



Test Report : SHP-10K-55

10KW 3 ψ 3W High Efficiency Digital Power 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

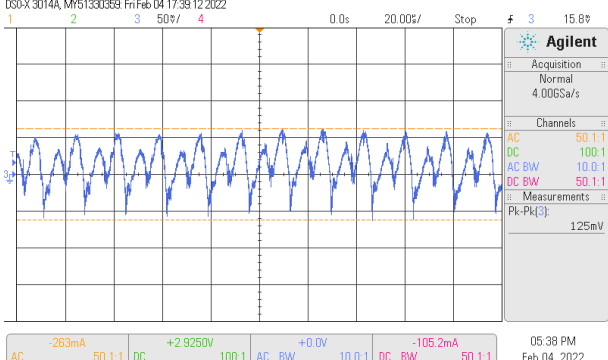
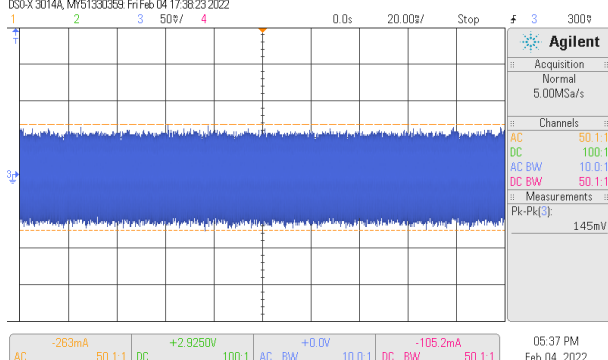
E.M.C. Test

