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Report Template Version: V02 Report Template Revision Date: 2021-06-01

# **EMC Test Report**

Applicant:	Shenzhen Times Innovation Technology Co., Ltd.		
Address of Applicant:	5th Floor,Building B,Baseus Intelligence Park, No.2008,Xuegang Rd,Gangtou Community, Bantian Street,Longgang District,Shenzhen.		
Manufacturer:	Shenzhen Times Innovation Technology Co., Ltd.		
Address of Manufacturer:	oth Floor,Building B,Baseus Intelligence Park, No.2008,Xuegang Rd,Gangtou Community, Bantian Street,Longgang District,Shenzhen.		
Factory:	Huizhou Hongxuanhe Technology Co., Ltd.		
Address of Factory:	Plant Phase 2, No.88 Taixiang Road, Taiyang'ao Industrial Zone, Baihua Town, Huidong County, Huizhou City, Guangdong Province, China		
Equipment Under Test (EUT	F):		
Product:	Baseus Wireless Adapter BA04		
Model No.:	Baseus BA04		
Test Model No.:	Baseus BA04		
Brand Name:	Baseus		
Standards:	Draft EN 301 489-1 V2.2.0 (2017-03) Draft EN 301 489-17 V3.2.0 (2017-03)		
Date of Test:	2021-11-09 to 2021-11-17		
Date of Issue:	2021-11-17		
Report No.:	D211109005-3		
Test Result :	Pass*		

Tested By: Damon lest ing (Damon Deng) F hivers ( Chivas Zeng) Reviewed By: Approved By: (Victor Meng)

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

\* The other tests (e.g. Low Voltage Directive 2014/35/EU) required in RED 2014/53/EU were not included in the report, only part tests related to EMC were performed and reported in this report. Hence to clarify compliance with RED 2014/53/EU shall comply with the other essential required tests additionally.



## Version

## **Revision History Of Report**

Report No.	Version	Description	Issue Date
D211109005-3	Rev.01	Initial report	2021-11-17



## 2 Test Summary

Electromagnetic Compatibility (EMC) Part							
	Electromagnetic Interference (EMI)						
Test Test Requirement Test Method Limit Result							
Radiated Emission	EN 301 489-17 V3.2.4 (2020-09)Clause 7.1	EN 301 489-1 V2.2.3 (2019- 11) Clause 8.2	Clause 8.2.3	PASS			
	Electromagnetic Susceptibility(EMS)						
ESD (Electrostatic Discharge)         EN 301 489-17 V3.2.4 (2020-09) Clause 7.2         EN 301 489-1 V2.2.3 (2019- 11) Clause 9.3         Clause 9.3.3         P/							
Radiated Immunity, 80MHz to 6 GHz	EN 301 489-17 V3.2.4 (2020-09) Clause 7.2	EN 301 489-1 V2.2.3 (2019- 11) Clause 9.2	Clause 9.2.3	PASS			

Remark:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

N/A: In this whole report not application



## 3 Contents

			Page
			1
۷	ERSION		2
2	TEO		2
2	IE9	I SUMMARY	
3	CON	TENTS	4
-		-	
4	GEN	ERAL INFORMATION	5
	4.1	CLIENT INFORMATION	5
	4.2	GENERAL DESCRIPTION OF EUT	5
	4.3	DETAILS OF EUT	5
	4.4	DESCRIPTION OF SUPPORT UNITS	6
	4.1	TEST LOCATION	6
	4.2		6
	4.3	DEVIATION FROM STANDARDS	6
	4.4	ABNORMALITIES FROM STANDARD CONDITIONS	
	4.5	OTHER INFORMATION REQUESTED BY THE CUSTOMER	
	4.6	MONITORING OF EUT FOR THE IMMUNITY TEST	
	4.7	MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2)	6
5	EQU	IPMENT LIST	7
~			
6	EMC	REQUIREMENTS SPECIFICATION IN EN 301 489-17	
	6.1	EMI (EMISSION)	9
	6.1.1	Radiated Emission	9
	6.2	EMS (IMMUNITY)	
	6.2.1	Radiated Immunity	
	6.2.2	2 ESD	
7	PHC	TOGRAPHS-EUT TEST SETUP	19
	7.1	RADIATED EMISSION	
	7.2	ESD	19



