EVALUATION DATA

MODEL NAME : OFI700A48

Tested by : Tetsuya Nagai

Tetsuya Nagai

Approved by : Elektroniskt undertecknad av Tomas Isaksson Datum: 2022.01.26 08:57:43 +01'00'

Tomas Isaksson

P R

B X

POWERBOX

A Cosel Group Company

Table of Contents

Remark:

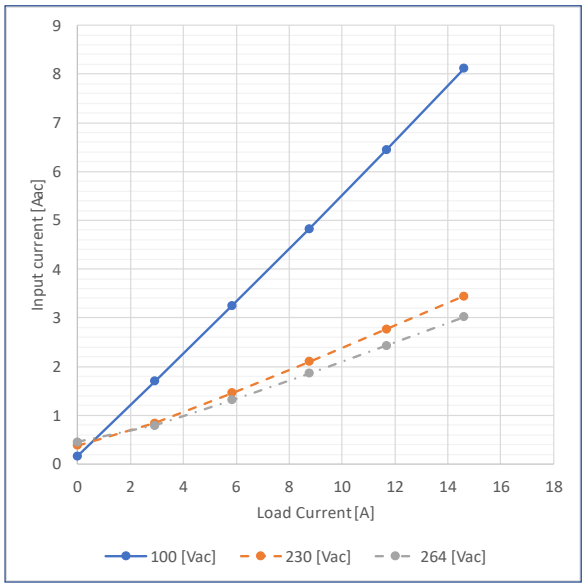
Unless specified the test condition shall be

Input voltage / Frequency:	230 [Vac] / 50 [Hz]
Load current:	14.6 [A]
Baseplate temperature:	25 [°C]

1. Input Current (by Load Current)

Test Circuitry : Figure A

Graph



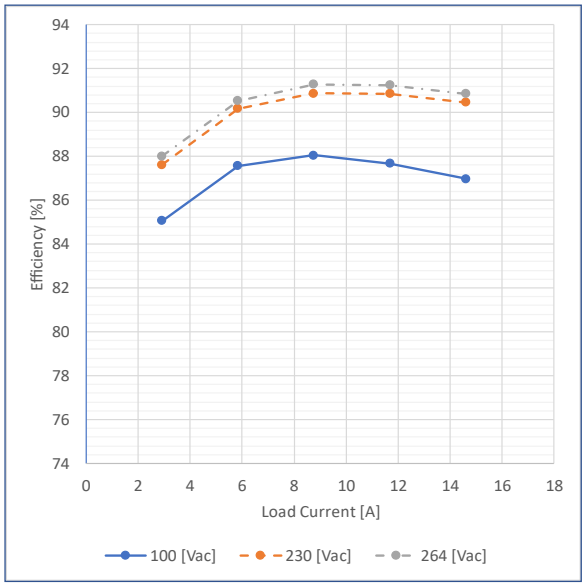
Value

Load Current [A]	Input Current [Aac]		
	Input Voltage		
	100 [Vac]	230 [Vac]	264 [Vac]
0.00	0.164	0.381	0.455
2.92	1.702	0.837	0.790
5.84	3.251	1.459	1.312
8.76	4.829	2.104	1.863
11.68	6.452	2.767	2.433
14.60	8.112	3.447	3.019

2. Efficiency (by Load Current)

Test Circuitry : Figure A

Graph



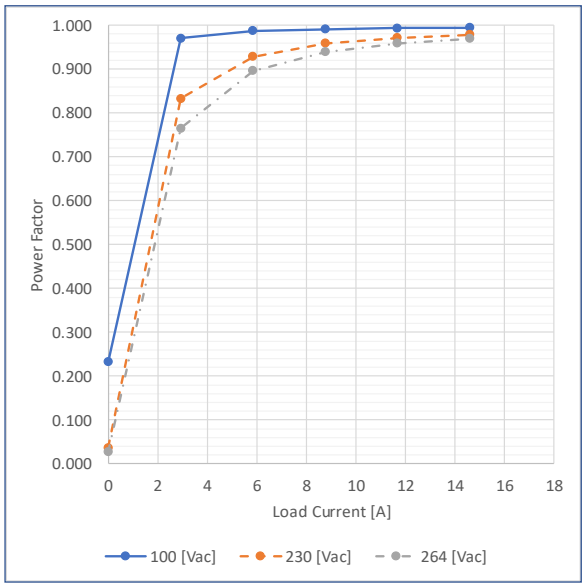
Value

Load Current [A]	Efficiency [%]		
	Input Voltage		
	100 [Vac]	230 [Vac]	264 [Vac]
0.00	-	-	-
2.92	85.072	87.627	88.012
5.84	87.560	90.166	90.535
8.76	88.048	90.880	91.275
11.68	87.671	90.858	91.254
14.60	86.985	90.464	90.855

3. Power Factor (by Load Current)

Test Circuitry : Figure A

Graph



Value

Load Current [A]	Power Factor		
	Input Voltage		
	100 [Vac]	230 [Vac]	264 [Vac]
0.00	0.232	0.037	0.028
2.92	0.971	0.833	0.765
5.84	0.987	0.929	0.896
8.76	0.991	0.958	0.939
11.68	0.993	0.971	0.958
14.60	0.995	0.979	0.969

