



Test Report: PHP-3500-115

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

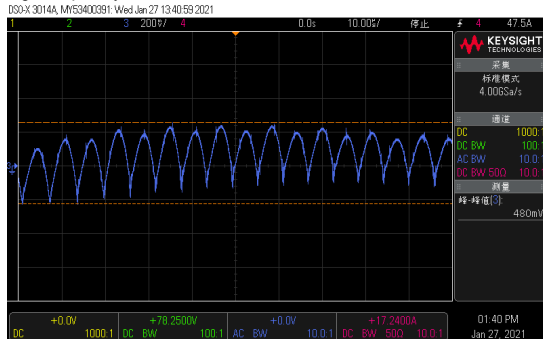
ENVIRONMENT TEST

DESIGN VERIFY TEST

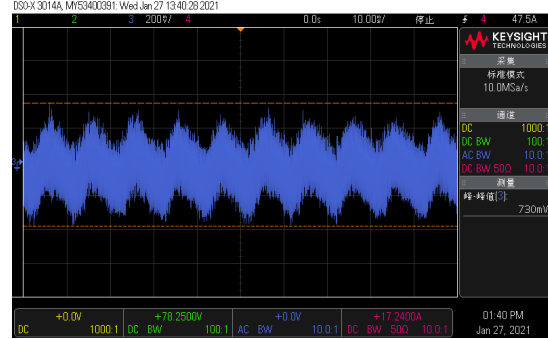
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 110V~ 160V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	101.39V~165.74V /230VAC 101.46V~165.71V /115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: 1%~ -1 %	I/P: 90VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1:-0.037%~0.131%
3	LINE REGULATION (Max)	V1: 0.5%~- 0.5 %	I/P: 90VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.026%~0.056%
4	LOAD REGULATION(Max)	V1: 0.5%~ -0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.059%~0.083%
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD(CC) Ta:25°C	V1: 0.8% (CC)
6	RIPPLE & NOISE(Max)	V1: 1150mVp-p	I/P: 230 VAC O/P:(1) FULL LOAD (2) 0%~100% LOAD Ta:25°C	(1) 730 mVp-p (2) 730 mVp-p

high frequency :



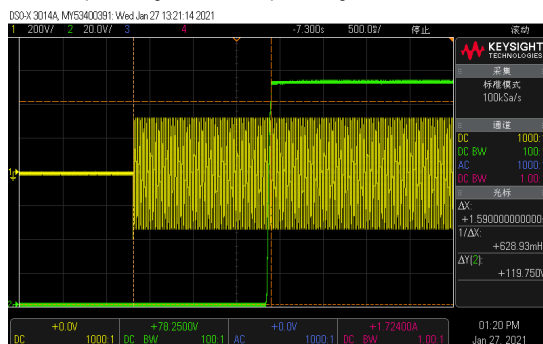
low frequency :



7	SET UP TIME(Max)	230VAC/2000ms	I/P : 230 VAC O/P : FULL LOAD(CC) Ta : 25°C	230VAC/1590ms(CC)
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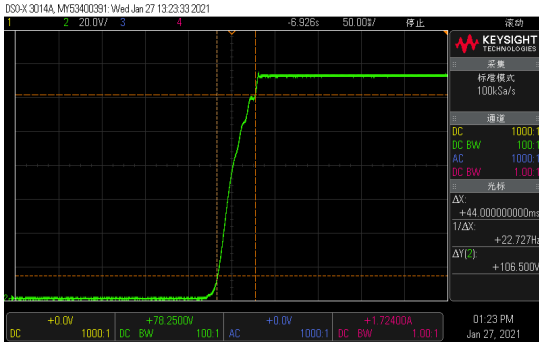
INPUT=230VAC/50HZ @ FULL LOAD CC

CH1 : Output Voltage CH2 : AC Input Voltage



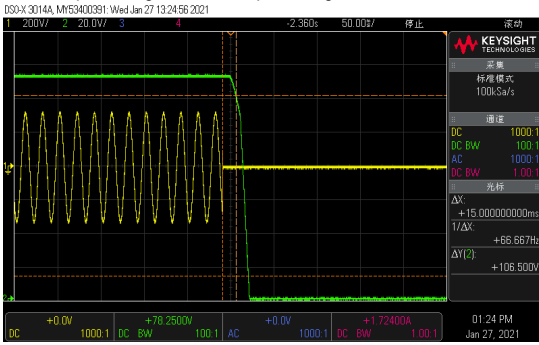
8	RISE TIME (Max)	230VAC/60ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/44ms
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INPUT=230VAC/50HZ @ FULL LOAD
CH2 : Output Voltage

