

# EVALUATION DATA

MODEL NAME : OFD1200A65

Tested by : *Shintaro Oki*  
Shintaro Oki

Approved by : *Tomas Isaksson*  
Tomas Isaksson

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POWERBOX  
A Cosel Group Company

## Table of Contents

1. Input Current (by Load Current) .....	3
2. Efficiency (by Load Current).....	3
3. Power Factor (by Load Current) .....	4
4. Leakage Current .....	4
5. Inrush Current .....	5
6. Line Regulation.....	6
7. Load Regulation .....	6
8. Ripple Noise.....	7
9. Dynamic Load Response .....	7
10. Rise Time Characteristics by AC ON .....	8
11. Rise Time Characteristics with RC Signal.....	8
12. Fall Time / Hold-up Time .....	9
13. Over Current Protection .....	10
14. Minimum Input Voltage for Regulated Output Voltage .....	11
15. Over Voltage Protection .....	11
16. Conducted Emission .....	12
17. Figure of Test Circuitry .....	15

Remark:

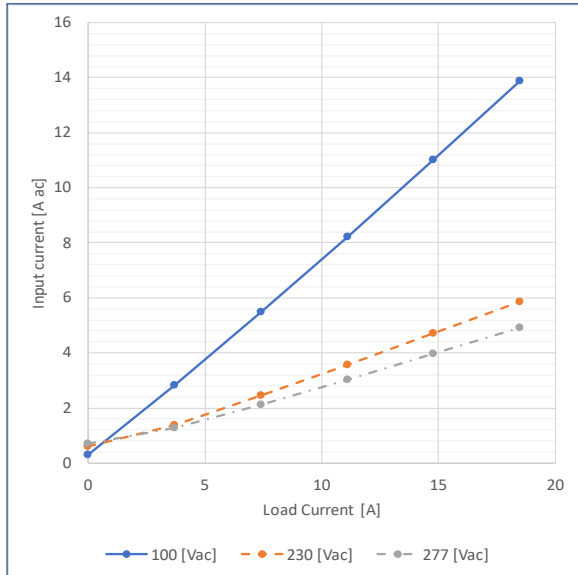
Unless specified the test condition shall be

Input voltage / Frequency: 230 [Vac] / 50 [Hz]  
 Load current: 18.5 [A]  
 Baseplate temperature: 25 [°C]

1. Input Current (by Load Current)

Test Circuitry : Figure A

Graph



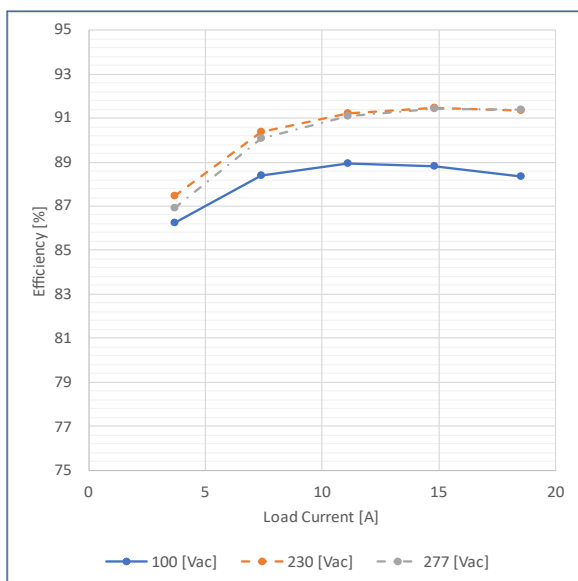
Value

Load Current [A]	Input Current [Aac]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	0.289	0.598	0.711
3.70	2.825	1.381	1.287
7.40	5.489	2.447	2.135
11.10	8.211	3.566	3.043
14.80	11.011	4.706	3.981
18.50	13.894	5.863	4.932

2. Efficiency (by Load Current)

Test Circuitry : Figure A

Graph



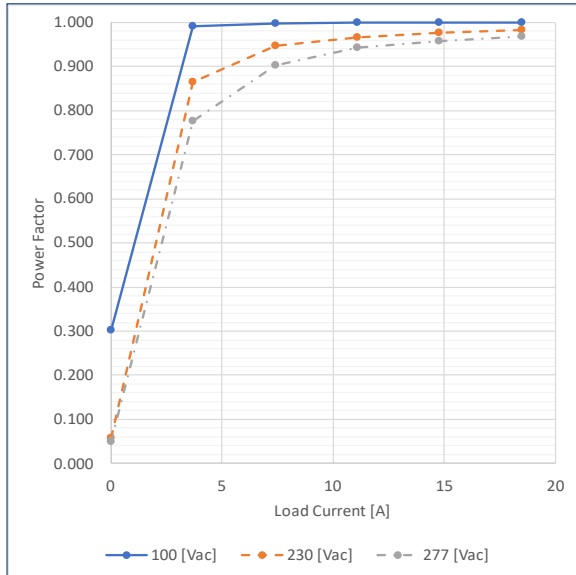
Value

Load Current [A]	Efficiency [%]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	-	-	-
3.70	86.221	87.472	86.897
7.40	88.396	90.350	90.077
11.10	88.923	91.230	91.065
14.80	88.816	91.476	91.412
18.50	88.338	91.342	91.374

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	0.303	0.058	0.050
3.70	0.991	0.866	0.777
7.40	0.998	0.947	0.904
11.10	0.999	0.967	0.942
14.80	0.999	0.976	0.958
18.50	0.999	0.982	0.968

4. Leakage Current

Test Circuitry : See table

Test Equipment: Simpson 228

Value

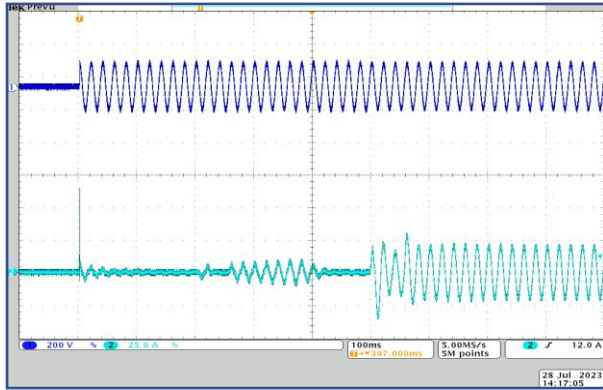
Standard	Testing Circuitry	Measuring Method	Leakage Current [mA]			Note
			Input Voltage			
			100 [Vac]	230 [Vac]	277 [Vac]	
IEC62368-1	Figure B-1	Both phases	0.25	0.60	0.74	Operation
		One of phases	0.44	1.20	1.45	Stand by
	Figure B-2	Both phases	0.25	0.60	0.74	Operation
		One of phases	0.44	1.20	1.45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

