DRL100-24-1/C2

EVALUATION DATA

INDEX

Terminology used

Vin	....	Input voltage
Vout	....	Output voltage
Iin	....	Input current
Iout	....	Output current
Ta	....	Ambient temperature
f	....	Frequency

TDK-Lambda

1.1   Circuit used for determination

Circuit 1 used for determination
- ・Steady state data
- ・Over current protection (OCP) characteristics
- ・Over voltage protection (OVP) characteristics
- ・Output rise characteristics
- ・Output fall characteristics
- ・Hold up time characteristics
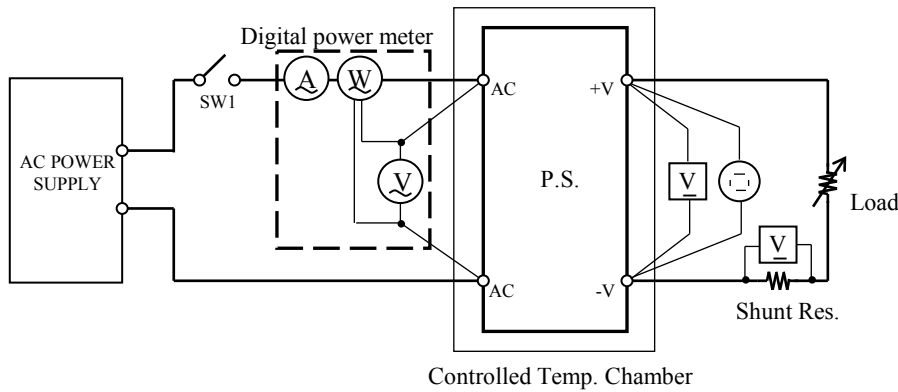
Circuit 2 used for determination
- ・Dynamic load response characteristics
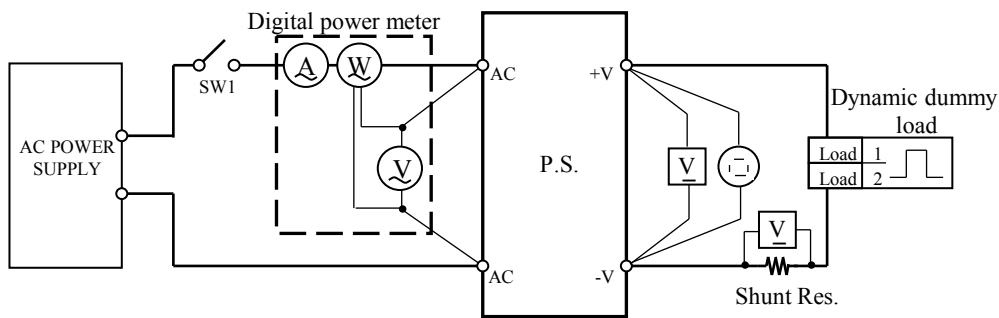
Output current waveform
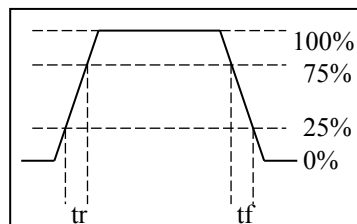
Circuit 3 used for determination
- ・Output ripple and noise waveform

TDK-Lambda   T-1
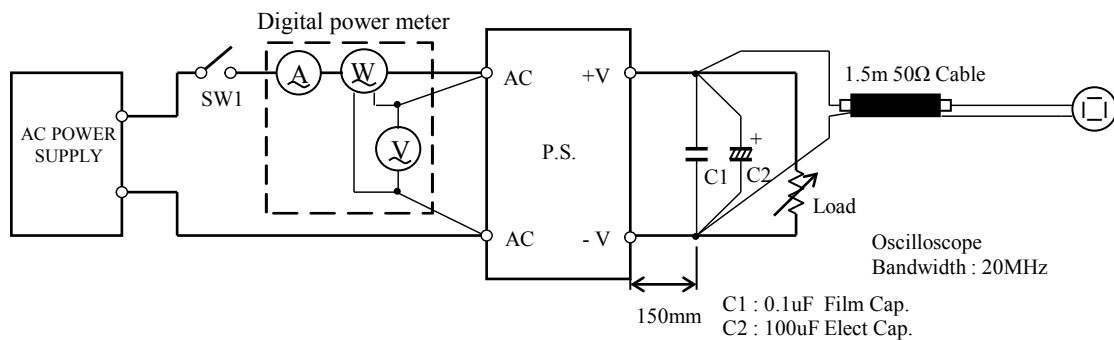
1.2 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA	DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	HIOKI	3333
4	CURRENT PROBE/AMPLIFIER	YOKOGAWA	701931
5	DATA ACQUISITION UNIT	AGILENT	34970A
6	DYNAMIC DUMMY LOAD	CHROMA	63112A
7	CONTROLLED TEMP. CHAMBER	ESPEC	SH-641
9	AC SOURCE	CHROMA	61505

