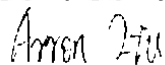


TEST REPORT

Product Name: Mobile Computer
FCC ID: VUJ-ATM66
Product Name: N/A
Model Number: ATM660
Prepared For: ATID Co. Ltd
Address: #1402, 83, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea.
Manufacturer: ATID Co. Ltd
Address: #1402, 83, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea.
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
Address: Floor 1&2, Building A, No. 26 of Xinghe Road, Xingqiao Community, Xingqiao Street, Baoan District, Shenzhen, Guangdong China
Sample Received Date: May. 8, 2021
Sample tested Date: May. 8, 2021 to May. 15, 2021
Issue Date: May. 15, 2021
Report No.: CTB210514020RFX
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
CTB210514020RFX	May. 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℃
frequency	1×10 ⁻⁷

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	ATM660
Model Description:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band 5: 824~849MHz WCDMA Band 2: 1850~1910MHz
Max. RF output power:	GSM850: 33.28dBm, GSM1900: 29.95dBm WCDMA Band 5: 23.43dBm WCDMA Band 2: 22.90dBm,
Type of Modulation:	GMSK, BPSK
Antenna installation:	Internal Antenna
Antenna Gain:	GSM 850:-2.4dBi GSM 1900:-1.64dBi WCDMA Band 5:-2.4dBi WCDMA Band 2: -1.64dBi
Ratings:	DC 5.0V charging from adapter DC 3.8V from battery, 4800mAh

4.2 Test Setup Configuration

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

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

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

4.4 Channel List

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

4.5 Test Mode

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

4.6 Test Environment

Humidity(%):	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

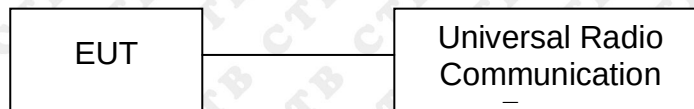
6.1 Standard Applicable

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	31.75	1.5	0	H	1.5	0	30.25	38.45
824.2	31.60	1.5	0	V	1.5	0	30.10	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	31.87	1.5	0	H	1.5	0	30.37	38.45
848.8	31.88	1.5	0	V	1.5	0	30.38	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	22.66	1.5	0	H	1.5	0	21.16	33.00
836.4	22.52	1.5	0	V	1.5	0	21.02	33.00
High Channel								
848.8	22.11	1.5	0	H	1.5	0	20.61	33.00
848.8	22.33	1.5	0	V	1.5	0	20.83	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	30.96	1.5	0	H	1.5	0	29.46	38.45
824.2	30.57	1.5	0	V	1.5	0	29.07	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	30.45	1.5	0	H	1.5	0	28.95	38.45
848.8	30.68	1.5	0	V	1.5	0	30.68	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	20.57	1.5	0	H	1.9	7.7	26.37	33.00
1850.2	21.15	1.5	0	V	1.9	7.7	26.95	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	19.40	1.5	0	H	1.9	7.7	25.20	33.00
1909.8	19.42	1.5	0	V	1.9	7.7	25.22	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	25.18	1.5	0	H	1.5	0	23.68	38.45
824.2	24.43	1.5	0	V	1.5	0	22.93	38.45
Middle Channel								
836.6	25.58	1.5	0	H	1.5	0	24.08	38.45
836.6	25.70	1.5	0	V	1.5	0	24.20	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	19.41	1.50	0.00	H	1.90	7.70	25.21	33.00
1850.2	19.45	1.50	0.00	V	1.90	7.70	25.25	33.00
Middle Channel								
1880.0	19.82	1.50	0.00	H	1.90	7.70	25.62	33.00
1880.0	19.17	1.50	0.00	V	1.90	7.70	24.97	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	21.52	1.50	0.00	H	1.90	7.70	27.32	38.45
836.6	21.85	1.50	0.00	V	1.90	7.70	27.65	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	20.08	1.5	0	H	1.5	0	18.58	38.45
836.6	20.78	1.5	0	V	1.5	0	19.28	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 HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	20.99	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	21.41	1.5	0	H	1.5	0	27.21	38.45
846.6	20.80	1.5	0	V	1.5	0	20.80	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	13.74	1.5	0	H	1.9	7.7	19.54	33
1852.4	13.77	1.5	0	V	1.9	7.7	19.57	33
Middle Channel								
1880.0	13.82	1.5	0	H	1.9	7.7	19.72	33
1880.0	13.92	1.5	0	V	1.9	7.7	19.86	33
High Channel								
1907.6	13.28	1.5	0	H	1.9	7.7	19.08	33
1907.6	14.07	1.5	0	V	1.9	7.7	19.87	33

EIRP For HSDPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	12.51	1.5	0	H	1.9	7.7	18.31	33
1852.4	12.52	1.5	0	V	1.9	7.7	18.32	33
Middle Channel								
1880.0	12.76	1.5	0	H	1.9	7.7	18.56	33
1880.0	13.07	1.5	0	V	1.9	7.7	18.87	33
High Channel								
1907.6	12.52	1.5	0	H	1.9	7.7	18.32	33
1907.6	12.50	1.5	0	V	1.9	7.7	18.30	33

EIRP For HSUPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	12.17	1.5	0	H	1.9	7.7	17.97	33
1852.4	12.15	1.5	0	V	1.9	7.7	17.95	33
Middle Channel								
1880.0	11.86	1.5	0	H	1.9	7.7	17.66	33
1880.0	12.06	1.5	0	V	1.9	7.7	17.86	33
High Channel								
1907.6	12.14	1.5	0	H	1.9	7.7	17.94	33
1907.6	12.11	1.5	0	V	1.9	7.7	17.91	33

Note: Result = Substitute - Cable loss + Antenna Gain

Max. Conducted Output Power

For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
GSM	Low Channel	824.2	33.22	38.45
	Middle Channel	836.6	33.28	38.45
	High Channel	848.8	33.06	38.45
GPRS(1 Slot)	Low Channel	824.2	33.22	38.45
	Middle Channel	836.6	33.27	38.45
	High Channel	848.8	33.05	38.45
EDGE(1 Slot)	Low Channel	824.2	27.38	38.45
	Middle Channel	836.6	27.18	38.45
	High Channel	848.8	27.39	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	29.61	33.0
	Middle Channel	1880.0	29.72	33.0
	High Channel	1909.8	29.95	33.0
GPRS(1 Slot)	Low Channel	1850.2	29.60	33.0
	Middle Channel	1880.0	29.72	33.0
	High Channel	1909.8	29.94	33.0
EDGE(1 Slot)	Low Channel	1850.2	25.69	33.0
	Middle Channel	1880.0	25.27	33.0
	High Channel	1909.8	25.47	33.0

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	23.43	38.45
	Middle Channel	836.6	23.34	38.45
	High Channel	846.6	23.33	38.45
HSDPA	Low Channel	826.4	22.46	38.45
	Middle Channel	836.6	22.40	38.45
	High Channel	846.6	22.34	38.45
HSUPA	Low Channel	826.4	20.90	38.45
	Middle Channel	836.6	22.25	38.45
	High Channel	846.6	22.16	38.45

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	22.83	33.00
	Middle Channel	1880.0	22.84	33.00
	High Channel	1907.6	22.90	33.00
HSDPA	Low Channel	1852.4	21.87	33.00
	Middle Channel	1880.0	21.86	33.00
	High Channel	1907.6	21.92	33.00
HSUPA	Low Channel	1852.4	20.47	33.00
	Middle Channel	1880.0	21.68	33.00
	High Channel	1907.6	21.89	33.00

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

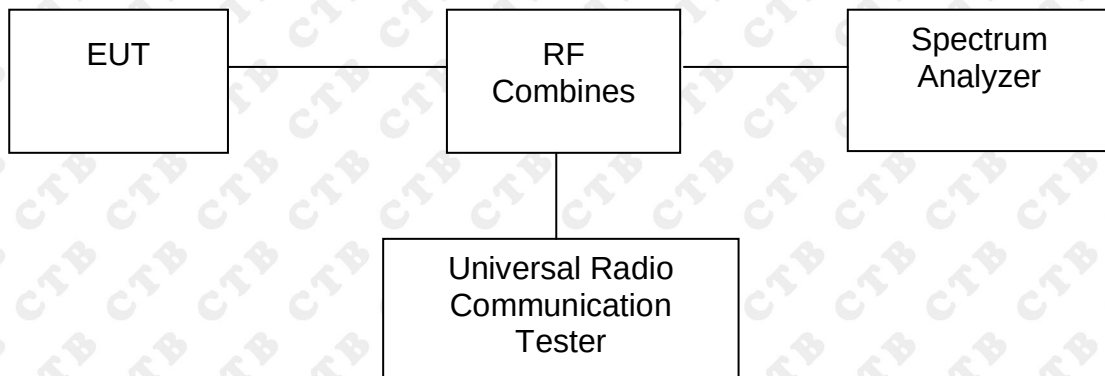
7.1 Standard Applicable

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

7.2 Test Procedure

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

Test Configuration for the emission bandwidth testing:



7.3 Environmental Conditions

Temperature:	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	2.68	13
GPRS(1 Slot)	190	836.6	2.72	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	2.68	13
GPRS(1 Slot)	512	1850.2	2.72	13
EDGE(1 Slot)	512	1850.2	2.76	13

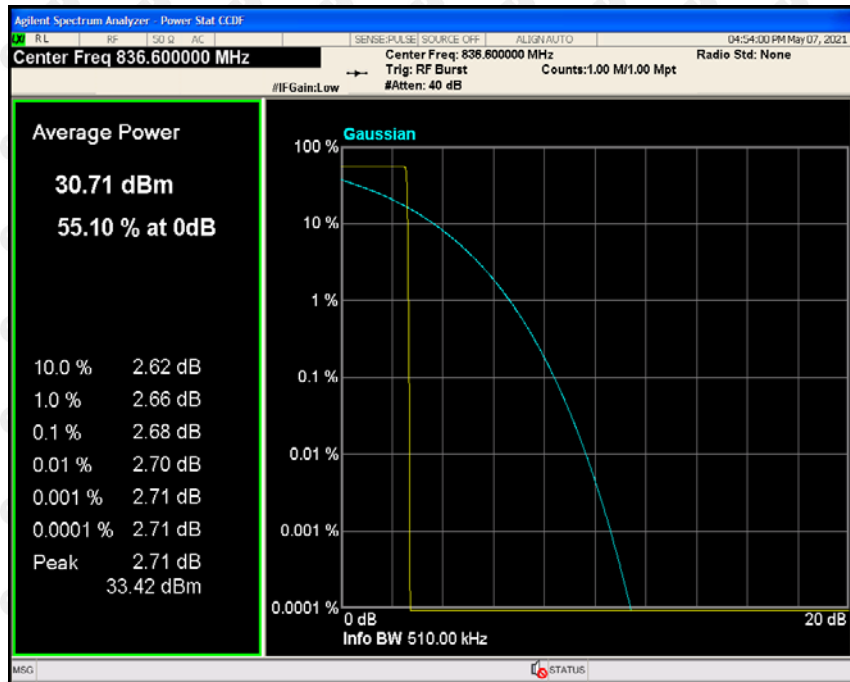
For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	4182	836.4	2.91	13
HSDPA	4182	836.4	3.09	13
HSUPA	4182	836.4	3.55	13

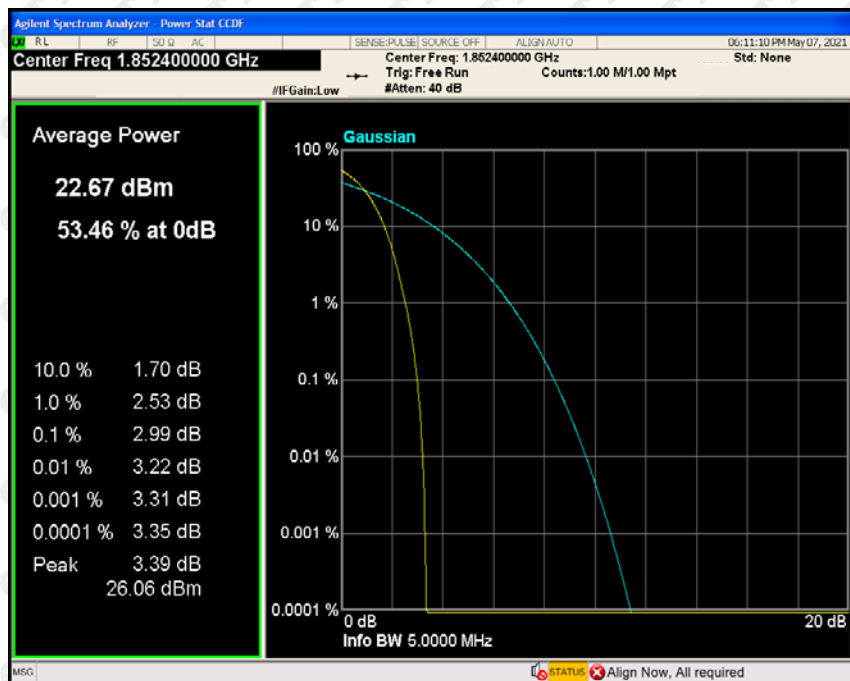
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	2.99	13
HSDPA	9400	1852.4	3.11	13
HSUPA	9400	1852.4	3.47	13

