FCC Radio Test Report

FCC ID: QIPBGS12

This report concerns: Original Grant

Project No.	: 1902H007
Equipment	: GSM/GPRS Wireless Module
Test Model	: BGS12
Series Model	: N/A
Applicant	: Gemalto M2M GmbH
Address	: Gemalto M2M GmbH , Siemensdamm 50 Berlin Germany

Date of Receipt	: Feb. 28, 2019
Date of Test	: Mar. 01, 2019 ~ Mar. 12, 2019
Issued Date	: Mar. 22, 2019
Tested by	: BTL Inc.

Technical Manager : David Mao
(David Mao)

Authorized Signatory : James Chiu
(James Chiu)

BTL INC.

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Certificate # 5123.03

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

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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.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Mar. 22, 2019

1. GENERAL SUMMARY

Equipment	:	GSM/GPRS Wireless Module
Brand Name	:	CINTERION
Test Model	:	BGS12
Series Model	:	N/A
Applicant	:	Gemalto M2M GmbH
Manufacturer	:	Gemalto M2M GmbH
Address	:	Gemalto M2M GmbH , Siemensdamm 50 Berlin Germany
Date of Test	:	Mar. 01, 2019 ~ Mar. 12, 2019
Test Sample	:	Engineering Sample No.: B190300056
Standard(s)	:	47 CFR FCC Part 22 Subpart H 47 CFR FCC Part 2 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.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1902H007) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

Test results included in this report are for the GSM850/GPRS850.

2. 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	Tested By
2.1046 22.913(a)	Radiated power	PASS	Krain Wu
2.1046 22.913(a)	Maximum Output Power	PASS	Krain Wu
2.1049(h) 22.917(a)	Occupied Bandwidth	PASS	Krain Wu
2.1051 22.917(a)	Conducted Spurious Emissions	PASS	Krain Wu
2.1053 22.917(a)	Radiated Spurious Emissions	PASS	Krain Wu
22.917(a)	Band Edge Measurements	PASS	Krain Wu
-	Peak To Average Ratio	PASS	Krain Wu
2.1055 22.355	Frequency Stability	PASS	Krain Wu

2.1 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 number for FCC: 476765
BTL's designation number for FCC: CN1241

2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)
The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB01	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.12
		30MHz ~ 200MHz	H	3.20
		200MHz ~ 1,000MHz	V	3.12
		200MHz ~ 1,000MHz	H	3.18

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01	CISPR	1GHz ~ 6GHz	4.40
		6GHz ~ 18GHz	4.86
		18GHz ~ 26.5GHz	3.64
		26.5GHz ~ 40GHz	3.78

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	GSM/GPRS Wireless Module				
Brand Name	CINTERION				
Test Model	BGS12				
Series Model	N/A				
Model Difference(s)	N/A				
Hardware Version	B2				
Software Version	00.915				
Antenna Type	Internal Antenna				
Antenna Gain	GSM850/GPRS850	1dBi			
IMEI No.	353514100000325				
Modulation Type	GSM/GPRS		GMSK		
Operation Frequency	GSM /GPRS		824.2MHz ~ 848.8MHz		
Max. ERP Power	GSM		GMSK	31.65	dBm
	GPRS		GMSK	31.76	dBm
Power Source	DC power supply.				
Power Rating	DC 3.8V				

Note:
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. EUT operation frequency: 824.2MHz ~ 848.8MHz; 1850.2MHz ~ 1909.8MHz. Only 824.2MHz ~ 848.8MHz test data record in this report.

3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

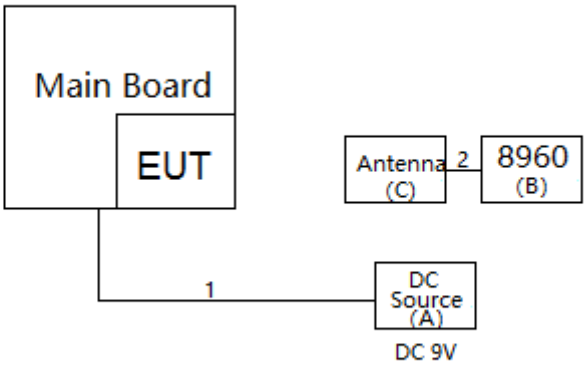
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on X-plane for ERP and X-axis for radiated emission.
Following channel(s) was (were) selected for the final test as listed below:

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

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage
ERP	21°C, 54%RH	DC 3.8V
Maximum Output Power	21°C, 54%RH	DC 3.8V
Occupied Bandwidth	21°C, 54%RH	DC 3.8V
Conducted Emission	21°C, 54%RH	DC 3.8V
Radiated Emission	21°C, 54%RH	DC 3.8V
Band Edge	21°C, 54%RH	DC 3.8V
Peak to Average Ratio	21°C, 54%RH	DC 3.8V
Frequency Stability	Normal and Extreme	Normal and Extreme

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATIONOFSYSTEMTESTED FOR RADIATED



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	DC Power Supply	GW	GPC3030ND	N/A
B	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942
C	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	00206960

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2M	DC Cable
2	NO	NO	1M	Cable

4. TEST RESULT

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMIT

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

4.1.2 TEST PROCEDURE

ERP:

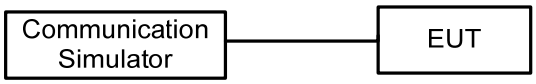
1. ERP power= EIPR power-2.15dBi.

Maximum Output Power:

The EUT was set up for the maximum power with GSM and GPRS 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.

4.1.3 TESTSETUP LAYOUT

Output Power Measurement



4.1.4 TEST DEVIATION

No deviation

4.1.5 TEST RESULTS

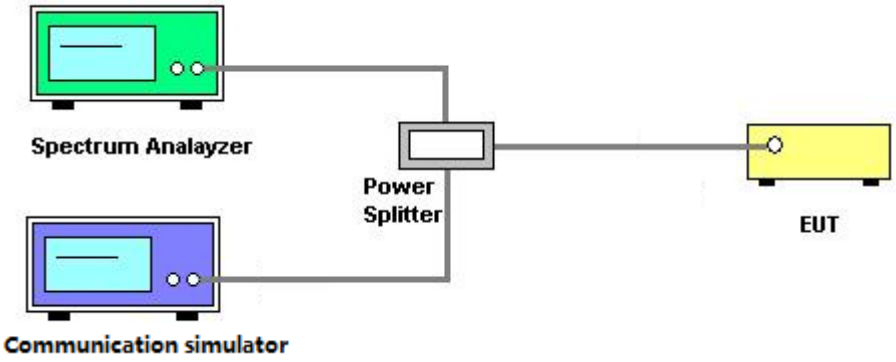
Please refer to the Appendix A.

4.2 OCCUPIED BANDWIDTH MEASUREMENT

4.2.1 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.

4.2.2 TEST SETUP LAYOUT



4.2.3 TEST DEVIATION

No deviation

4.2.4 TEST RESULTS

Please refer to the Appendix B.

4.3 CONDUCTED EMISSIONS MEASUREMENT

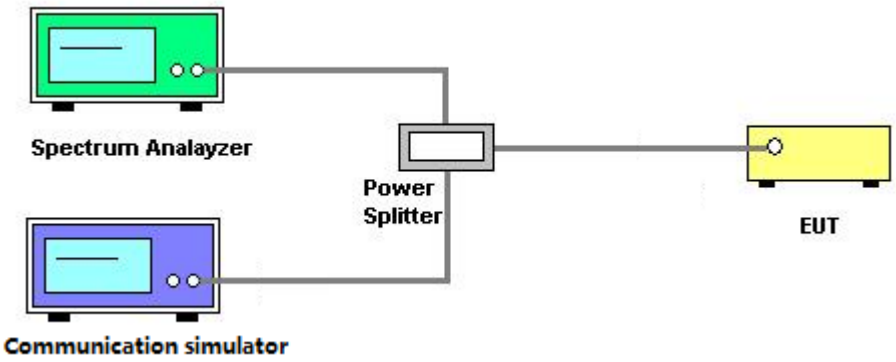
4.3.1 LIMIT

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.

4.3.2 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>=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.
6. The limit line is derived from 43+10log(P)dB below the transmitter power P(Watts)
   =P(W)-[43+10log(P)](dB)
   =[30+10log(P)](dBm)-[43+10log(P)](dB)
   =-13dBm

4.3.3 TESTSETUP LAYOUT



4.3.4 TESTDEVIATION

No deviation

4.3.5 TEST RESULTS

Please refer to the Appendix C.

4.4 RADIATED EMISSIONS MEASUREMENT

4.4.1 LIMIT

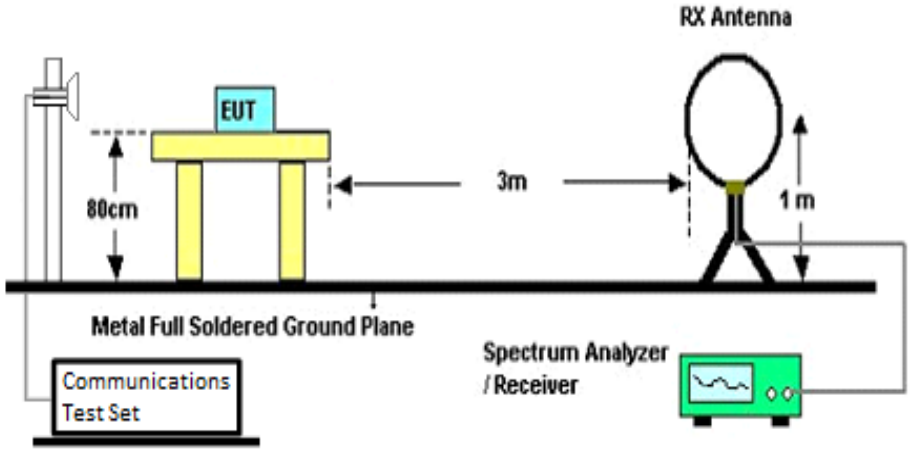
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

