



File Reference No.: 2019-10-12

Applicant: Shenzhen Geniatech Inc., Ltd.

Product: Smart Gateway

Model No.: GTW350,GTW350N,9501293,GTW350T,GTW360,

GTW370,GTW389,GTW410,GTW410E-L,SRF321,

UZW-100,UZB-100,UBT-100,ULR-100

Brand Name: N/A

Test Standards: FCC Part 15.249

Test Result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4&FCC Part 15 Subpart C,

Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: October 12, 2019

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.: FCC1909217-02 Page 2 of 42

Date: 2019-10-12



# **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 17025:2005 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

Date: 2019-10-12



# Test Report Conclusion

## Content

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
5.1	Test Method and Test Procedure	12
5.2	Configuration of the EUT	12
5.3	EUT Operation Condition	12
5.4	Radiated Emission Limit	13
5.5	Test Result	14
7.0	Band Edge	22
7.1	Test Method and Test Procedure.	22
7.2	Radiated Test Setup.	22
7.3	Configuration of the EUT	22
7.4	EUT Operating Condition.	22
7.5	Band Edge Limit.	22
7.6	Band Edge Test Result.	23
8.0	Antenna Requirement	27
9.0	20dB bandwidth measurement	28
10.0	FCC ID Label	31
11.0	Photo of Test Setup and EUT View.	32

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.

Date: 2019-10-12



Page 4 of 42

## 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: Shenzhen Geniatech Inc., Ltd.

Address: 18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China

Telephone: --Fax: --

## 1.3 Description of EUT

Product: GTW350

Manufacturer: Shenzhen Geniatech Inc., Ltd.

Address: 18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China

Brand Name: N/A
Model Number: GTW350

Additional Model GTW350N,9501293,GTW350T,GTW360,GTW370,GTW389,GTW410,

Name GTW410E-L,SRF321,UZW-100,UZB-100,UBT-100,ULR-100

Input Voltage: DC5V, 2A

Power Supply: Model: TEKA012-0503000UK; Input: 100-240V~, 50/60Hz, 0.35A MAX;

Output: DC5V, 2A

Modulation Type: OQPSK

Operation Frequency 2405-2480MHz

Channel Separation 5MHz

Antenna Designation Integral antenna with gain 2.0dBi Max

## 1.4 Submitted Sample

2 Sample

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.

Report No.: FCC1909217-02 Page 5 of 42

Date: 2019-10-12



#### 1.5 Test Duration

2019-09-29 to 2019-10-12

# 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

Terry Tang

The sample tested by

Print Name: Terry Tang

Page 6 of 42 Report No.: FCC1909217-02



2.0 Test Equipment Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver		ESPI 3	100379		
	R&S			2019-06-21	2020-06-20
LISN	R&S	EZH3-Z5	100294	2019-06-21	2020-06-20
LISN	R&S	EZH3-Z5	100253	2019-06-21	2020-06-20
Ultra Broadband ANT	R&S	HL562	100157	2019-06-21	2020-06-20
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2019-06-21	2020-06-20
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2019-06-21	2020-06-20
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2019-06-21	2021-06-20
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2019-08-22	2020-08-21
Power sensor	Anritsu	MA2491A	32263	2019-08-22	2020-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic			N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2019-06-21	2020-06-20
EMI Test Receiver	RS	ESH3	860904/006	2019-06-21	2020-06-20
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2019-06-21	2020-06-20
Spectrum	HP/Agilent	E4407B	MY50441392	2019-06-21	2020-06-20
Spectrum	RS	FSP	1164.4391.38	2019-01-20	2020-01-19
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA		2019-06-21	2020-06-20
RF Cable	Zhengdi	7m		2019-06-21	2020-06-20
RF Switch	EM	EMSW18	060391	2019-06-21	2020-06-20
Pre-Amplifier	Schwarebeck	BBV9743	#218	2019-06-21	2020-06-20
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2019-06-21	2020-06-20
LISN	SCHAFFNER	NNB42	00012	2019-01-08	2020-01-07

Page 7 of 42

Date: 2019-10-12



## 3.0 Technical Details

# 3.1 Summary of test results

Report No.: FCC1909217-02

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
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 and RSS-210	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

