EMC TEST REPORT
For

SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD

Motion Control Card

Model No.: DMC3600, DMC5600, DMC3800, DMC5800, DMC3400A, DMC5400A

Prepared for	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Address	:	Floor 9, Block A3, iPark 1001 Xueyuan Blvd. Nanshan District Shenzhen, Guangdong 518000 China
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282

Report Number	:	ES190430979E
Date of Test	:	April 30, 2019 to May 08, 2019
Date of Report	:	May 20, 2019

TABLE OF CONTENT

TEST REPORT DESCRIPTION

Applicant	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Manufacturer	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Trademark	:	雷赛智能 Leadshine
EUT	:	Motion Control Card
Model No.	:	DMC3600, DMC5600, DMC3800, DMC5800, DMC3400A, DMC5400A
Power Supply	:	DC 5V (Connect to PC), DC 24V, 6W

Measurement Procedure Used:

EN 61000-6-4:2007+A1: 2011
EN55011:2009+A1:2010(group 1, CLASS A)
EN 61000-6-2:2005
EN 61000-3-2: 2014
EN 61000-3-3: 2013
(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)

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN61000-6-4, EN61000-6-2 and EN55011:2009+A1:2010(group 1, CLASS A) requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test	:	April 30, 2019 to May 08, 2019
Prepared by	:	Winmy Huang/Editor
Reviewer	:	Jessie Hu /Supervisor
Approved & Authorized Signer	:	Lisa Wang/Manager

EMTEK (SHENZHEN) CO., LTD. TESTING

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ES190430979E	/	Original Report

1. SUMMARY OF TEST RESULT

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Disturbance at Mains Terminals	EN61000-6-4:2007+A1:2011 EN55011:2009+A1:2010(group 1, CLASS A)	--	Pass
Radiated Disturbance	EN61000-6-4:2007+A1:2011 EN55011:2009+A1:2010(group 1, CLASS A)	--	Pass
Harmonic Current Emissions	EN 61000-3-2:2014	Class A	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3:2013	Section 5	Pass
IMMUNITY (EN 61000-6-2:2005)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio-Frequency, Continuous Radiated Disturbance	EN 61000-4-3:2006 +A1:2008+A2:2010	A	Pass
EFT/B Immunity	IEC 61000-4-4:2012	B	Pass
Surge Immunity	IEC 61000-4-5:2014	B	Pass
Conducted RF Immunity	IEC 61000-4-6:2013	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8:2009	A	Pass
Voltage Dips, >95% Reduction	IEC 61000-4-11:2004	B	Pass
Voltage Dips, 30% Reduction		C	Pass
Voltage Interruptions		C	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	Motion Control Card
Model Number	:	DMC3600, DMC5600, DMC3800, DMC5800, DMC3400A, DMC5400A (Note: These models are identical in circuitry and electrical, mechanical and physical construction; the only difference is model number.for trading purpose.We prepare DMC3800 for test.)
Test Voltage	:	DC 5V from PC
Applicant	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Address	:	Floor 9, Block A3, iPark 1001 Xueyuan Blvd. Nanshan District Shenzhen, Guangdong 518000 China
Manufacturer	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Address	:	Floor 9, Block A3, iPark 1001 Xueyuan Blvd. Nanshan District Shenzhen, Guangdong 518000 China
Factory	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD
Address	:	Floor 9, Block A3, iPark 1001 Xueyuan Blvd. Nanshan District Shenzhen, Guangdong 518000 China
Date of Received	:	April 30, 2019
Date of Test	:	April 30, 2019 to May 08, 2019

2.2. Description of Support Device

Monitor		Manufacturer: LENOVO M/N: 9227-AE6 S/N:4M0293084302824 CE, FCC
Keyboard	:	Manufacturer: LENOVO M/N: KU-0225 S/N:0585494 CE, FCC
Mouse	:	Manufacturer: LENOVO M/N: MO28UOL S/N:44G7862 068 CE, FCC
PC	:	Manufacturer: Lenovo M/N: ThinkCentre 8701 S/N: 8701A53L3BC108 CE, FCC

2.3. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19
The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, August 06, 2018
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number is 4480A.

Accredited by A2LA, August 08, 2018
The Certificate Number is 4321.01.

Name of Firm : EMTEK (SHENZHEN) CO., LTD.

Site Location : Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2.4. Measurement Uncertainty

Test Item		Uncertainty
Conducted Emission Uncertainty	:	2.08dB(9k~150kHz Conduction 1#) 2.40dB(150k-30MHz Conduction 1#)
Radiated Emission Uncertainty (3m 1# Chamber)	:	4.46dB (30M~1GHz Polarize: H) 5.04dB (30M~1GHz Polarize: V) 4.92dB (1~6GHz)
Uncertainty for C/S Test	:	1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	:	2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	:	0.6℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Test Receiver	Rohde & Schwarz	ESCI	26115-010-0027	May 19, 2018	1 Year
☑	L.I.S.N.	Rohde & Schwarz	ENV216	101161	May 19, 2018	1 Year
☑	50Ω Coaxial Switch	Anritsu	MP59B	6100175589	May 19, 2018	1 Year
☑	Voltage Probe	Rohde & Schwarz	ESH2-Z3	100122	May 20, 2018	1 Year

3.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	1 Year
☑	Pre-Amplifier	HP	8447F	2944A07999	May 19, 2018	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	142	May 20, 2018	1 Year
☑	Cable	Schwarzbeck	AK9513	ACRX1	May 20, 2018	1 Year
☑	Cable	Rosenberger	N/A	FP2RX2	May 20, 2018	1 Year
☑	Cable	Schwarzbeck	AK9513	CRPX1	May 20, 2018	1 Year
☑	Cable	Schwarzbeck	AK9513	CRRX2	May 20, 2018	1 Year
☑	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	1 Year
☑	Pre-Amplifier	A.H.	PAM-0126	1415261	May 20, 2018	1 Year
☑	Horn Antenna	Schwarzbeck	BBHA 9120	707	May 20, 2018	1 Year
☑	Cable	H+B	0.5M SF104-26.5	289147/4	May 20, 2018	1 Year
☑	Cable	H+B	3M SF104-26.5	295838/4	May 20, 2018	1 Year
☑	Cable	H+B	6M SF104-26.5	295840/4	May 20, 2018	1 Year

3.3. Harmonics and Flick Test for Three phase equipment

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 28, 2018	1 Year
☑	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 28, 2018	1 Year
☐	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	Mar 03, 2018	1 Year
☐	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	Mar 03, 2018	1 Year
☑	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 19, 2018	1 Year

3.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	ESD Tester	TESEQ AG	NSG 438A	130	May 20, 2018	1 Year
☑	Impulse Module	TESEQ AG	IN NSG 438A A 4380-150pF/330Ohm	403-550/1712	May 20, 2018	1 Year

3.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Signal Generator	Agilent	N5181A	MY50145187	May 19, 2018	1 Year
☑	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 20, 2018	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 20, 2018	1 Year
☑	Field Strength Meter	DARE	RSS1006A	10I00037SO22	May 20, 2018	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 20, 2018	1 Year
☑	Power Amplifier	MILMEGA	80RF1000-175	1059345	May 19, 2018	1 Year
☑	Power Amplifier	MILMEGA	AS0102-55	1018770	May 19, 2018	1 Year
☑	Power Amplifier	MILMEGA	AS1860-50	1059346	May 19, 2018	1 Year
☑	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	811	May 20, 2018	1 Year
☑	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	May 20, 2018	1 Year
☑	Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
☑	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A

3.6. For Electrical Fast Transient / Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Burst Tester	HAEFELY	PEFT4010	080981-16	May 20, 2018	1 Year
☑	Coupling Clamp	HAEFELY	IP-4A	147147	May 20, 2018	1 Year
☑	Three phase CDN	Teseq	CDN 163	202	May 20, 2018	1 Year

3.7. For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Surge Controller	HAEFELY	Psurge 8000	174031	May 20, 2018	1Year
☑	Impulse Module	HAEFELY	PIM 100	174124	May 20, 2018	1Year
☑	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 20, 2018	1Year
☑	Coupling Module	HAEFELY	PCD122	174354	May 20, 2018	1Year
☑	Surge Impulse Module	HAEFELY	PIM 120	174435	May 20, 2018	1Year
☑	Coupling Module	HAEFELY	PCD 126A	174387	May 20, 2018	1Year
☑	Impulse Module	HAEFELY	PIM 110	174391	May 20, 2018	1Year
☑	Impulse Module	HAEFELY	PIM 150	178707	May 20, 2018	1Year

3.8. For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Simulator	EMTEST	CWS500C	0900-12	May 20, 2018	1Year
☑	CDN	EMTEST	CDN-M2	5100100100	May 20, 2018	1Year
☑	CDN	EMTEST	CDN-M3	0900-11	May 20, 2018	1Year
☑	Injection Clamp	EMTEST	F-2031-23MM	368	May 20, 2018	1Year
☑	Attenuator	EMTEST	ATT6	0010222A	May 20, 2018	1Year
☑	Three phase CDN	Teseq	CDN M332S	32655	May 20, 2018	1 Year
☑	Three phase CDN	Teseq	CDN M432S	33670	May 20, 2018	1 Year
☑	Three phase CDN	Teseq	CDN M432-3LNS	34048	May 20, 2018	1 Year
☑	Three phase CDN	Teseq	CDN M532S	33799	May 20, 2018	1 Year
☑	Bulk Current Injection Probe	FCC	F-120-9	140302	May 20, 2018	1 Year

3.9. For Magnetic Field Immunity Test

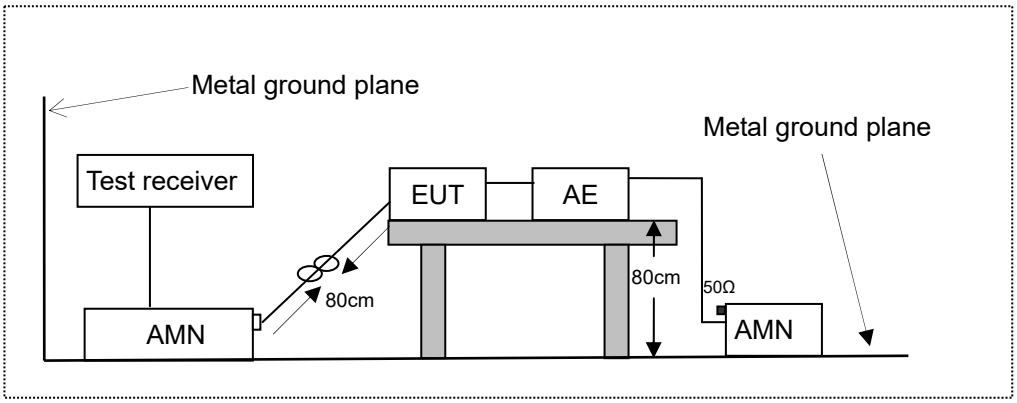
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 19, 2018	1 Year

3.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 19, 2018	1 Year
☑	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 19, 2018	1 Year
☑	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 19, 2018	1 Year
☑	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	May 19, 2018	1 Year
☑	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 19, 2018	1 Year

4. CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



LISN: Artificial Mains Network
AE: Associated equipment
EUT: Equipment under test

4.2. Measuring Standard

EN 61000-6-4:2007+A1: 2011
EN55011:2009+A1:2010(group 1, CLASS A)

4.3. Conducted Emission Limits

Power Line Conducted Emission Limits

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0
0.50 ~ 30.00	73.0	60.0
NOTE 1-The lower limit shall apply at the transition frequencies.		

4.4. EUT Configuration on Measurement

The following equipment are installed on Conducted Emission Measurement to meet EN 61000-6-4 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Motion Control Card
Model Number : DMC3800

4.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC/DC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipment. Both sides of AC/DC line are investigated to find out the maximum conducted emission according to the EN 61000-6-4 regulations during conducted

emission measurement.
The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.
The frequency range from 150kHz to 30MHz is investigated.
All the modes were tested and the data of the worsted mode are attached in the following pages.

4.6. Measuring Results

PASS.

Please see the following pages.

