

Report No.SH16060006W09

FCC RF TEST REPORT

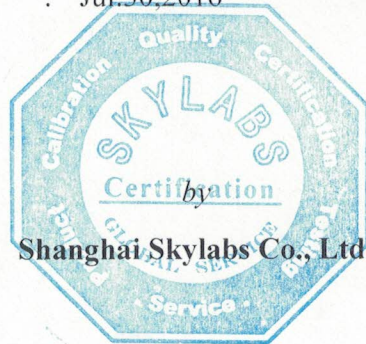
Issued to

Shanghai Rising Digital Co.,Ltd.

For

SECD-710F-02 display screen

Model Name : SECD-710F-02
Trade Name : RISING
Brand Name : RISING
Standard : 47 CFR Part 2,
47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E
47 CFR Part 27
Test date : Jul.20,2016 to Jul.28,2016
Issue date : Jul.30,2016



Shanghai Skylabs Co., Ltd.

Tested by Wu Hongfei

Approved by Gm Yinying

Review by Xiao Dong Wei

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Change History

Issue	Date	Reason for change
1.0	Jul.30,2016	First edition



General Information

1.1 Applicant

Shanghai Rising Digital Co.,Ltd.

No 318 ,Chuanda Road , Pudong New District, Shanghai,China

1.2 Manufacturer

Shanghai Rising Digital Co.,Ltd.

No 318 ,Chuanda Road , Pudong New District, Shanghai,China

1.3 Description of EUT

EUT Type: SECD-710F-02display screen
Brand Name.....: RISING
Trade Name: RISING
Model Name.....: SECD-710F-02
Hardware Version.....: V109
Software Version: V1318
Antenna type.....: PCB
Antenna gain.....: PCB 1.5dBi
Frequency Range..... GSM 850MHz:
Tx: 824.20-848.80 MHz (at intervals of 200kHz);
Rx: 869.20-893.80 MHz (at intervals of 200kHz)
GSM 1900MHz
Tx: 1850.20-1909.80 MHz (at intervals of 200kHz);
Rx: 1930.20-1989.80 MHz (at intervals of 200kHz)
WCDMA Band II
Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);
Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz)
WCDMA Band IV
Tx: 1712.4 - 1752.6 MHz (at intervals of 200kHz);
Rx: 2112.4 - 2152.6 MHz (at intervals of 200kHz)
WCDMA Band V
Tx: 826.4- 846.6MHz (at intervals of 200kHz);
Rx: 871.4 - 891.6MHz (at intervals of 200kHz)
Modulation Type.....: GPRS/GSM mode with GMSK modulation
EGPRS mode with 8PSK modulation
WCDMA mode with QPSK
Power.....: DC 24V

**NOTE:**

(1) The transmitter (Tx) frequency arrangement of the cellular 850MHz used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190(836.6MHz) and 251 (848.8MHz); the PCS 1900MHz used by the EUT can be represented with the formula $F(n)=1850.2+0.2*(n-512)$, $512 \leq n \leq 810$; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661(1880.0MHz) and 810 (1909.8MHz).

(2) The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4175(835MHz) and 4233 (846.6MHz).

(3) The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT can be represented with the formula $F(n)=1852.4+0.2*(n-9262)$, $9262 \leq n \leq 9538$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

(4) The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula $F(n)=1712.4+0.2*(n-1312)$, $1312 \leq n \leq 1513$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1450 (1742MHz) and 1513 (1752.6MHz).

(5) For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



Facilities and Accreditations

1.4 Test Facility

Shanghai Skylabs Co., Ltd. is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. FCC listed: 196218, IC listed: 21609.

The accreditation certificate number is L6644. A 9*6*6(m) fully anechoic chamber was used for the radiated spurious emissions test.

