

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

Shanghai Rising Digital Co.,Ltd.

No 318 ,Chuanda Road , Pudong New District Shanghai China

FCC ID: 2AJONSECD-7I0A-35

Report Type: Original Report	Product Type: SECD-7I0A-35 display screen
Test Engineer: Winnie Yang	<i>Winnie Yang</i>
Report Number: RSHA181207001-00A	
Report Date: 2019-07-26	
Reviewed By: Kyle Xu RF Leader	<i>Kyle Xu</i>
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	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY.....	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
CHANNEL LIST	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL CABLE LIST AND DETAILS	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS.....	7
TEST EQUIPMENT LIST	8
FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)	10
APPLICABLE STANDARD	10
CALCULATED FORMULARY:.....	10
CALCULATED DATA:.....	11
FCC §2.1047 - MODULATION CHARACTERISTIC	12
§2.1046; § 22.913 (A); § 24.232 (C) - RF OUTPUT POWER.....	13
APPLICABLE STANDARDS.....	13
TEST PROCEDURE	13
TEST DATA	14
FCC §2.1049, §22.917, §22.905, §24.238 - OCCUPIED BANDWIDTH	16
APPLICABLE STANDARDS.....	16
TEST PROCEDURE	16
TEST DATA	16
§ 2.1051; § 22.917 (A); § 24.238 (A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	19
APPLICABLE STANDARDS.....	19
TEST PROCEDURE	19
TEST DATA	19
FCC § 2.1053; § 22.917 (A); § 24.238 (A) - SPURIOUS RADIATED EMISSIONS.....	22
APPLICABLE STANDARDS.....	22
TEST PROCEDURE	22
TEST DATA	22
FCC § 22.917 (A); § 24.238 (A) - BAND EDGES.....	24
APPLICABLE STANDARDS.....	24
TEST PROCEDURE	24
TEST DATA	24
FCC § 2.1055; § 22.355; § 24.235 - FREQUENCY STABILITY	27
APPLICABLE STANDARDS.....	27
TEST PROCEDURE	27
TEST DATA	28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Shanghai Rising Digital Co.,Ltd.
Tested Model	SECD-7I0A-35
Product Type	SECD-7I0A-35 display screen
Dimension	228mm(L)*140.4mm(W)*51.5mm(H)
Power Supply	DC12/24V

**All measurement and test data in this report was gathered from production sample serial number: 20181207001.
(Assigned by the BACL. The EUT supplied by the applicant was received on 2018-12-07)*

Objective

This type approval report is prepared on behalf of Shanghai Rising Digital 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)

No Related Submittal(s)/Grant(s).

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
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

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 and CAB identifier CN0004 under the ISED requirement. 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.

Channel List

Mode	Channel		Frequency
GPRS 850	Low	128	824.2
	Middle	190	836.6
	High	251	848.8
GPRS 1900	Low	512	1850.2
	Middle	661	1880.0
	High	810	1909.8

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

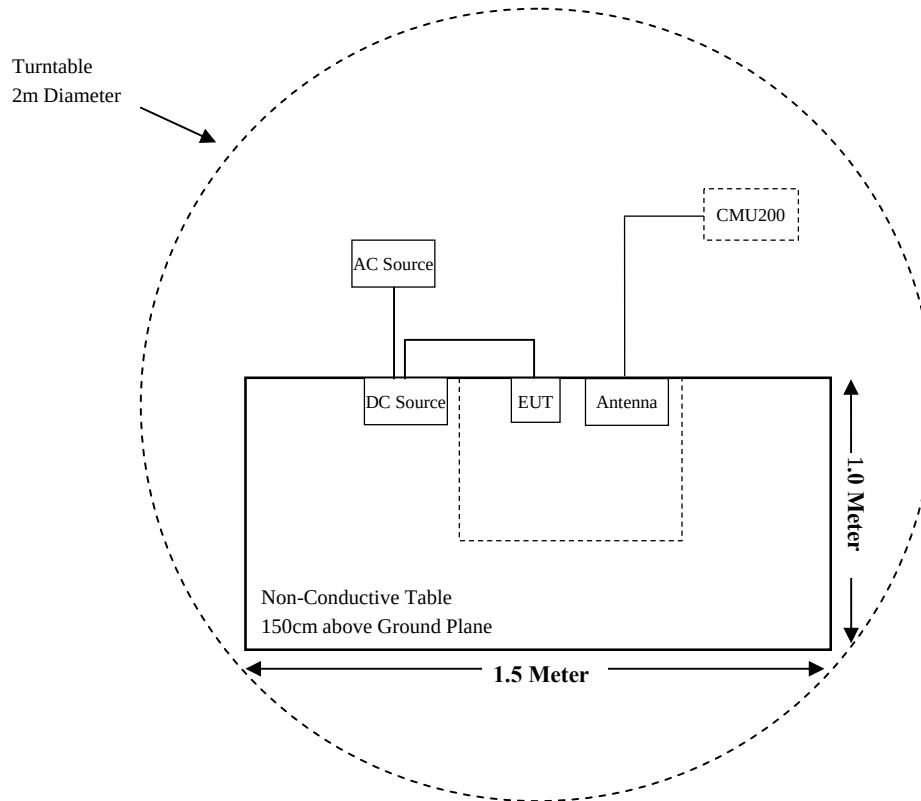
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605
ZHAOXIN	DC Power Supply	RXN-605D	DC002
Aihuaxin Technology	Antenna	/	/

