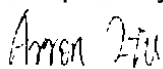


TEST REPORT

Product Name: Portable reader
FCC ID: TQ4-XC2907A
Product Name: N/A
Model Number: XC2907-A, XC2907, XC2907-B, XC2907-C, XC2907-D, XC2907-E, XC2907-F, XC2907-G
Prepared For: Invengo Information Technology Co., Ltd.
Address: 27th and 28th Floor, Hi-Tech Zone Union Tower, NO.63, Gaoxin South 10th Road, Yuehai Sub-district, Nanshan District, Shenzhen, China
Manufacturer: Invengo Information Technology Co., Ltd.
Address: 27th and 28th Floor, Hi-Tech Zone Union Tower, NO.63, Gaoxin South 10th Road, Yuehai Sub-district, Nanshan District, Shenzhen, China
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
Address: Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China
Sample Received Date: Jan. 6, 2021
Sample tested Date: Jan. 7, 2021 to Mar. 15, 2021
Issue Date: Mar. 15, 2021
Report No.: CTB210109004RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

Arron Liu

Reviewed by:

Bin Mei

Approved by:

Rita Xiao / Director

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.

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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB210109004RFX	Mar. 15, 2021	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^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	XC2907-A, XC2907, XC2907-B, XC2907-C, XC2907-D, XC2907-E, XC2907-F, XC2907-G
Model Description:	All the model are the same circuit and RF module, only for model name and colour. Test sample model: XC2907-A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 5: 824~849MHz
Max. RF output power:	GSM850: 33.60dBm, GSM1900: 29.93dBm WCDMA Band 5: 22.29dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Integral Antenna
Antenna Gain:	GSM 850:0.5dBi GSM 1900:0.7dBi WCDMA Band 5:0.5dBi
Ratings:	Battery DC 3.8V, 9000mAh DC5.0V charging from adapter

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
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

4.6 Test Environment

Humidity(%):	55
Atmospheric Pressure(kPa):	101.1
Normal Voltage(DC):	3.8V
Normal Temperature(°C)	25
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 Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen 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.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	Sep. 28, 2020	Sep. 28, 2021
2	Power Sensor	Agilent	U2021XA	MY56120032	Sep. 28, 2020	Sep. 28, 2021
3	Power Sensor	Agilent	U2021XA	MY56120034	Sep. 28, 2020	Sep. 28, 2021
4	Communication test set	R&S	CMW500	108058	Sep. 28, 2020	Sep. 28, 2021
5	Spectrum Analyzer	R&S	FSP40	100550	Sep. 28, 2020	Sep. 28, 2021
6	Signal Generator	Agilent	N5181A	MY49060920	Sep. 28, 2020	Sep. 28, 2021
7	Signal Generator	Agilent	N5182A	MY47420195	Sep. 28, 2020	Sep. 28, 2021
8	Communication test set	Agilent	E5515C	MY50102567	Oct. 10, 2020	Oct. 10, 2021
9	band rejection filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	Sep. 28, 2020	Sep. 28, 2021
10	band rejection filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	Sep. 28, 2020	Sep. 28, 2021
11	band rejection filter	Xingbo	XBLBQ-DZA 120	190821-1-1	Sep. 28, 2020	Sep. 28, 2021
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	\	\
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	Sep. 28, 2020	Sep. 28, 2021
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	Sep. 28, 2020	Sep. 28, 2021
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	\	\
16	966 chamber	C.R.T.	966 Room	966	Nov. 9, 2019	Nov. 08, 2022
17	Receiver	R&S	ESPI	100362	Sep. 28, 2020	Sep. 28, 2021

18	Amplifier	HP	8447E	2945A02747	Sep. 28, 2020	Sep. 28, 2021
19	Amplifier	Agilent	8449B	3008A01838	Sep. 28, 2020	Sep. 28, 2021
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	Nov. 02, 2020	Nov. 01, 2021
21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	Nov. 02, 2020	Nov. 01, 2021
22	Software	Fala	EZ-EMC	FA-03A2 RE	\	\
23	3-Loop Antenna	Daze	ZN30401	17014	Sep. 28, 2020	Sep. 28, 2021
24	loop antenna	ZHINAN	ZN30900A	/	Sep. 28, 2020	Sep. 28, 2021
25	Horn antenna	A/H/System	SAS-574	588	Sep. 28, 2020	Sep. 28, 2021
26	Amplifier	AEROFLEX	/	S/N/ 097	Sep. 28, 2020	Sep. 28, 2021

6. RF OUTPUT POWER

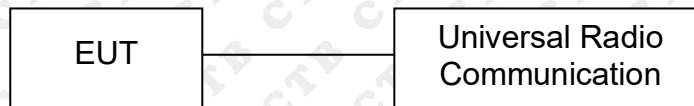
6.1 Standard Applicable

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:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 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	31.51	1.5	0	H	1.5	0	30.01	38.45
824.2	31.87	1.5	0	V	1.5	0	30.37	38.45
Middle Channel								
836.4	31.24	1.5	0	H	1.5	0	29.74	38.45
836.4	31.47	1.5	0	V	1.5	0	29.97	38.45
High Channel								
848.8	31.57	1.5	0	H	1.5	0	30.07	38.45
848.8	31.62	1.5	0	V	1.5	0	30.12	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								
824.2	20.41	1.5	0	H	1.9	0	18.51	33.00
824.2	20.12	1.5	0	V	1.9	0	18.22	33.00
Middle Channel								
836.4	20.06	1.5	0	H	1.9	0	18.16	33.00
836.4	20.58	1.5	0	V	1.9	0	18.68	33.00
High Channel								
848.8	19.29	1.5	0	H	1.9	0	17.39	33.00
848.8	19.92	1.5	0	V	1.5	0	18.42	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	30.98	1.5	0	H	1.5	0	29.48	38.45
824.2	31.00	1.5	0	V	1.5	0	29.50	38.45
Middle Channel								
836.6	30.32	1.5	0	H	1.5	0	28.82	38.45
836.6	30.33	1.5	0	V	1.5	0	28.83	38.45
High Channel								
848.8	30.66	1.5	0	H	1.5	0	29.16	38.45
848.8	30.24	1.5	0	V	1.5	0	28.74	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	20.49	1.5	0	H	1.9	0	18.59	33.00
1850.2	19.87	1.5	0	V	1.9	0	17.97	33.00
Middle Channel								
1880.0	19.63	1.5	0	H	1.9	0	17.73	33.00
1880.0	20.44	1.5	0	V	1.9	0	18.54	33.00
High Channel								
1909.8	19.25	1.5	0	H	1.9	0	17.35	33.00
1909.8	19.62	1.5	0	V	1.5	0	18.12	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	25.30	1.5	0	H	1.5	0	23.80	38.45
824.2	25.47	1.5	0	V	1.5	0	23.97	38.45
Middle Channel								
836.6	24.23	1.5	0	H	1.5	0	22.73	38.45
836.6	24.89	1.5	0	V	1.5	0	23.39	38.45
High Channel								
848.8	24.81	1.5	0	H	1.5	0	23.31	38.45
848.8	25.74	1.5	0	V	1.5	0	24.24	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	20.26	1.5	0	H	1.9	0	18.36	33.00
1850.2	19.93	1.5	0	V	1.9	0	18.03	33.00
Middle Channel								
1880.0	19.85	1.5	0	H	1.9	0	17.95	33.00
1880.0	20.46	1.5	0	V	1.9	0	18.56	33.00
High Channel								
1909.8	19.48	1.5	0	H	1.9	0	17.58	33.00
1909.8	19.94	1.5	0	V	1.5	0	18.44	33.00

ERP For WCDMA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.72	1.5	0	H	1.5	0	20.22	38.45
826.4	21.71	1.5	0	V	1.5	0	20.21	38.45
Middle Channel								
836.6	21.05	1.5	0	H	1.5	0	19.55	38.45
836.6	21.55	1.5	0	V	1.5	0	20.05	38.45
High Channel								
846.6	21.65	1.5	0	H	1.5	0	20.15	38.45
846.6	21.82	1.5	0	V	1.5	0	20.32	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	20.50	1.5	0	H	1.5	0	19.00	38.45
826.4	20.85	1.5	0	V	1.5	0	19.35	38.45
Middle Channel								
836.6	20.94	1.5	0	H	1.5	0	19.44	38.45
836.6	20.20	1.5	0	V	1.5	0	18.70	38.45
High Channel								
846.6	20.68	1.5	0	H	1.5	0	19.18	38.45
846.6	20.84	1.5	0	V	1.5	0	19.34	38.45

ERP For HSPA 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	20.99	1.5	0	H	1.5	0	19.49	38.45
826.4	20.93	1.5	0	V	1.5	0	19.43	38.45
Middle Channel								
836.6	20.99	1.5	0	H	1.5	0	19.49	38.45
836.6	20.97	1.5	0	V	1.5	0	19.47	38.45
High Channel								
846.6	20.65	1.5	0	H	1.5	0	19.15	38.45
846.6	20.75	1.5	0	V	1.5	0	19.25	38.45

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	33.11	38.45
	Middle Channel	836.6	33.48	38.45
	High Channel	848.8	33.60	38.45
GPRS(1 Slot)	Low Channel	824.2	33.10	38.45
	Middle Channel	836.6	33.45	38.45
	High Channel	848.8	33.58	38.45
EDGE(1 Slot)	Low Channel	824.2	25.43	38.45
	Middle Channel	836.6	25.40	38.45
	High Channel	848.8	25.28	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	29.31	33.0
	Middle Channel	1880.0	29.90	33.0
	High Channel	1909.8	29.71	33.0
GPRS(1 Slot)	Low Channel	1850.2	29.34	33.0
	Middle Channel	1880.0	29.93	33.0
	High Channel	1909.8	29.72	33.0
EDGE(1 Slot)	Low Channel	1850.2	27.22	33.0
	Middle Channel	1880.0	27.22	33.0
	High Channel	1909.8	27.17	33.0

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	21.96	38.45
	Middle Channel	836.6	22.29	38.45
	High Channel	846.6	22.09	38.45
HSDPA	Low Channel	826.4	21.03	38.45
	Middle Channel	836.6	21.35	38.45
	High Channel	846.6	21.18	38.45
HSUPA	Low Channel	826.4	20.93	38.45
	Middle Channel	836.6	20.17	38.45
	High Channel	846.6	20.31	38.45

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

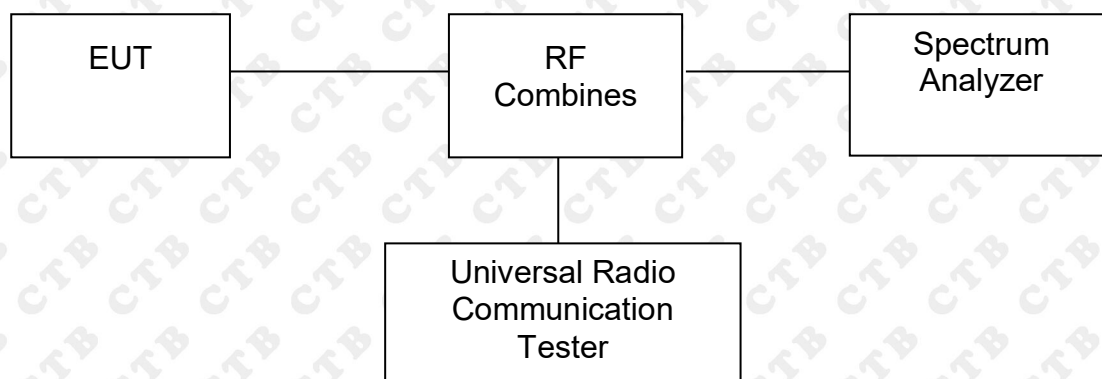
7.1 Standard Applicable

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:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 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	2.73	13
GPRS(1 Slot)	190	836.6	2.73	13
EDGE(1 Slot)	190	836.6	2.75	13

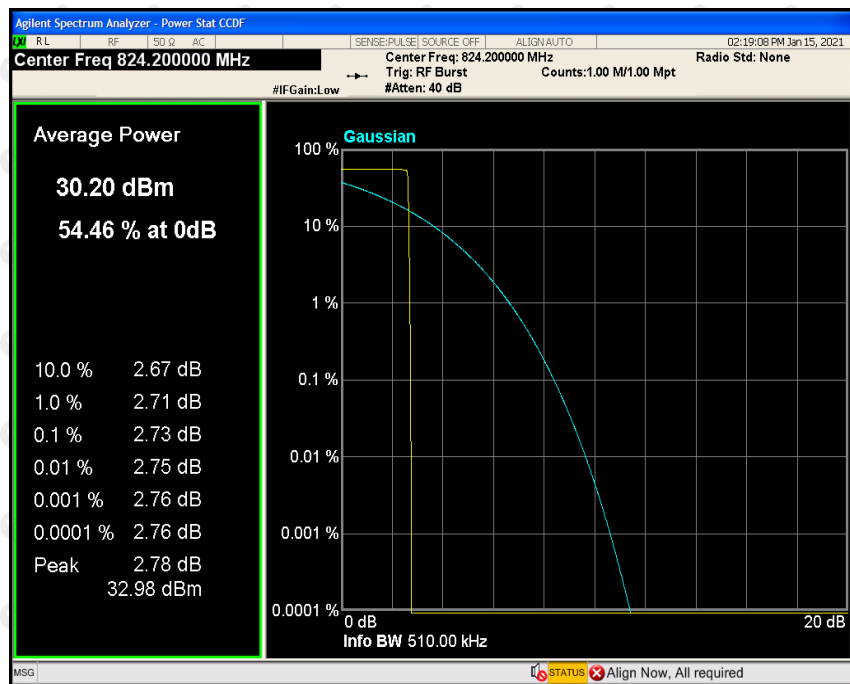
For PCS 1900

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

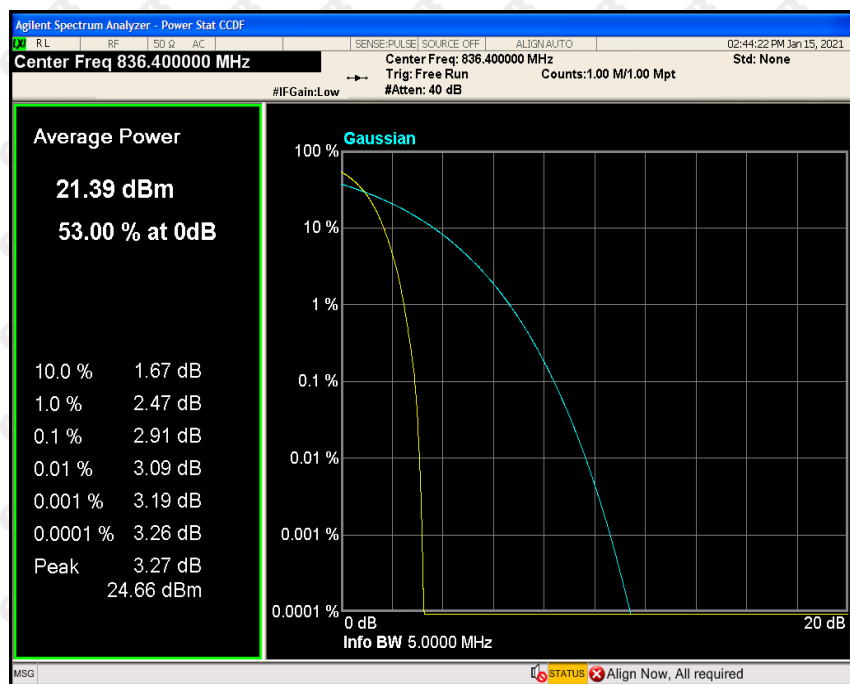
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.91	13
HSDPA	4182	836.4	3.77	13
HSUPA	4182	836.4	4.57	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

