

EVALUATION DATA

MODEL NAME : OFI1200A28

Tested by : Shintaro Oki

Shintaro Oki

Approved by : _____

Tomas Isaksson

P R

B X

POWERBOX

A Cosel Group Company

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Remark:

Unless specified the test condition shall be

Input voltage / Frequency: 230 [Vac] / 50 [Hz]

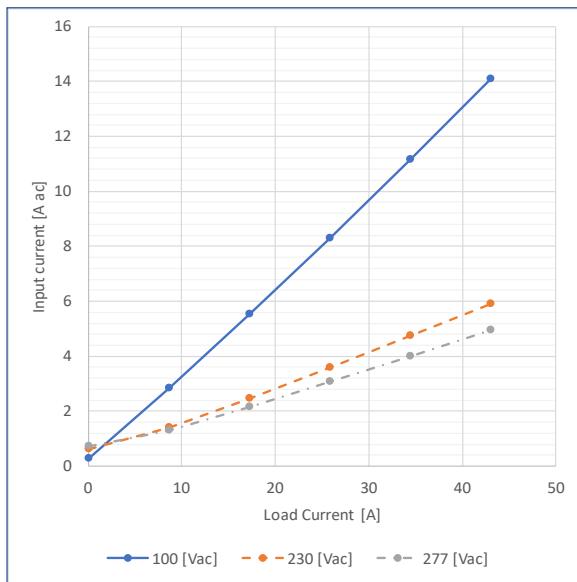
Load current: 43.0 [A]

Baseplate temperature: 25 [°C]

1. Input Current (by Load Current)

Test Circuitry : Figure A

Graph



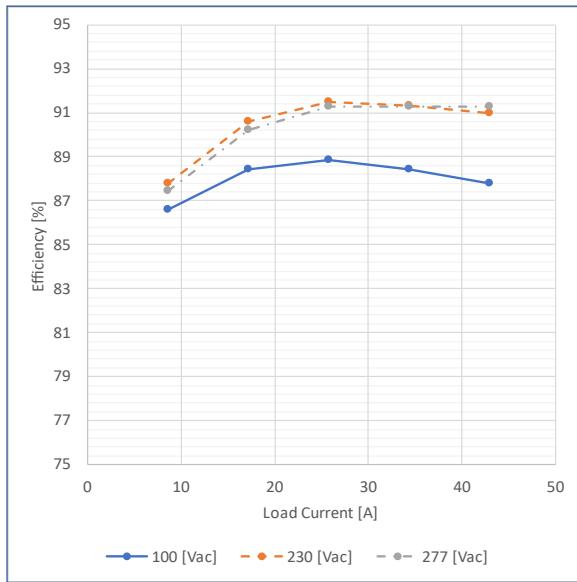
Value

Load Current [A]	Input Current [Aac]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	0.292	0.604	0.708
8.60	2.830	1.388	1.298
17.20	5.529	2.460	2.151
25.80	8.300	3.578	3.061
34.40	11.133	4.732	4.005
43.00	14.066	5.902	4.961

2. Efficiency (by Load Current)

Test Circuitry : Figure A

Graph



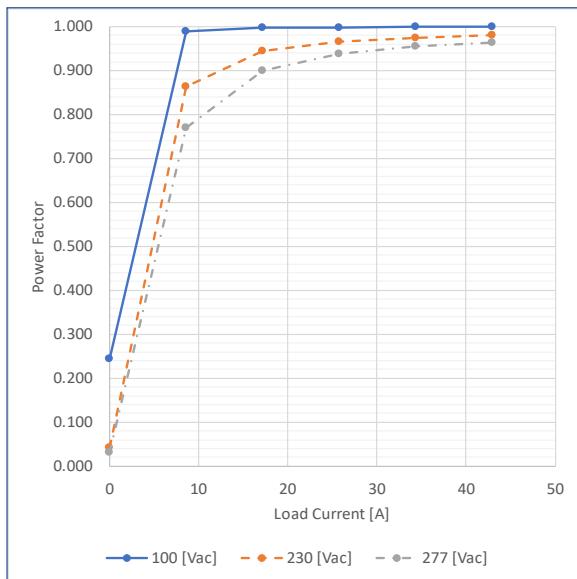
Value

Load Current [A]	Efficiency [%]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	-	-	-
8.60	86.580	87.771	87.458
17.20	88.415	90.579	90.225
25.80	88.832	91.502	91.269
34.40	88.412	91.319	91.280
43.00	87.795	90.983	91.282

