

TEST REPORT

Product Name: Droppity Agro
FCC ID: 2BA3Z-DA42
Trademark: Droppity
Model Number: DA42
Prepared For: Droppity Corp.
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Sample Received Date: Apr. 21, 2023
Sample tested Date: Apr. 21, 2023 to May. 27, 2023
Issue Date: May. 27, 2023
Report No.: CTB230527004RFX
Test Standards: FCC Part 22H & 24E & 27
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

Reviewed by:

Approved by:

*ChenZheng**Arron Liu*Chen ZhengArron LiuBin 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
CTB230527004RFX	May. 27, 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):	DA42
Model Description:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GPRS/EDGE 850: 824~849MHz GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 2: 1850~1910MHz WCDMA Band 4: 1710-1755MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 31.98dBm GSM1900: 26.29dBm WCDMA Band 2: 21.38dBm WCDMA Band 4: 22.91dBm WCDMA Band 5: 20.56dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	FPC antenna
Antenna Gain:	GSM850: 3dBi, GSM1900: 3dBi WCDMA Band 2: 3dBi WCDMA Band 4 3dBi WCDMA Band 5: 3dBi
Ratings:	DC 3.8V

4.2 Test Setup Configuration

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

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
/	/	/	/	/	/

Notes:

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

4.4 Channel List

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GPRS/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GPRS/EDGE	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538
WCDMA Band 4	WCDMA/HSDPA/HSUPA	1712.6MHz	1312
		1747.4MHz	1412
		1782.4MHz	1513
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
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	GPRS 850	Low, Middle, High Channels
TM2	EDGE 850	Low, Middle, High Channels
TM3	GPRS 1900	Low, Middle, High Channels
TM4	EDGE 1900	Low, Middle, High Channels
TM5	WCDMA Band 2	Low, Middle, High Channels
TM6	HSDPA Band 2	Low, Middle, High Channels
TM7	HSUPA Band 2	Low, Middle, High Channels
TM8	WCDMA Band 4	Low, Middle, High Channels
TM9	HSDPA Band 4	Low, Middle, High Channels
TM10	HSUPA Band 4	Low, Middle, High Channels
TM11	WCDMA Band 5	Low, Middle, High Channels
TM12	HSDPA Band 5	Low, Middle, High Channels
TM13	HSUPA Band 5	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	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
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	2023.07.19
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	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22



21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2023.07.22
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

6. RF OUTPUT POWER

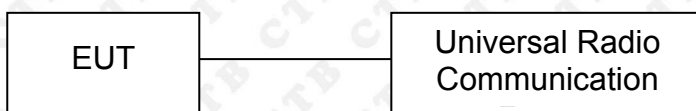
6.1 Standard Applicable

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 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	31.25	1.5	0	H	1.5	1	30.75	38.45
824.2	31.09	1.5	0	V	1.5	1	30.59	38.45
Middle Channel								
836.6	31.36	1.5	0	H	1.5	1	30.86	38.45
836.6	30.95	1.5	0	V	1.5	1	30.45	38.45
High Channel								
848.8	31.43	1.5	0	H	1.5	1	30.93	38.45
848.8	31.47	1.5	0	V	1.5	1	30.97	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	27.94	1.5	0	H	1.9	1	27.04	33
1850.2	28.14	1.5	0	V	1.9	1	27.24	33
Middle Channel								
1880	28.38	1.5	0	H	1.9	1	27.48	33
1880	27.90	1.5	0	V	1.9	1	27.00	33
High Channel								
1909.8	28.07	1.5	0	H	1.9	1	27.17	33
1909.8	28.19	1.5	0	V	1.9	1	27.29	33



ERP For EDGE Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	25.51	1.5	0	H	1.5	1	25.01	38.45
824.2	25.30	1.5	0	V	1.5	1	24.80	38.45
Middle Channel								
836.6	25.41	1.5	0	H	1.5	1	24.91	38.45
836.6	24.74	1.5	0	V	1.5	1	24.24	38.45
High Channel								
848.8	24.78	1.5	0	H	1.5	1	24.28	38.45
848.8	25.17	1.5	0	V	1.5	1	24.67	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	24.81	1.5	0	H	1.9	1	23.91	33
1850.2	25.27	1.5	0	V	1.9	1	24.37	33
Middle Channel								
1880	24.25	1.5	0	H	1.9	1	23.35	33
1880	24.47	1.5	0	V	1.9	1	23.57	33
High Channel								
1909.8	24.26	1.5	0	H	1.9	1	23.36	33
1909.8	24.11	1.5	0	V	1.9	1	23.21	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	18.82	1.5	0	H	1.5	1	18.32	38.45
826.4	19.63	1.5	0	V	1.5	1	19.13	38.45
Middle Channel								
836.6	19.78	1.5	0	H	1.5	1	19.28	38.45
836.6	19.60	1.5	0	V	1.5	1	19.10	38.45
High Channel								
846.6	20.39	1.5	0	H	1.5	1	19.89	38.45
846.6	19.82	1.5	0	V	1.5	1	19.32	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	17.60	1.5	0	H	1.5	1	17.10	38.45
826.4	18.13	1.5	0	V	1.5	1	17.63	38.45
Middle Channel								
836.6	18.88	1.5	0	H	1.5	1	18.38	38.45
836.6	18.34	1.5	0	V	1.5	1	17.84	38.45
High Channel								
846.6	18.25	1.5	0	H	1.5	1	17.75	38.45
846.6	18.94	1.5	0	V	1.5	1	18.44	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	17.18	1.5	0	H	1.5	1	16.68	38.45
826.4	16.80	1.5	0	V	1.5	1	16.30	38.45
Middle Channel								
836.6	17.92	1.5	0	H	1.5	1	17.42	38.45
836.6	18.59	1.5	0	V	1.5	1	18.09	38.45
High Channel								
846.6	17.99	1.5	0	H	1.5	1	17.49	38.45
846.6	17.90	1.5	0	V	1.5	1	17.40	38.45

EIRP For WCDMA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.4	22.92	1.5	0	H	1.9	1	22.02	30
1712.4	22.92	1.5	0	V	1.9	1	22.02	30
Middle Channel								
1740	23.13	1.5	0	H	1.9	1	22.23	30
1740	22.21	1.5	0	V	1.9	1	21.31	30
High Channel								
1752.6	22.37	1.5	0	H	1.9	1	21.47	30
1752.6	23.89	1.5	0	V	1.9	1	22.99	30

EIRP For HSDPA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.4	20.88	1.5	0	H	1.9	1	19.98	30
1712.4	21.77	1.5	0	V	1.9	1	20.87	30
Middle Channel								
1740	21.37	1.5	0	H	1.9	1	20.47	30
1740	22.22	1.5	0	V	1.9	1	21.32	30
High Channel								
1752.6	21.15	1.5	0	H	1.9	1	20.25	30
1752.6	22.30	1.5	0	V	1.9	1	21.40	30

EIRP For HSUPA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 27 Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.4	19.78	1.5	0	H	1.9	1	18.88	30
1712.4	20.54	1.5	0	V	1.9	1	19.64	30
Middle Channel								
1740	20.47	1.5	0	H	1.9	1	19.57	30
1740	20.14	1.5	0	V	1.9	1	19.24	30
High Channel								
1752.6	19.52	1.5	0	H	1.9	1	18.62	30
1752.6	19.60	1.5	0	V	1.9	1	18.70	30

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	21.02	1.5	0	H	1.9	1	20.12	33
1852.4	20.40	1.5	0	V	1.9	1	19.50	33
Middle Channel								
1880	20.51	1.5	0	H	1.9	1	19.61	33
1880	21.64	1.5	0	V	1.9	1	20.74	33
High Channel								
1907.6	20.23	1.5	0	H	1.9	1	19.33	33
1907.6	20.75	1.5	0	V	1.9	1	19.85	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	19.62	1.5	0	H	1.9	1	18.72	33
1852.4	20.19	1.5	0	V	1.9	1	19.29	33
Middle Channel								
1880	20.20	1.5	0	H	1.9	1	19.30	33
1880	20.24	1.5	0	V	1.9	1	19.34	33
High Channel								
1907.6	19.92	1.5	0	H	1.9	1	19.02	33
1907.6	19.21	1.5	0	V	1.9	1	18.31	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	19.08	1.5	0	H	1.9	1	18.18	33
1852.4	19.84	1.5	0	V	1.9	1	18.94	33
Middle Channel								
1880	18.86	1.5	0	H	1.9	1	17.96	33
1880	17.63	1.5	0	V	1.9	1	16.73	33
High Channel								
1907.6	19.09	1.5	0	H	1.9	1	18.19	33
1907.6	19.29	1.5	0	V	1.9	1	18.39	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)
GPRS(1 Slot)	Low Channel	824.2	31.81	38.45
	Middle Channel	836.6	31.85	38.45
	High Channel	848.8	31.98	38.45
EDGE(1 Slot)	Low Channel	824.2	26.29	38.45
	Middle Channel	836.6	25.67	38.45
	High Channel	848.8	25.53	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GPRS(1 Slot)	Low Channel	1850.2	28.88	33.0
	Middle Channel	1880.0	28.71	33.0
	High Channel	1909.8	28.57	33.0
EDGE(1 Slot)	Low Channel	1850.2	25.36	33.0
	Middle Channel	1880.0	24.50	33.0
	High Channel	1909.8	24.39	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	19.76	38.45
	Middle Channel	836.6	20.56	38.45
	High Channel	846.6	20.49	38.45
HSDPA	Low Channel	826.4	18.32	38.45
	Middle Channel	836.6	19.21	38.45
	High Channel	846.6	18.97	38.45
HSUPA	Low Channel	826.4	17.74	38.45
	Middle Channel	836.6	18.61	38.45
	High Channel	846.6	18.41	38.45

For WCDMA Band 4

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 27.50 Limit (dBm)
WCDMA	Low Channel	1712.4	22.49	30.00
	Middle Channel	1740	22.70	30.00
	High Channel	1752.6	22.91	30.00
HSDPA	Low Channel	1712.4	21.45	30.00
	Middle Channel	1740	21.92	30.00
	High Channel	1752.6	21.94	30.00
HSUPA	Low Channel	1712.4	20.69	30.00
	Middle Channel	1740	20.02	30.00
	High Channel	1752.6	20.15	30.00



For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	21.38	33.00
	Middle Channel	1880.0	21.15	33.00
	High Channel	1907.6	20.81	33.00
HSDPA	Low Channel	1852.4	20.13	33.00
	Middle Channel	1880.0	20.18	33.00
	High Channel	1907.6	19.88	33.00
HSUPA	Low Channel	1852.4	19.46	33.00
	Middle Channel	1880.0	18.08	33.00
	High Channel	1907.6	19.21	33.00

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

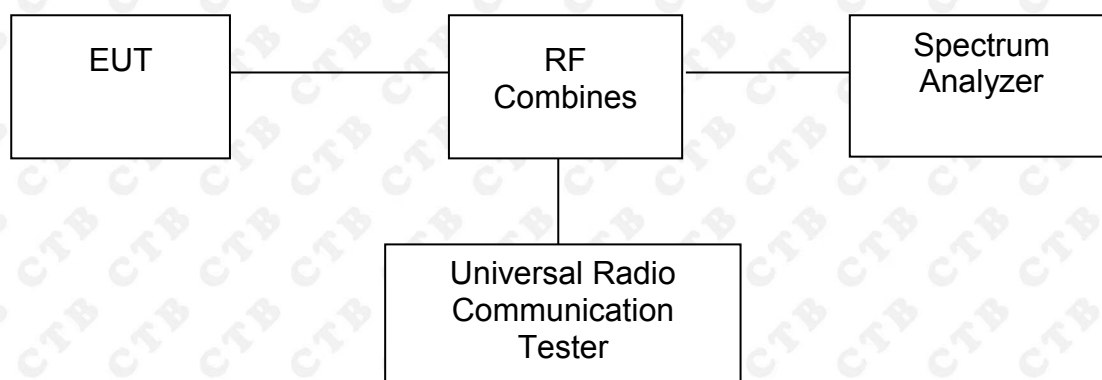
7.1 Standard Applicable

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)
GPRS(1 Slot)	190	836.6	2.70	13
EDGE(1 Slot)	190	836.6	8.53	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GPRS(1 Slot)	512	1850.2	2.73	13
EDGE(1 Slot)	512	1850.2	6.27	13

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	3.38	13
HSDPA	4182	836.4	3.53	13
HSUPA	4182	836.4	3.93	13

For WCDMA Band 4

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	1312	1712.4	2.76	13
HSDPA	1412	1740	3.15	13
HSUPA	1513	1752.6	3.57	13

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	3.13	13
HSDPA	9400	1852.4	3.24	13
HSUPA	9400	1852.4	3.98	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

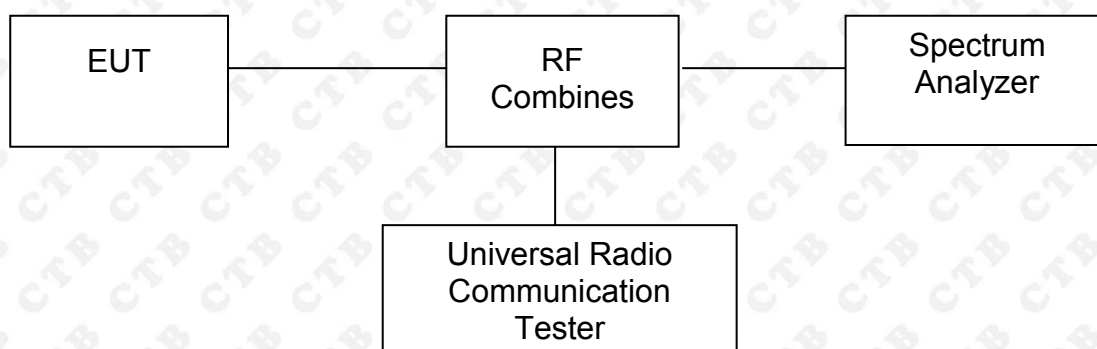
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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)
GPRS	128	824.2	246.297	307.203
	190	836.6	247.741	318.480
	251	848.8	248.571	318.289
EDGE	128	824.2	244.407	319.070
	190	836.6	241.216	302.784
	251	848.8	252.009	325.431

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GPRS	512	1850.2	245.539	317.211
	661	1880.0	251.257	319.158
	810	1909.8	242.830	318.848
EDGE	512	1850.2	258.514	321.130
	661	1880.0	255.150	325.081
	810	1909.8	247.886	313.164

For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4111.799	4691.185
	4183	836.6	4096.914	4685.067
	4233	846.6	4117.458	4713.784
HSDPA	4132	826.4	4112.328	4662.938
	4183	836.6	4124.421	4661.133
	4233	846.6	4103.124	4684.000
HSUPA	4132	826.4	4113.371	4706.398
	4183	836.6	4134.886	5926.051
	4233	846.6	4150.541	5888.156

For Band 4

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	1312	1712.4	4134.063	4788.000
	1412	1740	4159.068	5034.887
	1513	1752.6	4139.158	4711.022
HSDPA	1312	1712.4	4130.972	4753.862
	1412	1740	4155.809	4796.750
	1513	1752.6	4114.009	4678.124
HSUPA	1312	1712.4	4109.220	4715.392
	1412	1740	4144.101	4729.931
	1513	1752.6	4124.843	4694.138

