FCC RF EXPOSURE REPORT

FCC ID: QISAP6050DN6150DN

Project No. : 1604C201B
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

BTL INC.

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MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

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

2.4G

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	中山通宇	TT-245804-6W1	External	SMA	3.87
2	中山通宇	TT-245804-6W1	External	SMA	3.87
3	中山通宇	TT-245804-6W1	External	SMA	3.87
4	中山通宇	TT-245804-6W1	External	SMA	3.87

Note:
(1) The EUT incorporates a MIMO function. Physically, the EUT provides four completed transmitters and receivers (4T4R).
(2) For 2TX with beamforming:
The EUT with beamforming function, then, Direction gain = G_{ANT}+10log(N_{ANT}/N_{SS}), where N_{SS} = the number of independent spatial streams of data.
For 2TX with beamforming: Directional gain=3.87+10log(2/2)=3.87+0=3.87 dBi.
(3) For 3TX with beamforming:
The EUT with beamforming function, then, Direction gain = G_{ANT}+10log(N_{ANT}/N_{SS}), where N_{SS} = the number of independent spatial streams of data.
For 3TX with beamforming: Directional gain=3.87+10log(3/3)=3.87+0=3.87 dBi.
(4) For 4TX with beamforming:
The EUT with beamforming function, then, Direction gain = G_{ANT}+10log(N_{ANT}/N_{SS}), where N_{SS} = the number of independent spatial streams of data.
For 4TX with beamforming: Directional gain=3.87+10log(4/4)=3.87 + 0=3.87 dBi.

Operating Mode / TX Mode	1TX	2TX
802.11b	V (ANT 1)	V (ANT 1+ANT 2)
802.11g	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)

Operating Mode / TX Mode	3TX	4TX
802.11b	V (ANT 1+ANT 2+ANT 3)	V (ANT 1+ANT 2+ ANT 3+ANT 4)
802.11g	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)

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:
(1) The EUT incorporates a MIMO function. Physically, the EUT provides four completed transmitters and receivers (4T4R).

(2) For 2TX with beamforming:
The EUT with beamforming function, then, Direction gain = $G_{ANT}+10\log(N_{ANT}/N_{SS})$, where N_{SS} = the number of independent spatial streams of data.
For 2TX with beamforming: Directional gain=$4.82+10\log(2/2)=4.82+0=4.82$ dBi.

(3) For 3TX with beamforming:
The EUT with beamforming function, then, Direction gain = $G_{ANT}+10\log(N_{ANT}/N_{SS})$, where N_{SS} = the number of independent spatial streams of data.
For 3TX with beamforming: Directional gain=$4.82+10\log(3/3)=4.82+0=4.82$ dBi.

(4) For 4TX with beamforming:
The EUT with beamforming function, then, Direction gain = $G_{ANT}+10\log(N_{ANT}/N_{SS})$, where N_{SS} = the number of independent spatial streams of data.
For 4TX with beamforming: Directional gain=$4.82+10\log(4/4)=4.82 + 0=4.82$ dBi.

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)	V (ANT 1+ANT 2)
802.11ac Wave2(160MHz)	-	V (Ant 1+Ant 2)

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)
802.11ac Wave2(160MHz)	V (ANT 1+ANT 2+ANT 3)	V (ANT 1+ANT 2+ ANT 3+ANT 4)

TEST RESULTS

2.4G

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature :	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MODE / CH01, CH06, CH11-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^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3.87	2.4378	25.69	370.6807	0.11511458	1	Complies
3.87	2.4378	25.64	366.4376	0.11379688	1	Complies
3.87	2.4378	25.44	349.9452	0.10867517	1	Complies

UNII-1

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 ℃	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE / CH36, CH40, CH48-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^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
4.82	3.0339	24.02	252.3481	0.09752823	1	Complies
4.82	3.0339	24.95	312.6079	0.12081764	1	Complies
4.82	3.0339	25.07	321.3661	0.12420250	1	Complies

UNII-1 2TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP6150DN
Temperature:	25 ℃	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N40 MODE / CH38, CH46-Ant 1+Ant 2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
4.82	3.0339	19.72	93.7562	0.03623517	1	Complies
4.82	3.0339	21.59	144.2115	0.05573530	1	Complies
4.82	3.0339	21.90	154.8817	0.05985912	1	Complies

UNII-3

EUT：	Wireless LAN Access Point	Model Name：	AP6150DN
Temperature:	25 ℃	Relative Humidity:	60 %
Test Voltage：	AC 120V/60Hz		
Test Mode：	TX A MODE / CH149, CH157, CH165-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^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
4.82	3.0339	24.90	309.0295	0.11943465	1	Complies
4.82	3.0339	24.92	310.4560	0.11998594	1	Complies
4.82	3.0339	24.93	311.1716	0.12026253	1	Complies

UNII-3 2TX with beamforming

EUT：	Wireless LAN Access Point	Model Name：	AP6150DN
Temperature:	25 ℃	Relative Humidity:	60 %
Test Voltage：	AC 120V/60Hz		
Test Mode：	TX N20 MODE / CH155-Ant 1+Ant 2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
4.82	3.0339	21.64	145.8814	0.05638068	1	Complies
4.82	3.0339	21.69	147.5707	0.05703354	1	Complies
4.82	3.0339	21.89	154.5254	0.05972145	1	Complies

For 2.4G+5G simultaneous transmission MPE:

0.1151/1+0.1242/1=0.2393<1

Note: the calculated distance is 25 cm.