



TEST REPORT

Product Name: Fingerprint Handheld Terminal
FCC ID: 2BF3H-FP08
Trademark: N/A
Model Number: HF-FP08
Prepared For: CHONGQING HUIFAN TECHNOLOGY CO.,LTD
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Sample Received Date: Apr. 14, 2025
Sample tested Date: Apr. 14, 2025 to Jun. 28, 2025
Issue Date: Jun. 28, 2025
Report No.: CTB25041412401RF05
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

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Approved by:

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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	6
4.3 Support Equipment	6
4.4 Channel List	7
4.5 Test Mode	7
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	19
7.1 Standard Applicable	19
7.2 Test Procedure	19
7.3 Environmental Conditions	19
7.4 Summary of Test Results	20
8. EMISSION BANDWIDTH	22
8.1 Standard Applicable	22
8.2 Test Procedure	22
8.3 Environmental Conditions	22
8.4 Summary of Test Results/Plots	23
9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL	37
9.1 Standard Applicable	37
9.2 Test Procedure	37
9.3 Environmental Conditions	37
9.4 Summary of Test Results/Plots	38
10. SPURIOUS RADIATED EMISSIONS	62
10.1 Standard Applicable	62
10.2 Test Procedure	62
10.3 Environmental Conditions	62
10.4 Summary of Test Results/Plots	63
11. FREQUENCY STABILITY	67
11.1 Standard Applicable	67
11.2 Test Procedure	67
11.3 Environmental Conditions	67
11.4 Summary of Test Results/Plots	68
12. EUT TEST PHOTO	79

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB25041412401RF05	Jun. 28, 2025	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

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

3. MEASUREMENT UNCERTAINTY

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

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

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	HF-FP08
Model Description:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 31.26dBm GSM1900: 25dBm WCDMA Band 2: 21.56dBm WCDMA Band 5: 21.69dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: 3.9dBi, GSM1900: 5.1dBi WCDMA Band 2: 5.1dBi WCDMA Band 5: 3.9dBi
Ratings:	DC 5V charging from adapter DC 3.7V by battery

4.2 Test Setup Configuration

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

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note

Notes:

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

4.4 Channel List

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS/EDGE	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538
Note: the transmitter has been tested on the communications mode of GSM, GPRS, EDGE, WCDMA, HSDPA. HSUPA compliance test and record the worst case.			

4.5 Test Mode

Test Mode List		
Test Mode	Description	Remark
TM1	GSM 850	Low, Middle, High Channels
TM2	GPRS 850	Low, Middle, High Channels
TM3	EDGE 850	Low, Middle, High Channels
TM4	GSM 1900	Low, Middle, High Channels
TM5	GPRS 1900	Low, Middle, High Channels
TM6	EDGE 1900	Low, Middle, High Channels
TM7	WCDMA Band 5	Low, Middle, High Channels
TM8	HSDPA Band 5	Low, Middle, High Channels
TM9	HSUPA Band 5	Low, Middle, High Channels
TM10	WCDMA Band 2	Low, Middle, High Channels
TM11	HSDPA Band 2	Low, Middle, High Channels
TM12	HSUPA Band 2	Low, Middle, High Channels

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(DC):	3.7V
Normal Temperature(°C)	23
Low Temperature(°C)	0
High Temperature(°C)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

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

FCC Test Firm Registration Number: CN1276

5.2 Test Instrument Used

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2025/6/28
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2025/6/28
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2025/6/28
4	Communication test set	R&S	CMW500	108058	V3.5.80	2025/6/28
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/6/28
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2025/6/28
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2025/6/28
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/6/28
9	2.4 GHz Filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	/	2025/6/30
10	5 GHz Filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	/	2025/6/30
11	Filter	Xingbo	XBLBQ-DZA 120	190821-1-1	/	2025/6/30
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2025/6/28
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2025/6/28
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2027/6/21
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2025/6/28
18	Amplifier	HP	8447E	2945A02747	/	2025/6/28
19	Amplifier	Agilent	8449B	3008A01838	/	2025/6/28
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/28
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2025/6/28

22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/28
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2025/6/28
26	Amplifier	AEROFLEX	Aeroflex	097	/	2025/6/28
27	Power Metter	KEYSIGHT	N1912AP	N/A	A.05.00	2025/6/28

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	30.98	1.5	0	H	1.5	3.9	33.38	38.45
824.2	30.59	1.5	0	V	1.5	3.9	32.99	38.45
Middle Channel								
836.6	30.53	1.5	0	H	1.5	3.9	32.93	38.45
836.6	30.64	1.5	0	V	1.5	3.9	33.04	38.45
High Channel								
848.8	30.03	1.5	0	H	1.5	3.9	32.43	38.45
848.8	30.19	1.5	0	V	1.5	3.9	32.59	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	24.01	1.5	0	H	1.9	5.1	27.21	33
1850.2	24.42	1.5	0	V	1.9	5.1	27.62	33
Middle Channel								
1880	23.50	1.5	0	H	1.9	5.1	26.70	33
1880	23.45	1.5	0	V	1.9	5.1	26.65	33
High Channel								
1909.8	22.67	1.5	0	H	1.9	5.1	25.87	33
1909.8	21.95	1.5	0	V	1.9	5.1	25.15	33

ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	31.11	1.5	0	H	1.5	3.9	33.51	38.45
824.2	30.41	1.5	0	V	1.5	3.9	32.81	38.45
Middle Channel								
836.6	30.84	1.5	0	H	1.5	3.9	33.24	38.45
836.6	30.68	1.5	0	V	1.5	3.9	33.08	38.45
High Channel								
848.8	31.09	1.5	0	H	1.5	3.9	33.49	38.45
848.8	30.22	1.5	0	V	1.5	3.9	32.62	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	24.76	1.5	0	H	1.9	5.1	27.96	33
1850.2	24.88	1.5	0	V	1.9	5.1	28.08	33
Middle Channel								
1880	22.91	1.5	0	H	1.9	5.1	26.11	33
1880	23.21	1.5	0	V	1.9	5.1	26.41	33
High Channel								
1909.8	22.60	1.5	0	H	1.9	5.1	25.80	33
1909.8	22.32	1.5	0	V	1.9	5.1	25.52	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	30.90	1.5	0	H	1.5	3.9	33.30	38.45
824.2	30.63	1.5	0	V	1.5	3.9	33.03	38.45
Middle Channel								
836.6	30.19	1.5	0	H	1.5	3.9	32.59	38.45
836.6	30.08	1.5	0	V	1.5	3.9	32.48	38.45
High Channel								
848.8	30.44	1.5	0	H	1.5	3.9	32.84	38.45
848.8	30.57	1.5	0	V	1.5	3.9	32.97	38.45

EIRP For EDGE Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	24.05	1.5	0	H	1.9	5.1	27.25	33
1850.2	24.25	1.5	0	V	1.9	5.1	27.45	33
Middle Channel								
1880	23.16	1.5	0	H	1.9	5.1	26.36	33
1880	23.42	1.5	0	V	1.9	5.1	26.62	33
High Channel								
1909.8	21.81	1.5	0	H	1.9	5.1	25.01	33
1909.8	21.84	1.5	0	V	1.9	5.1	25.04	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	20.87	1.5	0	H	1.5	3.9	23.27	38.45
826.4	20.94	1.5	0	V	1.5	3.9	23.34	38.45
Middle Channel								
836.6	21.27	1.5	0	H	1.5	3.9	23.67	38.45
836.6	21.50	1.5	0	V	1.5	3.9	23.90	38.45
High Channel								
846.6	21.02	1.5	0	H	1.5	3.9	23.42	38.45
846.6	20.87	1.5	0	V	1.5	3.9	23.27	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	21.54	1.5	0	H	1.5	3.9	23.94	38.45
826.4	21.04	1.5	0	V	1.5	3.9	23.44	38.45
Middle Channel								
836.6	21.06	1.5	0	H	1.5	3.9	23.46	38.45
836.6	20.80	1.5	0	V	1.5	3.9	23.20	38.45
High Channel								
846.6	20.96	1.5	0	H	1.5	3.9	23.36	38.45
846.6	21.67	1.5	0	V	1.5	3.9	24.07	38.45

ERP For HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.22	1.5	0	H	1.5	3.9	23.62	38.45
826.4	21.12	1.5	0	V	1.5	3.9	23.52	38.45
Middle Channel								
836.6	21.10	1.5	0	H	1.5	3.9	23.50	38.45
836.6	21.03	1.5	0	V	1.5	3.9	23.43	38.45
High Channel								
846.6	21.15	1.5	0	H	1.5	3.9	23.55	38.45
846.6	21.13	1.5	0	V	1.5	3.9	23.53	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	22.43	1.5	0	H	1.9	5.1	25.63	33
1852.4	22.45	1.5	0	V	1.9	5.1	25.65	33
Middle Channel								
1880	22.16	1.5	0	H	1.9	5.1	25.36	33
1880	22.30	1.5	0	V	1.9	5.1	25.50	33
High Channel								
1907.6	21.48	1.5	0	H	1.9	5.1	24.68	33
1907.6	21.28	1.5	0	V	1.9	5.1	24.48	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	20.98	1.5	0	H	1.9	5.1	24.18	33
1852.4	20.79	1.5	0	V	1.9	5.1	23.99	33
Middle Channel								
1880	20.96	1.5	0	H	1.9	5.1	24.16	33
1880	20.41	1.5	0	V	1.9	5.1	23.61	33
High Channel								
1907.6	20.51	1.5	0	H	1.9	5.1	23.71	33
1907.6	20.70	1.5	0	V	1.9	5.1	23.90	33

EIRP For HSUPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	21.92	1.5	0	H	1.9	5.1	25.12	33
1852.4	21.69	1.5	0	V	1.9	5.1	24.89	33
Middle Channel								
1880	21.51	1.5	0	H	1.9	5.1	24.71	33
1880	20.80	1.5	0	V	1.9	5.1	24.00	33
High Channel								
1907.6	20.11	1.5	0	H	1.9	5.1	23.31	33
1907.6	21.51	1.5	0	V	1.9	5.1	24.71	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	31.26	38.45
	Middle Channel	836.6	31.16	38.45
	High Channel	848.8	31.00	38.45
GPRS(1 Slot)	Low Channel	824.2	31.25	38.45
	Middle Channel	836.6	31.15	38.45
	High Channel	848.8	31.16	38.45
EDGE(1 Slot)	Low Channel	824.2	31.00	38.45
	Middle Channel	836.6	30.97	38.45
	High Channel	848.8	31.06	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	24.88	33.0
	Middle Channel	1880.0	23.60	33.0
	High Channel	1909.8	22.75	33.0
GPRS(1 Slot)	Low Channel	1850.2	25.00	33.0
	Middle Channel	1880.0	23.71	33.0
	High Channel	1909.8	22.82	33.0
EDGE(1 Slot)	Low Channel	1850.2	24.62	33.0
	Middle Channel	1880.0	23.55	33.0
	High Channel	1909.8	22.71	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	21.69	38.45
	Middle Channel	836.6	21.62	38.45
	High Channel	846.6	21.67	38.45
HSDPA	Low Channel	826.4	21.67	38.45
	Middle Channel	836.6	21.62	38.45
	High Channel	846.6	21.68	38.45
HSUPA	Low Channel	826.4	21.67	38.45
	Middle Channel	836.6	21.63	38.45
	High Channel	846.6	21.63	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	21.53	33.00
	Middle Channel	1880.0	21.37	33.00
	High Channel	1907.6	20.88	33.00
HSDPA	Low Channel	1852.4	21.56	33.00
	Middle Channel	1880.0	21.37	33.00
	High Channel	1907.6	20.89	33.00
HSUPA	Low Channel	1852.4	21.55	33.00
	Middle Channel	1880.0	21.36	33.00
	High Channel	1907.6	20.87	33.00

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

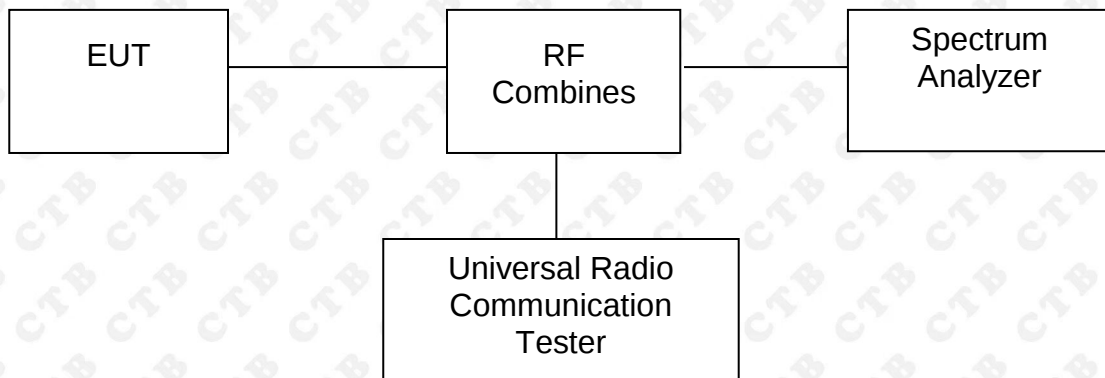
7.1 Standard Applicable

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

7.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

Test Configuration for the emission bandwidth testing:



7.3 Environmental Conditions

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

7.4 Summary of Test Results

Only the worst case was selected to record
For GSM850

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	190	836.6	2.68	13
GPRS(1 Slot)	190	836.6	2.67	13
EDGE(1 Slot)	190	836.6	2.68	13

For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.72	13
GPRS(1 Slot)	512	1850.2	2.71	13
EDGE(1 Slot)	512	1850.2	2.72	13

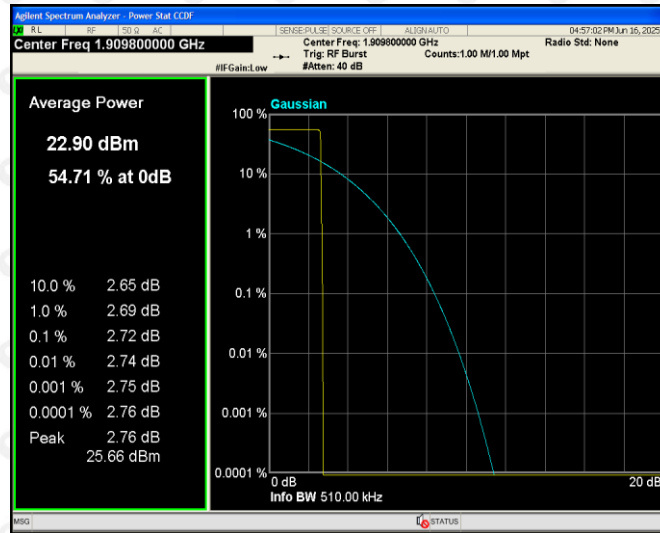
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.89	13
HSDPA	4182	836.4	2.96	13
HSUPA	4182	836.4	2.99	13

