Vecow Co., Ltd.

TEST REPORT

REPORT NUMBER
200500248TWN-001

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PAGES
47

EMC
TEST REPORT

Applicant:	**Vecow Co., Ltd.** **3F, No. 10, Jiankang Rd., Zhonghe Dist., New Taipei City, Taiwan**
Product:	**MTC-7000 Series Multi-touch panel pc**
Model No.:	**MTC-7XXX-XXX, MTC-7010W**
Brand Name:	**Vecow**
Test Method/ Standard:	**EN 50121-3-2: 2016+A1: 2019**
Test By:	**Intertek Testing Services Taiwan Ltd.,** **Hsinchu Laboratory** **No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,** **Shiang-Shan District, Hsinchu City, Taiwan**

Prepared and Checked by:

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Revision History

Report No.	Issue Date	Revision Summary
200500248TWN-001	Jun. 15, 2020	Original report

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1. General Information

1.1 Identification of the EUT

Product:	MTC-7000 Series Multi-touch panel pc
Model No.:	MTC-7010W
Rated Power:	DC 24V from adapter
Power Cord:	3C × 0.75mm^2 × 2 meter unshielded cable
Sample receiving date:	May 22, 2020
Sample condition:	Workable
Testing date:	May 28, 2020 ~ Jun. 09, 2020

1.2 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Model no.	Specification
Adapter	FSP120-AABN2	I/P: 100-240Vac, 50-60Hz, 1.8A O/P: 24Vdc, 5.0A, 120W

1.3 Additional information about the EUT

The customer confirmed MTC-7XXX-XXX is a series model to MTC-7010W (EUT), the different model numbers are served as marketing strategy.

For model: MTC-7XXX-XXX
The customer confirmed denote of “X” in model number as 0~9, A~Z, or blank for marketing purpose.

2. Test Summary

Emission			
Standard	**Test Type**	**Result**	**Remarks**
EN 50121-3-2: 2016+A1: 2019	Conducted Emission	PASS	Meet Limit
EN 61000-6-4: 2007	Radiated Emission	PASS	Meet Limit

Immunity				
Standard	**Test Type**	**Performance Criteria**	**Result**	
EN 61000-4-2: 2009	ESD	Criterion B	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-3: 2006 +A1:2008+A2:2010	RS	Criterion A	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-4: 2012	EFT	Criterion B	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-5: 2014	Surge	Criterion B	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-6: 2014	CS	Criterion A	PASS	Meets the requirements of Performance Criterion A

Note: 1. The test items of surge in this report were conducted at the International Standards Laboratory Corp. (No.120, Lane 180, Xinhe RD., Longtan Dist., Taoyuan City 325, Taiwan).

2. Please note that the test results with statement of conformity, the decision rules which are based on: Safety Testing: the specification, standard or IEC Guide 115. Other Testing: the specification, standard and not taking into account the measurement uncertainty.

3. Test Specifications

3.1 Standards

EN 50121-3-2: 2016+A1: 2019 Railway applications. Electromagnetic compatibility. Rolling stock. Apparatus

3.2 Performance criteria

Based on the criteria A, B, C defined in EN 50121-1: 2017

Criteria A:
The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criteria B:
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used

Criteria C:
Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

3.3 Mode of operation during the test

The EUT was supplied with DC 24 V from adapter. (Test voltage: 230Vac, 50Hz)

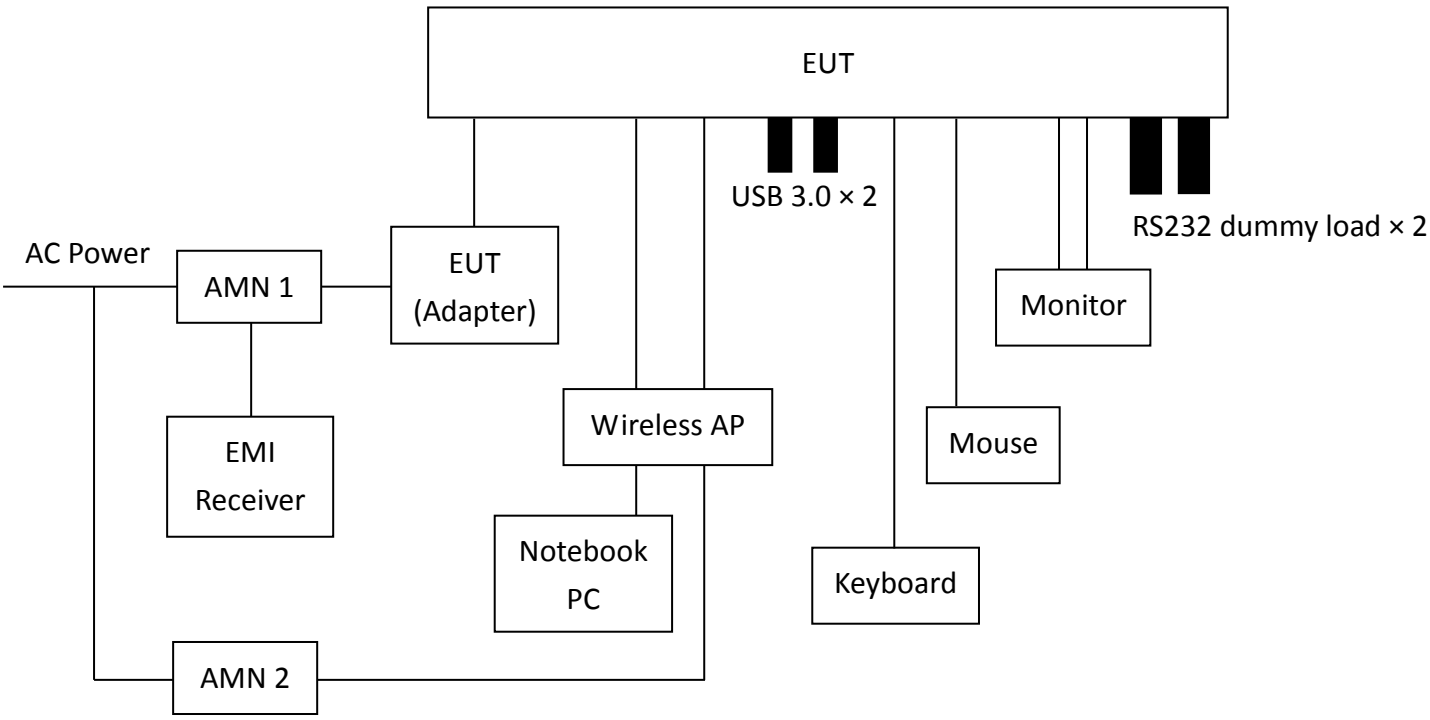
1. The EUT was setup in full load condition.
2. Ethernet port 1 & 2 connected to the WAP.
3. Power ON EUT, executed “ping command” at EUT and WAP & Notebook PC and connected each other.
4. EUT executed "Burn in" & Play color bar.
5. Start test.

3.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Description of Data Cable
Notebook PC	HP	HSTNN-Q96C	5CD8021S9J	N/A
Monitor	DELL	P2210t	CN-0R945K-74445-0BA-588S	1. Shielded Display cable 1.8meter 2. Shielded DVI cable 1.5 meter
Wireless AP	BUFFALO	WZR-AGL300NH	44000000000000	Unshielded RJ-45 cable 6 meter
Keyboard	ViewSonic	VS10230	P80053802065	N/A
Mouse	HP	M-UAE96		N/A
USB 3.0	Kingston	DTSE9G2/8GB	PR180707B003589-0000288	N/A
USB 3.0	Kingston	DTSE9G2/8GB	PR180707B003589-0000090	N/A
RS232 dummy load × 2	N/A	N/A	N/A	N/A

4. Conducted Emission Test

4.1 Test Procedure



The EUT along with its peripherals were placed on a 1.0 meter(W)×1.5meter(L) and 0.8 meter in height wooden table and the EUT was adjusted to maintain a 0.4meter space from a vertical reference plane. The EUT was connected to power mains through a Artificial Mains Network (AMN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
The excess power cable between the EUT and the AMN was bundled. All connecting cables of EUT and peripherals were moved to find the maximum emission

4.2 Test Equipment

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	R&S	ESR-7	101232	2020/01/18	2021/01/16
LISN	R&S	ENV216	101160	2019/07/17	2020/07/15
LISN	R&S	ESH3-Z5	835239/023	2019/09/23	2020/09/21
CON-2 Cable	SUHNER	EMCCFD300-BM-NM-6000	170502	2020/04/30	2021/04/29
Test software	Audix	e3	V4.20040112L	NCR	NCR

Note: No Calibration Required (NCR).