Site Conduction #1 Phase: N Temperature: 24.9

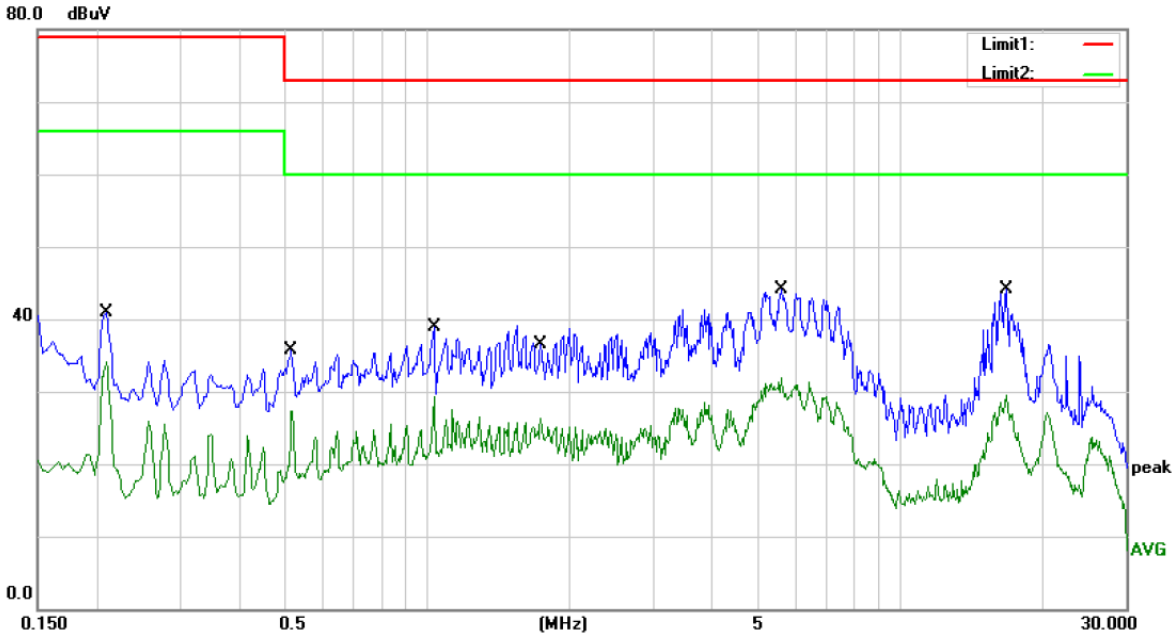
Limit: (CE)EN61000-6-4_QP Power: DC 5V from PC Humidity: 54 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2100	30.20	9.55	39.75	79.00	-39.25	QP	
2		0.2100	22.60	9.55	32.15	66.00	-33.85	AVG	
3		1.0340	33.11	9.58	42.69	73.00	-30.31	QP	
4	*	1.0340	27.76	9.58	37.34	60.00	-22.66	AVG	
5		2.0660	28.82	9.60	38.42	73.00	-34.58	QP	
6		2.0660	16.96	9.60	26.56	60.00	-33.44	AVG	
7		3.8740	31.43	9.63	41.06	73.00	-31.94	QP	
8		3.8740	18.66	9.63	28.29	60.00	-31.71	AVG	
9		5.2300	34.52	9.66	44.18	73.00	-28.82	QP	
10		5.2300	21.68	9.66	31.34	60.00	-28.66	AVG	
11		16.6100	33.31	10.08	43.39	73.00	-29.61	QP	
12		16.6100	18.96	10.08	29.04	60.00	-30.96	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan



Site Conduction #1 Phase: *L1* Temperature: 24.9

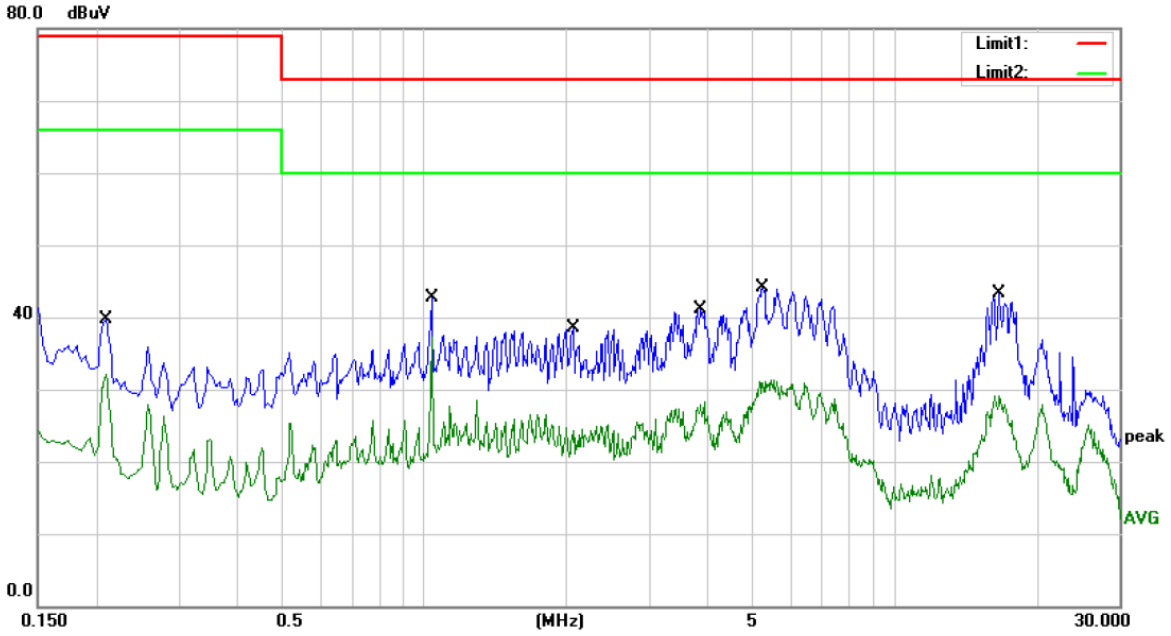
Limit: (CE)EN61000-6-4_QP Power: DC 5V from PC Humidity: 54 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2100	31.30	9.55	40.85	79.00	-38.15	QP	
2		0.2100	24.49	9.55	34.04	66.00	-31.96	AVG	
3		0.5180	26.05	9.56	35.61	73.00	-37.39	QP	
4		0.5180	17.80	9.56	27.36	60.00	-32.64	AVG	
5		1.0340	29.32	9.58	38.90	73.00	-34.10	QP	
6		1.0340	19.80	9.58	29.38	60.00	-30.62	AVG	
7		1.7420	29.45	9.59	39.04	73.00	-33.96	QP	
8		1.7420	16.65	9.59	26.24	60.00	-33.76	AVG	
9		5.6060	34.37	9.67	44.04	73.00	-28.96	QP	
10	*	5.6060	22.29	9.67	31.96	60.00	-28.04	AVG	
11		16.7940	33.96	10.09	44.05	73.00	-28.95	QP	
12		16.7940	19.33	10.09	29.42	60.00	-30.58	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan



Site Conduction #1 Phase: *N* Temperature: 24.9

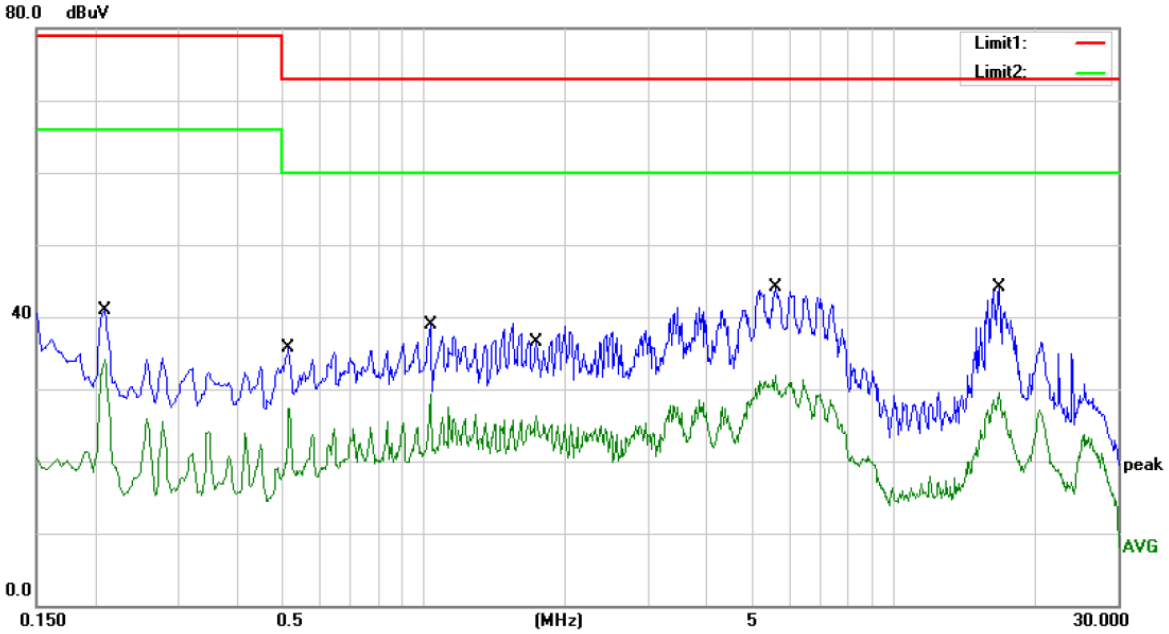
Limit: (CE)EN55011 class A_QP Power: DC 5V from PC Humidity: 54 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2100	30.20	9.55	39.75	79.00	-39.25	QP	
2		0.2100	22.60	9.55	32.15	66.00	-33.85	AVG	
3		1.0340	33.11	9.58	42.69	73.00	-30.31	QP	
4	*	1.0340	27.76	9.58	37.34	60.00	-22.66	AVG	
5		2.0660	28.82	9.60	38.42	73.00	-34.58	QP	
6		2.0660	16.96	9.60	26.56	60.00	-33.44	AVG	
7		3.8740	31.43	9.63	41.06	73.00	-31.94	QP	
8		3.8740	18.66	9.63	28.29	60.00	-31.71	AVG	
9		5.2300	34.52	9.66	44.18	73.00	-28.82	QP	
10		5.2300	21.68	9.66	31.34	60.00	-28.66	AVG	
11		16.6100	33.31	10.08	43.39	73.00	-29.61	QP	
12		16.6100	18.96	10.08	29.04	60.00	-30.96	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan



Site Conduction #1 Phase: *L1* Temperature: 24.9

Limit: (CE)EN55011 class A_QP Power: DC 5V from PC Humidity: 54 %

Mode: Connect to PC

Note:

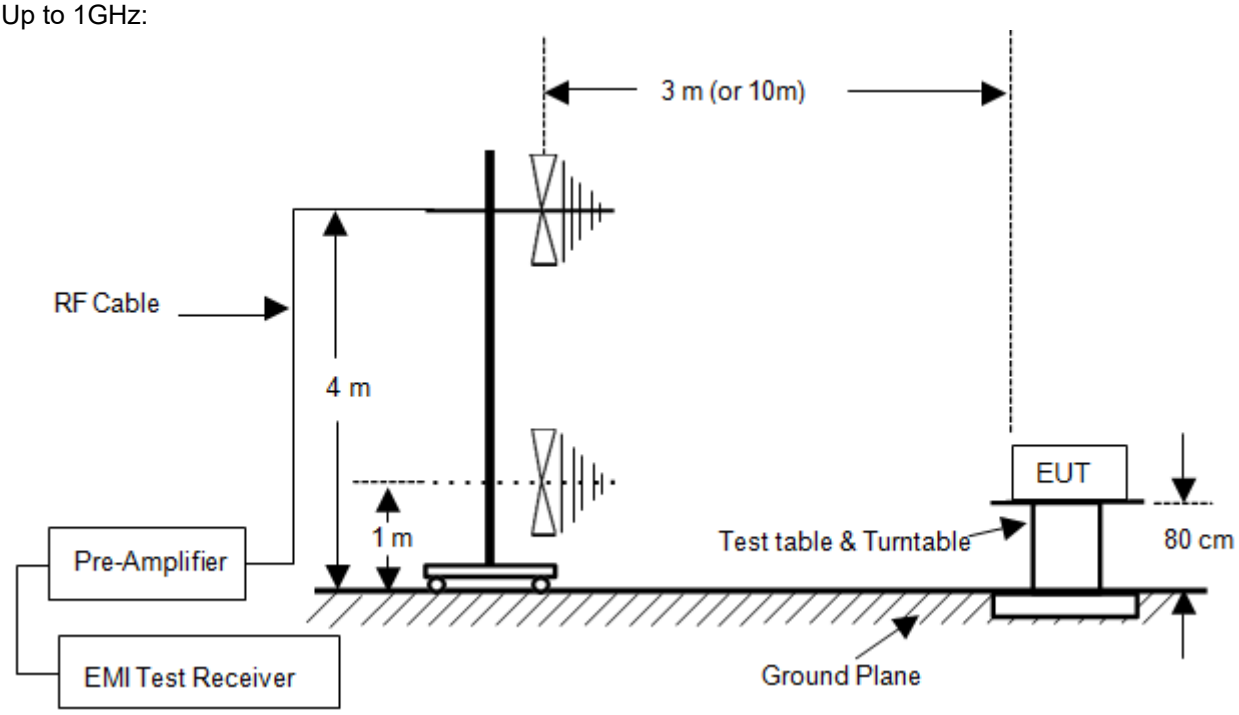
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2100	31.30	9.55	40.85	79.00	-38.15	QP	
2		0.2100	24.49	9.55	34.04	66.00	-31.96	AVG	
3		0.5180	26.05	9.56	35.61	73.00	-37.39	QP	
4		0.5180	17.80	9.56	27.36	60.00	-32.64	AVG	
5		1.0340	29.32	9.58	38.90	73.00	-34.10	QP	
6		1.0340	19.80	9.58	29.38	60.00	-30.62	AVG	
7		1.7420	29.45	9.59	39.04	73.00	-33.96	QP	
8		1.7420	16.65	9.59	26.24	60.00	-33.76	AVG	
9		5.6060	34.37	9.67	44.04	73.00	-28.96	QP	
10	*	5.6060	22.29	9.67	31.96	60.00	-28.04	AVG	
11		16.7940	33.96	10.09	44.05	73.00	-28.95	QP	
12		16.7940	19.33	10.09	29.42	60.00	-30.58	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan

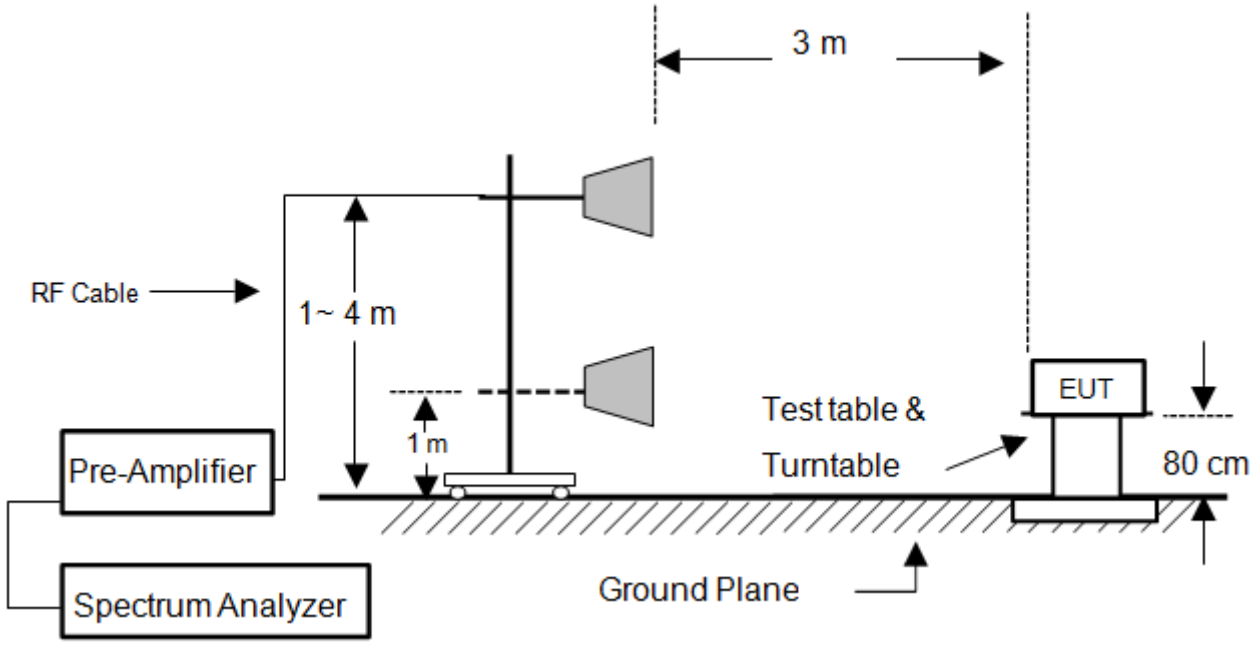
5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

Up to 1GHz:



Above 1GHz:



5.2. Measuring Standard

EN 61000-6-4:2007+A1: 2011
EN55011:2009+A1:2010(group 1, CLASS A)

5.3. Radiated Emission Limits

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Frequency range (MHz)	Measurement			Class A limits dB(μV/m)
	Facility	Distance (m)	Detector type/ bandwidth	
1000 to 3000	FSOATS	3	Average / 1 MHz	56
3000 to 6000				60
1000 to 3000			Peak /1 MHz	76
3000 to 6000				80

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4. EUT Configuration on Measurement

The EN 61000-6-4 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : Motion Control Card
Model Number : DMC3800

5.5. Test Procedure

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

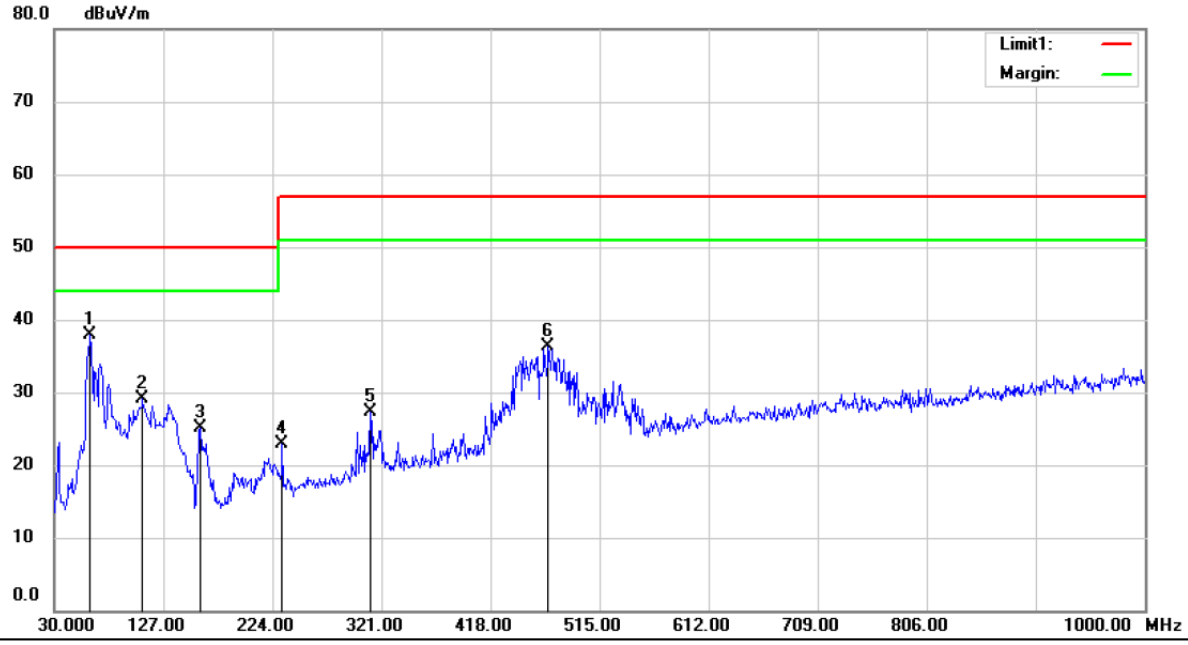
The bandwidth of the Receiver is set at 120kHz.
All the modes were tested and the data of the worsted mode are attached in the following pages.

5.6. Measuring Results

PASS.

The frequency range from 30MHz to 6000MHz is investigated.

Please see the following pages.



Site 3m Chamber #1 Polarization: *Vertical* Temperature: 29.5 C

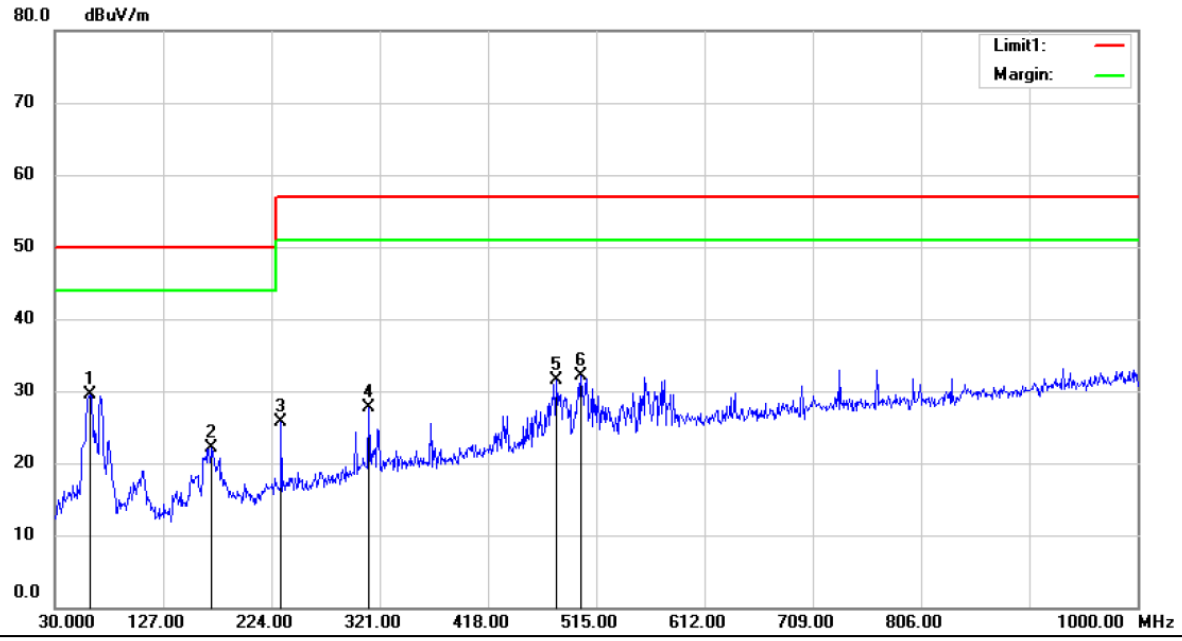
Limit: (RE)EN61000-6-4 Power: DC 5V from PC Humidity: 48 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	62.6890	51.13	-13.19	37.94	50.00	-12.06	QP			
2		109.0550	41.63	-12.50	29.13	50.00	-20.87	QP			
3		160.2710	39.72	-14.70	25.02	50.00	-24.98	QP			
4		233.3120	33.25	-10.44	22.81	57.00	-34.19	QP			
5		311.9790	35.42	-8.08	27.34	57.00	-29.66	QP			
6		470.2830	41.55	-5.17	36.38	57.00	-20.62	QP			

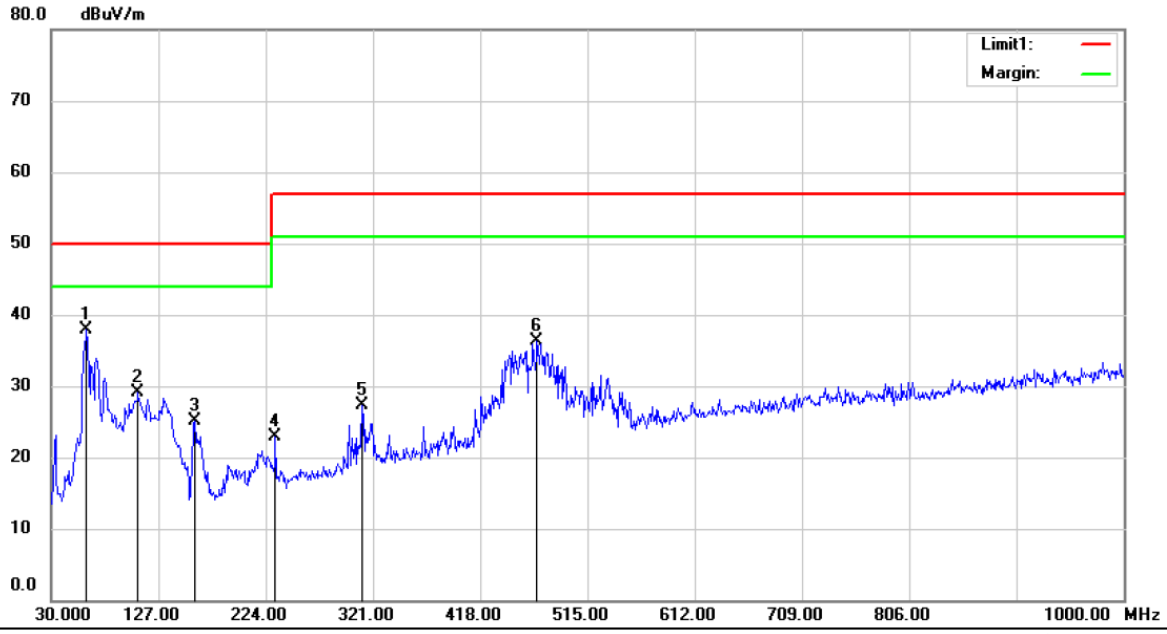
*:Maximum data x:Over limit !:over margin Operator: kk



Site 3m Chamber #1 Polarization: *Horizontal* Temperature: 29.5 C
Limit: (RE)EN61000-6-4 Power: DC 5V from PC Humidity: 48 %
Mode: Connect to PC
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	62.0100	42.61	-13.09	29.52	50.00	-20.48	QP			
2		171.5230	36.32	-14.23	22.09	50.00	-27.91	QP			
3		233.3120	36.13	-10.44	25.69	57.00	-31.31	QP			
4		311.9790	35.73	-8.08	27.65	57.00	-29.35	QP			
5		479.5950	36.50	-5.04	31.46	57.00	-25.54	QP			
6		501.8080	36.79	-4.71	32.08	57.00	-24.92	QP			

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



Site 3m Chamber #1
Limit: (RE)EN55011 Class A
Mode: Connect to PC
Note:

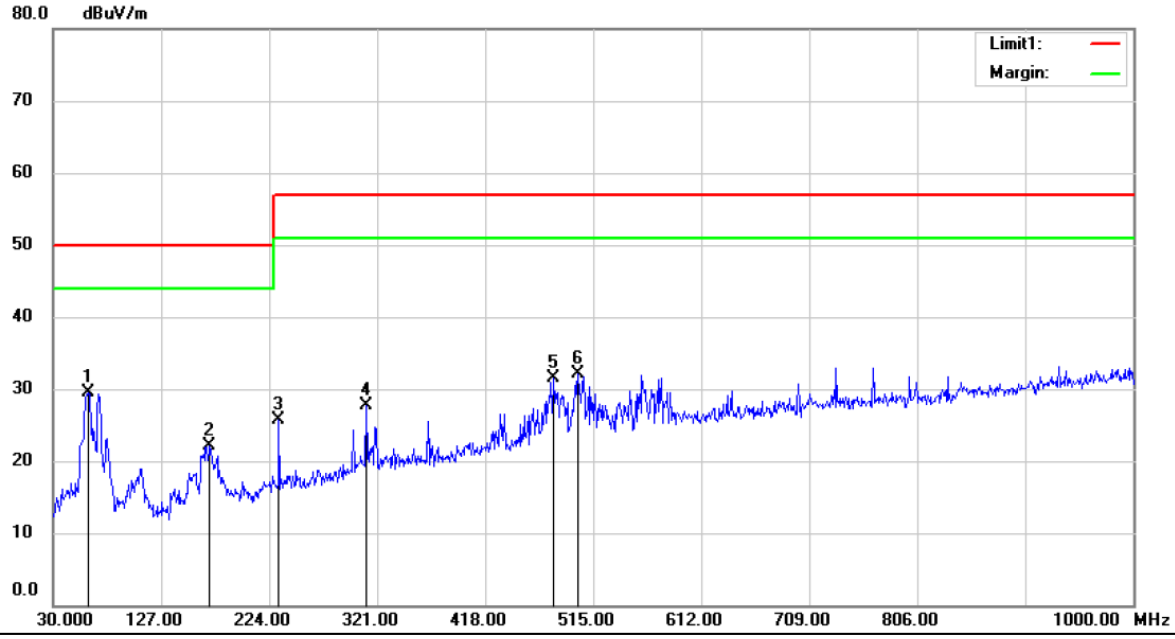
Polarization: *Vertical*
Power: DC 5V from PC

Temperature: 29.5 C
Humidity: 48 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	62.6890	51.13	-13.19	37.94	50.00	-12.06	QP			
2		109.0550	41.63	-12.50	29.13	50.00	-20.87	QP			
3		160.2710	39.72	-14.70	25.02	50.00	-24.98	QP			
4		233.3120	33.25	-10.44	22.81	57.00	-34.19	QP			
5		311.9790	35.42	-8.08	27.34	57.00	-29.66	QP			
6		470.2830	41.55	-5.17	36.38	57.00	-20.62	QP			

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

Operator: kk



Site 3m Chamber #1 Polarization: ***Horizontal*** Temperature: 29.5 C

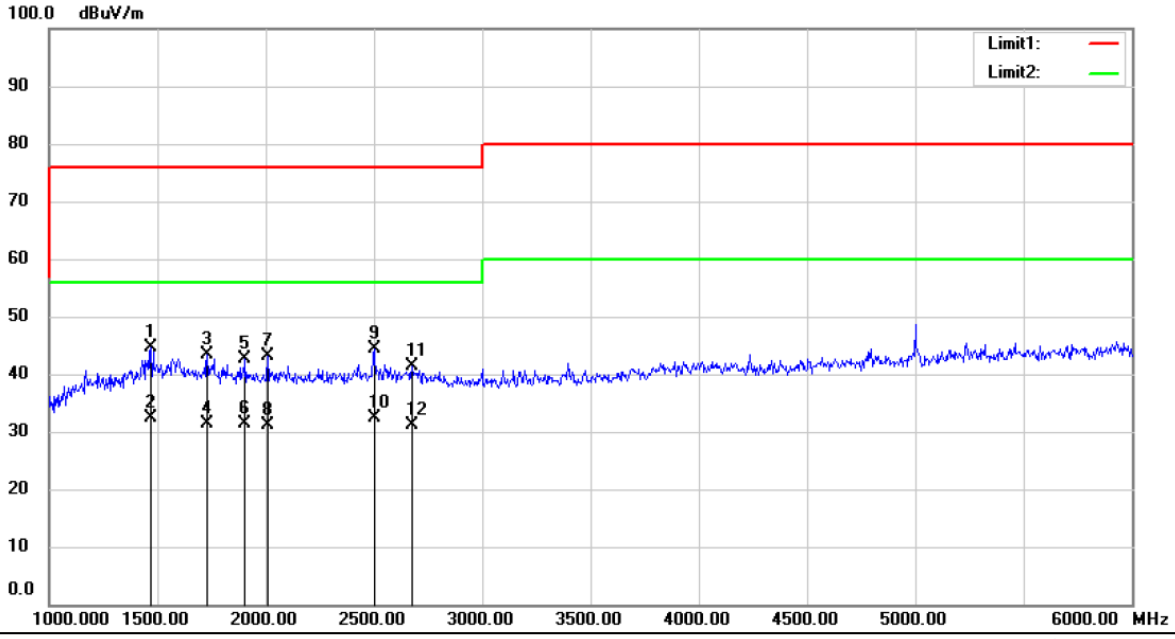
Limit: (RE)EN55011 Class A Power: DC 5V from PC Humidity: 48 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	62.0100	42.61	-13.09	29.52	50.00	-20.48	QP			
2		171.5230	36.32	-14.23	22.09	50.00	-27.91	QP			
3		233.3120	36.13	-10.44	25.69	57.00	-31.31	QP			
4		311.9790	35.73	-8.08	27.65	57.00	-29.35	QP			
5		479.5950	36.50	-5.04	31.46	57.00	-25.54	QP			
6		501.8080	36.79	-4.71	32.08	57.00	-24.92	QP			

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



Site 3m Chamber #1
Limit: (RE)EN61000-6-4
Mode: Connect to PC
Note:

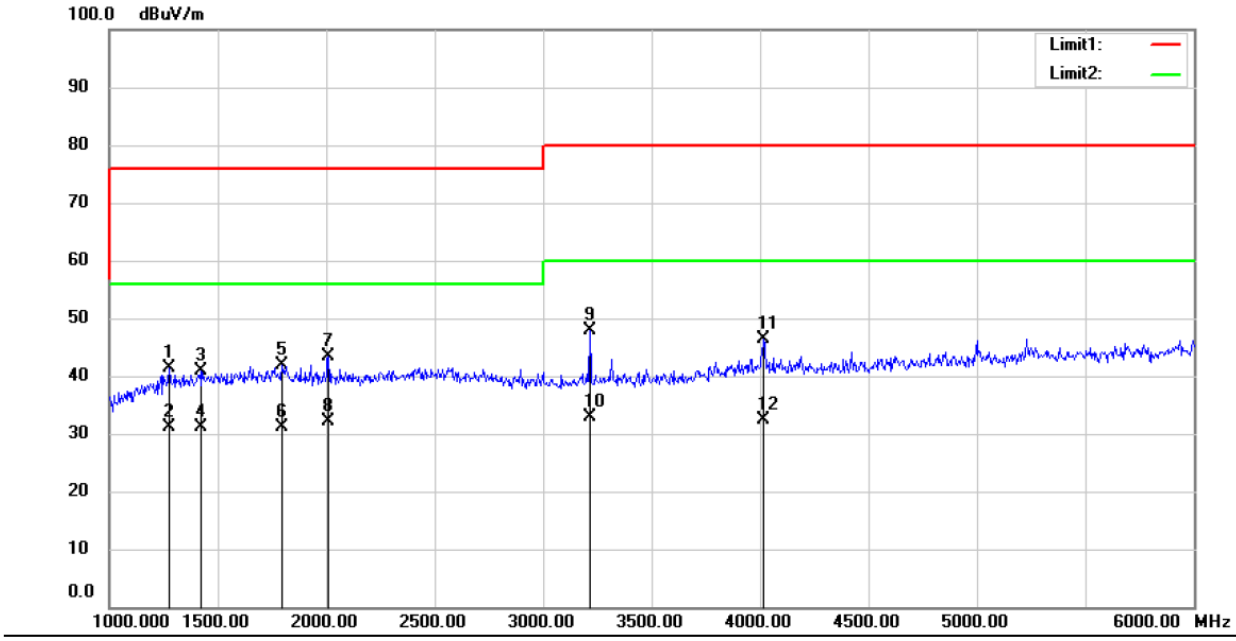
Polarization: *Vertical*
Power: DC 5V from PC

Temperature: 29.5 C
Humidity: 48 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1474.375	63.87	-19.33	44.54	76.00	-31.46	peak			
2	*	1474.375	51.83	-19.33	32.50	56.00	-23.50	AVG			
3		1731.250	62.87	-19.39	43.48	76.00	-32.52	peak			
4		1731.250	50.85	-19.39	31.46	56.00	-24.54	AVG			
5		1908.125	62.01	-19.47	42.54	76.00	-33.46	peak			
6		1908.125	50.80	-19.47	31.33	56.00	-24.67	AVG			
7		2010.625	62.59	-19.48	43.11	76.00	-32.89	peak			
8		2010.625	50.51	-19.48	31.03	56.00	-24.97	AVG			
9		2501.250	62.47	-18.17	44.30	76.00	-31.70	peak			
10		2501.250	50.64	-18.17	32.47	56.00	-23.53	AVG			
11		2678.125	59.60	-18.29	41.31	76.00	-34.69	peak			
12		2678.125	49.44	-18.29	31.15	56.00	-24.85	AVG			

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

Operator: kk



Site 3m Chamber #1 Polarization: *Horizontal* Temperature: 29.5 C

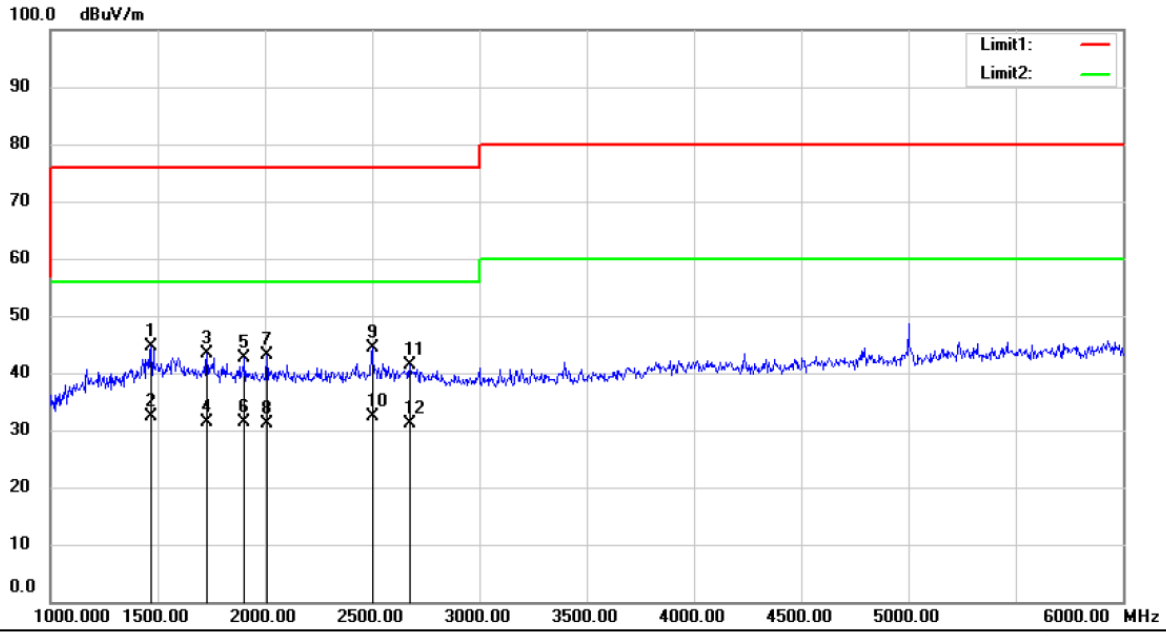
Limit: (RE)EN61000-6-4 Power: DC 5V from PC Humidity: 48 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1277.500	61.19	-19.77	41.42	76.00	-34.58	peak			
2		1277.500	50.88	-19.77	31.11	56.00	-24.89	AVG			
3		1421.250	60.37	-19.46	40.91	76.00	-35.09	peak			
4		1421.250	50.52	-19.46	31.06	56.00	-24.94	AVG			
5		1799.375	61.21	-19.42	41.79	76.00	-34.21	peak			
6		1799.375	50.64	-19.42	31.22	56.00	-24.78	AVG			
7		2011.250	62.91	-19.48	43.43	76.00	-32.57	peak			
8	*	2011.250	51.63	-19.48	32.15	56.00	-23.85	AVG			
9		3216.875	65.79	-18.02	47.77	80.00	-32.23	peak			
10		3216.875	50.89	-18.02	32.87	60.00	-27.13	AVG			
11		4016.250	61.41	-15.09	46.32	80.00	-33.68	peak			
12		4016.250	47.45	-15.09	32.36	60.00	-27.64	AVG			

