1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	ACOUSTMAX INTERNATIONAL CO.,LTD
Address of applicant:	Unit D16/F Cheuk Nang Plaza 250 Hennessy Road WanchaiHongKong, HongKong, China.
Manufacturer:	Monster, Inc.
Address of manufacturer:	Nevada City, California.

General Description of EUT:

Product Name:	ROCKIN’ ROLLER 270 X
Trade Name	MONSTER®
Model No.:	MNRR270
Adding Model(s):	MNRR270-X, MNRR270C, MNRR270-EU
Rated Voltage:	Power Port:AC120V/60Hz Battery:DC12V
Battery Capacity:	9.0Ah
Software Version:	V01
Hardware Version:	RR270
FCC ID:	2AAIN-MNRR2702
Equipment Type:	Mobile

Technical Characteristics of EUT:	
Bluetooth (BR/EDR mode)	
Bluetooth Version:	V5.0 (BR/EDR mode)
Frequency Range:	2402-2480MHz
RF Output Power:	-3.25dBm (Conducted)
Data Rate:	1Mbps, 2Mbps
Modulation:	GFSK, π/4 DQPSK
Quantity of Channels:	79
Channel Separation:	1MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	-0.58dBi
Bluetooth (BLE mode)	
Bluetooth Version:	V5.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	2.83dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK

Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	-0.58dBi

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

Bluetooth (BR/EDR mode):

Maximum Tune-Up output power: -3(dBm)

Maximum peak output power at antenna input terminal: 0.50 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2402 (MHz)

Antenna gain: -0.58 (dBi)

Directional gain (numeric gain): 0.87

The worst case is power density at prediction frequency at 20cm: 0.0001(mw/cm^2)

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

Bluetooth (BLE mode):

Maximum Tune-Up output power: 20(dBm)

Maximum peak output power at antenna input terminal: 2.00(mW)

Prediction distance: >20(cm)

Prediction frequency: 2402 (MHz)

Antenna gain: -0.58 (dBi)

Directional gain (numeric gain): 0.87

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

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

Mode for Simultaneous Multi-band Transmission

Bluetooth (BR/EDR mode) + Bluetooth (BLE mode)

The worst case is power density at prediction frequency at 20cm: 0.0001+0.0003=0.0004(mw/cm^2)

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

Result: Pass