

귀중

Evaluation Data

품 목	SMPS
품 명	CSF30-S
Rev. No.	A

2007 년 4 월 13 일

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Evaluation data

1. CSF30-05

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 - . Inrush Current Characteristics
 - . Input Current & Efficiency Characteristics
2. Output characteristics
 - . Line & Load Regulation Characteristics
 - . Dynamic Load Response Characteristics
 - . Ripple & Noise Characteristics
 - . Turn on Time Characteristics
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 - . Over Current Protection Characteristics
 - . Over Voltage Protection Characteristics

2. CSF30-09

1. Input characteristics
2. Output characteristics

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1. Input characteristics
2. Output characteristics

4. CSF30-15

1. Input characteristics
2. Output characteristics

5. CSF30-24

1. Input characteristics
2. Output characteristics

6. CSF30-48

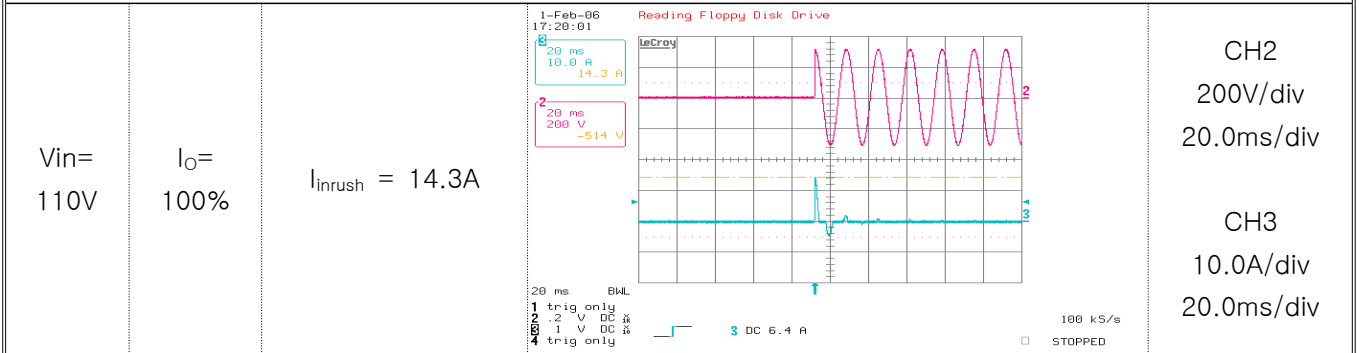
1. Input characteristics
2. Output characteristics

1-1. CSF30-05 Input characteristics

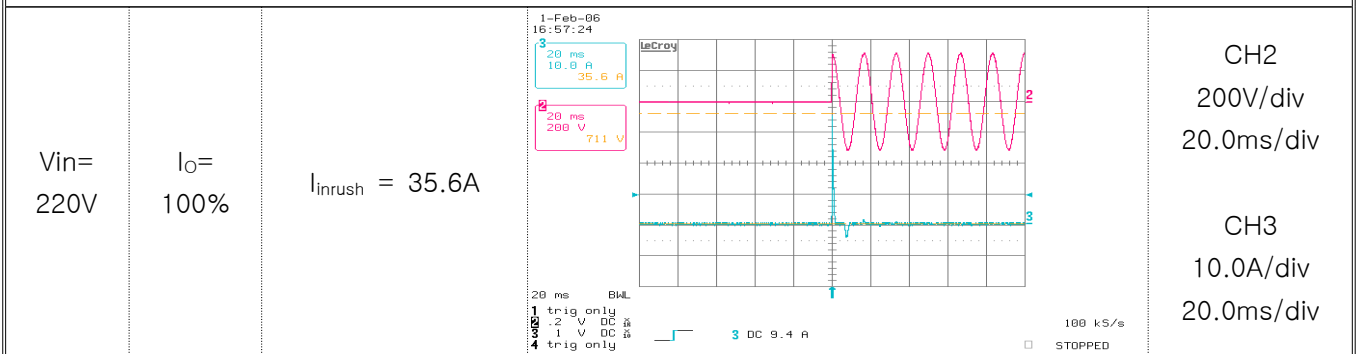
- ◆ (1) Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)



(2) Inrush Current Characteristics (220V)



