

TEST REPORT

Applicant: Hanhua Digital Drinking Water Appliance
Technology (Shenzhen) Co., LTD
Address: Room 911, Building T4, Fangcheng City,
Taoyuan Street, Nanshan District, Shenzhen City,
Guangdong Province, China
Equipment Type: Bluetooth module
Model Name: BM1032
Brand Name: N/A
Test Standard: ANSI/IEEE Std 149-1979
Test Date: Jul. 25, 2022
Date of Issue: Aug. 01, 2022

Tested by: Li Zhixiang

Checked by: Zhu Xusen

Approved by: Han tong
(Chief Engineer)

Li Zhixiang

Zhu Xusen.

Han tong

Revision History		
Version	Issue Date	Revisions Content
<u>Rev. 01</u>	Aug. 01, 2022	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Hanvor digital drinking water appliance technology (shenzhen) co. LTD
Address	911, building 4, Fangda Plaza, No. 20, Gaofa West Road, Taoyuan community, Taoyuan Street, Nanshan District, Shenzhen
Phone Number	+86 755 2662 6909

1.2 Identification of the Responsible Testing Location

Test Location 1	Hanvor digital drinking water appliance technology (shenzhen) co. LTD
Address	911, building 4, Fangda Plaza, No. 20, Gaofa West Road, Taoyuan community, Taoyuan Street, Nanshan District, Shenzhen
Description	All measurement facilities used to collect the measurement data are located at 911, building 4, Fangda Plaza, No. 20, Gaofa West Road, Taoyuan community, Taoyuan Street, Nanshan District, Shenzhen

1.3 Test Environment Condition

Ambient Pressure	100 to 102 KPa
Ambient Temperature	19 to 25 °C
Ambient Relative Humidity	45 to 55 %

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Hanvor digital drinking water appliance technology (shenzhen) co. LTD
Address	911, building 4, Fangda Plaza, No. 20, Gaofa West Road, Taoyuan community, Taoyuan Street, Nanshan District, Shenzhen

2.2 Manufacturer Information

Manufacturer	Hanvor digital drinking water appliance technology (shenzhen) co. LTD
Address	911, building 4, Fangda Plaza, No. 20, Gaofa West Road, Taoyuan community, Taoyuan Street, Nanshan District, Shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

Bluetooth Core Specification Version	Bluetooth Core Version 5.0
Product Type	End Product
Model Name Under Test	BM1032
Serial Model Name	BM1032
Hardware Version	V01
Software Version	V1.0
Brief Description	This is a Low power Bluetooth module.

2.5 Ancillary Equipment

N/A

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	ANSI/IEEE Std 149-1979	IEEE Standard Test Procedures for Antennas

3.2 Summary of Test Results

Report Section	Description	Remark
ANNEX A.1	Gain and Efficiency	--
ANNEX B	Radiation Pattern	--

