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-GMT200

Report Type:	**Product Type:**
Original Report	Compact Motorcycle GPS Tracker

Test Engineer:	Belle Cheng
Report Number:	RKS170602004-00B
Report Date:	2017-06-13
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Manufacturer	Queclink Wireless Solutions Co., Ltd
Model	GMT200
Product	Compact Motorcycle GPS Tracker
Dimension	70mm(L)×46mm(W)×17.5mm(H)
Power Supply	1: DC 9-32V supplied by DC source 2: DC 5V power by USB port 3: 3.7V power by battery

**All measurement and test data in this report was gathered from production sample serial number: 20170525017. (Assigned by BACL, Kunshan). The EUT was received on 2017-05-25.*

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	±5.91dB
	Above 1GHz	±4.92dB
Occupied Bandwidth		±0.5kHz
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.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports Submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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

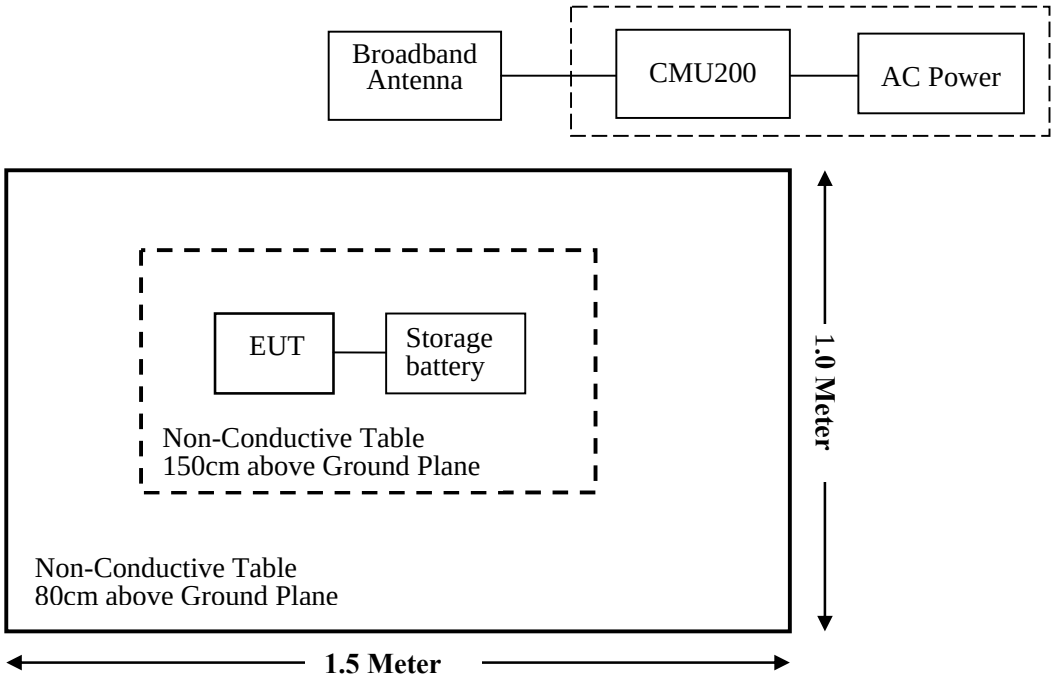
Manufacturer	Description	Model	Serial Number
Tianneng	Storage battery	6-DZM-12	1511064-3IG02071002DZ12
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605