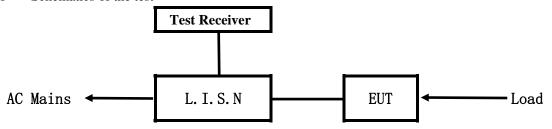
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

Date: 2019-10-12



# 5. Power Line Conducted Emission Test

# 5.1 Schematics of the test

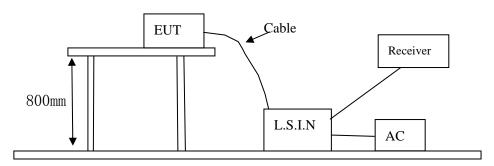


**EUT: Equipment Under Test** 

# 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2014.

# Block diagram of Test setup



# 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

# A. EUT

Device	Manufacturer	Model	FCC ID
Smart Gateway	Shenzhen Geniatech Inc., Ltd.	GTW350,GTW350N,9501293,GTW350T,GTW360, GTW370,GTW389,GTW410,GTW410E-L,SRF321, UZW-100,UZB-100,UBT-100,ULR-100	ZJU-E19C05

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.

Report No.: FCC1909217-02 Page 9 of 42

Date: 2019-10-12



## B. Internal Device

Device	Manufacturer	Model	FCC ID/SDOC
N/A			

# C. Peripherals

Device	Manufacturer	Model	FCC ID/SDOC/DOC
N/A			

# 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014

- 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 15.107 and 15.207

Eraguan ay (MHz)	Class A Limits (dB µ V)		Class B Limits (dB $\mu$ V)		
Frequency(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	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

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Date: 2019-10-12



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

**EUT Operating Environment** 

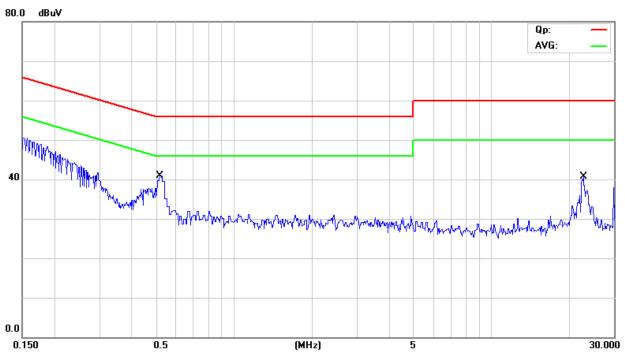
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep Transmitting** 

**Equipment Level: Class B** 

**Results: PASS** 

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5205	18.20	9.77	27.97	56.00	-28.03	QP	
2	*	0.5205	8.50	9.77	18.27	46.00	-27.73	AVG	
3		22.7627	19.20	10.85	30.05	60.00	-29.95	QP	
4		22.7627	9.20	10.85	20.05	50.00	-29.95	AVG	

Date: 2019-10-12



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

**EUT Operating Environment** 

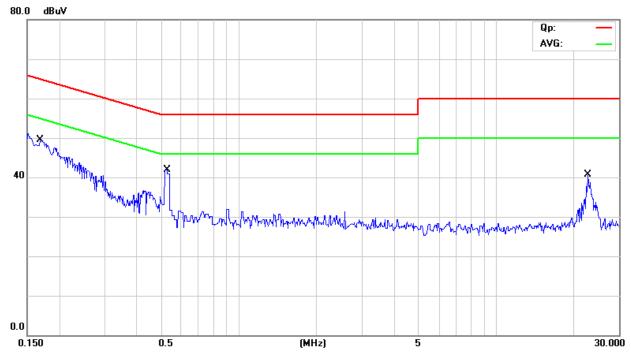
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep Transmitting** 

**Equipment Level: Class B** 

**Results: Pass** 

Please refer to following diagram for individual



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBu∀	dB	dBu∀	dBu∨	dB	Detector	Comment
1 *	0.5250	27.10	9.77	36.87	56.00	-19.13	QP	
2	0.5250	7.40	9.77	17.17	46.00	-28.83	AVG	
3	22.5475	21.20	10.84	32.04	60.00	-27.96	QP	
4	22.5475	10.10	10.84	20.94	50.00	-29.06	AVG	
5	0.1703	32.70	9.77	42.47	64.95	-22.48	QP	
6	0.1703	1.60	9.77	11.37	54.95	-43.58	AVG	

