



MPE TEST REPORT

Report Reference No..... : TRE1503016010 R/C.....:89420
FCC ID..... : 2AE6CEM8100U1
Applicant's name..... : Shenzhen Excera Technology Co., Ltd.
Address..... : Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan
WestRoad,Tongle Village,Nanshan,Shenzhen,China
Manufacturer..... : Shenzhen Excera Technology Co., Ltd.
Address..... : Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan
WestRoad,Tongle Village,Nanshan,Shenzhen,China
Test item description : Digital Mobile Radio
Trade Mark : EXCERA
Model/Type reference..... : EM8100 U1
Listed Model(s) : /
Standard : FCC Per 47 CFR 2.1091(b)
KDB447498 v05r02
Date of receipt of test sample..... : Mar 26, 2015
Date of testing..... : Mar 27, 2015- Apr 14, 2015
Date of issue..... : Apr 14, 2015
Result..... : PASS

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

Shayne Zhu

Cary Luo

Hans Hu

Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd
Address..... : Bldg3, Hongfa Hi-tech Industrial Park, Genyu Road, Shenzhen,
China

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1. SUMMARY

1.1. Client Information

Applicant:	Shenzhen Excera Technology Co., Ltd.
Address:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China
Manufacturer:	Shenzhen Excera Technology Co., Ltd.
Address:	Block K of 4F, Tower A of Junxiangda building,Zhongshanyuan WestRoad,Tongle Village,Nanshan,Shenzhen,China

1.2. Product Description

Name of EUT:	Digital Mobile Radio
Trade Mark:	EXCERA
Model/Type reference :	EM8100 U1
Listed Model(s):	/
Power supply:	DC 13.6V
Charger information:	/
Battery information:	/
Adapter information:	/
Bluetooth	
Version:	Supported BT3.0+EDR
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	Internal Antenna
Version:	Supported BT4.0+BLE
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	Internal Antenna
Antenna Gain	0dBi

1.3. Test frequency list

Bluetooth Version	Modulation Type	Test Frequency (MHz)
3.0+EDR	GFSK	2402
		2441
		2480
	$\pi/4$ QPSK	2402
		2441
		2480
	8DPSK	2402
		2441
		2480
4.0+BLE	GFSK	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 No.	Description of operation mode	Additional information
Op 1	BT3.0+EDR+TX	Modulation Type: GFSK
Op 2	BT3.0+EDR+TX	Modulation Type: $\pi/4$ QPSK
Op 3	BT3.0+EDR+TX	Modulation Type: 8DPSK
Op 4	BT4.0+BLE+TX	Modulation Type: GFSK

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

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:	<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 §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

FCC Part 2.1091:

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 ²)*	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

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 61cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, $r = 61\text{cm}$, as well as the gain of the used BT antenna is 0dBi, the RF power density can be obtained.

TEST RESULTS

FCC Part 2.1091:

Op 1							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 61 cm (mW/cm ²)	Power Density Limit FCC (mW/cm ²)	Test Results
2402	61	2.3	1.6982	1.0000	0.00004	1.0000	PASS
2441	61	2.98	1.9861	1.0000	0.00004	1.0000	PASS
2480	61	4.5	2.8184	1.0000	0.00006	1.0000	PASS

Op 2							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 61cm (mW/cm ²)	Power Density Limit FCC (mW/cm ²)	Test Results
2402	61	1.68	1.4723	1.0000	0.00003	1.0000	PASS
2441	61	2.45	1.7579	1.0000	0.00004	1.0000	PASS
2480	61	4.13	2.5882	1.0000	0.00006	1.0000	PASS

Op 3							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 61cm (mW/cm ²)	Power Density Limit FCC (mW/cm ²)	Test Results
2402	61	1.89	1.5453	1.0000	0.00003	1.0000	PASS
2441	61	2.43	1.7498	1.0000	0.00004	1.0000	PASS
2480	61	4.14	2.5942	1.0000	0.00006	1.0000	PASS

Op 4							
Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 61cm (mW/cm ²)	Power Density Limit FCC (mW/cm ²)	Test Results
2402	61	3.25	2.1135	1.0000	0.00005	1.0000	PASS
2440	61	3.85	2.4266	1.0000	0.00005	1.0000	PASS
2480	61	2.8	1.9055	1.0000	0.00004	1.0000	PASS

4. Conclusion

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

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