3. Power Factor (by Load Current)

Test Circuitry : Figure A

Graph



Value

Load Current [A]	Power Factor		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	0.245	0.043	0.031
8.60	0.990	0.864	0.770
17.20	0.997	0.945	0.900
25.80	0.998	0.965	0.938
34.40	0.999	0.975	0.955
43.00	0.999	0.980	0.964

4. Leakage Current

Test Circuitry : See table

Test Equipment: Simpson 228

Value

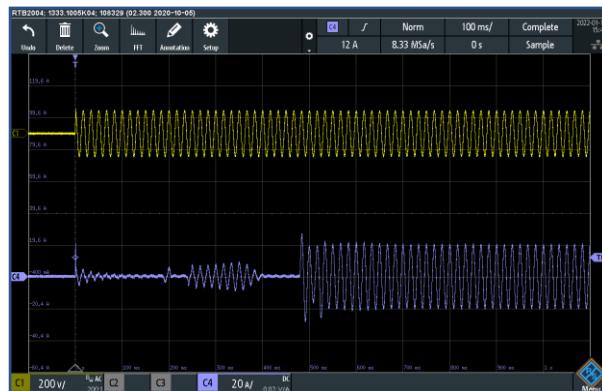
Standard	Testing Circuitry	Measuring Method	Leakage Current [mA]			Note	
			Input Voltage				
			100 [Vac]	230 [Vac]	277 [Vac]		
IEC62368-1	Figure B-1	Both phases	0.25	0.60	0.74	Operation	
		One of phases	0.44	1.20	1.45	Stand by	
	Figure B-2	Both phases	0.25	0.60	0.74	Operation	
		One of phases	0.44	1.20	1.45	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 : 12.7 [A]
- ② Secondary Inrush Current : 27.9 [A]

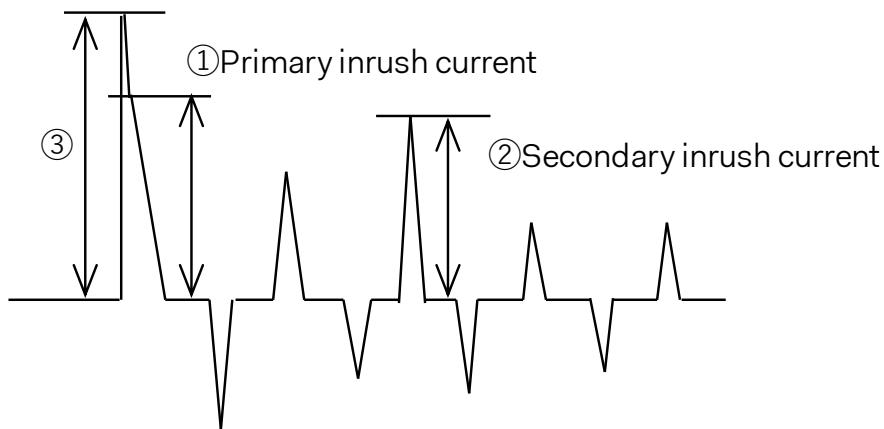


Input Voltage : 277 [Vac]
(100ms/div)

- ① Primary Inrush Current : 36.3 [A]
- ② Secondary Inrush Current : 15.6 [A]

Remark:

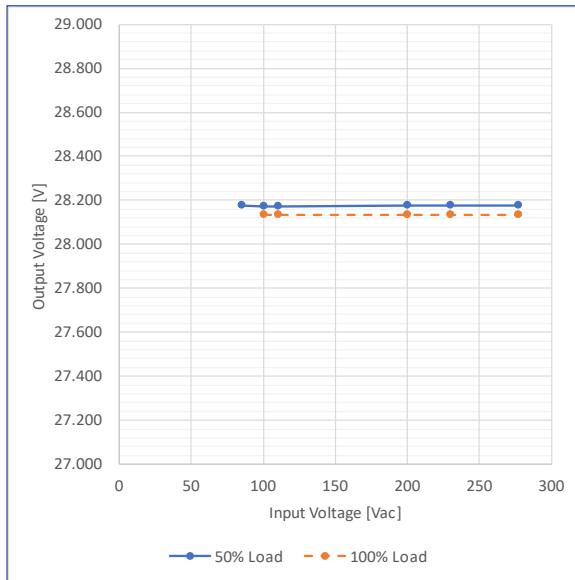
A surge current flown into Line-to-Line capacitor (③) would be excluded as primary inrush current (①).



