

FCC Radio Test Report

FCC ID: XMR202112UC200AGL

This report concerns: Original Grant

Project No. : 2110H019
Equipment : UMTS/HSPA+ Module
Brand Name : Quectel
Test Model : UC200A-GL
Series Model : N/A
Applicant : Quectel Wireless Solutions Co., Ltd
Address : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233.
Manufacturer : Quectel Wireless Solutions Co., Ltd
Address : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233.
Date of Receipt : Nov. 15, 2021
Date of Test : Nov. 15, 2021 ~ Nov. 22, 2021
Issued Date : Nov. 25, 2021
Report Version : R00
Test Sample : Engineering Sample No.: SH20211115157 for EUT, SH20211115156-3 for adapter.
Standard(s) : 47 CFR FCC Part 22 Subpart H
ANSI/TIA/EIA-603-E-2016
FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Maker Qi
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TESTING CERT #5123.03

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Nov. 25, 2021

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 22 Subpart H & Part 2			
Standard(s) Section	Test Item	Judgment	Remark
2.1046 22.913(a)	Effective Radiated Power	PASS	-----
2.1049	Occupied Bandwidth	PASS	-----
2.1051 22.917(a)	Conducted Spurious Emissions	PASS	-----
2.1053 22.917(a)	Radiated Spurious Emissions	PASS	-----
22.917(a)	Band Edge Measurements	PASS	-----
-	Peak To Average Ratio	PASS	-----
2.1055 22.355	Frequency Stability	PASS	-----

Note:

For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

BTL's Test Firm Registration Number for FCC: 476765

BTL's Designation Number for FCC: CN1241

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) $k=1.96$ or $k=2$ (which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Measurement Uncertainty for a Level of Confidence of 95 %, $U=2xUc(y)$.

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB02	CISPR	9 KHz~30 MHz	-	2.16
		30MHz ~ 200MHz	V	4.04
		30MHz ~ 200MHz	H	2.90
		200MHz ~ 1,000MHz	V	3.76
		200MHz ~ 1,000MHz	H	3.82

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB02 (3m)	CISPR	1GHz ~ 6GHz	4.40
		6GHz ~ 18GHz	4.86

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Output Power & ERP	22°C	51%	DC 3.8V	Danny Dang
Occupied Bandwidth	22°C	51%	DC 3.8V	Danny Dang
Conducted Spurious Emissions	22°C	51%	DC 3.8V	Danny Dang
Radiated Spurious Emissions	26°C	61%	DC 3.8V	Danny Dang
Band Edge	22°C	51%	DC 3.8V	Danny Dang
Peak to Average Ratio	22°C	51%	DC 3.8V	Danny Dang
Frequency Stability	Normal and Extreme			Danny Dang

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	UMTS/HSPA+ Module			
Brand Name	Quectel			
Test Model	UC200A-GL			
Series Model	N/A			
Model Difference(s)	N/A			
Software Version	UC200AGLAAR01A02M16_PAX			
Hardware Version	R1.0			
Power Source	DC Voltage supplied from AC/DC adapter(support unit)			
Power Rating	Supply voltage:3.4-4.5V, Typical supply voltage:3.8V			
Antenna Type	Dipole			
Antenna Gain	GSM850	2.53 dBi		
	WCDMA V			
Modulation Type	GSM	GMSK		
	GPRS	GMSK		
	EDGE	GMSK, 8PSK		
	WCDMA	UL: QPSK DL: QPSK, 16QAM		
Operation Frequency	EDGE/GSM/GPRS	824.2MHz ~ 848.8MHz		
	WCDMA Band V	826.4MHz ~ 846.6MHz		
Max. ERP Power	GSM	GMSK	32.76	dBm
	GPRS	GMSK	32.78	dBm
	EDGE	8PSK	27.99	dBm
	WCDMA	QPSK	23.81	dBm

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. WCDMA (UL: QPSK; DL: QPSK) mode was found to be the worst case and recorded.

2.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

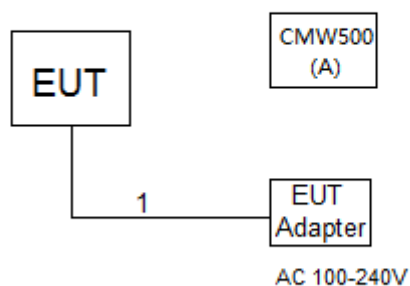
The worst case was found when positioned on X-plane for EIRP and X-axis for radiated emission.

Following channel(s) was (were) selected for the final test as listed below:

GSM MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	128 to 251	128, 190, 251	GSM, GPRS, EDGE
Output Power	128 to 251	128, 190, 251	GSM, GPRS, EDGE
Occupied Bandwidth	128 to 251	128, 190, 251	GSM, EDGE
Conducuted Emission	128 to 251	190	GSM, EDGE
Radiated Emission	128 to 251	190	EDGE
Band Edge	128 to 251	128, 251	GSM, EDGE
Peak to Average Ratio	128 to 251	128, 190, 251	GSM, EDGE
Frequency Stability	128 to 251	190	GSM

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Output Power	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Conducted Emission	4132 to 4233	4182	WCDMA
Radiated Emission	4132 to 4233	4182	WCDMA
Band Edge	4132 to 4233	4132, 4233	WCDMA
Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA
Frequency Stability	4132 to 4233	4182	WCDMA

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATIONOFSYSTEMTESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	CMW500	R&S	N/A	129246

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC	NO	NO	1m

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

Mobile / Portable station are limited to 7 watts e.r.p.

3.1.2 TEST PROCEDURE

EIRP/ ERP:

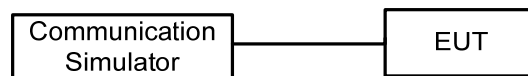
1. $EIRP = \text{Output Power} + \text{Antenan gain}$
 $ERP \text{ power} = EIPR \text{ power} - 2.15\text{dBi}$.

Output Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE and WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP LAYOUT

Output Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

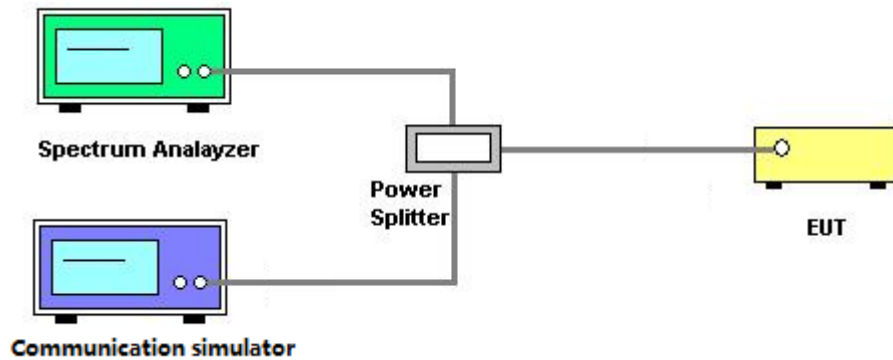
Please refer to the Appendix A.

3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the Appendix B.

3.3 CONDUCTED EMISSIONS MEASUREMENT

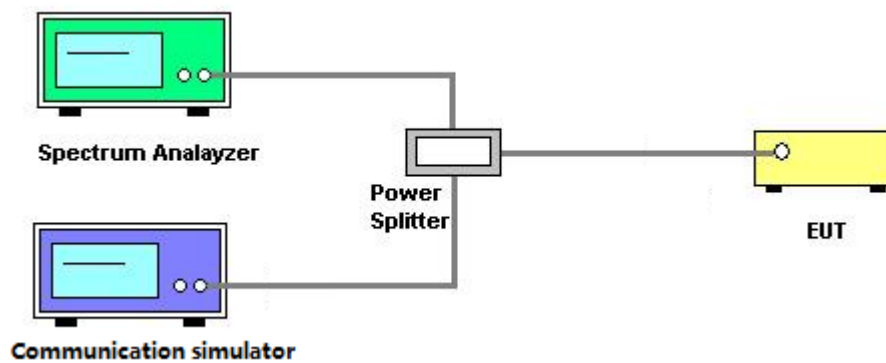
3.3.1 LIMIT

The power of any emission 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. The emission limit equal to -13dBm.

3.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.3.3 TEST SETUP LAYOUT



3.3.4 TEST DEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the Appendix C.

3.4 RADIATED EMISSIONS MEASUREMENT

3.4.1 LIMIT

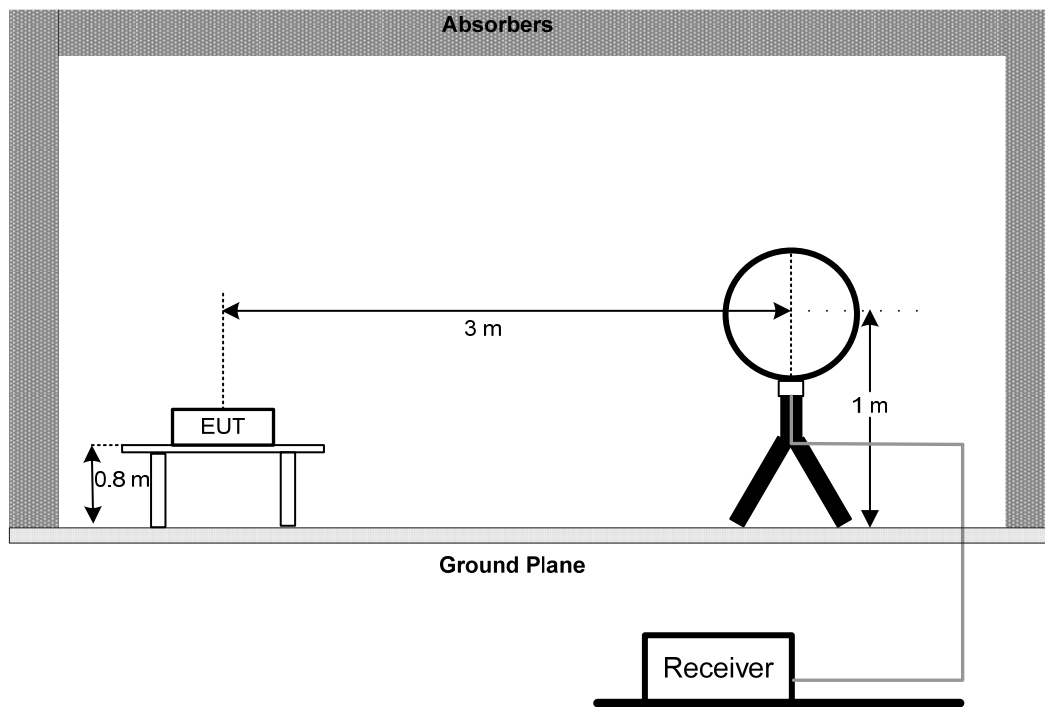
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

