



# Test Report: PHP-3500-48

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3500W Conduction Cooling with PFC Switching Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

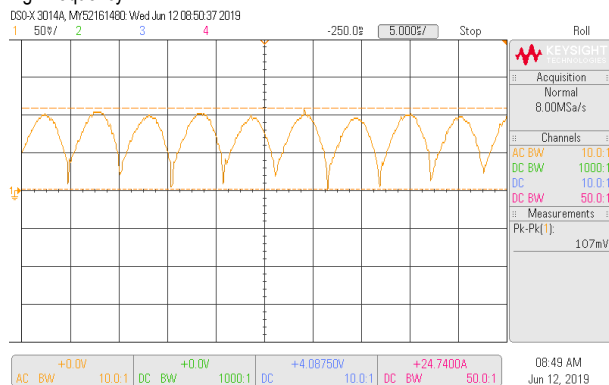
ENVIRONMENT TEST

## DESIGN VERIFY TEST

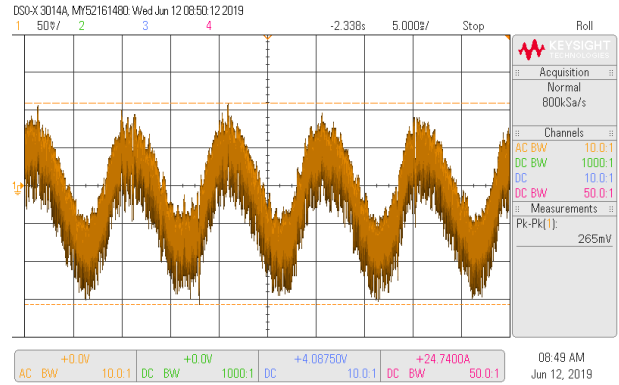
### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 48V~ 57.6 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	46.559V~60.197V/230VAC 46.557V~60.202V/115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: 1%~ -1 %	I/P: 180VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: 0.25%~-0.25%
3	LINE REGULATION (Max)	V1: 0.5%~-0.5 %	I/P: 180VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0.042 %~0%
4	LOAD REGULATION(Max)	V1: 0.5%~ -0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.208%~-0.042%
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	<5%
6	RIPPLE & NOISE(Max)	V1: 480mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 265mVp-p

high frequency :

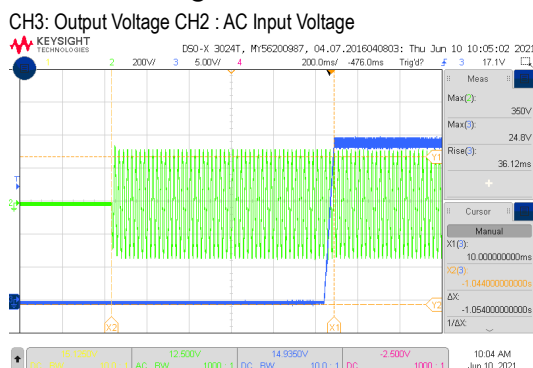


low frequency :