Report No.: FCC1909217-02 Page 12 of 42

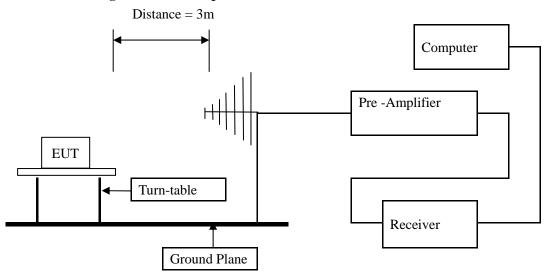
Date: 2019-10-12



## **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**



- 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.: FCC1909217-02 Page 13 of 42

Date: 2019-10-12



## 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	trength of Fundamental (3m)			Field Strength of Harmonics (3m)		
(MHz)	mV/m	dBuV/m		uV/m	dBuV/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 $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 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.

Report No.: FCC1909217-02 Page 14 of 42

Date: 2019-10-12



## 6.5 Test result

# A Fundamental & Harmonics Radiated Emission Data

Product:	Smart Gateway	Test Mode:	Keep transmitting-Low Channel
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	120V~	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2405	78.36 (PK)	Н	114/94	-15.64
2405	76.39 (PK)	V	114/94	-17.61
4810		Н	74/54	
4810		V	74/54	
7215		H/V	74/54	
9620		H/V	74/54	
12025		H/V	74/54	
14430		H/V	74/54	
16835		H/V	74/54	
19240		H/V	74/54	
21645		H/V	74/54	
24050		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

Report No.: FCC1909217-02 Page 15 of 42

Date: 2019-10-12



Product:	Smart Gateway	Test Mode:	Keep transmitting-Middle Channel
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	120V~	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2440	79.66 (PK)	Н	114/94	-14.34
2440	78.54 (PK)	V	114/94	-15.46
4880		Н	74/54	
4880	46.09 (PK)	V	74/54	-7.91
7320		H/V	74/54	
9760		H/V	74/54	
12200		H/V	74/54	
14640		H/V	74/54	
17080		H/V	74/54	
19520		H/V	74/54	
21960		H/V	74/54	
24400		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

Report No.: FCC1909217-02 Page 16 of 42

Date: 2019-10-12



Product:	Smart Gateway	Test Mode:	Keep transmitting-High Channel
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	120V~	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2480	82.46 (PK)	Н	114/94	-11.54
2480	82.47 (PK)	V	114/94	-11.53
4960		Н	74/54	
4960	42.24 (PK)	V	74/54	-11.76
7440		Н	74/54	
7440		V	74/54	
9920		H/V	74/54	
12400		H/V	74/54	
14880		H/V	74/54	
17360		H/V	74/54	
19840		H/V	74/54	
22320		H/V	74/54	
24800		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

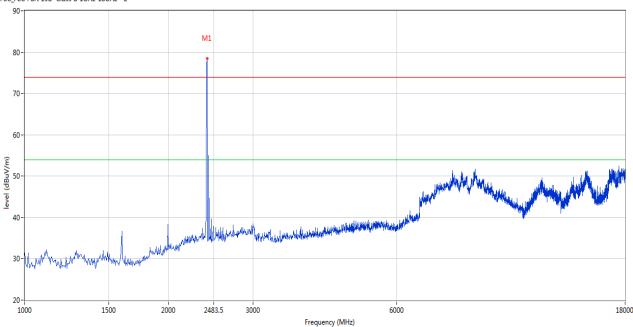
Date: 2019-10-12



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

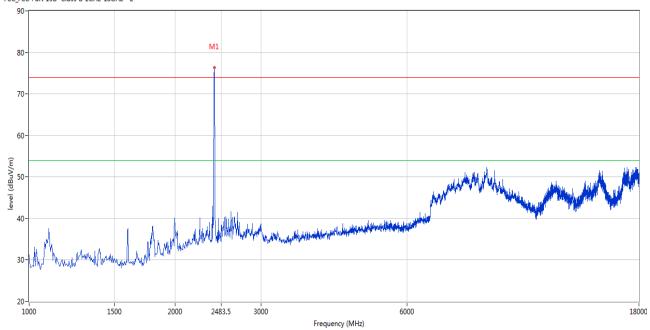
#### **Horizontal**





# Vertical

# FCC\_FCC Part 15B Class B 1GHz-18GHz - 2



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.

