

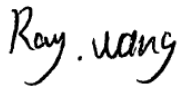

FCC PART 22H, PART 24E  
MEASUREMENT AND TEST REPORT

For

**Queclink Wireless Solutions Co.,Ltd**

Room 501, Building 9, No. 99 Tianzhou Road, Shanghai, China

**FCC ID: YQD-M10**

<b>Report Type:</b> Original Report	<b>Product Type:</b> GSM Module
<b>Test Engineer:</b> <u>Ray Wang</u> 	
<b>Report Number:</b> <u>RSA170921003-00A</u>	
<b>Report Date:</b> <u>2017-10-26</u>	
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**GENERAL INFORMATION****Product Description for Equipment under Test (EUT)**

Manufacturer	Queclink Wireless Solutions Co.,Ltd
Model	M10
Product	GSM Module
Dimension	29.0mm(L)×29.0mm(W)×3.6mm(H)
Power Supply	DC 4.0 V

*\*All measurement and test data in this report was gathered from production sample serial number: 20170921003.  
(Assigned by BACL, Kunshan). The EUT was received on 2017-09-21.*

**Objective**

This type approval report is prepared on behalf of Queclink Wireless Solutions Co.,Ltd in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E of the Federal Communication Commission's rules.

The objective is to determine the compliance of EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, and band edge.

**Related Submittal(s)/Grant(s)**

N/A

## Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-Part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services  
Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

Item		Uncertainty
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.05dB
	1GHz~6GHz	4.48dB
	6GHz~18GHz	5.22dB
Occupied Bandwidth		0.5kHz
Frequency Stability		1Hz
Temperature		1.0℃
Humidity		6%

## Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road,Kunshan,Jiangsu province,China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

## SYSTEM TEST CONFIGURATION

### Justification

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.

### Equipment Modifications

No modifications were made to the EUT.

### Support Equipment List and Details

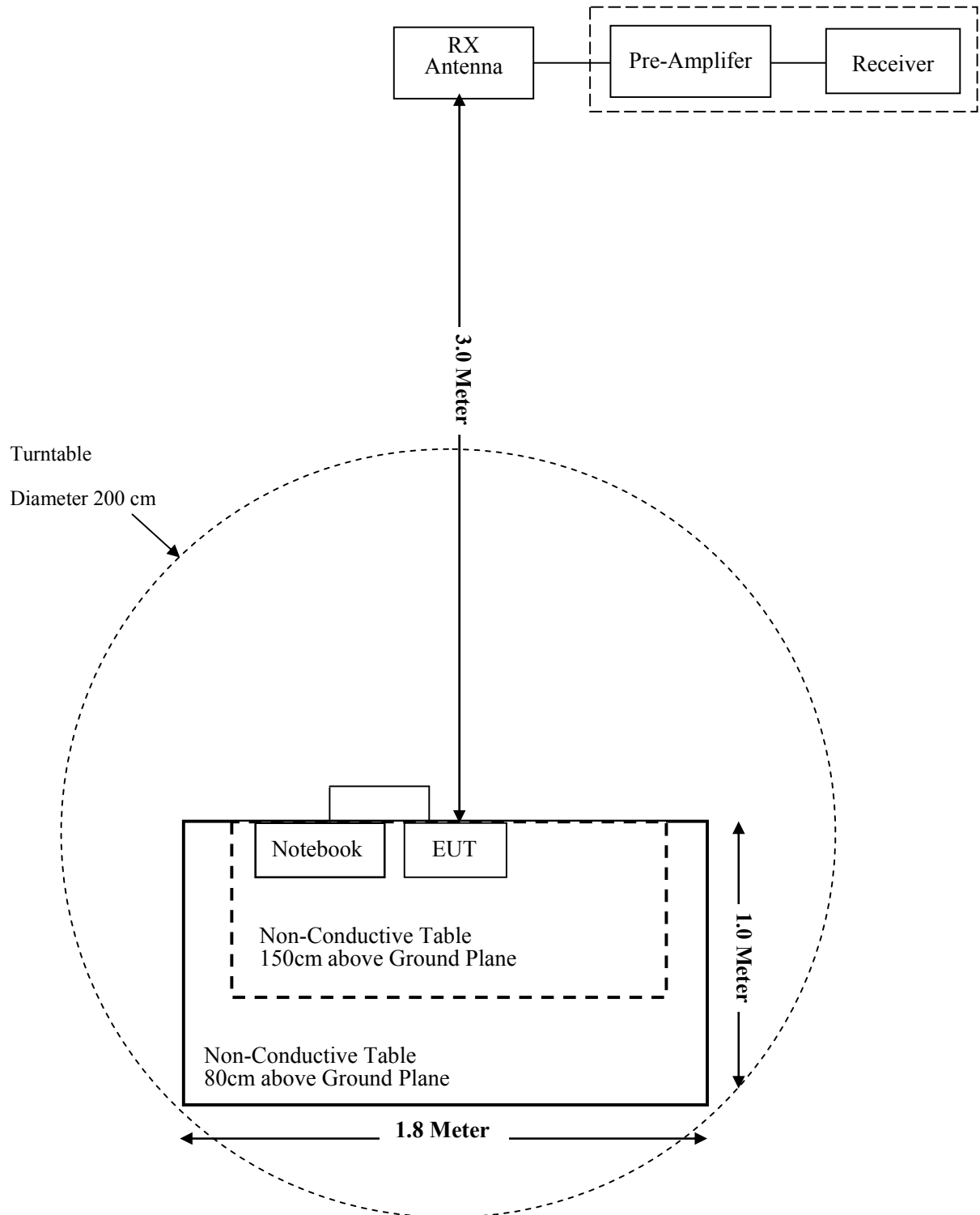
Manufacturer	Description	Model	Serial Number
DELL	Notebook	GX620	D65874152