For Band 2

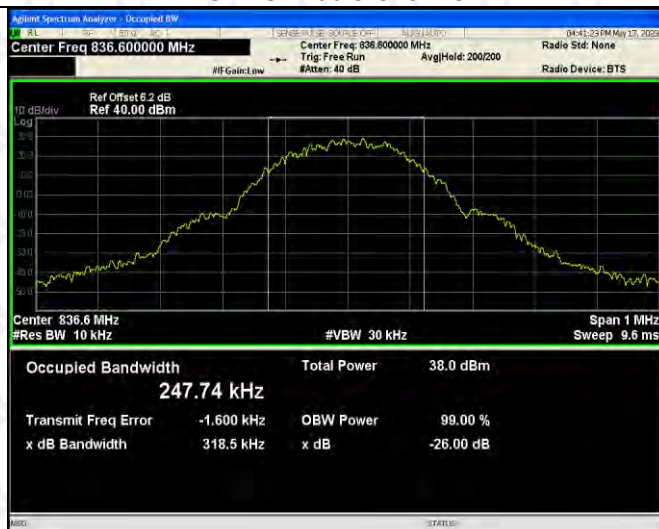
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4125.016	4681.802
	9400	1880.0	4122.714	4718.585
	9538	1907.6	4123.327	4702.968
HSDPA	9262	1852.4	4122.357	4667.423
	9400	1880.0	4119.867	4657.578
	9538	1907.6	4122.221	4679.176
HSUPA	9262	1852.4	4114.006	4655.718
	9400	1880.0	4121.439	4713.000
	9538	1907.6	4124.074	4696.906

