

TEST REPORT

Product Name: Your Phone
FCC ID: 2A593-HOT12I
Trademark: N/A
Model Number: 2A593-HOT12I, S21+Ultra, Reno5 pro+, HOT 12i, HOT 12PLAY, H88, H22, R4Pro, H314, H91, P37Pro, Reno7Pro, speak8c, S22ULTRA
Prepared For: Shenzhen Ai Di Er Technology Co., Ltd.
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Sample Received Date: Jun. 21, 2022
Sample tested Date: Jun. 21, 2022 to Jul. 07, 2022
Issue Date: Jul. 07, 2022
Report No.: CTB220705032RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is GSM radio test report.

Compiled by:

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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.

TABLE OF CONTENT

Test Report Declaration	Page
1. VERSION	3
2. TEST SUMMARY	4
3. MEASUREMENT UNCERTAINTY	5
4. PRODUCT INFORMATION AND TEST SETUP	6
4.1 Product Information	6
4.2 Test Setup Configuration	7
4.3 Support Equipment	7
N/A 4.4 Channel List	7
4.4 Channel List	8
4.5 Test Mode	8
4.6 Test Environment	9
5. TEST FACILITY AND TEST INSTRUMENT USED	10
5.1 Test Facility	10
5.2 Test Instrument Used	10
6. RF OUTPUT POWER	12
6.1 Standard Applicable	12
6.2 Test Procedure	12
6.3 Environmental Conditions	12
6.4 Summary of Test Results/Plots	13
7. PEAK-TO-AVERAGE RATIO(PAR) OF TRANSMITTER	19
7.1 Standard Applicable	19
7.2 Test Procedure	19
7.3 Environmental Conditions	20
7.4 Summary of Test Results	20
8. EMISSION BANDWIDTH	22
8.1 Standard Applicable	22
8.2 Test Procedure	22
8.3 Environmental Conditions	22
8.4 Summary of Test Results/Plots	23
9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL	34
9.1 Standard Applicable	34
9.2 Test Procedure	34
9.3 Environmental Conditions	34
9.4 Summary of Test Results/Plots	34
10. SPURIOUS RADIATED EMISSIONS	53
10.1 Standard Applicable	53
10.2 Test Procedure	53
10.3 Environmental Conditions	53
10.4 Summary of Test Results/Plots	54
11. FREQUENCY STABILITY	57
11.1 Standard Applicable	57
11.2 Test Procedure	57
11.3 Environmental Conditions	57
11.4 Summary of Test Results/Plots	58
12. EUT PHOTO	67
13. EUT TEST PHOTO	68

(Note: N/A means not applicable)

**1. VERSION**

Report No.	Issue Date	Description	Approved
CTB220705032RFX	Mar. 10, 2022	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

FCC Rules	Description of Test Item	Result
§1.1307, §2.1093	RF Exposure	Compliant
§22.913 (a), §24.232 (c)	RF Output Power	Compliant
§24.51	Peak-to-average Ratio(PAR) of Transmitter	Compliant
§22.917 (b), §24.238 (b)	Emission Bandwidth	Compliant
§22.917 (a), §24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§22.917 (a), §24.238 (a)	Spurious Radiation Emissions	Compliant
§22.917 (a), §24.238 (a)	Out of Band Emissions	Compliant
§22.355, §24.235	Frequency Stability	Compliant

3. MEASUREMENT UNCERTAINTY

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

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

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	2A593-HOT12I, S21+Urtra, Reno5 pro+, HOT 12i, HOT 12PLAY, H88, H22, R4Pro, H314, H91, P37Pro, Reno7Pro, speak8c, S22ULTRA
Model Description:	All the model are the same circuit and RF module, only the model name and inconsistencies in the size of the display. Test model : 2A593-HOT12I
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: 32.94dBm, GSM1900: 29.01dBm WCDMA Band 5: 22.73dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: 1.0dBi, GSM1900: 1.0dBi WCDMA Band 5: 1.0dBi
Ratings:	DC 5V charging from adapter Battery DC 3.7V



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

N/A

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(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC):	120V
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 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

No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated date	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2021.09.27	2022.08.05
2	Power Sensor	Agilent	U2021XA	MY56120032	2021.09.27	2022.08.05
3	Power Sensor	Agilent	U2021XA	MY56120034	2021.09.27	2022.08.05
4	Communication test set	R&S	CMW500	108058	2021.09.27	2022.08.05
5	Spectrum Analyzer	R&S	FSP40	100550	2021.09.27	2022.08.05
6	Signal Generator	Agilent	N5181A	MY49060920	2021.09.27	2022.08.16
7	Signal Generator	Agilent	N5182A	MY47420195	2021.09.27	2022.08.05
8	Communication test set	Agilent	E5515C	MY50102567	2021.09.27	2022.08.16
9	band rejection filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2021.09.27	2022.08.05
10	band rejection filter	Shenxiang	MSF5150-5850MS-1155	20181015001	2021.09.27	2022.08.05
11	band rejection filter	Xingbo	XBLBQ-DZA120	190821-1-1	2021.09.27	2022.08.05
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	2021.09.27	2022.08.05
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2021.09.27	2022.08.05
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2021.09.27	2022.08.05
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	2021.09.27	2022.08.05
16	966 chamber	C.R.T.	966 Room	966	2021.09.27	2024.08.11



17	Receiver	R&S	ESPI	100362	2021.09.27	2022.08.05
18	Amplifier	HP	8447E	2945A02747	2021.09.27	2022.08.05
19	Amplifier	Agilent	8449B	3008A01838	2021.09.27	2022.08.05
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	869	2021.09.27	2022.08.07
21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	2021.09.27	2022.08.08
22	Software	Fala	EZ-EMC	FA-03A2 RE	2021.09.27	2022.08.05
23	3-Loop Antenna	Daze	ZN30401	17014	2021.09.27	2022.08.05
24	loop antenna	ZHINAN	ZN30900A	/	2021.09.27	2022.08.05
25	Horn antenna	A/H/System	SAS-574	588	2021.09.27	2022.08.05
26	Amplifier	AEROFLEX	/	S/N/ 097	2021.09.27	2022.08.05

6. RF OUTPUT POWER

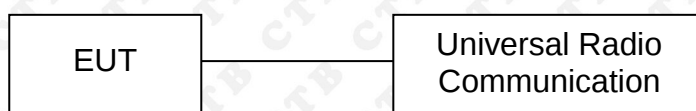
6.1 Standard Applicable

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

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

6.2 Test Procedure

Conducted output power test method:



Radiated power test method:

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

6.3 Environmental Conditions

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

6.4 Summary of Test Results/Plots

Max. Radiated Power

ERP For GSM Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	32.43	1.5	0	H	1.5	0.5	31.93	38.45
824.2	30.23	1.5	0	V	1.5	0.5	29.73	38.45
Middle Channel								
836.6	32.43	1.5	0	H	1.5	0.5	31.93	38.45
836.6	29.55	1.5	0	V	1.5	0.5	29.05	38.45
High Channel								
848.8	32.10	1.5	0	H	1.5	0.5	31.60	38.45
848.8	29.57	1.5	0	V	1.5	0.5	29.07	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	28.75	1.5	0	H	1.9	2	27.65	33.00
1850.2	27.19	1.5	0	V	1.9	2	26.09	33.00
Middle Channel								
1880	28.10	1.5	0	H	1.9	2	27.00	33.00
1880	28.36	1.5	0	V	1.9	2	27.26	33.00
High Channel								
1909.8	27.25	1.5	0	H	1.9	2	26.15	33.00
1909.8	28.11	1.5	0	V	1.9	2	27.01	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	31.93	1.5	0	H	1.5	0.5	31.43	38.45
824.2	30.29	1.5	0	V	1.5	0.5	29.79	38.45
Middle Channel								
836.6	32.41	1.5	0	H	1.5	0.5	31.91	38.45
836.6	29.21	1.5	0	V	1.5	0.5	28.71	38.45
High Channel								
848.8	32.47	1.5	0	H	1.5	0.5	31.97	38.45
848.8	29.81	1.5	0	V	1.5	0.5	29.31	38.45

EIRP For GPRS Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	28.57	1.5	0	H	1.9	2	27.47	33.00
1850.2	26.88	1.5	0	V	1.9	2	25.78	33.00
Middle Channel								
1880	27.42	1.5	0	H	1.9	2	26.32	33.00
1880	27.78	1.5	0	V	1.9	2	26.68	33.00
High Channel								
1909.8	25.82	1.5	0	H	1.9	2	24.72	33.00
1909.8	27.41	1.5	0	V	1.9	2	26.31	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	25.78	1.5	0	H	1.5	0.5	24.68	38.45
824.2	23.29	1.5	0	V	1.5	0.5	22.19	38.45
Middle Channel								
836.6	25.48	1.5	0	H	1.5	0.5	24.38	38.45
836.6	22.71	1.5	0	V	1.5	0.5	21.61	38.45
High Channel								
848.8	24.89	1.5	0	H	1.5	0.5	24.03	38.45
848.8	22.83	1.5	0	V	1.5	0.5	22.32	38.45

EIRP For EDGE Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	25.76	1.5	0	H	1.9	2	24.66	33.00
1850.2	23.58	1.5	0	V	1.9	2	22.48	33.00
Middle Channel								
1880	24.65	1.5	0	H	1.9	2	23.55	33.00
1880	22.92	1.5	0	V	1.9	2	21.82	33.00
High Channel								
1909.8	25.28	1.5	0	H	1.9	2	24.18	33.00
1909.8	23.29	1.5	0	V	1.9	2	22.19	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	22.01	1.5	0	H	1.5	0.5	20.91	38.45
826.4	21.60	1.5	0	V	1.5	0.5	20.50	38.45
Middle Channel								
836.6	22.02	1.5	0	H	1.5	0.5	20.92	38.45
836.6	21.53	1.5	0	V	1.5	0.5	20.43	38.45
High Channel								
846.6	21.67	1.5	0	H	1.5	0.5	20.57	38.45
846.6	21.41	1.5	0	V	1.5	0.5	20.31	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.44	1.5	0	H	1.5	0.5	20.34	38.45
826.4	21.30	1.5	0	V	1.5	0.5	20.20	38.45
Middle Channel								
836.6	20.96	1.5	0	H	1.5	0.5	19.86	38.45
836.6	20.06	1.5	0	V	1.5	0.5	18.96	38.45
High Channel								
846.6	20.62	1.5	0	H	1.5	0.5	19.52	38.45
846.6	21.64	1.5	0	V	1.5	0.5	20.54	38.45



ERP For HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	19.10	1.5	0	H	1.5	0.5	18.00	38.45
826.4	19.69	1.5	0	V	1.5	0.5	18.59	38.45
Middle Channel								
836.6	21.17	1.5	0	H	1.5	0.5	20.07	38.45
836.6	19.87	1.5	0	V	1.5	0.5	18.77	38.45
High Channel								
846.6	20.78	1.5	0	H	1.5	0.5	19.68	38.45
846.6	19.56	1.5	0	V	1.5	0.5	18.46	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	32.78	38.45
	Middle Channel	836.6	32.73	38.45
	High Channel	848.8	32.91	38.45
GPRS(1 Slot)	Low Channel	824.2	32.76	38.45
	Middle Channel	836.6	32.68	38.45
	High Channel	848.8	32.94	38.45
EDGE(1 Slot)	Low Channel	824.2	25.93	38.45
	Middle Channel	836.6	26.07	38.45
	High Channel	848.8	25.32	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	29.01	33.0
	Middle Channel	1880.0	28.41	33.0
	High Channel	1909.8	28.15	33.0
GPRS(1 Slot)	Low Channel	1850.2	28.98	33.0
	Middle Channel	1880.0	28.36	33.0
	High Channel	1909.8	28.09	33.0
EDGE(1 Slot)	Low Channel	1850.2	25.91	33.0
	Middle Channel	1880.0	25.62	33.0
	High Channel	1909.8	25.73	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	22.54	38.45
	Middle Channel	836.6	22.73	38.45
	High Channel	846.6	22.54	38.45
HSDPA	Low Channel	826.4	21.57	38.45
	Middle Channel	836.6	21.80	38.45
	High Channel	846.6	21.62	38.45
HSUPA	Low Channel	826.4	19.92	38.45
	Middle Channel	836.6	21.58	38.45
	High Channel	846.6	21.44	38.45

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

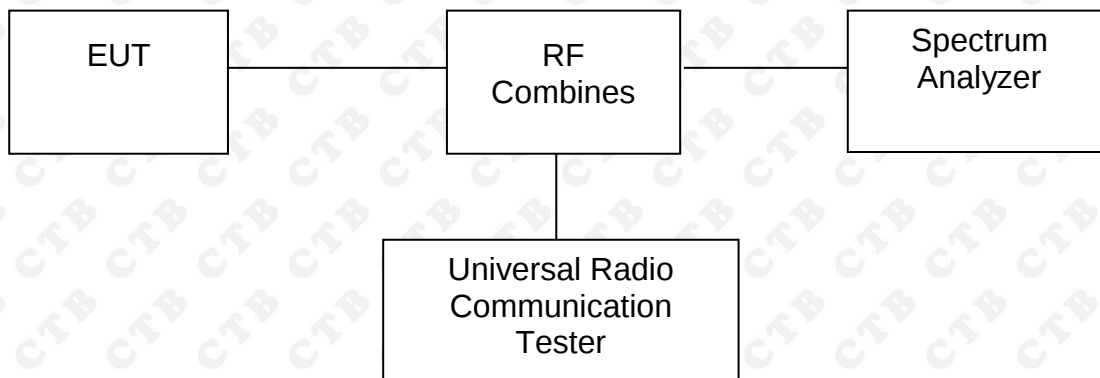
7.1 Standard Applicable

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:	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	2.70	13
GPRS(1 Slot)	190	836.6	2.73	13
EDGE(1 Slot)	190	836.6	2.73	13

