

EMC Test Report

Application No. : TB11061085

Applicant : WENZHOU SMART ELECTRIC & Technology CO., Ltd.

Equipment Under Test (EUT)

EUT Name : Intelligent Digital Variable Frequency Vibration Feeder Controller

Model No. : STVC31-M

Serial No. : STVC31-S, STVC31-L, STVC31-XL, STVC31-XXL,
STVC31-XXXL

Brand Name : No supplied by client

Receipt Date : 2011-06-27

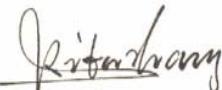
Test Date : 2011-06-27 to 2011-07-04

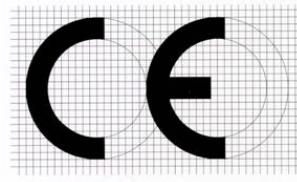
Issue Date : 2011-07-04

Standards : EN55022:2006+A1:2007
EN55024:1998+A1:2001+A2:2003
EN61000-3-2:2006+A1:2009+A2:2009
EN61000-3-3: 2008

Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above. The EUT technically complies with the 2004/108/EC directive requirements

Test/Witness Engineer : 



Approved & Authorized : 

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 the report.

TB-RF-075-1.0

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1. General Information

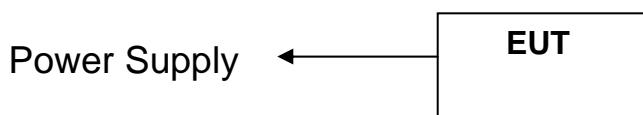
1.1. Client Information

Applicant	:	WENZHOU SMART ELECTRIC & Technology CO., Ltd.
Address	:	NO.506, XINGFENG RD., HONGQIAO, YUEQING, WENZHOU, ZHEJIANG, CHINA
Manufacturer	:	WENZHOU SMART ELECTRIC & Technology CO., Ltd.
Address	:	NO.506, XINGFENG RD., HONGQIAO, YUEQING, WENZHOU, ZHEJIANG, CHINA

1.2. General Description of EUT (Equipment Under Test)

EUT Name	:	Intelligent Digital Variable Frequency Vibration Feeder Controller
Model No.	:	STVC31-M
Serial No.	:	STVC31-S, STVC31-L, STVC31-XL, STVC31-XXL, STVC31-XXXL
Brand Name	:	No supplied by client
Power Supply	:	Input: AC 85-260V 50/60Hz ; Output: maxcurrent 3A
Remark: All above models are identical in schematic, structure and critical component except for maximum output current, therefore we choose STVC31-M for EMC test only.		

1.3. Block Diagram Showing The Configuration of System Tested



1.4. Description of Support Units

The EUT has been tested as an independent unit.

1.5. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed,

after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

1.6. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 10/F., A Block, Jiada R & D Bldg., No.5 Songpingshan Road, Science & Technology Park, Nanshan District, Shenzhen, China. At the time of testing, the following bodies accredited the Laboratory:

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

Jun. 04, 2010 certificated by TUV Rheinland, Shenzhen (Audit Report:17015407-001). The certificate is valid until the next scheduled inspection or up to 18 months, at the discretion of TUV Rhineland.

2. TEST Results Summary

EMISSION		
Description of test items	Standards	Results
Conducted disturbance at mains terminals	EN 55022: 2006+A1: 2007	Pass
Radiated Disturbance	EN 55022: 2006+A1: 2007	Pass
Harmonic current emissions	EN 61000-3-2: 2006+A1: 2009+A2:2009	Pass
Voltage fluctuation and flicker	EN 61000-3-3: 2008	Pass
IMMUNITY		
Description of test items	Standards	Results
Electrostatic Discharge (ESD)	EN 61000-4-2: 2009	Pass
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A1: 2008	Pass
EFT/B Immunity	EN 61000-4-4: 2004+A1:2010	Pass
Surge Immunity	EN 61000-4-5: 2006	Pass
Conducted RF Immunity	EN 61000-4-6: 2009	Pass
Power frequency magnetic field	EN 61000-4-8: 1993+A1:2001	Pass
Voltage dips, >95% reduction	EN 61000-4-11:2004	Pass
Voltage dips, 30% reduction		
Voltage interruptions		

Note: N/A is an abbreviation for Not Applicable.

3. Test Equipment Used

3.1. Test Equipment Used to Measure Conducted Emission

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC001	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.20, 2011	1 Year
TB-EMC002	AMN	Rohde & Schwarz	ENV216	Jan.20, 2011	1 Year
TB-EMC003	AMN	SCHWARZBECK	NNBL 8226-2	Jan.20, 2011	1 Year

3.2. Test Equipment Used to Measure Radiated Emission

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC004	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.20, 2011	1 Year
TB-EMC005	Bilog Antenna	SCHWARZBECK	VULB9163	Jan.20, 2011	1 Year
TB-EMC006	Positioning Controller	C&C	CC-C-1F	N/A	N/A

3.3. Test Equipment Used to Measure Harmonic Current/ Voltage Fluctuation and Flicker

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC007	Harmonic Flicker Test System	CI	5001ix-CTS-400	Jan.20, 2011	1 Year

3.4. Test Equipment Used to Measure Electrostatic Discharge Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC008	ESD Tester	TESEQ	NSG437	Jan.20, 2011	1 Year

3.5. Test Equipment Used to Measure Conducted Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC009	RF Generator	FRANKONIA	CIT-10/75	Jan.20, 2011	1 Year
TB-EMC010	Attenuator	FRANKONIA	59-6-33	Jan.20, 2011	1 Year
TB-EMC011	M-CDN	LUTHI	M2/M3	Jan.20, 2011	1 Year
TB-EMC012	CDN	LUTHI	AF2	Jan.20, 2011	1 Year
TB-EMC013	EM Injection Clamp	LUTHI	EM101	Jan.20, 2011	1 Year

3.6. Test Equipment Used to Measure Radio Frequency Electromagnetic Fields Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC014	Signal Generator	Rohde & Schwarz	SMT03	Jan.20, 2011	1 Year
TB-EMC015	Power Meter	Rohde & Schwarz	NRVD	Jan.20, 2011	1 Year
TB-EMC016	Voltage Probe	Rohde & Schwarz	URV5-Z2	Jan.20, 2011	1 Year
TB-EMC017	Voltage Probe	Rohde & Schwarz	URV5-Z2	Jan.20, 2011	1 Year
TB-EMC018	Power Amplifier	AR	150W1000	Jan.20, 2011	1 Year
TB-EMC019	Bilog Antenna	Chase	CBL6111C	Jan.20, 2011	1 Year

3.7. Test Equipment Used to Measure Electrical Fast Transient/Burst Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC020	Simulator	EMTEST	UCS500N5	Jan.20, 2011	1 Year
TB-EMC021	Auto-transformer	EMTEST	V4780S2	Jan.20, 2011	1 Year

3.8. Test Equipment Used to Measure Surge Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC022	Simulator	EMTEST	UCS500N5	Jan.20, 2011	1 Year
TB-EMC023	Coupling Clamp	EMTEST	HFK	Jan.20, 2011	1 Year

3.9. Test Equipment Used to Measure Voltage Dips and Interruptions Immunity

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC024	Simulator	EMTEST	UCS500N5	Jan.20, 2011	1 Year
TB-EMC025	Auto-transformer	EMTEST	V4780S2	Jan.20, 2011	1 Year

3.10. Test Equipment Used to Measure Power frequency magnetic field

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
TB-EMC026	Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	Jan.20, 2011	1 Year

4. Conducted Emission Test

4.1. Test Standard and Limit

4.1.1. Test Standard

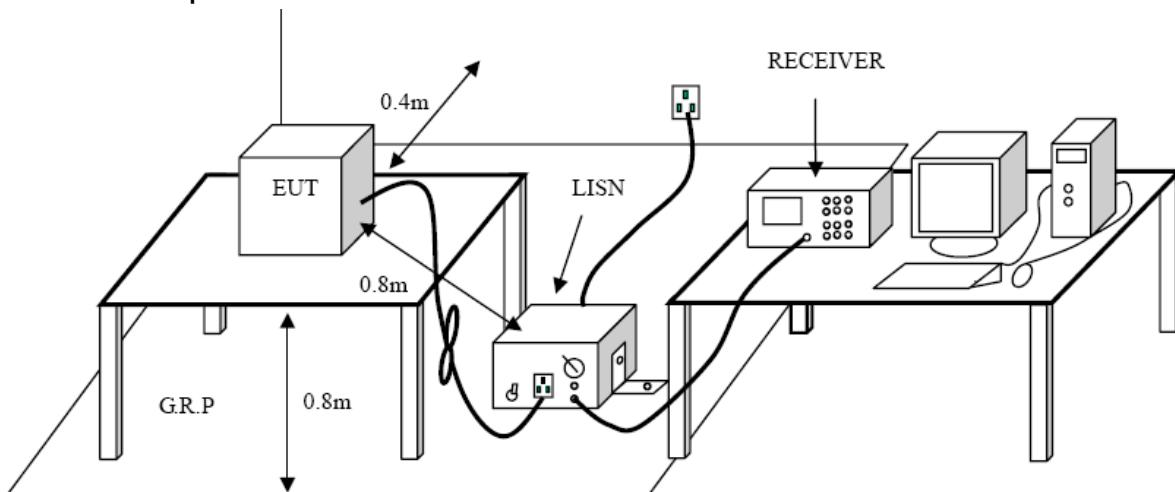
EN 55022:2006+A1:2007.