For Cellular Band

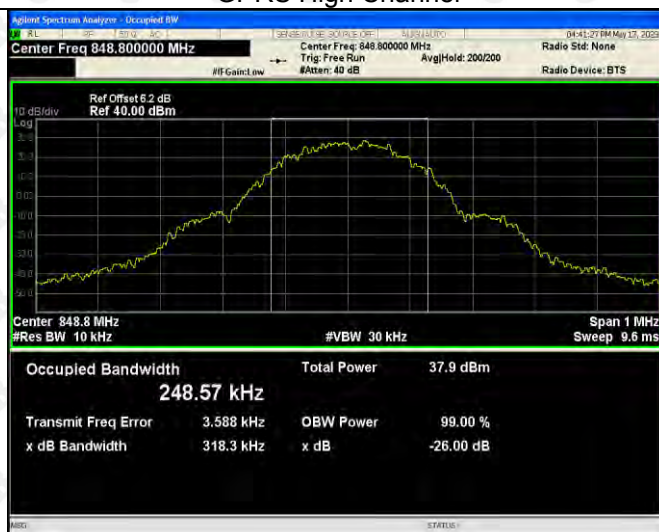
GPRS Low Channel



GPRS Middle Channel



GPRS High Channel



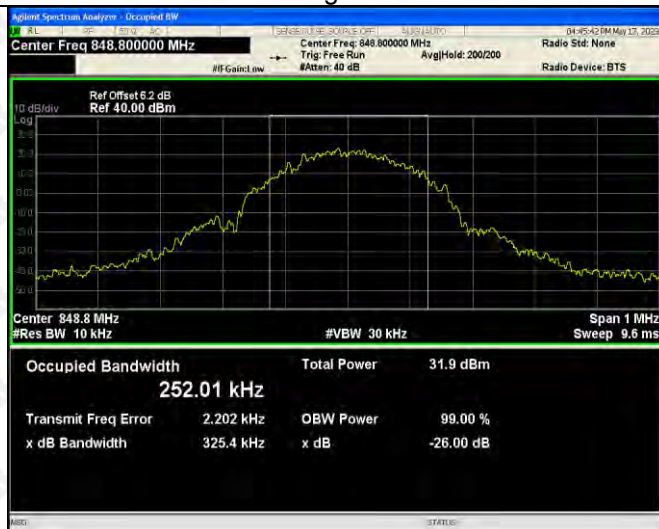
EDGE Low Channel



EDGE Middle Channel

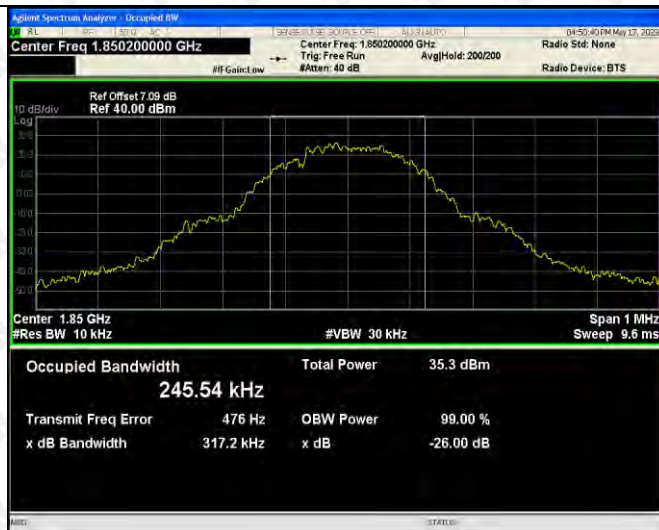


EDGE High Channel

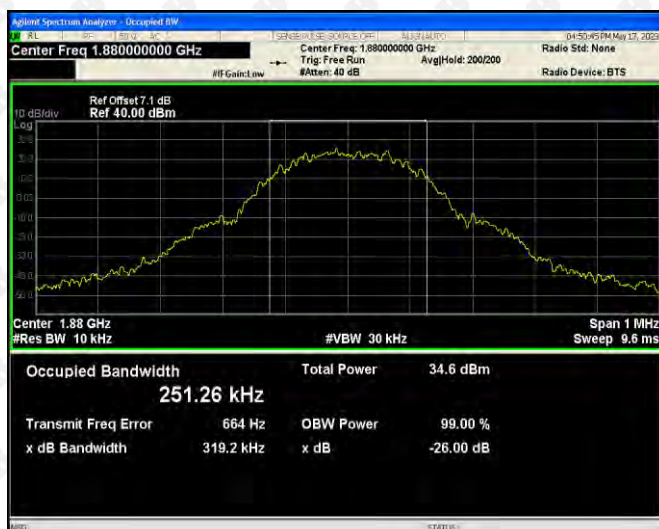


For PCS Band

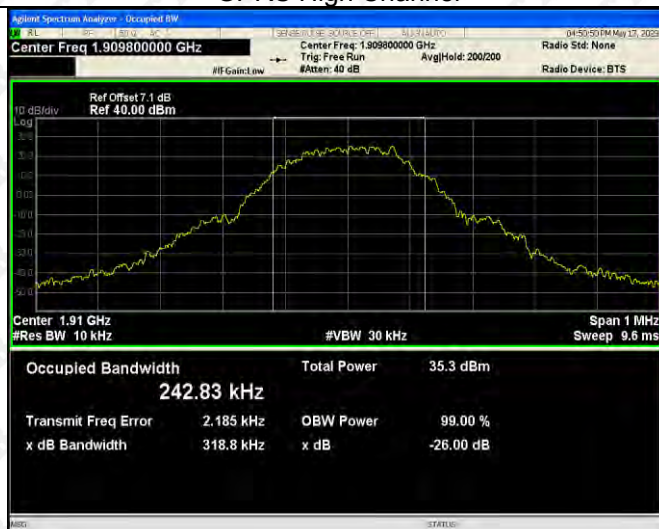
GPRS Low Channel



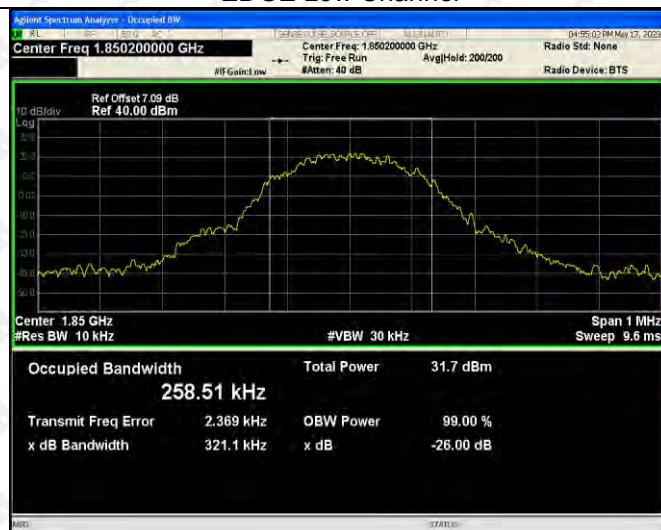
GPRS Middle Channel



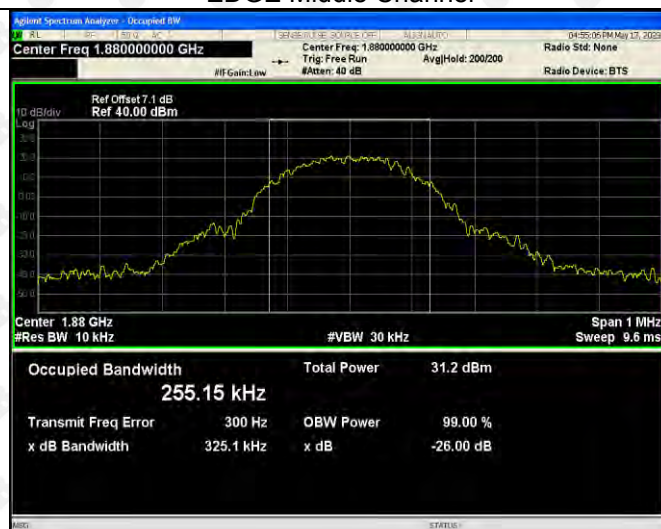
GPRS High Channel



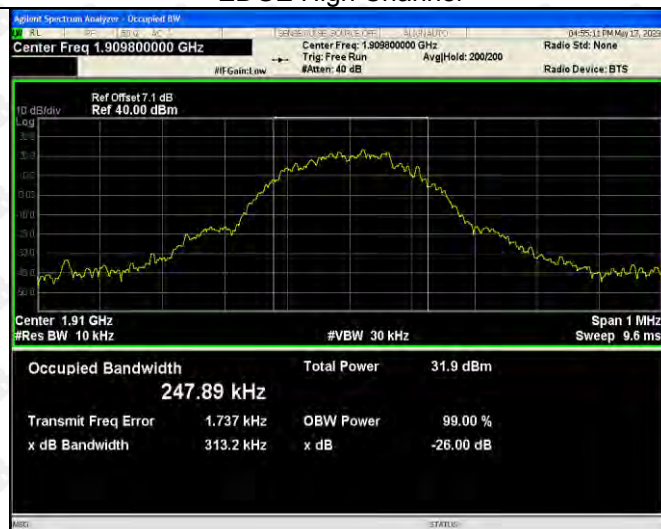
EDGE Low Channel



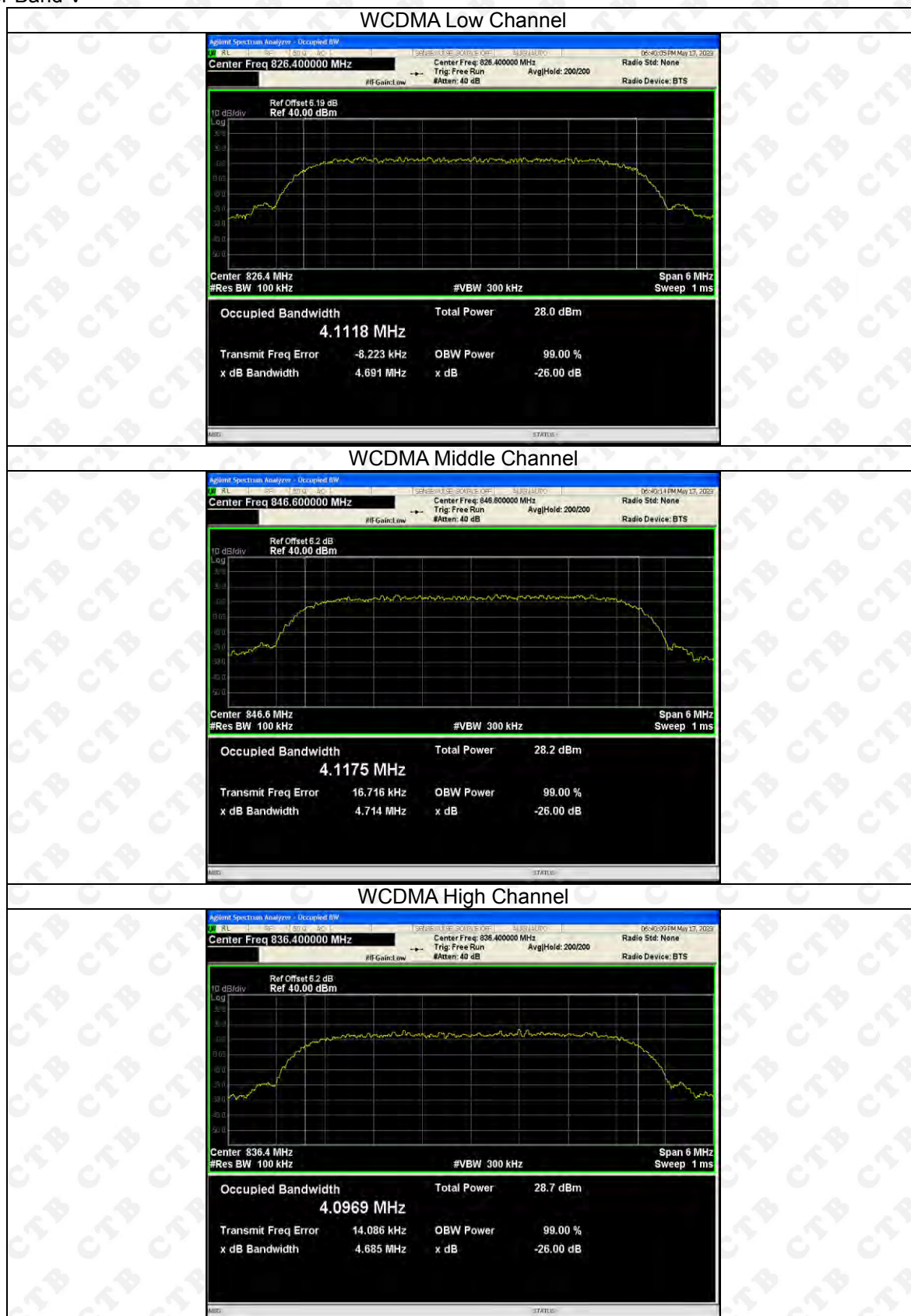
EDGE Middle Channel



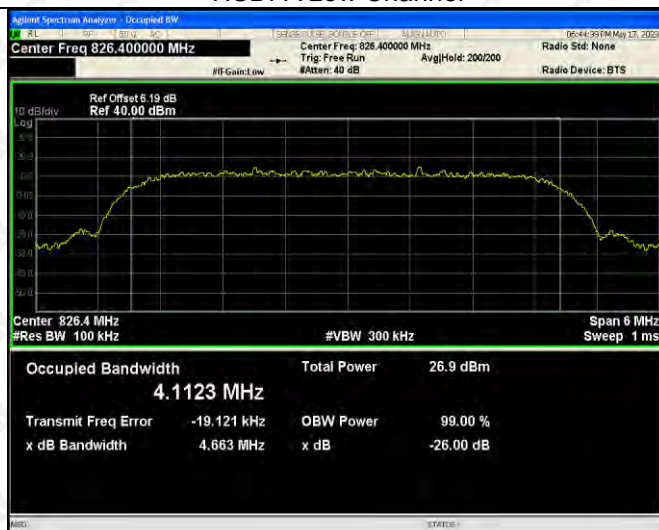
EDGE High Channel



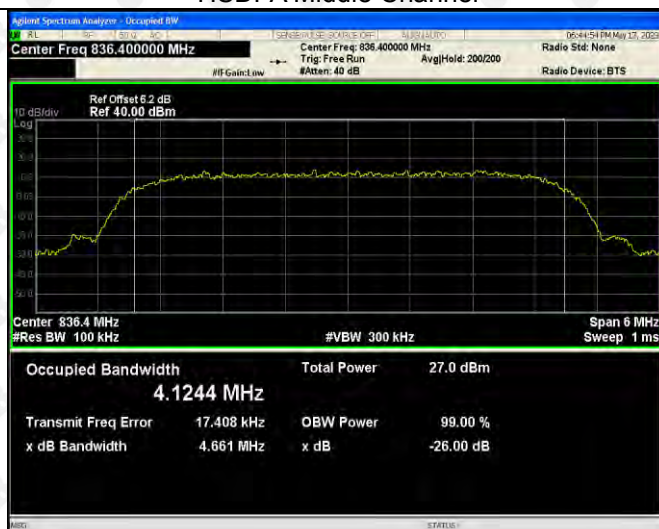
For Band V



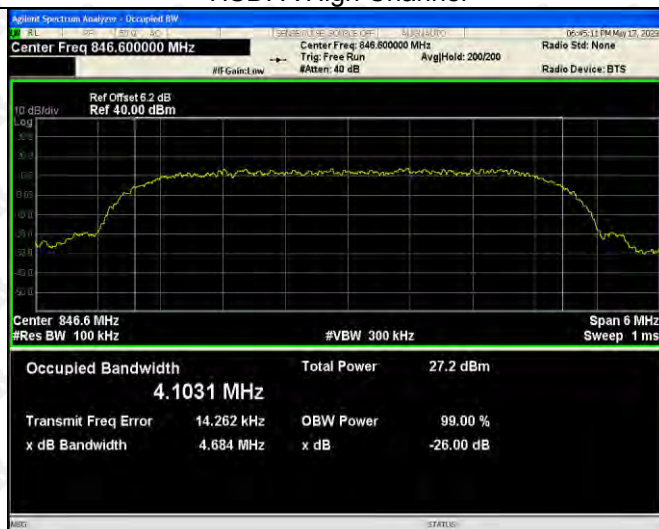
HSDPA Low Channel



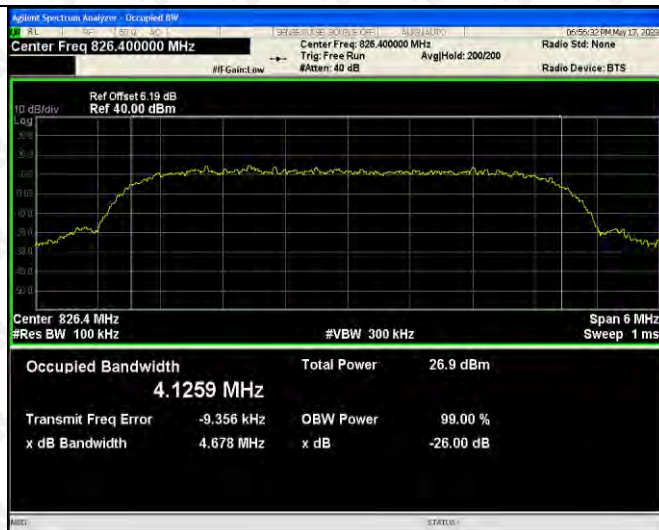
HSDPA Middle Channel



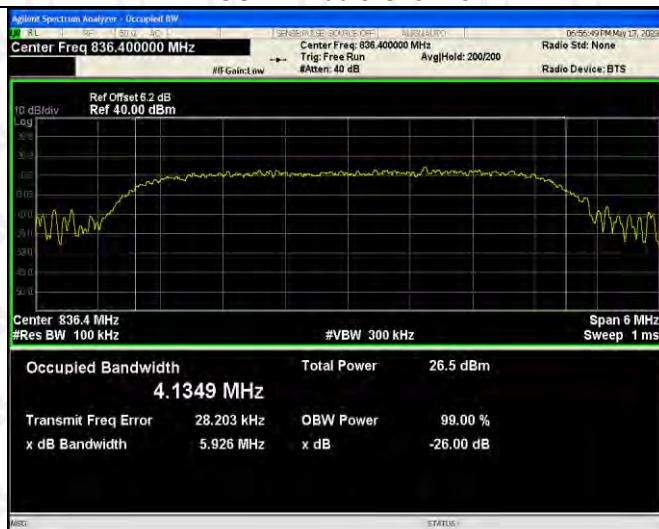
HSDPA High Channel



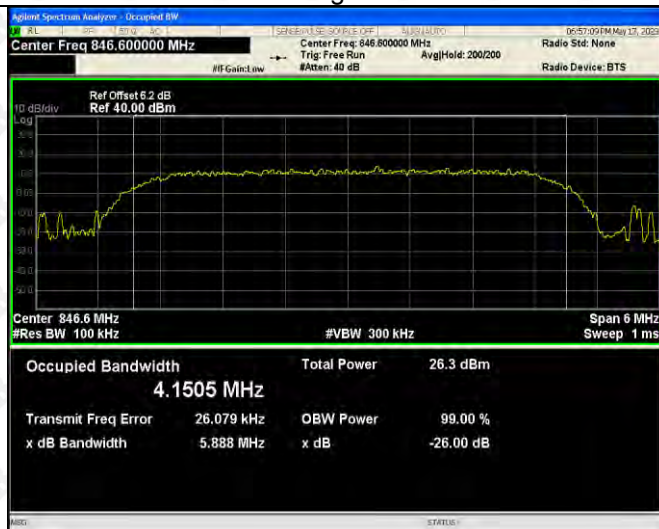