### External Cable List and Details

Cable Description	Length (m)	From Port	To
USB Cable	0.8	EUT	Notebook

## Block Diagram of Test Setup

For Radiated Emissions



Note: The edge of the test table is in the centre of the turntable in order to keep the EUT in the center of the turntable and to keep the test distance at 3m.

**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§1.1307 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; § 22.913 (a); § 24.232 (c)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a)	Spurious Radiated Emissions	Compliance
§ 22.917 (a); § 24.238 (a)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235	Frequency stability	Compliance

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test (Chamber 1#)</b>					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
HP	Signal Generator	HP 8341B	2624A00116	2017-08-29	2018-08-28
Sunol Sciences	Broadband Antenna	JB3	A040914-2	2016-01-09	2019-01-08
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Sonoma Instrument	Pre-amplifier	310N	171205	2017-08-15	2018-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2017-08-15	2018-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2016-11-25	2017-11-24
<b>Radiated Emission Test (Chamber 2#)</b>					
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
HP	Signal Generator	HP 8341B	2624A00116	2017-08-29	2018-08-28
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-12
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-12
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Heatsink Required	Amplifier	QLW-18405536-J0	15964001009	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2017-08-15	2018-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2016-11-25	2017-11-24



Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>RF Conducted Test</b>					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2017-09-21	2018-09-20
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2016-11-25	2017-11-24
BACL	Temperature & Humidity Chamber	BTH-150	30023	2016-10-10	2017-10-09
EAST	Adjustable DC Power Supply	MCH-303D-II	14070562	/	/
Agilent	Power Meter	N1912A	MY5000492	2016-11-18	2017-11-17
Agilent	Power Sensor	N1921A	MY54210024	2016-11-18	2017-11-17
Queclink	RF Cable	N/A	N/A	2017-09-26	2018-09-25

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## **FCC§1.1307& §2.1091 – MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

### **Applicable Standard**

According to subpart §2.1091 and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Averaging Time (minutes)</b>
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; \* = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

**Calculated Data:**

Mode	Max Tune-up power (dBm)	ERP/EIRP Limit (dBm)	Max Antenna Gain (dBi)
GSM 850/ GPRS 850	31	38.45	7.45
GSM1900/ GPRS1900	30	33.00	3.00

Mode	Frequency	Antenna Gain		Max Average Time-base Output Power		Evaluation Distance	Power Density	MPE Limit
	(MHz)	(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
GSM 850/ GPRS850	824.2	8.45	7.00	26	398.11	20	0.55	0.55
GSM1900/ GPRS1900	1880.0	13.02	20.04	24	251.19	20	1.00	1.00

Mode	Max Allow Antenna Gain (dBi)
GSM 850/ GPRS850	7.0
GSM1900/ GPRS1900	3.0

**Note :**

## 1. The target output power:

GSM 850: 30.5±0.5dBm, Maximum power 31dBm, Max Average Time-base power 22dBm;  
 GSM 1900: 29±1dBm, Maximum power 30dBm, Max Average Time-base power 21dBm;  
 GPRS 850: 1 slot 30.5±0.5dBm, 2 slots 30.5±0.5dBm, 3 slots 29.5±0.5dBm, 4 slots 28.5±0.5dBm  
 Max Average Time-base power 26dBm;  
 GPRS 1900: 1 slot 29±1dBm, 2slots 29±1dBm, 3 slots 27.5±0.5dBm, 4 slots 26.5±0.5dBm  
 Max Average Time-base power 24dBm.

which declared by the manufacturer.