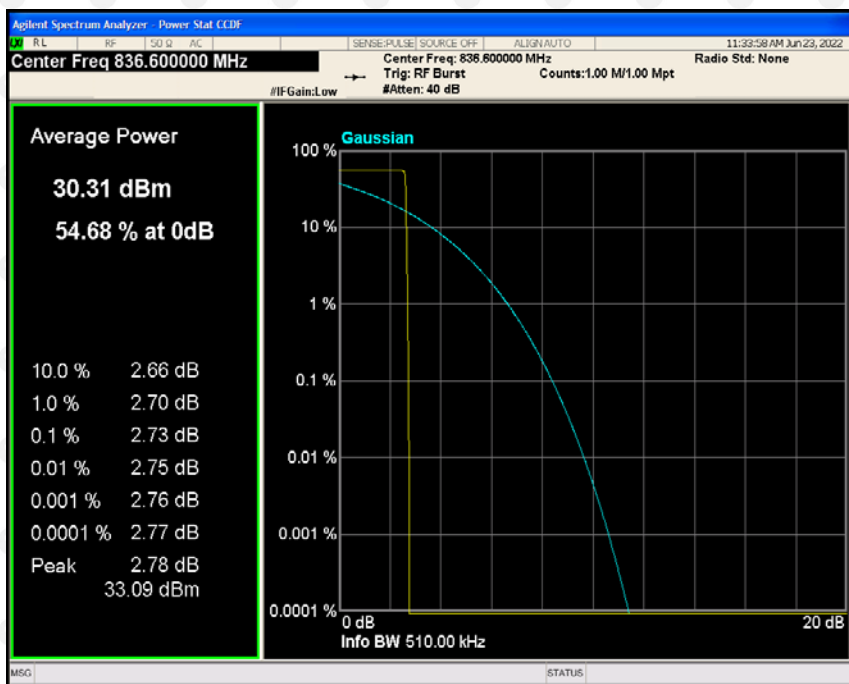
For PCS 1900

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.69	13
GPRS(1 Slot)	512	1850.2	2.73	13
EDGE(1 Slot)	512	1850.2	6.21	13

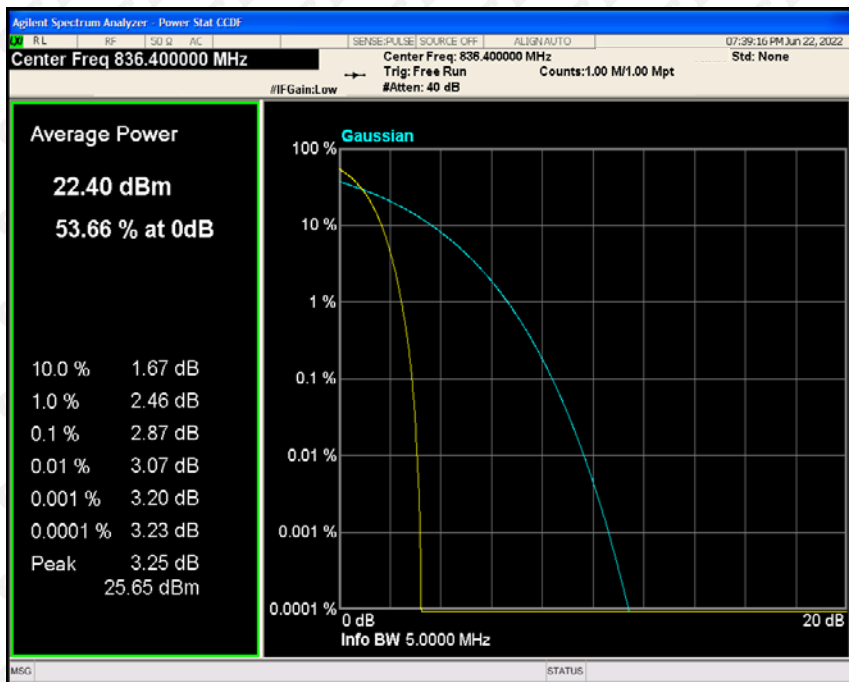
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.87	13
HSDPA	4182	836.4	2.80	13
HSUPA	4182	836.4	2.81	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

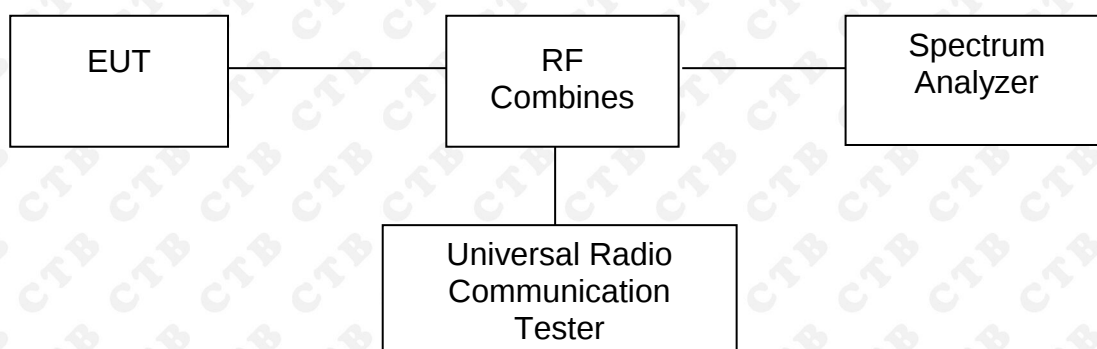
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	248.264	316.772
	190	836.6	245.944	319.154
	251	848.8	248.345	313.102
GPRS	128	824.2	247.371	321.710
	190	836.6	243.461	314.630
	251	848.8	247.755	316.484
EDGE	128	824.2	351.907	465.143
	190	836.6	325.510	451.348
	251	848.8	365.907	467.994

For PCS Band

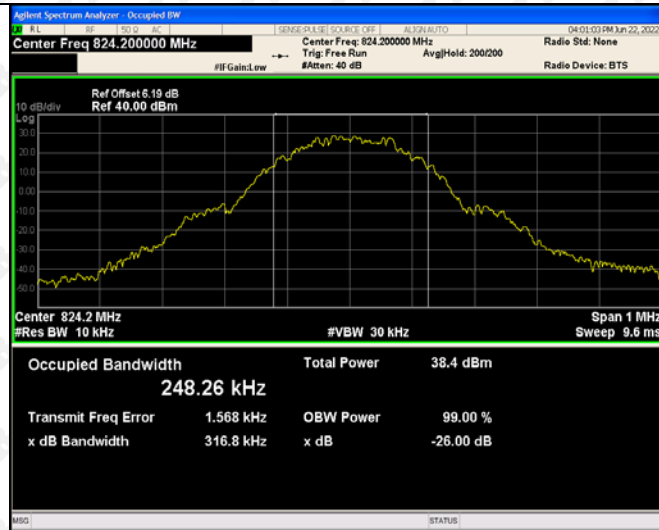
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	252.049	318.117
	661	1880.0	249.431	323.466
	810	1909.8	249.913	307.290
GPRS	512	1850.2	247.164	322.068
	661	1880.0	249.122	311.834
	810	1909.8	246.506	317.759
EDGE	512	1850.2	268.936	312.501
	661	1880.0	279.352	316.548
	810	1909.8	229.704	272.198

For Band 5

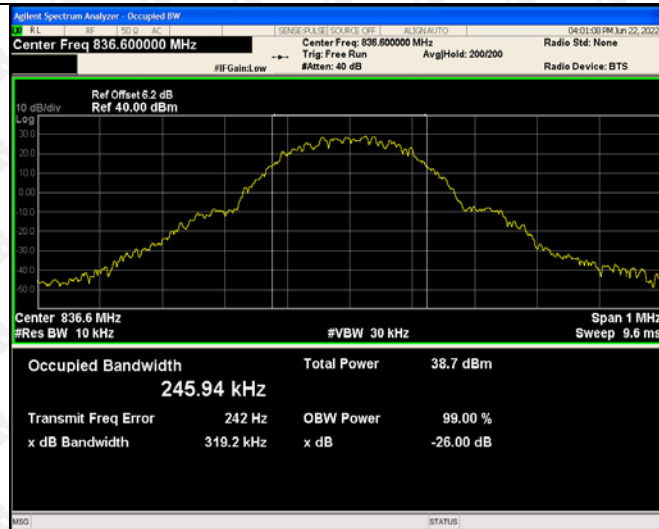
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
WCDMA	4132	826.4	4152.034	4686.197
	4183	836.6	4161.678	4678.021
	4233	846.6	4173.843	4683.013
HSDPA	4132	826.4	4160.362	4670.022
	4183	836.6	4150.154	4667.013
	4233	846.6	4156.156	4666.369
HSUPA	4132	826.4	4161.374	4665.660
	4183	836.6	4140.553	5097.382
	4233	846.6	4159.645	4676.247

