

1

TE	EST REPORT		
	For RF		
Report No	CHTEW23050011 Repo	ort Verification:	
Project No	SHT2304073101EW		
FCC ID:	2A6HJCT9P		
Applicant's name:	CiVinTec Global Co., Limited.		
Address	F20,Huatong Building,No.8,Ganli District,Shenzhen,Guangdong,51	Road 2,Jihua Street,Longgang 8112,China	
Product Name	CRYSTAL TOUCH TERMINAL		
Trade Mark	-		
Nodel No	CT9-T-QP-UV		
isted Model(s)	CT9-T-P, CT9-T-QP, CT9-T-P-M, CT9-T-QP-M, CT9-T-P-UV, CT9-T-P-M-UV, CT9-T-QP-M-UV		
Standard :	FCC CFR Title 47 Part 15 Subpart C § 15.209		
Date of receipt of test sample	Apr.25, 2023		
Date of testing	Apr.25, 2023- May.05, 2023		
Date of issue:	May.06, 2023		
Result	PASS		
Compiled by Position+Printed name+Signature):	File administrator Fanghui Zhu	Jang Mir Zhu	
Supervised by		Captar Chan	
Position+Printed name+Signature):	Project Engineer Caspar Chen	Cur Crigi	
Approved by		Hamas Hu	
Position+Printed name+Signature):	RF Manager Hans Hu		
esting Laboratory Name:	Shenzhen Huatongwei Internati	onal Inspection Co., Ltd.	
ddress	1/F, Bldg 3, Hongfa Hi-tech Indus Tianliao, Gongming, Shenzhen, C	trial Park, Genyu Road, China	
Shenzhen Huatongwei International Insp	ection Co., Ltd. All rights reserved.		
his publication may be reproduced in whol luatongwei International Inspection Co., Lt shenzhen Huatongwei International Inspect	e or in part for non-commercial purpose d. is acknowledged as copyright owner a ion Co., Ltd. takes no responsibility for a	s as long as the Shenzhen and source of the material. and will not assume liability for	

Shenzhen Huatongwei International Inspection Co., Ltd. takes no responsibility for and will not assume liability f damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

The test report merely correspond to the test sample.

## Contents

<u>1.</u>	TEST STANDARDS AND REPORT VERSION	3
1.1.	Test Standards	3
1.2.	Report version information	3
<u>2.</u>	TEST DESCRIPTION	4
<u>3.</u>	SUMMARY	5
3.1.	Client Information	5
3.2.	Product Description	5
3.3.	Radio Specification Description	5
3.4.	Testing Laboratory Information	5
<u>4.</u>	TEST CONFIGURATION	6
4.1.	EUT operation mode	6
4.2.	Test sample information	6
4.3.	Support unit used in test configuration and system	6
4.4.	Testing environmental condition	6
4.5.	Statement of the measurement uncertainty	7
4.6.	Equipments Used during the Test	8
<u>5.</u>	TEST CONDITIONS AND RESULTS	9
5.1.	Antenna requirement	9
5.2.	AC Power Conducted Emissions	10
5.3.	20dB Bandwidth	11
5.4.	Radiated Emission	12
<u>6.</u>	TEST SETUP PHOTOS	15
<u>7.</u>	EXTERNAL AND INTERNAL PHOTOS OF THE EUT	16
7.1.	External Photos	16
7.2.	Internal Photos	18

## 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Test Standards

The tests were performed according to following standards:

FCC CFR Title 47 Part 15 Subpart C § 15.209: Radiated emission limits; general requirements

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

### 1.2. Report version information

Revision No.	Date of issue	Description
N/A	2023-05-06	Original

## 2. TEST DESCRIPTION

Report clause	Test Item	Section in CFR 47	Result	Test Engineer
5.1	Antenna requirement	15.203	PASS	Xiaoqin Li
5.2	AC Power Conducted Emissions	15.207	N/A	N/A
5.3	20dB Bandwidth	2.1049	PASS	Xiaoqin Li
5.4	Radiated Emission	15.209	PASS	Haoxin Luo

Noted: The measurement uncertainty is not included in the test result. N/A: Not Applicable.