5. Inrush Current

Test Circuitry : Figure A

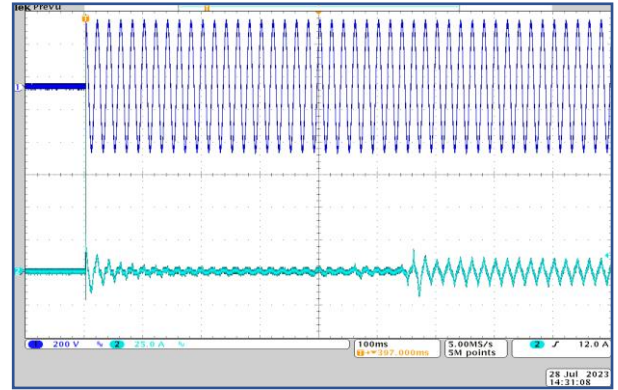
— C1: Input Voltage (200V/div)  
 — C2: Input Current (25A/div)

Waveform



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

- ① Primary Inrush Current : 14.0 [A]
- ② Secondary Inrush Current : 33.5 [A]

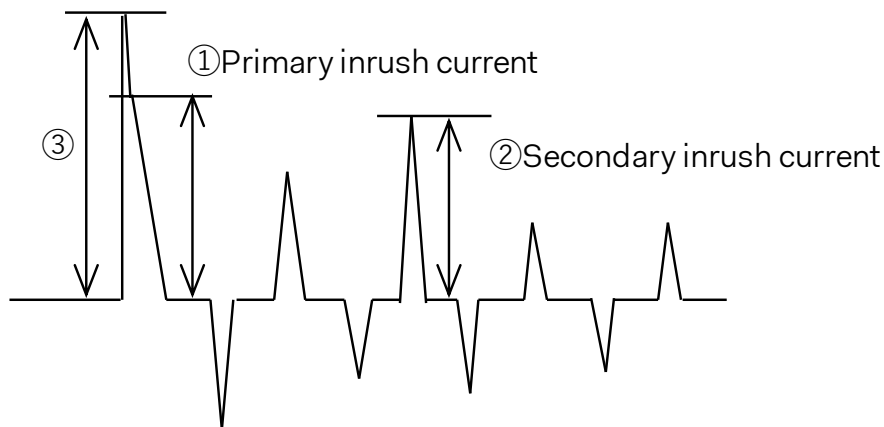


Input Voltage : 277 [Vac]  
 (100ms/div)

- ① Primary Inrush Current : 27.0 [A]
- ② Secondary Inrush Current : 15.5 [A]

Remark:

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

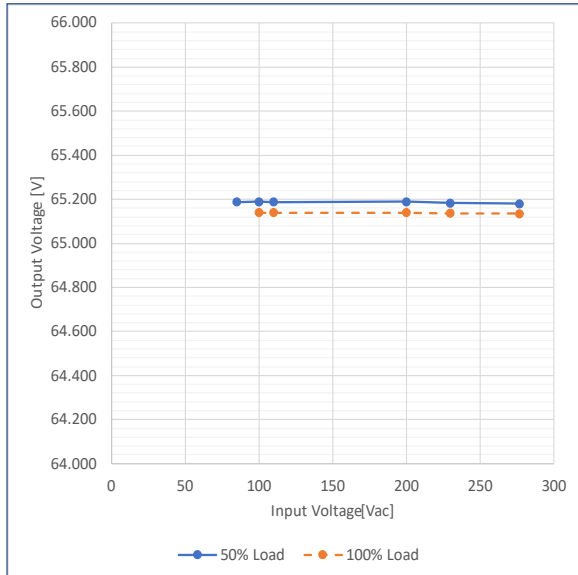


### 6. Line Regulation

Test Circuitry : Figure A

Change input voltage from 85 to 277 [Vac]

#### Graph



#### Value

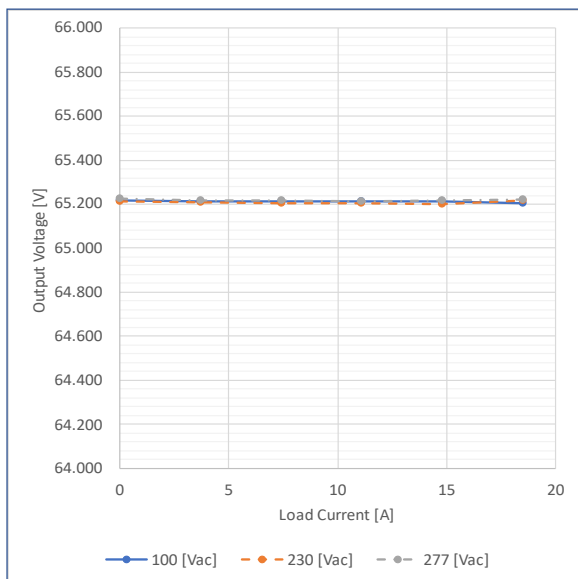
Input Voltage [Vac]	Output Voltage [V]	
	Load Factor	
	50% Load	100% Load
85.00	65.188	-
100.00	65.189	65.139
110.00	65.188	65.139
200.00	65.189	65.140
230.00	65.183	65.136
277.00	65.180	65.135

### 7. Load Regulation

Test Circuitry : Figure A

Change Load Current from 0 to 25.0 [A]

