TRACO POWER
Model: TCL 240-124
EMC – Test Report

EUT:	TRACO POWER Model: TCL 240-124	
Serial No.:	Test Unit 1:	31319786289
	Test Unit 2:	31244690081
	Test Unit 3:	31319786161
Manufacturer No.:	240PSM184	
Manufacturer:	Convertec Ltd. Whitemill Industrial Estate Wexford Republic of Ireland	
Tester:	Gunnar Tapper, Convertec	
Date:	05/11/2013	

It should be noted, that combining two or more CE compliant finished appliances does not automatically produce a compliant system. The manufacturer of an apparatus or a fixed installation as defined in the "Guide for the EMC Directive 2004/108EC, 21. May 2007" is responsible for the EMC-compliance of the final apparatus.

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1. Conducted Emissions Measurement at Mains Terminals

Equipment under Test: TCL 240-124
EUT Serial No.: 31244690081
Customer Spec: CS-240PSM184.doc
Date: 27/06/2013
Standards: IEC61000-6-3: 2011 referring to CISPR 16-2-1: 2005

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Emissions measured using Agilent E7402A EMC Analyzer and PMM LISN L2-16
- Tested to IEC 61000-6-3:Ed 2.1 Class B limits
- Transient limiter used to protect Agilent E7402A, with appropriate correction factors applied
- Tests carried out in a shielded room

1.1. Test Setup

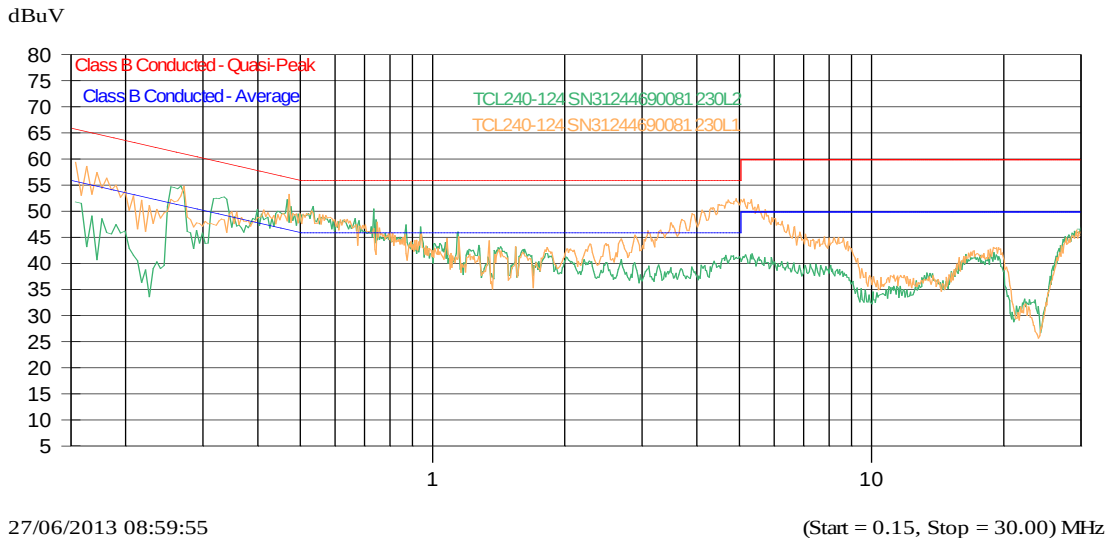
Test Equipment Settings:

Start Freq.	Stop Freq.	Pk Time	Qpk Time	Avg Time
150kHz	30MHz	200ms	200ms	200ms

Test Setup:

1.2. Conducted Emissions Test Results (Mains Terminals)

L1 and L2



Measurement-List

Frequency	Peak	Avg	QP	Delta Pk-QP Limit	Delta Avg-Avg Limit	Delta QP-QP Limit	Trace Name
MHz	dBuV	dBuV	dBuV	dB	dB	dB	
0.149	60.3	26.7	52.4				TCL240-124 SN31244690081 230L1
0.266	54.9	42.9	51.4	-6.3	-8.4	-9.8	TCL240-124 SN31244690081 230L1
0.467	53.3	30.2	45.8	-3.3	-16.4	-10.7	TCL240-124 SN31244690081 230L1
0.734	50.8	26.1	43.1	-5.2	-19.9	-12.9	TCL240-124 SN31244690081 230L1
3.072	46.2	25.1	42.3	-9.8	-20.9	-13.7	TCL240-124 SN31244690081 230L1
4.872	52.7	35.1	49.9	-3.3	-10.9	-6.1	TCL240-124 SN31244690081 230L1
0.268	55.6	41.8	53.0	-5.6	-9.4	-8.2	TCL240-124 SN31244690081 230L2
0.331	55.3	42.0	52.1	-4.1	-7.4	-7.4	TCL240-124 SN31244690081 230L2
0.469	53.7	29.9	46.5	-2.8	-16.6	-10.0	TCL240-124 SN31244690081 230L2
0.734	51.2	25.9	43.0	-4.8	-20.1	-13.0	TCL240-124 SN31244690081 230L2
0.930	48.3	28.1	42.1	-7.7	-17.9	-13.9	TCL240-124 SN31244690081 230L2
1.133	46.0	27.7	40.6	-10.0	-18.3	-15.4	TCL240-124 SN31244690081 230L2

Table 1 - average and quasi peak measurements of the 020PSM184

Remarks:

The orange graph represents peak measurements of line 1 and the green graph represents peak measurements of line 2. Quasi peak and average measurements are measured if the peak measurement is above the relevant limit. See Table 1.

PASS

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa

Environmental conditions during the test: ☒ kept ☐ not kept

2. Radiated Emissions Measurements

Equipment under Test: TCL 240-124
EUT Serial No.: 31244690081
Customer Spec: CS-240PSM184.doc
Date: 27/06/2013
Standards: IEC61000-6-3: 2011 referring to CISPR 16-2-3: 2003

For an apparatus to comply with EMC radiated emissions requirements as set down in CISPR 16-2-3, free field measurements need to be performed. A test method similar to that described in IEC61204-3 (for low-voltage power supplies) section 6.4.2 shall be used here instead of free field measurements. This test is designed to give a good indication of whether an EUT will pass free field measurements or not. The absorber clamp used in this method is replaced by a Fischer high frequency current probe (Model: F-33-1). The limits used are set by comparison with open field measurements and are compensated by 20dB per frequency decade. Two limit lines are indicated; Fis_a and Fis_b, and the results may be interpreted as follows:

- Below limit line Fis_b: Limits are kept
- Below limit line Fis_a: Limits probably kept
- Above limit line Fis_a: Limits most likely not kept

Final Compliance can only be established by free field measurements in accordance to the relevant standard applicable to the apparatus or enclosure in which the power supply is used

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Emissions measured using receiver Agilent E7402A and FCC RF current probe
- RF current probe kept a distance of 10cm from input/output
- Tests carried out in shielded room
- Tested to IEC 61000-6-3:Ed 2.1 Class B limits

2.1. Test Setup

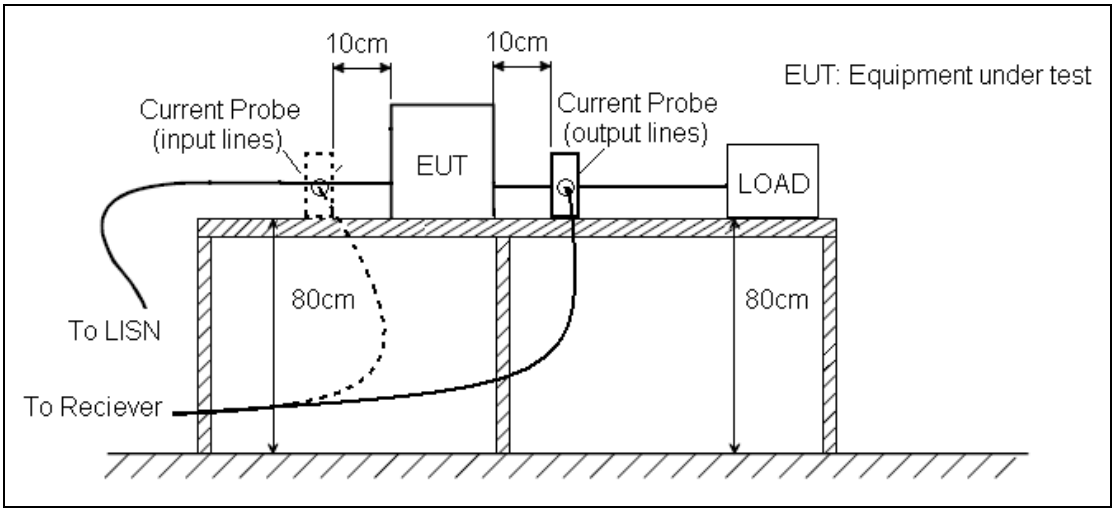
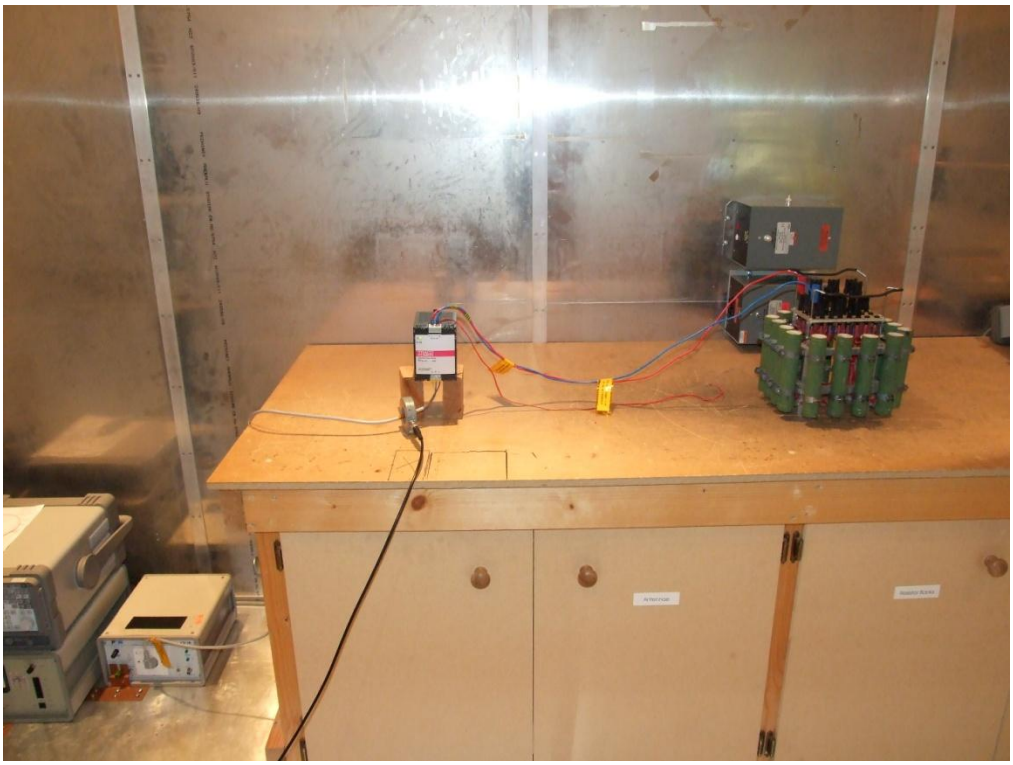