6. Line Regulation

Test Circuitry : Figure A

Change input voltage from 85 to 277 [Vac]

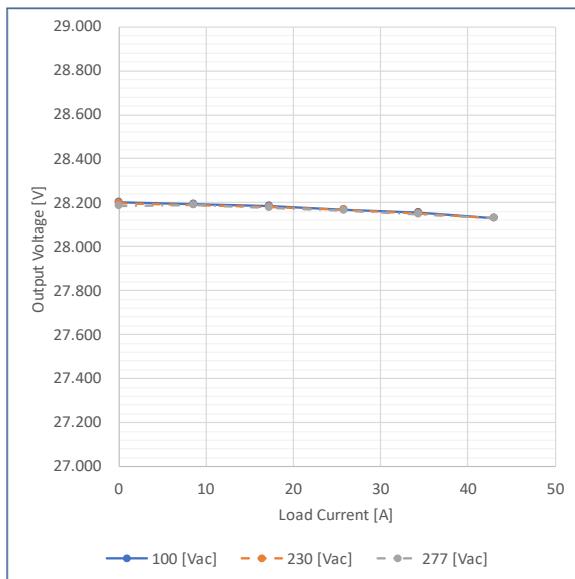
GraphValue

Input Voltage [Vac]	Output Voltage [V]	
	Load Factor	
	50% Load	100% Load
85.00	28.175	-
100.00	28.174	28.132
110.00	28.174	28.132
200.00	28.175	28.132
230.00	28.175	28.132
277.00	28.175	28.132

7. Load Regulation

Test Circuitry : Figure A

Change Load Current from 0 to 43.0 [A]

GraphValue

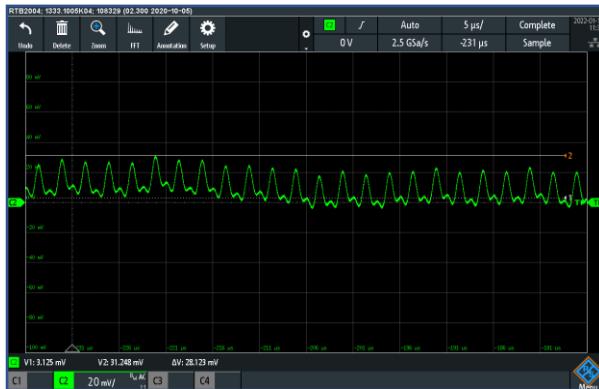
Load Current [A]	Output Voltage [V]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	28.200	28.196	28.184
8.60	28.192	28.189	28.187
17.20	28.186	28.182	28.178
25.80	28.167	28.166	28.164
34.40	28.153	28.149	28.147
43.00	28.128	28.129	28.129

8. Ripple Noise

Test Circuitry : Figure C

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

Waveform



(5μs/div)



(200ms/div)

9. Dynamic Load Response

Test Circuitry : Figure A
Load Current 4.3 [A] <-> 38.7 [A]

C2: Output voltage (50mV/div)
C4: Output current (20A/div)

Waveform



(20ms/div)

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

10. Rise Time Characteristics by AC ON

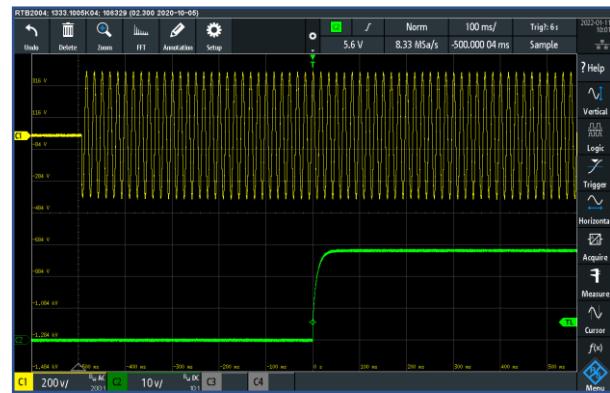
Test Circuitry : Figure A

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

Waveform



Input Voltage 100 [Vac]
Load Current 43.0 [A]
(100ms/div)



