

Applicant: Eastern Times Technology Co.,Ltd

Product: WIRELESS 100 KEYS HOT-SWAPPABLE MECHANICAL

KEYBOARD

Model No.: K656-RGB-PRO, ET-8857, K656WB-RGB-PRO

Trademark: REDRAGON

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10 &FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Term lang

Terry Tang

Manager

Dated: July 06, 2023

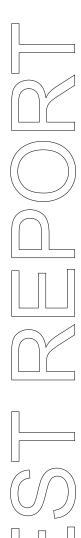
Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com



Report No.: TW2305239-02E Page 2 of 34

Date: 2023-07-06



Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

Industry Canada (IC) — Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number: 5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

CAB identifier: CN0033

Date: 2023-07-06



Test Report Conclusion

Content
Camanal

1.0	General Details	4
1.1	Test Lab Details	4
1.2	Applicant Details	4
1.3	Description of EUT	4
1.4	Submitted Sample	4
1.5	Test Duration.	5
1.6	Test Uncertainty	5
1.7	Test By	5
2.0	List of Measurement Equipment	6
3.0	Technical Details	7
3.1	Summary of Test Results	7
3.2	Test Standards	7
4.0	EUT Modification	7
5.0	Power Line Conducted Emission Test	8
5.1	Schematics of the Test	8
5.2	Test Method and Test Procedure	8
5.3	Configuration of the EUT	8
5.4	EUT Operating Condition.	9
5.5	Conducted Emission Limit.	9
5.6	Test Result.	9
6.0	Radiated Emission test	12
6.1	Test Method and Test Procedure	12
6.2	Configuration of the EUT	13
6.3	EUT Operation Condition	13
6.4	Radiated Emission Limit	14
6.5	Test Result.	15
7.0	Band Edge	23
7.1	Test Method and Test Procedure.	23
7.2	Radiated Test Setup	23
7.3	Configuration of the EUT	23
7.4	EUT Operating Condition.	23
7.5	Band Edge Limit.	23
7.6	Band Edge Test Result.	24
8.0	Antenna Requirement	28
9.0	20dB bandwidth measurement	29
10.0	FCC ID Label	32
11.0	Photo of Test Setup and EUT View	33

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Date: 2023-07-06



1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le

Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189 For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: Eastern Times Technology Co.,Ltd

Address: Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town, Dongguan City,

Guangdong, China.

Telephone: --Fax: --

1.3 Description of EUT

Product: WIRELESS 100 KEYS HOT-SWAPPABLE MECHANICAL KEYBOARD

Manufacturer: Eastern Times Technology Co.,Ltd

Address: Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town,

Dongguan City, Guangdong, China.

Trademark: REDRAGON

Additional Trademark: N/A

Model Number: K656-RGB-PRO

Additional Model Name ET-8857, K656WB-RGB-PRO

Hardware Version: 8857-A V1

Software Version: 5807

Serial No.: RDK656WB-RGB-PRO23041500937
Rating: DC5V, 860mA or DC3.7V, 360mA
Battery: DC3.7V, 3000mAh Li-ion battery

Modulation Type: GFSK

Operation Frequency: 2402-2480MHz

Channel Separate: 1MHz
Channel Number: 79

Antenna Designation PCB antenna with gain 2.34dBi Max (Get from the antenna specification)

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Report No.: TW2305239-02E Page 5 of 34

