For Reference

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TEST DATA OF HFA3500TF-48

Regulated DC Power Supply

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COSEL CO.,LTD.

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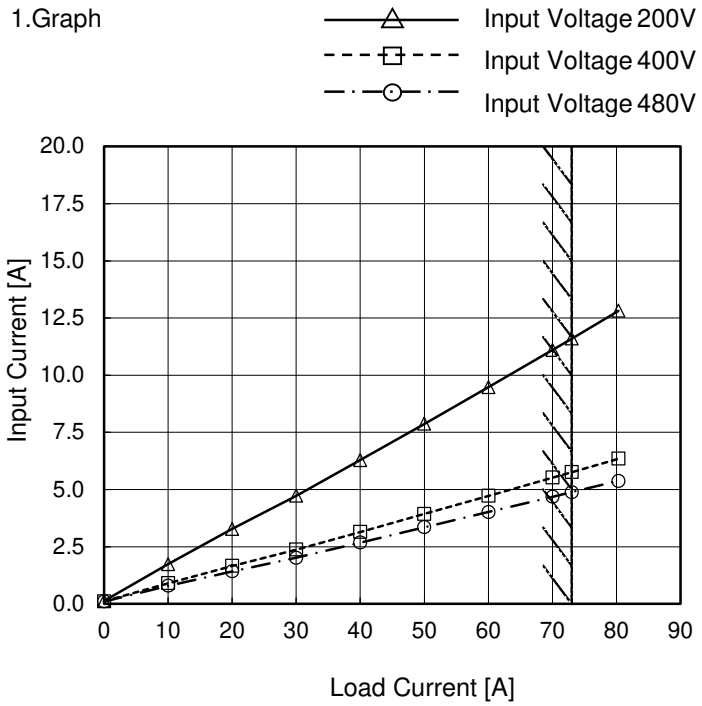
Model	HFA3500TF-48
Item	Input Current (by Load Current)
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	0.126	0.116	0.109
10.0	1.739	0.909	0.794
20.0	3.274	1.662	1.421
30.0	4.729	2.375	2.017
40.0	6.288	3.143	2.679
50.0	7.876	3.932	3.354
60.0	9.474	4.723	4.018
70.0	11.098	5.523	4.683
73.0	11.599	5.764	4.887
80.3	12.813	6.350	5.375
-	-	-	-

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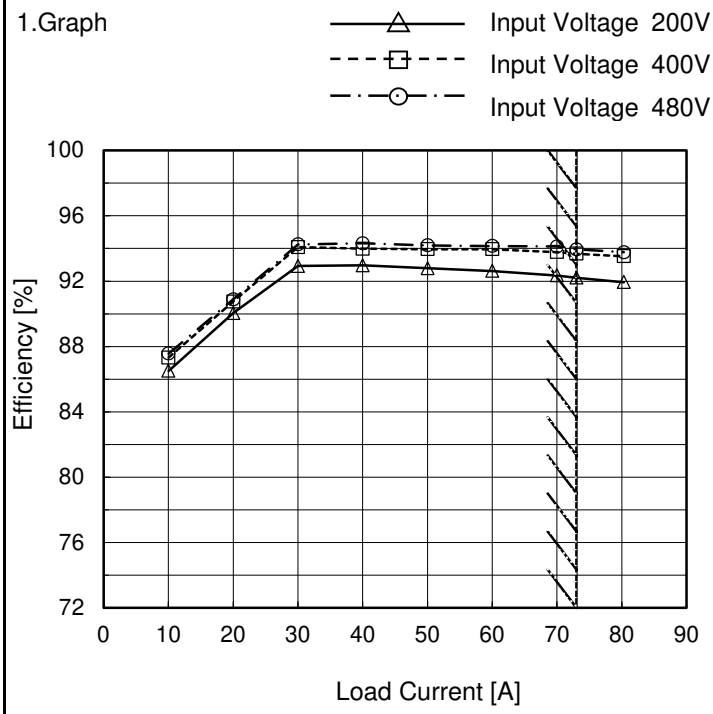
Model	HFA3500TF-48
Item	Efficiency (by Load Current)
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

Load Current [A]	Efficiency [%]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	-	-	-
10.0	86.5	87.3	87.6
20.0	90.1	90.8	90.9
30.0	92.9	94.1	94.3
40.0	93.0	94.0	94.3
50.0	92.8	94.0	94.2
60.0	92.6	94.0	94.2
70.0	92.3	93.8	94.1
73.0	92.2	93.7	94.0
80.3	91.9	93.5	93.8
-	-	-	-

