귀중

Evaluation Data

품 목	SMPS
품 명	JSF75-S
Rev. No.	A

2012년 9 월 14 일

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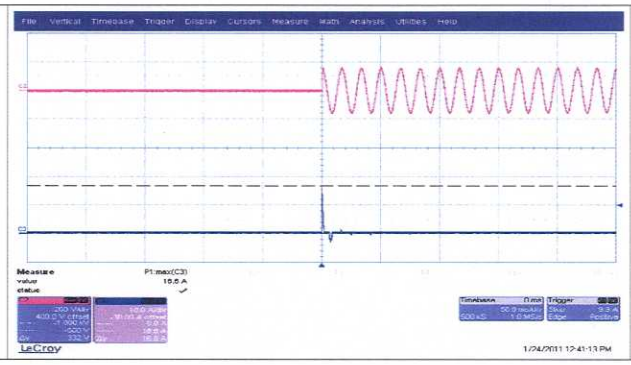
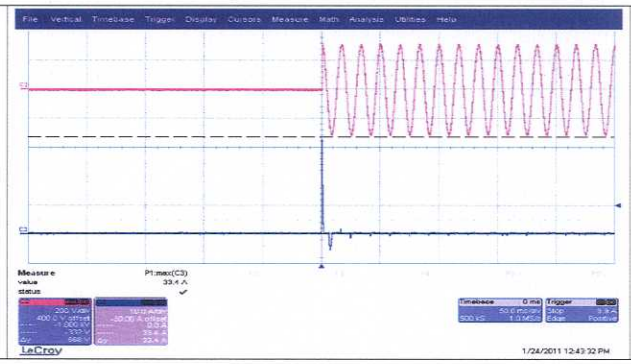
1-1. JSF75-3R3 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (15A)	Irush = **16.6** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (15A)	Irush = **33.4** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.037	0.039	0.040	0.045	0.054	0.061
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 7.5A	Input Current (A)	0.602	0.497	0.430	0.371	0.341	0.284
	Efficiency (%)	74.4	75.4	75.3	74.2	72.0	69.7
Load (100%) 15A	Input Current (A)	1.167	0.951	0.816	0.685	0.645	0.508
	Efficiency (%)	73.0	74.6	75.3	74.3	74.5	73.7

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.25	0.27	0.45	0.47	-	-
Line N (mA)	0.24	0.27	0.44	0.46	-	-

1-2. JSF75-3R3 Output Characteristics

< 계측기 >

(1) Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

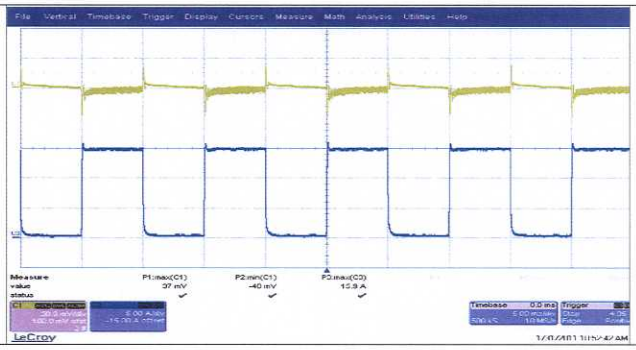
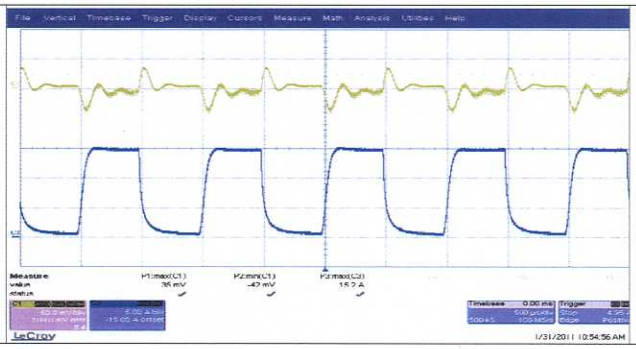
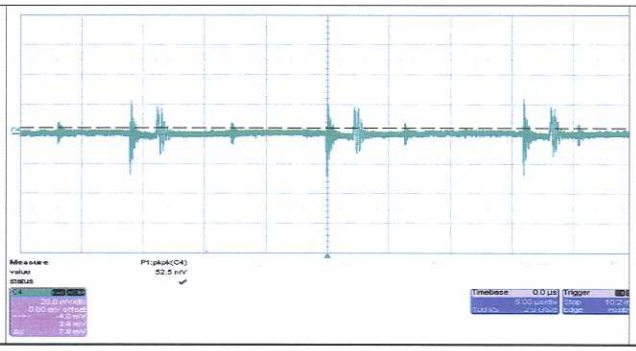
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

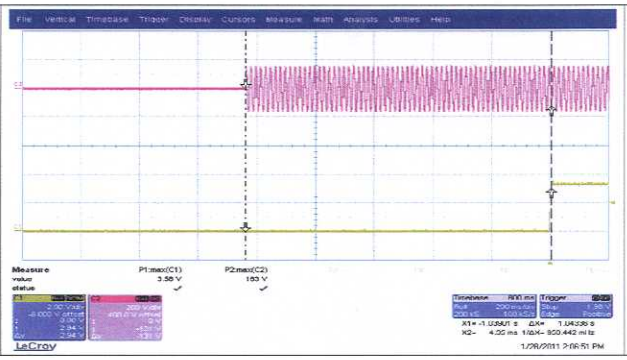
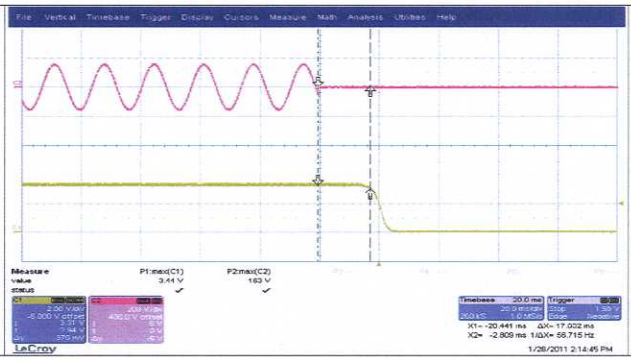
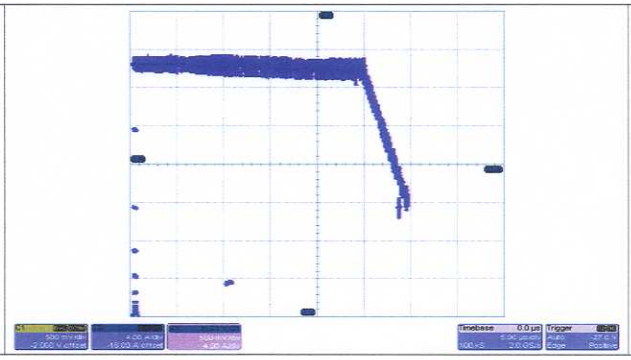
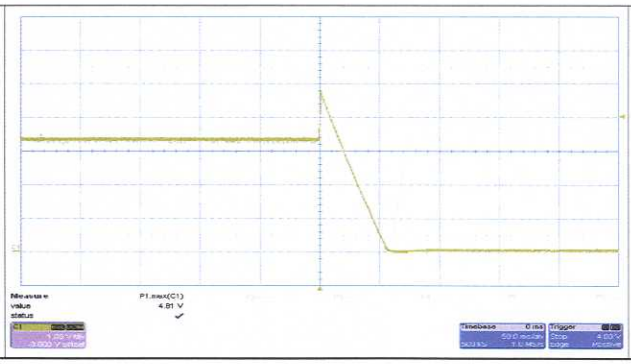
Line & Load Regulation Characteristics Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	3.319	3.320	3.320	3.320	3.320	3.320	1
Load (50%)	3.301	3.301	3.302	3.302	3.302	3.302	1
Load (100%)	3.281	3.282	3.283	3.284	3.284	3.285	4
Load Regulation (mV)	38	38	37	36	36	35	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 37mV (1.1%) -VPK = 48mV (1.5%)		CH1(전압) 50mV/div 5ms/div CH3(전류) 5A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 35mV (1.1%) -VPK = 42mV (1.2%)		CH1(전압) 50mV/div 500us/div CH3(전류) 5A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 15A	Ripple 7.8mV Ripple & Noise 52.5mV_{P-P}		CH4(전압) 20mV/div 5us/div