4.3 Conducted Emission Limit

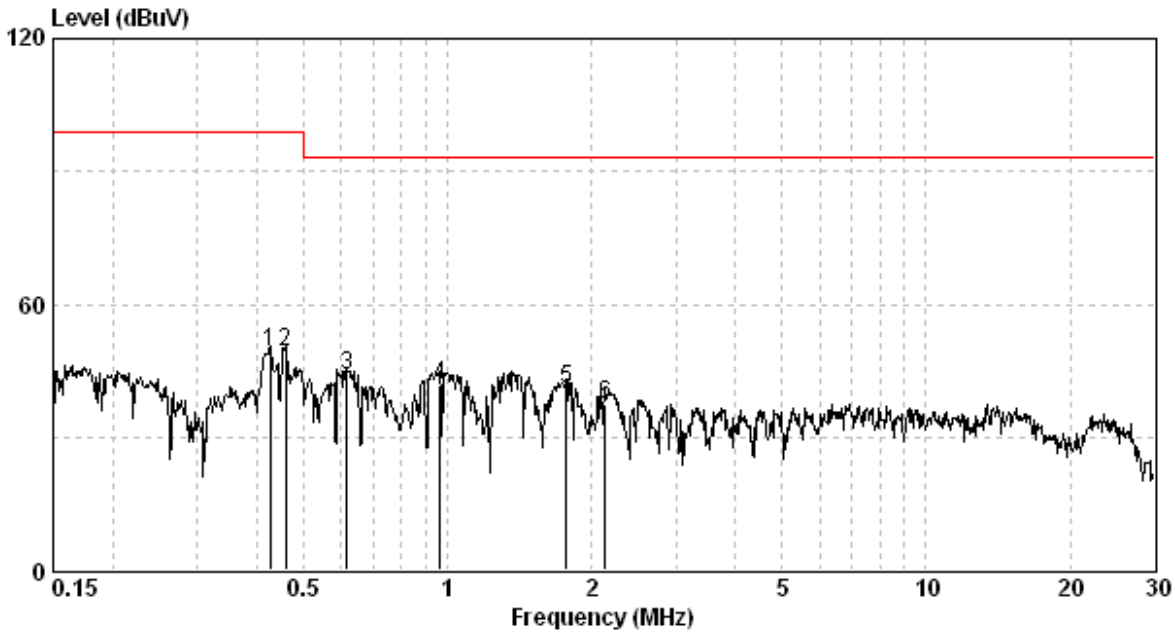
Frequency (MHz)	Limit (dBµV) Quasi-peak
0.15~0.50	99
0.50~30.0	93

4.4 Conducted Emission Data

Phase:	Live Line			
Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	58	%	Test Date:	May 29, 2020
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Margin (dB) QP
0.426	9.78	39.57	49.35	99.00	-49.65
0.459	9.79	39.55	49.34	99.00	-49.66
0.617	9.80	34.16	43.96	93.00	-49.04
0.963	9.81	32.05	41.86	93.00	-51.14
1.772	9.83	31.09	40.91	93.00	-52.09
2.133	9.83	27.64	37.48	93.00	-55.52

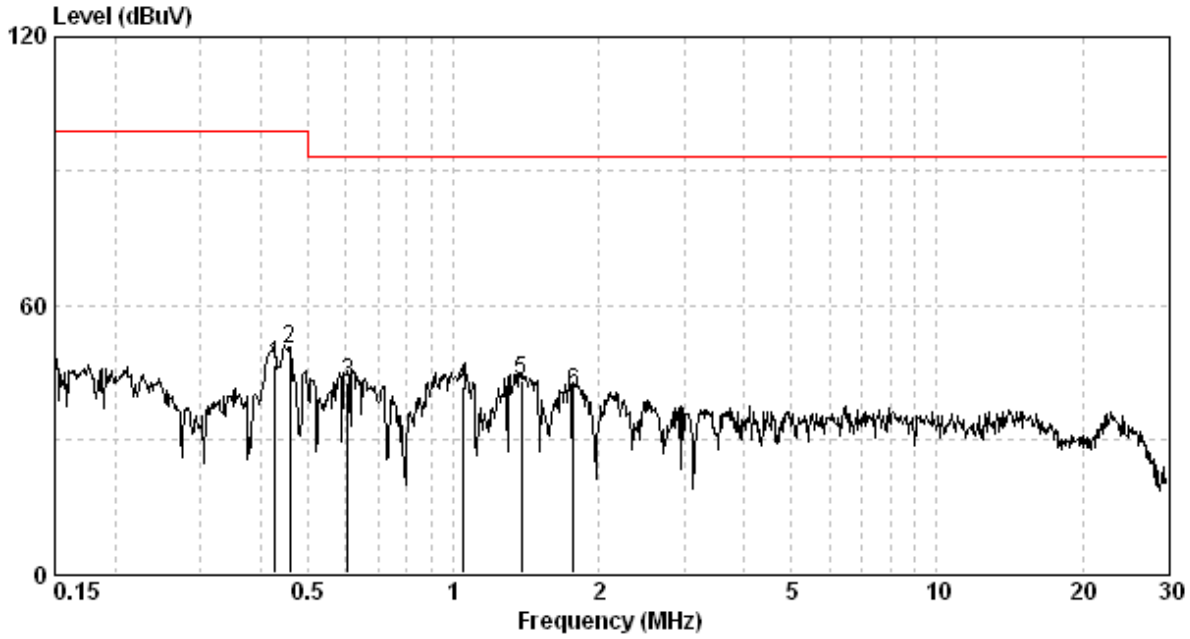
Remark:
1. Corr. Factor (dB) = AMN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)



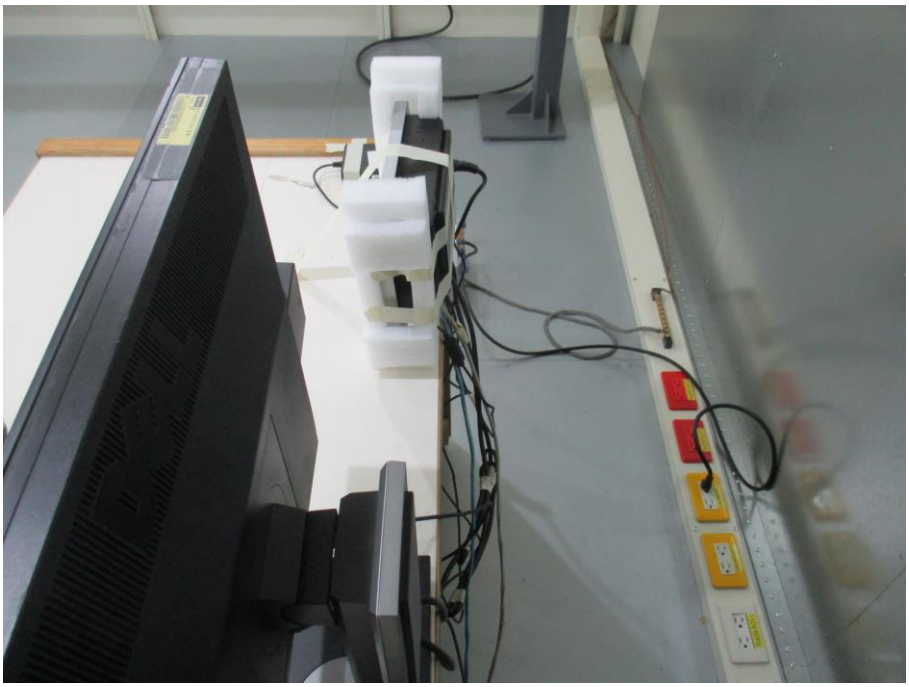
Phase:	Neutral Line			
Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	58	%	Test Date:	May 29, 2020
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Margin (dB) QP
0.428	9.78	36.87	46.65	99.00	-52.35
0.459	9.79	40.26	50.05	99.00	-48.95
0.604	9.81	33.01	42.82	93.00	-50.18
1.049	9.82	31.91	41.73	93.00	-51.27
1.381	9.83	33.32	43.15	93.00	-49.85
1.772	9.84	30.59	40.43	93.00	-52.57

Remark:
1. Corr. Factor (dB) = AMN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)



