



FCC TEST REPORT

FCC ID: SY4-B01019

On Behalf of

Shanghai Huace Navigation Technology Ltd.

Remote Controller

Model No.: EC10

Prepared for : Shanghai Huace Navigation Technology Ltd.
Address : 577 Songying Road, Qingpu District, 201706 Shanghai, China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

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Date of Receipt : February 20, 2024
Date of Test : February 20, 2024 - February 28, 2024
Date of Report : February 28, 2024
Version Number : V0
Result : Pass

TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
1 TEST SUMMARY	5
2 GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 RELATED SUBMITTAL(S) / GRANT (S)	8
2.3 TEST METHODOLOGY	8
2.4 TEST FACILITY.....	8
3 TEST INSTRUMENTS LIST	9
4 SYSTEM TEST CONFIGURATION	10
4.1 TEST MODE	10
4.2 CONFIGURATION OF TESTED SYSTEM.....	12
4.3 CONDUCTED AV OUTPUT POWER	13
4.4 PEAK-TO-AVERAGE RATIO	15
4.5 OCCUPY BANDWIDTH.....	17
4.6 MODULATION CHARACTERISTIC.....	21
4.7 OUT OF BAND EMISSION AT ANTENNA TERMINALS	21
4.8 ERP, EIRP MEASUREMENT	27
4.9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT	32
4.10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT	37
4.11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	39
5 TEST SETUP PHOTO	41

Revision History

Revision	Issue Date	Revisions	Revised By
V0	February 28, 2024	Initial released Issue	Yannis Wen

1 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 2.1046 Part 24.232 (d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Note: 1. Pass: The EUT complies with the essential requirements in the standard.

2. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

2 General Information

2.1 General Description of EUT

Description/PMN	:	Remote Controller
Model Number/HVIN(s)	:	EC10
Diff	:	N/A
Power supply	:	DC 9V from adapter, DC 3.7V from battery.
Support Networks	:	GPRS, EGPRS, WCDMA
Support Bands	:	GSM850, WCDMA Band V
TX Frequency	:	GSM850: 824.20MHz-848.80MHz WCDMA Band V: 826.40MHz -846.60MHz
GPRS Class	:	12
EGPRS Class	:	12
Modulation type	:	GPRS: GMSK EGPRS: GMSK/8PSK WCDMA Band V: QPSK
Antenna Type	:	Internal antenna, Maximum Gain is 4dBi. (Antenna information is provided by applicant.)
Software version	:	V1.0
Hardware version	:	V1.0

Remark: 1.The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for 2G and 3G function, and there is no other transmitter involved.

Operation Frequency List:

GSM 850		WCDMA Band V	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	4132	826.40
129	824.40	4133	826.60
· ∴	· ∴	· ∴	· ∴
189	836.40	4181	836.20
190	836.60	4182	836.40
191	836.80	4183	836.60
· ∴	· ∴	· ∴	· ∴
250	848.60	4232	846.40
251	848.80	4233	846.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Final test channel:

GSM 850		WCDMA Band V	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	4132	826.40
190	836.60	4183	836.60
251	848.80	4233	846.60

2.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

2.4 Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 25, 2017 Certificated by IC
Registration Number: 12135A

3 Test Instruments list

Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2022.05.17	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2023.08.16	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2023.08.16	1Year
Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-102082-Wa	2023.08.16	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2023.08.16	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2023.08.28	1Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2023.08.19	1Year
Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00128	2023.08.19	1Year
RF Cable	Resenberger	Cable 1	/	RE1	2023.08.16	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2023.08.16	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2023.08.16	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2023.08.16	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2023.08.16	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2023.08.16	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2023.08.16	1Year
Horn Antenna	SCHWARZBECK	BBHA 9170	/	00946	2023.08.19	1Year
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2023.08.16	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2023.08.16	1 Year
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2023.08.16	1 Year
Temp. & Humid. Chamber	Teelong	TL-HW408S	/	TL-20191205-01	2023.07.25	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2023.08.16	1 Year
Adjustable attenuator	MWRFTest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information

Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1

4 System test configuration

4.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
GSM 850	■ GPRS 1 link	■ GPRS 1 link
	■ EPRS 1 link	■ EGPRS 1 link
WCDMA Band V	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link

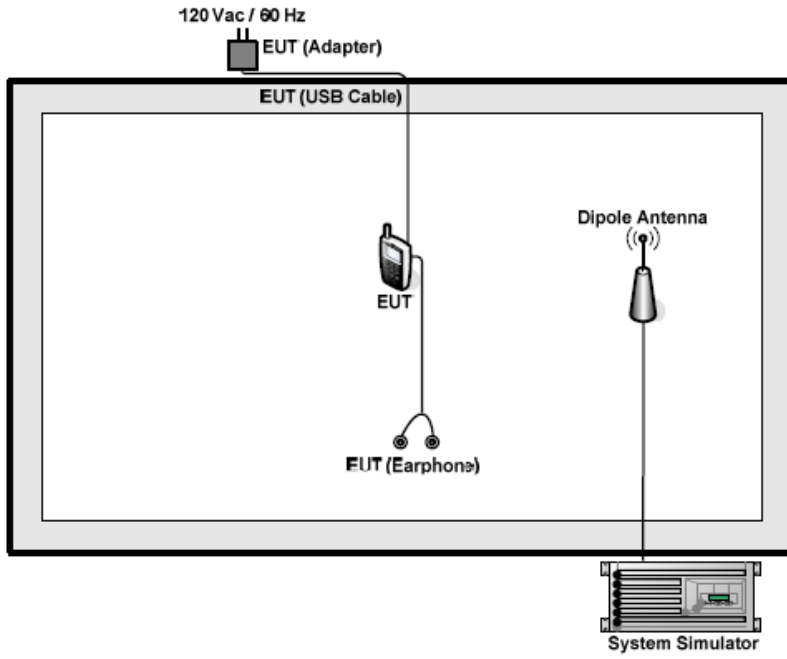
Note: The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EGPRS multi-slot class 8 mode for 8PSK link, RMC12.2Kbps mode for WCDMA Band V. only these modes were used for all tests.