HSUPA Low Channel



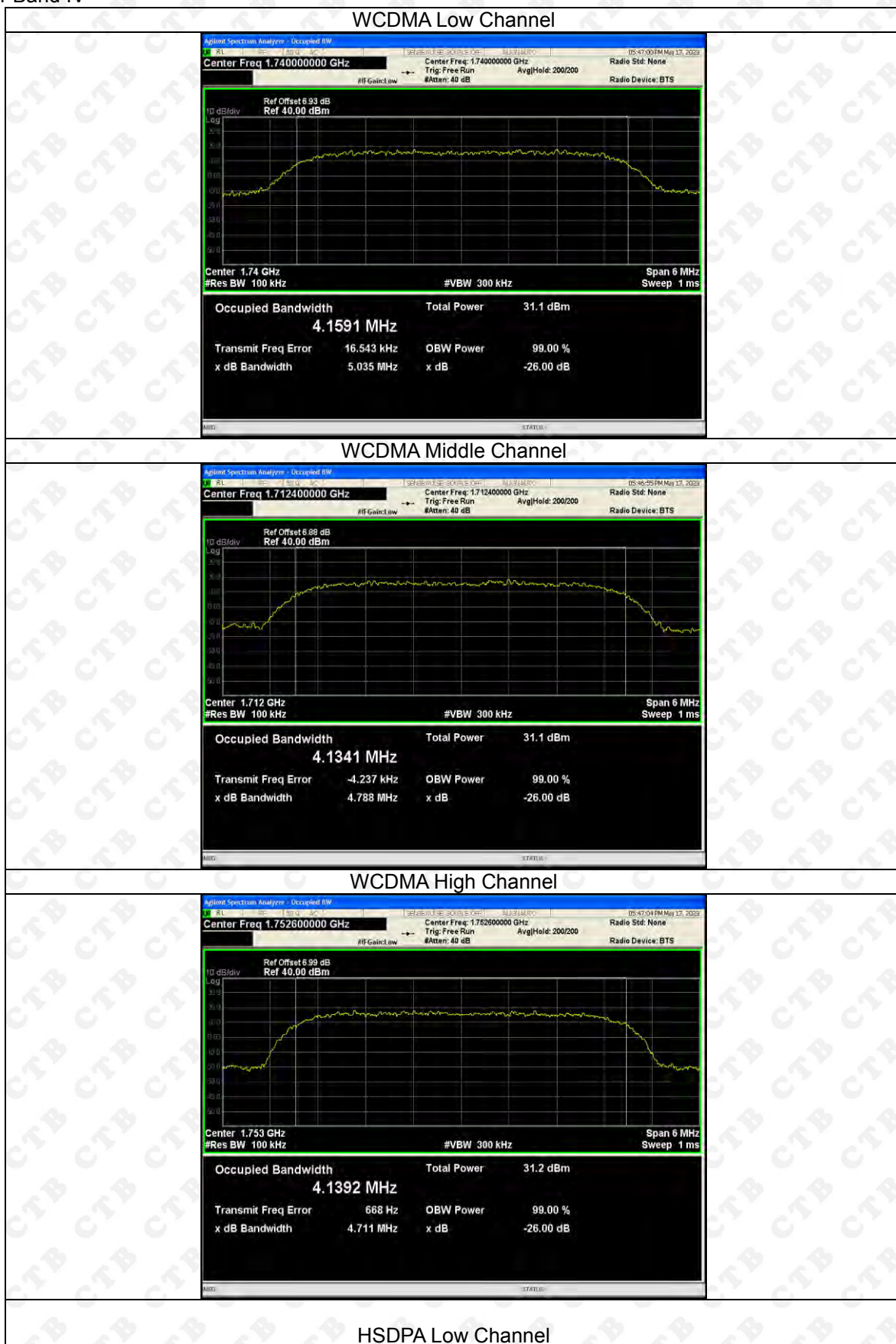
HSUPA Middle Channel

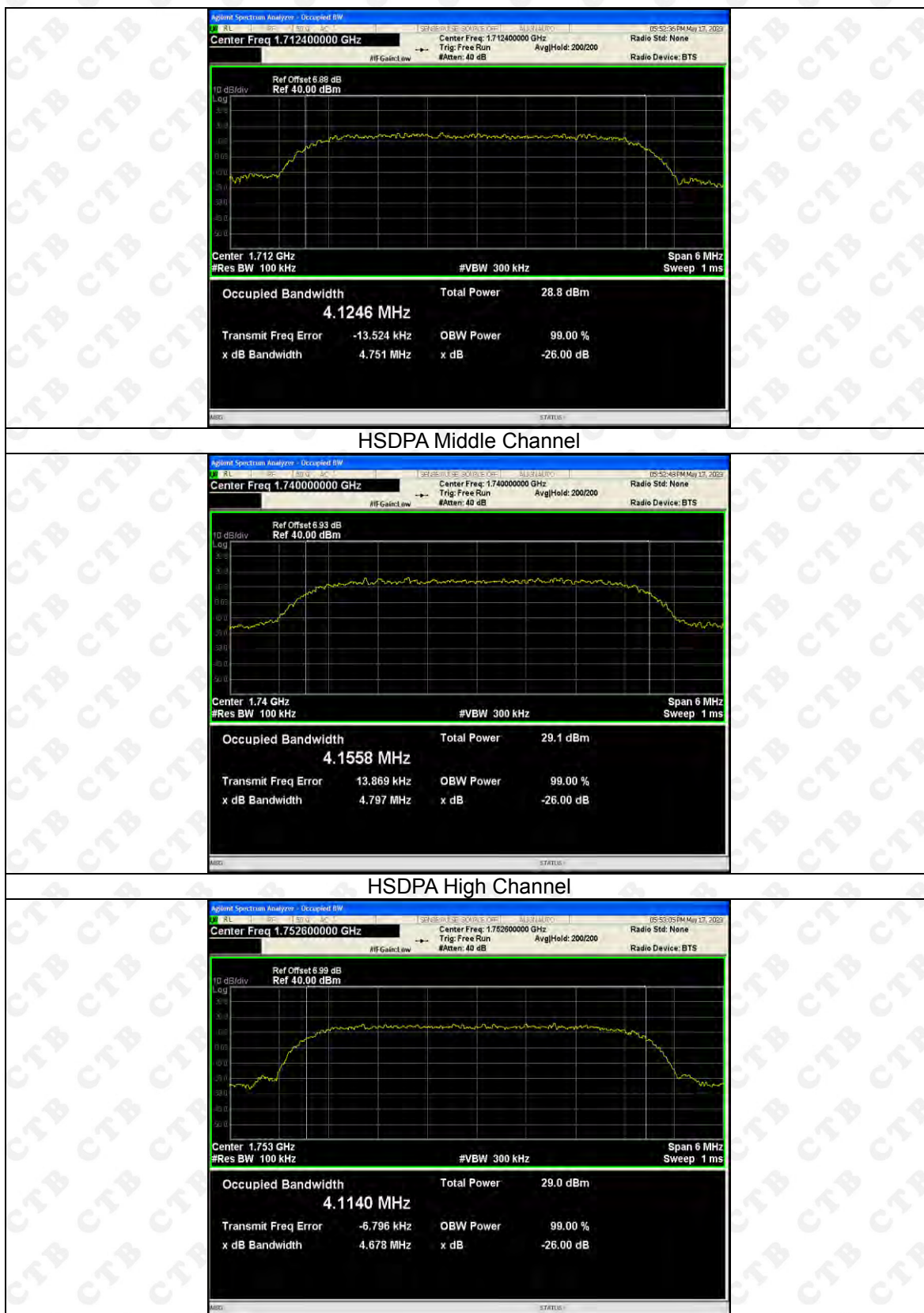


HSUPA High Channel

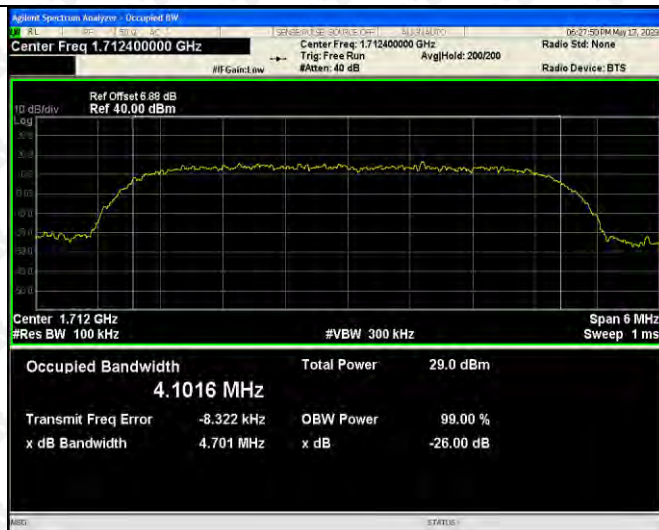


For Band IV

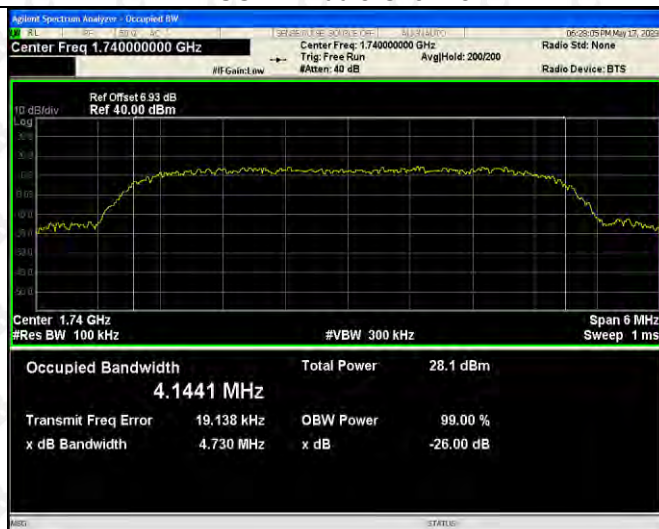




HSUPA Low Channel



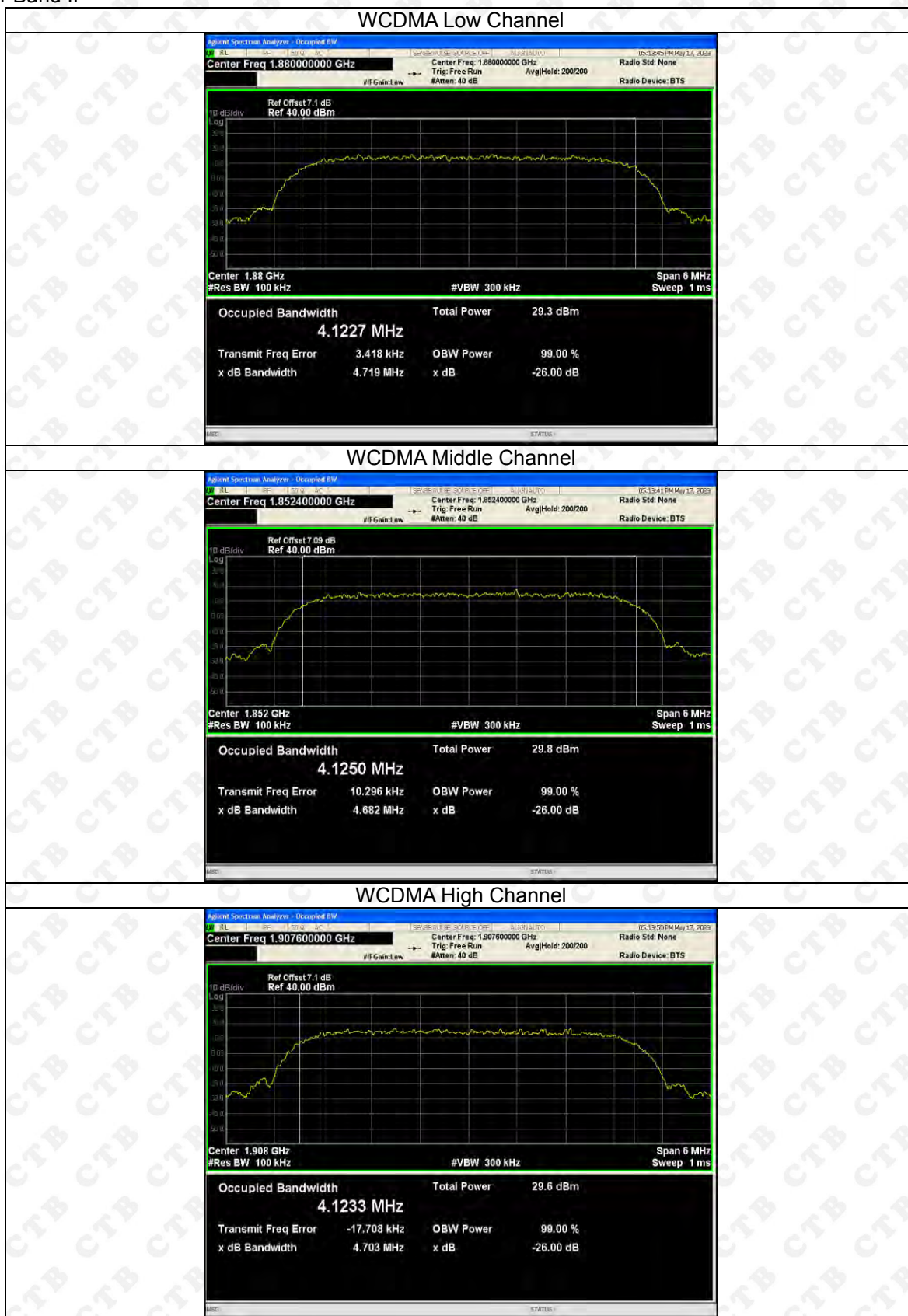
HSUPA Middle Channel



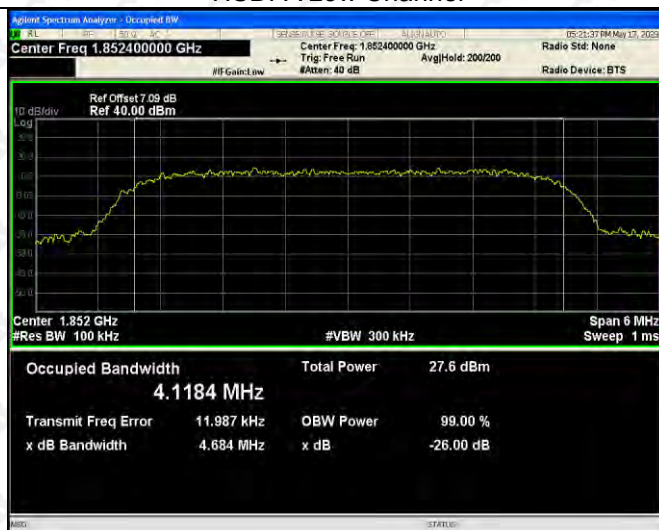
HSUPA High Channel



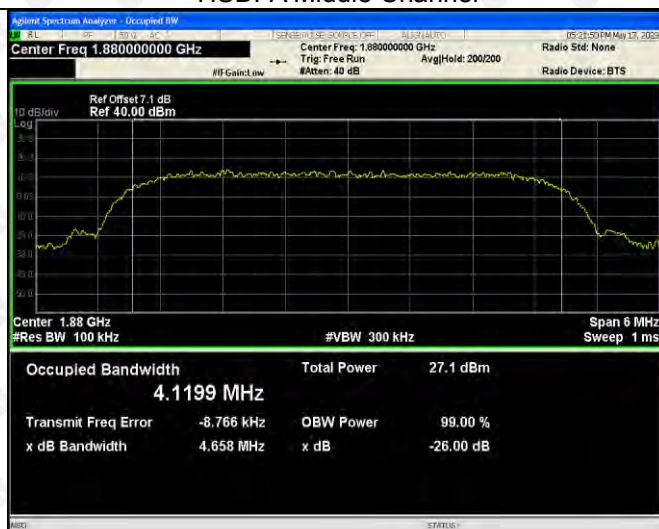
For Band II



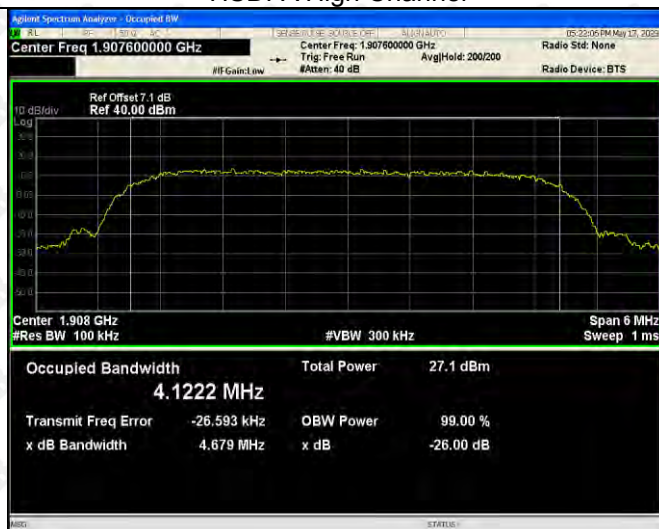
HSDPA Low Channel



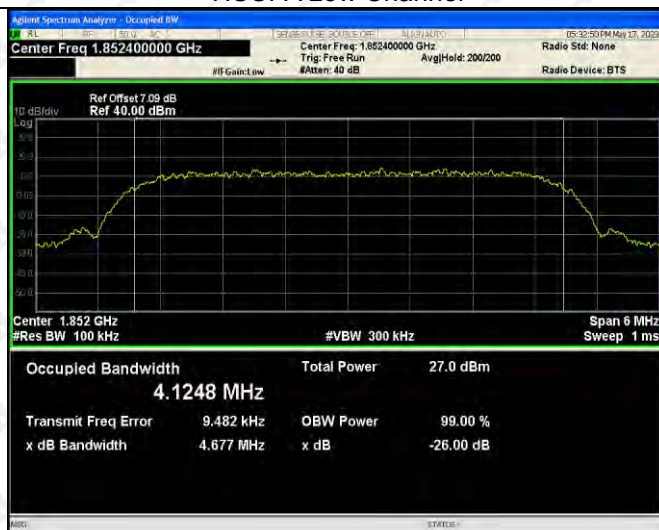
HSDPA Middle Channel



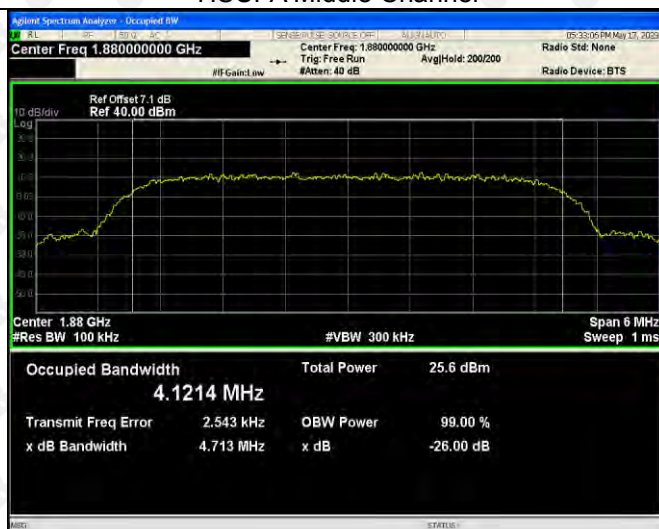
HSDPA High Channel



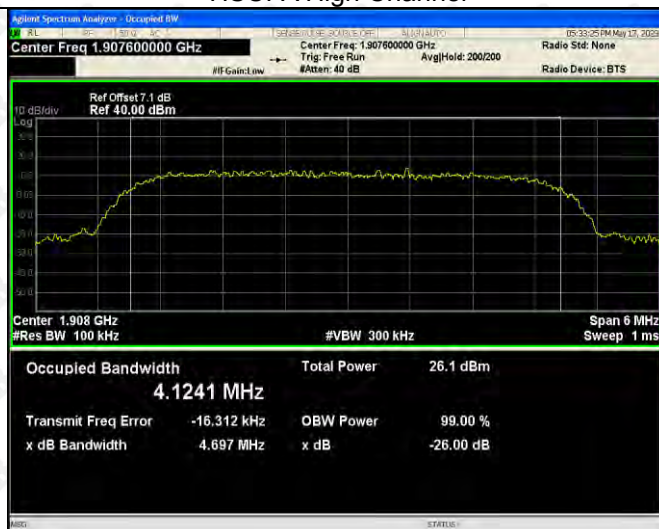
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

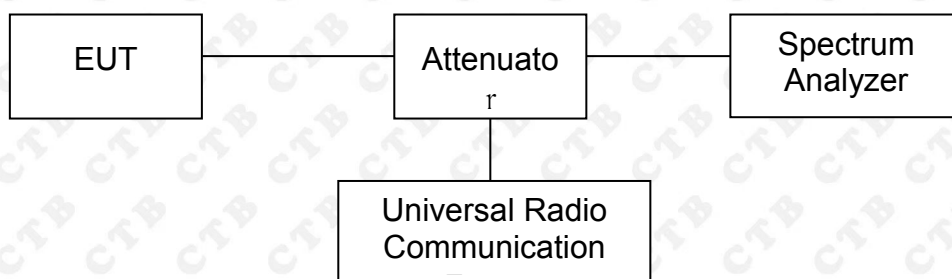
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:

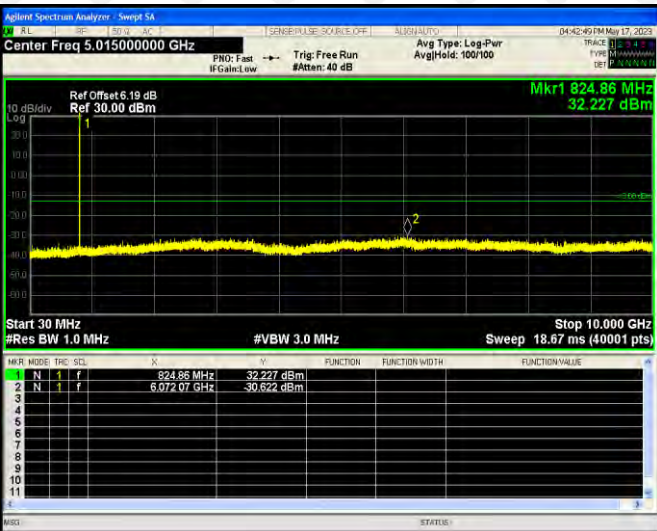
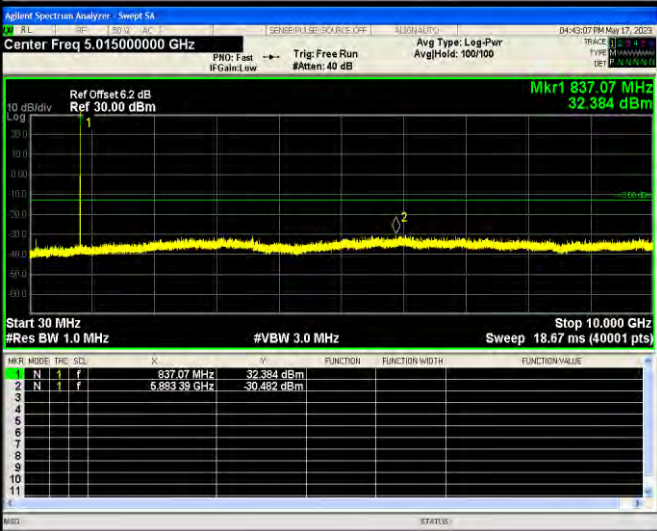
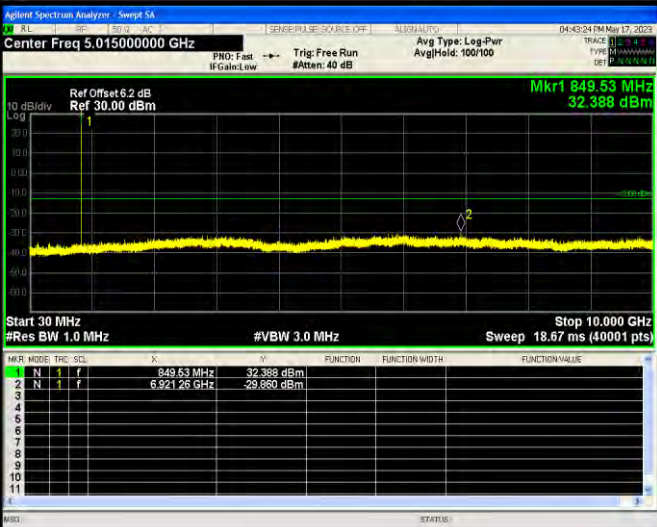