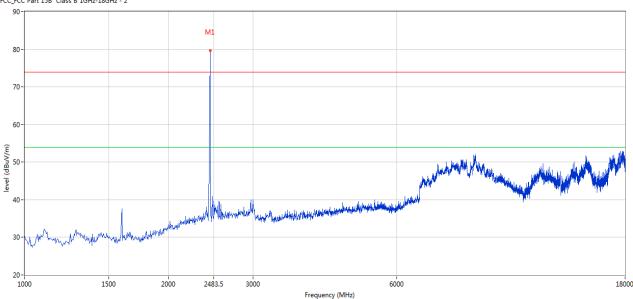
Date: 2019-10-12



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

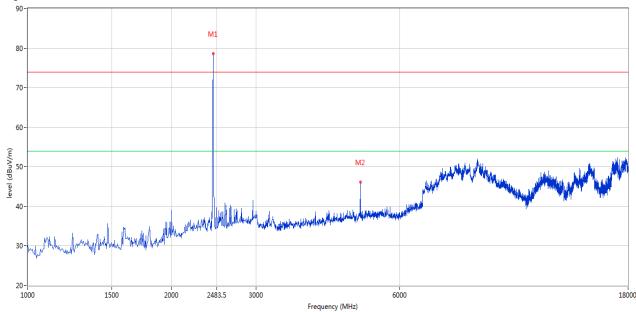
#### **Horizontal**





# Vertical





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.

18000

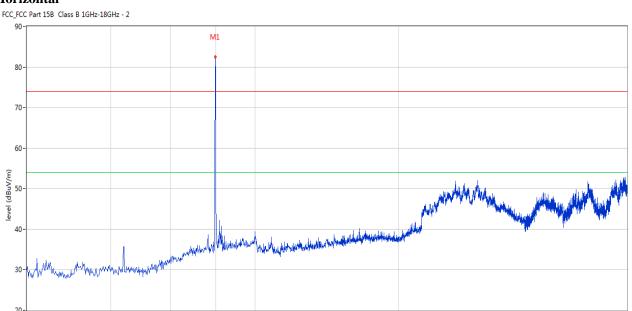
Report No.: FCC1909217-02

Date: 2019-10-12



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

#### **Horizontal**



Frequency (MHz)

6000

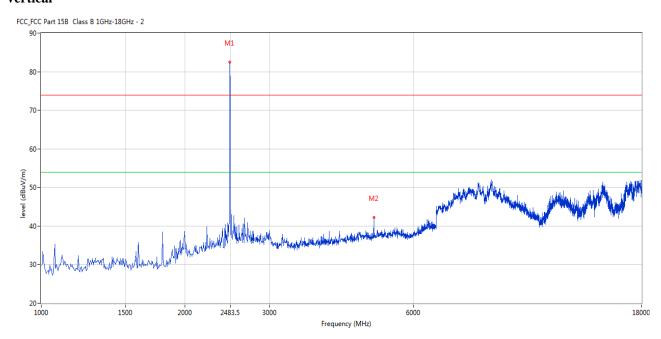
# Vertical

1000

1500

2000

2483.5



For emission above 18GHz, It is only the floor noise. No necessary to take down.

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.

Report No.: FCC1909217-02 Page 20 of 42

Date: 2019-10-12



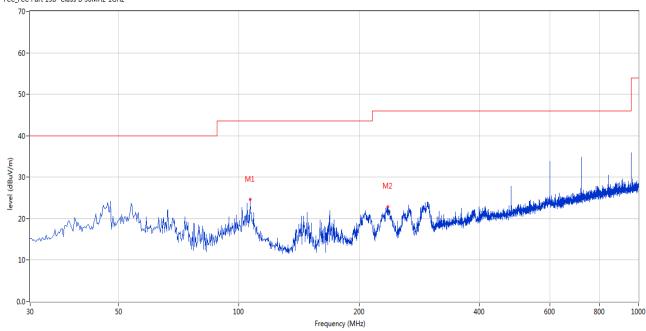
# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual

FCC\_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	106.611	24.66	-13.36	43.5	-18.84	Peak	359.00	100	Н	Pass
2	236.073	22.90	-12.42	46.0	-23.10	Peak	215.00	100	Н	Pass

