Shenzhen Huatongwei International Inspection Co., Ltd.
Keji S,12th , Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China
Phone:86-755-26748099 Fax:86-755-26748089 http://www.szhtw.com.cn

CNAS L1225

MPE TEST REPORT

FCC Per 47 CFR 2.1091(b)&RSS-102

Report Reference No.....:	**TRE1203004502**
FCC ID.....:	**X24-MOBILE-V**
IC.	**10337A-MOBILEV**
Compiled by (position+printed name+signature)..:	File administrators Tim Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Eric Zhang
Approved by (position+printed name+signature)..:	Manager Wenliang Li
Date of issue.....:	May 03, 2012
Testing Laboratory Name .....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**Quanzhou TYT Electronics Co., Ltd.**
Address.....:	Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China
Test specification:	
Standard .....:	**FCC Per 47 CFR 2.1091(b)** **OET Bulletin 65 Supplement C[June 2001]** **RSS-102**
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

Test item description ..... :	Mobile Radio
Trade Mark .....:	TYT
Model/Type reference.....:	TH-9000VHF
Listed Models .....:	TH-8900VHF/TH-9800VHF/TH-9900VHF
Ratings.....:	DC 13.60 V
Rated Output Power .....:	65 Watt(48.13 dBm)/25Watt(43.98 dBm)/10Watt(40.00 dBm)
Modulation	FM
Channel Separation.....	12.5KHz only for FCC &both 12.5KHz and 25KHz only for IC
Frequency Range .....:	From 138MHz to 174MHz only for IC From 136MHz to 174MHz only for FCC
Result.....:	**Positive**

MPE T E S T R E P O R T

Test Report No. :	**TRE1203004502**	May 03, 2012 Date of issue

Equipment under Test	:	Mobile Radio
Model /Type	:	TH-9000VHF
Listed Models	:	TH-8900VHF/TH-9800VHF/TH-9900VHF
Applicant	:	**Quanzhou TYT Electronics Co., Ltd.**
Address	:	Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China
Manufacturer	:	**Quanzhou TYT Electronics Co., Ltd.**
Address	:	Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China

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1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

●	Power Cable	Length (m) :	3
		Shield :	Unshield
		Detachable :	Detachable
○	Multimeter	Manufacturer :	/
		Model No. :	/

1.2. Product Description

The **Quanzhou TYT Electronics Co., Ltd.** 's Model: TH-9000VHF/TH-8900VHF/TH-9800VHF/TH-9900VHF or the "EUT" as referred to in this report; more general information as follows:

Name of EUT	Mobile Radio	
Model Number	TH-9000VHF/TH-8900VHF/TH-9800VHF/TH-9900VHF	
Rated Output Power	65 Watt(48.13 dBm)/25Watt(43.98 dBm)/10Watt(40.00 dBm)	
Modilation Type	FM for Analog Voice	
Emission Designator	Analog	16K0F3E for 25KHz Channel Separation
		11K50F3E for 12.5KHz Channel Separation
Channel Separation	Analog Voice	12.5KHz&25KHz only for IC
		12.5KHz only for FCC
Antenna Type	External	
Frequency Range	From 138 MHz to 174 MHz for IC From 136 MHz to 174 MHz for FCC	
Maximum Transmitter Power	Analog/FCC	74.30 W for 12.5 KHz Channel Separation
	Analog/IC	73.45 W for 25 KHz Channel Separation 74.30 W for 12.5 KHz Channel Separation

1.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 13.60 V

Test frequency list

Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Remark
FM/Analog	12.5KHz	Low	138.5000	Only for IC Review (Not For FCC Review)
		Middle	155.5000	
		High	173.5000	
	25KHz	Low	138.5000	
		Middle	155.5000	
		High	173.5000	
	12.5KHz	Low	138.5000	Only for FCC Review
		Middle	155.5000	
		High	173.5000	

1.4. Note

1. The EUT is a 136-174 MHz frequency band Mobile Radio (TH-9000VHF/TH-8900VHF/TH-9800VHF/TH-9900VHF),The functions of the EUT listed as below:

	Test Standards	Reference Report	Remark
Radio	FCC Part 90&RSS-119	TRE1203004501	For both FCC and IC Review
Health	Oet 65&RSS-102	TRE1203004502	
Health	Oet 65	TRE1203004503	Only for FCC Review

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.30 dB	(1)
Transmitter power Radiated	2.20 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

According to §RSS-102, Devices that have a radiating element normally operating at separation distances greater than 20 cm between the user and the device shall undergo an RF exposure evaluation. SAR evaluation may be performed in lieu of an RF exposure evaluation for devices operating below 6 GHz with a separation distance of greater than 20 cm between the user and the device.

According to §1.1310 and §2.1091 RF exposure is calculated.

OET Bulletin 65 Supplement C [June 2001]: Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields

RSS-102 Issue 4 March 2010 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	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

3.3. MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna

From the peak EUT RF output power, the minimum mobile separation distance, R=1.00 m, as well as the maximum gain of the used antenna is 2.15 dBi, the RF power density can be obtained.

TEST RESULTS

For both FCC and IC Review

For FM Modulation @ 12.5 KHz Channel Separation @ Rated High Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	48.41	69342.58	1.6406	1.00	0.9053	Compliance
155.5000	100.00	48.71	74301.91	1.6406	1.00	0.9700	Compliance
173.5000	100.00	48.46	70145.53	1.6406	1.00	0.9158	Compliance

For FM Modulation @ 12.5 KHz Channel Separation @ Rated Middle Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	44.72	29648.31	1.6406	1.00	0.3871	Compliance
155.5000	100.00	44.54	28444.61	1.6406	1.00	0.3714	Compliance
173.5000	100.00	44.58	28707.81	1.6406	1.00	0.3748	Compliance

For FM Modulation @ 12.5 KHz Channel Separation @ Rated Low Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	40.99	12560.30	1.6406	1.00	0.1640	Compliance
155.5000	100.00	40.74	11857.69	1.6406	1.00	0.1548	Compliance
173.5000	100.00	40.71	11776.06	1.6406	1.00	0.1537	Compliance

Only for IC Review *(Not For FCC Review)*

For FM Modulation @ 25 KHz Channel Separation @ Rated High Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	48.43	69622.65	1.6406	1.00	0.9095	Compliance
155.5000	100.00	48.66	73451.38	1.6406	1.00	0.9589	Compliance
173.5000	100.00	48.46	70145.53	1.6406	1.00	0.9158	Compliance

For FM Modulation @ 25 KHz Channel Separation @ Rated Middle Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	44.71	29580.12	1.6406	1.00	0.3862	Compliance
155.5000	100.00	44.53	28379.19	1.6406	1.00	0.3705	Compliance
173.5000	100.00	44.57	28641.78	1.6406	1.00	0.3739	Compliance

For FM Modulation @ 25 KHz Channel Separation @ Rated Low Power

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 100 cm (mW/cm^2)	Test Results
138.5000	100.00	40.96	12473.84	1.6406	1.00	0.1629	Compliance
155.5000	100.00	40.73	11830.42	1.6406	1.00	0.1545	Compliance
173.5000	100.00	40.69	11721.95	1.6406	1.00	0.1530	Compliance

4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 (b) for the controlled RF Exposure.

.....End of Report.....