■ RELIABILITY TEST

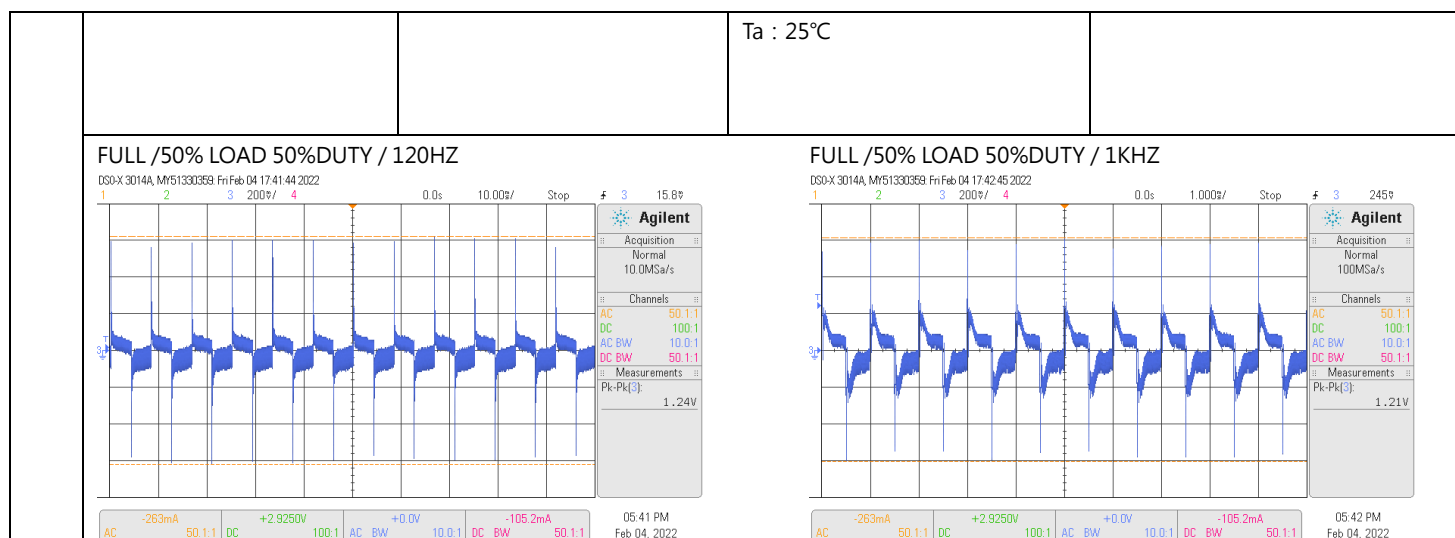
ENVIRONMENT TEST

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 : 400VAC I/P : 340 VAC O/P : MIN LOAD Ta : 25°C	36.257V~59.240V /400VAC 36.257V~59.240V/340VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1 : 1%~ -1 %	I/P : 340VAC /530VAC O/P : FULL/ MIN. LOAD Ta : 25°C	V1 : 0.0007 %~ 0 %
3	LINE REGULATION (Max)	V1 : 0.5%~ -0.5 %	I/P : 340VAC~ 530VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %~ -0.00018 %
4	LOAD REGULATION(Max)	V1 : 0.5%~ -0.5 %	I/P : 400VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.00090 %~ 0 %
5	OVER/UNDERSHOOT TEST	< $\pm$ 15%	I/P : 400VAC O/P : FULL LOAD Ta : 25°C	< $\pm$ 15%
6	RIPPLE & NOISE(Max)	V1 : 0.3Vp-p	I/P : 400VAC O/P : FULL LOAD Ta : 25°C	V1 : 145 mVp-p
high frequency :  low frequency : 				
7	SET UP TIME(Max)	400VAC/3000ms	I/P : 400VAC O/P : FULL LOAD Ta : 25°C	2060 ms
INPUT=400VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage				

8	RISE TIME (Max) INPUT=400VAC/50HZ @ FULL LOAD CH1 : Output Voltage	400VAC/100ms I/P : 400VAC O/P : FULL LOAD Ta : 25°C	78.2ms
9	HOLD UP TIME (Typ.) INPUT=400VAC/50HZ @ FULL LOAD CH3 : Output Voltage CH4 : AC Input Voltage	20ms / 400VAC at full load 25ms / 400VAC at 75% load I/P : 400VAC O/P : FULL LOAD/75% load Ta : 25°C	INPUT=400VAC/50HZ @ 75% LOAD CH1 : Output Voltage CH2 : AC Input Voltage
10	DYNAMIC LOAD	V1 : 5500 mVp-p	I/P : 400VAC O/P : (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ 1240mVp-p 1210mVp-p



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	340VAC~530VAC	(1) I/P : TESTING O/P : FULL LOAD Ta : 25°C	(1) 335 V~530V
			I/P : LOW-LINE-3V=337V HIGH-LINE+10V=540 V O/P : FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON : 30 Sec OFF : 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST : PASS
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 340 VAC ~530 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : PASS
3	INPUT CURRENT (Typ.)	400V / 11.2 A 480V/ 9.5 A	I/P : 400VAC I/P : 480 VAC O/P : FULL LOAD Ta : 25°C	I =10.96/ 400VAC I =9.13 / 480VAC
4	LEAKAGE CURRENT	< 6.5mA / 530 VAC	I/P : 530 VAC O/P : Min LOAD Ta : 25°C	L1-FG : 5.4mA peak L2-FG : 5.4mA peak L3-FG : 5.4mA peak
5	POWER FACTOR (Typ.)	≥ 0.98 / 400VAC ≥ 0.98 / 480VAC	I/P : 400VAC I/P : 480 VAC O/P : FULL LOAD Ta : 25°C	PF=0.9988 /400VAC PF=0.9964 /480VAC
	P.F vs LOAD			

6	EFFICIENCY(Typ.)	94.5%	I/P : 480VAC O/P : FULL LOAD Ta : 25°C	95.08%
	EFFICIENCY vs LOAD 			
7	INRUSH CURRENT(Typ.)	40A@400VAC 65A@480VAC COLD START	I/P : 400VAC I/P : 480 VAC O/P : FULL LOAD Ta : 25°C	I = 33.2A/ 400VAC T50=2.38ms I = 43.6A/ 480VAC T50=2.58ms
	INPUT=400VAC/50HZ @ FULL LOAD CH4 : AC Input Voltage CH3 : Input current INPUT=480VAC/ 60HZ @ FULL LOAD CH3 : AC Input Voltage CH4 : Input current 			

