Middle Channel	836.6	32.29	38.45
	High Channel	848.8	32.42	38.45
GPRS(1 Slot)	Low Channel	824.2	32.56	38.45
	Middle Channel	836.6	32.25	38.45
	High Channel	848.8	32.39	38.45
EDGE(1 Slot)	Low Channel	824.2	28.43	38.45
	Middle Channel	836.6	28.74	38.45
	High Channel	848.8	28.21	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	28.94	33.0
	Middle Channel	1880.0	28.90	33.0
	High Channel	1909.8	28.22	33.0
GPRS(1 Slot)	Low Channel	1850.2	28.84	33.0
	Middle Channel	1880.0	28.78	33.0
	High Channel	1909.8	28.08	33.0
EDGE(1 Slot)	Low Channel	1850.2	26.85	33.0
	Middle Channel	1880.0	26.85	33.0
	High Channel	1909.8	26.57	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	23.12	38.45
	Middle Channel	836.6	22.95	38.45
	High Channel	846.6	22.93	38.45
HSDPA	Low Channel	826.4	21.91	38.45
	Middle Channel	836.6	21.87	38.45
	High Channel	846.6	21.86	38.45
HSUPA	Low Channel	826.4	20.69	38.45
	Middle Channel	836.6	21.67	38.45
	High Channel	846.6	21.64	38.45

For WCDMA Band 4

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	1712.4	23.04	38.45
	Middle Channel	1740	22.59	38.45
	High Channel	1752.6	22.71	38.45
HSDPA	Low Channel	1712.4	22.16	38.45
	Middle Channel	1740	21.76	38.45
	High Channel	1752.6	21.75	38.45
HSUPA	Low Channel	1712.4	20.93	38.45
	Middle Channel	1740	21.42	38.45
	High Channel	1752.6	21.39	38.45



For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	21.93	33.00
	Middle Channel	1880.0	21.88	33.00
	High Channel	1907.6	21.74	33.00
HSDPA	Low Channel	1852.4	20.94	33.00
	Middle Channel	1880.0	20.92	33.00
	High Channel	1907.6	20.81	33.00
HSUPA	Low Channel	1852.4	19.71	33.00
	Middle Channel	1880.0	20.75	33.00
	High Channel	1907.6	20.56	33.00

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

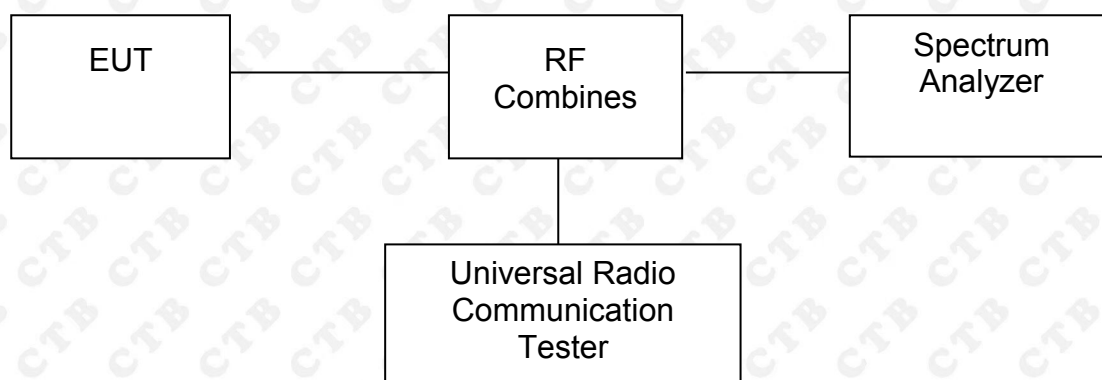
7.1 Standard Applicable

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	2.67	13
GPRS(1 Slot)	190	836.6	2.70	13
EDGE(1 Slot)	190	836.6	6.38	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.70	13
GPRS(1 Slot)	512	1850.2	2.73	13
EDGE(1 Slot)	512	1850.2	5.26	13

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4132	836.4	2.97	13
HSDPA	4182	836.4	3.06	13
HSUPA	4233	836.4	3.52	13

For WCDMA Band 4

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	1312	1712.4	3.06	13
HSDPA	1450	1740	3.16	13
HSUPA	1513	1752.6	3.53	13

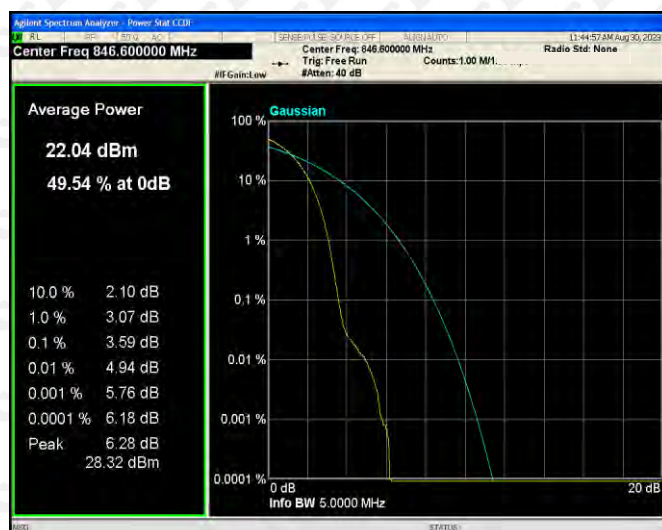
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	2.96	13
HSDPA	9400	1852.4	3.06	13
HSUPA	9538	1852.4	3.46	13

EDGE:



HSUPA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

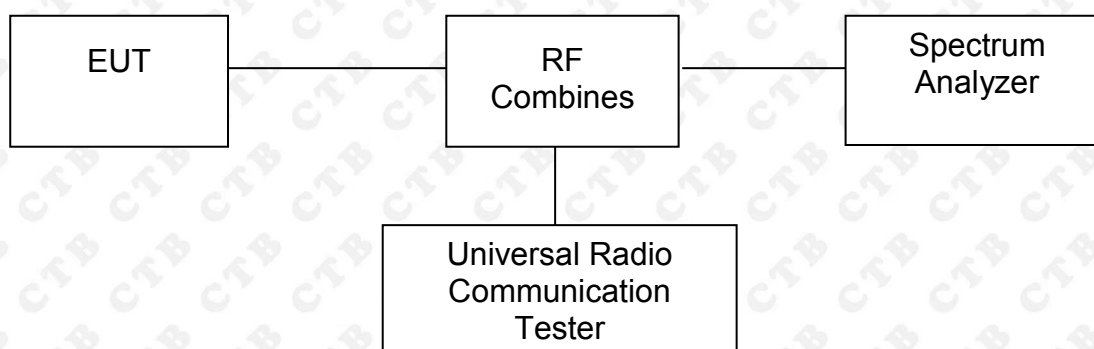
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

8.2 Test Procedure

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

Test Configuration for the emission bandwidth testing:



8.3 Environmental Conditions

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

8.4 Summary of Test Results/Plots

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	248.693	319.206
	190	836.6	248.762	326.867
	251	848.8	250.152	318.419
GPRS	128	824.2	242.807	319.803
	190	836.6	242.580	313.024
	251	848.8	248.501	315.848
EDGE	128	824.2	262.040	332.976
	190	836.6	264.012	337.641
	251	848.8	258.854	322.169

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	241.720	313.868
	661	1880.0	251.250	316.075
	810	1909.8	246.237	316.345
GPRS	512	1850.2	248.722	313.491
	661	1880.0	242.314	311.397
	810	1909.8	246.709	319.984
EDGE	512	1850.2	259.861	340.116
	661	1880.0	254.984	329.347
	810	1909.8	256.113	322.052

For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4171.944	4703.290
	4183	836.6	4180.695	4708.159
	4233	846.6	4174.908	4733.075
HSDPA	4132	826.4	4176.834	4712.173
	4183	836.6	4192.761	4707.685
	4233	846.6	4166.190	4693.242
HSUPA	4132	826.4	4164.647	4700.665
	4183	836.6	4174.977	4987.652
	4233	846.6	4202.171	4702.472

For Band 4

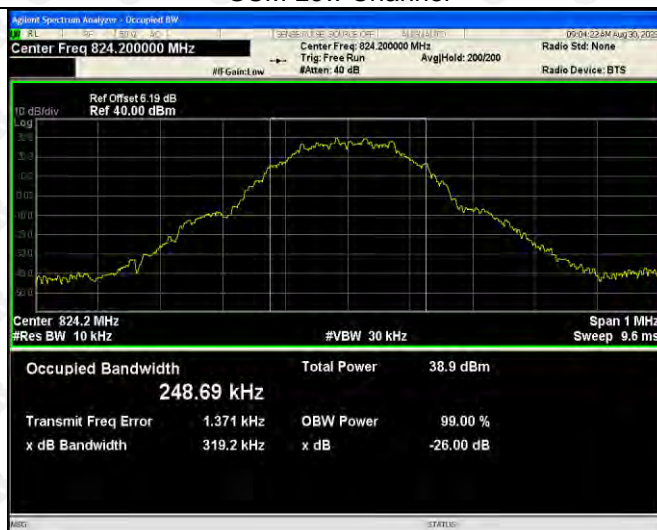
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	1312	1712.4	4176.711	4698.173
	1450	1740	4170.139	4694.578
	1513	1752.6	4156.952	4714.001
HSDPA	1312	1712.4	4177.797	4677.214
	1450	1740	4182.811	4708.816
	1513	1752.6	4186.786	4684.769
HSUPA	1312	1712.4	4179.484	4684.545
	1450	1740	4166.789	4712.565
	1513	1752.6	4189.915	4701.228

For Band 2

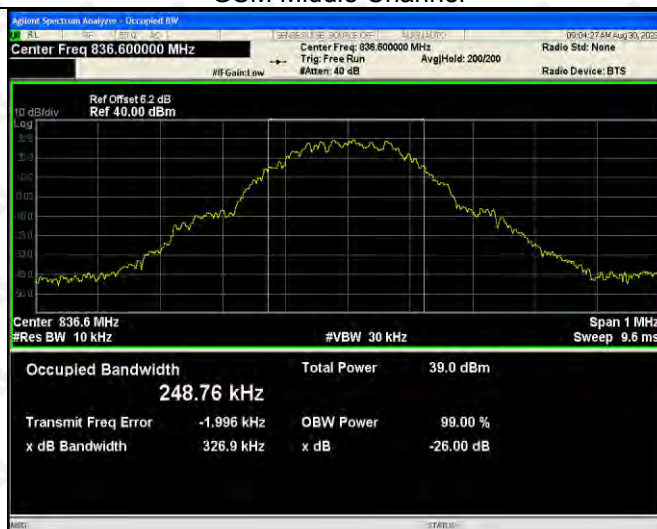
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4177.302	4694.175
	9400	1880.0	4175.471	4713.393
	9538	1907.6	4168.353	4983.750
HSDPA	9262	1852.4	4194.138	4739.653
	9400	1880.0	4171.597	4726.098
	9538	1907.6	4173.723	4687.371
HSUPA	9262	1852.4	4205.793	5082.950
	9400	1880.0	4171.179	4690.846
	9538	1907.6	4180.365	4704.487