9.3 Environmental Conditions

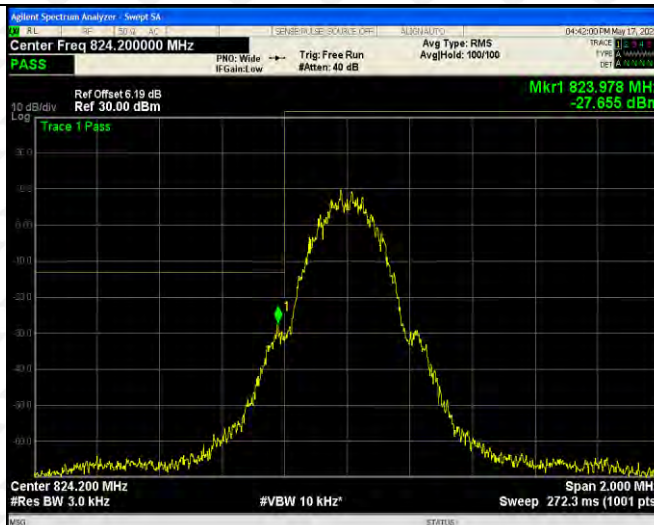
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

9.4 Summary of Test Results/Plots

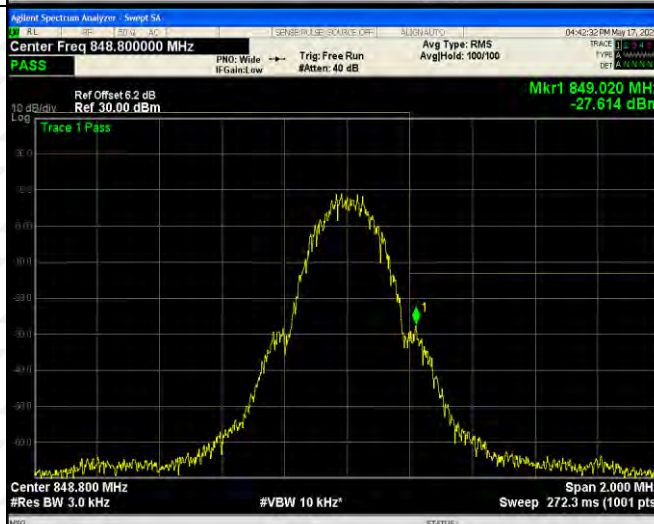
Please refer to the following test plots
For Cellular Band

GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

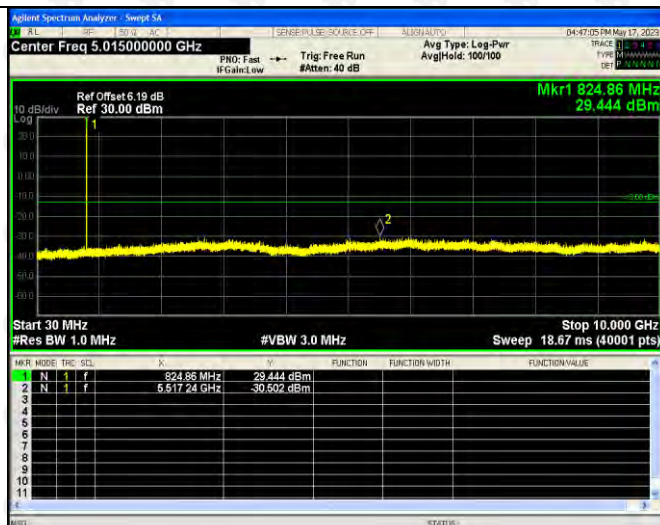
GPRS
Low
Band
Emission



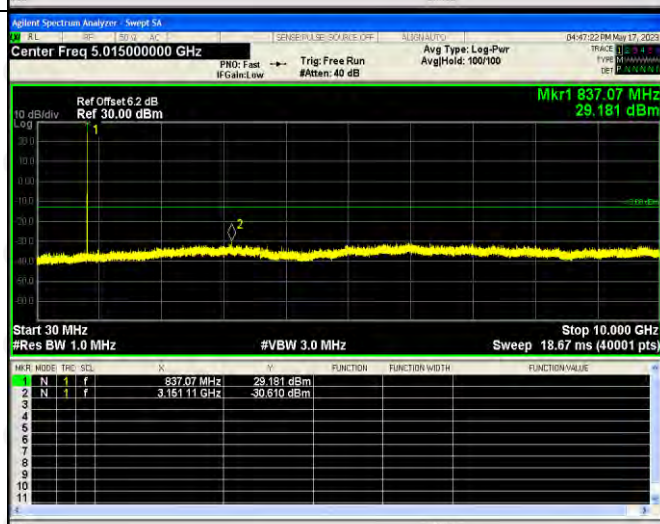
GPRS
High
Band
Emission



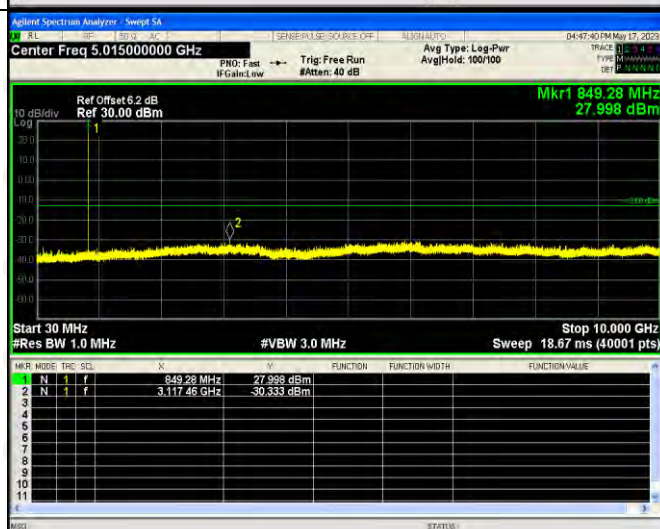
EDGE
Low
Channel



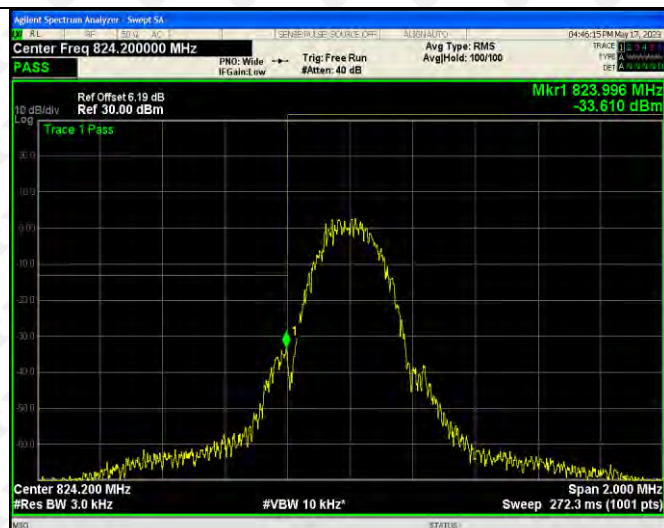
EDGE
Middle
Channel



EDGE
High
Channel



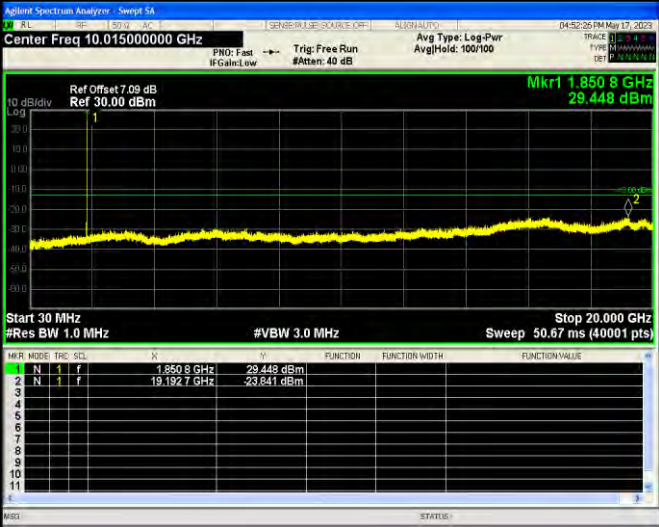
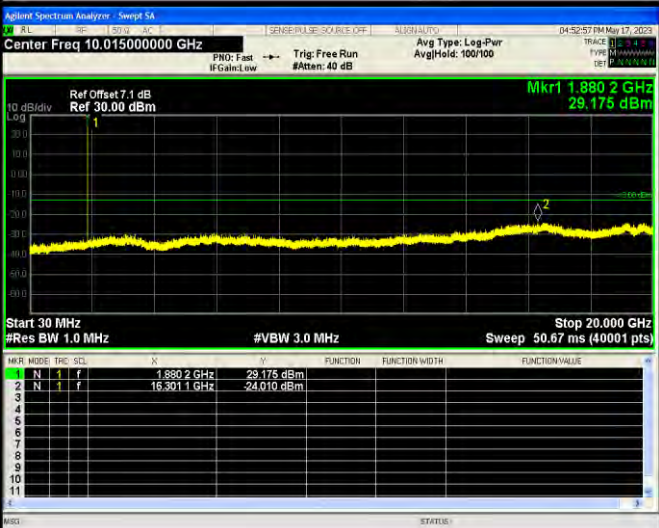
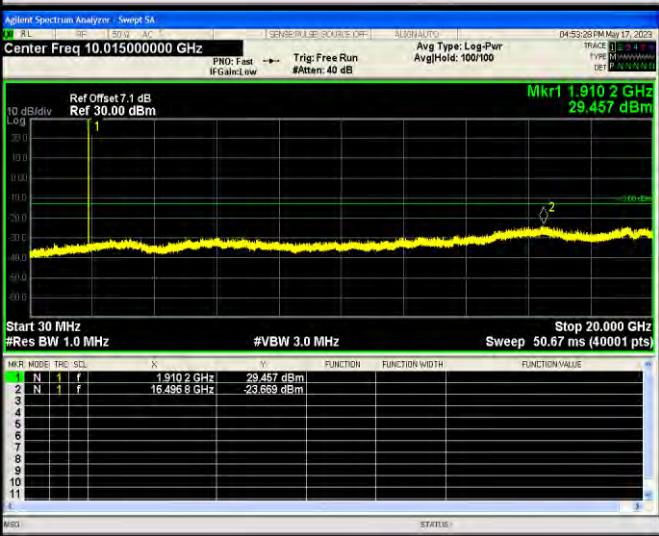
EDGE
Low
Band
Emission

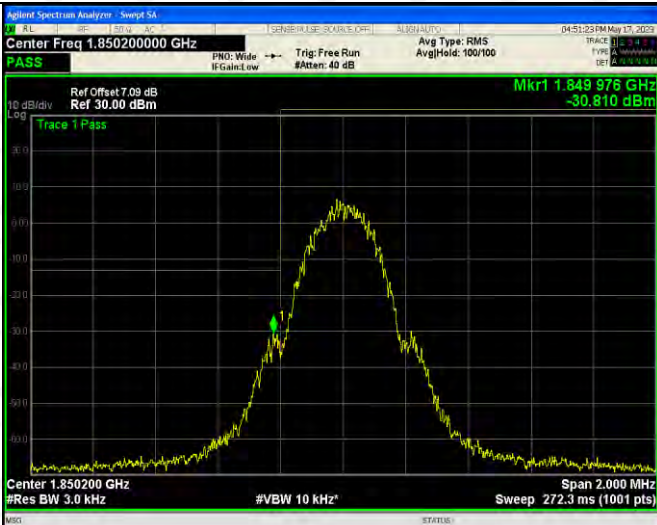


EDGE
High
Band
Emission

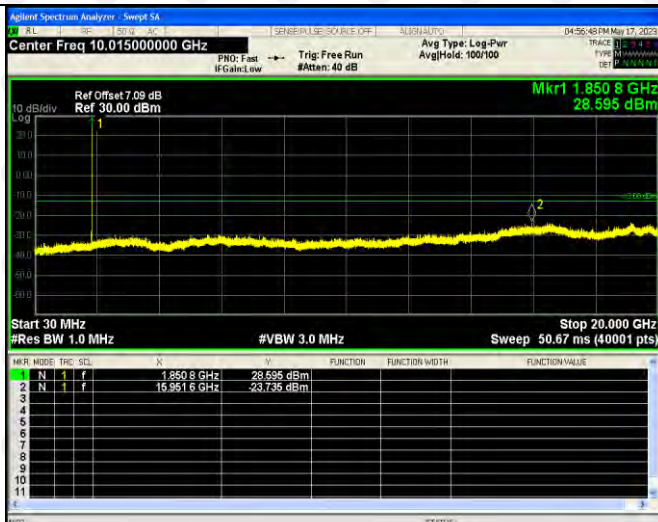


For PCS Band

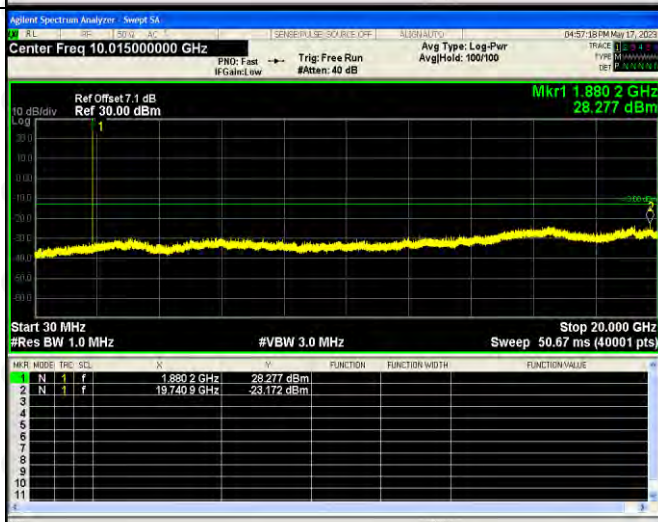
GPRS Low Channel	
GPRS Middle Channel	
GPRS High Channel	

GPRS Low Band Emission	 Agilent Spectrum Analyzer - Sweep SA Center Freq 1.85020000 GHz PASS Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.849 978 GHz -30.810 dBm Trace 1 Pass 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 7.1 dB Ref 30.00 dBm Mkr1 1.910 018 GHz -31.035 dBm Trace 1 Pass Center 1.909800 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 2.000 MHz Sweep 272.3 ms (1001 pts)