3.4.2 TEST PROCEDURES

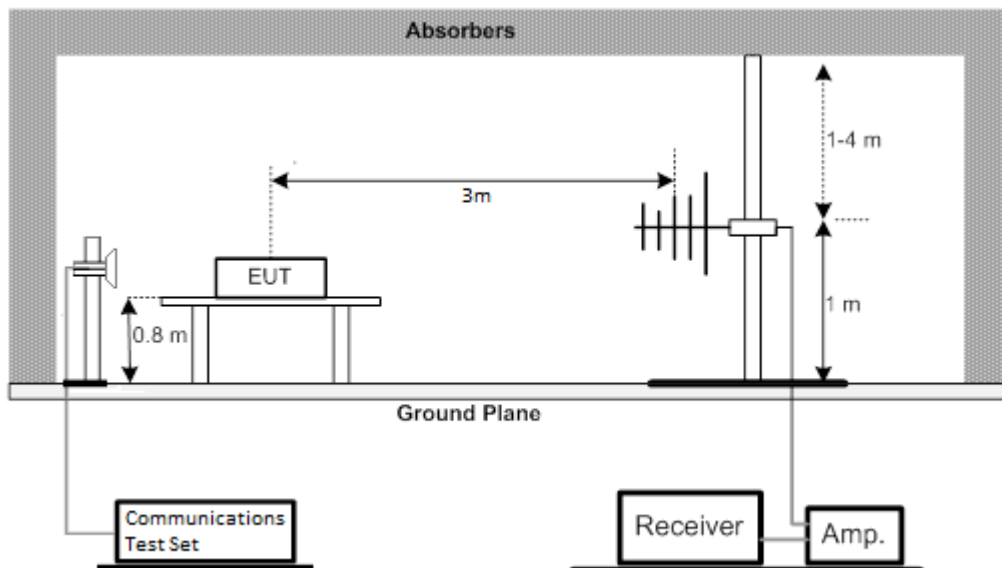
1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
3. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi}.$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

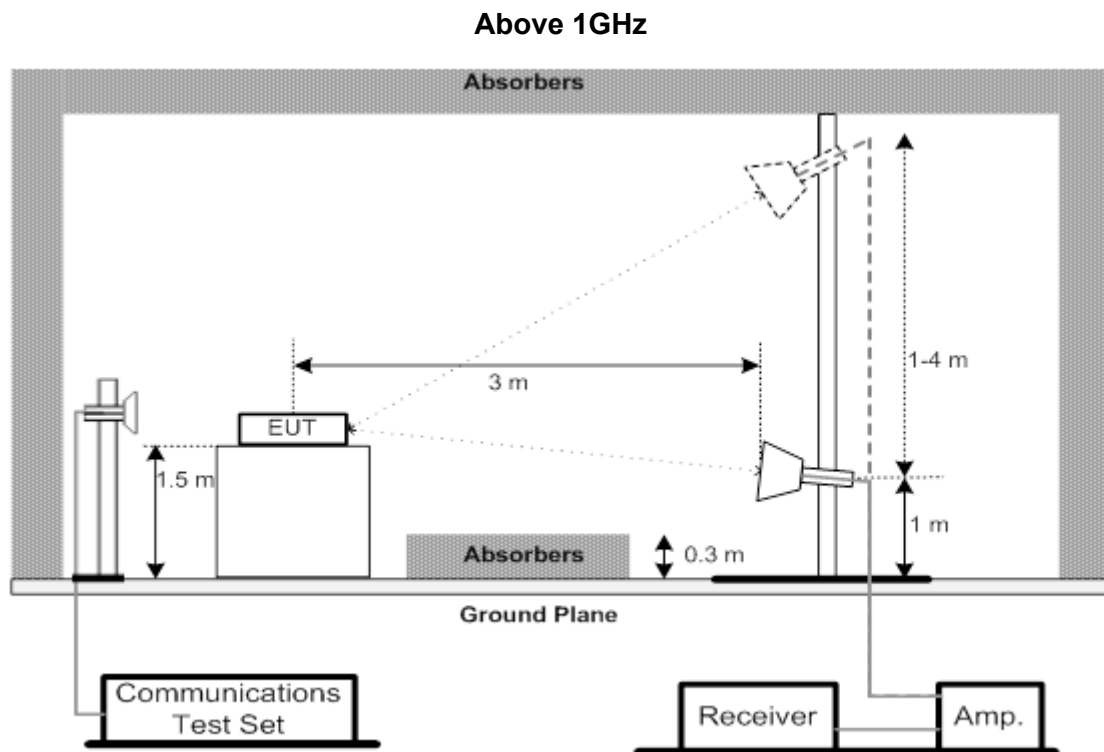
3.4.3 TEST SETUP LAYOUT

Below 30MHz



30MHz to 1GHz





3.4.4 TEST DEVIATION

No deviation

3.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

3.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

3.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

3.5 BAND EDGE MEASUREMENT

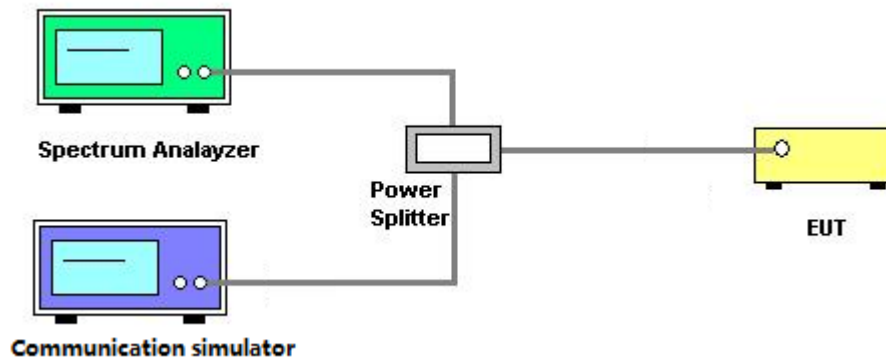
3.5.1 LIMIT

A Power of any emission 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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 TEST PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/EDGE).
3. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
4. Record the max trace plot into the test report.

3.5.3 TEST SETUP LAYOUT



3.5.4 TEST DEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the Appendix G.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

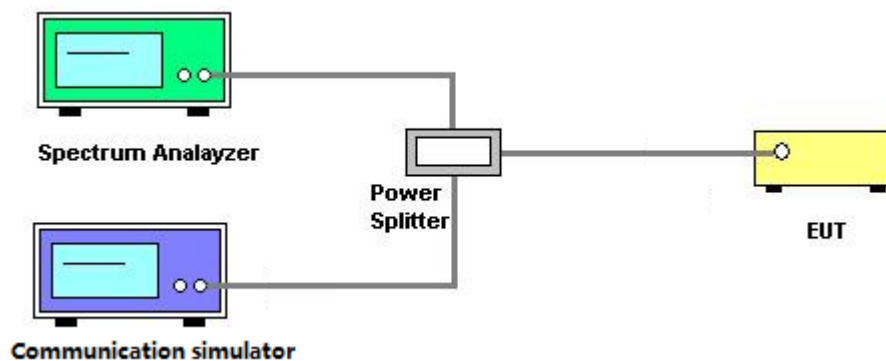
3.6.1 LIMIT

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.

3.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 TEST SETUP LAYOUT



3.6.4 TEST DEVIATION

No deviation

3.6.5 TEST RESULTS

Please refer to the Appendix H.

3.7 FREQUENCY STABILITY MEASUREMENT

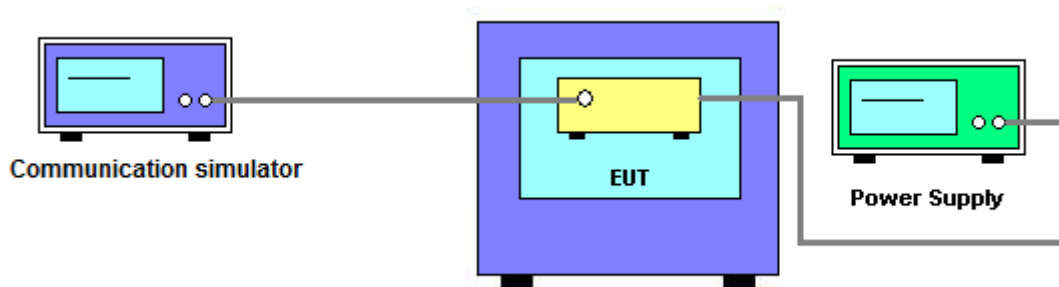
3.7.1 LIMIT

± 1.5 ppm is for base and fixed station. ± 2.5 ppm is for mobile station.