1.5 Environmental Conditions

Ambient temperature: 20~25°C

Relative humidity: 40~60%

Atmosphere pressure: 86-102kPa

1.6 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission: ± 1.76 dB

Uncertainty of Radiated Emission: ± 3.16 dB



1.7 List of Equipments Used

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMW500	100830	2015.9.22	1year
Spectrum Analyzer	Rohde&Schwarz	FSU26	200880	2016.6.17	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Power Splitter	Mini-Circuits	ZFRSC-183-S+	765001016	(n.a.)	(n.a.)
Attenuator 1	Mini-Circuits	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 3	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)
DC/AC Power supplier	NF	ES2000S	9087735	2015.10.17	1year
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2015.9.20	1year
Full/Half-AnechoicChamber	CHENGYU	9.2×6.25×6.15m	SAR	2016.04.11	3year
Signal Generator	Rohde&Schwarz	SMF100A	101935	2015.9.22	1year
Broadband Trilog Antenna	Schwarzbeck	VULB 9163	9163-561	2016.07.25	2year
SubstitutionBroadband Trilog Antenna	Schwarzbeck	VULB 9163	9163-572	2016.07.25	2year
Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1033	2016.07.25	2year
Substitution Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1034	2016.07.25	2year
Broadband Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91970171	2015.9.22	2year
Substitution Broadband Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91970208	2015.9.22	2year
Test Antenna-Loop	Rohde&Schwarz	HFH2-Z2	860004/001	2015.9.22	2year
RF Cable	(n.a.)	0-25GHz	(n.a.)	(n.a.)	(n.a.)

NOTE:

Equipments listed above have been calibrated and are in the period of validation.



Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and part 24 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22	Public Mobile Services
3	47 CFR Part 24	Personal Communications Services
4	47 CFR Part 27	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	FCC Rules	Description	Result
1	22.913 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
2	2.1053 2.1057 22.917 24.238	Radiated Out of Band Emissions	PASS