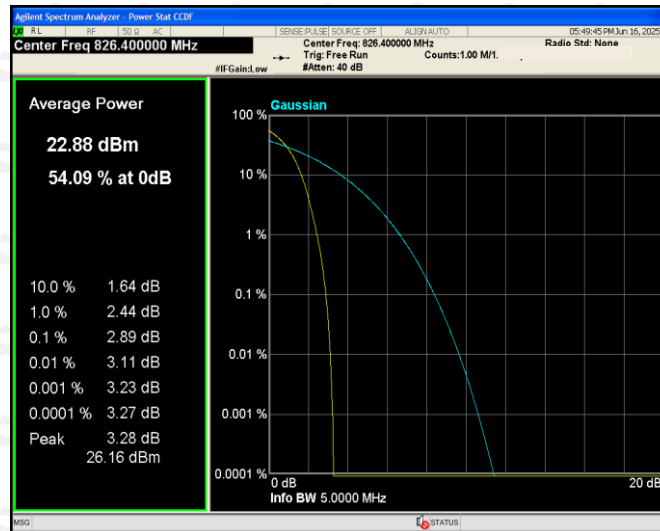
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	2.84	13
HSDPA	9400	1852.4	2.87	13
HSUPA	9400	1852.4	2.86	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

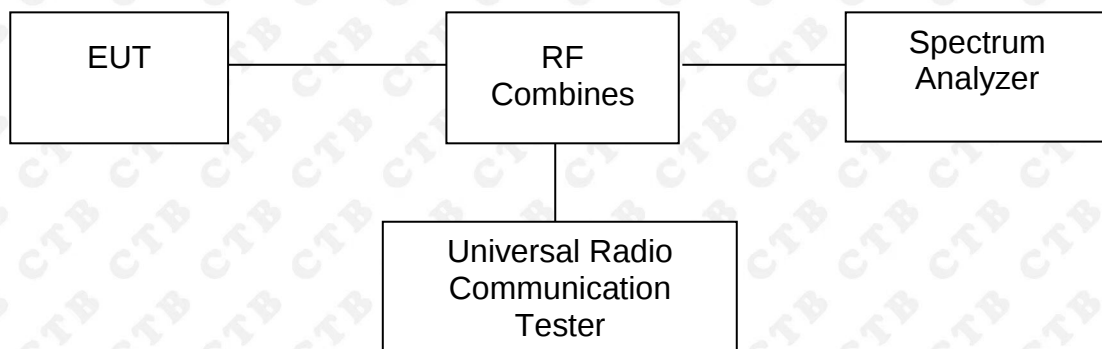
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

8.2 Test Procedure

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

Test Configuration for the emission bandwidth testing:



8.3 Environmental Conditions

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

8.4 Summary of Test Results/Plots

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	242.923	310.162
	190	836.6	247.509	312.715
	251	848.8	239.379	313.980
GPRS	128	824.2	243.770	307.926
	190	836.6	244.337	312.133
	251	848.8	242.459	317.154
EDGE	128	824.2	250.144	315.267
	190	836.6	246.821	308.472
	251	848.8	244.411	314.038

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	243.823	319.536
	661	1880.0	247.727	312.624
	810	1909.8	247.194	317.212
GPRS	512	1850.2	247.240	314.743
	661	1880.0	246.863	321.847
	810	1909.8	242.316	314.438
EDGE	512	1850.2	245.557	321.215
	661	1880.0	244.491	322.900
	810	1909.8	247.024	317.580

For Band 5

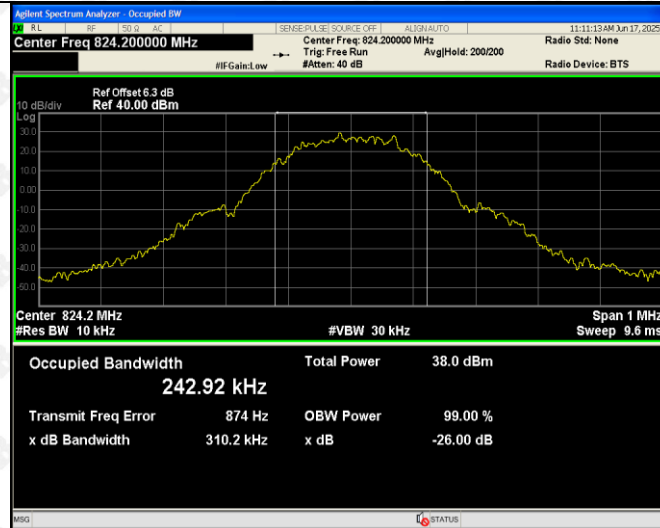
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4178.976	4728.317
	4183	836.6	4188.518	4709.868
	4233	846.6	4177.637	4696.531
HSDPA	4132	826.4	4170.802	4705.873
	4183	836.6	4163.364	4705.881
	4233	846.6	4169.851	4716.644
HSUPA	4132	826.4	4169.419	4712.564
	4183	836.6	4179.463	4713.060
	4233	846.6	4195.722	4730.101

For Band 2

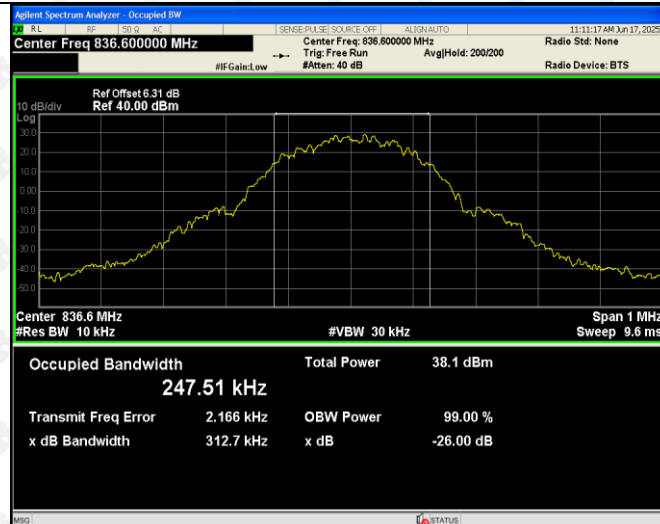
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4187.531	4713.572
	9400	1880.0	4183.742	4707.829
	9538	1907.6	4186.052	4724.619
HSDPA	9262	1852.4	4185.725	4673.782
	9400	1880.0	4187.454	4723.956
	9538	1907.6	4190.676	4711.704
HSUPA	9262	1852.4	4184.792	4673.522
	9400	1880.0	4179.281	4698.219
	9538	1907.6	4196.052	4727.658