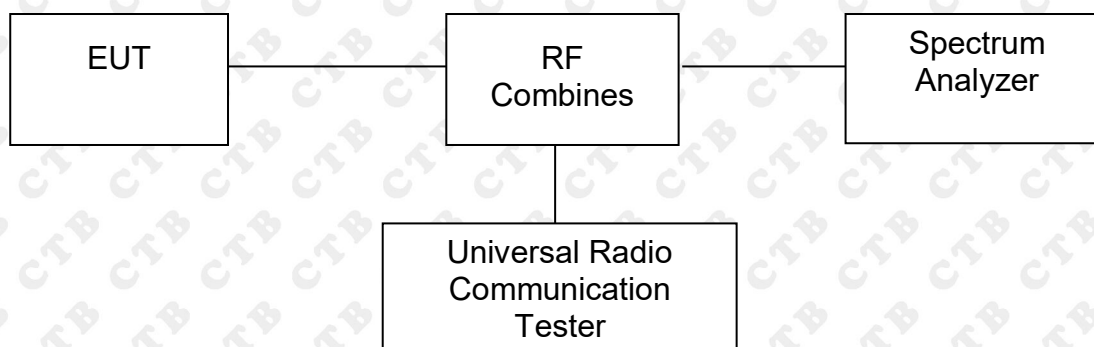
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 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	246.591	309.006
	190	836.6	245.957	316.441
	251	848.8	242.554	316.735
GPRS	128	824.2	241.181	314.909
	190	836.6	246.578	320.006
	251	848.8	246.766	307.179
EDGE	128	824.2	248.186	314.857
	190	836.6	247.161	323.680
	251	848.8	245.593	314.937

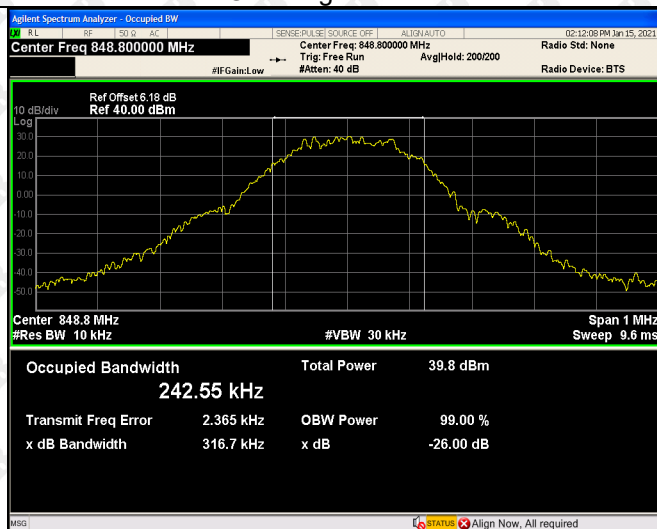
For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	246.663	317.208
	661	1880.0	245.785	315.352
	810	1909.8	248.192	325.145
GPRS	512	1850.2	247.929	306.162
	661	1880.0	244.478	314.316
	810	1909.8	249.230	316.498
EDGE	512	1850.2	251.065	317.224
	661	1880.0	252.367	314.624
	810	1909.8	246.085	324.403

For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4132	826.4	4189.444	4710.598
	4183	836.6	4156.556	4721.965
	4233	846.6	4177.199	4695.277
HSDPA	4132	826.4	4195.281	4709.794
	4183	836.6	4181.198	4724.811
	4233	846.6	4173.250	4721.791
HSUPA	4132	826.4	4204.361	4965.202
	4183	836.6	4172.358	4696.855
	4233	846.6	4195.838	4688.357

GSM Low Channel



Agilent Spectrum Analyzer - Occupied BW

02:16:10 PM Jan 15, 2021

SENSE:PLA SET SOURCE:OFF A:100.140.1.70

Center Freq 824.200000 MHz

Radio Std: None

Trig: Free Run AvgJHold: 200/200

#IF Gain: Low #Atten: 40 dB Radio Device: BTS

10 dB/div Ref Offset 6.17 dB
Log Ref 40.00 dBm

Center 824.2 MHz
#Res BW 10 kHz #VBW 30 kHz Span 1 MHz
Sweep 9.6 ms

Occupied Bandwidth 241.18 kHz

Total Power 38.9 dBm

Transmit Freq Error -606 Hz OBW Power 99.00 %

x dB Bandwidth 314.9 kHz x dB -26.00 dB

MSG STATUS Allan Now. All required

Agilent Spectrum Analyzer - Occupied BW

SENSE: F4.1 SE1 SOURCE: OFF A: F0.141/7.0 02:16:22 PM Jan 15, 2021

Center Freq 836.600000 MHz

Trig: Free Run Avg1/200 Radio Std: None

#IF Gain: Low #Atten: 40 dB Radio Device: BTS

10 dB/div Ref Offset 5.17 dB Ref 40.00 dBm

Center 836.6 MHz #Res BW 10 kHz #VBW 30 kHz Span 1 MHz

Occupied Bandwidth Total Power 39.6 dBm

246.58 kHz

Transmit Freq Error -451 Hz OBW Power 99.00 %

x dB Bandwidth 320.0 kHz x dB -26.00 dB

Sweep 9.6 ms

MSO STATUS Alligan Now. All required

Agilent Spectrum Analyzer - Occupied BW

SENSE: PULSE SOURCE: OFF ALIGN: AUTO 02:16:26 PM Jan 15, 2021

Center Freq 848.800000 MHz Radio Std: None

Trig: Free Run AvgHld: 200/200

#IF Gain: Low Radio Device: BTS

Ref Offset: 6.18 dB
Ref: 40.00 dBm

10 dB/div

Log

Center 848.8 MHz Span 1 MHz

#Res BW 10 kHz #VBW 30 kHz Sweep 9.6 ms

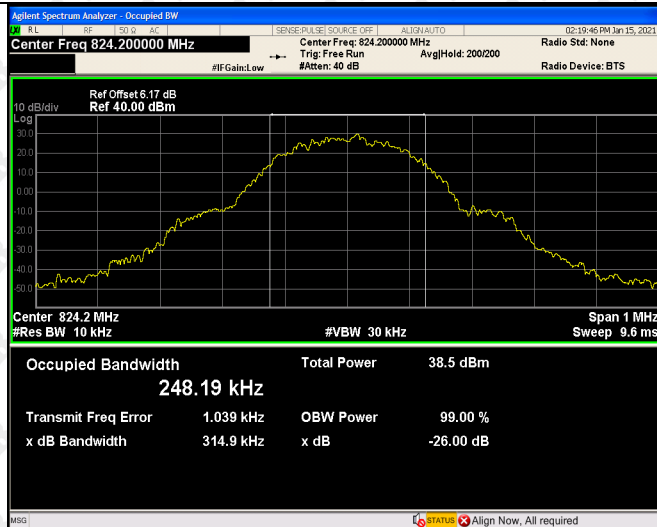
Occupied Bandwidth 246.77 kHz

Total Power 39.8 dBm

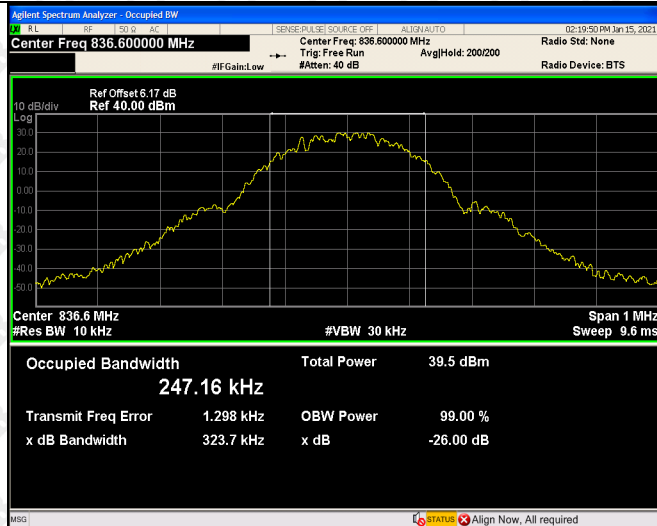
Transmit Freq Error 1.696 kHz OBW Power 99.00 %