Date: 2023-07-06



1.4 Submitted Sample: 2 Samples

1.5 Test Duration 2023-05-22 to 2023-07-06

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty = 6.0dB

Occupied Channel Bandwidth Uncertainty = 5%

Conducted Emissions Uncertainty = 3.6dB

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

The sample tested by

Print Name: Terry Tang

Page 6 of 34

Report No.: TW2305239-02E

Date: 2023-07-06



2.0 Test Equipment						
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date	
ESPI Test Receiver	R&S	ESPI 3	100379	2022-07-15	2023-07-14	
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17	
LISN	R&S	EZH3-Z5	100253	2022-07-18	2023-07-17	
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2022-07-18	2023-07-17	
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17	
Spectrum	R&S	FSIQ26	100292	2022-07-15	2023-07-14	
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17	
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2024-07-17	
Power meter	Anritsu	ML2487A	6K00003613	2022-07-18	2023-07-17	
Power sensor	Anritsu	MA2491A	32263	2022-07-18	2023-07-17	
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17	
9*6*6 Anechoic			N/A	2022-07-26	2025-07-25	
EMI Test Receiver	RS	ESVB	826156/011	2022-07-15	2023-07-14	
EMI Test Receiver	RS	ESCS 30	834115/006	2022-07-15	2023-07-14	
Spectrum	HP/Agilent	E4407B	MY50441392	2022-07-15	2023-07-14	
Spectrum	RS	FSP	1164.4391.38	2022-07-15	2023-07-14	
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA		2022-07-15	2023-07-14	
RF Cable	Zhengdi	7m		2022-07-15	2023-07-14	
Pre-Amplifier	Schwarebeck	BBV9743	#218	2022-07-15	2023-07-14	
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2022-07-15	2023-07-14	
LISN	SCHAFFNER	NNB42	00012	2022-08-18	2023-07-17	
ESPI Test Receiver	R&S	ESPI 3	100379	2022-07-15	2023-07-14	
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17	

2.2 Automation Test Software

For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Page 7 of 34

Report No.: TW2305239-02E

Date: 2023-07-06



3.0 Technical Details

3.1 Summary of test results

The EUT has	been tested	l according to	o the foll	owing s	specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna Requirement	Pass	Complies
FCC Part 15, Paragraph 15.207	Conducted Emission Test	Pass	Complies
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	Pass	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	Pass	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	Pass	Complies

3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.249, ANSI C63.4:2014 and ANSI C63.10:2013

4.0 EUT Modification

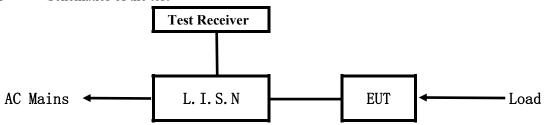
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

Date: 2023-07-06



5. Power Line Conducted Emission Test

5.1 Schematics of the test

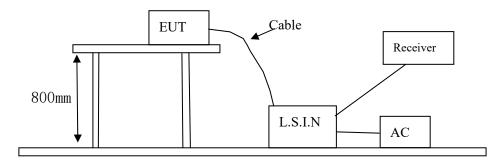


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013.

Test Voltage: 120V~, 60Hz Block diagram of Test setup



5.3 Configuration of the EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
WIRELESS 100 KEYS	Eastern Times	K656-RGB-PRO, ET-8857,	
HOT-SWAPPABLE			TUVET-8857A
MECHANICAL KEYBOARD	Technology Co.,Ltd	K656WB-RGB-PRO	

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Report No.: TW2305239-02E Page 9 of 34

Date: 2023-07-06



B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	KEYU	KA23-0502000DEU	Input: 100-240V~, 50/60Hz, 0.35A;
			Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (dB μ V)			
(MHz)	Quasi-peak Level	Average Level		
$0.15 \sim 0.50$	66.0~56.0*	56.0~46.0*		
$0.50 \sim 5.00$	56.0	46.0		
5.00 ~ 30.00	60.0	50.0		

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results:

Pass

Date: 2023-07-06



A: Conducted Emission on Live Terminal (150kHz to 30MHz)

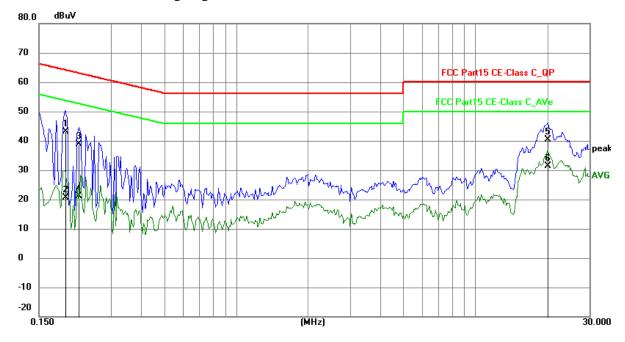
EUT Operating Environment

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging and Communication by BT

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1929	33.44	9.75	43.19	63.91	-20.72	QP	Р
2	0.1929	10.80	9.75	20.55	53.91	-33.36	AVG	Р
3	0.2202	29.06	9.75	38.81	62.81	-24.00	QP	Р
4	0.2202	11.48	9.75	21.23	52.81	-31.58	AVG	Р
5	20.0742	29.77	10.68	40.45	60.00	-19.55	QP	Р
6	20.0742	20.81	10.68	31.49	50.00	-18.51	AVG	Р

