

Test Data

Model Number: UDP-240-A24

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 24 V 10A (16.7 A_{peak})

Minimum load : 0W
Rated load :240W
Peak output power: 400.8W

Approved by : Naoaki Yamamoto

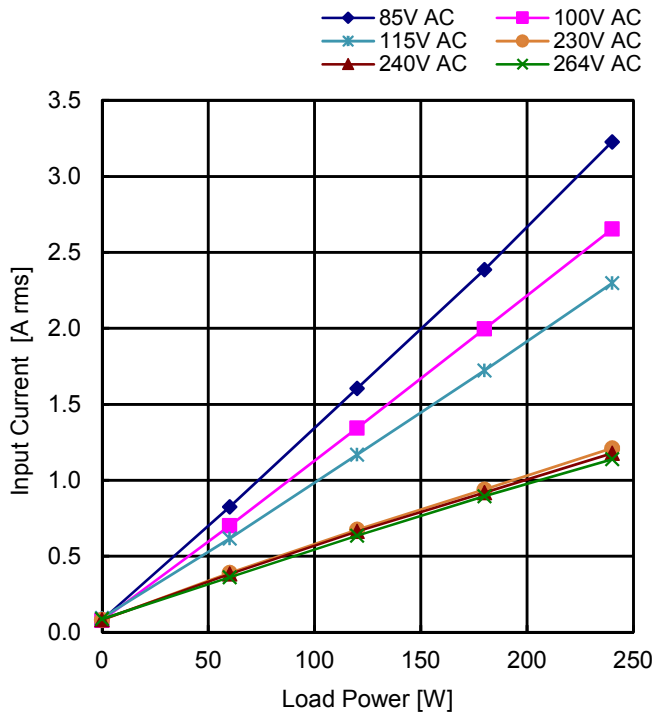
Designed by : Idohei Ono

Tested by : Kohji Samada

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Model	UDP-240-A24	Temperature: 25°C
Item	Input Current (by Load Power)	



Load Power [W]	Input Current [A rms]					
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 115V AC	Input Voltage 230V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	0.08	0.08	0.09	0.08	0.08	0.09
60.0	0.83	0.70	0.62	0.39	0.38	0.36
120.0	1.60	1.34	1.17	0.68	0.66	0.64
180.0	2.39	2.00	1.72	0.94	0.92	0.89
240.0	3.23	2.65	2.30	1.21	1.18	1.14

Model	UDP-240-A24	Temperature: 25°C			
Item	Efficiency				

■ Efficiency(by Input Voltage)

AC Input Voltage [V]	50% Load	Rated Load
85	88.47	88.16
100	90.06	90.51
115	90.85	91.55
132	91.43	92.20
176	92.37	93.34
200	92.62	93.81
230	92.87	94.16
240	93.07	94.25
264	93.32	94.40

AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	88.47	88.16
100	90.06	90.51
115	90.85	91.55
132	91.43	92.20
176	92.37	93.34
200	92.62	93.81
230	92.87	94.16
240	93.07	94.25
264	93.32	94.40

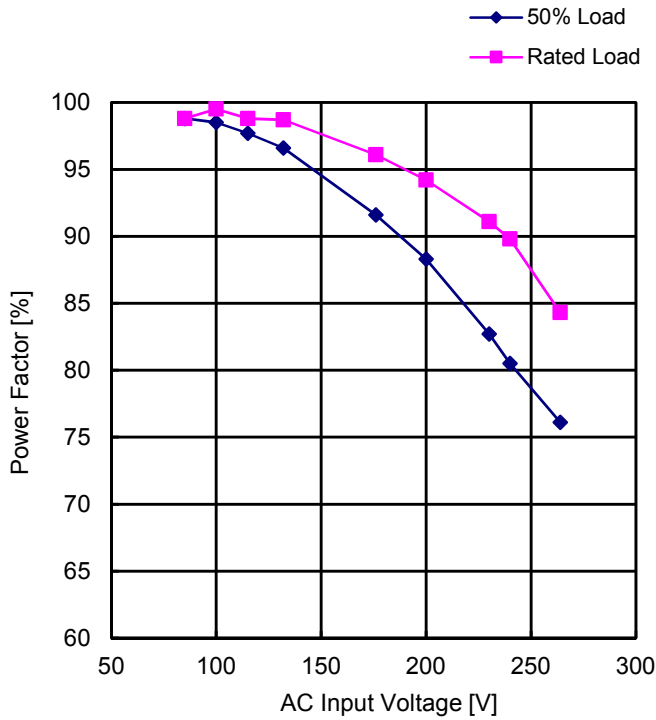
■ Efficiency(by Load Power)

Load Power [W]	Efficiency [%]					
	85V AC	100V AC	115V AC	230V AC	240V AC	264V AC
60.0	86.22	87.39	88.10	89.73	89.85	89.90
120.0	88.47	90.06	90.85	92.87	93.07	93.32
180.0	88.85	90.69	91.65	94.05	94.22	94.28
240.0	88.16	90.51	91.55	94.16	94.25	94.40

Load Power [W]	Efficiency [%]					
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 115V AC	Input Voltage 230V AC	Input Voltage 240V AC	Input Voltage 264V AC
60.0	86.22	87.39	88.10	89.73	89.85	89.90
120.0	88.47	90.06	90.85	92.87	93.07	93.32
180.0	88.85	90.69	91.65	94.05	94.22	94.28
240.0	88.16	90.51	91.55	94.16	94.25	94.40

