



MPE TEST REPORT

Report Reference No...... : **TRE1706008205** R/C.....: 91248

FCC ID..... : **YAMMD61XU1**

Applicant's name..... : **Hytera Communications Corporation Limited**

Address..... : Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China

Manufacturer.....: Hytera Communications Corporation Limited

Address.....: Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China

Test item description : **Digital Mobile Radio**

Trade Mark: Hytera

Model/Type reference.....: MD615 U(1)

Listed Model(s): MD612 U(1),MD616 U(1),MD618 U(1)


Standard : **FCC Per 47 CFR 2.1091(b)**
KDB447498 v05r02

Date of receipt of test sample.....: June 12, 2017


Date of testing.....: June 13, 2017 – July 17, 2017

Date of issue.....: July 17, 2017

Result.....: **PASS**

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

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*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. Client Information

Applicant:	Hytera Communications Corporation Limited
Address:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China
Manufacturer:	Hytera Communications Corporation Limited
Address:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China

1.2. Product Description

Name of EUT:	Digital Mobile Radio
Trade Mark:	Hytera
Model/Type reference :	MD615 U(1)
Listed Model(s):	MD612 U(1),MD616 U(1),MD618 U(1)
Power supply:	DC 13.6V
Charger information:	-
Battery information:	-
Adapter information:	-
Bluetooth	
Version:	Supported BT4.0+EDR/BLE
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79/40
Channel separation:	1/2MHz
Antenna type:	Internal Antenna
Antenna Gain	0dBi

1.3. Test frequency list

Bluetooth Version	Test Frequency (MHz)
4.0+EDR	2402
	2441
	2480
4.0+BLE	2402
	2440
	2480

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.

1.4. 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	Transmitting	BT 4.0+EDR	BT 4.0+BLE
TX1	√	√	
TX2	√		√

1.5. 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. :	/

1.6. Modifications

No modifications were implemented to meet testing criteria.

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 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 (2014) and CISPR Publication 22.

2.2. Environmental conditions

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

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

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 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. 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 source-based Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, $r = 20\text{cm}$, as well as the gain of the used BT antenna is 0dBi, the RF power density can be obtained.

TEST RESULTS

TX1									
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Tune up (dB)	Max Output Power (dBm)	Max Output Power (mW)	Antenna Gain (Numeric)	Power Density (mW/cm ²)	Power Density Limit RSS (mWc/m ²)	Test Results
2402	20	4.44	1	5.44	3.4995	1.0000	0.00070	1.0000	Pass
2441	20	5.2	1	6.2	4.1687	1.0000	0.00083	1.0000	Pass
2480	20	5.29	1	6.29	4.2560	1.0000	0.00085	1.0000	Pass

TX2									
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Tune up (dB)	Max Output Power (dBm)	Max Output Power (mW)	Antenna Gain (Numeric)	Power Density (mW/cm ²)	Power Density Limit RSS (mWc/m ²)	Test Results
2402	20	4.1	1	5.1	3.2359	1.0000	0.00064	1.0000	Pass
2440	20	4.87	1	5.87	3.8637	1.0000	0.00077	1.0000	Pass
2480	20	4.97	1	5.97	3.9537	1.0000	0.00079	1.0000	Pass

Note:
 Max Output Power(dBm)= Output Power(dBm)+Tune up(dB)

4. Conclusion

RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

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