1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	Net Profit Global Company Limited
Address of applicant:	RM 1421-22 14/F BLK A HI-TECH IND CTR, TSUEN WAN, N.T, HONG KONG
Manufacturer:	MEI HUA ELECTRONICS (HUIZHOU) LIMITED
Address of manufacturer:	No.1,GongYe 5nd Road,HuiZhou Industry Transfer Ind. park,LongMen Village,HuiZhou City,Guangdong Province,P.R.China.

General Description of EUT:

Product Name:	Amazon Music Box with Voice Remote Controller
Trade Name:	iHaper / dpnao
Model No.:	SP1, dp-012
FCC ID:	2AOW9SP1D
Rated Voltage:	Adapter: DC 5V

Technical Characteristics of EUT:

Wi-Fi

Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 80.211n(HT40)
RF Output Power:	15.85dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11/7
Channel Separation:	5MHz
Type of Antenna:	Integral
Antenna Gain:	3.51dBi

BT

Bluetooth Version:	V4.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	0.40dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB
Antenna Gain:	0dBi

1.2 Standard Applicable

According to §1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\mid E \mid^2$, $\mid H \mid^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\mid E \mid^2$, $\mid H \mid^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density

1.3 MPE Calculation Method

$S = (30*P*G) / (377*R^2)$

S = power density (in appropriate units, e.g., mw/cm^2)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

Wi-Fi:

Maximum Tune-Up output power: <u>16.0 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>39.81 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>2412 (MHz)</u>

Antenna gain: <u>3.51 (dBi)</u>

Directional gain (numeric gain): <u>2.24</u>

The worst case is power density at prediction frequency at 20cm: <u>0.018(mw/cm^2)</u>

MPE limit for general population exposure at prediction frequency: <u>1 (mw/cm^2)</u>

BT:

Maximum Tune-Up output power: <u>1.0 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>0.40 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>2402 (MHz)</u>

Antenna gain: <u>0 (dBi)</u>

Directional gain (numeric gain): <u>1</u>

The worst case is power density at prediction frequency at 20cm: <u>0.0003(mw/cm^2)</u>

MPE limit for general population exposure at prediction frequency: <u>1 (mw/cm^2)</u>

Simultaneous Transmission
Wi-Fi+BT: 0.0183

Result: Pass