## 4 General Information

### 4.1 Client Information

Applicant:	Shenzhen Times Innovation Technology Co., Ltd.		
Address of Applicant:	5th Floor, Building B, Baseus Intelligence Park, No.2008, Xuegang Rd, Gangtou		
	Community, Bantian Street, Longgang District, Shenzhen.		
Manufacturer:	Shenzhen Times Innovation Technology Co., Ltd.		
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Factory:	Huizhou Hongxuanhe Technology Co., Ltd.		
Address of Factory:	Plant Phase 2, No.88 Taixiang Road, Taiyang'ao Industrial Zone, Baihua Town, Huidong County, Huizhou City, Guangdong Province, China		

## 4.2 General Description of EUT

Product Name:	Baseus Wireless Adapter BA04
Model No.:	Baseus BA04
Test Model No.:	Baseus BA04
Trade Mark:	Baseus
Operation Frequency:	2402MHz to 2480MHz
Channel Numbers:	79 Channels
Channel Separation:	1MHz
Type of Modulation:	GFSK, π/4DQPSK, 8DPSK
Sample Type:	Portable production
Antenna Type:	Integral antenna
Antenna Gain:	0dBi

### 4.3 Details of EUT

Power Supply:	5VDC, 500Ma from USB
Charging mode	5VDC, 500Ma from USB
Normal working	Bluetooth connecting



### 4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark
PC	Lenovo	ThinkPad E450c	/

### 4.1 Test Location

Other than radiated immunity, all tests were performed at:

Dongguan Hongnuo Product Testing Service Co., Ltd.

No.8, JinQianLing street 5, Huangjiang Town, Dongguan, Guangdong, China

Tel: 0086-769-39001678, Fax: 0086-20-62824387

Radiated immunity test is performed at:

Guangdong Huizhou Quality & Measuring Supervision Testing Institute

Quality Supervision & Test Building No.1, Wenhua 2th Road, Jiangbei, Huizhou, Guangdong, China

### 4.2

### 4.3 Deviation from Standards

None.

- 4.4 Abnormalities from Standard Conditions None.
- 4.5 Other Information Requested by the Customer None.

### 4.6 Monitoring of EUT for the Immunity Test

Visual: N/A. Audio: N/A.

### 4.7 Measurement Uncertainty (95% confidence levels, k=2)

No.	ltem	Measurement Uncertainty
1 Conduction emission		3.74dB (9kHz to 150kHz)
I	2 Radiated emission	3.34dB (150kHz to 30MHz)
		5.12dB (30MHz-1GHz )
2 Radiated emission	4.60dB (1GHz-6GHz )	
3	Radiated Immunity	1.61dB
4	Conducted Immunity	0.92dB
5	Temperature test	0.8°C



## 5 Equipment List

## Conducted Emissions (150kHz-30MHz)

· ·					
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date
EMI Test receiver	R&S	ESCI	DGITL-303a	2021.05.11	2022.05.11
L.I.S.N.#1	R&S	ESH3-Z5	DGITL-304	2021.05.11	2022.05.11
Shielded Room	ETS•Lindgren	8*4*3	DGITL-302	2020.08.03	2022.08.03
Pulse Limiter	R&S	ESH3-Z2	DGITL-316	2021.05.11	2022.05.11

Radiated Emissions					
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic chamber	ETS•Lindgren	9*6*6	DGITL- 301	2020.08.03	2022.08.03
EMI test receiver	R&S	ESVS10	DGITL- 307	2021.05.11	2022.05.11
Spectrum Analyzer	Agilent	N9010A	DGITL- 306	2021.05.11	2022.05.11
	Technologies				
Bilog Antenna	ETS•Lindgren	3142E	DGITL- 308	2020.06.20	2022.06.20
Pre Amplifier	MInI-CIrcuits	ZFC-1000HB	DGITL- 352	2021.05.11	2022.05.11

Software list				
Testing software	Manufacturer	Model	Version number	
e3	AUDIX	e3.Ink	Version:6.2009-11-3c(itl)	

Harmonic Current & Voltage Fluctuation and Flicker						
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date	
Harmonics analyzer with	LAPLACE	AC2000A	DGITI - 341	2021.05.11	2022.05.11	
flicker meter	INSTRUMENTS	110200011	DOME OF			
Power source	C.I.	5001iX-400	DGITL- 342	2021.05.11	2022.05.11	

Electrostatic Discharge						
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date	
Electrostatic Discharge	3ctest	ESD-30G	DGITL- 310	2021.05.11	2022.05.11	
Generator	001001	202 000	00112 010			