External Cable List and Details

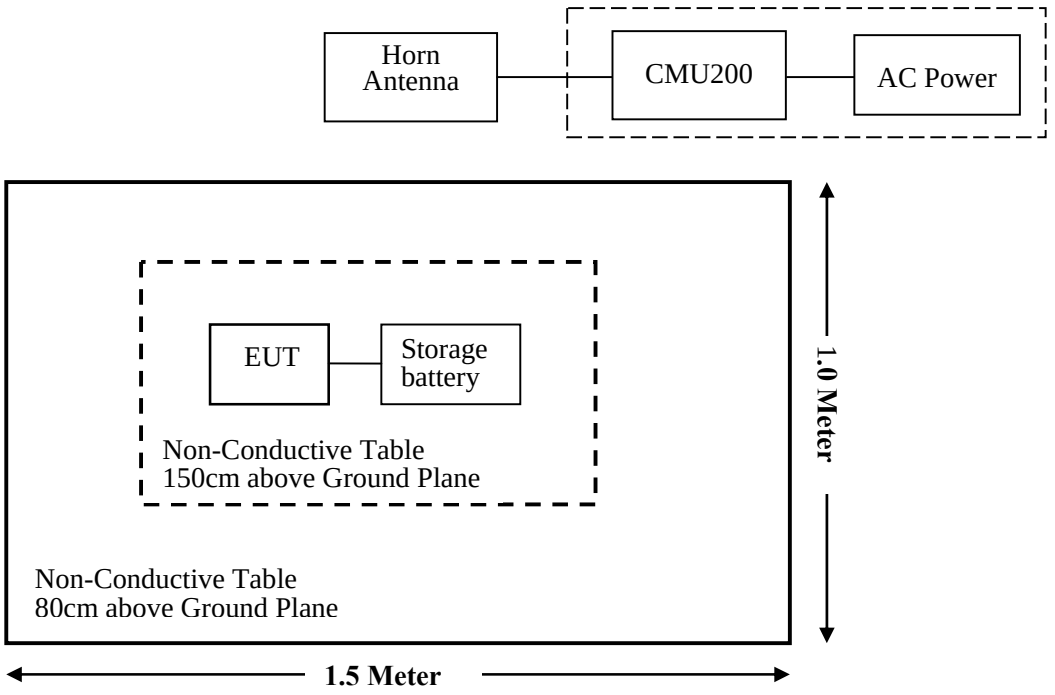
Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions(Below 1GHz)



For Radiated Emissions(Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§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
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
HP	Signal Generator	8341B	DE23437	2016-08-29	2017-08-28
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A040914-1	2016-01-09	2019-01-08
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
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	2016-10-18	2019-10-17
Sonoma Instrument	Pre-amplifier	330N	160904	2016-10-21	2017-10-20
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
Haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-7	007	2016-12-12	2017-12-11
Tianneng	Storage battery	6-DZM-12	1511064-3IG02071002DZ12	/	/
RF Conducted Test					
Rohde & Schwarz	FSV40 Signal Analyzer	FSV40	101116	2016-07-04	2017-07-03
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION	CMU200	110605	2016-11-25	2017-11-24
BACL	Temperature & Humidity Chamber	BTH-150	30023	2016-10-10	2017-10-09
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	/	/
Queclink	RF Cable	N/A	N/A	2017-06-08	2018-06-07
Tianneng	Storage battery	6-DZM-12	1511064-3IG02071002DZ12	/	/

*** 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 §2.1051and 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) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f²)	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^2);
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	Frequency Range	Antenna Gain		Output Power		Evaluation Distance	Power Density	MPE Limit
	(MHz)	(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm^2)	(mW/cm^2)
GPRS 850	824.2-848.8	-2.00	0.63	26.5	446.68	20	0.0561	0.57
GPRS1900	1850.2-1909.8	-1.00	0.79	24.5	281.84	20	0.0445	1.00

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

Note: The target output power:
GPRS 850: 1 slot 32.5±0.5dBm, 2slot 32±0.5dBm max average power 26.5dBm
GPRS 1900: 1 slot 31±0.5dBm, 2slot 30±0.5dBm max average power 24.5dBm
Which declared by the manufacturer.

Result: The device meet FCC MPE at 20 cm distance.

FCC §2.1047 – MODULATION CHARACTERISTIC

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

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

Applicable Standards

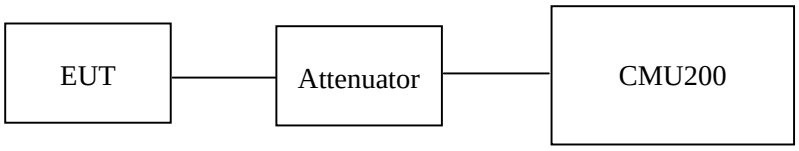
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

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:	23.1 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)		Limit (dBm)
			1 slot	2 slots	
GPRS	128	824.2	32.81	32.31	38.45
	190	836.6	32.74	32.31	38.45
	251	848.8	32.97	32.50	38.45

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)		Limit (dBm)
			1 slot	2 slots	
GPRS	512	1850.2	31.03	30.30	33
	661	1880.0	30.81	30.06	33
	810	1909.8	30.64	29.99	33