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	100%~ 105 % PROTECTION TYPE : Constant current limiting, unit will shutdown after 5 sec. re-power on to recover	I/P : 530 VAC I/P : 400VAC I/P : 340VAC O/P : TESTING Ta : 25°C	103.6%/ 530 VAC 103.6%/400VAC 103.6% /340VAC PROTECTION TYPE : Constant current limiting, unit will shutdown after 5 sec. re-power on to recover
2	OVER VOLTAGE PROTECTION	60.5 ~ 69.1V PROTECTION TYPE : Shut down o/p voltage, re-power on to recover	I/P : 530 VAC I/P : 400VAC I/P : 340 VAC O/P : MIN LOAD Ta : 25°C	64.9V/ 530 VAC 64.7V/ 400VAC 64.9 V/ 340VAC 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 : 530 VAC I/P : 340 VAC 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	I/P : 530 VAC I/P : 340 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE PROTECTION TYPE :

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT								
1	AUXILIARY POWER (AUX)	Auxiliary voltage output, 11.4~12.6V, referenced to GND-AUX (pin15 & 16). The maximum load current is 1A. This output is not controlled by "Remote ON-OFF" . I/P : 400VAC O/P : FULL LOAD Ta : 25°C Test Result : PASS <table><tr><td>AUX</td><td>TOLERANCE</td><td>RIPPLE</td><td>TEST RESULT</td></tr><tr><td>12V / 1A</td><td>11.4~12.6V</td><td>150mVp-p</td><td>NoLoad : 12.114V FullLoad : 11.693V Ripple : 27mV</td></tr></table>			AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 1A	11.4~12.6V	150mVp-p	NoLoad : 12.114V FullLoad : 11.693V Ripple : 27mV
AUX	TOLERANCE	RIPPLE	TEST RESULT									
12V / 1A	11.4~12.6V	150mVp-p	NoLoad : 12.114V FullLoad : 11.693V Ripple : 27mV									

2 REMOTE ON/OFF CONTROL

4.Remote ON-OFF Control

※ The power supply can be turned ON-OFF by using the "Remote ON-OFF" function.

Between Remote ON-OFF(CN86 pin1) and 5V-AUX(CN86 pin2)	Output Status
Switch close (Short)	power supply ON
Switch open (Open)	power supply OFF