External Cable List and Details

Cable Description	Length (m)	From Port	To
Power Cable	1.0	EUT	DC Source

Block Diagram of Test Setup

For Radiated Emissions(Below &Above 1GHz)



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliant
§2.1046; § 22.913 (a);§ 24.232 (c)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a)	Spurious Radiated Emissions	Compliant
§ 22.917 (a); § 24.238 (a)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-30	2019-11-29
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Bilog antenna	JB3	A060217	2017-08-04	2020-08-03
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-14	2019-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-7	007	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29
Radiated Emission Test (Chamber 2#)					
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3115	6229	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-11
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2018-08-15	2019-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2018-11-30	2019-11-29
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-12-20	2019-12-19
BEST	DC Power Supply	PS-1502D+	DC001	2018-10-10	2019-10-09
Rising	RF Cable	Rising 01	C01	Each Time	/

* **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 §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	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

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4 \pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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 (MHz)	Max Antenna Gain		Tune-up time based average power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
GPRS 850	824.2-848.8	2.70	1.86	25.50	354.81	20	0.1314	0.55
GPRS 1900	1850.2-1909.8	1.00	1.26	24.00	251.19	20	0.0629	1.00

Note:

1. The tune-up output power was declared by the Manufacturer.
2. GSM 850: Maximum target power: 1 slot 33.0 dBm, 2 slots 31.5 dBm, max time based average power 25.50dBm;
PCS 1900: Maximum target power: 1 slot 31.0 dBm, 2 slots 30.0 dBm, max time based average power 24.00dBm.
- 3: Antenna Gain (numeric): 2.70 dBi (1.86) for GPRS 850, 1.00 dBi(1.26) for GPRS 1900.
4. For GPRS Mode, the time based average power is relevant, the difference in between depends on the duty cycle of the TDMA signal.

Number of Time slot	1	2
Duty Cycle	1:8	1:4
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB

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.

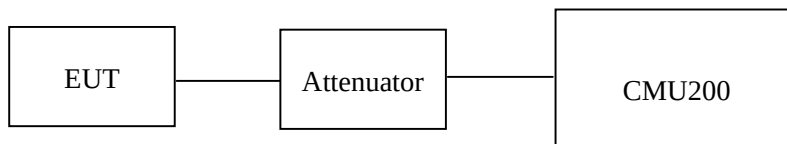
According to FCC §2.1046 and §24.232 (c), mobile and portable stations are limited to 2 watts(33dBm) EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications..

According to FCC §24.232 (d), The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

Test Procedure

Conducted method:

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



Radiated Output Power:

The measurements procedures specified in ANSI/TIA-603-D were applied.

- Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- Key the transmitter, then rotate the EUT 360o azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used,raise and lower the test antenna to obtain a maximum reading.
$$\text{LOSS} = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$$
- Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:
$$\text{ERP (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$$
- The maximum ERP is the maximum value determined in the preceding step.
(Note: Effective Isotropic Radiated Power (EIRP) can be computed using the following:
$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB.)}$$

Test Data**Environmental Conditions**

Temperature:	24.6°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

The testing was performed by Winnie Yang on 2019-06-24.