GSM :



WCDMA:



8. EMISSION BANDWIDTH

8.1 Standard Applicable

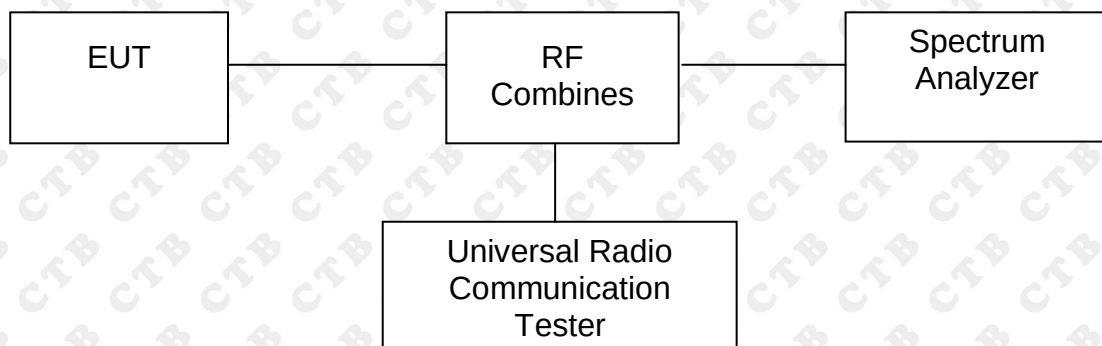
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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	252.264	324.583
	190	836.6	247.492	314.708
	251	848.8	244.526	315.852
GPRS	128	824.2	244.815	312.468
	190	836.6	244.247	319.957
	251	848.8	241.322	315.206
EDGE	128	824.2	245.086	306.100
	190	836.6	248.439	320.248
	251	848.8	253.218	314.630

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	244.158	315.866
	661	1880.0	247.608	320.223
	810	1909.8	246.745	320.117
GPRS	512	1850.2	247.790	325.653
	661	1880.0	244.052	319.099
	810	1909.8	241.854	314.399
EDGE	512	1850.2	244.996	317.741
	661	1880.0	250.965	306.920
	810	1909.8	249.566	313.883

For Band 5

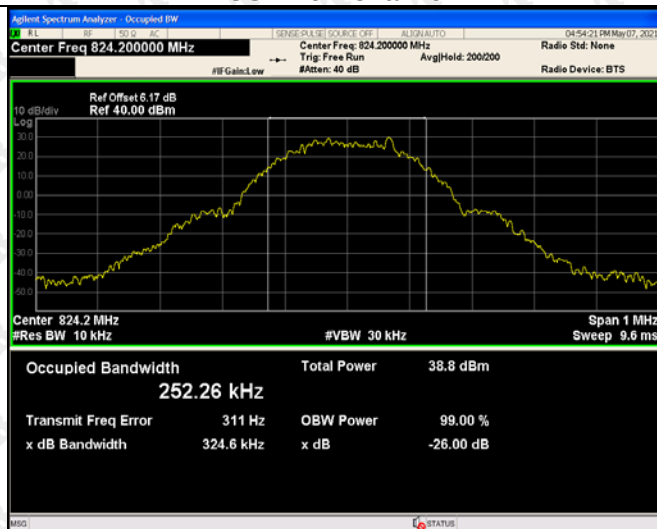
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4132	826.4	4158.223	4696.566
	4183	836.6	4182.480	4706.882
	4233	846.6	4182.155	4689.698
HSDPA	4132	826.4	4156.465	4695.583
	4183	836.6	4176.996	4692.152
	4233	846.6	4167.585	4695.965
HSUPA	4132	826.4	4168.978	4690.213
	4183	836.6	4171.720	4682.472
	4233	846.6	4190.463	4691.254

For Band 2

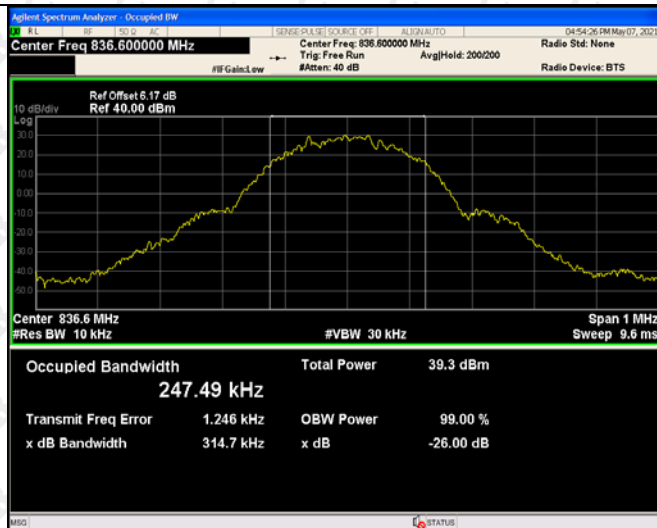
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	9262	1852.4	4175.154	4702.541
	9400	1880.0	4161.942	4712.433
	9538	1907.6	4179.869	4733.065
HSDPA	9262	1852.4	4195.464	4709.342
	9400	1880.0	4171.010	4709.402
	9538	1907.6	4183.261	4689.616
HSUPA	9262	1852.4	4187.492	4699.798
	9400	1880.0	4171.669	4680.613
	9538	1907.6	4177.810	4706.213