Input Voltage 277 [Vac]
Load Current 43.0 [A]
(100ms/div)

11. Rise Time Characteristics with RC Signal

Test Circuitry : Figure D

C1: Input voltage (500V/div)
C2: Output voltage (10V/div)
C3: RC signal (10V/div)

Waveform



Input Voltage 100 [Vac]
Load Current 43.0 [A]
(100ms/div)



Input Voltage 277 [Vac]
Load Current 43.0 [A]
(100ms/div)

12. Fall Time / Hold-up Time

Test Circuitry : Figure A

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

Waveform

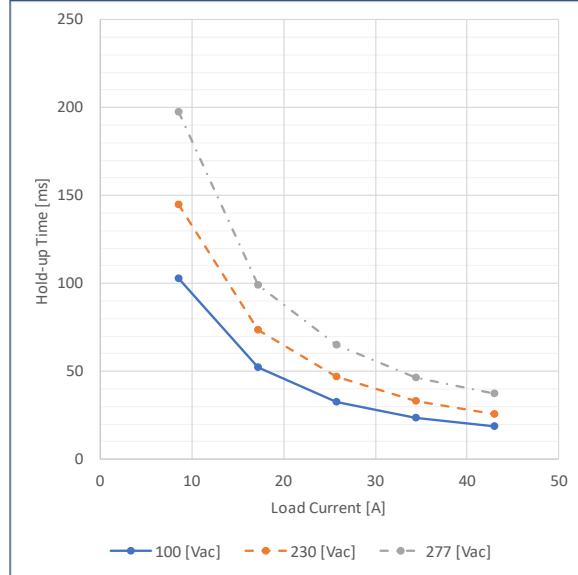


Input Voltage 100 [Vac]
Load Current 43.0 [A]
(10ms/div)



Input Voltage 277 [Vac]
Load Current 43.0 [A]
(10ms/div)

Graph



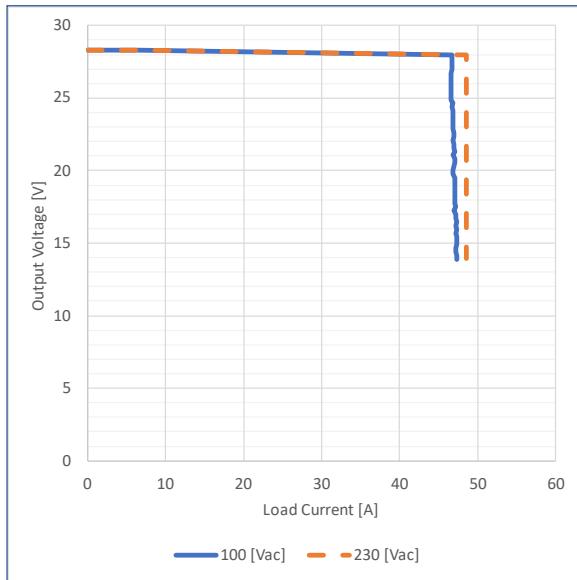
Value

Load Current [A]	Hold-up Time [ms]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	-	-	-
8.60	102.5	144.9	197.4
17.20	52.1	73.5	98.9
25.80	32.3	46.7	65.1
34.40	23.4	33.0	46.5
43.00	18.9	25.6	37.1

13. Over Current Protection

Test Circuitry : Figure A

Graph



Value

Output Voltage [V]	Load Current [A]	
	Input Voltage	
	100 [Vac]	230 [Vac]
28.00	46.688	48.538
26.60	46.578	48.537
25.20	46.582	48.537
22.40	46.913	48.549
19.60	46.871	48.566
16.80	47.163	48.576