For Cellular Band

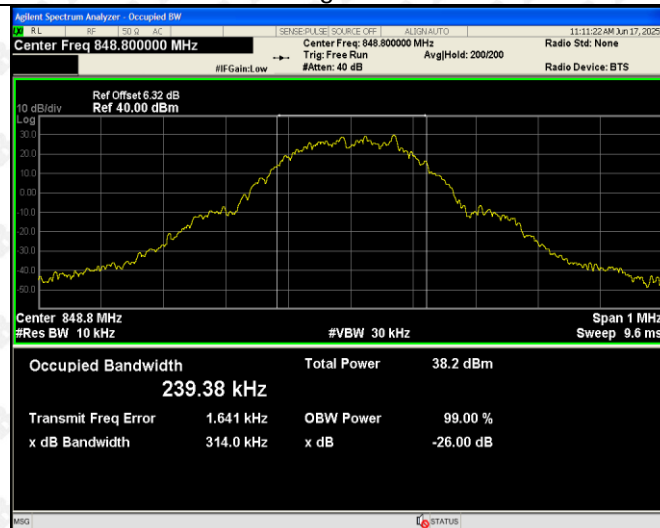
GSM Low Channel



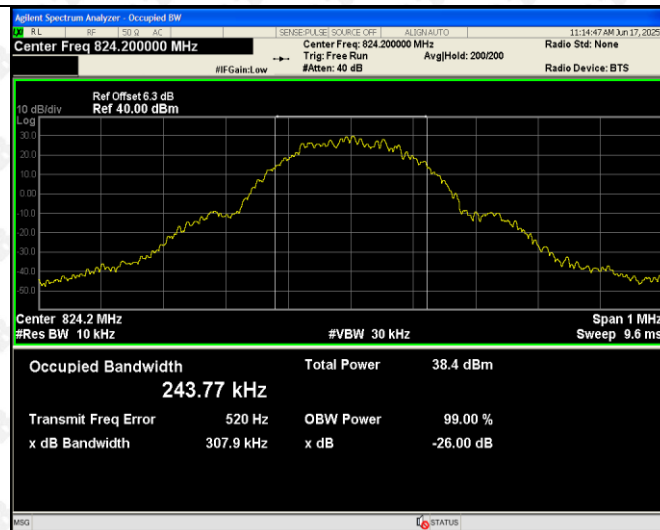
GSM Middle Channel



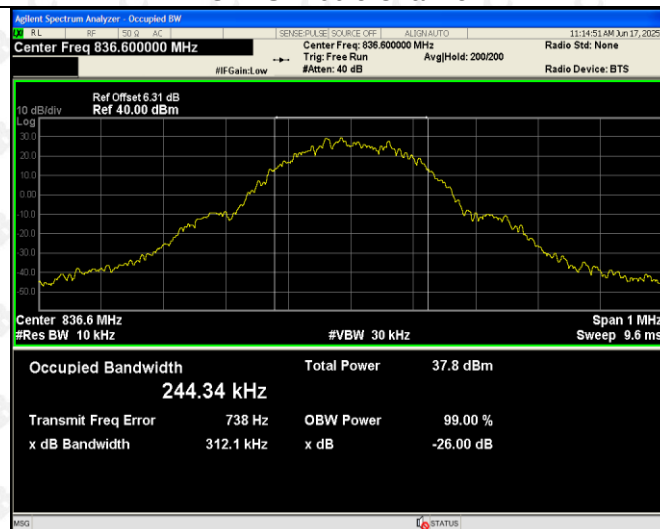
GSM High Channel



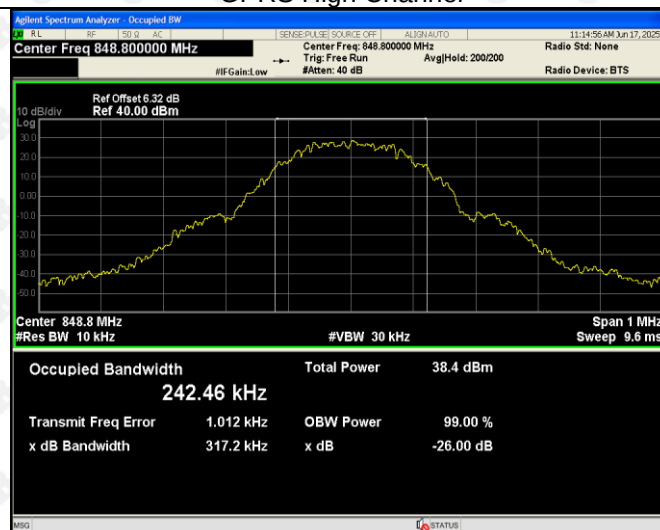
GPRS Low Channel



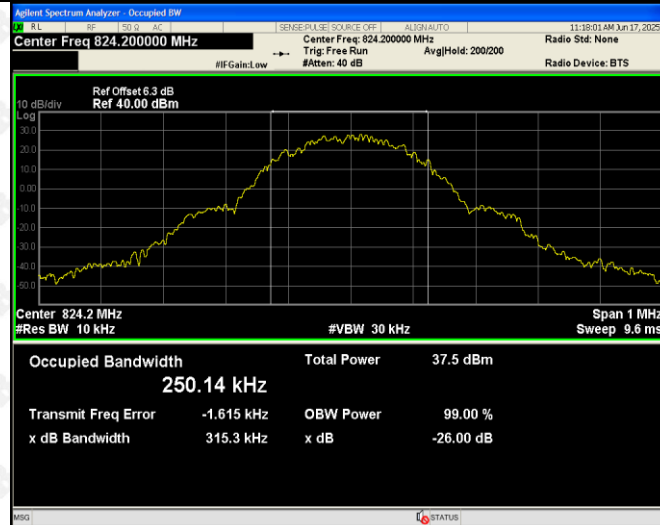
GPRS Middle Channel



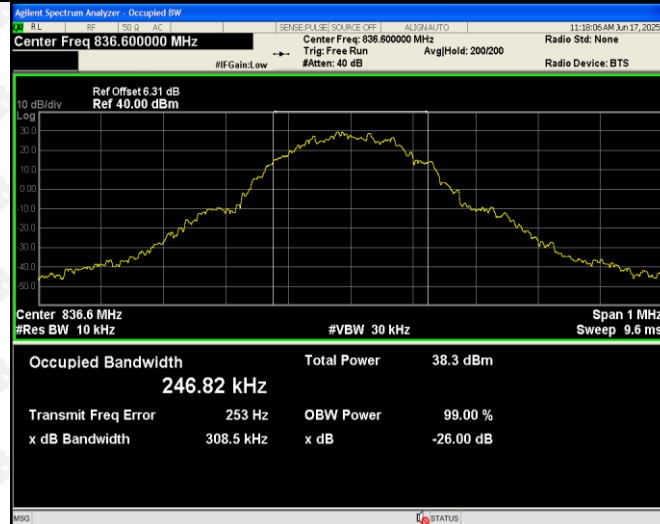
GPRS High Channel



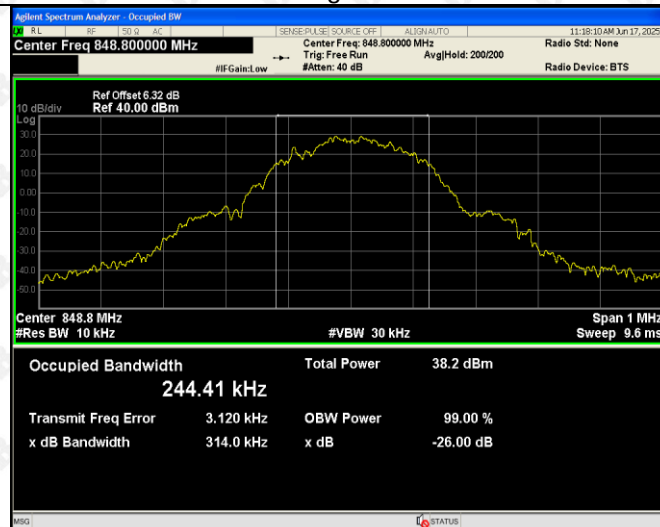
EDGE Low Channel



EDGE Middle Channel



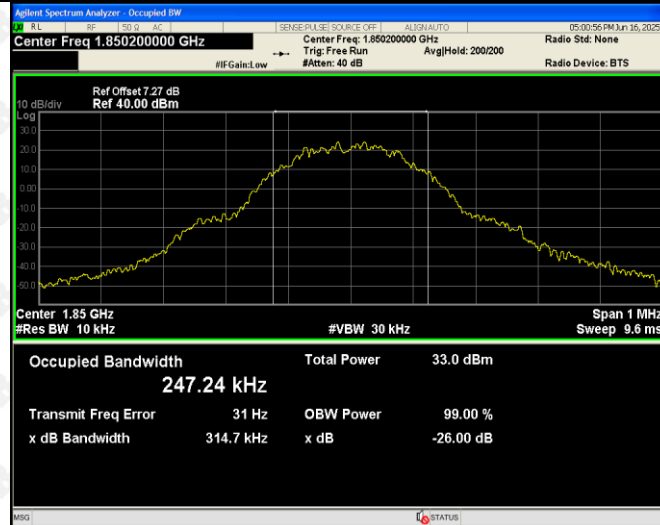
EDGE High Channel



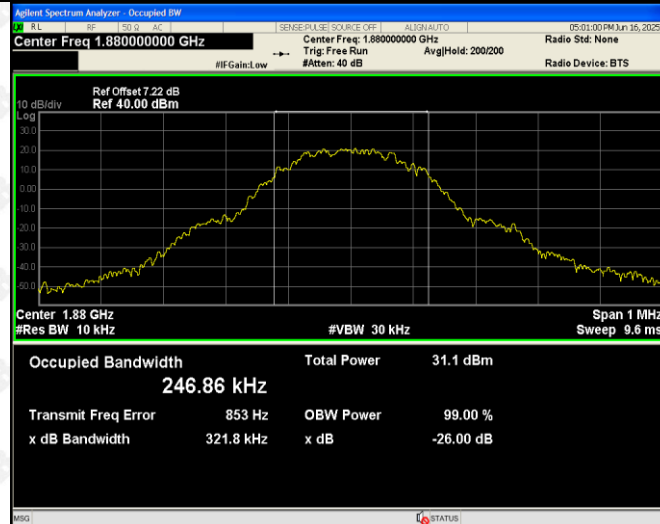
For PCS Band



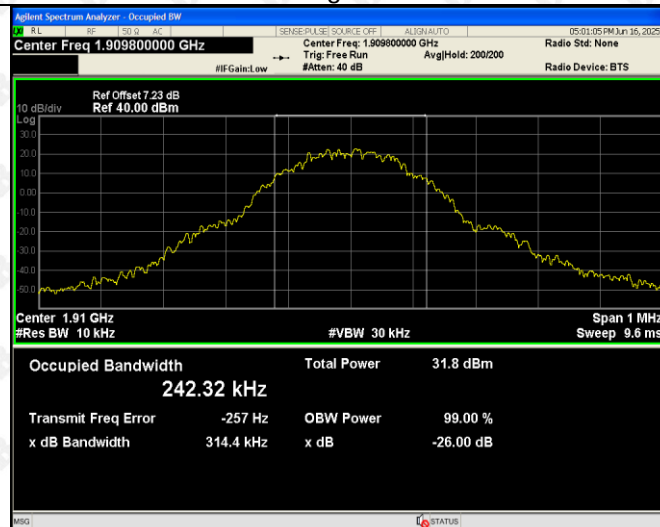
GPRS Low Channel



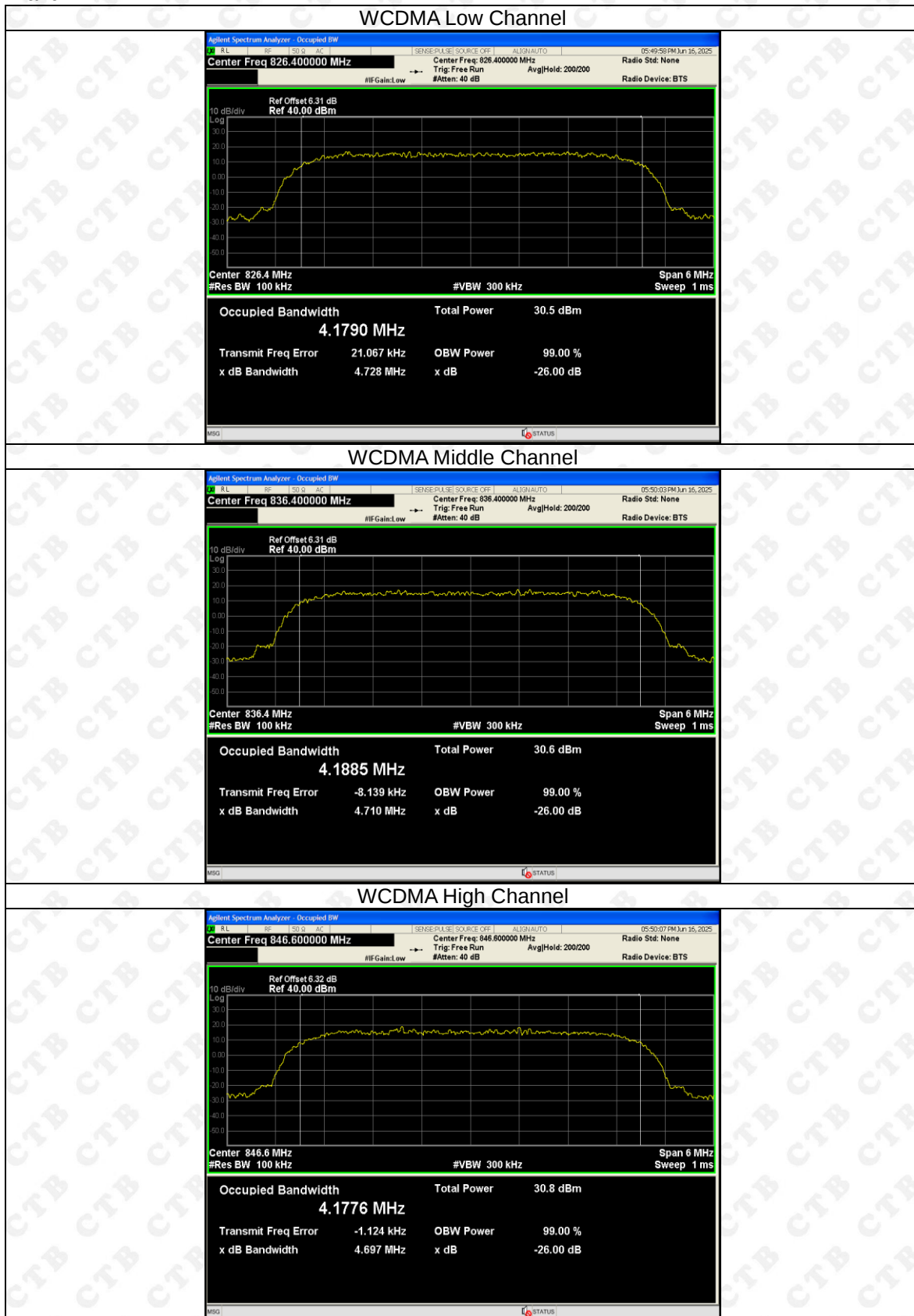
GPRS Middle Channel



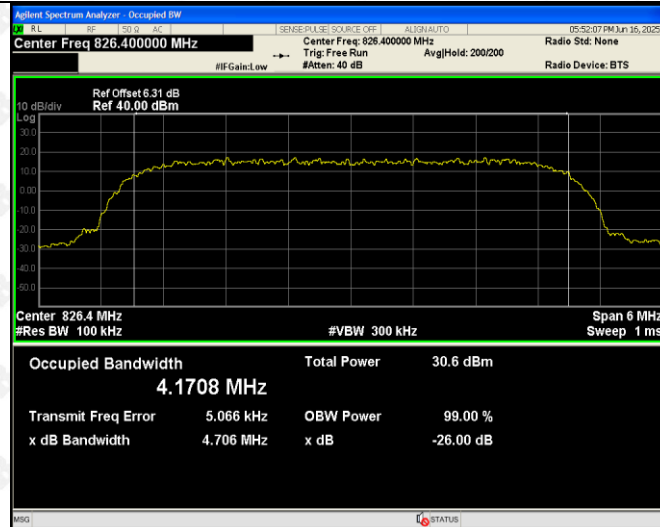
GPRS High Channel



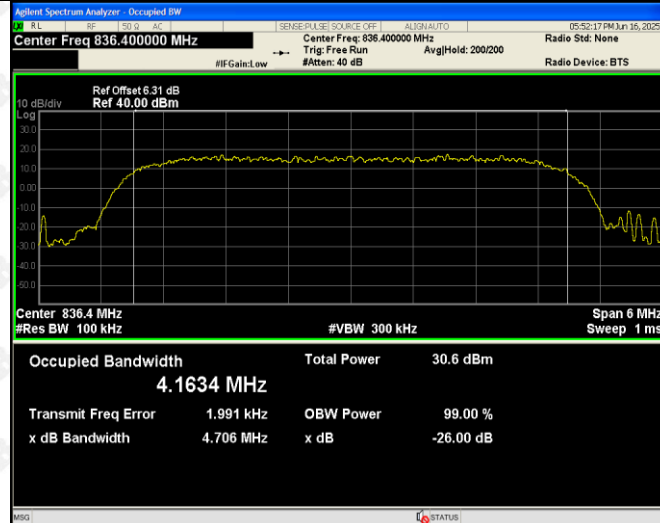
For Band V



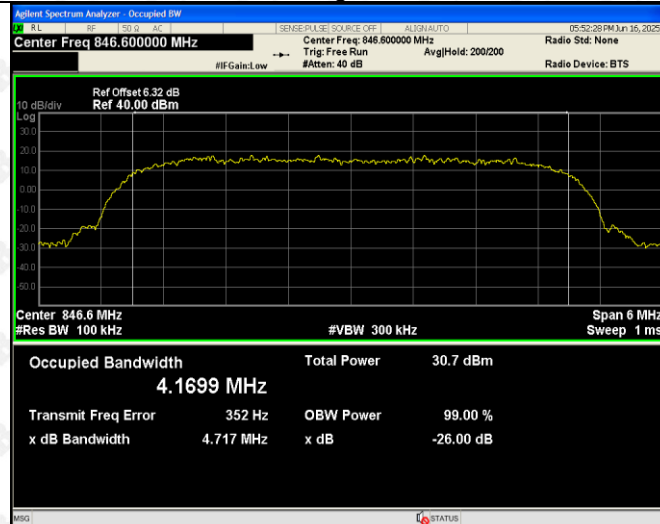
HSDPA Low Channel



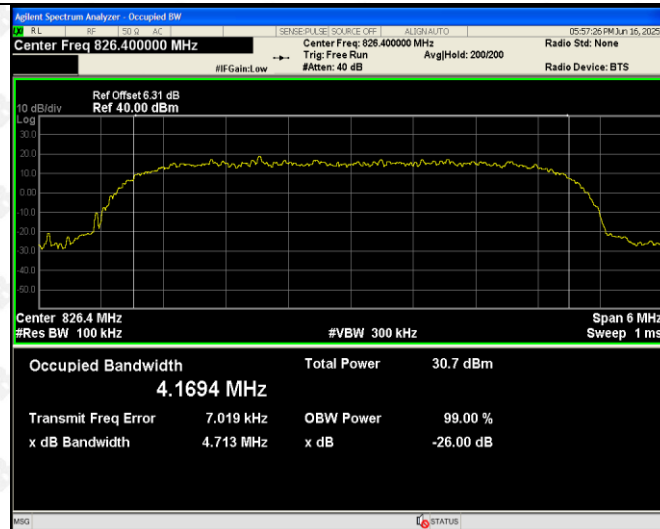
HSDPA Middle Channel