Number of Time slot	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.08
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.26 dB	-3 dB

2. To meet RF exposure & ERP/ERIP, the maximum net gain of antennas allowed are 7.0dBi@ GSM 850/ GPRS 850 and 3.00@ GSM1900/ GPRS1900. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

## **FCC §2.1047 – MODULATION CHARACTERISTIC**

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According to FCC § 2.1047(d) , Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## FCC §2.1046; § 22.913 (a);§ 24.232 (c) – RF OUTPUT POWER

### Applicable Standards

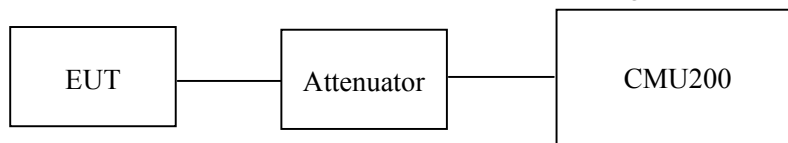
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §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..

### Test Procedure

*Conducted method:*

The RF output of the transmitter was connected to the CMU200 through sufficient attenuation.



### Test Data

#### Environmental Conditions

Temperature:	23.6 °C
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

*The testing was performed by Ray Wang on 2017-09-26.*

### Conducted Power

#### Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	30.87	38.45
	190	836.6	30.82	38.45
	251	848.8	30.75	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	30.99	30.92	29.32	28.73	38.45
	190	836.6	30.92	30.84	29.28	28.51	38.45
	251	848.8	30.77	30.75	29.09	28.46	38.45

**PCS Band (Part 24E)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.51	33
	661	1880.0	29.59	33
	810	1909.8	29.54	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.41	28.03	27.03	26.09	33
	661	1880.0	29.58	28.87	27.28	26.41	33
	810	1909.8	29.52	28.83	27.16	26.26	33

**Peak-to-average ratio (PAR)****PCS Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	2.38	13
	Middle	2.24	13
	High	2.11	13

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.34	13
	Middle	2.25	13
	High	2.19	13

**Radiated Power****GMSK Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
Cellular Band (Part 22H), Middle Channel										
836.60	80.24	352	115	H	25.49	0.30	4.86	30.05	38.45	8.40
836.60	79.52	125	214	V	27.14	0.30	4.86	31.70	38.45	6.75
PCS Band (Part 24E), Middle Channel										
1880.00	88.58	118	247	H	19.94	0.84	8.74	27.84	33.00	5.16
1880.00	90.71	226	143	V	20.05	0.84	8.74	27.95	33.00	5.05

**Note:**

All above data were tested with no amplifier.

Absolute Level = Submitted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

## **FCC §2.1049, §22.917, §22.905 & §24.238 – OCCUPIED BANDWIDTH**

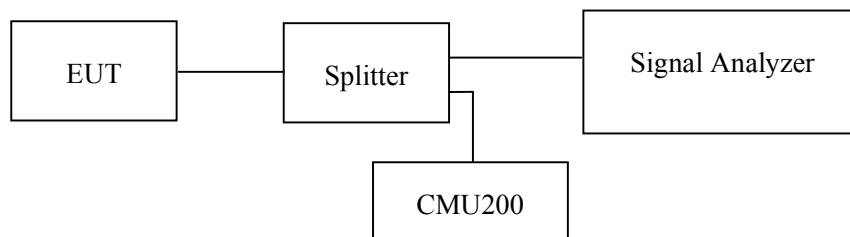
### **Applicable Standards**

FCC 47 §2.1049, §22.917, §22.905, §24.238.

### **Test Procedure**

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 5 kHz (Cellular /PCS) & 100 kHz (WCDMA) and the 26 dB & 99% bandwidth was recorded.



### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	23.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	101.3kPa

*The testing was performed by Ray Wang on 2017-09-26.*

*EUT operation mode: Transmitting*

**Test Result:** Compliant.

#### **Cellular Band (Part 22H)**

<b>Mode</b>	<b>Frequency (MHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>	<b>26 dB Emission Bandwidth (kHz)</b>
GSM(GMSK)	836.6	248.50	318.64

#### **PCS Band (Part 24E)**

<b>Mode</b>	<b>Frequency (MHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>	<b>26 dB Emission Bandwidth (kHz)</b>
GSM(GMSK)	1880.0	252.51	320.64



### 99% Occupied & 26 dB Emissions Bandwidth for GSM (GMSK) Mode



## FCC § 2.1051; § 22.917 (a);§ 24.238 (a) – SPURIOUS EMISSIONS AT ANTENNA TERMINALS

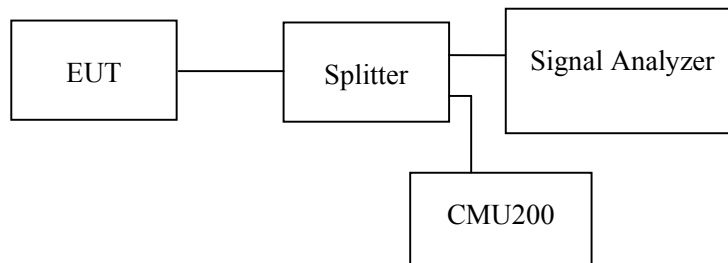
### Applicable Standards

FCC §2.1051, §22.917(a) and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

### Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.



### Test Data

#### Environmental Conditions

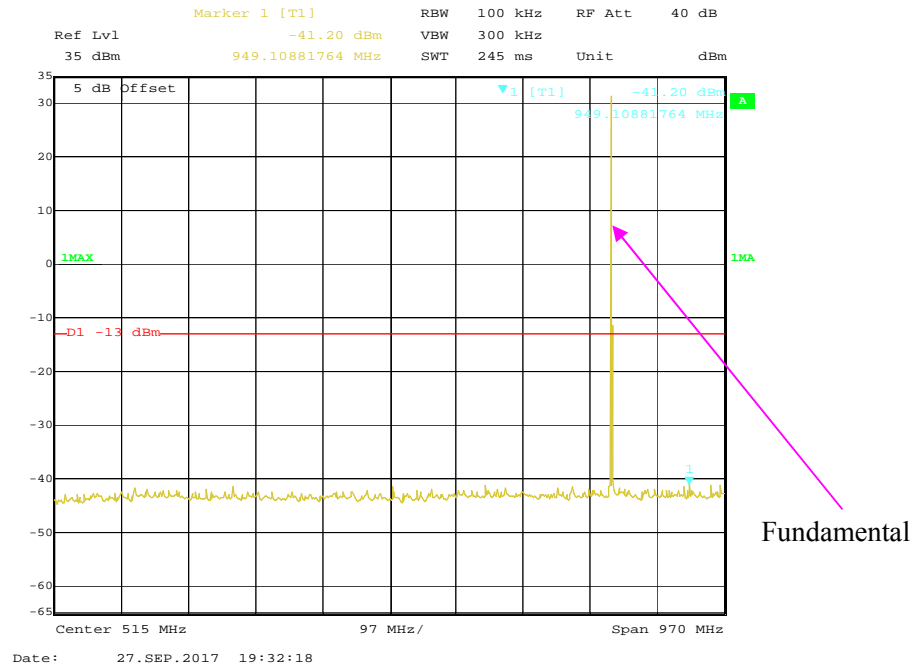
Temperature:	23.6 °C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