x dB Bandwidth 307.2 kHz x dB -26.00 dB

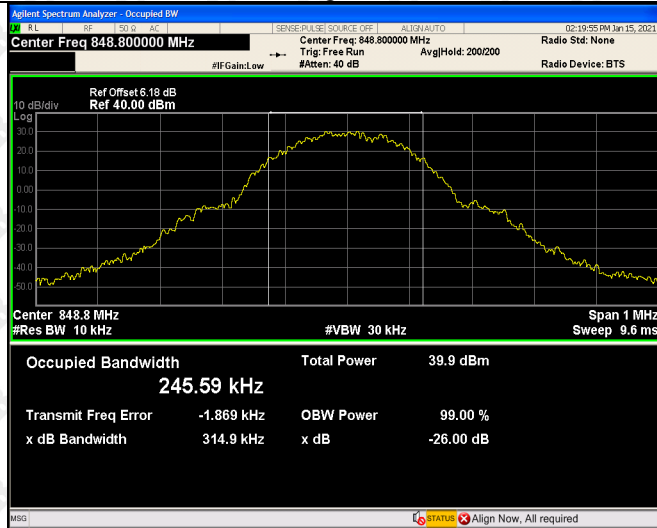
EDGE Low Channel



EDGE Middle Channel

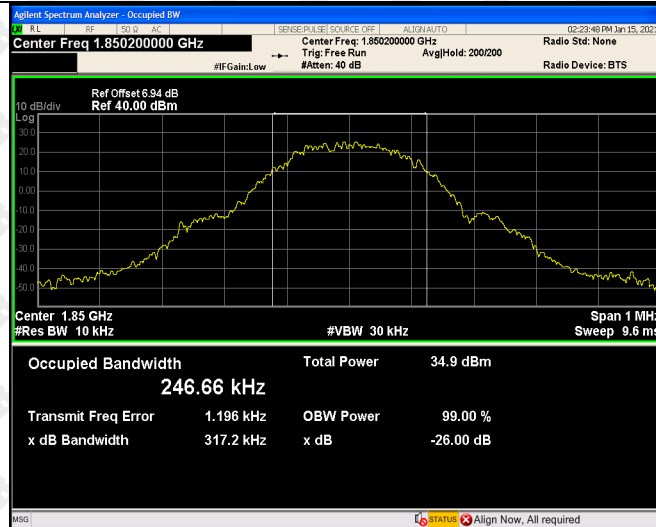


EDGE High Channel

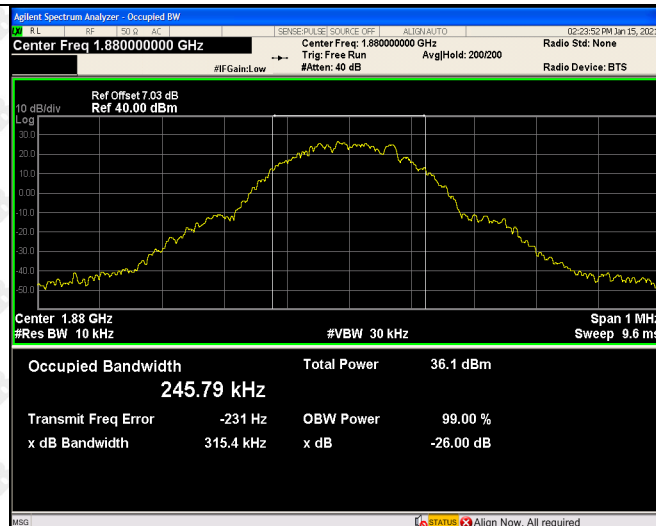


For PCS Band

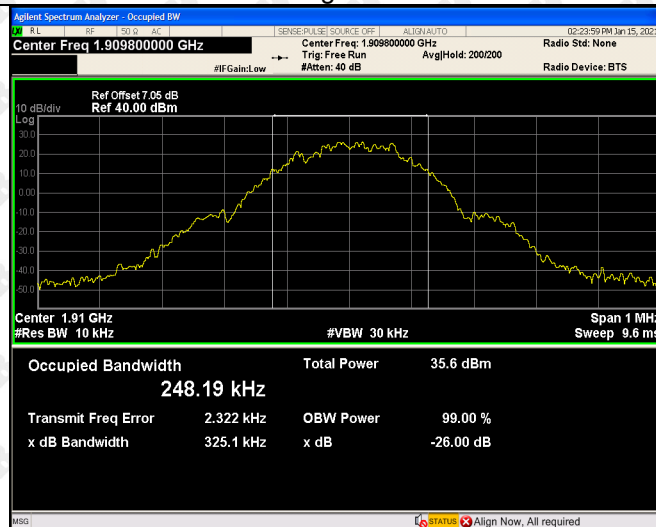
GSM Low Channel



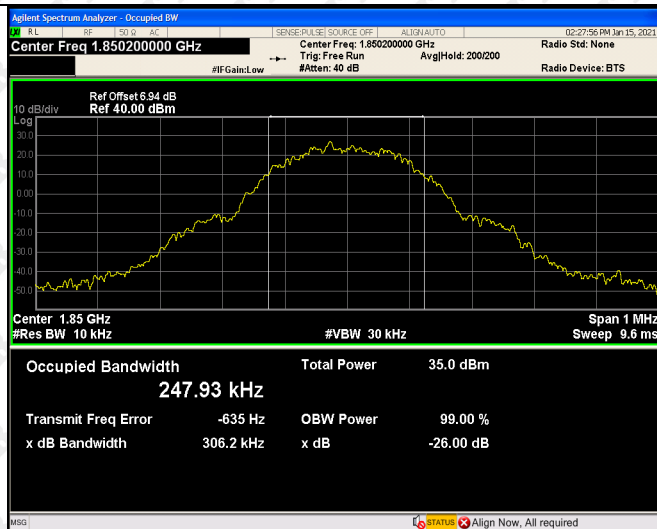
GSM Middle Channel



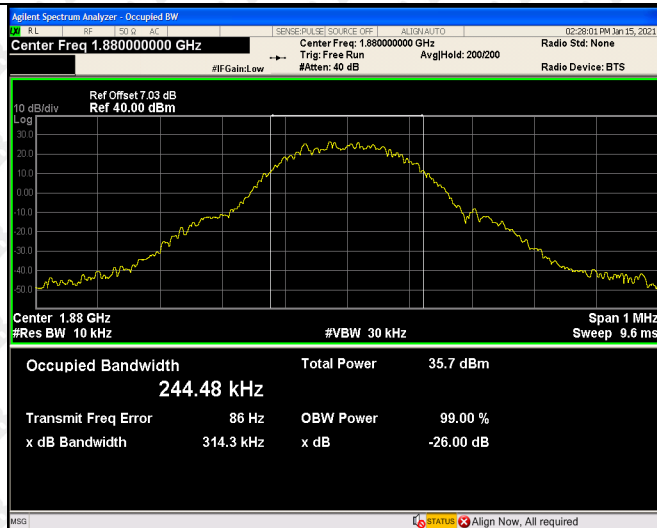
GSM High channel



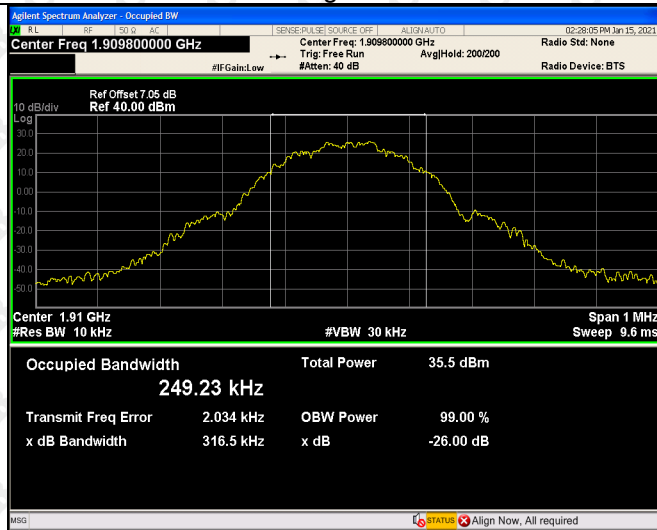
GPRS Low Channel



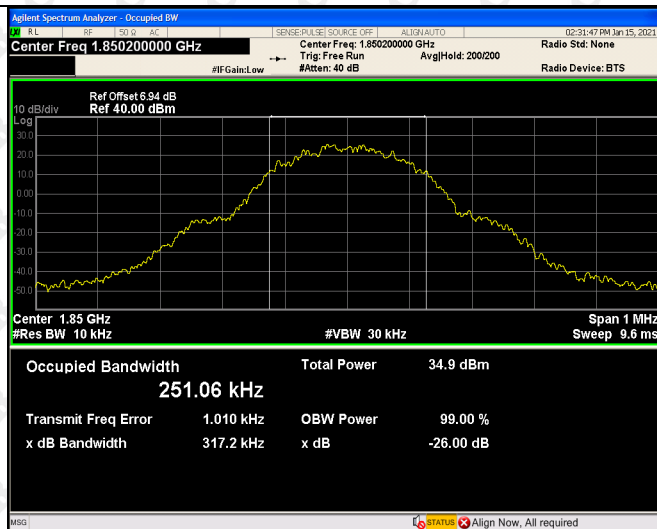
GPRS Middle Channel



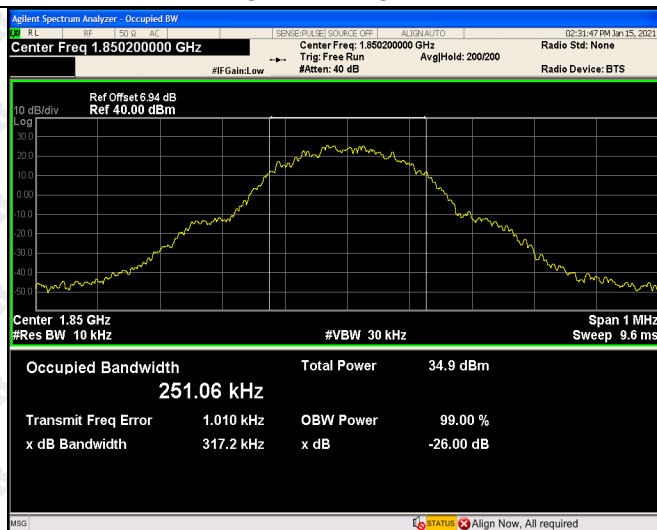
GPRS High Channel



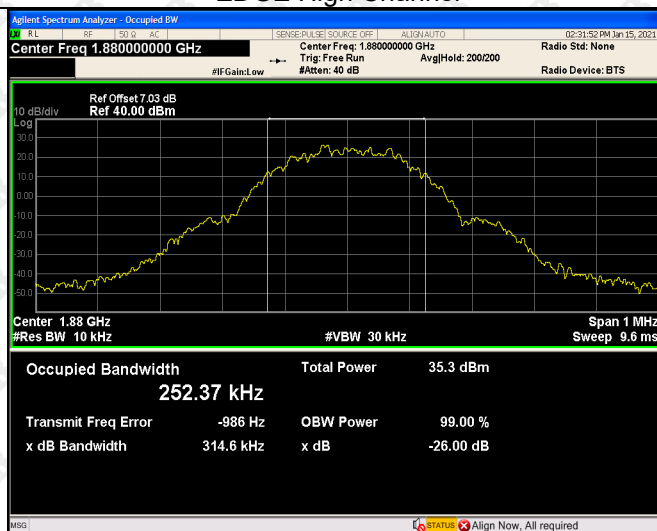
EDGE Low Channel



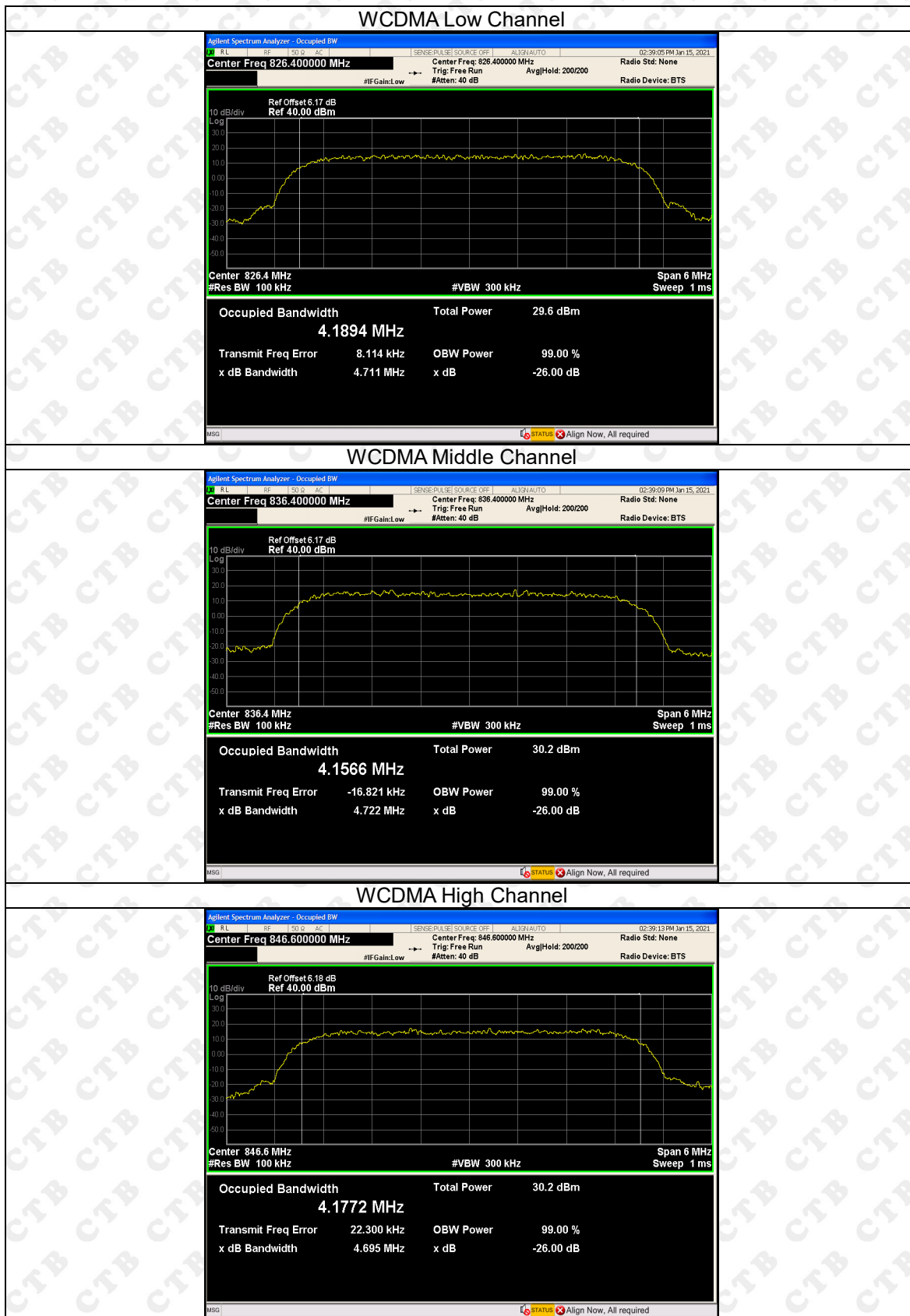
EDGE Middle Channel



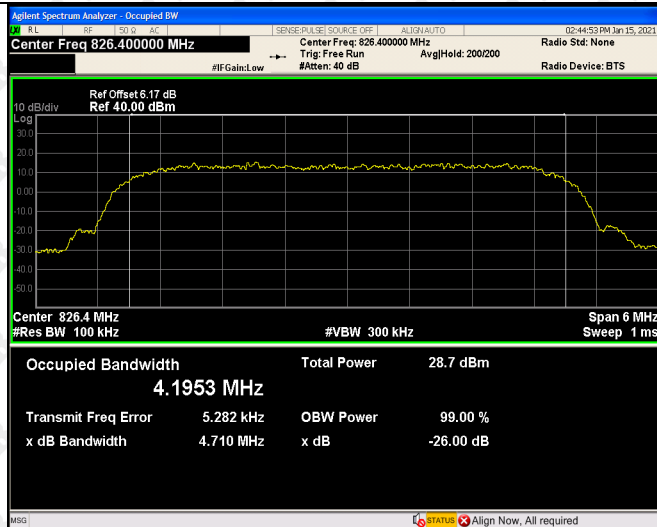
EDGE High Channel



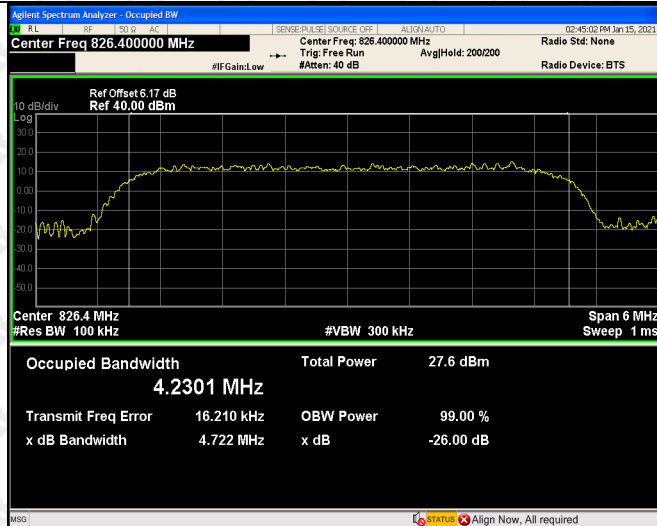
For Band V



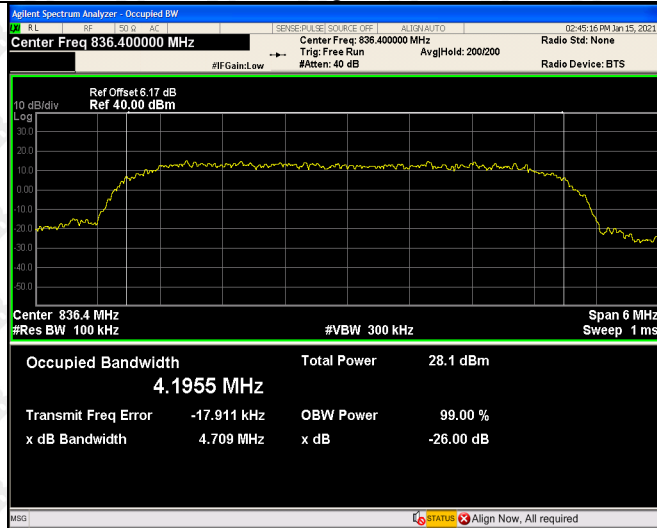
HSDPA Low Channel



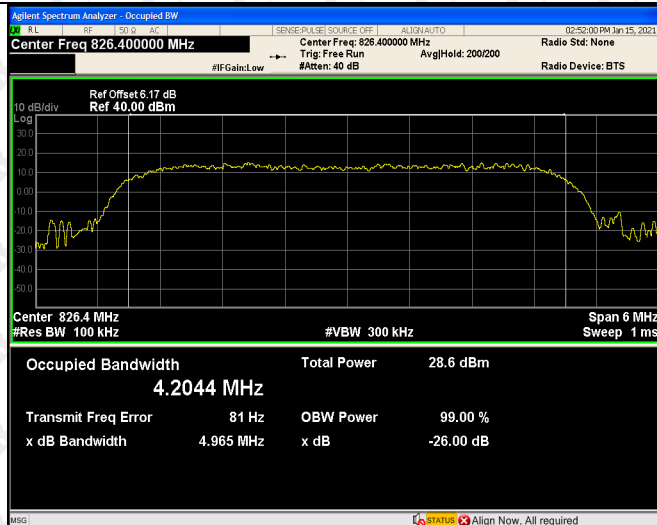
HSDPA Middle Channel



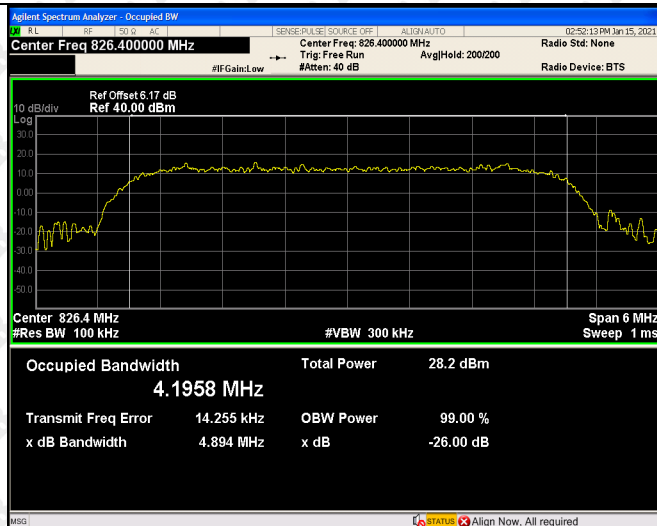
HSDPA High Channel



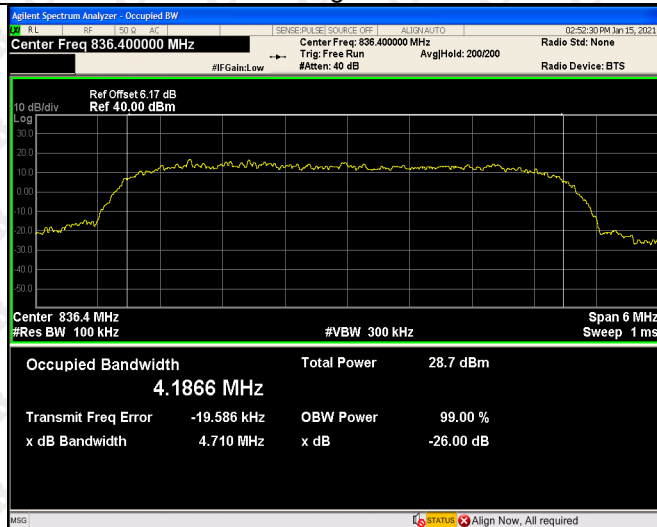
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