4. Leakage Current

Test Circuitry : See table

Test Equipment: Simpson 228

Value

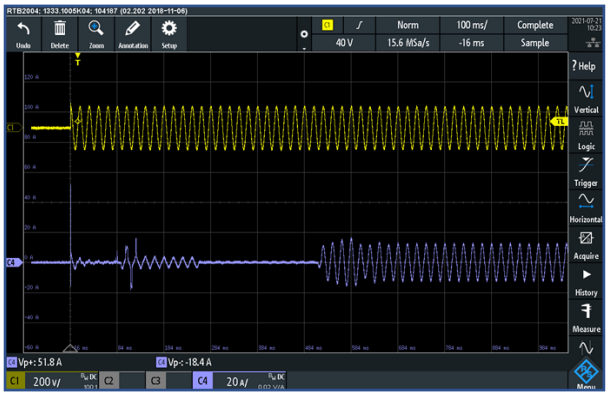
Standard	Testing Circuitry	Measuring Method	Leakage Current [mA]			Note
			Input Voltage			
			100 [Vac]	230 [Vac]	264 [Vac]	
IEC62368-1	Figure B-1	Both phases	0.18	0.45	0.52	Operation
		One of phases	0.34	0.80	0.93	Stand by
	Figure B-2	Both phases	0.18	0.45	0.52	Operation
		One of phases	0.34	0.80	0.93	Stand by

5. Inrush current

Test Circuitry : Figure A

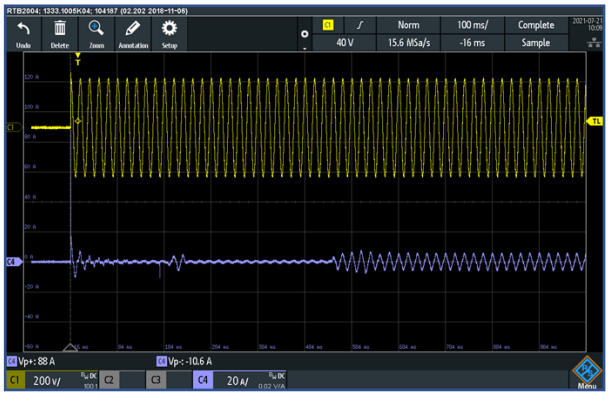
C1: Input Voltage (200V/div)
C4: Input Current (20A/div)

Waveform



Input Voltage : 100 [Vac]
(100ms/div)

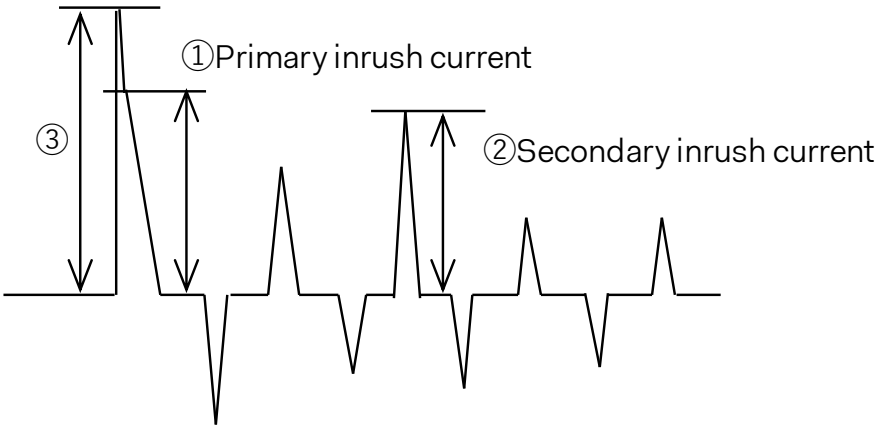
① Primary Inrush Current : 7.8 [A]
② Secondary Inrush Current : 18.4 [A]



Input Voltage : 230 [Vac]
(100ms/div)

① Primary Inrush Current : 15.1 [A]
② Secondary Inrush Current : 10.6 [A]

Remark:
A surge current flown into Line-to-Line capacitor (③) would be excluded as primary inrush current (①).

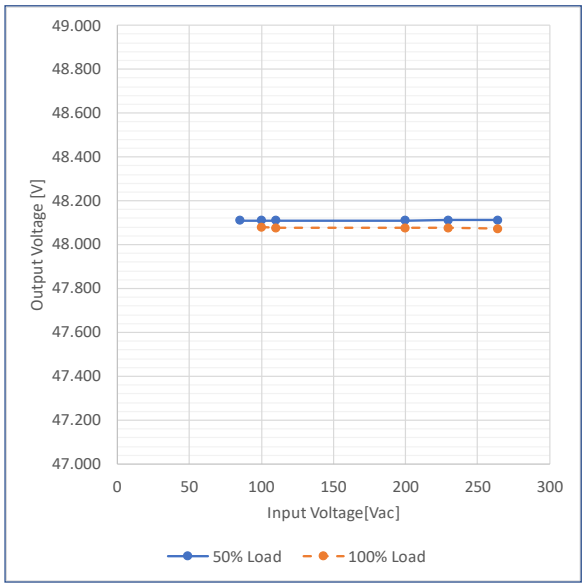


6. Line Regulation

Test Circuitry : Figure A

Change input voltage from 85 to 264[Vac]

Graph



Value

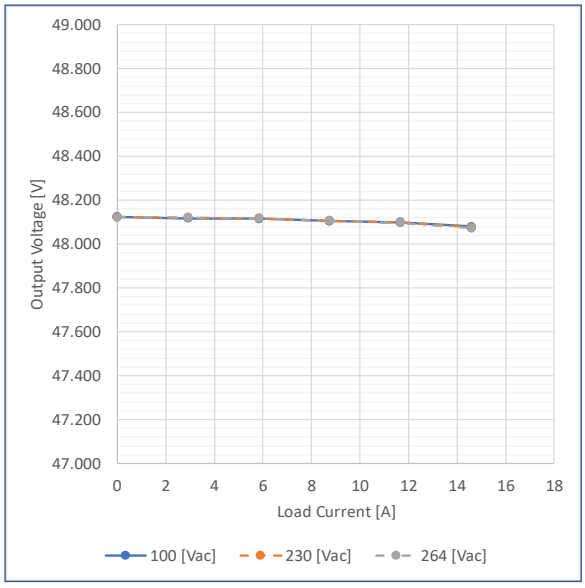
Input Voltage [Vac]	Output Voltage [V] Load Factor	
	50% Load	100% Load
85	48.111	-
100	48.111	48.080
110	48.110	48.077
200	48.111	48.076
230	48.112	48.076
264	48.112	48.072

