FCC RF EXPOSURE REPORT

FCC ID: QISAP7050DE

Project No. : 1604C207A
Equipment : Wireless LAN Access Point
Model : AP7050DE
Applicant : Huawei Technologies Co.,Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,Bantian, Longgang District, Shenzhen 518129 China
According: : FCC Guidelines for Human Exposure IEEE C95.1

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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

BLE

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	上海旌泓通信技术有限公司	N/A	Internal	U.FL	5.76

2.4G WIFI

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.0
2	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.0
3	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.0
4	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.0

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

Remark:
For 2TX with beamforming
The EUTwith beamforming function, then, Direction gain = GANT + 10log(NANT/NSS), where NSS = the number of independent spatial streams of data.
Directional gain=2.0+10log(2/4)=2.0 - 3.0 = -1.0 dBi.

For 3TX with beamforming
The EUTwith beamforming function, then, Direction gain = GANT + 10log(NANT/NSS), where NSS = the number of independent spatial streams of data.
Directional gain=2.0+10log(3/4)=2.0 - 1.25 = -0.75 dBi.

For 4TX with beamforming
The EUTwith beamforming function, then, Direction gain = GANT + 10log(NANT/NSS), where NSS = the number of independent spatial streams of data.
Directional gain=2.0+10log(4/4)=2.0 + 0 = 2.0 dBi.

5G

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.70
2	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.70
3	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.70
4	上海旌泓通信技术有限公司	N/A	Internal	U.FL	2.70

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

Remark:
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.
Directional gain=2.7+10log(2/4)=2.7 - 3.0 = -0.3 dBi.

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.
Directional gain=2.7+10log(3/4)=2.7 - 1.25 = 1.45 dBi.

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.
Directional gain=2.7+10log(4/4)=2.7 + 0 = 2.7 dBi.

TEST RESULTS

BLE

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 1Mbps / CH00, CH19, CH39		

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
5.76	3.7670	4.31	2.6977	0.00202279	1	Complies
5.76	3.7670	4.15	2.6002	0.00194962	1	Complies
5.76	3.7670	4.00	2.5119	0.00188343	1	Complies

2.4G WIFI

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
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
2.0	1.5849	26.43	439.5416	0.13865974	1	Complies
2.0	1.5849	26.40	436.5158	0.13770521	1	Complies
2.0	1.5849	26.38	434.5102	0.13707251	1	Complies

2.4G WIFI 4TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M 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
2	1.5849	24.45	278.6121	0.08789221	1	Complies
2	1.5849	24.41	276.0578	0.08708641	1	Complies
2	1.5849	24.47	279.8981	0.08829790	1	Complies

UNII-1

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11a Mode-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
2.70	1.8621	25.52	356.4511	0.13211446	1	Complies
2.70	1.8621	27.64	580.7644	0.21525357	1	Complies
2.70	1.8621	24.44	277.9713	0.10302684	1	Complies

UNII-1 4TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.7	1.8621	22.68	185.3532	0.06869899	1	Complies

UNII-2A

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.70	1.8621	24.68	293.7650	0.10888057	1	Complies

UNII-2A 2TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.70	1.8621	21.76	149.9685	0.05558407	1	Complies

UNII-2C

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.70	1.8621	24.72	296.4831	0.10988803	1	Complies
2.70	1.8621	24.63	290.4023	0.10763422	1	Complies

UNII-2C 2TX with Beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.70	1.8621	21.75	149.6236	0.05545623	1	Complies
2.70	1.8621	21.74	149.2794	0.05532869	1	Complies

UNII-3

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11a Mode-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
2.70	1.8621	25.40	346.7369	0.12851398	1	Complies
2.70	1.8621	27.57	571.4786	0.21181191	1	Complies
2.70	1.8621	25.45	350.7519	0.13000210	1	Complies

UNII-3 4TX with beamforming

EUT :	Wireless LAN Access Point	Model Name :	AP7050DE
Temperature:	24 ℃	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 802.11ac Wave2(80MHz) Mode-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
2.7	1.8621	22.79	190.1078	0.07046125	1	Complies

For 2.4G+5G simultaneous transmission MPE:

0.0020/1+0.1387/1+0.2153/1=0.3560<1

Note: the calculated distance is 20 cm.