Report No.: FCC1909217-02 Page 21 of 42

Date: 2019-10-12

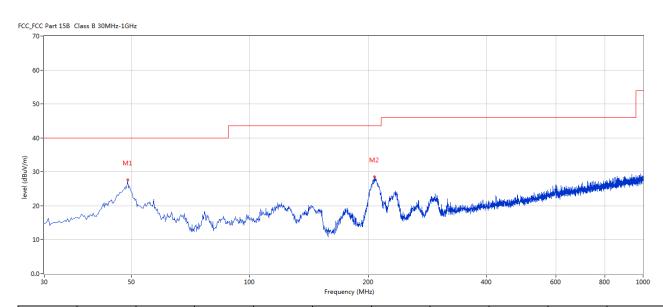


# Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequen	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	cy (MHz)	(dBuV/m	(dB)	(dBuV/m	Limit			(cm)		
		)		)	(dB)					
1	48.910	27.57	-11.21	40.0	-12.43	Peak	240.00	100	V	Pass
2	207.466	28.57	-13.68	43.5	-14.93	Peak	98.00	100	V	Pass

Date: 2019-10-12

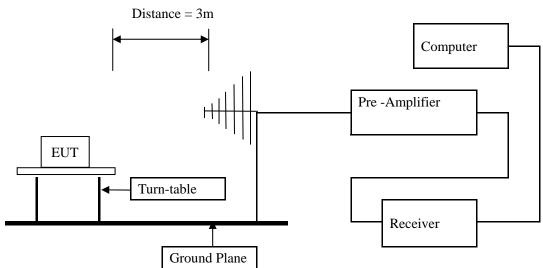


# 7. Band Edge

## 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=3MHz,VBW=10MHz and Peak detector used
- (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.

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.

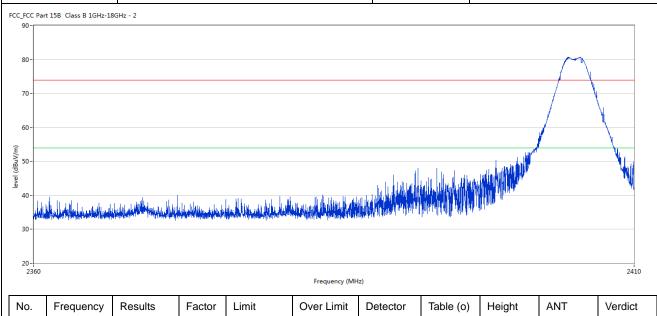
Report No.: FCC1909217-02 Page 23 of 42

Date: 2019-10-12



## 7.6 Test Result

Product:	Smart Gateway	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2400	52.19	-3.57	54.0	-1.81	Peak	136.00	100	Н	Pass
2	2390	46.00	-3.53	54.0	-8.00	Peak	158.00	100	Н	Pass

Report No.: FCC1909217-02 Page 24 of 42



Product:		Sma	rt Gateway		Dete	ctor		Vertical	[
Mode		Keeping	g Transmitti	ng	Test Vo	oltage		120V~	
Temperature		24	4 deg. C,		Hum	idity		56% RF	I
Test Result:			Pass						
CC Part 15B Class B 1GHz-	6GHz-2								
0-									
0-								-	<del>\</del>
0-									<b>V</b>
0-								_/_	-
								¥	
								<del></del>	
0-						in de de de de de	المالالال المالية	M	
0-	dalaritha o John John	1	natriffi, governi da juda salata j					MA .	
			MALLONALALIA	tally and the filter state				M	W
10 -				i allumini dell'est				Lange Control	
0-			Mallarm NAJA politic					J.	W
		ALL WARRAN	Malayana	Frequency (MH	lz)			M	2
0-2360	Results	Factor	Limit	Frequency (MF	lz)  Detector	Table (o)	Height	ANT	2 Verdict
2360	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	T T		Table (o)	Height (cm)	ANT	1
0. Frequency				Over Limit		Table (o)	_	ANT	Verdict Pass