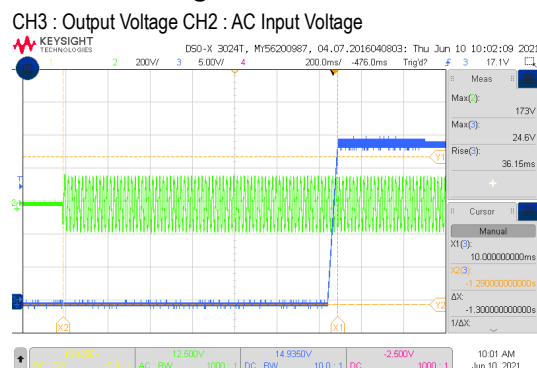


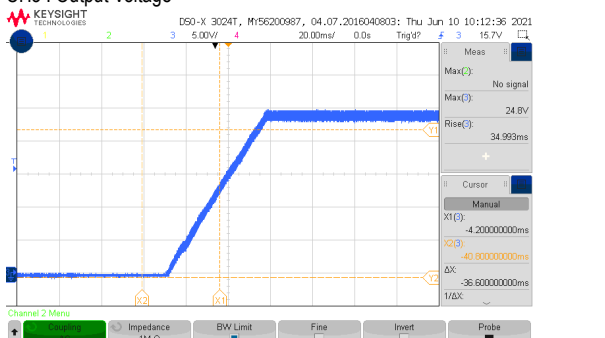
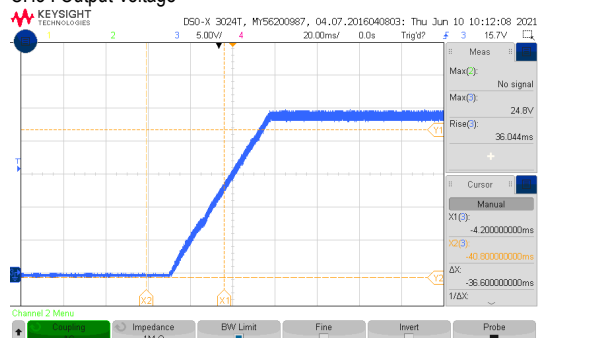
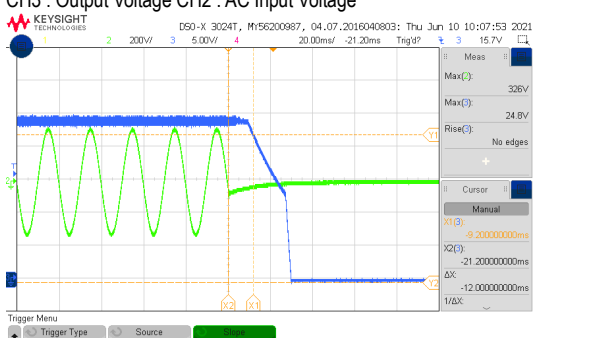
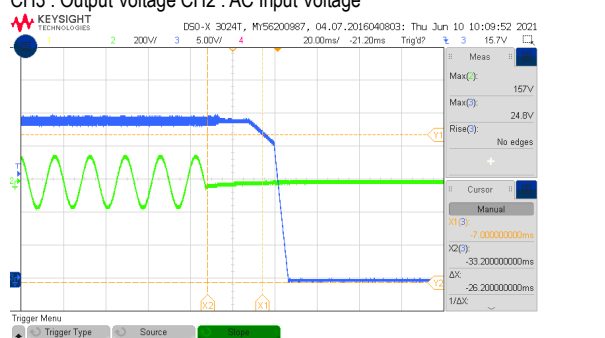
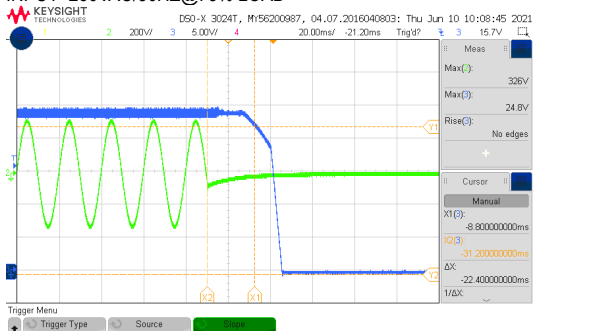
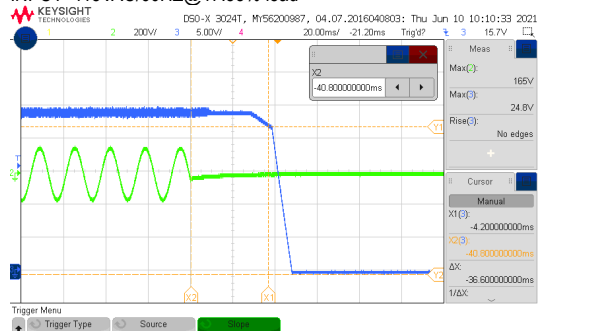
7	SET UP TIME(Max)	230VAC/1500ms 115VAC/1500ms Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details	I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 63.8% LOAD Ta : 25°C	230VAC/ 1054ms 115VAC/ 1300 ms
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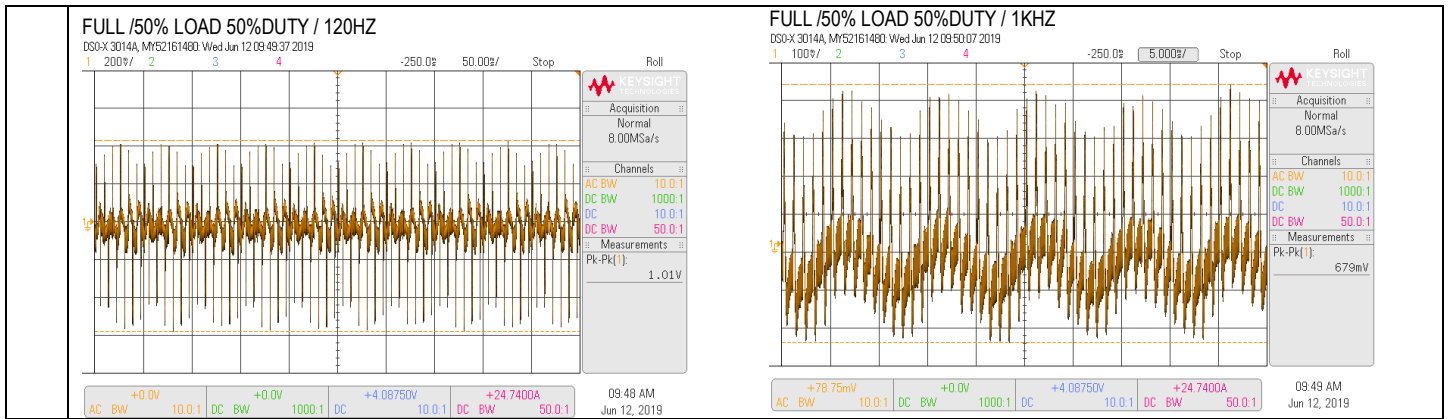
INPUT=230VAC/50HZ @ FULL LOAD



