

# TEST REPORT

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

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Reviewed by:

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Approved by:



Bin Mei / Director

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB240222007RFX	Feb. 23, 2024	Original	Valid



## 2. TEST SUMMARY

The Product has been tested according to the following specifications:

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

### 3. MEASUREMENT UNCERTAINTY

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

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

#### 4. PRODUCT INFORMATION AND TEST SETUP

##### 4.1 Product Information

Model(s):	WP38, WP38 S, WP38 Pro, WP38 Ultra
Model Description:	All the model are the same circuit and RF module, only different for model name .Test sample model: WP38
Hardware Version:	E358_MAIN_PCB_V1.0
Software Version:	OUKITEL_WP38_EEA_V03
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 32.93dBm GSM1900: 29.85dBm WCDMA Band 2: 22.89dBm WCDMA Band 5: 23.09dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: -2.33dBi GSM1900: -1.02dBi WCDMA Band 2: -1.02dBi WCDMA Band 5: -2.33dBi
Ratings:	DC 5V charging from adapter DC 3.7V from battery



#### 4.2 Test Setup Configuration

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

#### 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

**Notes:**

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

#### 4.4 Channel List

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

#### 4.5 Test Mode

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

#### 4.6 Test Environment

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



## 5. TEST FACILITY AND TEST INSTRUMENT USED

### 5.1 Test Facility

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

### 5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2024.07.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2024.07.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2024.07.05
4	Communication test set	R&S	CMW500	108058	2024.07.05
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2024.07.05
6	Signal Generator	Agilent	N5181A	MY50140365	2024.07.05
7	Vector signal generator	Agilent	N5182A	MY47420195	2024.07.05
8	Communication test set	Agilent	E5515C	MY50102567	2024.07.06
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2024.07.05
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2024.07.06
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.07.06
12	BT&WI-FI Automatic test software	Microwave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2024.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2024.07.05
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2024.07.05
18	Amplifier	HP	8447E	2945A02747	2024.07.05
19	Amplifier	Agilent	8449B	3008A01838	2024.07.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2024.07.08



21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2024.07.08
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2024.07.08
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.07.05

## 6. RF OUTPUT POWER

### 6.1 Standard Applicable

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

### 6.2 Test Procedure

Conducted output power test method:



Radiated power test method:

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

### 6.3 Environmental Conditions

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



6.4 Summary of Test Results/Plots

**Max. Radiated Power**

ERP For GSM Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	31.96	1.5	0	H	1.5	1	31.46	38.45
824.2	31.95	1.5	0	V	1.5	1	31.45	38.45
Middle Channel								
836.6	31.74	1.5	0	H	1.5	1	31.24	38.45
836.6	31.79	1.5	0	V	1.5	1	31.29	38.45
High Channel								
848.8	31.93	1.5	0	H	1.5	1	31.43	38.45
848.8	32.31	1.5	0	V	1.5	1	31.81	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	29.29	1.5	0	H	1.9	1	28.39	33
1850.2	28.65	1.5	0	V	1.9	1	27.75	33
Middle Channel								
1880	29.59	1.5	0	H	1.9	1	28.69	33
1880	29.24	1.5	0	V	1.9	1	28.34	33
High Channel								
1909.8	29.22	1.5	0	H	1.9	1	28.32	33
1909.8	29.39	1.5	0	V	1.9	1	28.49	33



ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	32.16	1.5	0	H	1.5	1	31.66	38.45
824.2	32.75	1.5	0	V	1.5	1	32.25	38.45
Middle Channel								
836.6	31.85	1.5	0	H	1.5	1	31.35	38.45
836.6	31.90	1.5	0	V	1.5	1	31.40	38.45
High Channel								
848.8	31.98	1.5	0	H	1.5	1	31.48	38.45
848.8	32.34	1.5	0	V	1.5	1	31.84	38.45

EIRP For GPRS Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	28.61	1.5	0	H	1.9	1	27.71	33
1850.2	28.86	1.5	0	V	1.9	1	27.96	33
Middle Channel								
1880	29.20	1.5	0	H	1.9	1	28.30	33
1880	29.09	1.5	0	V	1.9	1	28.19	33
High Channel								
1909.8	29.01	1.5	0	H	1.9	1	28.11	33
1909.8	29.03	1.5	0	V	1.9	1	28.13	33



## ERP For EDGE Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	25.95	1.5	0	H	1.5	1	25.45	38.45
824.2	25.62	1.5	0	V	1.5	1	25.12	38.45
Middle Channel								
836.6	25.33	1.5	0	H	1.5	1	24.83	38.45
836.6	25.29	1.5	0	V	1.5	1	24.79	38.45
High Channel								
848.8	25.31	1.5	0	H	1.5	1	24.81	38.45
848.8	25.47	1.5	0	V	1.5	1	24.97	38.45

## EIRP For EDGE Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	25.67	1.5	0	H	1.9	1	24.77	33
1850.2	25.73	1.5	0	V	1.9	1	24.83	33
Middle Channel								
1880	25.82	1.5	0	H	1.9	1	24.92	33
1880	25.73	1.5	0	V	1.9	1	24.83	33
High Channel								
1909.8	25.27	1.5	0	H	1.9	1	24.37	33
1909.8	25.09	1.5	0	V	1.9	1	24.19	33



## ERP For WCDMA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.57	1.5	0	H	1.5	1	22.07	38.45
826.4	23.01	1.5	0	V	1.5	1	22.51	38.45
Middle Channel								
836.6	22.92	1.5	0	H	1.5	1	22.42	38.45
836.6	22.08	1.5	0	V	1.5	1	21.58	38.45
High Channel								
846.6	22.34	1.5	0	H	1.5	1	21.84	38.45
846.6	22.30	1.5	0	V	1.5	1	21.80	38.45

## ERP For HSDPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.12	1.5	0	H	1.5	1	21.62	38.45
826.4	21.94	1.5	0	V	1.5	1	21.44	38.45
Middle Channel								
836.6	21.76	1.5	0	H	1.5	1	21.26	38.45
836.6	21.35	1.5	0	V	1.5	1	20.85	38.45
High Channel								
846.6	21.35	1.5	0	H	1.5	1	20.85	38.45
846.6	21.35	1.5	0	H	1.5	1	20.85	38.45

## ERP For HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	20.51	1.5	0	H	1.5	1	20.01	38.45
826.4	20.61	1.5	0	V	1.5	1	20.11	38.45
Middle Channel								
836.6	21.18	1.5	0	H	1.5	1	20.68	38.45
836.6	21.84	1.5	0	V	1.5	1	21.34	38.45
High Channel								
846.6	21.21	1.5	0	H	1.5	1	20.71	38.45
846.6	20.98	1.5	0	V	1.5	1	20.48	38.45

## EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	22.68	1.5	0	H	1.9	1	21.78	33
1852.4	21.98	1.5	0	V	1.9	1	21.08	33
Middle Channel								
1880	23.50	1.5	0	H	1.9	1	22.60	33
1880	22.54	1.5	0	V	1.9	1	21.64	33
High Channel								
1907.6	21.96	1.5	0	H	1.9	1	21.06	33
1907.6	21.96	1.5	0	V	1.9	1	21.06	33

## EIRP For HSDPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	22.52	1.5	0	H	1.9	1	21.62	33
1852.4	22.75	1.5	0	V	1.9	1	21.85	33
Middle Channel								
1880	22.27	1.5	0	H	1.9	1	21.37	33
1880	21.55	1.5	0	V	1.9	1	20.65	33
High Channel								
1907.6	20.78	1.5	0	H	1.9	1	19.88	33
1907.6	20.98	1.5	0	V	1.9	1	20.08	33

## EIRP For HSUPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	21.04	1.5	0	H	1.9	1	20.14	33
1852.4	22.02	1.5	0	V	1.9	1	21.12	33
Middle Channel								
1880	22.35	1.5	0	H	1.9	1	21.45	33
1880	22.22	1.5	0	V	1.9	1	21.32	33
High Channel								
1907.6	20.69	1.5	0	H	1.9	1	19.79	33
1907.6	22.06	1.5	0	V	1.9	1	21.16	33

Note: Result = Substitute - Cable loss + Antenna Gain

**Max. Conducted Output Power**

For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
GSM	Low Channel	824.2	32.92	38.45
	Middle Channel	836.6	32.70	38.45
	High Channel	848.8	32.93	38.45
GPRS(1 Slot)	Low Channel	824.2	32.91	38.45
	Middle Channel	836.6	32.67	38.45
	High Channel	848.8	32.91	38.45
EDGE(1 Slot)	Low Channel	824.2	26.03	38.45
	Middle Channel	836.6	25.34	38.45
	High Channel	848.8	25.65	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	29.56	33.0
	Middle Channel	1880.0	29.85	33.0
	High Channel	1909.8	29.63	33.0
GPRS(1 Slot)	Low Channel	1850.2	29.55	33.0
	Middle Channel	1880.0	29.85	33.0
	High Channel	1909.8	29.61	33.0
EDGE(1 Slot)	Low Channel	1850.2	25.89	33.0
	Middle Channel	1880.0	26.47	33.0
	High Channel	1909.8	25.38	33.0



## For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	23.09	38.45
	Middle Channel	836.6	23.01	38.45
	High Channel	846.6	23.07	38.45
HSDPA	Low Channel	826.4	22.14	38.45
	Middle Channel	836.6	22.07	38.45
	High Channel	846.6	22.13	38.45
HSUPA	Low Channel	826.4	21.08	38.45
	Middle Channel	836.6	21.89	38.45
	High Channel	846.6	21.84	38.45

## For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	22.89	33.00
	Middle Channel	1880.0	22.87	33.00
	High Channel	1907.6	22.63	33.00
HSDPA	Low Channel	1852.4	21.92	33.00
	Middle Channel	1880.0	21.94	33.00
	High Channel	1907.6	21.67	33.00
HSUPA	Low Channel	1852.4	21.35	33.00
	Middle Channel	1880.0	21.76	33.00
	High Channel	1907.6	21.47	33.00

