



CTC Laboratories, Inc.

2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

Tel: +86-755-27521059 Fax: +86-755-27521011 <http://www.sz-ctc.org.cn>

Maximum Permissible Exposure Evaluation

FCC ID: A5M-MD80

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b).

EUT Specification

Product Name:	Lenovo Wireless Transmitter
Trade Mark:	Lenovo
Model/Type Reference:	Lenovo MD80
Listed Model(s):	/
Model Differences:	/
Frequency Band (Operating)	BT: 2402MHz ~ 2480MHz WLAN: 2412MHz ~ 2462MHz U-NII-1: 5180MHz ~ 5240MHz U-NII-2A: 5260MHz ~ 5320MHz U-NII-2C: 5500MHz ~ 5700MHz U-NII-3: 5745MHz ~ 5825MHz
Device Category	<input type="checkbox"/> Portable (<5mm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Fixed (>20cm separation) <input type="checkbox"/> Others ____
Exposure Classification	<input type="checkbox"/> Occupational/Controlled exposure (S=5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna Diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Antenna Gain (Max)	BT: 1.58dBi WLAN: ANT1: 5.75dBi ANT2: 1.39dBi Directional Gain: 6.85dBi RLAN: ANT1: 3.86dBi ANT2: 1.57dBi Directional Gain: 5.80dBi
Evaluation Applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

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**Limits for Maximum Permissible Exposure (MPE)**

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposure				
300-1500	--	--	F/300	<6
1500-100000	--	--	5	<6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	--	--	F/1500	<30
1500-100000	--	--	1	<30

Calculation Method

Friis transmission formula: $Pd = (P_{out} * G) / (4 * \pi * R^2)$

Where:

Pd= Power density in mW/cm²

P_{out}= output power to antenna in mW

G= gain of antenna in linear scale

Pi= 3.1416

R= distance between observation point and center of the radiator in cm

Pd limit of MPE is 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Mode	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune Up Tolerance (dB)	Max. Tune Up Power (dBm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
GFSK (BLE)	2440	1.58	4.717	±1	5.50	0.0010	1
8DPSK (EDR)	2402	1.58	8.861	±1	9.50	0.0026	1
WLAN 802.11b	2412	1.39	17.91	±1	19.00	0.0218	1
RLAN U-NII-3 802.11a	5785	1.57	15.830	±1	16.50	0.0128	1

The BT and WiFi can transmit simultaneously.

BT Power density at 20cm (mW/cm ²)	WLAN Power density at 20cm (mW/cm ²)	RLAN Power density at 20cm (mW/cm ²)	Total Power density at 20cm (mW/cm ²)	Power density Limit (mW/cm ²)
0.0026	0.0218	0.0128	0.0372	1

Note:

1. Calculate in the worst-case mode.
2. Max. Tune Up Power is declared by manufacturer, and used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.

*****THE END*****

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