4.1.2. Test Limit

Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

4.2. Test Setup



4.3. Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

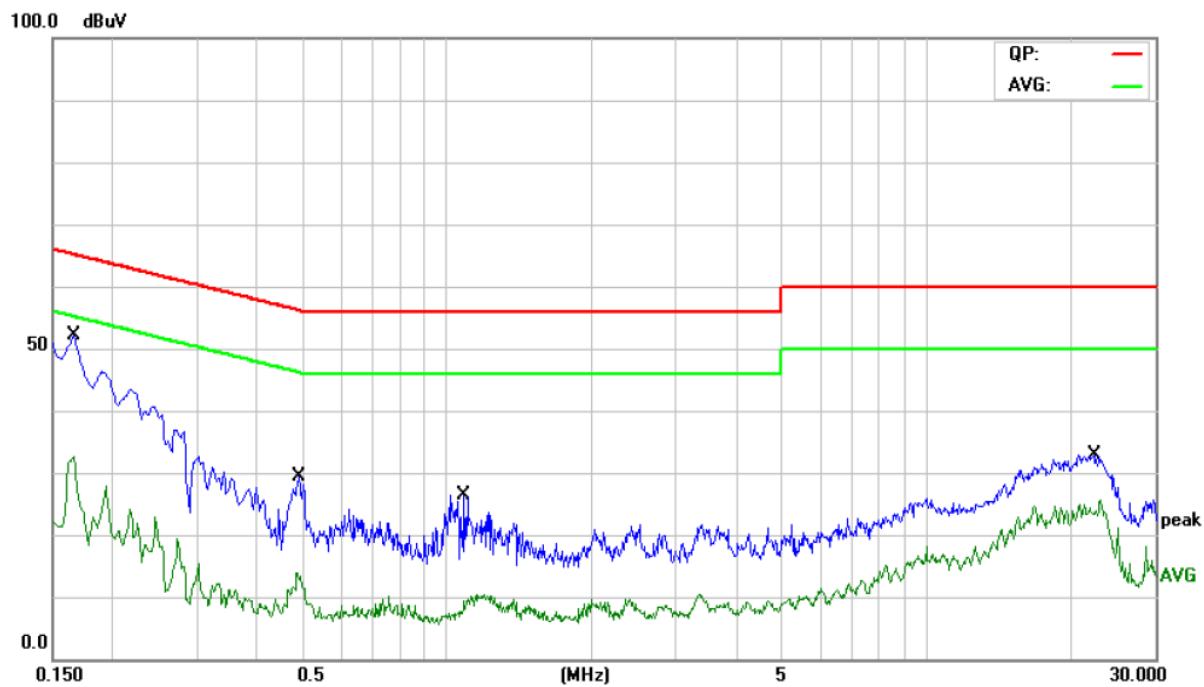
The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4. Test Condition

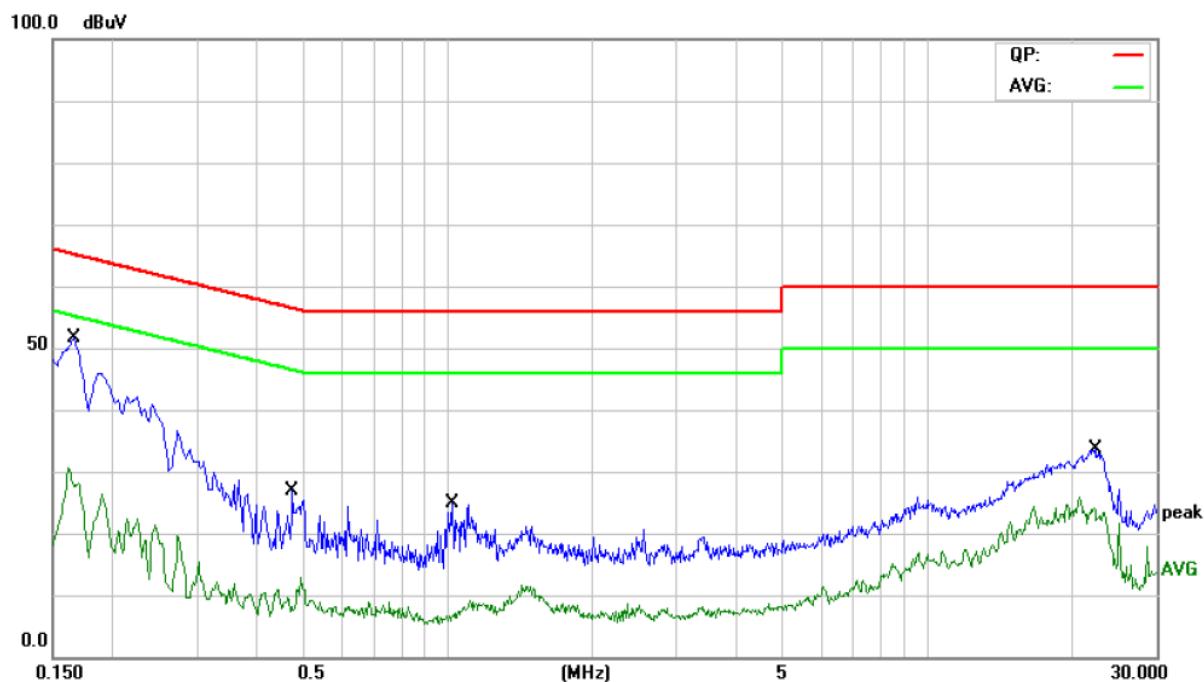
Temperature	:	25 °C
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V/50Hz

4.5. Test Data

Please refer to the following pages.

Operating Condition: Normal**Test Specification: Line**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1660	37.55	10.71	48.26	65.15	-16.89	QP	
2		0.1660	18.97	10.71	29.68	55.15	-25.47	AVG	
3		0.4900	14.25	9.48	23.73	56.17	-32.44	QP	
4		0.4900	3.26	9.48	12.74	46.17	-33.43	AVG	
5		1.0859	7.30	9.31	16.61	56.00	-39.39	QP	
6		1.0859	-0.72	9.31	8.59	46.00	-37.41	AVG	
7		22.3940	17.66	10.09	27.75	60.00	-32.25	QP	
8		22.3940	11.39	10.09	21.48	50.00	-28.52	AVG	

Operating Condition: Normal**Test Specification: Neutral**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1660	37.20	10.71	47.91	65.15	-17.24	QP	
2		0.1660	18.72	10.71	29.43	55.15	-25.72	AVG	
3		0.4740	9.72	9.50	19.22	56.44	-37.22	QP	
4		0.4740	-1.49	9.50	8.01	46.44	-38.43	AVG	
5		1.0260	5.38	9.31	14.69	56.00	-41.31	QP	
6		1.0260	-3.36	9.31	5.95	46.00	-40.05	AVG	
7		22.3140	18.40	10.07	28.47	60.00	-31.53	QP	
8		22.3140	10.94	10.07	21.01	50.00	-28.99	AVG	

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1. Test Standard

EN 55022:2006+A1:2007

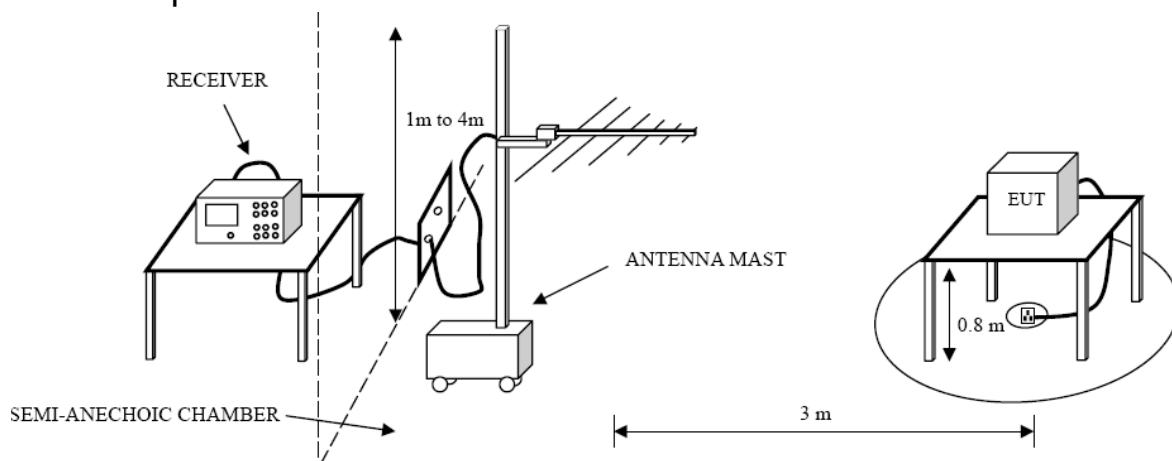
5.1.2. Test Limit

Radiated Disturbance Test Limit (Class B)

Frequency	Limit ($\text{dB}\mu\text{V/m}$)	Quasi-peak Level	
		30MHz~230MHz	230MHz~1000MHz
30MHz~230MHz	40		
230MHz~1000MHz	47		

Remark: 1. The lower limit shall apply at the transition frequency.
2. The test distance is 3m.

