



MPE TEST REPORT

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

Report Reference No.: TRE1207002902 R/C:18530

FCC ID: YAMMD78XGU5

IC: 8913A-MD782GU5

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Date of issue: Aug 01, 2012

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: Hytera Communications Corporation Ltd.

Address: HYT Tower, Hi-Tech Industrial Park North, Nanshan District, Shenzhen China. 518057

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

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Test item description: Digital Mobile Radio

Trade Mark: Hytera

Manufacturer: Hytera Communications Corporation Ltd.

Model/Type reference: MD782G U(5)/MD785G U(5)/MD786G U(5)/MD788G U(5)

Listed Models: /

Ratings: DC 13.6 V

Modulation: FM&4FSK

Channel Separation: 25KHz&12.5KHz

Rated Power: 35 Watts(45.44dBm)/10 Watts(40.00dBm)

Operation Frequency Range: 806-825MHz/851-870MHz/896-902MHz/935-941MHz

Result: Positive

M P E T E S T R E P O R T

Test Report No. : TRE1207002902	Aug 01, 2012 Date of issue
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Equipment under Test : Digital Mobile Radio

Model /Type : MD782G U(5)/MD785G U(5)/MD786G U(5)/MD788G U(5)

Listed Models : /

Applicant : **Hytera Communications Corporation Ltd.**

Address : HYT Tower,Hi-Tech Industrial Park North,Nanshan
District,Shenzhen China.518057

Manufacturer : **Hytera Communications Corporation Ltd.**

Address : HYT Tower,Hi-Tech Industrial Park North,Nanshan
District,Shenzhen China.518057

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.

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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 Hytera Communications Corporation Ltd.'s Model: MD782G U(5)/MD785G U(5)/MD786G U(5)/MD788G U(5) or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Digital Mobile Radio	
Model Number	MD782G U(5)/MD785G U(5)/MD786G U(5)/MD788G U(5)	
FCC ID	YAMMD78XGU5	
IC	8913A-MD782GU5	
Rated Output Power	35 Watts(45.44dBm)/10 Watts(40.00dBm) for 806-825MHz/851-870MHz	
	30 Watts(44.77dBm)/10 Watts(40.00dBm) for 896-902MHz/935-941MHz	
Support data rate	9.6kbps	
Modulation Type	FM for Analog Voice	
	4FSK for Digital Voice/Digital Data	
	4FSK for Digital Data	
	Analog	16K0F3E for 25KHz Channel Separation
		11K0F3E for 12.5KHz Channel Separation
	Digital	7K60FXD for Digital Data only
Channel Separation	Analog Voice	12.5KHz&25KHz
	Digital Voice/Data	12.5KHz
	Digital Data	12.5KHz
Antenna Type	External	
Frequency Range	806-825MHz/851-870MHz/896-902MHz/935-941MHz	
Maximum Output Power	Analog	41.69 W for 25 KHz Channel Separation
		41.49 W for 12.5 KHz Channel Separation
	Digital	41.49 W for 12.5 KHz Channel Separation

1.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 13.60 V**Test frequency list**

Frequency Range (MHz)	Modulation Type	Channel Separation (KHz)	Test Channel	Test Frequency (MHz)	
				TX	RX
806-825	Analog/FM	25	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
		12.5	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
	Digital/4FSK	12.5	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
851-870	Analog/FM	25	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
		12.5	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
	Digital/4FSK	12.5	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
896-902	Analog/FM	12.5	Low Channel	896.5000	935.5000
	High Channel		900.5000	939.5000	
	Digital/4FSK		Low Channel	896.5000	935.5000
	High Channel		900.5000	939.5000	
935-941	Analog/FM	12.5	Low Channel	935.5000	935.5000
	High Channel		939.5000	939.5000	
	Digital/4FSK		Low Channel	935.5000	935.5000
	High Channel		939.5000	939.5000	

1.4. Note

The EUT is a U frequency band (806-825MHz/851-870MHz/896-902MHz/935-941MHz) Digital Mobile Radio with GPS function, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 90&RSS-119	TRE1207002901
Health	Oet 65&RSS-102	TRE1207002902
Health	Oet 65	TRE1207002903

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	0.57 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

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/cm ²)	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/cm ²)	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 7.0 dBi, the RF power density can be obtained.

TEST RESULTS

For FM Modulation@12.5KHz

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
806.5000	100.00	46.01	39902.49	5.0119	2.6883	1.5914	Compliance
817.0000	100.00	45.97	39536.66	5.0119	2.7233	1.5768	Compliance
823.5000	100.00	46.10	40738.03	5.0119	2.7450	1.6248	Compliance
851.5000	100.00	46.18	41495.40	5.0119	2.8383	1.6550	Compliance
860.0000	100.00	46.18	41495.40	5.0119	2.8667	1.6550	Compliance
868.5000	100.00	46.16	41304.75	5.0119	2.8950	1.6474	Compliance
896.5000	100.00	45.47	35237.09	5.0119	2.9883	1.4054	Compliance
900.5000	100.00	45.49	35399.73	5.0119	3.0017	1.4119	Compliance
935.5000	100.00	45.14	32658.78	5.0119	3.1183	1.3025	Compliance
939.5000	100.00	44.96	31332.86	5.0119	3.1317	1.2497	Compliance

For FM Modulation @25KHz

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
806.5000	100.00	45.98	39627.80	5.0119	2.6883	1.5805	Compliance
817.0000	100.00	46.03	40086.67	5.0119	2.7233	1.5988	Compliance
823.5000	100.00	46.11	40831.94	5.0119	2.7450	1.6285	Compliance
851.5000	100.00	46.20	41686.94	5.0119	2.8383	1.6626	Compliance
860.0000	100.00	46.13	41020.41	5.0119	2.8667	1.6360	Compliance
868.5000	100.00	46.14	41114.97	5.0119	2.8950	1.6398	Compliance

For 4FSK Modulation @12.5KHz

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
806.5000	100.00	46.18	41495.40	5.0119	2.6883	1.6550	Compliance
817.0000	100.00	46.16	41304.75	5.0119	2.7233	1.6474	Compliance
823.5000	100.00	46.14	41114.97	5.0119	2.7450	1.6398	Compliance
851.5000	100.00	46.18	41495.40	5.0119	2.8383	1.6550	Compliance
860.0000	100.00	46.18	41495.40	5.0119	2.8667	1.6550	Compliance
868.5000	100.00	46.12	40926.07	5.0119	2.8950	1.6323	Compliance
896.5000	100.00	45.50	35481.34	5.0119	2.9883	1.4151	Compliance
900.5000	100.00	45.46	35156.04	5.0119	3.0017	1.4021	Compliance
935.5000	100.00	45.23	33342.64	5.0119	3.1183	1.3298	Compliance
939.5000	100.00	45.40	34673.69	5.0119	3.1317	1.3829	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**.....