4.5 Conducted Emission Test Set-up

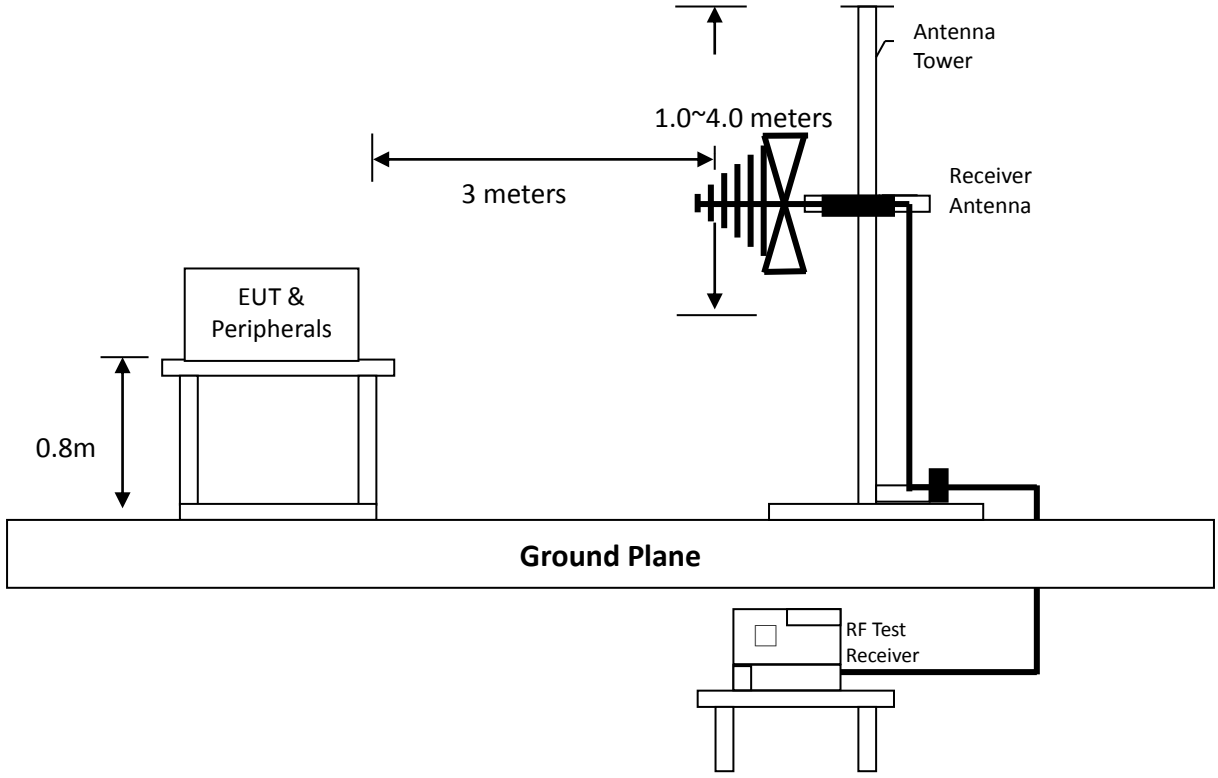


5. Radiated Emission Test

5.1 Test Procedure

The figure below shows the test setup, which is utilized to make these measurements.

Side View



Radiated testing was performed at a 3 meters semi-anechoic chamber. The equipment under test were placed on a turntable top 0.8 meter above ground. The table was 360 degrees to determine the position of the highest radiation. EUT is set 3 meters from the EMI receiving antenna, which is mounted on a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength. Both horizontal polarization and vertical polarization of the antenna was set to conduct the measurement.

The bandwidth was set on the EMI meter 120 kHz.

The levels are quasi peak value readings. The frequency spectrum from 30 MHz to 1000 MHz was investigated.

5.2 Test Equipment

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	R&S	ESU40	100381	2019/06/05	2020/06/03
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIC	VULB 9168	9168-172	2019/06/05	2020/06/03
966-1(A) Cable	SUHNER	SMA / SUCOFLEX 104	29510614	2020/04/13	2021/04/12
966-1(B) Cable	JUNFLON	SMA / J12J100880-00	AUG-26-08-001	2020/04/13	2021/04/12
966-1_3m Semi-Anechoic Chamber	966_1	CEM-966_1	N/A	2020/03/04	2021/03/02
Test software	Audix	e3	4.20040112L	NCR	NCR

Note: No Calibration Required (NCR).

5.3 Radiated Emission Limit

Frequency (MHz)	Distance(m)	Limit (dBμV/m)
30~230	3	50
230~1000	3	57

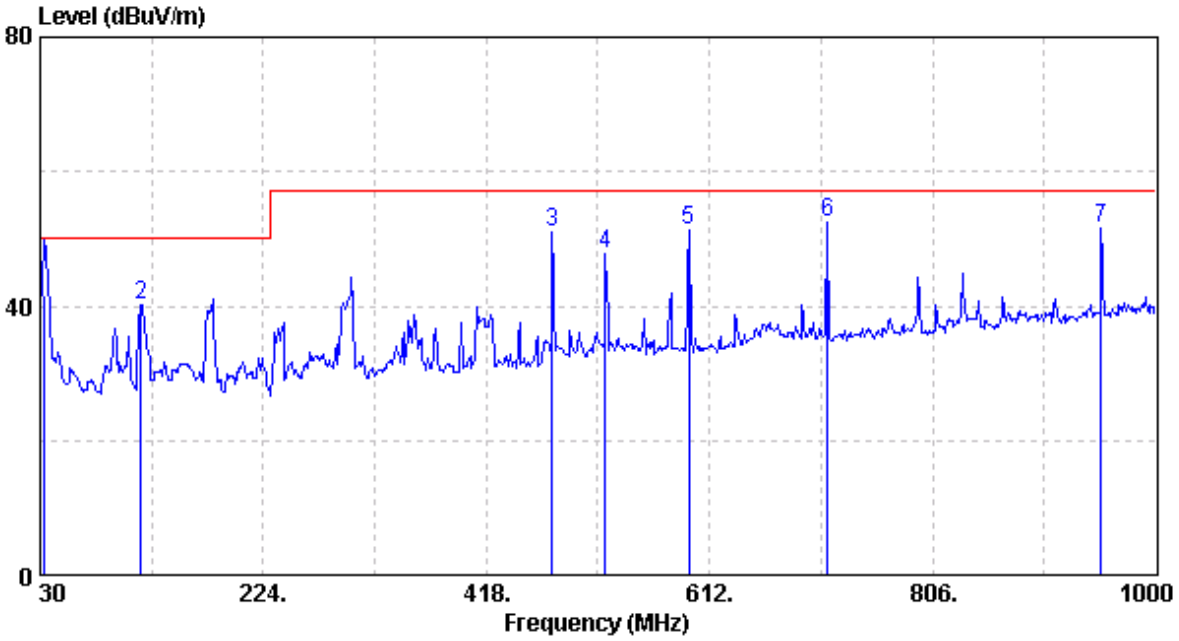
Note:
1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the EUT to antenna.

5.4 Radiated Emission Test Data

Polarity:	Vertical			
Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	58	%	Test Date:	May 28, 2020
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Freq	Pol/Phase	Factor	Read Level	Level	Limit Line	Over Limit	Remark
MHz		dB	dBuV	dBuV/m	dBuV/m	dB	
32.910	VERTICAL	24.75	16.90	41.65	50.00	-8.35	QP
117.300	VERTICAL	17.81	22.44	40.25	50.00	-9.75	QP
475.230	VERTICAL	26.22	24.69	50.90	57.00	-6.10	QP
521.790	VERTICAL	27.26	20.48	47.75	57.00	-9.25	QP
594.540	VERTICAL	27.90	23.33	51.22	57.00	-5.78	QP
714.820	VERTICAL	29.71	22.68	52.39	57.00	-4.61	QP
952.470	VERTICAL	33.53	17.99	51.51	57.00	-5.49	QP

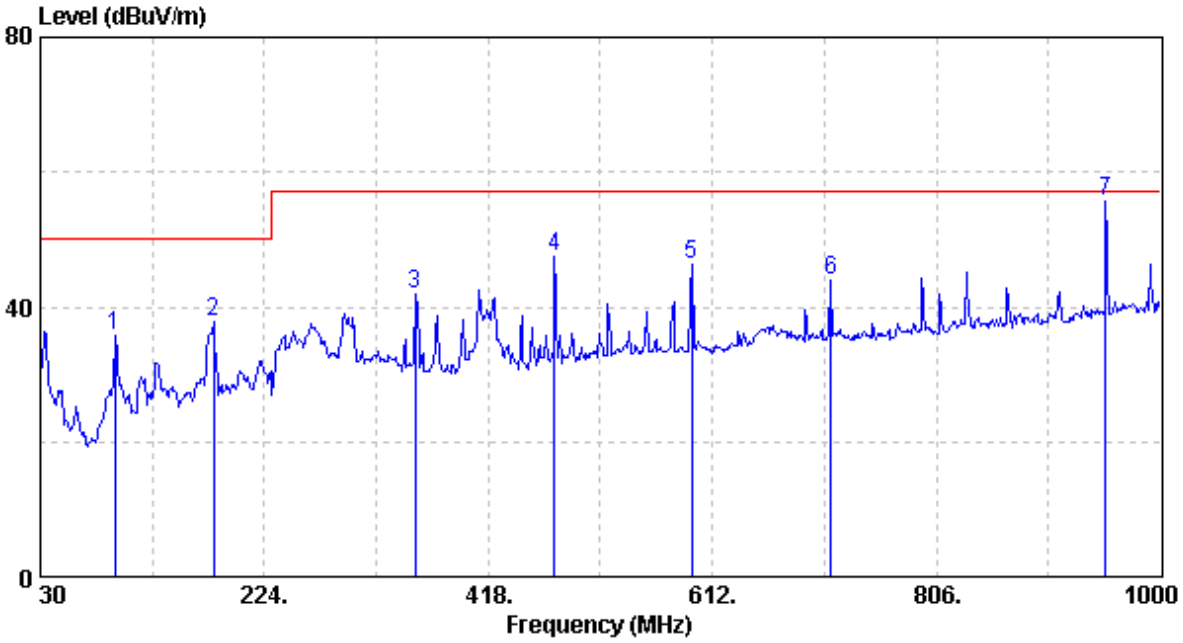
Remark:
1. Factor = Antenna Factor (dB/m) + Cable Loss (dB)
2. Level (dBµV/m) = Factor (dB) + Read Level (dBµV)
3. Over Limit (dB) = Level (dBµV/m) – Limit Line (dBµV/m)