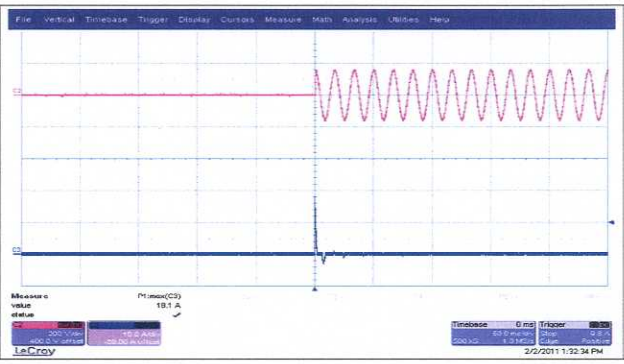
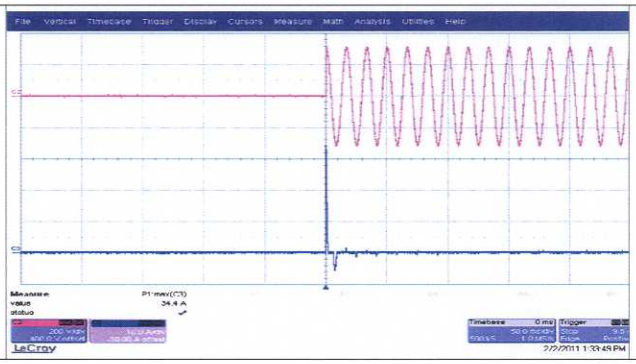
1-2. JSF75-3R3 Output characteristics

< 계측기 >
(3) Oscilloscope : WAVESURFER 454 (LeCroy)
◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 15A	T_{on} = 1043ms		CH1: 2.00V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 15A	T_{off} = 17.63ms		CH1: 2.00V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 20.25A (135%)		CH1(전압) 0.50V/div 5us/div CH3(전류) 4.0A/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 1.5A	OVP = 4.08V (123%)		CH1(전압) 1.00V/div 50.0ms/div

2-1. JSF75-05 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (12A)	Irush = **18.1** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (12A)	Irush = **34.4** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.055	0.057	0.056	0.055	0.063	0.067
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 6A	Input Current (A)	0.721	0.597	0.519	0.445	0.422	0.334
	Efficiency (%)	76.7	76.9	76.5	75.1	73.1	71.7
Load (100%) 12A	Input Current (A)	1.312	1.093	0.944	0.798	0.774	0.580
	Efficiency (%)	77.5	78.1	78.6	78.3	77.6	76.5

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.24	0.25	0.43	0.46	-	-
Line N (mA)	0.24	0.26	0.44	0.45	-	-

2-2. JSF75-05 Output Characteristics

< 계측기 >

(1) Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

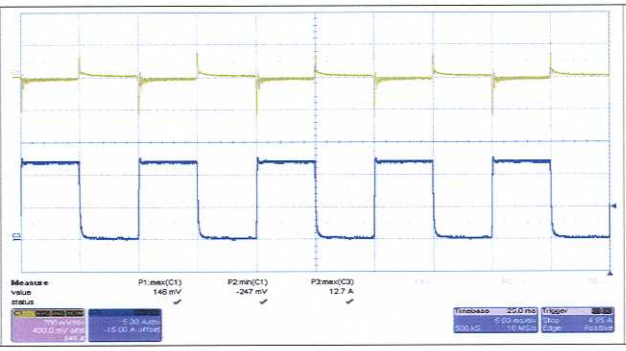
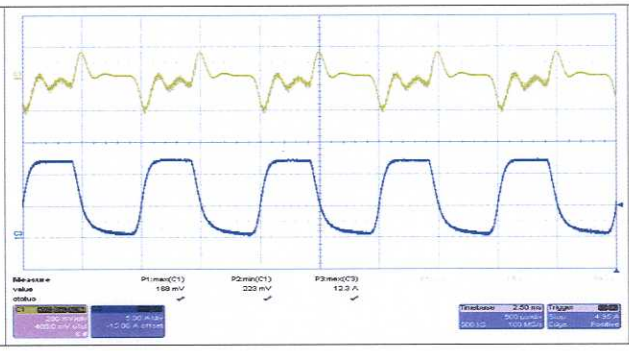
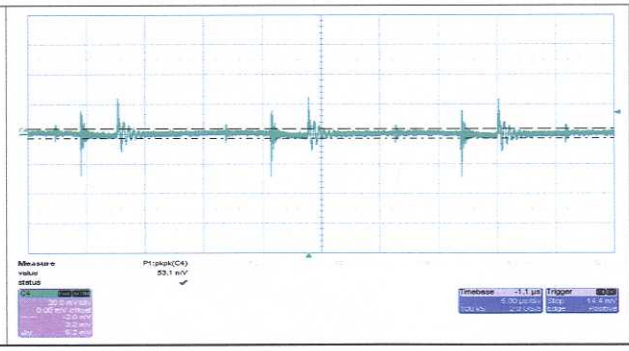
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

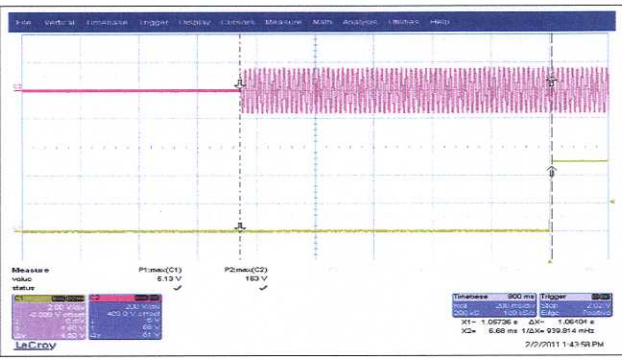
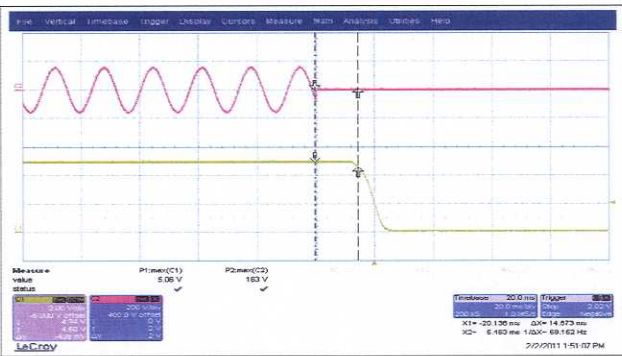
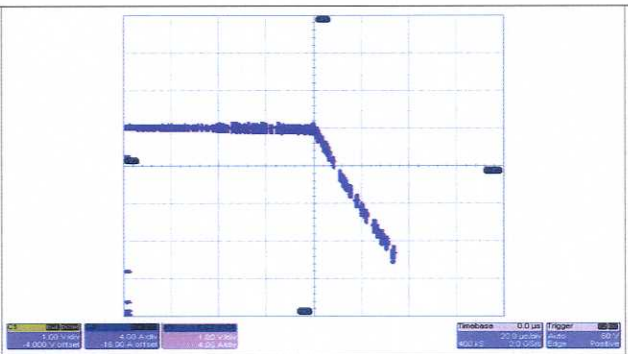
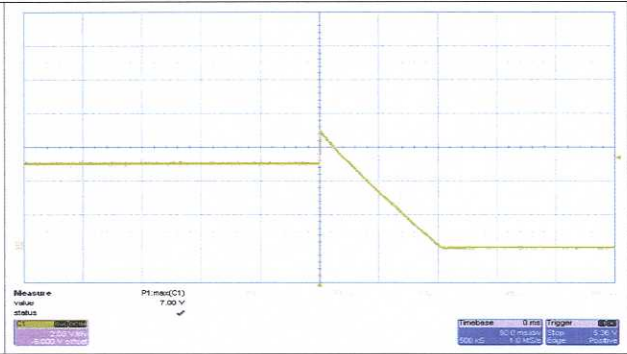
Line & Load Regulation Characteristics Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	5.021	5.021	5.021	5.021	5.021	5.021	0
Load (50%)	5.014	5.014	5.014	5.014	5.014	5.015	1
Load (100%)	5.006	5.006	5.007	5.007	5.007	5.007	1
Load Regulation (mV)	15	15	14	14	14	14	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 200uS	+VPK = 146mV (2.9%) -VPK = 247mV (4.9%)		CH1(전압) 200mV/div 5ms/div CH3(전류) 5A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 200uS	+VPK = 168mV (3.3%) -VPK = 223mV (4.4%)		CH1(전압) 200mV/div 500us/div CH3(전류) 5A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 12A	Ripple 6.2mV Ripple & Noise 53.1mV_{P-P}		CH4(전압) 20mV/div 5us/div