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

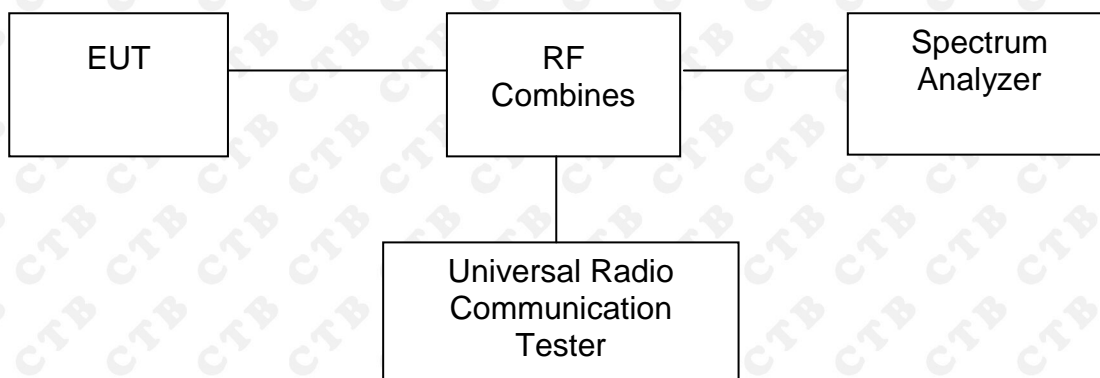
### 7.1 Standard Applicable

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

### 7.2 Test Procedure

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

Test Configuration for the emission bandwidth testing:



### 7.3 Environmental Conditions

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

#### 7.4 Summary of Test Results

Only the worst case was selected to record  
For GSM850

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	190	836.6	2.68	13
GPRS(1 Slot)	190	836.6	2.71	13
EDGE(1 Slot)	190	836.6	9.58	13

For PCS 1900

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

For WCDMA Band 5

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

For WCDMA Band 2

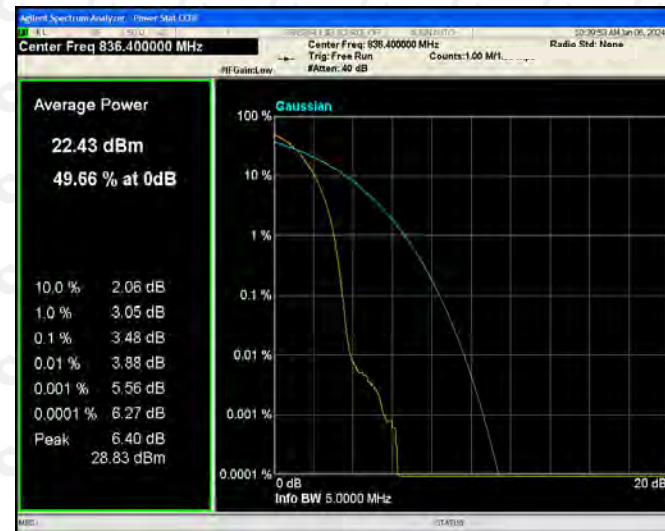
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1880	2.98	13
HSDPA	9400	1880	3.06	13
HSUPA	9400	1880	3.48	13



GSM :



WCDMA:



## 8. EMISSION BANDWIDTH

### 8.1 Standard Applicable

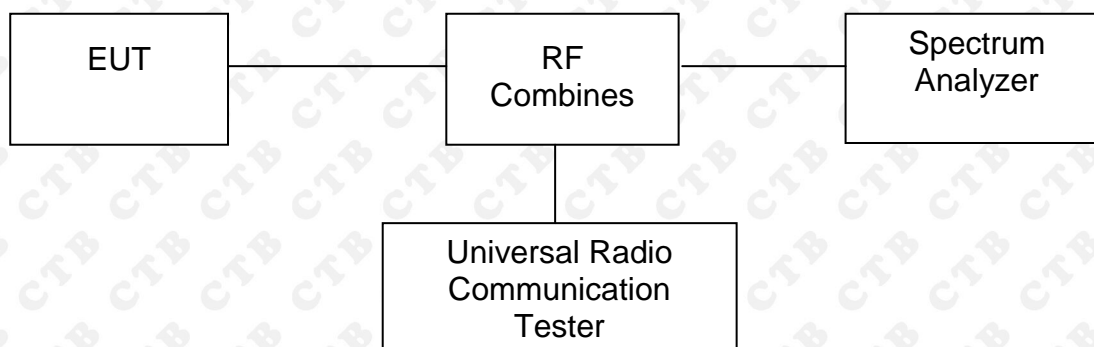
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

### 8.2 Test Procedure

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

Test Configuration for the emission bandwidth testing:



### 8.3 Environmental Conditions

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

## 8.4 Summary of Test Results/Plots

## For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	246.677	311.450
	190	836.6	246.301	318.898
	251	848.8	246.369	319.934
GPRS	128	824.2	251.347	327.691
	190	836.6	249.269	314.202
	251	848.8	244.727	317.894
EDGE	128	824.2	248.737	300.137
	190	836.6	246.625	308.714
	251	848.8	252.692	330.209

## For PCS Band

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



## For Band 5

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

## For Band 2

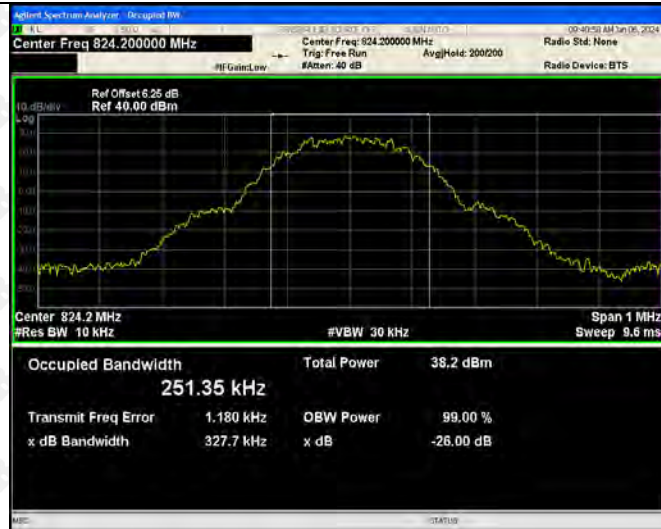
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4185.393	4694.941
	9400	1880.0	4171.711	4713.051
	9538	1907.6	4143.209	4710.217
HSDPA	9262	1852.4	4170.005	4706.787
	9400	1880.0	4162.059	4712.840
	9538	1907.6	4177.480	4694.907
HSUPA	9262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

