# MPE REPORT

FCC ID: OWT-KS214BT

Date of issue: Aug. 15, 2018

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|---|---|
| Report Number: | MTi180813E049 |
| Sample Description: | Bluetooth CD+G Karaoke System |
| Model(s): | KS214B-BT, KS214, KS21X-BT, KS21X, 10026826, KS214-BT |
| Applicant: | Arts Digital Technology (HK) Limited |
| Address: | 1704, 17/F, Fo Tan Industrial Centre 26-28 Au Pui Wan Street, Fo Tan, N.T. Hong Kong |
| Date of Test: | July 17, 2018 to Aug. 15, 2018 |

## TEST RESULT CERTIFICATION

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|---|---|
| Applicant's name: | Arts Digital Technology (HK) Limited |
| Address: | 1704, 17/F, Fo Tan Industrial Centre 26-28 Au Pui Wan Street, Fo Tan, N.T. Hong Kong |
| Manufacture's name: | Arts Digital Technology (HK) Limited |
| Address: | 1704, 17/F, Fo Tan Industrial Centre 26-28 Au Pui Wan Street, Fo Tan, N.T. Hong Kong |
| Product name: | Bluetooth CD+G Karaoke System |
| Trademark: | iKaraoke, ADT, auna |
| Model name: | KS214B-BT |
| Series model: | KS214, KS21X-BT, KS21X, 10026826, KS214-BT |
| Difference in series models: | All the model are the same circuit and RF module, X can be 0-9, A-Z, for different coloration or export country |
| RF Exposure Procedures: | KDB 447498 D01 v06 |

*This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.*

Tested by:

Demi Mu        Aug. 15, 2018

Reviewed by:

Blue Zheng        Aug. 15, 2018

Approved by:

Smith Chen        Aug. 15, 2018

# 1. RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm$^2$) | 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/f$^2$ | 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/f$^2$ | 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

MPE Calculation Method

Friis transmission formula: Pd= (Pout*G)\ (4*pi*R$^2$)

Where

Pd= Power density in mW/cm2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.14115926

R= distance between observation point and center of the radiator in cm(20cm)

Pd the limit of MPE, 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

**WIFI:**

Operation Frequency: BT: GFSK, π/4-DQPSK, 8DPSK:2402-2480MHz,

Power density limited: 1mW/ cm$^2$

Antenna Type: BT Antenna: PCB Antenna;
BT antenna gain: -0.68dBi

R=20cm

mW=10^(dBm/10)

antenna gain Numeric=10^(dBi/10)= 10^(-0.68/10)=0.86

# 2. SAR Test Exclucsion Thresholds

We use 5mm as separation distance to calculated.
Bluetooth DSS:

| Channel Freq. (MHz) | modulation | conducted power (dBm) | Tune-up power (dBm) | Max | | Antenna | | Evaluation result (mW/cm2 ) | Power density Limits (mW/cm2) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | tune-up power | | Gain | | | |
| | | | | (dBm) | (mW) | (dBi) | Numeric | | |
| 2402 | GFSK | 0.287 | 0±1 | 1 | 1.259 | -0.68 | 0.86 | 0.0002 | 1 |
| 2441 | | 1.158 | 1±1 | 2 | 1.585 | -0.68 | 0.86 | 0.0003 | 1 |
| 2480 | | 3.391 | 3±1 | 4 | 2.512 | -0.68 | 0.86 | 0.0004 | 1 |
| 2402 | π/4-DQPSK | -0.415 | -0±1 | 1 | 1.259 | -0.68 | 0.86 | 0.0002 | 1 |
| 2441 | | 0.843 | 0±1 | 1 | 1.259 | -0.68 | 0.86 | 0.0002 | 1 |
| 2480 | | 3.044 | 3±1 | 4 | 2.512 | -0.68 | 0.86 | 0.0004 | 1 |
| 2402 | 8DPSK | -1.363 | -1±1 | 0 | 1.000 | -0.68 | 0.86 | 0.0002 | 1 |
| 2441 | | 0.021 | 0±1 | 1 | 1.259 | -0.68 | 0.86 | 0.0002 | 1 |
| 2480 | | 3.285 | 3±1 | 4 | 2.512 | -0.68 | 0.86 | 0.0004 | 1 |

**Conclusion:**

For the max result: 0.0004≤ 1.0 for 1g SAR, No SAR is required.

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