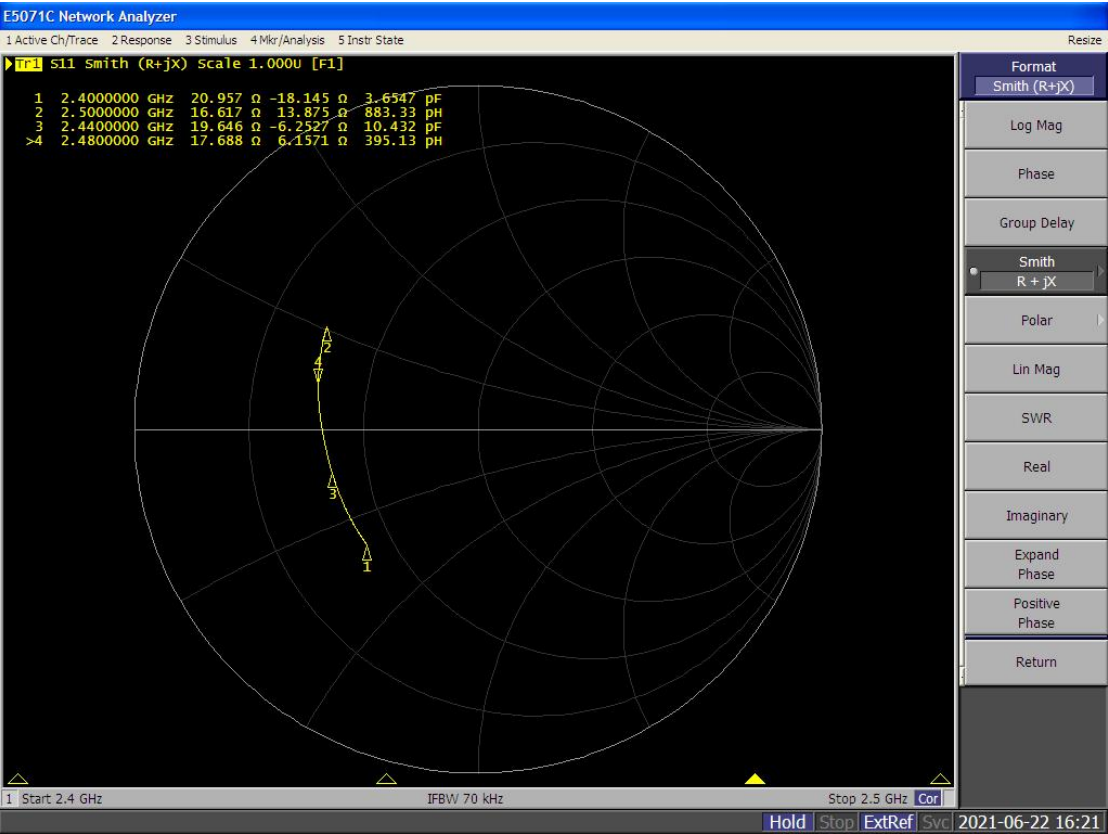
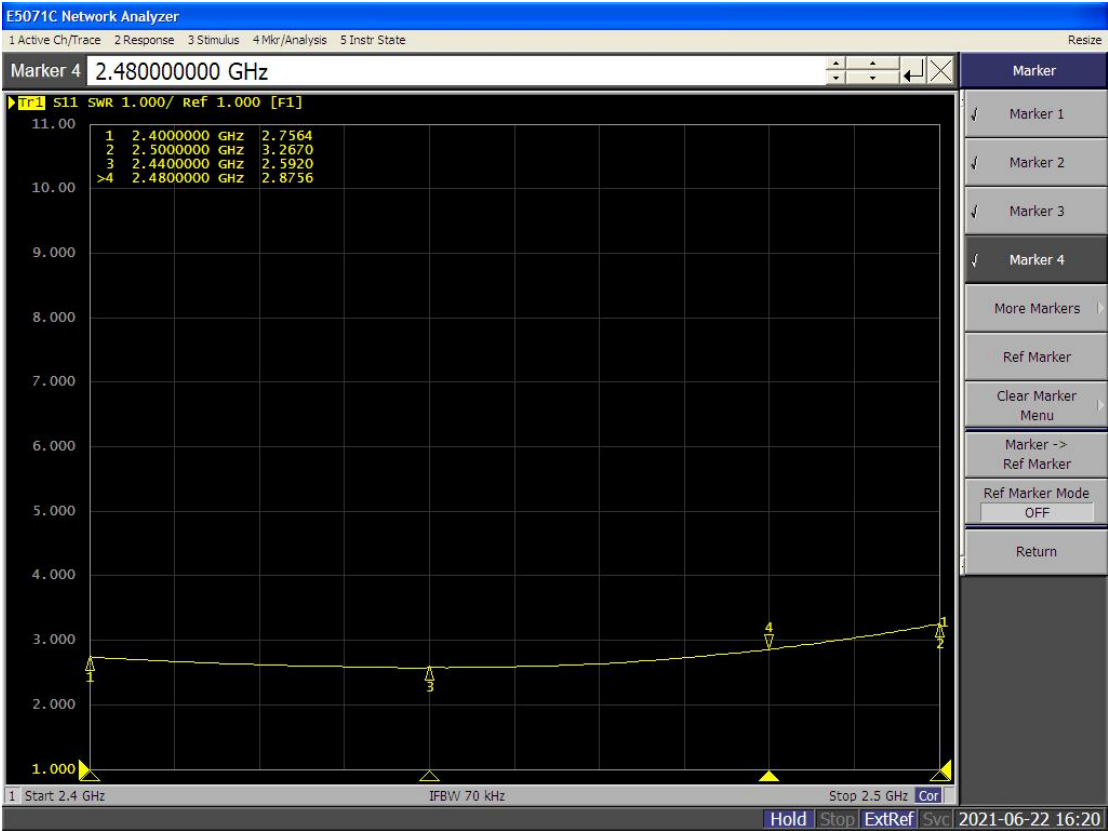
3.3 ANNEX A TEST RESULTS