For Cellular Band





### GPRS Low Channel



### GPRS Middle Channel



### GPRS High Channel





### EDGE Low Channel



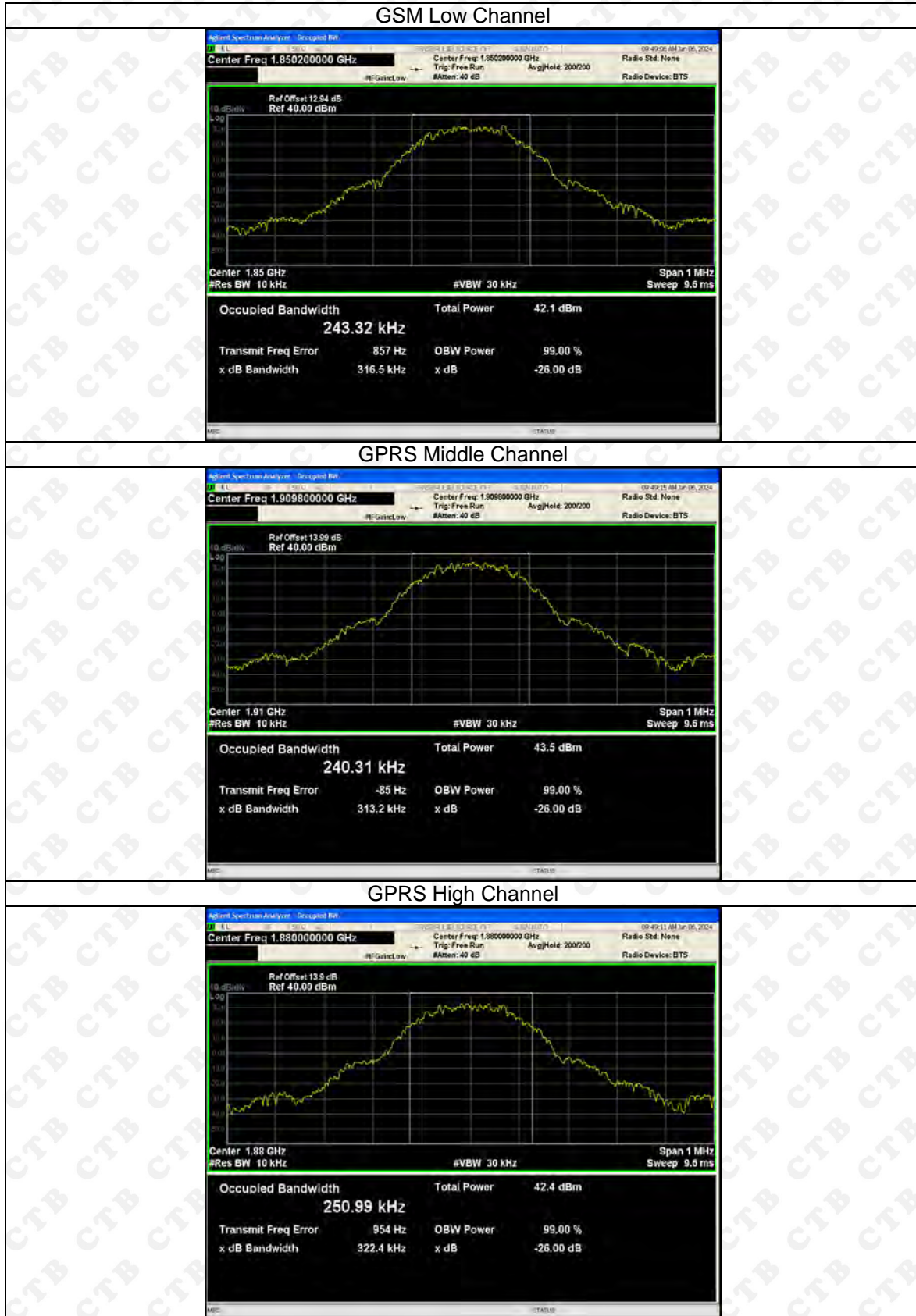
### EDGE Middle Channel



### EDGE High Channel



For PCS Band





### GPRS Low Channel



### GPRS Middle Channel

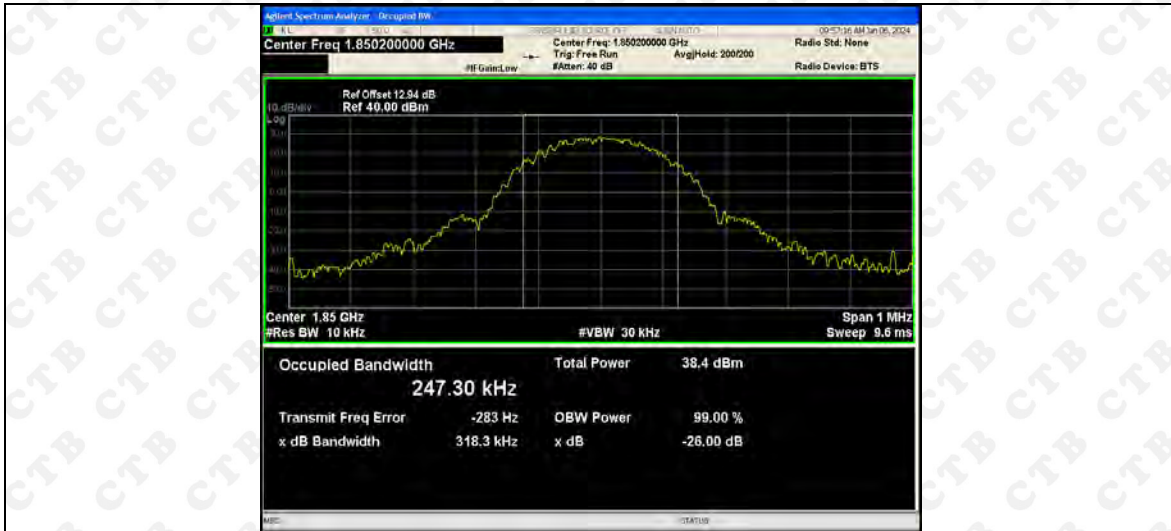


### GPRS High Channel

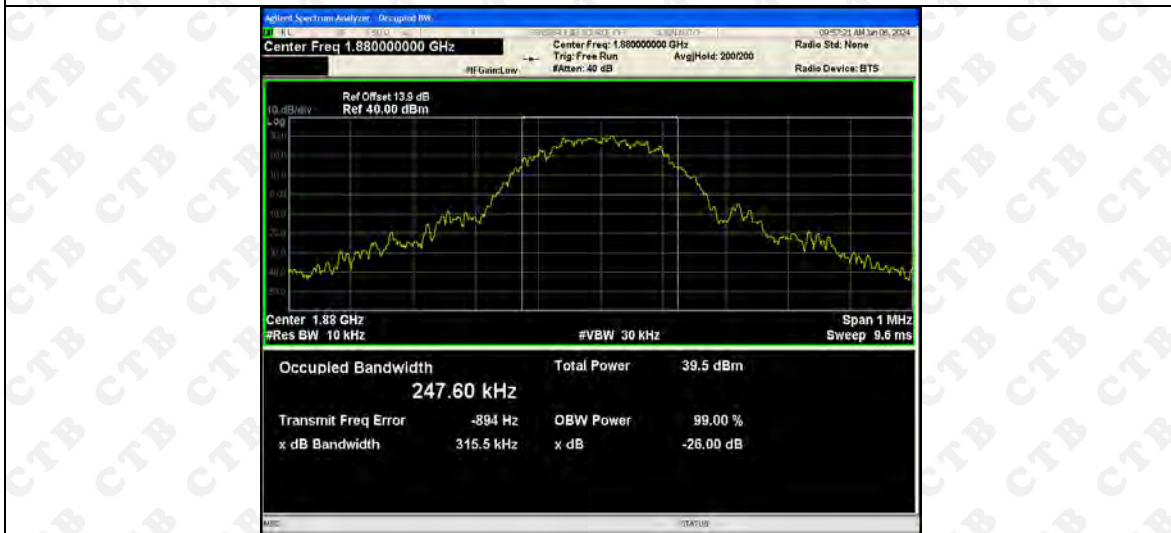