Table 4.1

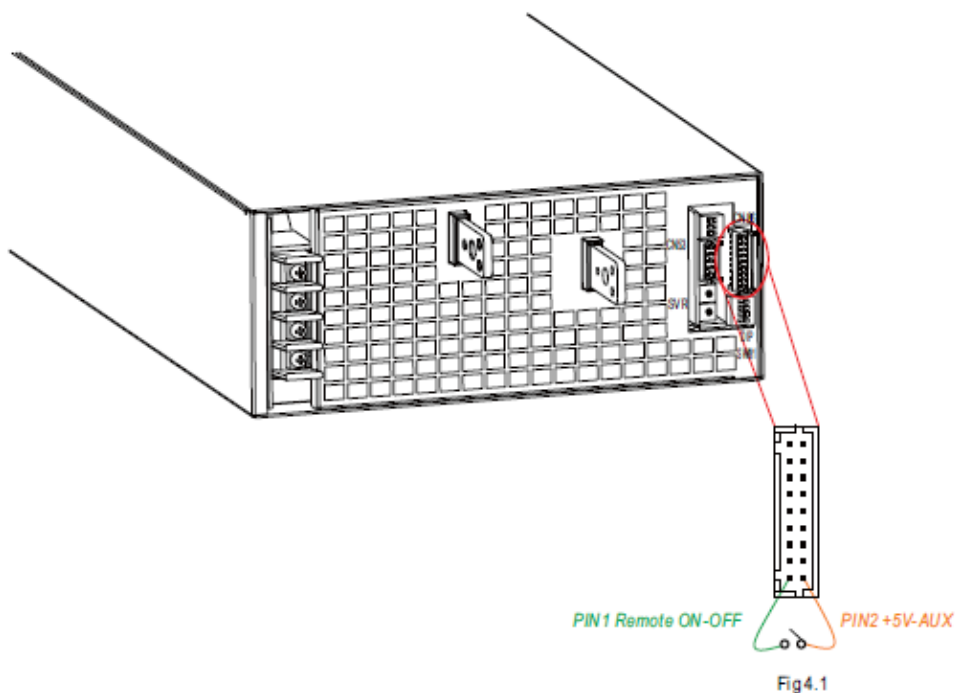


Fig4.1

I/P : 400VAC

O/P : FULL LOAD

Ta : 25°C

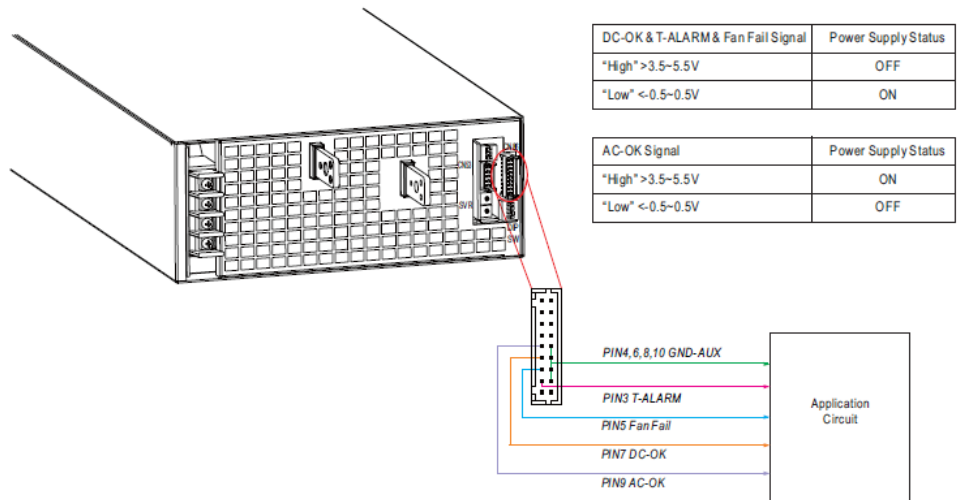
Test Result : PASS

Between Remote ON-OFF(CN86 pin1) and 5V-AUX(CN86 pin2)	Output Status
Switch close (Short)	power supply ON
Switch open (Open)	power supply OFF

3 ALARM SIGNAL

5. Alarm Signal Output

※ There are 4 alarm signals, DC-OK, T-ALARM, Fan Fail and AC-OK, in TTL signal form, on CN86. These signals are isolated from output.



※ DC OK might mis-triggered when the voltage difference between PSU and the load, please minimized the unnecessary voltage difference.

1. DC OK SIGNAL

High (3.5 ~ 5.5V) : When the $V_{out} \leq 80\% \pm 6\%$.

Low (-0.5 ~ 0.5V) : When the $V_{out} \geq 80\% \pm 6\%$.

The maximum sourcing current is 10mA and only for output.

I/P : 400VAC

O/P : FULL LOAD

Ta : 25°C

Test Result :

Vout	DC OK SIGNAL
$V_{out} \leq 74\%$	5.05V
$V_{out} \geq 86\%$	0V

2. T-ALARM

High (3.5 ~ 5.5V) : When the internal temperature exceeds the limit of temperature alarm.

Low (-0.5 ~ 0.5V) : When the internal temperature is normal.