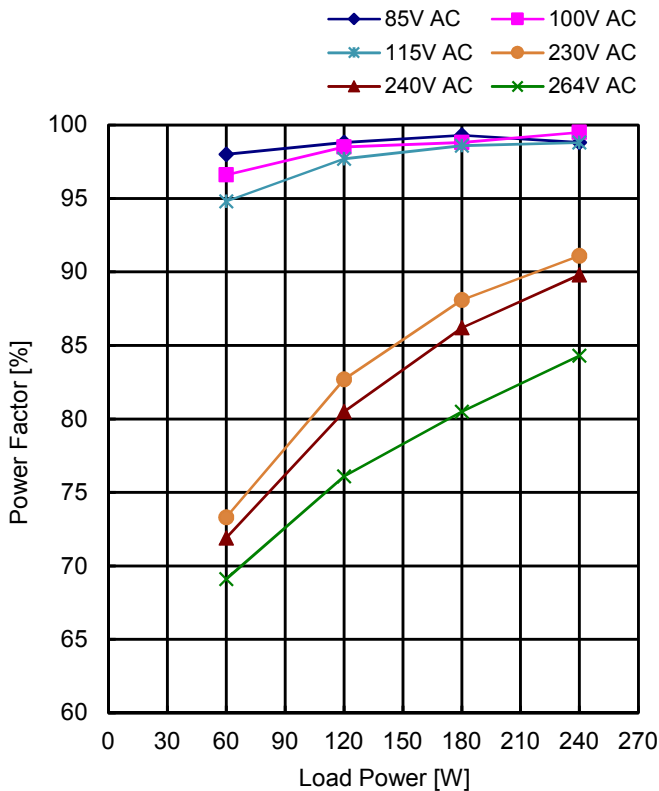
Model	UDP-240-A24	Temperature: 25°C
Item	Power Factor	

Power Factor (by Input Voltage)

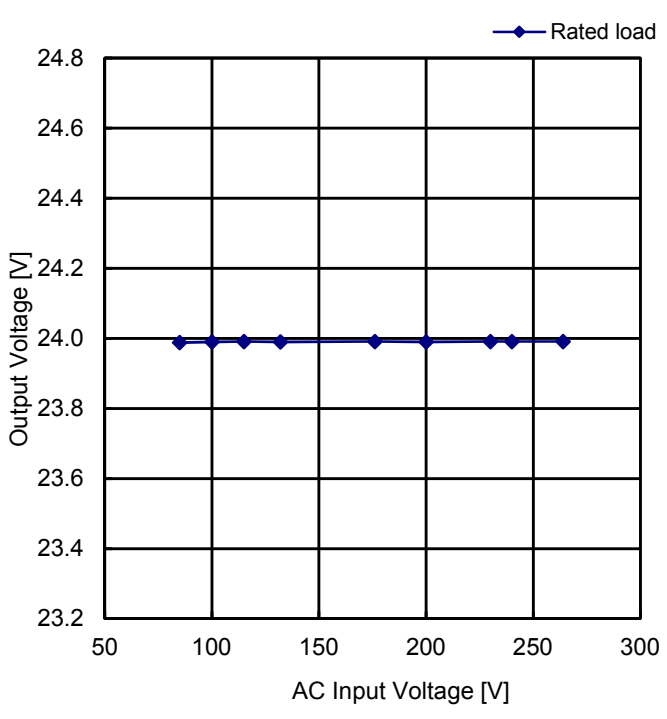


AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	98.8	98.8
100	98.5	99.5
115	97.7	98.8
132	96.6	98.7
176	91.6	96.1
200	88.3	94.2
230	82.7	91.1
240	80.5	89.8
264	76.1	84.3

Power Factor (by Load Power)

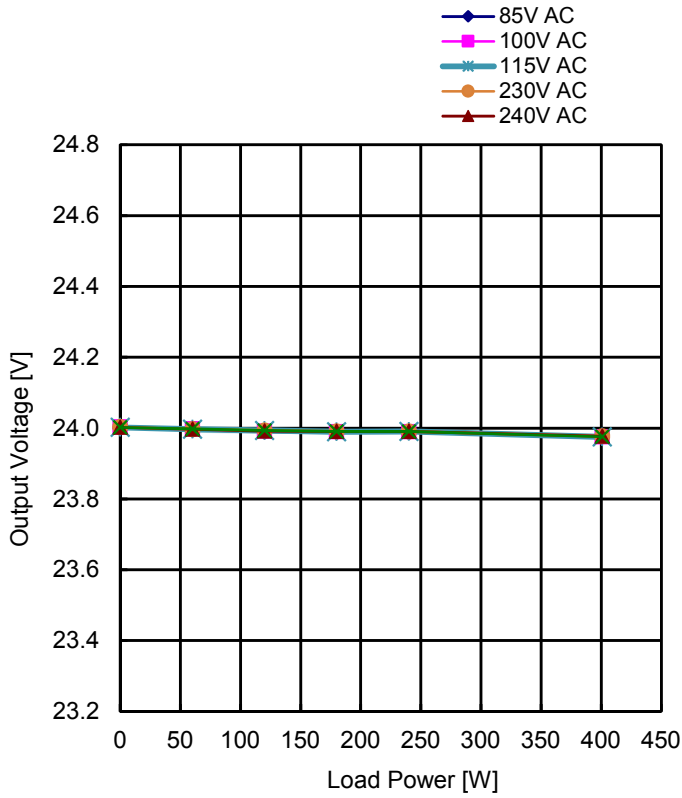


Load Power [W]	Power Factor [%]					
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 115V AC	Input Voltage 230V AC	Input Voltage 240V AC	Input Voltage 264V AC
60.0	98.0	96.6	94.8	73.3	71.9	69.1
120.0	98.8	98.5	97.7	82.7	80.5	76.1
180.0	99.3	98.8	98.6	88.1	86.2	80.5
240.0	98.8	99.5	98.8	91.1	89.8	84.3

Model	UDP-240-A24	Temperature: 25°C																				
Item	Line Regulation																					
<h2>24V/10A</h2>  <p>Legend: Rated load</p>		<table border="1"> <thead> <tr> <th>AC Input Voltage [V]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>85</td><td>23.988</td></tr> <tr><td>100</td><td>23.990</td></tr> <tr><td>115</td><td>23.991</td></tr> <tr><td>132</td><td>23.990</td></tr> <tr><td>176</td><td>23.991</td></tr> <tr><td>200</td><td>23.990</td></tr> <tr><td>230</td><td>23.991</td></tr> <tr><td>240</td><td>23.991</td></tr> <tr><td>264</td><td>23.991</td></tr> </tbody> </table>	AC Input Voltage [V]	Output Voltage [V]	85	23.988	100	23.990	115	23.991	132	23.990	176	23.991	200	23.990	230	23.991	240	23.991	264	23.991
AC Input Voltage [V]	Output Voltage [V]																					
85	23.988																					
100	23.990																					
115	23.991																					
132	23.990																					
176	23.991																					
200	23.990																					
230	23.991																					
240	23.991																					
264	23.991																					