### EDGE Low Channel

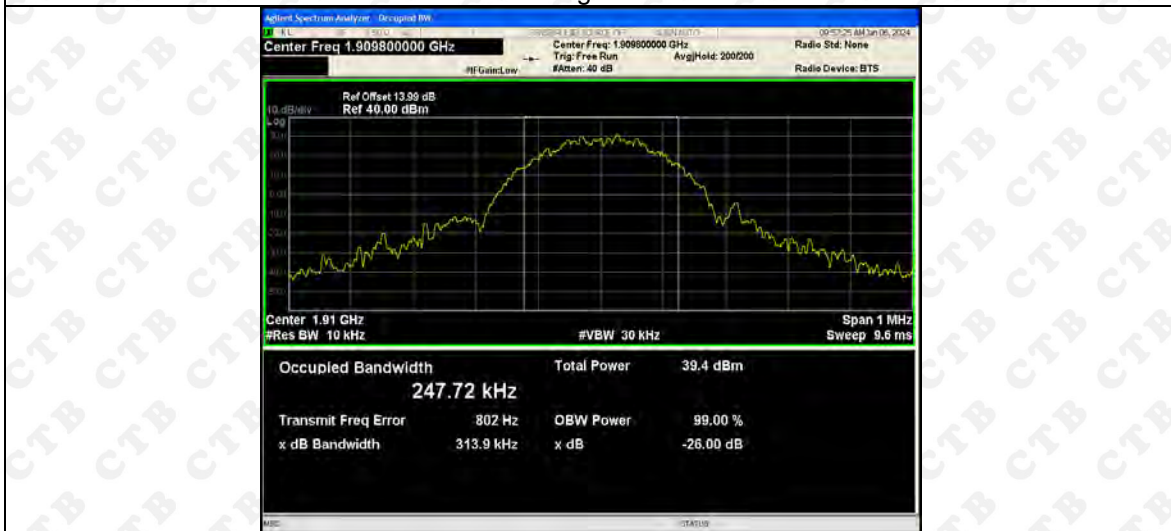




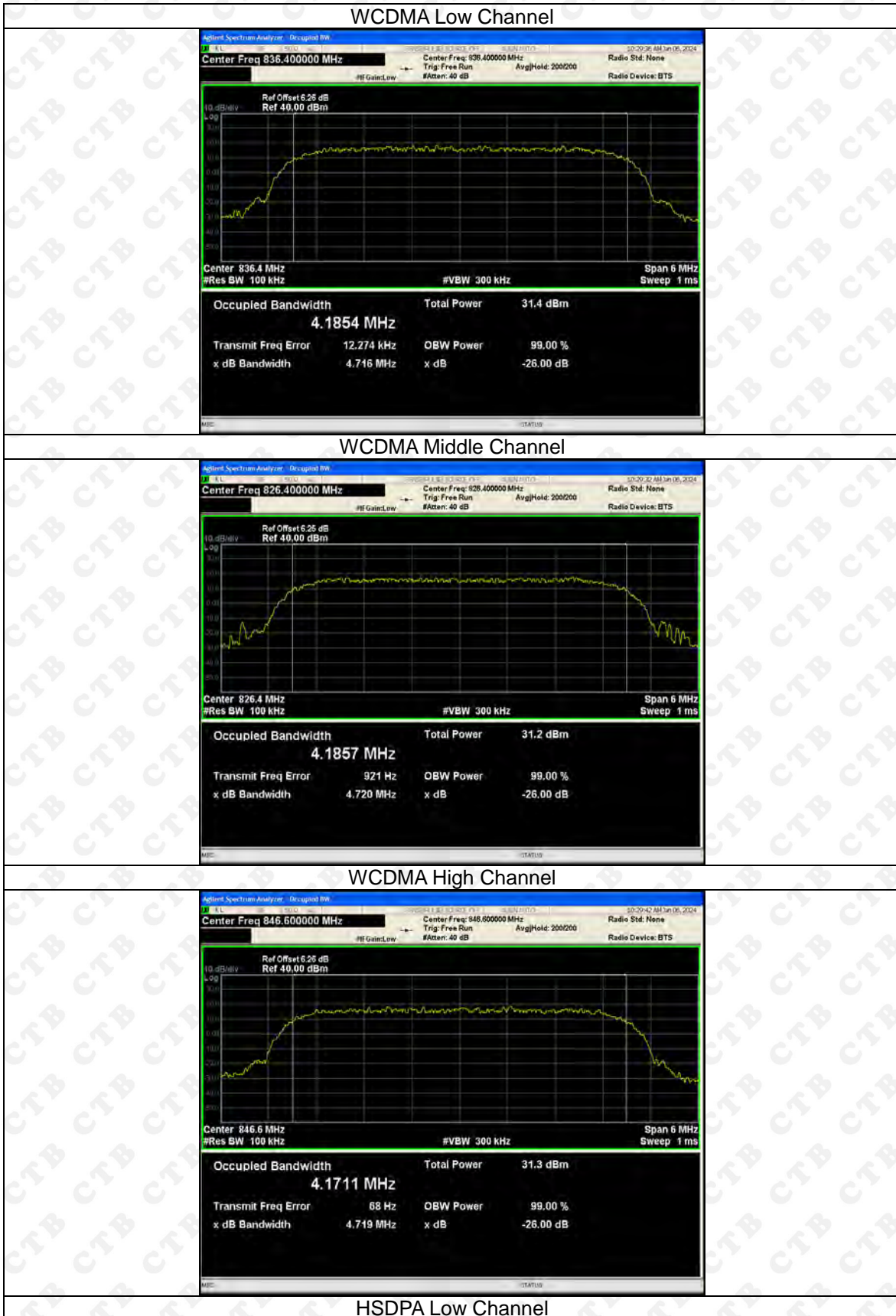
EDGE Middle Channel



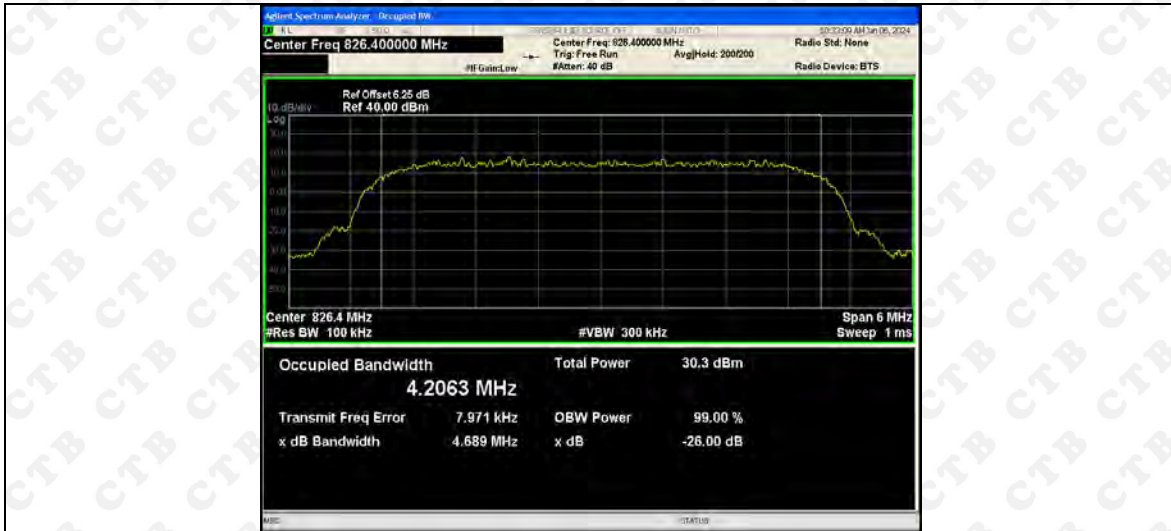
EDGE High Channel



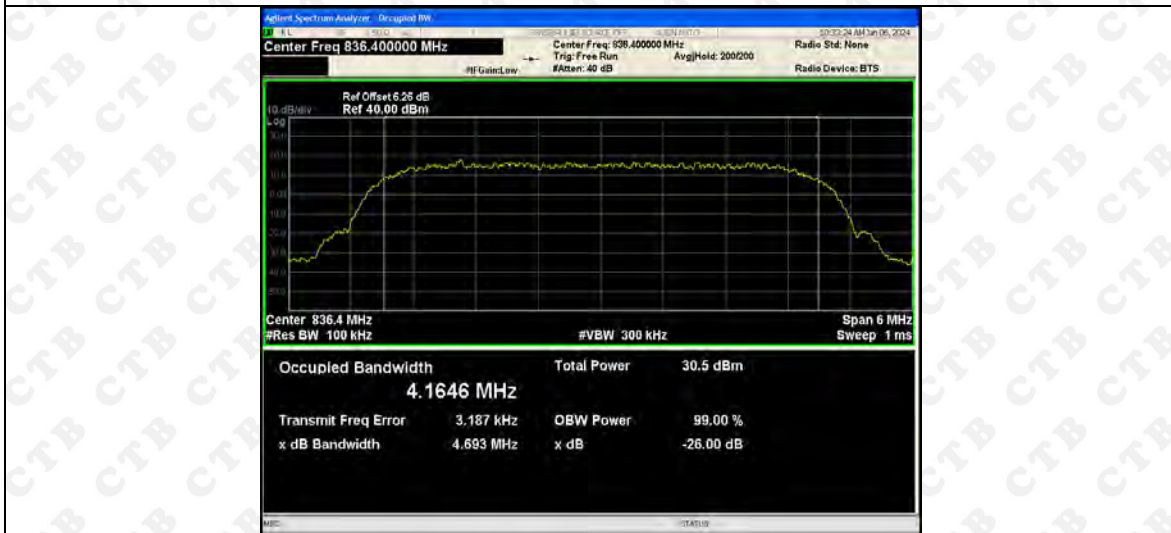
For Band V







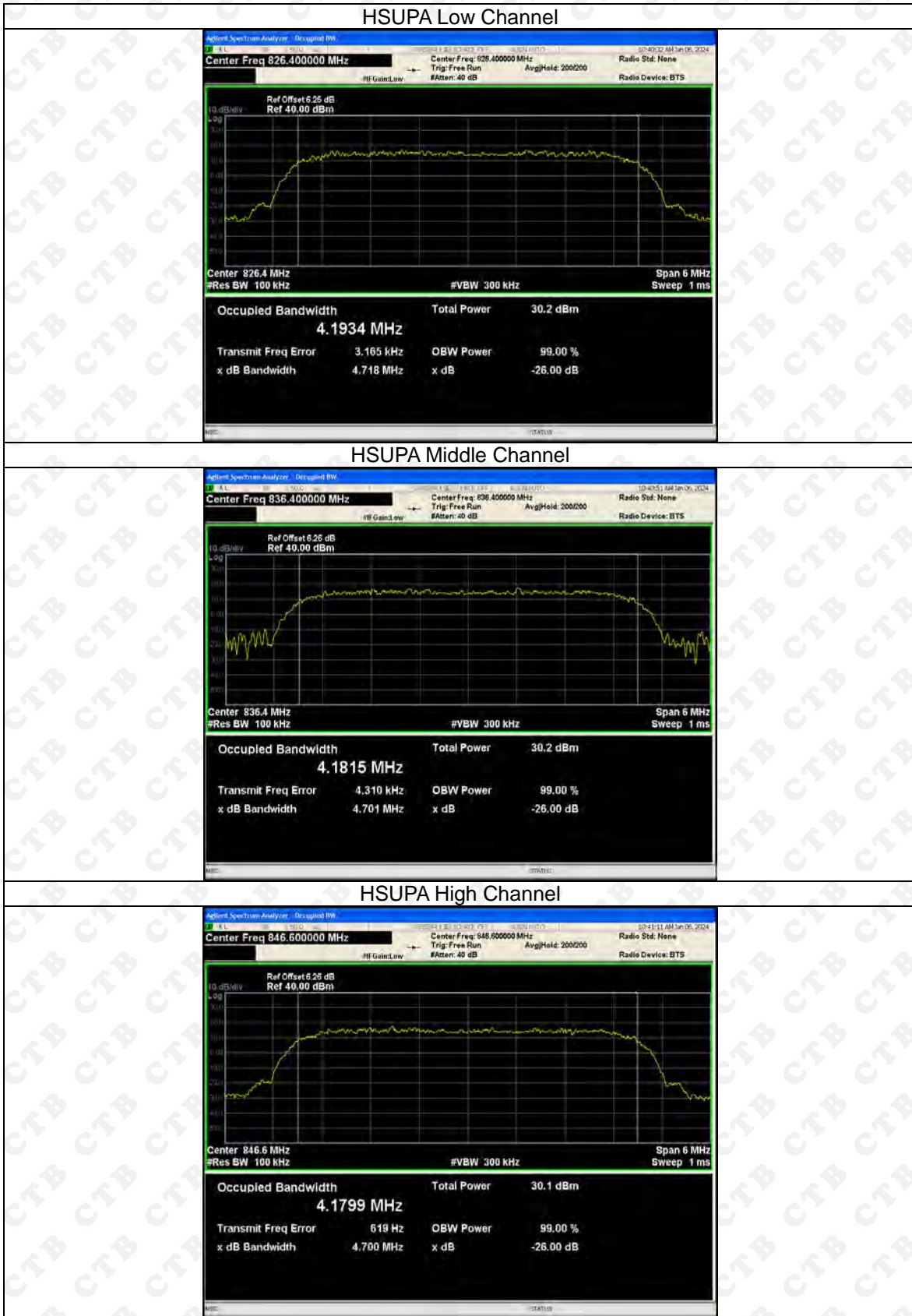
HSDPA Middle Channel



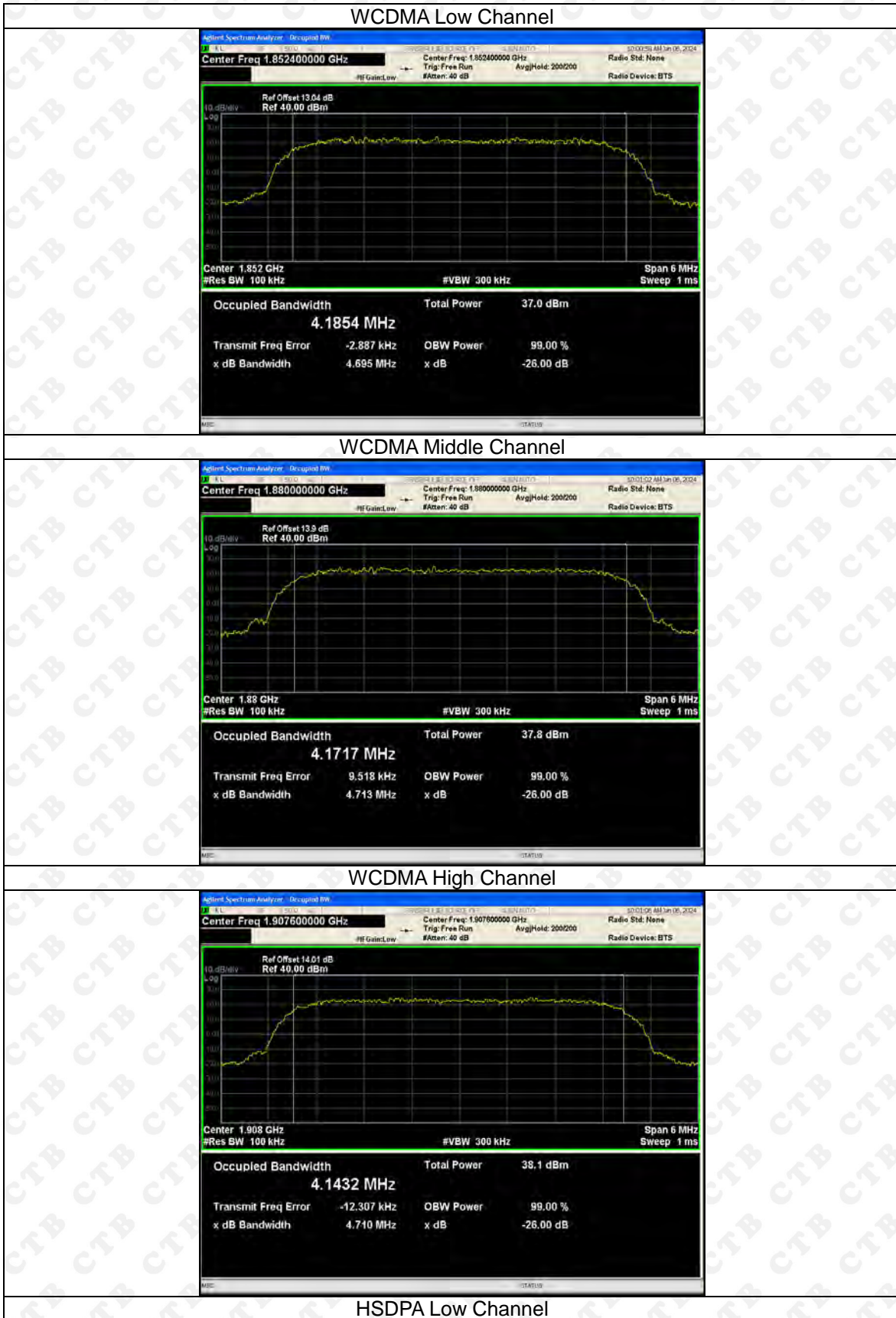
HSDPA High Channel



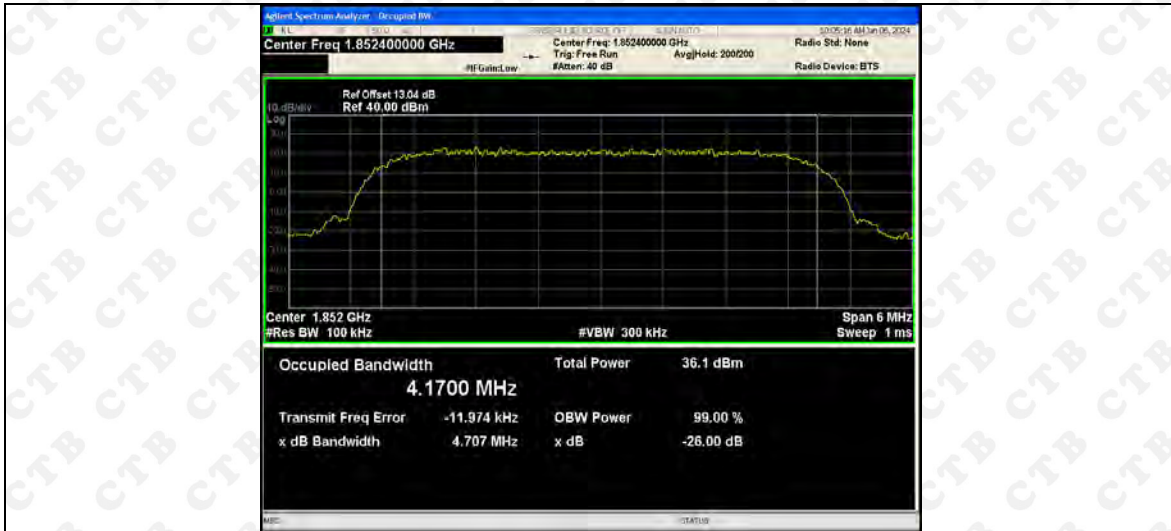