The conducted power tables are as follows:

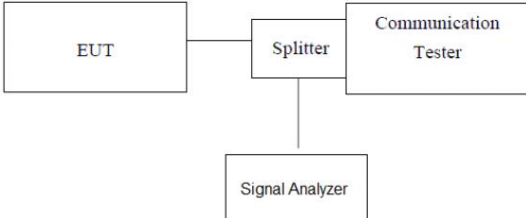
Band	GSM850		
	128	190	251
Channel	128	190	251
Frequency	824.20	836.60	848.80
GPRS (GMSK, 1 TX slot)	33.58	33.31	33.83
GPRS (GMSK, 2 TX slot)	32.50	33.19	33.78
GPRS (GMSK, 3 TX slot)	33.41	33.59	33.43
GPRS (GMSK, 4 TX slot)	34.65	35.61	34.21
EGPRS (8PSK, 1 TX slot)	33.63	34.04	33.51
EGPRS (8PSK, 2 TX slot)	31.79	32.36	33.15
EGPRS (8PSK, 3 TX slot)	33.27	33.32	32.77
EGPRS (8PSK, 4 TX slot)	33.21	32.66	33.76

Band	WCDMA Band V		
Channel	4132	4132	4132
Frequency	826.4	826.4	826.4
RMC 12.2Kbps	24.02	23.30	23.96
HSDPA Subtest-1	23.53	22.67	23.63
HSDPA Subtest-2	23.26	23.14	23.50
HSDPA Subtest-3	23.13	23.16	23.19
HSDPA Subtest-4	22.58	21.87	21.69
HSUPA Subtest-1	22.96	23.00	22.97
HSUPA Subtest-2	22.92	22.35	22.24
HSUPA Subtest-3	22.77	22.58	23.07
HSUPA Subtest-4	22.98	22.69	23.33
HSUPA Subtest-5	22.79	22.40	22.35

4.2 Configuration of Tested System



4.3 Conducted AV Output Power

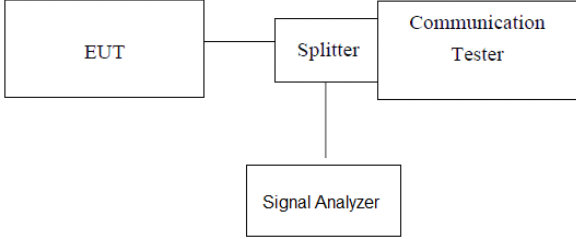
Test Requirement:	FCC part22.913(a) and FCC part24.232(b), FCC part 27.50 (d)(4)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W(38.45dbm) PCS1900, WCDMA Band II: 2W(33.01dbm) WCDMA Band IV: 1W(30.00dbm)
Test setup:	 <pre> graph LR EUT[EUT] --- Splitter[Splitter] Splitter --- CT[Communication Tester] Splitter --- SA[Signal Analyzer] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Band	GSM850		
Channel	128	190	251
Frequency	824.20	836.60	848.80
GPRS (GMSK, 1 TX slot)	31.50	30.05	32.60
GPRS (GMSK, 2 TX slot)	30.14	30.72	30.24
GPRS (GMSK, 3 TX slot)	28.50	30.75	28.69
GPRS (GMSK, 4 TX slot)	28.55	30.78	28.27
EGPRS (8PSK, 1 TX slot)	27.04	26.06	27.58
EGPRS (8PSK, 2 TX slot)	24.19	23.45	23.78
EGPRS (8PSK, 3 TX slot)	23.67	26.38	23.77
EGPRS (8PSK, 4 TX slot)	23.78	23.25	23.54

Band	WCDMA Band V		
Channel	4132	4132	4132
Frequency	826.4	826.4	826.4
RMC 12.2Kbps	24.05	23.48	23.78
HSDPA Subtest-1	23.19	23.64	23.52
HSDPA Subtest-2	22.84	22.74	23.28
HSDPA Subtest-3	23.14	23.87	23.79
HSDPA Subtest-4	22.20	22.27	22.07
HSUPA Subtest-1	22.78	22.99	22.59
HSUPA Subtest-2	23.02	22.43	22.32
HSUPA Subtest-3	22.26	22.67	22.69
HSUPA Subtest-4	23.02	23.07	23.28
HSUPA Subtest-5	22.90	23.15	22.57

4.4 Peak-to-Average Ratio

Test Requirement:	FCC part24.232(d)
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power. 6. Record the maximum peak-to-average ratio value.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

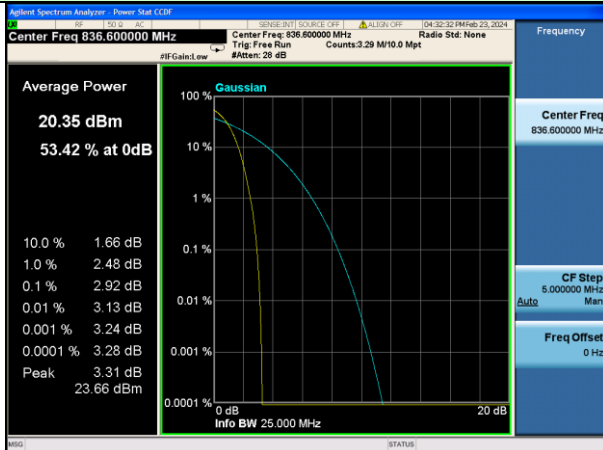
Measurement data

Test mode	Peak to Average Ratio (dB)			Limit (dB)	Result
	Low Ch.	Middle Ch.	High Ch.		
WCDMA Band V	2.73	2.92	3.00	13	PASS

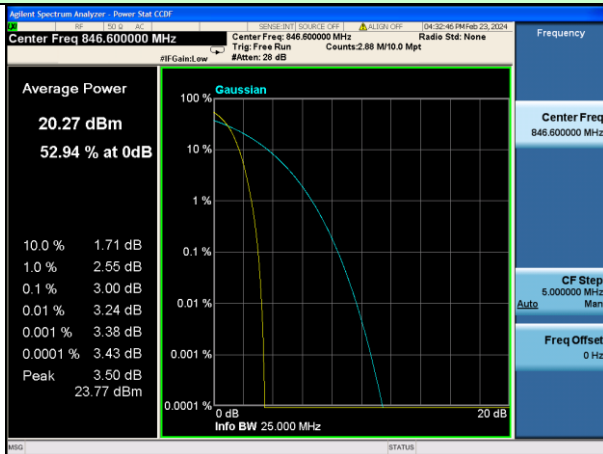
Test Mode: WCDMA Band V
Low Ch.



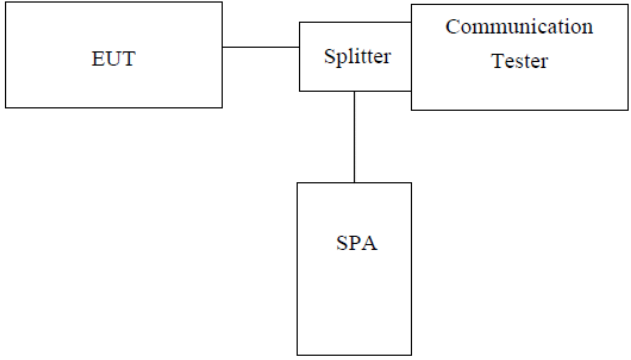
Middle Ch.