For Cellular Band

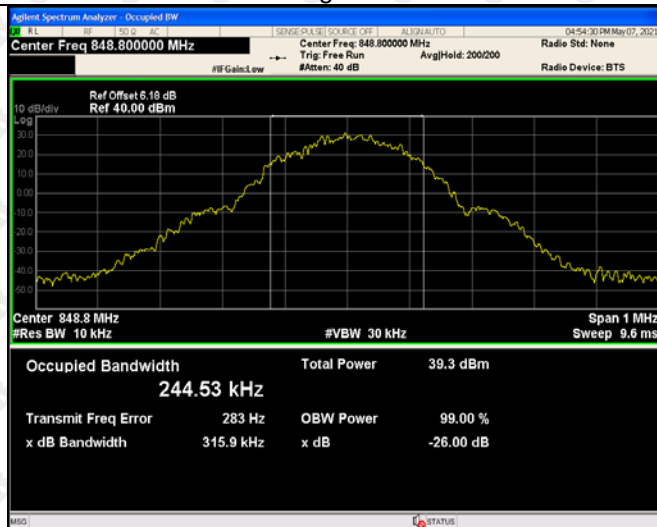
GSM Low Channel



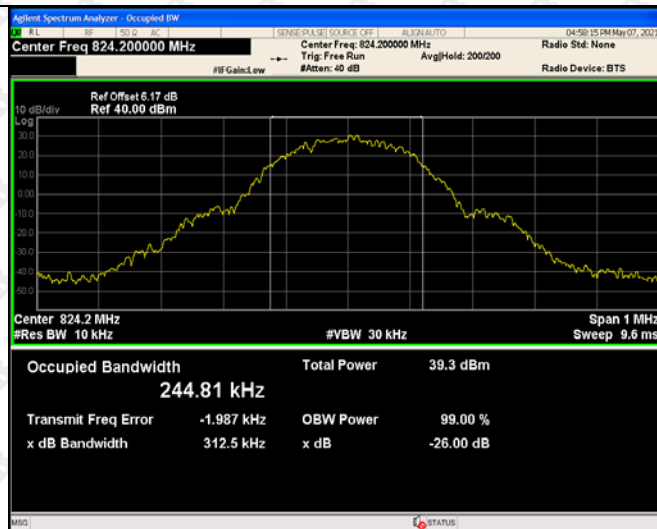
GSM Middle Channel



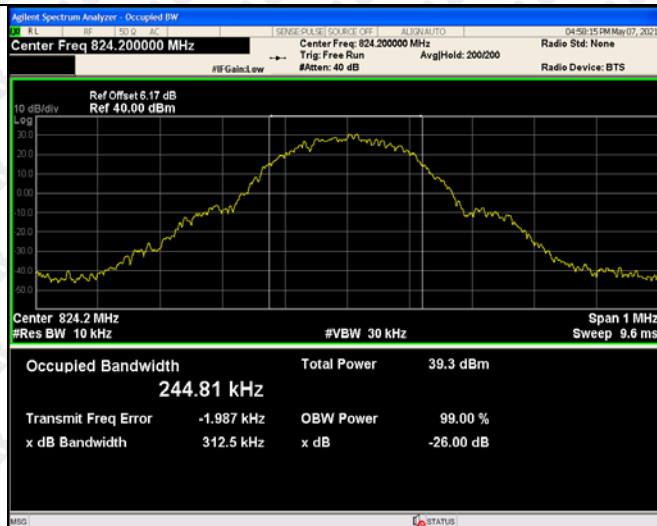
GSM High channel



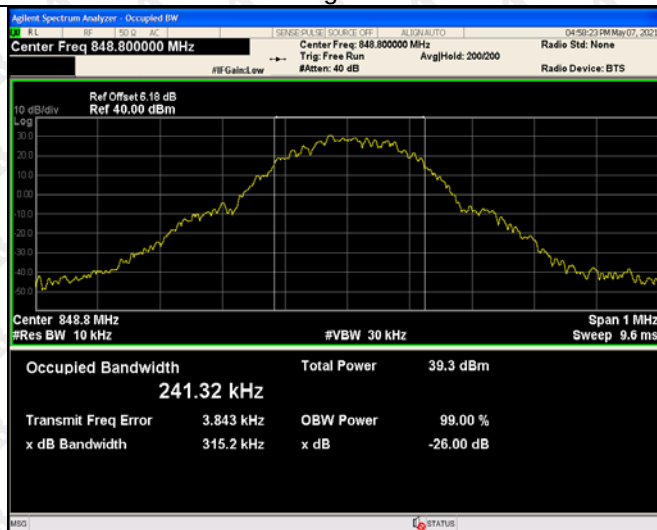
GPRS Low Channel



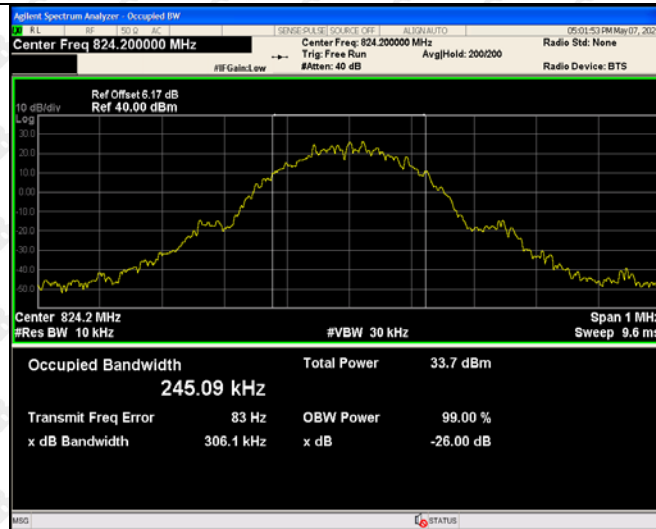
GPRS Middle Channel



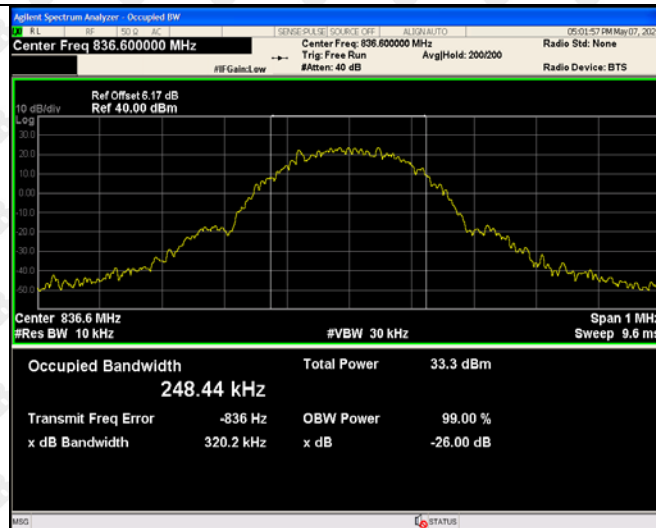
GPRS High Channel



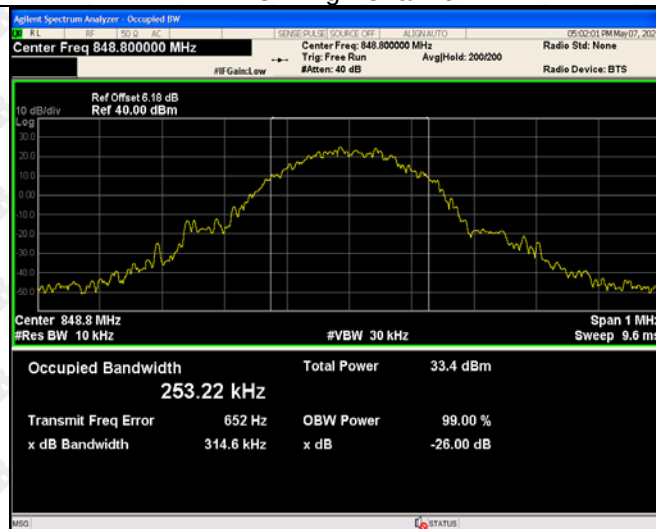
EDGE Low Channel



EDGE Middle Channel

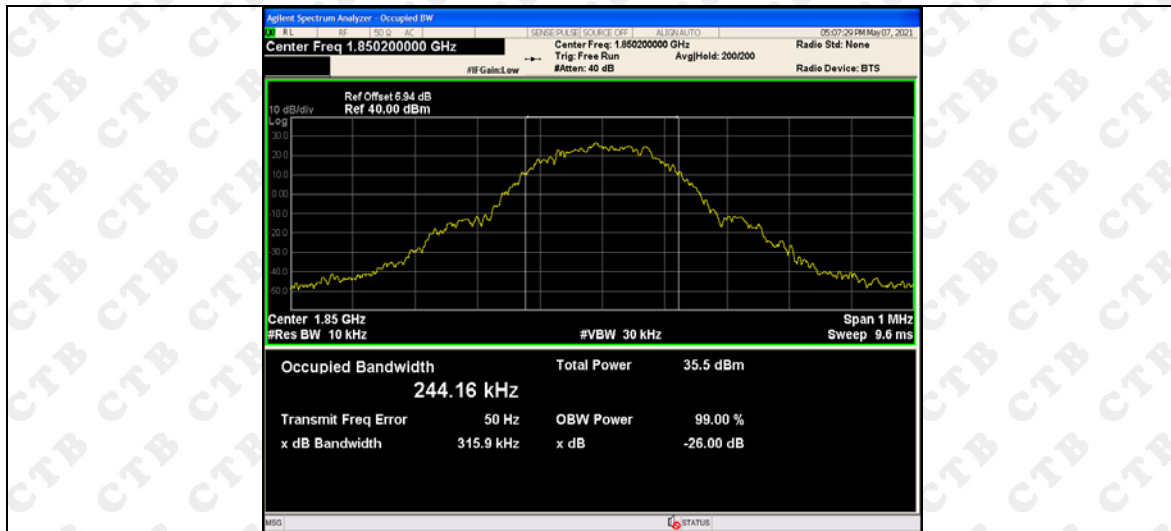


EDGE High Channel

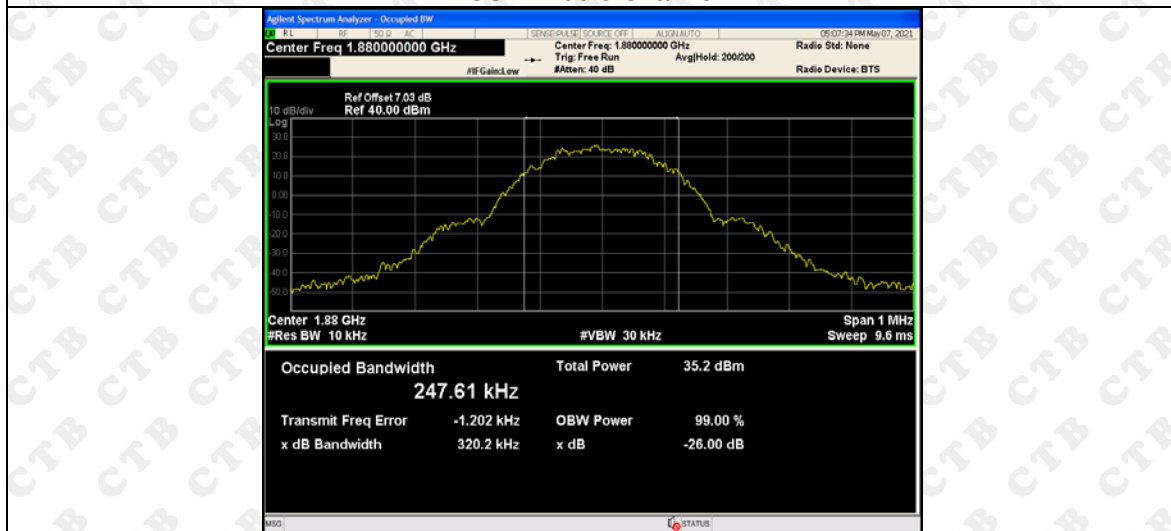


