



Test Report: UHP-1500-24

1500W 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

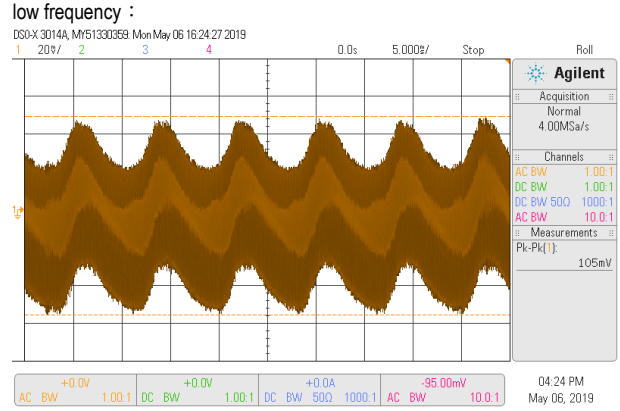
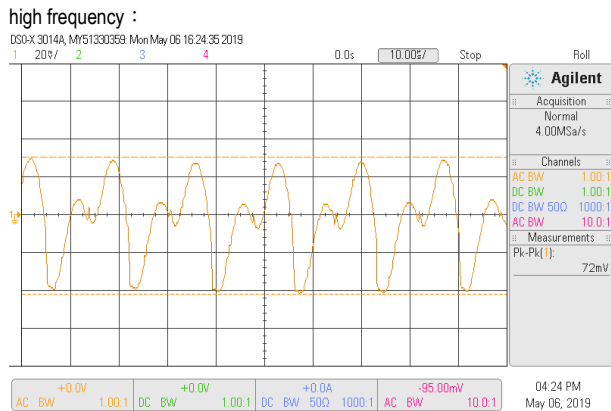
■ RELIABILITY TEST

ENVIRONMENT TEST

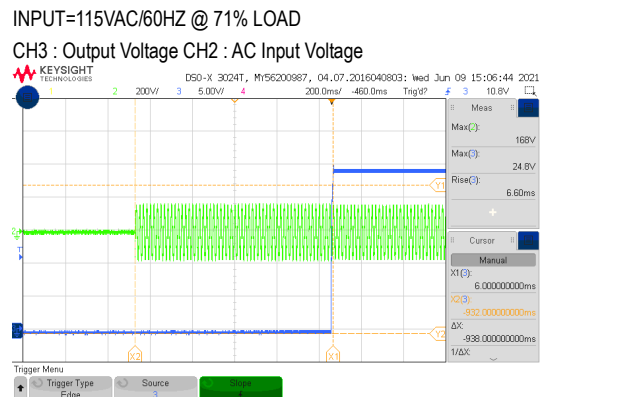
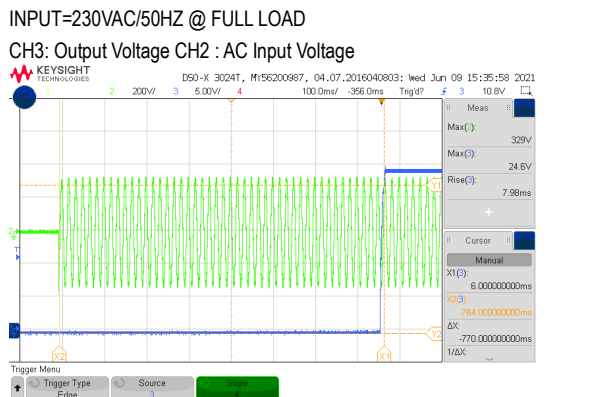
DESIGN VERIFY TEST