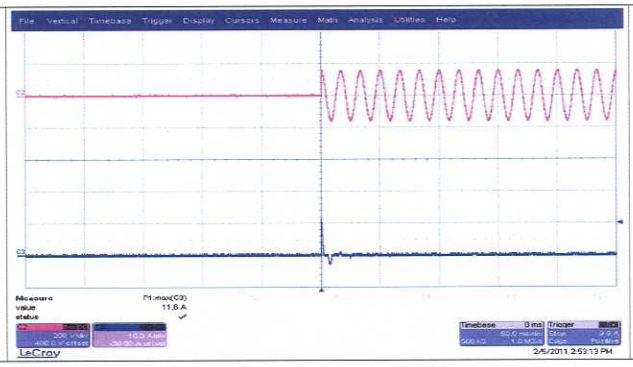
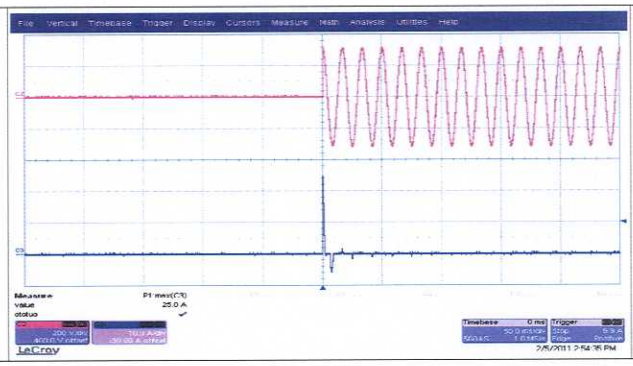
2-2. JSF75-05 Output characteristics

< 계측기 >
(3) Oscilloscope : WAVESURFER 454 (LeCroy)
◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 12A	T_{on} = 1064ms		CH1: 2.00V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 12A	T_{off} = 14.67ms		CH1: 2.00V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 16.5A (137%)		CH1(전압) 1.00V/div 20us/div CH3(전류) 4.00A/div 20us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 1.2A	OVP = 6.06V (121%)		CH1(전압) 2.00V/div 50.0ms/div

3-1. JSF75-09 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (8A)	Irush = **11.6** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (8A)	Irush = **25.0** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/di

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.036	0.036	0.038	0.043	0.053	0.059
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 4A	Input Current (A)	0.763	0.639	0.559	0.465	0.402	0.345
	Efficiency (%)	81.4	81.8	82.1	82.7	80.0	78.2
Load (100%) 8A	Input Current (A)	1.480	1.219	1.040	0.867	0.741	0.618
	Efficiency (%)	81.5	81.9	82.9	83.2	82.8	82.0

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.26	0.28	0.46	0.48	-	-
Line N (mA)	0.27	0.29	0.47	0.49	-	-

3-2. JSF75-09 Output Characteristics

< 계측기 >

(1)Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

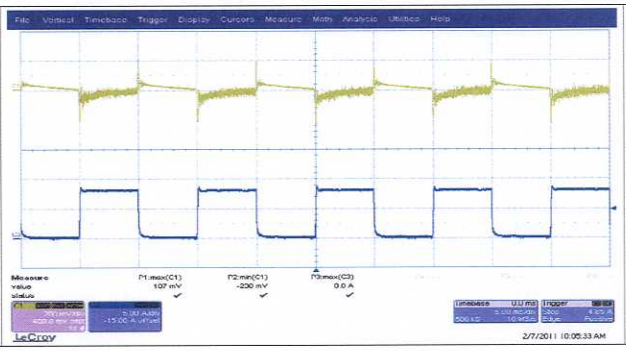
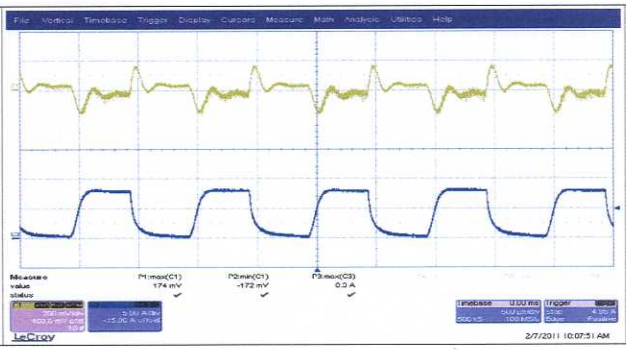
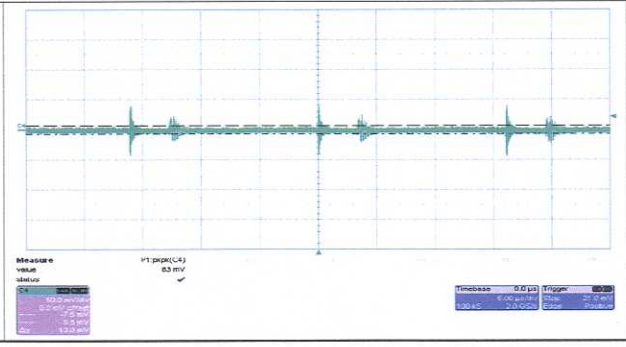
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

Line & Load Regulation Characteristics — Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	9.037	9.038	9.038	9.038	9.039	9.039	2
Load (50%)	9.032	9.032	9.033	9.033	9.034	9.034	2
Load (100%)	9.026	9.027	9.027	9.028	9.028	9.029	3
Load Regulation (mV)	11	11	11	10	11	10	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 187mV (2.0%) -VPK = 238mV (2.6%)		CH1(전압) 200mV/div 5ms/div CH3(전류) 5A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 174mV (1.9%) -VPK = 172mV (1.9%)		CH1(전압) 200mV/div 500us/div CH3(전류) 5A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 8A	Ripple 13mV Ripple & Noise 83mV_{P-P}		CH4(전압) 50mV/div 5us/div