NOTE: Measurement method according to TIA/EIA 603.D-2010



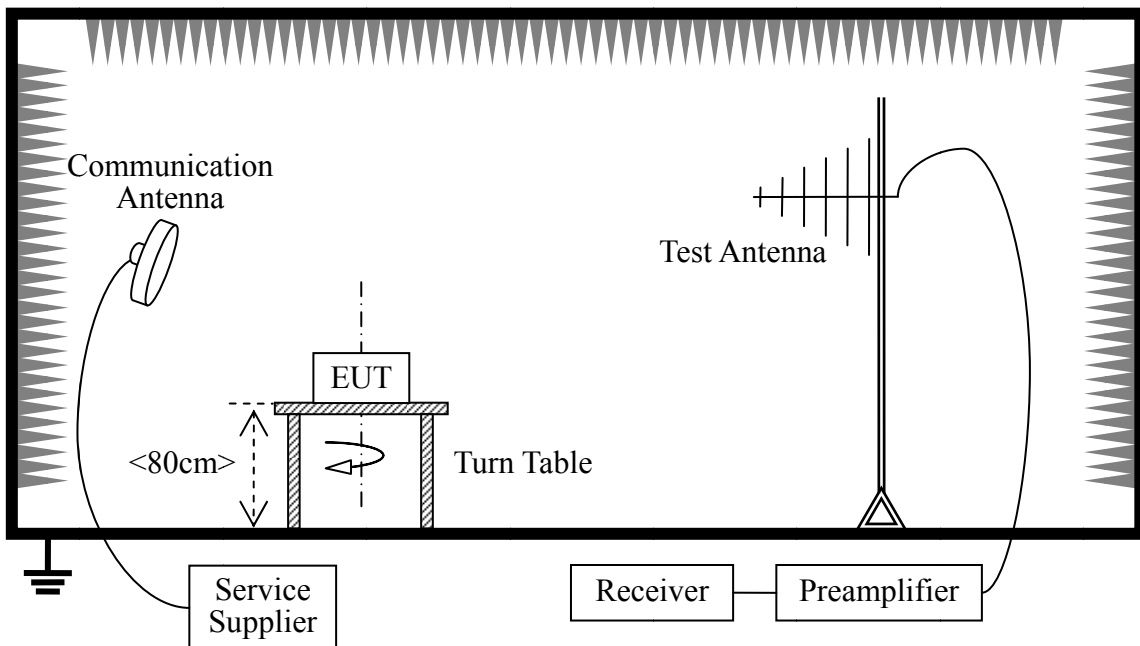
Test Result

1.8 Transmitter Radiated Power (EIRP/ERP)

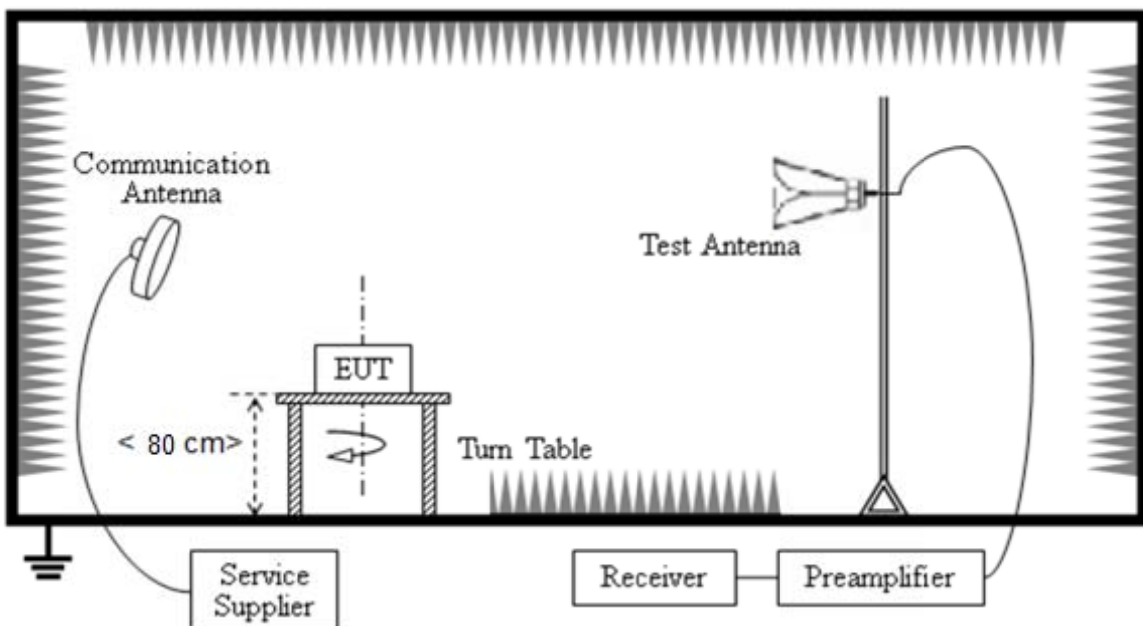
1.8.1 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCCsection24.232, the broadband PCS mobile station is limited to 2Wattse.i.r.p.peak power.

1.8.2 Test Description

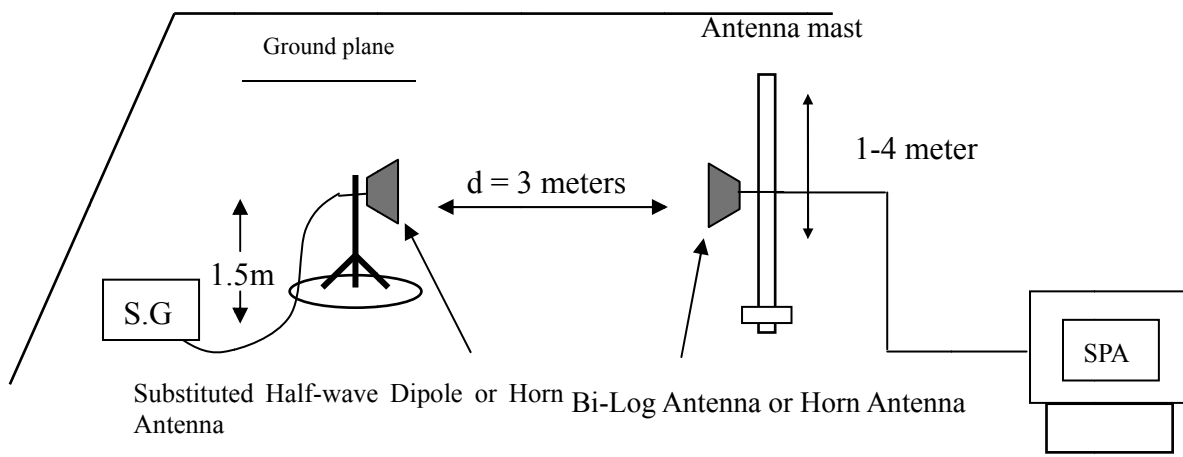


Radiated Emissions 30-1000MHz





Radiated Emissions above 1000MHz



Substituted method

1.8.3 Test Procedure

The measurements procedures in TIA-603D-2010 are used.

1. EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1-4m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (P_r).
3. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
4. The cable loss (P_{cl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test. The measurement results are obtained as described below:
$$\text{Power(EIRP)} = P_{Mea} + P_{cl} + G_a$$
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.