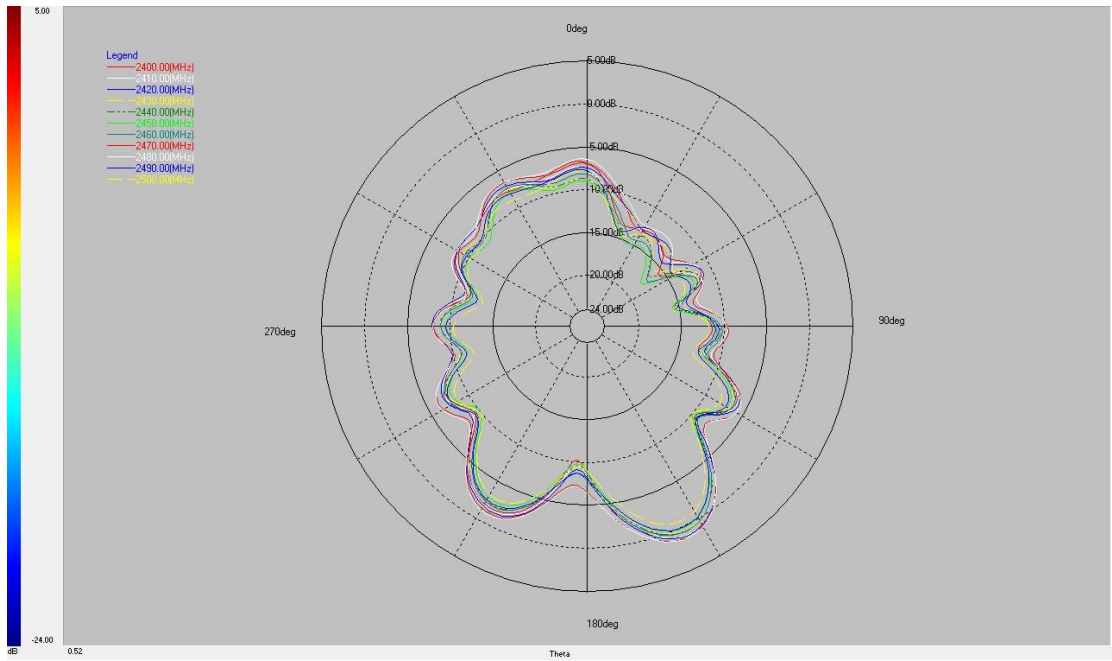
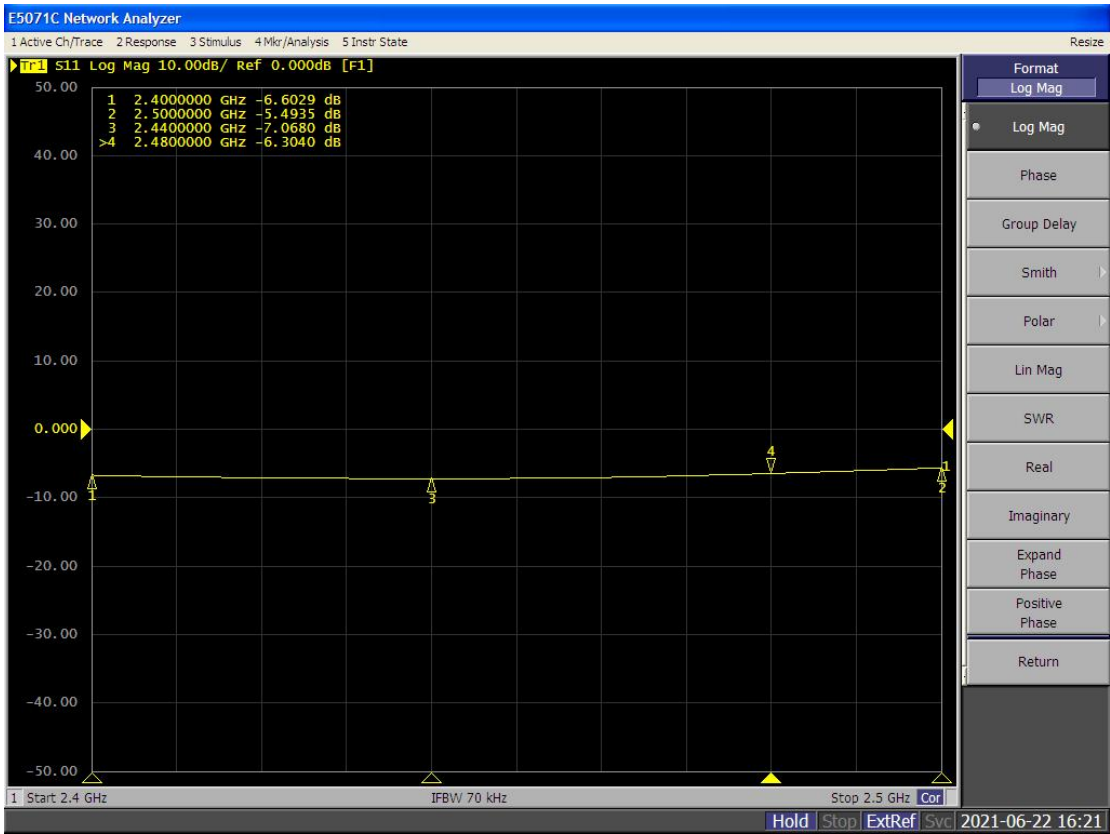
A.1 Gain and Efficiency

