

# TEST REPORT

Product Name: Tablet PC  
FCC ID: 2AT2F-ML1009P  
Trademark: POWER KNOWLEDGE  
Model Number: ML1009P  
Prepared For: ShenzhenAdreamerEliteCo.,Ltd.  
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Manufacturer: ShenzhenAdreamerEliteCo.,Ltd.  
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Sample Received Date: Mar. 06, 2023  
Sample tested Date: Mar. 06, 2023 to Mar. 16, 2023  
Issue Date: Mar. 16, 2023  
Report No.: CTB230316003RFX  
Test Standards: FCC Part 22H & 24E  
Test Results: PASS  
Remark: This is GSM radio test report.

Compiled by:

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Reviewed by:

Arron Liu

Approved by:

Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "\*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
CTB230316003RFX	Mar. 16, 2023	Original	Valid

**2. TEST SUMMARY**

The Product has been tested according to the following specifications:

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

### 3. MEASUREMENT UNCERTAINTY

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

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m 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): ML1009P

Model Description: N/A

Hardware Version: E30A\_V2.0X

Software Version: ML1009P\_E863D\_KidsPad10\_V1.0

Operation Frequency: GSM/GPRS/EDGE 850: 824~849MHz  
 GSM/GPRS/EDGE 1900: 1850~1910MHz  
 WCDMA Band 2: 1850~1910MHz

Max. RF output power: GSM850: 32.30dBm,  
 GSM1900: 27.93dBm  
 EDGR850: 32.31dBm,  
 EDGE1900: 27.94dBm  
 WCDMA Band 2: 22.01dBm,

Type of Modulation: GMSK, BPSK

Antenna installation: FPC antenna

Antenna Gain: GSM850: -0.02dBi,  
 GSM1900: 3.86dBi  
 WCDMA Band 2: 3.86dBi

Ratings: Input: DC 5V --- 2A  
 DC 3.8V 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
/	Adapter	JIYIN	JY-05100C	/	/

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 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 2	Low, Middle, High Channels
TM8	HSDPA Band 2	Low, Middle, High Channels
TM9	HSUPA Band 2	Low, Middle, High Channels

#### 4.6 Test Environment

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

## 5. TEST FACILITY AND TEST INSTRUMENT USED

### 5.1 Test Facility

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

### 5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Microwave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22





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

## 6. RF OUTPUT POWER

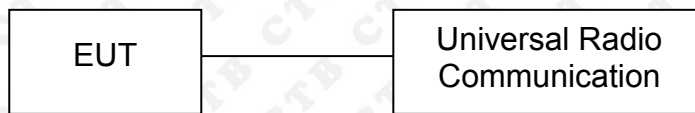
### 6.1 Standard Applicable

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

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

### 6.2 Test Procedure

Conducted output power test method:



Radiated power test method:

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

### 6.3 Environmental Conditions

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

## 6.4 Summary of Test Results/Plots

**Max. Radiated Power**

## ERP For 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	32.30	1.5	0	H	1.5	-0.02	30.78	38.45
824.2	29.53	1.5	0	V	1.5	-0.02	28.01	38.45
Middle Channel								
836.6	32.17	1.5	0	H	1.5	-0.02	30.65	38.45
836.6	29.76	1.5	0	V	1.5	-0.02	28.24	38.45
High Channel								
848.8	31.91	1.5	0	H	1.5	-0.02	30.39	38.45
848.8	29.40	1.5	0	V	1.5	-0.02	27.88	38.45

## EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	27.55	1.5	0	H	1.9	3.86	29.51	33.00
1850.2	27.31	1.5	0	V	1.9	3.86	29.27	33.00
Middle Channel								
1880	27.12	1.5	0	H	1.9	3.86	29.08	33.00
1880	27.93	1.5	0	V	1.9	3.86	29.89	33.00
High Channel								
1909.8	26.98	1.5	0	H	1.9	3.86	28.94	33.00
1909.8	27.59	1.5	0	V	1.9	3.86	29.55	33.00



## ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	25.07	1.5	0	H	1.5	-0.02	23.55	38.45
824.2	25.49	1.5	0	V	1.5	-0.02	23.97	38.45
Middle Channel								
836.6	25.78	1.5	0	H	1.5	-0.02	24.26	38.45
836.6	26.03	1.5	0	V	1.5	-0.02	24.51	38.45
High Channel								
848.8	25.34	1.5	0	H	1.5	-0.02	23.82	38.45
848.8	25.58	1.5	0	V	1.5	-0.02	24.06	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	25.73	1.5	0	H	1.9	3.86	27.69	33.00
1850.2	25.45	1.5	0	V	1.9	3.86	27.41	33.00
Middle Channel								
1880	25.37	1.5	0	H	1.9	3.86	27.33	33.00
1880	25.29	1.5	0	V	1.9	3.86	27.25	33.00
High Channel								
1909.8	25.51	1.5	0	H	1.9	3.86	27.47	33.00
1909.8	25.8	1.5	0	V	1.9	3.86	27.76	33.00



## ERP For EDGE Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	32.3	1.5	0	H	1.5	-0.02	30.78	38.45
824.2	30.46	1.5	0	V	1.5	-0.02	28.94	38.45
Middle Channel								
836.6	32.31	1.5	0	H	1.5	-0.02	30.79	38.45
836.6	30.33	1.5	0	V	1.5	-0.02	28.81	38.45
High Channel								
848.8	32.17	1.5	0	H	1.5	-0.02	30.65	38.45
848.8	30.06	1.5	0	V	1.5	-0.02	28.54	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	27.93	1.5	0	H	1.9	3.86	29.89	33.00
1850.2	25.78	1.5	0	V	1.9	3.86	27.74	33.00
Middle Channel								
1880	27.94	1.5	0	H	1.9	3.86	29.90	33.00
1880	25.52	1.5	0	V	1.9	3.86	27.48	33.00
High Channel								
1909.8	27.74	1.5	0	H	1.9	3.86	29.70	33.00
1909.8	25.18	1.5	0	V	1.9	3.86	27.14	33.00

## EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	21.44	1.5	0	H	1.9	3.86	23.40	33
1852.4	19.44	1.5	0	V	1.9	3.86	21.40	33
Middle Channel								
1880	21.46	1.5	0	H	1.9	3.86	23.42	33
1880	20.48	1.5	0	V	1.9	3.86	22.44	33
High Channel								
1907.6	21.34	1.5	0	H	1.9	3.86	23.30	33
1907.6	19.27	1.5	0	V	1.9	3.86	21.23	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	21.33	1.5	0	H	1.9	3.86	23.29	33
1852.4	21.07	1.5	0	V	1.9	3.86	23.03	33
Middle Channel								
1880	22.01	1.5	0	H	1.9	3.86	23.97	33
1880	21.63	1.5	0	V	1.9	3.86	23.59	33
High Channel								
1907.6	21.68	1.5	0	H	1.9	3.86	23.64	33
1907.6	21.41	1.5	0	V	1.9	3.86	23.37	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	21.83	1.5	0	H	1.9	3.86	23.64	33
1852.4	19.11	1.5	0	V	1.9	3.86	23.37	33
Middle Channel								
1880	21.38	1.5	0	H	1.9	3.86	23.34	33
1880	19.09	1.5	0	V	1.9	3.86	21.05	33
High Channel								
1907.6	20.73	1.5	0	H	1.9	3.86	22.69	33
1907.6	19.82	1.5	0	V	1.9	3.86	21.78	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	32.30	38.45
	Middle Channel	836.6	32.17	38.45
	High Channel	848.8	31.91	38.45
GPRS(1 Slot)	Low Channel	824.2	25.49	38.45
	Middle Channel	836.6	26.03	38.45
	High Channel	848.8	25.58	38.45
EDGE(1 Slot)	Low Channel	824.2	32.30	38.45
	Middle Channel	836.6	32.31	38.45
	High Channel	848.8	32.17	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	27.55	33.0
	Middle Channel	1880.0	27.93	33.0
	High Channel	1909.8	27.59	33.0
GPRS(1 Slot)	Low Channel	1850.2	25.73	33.0
	Middle Channel	1880.0	25.37	33.0
	High Channel	1909.8	25.8	33.0
EDGE(1 Slot)	Low Channel	1850.2	27.93	33.0
	Middle Channel	1880.0	27.94	33.0
	High Channel	1909.8	27.74	33.0



For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	21.44	33.00
	Middle Channel	1880.0	21.46	33.00
	High Channel	1907.6	21.34	33.00
HSDPA	Low Channel	1852.4	21.33	33.00
	Middle Channel	1880.0	22.01	33.00
	High Channel	1907.6	21.68	33.00
HSUPA	Low Channel	1852.4	21.83	33.00
	Middle Channel	1880.0	21.38	33.00
	High Channel	1907.6	20.73	33.00



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

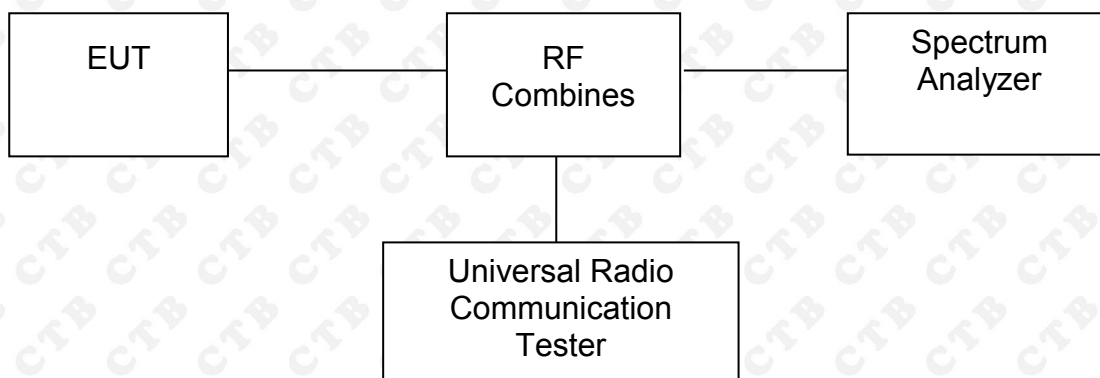
### 7.1 Standard Applicable

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	2.66	13
GPRS(1 Slot)	190	836.6	2.69	13
EDGE(1 Slot)	190	836.6	9.18	13

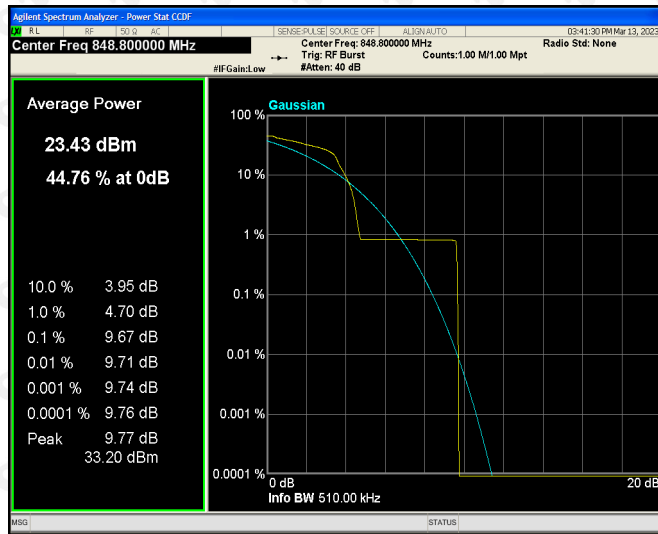
For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.67	13
GPRS(1 Slot)	512	1850.2	2.69	13
EDGE(1 Slot)	512	1850.2	5.38	13

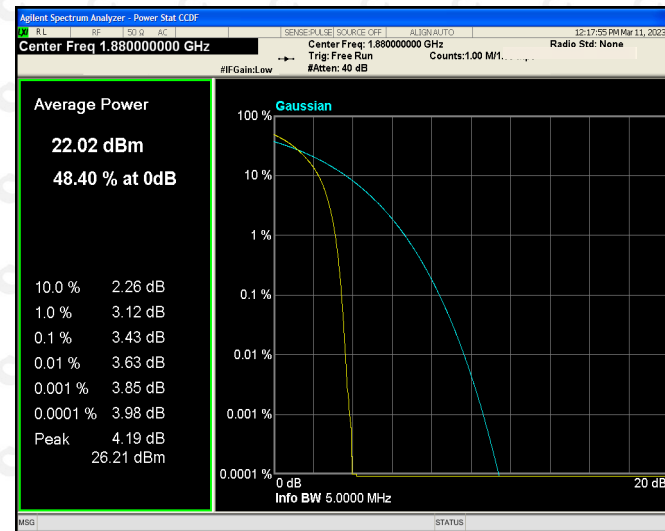
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	2.97	13
HSDPA	9400	1852.4	2.97	13
HSUPA	9400	1852.4	3.43	13

