



Test Report: PHP-3500-48

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

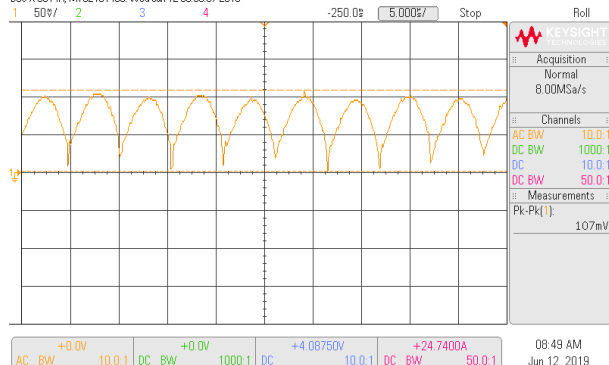
DESIGN VERIFY TEST

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

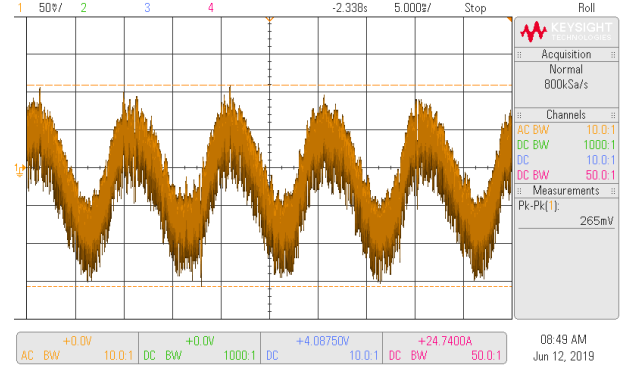
high frequency :

D50-X 3014A, MY52161480 Wed Jun 12 08:50:37 2019



low frequency :

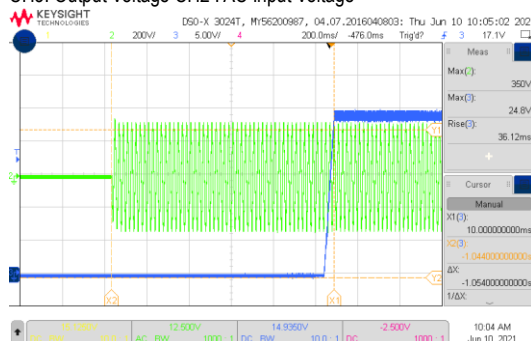
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7	SET UP TIME(Max)	230VAC/1500ms 115VAC/1500ms Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details	I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 63.8% LOAD Ta : 25°C	230VAC/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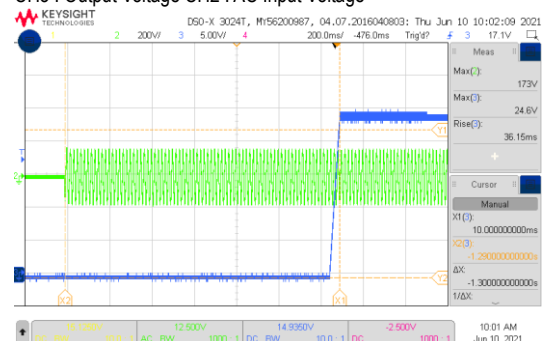
INPUT=230VAC/50HZ @ FULL LOAD

