Shenzhen Huatongwei International Inspection Co., Ltd.
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MPE TEST REPORT

Report Reference No. ..... :	**TRE1712016102** R/C…….: 36580
FCC ID ..... :	**P6NDM-9800V**
Applicant's name ..... :	**Shenzhen HQT Science&Technology Co., Ltd.**
Address.....:	5/F, East of Building M-8, Central Zone, Hi-Tech Industrial Park, Nanshan District,Shenzhen,China
Manufacturer.....:	Shenzhen HQT Science&Technology Co., Ltd.
Address.....:	5/F, East of Building M-8, Central Zone, Hi-Tech Industrial Park, Nanshan District,Shenzhen,China
Test item description ..... :	**Digital Mobile Radio**
Trade Mark .....:	HQT
Model/Type reference.....:	DM-9800
Listed Model(s) .....:	-
Standard ..... :	**FCC Per 47 CFR 2.1091(b)；KDB447498 v05r02**
Date of receipt of test sample……..:	Dec. 18, 2017
Date of testing……...:	Dec. 19, 2017 – Jan. 09, 2018
Date of issue……..:	Jan. 10, 2018
Result……..……...:	**PASS**

Compiled by (position+printed name+signature)..:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printed name+signature)..:	Project Engineer Jerry Wang	Jerry Wang
Approved by (position+printed name+signature)..:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. SUMMARY

1.1. Client Information

Applicant:	Shenzhen HQT Science&Technology Co., Ltd.
Address:	5/F, East of Building M-8, Central Zone, Hi-Tech Industrial Park, Nanshan District,Shenzhen,China
Manufacturer:	Shenzhen HQT Science&Technology Co., Ltd.
Address:	5/F, East of Building M-8, Central Zone, Hi-Tech Industrial Park, Nanshan District,Shenzhen,China

1.2. Report version

Version No.	Date of issue	Description
00	Jan. 10, 2018	Original

1.3. Product Description

Name of EUT:	Digital Mobile Radio	
Trade mark:	HQT	
Model/Type reference:	DM-9800	
Listed mode(s):	-	
Power supply:	DC 13.6V	
Battery information:	-	
Charger information:	-	
Adapter information:	-	
Operation Frequency Range:	From 136MHz to 174MHz	
Rated Output Power:	High Power: 50W (46.99dBm)/Low Power: 25W (43.98dBm)	
Modulation Type:	Analog Voice:	FM
	Digital Voice /Digital Data:	4FSK
Digital Type:	DMR	
Channel Separation:	Analog Voice:	☒ 12.5kHz
	Digital Voice /Digital Data:	☒ 12.5kHz ☐ 6.25kHz
Emission Designator:	Analog Voice:	☒12.5kHz Channel Separation: 7K63F3E
	Digital Voice& Data:	☒12.5kHz Channel Separation: 5K32FXW
	Digital Data:	☒12.5kHz Channel Separation: 5K32FXD
Support data rate:	9.6kbps	
Antenna Type:	External	
Maximum Transmitter Power:	Digital	48.87W for 12.5kHz Channel Separation
	Analog	44.87Wfor 12.5kHz Channel Separation

Note: The product has the same digital working characters when operating in both two digitized voice/data mode. So only one set of test results for digital modulation modes are provided in this test report.

1.4. Test frequency list

Mode	Modulation	Operation Frequency Range (MHz)	Test Frequency (MHz)
Analog	FM	136-174	CH_L 136.0125
			CH_M 155.0125
			CH_H 173.9875
Digital	4FSK	136-174	CH_L 136.0125
			CH_M 155.0125
			CH_H 173.9875

Note:

In section 15.31(m), 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, please see the above listed frequency for testing.

1.5. EUT operation mode

Test mode	Transmitting	Power level		Digital	Analog
		High	Low	12.5kHz	12.5kHz
TX1	√	√		√	
TX2	√		√	√	
TX3	√	√			√
TX4	√		√		√

√: is operation mode.

