

C-Tick REPORT

Prepared For :	Polyhex Technology Company Limited 5/F., East Zone, Shunheda A2 Building, Liuxiandong Industrial Park, Xili, Nanshan Dist., Shenzhen
Product Name:	DEBIX Model A LoRa Board
Trade Name:	N/A
Model :	EMB-AS-03
Prepared By :	Shenzhen HTT Technology Co., Ltd. 1F, B Building, Huafeng International Robotics Industrial Park, Gushu, Xixiang Street, Bao'an District, Shenzhen
Test Date:	May.24,2022~May.30,2022
Date of Report :	May.30,2022
Report No.:	HTT202205383CR



TABLE OF CONTENTS

TEST REPORT DECLARATION	3
1. GENERAL INFORMATION	4
1.1. Report information	4
1.2. Measurement Uncertainty	4
2. PRODUCT DESCRIPTION	5
2.1. EUT Description	5
2.2. Test Conditions	5
3. TEST RESULTS SUMMARY	6
4. TEST EQUIPMENT USED	7
4.1. For Conducted Emission Test	7
4.2. For Radiated Emission Measurement	7
5. POWER LINE CONDUCTED EMISSION TEST	8
5.1. Block Diagram of Test Setup	8
5.2. Test Standard	8
5.3. Conducted Emission Limit	8
5.4. EUT Configuration on Test	8
5.5. Operating Condition of EUT	9
5.6. Test Procedure	9
5.7. Test Result	9
6. MAGNETIC FIELD EMISSION TEST	10
6.3. EUT Configuration on Test	11
6.4. Operating Condition of EUT	11
6.5. Test Procedure	12
6.6. Test Results	12
PHOTOS OF THE PRODUCT	15



TEST REPORT DECLARATION

Applicant	:	Polyhex Technology Company Limited
Address	:	5/F., East Zone, Shunheda A2 Building, Liuxiandong Industrial Park, Xili, Nanshan Dist., Shenzhen
EUT Description	:	DEBIX Model A LoRa Board
Model Number	:	EMB-AS-03
Power Rating	:	DC5V, 0.5A,2.5W

Test Standards:

AS/NZS CISPR 32:2015

The EUT described above is tested by US to determine the maximum emissions from the EUT, the maximum emission levels are compared to the AS/NZS CISPR 32:2015 Class B limits. The measurement results are contained in this test report and Shenzhen HTT Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is to be technically compliant with the C-Tick requirements

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen HTT Technology Co., Ltd.

Prepared by:


Ervin Xu

Reviewer:

Bruce Zhu

Approved & Authorized Signer:

Kevin Yang





1. GENERAL INFORMATION

1.1. Report information

- 1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that HTT approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that HTT in any way guarantees the later performance of the product/equipment.
- 1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, HTT therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through HTT, unless the applicant has authorized HTT in writing to do so.

1.2. Measurement Uncertainty

Available upon request.

1.3. Test Facility

Site Description

Name of Film : Shenzhen HTT Technology Co.,Ltd

Site Location : 1F, B Building, Huafeng International Robotics Industrial Park,
Gushu, Xixiang Street, Bao'an District, Shenzhen

1.4. Test Uncertainty

Conducted Emission Uncertainty = $\pm 2.66\text{dB}$

Radiated Emission Uncertainty = $\pm 4.26\text{dB}$



2. PRODUCT DESCRIPTION

2.1. EUT Description

Description	:	DEBIX Model A LoRa Board
Applicant	:	Polyhex Technology Company Limited
Manufacturer	:	5/F., East Zone, Shunheda A2 Building, Liuxiandong Industrial Park, Xili, Nanshan Dist., Shenzhen
Model Number	:	EMB-AS-03

2.2. Test Conditions

Temperature: 23-26°C
Relative Humidity: 55-68 %



3. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted disturbance	N/A
Radiated disturbance	Pass

Remark: "N/A" means "Not applicable."