5.2 Test Setup



5.3 Test Procedure

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

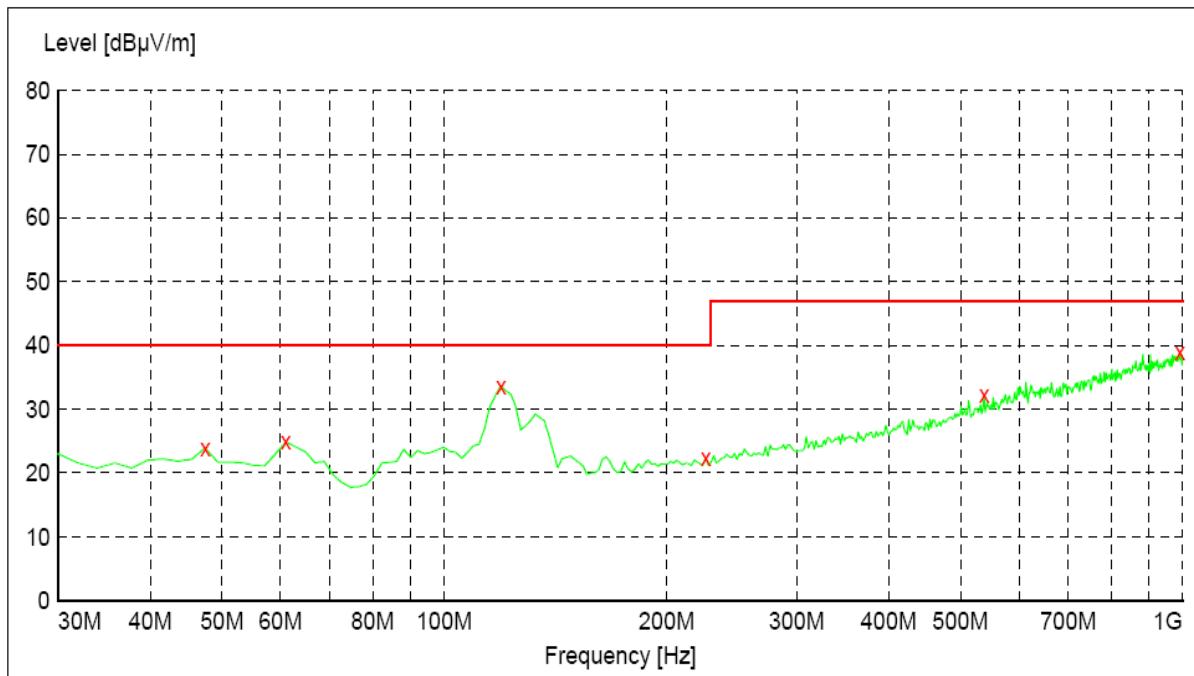
5.4 Test Condition

Temperature	:	25 °C
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V/50Hz

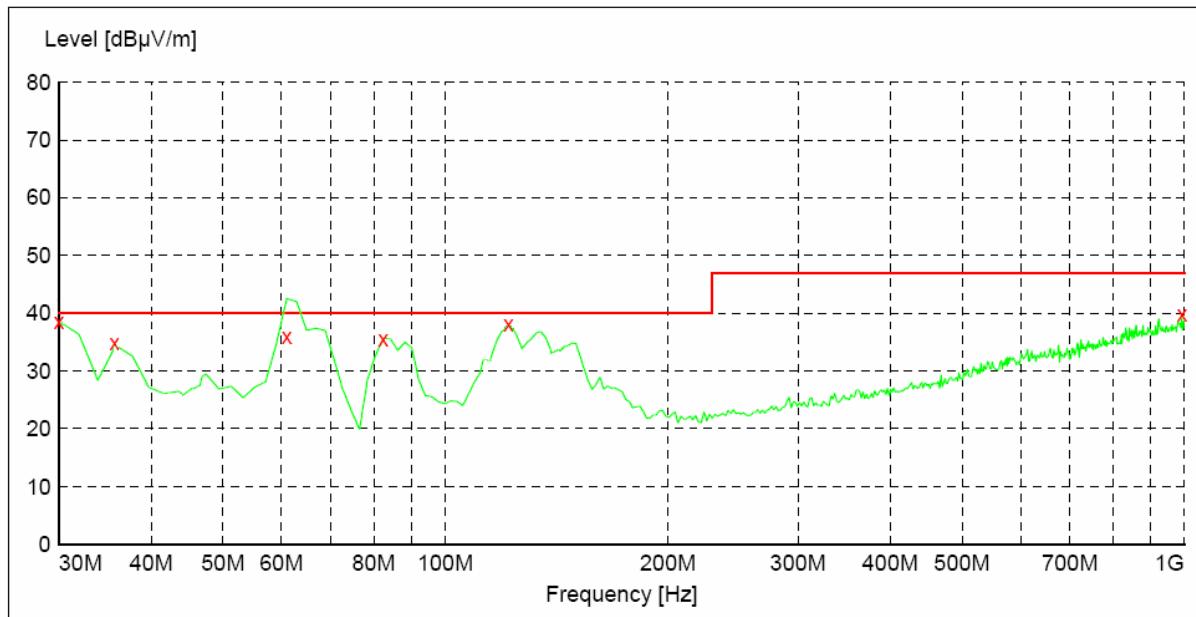
5.5 Test Data

Please refer to the following pages.

Operating Condition: Normal
Test Specification: Horizontal



Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	23.90	15.8	40.0	16.1	---	100.0	0.00	HORIZONTAL
61.040000	24.90	14.2	40.0	15.1	---	100.0	0.00	HORIZONTAL
119.240000	33.70	15.2	40.0	6.3	---	100.0	0.00	HORIZONTAL
225.940000	22.50	16.4	40.0	17.5	---	100.0	0.00	HORIZONTAL
538.280000	32.20	24.9	47.0	14.8	---	100.0	0.00	HORIZONTAL
990.300000	38.90	32.2	47.0	8.1	---	100.0	0.00	HORIZONTAL

Operating Condition: Normal**Test Specification: Vertical**

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	38.60	14.3	40.0	1.4	---	100.0	0.00	VERTICAL
35.820000	35.10	14.7	40.0	4.9	---	100.0	0.00	VERTICAL
61.040000	36.00	14.2	40.0	4.0	QP	100.0	0.00	VERTICAL
82.380000	35.60	13.4	40.0	4.4	---	100.0	0.00	VERTICAL
121.180000	38.00	14.9	40.0	2.0	---	100.0	0.00	VERTICAL
992.240000	39.90	32.2	47.0	7.1	---	100.0	0.00	VERTICAL

6. Harmonic Current Emission Test

6.1 Test Standard and Limit

6.1.1. Test Standard

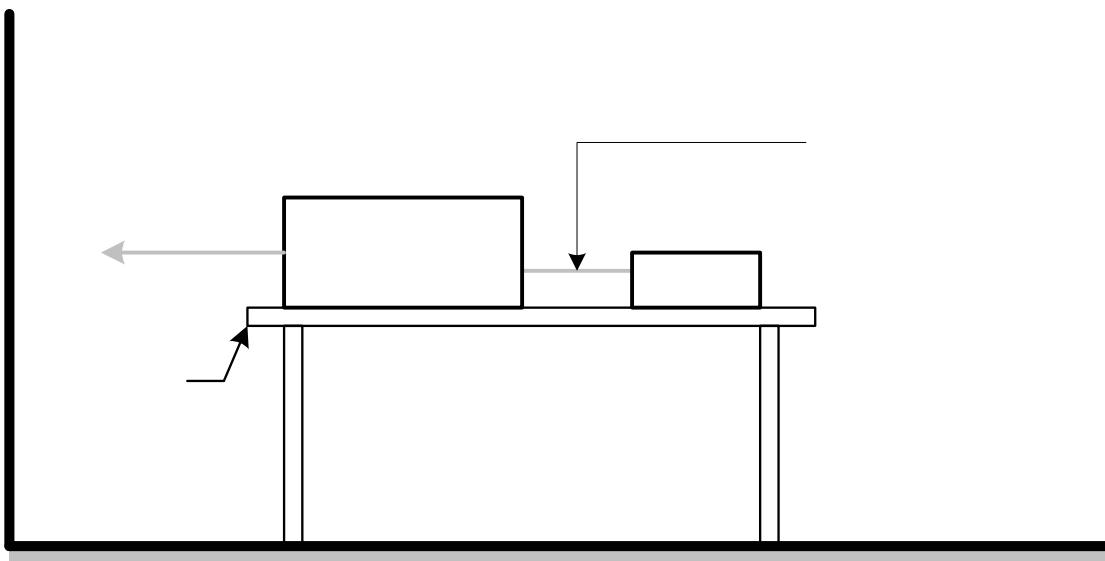
EN 61000-3-2:2006+A1: 2009

6.1.2. Limits

Harmonic Current Test Limit (Class A)

Harmonic order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \times 8/n$

6.2 Test Setup



6.3 Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.

To AC Mains

The classification of EUT Power Supply section 5 of EN 61000-3-2: 2006. The EUT is classified as follows:

Power Analyzer & Power Source

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Arc welding equipment which is not professional equipment.

Non-Metallic Table

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

6.4 Test Condition

Temperature	:	25 °C
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V/50Hz

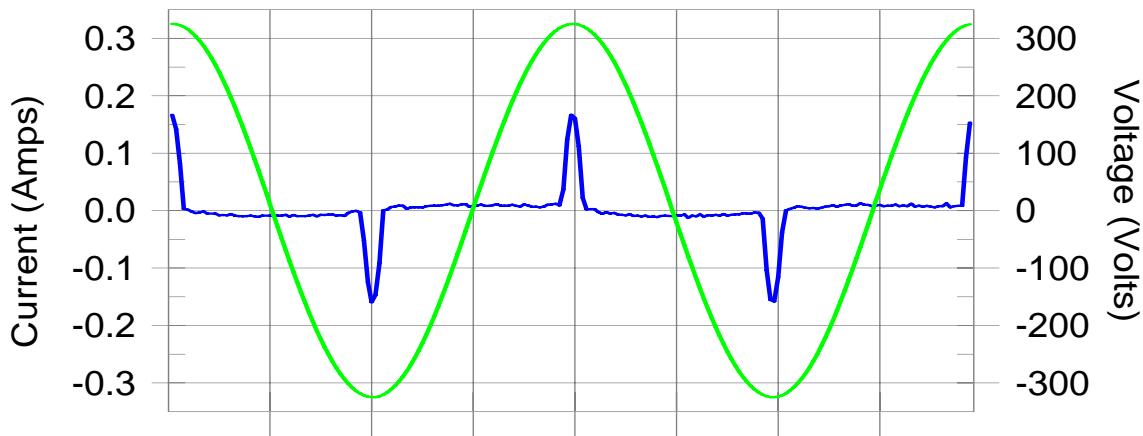
6.5 Test Data

Harmonics – Class-A per Ed. 3.0 (2006)(Run time)

EUT: Ntelligent Digital Frequency
Test category: Class-A per Ed. 3.0 (2006) (European limits)
Test date: 2011-6-29 Start time: 10:56:27 End time: 11:06:48
Test duration (min): 10 Data file name: H-000005.cts_data
Comment: STVC31-M
Customer: Customer information

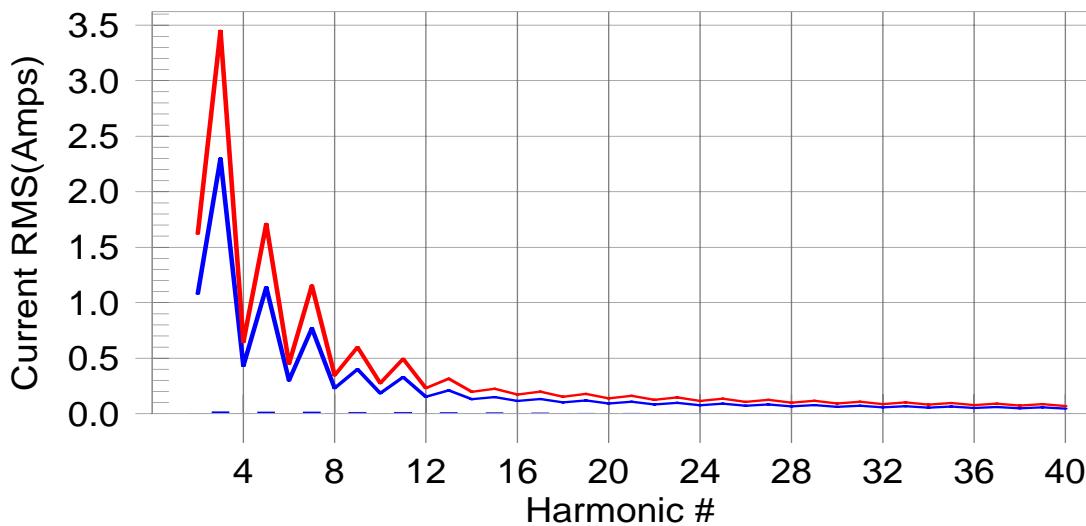
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonic was #15 with 5.30% of the limit.