(3) Input Current & Efficiency Characteristics

Condition $T_a : 25^\circ C$

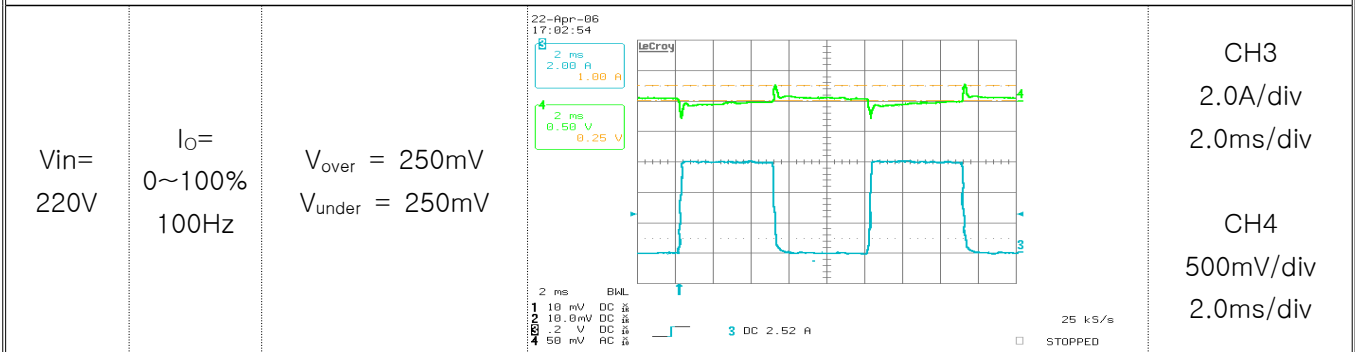
Vin		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.03A	0.03A	0.03A	0.03A	0.03A	0.03A
	Efficiency	–	–	–	–	–	–
Load (50%)	Input Current	0.41A	0.34A	0.30A	0.25A	0.21A	0.19A
	Efficiency	73.7%	73.9%	73.6%	72.2%	70.6%	67.6%
Load (100%)	Input Current	0.81A	0.67A	0.58A	0.48A	0.40A	0.36A
	Efficiency	70.8%	72.4%	74.2%	74.3%	73.3%	71.6%

1-2. CSF30-05 Output characteristics

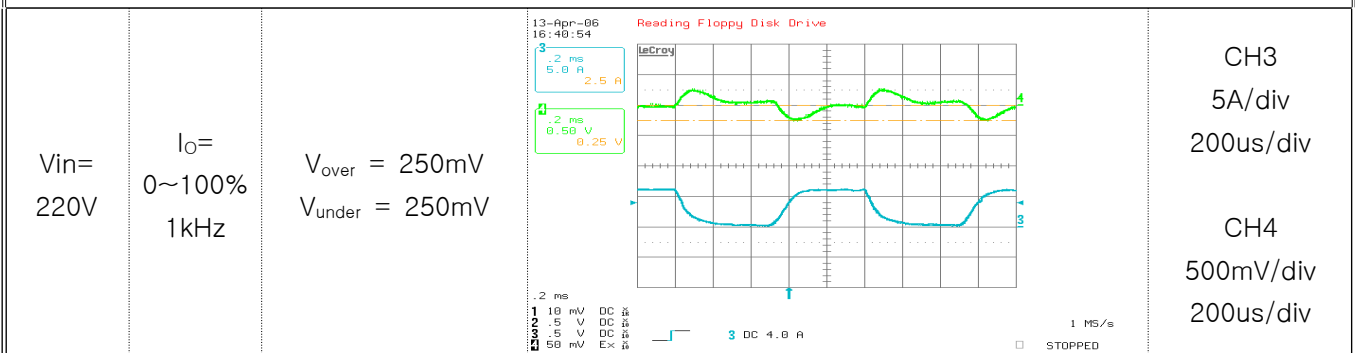
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Output current – AP015 current probe
 - ◇ CH4 : Output voltage – DA1855 differential probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
V_{in}	85V	110V	132V	170V	220V	264V	Line Regulation
I_o							
Load (min)	5.028V	5.028V	5.028V	5.028V	5.028V	5.028V	0mV
Load (50%)	5.025V	5.025V	5.025V	5.026V	5.026V	5.026V	1mV
Load (100%)	5.022V	5.022V	5.022V	5.022V	5.021V	5.021V	1mV
Load Regulation	6mV	6mV	6mV	6mV	7mV	7mV	

(3) Dynamic Load Response Characteristics (100Hz)



(4) Dynamic Load Response Characteristics (1kHz)



1-3. CSF30-05 Output characteristics

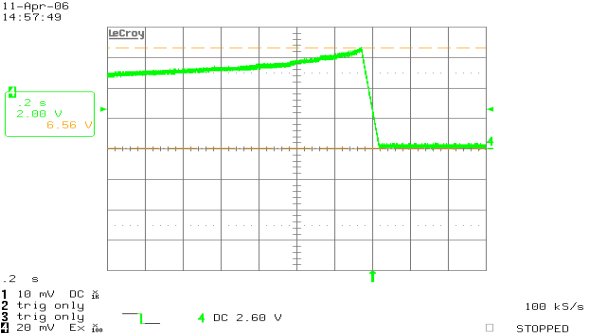
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage - DA1855 Differential Probe(BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage - ADP305 High voltage differential probe