4.4.2 TEST PROCEDURES

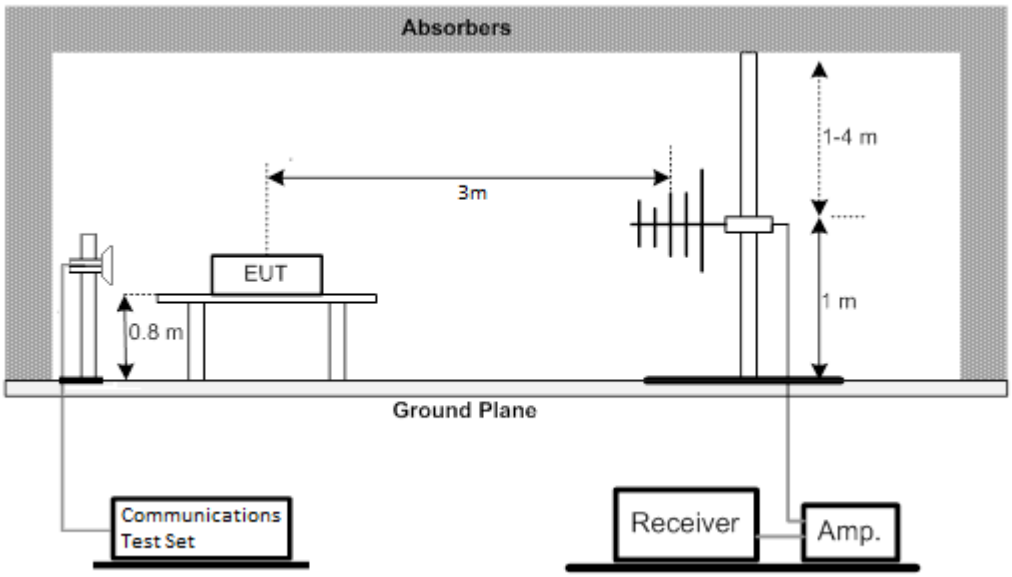
1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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 = Output power level of S.G – TX cable loss + 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 power = E.I.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.3 TESTSETUP LAYOUT

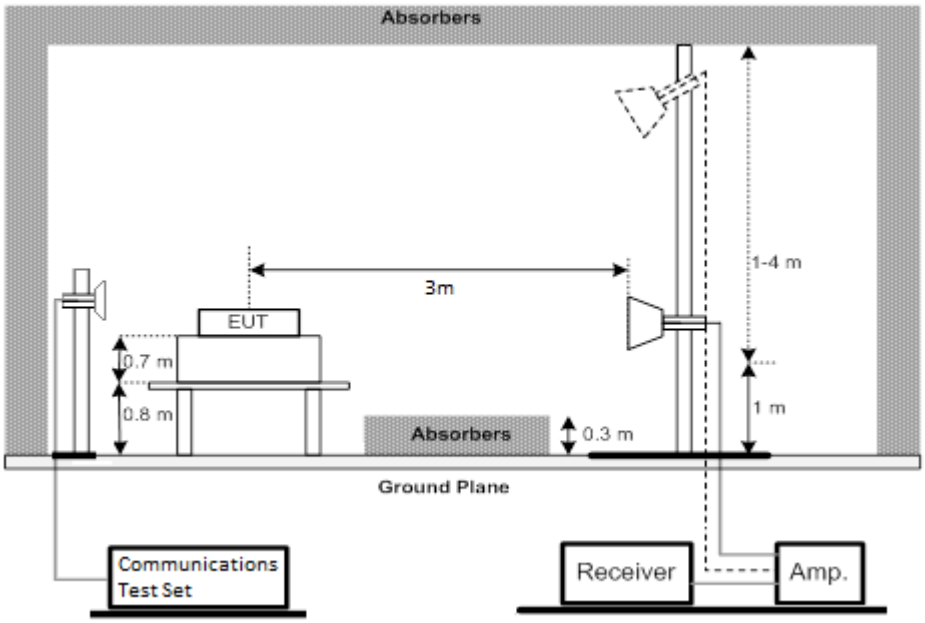
Below 30MHz



30MHz to 1GHz



Above 1GHz



4.4.4 TESTDEVIATION

No deviation

4.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

4.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

4.5 BAND EDGE MEASUREMENT

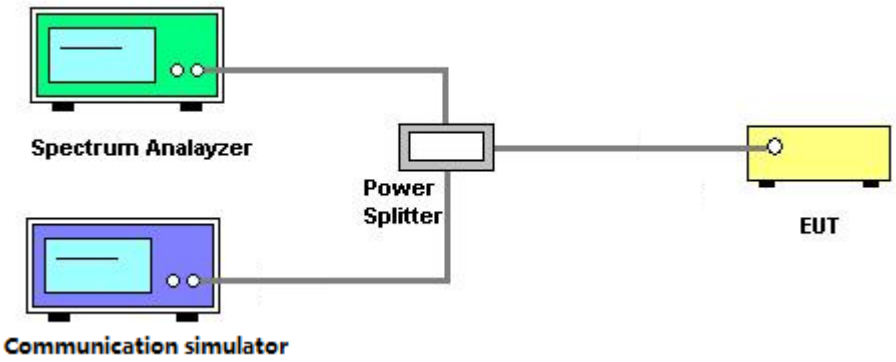
4.5.1 LIMIT

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.

4.5.2 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/GPRS).
3. Record the max trace plot into the test report.

4.5.3 TESTSETUP LAYOUT



4.5.4 TESTDEVIATION

No deviation

4.5.5 TEST RESULTS

Please refer to the Appendix G.

4.6 PEAK TO AVERAGE RATIO MEASUREMENT

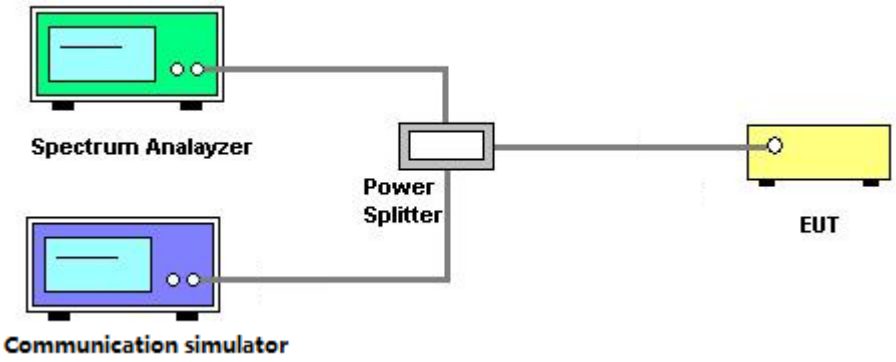
4.6.1 LIMIT

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.

4.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ 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%.

4.6.3 TESTSETUP LAYOUT



4.6.4 TESTDEVIATION

No deviation

4.6.5 TEST RESULTS

Please refer to the Appendix H.

4.7 FREQUENCY STABILITY MEASUREMENT

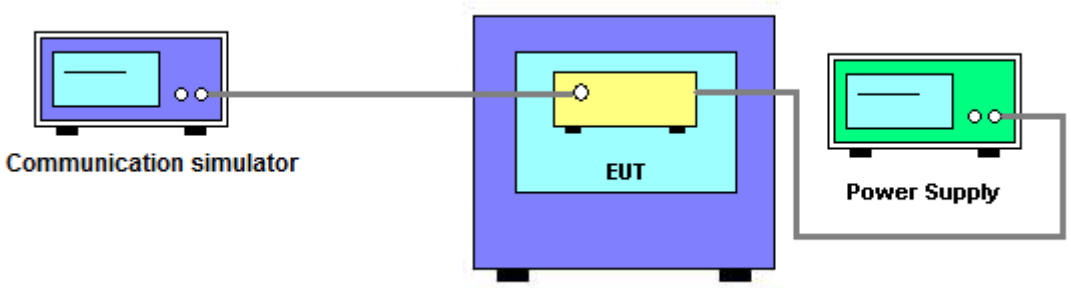
4.7.1 LIMIT

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

4.7.2 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 ±0.5°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.

4.7.3 TESTSETUP LAYOUT



4.7.4 TESTDEVIATION

No deviation

4.7.5 TEST RESULTS

Please refer to the Appendix I.

5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 31, 2019
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 31, 2019
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 31, 2019
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 31, 2019
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 31, 2019
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 31, 2019
7	Cable	N/A	EMC102-SM-SM-6000	170336	Jun. 10, 2019
8	Cable	N/A	EMC102-KM-KM-2500	170627	Jun. 10, 2019
9	Cable	N/A	EMC104-SM-NM-3500	170621	Jun. 10, 2019
10	Cable	N/A	EMC104-SM-SM-1000	170331	Jun. 10, 2019
11	Cable	N/A	EMC104-SM-SM-7000	170330	Jun. 10, 2019
12	Notch Filter	Woken	WFIL-N699-721F-03	WRS45WC2B2	Jul. 17, 2019
13	Notch Filter	Woken	WFIL-N1710-1755F-01	WR455FWC2B6	Jul. 17, 2019
14	Notch Filter	Woken	WFIL-N1850-1910F-01	WRS45WC2B4	Jul. 17, 2019
15	Notch Filter	Woken	WFIL-N824-849F-01	WRS45WC2B6	Jul. 17, 2019
16	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 31, 2019
17	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Mar. 31, 2019
18	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 11, 2019
19	Controller	MF	MF-7802BS	N/A	N/A
20	Controller	innco systems GmbH	CO3000-1D	976	N/A
21	EMI Test Receiver	R&S	ESCI	100082	Mar. 31, 2019
22	Loop Antenna	emci	EMCI LPA600	275	Mar. 31, 2019

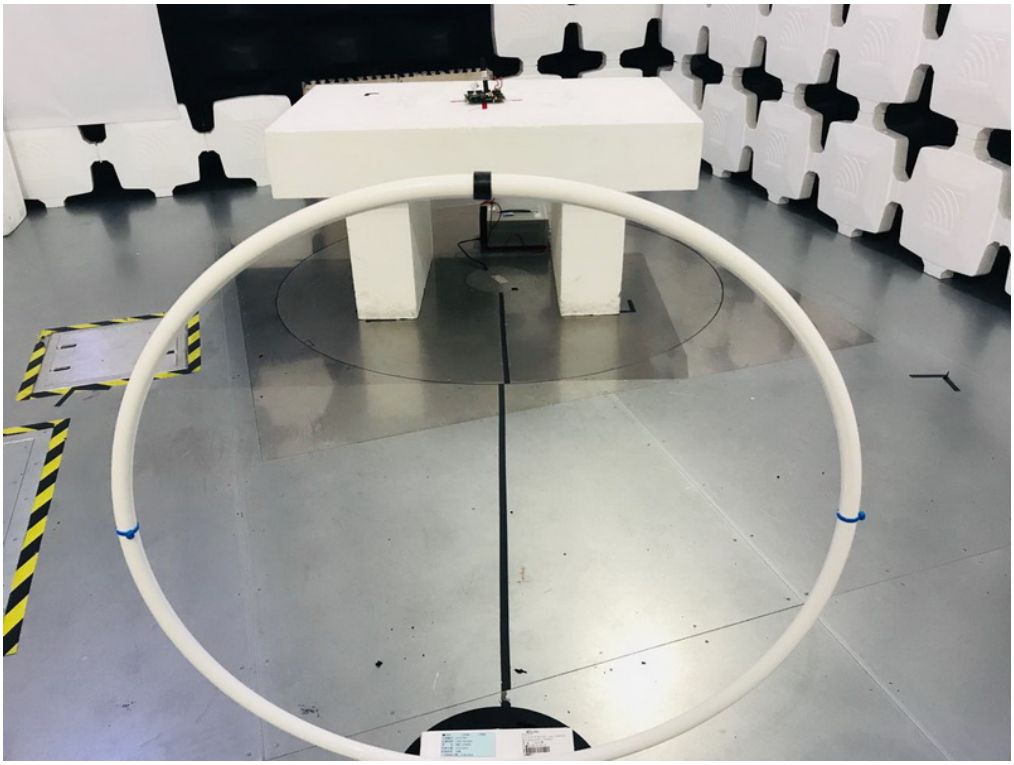
Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2	Spectrum Analyzer	R&S	FSP40	100626	Mar. 31, 2019
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 31, 2019
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A