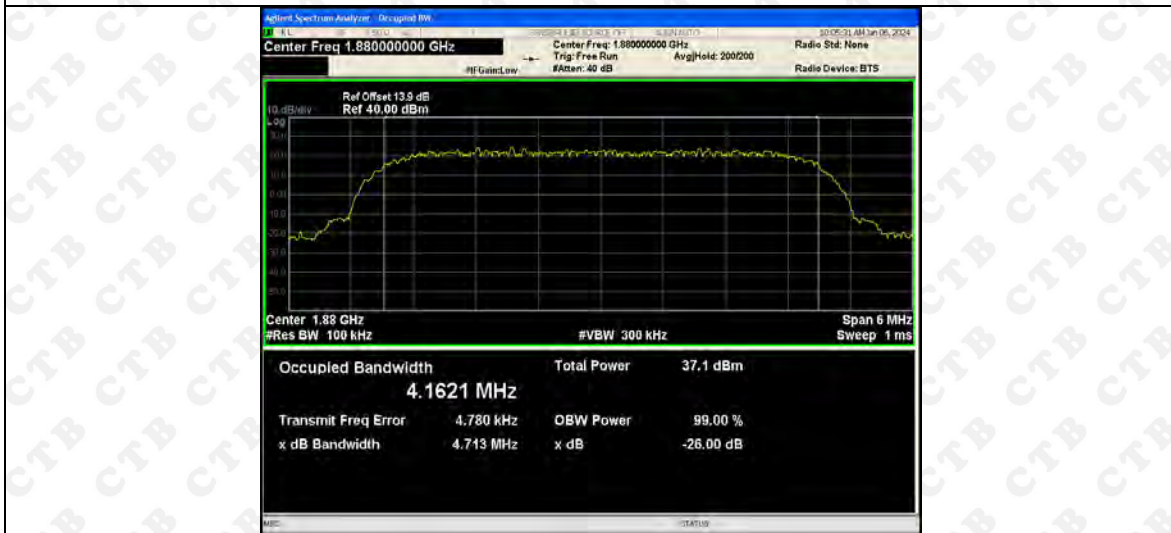
For Band II







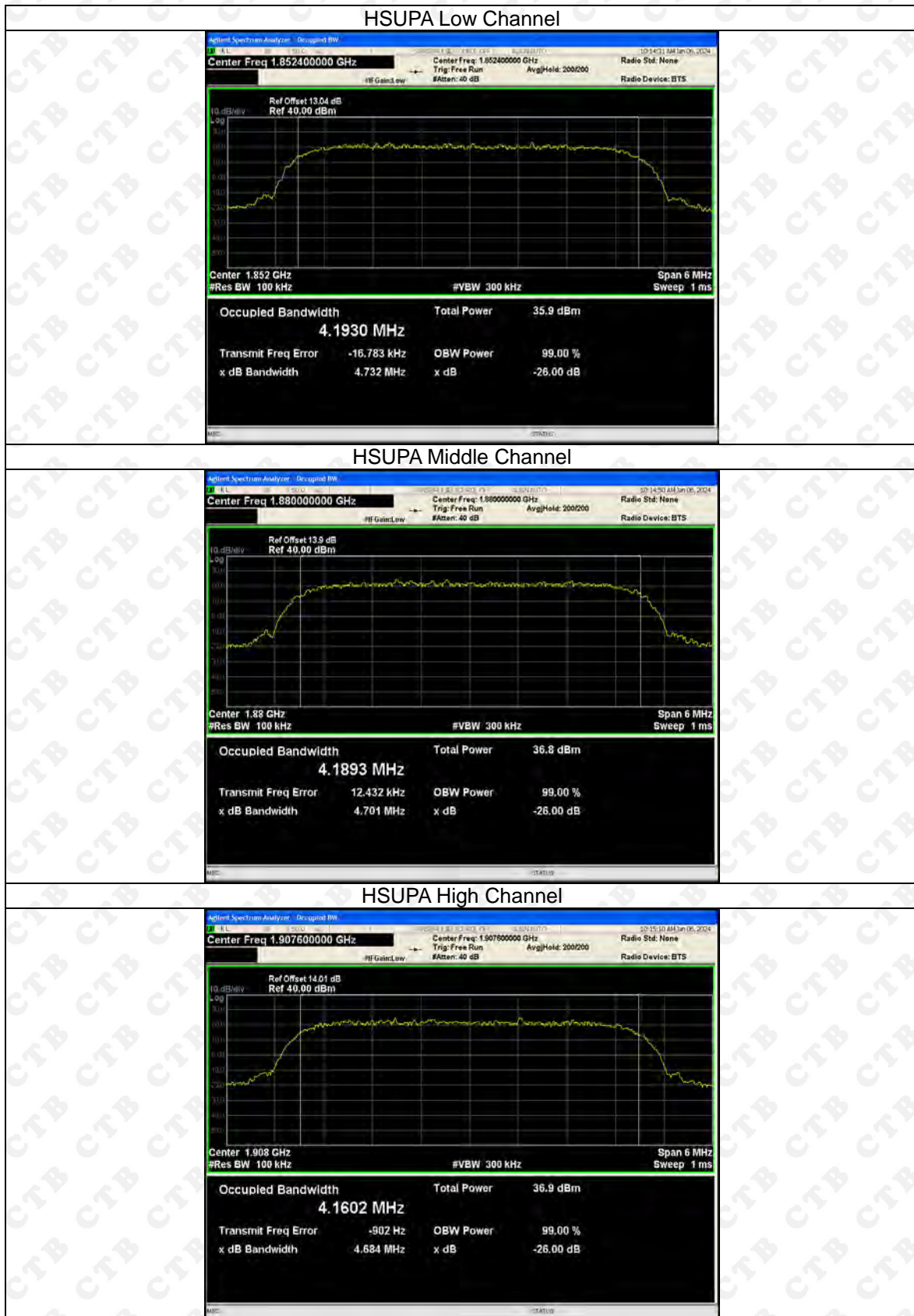
HSDPA Middle Channel



HSDPA High Channel







## 9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

### 9.1 Standard Applicable

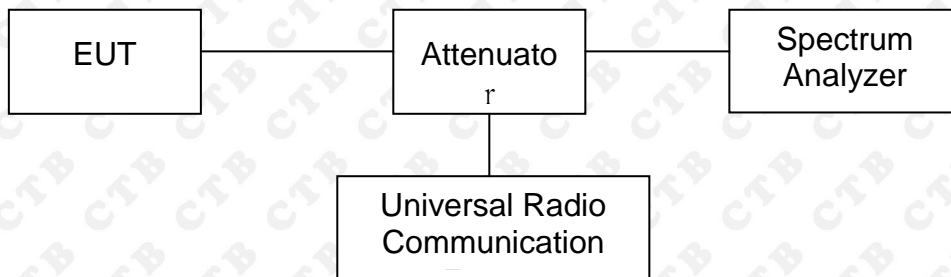
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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 10<sup>th</sup> harmonic.