1.6. 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) :	3.00
		Shield :	Unshielded
		Detachable :	Undetachable
○	Multimeter	Manufacturer :	/
		Model No. :	/
○	Antenna	Model No. :	TQC-136FC
		Antenna Gain. :	3.5dBi

1.7. Modifications

No modifications were implemented to meet testing criteria.

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 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 TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " 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	0.57 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=1.96.

2.4. Equipments Used during the Test

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.
Field Probe	ETS-LINDGREN	HI-6005	00064170	2017/11/13
Field Meter	AR	FM 5004	300239	2017/11/13

The calibration interval was one year.

3. Method of measurement

3.1. Applicable Standard

According to FCC Part 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 FCC Part 1.1310 and FCC Part 2.1091 RF exposure is calculated.
IEEE Std C95.1: 2005: "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz".
FCC OET Bulletin 65, Edition 97-01: "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields".
FCC Supplement C to OET Bulletin 65, Edition 01-01: "Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emission".
IEEE Std C95.3: 2002: "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz – 300 GHz",
KDB447498 v05r02:Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2. Limit

FCC Part 1.1310(e):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f=frequency in MHz
*=Plane-wave equivalent power density

3.3. Calculating the Safe Distance

Before starting EME measurements, we calculated the safe distance, R_{safe} using the following formula:

$$Rsafe = \sqrt{\frac{P\max \cdot Gn \cdot \eta}{4\pi \cdot S}}$$

G_n: antenna gain (numeric)
P_{max}: maximum power input to the antenna (mW)
S: power density limit (mW/m^2) respectively
η: duty cycle (decimal number), for these measurements $\eta = 0.5$

The results of R_{safe} calculations:

FCC Part 2.1091:
RF Field Strength Limits for Occupational/Controlled Exposure

TX1							
Test Frequency (MHz)	Conducted Output Power (dBm)	Tolerance (dB)	Max Output Power (dBm)	Max Output Power (mW)	Antenna Gain (Numeric)	Power Density (W/cm^2)	Safe Distance (m)
136.0125	46.3	1.00	47.3	53703	2.2387	1.0000	0.69
155.0125	46.8	1.00	47.8	60256	2.2387	1.0000	0.73
173.9875	46.9	1.00	47.9	61660	2.2387	1.0000	0.74

TX3							
Test Frequency (MHz)	Conducted Output Power (dBm)	Tolerance (dB)	Max Output Power (dBm)	Max Output Power (mW)	Antenna Gain (Numeric)	Power Density (mW/cm^2)	Safe Distance (m)
136.0125	46.3	1.00	47.3	53456	2.2387	1.0000	0.69
155.0125	46.3	1.00	47.3	54075	2.2387	1.0000	0.69
173.9875	46.4	1.00	47.4	55081	2.2387	1.0000	0.70

Note:
Max Output Power(dBm)= Rated Output Power(dBm)+Tolerance(dB)

3.4. Antenna Information

Model and Frequency:	TQC-136FC	136MHz-174MHz
Antenna Type:	External (Whip Antenna)	
Antenna Gain:	3.5dBi	

3.5. Measurement Procedure

1. Polarization of the EUT's antenna was vertical, which is its polarization in actual use.
2. The EUT at the chosen modulation was set to transmit at the chosen frequency at maximum RF power and at 50% duty cycle (50% duty cycle is simulated either by lowering the radio's power by 3dB or by using a 3 dB pad on the output of the radio). During preliminary measurements, we set the distance between the power density probe and the investigated EUT's antenna equal to the average calculated Rsafe applicable either for controlled or uncontrolled environments.
3. Power density measurements were taken at different heights of the probe from the ground (0.1 to 2 meters) while rotating versus azimuth (from 0° to 360°) the antenna.
4. The azimuth between the probe and the antenna position corresponding to the highest MPE level was chosen as the "worst case" position for the final measurements.
5. For the final measurements, we adjusted the distance between the test probe and the tested antenna to the real safe distance, Rreal, such that the measured highest power density in the "worst case" position was the same or slightly less than the test limit.
6. The measurement results of final measurements conducted at the chosen azimuth and different heights of the probe above the ground.
7. Average values of power density were calculated for the imaginary whole human body (0.1–2.0 m), for the lower part of the body (0.1–0.9 m) and for the upper part of the body (1.0–2.0 m).