INPUT=115VAC/60HZ @ 63.8% LOAD



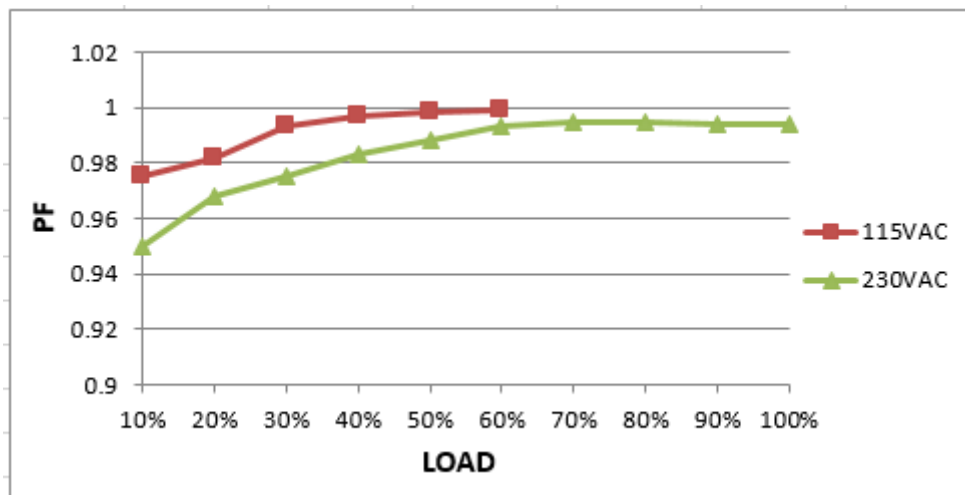
<p><b>8</b> RISE TIME (Max)</p>	<p>230VAC/50ms 115VAC/60ms</p> <p>Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details</p>	<p>I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 63.8% LOAD Ta : 25°C</p>	<p>230VAC/ 34.99 ms 115VAC/ 36.04 ms</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD CH3 : Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ 63.8% LOAD CH3 : Output Voltage</p> 	
<p><b>9</b> HOLD UP TIME (Typ.)</p>	<p>230、115VAC/10ms at full load 230、115VAC/16ms at 75% load</p> <p>Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details</p>	<p>I/P : 230 VAC O/P : FULL LOAD/75% LOAD I/P : 115 VAC O/P : 63.8% LOAD/47.85% LOAD Ta : 25°C</p>	<p>230VAC/ 12 ms at full load 230VAC/ 22.4 ms at 75% load 115VAC/ 26.2 ms at 63.8% load 115VAC/ 36.6 ms at 47.85% load</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD CH3 : Output Voltage CH2 : AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ 63.8% LOAD CH3 : Output Voltage CH2 : AC Input Voltage</p> 	
<p>INPUT=230VAC/50HZ@75% LOAD</p> 		<p>INPUT=115VAC/60HZ@47.85% load</p> 	
<p><b>10</b> DYNAMIC LOAD</p>	<p>V1: 4800 mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C</p>	<p>1010mVp-p 679mVp-p</p>