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.19	13
	Middle	2.25	13
	High	2.30	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.19	13
	Middle	2.31	13
	High	2.28	13

Radiated Power

GPRS 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										
836.6	78.24	115	135	H	25.86	0.30	4.86	30.42	38.45	8.03
836.6	75.35	127	110	V	20.60	0.30	4.86	25.16	38.45	13.29
PCS Band (Part 24E), Middle Channel										
1880.00	89.63	284	146	H	21.18	0.44	8.81	29.55	33.01	3.46
1880.00	89.34	166	325	V	18.68	0.44	8.81	27.05	33.01	5.96

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

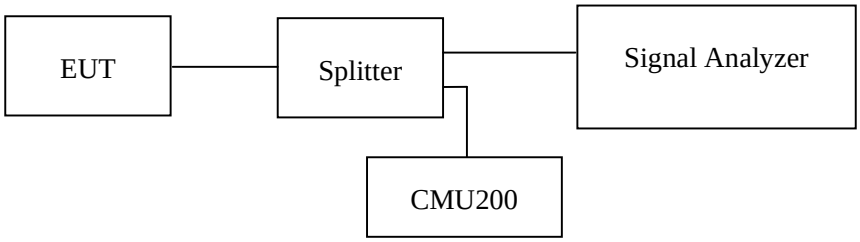
Applicable Standards

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

Temperature:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

Cellular Band (Part 22H)

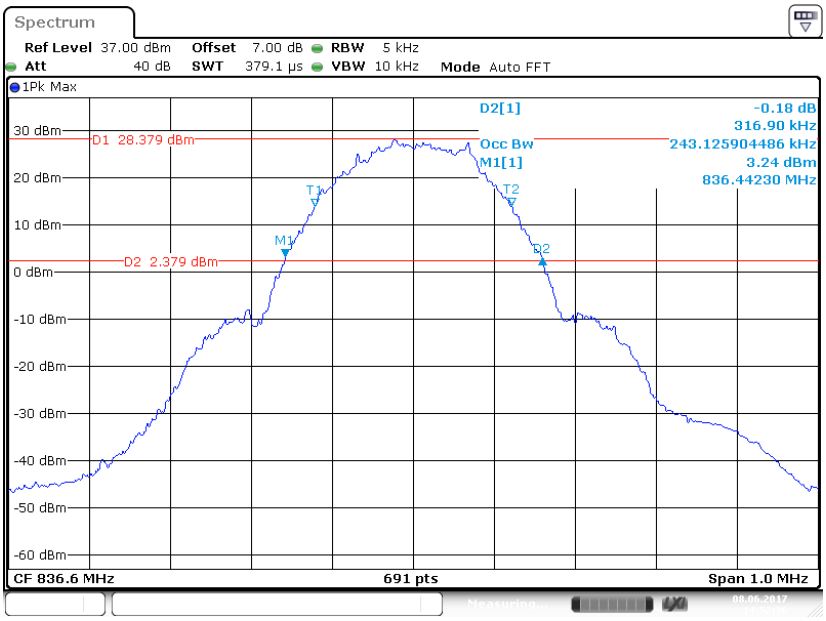
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GPRS(GMSK)	836.6	243.12	316.90

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GPRS(GMSK)	1880.0	246.02	325.60

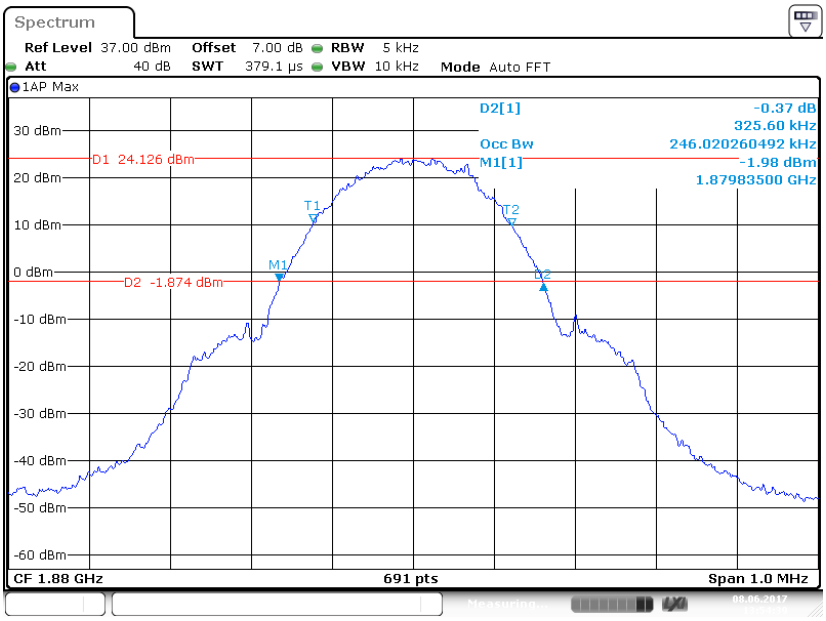
Cellular Band (Part 22H)