#### Graph



#### Value

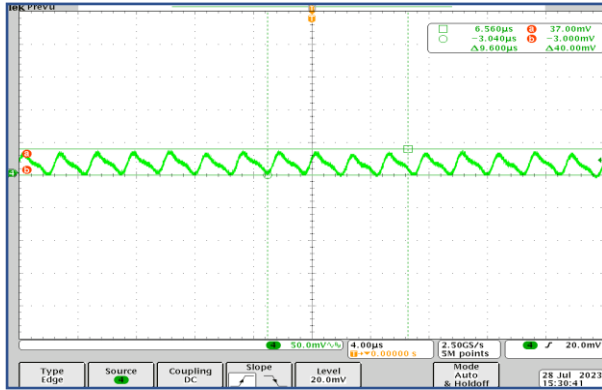
Load Current [A]	Output Voltage [V]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	65.215	65.213	65.224
3.70	65.214	65.207	65.217
7.40	65.214	65.205	65.215
11.10	65.213	65.205	65.214
14.80	65.211	65.201	65.215
18.50	65.204	65.215	65.219

8. Ripple Noise

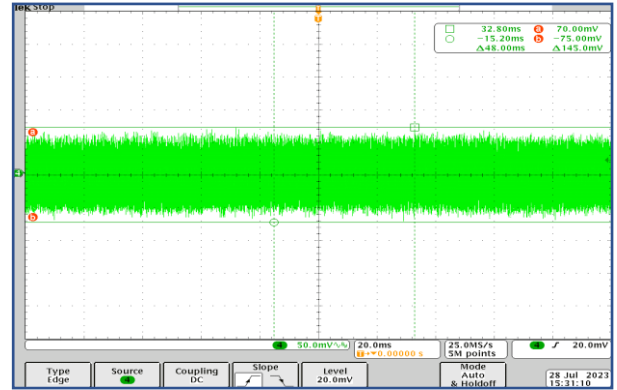
Test Circuitry : Figure C

— C4: Output voltage  
 BW: 20MHz

Waveform



(4µs/div)  
 (50mV/div)



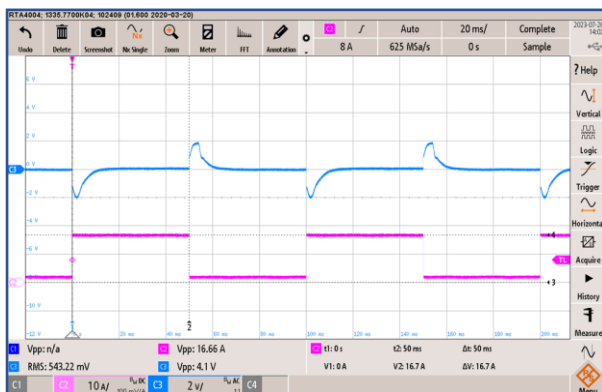
(20ms/div)  
 (50mV/div)

9. Dynamic Load Response

Test Circuitry: Figure A  
 Load Current: 1.85 [A] <-> 16.65 [A]

— C2: Output voltage (2V/div)  
— C4: Output current (10A/div)

Waveform



(20ms/div)

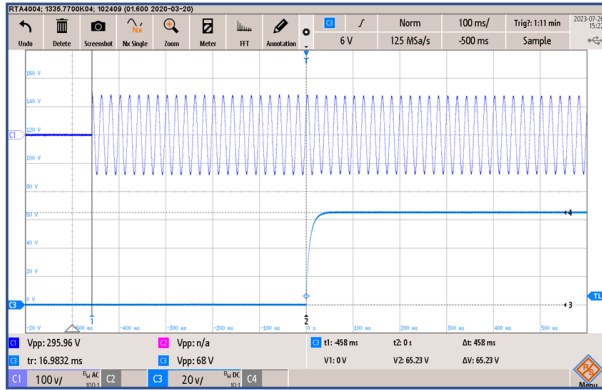
Load changes from 10% to 90% of rated current.

10. Rise Time Characteristics by AC ON

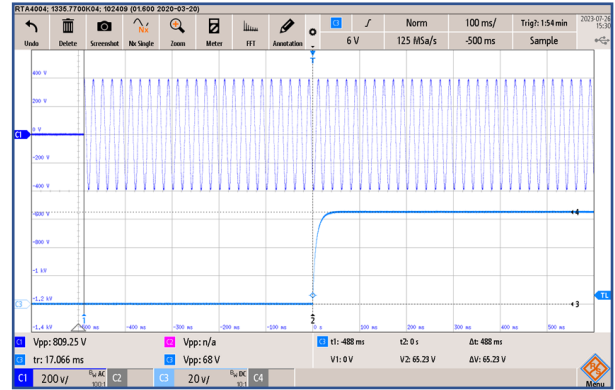
Test Circuitry : Figure A

— C1: Input voltage  
— C3: Output voltage (20V/div)

Waveform



Input Voltage 100 [Vac]  
Load Current 18.5 [A]  
(100ms/div)



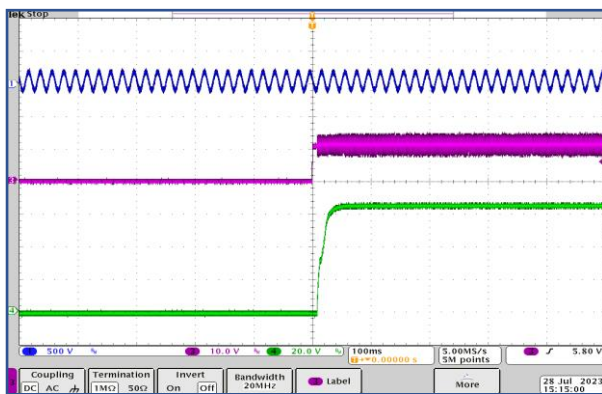
Input Voltage 277 [Vac]  
Load Current 18.5 [A]  
(100ms/div)

11. Rise Time Characteristics with RC Signal

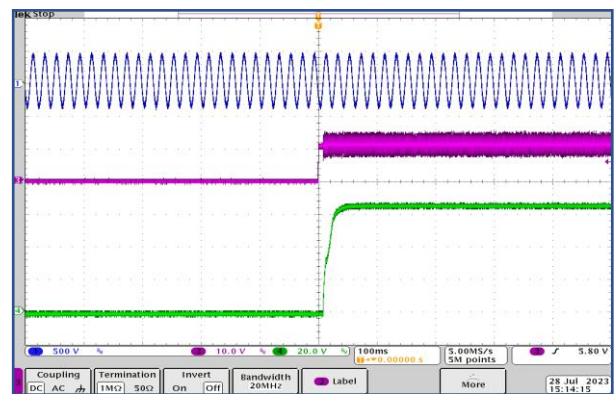
Test Circuitry : Figure D

— C1: Input voltage (500V/div)  
— C3: RC signal (10V/div)  
— C4: Output voltage (20V/div)

