



REPORT No.: SZ23080222B02

# TEST REPORT

**APPLICANT** : Shenzhen Hope Microelectronics Co., Ltd

**PRODUCT NAME** : HopeRF CMT453X

**MODEL NUMBER** : CMT453X

**BRAND NAME** : HOPERF

**BLUETOOTH  
VERSION** : 5.2

**STANDARD(S)** : Refer to item 3.2

**RECEIPT DATE** : 2023-08-23

**TEST DATE** : 2023-08-23 to 2023-08-28

**ISSUE DATE** : 2023-10-18



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Change History		
Version	Date	Reason for change
1.0	2023-10-09	First edition
2.0	2023-10-18	Replace Version 1.0. Update Description of IUT.



# 1. Identification Summary

## 1.1 Test Laboratory

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Address:</b>	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R.China
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### Competences and guarantees:

Morlab is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, Morlab has a calibration and maintenance programme for its measuring equipment.

Morlab guarantees the reliability of the data presented in this report, which is the result of measurements and tests performed to the item under test on the date and under the conditions stated on the report and is based on the knowledge and technical facilities available at Morlab at the time of execution of the test.

Morlab is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the item under test and the results of the test.



## 1.2 Client

<b>Name:</b>	Shenzhen Hope Microelectronics Co., Ltd
<b>Address:</b>	30th floor of 8th Building, C Zone, Vanke Cloud City, Xili Sub-district, Nanshan, Shenzhen, GD, P.R. China

## 1.3 Implementation Under Test (IUT)

<b>Hw version:</b>	1.0
<b>Sw version:</b>	1.0
<b>Description of IUT:</b>	<p>Ultra power-efficient Bluetooth LE 5.2 chip with 256KB-2048KB Flash, 48KB RAM, and industry leading 2.4GHz RF transceivers. It is built around an ARM Cortex-M0 running up to 64MHz, and a wide selection of peripherals. The chip features an ultra-low transmit and receive power (4.2mA TX at 0dBm, 3.8mA RX) and sleep power consumption is 1.4uA with all RAM retention.</p> <p>CMT453X supports Bluetooth Low Energy 5.2 including 2Mbps PHY, LE Coded PHYs, direction finding using Angle-of-Arrival (AoA) and Angle-of-Departure (AoD), etc. It also supports Bluetooth Mesh, multi-connections, operating as both peripheral and central devices simultaneously. The device is well suited for high performance, low energy consumption IoT connected applications.</p> <p>The HM-BT4531, HM-BT4531B, HM-BT4531C, HM-BT4531D, HM-BT4531E are BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.</p>
<b>Sampling method:</b>	Samples undergoing test have been selected by: the client



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Internal Control No.:	Element:	BT_ADD:
2#	1PCS	2F6300173930

## 2. Test Equipment

The following equipment was used during this testing:

Hardware:	Frontline Harmony LE Tester SN:C1912-00012
Software:	Harmony LE Tester (TCRL 2022-2) 23.3.31736.33095
Test Setup:	See “Annex C Test setup” section.

## 3. Test Results

### 3.1 Test Environment/Conditions

Nominal Temperature	15-35°C
Nominal Humidity	20% – 75%
Air Pressure:	86 –106 kPa

### 3.2 Applied Reference Documents

The tests performed on the IUT are in compliance with the Bluetooth Wireless Technology Specification(s) below.

TCRL	Core.TCRL.2023-1
Test Specification for HCI	HCI.TS.p33

### 3.3 Items used in the Test Results List

Terms in the column “Verdict” for the test results list of the section 0:

Verdict	Description
Pass	Test case requirements were reviewed to be in conformance.
Fail	Test case requirements were reviewed and not in conformance.
INC	Test case define Inconclusive verdict was met instead of the Pass verdict.
Not Required	Test case requirements were reviewed and not required.
Declaration	The required documentation is available in the client’s Compliance Folder
N/A	Test case requirements are not applicable.