3-2. JSF75-09 Output characteristics

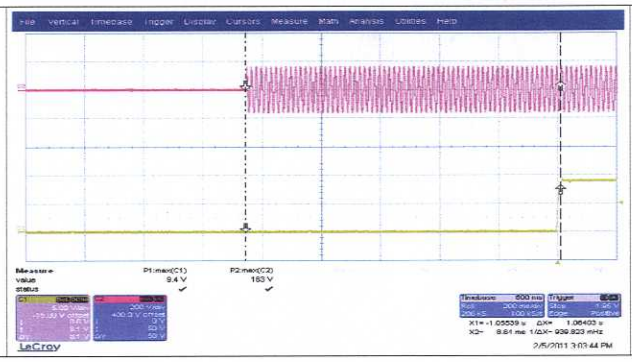
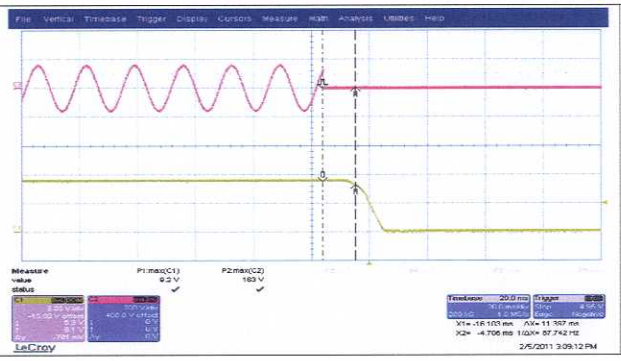
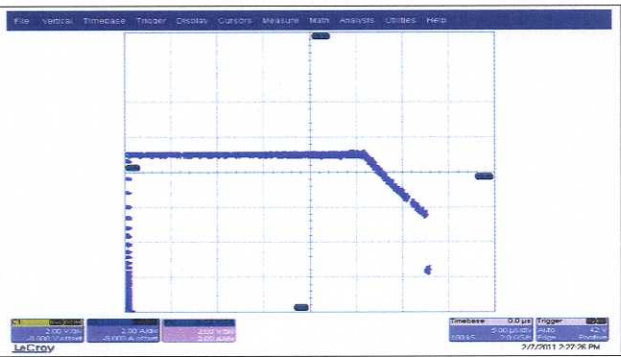
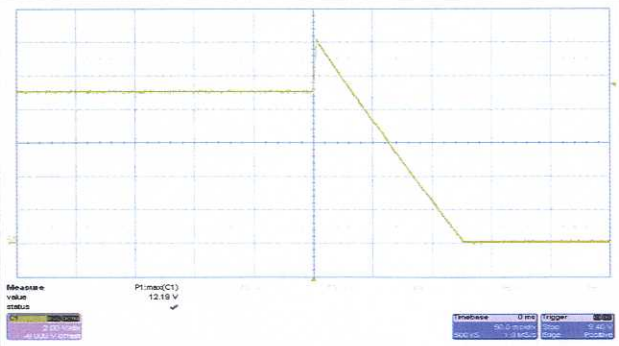
< 계측기 >

(3) Oscilloscope : WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)

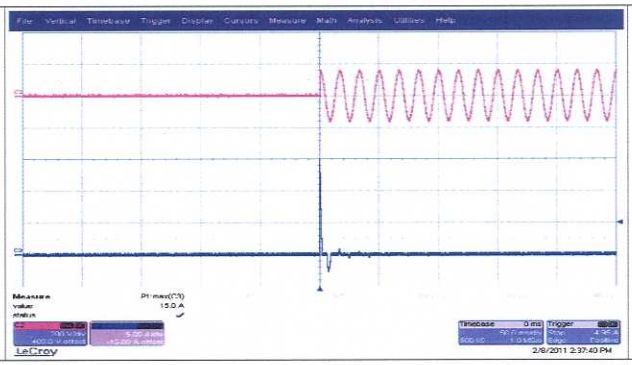
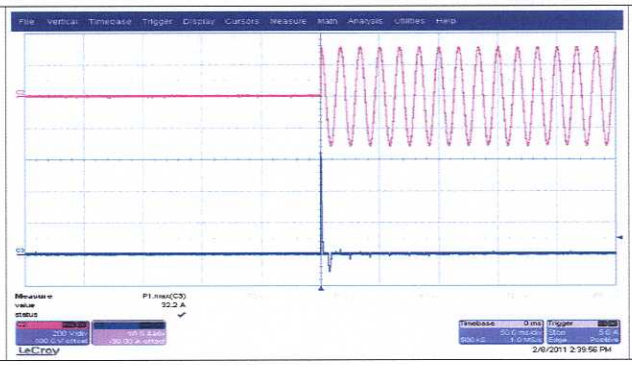
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)

◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 8A	T_{on} = 1064ms		CH1: 5.00V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 8A	T_{off} = 11.39ms		CH1: 5.00V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 10.75A (134%)		CH1(전압) 2.00V/div 5us/div CH3(전류) 2.00A/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 0.8A	OVP = 11.7V (130%)		CH1(전압) 2.00V/div 50.0ms/div

4-1. JSF75-12 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (6A)	Irush = 15.0 [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 5A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (6A)	Irush = 32.2 [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.037	0.039	0.040	0.044	0.054	0.061
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 3A	Input Current (A)	0.776	0.653	0.564	0.463	0.401	0.345
	Efficiency (%)	81.3	82.2	82.1	82.5	80.0	77.9
Load (100%) 6A	Input Current (A)	1.474	1.210	1.042	0.865	0.738	0.612
	Efficiency (%)	81.5	82.8	83.4	83.8	83.5	82.7

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.25	0.27	0.45	0.48	-	-
Line N (mA)	0.24	0.28	0.44	0.48	-	-

4-2. JSF75-12 Output Characteristics

< 계측기 >

(2) Oscilloscope: WAVESSSSSSSSSSSSURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

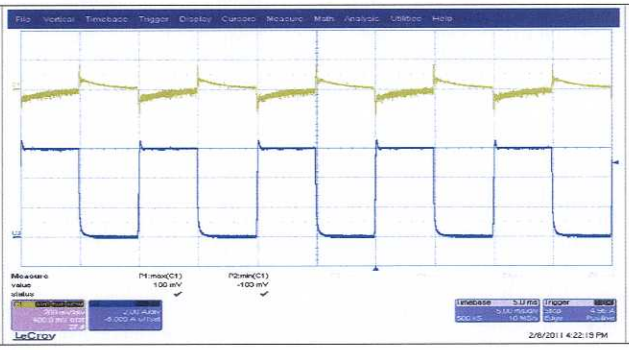
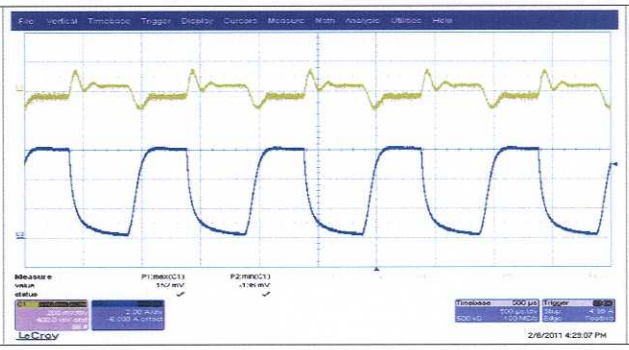
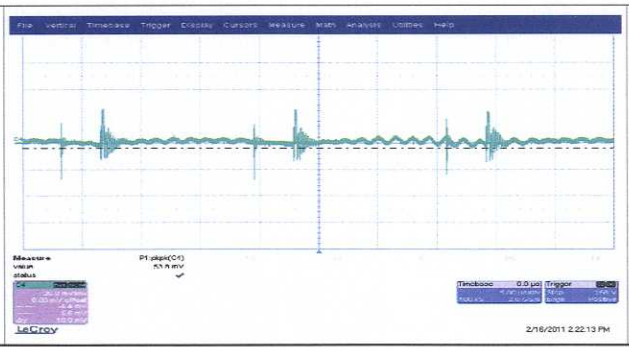
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

Line & Load Regulation Characteristics Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	12.023	12.025	12.026	12.027	12.027	12.027	4
Load (50%)	12.019	12.020	12.021	12.021	12.022	12.022	3
Load (100%)	12.014	12.015	12.016	12.016	12.017	12.017	3
Load Regulation (mV)	9	10	10	11	10	10	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 166mV (1.3%) -VPK = 183mV (1.5%)		CH1(전압) 200mV/div 5ms/div CH3(전류) 2A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 152mV (1.2%) -VPK = 136mV (1.1%)		CH1(전압) 200mV/div 500us /div CH3(전류) 2A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 6A	Ripple 10mV Ripple & Noise 53.8mV_{P-P}		CH4(전압) 20mV/div 5us/div