Waveform



Input Voltage 100 [Vac]  
Load Current 18.5 [A]  
(100ms/div)



Input Voltage 277 [Vac]  
Load Current 18.5 [A]  
(100ms/div)

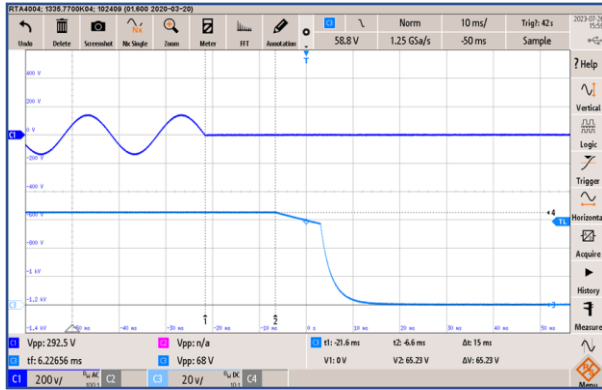


12. Fall Time / Hold-up Time

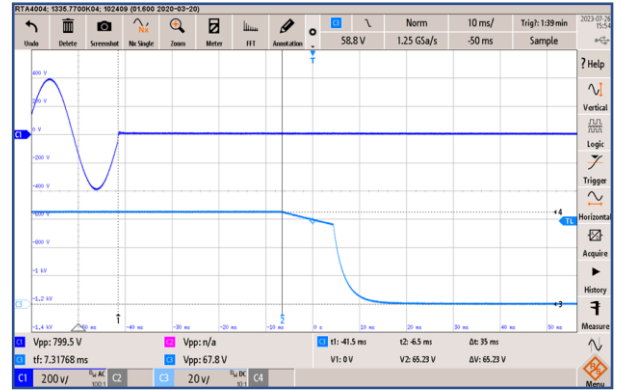
Test Circuitry : Figure A

— C1: Input voltage (200V/div)  
 — C2: Output voltage (20V/div)

Waveform

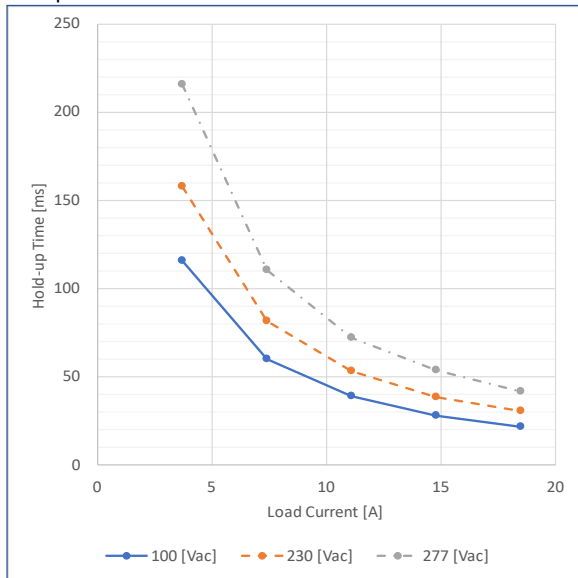


Input Voltage 100 [Vac]  
 Load Current 18.5 [A]  
 (10ms/div)



Input Voltage 277 [Vac]  
 Load Current 18.5 [A]  
 (10ms/div)

Graph



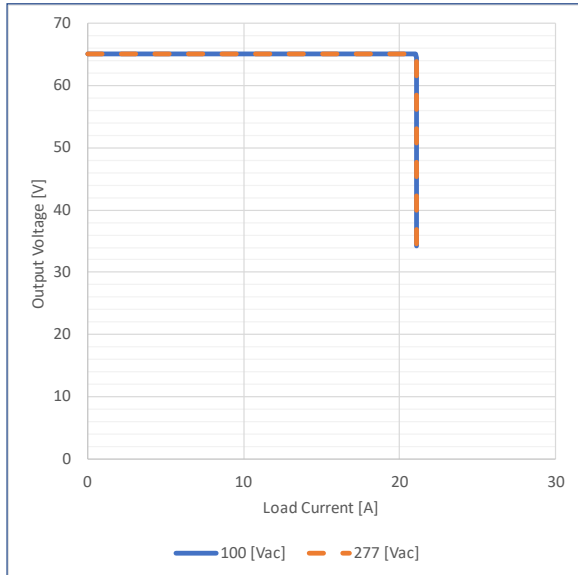
Value

Load Current [A]	Hold-up Time [ms]		
	Input Voltage		
	100 [Vac]	230 [Vac]	277 [Vac]
0.00	-	-	-
3.70	115.5	158.0	215.5
7.40	59.8	81.4	110.5
11.10	38.8	53.2	72.0
14.80	28.0	38.6	53.4
18.50	21.6	30.4	41.6

13. Over Current Protection

Test Circuitry : Figure A

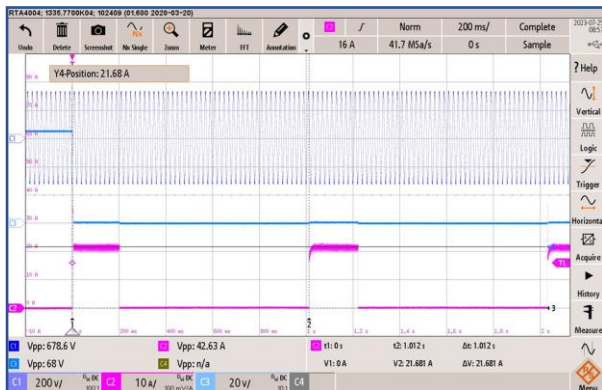
Graph



Value

Output Voltage [V]	Load Current [A]	
	Input Voltage	
	100 [Vac]	277 [Vac]
65.00	21.030	21.039
61.75	21.061	21.072
58.50	21.061	21.070
52.00	21.061	21.071
45.50	21.061	21.069
39.00	21.062	21.069
32.50	21.057	21.066