Figure 1. Test set-up for measurement of disturbance power similar to IEC61204-3

Test Equipment Settings:

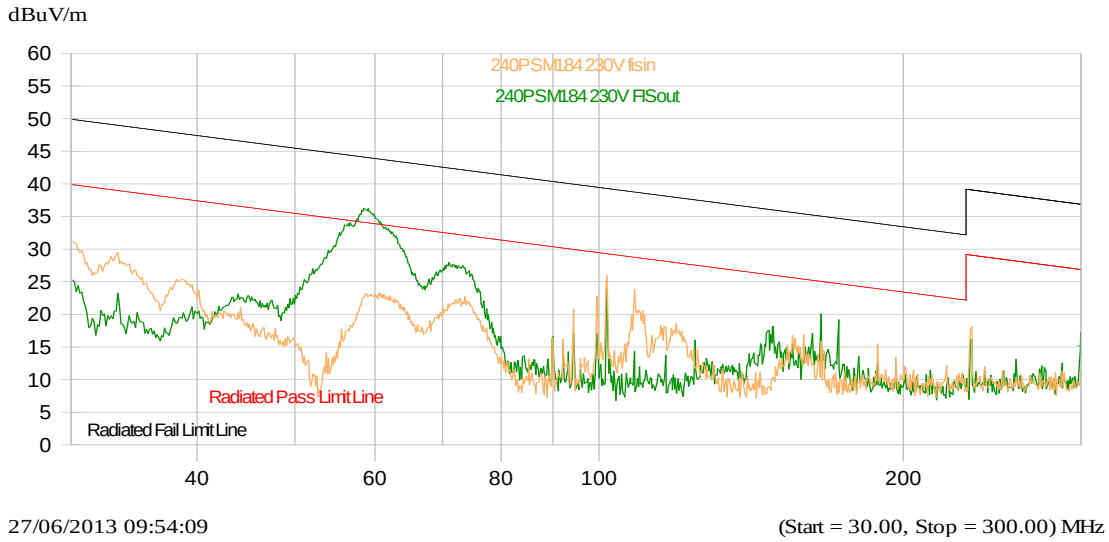
Start Freq.	Stop Freq.	Pk Time
30MHz	300MHz	200ms

Test Setup: The following shows the setup used for input lines, the setup used for the output lines is the same with the clamp on the input lines.



2.2. Radiated Emissions Test Results

Input Lines and Output Lines:



PASS

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa

Environmental conditions during the test:
☒ kept
☐ not kept

3. Harmonic Current Emissions Measurement at Mains Terminal

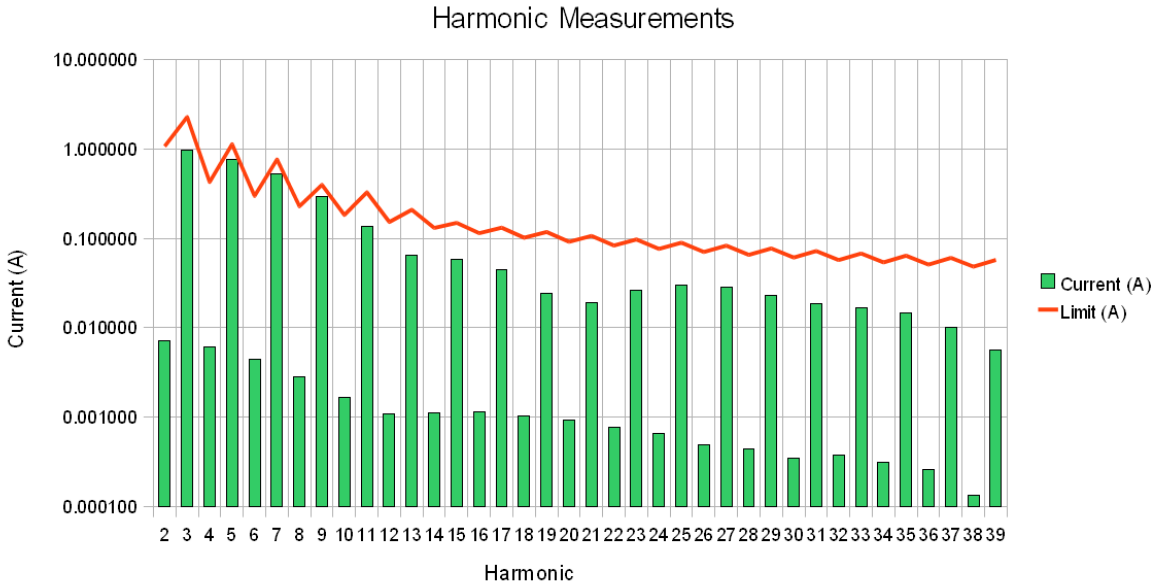
Equipment under Test: TCL 240-124
EUT Serial No.: 31319786289
Customer Spec: CS-240PSM184.doc
Date: 19/08/2013
Standards: IEC61000-6-3: 2006 referring to IEC 61000-3-2: 2005

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (12V, 10A Resistive).
- EUT powered by low-distortion AC Voltage Source, TTI AC-1000
- Harmonic Limits measured using LMG 95 Power Meter
- Tested to IEC61000-3-2 Table 1 Class A

3.1. Test Setup:

3.2. Harmonic Current Emissions Test Results



Harmonic	Current (A)	Limit (A)	Harmonic	Current (A)	Limit (A)
0	0.004111		20	0.000926	0.092000
1	1.092490		21	0.018938	0.107143
2	0.007212	1.080000	22	0.000766	0.083636
3	0.978341	2.300000	23	0.026545	0.097826
4	0.006018	0.430000	24	0.000651	0.076667
5	0.770049	1.140000	25	0.030173	0.090000
6	0.004481	0.300000	26	0.000486	0.070769
7	0.523625	0.770000	27	0.028337	0.083333
8	0.002831	0.230000	28	0.000439	0.065714
9	0.297837	0.400000	29	0.023066	0.077586
10	0.001637	0.184000	30	0.000348	0.061333
11	0.134904	0.330000	31	0.018724	0.072581
12	0.001088	0.153333	32	0.000372	0.057500
13	0.065201	0.210000	33	0.016934	0.068182
14	0.001099	0.131429	34	0.000307	0.054118
15	0.058855	0.150000	35	0.014701	0.064286
16	0.001137	0.115000	36	0.000258	0.051111
17	0.045042	0.132353	37	0.010108	0.060811
18	0.001037	0.102222	38	0.000134	0.048421
19	0.024335	0.118421	39	0.005693	0.057692

PASS

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa

Environmental conditions during the test: ☒ kept ☐ not kept

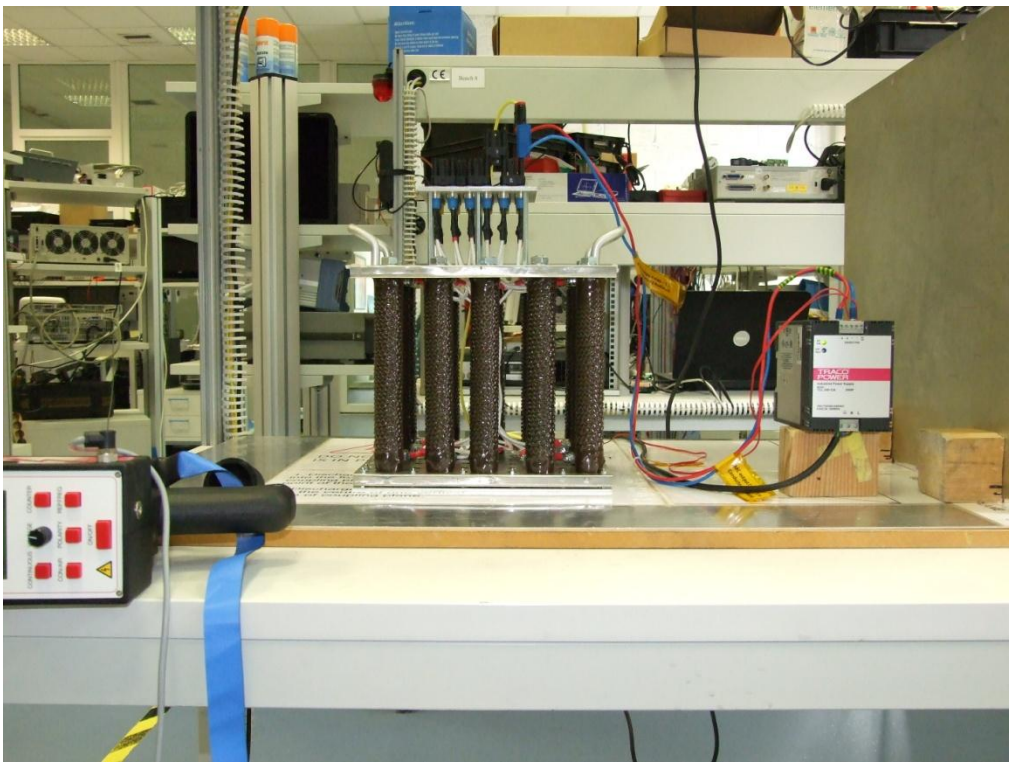
4. Electrostatic Discharge Immunity Test