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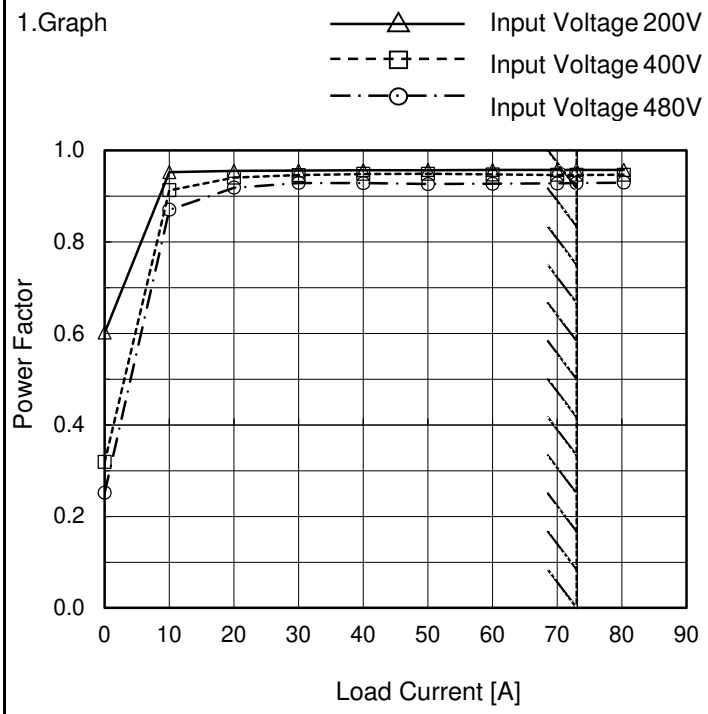
Model	HFA3500TF-48
Item	Power Factor (by Load Current)
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

Load Current [A]	Power Factor		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	0.602	0.319	0.252
10.0	0.953	0.913	0.870
20.0	0.955	0.941	0.918
30.0	0.956	0.946	0.929
40.0	0.957	0.949	0.929
50.0	0.957	0.949	0.926
60.0	0.957	0.948	0.927
70.0	0.957	0.947	0.928
73.0	0.957	0.947	0.929
80.3	0.958	0.947	0.930
-	-	-	-

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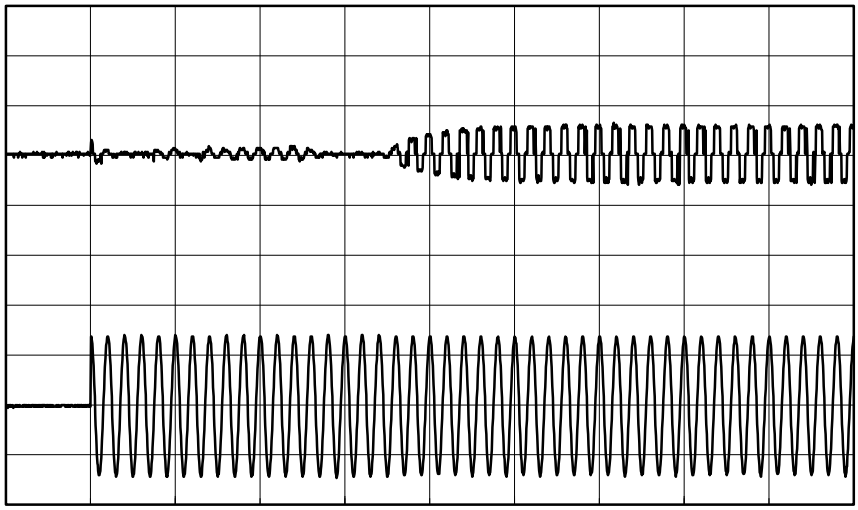
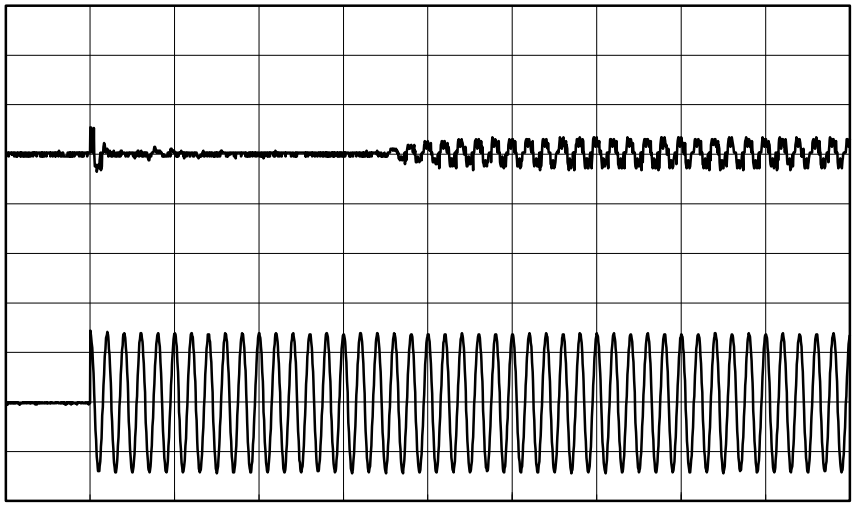
Model	HFA3500TF-48		
Item	Inrush Current	Temperature	25°C
		Testing Circuitry	Figure A
Object	+48V73A		