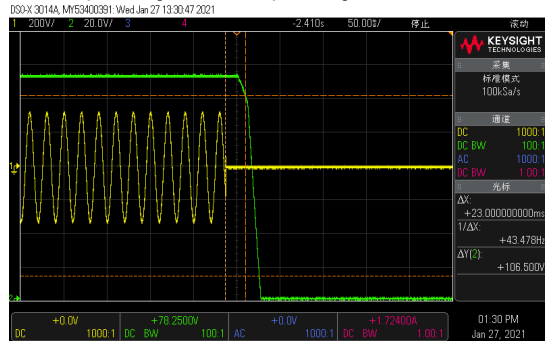


9	HOLD UP TIME (Typ.)	230VAC/10ms at full load 230VAC/16ms at 75% load	I/P : 230 VAC O/P : FULL LOAD/75% LOAD Ta : 25°C	230VAC/15ms /full load 230VAC/23ms/75% load
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INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage CH2: AC Input Voltage

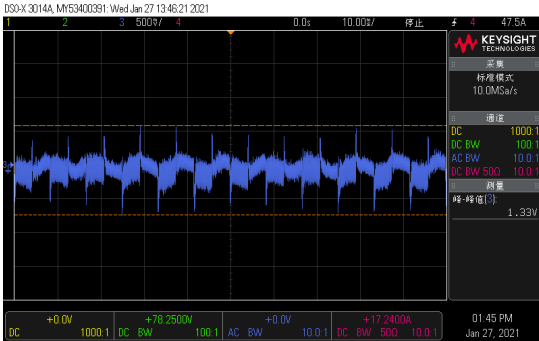


INPUT=230VAC/60HZ @ 75% LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

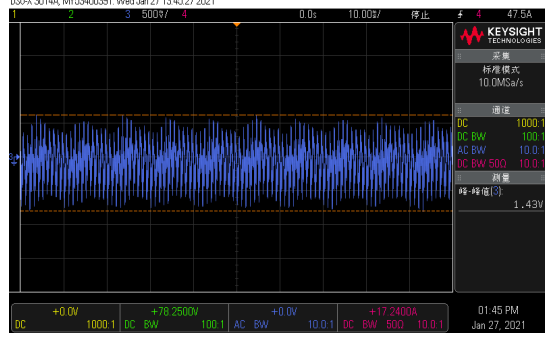


10	DYNAMIC LOAD	V1: 13300 mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	1330mVp-p FULL /50% LOAD 50%DUTY / 120HZ 1430mVp-p FULL /50% LOAD 50%DUTY / 1KHZ
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FULL /50% LOAD 50%DUTY / 120HZ