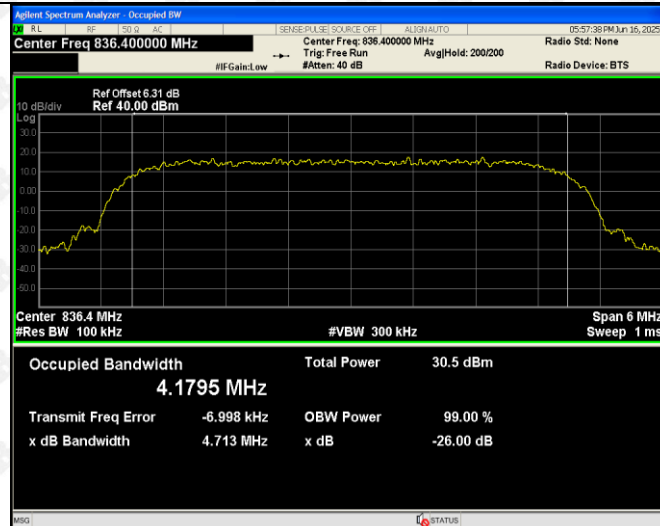
HSDPA High Channel



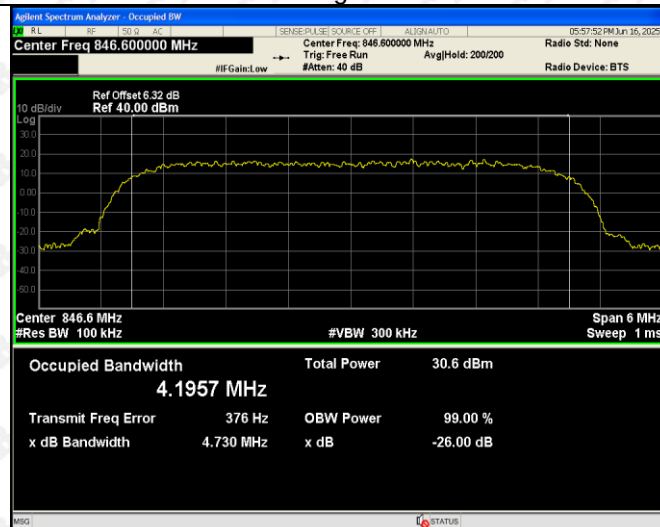
HSUPA Low Channel



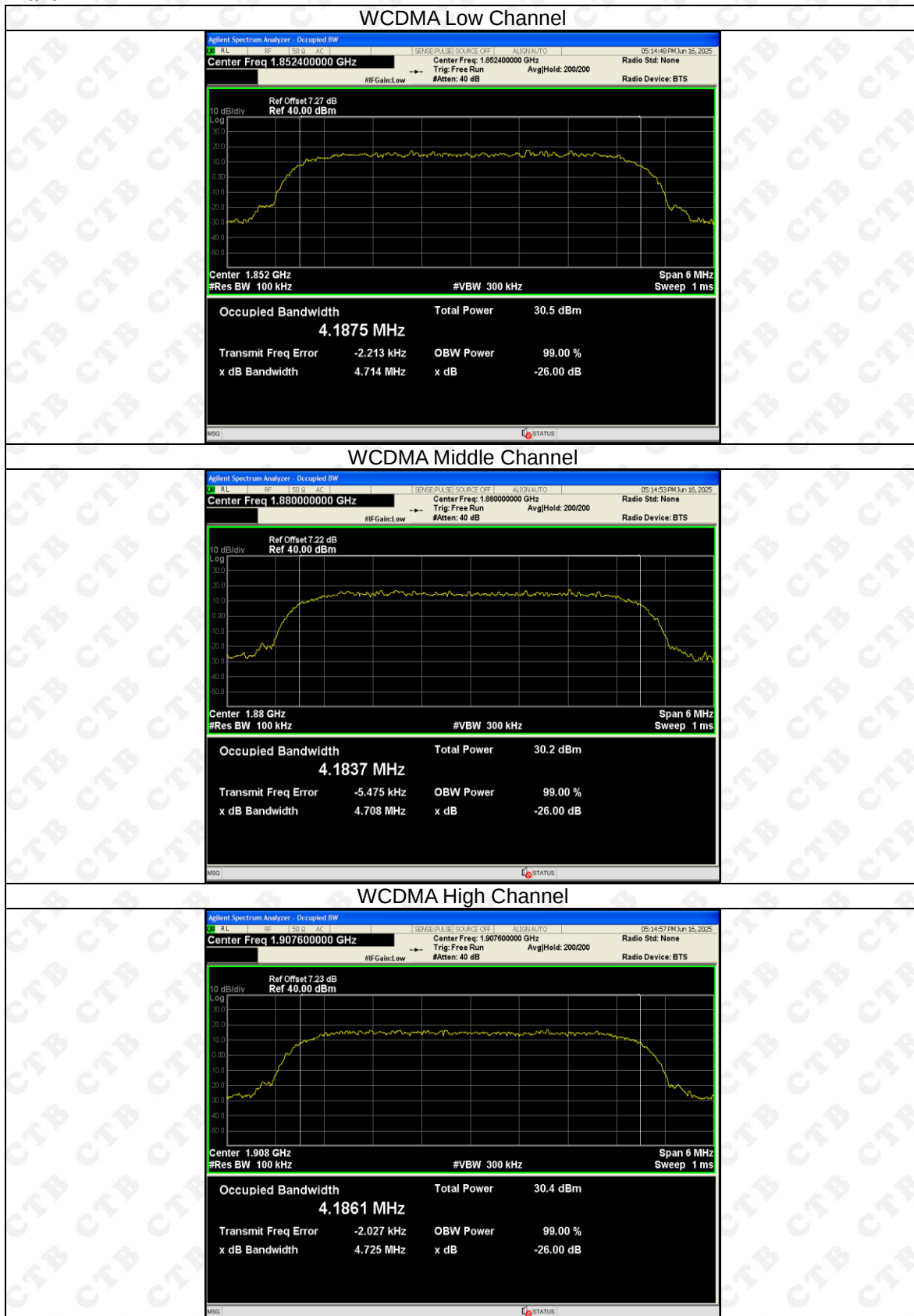
HSUPA Middle Channel



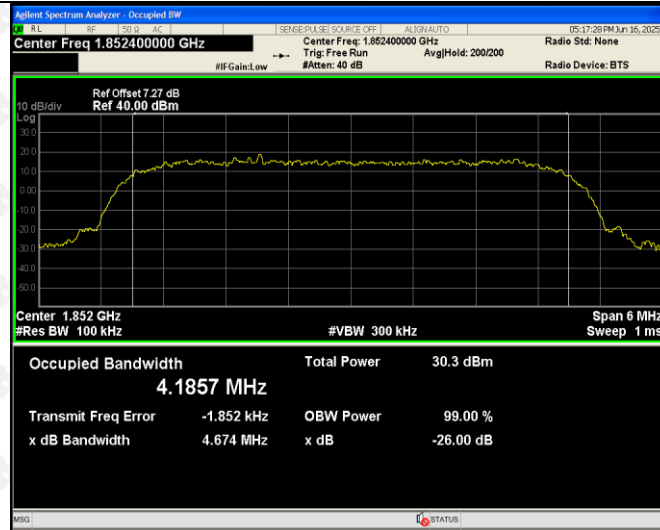
HSUPA High Channel



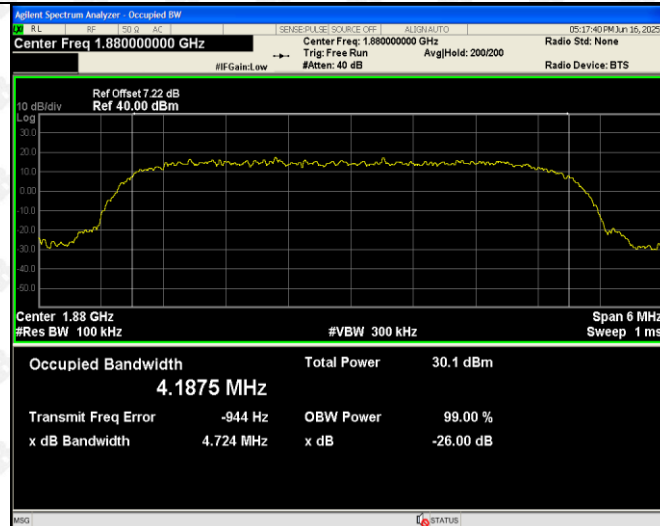
For Band II



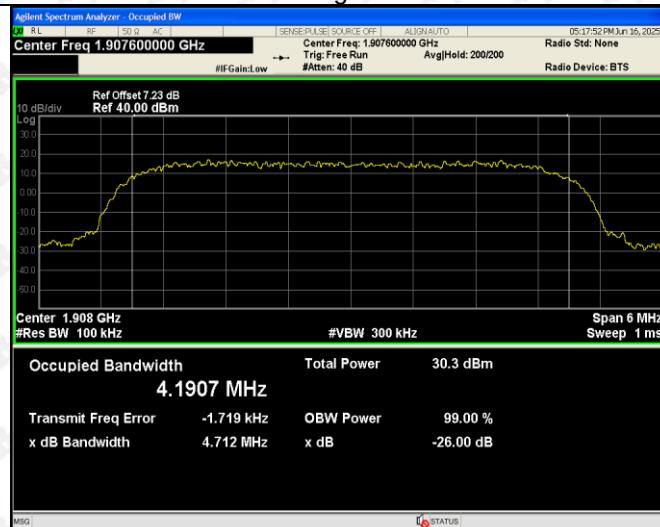
HSDPA Low Channel



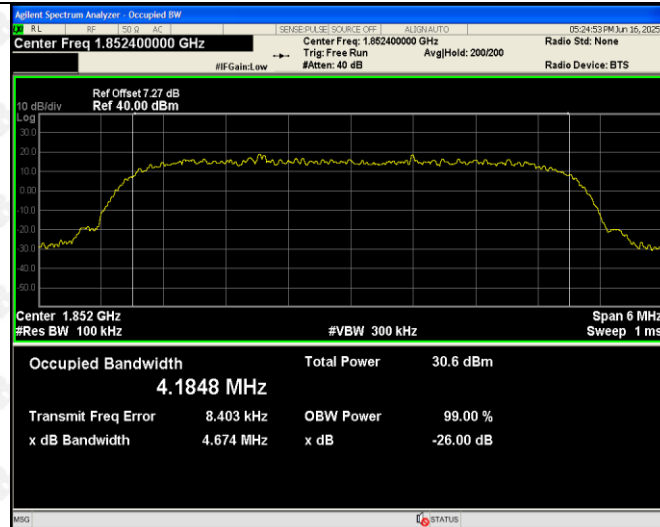
HSDPA Middle Channel



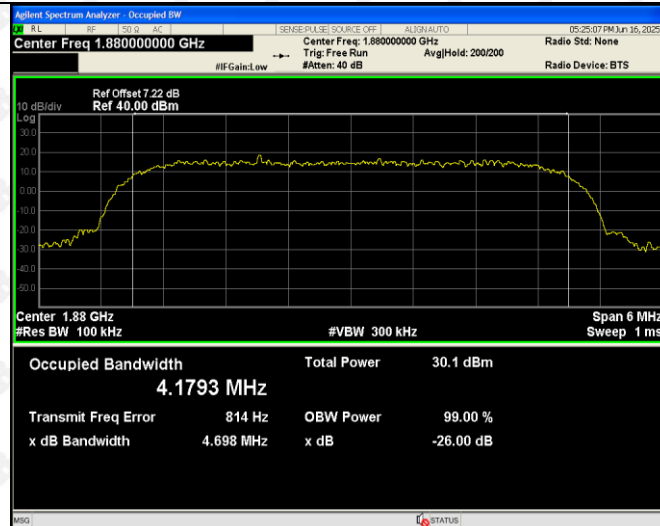
HSDPA High Channel



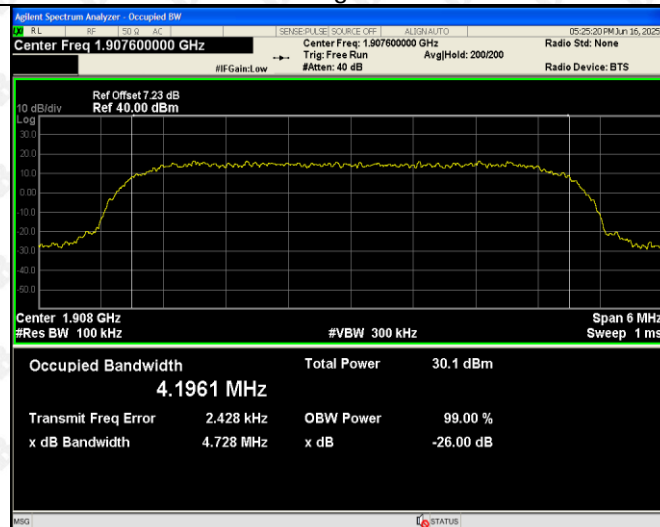
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

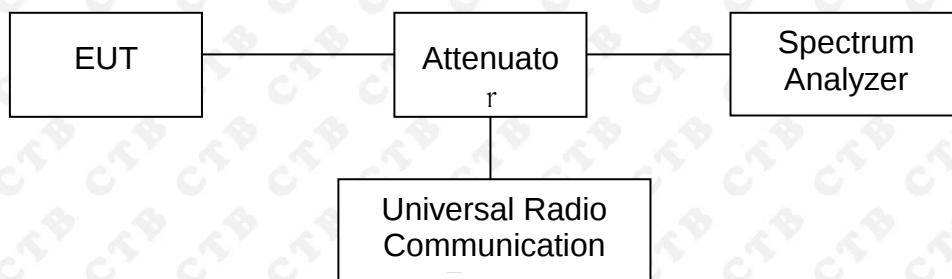
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

9.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

Test Configuration for the out of band emissions testing:



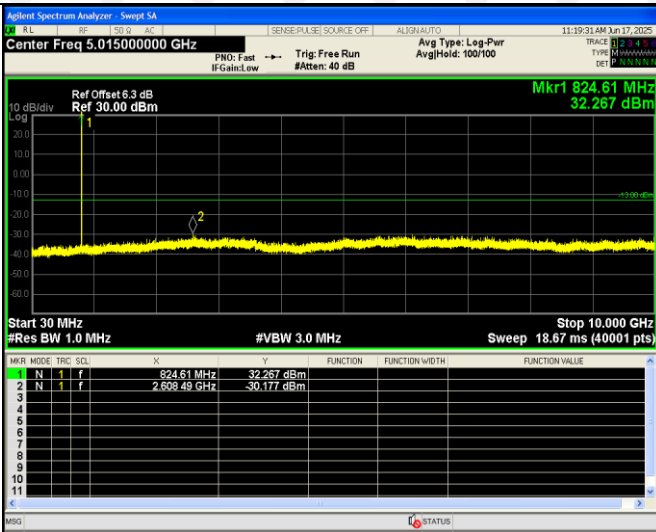
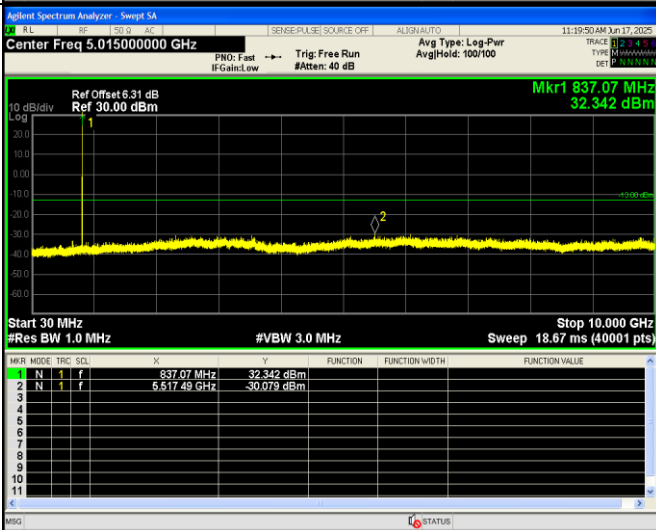
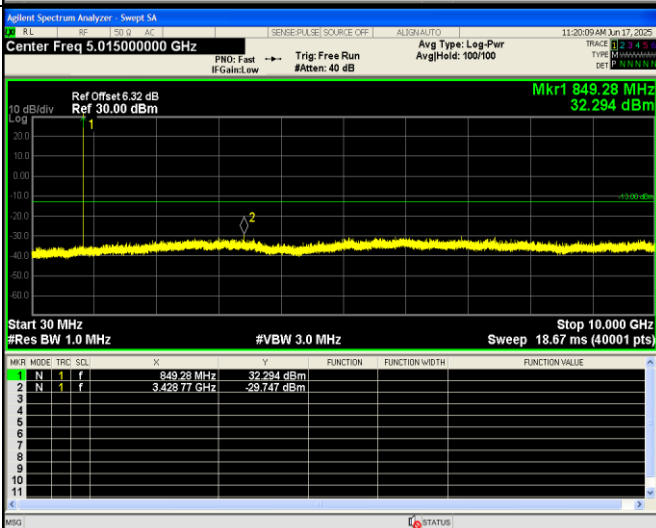
9.3 Environmental Conditions