Test Configuration for the out of band emissions testing:



### 9.3 Environmental Conditions

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



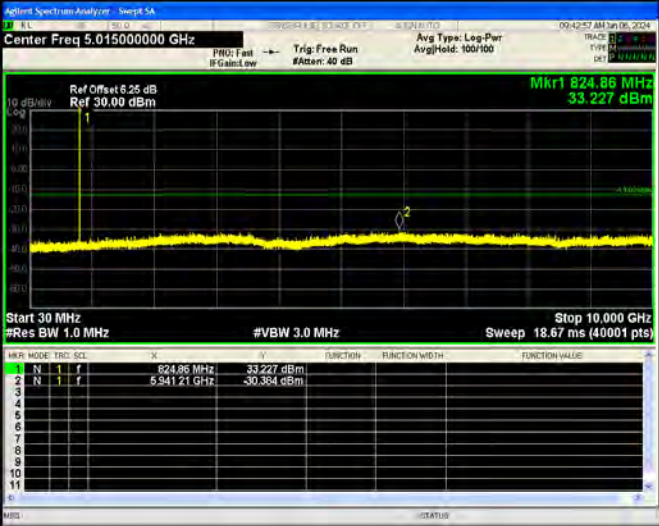
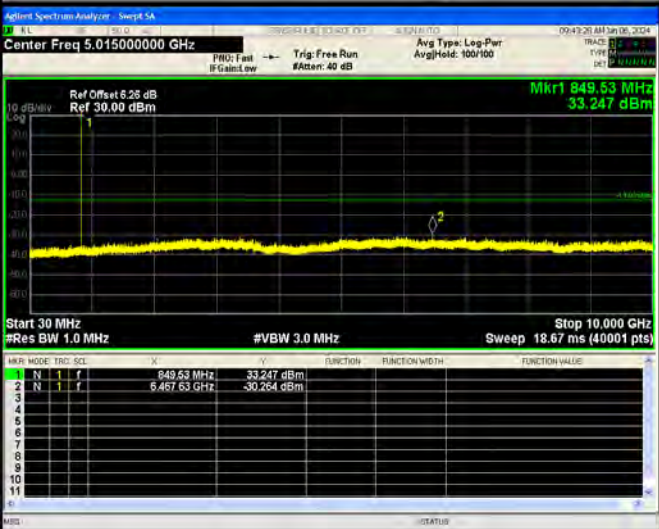
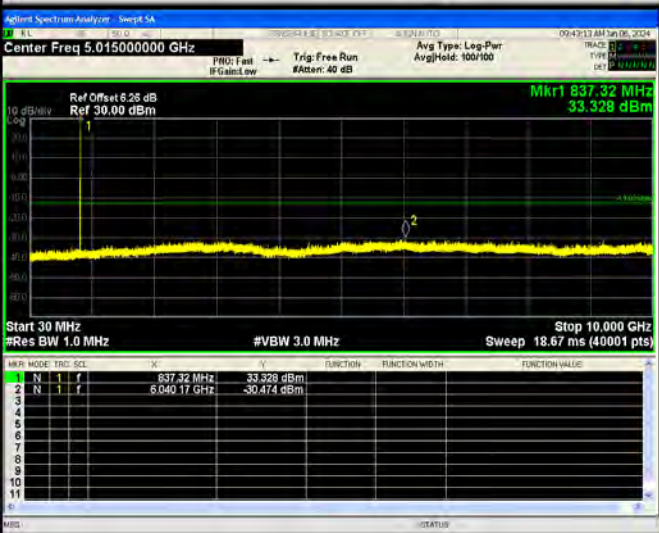
9.4 Summary of Test Results/Plots

Please refer to the following test plots  
For Cellular Band

<p>GSM Low Channel</p>	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 824.86 MHz 33.023 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>PKR</th> <th>MODE</th> <th>FREQ</th> <th>SCN</th> <th>X1</th> <th>X2</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>7</td> <td>824.86 MHz</td> <td>33.023 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>3511.52 GHz</td> <td>-31.637 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	824.86 MHz	33.023 dBm				2	N	1	7	3511.52 GHz	-31.637 dBm				
PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	7	824.86 MHz	33.023 dBm																								
2	N	1	7	3511.52 GHz	-31.637 dBm																								
<p>GSM Middle Channel</p>	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 837.07 MHz 33.126 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>PKR</th> <th>MODE</th> <th>FREQ</th> <th>SCN</th> <th>X1</th> <th>X2</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>7</td> <td>837.07 MHz</td> <td>33.126 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>3113.47 GHz</td> <td>-31.662 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	837.07 MHz	33.126 dBm				2	N	1	7	3113.47 GHz	-31.662 dBm				
PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	7	837.07 MHz	33.126 dBm																								
2	N	1	7	3113.47 GHz	-31.662 dBm																								
<p>GSM High Channel</p>	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 849.28 MHz 33.041 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>PKR</th> <th>MODE</th> <th>FREQ</th> <th>SCN</th> <th>X1</th> <th>X2</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>7</td> <td>849.28 MHz</td> <td>33.041 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>5940.47 GHz</td> <td>-31.263 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	849.28 MHz	33.041 dBm				2	N	1	7	5940.47 GHz	-31.263 dBm				
PKR	MODE	FREQ	SCN	X1	X2	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	7	849.28 MHz	33.041 dBm																								
2	N	1	7	5940.47 GHz	-31.263 dBm																								



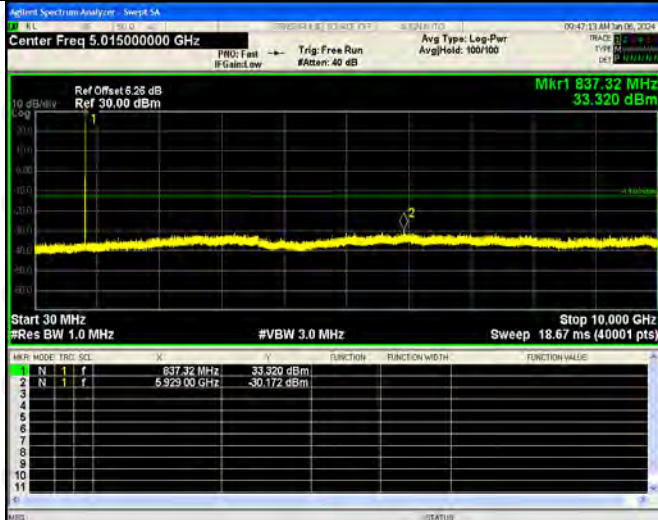
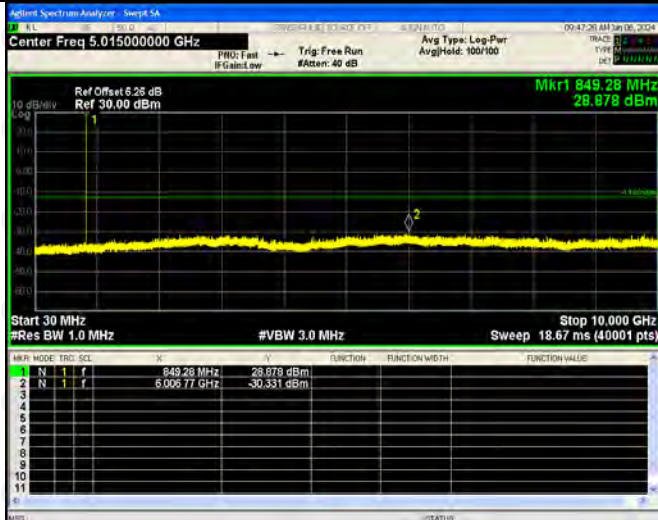
<p>GSM Low Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 824.200000 MHz PASS Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 823.994 MHz -27.783 dBm Trace 1 Pass Center 824.200 MHz #Res BW 3.0 kHz #VBW 10 kHz Span 2.000 MHz Sweep 272.3 ms (1001 pts)</p>	
<p>GSM High Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 848.800000 MHz PASS Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 849.018 MHz -24.483 dBm Trace 1 Pass Center 848.800 MHz #Res BW 3.0 kHz #VBW 10 kHz Span 2.000 MHz Sweep 272.3 ms (1001 pts)</p>	