GSM :



WCDMA:



## 8. EMISSION BANDWIDTH

### 8.1 Standard Applicable

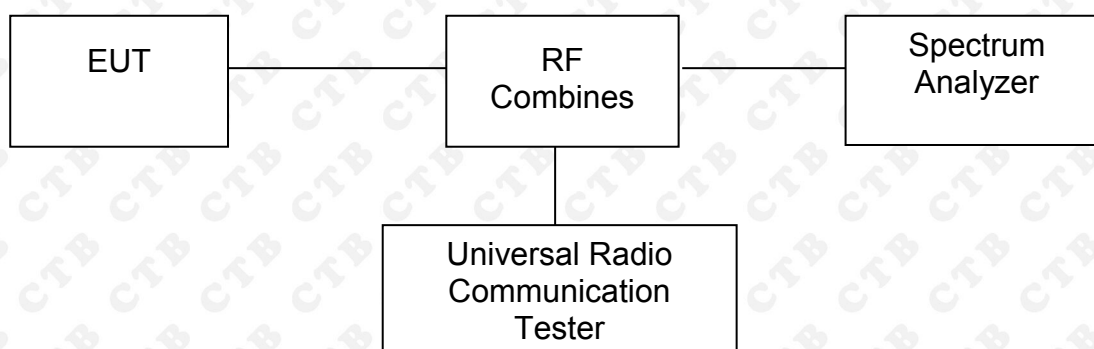
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	248.277	319.481
	190	836.6	241.430	311.664
	251	848.8	245.961	302.340
GPRS	128	824.2	245.941	313.562
	190	836.6	241.632	315.414
	251	848.8	246.602	314.079
EDGE	128	824.2	233.987	292.117
	190	836.6	258.912	319.102
	251	848.8	240.513	280.793

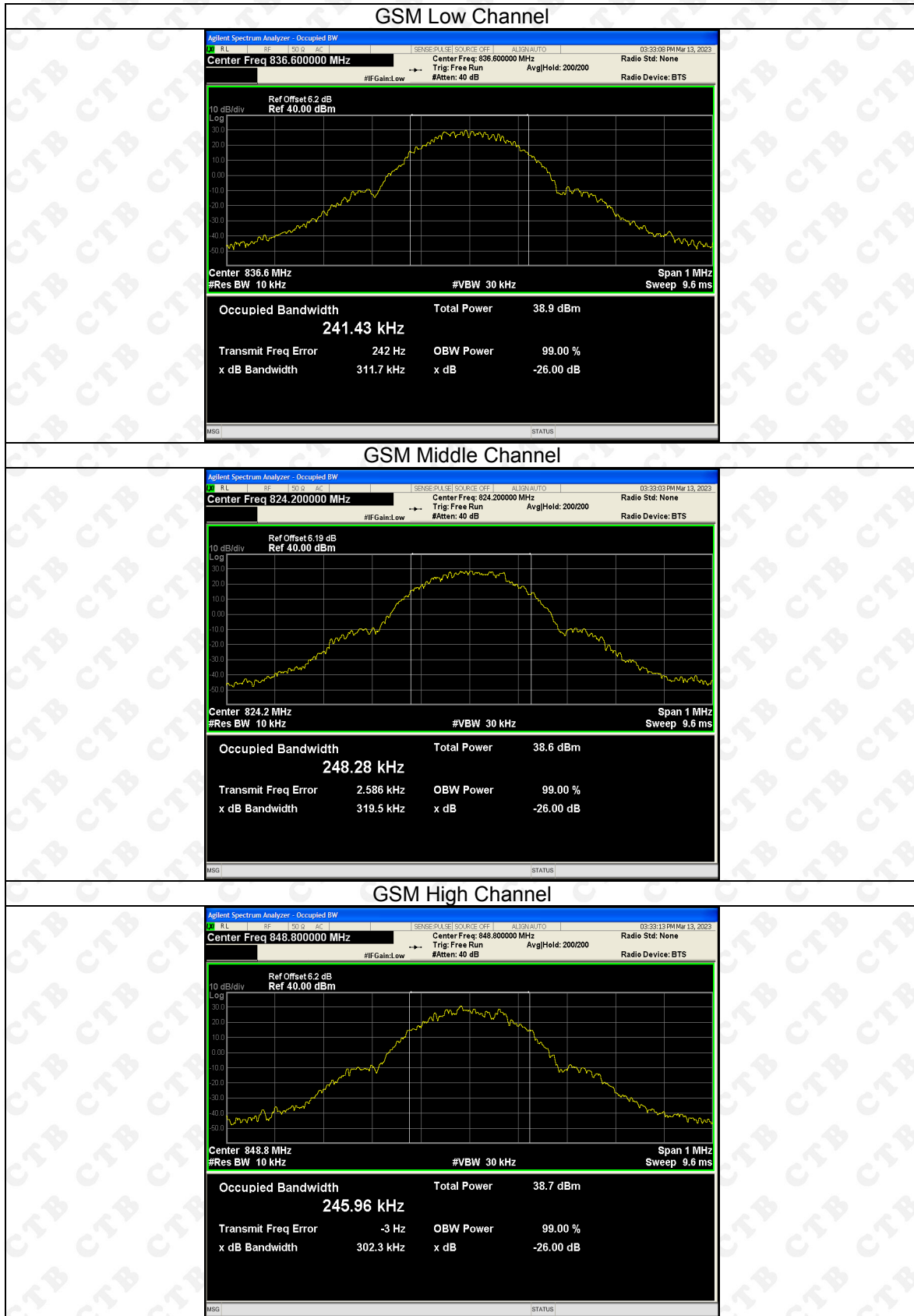
For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	245.345	317.553
	661	1880.0	243.972	312.835
	810	1909.8	243.162	313.674
GPRS	512	1850.2	236.237	303.579
	661	1880.0	243.189	303.274
	810	1909.8	242.510	312.162
EDGE	512	1850.2	242.410	302.900
	661	1880.0	245.897	318.175
	810	1909.8	250.953	311.201

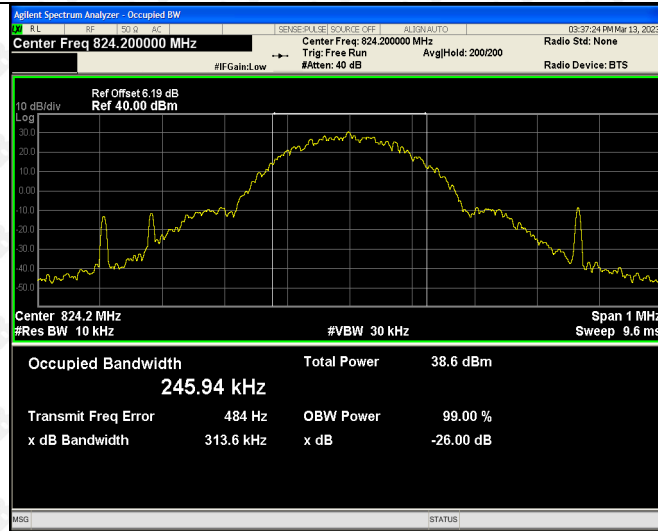
For Band 2

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	9262	1852.4	4155.284	4695.029
	9400	1880.0	4138.200	4658.333
	9538	1907.6	4177.827	4683.479
HSDPA	9262	1852.4	4149.164	4667.940
	9400	1880.0	4172.618	4651.730
	9538	1907.6	4147.798	4682.776
HSUPA	9262	1852.4	4142.459	4681.917
	9400	1880.0	4146.157	4637.643
	9538	1907.6	4147.929	4678.473