Date: 2023-07-06



B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

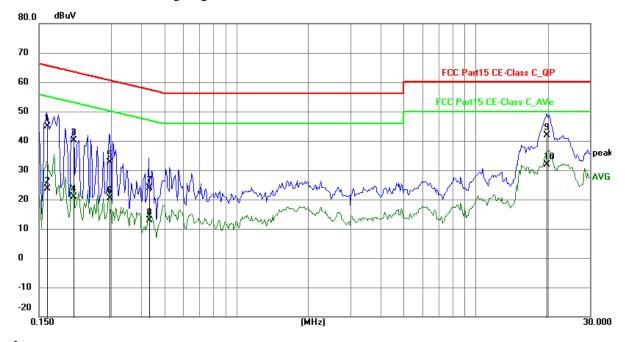
EUT Operating Environment

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging and Communication by BT

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1617	35.15	9.78	44.93	65.38	-20.45	QP	Р
2	0.1617	13.84	9.78	23.62	55.38	-31.76	AVG	Р
3	0.2085	30.32	9.75	40.07	63.26	-23.19	QP	Р
4	0.2085	11.04	9.75	20.79	53.26	-32.47	AVG	Р
5	0.2943	22.82	9.76	32.58	60.40	-27.82	QP	Р
6	0.2943	10.71	9.76	20.47	50.40	-29.93	AVG	Р
7	0.4308	14.02	9.77	23.79	57.24	-33.45	QP	Р
8	0.4308	3.23	9.77	13.00	47.24	-34.24	AVG	Р
9	19.8285	31.09	10.67	41.76	60.00	-18.24	QP	Р
10	19.8285	21.18	10.67	31.85	50.00	-18.15	AVG	Р

Report No.: TW2305239-02E Page 12 of 34

Date: 2023-07-06

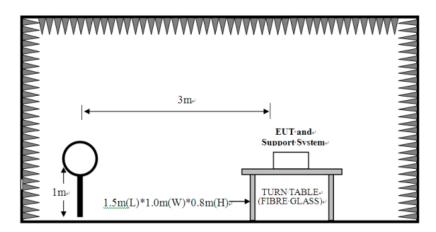


6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

For radiated emissions from 9kHz to 30MHz



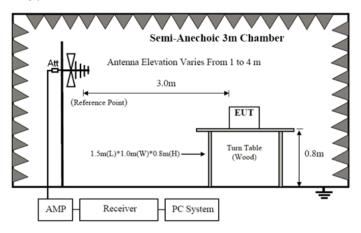
Page 13 of 34

Report No.: TW2305239-02E

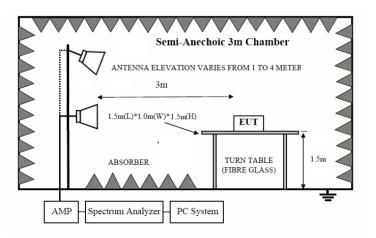
Date: 2023-07-06



For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



- 6.2 Configuration of The EUT

 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.

Report No.: TW2305239-02E Page 14 of 34

Date: 2023-07-06



6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Stre	ength of Fundame	ental (3m)	Field Strength of Harmonics (3m)			
(MHz)	mV/m	dBuV/m		uV/m	dBu	V/m	
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)	

Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.490	3	20log(2400/F(kHz)) +40log (300/3)
0.490-1.705	3	20log(24000/F(kHz)) +40log (30/3)
1.705-30	3	69.5
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK. For fundamental measurement, PK detector used.
- 5. For radiated emissions from 9kHz to 30MHz, the emission level is much less than the limit for more than 20dB. No necessary to take down the record.
- 6. Battery full charged during tests.