The maximum sourcing current is 10mA and only for output.(Note)

I/P : 400VAC

O/P : FULL LOAD

Ta : 25°C

Test Result :

PSU STATUS	T-ALARM SPEC	T-ALARM TEST
NORMAL	-0.5 ~ 0.5V	0V
OTP	3.5~5.5V	5.02V

3. AC OK
 High (3.5 ~ 5.5V): When AC input $\geq 335 \pm 1.5\%$ Vac, PSU works normally.
 Low (-0.5 ~ 0.5V): When AC input $\leq 320 \pm 1.5\%$ Vac, PSU shut down.
 The maximum sourcing current is 10mA and only for output.(Note)
 I/P : 400VAC
 O/P : FULL LOAD
 Ta : 25°C
 Test Result :

AC	AC OK SIGNAL
$AC \leq 320V$	0V
$AC \geq 335V$	5.04V

4. FAN FAIL
 High(3.5~5.5V):When the fan fail.
 Low(-0.5~0.5V):When the fan works normally.
 The maximum sourcing current is 10mA and only for output.(Note)
 I/P : 400VAC
 O/P : FULL LOAD
 Ta : 25°C
 Test Result :

FAN	AC OK SIGNAL
Fan works	0V
Fan lock	5.03V

4 OUTPUT VOLTAGE PROGRAMMABLE(PV)

1.Output Voltage Programming (or, PV / remote voltage programming / remote adjust / margin programming / dynamic voltage trim)

(1)by potentiometer (SVR)

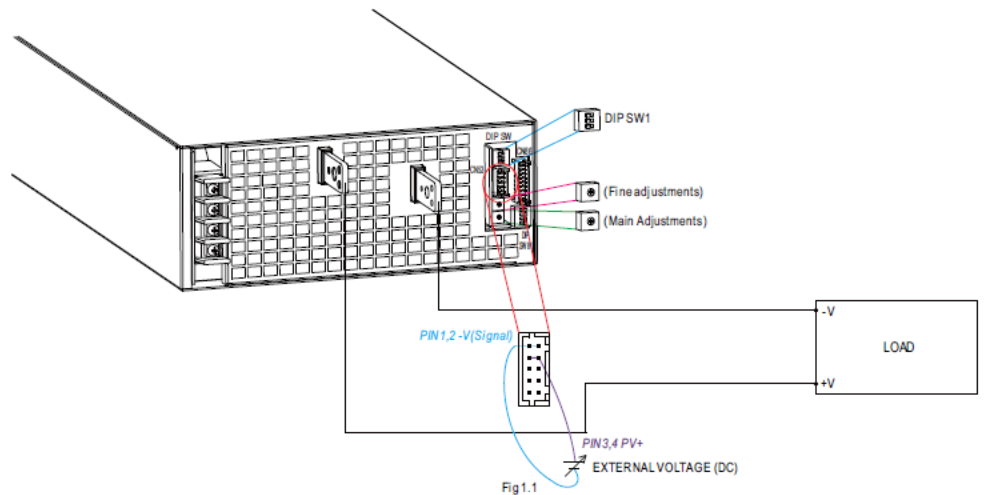
(a)Have the DIP switch position-3 set as 

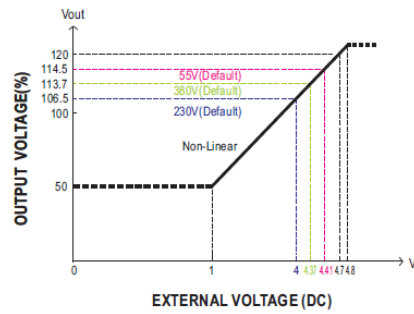
(b)Output voltage can be trimmed by SVR.

(2)by Output Voltage Programming

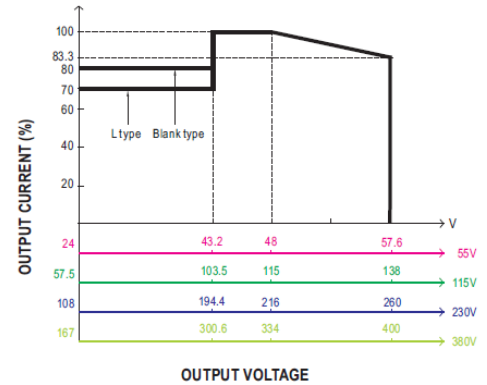
(a)Have the DIP switch position-3 set as 

(b)The output voltage can be trimmed to 50~120% by applying EXTERNAL VOLTAGE between PV+ and PV-on CN53.