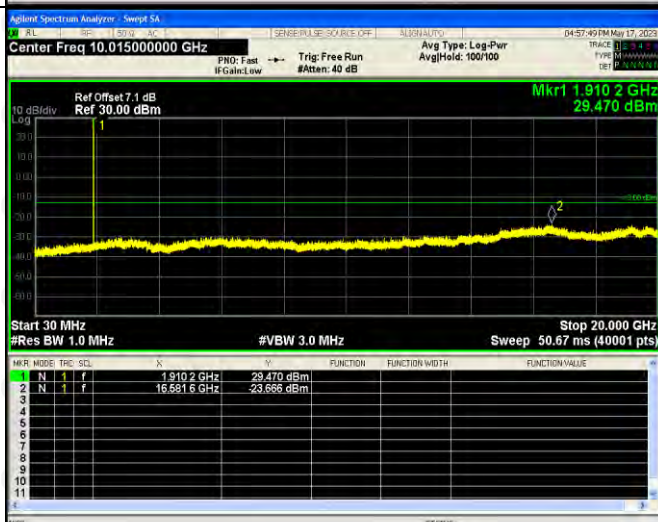
EDGE
Low
Channel



EDGE
Middle
Channel



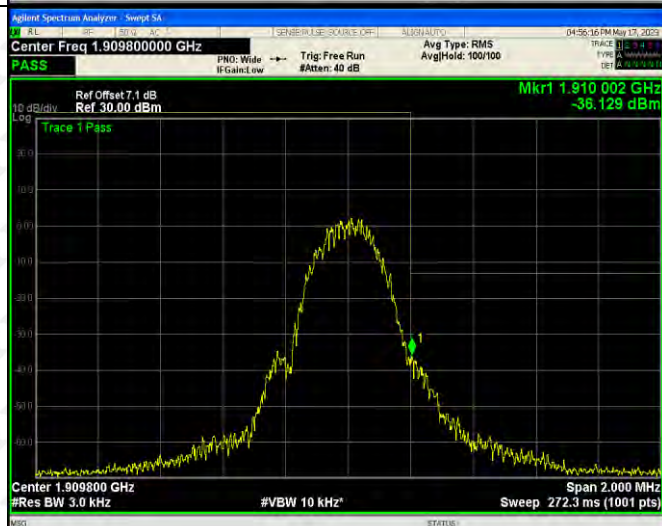
EDGE
High
Channel



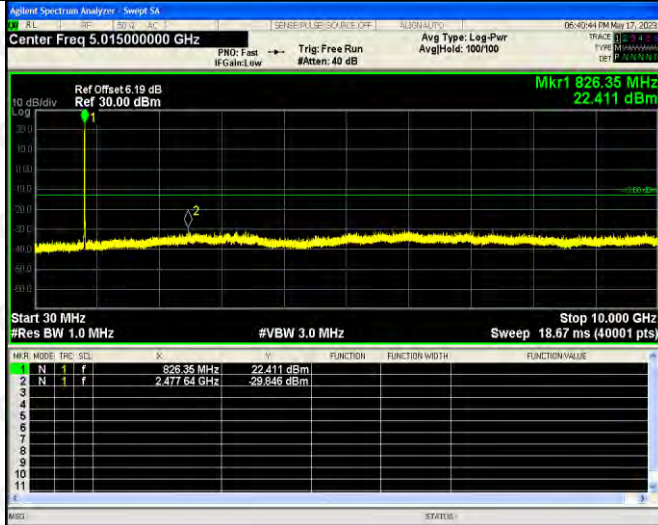
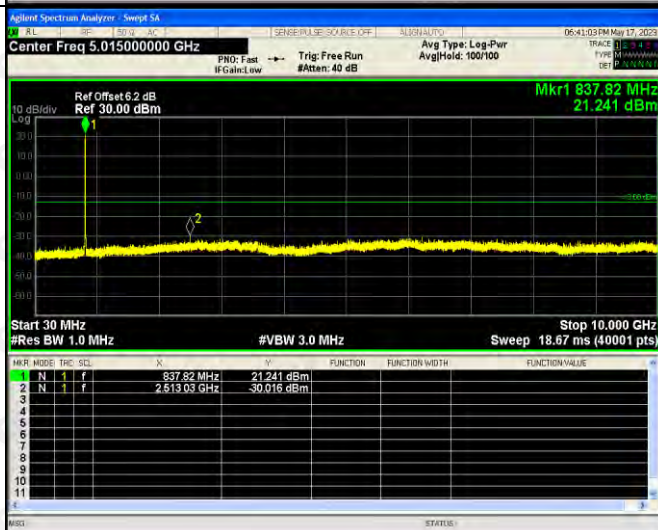
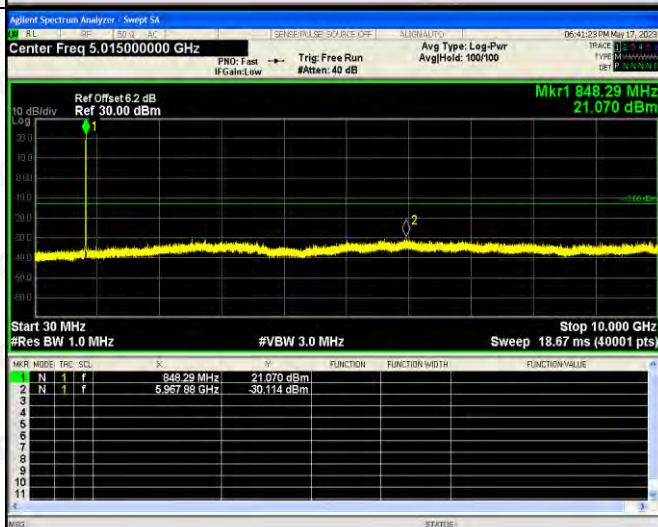
EDGE
Low
Band
Emission



EDGE
High
Band
Emission



For Band V

WCDMA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 826.35 MHz 22.411 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</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>826.35 MHz</td><td></td><td></td><td>22.411 dBm</td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.477 64 GHz</td><td></td><td></td><td>-39.846 dBm</td></tr></table>	MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	826.35 MHz			22.411 dBm	2	N	1	f	2.477 64 GHz			-39.846 dBm
MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																		
1	N	1	f	826.35 MHz			22.411 dBm																		
2	N	1	f	2.477 64 GHz			-39.846 dBm																		
WCDMA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.82 MHz 21.241 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</th><th>F</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.82 MHz</td><td></td><td></td><td>21.241 dBm</td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.513 03 GHz</td><td></td><td></td><td>-30.016 dBm</td></tr></table>	MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.82 MHz			21.241 dBm	2	N	1	f	2.513 03 GHz			-30.016 dBm
MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																		
1	N	1	f	837.82 MHz			21.241 dBm																		
2	N	1	f	2.513 03 GHz			-30.016 dBm																		
WCDMA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 848.29 MHz 21.070 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</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>848.29 MHz</td><td></td><td></td><td>21.070 dBm</td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.967 98 GHz</td><td></td><td></td><td>-30.114 dBm</td></tr></table>	MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	848.29 MHz			21.070 dBm	2	N	1	f	6.967 98 GHz			-30.114 dBm
MNR	MODE	TRF	SQL	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																		
1	N	1	f	848.29 MHz			21.070 dBm																		
2	N	1	f	6.967 98 GHz			-30.114 dBm																		

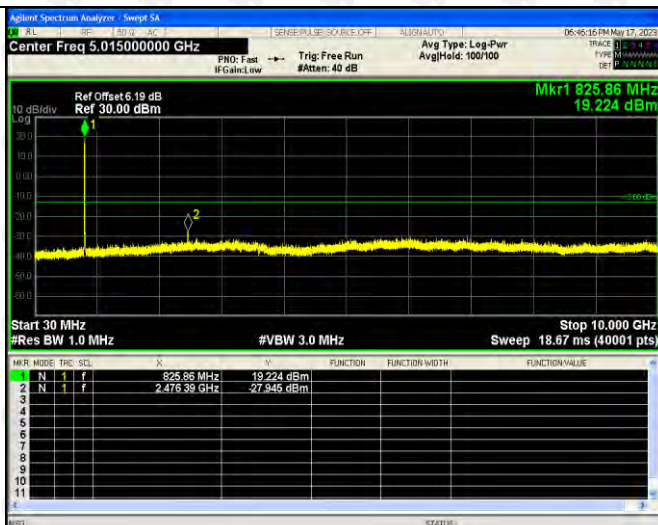
WCDMA
Low
Band
Spurious
Emission



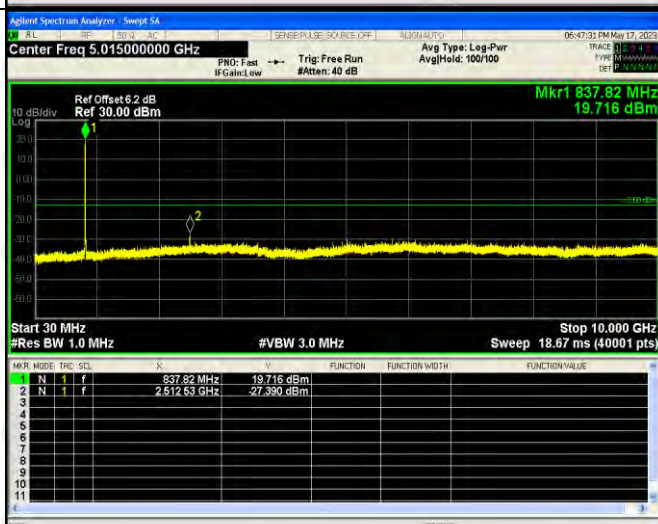
WCDMA
High
Band
Spurious
Emission



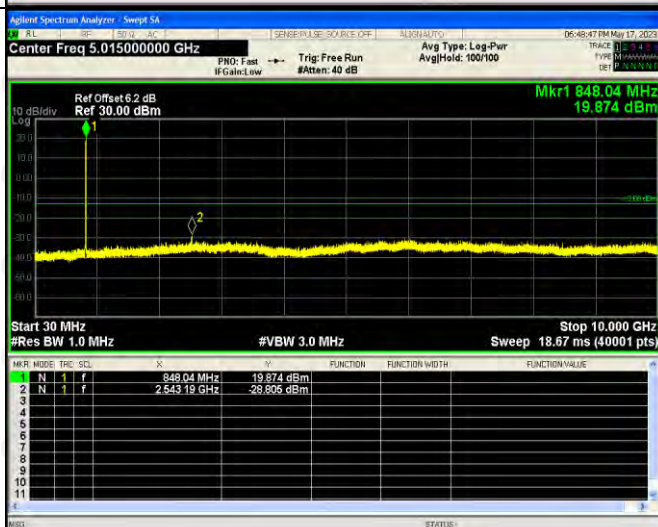
HSDPA
Low
Channel



HSDPA
Middle
Channel



HSDPA
High
Channel

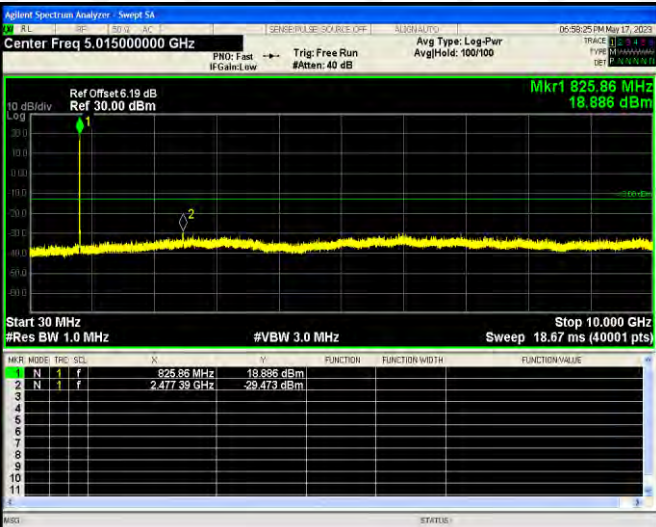
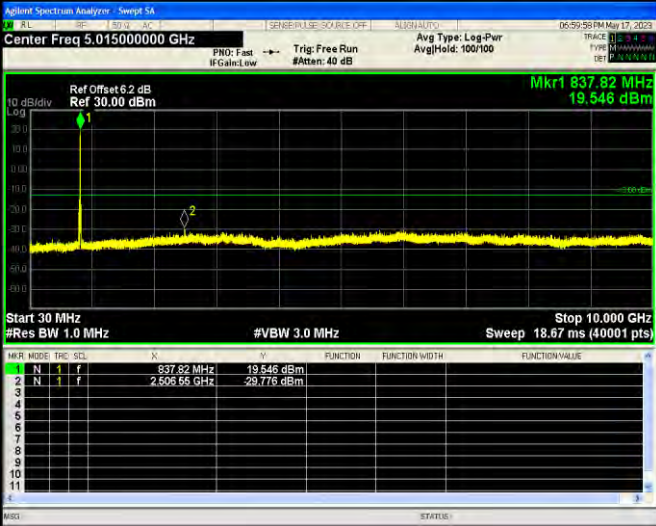
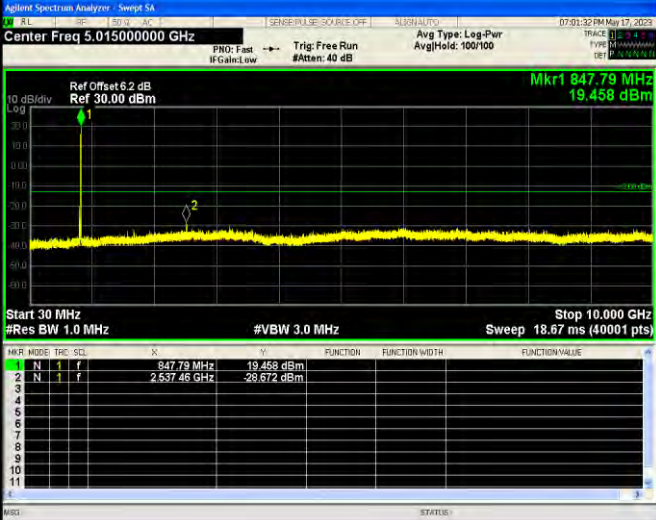


HSDPA
Low
Band
Spurious
Emission



HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel		
HSUPA Middle Channel		
HSUPA High Channel		

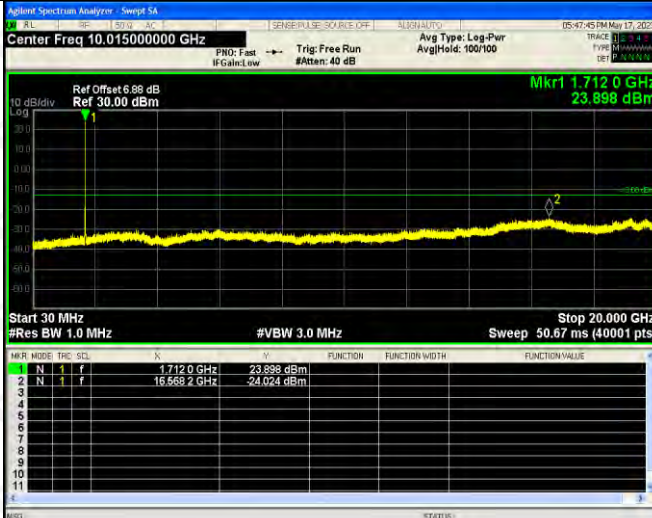
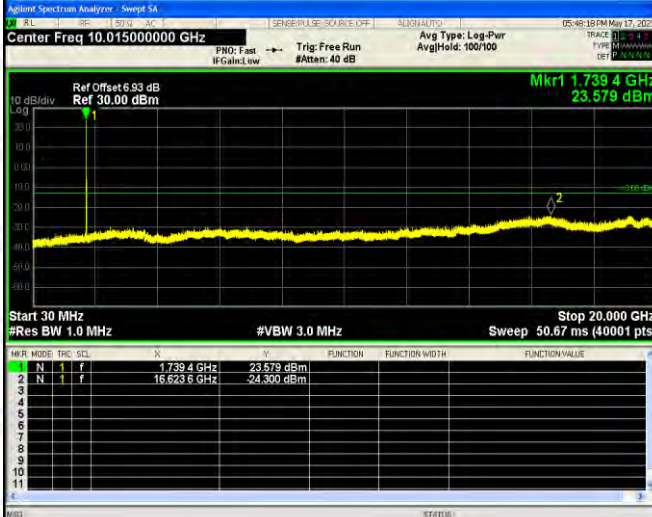
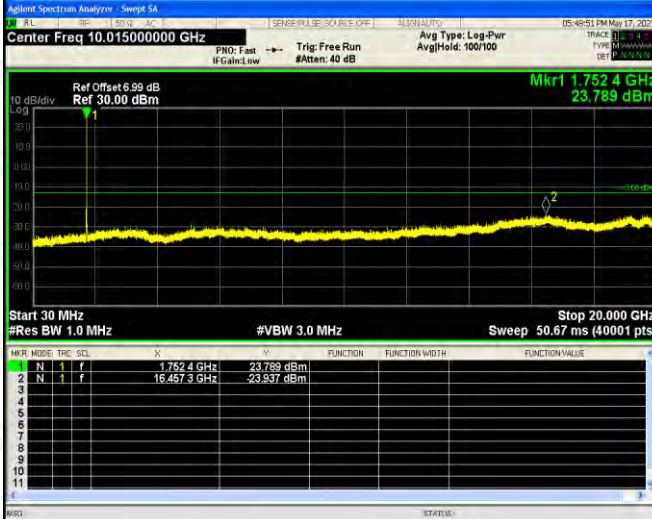
HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