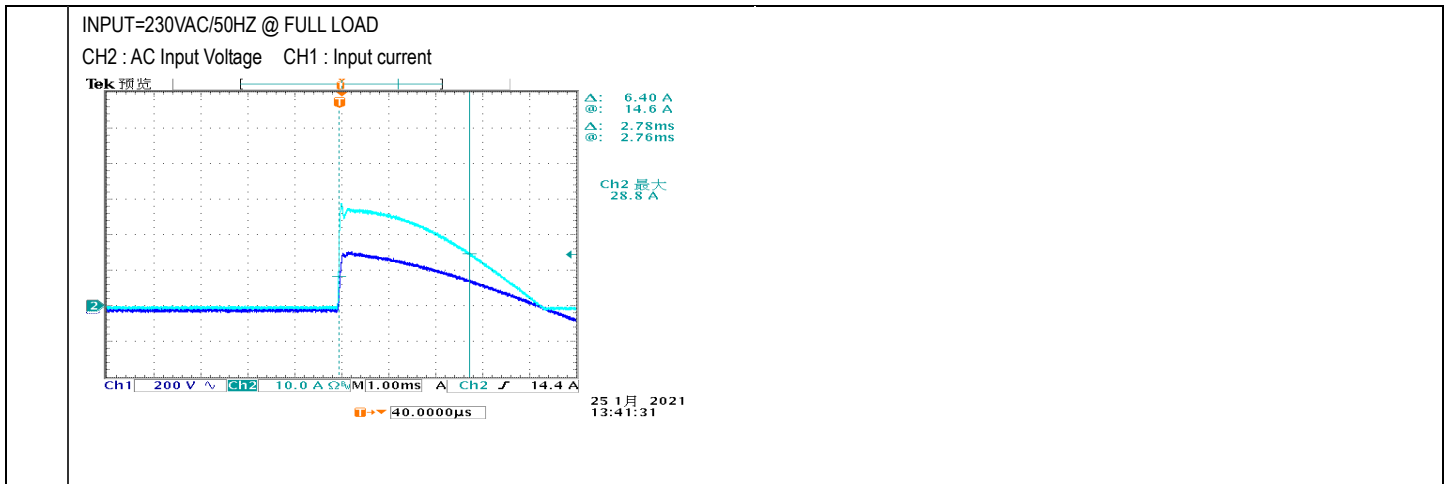


FULL /50% LOAD 50%DUTY / 1KHZ



INPUT FUNCTION TEST

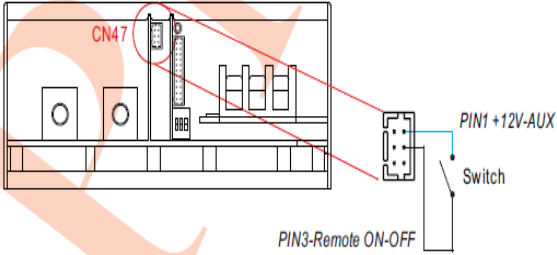
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																	
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL/50% LOAD Ta:25°C	180V~264V full load 90V~264V 50% load																																	
			I/P: LOW-LINE-3V=87V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK 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=16.1A/ 230VAC																																	
4	LEAKAGE CURRENT	< 2mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.7321mA N-FG : 0.7397 mA																																	
5	POWER FACTOR (Typ.)	0.95/ 230VAC	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF=0.975/230VAC																																	
<p>P.F vs LOAD</p> <table border="1"> <caption>P.F vs LOAD Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>115VAC PF</th> <th>230VAC PF</th> </tr> </thead> <tbody> <tr><td>10%</td><td>0.975</td><td>0.885</td></tr> <tr><td>20%</td><td>0.975</td><td>0.900</td></tr> <tr><td>30%</td><td>0.975</td><td>0.925</td></tr> <tr><td>40%</td><td>0.975</td><td>0.945</td></tr> <tr><td>50%</td><td>0.975</td><td>0.960</td></tr> <tr><td>60%</td><td>0.975</td><td>0.965</td></tr> <tr><td>70%</td><td>0.975</td><td>0.970</td></tr> <tr><td>80%</td><td>0.975</td><td>0.975</td></tr> <tr><td>90%</td><td>0.975</td><td>0.975</td></tr> <tr><td>100%</td><td>0.975</td><td>0.975</td></tr> </tbody> </table>					LOAD (%)	115VAC PF	230VAC PF	10%	0.975	0.885	20%	0.975	0.900	30%	0.975	0.925	40%	0.975	0.945	50%	0.975	0.960	60%	0.975	0.965	70%	0.975	0.970	80%	0.975	0.975	90%	0.975	0.975	100%	0.975	0.975
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6	EFFICIENCY(Typ.)	95%	I/P:230 VAC O/P: FULLLOAD Ta:25°C	95.4%																																	
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7	INRUSH CURRENT(Typ.)	230V/80A COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=28.8A/ 230VAC T50= 2780us/230VC																																	



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 115 %	I/P: 264VAC I/P: 230VAC I/P: 180VAC O/P: TESTING Ta:25°C	264VAC :111.49% 230VAC :111.67% 180VAC :110.0% PROTECTION TYPE : Constant current limiting, unit will shut down after 5 sec, re-power on to recover.
2	OVER VOLTAGE PROTECTION	168V~200V	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta:25°C	264VAC :182V 230VAC :182V 90VAC : 184V PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD/50%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	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Constant current limiting, unit will shut down after 5 sec, re-power on to recover.