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
Vin= 220V	Io= 100%	V _{Ripple} = 5.3mV V _{Noise} = 29.6mV		CH4: 10.0mV/div 5.0us/div
(2) Turn on time characteristics				
Vin= 85V	Io= 100%	t _{turn on} = 728.9ms		CH2 200V/div 200ms/div CH4 2.00V/div 200ms/div
(3) Hold up characteristics				
Vin= 100V	Io= 100%	t _{hold up} = 20.9ms		CH2 100V/div 10.0ms/div CH4 2.00V/div 10.0ms/div
(4) Over Current protection characteristics				
Vin= 220V	Io= 110~145%	O.C.P = 7.5A		X 2.00A/div 10ms/div Y 2.00V/div 10ms/div

1-4. CSF30-05 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
Vin= 220V	I _o = 10%	O.V.P = 6.56V	 <p>11-Apr-06 14:57:49</p> <p>2.00 V 0.20 s 6.56 V</p> <p>1 10 mV DC 2 10 mV DC 3 10 mV DC 4 DC 2.60 V</p> <p>100 kS/s STOPPED</p>	CH4 2.00V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

2-1. CSF30-09 Input characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)

$V_{in} = 110V$	$I_o = 100\%$	$I_{inrush} = 11.1A$		CH2 200V/div 20ms/div CH3 10.0A/div 20ms/div
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(2) Inrush Current Characteristics (220V)

$V_{in} = 220V$	$I_o = 100\%$	$I_{inrush} = 24.8A$		CH2 200V/div 20ms/div CH3 10.0A/div 20ms/div
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(3) Input Current & Efficiency Characteristics

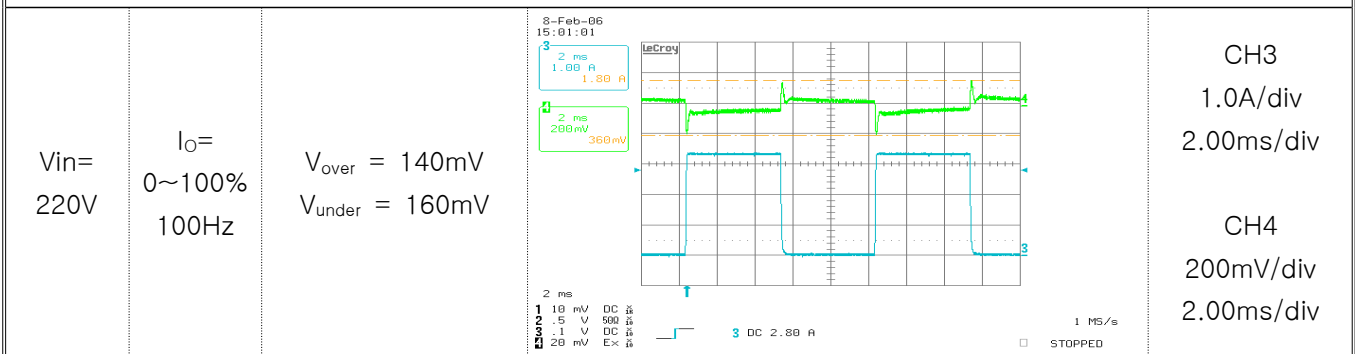
I_o \ V_{in}		Condition $T_a : 25^\circ C$					
		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.02A	0.02A	0.02A	0.02A	0.03A	0.03A
	Efficiency	-	-	-	-	-	-
Load (50%)	Input Current	0.38A	0.31A	0.27A	0.23A	0.20A	0.18A
	Efficiency	78.3%	79.5%	79.2%	76.0%	74.0%	71.7%
Load (100%)	Input Current	0.74A	0.60A	0.52A	0.44A	0.37A	0.33A
	Efficiency	77.9%	79.0%	80.2%	79.7%	79.5%	76.2%