For Band IV

WCDMA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset: 6.98 dB Ref 30.00 dBm Mkr1 1.712 0 GHz 23.898 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.712 0 GHz</td><td>23.898 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.568 2 GHz</td><td>-24.024 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.712 0 GHz	23.898 dBm				2	N	1	f	16.568 2 GHz	-24.024 dBm			
MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.712 0 GHz	23.898 dBm																							
2	N	1	f	16.568 2 GHz	-24.024 dBm																							
WCDMA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset: 6.93 dB Ref 30.00 dBm Mkr1 1.739 4 GHz 23.579 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.739 4 GHz</td><td>23.579 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.623 6 GHz</td><td>-24.300 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.739 4 GHz	23.579 dBm				2	N	1	f	16.623 6 GHz	-24.300 dBm			
MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.739 4 GHz	23.579 dBm																							
2	N	1	f	16.623 6 GHz	-24.300 dBm																							
WCDMA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset: 6.99 dB Ref 30.00 dBm Mkr1 1.752 4 GHz 23.789 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>MNR</th><th>MODE</th><th>TRF</th><th>SQL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.752 4 GHz</td><td>23.789 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.457 3 GHz</td><td>-23.937 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.752 4 GHz	23.789 dBm				2	N	1	f	16.457 3 GHz	-23.937 dBm			
MNR	MODE	TRF	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	1.752 4 GHz	23.789 dBm																							
2	N	1	f	16.457 3 GHz	-23.937 dBm																							

WCDMA
Low
Band
Spurious
Emission



WCDMA
High
Band
Spurious
Emission



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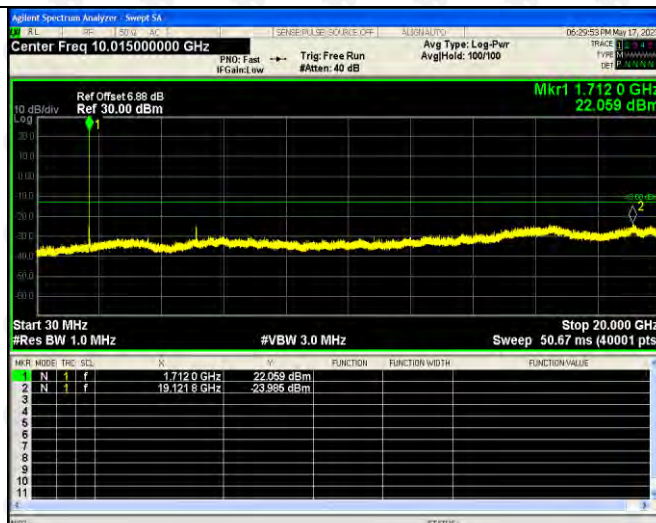
HSDPA
Low
Band
Spurious
Emission



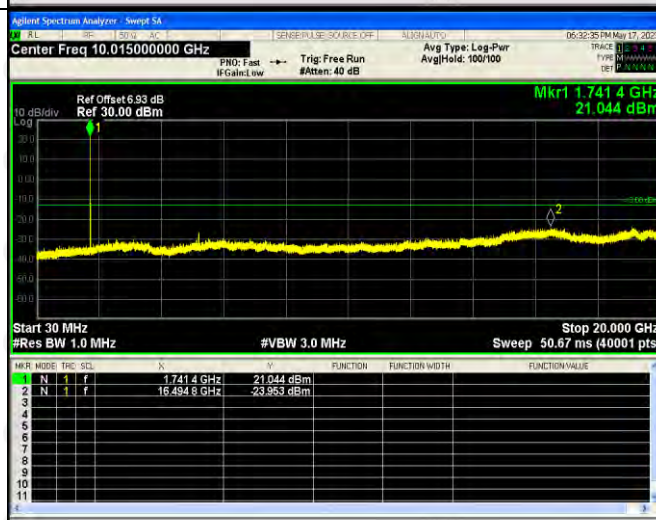
HSDPA
High
Band
Spurious
Emission



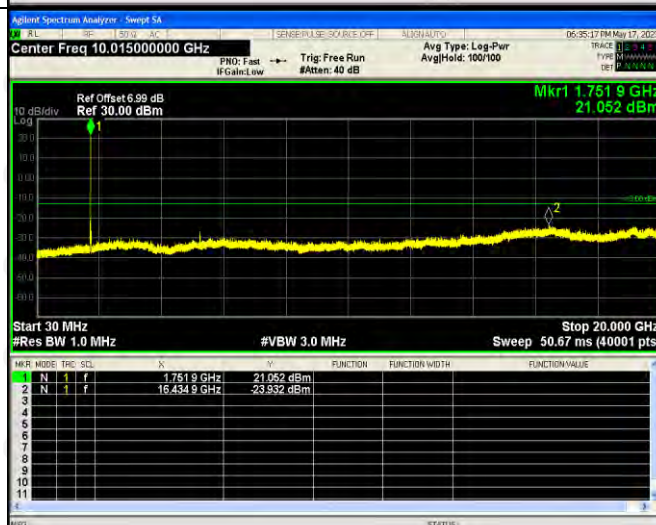
HSUPA
Low
Channel



HSUPA
Middle
Channel



HSUPA
High
Channel



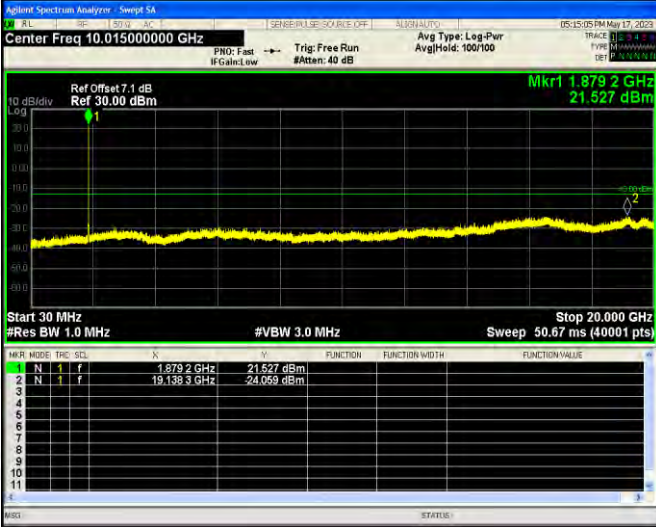
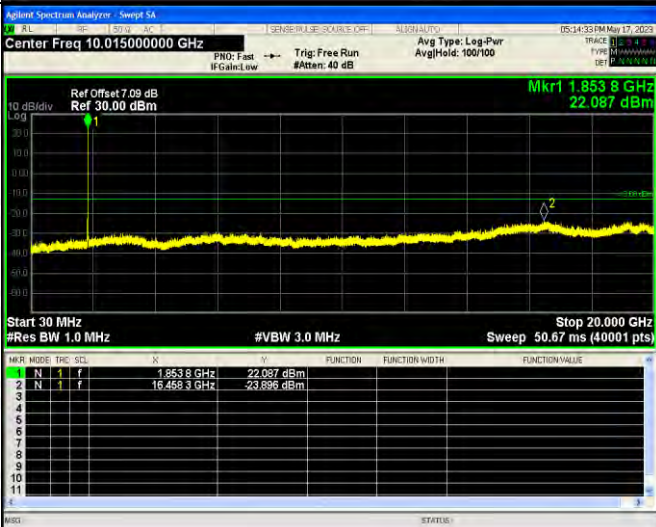
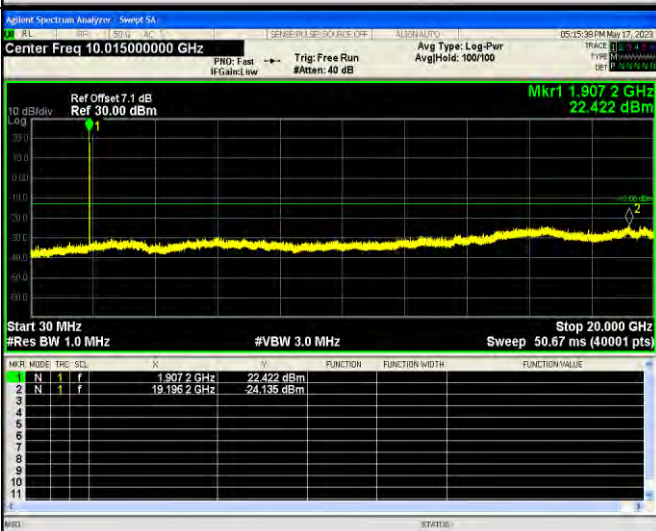
HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



For Band II

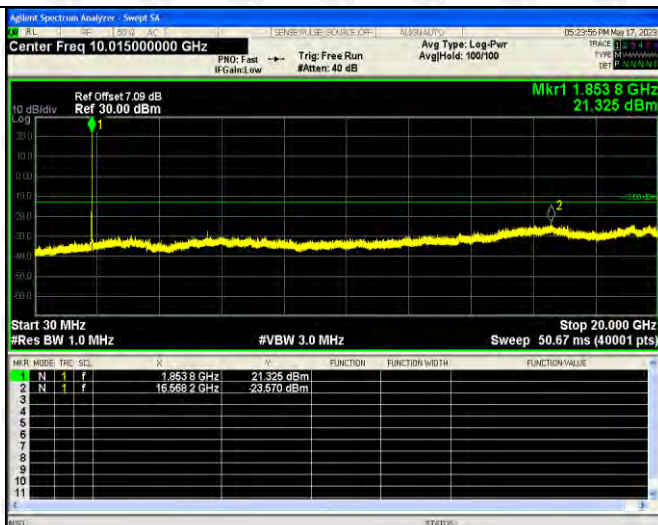
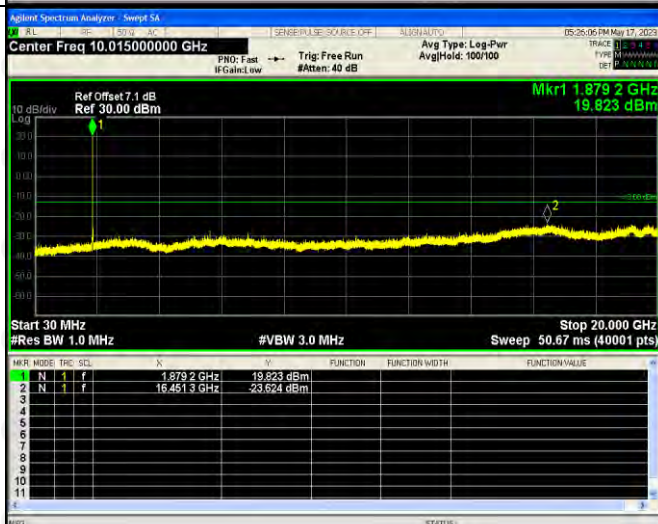
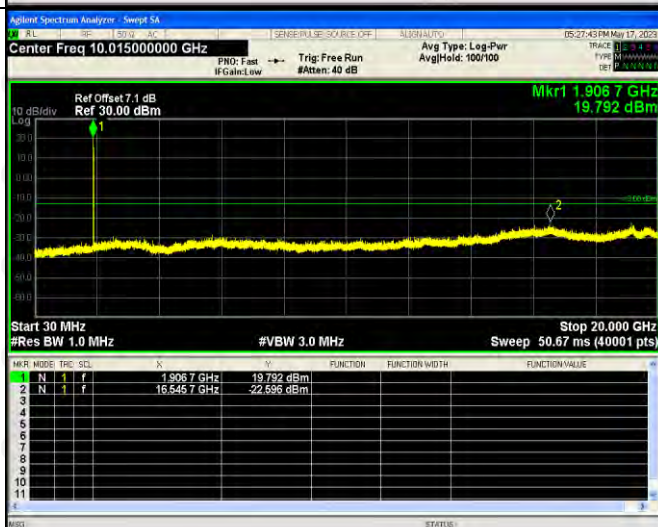
WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