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



Site 3m Chamber #1 Polarization: *Vertical* Temperature: 29.5 C

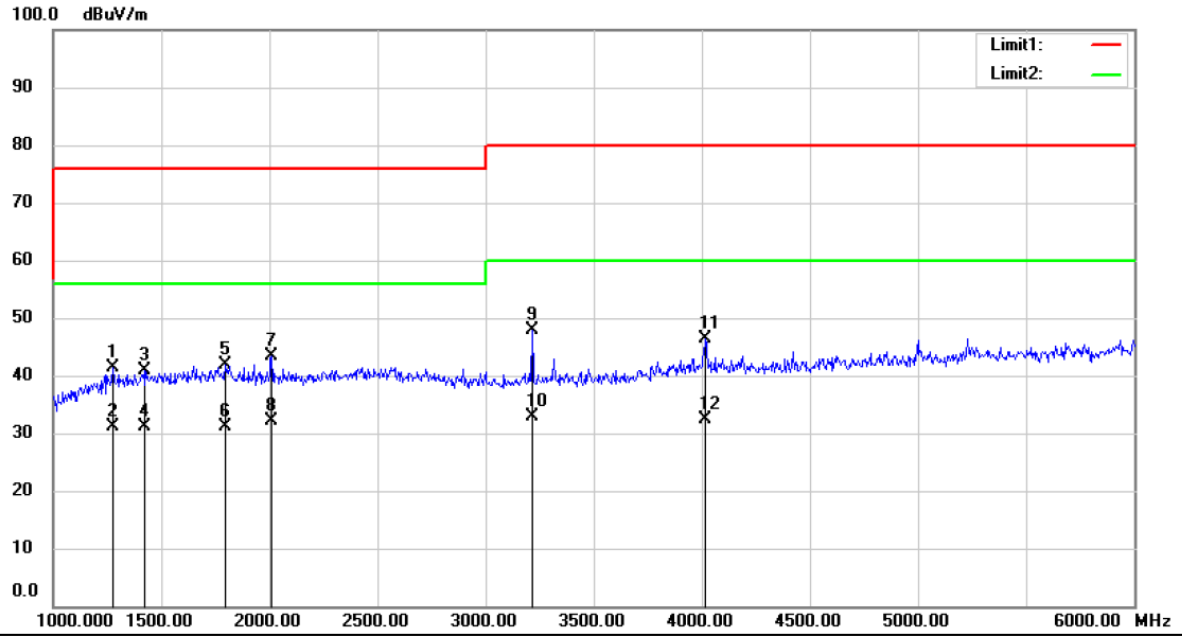
Limit: (RE)EN55011 Class A Power: DC 5V from PC Humidity: 48 %

Mode: Connect to PC

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1474.375	63.87	-19.33	44.54	76.00	-31.46	peak			
2	*	1474.375	51.83	-19.33	32.50	56.00	-23.50	AVG			
3		1731.250	62.87	-19.39	43.48	76.00	-32.52	peak			
4		1731.250	50.85	-19.39	31.46	56.00	-24.54	AVG			
5		1908.125	62.01	-19.47	42.54	76.00	-33.46	peak			
6		1908.125	50.80	-19.47	31.33	56.00	-24.67	AVG			
7		2010.625	62.59	-19.48	43.11	76.00	-32.89	peak			
8		2010.625	50.51	-19.48	31.03	56.00	-24.97	AVG			
9		2501.250	62.47	-18.17	44.30	76.00	-31.70	peak			
10		2501.250	50.64	-18.17	32.47	56.00	-23.53	AVG			
11		2678.125	59.60	-18.29	41.31	76.00	-34.69	peak			
12		2678.125	49.44	-18.29	31.15	56.00	-24.85	AVG			

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



Site 3m Chamber #1 Polarization: ***Horizontal*** Temperature: 29.5 C

Limit: (RE)EN55011 Class A Power: DC 5V from PC Humidity: 48 %

Mode:Connect to PC

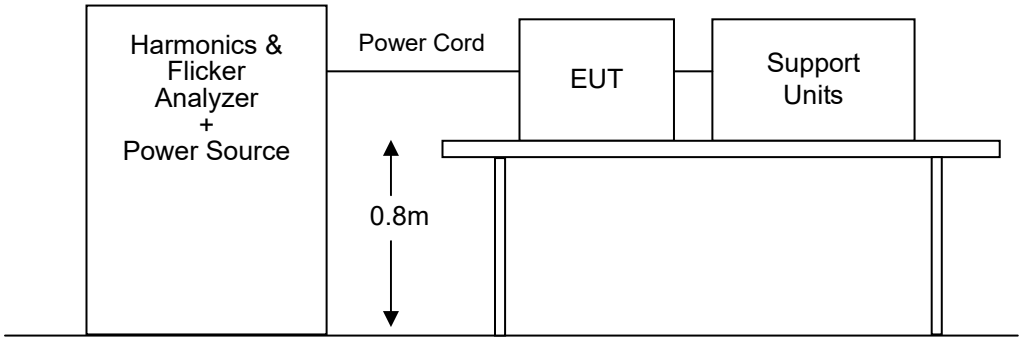
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1277.500	61.19	-19.77	41.42	76.00	-34.58	peak			
2		1277.500	50.88	-19.77	31.11	56.00	-24.89	AVG			
3		1421.250	60.37	-19.46	40.91	76.00	-35.09	peak			
4		1421.250	50.52	-19.46	31.06	56.00	-24.94	AVG			
5		1799.375	61.21	-19.42	41.79	76.00	-34.21	peak			
6		1799.375	50.64	-19.42	31.22	56.00	-24.78	AVG			
7		2011.250	62.91	-19.48	43.43	76.00	-32.57	peak			
8	*	2011.250	51.63	-19.48	32.15	56.00	-23.85	AVG			
9		3216.875	65.79	-18.02	47.77	80.00	-32.23	peak			
10		3216.875	50.89	-18.02	32.87	60.00	-27.13	AVG			
11		4016.250	61.41	-15.09	46.32	80.00	-33.68	peak			
12		4016.250	47.45	-15.09	32.36	60.00	-27.64	AVG			

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

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Measuring Standard

EN 61000-3-2: 2011 CLASS A

6.3. Operation Condition of EUT

Same as Section 6.4, except the test setup replaced as Section 6.1.

6.4. Measuring Results

PASS.

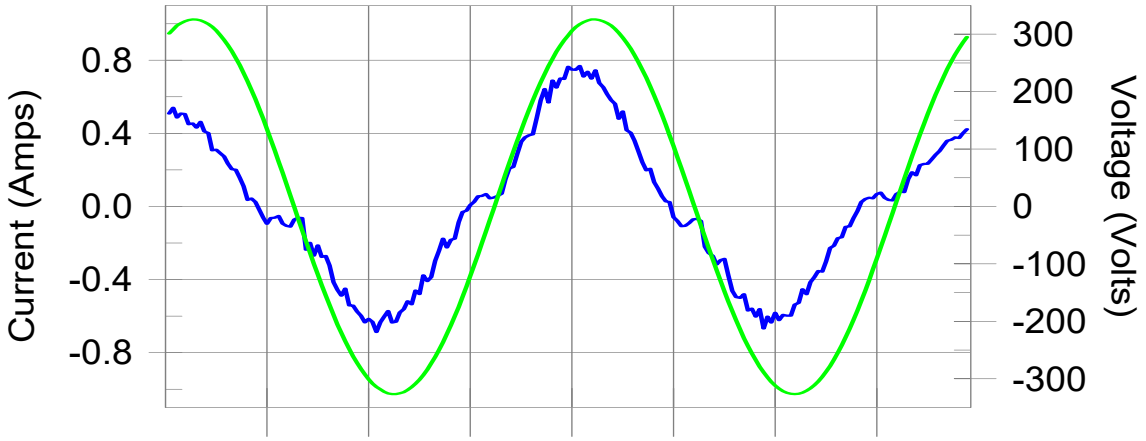
Please see the attached page.

Harmonics – Class-A per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

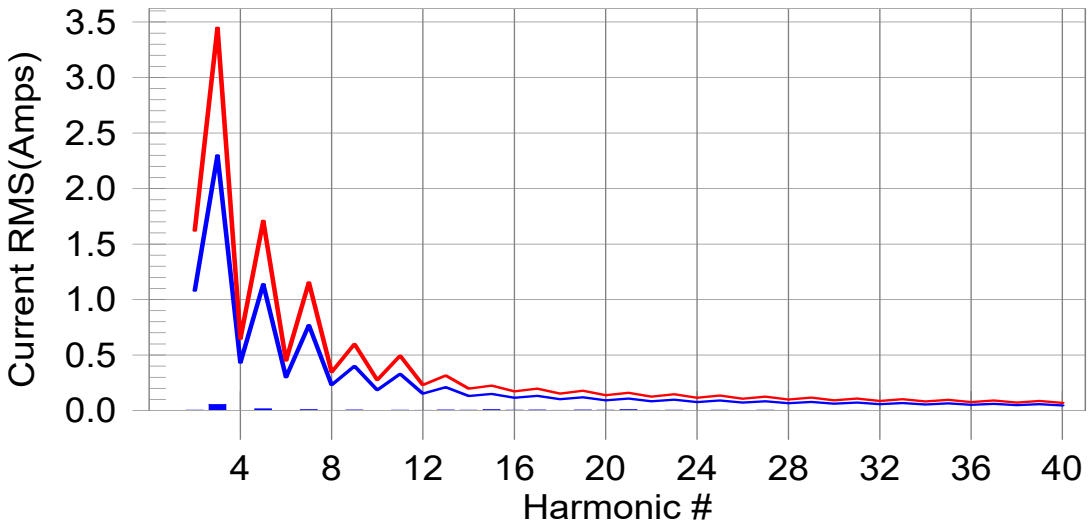
EUT: MOTION CONTROL CARD **Tested by: LJX**
Test category: Class-A per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019/5/3 **Start time: 11:41:02** **End time: 11:43:55**
Test duration (min): 2.5 **Data file name: WIN2105_H-000648.cts_data**
Comment: DMC3800
Customer: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO.,LTD

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonic was #21 with 7.0% of the limit.**

Current Test Result Summary (Run time)

EUT: MOTION CONTROL CARD **Tested by: LJX**
Test category: Class-A per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019/5/3 **Start time: 11:41:02** **End time: 11:43:55**
Test duration (min): 2.5 **Data file name: WIN2105_H-000648.cts_data**
Comment: DMC3800
Customer: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO.,LTD

Test Result: Pass **Source qualification: Normal**
THC: 0.063 A **I-THD: 19.2 %** **POHC(A): 0.008 A** **POHC Limit(A): 0.251 A**
Highest parameter values during test:

V_RMS (Volts):	**230.750**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.837**	**I_RMS (Amps):**	**0.361**
I_Fund (Amps):	**0.355**	**Crest Factor:**	**2.428**
Power (Watts):	**77.4**	**Power Factor:**	**0.949**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.004	1.080	N/A	0.005	1.620	N/A	Pass
3	0.057	2.300	2.5	0.058	3.450	1.7	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.015	1.140	1.3	0.015	1.710	0.9	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.008	0.770	1.0	0.008	1.155	0.7	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.005	0.400	1.3	0.006	0.600	1.0	Pass
10	0.002	0.184	N/A	0.002	0.276	N/A	Pass
11	0.004	0.330	N/A	0.005	0.495	N/A	Pass
12	0.002	0.153	N/A	0.003	0.230	N/A	Pass
13	0.006	0.210	2.6	0.006	0.315	1.8	Pass
14	0.004	0.131	N/A	0.005	0.197	N/A	Pass
15	0.009	0.150	5.7	0.009	0.225	3.9	Pass
16	0.003	0.115	N/A	0.004	0.173	N/A	Pass
17	0.006	0.132	4.5	0.007	0.198	3.3	Pass
18	0.003	0.102	N/A	0.003	0.153	N/A	Pass
19	0.006	0.118	5.2	0.006	0.178	3.6	Pass
20	0.005	0.092	N/A	0.005	0.138	N/A	Pass
21	0.008	0.107	7.0	0.008	0.161	4.9	Pass
22	0.003	0.084	N/A	0.003	0.125	N/A	Pass
23	0.004	0.098	N/A	0.005	0.147	N/A	Pass
24	0.002	0.077	N/A	0.002	0.115	N/A	Pass
25	0.005	0.090	N/A	0.005	0.135	N/A	Pass
26	0.002	0.071	N/A	0.002	0.107	N/A	Pass
27	0.004	0.083	N/A	0.004	0.125	N/A	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.002	0.078	N/A	0.003	0.116	N/A	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.002	0.073	N/A	0.003	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.002	0.068	N/A	0.002	0.102	N/A	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.001	0.061	N/A	0.002	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.002	0.058	N/A	0.002	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

EUT: MOTION CONTROL CARD **Tested by: LJX**
Test category: Class-A per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019/5/3 **Start time: 11:41:02** **End time: 11:43:55**
Test duration (min): 2.5 **Data file name: WIN2105_H-000648.cts_data**
Comment: DMC3800
Customer: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO.,LTD