2-2. CSF30-09 Output characteristics

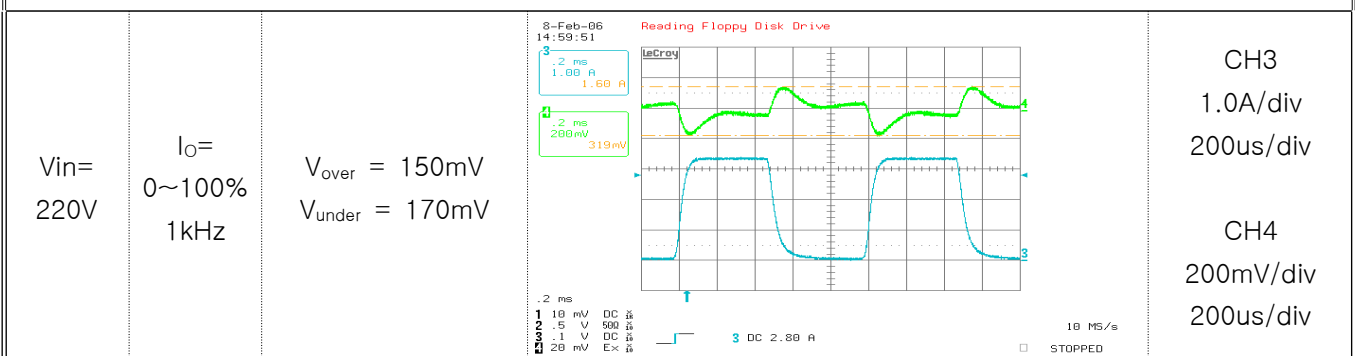
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Output current – AP015 current probe
 - ◇ CH4 : Output voltage – DA1855 differential probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
I_o \ V_{in}	85V	110V	132V	170V	220V	264V	Line Regulation
Load (min)	9.030V	9.030V	9.030V	9.031V	9.031V	9.031V	1mV
Load (50%)	9.028V	9.029V	9.029V	9.029V	9.029V	9.029V	1mV
Load (100%)	9.027V	9.027V	9.027V	9.026V	9.026V	9.026V	1mV
Load Regulation	3mV	3mV	3mV	5mV	5mV	5mV	

(3) Dynamic Load Response Characteristics (100Hz)



(4) Dynamic Load Response Characteristics (1kHz)



2-3. CSF30-09 Output characteristics

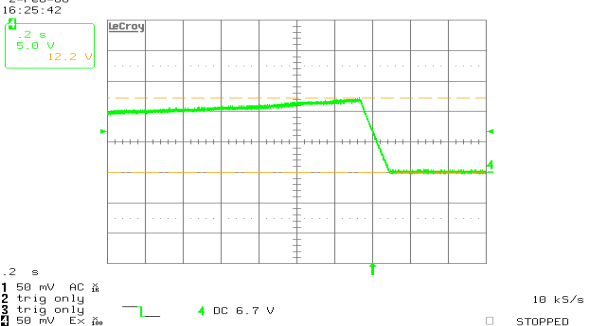
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage – DA1855 Differential Probe (BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
Vin= 220V	Io= 100%	V _{Ripple} = 5.3mV V _{Noise} = 32.1mV		CH4: 10.0mV/div 5.00us/div
(2) Turn on time characteristics				
Vin= 85V	Io= 100%	t _{turn on} = 767.8ms		CH4 5.00V/div 200ms/div CH2 200V/div 200ms/div
(3) Hold up characteristics				
Vin= 100V	Io= 100%	t _{hold up} = 22.6ms		CH4 2.00V/div 10.0ms/div CH2 200V/div 10.0ms/div
(4) Over Current protection characteristics				
Vin= 220V	Io= 110~145%	O.C.P = 4.18A		X 1.00A/div 10ms/div Y 2.00V/div 10ms/div

2-4. CSF30-09 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
$V_{in} = 220V$	$I_o = 10\%$	$O.V.P = 12.2V$	 <p>2-Feb-06 16:25:42</p> <p>1 50 mV AC 500ns 2 trig onlg 3 trig onlg 4 DC 6.7 V</p> <p>10 kS/s STOPPED</p>	CH4 5.00V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

3-1. CSF30-12 Input characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input line voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input line current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)

$V_{in} = 110V$	$I_o = 100\%$	$I_{inrush} = 11.3A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(2) Inrush Current Characteristics (220V)

$V_{in} = 220V$	$I_o = 100\%$	$I_{inrush} = 23.6A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(3) Input Current & Efficiency Characteristics

I_o \ V_{in}		Condition $T_a : 25^\circ C$					
		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.03A	0.03A	0.03A	0.03A	0.03A	0.03A
	Efficiency	-	-	-	-	-	-
Load (50%)	Input Current	0.39A	0.33A	0.29A	0.24A	0.20A	0.19A
	Efficiency	76.0%	76.2%	75.1%	74.8%	72.7%	68.8%
Load (100%)	Input Current	0.75A	0.62A	0.54A	0.45A	0.38A	0.33A
	Efficiency	76.8%	78.0%	78.6%	78.0%	79.4%	76.4%