Waveform



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

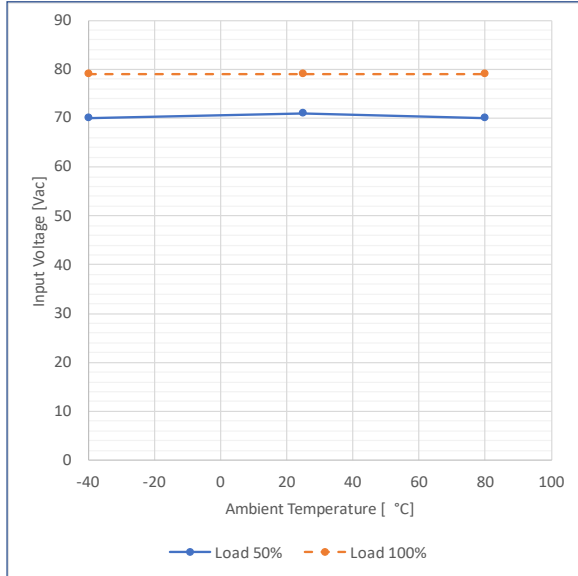
- C1: Input voltage      (200V/div)
- C2: Output Current    (10A/div)
- C3: Output voltage    (20V/div)

Intermittent operation occurs when the output voltage is from 30.0V to 0V.

14. Minimum Input Voltage for Regulated Output Voltage

Test Circuitry : Figure A

Graph



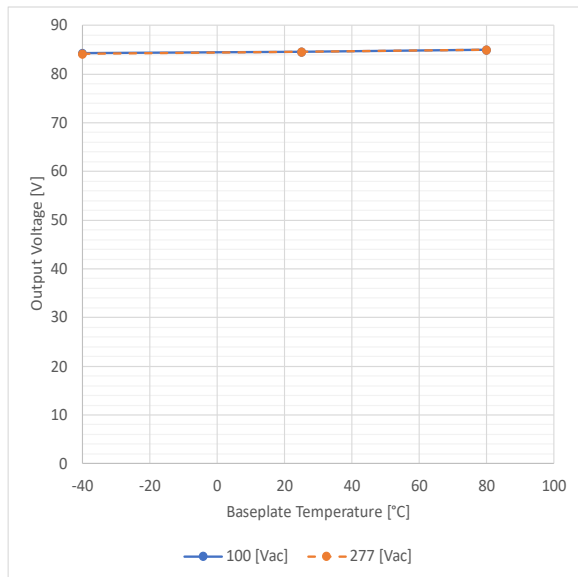
Value

Baseplate Temperature [°C]	Input Voltage [Vac]	
	Load Current	
	Load 50%	Load 100%
-40	70	79
25	71	79
80	70	79

15. Over Voltage Protection

Test Circuitry : Figure A

Graph



Value

Baseplate Temperature [°C]	Output Voltage [V]	
	Input Voltage	
	100 [Vac]	277 [Vac]
-40	84.290	84.170
25	84.580	84.580
80	84.990	84.990