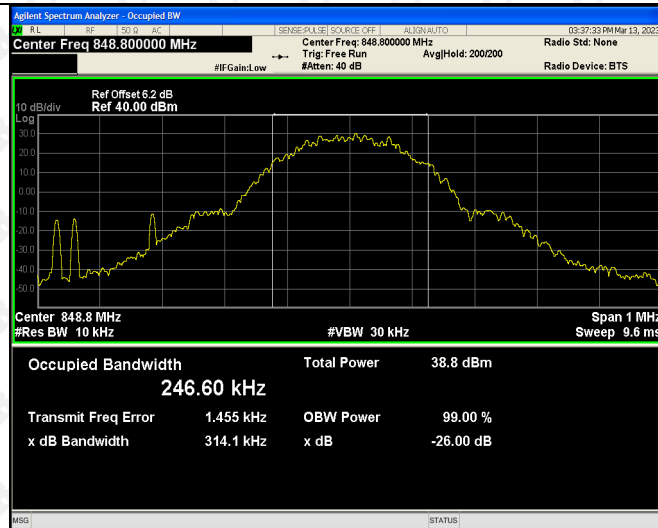
For Cellular Band



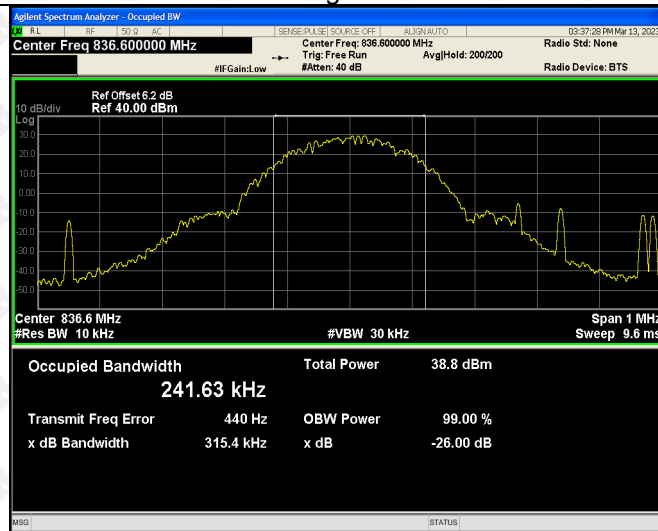
### GPRS Low Channel



### GPRS Middle Channel

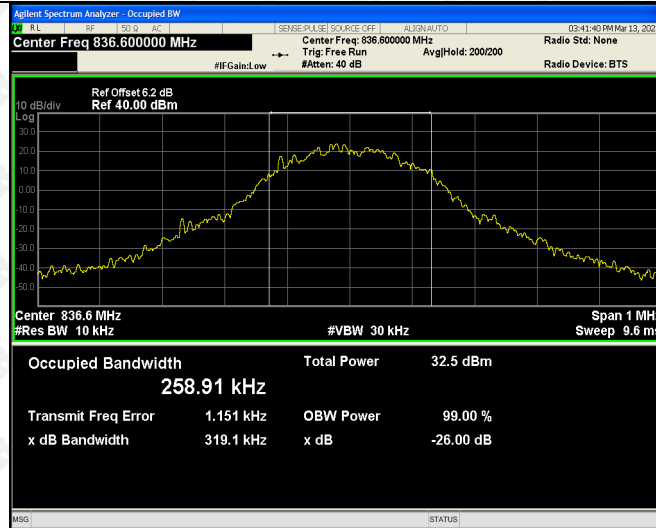


### GPRS High Channel

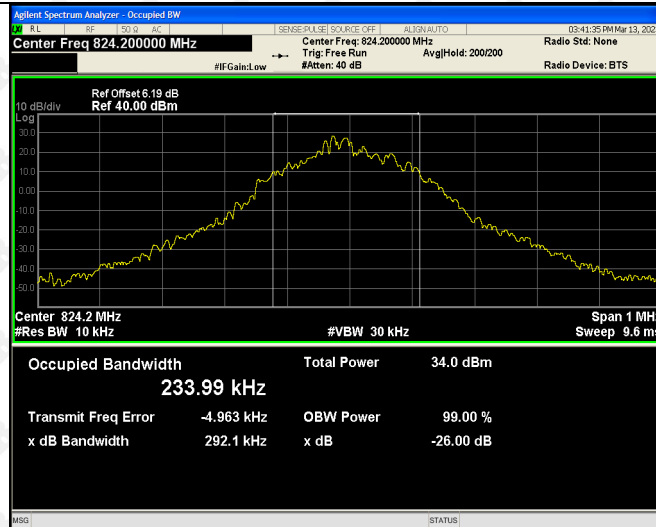




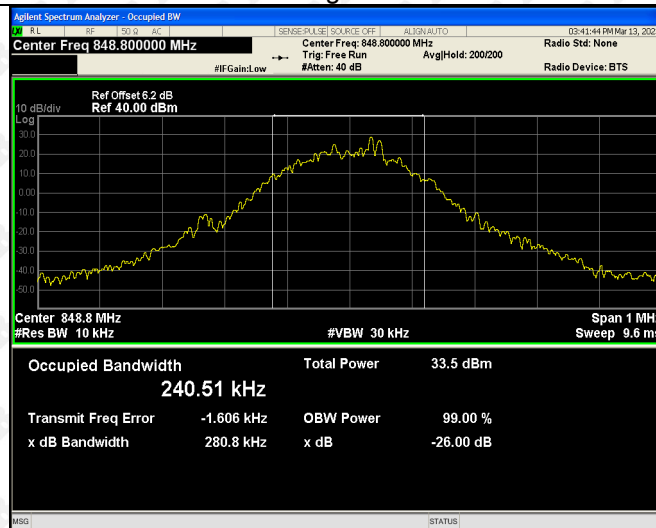
## EDGE Low Channel



## EDGE Middle Channel



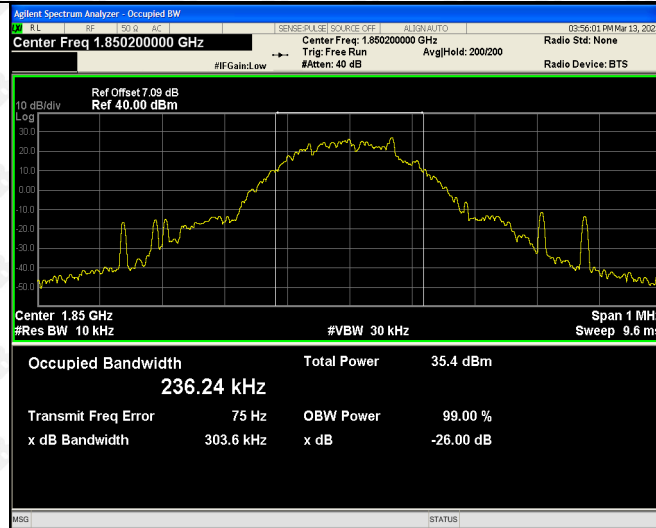
## EDGE High Channel



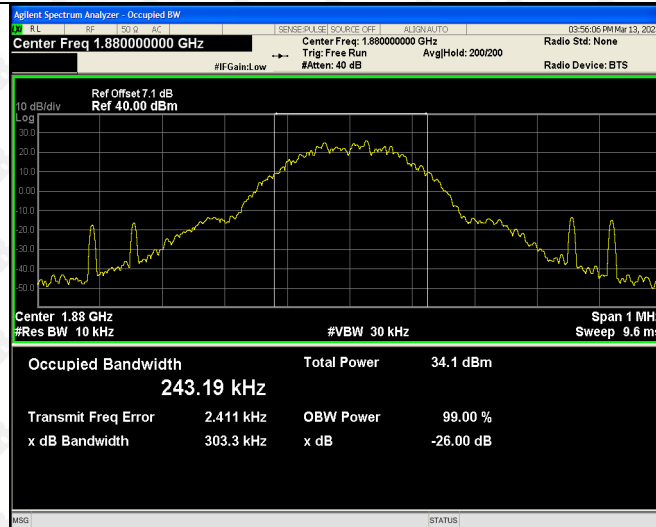
For PCS Band



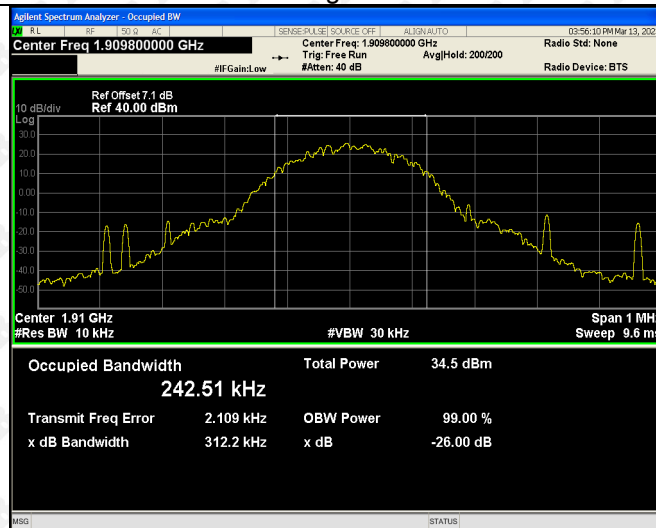
## GPRS Low Channel



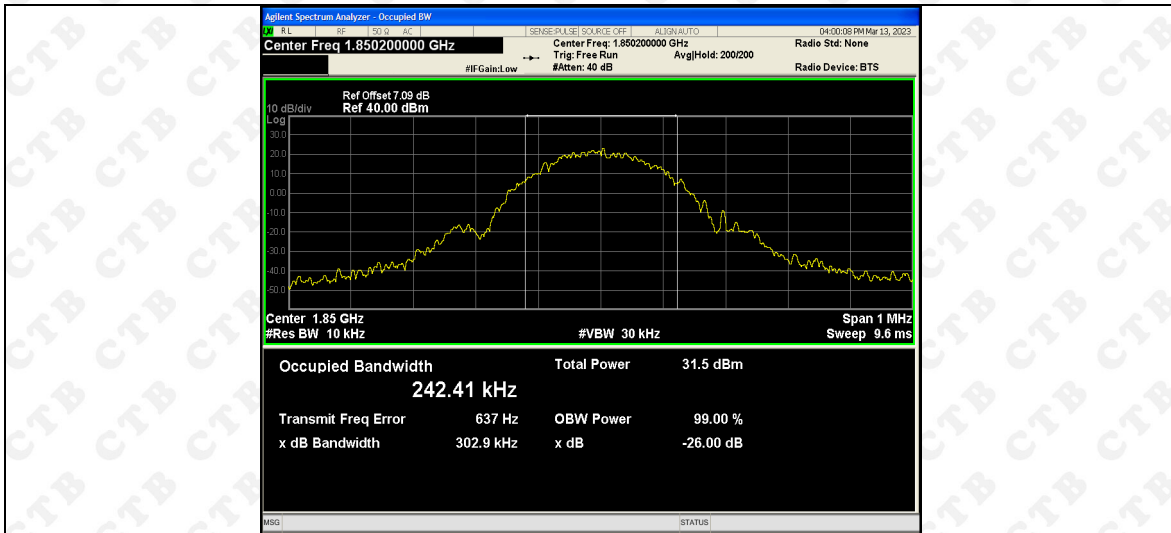
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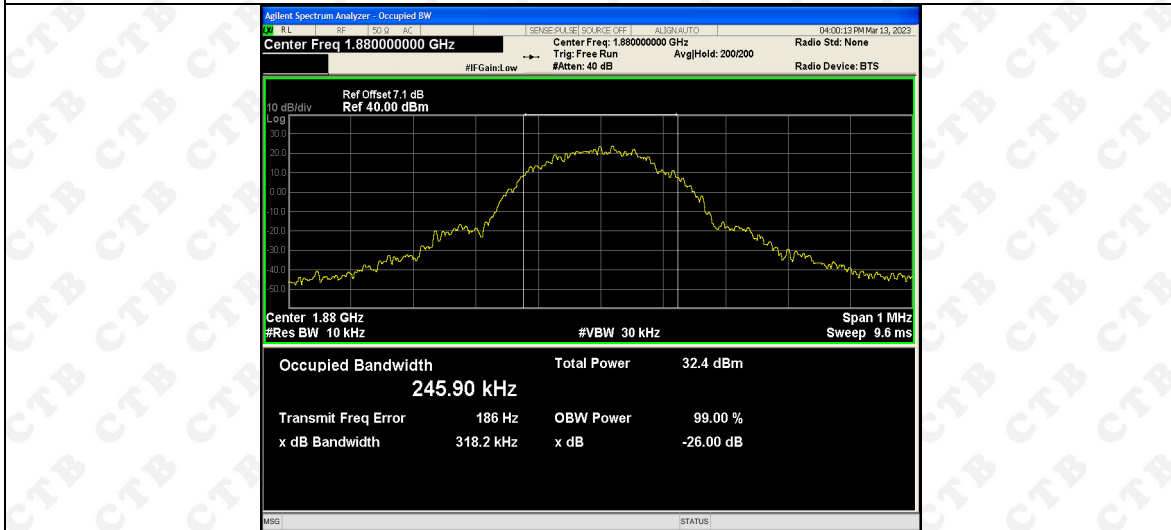
## GPRS High Channel