## 3. SUMMARY

## 3.1. Client Information

Applicant:	CiVinTec Global Co., Limited.	
Address:	F20,Huatong Building,No.8,Ganli Road 2,Jihua Street,Longgang District,Shenzhen,Guangdong,518112,China	
Manufacturer:	CiVinTec Global Co., Limited.	
Address:	F20,Huatong Building,No.8,Ganli Road 2,Jihua Street,Longgang District,Shenzhen,Guangdong,518112,China	

## 3.2. Product Description

Main unit information:	
Product Name:	CRYSTAL TOUCH TERMINAL
Trade Mark:	-
Model No.:	CT9-T-QP-UV
Listed Model(s):	CT9-T-P, CT9-T-QP, CT9-T-P-M, CT9-T-QP-M, CT9-T-P-UV, CT9-T-P-M-UV, CT9-T-QP-M-UV
Power supply:	DC 12V
Hardware version:	v3.1
Software version:	V3.0.1.33

## 3.3. Radio Specification Description

Operation frequency:	125kHz
Channel number:	1
Modulation Type:	ASK
Antenna type:	Copper coil antenna

## 3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.			
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China			
Contact information:	Phone: 86-755-26715499 E-mail: <u>cs@szhtw.com.cn</u> <u>http://www.szhtw.com.cn</u>			
Qualifications	Туре	Accreditation Number		
Qualifications	FCC	762235		

## 4. TEST CONFIGURATION

### 4.1. EUT operation mode

#### TEST MODE

For RF	test items					
				 	•.	

The engineering test program was provided and enabled to make EUT continuous transmit.

#### 4.2. Test sample information

Test item	HTW sample no.	
RF Radiated test items	YPHT23040731001	

Note:

RF Radiated test items: Radiated Emission, 20dB Bandwidth

### 4.3. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?				
✓ No				
Item	Equipement	Trade Name	Model No.	
1	-	-	-	
2	-	-	-	

### 4.4. Testing environmental condition

Туре	Requirement	Actual
Temperature:	15~35°C	25°C
Relative Humidity:	25~75%	50%
Air Pressure:	860~1060mbar	1000mbar

## 4.5. Statement of the measurement uncertainty

Test Items	Measurement Uncertainty	
Radiated emissions below 1GHz	4.54dB	
Radiated emissions above 1GHz	5.10 dB	
Occupied Bandwidth	0.002%	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

## 4.6. Equipments Used during the Test

•	Conducted test item						
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Signal and spectrum Analyzer	R&S	HTWE0242	FSV40	100048	2022/08/25	2023/08/24
•	Signal & Spectrum Analyzer	R&S	HTWE0262	FSW26	103440	2022/08/25	2023/08/24
•	Vector signal generator	R&S	HTWE0244	SMBV100A	260790	2022/05/25	2023/05/24
•	Test software	Tonscend	N/A	JS1120	N/A	N/A	N/A

•	Radiated emission- Below 1GHz						
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2023/09/29
•	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2022/08/30	2023/08/29
•	Loop Antenna	R&S	HTWE0546	HFH2-Z2E	101073	2021/05/25	2024/05/24
•	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0547	VULB9163	945	2022/05/23	2025/05/22
•	Pre-Amplifer	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2022/11/04	2023/11/03
•	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2023/02/24	2024/02/23
•	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2023/02/24	2024/02/23
•	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

•	Radiated emission- Above 1GHz						
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11121	2018/09/27	2023/09/26
•	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2022/08/25	2023/08/24
•	Horn Antenna	ETS	HTWE0548	3117	240120	2022/05/20	2025/05/19
•	Horn Antenna	STEATITE	HTWE0549	QMS-00880	25661	2022/05/20	2025/05/19
•	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2022/11/04	2023/11/03
•	Broadband Pre- amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2023/02/27	2024/02/26
•	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2023/02/24	2024/02/23
•	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2023/02/24	2024/02/23
•	RF Connection Cable	HUBER+SUHNER	HTWE0119-05	6m 3GHz RG Serisa	N/A	2023/02/24	2024/02/23
•	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2023/02/24	2024/02/23
•	Test Software	Audix	N/A	E3	N/A	N/A	N/A

### 5.1. Antenna requirement

#### <u>Requirement</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### TEST RESULTS

#### ☑ Passed □ Not Applicable

The antenna type is a Copper coil antenna, please refer to the below antenna photo.