4. TEST EQUIPMENT USED

4.1. For Conducted Emission Test

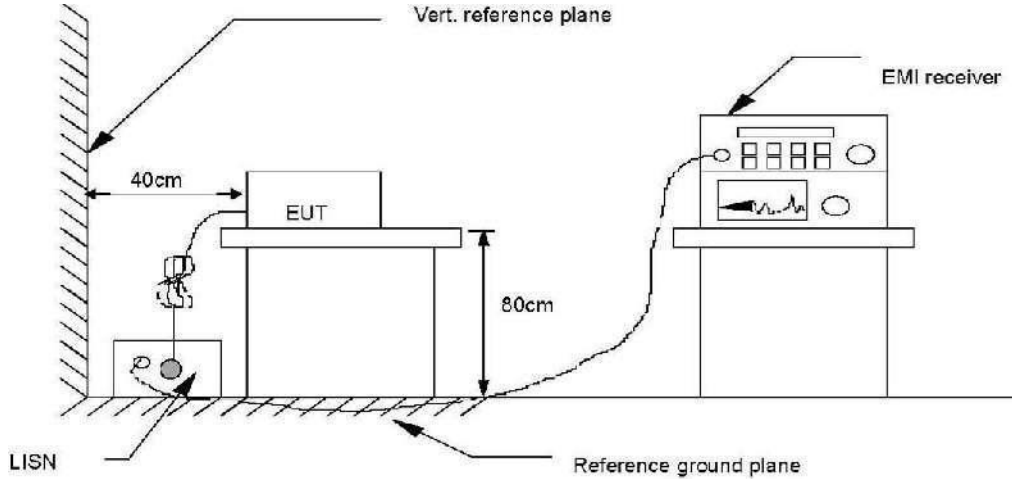
Item	Equipment	Manufacturer	ModelNo.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde &Schwarz	ESHS30	828985/018	Jun. 09, 2021	1 Year
2.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Jun. 09, 2021	1 Year
3.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005	Jun. 09, 2021	1 Year
4.	Conical	Emtek	N/A	N/A	N/A	N/A
5.	Voltage Probe	Schwarzbeck	TK9416	N/A	Jun. 09, 2021	1 Year
6.	Coaxial Switch	Anritsu	MP59B	6100214550	Jun. 09, 2021	1 Year

4.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Jun. 09, 2021	1 Year
2.	Test Receiver	Rohde&Schwarz	ESC830	828982/018	Jun. 09, 2021	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Jun. 09, 2021	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Jun. 09, 2021	1 Year
5.	Cable	Schwarzbeck	AK9513	ACRX1	Jun. 09, 2021	1 Year
6.	Cable	Rosenberger	N/A	FR2RX2	Jun. 09, 2021	1 Year
7.	Cable	Schwarzbeck	AK9513	CRRX2	Jun. 09, 2021	1 Year
8.	Cable	Schwarzbeck	AK9513	CRRX2	Jun. 09, 2021	1 Year
9.	Signal Generator	HP	864A	3625U00573	Jun. 09, 2021	1 Year

5. POWER LINE CONDUCTED EMISSION TEST

5.1. Block Diagram of Test Setup



5.2. Test Standard

AS/NZS CISPR 32:2015

5.3. Conducted Emission Limit

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

5.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet CISPR 32 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.



5.5. Operating Condition of EUT

- 5.5.1. Setup the EUT and simulators as shown in Section 5.1
- 5.5.2. Turn on the power of all equipments.
- 5.5.3. Let the EUT work in test modes (EUT Working) and test it

5.6. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. The vertical conducting

Wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N).A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz. waveform are attached within **Appendix I**

5.7. Test Result

6dB Bandwidth	10 KHz	Environmental Conditions	26°C, 55% RH
Test Mode	Working	Detector Function	Peak / Quasi-peak/AV
Test By	Jack Chen	Test Results	N/A

6. MAGNETIC FIELD EMISSION TEST

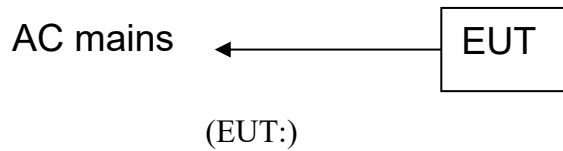
6.1. Test Equipment

The following test equipments are used during the radiated emission test:

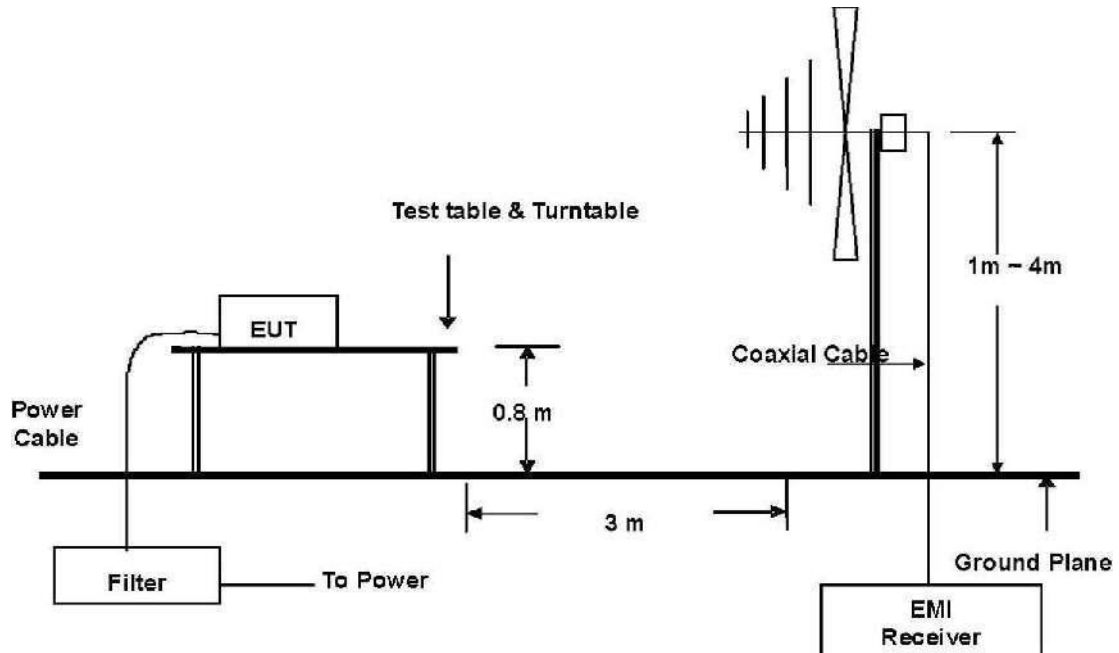
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Loop Antenna	Chase	HLA6120	1062	Jun. 09, 2021	1 Year
2.	Test Receiver	Rohde&Schwarz	ESHS20	836600/006	Jun. 09, 2021	1 Year

6.1.1. Block Diagram of Test Setup

6.1.2. Block Diagram of connection between the EUT and simulators



6.1.3. In Anechoic Chamber Test Setup Diagram



6.2. Test Standard

AS/NZS CISPR 32:2015

Magnetic Field Emission Limit

All emanations from Non-ISM devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency band MHz	Quasi-peak Electric Field Test Distance 3m dB(u V/m)
30-230	40
230-1000	47

- (1) The limit shall decreasing linearly with logarithm of frequency
- (2) Distance refers to the distance in meters between the test Instrument antenna and the closed point of any part of the E.U.T

6.3. EUT Configuration on Test

The following equipment are installed on Radiated Emission Measurement to meet the Commission requirement and operating regulations in a manner which tends to maximize Its emission characteristics in normal application

6.4. Operating Condition of EUT

- 6.4.1. Setup the EUT as shown in Section 6.1.3
- 6.4.2. Turn on the power of all equipments.
- 6.4.3. Let the EUT work in test mode (ON) and test it.



6.5. Test Procedure

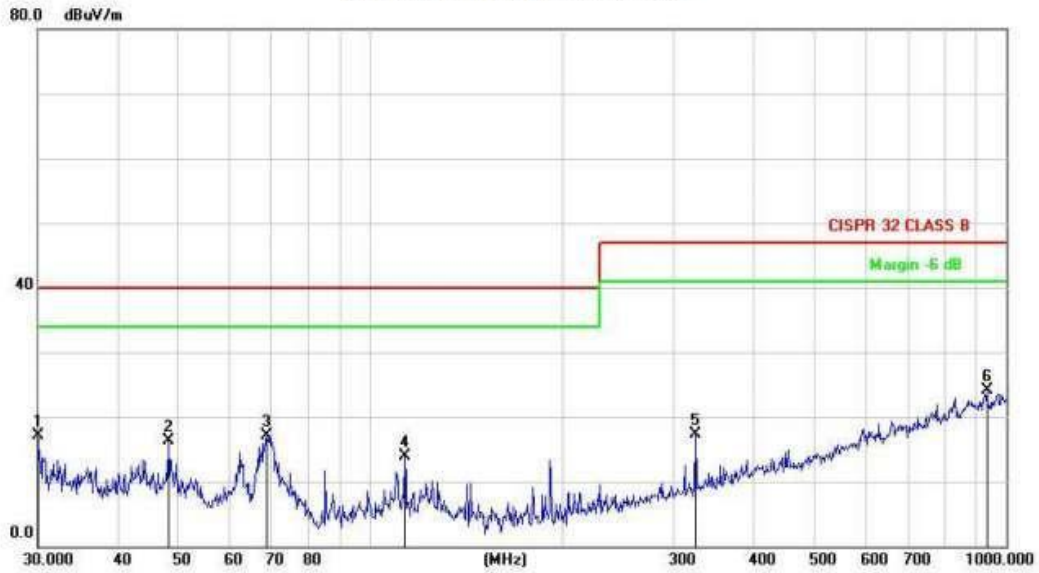
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. The bandwidth setting on the test receiver(R&S Test Receiver ESCS20) is 120KHz. The EUT is tested in Anechoic Chamber. The frequency range from 14MHz to 1000MHz is checked. All the test results are listed in Section 6.6.and all the scanning waveform are attached within **Appendix I**