CONTROL FUNCTION TEST

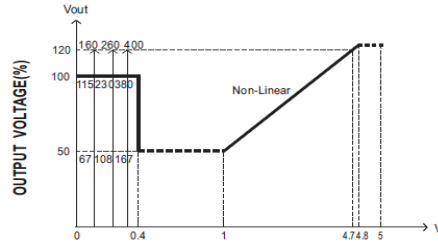
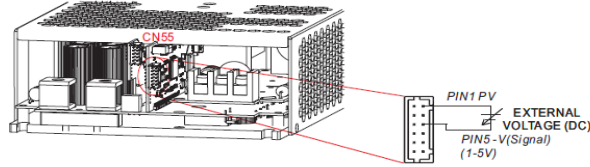
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT												
1	AUXILIARY POWER (AUX)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>AUX</th> <th>TOLERANCE</th> <th>RIPPLE</th> <th>TEST RESULT</th> </tr> </thead> <tbody> <tr> <td>12V / 0.5A</td> <td>10.8~13.2 V</td> <td>150mVp-p</td> <td>64 mVp-p</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.5A	10.8~13.2 V	150mVp-p	64 mVp-p						
AUX	TOLERANCE	RIPPLE	TEST RESULT													
12V / 0.5A	10.8~13.2 V	150mVp-p	64 mVp-p													
2	REMOTE ON/OFF CONTROL	<h3>3.Remote ON-OFF Control</h3> <p>The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.</p>  <table border="1" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <thead> <tr> <th>Between ON/OFF and +12V-AUX</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>SW SHORT(10.8 ~ 13.2V)</td> <td>11.96V / ON</td> </tr> <tr> <td>SW OPEN(-0.5 ~ 0.5V)</td> <td>0.297V/ OFF</td> </tr> </tbody> </table>	Remote ON-OFF	Power Supply Status	Short circuit	ON	Open circuit	OFF	Between ON/OFF and +12V-AUX	Power Supply Status	SW SHORT(10.8 ~ 13.2V)	11.96V / ON	SW OPEN(-0.5 ~ 0.5V)	0.297V/ OFF		
Remote ON-OFF	Power Supply Status															
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3 OUTPUT VOLTAGE PROGRAMMABLE(PV)

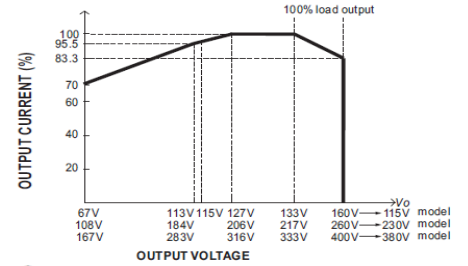
FUNCTION MANUAL

1. Output Voltage Programming (or, PV / remote voltage programming / remote adjust / margin programming / dynamic voltage trim)
 ※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.

115V, 230V, 380V model



◎ The 100% output voltage is based on default.



◎ The rated current should change with the Output Voltage Programming accordingly.

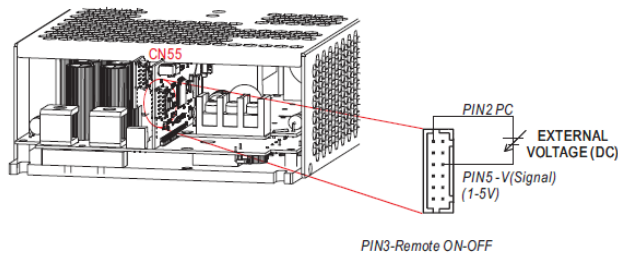
I/P: 230 VAC
 O/P: FULL LOAD
 Ta: 25°C
 TEST RESULT : OK

PV	0V (0~0.3V)	1V (0.45~1V)	4.7V	5V
MODEL				
SPEC	133V±5%	67V±5%	160V±5%	160V±5%
Vout	132.97V	65.615V	159.63V	162.66V

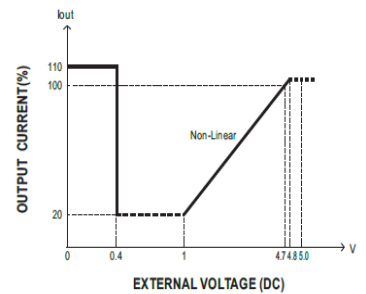
4 OUTPUT CURRENT PROGRAMMABLE (PC)