Model	UDP-240-A24	Temperature: 25°C
Item	Load Regulation	

24V

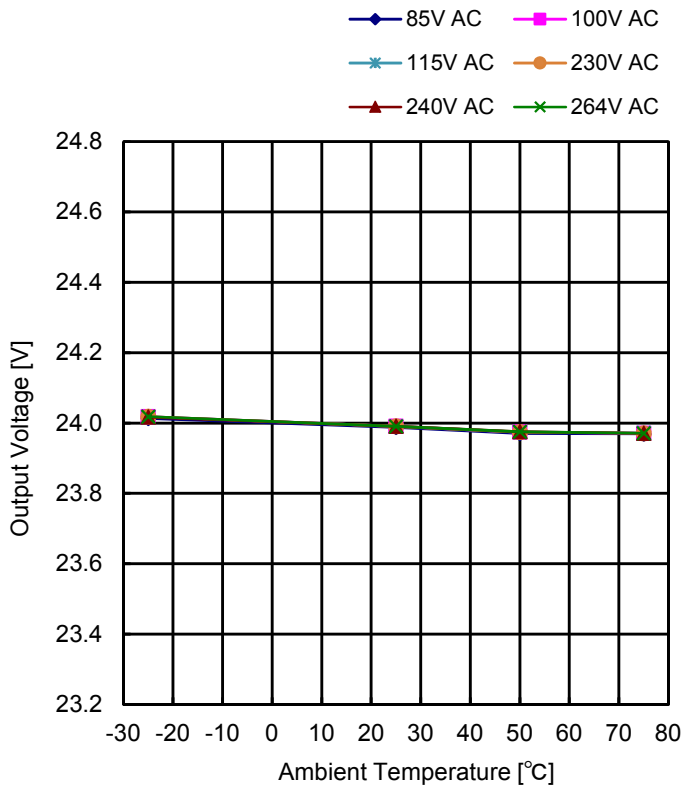


Load Power [W]	Output Voltage [V]					
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 115V AC	Input Voltage 230V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	24.000	24.003	24.002	24.003	24.002	24.002
60.0	23.995	23.998	23.997	23.997	23.997	23.998
120.0	23.990	23.992	23.993	23.993	23.992	23.993
180.0	23.988	23.990	23.990	23.991	23.991	23.991
240.0	23.988	23.990	23.991	23.991	23.991	23.991
400.8	23.978	23.975	23.975	23.977	23.977	23.976

Load Condition	
Load Power [W]	Load Current [A]
24V	
0.0	0.00
60.0	2.50
120.0	5.00
180.0	7.50
240.0	10.00
400.8	16.70

Model	UDP-240-A24
Item	Ambient Temperature Drift

24V



Ambient Temp. (°C)	Output Voltage [V]					
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 115V AC	Input Voltage 230V AC	Input Voltage 240V AC	Input Voltage 264V AC
-25	24.013	24.018	24.018	24.018	24.017	24.018
25	23.988	23.990	23.991	23.991	23.991	23.991
50	23.971	23.974	23.974	23.974	23.975	23.975
75	23.969	23.972	23.972	23.971	23.971	23.971

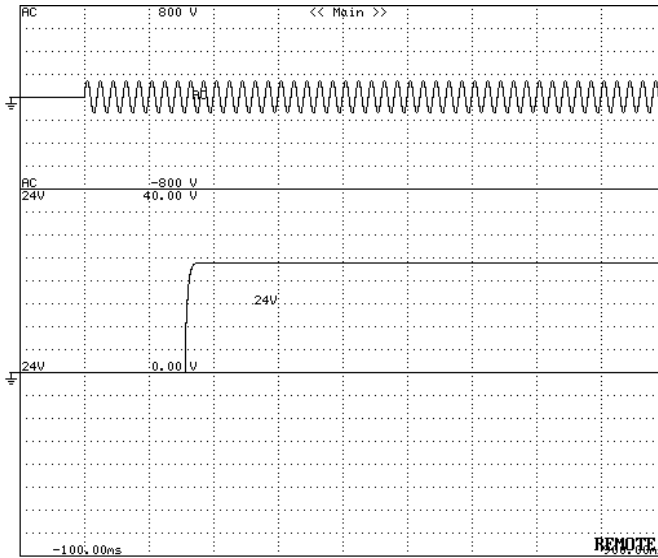
Load Condition	
Ambient Temp. (°C)	Load Current [A]
-25	10.00
25	10.00
50	10.00
75	3.00

Model	UDP-240-A24	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	

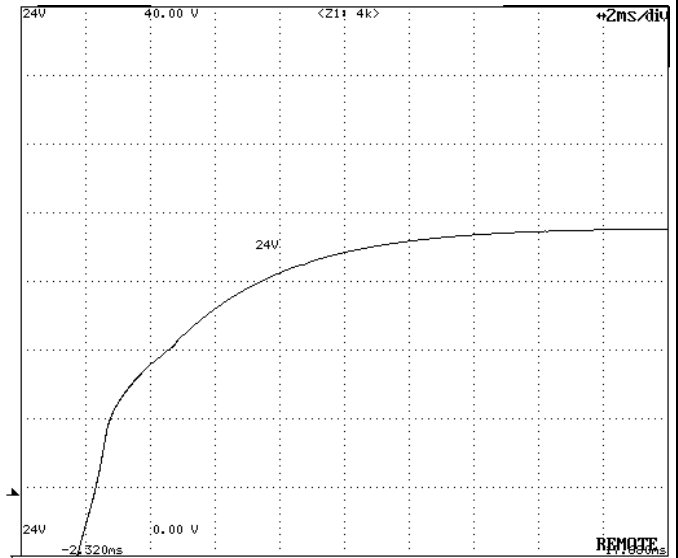
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div
Timebase Range: 2ms/div