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786289
Customer Spec: CS-240PSM184.doc
Date: 06/08/2013
Standards: IEC61000-6-2: 2005 referring to IEC 61000-4-2: 2000

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Since the EUT output is isolated from earth, a 470K HV resistor was placed between output and Earth to provide a discharge path between spikes
- Contact discharge tests shall be applied to all areas exposed to the end user under final installation using ESD gun SESD 200
- Test voltage shall be increased from 2kV up to the max 8kV/4kV (air/contact) as required by the standard IEC/EN 61000-4-2
- At least 10 discharges were applied per test point (in both polarities)
- A time interval between discharges of a least 1s was used
- The ESD generator was held perpendicular to the test point wherever possible for repeatability of results
- In the case of air discharges, the trigger is engaged at about 20cm and the tester is moved quickly toward the test point until a spark occurs and trigger is released

4.1. Test Set-Up:



4.2. Electrostatic Discharge Immunity Test Results

All exposed metal screw heads and ground planes were tested as contact test points and also as air test points.
The connector pins and all vents and inlets were also tested as air test points.

	Contact Test points:	Air Test points:
EUT	PASS	PASS

Conclusion:
EUT still functions as expected after tests therefore are in accordance with IEC61000-4-2

PASS

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa
Environmental conditions during the test:	☒ kept ☐ not kept

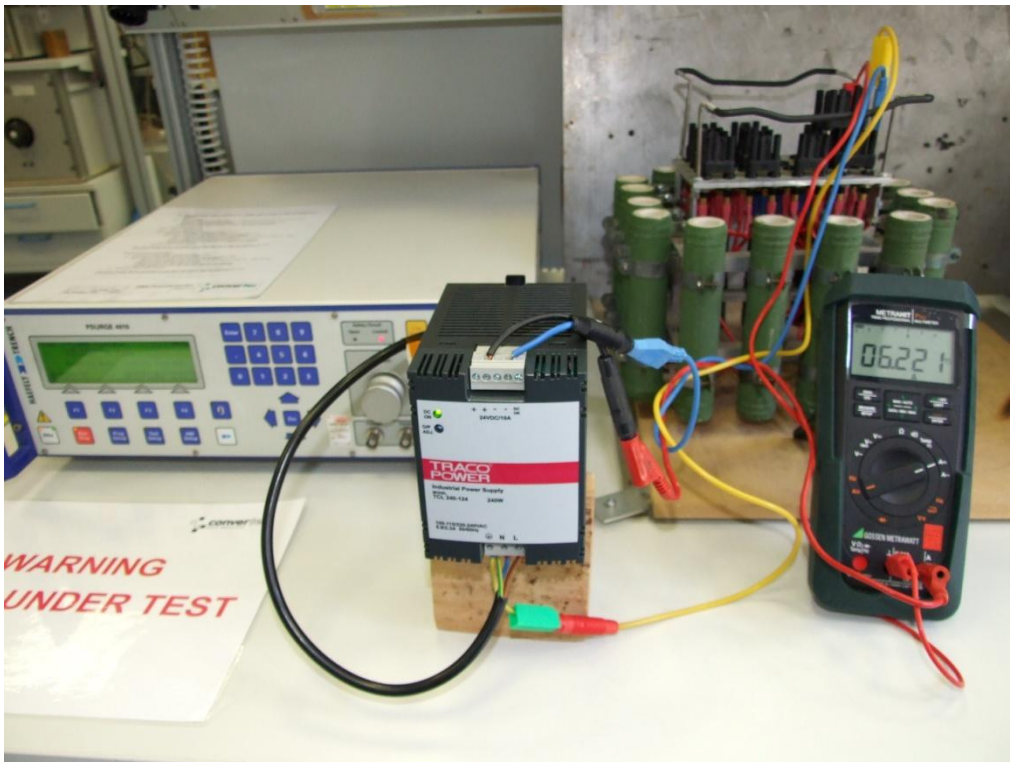
5. Surge Voltage Immunity Test

Equipment under Test: TCL 240-124
EUT Serial No.: 31244690081
Customer Spec: CS-240PSM184.doc
Date: 25/06/2013
Standards: IEC61000-6-2: 2005 referring to IEC 61000-4-5: 2005

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V /10A Resistive).
- Used Haefely Surge generator PSURGE 4010
- Voltage test level: AC port Line-Line +/- 1kV, AC port Line-Earth +/- 2kV (installation class 3)
- DC ports Line-Line & DC ports Line-Earth +/-0,5kV & Signal Ports Line-Earth +/- 1kV (Not tested due to lack of suitable equipment)
- No. of Surges per set: 5 tests Positive and 5 tests Negative
- Interval Between Surges: 10s

5.1. Test Setup



5.2. Surge Voltage Immunity Test Results

	L+VE to L-VE	L+VE to PE	L-VE to PE
EUT	PASS	PASS	PASS

Conclusion:
Meets Classification B as required per Table 4, IEC 61000-6-2

PASS

Environmental conditions

Temperature: 15-30°C
Humidity: 30-60%
Air Pressure: 860-1060 hPa
Environmental conditions during the test: ☒ kept
☐ not kept

6. Fast Transient Voltage Immunity Test (Burst)

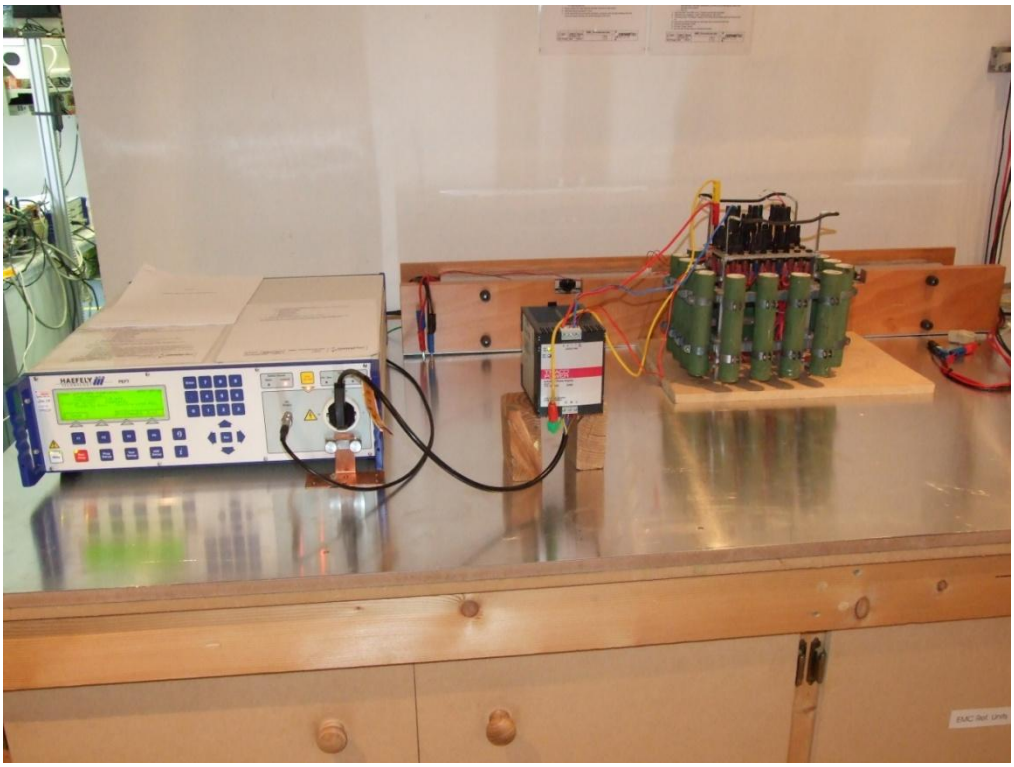
Equipment under Test: TCL 240-124
EUT Serial No.: 31319786289
Customer Spec: CS-240PSM184.doc
Date: 06/08/2013
Standard: IEC61000-6-2: 2005 referring to IEC 61000-4-4: 2004

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Units tested to IEC61000-4-4 test level 3
- Used Haefely Burst tester PEFT 4010
- AC & DC Power ports Voltage test level:+/-2kV
- Signal Ports Voltage test level:+/-1kV
- Burst Duration: 0.75ms
- Spike frequency: 100kHz
- Burst Period: 300ms
- Individual test time: 1 min
- Polarity: Positive and Negative

The Output lines and Signal lines were tested to the above mentioned limits with Haefely coupling capacitor IP4A

6.1. Test Setup



6.2. Fast Transient Voltage (Burst) Test Results.

EUT:	+VE-G	-VE-G	PE-G	+VE, -VE-G	+VE,PE-G	-VE,PE-G	+VE, -VE,PE-G	Outputs -G	Signals -G
Positive	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Negative	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Conclusion:

Meets Classification B as required per Table 2, 3 & 4, IEC 61000-6-2

PASS

Environmental conditions

Temperature: 15-30°C
Humidity: 30-60%
Air Pressure: 860-1060 hPa
Environmental conditions during the test: ☒ kept
☐ not kept

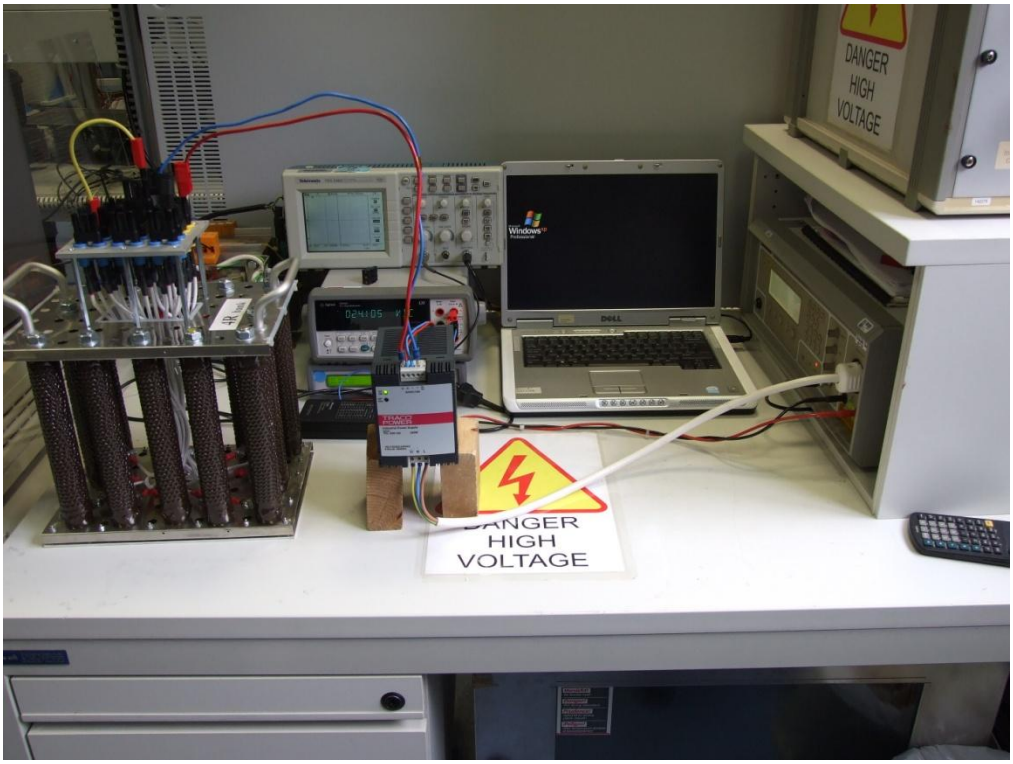
7. Voltage Dips and Short Interruptions Test at AC Input Terminals

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786161
Customer Spec: CS-240PSM184.doc
Date: 04/11/2013
Standard: IEC61000-6-2:2005 referring to IEC 61000-4-11:2004

Notes:

- EUT tested at full load (24V/10A Resistive).
- Test carried out using 2 Variacs and dropout simulator NSG 1003
- Tested according to class 3 IEC61000-4-11 (as per Annex B)
- Unit tested with the nominal low line and high line input voltage (115V/230V) in accordance with IEC61000-4-11 section 5
- Interval between dropouts and short interruptions was 10s
- Phase angle was set to 0^{o}, 90^{o}, 180^{o}, 270^{o} for each voltage level tested
- Voltage Dips were tested from 100%-80% for 250 Mains cycles in accordance with IEC61000-4-11 table 1
- Voltage Dips were tested from 100%-70% for 25 Mains cycles in accordance with IEC61000-4-11 table 1
- Voltage Dips were tested from 100%-40% for 10 Mains cycles in accordance with IEC61000-4-11 table 1
- Voltage Dips were tested from 100%-0% for 1 Mains cycle in accordance with IEC61000-4-11 table 1
- Voltage Dips were tested from 100%-0% for ½ Mains cycle in accordance with IEC61000-4-11 table 1
- 3 Voltage dips and 3 Short Interruptions were carried out per test
- Short interruptions tests were carried out at 100% to 0% for each duration 0.1s, 0.2s, 0.5s, 1s, 2s, and 5s. Voltage interruption of 250 cycles @ 50Hz (5s) required for Class 3, IEC61000-4-11 table 2.
- Short interruptions were done at worst case 0^{o} phase angle
- Classification of performance in accordance to IEC61000-4-11 Section 9.

7.1. Test Setup



7.2. Voltage Dips & Short Interruptions Results (Classifications)

Voltage Dips Test Results						
230VAC						
Input Voltage		Phase Angle				Mains Cycles (50Hz)
		0°	90°	180°	270°	
100% - 80%	184VAC	A	A	A	A	250
100% - 70%	161VAC	A	A	A	A	25
100% - 40%	92VAC	B	B	B	B	10
100% - 0%	0VAC	A	A	A	A	1
100% - 0%	0VAC	A	A	A	A	0.5

100Vac						
Input Voltage		Phase Angle				Mains Cycles (50Hz)
		0°	90°	180°	270°	
100% - 80%	80VAC	B	B	B	B	250
100% - 70%	70VAC	B	B	B	B	25
100% - 40%	40VAC	B	B	B	B	10
100% - 0%	0VAC	A	A	A	A	1
100% - 0%	0VAC	A	A	A	A	0.5

Voltage Interruptions Test Results						
Mains Cycles	5	10	25	50	100	250
100% - 0%	0.1s	0.2s	0.5s	1s	2s	5s
230VAC	B	B	B	B	B	B
100VAC	B	B	B	B	B	B

Conclusion:

Test Result were evaluated in relation to the Customer Specification CS-240PSM184.doc and the EUT was considered to have PASSED the tests.

PASS

Environmental conditions

Temperature: 15-30°C
Humidity: 30-60%
Air Pressure: 860-1060 hPa
Environmental conditions during the test: ☒ kept ☐ not kept

8. Conducted RF Immunity Test at AC Mains Terminals

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786161
Customer Spec: CS-240PSM184.doc
Date: 04/11/2013
Standard: IEC61000-6-2: 2005 referring to IEC 61000-4-6:2004

Notes:

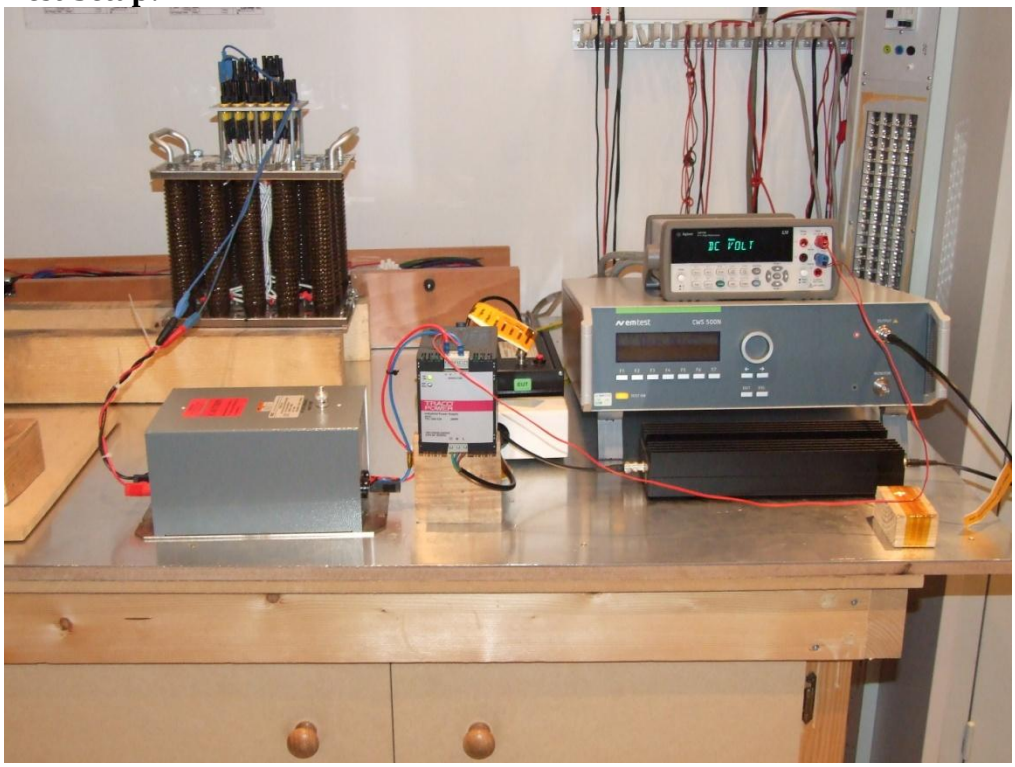
- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Test carried out using test generator "EM Test CWS 500N", Coupling/Decoupling network "EM Test CDN M2/M3", an attenuator "EM Test ATT6/75" and measurement instrument "Agilent 34410A"
- Unit tested to IEC61000-4-6 test level 3

8.1. Test Setup

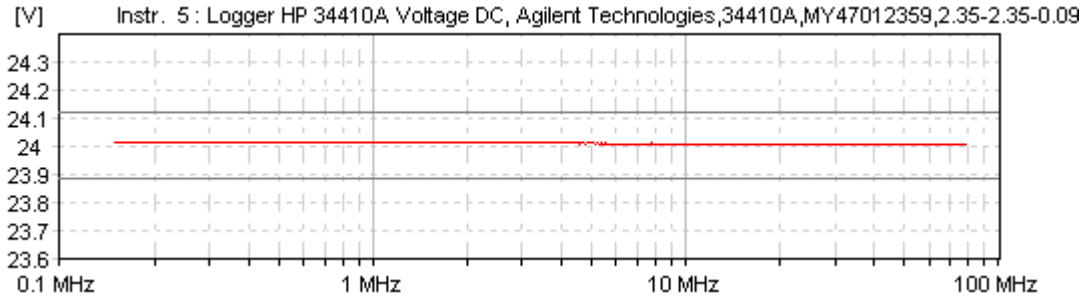
Test Equipment Settings:

Frq. start [MHz]	Level start [V]	Frq. stop [MHz]	Level stop [V]	Frq. step	td [s]	tp [s]	Modulation
0.150	10.0	80.000	10.0	1.0 %	0.5	0.0	AM 1kHz 80%

Test Setup:



8.2. Conducted RF Immunity Test Results



Conclusion:
Meets Classification A (Ref. Section 9, IEC 61000-4-3)
Test Results were evaluated in relation to the Customer Specification CS-240PSM184.doc and the output did not change by more than +/-120mV therefore EUT was considered to have PASSED the tests.