For Cellular Band

GSM Low Channel



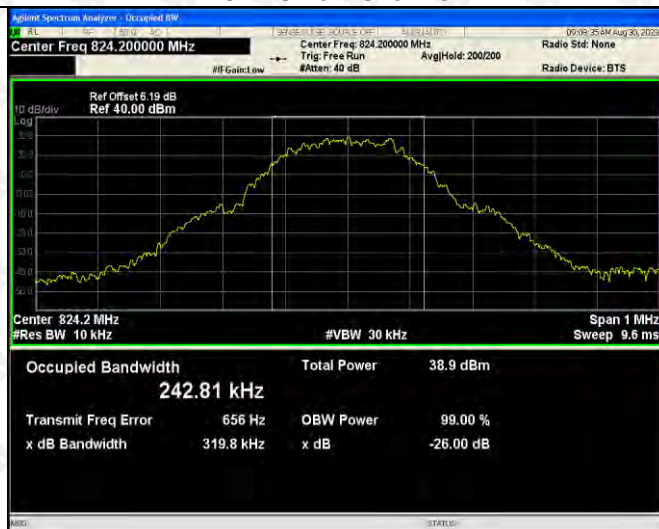
GSM Middle Channel



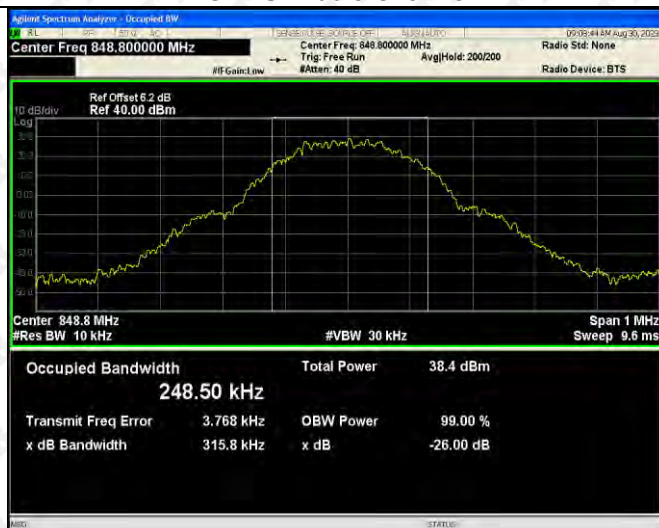
GSM High Channel



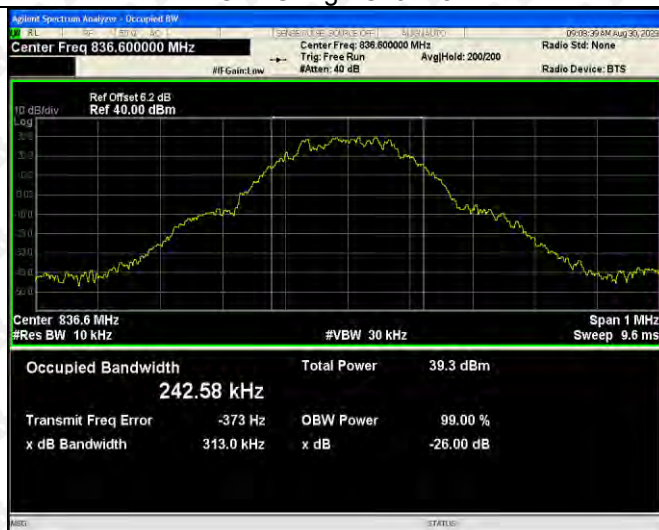
GPRS Low Channel



GPRS Middle Channel



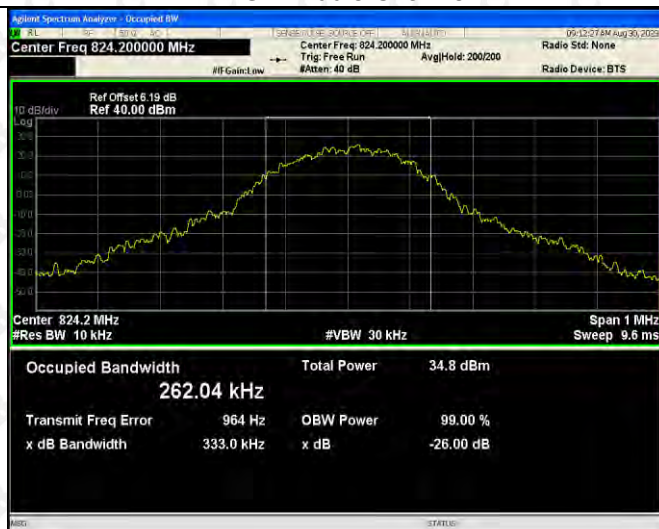
GPRS High Channel



EDGE Low Channel



EDGE Middle Channel

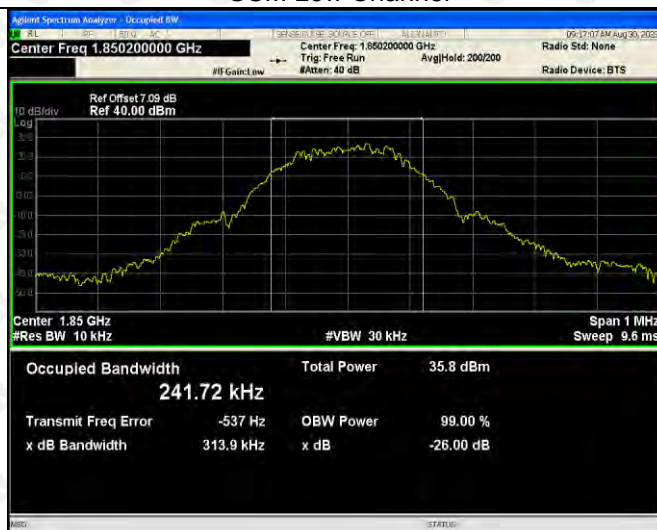


EDGE High Channel



For PCS Band

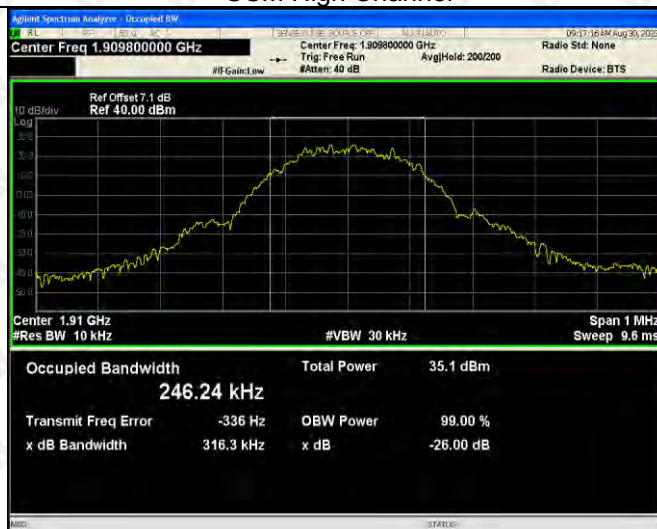
GSM Low Channel



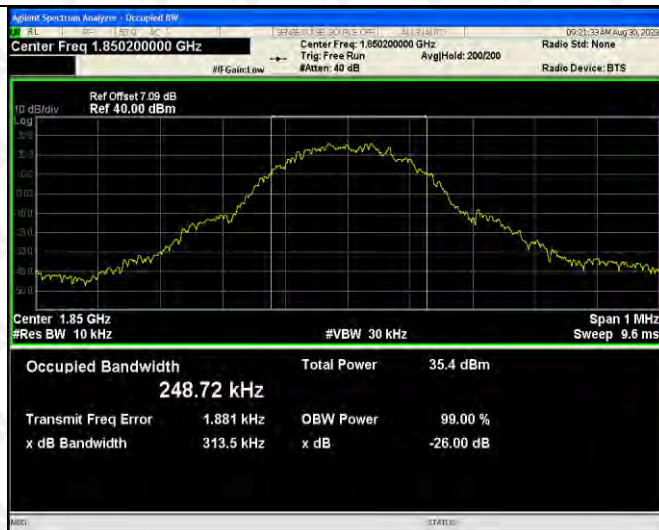
GSM Middle Channel



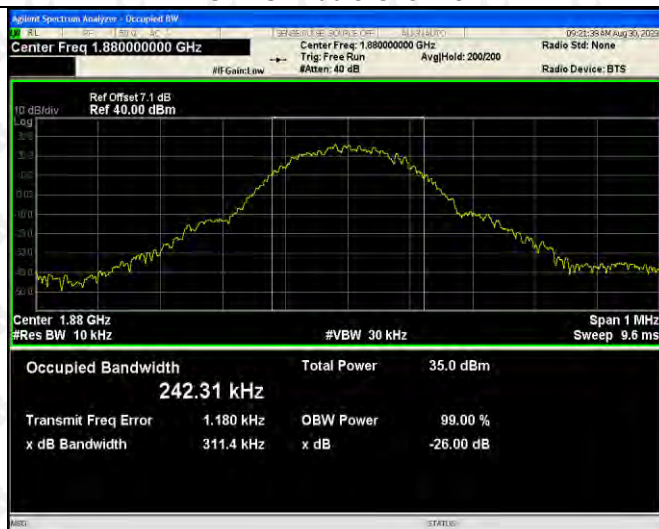
GSM High Channel



GPRS Low Channel



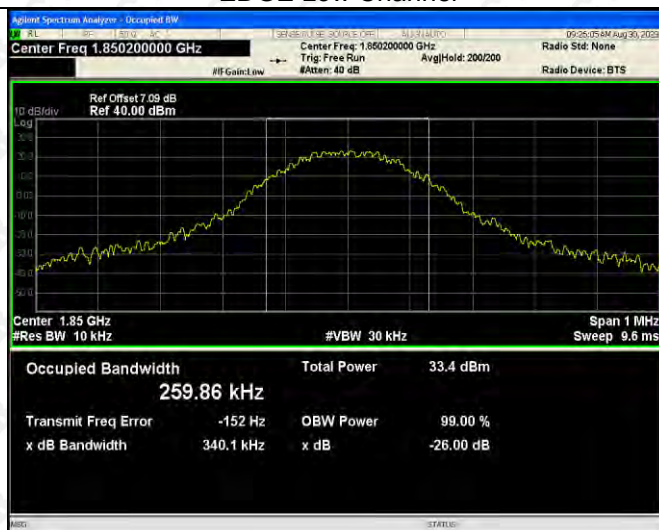
GPRS Middle Channel



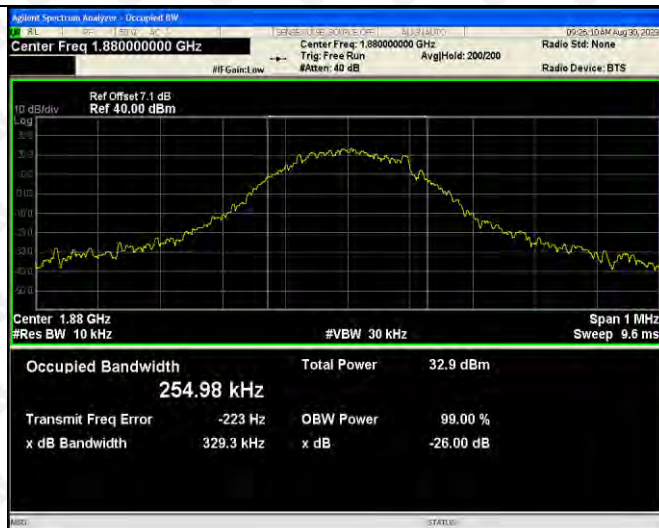
GPRS High Channel



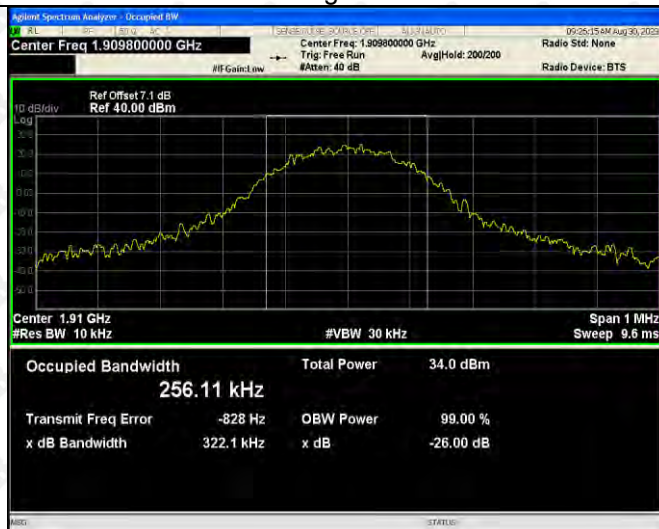
EDGE Low Channel



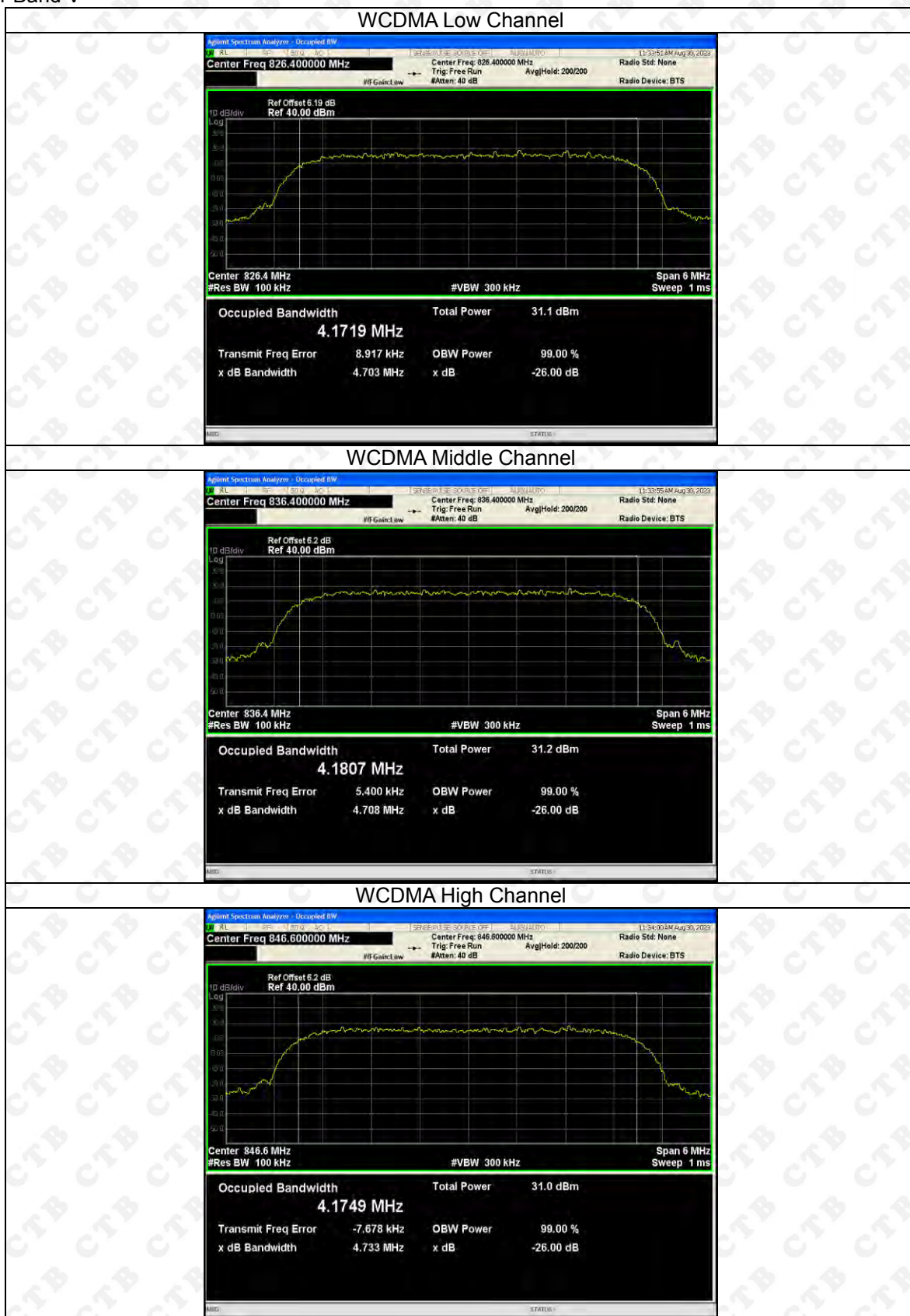
EDGE Middle Channel



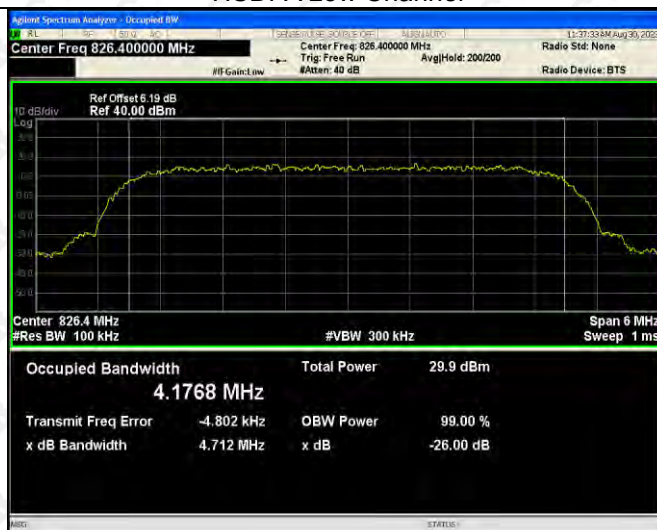