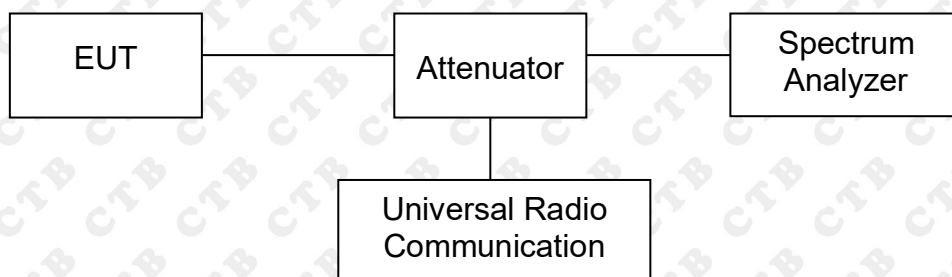
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

9.2 Test Procedure

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

Test Configuration for the out of band emissions testing:



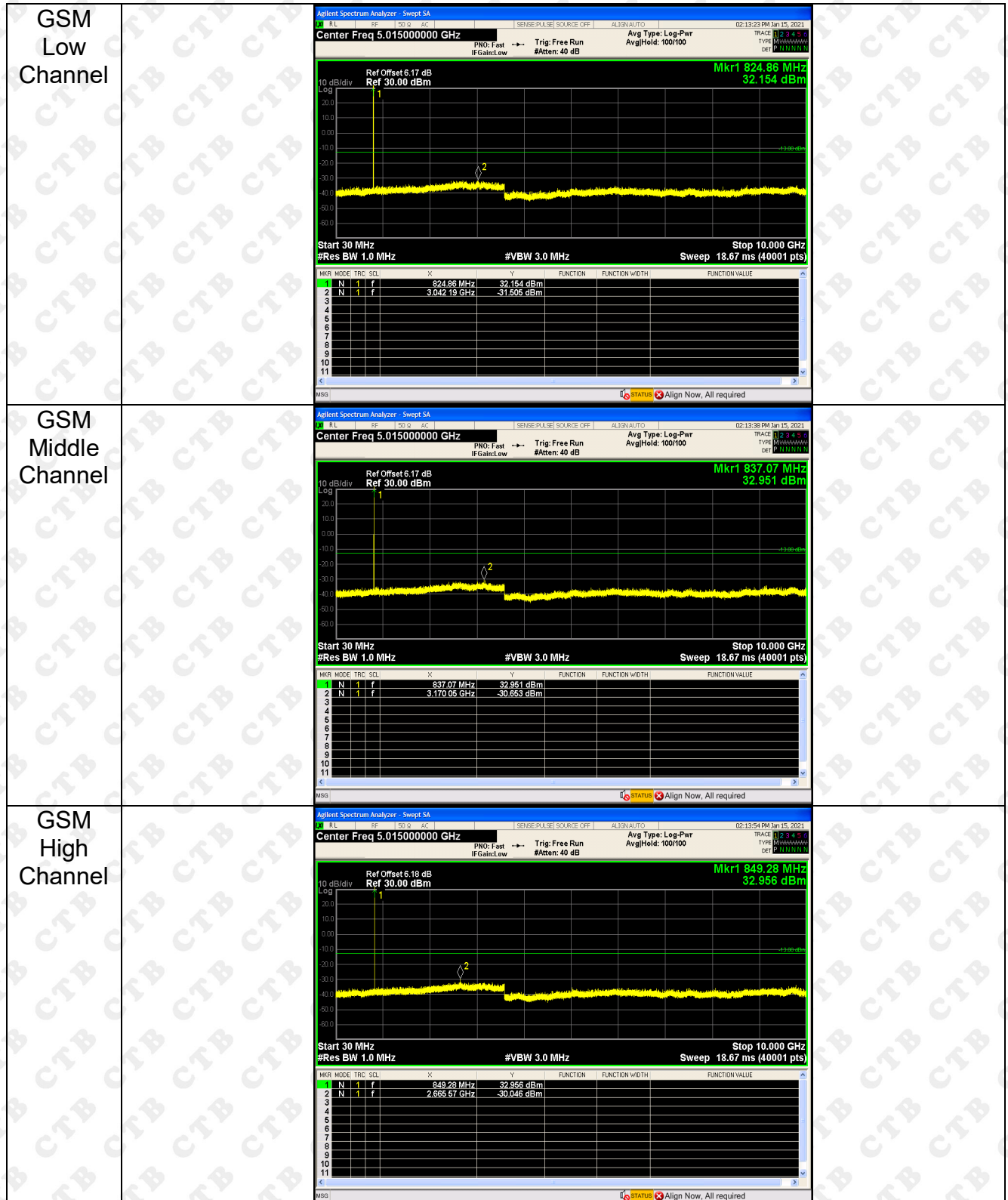
9.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

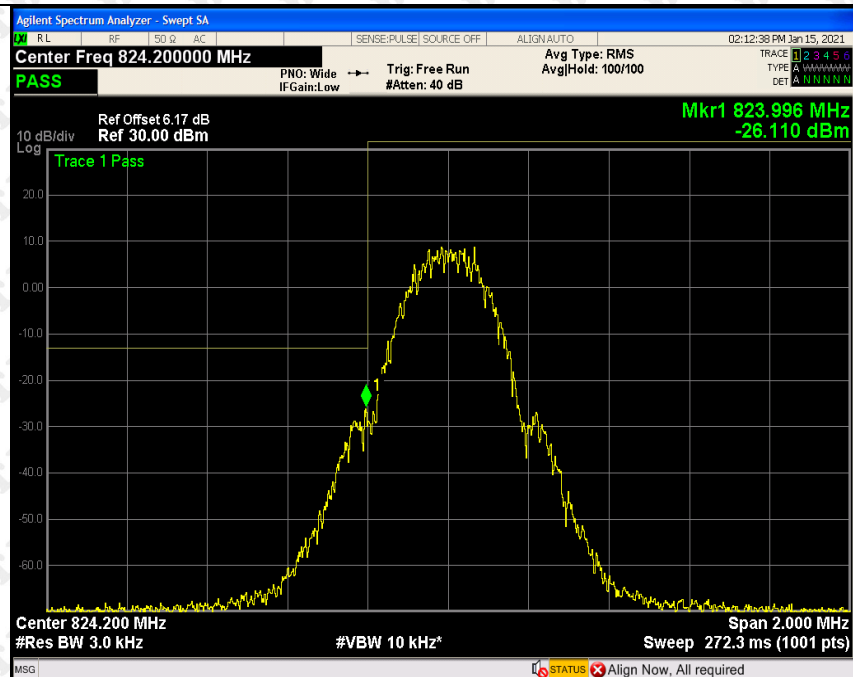
9.4 Summary of Test Results/Plots

Please refer to the following test plots

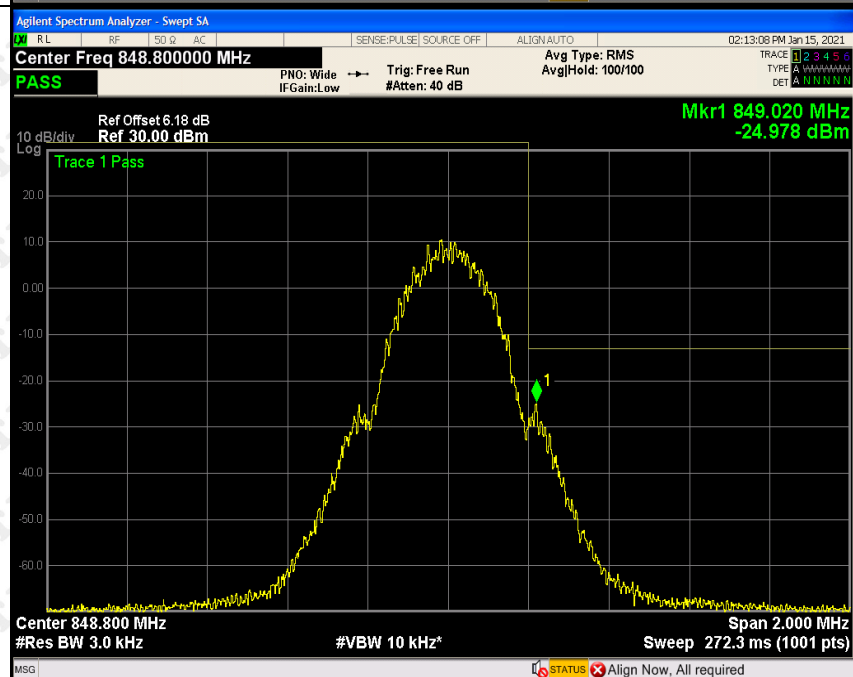
For Cellular Band

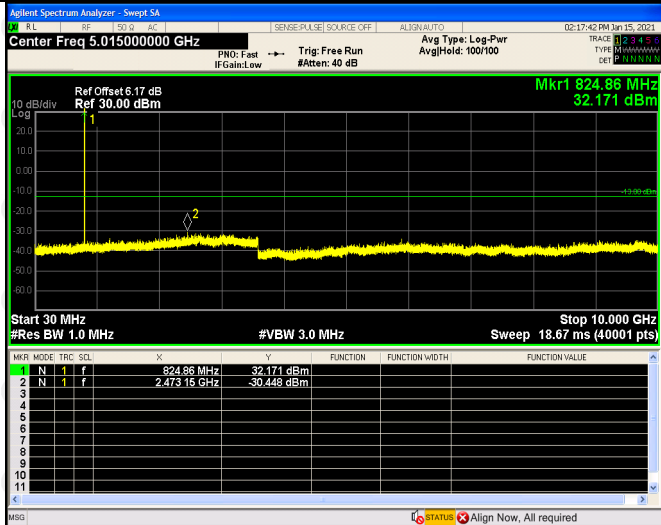
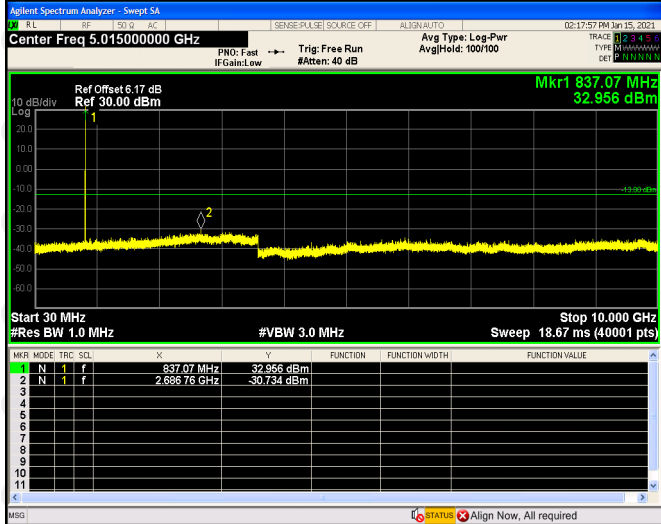
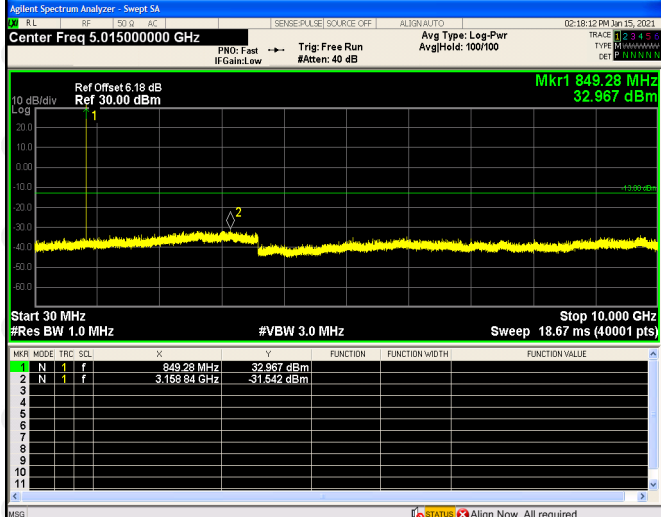