## 5.2. AC Power Conducted Emissions

#### LIMIT

FCC	CFR	Title 47	Part	15	Subpart	С	Section	$15\ 207$
100	0111	$1100 \pm 1$	i an	10	ouppart	$\mathbf{U}$	OCCUON	10.207.

	Limit (dBuV)			
Frequency range (MHZ)	Quasi-peak	Average		
0.15-0.5	66 to 56*	56 to 46*		
0.5-5	56	46		
5-30	60	50		

\* Decreases with the logarithm of the frequency.

#### **TEST CONFIGURATION**



#### TEST PROCEDURE

- 1. The EUT was setup according to ANSI C63.10
- The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
- 4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
- 6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 8. During the above scans, the emissions were maximized by cable manipulation.

#### TEST MODE:

Please refer to the clause 4.1

#### TEST RESULTS

#### 5.3. 20dB Bandwidth

<u>Limit</u> N/A

#### **TEST CONFIGURATION**



➡ Ground Reference Plane 

#### TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

#### TEST MODE:

Please refer to the clause 4.1

#### TEST RESULTS

#### 🛛 Passed

Not Applicable

20dB Bandwidth (Hz)	Limit (Hz)	Result
50	-	Pass



### 5.4. Radiated Emission

<u>LIMIT</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

Limit for frequency below 30MHz:

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009~0.490	2400/F(kHz)	300	Quasi-peak
0.490~1.705	24000/F(kHz)	30	Quasi-peak
1.705~30.0	30	30	Quasi-peak

Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40\*log(300/3)= Limit dBuV/m @300m +80,

Limit dBuV/m @3m = Limit dBuV/m @30m +40\*log(30/3)= Limit dBuV/m @30m + 40.

Limit for frequency above 30MHz:

Frequency	Limit (dBuV/m@3m)	Remark
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak

#### **TEST CONFIGURATION**

• 9 kHz ~ 30 MHz



• 30 MHz ~ 1 GHz



#### TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10 requirements.
- The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 30MHz:
    - RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
  - (3) 30MHz to 1 GHz: RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (4) From 1 GHz to 10<sup>th</sup> harmonic: RBW=1MHz, VBW=3MHz Peak detector for Peak value. RBW=1MHz, VBW=3MHz RMS detector for Average value.

#### TEST MODE:

Please refer to the clause 4.1

#### TEST RESULTS

#### ☑ Passed □ Not Applicable



14 of 21

Page:



# 6. TEST SETUP PHOTOS

#### Radiated Emissions

![](_page_14_Figure_6.jpeg)

![](_page_14_Figure_7.jpeg)

![](_page_14_Figure_8.jpeg)

## 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

## 7.1. External Photos

![](_page_15_Picture_5.jpeg)

![](_page_15_Picture_6.jpeg)

![](_page_15_Picture_7.jpeg)

![](_page_16_Picture_2.jpeg)

![](_page_16_Picture_3.jpeg)

![](_page_16_Picture_4.jpeg)

Page:

2023-05-06

#### 7.2. Internal Photos

![](_page_17_Picture_4.jpeg)

![](_page_17_Picture_5.jpeg)

![](_page_17_Picture_6.jpeg)

![](_page_18_Picture_3.jpeg)

![](_page_18_Picture_4.jpeg)

![](_page_18_Picture_5.jpeg)

![](_page_19_Picture_3.jpeg)

![](_page_19_Picture_4.jpeg)

![](_page_19_Figure_5.jpeg)

Shenzhen Huatongwei International Inspection Co., Ltd.

![](_page_20_Picture_3.jpeg)

![](_page_20_Picture_4.jpeg)

-----End of Report------