

Applicant: Delta Electronics Incorporated

Product: NovoDS Digital Signage Solution

Model No.: DS210, DS110

Trademark: Vivitek

FCC ID: H79-023DS2

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

Terry Tang

Manager

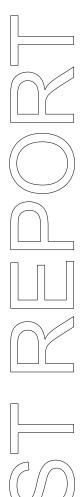
Dated: June 05, 2023

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.: TW2305190-01E Page 2 of 40

Date: 2023-06-05



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: 2023-06-05



Test Report Conclusion

Content 1.0 General Details.... 1.1 Test Lab Details 4 1.2 Applicant Details.... 4 1.3 Description of EUT 1.4 Submitted Sample.... 4 1.5 Test Duration. 5 1.6 Test Uncertainty. 1.7 Test By..... 5 2.0 List of Measurement Equipment 3.0 7 Technical Details..... Summary of Test Results.... 7 3.1 3.2 7 Test Standards 4.0 EUT Modification 7 Power Line Conducted Emission Test. 5.0 8 5.1 Schematics of the Test. 8 5 2 Test Method and Test Procedure. 8 Configuration of the EUT..... 5.3 8 5.4 EUT Operating Condition. Conducted Emission Limit. 5.5 9 5.6 Test Result. 6.0 Radiated Emission test 12 Test Method and Test Procedure. 6.1 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 19 7.1 Test Method and Test Procedure. 19 7.2 Radiated Test Setup. 19 19 7.3 Configuration of the EUT.... 7.4 19 EUT Operating Condition. 7.5 Band Edge Limit. 19 7.6 Band Edge Test Result. 20 8.0 Antenna Requirement 21 20dB bandwidth measurement 9.0 22 FCC ID Label 10.0 30 Photo of Test Setup and EUT View.... 31 11.0

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: 2023-06-05



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: Delta Electronics Incorporated

Address: 3 Tungyung rd., Chungli Industrial Zone, Taoyuan County 32063 Taiwan

Telephone: -Fax: --

1.3 Description of EUT

Product: NovoDS Digital Signage Solution

Manufacturer: Delta Electronics Incorporated

Address: 3 Tungyung rd., Chungli Industrial Zone, Taoyuan County 32063 Taiwan

Trademark: Vivitek
Additional Trademark: N/A
Model Number: DS210
Additional Model Name DS110

Rating: Input: DC5V, 3.0A

Power Supply: Model: CNXZX3015-050030SA

Input: AC100-240V~, 50/60Hz, 0.4A; Output: DC5V, 3A, 15W

Modulation Type: GFSK (Bluetooth Low Energy)

Operation Frequency: 2402-2480MHz

Channel Separate: 2MHz Channel Number: 40

Hardware Version: RKS221012

Software Version: build number: 5.0.0.12

Serial No.: N/A

Antenna Designation Dipole antenna used with reverse polarity antenna connector. The gain of the

antenna is 4.21dBi (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.: TW2305190-01E Page 5 of 40

Date: 2023-06-05



1.4 Submitted Sample: 2 Samples

1.5 Test Duration 2023-05-15 to 2023-06-05

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: Andy Xing

Page 6 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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
Spectrum	Keysight	N9020A	MY53300466	2023-03-05	2024-03-04
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		1	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 40

Report No.: TW2305190-01E

Date: 2023-06-05



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following 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

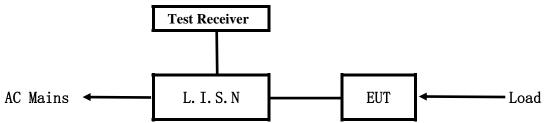
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

Date: 2023-06-05



5. Power Line Conducted Emission Test

5.1 Schematics of the test

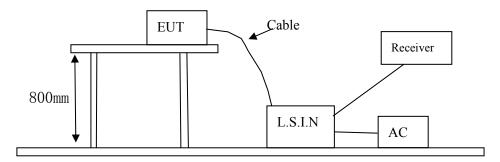


EUT: Equipment Under Test

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.