3.7.2 TEST PROCEDURES

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

3.7.3 TEST SETUP LAYOUT



3.7.4 TEST DEVIATION

No deviation

3.7.5 TEST RESULTS

Please refer to the Appendix I.

4. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement(9K-30M)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	May. 20, 2022
2	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
4	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9160	9160-3233	Mar. 26, 2022
2	Pre-Amplifier	emci	EMC9135	980401	Mar. 20, 2022
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-SM-7000	181020	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-SM-2500	170618	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-SM-800	170647	Apr. 11, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1817	Mar. 26, 2022
2	Pre-Amplifier	emci	EMC051845SE	980725	Aug. 23, 2022
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-SM-7000	181020	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-SM-2500	170618	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-SM-800	170647	Apr. 11, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

For WCDMA

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022
2	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
3	Power Divider	JUK	PD-2SF-2060	N/A	N/A

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022
2	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
3	Power Divider	JUK	PD-2SF-2060	N/A	N/A
4	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Aug. 23, 2022

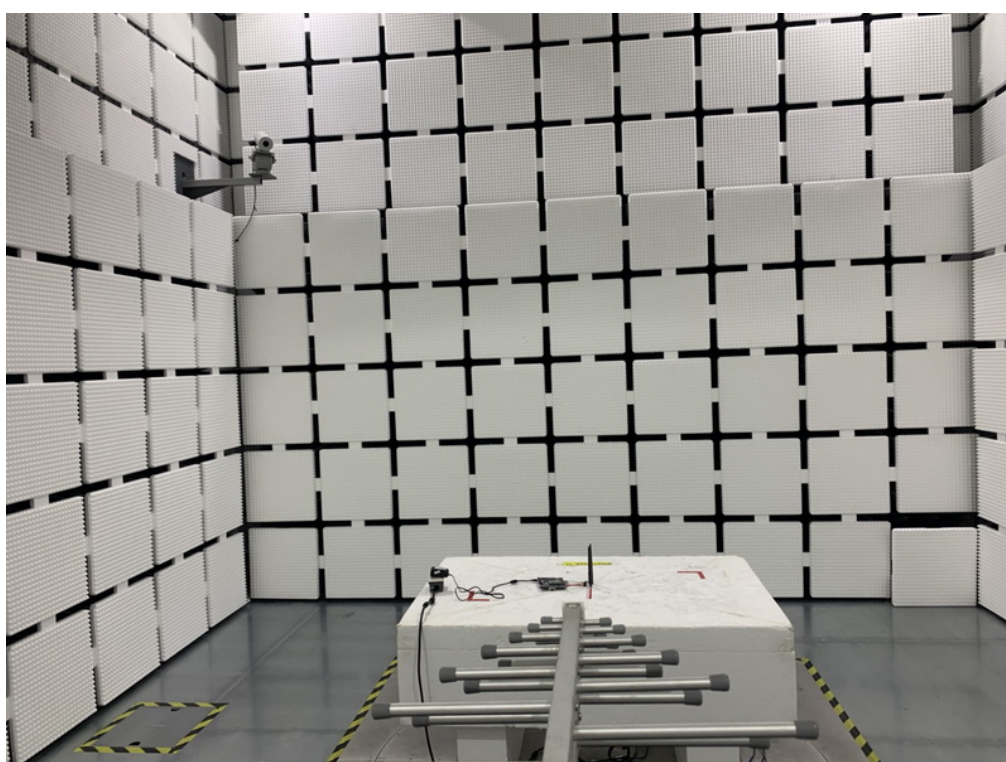
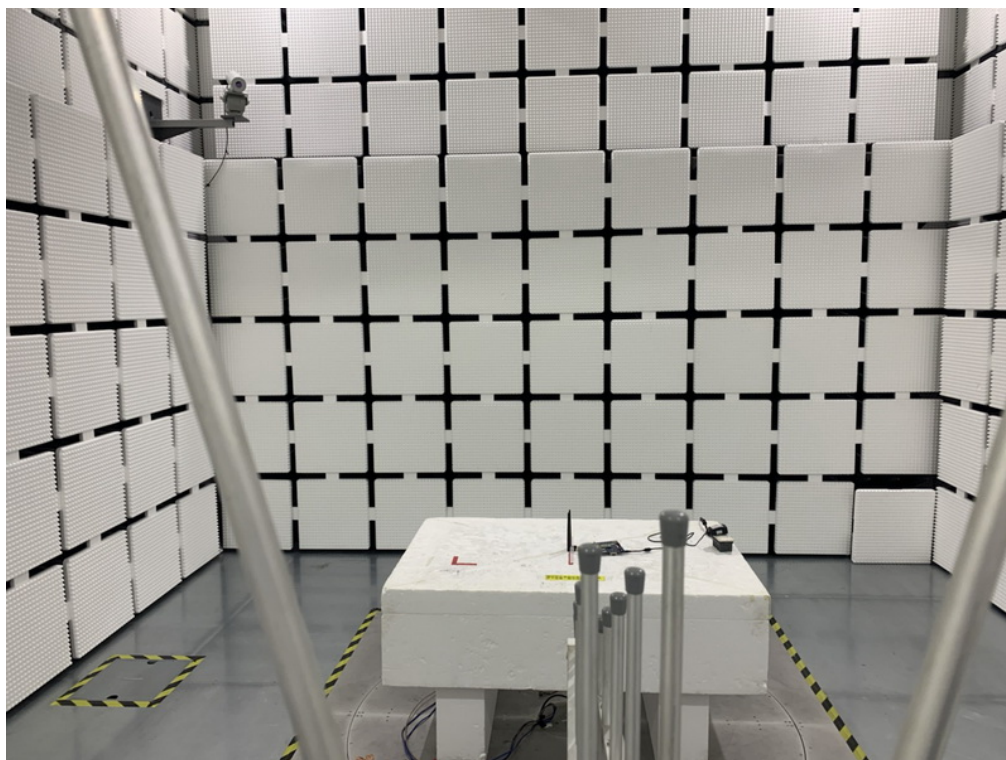
Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

5. EUT TEST PHOTO

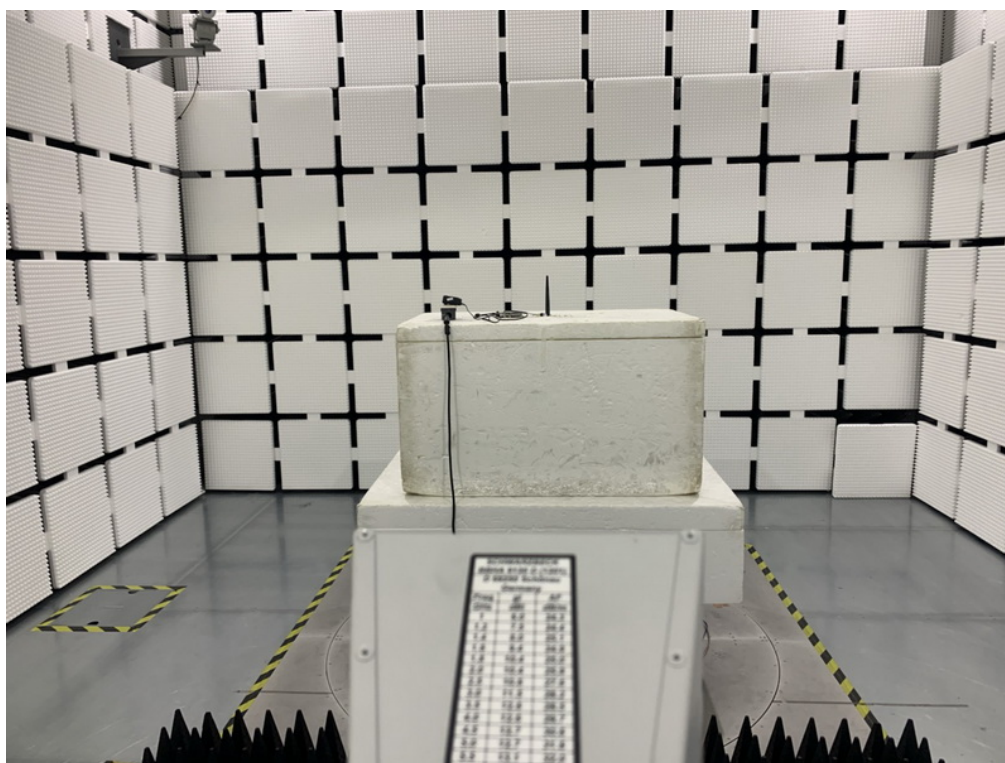
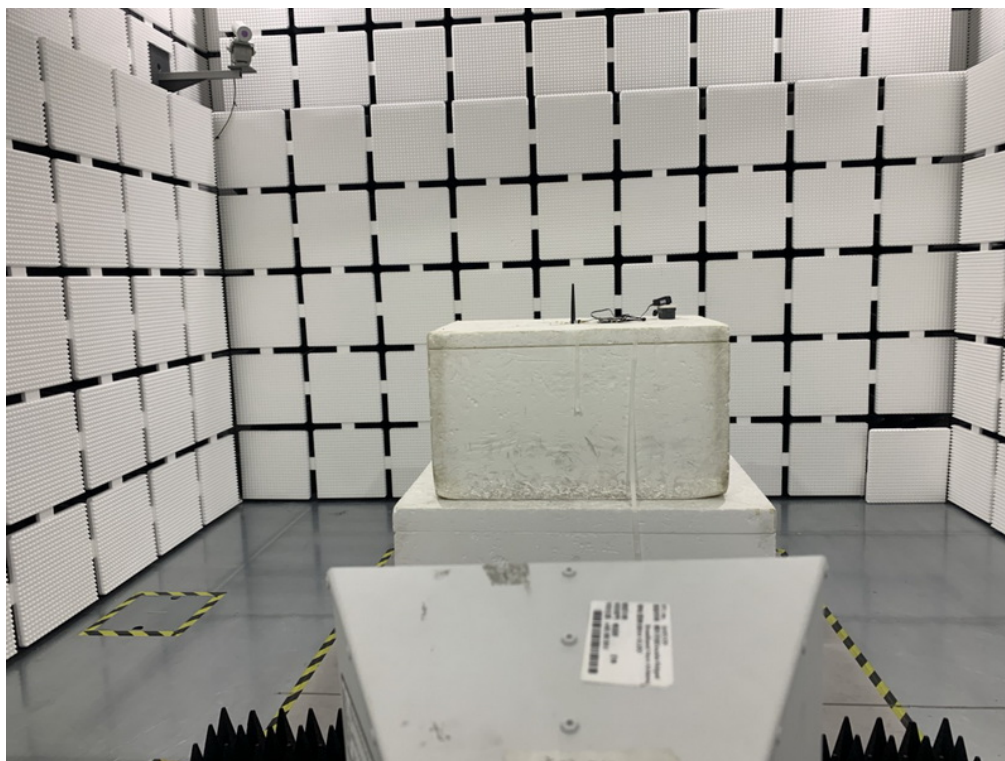
Radiated Emissions Test Photos

