



FCC PART 15 B TEST REPORT

For

TYT ELECTRONICS CO., LTD

Block 39-1, Optoelectronics-information industry base, Nan'an, Quanzhou, Fujian, China

FCC ID: POD25W-WP

Report Type: Original Report	Product Name: Mobile Radio
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The **TYT ELECTRONICS CO., LTD**'s product, model number: **TH-8600 (FCC ID: POD25W-WP)** (the "EUT") in this report was a **Mobile Radio**, which was measured approximately: 14 cm (L) × 10.5 cm (W) × 4.5 cm (H), rated input voltage: DC13.8V. The highest operation frequency is 450 MHz.

**All measurement and test data in this report was gathered from final production sample, serial number: 161213052 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-12-15, and EUT conformed to test requirement.*

Objective

This test report is prepared on behalf of **TYT ELECTRONICS CO., LTD** in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 B Class B.

Related Submittal(s)/Grant(s)

NO Related Submittal(s)/Grant(s)

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The uncertainty of any RF tests which use conducted method measurement is ± 3.17 dB, the uncertainty of any radiation on emissions measurement is:

30M~200MHz: ± 4.7 dB;
200M~1GHz: ± 6.0 dB;
1G~6GHz: ± 5.13 dB;
6G~25GHz: ± 5.47 dB;

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication 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 April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. 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

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

No software was used during test.

Equipment Modifications

No modification was made to the EUT tested.

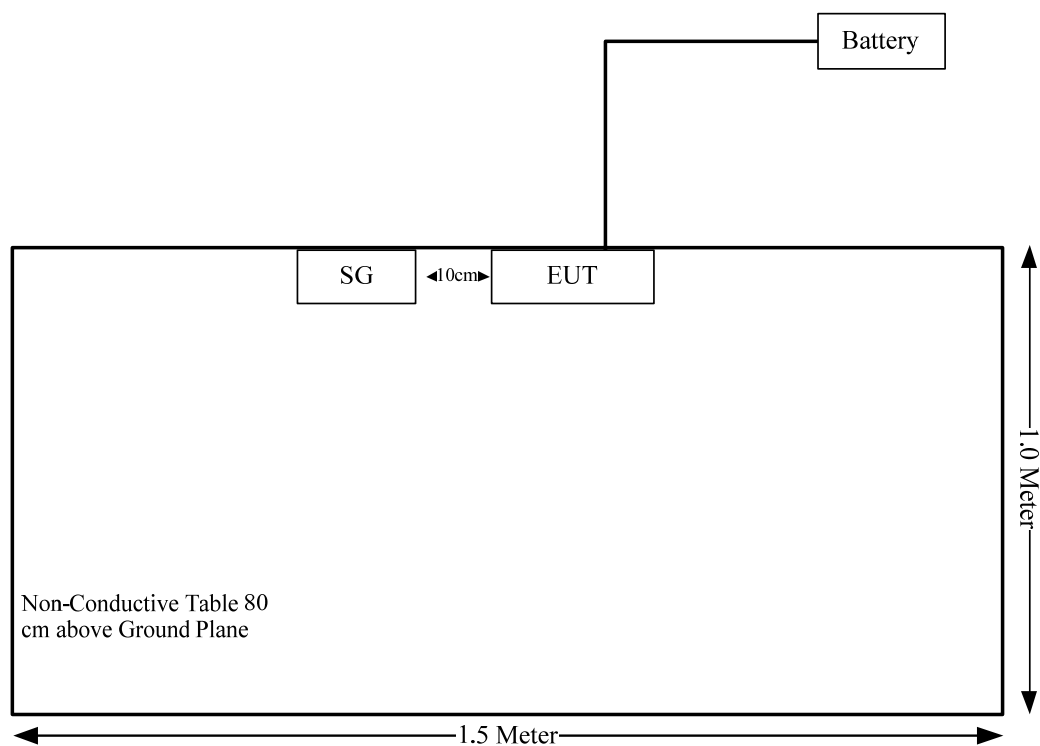
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HEWLETT	Signal Generator	ESG-D3000A	N/A
Panasonic	Lead acid battery	UP-RW1236	N/A

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power line	No	No	2.2	Battery	EUT

Configuration of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Not Applicable
§15.109	Radiated Emissions	Compliance
§15.121	Compliance for Scanning Receiver	Compliance

Not Applicable: the device was powered by battery.

FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:

30M~200MHz: ±4.7 dB;

200M~1GHz: ±6.0 dB;

1G~6GHz: ±5.13dB;

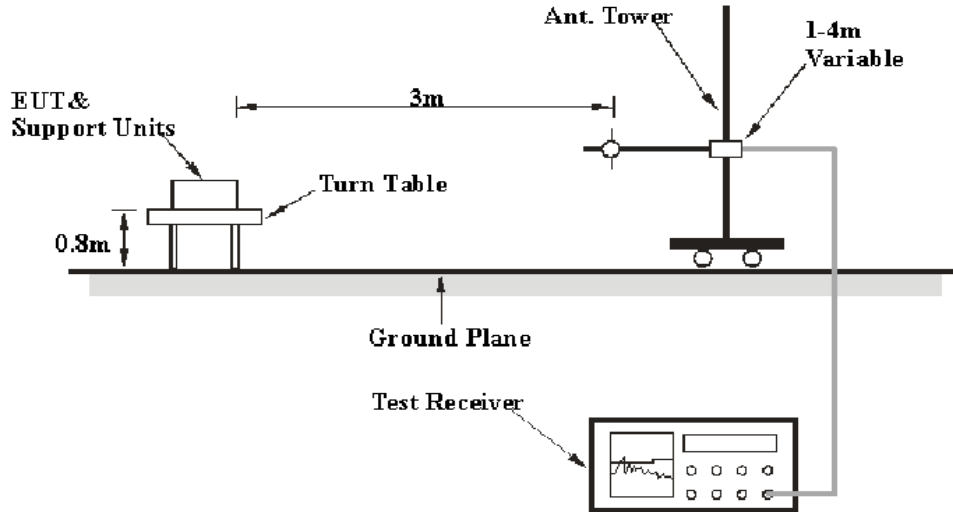
6G~25GHz: ±5.47 dB;

Table 2 – Values of U_{cispr}

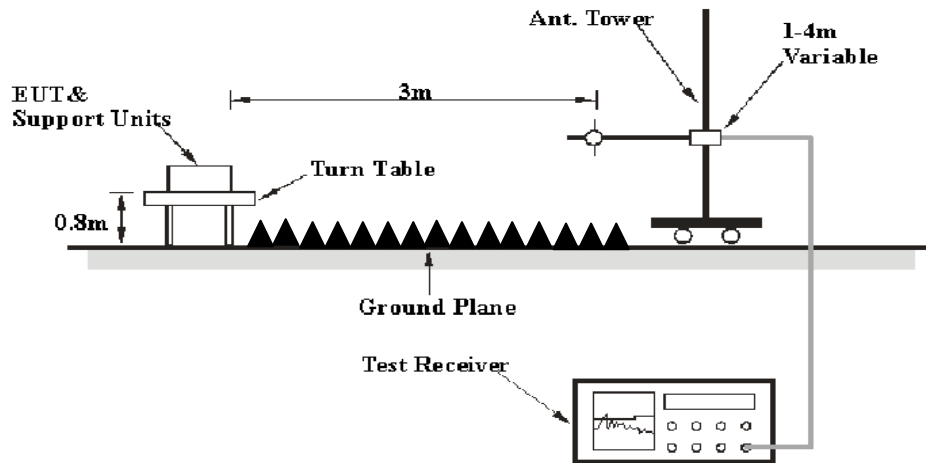
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed at the 3 meters distance in chamber, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5.0 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
HEWLETT	Signal Generator	ESG-D3000A	N/A	2016-12-02	2017-12-01
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2016-05-20	2017-05-19
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09

* **Statement of Traceability:** BAACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

Environmental Conditions

Temperature:	22.3 °C
Relative Humidity:	56 %
ATM Pressure:	102kPa

** The testing was performed by Kevin Hu on 2017-01-20.*

Test Result: Compliance

Test Mode: Receiving (146MHz signal applied)

30MHz-5GHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB(1/m))					
52.31	41.26	QP	H	8.28	0.43	28.45	21.52	40.00	18.48
291.9	47.07	QP	H	14.02	1.09	27.53	34.65	46.00	11.35
330.7	47.25	QP	H	14.71	1.18	27.67	35.47	46.00	10.53
419.94	42.14	QP	H	16.80	1.46	28.40	32.00	46.00	14.00
438.37	42.35	QP	H	16.89	1.58	28.44	32.38	46.00	13.62
876.81	34.88	QP	H	22.52	2.35	28.22	31.53	46.00	14.47
291.9	42.57	QP	V	14.02	1.09	27.53	30.15	46.00	15.85
330.7	41.65	QP	V	14.71	1.18	27.67	29.87	46.00	16.13
419.94	40.44	QP	V	16.80	1.46	28.40	30.30	46.00	15.70
438.37	39.55	QP	V	16.89	1.58	28.44	29.58	46.00	16.42
1160	46.04	PK	H	23.22	2.20	26.66	44.80	74.00	29.20
1160	45.21	AV	H	23.22	2.20	26.66	43.97	54.00	10.03
1245	45.68	PK	H	23.44	2.32	26.57	44.87	74.00	29.13
1245	35.1	AV	H	23.44	2.32	26.57	34.29	54.00	19.71

Test Mode: Receiving(435MHz signal applied)