High Ch.



4.5 Occupy Bandwidth

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1049
Test setup:	 <pre> graph LR EUT[EUT] --- Splitter[Splitter] Splitter --- CT[Communication Tester] Splitter --- SPA[SPA] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

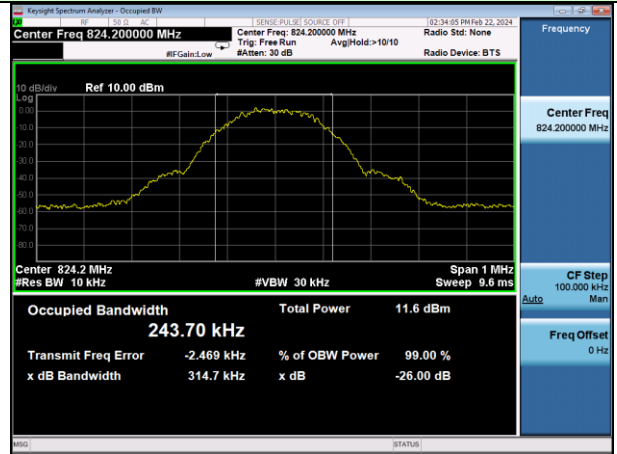
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GPRS 1 link)	128	824.20	242.54	301.7
	190	836.60	240.92	315.8
	251	848.80	243.40	312.2
GSM 850 (EGPRS 1 link)	128	824.20	243.70	318.4
	190	836.60	245.08	308.8
	251	848.80	244.27	314.6
WCDMA Band V (RMC 12.2Kbps link)	4132	826.40	4167.1	4733.0
	4183	836.60	4183.6	4716.0
	4233	846.60	4165.4	4748.0

Test plot as follows:

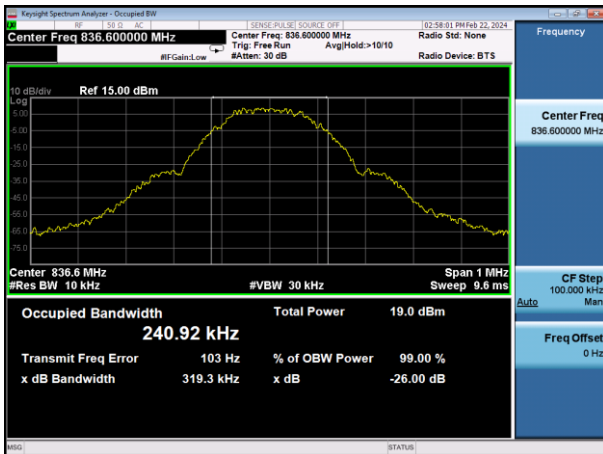
GSM 850 (GPRS 1 link)	GSM 850 (EGPRS 1 link)
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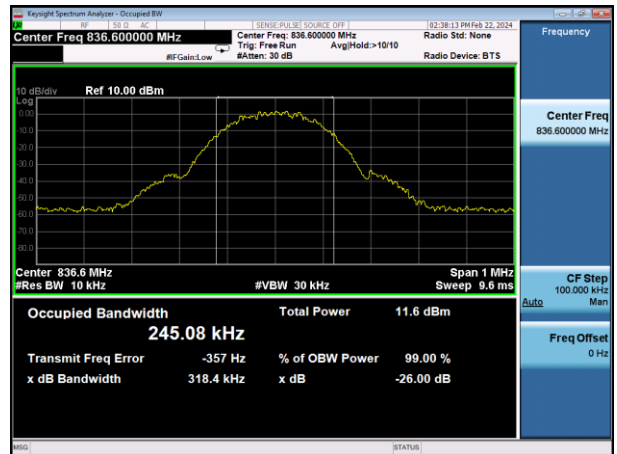
Lowest channel