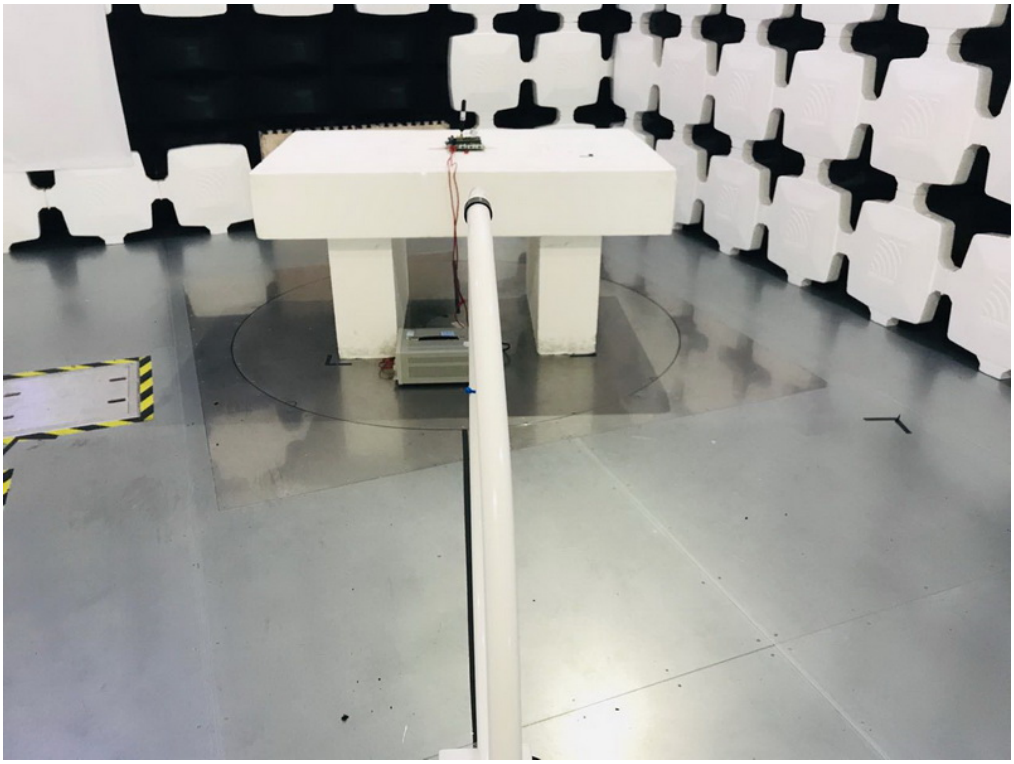
Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2*	Spectrum Analyzer	R&S	FSP40	100626	Mar. 31, 2019
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 31, 2019
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.
*All calibration period of equipment list is three year.

