

FCC RF Exposure Report

FCC ID : ACQ-MG3R
Equipment : Set Top Box
Model No. : MG3-R
Brand Name : TiVo
Applicant : ARRIS
Address : 101 Tournament Drive, Horsham
Pennsylvania, United States, 19044
Standard : 47 CFR FCC Part 2.1091
Received Date : Mar. 20, 2019
Tested Date : Apr. 23 ~ May 28, 2019

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FA932003	Rev. 01	Initial issue	Jun. 10, 2019

1 MPE EVALUATION OF MOBILE DEVICES

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

1.1 LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

Frequency Range (MHz)	Power Density (mW /cm ²)	Averaging Time (minutes)
300~1500	F/1500	30
1500~100000	1.0	30

1.2 MPE EVALUATION FORMULA

$$Pd = \frac{Pt}{4 * Pi * R^2}$$

Where

Pd= Power density in mW/cm²
 Pt= EIRP in mW
 Pi= 3.1416
 R= Measurement distance

1.3 DEVIATION FROM TEST STANDARD AND MEASUREMENT PROCEDURE

None

1.4 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Parameters	Uncertainty
Conducted power	±0.808 dB

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared values of gain for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of the gain.

1.5 MPE EVALUATION RESULTS

Non-beamforming mode

Frequency Range (MHz)	Maximum Conducted Power (dBm)	Rated Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Ratio*	Pass / Fail
WLAN								
2412-2462	29.87	30.00	3.2	20	0.416	1	0.416	Pass
5180-5240	21.90	22.00	5.3	20	0.107	1	0.107	Pass
5260-5320	22.12	22.50	6	20	0.141	1	0.141	Pass
5500-5720	23.59	24.00	5.5	20	0.177	1	0.177	Pass
5745-5825	28.96	29.00	5.5	20	0.561	1	0.561	Pass
BT								
2402-2480 (BT-BR)	1.46	1.50	3.6	20	0.001	1	0.001	Pass
2402-2480 (BT-LE)	1.33	1.50	3.6	20	0.001	1	0.001	Pass

*Ratio = Power density / Limit.

Beamforming mode

Frequency Range (MHz)	Maximum Conducted Power (dBm)	Rated Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Ratio*	Pass / Fail
WLAN								
2412-2462	25.70	26.00	8.90	20	0.615	1	0.615	Pass
5180-5240	18.92	19.00	10.73	20	0.187	1	0.187	Pass
5260-5320	18.65	19.00	10.90	20	0.194	1	0.194	Pass
5500-5720	18.17	18.50	11.06	20	0.180	1	0.180	Pass
5745-5825	25.73	26.00	10.20	20	0.829	1	0.829	Pass

*Ratio = Power density / Limit.

Note:

2412~2462MHz: Directional gain = $10 * \log((10^{3.2/20} + 10^{3/20} + 10^{2.5/20} + 10^{2.8/20})^2 / 4) = 8.90$ dBi

5150-5250MHz: Directional gain = $10 * \log((10^{4.1/20} + 10^{4.9/20} + 10^{5.3/20} + 10^{4.5/20})^2 / 4) = 10.73$ dBi

5250-5350MHz: Directional gain = $10 * \log((10^{4.7/20} + 10^{4.2/20} + 10^{6/20} + 10^{4.5/20})^2 / 4) = 10.90$ dBi

5470-5725MHz: Directional gain = $10 * \log((10^{5.1/20} + 10^{5.3/20} + 10^{5.5/20} + 10^{4.2/20})^2 / 4) = 11.06$ dBi

5725-5850MHz: Directional gain = $10 * \log((10^{5.1/20} + 10^{5.5/20} + 10^{3/20} + 10^{2.8/20})^2 / 4) = 10.20$ dBi

1.6 MPE EVALUATION OF SIMULTANEOUS TRANSMISSION

Only WLAN 5GHz + BT can transmit at the same time.

Non-beamforming mode

Mode	Max Ratio of Each Mode
WLAN 5GHz	0.561
BT	0.001
Sum	0.562
Limit	1
Pass / Fail	Pass

Beamforming mode

Mode	Max Ratio of Each Mode
WLAN 5GHz	0.829
BT	0.001
Sum	0.830
Limit	1
Pass / Fail	Pass

2 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

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No. 30-2, Ding Fwu Tsuen, Lin
Kou District, New Taipei City,
Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

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No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

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