Lowest channel



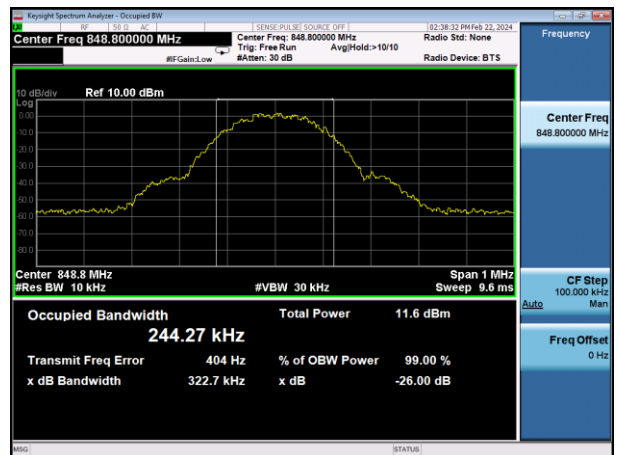
Middle channel



Middle channel

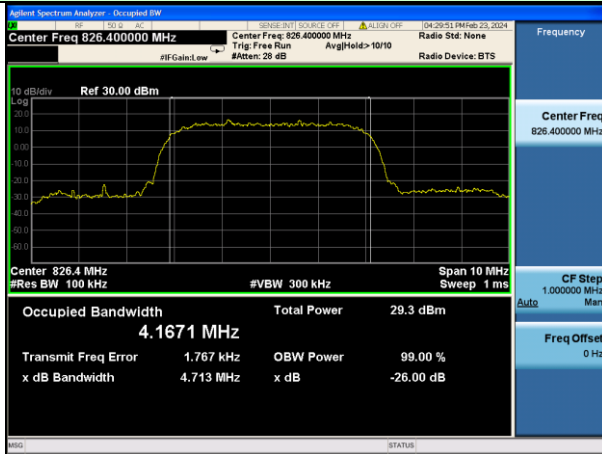


Highest channel

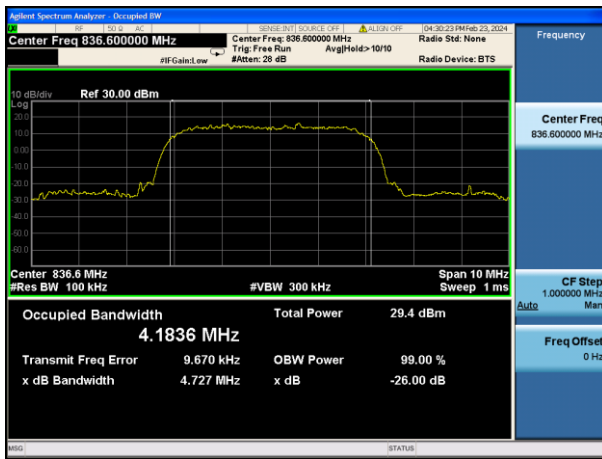


Highest channel

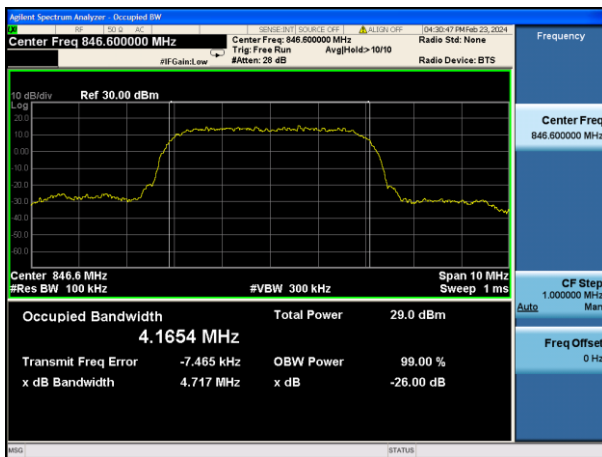
WCDMA Band V (RMC 12.2Kbps link)



Lowest channel



Middle channel



Highest channel

4.6 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.

4.7 Out of band emission at antenna terminals

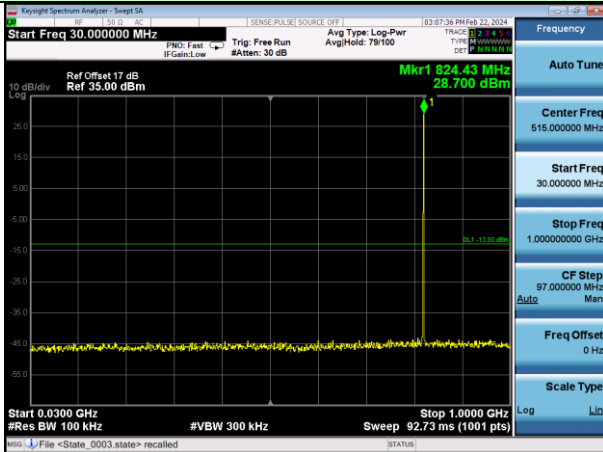
Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	<p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Test plot as follows:

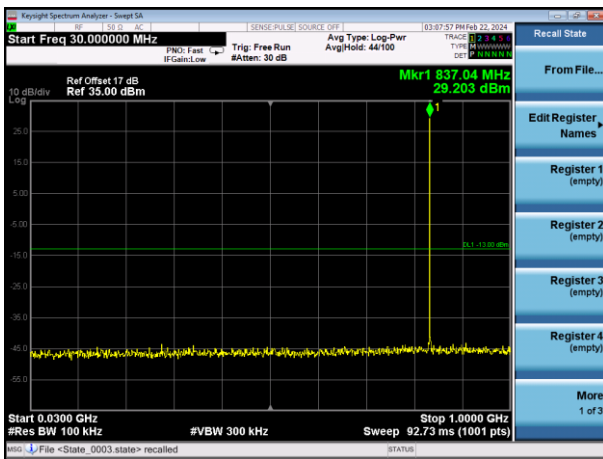
Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).

Test Mode: Traffic mode

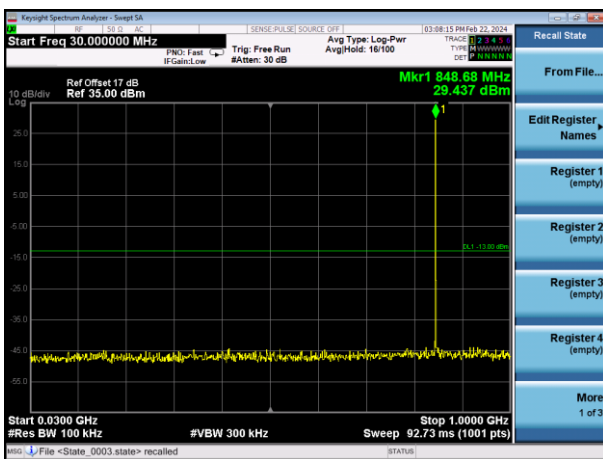
GSM 850 (GPRS 1 link)



Lowest channel

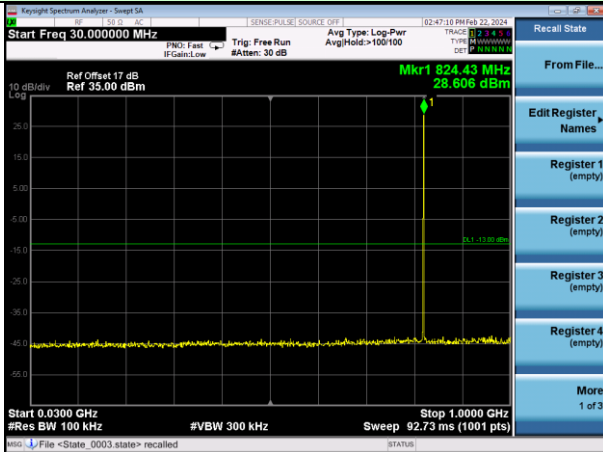


Middle channel

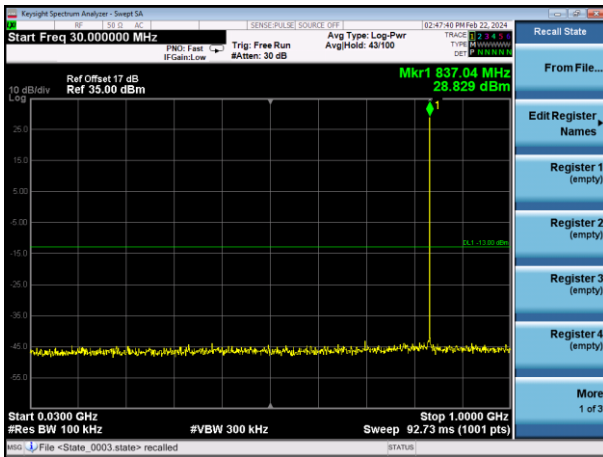


Highest channel

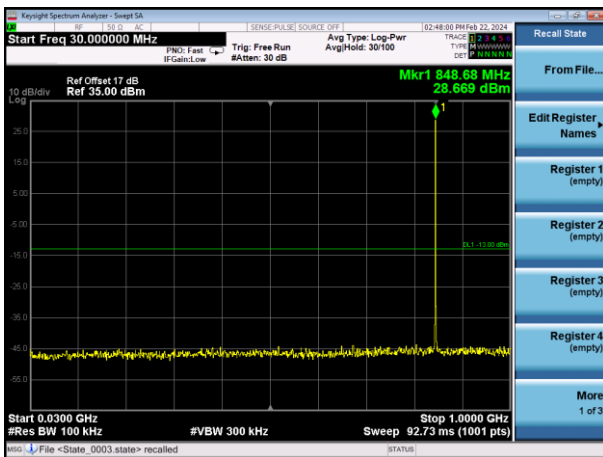
Test Mode: Traffic mode GSM 850 (EGPRS 1 link)