Electrical Fast Transients/Burst & Surge & Voltage Dips and Interruptions at Power Port							
Equipment	Equipment Manufacturer Model No Inventory No.				Cal Due Date		
Electrostatic Discharge Generator	3ctest	ESD-30G	DGITL- 310	2021.05.11	2022.05.11		
EFT Generator	3ctest	EFT-4003G	DGITL-312	2021.05.11	2022.05.11		
Surge Generator	3ctest	SG5010	DGITL-311	2021.05.11	2022.05.11		

Conducted Immunity (150kHz-80MHz)						
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date	
9k-1.1GHz signal generator	R&S	SML01	ITL-135	2021/01/20	2022/01/19	
150k-230MHz 30W amplifier	Schaffner	CBA9425	ITL-136	2021/01/20	2022/01/19	
CDN	Schaffner	CDN M016	ITL-137	2021/01/20	2022/01/19	
6dB/50W attenuation	Schaffner	ATN6050	ITL-139	2021/01/20	2022/01/19	

Radiated Immunity (80MHz-6GHz)						
Equipment	Manufacturer	Model No	Inventory No.	Cal Date	Cal Due Date	
9k-1.1GHz signal generator	R&S	SML01	ITL-135	2021/01/20	2022/01/19	
RF power Amplifier(1GHz- 6GHz)	Lingde	LDPA1G6G1 00	ITL-173	2021/01/29	2022/01/28	
RF power Amplifier(80MHz- 1000MHz)	Lingde	LDPA80M1G 250	ITL-174	2021/01/29	2022/01/28	
Biconilog Antenna	ETS•Lindgren	3142D	ITL-105	2020/07/03	2022/07/02	
Full Anechoic Chamber	ETS•Lindgren	FACT3 2.0	ITL-100	2019/10/15	2022/10/14	



is

## 6 EMC Requirements Specification in EN 301 489-17

EMI in EN 301 489-1, sub clause 7.1 table 1.

EMS in EN 301 489-1, sub clause 7.2 table 2.

### 6.1 EMI (Emission)

#### 6.1.1 Radiated Emission

Test Requirement:	EN 301 489-17 Clause 7.1	EN 301 489-17 Clause 7.1					
Test Method:	EN 301 489-1 Clause 8.2.2	2					
EUT Operation:	Normal operation mode	Normal operation mode					
Ambient:	Temp.: 25 °C	Humid.: 56	% Pr	ess.: 1010 mbar			
Test Mode:	Charging						
Test Status:	Pretest the EUT at differe worst case, the test worst c	Pretest the EUT at different test mode and found the normal mode which worst case, the test worst case mode is recorded in the report.					
Receive Setup:	Frequency range (MHz)	Detector	RBW	VBW			

Limit:

	Frequency range (MHz)	) Detector		RBW	VBW
	30-1000	Quasi	i-peak	120kHz	300kHz
	Above 1000	Pe	eak	1MHz	3MHz
	Frequency		L	imit(@3m)	Remark
	30MHz-230MHz		40dBuv/m		QP value
	230MHz-1GHz		47dBuv/m		QP value
	1GHz-3GHz		50dBuv/m		Average value
			70dBuv/m		PK value
			54dBuv/m		Average value
	3612-6612			74dBuv/m	PK value

#### **Test Setup:**



Figure 1. 30MHz to 1GHz

Test Procedure:

Figure 2. Above 1 GHz

- 1. From 30 MHz to1GHz test procedure as below:
- 1) The radiated emissions were tested in a semi-anechoic chamber.
- 2) The EUT is placed on a turntable, which is 0.8m above ground plane.
- 3) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4) EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
- 5) Maximum procedure was performed on the six highest emissions to ensure



EUT compliance.

Refer to section 5 for details.

- 6) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7) Repeat above procedures until the measurements for all frequencies are complete.
- 2. Above 1GHz test procedure as below:
- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and receiving antenna is moved from 1m to 2m.

Equipment Used: Measurement Data:





#### Vertical:



Note: 1. Standards need to read Quasi-peak values. 2. Measured= Antenna Factor + Cable Loss + Reading - Preamp Factor



#### Above 1GHz:



Note: 1. Standards need to read Quasi-peak values. 2. Measured= Antenna Factor + Cable Loss + Reading - Preamp Factor



#### Above 1GHz



Note: 1. Standards need to read Quasi-peak values. 2. Measured= Antenna Factor + Cable Loss + Reading - Preamp Factor



## 6.2 EMS (Immunity)

#### Performance Criteria of EN 301 489-17, sub clause 6.2 table 1.

Criteria	a During test	After test				
A	Shall operate as intended May show degradation of performance (see note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (see note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions				
В	May show loss of function (one or more) May show degradation of performance (see note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (see note 2) Shall be no loss of stored data or user programmable functions				
С	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance (see note 2)				
Shall be no degradation of performance (see note 2)           NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.           If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.           NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.						
	If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.					