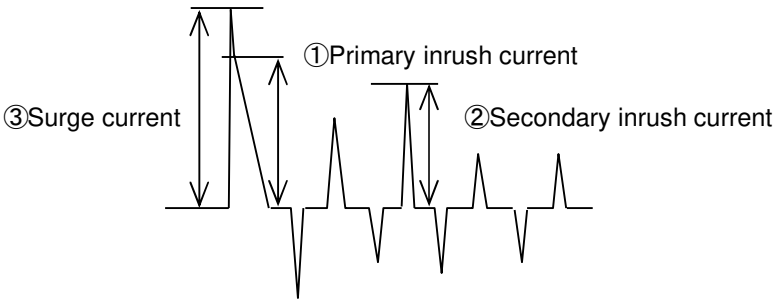
Input Voltage 200 V
Frequency 50 Hz
Load 100 %

①Primary inrush current : 6.33A
②Secondary inrush current : 16.5 A



Input Voltage 400 V
Frequency 50 Hz
Load 100 %

①Primary inrush current : 13.6A
②Secondary inrush current : 8.6 A



※ The specification of the primary inrush current means that the surge current to a built-in noise filter (0.2msec or less : waveform ③) is excluded.

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Model	HFA3500TF-48		
Item	Leakage Current	Temperature	25°C
		Testing Circuitry	Figure B
Object	+48V73A		

1.Results

[mA]

Standards	Testing Circuitry	Phase	Input Voltage			Note
			200[V]	400[V]	480[V]	
IEC62368-1	FigureB-1	Full phase	0.80	1.80	2.00	
		Phase loss	0.01	0.01	0.01	
	FigureB-2	Full phase	0.80	1.80	2.00	
		Phase loss	0.01	0.01	0.01	

2.Condition

Leakage current value is concluded after measuring all phase of AC input and choosing the largest one.

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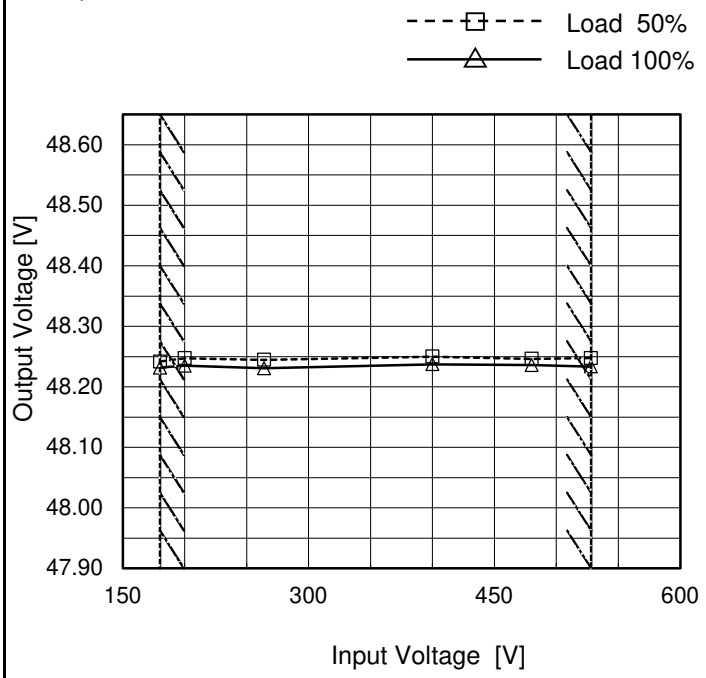
Model	HFA3500TF-48
Item	Line Regulation
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
180	48.242	48.232
200	48.247	48.235
264	48.245	48.231
400	48.250	48.237
480	48.246	48.236
528	48.248	48.234
-	-	-
-	-	-
-	-	-

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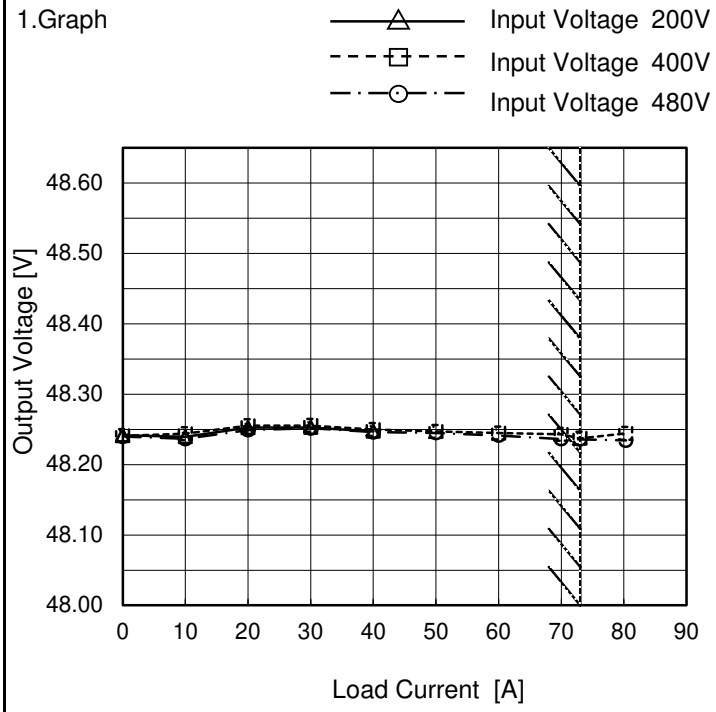
Model	HFA3500TF-48
Item	Load Regulation
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