4-2. JSF75-12 Output characteristics

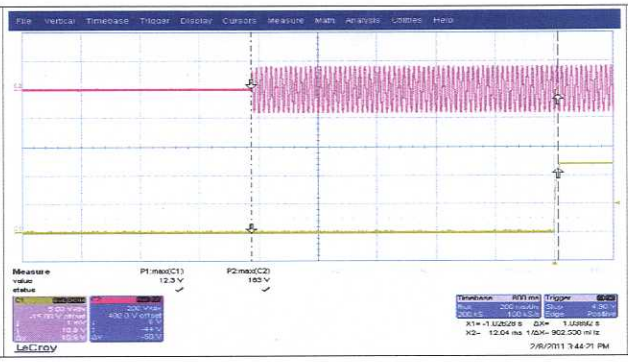
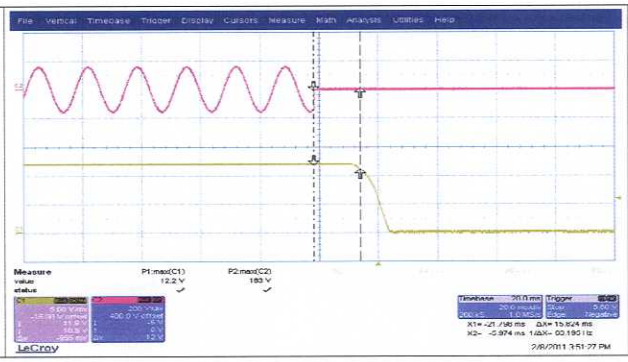
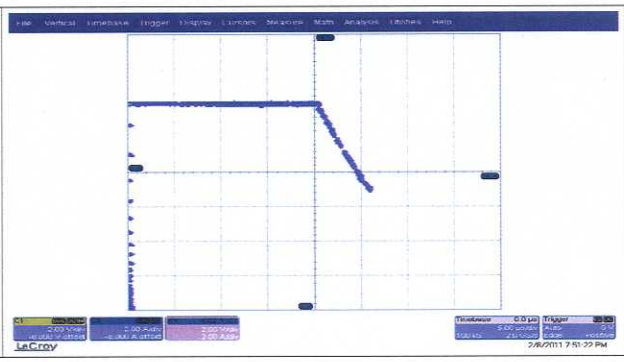
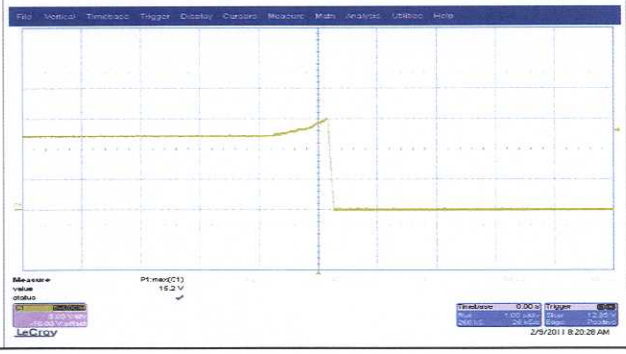
< 계측기 >

(3) Oscilloscope : WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)

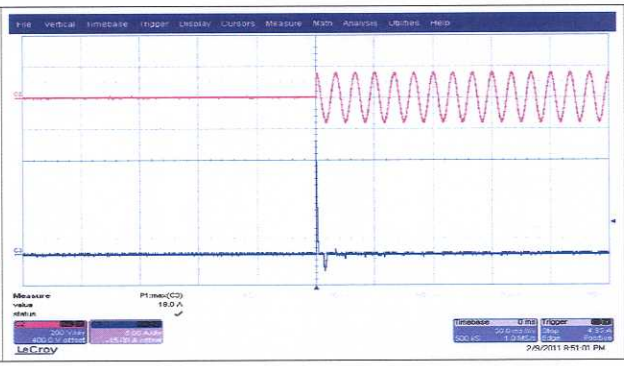
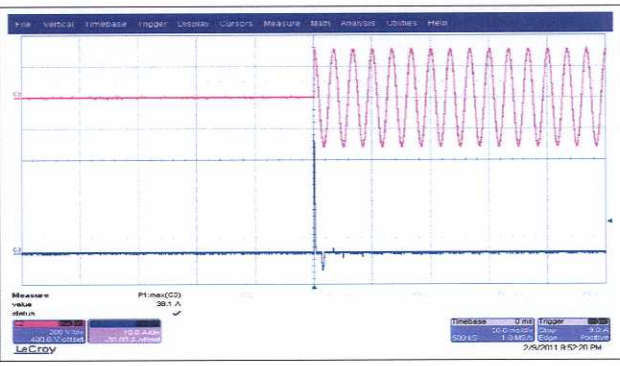
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)

◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 6A	T_{on} = 1038ms		CH1: 5.00V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 6A	T_{off} = 15.82ms		CH1: 5.00V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 8.17A (136%)		CH1(전압) 2.00V/div 5us/div CH3(전류) 2.00A/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 0.6A	OVP = 15.2V (126%)		CH1(전압) 5.00V/div 1.0s/div

5-1. JSF75-15 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (5A)	Irush = **18.0** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 5A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (5A)	Irush = **38.1** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.043	0.046	0.046	0.048	0.058	0.063
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 2.5A	Input Current (A)	0.783	0.670	0.578	0.480	0.413	0.354
	Efficiency (%)	82.3	83.1	83.2	83.0	81.7	78.8
Load (100%) 5A	Input Current (A)	1.504	1.237	1.064	0.886	0.762	0.634
	Efficiency (%)	83.0	84.3	85.0	84.9	84.7	83.7

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.26	0.29	0.46	0.50	-	-
Line N (mA)	0.25	0.28	0.45	0.49	-	-

5-2. JSF75-15 Output Characteristics

< 계측기 >

(1) Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

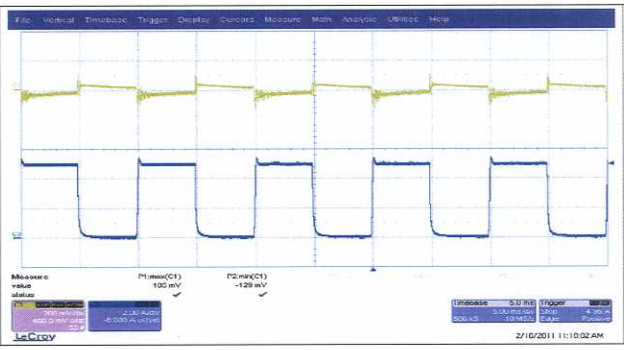
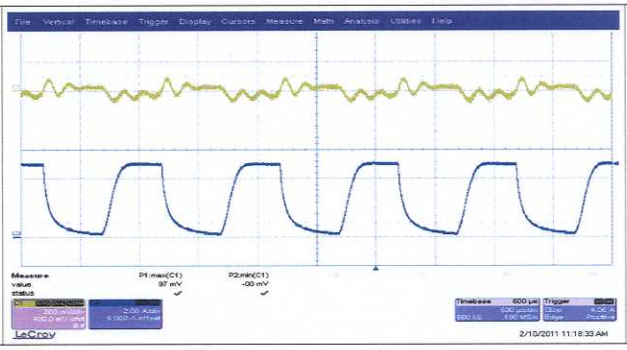
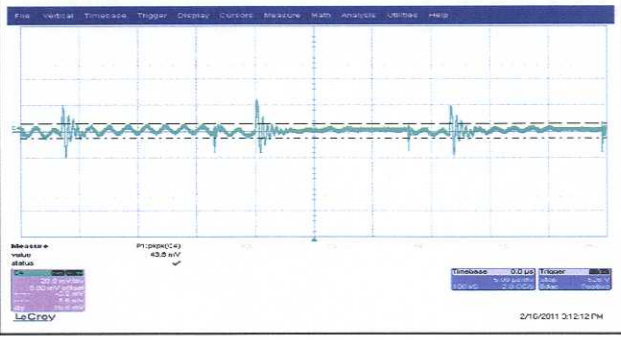
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

