



TEST REPORT

FCC SAR Exclusion Report for MerchBox13M Certification

APPLICANT
KEYTH INTERNATIONAL

REPORT NO.
HCT-SR-2309-FC002-R3

DATE OF ISSUE
September 27, 2023

Technical Manager
Yun Jeang Heo

(signature) 

Accredited by KOLAS, Republic of KOREA

HCT CO., LTD.

BongJai Huh / CEO

HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 645 6300 F ax. +82 31 645 6401



HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 634 6300 Fax. +82 31 645 6401

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CUSTOMER SECRET



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Applicant

KEYTH INTERNATIONAL

317, Dosan-daero, Gangnam-gu, Seoul, South Korea

EUT Type Model Name

Merch Box13_MOUSE

MerchBox13M

FCC ID

2AZWB-MERCHBOX13M

Max. RF Output Power

-7.5 dBm

FCC Rule Part(s)

47CFR §2.1093

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	September 05, 2023	Initial Release
1	September 18, 2023	Revised Applicant's Address
2	September 26, 2023	Revised Applicant's Address
3	September 27, 2023	Revised Equipment Name

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

This laboratory is not accredited for the test results marked *.

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 AND KOLAS (Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr



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1. EUT DESCRIPTION

Model Name	MerchBox13M
EUT Type	Merch Box13_MOUSE
Power Supply	1.5 V
Frequency Range	2.4 GHz ISM Band 2 402 MHz – 2 480 MHz
Max. RF Output Power	-7.5 dBm (EIRP)
Modulation Type	GFSK
Modulation Technique	FHSS
Number of Channels	40 Channels
Channel Spacing, Bandwidth	2 MHz
Antenna Specification	Antenna type: Printed Antenna Peak Gain: -4.62 dBi
EUT Serial numbers	Radiated: MerchBox13M-01 Conducted: MerchBox13M-02
Manufacturer	KEYTH INTERNATIONAL 317, Dosan-daero, Gangnam-gu, Seoul, South Korea

2. TEST METHODOLOGY

2.1 FCC

Limb SAR and Body SAR Test Exclusions Applied _ GFSK

Since this product is a remote Mouse product, it is used by most users in the hand, so Limb SAR standard is applied. In addition, since this product is capable of Portable device by the user, an exception evaluation is applied at a distance of 10 mm from the Body SAR.

According to the FCC KDB 447498 D01 v06 section 4.3.1, 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:

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

$$\frac{\text{Max Power of Channel(mW)}}{\text{Test Separation Distance (mm)}} * \sqrt{\text{Frequency(GHz)}} \leq 3.0 \text{ For 1g SAR, } 7.5. \text{ for 10g SAR}$$

where

- f(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

Calculation Result:

Tx frequency range: 2 402 MHz ~ 2 480 MHz

Limb SAR Consideration Min. test separation distance: 5 mm

Body SAR Consideration Min. test separation distance: 10 mm

Maximum Output Power: -7.5 dBm(0.18 mW)

The Highest RF channel frequency: 2 480 MHz

For Body SAR Exclusion

Mode	Frequency	Maximum Allowed Power	Separation Distance	≤ 3.0 for 1 g SAR
	[MHz]	[mW]	[mm]	
GFSK	2 480	0.18	10	0.03

For Limb SAR exclusion

Mode	Frequency	Maximum Allowed Power	Separation Distance	≤ 7.5 for 10 g SAR
	[MHz]	[mW]	[mm]	
GFSK	2 480	0.18	5	0.06

Based on the maximum output power of MerchBox13M and antenna to use separation distance, MerchBox13M Limb SAR and Body SAR were not required.