2.Characteristics

2.1 Steady State Data

(1)   Regulation - Line and Load, Temperature Drift , Start up voltage and Drop out voltage

Conditions: Ta= 25°C

1. Regulation - Line and Load

24V	Io	Vin	85Vac	115Vac	230Vac	265Vac	Line Regulation	
	0%		24.11	24.11	24.11	24.11	0.000	0.00%
	50%		24.11	24.11	24.11	24.11	0.004	0.02%
	100%		24.10	24.10	24.10	24.10	0.001	0.00%
Load		0%	0.009	0.010	0.010	0.009	85V	265V
Regulation		100%	0.04%	0.04%	0.04%	0.04%		

Conditions: Vin= 115Vac
                         Io= 100%

2. Temperature Drift

Ta	-30°C	25°C	70°C	Temp. Stability	
Vout	24.140	24.100	24.046	0.094	0.392%

Conditions: Ta= 25°C
                         Io= 100%

3. Start up voltage and Drop out voltage
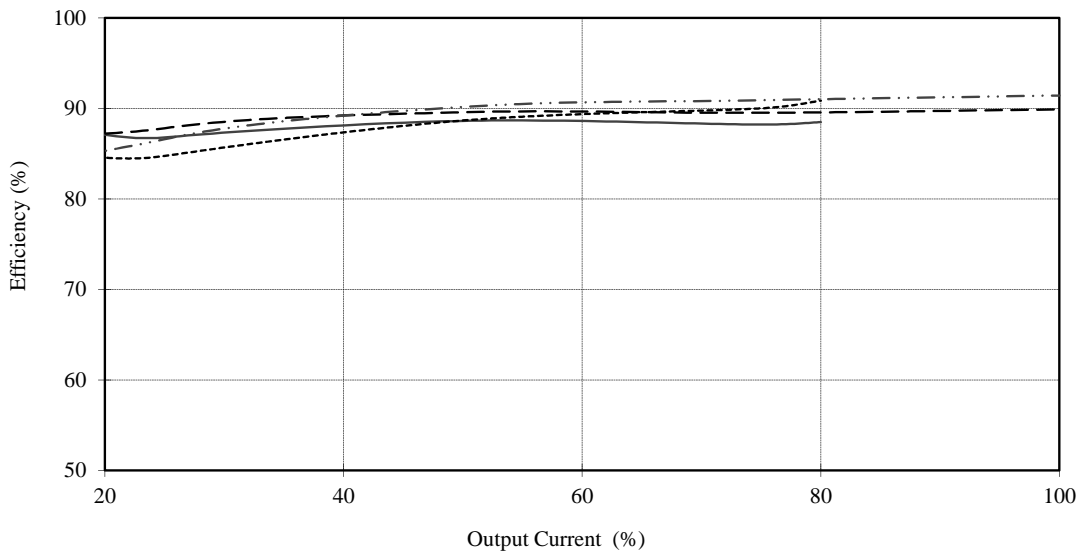
Start up voltage (Vin)	71 VAC
Drop out voltage (Vin)	69 VAC

1 Steady State Data

(2) Efficiency vs. Output Current

Conditions: Vin= 85Vac   ———
                115Vac   — — —
                230Vac   —··—··—
                265Vac   - - - - - -
          Ta= 25°C

| 24V |

Efficiency (%)

Output Current (%)