EDGE High Channel



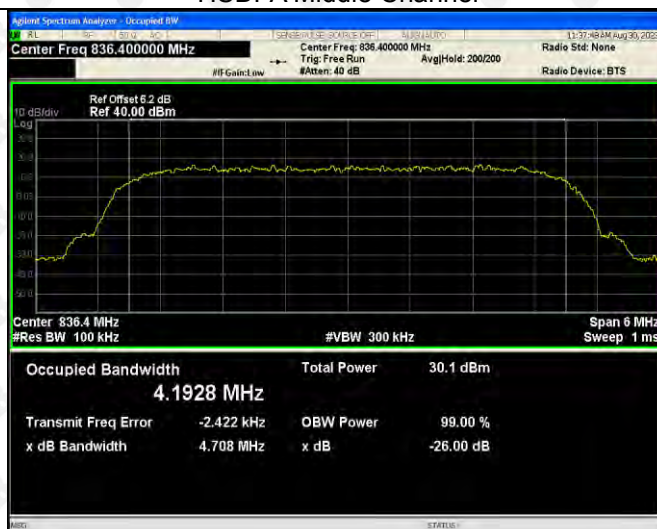
For Band V



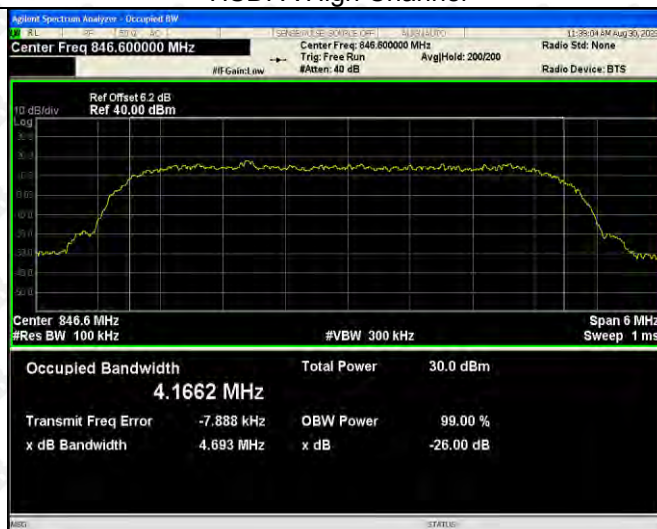
HSDPA Low Channel



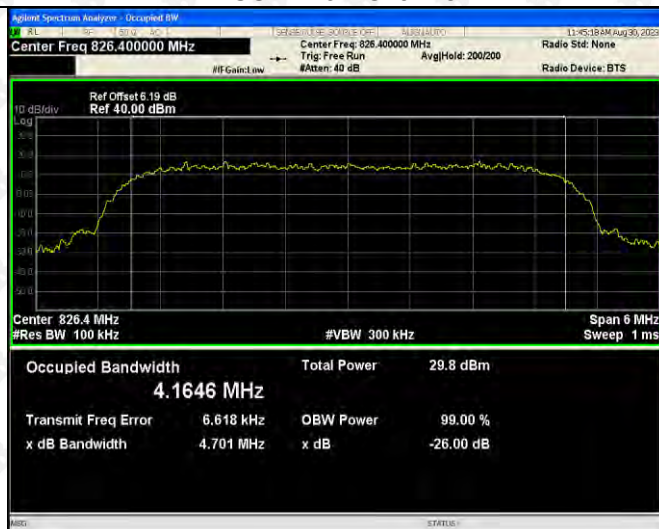
HSDPA Middle Channel



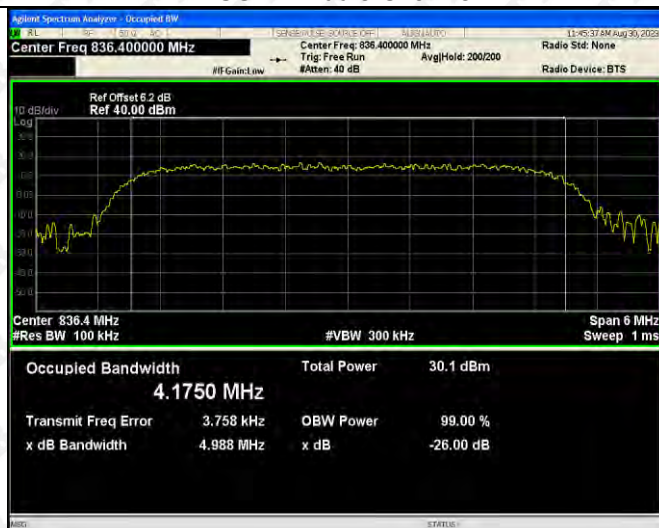
HSDPA High Channel



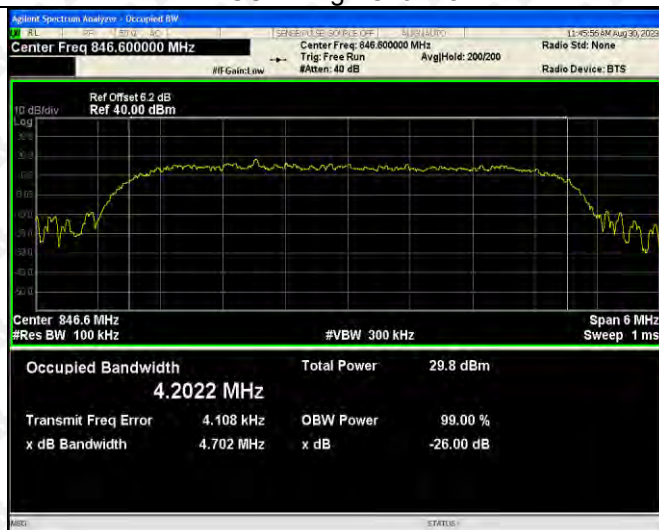
HSUPA Low Channel



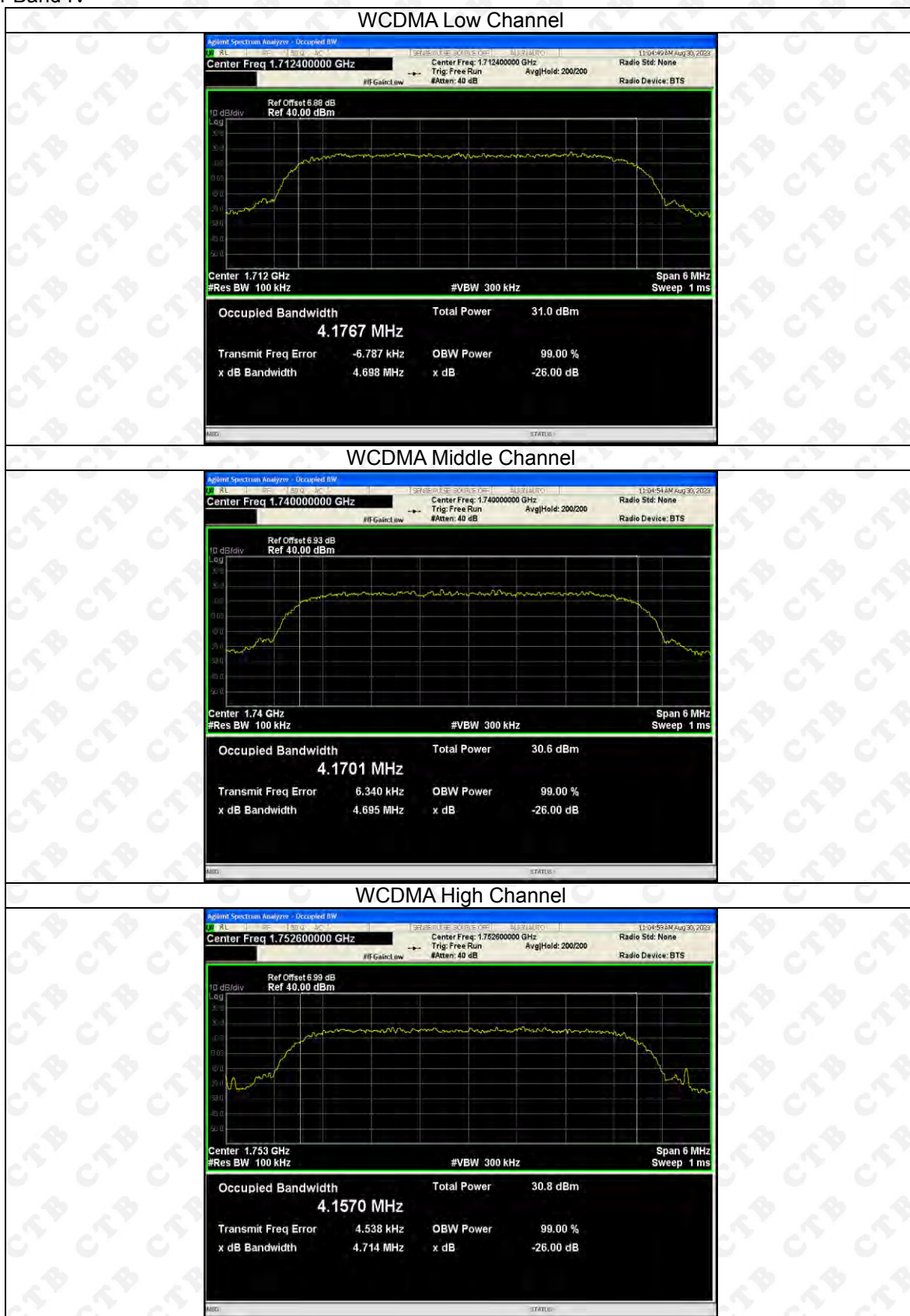
HSUPA Middle Channel



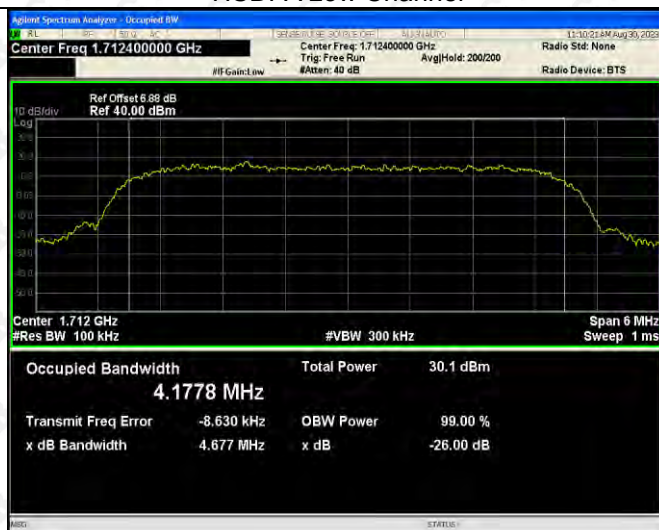
HSUPA High Channel



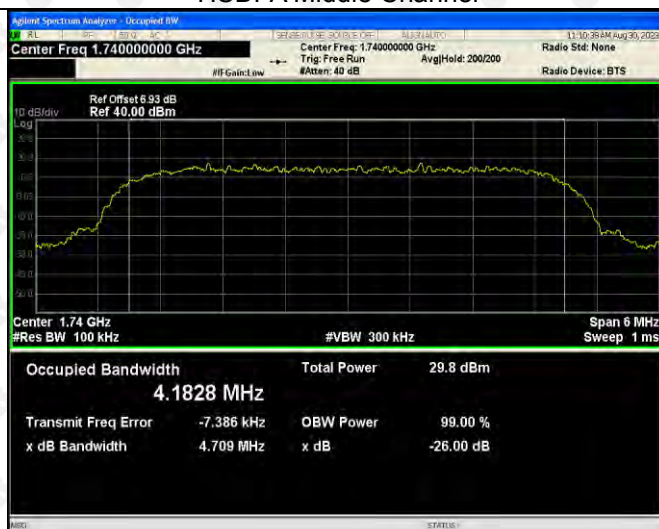
For Band IV



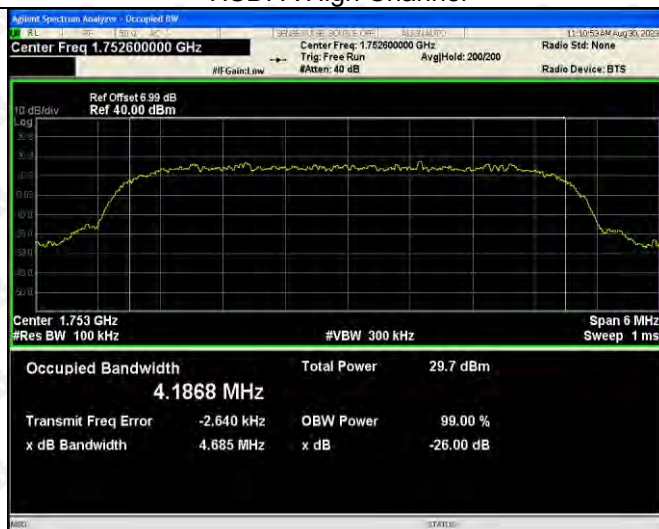
HSDPA Low Channel



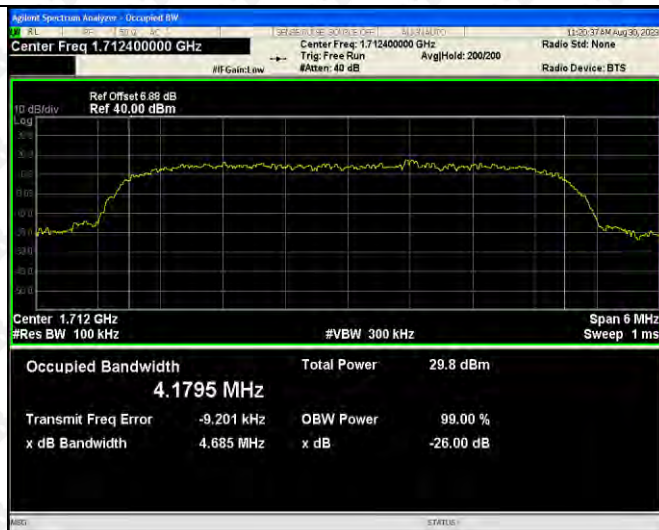
HSDPA Middle Channel



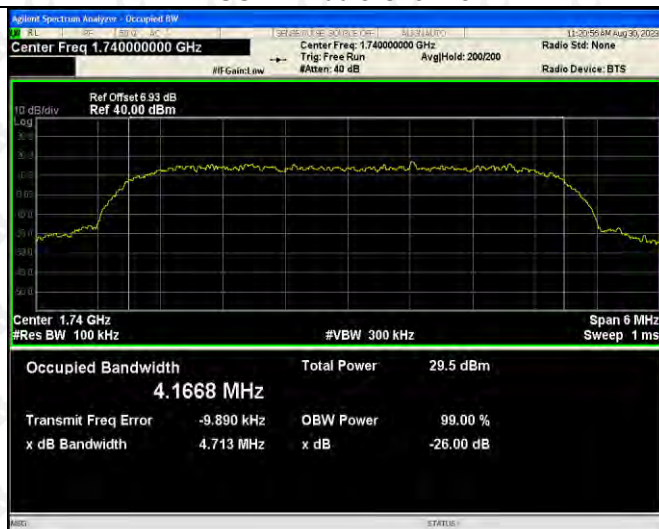
HSDPA High Channel



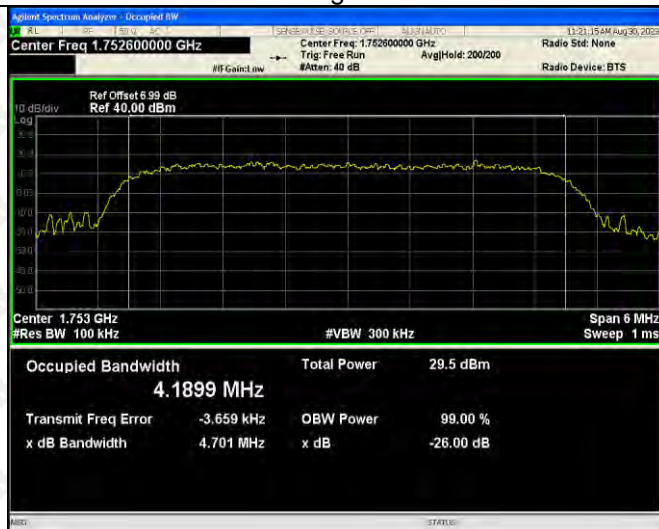
HSUPA Low Channel



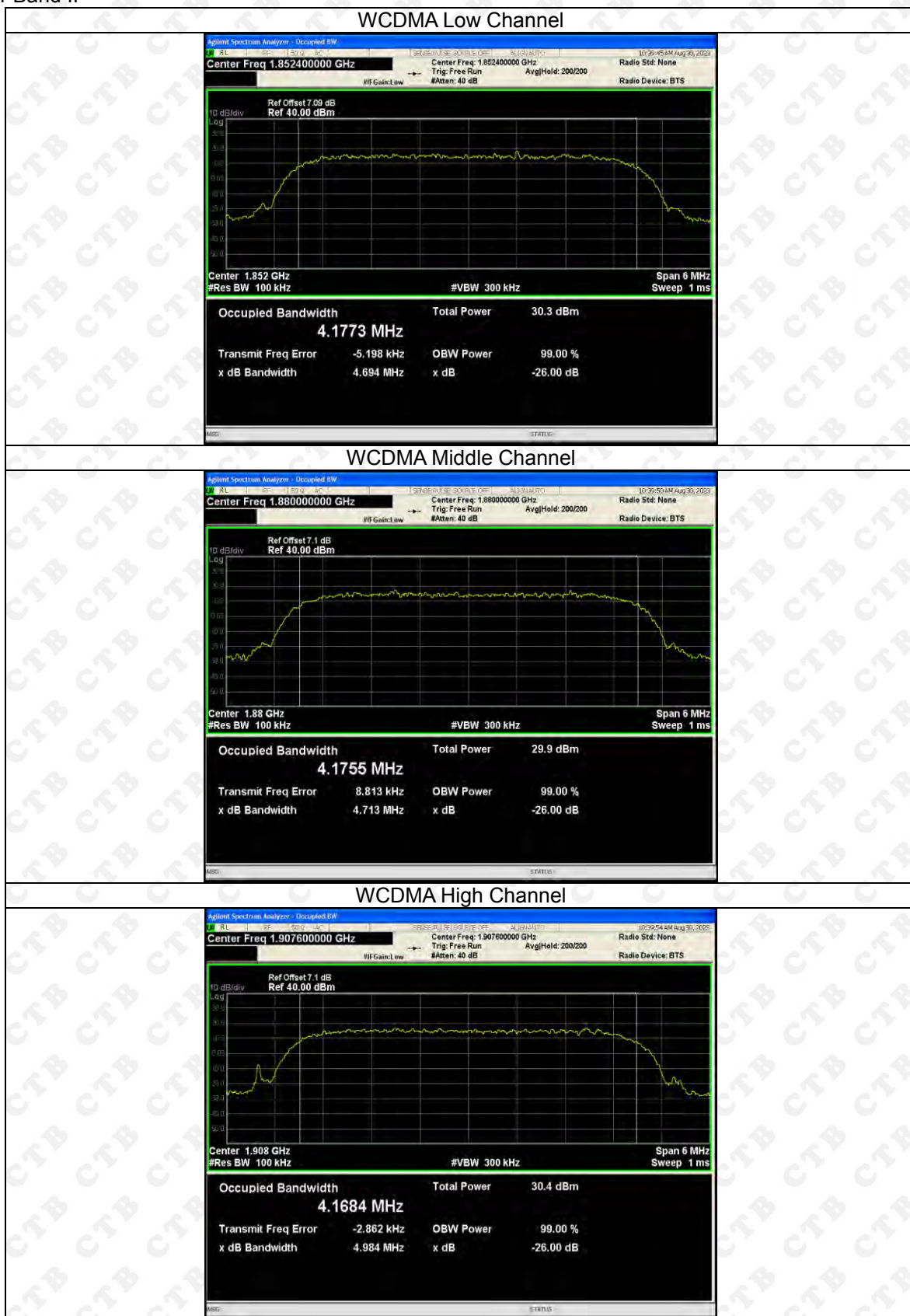
HSUPA Middle Channel



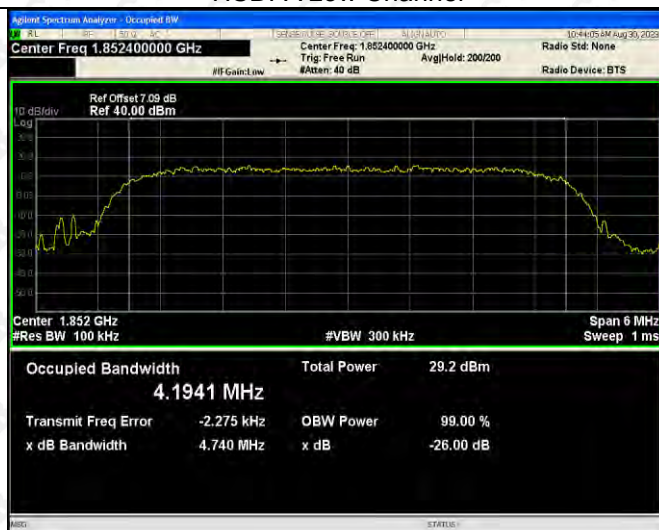
HSUPA High Channel