Lowest channel



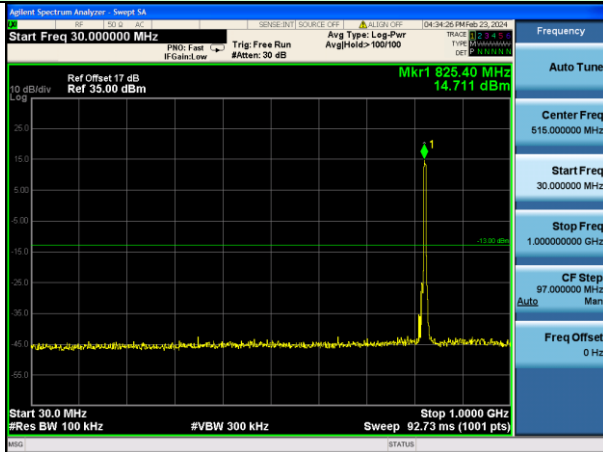
Middle channel



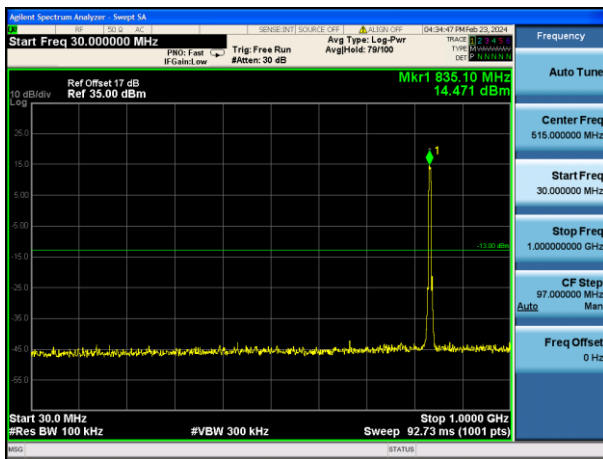
Highest channel

Test Mode: Traffic mode

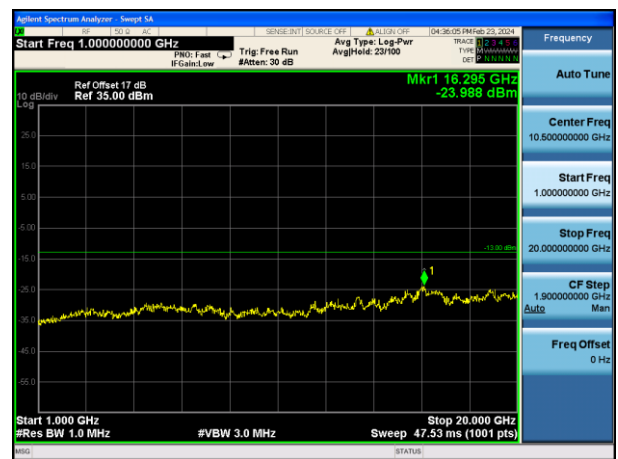
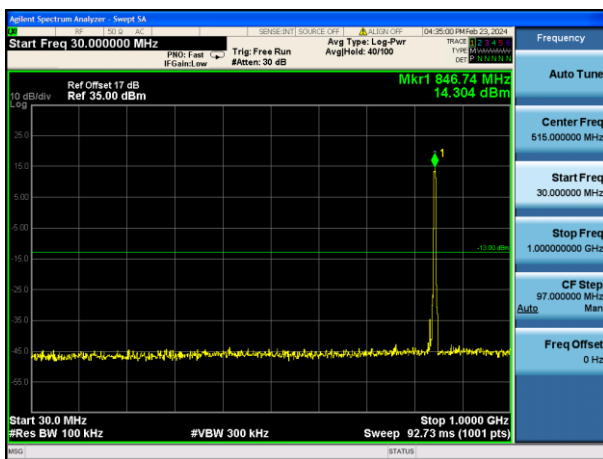
WCDMA Band V (RMC 12.2Kbps link)



Lowest channel



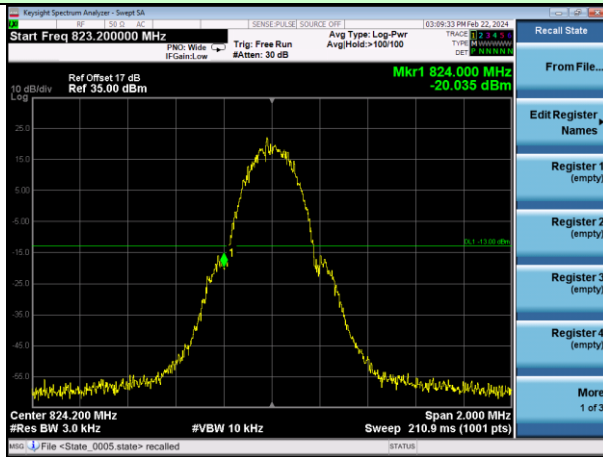
Middle channel



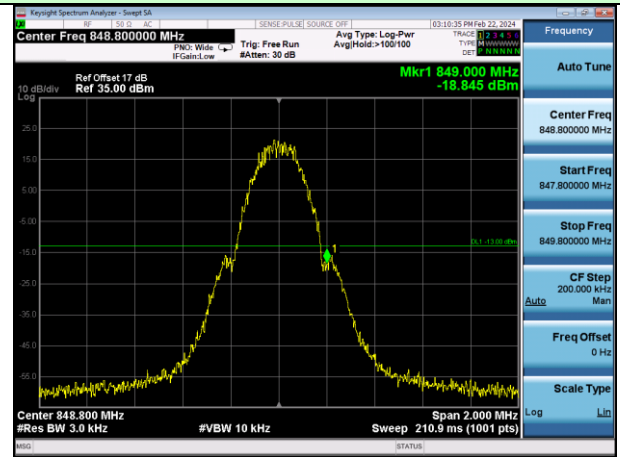
Highest channel

Band Edge:

Test Mode: Traffic mode GSM850 (GPRS 1 link)

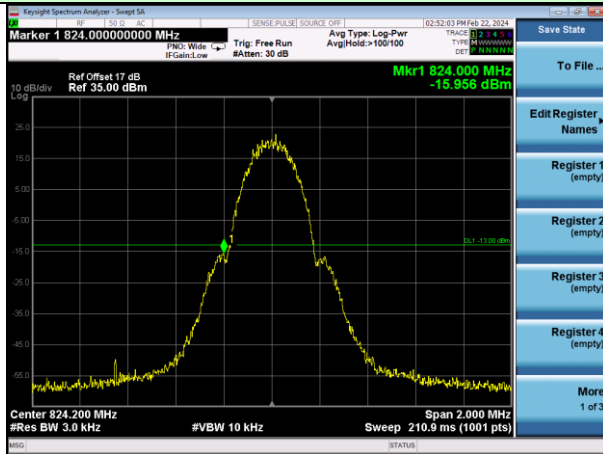


Lowest channel

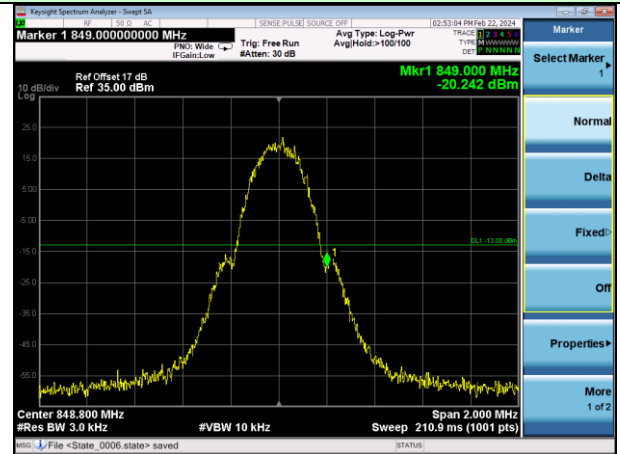


Highest channel

Test Mode: Traffic mode GSM850 (EGPRS 1 link)



Lowest channel



Highest channel

Test Mode: Traffic mode WCDMA Band V (RMC 12.2Kbps link)

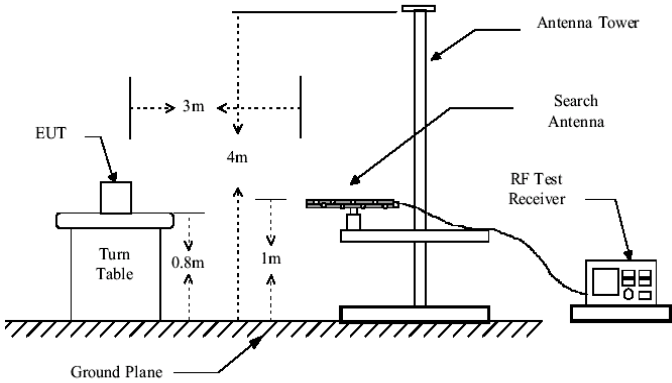
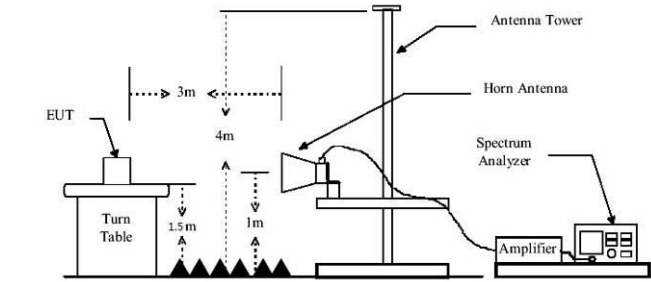
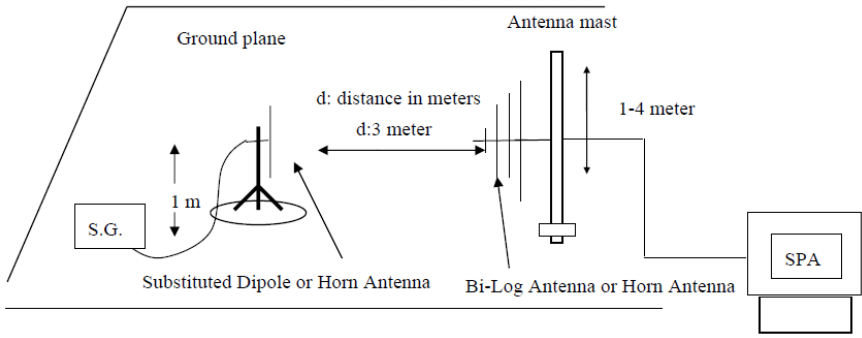


Lowest channel



Highest channel

4.8 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W WCDMA Band IV: 1W
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. 3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

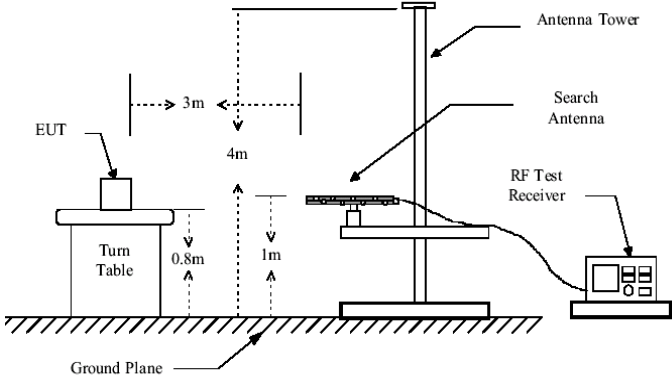
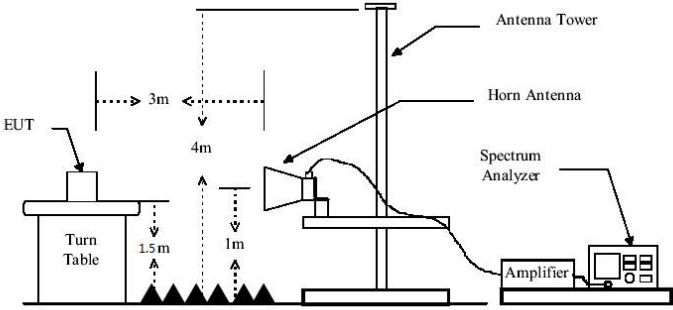
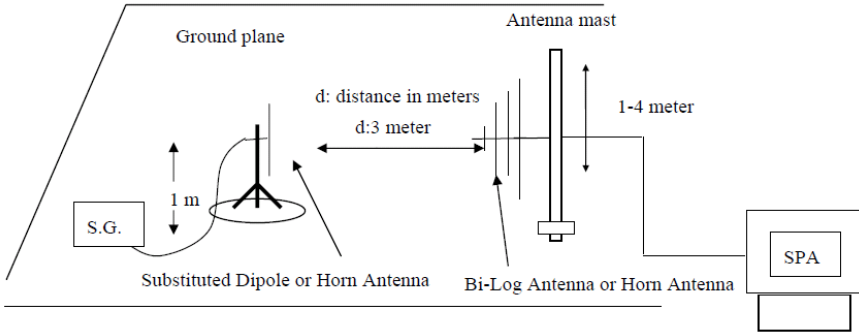
Measurement Data