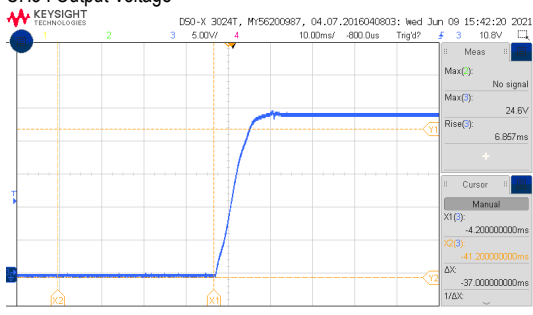
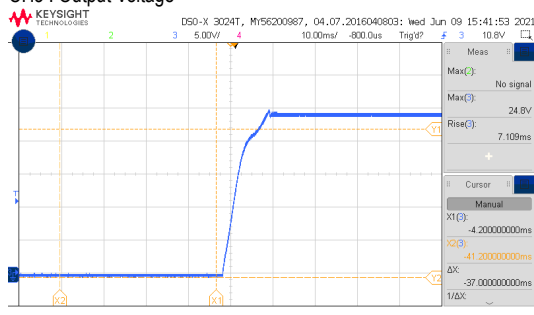
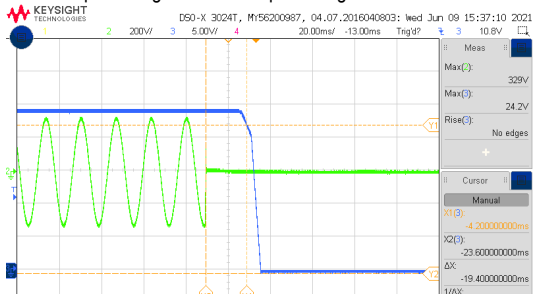
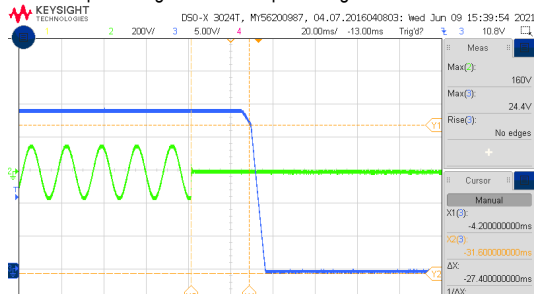
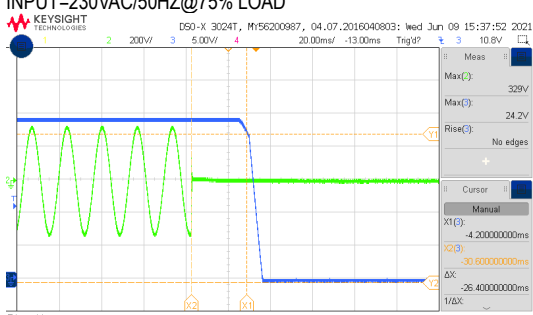
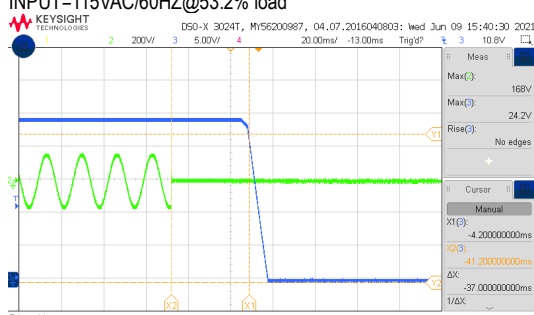
OUTPUT FUNCTION TEST

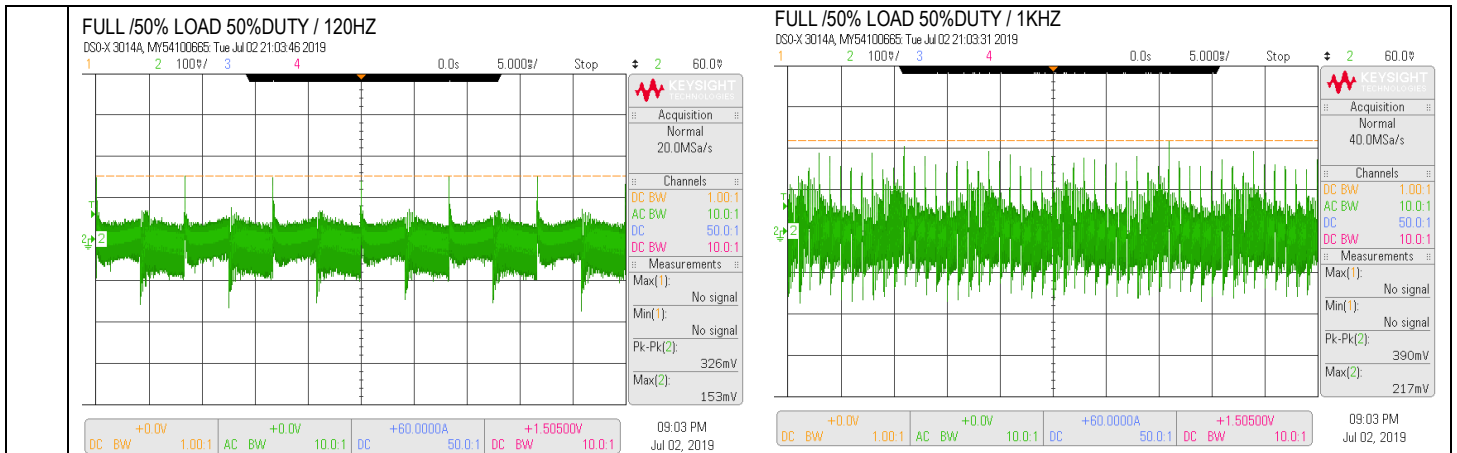
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 24 V~ 28.8 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	23.33V~ 29.58 V/230VAC 23.33V~ 29.58 V /115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: 1%~ -1 %	I/P: 180VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: 0.17 %~ -0.17 %
3	LINE REGULATION (Max)	V1: 0.5%~ -0.5 %	I/P: 180VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0.05%~ -0.05 %
4	LOAD REGULATION(Max)	V1: 0.5%~ - 0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.13 %~ -0.13 %
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< 5 %
6	RIPPLE & NOISE(Max)	V1: 240mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 105mVp-p