PASS

Environmental conditions

Temperature:	15-30°C	
Humidity:	30-60%	
Air Pressure:	860-1060 hPa	
Environmental conditions during the test:		☒ kept
		☐ not kept

9. Conducted RF Immunity Test at DC Output Terminals

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786161
Customer Spec: CS-240PSM184.doc
Date: 04/11/2013
Standard: IEC61000-6-2: 2005 referring to IEC 61000-4-6:2004

Notes:

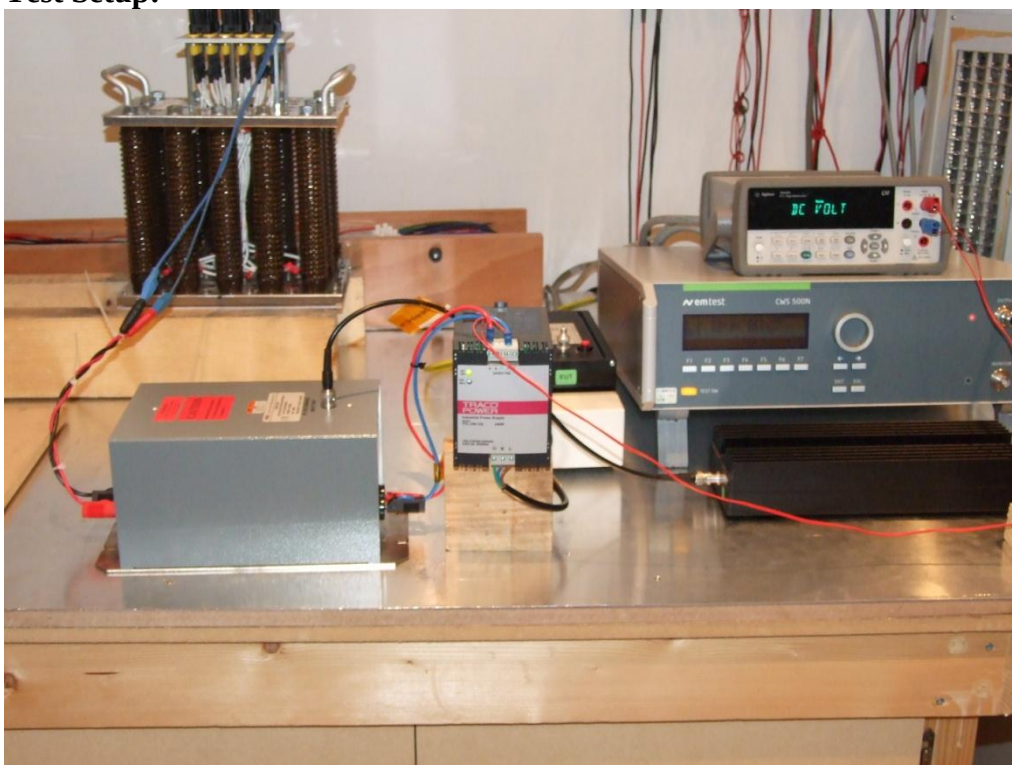
- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Test carried out using test generator "EM Test CWS 500N", Coupling/Decoupling network "EM Test CDN M2/M3", an attenuator "EM Test ATT6/75", measurement instrument "Agilent 34410A" and FCC-801-M2-50A Coupling/Decoupling network.
- Unit tested to IEC61000-4-6 test level 3

9.1. Test Setup:

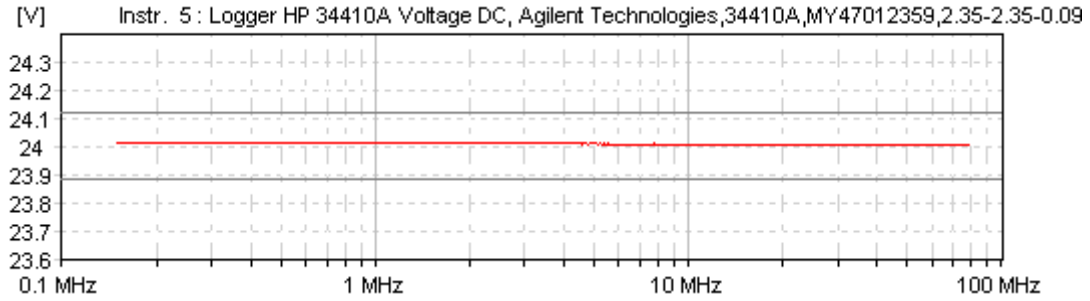
Test Equipment Settings:

Frq. start [MHz]	Level start [V]	Frq. stop [MHz]	Level stop [V]	Frq. step	td [s]	tp [s]	Modulation
0.150	10.0	80.000	10.0	1.0 %	0.5	0.0	AM 1kHz 80%

Test Setup:



9.2. Conducted RF Immunity Test Results



Conclusion:
Meets Classification A (Ref. Section 9, IEC 61000-4-3)
Test Results were evaluated in relation to the Customer Specification CS-240PSM184.doc and the output did not change by more than +/-120mV therefore the EUT was considered to have PASSED the tests.

PASS

Environmental conditions

Temperature:	15-30°C	
Humidity:	30-60%	
Air Pressure:	860-1060 hPa	
Environmental conditions during the test:		☒ kept
		☐ not kept

10. Radiated RF Immunity Test

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786161
Customer Spec: CS-240PSM184.doc
Date: 04/11/2013
Standard: IEC61000-6-2: 2005 referring to IEC61000-4-3: 2004

Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Test carried out using test generator "EM Test CWS 500N", Antenna BicoLOG 30100 X and Digitizing Multi Meter "Agilent 34405A"
- Measurement was carried out in a shielded room
- The input power port of the EUT was connected to mains via a 1.5m 3-core cable
- The output power port of the EUT was connected to the resistor bank via 1.5m long single core wires –wire size 14AWG

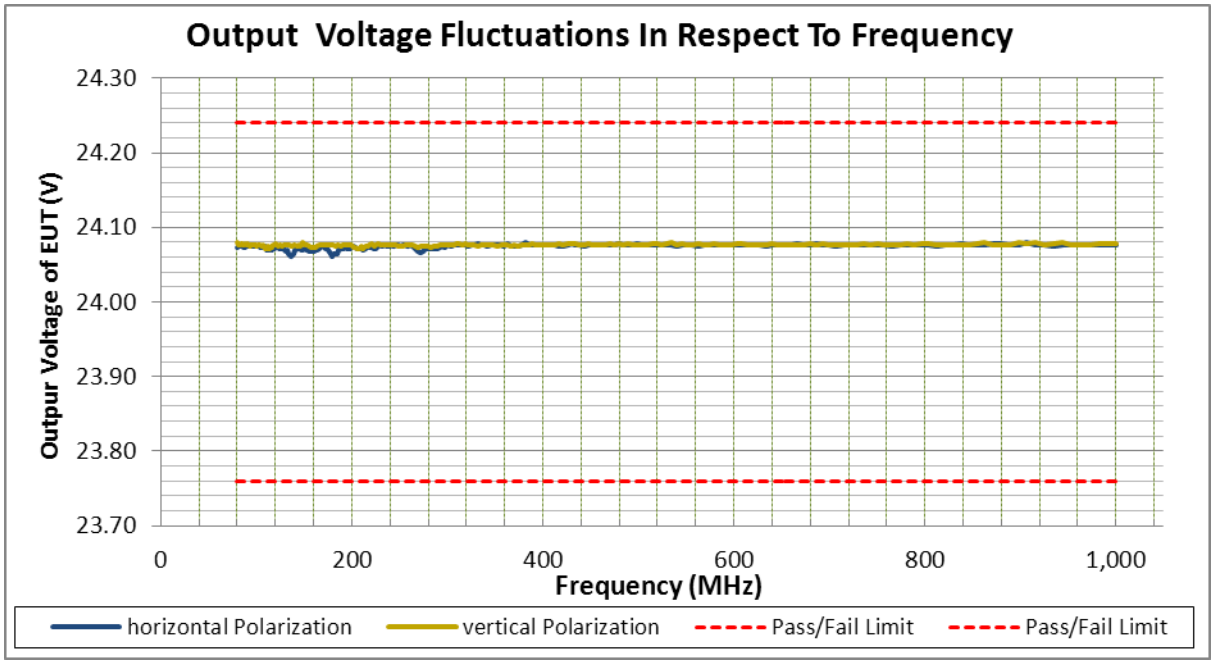
10.1. Test Setup

Test Equipment Settings:

Frq. start [MHz]	Level start [V]	Frq. stop [MHz]	Level stop [V]	Frq. step	td [s]
80.0	10.0	1000.0	10.0	1.0 %	1

Test Setup:

10.2. Radiated RF Immunity Test Results



Conclusion:
Meets Classification A (Ref. Section 9, IEC 61000-4-3)
Test Results were evaluated in relation to the Customer Specification CS-240PSM184.doc and the output did not change by more than +/-120mV therefore the EUT was considered to have PASSED the tests.