Waveform



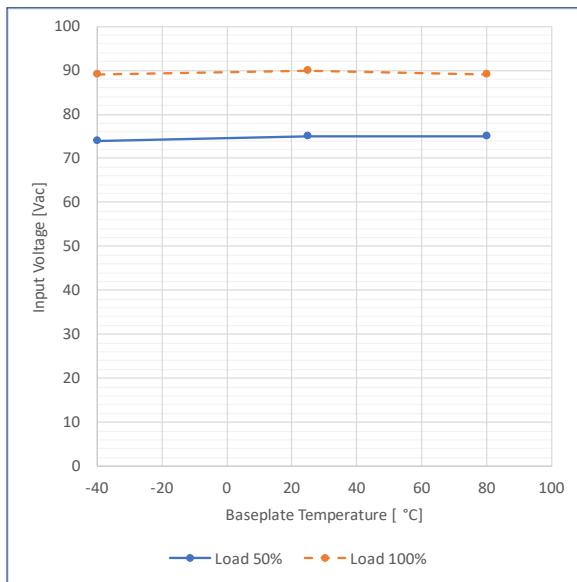
Input Voltage 230 [Vac]
Output Short
(200ms/div)

— C4: Output Current (20A/div)

Intermittent operation occurs when the output voltage is from 14.0V to 0V.

14. Minimum Input Voltage for Regulated Output Voltage

Test Circuitry : Figure A

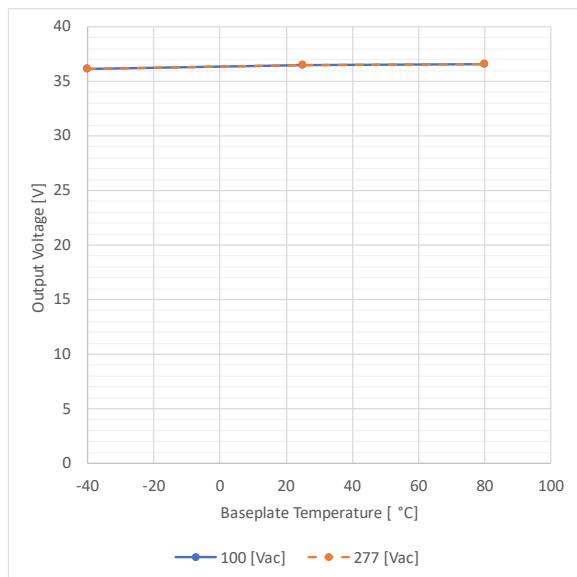
GraphValue

Baseplate Temperature [°C]	Input Voltage [Vac]	
	Load Current	
	Load 50%	Load 100%
-40	74	89
25	75	90
80	75	89

The low input voltage protection is activated on the condition of load 100%.

15. Over Voltage Protection

Test Circuitry : Figure A

GraphValue

Baseplate Temperature [°C]	Output Voltage [V]	
	Input Voltage	
	100 [Vac]	277 [Vac]
-40	36.160	36.160
25	36.450	36.460
80	36.570	36.570