All Output Start-up Sequence

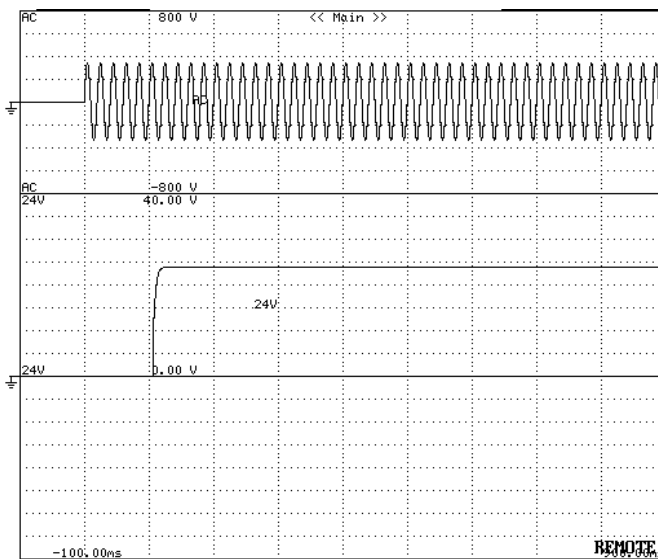


24V DC Output Rise Characteristics

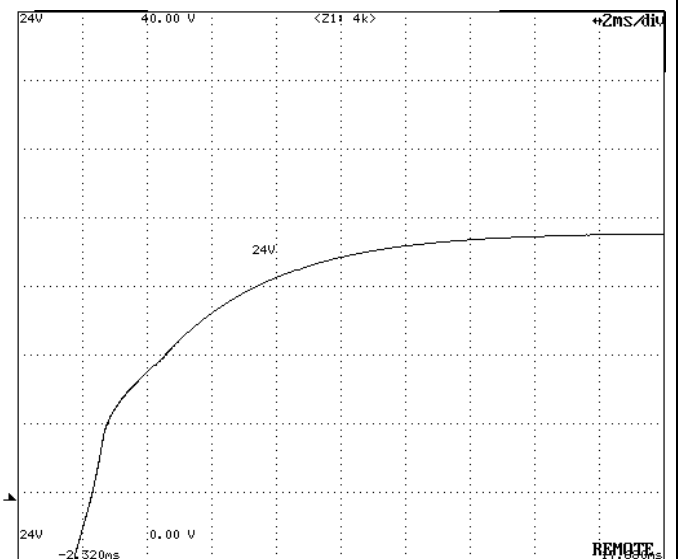
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div
Timebase Range: 2ms/div



All Output Start-up Sequence

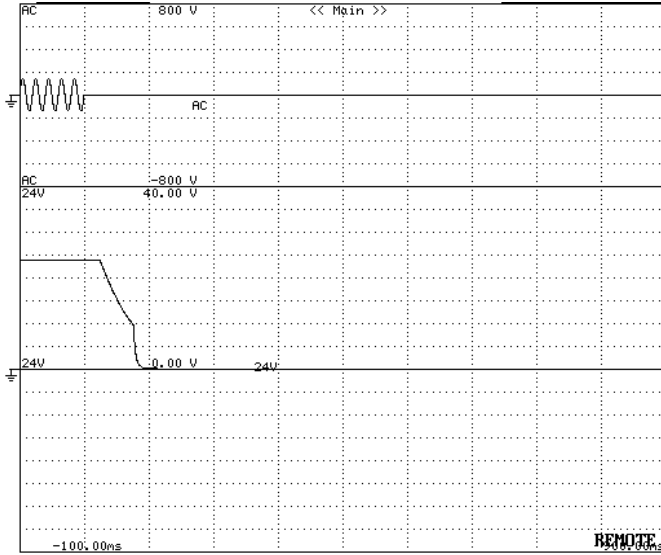


24V DC Output Rise Characteristics

Model	UDP-240-A24	Temperature: 25°C
Item	Output Fall Characteristics (at AC Power OFF)	

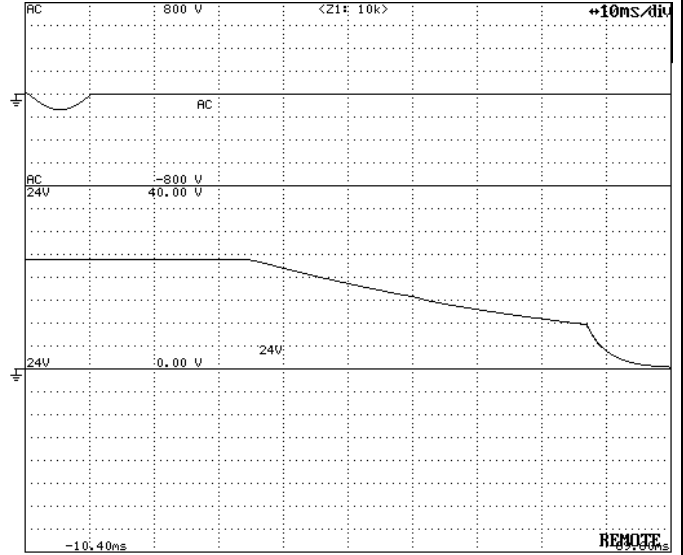
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div



Output Fall Characteristics

Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

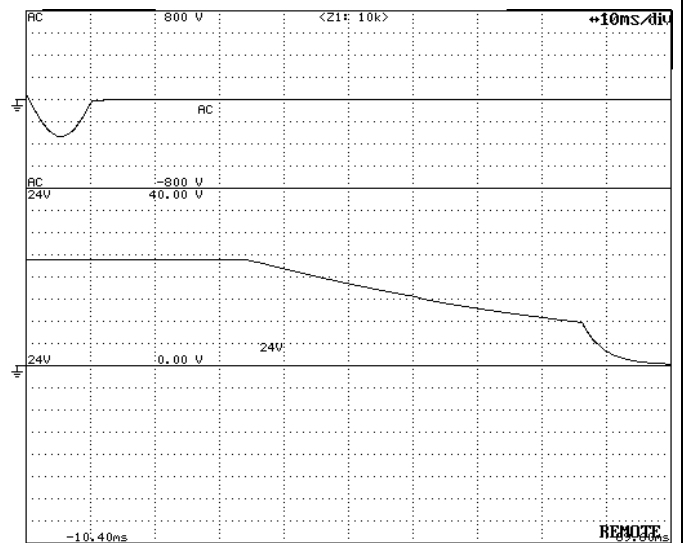
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div