Report No.: FCC1909217-02 Page 25 of 42



Produ	uct:		Sma	art Gateway		Pola	rity		Horizont	al
Mod	de		Keepin	g Transmitt	ing	Test Vo	oltage		120V~	
Tempera	rature		2	4 deg. C,		Humi	dity		56% RH	I
Test Re	esult:			Pass						
C_FCC Part 15B C	Class B 1GHz-1	8GHz - 2								
70-										
30- 20- 2470		White Hall to the			2483.5				Muhai	2500
30- 20- 2470		Marin Marin Land			2483.5 Frequency (MH:	2				2500
30- 20- 2470	equency	Results	Factor	Limit		2) Detector	Table (o)	Height	ANT	2500 Verdict
30- 20- 2470	equency 1Hz)		Factor (dB)	Limit (dBuV/m)	Frequency (MHz		Table (o)	Height (cm)	ANT	2500 Verdict

Page 26 of 42

Report No.: FCC1909217-02

Date: 2019-10-12



P	Product:		Sma	ırt Gateway		Dete	ctor		Vertical	-
	Mode		Keepin	g Transmitt	ing	Test Vo	oltage		120V~	
Ter	nperature		2	4 deg. C,		Humi	dity		56% RH	I
Te	st Result:			Pass						
_	art 15B Class B 1GHz-1	.8GHz - 2								
80-										
70-				N. A.						
			,	N <sub>k</sub>						
60-		- Idh			\					
			/							
		Maria Charles			The second second	paralli Maria de Li Maria		ANNAT (NANAY		
50-		Tildia (ilkuli) irindir			No. of the last of					
50-		Maria College Colored			2483.5 Frequency (MHz			MWINN		2500
30 - 20 - 2470		Results	Factor	Limit	2483.5		Table (o)	Height	ANT	
40-			Factor (dB)	Limit (dBuV/m)	2483.5 Frequency (MHz	z)				2500

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

Report No.: FCC1909217-02 Page 27 of 42

Date: 2019-10-12



# 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 Integral antenna. The antenna gain is 2.0dBi Max. It fulfills the requirement of this section. Test Result: Pass

Page 28 of 42

Report No.: FCC1909217-02



Product:	Smart Gateway				Test Mode:		Keep transmitting				
Mode	Keeping Transmitting				Test Voltage			120V~			
Temperature 24 deg. C,						Humidity	56% RH PK				
Test Result:	Result: Pass					Detector					
dB Bandwidth	ndwidth 2.42MH		2.42MHz								
	Del	ta 1	[T1]		RI	ЗW	100 k	Hz R	F Att	10 dB	
Ref Lvl			-0.	39 dB	VI	ЗW	300 k				
0 dBm		2	.424849	70 MHz	SI	$^{ m I}$	5 m	s U	nit	dBm	ı
0							<b>v</b> <sub>1</sub>	[T1]	-29	.30 dBm	
				Š					2.40374	749 GHz	
-10				M	V		<u>1</u>	[T1]	- (	1.39 dB	
				$\wedge$	مرسم	ν,	$\nabla_2$	[T1]	2.42484	970 MHz	
-20				$\sqrt{}$		4			2.40501	002 GHz	
			<u></u>				41				
_30 <u>D1 -29.59</u>	dBm		7								11
IMAX			~ /				10				
-40			$\forall$				\(\frac{1}{2}\)	$\overline{}$			
	~/M							/ W	$\bigvee_{\Lambda}$		
-50	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	/ <del>*</del>						<u> </u>	M m	$\wedge$	
WW ,	4								00	VVW	
-60											
-70											
-80											
-90											
100											
Center 2.4	05 GHz			1 M	Hz/				Span	10 MHz	

Page 29 of 42

Report No.: FCC1909217-02



Product:	Smart Ga	Test I	Mode:	Keep transmitting			
Mode	Keeping Tra	Test V	/oltage	120V~			
Temperature	24 deg	Hum	nidity	56% RH			
Test Result:	Pas	Dete	ector	PK			
20dB Bandwidth	2.44N	IHz	_				
(R)	Delta 1 [T	1]	RBW 1	100 kHz	RF Att	10 dB	
Ref Lvl		-0.27 dB		300 kHz			
0 dBm	2.44	488978 MHz	SWT	5 ms	Unit	dBm	
				▼ <sub>1</sub> [T1]	-28	.84 dBm	A
		-			2.43876	754 GHz	A
-10		- M	<u>۸</u>	▲1 [T1]	- C	.27 dB	
		/W *	~~~		2.44488		
-20			<del>\</del> -\-	∇ <sub>2</sub> [T1]	-8	.55 dBm	
		1/	41		2.44001	002 GHz	
-30 —D1 -28.55	dBm	7					
1MAX		/	)	\ .		1	1MA
-40	M^_/			\mu\			
					M	м	
-50	V				M	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
-60							
-70							
7.0							
-80							
-80							
-90							
-100							
Center 2.44 GHz 1 MHz/ Span 10 MHz							
Date: 11.OCT.2019 13:46:38							