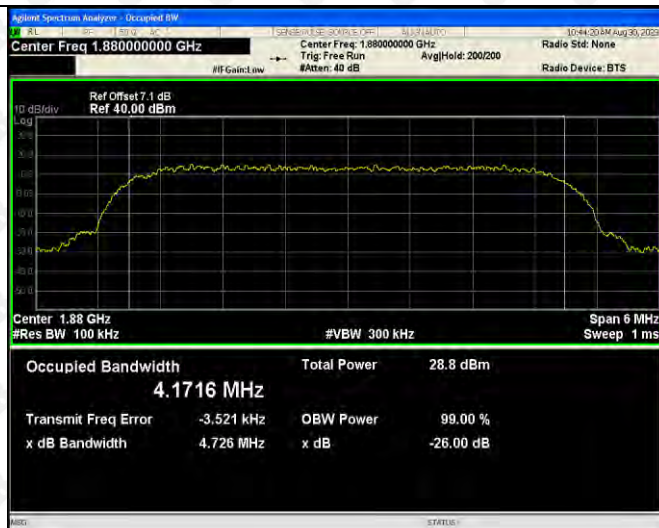
For Band II



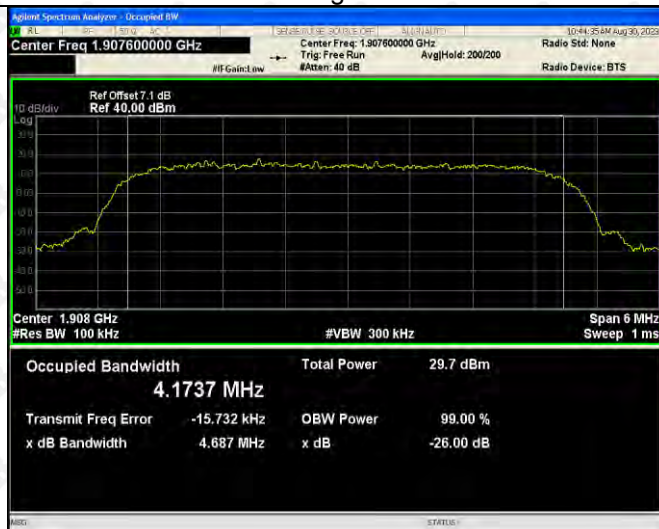
HSDPA Low Channel



HSDPA Middle Channel



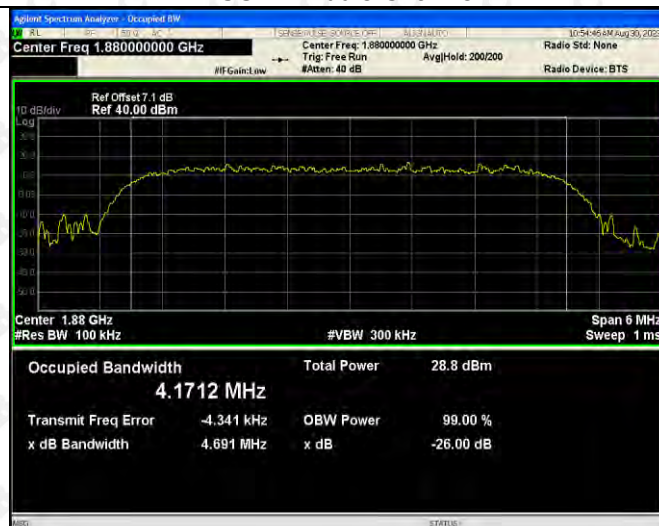
HSDPA High Channel



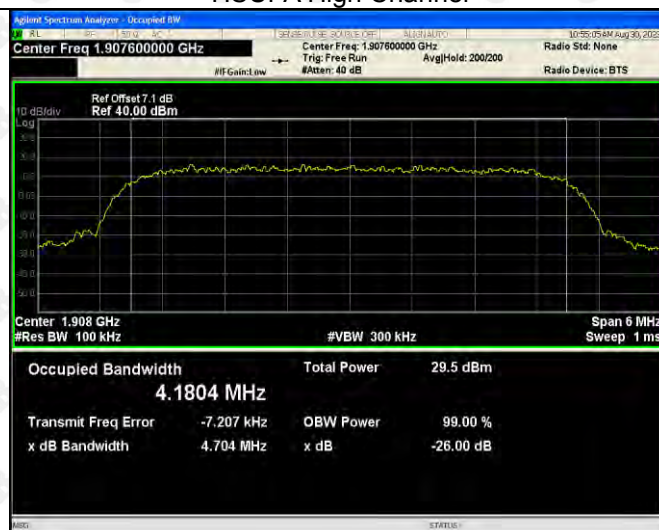
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

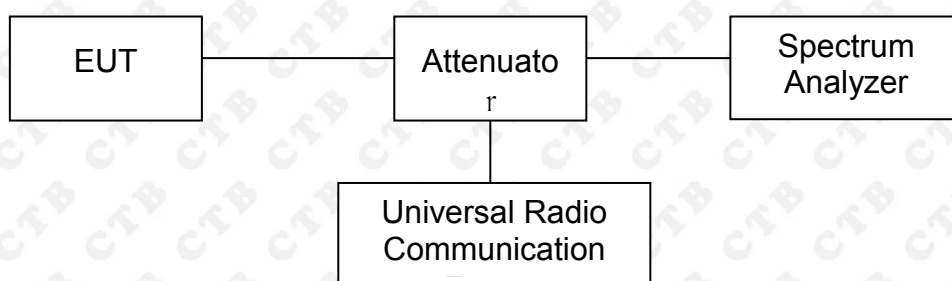
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:



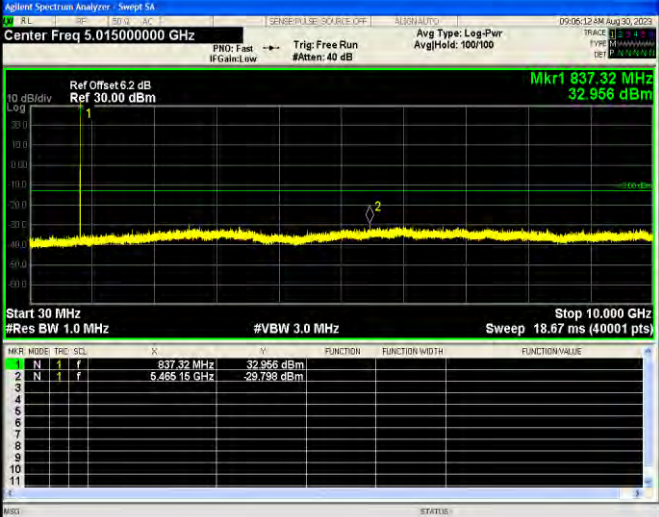
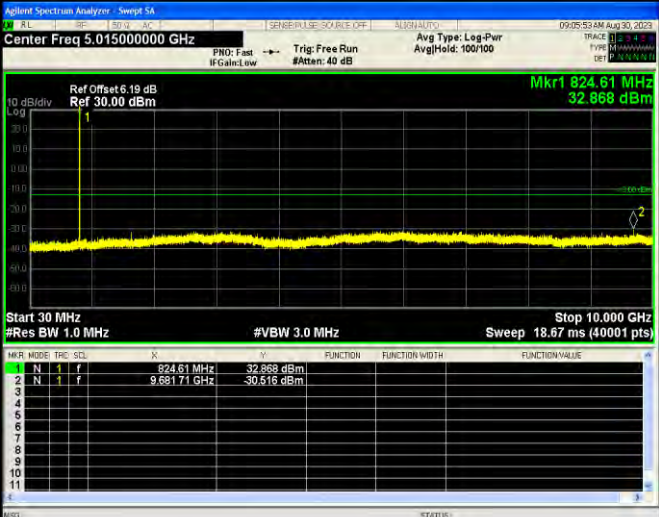
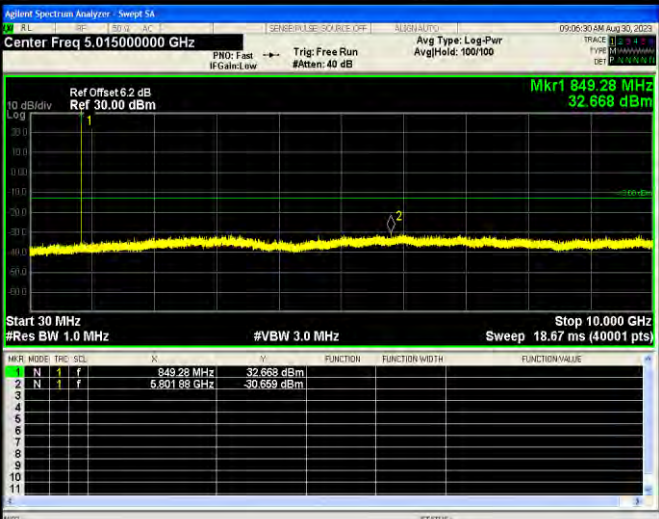
9.3 Environmental Conditions

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

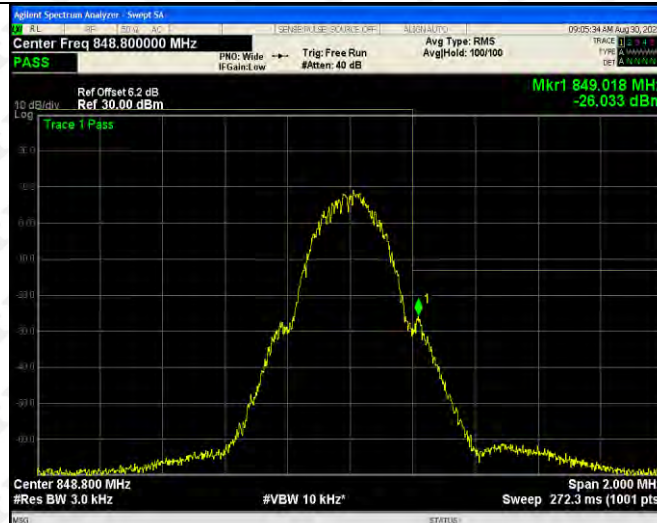
9.4 Summary of Test Results/Plots

Please refer to the following test plots

For Cellular Band

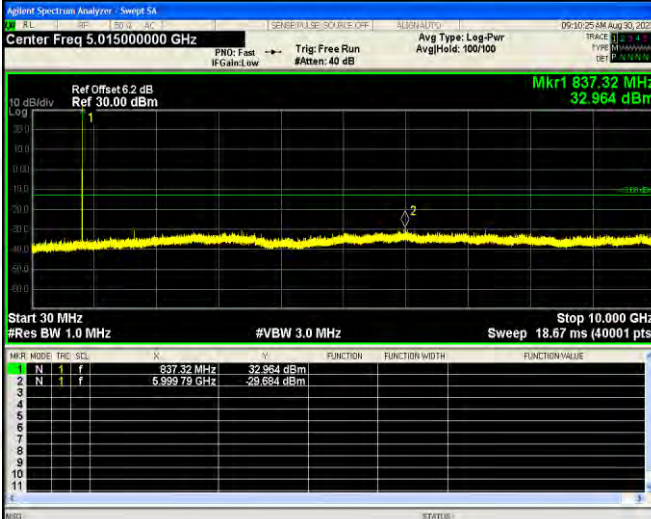
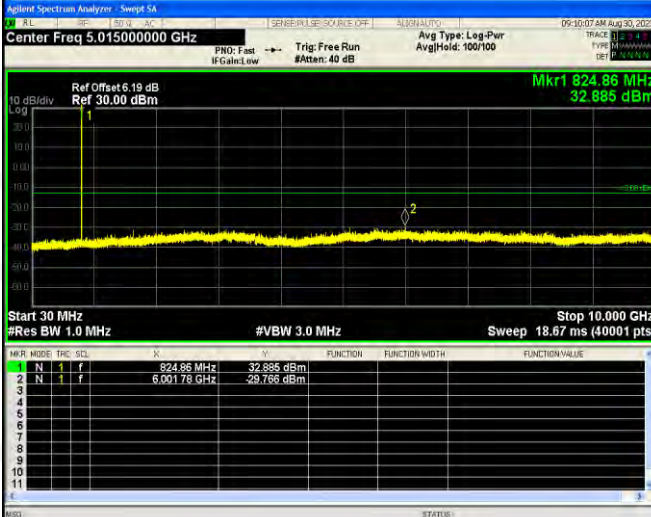
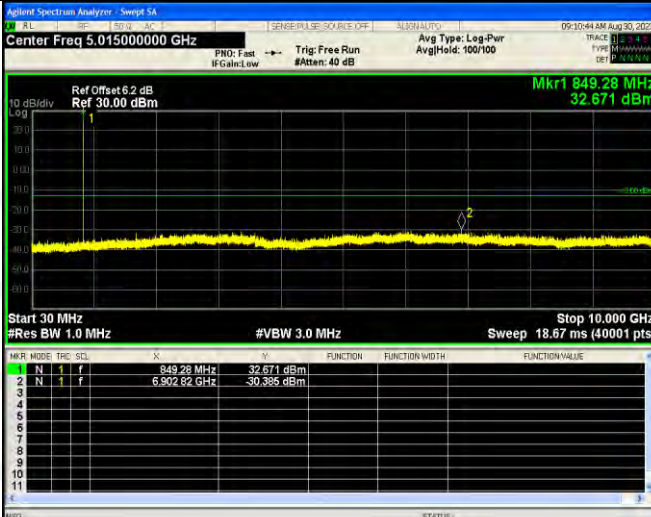
GSM Low Channel	
GSM Middle Channel	
GSM High Channel	