CH3: Output Voltage CH2: AC Input Voltage

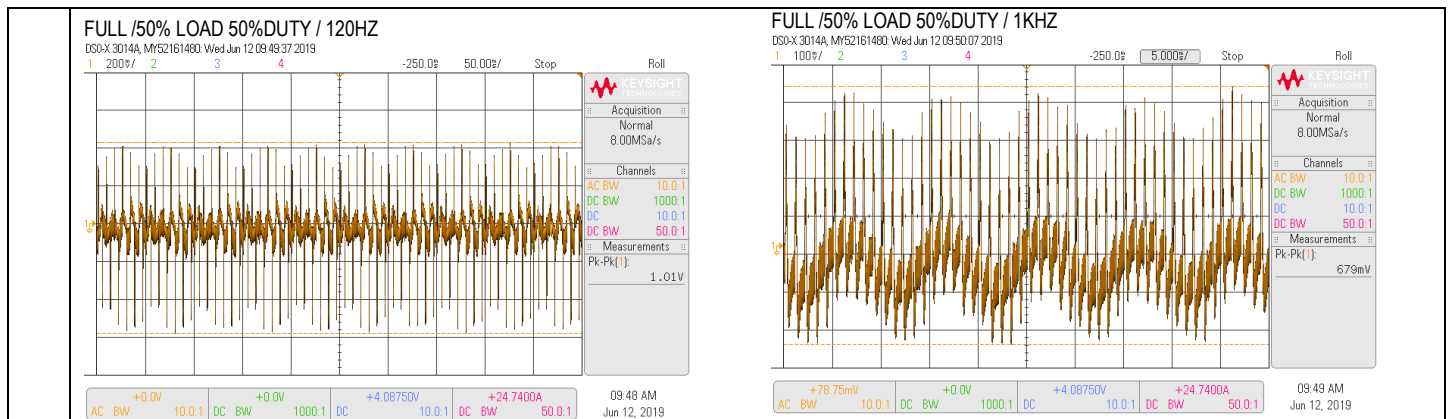


INPUT=115VAC/60HZ @ 63.8% LOAD

CH3: Output Voltage CH2: AC Input Voltage



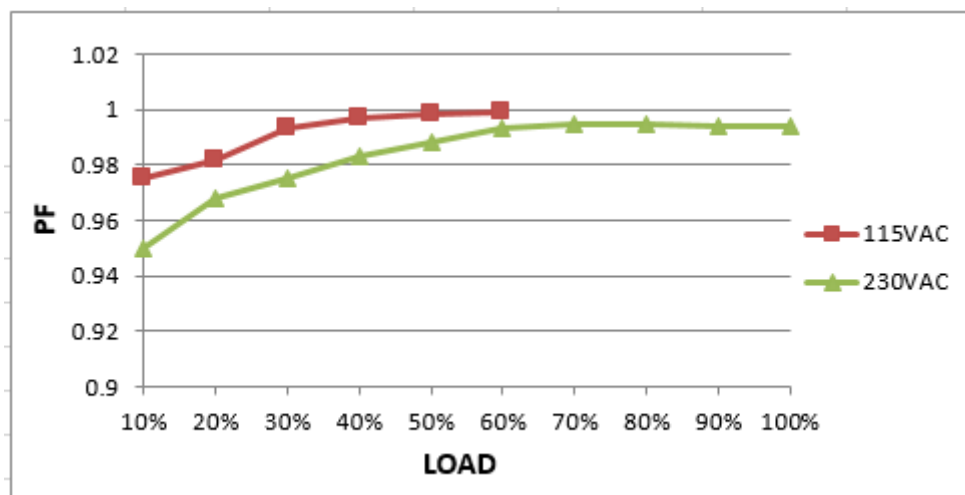
8	RISE TIME (Max)	230VAC/50ms 115VAC/60ms Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details	I/P : 230 VAC O/P : FULL LOAD I/P : 115 VAC O/P : 63.8% LOAD Ta : 25°C	230VAC/ 34.99 ms 115VAC/ 36.04 ms
INPUT=230VAC/50HZ @ FULL LOAD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

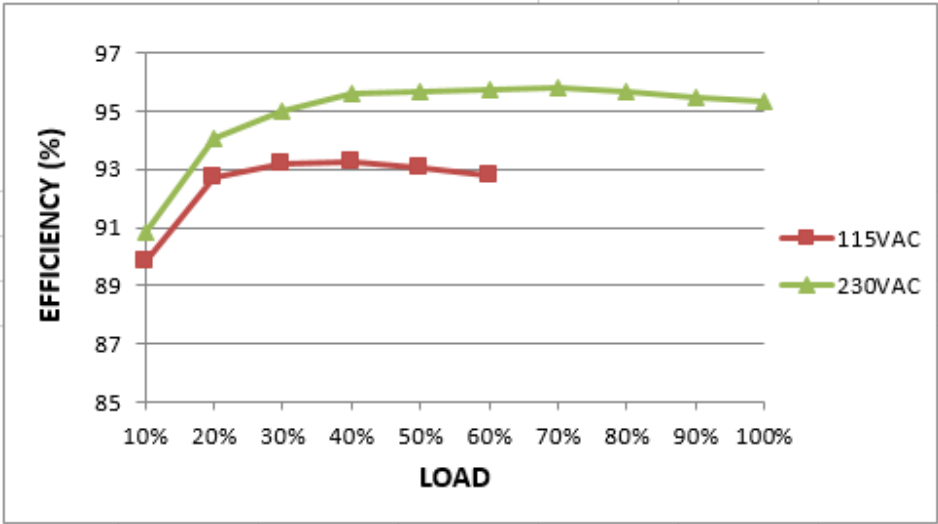
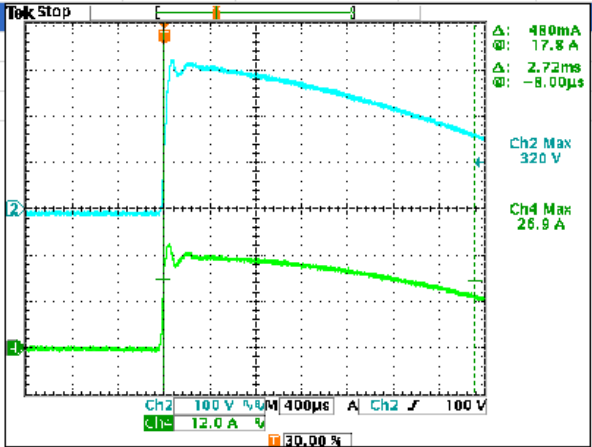
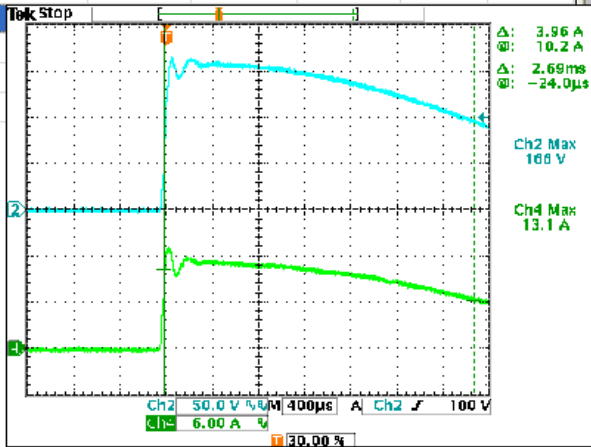