WCDMA
Low
Band
Spurious
Emission



WCDMA
High
Band
Spurious
Emission



HSDPA
Low
Channel

HSDPA
Middle
Channel

HSDPA
High
Channel


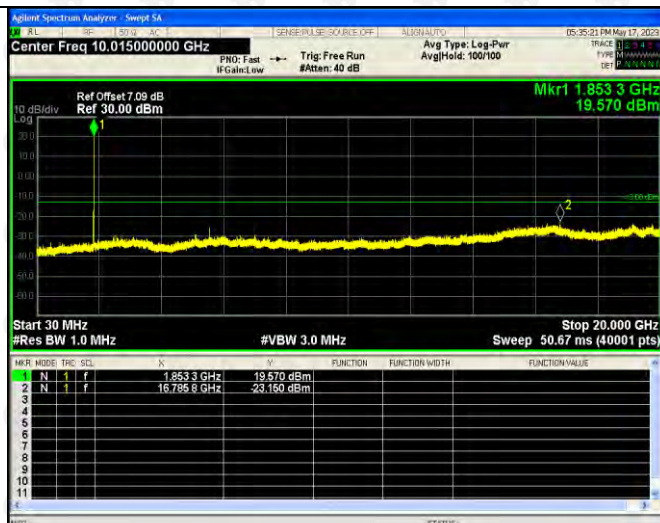
HSDPA
Low
Band
Spurious
Emission



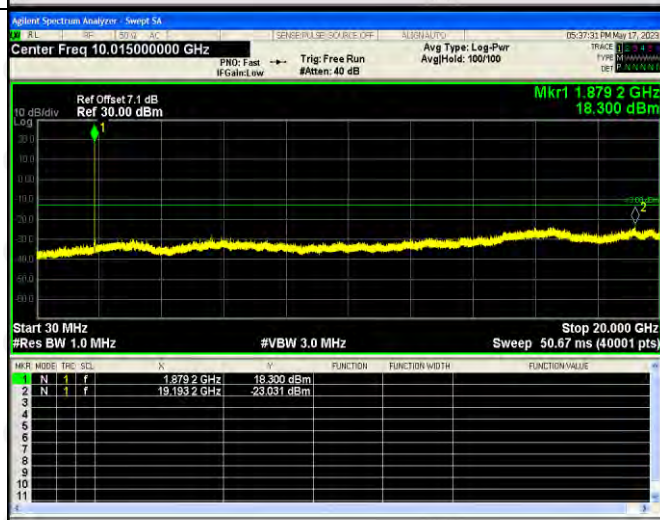
HSDPA
High
Band
Spurious
Emission



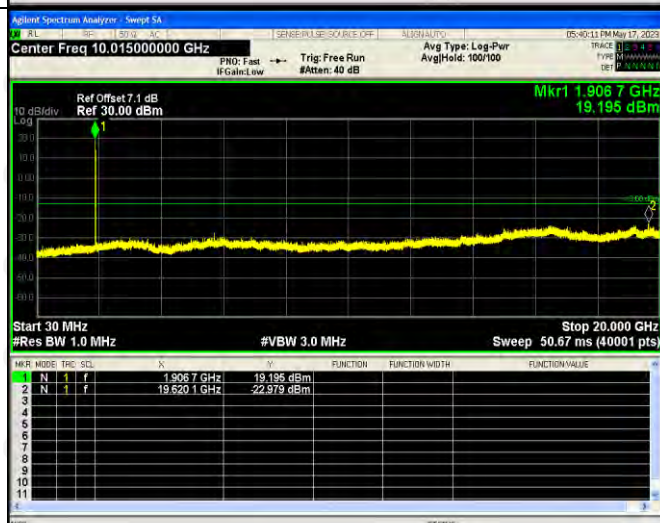
HSUPA
Low
Channel



HSUPA
Middle
Channel



HSUPA
High
Channel



HSUPA
Low
Band
Spurious
Emission



HSUPA
High
Band
Spurious
Emission



10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

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

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

10.2 Test Procedure

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

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

10.3 Environmental Conditions

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

10.4 Summary of Test Results/Plots

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

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

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

For Cellular Band GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
36.70	-74.29	3.9	-70.39	-13	-57.39	H
1646.72	-51.45	4.83	-46.62	-13	-33.62	H
2466.66	-50.79	8.08	-42.71	-13	-29.71	H
40.94	-68.79	4.02	-64.77	-13	-51.77	V
1640.19	-53.45	4.48	-48.97	-13	-35.97	V
2467.26	-47.61	8.2	-39.41	-13	-26.41	V
Middle Channel (836.6MHz)						
38.62	-74.09	3.84	-70.25	-13	-57.25	H
1667.23	-57.58	4.62	-52.96	-13	-39.96	H
2502.82	-58.02	8.25	-49.77	-13	-36.77	H
41.36	-73.00	4.25	-68.75	-13	-55.75	V
1672.20	-47.64	4.54	-43.10	-13	-30.10	V
2503.31	-48.87	8.35	-40.52	-13	-29.75	V
High Channel (848.8MHz)						
45.43	-73.92	4.22	-78.14	-13	-65.14	H
1696.10	-55.11	4.87	-59.98	-13	-46.98	H
2538.59	-55.99	8.38	-64.37	-13	-51.37	H
41.24	-69.29	4.02	-73.31	-13	-60.31	V
1691.16	-53.81	4.56	-58.37	-13	-45.37	V
2538.24	-52.65	8.41	-61.06	-13	-48.06	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)						
44.96	-73.41	4.34	-69.07	-13	-56.07	H
3696.67	-51.30	10.54	-40.76	-13	-27.76	H
5543.16	-54.74	13.37	-41.37	-13	-28.37	H
36.68	-73.43	4.34	-69.09	-13	-56.09	V
3691.84	-52.92	10.54	-42.38	-13	-29.38	V
5543.26	-60.48	13.37	-47.11	-13	-34.11	V
Middle Channel (1880MHz)						
42.94	-69.58	4.02	-65.56	-13	-52.56	H
3758.33	-53.47	10.71	-42.76	-13	-29.76	H
5635.44	-54.11	13.73	-40.38	-13	-27.38	H
44.85	-72.56	4.14	-68.42	-13	-55.42	V
3757.56	-53.75	10.22	-43.53	-13	-30.53	V
5638.33	-59.21	13.16	-46.05	-13	-33.05	V
High Channel (1909.8MHz)						
40.51	-68.54	4.02	-64.52	-13	-51.52	H
3818.58	-57.33	4.9	-52.43	-13	-39.43	H
5719.47	-46.91	8.09	-38.82	-13	-25.82	H
37.54	-55.70	4.25	-51.45	-13	-38.45	V
3811.72	-55.98	4.93	-51.05	-13	-38.05	V
5722.15	-65.59	8.43	-57.16	-13	-44.16	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
41.43	-69.62	3.91	-65.71	-13	-52.71	H
1652.72	-58.25	10.56	-47.69	-13	-34.69	H
2472.85	-59.16	13.5	-45.66	-13	-32.66	H
39.15	-72.67	3.93	-68.74	-13	-55.74	V
1647.75	-51.47	10.41	-41.06	-13	-28.06	V
2473.86	-57.04	13.16	-43.88	-13	-30.88	V
Middle Channel (836.6MHz)						
39.48	-68.32	4.02	-64.30	-13	-51.30	H
1668.07	-62.63	4.66	-57.97	-13	-44.97	H
2499.40	-43.18	8.34	-34.84	-13	-21.84	H
42.09	-57.23	4.17	-53.06	-13	-40.06	V
1667.49	-61.37	4.94	-56.43	-13	-43.43	V
2502.97	-60.34	8.19	-52.15	-13	-39.15	V
High Channel (846.6MHz)						
46.13	-71.46	3.87	-67.59	-13	-54.59	H
1687.50	-56.14	4.89	-51.25	-13	-38.25	H
2537.40	-42.96	8.42	-34.54	-13	-21.54	H
40.64	-54.18	3.95	-50.23	-13	-37.23	V
1683.34	-56.89	4.99	-51.90	-13	-38.90	V
2531.53	-63.66	8.12	-55.54	-13	-42.54	V

For Band 4Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1712.6MHz)						
38.05	-73.38	3.91	-69.47	-13	-56.47	H
1643.53	-49.74	10.56	-39.18	-13	-26.18	H
2471.29	-55.26	13.5	-41.76	-13	-28.76	H
43.72	-66.96	3.93	-63.03	-13	-50.03	V
1643.65	-55.96	10.41	-45.55	-13	-32.55	V
2473.86	-56.62	13.16	-43.46	-13	-30.46	V
Middle Channel (1747.4MHz)						
36.96	-66.85	4.02	-62.83	-13	-49.83	H
1669.28	-61.42	4.66	-56.76	-13	-43.76	H
2506.67	-42.86	8.34	-34.52	-13	-21.52	H
36.69	-62.51	4.17	-58.34	-13	-45.34	V
1665.87	-56.63	4.94	-51.69	-13	-38.69	V
2504.63	-57.21	8.19	-49.02	-13	-36.02	V
High Channel (1782.4MHz)						
39.51	-70.78	3.87	-66.91	-13	-53.91	H
1690.10	-57.57	4.89	-52.68	-13	-39.68	H
2535.47	-41.88	8.42	-33.46	-13	-20.46	H
40.84	-56.39	3.95	-52.44	-13	-39.44	V
1686.45	-58.47	4.99	-53.48	-13	-40.48	V
2537.88	-64.65	8.12	-56.53	-13	-43.53	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
40.58	-74.90	3.91	-70.99	-13	-57.99	H
1645.56	-53.34	10.56	-42.78	-13	-29.78	H
2470.30	-59.74	13.5	-46.24	-13	-33.24	H
39.78	-67.06	3.93	-63.13	-13	-50.13	V
1651.75	-50.21	10.41	-39.80	-13	-26.80	V
2470.53	-55.96	13.16	-42.80	-13	-29.80	V
Middle Channel (1880MHz)						
42.05	-68.88	4.02	-64.86	-13	-51.86	H
1669.73	-55.46	4.66	-50.80	-13	-37.80	H
2507.94	-46.43	8.34	-38.09	-13	-25.09	H
37.83	-63.36	4.17	-59.19	-13	-46.19	V
1670.43	-54.64	4.94	-49.70	-13	-36.70	V
2508.22	-57.13	8.19	-48.94	-13	-35.94	V
High Channel (1907.6MHz)						
45.45	-68.93	3.87	-65.06	-13	-52.06	H
1691.04	-55.50	4.89	-50.61	-13	-37.61	H
2531.56	-46.91	8.42	-38.49	-13	-25.49	H
43.58	-58.87	3.95	-54.92	-13	-41.92	V
1684.99	-58.78	4.99	-53.79	-13	-40.79	V
2539.16	-63.31	8.12	-55.19	-13	-42.19	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 GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.05	0.01082
40	NV	9.55	0.01141
30	NV	8.92	0.01066
20	NV	9.57	0.01144
10	NV	10.03	0.01199
0	NV	10.26	0.01227
-10	NV	10.13	0.01211
-20	NV	10.88	0.01300
-30	NV	11.26	0.01347

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	12.86	0.00684
40	NV	12.20	0.00649
30	NV	13.03	0.00693
20	NV	12.72	0.00677
10	NV	13.21	0.00703
0	NV	13.13	0.00698
-10	NV	13.85	0.00737
-20	NV	13.99	0.00744
-30	NV	14.78	0.00786

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	10.64	0.01272
40	NV	12.00	0.01434
30	NV	11.66	0.01394
20	NV	11.88	0.01420
10	NV	11.69	0.01397
0	NV	12.11	0.01448
-10	NV	12.20	0.01458
-20	NV	12.92	0.01545
-30	NV	13.24	0.01582

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	-10.80	-0.00574
40	NV	-10.17	-0.00541
30	NV	-9.89	-0.00526
20	NV	-9.50	-0.00505
10	NV	-8.67	-0.00461
0	NV	-8.95	-0.00476
-10	NV	-8.82	-0.00469
-20	NV	-8.66	-0.00461
-30	NV	-7.67	-0.00408

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	-0.21	-0.00025
40	NV	-0.17	-0.00021
30	NV	-0.09	-0.00011
20	NV	0.22	0.00026
10	NV	1.07	0.00128
0	NV	0.76	0.00091
-10	NV	0.71	0.00085
-20	NV	0.76	0.00091
-30	NV	1.35	0.00161

For WCDMA Band 4 Mode

Reference Frequency(Middle Channel): 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.21	-0.00012
40	NV	-0.17	-0.00010
30	NV	-0.09	-0.00005
20	NV	0.22	0.00013
10	NV	1.07	0.00062
0	NV	0.76	0.00044
-10	NV	0.71	0.00041
-20	NV	0.76	0.00044
-30	NV	1.35	0.00078

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	-0.27	-0.00015
40	NV	0.15	0.00008
30	NV	-0.18	-0.00010
20	NV	0.47	0.00025
10	NV	0.44	0.00023
0	NV	1.11	0.00059
-10	NV	1.18	0.00063
-20	NV	1.68	0.00090
-30	NV	1.98	0.00105

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	-0.08	-0.00009
40	NV	-0.01	-0.00001
30	NV	-0.01	-0.00001
20	NV	0.18	0.00022
10	NV	1.14	0.00136
0	NV	1.16	0.00139
-10	NV	1.23	0.00147
-20	NV	1.86	0.00223
-30	NV	2.07	0.00248

For HSDPA Band 4 Mode

Reference Frequency(Middle Channel): 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.25	-0.00014
40	NV	-0.19	-0.00011
30	NV	-0.23	-0.00013
20	NV	0.28	0.00016
10	NV	1.08	0.00062
0	NV	0.88	0.00051
-10	NV	0.96	0.00055
-20	NV	0.77	0.00044
-30	NV	1.35	0.00078

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	4.40	0.00234
40	NV	4.50	0.00239
30	NV	4.99	0.00265
20	NV	6.27	0.00334
10	NV	6.14	0.00327
0	NV	6.75	0.00359
-10	NV	6.40	0.00341
-20	NV	6.64	0.00353
-30	NV	7.18	0.00382

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	0.40	0.00048
40	NV	0.50	0.00059
30	NV	0.79	0.00094
20	NV	0.87	0.00104
10	NV	0.88	0.00105
0	NV	2.04	0.00244
-10	NV	1.85	0.00221
-20	NV	2.13	0.00255
-30	NV	2.45	0.00293

For HSUPA Band 4 Mode

Reference Frequency(Middle Channel): 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.36	-0.00021
40	NV	-0.72	-0.00042
30	NV	-0.33	-0.00019
20	NV	0.96	0.00055
10	NV	1.88	0.00109
0	NV	0.65	0.00038
-10	NV	1.33	0.00077
-20	NV	2.68	0.00155
-30	NV	0.36	0.00021

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	6.71	0.00388
40	NV	6.94	0.00401
30	NV	7.48	0.00431
20	NV	7.52	0.00434
10	NV	7.68	0.00443
0	NV	7.55	0.00436
-10	NV	7.84	0.00452
-20	NV	8.00	0.00462
-30	NV	8.80	0.00508

So, Frequency Stability Versus Input Voltage is:

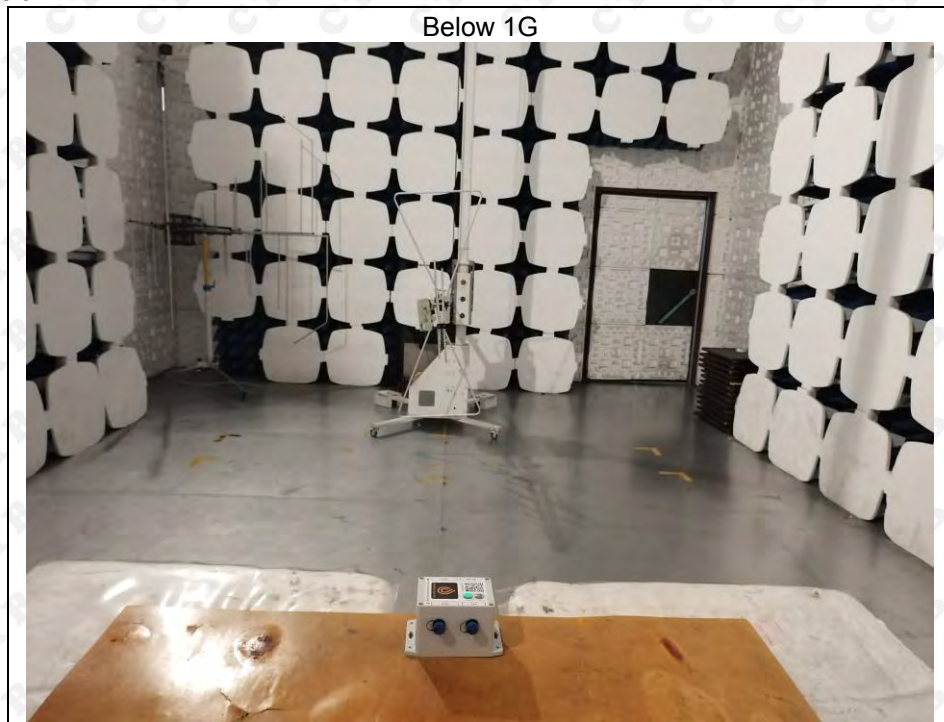
Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	10.63	0.01270
	NV	11.20	0.01339
	HV	12.09	0.01445
Reference Frequency(Middle Channel): GPRS 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	14.24	0.00757
	NV	14.74	0.00784
	HV	14.99	0.00797
Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	13.23	0.01582
	NV	12.66	0.00673
	HV	13.87	0.00738
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	-7.61	-0.00405
	NV	-7.60	-0.00404
	HV	-7.28	-0.00387
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	1.56	0.00186
	NV	1.35	0.00161
	HV	1.48	0.00176
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	1.69	0.0009

	NV	1.27	0.0007
	HV	1.83	0.0001
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	1.98	0.00105
	NV	2.65	0.00141
	HV	3.03	0.00161
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	2.46	0.00294
	NV	2.59	0.00310
	HV	3.22	0.00384
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	6.61	0.004441
	NV	6.8	0.004716
	HV	7.2	0.004822
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	7.38	0.00392
	NV	7.17	0.00381
	HV	7.42	0.00395
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	0.73	0.00039
	NV	1.51	0.00080
	HV	1.43	0.00076

Reference Frequency(Middle Channel): HSUPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	6.0	0.00421
	NV	6.4	0.004477
	HV	6.8	0.004537
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	8.49	0.00452
	NV	9.02	0.00480
	HV	8.93	0.00475

12. EUT TEST PHOTO

Radiated Emission



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