Conducted Power:**GPRS 850 Band**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)		Limit (dBm)
			1 slot	2 slots	
GPRS	128	824.2	32.74	31.02	38.45
	190	836.6	32.80	31.10	38.45
	251	848.8	32.96	31.23	38.45

GPRS 1900 Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)		Limit (dBm)
			1 slot	2 slots	
GPRS	512	1850.2	30.82	29.67	33.00
	661	1880.0	30.79	29.65	33.00
	810	1909.8	30.87	29.79	33.00

Peak-to-average ratio (PAR):**GPRS 1900 Band**

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.36	13
	Middle	2.28	13
	High	2.31	13

Radiated Power:

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 (dBd/dBi)			
GPRS 850, Middle Channel (ERP)										
836.6	95.62	96	150	H	34.65	0.63	-1.14	32.88	38.45	5.57
836.6	98.33	220	155	V	31.66	0.63	-1.14	29.89	38.45	8.56
GPRS 1900, Middle Channel (EIRP)										
1880.00	88.91	125	155	H	23.00	0.85	8.81	30.96	33	2.04
1880.00	87.26	185	169	V	20.98	0.85	8.81	28.94	33	4.06

Note:

All above data were tested with no amplifier

Absolute Level = Submitted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

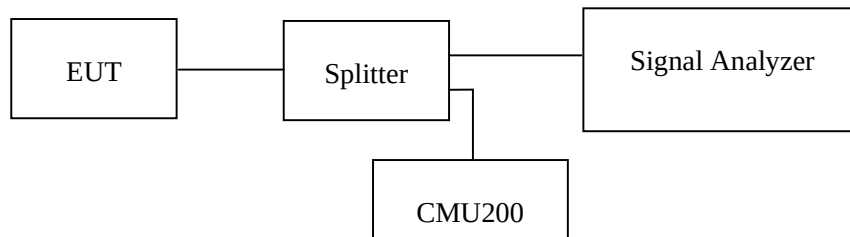
FCC §2.1049, §22.917, §22.905, §24.238 - OCCUPIED BANDWIDTH**Applicable Standards**

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 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.

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

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	101.0kPa

The testing was performed by Winnie Yang on 2019-06-24.

EUT operation mode: Transmitting

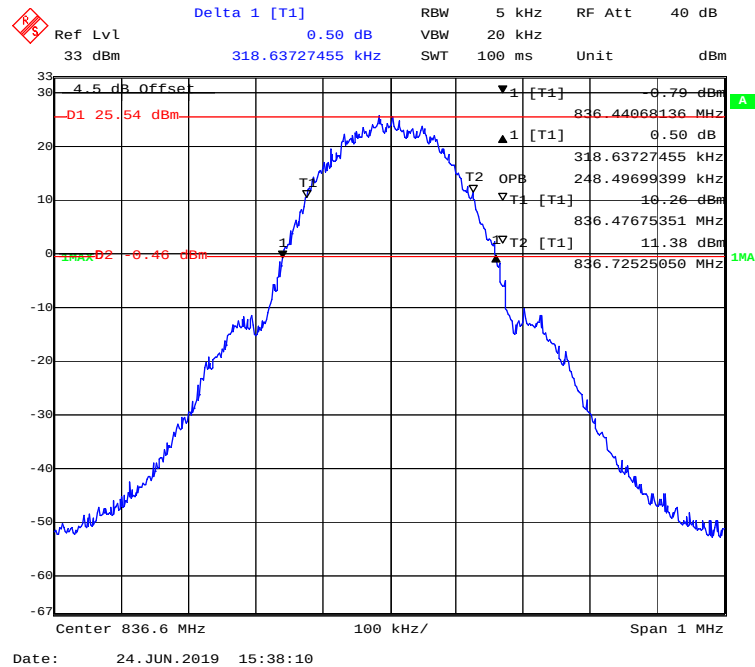
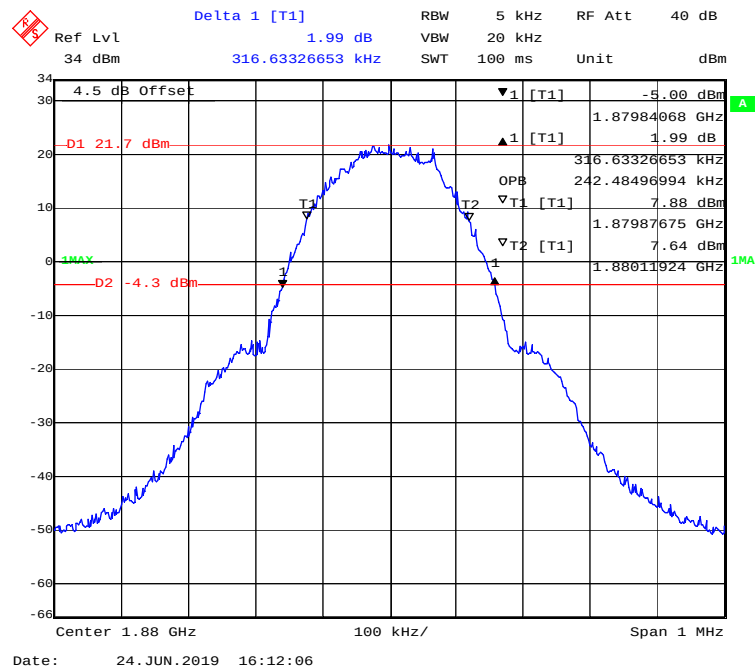
Test Result: Compliant.

