

FCC RF EXPOSURE REPORT

FCC ID: Q78-B820CA15

Project No. : 2108H060
Equipment : Hybrid STB
Brand Name : ZTE
Test Model : ZXV10 B820C-A15
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 : Sep. 03, 2021
Date of Test : Sep. 03, 2021~Sep. 23, 2021
Issued Date : Sep. 29, 2021
Report Version : R00
Test Sample : Engineering Sample No.:
EUT(MTK7661): SH20210903181-1 for radiated,
SH20210903181-10 for conducted.
EUT(MTK7663): SH20210903181 for radiated,
SH20210903181-9 for conducted.
Adapter: SH20210903181-6
Standard(s) : FCC Title 47 Part 2.1091
KDB 447498 D01 General RF exposure guidance v06

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

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TESTING CERT #5123.03

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Sep. 29, 2021

1. 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

For 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Clamping Antenna	N/A	1.1	N/A
2	N/A	N/A	Clamping Antenna	N/A	1.9	N/A

Note:

- This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{1.1/20}+10^{1.9/20})²/2]dBi =4.52. So, the output power limit is 30, the power spectral density limit is 8.
- This EUT supports CDD, and all antennas are not equal, Directional gain = G_{ANT}+Array Gain. For power measurements, Array Gain=0dB (N_{ANT}≤4), so the Directional gain=1.9. For power spectral density measurements, N_{ANT}=2, N_{SS} = 1. So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=1.9+10log(2/1)dBi=4.91. Then, the power spectral density limit is 8
- The antenna gain is provided by the manufacturer.

For 5G :

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Clamping Antenna	N/A	3.3
2	N/A	N/A	Clamping Antenna	N/A	2.5

Note:

- This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{3.3/20}+10^{2.5/20})²/2]dBi =5.92. So, the UNII-1, UNII-2A, UNII-2C output power limit is 23.98, UNII-3 output power limit is 30, The UNII-1,UNII-2A, UNII-2C power spectral density limit is 11, the UNII-3 power spectral density limit is 30.
- This EUT supports CDD, and all antennas are not equal, Directional gain = G_{ANT}+Array Gain. For power measurements, Array Gain=0dB (N_{ANT}≤4), so the Directional gain=3.3. For power spectral density measurements, N_{ANT}=2, N_{SS} = 1. So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=3.3+10log(2/1)dBi=6.31. Then, the UNII-1,UNII-2A, UNII-2C power spectral density limit is 11-(6.31-6)=10.69, the UNII-3 power spectral density limit is 30-(6.31-6)=29.69.

The antenna gain is provided by the manufacturer.

For BT and BLE:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Onboard Antenna	N/A	1.9

Note:

The antenna gain is provided by the manufacturer.

Table for Antenna Configuration:
For 2.4G:

Operating Mode TX Mode	Ant. 1	Ant. 2	Ant. 1+2
802.11b	✓	✓	✓
802.11g	✓	✓	✓
802.11n(20 MHz)	✓	✓	✓
802.11n(40 MHz)	✓	✓	✓

For 5G:

Operating Mode TX Mode	Ant. 1	Ant. 2	Ant. 1+2
IEEE 802.11a	✓	✓	✓
IEEE 802.11n (HT20)	✓	✓	✓
IEEE 802.11n (HT40)	✓	✓	✓
IEEE 802.11ac (VHT20)	✓	✓	✓
IEEE 802.11ac (VHT40)	✓	✓	✓
IEEE 802.11ac (VHT80)	✓	✓	✓

2. TEST RESULTS

For BLE:

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
1.9	1.5488	10.00	10.00	0.003081	1	Complies

For BT:

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
1.9	1.5488	10.00	10.00	0.003081	1	Complies

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
1.9	1.5488	29	794.3282	0.2448	1	Complies

For 5GHz:

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
3.3	2.1380	20	100.0000	0.0425	1	Complies

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

End of Test Report