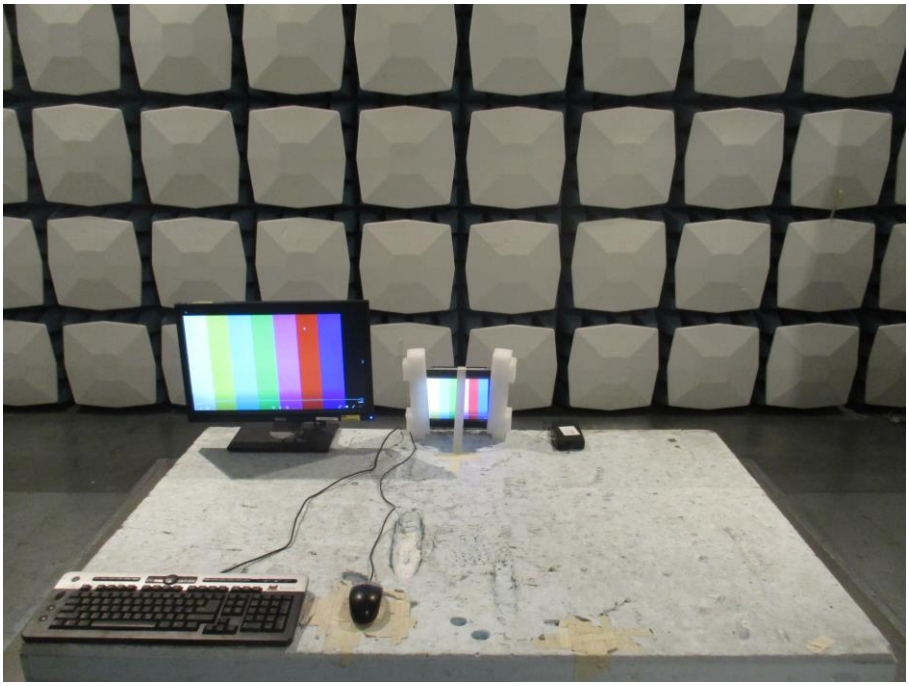
Polarity:	Horizontal			
Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	58	%	Test Date:	May 28, 2020
Atmospheric Pressure:	1008	hPa	Remark:	N/A

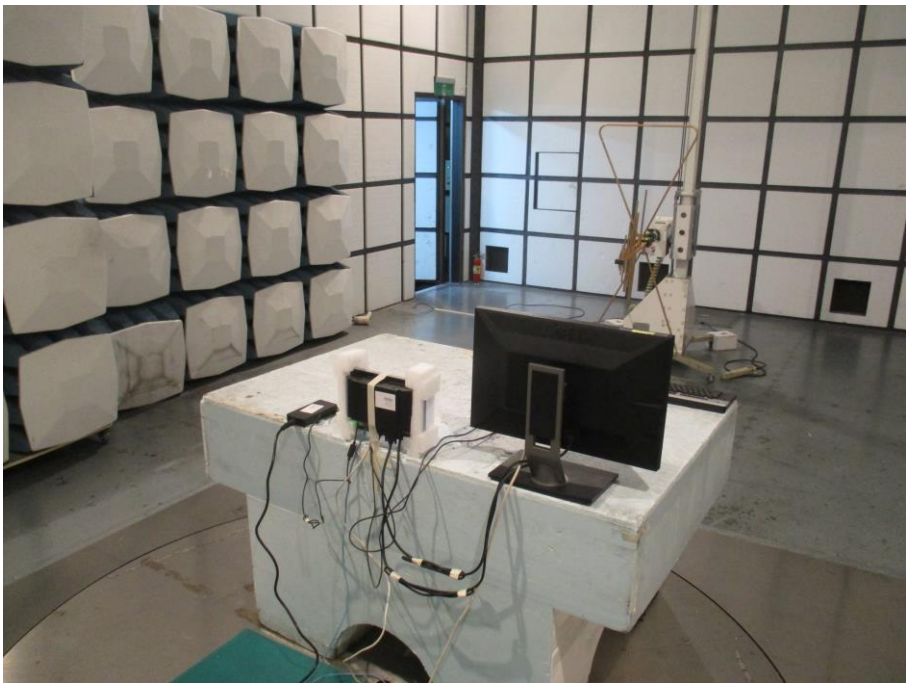
Freq	Pol/Phase	Factor	Read Level	Level	Limit Line	Over Limit	Remark
MHz		dB	dBuV	dBuV/m	dBuV/m	dB	
94.990	HORIZONTAL	16.10	19.77	35.86	50.00	-14.14	QP
180.350	HORIZONTAL	17.08	20.63	37.71	50.00	-12.29	QP
354.950	HORIZONTAL	23.93	17.91	41.84	57.00	-15.16	QP
475.230	HORIZONTAL	26.22	21.16	47.37	57.00	-9.63	QP
594.540	HORIZONTAL	27.90	18.51	46.41	57.00	-10.59	QP
714.820	HORIZONTAL	29.71	14.35	44.07	57.00	-12.93	QP
952.470	HORIZONTAL	33.53	22.12	55.65	57.00	-1.36	QP

Remark:
1. Factor = Antenna Factor (dB/m) + Cable Loss (dB)
2. Level (dBµV/m) = Factor (dB) + Read Level (dBµV)
3. Over Limit (dB) = Level (dBµV/m) – Limit Line (dBµV/m)



5.5 Radiated Emission Test Set-up





6. Electrostatic Discharge Immunity Test

6.1 Purpose

The object of the test is to evaluate the ESD immunity performance of EUT.

6.2 Test Set-Up

A horizontal coupling plane (HCP) was placed on a non-metallic table 0.8 meter above a reference ground plane (RGP) and connected to it with a cable with two 470 kΩ resistors. The EUT was placed on an insulation sheet on the HCP and was operated according to the specified operating mode.

A vertical coupling plane (VCP) was connected to the RGP with a cable with two 470 kΩ resistors.

6.3 Test Specification

Test level:	Air discharge	-------	+/- 8 kV
	Contact discharge	-------	+/- 6 kV

Single discharge at 1 second interval positive discharge and negative discharge

The selected test points are listed in this table, the numbers refer to the figures attached.

6.4 Test Equipment

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
Electrostatic Discharge System	NoiseKen	ESS-2002	ESS0291088	2019/08/17	2020/08/15

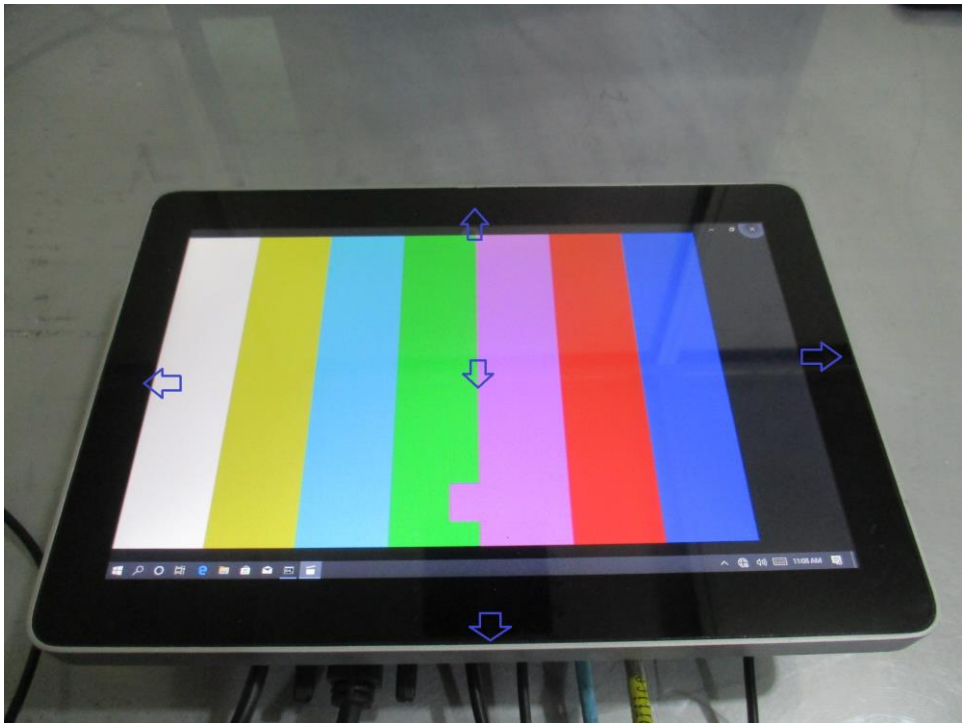
6.5 Test Result

Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	52	%	Test Date:	Jun. 04, 2020
Atmospheric Pressure:	1003	hPa	Remark:	N/A

Point of Discharge	Applied Voltage (kV)	Number of Discharge	Test Result	Performance Criterion
Contact Test Point (Red points)	±6	20	PASS	A
Air Test Point (Blue points)	±8	20	PASS	A
VCP (4 sides)	±6	20	PASS	A
HCP (4 sides)	±6	20	PASS	A

Description of Discharge Point

Contact Discharge 15 Test points		Air Discharge	
☒	Metallic Screws	☐	Plastic Screws
☒	Metallic Case	☐	Plastic Case (gap)
☒	Metallic Connect ports	☐	Plastic Connect ports
☒	Metallic Junctions	☐	Plastic Junctions
☐	Others:	☐	LED indicator
		☒	Panel Board
		☐	Others:




FSP GROUP INC.
全漢企業股份有限公司/全汉企业股份有限公司
Switching Power Adapter (電源供應器/电源适配器)
Model No (型號/型号): FSP120-AABN2
AC Input (輸入/输入): 100-240V~,1.8A, 50-60Hz
DC Output (輸出/输出): 24.0V⎓5.0A 120.0W
CAUTION(警告/警告):
For use with Information Technology Equipment.
(適用於資訊類產品/适用于资讯类产品)
ATTENTIONS:
Pour les équipements de traitement de l'information.
ATTENTION:
Nur zur Verwendung mit informationstechnischen Einrichtungen.
VO(+)
GND(-)
LISTED
I.T.E. POWER SUPPLY
E190414
RoHS
EFFICIENCY LEVEL VI
MADE IN CHINA YL
(中国製造/中国制造)

6.6 Electrostatic Discharge (ESD) Test Set-up

7. Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

7.1 Purpose

This test method subjects the EUT to a power source of disturbance comprising electric and magnetic field, simulating those coming from intentional RF transmitters.