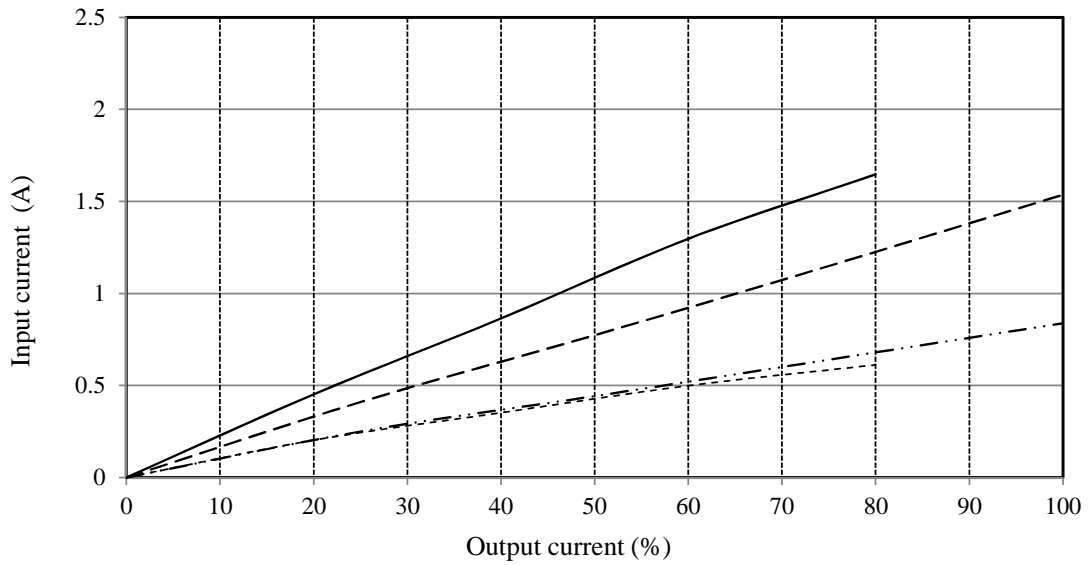## 1 Steady State Data

(3) Input Current vs. Output Current

Conditions:　Vin= 85Vac ————
　　　　　　　　　　115Vac - - - -
　　　　　　　　　　230Vac —··—··—
　　　　　　　　　　265Vac - - - - -
　　　　　　Ta= 25°C

24V

Vin	Input Current	Output Current
85Vac	1.647A	80%
115Vac	1.536A	100%
230Vac	0.838A	100%
265Vac	0.612A	80%

1 Steady State Data

(4)   Input power vs. Output Current

Conditions: Vin= 85Vac   ————
                     115Vac   — — — —
                     230Vac   —··—··—
                     265Vac   ------
             Ta= 25°C

24V

Vin	Input Power	Output Current
85Vac	80.1W	80%
115Vac	98.2W	100%
230Vac	96.6W	100%
265Vac	78.0W	80%

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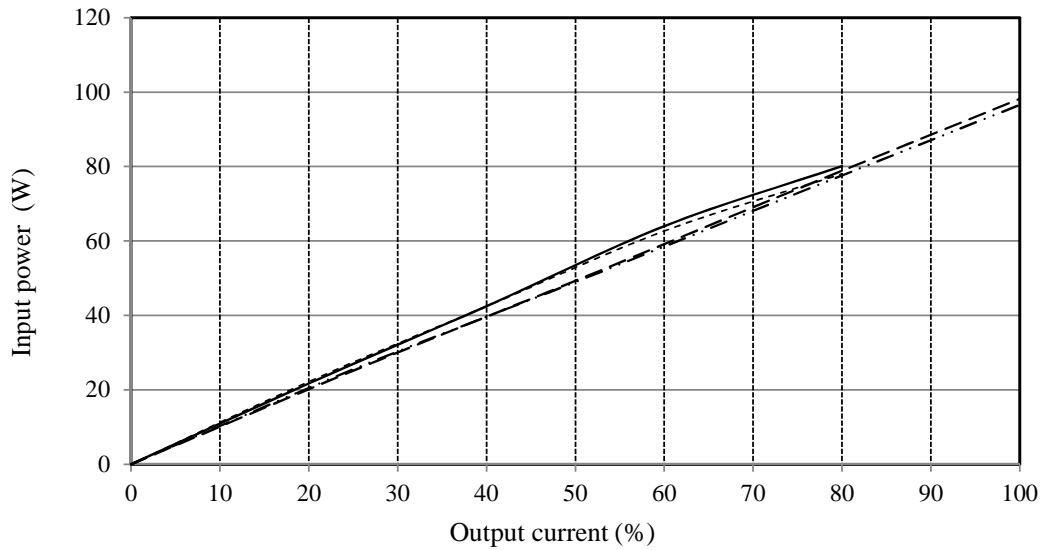
2.2 Over Current Protection (OCP) characteristics