For Cellular Band

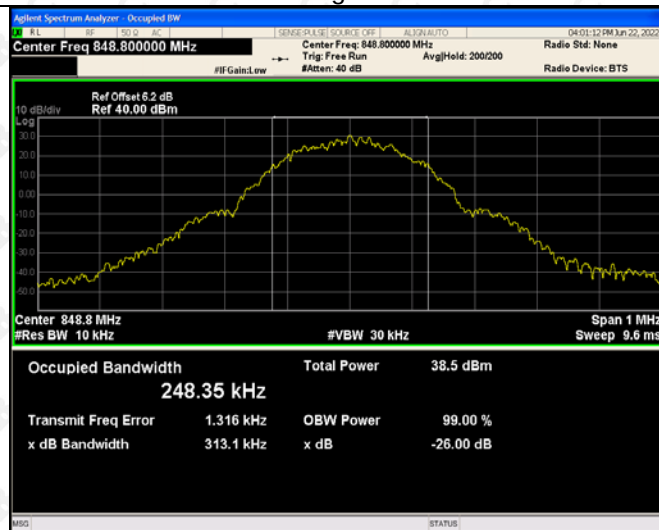
GSM Low Channel



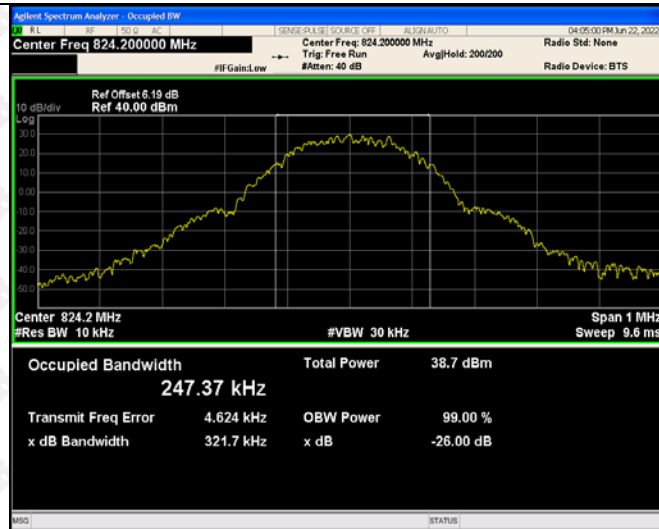
GSM Middle Channel



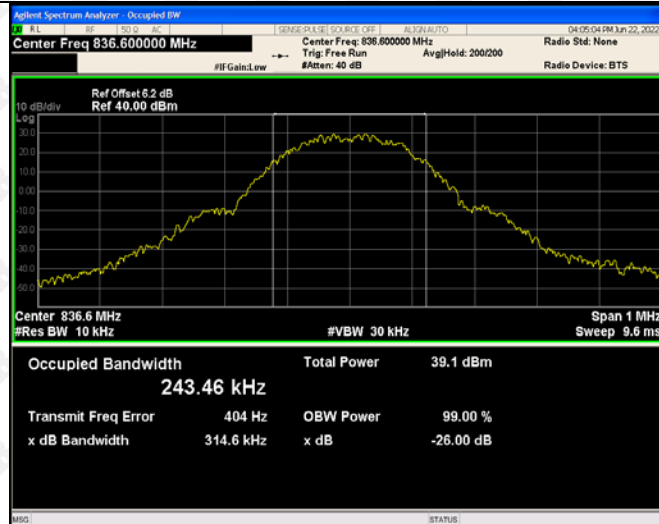
GSM S High Channel



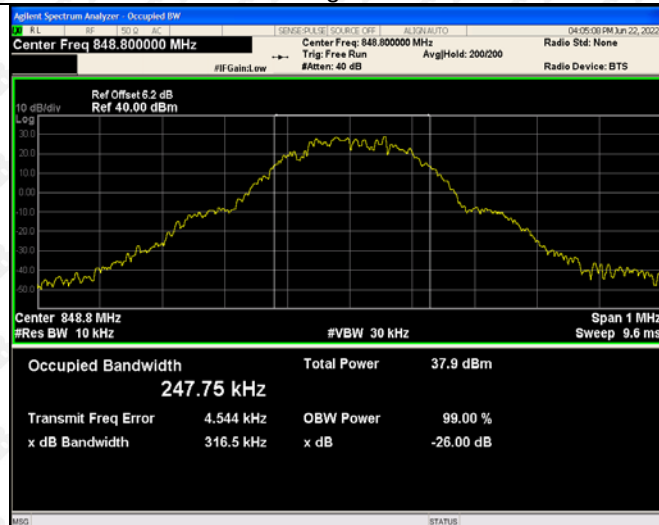
GPRS Low Channel



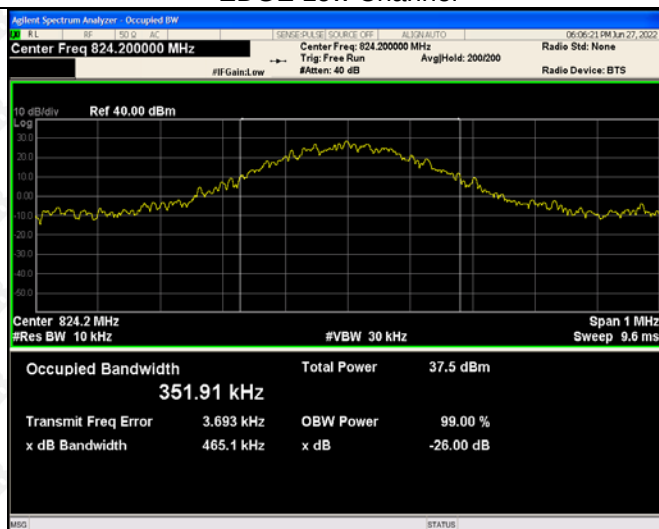
GPRS Middle Channel



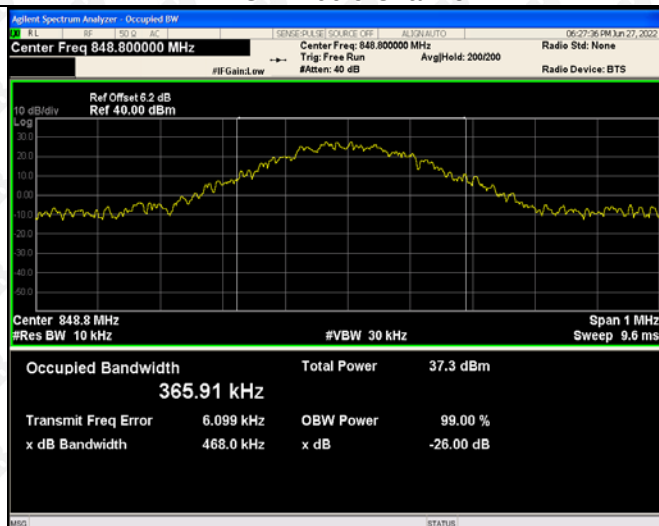
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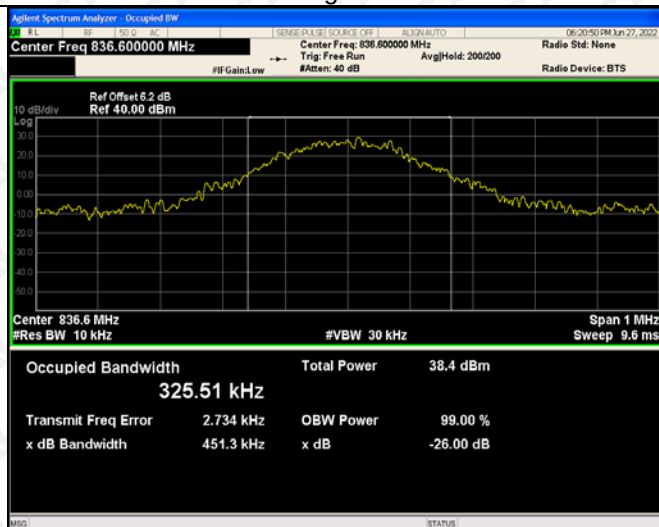
EDGE Low Channel