Line & Load Regulation Characteristics — Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	15.031	15.031	15.032	15.033	15.033	15.034	3
Load (50%)	15.025	15.026	15.028	15.029	15.029	15.030	5
Load (100%)	15.021	15.021	15.024	15.024	15.025	15.025	4
Load Regulation (mV)	10	10	8	9	8	9	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 105mV (0.7%) -VPK = 129mV (0.86%)		CH1(전압) 200mV/div 5ms/div CH3(전류) 2A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 97mV (0.65%) -VPK = 88mV (0.58%)		CH1(전압) 200mV/div 500us/div CH3(전류) 2A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 5A	Ripple 10.8mV Ripple & Noise 43.8mV_{P-P}		CH4(전압) 20mV/div 5us/div

5-2. JSF75-15 Output characteristics

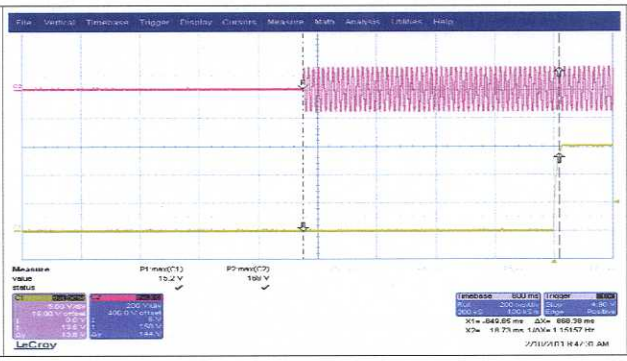
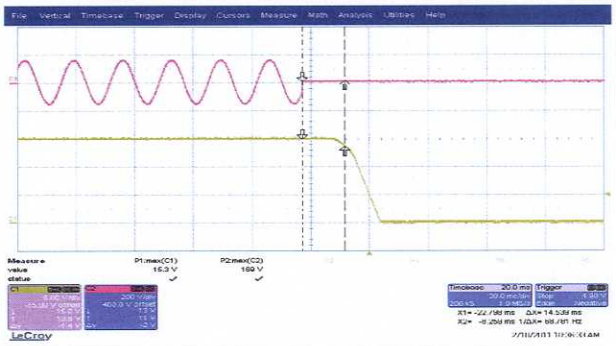
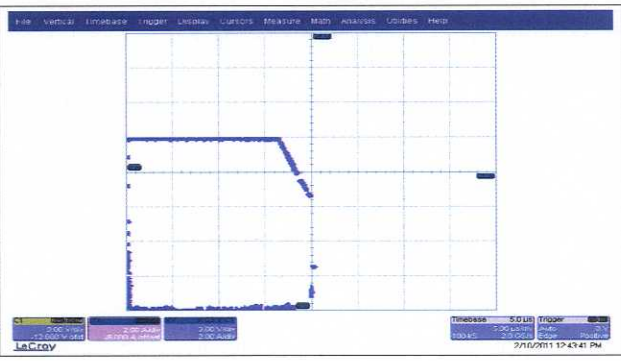
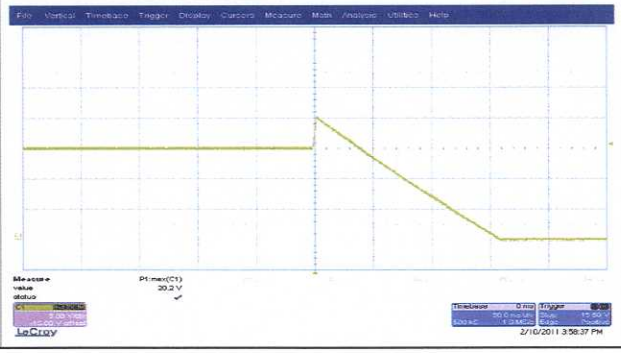
< 계측기 >

(3) Oscilloscope : WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)

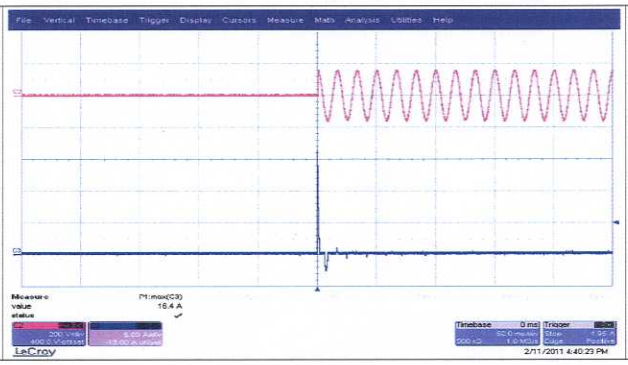
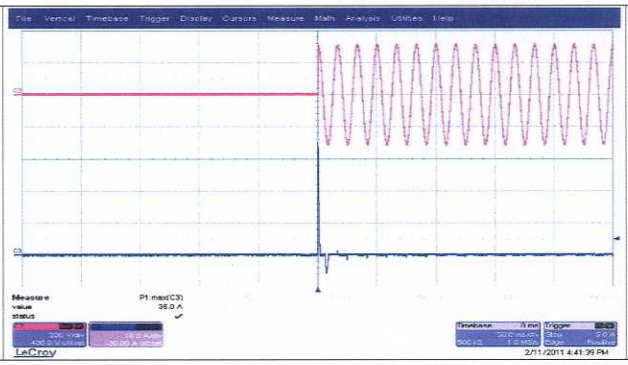
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)

◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 5A	T_{on} = 868ms		CH1: 5.00V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 5A	T_{off} = 14.53ms		CH1: 5.00V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 6.93A (138%)		CH1(전압) 3.00V/div 5us/div CH3(전류) 2.00A/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 0.5A	OVP = 19.3V (128%)		CH1(전압) 5.00V/div 50.0ms/div

6-1. JSF75-24 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (3.2A)	Irush = **16.4** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 5A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (3.2A)	Irush = **35.0** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.046	0.045	0.046	0.051	0.060	0.067
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 1.6A	Input Current (A)	0.804	0.660	0.577	0.488	0.438	0.369
	Efficiency (%)	83.2	84.1	84.2	84.4	82.1	81.0
Load (100%) 3.2A	Input Current (A)	1.528	1.241	1.077	0.919	0.819	0.670
	Efficiency (%)	83.5	85.2	85.9	86.2	85.6	85.1

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.25	0.27	0.45	0.47	-	-
Line N (mA)	0.24	0.26	0.44	0.46	-	-

6-2. JSF75-24 Output Characteristics

< 계측기 >

(1) Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

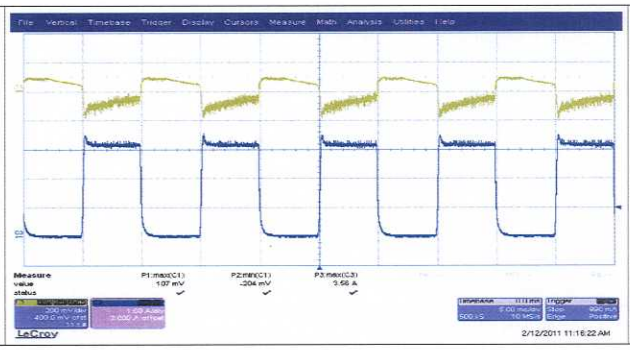
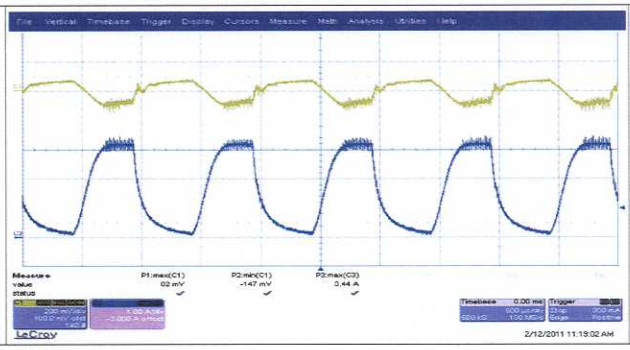
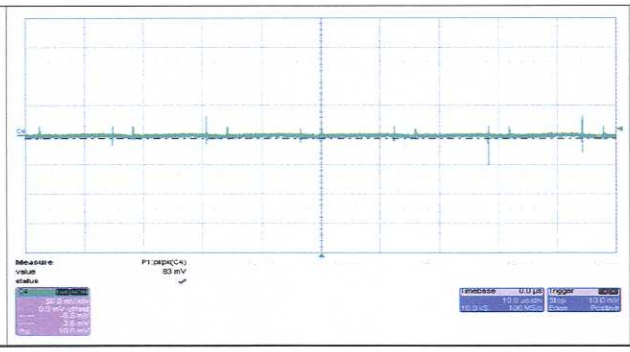
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