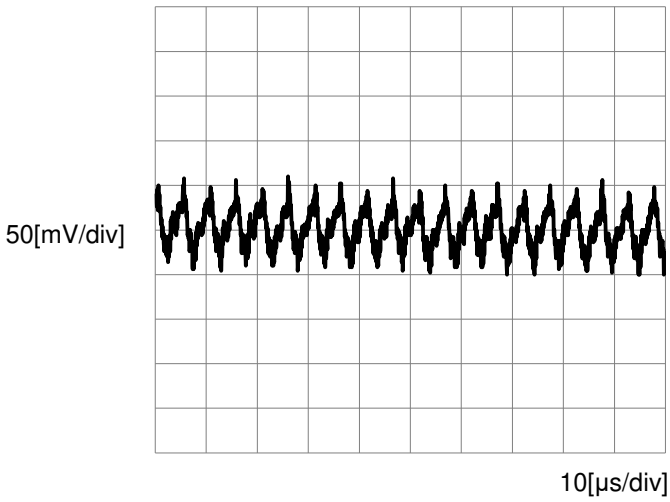
Load Current [A]	Output Voltage [V] Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	48.242	48.241	48.240
10.0	48.240	48.244	48.237
20.0	48.253	48.255	48.249
30.0	48.253	48.255	48.252
40.0	48.247	48.250	48.246
50.0	48.244	48.247	48.245
60.0	48.239	48.245	48.241
70.0	48.238	48.243	48.236
73.0	48.235	48.237	48.236
80.3	48.238	48.244	48.234
-	-	-	-

Item	Ripple-Noise
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure C

1.Graph

Input Voltage 400V
Load 100%



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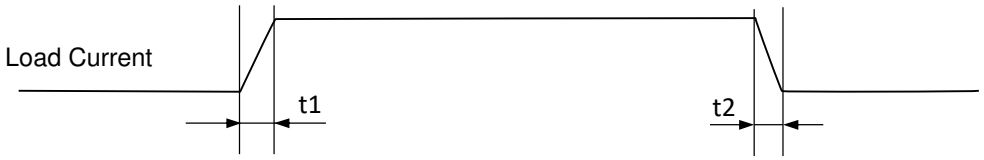
Model	HFA3500TF-48	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+48V73A	

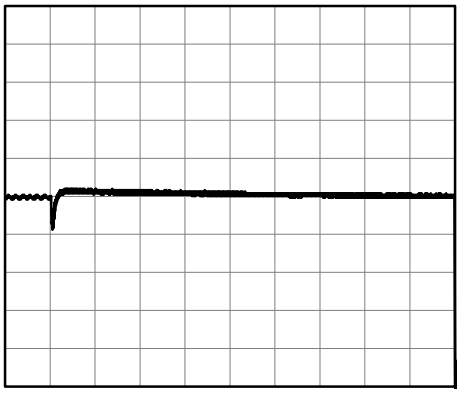
Input Volt. 400 V

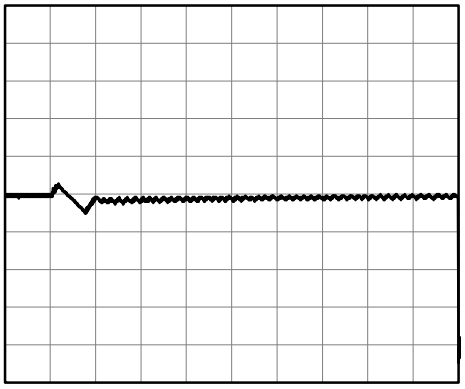
Cycle 1000 ms

Response. t1=t2=50µs. Typ



Load 0%(0A) ←→
Load 100%(73A)



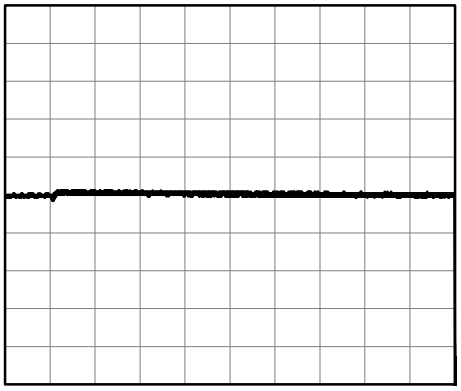


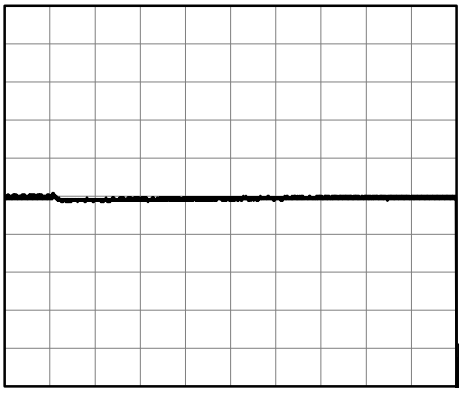
1[V/div]

10[ms/div]

10[ms/div]

Load 50%(36.5A) ←→
Load 100%(73A)





1[V/div]

10[ms/div]