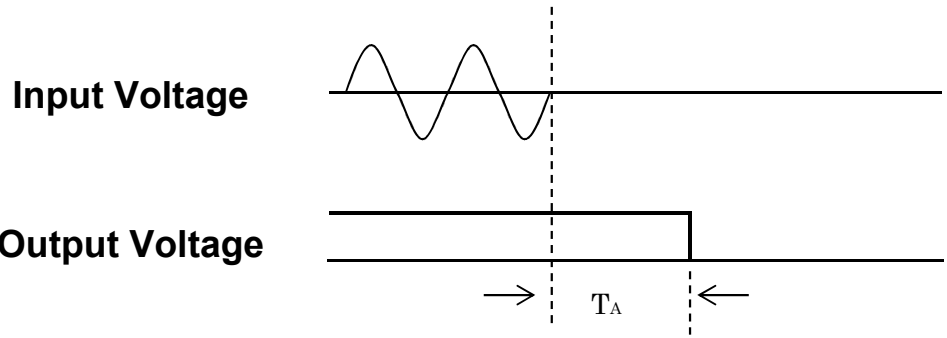
Output Fall Characteristics

Timebase Range: 10ms/div

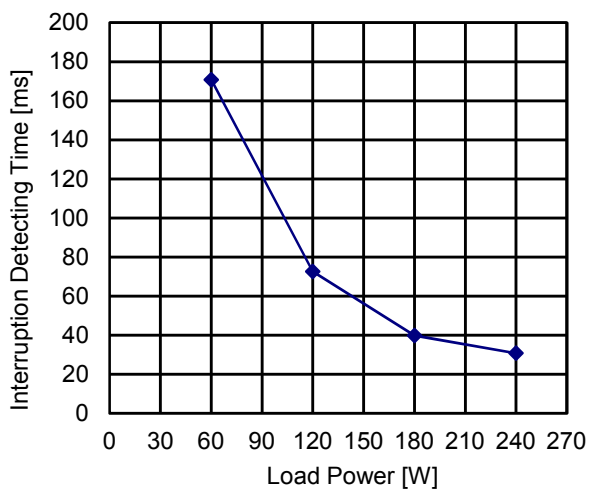


Output Fall Characteristics (magnification)

Model	UDP-240-A24	Temperature: 25°C
Item	Instantaneous Interruption Compensation (by Load Power)	

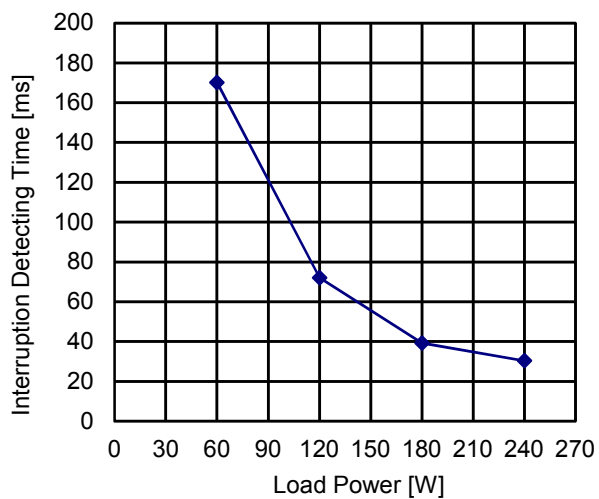


Input Voltage:100V AC



Load Power [W]	Interruption Detecting Time [ms]
	Output Voltage
	T_A
60.0	170.8
120.0	72.6
180.0	39.9
240.0	30.8

Input Voltage:240V AC

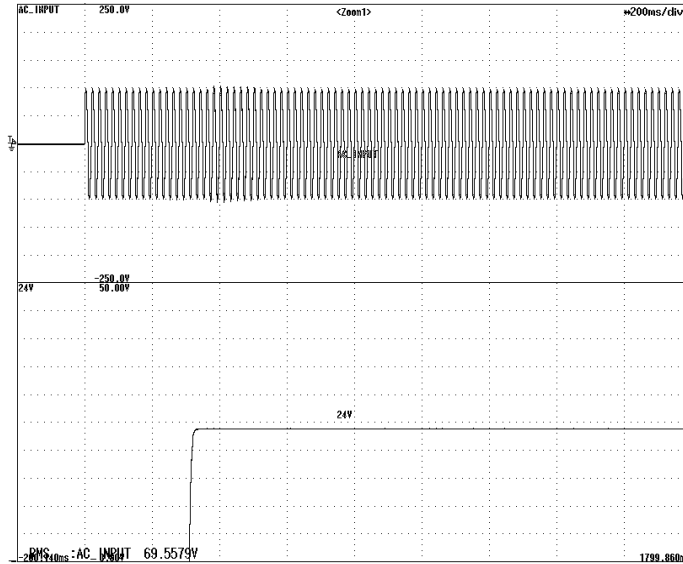


Load Power [W]	Interruption Detecting Time [ms]
	Output Voltage
	T_A
60.0	170.2
120.0	72.0
180.0	39.2
240.0	30.3