Conditions :   Vin = 85VAC ————
                     = 115VAC — — — —
                     = 230VAC - - - - - -
                     = 265VAC — · — · — ·
               Ta = 25°C

24V

TDK-Lambda   T-7
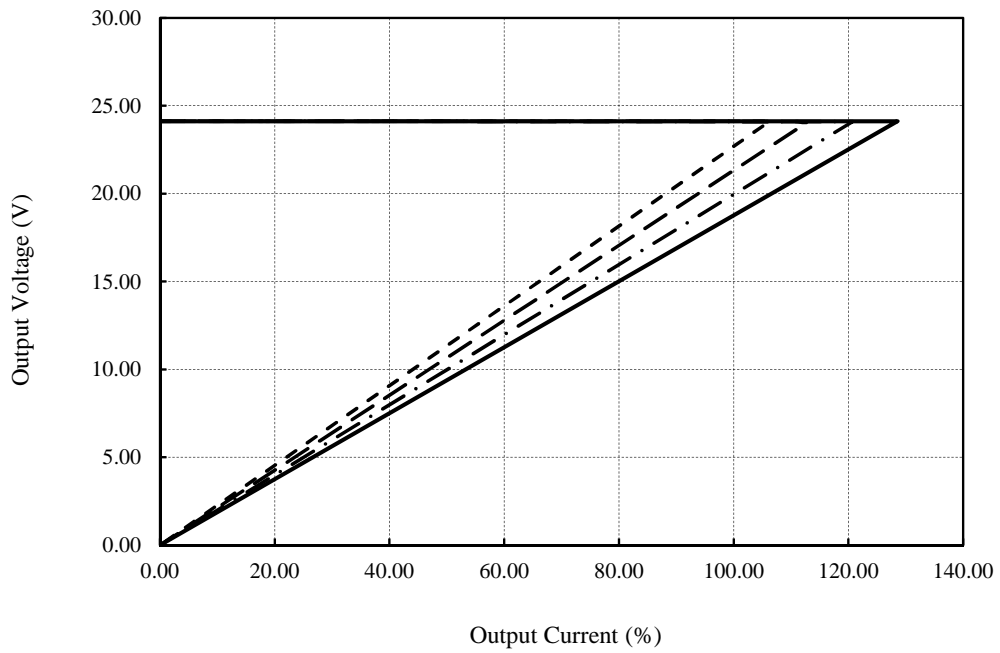
2.3 Over Voltage Protection (OVP) characteristics