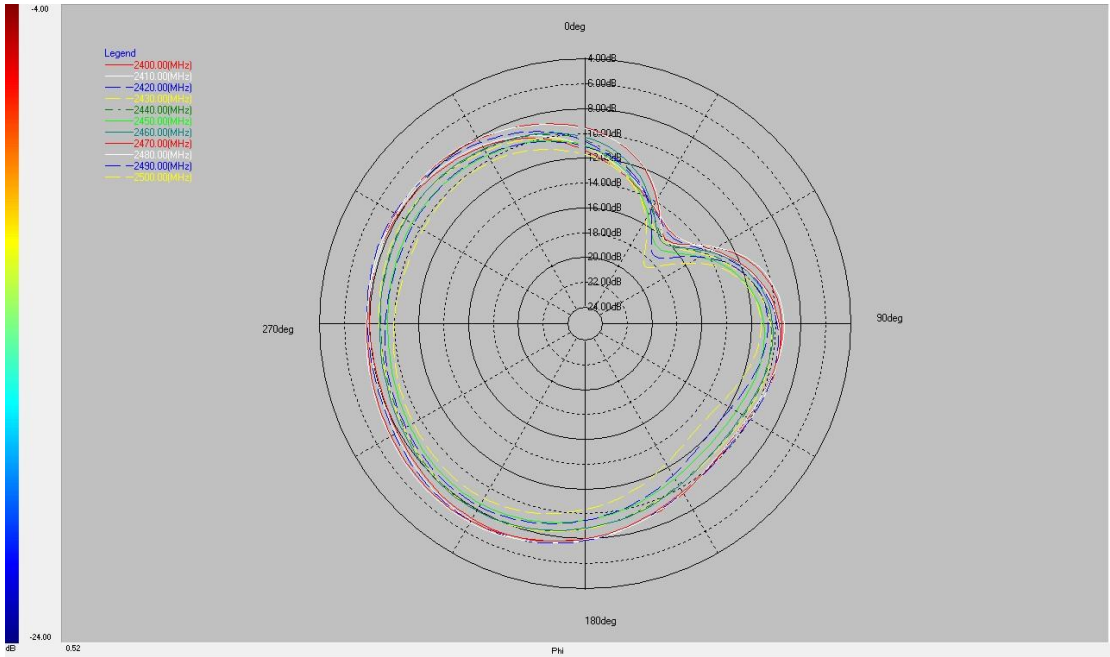
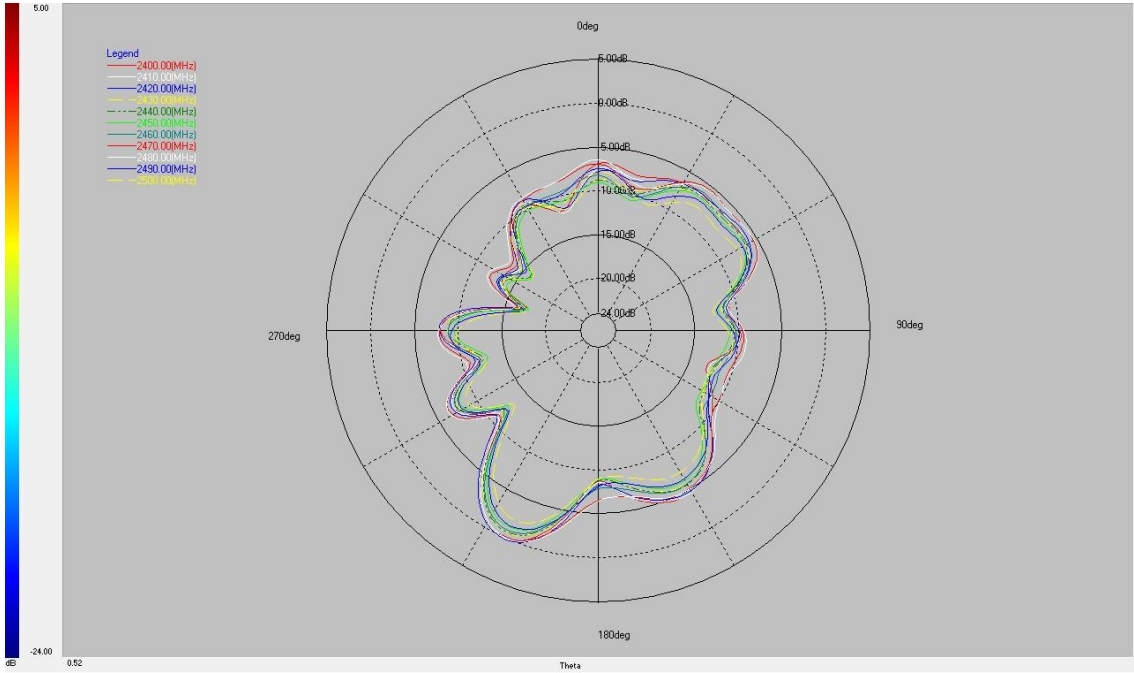
Frequency	Gain (dBi)	Efficiency (%)
2400MHz	1.39	17.12%
2410MHz	1.4	17.30%
2420MHz	1.55	17.70%
2430MHz	0.98	14.89%
2440MHz	0.98	14.92%
2450MHz	0.44	13.22%
2460MHz	0.84	15.12%
2470MHz	1.59	18.48%
2480MHz	1.62	19.01%
2490MHz	0.18	13.82%
2500MHz	-0.65	11.72%