16. Conducted Emission

Input Voltage : 115Vac / 230Vac 50Hz      Load : 100 %

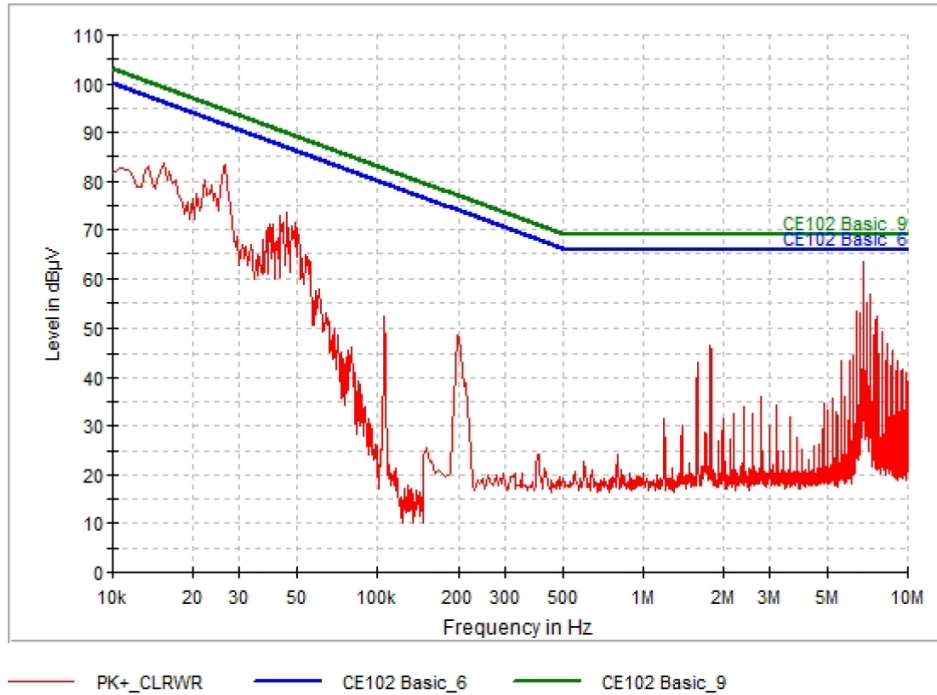


Fig. 16.1 MIL-STD-461F CE102 Result OFD1200A65, 115V, N

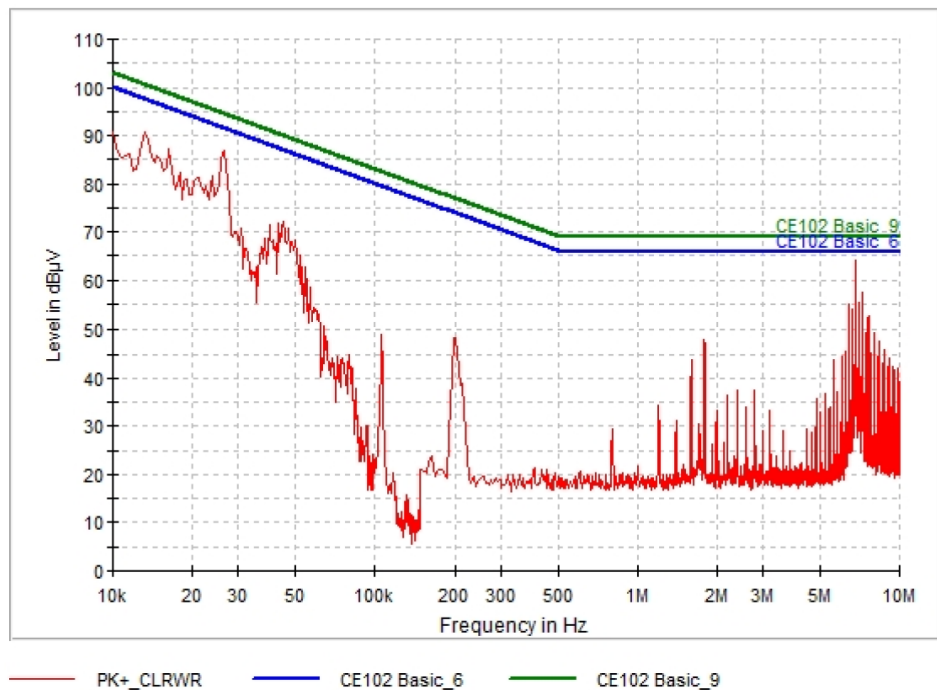
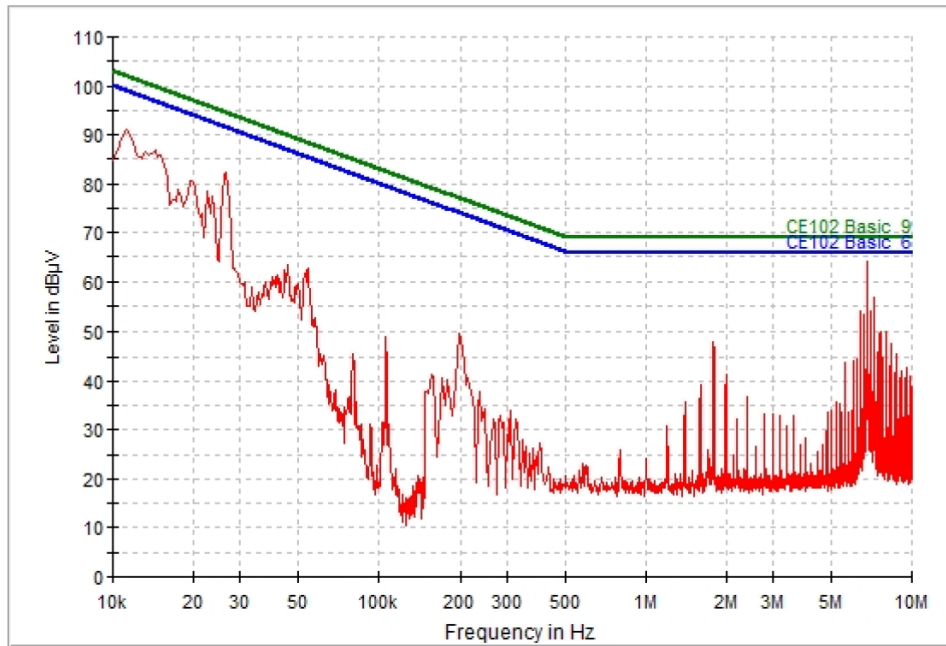
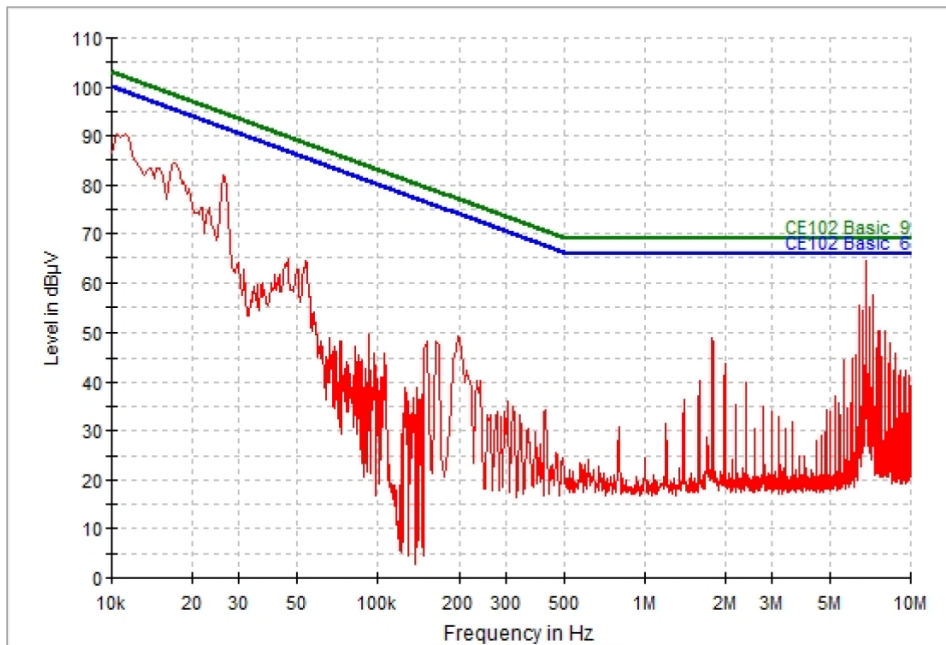