## INPUT FUNCTION TEST

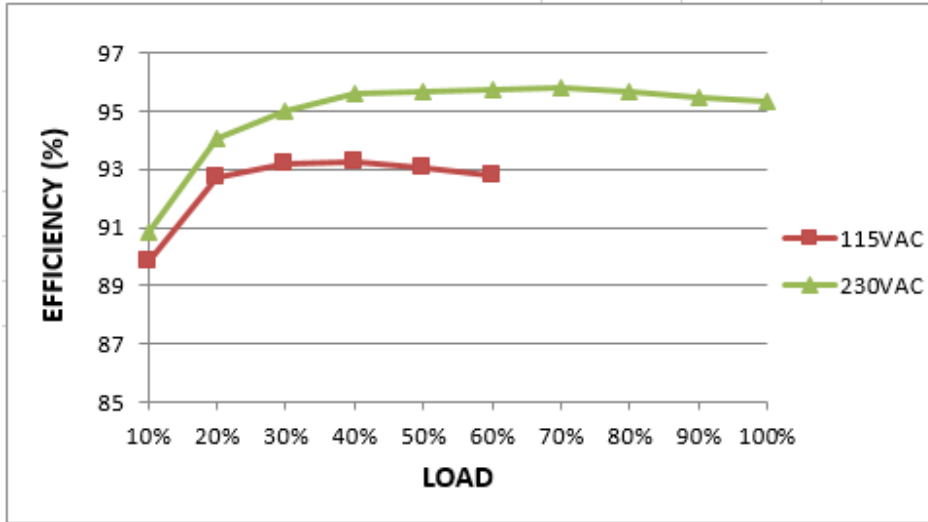
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD/ Derating Load Ta:25°C	165V~264V full load 84V~264V Derating Load
			I/P: LOW-LINE-3V=177 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST:OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:90 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (Typ.)	230V/ 20 A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=16.22A/ 230VAC
4	LEAKAGE CURRENT	< 2mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.68 mA N-FG : 0.7 mA
5	POWER FACTOR (Typ.)	0.95/ 230VAC	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF=0.994/230VAC

P.F vs LOAD



6	EFFICIENCY(Typ.)	96%	I/P:230 VAC O/P:75% LOAD Ta:25°C	96.26%
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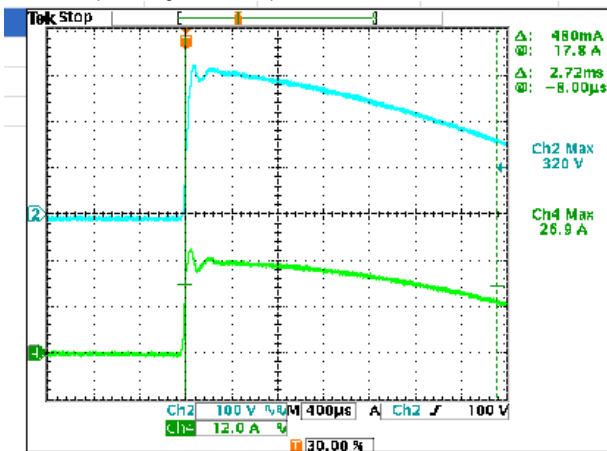
EFFICIENCY vs LOAD



7	INRUSH CURRENT(Typ.)	230V/80A 115V/30A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I=26.9A/ 230VAC T50= 2720us I=13.1A/ 115VAC T50= 2690us
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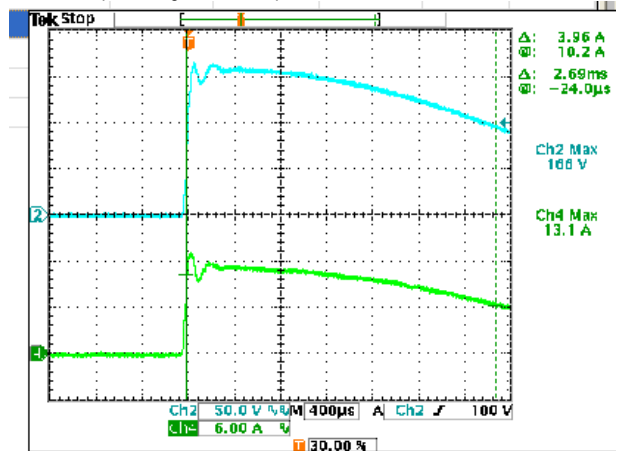
INPUT=230VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current



INPUT=115VAC/60HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current



## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 115 % Protection type : Constant current limiting, shut down O/P voltage 5 sec. after O/P voltage is down low, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 180VAC O/P: TESTING Ta:25°C	264VAC : 112.16% 230VAC : 112.16% 180VAC : 112.16% PROTECTION TYPE : Constant current limiting, shut down O/P voltage 5 sec. after O/P voltage is down low, re-power on to recover