7.2 Test Set-Up

The EUT was placed on a non-metallic table 0.8 meter above the reference ground plane (RGP) and was operated according to its specified operating mode.

Ferrite tiles/absorbers were placed on the RGP between the EUT and the antenna to reduce the reflections from the RGP. The EUT and its cables were exposed for the electromagnetic field for 1.5meter vertically and 1.5m horizontally.

The distance between antenna and EUT is 3 meter.

7.3 Test Specification

The frequency steps	: 1 % of preceding frequency value
Modulation	: 1kHz Sine Wave, 80%, AM Modulation
Dwell time	: 3 sec
Frequency range	: 80 MHz ~ 6000 MHz
Test ports	: Enclosure port
Test field strength	: 20V/m, 10V/m, 5V/m, 3V/m

7.4 Test Equipment

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
733 Compact Full Anechoic Chamber	Comtest	9708093	N/A	2019/09/12	2020/09/10
Signal Generator	R&S	SMB100A	102385	2020/02/17	2021/02/15
Field Meter	Narda	NBM-520	D-1426	2019/06/09	2022/06/07
Field Probe	Narda	EF0691	H-0199	2019/06/09	2022/06/07
Test software	Audix	i2	V5.160923	NCR	NCR

Note: No Calibration Required (NCR).

7.5 Generation of the Electromagnetic Field

The electromagnetic field is generated from a computer controlled signal generator. The output power is amplified and then radiated from broadband log periodic antennas. For each sweep a pre-recorded empty chamber calibration file is used to establish the required field strength. When using these files the field strength inside an area of 1.5/1.0 meter x 1.5 meter is in accordance with the standard.

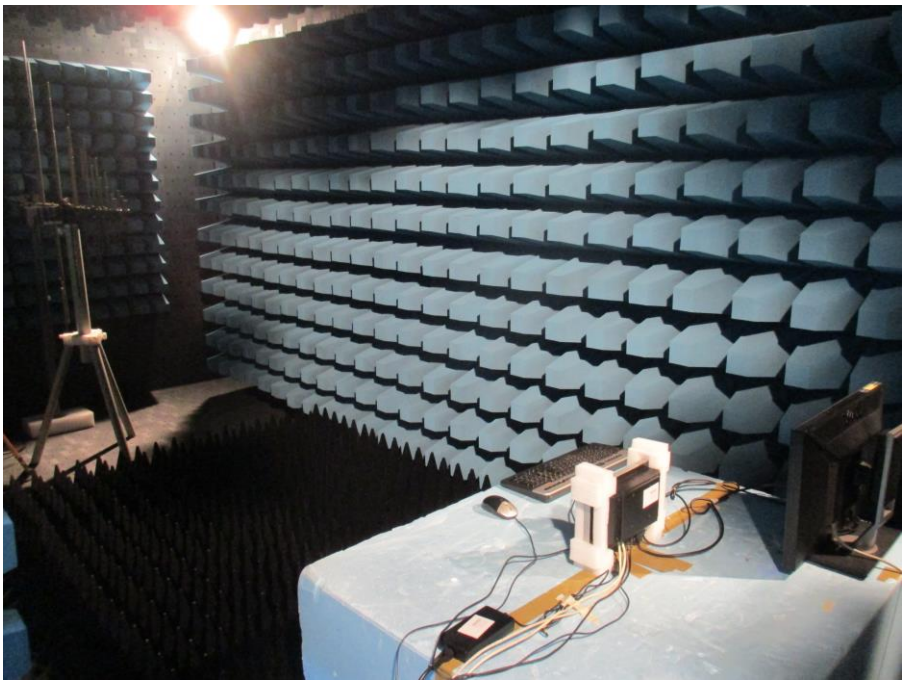
7.6 Test Results

Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	52	%	Test Date:	Jun. 02, 2020
Atmospheric Pressure:	1003	hPa	Remark:	N/A

Exposed Side: ☒ Front ☒ Left ☒ Rear ☒ Right

Frequency (MHz)	Test field strength (V/m)	Antenna Polarization	Test Result	Performance Criterion
80 ~ 1000	20	Vertical	PASS	A
80 ~ 1000		Horizontal	PASS	A
1400 ~ 2000	10	Vertical	PASS	A
1400 ~ 2000		Horizontal	PASS	A
2000 ~ 2700	5	Vertical	PASS	A
2000 ~ 2700		Horizontal	PASS	A
5100 ~ 6000	3	Vertical	PASS	A
5100 ~ 6000		Horizontal	PASS	A

7.7 Radiated Susceptibility (RS) Test Set-up



8. Electrical Fast Transient/Burst Immunity Test

8.1 Purpose

The purpose of this test is to evaluate the EUT performance during the repetitive transient bursts applied to power port and ports for I/O ports.

8.2 Test Set-Up

For I/O ports testing, the EUT was placed on a non-metallic support 0.1±0.01 meter above a reference ground plane (RGP) and operated in the operating mode specified.

Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 meter.

8.3 Test Specification

Open-circuit output test voltage (±10%) and repetition rate of the impulses (±20%)				
Level	On power supply port, PE		On I/O (Input/Output) signal, Data and control ports	
	Voltage peak (kV)	Repetition rate (kHz)	Voltage peak (kV)	Repetition rate (kHz)
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X(1)	Special	Special	Special	Special
NOTE 1 Use of 5 kHz repetition rates is traditional; however, 100 kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. NOTE 2 With some products, there may be no clear distinction between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.				
(1) "x" is an open level. The level has to be specified in the dedicated equipment specification				

8.4 Test Equipment

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMC Test System	TESEQ	NSG 3060	1366	2019/11/05	2020/11/03
CDN	TESEQ	CDN 3061	1342	2019/11/05	2020/11/03
CDN	TESEQ	CDN 3063	1992	2019/11/05	2020/11/03
Clamp	TESEQ	CDN 3425	1682	2019/11/04	2020/11/02
Test software	TESEQ	WIN3000	V1.1.0	NCR	NCR

Note: No Calibration Required (NCR).

8.5 Test Results

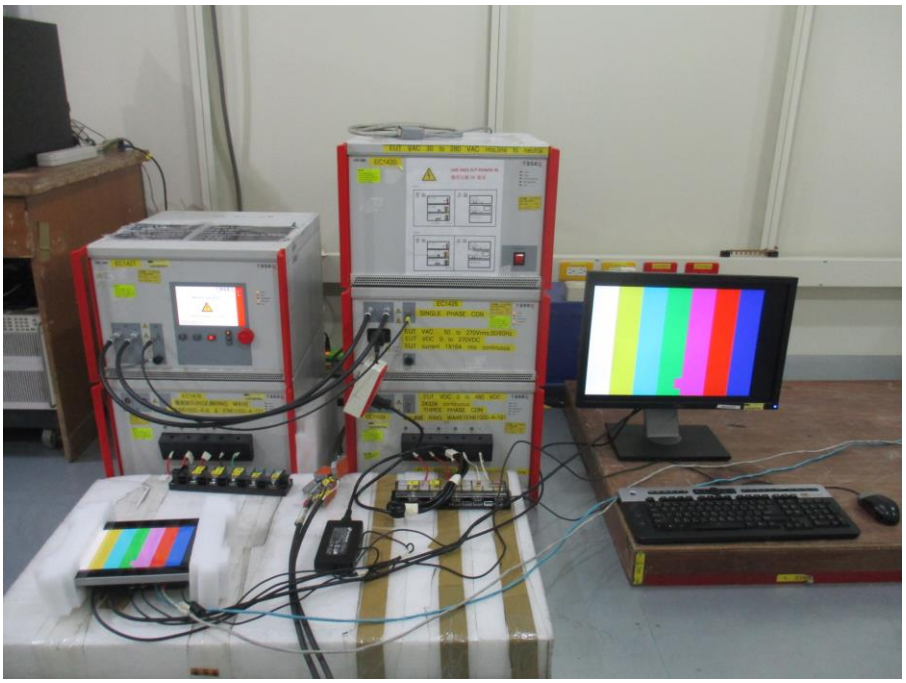
Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	52	%	Test Date:	Jun. 03, 2020
Atmospheric Pressure:	1003	hPa	Remark:	N/A

Level	Polarity	Repetition Rate	Power supply port Test Result	Signal port & Control port Test Result (see Note 1)	Performance Criterion
2 kV	+	5 kHz	PASS	PASS	A
2 kV	-	5 kHz	PASS	PASS	A