Report No.: TW2305239-02E Page 15 of 34

Date: 2023-07-06

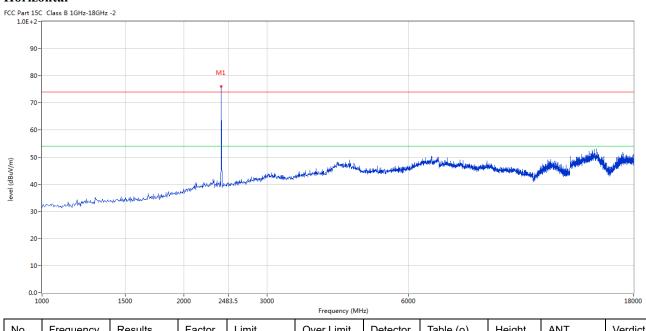


6.5 Test result

A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2402MHz

Horizontal



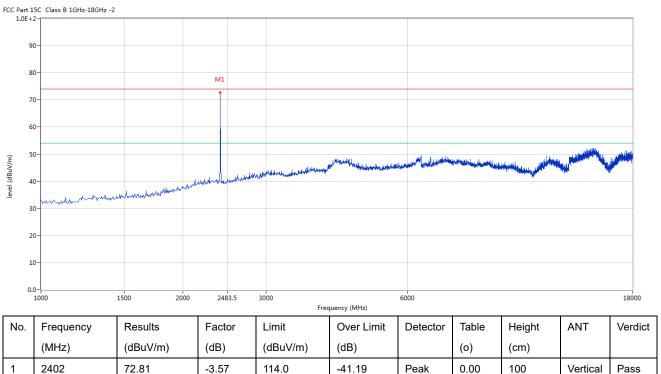
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2402	76.08	-3.57	114.0	-37.92	Peak	53.00	100	Horizontal	Pass

Report No.: TW2305239-02E Page 16 of 34

Date: 2023-07-06



Vertical



					, , ,					
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		Ì
1	2402	72.81	-3.57	114.0	-41.19	Peak	0.00	100	Vertical	Pass

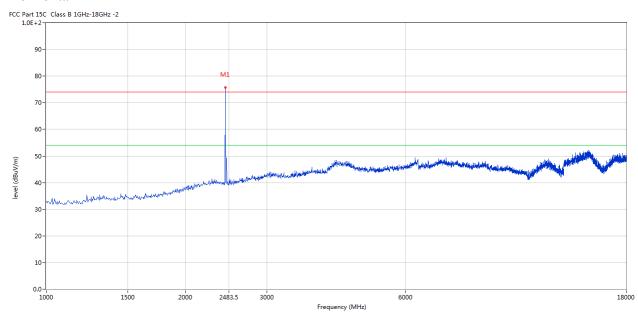
Report No.: TW2305239-02E Page 17 of 34

Date: 2023-07-06



Please refer to the following test plots for details: Middle Channel-2441MHz

Horizontal



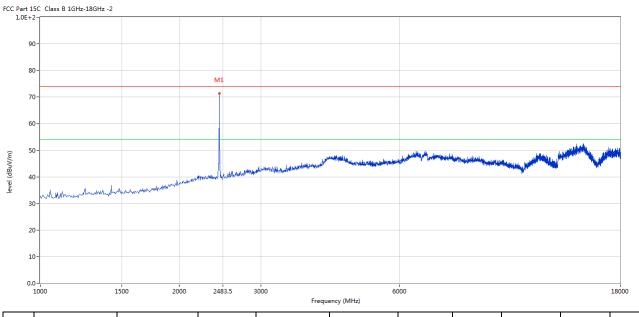
Ī	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
	1	2441	75.77	-3.57	114.0	-38.23	Peak	100.00	100	Horizontal	Pass

Report No.: TW2305239-02E Page 18 of 34

Date: 2023-07-06



Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2441	70.38	-3.57	114.0	-43.62	Peak	0.00	100	Vertical	Pass

