

FCC 47 CFR MPE REPORT

INMUSIC BRANDS INC

BLUETOOTH MIXER

Model Number: BLACK&BLUE

Additional Model: RA08

FCC ID: Y4O-RA08

| | |
|--------------------------|---|
| Prepared for: | INMUSIC BRANDS INC |
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| | |
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|-----------------|-----------------------|
| Report Number: | ESTE-R1709020 |
| Date of Test: | June 26~July 01, 2017 |
| Date of Report: | July 03, 2017 |

Maximum Permissible Exposure

1、Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(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 E 2 , H 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 |
| 1500-10000 | | | 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 E 2 , H 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 |
| 1500-10000 | | | 1.0 | 30 |

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

2、MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } P_d \text{ (W/m}^2\text{)} = E^2 / 377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$P_d = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

3、Conducted Power Result

| Mode | Frequency (MHz) | Peak output power (dBm) | Peak output power (mW) | Target power (dBm) | Antenna gain | |
|-------------|--------------------|----------------------------|---------------------------|----------------------------|--------------|----------|
| | | | | | (dBi) | (Linear) |
| BLUETOOTH A | | | | | | |
| GFSK | 2402 | -2.016 | 0.629 | -3±1 | 5 | 3.162 |
| | 2441 | -2.663 | 0.542 | -3±1 | 5 | 3.162 |
| | 2480 | -3.126 | 0.487 | -4±1 | 5 | 3.162 |
| 8-DPSK | 2402 | -3.208 | 0.478 | -4±1 | 5 | 3.162 |
| | 2441 | -3.193 | 0.479 | -4±1 | 5 | 3.162 |
| | 2480 | -3.579 | 0.439 | -4±1 | 5 | 3.162 |
| BLE | 2402 | -2.410 | 0.574 | -3±1 | 5 | 3.162 |
| | 2440 | -3.050 | 0.495 | -4±1 | 5 | 3.162 |
| | 2480 | -3.050 | 0.495 | -4±1 | 5 | 3.162 |
| BLUETOOTH B | | | | | | |
| GFSK | 2402 | -2.806 | 0.524 | -3±1 | 5 | 3.162 |
| | 2441 | -3.000 | 0.501 | -3±1 | 5 | 3.162 |
| | 2480 | -3.283 | 0.470 | -4±1 | 5 | 3.162 |
| 8-DPSK | 2402 | -3.845 | 0.413 | -4±1 | 5 | 3.162 |
| | 2441 | -3.461 | 0.451 | -4±1 | 5 | 3.162 |
| | 2480 | -3.672 | 0.429 | -4±1 | 5 | 3.162 |
| BLE | 2402 | -2.740 | 0.532 | -3±1 | 5 | 3.162 |
| | 2440 | -3.140 | 0.485 | -4±1 | 5 | 3.162 |
| | 2480 | -2.950 | 0.507 | -3±1 | 5 | 3.162 |
| BLUETOOTH C | | | | | | |
| GFSK | 2402 | -6.707 | 0.213 | -7±1 | 5 | 3.162 |
| | 2441 | -6.945 | 0.202 | -7±1 | 5 | 3.162 |
| | 2480 | -7.050 | 0.197 | -8±1 | 5 | 3.162 |
| 8-DPSK | 2402 | -7.946 | 0.160 | -8±1 | 5 | 3.162 |
| | 2441 | -7.349 | 0.184 | -8±1 | 5 | 3.162 |
| | 2480 | -7.331 | 0.185 | -8±1 | 5 | 3.162 |
| BLE | 2402 | -6.740 | 0.212 | -7±1 | 5 | 3.162 |
| | 2440 | -7.080 | 0.196 | -8±1 | 5 | 3.162 |
| | 2480 | -6.630 | 0.217 | -7±1 | 5 | 3.162 |

4、Calculated Result and Limit

| Mode | Target power (dBm) | Antenna gain | | Power Density (S) (mW /cm2) | Limited of Power Density (S) (mW /cm2) | Test Result |
|-------------|-------------------------|--------------|----------|-----------------------------------|--|-------------|
| | | (dBi) | (Linear) | | | |
| BLUETOOTH A | | | | | | |
| GFSK | -2 | 5 | 3.162 | 0.00040 | 1 | Compiles |
| 8-DPSK | -3 | 5 | 3.162 | 0.00032 | 1 | Compiles |
| BLE | -2 | 5 | 3.162 | 0.00040 | 1 | Compiles |
| BLUETOOTH B | | | | | | |
| GFSK | -2 | 5 | 3.162 | 0.00040 | 1 | Compiles |
| 8-DPSK | -3 | 5 | 3.162 | 0.00032 | 1 | Compiles |
| BLE | -2 | 5 | 3.162 | 0.00040 | 1 | Compiles |
| BLUETOOTH C | | | | | | |
| GFSK | -6 | 5 | 3.162 | 0.00016 | 1 | Compiles |
| 8-DPSK | -7 | 5 | 3.162 | 0.00013 | 1 | Compiles |
| BLE | -6 | 5 | 3.162 | 0.00016 | 1 | Compiles |

| Mode | Power Density (S) (mW/cm ²) Antenna A | Power Density (S) (mW/cm ²) Antenna B | Power Density (S) (mW/cm ²) Antenna C | Power Density (S) (mW/cm ²) Total | Limited of Power Density (S) (mW/cm ²) | Test Result |
|--------|--|--|--|--|--|-------------|
| GFSK | 0.00040 | 0.00040 | 0.00016 | 0.00096 | 1 | Compiles |
| 8-DPSK | 0.00032 | 0.00032 | 0.00013 | 0.00077 | 1 | Compiles |
| BLE | 0.00040 | 0.00040 | 0.00016 | 0.00096 | 1 | Compiles |