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	32.53	38.45	Pass
			H	30.05		
		E1	V	32.41		
			H	30.18		
		E2	V	31.68		
			H	30.23		
	Middle	H	V	31.65	38.45	Pass
			H	30.72		
		E1	V	32.39		
			H	30.40		
		E2	V	31.98		
			H	31.05		
	Highest	H	V	32.36	38.45	Pass
			H	30.58		
		E1	V	32.24		
			H	30.42		
		E2	V	33.13		
			H	32.49		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (EGPRS 1 link)	Lowest	H	V	32.47	38.45	Pass
			H	31.83		
		E1	V	31.91		
			H	30.06		
		E2	V	32.58		
			H	30.32		
	Middle	H	V	32.33	38.45	Pass
			H	30.19		
		E1	V	31.64		
			H	30.06		
		E2	V	31.61		
			H	30.77		
	Highest	H	V	32.90	38.45	Pass
			H	30.37		
		E1	V	32.38		
			H	30.82		
		E2	V	32.39		
			H	32.28		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
WCDMA Band V	Lowest	H	V	23.58	38.45	Pass
			H	23.22		
		E1	V	22.87		
			H	23.49		
		E2	V	23.75		
			H	22.86		
	Middle	H	V	24.02	38.45	Pass
			H	22.33		
		E1	V	23.97		
			H	23.22		
		E2	V	23.71		
			H	22.80		
	Highest	H	V	23.39	38.45	Pass
			H	22.83		
		E1	V	23.36		
			H	22.84		
		E2	V	23.19		
			H	22.82		

4.9 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Test mode:		GSM850(EGPRS 1 link)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1648.40	Vertical	-36.38	-13.00	Pass	
2472.60	V	-39.08			
3296.80	V	-37.52			
4121.00	V	-43.57			
4945.20	V	---			
1648.40	Horizontal	-38.82	-13.00	Pass	
2472.60	H	-42.39			
3296.80	H	-45.30			
4121.00	H	-46.22			
4945.20	H	---			
Test mode:		GSM850(EGPRS 1 link)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1672.80	Vertical	-37.25	-13.00	Pass	
2509.20	V	-39.60			
3345.60	V	-38.23			
4182.00	V	-42.90			
5018.40	V	---			
1672.80	Horizontal	-38.70	-13.00	Pass	
2509.20	H	-42.88			
3345.60	H	-44.79			
4182.00	H	-45.81			
5018.40	H	---			
Test mode:		GSM850(EGPRS 1 link)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1697.20	Vertical	-36.33	-13.00	Pass	
2545.80	V	-39.34			
3394.40	V	-38.44			
4243.00	V	-43.19			
5091.60	V	---			
1697.20	Horizontal	-39.50	-13.00	Pass	
2545.80	H	-42.89			
3394.40	H	-44.62			
4243.00	H	-45.80			
5091.60	H	---			

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:		GSM850(EGPRS 1 link)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1648.40	Vertical	-36.51	-13.00	Pass	
2472.60	V	-39.89			
3296.80	V	-38.15			
4121.00	V	-43.23			
4945.20	V	---			
1648.40	Horizontal	-39.06	-13.00	Pass	
2472.60	H	-43.03			
3296.80	H	-45.10			
4121.00	H	-46.37			
4945.20	H	---			
Test mode:		GSM850(EGPRS 1 link)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1672.80	Vertical	-36.64	-13.00	Pass	
2509.20	V	-39.76			
3345.60	V	-38.35			
4182.00	V	-43.52			
5018.40	V	---			
1672.80	Horizontal	-39.00	-13.00	Pass	
2509.20	H	-42.43			
3345.60	H	-44.61			
4182.00	H	-45.98			
5018.40	H	---			
Test mode:		GSM850(EGPRS 1 link)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1697.20	Vertical	-36.61	-13.00	Pass	
2545.80	V	-39.45			
3394.40	V	-37.63			
4243.00	V	-43.26			
5091.60	V	---			
1697.20	Horizontal	-39.03	-13.00	Pass	
2545.80	H	-42.68			
3394.40	H	-44.86			
4243.00	H	-46.11			
5091.60	H	---			

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:		WCDMA Band V		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1652.80	Vertical	-36.49	-13.00	Pass	
2479.20	V	-39.28			
3305.60	V	-37.95			
4132.00	V	-43.03			
4958.40	V	---			
1652.80	Horizontal	-38.90	-13.00	Pass	
2479.20	H	-42.32			
3305.60	H	-44.49			
4132.00	H	-46.31			
4958.40	H	---			
Test mode:		WCDMA Band V		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1673.20	Vertical	-36.91	-13.00	Pass	
2509.80	V	-39.79			
3346.40	V	-38.17			
4183.00	V	-43.45			
5019.60	V	---			
1673.20	Horizontal	-39.18	-13.00	Pass	
2509.80	H	-42.45			
3346.40	H	-44.85			
4183.00	H	-46.30			
5019.60	H	---			
Test mode:		WCDMA Band V		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1693.20	Vertical	-36.70	-13.00	Pass	
2539.80	V	-39.73			
3386.40	V	-37.80			
4233.00	V	-43.09			
5079.60	V	---			
1693.20	Horizontal	-39.00	-13.00	Pass	
2539.80	H	-42.81			
3386.40	H	-44.54			
4233.00	H	-46.04			
5079.60	H	---			