EDGE Middle Channel



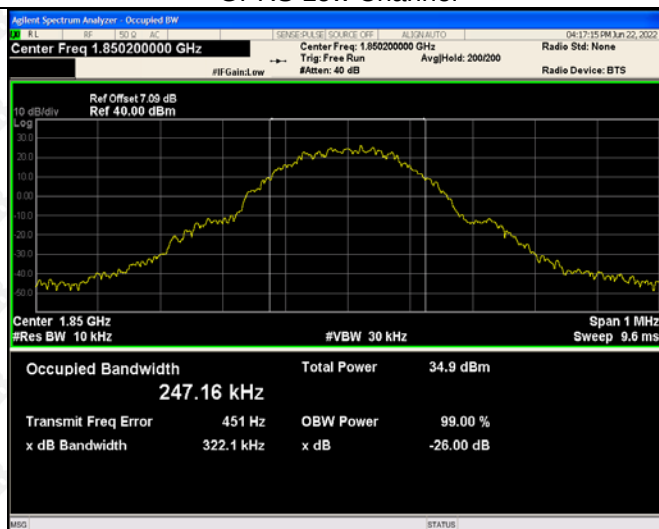
EDGE High Channel



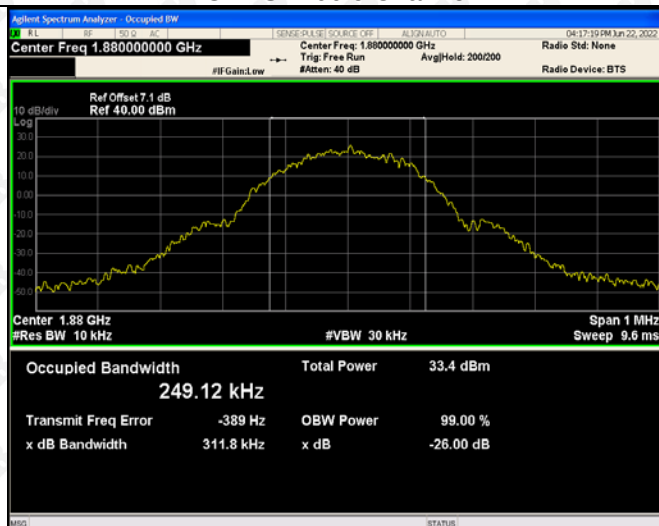
For PCS Band



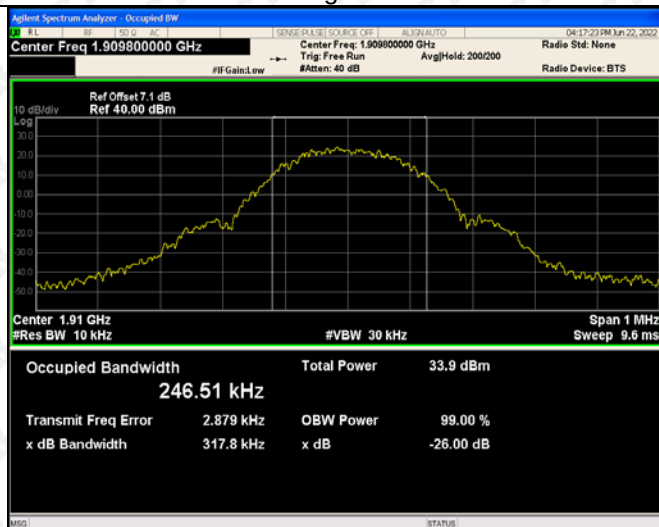
GPRS Low Channel



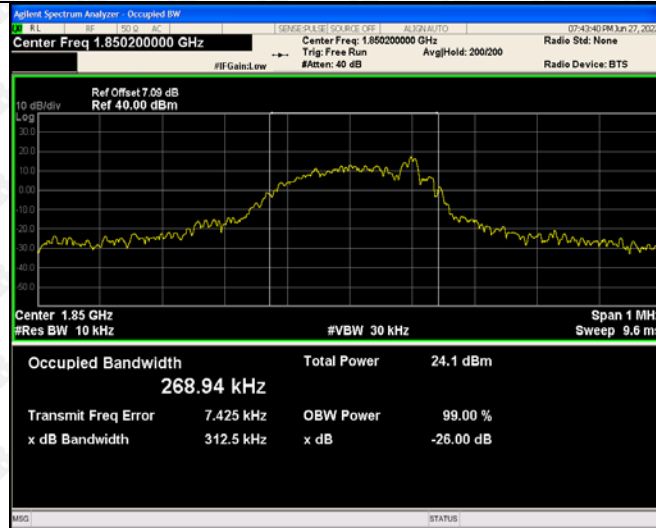
GPRS Middle Channel



GPRS High Channel



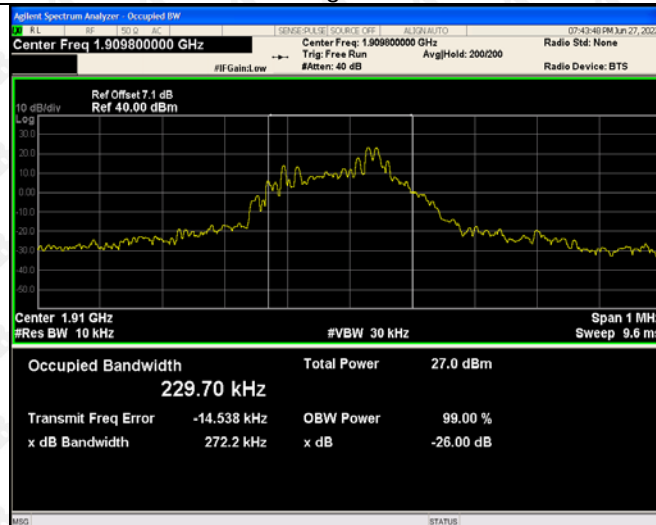
EDGE Low Channel



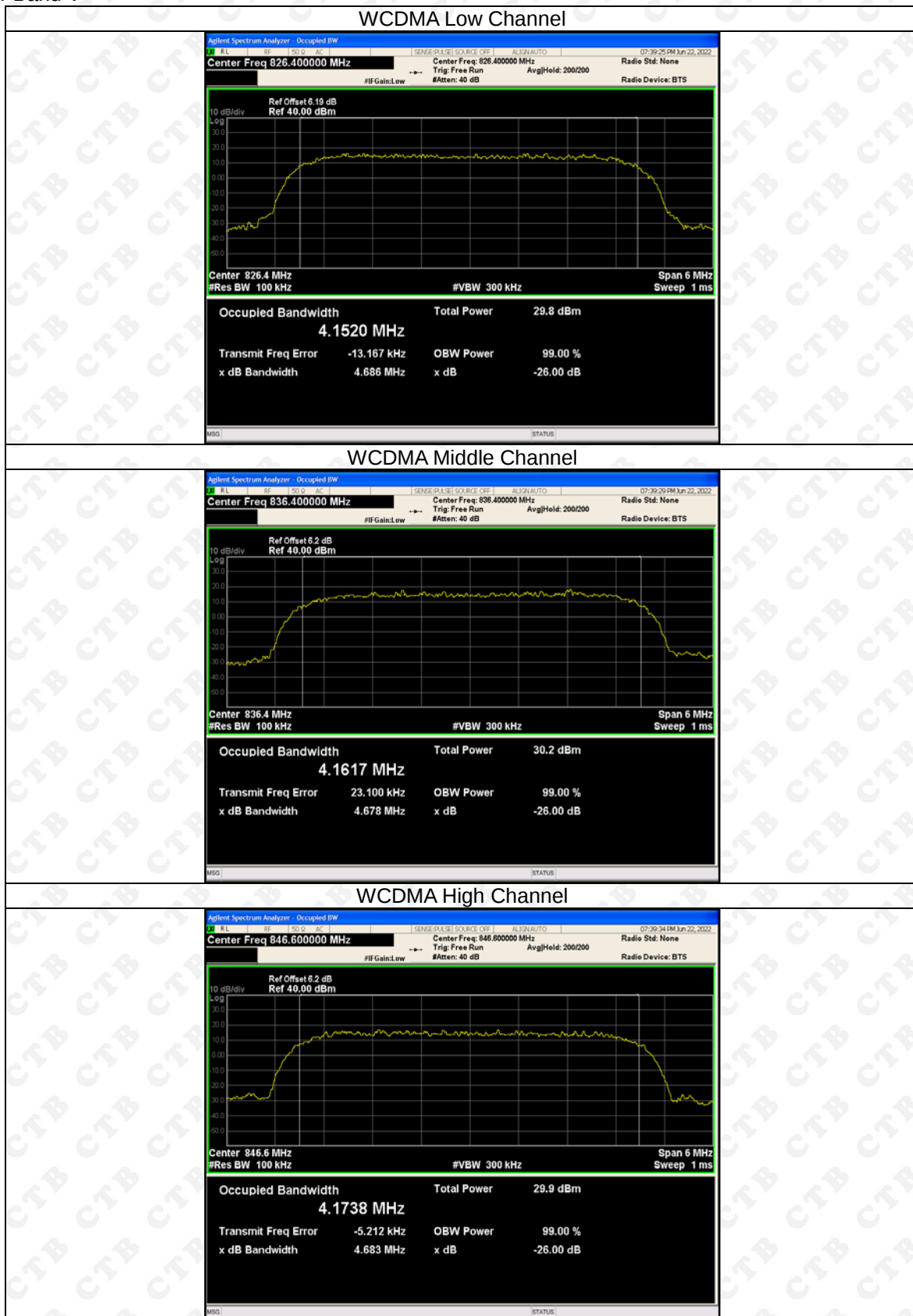
EDGE Middle Channel



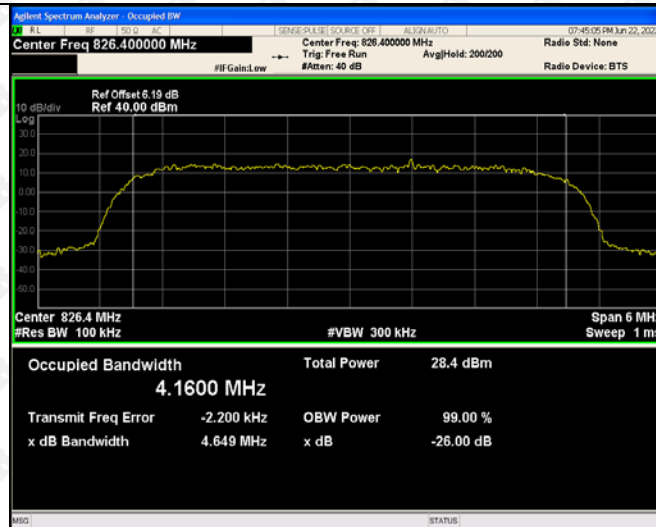
EDGE High Channel



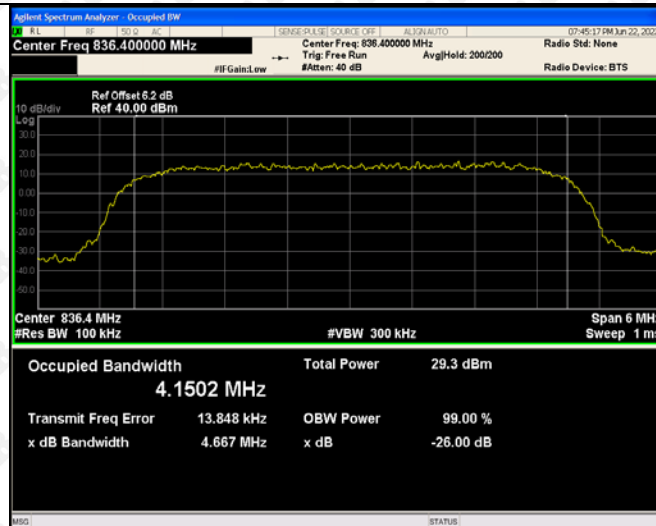
For Band V



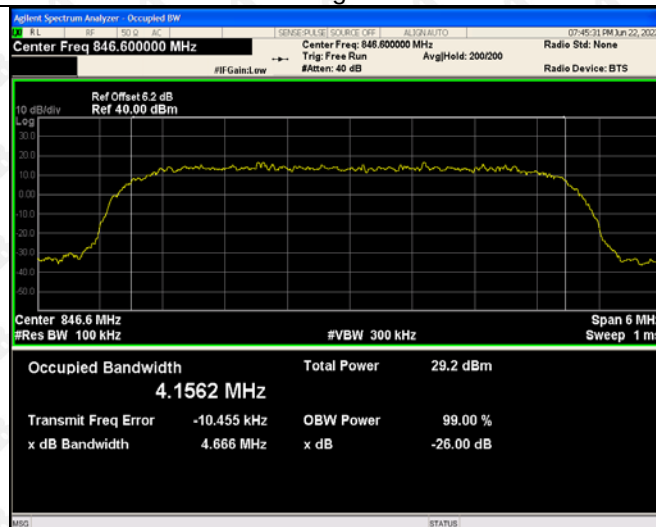
HSDPA Low Channel



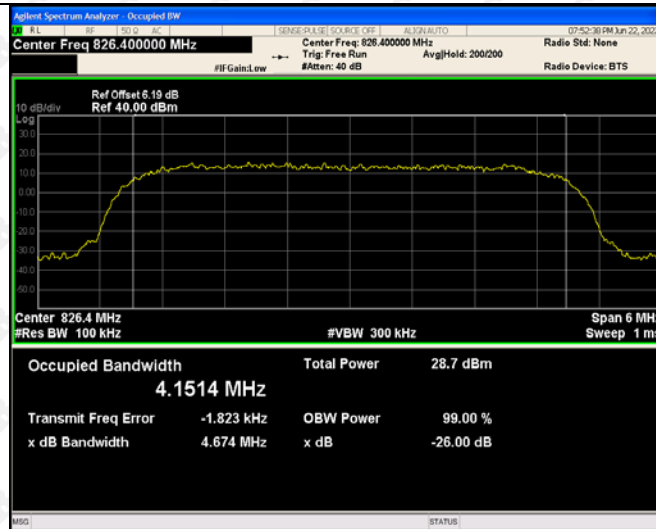
HSDPA Middle Channel



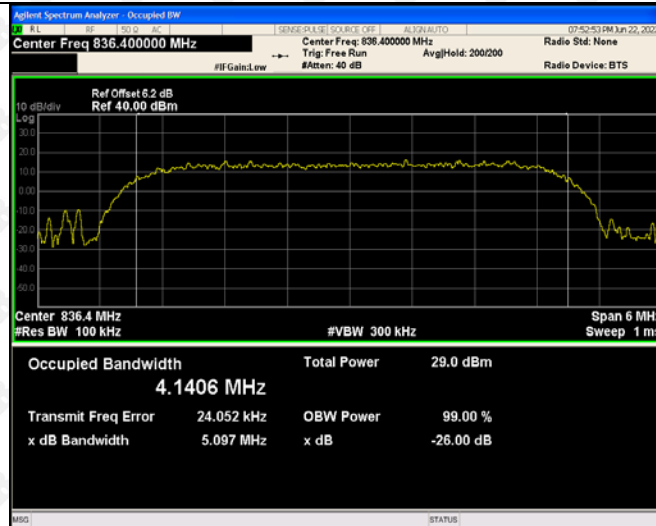
HSDPA High Channel



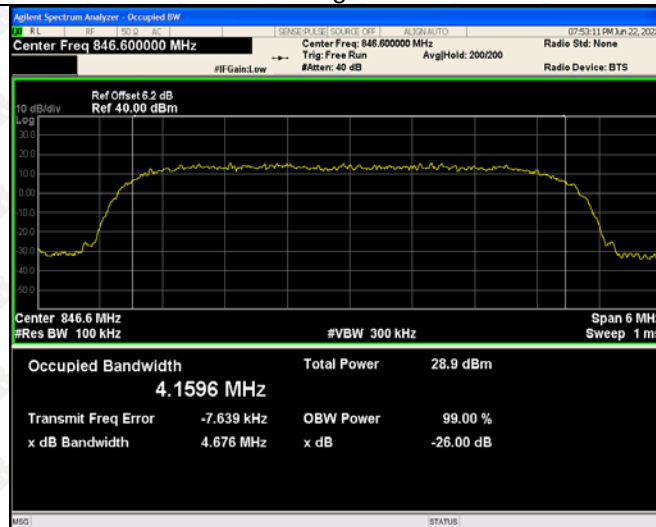
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

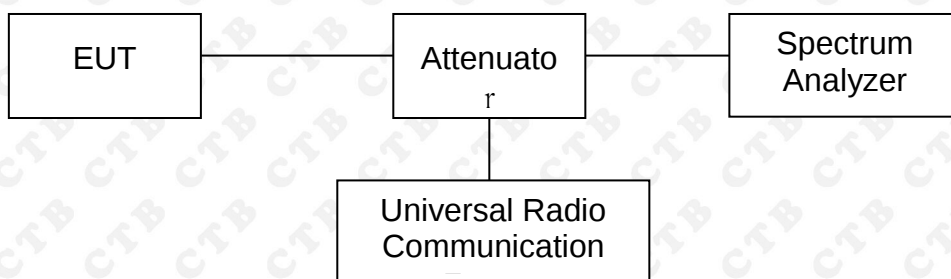
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

9.2 Test Procedure

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

Test Configuration for the out of band emissions testing:

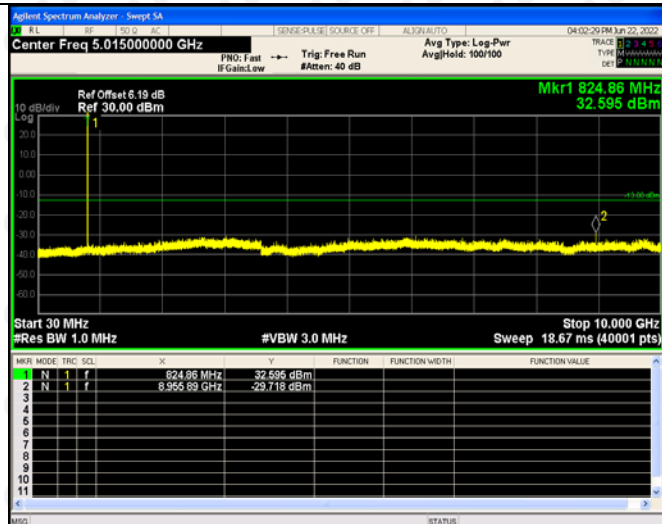
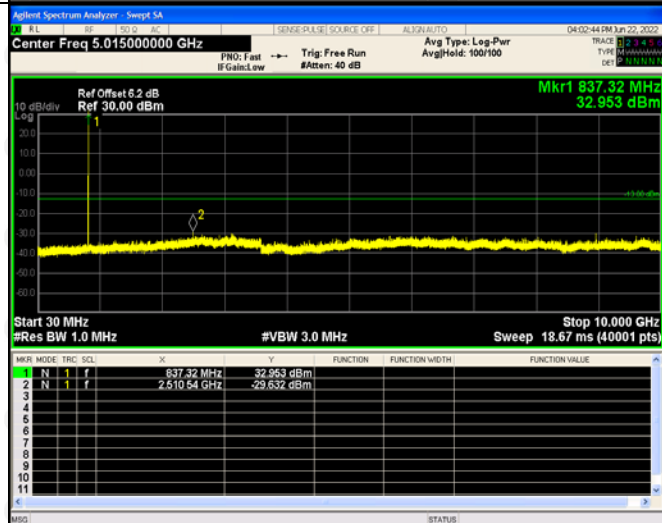
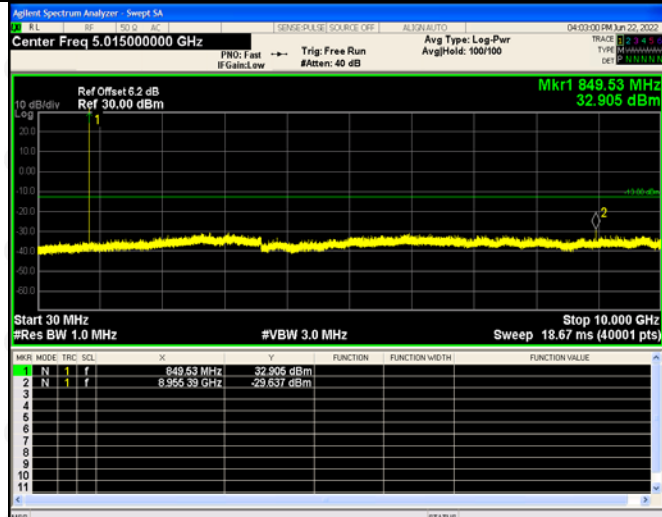


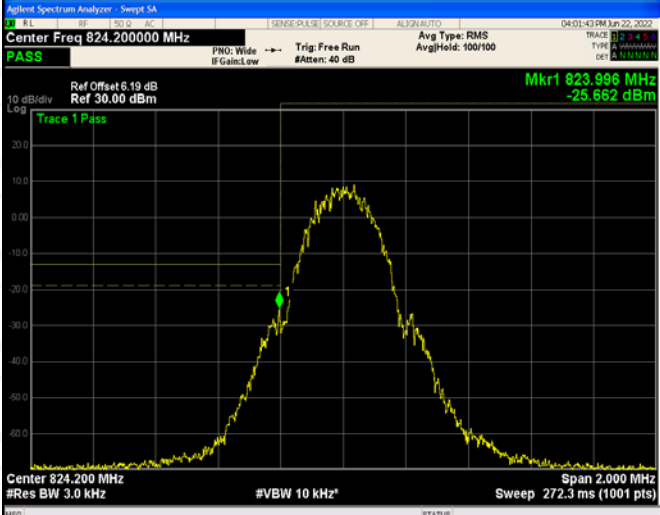
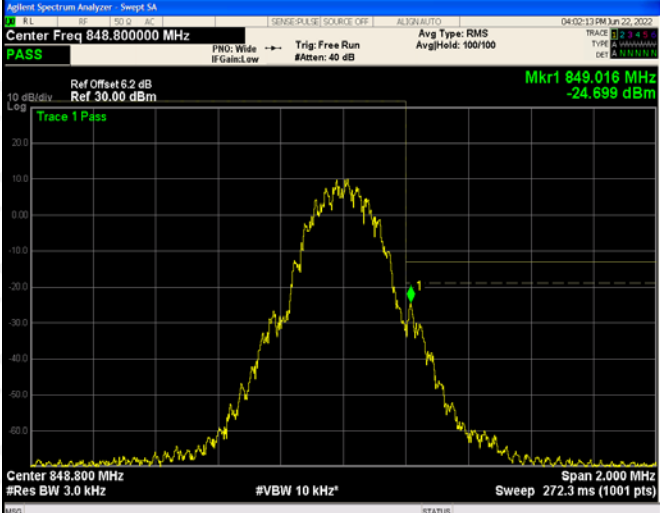
9.3 Environmental Conditions