ANNEX B RADIATION PATTERN

Frequency	Return Loss	Standing wave	impedance
2400MHz	-6.60	2.75	20.95
2440MHz	-7.06	2.59	19.64
2480MHz	-6.30	2.87	19.68
2500MHz	-5.49	3.26	16.61







4 Test Equipment & Conditions

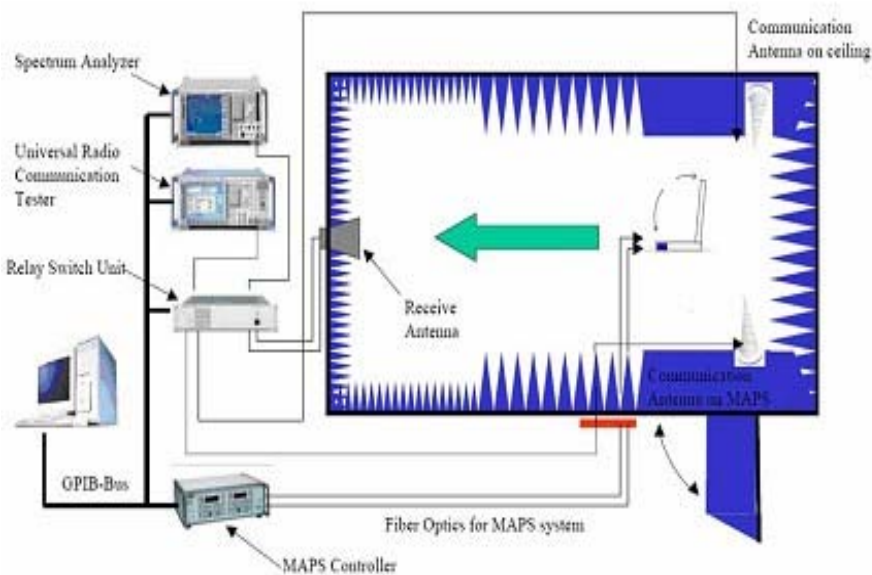
1. Network Analyzers :

Agilent 8753D 5071C

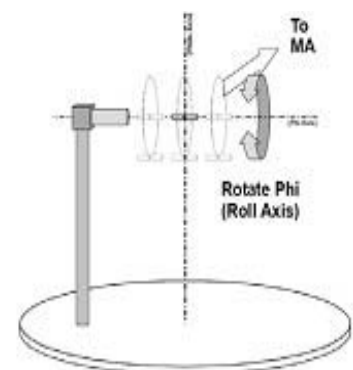
2. Communications Test Set:

Agilent E5515C CMW500

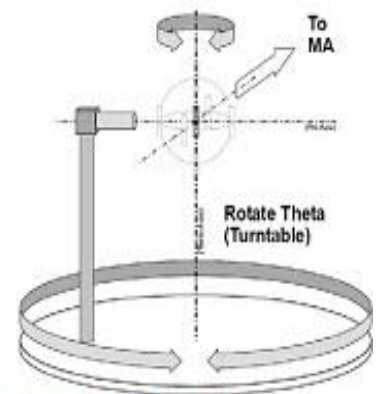
3. 3D Chamber Test System



(Testing by 3D anechoic chamber)