10[ms/div]

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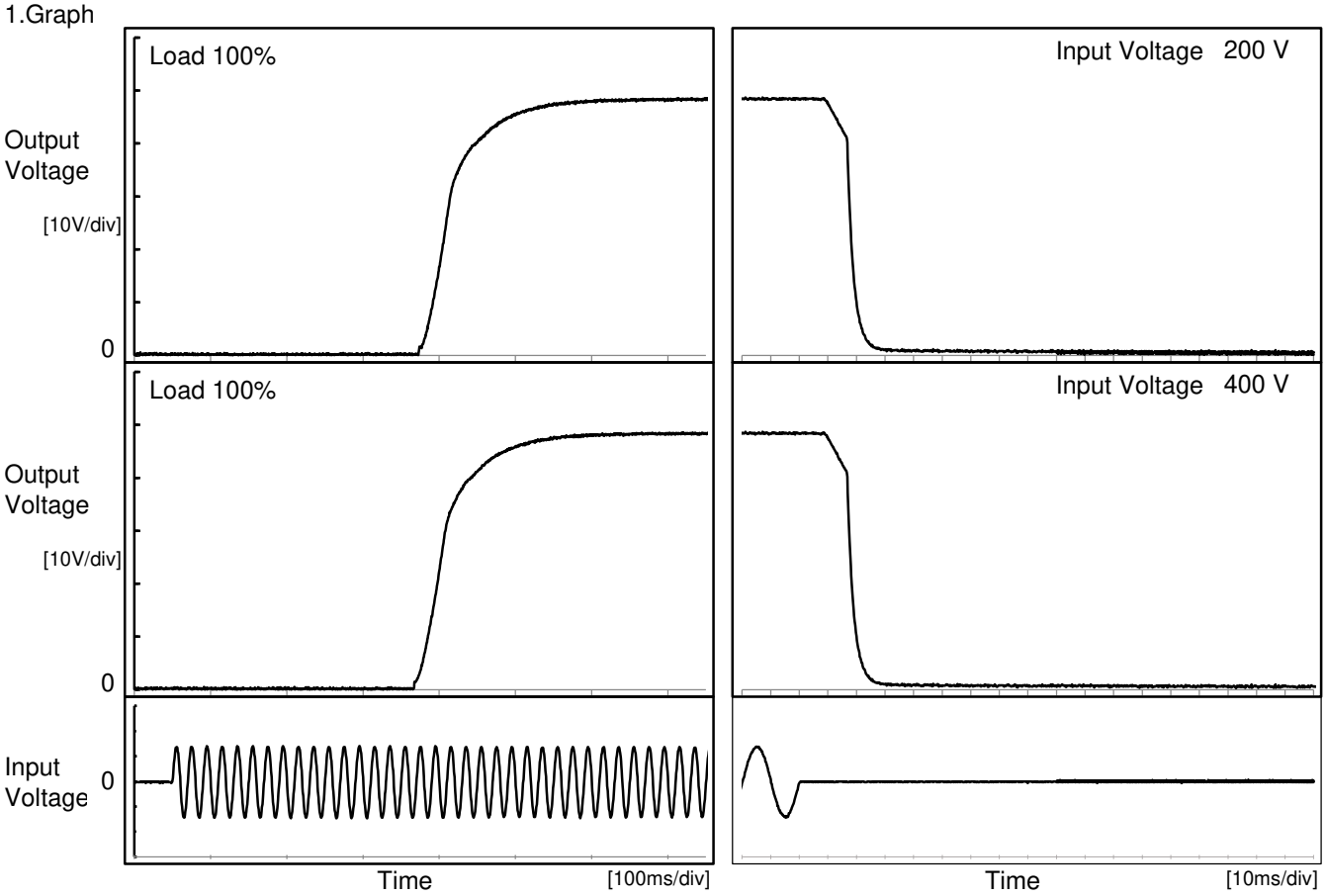
Model	HFA3500TF-48
Item	Rise and Fall Time
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

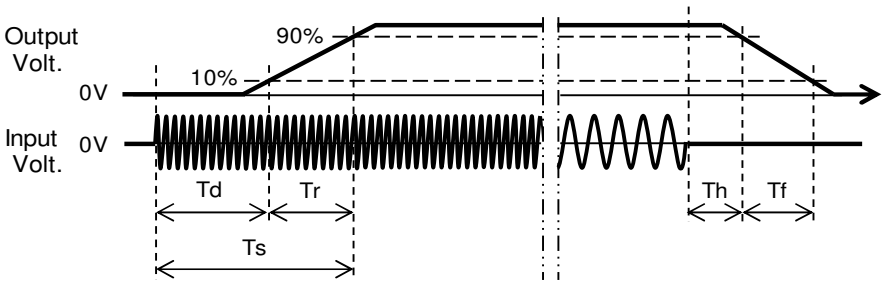
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
200 V	334.0	88.5	422.5	11.0	8.2
400 V	327.5	87.0	414.5	10.8	8.1