GSM Low Band Emission

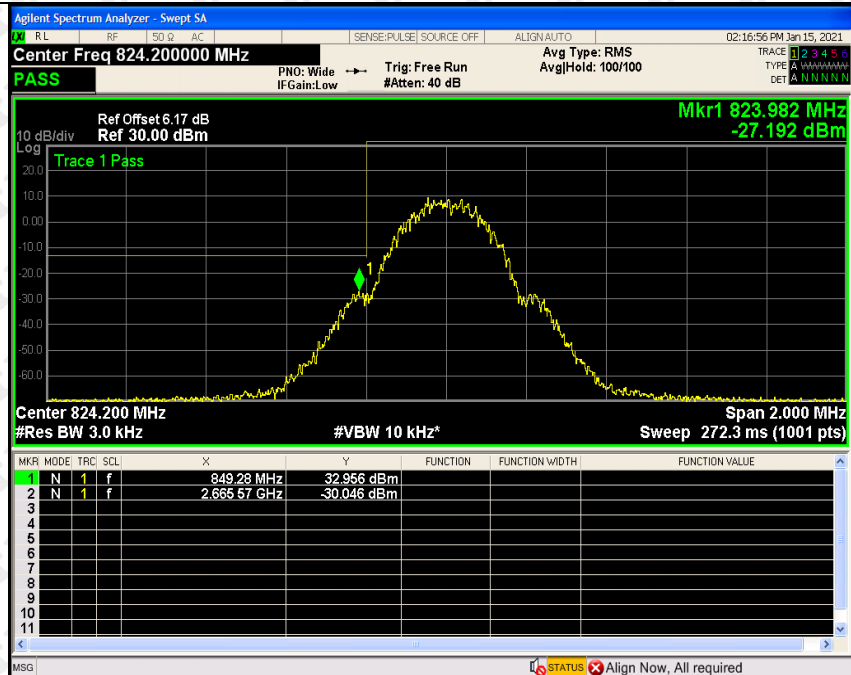


GSM High Band Emission

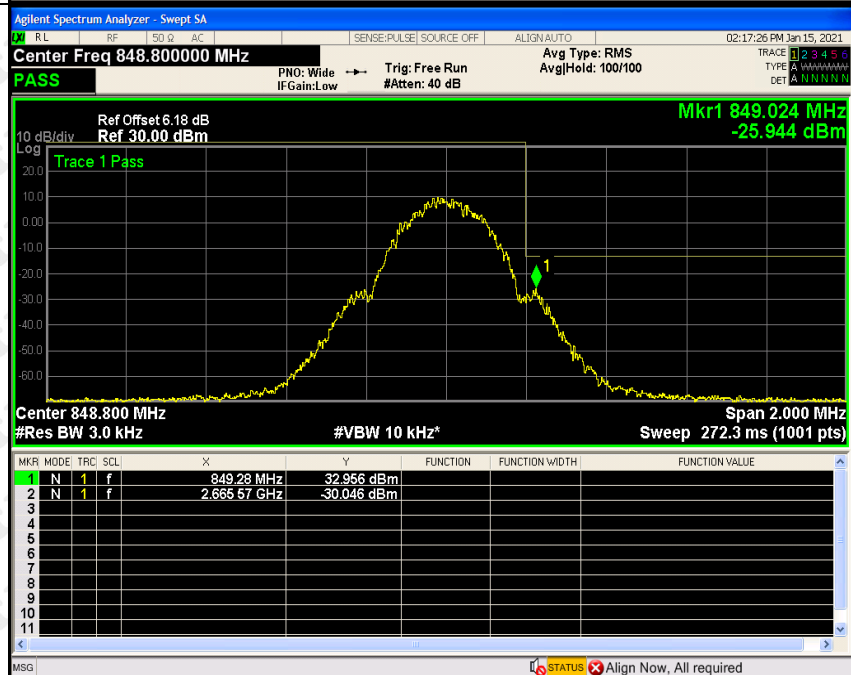


GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

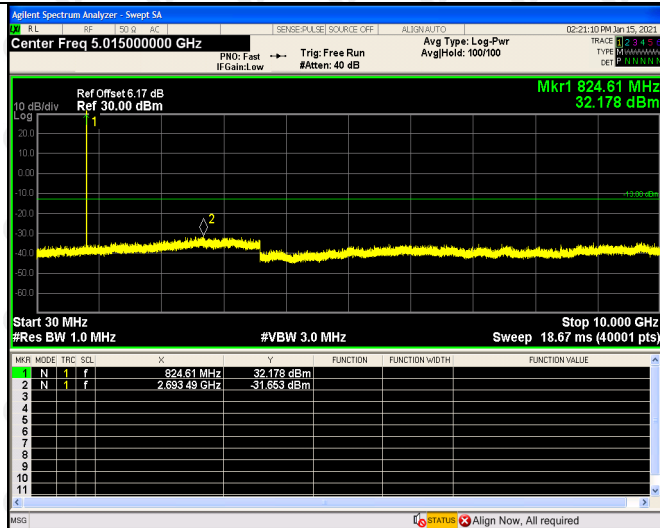
GPRS Low Band Emission



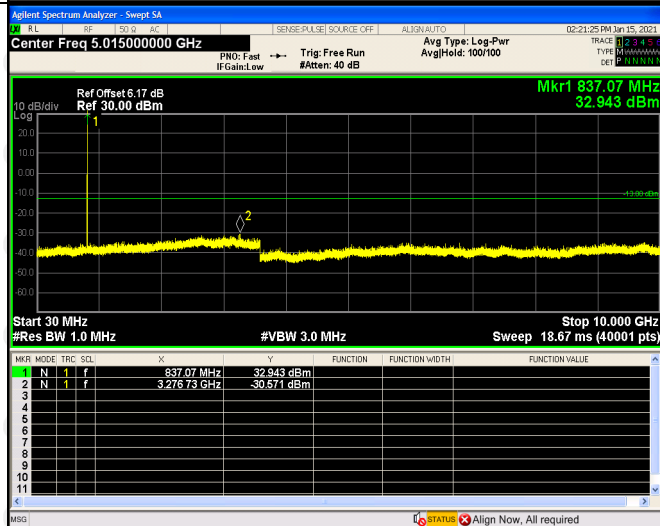
GPRS High Band Emission



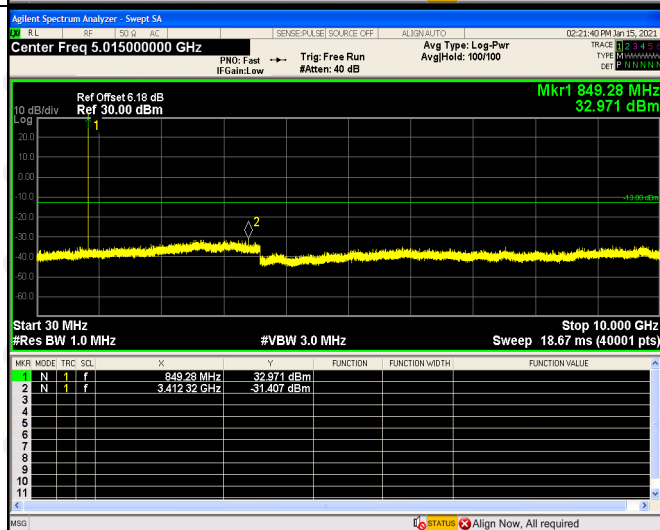
EDGE
Low
Channel



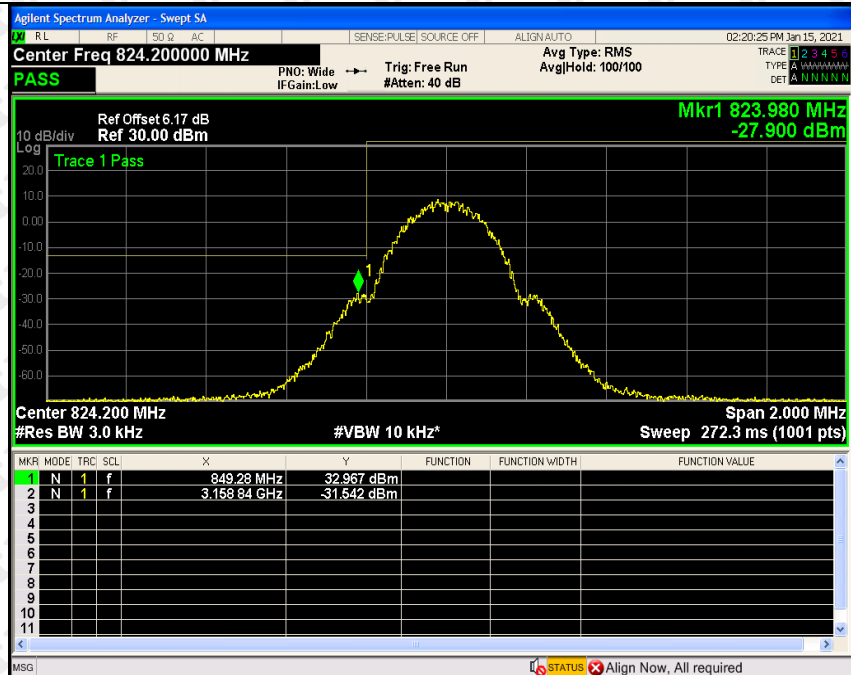
EDGE
Middle
Channel



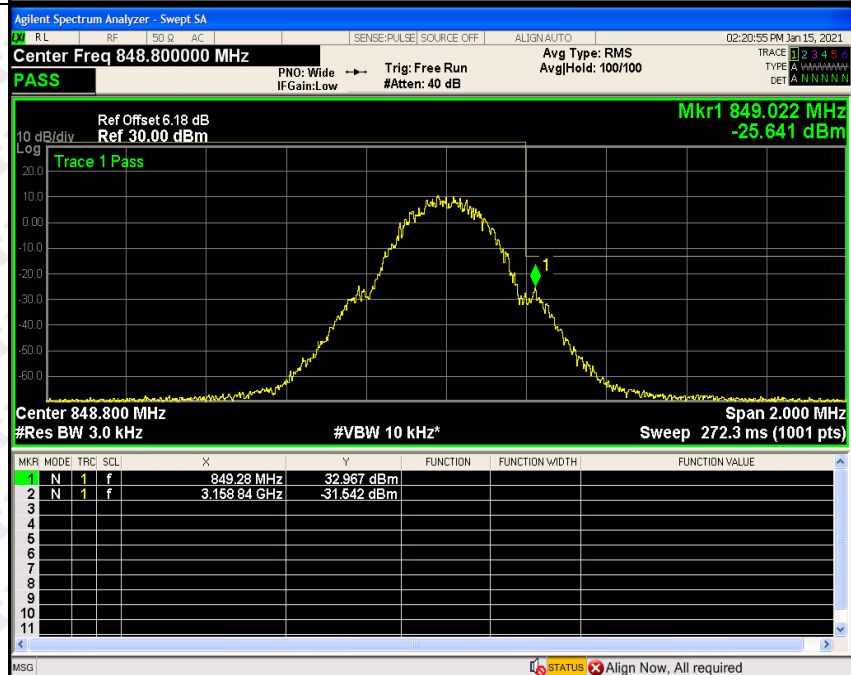
EDGE
High
Channel



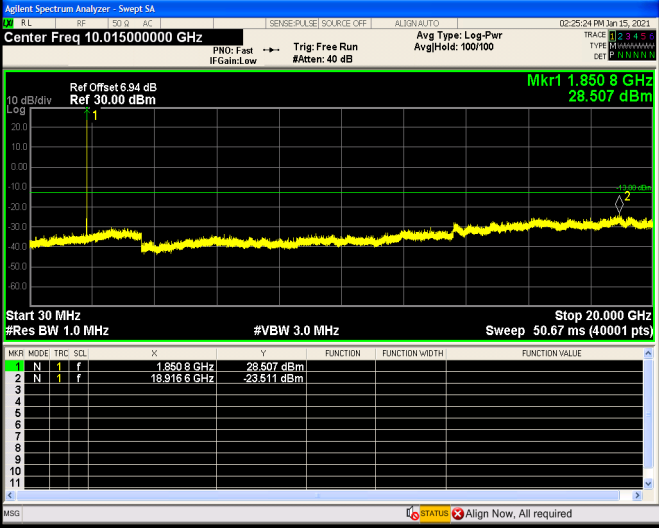
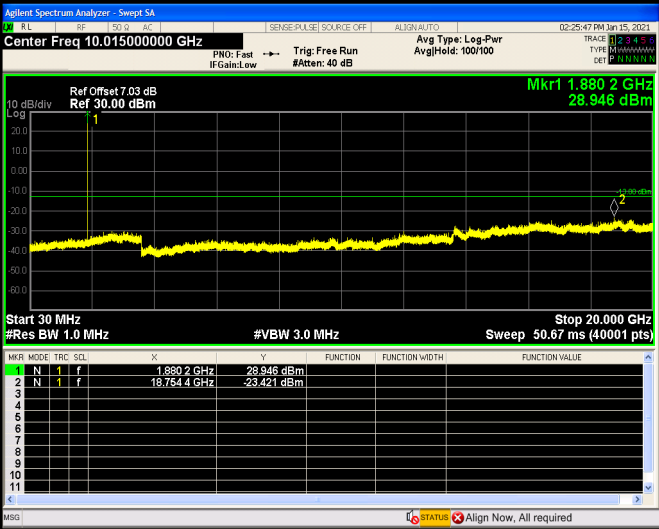
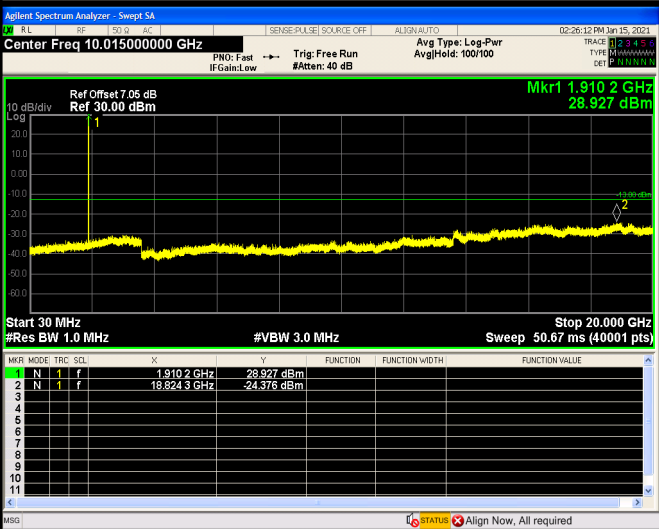
EDGE Low Band Emission