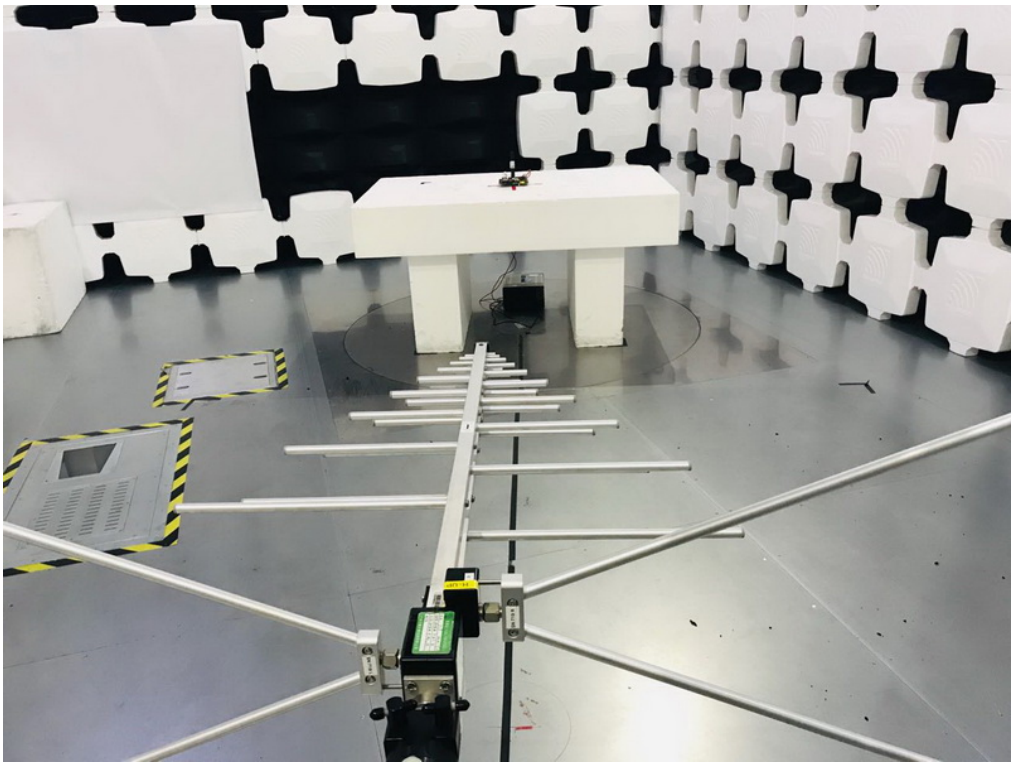
6. EUT TEST PHOTO

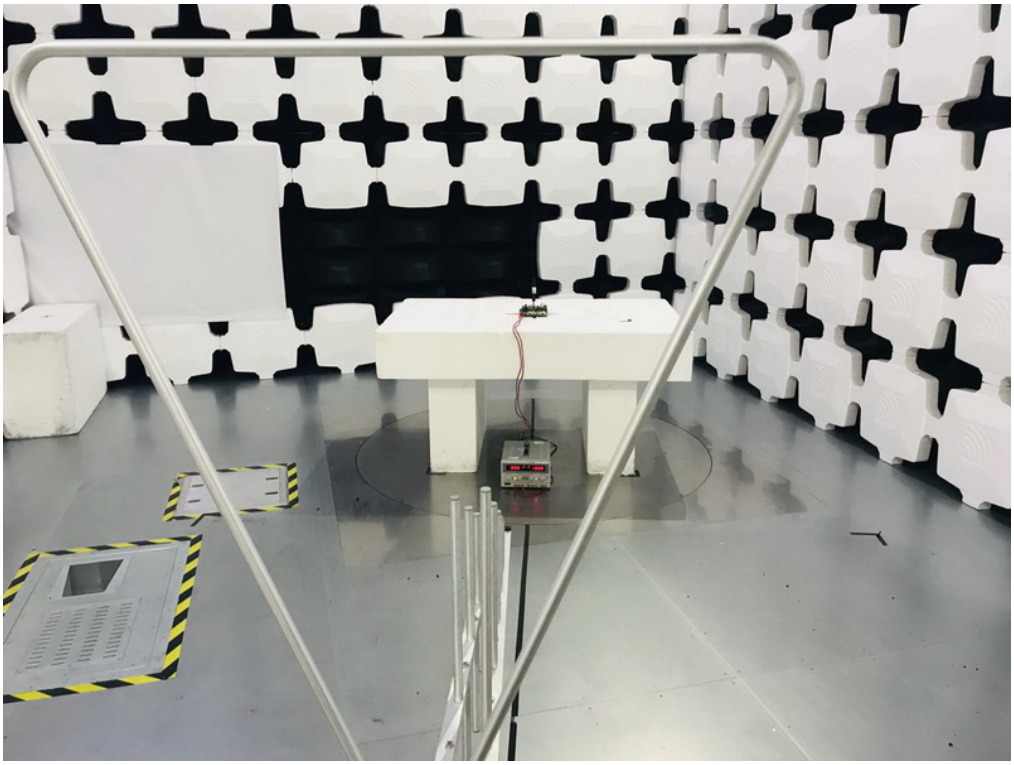
9 kHz to 30 MHz



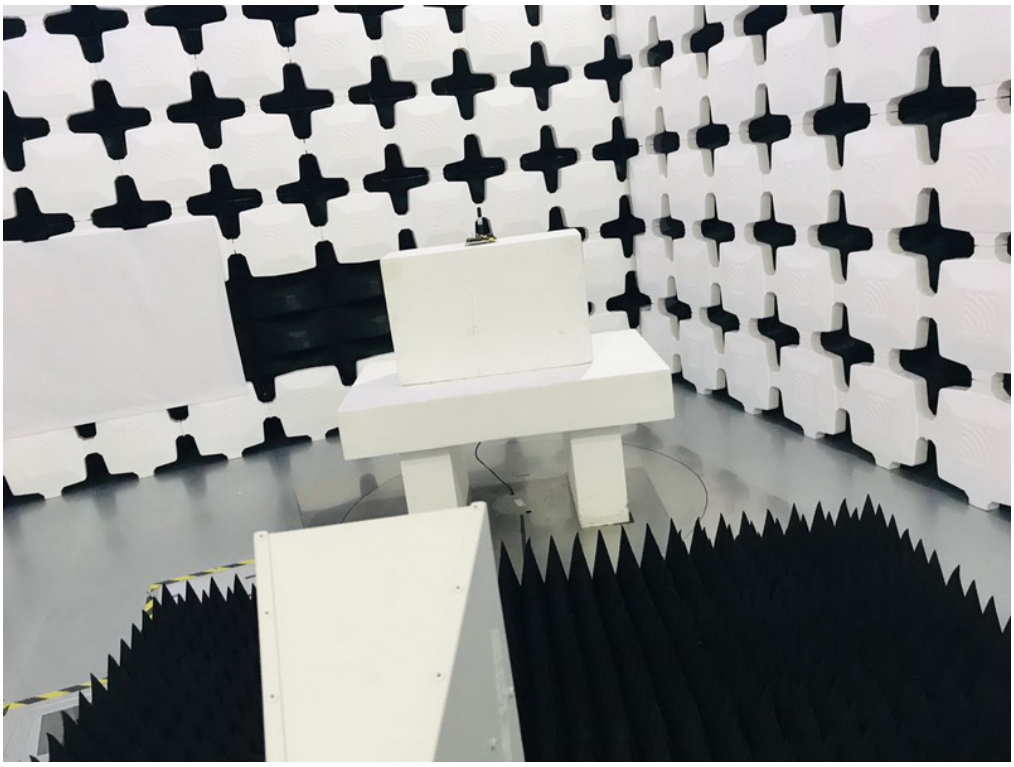


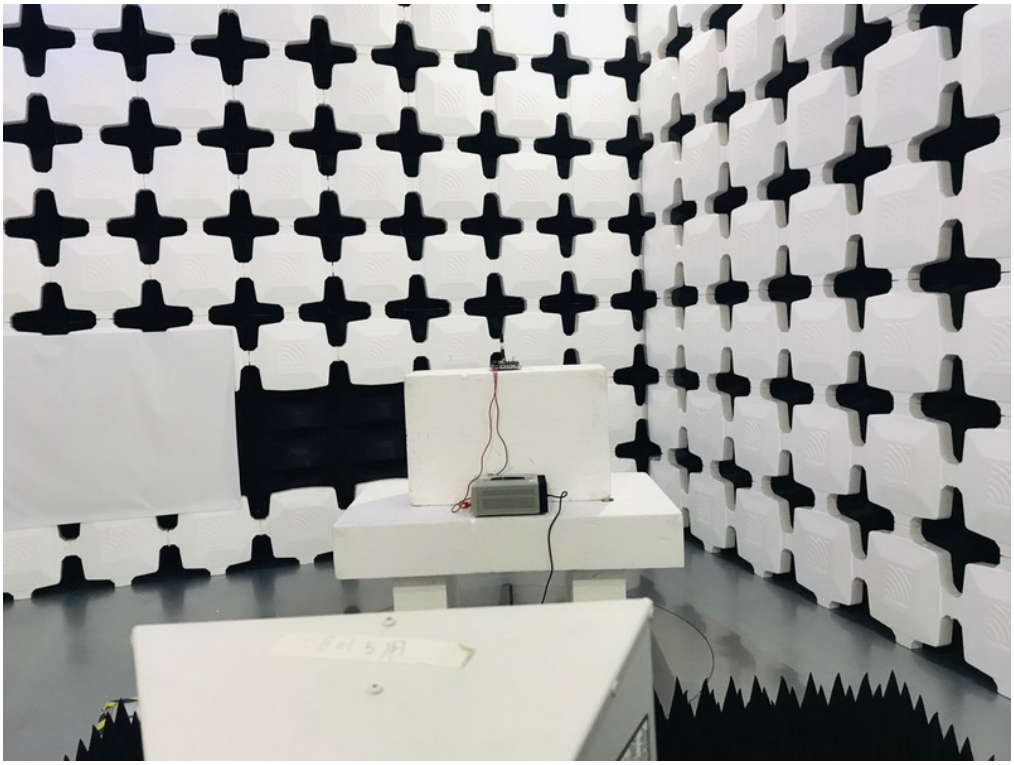
30 MHz to 1 GHz





Above 1 GHz





APPENDIX A - MAXIMUM OUTPUT POWER

Maximum Output Power (dBm):

GSM/GPRS		Burst Output Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM850		31.62	31.61	31.65
GPRS850 (GMSK)	1 Tx Slot	31.74	31.75	31.76

ERP Power (dBm):

GSM/GPRS		ERP Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM850		30.47	30.46	30.50
GPRS850 (GMSK)	1 Tx Slot	30.59	30.60	30.61

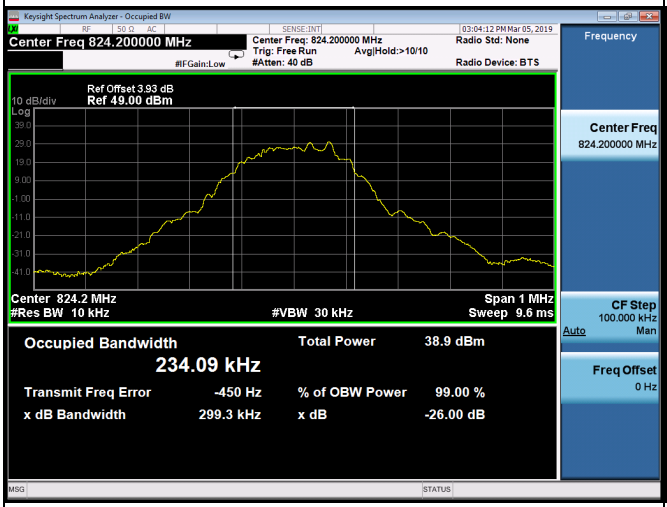
APPENDIX B - OCCUPIED BANDWIDTH

GSM850		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
128	824.2	0.234
190	836.6	0.233
251	848.8	0.233
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
128	824.2	0.299
190	836.6	0.300
251	848.8	0.300

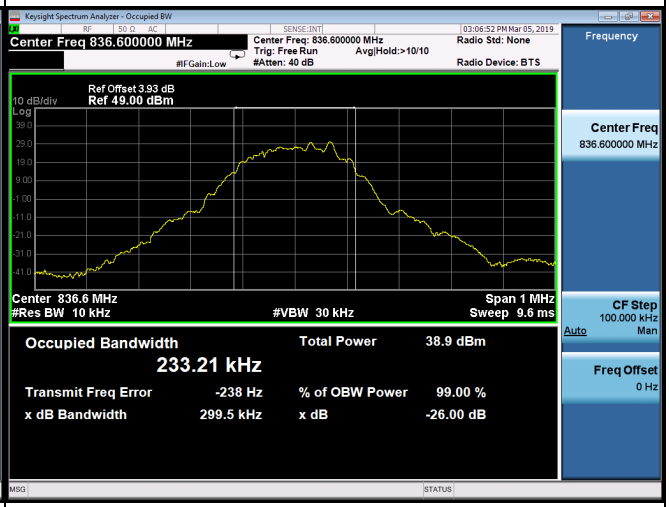
GPRS850		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
128	824.2	0.238
190	836.6	0.244
251	848.8	0.238
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
128	824.2	0.308
190	836.6	0.315
251	848.8	0.310