Current Test Result Summary (Run time)

EUT: Ntelligent Digital Frequency Tested by: Tested by

Test category: Class-A per Ed. 3.0 (2006) (European limits) Test Margin: 100

Test date: 2011-6-29 Start time: 10:56:27 End time: 11:06:48

Test duration (min): 10 Data file name: H-000005.cts_data

Comment: STVC31-M

Customer: Customer information

Test Result: Pass **Source qualification:** Normal
THC(A): 0.03 **I-THD(%):** 179.48 **POHC(A):** 0.000 **POHC Limit(A):** 0.320

Highest parameter values during test:

V_RMS (Volts): 229.96	Frequency(Hz): 50.00
I_Peak (Amps): 0.175	I_RMS (Amps): 0.041
I_Fund (Amps): 0.020	Crest Factor: 4.385
Power (Watts): 4.2	Power Factor: 0.458

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.0	0.001	1.620	0.07	Pass
3	0.016	2.300	0.7	0.017	3.450	0.50	Pass
4	0.001	0.430	0.0	0.001	0.645	0.12	Pass
5	0.015	1.140	1.3	0.015	1.710	0.90	Pass
6	0.000	0.300	0.0	0.000	0.450	0.09	Pass
7	0.014	0.770	1.8	0.015	1.155	1.26	Pass
8	0.000	0.230	0.0	0.000	0.345	0.09	Pass
9	0.013	0.400	3.2	0.013	0.600	2.18	Pass
10	0.000	0.184	0.0	0.000	0.276	0.13	Pass
11	0.011	0.330	3.4	0.012	0.495	2.32	Pass
12	0.000	0.153	0.0	0.000	0.230	0.14	Pass
13	0.010	0.210	4.6	0.010	0.315	3.12	Pass
14	0.000	0.131	0.0	0.000	0.197	0.09	Pass
15	0.008	0.150	5.3	0.008	0.225	3.63	Pass
16	0.000	0.115	0.0	0.000	0.173	0.08	Pass
17	0.006	0.132	4.7	0.007	0.199	3.27	Pass
18	0.000	0.102	0.0	0.000	0.153	0.11	Pass
19	0.005	0.118	0.0	0.005	0.178	2.79	Pass
20	0.000	0.092	0.0	0.000	0.138	0.08	Pass
21	0.003	0.107	0.0	0.003	0.161	2.13	Pass
22	0.000	0.084	0.0	0.000	0.125	0.08	Pass
23	0.002	0.098	0.0	0.002	0.147	1.46	Pass
24	0.000	0.077	0.0	0.000	0.115	0.12	Pass
25	0.001	0.090	0.0	0.001	0.135	0.78	Pass
26	0.000	0.071	0.0	0.000	0.106	0.18	Pass
27	0.000	0.083	0.0	0.000	0.125	0.18	Pass
28	0.000	0.066	0.0	0.000	0.099	0.14	Pass
29	0.001	0.078	0.0	0.001	0.116	0.68	Pass
30	0.000	0.061	0.0	0.000	0.092	0.11	Pass
31	0.001	0.073	0.0	0.001	0.109	1.06	Pass
32	0.000	0.058	0.0	0.000	0.086	0.13	Pass
33	0.001	0.068	0.0	0.001	0.102	1.29	Pass
34	0.000	0.054	0.0	0.000	0.081	0.11	Pass
35	0.001	0.064	0.0	0.001	0.096	1.35	Pass
36	0.000	0.051	0.0	0.000	0.077	0.12	Pass
37	0.001	0.061	0.0	0.001	0.091	1.33	Pass
38	0.000	0.048	0.0	0.000	0.073	0.11	Pass
39	0.001	0.058	0.0	0.001	0.087	1.17	Pass
40	0.000	0.046	0.0	0.000	0.069	0.12	Pass

Voltage Source Verification Data (Run time)

EUT: Ntelligent Digital Frequency Tested by: Tested by
Test category: Class-A per Ed. 3.0 (2006) (European limits) Test Margin: 100
Test date: 2011-6-29 Start time: 10:56:27 End time: 11:06:48
Test duration (min): 10 Data file name: H-000005.cts_data
Comment: STVC31-M
Customer: Customer information

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.96	Frequency(Hz):	50.00
I_Peak (Amps):	0.175	I_RMS (Amps):	0.041
I_Fund (Amps):	0.020	Crest Factor:	4.385
Power (Watts):	4.2	Power Factor:	0.458

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.071	0.460	15.42	OK
3	0.549	2.069	26.55	OK
4	0.071	0.460	15.50	OK
5	0.050	0.920	5.45	OK
6	0.025	0.460	5.40	OK
7	0.035	0.690	5.06	OK
8	0.008	0.460	1.83	OK
9	0.025	0.460	5.39	OK
10	0.014	0.460	3.12	OK
11	0.015	0.230	6.51	OK
12	0.011	0.230	4.83	OK
13	0.016	0.230	6.78	OK
14	0.006	0.230	2.64	OK
15	0.017	0.230	7.58	OK
16	0.010	0.230	4.46	OK
17	0.012	0.230	5.06	OK
18	0.010	0.230	4.45	OK
19	0.010	0.230	4.52	OK
20	0.011	0.230	4.76	OK
21	0.009	0.230	3.87	OK
22	0.004	0.230	1.62	OK
23	0.005	0.230	2.21	OK
24	0.003	0.230	1.43	OK
25	0.006	0.230	2.45	OK
26	0.003	0.230	1.37	OK
27	0.006	0.230	2.70	OK
28	0.004	0.230	1.62	OK
29	0.006	0.230	2.79	OK
30	0.003	0.230	1.34	OK
31	0.005	0.230	2.16	OK
32	0.003	0.230	1.18	OK
33	0.006	0.230	2.55	OK
34	0.003	0.230	1.30	OK
35	0.005	0.230	2.14	OK
36	0.003	0.230	1.36	OK
37	0.006	0.230	2.61	OK
38	0.003	0.230	1.26	OK
39	0.005	0.230	2.35	OK
40	0.005	0.230	2.37	OK