*The testing was performed by Ray Wang on 2017-09-27.*

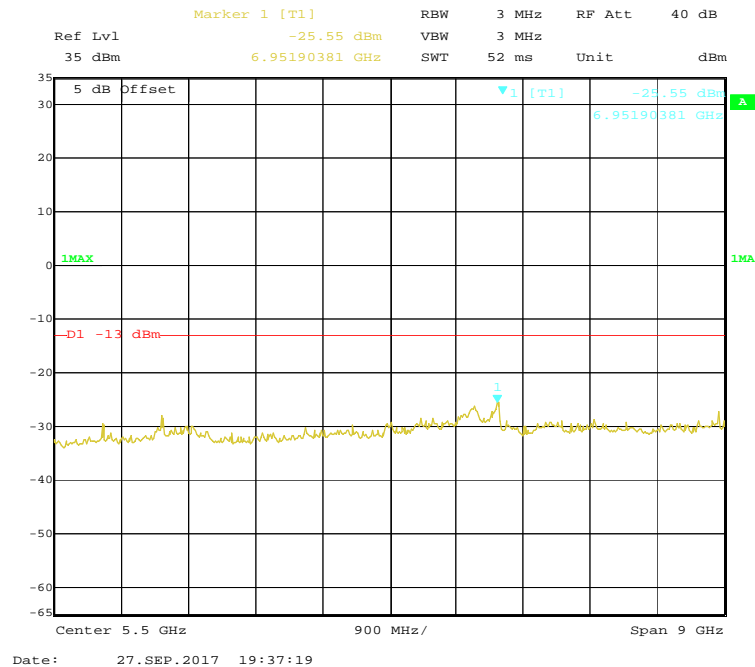
*EUT operation mode: Transmitting*

**Cellular Band (Part 22H)**

**30 MHz – 1 GHz (GSM Mode)**

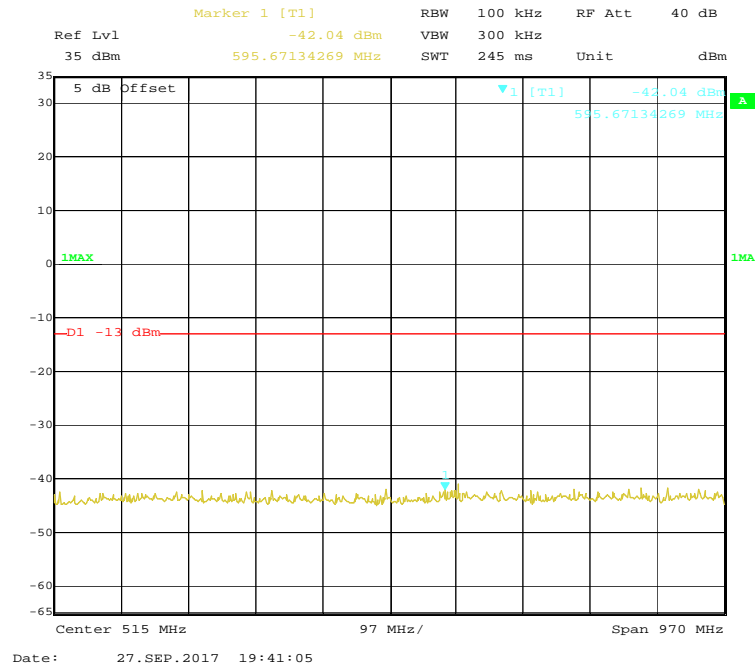


**1 GHz – 10 GHz (GSM Mode)**

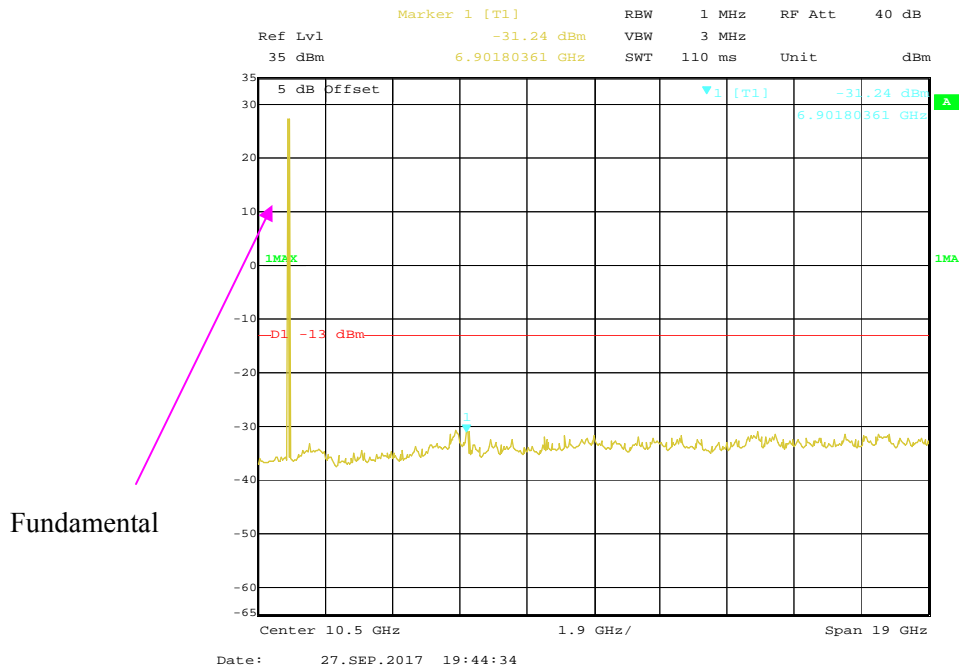


PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



1 GHz – 20 GHz (GSM Mode)



## **FCC § 2.1053; § 22.917 (a);§ 24.238 (a) – SPURIOUS RADIATED EMISSIONS**

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### **Applicable Standards**

FCC § 2.1053, §22.917(a) and § 24.238(a)

### **Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

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.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \lg (\text{TX pwr in Watts}/0.001)$  – the absolute level

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

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	101.3kPa

The testing was performed by Ray Wang on 2017-09-26.

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

**30 MHz ~ 10 GHz:****Cellular Band (Part 22H)**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Middle channel										
341.75	31.62	39	150	H	-71.26	0.30	4.19	-67.37	-13	54.37
