

# **FCC RF EXPOSURE REPORT**

**FCC ID: QISAP6050DN6150DN**

**Project No. : 1604C201C**  
**Equipment : Wireless LAN Access Point**  
**Model : AP6150DN**  
**Applicant : Huawei Technologies Co.,Ltd.**  
**Address : Administration Building, Headquarters of Huawei  
Technologies Co., Ltd., Bantian, Longgang District  
Shenzhen China**  
**According: : FCC Guidelines for Human Exposure IEEE C95.1**

**B T L I N C .**

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## MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

where:

S = power density

P = power input to the 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

Table for Filed Antenna

5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	中山通宇	TT-245804-6W1	External	SMA	4.82
2	中山通宇	TT-245804-6W1	External	SMA	4.82
3	中山通宇	TT-245804-6W1	External	SMA	4.82
4	中山通宇	TT-245804-6W1	External	SMA	4.82

Note:

The EUT incorporates a MIMO function. Physically, the EUT provides four completed transmitters and receivers (4T4R), all transmit signals are completely correlated.

**(1) For 2TX without beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT}/N_{SS})$ .

For 2TX without beamforming: Directional gain =  $4.82 + 10\log(2/2) = 4.82 + 0 = 4.82$  dBi.

**(2) For 3TX without beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT}/N_{SS})$ .

For 3TX without beamforming: Directional gain =  $4.82 + 10\log(3/3) = 4.82 + 0 = 4.82$  dBi.

**(3) For 4TX without beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT}/N_{SS})$ .

For 4TX without beamforming: Directional gain =  $4.82 + 10\log(4/4) = 4.82 + 0 = 4.82$  dBi.

**(1) For 2TX with beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT})$ .

For 2TX with beamforming: Directional gain =  $4.82 + 10\log(2) = 4.82 + 3 = 7.82$  dBi.

So for fixed device, the UNII-2A, UNII-2C output power limit is  $24 - (7.82 - 6) = 22.18$ . The UNII-2A power density limit is  $11 - (7.82 - 6) = 9.18$ , the UNII-2C power density limit is  $11 - (7.82 - 6) = 9.18$ .

**(2) For 3TX with beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT})$ .

For 3TX with beamforming: Directional gain =  $4.82 + 10\log(3) = 4.82 + 4.77 = 9.59$  dBi.

So for fixed device, the UNII-2A, UNII-2C output power limit is  $24 - (9.59 - 6) = 20.41$ . The UNII-2A power density limit is  $11 - (9.59 - 6) = 7.41$ , the UNII-2C power density limit is  $11 - (9.59 - 6) = 7.41$ .

**(3) For 4TX with beamforming:**

The EUT with beamforming function, then, Direction gain =  $G_{ANT} + 10\log(N_{ANT})$ .

For 4TX with beamforming: Directional gain =  $4.82 + 10\log(4) = 4.82 + 6 = 10.82$  dBi.

So for fixed device, the UNII-2A, UNII-2C output power limit is  $24 - (10.82 - 6) = 19.18$ . The UNII-2A power density limit is  $11 - (10.82 - 6) = 6.18$ , the UNII-2C power density limit is  $11 - (10.82 - 6) = 6.18$ .

Operating Mode / TX Mode	1TX	2TX
802.11a	V (Ant 1)	V (Ant 1+Ant 2)
802.11n(20MHz)	V (Ant 1)	V (Ant 1+Ant 2)
802.11n(40MHz)	V (Ant 1)	V (Ant 1+Ant 2)
802.11ac Wave2(20MHz)	V (Ant 1)	V (Ant 1+Ant 2)
802.11ac Wave2(40MHz)	V (Ant 1)	V (Ant 1+Ant 2)
802.11ac Wave2(80MHz)	V (Ant 1)	V (Ant 1+Ant 2)
802.11ac Wave2(160MHz)	V (Ant 1+Ant 2)	V (Ant 1+Ant 2+ Ant 3+Ant 4)

Operating Mode / TX Mode	3TX	4TX
802.11a	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)
802.11n(20MHz)	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)
802.11n(40MHz)	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)
802.11ac Wave2(20MHz)	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)
802.11ac Wave2(40MHz)	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)
802.11ac Wave2(80MHz)	V (Ant 1+Ant 2+Ant 3)	V (Ant 1+Ant 2+ Ant 3+Ant 4)

Note:1TX means Nss=1, 2TX means Nss=2, 3TX means Nss=3, 4TX means Nss=4.

# TEST RESULTS

## UNII-2A 4TX

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE / CH52, CH60, CH64-Ant 1+Ant 2+Ant 3+Ant 4		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
4.82	3.0339	23.56	226.9865	0.13707	1	Complies
4.82	3.0339	21.52	141.9058	0.08569	1	Complies
4.82	3.0339	21.48	140.6048	0.08491	1	Complies

## UNII-2A 2TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N40 MODE / CH54, CH62-Ant 1+Ant 2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
7.82	6.0534	18.53	71.2853	0.08589154	1	Complies
7.82	6.0534	14.55	28.5102	0.03435187	1	Complies

## UNII-2C 4TX

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC Wave2(40 MHz)MODE / CH102, CH110, CH134 -Ant 1+Ant 2+Ant 3+Ant 4		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
4.82	3.0339	17.16	51.9996	0.03140	1	Complies
4.82	3.0339	23.54	225.9436	0.13644	1	Complies
4.82	3.0339	17.5	56.2341	0.03396	1	Complies

## UNII-2C 2TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N20 MODE / CH100, CH116, CH140-Ant 1+Ant 2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
7.82	6.0534	17.47	55.8470	0.06728998	1	Complies
7.82	6.0534	18.55	71.6143	0.08628799	1	Complies
7.82	6.0534	16.59	45.6037	0.05494781	1	Complies

Note: the calculated distance is 25 cm.