7	SET UP TIME(Max)	230VAC/1800ms 115VAC/1800ms 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 : 71% LOAD Ta : 25°C	230VAC/ 770ms 115VAC/ 938 ms
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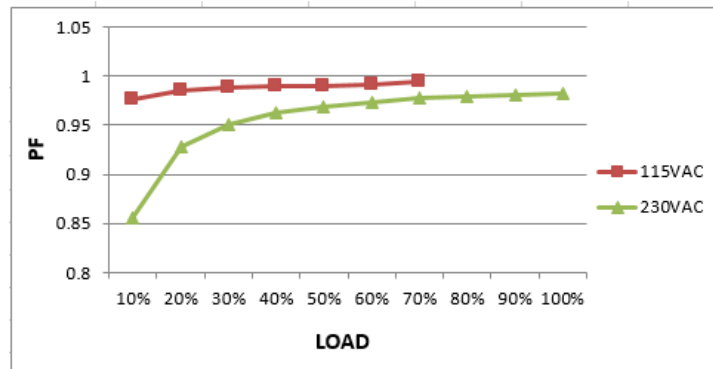
<p>8 RISE TIME (Max)</p>	<p>230VAC/50ms 115VAC/60ms</p> <p>Derating may be needed under low input voltages. Please check the derating curve and Static characteristics for more details</p>	<p>I/P : 230 VAC O/P : FULL LOAD</p> <p>I/P : 115 VAC O/P : 71% LOAD</p> <p>Ta : 25°C</p>	<p>230VAC/ 6.85 ms 115VAC/ 7.1 ms</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH3 : Output Voltage</p> 		<p>INPUT=115VAC/50HZ @ 71% LOAD</p> <p>CH3 : Output Voltage</p> 	
<p>9 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</p> <p>I/P : 115 VAC O/P : 71% LOAD/53.2% LOAD</p> <p>Ta : 25°C</p>	<p>230VAC/ 19.4 ms at full load 230VAC/ 26.4 ms at 75% load 115VAC/ 27.4 ms at 71% load 115VAC/ 37 ms at 53.2% load</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH3 : Output Voltage CH2 : AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ 71% LOAD</p> <p>CH3 : Output Voltage CH2 : AC Input Voltage</p> 	
<p>INPUT=230VAC/50HZ@75% LOAD</p> 		<p>INPUT=115VAC/60HZ@53.2% load</p> 	
<p>10 DYNAMIC LOAD</p>	<p>V1: 2400 mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ</p> <p>Ta:25°C</p>	<p>326mVp-p 390mVp-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	160V~264 V/ FULL LOAD 77V~264 V/ 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/ 8A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 7.07A/ 230 VAC
4	LEAKAGE CURRENT	< 0.75mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.58 mA N-FG : 0.58 mA
5	POWER FACTOR (Typ.)	0.95/ 230VAC	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF=0.984 /230 VAC

P.F vs LOAD



6	EFFICIENCY(Typ.)	95%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	95.3%
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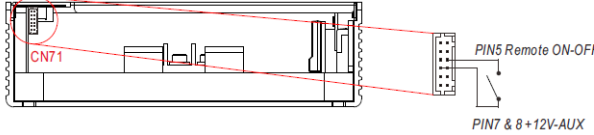
<p>EFFICIENCY vs LOAD</p>			
7	<p>INRUSH CURRENT(Typ.)</p> <p>230V/60A 115V/30A COLD START</p>	<p>I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C</p>	<p>I=44.9 A/ 230VAC T50= 1020 us I=22.7 A/ 115VAC</p>
<p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Input current</p>		<p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Input current</p>	
8	<p>NO LOAD CONSUMPTION</p> <p>---</p>	<p>I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C</p>	<p>14.6 W/115VAC 10.6 W/230VAC</p>