7. Voltage Fluctuation and Flicker Test

7.1 Test Standard and Limit

7.1.1. Test Standard

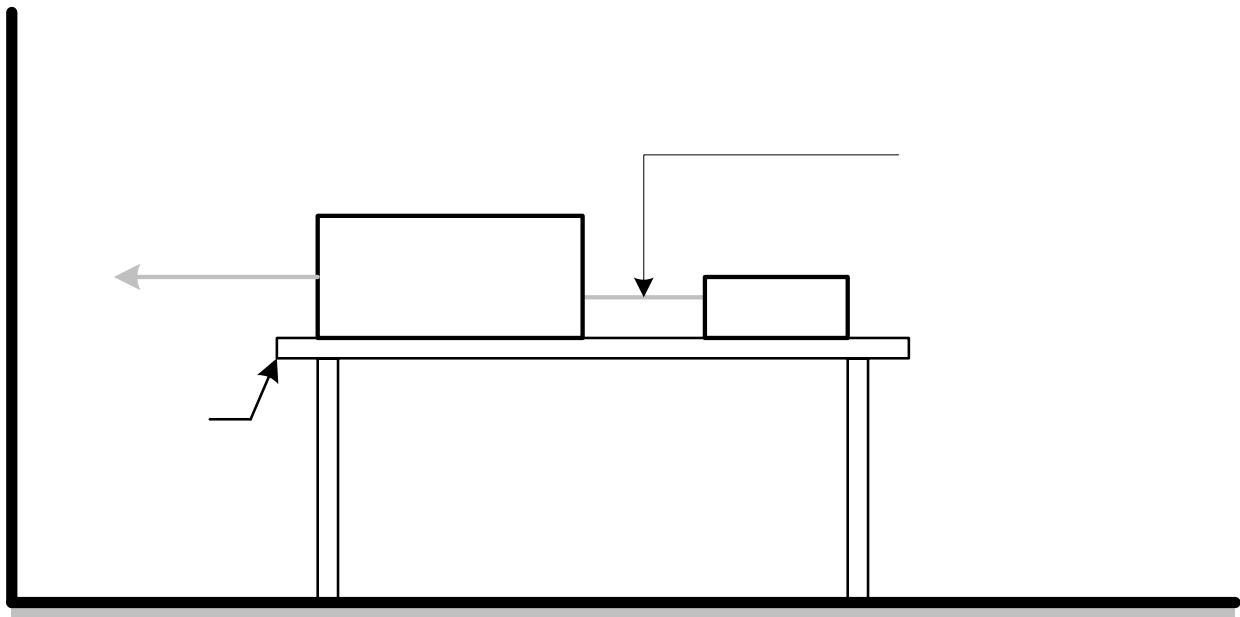
EN 61000-3-3:2008

7.1.2. Limit

Voltage Fluctuation and Flicker Test Limit

Test Items	Limits
Pst	1.0
dc	3.3%
dmax	4.0%
dt	Not exceed 3.3% for 500ms

7.2 Test Setup



7.3 Test Procedure

7.3.1 Harmonic Current Test

Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

7.3.2 Fluctuation and Flickers Test:

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

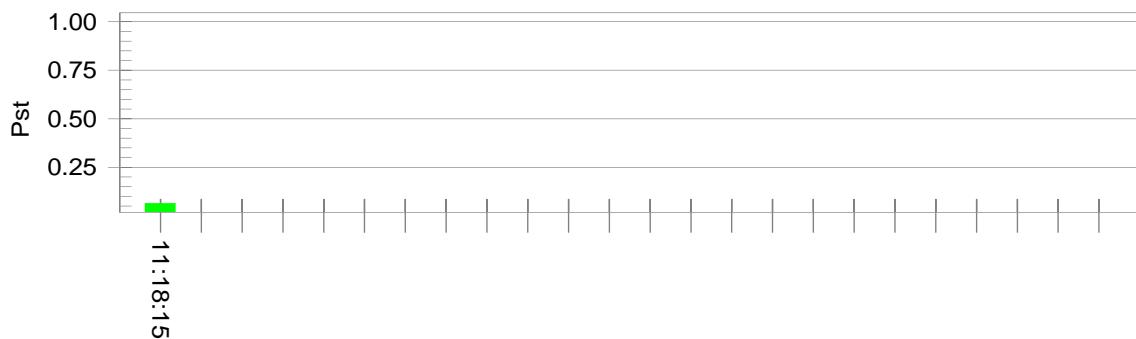
For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 1.3).

7.3 Test Condition

Temperature	:	25 °C
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V/50Hz

7.4 Test Data

Please refer to the following pages.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)**EUT: Ntelligent Digital Frequency****Tested by: Vans****Test category: All parameters (European limits)****Test Margin: 100****Test date: 2011-6-29****Start time: 11:07:55****End time: 11:18:16****Test duration (min): 10****Data file name: F-000006.cts_data****Comment: STVC31-M****Customer: Customer information****Test Result: Pass****Status: Test Completed****Pst, and limit line****European Limits****Plt and limit line****Parameter values recorded during the test:****Vrms at the end of test (Volt): 229.86**

Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	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. Electrostatic Discharge Immunity Test

8.1 Test Requirements

8.1.1 Test Standard

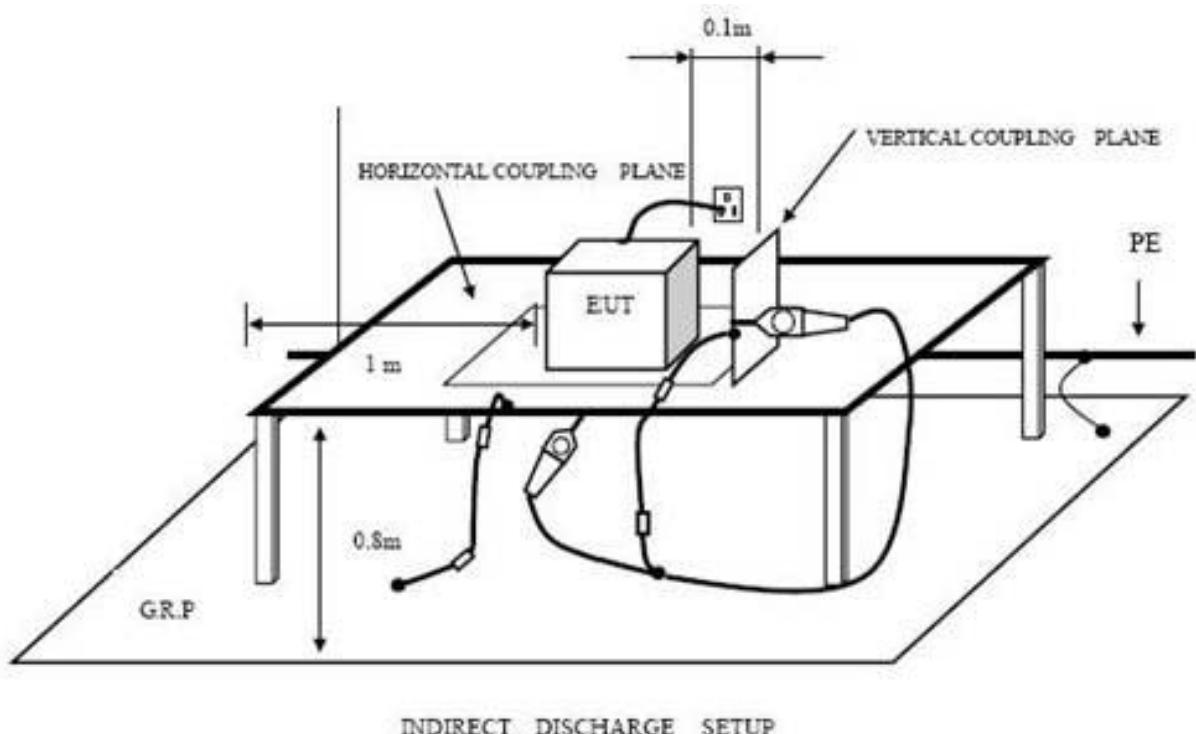
EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-2:2009)

8.1.2 Test 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

8.1.3 Performance criterion: B

8.2 Test Setup



8.3 Test Procedure

8.3.1 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.

8.3.2 Contact Discharge:

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

8.3.3 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.

8.3.4 Indirect discharge for vertical coupling plane

At least 10 single discharges (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 X 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.

8.4 Test Data

Please refer to the following pages.

Electrostatic Discharge Test Result

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M
Temperature	22°C	Humidity	50%
Power supply	AC 230V/50Hz	Test Mode	Normal
Criterion: B			
Air Discharge: ±8kV Contact Discharge: ±4kV			
For each point positive 10 times and negative 10 times discharge.			
Location	Kind A-Air Discharge C-Contact Discharge	Result	
Slots of the EUT	A	PASS	
Nonconductive Enclosure	A	PASS	
Button	A	PASS	
Conductive Enclosure	C	PASS	
Screw	C	PASS	
HCP	C	PASS	
VCP of front	C	PASS	
VCP of rear	C	PASS	
VCP of left	C	PASS	
VCP of right	C	PASS	
Remark:			

9. Radiated Electromagnetic Field Immunity Test

9.1 Test Requirements

9.1.1. Test Standard

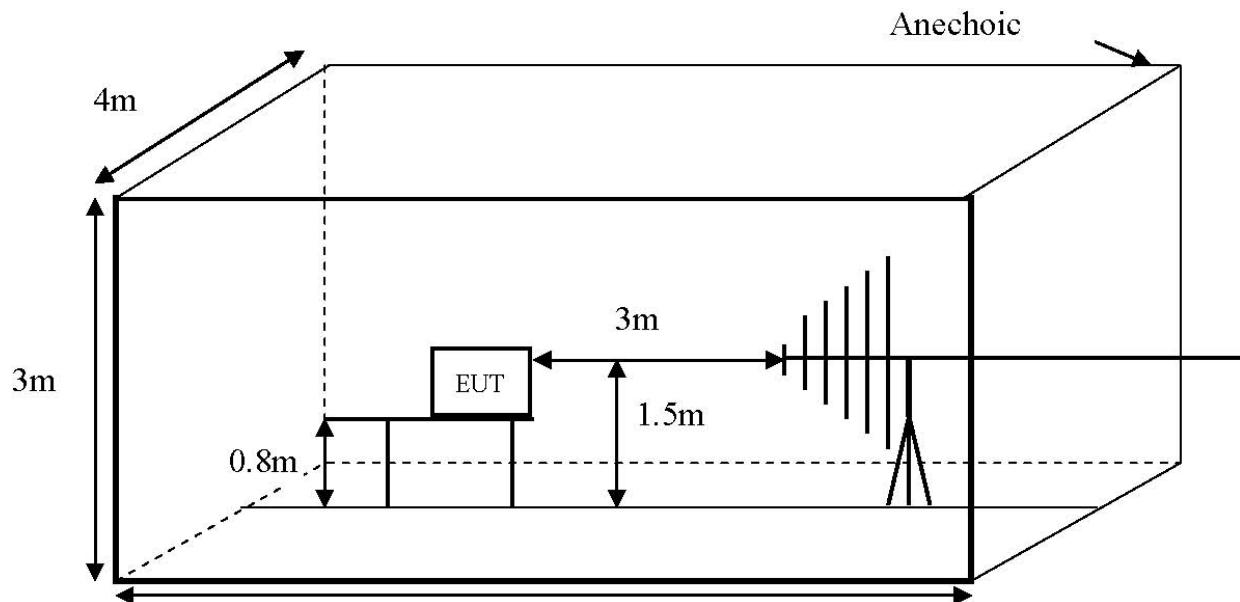
EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-3:2006+A1:2008)

9.1.2. Test Level

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

9.1.3. Performance criterion: A

9.1 Test Setup



9.2 Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a camera is used to monitor its screen.

All the scanning conditions are as following:

Condition of Test	Remark
Fielded strength	3V/m (Severity Level 2)
Radiated signal	Modulated
Scanning frequency	80-1000MHz
Sweep time of radiated	0.0015 Decade/s
Dwell time	1 Sec.

9.3 Test Data

Please refer to the following pages.