1.8.4 Test Results

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested. All modes are tested.

Limits

Band	Burst Peak ERP (dBm)
GSM 850MHz	≤38.45dBm (7W)
WCDMA Band 5	≤38.45dBm (7W)

Band	Burst Peak ERIP (dBm)
GSM 1900MHz	≤33.0dBm (2W)
WCDMA Band 2	≤33.0dBm (2W)

Band	Burst Peak ERP (dBm)
WCDMA Band 4	≤30dBm (1W)

Band	Channel	PeakERP (dBm)	Limit (dBm)	Polarization
GSM 850	128	27.18	38.45	Horizontal
	190	26.01	38.45	Horizontal
	251	24.97	38.45	Horizontal
	128	24.21	38.45	Vertical
	190	24.83	38.45	Vertical
	251	23.61	38.45	Vertical

Band	Channel	PeakEIRP (dBm)	Limit (dBm)	Polarization
GSM 1900	512	28.09	33	Horizontal
	661	28.89	33	Horizontal
	810	27.77	33	Horizontal
	512	25.37	33	Vertical
	661	24.80	33	Vertical
	810	25.94	33	Vertical



Band	Channel	PeakERP (dBm)	Limit (dBm)	Polarization
UMTS-FDD Band 5	4132	18.55	38.5	Horizontal
	4175	16.84	38.5	Horizontal
	4233	17.87	38.5	Horizontal
	4132	15.20	38.5	Vertical
	4175	14.95	38.5	Vertical
	4233	14.52	38.5	Vertical

Band	Channel	PeakEIRP (dBm)	Limit (dBm)	Polarization
UMTS-FDD Band 2	9262	23.80	33	Horizontal
	9400	23.59	33	Horizontal
	9538	23.56	33	Horizontal
	9262	21.45	33	Vertical
	9400	21.06	33	Vertical
	9538	21.29	33	Vertical

Band	Channel	PeakEIRP (dBm)	Limit (dBm)	Polarization
UMTS-FDD Band 4	1312	22.96	30	Horizontal
	1450	22.99	30	Horizontal
	1513	21.60	30	Horizontal
	1312	19.41	30	Vertical
	1450	20.73	30	Vertical
	1513	19.84	30	Vertical

Remark:ERP(dBm)= $P_{Mea} + P_{cl} + G_a - 2.15$



1.9 Radiated Out of Band Emissions

1.9.1 Requirement

According to FCC section 22.917(a) and section 24.238(a), 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. This calculated to be -13dBm.

1.9.2 Test Description

See section 4.7.2 of this report.

1.9.3 Test Procedure

1. The lowest, middle and the highest channel were selected to perform tests respectively.
2. The EUT was placed on a rotatable non-conductive table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antennatower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A substituted antenna was in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12. $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



1.9.4 Test Results

Measurement Result

Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
GSM 850MHz	128	V	1648.4	-26.9	-13	Pass
		V	2472.6	-33.0	-13	Pass
		V	3296.8	-48.7	-13	Pass
		V	4121.0	-42.7	-13	Pass
		V	4945.2	nf	-13	Pass
		H	1648.4	-45.3	-13	Pass
		H	2472.6	-38.1	-13	Pass
		H	3296.8	-39.6	-13	Pass
		H	4121.0	-43.5	-13	Pass
		H	4945.2	nf	-13	Pass
	190	V	1673.2	-27.5	-13	Pass
		V	2509.8	-48.9	-13	Pass
		V	3346.4	-46.0	-13	Pass
		V	4183.0	-41.6	-13	Pass
		V	5019.6	nf	-13	Pass
		H	1673.2	-53.6	-13	Pass
		H	2509.8	-48.1	-13	Pass
		H	3346.4	-47.8	-13	Pass
		H	4183.0	-48.8	-13	Pass
		H	5019.6	nf	-13	Pass
	251	V	1697.6	-41.7	-13	Pass
		V	2546.4	-46.2	-13	Pass
		V	3395.2	-46.9	-13	Pass
		V	4244.0	-49.0	-13	Pass
		V	5092.8	nf	-13	Pass
		H	1697.6	-57.2	-13	Pass
		H	2546.4	-44.0	-13	Pass
		H	3395.2	-48.3	-13	Pass
		H	4244.0	-47.7	-13	Pass
		H	5092.8	nf	-13	Pass



Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
GSM 1900MHz	512	V	3700.4	-52.4	-13	Pass
		V	5550.6	-44.0	-13	Pass
		V	7400.8	-50.3	-13	Pass
		V	9251.0	-35.9	-13	Pass
		V	11101.2	nf	-13	Pass
		H	3700.4	-43.3	-13	Pass
		H	5550.6	-45.5	-13	Pass
		H	7400.8	-45.0	-13	Pass
		H	9251.0	-48.3	-13	Pass
		H	11101.2	nf	-13	Pass
	661	V	3760.0	-41.8	-13	Pass
		V	5640.0	-45.9	-13	Pass
		V	7520.0	-45.0	-13	Pass
		V	9400.0	-50.0	-13	Pass
		V	11280.0	nf	-13	Pass
		H	3760.0	-46.4	-13	Pass
		H	5640.0	-45.5	-13	Pass
		H	7520.0	-40.2	-13	Pass
		H	9400.0	-41.5	-13	Pass
		H	11280.0	nf	-13	Pass
	810	V	3819.6	-47.1	-13	Pass
		V	5729.4	-41.8	-13	Pass
		V	7639.2	-47.6	-13	Pass
		V	9549.0	-48.9	-13	Pass
		V	11458.8	nf	-13	Pass
		H	3819.6	-43.9	-13	Pass
		H	5729.4	-45.8	-13	Pass
		H	7639.2	-40.1	-13	Pass
		H	9549.0	-46.2	-13	Pass
		H	11458.8	nf	-13	Pass



Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
UMTS-FDD Band 5	4132	V	1652.8	-53.1	-13	Pass
		V	2479.2	-51.5	-13	Pass
		V	3305.6	nf	-13	Pass
		V	4132.0	nf	-13	Pass
		V	4958.4	nf	-13	Pass
		H	1652.8	-58.5	-13	Pass
		H	2479.2	-48.2	-13	Pass
		H	3305.6	nf	-13	Pass
		H	4132.0	nf	-13	Pass
		H	4958.4	nf	-13	Pass
	4175	V	1670.0	-52.3	-13	Pass
		V	2505.0	-55.2	-13	Pass
		V	3340.0	nf	-13	Pass
		V	4175.0	nf	-13	Pass
		V	5010.0	nf	-13	Pass
		H	1670.0	-46.8	-13	Pass
		H	2505.0	-49.5	-13	Pass
		H	3340.0	nf	-13	Pass
		H	4175.0	nf	-13	Pass
		H	5010.0	nf	-13	Pass
	4233	V	1693.2	-52.8	-13	Pass
		V	2539.8	-50.7	-13	Pass
		V	3386.4	nf	-13	Pass
		V	4233.0	nf	-13	Pass
		V	5079.6	nf	-13	Pass
		H	1693.2	-53.0	-13	Pass
		H	2539.8	-47.6	-13	Pass
		H	3386.4	nf	-13	Pass
		H	4233.0	nf	-13	Pass
		H	5079.6	nf	-13	Pass



Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
UMTS-FDD Band 2	9262	V	3704.8	-53.4	-13	Pass
		V	5557.2	-53.8	-13	Pass
		V	7409.6	-51.5	-13	Pass
		V	9262.0	nf	-13	Pass
		V	11114.4	nf	-13	Pass
		H	3704.8	-47.3	-13	Pass
		H	5557.2	-56.9	-13	Pass
		H	7409.6	-50.3	-13	Pass
		H	9262.0	nf	-13	Pass
		H	11114.4	nf	-13	Pass
	9400	V	3760.0	-54.1	-13	Pass
		V	5640.0	-52.4	-13	Pass
		V	7520.0	-52.0	-13	Pass
		V	9400.0	nf	-13	Pass
		V	11280.0	nf	-13	Pass
		H	3760.0	-49.2	-13	Pass
		H	5640.0	-56.1	-13	Pass
		H	7520.0	-54.4	-13	Pass
		H	9400.0	nf	-13	Pass
		H	11280.0	nf	-13	Pass
	9538	V	3815.2	-51.2	-13	Pass
		V	5722.8	-50.4	-13	Pass
		V	7630.4	-51.4	-13	Pass
		V	9538.0	nf	-13	Pass
		V	11445.6	nf	-13	Pass
		H	3815.2	-48.3	-13	Pass
		H	5722.8	-54.9	-13	Pass
		H	7630.4	-52.8	-13	Pass
		H	9538.0	nf	-13	Pass
		H	11445.6	nf	-13	Pass