<p>GPRS Low Channel</p>		
<p>GPRS Middle Channel</p>		
<p>GPRS High Channel</p>		



<p>GPRS Low Band Emission</p>			
<p>GPRS High Band Emission</p>			






<p>EDGE Low Channel</p>		
<p>EDGE Middle Channel</p>		
<p>EDGE High Channel</p>		

<p>EDGE Low Band Emission</p>			
<p>EDGE High Band Emission</p>			






For PCS Band

<p>GSM Low Channel</p>		
<p>GSM Middle Channel</p>		
<p>GSM High Channel</p>		






<p>GSM Low Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 1.90980000 GHz PWR: Wide #Gain: Low Trig: Free Run Avg Type: RMS Avg/Hold: 100/100 Ref Offset 13.99 dB Ref 30.00 dBm Trace 1 Pass Mkr1 1.910 018 GHz -21.613 dBm Center 1.909800 GHz Span 2,000 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 272.3 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SCN</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>7</td> <td>849.28 MHz</td> <td>28.878 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>6.006 77 GHz</td> <td>-30.331 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	849.28 MHz	28.878 dBm				2	N	1	7	6.006 77 GHz	-30.331 dBm				
MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																						
1	N	1	7	849.28 MHz	28.878 dBm																									
2	N	1	7	6.006 77 GHz	-30.331 dBm																									
<p>GSM High Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 1.85020000 GHz PWR: Wide #Gain: Low Trig: Free Run Avg Type: RMS Avg/Hold: 100/100 Ref Offset 12.94 dB Ref 30.00 dBm Trace 1 Pass Mkr1 1.849 976 GHz -24.219 dBm Center 1.850200 GHz Span 2,000 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 272.3 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SCN</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>7</td> <td>849.28 MHz</td> <td>28.878 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>6.006 77 GHz</td> <td>-30.331 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	849.28 MHz	28.878 dBm				2	N	1	7	6.006 77 GHz	-30.331 dBm				
MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																						
1	N	1	7	849.28 MHz	28.878 dBm																									
2	N	1	7	6.006 77 GHz	-30.331 dBm																									

<p>GPRS Low Channel</p>		
<p>GPRS Middle Channel</p>		
<p>GPRS High Channel</p>		



<p>GPRS Low Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 1.85020000 GHz Ref Offset 12.04 dB Ref 30.00 dBm Mkr1 1.849 978 GHz -23.698 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)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SCN</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>7</td> <td>1.910 2 GHz</td> <td>37.339 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>19.148 8 GHz</td> <td>-16.068 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	1.910 2 GHz	37.339 dBm				2	N	1	7	19.148 8 GHz	-16.068 dBm				
MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																						
1	N	1	7	1.910 2 GHz	37.339 dBm																									
2	N	1	7	19.148 8 GHz	-16.068 dBm																									
<p>GPRS High Band Emission</p>		<p>Agilent Spectrum Analyzer - Sweep SA Center Freq 1.90980000 GHz Ref Offset 13.99 dB Ref 30.00 dBm Mkr1 1.910 022 GHz -22.010 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)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SCN</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>7</td> <td>1.910 2 GHz</td> <td>37.339 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>7</td> <td>19.148 8 GHz</td> <td>-16.068 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	7	1.910 2 GHz	37.339 dBm				2	N	1	7	19.148 8 GHz	-16.068 dBm				
MKR	MODE	TRIG	SCN	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																						
1	N	1	7	1.910 2 GHz	37.339 dBm																									
2	N	1	7	19.148 8 GHz	-16.068 dBm																									



<p>EDGE Low Channel</p>		
<p>EDGE Middle Channel</p>		
<p>EDGE High Channel</p>		

<p>EDGE Low Band Emission</p>			
<p>EDGE High Band Emission</p>			

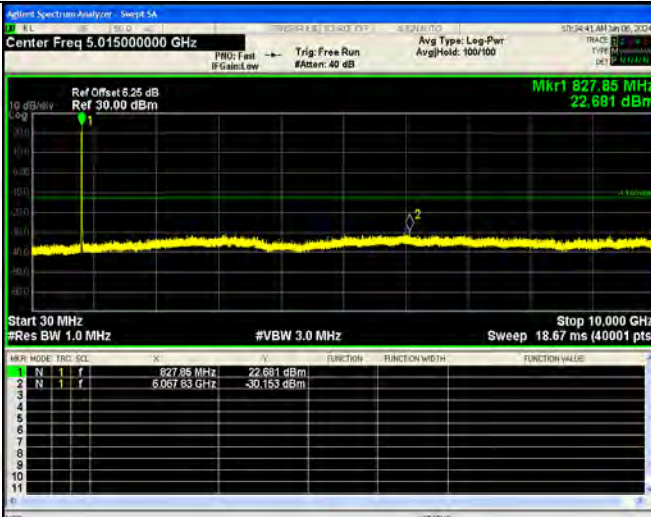
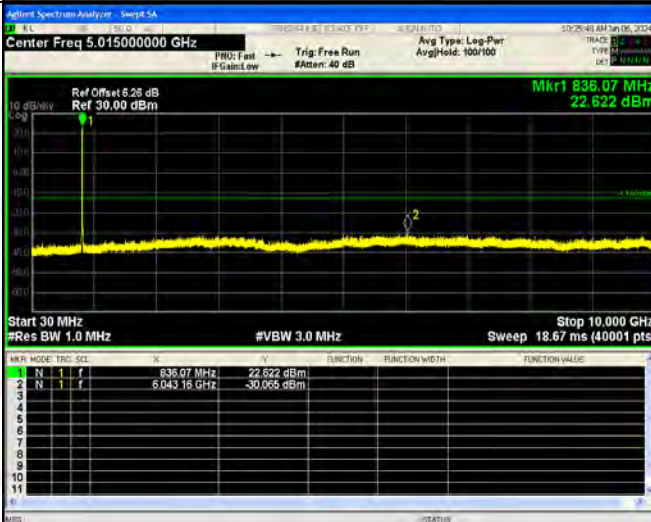
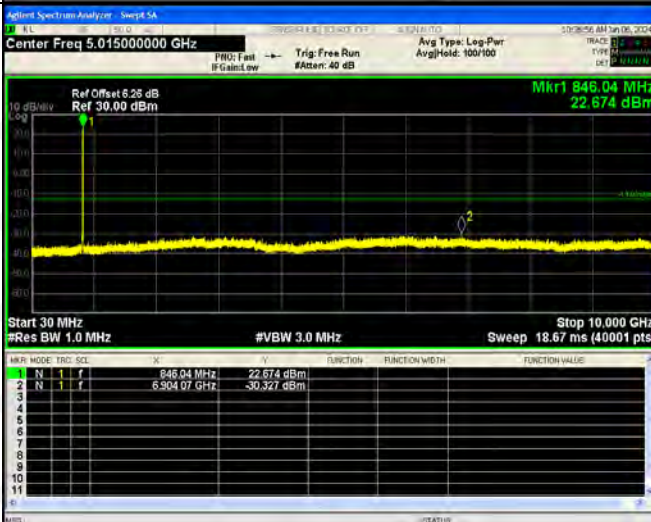


For Band V

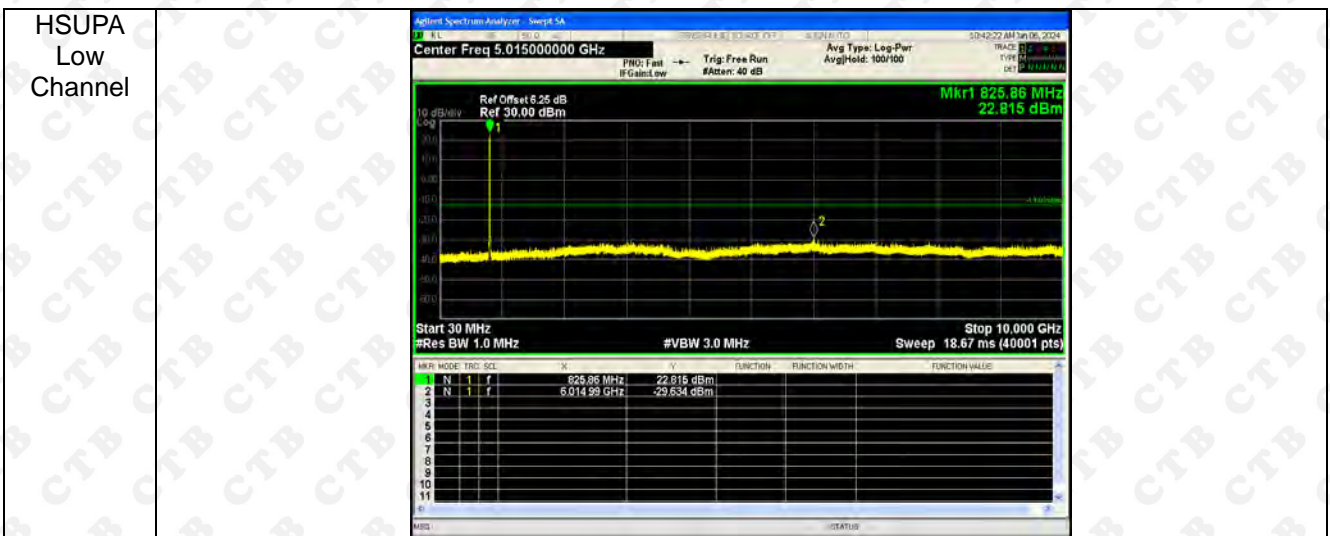
<p>WCDMA Low Channel</p>	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 5.015000000 GHz Ref Offset 6.25 dB Ref 30.00 dBm Mkr1 825.61 MHz 23.612 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>825.61 MHz</td> <td>23.612 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>6.988 07 GHz</td> <td>-30.286 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	825.61 MHz	23.612 dBm				2	N	1	f	6.988 07 GHz	-30.286 dBm				
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HSUPA  
High  
Band  
Spurious  
Emission



For Band II

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

10.3 Environmental Conditions

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



10.4 Summary of Test Results/Plots

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

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

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

For Cellular Band\_GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
42.83	-73.85	3.9	-69.95	-13	-56.95	H
1644.83	-57.52	4.83	-52.69	-13	-39.69	H
2462.68	-54.14	8.08	-46.06	-13	-33.06	H
40.21	-66.92	4.02	-62.90	-13	-49.90	V
1647.35	-48.93	4.48	-44.45	-13	-31.45	V
2464.48	-55.72	8.2	-47.52	-13	-34.52	V
Middle Channel (836.6MHz)						
39.56	-68.93	3.84	-65.09	-13	-52.09	H
1664.51	-60.40	4.62	-55.78	-13	-42.78	H
2501.36	-56.11	8.25	-47.86	-13	-34.86	H
42.43	-68.40	4.25	-64.15	-13	-51.15	V
1666.57	-46.53	4.54	-41.99	-13	-28.99	V
2501.51	-52.11	8.35	-43.76	-13	-29.75	V
High Channel (848.8MHz)						
38.25	-67.07	4.22	-71.29	-13	-58.29	H
1694.00	-52.91	4.87	-57.78	-13	-44.78	H
2536.90	-49.95	8.38	-58.33	-13	-45.33	H
43.69	-72.18	4.02	-76.20	-13	-63.20	V
1689.52	-55.62	4.56	-60.18	-13	-47.18	V
2543.47	-52.27	8.41	-60.68	-13	-47.68	V