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



PCS Band (Part 24E)

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



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

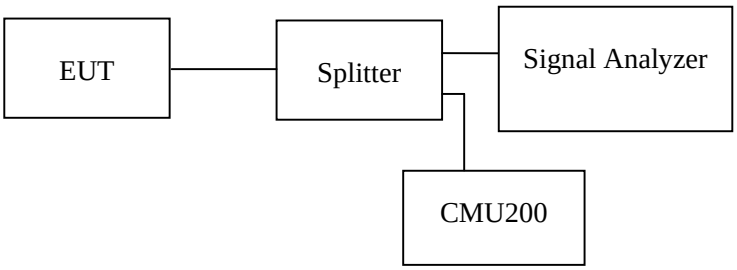
Applicable Standards

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^{th} harmonic.



Test Data

Environmental Conditions

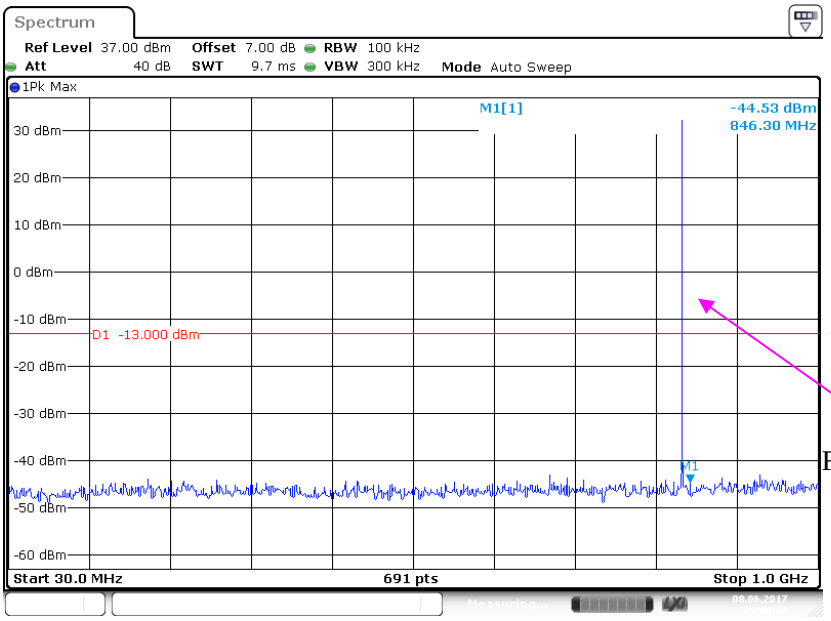
Temperature:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

Please refer to the following plots.

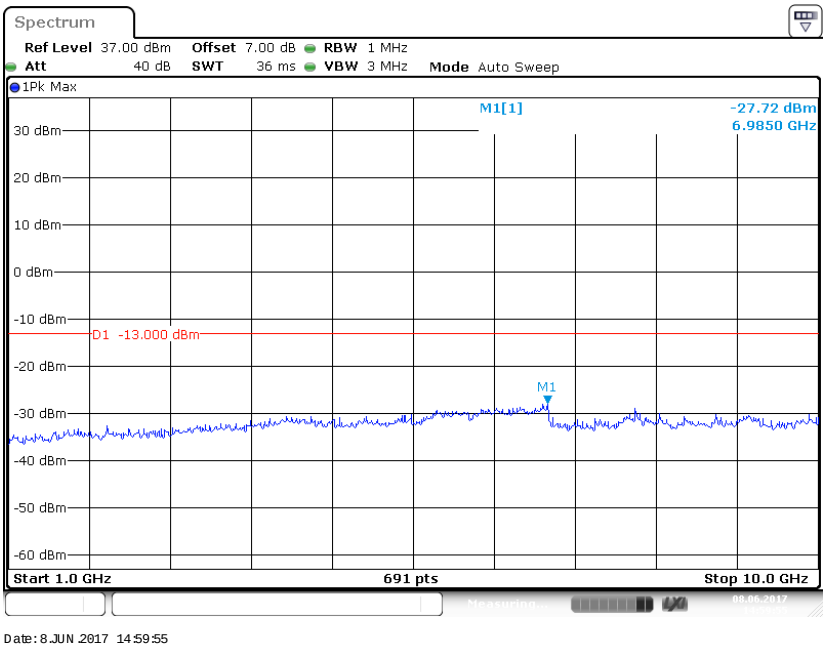
Cellular Band (Part 22H)