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#### 6.2.1 Radiated Immunity

Test Requirement: Test Method: EUT Operation:	EN 301 489-17 Clause 7.2 EN 301 489-1 Clause 9.2.2 Normal operation mode	
Ambient: Test Mode: Criterion Required: Equipment Used: Test Setup:	Temp.: 24 °C Normal operation mode and A Refer to section 5 for details	Humid.:56 % Idle mode



Figure 1. 80MHz to 1GHz

```
Test Procedure:
```

#### Figure 2. 1GHz to 6GHz

- For table-top equipment, the EUT was placed in the chamber on a nonconductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
- 2) If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled lowinductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
- The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
- 4) The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceed 1% of the preceding frequency value.
- 5) The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.
- 6) The test normally was performed with the generating antenna facing each side of the EUT.
- 7) The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
- The EUT was performed in a configuration to actual installation conditions, a video camera and/or an audio monitor were used to monitor the performance of the EUT.



### 6.2.1.1 Test Results

Frequency	Level	Modulation	EUT Face	Antenna Polaxis	Result / Observations
			Front	V	А
			FION	Н	А
			Dool	V	А
		1kHz, 80% Amp. Mod, 1% increment Dwell time: 3 seconds	DACK	Н	А
	3V/m		Left Right	V	А
80MHz-1GHz,				Н	А
1GHz to 6GHz				V	А
				Н	А
			<b>-</b>	V	А
			тор	Н	А
			Under	V	A
			Under	Н	A

#### Remark:

A: No performance degradation during test



#### Report No.: D211109005-3

#### 6.2.2 ESD

Test Requirement:	EN 301 489-1	EN 301 489-17 Clause 7.2				
Test Method:	EN 301 489-1	EN 301 489-1 Clause 9.3.2				
EUT Operation:	Normal opera	ation mode				
Ambient:	Temp.: 24	°C	Humid.: 56 %	Press.: 1010 mbar		
Criterion Required:	В					
Discharge Impedance:	330 $\Omega$ / 150 p	ρF				
Polarity:	Positive & Ne	egative				
Number of Discharge:	Minimum 10	times at each test	point			
Discharge Mode:	Single Discha	arge				
Discharge Period:	1 second mir	nimum				
Equipment Used:	Refer to sect	ion 5 for details.				
Test Setup:						



#### **Test Procedure:**

1) Contact discharges to the conductive surfaces and to coupling planes:

The EUT was exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points was subjected to at least 50 indirect discharges (contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points were available, then at least 200 indirect discharges were applied in the indirect mode. Tests were performed at a maximum repetition rate of one discharge per second.

Air discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it was not possible to perform contact discharge testing, the equipment was investigated to identify user accessible points where breakdown may occur. This investigation was restricted to those areas normally handled by the user. A minimum of 10 single air discharges were applied to the selected test point for each such area.

The application of electrostatic discharges to the contacts of open connectors was not required by this standard.

- The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane(GRP).
- 3) A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & thinkmess as that of the



GRP, and connected to the GRP via a  $470k\Omega$  resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.

- 4) During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
- 5) After each discharge, the ESD generator was removed from the EUT, the generator was then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

#### **Test Results:**

Observations: Test Point:

- 1. All insulated enclosure and seams.
- 2. All accessible metal parts of the enclosure.

#### Direct Application Test Results

Direct	Application	Test Results		
Discharge Level (kV)	Pulse No.	Test Point	Contact Discharge	Air Discharge
± 2,4,8	10 for every level	3	N/A	A
± 4	10 for every level	1	A	N/A

Indirect Application Test Results

Indirect Application		Test Results	
Discharge Level (kV)	Pulse No.	Horizontal Coupling	Vertical Coupling
± 4	10 for every level	А	А

#### Remark:

A: No performance degradation during test.

N/A: Not applicable



## 7 Photographs-EUT Test Setup

## 7.1 Radiated Emission



### 7.2 ESD

























Report No.: D211109005-3



\*\*\* End of Report \*\*\*