For PCS Band

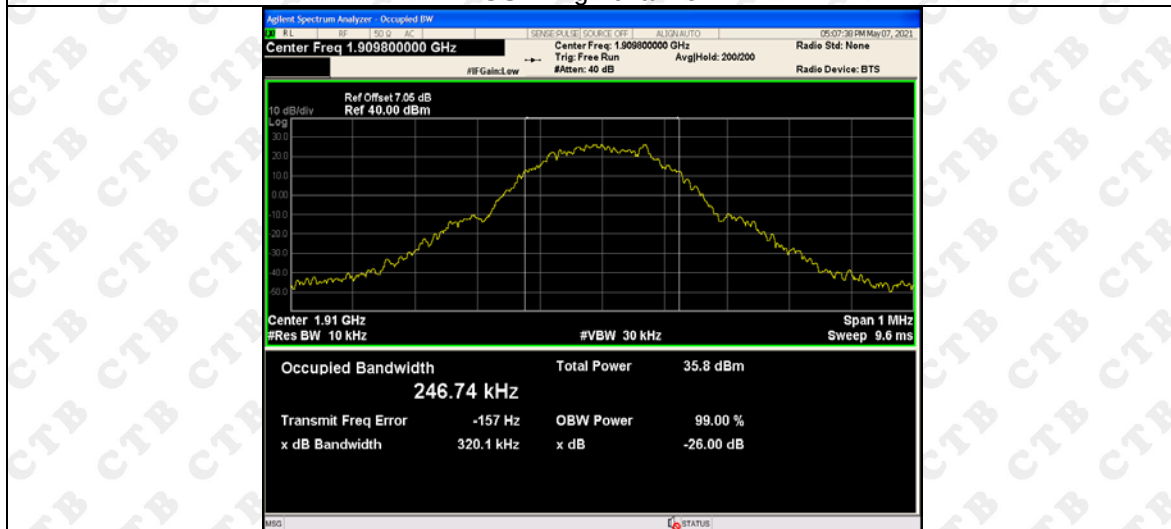
GSM Low Channel



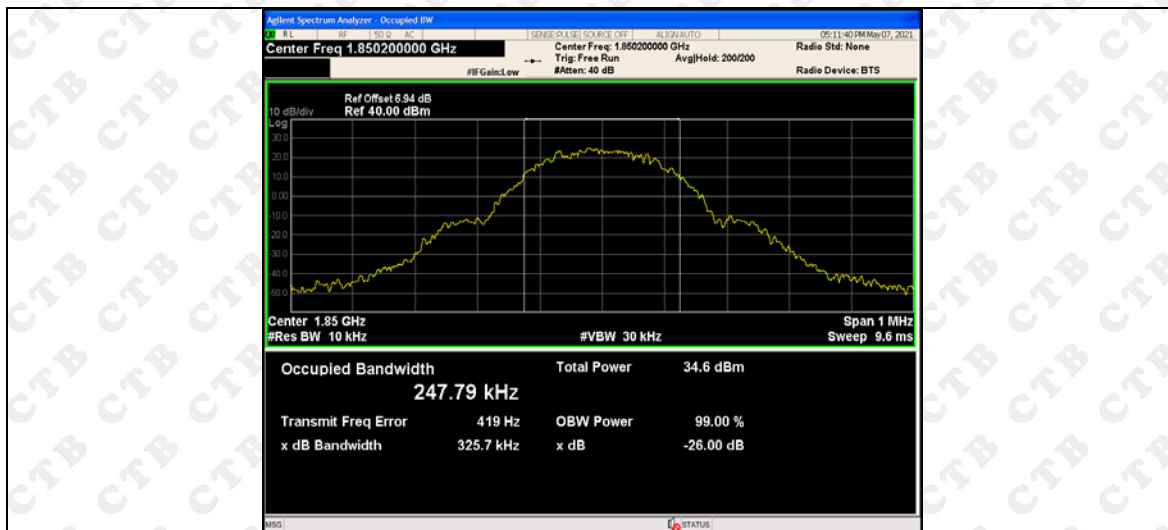
GSM Middle Channel



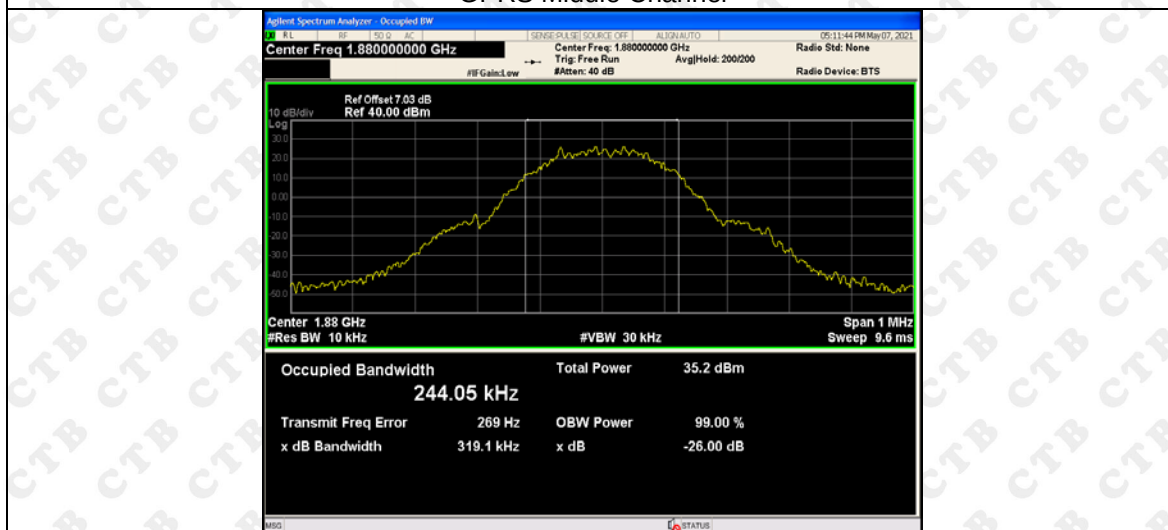
GSM High channel



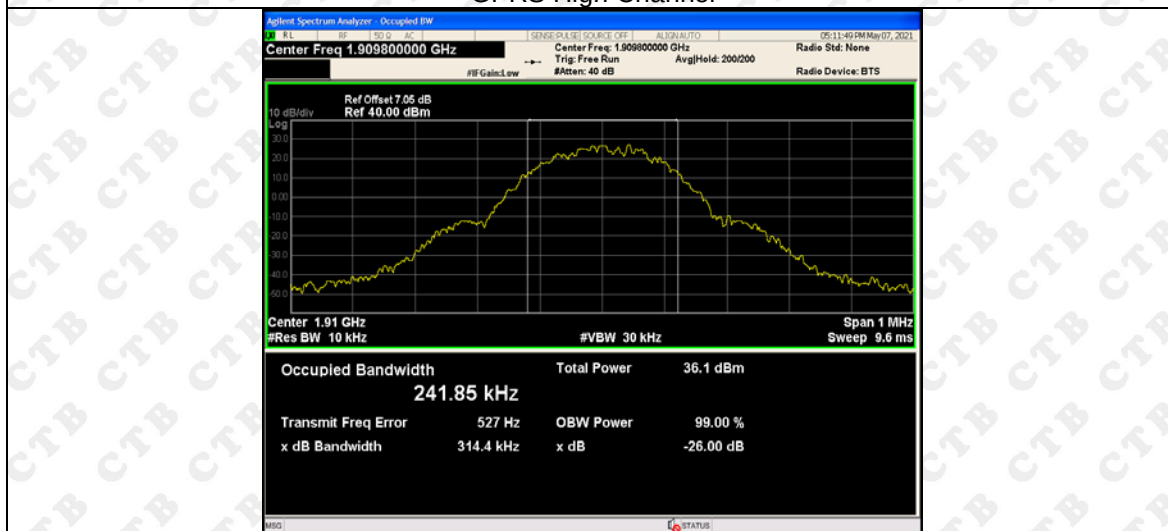
GPRS Low Channel



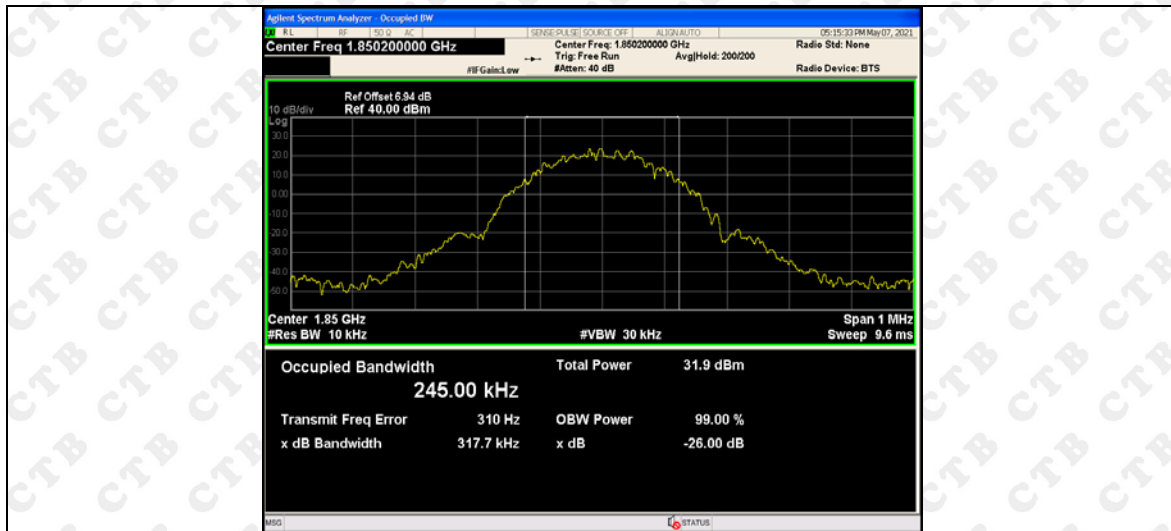
GPRS Middle Channel



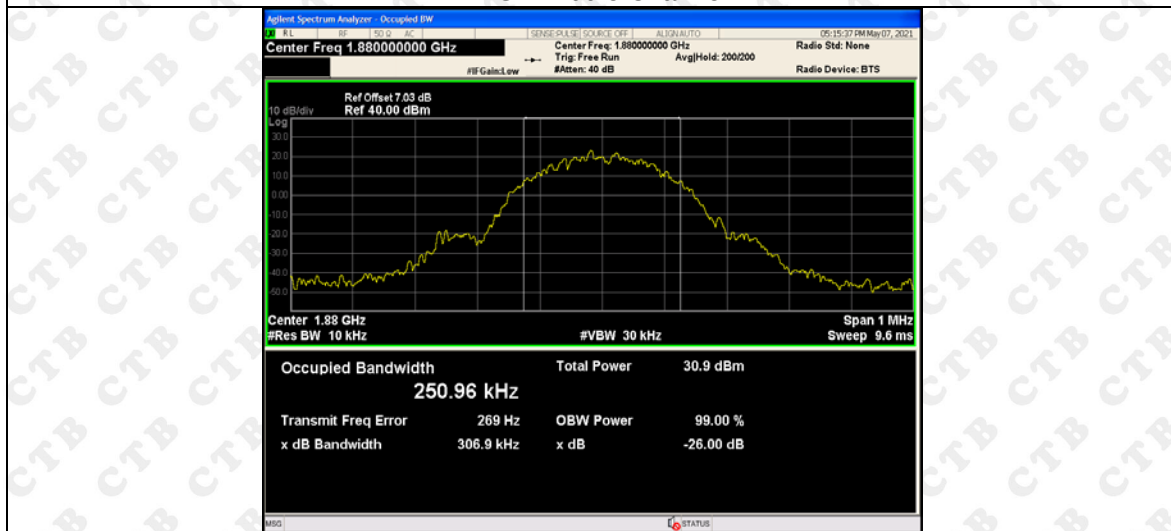
GPRS High Channel



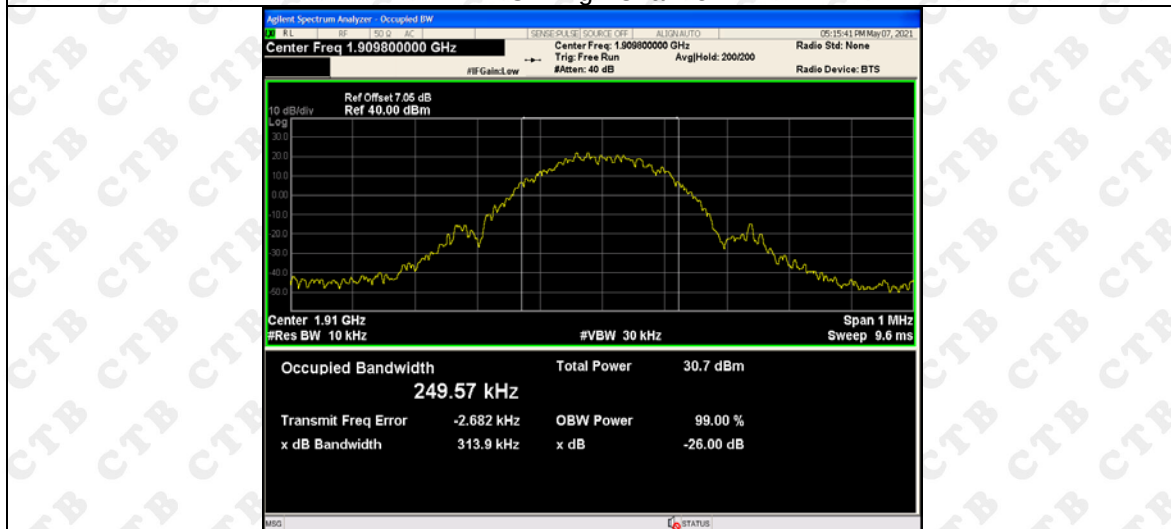
EDGE Low Channel



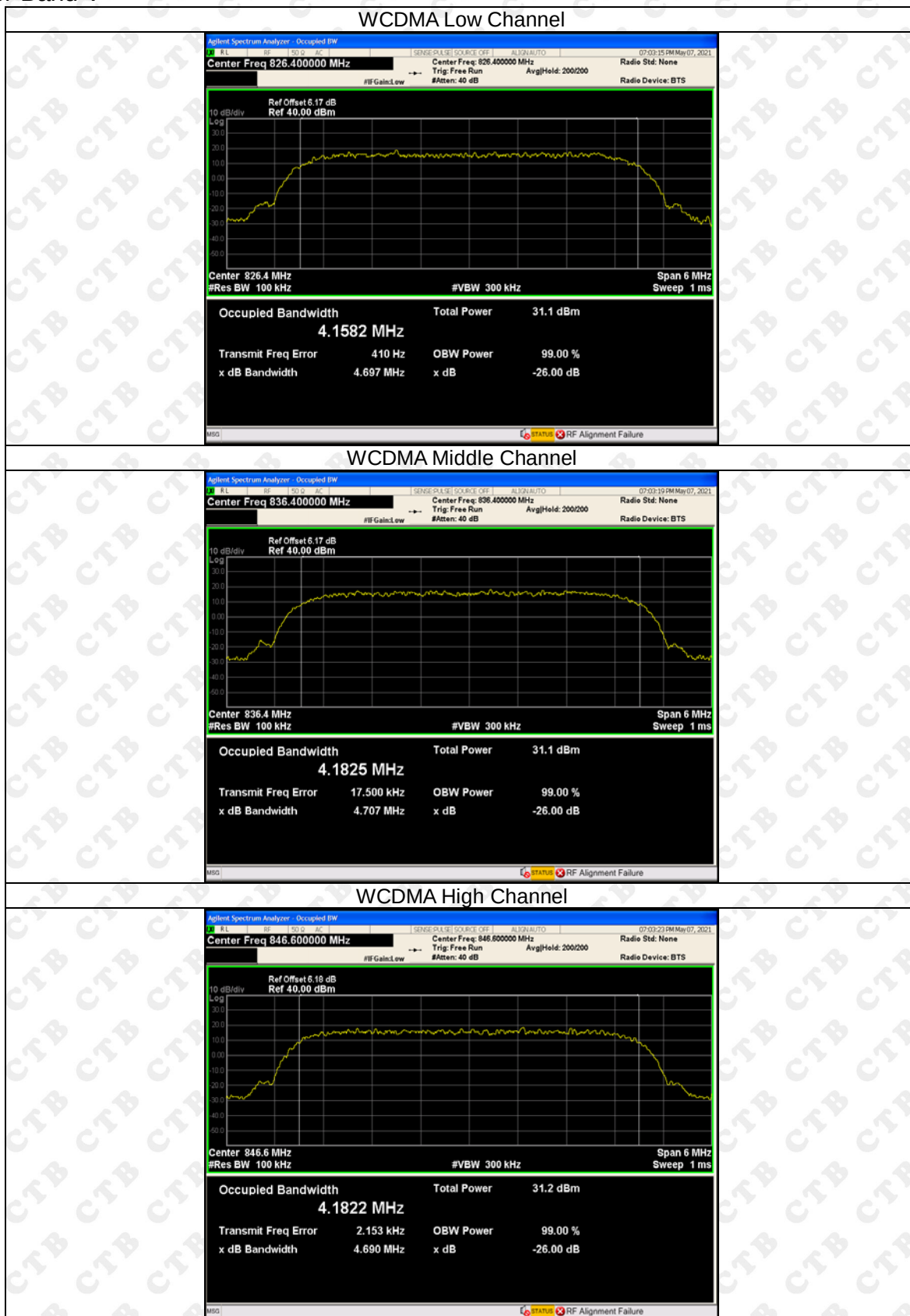
EDGE Middle Channel



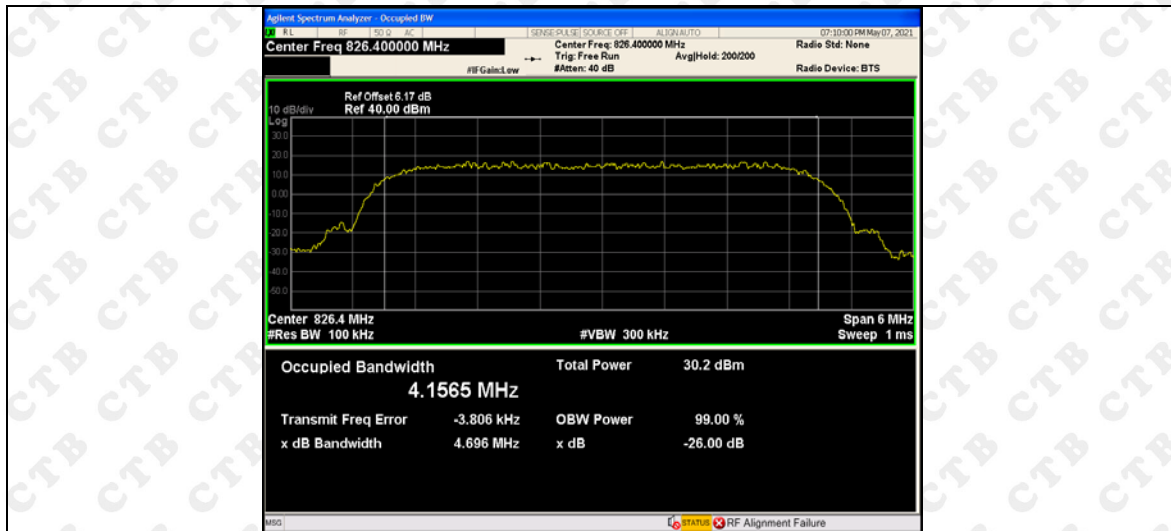