30 MHz – 1 GHz (GPRS Mode)



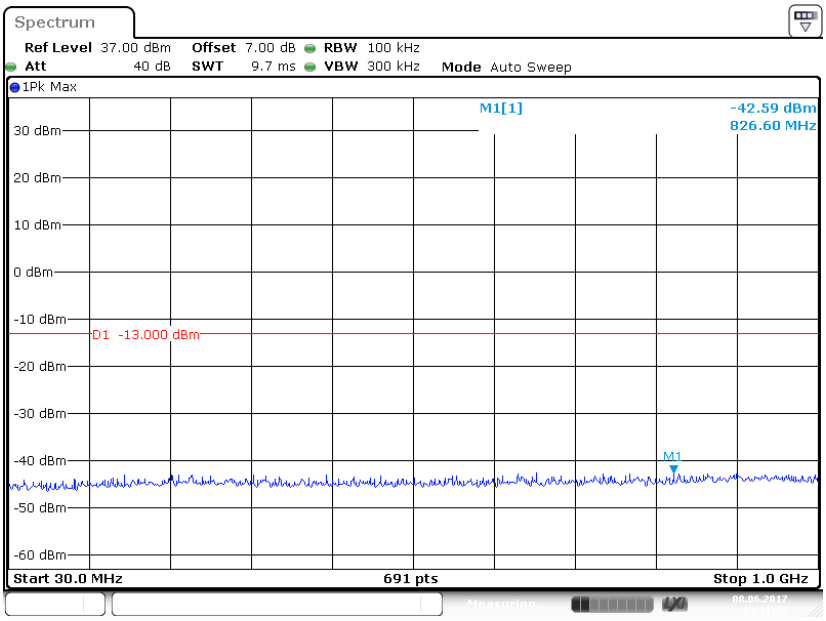
Fundamental test

1 GHz – 10 GHz (GPRS Mode)



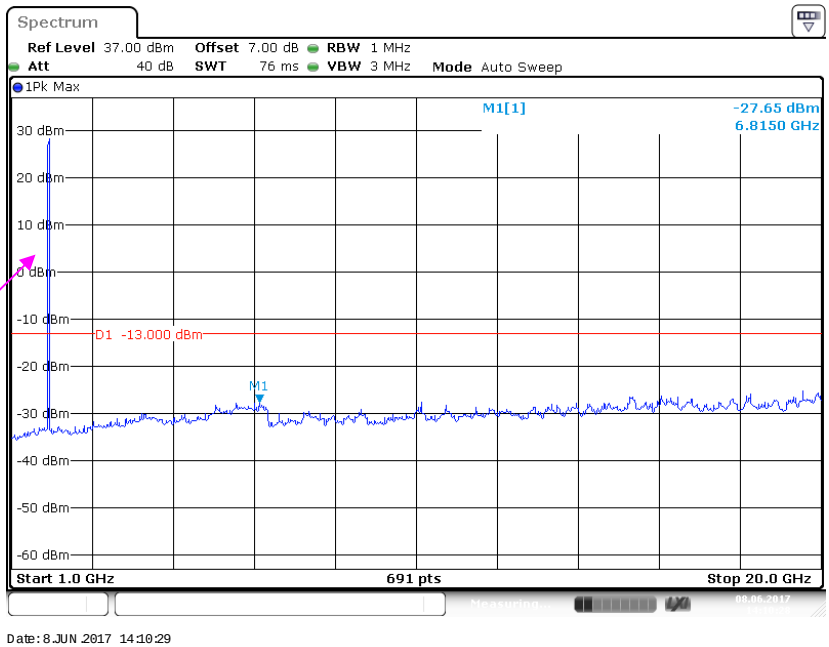
PCS Band (Part 24E)