3-2. CSF30-12 Output characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Output line current – AP015 current probe
 - ◇ CH4 : Output line voltage – ADP305 High voltage differential probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
I_o \ V_{in}	85V	110V	132V	170V	220V	264V	Line Regulation
Load (min)	12.01V	12.01V	12.01V	12.01V	12.01V	12.01V	0mV
Load (50%)	12.01V	12.01V	12.01V	12.01V	12.01V	12.01V	0mV
Load (100%)	12.01V	12.01V	12.01V	12.01V	12.01V	12.01V	0mV
Load Regulation	2mV	2mV	2mV	2mV	2mV	2mV	

(3) Dynamic Load Response Characteristics (100Hz)

$V_{in} = 220V$	$I_o = 0 \sim 100\%$ 100Hz	$V_{over} = 98mV$ $V_{under} = 148mV$		CH3 1.00A/div 2ms/div CH4 200mV/div 2ms/div
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(4) Dynamic Load Response Characteristics (1kHz)

$V_{in} = 220V$	$I_o = 0 \sim 100\%$ 1kHz	$V_{over} = 110mV$ $V_{under} = 119mV$		CH3 1.00A/div 200us/div CH4 200mV/div 200us/div
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3-3. CSF30-12 Output characteristics

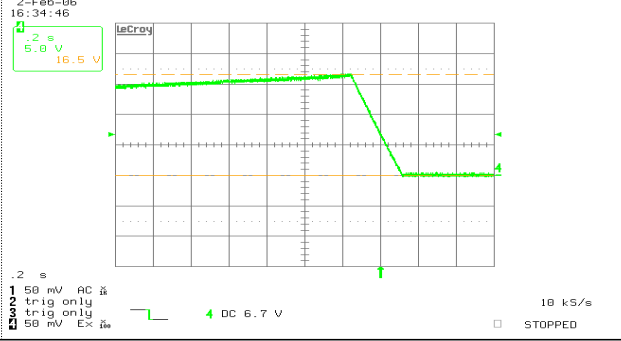
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage – DA1855 Differential Probe (BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
Vin= 220V	Io= 100%	V _{Ripple} = 6mV V _{Noise} = 52mV		CH4: 10.0mV/div 5.00us/div
(2) Turn on time characteristics				
Vin= 85V	Io= 100%	t _{turn on} = 736.4ms		CH2 200V/div 2ms/div CH4 5.00V/div 200ms/div
(3) Hold up characteristics				
Vin= 100V	Io= 100%	t _{hold up} = 17.8ms		CH2 100V/div 10.0ms/div CH4 5.00V/div 10.0ms/div
(4) Over Current protection characteristics				
Vin= 220V	Io= 110~145%	O.C.P = 3.1A		X 1.00A/div 10ms/div Y 2.00V/div 10ms/div

3-4. CSF30-12 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
Vin= 220V	I _o = 10%	O.V.P = 16.5V		CH4 5.00V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

4-1. CSF30-15 Input characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)

$V_{in} = 110V$	$I_o = 100\%$	$I_{inrush} = 12.7A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(2) Inrush Current Characteristics (220V)

$V_{in} = 220V$	$I_o = 100\%$	$I_{inrush} = 25.5A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(3) Input Current & Efficiency Characteristics

Condition $T_a : 25^\circ C$

Vin		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.02A	0.02A	0.03A	0.03A	0.03A	0.03A
	Efficiency	-	-	-	-	-	-
Load (50%)	Input Current	0.31A	0.25A	0.22A	0.18A	0.17A	0.15A
	Efficiency	79.7%	78.9%	79.3%	78.0%	73.8%	71.3%
Load (100%)	Input Current	0.61A	0.48A	0.41A	0.33A	0.29A	0.25A
	Efficiency	80.1%	80.6%	81.8%	81.6%	81.2%	79.0%

4-2. CSF30-15 Output characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Input current – AP015 current probe
 - ◇ CH4 : Output voltage – ADP305 High voltage differential probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
I_o \ Vin	85V	110V	132V	170V	220V	264V	Line Regulation
Load (min)	15.06V	15.06V	15.06V	15.06V	15.06V	15.06V	0mV
Load (50%)	15.06V	15.06V	15.06V	15.06V	15.06V	15.06V	0mV
Load (100%)	15.06V	15.06V	15.06V	15.06V	15.06V	15.06V	0mV
Load Regulation	0mV	0mV	0mV	0mV	0mV	0mV	

(3) Dynamic Load Response Characteristics (100Hz)

<p>$V_{in} = 220V$</p> <p>$I_o = 0 \sim 100\%$ 100Hz</p> <p>$V_{over} = 109mV$ $V_{under} = 164mV$</p>		<p>CH3 1.0A/div 2.00ms/div</p> <p>CH4 200mV/div 2.00ms/div</p>
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(4) Dynamic Load Response Characteristics (1kHz)

