

Maximum Permissible Exposure Report

FCC ID: M82-DLTV6210LTE

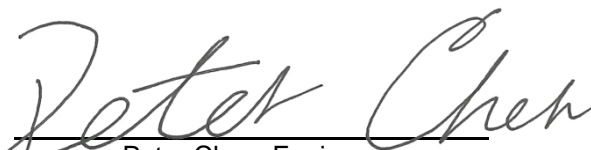
Report No. : BTL-FCCP-4-1608T164C
Equipment : Computer
Model Name : DLT-V6210LTE, DLTV6210XXXXXXXXXXXXXXXXX (where X may be any alphanumeric character, blank or "-".)
Brand Name : ADVANTECH
Applicant : Advantech Co., Ltd.
Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.
Manufacturer : Advantech Co., Ltd.
Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.

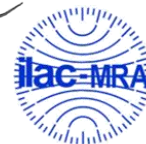
FCC Rule Part(s) : FCC Guidelines for Human Exposure IEEE C95.1

Date of Receipt : 2019/10/18
Date of Test : 2019/10/18 ~ 2019/11/19
Issued Date : 2020/9/1


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

Prepared by :


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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	2020/4/27
R01	Revised report to address TCB's comments.	2020/7/9
R02	Revised report to address TCB's comments.	2020/9/1

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

WWAN Antenna:

Group 1(External):

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	TLS.01.305111	Dipole	SMA(M)	2.32	WCDMA Band II
					2.50	WCDMA Band IV
					2.42	WCDMA Band V
					2.32	LTE Band 2
					2.50	LTE Band 4
					2.42	LTE Band 12
2	taoglas	TLS.01.305111	Dipole	SMA(M)	2.32	WCDMA Band II
					2.50	WCDMA Band IV
					2.42	WCDMA Band V
					2.32	LTE Band 2
					2.50	LTE Band 4
					2.42	LTE Band 12

Group 2(Integrated):

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	2.4	WCDMA Band II
					3.5	WCDMA Band IV
					-2.1	WCDMA Band V
					2.4	LTE Band 2
					3.5	LTE Band 4
					-2.67	LTE Band 12
2	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	1.9	WCDMA Band II
					2.2	WCDMA Band IV
					-0.6	WCDMA Band V
					1.9	LTE Band 2
					2.2	LTE Band 4
					-2.64	LTE Band 12

Note: Group 2 is found to be the worst case and used for final test.

WLAN Antenna:

Group 1:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	PC163.54.0175C.db	PIFA	IPEX MHF	4.44	2400~2500 MHz
					4.33	5150~5850 MHz
2	taoglas	PC163.54.0175C.db	PIFA	IPEX MHF	2.64	2400~2500 MHz
					4.25	5150~5850 MHz

Group 2:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	2.4	2400~2500 MHz
					5.3	5150~5850 MHz
2	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	2.8	2400~2500 MHz
					5.8	5150~5850 MHz

CALCULATED RESULTS

Mode	Band	Frequency Range (MHz)	Target Power (dBm)	Antenna Gain (dBi)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
WCDMA	Band II	1852.4~1907.6	23.5	2.4	0.0774	1.0000	Complies
WCDMA	Band IV	1712.4~1752.6	23.5	3.5	0.0997	1.0000	Complies
WCDMA	Band V	826.4~846.6	23.5	-0.6	0.0388	0.5509	Complies
LTE	Band 2	1850.7~1909.3	24	2.4	0.0868	1.0000	Complies
LTE	Band 4	1710.7~1754.3	24	3.5	0.1119	1.0000	Complies
LTE	Band 12	699.7~715.3	24	-2.64	0.0272	0.5577	Complies

The values are adopted from test report: RKS160908001-00A.

Mode	Band	Frequency Range (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
BT	-	2402~2480	2.91	4.44	0.0011	1.0000	Complies
BLE	-	2402~2480	-1.03	4.44	0.0004	1.0000	Complies
WLAN	-	2412~2462	19.49	6.60	0.0809	1.0000	Complies
WLAN	UNII-1	5180~5240	18.76	8.56	0.1073	1.0000	Complies
WLAN	UNII-2A	5260~5320	18.71	8.56	0.1061	1.0000	Complies
WLAN	UNII-2C	5500~5720	17.13	8.56	0.0737	1.0000	Complies
WLAN	UNII-3	5745~5825	18.02	8.56	0.0905	1.0000	Complies

- The RF output power values are adopted from filing reports of FCC ID: M82-261ACNBT.
- Directional Gain
 Group 1:
 2400~2500 MHz: Directional Gain = $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ANT}] = 6.60$ dBi.
 5150~5850 MHz: Directional Gain = $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ANT}] = 7.30$ dBi.
 Group 2:
 2400~2500 MHz: Directional Gain = $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ANT}] = 5.61$ dBi.
 5150~5850 MHz: Directional Gain = $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ANT}] = 8.56$ dBi.

Note:

- The calculated distance is 20 cm.

COLLOCATED POWER DENSITY CALCULATIONS

So for simultaneous transmission (WWAN+BT+WLAN): $0.0018/1+0.1073/1+0.3039/1=0.4130 < 1$.

End of Test Report