### 3.4 Test Results List

#### 3.4.1 HCI Test Cases

Total:4, Pass:4

No.	Test Case Identifier	Test Case Description	Category	Verdict	Date
1	HCI/CIN/BV-14-C	Read RSSI Value, LE PHY	A	Pass	8/28/2023
2	HCI/CIN/BV-04-C	Read Local Version Information Command	A	Pass	8/28/2023
3	HCI/CCO/BI-43-C	LE Read Channel Map - Reject Invalid Handle	A	Pass	8/28/2023
4	HCI/CIN/BV-12-C	LE Read Local Supported Features Command	A	Pass	8/28/2023

Note 1: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



## 4. Test Procedure

The test procedure followed for the test cases is in compliance with the applicable test specification as below:

Test Specification for HCI	HCI.TS.p33
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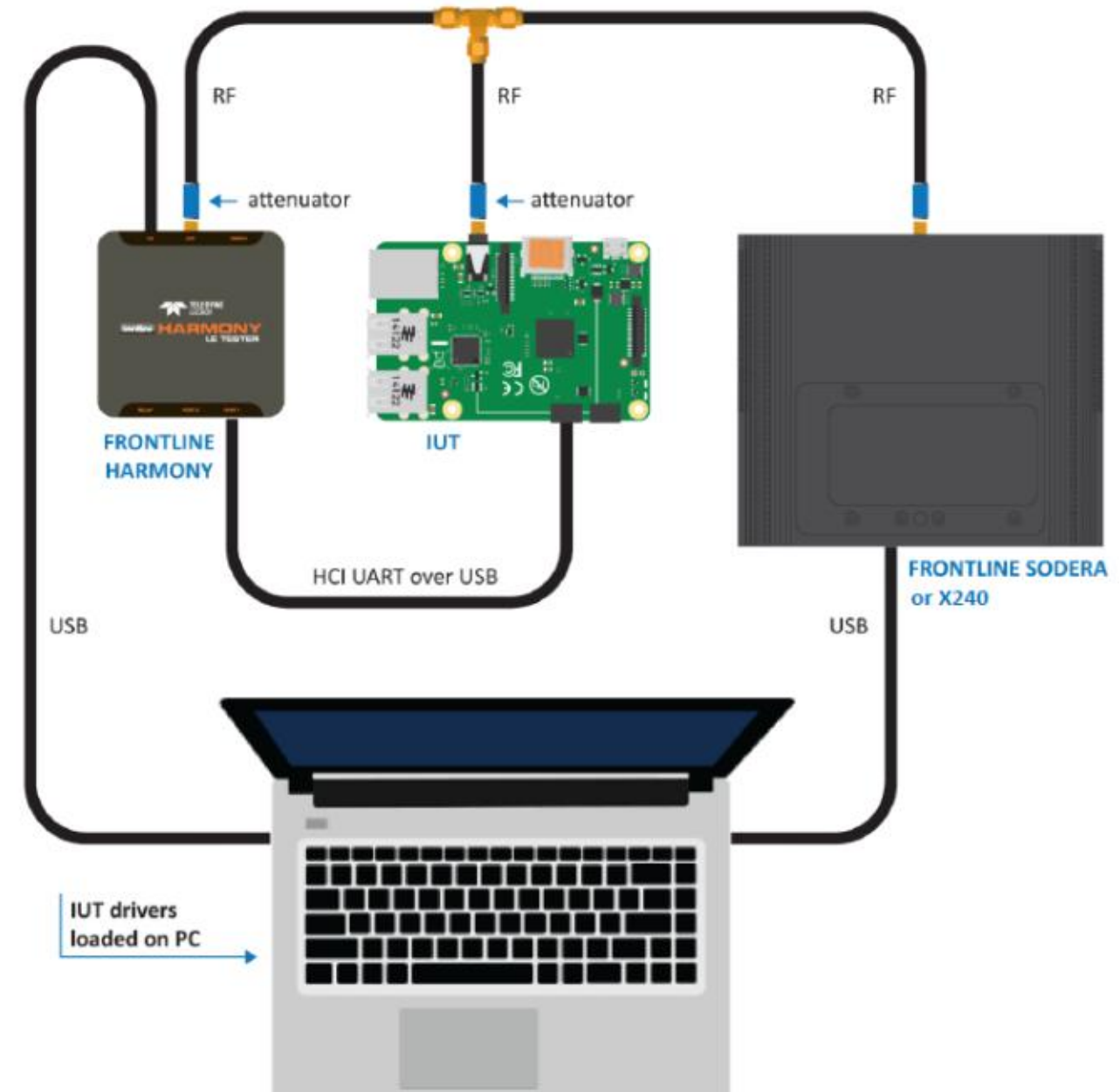
## **Annex A. ICS/IXIT**

Please reference the compliance folder for complete details. Shenzhen Morlab Communications Technology Co.,Ltd., retains a copy of the data.