Fig. 16.2 MIL-STD-461F CE102 Result OFD1200A65, 115V, L1



— PK+\_CLRWR — CE102 Basic\_6 — CE102 Basic\_9

Fig. 16.3 MIL-STD-461F CE102 Result OFD1200A65, 230V, N



— PK+\_CLRWR — CE102 Basic\_6 — CE102 Basic\_9

Fig. 16.4 MIL-STD-461F CE102 Result OFD1200A65, 230V, L1

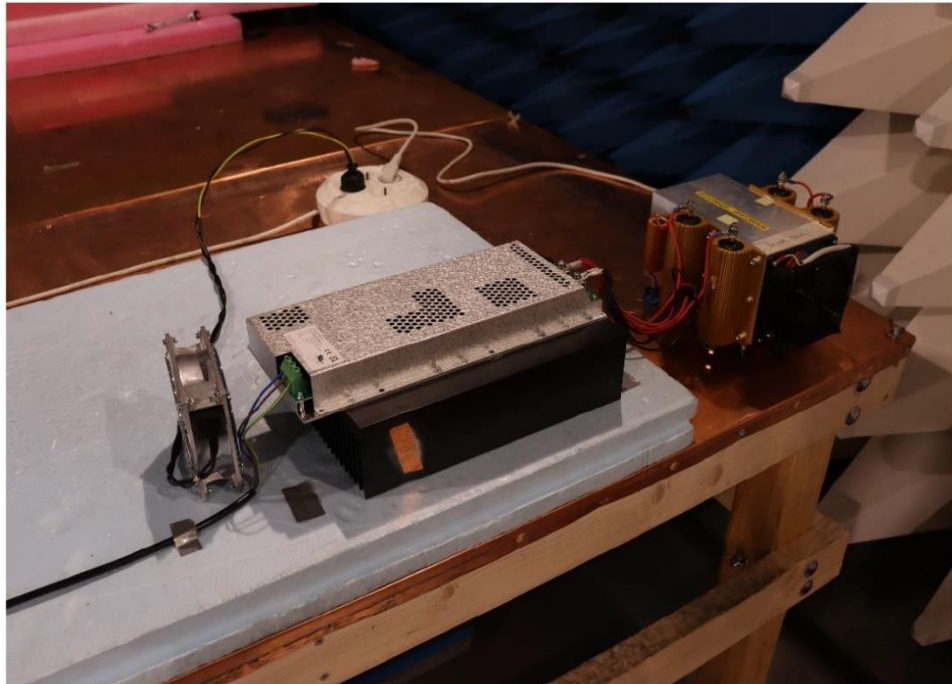


Fig. 16.5 MIL-STD-461F CE102 test environment

17. Figure of Test Circuitry

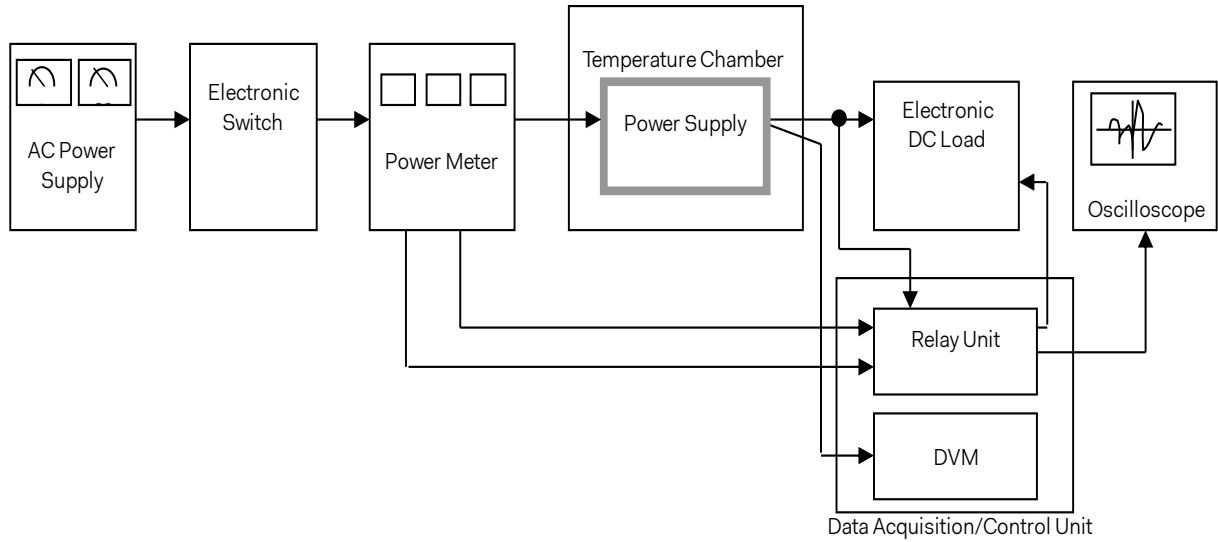


Figure A Test circuitry for general performance measurement

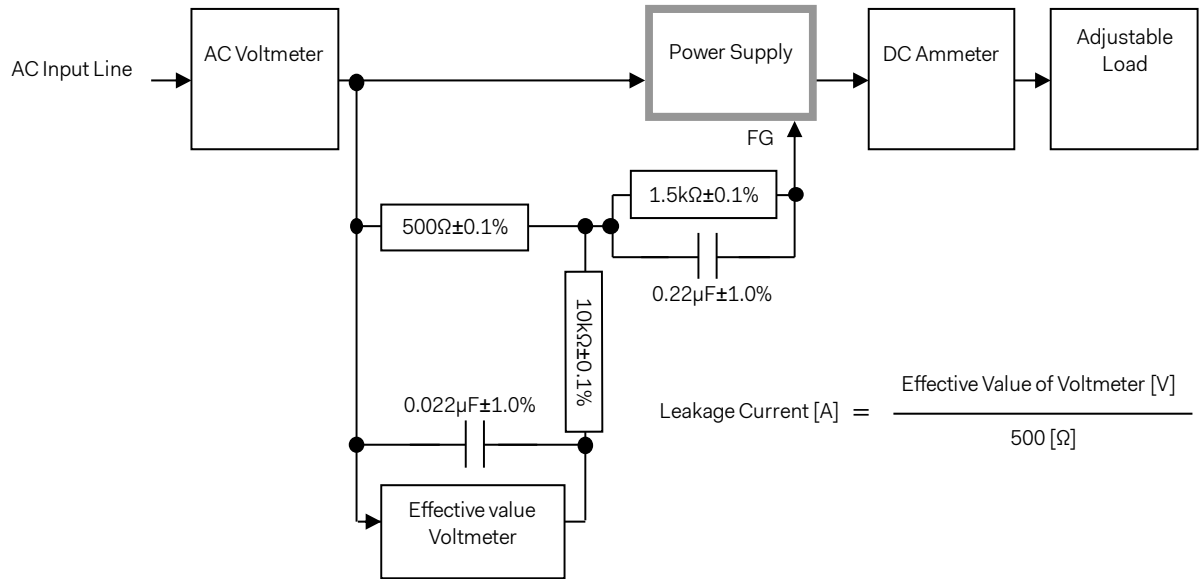


Figure B-1 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.4)