2. Output Current Programming (or, PC / remote current programming / dynamic current trim)

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

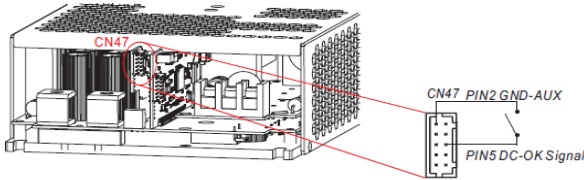


115V, 230V, 380V model



I/P: 230 VAC
 O/P: TESTING(133V /26.3A)
 Ta: 25°C

ADJ V	0V (0~0.3V)	1V (0.45~1V)	4.7V	5V
SPEC	110%±5%	20%±5%	100%±5%	100%±5%
TEST	106.19%	19.23%	96.1%	98.49%

5	DC OK CONTACT RATINGS	<p>4.DC-OK Signal DC-OK signal is a TTL level signal. The maximum sourcing current is 10mA and the maximum external voltage is 5.6V.</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>DC-OK signal</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>"High" >3.5~5.5V</td> <td>OFF</td> </tr> <tr> <td>"Low" <-0.5~0.5V</td> <td>ON</td> </tr> </tbody> </table> <p style="text-align: center;">115V, 230V, 380V model</p> <p>I/P: 230 VAC O/P: TESTING Ta: 25°C</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>DC-OK signal</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>"High" >4.5~5.5V</td> <td>5.04V / OFF</td> </tr> <tr> <td>"Low" <-0.5~0.5V</td> <td>0.0V / ON</td> </tr> </tbody> </table>	DC-OK signal	Power Supply Status	"High" >3.5~5.5V	OFF	"Low" <-0.5~0.5V	ON	DC-OK signal	Power Supply Status	"High" >4.5~5.5V	5.04V / OFF	"Low" <-0.5~0.5V	0.0V / ON
DC-OK signal	Power Supply Status													
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COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated 62 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) 0% → 400% Load. (8) NO LOAD (9) 200% 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/ Min. Load 90% Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50% Duty/120Hz (7) 0% → 400% Load. (8) NO LOAD (9) 200% Load</p> <p style="text-align: center;">Ta: 25°C</p>	<p>VDS: (1) 447V (2) 439V (3) 447V (4) 443V (5) 443V (6) 447V (7) 443V (8) 443V (9) 439V</p> <p>VDS: (1) 459V (2) 435V (3) 455V (4) 455V (5) 455V (6) 459V (7) 435V (8) 455V (9) 467V</p>

<p>2</p>	<p>P.F.C Transistor (D to S) or (C to E) Peak Voltage</p>	<p>Q 903 Rated 34A/ 600V</p>	<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) 0%→400% Load. (8) NO LOAD (9) 200% 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) 0%→400% Load. (8) NO LOAD (9) 200% Load</p> <p>Ta:25°C</p>	<p>VDS: (1) 484V (2) 420V (3) 480V (4) 480V (5) 480V (6) 468V (7) 464V (8) 432V (9) 420V</p> <p>VDS: (1) 500V (2) 452V (3) 496V (4) 500V (5) 496V (6) 488V (7) 468V (8) 472V (9) 452V</p>
<p>3</p>	<p>P.F.C DIODE</p>	<p>D 8 Rated 20A/ 650V</p>	<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 (5) NO LOAD (6) 200% 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/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (5) NO LOAD (6) 200% Load</p> <p>Ta:25°C</p>	<p>(1) 501V (2) 493V (3) 501V (4) 497V (5) 525V (6) 489V</p> <p>(1) 505V (2) 493V (3) 505V (4) 497V (5) 485V (6) 489V</p>