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

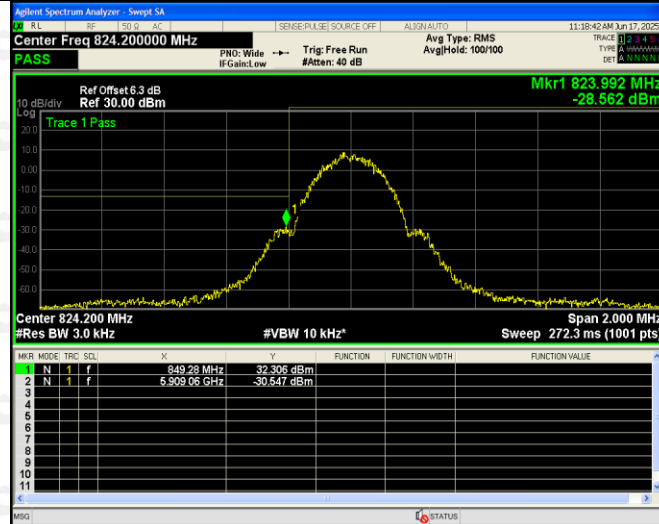
9.4 Summary of Test Results/Plots

Please refer to the following test plots

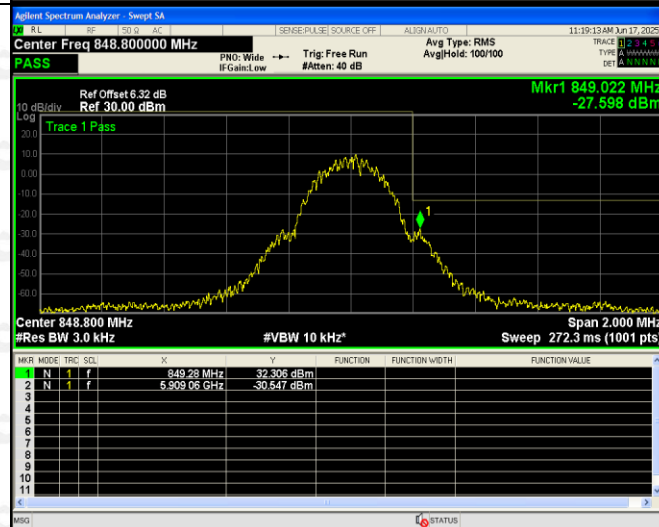
For Cellular Band

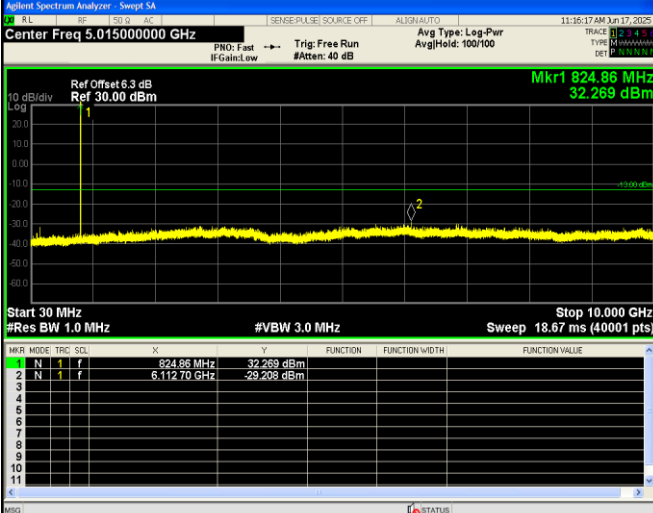
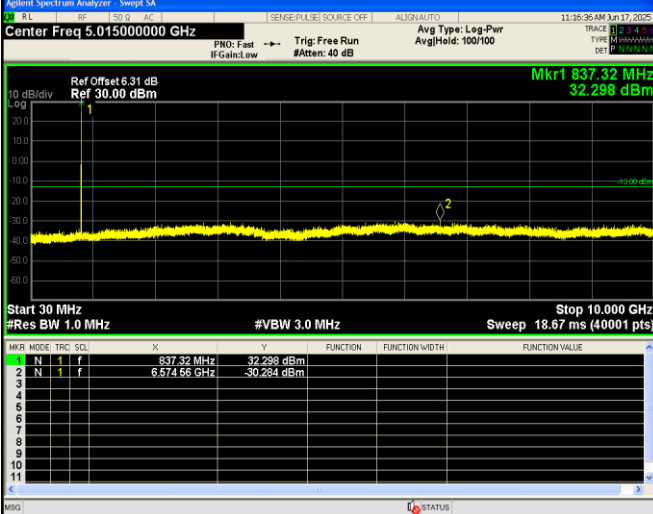
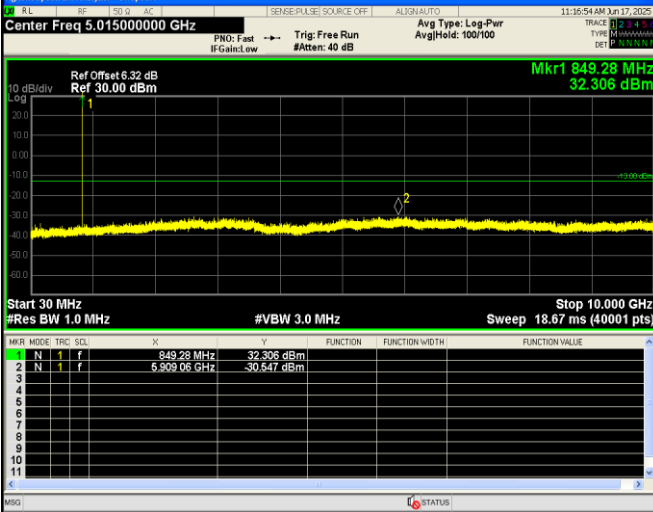
GSM Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.3 dB Ref 30.00 dBm Mkr1 824.61 MHz 32.267 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MNR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.61 MHz</td><td>32.267 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.608 49 GHz</td><td>-30.177 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.61 MHz	32.267 dBm				2	N	1	f	2.608 49 GHz	-30.177 dBm			
MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.61 MHz	32.267 dBm																							
2	N	1	f	2.608 49 GHz	-30.177 dBm																							
GSM Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.31 dB Ref 30.00 dBm Mkr1 837.07 MHz 32.342 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>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>32.342 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.517 49 GHz</td><td>-30.079 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	32.342 dBm				2	N	1	f	5.517 49 GHz	-30.079 dBm			
MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	32.342 dBm																							
2	N	1	f	5.517 49 GHz	-30.079 dBm																							
GSM High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.32 dB Ref 30.00 dBm Mkr1 849.28 MHz 32.294 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>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>32.294 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>3.428 77 GHz</td><td>-29.747 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	32.294 dBm				2	N	1	f	3.428 77 GHz	-29.747 dBm			
MNR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.28 MHz	32.294 dBm																							
2	N	1	f	3.428 77 GHz	-29.747 dBm																							

GSM
Low
Band
Emission

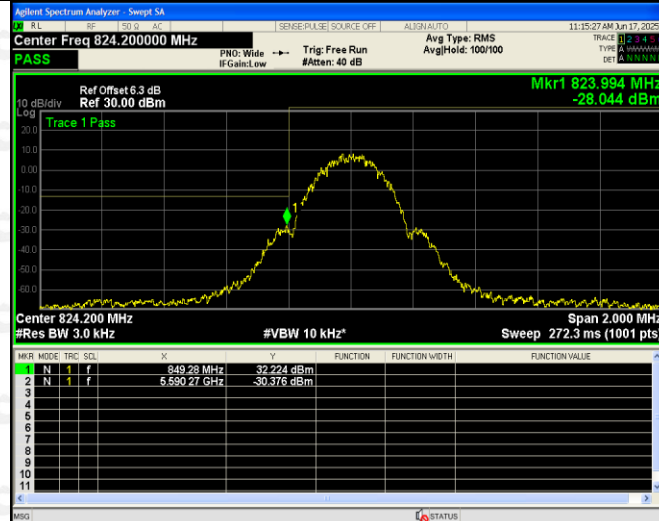


GSM
High
Band
Emission

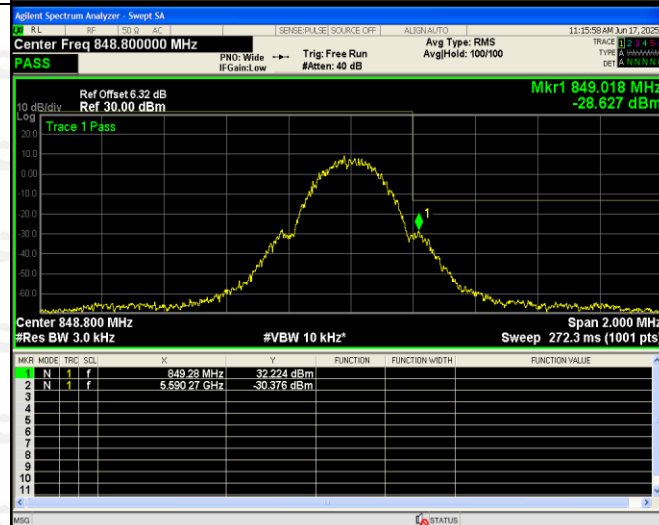


GPRS Low Channel	
GPRS Middle Channel	
GPRS High Channel	

GPRS
Low
Band
Emission

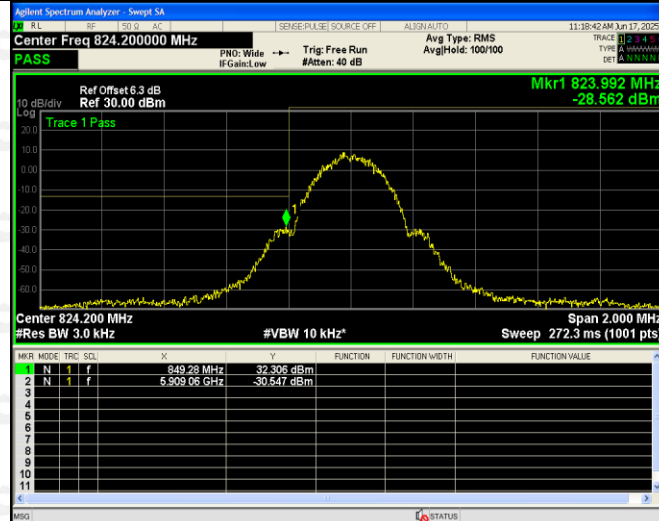


GPRS
High
Band
Emission

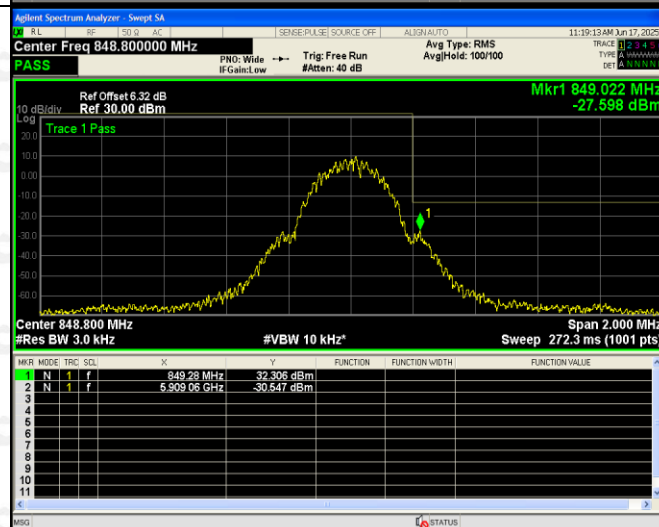


EDGE Low Channel	<table><thead><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.61 MHz</td><td>32.267 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.60849 GHz</td><td>-30.177 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.61 MHz	32.267 dBm				2	N	1	f	2.60849 GHz	-30.177 dBm			
MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.61 MHz	32.267 dBm																							
2	N	1	f	2.60849 GHz	-30.177 dBm																							
EDGE Middle Channel	<table><thead><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>32.342 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.51749 GHz</td><td>-30.079 dBm</td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	32.342 dBm				2	N	1	f	5.51749 GHz	-30.079 dBm			
MKR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	32.342 dBm																							
2	N	1	f	5.51749 GHz	-30.079 dBm																							
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EDGE
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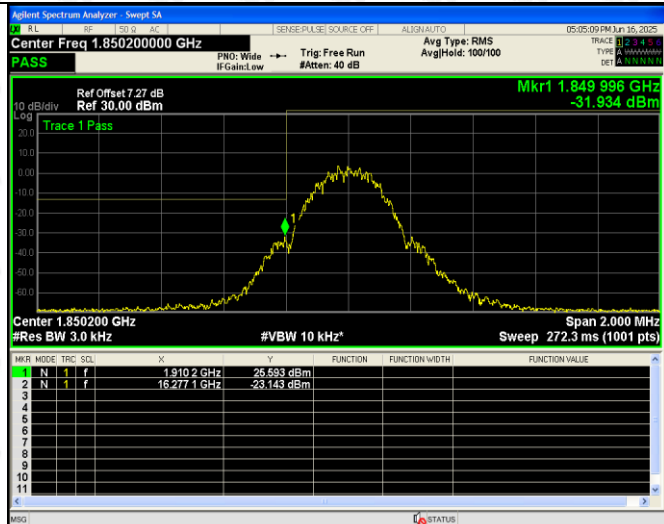
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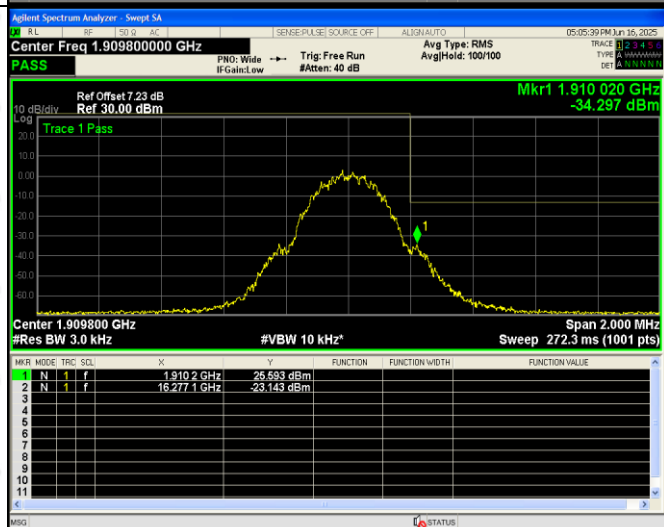
For PCS Band