Test Result: Pass **Source qualification: Normal**

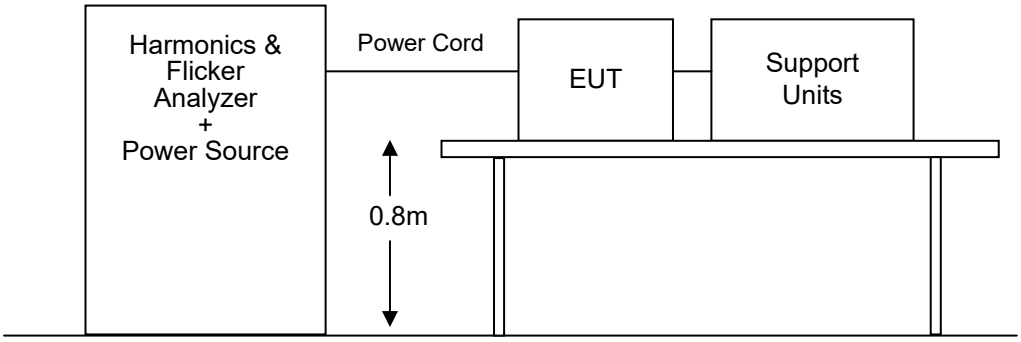
Highest parameter values during test:

Voltage (Vrms):	**230.750**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.837**	**I_RMS (Amps):**	**0.361**
I_Fund (Amps):	**0.355**	**Crest Factor:**	**2.428**
Power (Watts):	**77.4**	**Power Factor:**	**0.949**

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.099	0.461	21.43	OK
3	0.119	2.077	5.72	OK
4	0.034	0.461	7.41	OK
5	0.057	0.923	6.20	OK
6	0.018	0.461	4.00	OK
7	0.047	0.692	6.77	OK
8	0.021	0.461	4.53	OK
9	0.040	0.461	8.75	OK
10	0.022	0.461	4.66	OK
11	0.030	0.231	13.03	OK
12	0.019	0.231	8.06	OK
13	0.025	0.231	10.80	OK
14	0.023	0.231	10.13	OK
15	0.022	0.231	9.53	OK
16	0.021	0.231	9.25	OK
17	0.023	0.231	9.77	OK
18	0.021	0.231	9.15	OK
19	0.021	0.231	9.17	OK
20	0.028	0.231	12.30	OK
21	0.026	0.231	11.28	OK
22	0.018	0.231	7.82	OK
23	0.021	0.231	9.18	OK
24	0.017	0.231	7.22	OK
25	0.021	0.231	9.21	OK
26	0.017	0.231	7.49	OK
27	0.026	0.231	11.19	OK
28	0.020	0.231	8.71	OK
29	0.022	0.231	9.66	OK
30	0.020	0.231	8.76	OK
31	0.017	0.231	7.53	OK
32	0.015	0.231	6.50	OK
33	0.019	0.231	8.36	OK
34	0.014	0.231	6.03	OK
35	0.021	0.231	9.25	OK
36	0.017	0.231	7.45	OK
37	0.019	0.231	8.04	OK
38	0.018	0.231	7.69	OK
39	0.022	0.231	9.60	OK
40	0.020	0.231	8.60	OK

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Standard Limits

EN 61000-3-3 Limits
The objective of voltage changes, voltage fluctuations and flicker in public low voltage supply systems during equipment with rated current≤16 A per phase, ensures that home appliances and certain other electrical equipment do not adversely affect lighting equipment when connected to the same power system.
Voltage Fluctuation and Flicker Limits:
— the value of Pst shall not be greater than 1.0;
— the value of Plt shall not be greater than 0.65;
— the value of d(t) during a voltage change shall not exceed 3.3 % for more than 500 ms;
— the relative steady-state voltage change, dc, shall not exceed 3.3 %;
— the maximum relative voltage change, dmax, shall not exceed 4.0 %;

7.3. Test Procedure

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of 8% is achieved during the whole assessment procedure.

7.4. Test Results

PASS.

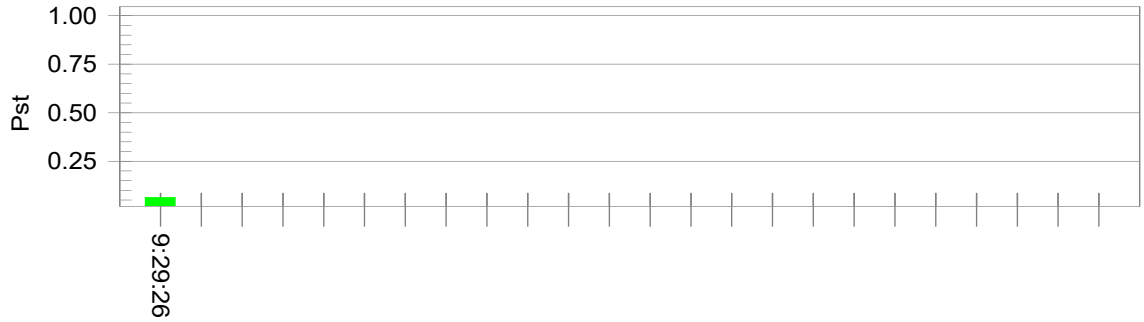
Please see the attached page.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

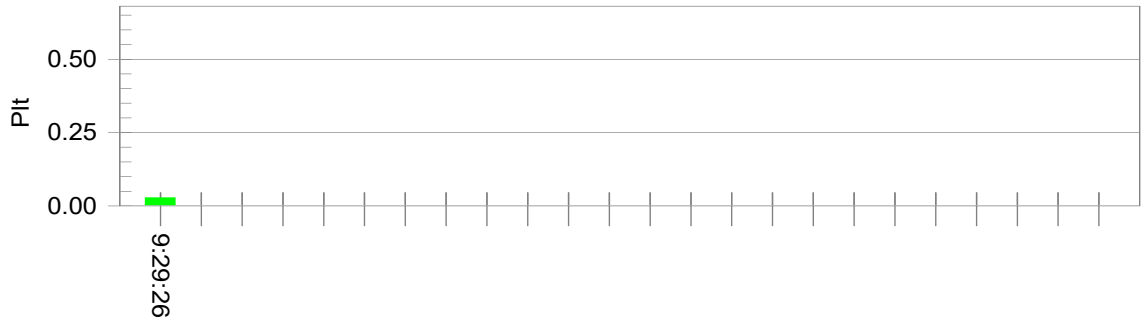
EUT: MOTION CONTROL CARD **Tested by: LJX**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2019/05/03 **Start time: 9:18:55** **End time: 9:29:27**
Test duration (min): 10 **Data file name: WIN2105_F-000496.cts_data**
Comment: CONNECT TO PC
Customer: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO.,LTD

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.67**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**-0.05**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.028**	**Test limit:**	**0.650**	**Pass**

8. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:
1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

Criterion 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 what the user may reasonably expect from the apparatus if used as intended.

Criterion B:

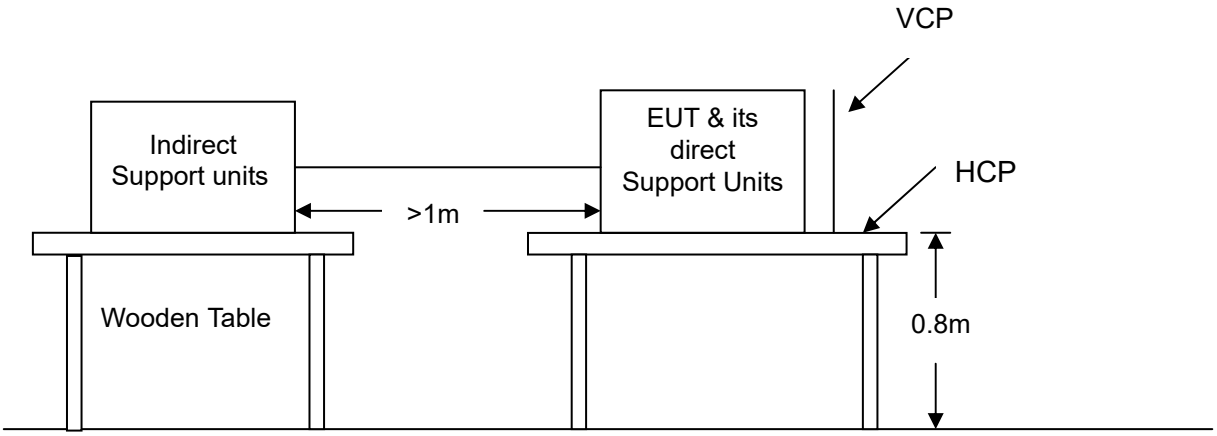
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. 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 what the user may reasonably expect from the apparatus if 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.

9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1. Block Diagram of Test Setup



Ground Reference Plane

9.2. Test Standard

EN 61000-6-2:2005
(IEC 61000-4-2:2008 Severity Level: 3 / Air Discharge: ±8kV;
Level: 2 / Contact Discharge: ±4kV)

9.3. Severity Levels and Performance Criterion

9.3.1.Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	±2	±2
2	±4	±4
3	±6	±8
4	±8	±15
X	Special	Special

9.3.2.Performance criterion: B

9.4. Test Procedure

9.4.1.Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.4.2.Contact Discharge:

All the procedure shall be same as Section 9.4.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.4.3.Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

9.4.4.Indirect discharge for vertical coupling plane

At least 10 singles discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m×0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.5. Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK (SHENZHEN) CO., LTD.

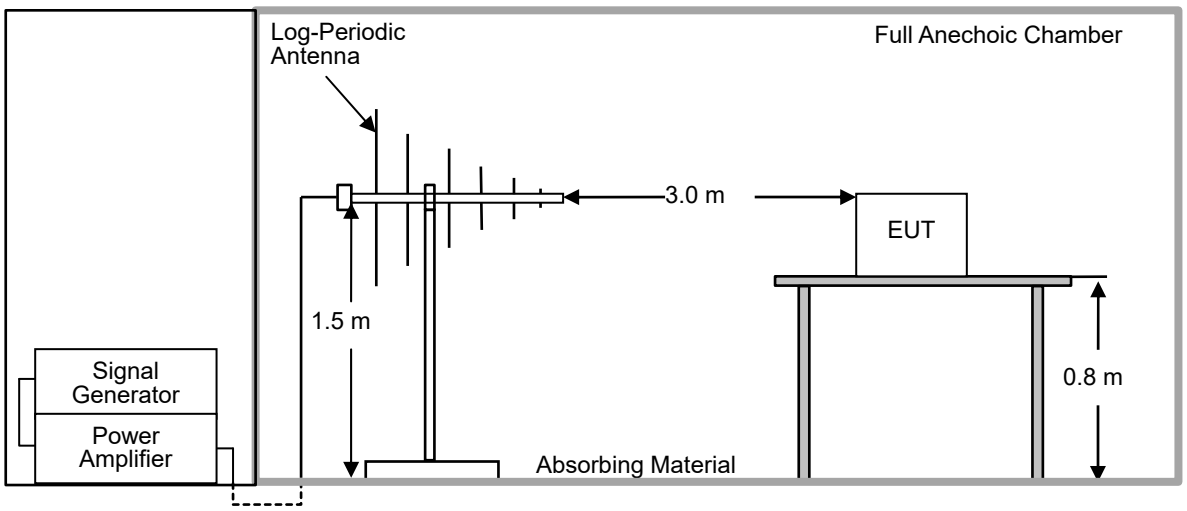
Applicant	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD			
EUT	:	Motion Control Card	Test Date	:	2019-05-05
M/N	:	DMC3800	Temperature	:	24.8℃
Power Supply	:	DC 5V from PC	Humidity	:	48%
Air discharge	:	± 8.0kV	Test Mode	:	Connect to PC
Contact discharge	:	± 4.0kV	Criterion	:	B

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Metal/ Screw/ card reader	C	A
Slot	A	A
HCP of all sides	C	A
VCP of front	C	A
VCP of rear	C	A
VCP of left	C	A
VCP of right	C	A

Note:

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1. Block Diagram of Test Setup



10.2. Test Standard

EN 61000-6-2:2005 (IEC 61000-4-3:2006+A1:2007+A2:2010, Severity Level : 1V/m, 3V/m, 10V/m)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

10.3.2. Performance Criterion: A

10.4. Test Procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.

b. The test is performed with the antenna facing the front and back sides of the EUT with. Both vertical and horizontal polarizations from antenna are tested.

10.5. Test Results

PASS.

Please refer to the following pages.

