

FCC RF EXPOSURE REPORT

FCC ID: 2AVUGAP8220

Project No. : 2005C033
Equipment : Wireless LAN Access Point
Brand Name : Alibaba Cloud
Test Model : AP8220
Series Model : N/A
Applicant : Alibaba Cloud Computing Co.,Ltd
Address : Building 8, No.16, Zhuan Tang Jing Ji Qu Kuai, Xihu District, Hangzhou, Zhejiang, China
Manufacturer : Alibaba Cloud Computing Co.,Ltd
Address : Building 8, No.16, Zhuan Tang Jing Ji Qu Kuai, Xihu District, Hangzhou, Zhejiang, China
Factory : Joy Technology (ShenZhen) Corporation
Address : HengKeng Ind., Shangpai, Shangwu,Aiqun Rd., Shiyan Town,Shenzhen 518108 China
Date of Receipt : May 11, 2020
Date of Test : May 13, 2020 ~ Jul. 25, 2020
Issued Date : Aug. 06, 2020
Report Version : R00
Test Sample : Engineering Sample No.: DG202005125
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	Aug. 06, 2020

1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

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 Bluetooth LE:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25GC4-A1-ZF	Internal	N/A	5.19

For WLAN 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25GC4-A1-ZF	Internal	N/A	5.43
2	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25GC4-A1-ZF	Internal	N/A	5.36

Note:

This EUT supports CDD, and antenna gains are not equal, so Directional gain=
 $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N]$ dBi=8.41. So the output power limit is 30-(8.41-6)=27.59,
the power spectral density limit is 8-(8.41-6)=5.59.

For WLAN 5GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.55	UNII-1
2	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.72	
3	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.43	
4	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.76	
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	7.04	UNII-2A
2	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.92	
3	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.00	
4	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.63	
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	7.11	UNII-2C
2	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.48	
3	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.80	
4	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	5.49	
1	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	7.17	UNII-3
2	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.89	
3	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	6.77	
4	MAG. LAYERS SCIENTIFIC-TEC HNICS CO., LTD	MSA-1313-25 GC4-A1-ZF	Internal	N/A	5.50	

Note:

This EUT supports CDD, and antenna gains are not equal, so Directional gain=

 $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N] \text{dBi}$. So,

For UNII-1: Directional gain= $10\log [(10^{6.55/20} + 10^{6.72/20} + 10^{6.43/20} + 10^{6.76/20})^2 / 4] = 12.64$. Then the output power limit is $30 - (12.64 - 6) = 23.36$, the power spectral density limit is $17 - (12.64 - 6) = 10.36$.

For UNII-2A: Directional gain= $10\log [(10^{7.04/20} + 10^{6.92/20} + 10^{6.00/20} + 10^{6.63/20})^2 / 4] = 12.68$. Then the output power limit is $24 - (12.68 - 6) = 17.32$, the power spectral density limit is $11 - (12.68 - 6) = 4.32$.

For UNII-2C: Directional gain= $10\log [(10^{7.11/20} + 10^{6.48/20} + 10^{6.80/20} + 10^{5.49/20})^2 / 4] = 12.51$. Then the output power limit is $24 - (12.51 - 6) = 17.49$, the power spectral density limit is $11 - (12.51 - 6) = 4.49$.

For UNII-3: Directional gain= $10\log [(10^{7.17/20} + 10^{6.89/20} + 10^{6.77/20} + 10^{5.50/20})^2 / 4] = 12.63$. Then the output power limit is $30 - (12.63 - 6) = 23.37$, the power spectral density limit is $30 - (12.63 - 6) = 23.37$.

3. TEST RESULTS

For Bluetooth LE:

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
5.19	3.3037	4.86	3.0620	0.00201	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
8.41	6.9343	22.67	184.9269	0.25524	1	Complies

For 5GHz UNII-1:

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
12.64	18.3654	22.93	196.3360	0.71771	1	Complies

For 5GHz UNII-2A:

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
12.68	18.5353	16.94	49.4311	0.18237	1	Complies

For 5GHz UNII-2C:

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
12.51	17.8238	16.94	49.4311	0.17537	1	Complies

For 5GHz UNII-3:

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
12.63	18.3231	22.97	198.1527	0.72269	1	Complies

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Total	Limit of Power Density (S) (mW/cm ²)	Test Result
LE	2.4GHz	5GHz			
0.00201	0.25524	0.72269	0.97994	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report