341.75	29.83	233	148	V	-71.35	0.30	4.19	-67.46	-13	54.46
1673.20	67.33	50	150	H	-42.83	0.39	8.48	-34.74	-13	21.74
1673.20	67.00	305	209	V	-45.10	0.39	8.48	-37.01	-13	24.01
2509.80	57.22	350	209	H	-53.69	0.49	10.09	-44.09	-13	31.09
2509.80	55.46	122	176	V	-56.16	0.49	10.09	-46.56	-13	33.56

**30 MHz ~ 20 GHz:****PCS Band (Part 24E)**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Middle channel										
542.33	32.62	177	139	H	-66.29	0.30	4.59	-62.00	-13	49.00
542.33	30.98	243	175	V	-66.11	0.30	4.59	-61.82	-13	48.82
3760.00	66.29	197	194	H	-39.04	0.59	9.74	-29.89	-13	16.89
3760.00	71.26	61	213	V	-35.19	0.59	9.74	-26.04	-13	13.04
5640.00	51.93	199	183	H	-49.72	0.67	10.47	-39.92	-13	26.92
5640.00	50.27	176	167	V	-53.25	0.67	10.47	-43.45	-13	30.45

**Note:**

Absolute Level = Submitted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

**FCC § 22.917 (a);§ 24.238 (a) – BAND EDGES****Applicable Standards**

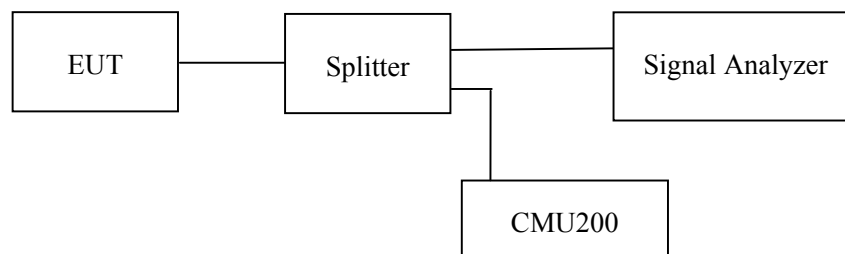
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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.