RF Field Strength Susceptibility Test Results

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M			
Temperature	22°C	Humidity	50%			
Power supply	AC 230V/50Hz	Test Mode	Normal			
Criterion: A						
Modulation: Unmodulated						
Pulse: AM 1KHz 80%						
	Frequency Rang 1		Frequency Rang 2			
	80~1000MHz		/			
	Horizontal	Vertical	Horizontal	Vertical		
Front	PASS	PASS	/	/		
Right	PASS	PASS	/	/		
Rear	PASS	PASS	/	/		
Left	PASS	PASS	/	/		
Remark:						

10. Electrical Fast Transient/Burst Test

10.1 Test Requirements

10.1.1. Test Standard

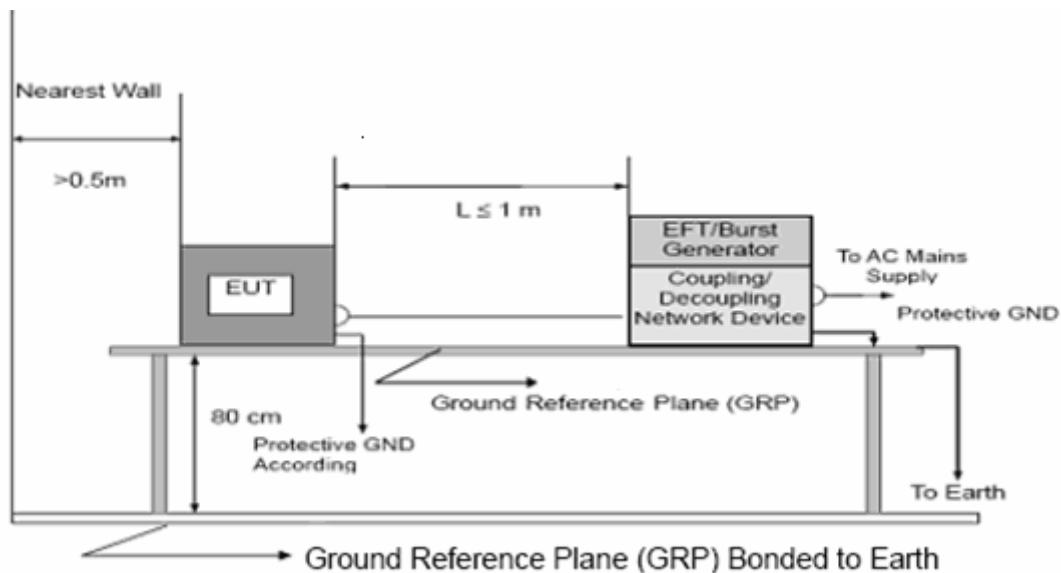
EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-4:2004+A1:2010)

10.1.2. Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Switching Adapter 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

10.1.3. Performance criterion: B

10.2 Test Setup



10.3 Test Procedure

10.3.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

10.3.2 For signal lines and control lines ports:

A coupling clamp is used to couple the EFT interference signal to the signal and control lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

10.3.3 For DC input and DC output power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

10.4 Test Data

Please refer to the following pages.

Electrical Fast Transient/Burst Test Results

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M
Temperature	22°C	Humidity	50%
Power supply	AC 230V/50Hz	Test Mode	Normal
Criterion: B			
Line : <input checked="" type="checkbox"/> AC Mains Coupling : <input checked="" type="checkbox"/> Direct			
Line : <input type="checkbox"/> Signal <input type="checkbox"/> I/O Cable Coupling : <input type="checkbox"/> Capacitive			
Line	Voltage(kV)	Result(+)	Result(-)
L	1.0	Pass	Pass
N	1.0	Pass	Pass
L-N	1.0	Pass	Pass
PE	1.0	Pass	Pass
L-PE	1.0	Pass	Pass
N-PE	1.0	Pass	Pass
L-N-PE	1.0	Pass	Pass

11. SURGE Immunity Test

11.1 Test Requirements

11.1.1. Test Standard

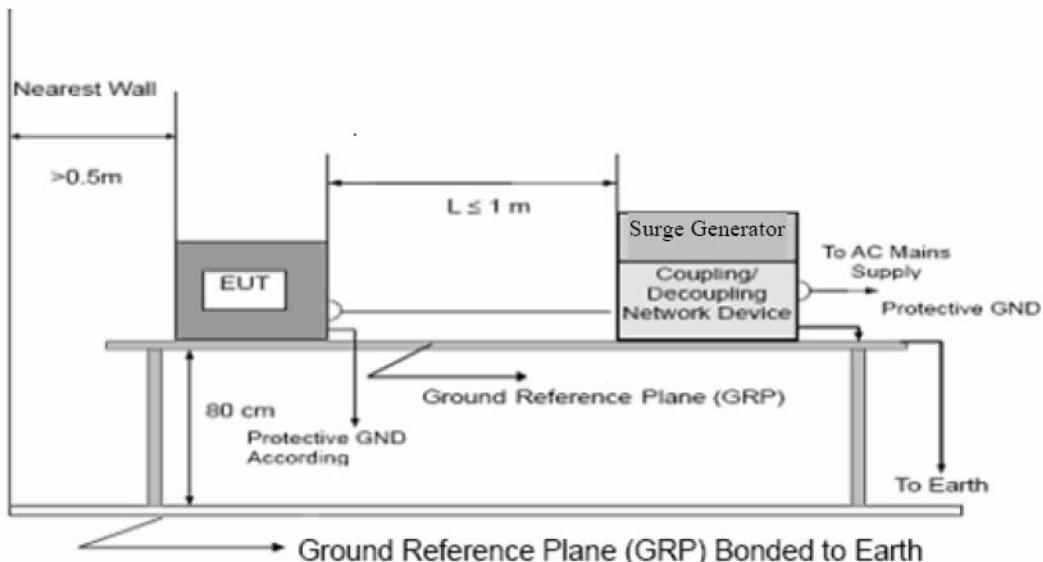
EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-5:2006)

11.1.2. Level

Severity Level	Open-Circuit Test Voltage kV
1	1.5
2	1.0
3	1.0
4	4.0
*	Special

11.1.3. Performance criterion: B

11.2 Test Setup



11.3 Test Procedure

11.3.1 Set up the EUT and test generator as shown on Section 11.1.2.

11.3.2 For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge

(at open-circuit condition) and 8/20us current surge to EUT selected points.

11.3.3 At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

11.3.4 Different phase angles are done individually.

11.3.5 Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.4 Test Data

Please refer to the following pages.

Surge Immunity Test Results

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M
Temperature	22°C	Humidity	50%
Power supply	AC 230V/50Hz	Test Mode	Normal
Criterion: B			
Injected Line	Voltage(kV)	Phase	Result
		(+)	(-)
L-N	1.0	0°	Pass
		90°	Pass
		180°	Pass
		270°	Pass
L-PE	2.0	0°	Pass
		90°	Pass
		180°	Pass
		270°	Pass
N-PE	2.0	0°	Pass
		90°	Pass
		180°	Pass
		270°	Pass
L-N-PE	2.0	0°	Pass
		90°	Pass
		180°	Pass
		270°	Pass

12. Conducted Immunity Test

12.1 Test Requirements

12.1.1. Test Standard

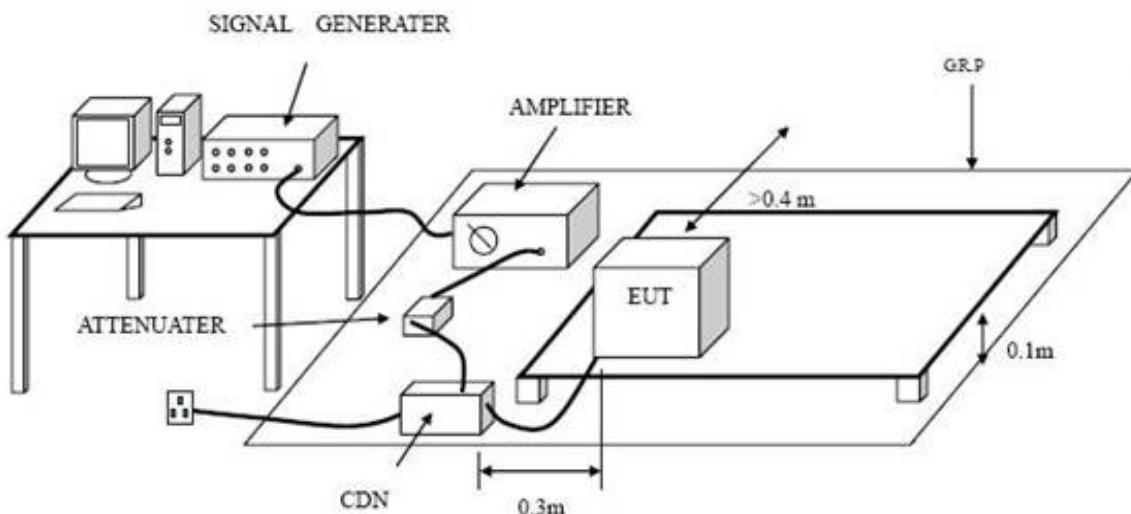
EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-6:2009)

12.1.2. Level

Level	Voltage Level (e.m.f.) V
1	1
2	3
3	10
X	Special

12.1.3. Performance criterion: A

12.2 Test Setup



12.3 Test Procedure

12.3.1 Set up the EUT, CDN and test generators.

12.3.2 Let the EUT work in test mode and test it.

12.3.3 The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

- 12.3.4 The disturbance signal description below is injected to EUT through CDN.
- 12.3.5 The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 12.3.6 The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 12.3.7 The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 12.3.8 Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.4 Test Data

Please refer to the following pages.

Injected Currents Susceptibility Test Results

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M
Temperature	22°C	Humidity	50%
Power supply	AC 230V/50Hz	Test Mode	Normal
Criterion: A			
Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Result
0.15 ~ 80	AC Mains	3V(rms), Unmodulated	PASS
0.15 ~ 80	DC Mains	3V(rms), Unmodulated	/
0.15 ~ 80	Signal Line	3V(rms), Unmodulated	/

13. Voltage Dips and Interruptions Immunity Test

13.1 Test Requirements

13.1.1. Test Standard

EN 55024:1998+A1:2001+A2:2003 (EN 61000-4-11:2004)

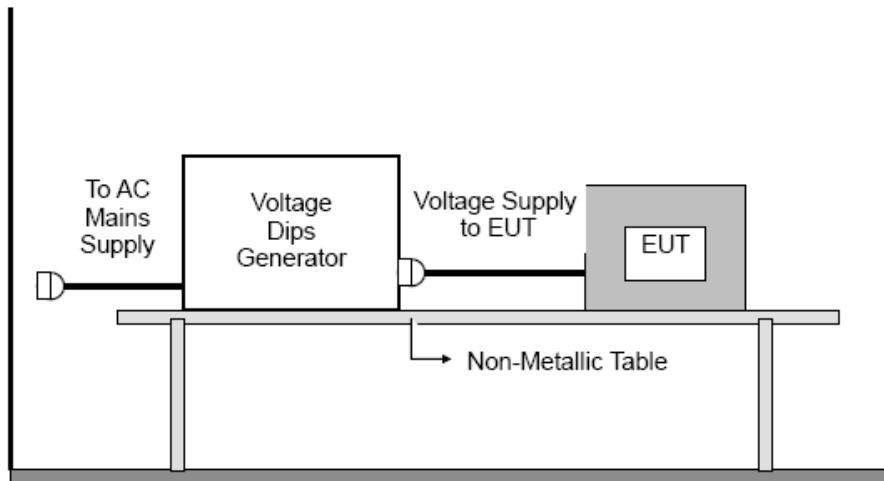
13.1.2. Level

Test Level for Voltage Dips and Interruptions

Test Level %U _T	Voltage dip and short interruptions %U _T	Duration (in period)
0	100	250
0	100	0.5
70	30	25
40	60	5

13.1.3. Performance criterion: B&C

13.2 Test Setup



13.3 Test Procedure

Set up the EUT and test generator as shown above. The EUT is tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10s minimum.