40 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID	
NovoDS Digital Signage	Delta Electronics	DC210 DC110	H79-023DS2	
Solution	Incorporated	DS210, DS110	H/9-025D52	

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.: TW2305190-01E Page 9 of 40

Date: 2023-06-05



B. Internal Device

Device	Trademark	Model	FCC ID/DOC
Adapter	Utech	CNXZX3015-0500305A	DOC

C. Peripherals

Device	Trademark	Model	Rating
LED Display	DELL	U2720QM	

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		
$5.00 \sim 30.00$	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: 2023-06-05



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

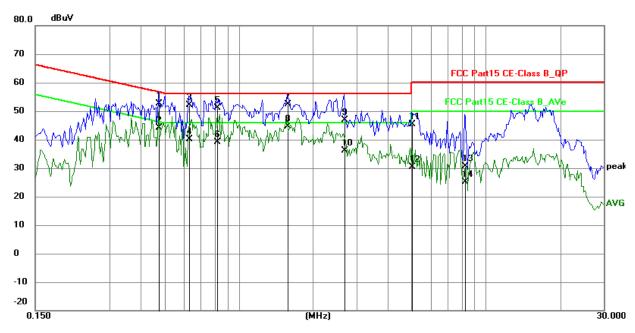
EUT Operating Environment

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

EUT set Condition: Communication by BT

Results: Pass Test Power:AC120V/60Hz

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.4737	42.80	9.77	52.57	56.45	-3.88	QP	Р
2	0.4737	34.24	9.77	44.01	46.45	-2.44	AVG	Р
3	0.6297	42.28	9.78	52.06	56.00	-3.94	QP	Р
4	0.6297	30.32	9.78	40.10	46.00	-5.90	AVG	Р
5	0.8169	41.37	9.78	51.15	56.00	-4.85	QP	Р
6	0.8169	29.29	9.78	39.07	46.00	-6.93	AVG	Р
7	1.5735	42.50	9.80	52.30	56.00	-3.70	QP	Ъ
8	1.5735	34.95	9.80	44.75	46.00	-1.25	AVG	Р
9	2.6655	37.00	9.83	46.83	56.00	-9.17	QP	Р
10	2.6655	26.33	9.83	36.16	46.00	-9.84	AVG	Р
11	5.0162	35.43	9.93	45.36	60.00	-14.64	QP	Р
12	5.0162	20.44	9.93	30.37	50.00	-19.63	AVG	Р
13	8.2299	20.46	10.07	30.53	60.00	-29.47	QP	Р
14	8.2299	14.94	10.07	25.01	50.00	-24.99	AVG	Р

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: 2023-06-05



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

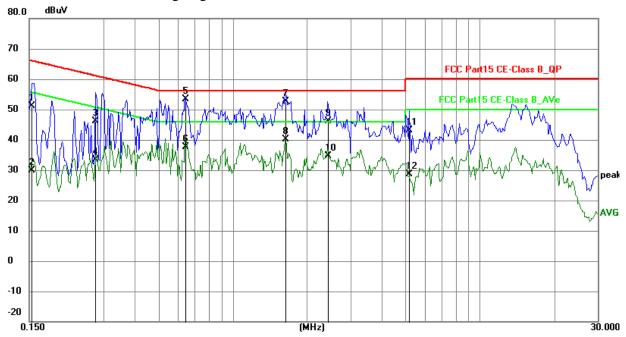
EUT Operating Environment

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

EUT set Condition: Communication by BT

Results: Pass Test Power:AC120V/60Hz

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1539	41.32	9.78	51.10	65.79	-14.69	QP	Р
2	0.1539	20.17	9.78	29.95	55.79	-25.84	AVG	Р
3	0.2787	36.26	9.76	46.02	60.85	-14.83	QP	Р
4	0.2787	23.60	9.76	33.36	50.85	-17.49	AVG	Р
5	0.6414	43.51	9.78	53.29	56.00	-2.71	QP	Р
6	0.6414	27.83	9.78	37.61	46.00	-8.39	AVG	Р
7	1.6320	42.84	9.80	52.64	56.00	-3.36	QP	Р
8	1.6320	30.37	9.80	40.17	46.00	-5.83	AVG	Р
9	2.4276	36.32	9.82	46.14	56.00	-9.86	QP	Р
10	2.4276	24.90	9.82	34.72	46.00	-11.28	AVG	Р
11	5.1840	33.10	9.94	43.04	60.00	-16.96	QP	Р
12	5.1840	18.68	9.94	28.62	50.00	-21.38	AVG	Р

Note: Both 240V and 120V voltages are tested, the data of the worst-case is shown in the report.