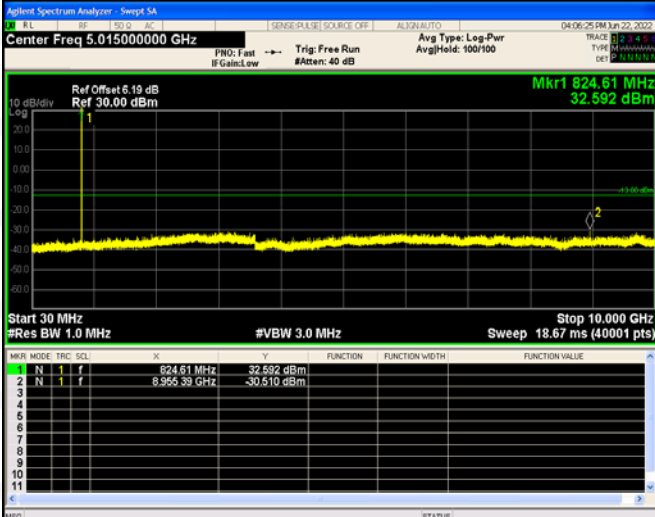
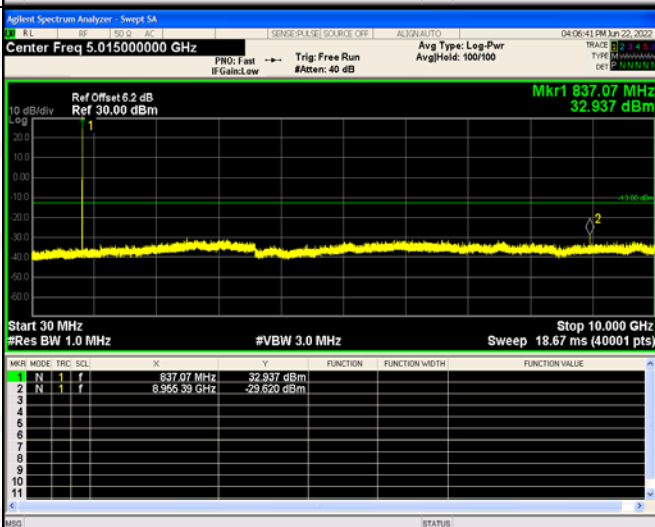
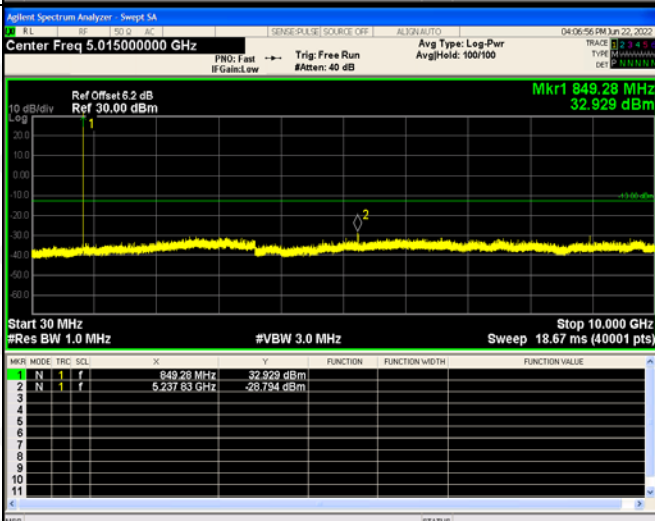
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1010 mbar

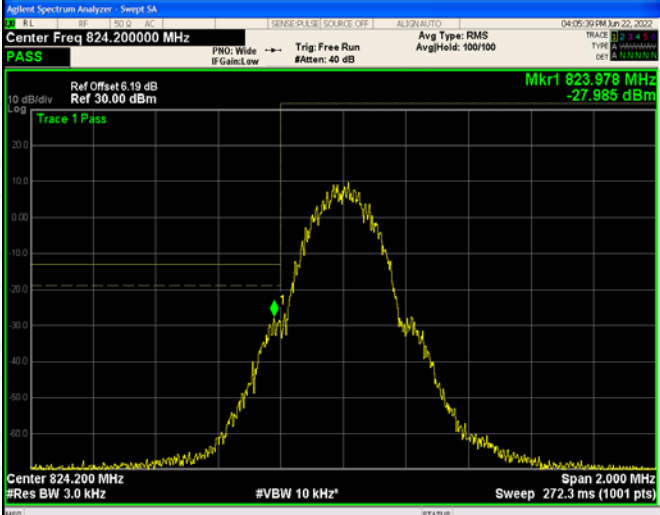
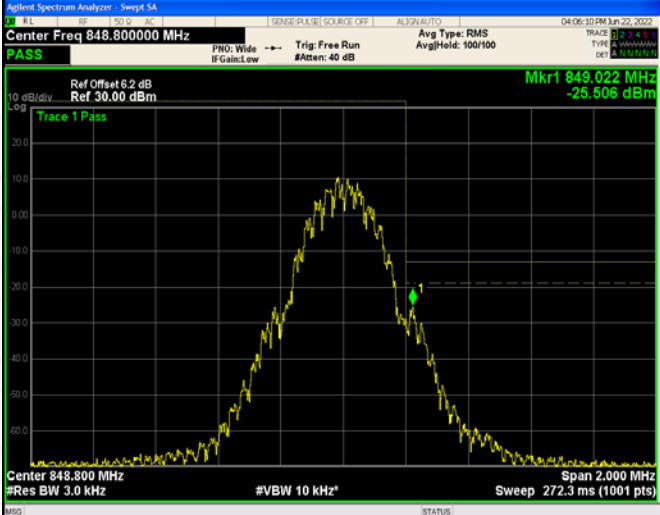
9.4 Summary of Test Results/Plots

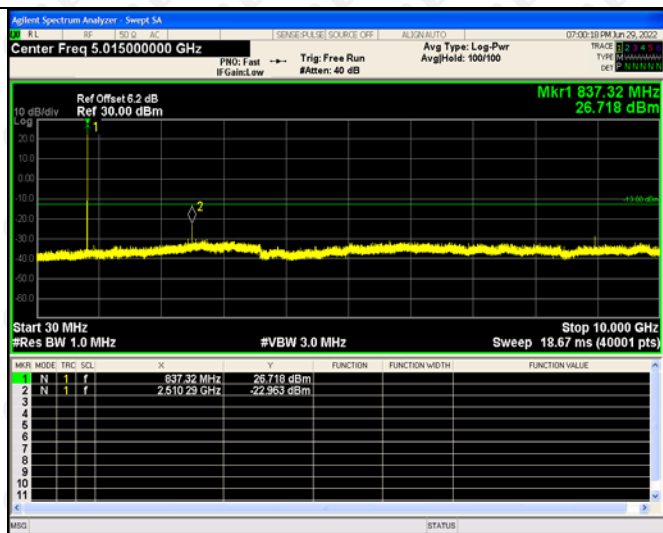
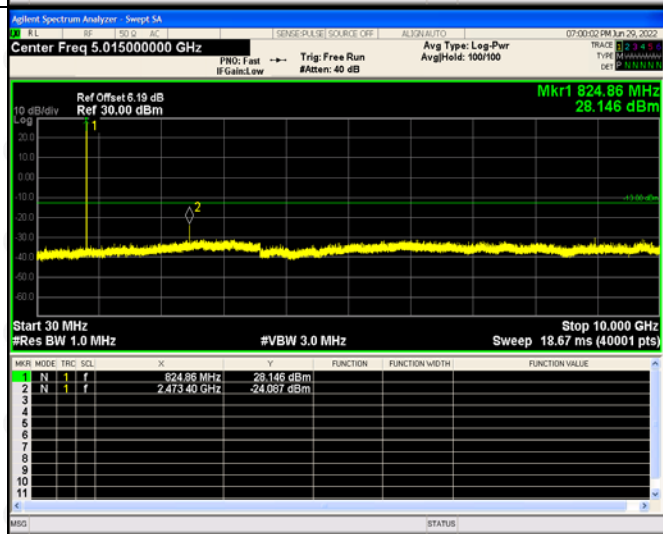
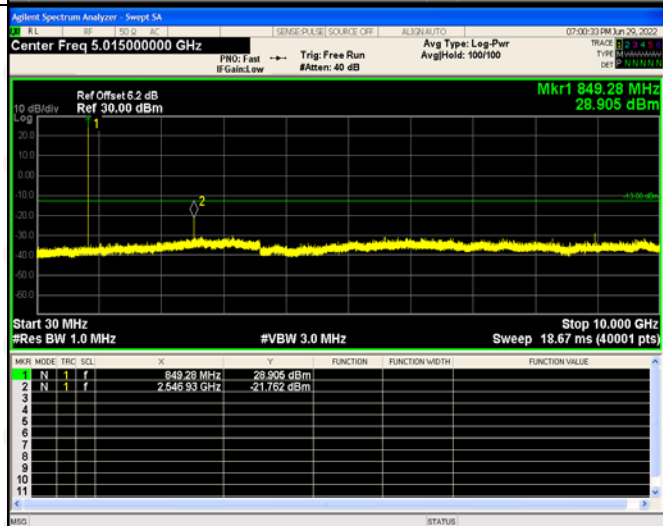
Please refer to the following test plots
For Cellular Band

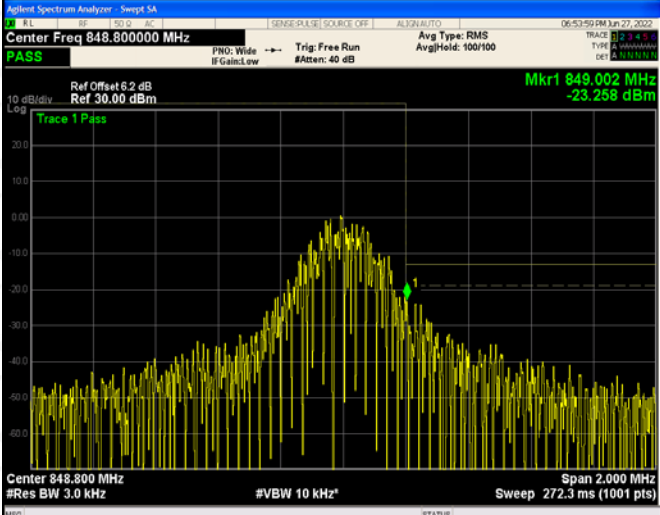
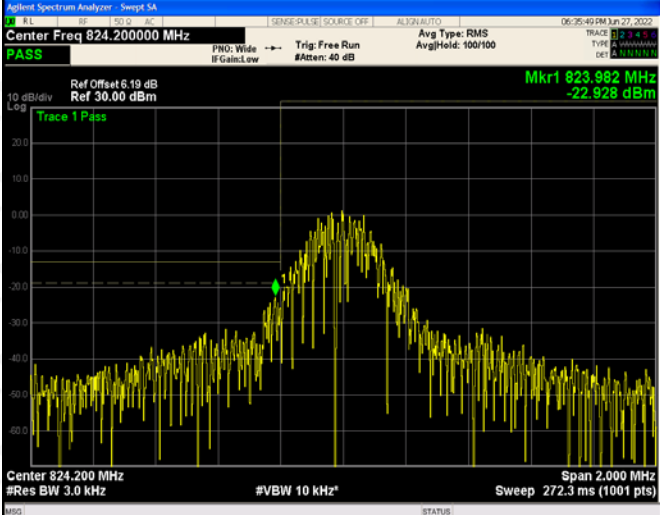
GSM Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 5.18 dB Ref 30.00 dBm Mkr1 824.86 MHz 32.595 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.86 MHz</td><td>32.595 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>8.955 89 GHz</td><td>-29.718 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.86 MHz	32.595 dBm				2	N	1	f	8.955 89 GHz	-29.718 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.86 MHz	32.595 dBm																							
2	N	1	f	8.955 89 GHz	-29.718 dBm																							
GSM Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.32 MHz 32.953 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.32 MHz</td><td>32.953 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.510 54 GHz</td><td>-29.632 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.32 MHz	32.953 dBm				2	N	1	f	2.510 54 GHz	-29.632 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.32 MHz	32.953 dBm																							
2	N	1	f	2.510 54 GHz	-29.632 dBm																							
GSM High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.53 MHz 32.905 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.53 MHz</td><td>32.905 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>8.955 39 GHz</td><td>-29.637 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.53 MHz	32.905 dBm				2	N	1	f	8.955 39 GHz	-29.637 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.53 MHz	32.905 dBm																							
2	N	1	f	8.955 39 GHz	-29.637 dBm																							

GSM Low Band Emission	
GSM High Band Emission	

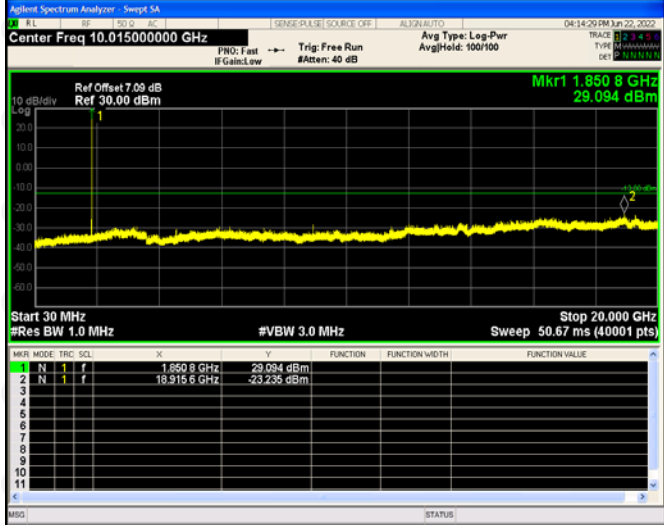
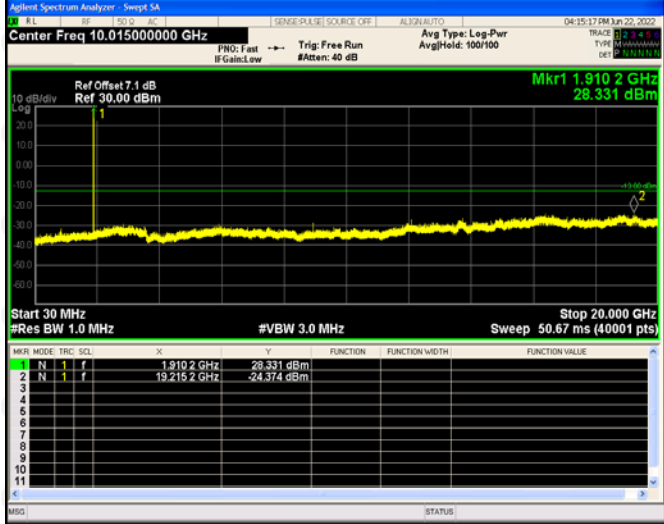
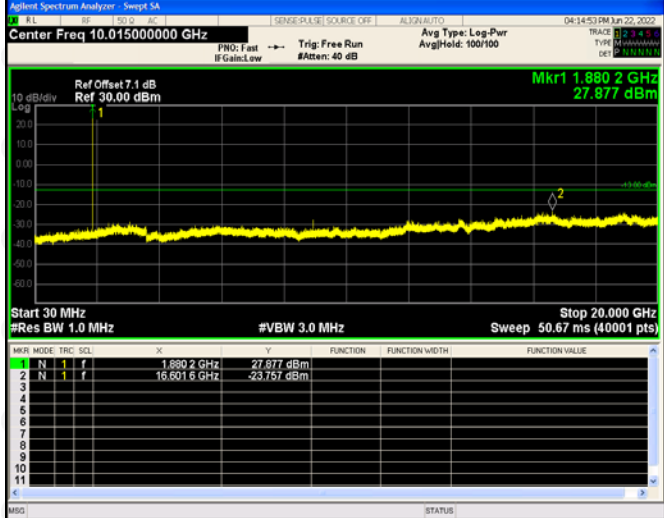
GPRS Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 5.18 dB Ref 30.00 dBm Mkr1 824.61 MHz 32.592 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.61 MHz</td><td>32.592 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>8.95539 GHz</td><td>-30.510 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.61 MHz	32.592 dBm				2	N	1	f	8.95539 GHz	-30.510 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.61 MHz	32.592 dBm																							
2	N	1	f	8.95539 GHz	-30.510 dBm																							
GPRS Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.07 MHz 32.937 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.07 MHz</td><td>32.937 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>8.95539 GHz</td><td>-29.620 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.07 MHz	32.937 dBm				2	N	1	f	8.95539 GHz	-29.620 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.07 MHz	32.937 dBm																							
2	N	1	f	8.95539 GHz	-29.620 dBm																							
GPRS High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 32.929 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>32.929 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.23783 GHz</td><td>-28.794 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	32.929 dBm				2	N	1	f	5.23783 GHz	-28.794 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	849.28 MHz	32.929 dBm																							
2	N	1	f	5.23783 GHz	-28.794 dBm																							

