

CE-EMC TEST REPORT

Test Report No. :E1/2016/B0031

Applicant : Grizzly Electrodynamic Corporation

Address : No.19, Wu-chuan 6th Rd., Wuku Dist., New Taipei City , Taiwan

Manufacturer : Grizzly Electrodynamic Corporation

Address : No.19, Wu-chuan 6th Rd., Wuku Dist., New Taipei City , Taiwan

Equipment Under Test (EUT) :

Name : Automatic door operator

Brand Name : Grizzly

Model No.: A86PLc Multi

Added Model(s) : E86PLc Multi, A86PLc Basic, E86PLc Basic, A87-PLd Multi, E87-PLd Multi, A87-PLd Basic, E87-PLd Basic, A88-PLd Multi, E88-PLd Multi, A88-PLd Basic, E88-PLd Basic

Standards:

EN 61000-6-4 : 2007+A1:2011	EN 61000-6-2 : 2005+AC:2005
IEC 61000-4-2 : 2008	IEC 61000-4-3 : 2006+A1:2007+A2:2010
IEC 61000-4-4 : 2012	IEC 61000-4-5 : 2014
IEC 61000-4-6 : 2013	IEC 61000-4-8 : 2009
IEC 61000-4-11 : 2004	

In the configuration tested, the EUT complied with the standards specified above.

Date of Receipt : Nov. 04, 2016

Date of Test : Nov. 04, 2016 ~ Feb. 14, 2017

Date of Issue : Mar. 22, 2017

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Tested By: Original is signed
Johnny Ho (Engineer)

Date Mar. 22, 2017

Approved By Original is signed
Wisely Huang
(Assistant Supervisor)

Date Mar. 22, 2017



Version

Version No.	Description	Date
00	Original report	Mar. 22, 2017

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1. General Description

1.1 General Description of EUT

Name of EUT	:	Automatic door operator
Brand Name	:	Grizzly
Model No.(s)	:	A86PLc Multi
Added Model(s)	:	E86PLc Multi, A86PLc Basic, E86PLc Basic, A87-PLd Multi, E87-PLd Multi, A87-PLd Basic, E87-PLd Basic, A88-PLd Multi, E88-PLd Multi, A88-PLd Basic, E88-PLd Basic
Variant Description	:	Please see as below.

Diversity Description	Original Model	Series Model				
	A86-PLc/E86-PLc Multi	A86-PLc/E86-PLc Basic	A87-PLd/E87-PLd Multi	A87-PLd/E87-PLd Basic	A88-PLd/E88-PLd Multi	A88-PLd/E88-PLd Basic
Input power	AC 220 V / 50 Hz	○	○	○	○	○
Power Consumption	Rated power 80 W door weight 150 kg	○	Rated power 100 W door weight 150 kg	Rated power 100 W door weight 150 kg	Rated power 100 W door weight 150 kg	Rated power 100 W door weight 150 kg
Brand name /Trade mark	Grizzly	○	○	○	○	○
Function	Opening speed 60cm/s	○	Opening speed 70cm/s	Opening speed 70cm/s	Opening speed 80cm/s	Opening speed 80cm/s
Size	Engine case 100x200x1600 mm	Engine case (a) A: 100x180 mm E: 160x100 mm	Engine case (a) A: 100x180 mm E: 160x100 mm	Engine case (a) A: 100x180 mm E: 160x100 mm	Engine case (a) A: 100x180 mm E: 160x100 mm	Engine case (a) A: 100x180 mm E: 160x100 mm
Others	With electronic motor lock & remote control	Without electronic motor lock & remote control	○	Without electronic motor lock & remote control	○	Without electronic motor lock & remote control



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1.2 Details of EUT

Power Supply	:	AC 220V, 50Hz
Modes/Function	:	Mode 1. Operation
Adapter	:	N/A
Highest operate description	:	20 MHz

1.3 Description of Support Units

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
N/A	N/A	N/A	N/A

Support Equipment Used in Tested Cable

Cable Type	Core	Length	Shielding/Non-shielding
N/A	N/A	N/A	N/A

1.4 Operation Procedure

Test mode 1

1. EUT connected to the power supply, press the power switch, the door will automatically open and close.
2. Start the test.

1.5 The worst case of the EUT

EUT will be carried out in the worst case as followings:

Worst Case:

CE Worst case: Mode 1. Operation

RE Worst case : Mode 1. Operation

1.6 Modification List

No modification by SGS Taiwan Electronics & Communication Laboratory.

1.7 Configuration of Tested System

EUT

1.8 Accessories Cable List

Cable Type	Core	Length	Category	Shielding/Non-shielding
Power cable	N/A	3m	N/A	Non-shielding
signal cable	N/A	2m	N/A	Shielding

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1.9 Summary of Results

Highest Emission					
Standard	Test Type	Result	Phase/Pol.	Frequency(MHz)	Margin(dB)
EN61000-6-4: 2007+A1:2011	Conducted Emission	PASS	Line	4.0340	-39.44 (QP)
			Neutral	4.4060	-37.34 (AVG)
	ISN	N/A	N/A	N/A	N/A
	Radiated Emission	PASS	Ver.	71.7600	-8.30 (QP)
IEC 61000-3-2:2014	Harmonic current emissions	N/A	N/A		
IEC 61000-3-3:2013	Voltage changes, voltage fluctuations & flicker	N/A	N/A		

Immunity (EN 61000-6-2: 2005+AC:2005)				
Standard	Test Type	Result	Performance Criteria	Test Judgment
IEC 61000-4-2 : 2008	ESD test	PASS	Criterion B	Meets the requirements of Performance Criterion A
IEC 61000-4-3 : 2006+A1:2007+A2:2010	RS test	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-4 : 2012	EFT Test	PASS	Criterion B	Meets the requirements of Performance Criterion B
IEC 61000-4-5 : 2014	Surge Test	PASS	Criterion B	Meets the requirements of Performance Criterion A
IEC 61000-4-6 : 2013	CS Test	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-8 : 2009	PMF Test	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-11 : 2004	DIP Test	PASS	Voltage Dips : 1. 0% residual 1 periods Performance Criterion A 2. 40% residual 10 periods Performance Criterion C 3. 70% residual 25 periods Performance Criterion C Voltage interruption : 0% residual 250 periods Performance Criterion C	Meets the requirements of Voltage Dips: 1. 0% residual 1 periods Performance Criterion A 2. 40% residual 10 periods Performance Criterion A 3. 70% residual 25 periods Performance Criterion A Voltage interruption : 0% residual 250 periods Performance Criterion B

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2. EMISSION

EN 61000-6-4 : 2007+A1:2011

2.1 Test Results

Conducted Emission	PASS
Radiated Emission	PASS
Telecommunications/network Emission	N/A

2.2 Frequency Range

Conducted Emission : 150 kHz - 30 MHz

Radiated Emission : 30 MHz - 1000 MHz

Telecommunications/network Emission: 150 kHz – 30 MHz

2.3 Methods and Procedures

Standard	Version	Description
CISPR 16-2-1	2008+A1:2010 +A2:2013	Methods of measurement of disturbance and immunity conducted disturbance measurements.
CISPR 16-2-3	2010+A1:2010 +A2:2014	Methods of measurement of disturbance and immunity radiated disturbance measurements.

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2.4 Test of Conducted Emission

2.4.1 Test Instruments

SGS Conducted Emission HWAYA Conducted Room No.A EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101311	2016/6/23	2017/6/22
Coaxial Cables	EMC Instruments Corp	EMCRG58-BM-BM-3000	160812	2016/8/30	2017/8/29
LISN	SCHWARZBECK	NSLK 8127	8127-648	2016/6/13	2017/6/12
Pulse Limiter	Narda S.T.S.	PMM PL01	1110X30602	2016/8/12	2017/8/11
LISN	Schwarzbeck	NSLK 8128	NSLK8127-300	2016/6/22	2017/6/21
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Measurement Uncertainty of Conducted Emission Expanded uncertainty (K=2) of conducted emission is 2.20 dB					

2.4.2 EUT Operating Condition

Environment:

Temperature	Humidity
23 °C	65 %RH

Test setup : Please refer to photo of CE testing set-up

2.4.3 Measurement Level Calculation

Factor = LISN insertion loss + Cable loss+ Pulse Limiter Insertion Loss

Measurement Level = Reading Level + Factor

Over (Margin) = Measurement Level – Limit

2.4.4 Measurement Data(CE)

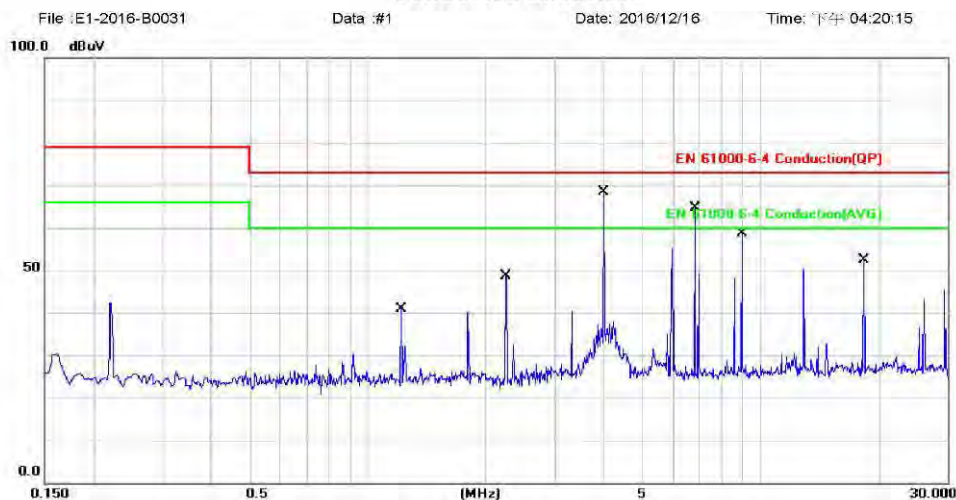
Model No.:A86PLc Multi
Mode_1_L

Site : Conduction Room
Limit: EN 61000-6-4 Conduction(QP)
Mode: Mode_1
Note:

Phase: L1
Power: AC 220V/50Hz

Temperature: 23 °C
Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		1.2220	5.26	19.91	25.17	73.00	-47.83	QP	
2		1.2220	0.11	19.91	20.02	60.00	-39.98	AVG	
3		2.2500	8.42	19.93	28.35	73.00	-44.65	QP	
4		2.2500	0.23	19.93	20.16	60.00	-39.84	AVG	
5 *		4.0340	13.60	19.96	33.56	73.00	-39.44	QP	
6		4.0340	0.52	19.96	20.48	60.00	-39.52	AVG	
7		6.8140	7.33	20.01	27.34	73.00	-45.66	QP	
8		6.8140	0.09	20.01	20.10	60.00	-39.90	AVG	
9		8.9900	4.31	20.05	24.36	73.00	-48.64	QP	
10		8.9900	0.12	20.05	20.17	60.00	-39.83	AVG	
11		18.3580	7.32	20.43	27.75	73.00	-45.25	QP	
12		18.3580	0.08	20.43	20.51	60.00	-39.49	AVG	

*:Maximum data x:Over limit !:over margin

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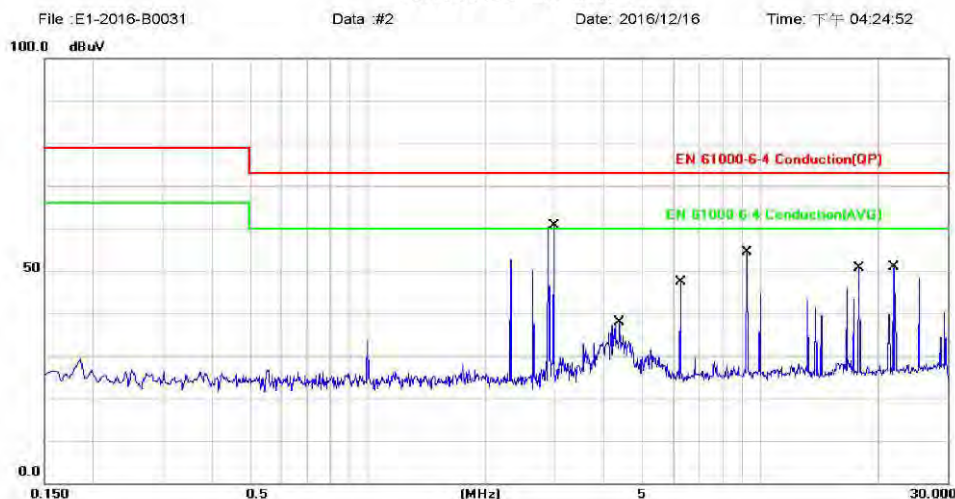
Mode_1_N

Site : Conduction Room
Limit: EN 61000-6-4 Conduction(QP)
Mode: Mode_1
Note:

Phase: N
Power: AC 220V/50Hz

Temperature: 23 °C
Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		2.9820	4.16	19.95	24.11	73.00	-48.89	QP	
2		2.9820	0.12	19.95	20.07	60.00	-39.93	AVG	
3		4.4060	12.50	19.98	32.48	73.00	-40.52	QP	
4 *		4.4060	2.68	19.98	22.66	60.00	-37.34	AVG	
5		6.2660	5.11	20.02	25.13	73.00	-47.87	QP	
6		6.2660	0.08	20.02	20.10	60.00	-39.90	AVG	
7		9.2940	7.24	20.08	27.32	73.00	-45.68	QP	
8		9.2940	0.13	20.08	20.21	60.00	-39.79	AVG	
9		17.9140	6.14	20.50	26.64	73.00	-46.36	QP	
10		17.9140	0.15	20.50	20.65	60.00	-39.35	AVG	
11		21.8460	8.23	20.68	28.91	73.00	-44.09	QP	
12		21.8460	0.19	20.68	20.87	60.00	-39.13	AVG	

*:Maximum data x:Over limit !:over margin

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2.4.5 Measurement Data(ISN)

N/A

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2.5 Test of Radiated Emission

2.5.1 Test Instruments

SGS Radiated_Below_1GHz HWAYA 10m_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101342	2016/3/5	2017/3/4
EMI Test Receiver	R&S	ESCI 3	101343	2016/12/21	2017/12/20
Broadband Antenna	SCHWAZBECK	VULB9168	9168-628	2016/9/22	2017/9/21
Broadband Antenna	SCHWAZBECK	VULB9168	9168-629	2016/9/22	2017/9/21
Pre Amplifier	EMC Instruments Corp.	EMC330	980178	2016/3/31	2017/3/30
Pre Amplifier	EMC Instruments Corp.	EMC330	980179	2016/3/31	2017/3/30
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150917	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150919	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150820	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150918	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150821	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150822	2016/9/18	2017/9/17
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	Chance Most	10M Chamber	10M SAC	2016/12/31	2017/12/31
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Measurement Uncertainty of Radiated Emission Expanded uncertainty of radiated emission is 4.24 dB. (30MHz ~ 1000MHz)					

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2.5.2 EUT Operating Condition

Environment:

Temperature	Humidity
20 °C	70 %RH

Test setup : Please refer to photo of RE testing set-up

2.5.3 Measurement Level Calculation

Correction Factor = Antenna Factor + Cable loss- Amplifier Gain

Measurement Level = Reading Level + Correction Factor

Over (Margin) = Measurement Level – Limit

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Member of SGS Group

2.5.4 Measurement Data

Model No.:A86PLc Multi Mode_1_H

Site: SGS 10m Chamber Polarization: **Horizontal** Temperature: 20 °C
Limit: EN 61000-6-4 10M Radiation Power: AC 220V/50Hz Humidity: 70 %
Mode: Mode_1 Distance: 10m
Note:

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	45.5000	29.56	-11.45	18.11	40.00	-21.89	QP	
2		108.6800	32.59	-15.19	17.40	40.00	-22.60	QP	
3		195.6300	31.11	-14.64	16.47	40.00	-23.53	QP	
4		261.1200	32.12	-12.46	19.66	47.00	-27.34	QP	
5		375.5100	29.24	-9.02	20.22	47.00	-26.78	QP	
6		630.9400	24.33	-3.28	21.05	47.00	-25.95	QP	

*: Maximum data x: Over limit !: over margin

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Mode_1_V

Site: SGS 10m Chamber
Limit: EN 61000-6-4 10M Radiation
Mode: Mode_1
Note:

Polarization: **Vertical**
Power: AC 220V/50Hz
Distance: 10m

Temperature: 20 °C
Humidity: 70 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		42.9100	38.82	-11.27	27.55	40.00	-12.45	QP	
2	*	71.7600	45.64	-13.94	31.70	40.00	-8.30	QP	
3		104.5500	34.01	-15.52	18.49	40.00	-21.51	QP	
4		140.5800	32.81	-11.76	21.05	40.00	-18.95	QP	
5		406.9900	30.72	-8.09	22.63	47.00	-24.37	QP	
6		662.8900	25.91	-2.44	23.47	47.00	-23.53	QP	

*: Maximum data x: Over limit !: over margin

File: E1-2016-B0031\Data: #13

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3. Harmonics

IEC 61000-3-2 : 2014

3.1 Test Results

IEC 61000-3-2 : 2014	N/A
----------------------	-----

3.2 Methods and Procedures

Standard	Edition	Description
IEC 61000-3-2	2014	Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

3.3 Test Instruments

SGS Harmonic EN61000-3-2 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Power Analyzer	TESEQ	CCN 1000-1	1504A02654	2016/3/21	2017/3/20
AC Power Source	TESEQ	NSG 1007	1504A02654	2016/3/21	2017/3/20
Test Software	TESEQ	Win2100 V4	Ver. 4.5.8	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

3.4 EUT Operating Condition

Environment:

Temperature	Humidity
N/A °C	N/A %RH

Test setup : N/A

3.5 Measurement Data

N/A

4. Flicker

IEC 61000-3-3 : 2013

4.1 Test Results

IEC 61000-3-3 : 2013	N/A
----------------------	-----

4.2 Methods and Procedures

Standard	Edition	Description
IEC 61000-3-3	2013	Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

4.3 Test Instruments

SGS Flicker EN61000-3-3 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Power Analyzer	TESEQ	CCN 1000-1	1504A02654	2016/3/21	2017/3/20
AC Power Source	TESEQ	NSG 1007	1504A02654	2016/3/21	2017/3/20
Test Software	TESEQ	Win2100 V4	Ver. 4.5.8	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

4.4 EUT Operating Condition

Environment:

Temperature	Humidity
N/A °C	N/A %RH

Test setup : N/A

4.5 Measurement Data

N/A

5. IMMUNITY

EN 61000-6-2 : 2005+AC:2005

5.1 Test Results

Test Standard	Result
IEC 61000-4-2 : 2008	PASS
IEC 61000-4-3 : 2006+A1:2007+A2:2010	PASS
IEC 61000-4-4 : 2012	PASS
IEC 61000-4-5 : 2014	PASS
IEC 61000-4-6 : 2013	PASS
IEC 61000-4-8 : 2009	PASS
IEC 61000-4-11 : 2004	PASS

5.2 Performance Criteria Description

Criterion A - The apparatus shall continue to operate as intended. 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.