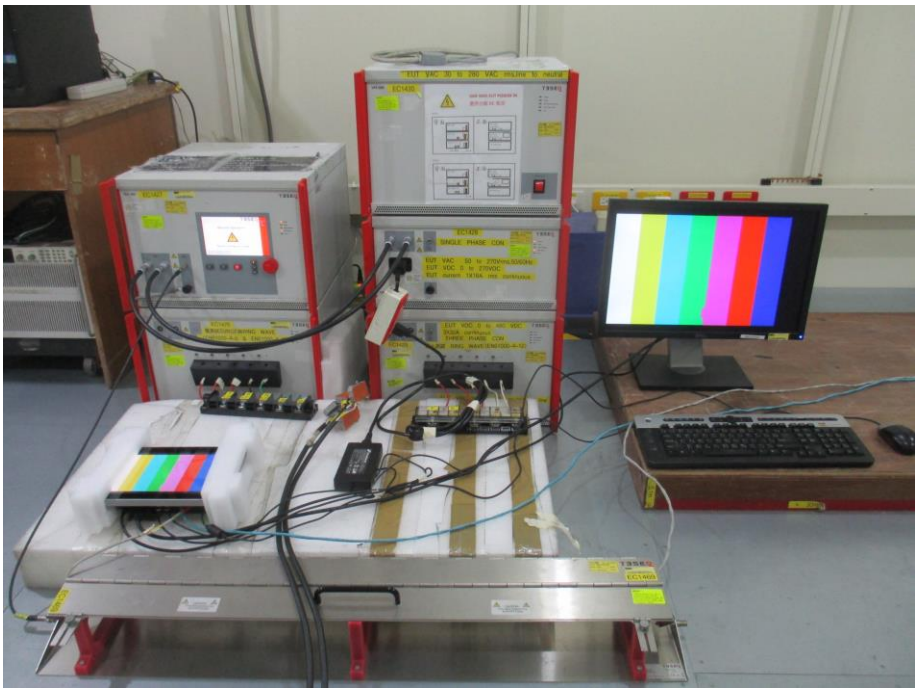
Note 1: Signal Line and Control Line were tested for : Ethernet port

8.6 Electrical fast transient / burst (EFT) Test Set-up

AC port



Ethernet port



9. Surge Immunity Test

9.1 Purpose

The object of this test is to establish a common reference to evaluate the performance of EUT when subjected to high-energy disturbances on the power and interconnection lines.

9.2 Test Set-Up

The EUT was placed on a non-metallic support 0.8 meter above a reference ground plane and was put into operation according to the specified operating mode.

9.3 Test Specification

Level	Open circuit test voltage kV +/- 10%	Remark
1	0.5	-
2	1.0	L to N
3	2.0	L to Gnd N to Gnd
4	4.0	-
X	Special	-
Note: "X" is an open class. This level can be specified in the product specification		

Surge wave form: 1.2 x 50 μs, Repetition rate: 1 /min (max)

9.4 Test Equipment.

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
SURGE-TESTER	EMC Partner	IMU3000	1547	03/19/2019	09/19/2020

9.5 Test Results

Temperature:	25	℃	Model No.:	MTC-7010W
Relative Humidity:	50	%	Test Date:	Jun. 09, 2020
Atmospheric Pressure:	982	hPa	Remark:	N/A

A=criteria A, B=criteria B, C=criteria C

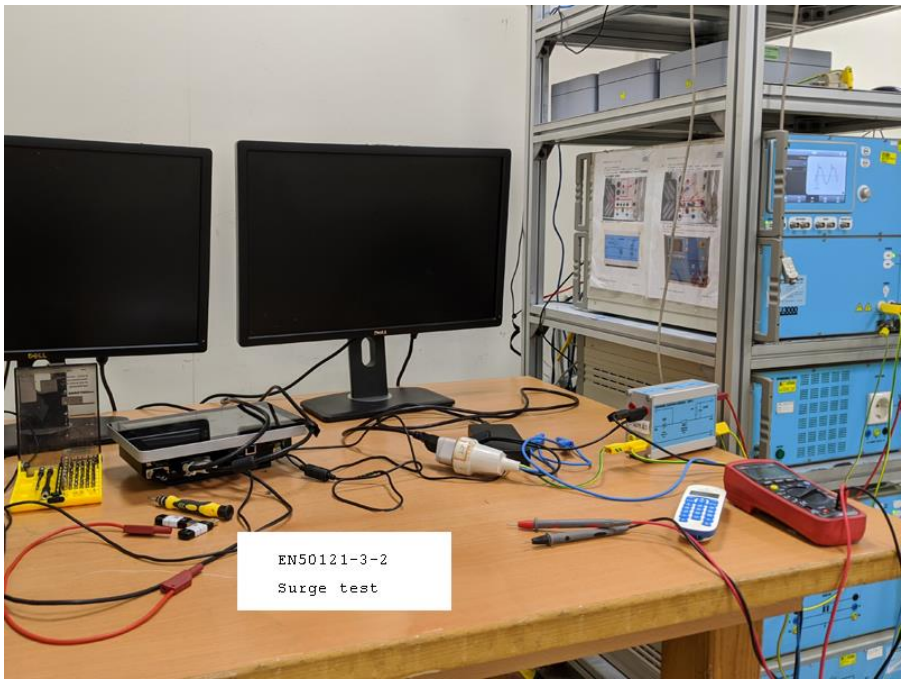
AC Power Port: ☑	DC Power Port: ☐	LAN Port: ☐	Telephone Port: ☐

AC Power

Line Under Test	Voltage	Level	Impedance	Repetition Rate	Cycle	Pulse Position	EUT Status	Comments
Line-Neutral	+ 1.0kV	3	42Ω	60 sec	5	0, 90, 180, 270	A	
Line-Neutral	- 1.0kV	3	42Ω	60 sec	5	0, 90, 180, 270	A	
Line-Ground	+ 2.0kV	4	42Ω	60 sec	5	0, 90, 180, 270	A	
Line-Ground	- 2.0kV	4	42Ω	60 sec	5	0, 90, 180, 270	A	
Neutral -Ground	+ 2.0kV	4	42Ω	60 sec	5	0, 90, 180, 270	A	
Neutral -Ground	- 2.0kV	4	42Ω	60 sec	5	0, 90, 180, 270	A	

Additional Notes: A=criteria A, B=criteria B, C=criteria C

9.6 Surge Test Set-up



10. Immunity to Conducted Disturbances, Inducted by Radio-Frequency Fields

10.1 Purpose

The test method subjects the EUT to a power source of disturbance comprising electric and magnetic field, simulating those coming from intentional RF transmitters.
The measurement is for evaluating the performance of EUT when subjected to RF conducted disturbance.

10.2 Test Set-Up

The EUT was placed on a non-metallic support 0.1 meter above a reference ground plane (RGP) with the coupling/decoupling network (CDN) placed 0.3 meter from the EUT on the RGP. The injection clamp was placed 0.3 meter from the EUT on the RGP.

10.3 Test Specification

Test level	Voltage (Vrms)	Modulation
1	1	1 kHz 80 % AM
2	3	1 kHz 80 % AM
3	10	1 kHz 80 % AM
X	Special	1 kHz 80 % AM

The frequency steps : 1%, Log sweep
Dwell time : 3 sec
Frequency range : 150 kHz to 80 MHz
Test ports : AC port, Ethernet port
Test voltage : 3 Vrms

10.4 Test Equipment

Test Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
CS test system	TESEQ	NSG 4070B-35	41146	2019/08/26	2020/08/24
CDN	Schaffner	CDN M016	21272	2020/06/01	2021/05/31
CDN	Fischer	FCC-801-M2-16A	04017	2019/08/27	2020/08/25
Clamp	TESEQ	KEMZ 801A	41333	2019/08/27	2020/08/25
CDN	Fischer	FCC-801-M1-16A	04015	2019/08/27	2020/08/25
CDN	Fischer	FCC-801-T8-RJ45	08036	2019/08/27	2020/08/25
CDN	Schaffner	CDN T400	19096	2019/08/27	2020/08/25
Test software	TESEQ	NSG4070	V 1.2.0	NCR	NCR

Note: No Calibration Required (NCR)

10.5 Generation and Calibration of the Disturbance Signal

The disturbance signal is generated from a computer controlled signal generator.
The output signal is amplified and injected to the CDN/injection clamp. The disturbance signal level was calibrated as specified in the standard. A power meter was connected to the EUT side of the CDN through a 150 -50Ω adapter. The auxiliary equipment (AE) side of the network was terminated with 150Ω to ground during the calibration. The generator settings obtained during the calibration procedure were later repeated in the tests.