13.4 Test Data

Voltage Dips and Interruptions Test Results

EUT	Intelligent Digital Variable Frequency Vibration Feeder	M/N	STVC31-M	
Temperature	22°C	Humidity	50%	
Power supply	AC 230V/50Hz	Test Mode	Normal	
Criterion: B&C				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Phase Angle	Result
0	100	250P	0°~360°	PASS
70	30	25P	0°~360°	PASS
0	100	0.5P	0°~360°	PASS
Remark: U _T is the rated voltage for the equipment.				

14. Photographs - Constructional Details

Photo 1 Appearance of EUT



Photo 2 Appearance of EUT



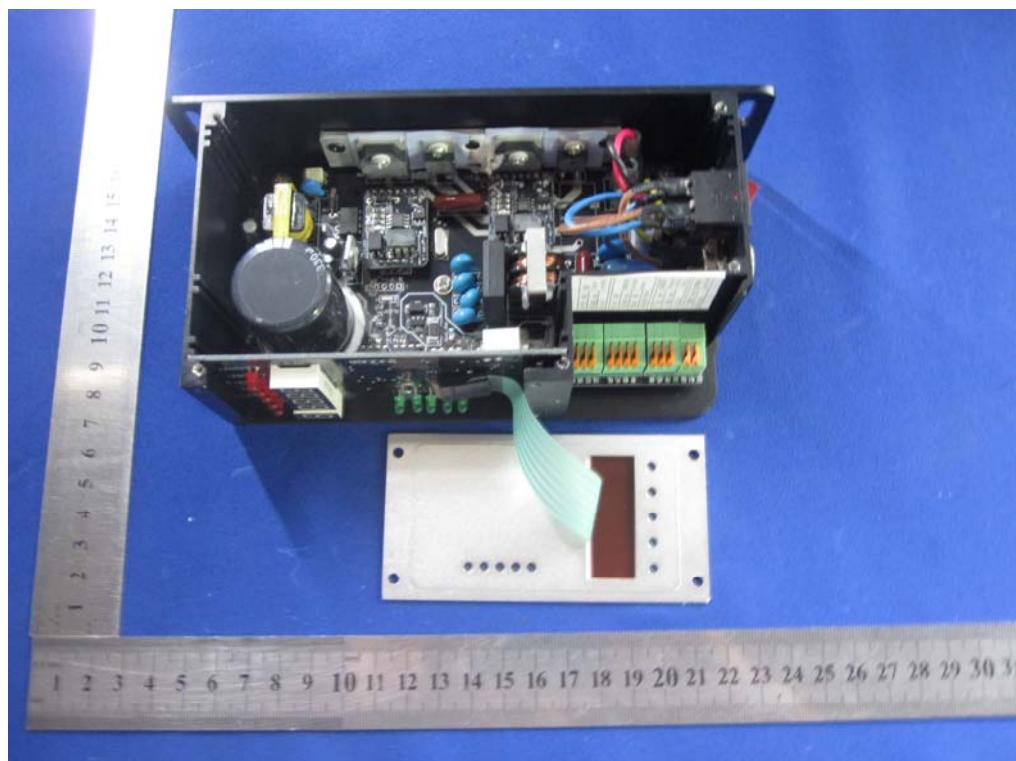
Photo 3 Appearance of EUT**Photo 4 Inside of EUT**

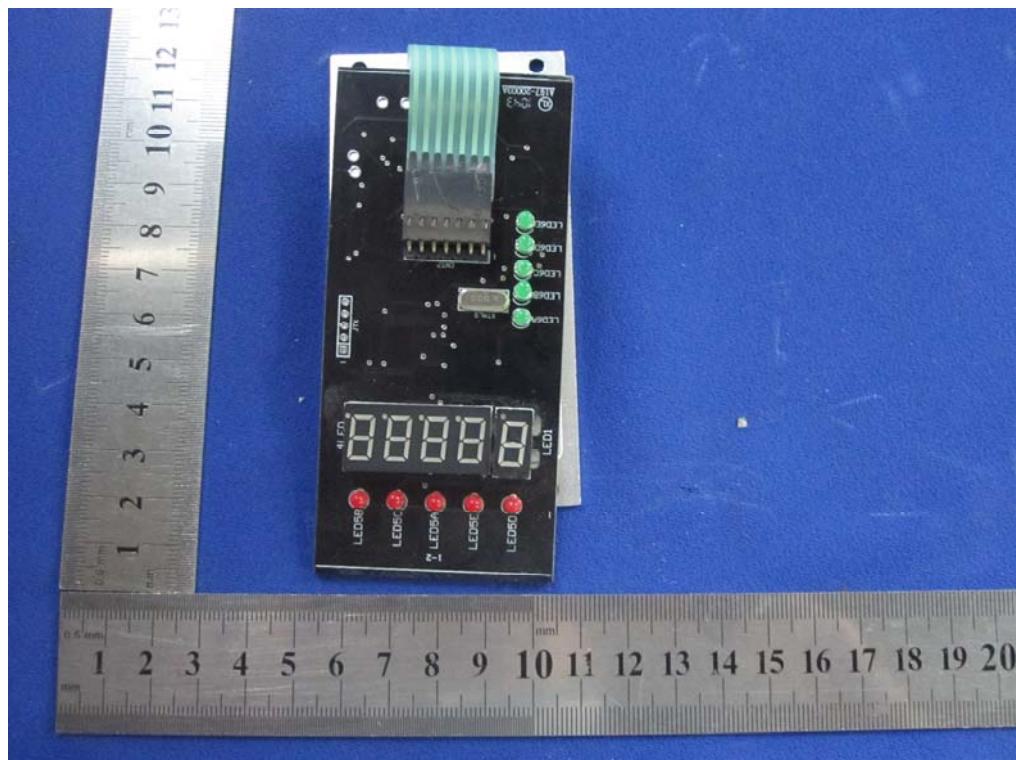
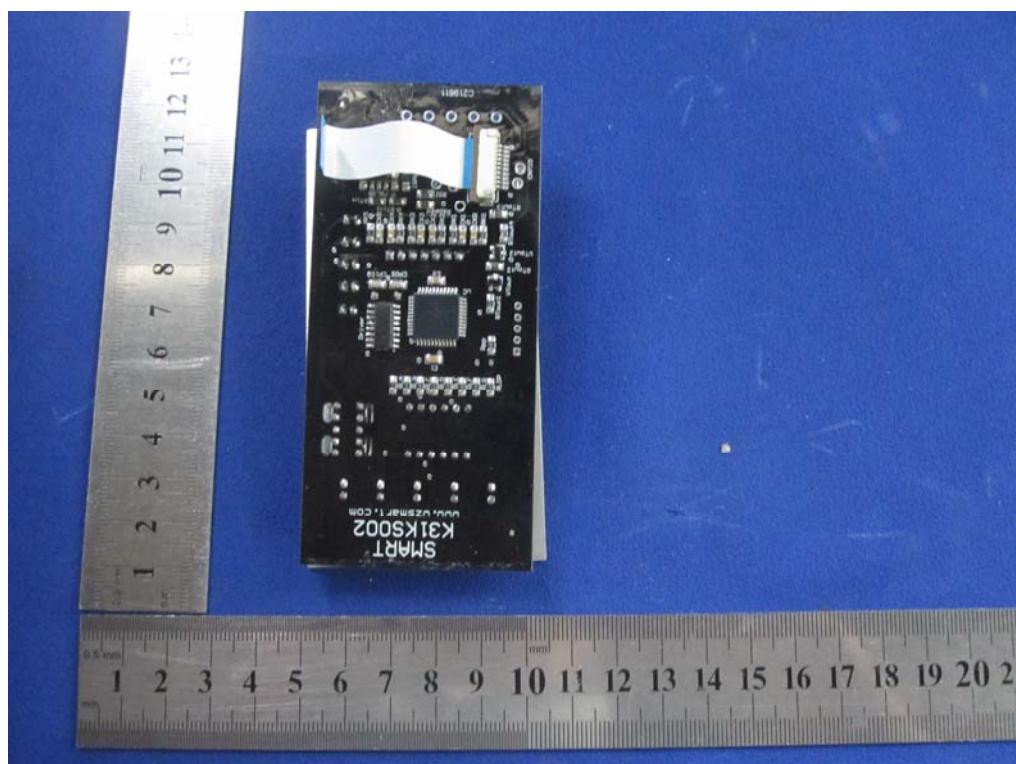
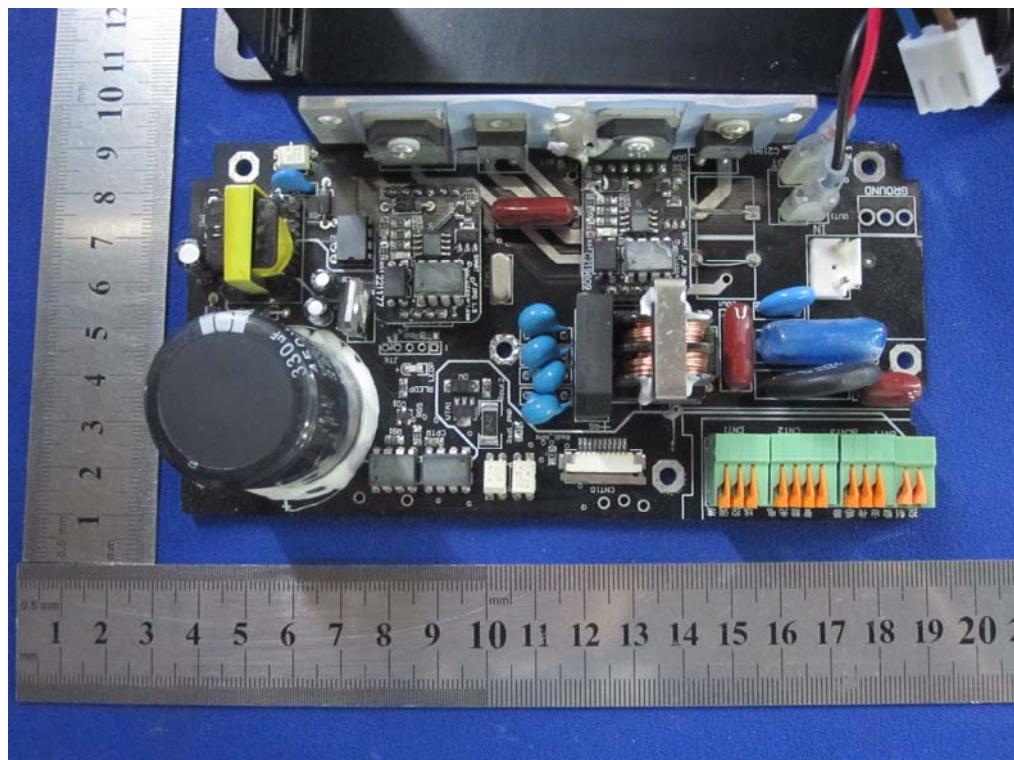
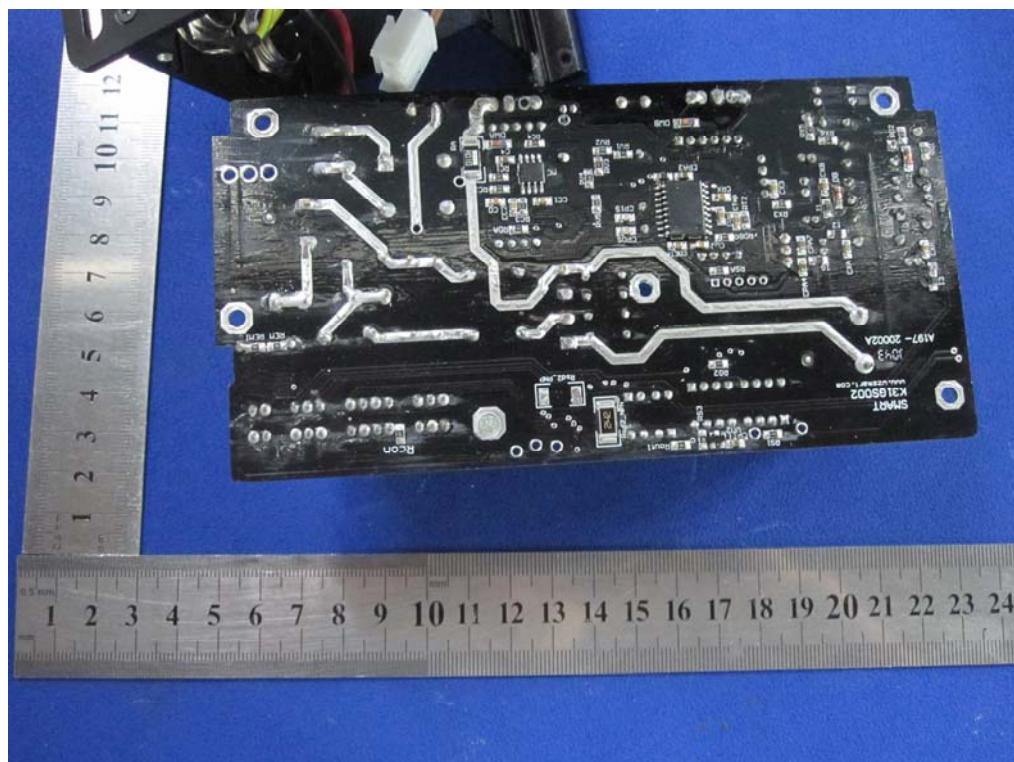
Photo 5 Appearance of PCB**Photo 6 Appearance of PCB**