7. Load Regulation

Test Circuitry : Figure A

Change Load Current from 0 to 14.6[A]

Graph



Value

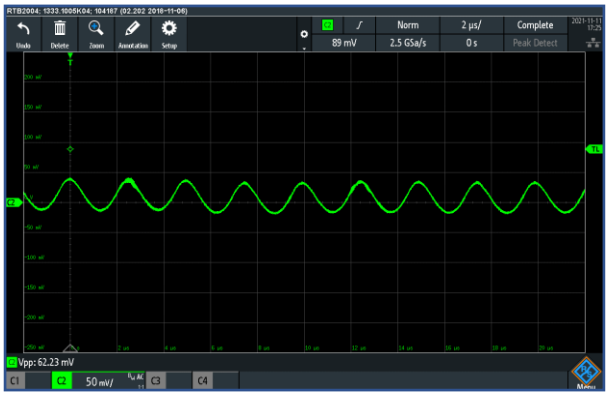
Load Current [A]	Output Voltage [V] Input Voltage		
	100 [Vac]	230 [Vac]	264 [Vac]
0.00	48.124	48.123	48.122
2.92	48.118	48.120	48.120
5.84	48.116	48.117	48.117
8.76	48.105	48.106	48.107
11.68	48.099	48.097	48.096
14.60	48.080	48.076	48.072

8. Ripple Noise

Test Circuitry : Figure C

C2: Output voltage (50mV/div)
BW: 20MHz

Waveform



(2µs/div)

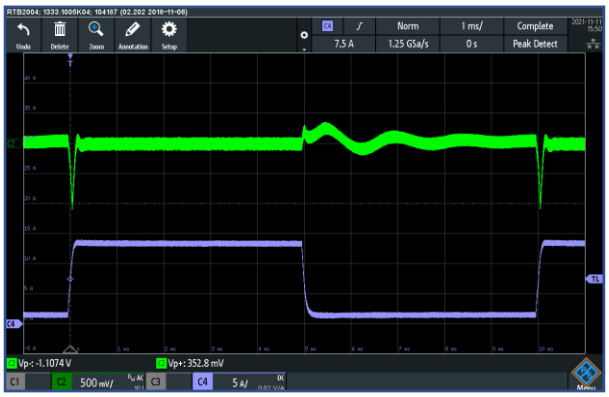
(200ms/div)

9. Dynamic Load Response

Test Circuitry : Figure A
Load Current 1.5 [A]<-> 13.2 [A]

C2: Output voltage (500mV/div)
C4: Output current (5A/div)

Waveform



(10ms/div)

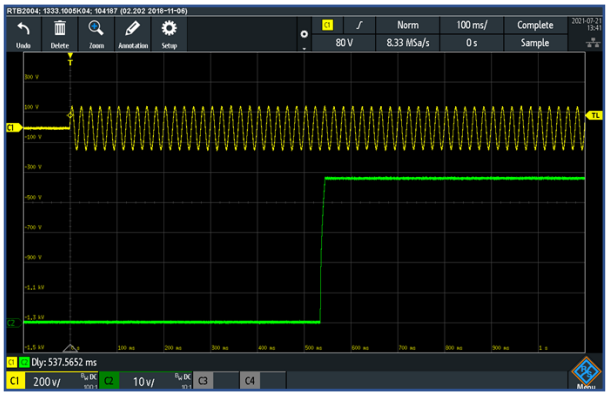
Load changes from 10% to 90% of rated current.

10. Rise Time Characteristics by AC ON

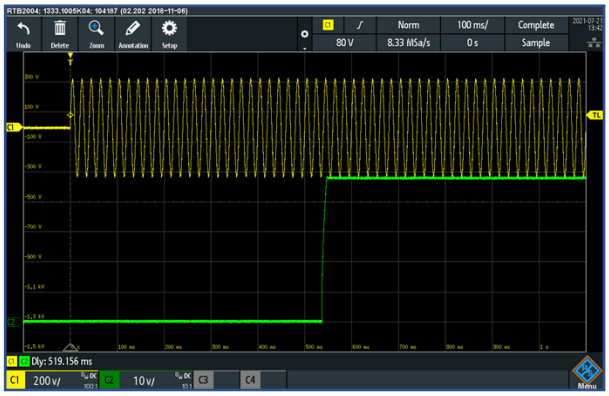
Test Circuitry : Figure A

C1: Input voltage (200V/div)
C2: Output voltage (10V/div)

Waveform



Input Voltage 100 [Vac]
Load Current 14.6 [A]
(100ms/div)



Input Voltage 230 [Vac]
Load Current 14.6 [A]
(100ms/div)

11. Rise Time Characteristics with RC signal

Test Circuitry : Figure D

C2: Output voltage (20V/div)
C3: RC signal (10V/div)

Waveform

Input Voltage 100 [Vac]
Load Current 14.6 [A]
(100ms/div)

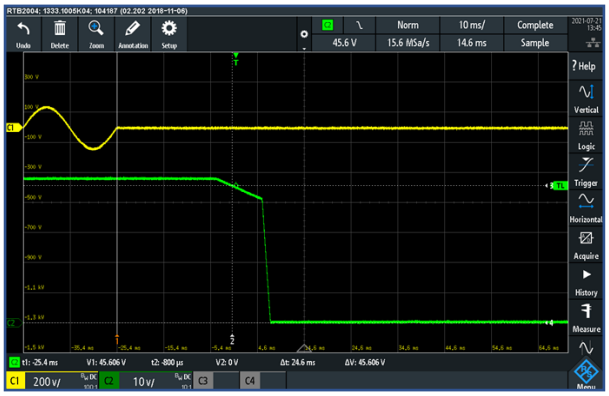
Input Voltage 230 [Vac]
Load Current 14.6 [A]
(100ms/div)

