



## RF Exposure Evaluation Declaration

Product Name : Xiaomi Router HD

Model No. : R3D

FCC ID : 2AIMRMIWIFIR3D

Applicant : Beijing Xiaomi Electronics Co., Ltd.

Address : No.58 Yard, Fifth Jinghai Road, Beijing  
Economic-Technological Development Area, Beijing,  
China.

Date of Receipt : Apr. 26, 2017

Test Date : Apr. 26, 2017~ Sep. 21, 2017

Issued Date : Oct. 23, 2017

Report No. : 1742142R-RF-US-P20V01

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, A2LA or any agency of the government.

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# Test Report Certification

Issued Date : Oct. 23, 2017

Report No. : 1742142R-RF-US-P20V01



Product Name : Xiaomi Router HD

Applicant : Beijing Xiaomi Electronics Co., Ltd.

Address : No.58 Yard, Fifth Jinghai Road, Beijing  
Economic-Technological Development Area, Beijing,  
China.

Manufacturer : Beijing Xiaomi Electronics Co., Ltd.

Address : No.58 Yard, Fifth Jinghai Road, Beijing  
Economic-Technological Development Area, Beijing,  
China.

Model No. : R3D

FCC ID : 2AIMRMIWIFIR3D

Brand Name : MI

EUT Voltage : AC 100-240V/50-60Hz

Applicable Standard : KDB 447498D01V06  
FCC Part1.1310

Test Result : Complied

Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.  
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,  
215006, Jiangsu, China  
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098  
FCC Registration Number: 800392

Documented By :



(Adm. Specialist: Kitty Li )

Reviewed By :



(Senior Engineer: Frank He )

Approved By :



(Engineering Manager : Harry Zhao )

## 1. RF Exposure Evaluation

### 1.1. Limits

According to FCC 1.1310: 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 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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.

## 1.2. Test Procedure

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

The temperature and related humidity: 18 and 78% RH.

## 1.3. Test Result of RF Exposure Evaluation

Product	:	Xiaomi Router HD
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna Information:

### 2.4G:

Antenna manufacturer	N/A							
Antenna Delivery	<input type="checkbox"/>	1*TX+1*RX	<input type="checkbox"/>	2*TX+2*RX	<input type="checkbox"/>	3*TX+3*RX	<input checked="" type="checkbox"/>	4*TX+4*RX
Antenna technology	<input type="checkbox"/>	SISO						
	<input checked="" type="checkbox"/>	MIMO	<input type="checkbox"/>	Basic				
			<input type="checkbox"/>	Sectorized antenna systems				
			<input type="checkbox"/>	Cross-polarized antennas				
			<input type="checkbox"/>	Unequal antenna gains, with equal transmit powers				
			<input type="checkbox"/>	Spatial Multiplexing				
			<input checked="" type="checkbox"/>	CDD				
			<input checked="" type="checkbox"/>	Beam-forming				
Antenna Type	<input checked="" type="checkbox"/>	External	<input checked="" type="checkbox"/>	Dipole				
	<input type="checkbox"/>	Internal	<input type="checkbox"/>	PIFA				
			<input type="checkbox"/>	PCB				
			<input type="checkbox"/>	Ceramic Chip Antenna				
			<input type="checkbox"/>	Metal plate type F antenna				
			<input type="checkbox"/>	Cross-polarize Antenna				
			<input type="checkbox"/>	Samrt antenna				
	Antenna Gain #1	2dBi						
Antenna Gain #2	2dBi							
Antenna Gain #3	2dBi							
Antenna Gain #4	2dBi							
Antenna Gain with Beamforming	8.02dBi							

**5G:**

Antenna Model No.	N/A									
Antenna manufacturer	N/A									
Antenna Delivery	<input type="checkbox"/>	1*TX+1*RX	<input type="checkbox"/>	2*TX+2*RX	<input type="checkbox"/>	3*TX+3*RX	<input checked="" type="checkbox"/>	4*TX+4*RX		
Antenna technology	<input type="checkbox"/>	SISO								
	<input checked="" type="checkbox"/>	MIMO	<input type="checkbox"/>	Basic						
			<input type="checkbox"/>	Sectorized antenna systems						
			<input type="checkbox"/>	Cross-polarized antennas						
			<input type="checkbox"/>	Unequal antenna gains, with equal transmit powers						
			<input type="checkbox"/>	Spatial Multiplexing						
			<input checked="" type="checkbox"/>	CDD						
			<input checked="" type="checkbox"/>	Beam-forming						
Antenna Type	<input checked="" type="checkbox"/>	External	<input checked="" type="checkbox"/>	Dipole						
	<input type="checkbox"/>	Internal	<input type="checkbox"/>	PIFA						
			<input type="checkbox"/>	PCB						
			<input type="checkbox"/>	Ceramic Chip Antenna						
			<input type="checkbox"/>	Metal plate type F antenna						
			<input type="checkbox"/>	Cross-polarize Antenna						
			<input type="checkbox"/>	Samrt antenna						
Antenna Gain #1	2dBi									
Antenna Gain #2	2dBi									
Antenna Gain #3	2dBi									
Antenna Gain #4	2dBi									
Beamforming Gain	8.02dBi									

- Output Power into Antenna & RF Exposure Evaluation Distance:

### Standalone modes

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Power Density Limit at R = 20 cm (mW/cm <sup>2</sup> )
802.11b/g/n/ac(20MHz) with CDD	2412 ~ 2462 MHz	26.45	2	0.1392	1.0
802.11n/ac(40MHz) with CDD	2422 ~ 2452 MHz	24.26	2	0.0841	1.0
802.11n/ac(20MHz) with Beamforming	2412 ~ 2462 MHz	24.92	8.02	0.3915	1.0
802.11n/ac(40MHz) with Beamforming	2422 ~ 2452 MHz	24.26	8.02	0.3363	1.0
802.11a/n/ac (20MHz) with CDD	5180-5240MHz 5745-5825 MHz	26.08	2	0.1279	1.0
802.11n/ac (40MHz) with CDD	5190-5230MHz 5755-5795 MHz	24.29	2	0.0847	1.0
802.11ac(80MHz) with CDD	5210MHz 5775MHz	20.70	2	0.0370	1.0
802.11 a/n/ac (20MHz) with Beamforming	5180-5240MHz 5745-5825 MHz	26.07	8.02	0.5102	1.0
802.11n/ac (40MHz) with Beamforming	5190-5230MHz 5755-5795 MHz	24.29	8.02	0.3386	1.0
802.11ac(80MHz) with Beamforming	5210MHz 5775MHz	20.76	8.02	0.1502	1.0

**Simultaneous transmission:**

Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Power Density Limit at R = 20 cm (mW/cm <sup>2</sup> )
2412 ~ 2462	24.92	8.02	0.3915	1.0
5180-5240 5745-5825	25.90	8.02	0.5102	1.0
Simultaneous transmission power density			0.9017	1.0

Note: The simultaneous transmission power density is 0.9017mW/cm<sup>2</sup> for Xiaomi Router HD without any other radio equipment.

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