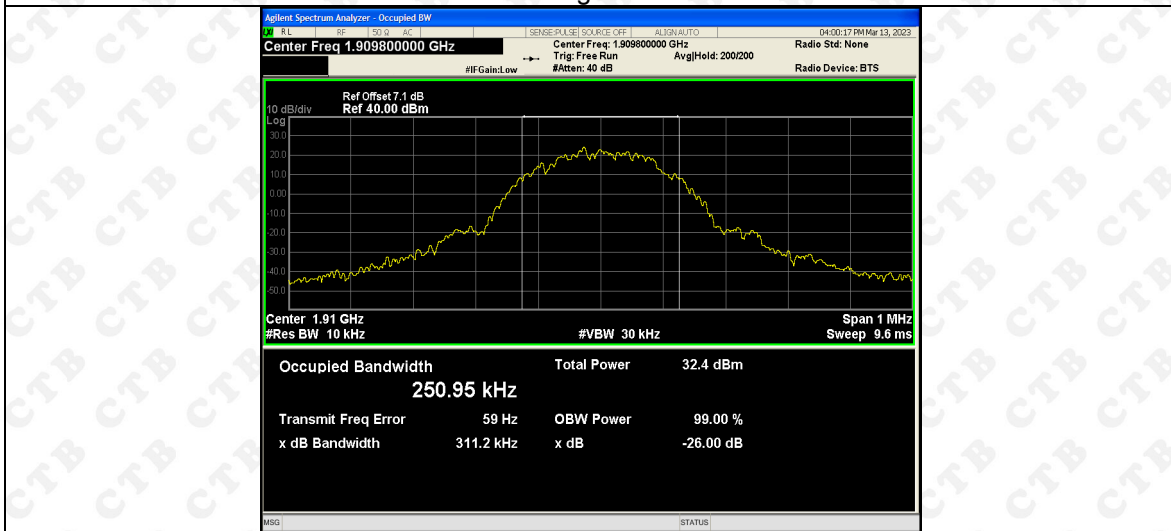
## EDGE Low Channel



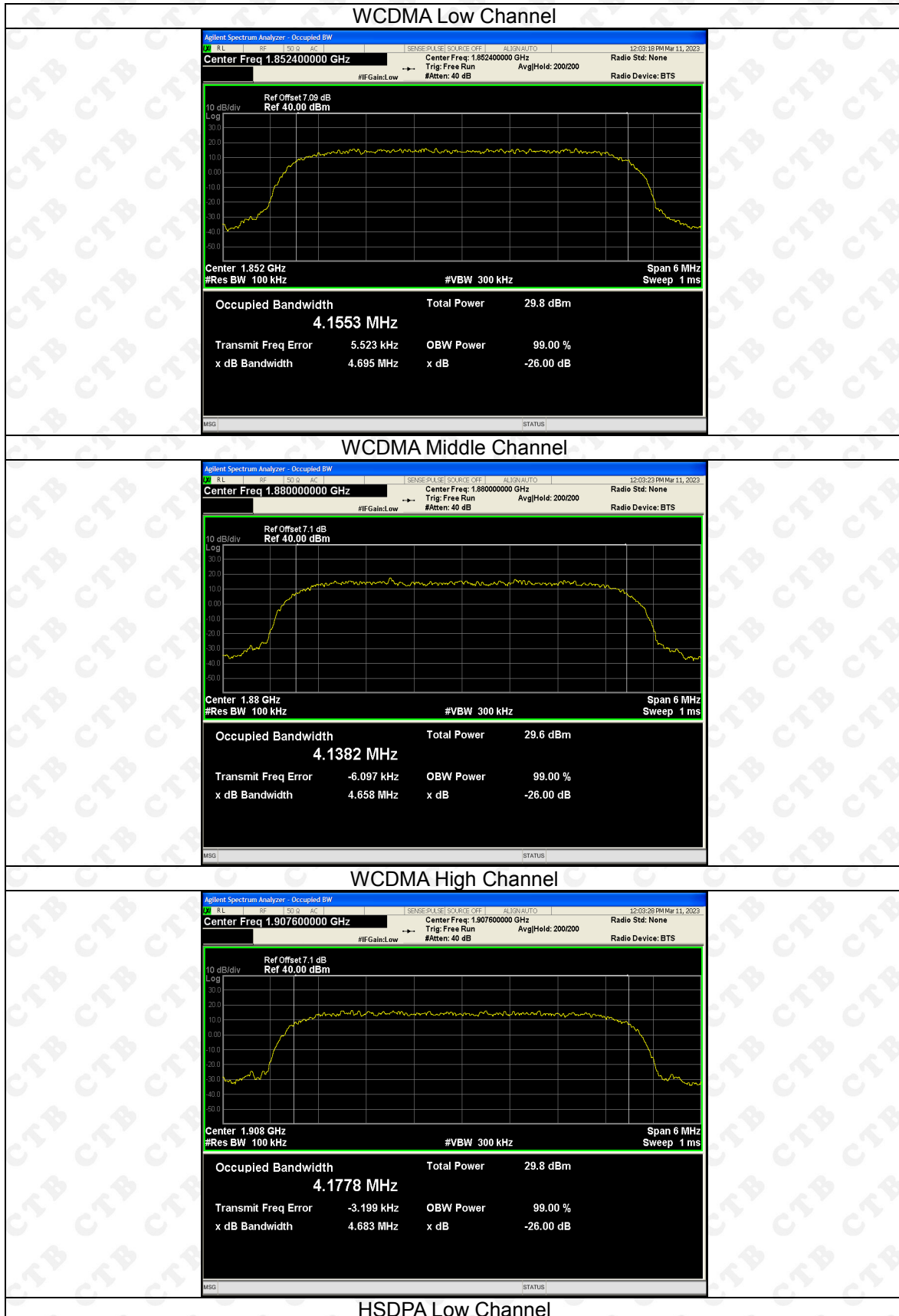
EDGE Middle Channel

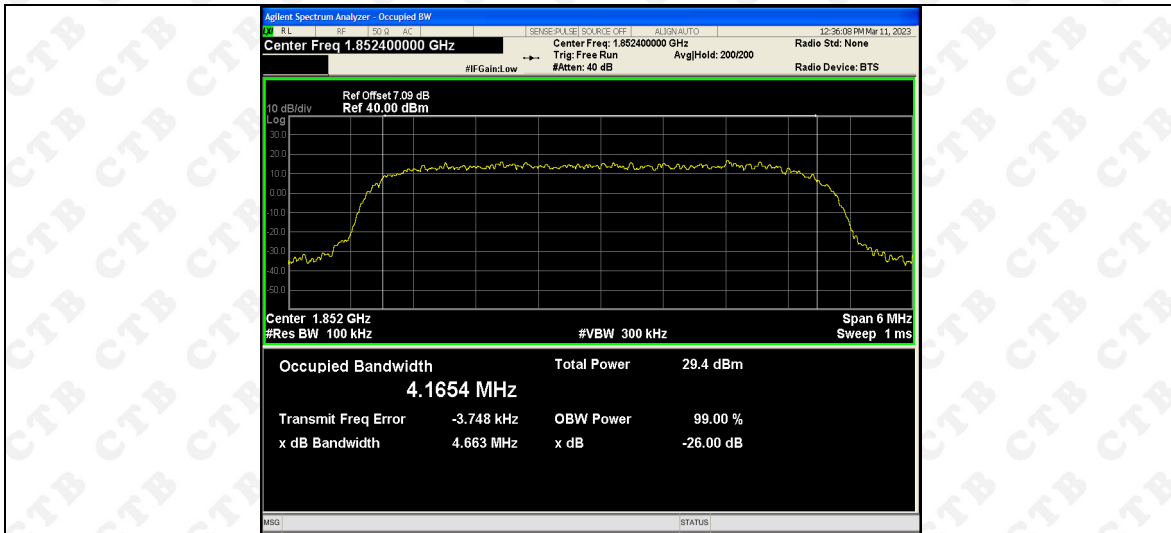


EDGE High Channel

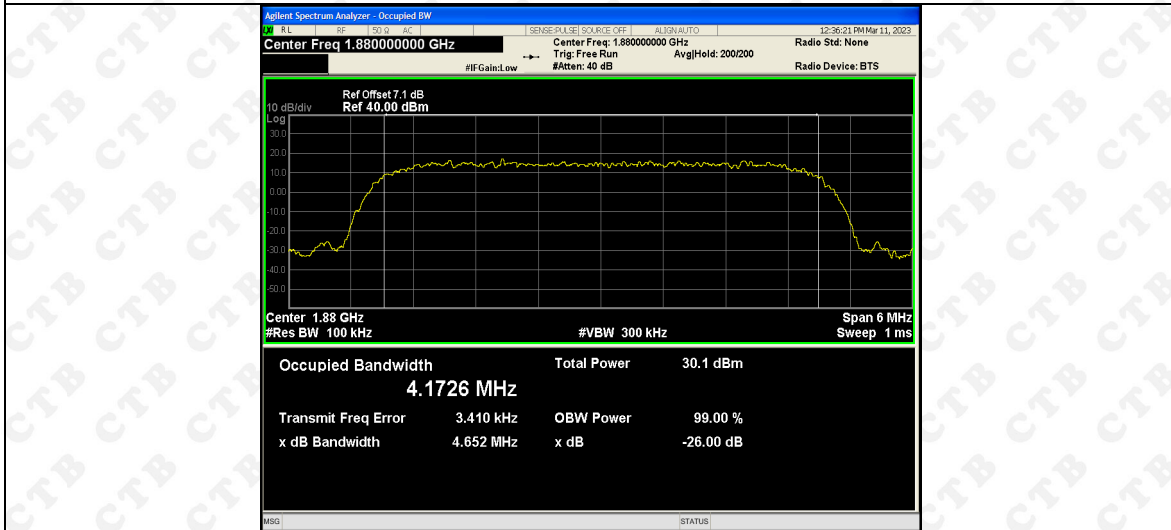


For Band II

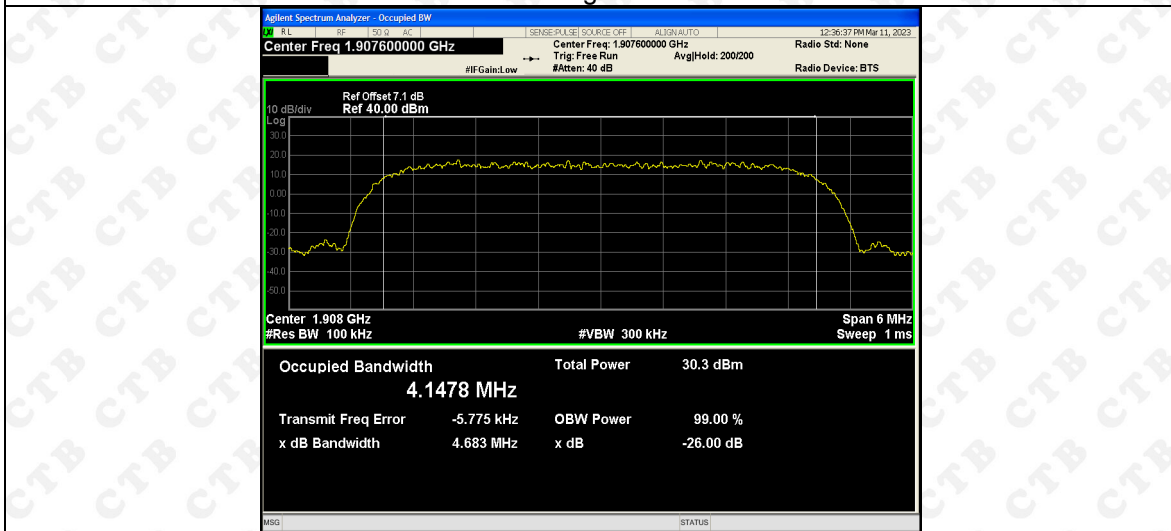




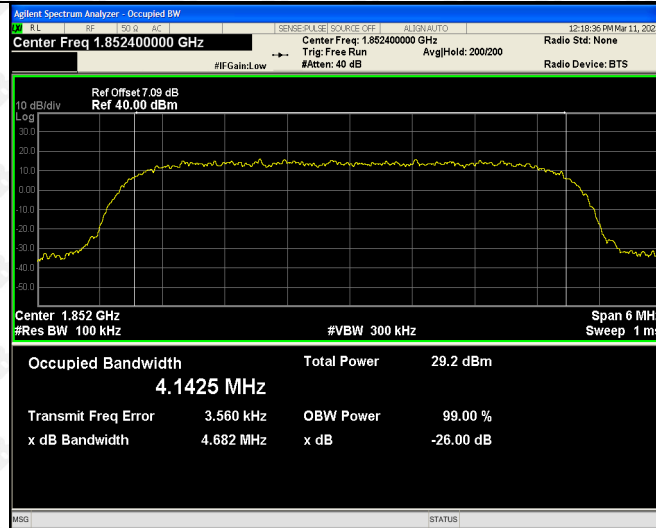
### HSDPA Middle Channel



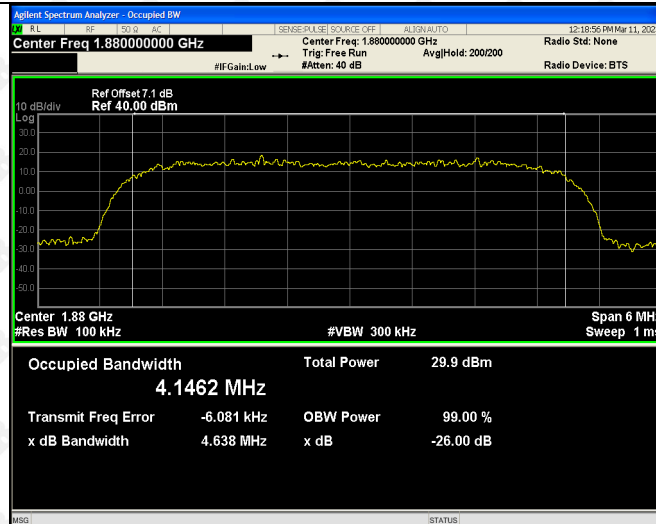
### HSDPA High Channel



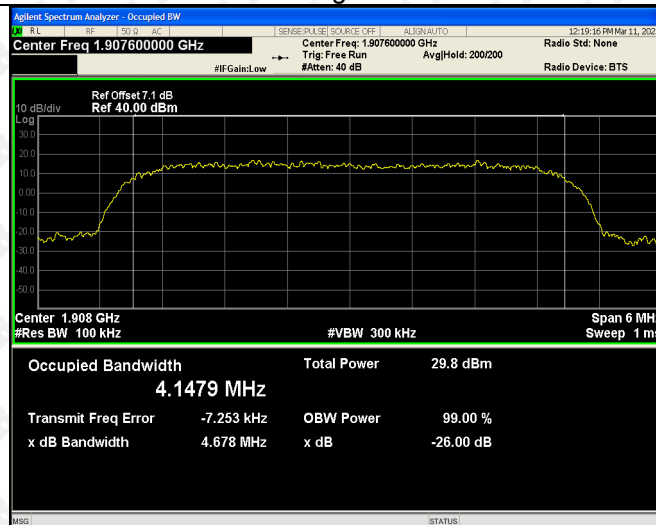
## HSUPA Low Channel



## HSUPA Middle Channel



## HSUPA High Channel



## 9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

### 9.1 Standard Applicable

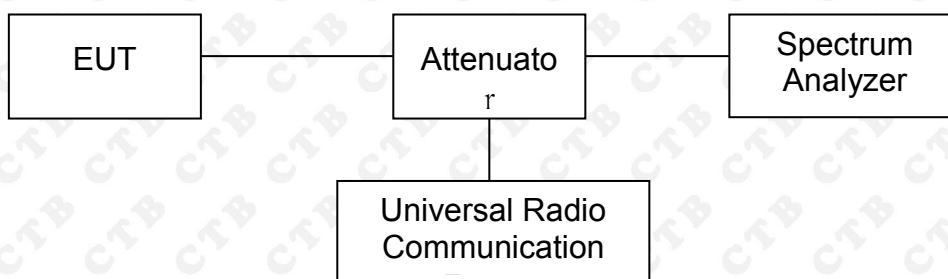
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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 10<sup>th</sup> harmonic.