12. Fall time / Hold-up Time

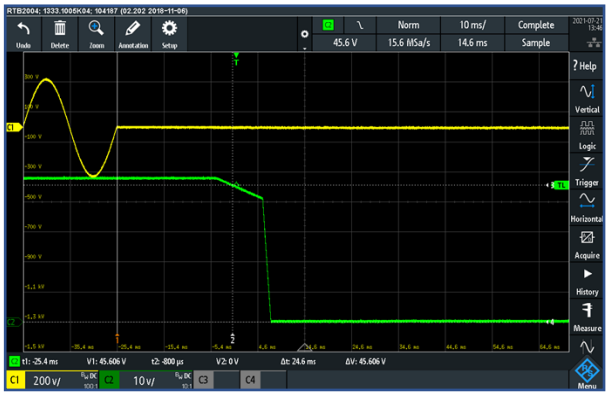
Test Circuitry : Figure A

C1: Input voltage (200V/div)
C2: Output voltage (10V/div)

Waveform

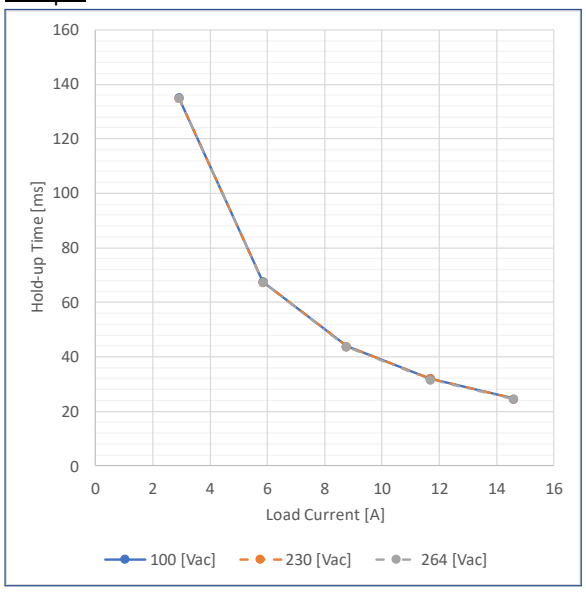


Input Voltage 100 [Vac]
Load Current 14.6 [A]
(10ms/div)



Input Voltage 230 [Vac]
Load Current 14.6 [A]
(10ms/div)

Graph



Value

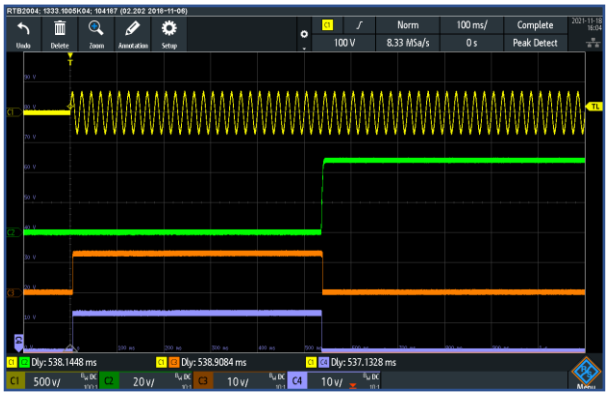
Load Current [A]	Hold-up Time [ms]		
	Input Voltage		
	100 [Vac]	230 [Vac]	264 [Vac]
0.00	-	-	-
2.92	135.2	135.0	135.0
5.84	67.6	67.5	67.5
8.76	43.9	43.9	43.7
11.68	32.1	32.1	31.6
14.60	24.6	24.6	24.5

13. DC OK and IOG signal

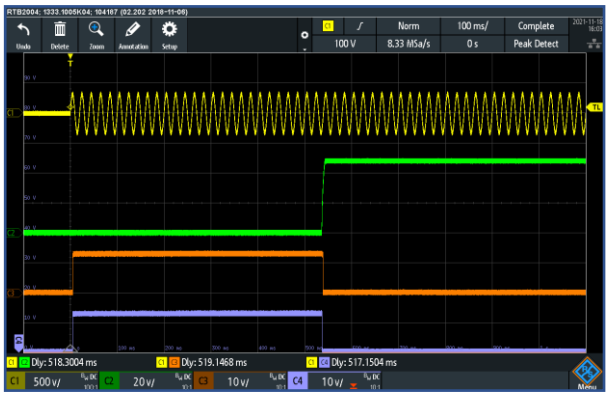
Test Circuitry : Figure D

C1: Input voltage (500V/div)
C2: Output Voltage (20V/div)
C3: DC OK (10V/div)
C4: IOG (10V/div)

Waveform

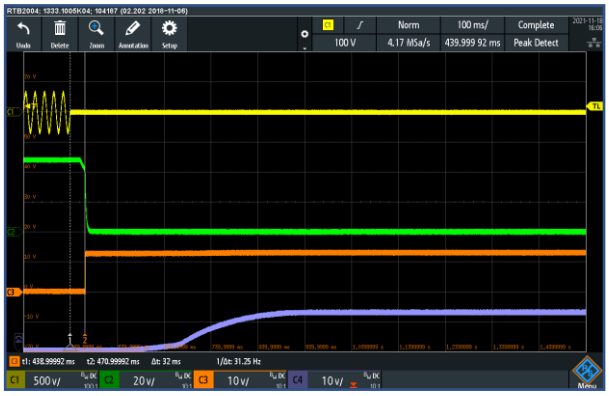


Turn ON AC input Load Current : 0A
(100ms/div)