<p>$V_{in} = 220V$</p> <p>$I_o = 0 \sim 100\%$ 1kHz</p> <p>$V_{over} = 120mV$ $V_{under} = 144mV$</p>		<p>CH3 1.0A/div 200us/div</p> <p>CH4 200mV/div 200us/div</p>
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4-3. CSF30-15 Output characteristics

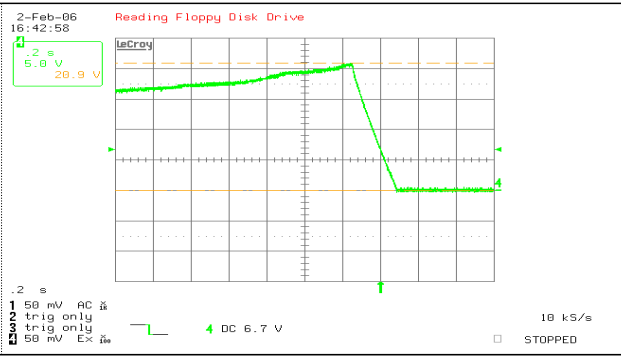
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage - DA1855 Differential Probe (BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage - ADP305 High voltage differential probe

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
$V_{in} = 220V$	$I_O = 100\%$	$V_{Ripple} = 3.6mV$ $V_{Noise} = 39mV$		CH4: 10.0mV/div 5.00us/div
(2) Turn on time characteristics				
$V_{in} = 85V$	$I_O = 100\%$	$t_{turn\ on} = 785.5ms$		CH4 5.00V/div 200ms/div CH2 200V/div 200ms/div
(3) Hold up characteristics				
$V_{in} = 100V$	$I_O = 100\%$	$t_{hold\ up} = 20.1ms$		CH1 10.0V/div 10.0ms/div CH2 100V/div 10.0ms/div
(4) Over Current protection characteristics				
$V_{in} = 220V$	$I_O = 110\sim 145\%$	O.C.P = 2.4A		X 1.00A/div 10ms/div Y 2.00V/div 10ms/div

4-4. CSF30-15 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
Vin= 220V	I _o = 10%	O.V.P = 20.9V		CH4 5.00V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

5-1. CSF30-24 Input characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)

$V_{in} = 110V$	$I_o = 100\%$	$I_{inrush} = 13.4A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(2) Inrush Current Characteristics (220V)

$V_{in} = 220V$	$I_o = 100\%$	$I_{inrush} = 23.2A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(3) Input Current & Efficiency Characteristics

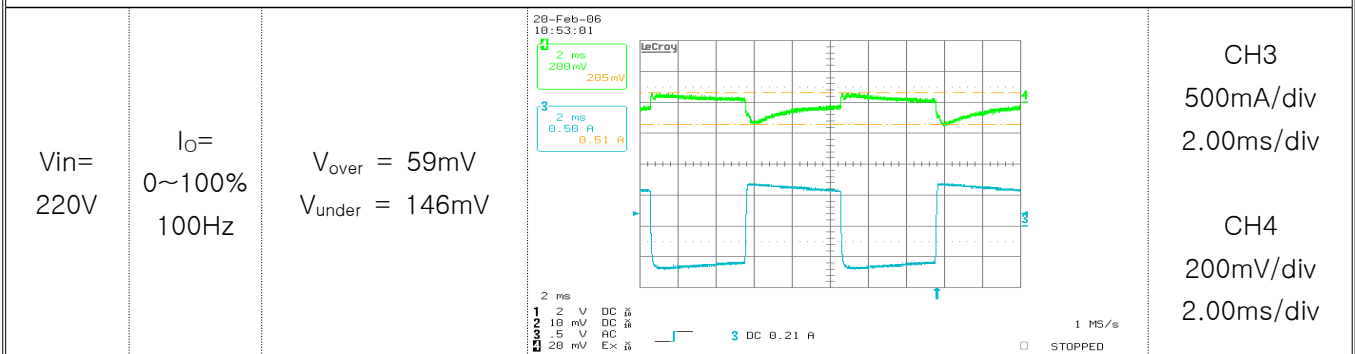
I_o \ V_{in}		Condition $T_a : 25^\circ C$					
		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.03A	0.03A	0.03A	0.03A	0.03A	0.03A
	Efficiency	-	-	-	-	-	-
Load (50%)	Input Current	0.31A	0.25A	0.21A	0.18A	0.16A	0.15A
	Efficiency	80.8%	79.5%	79.9%	79.5%	75.1%	70.6%
Load (100%)	Input Current	0.60A	0.48A	0.42A	0.33A	0.28A	0.26A
	Efficiency	80.6%	81.2%	82.1%	82.3%	82.0%	79.1%