GSM
Low
Band
Emission

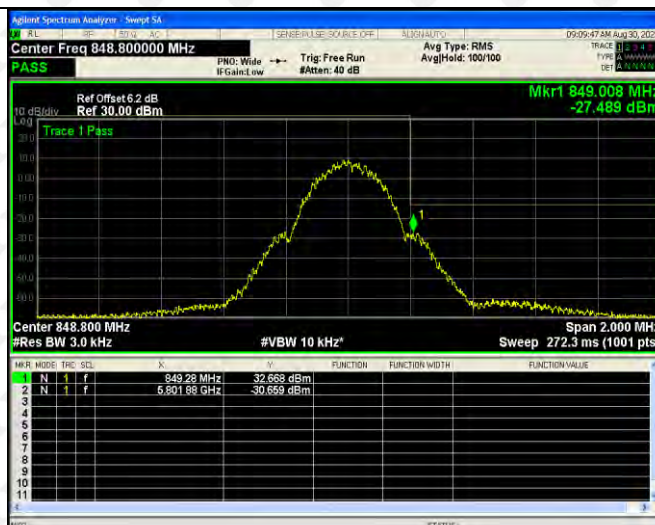


GSM
High
Band
Emission

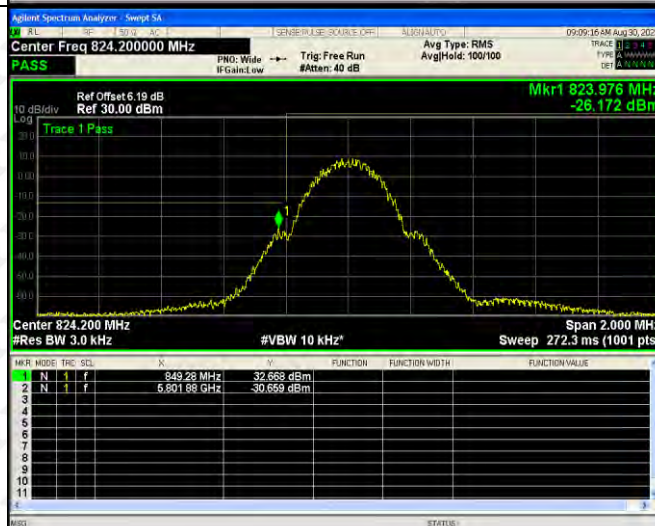


GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

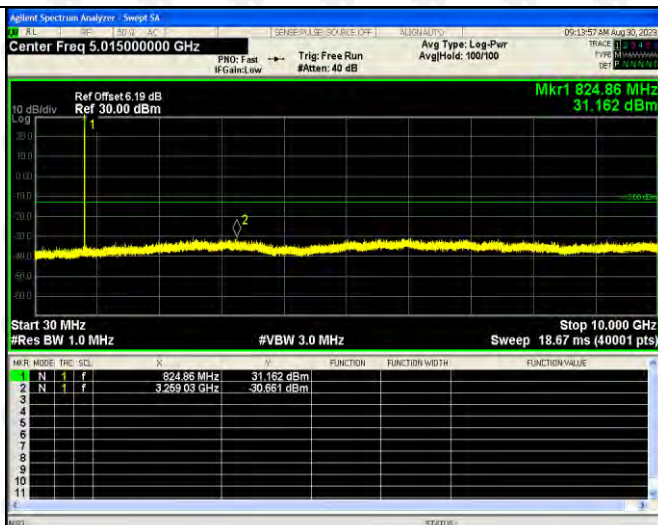
GPRS
Low
Band
Emission



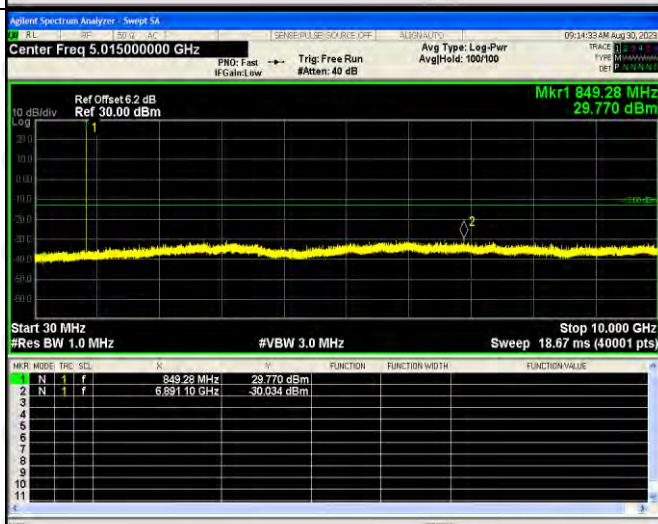
GPRS
High
Band
Emission



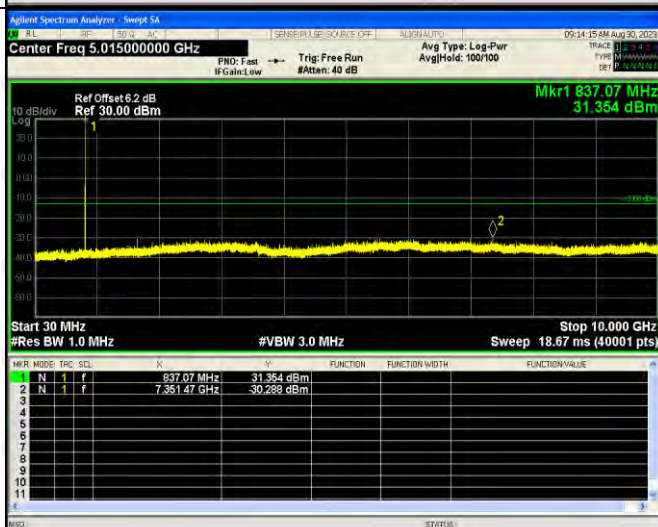
EDGE
Low
Channel



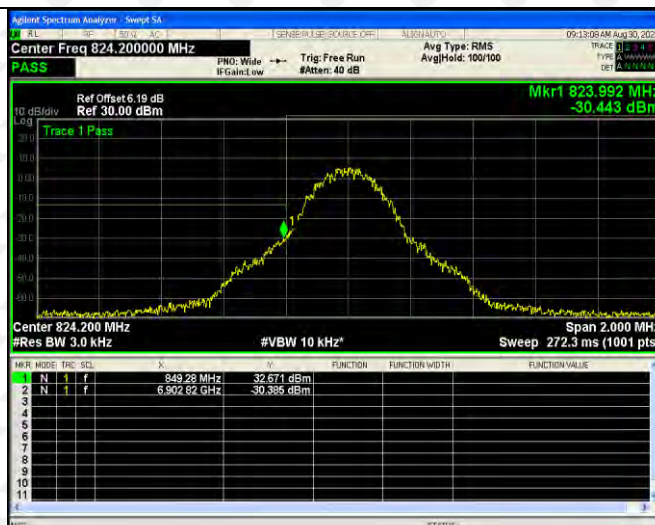
EDGE
Middle
Channel



EDGE
High
Channel



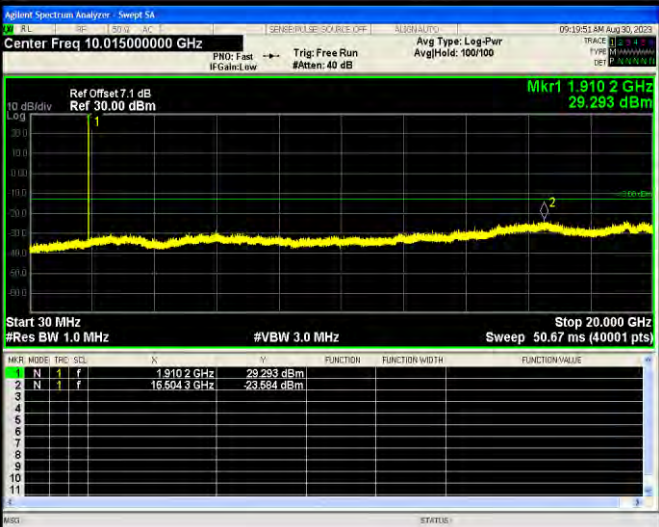
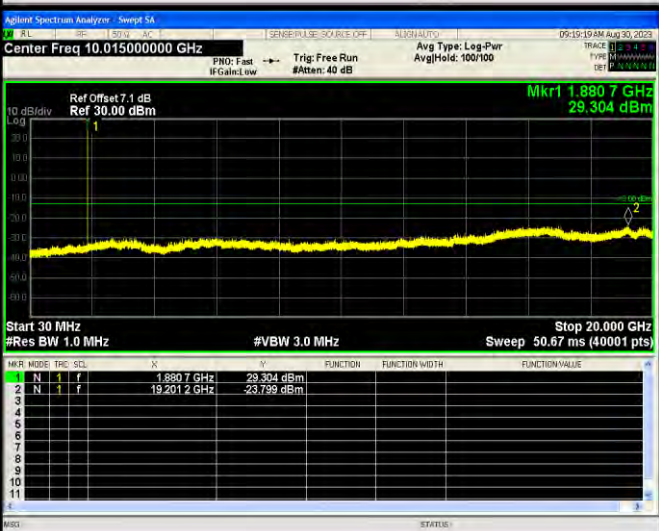
EDGE
Low
Band
Emission