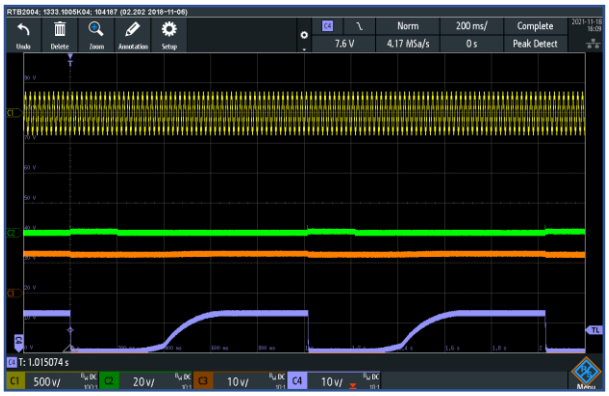


Turn ON AC input Load Current : 14.6A
(100ms/div)

Turn OFF AC input Load Current : 0A
(1s/div)



Turn OFF AC input Load Current : 14.6A
(100ms/div)

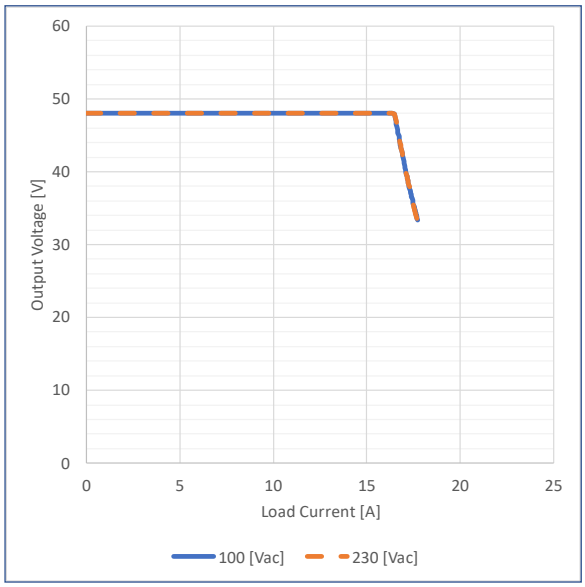


Output Short
(200ms/div)

14. Over Current Protection

Test Circuitry : Figure A

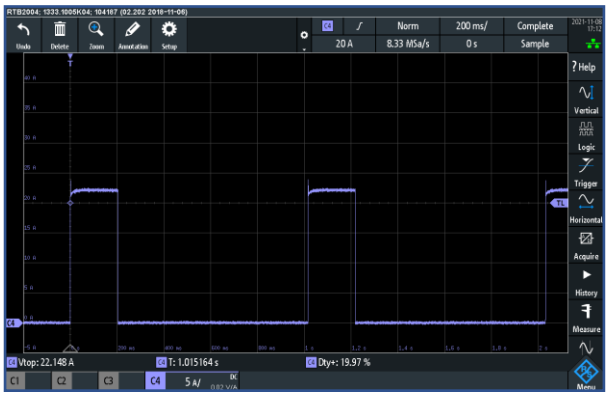
Graph



Value

Output Voltage [V]	Load Current [A]	
	Input Voltage	
	100 [Vac]	230 [Vac]
48.00	14.668	14.666
45.60	16.658	16.657
43.20	16.840	16.846
38.40	17.236	17.234
33.60	17.705	17.663

Waveform



C4: Output Current (5A/div)

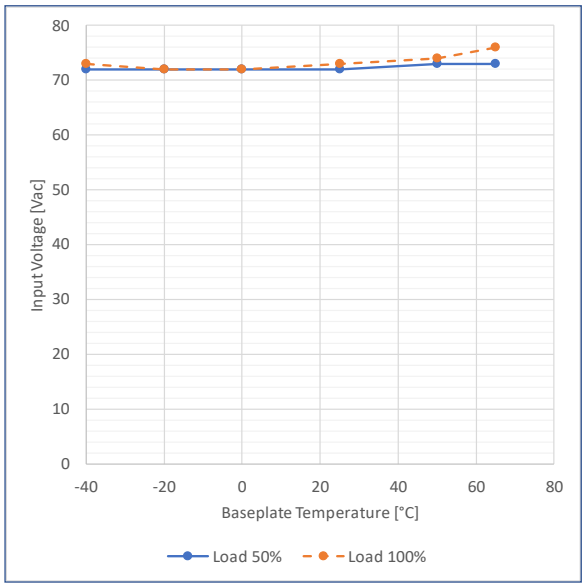
Intermittent operation occurs when the output voltage is from 33.6V to 0V.

Input Voltage 230 [Vac]
Output Short
(200ms/div)

15. Minimum Input Voltage for Regulated Output Voltage

Test Circuitry : Figure A

Graph



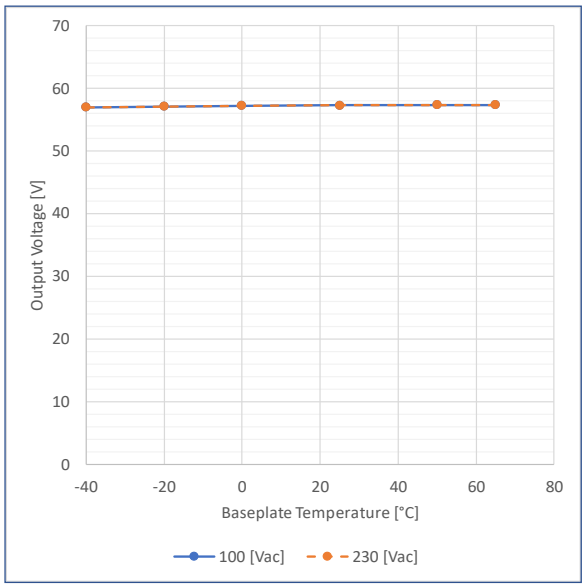
Value

Baseplate Temperature [°C]	Input Voltage [Vac]	
	Load Current	
	Load 50%	Load 100%
-40	72	73
-20	72	72
0	72	72
25	72	73
50	73	74
65	73	76