5-2. CSF30-24 Output characteristics

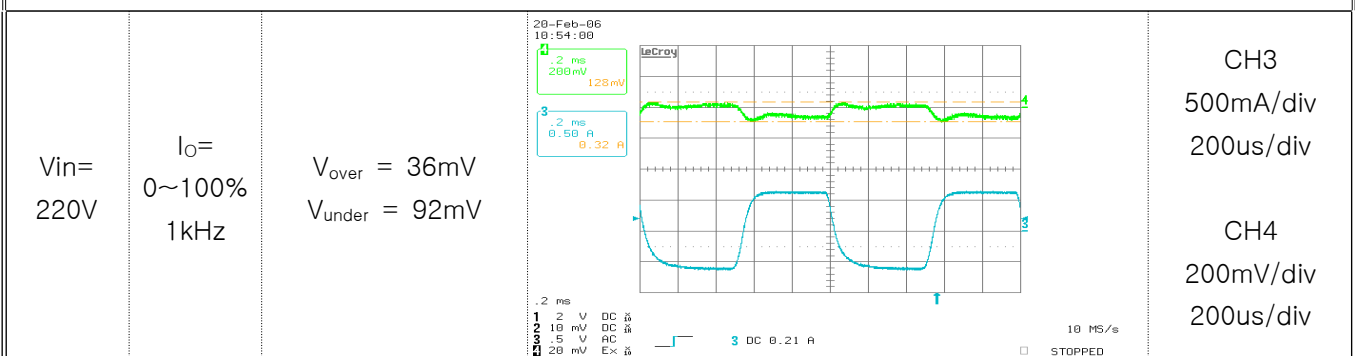
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Input current – AP015 current probe
 - ◇ CH4 : Output voltage – ADP305 High voltage differential probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
V_{in}	85V	110V	132V	170V	220V	264V	Line Regulation
I_o							
Load (min)	24.05V	24.05V	24.05V	24.05V	24.05V	24.05V	0mV
Load (50%)	24.05V	24.05V	24.05V	24.05V	24.05V	24.05V	0mV
Load (100%)	24.05V	24.05V	24.05V	24.05V	24.05V	24.05V	0mV
Load Regulation	0mV	0mV	0mV	0mV	0mV	0mV	

(3) Dynamic Load Response Characteristics (100Hz)



(4) Dynamic Load Response Characteristics (1kHz)



5-3. CSF30-24 Output characteristics

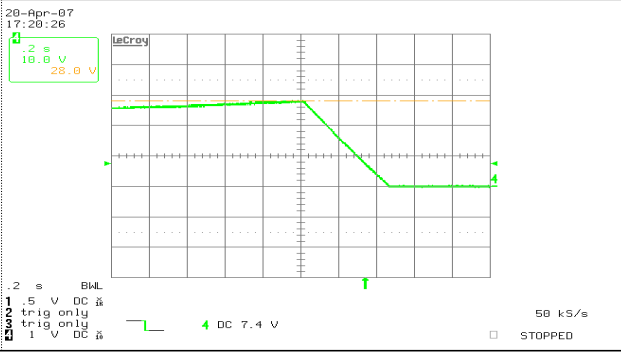
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage - DA1855 Differential Probe (BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage - ADP305 High voltage differential probe

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
Vin= 220V	Io= 100%	V _{Ripple} = 5.2mV V _{Noise} = 26.1mV		CH4: 5.0mV/div 5.00us/div
(2) Turn on time characteristics				
Vin= 85V	Io= 100%	t _{turn on} = 775ms		CH4 10.0V/div 200ms/div CH2 200V/div 200ms/div
(3) Hold up characteristics				
Vin= 100V	Io= 100%	t _{hold up} = 22.0ms		CH4 20.0V/div 10.0ms/div CH2 100V/div 10.0ms/div
(4) Over Current protection characteristics				
Vin= 220V	Io= 110~145%	O.C.P = 1.6A		X 0.50A/div 10ms/div Y 5.00V/div 10ms/div

5-4. CSF30-24 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
Vin= 220V	Io= 10%	O.V.P = 28.0V		CH4 10.0V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

6-1. CSF30-48 Input characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH2 : Input voltage – ADP305 High voltage differential probe
 - ◇ CH3 : Input current – AP015 current probe
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형	비고
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(1) Inrush Current Characteristics (110V)

$V_{in} = 110V$	$I_o = 100\%$	$I_{inrush} = 12.7A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(2) Inrush Current Characteristics (220V)

$V_{in} = 220V$	$I_o = 100\%$	$I_{inrush} = 25.5A$		CH2 200V/div 20.0ms/div CH3 10.0A/div 20.0ms/div
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(3) Input Current & Efficiency Characteristics