Spectrum Plot

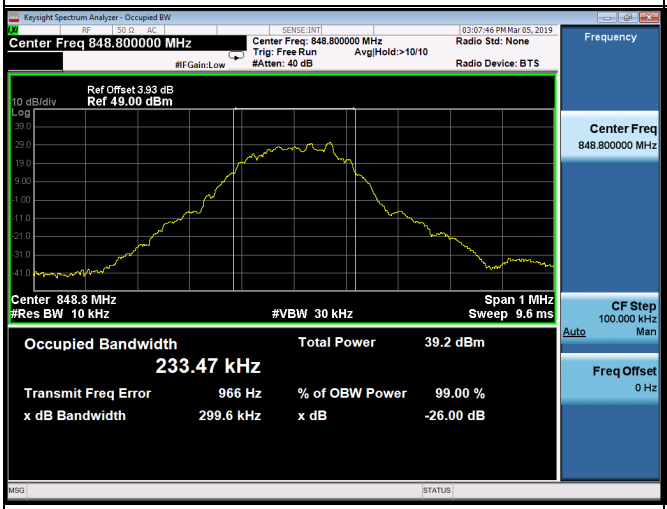
GSM -128



GSM-190

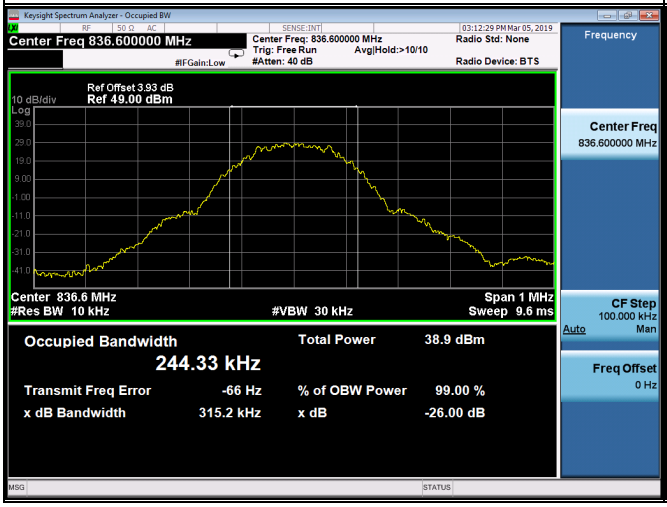


GSM-251

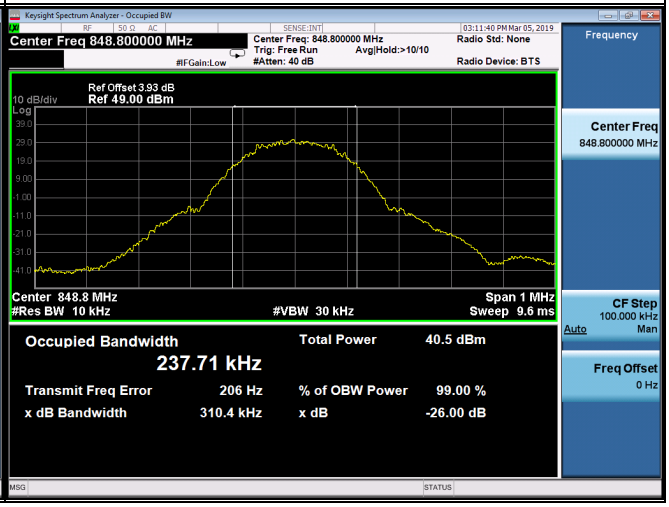


GPRS-128

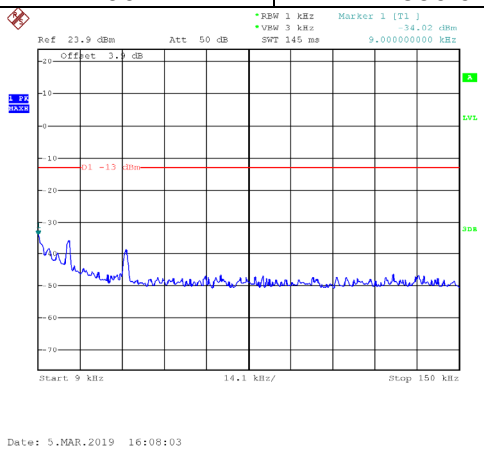
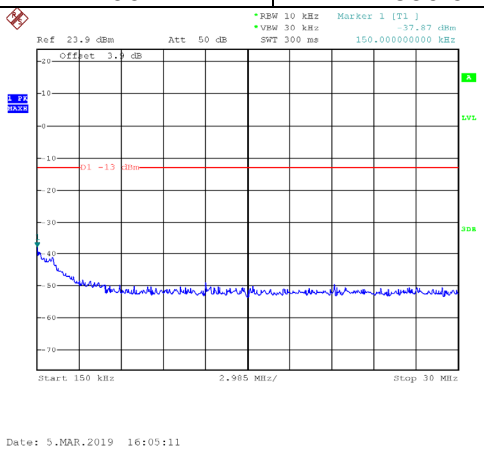
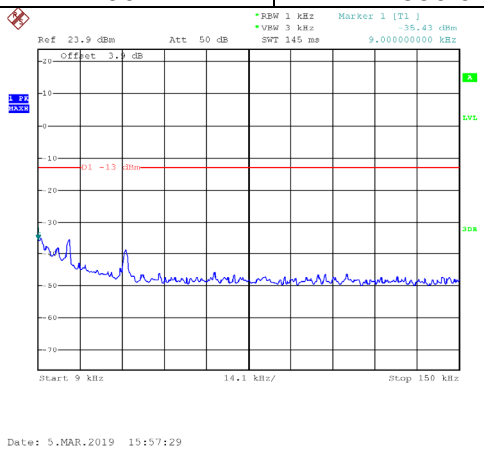
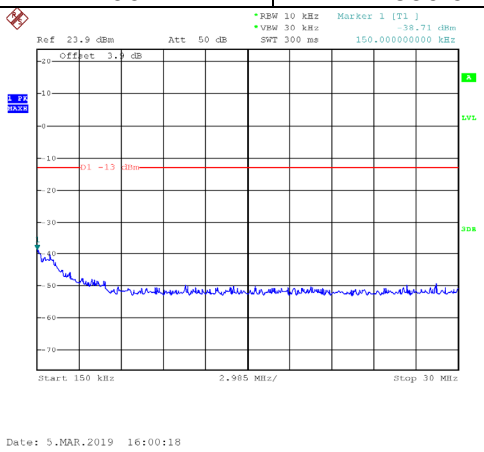
GPRS-190



GPRS-251



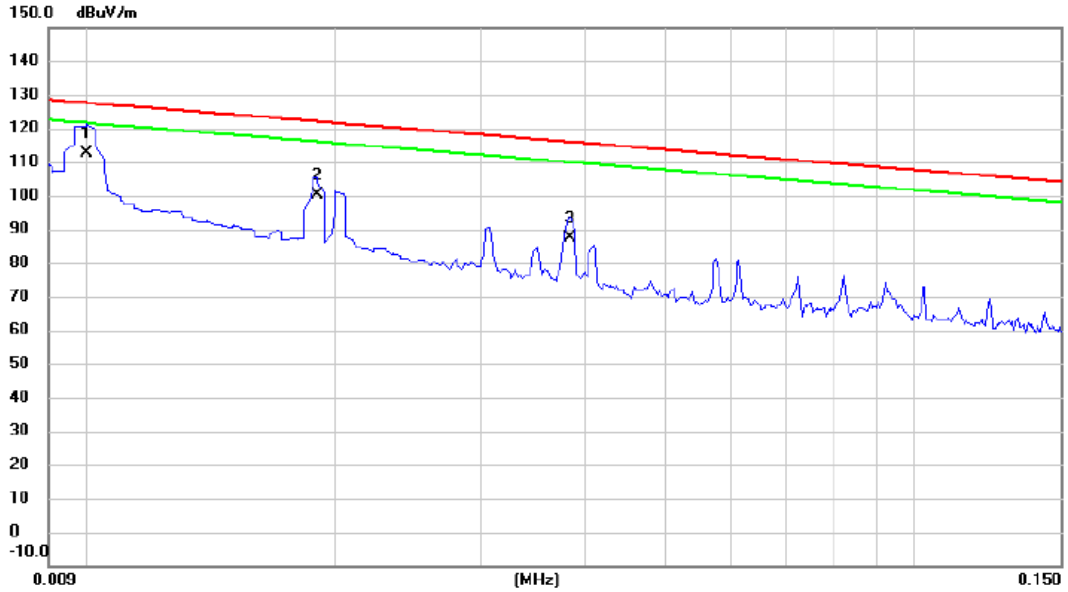
APPENDIX C - CONDUCTED EMISSIONS

GSM850		GSM850	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
190	836.6	190	836.6
			
GPRS850		GPRS850	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
190	836.6	190	836.6
			

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

Test Mode:	TX Mode

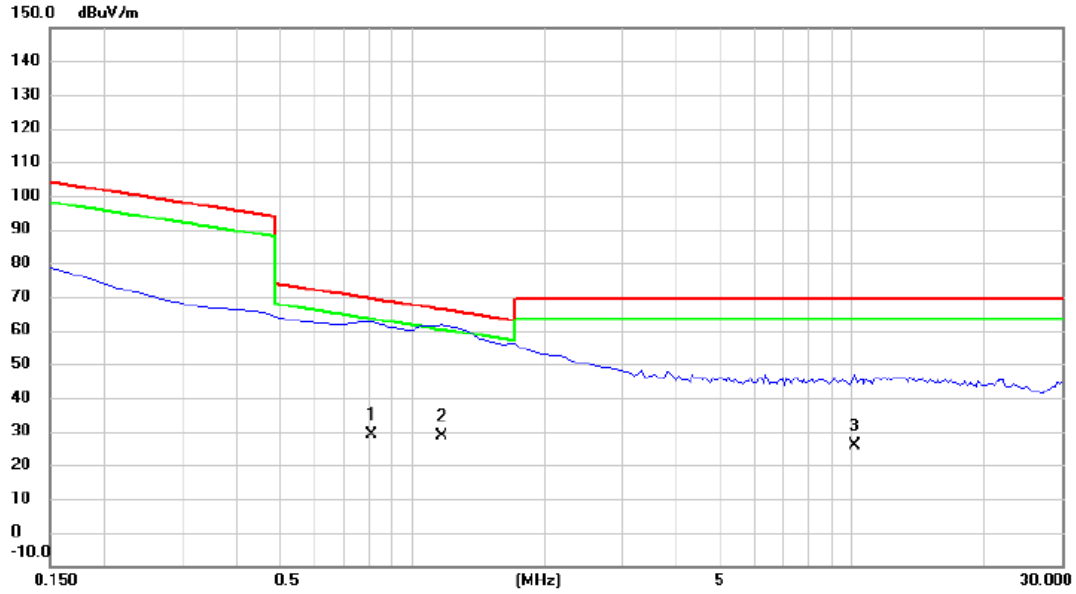
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0100	34.11	78.40	112.51	127.60	-15.09	AVG	
2		0.0190	27.24	72.91	100.15	122.03	-21.88	AVG	
3		0.0383	20.17	67.21	87.38	115.94	-28.56	AVG	

Test Mode:	TX Mode

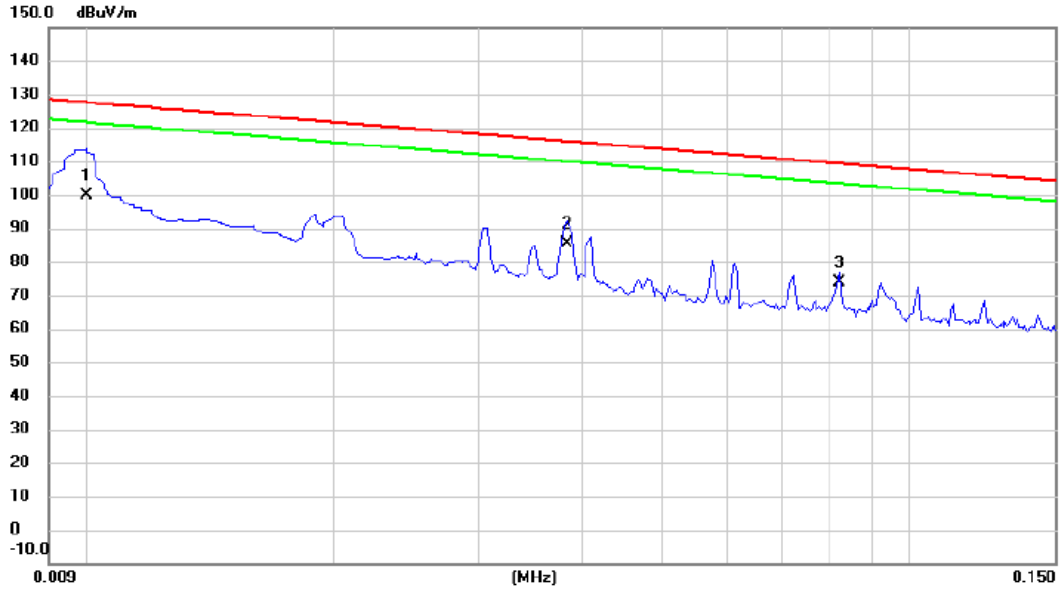
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.8080	-12.86	42.05	29.19	69.46	-40.27	QP	
2	*	1.1670	-12.35	40.80	28.45	66.26	-37.81	QP	
3		10.1393	-12.01	37.97	25.96	69.54	-43.58	QP	

Test Mode:	TX Mode

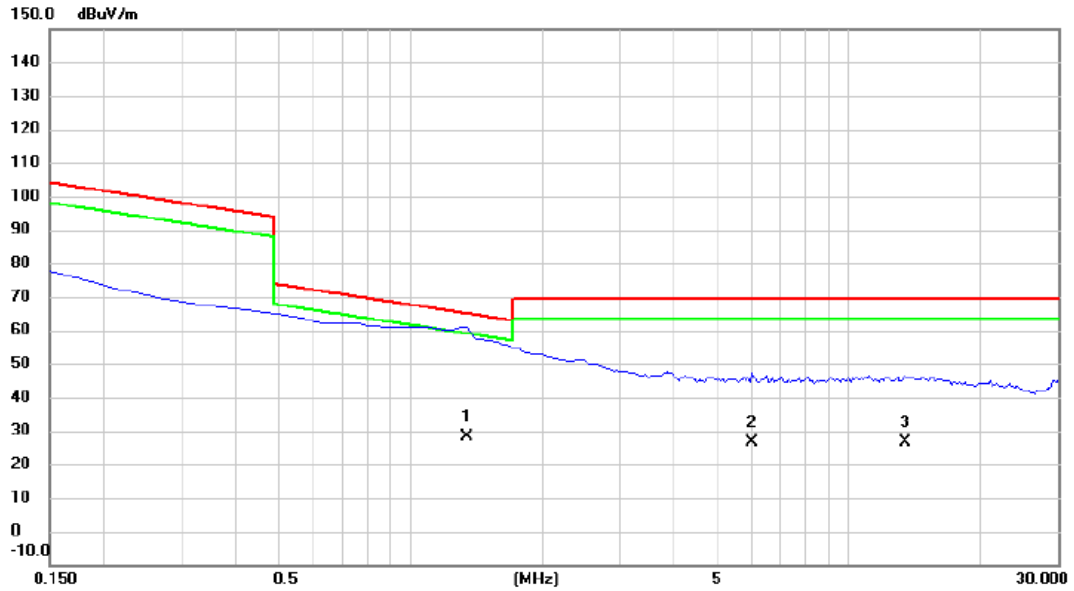
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0100	21.24	78.40	99.64	127.60	-27.96	AVG	
2		0.0383	18.15	67.21	85.36	115.94	-30.58	AVG	
3		0.0821	13.71	59.91	73.62	109.32	-35.70	AVG	