Criterion 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.

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

5.3 Test of IEC 61000-4-2

5.3.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-2	2008	Electrostatic Discharge (ESD)

5.3.2 Test Instruments

SGS ESD EN61000-4-2 HwaYa No.1 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
ESD Simulator	Thermo	MiniZap	612312	2016/6/13	2017/6/12
HCP	N/A	1.6 x 0.8 m	N/A	N.C.R.	N.C.R.
VCP	N/A	0.5 x 0.5 m	N/A	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.3.3 EUT Operating Condition

Environment:

Temperature	Humidity
22 °C	43 %RH

Test setup : Please refer to photo of ESD testing set-up

5.3.4 Results of Electrostatic Discharge Test (ESD)

Model No.:A86PLc Multi

Test Mode : Test mode 1
Basic Standard : IEC 61000-4-2
Discharge Impedance : 330 ohm / 150 pF
Discharge Voltage : Air Discharge : $\pm 2, 4, 8$ kV
Contact Discharge : $\pm 2, 4$ kV
HCP/VCP : $\pm 2, 4$ kV
Polarity : Positive/Negative
Number of Discharge : 10 times at each test point
Discharge Mode : Single Discharge
Discharge Period : 1 second

A. Observations :

Test points: 1. Surface of case. 2. Junction of case. 3. Control Button.
4. Power SW.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2, 4, 8	+/-	1~4	N/A	A
2, 4	+/-	1	A	N/A

Remark: A: No degradation of performance or loss of function.

N/A: Not Applicable.

B. Observations :

Test points: 1. Front side. 2. Rear side. 3. Left side. 4. Right side.

Indirect Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2, 4	+/-	1 - 4	A	A

Remark: A: No degradation of performance or loss of function.

N/A: Not Applicable.

5.4 Test of IEC 61000-4-3

5.4.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-3	2006+A1:2007 +A2:2010	Radio-Frequency Electromagnetic Field Susceptibility Test, RS

5.4.2 Test Instruments

SGS RS EN61000-4-3 HWAYA SAC-B EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Test Site	Chance Most	10M Chamber	10M SAC	2016/3/29	2017/3/28
Signal Generator	R&S	SMT 06	100867	2016/3/18	2017/3/17
Power Sensor	R&S	NRP-Z11	111682	2016/3/30	2017/3/29
Power Sensor	R&S	NRP-Z11	112186	2016/3/24	2017/3/23
Power Amplifier	R&S	BBA100	101075	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA100	101021	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0104-100/100	1049222	N.C.R.	N.C.R.
High Power Broadband Antenna	Schwarzbeck	VHBD 9134	9134-075	N.C.R.	N.C.R.
Calibrated Broadband Log-Per. Test-Antenna	R&S	HL046E	100112	N.C.R.	N.C.R.
Field Probes	Narda	NBM-550	V8.F-0375	2015/6/18	2017/6/17
Test Software	R&S	EMC 32	V9.21.00	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.4.3 EUT Operating Condition

Environment:

Temperature	Humidity
25 °C	56 %RH

Test setup : Please refer to photo of RS testing set-up

5.4.4 Results of Radiated Radio Frequency Electromagnetic (RS)

Model No.:A86PLc Multi

Test Mode : Test mode 1
 Basic Standard : IEC 61000-4-3
 Frequency range : 80 MHz -1000 MHz;
 1.4GHz-2.0GHz;
 2.0GHz-2.7GHz
 Field strength : 10 V/m (for 80 MHz -1000 MHz);
 3 V/m (for 1.4GHz-2.0GHz);
 1 V/m (for 2.0GHz ~ 2.7GHz)
 Modulation : 80% AM (1kHz)
 Frequency step : 1 % of fundamental
 Polarity of Antenna: Horizontal and Vertical
 Test distance : 3 m
 Dwell time : 3 Secs

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	80 - 1000	Vertical/Horizontal	A	0 degree
2	80 - 1000	Vertical/Horizontal	A	90 degree
3	80 - 1000	Vertical/Horizontal	A	180 degree
4	80 - 1000	Vertical/Horizontal	A	270 degree

No.	Frequency (GHz)	Antenna Orientation	Observation	EUT Orientation
5	1.4 – 2.0	Vertical/Horizontal	A	0 degree
6	1.4 – 2.0	Vertical/Horizontal	A	90 degree
7	1.4 – 2.0	Vertical/Horizontal	A	180 degree
8	1.4 – 2.0	Vertical/Horizontal	A	270 degree

No.	Frequency (GHz)	Antenna Orientation	Observation	EUT Orientation
9	2.0 – 2.7	Vertical/Horizontal	A	0 degree
10	2.0 – 2.7	Vertical/Horizontal	A	90 degree
11	2.0 – 2.7	Vertical/Horizontal	A	180 degree
12	2.0 – 2.7	Vertical/Horizontal	A	270 degree

Remark: A: No degradation of performance or loss of function.

N/A: Not Applicable.

5.5 Test of IEC 61000-4-4

5.5.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-4	2012	Electrical fast transient/burst requirements

5.5.2 Test Instruments

SGS EFT EN61000-4-4 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Burst Generator	TESEQ	NSG 3025	35177	2016/12/6	2017/12/5
EFT Clamp	Thermo	CCL	612359	2016/12/6	2017/12/5
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.5.3 EUT Operating Condition

Environment:

Temperature	Humidity
20 °C	56 %RH

Test setup : Please refer to photo of EFT testing set-up

5.5.4 Results of Electrical Fast Transient (EFT)

Model No.:A86PLc Multi

Test Mode : Test mode 1

Basic Standard : IEC 61000-4-4

Test Voltage : AC Input/Output : ± 2 kV, DC Input/Output : ± 2 kV, Signal port : ± 1 kV

Polarity : Positive/Negative

Impulse Frequency: 5 kHz

Tr/Tn : 5/50ns

Burst : 15ms/300ms

Observation :

Test Point	Polarity	Test Level (kV)	Results
AC Input	+/-	2	B
DC Input	+/-	2	N/A
Signal/Comm.	+/-	1	N/A

Remark: B : During test, the EUT's function degradation. After test, it recovery by itself.

N/A: Not Applicable.

5.6 Test of IEC 61000-4-5

5.6.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-5	2014	Surge immunity test

5.6.2 Test Instruments

SGS Surge EN61000-4-5 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Surge Tester	EMC Partner	MIG0603IN2 S-T	1515	2016/5/17	2017/5/16
Universal Surge CDN	EMC Partner	CDN-UTP8	CDN-UTP8-1516	2016/5/25	2017/5/24
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.6.3 EUT Operating Condition

Environment:

Temperature	Humidity
21 °C	52 %RH

Test setup : Please refer to photo of SURGE testing set-up

5.6.4 Results of Surge Test

Model No.:A86PLc Multi

Test Mode : Test mode 1

Test Rate : 1 pulse every minute

No. of Tests: 5 positive and 5 negative pulses

Observation Description

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
L – N	0, 90, 180, 270	+/-	1	A
L – PE	0, 90, 180, 270	+/-	2	A
N – PE	0, 90, 180, 270	+/-	2	A
DC input	N/A	+/-	0.5	N/A
Signal I/O	N/A	+/-	1	N/A
POE LAN	N/A	+/-	1	N/A

Remark: A: No degradation of performance or loss of function.

N/A: Not Applicable.

5.7 Test of IEC 61000-4-6

5.7.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-6	2013	Immunity to conducted disturbances, induced by radio-frequency fields.

5.7.2 Test Instruments

SGS CS EN61000-4-6 HwaYa EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Signal Generator	R&S	SMB 100A	102920	2016/5/10	2017/5/9
Power Sensor	R&S	NRP-Z91	100373	2016/12/6	2017/12/5
Power Sensor	R&S	NRP-Z91	100547	2016/2/15	2017/2/14
Power Amplifier	R&S	BBA150	102118	N.C.R.	N.C.R.
CDN	LUTHI	CDN M2	P1317118042	2016/5/26	2017/5/25
CDN	LUTHI	CDN M3	P1318118505	2016/5/20	2017/5/19
CDN	FCC	FCC-801-T2-RJ1 1	5032	2016/2/26	2017/2/25
CDN	FCC	FCC-801-T8-RJ4 5	5034	2016/2/26	2017/2/25
EM Injection Clamp	LUTHI	EM 101	36158	2016/5/18	2017/5/17
CDN	Frankonia	CDN M2+M3	A3011070	N.C.R.	N.C.R.
Test Software	R&S	EMC 32	V9.25.00	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.7.3 EUT Operating Condition

Environment:

Temperature	Humidity
20 °C	56 %RH

Test setup : Please refer to photo of CS testing set-up

5.7.4 Results of Immunity to Conducted Disturbances (CS)

Model No.:A86PLc Multi

Test Mode : Test mode 1
Basic Standard : IEC 61000-4-6
Frequency range : 0.15 MHz - 80 MHz
Field strength : 10 Vrms
Modulation : AM 80%, 1 kHz Sinewave
Frequency step : 1 % of fundamental
Dwell Time : 2 seconds
Coupling Method : CDN 3 Lines

Cable Description	Frequency (MHz)	Observation
AC input	0.15 – 80	A
DC input	0.15 – 80	N/A

Signal Ports

Cable Description	Frequency (MHz)	Observation
Signal/Comm.	0.15 – 80	N/A

Remark: A: No degradation of performance or loss of function.