4	Diode Peak Voltage	<p>D204 Rated: 10A/650V</p> <p>D207 Rated: 10A/650V</p>	<p>AC ON/OFF</p> <p>I/P:High-Line +3V =267 V</p> <p>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) 0%→400% Load. (8)NO LOAD (9) burst Mode (10) (6) 200% Load</p> <p>Ta:25°C</p>	<table border="0"> <tr> <td>D204:</td> <td>D207</td> </tr> <tr> <td>(1) 287V</td> <td>(1) 292V</td> </tr> <tr> <td>(2) 23.3V</td> <td>(2) 21.3V</td> </tr> <tr> <td>(3) 290V</td> <td>(3) 293V</td> </tr> <tr> <td>(4) 294V</td> <td>(4) 297V</td> </tr> <tr> <td>(5) 290V</td> <td>(5) 293V</td> </tr> <tr> <td>(6) 298V</td> <td>(6) 297V</td> </tr> <tr> <td>(7) 298V</td> <td>(7) 301V</td> </tr> <tr> <td>(8) 294V</td> <td>(8) 293V</td> </tr> <tr> <td>(9) 294V</td> <td>(9) 297V</td> </tr> <tr> <td>(10) 23.4V</td> <td>(10) 21.7V</td> </tr> </table>	D204:	D207	(1) 287V	(1) 292V	(2) 23.3V	(2) 21.3V	(3) 290V	(3) 293V	(4) 294V	(4) 297V	(5) 290V	(5) 293V	(6) 298V	(6) 297V	(7) 298V	(7) 301V	(8) 294V	(8) 293V	(9) 294V	(9) 297V	(10) 23.4V	(10) 21.7V										
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(7) 298V	(7) 301V																																			
(8) 294V	(8) 293V																																			
(9) 294V	(9) 297V																																			
(10) 23.4V	(10) 21.7V																																			
5	Input Capacitor Voltage	<p>C5 Rated: 470 μ / 450 V</p>	<p>I/P:High-Line +3V =267V</p> <p>O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue</p> <p>Ta:25°C</p>	<table border="0"> <tr> <td>(1) 421V</td> </tr> <tr> <td>(2) 409V</td> </tr> <tr> <td>(3) 413V</td> </tr> <tr> <td>(4) 409V</td> </tr> </table>	(1) 421V	(2) 409V	(3) 413V	(4) 409V																												
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6	Control IC Voltage Test	<p>U1 Rated 6.5V~ 30 V</p> <p>U901 Rated 4.5V~20 V</p> <p>U501 Rated 2.97V~ 4.6V</p> <p>U951 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 (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin(LOW LINE) (6)NO/FULL LOAD(AC on) (7)NO LOAD(AC on)</p> <p>Ta:25°C</p>	<table border="0"> <tr> <td>U1:</td> <td>U501:</td> </tr> <tr> <td>(1) 14.7V</td> <td>(1) 3.5V</td> </tr> <tr> <td>(2) 15.5V</td> <td>(2) 3.43V</td> </tr> <tr> <td>(3) 16.1V</td> <td>(3) 3.47V</td> </tr> <tr> <td>(4) 14.2V</td> <td>(4) 3.51V</td> </tr> <tr> <td>(5) 13.4V</td> <td>(5) 3.43V</td> </tr> <tr> <td>(6) 14.0V</td> <td>(6) 3.56V</td> </tr> <tr> <td>(7) 12.6V</td> <td>(7) 3.43V</td> </tr> <tr> <td>U901:</td> <td>U951:</td> </tr> <tr> <td>(1) 12.88V</td> <td>(1) 3.68V</td> </tr> <tr> <td>(2) 12.96V</td> <td>(2) 3.6V</td> </tr> <tr> <td>(3) 12.63V</td> <td>(3) 3.6V</td> </tr> <tr> <td>(4) 12.79V</td> <td>(4) 3.76V</td> </tr> <tr> <td>(5) 12.55V</td> <td>(5) 3.56V</td> </tr> <tr> <td>(6) 12.96V</td> <td>(6) 3.56V</td> </tr> <tr> <td>(7) 12.55V</td> <td>(7) 3.64V</td> </tr> </table>	U1:	U501:	(1) 14.7V	(1) 3.5V	(2) 15.5V	(2) 3.43V	(3) 16.1V	(3) 3.47V	(4) 14.2V	(4) 3.51V	(5) 13.4V	(5) 3.43V	(6) 14.0V	(6) 3.56V	(7) 12.6V	(7) 3.43V	U901:	U951:	(1) 12.88V	(1) 3.68V	(2) 12.96V	(2) 3.6V	(3) 12.63V	(3) 3.6V	(4) 12.79V	(4) 3.76V	(5) 12.55V	(5) 3.56V	(6) 12.96V	(6) 3.56V	(7) 12.55V	(7) 3.64V