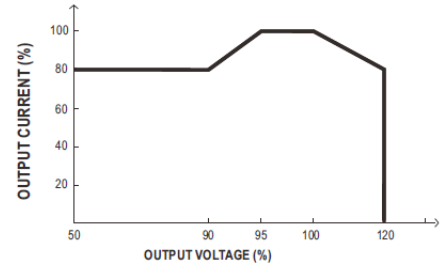
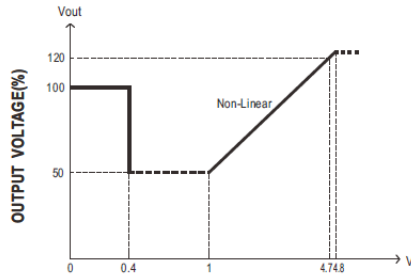
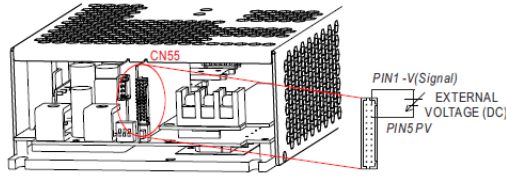
2	OVER VOLTAGE PROTECTION	60V~72V Protection type : Shut down O/P voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta: 25°C	264VAC : 67.87V 230VAC : 67.85V 90VAC : 67.88V PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down O/P voltage, recovers automatically after temperature goes down	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	O.T.P. Active Protection type : Shut down O/P voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type : Constant current limiting, shut down O/P voltage 5 sec. after O/P voltage is down low, re-power on to recover	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE PROTECTION TYPE : Constant current limiting, shut down O/P voltage 5 sec. after O/P voltage is down low, re-power on to recover

## CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT												
1	AUXILIARY POWER (AUX)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C Test Result :														
		<table border="1"> <thead> <tr> <th>AUX</th> <th>TOLERANCE</th> <th>RIPPLE</th> <th>TEST RESULT</th> </tr> </thead> <tbody> <tr> <td>12V / 0.5A</td> <td>10.8~13.2 V</td> <td>150mVp-p</td> <td>12V/63.7mV</td> </tr> </tbody> </table>			AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.5A	10.8~13.2 V	150mVp-p	12V/63.7mV				
AUX	TOLERANCE	RIPPLE	TEST RESULT													
12V / 0.5A	10.8~13.2 V	150mVp-p	12V/63.7mV													
2	REMOTE ON/OFF CONTROL	The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.														
		<p style="text-align: center;">PIN1 +12V-AUX Switch PIN3-Remote ON-OFF</p> <table border="1"> <thead> <tr> <th>Remote ON-OFF</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>Short circuit</td> <td>ON</td> </tr> <tr> <td>Open circuit</td> <td>OFF</td> </tr> </tbody> </table> <p>I/P: 230 VAC O/P: FULL LOAD Ta: 25°C Test Result :</p> <table border="1"> <thead> <tr> <th>Remote ON/OFF</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>SW SHORT</td> <td>ON</td> </tr> <tr> <td>SW OPEN</td> <td>OFF</td> </tr> </tbody> </table>			Remote ON-OFF	Power Supply Status	Short circuit	ON	Open circuit	OFF	Remote ON/OFF	Power Supply Status	SW SHORT	ON	SW OPEN	OFF
Remote ON-OFF	Power Supply Status															
Short circuit	ON															
Open circuit	OFF															
Remote ON/OFF	Power Supply Status															
SW SHORT	ON															
SW OPEN	OFF															

3 OUTPUT VOLTAGE PROGRAMMABLE(PV)

※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.



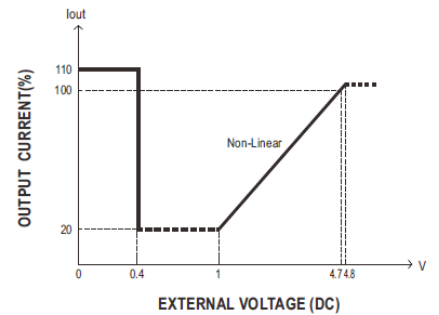
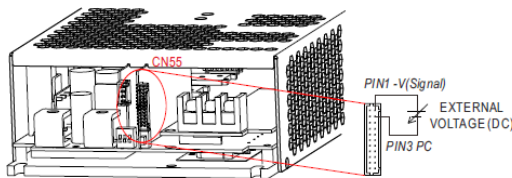
- ⊙ The rated current should change with the Output Voltage Programming accordingly.
- ⊙ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.