30 MHz to 1000 MHz



Radiated Emissions Test Photos

Above 1 GHz



APPENDIX A - OUTPUT POWER

Output Power (dBm):

GSM850		Burst Output Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM(GMSK)		32.38	32.32	32.34
GPRS/EDGE (GMSK)	1 Tx Slot	32.40	32.34	32.37
	2 Tx Slot	32.38	32.33	32.36
	3 Tx Slot	31.21	31.16	31.22
	4 Tx Slot	29.47	29.41	29.49
EDGE (8PSK)	1 Tx Slot	27.51	27.61	27.54
	2 Tx Slot	27.20	27.57	27.36
	3 Tx Slot	25.33	25.84	25.76
	4 Tx Slot	23.47	23.74	23.55

Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
QPSK	RMC 12.2K	23.27	23.39	23.40
	RMC 64K	23.22	23.40	23.41
	RMC 144K	23.19	23.37	23.33
	RMC 384K	23.19	23.43	23.19
	HSDPA Subtest-1	23.11	22.94	23.19
	HSDPA Subtest-2	22.88	22.73	23.11
	HSDPA Subtest-3	22.59	22.59	23.09
	HSDPA Subtest-4	22.32	22.47	22.89
	HSUPA Subtest-1	22.59	22.39	22.80
	HSUPA Subtest-2	22.37	22.17	22.40
	HSUPA Subtest-3	22.39	22.11	22.45
	HSUPA Subtest-4	22.36	21.85	22.33
	HSUPA Subtest-5	22.10	21.70	22.35

ERP Power (dBm):

GSM850		ERP Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM(GMSK)		32.76	32.70	32.72
GPRS/EDGE (GMSK)	1 Tx Slot	32.78	32.72	32.75
	2 Tx Slot	32.76	32.71	32.74
	3 Tx Slot	31.59	31.54	31.60
	4 Tx Slot	29.85	29.79	29.87
EDGE (8PSK)	1 Tx Slot	27.89	27.99	27.92
	2 Tx Slot	27.58	27.95	27.74
	3 Tx Slot	25.71	26.22	26.14
	4 Tx Slot	23.85	24.12	23.93

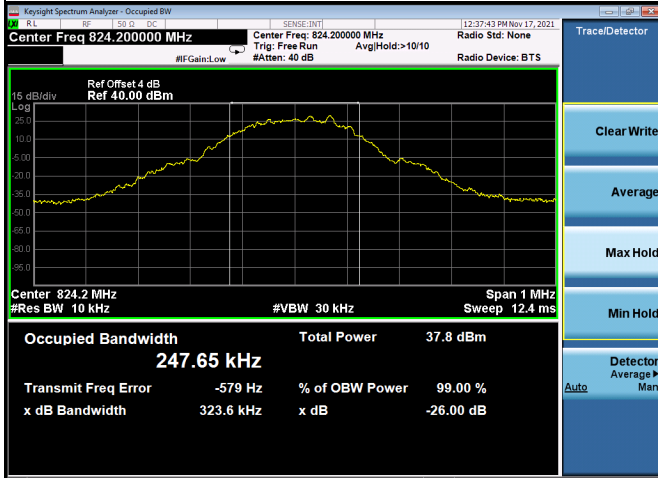
Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
QPSK	RMC 12.2K	23.65	23.77	23.78
	RMC 64K	23.60	23.78	23.79
	RMC 144K	23.57	23.75	23.71
	RMC 384K	23.57	23.81	23.57
	HSDPA Subtest-1	23.49	23.32	23.57
	HSDPA Subtest-2	23.26	23.11	23.49
	HSDPA Subtest-3	22.97	22.97	23.47
	HSDPA Subtest-4	22.70	22.85	23.27
	HSUPA Subtest-1	22.97	22.77	23.18
	HSUPA Subtest-2	22.75	22.55	22.78
	HSUPA Subtest-3	22.77	22.49	22.83
	HSUPA Subtest-4	22.74	22.23	22.71
	HSUPA Subtest-5	22.48	22.08	22.73

APPENDIX B - OCCUPIED BANDWIDTH

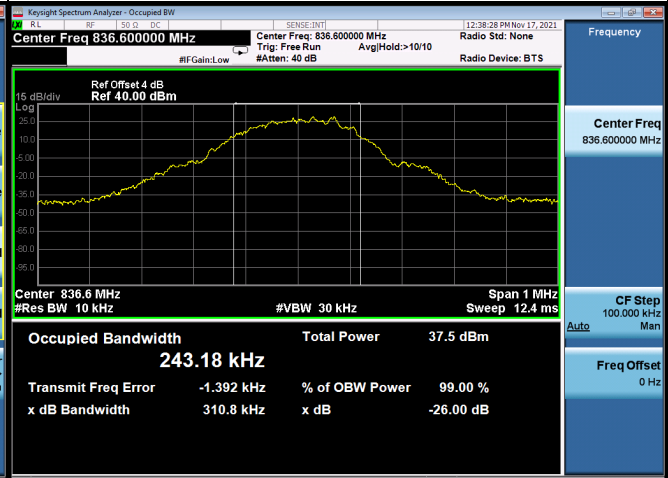
GSM850					
GSM			EDGE		
GMSK			8PSK		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
128	824.2	0.2477	128	824.2	0.2442
190	836.6	0.2432	190	836.6	0.2398
251	848.8	0.2417	251	848.8	0.2417
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
128	824.2	0.3236	128	824.2	0.3092
190	836.6	0.3108	190	836.6	0.3090
251	848.8	0.3088	251	848.8	0.3100