16. Overvoltage Protection

Test Circuitry : Figure A

Graph

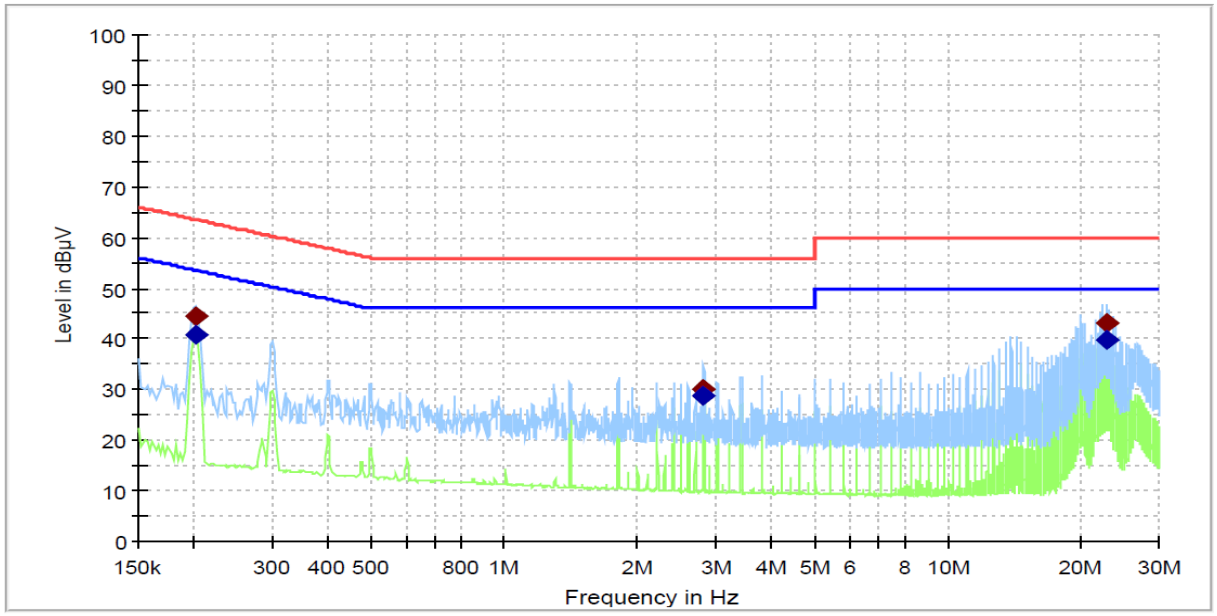


Value

Baseplate Temperature [°C]	Output Voltage [V]	
	Input Voltage	
	100 [Vac]	230 [Vac]
-40	56.960	56.960
-20	57.130	57.130
0	57.260	57.260
25	57.310	57.310
50	57.370	57.370
65	57.370	57.370

17. Conducted Emission

Input Voltage : 230Vac / 50Hz Load : 100 %



Preview Result 2-AVG
EN55032 AC Table A.10 Class B QP
Final_Result QPK

Preview Result 1-PK+
EN55032 AC Table A.10 Class B AV
Final_Result CAV

Table Conducted emission test result (230Vrms / 50Hz Line L)

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	PE	Corr. (dB)
0.201750	44.43	---	63.54	19.11	L1	GND	11.2
0.201750	---	40.89	53.54	12.64	L1	GND	11.2
2.818500	30.18	---	56.00	25.82	L1	GND	11.2
2.818500	---	28.69	46.00	17.31	L1	GND	11.2
22.749000	43.15	---	60.00	16.85	L1	GND	11.2
22.753500	---	39.72	50.00	10.28	L1	GND	11.2