© The 100% output voltage is 48/115/216/334V.



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

I/P: 400VAC
O/P: FULL LOAD
Ta: 25°C
TEST RESULT :

PV	1V	5V
MODEL		
SPEC	24V $\pm$ 5%	57.6V $\pm$ 5%
Vout	23.908V	58.74V

5 OUTPUT CURRENT PROGRAMMABLE (PC)

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

(1) Default Overload Protection (OLP) value

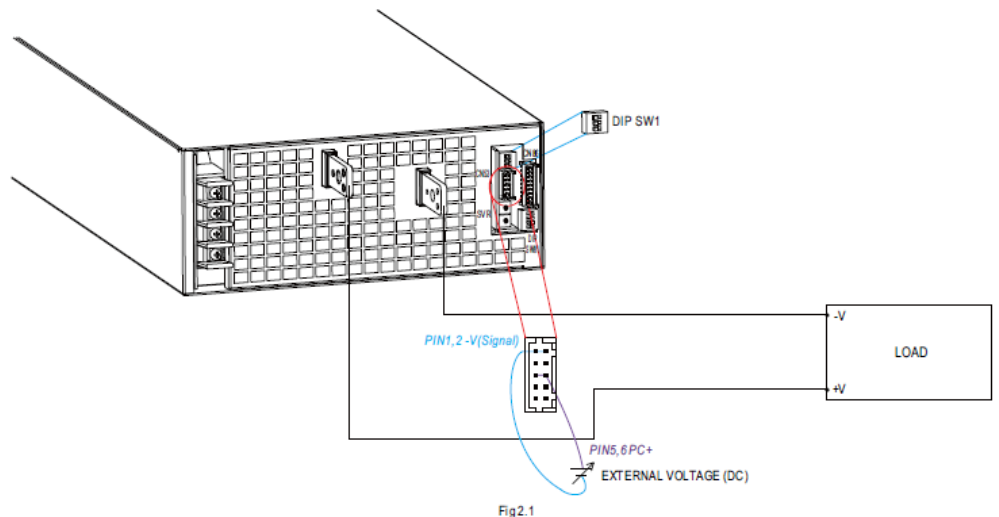
(a) Have the DIP switch position-2 set as

(b) Output current is set default value.

(2) by Constant Current Level Programming

(a) Have the DIP switch position-2 set as

(b) The constant current level can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE between PC+ and PC- on CN53.

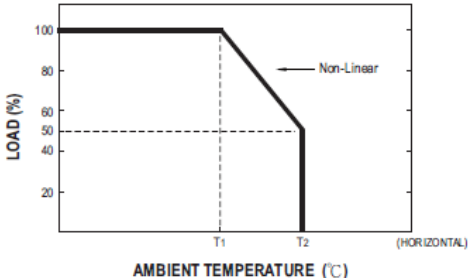
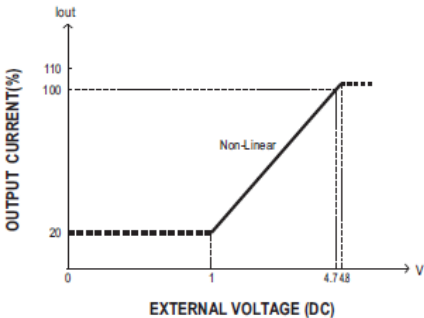


※ Under PC function at wattage < 4KW, the power supply might enter burst mode and cause output unstable, please increase the load to minimized the effect.

※ Auto de-rating function covered by over temperature protection, it works either in PC mode or under control by communication protocol.

T₁(Typ.): Maximum ambient temperature of full load.

T₂(Typ.): T₁+5°C.