Photo 7 Appearance of PCB**Photo 8 Appearance of PCB**

15. Photographs – Test Setup

Photo 1 Conducted Emission Test Setup



Photo 2 Radiated Emission Test Setup

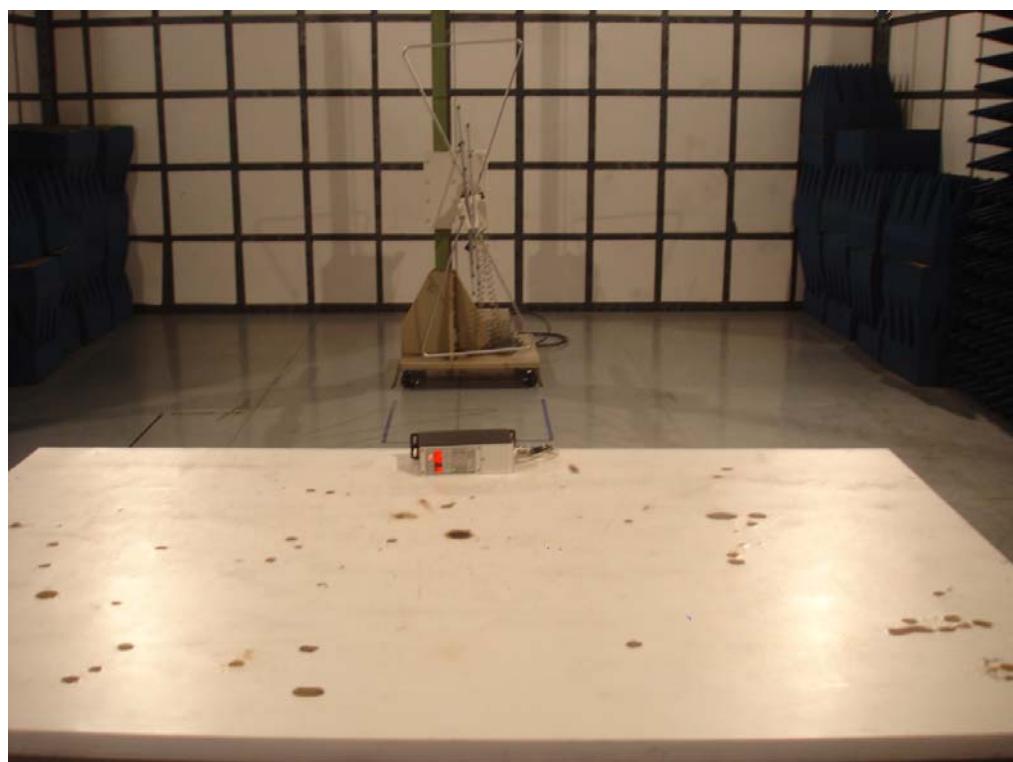


Photo 3 Harmonic current emissions and Voltage fluctuations & flicker Test Setup



Photo 4 Electrostatic Discharge Test Setup

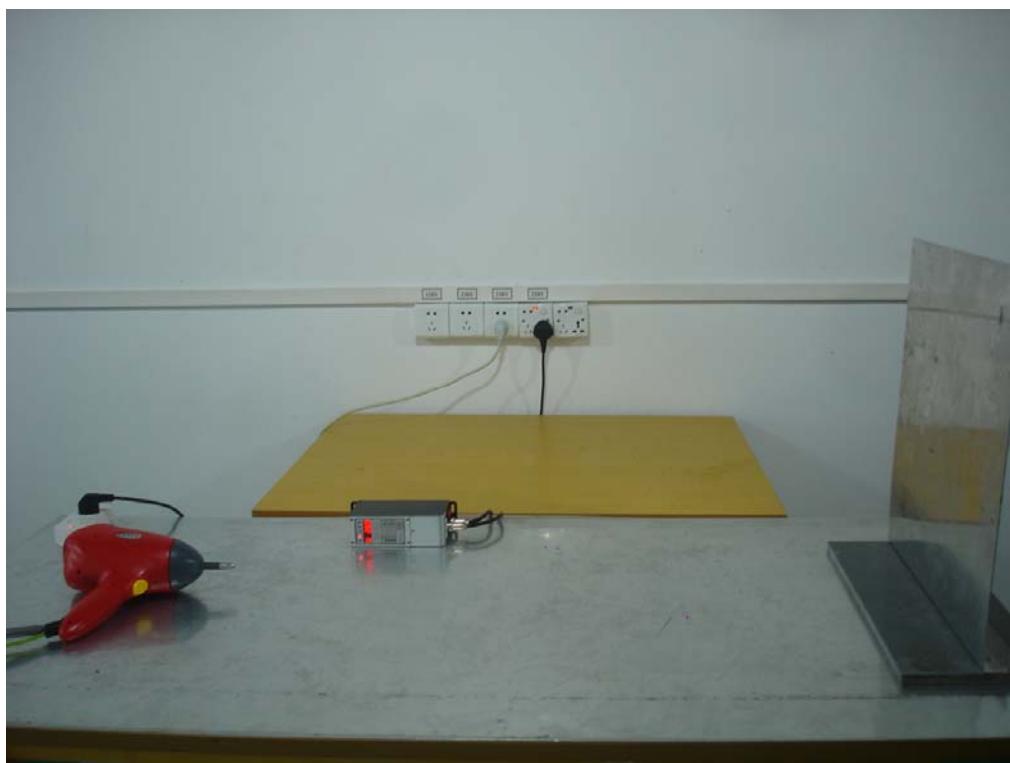


Photo 5 EFT, Surge, Voltage Dips Test Setup**Photo 6 Radio-frequency, Continuous Conducted Disturbance Test Setup**