INPUT FUNCTION TEST

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



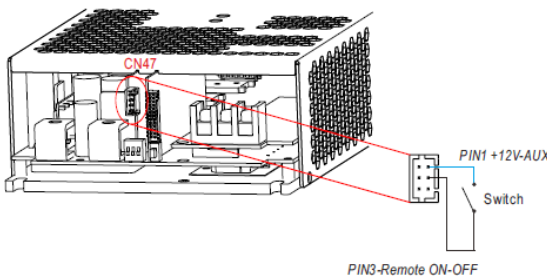
6	EFFICIENCY(Typ.)	96%	I/P:230 VAC O/P:75% LOAD Ta:25°C	96.26%
EFFICIENCY vs LOAD 				
7	INRUSH CURRENT(Typ.)	230V/80A 115V/30A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I=26.9A/ 230VAC T50= 2720us I=13.1A/ 115VAC T50= 2690us
<div> <div> INPUT=230VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current  </div> <div> INPUT=115VAC/60HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current  </div> </div>				

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

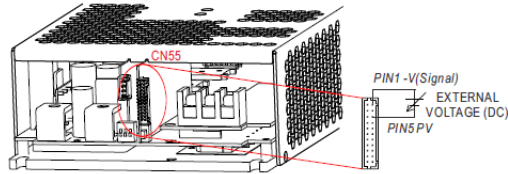
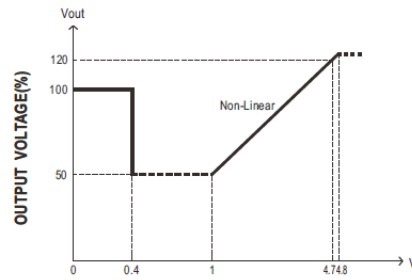
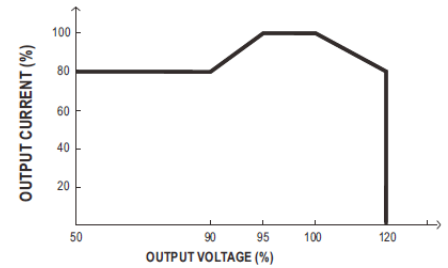
2	OVER VOLTAGE PROTECTION	60V~72V Protection type : Shut down O/P voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta: 25°C	264VAC : 67.87V 230VAC : 67.85V 90VAC : 67.88V PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection 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)	<div>I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result :</div> <table><tr><td>AUX</td><td>TOLERANCE</td><td>RIPPLE</td><td>TEST RESULT</td></tr><tr><td>12V / 0.5A</td><td>10.8~13.2 V</td><td>150mVp-p</td><td>12V/63.7mV</td></tr></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	<div>The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.</div> <div></div> <div><table><tr><td>Remote ON-OFF</td><td>Power Supply Status</td></tr><tr><td>Short circuit</td><td>ON</td></tr><tr><td>Open circuit</td><td>OFF</td></tr></table></div> <div><div>I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result :</div><table><tr><td>Remote ON/OFF</td><td>Power Supply Status</td></tr><tr><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr></table></div>			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

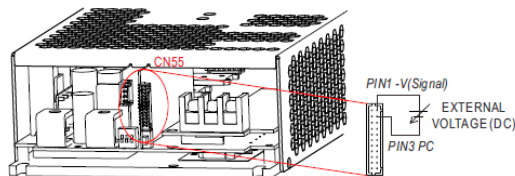
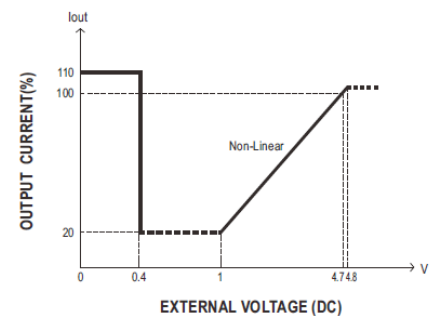
Ta: 25°C

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.