30 MHz – 1 GHz (GPRS Mode)



1 GHz – 20 GHz (GPRS Mode)

Fundamental test



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

Applicable Standards

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

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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 (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

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)			
GPRS Mode, Middle channel										
289.34	34.18	346	217	H	-69.40	0.20	3.83	-65.77	-13	52.77
289.34	33.67	162	128	V	-68.51	0.20	3.83	-64.88	-13	51.88
1673.20	42.37	72	227	H	-67.79	0.39	8.48	-59.70	-13	46.70
1673.20	43.36	73	128	V	-68.74	0.39	8.48	-60.65	-13	47.65
2509.80	43.25	153	241	H	-67.66	0.49	10.09	-58.06	-13	45.06
2509.80	42.17	33	225	V	-69.45	0.49	10.09	-59.85	-13	46.85

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)			
GPRS Mode, Middle channel										
289.34	35.26	43	195	H	-68.32	0.20	3.83	-64.69	-13	51.69
289.34	34.58	307	208	V	-67.60	0.20	3.83	-63.97	-13	50.97
3760.00	43.03	14	153	H	-62.30	0.59	9.74	-53.15	-13	40.15
3760.00	44.18	324	101	V	-62.27	0.59	9.74	-53.12	-13	40.12
5640.00	43.67	14	144	H	-57.98	0.67	10.47	-48.18	-13	35.18
5640.00	42.35	243	185	V	-61.17	0.67	10.47	-51.37	-13	38.37

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.

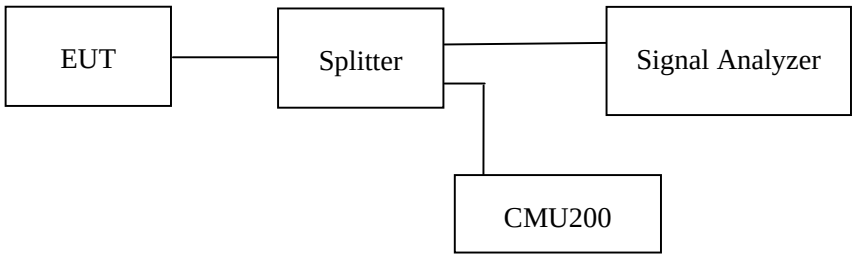
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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

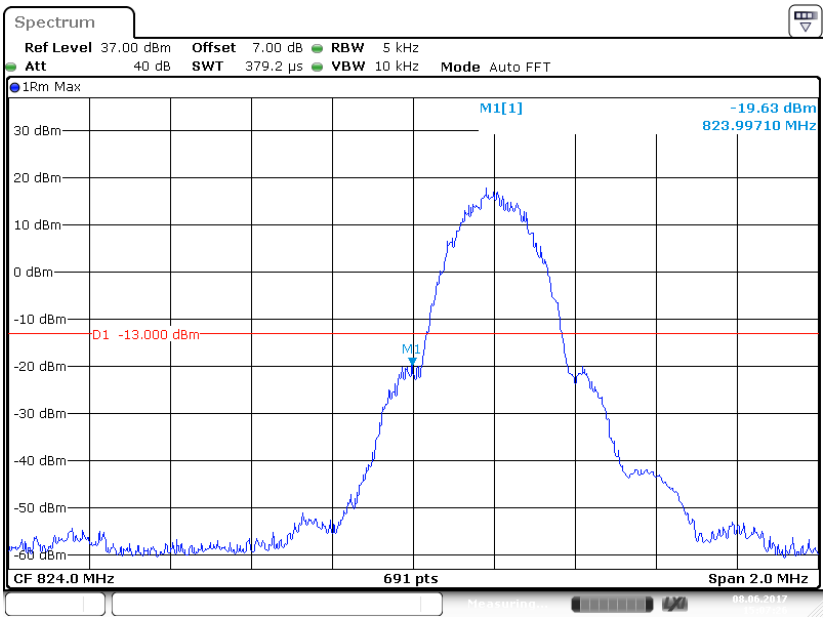
Temperature:	23.1 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GPRS (GMSK) Mode