Date: 2023-06-05



6 Radiated Emission Test

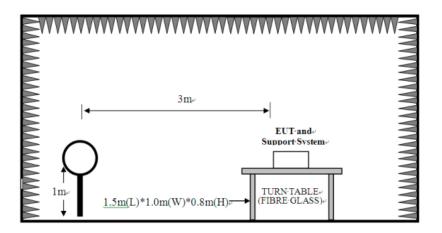
- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size 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 is set as follows:

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
Above IGHZ	Peak	1MHz	10Hz	Average

- (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



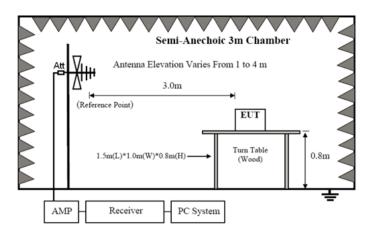
For radiated emissions from 30MHz to1GHz

Page 13 of 40

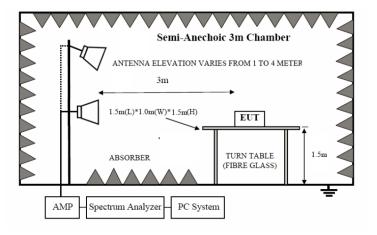
Report No.: TW2305190-01E

Date: 2023-06-05





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.: TW2305190-01E Page 14 of 40

Date: 2023-06-05



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 Strength of Fundamental (3m)			Field S	trength of Harmo	onics (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. BLE_1M and BLE_2M were tested and only the worst case was recorded in the test report and BLE_1M modulation was the worst case.

Report No.: TW2305190-01E Page 15 of 40

Date: 2023-06-05

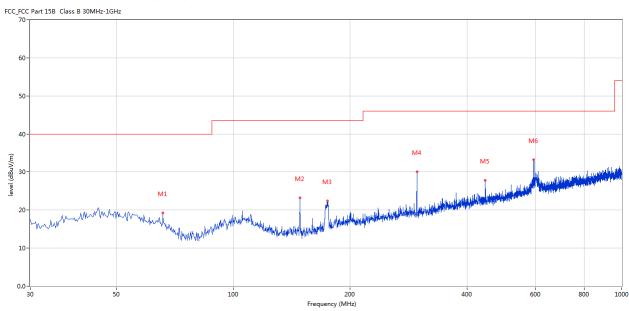


General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

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)		(0)	(cm)		
1	65.881	19.27	-13.87	40.0	-20.73	Peak	22.00	100	Horizontal	Pass
2	148.553	23.15	-17.15	43.5	-20.35	Peak	185.00	100	Horizontal	Pass
3	174.979	22.40	-15.68	43.5	-21.10	Peak	137.00	100	Horizontal	Pass
4	296.926	30.10	-11.07	46.0	-15.90	Peak	153.00	100	Horizontal	Pass
5	445.541	27.85	-8.02	46.0	-18.15	Peak	153.00	100	Horizontal	Pass
6	593.914	33.19	-5.25	46.0	-12.81	Peak	147.00	100	Horizontal	Pass