$V_{in} \backslash I_o$		Condition $T_a : 25^\circ C$					
		85V	110V	132V	170V	220V	264V
Load (min)	Input Current	0.03A	0.03A	0.03A	0.03A	0.03A	0.03A
	Efficiency	-	-	-	-	-	-
Load (50%)	Input Current	0.32A	0.26A	0.23A	0.19A	0.17A	0.15A
	Efficiency	77.6%	77.2%	76.0%	76.0%	74.2%	70.0%
Load (100%)	Input Current	0.61A	0.48A	0.41A	0.32A	0.27A	0.25A
	Efficiency	80.9%	81.9%	82.4%	82.7%	80.5%	80.2%

6-2. CSF30-48 Output characteristics

- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH3 : Input current – AP015 current probe (BW:20MHz)
 - ◇ CH4 : Output voltage – ADP305 High voltage differential probe(BW:200MHz)
- ◆ Digital Multimeter : FLUKE189 (FLUKE)

입력	출력	측정값	파형				비고
(1) Line & Load Regulation Characteristics							
Condition Ta : 25°C							
V_{in}	85V	110V	132V	170V	220V	264V	Line Regulation
I_o							
Load (min)	48.06V	48.06V	48.06V	48.06V	48.06V	48.06V	0mV
Load (50%)	48.06V	48.06V	48.06V	48.06V	48.06V	48.05V	1mV
Load (100%)	48.05V	48.05V	48.05V	48.05V	48.06V	48.05V	1mV
Load Regulation	10mV	10mV	10mV	10mV	0mV	10mV	

(3) Dynamic Load Response Characteristics (100Hz)

$V_{in} = 220V$	$I_o = 0 \sim 100\%$ 100Hz	$V_{over} = 64mV$ $V_{under} = 73mV$		CH3 0.5A/div 2ms/div CH4 200mV/div 2ms/div
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(4) Dynamic Load Response Characteristics (1kHz)

$V_{in} = 220V$	$I_o = 0 \sim 100\%$ 1kHz	$V_{over} = 58mV$ $V_{under} = 51mV$		CH3 0.5A/div 200us/div CH4 200mV/div 200us/div
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6-3. CSF30-48 Output characteristics

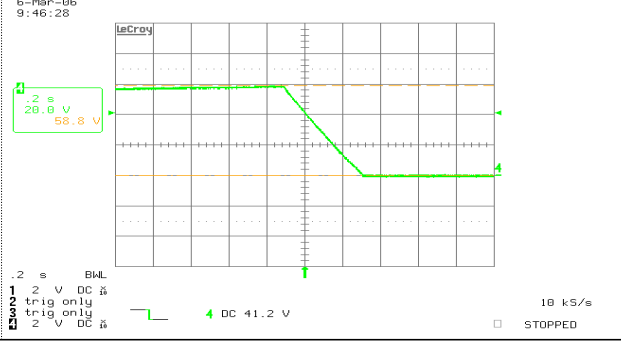
- ◆ Oscilloscope : WAVE RUNNER LT374L (LeCroy)
 - ◇ CH4 : Output voltage - DA1855 Differential Probe (BW:20MHz)
or PP005A passive probe
 - ◇ CH2 : Input voltage - ADP305 High voltage differential probe(BW:200MHz)

입력	출력	측정값	파형	비고
(1) Ripple & Noise characteristics.				
Vin= 220V	I _O = 100%	V _{Ripple} = 4.1mV V _{Noise} = 16.2mV		CH4 5.0mV/div 5us/div
(2) Turn on time characteristics				
Vin= 85V	I _O = 100%	t _{turn on} = 808.1ms		CH2 200V/div 200ms/div CH4 20.0V/div 200ms/div
(3) Hold up characteristics				
Vin= 100V	I _O = 100%	t _{hold up} = 22.3ms		CH2 100V/div 20.0ms/div CH4 20.0V/div 20.0ms/div
(4) Over Current protection characteristics				
Vin= 220V	I _O = 110~145%	O.C.P = 0.81A		X 200mA/div 1ms/div Y 10V/div 1ms/div

6-4. CSF30-48 Output characteristics

◆ Oscilloscope : LT374AL(LeCroy)

◇ CH4 : Output voltage - PP005A passive probe

입력	출력	측정값	파형	비고
(1) Over-voltage protection characteristics				
Vin= 220V	I _o = 10%	O.V.P = 58.8V	 <p>6-Mar-06 9:46:28</p> <p>20.0 V 58.8 V</p> <p>20.0 V/div 0.20s/div</p> <p>10 kS/s STOPPED</p>	CH4 20.0V/div 0.20s/div
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-