I/P: 230 VAC  
 O/P: FULL LOAD  
 Ta: 25°C  
 TEST RESULT :

PV	0V (0~0.3V)	1V (0.45~1V)	4.7V	5V
MODEL				
SPEC	48V±5%	24V±5%	57.6V±5%	57.6V±5%
Vout	47.92V	23.81V	57.58V	58.94V

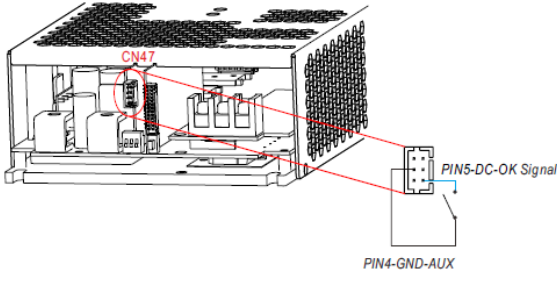
4 OUTPUT CURRENT PROGRAMMABLE (PC)

※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.



I/P: 230 VAC  
 O/P: TESTING  
 Ta: 25°C

ADJ V	0V (0~0.3V)	1V (0.45~1V)	4.7V	5V
SPEC	110%±10%	20%±10%	100%±10%	100%±10%
TEST	111.12%	19.26%	99.58%	102.37%

5	DC OK CONTACT RATINGS	<p>DC-OK signal is a TTL level signal. The maximum sourcing current is 4mA and the maximum external voltage is 5.6V.</p>  <table border="1" data-bbox="1157 369 1508 470"> <thead> <tr> <th>DC-OK signal</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>"High" &gt;4.5~5.5V</td> <td>OFF</td> </tr> <tr> <td>"Low" &lt;-0.5~-0.5V</td> <td>ON</td> </tr> </tbody> </table> <p>I/P: 230 VAC O/P: TESTING Ta: 25°C</p> <table border="1" data-bbox="502 750 1061 846"> <thead> <tr> <th>DC-OK signal</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>"High" &gt;4.5~5.5V</td> <td>OFF</td> </tr> <tr> <td>"Low" &lt;-0.5~-0.5V</td> <td>ON</td> </tr> </tbody> </table>			DC-OK signal	Power Supply Status	"High" >4.5~5.5V	OFF	"Low" <-0.5~-0.5V	ON	DC-OK signal	Power Supply Status	"High" >4.5~5.5V	OFF	"Low" <-0.5~-0.5V	ON
DC-OK signal	Power Supply Status															
"High" >4.5~5.5V	OFF															
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DC-OK signal	Power Supply Status															
"High" >4.5~5.5V	OFF															
"Low" <-0.5~-0.5V	ON															
6	CURRENT SHARING	<p>CURRENT SHARING TOLERANCE <math>\leq \pm 10\%</math></p>	<p>I/P : 230 VAC O/P : 90/50% LOAD Ta : 25°C</p>	<p>O/P : 90% PSU1 : 66A PSU2 : 66.4 A PSU3 : 65.2 A PSU4 : 65.8 A O/P : 50% PSU1 : 36.6A PSU2 : 37 A PSU3 : 36.2 A PSU4 : 36.6 A</p>												

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated 76 A/ 600V	<p>AC ON/OFF I/P: High-Line +3V = 267V VDS: O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90% Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90% Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90% Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50% Duty/120Hz (7) 5% → 400% Load.</p> <p>I/P: Low-Line -3V = 177V O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90% Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90% Duty/3KHz (5) Dynamic Load Full Load/</p>	<p>VDS: (1) 452 V (2) 460V (3) 452V (4) 452V (5) 452V (6) 452V (7) 432V</p> <p>VDS: (1) 456V (2) 440V (3) 456V (4) 452V (5) 452V</p>