EDGE
High
Band
Emission



For PCS Band

GSM Low Channel		
GSM Middle Channel		
GSM High Channel		

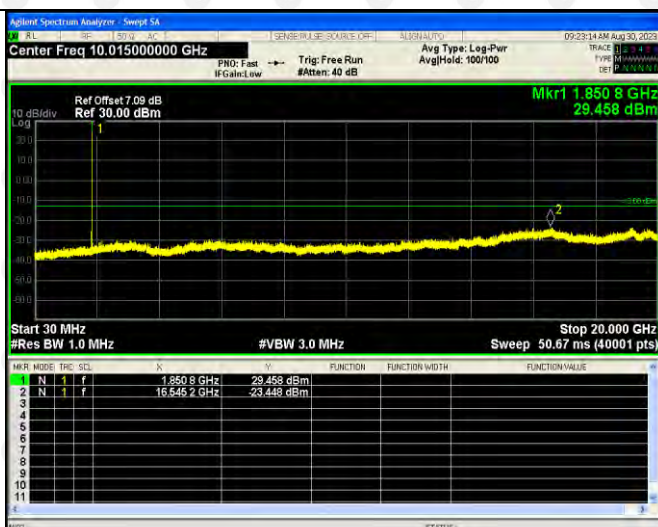
GSM
Low
Band
Emission



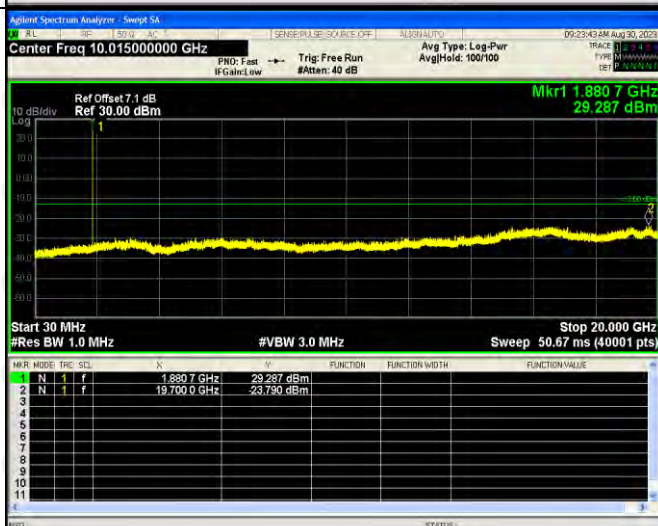
GSM
High
Band
Emission



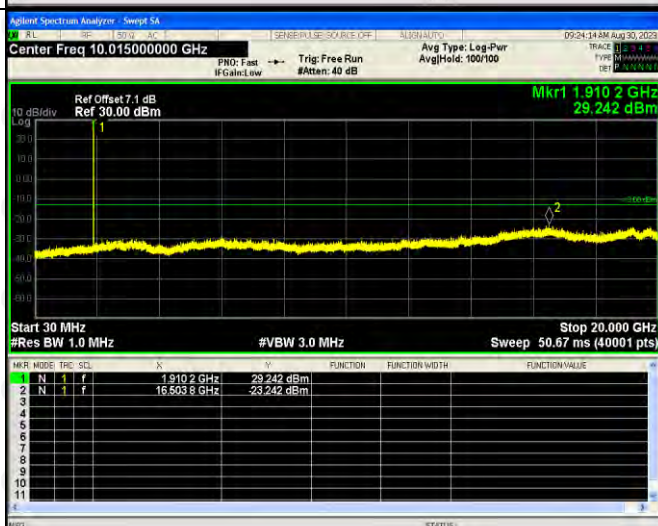
GPRS
Low
Channel



GPRS
Middle
Channel



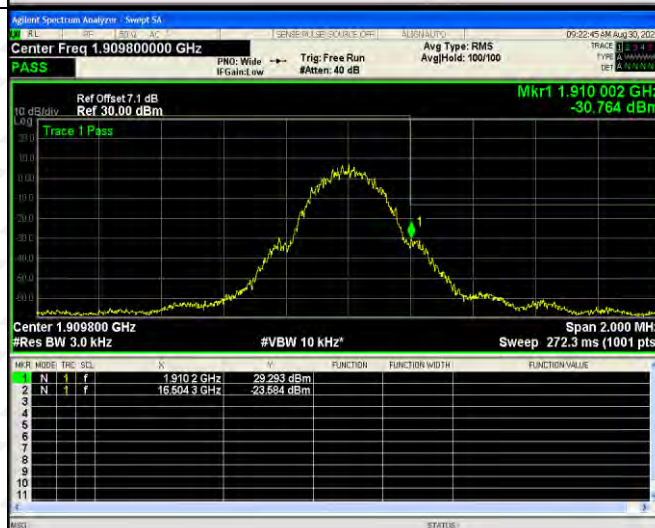
GPRS
High
Channel



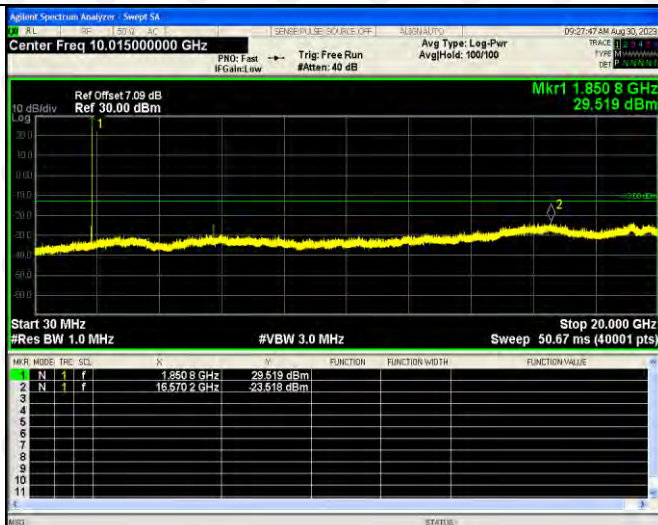
GPRS
Low
Band
Emission



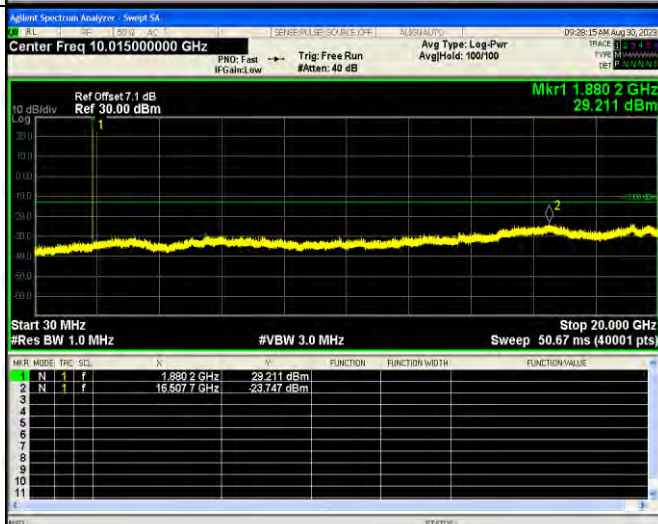
GPRS
High
Band
Emission



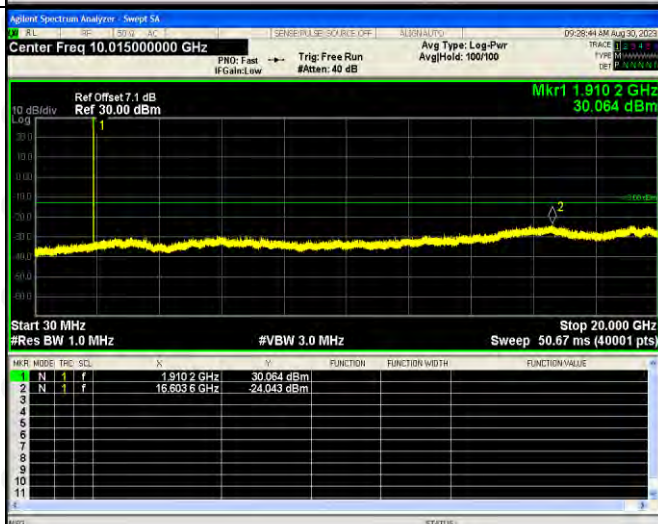
EDGE
Low
Channel



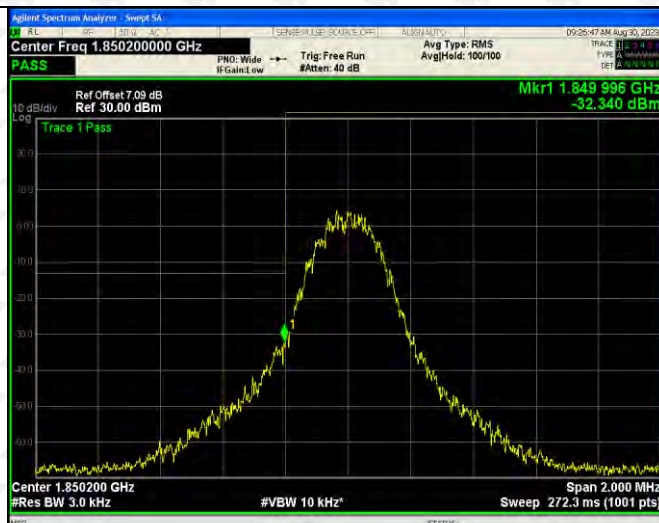
EDGE
Middle
Channel



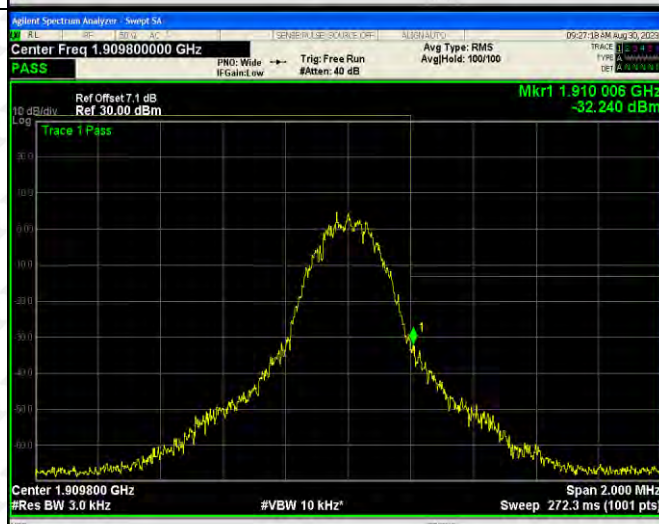
EDGE
High
Channel



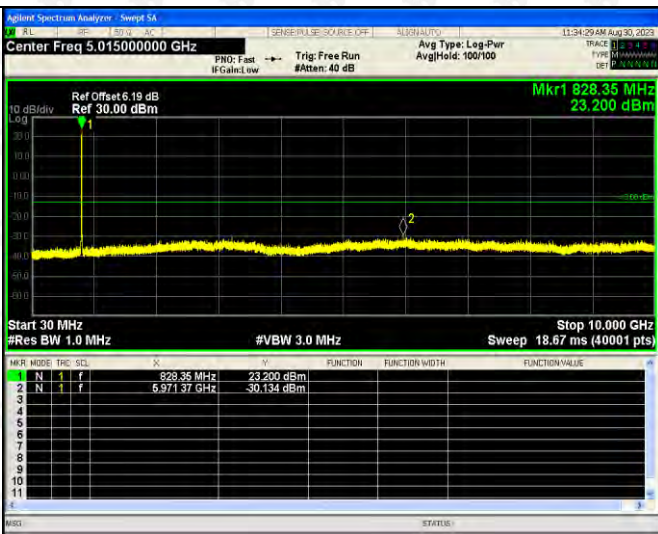
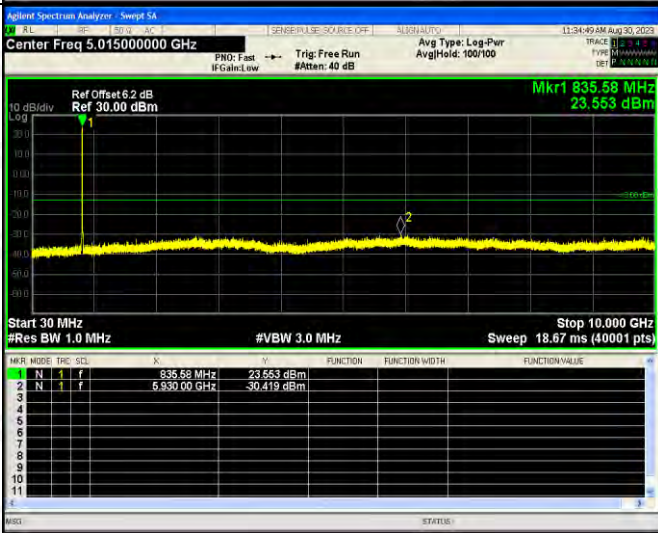
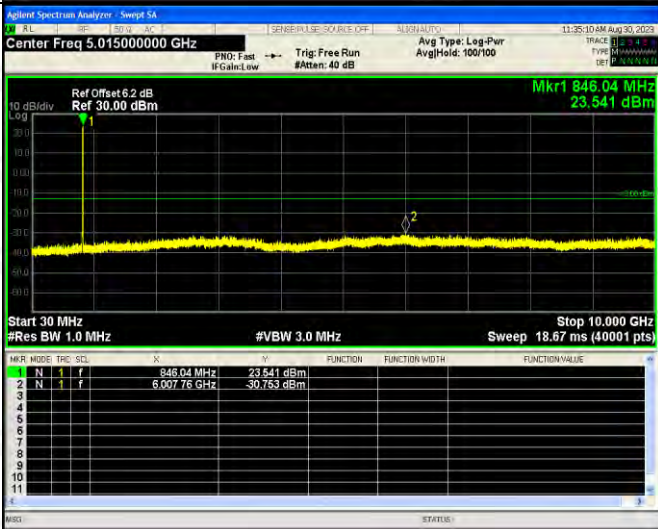
EDGE
Low
Band
Emission



EDGE
High
Band
Emission



For Band V

WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

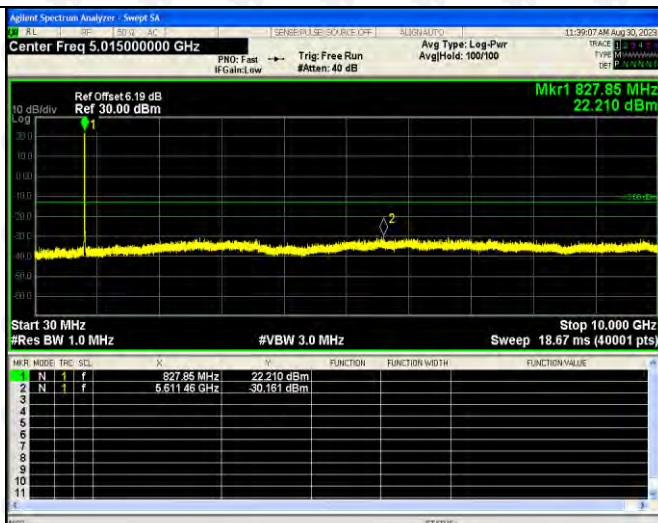
WCDMA
Low
Band
Spurious
Emission



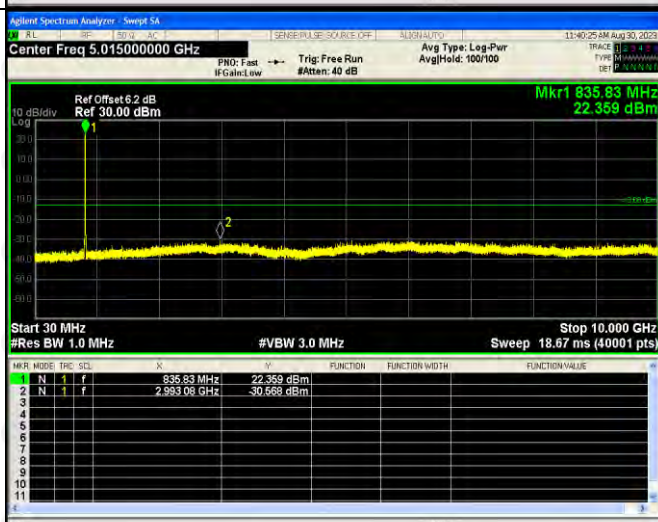
WCDMA
High
Band
Spurious
Emission



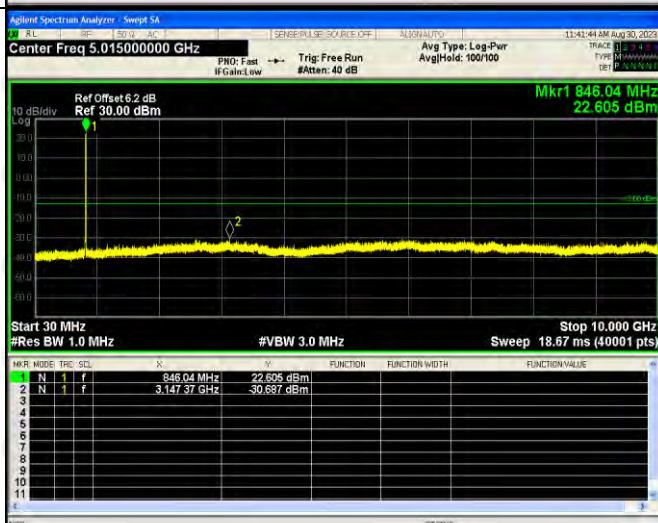
HSDPA
Low
Channel



HSDPA
Middle
Channel



HSDPA
High
Channel

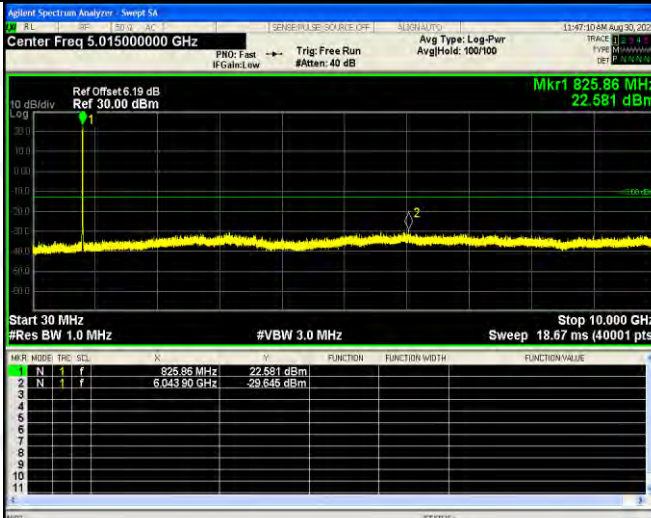
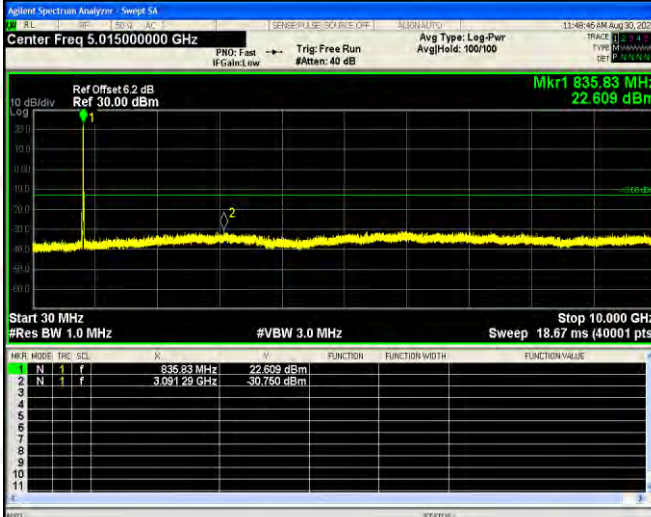
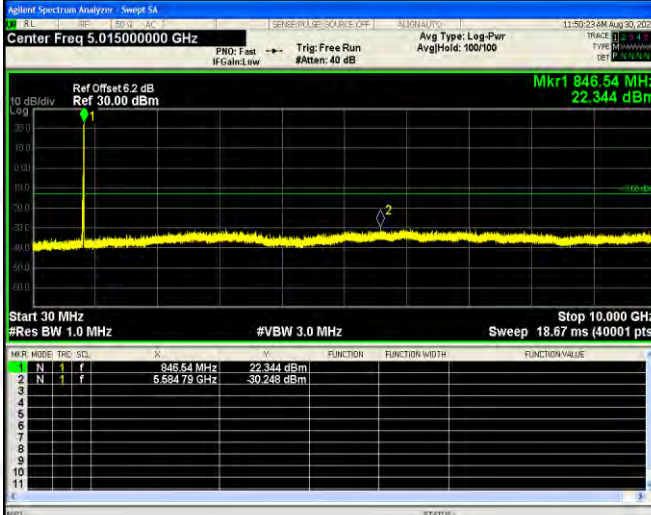


HSDPA
Low
Band
Spurious
Emission



HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 825.86 MHz 22.581 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>N</th><th>F</th><th>P</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>825.86 MHz</td><td>22.581 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>6.043 90 GHz</td><td>-28.645 dBm</td><td></td><td></td><td></td></tr></tbody></table>	N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	825.86 MHz	22.581 dBm				2	6.043 90 GHz	-28.645 dBm				
N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE															
1	825.86 MHz	22.581 dBm																		
2	6.043 90 GHz	-28.645 dBm																		
HSUPA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 835.83 MHz 22.609 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>N</th><th>F</th><th>P</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>835.83 MHz</td><td>22.609 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>3.091 29 GHz</td><td>-30.750 dBm</td><td></td><td></td><td></td></tr></tbody></table>	N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	835.83 MHz	22.609 dBm				2	3.091 29 GHz	-30.750 dBm				
N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE															
1	835.83 MHz	22.609 dBm																		
2	3.091 29 GHz	-30.750 dBm																		
HSUPA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 846.54 MHz 22.344 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><thead><tr><th>N</th><th>F</th><th>P</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>846.54 MHz</td><td>22.344 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>5.684 79 GHz</td><td>-30.248 dBm</td><td></td><td></td><td></td></tr></tbody></table>	N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	846.54 MHz	22.344 dBm				2	5.684 79 GHz	-30.248 dBm				
N	F	P	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE															
1	846.54 MHz	22.344 dBm																		
2	5.684 79 GHz	-30.248 dBm																		