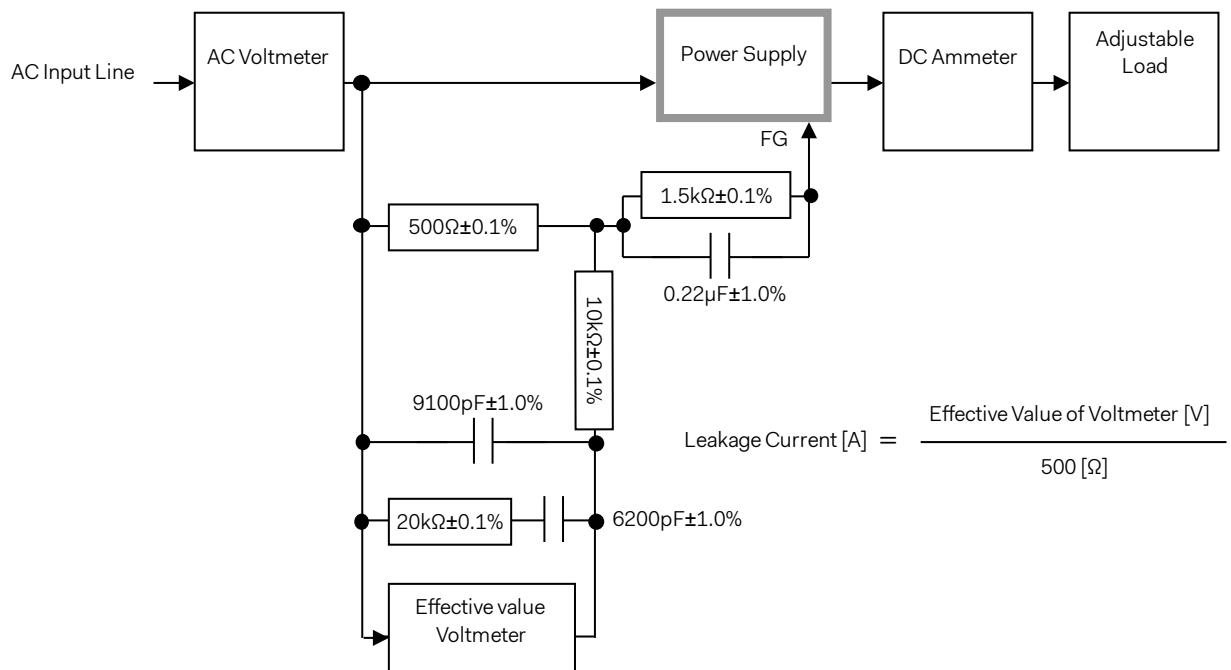


Figure B-2 Leakage current measurement (IEC62368-1, refer to IEC60990 Fig.5)



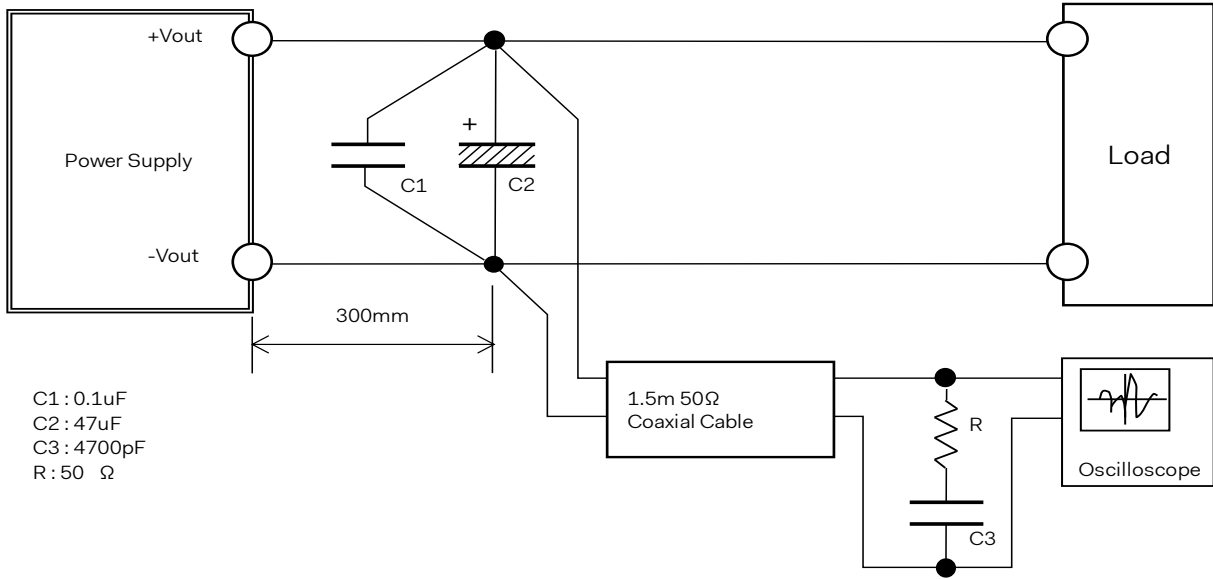


Figure C Ripple voltage measurement (JEITA RC-9131D)

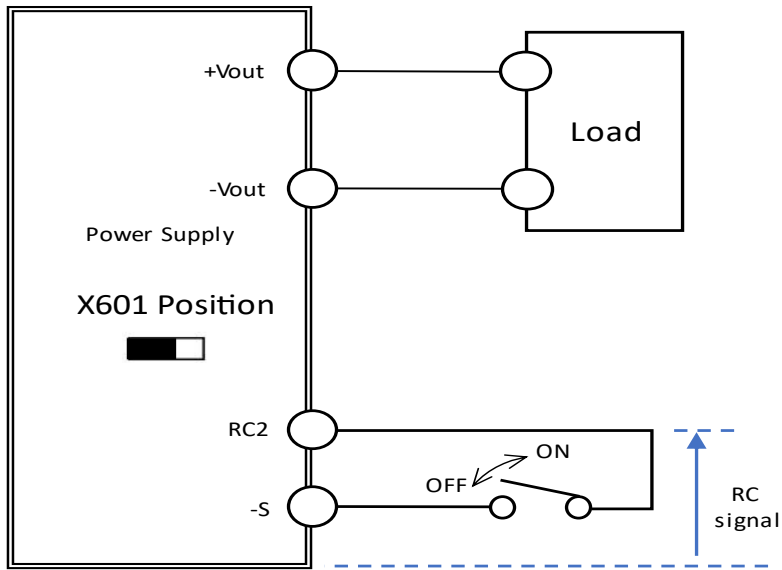


Figure D Turn on by RC measurement