EDGE High Channel



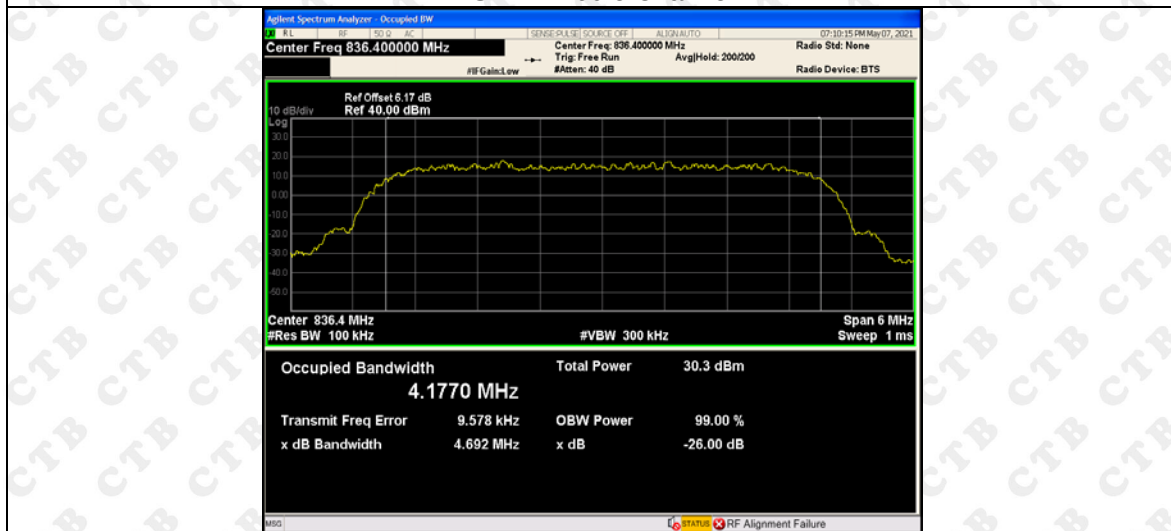
For Band V



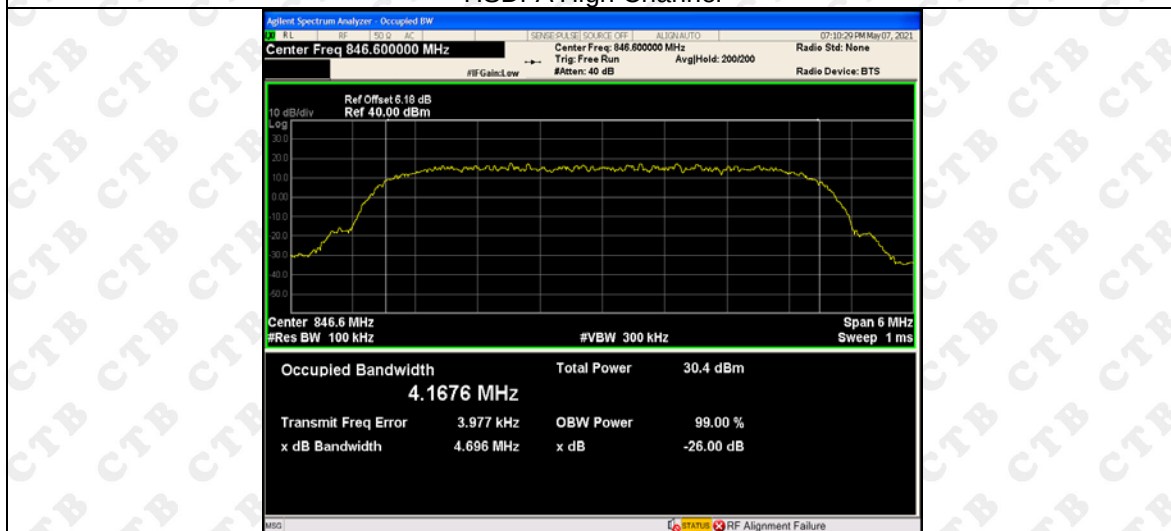
HSDPA Low Channel



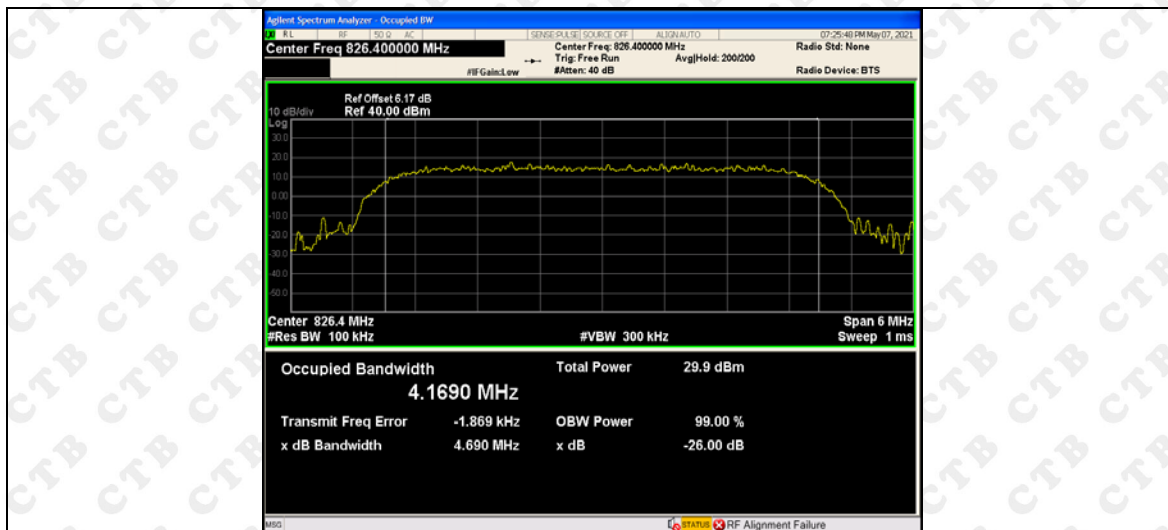
HSDPA Middle Channel



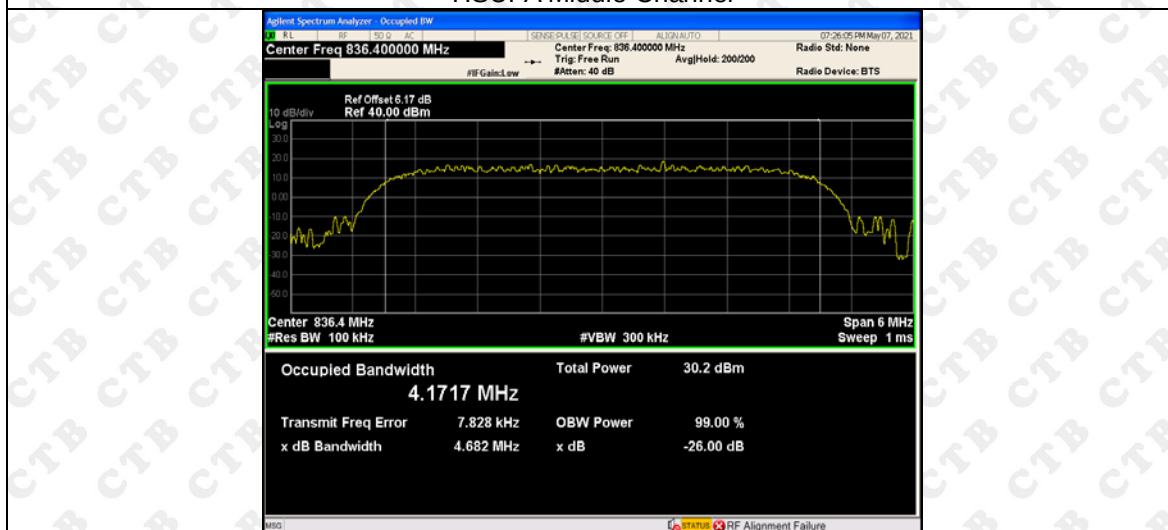
HSDPA High Channel



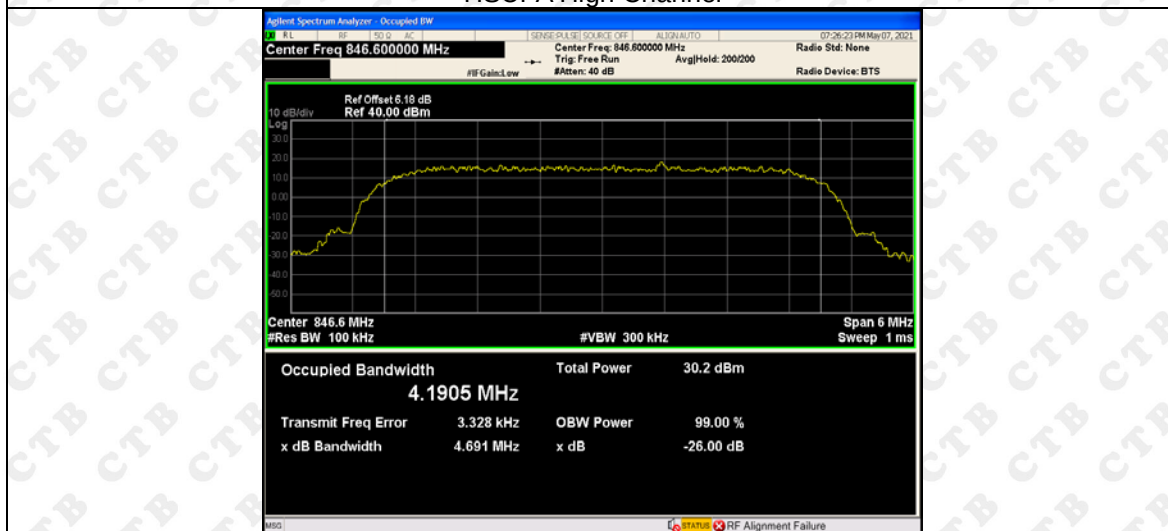
HSUPA Low Channel



HSUPA Middle Channel

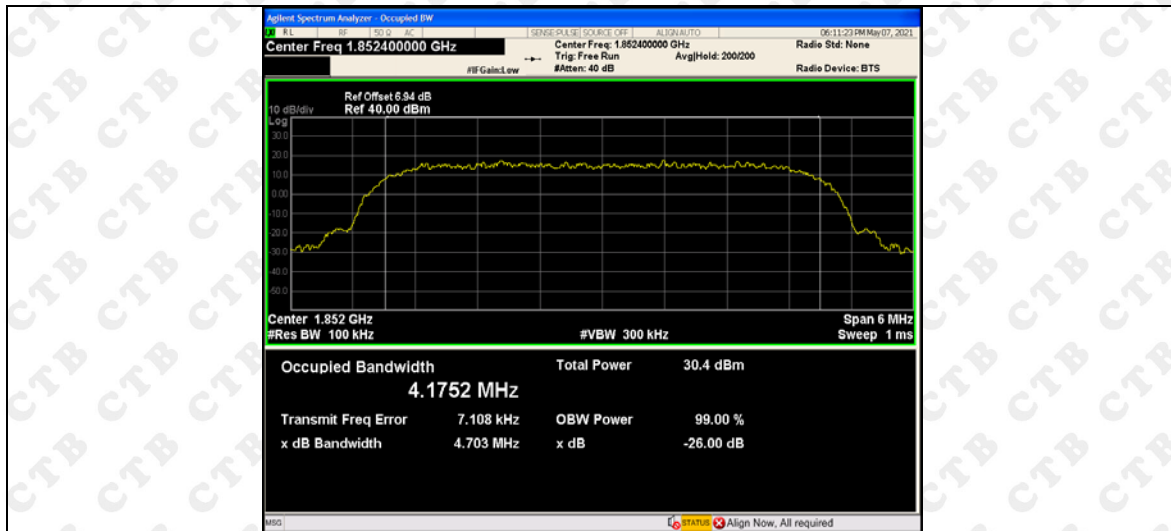


HSUPA High Channel

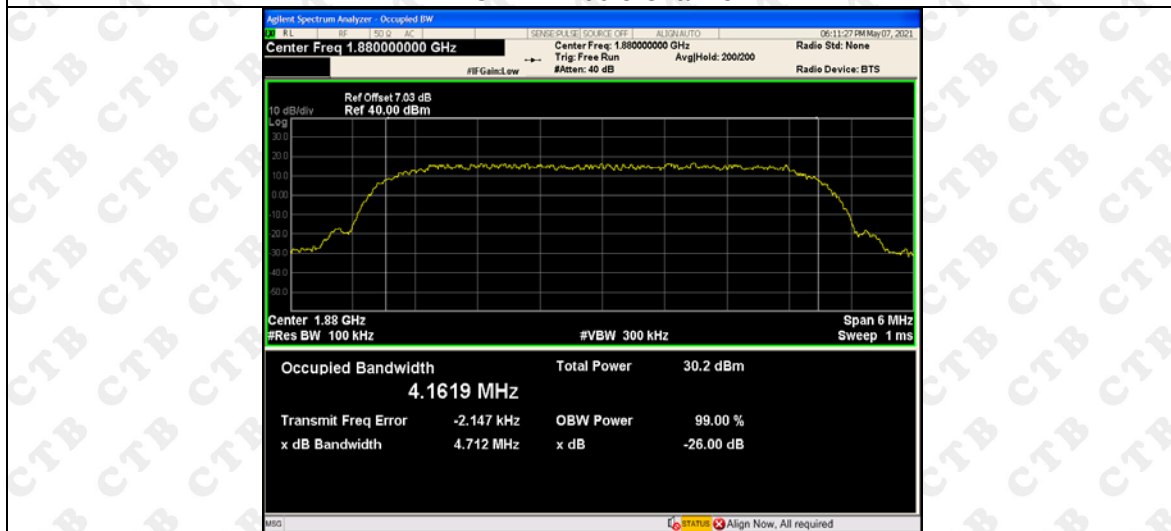


For Band II

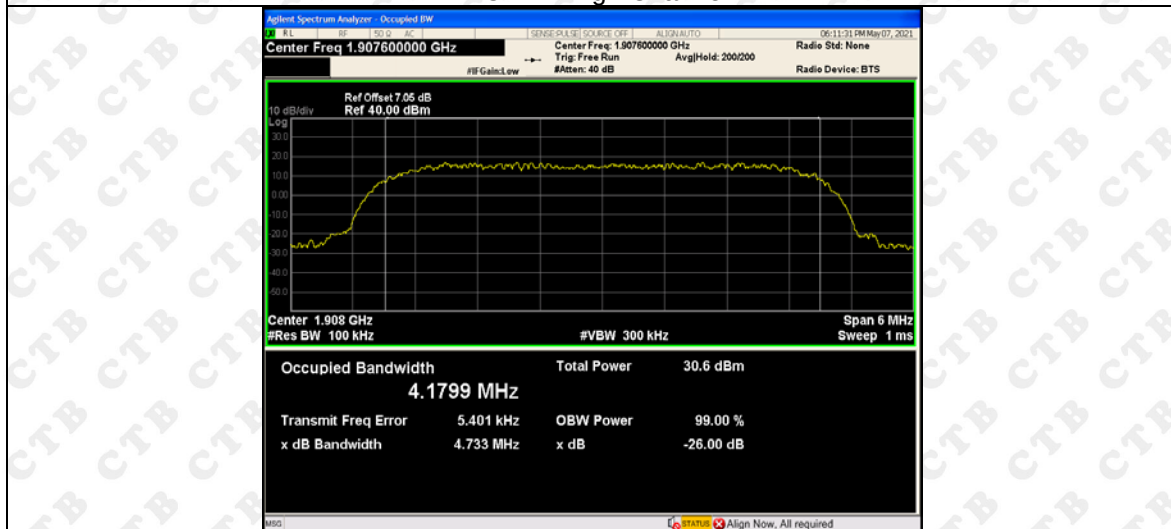
WCDMA Low Channel



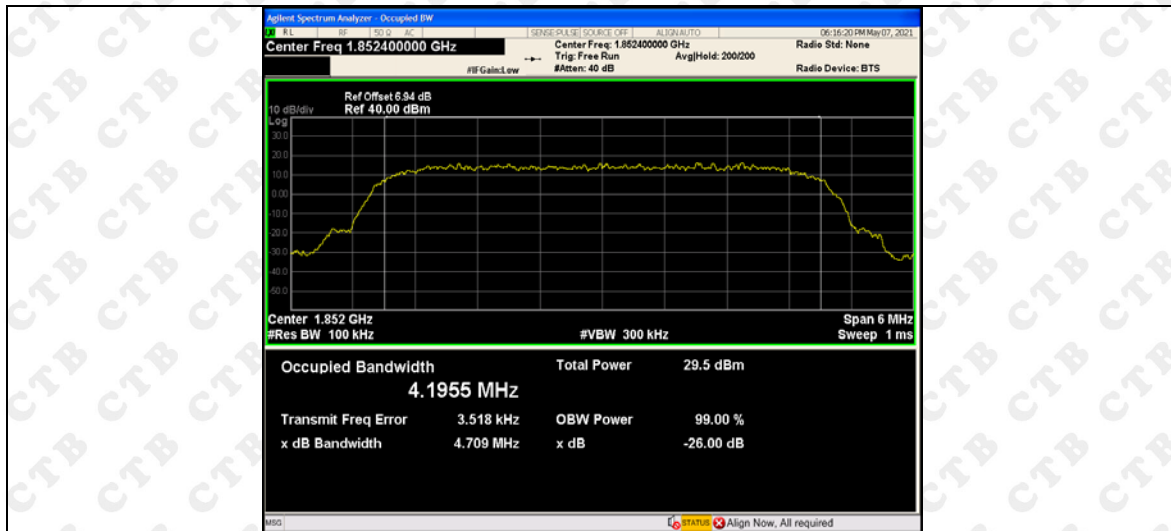