24V

Conditions: Vin = 115VAC
                Iout = 0%
                 Ta = 25°C

10V/DIV	50s/DIV
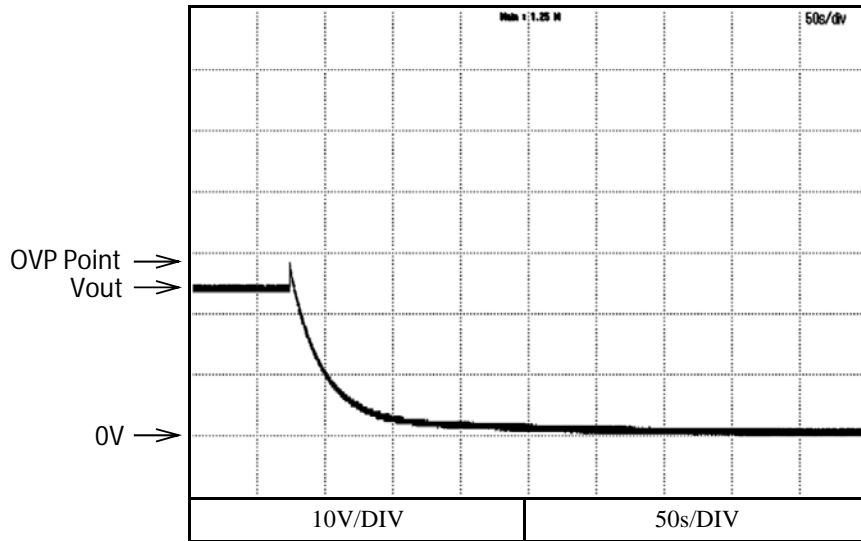
Conditions: Vin = 230VAC
                Iout = 0%
                 Ta = 25°C
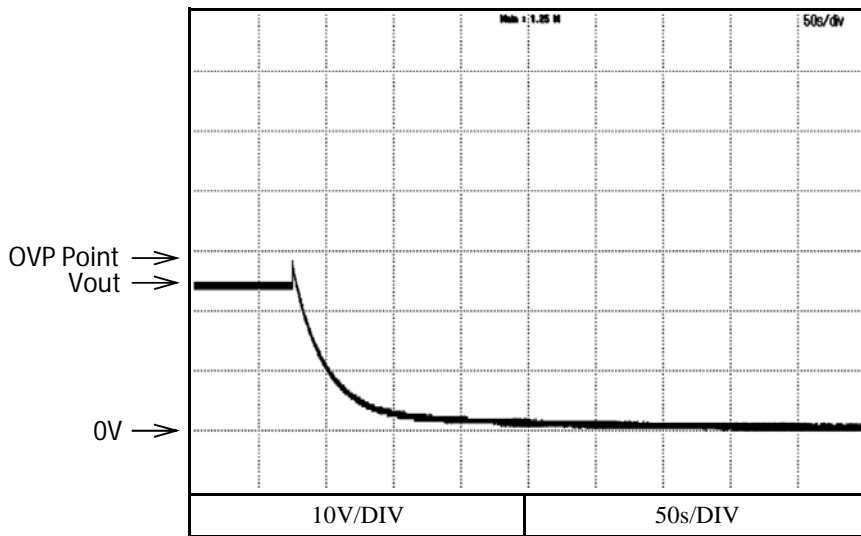
10V/DIV	50s/DIV

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2.4 Output Rise Characteristics
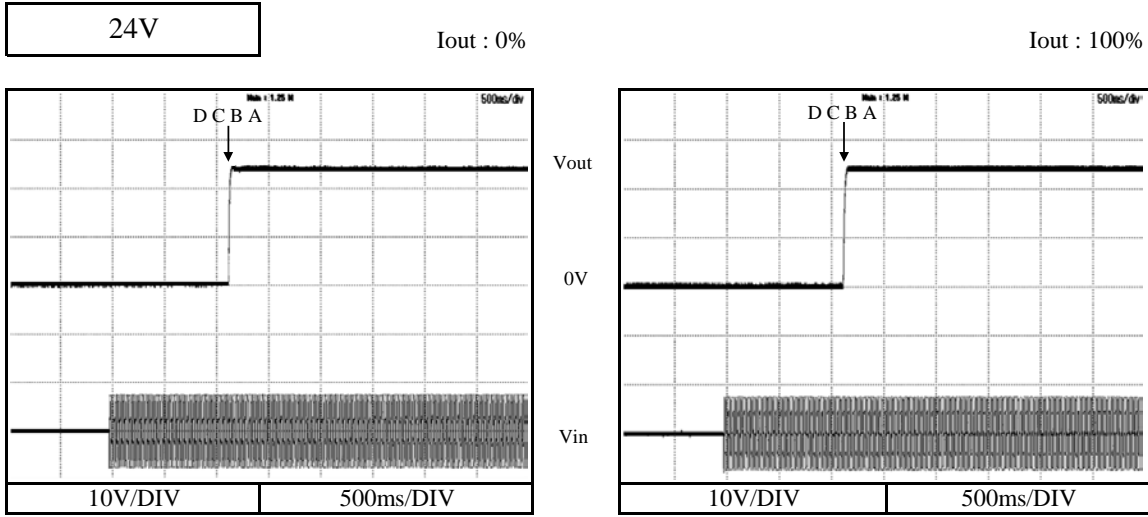
Conditions: Vin : 85VAC (A)
115VAC (B)
230VAC (C)
265VAC (D)
Ta : 25°C

