



# 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.

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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  
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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

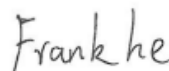
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Documented By :



(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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