## For PCS Band GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
42.26	-71.36	4.34	-67.02	-13	-54.02	H
3694.59	-56.55	10.54	-46.01	-13	-33.01	H
5541.04	-59.22	13.37	-45.85	-13	-32.85	H
37.23	-68.04	4.34	-63.70	-13	-50.70	V
3692.37	-53.20	10.54	-42.66	-13	-29.66	V
5548.61	-53.20	13.37	-39.83	-13	-26.83	V
Middle Channel (1880MHz)						
41.68	-71.24	4.02	-67.22	-13	-54.22	H
3755.75	-58.11	10.71	-47.40	-13	-34.40	H
5630.05	-61.09	13.73	-47.36	-13	-34.36	H
40.82	-64.94	4.14	-60.80	-13	-47.80	V
3752.55	-54.77	10.22	-44.55	-13	-31.55	V
5639.60	-57.85	13.16	-44.69	-13	-31.69	V
High Channel (1909.8MHz)						
42.74	-67.73	4.02	-63.71	-13	-50.71	H
3811.94	-60.73	4.9	-55.83	-13	-42.83	H
5729.22	-44.27	8.09	-36.18	-13	-23.18	H
37.95	-62.26	4.25	-58.01	-13	-45.01	V
3819.23	-63.94	4.93	-59.01	-13	-46.01	V
5727.68	-62.59	8.43	-54.16	-13	-41.16	V



For Band 5 Mode

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

## For Band 2 Mode

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

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



**11. FREQUENCY STABILITY**

11.1 Standard Applicable

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Cellular Band

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

According to §27.54 The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

11.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

11.3 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	101kPa

## 11.4 Summary of Test Results/Plots

## For Cellular Band GSM Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	8.71	0.01041
40	NV	9.63	0.01151
30	NV	8.94	0.01069
20	NV	9.16	0.01095
10	NV	10.11	0.01208
0	NV	10.27	0.01227
-10	NV	9.95	0.01189
-20	NV	11.02	0.01318
-30	NV	11.06	0.01321

## For PCS Band GSM Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	12.53	0.00666
40	NV	12.63	0.00672
30	NV	12.39	0.00659
20	NV	12.62	0.00671
10	NV	13.31	0.00708
0	NV	13.70	0.00729
-10	NV	13.89	0.00739
-20	NV	14.29	0.00760
-30	NV	14.35	0.00763



## For Cellular Band GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.24	0.01104
40	NV	8.97	0.01072
30	NV	9.06	0.01083
20	NV	9.35	0.01118
10	NV	9.95	0.01190
0	NV	10.05	0.01201
-10	NV	10.42	0.01246
-20	NV	10.51	0.01257
-30	NV	11.07	0.01324

## For PCS Band GPRS Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	12.25	0.00651
40	NV	12.99	0.00691
30	NV	12.41	0.00660
20	NV	12.42	0.00661
10	NV	13.59	0.00723
0	NV	13.72	0.00730
-10	NV	14.34	0.00763
-20	NV	14.43	0.00767
-30	NV	14.26	0.00759

## For Cellular Band EDGE Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	11.23	0.01342
40	NV	11.87	0.01419
30	NV	11.93	0.01426
20	NV	12.14	0.01451
10	NV	11.66	0.01394
0	NV	12.07	0.01443
-10	NV	11.69	0.01398
-20	NV	12.49	0.01493
-30	NV	13.28	0.01587

## For PCS Band EDGE Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-10.77	-0.00573
40	NV	-9.97	-0.00530
30	NV	-9.41	-0.00501
20	NV	-9.71	-0.00517
10	NV	-9.38	-0.00499
0	NV	-8.79	-0.00467
-10	NV	-9.03	-0.00480
-20	NV	-7.79	-0.00414
-30	NV	-7.84	-0.00417



## For WCDMA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.40	0.00048
40	NV	-0.25	-0.00029
30	NV	0.20	0.00024
20	NV	0.45	0.00053
10	NV	1.21	0.00144
0	NV	0.64	0.00076
-10	NV	1.26	0.00150
-20	NV	0.78	0.00093
-30	NV	1.27	0.00152

## For WCDMA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.21	0.00025
40	NV	0.20	0.00024
30	NV	0.59	0.00071
20	NV	0.78	0.00093
10	NV	0.42	0.00050
0	NV	0.92	0.00109
-10	NV	0.91	0.00109
-20	NV	1.72	0.00206
-30	NV	1.85	0.00221

## For HSDPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.35	-0.00042
40	NV	-0.15	-0.00018
30	NV	0.72	0.00086
20	NV	-0.10	-0.00012
10	NV	0.50	0.00060
0	NV	1.06	0.00126
-10	NV	0.93	0.00111
-20	NV	1.46	0.00175
-30	NV	1.40	0.00167

## For HSDPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	5.08	0.00608
40	NV	4.76	0.00569
30	NV	5.56	0.00664
20	NV	5.98	0.00715
10	NV	6.16	0.00736
0	NV	6.26	0.00749
-10	NV	6.64	0.00794
-20	NV	6.40	0.00765
-30	NV	7.23	0.00864



## For HSUPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.81	0.00097
40	NV	0.59	0.00071
30	NV	1.28	0.00153
20	NV	1.34	0.00160
10	NV	0.85	0.00101
0	NV	2.06	0.00247
-10	NV	1.35	0.00161
-20	NV	2.49	0.00297
-30	NV	1.98	0.00237

## For HSUPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	6.57	0.00785
40	NV	7.02	0.00839
30	NV	7.39	0.00883
20	NV	7.51	0.00898
10	NV	7.15	0.00855
0	NV	8.26	0.00987
-10	NV	8.04	0.00960
-20	NV	8.05	0.00963
-30	NV	9.07	0.01084

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): GSM 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	11.16	0.01334
	NV	11.75	0.01405
	HV	11.14	0.01332
Reference Frequency(Middle Channel): GSM 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	14.50	0.00771
	NV	14.21	0.00756
	HV	14.59	0.00776



Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	11.15	0.01332
	NV	11.44	0.01367
	HV	11.48	0.01373
Reference Frequency(Middle Channel): GPRS 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	14.41	0.00766
	NV	14.30	0.00760
	HV	14.72	0.00783

Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	13.23	0.01581
	NV	12.99	0.01552
	HV	13.04	0.01559
Reference Frequency(Middle Channel): EDGE 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	-7.89	-0.00943
	NV	-7.21	-0.00862
	HV	-7.58	-0.00906
Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	0.88	0.00105
	NV	1.48	0.00177
	HV	1.52	0.00182
Reference Frequency(Middle Channel): WCDMA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.19	0.00262
	NV	1.81	0.00216
	HV	2.01	0.00240
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.67	0.00319
	NV	3.00	0.00359
	HV	3.47	0.00414



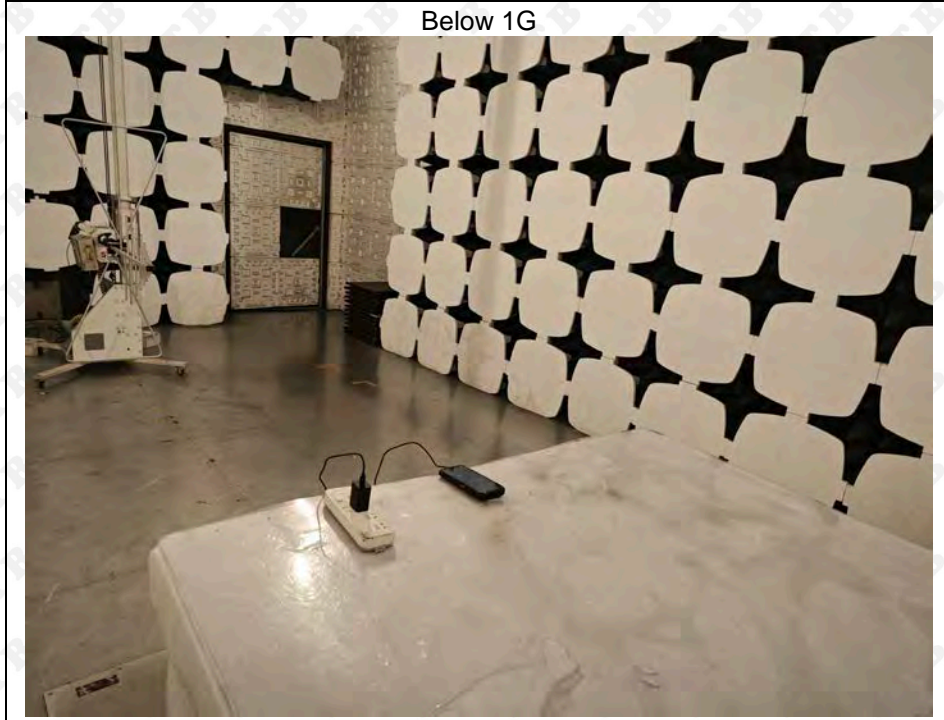
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.12	0.00254
	NV	1.89	0.00226
	HV	1.93	0.00231
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.78	0.00213
	NV	1.43	0.00171
	HV	1.99	0.00238
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	6.90	0.00825
	NV	7.02	0.00840
	HV	7.55	0.00903
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.35	0.00281
	NV	3.33	0.00398
	HV	3.27	0.00391
Reference Frequency(Middle Channel): HSUPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	6.60	0.00788
	NV	6.99	0.00835
	HV	7.63	0.00912

Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	8.44	0.01009
	NV	9.01	0.01077
	HV	8.91	0.01064



## 12. EUT TEST PHOTO

### Radiated Emission



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