

FCC RF EXPOSURE REPORT

FCC ID: Q78-ZXHNF680V5

Project No. : 1906H014
Equipment : GPON ONT
Model : ZXHN F680
Applicant : ZTE Corporation
**Address : ZTE Plaza, Hi-Tech Park, Nanshan District,
Shenzhen, Guangdong, P.R.China**

**According: : FCC Guidelines for Human Exposure IEEE
C95.1 & FCC Part 2.1091**

B T L I N C .

No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area,
Shanghai 201210, China
TEL: +86-021-61765666



Certificate # 5123. 03

1. GENERAL SUMMARY

Equipment : GPON ONT
 Brand Name : ZTE
 Test Model : ZXHN F680
 Series Model : N/A
 Applicant : ZTE Corporation
 Manufacturer : ZTE Corporation
 Address : ZTE Plaza, Hi-Tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China
 Date of Test : Jun. 27, 2019~Jul. 29, 2019
 Test Sample : Engineering Sample No.: SH190612106
 Standards : FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-4-1906H014) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

2. 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

For 2.4GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	N/A	N/A	PCB	N/A	2.1
2	N/A	N/A	PCB	N/A	2.1
3	N/A	N/A	PCB	N/A	2.1

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=2.1.

For 5GHz:

For UNII-1

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	2.4
2	N/A	N/A	PCB	N/A	2.4
3	N/A	N/A	PCB	N/A	2.4
4	N/A	N/A	PCB	N/A	2.0

For UNII-2A

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	2.2
2	N/A	N/A	PCB	N/A	2.2
3	N/A	N/A	PCB	N/A	2.2
4	N/A	N/A	PCB	N/A	2.4

For UNII-2C

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	2.5
2	N/A	N/A	PCB	N/A	2.5
3	N/A	N/A	PCB	N/A	2.5
4	N/A	N/A	PCB	N/A	2.8

For UNII-3

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	3.6
2	N/A	N/A	PCB	N/A	3.6
3	N/A	N/A	PCB	N/A	3.6
4	N/A	N/A	PCB	N/A	3.5

Note:

- (1) The EUT incorporates a MIMO function. Physically, the EUT provides four completed transmitters and receivers (4T4R), all transmit signals are completely uncorrelated, then, Direction gain = G_{ANT} , that is Directional gain for UNII-1=2.4; for UNII-2A=2.4; for UNII-2C=2.8; for UNII-3=3.6.
- (2) Beamforming Function, Beamforming Gain: 5dB, so Directional gain for UNII-1=7.4; for UNII-2A=7.4; for UNII-2C=7.8; for UNII-3=8.6. Then, the UNII-2A output power limit is $24-(7.4-6)=22.6$, the UNII-2C output power limit is $24-(7.8-6)=22.2$, the UNII-1 output power limit is $30-(7.4-6)=28.6$, the UNII-3 output power limit is $30-(8.6-6)=27.4$; the UNII-1 power density limit is $17-(7.4-6)=15.6$, the UNII-2A power spectral density limit is $11-(7.4-6)=9.6$, the UNII-2C power spectral density limit is $11-(7.8-6)=9.2$, the UNII-3 power density limit is $30-(8.6-6)=27.4$.

3. TEST RESULTS

For 2.4GHz:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.1	1.6218	28.99	792.5013	0.25583	1	Complies

For 5GHz UNII-1 Non-Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4	1.7378	26.05	402.7170	0.13930	1	Complies

For 5GHz UNII-2A Non-Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4	1.7378	20.97	125.0259	0.04325	1	Complies

For 5GHz UNII-2C Non-Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.8	1.9055	20.59	114.5513	0.04345	1	Complies

For 5GHz UNII-3 Non-Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.6	2.2909	26.93	493.1738	0.22488	1	Complies

For 5GHz UNII-1 with Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4	1.7378	26.05	402.7170	0.13930	1	Complies

For 5GHz UNII-2A with Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4	1.7378	20.76	119.1242	0.04325	1	Complies

For 5GHz UNII-2C with Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.8	1.9055	20.39	109.3956	0.04149	1	Complies

For 5GHz UNII-3 with Beamforming:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.6	2.2909	26.93	493.1738	0.22488	1	Complies

Note: The calculated distance is 20 cm.
Output power including tune up tolerance.

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Total	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4GHz	5GHz			
0.25583	0.22488	0.48071	1	Complies

End of Test Report