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EVALUATION DATA

OFI1200A28

28Vdc / 43.0A

16. Conducted Emission

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

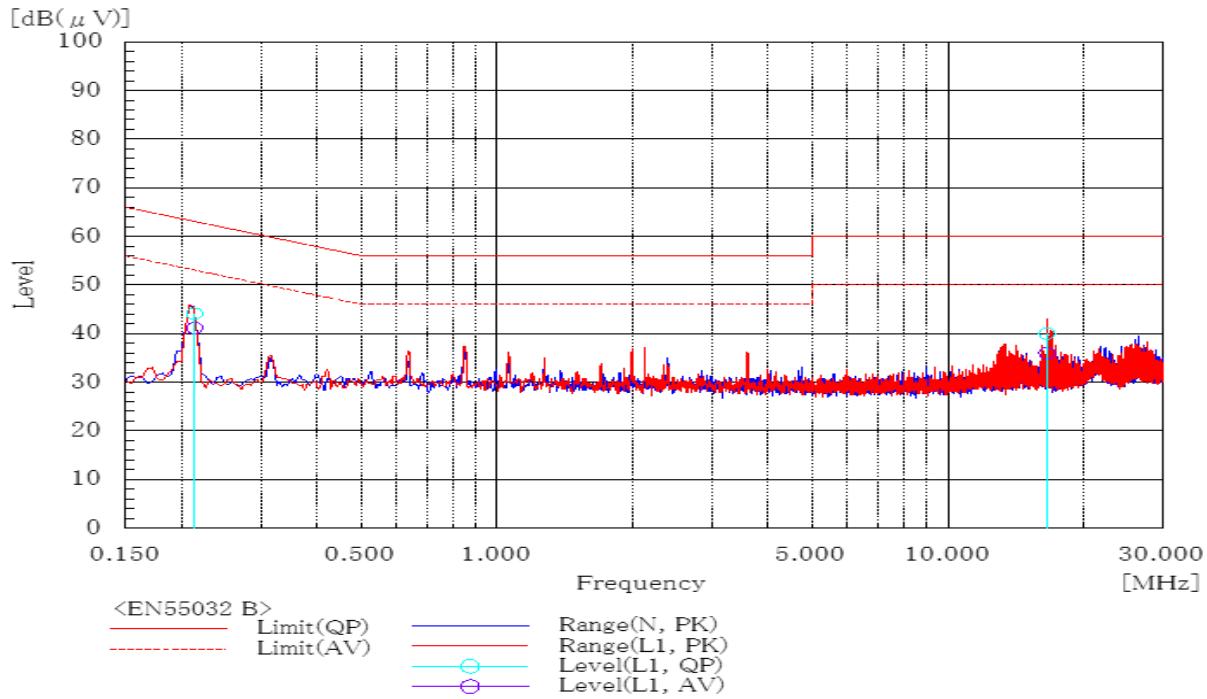


Table Conducted emission test result (230Vrms / 50Hz)

Frequency MHz	Line	Level		Limit		Margin		Pass/Fail	Remark		
		dB(μV)		dB(μV)		dB					
		QP	AV	QP	AV	QP	AV				
0.214	L1	44.1	41.2	63.1	53.1	19	11.9	Pass			
16.588	L1	40	36	60	50	20	14	Pass			