Line & Load Regulation Characteristics — Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	24.023	24.030	24.031	24.035	24.035	24.037	14
Load (50%)	24.020	24.025	24.028	24.031	24.032	24.033	13
Load (100%)	24.018	24.021	24.025	24.025	24.028	24.028	10
Load Regulation (mV)	5	9	6	10	7	9	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 107mV (0.44%) -VPK = 204mV (0.85%)		CH1(전압) 200mV/div 5ms/div CH3(전류) 1A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 82mV (0.34%) -VPK = 147mV (0.61%)		CH1(전압) 200mV/div 500us/div CH3(전류) 1A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 3.2A	Ripple 10mV Ripple & Noise 83mV$_{P-P}$		CH4(전압) 50mV/div 10us/div

6-2. JSF75-24 Output characteristics

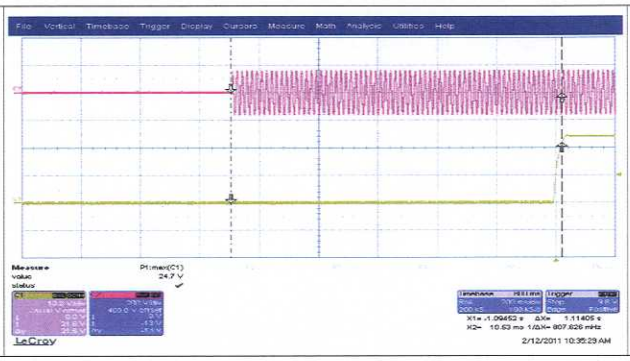
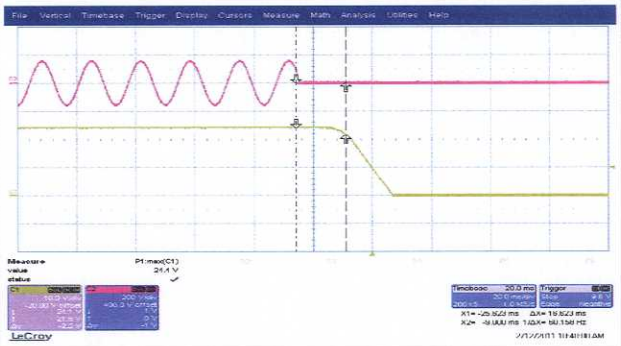
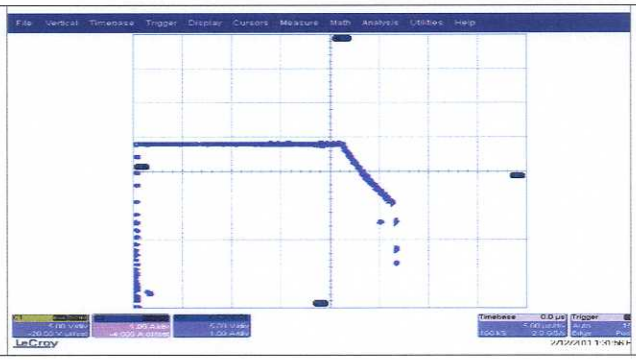
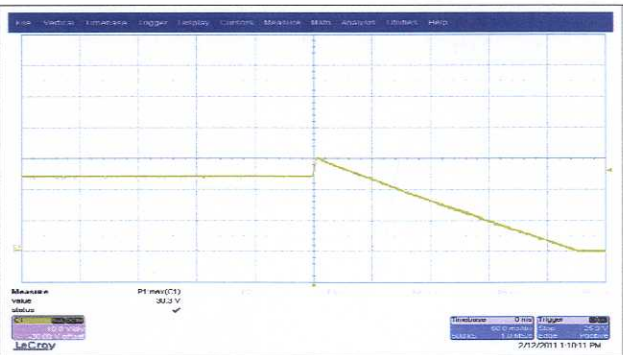
< 계측기 >

(3) Oscilloscope : WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)

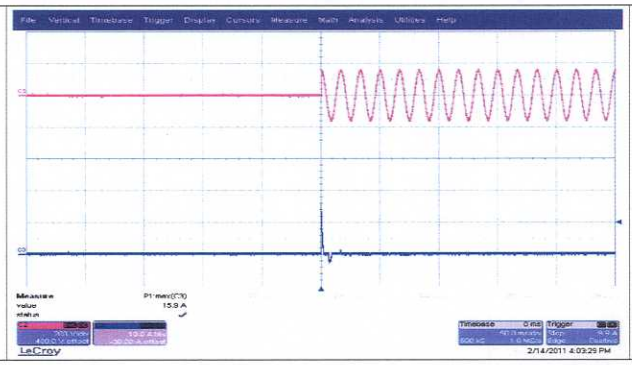
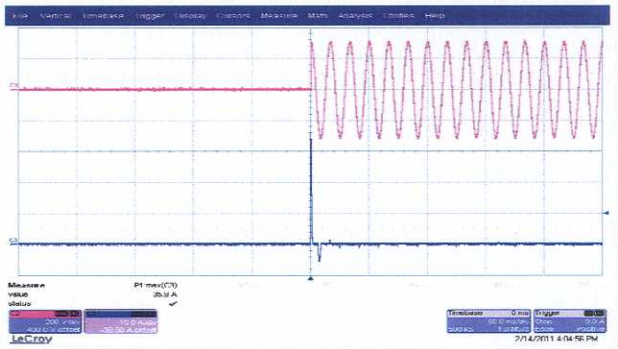
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)

◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 3.2A	T_{on} = 1114ms		CH1: 10.0V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 3.2A	T_{off} = 16.62ms		CH1: 10.0V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 4.42A (138%)		CH1(전압) 5.00V/div 5us/div CH3(전류) 1.00A/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 0.32A	OVP = 29.8V (124%)		CH1(전압) 10.0V/div 50.0ms/div

7-1. JSF75-48 Input Characteristics

< 계측기 >
(1) Oscilloscope: WAVESURFER 454 (LeCroy)
◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)
◇ CH3 : INPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)
(2) Power Analyzer: 3332 (HIOKI)
(3) Leakage Current Tester: 3226 (YOKOGAWA)

입력	출력	측정값	파형	비고
Inrush Current Characteristics (110V)				
AC110V	I_O=100% (1.6A)	Irush = **15.9** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div
Inrush Current Characteristics (220V)				
AC220V	I_O=100% (1.6A)	Irush = **35.9** [A]		CH2(전압) 200V/div 50ms/div CH3(전류) 10A/div 50ms/div

Input Current & Efficiency Characteristics — Condition Ta : 25℃

I_O \ Vin		88V	110V	132V	170V	220V	264V
Load (min) 0A	Input Current (A)	0.058	0.055	0.055	0.058	0.069	0.073
	Efficiency (%)	-	-	-	-	-	-
Load (50%) 0.8A	Input Current (A)	0.793	0.662	0.575	0.487	0.438	0.374
	Efficiency (%)	84.6	85.3	85.3	85.5	83.4	80.8
Load (100%) 1.6A	Input Current (A)	1.492	1.216	1.055	0.896	0.815	0.667
	Efficiency (%)	85.7	87.2	87.6	87.4	86.5	85.5

Leakage Current Characteristics — Condition Ta : 25℃

I_O \ Vin	88V	110V	220V	264V	-	-
Line L (mA)	0.26	0.28	0.44	0.49	-	-
Line N (mA)	0.25	0.27	0.43	0.48	-	-

7-2. JSF75-48 Output Characteristics

< 계측기 >

(1) Oscilloscope: WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive Voltage probe (BANDWIDTH: 200MHz)