10.6 Test Results

Temperature:	24	℃	Model No.:	MTC-7010W
Relative Humidity:	52	%	Test Date:	Jun. 02, 2020
Atmospheric Pressure:	1003	hPa	Remark:	N/A

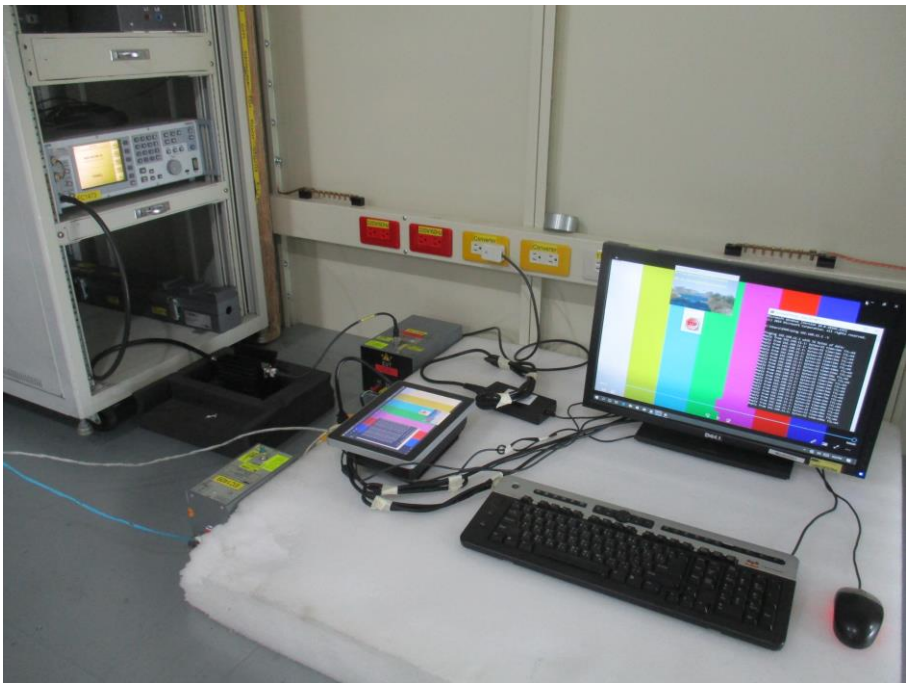
Measurement at power port:

Frequency	Test Port	Test Result	Performance Criterion
0.15 MHz to 80 MHz	AC	PASS	A

Measurement at signal port:

Frequency	Test Port	Test Result	Performance Criterion
0.15 MHz to 80 MHz	Ethernet	PASS	A

10.7 Conducted disturbances (CS) Test Set-up

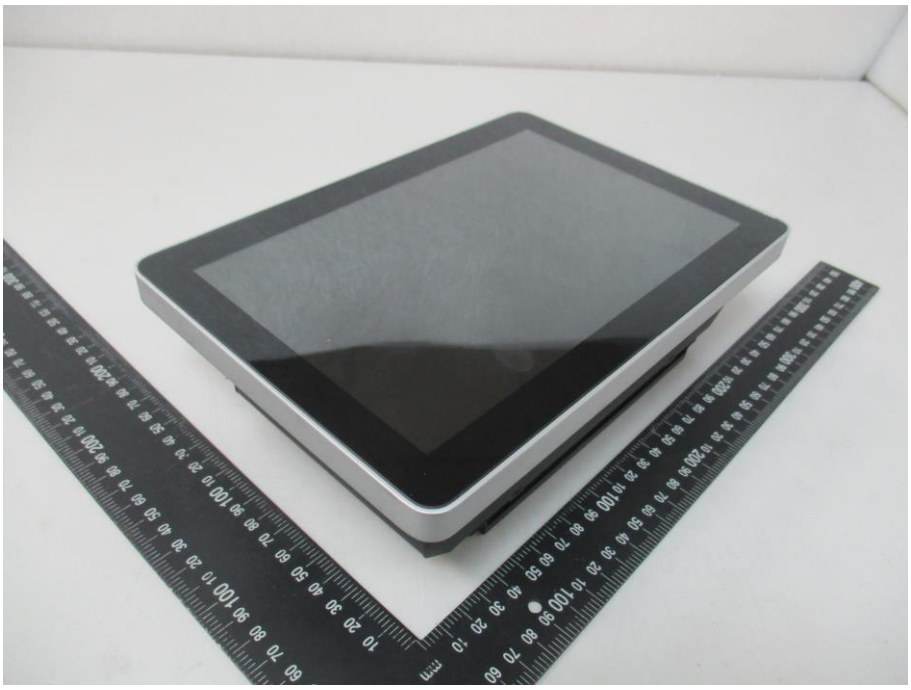


Appendix A: Uncertainty

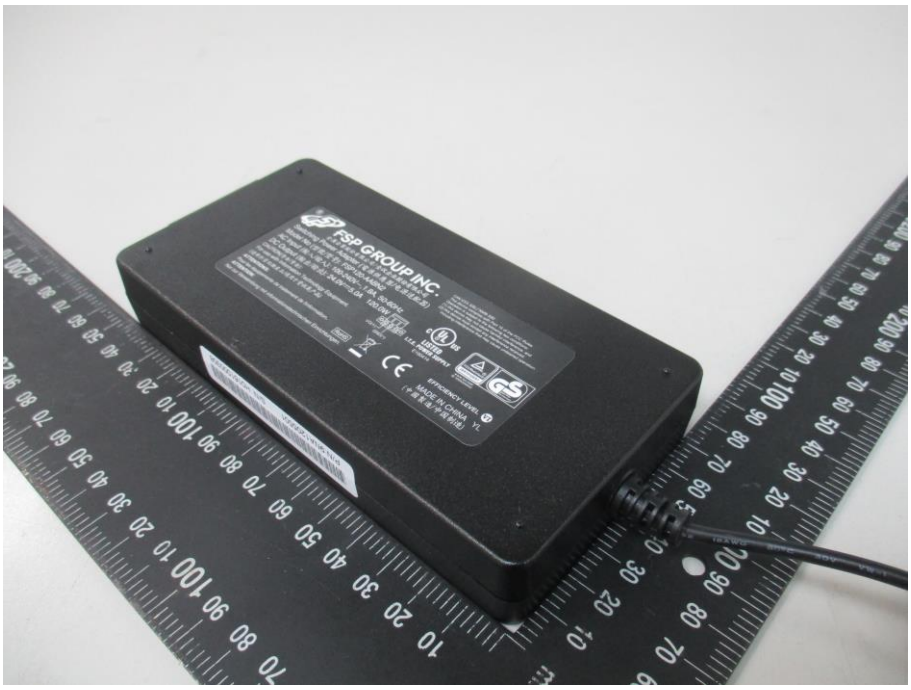
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

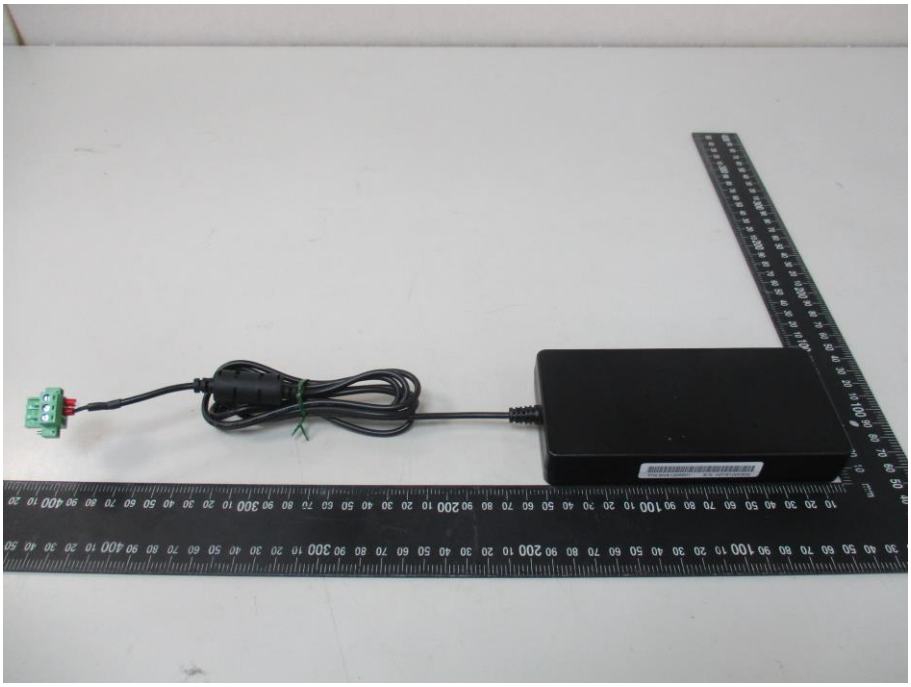
Item	Uncertainty
Conducted disturbance measurements at a mains port from 9 kHz to 30 MHz using a 50 Ω/50 µH +5Ω artificial mains network (AMN)	2.52 dB
Conducted disturbance measurements at a telecommunication port from 150 kHz to 30 MHz using an asymmetrical artificial network (AAN)	4.02 dB
Vertically polarized radiated disturbances from 30MHz~1GHz in a open area test site at a distance of 10m	4.90 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a open area test site at a distance of 10m	4.89 dB
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.10 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.18 dB
Radiated disturbances measurements from 1GHz~6GHz in a semi-anechoic chamber at a distance of 3m	4.96 dB
ESD	7.18 %
RS	2.20 dB
RS (Audio)	1.49 dB
EFT	6.20 %
SURGE	5.60 %
CS	1.06 dB