Page 30 of 42

Report No.: FCC1909217-02



Product:	Smar	Te	est Mode:	Keep transmitting			
Mode	Keeping	Te	st Voltage	120V~			
Temperature	24	H	Iumidity	56% RH			
Test Result:		I	Detector	PK			
20dB Bandwidth	2.5						
	Delta 1		RBW	100 kHz		10 dB	
Ref Lvl		-0.50 dB	VBW	300 kH			
0 dBm	2.	50501002 MHz	SWT	5 ms	Unit	dBm	
				<b>v</b> <sub>1</sub> [	T1] -2	28.21 dBm	
			٨		2.4787	0741 GHz	
-10		N	M	<u></u> 1 [	T1] -	0.50 dB	
		JV	~~	₩		1002 MHz	
-20			7	<b>▽</b> 2 [	T1] -	8.20 dBm	
		<u>1</u> ~		<b>1</b> 1	2.4800	1002 GHz	
-30 —D1 -28.2	2 dBm						
1MAX		_ /		\ a M		1MA	
-40		\/		$\sqrt{\gamma}$	\ <u>,</u>		
	• • • • • • • • • • • • • • • • • • • •	<b>V</b>			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
-50					W	Λ.Α	
w \\	VV				· · · · · · · · · · · · · · · · · · ·		
-60							
-70							
-80							
-90							
-100							
Center 2.48 GHz 1 MHz/ Span 10 MHz							
Date: 11.OCT.2019 13:57:39							

Report No.: FCC1909217-02 Page 31 of 42

Date: 2019-10-12



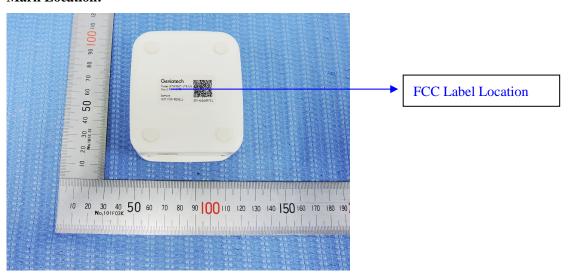
# 10.0 FCC ID Label

#### FCC ID: ZJU-E19C05

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:**



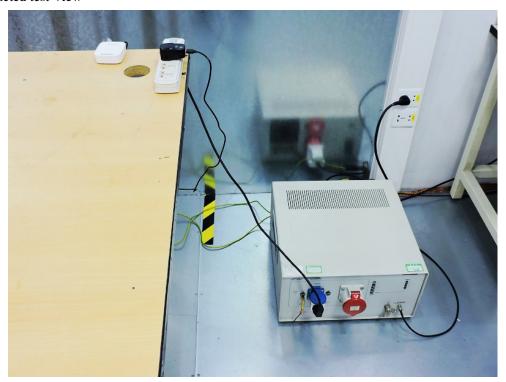
Report No.: FCC1909217-02 Page 32 of 42

Date: 2019-10-12



# 11.0 Photo of testing

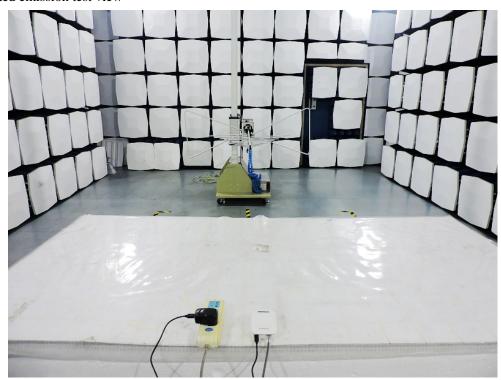
# 11.1 Conducted test View

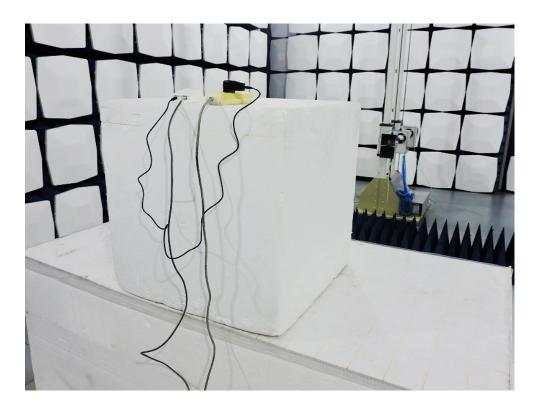


Date: 2019-10-12



#### 11.2 Radiated emission test view





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.