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8	TOP SWITCHING STAND BY POWER	<p>U301 Rated 20 A/ 800V</p>	<p>AC ON/OFF</p> <p>I/P:High-Line +3V =267 V</p> <p>O/P: (1)Full Load (2)Remote On/Off</p> <p>I/P:Low-Line -3V =97 V</p> <p>O/P: (1)Full Load (2)Remote On/Off</p> <p>Ta:25°C</p>	<table border="0"> <tr> <td>U301</td> </tr> <tr> <td>(1) 658V</td> </tr> <tr> <td>(2) 654V</td> </tr> <tr> <td>(1) 658V</td> </tr> <tr> <td>(2) 618V</td> </tr> </table>	U301	(1) 658V	(2) 654V	(1) 658V	(2) 618V																											
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SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 6KVDC/min I/P-FG : 4KVDC /min O/P-FG: 4KVDC /min	I/P-O/P: 6KVDC/min I/P-FG: 4KVDC /min O/P-FG: 4KVDC /min Ta:25°C	I/P-O/P: 0.65uA I/P-FG: 0.71uA O/P-FG:6.3uA 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: >9999 MΩ I/P-FG: >9999 MΩ O/P-FG: 1887 MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	5 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-12	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	VOLTAGE FLICKER	EN61000-3-3	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
3	CONDUCTION	EN55032 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
4	RADIATION	EN55032 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
5	E.S.D	EN61000-4-2 INDUSTRY AIR: 8KV / Contact: 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA
6	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA
7	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
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-3500-115 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=29 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=52.2 °C			
		NO	Position	ROOM AMBIENT Ta=29°C	HIGH AMBIENT Ta=52.2°C
		1	LF1	52.4°C	77.9°C
		2	BD1	55.7°C	80.4°C
		3	RTH3	69.3°C	92.8°C
		4	RY1	48.0°C	72.3°C
		5	ZNR3	44.0°C	68.4°C
		6	U11	47.2°C	72.2°C
		7	L3	49.3°C	74.0°C
		8	T1wire	48.8°C	74.1°C
		9	T2wire	50.6°C	75.7°C
		10	R299	46.2°C	70.9°C
		11	T3	37.1°C	61.3°C
		12	U1	32.5°C	56.4°C
		13	L1	48.2°C	73.4°C
		14	T901	42.8°C	66.7°C
		15	RTH9	44.0°C	68.4°C
		16	C5	33.8°C	57.6°C
		17	Q901	65.5°C	91.4°C
		18	D8	67.3°C	91.6°C
		19	Q903	62.0°C	87.6°C
		20	Q2	54.7°C	81.5°C
		21	RG31	50.1°C	74.0°C
		22	U301	49.5°C	73.7°C
		23	C342	39.4°C	63.2°C
		24	D337	44.1°C	68.1°C
		25	T301	38.8°C	62.7°C
		26	U951	46.5°C	70.4°C
		27	C125	35.2°C	58.6°C
		28	U501	47.7°C	71.8°C
		29	D102	32.7°C	56.1°C
		30	D203	56.8°C	80.4°C
		31	D212	47.8°C	71.9°C
		32	U201	49.1°C	73.7°C
		33	RG41	37.4°C	60.9°C
34	TC(L3)	48.9°C	72.8°C		

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 108.44 %LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/90VAC O/P : FULL/50% LOAD Ta= -35/-30 °C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	$\pm 0.03 \%$ /(0°C~50°C)	I/P : 230 VAC O/P : FULL LOAD	$\pm 0.0003 \%$ /°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 : 10CYCLE 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, 2G 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 : 3G (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) 2525629HRS (2) 437284HRS (3) 498522HRS (4) 558674 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 576.5K hrs min. Telcordia SR-332 (Bellcore) ; 63.9K 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	WUWQ/HUANGMK	WENF	LINKX

2018.4.30 GP-A50-F010