		 I/P : 400VAC O/P : TESTING (factory default) Ta : 25°C <table><tr><td> PC MODEL </td><td>1V</td><td>5V</td></tr><tr><td>SPEC</td><td>30A±10%</td><td>133.83A±10%</td></tr><tr><td>I_{out}</td><td>28.85A</td><td>135.41A</td></tr></table>	PC MODEL	1V	5V	SPEC	30A±10%	133.83A±10%	I _{out}	28.85A	135.41A
PC MODEL	1V	5V									
SPEC	30A±10%	133.83A±10%									
I _{out}	28.85A	135.41A									
6	CURRENT SHARING	CURRENT SHARING TOLERANCE < ±10%	I/P : 400 VAC O/P : 55V (factory default) 100/50% LOAD Ta : 25°C	O/P : 100% PSU1 : 129 A PSU2 : 128.4 A PSU3 : 131.6 A PSU4 : 135 A O/P : 50% PSU1 : 65 A PSU2 : 65.6 A PSU3 : 69.1 A PSU4 : 67.3 A							

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q400 Rated : 56A/1200V VGS : -7V~+23V Q401 Rated : 56A/1200V VGS : -7V~+23V	AC ON/OFF I/P : High-Line +3V =533V VDS : VO : 55V 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	Q400 VO : 55V VDS: (1) 947.83V (2) 947.83V (3) 947.83V (4) 947.83V (5) 947.83V (6) 963.64V (7) 971.54V	Q401 VO : 55V VDS: (1) 876.68V (2) 876.68V (3) 876.68V (4) 876.68V (5) 876.68V (6) 876.68V (7) 876.68V

			(6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. <u>VO : 48V</u> O/P : (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz Ta:25°C	<u>VO : 48V</u> (1) 979.45V (2) 947.83V (3) 979.45V	<u>VO : 48V</u> (1) 884.58V (2) 868.77V (3) 884.58V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q165 Rated : 45 A/ 650 V VGS : 22 V / -10V	I/P : High-Line +3V =533V AC ON/OFF <u>VO : 48V</u> 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/IDS : (1) 525.3V / 19.763A (2) 458.1V / 10.672A (3) 521.3V / 15.02A (4) 525.3V / 15.415A (5) 525.3V / 15.415A (6) 513.44V / 15.415A (7) 564.82V / 15.415A	
3	P.F.C DIODE	D163 Rated : 10A/1200V	I/P : High-Line +3V =533V AC ON/OFF <u>VO : 48V</u> 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) 947.83V (2) 892.49V (3) 947.83V (4) 884.58V	
4	Diode Peak Voltage	D610 Rated : 130A/200V D613 Rated : 130A/200V D616 Rated : 130A/200V D619 Rated : 130A/200V	AC ON/OFF I/P : High-Line +3V =533V <u>VO : 48V</u> 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/	D610 : VDS : (1) 154.31V (2) 29.407V (3) 156.68V (4) 140.08V (5) 155.89V (6) 155.89V (7) 76.838V (8) 136.13V	D613 : VDS : (1) 153.52V (2) 28.617V (3) 155.89V (4) 154.31V (5) 155.89V (6) 158.26V (7) 98.972V (8) 140.87V

			Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD Ta : 25°C	D616 : VDS : (1) 162.21V (2) 38.103V (3) 163V (4) 163V (5) 163V (6) 163.79V (7) 113.2V (8) 129.8V	D619 : VDS : (1) 154.31V (2) 29.407V (3) 156.68V (4) 140.08V (5) 155.89V (6) 155.89V (7) 76.838V (8) 136.13V
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■ SAFETY& E.M.C. TEST

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 : 4.125KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 1.5 KVAC/min Ta : 25°C	I/P-O/P : 18.9mA I/P-FG : 14.83mA O/P-FG : 16.19m A NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100M Ω I/P-FG : 500VDC>100M Ω O/P-FG : 500VDC>100M Ω	I/P-O/P : 500 VDC I/P-FG : 500 VDC O/P-FG : 500 VDC Ta : 25°C	I/P-O/P : 5.82G Ω I/P-FG : 9.18G Ω O/P-FG : 1.57 G Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40A / 2min Ta : 25°C	28 m Ω