Test Configuration for the out of band emissions testing:



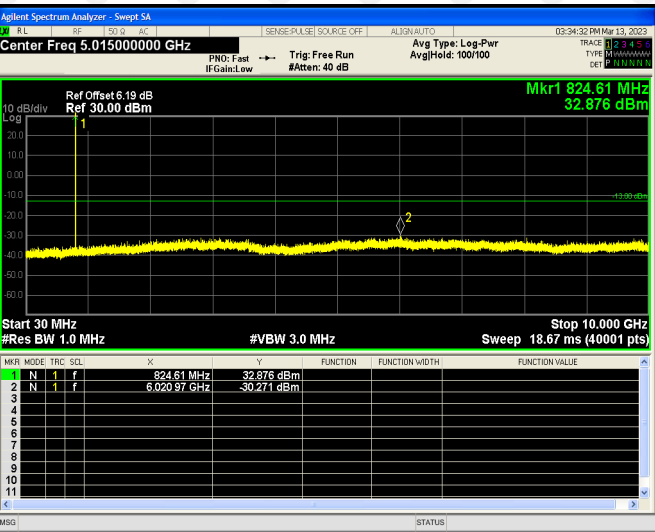
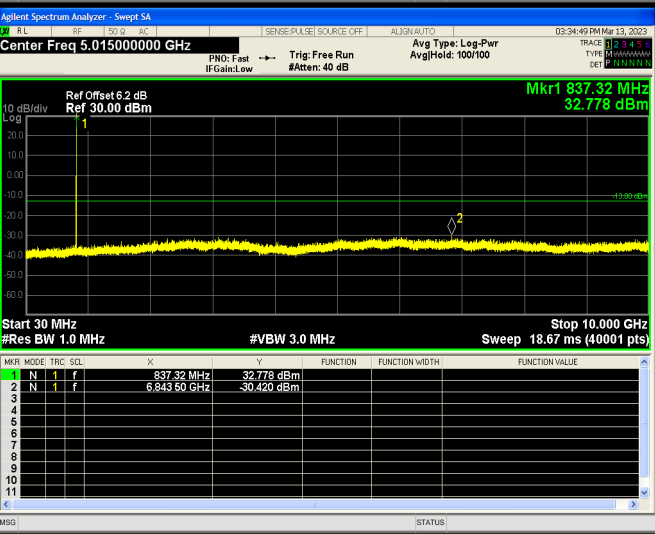
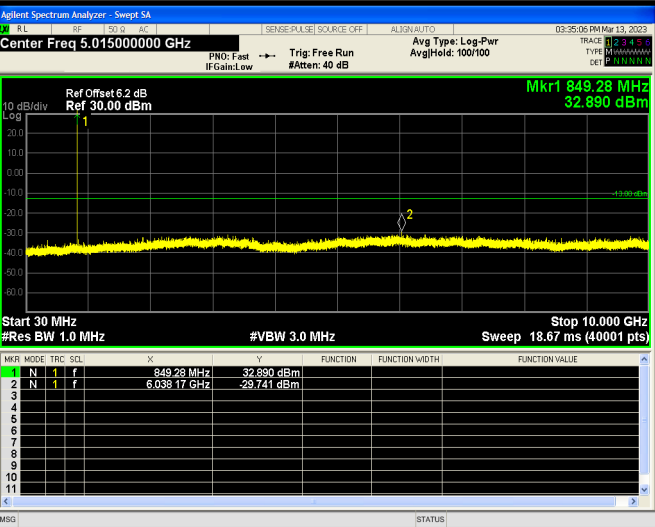
### 9.3 Environmental Conditions

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

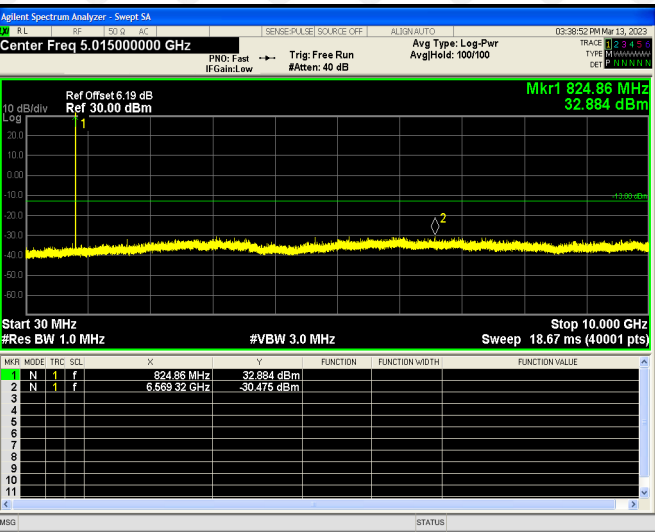
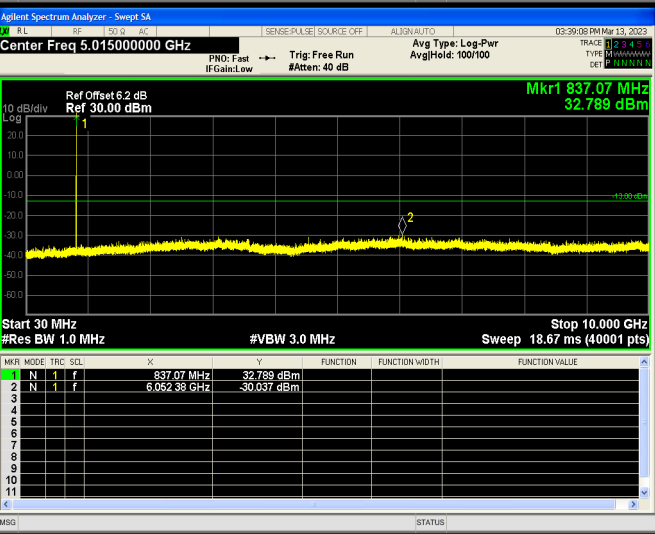
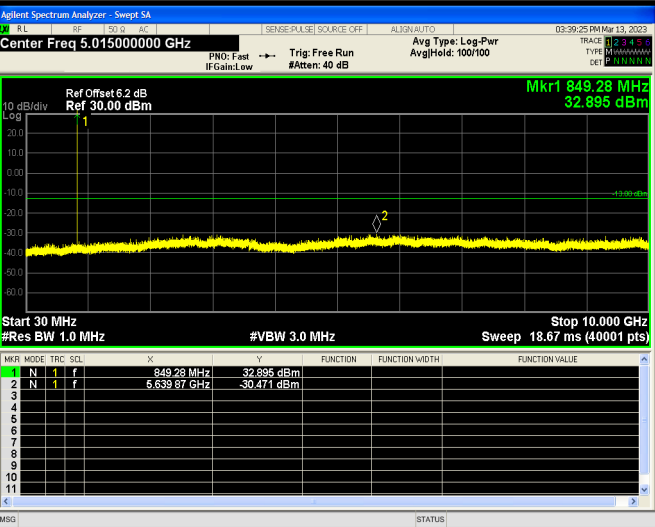
### 9.4 Summary of Test Results/Plots

*Please refer to the following test plots*  
For Cellular Band

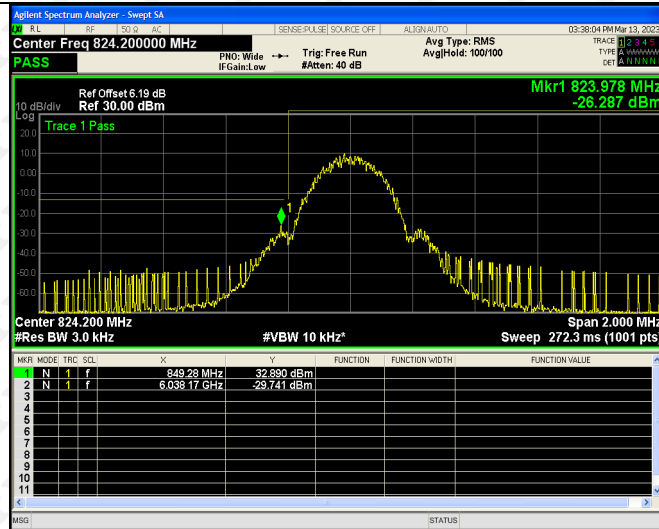


<p>GSM Low Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 824.61 MHz 32.876 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SOL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>824.61 MHz</td> <td>32.876 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>6.020.97 GHz</td> <td>-30.271 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.61 MHz	32.876 dBm				2	N	1	f	6.020.97 GHz	-30.271 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	824.61 MHz	32.876 dBm																								
2	N	1	f	6.020.97 GHz	-30.271 dBm																								
<p>GSM Middle Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.32 MHz 32.778 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>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>837.32 MHz</td> <td>32.778 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>6.843.50 GHz</td> <td>-30.420 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.32 MHz	32.778 dBm				2	N	1	f	6.843.50 GHz	-30.420 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	837.32 MHz	32.778 dBm																								
2	N	1	f	6.843.50 GHz	-30.420 dBm																								
<p>GSM High Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 32.890 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>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>849.28 MHz</td> <td>32.890 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>6.038.17 GHz</td> <td>-29.741 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	32.890 dBm				2	N	1	f	6.038.17 GHz	-29.741 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	849.28 MHz	32.890 dBm																								
2	N	1	f	6.038.17 GHz	-29.741 dBm																								

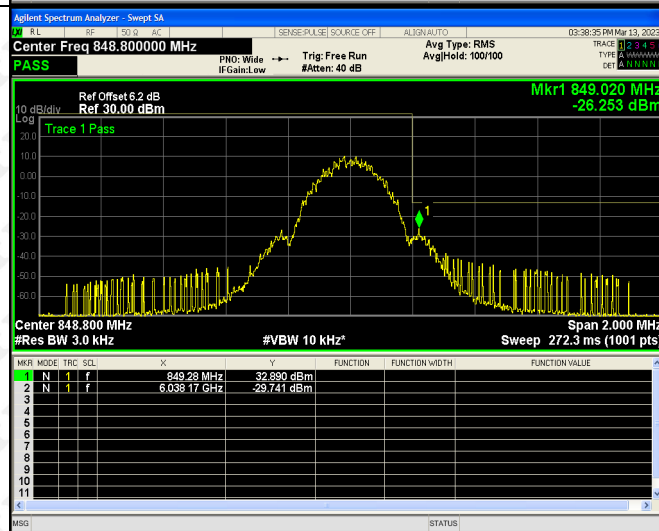
<p>GSM Low Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 824.200000 MHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 823.980 MHz -27.306 dBm Trace 1 Pass Center 824.200 MHz #Res BW 3.0 kHz #VBW 10 kHz* Span 2.000 MHz Sweep 272.3 ms (1001 pts)</p>
<p>GSM High Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 848.800000 MHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.020 MHz -26.647 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>