Test Mode:	TX Mode

Ant 90°

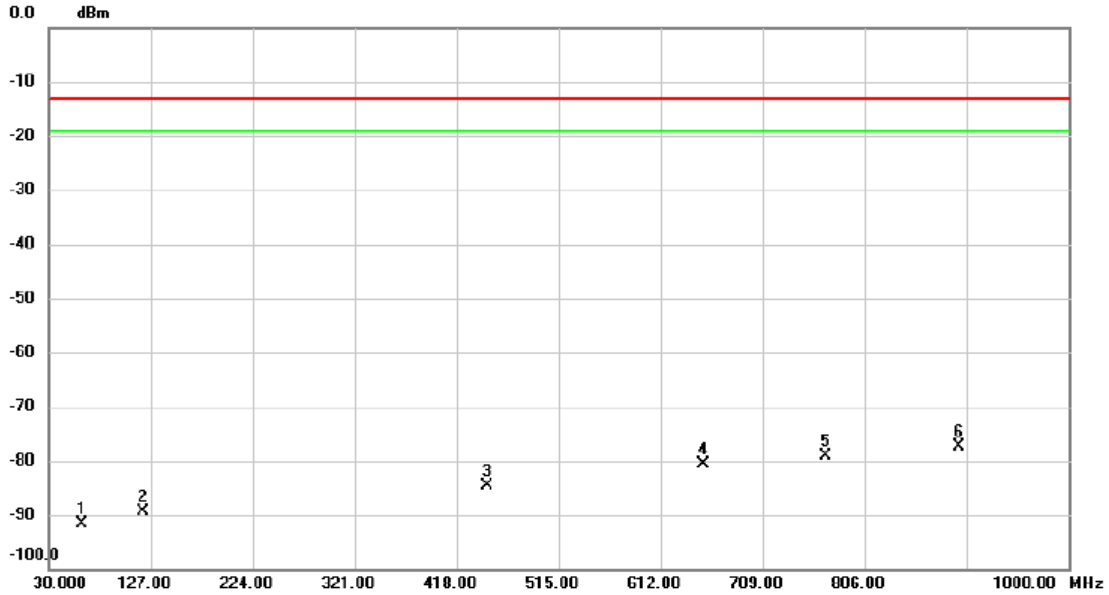


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	1.3463	-12.33	40.37	28.04	65.02	-36.98	QP	
2		6.0121	-11.21	37.80	26.59	69.54	-42.95	QP	
3		13.4894	-11.47	37.97	26.50	69.54	-43.04	QP	

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

Test Mode:	GSM850_TX CH190

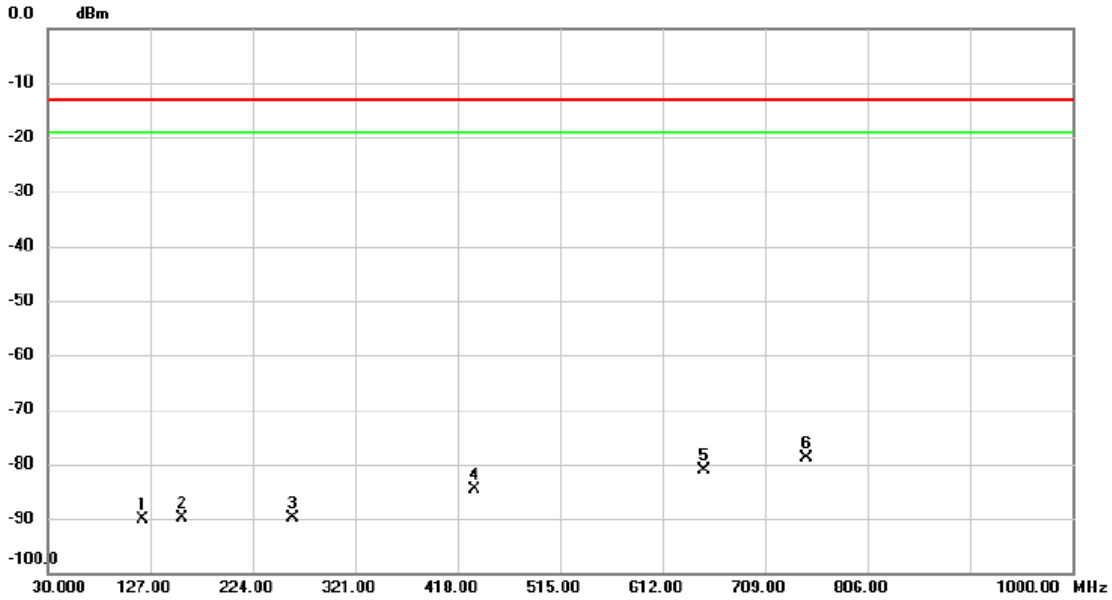
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		61.0400	-72.94	-18.59	-91.53	-13.00	-78.53	peak	
2		119.2400	-70.27	-19.11	-89.38	-13.00	-76.38	peak	
3		446.6150	-73.39	-11.23	-84.62	-13.00	-71.62	peak	
4		653.2250	-73.08	-7.64	-80.72	-13.00	-67.72	peak	
5		769.1400	-72.87	-6.17	-79.04	-13.00	-66.04	peak	
6	*	896.2100	-72.17	-5.29	-77.46	-13.00	-64.46	peak	

Test Mode:	GSM850_ TX CH190

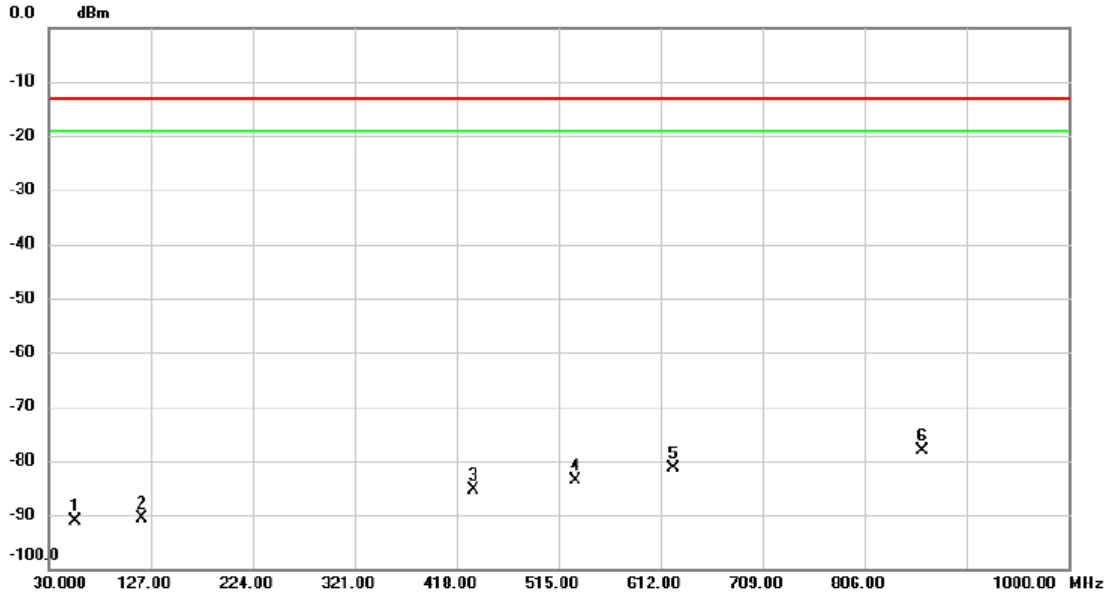
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		119.7250	-71.11	-19.08	-90.19	-13.00	-77.19	peak	
2		157.0700	-73.45	-16.41	-89.86	-13.00	-76.86	peak	
3		261.8300	-72.94	-16.83	-89.77	-13.00	-76.77	peak	
4		434.0050	-72.86	-11.74	-84.60	-13.00	-71.60	peak	
5		651.7700	-73.56	-7.60	-81.16	-13.00	-68.16	peak	
6	*	748.2850	-72.90	-5.88	-78.78	-13.00	-65.78	peak	

Test Mode:	GPRS850_TX CH190

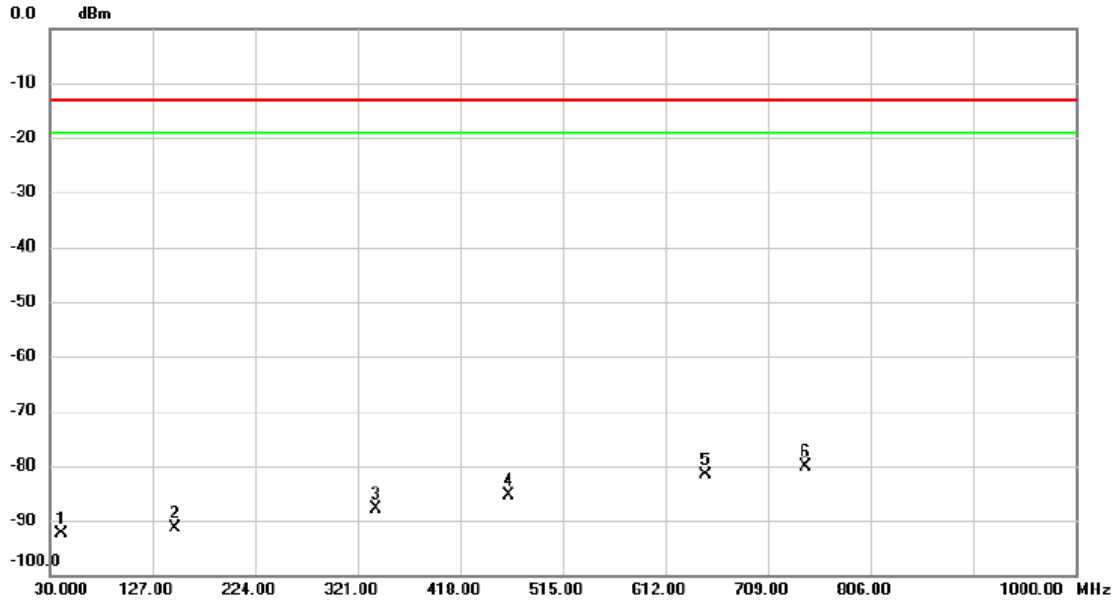
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		55.2200	-72.80	-18.42	-91.22	-13.00	-78.22	peak	
2		118.2700	-71.44	-19.15	-90.59	-13.00	-77.59	peak	
3		433.5200	-73.53	-11.75	-85.28	-13.00	-72.28	peak	
4		531.4900	-73.39	-10.11	-83.50	-13.00	-70.50	peak	
5		624.6100	-72.95	-8.49	-81.44	-13.00	-68.44	peak	
6	*	860.3200	-72.62	-5.43	-78.05	-13.00	-65.05	peak	