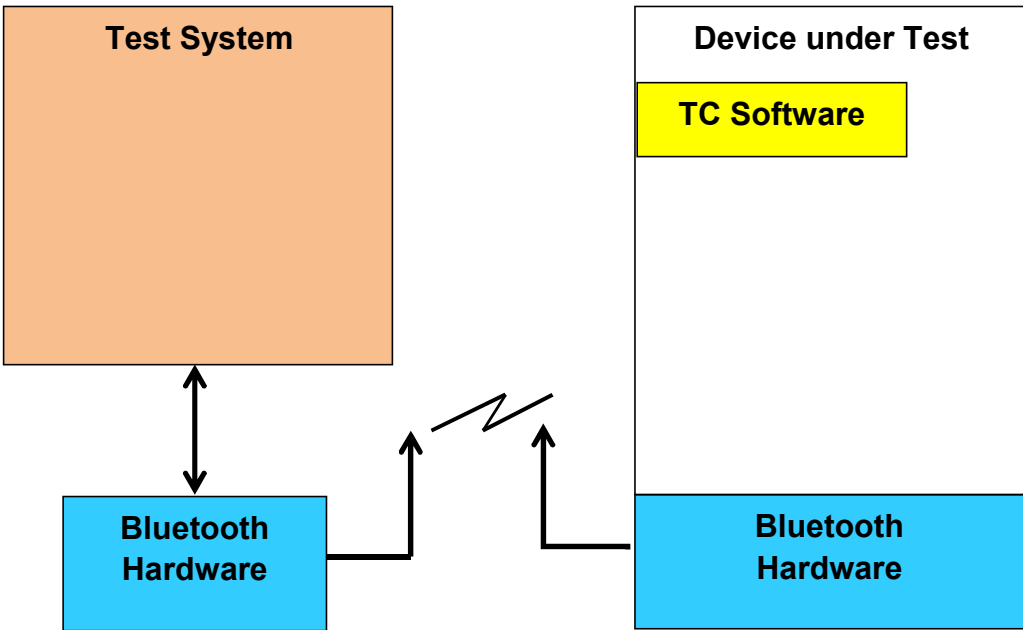


Phi axis test



Theta axis test

4.3.2 Profile Test System



5 RF-PHY CONFORMANCE TEST RESULTS

5.1 RF-PHY ICS /IXIT (Bluetooth Low Energy)

Bluetooth LE RF-PHY Capabilities				
Item	Capability	System Spec Reference	Status	Support [Yes] or [No]
1	LE Transmitter (Non-connectable, Broadcaster)	[1], 3	C.1	Yes
2	LE Receiver (Non-connectable, Observer)	[1], 4	C.1	Yes
3	LE Transceiver (Connectable, Peripheral/Central)	[1], 3, 4	C.1	Yes
4	LE 2M PHY	[3], 3, 4	C.2	No
5	Stable Modulation Index - Transmitter	[3], 3.1.1	C.3	No
6	Stable Modulation Index - Receiver	[3], 3.1.1	C.4	No
7	LE Coded PHY	[3], 3, 4	C.2	No
8	Transmitting Constant Tone Extensions	[4], 5	C.3	No
9	2 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)	[4], 5	C.5	No
10	1 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)	[4], 5	C.6	No
11	2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)	[4], 5	C.4	No
12	2 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)	[4], 5	C.7	No
13	1 μ s Antenna Sampling During Constant Tone Extension Reception (AoA)	[4], 5	C.7	No
14	1 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)	[4], 5	C.8	No

C.1: Mandatory to support at least one of these capabilities.

C.2: Optional IF (SUM ICS 21/16 "Core 5.0" OR SUM ICS 21/18 "Core 5.1") AND RFPHY 1/3 "LE Transceiver" are supported, otherwise Excluded.

C.3: Optional IF (SUM ICS 21/16 "Core 5.0" OR SUM ICS 21/18 "Core 5.1") AND (RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver") are supported, otherwise Excluded.

C.4: Optional IF (SUM ICS 21/16 "Core 5.0" OR SUM ICS 21/18 "Core 5.1") AND (RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver") are supported, otherwise Excluded.

C.5: Optional IF RFPHY 1/8 "Transmitting Constant Tone Extensions" is supported, otherwise Excluded.

C.6: Optional IF 1/9 "2 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)" is supported, otherwise Excluded.

C.7: Optional IF RFPHY 1/11 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)" is supported, otherwise Excluded.

C.8: Mandatory IF RFPHY 1/12 "2 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)" and RFPHY 1/13 "1 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)" are supported, otherwise Excluded.