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	<p>105%~ 125 %(180VAC~264VAC) 60%~70%(90VAC) Protection type : Constant current limiting, unit will shutdown after 5 sec, re-power on to recover.</p>	<p>I/P: 264VAC I/P: 230VAC I/P: 180VAC I/P: 90VAC O/P:TESTING Ta:25°C</p>	<p>110.1%/ 264VAC 110.3%/ 230VAC 108.7%/180VAC 64.5%/90VAC PROTECTION TYPE : Constant current limiting, unit will shutdown after 5 sec, re-power on to recover.</p>
2	OVER VOLTAGE PROTECTION	<p>30V~35V Protection type : Shut down O/P voltage,re-power on to recover</p>	<p>I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P:MIN LOAD Ta:25°C</p>	<p>32.44V/ 264VAC 32.44V/ 230VAC 32.42V/ 90VAC PROTECTION TYPE : Shut down O/P voltage,re-power on to recover</p>

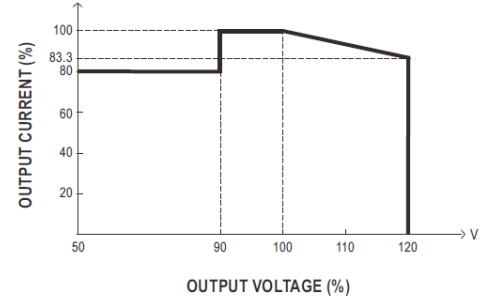
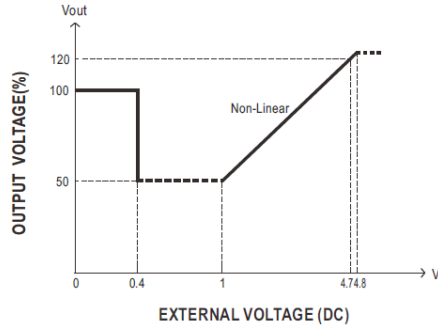
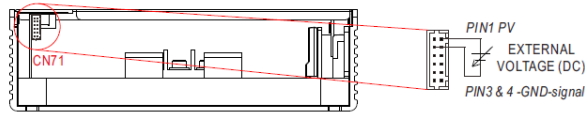
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down O/P voltage, recovers automatically after temperature goes down	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	O.T.P. Active Protection type : Shut down O/P voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type : Constant current limiting, unit will shutdown after 5 sec, 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, unit will shutdown 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"> <thead> <tr> <th>AUX</th> <th>TOLERANCE</th> <th>RIPPLE</th> <th>TEST RESULT</th> </tr> </thead> <tbody> <tr> <td>12V / 0.4A</td> <td>10.8~13.2 V</td> <td>150mVp-p</td> <td>11.525 V/ 32 mVp-p</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.4A	10.8~13.2 V	150mVp-p	11.525 V/ 32 mVp-p		
AUX	TOLERANCE	RIPPLE	TEST RESULT									
12V / 0.4A	10.8~13.2 V	150mVp-p	11.525 V/ 32 mVp-p									
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.  I/P: 230 VAC O/P: FULL LOAD Ta:25°C Test Result :										
		<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>	Remote ON-OFF	Power Supply Status	Short circuit	ON	Open circuit	OFF				
Remote ON-OFF	Power Supply Status											
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		<table border="1"> <thead> <tr> <th>Between ON/OFF and +5V-AUX</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>	Between ON/OFF and +5V-AUX	Power Supply Status	SW SHORT	ON	SW OPEN	OFF				
Between ON/OFF and +5V-AUX	Power Supply Status											
SW SHORT	ON											
SW OPEN	OFF											

3 OUTPUT VOLTAGE PROGRAMMABLE(PV)

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.