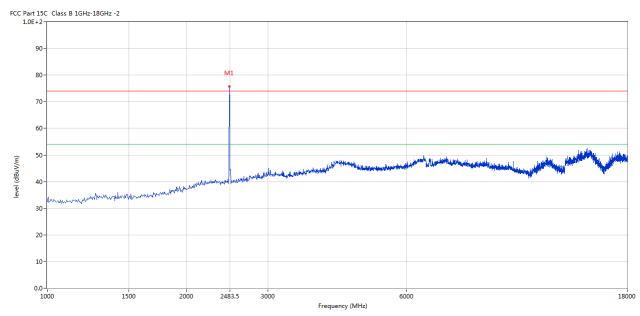
Report No.: TW2305239-02E Page 19 of 34

Date: 2023-07-06



Please refer to the following test plots for details: High Channel-2480MHz

Horizontal



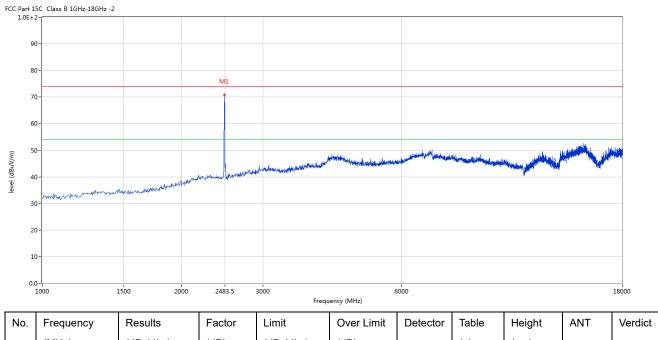
١	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	1	2480	75.69	-3.57	114.0	-38.31	Peak	207.00	100	Horizontal	Pass

Report No.: TW2305239-02E Page 20 of 34

Date: 2023-07-06



Vertical



No	0.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1		2480	71.05	-3.57	114.0	-42.95	Peak	354.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

- (3) Margin=Emission-Limits
- (4) According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) For test purpose, keep EUT continuous transmitting
- (5) For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.
- (6) the measured PK value less than the AV limit.

Report No.: TW2305239-02E Page 21 of 34

Date: 2023-07-06

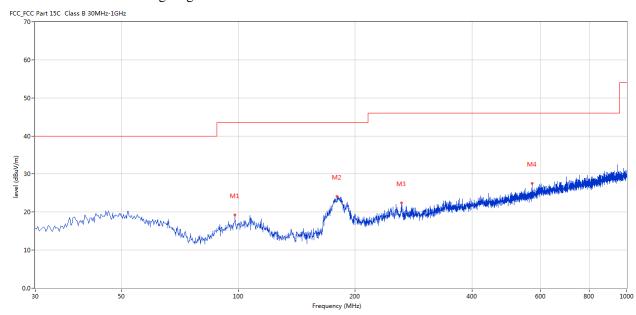


B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	98.125	19.22	-13.73	43.5	-24.28	Peak	74.00	100	Horizontal	Pass
2	179.585	24.17	-15.36	43.5	-19.33	Peak	333.00	100	Horizontal	Pass
3	263.469	22.41	-11.79	46.0	-23.59	Peak	270.00	100	Horizontal	Pass
4	570.882	27.59	-5.82	46.0	-18.41	Peak	316.00	100	Horizontal	Pass

Report No.: TW2305239-02E Page 22 of 34

Date: 2023-07-06

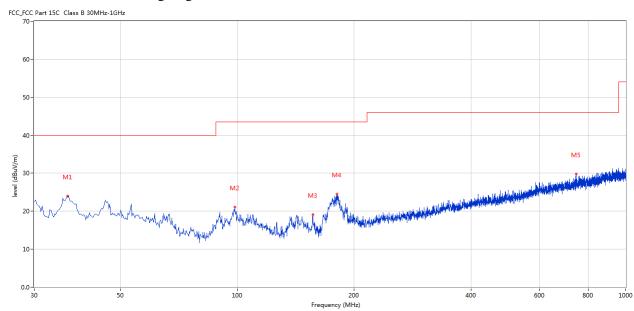


Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	36.546	23.99	-13.45	40.0	-16.01	Peak	27.00	100	Vertical	Pass
2	98.610	21.09	-13.70	43.5	-22.41	Peak	178.00	100	Vertical	Pass
3	156.553	19.13	-16.60	43.5	-24.37	Peak	355.00	100	Vertical	Pass
4	180.312	24.46	-15.27	43.5	-19.04	Peak	289.00	100	Vertical	Pass
5	745.439	29.85	-3.43	46.0	-16.15	Peak	155.00	100	Vertical	Pass

Date: 2023-07-06

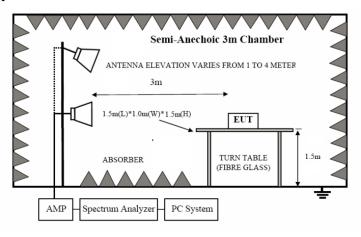


7. Band Edge

7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

7.3 Configuration of the EUT

Same as section 5.3 of this report

7.4 EUT Operating Condition

Same as section 5.4 of this report.