WCDMA Middle Channel



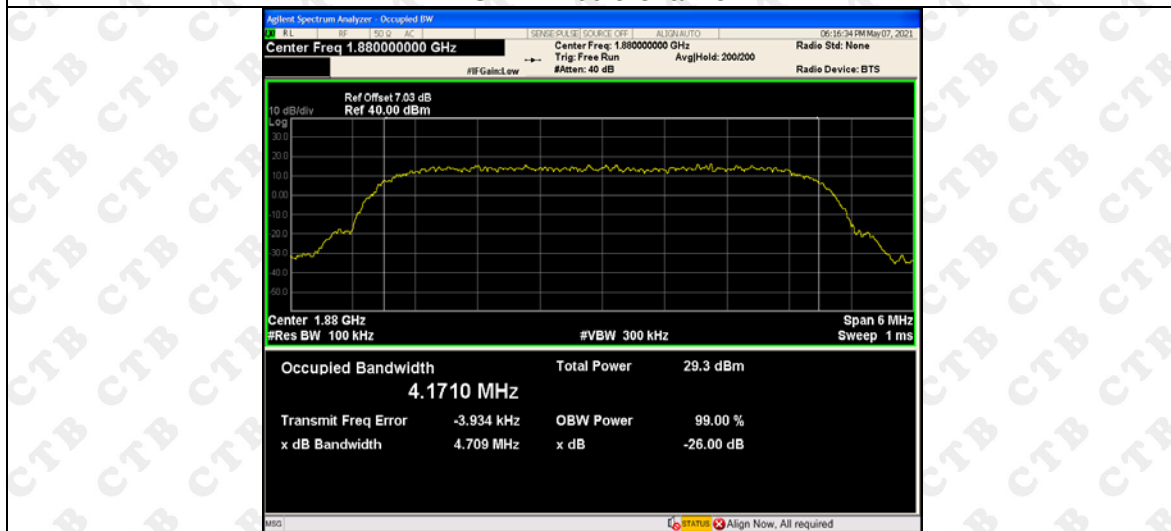
WCDMA High Channel



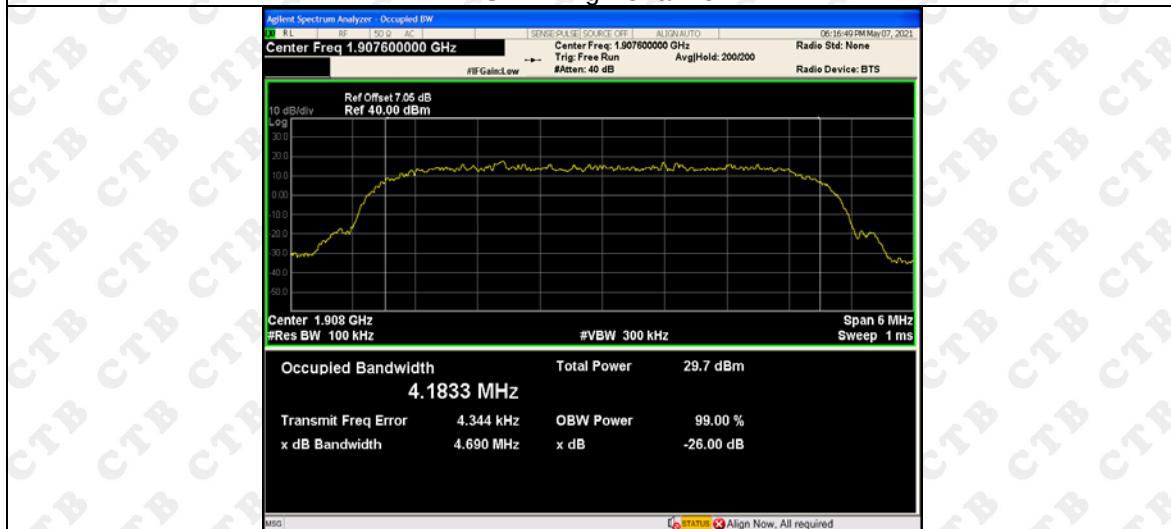
HSDPA Low Channel



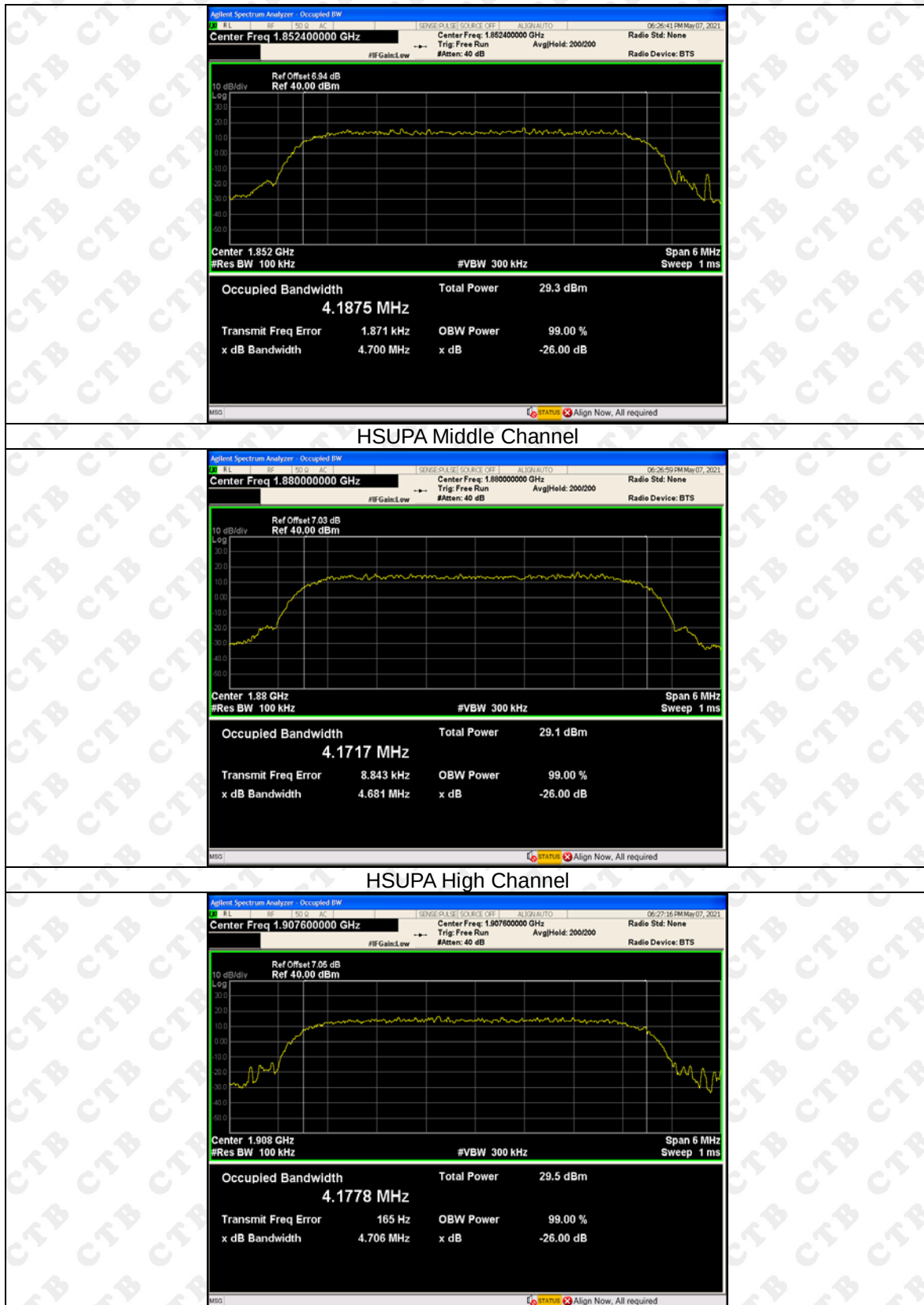
HSDPA Middle Channel



HSDPA High Channel



HSUPA Low Channel



9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

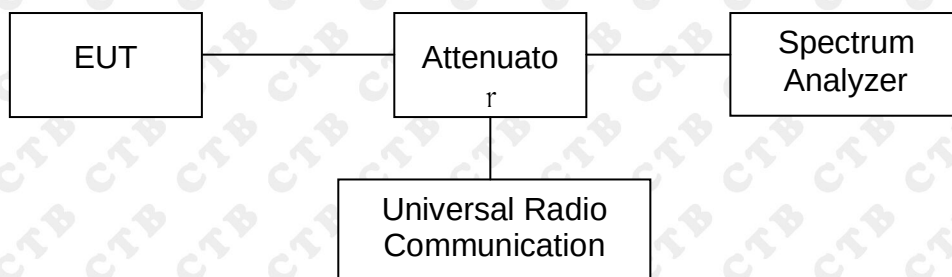
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:



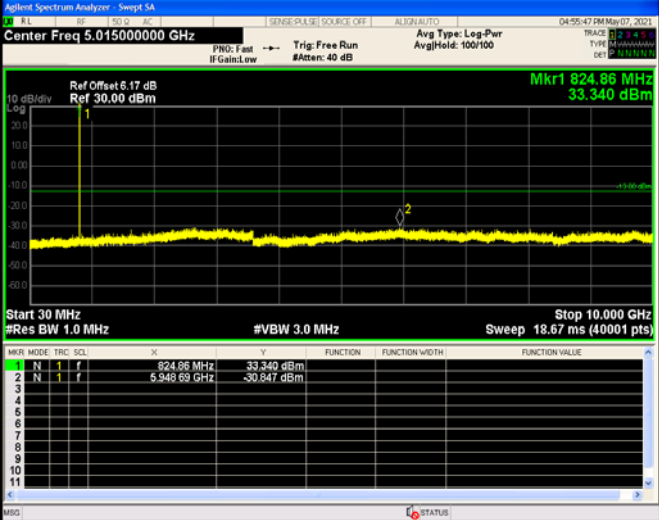
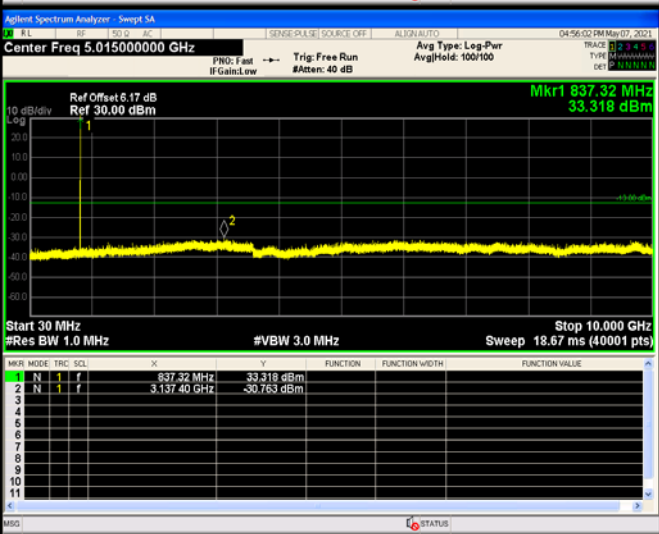
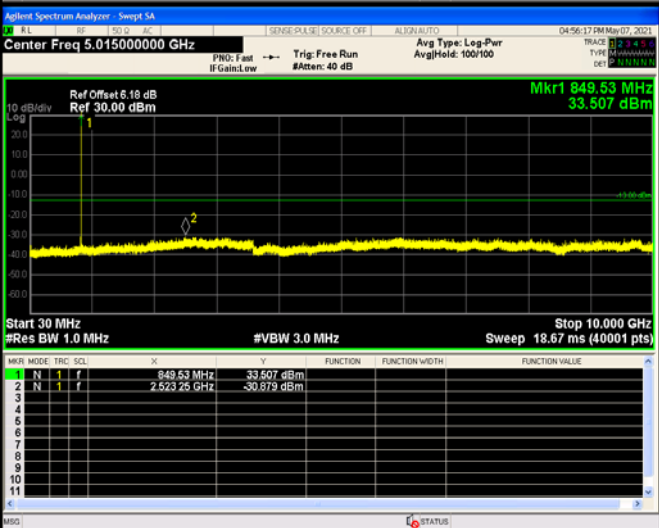
9.3 Environmental Conditions