Report No.: TW2305190-01E Page 16 of 40

Date: 2023-06-05

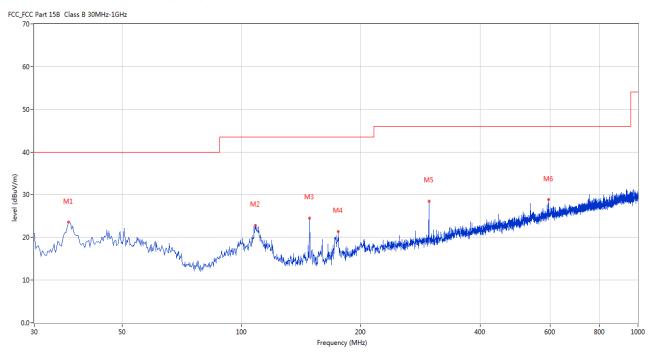


Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	36.546	23.53	-13.45	40.0	-16.47	Peak	100.00	100	Vertical	Pass
2	108.550	22.86	-13.46	43.5	-20.64	Peak	354.00	100	Vertical	Pass
3	148.553	24.47	-17.15	43.5	-19.03	Peak	116.00	100	Vertical	Pass
4	175.464	21.37	-15.57	43.5	-22.13	Peak	0.00	100	Vertical	Pass
5	296.926	28.44	-11.07	46.0	-17.56	Peak	42.00	100	Vertical	Pass
6	594.156	28.81	-5.26	46.0	-17.19	Peak	219.00	100	Vertical	Pass

Report No.: TW2305190-01E Page 17 of 40

Date: 2023-06-05



Operation Mode: Transmitting under Low Channel (2402MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dB \(\mu \text{V/m} \)
2402	85.23	Н	114(Peak)/ 94(AV)
2402	90.06	V	114(Peak)/ 94(AV)
4804		Н	74(Peak)/ 54(AV)
4804		V	74(Peak)/ 54(AV)
7206	-	H/V	74(Peak)/ 54(AV)
9608		H/V	74(Peak)/ 54(AV)
12010	1	H/V	74(Peak)/ 54(AV)
14412	1	H/V	74(Peak)/ 54(AV)
16814	-	H/V	74(Peak)/ 54(AV)
19216		H/V	74(Peak)/ 54(AV)
21618	-	H/V	74(Peak)/ 54(AV)
24020		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting g under Middle Channel (2440MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)
2440	85.30	Н	114(Peak)/ 94(AV)
2440	90.21	V	114(Peak)/ 94(AV)
4880		Н	74(Peak)/ 54(AV)
4880		V	74(Peak)/ 54(AV)
7320		H/V	74(Peak)/ 54(AV)
9760		H/V	74(Peak)/ 54(AV)
12200		H/V	74(Peak)/ 54(AV)
14640		H/V	74(Peak)/ 54(AV)
17080		H/V	74(Peak)/ 54(AV)
19520		H/V	74(Peak)/ 54(AV)
21960		H/V	74(Peak)/ 54(AV)
24400		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp

2. Remark "---" means that the emissions level is too low to be measured

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.: TW2305190-01E Page 18 of 40

Date: 2023-06-05



Operation Mode: Transmitting under High Channel (2480MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \text{V/m} \)
2480	85.61	Н	114(Peak)/ 94(AV)
2480	91.93	V	114(Peak)/ 94(AV)
4960		Н	74(Peak)/ 54(AV)
4960		V	74(Peak)/ 54(AV)
7440	1	H/V	74(Peak)/ 54(AV)
9920		H/V	74(Peak)/ 54(AV)
12400	1	H/V	74(Peak)/ 54(AV)
14880	1	H/V	74(Peak)/ 54(AV)
17360	-	H/V	74(Peak)/ 54(AV)
19840		H/V	74(Peak)/ 54(AV)
22320	-	H/V	74(Peak)/ 54(AV)
24800		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp

^{2.} Remark "---" means that the emissions level is too low to be measured

Date: 2023-06-05

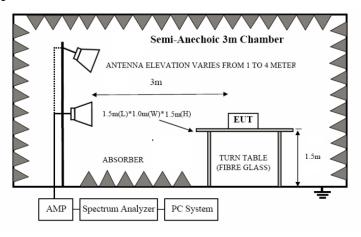


7. Band Edge

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.