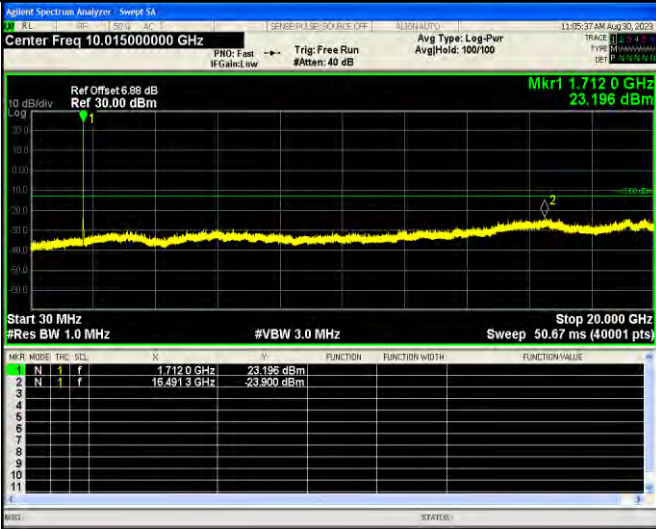
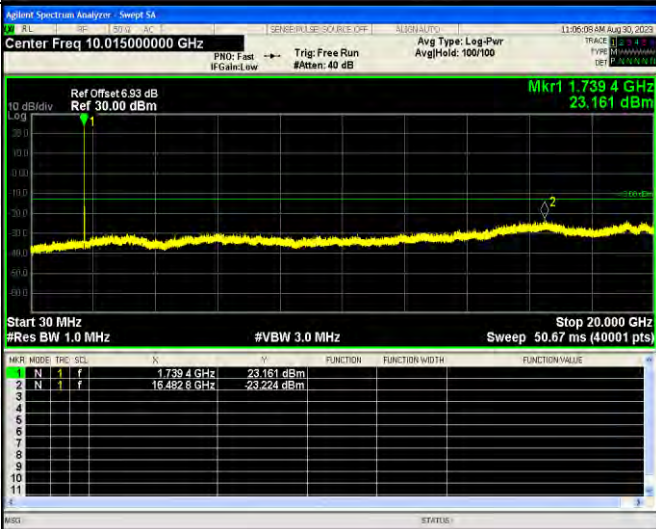
HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



For Band IV

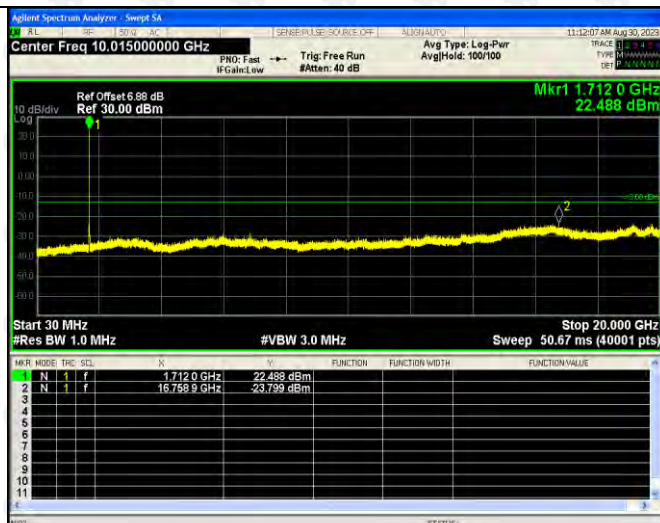
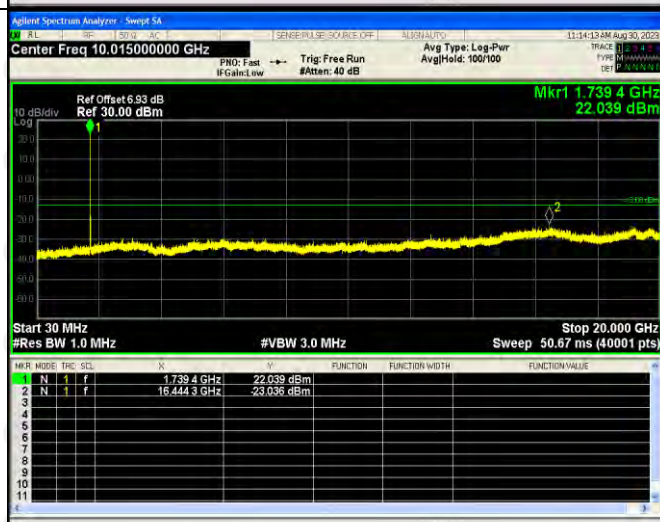
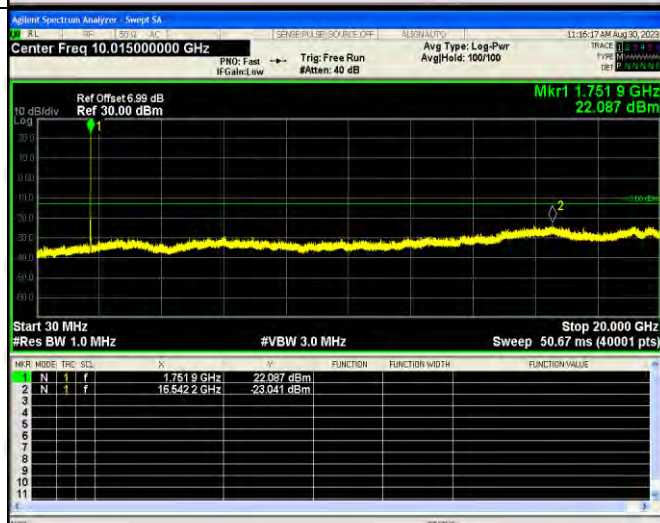
WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

WCDMA
Low
Band
Spurious
Emission



WCDMA
High
Band
Spurious
Emission



HSDPA
Low
Channel

HSDPA
Middle
Channel

HSDPA
High
Channel


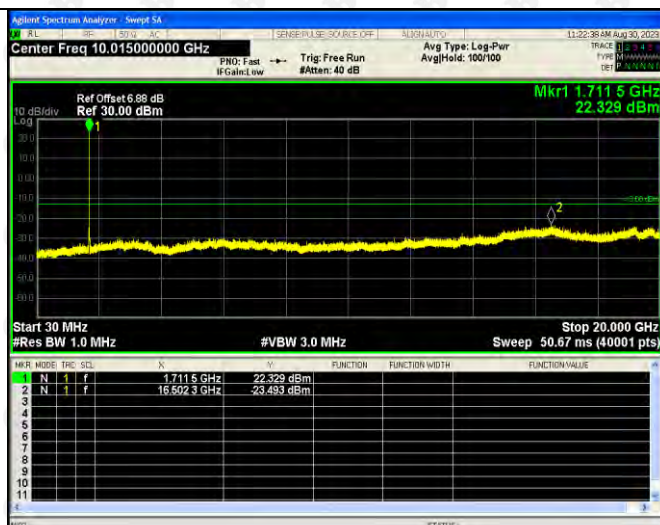
HSDPA
Low
Band
Spurious
Emission



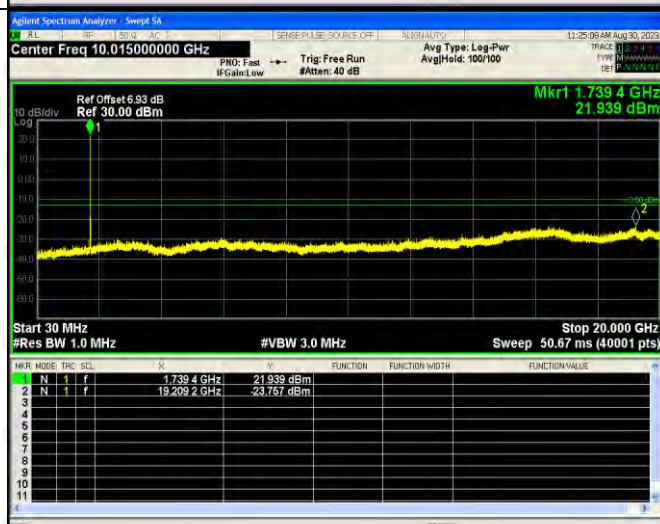
HSDPA
High
Band
Spurious
Emission



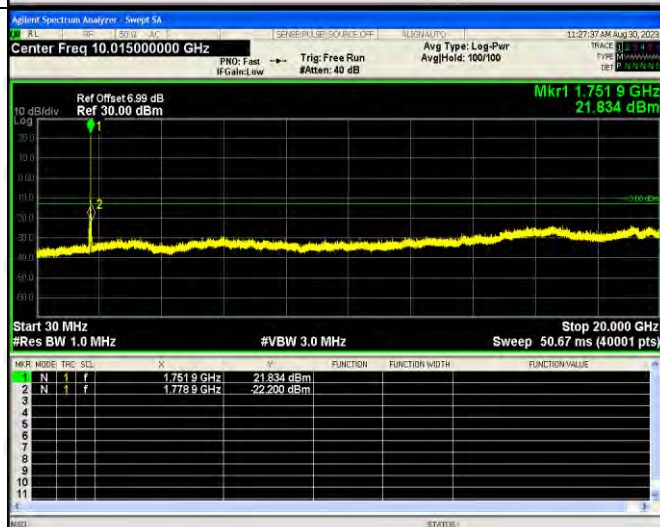
HSUPA
Low
Channel



HSUPA
Middle
Channel



HSUPA
High
Channel



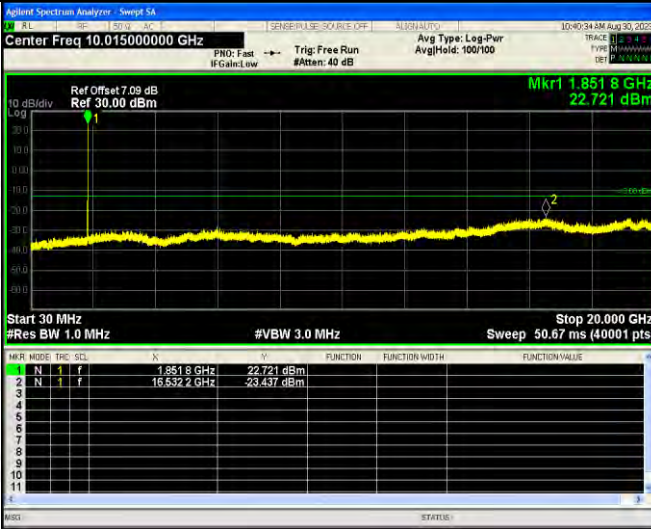
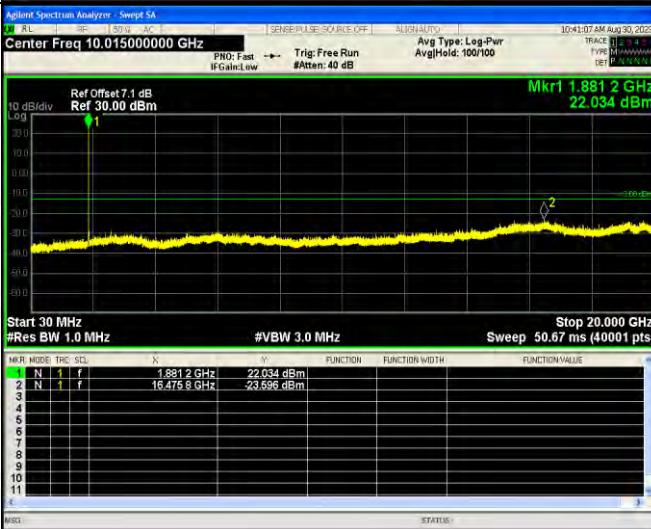
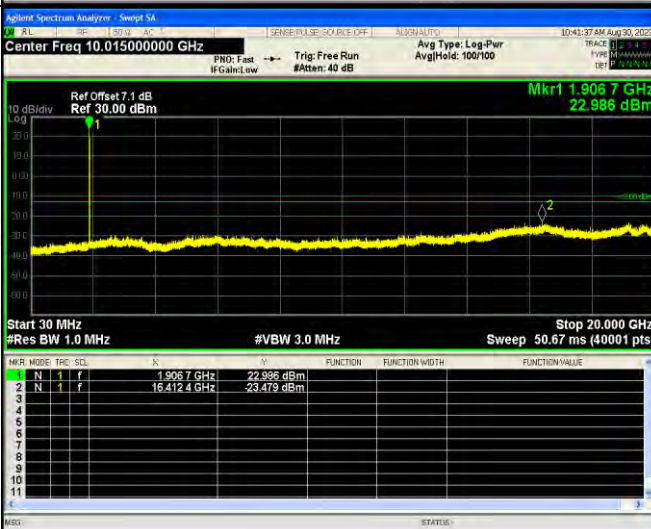
HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