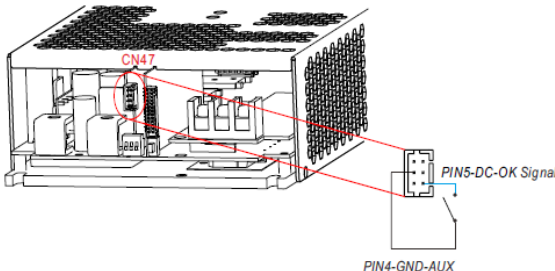


I/P: 230 VAC

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> <div><table><tr><th>DC-OK signal</th><th>Power Supply Status</th></tr><tr><td>"High" >4.5~5.5V</td><td>OFF</td></tr><tr><td>"Low" <-0.5~-0.5V</td><td>ON</td></tr></table></div> <p>I/P: 230 VAC O/P:TESTING Ta:25°C</p> <table><tr><th>DC-OK signal</th><th>Power Supply Status</th></tr><tr><td>"High" >4.5~5.5V</td><td>OFF</td></tr><tr><td>"Low" <-0.5~-0.5V</td><td>ON</td></tr></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															
"Low" <-0.5~-0.5V	ON															
DC-OK signal	Power Supply Status															
"High" >4.5~5.5V	OFF															
"Low" <-0.5~-0.5V	ON															
6	CURRENT SHARING	CURRENT SHARING TOLERANCE <±10%	I/P : 230 VAC O/P : 90/50% LOAD Ta : 25°C	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												

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	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. 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/	VDS: (1) 452 V (2) 460V (3) 452V (4) 452V (5) 452V (6) 452V (7) 432V VDS: (1) 456V (2) 440V (3) 456V (4) 452V (5) 452V

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

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

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: 16.6m A 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℃	HIGH AMBIENT Ta= 50℃
			1	LF1	47.3℃	76.3℃
			2	C2	62.7℃	79.3℃
			3	ZNR2	55.7℃	72.8℃
			4	LF2	71.0℃	90.6℃
			5	T1 WIRE	68.4℃	83.5℃
			6	T2 WIRE	67.4℃	81.5℃
			7	T2 CORE	73.1℃	88.4℃
			8	L3	59.9℃	80.9℃
			9	T903	56.0℃	75.0℃
			10	Q901	40.7℃	49.4℃
			11	Q903	47.6℃	57.1℃
			12	BD2	40.3℃	53.2℃
			13	RTH3	47.9℃	63.8℃
			14	T301	49.6℃	71.6℃
			15	C6	48.5℃	68.6℃
			16	L1	79.8℃	95.4℃
			17	L2	76.7℃	92.4℃
			18	RTH9	60.5℃	81.4℃
			19	Q2	46.3℃	56.5℃
			20	T3	83.4℃	97.2℃
			21	C111	33.8℃	43.3℃
			22	C125	33.0℃	45.2℃
			23	C362	44.2℃	66.8℃
			24	D103	55.4℃	71.6℃
			25	D102	44.6℃	55.4℃
			26	U201	45.1℃	55.9℃
			27	Q231	43.2℃	52.5℃
			28	Q214	46.8℃	57.1℃
			29	U263	48.8℃	58.8℃
			30	R299	65.6℃	84.9℃
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 110 % LOAD Ta : 25℃		TEST : OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/90VAC O/P : 100% /50%LOAD Ta= -35℃/-25℃		TEST : OK	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ /95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H		TEST : OK	
5	TEMPERATURE COEFFICIENT	± 0.03 %/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD		± 0.001 %/℃ (0~50℃)	
6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature : -45℃~ +90℃ 2. Temperature change rate : 25℃ / 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℃	1. Thermal shock Temperature : -35℃~ +55℃ 2. Temperature change rate : 25℃ / 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℃
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 183.4K hrs min. Telcordia SR-332 (Bellcore) ; 56.26K hrs min. MIL-HDBK-217F (25℃)	
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 50,000 hours	

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

2018.4.30 GP-A50-F010