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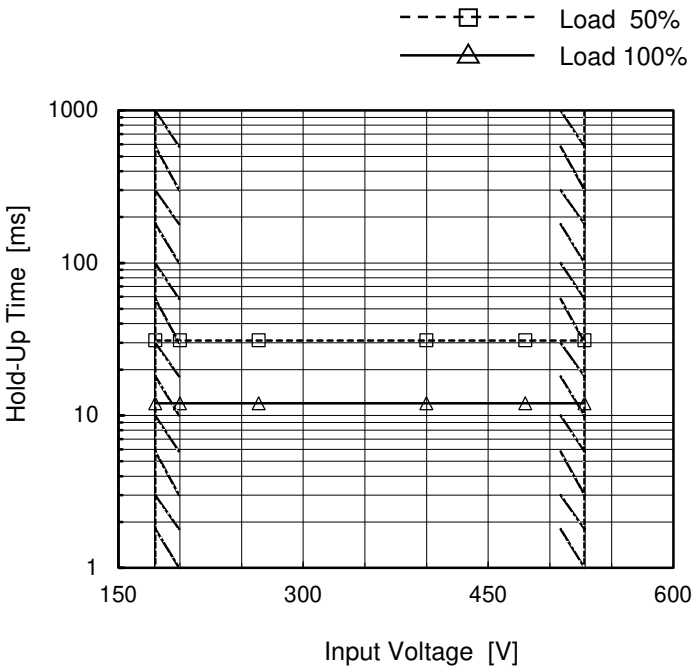
Model	HFA3500TF-48
Item	Hold-Up Time
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage drops to 95% of the rated voltage.

Note: Hatched line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
180	31	12
200	31	12
264	31	12
400	31	12
480	31	12
528	31	12
--	-	-
--	-	-
--	-	-

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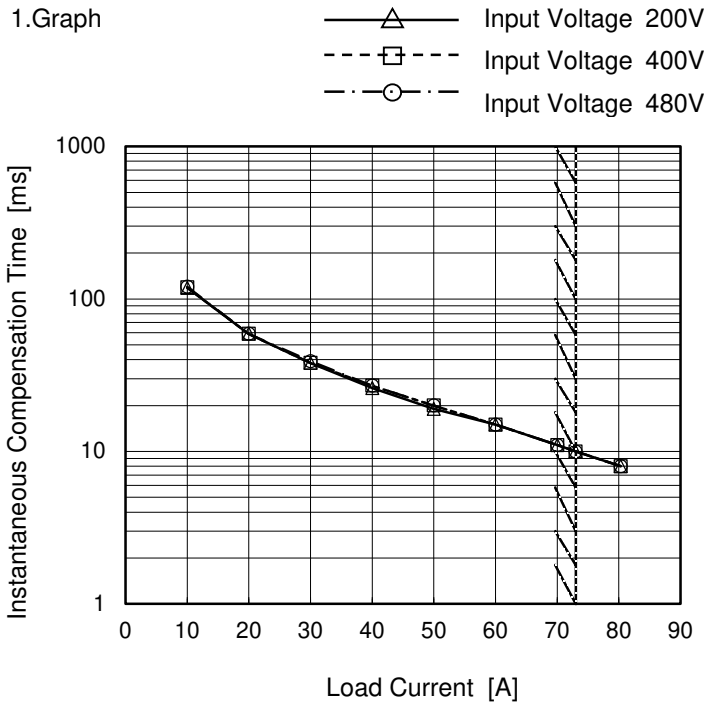
Model	HFA3500TF-48
Item	Instantaneous Interruption Compensation
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

Load Current [A]	Time [ms]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	-	-	-
10.0	118	119	120
20.0	59	59	59
30.0	38	38	39
40.0	26	27	27
50.0	19	20	20
60.0	15	15	15
70.0	11	11	11
73.0	10	10	10
80.3	8	8	8
--	-	-	-

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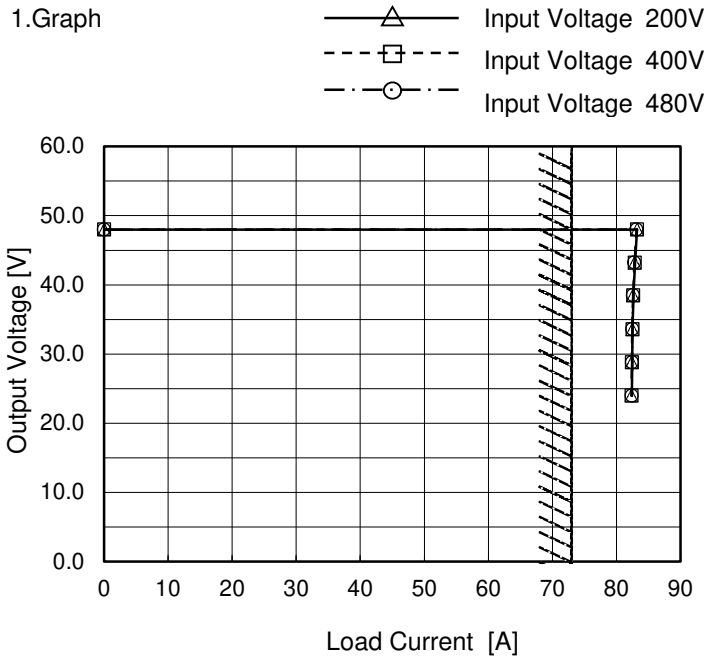
Model	HFA3500TF-48
Item	Overcurrent Protection
Object	+48V73A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Hatched line shows the range of the rated load current.