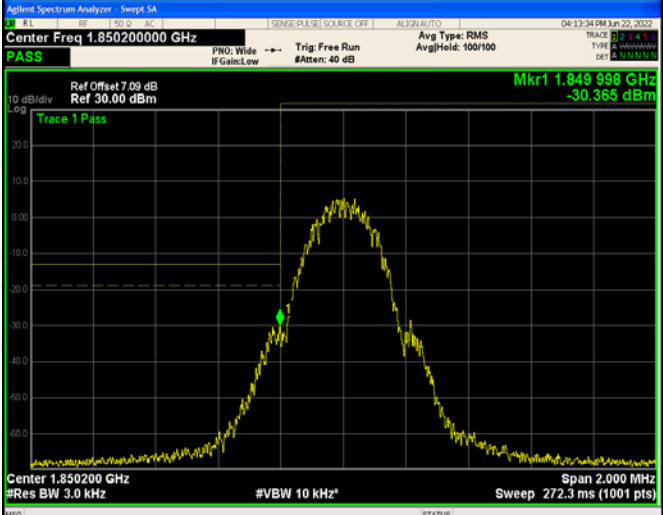
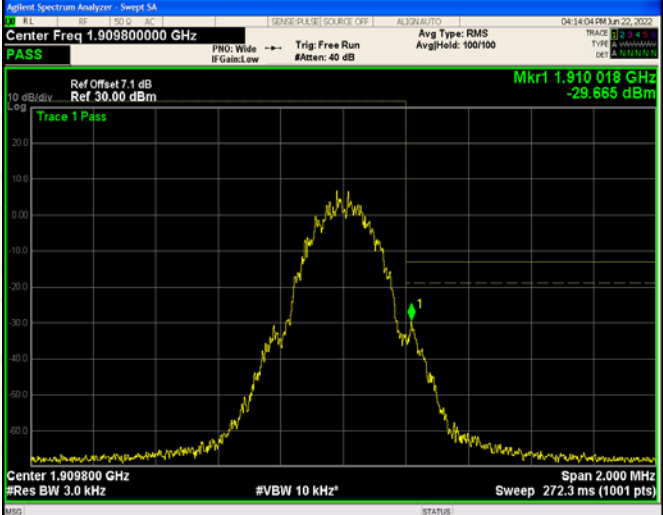
GPRS Low Band Emission	
GPRS High Band Emission	

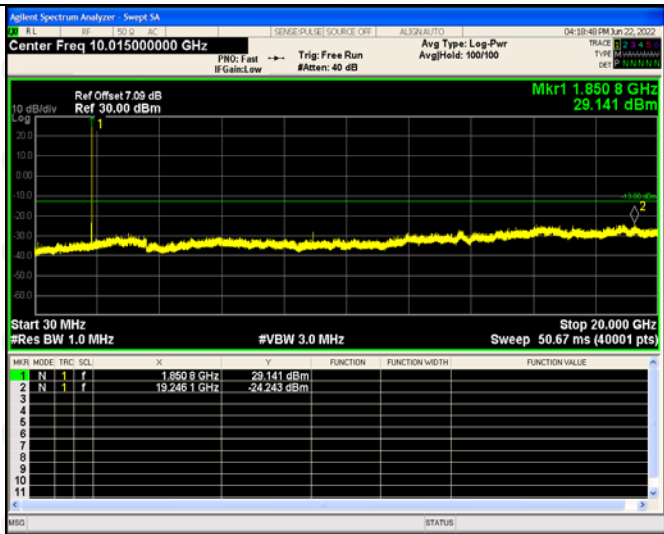
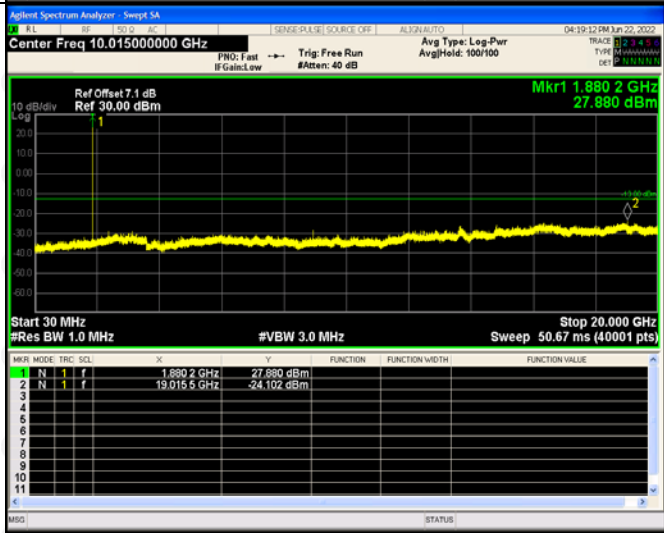
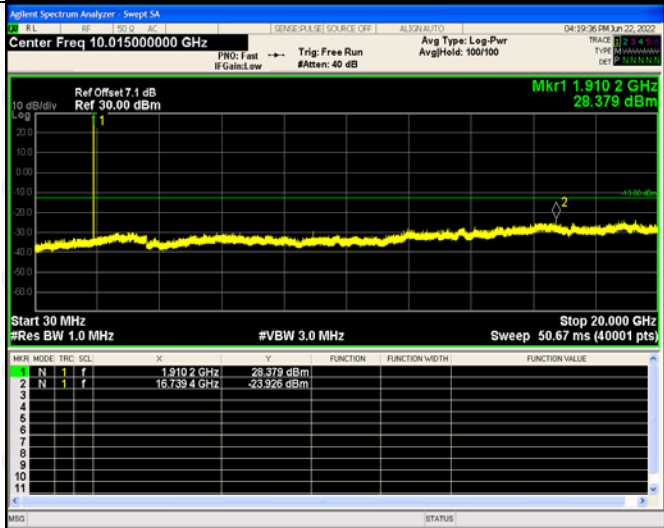
EDGE Low Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 837.32 MHz 26.718 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>837.32 MHz</td><td>26.718 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.510 29 GHz</td><td>-22.963 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	837.32 MHz	26.718 dBm				2	N	1	f	2.510 29 GHz	-22.963 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	837.32 MHz	26.718 dBm																							
2	N	1	f	2.510 29 GHz	-22.963 dBm																							
EDGE Middle Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 824.86 MHz 28.146 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>824.86 MHz</td><td>28.146 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.473 40 GHz</td><td>-24.087 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	824.86 MHz	28.146 dBm				2	N	1	f	2.473 40 GHz	-24.087 dBm			
MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	N	1	f	824.86 MHz	28.146 dBm																							
2	N	1	f	2.473 40 GHz	-24.087 dBm																							
EDGE High Channel	 Agilent Spectrum Analyzer - Sweep SA Center Freq 5.015000000 GHz Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.28 MHz 28.905 dBm Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 10.000 GHz Sweep 18.67 ms (40001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRIG</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>849.28 MHz</td><td>28.905 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.546 93 GHz</td><td>-21.762 dBm</td><td></td><td></td><td></td></tr></table>	MKR	MODE	TRIG	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	849.28 MHz	28.905 dBm				2	N	1	f	2.546 93 GHz	-21.762 dBm			
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2	N	1	f	2.546 93 GHz	-21.762 dBm																							

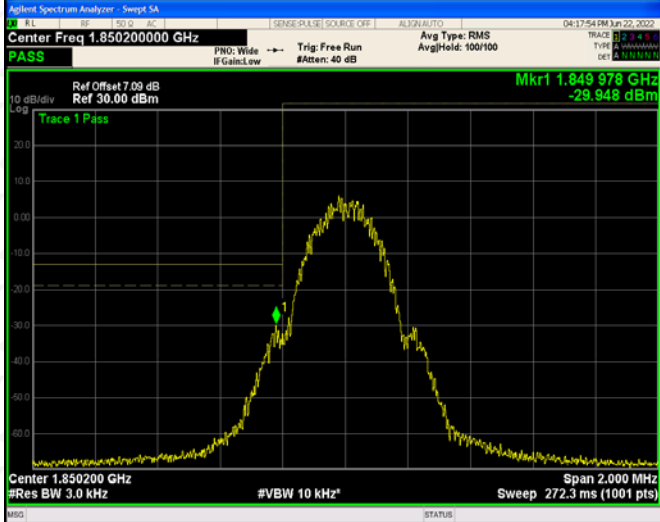
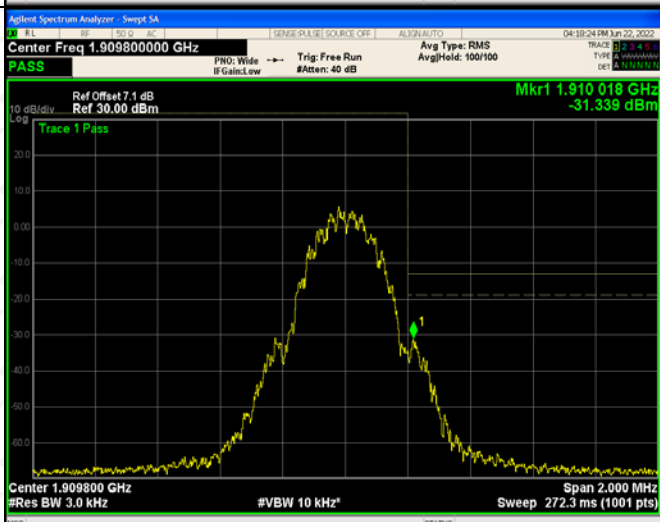
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EDGE High Band Emission	

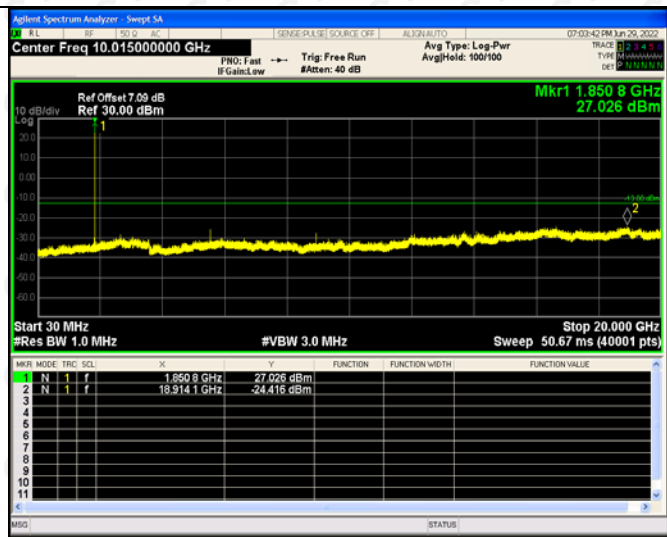
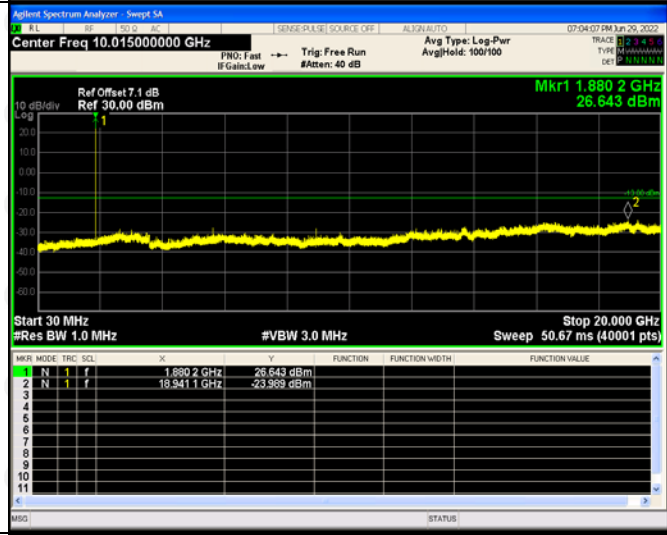
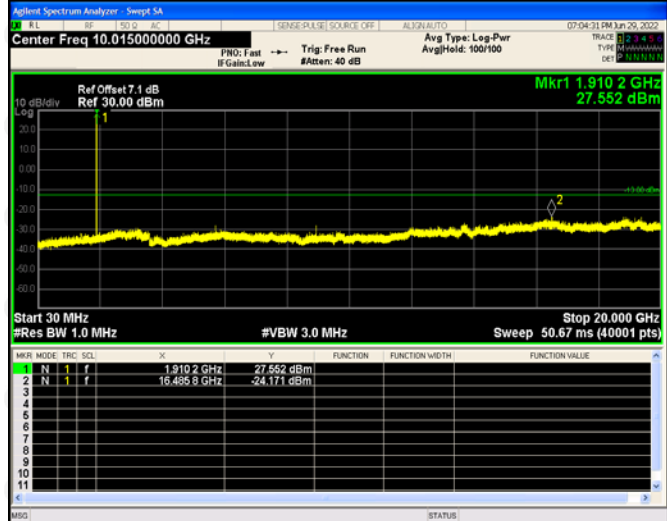
For PCS Band