Date: 2019-10-12



# 11.3 Photographs – EUT

## Outside View





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.

Page 35 of 42

Report No.: FCC1909217-02

Date: 2019-10-12



Outside View





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.

Report No.: FCC1909217-02 Page 36 of 42

Date: 2019-10-12



Outside View





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.

Report No.: FCC1909217-02 Page 37 of 42

Date: 2019-10-12



# Outside View



Page 38 of 42

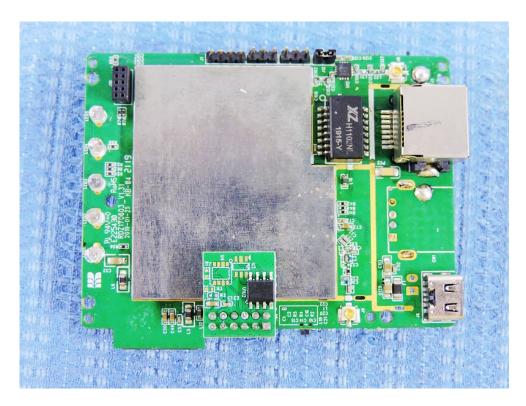
Report No.: FCC1909217-02

Date: 2019-10-12



Inside view





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

Page 39 of 42

Report No.: FCC1909217-02

Date: 2019-10-12



Inside view





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

Page 40 of 42

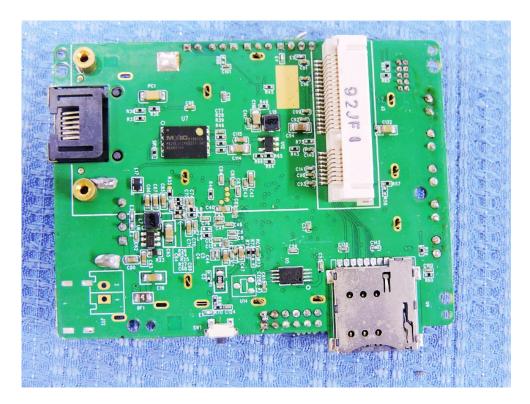
Report No.: FCC1909217-02

Date: 2019-10-12



Inside view





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

Page 41 of 42

Report No.: FCC1909217-02

Date: 2019-10-12



Inside view





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

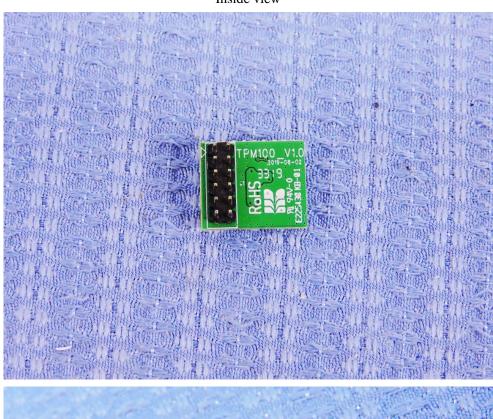
Page 42 of 42

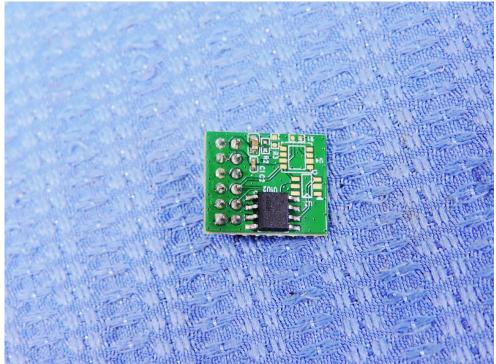
Report No.: FCC1909217-02

Date: 2019-10-12



Inside view





-- 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