Model	UDP-240-A24	Temperature: 25°C
Item	Start-Up Voltage	

**Timebase Range: 200ms/div
Load: Rated Load**

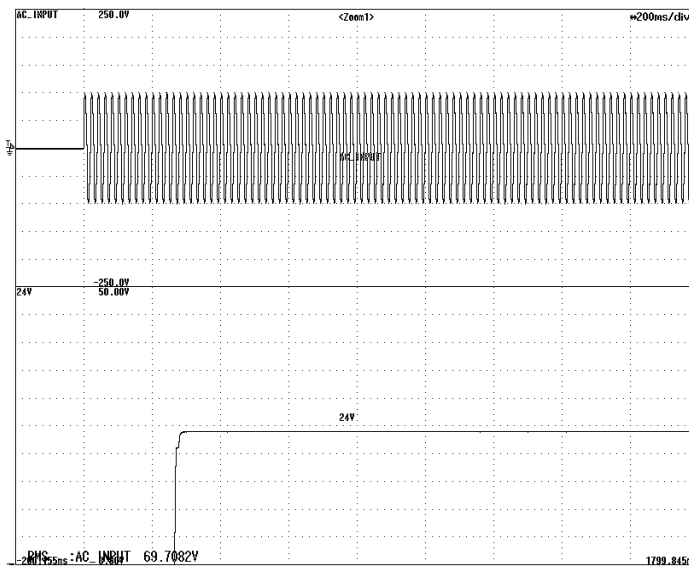
AC Input



Start-up Voltage: 69.56V AC

**Timebase Range: 200ms/div
Load: Minimum Load**

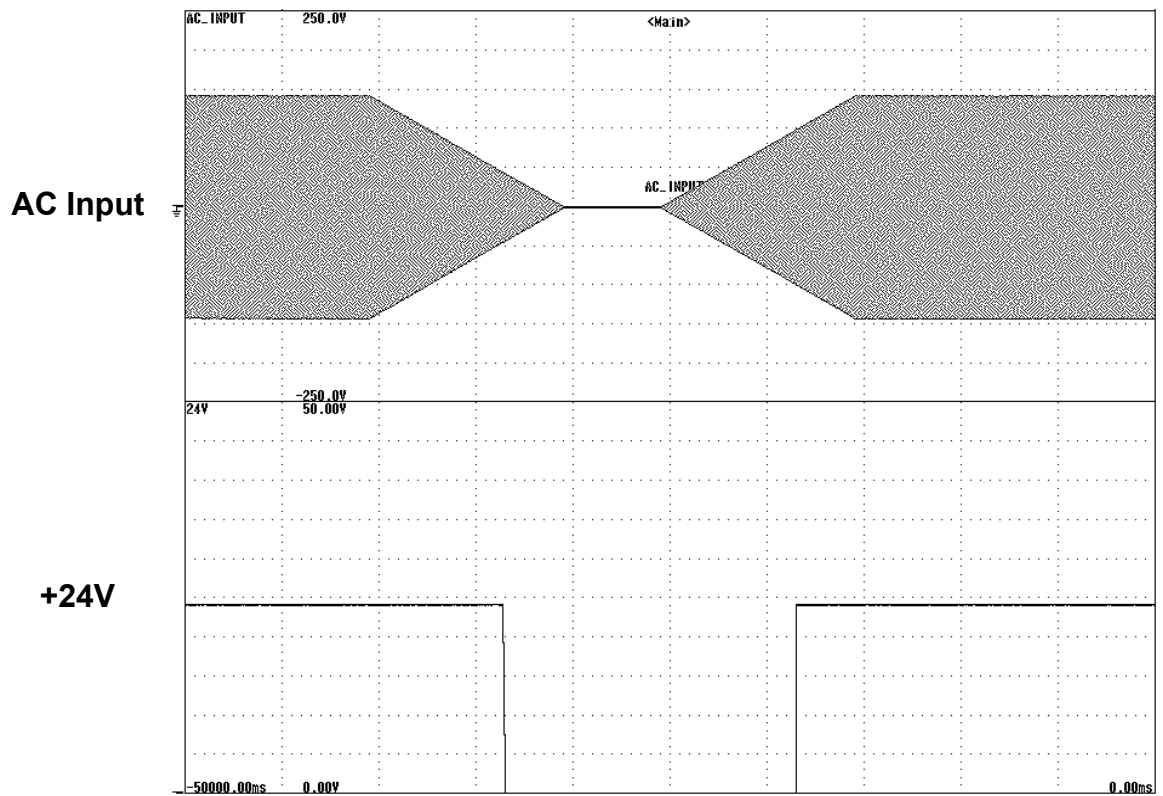
AC Input



Start-up Voltage: 69.7V AC

Model	UDP-240-A24	Temperature: 25°C
Item	Input Voltage Sweep Up/Down	

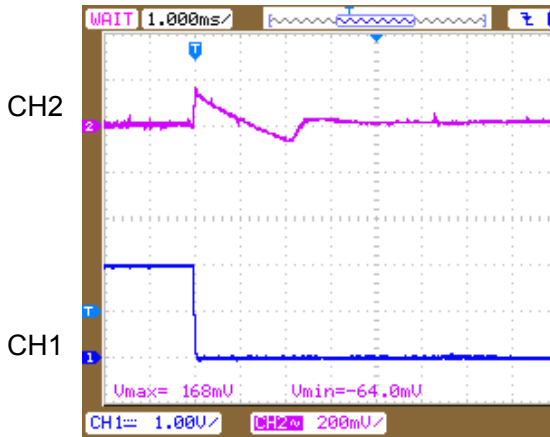
Timebase Range: 5s/div
Load: Rated Load



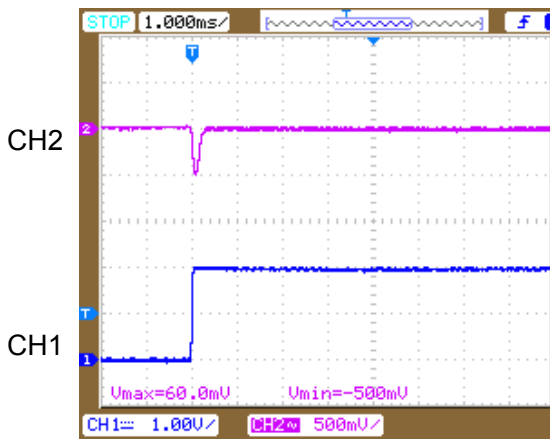
Sweep Rate: 10Vave/sec

Model	UDP-240-A24	Temperature: 25°C
Item	Dynamic Load Response	

+24V DC Output Transient Response Waveforms

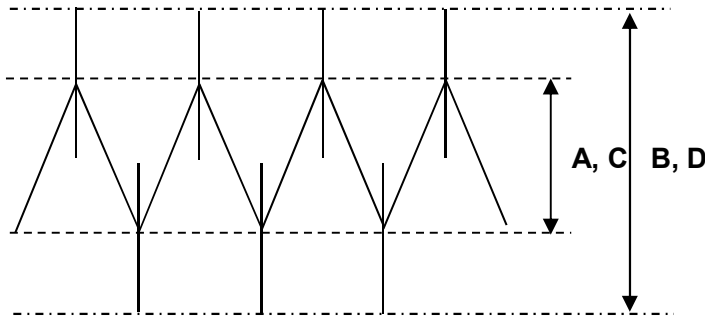


Waveform No.1	
CH2	DC Output voltage Range: 200mV/div
CH1	DC Output current Range: 5A/div
Temporal axis	1 ms/div
Conditions	Input: 100V AC
[Note] 24V Output current: Rated load ⇒ 0A	



Waveform No.2	
CH2	DC Output voltage Range: 500mV/div
CH1	DC Output current Range: 5A/div
Temporal axis	1 ms/div
Conditions	Input: 100V AC
[Note] 24V Output current: 0A ⇒ Rated load	

Model	UDP-240-A24	Load: Rated Load
Item	Ripple / Noise Voltage	



at 100V AC

A: Ripple Voltage (mV_{P-P})