N/A: Not Applicable.

5.8 Test of IEC 61000-4-8

5.8.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-8	2009	Power Frequency Magnetic Field Immunity Test

5.8.2 Test Instruments

SGS PFMF EN61000-4-8 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Magnetic Field Generator	Narda S.T.S.	PMM 1008	0100X30601	2016/11/21	2017/11/20
AC CLAMP METER	CHAUVIN ARNOUX	96	12002769	2016/9/5	2017/9/4
Triax Elf Magnetic Field Meter	F.W. BELL	4180	1248004	2016/7/1	2017/6/30
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.8.3 Environment

Environment:

Temperature	Humidity
20 °C	56 %RH

Test setup : Please refer to photo of PMF testing set-up

5.8.4 Result of Immunity to power Frequency Magnetic Field Immunity Tests

Model No.:A86PLc Multi

Test Mode : Test mode 1

Basic Standard : IEC 61000-4-8 : 2009

Power Frequency :50 Hz

Magnetic Field : 30 A/m(r.m.s)

Coil Orientation : X, Y, Z Axis

5.8.5 Results

Observation: A

Remark: A: No degradation of performance or loss of function.
N/A: Not Applicable.

5.9 Test of IEC 61000-4-11

5.9.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-11	2004	Voltage dips, short interruptions and voltage variations immunity tests

5.9.2 Test Instruments

SGS DIP EN61000-4-11 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	EMC Partner	TRANSIENT 3000D	D-1500	2016/5/4	2017/5/3
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

5.9.3 EUT Operating Condition

Environment:

Temperature	Humidity
21 °C	52 %RH

Test setup : Please refer to photo of DIP testing set-up

5.9.4 Results of Voltage Dips Immunity Test

Model No.:A86PLc Multi

EUT Rated Voltage : AC 230V/50Hz

Test Mode : Test mode 1

Voltage : 0, 40, 70 % Ut

Phase Angle : 0, 180 degree

Total events : 3 dropouts

Event interval : 10 seconds

Environmental phenomena	Test specifications (% residual voltage)	Cycle	Observation
Interruptions	0	250	B
Voltage dips	0	1	A
	40	10	A
	70	25	A

Remark: A: No degradation of performance or loss of function.

B : During test, the EUT's function degradation. After test, it recovery by itself.

N/A: Not Applicable.

APPENDIX - Constructional Details

Photography of General Testing Set-up.....	36-44
Photographs of Product.....	45-50

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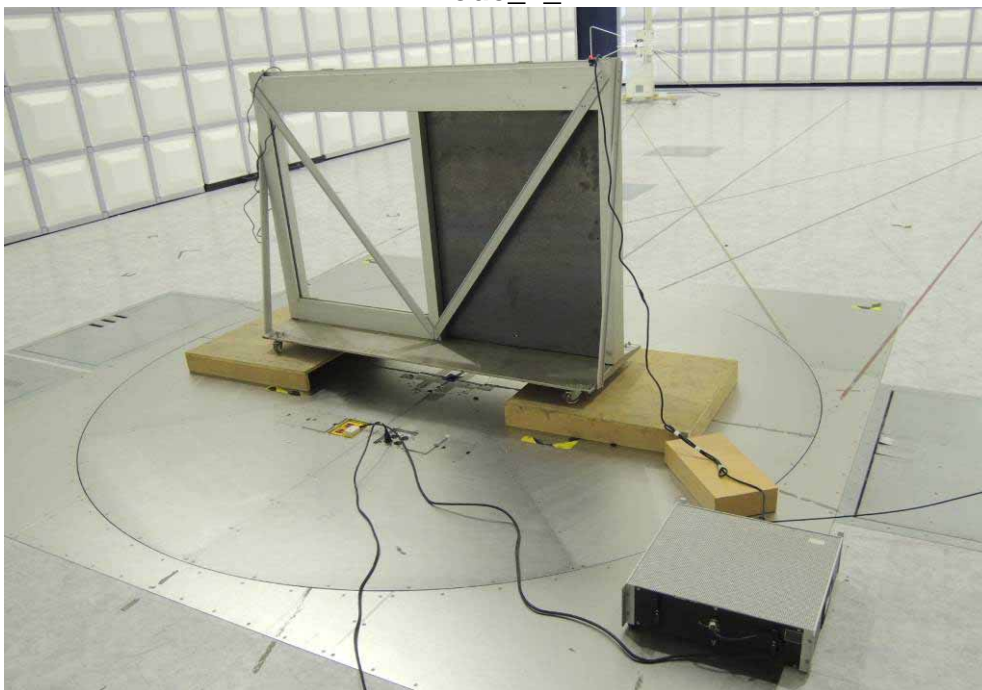
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Photography of General Testing Set-up CE Testing Set-up

Model No.:A86PLc Multi
Mode_1_+



Mode_1_-



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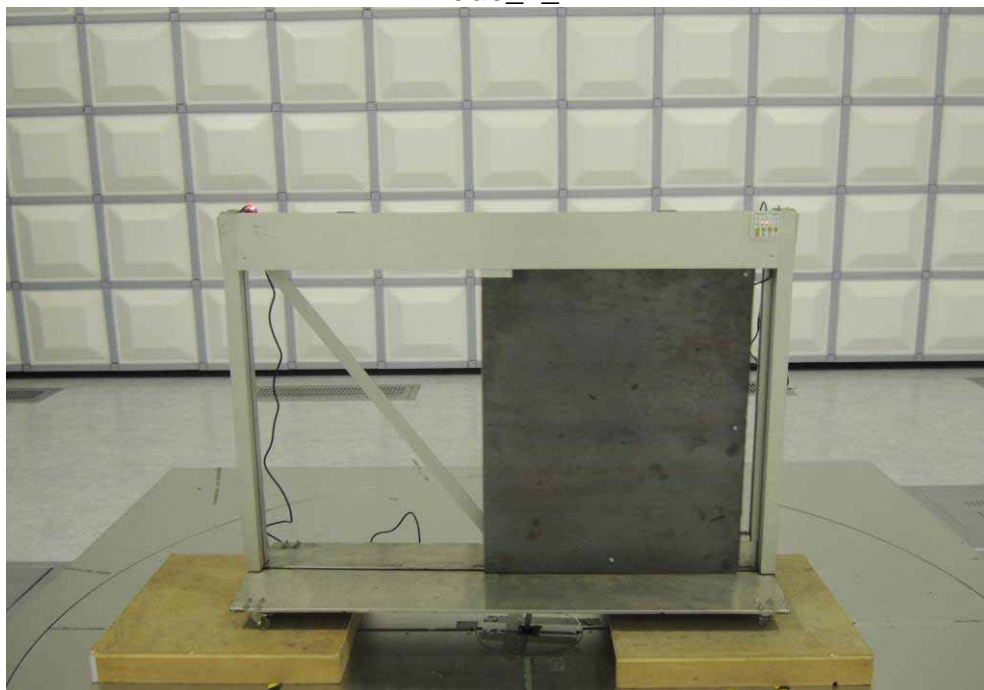
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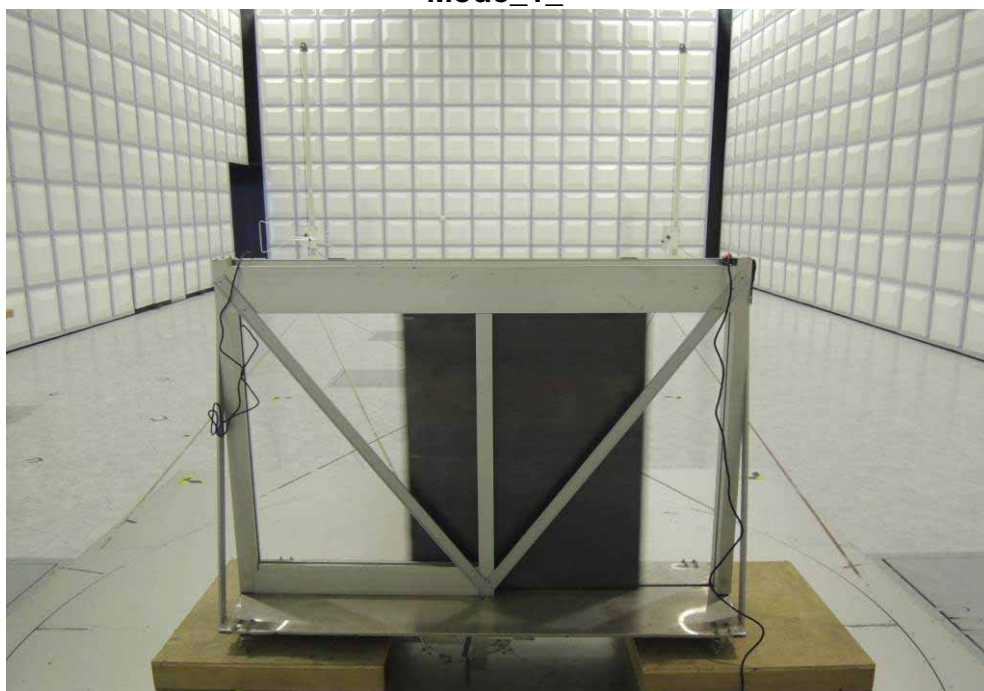
RE Testing Set-up