GSM Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 10.01500000 GHz Ref Offset 7.27 dB Ref 30.00 dBm Mkr1 1.850 8 GHz 27.048 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>1.850 8 GHz</td><td>27.048 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>16.438 8 GHz</td><td>-23.338 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	MNR	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.850 8 GHz	27.048 dBm				2	N	1	f	16.438 8 GHz	-23.338 dBm				3									4									5									6									7									8									9									10									11								
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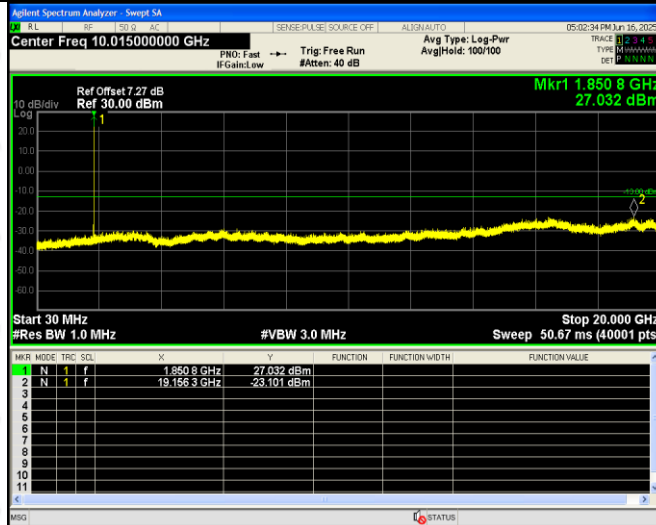
GSM
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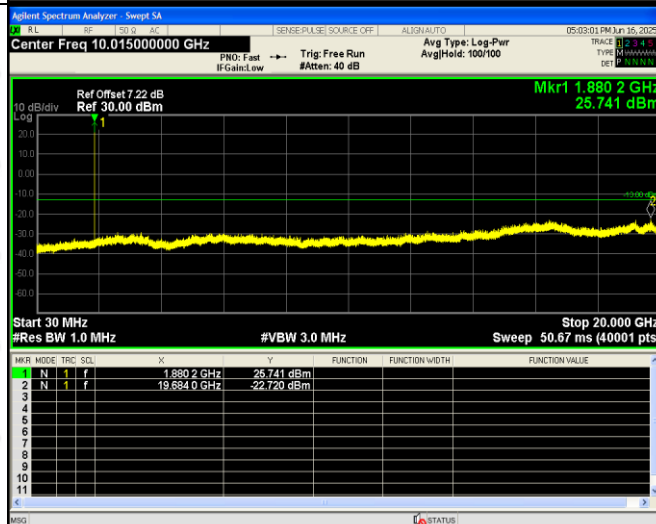
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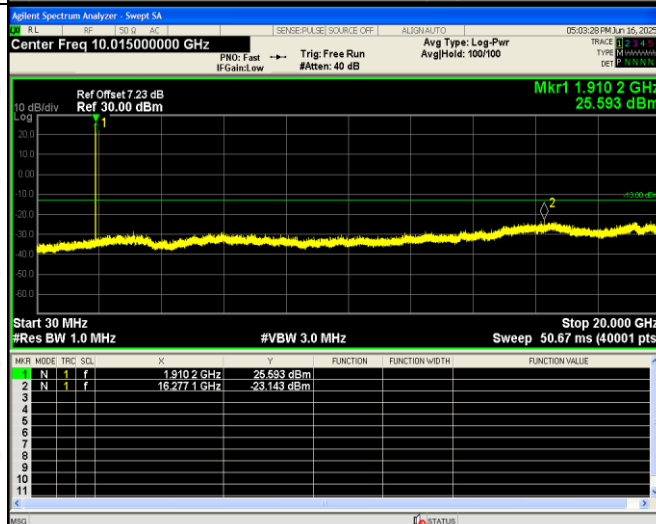
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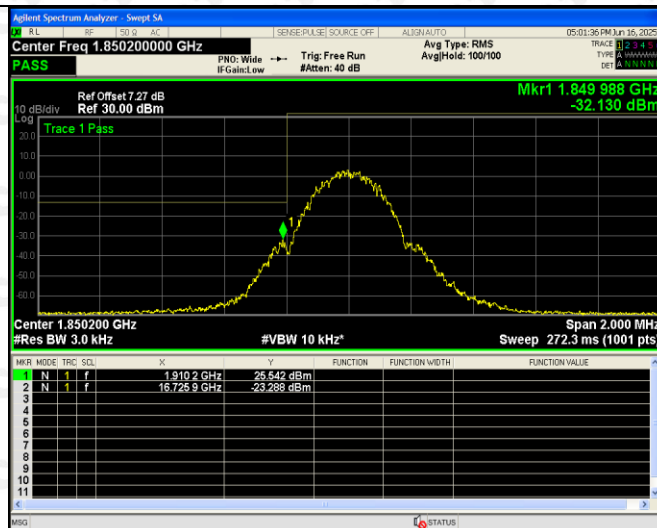
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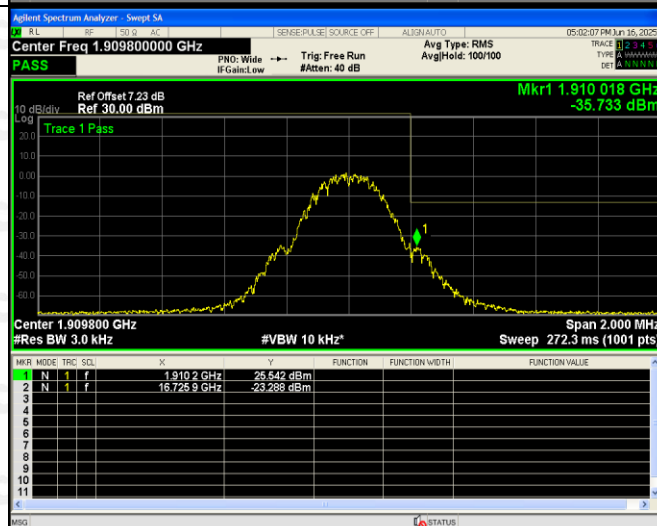
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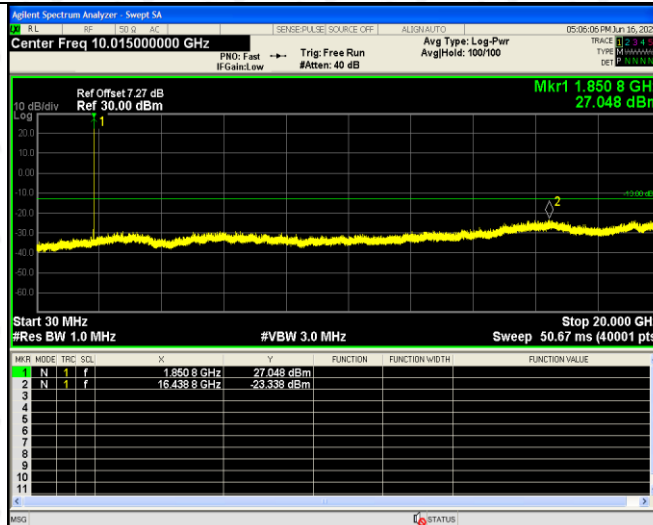
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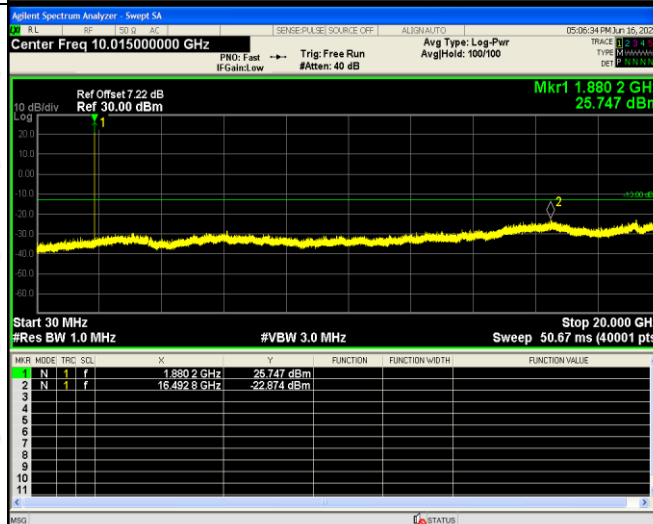
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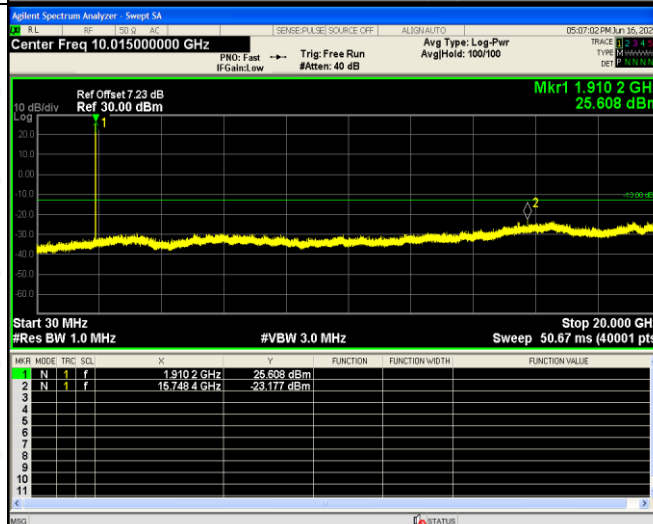
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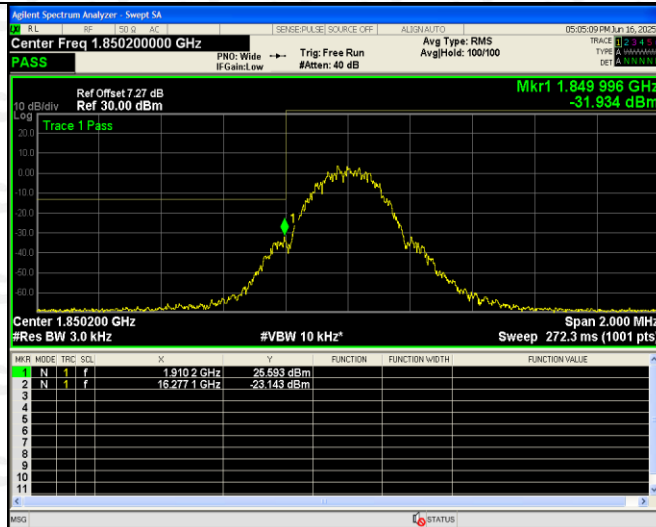
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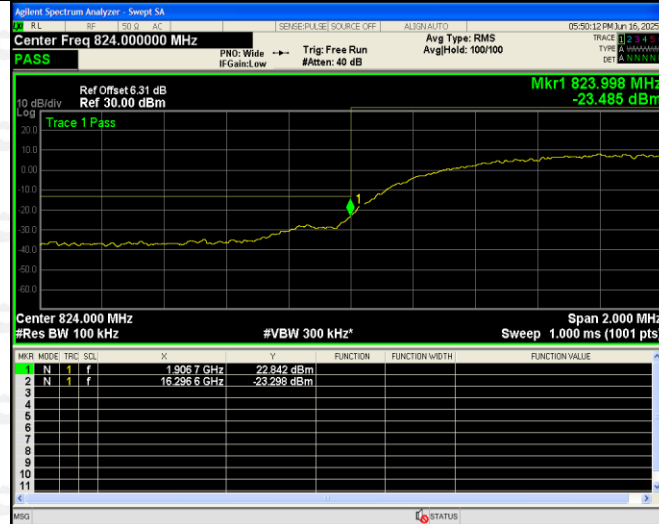
EDGE
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For Band V

WCDMA Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.31 dB Ref 30.00 dBm Mkr1 827.85 MHz 23.005 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>Mkr</th><th>MODE</th><th>TRG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>827.85 MHz</td><td>23.005 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.62120 GHz</td><td>-29.749 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSO	Mkr	MODE	TRG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	827.85 MHz	23.005 dBm				2	N	1	f	2.62120 GHz	-29.749 dBm				3									4									5									6									7									8									9									10									11								
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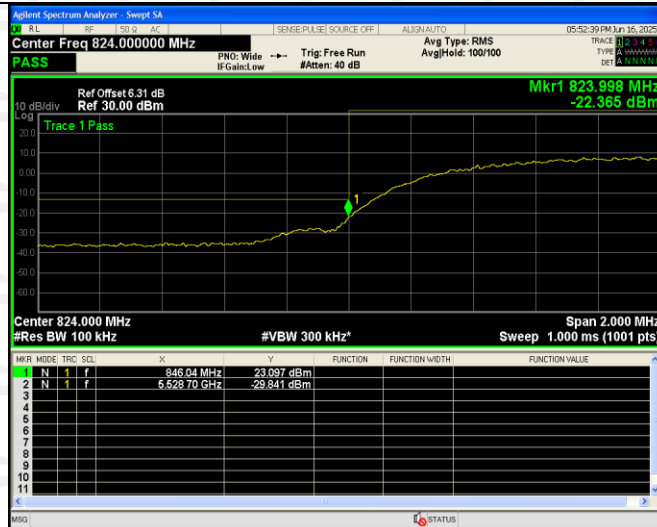