GPRS 850 Band

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GPRS (GMSK)	836.6	0.319	0.248

GPRS 1900 Band

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GPRS (GMSK)	1880.0	0.317	0.242

GPRS 850 Band**99% Occupied & 26 dB Emissions Bandwidth for GPRS (GMSK) Mode****GPRS 1900 Band****99% Occupied & 26 dB Emissions Bandwidth for GPRS (GMSK) Mode**

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

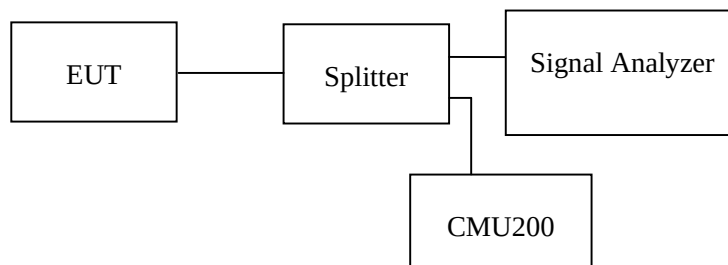
Applicable Standards

FCC §2.1051, §22.917(a), § 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 100kHz for below 1GHz & 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

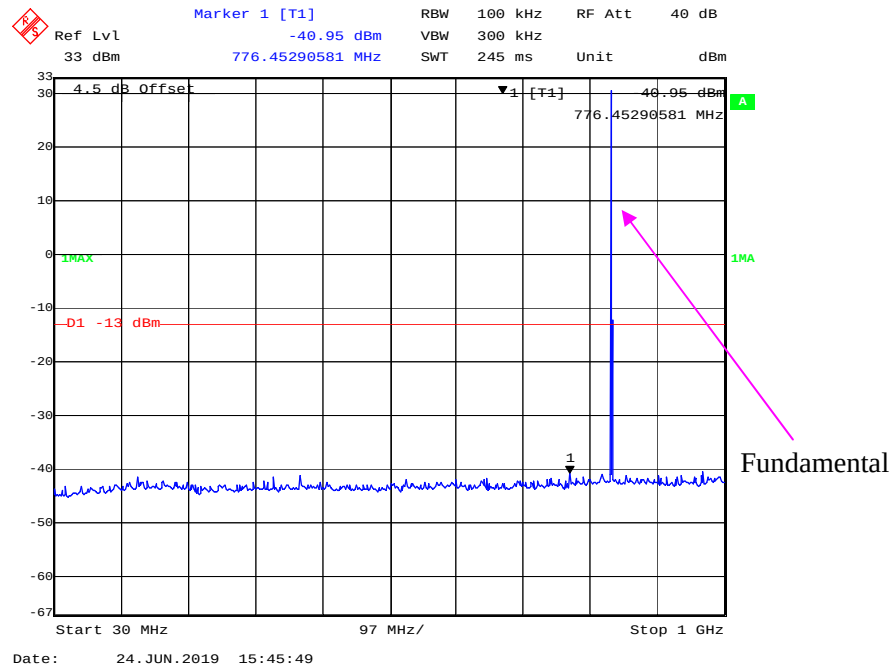
Environmental Conditions

Temperature:	24.6°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

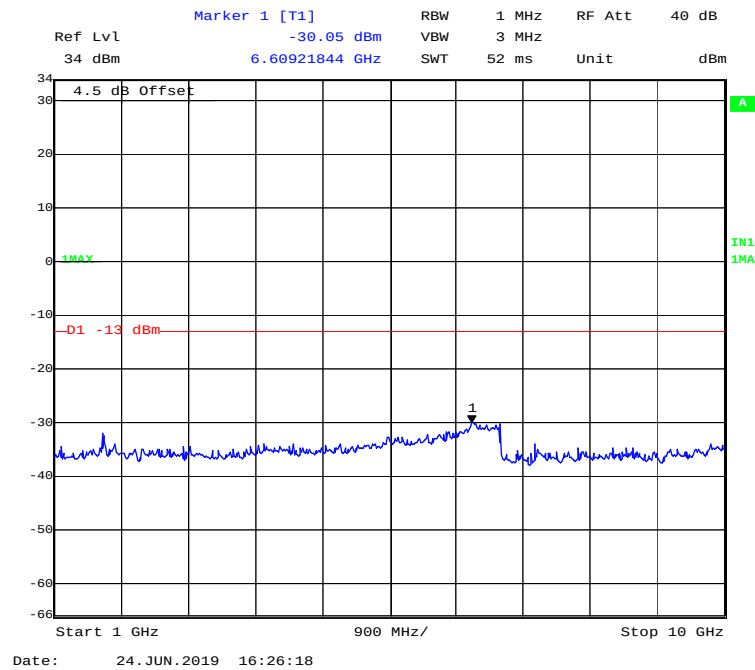
The testing was performed by Winnie Yang on 2019-06-24.

GPRS 850 Band:

30 MHz – 1 GHz(GPRS Mode)

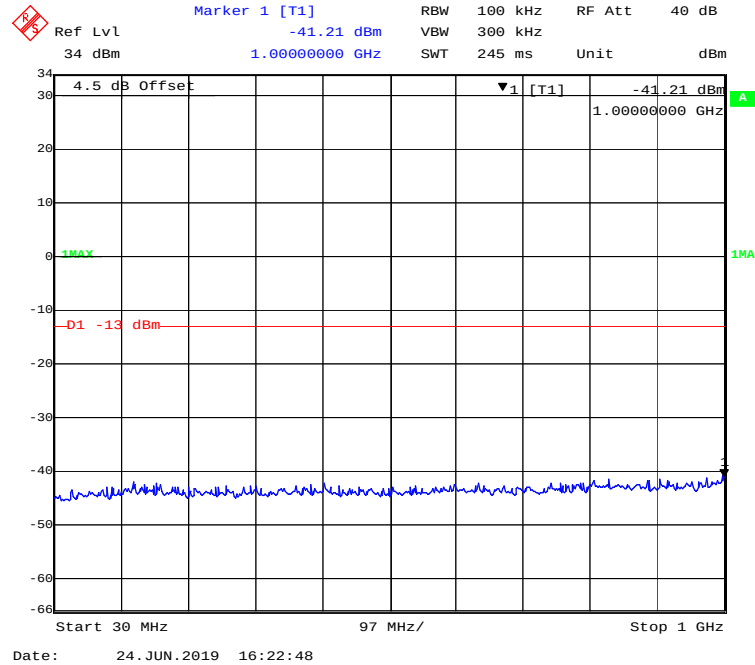


1 GHz – 10 GHz (GPRS Mode)

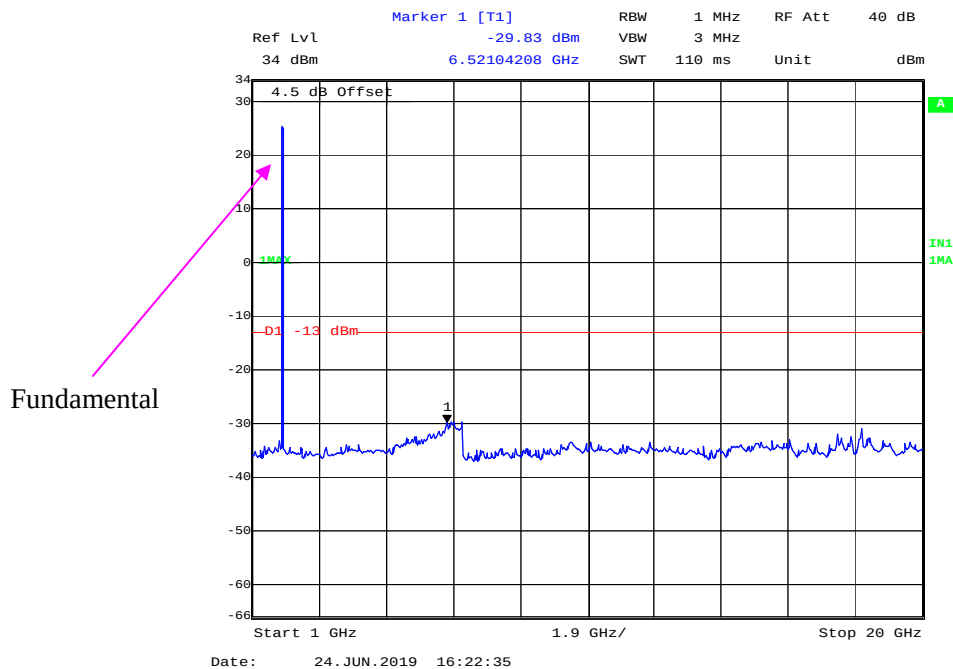


GPRS 1900 Band:

30 MHz – 1 GHz(GPRS Mode)



1 GHz – 20 GHz (GPRS Mode)



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

Applicable Standards

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

22.917 (a) Out of band emissions. 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.

24.238 (a) Out of band emissions. 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.

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

Temperature:	24.6°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

The testing was performed by Winnie Yang on 2019-06-24.

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

30 MHz ~ 10 GHz:**GPRS 850 Band**

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 (dBd/dBi)			
GPRS Mode, Middle channel										
881.68	64.28	196	220	H	-31.73	0.63	-1.00	-33.36	-13	20.36
881.68	65.34	115	210	V	-31.18	0.63	-1.00	-32.81	-13	19.81
1673.20	78.41	330	150	H	-24.98	0.84	8.48	-17.34	-13	4.34
1673.20	80.00	229	174	V	-23.89	0.84	8.48	-16.25	-13	3.25
2509.80	56.45	77	135	H	-44.49	0.89	10.09	-35.29	-13	22.29
2509.80	57.88	56	167	V	-43.07	0.89	10.09	-33.87	-13	20.87

30 MHz ~ 20 GHz:**GPRS 1900 Band**

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 (dBd/dBi)			
GPRS Mode, Middle channel										
351	49.71	196	220	H	-58.67	0.49	-1.74	-60.90	-13	47.90
351	50.36	115	210	V	-53.80	0.49	-1.74	-56.03	-13	43.03
3760	29.51	303	162	H	-67.20	0.95	9.74	-58.41	-13	45.41
3760	32.19	351	210	V	-65.95	0.95	9.74	-57.16	-13	44.16
5640	29.76	32	165	H	-64.17	1.15	10.74	-54.58	-13	41.58
5640	31.37	18	156	V	-62.59	1.15	10.74	-53.00	-13	40.00

Note:

- 1) Absolute Level = Submitted Level - Cable loss + Antenna Gain
- 2) 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.

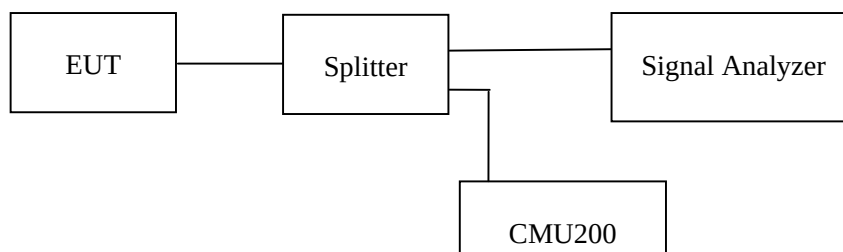
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 than $43 + 10 \log(P)$ 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