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.: TW2305190-01E Page 20 of 40

Date: 2023-06-05



7.6 Test Result

Restricted band Measurement

EUT	NovoDS Digital Signage Solution			Мо	del	DS210
Mode	Kee	eping Transmitting		Test V	oltage/	120V~
Temperature		24 deg. C,		Hum	nidity	56% RH
Test Result:		Pass		Dete	ector	PK
		Low Channe	l, Vertical	L		
2390	PK (dBµV/m)	41.35	т :-	:+		$74(dB\mu V/m)$
	AV (dBμV/m)		Limit			54(dBµV/m)
2400	PK (dBµV/m)	63.12	Limit		74(dBμV/m)	
	AV (dBμV/m)	46.85			54(dBμV/m)	
		Low Channe	l, Vertical			
2390	PK (dBµV/m)	41.55	т.:.	.		$74(dB\mu V/m)$
	AV (dBμV/m)		Limit			54(dBµV/m)
2400	PK (dBµV/m)	59.71	Limit			$74(dB\mu V/m)$
	AV (dBμV/m)	44.28	Lii	IIIt		54(dBµV/m)

Restricted band Measurement

EUT	NovoDS Digital Signage Solution			M	odel	DS210				
Mode	Ke	eeping Transmitting		Test	Voltage	120V~				
Temperature		24 deg. C,		Hur	nidity	56% RH				
Test Result:	Pass			De	tector	PK				
	High Channel, Horizontal									
2483.5	PK (dBμV/m)	50.53	т ::	:4	$74(dB\mu V/m)$					
	AV $(dB\mu V/m)$		Limit			$54(dB\mu V/m)$				
	High Channel, Vertical									
2483.5	PK (dBμV/m)	55.76	Limit			$74(dB\mu V/m)$				
	AV (dBμV/m)	41.32	Limi	I		54(dBμV/m)				

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

2. BLE_1M and BLE_2M were tested and only the worst case was recorded in the test report and BLE_1M modulation was the worst case.

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.: TW2305190-01E Page 21 of 40

Date: 2023-06-05



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 Dipole antenna used with reverse polarity antenna connectors. The gain is 4.21dBi (Get from the antenna specification). It fulfills the requirement of this section.

Test Result: Pass

Date: 2023-06-05



Page 22 of 40

9.0 20dB Bandwidth Measurement

Type of Modulation: GFSK 1M

Type of Middle of Sir 111							
EUT	NovoDS Digital Signage Solution		Model	DS210			
Mode	Mode Keep Transmitting		Input Voltage	120V~			
Temperat	mperature 24 deg. C,		Humidity	56% RH			
Channel	Channel Frequency (MHz)	• •		Pass/ Fail			
Low	2402	1.182		Pass			
Middle	2441	1.181		Pass			
High	2480	1.184		Pass			

Page 23 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



Test Figure:

1. Condition: Low Channel



Page 24 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



2. Condition: Middle Channel



Page 25 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



3. High Channel



Page 26 of 40 Report No.: TW2305190-01E

Date: 2023-06-05



Type of Modulation: GFSK 2M

-J P							
EUT	Γ NovoDS Digital Signage Solution		Model	DS210			
Mode	Mode Keep Transmitting		Input Voltage	120V~			
Temperat	ure 2	24 deg. C, Humidity		24 deg. C,		56% RH	
Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass/ Fail			
Low	2402	2.214		Pass			
Middle	2441	2.244		Pass			
High	2480 2.247			Pass			

Page 27 of 40

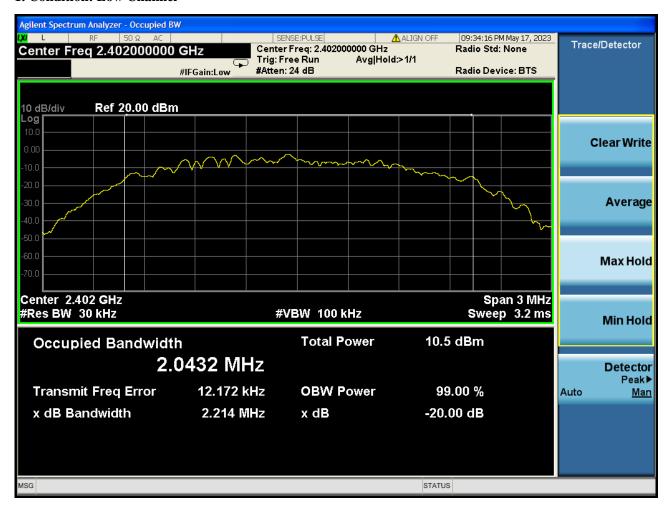
Report No.: TW2305190-01E

Date: 2023-06-05



Test Figure:

1. Condition: Low Channel



Page 28 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



2. Condition: Middle Channel



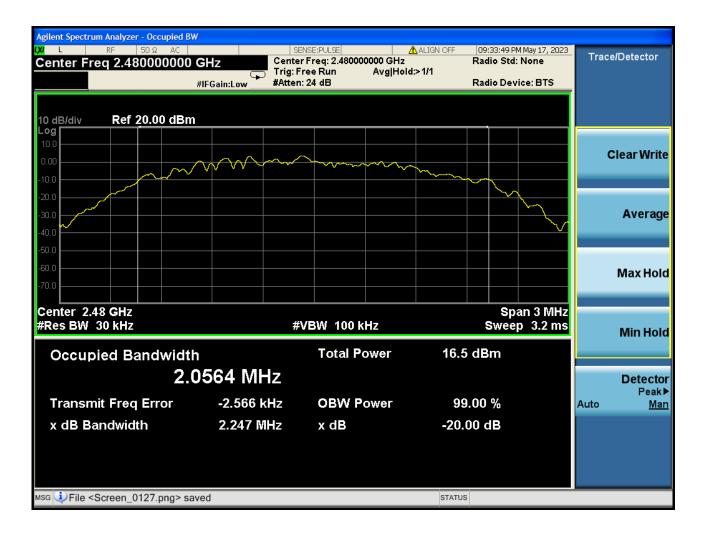
Page 29 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



3. High Channel



Report No.: TW2305190-01E Page 30 of 40

Date: 2023-06-05



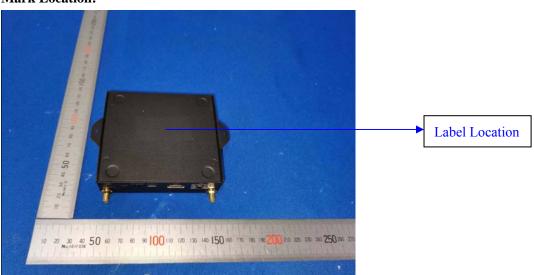
10.0 FCC ID Label

FCC ID: H79-023DS2

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 31 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



11.0 Photo of testing

11.1 Conducted test View



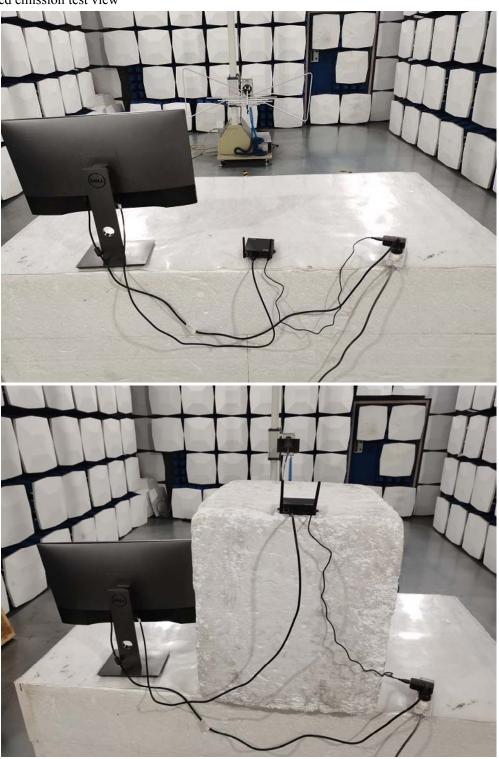
Page 32 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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.

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.

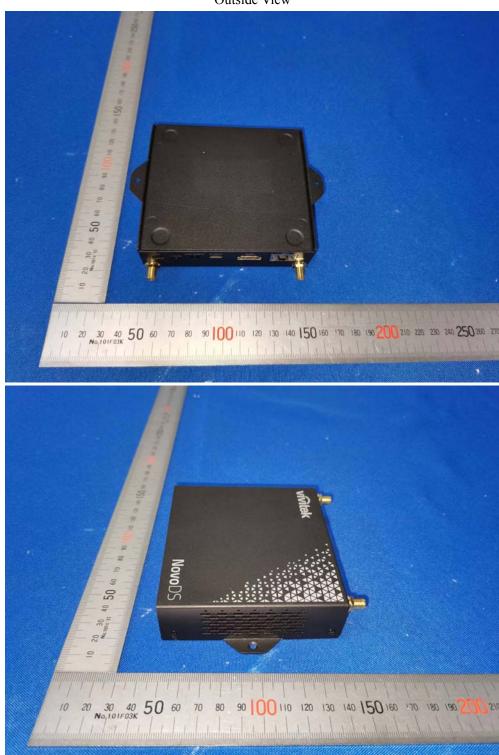
Page 33 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to