Spectrum Plot

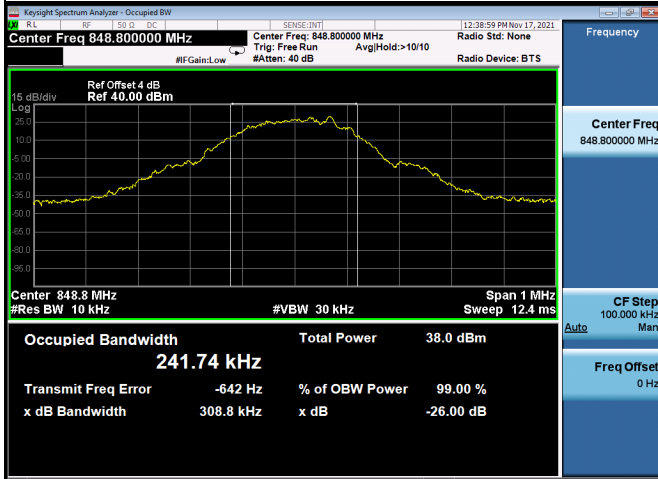
GSM -128



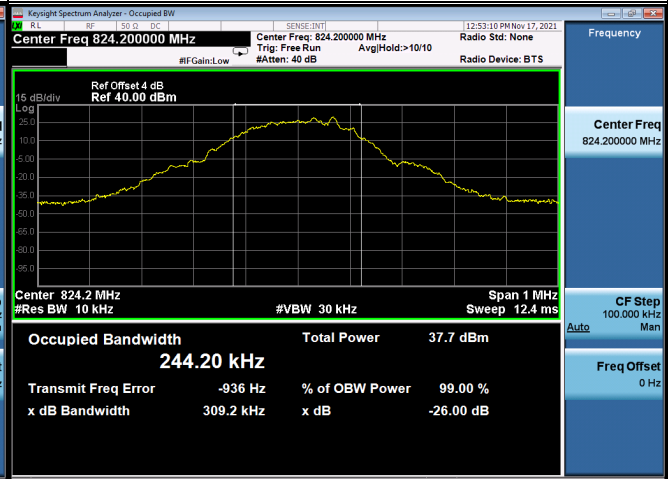
GSM -190



GSM -251



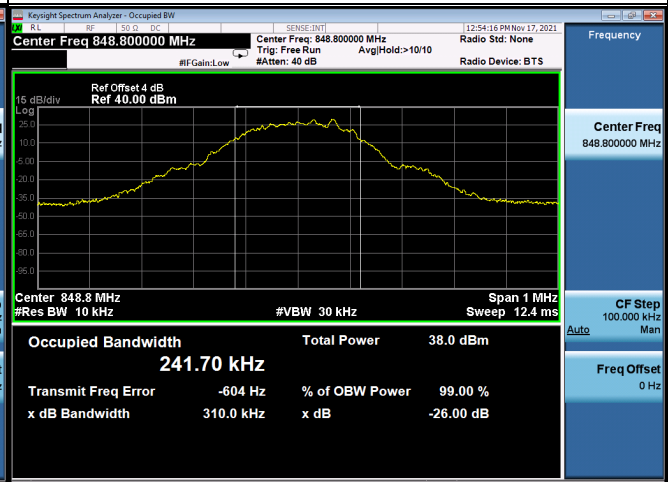
GSM -128



GSM -190



GSM -251



WCDMA Band V

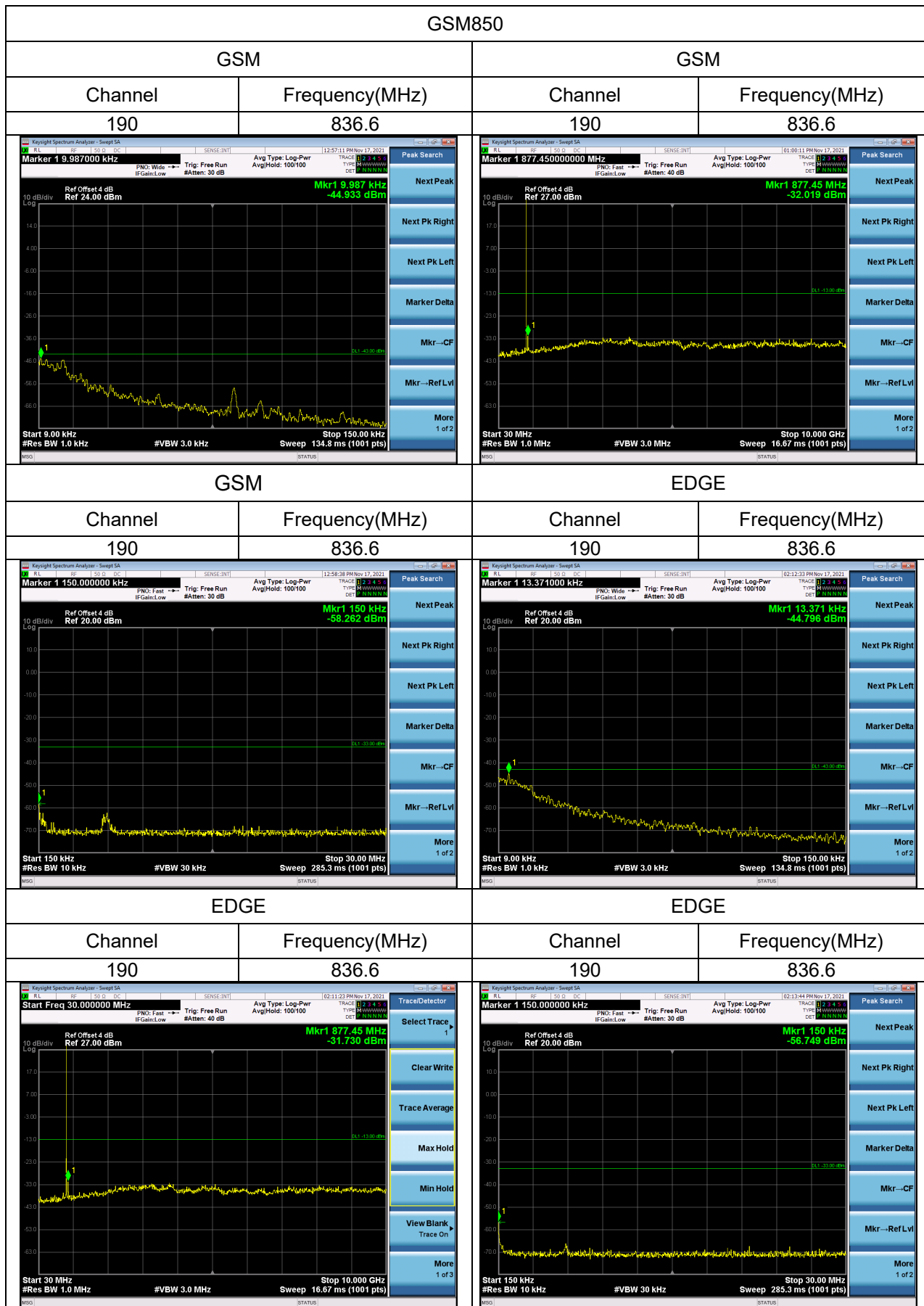
QPSK

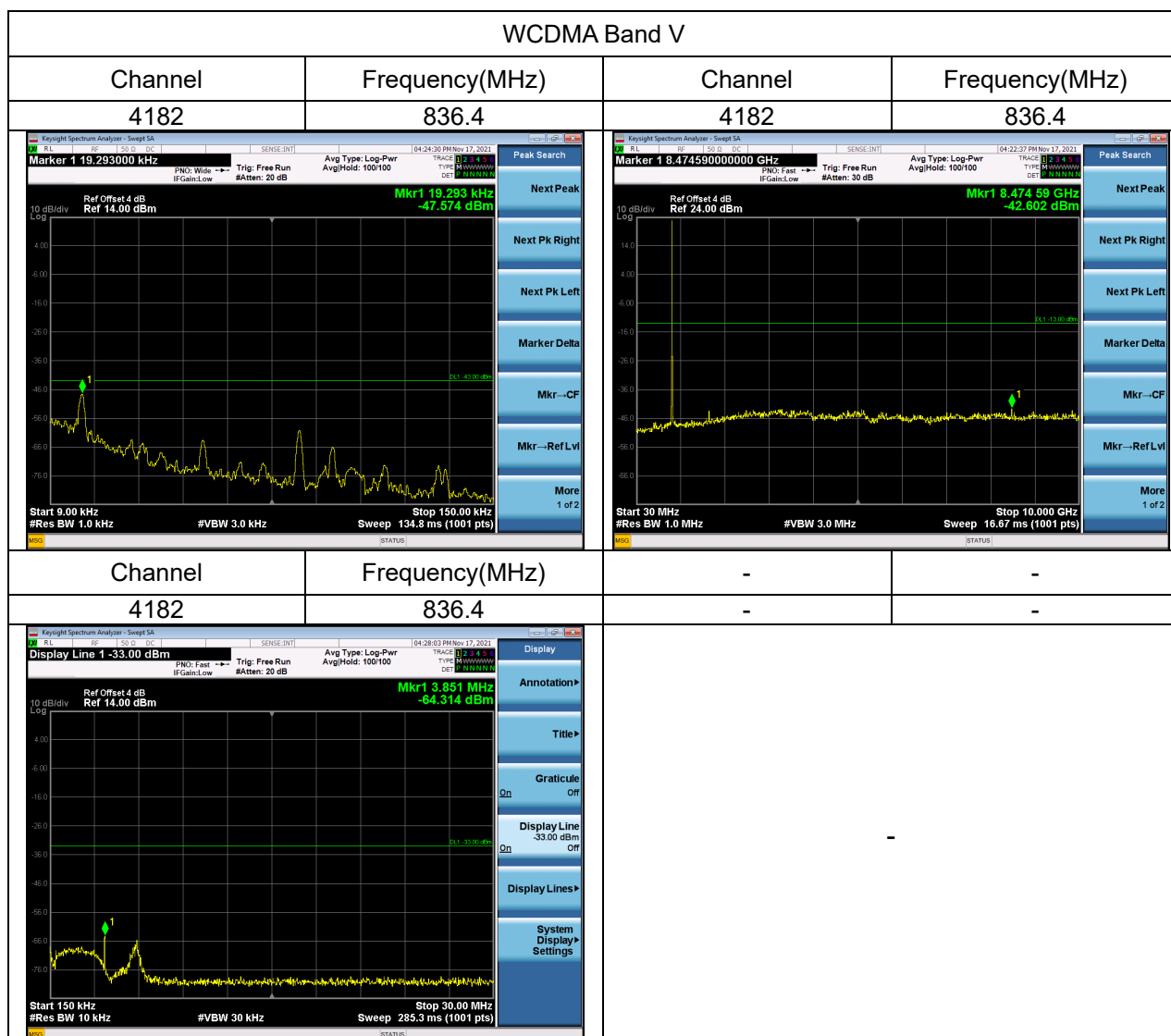
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.1706	4132	826.4	4.721
4182	836.4	4.1540	4182	836.4	4.712
4233	846.6	4.1614	4233	846.6	4.717

Spectrum Plot



APPENDIX C - CONDUCTED EMISSIONS



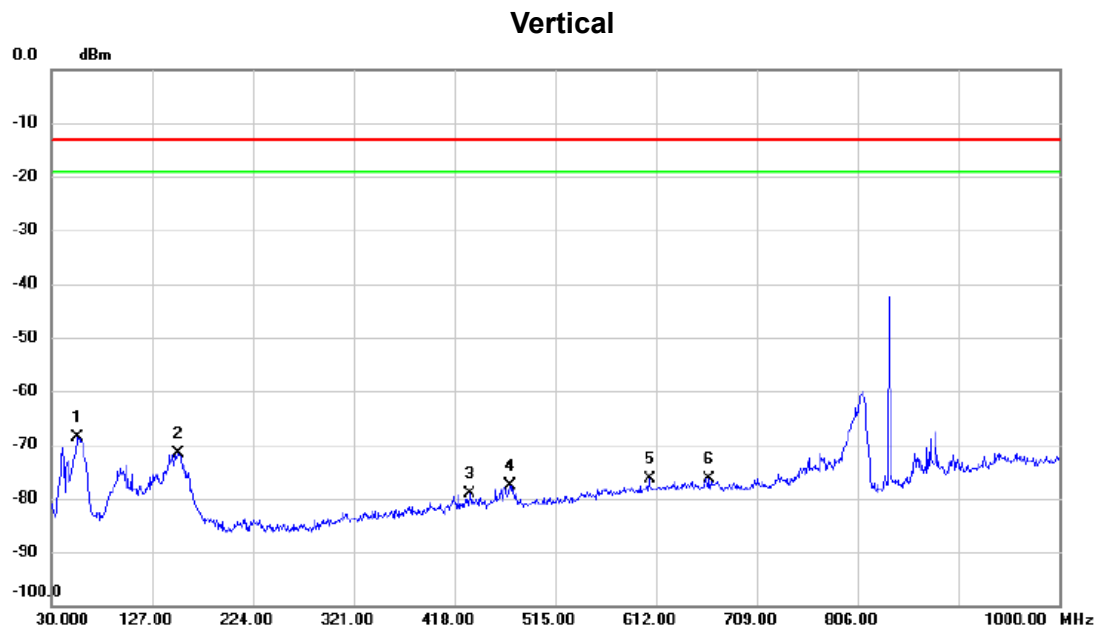


APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)

Note: Below 30MHz, The measured value have enough margin over 20dB than the limit, therefore they are not reported.

APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)

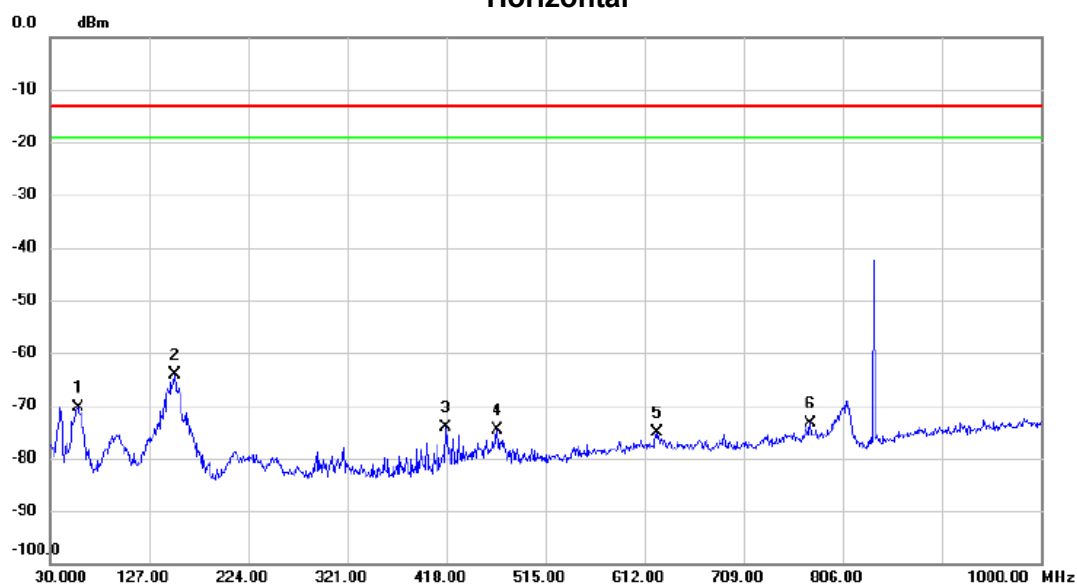
Test Mode: GSM850_TX Mode



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	55.2200	-58.71	-9.87	-68.58	-13.00	-55.58	RMS	
2		151.7350	-72.06	0.36	-71.70	-13.00	-58.70	RMS	
3		432.5500	-80.04	0.82	-79.22	-13.00	-66.22	RMS	
4		471.3500	-78.64	1.11	-77.53	-13.00	-64.53	RMS	
5		605.6950	-80.63	4.15	-76.48	-13.00	-63.48	RMS	
6		663.4100	-80.47	4.09	-76.38	-13.00	-63.38	RMS	

Test Mode: GSM850_TX Mode

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		57.1600	-63.58	-6.72	-70.30	-13.00	-57.30	RMS	
2	*	152.2200	-61.23	-2.87	-64.10	-13.00	-51.10	RMS	
3		417.5150	-74.60	0.56	-74.04	-13.00	-61.04	RMS	
4		467.9550	-75.82	1.14	-74.68	-13.00	-61.68	RMS	
5		623.6400	-79.20	4.10	-75.10	-13.00	-62.10	RMS	
6		773.9900	-79.31	5.96	-73.35	-13.00	-60.35	RMS	

Test Mode: WCDMA Band V_TX Mode

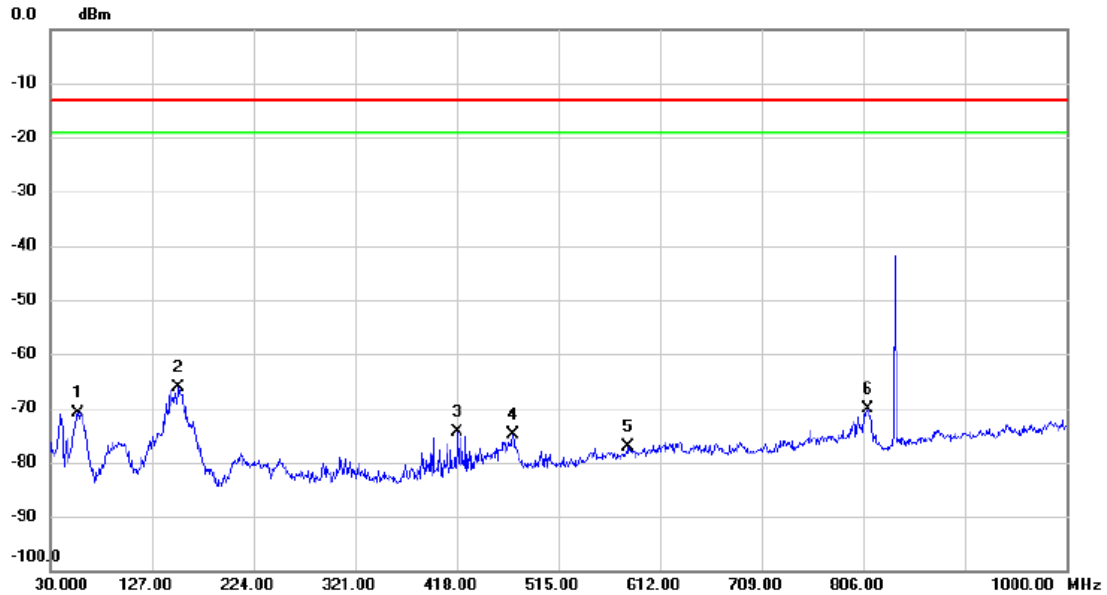
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	56.6750	-58.08	-9.95	-68.03	-13.00	-55.03	RMS	
2		150.2800	-71.67	0.48	-71.19	-13.00	-58.19	RMS	
3		434.4900	-80.41	0.84	-79.57	-13.00	-66.57	RMS	
4		474.2600	-78.23	1.13	-77.10	-13.00	-64.10	RMS	
5		573.2000	-81.19	3.53	-77.66	-13.00	-64.66	RMS	
6		652.7400	-80.18	4.08	-76.10	-13.00	-63.10	RMS	

Test Mode: WCDMA Band V_TX Mode

Horizontal

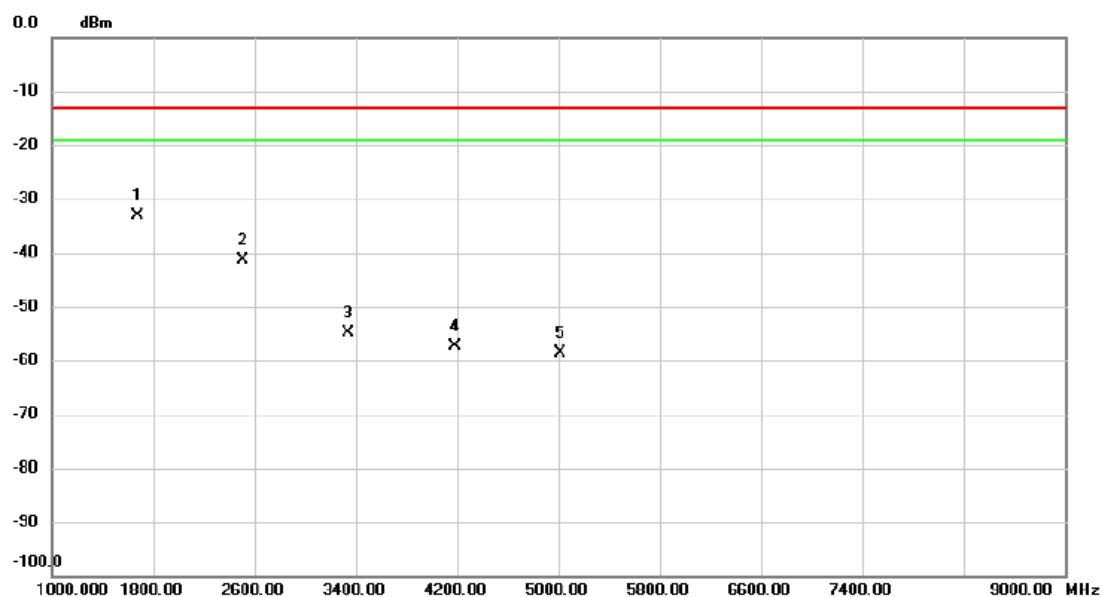


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		56.6750	-64.26	-6.63	-70.89	-13.00	-57.89	RMS	
2	*	152.2200	-63.15	-2.87	-66.02	-13.00	-53.02	RMS	
3		418.9700	-74.91	0.58	-74.33	-13.00	-61.33	RMS	
4		471.8350	-75.97	1.19	-74.78	-13.00	-61.78	RMS	
5		581.4450	-80.95	3.72	-77.23	-13.00	-64.23	RMS	
6		810.8500	-76.42	6.41	-70.01	-13.00	-57.01	RMS	

APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)

Test Mode: GSM850_TX Mode

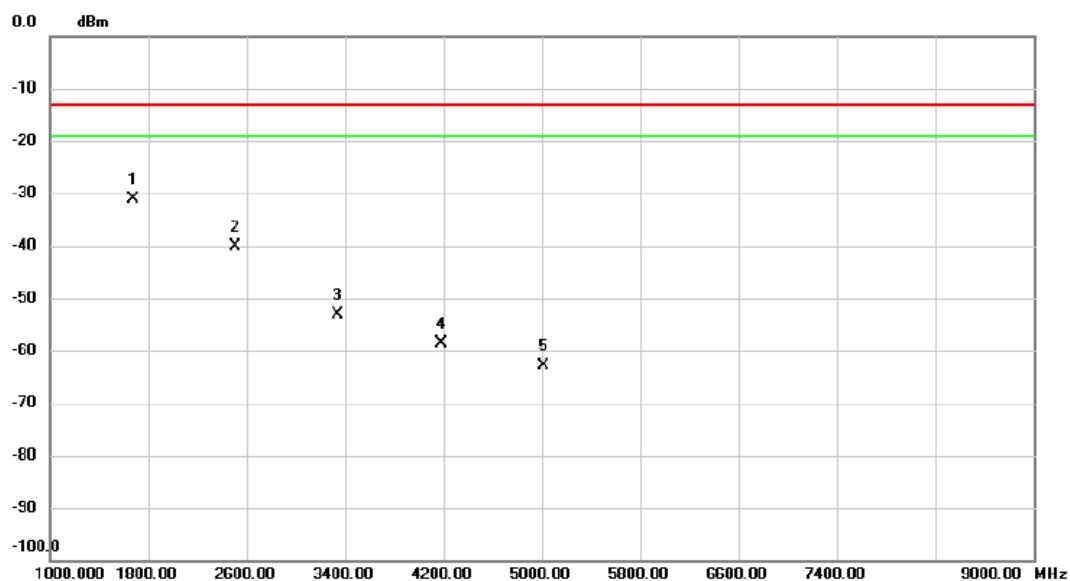
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	1672.800	-22.03	-11.19	-33.22	-13.00	-20.22	RMS	
2		2509.200	-33.81	-7.53	-41.34	-13.00	-28.34	RMS	
3		3345.600	-48.51	-6.24	-54.75	-13.00	-41.75	RMS	
4		4182.000	-53.37	-4.09	-57.46	-13.00	-44.46	RMS	
5		5018.400	-56.20	-2.42	-58.62	-13.00	-45.62	RMS	

Test Mode: GSM850_TX Mode

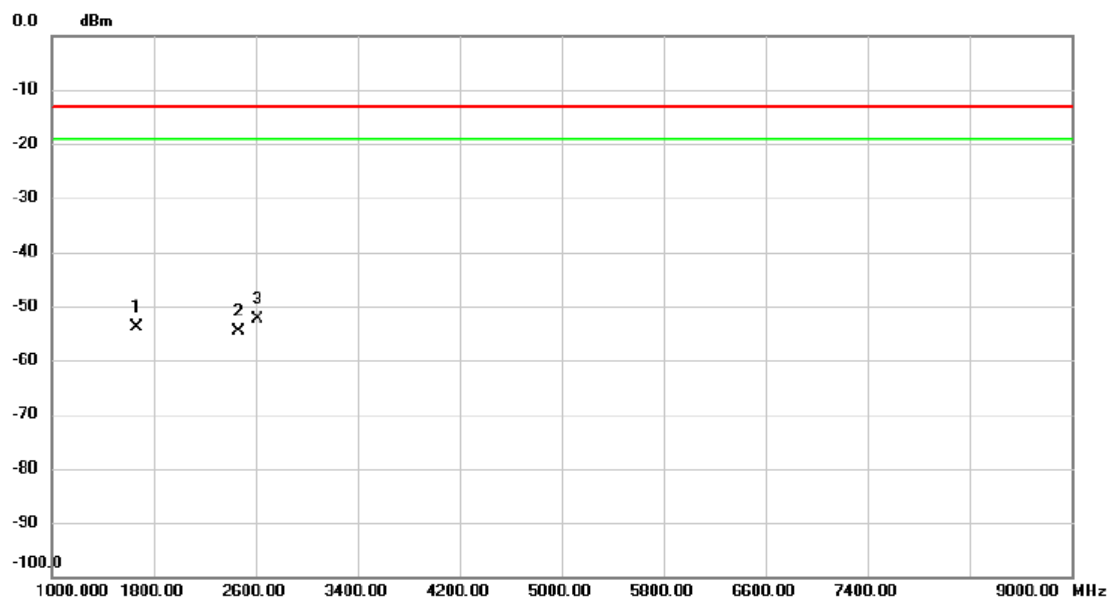
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	1672.800	-20.02	-11.01	-31.03	-13.00	-18.03	RMS	
2		2509.200	-32.26	-7.92	-40.18	-13.00	-27.18	RMS	
3		3345.600	-46.84	-6.21	-53.05	-13.00	-40.05	RMS	
4		4182.000	-54.30	-4.20	-58.50	-13.00	-45.50	RMS	
5		5018.800	-60.22	-2.60	-62.82	-13.00	-49.82	RMS	

Test Mode: WCDMA Band V_ TX Mode

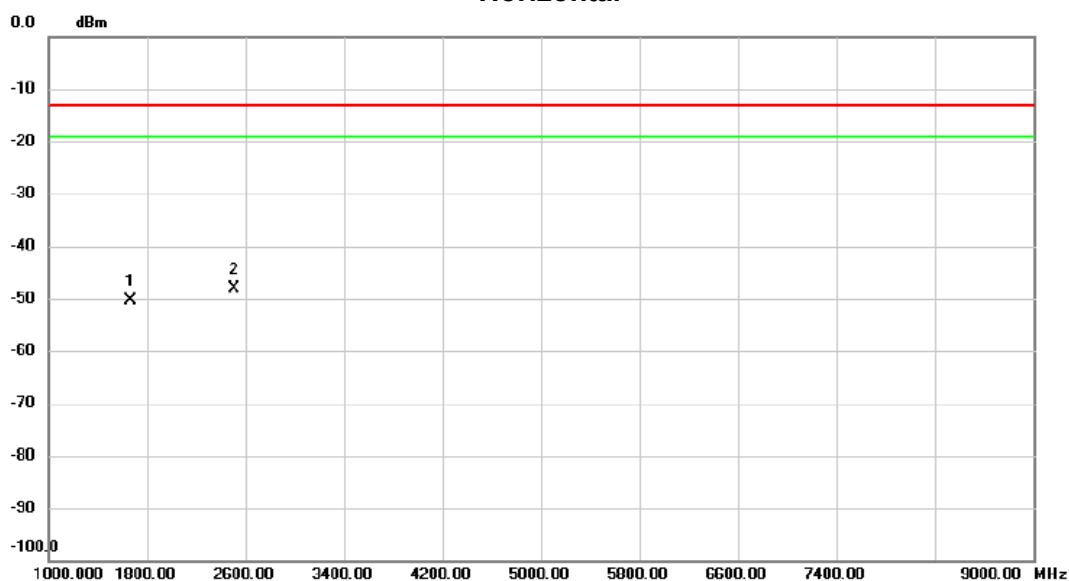
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1671.200	-42.58	-11.18	-53.76	-13.00	-40.76	RMS	
2		2463.600	-46.87	-7.69	-54.56	-13.00	-41.56	RMS	
3	*	2616.400	-45.13	-7.18	-52.31	-13.00	-39.31	RMS	