RF Field Strength Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant	:	SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD			
EUT	:	Motion Control Card	Test Date	:	2019-05-05
M/N	:	DMC3800	Temperature	:	22℃
Field Strength	:	10 V/m, 3 V/m, 10 V/m	Humidity	:	50%
Power Supply	:	DC 5V from PC	Criterion	:	A
Test Mode	:	Connect to PC	Frequency Range	:	80MHz to 1000MHz

Modulation: ☐ None ☐ Pulse ☒ AM 1kHz 80%

	Frequency Rang 1: 80~ 1000MHz Frequency Rang 2: 1400~ 2000MHz		Frequency Rang 2: 2000~ 2700MHz	
Field Strength	Frequency Rang 1: 10V/m Frequency Rang 2: 3V/m		Frequency Rang 3: 1V/m	
Steps	1%			
	Horizontal	Vertical	Horizontal	Vertical
Front	A	A		
Right	A	A		
Rear	A	A		
Left	A	A		

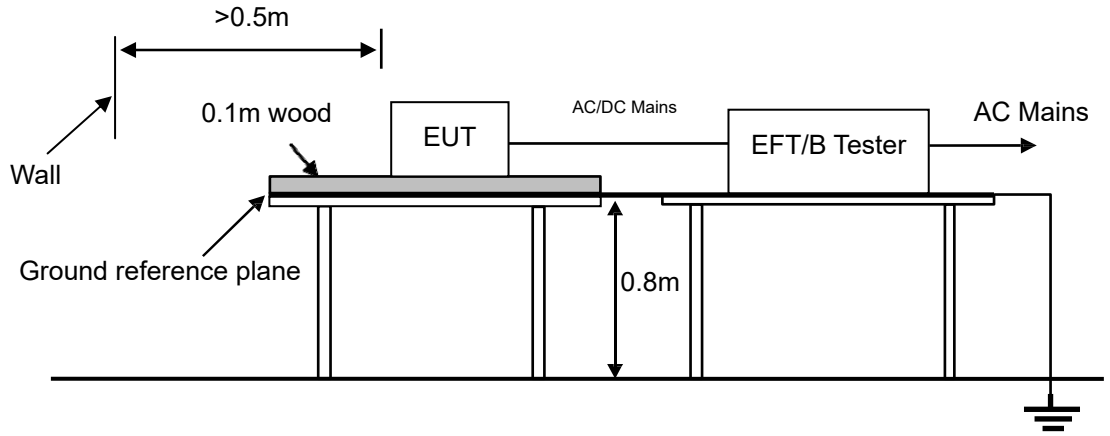
Test Equipment:
1. Signal generator：Agilent;N5181A;
Power Amplifier：MILMEGA; 80RF1000-175;
MILMEGA;AS0102-55;
MILMEGA;AS1860-50;
3. Log.-Per. Antenna： SCHWARZBECK: VULP 9118E;
Broad-Band Horn Antenna: SCHWARZBECK; STLP 9149
4. Field Monitor：DARE;RSS1006A

Note:

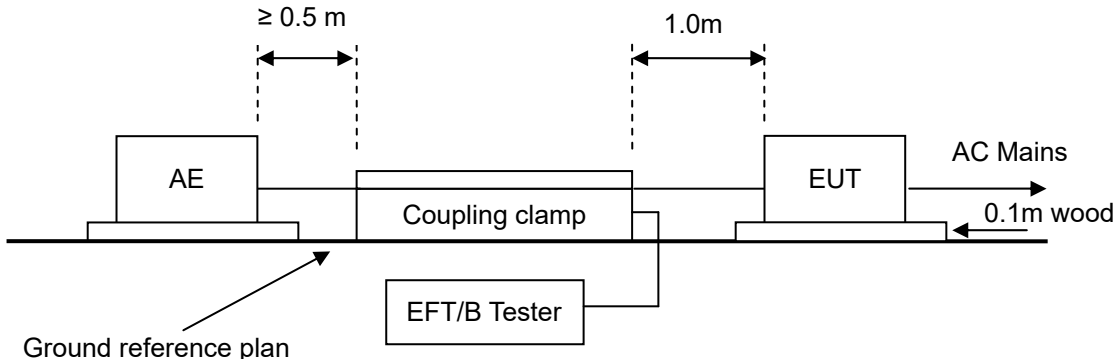
11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

11.1. Block Diagram of Test Setup

AC/DC Lines:



Signal lines:



11.2. Test Standard

EN 61000-6-2:2005 (IEC 61000-4-4:2012, Severity Level For DC Line: 2.0kV, For signal line: 1.0kV)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Open Circuit Output Test Voltage ±10%		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

11.3.2.Performance criterion: B

11.4.Test Procedure

The EUT is put on the table that is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

11.5.Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

EMTEK (SHENZHEN) CO., LTD.

Standard: ☒ IEC 61000-4-4	Result: ☒ PASS / ☐ FAIL

Applicant : SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD

EUT : Motion Control Card

M/N : DMC3800

Input Voltage : DC 5V from PC

Criterion : B

Ambient Condition : 22℃ 50% RH

Operation Mode: Connect to PC

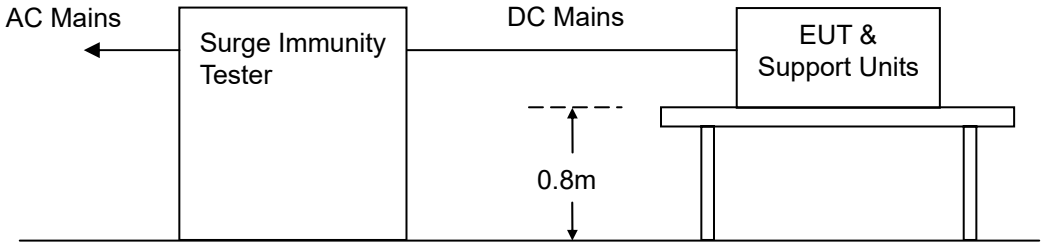
Line : ☒ AC Mains ☐ DC Line	Line : ☐ Signal ☐ I/O Cable
Coupling : ☒ Direct	Coupling : ☒ Capacitive
Test Time : 120s	

Line	Test Voltage	Result(+)	Result(-)
L	2kV	A	A
N	2kV	A	A
PE	2kV	A	A
L、N	2kV	A	A
L、PE	2kV	A	A
N、PE	2kV	A	A
L、N、PE	2kV	A	A
DC Line	/	/	/
Signal Line	/	/	/

Note:

12. SURGE IMMUNITY TEST

12.1. Block Diagram of Test Setup



12.2. Test Standard

EN 61000-6-2:2005
(IEC 61000-4-5:2014)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.3.2. Performance criterion: B

12.4. Test Procedure

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common mode (Line to Ground) and differential mode (Line to Line). Each device was tested in a total of two surge configurations: Line to Ground (L-G): Combination Wave, Line to Protective Earth with 9uF and 10Ohm and Neutral to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.
Line to Line (L-L): Combination Wave,
Line to Neutral with 18uF, differential mode, generator floated.
2 ohm : the source impedance of the low-voltage power supply network.
12 ohm : the source impedance of the low-voltage power supply network and ground.

a. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).
b. The surges have to be applied line to line and line to earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
c. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan. All lower levels including the selected test level shall be satisfied.
d. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.

e. Testing shall be performed according to a Test Plan, which shall be included in the test report.
f. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied.

12.5. Test Results

PASS.

Please refer to the following pages.

Surge Immunity Test Results

EMTEK (SHENZHEN) CO., LTD.

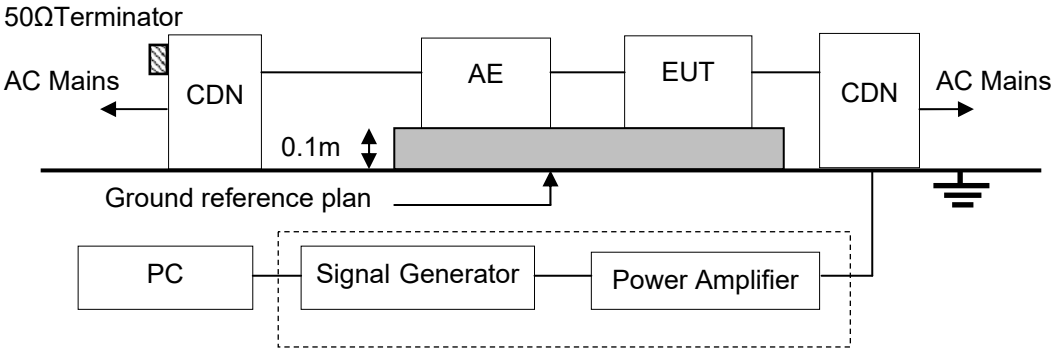
Applicant	: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD		
EUT	: Motion Control Card	Test Date	: 2019-05-05
M/N	: DMC3800	Temperature	: 22℃
Power Supply	: DC 5V from PC	Humidity	: 50%
Test Mode	: ON	Criterion	: B

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	±	0˚, 90˚, 180˚, 270˚	5	1.0	A
L-PE	±	0˚, 90˚, 180˚, 270˚	5	2.0	A
N-PE	±	0˚, 90˚, 180˚, 270˚	5	2.0	A

Remark:

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1. Block Diagram of Test Setup



13.2. Test Standard

EN 61000-6-2:2005
(IEC 61000-4-6:2013, Severity Level: Level 3, 10V (r.m.s.), 0.15MHz ~ 80MHz)

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

13.3.2. Performance criterion: A

13.4. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
b. The EUT is placed on a 0.1m high test table, and a well grounded cable is connected to metallic plane above the test table.
c. All cables/wires must be laid out on test plate (3cm in thickness),and the EUT is set up on test plate (10 cm in thickness) as shown in test setup photo, and the cables/wires must not be in mid-air, they should be touching the surface of test plate. Ensure that the EUT is properly connected to the accessory equipment. d. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
e. The frequency range is swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5 x 10-3 decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.

f. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
g. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility
h. Testing shall be performed according to a Test Plan, which shall be included in the test report.

13.5. Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant	: SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD		
EUT	: Motion Control Card	Test Date	: 2019-05-05
M/N	: DMC3800	Temperature	: 22℃
Power Supply	: DC 5V from PC	Humidity	: 50%
Test Engineer	: LJX		

Test Mode : ON

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Line	10V	A	A

Test Mode : N/A

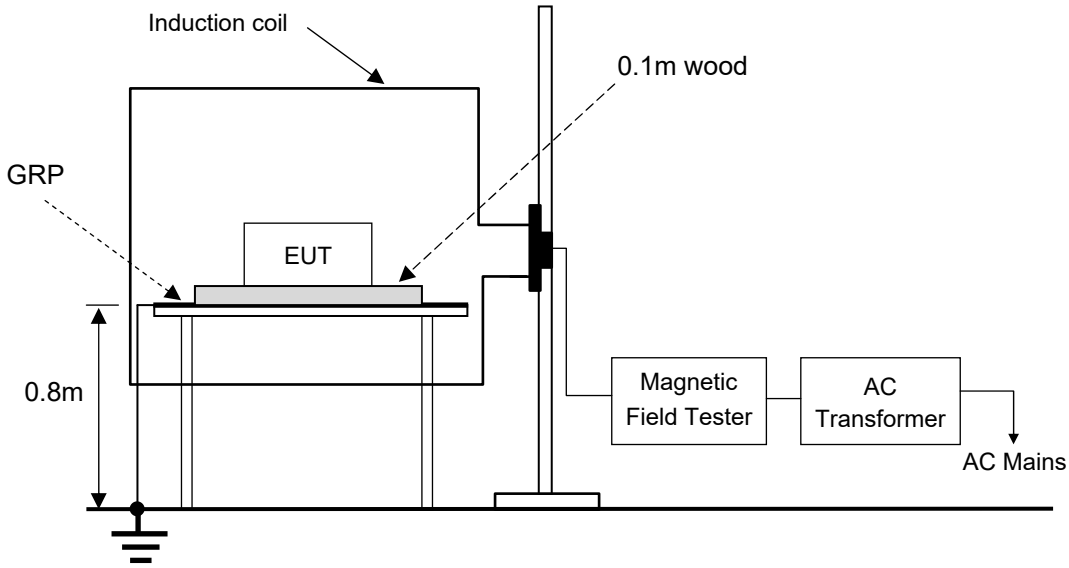
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result

Remark : 1. Modulation Signal:1kHz 80% AM
Measurement Equipment :
Simulator: CWS 500 (SWITZERLAND EMTEST)
CDN : ☐ CDN-M2 (SWITZERLAND EMTEST)
☒ CDN-M3 (SWITZERLAND EMTEST)
☐ CDN-M432 (TESEQ)
☐ Injection Clamp (EMTEST F-2031-23MM)

Note:

14. MAGNETIC FIELD SUSCEPTIBILITY TEST

14.1. Block Diagram of Test Setup



GRP: Ground reference plane
EUT: Equipment under test

14.2. Test Standard

EN 61000-6-2:2005
(IEC 61000-4-8:2009, Severity Level: Level 4, 30 A/m)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity Levels

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

14.3.2. Performance Criterion: A

14.4. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table,

this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

14.5.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Results

EMTEK (SHENZHEN) CO., LTD.