For Band II

WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

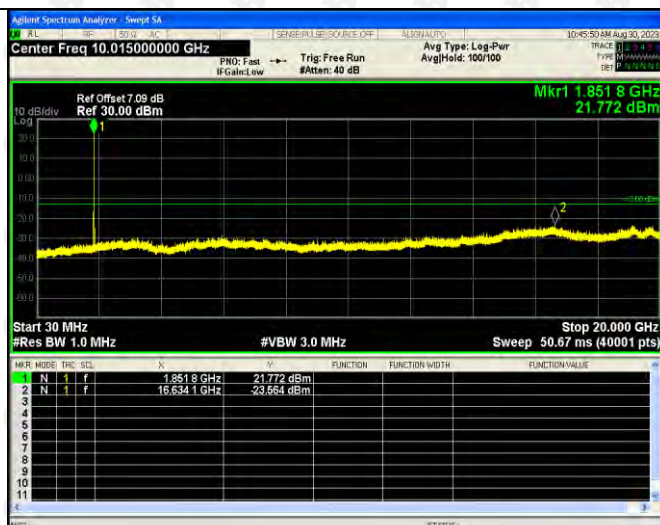
WCDMA
Low
Band
Spurious
Emission



WCDMA
High
Band
Spurious
Emission



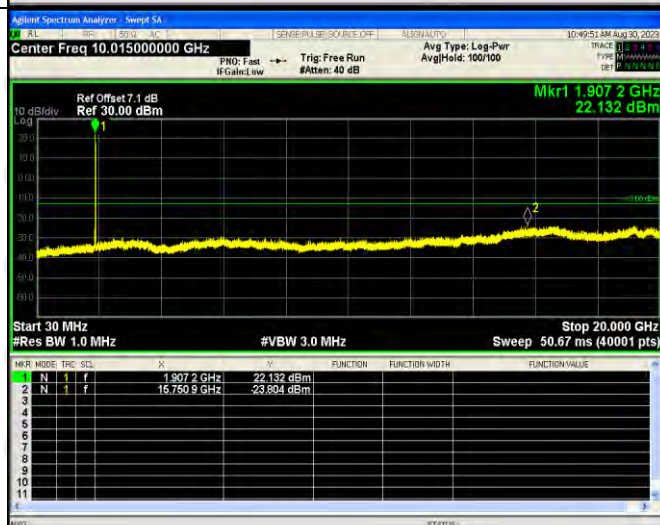
HSDPA
Low
Channel



HSDPA
Middle
Channel



HSDPA
High
Channel



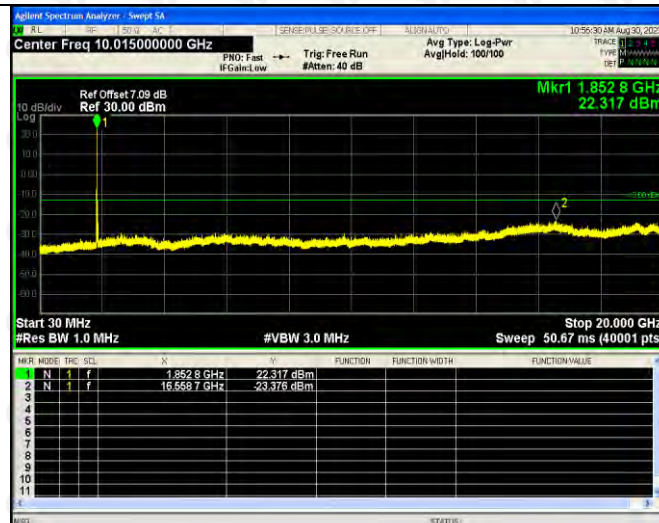
HSDPA
Low
Band
Spurious
Emission



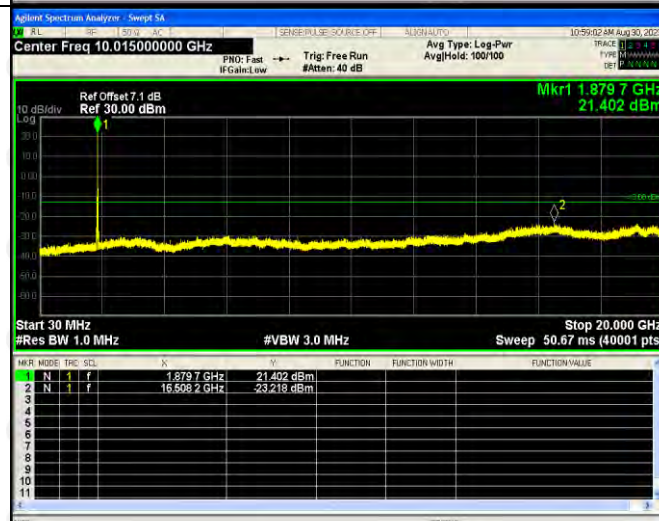
HSDPA
High
Band
Spurious
Emission



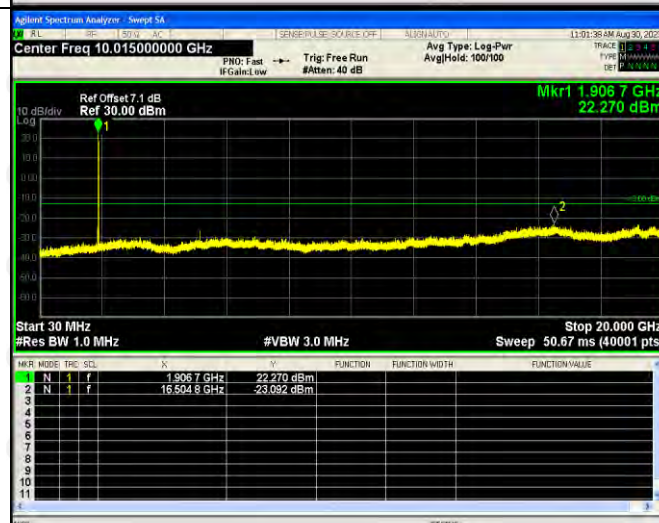
HSUPA
Low
Channel



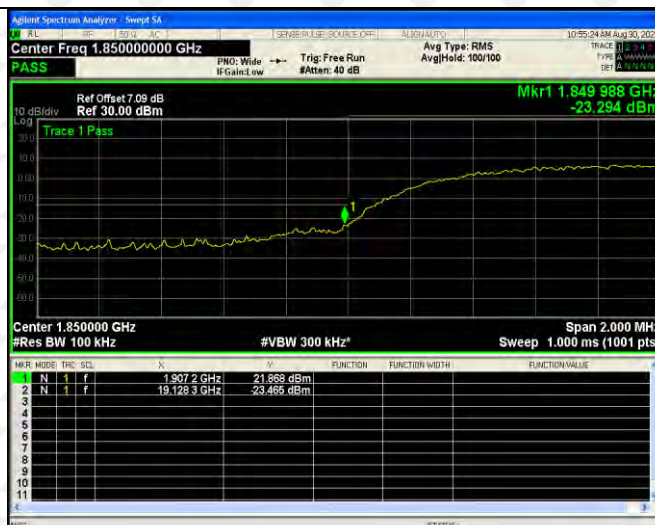
HSUPA
Middle
Channel



HSUPA
High
Channel



HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

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

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

10.2 Test Procedure

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

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

10.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	101 kPa
Test Voltage	DC3.7V

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)						
45.41	-67.05	3.9	-63.15	-13	-50.15	H
1643.28	-54.88	4.83	-50.05	-13	-37.05	H
2465.37	-54.03	8.08	-45.95	-13	-32.95	H
40.28	-72.51	4.02	-68.49	-13	-55.49	V
1638.42	-47.89	4.48	-43.41	-13	-30.41	V
2463.53	-48.59	8.2	-40.39	-13	-27.39	V
Middle Channel (836.6MHz)						
42.64	-72.20	3.84	-68.36	-13	-55.36	H
1663.51	-51.01	4.62	-46.39	-13	-33.39	H
2507.40	-51.97	8.25	-43.72	-13	-30.72	H
42.82	-67.10	4.25	-62.85	-13	-49.85	V
1663.20	-54.45	4.54	-49.91	-13	-36.91	V
2502.72	-54.28	8.35	-45.93	-13	-29.75	V
High Channel (848.8MHz)						
37.25	-72.35	4.22	-76.57	-13	-63.57	H
1692.56	-53.11	4.87	-57.98	-13	-44.98	H
2543.86	-52.57	8.38	-60.95	-13	-47.95	H
45.76	-70.09	4.02	-74.11	-13	-61.11	V
1687.65	-48.18	4.56	-52.74	-13	-39.74	V
2539.36	-51.23	8.41	-59.64	-13	-46.64	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)						
43.50	-67.74	4.34	-63.40	-13	-50.40	H
3692.53	-50.94	10.54	-40.40	-13	-27.40	H
5543.70	-60.72	13.37	-47.35	-13	-34.35	H
39.17	-68.96	4.34	-64.62	-13	-51.62	V
3693.74	-54.05	10.54	-43.51	-13	-30.51	V
5548.32	-56.29	13.37	-42.92	-13	-29.92	V
Middle Channel (1880MHz)						
39.97	-65.76	4.02	-61.74	-13	-48.74	H
3751.09	-55.64	10.71	-44.93	-13	-31.93	H
5639.22	-53.04	13.73	-39.31	-13	-26.31	H
36.91	-68.79	4.14	-64.65	-13	-51.65	V
3752.34	-51.88	10.22	-41.66	-13	-28.66	V
5631.51	-57.76	13.16	-44.60	-13	-31.60	V
High Channel (1909.8MHz)						
42.37	-70.05	4.02	-66.03	-13	-53.03	H
3810.14	-60.55	4.9	-55.65	-13	-42.65	H
5720.27	-47.99	8.09	-39.90	-13	-26.90	H
46.18	-62.77	4.25	-58.52	-13	-45.52	V
3817.53	-60.37	4.93	-55.44	-13	-42.44	V
5725.28	-58.85	8.43	-50.42	-13	-37.42	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
44.53	-72.42	3.91	-68.51	-13	-55.51	H
1643.67	-56.35	10.56	-45.79	-13	-32.79	H
2476.08	-55.70	13.5	-42.20	-13	-29.20	H
44.91	-65.39	3.93	-61.46	-13	-48.46	V
1646.69	-50.73	10.41	-40.32	-13	-27.32	V
2472.57	-60.47	13.16	-47.31	-13	-34.31	V
Middle Channel (836.6MHz)						
38.95	-71.96	4.02	-67.94	-13	-54.94	H
1668.23	-56.92	4.66	-52.26	-13	-39.26	H
2506.31	-41.90	8.34	-33.56	-13	-20.56	H
40.31	-62.66	4.17	-58.49	-13	-45.49	V
1663.09	-56.49	4.94	-51.55	-13	-38.55	V
2508.11	-59.83	8.19	-51.64	-13	-38.64	V
High Channel (846.6MHz)						
37.72	-68.80	3.87	-64.93	-13	-51.93	H
1692.99	-58.12	4.89	-53.23	-13	-40.23	H
2535.99	-45.54	8.42	-37.12	-13	-24.12	H
39.25	-57.78	3.95	-53.83	-13	-40.83	V
1687.82	-54.94	4.99	-49.95	-13	-36.95	V
2532.33	-61.60	8.12	-53.48	-13	-40.48	V

For Band 4 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1712.4MHz)						
42.56	-72.88	3.95	-68.93	-13	-55.93	H
1650.75	-56.61	10.56	-46.05	-13	-33.05	H
2478.16	-59.59	13.5	-46.09	-13	-33.09	H
41.35	-70.51	3.93	-66.58	-13	-53.58	V
1643.48	-55.31	10.41	-44.90	-13	-31.90	V
2473.81	-61.41	13.16	-48.25	-13	-35.25	V
Middle Channel (1740MHz)						
42.83	-68.58	4	-64.58	-13	-51.58	H
1666.12	-63.15	4.66	-58.49	-13	-45.49	H
2506.82	-47.92	8.34	-39.58	-13	-26.58	H
42.37	-62.77	4.17	-58.60	-13	-45.60	V
1666.47	-56.08	4.94	-51.14	-13	-38.14	V
2499.51	-59.59	8.19	-51.40	-13	-38.40	V
High Channel (1752.6MHz)						
37.77	-73.57	3.89	-69.68	-13	-56.68	H
1685.53	-56.03	4.89	-51.14	-13	-38.14	H
2533.62	-45.27	8.42	-36.85	-13	-23.85	H
40.98	-57.31	3.95	-53.36	-13	-40.36	V
1686.30	-62.90	4.99	-57.91	-13	-44.91	V
2536.63	-59.74	8.12	-51.62	-13	-38.62	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
36.95	-68.60	4.22	-64.38	-13	-51.38	H
1648.52	-58.43	10.7	-47.73	-13	-34.73	H
2471.73	-62.72	13.73	-48.99	-13	-35.99	H
38.97	-70.94	3.93	-67.01	-13	-54.01	V
1644.66	-57.21	10.09	-47.12	-13	-34.12	V
2477.84	-58.64	13.11	-45.53	-13	-32.53	V
Middle Channel (1880MHz)						
36.43	-67.86	4.26	-63.60	-13	-50.60	H
1665.19	-62.39	4.76	-57.63	-13	-44.63	H
2500.56	-44.29	8.37	-35.92	-13	-22.92	H
36.59	-58.53	3.96	-54.57	-13	-41.57	V
1664.94	-58.04	4.63	-53.41	-13	-40.41	V
2502.42	-62.51	8.1	-54.41	-13	-41.41	V
High Channel (1907.6MHz)						
43.43	-68.88	4.26	-64.62	-13	-51.62	H
1691.73	-57.52	4.76	-52.76	-13	-39.76	H
2537.88	-47.41	8.37	-39.04	-13	-26.04	H
43.61	-53.95	3.96	-49.99	-13	-36.99	V
1689.66	-62.92	4.63	-58.29	-13	-45.29	V
2530.25	-59.31	8.1	-51.21	-13	-38.21	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	8.98	0.01073
40	NV	9.41	0.01124
30	NV	9.23	0.01103
20	NV	9.31	0.01113
10	NV	9.90	0.01184
0	NV	9.94	0.01188
-10	NV	9.85	0.01177
-20	NV	10.52	0.01257
-30	NV	11.13	0.01331

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	12.29	0.00654
40	NV	12.96	0.00689
30	NV	13.17	0.00701
20	NV	12.88	0.00685
10	NV	13.57	0.00722
0	NV	13.13	0.00698
-10	NV	13.69	0.00728
-20	NV	14.26	0.00759
-30	NV	13.98	0.00743

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	8.43	0.01007
40	NV	9.04	0.01080
30	NV	9.81	0.01173
20	NV	9.32	0.01114
10	NV	9.73	0.01163
0	NV	9.99	0.01194
-10	NV	10.30	0.01231
-20	NV	10.85	0.01297
-30	NV	10.59	0.01265

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	12.44	0.00662
40	NV	12.47	0.00663
30	NV	12.22	0.00650
20	NV	13.01	0.00692
10	NV	12.76	0.00679
0	NV	13.96	0.00743
-10	NV	13.89	0.00739
-20	NV	13.70	0.00729
-30	NV	14.55	0.00774

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	11.97	0.01430
30	NV	11.56	0.01382
20	NV	12.06	0.01441
10	NV	11.43	0.01366
0	NV	12.08	0.01444
-10	NV	11.66	0.01394
-20	NV	12.88	0.01540
-30	NV	12.57	0.01503

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	-10.72	-0.00570
40	NV	-9.63	-0.00512
30	NV	-9.70	-0.00516
20	NV	-9.30	-0.00495
10	NV	-8.69	-0.00462
0	NV	-9.19	-0.00489
-10	NV	-8.97	-0.00477
-20	NV	-8.63	-0.00459
-30	NV	-7.53	-0.00400

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	-0.50	-0.00060
40	NV	0.46	0.00055
30	NV	0.64	0.00077
20	NV	1.04	0.00124
10	NV	1.23	0.00147
0	NV	0.68	0.00082
-10	NV	1.38	0.00165
-20	NV	1.23	0.00147
-30	NV	1.05	0.00126

For WCDMA Band 4 Mode

Reference Frequency(Middle Channel): 1740 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.02	-0.00001
40	NV	0.30	0.00017
30	NV	0.34	0.00019
20	NV	0.71	0.00041
10	NV	1.00	0.00058
0	NV	0.73	0.00042
-10	NV	0.98	0.00056
-20	NV	1.34	0.00077
-30	NV	0.91	0.00052

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	-0.73	-0.00039
40	NV	-0.60	-0.00032
30	NV	-0.22	-0.00012
20	NV	-0.50	-0.00027
10	NV	0.44	0.00023
0	NV	0.52	0.00028
-10	NV	0.86	0.00046
-20	NV	1.23	0.00065
-30	NV	1.92	0.00102

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	-0.06	-0.00007
40	NV	0.28	0.00033
30	NV	0.72	0.00087
20	NV	0.32	0.00038
10	NV	0.92	0.00110
0	NV	1.16	0.00139
-10	NV	1.16	0.00139
-20	NV	0.68	0.00082
-30	NV	1.33	0.00160

For HSDPA Band 4 Mode

Reference Frequency(Middle Channel): 1740 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.77	0.00044
40	NV	0.65	0.00037
30	NV	0.78	0.00045
20	NV	0.44	0.00025
10	NV	1.66	0.00095
0	NV	1.74	0.00100
-10	NV	2.17	0.00125
-20	NV	2.23	0.00128
-30	NV	2.35	0.00135

For HSDPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	4.64	0.00247
40	NV	4.92	0.00262
30	NV	5.08	0.00270
20	NV	6.20	0.00330
10	NV	6.11	0.00325
0	NV	6.39	0.00340
-10	NV	6.67	0.00355
-20	NV	6.32	0.00336
-30	NV	6.86	0.00365

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	0.92	0.00109
40	NV	0.75	0.00090
30	NV	0.73	0.00087
20	NV	1.29	0.00155
10	NV	1.22	0.00146
0	NV	1.32	0.00158
-10	NV	1.90	0.00227
-20	NV	1.93	0.00231
-30	NV	2.69	0.00322

For HSUPA Band 4 Mode

Reference Frequency(Middle Channel): 1740 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.68	0.00039
40	NV	0.51	0.00029
30	NV	0.86	0.00049
20	NV	0.99	0.00057
10	NV	1.69	0.00097
0	NV	1.89	0.00109
-10	NV	2.14	0.00123
-20	NV	1.81	0.00104
-30	NV	2.33	0.00134

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	6.45	0.00343
40	NV	7.16	0.00381
30	NV	7.03	0.00374
20	NV	6.93	0.00368
10	NV	7.17	0.00381
0	NV	8.16	0.00434
-10	NV	7.74	0.00411
-20	NV	8.36	0.00445
-30	NV	8.51	0.00453

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	10.42	0.01246
	NV	10.73	0.01282
	HV	11.10	0.01326
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	14.57	0.00775
	NV	14.02	0.00746
	HV	14.46	0.00769

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	10.32	0.01233
	NV	9.49	0.01135
	HV	10.33	0.01235
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	13.25	0.00705
	NV	14.42	0.00767
	HV	14.62	0.00778
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	12.49	0.01493
	NV	12.20	0.01458
	HV	12.66	0.01513
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	-9.10	-0.00484
	NV	-7.98	-0.00424
	HV	-7.78	-0.00414

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	1.07	0.00127
	NV	1.24	0.00148
	HV	1.64	0.00196
Reference Frequency(Middle Channel): WCDMA 1740MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.06	0.00061
	NV	0.66	0.00038
	HV	1.19	0.00068
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	2.7	0.0014
	NV	3.0	0.0016
	HV	3.4	0.0018
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	2.2	0.0026
	NV	2.4	0.0029
	HV	2.6	0.0031
Reference Frequency(Middle Channel): HSDPA 1740MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	5.87	0.00338
	NV	6.70	0.00385
	HV	6.85	0.00394
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	7.4	0.0039
	NV	7.5	0.0040

	HV	7.7	0.0041
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	2.9	0.0035
	NV	3.4	0.0040
	HV	3.6	0.0043
Reference Frequency(Middle Channel): HSUPA 1740MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	5.90	0.00339
	NV	5.52	0.00317
	HV	6.49	0.00373

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	9.4	0.0050
	NV	9.6	0.0051
	HV	9.9	0.0053

12. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



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