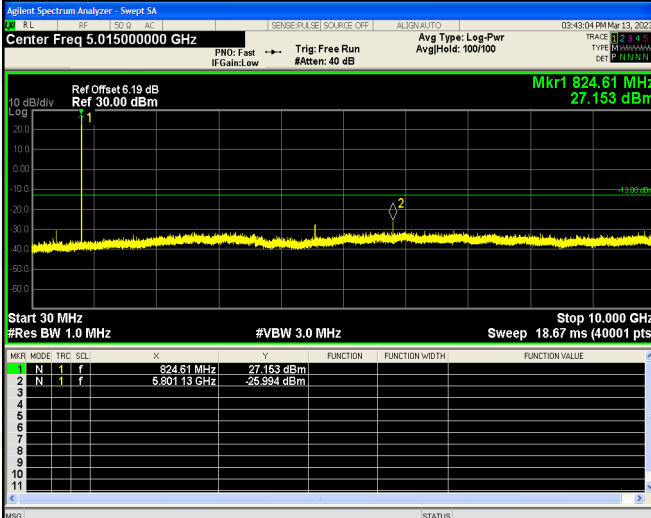
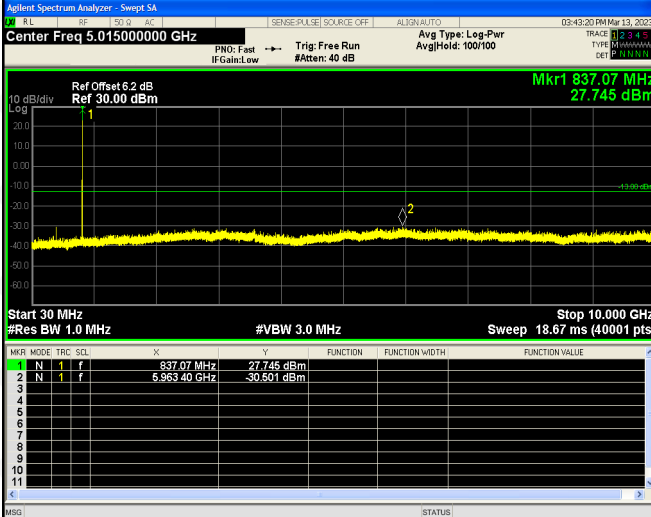
<p>GPRS Low Channel</p>		
<p>GPRS Middle Channel</p>		
<p>GPRS High Channel</p>		

GPRS  
Low  
Band  
Emission



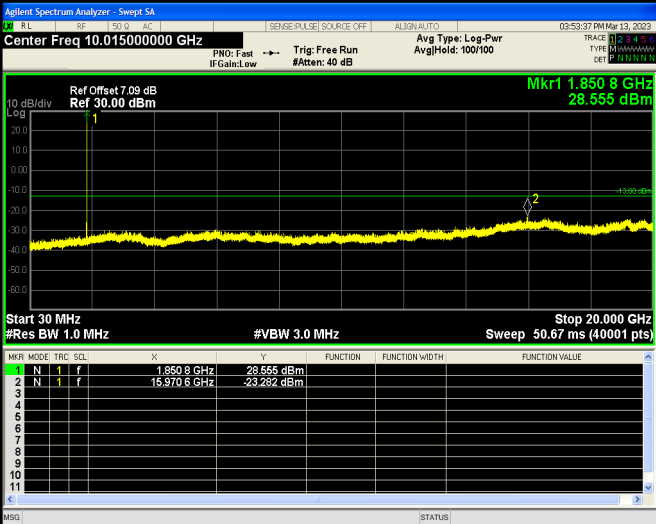
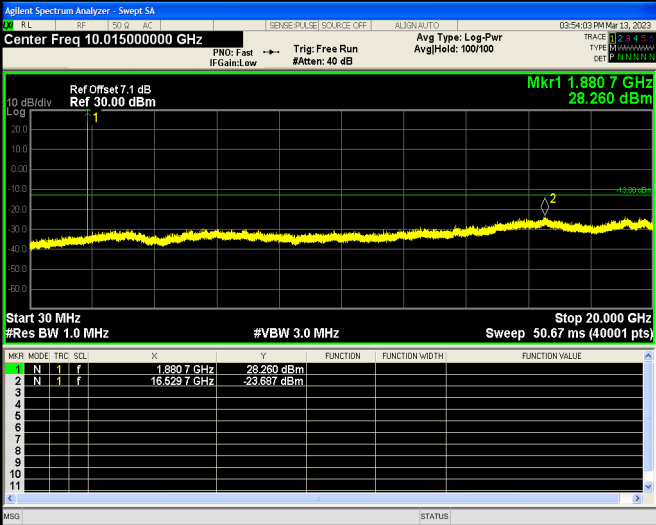
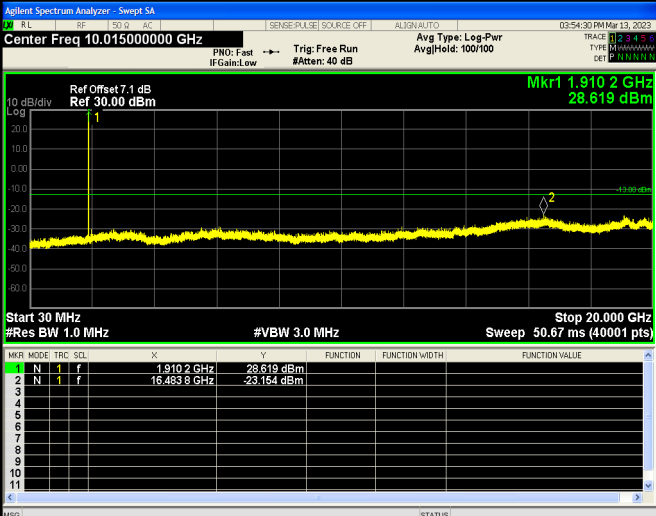
GPRS  
High  
Band  
Emission



<p>EDGE Low Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 824.61 MHz 27.153 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>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>824.61 MHz</td> <td>27.153 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>5.80113 GHz</td> <td>-26.994 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.61 MHz	27.153 dBm				2	N	1	f	5.80113 GHz	-26.994 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	824.61 MHz	27.153 dBm																								
2	N	1	f	5.80113 GHz	-26.994 dBm																								
<p>EDGE Middle Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 27.959 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>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>849.28 MHz</td> <td>27.959 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>5.65856 GHz</td> <td>-30.856 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	27.959 dBm				2	N	1	f	5.65856 GHz	-30.856 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	849.28 MHz	27.959 dBm																								
2	N	1	f	5.65856 GHz	-30.856 dBm																								
<p>EDGE High Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.07 MHz 27.745 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>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>837.07 MHz</td> <td>27.745 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>5.96340 GHz</td> <td>-30.501 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	27.745 dBm				2	N	1	f	5.96340 GHz	-30.501 dBm				
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	N	1	f	837.07 MHz	27.745 dBm																								
2	N	1	f	5.96340 GHz	-30.501 dBm																								

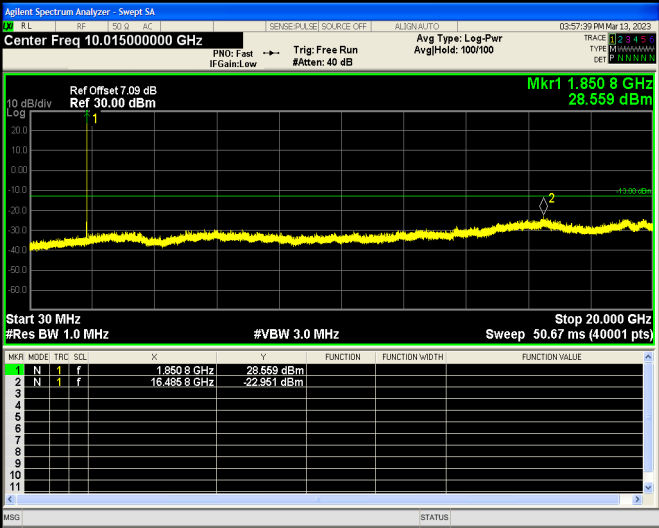
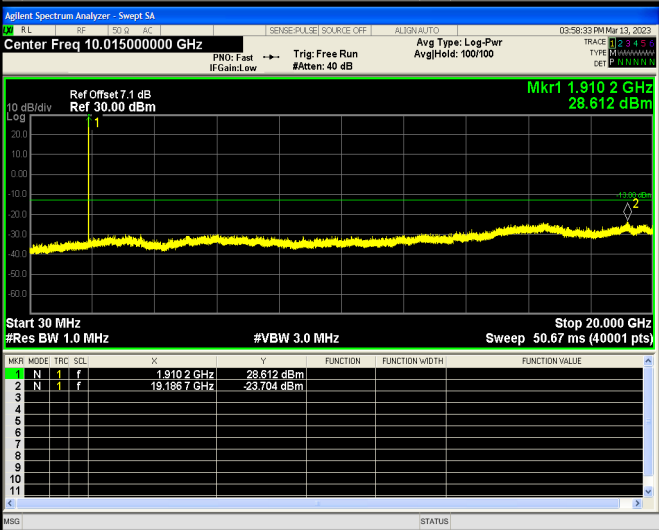
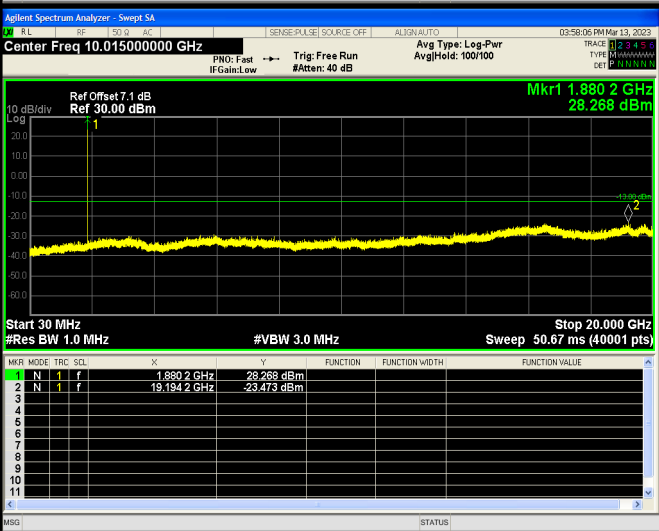
<p>EDGE Low Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 824.200000 MHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS AvgHold: 100/100 Mkr1 823.988 MHz -34.764 dBm Trace 1 Pass 10 dB/div Ref Offset 6.19 dB Ref 30.00 dBm Center 824.200 MHz #Res BW 3.0 kHz #VBW 10 kHz* Span 2.000 MHz Sweep 272.3 ms (1001 pts)</p>
<p>EDGE High Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 848.800000 MHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS AvgHold: 100/100 Mkr1 849.002 MHz -33.650 dBm Trace 1 Pass 10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm Center 848.800 MHz #Res BW 3.0 kHz #VBW 10 kHz* Span 2.000 MHz Sweep 272.3 ms (1001 pts)</p>

For PCS Band

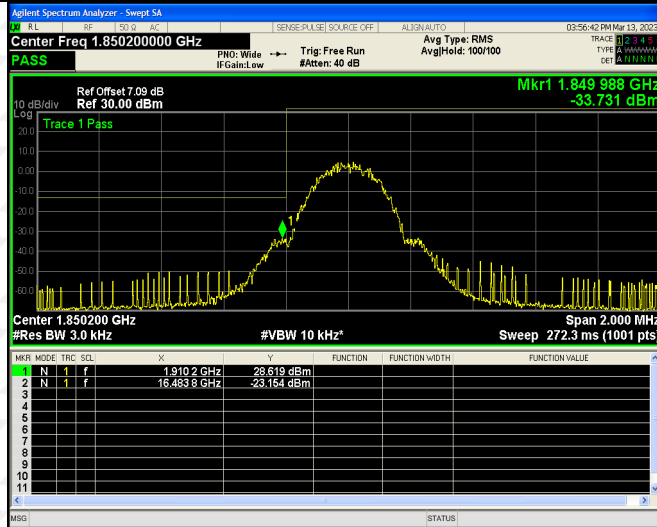
<p>GSM Low Channel</p>		
<p>GSM Middle Channel</p>		
<p>GSM High Channel</p>		

<p>GSM Low Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.85020000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Mkr1 1.849 978 GHz -32.135 dBm Ref Offset 7.09 dB Ref 30.00 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>
<p>GSM High Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.90980000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Mkr1 1.910 016 GHz -32.013 dBm Ref Offset 7.1 dB Ref 30.00 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>

