

RF EXPOSURE REPORT



Report No.: 17070849-FCC-H-V1

| | | |
|--|--|-------------------------------------|
| Applicant | Tivo Solution Inc. d/b/a Tivo Inc. | |
| Product Name | Bluetooth USB Dongle | |
| Model No. | EC80 | |
| Serial No. | N/A | |
| Test Standard | FCC 2.1091:2016 | |
| Test Date | September 06 to September 21, 2017 | |
| Issue Date | September 28, 2017 | |
| Test Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | |
| Equipment complied with the specification | | <input checked="" type="checkbox"/> |
| Equipment did not comply with the specification | | <input type="checkbox"/> |
| Loren Luo | David Huang | |
| Loren Luo Test Engineer | David Huang Checked By | |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | | |

Issued by:

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

| Country/Region | Scope |
|----------------|------------------------------------|
| USA | EMC, RF/Wireless, SAR, Telecom |
| Canada | EMC, RF/Wireless, SAR, Telecom |
| Taiwan | EMC, RF, Telecom, SAR, Safety |
| Hong Kong | RF/Wireless, SAR, Telecom |
| Australia | EMC, RF, Telecom, SAR, Safety |
| Korea | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan | EMI, RF/Wireless, SAR, Telecom |
| Singapore | EMC, RF, SAR, Telecom |
| Europe | EMC, RF, SAR, Telecom, Safety |

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1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|-------------------|----------------|-------------------------------------|--------------------|
| 17070849-FCC-H | NONE | Original | September 22, 2017 |
| 17070849-FCC-H-V1 | V1 | Updated the Number of Channels data | September 28, 2017 |
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| | | | |

2. Customer information

| | |
|------------------|--|
| Applicant Name | Tivo Solution Inc. d/b/a Tivo Inc. |
| Applicant Add | 2160 Gold Street Alviso California United States |
| Manufacturer | REMOTE SOLUTION. CO., LTD |
| Manufacturer Add | 326-14,APO-DAERO, NAM-MYEON, GIMCHEON CITY, GYEONGSANGBUK-DO,KOREA |

3. Test site information

| | |
|----------------------|--|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES |
| Lab Address | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108 |
| FCC Test Site No. | 535293 |
| IC Test Site No. | 4842E-1 |
| Test Software | Labview of SIEMIC version 2.0 |

4. Equipment under Test (EUT) Information

Description of EUT: Bluetooth USB Dongle

Main Model: EC80

Serial Model: N/A

Equipment Category : DTS

Antenna Gain: -0.7dBi

Antenna Type: PCB antenna

Input Power: N/A

Trade Name : N/A

FCC ID: TGN-EC80

Type of Modulation: BLE: GFSK

RF Operating Frequency (ies): BLE: 2402-2480 MHz

Number of Channels: BLE: 40CH

Date EUT received: September 05, 2017

Test Date(s): September 06 to September 21, 2017

5. FCC §2.1091 - Maximum Permissible exposure (MPE)

6.1 Applicable Standard

According to §1.1307(b)(1), 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 of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

| Limits for General Population/Uncontrolled Exposure | | | | |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Averaging Time (minutes) |
| 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 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

f = frequency in MHz

* = Plane-wave equivalent power density

6.2 Test Result

| Type | CH | Freq (MHz) | Conducted Power (dBm) | Tune Up Power (dBm) |
|--------------|------|------------|-----------------------|---------------------|
| Output power | Low | 2402 | 6.859 | 6.5±1 |
| | Mid | 2440 | 7.205 | 6.5±1 |
| | High | 2480 | 6.934 | 6.5±1 |

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

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 (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 7.5(dBm)

Maximum output power at antenna input terminal: 5.623(mW)

Prediction distance: >20 (cm)

Predication frequency: 2440 (MHz) Mid frequency

Antenna Gain (typical): -0.7 (dBi)

The worst case is power density at predication frequency at 20 cm: 0.000952(mW/cm²)

MPE limit for general population exposure at predication frequency: 1.0 (mW/cm²)

0.000952 (mW/cm²) < 1.0 (mW/cm²)

Result: Pass