Maximum Permissible Exposure Report

For

Shenzhen Coolmusic Tech co.,Ltd

5th Floor Building A, NO.28 Longteng street, Baoang commuinity

Longgang District, Shenzhen, China.

FCC ID: 2ATJ3-BP40

FCC Rule(s):	FCC Part 15.247
Product Description:	Multi-function speakers
Tested Model:	BP40
Report No.:	WTG19G05030574W-2
Sample Receipt Date:	2019-05-17
Tested Date:	2019-05-17 to 2019-05-27
Issued Date:	2019-05-27
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager
Prepared By:	

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Shenzhen Coolmusic Tech co.,Ltd
Address of applicant:	5th Floor Building A, NO.28 Longteng street Baoang commuinity Longgang District Shenzhen China.
Manufacturer:	Shenzhen Coolmusic Tech co.,Ltd
Address of manufacturer:	5th Floor Building A, NO.28 Longteng street Baoang commuinity Longgang District Shenzhen China.

General Description of EUT	
Product Name:	Multi-function speakers
Brand Name:	COOLMUSIC
Model No.:	BP40
Adding Model(s):	DK35S, DM35S, MR2, MR1, DM100, DK200, BP60, BP120, UNIGUE10G, DK20, BT10
Rated Voltage:	N/A
Battery Capacity:	N/A
Power Adapter:	Input: 100-240V 1.5A 50/60Hz Output: DC18V 3000mA
Software Version:	KYBT6925 V1.2
Hardware Version:	AC6925F
Note: The test data is gathered from a production sample,provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth Version:	V4.2 (EDR mode)
Frequency Range:	2402-2480MHz
RF Output Power:	4.110dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, π/4 DQPSK
Quantity of Channels:	79
Channel Separation:	1MHz
Type of Antenna:	Inverted F Antenna
Antenna Gain:	0 dBm
Lowest Internal Frequency of EUT:	24MHz

1.2 Test Standards

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1310

1.3 General Description of Test

Items	**Description**
EUT Frequency band	☐ FHSS: 2.400GHz ~ 2.483GHz ☐ WLAN: 2.400GHz ~ 2.483GHz ☐ WLAN: 5.150GHz ~ 5.250GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☒ Others: BT: 2402-2480MHz
Device category	☐ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☒ Others Fixed location (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2) ☐ Others: _____
Antenna diversity	☒ Single antenna ☐ Multiple antennas: ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	4.110 dBm = 2.60 mW
Antenna gain (Max)	0 dBi
Evaluation applied	☒MPE Evaluation ☐SAR Evaluation
Note: *1. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*	

1.4 Human Exposure Assessment Results

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*100	6
3.0–30	1842/f	4.89/f	*900/f²	6
30–300	61.4	0.163	1.0	6
300–1,500	.....	.....	f/300	6
1,500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*100	30
1.34–30	824/f	2.19/f	*180/f²	30
30–300	27.5	0.073	0.2	30
300–1,500	.....	.....	f/1500	30
1,500–100,000	.....	.....	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = *Field Strength in Volts / meter*
P = *Power in Watts*
G = *Numeric antenna gain*
d = *Distance in meters*
S = *Power Density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$P\ (mW) = P\ (W) / 1000$ *and*
$d\ (cm) = 100 * d\ (m)$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textit{Equation 1}$$

Where d = *distance in cm*
P = *Power in mW*
G = *Numeric antenna gain*
S = *Power Density in* mW / cm^2

EUT parameter (data from the separate report)	
Given $E=\frac{\sqrt{30\times P\times G}}{d}$ & $S=\frac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Exposure classification	S=1mW/cm^2
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields $S=\frac{30xPxG}{3770d^2}$, d=0.2m=20cm P=0.0026 W=2.60 mW, G = 1, S=0.00005mW/cm^2	
Conclusion: S=0.00005mW/cm^2 is significant lower than the FCC 47CFR Part 1.1310 Limit 1mW/cm^2 . (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)	