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

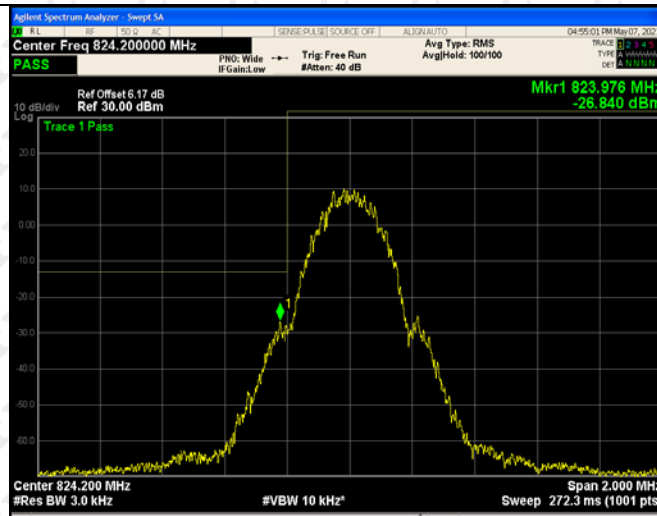
9.4 Summary of Test Results/Plots

Please refer to the following test plots

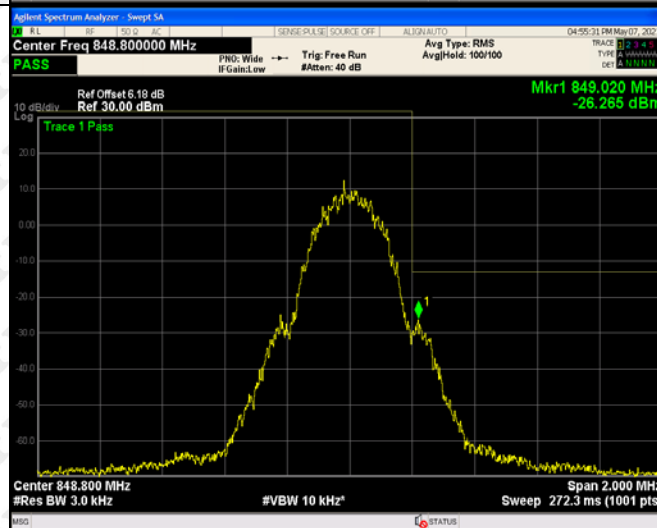
For Cellular Band

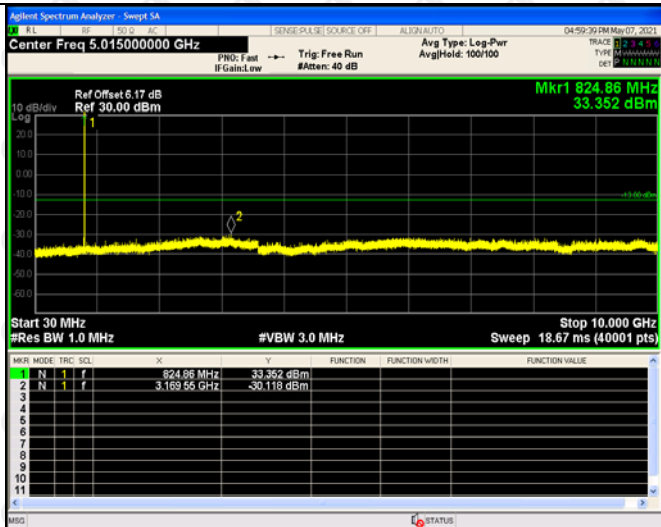
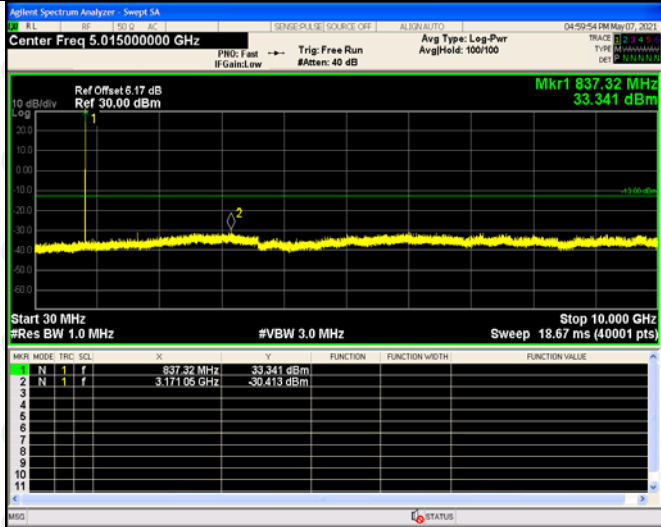
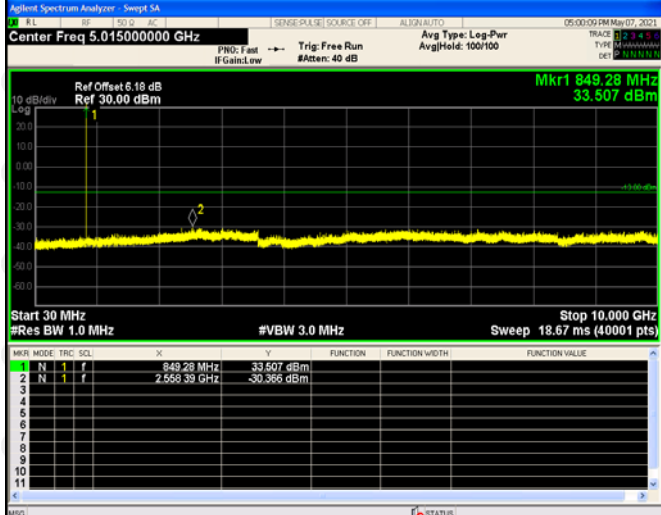
GSM Low Channel		
GSM Middle Channel		
GSM High Channel		

GSM
Low
Band
Emission

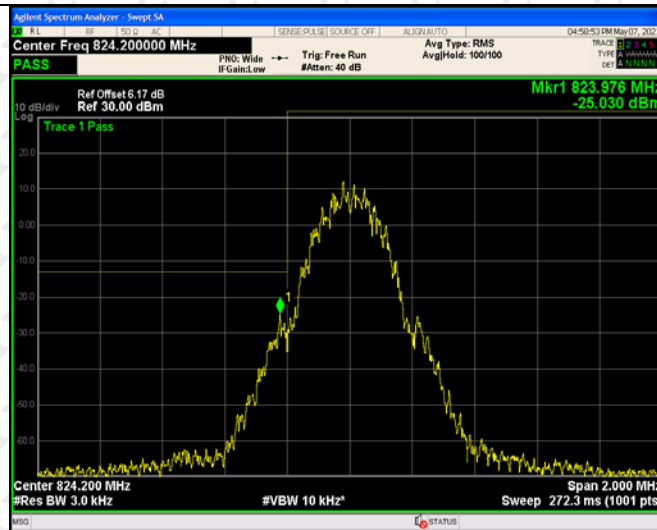


GSM
High
Band
Emission

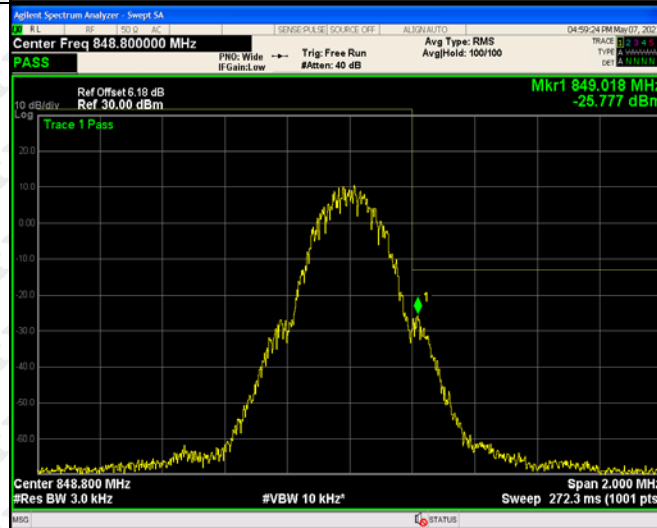


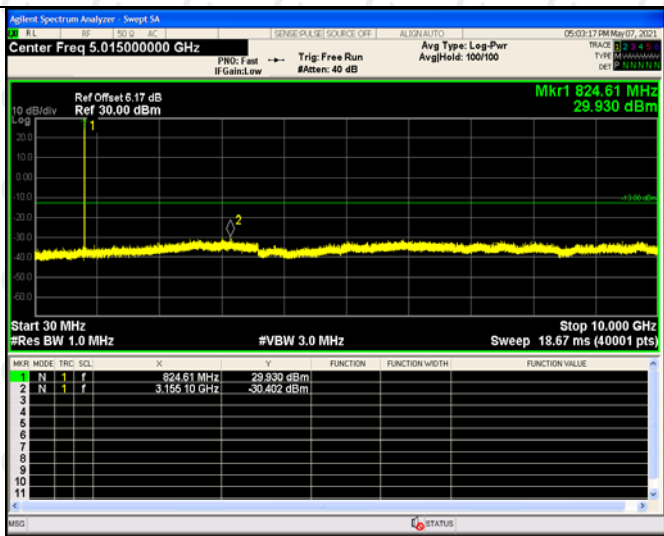
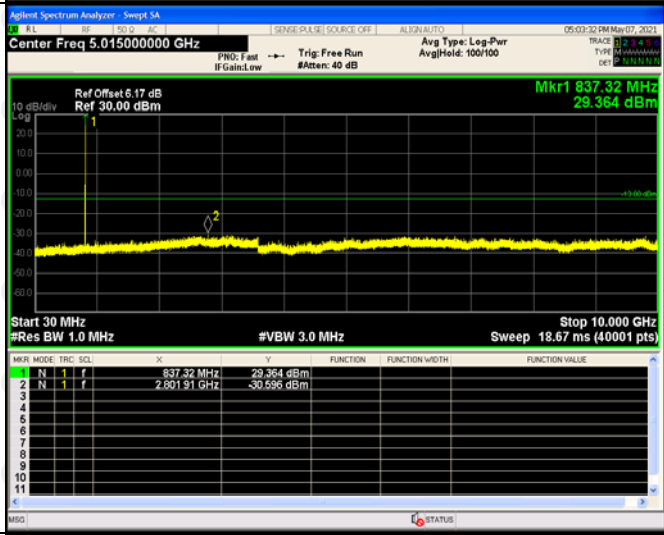
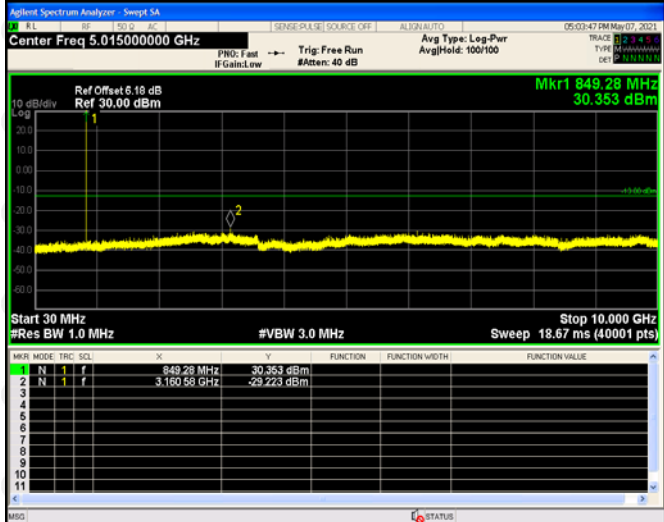
GPRS Low Channel	
GPRS Middle Channel	
GPRS High Channel	