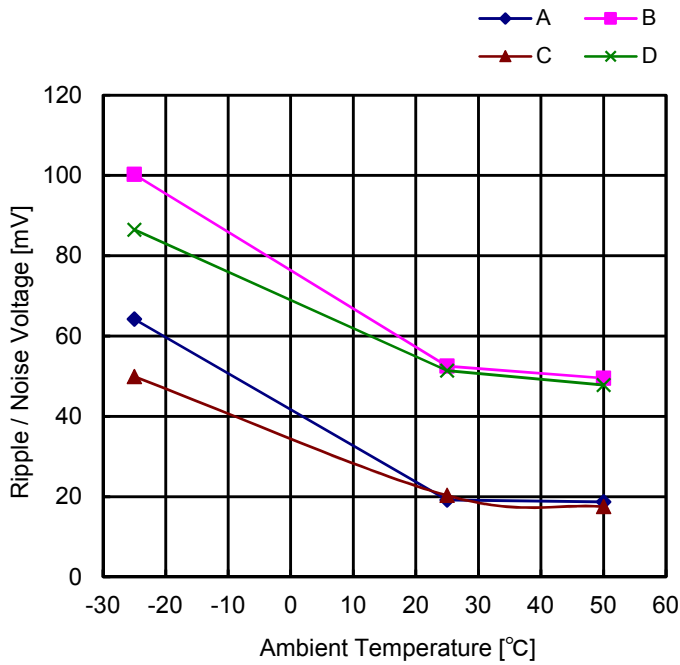
B: Noise Voltage (mV_{P-P})

at 240V AC

C: Ripple Voltage (mV_{P-P})

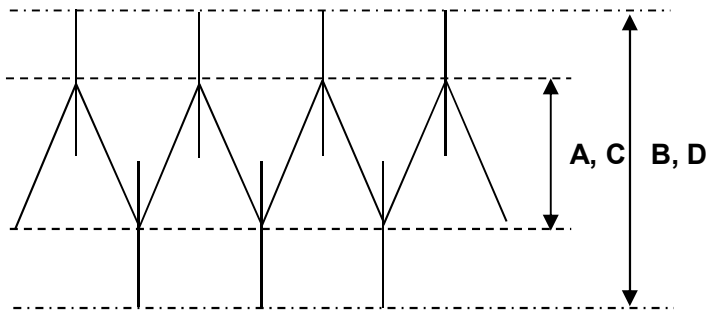
D: Noise Voltage (mV_{P-P})

24V



Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-25	64.2	100.3	49.9	86.5
25	19.2	52.5	20.3	51.4
50	18.7	49.5	17.5	47.8

Model	UDP-240-A24	Temperature: 25°C
Item	Ripple / Noise Voltage	



at 100V AC

A: Ripple Voltage (mV_{P-P})

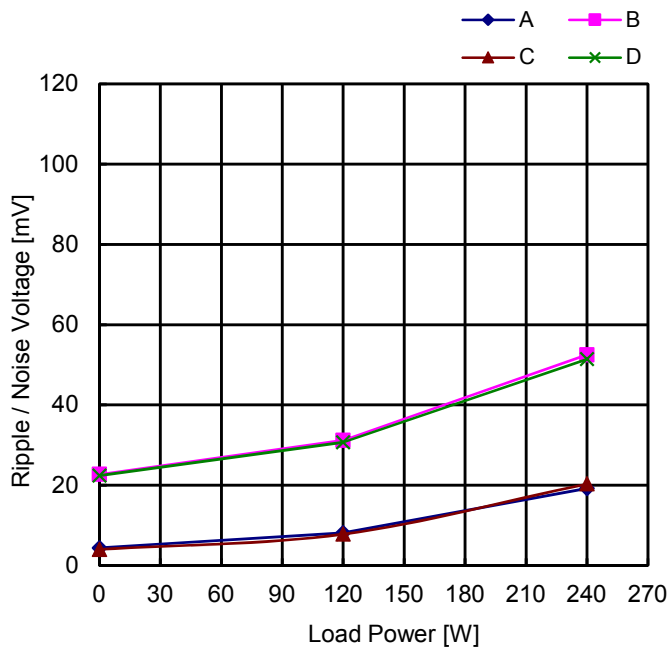
B: Noise Voltage (mV_{P-P})

at 240V AC

C: Ripple Voltage (mV_{P-P})

D: Noise Voltage (mV_{P-P})

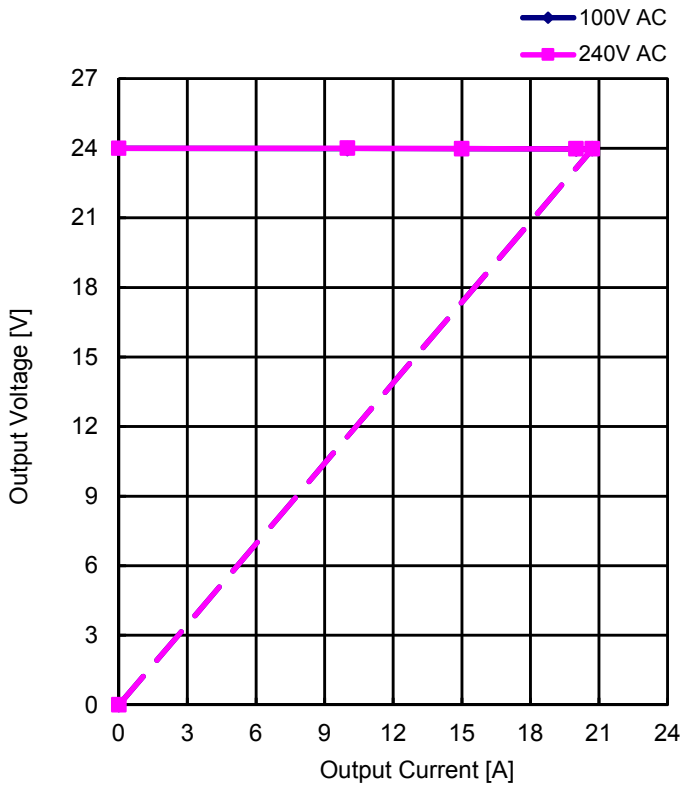
24V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	4.4	22.7	4.0	22.4
120	8.1	31.2	7.8	30.7
240	19.2	52.5	20.3	51.4