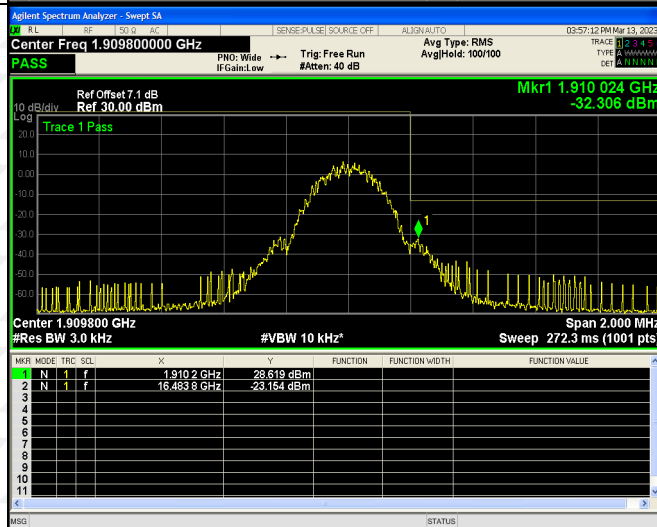


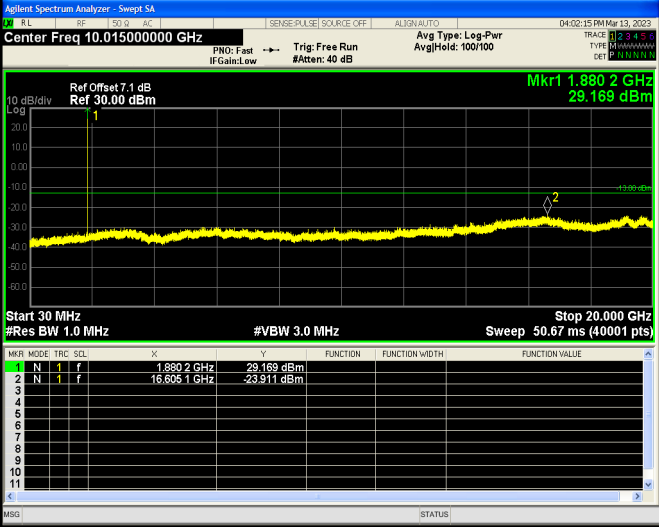
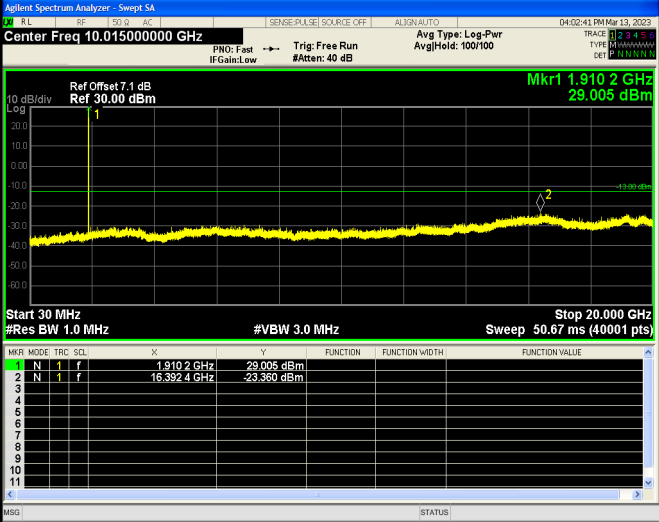
<p>GPRS Low Channel</p>	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.850 8 GHz 28.559 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SOL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>1.850 8 GHz</td> <td>28.559 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>16.486 8 GHz</td> <td>-22.951 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.850 8 GHz	28.559 dBm				2	N	1	f	16.486 8 GHz	-22.951 dBm				
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<p>GPRS Middle Channel</p>	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 10.015000000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.910 2 GHz 28.612 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>1.910 2 GHz</td> <td>28.612 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>19.186 7 GHz</td> <td>-23.704 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.910 2 GHz	28.612 dBm				2	N	1	f	19.186 7 GHz	-23.704 dBm				
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GPRS  
Low  
Band  
Emission



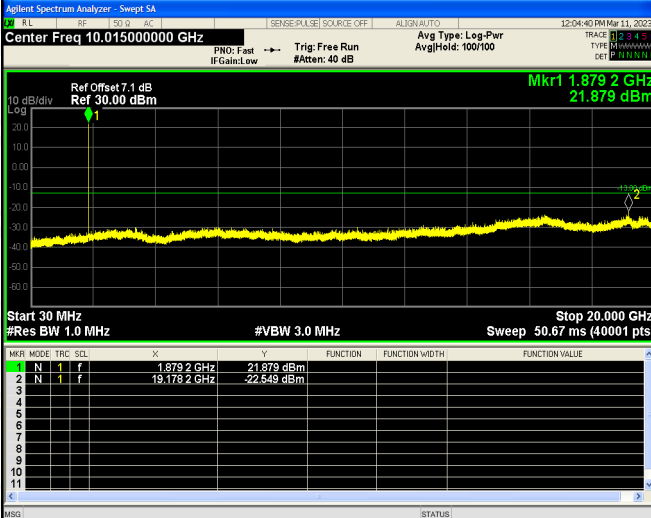
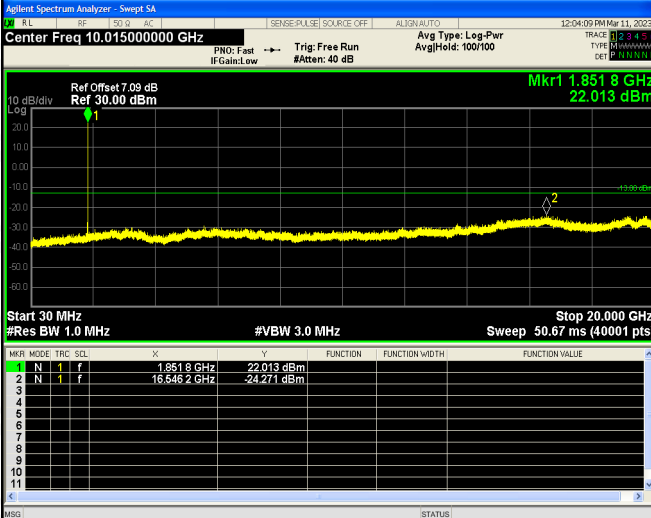
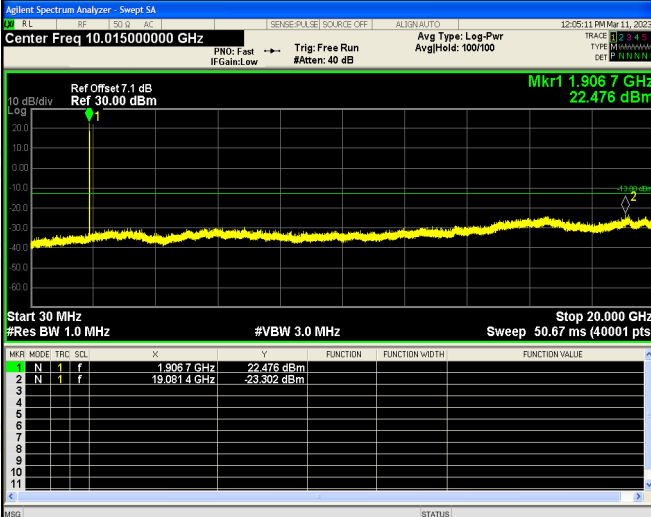
GPRS  
High  
Band  
Emission



<p>EDGE Low Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 10.01500000 GHz</p> <p>Ref Offset 7.09 dB Ref 30.00 dBm</p> <p>Mkr1 1.850 8 GHz 27.838 dBm</p> <p>Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <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>1.850 8 GHz</td> <td>27.838 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>16.393 4 GHz</td> <td>-23.326 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	1.850 8 GHz	27.838 dBm				2	N	1	f	16.393 4 GHz	-23.326 dBm			
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<p>EDGE Low Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.85020000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Mkr1 1.849 988 GHz -35.968 dBm 10 dB/div Ref Offset 7.09 dB Ref 30.00 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>
<p>EDGE High Band Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.90980000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Mkr1 1.910 002 GHz -36.935 dBm 10 dB/div Ref Offset 7.1 dB Ref 30.00 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>

For Band II

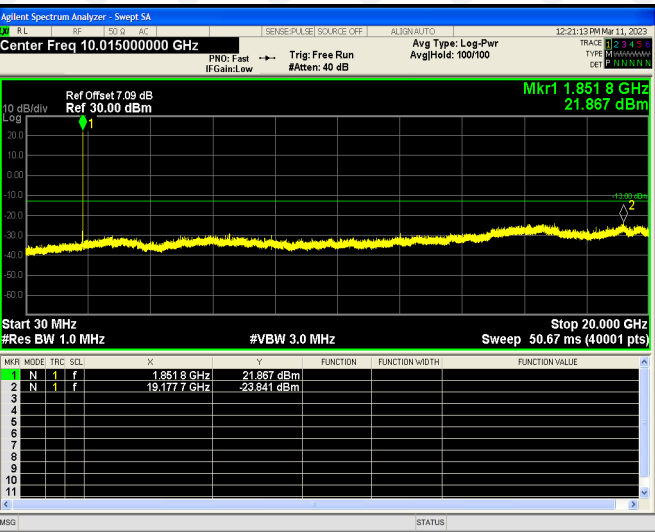
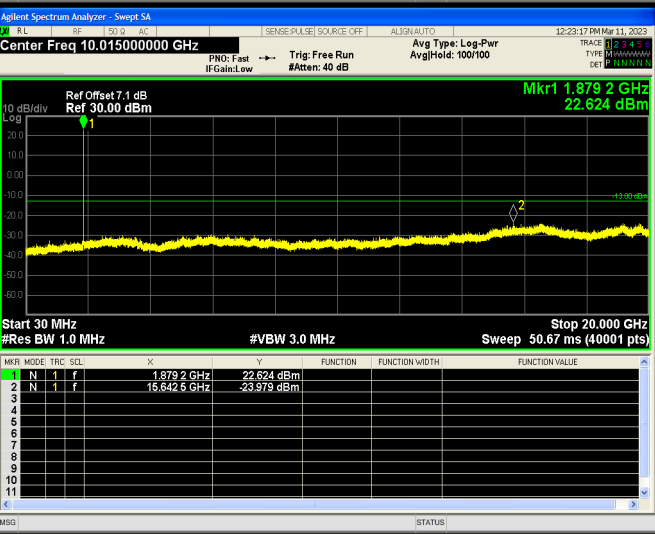
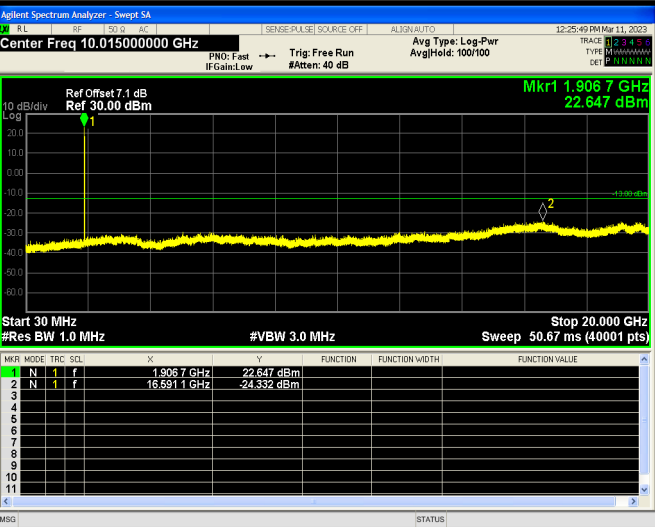
<p>WCDMA Low Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.879 2 GHz 21.879 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20,000 GHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SZ</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>1.879 2 GHz</td> <td></td> <td></td> <td>21.879 dBm</td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>19.178 2 GHz</td> <td></td> <td></td> <td>-22.649 dBm</td> </tr> </tbody> </table>	MKR MODE	TRC	SZ	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.879 2 GHz			21.879 dBm	2	N	1	f	19.178 2 GHz			-22.649 dBm	
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<p>WCDMA Middle Channel</p>	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.851 8 GHz 22.013 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20,000 GHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SZ</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>1.851 8 GHz</td> <td></td> <td></td> <td>22.013 dBm</td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>16.546 2 GHz</td> <td></td> <td></td> <td>-24.271 dBm</td> </tr> </tbody> </table>	MKR MODE	TRC	SZ	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.851 8 GHz			22.013 dBm	2	N	1	f	16.546 2 GHz			-24.271 dBm	
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<p>WCDMA Low Band Spurious Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.85000000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Ref Offset 7.09 dB Ref 30.00 dBm Mkr1 1.849 998 GHz -28.515 dBm Trace 1 Pass Center 1.850000 GHz #Res BW 100 kHz #VBW 300 kHz* Span 2.000 MHz Sweep 1.000 ms (1001 pts)</p>	
<p>WCDMA High Band Spurious Emission</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 1.91000000 GHz PNO: Wide IFGain: low Trig: Free Run #Atten: 40 dB Avg Type: RMS Avg/Hold: 100/100 Ref Offset 7.1 dB Ref 30.00 dBm Mkr1 1.910 002 GHz -26.290 dBm Trace 1 Pass Center 1.910000 GHz #Res BW 100 kHz #VBW 300 kHz* Span 2.000 MHz Sweep 1.000 ms (1001 pts)</p>	