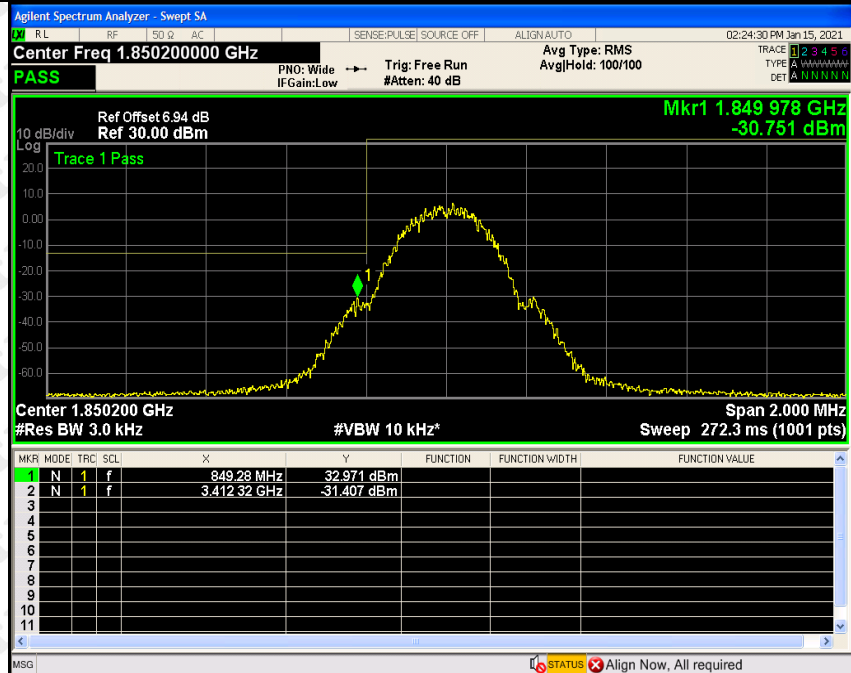
EDGE High Band Emission



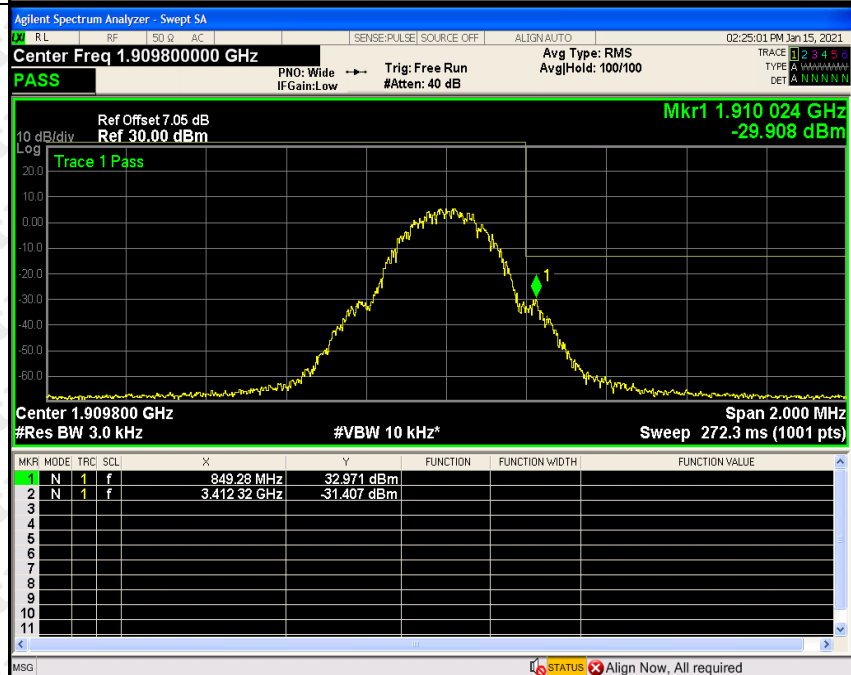
For PCS Band

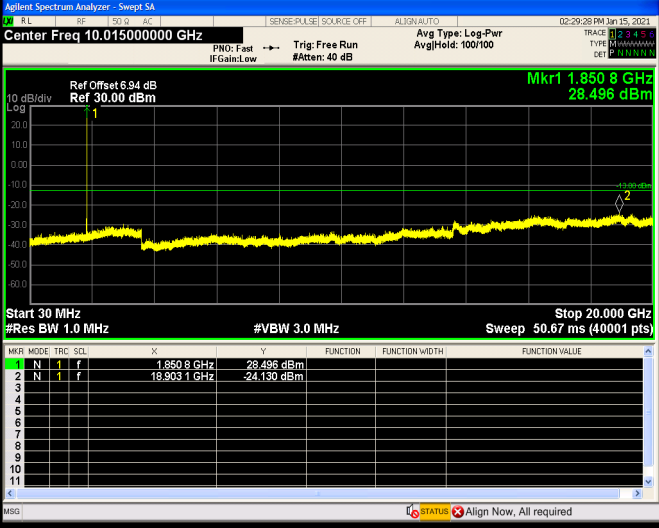
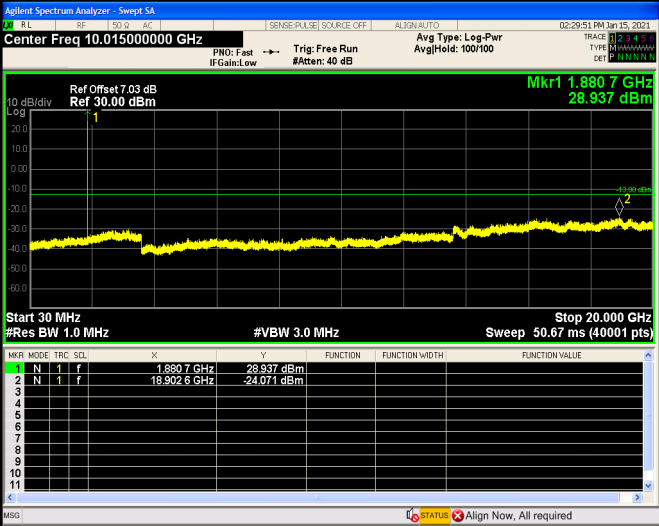
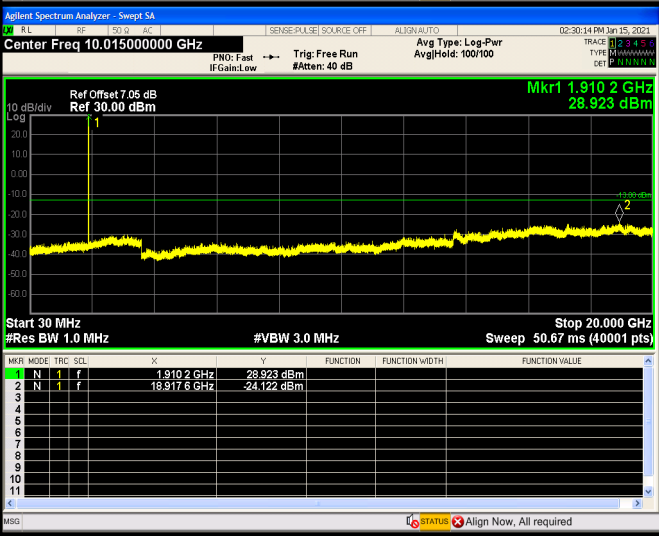
GSM Low Channel	
GSM Middle Channel	
GSM High Channel	

GSM
Low
Band
Emission

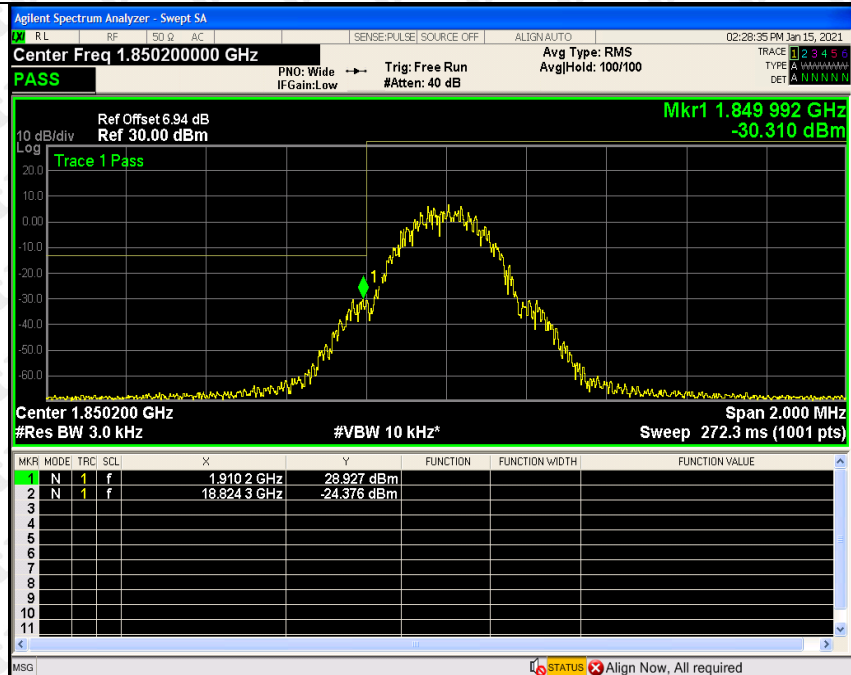


GSM
High
Band
Emission

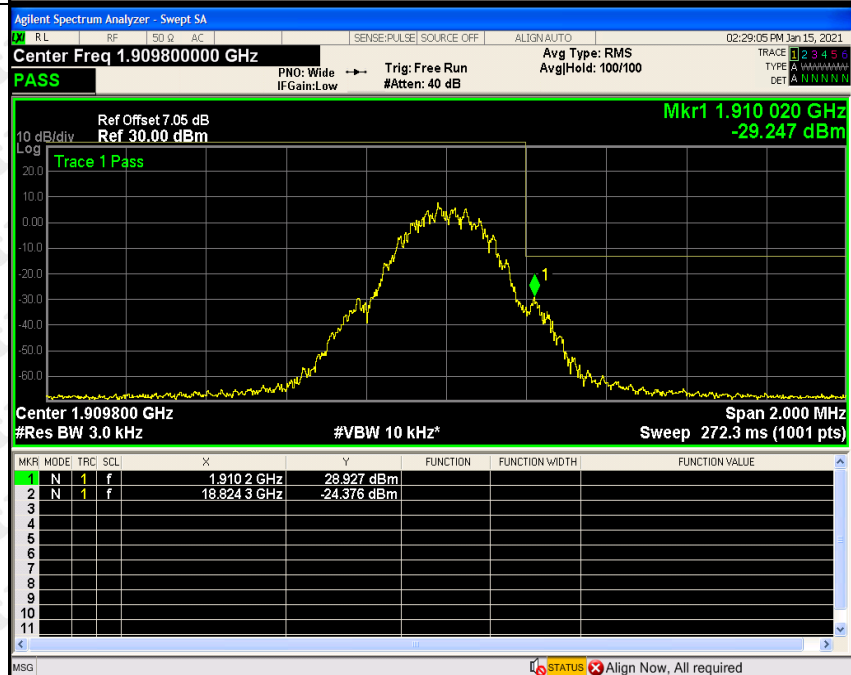


GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

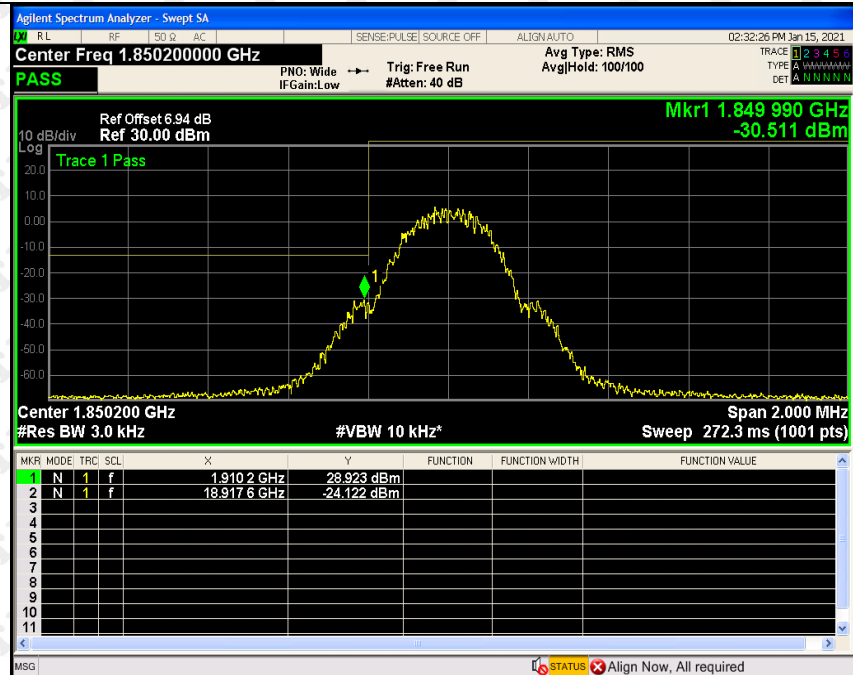
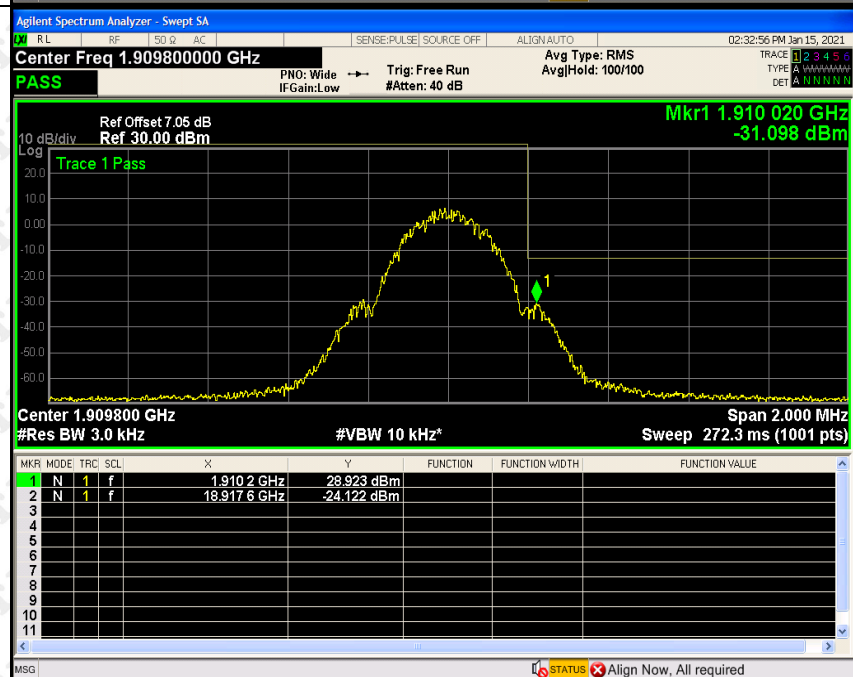
GPRS Low Band Emission