Model No.:A86PLc Multi

Mode_1_+



Mode_1_-



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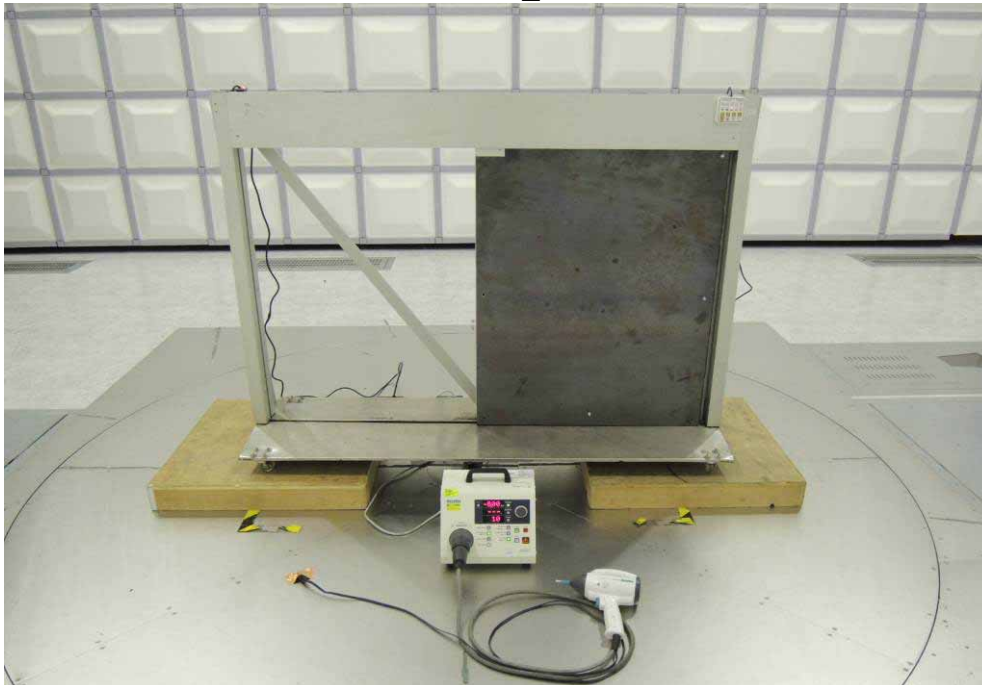
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ESD Testing Set-up

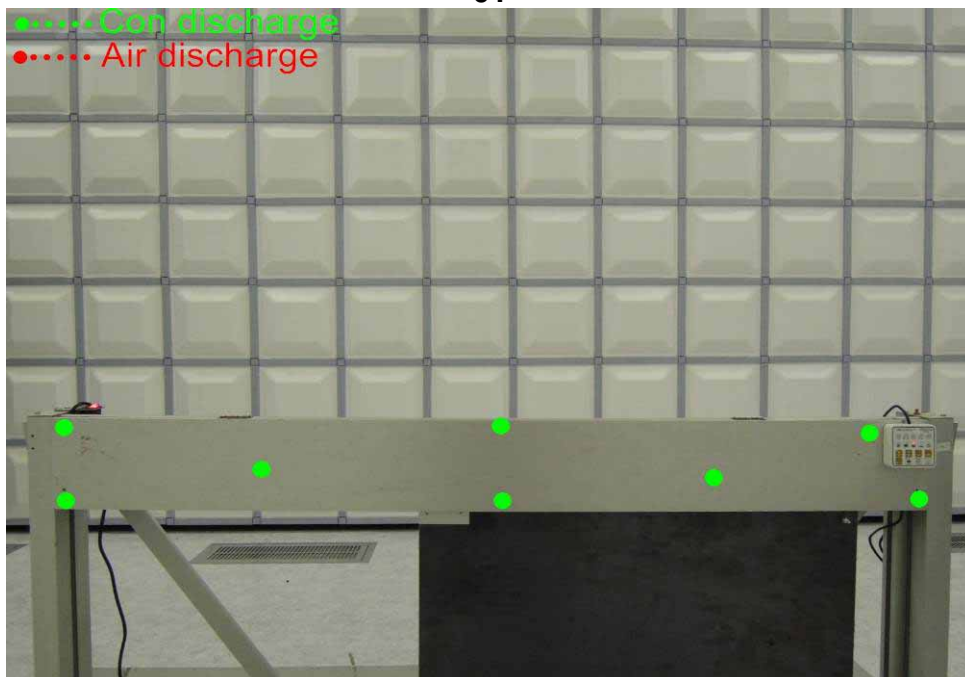
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ESD Test point

Air 
Cont. 

01



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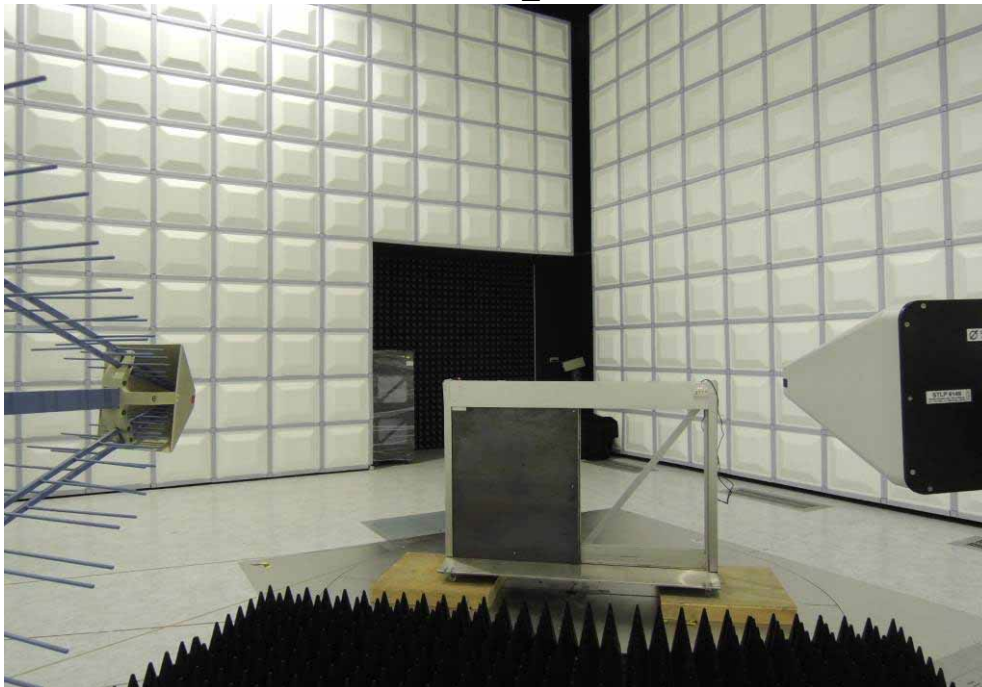


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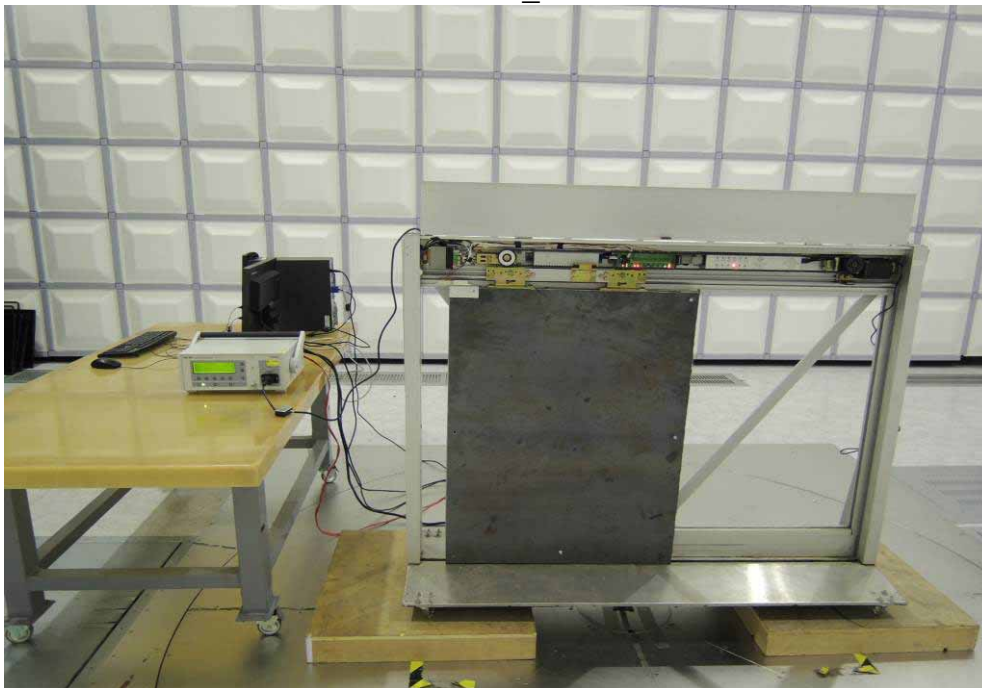
RS Testing Set-up