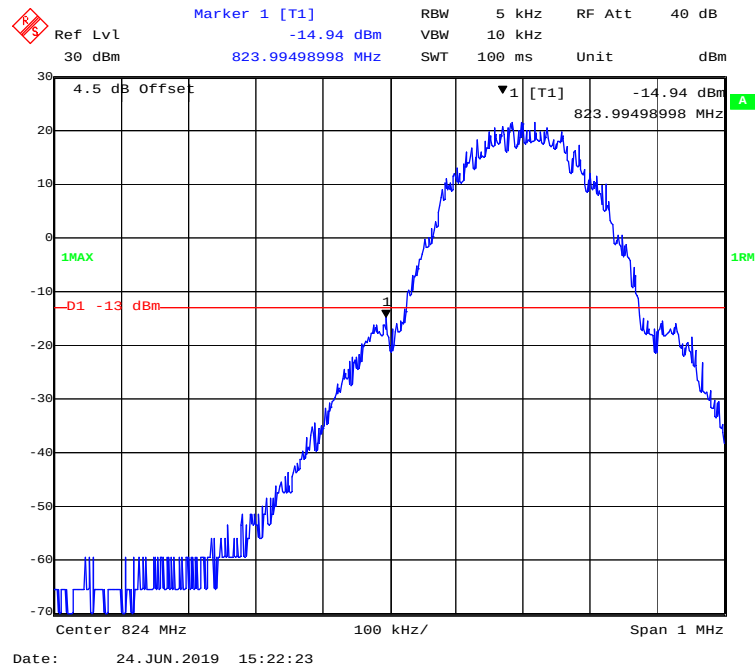
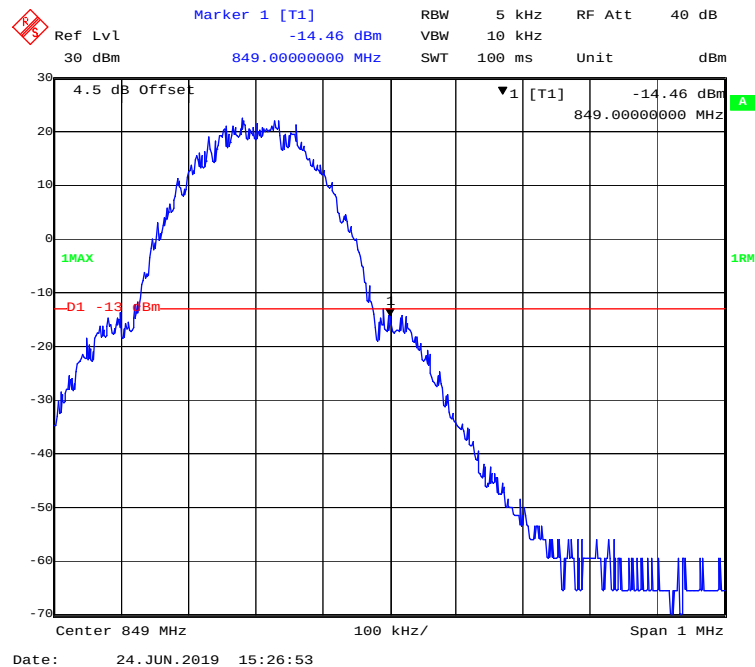
**Test Data****Environmental Conditions**