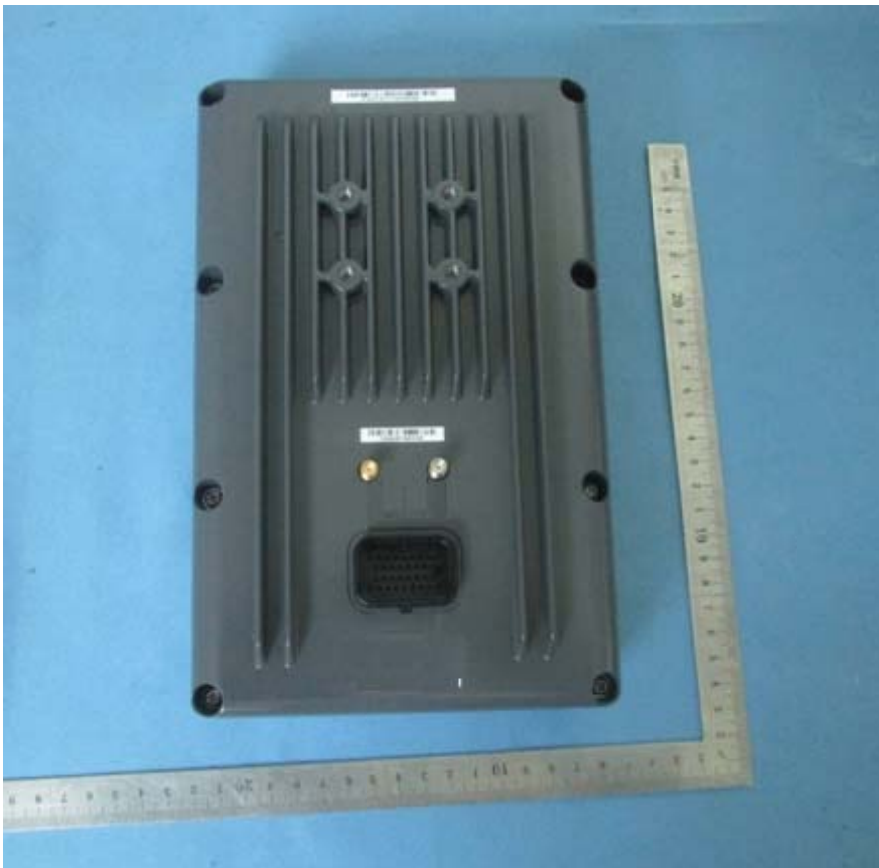
Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
UMTS-FDD Band 4	1312	V	3424.8	-52.2	-13	Pass
		V	5137.2	-53.2	-13	Pass
		V	6849.6	-55.1	-13	Pass
		V	8562	nf	-13	Pass
		V	10274.4	nf	-13	Pass
		H	3424.8	-45.4	-13	Pass
		H	5137.2	-50.4	-13	Pass
		H	6849.6	-54.4	-13	Pass
		H	8562	nf	-13	Pass
		H	10274.4	nf	-13	Pass
	1450	V	3484	-55.1	-13	Pass
		V	5226	-52.5	-13	Pass
		V	6968	-50.7	-13	Pass
		V	8710	nf	-13	Pass
		V	10452	nf	-13	Pass
		H	3484	-43.5	-13	Pass
		H	5226	-53.1	-13	Pass
		H	6968	-53.7	-13	Pass
		H	8710	nf	-13	Pass
		H	10452	nf	-13	Pass
	1513	V	3505.2	-48.6	-13	Pass
		V	5257.8	-53.4	-13	Pass
		V	7010.4	-52.8	-13	Pass
		V	8763	nf	-13	Pass
		V	10515.6	nf	-13	Pass
		H	3505.2	-45.3	-13	Pass
		H	5257.8	-53.6	-13	Pass
		H	7010.4	-53.5	-13	Pass
		H	8763	nf	-13	Pass
		H	10515.6	nf	-13	Pass

