RF Exposure Evaluation

FCC ID: 2AVAA-XN002

1. Client Information

Applicant	:	Shenzhen Double New Technology Co.,Ltd
Address	:	301B, No.13, phase I, zone 3, Xinhe community, Fuhai street, Bao'an District, Shenzhen, China
Manufacturer	:	Shenzhen Double New Technology Co.,Ltd
Address	:	301B, No.13, phase I, zone 3, Xinhe community, Fuhai street, Bao'an District, Shenzhen, China

2. General Description of EUT

EUT Name	:	Micro laser engraving machine	
Models No.	:	XN002,XN003,XN004,XN005,XN006,XN007,XN008	
Model Difference	:	All these models are in the same PCB, layout and electrical circuit, the only difference is color.	
Product Description	:	Operation Frequency:	Bluetooth V4.1: 2402~2480 MHz
		Antenna Gain:	1.5dBi PCB Antenna
Power Supply	:	DC Voltage Supply from AC/DC Adapter.	
Power Rating	:	AC/DC Adapter : MA24W1-1202000U Input: 100~240V/50~60Hz 0.7A Output: 12V 2A	
Software Version	:	V1.0	
Hardware Version	:	V1.8	
Connecting I/OPort(S)	:	Please refer to the User's Manual	
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note: More test information about the EUT please refer the RF Test Report.

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SAR Test Exclusion Calculations

1. **FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.**
   (1) Clause 4.3: General SAR test reduction and exclusion guidance
   Sub clause 4.31: Standalone SAR test exclusion considerations
   1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance≤5 mm are determined by:
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤3.0 for 1-g SAR
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤7.5.0 for 10-g SAR

2. Calculation:

Test separation: 5mm						
Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.614	-2±1	-1	0.794	0.246	**3.0**
2.441	-2.830	-2±1	-1	0.794	0.248	**3.0**
2.480	-1.963	-2±1	-1	0.794	0.250	**3.0**
Bluetooth Mode (Pi/4-DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.945	-2±1	-1	0.794	0.246	**3.0**
2.441	-1.872	-2±1	-1	0.794	0.248	**3.0**
2.480	-2.303	-2±1	-1	0.794	0.250	**3.0**
Bluetooth Mode (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.974	-2±1	-1	0.794	0.246	**3.0**
2.441	-1.769	-2±1	-1	0.794	0.248	**3.0**
2.480	-2.305	-2±1	-1	0.794	0.250	**3.0**

Test separation: 5mm						
BLE Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-2.912	-2±1	-1	0.794	0.246	**3.0**
2.442	-2.548	-2±1	-1	0.794	0.248	**3.0**
2.480	-2.670	-2±1	-1	0.794	0.250	**3.0**

Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

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