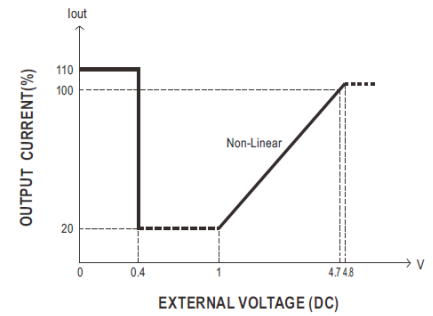
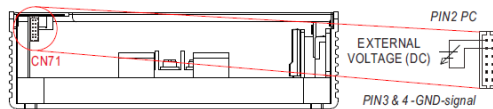


I/P: 230 VAC
 O/P: FULL LOAD
 Ta: 25°C
 TEST RESULT :

MODEL \ PV	≤ 0.4V	1V	4.7V	5V
SPEC	24V±5%	12V±5%	28.8V±5%	30V±5%
Vout	24.09V	132	28.8V	29.32V

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.

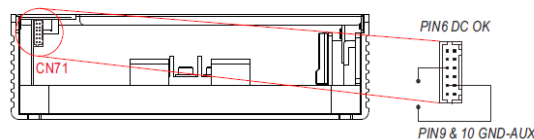


I/P: 230 VAC
 O/P: TESTING
 Ta: 25°C

ADJ V	<0.4V	1V	4.7V	5V
SPEC	110%±5%	20%±5%	100%±5%	100%±5%
TEST	110.2%	20.09%	99.93%	102.52%

5 DC OK CONTACT RATINGS

DC-OK signal is a TTL level signal. The maximum sink current is 10mA and the maximum external voltage is 5.6V.



DC-OK signal	Power Supply Status
"High" >4.4~5.5V	ON
"Low" <-0.5~0.5V	OFF



		I/P: 230 VAC O/P: TESTING Ta: 25°C	<table border="1"> <tr> <td>DC-OK signal</td> <td>Power Supply Status</td> </tr> <tr> <td>"High" >4.4~5.5V</td> <td><u>ON</u></td> </tr> <tr> <td>"Low" <-0.5~0.5V</td> <td><u>OFF</u></td> </tr> </table>	DC-OK signal	Power Supply Status	"High" >4.4~5.5V	<u>ON</u>	"Low" <-0.5~0.5V	<u>OFF</u>
DC-OK signal	Power Supply Status								
"High" >4.4~5.5V	<u>ON</u>								
"Low" <-0.5~0.5V	<u>OFF</u>								

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q903 Rated : 22A/ 650V VGS ± 25V	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. 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. Ta: 25°C	VDS: (1) 452V (2) 452V (3) 448V (4) 472V (5) 480V (6) 444V/ (7) 440V VDS: (1) 480V (2) 460V (3) 480V (4) 480V (5) 480V (6) 468V (7) 440V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q 52 Rated 31A/ 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) 0% → 400% Load. I/P: Low-Line -3V = 177V AC ON/OFF	VDS: (1) 416V (2) 420V (3) 416V (4) 416V (5) 416V (6) 408V (7) 388V VDS: (1) 432V

			<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. Ta:25°C</p>	<p>(2) 444V (3) 428V (4) 428V (5) 424V (6) 424V (7) 392V</p>
3	P.F.C DIODE	D 10 Rated 6 A/ 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 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) 400V (2) 412V (3) 396V (4) 396V (1) 412V (2) 388V (3) 404V (4) 392V</p>
4	Diode Peak Voltage	<p>Q101 Rated 100A/ 80V Q105 Rated 100A/ 80V Q109 Rated 100A/ 80V Q113 Rated 100A/ 80V</p>	<p>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 (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 Ta:25°C</p>	<p>Q101: VDS: (1) 55.7V (2) 55.7V (3) 65.3V (4) 70.2V (5)68.2V (6) 57V (7) 53.6V (8) 53.4V (9) 54.2V Q105: VDS: (1) 61.4V (2)60.6V (3) 70.6V (4) 72.1V (5) 73.7V (6) 54.4V (7) 56V (8) 54.4V (9)56.6 V</p> <p>Q109: VDS: (1)58.5 V (2) 54.4V (3) 61.7V (4) 66.5V (5) 64.1V (6)56V (7) 54.4V (8)54.4 V (9) 54.4V Q113: VDS: (1) 63.3V (2) 60.1V (3) 63.3V (4) 77.8V (5) 72.1V (6)55.2V (7) 56.9V (8) 55.2V (9) 55.2V</p>
5	Input Capacitor Voltage	C5 Rated: 220u/450V -55~105°C	<p>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</p>	<p>(1) 400V (2) 392V (3) 408V (4) 396V</p>