<p>HSDPA Low Channel</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 10.01500000 GHz Mkr1 1.8518 GHz 21.960 dBm Ref Offset 7.09 dB Ref 30.00 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.00 GHz Sweep 50.67 ms (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</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> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>1.8518 GHz</td> <td>21.960 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>19.1663 GHz</td> <td>-23.846 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.8518 GHz	21.960 dBm				2	N	1	f	19.1663 GHz	-23.846 dBm				
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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	DC3.8V

#### 10.4 Summary of Test Results/Plots

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

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

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

For Cellular Band\_GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
45.69	-69.80	3.9	-65.90	-13	-52.90	H
1644.75	-59.54	4.83	-54.71	-13	-41.71	H
2463.53	-58.97	8.08	-50.89	-13	-37.89	H
39.95	-73.16	4.02	-69.14	-13	-56.14	V
1640.27	-54.26	4.48	-49.78	-13	-36.78	V
2468.24	-47.74	8.2	-39.54	-13	-26.54	V
Middle Channel (836.6MHz)						
43.78	-70.19	3.84	-66.35	-13	-53.35	H
1663.26	-57.43	4.62	-52.81	-13	-39.81	H
2500.38	-57.37	8.25	-49.12	-13	-36.12	H
39.68	-74.77	4.25	-70.52	-13	-57.52	V
1666.42	-46.95	4.54	-42.41	-13	-29.41	V
2503.46	-56.86	8.35	-48.51	-13	-29.75	V
High Channel (848.8MHz)						
41.96	-71.87	4.22	-76.09	-13	-63.09	H
1697.47	-52.78	4.87	-57.65	-13	-44.65	H
2542.72	-58.43	8.38	-66.81	-13	-53.81	H
45.57	-66.45	4.02	-70.47	-13	-57.47	V
1687.71	-49.66	4.56	-54.22	-13	-41.22	V
2545.82	-48.13	8.41	-56.54	-13	-43.54	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)						
41.58	-68.53	4.34	-64.19	-13	-51.19	H
3700.14	-55.50	10.54	-44.96	-13	-31.96	H
5541.10	-54.71	13.37	-41.34	-13	-28.34	H
41.84	-70.49	4.34	-66.15	-13	-53.15	V
3699.70	-57.90	10.54	-47.36	-13	-34.36	V
5549.21	-57.24	13.37	-43.87	-13	-30.87	V
Middle Channel (1880MHz)						
45.37	-71.25	4.02	-67.23	-13	-54.23	H
3757.78	-59.38	10.71	-48.67	-13	-35.67	H
5635.51	-54.08	13.73	-40.35	-13	-27.35	H
39.00	-65.53	4.14	-61.39	-13	-48.39	V
3759.16	-50.94	10.22	-40.72	-13	-27.72	V
5639.33	-56.93	13.16	-43.77	-13	-30.77	V
High Channel (1909.8MHz)						
36.56	-69.25	4.02	-65.23	-13	-52.23	H
3811.61	-58.10	4.9	-53.20	-13	-40.20	H
5723.38	-47.35	8.09	-39.26	-13	-26.26	H
37.32	-57.15	4.25	-52.90	-13	-39.90	V
3815.70	-59.26	4.93	-54.33	-13	-41.33	V
5720.39	-59.40	8.43	-50.97	-13	-37.97	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
45.52	-72.35	3.91	-68.44	-13	-55.44	H
1644.65	-58.40	10.56	-47.84	-13	-34.84	H
2476.97	-62.06	13.5	-48.56	-13	-35.56	H
41.50	-69.21	3.93	-65.28	-13	-52.28	V
1648.30	-55.75	10.41	-45.34	-13	-32.34	V
2474.68	-58.08	13.16	-44.92	-13	-31.92	V
Middle Channel (1880MHz)						
43.65	-75.58	4.02	-71.56	-13	-58.56	H
1668.46	-54.38	4.66	-49.72	-13	-36.72	H
2501.80	-50.18	8.34	-41.84	-13	-28.84	H
43.52	-63.08	4.17	-58.91	-13	-45.91	V
1668.55	-64.25	4.94	-59.31	-13	-46.31	V
2500.26	-58.11	8.19	-49.92	-13	-36.92	V
High Channel (1907.6MHz)						
42.30	-73.07	3.87	-69.20	-13	-56.20	H
1684.25	-61.16	4.89	-56.27	-13	-43.27	H
2530.61	-43.58	8.42	-35.16	-13	-22.16	H
39.22	-55.15	3.95	-51.20	-13	-38.20	V
1690.94	-58.71	4.99	-53.72	-13	-40.72	V
2539.37	-55.76	8.12	-47.64	-13	-34.64	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	8.41	0.01005
40	NV	9.07	0.01084
30	NV	8.97	0.01072
20	NV	9.91	0.01185
10	NV	10.10	0.01208
0	NV	10.56	0.01263
-10	NV	10.23	0.01223
-20	NV	10.84	0.01295
-30	NV	10.88	0.01300

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	12.82	0.00682
40	NV	12.48	0.00664
30	NV	12.80	0.00681
20	NV	12.50	0.00665
10	NV	12.91	0.00687
0	NV	13.90	0.00740
-10	NV	13.71	0.00729
-20	NV	13.89	0.00739
-30	NV	14.06	0.00748



## 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	8.37	0.01000
40	NV	9.29	0.01110
30	NV	9.14	0.01093
20	NV	9.47	0.01132
10	NV	9.84	0.01176
0	NV	10.28	0.01229
-10	NV	10.26	0.01226
-20	NV	11.00	0.01315
-30	NV	10.87	0.01299

## 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	12.36	0.00658
40	NV	12.46	0.00663
30	NV	12.57	0.00669
20	NV	13.14	0.00699
10	NV	13.18	0.00701
0	NV	13.20	0.00702
-10	NV	13.54	0.00720
-20	NV	13.91	0.00740
-30	NV	14.16	0.00753

## 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	11.42	0.01365
40	NV	11.71	0.01400
30	NV	11.67	0.01395
20	NV	11.61	0.01388
10	NV	11.92	0.01425
0	NV	11.93	0.01426
-10	NV	11.72	0.01401
-20	NV	12.53	0.01498
-30	NV	12.44	0.01487

## 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	-10.05	-0.00534
40	NV	-9.98	-0.00531
30	NV	-9.32	-0.00496
20	NV	-8.87	-0.00472
10	NV	-8.47	-0.00450
0	NV	-8.42	-0.00448
-10	NV	-8.13	-0.00433
-20	NV	-8.65	-0.00460
-30	NV	-8.41	-0.00447

## 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	-0.33	-0.00039
40	NV	0.33	0.00039
30	NV	0.57	0.00068
20	NV	0.15	0.00018
10	NV	0.44	0.00052
0	NV	1.11	0.00133
-10	NV	1.38	0.00165
-20	NV	1.44	0.00173
-30	NV	2.64	0.00316

## 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	5.33	0.0028
40	NV	5.3	0.0028
30	NV	5.8	0.0031
20	NV	6.3	0.0033
10	NV	6.5	0.0035
0	NV	6.9	0.0037
-10	NV	7.1	0.0038
-20	NV	7.3	0.0039
-30	NV	7.4	0.0039

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	4.38	0.00523
40	NV	5.16	0.00617
30	NV	4.82	0.00576
20	NV	6.12	0.00731
10	NV	5.99	0.00716
0	NV	6.02	0.00719
-10	NV	6.58	0.00787
-20	NV	7.25	0.00867
-30	NV	6.90	0.00824

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	10.46	0.01250
	NV	11.11	0.01328
	HV	11.34	0.01355
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	14.71	0.00782
	NV	14.52	0.00772
	HV	14.57	0.00775

Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	10.53	0.01258
	NV	10.86	0.01299
	HV	12.00	0.01434
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	14.86	0.00790
	NV	14.61	0.00777
	HV	14.82	0.00788
Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	12.86	0.01537
	NV	12.81	0.01531
	HV	13.56	0.01621
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	-7.73	-0.00924
	NV	-7.36	-0.00879
	HV	-7.11	-0.00850
Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	1.91	0.00228
	NV	1.98	0.00237
	HV	1.65	0.00197
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	1.39	0.00166
	NV	1.52	0.00182
	HV	1.88	0.00225

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	2.78	0.00333
	NV	2.75	0.00328
	HV	2.98	0.00356
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	2.55	0.00305
	NV	2.44	0.00291
	HV	3.50	0.00418
Reference Frequency(Middle Channel): HSDPA 1732.4MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	5.73	0.00685
	NV	6.45	0.00771
	HV	6.52	0.00779
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	6.74	0.00806
	NV	7.24	0.00865
	HV	7.02	0.00839
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	1.53	0.00183
	NV	2.12	0.00253
	HV	1.92	0.00230
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	5.39	0.00644
	NV	5.68	0.00679
	HV	5.92	0.00707

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	9.36	0.01119
	NV	8.63	0.01032
	HV	9.35	0.01117



## 12. EUT PHOTO

EUT Photo 1

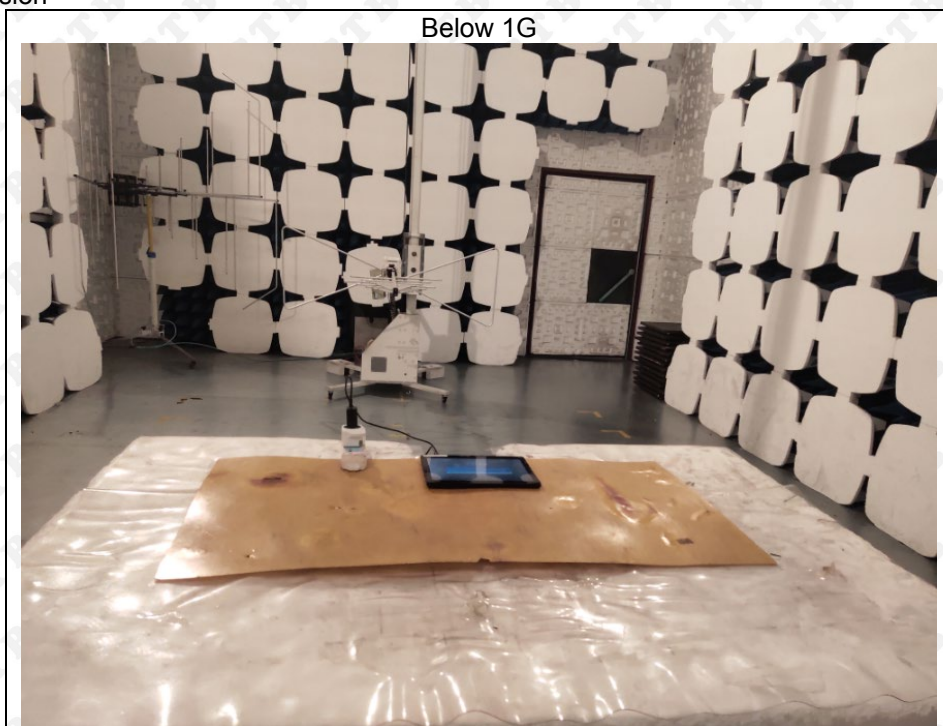


EUT Photo 2



### 13. EUT TEST PHOTO

#### Radiated Emission



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