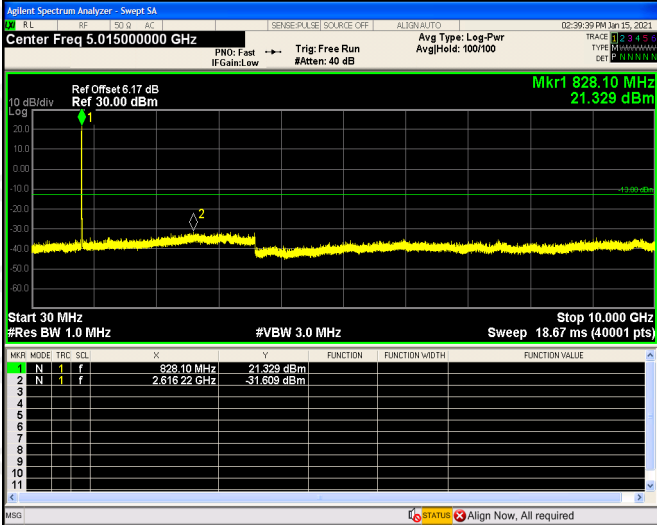
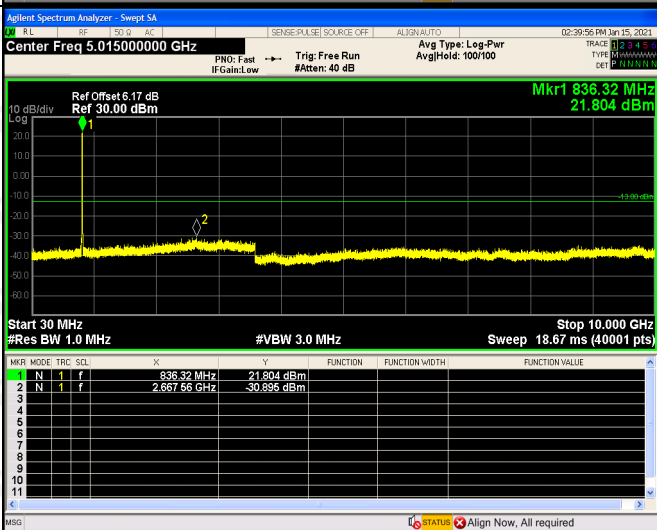
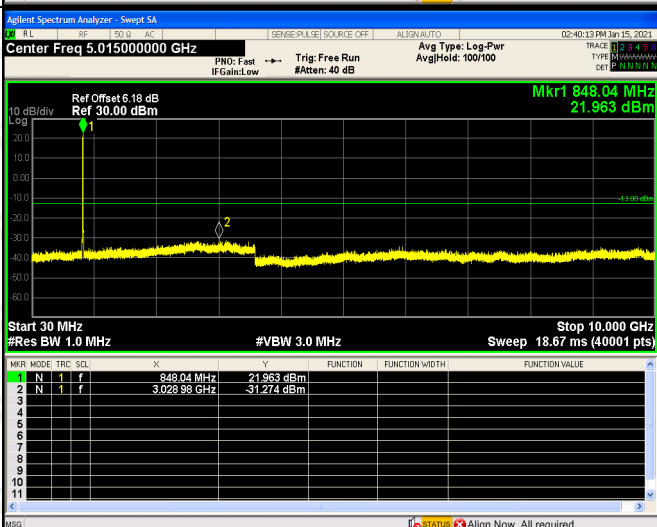
GPRS High Band Emission



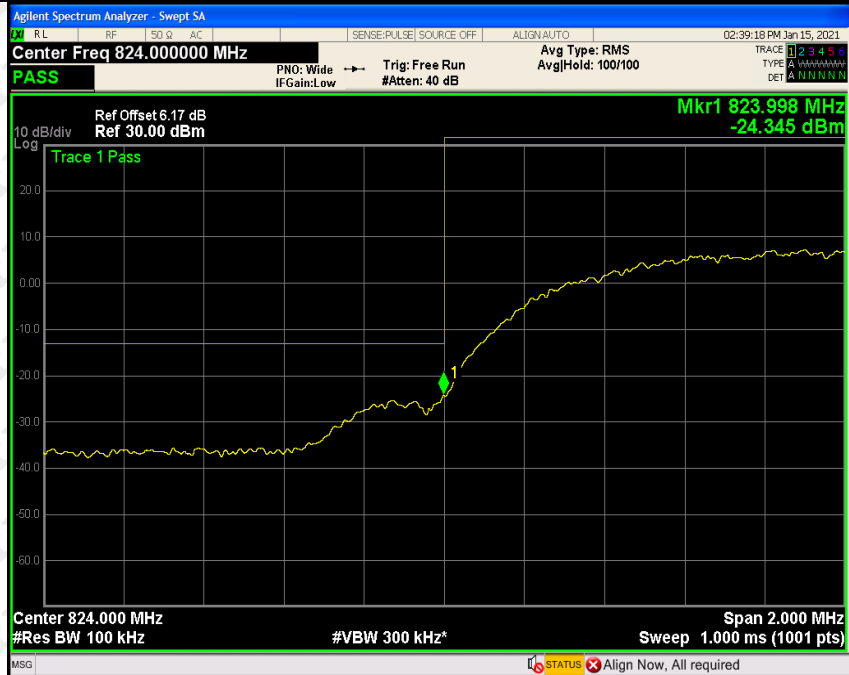
EDGE Low Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 10.01500000 GHz Ref Offset 6.94 dB Ref 30.00 dBm Mkr1 1.850 8 GHz 28.508 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</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>28.508 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>18.907 1 GHz</td><td>-24.301 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.850 8 GHz	28.508 dBm				2	N	1	f	18.907 1 GHz	-24.301 dBm				3									4									5									6									7									8									9									10									11								
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EDGE Middle Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 10.01500000 GHz Ref Offset 7.03 dB Ref 30.00 dBm Mkr1 1.880 2 GHz 28.937 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRC</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>1.880 2 GHz</td><td>28.937 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>18.976 5 GHz</td><td>-23.789 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.880 2 GHz	28.937 dBm				2	N	1	f	18.976 5 GHz	-23.789 dBm				3									4									5									6									7									8									9									10									11								
MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																																																																																					
1	N	1	f	1.880 2 GHz	28.937 dBm																																																																																																								
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EDGE High Channel	Agilent Spectrum Analyzer - Sweep SA Center Freq 10.01500000 GHz Ref Offset 7.05 dB Ref 30.00 dBm Mkr1 1.910 2 GHz 28.917 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 20.000 GHz Sweep 50.67 ms (40001 pts) <table><thead><tr><th>MKR</th><th>MODE</th><th>TRC</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>28.917 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>18.891 2 GHz</td><td>-23.159 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	1.910 2 GHz	28.917 dBm				2	N	1	f	18.891 2 GHz	-23.159 dBm				3									4									5									6									7									8									9									10									11								
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EDGE
Low
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High
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For Band V

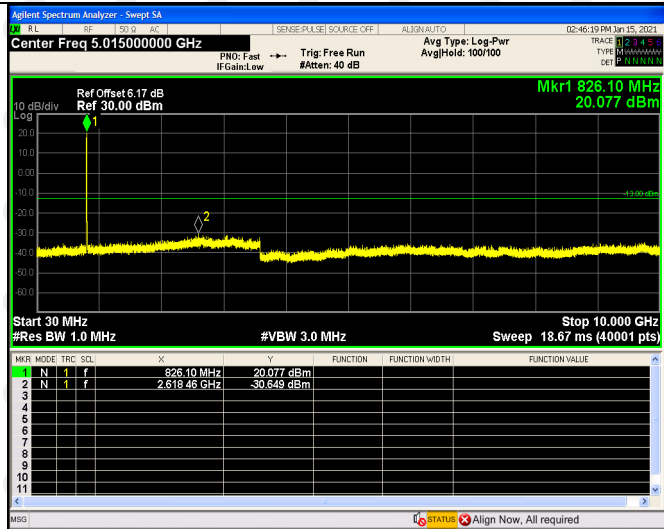
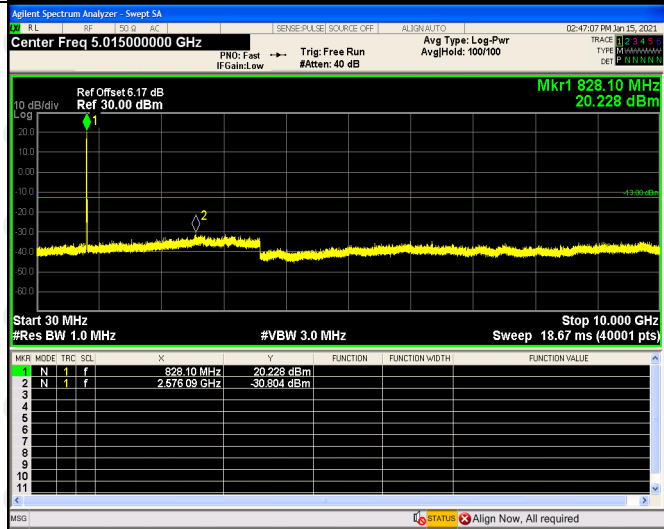
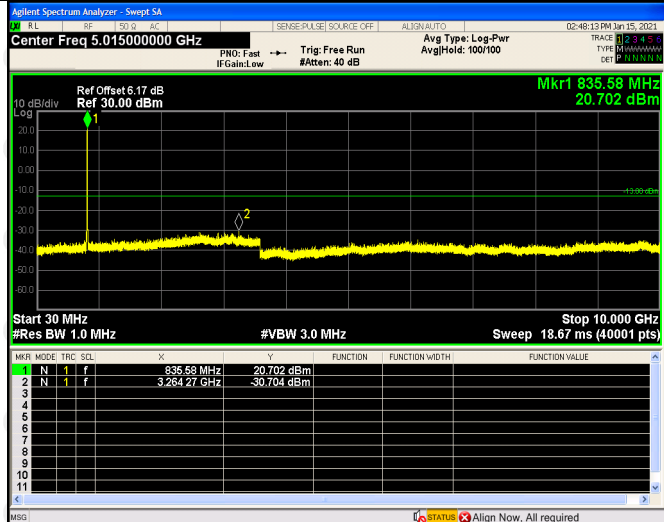
WCDMA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.17 dB Ref 30.00 dBm Mkr1 828.10 MHz 21.329 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>828.10 MHz</td><td>21.329 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.616 22 GHz</td><td>-31.609 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	828.10 MHz	21.329 dBm				2	N	1	f	2.616 22 GHz	-31.609 dBm			
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WCDMA Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.17 dB Ref 30.00 dBm Mkr1 836.32 MHz 21.804 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><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><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>836.32 MHz</td><td>21.804 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.667 56 GHz</td><td>-30.896 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	836.32 MHz	21.804 dBm				2	N	1	f	2.667 56 GHz	-30.896 dBm			
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2	N	1	f	2.667 56 GHz	-30.896 dBm																							
WCDMA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.18 dB Ref 30.00 dBm Mkr1 848.04 MHz 21.963 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><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><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>848.04 MHz</td><td>21.963 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>3.028 89 GHz</td><td>-31.274 dBm</td><td></td><td></td><td></td></tr></table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	848.04 MHz	21.963 dBm				2	N	1	f	3.028 89 GHz	-31.274 dBm			
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WCDMA
Low
Band
Spurious
Emission

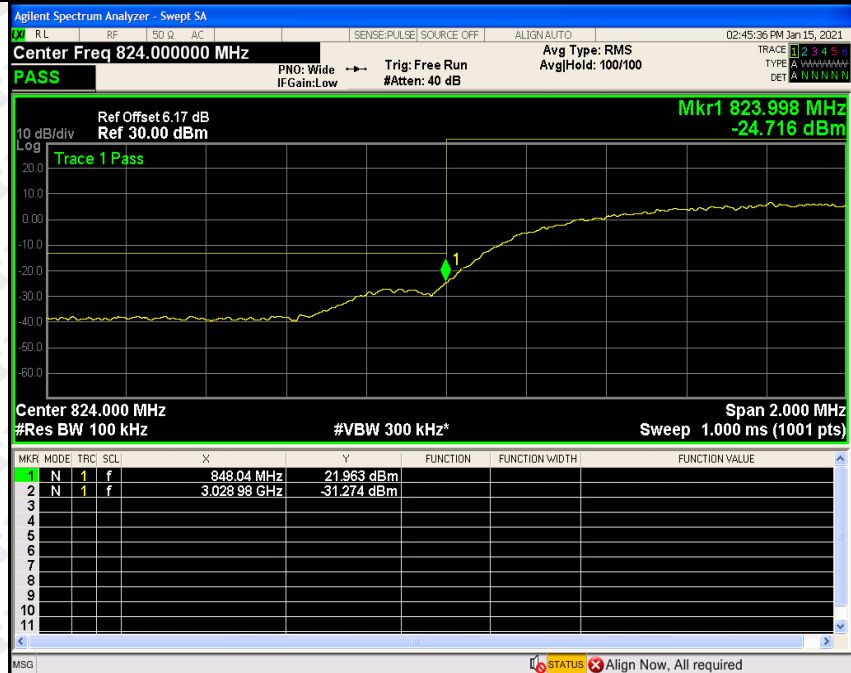


WCDMA
High
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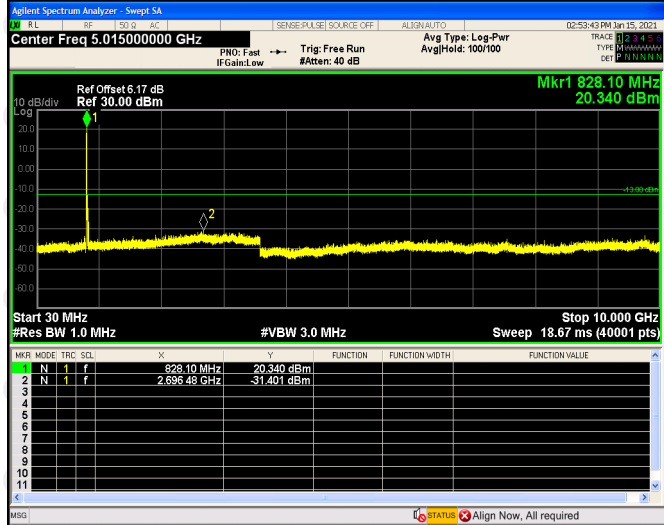
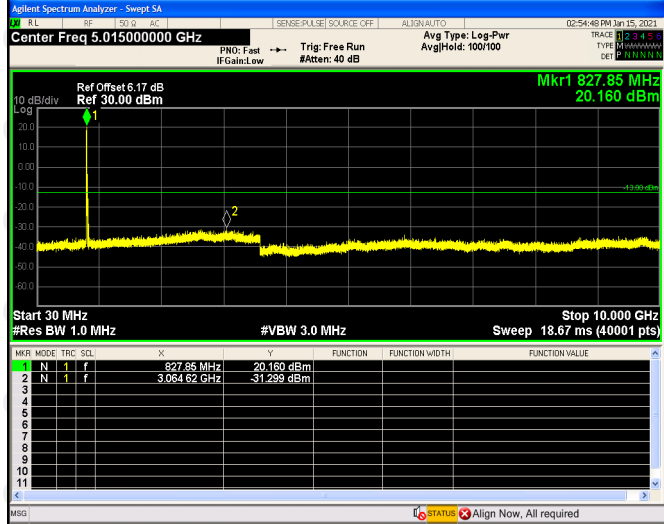
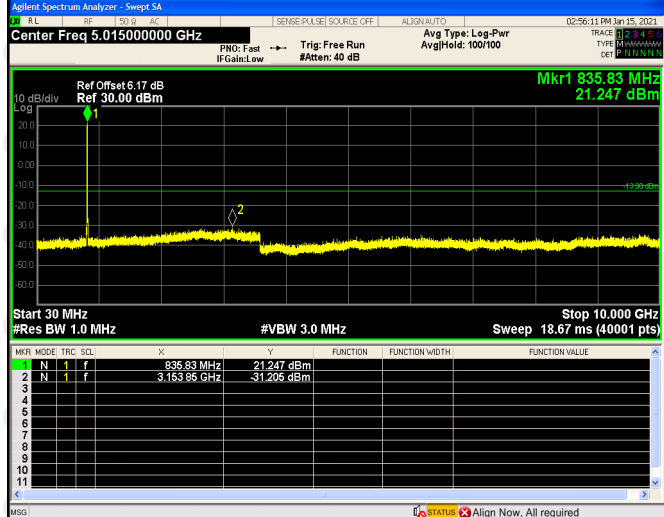
HSDPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 5.17 dB Ref 30.00 dBm Mkr1 826.10 MHz 20.077 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>826.10 MHz</td><td>20.077 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.619.46 GHz</td><td>-30.649 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	826.10 MHz	20.077 dBm				2	N	1	f	2.619.46 GHz	-30.649 dBm			
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HSDPA High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 5.17 dB Ref 30.00 dBm Mkr1 835.58 MHz 20.702 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>835.58 MHz</td><td>20.702 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>3.264.27 GHz</td><td>-30.704 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	835.58 MHz	20.702 dBm				2	N	1	f	3.264.27 GHz	-30.704 dBm			
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HSDPA Low Band Spurious Emission