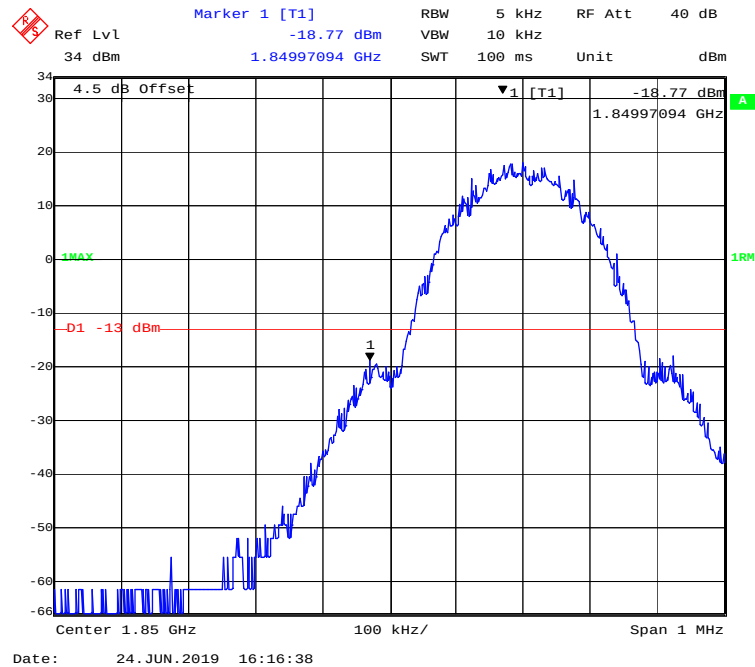
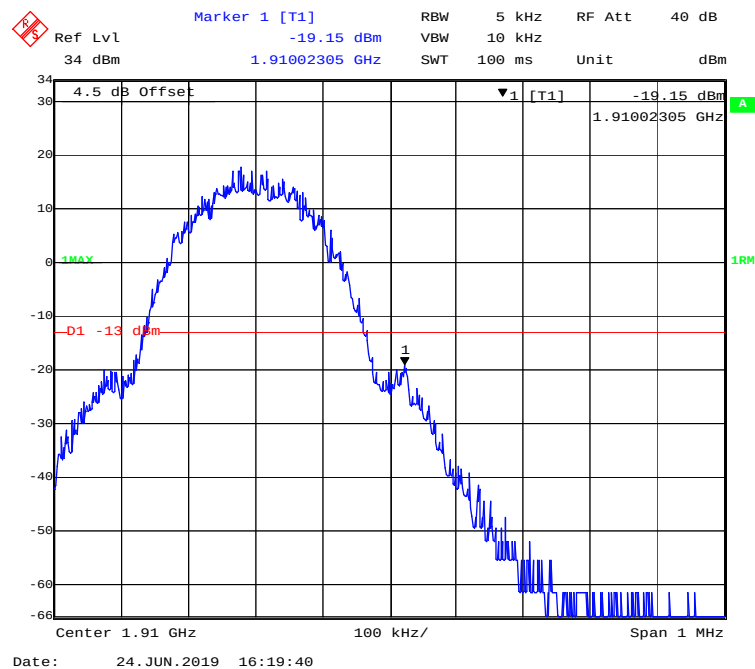
Temperature:	24.6°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