**Test Procedure**

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency

**Test Data****Environmental Conditions**

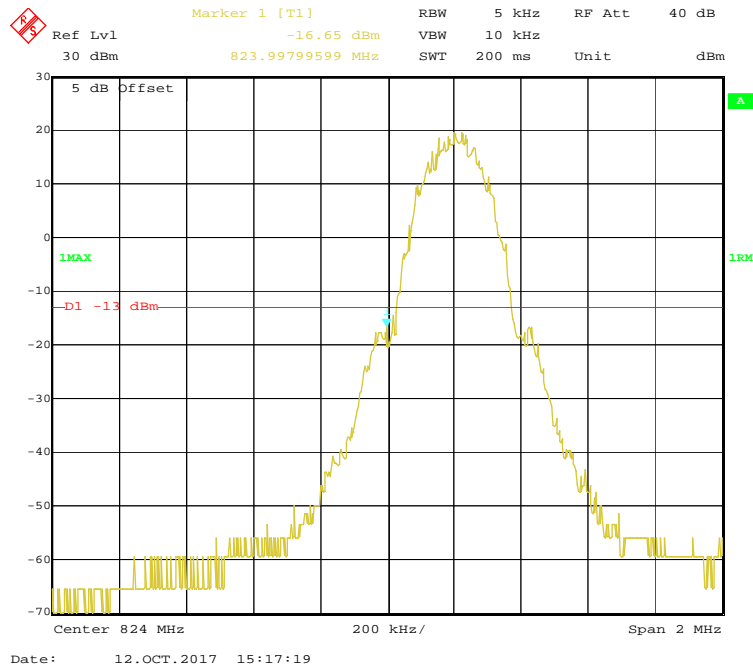
Temperature:	23.6 °C
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

