

FCC RF EXPOSURE REPORT

FCC ID: Q78-ZXHNF680V6

Project No. : 1904H001
Equipment : GPON ONT
Brand Name : ZTE
Test Model : ZXHN F680
Series Model : N/A
Applicant : ZTE Corporation
Address : ZTE Plaza, Hi-Tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China
Manufacturer : ZTE Corporation
Address : ZTE Plaza, Hi-Tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China
Date of Receipt : Apr. 10, 2019
Date of Test : Apr. 10, 2019~Aug. 24, 2019
Issued Date : Sep. 15, 2019
Report Version : R00
Test Sample : Engineering Sample No.: D190403600
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
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.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Sep. 15, 2019

1. 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	Dipole	N/A	4.59
2	N/A	N/A	Dipole	N/A	4.01

Note:

The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and receivers (2T2R), all transmit signals are completely uncorrelated, then, Direction gain = G_{ANT} , that is Directional gain=4.59.

For 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	4.58
2	N/A	N/A	Dipole	N/A	4.70
3	N/A	N/A	Dipole	N/A	4.42
4	N/A	N/A	Dipole	N/A	4.28

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=4.70.
- (2) Beamforming Function, Beamforming Gain: 5dB, so Directional gain=5+4.7=9.7. Then, the UNII-2A,UNII-2C output power limit is 24-(9.7-6)=20.3, the UNII-1 and UNII-3 output power limit is 30-(9.7-6)=26.3; the UNII-1 power density limit is 17-(9.7-6)=13.3, the UNII-2A, UNII-2C power spectral density limit is 11-(9.7-6)=7.3, the UNII-3 power density limit is 30-(9.7-6)=26.3.

2. 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
4.59	2.8774	22.81	190.9853	0.10938	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
4.70	2.9512	26.41	437.5221	0.25701	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
4.70	2.9512	23.55	226.4644	0.13303	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
4.70	2.9512	23.44	220.8005	0.12970	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
4.70	2.9512	27.40	549.5409	0.32281	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
9.7	9.3325	24.22	264.2409	0.49085	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
9.7	9.3325	18.49	70.6318	0.13120	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
9.7	9.3325	19.51	89.3305	0.16594	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
9.7	9.3325	25.84	383.7072	0.71277	1	Complies

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

For the max simultaneous transmission MPE:

2.4G+5G

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			
0.10938	0.71277	0.82215	1	Complies

Note: The calculated distance is 20 cm.

Output power including tune up tolerance(tune up tolerance: X.XX dBm).

End of Test Report