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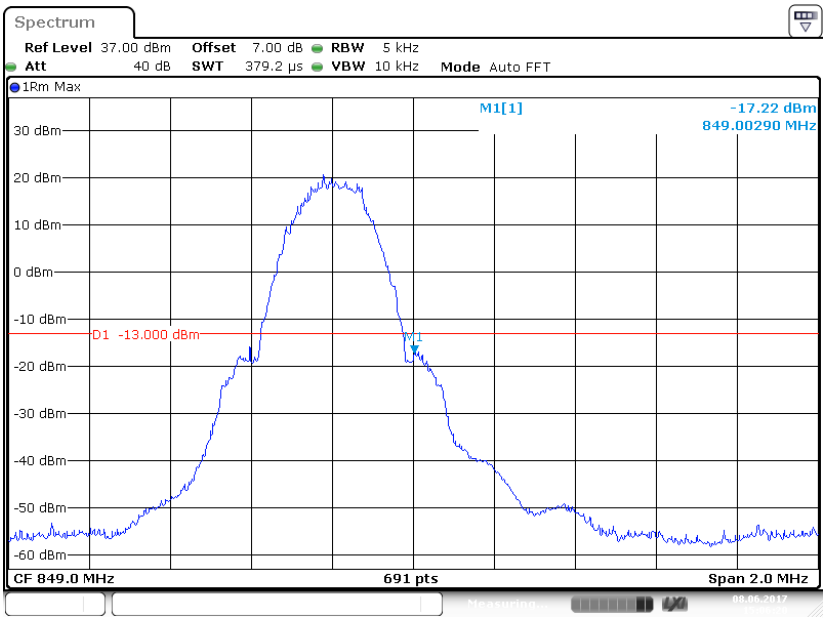
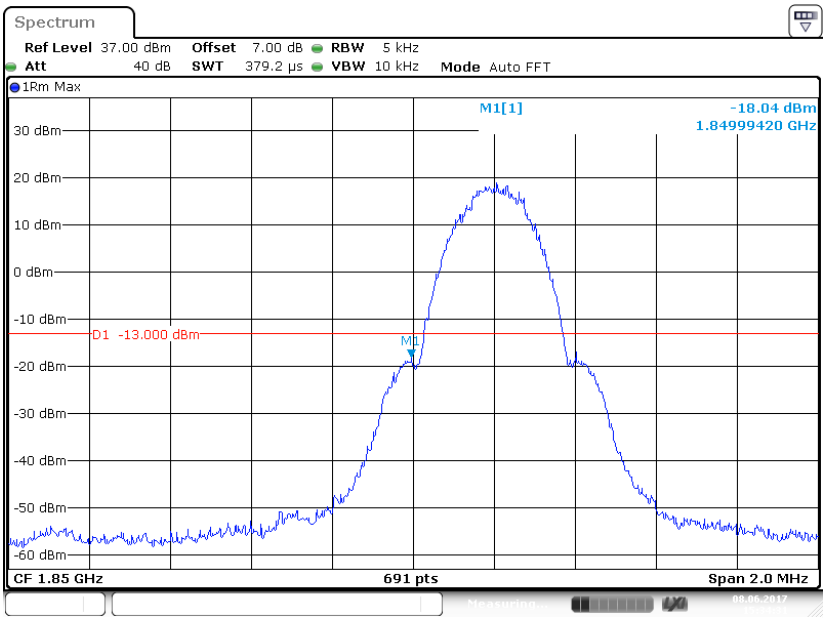
Cellular Band, Right Band Edge for GPRS (GMSK) Mode