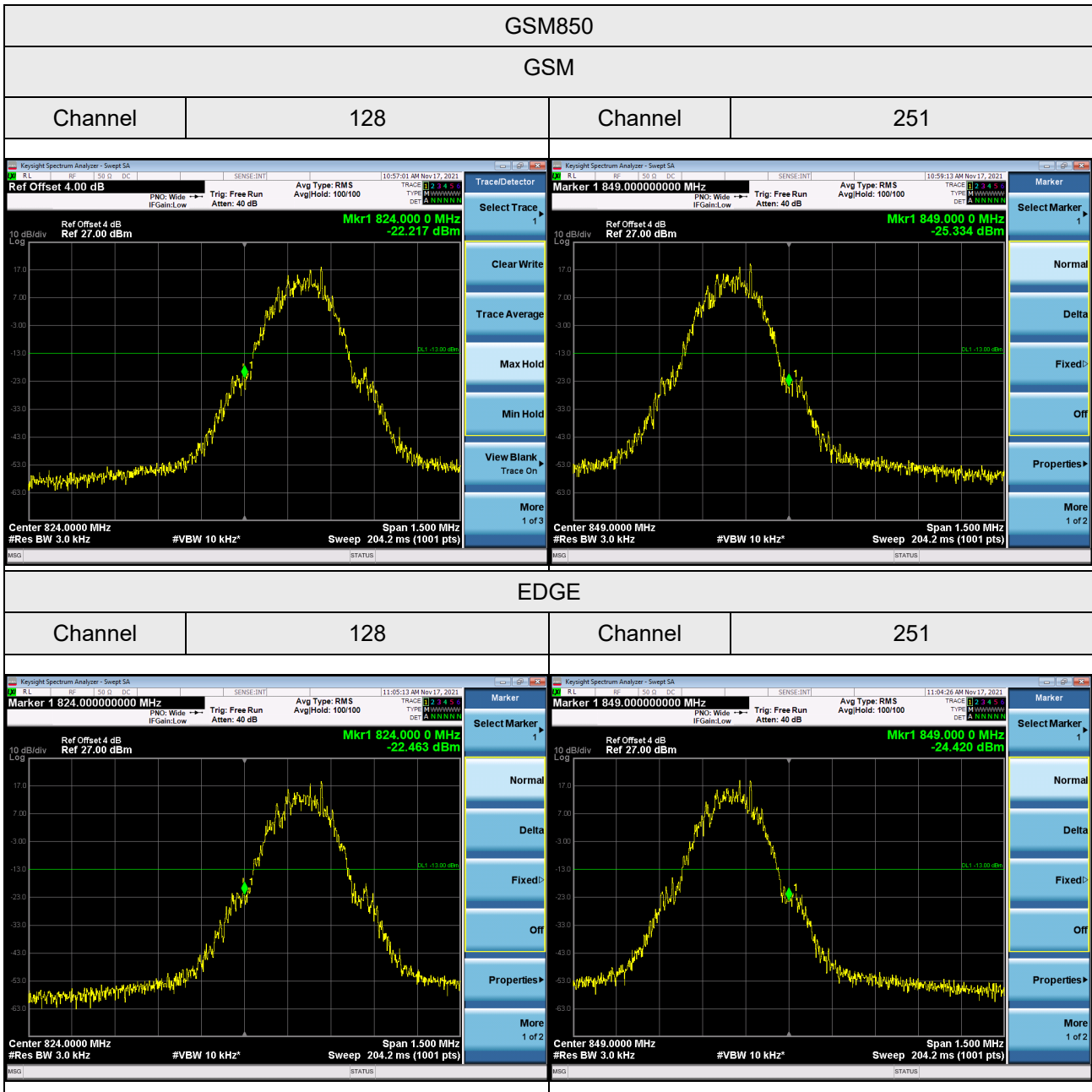
Test Mode: WCDMA Band V_ TX Mode

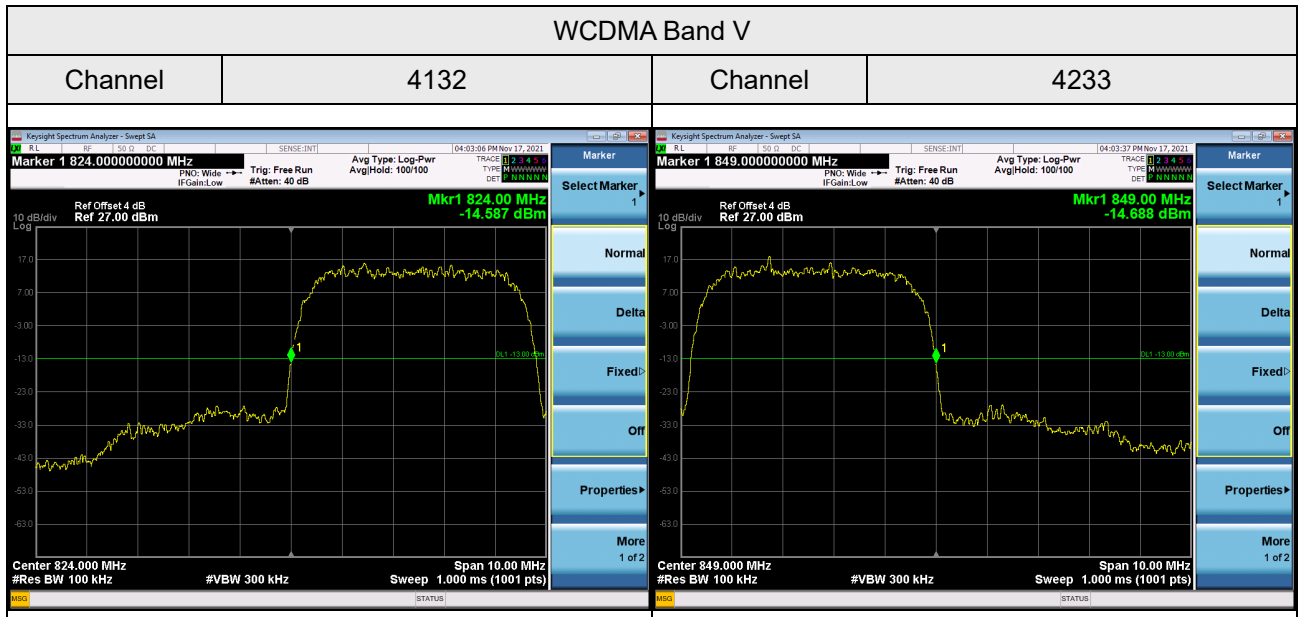
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1671.200	-39.26	-11.01	-50.27	-13.00	-37.27	RMS	
2	*	2512.400	-40.29	-7.92	-48.21	-13.00	-35.21	RMS	

APPENDIX G - BAND EDGE





APPENDIX H - PEAK TO AVERAGE RATIO

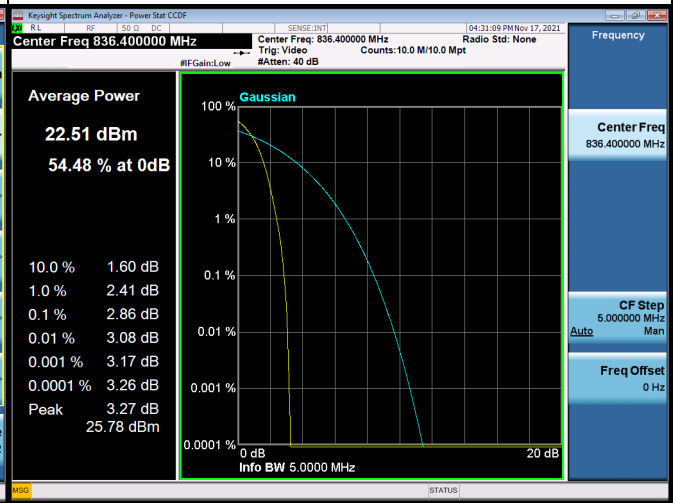
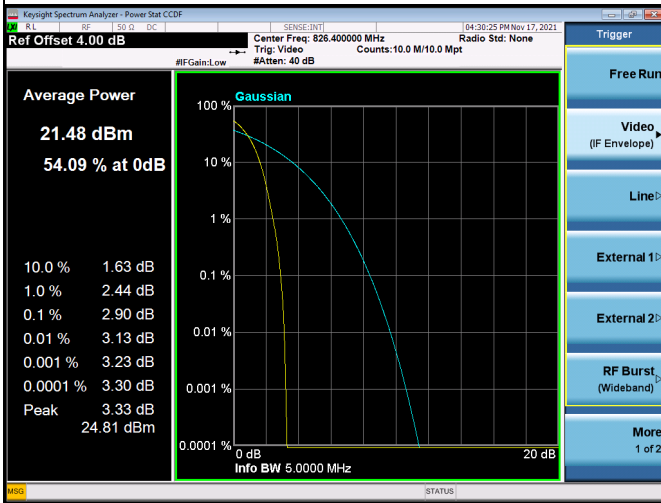
GSM 850 Spectrum Plot



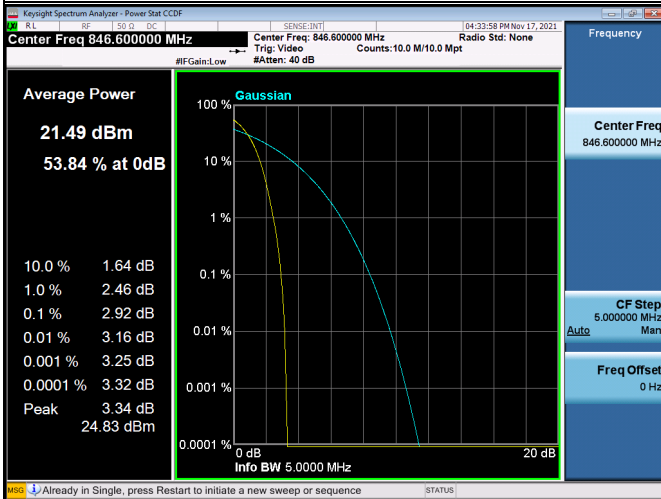
WCDMA Band V Spectrum Plot

4132

4182



4233



APPENDIX I - FREQUENCY STABILITY

Test Mode:	GSM850_CH190
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Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-20	-6.48	-0.007745637	± 2.5
-10	3.79	0.004530241	
0	4.21	0.005032273	
10	6.29	0.007518527	
20	3.74	0.004470476	
30	6.76	0.008080325	
40	5.94	0.007100167	
50	3.72	0.004446569	
Max. Deviation (ppm)	6.76	0.008080325	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.5	-5.60	-0.006693760	± 2.5
3.8	-6.75	-0.008068372	
3.4	-5.04	-0.006024384	
Max. Deviation (ppm)	6.75	-0.006024384	

Test Mode:	WCDMA Band V_CH4407
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Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-20	-4.31	0.005153037	± 2.5
-10	2.76	0.003299857	
0	-1.59	0.001901004	
10	2.45	0.002929220	
20	4.36	0.005212817	
30	-3.23	0.003861789	
40	-4.05	0.004842181	
50	4.96	0.005930177	
Max. Deviation (ppm)	4.96	0.005930177	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.5	-5.12	0.006121473	± 2.5
3.8	-2.47	0.002953132	
3.4	3.56	0.004256337	
Max. Deviation (ppm)	5.12	0.006121473	

End of Test Report