6.6. Test Results

Test Mode	Working	Environmental Conditions	26°C, 55% RH
6dB Bandwidth	120 KHz	Antenna Pole	Vertical / Horizontal
Antenna Distance	3m	Detector Function	Peak / Quasi-peak
Tested by	Jack Chen	Test Results	Pass



Radiated Emission Measurement



Site LAB

Limit: CISPR 32 CLASS B

Polarization: **Horizontal**

Power:

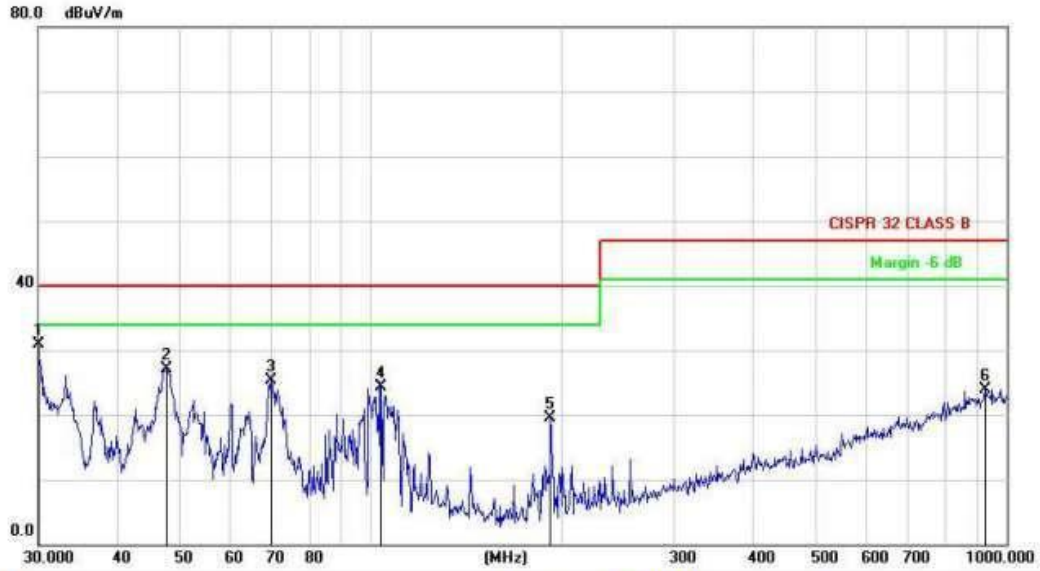
Temperature:

Humidity: %

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dB/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1	30.0000	35.63	-18.59	17.04	40.00	-22.96	peak			
2	48.1626	33.54	-17.20	16.34	40.00	-23.66	peak			
3	68.6310	36.86	-19.72	17.14	40.00	-22.86	peak			
4	113.3163	34.03	-20.18	13.85	40.00	-26.15	peak			
5	324.4561	34.28	-17.07	17.21	47.00	-29.79	peak			
6 *	932.2715	28.80	-4.65	24.15	47.00	-22.85	peak			



Radiated Emission Measurement



Site LAB Polarization: *Vertical* Temperature:
 Limit: CISPR 32 CLASS B Power: Humidity: %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	30.0000	49.47	-18.59	30.88	40.00	-9.12	peak		
2		47.8260	44.40	-17.29	27.11	40.00	-12.89	peak		
3		69.8450	45.25	-19.94	25.31	40.00	-14.69	peak		
4		103.8055	45.29	-20.90	24.39	40.00	-15.61	peak		
5		191.7450	39.96	-20.51	19.45	40.00	-20.55	peak		
6		925.7563	28.73	-4.89	23.84	47.00	-23.16	peak		

7. Photos of the Product