			<p>Min. Load 90%Duty/5KHz          (6)Dynamic Load 100% Load/          Min. Load 50%Duty/120Hz          (7)5%→400% Load.          Ta:25°C</p>	<p>(6) 456V          (7) 444V</p>
2	P.F.C Transistor ( D to S) or (C to E) Peak Voltage	Q 903 Rated 34A/ 600V	<p>I/P:High-Line +3V =267 V          AC ON/OFF          O/P: (1)Full Load          (2)Output Short          (3)Dynamic Load Full Load/          Min. Load 90%Duty/1KHz          (4)Dynamic Load Full Load/          Min. Load 90%Duty/3KHz          (5)Dynamic Load Full Load/          Min. Load 90%Duty/5KHz          (6)Dynamic Load 100% Load/          Min. Load 50%Duty/120Hz          (7)5%→400% Load.</p> <p>I/P:Low-Line -3V = 177V          AC ON/OFF          O/P: (1)Full Load          (2)Output Short          (3)Dynamic Load Full Load/          Min. Load 90%Duty/1KHz          (4)Dynamic Load Full Load/          Min. Load 90%Duty/3KHz          (5)Dynamic Load Full Load/          Min. Load 90%Duty/5KHz          (6)Dynamic Load 100% Load/          Min. Load 50%Duty/120Hz          (7)5%→400% Load.          Ta:25°C</p>	<p>VDS:          (1) 476V          (2) 444V          (3) 476V          (4) 476V          (5) 476V          (6) 464V          (7) 444V</p> <p>VDS:          (1) 496V          (2) 448V          (3) 492V          (4) 492V          (5) 488V          (6) 480V          (7) 412V</p>
3	P.F.C DIODE	D 8 Rated 20A/ 650V	<p>I/P:High-Line +3V =267 V          AC ON/OFF          O/P: (1)Full Load          (2)Output Short          (3)Dynamic Load Full Load/          Min. Load 90%Duty/5KHz          (4)Dynamic Load 100% Load/          Min. Load 50%Duty/120Hz</p> <p>I/P:Low-Line -3V = 177V          AC ON/OFF          O/P: (1)Full Load          (2)Output Short          (3)Dynamic Load Full Load/          Min. Load 90%Duty/5KHz          (4)Dynamic Load 100% Load/          Min. Load 50%Duty/120Hz          Ta:25°C</p>	<p>(1) 440V          (2) 460V          (3) 456V          (4) 460V</p> <p>(1) 464V          (2) 448V          (3) 460V          (4) 472V</p>
4	Diode Peak Voltage	<p>Q211 Rated 87A/150V</p> <p>Q241 Rated 87A/150V</p>	<p>AC ON/OFF</p> <p>I/P:High-Line +3V =267 V          O/P: (1)Full Load          (2)Output Short          (3)Dynamic Load Full Load/          Min. Load 90%Duty/1KHz</p>	<p>Q211:                      Q241:          VDS:                      VDS:          (1)112.9 V                (1) 128.2V          (2) 27.7V                (2) 37.3V          (3) 112.9V                (3) 124.2V          (4) 112.9V                (4) 127.4V</p>

			<p>(4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz</p> <p>(5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)5%→400% Load.</p> <p>(8).NO LOAD</p> <p>(9) burst Mode</p> <p>Ta:25°C</p>	<p>(5) 112.1V</p> <p>(6) 115.3V</p> <p>(7) 108.1V</p> <p>(8)111.3V</p> <p>(9) 111.3V</p>	<p>(5) 125.8V</p> <p>(6) 128.2V</p> <p>(7) 127.4V</p> <p>(8) 117.7V</p> <p>(9) 112.1V</p>
5	Input Capacitor Voltage	<p>C5 Rated: : 470 μ/ 450 V 105°C/ MXK Series Surge Voltage=500V</p>	<p>I/P:High-Line +3V =267V</p> <p>O/P: (1)Full Load input on/off</p> <p>(2) Min load input on /Off</p> <p>(3)Full Load /Min load Change</p> <p>(4)Full load continue</p> <p>Ta:25°C</p>	<p>(1) 449V</p> <p>(2) 448V</p> <p>(3) 449V</p> <p>(4) 418V</p>	
6	Control IC Voltage Test	<p>PWM IC U1 Rated 6.5V~ 30 V</p> <p>PFC IC U901 Rated 4.5V~20 V</p> <p>O/P IC U261 Rated 8V~27 V</p> <p>PWM MCU IC U501 Rated 2.97V~ 4.6V</p>	<p>AC ON/OFF</p> <p>I/P:High-Line +3V =267 V</p> <p>O/P(1)FULL LOAD</p> <p>(2) Output Short</p> <p>(3)O.L.P</p> <p>(4)O.V.P.</p> <p>(5)NO LOAD VRmin(LOW LINE)</p> <p>Ta:25°C</p>	<p>U1:</p> <p>(1) 12.48V</p> <p>(2) 12.4V</p> <p>(3) 10.47V</p> <p>(4) 11.11V</p> <p>(5) 11.51V</p> <p>U901:</p> <p>(1) 12.6V</p> <p>(2) 12.56V</p> <p>(3) 11.11V</p> <p>(4) 11.92V</p> <p>(5) 11.59V</p>	<p>U261:</p> <p>(1) 12.68V</p> <p>(2) 10.26V</p> <p>(3) 10.02V</p> <p>(4) 12.52V</p> <p>(5) 11.72V</p> <p>U501</p> <p>(1) 4.23V</p> <p>(2) 4.03V</p> <p>(3) 4.23V</p> <p>(4) 3.38V</p> <p>(5) 3.18V</p> <p>U951</p> <p>(1) 3.57V</p> <p>(2) 3.77V</p> <p>(3) 3.73V</p> <p>(4) 3.41V</p> <p>(5) 3.15V</p>
8	TOP SWITCHING STAND BY POWER	<p>U301 Rated(PIN5/PIN8) 20 A/ 800V</p>	<p>AC ON/OFF</p> <p>I/P:High-Line +3V =267 V</p> <p>O/P: (1)Full Load</p> <p>(2)Remote On/Off</p> <p>I/P:Low-Line -3V =177 V</p> <p>O/P: (1)Full Load</p> <p>(2)Remote On/Off</p> <p>Ta:25°C</p>	<p>U301</p> <p>(1) 768 V</p> <p>(2) 776V</p> <p>(1) 776V</p> <p>(2) 768V</p>	