Model No.:A86PLc Multi
Mode_1



EFT Testing Set-up

Model No.:A86PLc Multi
Mode_1



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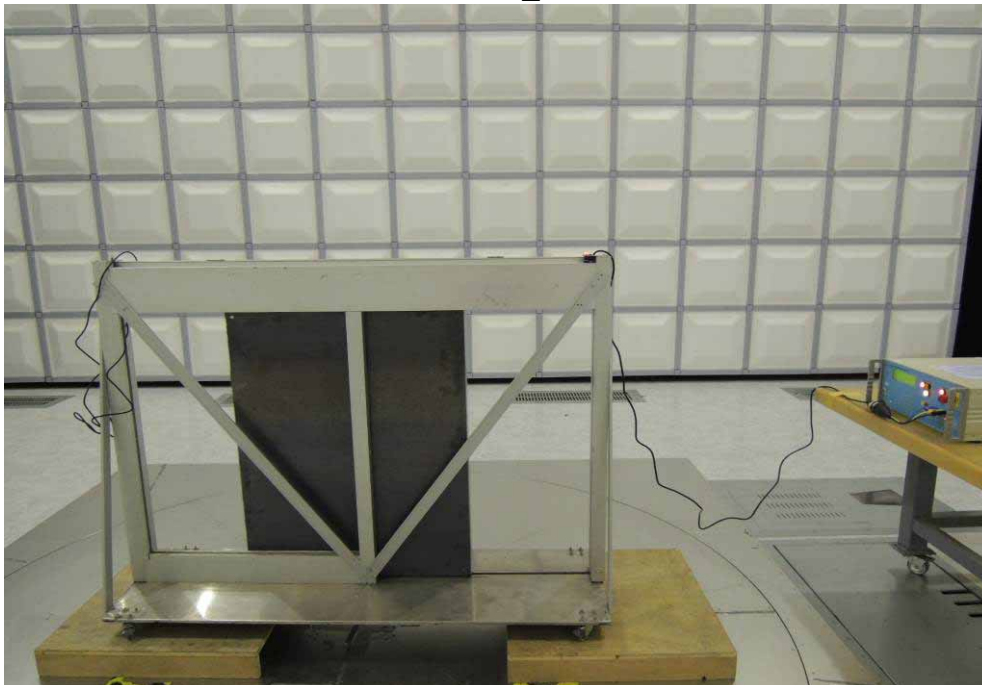
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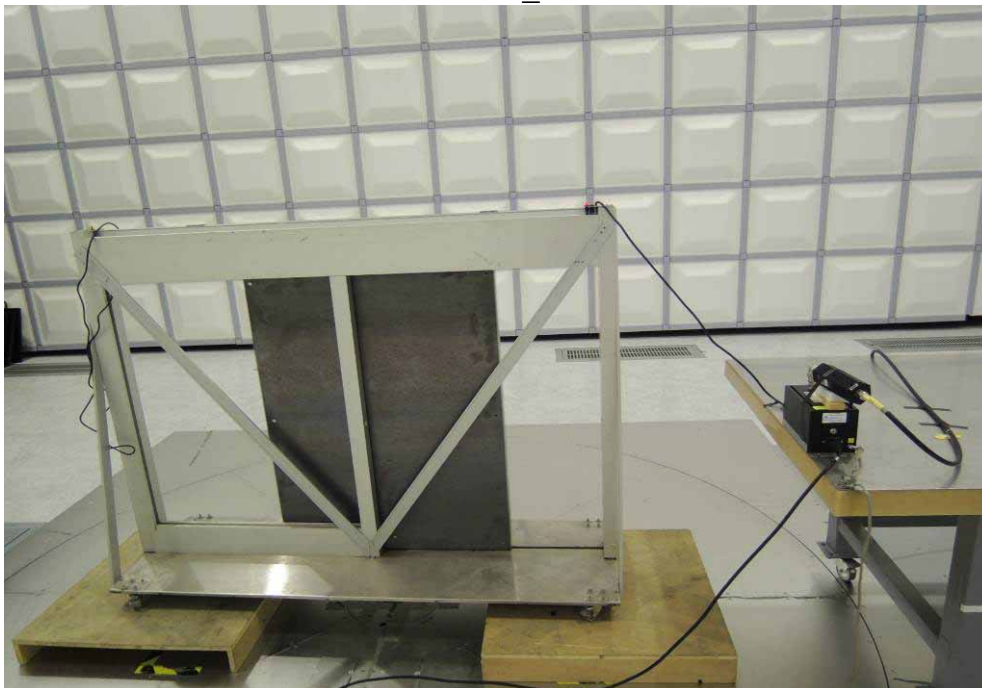
Surge Testing Set-up

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Mode_1



CS Testing Set-up

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Mode_1



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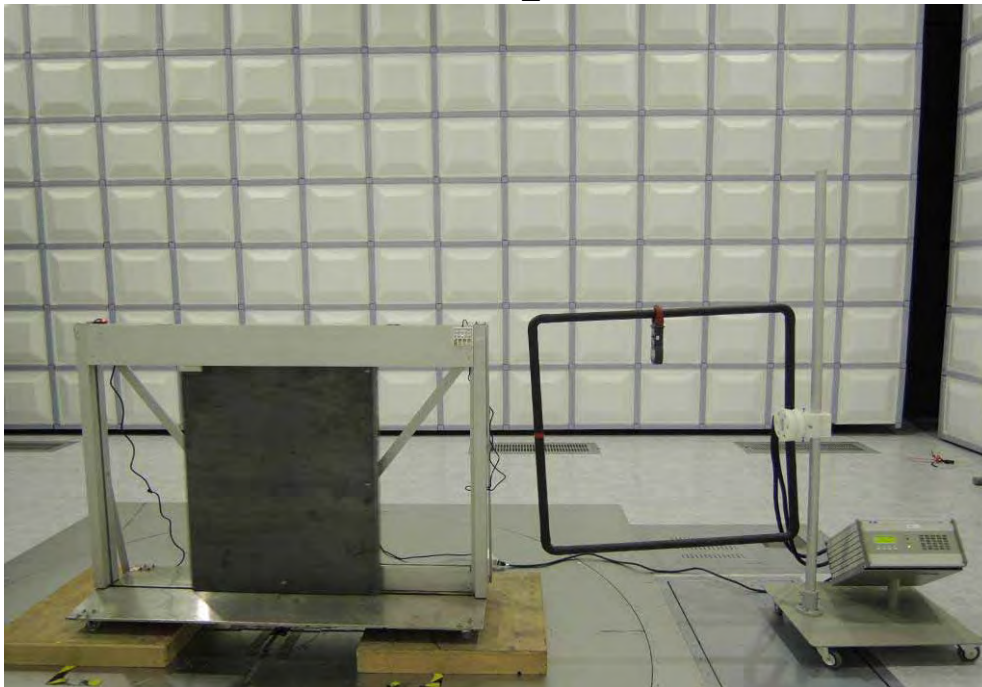
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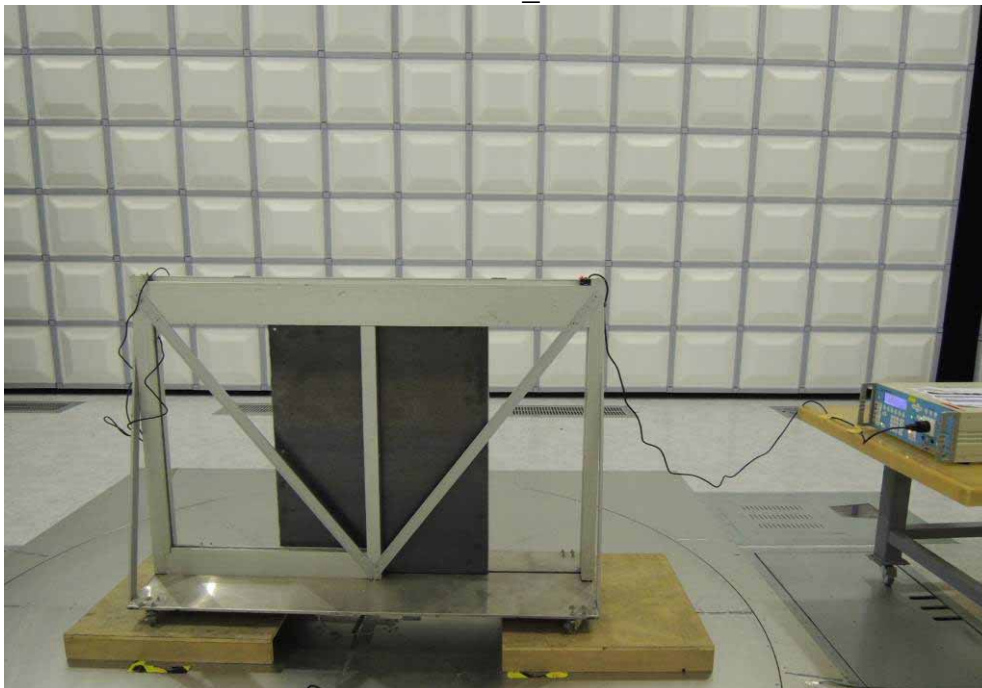
PMF Testing Set-up