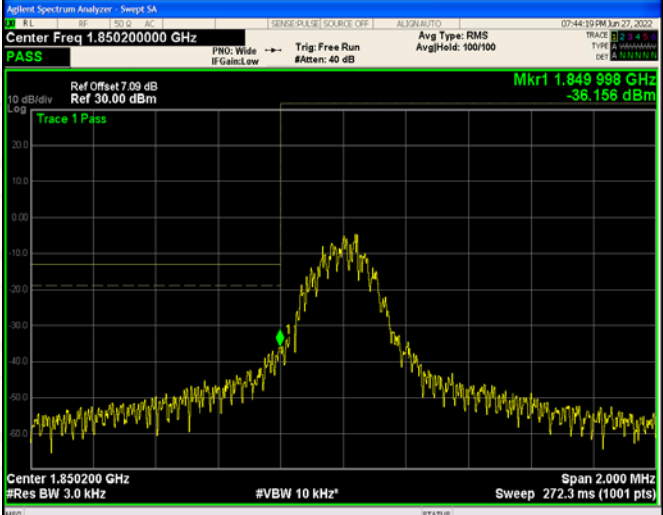
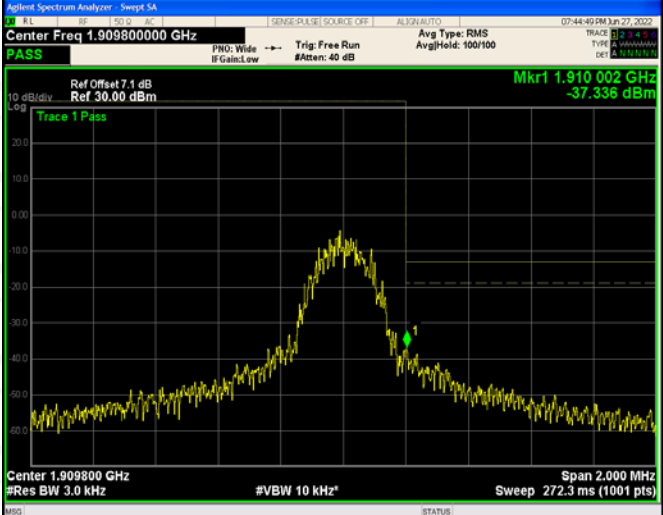
GSM Low Channel		
GSM Middle Channel		
GSM High Channel		

GSM Low Band Emission	
GSM High Band Emission	

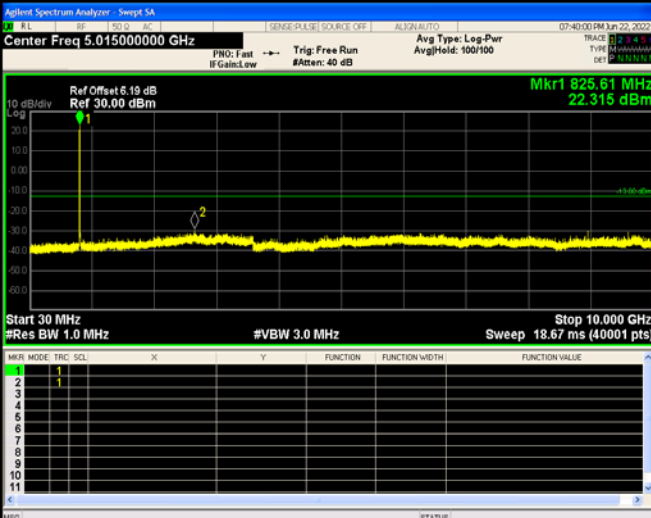
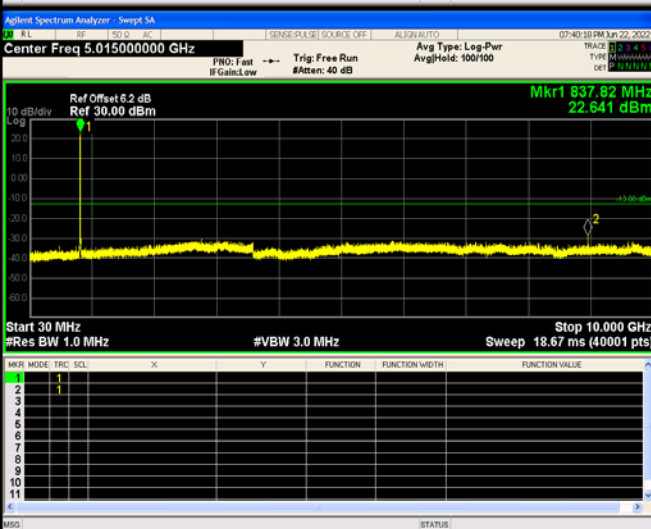
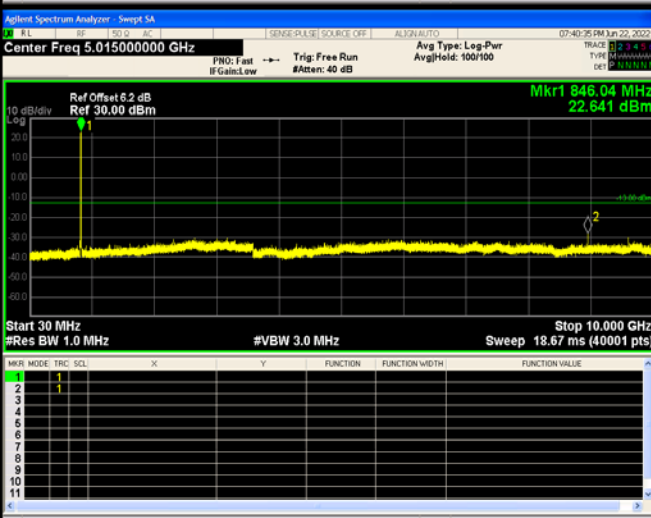
GPRS Low Channel	
GPRS Middle Channel	
GPRS High Channel	

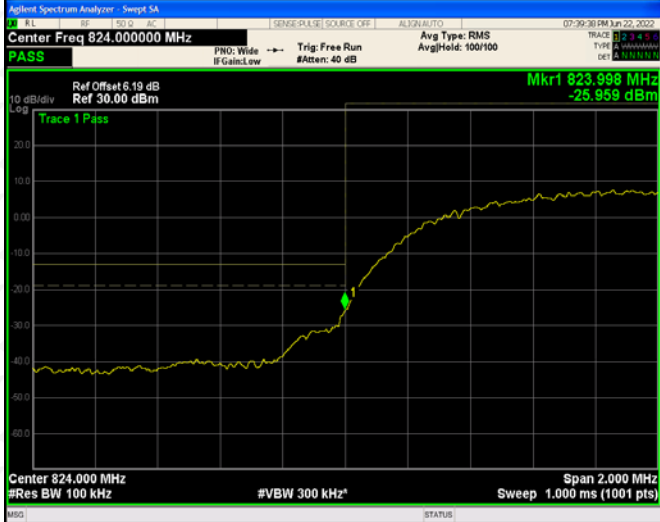
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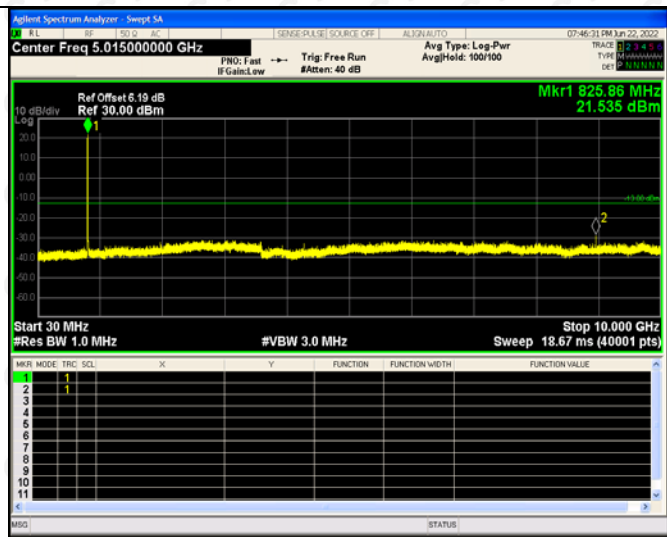
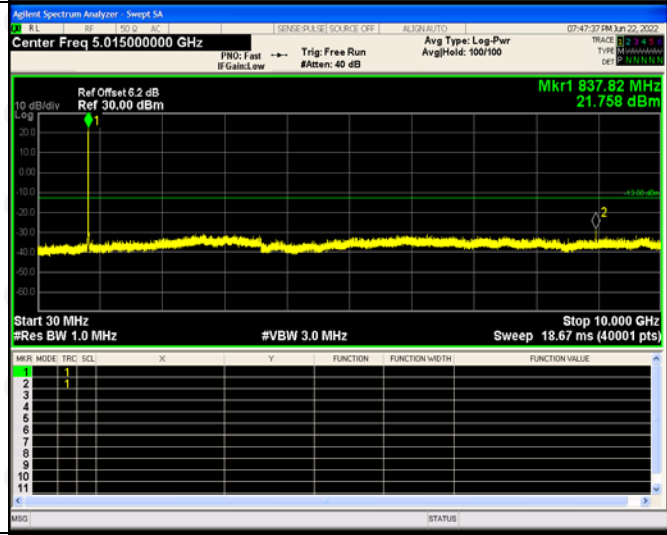
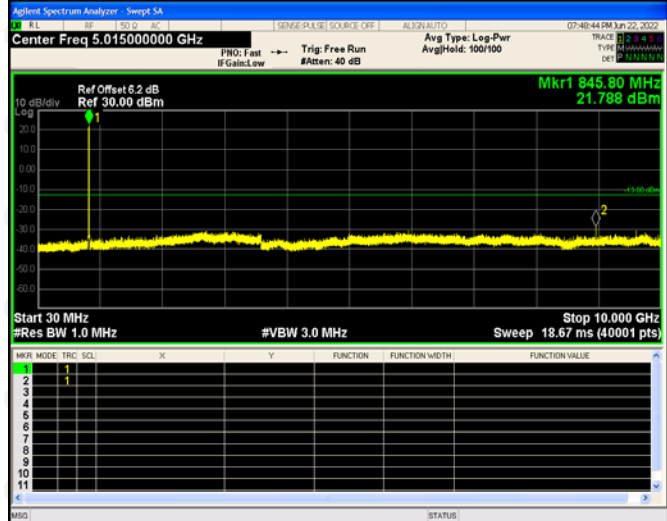
EDGE Low Channel		
EDGE Middle Channel		
EDGE High Channel		

EDGE Low Band Emission	
EDGE High Band Emission	

For Band V

WCDMA Low Channel		
WCDMA Middle Channel		
WCDMA High Channel		

WCDMA Low Band Spurious Emission	 Agilent Spectrum Analyzer - Sweep SA Center Freq 824.000000 MHz PNO: Wide IF Gain: Low Trig: Free Run #Atten: 40 dB Avg Type: RMS AvgHold: 100/100 Ref Offset 6.19 dB Ref 30.00 dBm Mkr1 823.998 MHz -25.959 dBm Trace 1 Pass Center 824.000 MHz #Res BW 100 kHz #VBW 300 kHz* Span 2.000 MHz Sweep 1.000 ms (1001 pts)
WCDMA High Band Spurious Emission	 Agilent Spectrum Analyzer - Sweep SA Center Freq 849.000000 MHz PNO: Wide IF Gain: Low Trig: Free Run #Atten: 40 dB Avg Type: RMS AvgHold: 100/100 Ref Offset 6.2 dB Ref 30.00 dBm Mkr1 849.002 MHz -24.331 dBm Trace 1 Pass Center 849.000 MHz #Res BW 100 kHz #VBW 300 kHz* Span 2.000 MHz Sweep 1.000 ms (1001 pts)

