FCC RF EXPOSURE REPORT

FCC ID: PJZ6768

Project No.	**:**	**1609C026**
Equipment	**:**	**XDSL 4 Port WiFi 802.11ac Gateway**
Model	**:**	**6768-W1YXX, 6768-W1YXXYXXX, 400-01422-XX (where X can be 0~9 or A~Z or blank, and Y can be dash or blank)**
Applicant	**:**	**DASAN Zhone Solutions, Inc.**
Address	**:**	**7195 Oakport Street, Oakland, CA 94621. USA**
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

2.4G WIFI

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	Airgain	N2430GNS	PCB	N/A	5
2	Airgain	N2430GNS	PCB	N/A	5

Note:
The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R), all transmit signals are completely uncorrelated, then, **Direction gain = G_{ANT}**, that is Directional gain=5.

Operating Mode / TX Mode	1TX	2TX
802.11b	V (ANT 1)	-
802.11g	V (ANT 1)	-
802.11n (20MHz)	-	V (ANT+1 ANT 2)
802.11n (40MHz)	-	V (ANT+1 ANT 2)

5G WIFI

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
10	Airgain	M5X35T	PCB	N/A	2.8
20	Airgain	M5X35T	PCB	N/A	2.8
30	Airgain	M5X35T	PCB	N/A	2.8

Note:
The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and receivers (3T3R), all transmit signals are completely uncorrelated, then, **Direction gain = G_{ANT}**, that is Directional gain=2.8.

Operating Mode / TX Mode	1TX	3TX
802.11a	V (ANT 10)	-
802.11n (20MHz)	-	V (ANT+10 ANT 20+ANT 30)
802.11n (40MHz)	-	V (ANT+10 ANT 20+ANT 30)
802.11ac (20MHz)	-	V (ANT+10 ANT 20+ANT 30)
802.11ac (40MHz)	-	V (ANT+10 ANT 20+ANT 30)
802.11ac (80MHz)	-	V (ANT+10 ANT 20+ANT 30)

TEST RESULTS

2.4G WIFI

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MODE /CH01, CH06, CH11-ANT 1		

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	3.1623	22.83	191.8669	0.12076758	1	Complies
5	3.1623	24.83	304.0885	0.19140372	1	Complies
5	3.1623	24.03	252.9298	0.15920268	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE /CH01, CH06, CH11-ANT 1		

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	3.1623	26.60	457.0882	0.28770696	1	Complies
5	3.1623	26.80	478.6301	0.30126617	1	Complies
5	3.1623	26.26	422.6686	0.26604210	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N20 MODE /CH01, CH06, CH11-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
5	3.1623	27.24	529.6634	0.33338831	1	Complies
5	3.1623	27.44	554.6257	0.34910042	1	Complies
5	3.1623	27.08	510.5050	0.32132933	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N40 MODE /CH03, CH06, CH09-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
5	3.1623	22.94	196.7886	0.12386550	1	Complies
5	3.1623	24.53	283.7919	0.17862834	1	Complies
5	3.1623	23.54	225.9436	0.14221663	1	Complies

UNII-1

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH36, CH40, CH48		

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
2.8	1.9055	22.38	172.9816	0.06560703	1	Complies
2.8	1.9055	21.77	150.3142	0.05700991	1	Complies
2.8	1.9055	21.72	148.5936	0.05635732	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N20 MODE_Total / CH36, CH40, CH48		

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
2.8	1.9055	24.02	252.3481	0.09570847	1	Complies
2.8	1.9055	24.71	295.8012	0.11218902	1	Complies
2.8	1.9055	24.81	302.6913	0.11480224	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N40 MODE_Total / CH38, CH46		

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
2.8	1.9055	24.31	269.7739	0.10231761	1	Complies
2.8	1.9055	28.04	636.7955	0.24151848	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE_Total / CH36, CH40, CH48		

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
2.8	1.9055	24.87	306.9022	0.11639930	1	Complies
2.8	1.9055	25.12	325.0873	0.12329639	1	Complies
2.8	1.9055	25.26	335.7376	0.12733576	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_Total / CH38, CH46		

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
2.8	1.9055	26.90	489.7788	0.18575922	1	Complies
2.8	1.9055	27.74	594.2922	0.22539816	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_Total /CH42		

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
2.8	1.9055	27.84	608.1350	0.23064836	1	Complies

UNII-3

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH149, CH157, CH165		

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
2.8	1.9055	26.06	403.6454	0.15309125	1	Complies
2.8	1.9055	26.09	406.4433	0.15415243	1	Complies
2.8	1.9055	27.41	550.8077	0.20890574	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N20 MODE_Total / CH149, CH157, CH165		

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
2.8	1.9055	27.47	558.4702	0.21181191	1	Complies
2.8	1.9055	27.44	554.6257	0.21035380	1	Complies
2.8	1.9055	27.44	554.6257	0.21035380	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N40 MODE_Total / CH151, CH159		

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
2.8	1.9055	28.62	727.7798	0.27602624	1	Complies
2.8	1.9055	28.71	743.0191	0.28180609	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE_Total / CH149, CH157, CH165		

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
2.8	1.9055	28.68	737.9042	0.27986615	1	Complies
2.8	1.9055	28.51	709.5778	0.26912272	1	Complies
2.8	1.9055	28.50	707.9458	0.26850376	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_Total / CH151, CH159		

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
2.8	1.9055	28.77	753.3556	0.28572640	1	Complies
2.8	1.9055	28.69	739.6053	0.28051131	1	Complies

EUT:	XDSL 4 Port WiFi 802.11ac Gateway	Model Name :	6768-W1-NA
Temperature:	25 ℃	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_Total / CH155		

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
2.8	1.9055	28.18	657.6578	0.24943097	1	Complies

For 2.4G+5G simultaneous transmission MPE:

0.3491/1+0.2857/1=0.6348<1

Note: the calculated distance is 20 cm.