Model No.:A86PLc Multi
Mode_1



DIP Testing Set-up

Model No.:A86PLc Multi
Mode_1



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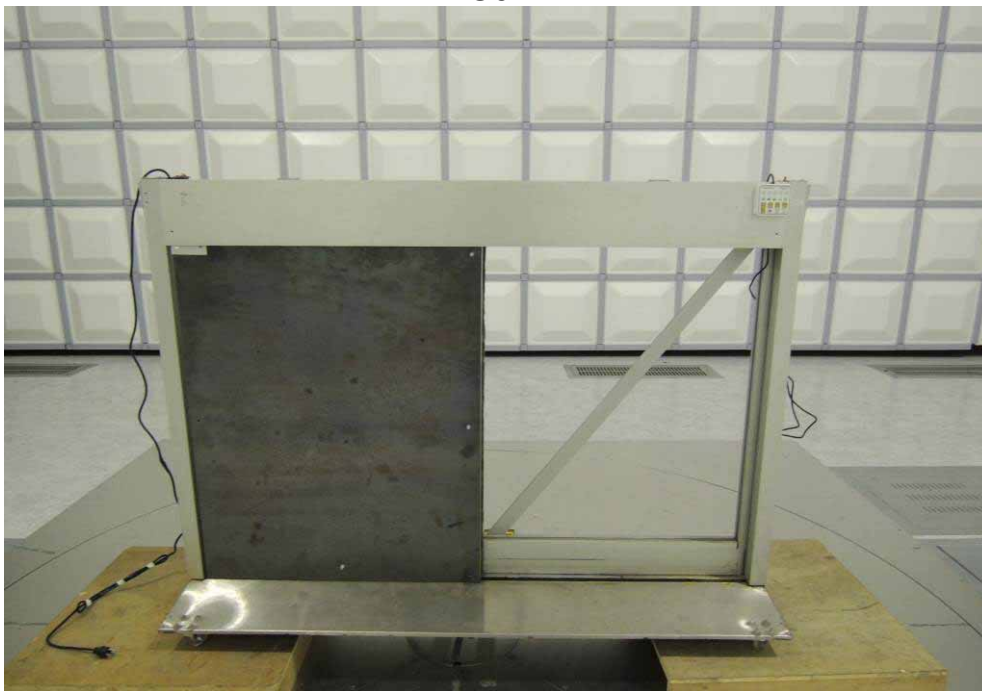
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Photographs of Product

Exterior

Model No.:A86PLc Multi

O01



O02



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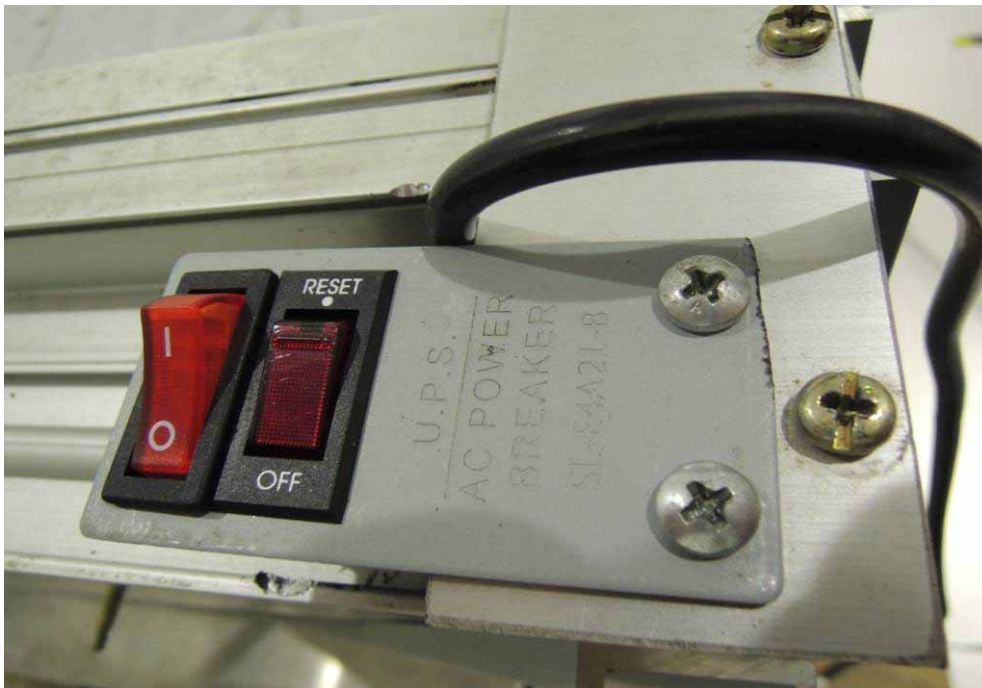
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003



004



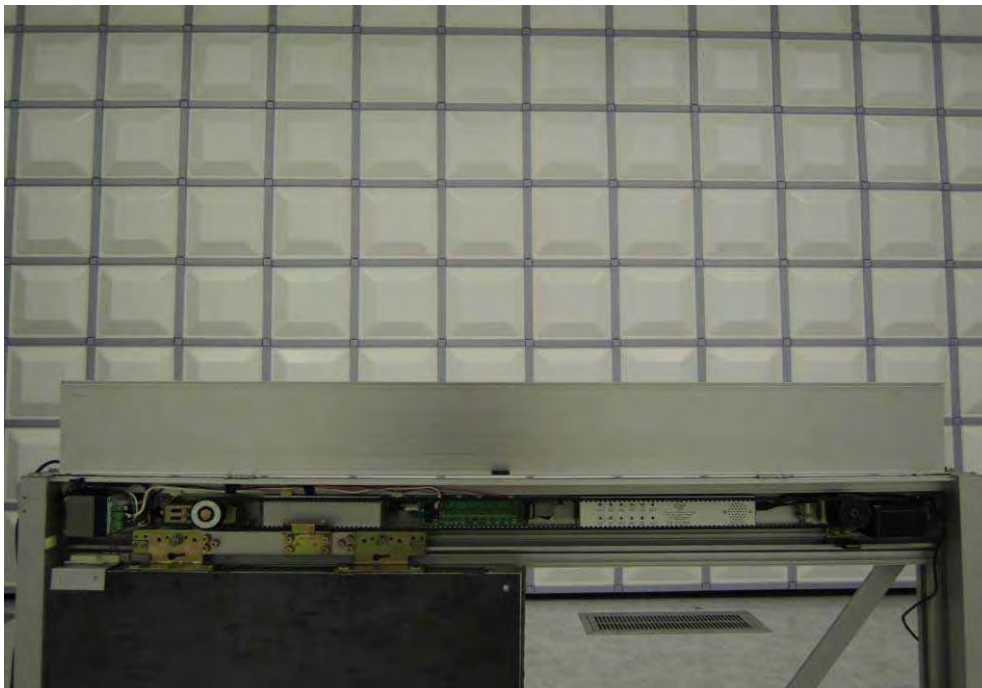
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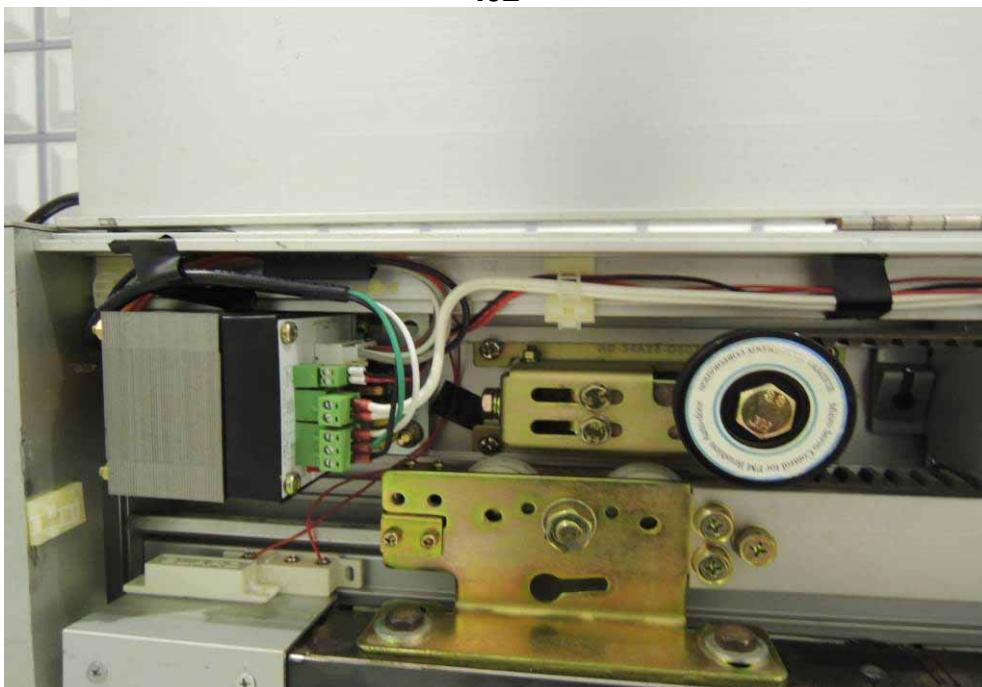
Interior