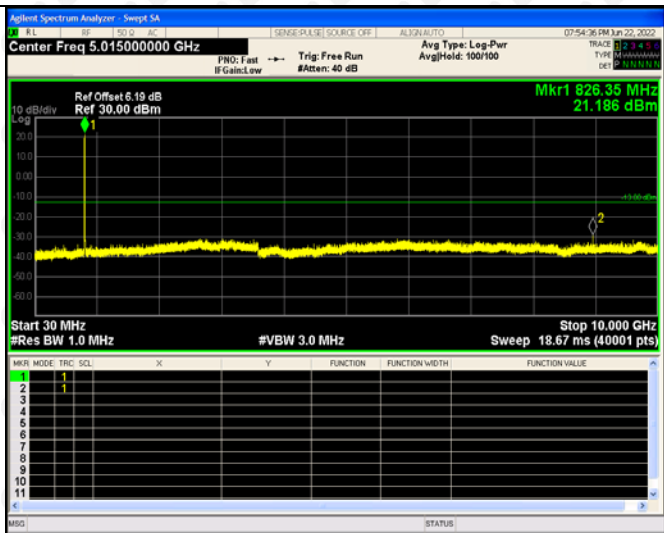
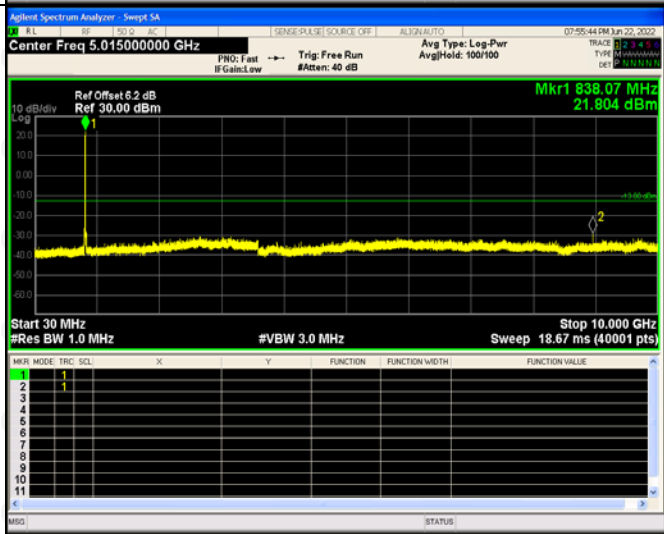
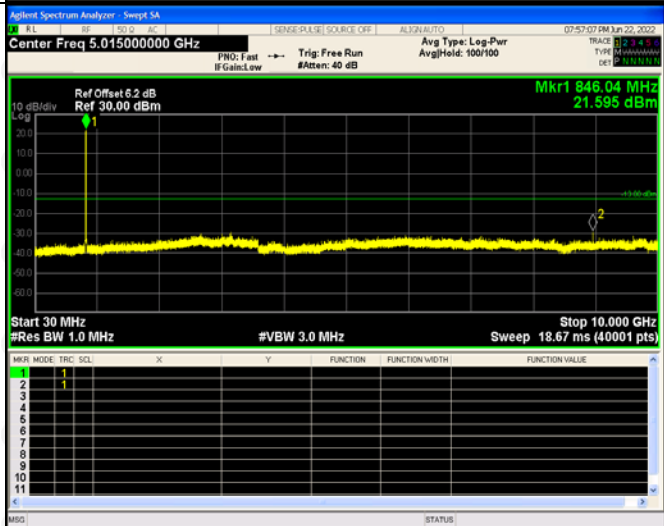
HSDPA Low Channel	
HSDPA Middle Channel	
HSDPA High Channel	

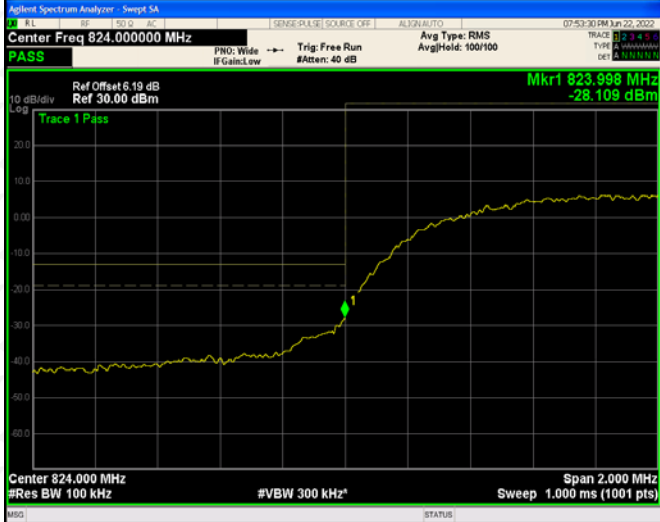
HSDPA
Low
Band
Spurious
Emission



HSDPA
High
Band
Spurious
Emission



HSUPA Low Channel		
HSUPA Middle Channel		
HSUPA High Channel		

HSUPA Low Band Spurious Emission	
HSUPA High Band Spurious Emission	

10. SPURIOUS RADIATED EMISSIONS

10.1 Standard Applicable

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

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

10.2 Test Procedure

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

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

10.3 Environmental Conditions

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

10.4 Summary of Test Results/Plots

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

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

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

For Cellular Band GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
45.77	-69.18	3.9	-65.28	-13	-52.28	H
1642.95	-56.61	4.83	-51.78	-13	-38.78	H
2468.84	-55.39	8.08	-47.31	-13	-34.31	H
37.06	-66.82	4.02	-62.80	-13	-49.80	V
1638.40	-54.44	4.48	-49.96	-13	-36.96	V
2468.27	-51.06	8.2	-42.86	-13	-29.86	V
Middle Channel (836.6MHz)						
44.23	-67.41	3.84	-63.57	-13	-50.57	H
1671.15	-59.05	4.62	-54.43	-13	-41.43	H
2506.18	-56.65	8.25	-48.40	-13	-35.40	H
44.94	-75.10	4.25	-70.85	-13	-57.85	V
1667.04	-48.81	4.54	-44.27	-13	-31.27	V
2506.54	-51.17	8.35	-42.82	-13	-29.75	V
High Channel (848.8MHz)						
45.35	-73.19	4.22	-77.41	-13	-64.41	H
1691.97	-53.35	4.87	-58.22	-13	-45.22	H
2545.76	-52.23	8.38	-60.61	-13	-47.61	H
42.10	-65.85	4.02	-69.87	-13	-56.87	V
1693.74	-50.34	4.56	-54.90	-13	-41.90	V
2538.37	-49.50	8.41	-57.91	-13	-44.91	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)						
39.46	-74.62	4.34	-70.28	-13	-57.28	H
3698.36	-51.18	10.54	-40.64	-13	-27.64	H
5541.64	-57.52	13.37	-44.15	-13	-31.15	H
45.04	-65.65	4.34	-61.31	-13	-48.31	V
3691.35	-50.87	10.54	-40.33	-13	-27.33	V
5546.61	-56.38	13.37	-43.01	-13	-30.01	V
Middle Channel (1880MHz)						
43.53	-70.96	4.02	-66.94	-13	-53.94	H
3757.42	-50.90	10.71	-40.19	-13	-27.19	H
5633.87	-61.52	13.73	-47.79	-13	-34.79	H
45.89	-66.02	4.14	-61.88	-13	-48.88	V
3753.74	-54.41	10.22	-44.19	-13	-31.19	V
5633.13	-53.27	13.16	-40.11	-13	-27.11	V
High Channel (1909.8MHz)						
44.60	-66.53	4.02	-62.51	-13	-49.51	H
3812.41	-63.11	4.9	-58.21	-13	-45.21	H
5727.41	-48.89	8.09	-40.80	-13	-27.80	H
40.80	-61.91	4.25	-57.66	-13	-44.66	V
3813.04	-58.93	4.93	-54.00	-13	-41.00	V
5723.93	-56.95	8.43	-48.52	-13	-35.52	V

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
41.29	-68.69	3.91	-64.78	-13	-51.78	H
1643.21	-51.39	10.56	-40.83	-13	-27.83	H
2474.41	-61.32	13.5	-47.82	-13	-34.82	H
41.52	-68.69	3.93	-64.76	-13	-51.76	V
1652.34	-55.30	10.41	-44.89	-13	-31.89	V
2474.74	-54.65	13.16	-41.49	-13	-28.49	V
Middle Channel (836.6MHz)						
38.77	-69.24	4.02	-65.22	-13	-52.22	H
1667.23	-58.22	4.66	-53.56	-13	-40.56	H
2501.50	-41.08	8.34	-32.74	-13	-19.74	H
43.69	-62.36	4.17	-58.19	-13	-45.19	V
1665.59	-54.46	4.94	-49.52	-13	-36.52	V
2501.17	-61.11	8.19	-52.92	-13	-39.92	V
High Channel (846.6MHz)						
38.84	-65.79	3.87	-61.92	-13	-48.92	H
1683.28	-60.82	4.89	-55.93	-13	-42.93	H
2538.77	-49.47	8.42	-41.05	-13	-28.05	H
37.79	-56.76	3.95	-52.81	-13	-39.81	V
1692.33	-58.27	4.99	-53.28	-13	-40.28	V
2538.16	-55.58	8.12	-47.46	-13	-34.46	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	9.01	0.0108
40	NV	9.44	0.0113
30	NV	9.36	0.0112
20	NV	9.26	0.0111
10	NV	9.97	0.0119
0	NV	10.60	0.0127
-10	NV	10.18	0.0122
-20	NV	10.78	0.0129
-30	NV	10.46	0.0125

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	12.29	0.0065
40	NV	12.77	0.0068
30	NV	12.83	0.0068
20	NV	13.03	0.0069
10	NV	13.64	0.0073
0	NV	13.93	0.0074
-10	NV	13.80	0.0073
-20	NV	14.49	0.0077
-30	NV	14.67	0.0078

For Cellular Band GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	9.27	0.0111
40	NV	9.7	0.0116
30	NV	9.9	0.0119
20	NV	10.0	0.0120
10	NV	10.5	0.0125
0	NV	10.8	0.0129
-10	NV	10.8	0.0129
-20	NV	11.2	0.0134
-30	NV	11.4	0.0136

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	12.67	0.0067
40	NV	13.07	0.0069
30	NV	12.82	0.0068
20	NV	12.36	0.0066
10	NV	13.23	0.0070
0	NV	14.05	0.0075
-10	NV	14.22	0.0076
-20	NV	14.24	0.0076
-30	NV	14.51	0.0077

For Cellular Band EDGE Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	10.67	0.0128
40	NV	11.99	0.0143
30	NV	11.56	0.0138
20	NV	11.75	0.0141
10	NV	11.37	0.0136
0	NV	11.68	0.0140
-10	NV	11.92	0.0143
-20	NV	12.38	0.0148
-30	NV	12.63	0.0151

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	-10.18	-0.0054
40	NV	-9.81	-0.0052
30	NV	-9.56	-0.0051
20	NV	-8.96	-0.0048
10	NV	-9.16	-0.0049
0	NV	-8.92	-0.0048
-10	NV	-8.15	-0.0043
-20	NV	-7.74	-0.0041
-30	NV	-8.37	-0.0045

For WCDMA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.36	-0.0004
40	NV	-0.16	-0.0002
30	NV	-0.03	0.0000
20	NV	1.02	0.0012
10	NV	0.95	0.0011
0	NV	0.75	0.0009
-10	NV	1.05	0.0013
-20	NV	1.04	0.0012
-30	NV	1.25	0.0015

For HSDPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	-0.20	-0.0002
40	NV	-0.06	-0.0001
30	NV	-0.11	-0.0001
20	NV	0.83	0.0010
10	NV	0.43	0.0005
0	NV	0.51	0.0006
-10	NV	0.59	0.0007
-20	NV	1.45	0.0017
-30	NV	1.59	0.0019

For HSUPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	0.90	0.0011
40	NV	0.88	0.0011
30	NV	1.26	0.0015
20	NV	0.77	0.0009
10	NV	1.44	0.0017
0	NV	1.96	0.0023
-10	NV	1.92	0.0023
-20	NV	1.99	0.0024
-30	NV	2.72	0.0032

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	12.62	0.0151
	NV	13.25	0.0158
	HV	12.96	0.0155
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	-7.76	-0.0093
	NV	-7.18	-0.0086
	HV	-7.28	-0.0087

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	10.44	0.0125
	NV	11.52	0.0138
	HV	11.13	0.0133
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	14.21	0.0076
	NV	14.40	0.0077
	HV	15.03	0.0080

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	12.76	0.0153
	NV	13.30	0.0159
	HV	12.91	0.0154
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	-8.01	-0.0096
	NV	-7.84	-0.0094
	HV	-6.89	-0.0082
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	1.31	0.0016
	NV	1.64	0.0020
	HV	1.74	0.0021

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	2.2	0.0026
	NV	2.4	0.0029
	HV	2.6	0.0031
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.9	0.0035
	NV	3.4	0.0040
	HV	3.6	0.0043

12. EUT PHOTO

EUT Photo 1

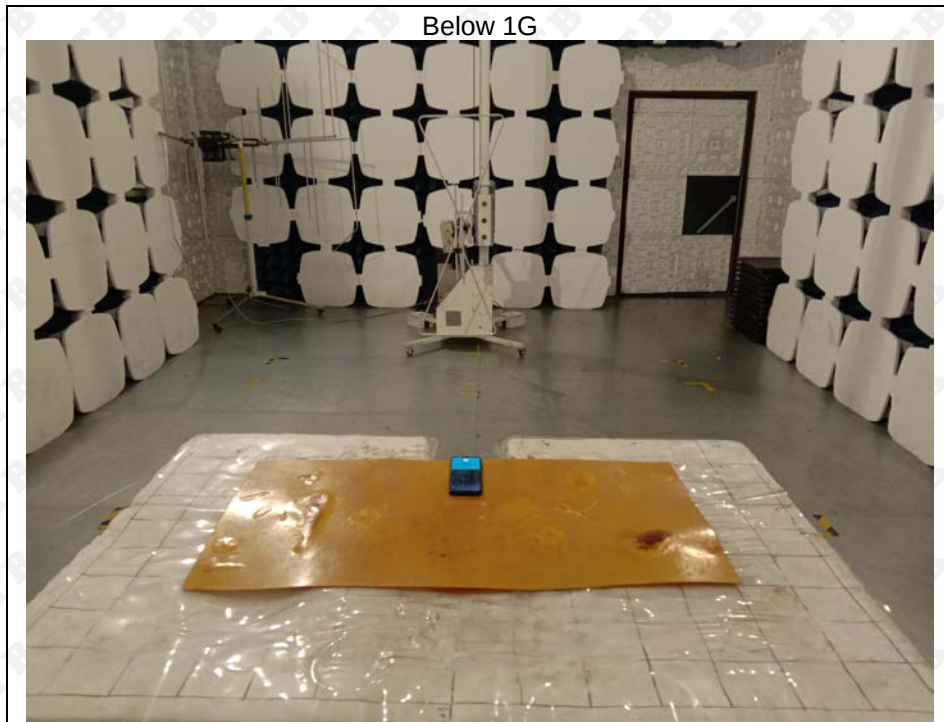


EUT Photo 2



13. EUT TEST PHOTO

Radiated Emission



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