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Spurious
Emission



HSDPA Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.31 dB Ref 30.00 dBm Mkr1 828.35 MHz 22.765 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>Mkr</th><th>Mode</th><th>Trig</th><th>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>828.35 MHz</td><td>22.765 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>6.059 61 GHz</td><td>-30.472 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Mkr	Mode	Trig	SQL	X	Y	Function	Function Width	Function Value	1	N	1	f	828.35 MHz	22.765 dBm				2	N	1	f	6.059 61 GHz	-30.472 dBm				3									4									5									6									7									8									9									10									11								
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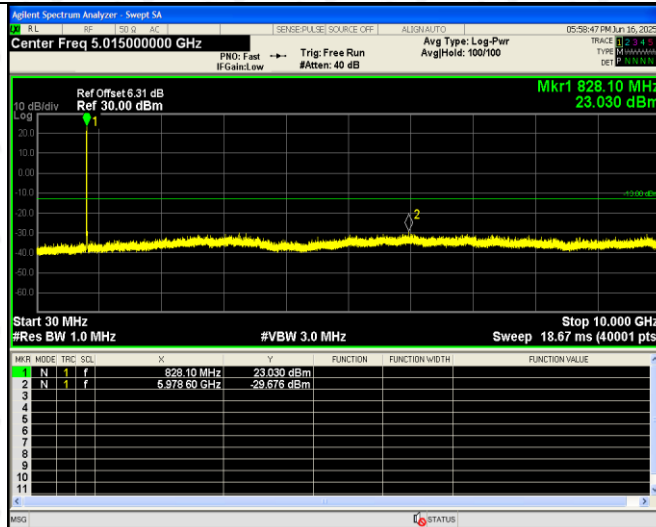
HSDPA
Low
Band
Spurious
Emission



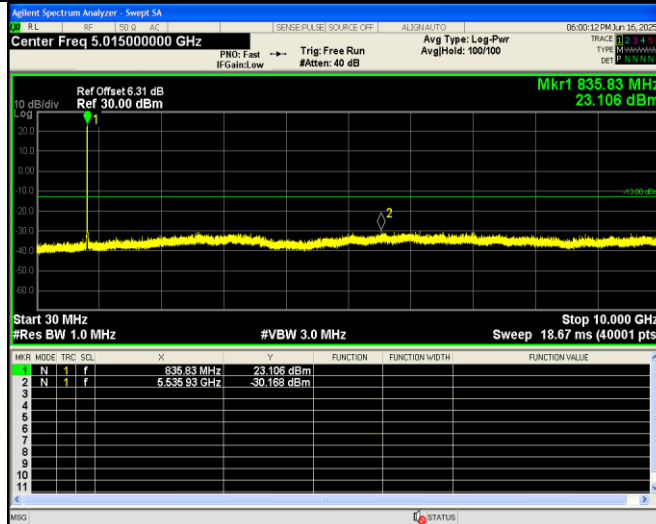
HSDPA
High
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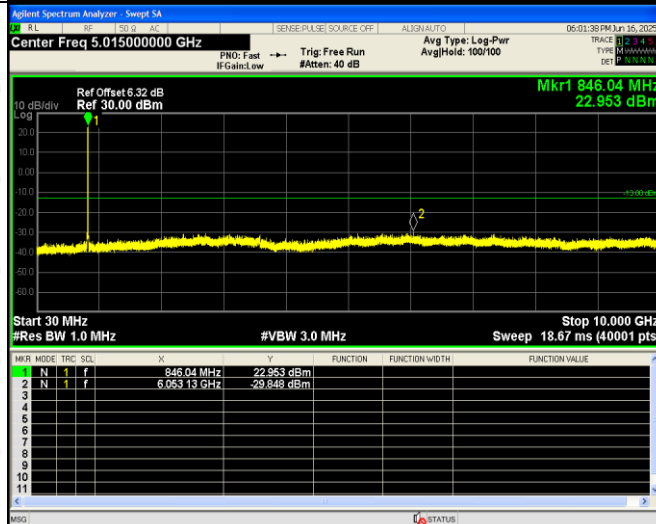
HSUPA
Low
Channel



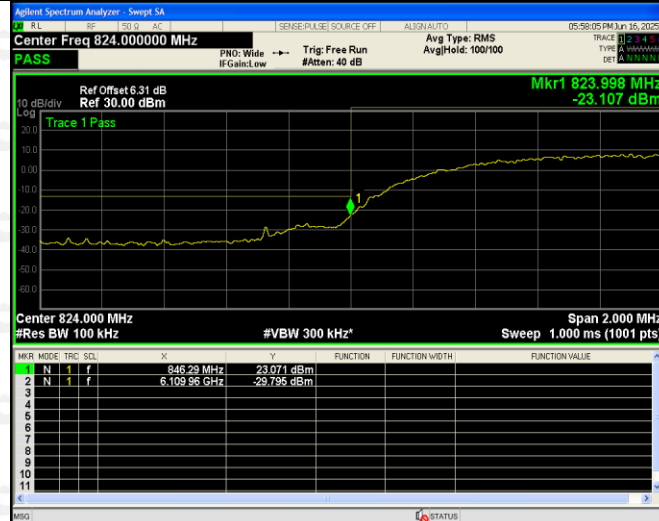
HSUPA
Middle
Channel



HSUPA
High
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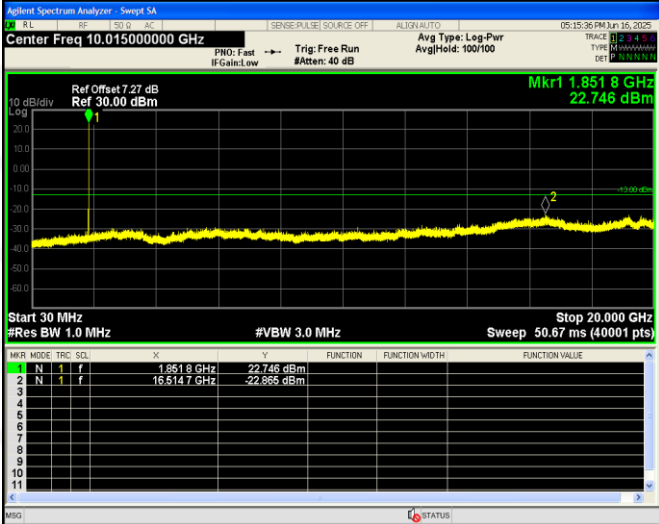
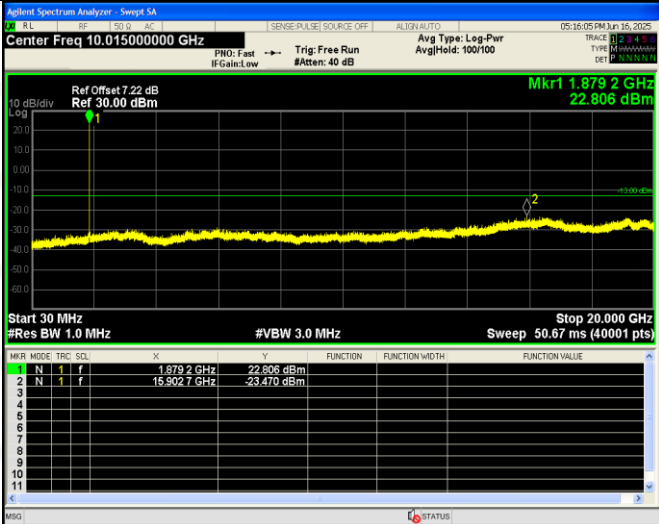
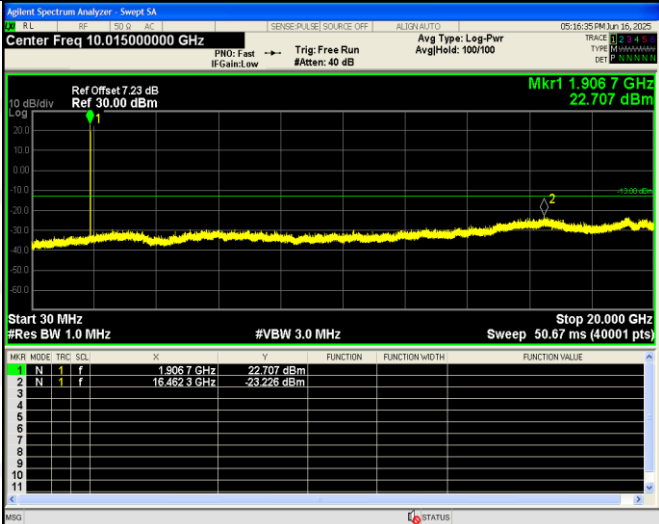
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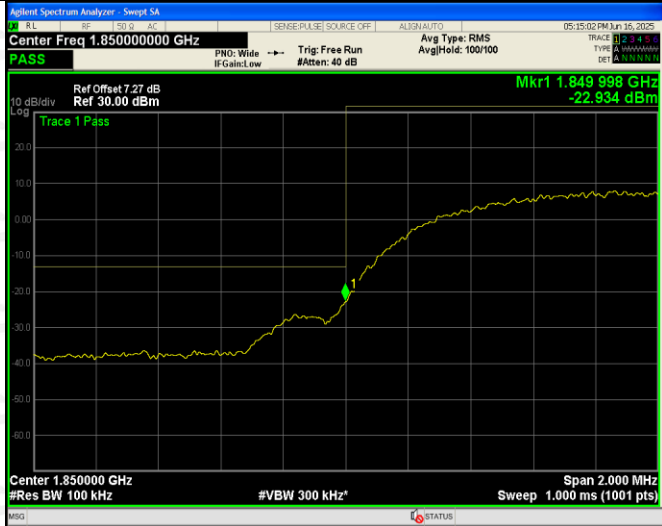


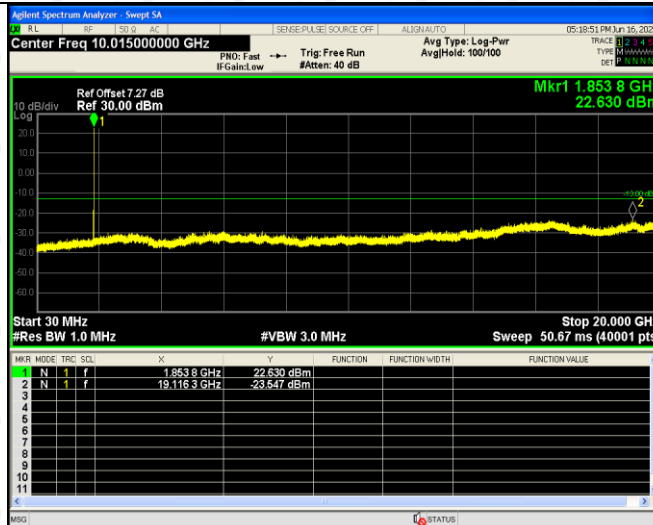
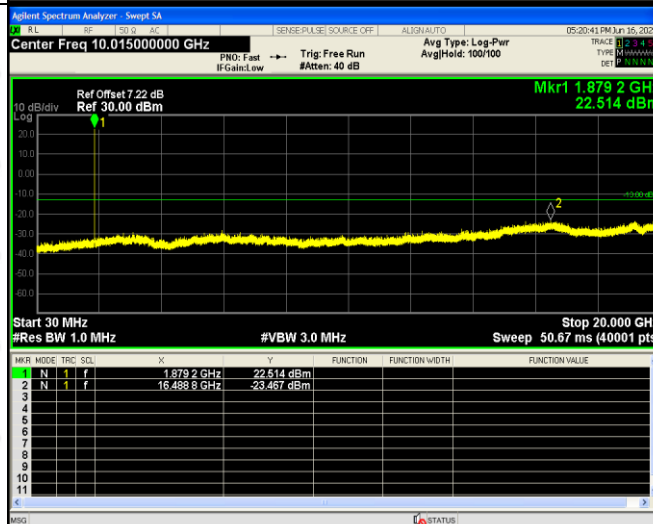
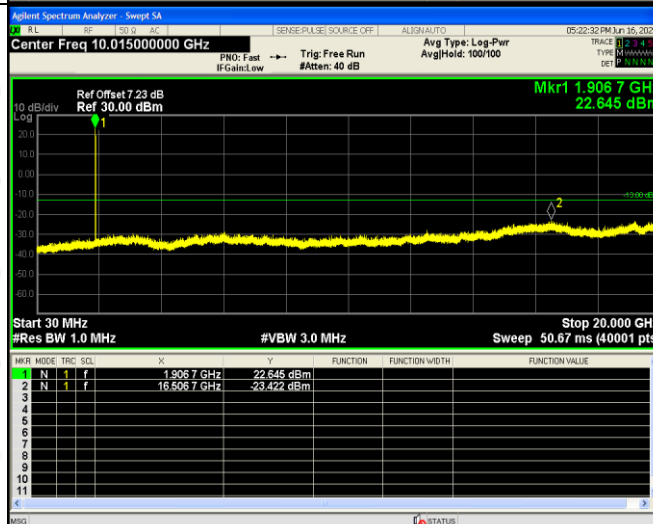
HSUPA
High
Band
Spurious
Emission