PASS

Environmental conditions

Temperature:	15-30°C	
Humidity:	30-60%	
Air Pressure:	860-1060 hPa	
Environmental conditions during the test:		☒ kept
		☐ not kept

11. Power Frequency Magnetic Field Immunity Test

Equipment under Test: TCL 240-124
EUT Serial No.: 31319786289
Customer Spec: CS-240PSM184.doc
Date: 06/08/2013
Standard: IEC61000-6-2: 2005 referring to IEC61000-4-8: 2001

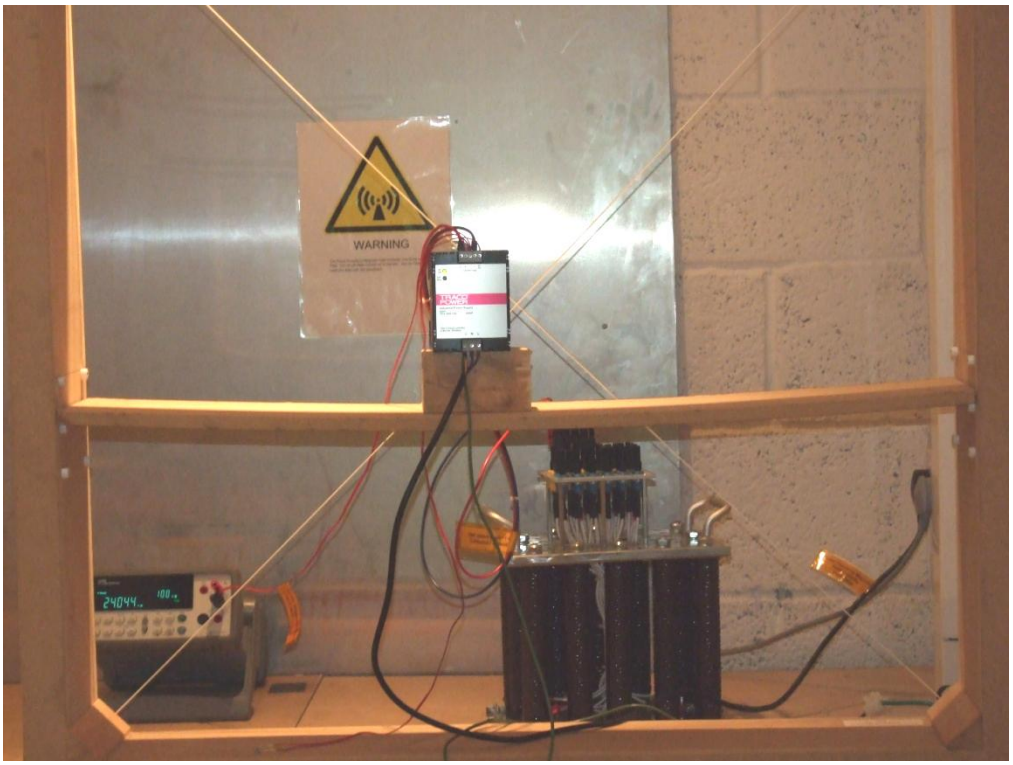
Notes:

- EUT tested under normal operating conditions of 230V 50Hz input at full load (24V/10A Resistive).
- Test carried out using test generator “Chroma Programmable AC Source”, “1meter x 1meter 100 turn Induction Coil" and measurement instrument “Agilent 34405A”
- Unit only required to meet test level 4 but tested to IEC61000-4-8 test levels 5

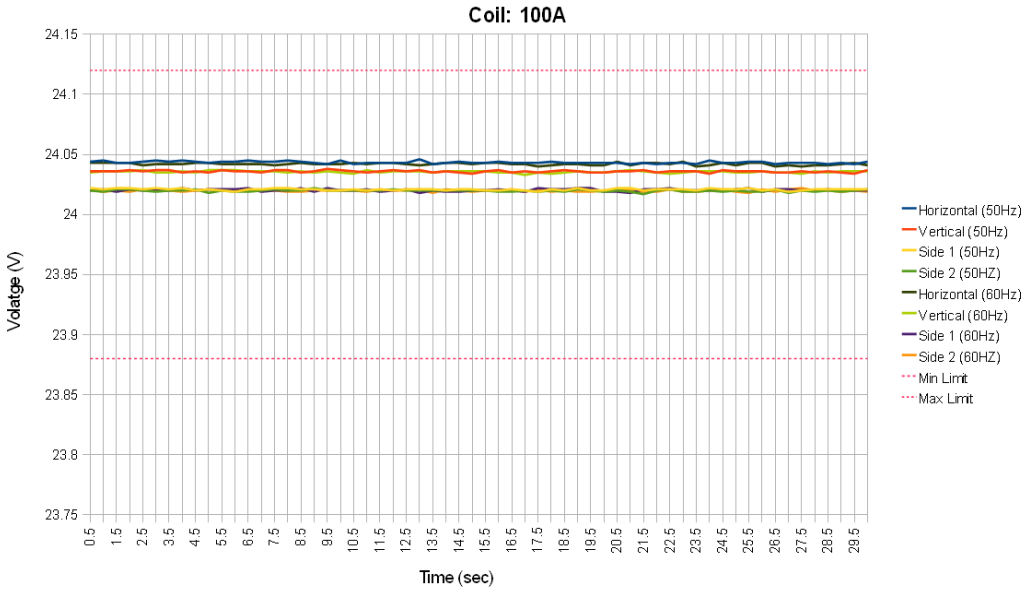
11.1. Test Setup

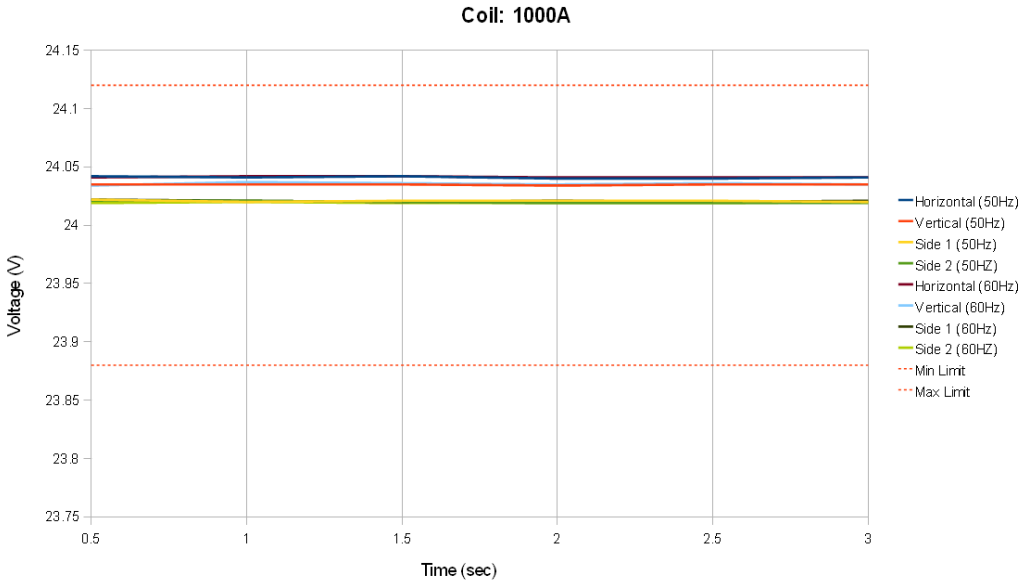
Test Equipment Settings:

Test generator settings			
Frequency	**AC Current through Induction Coil (Arms)**	**Magnetic Field Strength (A/m)**	**Applied Field duration [s]**
50Hz	1	100	Continuous
60Hz	1	100	Continuous
50Hz	10	1000	3
60Hz	10	1000	3



11.2. Power Frequency Magnetic Field Immunity Test Results





Conclusion:
Meets Classification A (Ref. Section 9, IEC 61000-4-8)
Test Results were evaluated in relation to the Customer Specification CS-240PSM184.doc and the EUT was considered to have PASSED the tests.

PASS

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa

Environmental conditions during the test: ☒ kept
☐ not kept

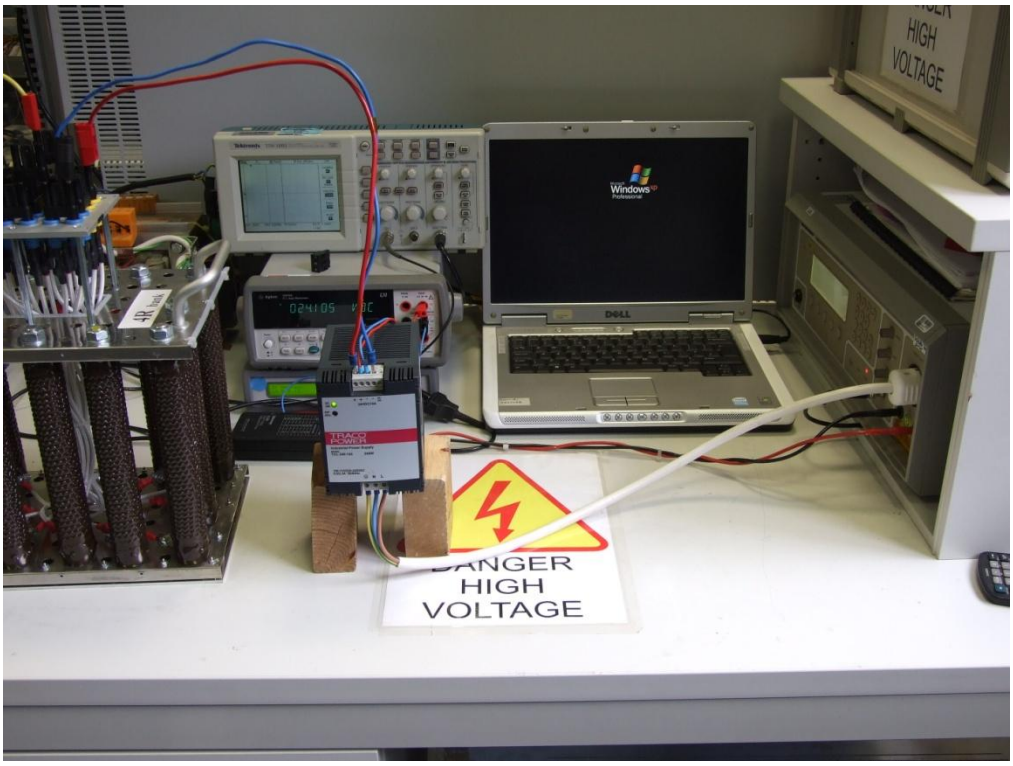
12. Voltage Sag Immunity Test (Semi F47)