Appendix B1: External photo of EUT



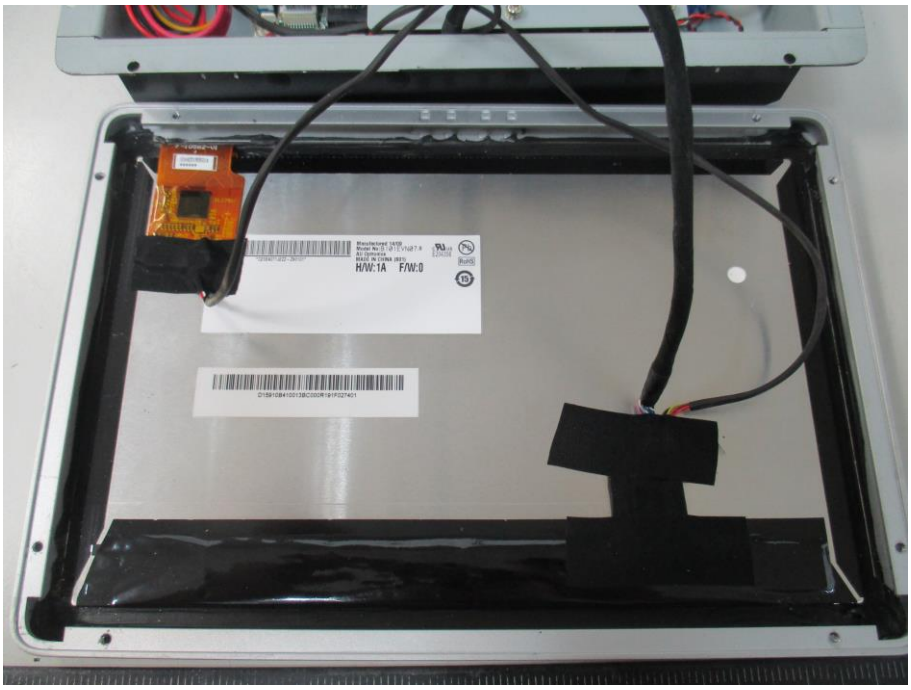

DC9V ~ DC48V
USB 3.0
USB 3.0
DVI
DP
COM 1
COM 2


FSP GROUP INC.



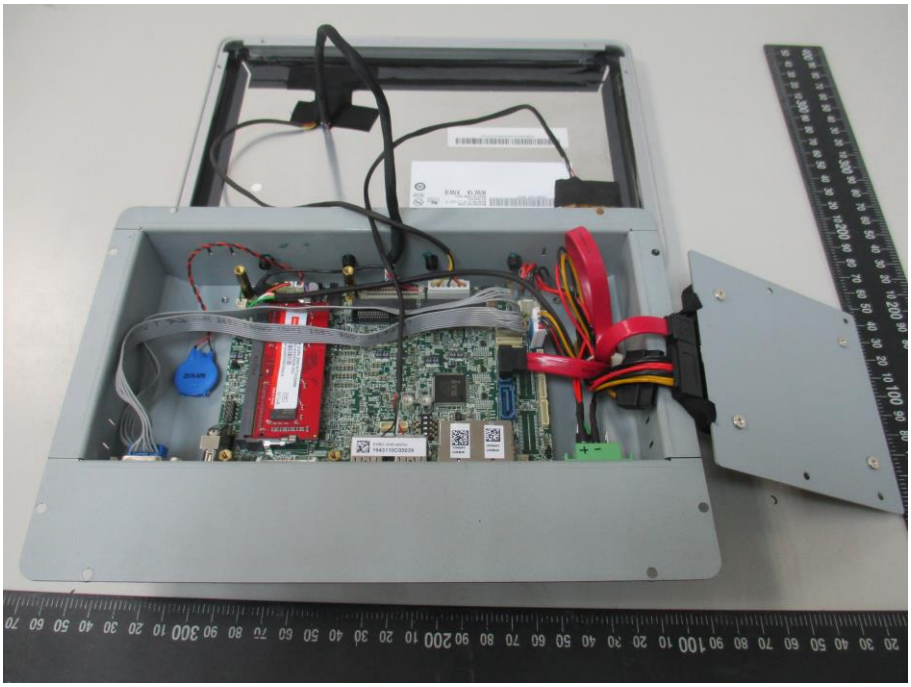

FSP GROUP INC.
全漢企業股份有限公司/全汉企业股份有限公司
Switching Power Adapter (電源供應器/电源适配器)
Model No (型號/型号): FSP120-AABN2
AC Input (輸入/输入): 100-240V~,1.8A, 50-60Hz
DC Output (輸出/输出): 24.0V⎓5.0A 120.0W
CAUTION(警告/警告):
For use with Information Technology Equipment.
(適用於資訊類產品/适用于资讯类产品)
ATTENTIONS:
Pour les équipements de traitement de l'information.
ATTENTION:
Nur zur Verwendung mit informationstechnischen Einrichtungen.
CAN ICES-3(B) / NMB-3(B)
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.
VO(+)
GND(-)
LISTED
I.T.E. POWER SUPPLY
E190414
RoHS
EFFICIENCY LEVEL VI
MADE IN CHINA YL
(中國製造/中国制造)

Appendix B2: Internal photo of EUT

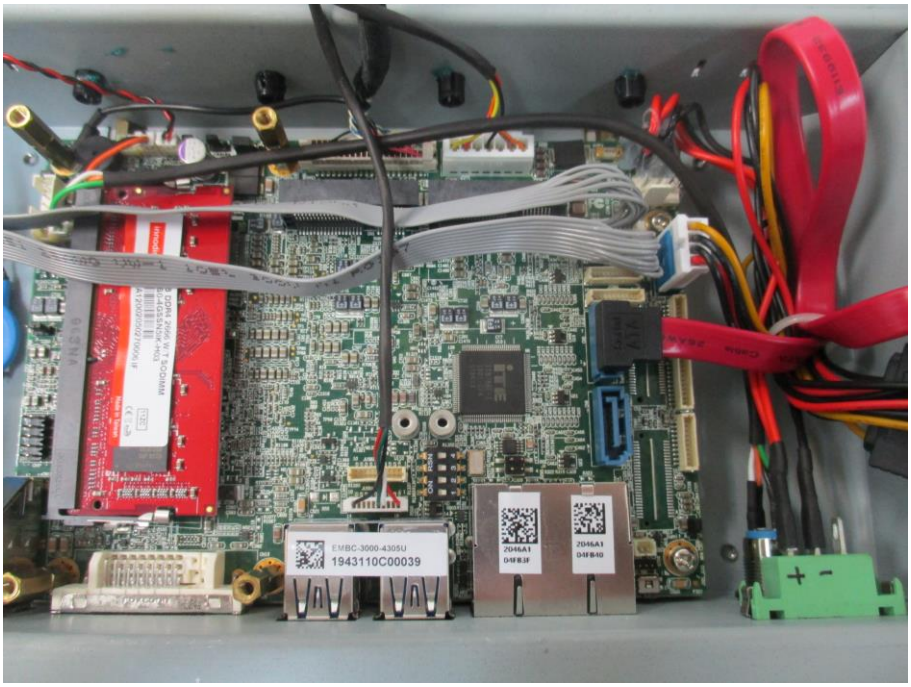

H/W:1A F/W:0


Manufactured 14/09
Model No:B101EVN07.0
AU Optronics
MADE IN CHINA (801)
H/W:1A F/W:0
RoHS
D15910B410013BC000R191F027401


innodisk
Industrial
2.5" SATA SSD
3ME4
Series




2019-APR
EMBC-3000-4305U
1943110C00039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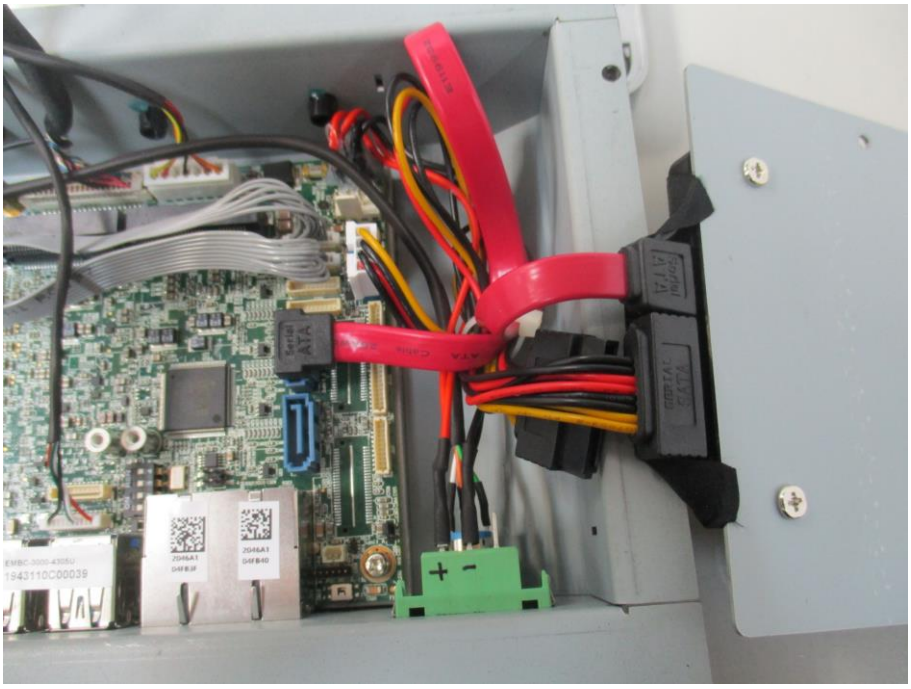
Serial ATA
SATA
+ -