7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

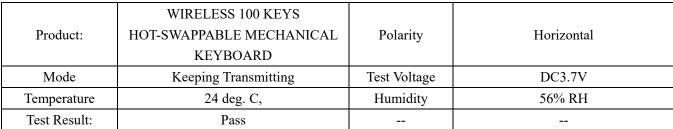
The report refers only to the sample tested and does not apply to the bulk.

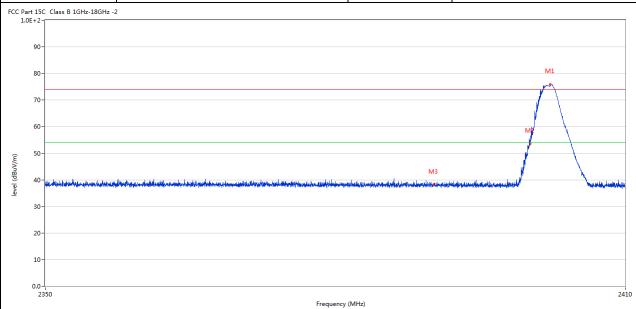
Report No.: TW2305239-02E Page 24 of 34

Date: 2023-07-06



7.6 Test Result





I	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
	1	2402.157	75.94	-3.57	74.0	1.94	Peak	58.00	100	Horizontal	N/A
:	2	2400.072	53.48	-3.57	74.0	-20.52	Peak	245.00	100	Horizontal	Pass
;	3	2390.000	38.19	-3.53	74.0	-35.81	Peak	67.00	100	Horizontal	Pass

Report No.: TW2305239-02E Page 25 of 34



Product:		HOT-SWA	ELESS 10 PPABLE N KEYBOA	MECHANICAL	L Det	tector	Vertical				
	Mode	Kee	eping Trans	smitting	Test '	Voltage		DC3	3.7V		
Temperature			24 deg. (-	nidity		56%	RH		
Te	est Result:		Pass						-		
8 7 6	0-							M1			
3	0-	orushdod, dhikiyyaadhirisan, uu uu kkassii	engandistructurida edin	ikayadan dike-adapa dankan para kana penjada pida	Philiphingh Apparollusidae tich 12(27) o	M3	natively for with any port a new state of the section of the	yahana wal	howitan.	diplocation of the	
3 2 1	O-businessab dimension while hy ha	on, shakor, dhekir jagankari kan ku ya dekessi	one of the section of		pency (MHz)		natell privage university	NA AMERICAN SERVICE SE	houltan	2410	
4 3 2 1		Results	Factor	Freque			Table	Height	ANT	2410	
4 3 2 1	0-			Freque Limit (uency (MHz)		Table (o)	Height (cm)		2410	
4 3 3 2 2 1 0.	0- 0- 0- 2350	Results	Factor	Limit (dBuV/m)	uency (MHz) Over Limit			_		2410 Verdi	
3 2 1	o- 0- 0- 0- 0- 0- 0- 2350 Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m) (uency (MHz) Over Limit (dB)	Detector	(0)	(cm)	ANT		