*The testing was performed by Ray Wang on 2017-10-12.*

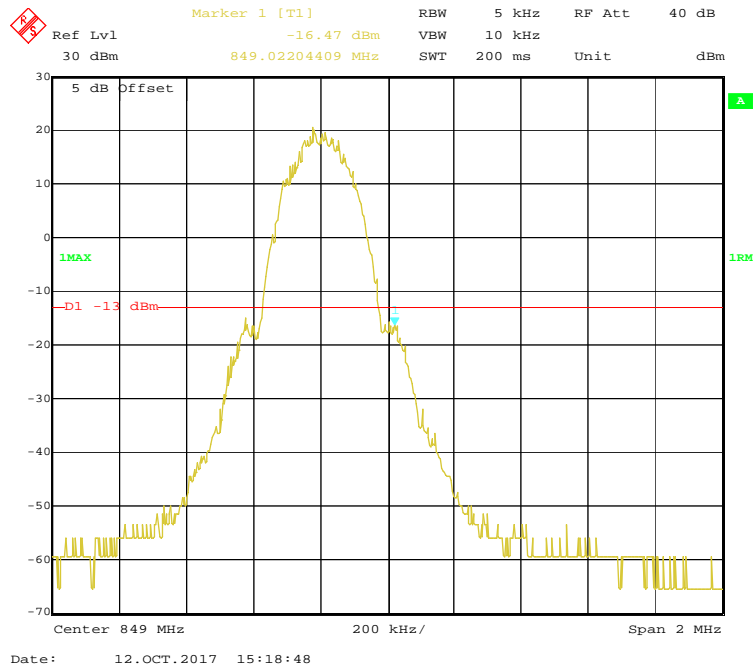
*EUT operation mode: Transmitting*

**Test Result:** Compliant

### Cellular Band, Left Band Edge for GSM (GMSK) Mode

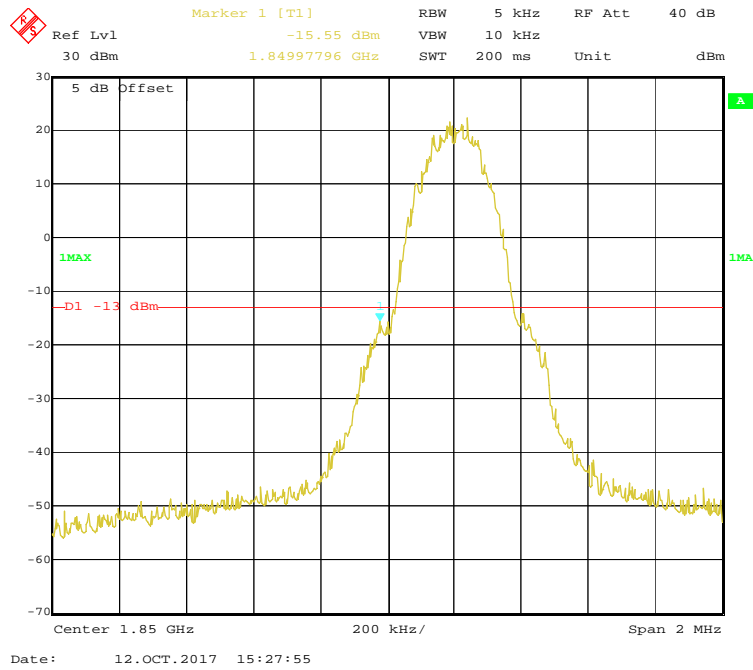


### Cellular Band, Right Band Edge for GSM (GMSK) Mode

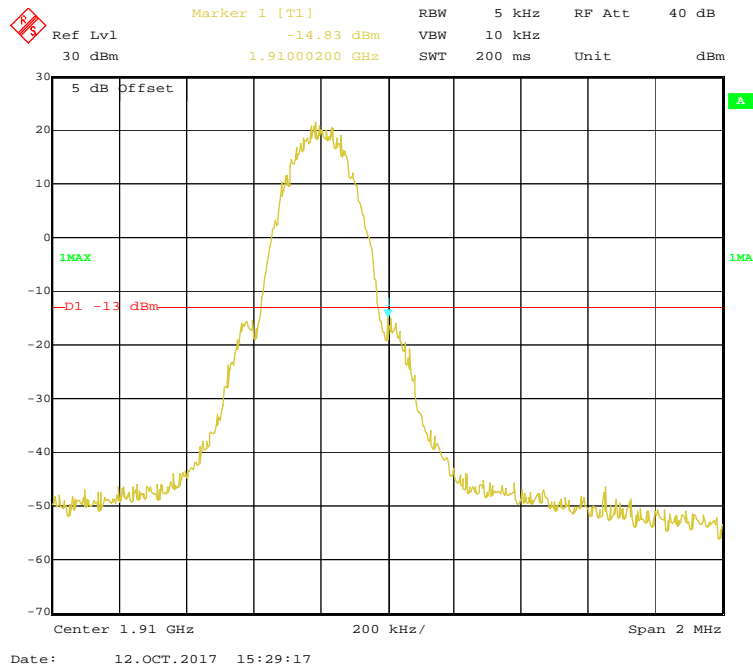




### PCS Band, Left Band Edge for GSM (GMSK) Mode



### PCS Band, Right Band Edge for GSM (GMSK) Mode



## **FCC § 2.1055; § 22.355;§ 24.235 – FREQUENCY STABILITY**

### **Applicable Standards**

FCC § 2.1055, §22.355, §24.235.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

**Frequency Tolerance for Transmitters in the Public Mobile Services**

<b>Frequency Range (MHz)</b>	<b>Base, fixed (ppm)</b>	<b>Mobile &gt; 3 watts (ppm)</b>	<b>Mobile ≤ 3 watts (ppm)</b>
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

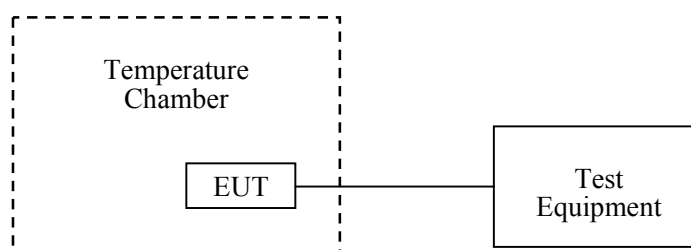
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### **Test Procedure**

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



**Test Data****Environmental Conditions**

<b>Temperature:</b>	23.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	101.3kPa

*The testing was performed by Ray Wang on 2017-09-26.*

*EUT operation mode: Transmitting*

**Test Result:** Compliance.

**Power supply by battery:****Cellular Band (Part 22H)****GSM Mode**

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	4.0	13	0.0155	2.5
-20		12	0.0143	2.5
-10		12	0.0143	2.5
0		11	0.0131	2.5
10		10	0.0120	2.5
20		2	0.0024	2.5
30		9	0.0108	2.5
40		13	0.0155	2.5
50		6	0.0072	2.5
25	V min.= 3.4	7	0.0084	2.5
25	V max.= 4.5	12	0.0143	2.5

**PCS Band (Part 24E)****GSM Mode**

<b>Middle Channel, <math>f_o</math> =1880.0 MHz</b>				
<b>Temperature (°C)</b>	<b>Power Supplied (V<sub>DC</sub>)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Result</b>
-30	4.0	18	0.0096	Pass
-20		17	0.0090	Pass
-10		17	0.0090	Pass
0		15	0.0080	Pass
10		15	0.0080	Pass
20		6	0.0032	Pass
30		16	0.0085	Pass
40		14	0.0074	Pass
50		6	0.0032	Pass
25	V min.= 3.4	6	0.0032	Pass
25	V max.= 4.5	3	0.0016	Pass

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