

Report No.: SZEM200500375503

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RF Exposure Evaluation Report

Application No.: SZEM2005003755CR

Applicant: Hytera Communications Corporation Limited

Address of Applicant: Hytera Tower, Hi-Tech Industrial Park North 9108#Beihuan Road, Nanshan

Manufacturer: District, Shenzhen, People's Republic of China Hytera Communications Corporation Limited

Address of Hytera Tower, Hi-Tech Industrial Park North 9108#Beihuan Road, Nanshan

Manufacturer:District, Shenzhen, People's Republic of ChinaFactory:Hytera Communications Corporation Limited

Address of Factory:

Plant No.1, No.2 And No.3, Hytera Hi-Tech Park, No.3 Baolong 4th Road,

Paging Street Language District Shapphan Changedons

Baolong Street, Longgang District, Shenzhen, Guangdong

Product Name: Digital Repeater

RD982S VHF 100W, RD985S VHF 100W, RD986S VHF 100W, RD988S VHF

100W *

Model No.(EUT): Please refer to section 4.1 of this report which indicates which model was

actually tested and which were electrically identical.

Trade Mark: Hytera

FCC ID: YAMRD98XSVHFH

Standards: 47 CFR Part 1.1307 (2016)

47 CFR Part 1.1310 (2016)

Date of Receipt: 2020-05-14

Date of Test: 2020-05-15 to 2020-06-24

Date of Issue: 2020-06-30

Test Result : PASS*

Keny Xu EMC Laboratory Manager

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^{*} In the configuration tested, the EUT complied with the standards specified above.



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2 Version

Revision Record					
Version	Chapter	Date	Date Modifier Remar		
01		2020-06-30		Original	

Authorized for issue by:		
	Robsonti	
	Edison Li /Project Engineer	-
	EvicFu	
	Eric Fu /Reviewer	-



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4 General Information

4.1 General Description of EUT

Power supply:	DC28V		
Cable:	DC cable: 3017cm unshielded Control cable: 170cm unshielded		
Internal source:	More than 108MHz		
Sample Type:	Fixed device		
Frequency Range:	136MHz to 174MHz		
Modulation Type:	FM for Analog; 4FSK for Digital		
Channel Separation:	12.5KHz/25KHz for FM, 12.5KHz for 4FSK		
Number of Channels:	The equipment is able to operate on any designated channel within the specified frequency range.		
Antenna Type:	External		
Antenna Gain:	15dBi		
Classification:	Occupational/ Controlled Environment		

Remark:

Model No.: RD982S VHF 100W, RD985S VHF 100W, RD986S VHF 100W, RD988S VHF 100W Only the model RD982S VHF 100W was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on sales territory.



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4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None

4.6 Other Information Requested by the Customer

None.



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5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

Table 1—Limits for Maximum Permissible Exposure (MPE)

Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)			
(A) Limits for Occupational/Controlled Exposures						
614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6			
for General Populati	on/Uncontrolled Exp	oosure				
614 824/ī 27.5	1.63 2.19/f 0.073	*(100) *(180/f²) 0.2 f/1500	30 30 30 30 30			
	strength (V/m) its for Occupational 614 1842/f 61.4 for General Populati 614 824/f 27.5	Strength (V/m) Strength (A/m)	Strength (V/m) Strength (A/m) Power defisity (mW/cm²)			

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*Pi*R^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

The limit of MPE is 1.0 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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5.1.3 EUT RF Exposure Evaluation

1) Test Results

The best case gain of the antenna is 15dBi. 15dB logarithmic terms convert to numeric result is nearly 3.55.

FM	136-174MH	łz					
Frequency (MHz)	Maximun Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Peak Output Power (dBm)	Max Tune-up tolerance power (dBm)	Max Tune- up tolerance power (mW)	Power density (mW/cm²)	Minimum Distance to Human body (cm)
136.125	15	31.62	50	50	100000.00	1.00	502
136.125	15	31.62	36.9	37	5011.87	1.00	112
151.125	15	31.62	50	50	100000.00	1.00	502
151.125	15	31.62	37	37	5011.87	1.00	112
158.125	15	31.62	50	50	100000.00	1.00	502
158.125	15	31.62	37	37	5011.87	1.00	112
173.875	15	31.62	50	50	100000.00	1.00	502
173.875	15	31.62	37	37	5011.87	1.00	112
4FSK	136-174MHz						
Frequency (MHz)	Maximun Antenna Gain (dBi)	Maximum Antenna Gain (Numeric)	Peak Output Power (dBm)	Max Tune-up tolerance power (dBm)	Max Tune- up tolerance power (mW)	Power density (mW/cm²)	Minimum Distance to Human body (cm)
136.125	15	31.62	50	50	100000.00	1.00	502
136.125	15	31.62	37	37	5011.87	1.00	112
151.125	15	31.62	50	50	100000.00	1.00	502
151.125	15	31.62	37	37	5011.87	1.00	112
158.125	15	31.62	50	50	100000.00	1.00	502
158.125	15	31.62	37	37	5011.87	1.00	112
173.875	15	31.62	50	50	100000.00	1.00	502
173.875	15	31.62	37	37	5011.87	1.00	112

50 dBm is the declared maximum rated power, 36.98dBm is the declared low rated power by manufacturer. To satisfy RF exposure requirements, a separation distance of 502 cm or more should be maintained between this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

End of Report



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