## SAFETY& E.M.C. TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG :2KVAC/min O/P-FG:1..25KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:1.5KVAC/min Ta:25°C	I/P-O/P: 14.4mA I/P-FG: 12.3mA O/P-FG: 16.6mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 6.1 GΩ I/P-FG: 5.7 GΩ O/P-FG: 9.94 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	15 mΩ

### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55032 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55032 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 INDUSTRY AIR: 8KV / Contact: 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A PASS
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A PASS
6	SURGE	IEC61000-6-2 INDUSTRY L-N : 2KV L,N-PE : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A PASS
7	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report.			

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL : PHP-3500-48 (AMBIENT TEMPERATURE WITH WATER COOLING SYSTEM ) 1L/min 25°C 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50 °C		

		NO	Position	ROOM AMBIENT Ta= 25°C	HIGH AMBIENT Ta= 50°C
		1	LF1	47.3°C	76.3°C
		2	C2	62.7°C	79.3°C
		3	ZNR2	55.7°C	72.8°C
		4	LF2	71.0°C	90.6°C
		5	T1 WIRE	68.4°C	83.5°C
		6	T2 WIRE	67.4°C	81.5°C
		7	T2 CORE	73.1°C	88.4°C
		8	L3	59.9°C	80.9°C
		9	T903	56.0°C	75.0°C
		10	Q901	40.7°C	49.4°C
		11	Q903	47.6°C	57.1°C
		12	BD2	40.3°C	53.2°C
		13	RTH3	47.9°C	63.8°C
		14	T301	49.6°C	71.6°C
		15	C6	48.5°C	68.6°C
		16	L1	79.8°C	95.4°C
		17	L2	76.7°C	92.4°C
		18	RTH9	60.5°C	81.4°C
		19	Q2	46.3°C	56.5°C
		20	T3	83.4°C	97.2°C
		21	C111	33.8°C	43.3°C
		22	C125	33.0°C	45.2°C
		23	C362	44.2°C	66.8°C
		24	D103	55.4°C	71.6°C
		25	D102	44.6°C	55.4°C
		26	U201	45.1°C	55.9°C
		27	Q231	43.2°C	52.5°C
		28	Q214	46.8°C	57.1°C
		29	U263	48.8°C	58.8°C
		30	R299	65.6°C	84.9°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )		I/P : 230 VAC O/P : 110 % LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR		I/P : 264VAC/90VAC O/P : 100% /50%LOAD Ta= -35°C/-25°C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C /95 %R.H NO DAMAGE		I/P : 272 VAC O/P : FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~50°C)		I/P : 230 VAC O/P : FULL LOAD	± 0.001 %/°C (0~50°C)
6	STORAGE TEMPERATURE TEST	-40~85°C		1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : STATIC	



7	THERMAL SHOCK TEST	-30~50°C	1. Thermal shock Temperature : -35°C~ +55°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test
8	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 6G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C
9	CAPACITOR LIFE CYCLE	SUPPOSE C111 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 1595120HRS (2) 825686HRS (3) 996752HRS (4) 1433840HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 544.8K hrs min. Telcordia SR-332 (Bellcore) ; 56.3K hrs min. MIL-HDBK-217F (25°C)	
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT ZENG

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