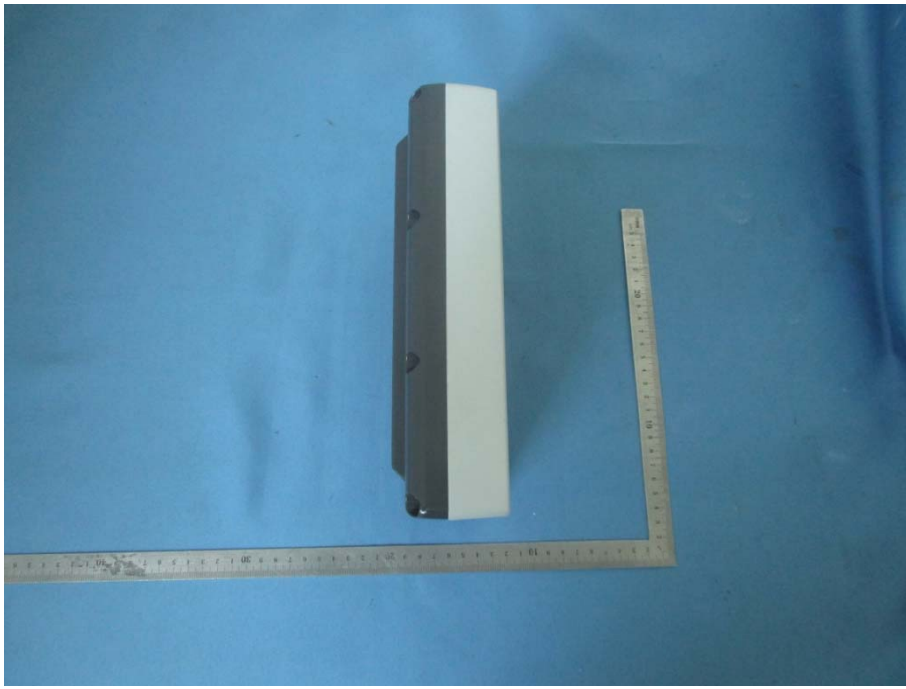
NOTE:

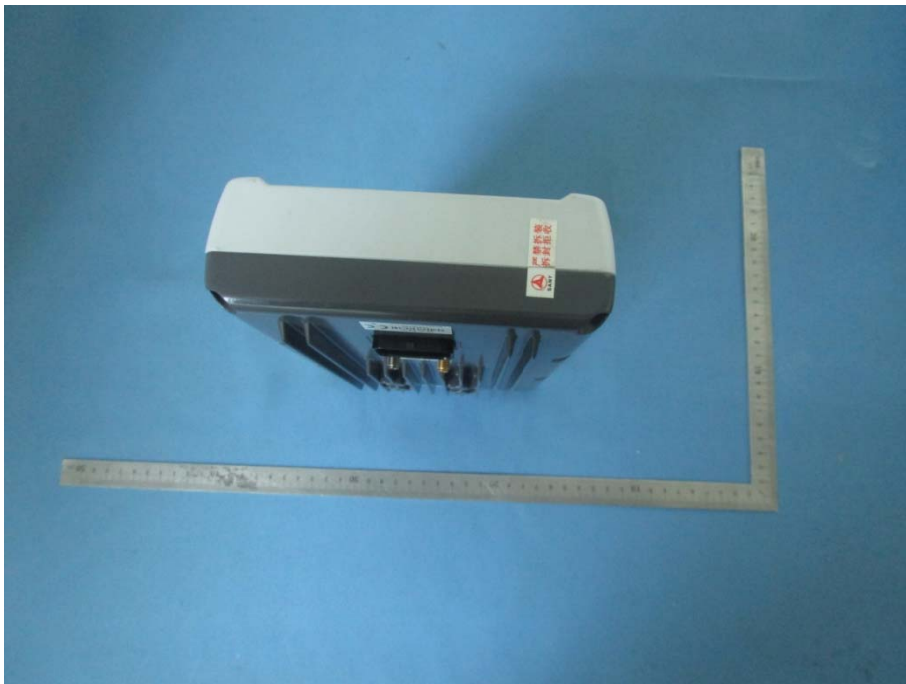
- 1) The power of the EUT transmitting frequency should be ignored.
- 2) All spurious emission tests were performed in X,Y,Z axis direction. Only the worst axis test condition was recored in this test report.
- 3) 'nf' means that the emission level is too low to read out from the noise floor.4) The emission levels of below 1 GHz are very lower than the limit(<-40dBm) and not show in this report.



Annex Photos of the EUT







**** END OF REPORT ****