			Ta:25°C		
6	Control IC Voltage Test	PWM IC U800 Rated 8.85 V~ 16V PFC IC U401 Rated 10.6V~ 21 V O/P IC U151 Rated 8V~ 24V MCU IC U701 Rated -0.3V~ 4V	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	U800: (1) 13.24V (2) 12.68V (3) 12.12V (4) 12.68V (5) 12.44V U401: (1) 14.93V (2) 12.28V (3) 12.44V (4) 12.6V (5) 11.88V	U151: (1) 12.36V (2) 12.52V (3) 11.96V (4) 12.04V (5) 11.88V U701: (1) 3.37V (2) 3.12V (3) 3.12V (4) 3.2V (5) 3.16V
8	TOP SWITCHING STAND BY POWER	U601 Rated 11.5A/ 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	U601 (1) 550V (2) 546V (1) 522V (2) 530 V	
9	Capacitor Voltage	C652 Rated : 25V C682 Rated : 25V	AC ON/OFF 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	C652: (1) 13.82V (2) 13.42V (3) 13.42V (4) 13.02V C682 (1) 15.1V (2) 15.15V (3) 14.26V (4) 14.18V	

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min I/P-FG :2KVAC/min O/P-FG:1..25KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:1.5KVAC/min Ta:25°C	I/P-O/P: 9.09mA I/P-FG: 7.56mA O/P-FG:8.35m 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: 11.6GΩ I/P-FG: 10.8GΩ O/P-FG: 3.58GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	13 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
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
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
7	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL : UHP-1500-24 (AMBIENT TEMPERATURE WITH CONDUCTION COOLING) 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=25 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 45 °C		

NO	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 45 °C
1	BD1	72.8°C	88.3°C
2	BD2	76.9°C	92.6°C
3	ZNR2	61.6°C	76.9°C
4	LF1	58.4°C	73.4°C
5	LF2	64.7°C	80.0°C
6	LF3	69.9°C	85.4°C
7	C2	57.4°C	72.5°C
8	T51	69.9°C	88.1°C
9	T52	68.5°C	90.6°C
10	L1	72.3°C	88.8°C
11	L2	78.1°C	97.5°C
12	L3	81.9°C	101.1°C
13	C960	69.4°C	86.6°C
14	Q51	66.2°C	82.3°C
15	Q65	67.6°C	84.7°C
16	RY1	64.1°C	80.1°C
17	C417	67.4°C	84.4°C
18	C6	65.4°C	82.0°C
19	C964	67.8°C	84.1°C
20	C967	75.6°C	86.7°C
21	T1-1 COIL	79.2°C	97.1°C
22	T1CORE	77.7°C	96.0°C

		23	T2-1 COIL	84.6°C	101.3°C
		24	T2CORE	79.6°C	95.9°C
		25	C114	63.7°C	80.2°C
		26	C115	60.2°C	76.5°C
		27	C122	63.0°C	79.6°C
		28	C123	66.0°C	82.5°C
		29	RTH4	67.2°C	82.4°C
		30	RTH5	69.9°C	88.1°C
		31	RTH21	69.3°C	90.6°C
		32	Q102	69.0°C	83.8°C
		33	Q106	74.1°C	90.6°C
		34	Q111	68.5°C	82.9°C
		35	Q113	69.3°C	83.7°C
		36	Q901	79.6°C	108.2°C
		37	Q904	81.5°C	99.7°C
		38	D14	77.4°C	94.3°C
		39	D10	69.5°C	86.2°C
		40	U153	68.1°C	83.6°C
		41	U151	66.3°C	83.1°C
		41	D7	64.0°C	80.6°C
		42	U401	63.2°C	80.0°C
		43	T601	73.7°C	90.3°C
		44	C682	70.8°C	87.6°C
		45	C652	73.0°C	89.4°C
		46	RG61	70.8°C	87.7°C
		47	U701	66.2°C	82.5°C
		48	RG52	55.1°C	71.1°C
		49	C632	68.8°C	84.4°C
		50	RG65	70.2°C	86.2°C
		51	U900	64.1°C	79.9°C
		52	U601	69.0°C	84.6°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/180VAC O/P : 100 % LOAD Ta= -35°C / -30°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 (0~45°C)		I/P : 230 VAC O/P : FULL LOAD	± 0.005 %/°C (0~45°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	-30~45°C	1. Thermal shock Temperature : -35°C~ +50°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 C123 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= 45 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 45°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 45 °C LIFE TIME	(1) 185636HRS (2) 62091HRS (3) 126459HRS (4) 234220HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 535.4K hrs min. Telcordia SR-332 (Bellcore) ; 56.7K 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 TSENG

2018.4.30 GP-A50-F010