The testing was performed by Winnie Yang on 2019-06-24.

EUT operation mode: Transmitting

Test Result: Compliant.

GPRS 850 Band:**GPRS Mode, Left Band Edge****GPRS Mode, Right Band Edge**

GPRS 1900 Band:**GPRS Mode, Left Band Edge****GPRS Mode, Right Band Edge**

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

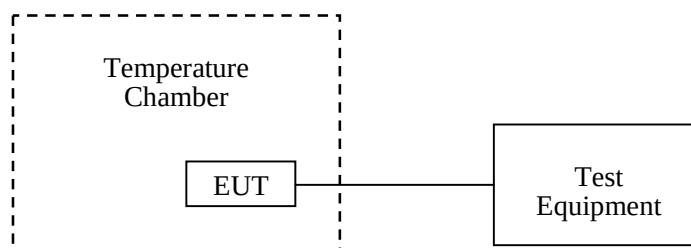
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	24.6°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

The testing was performed by Winnie Yang on 2019-06-24.

EUT operation mode: Transmitting

Test Result: Compliant.

GPRS 850 Band

GPRS Mode, Middle Channel, $f_o = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	24	-13	-0.01554	2.5
-10		-11	-0.01315	2.5
0		-11	-0.01315	2.5
10		-12	-0.01434	2.5
20		-13	-0.01554	2.5
30		-12	-0.01434	2.5
40		-11	-0.01315	2.5
50		-10	-0.01195	2.5
25	V min.= 20.4	-11	-0.01315	2.5
25	V max.= 27.6	-5	-0.00598	2.5

GPRS 1900 Band:

GRPS Mode, Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	24	3	0.00160	pass
-10		2	0.00106	pass
0		-2	-0.00106	pass
10		-1	-0.00053	pass
20		-1	-0.00053	pass
30		1	0.00053	pass
40		2	0.00106	pass
50		1	0.00053	pass
25	V min.= 20.4	-2	-0.00106	pass
25	V max.= 27.6	3	0.00160	pass

GPRS 850 Band

GRPS Mode, Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	12	-12	-0.01434	2.5
-10		-10	-0.01195	2.5
0		-9	-0.01076	2.5
10		-8	-0.00956	2.5
20		-11	-0.01315	2.5
30		-10	-0.01195	2.5
40		-9	-0.01076	2.5
50		-11	-0.01315	2.5
25	V min.= 10.2	-12	-0.01434	2.5
25	V max.= 13.8	-6	-0.00717	2.5

GPRS 1900 Band:

GRPS Mode, Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	12	4	0.00213	pass
-10		3	0.00160	pass
0		-3	-0.00160	pass
10		-2	-0.00106	pass
20		-1	-0.00053	pass
30		2	0.00106	pass
40		1	0.00053	pass
50		3	0.00160	pass
25	V min.= 10.2	-3	-0.00160	pass
25	V max.=13.8	4	0.00213	pass

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