3.6. Test Results

EME Data:

Measuring Antenna Height (cm)	FCC Part 2.1091			
	Controlled RF Exposure(mW/cm^2)			
	3.5dBi Antenna 64cm	3.5dBi Antenna 74cm	3.5dBi Antenna 84cm	3.5dBi Antenna 94cm
10	0.17	0.10	0.07	0.04
20	0.31	0.12	0.10	0.05
30	0.49	0.27	0.21	0.12
40	0.62	0.49	0.43	0.24
50	0.77	0.69	0.55	0.35
60	1.07	0.87	0.86	0.43
70	1.11	0.97	0.82	0.52
80	1.04	0.86	0.74	0.67
90	0.98	0.82	0.71	0.59
100	0.87	0.80	0.79	0.62
110	0.77	0.74	0.72	0.51
120	0.62	0.56	0.53	0.46
130	0.61	0.60	0.48	0.33
140	0.53	0.51	0.43	0.26
150	0.44	0.36	0.33	0.24
160	0.37	0.28	0.21	0.16
170	0.30	0.19	0.15	0.08
180	0.21	0.08	0.06	0.05
190	0.17	0.07	0.04	0.04
200	0.08	0.03	0.03	0.03

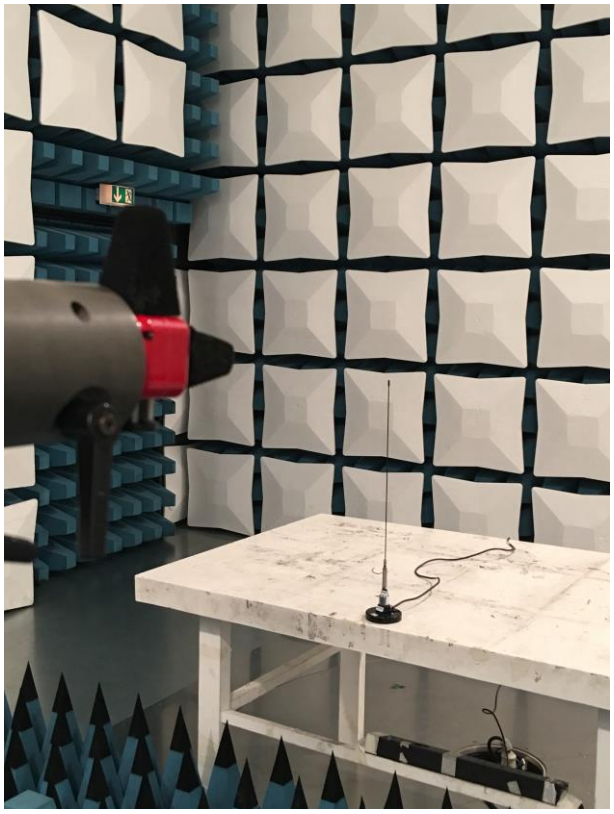
EME for Body Parts:

Part of the body/averaging points (m)	FCC Part 2.1091
	Controlled RF Exposure
	3.5dBi Antenna 74cm (mW/cm^2)
Whole body (0.1 to 2.0)	0.95
Lower body (0.1 to 0.9)	0.87
Upper body (1.0 to 2.0)	0.79

3.7. Conclusion

The User Manual shall include RF radiation safety warnings:
The antenna of this device must be installed on the roof or trunk of the vehicle. If the gain of the used antenna is 3.5dBi, the minimum mobile separation distance R_{safe} =74cm.

3.8. Test Setup Photos of the EUT



----------End of Report----------