Report No.: TW2305239-02E Page 26 of 34



		W	IRELESS	100 KEYS						
	Product:	HOT-SW	APPABLE	E MECHANI	CAL	Polarity		H	orizontal	
			KEYBO	OARD						
Mode Temperature		K	eeping Tra	ansmitting	Т	Test Voltag	e	I	DC3.7V	
			24 deg	g. C,		Humidity		5	66% RH	
To	est Result:		Pas	SS						
C Part :	15C Class B 1GHz-18GHz	-2								
2.02										
9	90-									
8	80-		M	1						
-	70-		MA	N. C.						
			للعلمل							
	60-		W ^M	-7						
'				1						
	50-		1	1						
	40-	والمساورة والمسا		M2	a la distribui de la contra del la	in the circle state of more and	ر خواند الحد العلم ور معامل المتعدد المارة المتعدد	المعارضين معارفان المعارفان	ماريونين من المواجعة	a post alla Bassa d
5	40-	ish montaphotomore intended deposition		M2	s and the second se	المراوي عارسال عنظاما المراوي وبرده ف	ara (dalamentari dalami) yang bad	hadal anasistan an the addition has p eopled	esiye xasik ostasi sabadasi nediyo artik ingiriya	panjalishtesi
5	40-	iskoron kaplindadoron alijdadekil kapetela bid		M2	- wind de and a service of the relative	بارساره ويسارس المدورة الإنسان والمرادر والمرادر والمرادر والمرادر والمرادر والمرادر والمرادر والمرادر والمرادر	no a laboraryo izadi nadi nati oko d	andalumining and and and ye rly.	asiya saki ugu cisha dabadhu walisan iyo	pangalukanna
3	40-	isikeran dapituda dan erisike da kabi da papurin da		M2	in the second	ing day and particular security of the second security of the second second second second second second second	kori kalmantusi, deli sadigarety, pel	agalaman i maga karaban yani ka	دام دور	n and distance
3	40 - Janus Akeeliik and Igrae il latter who d	iskeron haplinekulen, alijankish kirikupekin kel		M2	-airde kanalasevisis airdi	ika dalam kan salika di kana kana kana kana kana kana kana kan	an falka untur jedi neli jesevi ped	the following the state of the	any a saik-agus a bhraigh a dh'aigh a dh	n and disk area
3	40 - 1000 Miles and Agree and Legendra and Agree and A	terkeren depthedesimon, sieterat kirkete konsujein sed		M2	ىلىرىنى دونون مەيدىلىقىنىدىلىقىنىدىن دو	iquidge ani yan ku sinibikasi dige kilipun k	kort kalen andresi oleh sudi sasurin pel	nghilusan naga kardina ya pirka	etigas siste vaspus selvent dir milija va Alempira	nang dikarrai
3	40 - town Alexandria politik per articologica di 30 -	ipikeron kapilinduden valikindaki kupipetin kid		2483.		ikalakani, mba sebingi inganipan	anstalan umrainka kultususiyni	the file construction of the development of the	any a sail, agus a ghe saile agh aille a a bhaire ag	2500
\$ \$ 2 2 11 0 0	40 -	Results	Factor	2483.:	5	Detector	Table	Height	any and any and any and any	2500
\$ \$ 2 2 11 0 0	40 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -		Factor (dB)	<u> </u>	5 Frequency (MHz)					2500
3	40 - 40 - 40 - 40 - 40 - 40 - 40 - 40 -	Results		Limit	5 Frequency (MHz)		Table	Height		

Page 27 of 34

Report No.: TW2305239-02E

Date: 2023-07-06



]	Product:		RELESS 1 APPABLE KEYBO	MECHANICA	L D	etector	Vertical				
	Mode	Ke	eping Tran	nsmitting	Test	Voltage		DC	3.7V		
Te	mperature		24 deg.		Hı	ımidity		56%	6 RH		
Те	est Result:		Pass								
1.0E+ 9 8 8 7 6 (u/\ngp) ava 3 3 1		iki, amanda aya ka a	M1	M2	in description, which has been reduction	defends and their school production	nambana, mana anakati ta Abiya	analidea articopa cilidati inchilich	l Margal um en Millen es de la festiva es d	2500	
	1			Frequ	uency (MHz)	<u> </u>		T	T		
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdic	
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		_	
1	2479.980	70.97	-3.57	74.0	-3.03	Peak	206.00	100	Vertical	Pass	
2	2483.500	38.54	-3.57	74.0	-35.46	Peak	269.57	100	Vertical	Pass	

Note: The PK emission level less than the AV limit. No necessary to record the AV emission level.

Date: 2023-07-06



Page 28 of 34

8.0 Antenna Requirement

Applicable Standard

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 an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a PCB antenna with gain 2.34dBi maximum. It fulfills the requirement of this section.

