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MPE TEST REPORT

Report Reference No. ..... :	**TRE1411001802**	R/C…….:43921
FCC ID ..... :	**YAMMD65XU2**	
Applicant's name ..... :	**Hytera Communications Co.,Ltd**	
Address.....:	HYT Tower, Hi-Tech Industrial Park North, Nanshan District, Shenzhen China	
Manufacturer.....:	**Hytera Communications Co.,Ltd**	
Address.....:	HYT Tower,Hi-Tech Industrial Park North, Nanshan District, Shenzhen China	
Test item description ..... :	**Digital Mobile Radio**	
Trade Mark .....:	Hytera	
Model/Type reference.....:	MD650 U(2)	
Listed Model(s) .....:	MD652 U(2), MD655 U(2), MD656 U(2), MD658 U(2)	
Standard ..... :	**FCC Per 47 CFR 2.1091(b)**	
	KDB447498 v05r02	
Date of receipt of test sample……..:	Nov 13, 2014	
Date of testing……:	Nov 13, 2014- Nov 27, 2014	
Date of issue……...:	Nov 27, 2014	
Result..... ……..:	**PASS**	

Compiled by (position+printed name+signature)..:	File administrators Yingchun Shan	Yingchun Shan
Supervised by (position+printed name+signature)..:	Project Engineer Cary Luo	Cary Luo
Approved by (position+printed name+signature)..:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Contents

1. SUMMARY

1.1. Client Information

Applicant:	Hytera Communications Co.,Ltd
Address:	HYT Tower, Hi-tech Industrial Park North,Nanshan District, Shenzhen China
Manufacturer:	Hytera Communications Co.,Ltd
Address:	HYT Tower, Hi-tech Industrial Park North,Nanshan District, Shenzhen China

1.2. Product Description

Name of EUT:	Digital Mobile Radio	
Trade mark:	Hytera	
Model/Type reference:	MD650 U(2)	
Listed mode(s):	MD652 U(2), MD655 U(2), MD656 U(2), MD658 U(2)	
Power supply:	DC 13.6V	
Charger information:	/	
Adapter information:	/	
Operation Frequency Range:	From 450 MHz to 527 MHz	
Rated Output Power:	25 Watts(43.98dBm)/1Watts(30.00dBm)	
Modilation Type:	Analog Voice:	FM
	Digital Voice/Digital Data:	4FSK
Channel Separation:	Analog Voice:	12.5KHz, 25 KHz
	Digital Voice/Digital Data:	12.5KHz
Emission Designator:	Analog Voice:	11K0F3E for 12.5KHz Channel Separation 16K0F3E for 25KHz Channel Separation
	Digital Voice:	7K60FXW
	Digital Data:	7K60FXD
Support data rate	9.6kbps	
Antenna Type	External	
Maximum Transmitter Power	Analog	27.67W for 12.5 KHz Channel Separation
		27.10W for 25 KHz Channel Separation
	Digital	27.42W for 12.5 KHz 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.

Test frequency list

Modulation Type	Test Channel	Test Frequency (MHz)
Analog/FM Digital/4FSK	Lowest channel	450.5
	Middle channel	488.5
	Highest channel	526.5

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.

EUT operation mode
The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test mode No.	Description of operation mode	Additional information
Op 1	FM+BW12.5KHz+TX	The equipment is set with FM modulation and 12.5KHz bandwidth at maximum rated power for transmitter,powered by DC 13.60V
Op 2	FM+BW25KHz+TX	The equipment is set with FM modulation and 12.5KHz bandwidth at maximum rated power for transmitter,powered by DC 13.60V
Op 3	4FSK+BW12.5KHz+TX	The equipment is set with 4FSK modulation and 12.5KHz bandwidth at maximum rated power for transmitter,powered by DC 13.60V

1.3. 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. :	/

1.4. Modifications

No modifications were implemented to meet testing criteria.

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 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)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

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 §1.1310 and §2.1091 RF exposure is calculated.
KDB447498 v05r02:Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

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	$(900/f^2)$*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

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

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 50%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 100 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =100cm, as well as the gain of the used antenna is 5.0dBi, the RF power density can be obtained.

TEST RESULTS

Op 1							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 100 cm (mW/cm^2)	Power Density Limit FCC (mW/cm^2)	Test Results
450.5	100	44.05	25409.73	3.1623	0.3199	1.5017	PASS
488.5	100	44.17	26121.61	3.1623	0.3288	1.6283	PASS
526.5	100	44.10	25703.96	3.1623	0.3236	1.7550	PASS

Op 2							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 100 cm (mW/cm^2)	Power Density Limit FCC (mW/cm^2)	Test Results
450.5	100	44.00	25118.86	3.1623	0.3162	1.5017	PASS
488.5	100	43.96	24888.57	3.1623	0.3133	1.6283	PASS
526.5	100	44.10	25703.96	3.1623	0.3236	1.7550	PASS

Op 3							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 100 cm (mW/cm^2)	Power Density Limit FCC (mW/cm^2)	Test Results
450.5	100	43.88	24434.31	3.1623	0.3076	1.5017	PASS
488.5	100	43.46	22181.96	3.1623	0.2792	1.6283	PASS
526.5	100	43.67	23280.91	3.1623	0.2931	1.7550	PASS

4. Conclusion

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

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