24V

Iout : 0%

Iout : 100%

10V/DIV	500ms/DIV

Vout

0V

Vin

10V/DIV	500ms/DIV

2.5 Output Fall Characteristics

Conditions: Vin : 85VAC (A)
                      115VAC (B)
                      230VAC (C)
                      265VAC (D)
              Ta : 25°C

24V

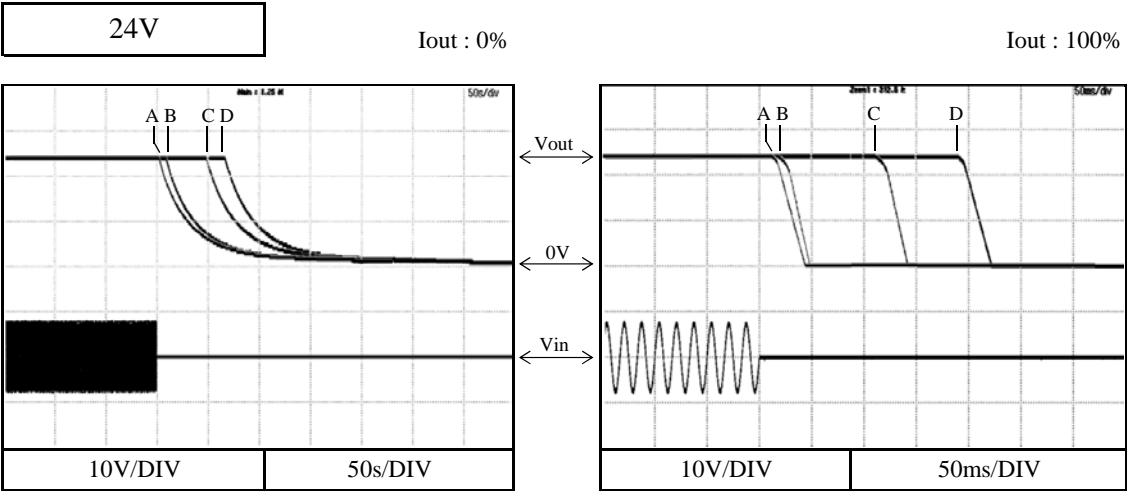Iout : 0%   Iout : 100%

10V/DIV	50s/DIV

10V/DIV	50ms/DIV

Vout
0V
Vin

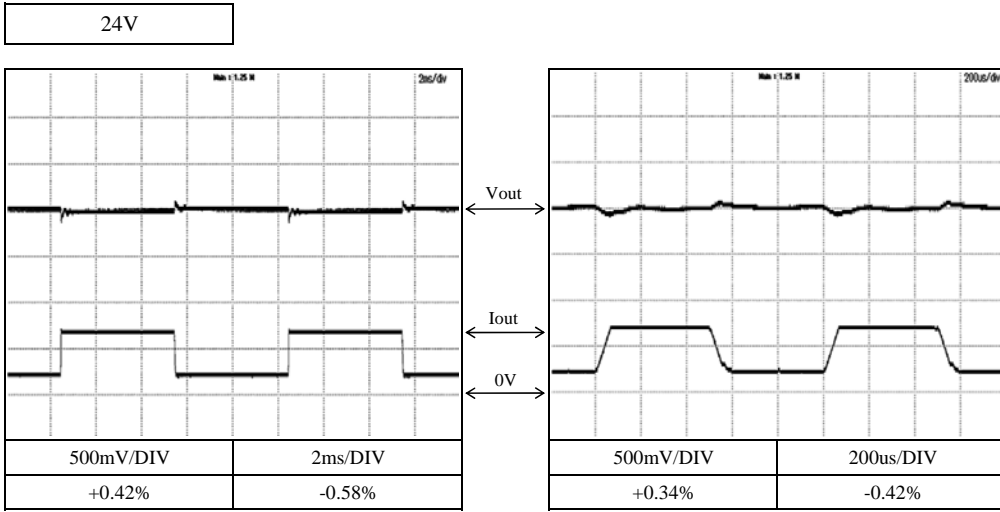**2.6 Hold Up Time Characteristics**

Conditions: Vin : 115VAC ——
230VAC – · –

Ta : 25°C