Bluetooth LE Test Interface Capabilities				
Item	Capability	System Spec Reference	Status	Support [Yes] or [No]
1	HCI Test Interface	[2], 2	C.1	Yes
2	UART Test Interface	[2], 3	C.1	No
C.1: At least one of the capabilities shall be supported.				

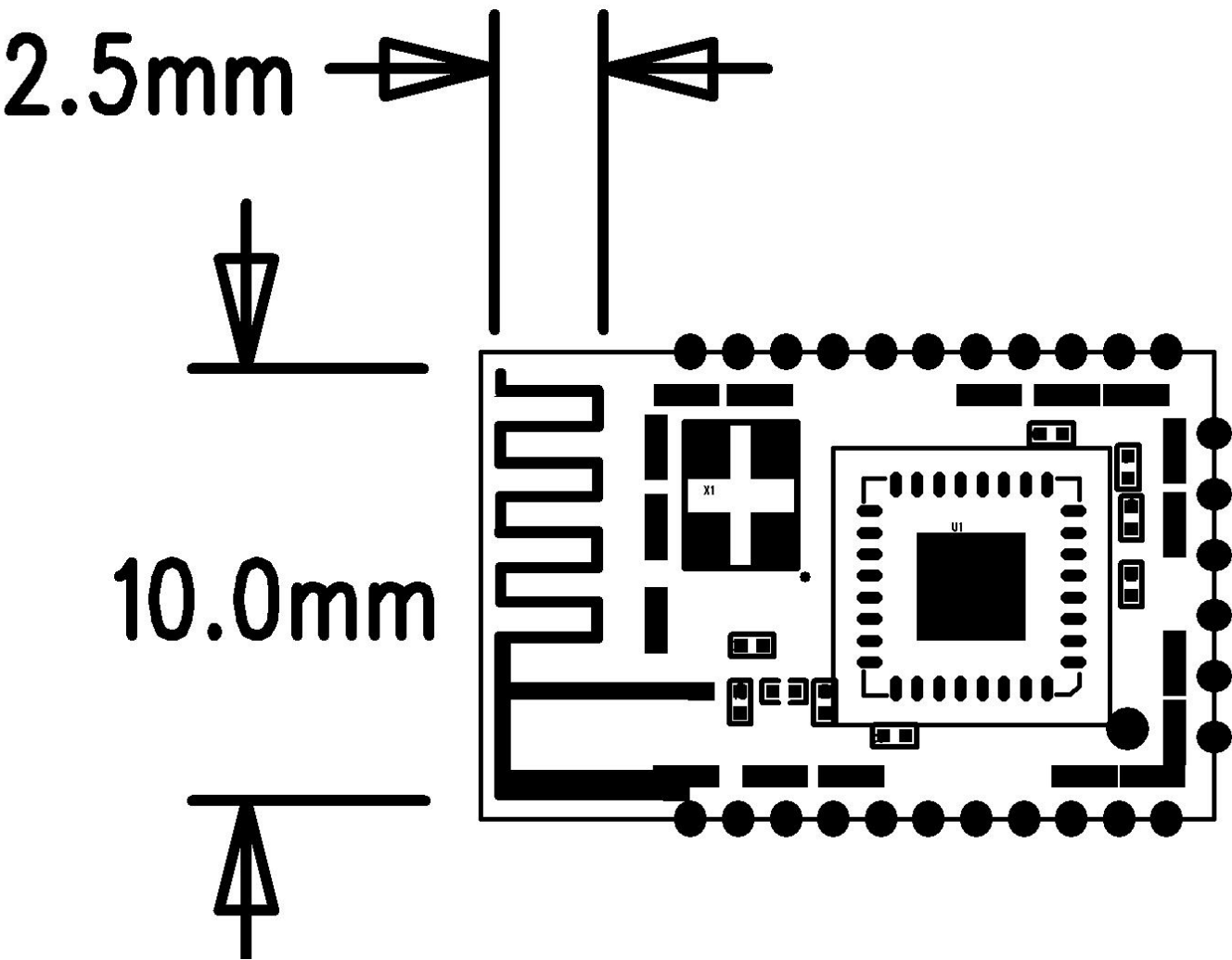
RF-PHY PIXIT				
PIXIT Reference	Identifier	Sub-Identifier (Optional)	Value	Units
RF-PHY:P1:1	In-band Image frequency	Low frequency	0	MHz
RF-PHY:P1:2		Middle frequency	0	MHz
RF-PHY:P1:3		High frequency	0	MHz
RF-PHY:P2:1	Value n for Intermodulation test	Low frequency	5	Integer
RF-PHY:P2:2		Middle frequency	5	Integer
RF-PHY:P2:3		High frequency	5	Integer
RF-PHY:P4	Power source voltage	Nominal (NOC)	3.3	V
RF-PHY:P5	Operating temperature	Nominal (NOC)	25	°C
RF-PHY:P6:1	Operating air humidity range (relative)	Maximum (EOC)	95	%
RF-PHY:P6:2		Minimum (EOC)	40	%
RF-PHY:P6:3		Air humidity level for NOC/EOC tests	40 to 95	%
RF-PHY:P7:1	Test interface implementation	HCI or 2-wire UART	HCI	--
RF-PHY:P7:2		Data Rate	115200	bps
RF-PHY:P9:1	Maximum TX packet length (MAX_TX_LENGTH)	--	37	Bytes
RF-PHY:P9:2	Maximum RX packet length (MAX_RX_LENGTH)	--	37	Bytes
RF-PHY:P9:3	Maximum TX packet length (MAX_TX_LENGTH) 2M	--	N/A	Bytes
RF-PHY:P9:4	Maximum TX packet length (MAX_TX_LENGTH) S=2	--	N/A	Bytes
RF-PHY:P9:5	Maximum TX packet length (MAX_TX_LENGTH) S=8	--	N/A	Bytes
RF-PHY:P9:6	Maximum RX packet length (MAX_RX_LENGTH) 2M	--	N/A	Bytes
RF-PHY:P9:7	Maximum RX packet length (MAX_RX_LENGTH) S=2	--	N/A	Bytes
RF-PHY:P9:8	Maximum RX packet length (MAX_RX_LENGTH) S=8	--	N/A	Bytes
RF-PHY:P10:1	Maximum TX mode output power	--	10	dBm
RF-PHY:11:1	Inband Image Frequency (2Ms/s)	Low frequency	N/A	MHz
RF-PHY:11:2		Middle frequency	N/A	MHz
RF-PHY:11:3		High frequency	N/A	MHz
RF-PHY:12:1	Value n for Intermodulation test (2Ms/s)	Low frequency	N/A	Integer
RF-PHY:12:2		Middle frequency	N/A	Integer
RF-PHY:12:3		High frequency	N/A	Integer
RF-PHY:13:1	Inband Image Frequency (Stable Modulation Receiver)	Low frequency	N/A	MHz
RF-PHY:13:2		Middle frequency	N/A	MHz
RF-PHY:13:3		High frequency	N/A	MHz
RF-PHY:14:1	Value n for Intermodulation	Low frequency	N/A	Integer

