

RF EXPOSURE REPORT



Applicant: Raytac Corporation
5F., No.3, Jiankang Road, Zhonghe District, New Taipei City
23586, Taiwan

Product Name: Bluetooth Module

Brand Name: Raytac Corporation

Model No.: MDBT53V, MDBT53V-P

Model Difference: Antenna type & appearance between two models are different.

Report Number: E2/2021/A0089

FCC ID SH6MDBT53V

IC: 8017A-MDBT53V

Issue Date: November 10, 2021

Date of EUT Received: October 7, 2021

Approved By

John Yeh

We hereby certify that:

The above equipment was evaluate by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1093 and RSS-102.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History

Report Number	Revision	Description	Issue Date	Revised By
E2/2021/A0089	00	Original.	November 10, 2021	Ariel Chang

Note:

1. Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	Bluetooth Module
Brand Name:	Raytac Corporation
Model No.:	MDBT53V, MDBT53V-P
Model Difference:	Antenna type & appearance between two models are different.
Hardware Version:	1
Firmware Version:	1
EUT Series No.:	Conducted: PJ219155009 Radiated: PJ219155008
Power Supply:	3.3Vdc

1.2 Antenna Information:

1.2.1 BT / WLAN 2.4GHz

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)
Chip	Raytac	MDBT53V	2402~2480	-1.35
PCB		MDBT53V-P		-2.26

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2 FCC STANDARD APPLICABLE

2.1 FCC Standard Applicable:

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

As per KDB 447498 D01 4.3.1,

Step a: For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot$$

$$[\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g Head \& Body SAR and } \leq 7.5 \text{ for 10-g extremity Hand SAR, where}$$

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as numeric thresholds in **step b)** below

Step b: For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

1) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz

2) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

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2.2 Measurement Result:

Step a:

This is a portable device and the max. output power including tune-up tolerance is 2.094 (mW), lower than the threshold given and derived as formula given above, where

$$=2.094(\text{mW})/5(\text{mm})*\sqrt{2.48(\text{GHz})} = 0.66 < 3.0$$

Frequency (MHz)	Max. output power including tune-up tolerance(dBm)	Max. output power including tune-up tolerance(mW)	Distance (mm)	Result	≤ 3.0 for 1-g SAR
2480	3.21	2.094	5	0.660	TRUE

As the result of calculation result indicates, the RF exposure generating from given transmitter (transmitter employed digital modulation) can be excluded from SAR measurement, and is deemed compliant with RF exposure as per FCC.

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2.3 ISED Standard Applicable

As per RSS-102 Issue 5 March 19, 2015, any transmitter shall be compliant with applicable RF exposure prior to being market. In §2.5.1, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power.

For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5.

2.4 Measurement Result:

Freq. (MHz)	Max. output power including tune-up tolerance(dBm)	Peak Gain (dBi)	Max Conducted Output Power (mW)	e.i.r.p (mW)	Exemption Limit (mW)
2480	3.21	-1.35	2.094	1.535	4
Measurement Result The Max. Conducted Output Power is 2.094mW when the device operates at the separation distance below or equals to 5mm. It is below the SAR exemption limit 4mW.					

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