

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 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:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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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

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 prediction frequency: 1.0 (mW/cm²)

0.000952 (mW/cm²) < 1.0 (mW/cm²)

Result: Pass