Date: 8.JUN.2017 15:06:20

PCS Band, Left Band Edge for GPRS (GMSK) Mode



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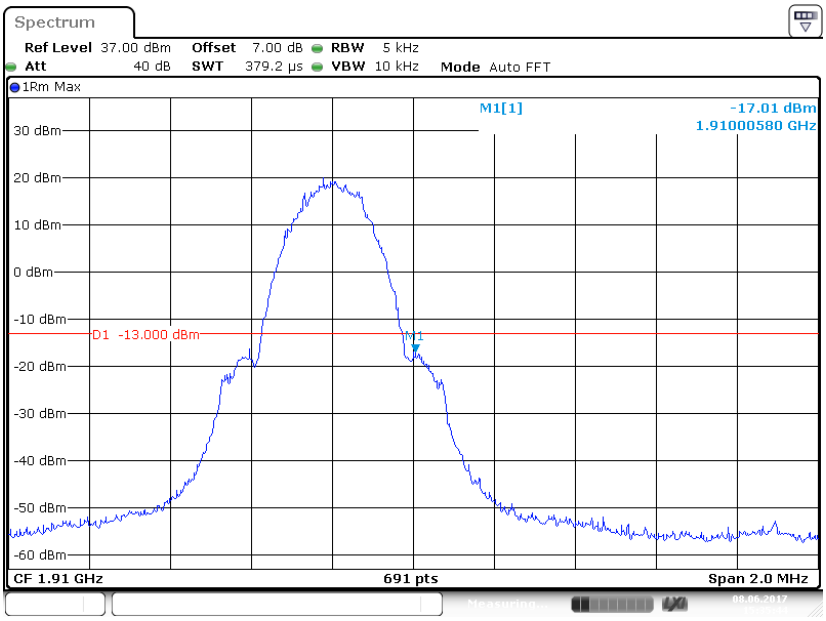
PCS Band, Right Band Edge for GPRS (GMSK) Mode



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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

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

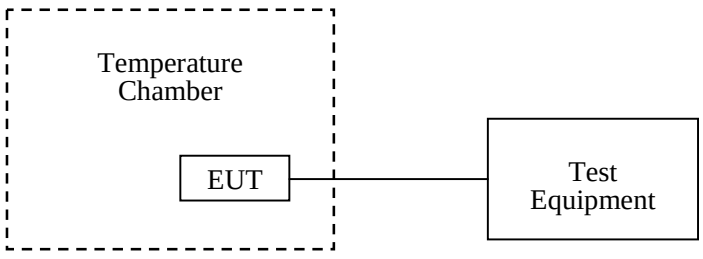
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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

Temperature:	23.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Belle Cheng on 2017-06-08.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

Cellular Band (Part 22H)

GPRS Mode

Power supply by DC source

Middle Channel, f_o =836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	12	11	0.013	2.5
-20		12	0.014	2.5
-10		12	0.014	2.5
0		12	0.014	2.5
10		11	0.013	2.5
20		-1	-0.001	2.5
30		9	0.011	2.5
40		10	0.012	2.5
50		9	0.011	2.5
25	V min.= 9	4	0.005	2.5
25	V max.= 32	11	0.013	2.5

Power supply by USB port

Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	5.0	10	0.012	2.5
-20		11	0.013	2.5
-10		12	0.014	2.5
0		12	0.014	2.5
10		11	0.013	2.5
20		-2	-0.002	2.5
30		4	0.005	2.5
40		8	0.010	2.5
50		9	0.011	2.5

Power supply by battery

Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	12	0.014	2.5
-20		11	0.013	2.5
-10		12	0.014	2.5
0		9	0.011	2.5
10		10	0.012	2.5
20		-1	-0.001	2.5
30		7	0.008	2.5
40		9	0.011	2.5
50		10	0.012	2.5
25	V min.= 3.5	6	0.007	2.5
25	V max.= 4.2	8	0.010	2.5

PCS Band (Part 24E)

GPRS Mode

Power supply by DC source

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	12	17	0.009	pass
-20		17	0.009	pass
-10		17	0.009	pass
0		18	0.010	pass
10		17	0.009	pass
20		5	0.003	pass
30		13	0.007	pass
40		8	0.004	pass
50		10	0.005	pass
25	V min.= 9	13	0.007	pass
25	V max.= 32	9	0.005	pass

Power supply by USB port

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	5.0	17	0.009	pass
-20		16	0.009	pass
-10		16	0.009	pass
0		15	0.008	pass
10		10	0.005	pass
20		-1	-0.001	pass
30		9	0.005	pass
40		6	0.003	pass
50		10	0.005	pass

Power supply by battery

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	17	0.009	2.5
-20		16	0.009	2.5
-10		17	0.009	2.5
0		12	0.006	2.5
10		10	0.005	2.5
20		-2	-0.001	2.5
30		8	0.004	2.5
40		15	0.008	2.5
50		10	0.005	2.5
25	V min.= 3.5	5	0.003	2.5
25	V max.= 4.2	12	0.006	2.5

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