Model	UDP-240-A24	Temperature: 25°C
Item	Over-Current Protection	

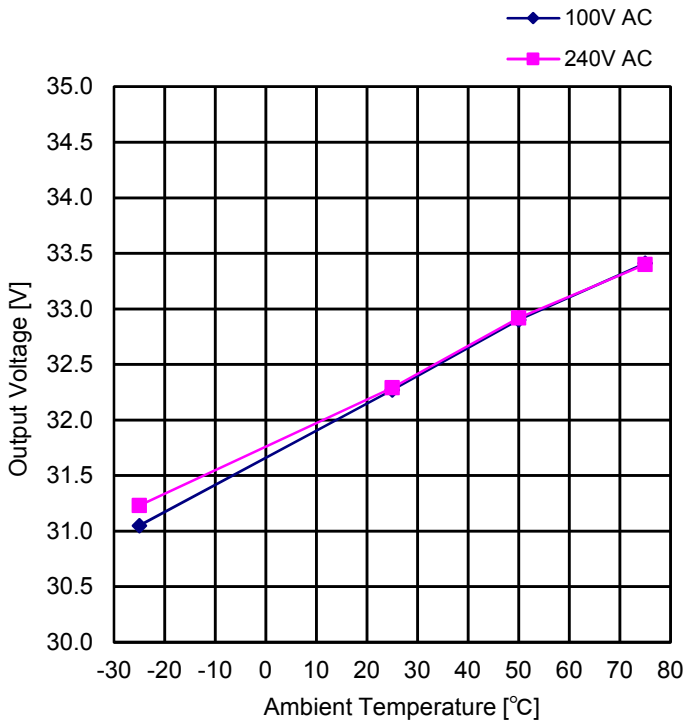
V-I Characteristics of 24V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	24.00	0.00	24.00
10.00	23.99	10.00	24.00
15.00	23.98	15.00	23.98
20.00	23.98	20.00	23.98

Model	UDP-240-A24	Load: Minimum Load
Item	Over-Voltage Protection	Temperature: 25°C

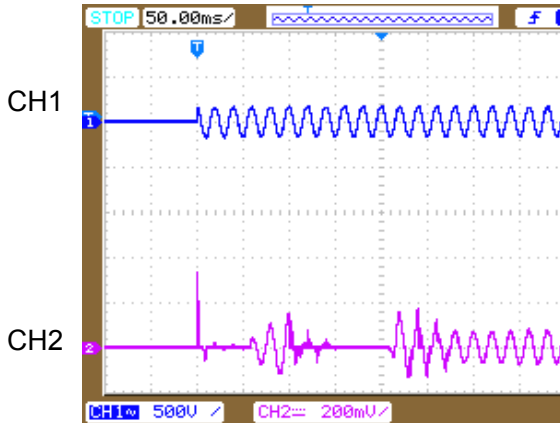
+24V



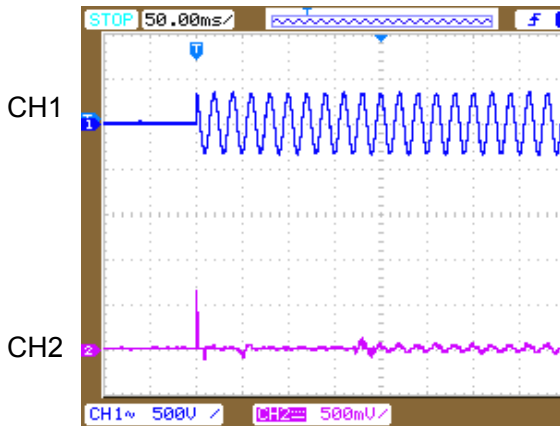
Ambient Temp. [°C]	Output Voltage[V]	
	Input Voltage 100V AC	Input Voltage 240V AC
-25	31.05	31.23
25	32.27	32.29
50	32.90	32.92
75	33.41	33.40

Model	UDP-240-A24	Temperature: 25°C
Item	Inrush Current	Load: Rated Load

Inrush Current Waveforms

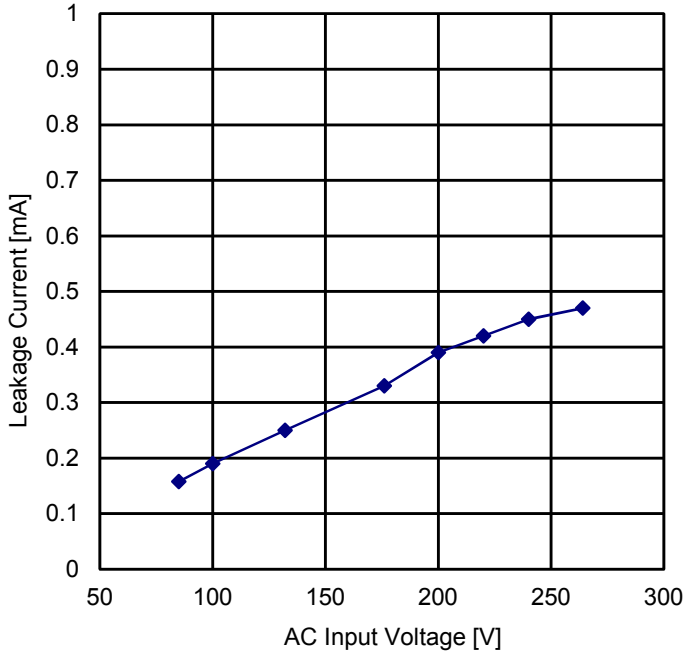


Waveform No.1	
CH1	AC Input voltage Range: 500V/div
CH2	AC Input current Range: 10A/div
Temporal axis	50 ms/div
Conditions	Input: 115V AC Frequency: 50 Hz
[Note] Measured current: 19.2A	



Waveform No.2	
CH1	AC Input voltage Range: 500V/div
CH2	AC Input current Range: 25A/div
Temporal axis	50 ms/div
Conditions	Input: 230V AC Frequency: 50 Hz
[Note] Measured current: 38.0A	

Model	UDP-240-A24	Load: Rated Load
Item	Leakage Current	



AC Input Voltage [V]	Leakage Current [mA]
85	0.16
100	0.19
132	0.25
176	0.33
200	0.39
220	0.42
240	0.45
264	0.47