30MHz-2GHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB(1/m))					
51.34	46.82	QP	H	8.50	0.42	28.46	27.28	40.00	12.72
143.49	35.19	QP	H	12.96	0.69	28.10	20.74	43.50	22.76
288.02	44.92	QP	H	13.98	1.13	27.52	32.51	46.00	13.49
415.09	41.03	QP	H	16.63	1.50	28.36	30.80	46.00	15.20
831.22	28.47	QP	H	22.09	2.30	28.37	24.49	46.00	21.51
870.02	34.99	QP	H	22.44	2.34	28.25	31.52	46.00	14.48
415.09	43.63	QP	V	16.63	1.50	28.36	33.40	46.00	12.60
870.02	31.29	QP	V	22.44	2.34	28.25	27.82	46.00	18.18
2152.5	46.2	PK	H	24.38	3.03	26.84	46.77	74.00	27.23
2152.5	35.85	AV	H	24.38	3.03	26.84	36.42	54.00	17.58
2492.5	44.05	PK	H	23.23	2.99	26.89	43.38	74.00	30.62
2492.5	33.36	AV	H	23.23	2.99	26.89	32.69	54.00	21.31

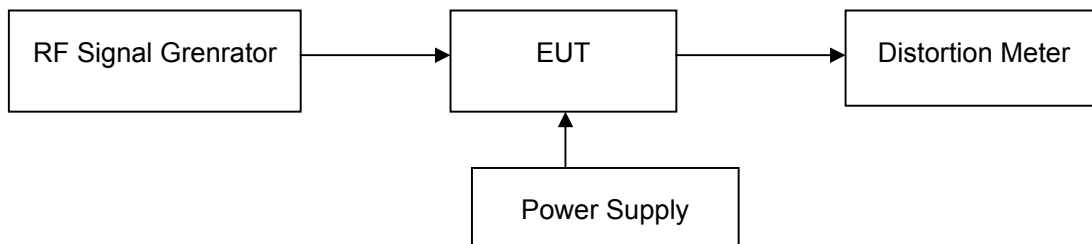
FCC §15.121 – COMPLIANCE FOR SCANNING RECEIVER

Applicable Standard

FCC §15.121

EUT Setup

For FCC §15.121 (b) Scanning Receiver Cellular Band Rejection Test



Test Procedure

- 1) Connected the EUT as shown in the above block diagram.
- 2) Apply a RF signal to the receiver input port at lowest, middle and highest channel frequencies of receiver operation band.
- 3) Adjust the audio output level of the receiver to it's rated value with the distortion less than 10%.
- 4) Adjust the RF Signal Generator Output Power to produce 12 dB SINAD without the audio output power dropping by more than 3 dB. This output level of the RF SG at each channel frequency is the sensitivity of the receiver.
- 5) Select the lowest or worse-case sensitivity level for all of the bands as the reference sensitivity.
- 6) Adjust the RF Signal Generator output to a level of +60 dB above the reference sensitivity obtained in step 5) and its frequency to the frequency points in the cellular band.
- 7) Set the Receiver squelch to threshold, the signal required to open the squelch must be lower than the reference sensitivity level.
- 8) Set the receiver in a scanning mode and allow it to scan through it's complete receiving range.
- 9) If the receiver unsquelched or stopped on any frequency, receiving at this frequency, then adjust the signal generator output level until 12 dB SINAD is produced, this level is the spurious value and the difference between the reference sensitivity and the spurious value is the rejection ratio and must be at least 38dB.
- 10) Repeat above procedure at the frequencies 824.5, 836.0, and 848.5 MHz for the mobile band, and 869.1, 881.5, and 893.5MHz for the cellular base band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 247	2016-08-10	2017-08-09
HEWLETT	Signal Generator	ESG-D3000A	N/A	2016-12-02	2017-12-01
FLUKE	Multimeter	1587	27870099	2016-12-30	2017-12-29

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

Comply with FCC 121(a):

– Please refer to the technical informations or the attestation letter conforming compliance with this requirement.

Comply with FCC 121(b):

– Please refer to the following Scanning Receiver Cellular Band Rejection Test Result.

Comply with FCC 121(c):

– Not applicable.

Comply with FCC 121(d):

–Please refer to the User Manual.

Comply with FCC 121(e):

– This Scanning Receiver is not assembled from kits or marketed in kit form.

Comply with FCC 121(f):

–Please refer to the label of the product.

Test Data

For FCC §15.121(b) Scanning Receiver Cellular Band Rejection

Environmental Conditions

Temperature:	22.3 °C
Relative Humidity:	56 %
ATM Pressure:	102kPa

* The testing was performed by Kevin Hu on 2017-01-20.

Test Result: Compliance

Scanning Receiver Cellular Band Rejection Test Data:

EUT's Scanning Frequency Band (MHz)	Test Frequencies of Cellular Band (MHz)	Spurious Value of Cellular Frequencies for 12 dB SINAD (dBm)	Reference Sensitivity for 12 dB SINAD (dBm)	Rejection Ratio (dB)	Rejection Ratio Limit (dB)
144-148 420-450	824.5, 836.0, 848.5, 869.1, 881.5, 893.5	> -51.2	-116.5	< -65.3	< -38.0

Note: Rejection Ratio = Reference Sensitivity - Spurious Value

Result

Compliance with the requirements specified in Part 15.121 for scanning receiver.

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