Equipment under Test: TCL 240-124
EUT Serial No.: 313119786161
Customer Spec: CS-240PSM184.doc
Date: 04/11/2013
Standard: SEMI F47-0706

Notes:

- EUT tested under operating conditions of 240V/100V 50Hz input at full load (11.86V/3.86A Resistive).
- Test carried out using test generator using Voltage Sag Generator: Schaffner NSG1003: Dropout and Variation Simulator and Oscilloscope Tektronix: TDS2014C

12.1. Test Setup



12.2. Voltage Sag Immunity test Results (Semi F47)

Input Voltage = 208VAC, Output = 24.09V, 10.0A

Voltage Sag	Duration	Duration	Output Voltage	% delta of nominal output voltage	Semi F47	Criteria
[V]	[s]	[cycles]	[V]	DUT 50Hz [%]	[%]	[Class]
187.2	20	1000	24.09	0.0	90	A
187.2	10	500	24.08	0.0	90	A
166.4	10	500	24.08	0.0	80	A
166.4	1	50	24.08	0.1	80	A
166.4	0.5	25	24.07	0.1	80	A
145.6	0.5	25	0.01	100.0	70	C
145.6	0.5	10	0.07	99.7	70	C
104	0.2	10	0.08	99.7	50	C
104	0.02	1	24.06	0.1	50	A
0	0.02	1	24.06	0.1	0	A

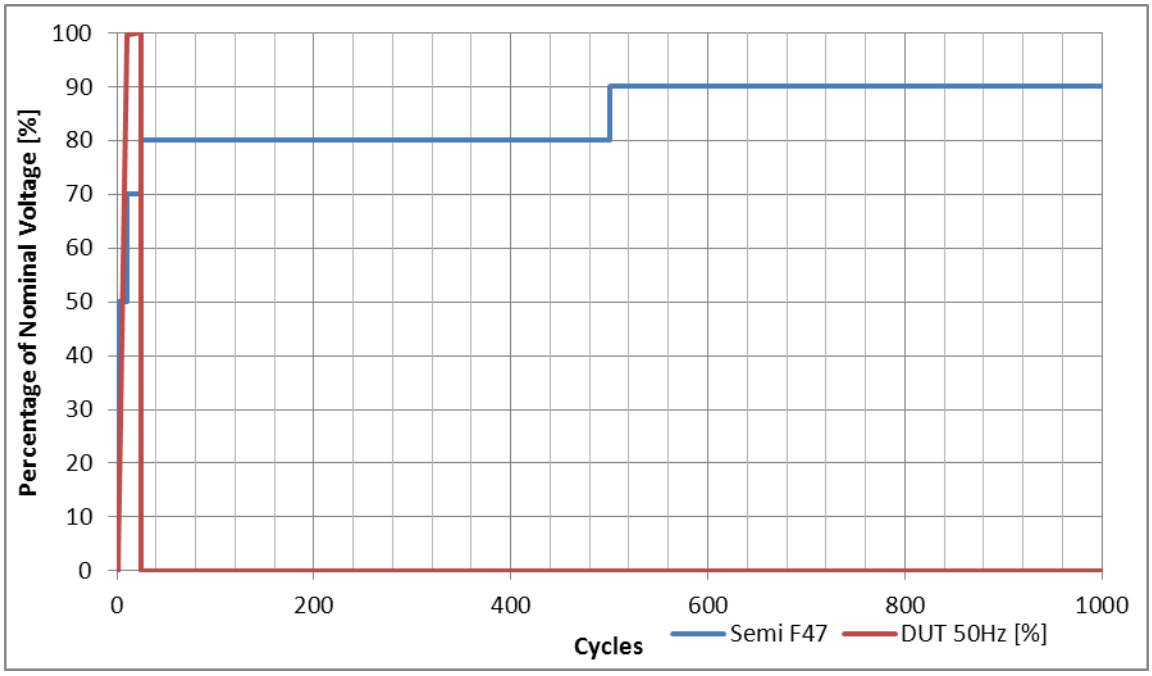


Figure 1: TCL 240-124 / 0-1000 cycles

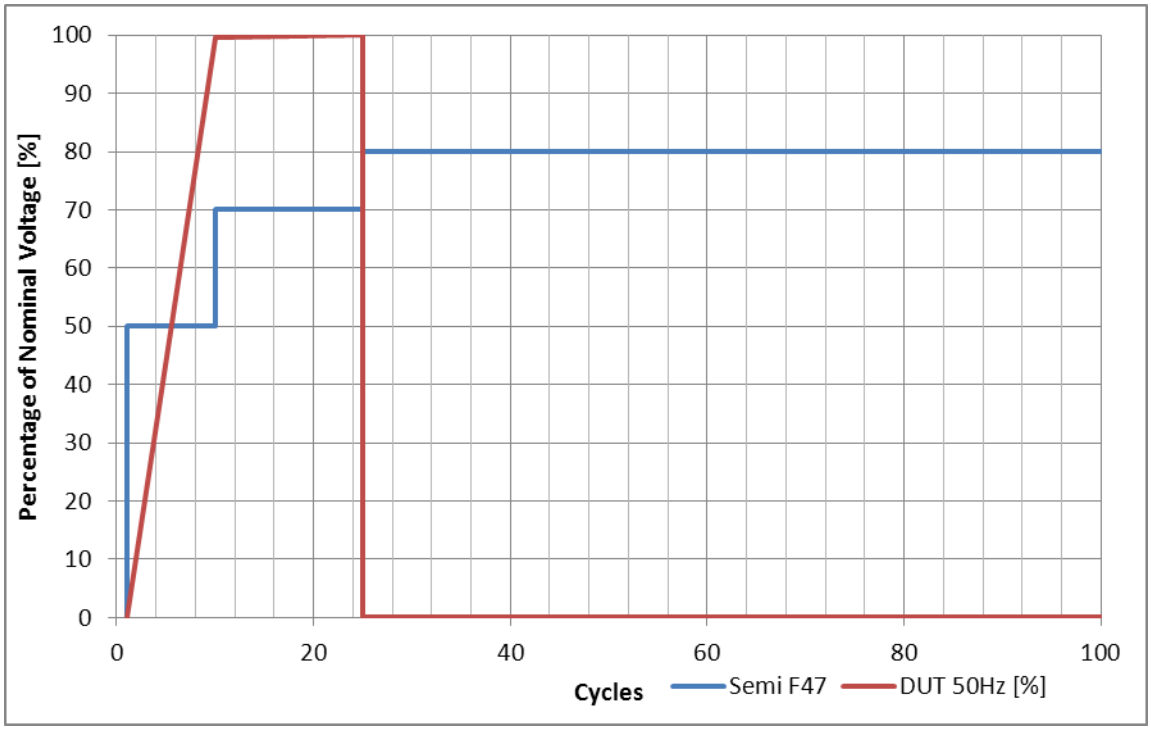


Figure 2: TCL 240-124 / 0-100 cycles

Input Voltage = 100VAC, Output = 24.09V, 10.0A

Voltage Sag	Duration	Duration	Output Voltage	% delta of nominal output voltage	Semi F47	Criteria
[V]	[s]	[cycles]	[V]	DUT 50Hz [%]	[%]	[Class]
90	20	1000	24.06	0.1	90	A
90	10	500	24.05	0.1	90	A
80	10	500	1.42	94.1	80	C
80	1	50	1.45	94.0	80	C
80	0.5	25	1.45	94.0	80	C
70	0.5	25	0.00	100.0	70	C
70	0.5	10	0.07	99.7	70	C
50	0.2	10	0.07	99.7	50	C
50	0.02	1	24.05	0.2	50	A
0	0.02	1	24.05	0.2	0	A