Test Mode:	GPRS850_TX CH190

Horizontal

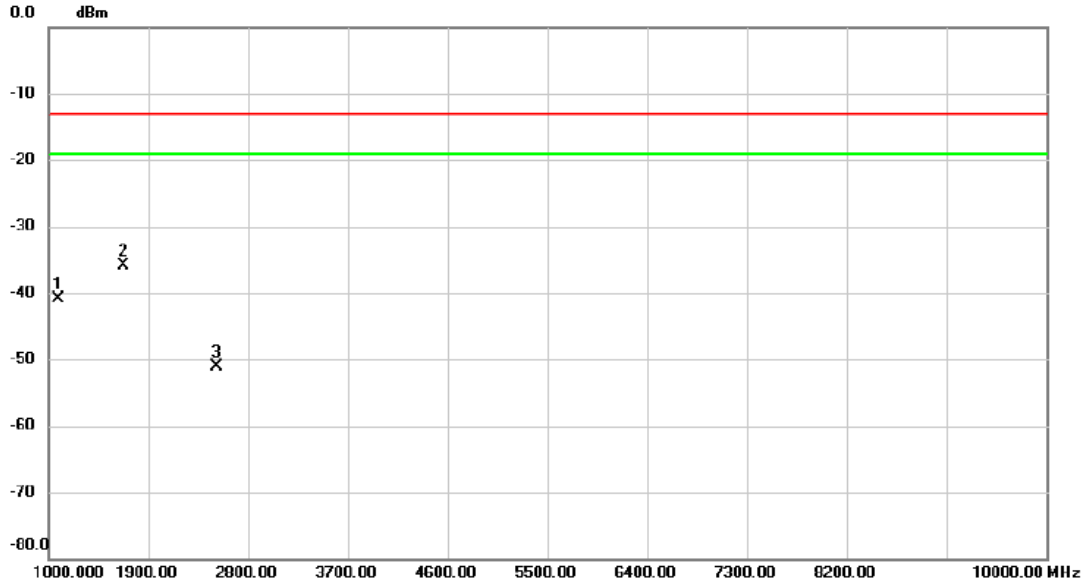


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		40.6700	-75.14	-17.21	-92.35	-13.00	-79.35	peak	
2		148.3400	-74.57	-16.76	-91.33	-13.00	-78.33	peak	
3		337.9750	-73.06	-14.77	-87.83	-13.00	-74.83	peak	
4		464.0750	-73.80	-11.55	-85.35	-13.00	-72.35	peak	
5		650.3150	-74.07	-7.57	-81.64	-13.00	-68.64	peak	
6	*	744.8900	-74.13	-6.08	-80.21	-13.00	-67.21	peak	

APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)

Test Mode:	GSM850_ TX CH190

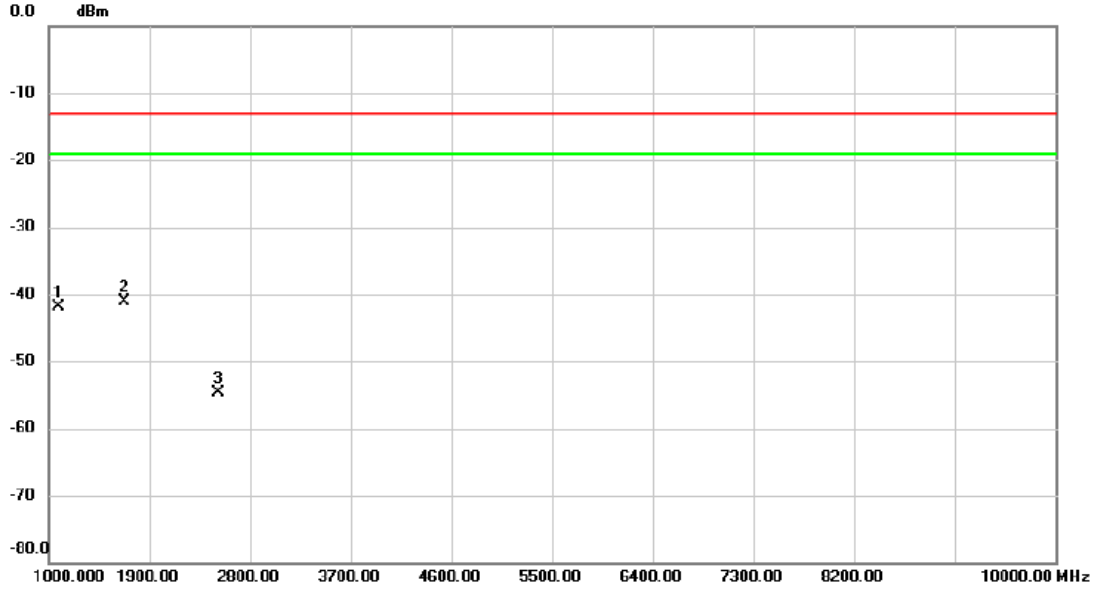
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1085.000	-24.44	-16.55	-40.99	-13.00	-27.99	peak	
2	*	1680.000	-20.90	-15.04	-35.94	-13.00	-22.94	peak	
3		2513.000	-40.40	-10.68	-51.08	-13.00	-38.08	peak	

Test Mode:	GSM850_ TX CH190

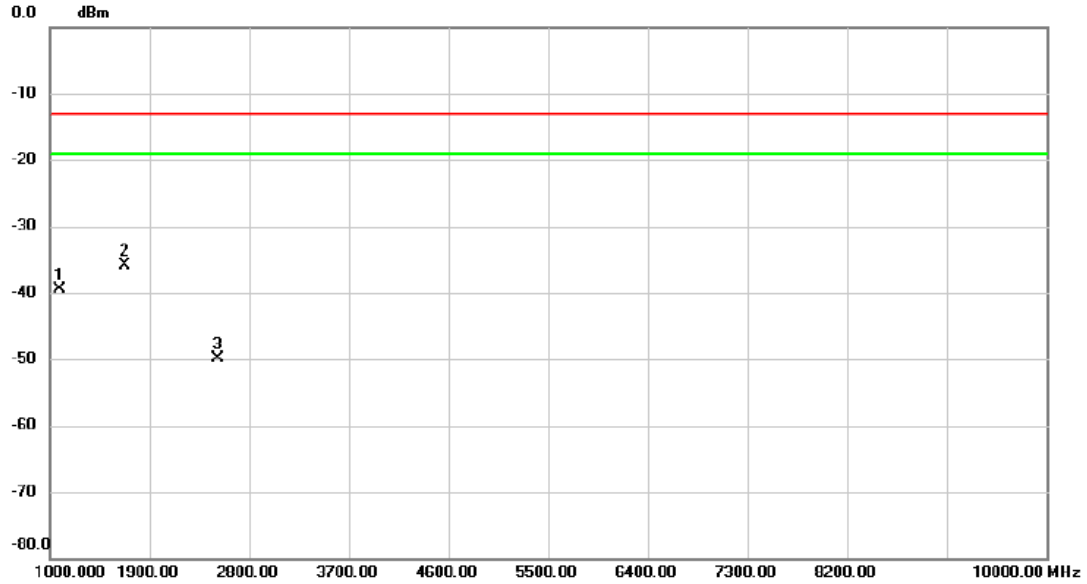
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1085.000	-25.41	-16.55	-41.96	-13.00	-28.96	peak	
2	*	1680.000	-26.03	-15.04	-41.07	-13.00	-28.07	peak	
3		2513.000	-44.05	-10.68	-54.73	-13.00	-41.73	peak	

Test Mode:	GPRS850_ TX CH190

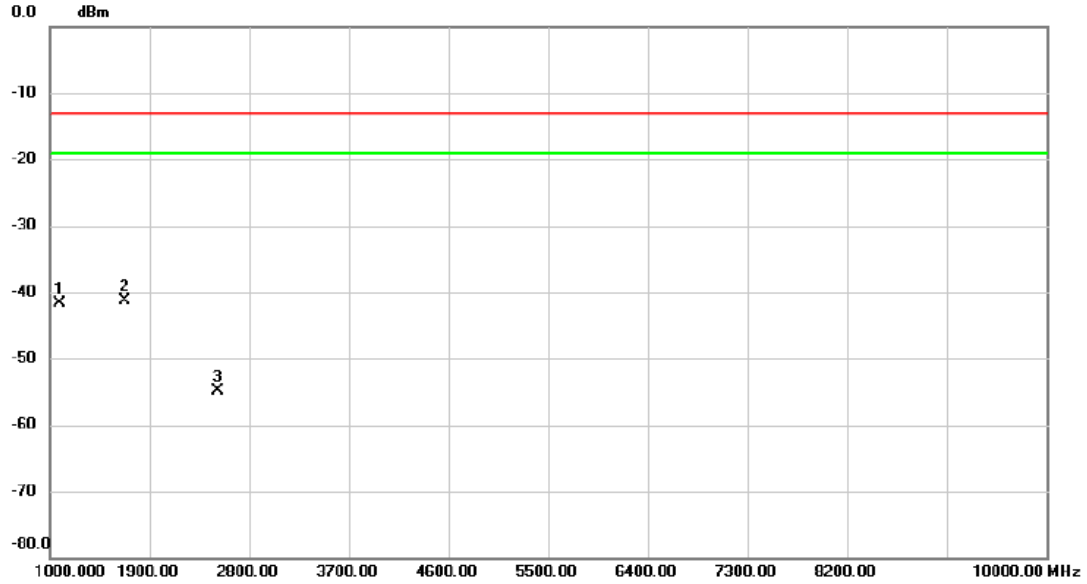
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1085.000	-22.90	-16.55	-39.45	-13.00	-26.45	peak	
2	*	1680.000	-20.91	-15.04	-35.95	-13.00	-22.95	peak	
3		2513.000	-39.25	-10.68	-49.93	-13.00	-36.93	peak	