## **Annex B. Test Data**

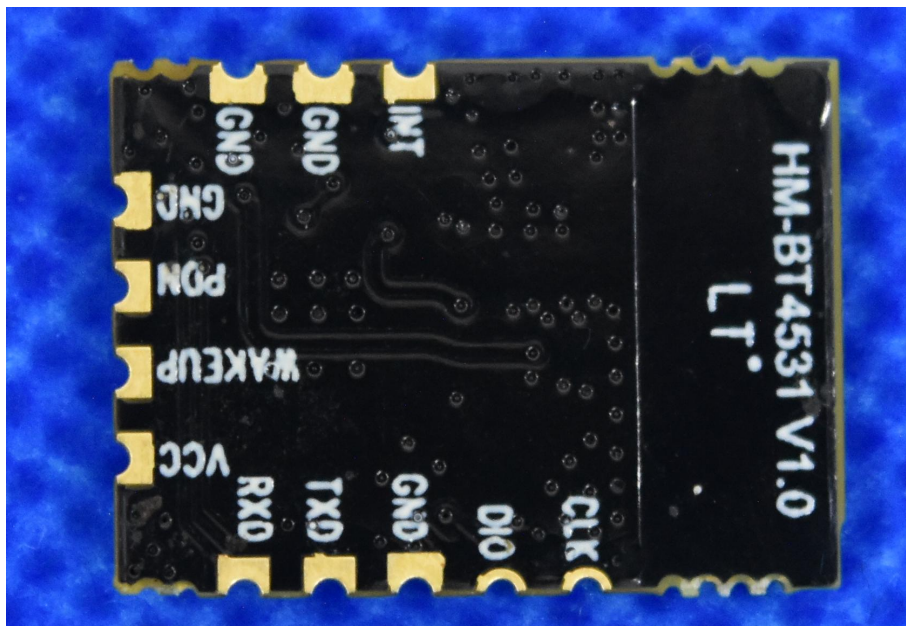
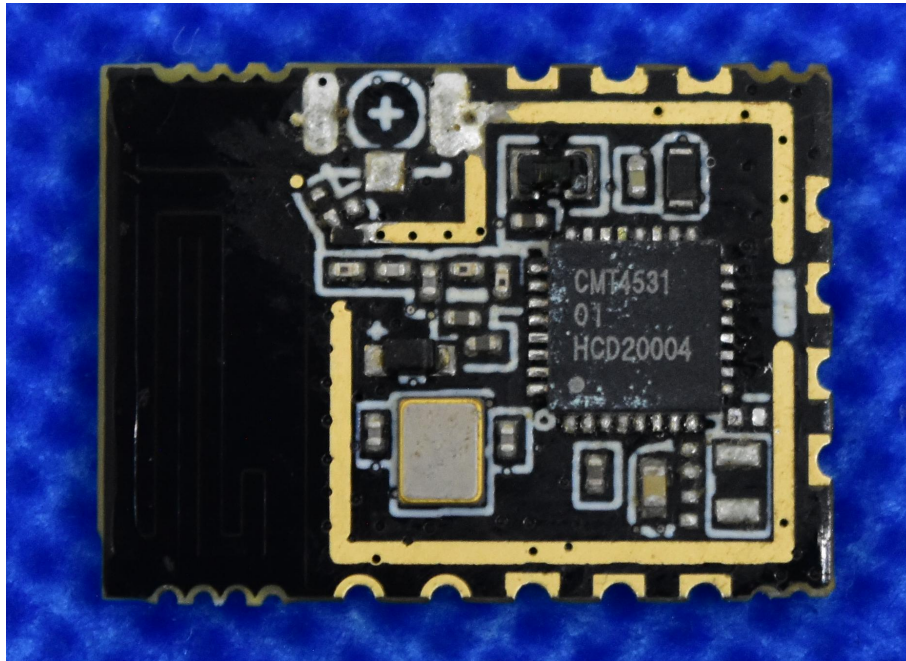
1.Test Data for Compliance Testing: SZ23080222\_Evidence.zip

## Annex C. Test setup



Teledyne LeCroy Harmony LE Tester

## Annex D. EUT Photo



\*\*\*\*\* END OF REPORT \*\*\*\*\*