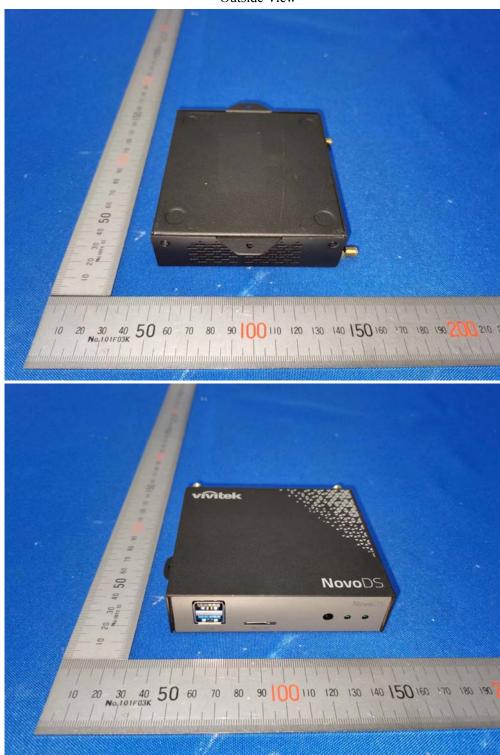
Page 34 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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.

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.: TW2305190-01E Page 35 of 40

Date: 2023-06-05



Outside View



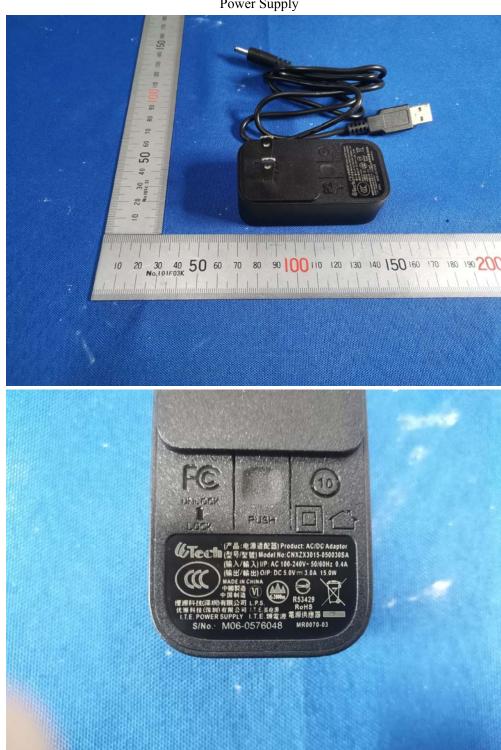
Page 36 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



Power Supply



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

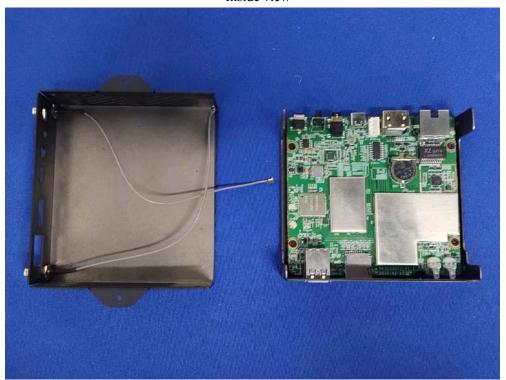
Page 37 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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 38 of 40

Report No.: TW2305190-01E

Date: 2023-06-05



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 40

Report No.: TW2305190-01E

Date: 2023-06-05



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 40

Report No.: TW2305190-01E

Date: 2023-06-05



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