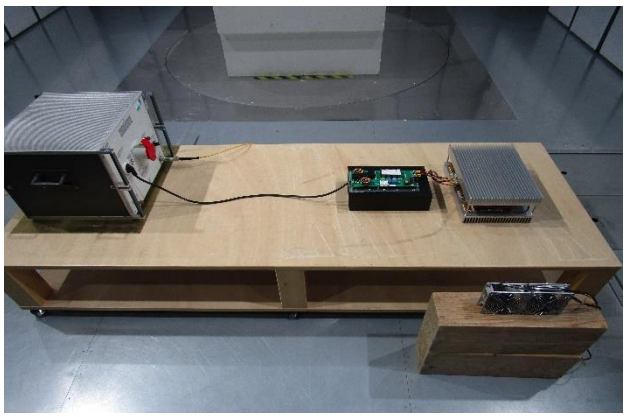


Fig. Conducted emission test environment

18. Figure of Test Circuitry

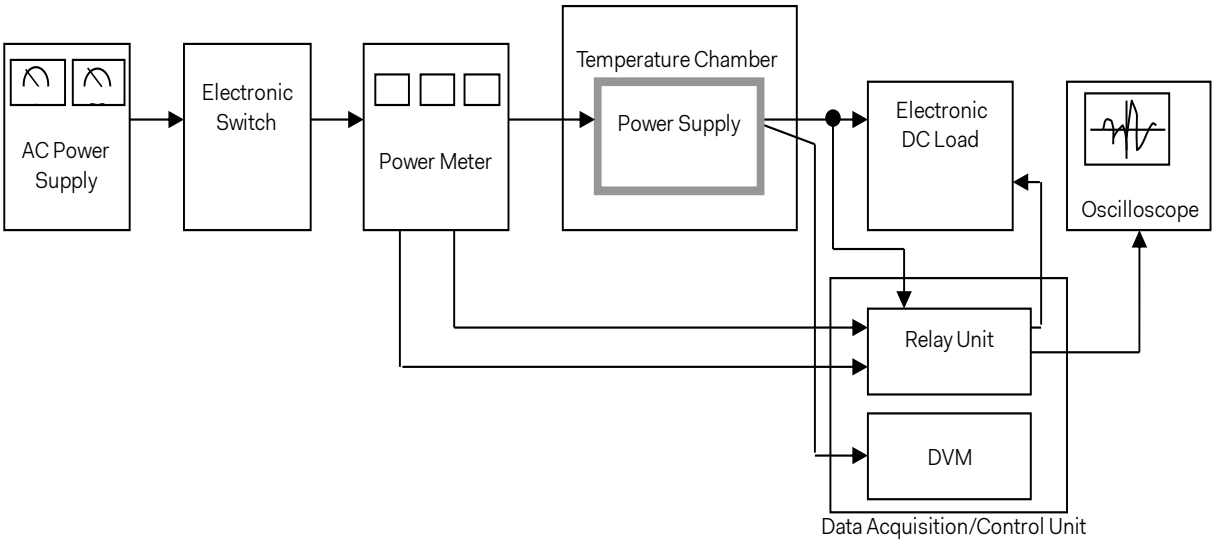


Figure A Test circuity for general performance measurement

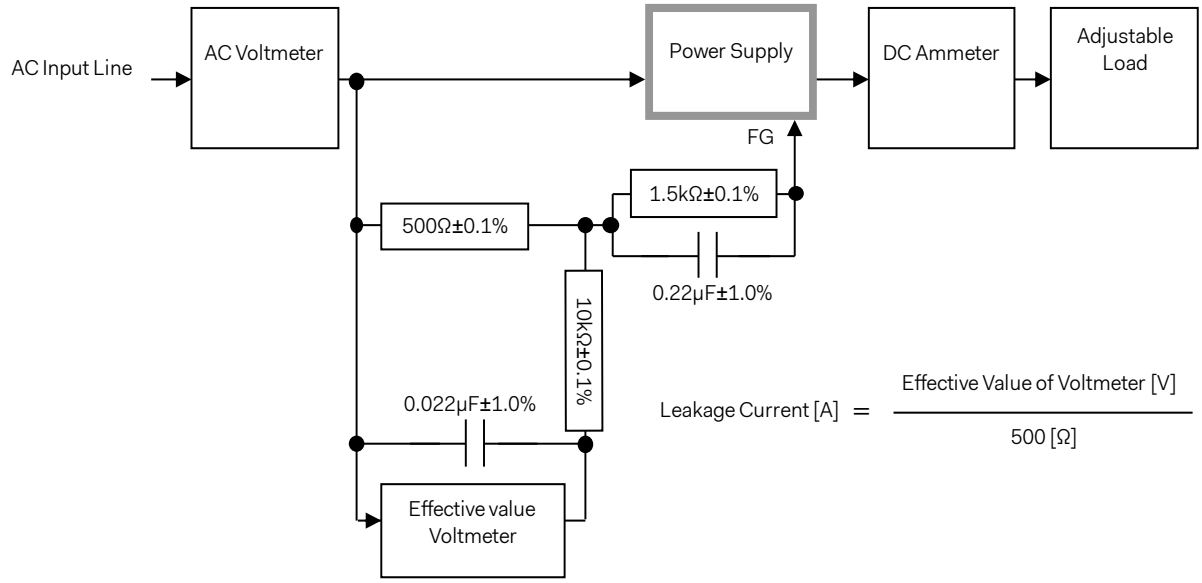


Figure B-1 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.4)

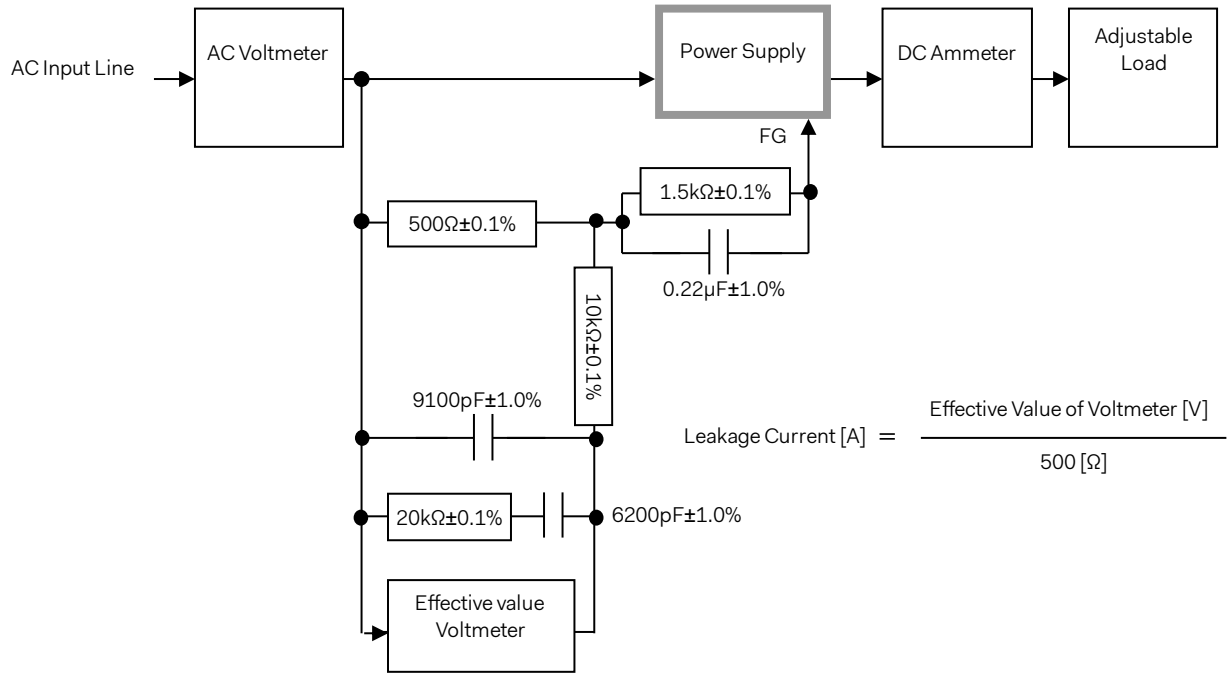


Figure B-2 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.5)