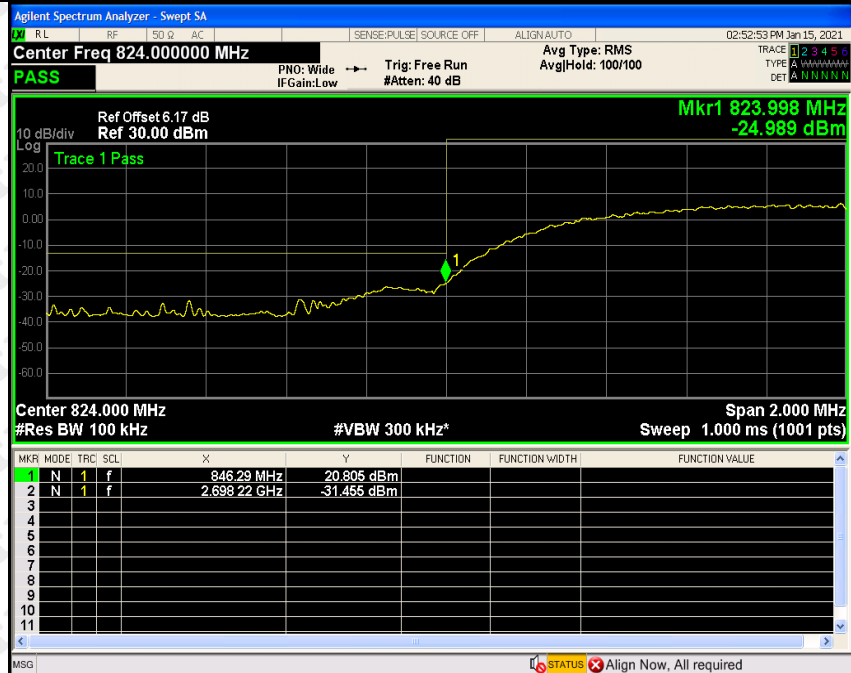


HSDPA High Band Spurious Emission



HSUPA Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 5.17 dB Ref 30.00 dBm Mkr1 828.10 MHz 20.340 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>828.10 MHz</td><td>20.340 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.69648 GHz</td><td>-31.401 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	828.10 MHz	20.340 dBm				2	N	1	f	2.69648 GHz	-31.401 dBm			
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2	N	1	f	3.15395 GHz	-31.205 dBm																							

HSUPA Low Band Spurious Emission



HSUPA High Band Spurious Emission



10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

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

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

10.2 Test Procedure

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

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

10.3 Environmental Conditions

Temperature:	26 °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)						
46.34	-69.29	4.34	-64.95	-13.00	-51.95	H
1648.4	-54.15	4.94	-49.21	-13.00	-36.21	H
2472.6	-52.93	8.46	-44.47	-13.00	-31.47	H
46.34	-69.17	4.34	-64.83	-13.00	-51.83	V
1648.4	-50.38	4.94	-45.44	-13.00	-32.44	V
2472.6	-50.94	8.46	-42.48	-13.00	-29.48	V
Middle Channel (836.6MHz)						
46.34	-68.61	4.34	-64.27	-13.00	-51.27	H
1673.2	-54.16	5.11	-49.05	-13.00	-36.05	H
2509.8	-52.93	8.54	-44.39	-13.00	-31.39	H
46.34	-68.72	4.34	-64.38	-13.00	-51.38	V
1673.2	-50.38	5.11	-45.27	-13.00	-32.27	V
2509.8	-50.99	8.54	-42.45	-13.00	-29.45	V
High Channel (848.8MHz)						
46.34	-69.15	4.34	-64.81	-13.00	-51.81	H
1697.6	-49.13	5.29	-43.84	-13.00	-30.84	H
2546.4	-51.42	8.59	-42.83	-13.00	-29.83	H
46.34	-69.20	4.34	-64.86	-13.00	-51.86	V
1697.6	-49.36	5.29	-44.07	-13.00	-31.07	V
2546.4	-51.73	8.59	-43.14	-13.00	-30.14	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)						
46.34	-69.22	4.34	-64.88	-13.00	-51.88	H
3700.4	-53.35	10.54	-42.81	-13.00	-29.81	H
5550.6	-56.25	13.37	-42.88	-13.00	-29.88	H
46.34	-68.54	4.34	-64.20	-13.00	-51.20	V
3700.4	-52.76	10.54	-42.22	-13.00	-29.22	V
5550.6	-56.32	13.37	-42.95	-13.00	-29.95	V
Middle Channel (1880MHz)						
46.34	-68.81	4.34	-64.47	-13.00	-51.47	H
3760.0	-51.45	10.64	-40.81	-13.00	-27.81	H
5640.0	-56.51	13.54	-42.97	-13.00	-29.97	H
46.34	-69.14	4.34	-64.80	-13.00	-51.80	V
3760.0	-51.32	10.64	-40.68	-13.00	-27.68	V
5640.0	-56.14	13.54	-42.6	-13.00	-29.60	V
High Channel (1909.8MHz)						
46.34	-69.50	4.34	-65.16	-13.00	-52.16	H
3819.6	-53.18	10.74	-42.44	-13.00	-29.44	H
5729.4	-56.65	13.71	-42.94	-13.00	-29.94	H
46.34	-68.88	4.34	-64.54	-13.00	-51.54	V
3819.6	-53.25	10.74	-42.51	-13.00	-29.51	V
5729.4	-56.11	13.71	-42.4	-13.00	-29.40	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
46.34	-69.19	4.34	-64.85	-13.00	-51.85	H
1652.8	-58.43	4.94	-53.49	-13.00	-40.49	H
2479.2	-58.45	8.46	-49.99	-13.00	-36.99	H
46.34	-69.24	4.34	-64.90	-13.00	-51.90	V
1652.8	-57.12	4.94	-52.18	-13.00	-39.18	V
2479.2	-58.53	8.46	-50.07	-13.00	-37.07	V
Middle Channel (836.6MHz)						
46.34	-69.47	4.34	-65.13	-13.00	-52.13	H
1672.8	-57.47	5.11	-52.36	-13.00	-39.36	H
2509.2	-57.54	8.54	-49.00	-13.00	-36.00	H
46.34	-69.17	4.34	-64.83	-13.00	-51.83	V
1672.8	-58.32	5.11	-53.21	-13.00	-40.21	V
2509.2	-59.47	8.54	-50.93	-13.00	-37.93	V
High Channel (846.6MHz)						
46.34	-69.45	4.34	-65.11	-13.00	-52.11	H
1693.2	-56.43	5.29	-51.14	-13.00	-38.14	H
2539.8	-59.23	8.59	-50.64	-13.00	-37.64	H
46.34	-68.81	4.34	-64.47	-13.00	-51.47	V
1693.2	-57.11	5.29	-51.82	-13.00	-38.82	V
2539.8	-58.32	8.59	-49.73	-13.00	-36.73	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:	26°C
Relative Humidity:	54%
ATM Pressure:	101kPa

11.4 Summary of Test Results/Plots

For Cellular Band GSM 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	5.04	0.0060
40	NV	4.85	0.0058
30	NV	7.04	0.0084
20	NV	4.81	0.0057
10	NV	6.52	0.0078
0	NV	5.87	0.0070
-10	NV	5.25	0.0063
-20	NV	5.55	0.0066
-30	NV	5.34	0.0064

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	14.02	0.0075
40	NV	16.93	0.0090
30	NV	15.66	0.0083
20	NV	16.10	0.0086
10	NV	15.10	0.0080
0	NV	13.88	0.0074
-10	NV	15.79	0.0084
-20	NV	16.45	0.0087
-30	NV	15.30	0.0081

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	24.49	0.0293
40	NV	25.65	0.0307
30	NV	25.82	0.0309
20	NV	26.37	0.0315
10	NV	27.36	0.0327
0	NV	26.98	0.0323
-10	NV	27.02	0.0323
-20	NV	27.05	0.0323
-30	NV	25.24	0.0302

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	23.50	0.0125
40	NV	23.32	0.0124
30	NV	25.93	0.0138
20	NV	23.18	0.0123
10	NV	25.24	0.0134
0	NV	25.23	0.0134
-10	NV	23.92	0.0127
-20	NV	23.09	0.0123
-30	NV	24.82	0.0132

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	19.89	0.0238
40	NV	21.85	0.0261
30	NV	23.48	0.0281
20	NV	21.38	0.0256
10	NV	22.58	0.0270
0	NV	20.81	0.0249
-10	NV	21.20	0.0253
-20	NV	21.47	0.0257
-30	NV	22.12	0.0264

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	13.94	0.0074
40	NV	14.39	0.0077
30	NV	15.73	0.0084
20	NV	13.38	0.0071
10	NV	14.63	0.0078
0	NV	14.63	0.0078
-10	NV	16.23	0.0086
-20	NV	12.77	0.0068
-30	NV	16.66	0.0089

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	1.08	0.0013
40	NV	0.24	0.0003
30	NV	1.80	0.0021
20	NV	2.11	0.0025
10	NV	1.82	0.0022
0	NV	1.11	0.0013
-10	NV	1.19	0.0014
-20	NV	-0.10	-0.0001
-30	NV	1.83	0.0022

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	-15.90	-0.0190
40	NV	-13.95	-0.0167
30	NV	-10.74	-0.0128
20	NV	-15.76	-0.0188
10	NV	-16.70	-0.0200
0	NV	-13.94	-0.0167
-10	NV	-14.04	-0.0168
-20	NV	-16.85	-0.0201
-30	NV	-14.72	-0.0176

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	-6.88	-0.0082
40	NV	-6.92	-0.0083
30	NV	-6.35	-0.0076
20	NV	-7.80	-0.0093
10	NV	-9.45	-0.0113
0	NV	-6.96	-0.0083
-10	NV	-8.44	-0.0101
-20	NV	-7.01	-0.0084
-30	NV	-4.91	-0.0059

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	6.60	0.0079
	NV	6.20	0.0074
	HV	5.50	0.0066
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	14.53	0.0077
	NV	13.81	0.0073
	HV	15.17	0.0081
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	26.47	25.54
	NV	26.73	25.23
	HV	26.51	25.03

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	23.14	0.0123
	NV	25.41	0.0135
	HV	25.14	0.0134

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	19.82	0.0237
	NV	21.62	0.0258
	HV	21.48	0.0257

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	13.23	0.0070
	NV	14.14	0.0075
	HV	15.08	0.0080

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	2.31	0.0028
	NV	0.61	0.0007
	HV	2.93	0.0035

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	-15.06	-0.0180
	NV	-14.97	-0.0179
	HV	-16.42	-0.0196
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	-8.55	-0.0102
	NV	-5.91	-0.0071
	HV	-8.49	-0.0101

12. EUT PHOTO

EUT Photo 1

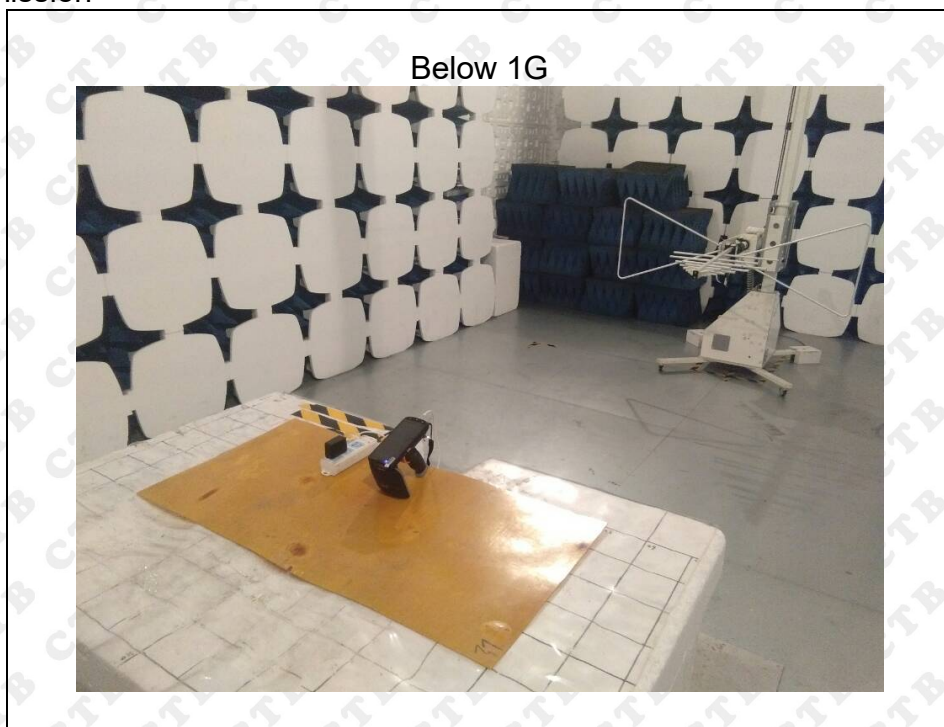


EUT Photo 2



13. EUT TEST PHOTO

Radiated Emission



Conducted Emission



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