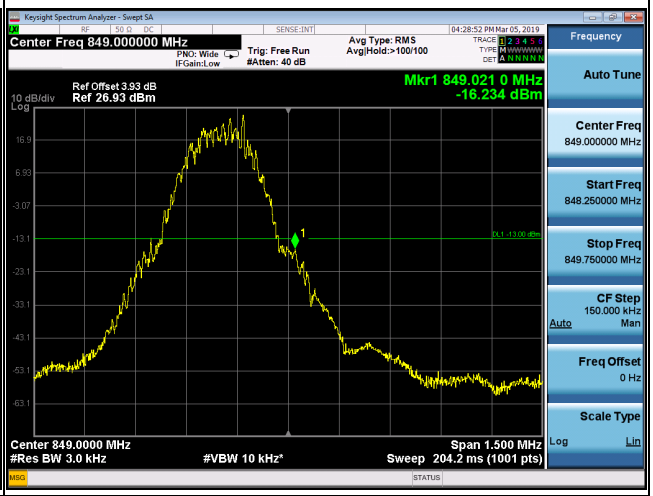
Test Mode:	GPRS850_ TX CH190

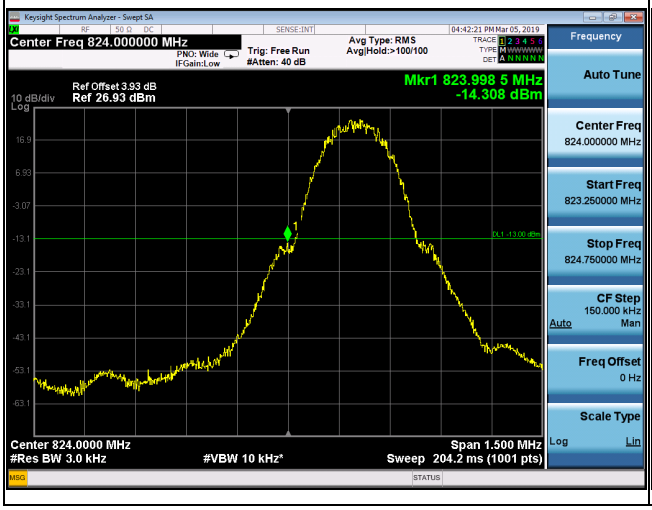
Horizontal



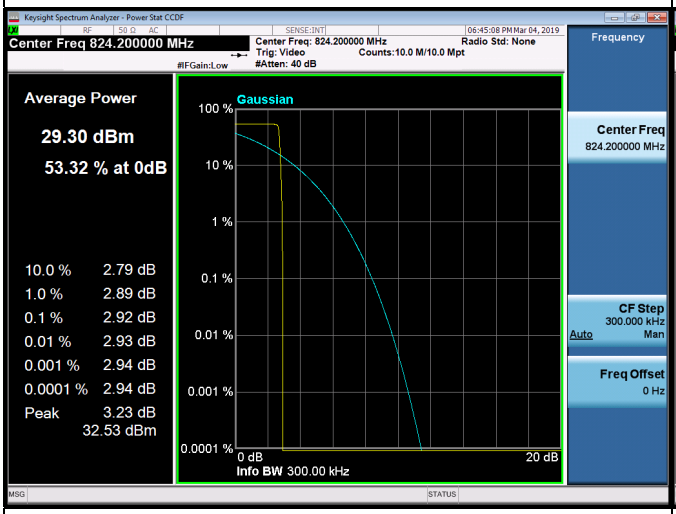
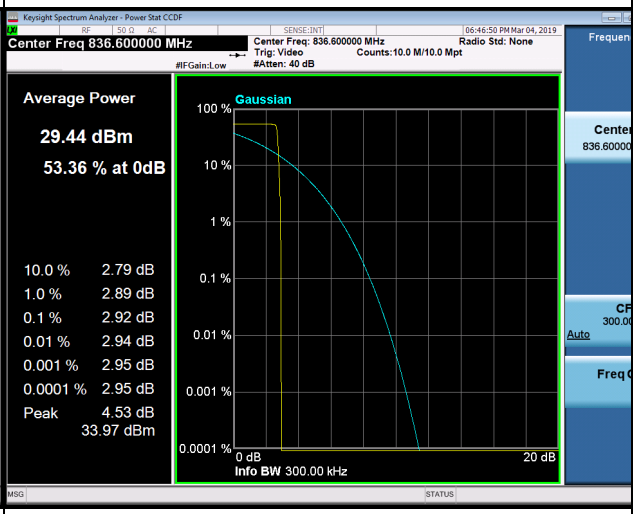
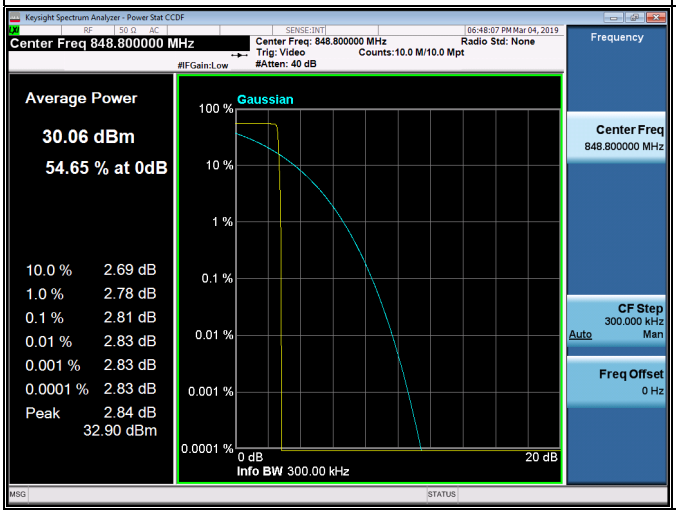
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1085.000	-25.10	-16.55	-41.65	-13.00	-28.65	peak	
2	*	1680.000	-26.35	-15.04	-41.39	-13.00	-28.39	peak	
3		2513.000	-44.18	-10.68	-54.86	-13.00	-41.86	peak	

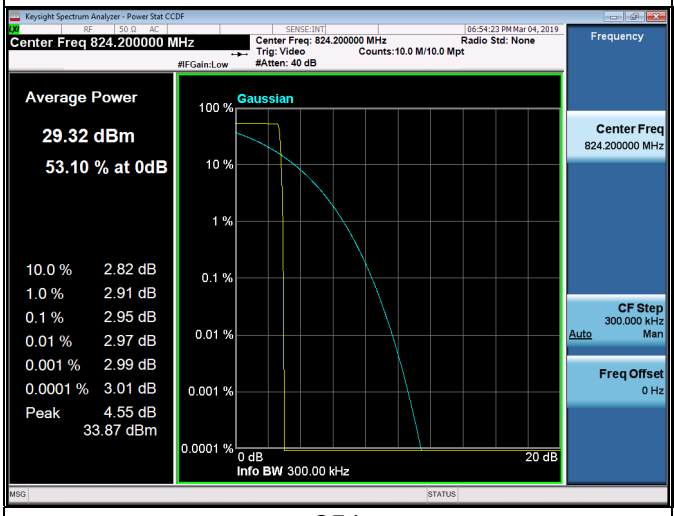
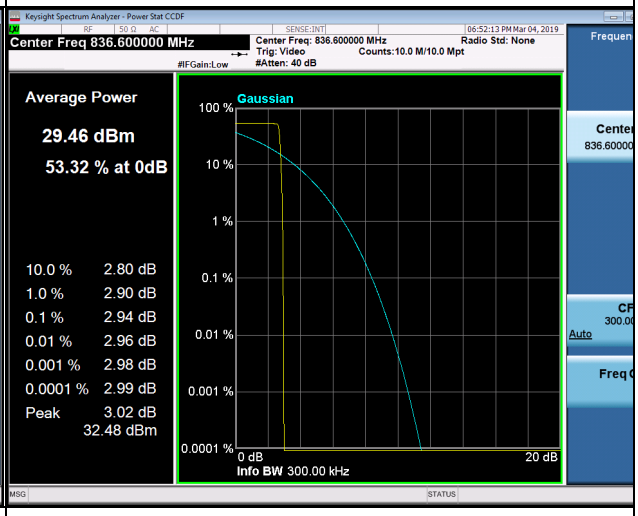
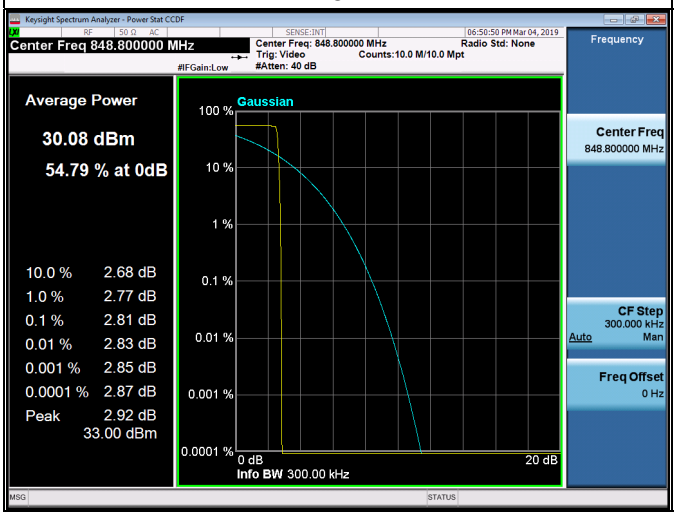
APPENDIX G - BAND EDGE

GSM850			
Channel	128	Channel	251
			

GPRS			
Channel	128	Channel	251
			

APPENDIX H - PEAK TO AVERAGE RATIO

GSM850	
128	190
	
251	-
	-

GPRS850	
128	190
	
251	-
	-

APPENDIX G - FREQUENCY STABILITY

Test Mode:	GSM850_CH190

Temperature vs. Frequency Stabiility

Temperature(℃)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-10	3.75	0.004482429	±2.5
0	7.39	0.008833373	
10	4.98	0.005952666	
20	4.42	0.00528329	
30	5.32	0.006359072	
40	6.47	0.007733684	
50	5.62	0.006717667	
55	4.29	0.005127899	
Max. Deviation (ppm)	7.39	0.008833373	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.42	3.58	0.004279225	±2.5
3.80	6.38	0.007626106	
4.18	4.29	0.005127899	
Max. Deviation (ppm)	6.38	0.007626106	

End of Test Report