Model No.:A86PLc Multi

I01



I02



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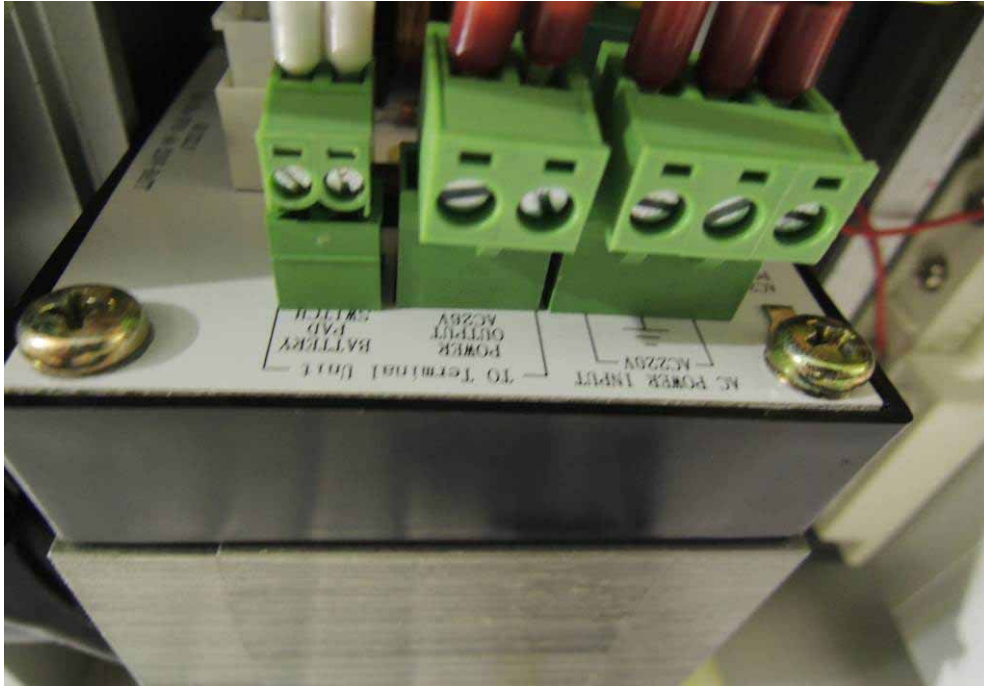
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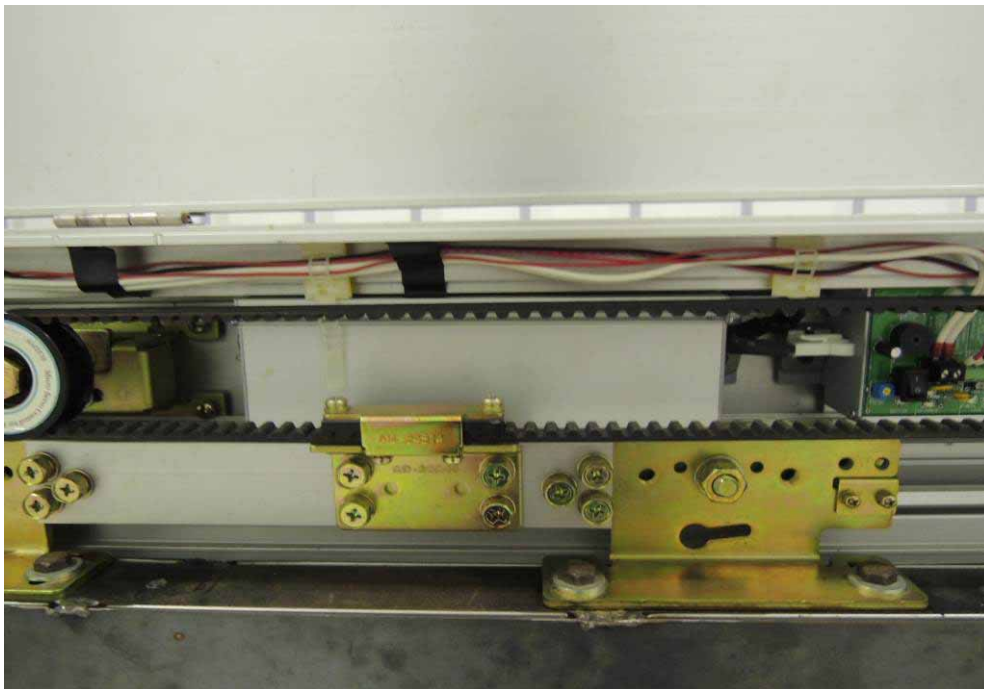
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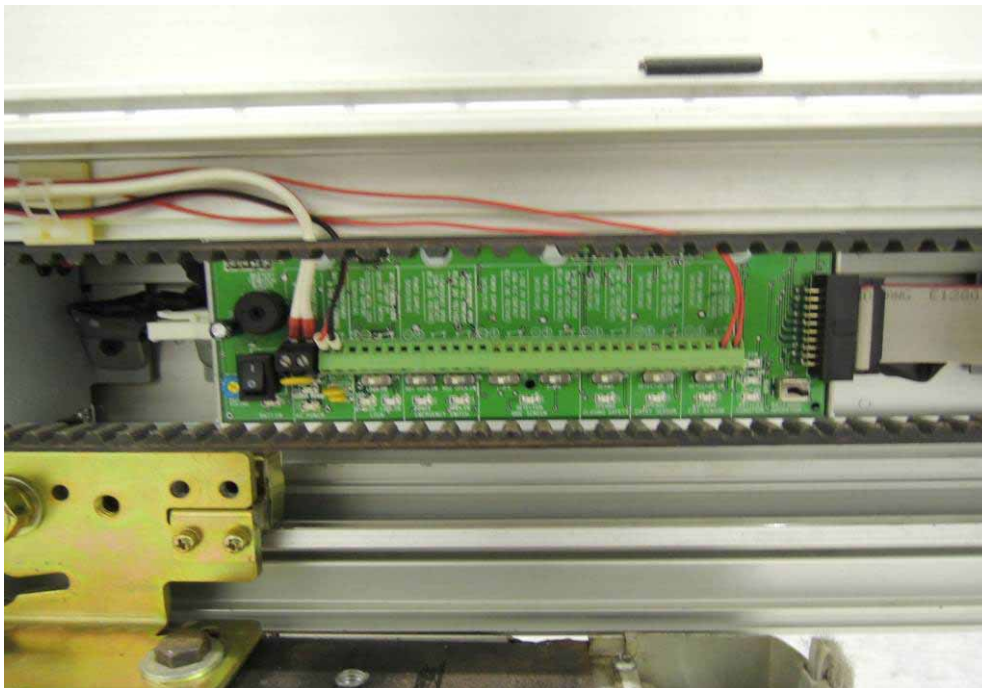
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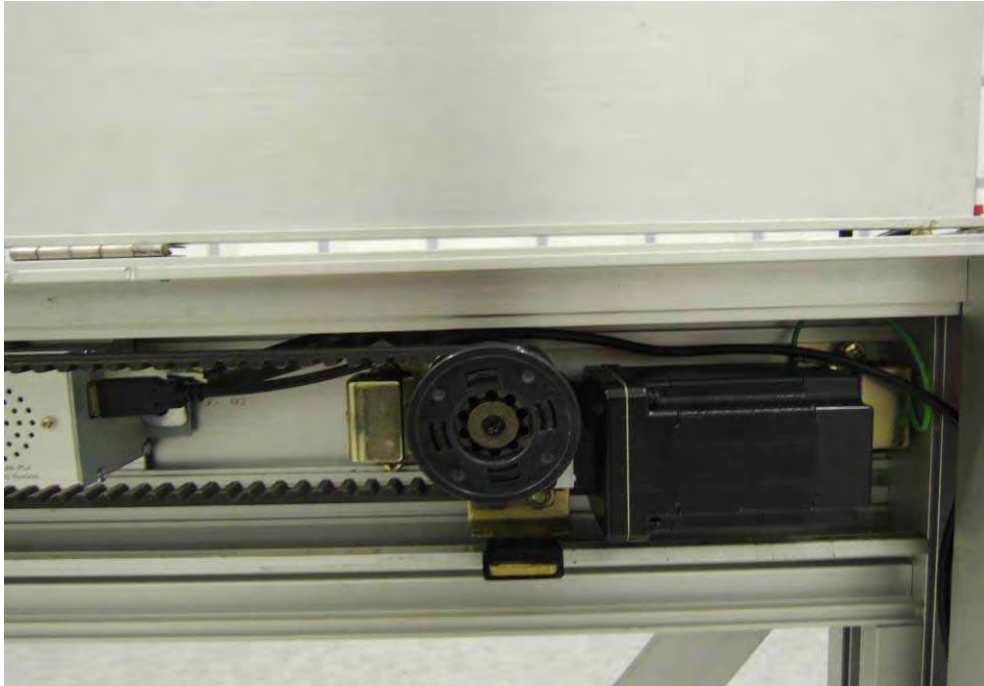
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