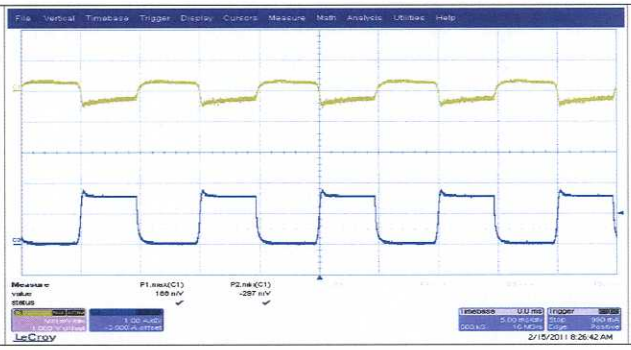
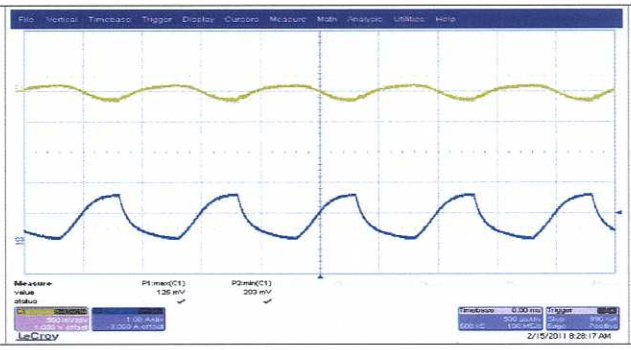
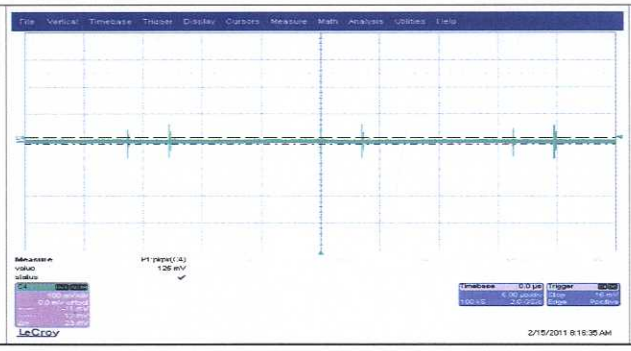
◇ CH3 : OUTPUT CURRENT - AP015 Current probe (BANDWIDTH: 200MHz)

◇ CH4 : BNC Cable 1.5m, 50Ω (BANDWIDTH: 200MHz)

(2) Digital Multi Meter: 2000 (KEITHLEY)

Line & Load Regulation Characteristics Condition Ta : 25℃

Vin / I_O	88V	110V	132V	170V	220V	264V	Line Regulation (mV)
Load (0A)	48.074	48.076	48.078	48.080	48.083	48.085	11
Load (50%)	48.070	48.072	48.074	48.077	48.079	48.080	10
Load (100%)	48.066	48.068	48.071	48.073	48.074	48.075	9
Load Regulation (mV)	8	8	7	7	9	10	

입력	출력	측정값	파형	비고
Dynamic Load Response Characteristics (100Hz)				
AC220V	I_O=0↔100% fs=100Hz Duty=50% Slew rate 50uS	+VPK = 188mV (0.39%) -VPK = 297mV (0.61%)		CH1(전압) 500mV/div 5ms/div CH3(전류) 1A/div 5ms/div
Dynamic Load Response Characteristics (1KHz)				
AC220V	I_O=0↔100% fs=1Kz Duty=50% Slew rate 50uS	+VPK = 125mV (0.26%) -VPK = 203mV (0.42%)		CH1(전압) 500mV/div 500us/div CH3(전류) 1A/div 500us/div
Ripple & Noise Characteristics				
AC220V	I_O=100% 1.6A	Ripple 23mV Ripple & Noise 125mV_{P-P}		CH1(전압) 100mV/div 5us/div

7-2. JSF75-48 Output characteristics

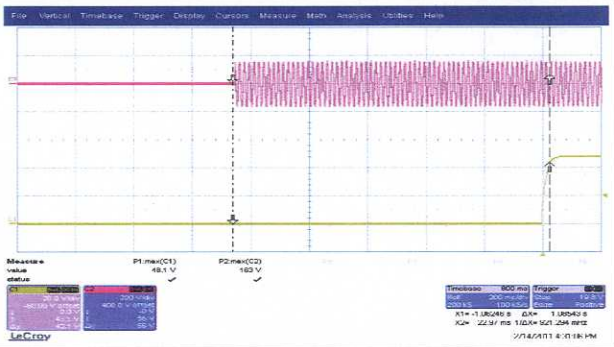
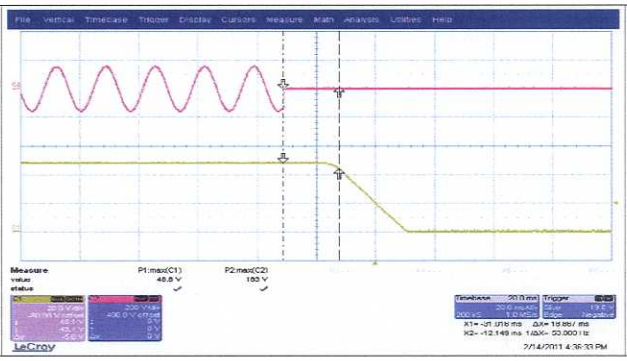
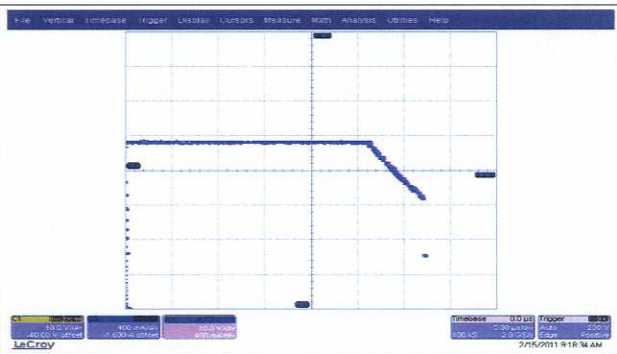
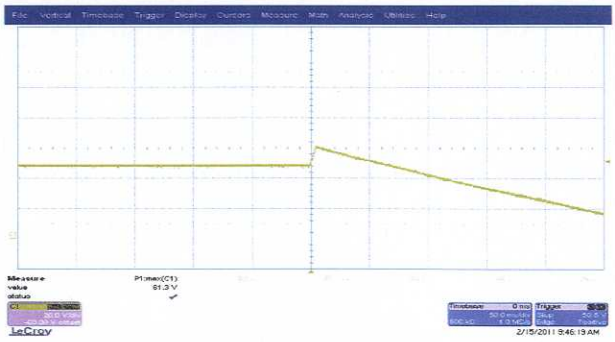
< 계측기 >

(3) Oscilloscope : WAVESURFER 454 (LeCroy)

◇ CH1 : OUTPUT VOLTAGE - PP005-WS Passive probe (BANDWIDTH: 200MHz)

◇ CH2 : INPUT VOLTAGE - ADP305 High voltage differential probe (BANDWIDTH: 200MHz)

◇ CH3 : OUTPUT CURRENT - AP015 Current probe

입력	출력	측정값	파형	비고
Turn on Time Characteristics				
AC110V	I_O=100% 1.6A	T_{on} = 1085ms		CH1: 20.0V/div CH2: 200V/div 200ms/div
Hold up Time Characteristics				
AC110V	I_O=100% 1.6A	T_{off} = 18.86ms		CH1: 20.0V/div CH2: 200V/div 20.0ms/div
Over Current protection characteristics				
220VAC	I_O= 0A~가변	OCP= 2.23A (139%)		CH1(전압) 10.0V/div 5us/div CH3(전류) 400mA/div 5us/div
Over Voltage protection characteristics				
AC220V	I_O=10% 0.16A	OVP = 60.0V (125%)		CH1(전압) 20.0V/div 50.0ms/div