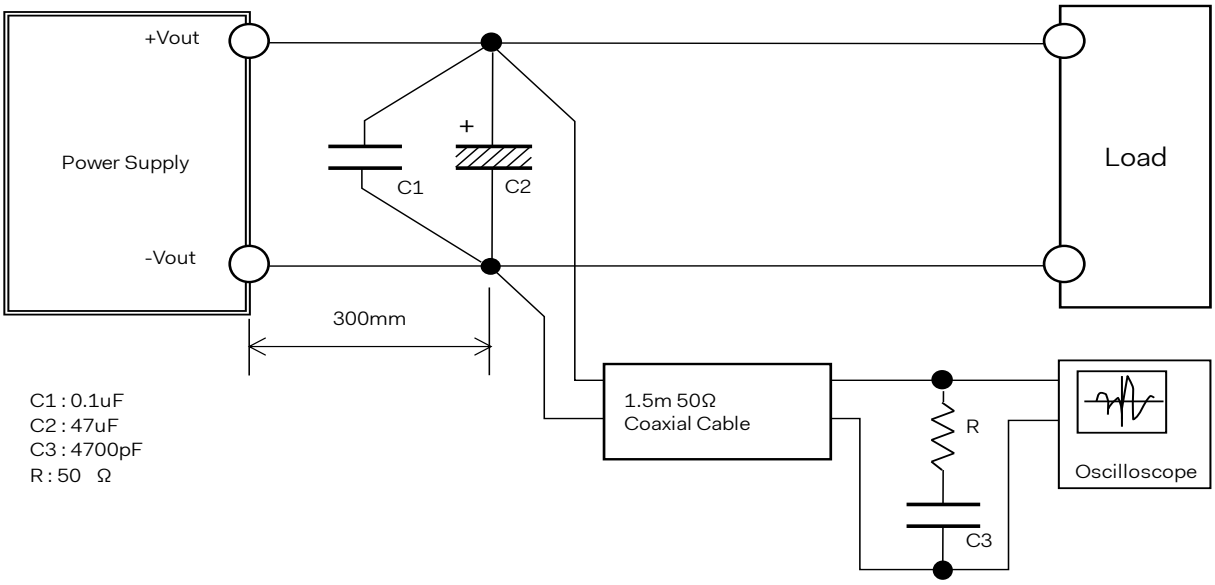


Figure C Ripple voltage measurement (JEITA RC-9131D)

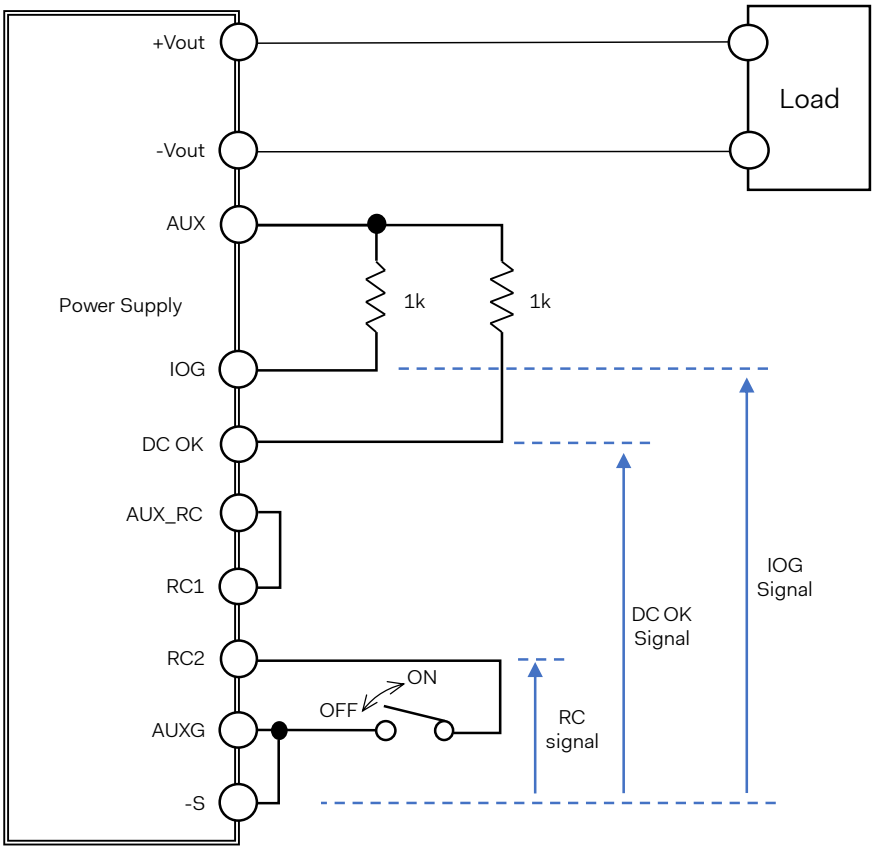


Figure D Alarm signal measurement