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


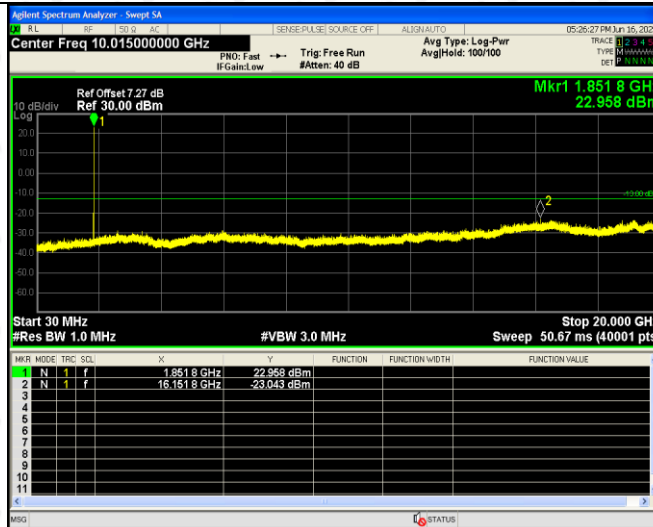
HSDPA
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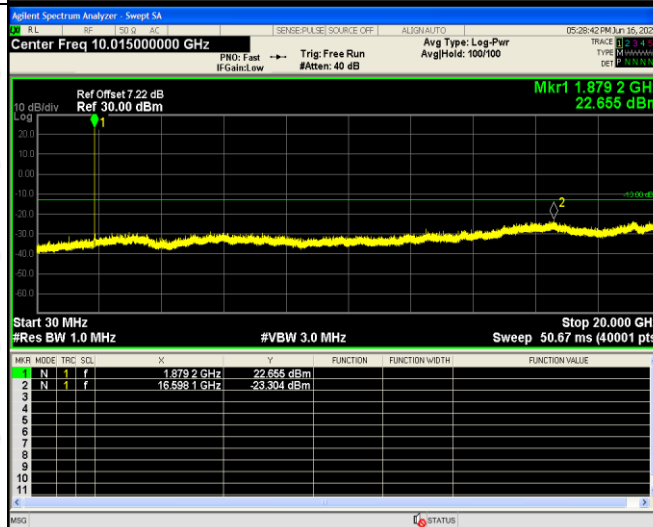
HSDPA
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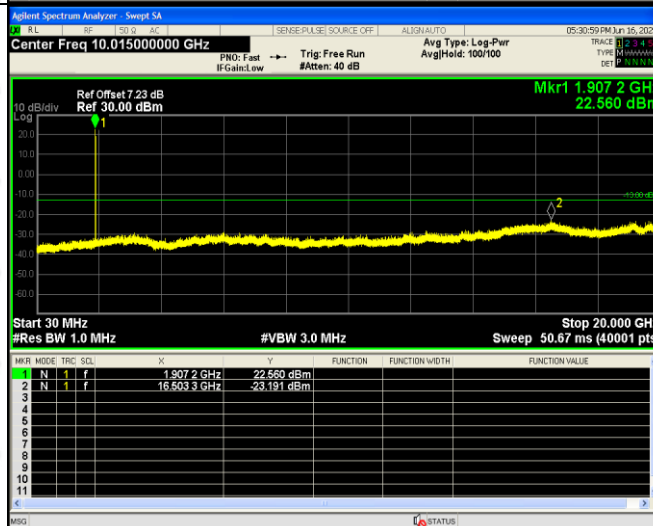
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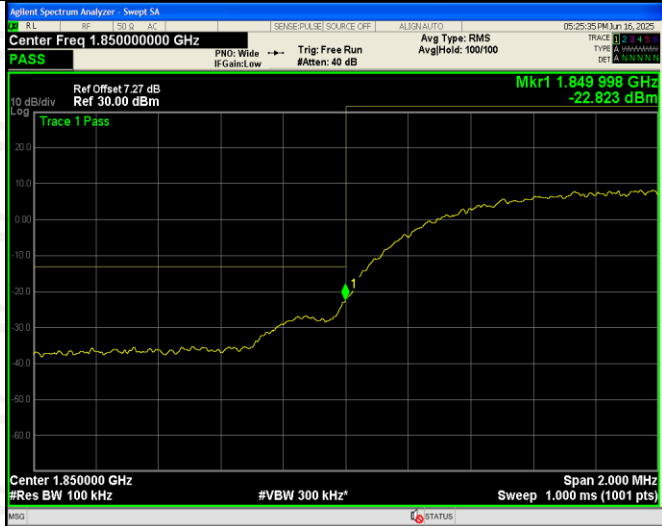


HSUPA
Middle
Channel



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	DC 3.7V

10.4 Summary of Test Results/Plots

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

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

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

For Cellular Band GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
46.10	-68.65	3.9	-64.75	-13	-51.75	H
1638.68	-53.84	4.83	-49.01	-13	-36.01	H
2465.28	-57.13	8.08	-49.05	-13	-36.05	H
41.89	-71.05	4.02	-67.03	-13	-54.03	V
1640.77	-52.35	4.48	-47.87	-13	-34.87	V
2463.04	-53.62	8.2	-45.42	-13	-32.42	V
Middle Channel (836.6MHz)						
45.26	-70.47	3.84	-66.63	-13	-53.63	H
1664.89	-54.08	4.62	-49.46	-13	-36.46	H
2505.26	-49.29	8.25	-41.04	-13	-28.04	H
39.37	-65.59	4.25	-61.34	-13	-48.34	V
1672.74	-53.45	4.54	-48.91	-13	-35.91	V
2501.27	-48.99	8.35	-40.64	-13	-29.75	V
High Channel (848.8MHz)						
40.10	-74.48	4.22	-78.70	-13	-65.70	H
1688.07	-59.93	4.87	-64.80	-13	-51.80	H
2543.96	-55.48	8.38	-63.86	-13	-50.86	H
39.03	-71.78	4.02	-75.80	-13	-62.80	V
1687.88	-48.66	4.56	-53.22	-13	-40.22	V
2538.71	-53.61	8.41	-62.02	-13	-49.02	V

For PCS Band GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
40.90	-73.56	4.34	-69.22	-13	-56.22	H
3693.17	-51.58	10.54	-41.04	-13	-28.04	H
5543.97	-59.42	13.37	-46.05	-13	-33.05	H
42.00	-70.59	4.34	-66.25	-13	-53.25	V
3697.59	-57.90	10.54	-47.36	-13	-34.36	V
5549.55	-58.10	13.37	-44.73	-13	-31.73	V
Middle Channel (1880MHz)						
40.23	-72.31	4.02	-68.29	-13	-55.29	H
3753.06	-58.64	10.71	-47.93	-13	-34.93	H
5635.05	-58.98	13.73	-45.25	-13	-32.25	H
45.80	-68.60	4.14	-64.46	-13	-51.46	V
3754.09	-52.21	10.22	-41.99	-13	-28.99	V
5635.54	-56.01	13.16	-42.85	-13	-29.85	V
High Channel (1909.8MHz)						
39.84	-75.29	4.02	-71.27	-13	-58.27	H
3817.08	-62.06	4.9	-57.16	-13	-44.16	H
5724.58	-44.65	8.09	-36.56	-13	-23.56	H
42.62	-54.08	4.25	-49.83	-13	-36.83	V
3813.03	-63.98	4.93	-59.05	-13	-46.05	V
5723.15	-62.75	8.43	-54.32	-13	-41.32	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
42.85	-66.82	3.91	-62.91	-13	-49.91	H
1644.44	-59.06	10.56	-48.50	-13	-35.50	H
2469.77	-58.45	13.5	-44.95	-13	-31.95	H
39.04	-66.62	3.93	-62.69	-13	-49.69	V
1643.80	-54.59	10.41	-44.18	-13	-31.18	V
2472.67	-59.58	13.16	-46.42	-13	-33.42	V
Middle Channel (836.6MHz)						
39.65	-71.61	4.02	-67.59	-13	-54.59	H
1671.71	-55.06	4.66	-50.40	-13	-37.40	H
2504.53	-50.32	8.34	-41.98	-13	-28.98	H
40.34	-62.96	4.17	-58.79	-13	-45.79	V
1668.46	-57.51	4.94	-52.57	-13	-39.57	V
2499.32	-58.08	8.19	-49.89	-13	-36.89	V
High Channel (846.6MHz)						
40.39	-71.83	3.87	-67.96	-13	-54.96	H
1687.46	-62.94	4.89	-58.05	-13	-45.05	H
2537.94	-43.03	8.42	-34.61	-13	-21.61	H
44.57	-57.60	3.95	-53.65	-13	-40.65	V
1690.07	-62.97	4.99	-57.98	-13	-44.98	V
2529.85	-59.64	8.12	-51.52	-13	-38.52	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
41.38	-74.45	3.91	-70.54	-13	-57.54	H
1648.38	-57.03	10.56	-46.47	-13	-33.47	H
2475.53	-54.25	13.5	-40.75	-13	-27.75	H
36.58	-74.14	3.93	-70.21	-13	-57.21	V
1644.72	-58.86	10.41	-48.45	-13	-35.45	V
2472.72	-62.39	13.16	-49.23	-13	-36.23	V
Middle Channel (1880MHz)						
44.98	-70.15	4.02	-66.13	-13	-53.13	H
1668.73	-59.93	4.66	-55.27	-13	-42.27	H
2507.17	-41.19	8.34	-32.85	-13	-19.85	H
36.80	-60.73	4.17	-56.56	-13	-43.56	V
1668.47	-59.25	4.94	-54.31	-13	-41.31	V
2500.99	-62.70	8.19	-54.51	-13	-41.51	V
High Channel (1907.6MHz)						
42.40	-69.11	3.87	-65.24	-13	-52.24	H
1686.09	-59.12	4.89	-54.23	-13	-41.23	H
2531.36	-44.53	8.42	-36.11	-13	-23.11	H
43.75	-58.02	3.95	-54.07	-13	-41.07	V
1683.54	-55.46	4.99	-50.47	-13	-37.47	V
2532.37	-63.69	8.12	-55.57	-13	-42.57	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	8.94	0.01068
40	NV	9.14	0.01093
30	NV	9.12	0.01090
20	NV	9.15	0.01094
10	NV	10.47	0.01251
0	NV	9.81	0.01173
-10	NV	10.74	0.01284
-20	NV	10.95	0.01309
-30	NV	10.40	0.01243

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	12.66	0.00674
40	NV	12.41	0.00660
30	NV	13.05	0.00694
20	NV	12.73	0.00677
10	NV	12.72	0.00676
0	NV	13.67	0.00727
-10	NV	13.87	0.00738
-20	NV	14.45	0.00769
-30	NV	14.77	0.00785

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	8.59	0.01027
40	NV	9.14	0.01093
30	NV	9.13	0.01091
20	NV	9.11	0.01088
10	NV	9.95	0.01189
0	NV	10.77	0.01287
-10	NV	10.23	0.01223
-20	NV	10.54	0.01260
-30	NV	10.61	0.01269

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	12.69	0.00675
40	NV	13.17	0.00700
30	NV	12.35	0.00657
20	NV	13.21	0.00703
10	NV	13.20	0.00702
0	NV	14.10	0.00750
-10	NV	13.85	0.00737
-20	NV	13.96	0.00743
-30	NV	14.25	0.00758

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	11.19	0.01337
40	NV	11.01	0.01316
30	NV	11.29	0.01349
20	NV	11.31	0.01352
10	NV	12.17	0.01455
0	NV	11.31	0.01351
-10	NV	12.37	0.01479
-20	NV	12.11	0.01447
-30	NV	12.73	0.01521

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	-10.43	-0.00555
40	NV	-10.10	-0.00537
30	NV	-10.20	-0.00542
20	NV	-9.43	-0.00501
10	NV	-8.42	-0.00448
0	NV	-9.30	-0.00495
-10	NV	-8.27	-0.00440
-20	NV	-8.64	-0.00459
-30	NV	-8.37	-0.00445

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	-0.14	-0.00017
40	NV	0.34	0.00040
30	NV	0.82	0.00098
20	NV	0.48	0.00058
10	NV	1.19	0.00142
0	NV	0.71	0.00085
-10	NV	0.82	0.00098
-20	NV	1.00	0.00119
-30	NV	0.99	0.00118

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	-0.32	-0.00017
40	NV	0.28	0.00015
30	NV	-0.02	-0.00001
20	NV	0.63	0.00033
10	NV	0.66	0.00035
0	NV	0.63	0.00034
-10	NV	0.60	0.00032
-20	NV	1.01	0.00054
-30	NV	0.85	0.00045

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	0.89	0.00106
40	NV	1.00	0.00120
30	NV	1.08	0.00129
20	NV	1.38	0.00165
10	NV	1.38	0.00165
0	NV	1.54	0.00184
-10	NV	1.36	0.00162
-20	NV	1.77	0.00212
-30	NV	2.89	0.00345

For HSDPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.32	0.00017
40	NV	0.23	0.00012
30	NV	0.05	0.00003
20	NV	0.48	0.00026
10	NV	0.89	0.00048
0	NV	0.89	0.00048
-10	NV	1.83	0.00097
-20	NV	1.27	0.00067
-30	NV	1.84	0.00098

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	-0.39	-0.00021
40	NV	-0.39	-0.00021
30	NV	0.24	0.00013
20	NV	0.70	0.00037
10	NV	1.13	0.00060
0	NV	1.37	0.00073
-10	NV	1.23	0.00065
-20	NV	2.12	0.00113
-30	NV	2.05	0.00109

For HSUPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	4.56	0.00242
40	NV	4.88	0.00260
30	NV	5.13	0.00273
20	NV	5.47	0.00291
10	NV	5.85	0.00311
0	NV	6.41	0.00341
-10	NV	6.43	0.00342
-20	NV	7.25	0.00385
-30	NV	6.59	0.00351

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	10.40	0.01244
	NV	11.22	0.01341
	HV	11.12	0.01329
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	14.37	0.00765
	NV	14.95	0.00795
	HV	14.68	0.00781
Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	11.29	0.01349
	NV	11.52	0.01377
	HV	11.16	0.01334
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	14.31	0.00761
	NV	14.83	0.00789
	HV	14.92	0.00794
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	13.14	0.01572
	NV	12.99	0.01554
	HV	13.87	0.01659
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	-7.62	-0.00405
	NV	-7.51	-0.00400
	HV	-7.57	-0.00403

Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	0.77	0.00092
	NV	1.59	0.00190
	HV	1.50	0.00179
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	1.38	0.00080
	NV	0.46	0.00027
	HV	1.40	0.00081
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	2.03	0.00108
	NV	2.34	0.00280
	HV	2.94	0.00351

Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.73	0.00207
	NV	2.31	0.00276
	HV	1.91	0.00228
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	6.19	0.00357
	NV	6.66	0.00384
	HV	7.09	0.00409
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	6.86	0.00365
	NV	7.45	0.00396
	HV	7.31	0.00389

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	2.76	0.00331
	NV	2.73	0.00326
	HV	3.51	0.00420
Reference Frequency(Middle Channel): HSUPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	5.81	0.00335
	NV	6.09	0.00351
	HV	6.32	0.00365
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	9.13	0.00485
	NV	9.31	0.00495
	HV	9.74	0.00518

12. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



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