GPRS
Low
Band
Emission

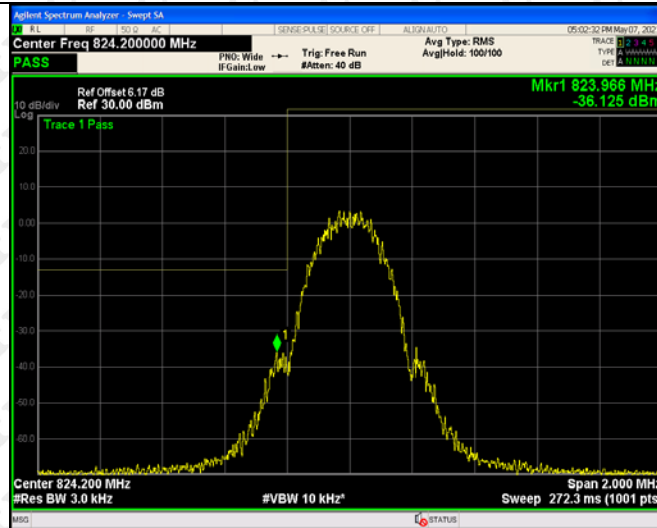


GPRS
High
Band
Emission

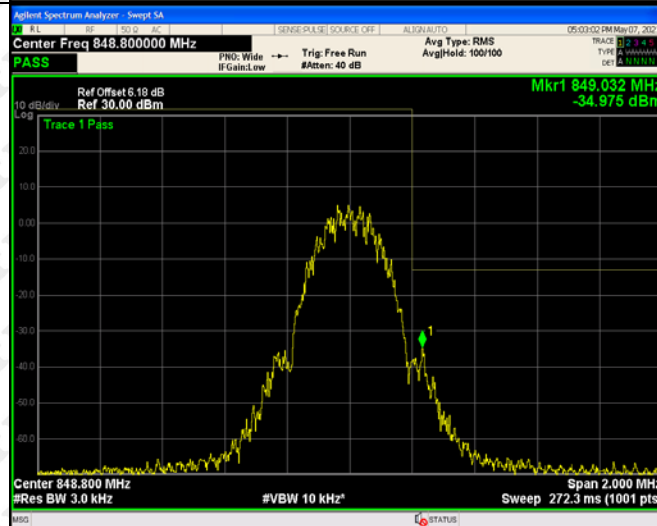


EDGE Low Channel		
EDGE Middle Channel		
EDGE High Channel		

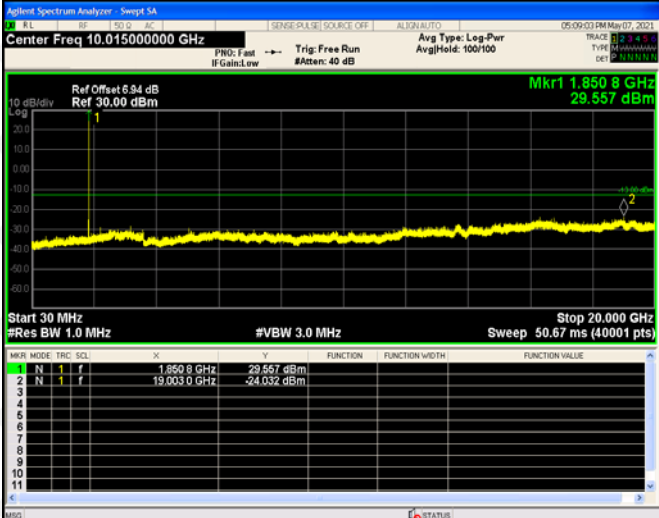
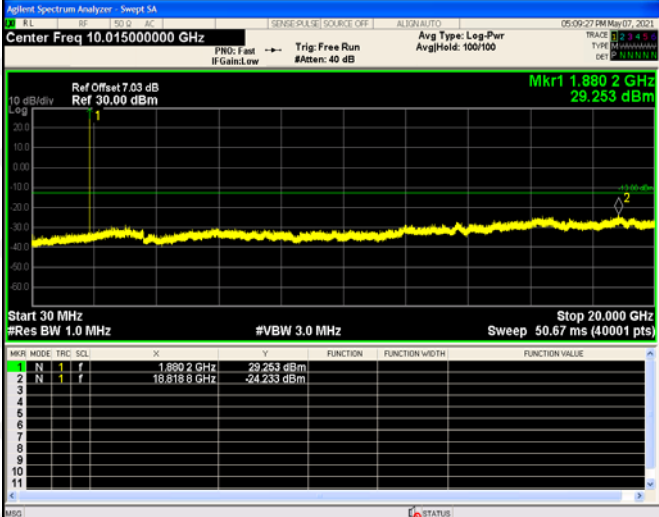
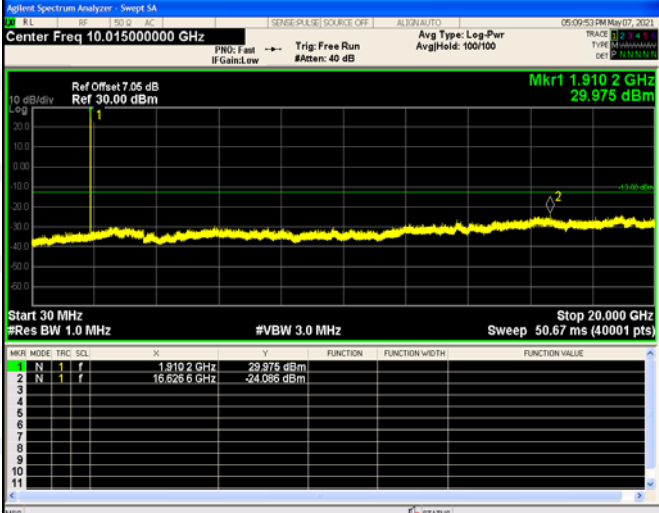
EDGE
Low
Band
Emission



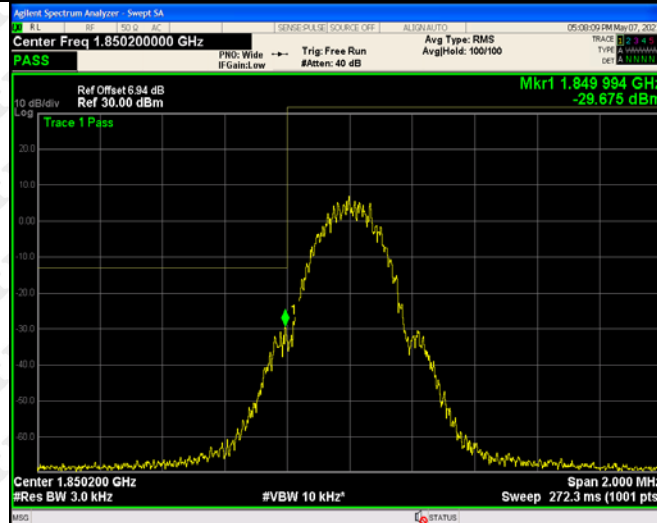
EDGE
High
Band
Emission



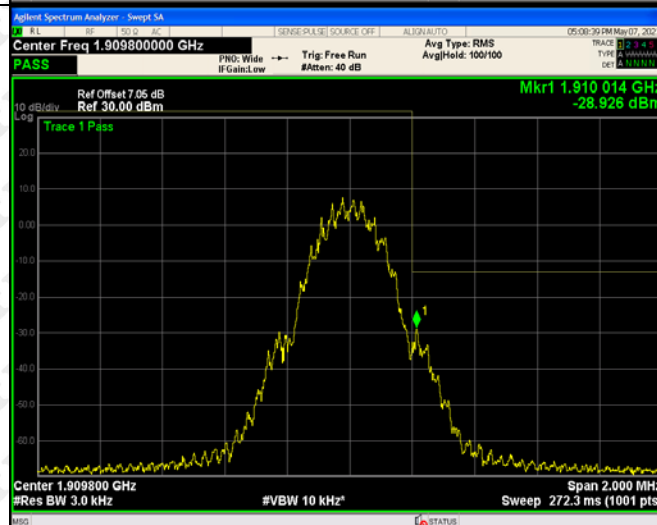
For PCS Band

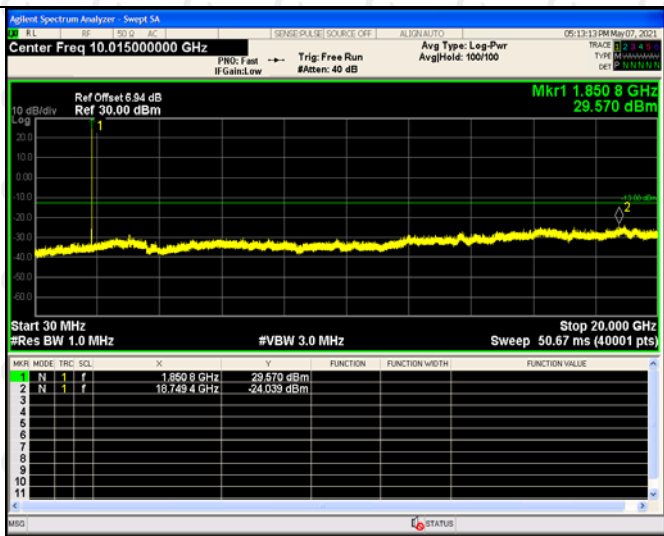
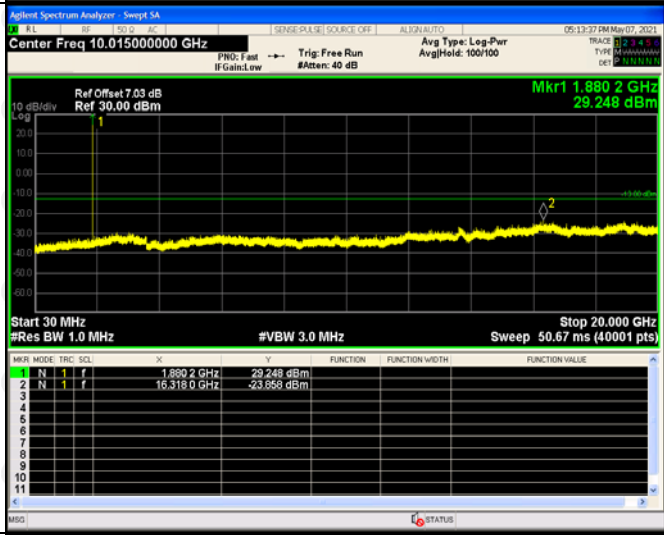
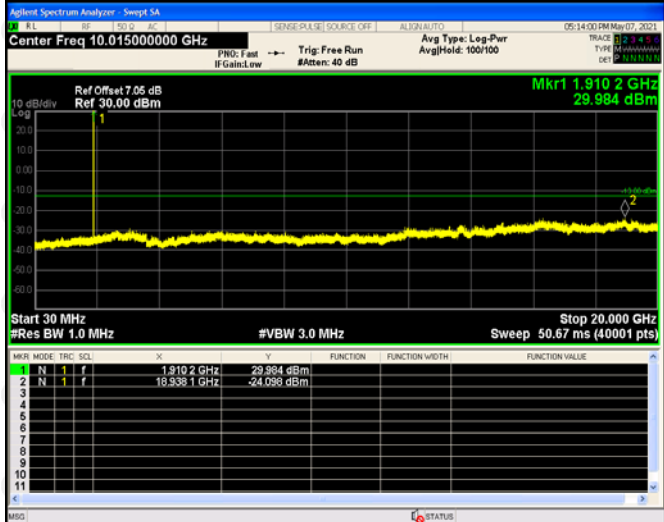
GSM Low Channel	
GSM Middle Channel	
GSM High Channel	

GSM
Low
Band
Emission

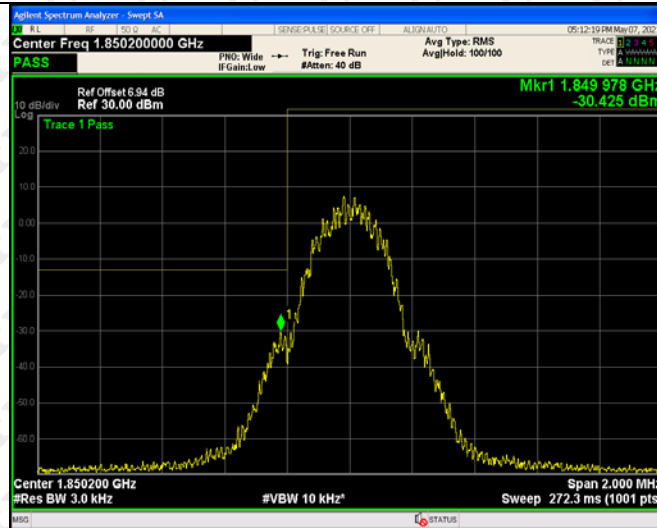


GSM
High
Band
Emission



GPRS Low Channel		
GPRS Middle Channel		
GPRS High Channel		

GPRS
Low
Band
Emission



GPRS
High
Band
Emission