2.Values

Output Voltage [V]	Load Current [A]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
48	83.21	83.20	83.14
43.2	83.82	82.87	82.81
38.4	82.58	82.63	82.60
33.6	82.45	82.50	82.50
28.8	82.38	82.43	82.43
24	82.33	82.38	82.39
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	HFA3500TF-48
Item	Ambient Temperature Drift
Object	+48V73A

Testing Circuitry Figure A

1.Values

Load 100%

Ambient Temperature[°C]	Output Voltage [V]		
	Input Voltage 200V	Input Voltage 400V	Input Voltage 480V
-10	48.308	48.309	48.306
25	48.235	48.237	48.236
50	48.098	48.105	48.103

Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V73A

Testing Circuitry Figure A

1.Values

Ambient Temperature[℃]	Input Voltage [V]	
	Load 50%	Load 100%
-10	170	168
25	171	170
50	171	170

Item	Overvoltage Protection
Object	+48V73A

Testing Circuitry Figure A

1.Values

Load 0%

Ambient Temperature[℃]	Operating Point [V]	
	Input Voltage 200V	Input Voltage 400V
-10	58.15	58.15
25	58.28	58.28
70	58.40	58.40

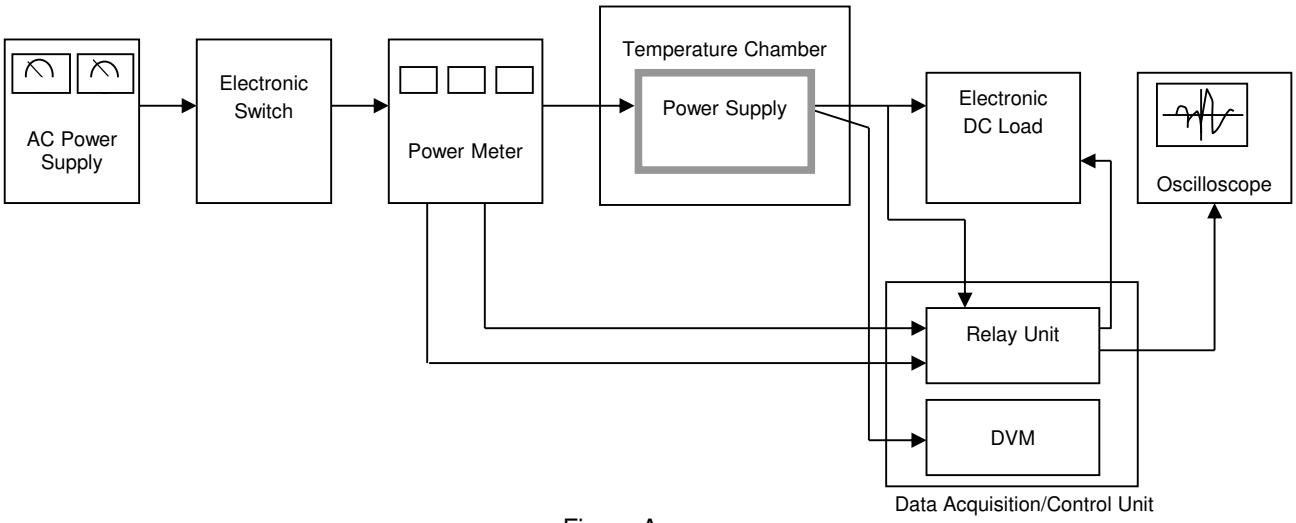

Figure A

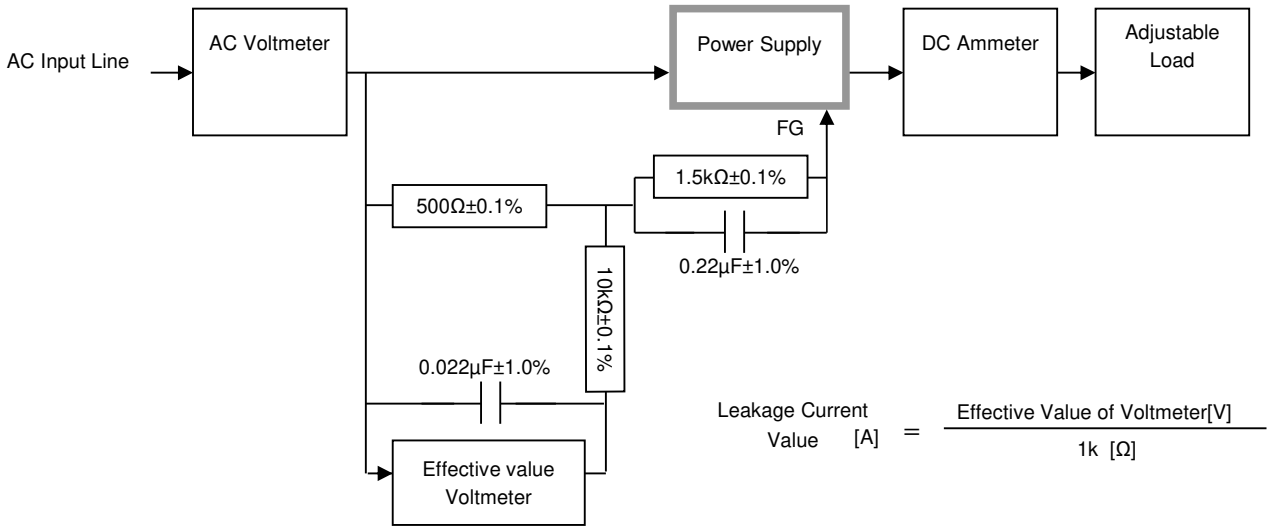

Figure B-1 (IEC62368-1)

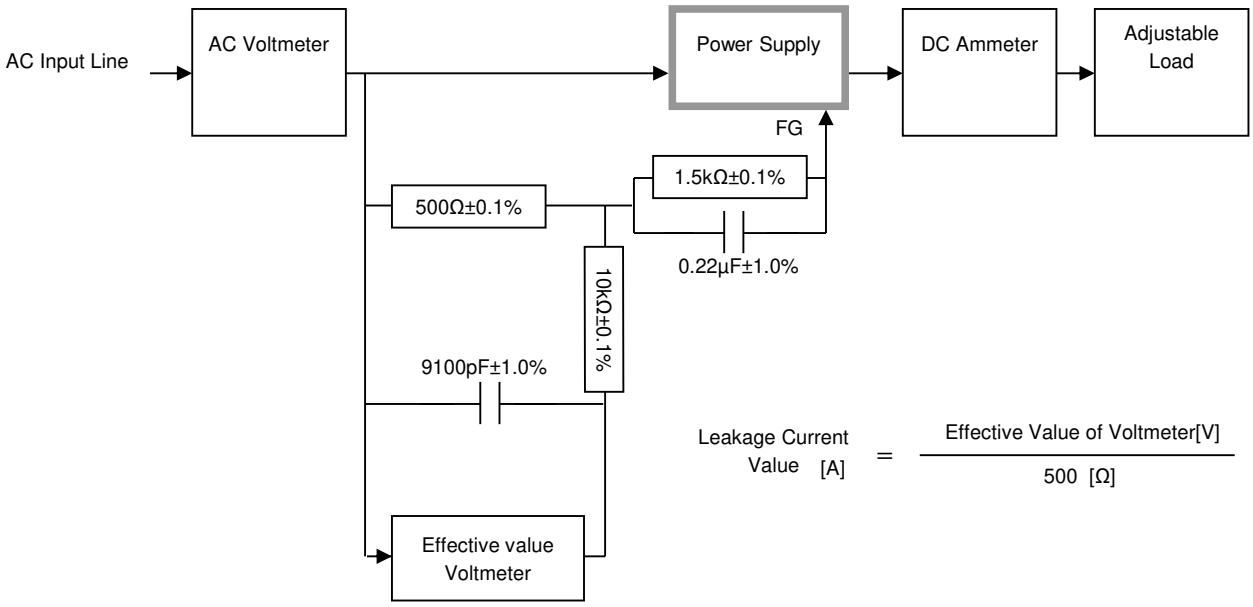

Figure B-2 (IEC62368-1)

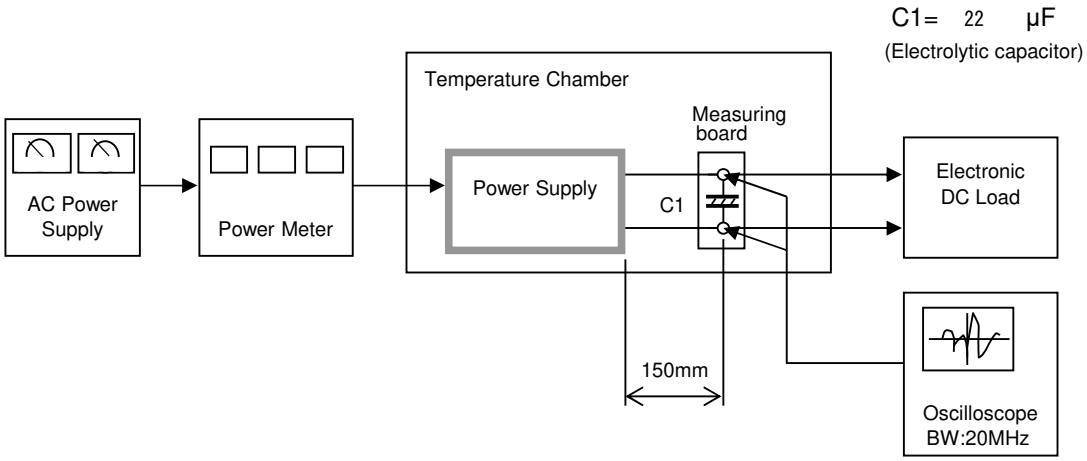
C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope BW:20MHz

Figure C