Fig. Conducted emission test environment

17. Figure of Test Circuitry

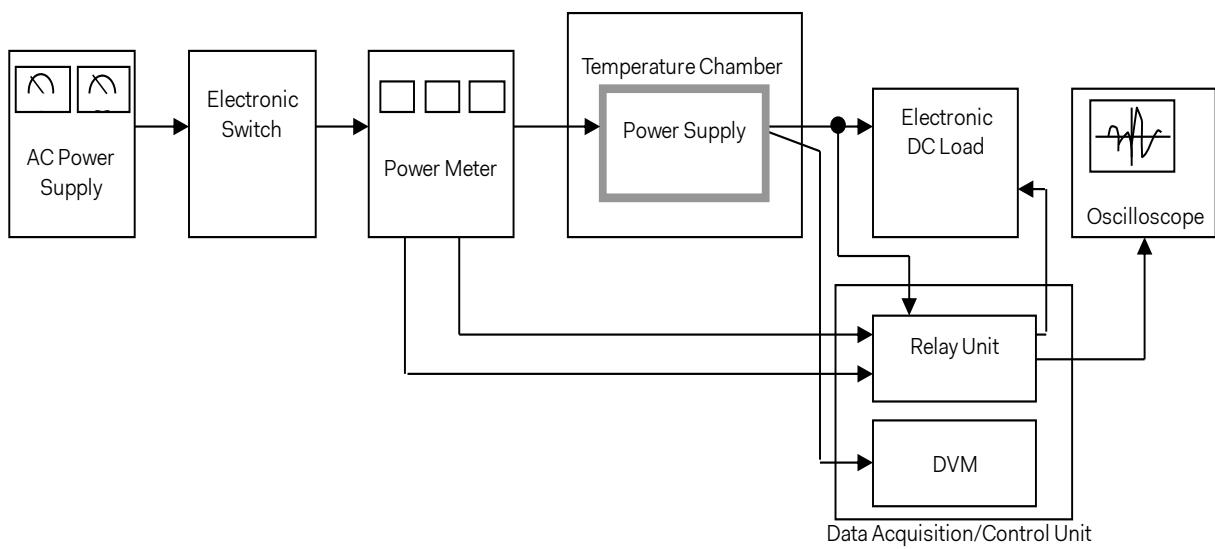


Figure A

Test circuitry for general performance measurement

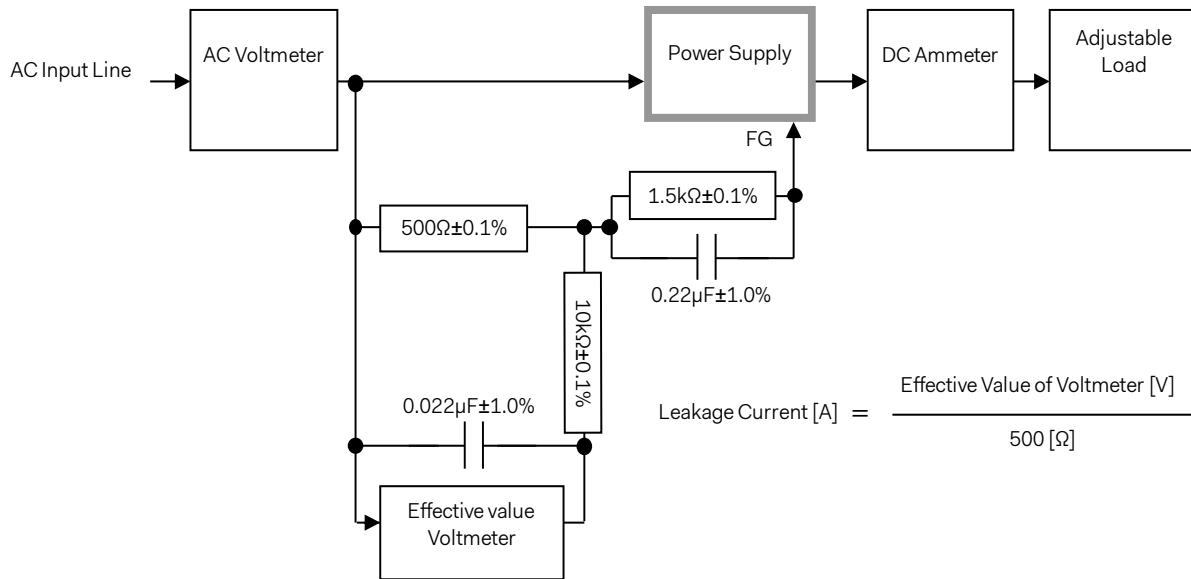


Figure B-1 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.4)

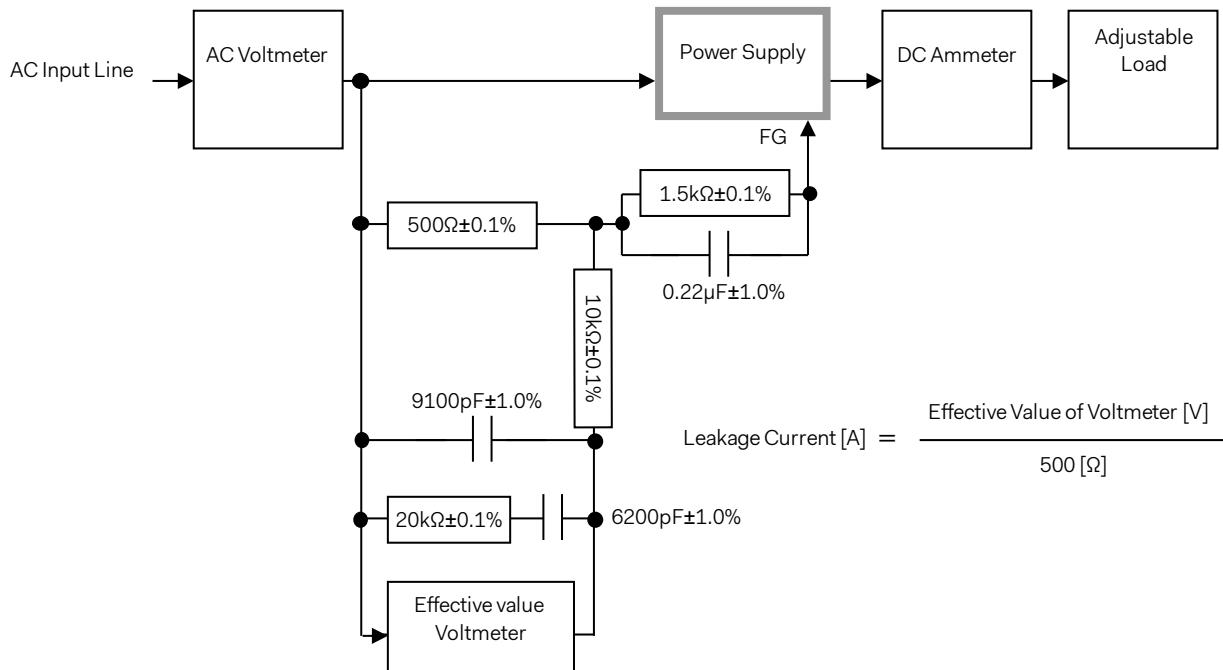


Figure B-2 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.5)