Standard: ☒ IEC 61000-4-8	Result: ☒ PASS / ☐ FAIL

Applicant : SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD

EUT : Motion Control Card

M/N : DMC3800

Input Voltage : DC 5V from PC

Date of Test : 2019-05-05 Test Engineer: LJX

Ambient Condition : Temp : 22℃ Humid : 50%

Criterion: A

Operation Mode: ON

Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
30	5 mins	X	A	A
30	5 mins	Y	A	A
30	5 mins	Z	A	A

Operation Mode: N/A

Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result

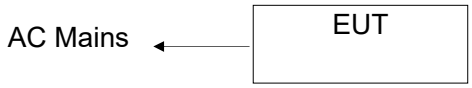
Test Equipment	Magnetic Field Test: HEAFELY MAG 100.1

Note:

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

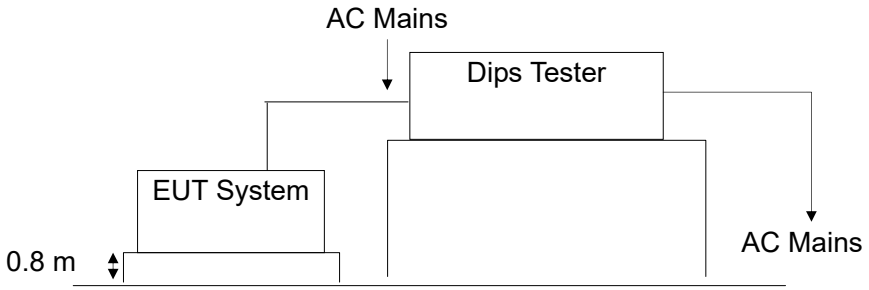
15.1. Block Diagram of Test Setup

15.1.1. Block Diagram of EUT System



(EUT: Motion Control Card)

15.1.2. Dips Test Setup



(EUT: Motion Control Card)

15.2. Test Standard

EN 61000-6-2:2005 (IEC 61000-4-11:2004)

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

15.3.2. Performance criterion: B&C

15.4.Operating Condition of EUT

15.4.1.Setup the EUT as shown on Section 15.1.

15.4.2.Turn on the power of all equipments.

15.4.3.Let the EUT work in test mode (ON) and test it.

15.5.Test Procedure

1) Set up the EUT and test generator as shown on Section 15.1.2.
2) The interruption is introduced at selected phase angles with specified duration.
3) Record any degradation of performance.

15.6.Test Results

PASS.

Please refer to the following page.

Voltage Dips and Interruptions Test Results

SHENZHEN EMTEK CO., LTD.

Applicant : SHENZHEN LEADSHINE CONTROL TECHNOLOGY CO., LTD

EUT : Motion Control Card

Test Date : 2019-05-05

M/N : DMC3800

Temperature : 22℃

Power Supply : DC 5V from PC

Humidity : 50%

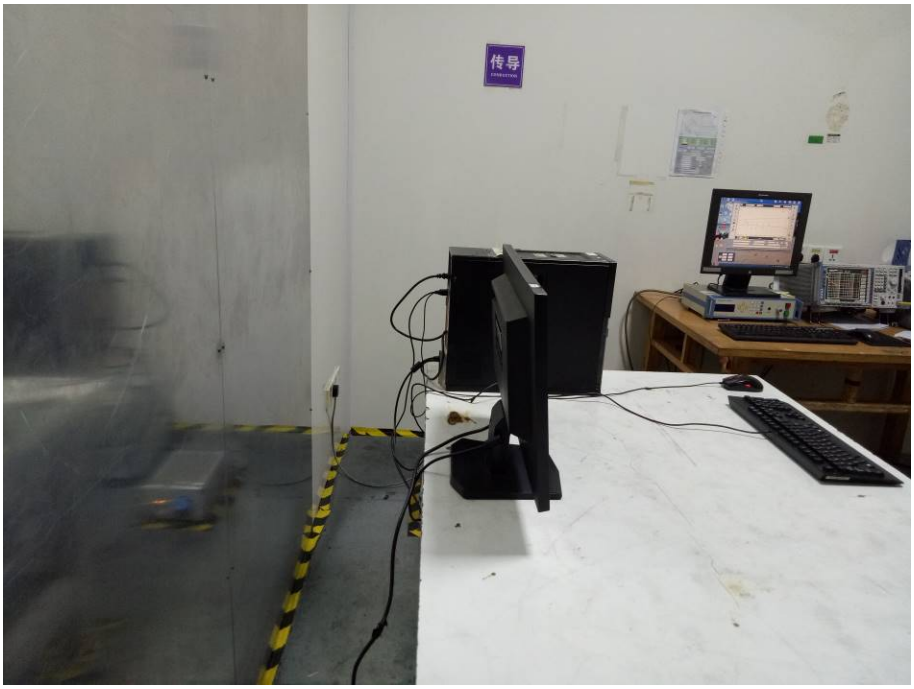
Test Mode: ON

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in periods)	Criterion ☐A ☒B ☒C ☐D	Result
0	100	0.5	B	A
40	60	10	C	A
70	30	25	C	A
0	100	250	C	C

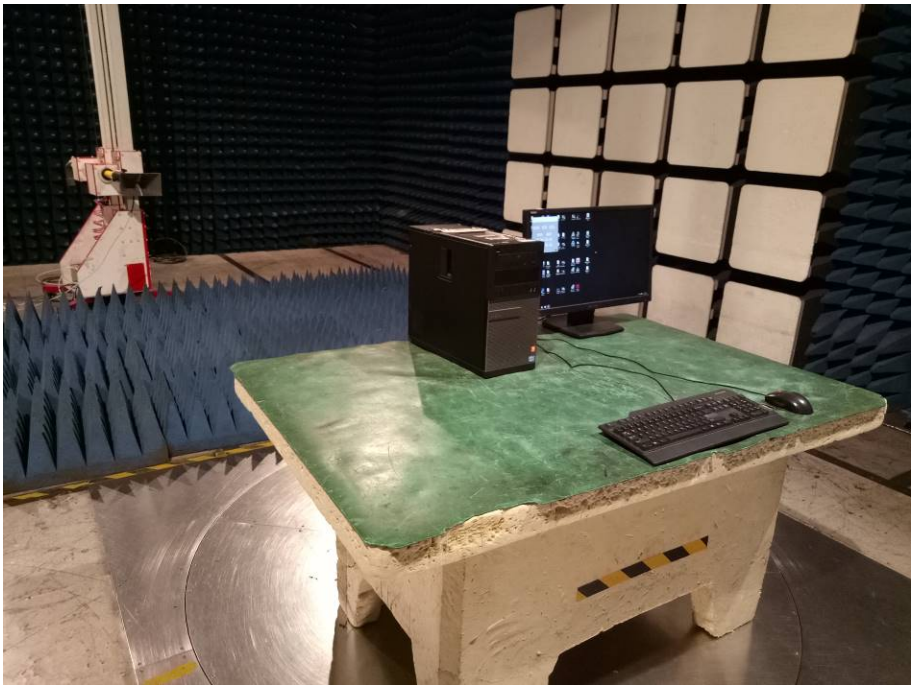
Note: Test in 0%, 250P, EUT stop work, but could return to normal manually.

16. PHOTOGRAPHS

16.1.Photos of Conducted Emission Measurement

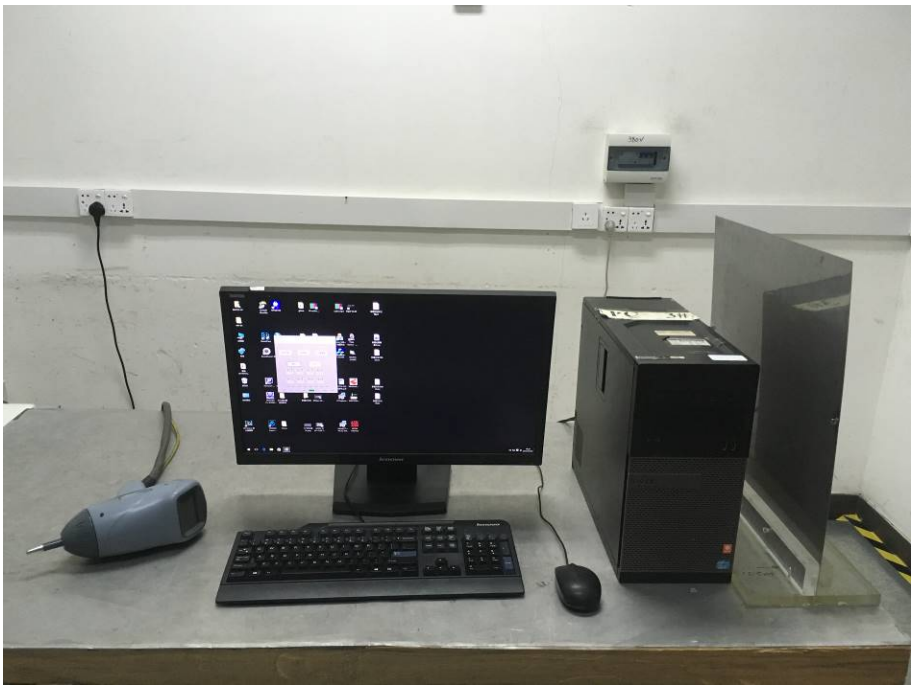


16.2.Photo of Radiation Emission Measurement



16.3.Photo of Harmonic / Flick Measurement

16.4.Photo of Electrostatic Discharge Test



16.5.Photo of RF Field Strength Susceptibility Test

16.6.Photo of Electrical Fast Transient / Burst Test

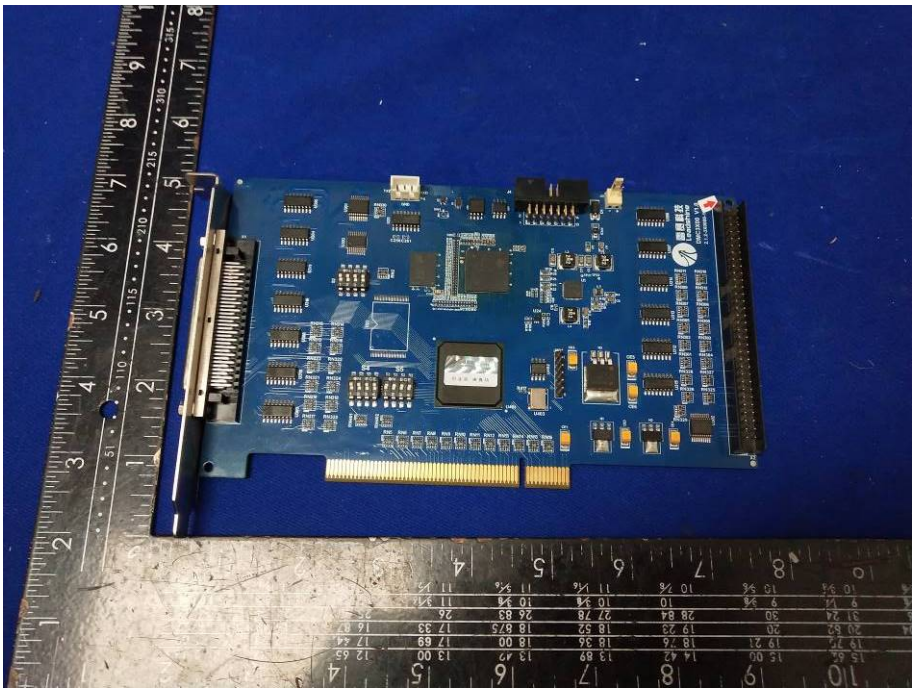
16.7.Photo of Surge Test

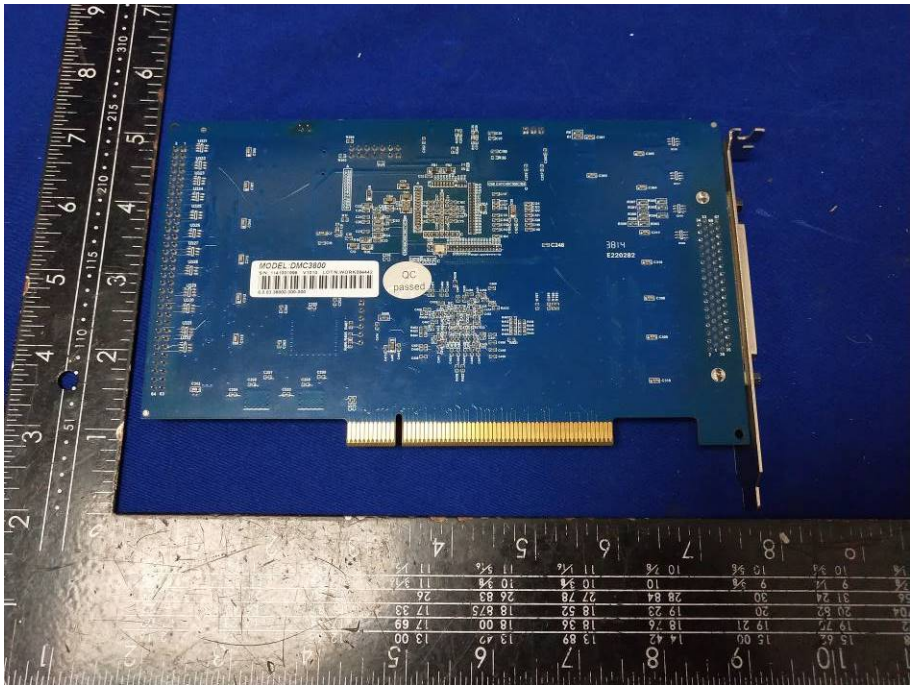
16.8.Photo of Injected Currents Susceptibility Test

16.9.Photo of Magnetic Field Immunity Test

16.10.Photo of Voltage Dips and Interruption Immunity Test

APPENDIX
(Photos of EUT)





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