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

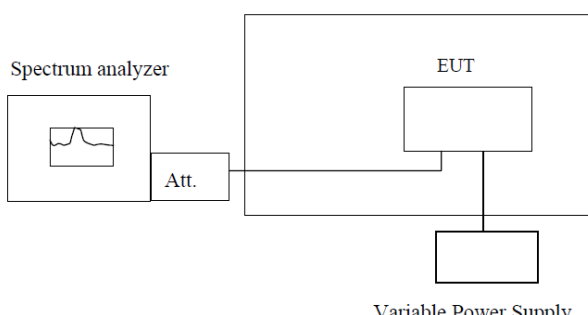
4.10 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	<div style="text-align: center;"> <p style="text-align: center;">Temperature Chamber</p> <p style="text-align: center;">Spectrum analyzer</p> <p style="text-align: center;">Att.</p> <p style="text-align: center;">EUT</p> <p style="text-align: center;">Variable Power Supply</p> </div> <p>Note : Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> 1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	2	0.0010	2.5	Pass
	-10	7	0.0040		
	0	0	-0.0001		
	10	0	0.0000		
	20	1	0.0006		
	30	3	0.0014		
	40	-1	-0.0008		
	50	7	0.0037		
	60	3	0.0016		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	3	0.0035	2.5	Pass
	-10	3	0.0036		
	0	5	0.0056		
	10	5	0.0060		
	20	5	0.0063		
	30	4	0.0049		
	40	3	0.0040		
	50	-1	-0.0012		
	60	5	0.0065		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-20	5	0.0027	2.5	Pass
	-10	5	0.0029		
	0	6	0.0030		
	10	5	0.0024		
	20	4	0.0020		
	30	4	0.0019		
	40	2	0.0011		
	50	2	0.0008		
	60	6	0.0030		

4.11 Frequency stability V.S. Voltage measurement

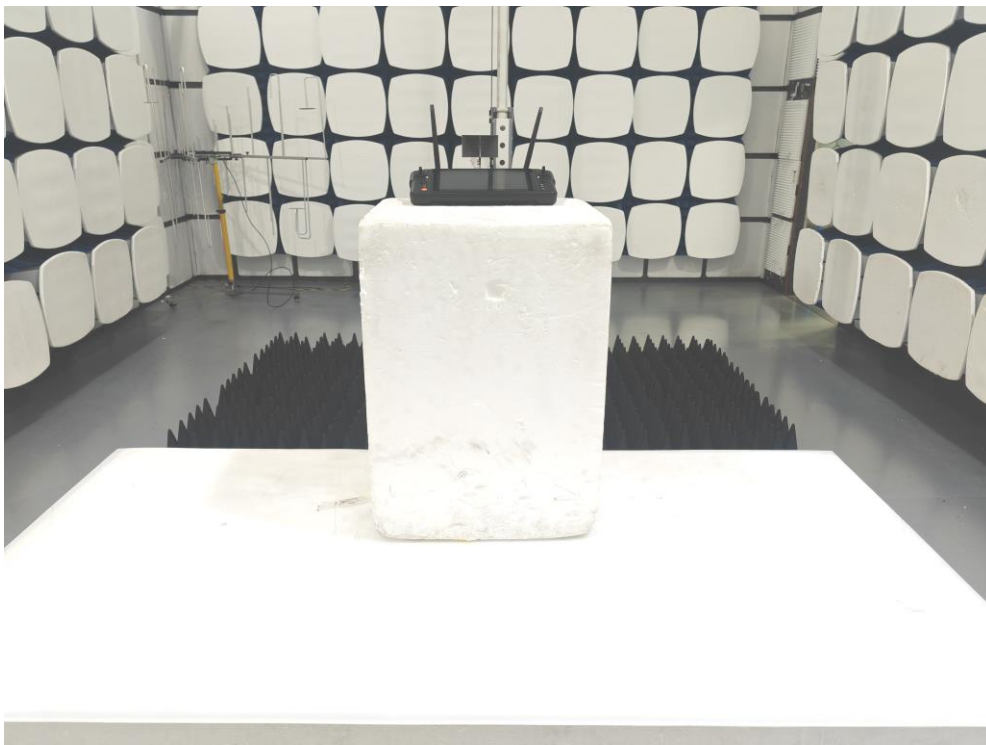
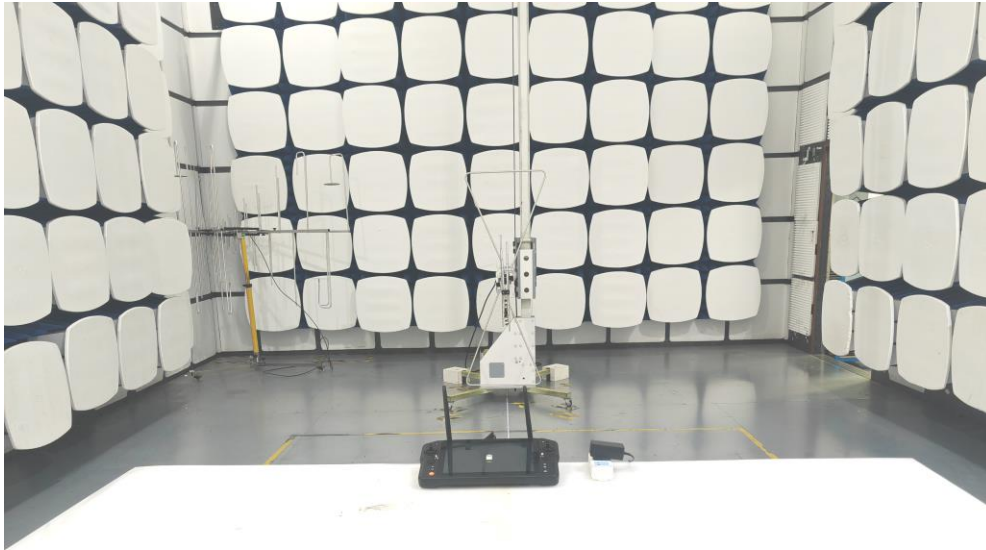
Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	<p style="text-align: center;">Temperature Chamber</p>  <p style="text-align: center;">Variable Power Supply</p> <p>Note : Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	6	0.0069	2.5	Pass
	3.70	5	0.0063		
	3.33	-1	-0.0009		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	4	0.0043	2.5	Pass
	3.70	5	0.0056		
	3.33	5	0.0063		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.07	8	0.0094	2.5	Pass
	3.70	5	0.0063		
	3.33	2	0.0020		

5 Test Setup Photo

Radiated Emission



-----END OF REPORT-----