RF-PHY:14:2	test (Stable Modulation Receiver)	Middle frequency	N/A	Integer
RF-PHY:14:3		High frequency	N/A	Integer
RF-PHY:15:1	Inband Image Frequency (Stable Modulation Receiver, 2Ms/s)	Low frequency	N/A	MHz
RF-PHY:15:2		Middle frequency	N/A	MHz
RF-PHY:15:3		High frequency	N/A	MHz
RF-PHY:16:1	Value n for Intermodulation	Low frequency	N/A	Integer
RF-PHY:16:2	test (Stable Modulation Receiver, 2Ms/s)	Middle frequency	N/A	Integer
RF-PHY:16:3		High frequency	N/A	Integer
RF-PHY:17	IQ Report Rate	--	N/A	--
RF-PHY:18	The length of the Constant Tone Extension(1Ms/s)	--	N/A	bits
RF-PHY:19	The length of the Constant Tone Extension(2Ms/s)	--	N/A	bits
RF-PHY:20	The number of antennae	--	1	--

5.2 Test Results List

Bluetooth Low Energy					
TC. Identifier	Description	Cat.	Verdict	Test Condition	Test Equipment
TRM-LE/CA/BV-01-C	Output power	A	Pass	NTNV	7Layers Systems
TRM-LE/CA/BV-03-C	In-band emissions	A	Pass	NTNV	7Layers Systems
TRM-LE/CA/BV-05-C	Modulation characteristics	A	Pass	NTNV	7Layers Systems
TRM-LE/CA/BV-06-C	Carrier frequency offset and drift	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-01-C	Receiver sensitivity	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-03-C	C/I and receiver selectivity performance	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-04-C	Blocking performance	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-05-C	Intermodulation performance	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-06-C	Maximum input signal level	A	Pass	NTNV	7Layers Systems
RCV-LE/CA/BV-07-C	PER Report Integrity	A	Pass	NTNV	7Layers Systems

6. Product Drawing



ANNEX A EUT PHOTOS