Test Result: Pass

Page 29 of 34

Report No.: TW2305239-02E



FSK Modulation	1										
Product:		WIRELESS 100 KEYS HOT-SWAPPABLE MECHANICAL KEYBOARD					de:	Keep tr	ansmitting		
Mode		Keep	oing Trans	mitting		Test Volt	age	DC3.7V			
Temperature	Temperature 24 deg. C,					Humidi	ity	56% RH			
Test Result:			Pass			Detecto	or	-	PK		
20dB Bandwidth			1.112MH	[z							
Ref Lvl 10 dBm	n	dB	1 [T1 n 20.	00 dB	RBW VBW SWT	30 k 100 k 8.5 m	Hz	RF Att 20 dB			
0				~~		V ₁ nd1 BW	[T1]	2.40200 20 1.11222		A	
-10 -20		0		~	h	V _T	[[T1]	2.40146 -22 2.40257	.07 dBm 192 GHz .61 dBm 415 GHz	1M	
-30 -40											
-50											
-70											
-80											
-90 Center 2.	402 CH5	,		300	kHz/		l	Sna	an 3 MHz	<u>I</u>	

Page 30 of 34

Report No.: TW2305239-02E



Product:	HOT-SWAPP	LESS 100 K ABLE MEC EYBOARD	CHANICAL	, 1	Test Mode:	Keep transmitting			
Mode	Keepi	ng Transmit	ting	Т	est Voltage	D	C3.7V		
Temperature		24 deg. C,			Humidity	56	5% RH		
Test Result:		Pass			Detector		PK		
0dB Bandwidth	-	1.028MHz							
Ref Lvl 10 dBm	ndB	1 [T1 n 20. 1.028056	00 dB	RBW VBW SWT	30 kHz 100 kHz 8.5 ms		20 dB	ı	
0					▼1 [1	[T1] - 2.4410	-3.27 dBm 00902 GHz	Α	
-10			~	my hy		1.0280 [T1] -2 2.4405	23.36 dBm 51002 GHz		
-20 1MAX		7			V _{T2}	[T1] -2 2.4415	23.15 dBm	1M2	
-40						\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
-50							1		
-60							V		
-70									
-80									
Center 2	.441 GHz JUL.2023 16		300 k	Hz/	•	Sp	oan 3 MHz		

Page 31 of 34

Report No.: TW2305239-02E



		WIREL	ESS 100 k	EYS							
Product:	НОТ			CHANICA	L	Te	est Mode:		Keep tra	nsmitting	
	KEYBOARD								Troop numbers		
Mode		Keepin	g Transmi	tting		Te	est Voltage	;	DC	3.7V	
Temperature		24	4 deg. C,			I	Humidity		56%	6 RH	
Test Result:			Pass]	Detector		I	PK	
20dB Bandwidth		9	55.9kHz								
Ŕ		Marker	1 [T1 r	ndB]	R	BW	30 k	Hz R	F Att	20 dB	
Ref Lvl		ndB		00 dB		BW	100 k				
10 dBm		BW 955	5.911823	865 kHz	SI	WT	8.5 m	s U:	nit	dBm	n -
							v ₁	[T1]	- 3	.87 dBm	A
0									2.48001	503 GHz	
							ndE	3	20	.00 dB	
					7		BW ▽ _{T1}	95 T11 .	5.91182	365 kHz	
-10				7		7	. 11		2.47955		
			"~	ſ		* \		[T1]	-23	.54 dBm	
-20			TZ				T2		2.48051	403 GHz	
1MAX							7				1M2
-30		\sim						7			
		$^{\sim}$						7			
-40	\sim	V						- -√			
٨									7		
-50									/	\wedge	
John State of the										\/ \	
-60										<u>'</u>	
-70						+					
-80											
-90											ļ
Center 2	.48 GH:	Z		300	kHz/				Spa	ın 3 MHz	

Report No.: TW2305239-02E Page 32 of 34

Date: 2023-07-06



10.0 FCC ID Label

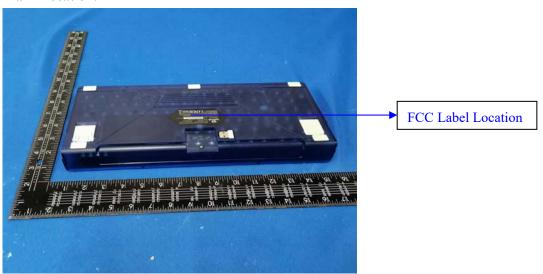
FCC ID: TUVET-8857A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



Page 33 of 34

Report No.: TW2305239-02E

Date: 2023-07-06



11.0 Photo of testing

11.1 Conducted test View--



Date: 2023-07-06



Radiated emission test view



Photographs – EUT

Please refer test report TW2305239-01E

-- End of the report--

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it. or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.