24V
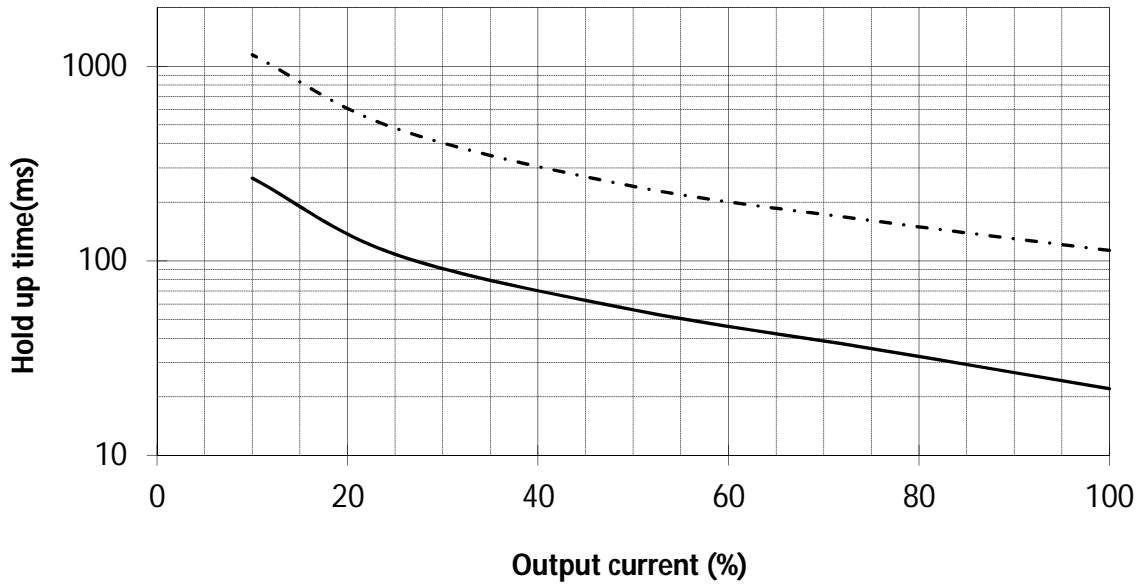
2.7 Dynamic Load Response Characteristics

Conditions: Vin : 115VAC
Iout : 25% ⟷ 75%
(tr = tf = 75us)
Ta : 25°C

24V

| Vout |
| Iout |
| 0V |

500mV/DIV	2ms/DIV	500mV/DIV	200us/DIV
+0.42%	-0.58%	+0.34%	-0.42%

Conditions: Vin : 230VAC
Iout : 25% ⟷ 75%
(tr = tf = 75us)
Ta : 25°C

| Vout |
| Iout |
| 0V |

500mV/DIV	2ms/DIV	500mV/DIV	200us/DIV
+0.42%	-0.58%	+0.34%	-0.42%

TDK-Lambda
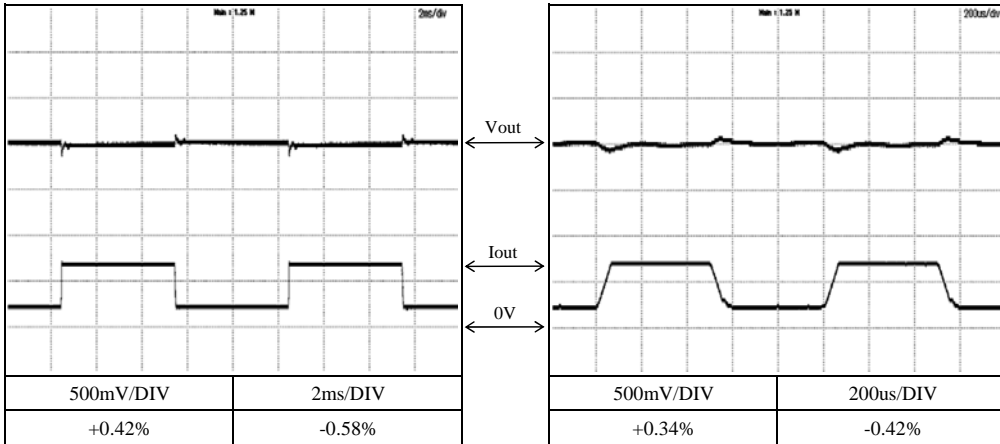
2.8 Response to Brown out Characteristics