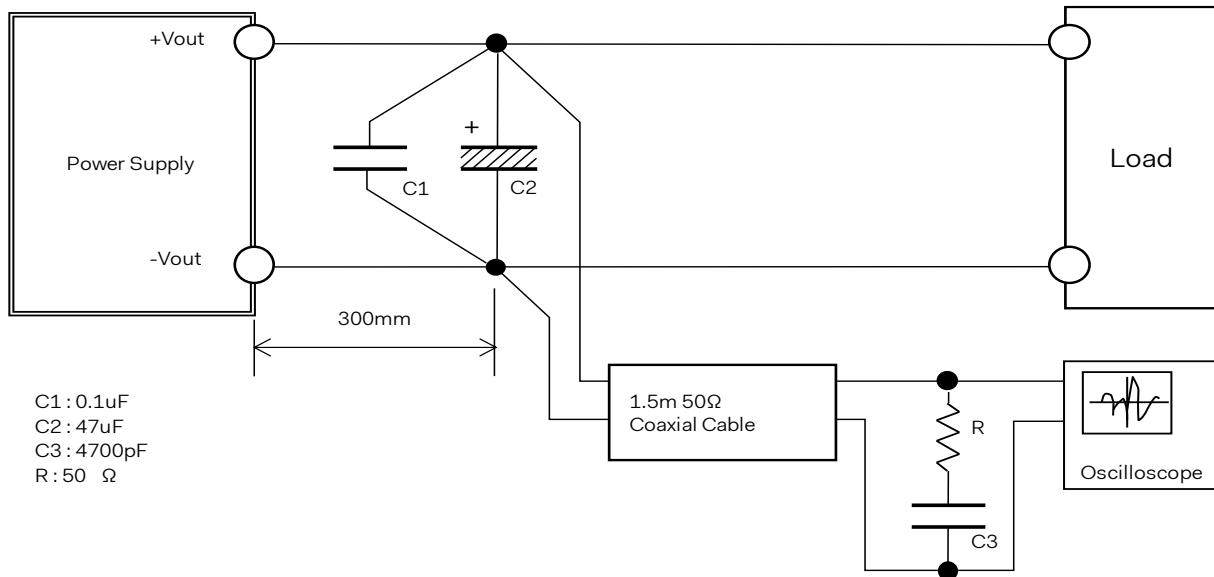


Figure C Ripple voltage measurement (JEITA RC-9131D)

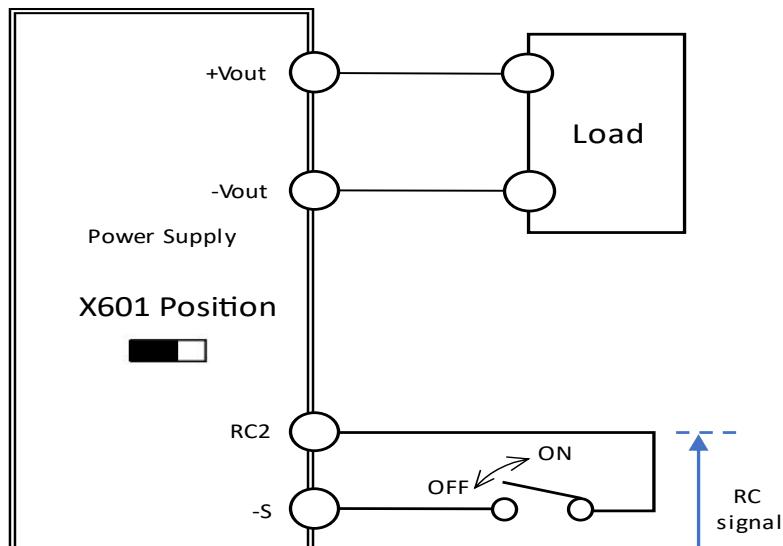


Figure D Turn on by RC measurement