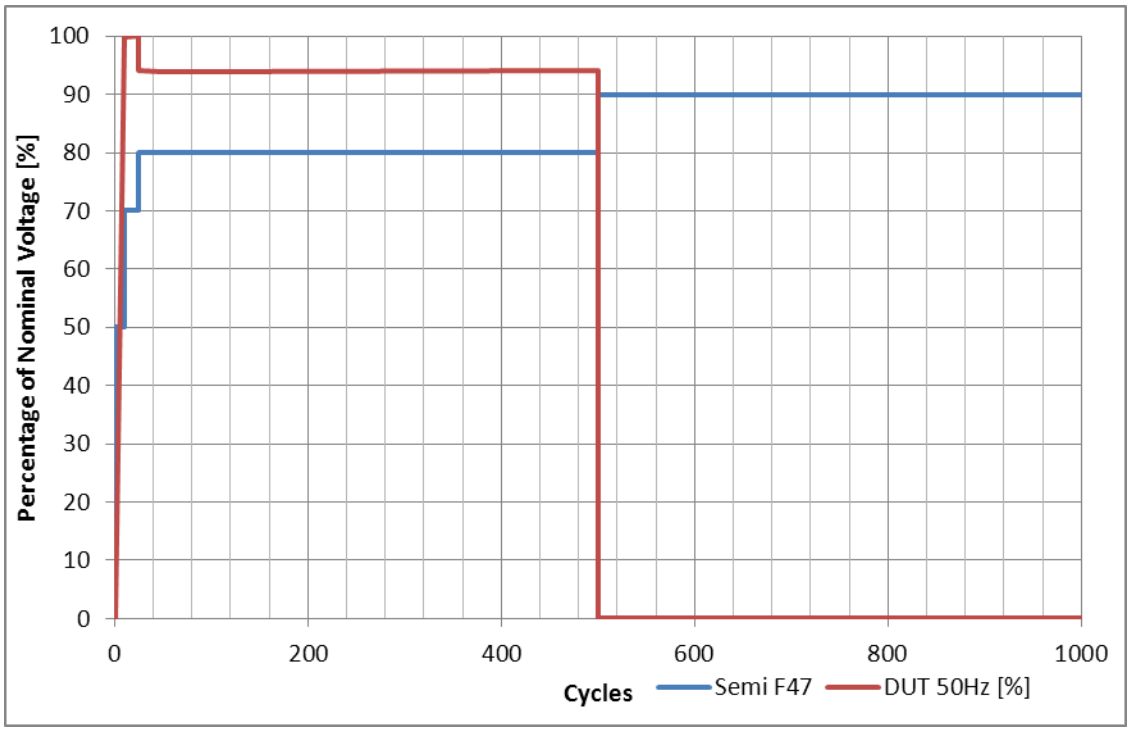


Figure 3: TCL 240-124 / 0-1000 cycles

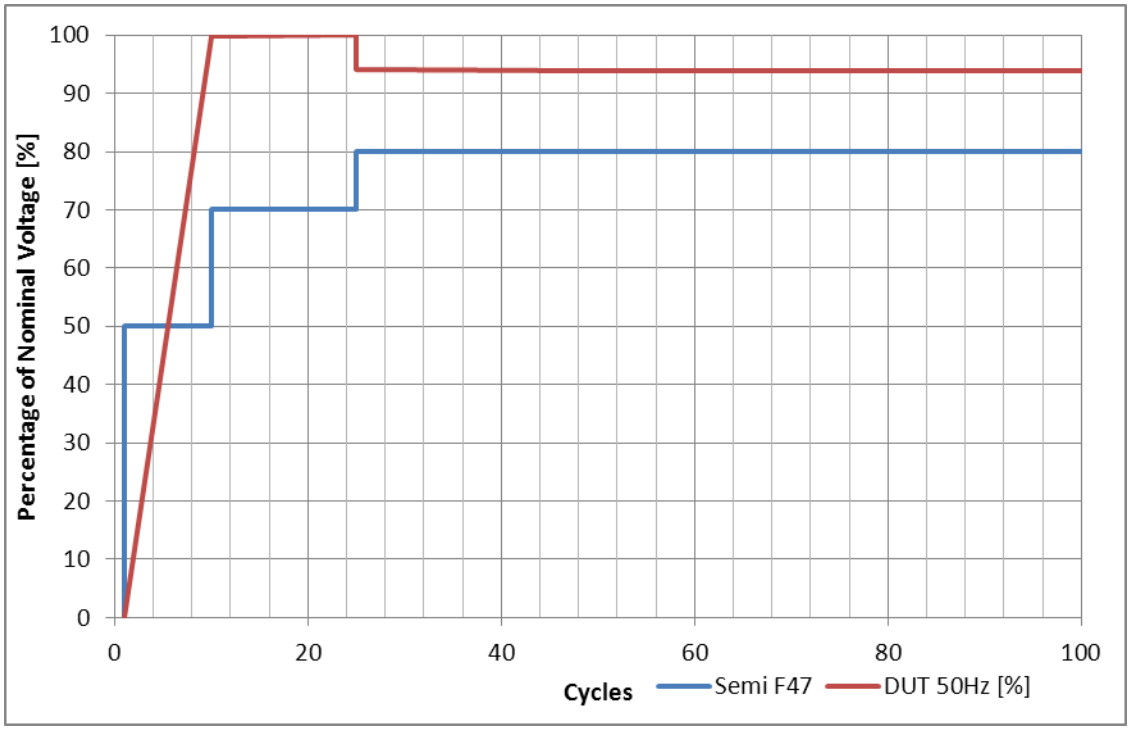


Figure 4: TCL 240-124 / 0-100 cycles

Conclusion:

Meets Classification B (Ref. SEMI F47-0706)
Test Results were evaluated in relation to the Customer Specification CS-020PSM184.doc and the EUT was considered to have PASSED the tests.

Environmental conditions

Temperature:	15-30°C
Humidity:	30-60%
Air Pressure:	860-1060 hPa
Environmental conditions during the test:	☒ kept
	☐ not kept

13. Summary

Regulation	Class/Test Level	Result	Comments
IEC61000-6-3: 2006 + CISPR 16-1-2: 2003 + CISPR 16-2-3: 2003			
Conducted Input (0.15-30MHz)	Class B	PASS	
Conducted Output (0.15-30MHz)	Class B	n/a	
Radiated (30-300MHz)	Class B	PASS	
IEC61000-6-3: 2011 + IEC 61000-3-2: 2005			
Harmonic Current Emissions Measurement at Mains Terminal	Class A	PASS	
IEC61000-6-2: 2005 + IEC 61000-4-2:2005			
Electrostatic Discharge			
- Air Discharge	+/- 2/8kV (Class B)	PASS	
- Contact Discharge	+/- 2/4kV (Class B)	PASS	
IEC61000-6-2: 2005 + IEC 61000-4-5:2005			
Surge			
- AC Power Ports	+/- 1kV (Class B) +VE to –VE	PASS	
- AC Power Ports	+/- 2kV (Class B) +VE to PE	PASS	
- AC Power Ports	+/- 2kV (Class B) –VE to PE	PASS	
IEC61000-6-2: 2005 + IEC 61000-4-4: 2004			
Fast Transient (Burst)			
- AC & DC Power Ports	+/- 2kV (Class B) between all lines and ground plane	PASS	
- Signal Ports	+/- 1kV (Class B) between all lines and ground plane	PASS	
IEC61000-6-2: 2005 + IEC61000-4-6:2004			
Conducted Input RF Immunity	Level III 10V **(**Class **A)**	PASS	
Conducted Output RF Immunity	Level III 10V **(**Class **A)**	PASS	
Signal Ports RF Immunity	Level III 10V **(**Class **A)**	PASS	
IEC61000-6-2: 2005 + IEC61000-4-3:2004			
Radiated RF Immunity	Level III 10V **(**Class **A)**	PASS	
IEC61000-6-2: 2005 + IEC61000-4-8: 2001			
Power Frequency Magnetic Field Immunity	Level 5 **(**Class **A)**	PASS	

IEC61000-6-2:2005 + IEC 61000-4-11:2004			
Voltage Dips			
-AC Supply (240VAC and 100VAC)	100%-0% (Class B)	PASS	
	100%-40% (Class C)	PASS	
	100%-70% (Class C)	PASS	
	100%-80% (Class C)	PASS	
Short Interruptions (100%-0% for: 0.1s, 0.2s, 0.5s, 1s, 2s and 5s)	100%-0% (Class C)	PASS	
SEMI F47-0706			
Semi F47 Voltage SAG Immunity			
-AC Supply (208VAC and 100VAC)	**(Class B)**	PASS	
IEC61000-6-2:2005 + IEC 61000-4-11:2004			
Voltage Dips			
DC Supply (240VDC and 100VDC)	100%-70% (Class B)	PASS	
	100%-40% (Class B)	PASS	
Short Interruptions (100%-0% for: 1mS, 3mS, 10mS, 30mS, 100mS, 300mS, 1S)	100%-0% (Class B)	PASS	

14. List of Equipment Used:

Description	Model No.	Manufacturer	Serial No.
EMC Analyzer	E7402A	Agilent	MY45119210
LISN 1	PMM L2-16	PMM	1230L00301
LISN 2	FCC-801-M2-50A	FCC	3035
LISN 3	NSLK 8127	Schwarzbeck	8127683
RF Current Probe	F-33-1	FCC	759
Transient Limiter	11947A	Agilent	3107A03645
Precision Power Meter	LMG95	Zimmer	10790709
ESD Gun	SESD 200	Schloder	142261
Surge Generator	PSURGE 4010	Haefely	583 334-63
Burst generator	PEFT 4010	Haefely	080 981-08
Coupling Capacitor	IP4A	Haefely	171241
Electronic Load	ELA 500	Zentro-Electrik	63145803
High Power Resistors	n/a	n/a	n/a
Multimeter	34405A	Agilent	TW46290007
Multimeter	34405A	Agilent	TW46290015
Multimeter	34410A	Agilent	MY47012359
Multimeter	1906	TTI	n/a
High frequency generator	CWS 500N	EM Test	V0847104427
Coupling/Decoupling Network	CDN M2/M3	EM Test	1108-34
Attenuator	ATT6/75	EM Test	1107-53
Oscilloscope	TDS1002	Tektronix	C016388
Oscilloscope	TDS2014C	Tektronix	C010602
Programmable AC Source	61604	Chroma	ABR000000672
DC power supply	SM 7020 - D	Delta electronika	014604000011
DC power supply	SM 7020 - D	Delta electronika	014604000024
Pulse Generator	33220A	AGILENT	MY44044002
Biconical Antenna	BicoLOG 30100 X	AARONIA	79479
Cables	**Type**	**Length**	**Comments**
Mains Supply Cable	3-wire	1m	Unshielded
Mains Supply Cable	3-wire	1.5m	Unshielded
DC Lines Cable	2-wire	1m	Unshielded
DC Lines Cable	2-wire	1.5m	Unshielded