A: Output voltage does not drop.   Conditions   Vin = 115Vac
B : Output voltage drop down not reaching 0V.   Io = 100%
C : Output voltage drops until 0V.   Ta = 25°C

24V

A = 17ms

B = 30ms

C = 45ms

Vout/Vin	Time
10V/200Vac /DIV	50ms /DIV

A: Output voltage does not drop.   Conditions   Vin = 230Vac
B : Output voltage drop down not reaching 0V.   Io = 100%
C : Output voltage drops until 0V.   Ta = 25°C

24V

A = 100ms

B = 126ms

C = 133ms

Vout/Vin	Time
10V/500Vac /DIV	50ms /DIV

TDK-Lambda
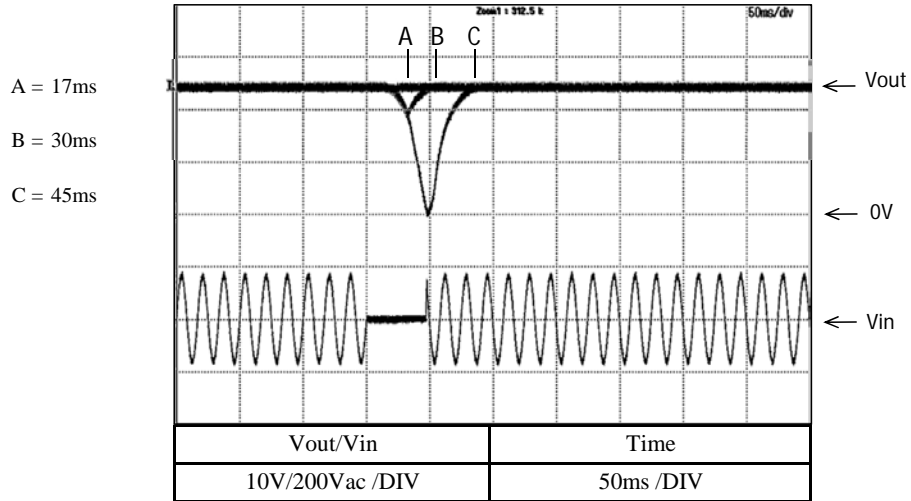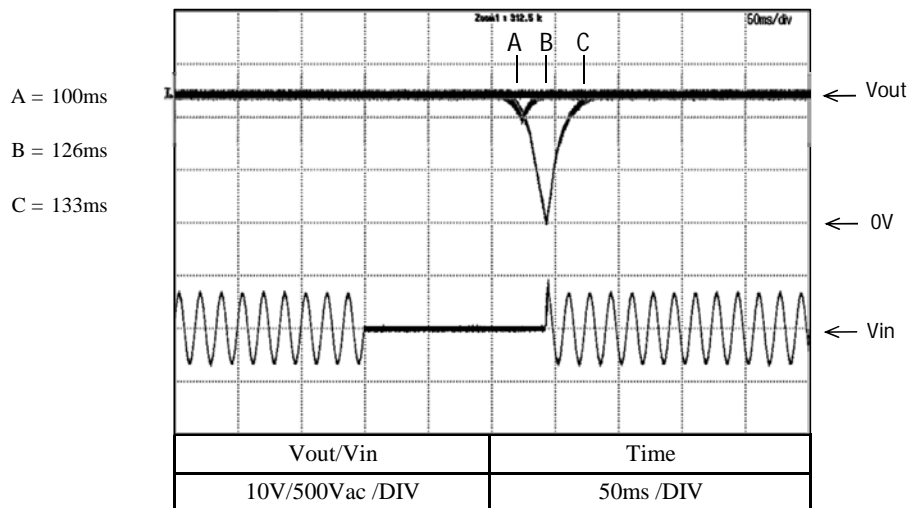
2.9 Output Ripple and Noise Waveform

Conditions: Vin = 115VAC
Ta = 25°C

| 24V | | Iout:0% | | Iout:100% |

Vout	Time
50mV/DIV	5ms/DIV

Vout	Time
50mV/DIV	5us/DIV

0V

Conditions: Vin = 230VAC
Ta = 25°C

| 24V | | Iout:0% | | Iout:100% |

Vout	Time
50mV/DIV	5ms/DIV

Vout	Time
50mV/DIV	5us/DIV

0V

TDK-Lambda