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P : 400VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS
2	CONDUCTION	EN55032 /EN55011 CLASS B	I/P : 400VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS
3	RADIATION	EN55032 /EN55011 CLASS A	I/P : 400VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS
4	E.S.D	EN61000-4-2 INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 400VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 400VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS

6	SURGE	IEC61000-4-5 INDUSTRY L-N : 2KV L,N-PE : 4KV	I/P : 400VAC/50HZ O/P : FULL LOAD Ta : 25°C	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 : SHP-10K-55 (Forced air cooling) 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 400VAC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 400VAC O/P : FULL LOAD Ta= 50 °C																																																																																										
		<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 25°C</th><th>HIGH AMBIENT Ta= 50°C</th></tr><tr><td>1</td><td>D163</td><td>60.1°C</td><td>86.5°C</td></tr><tr><td>2</td><td>L5</td><td>38.7°C</td><td>64.8°C</td></tr><tr><td>3</td><td>Q161</td><td>60.6°C</td><td>86.8°C</td></tr><tr><td>4</td><td>Q163</td><td>62.8°C</td><td>89.4°C</td></tr><tr><td>5</td><td>Q165</td><td>65.6°C</td><td>91.7°C</td></tr><tr><td>6</td><td>C173</td><td>34.0°C</td><td>61.0°C</td></tr><tr><td>7</td><td>LF2</td><td>26.8°C</td><td>49.9°C</td></tr><tr><td>8</td><td>L2</td><td>24.1°C</td><td>48.5°C</td></tr><tr><td>9</td><td>C435</td><td>40.4°C</td><td>67.7°C</td></tr><tr><td>10</td><td>Q404</td><td>67.1°C</td><td>94.0°C</td></tr><tr><td>11</td><td>T1 core</td><td>55.4°C</td><td>83.8°C</td></tr><tr><td>12</td><td>T2 core</td><td>59.5°C</td><td>88.2°C</td></tr><tr><td>13</td><td>L40 core</td><td>62.5°C</td><td>88.9°C</td></tr><tr><td>14</td><td>L40 wire</td><td>44.1°C</td><td>71.3°C</td></tr><tr><td>15</td><td>D611</td><td>60.3°C</td><td>85.0°C</td></tr><tr><td>16</td><td>D619</td><td>54.3°C</td><td>79.3°C</td></tr><tr><td>17</td><td>RT61</td><td>42.3°C</td><td>68.3°C</td></tr><tr><td>18</td><td>RT63</td><td>42.6°C</td><td>68.8°C</td></tr><tr><td>19</td><td>RT64</td><td>47.7°C</td><td>74.2°C</td></tr><tr><td>20</td><td>RT65</td><td>50.1°C</td><td>76.5°C</td></tr><tr><td>21</td><td>RTH6</td><td>32.9°C</td><td>60.2°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 25°C	HIGH AMBIENT Ta= 50°C	1	D163	60.1°C	86.5°C	2	L5	38.7°C	64.8°C	3	Q161	60.6°C	86.8°C	4	Q163	62.8°C	89.4°C	5	Q165	65.6°C	91.7°C	6	C173	34.0°C	61.0°C	7	LF2	26.8°C	49.9°C	8	L2	24.1°C	48.5°C	9	C435	40.4°C	67.7°C	10	Q404	67.1°C	94.0°C	11	T1 core	55.4°C	83.8°C	12	T2 core	59.5°C	88.2°C	13	L40 core	62.5°C	88.9°C	14	L40 wire	44.1°C	71.3°C	15	D611	60.3°C	85.0°C	16	D619	54.3°C	79.3°C	17	RT61	42.3°C	68.3°C	18	RT63	42.6°C	68.8°C	19	RT64	47.7°C	74.2°C	20	RT65	50.1°C	76.5°C	21	RTH6	32.9°C	60.2°C
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22	RTH7	50.9℃	78.1℃
23	C641	36.1℃	63.5℃
24	T900	33.9℃	60.6℃
25	Q930	35.3℃	61.9℃
26	C439	42.2℃	68.5℃

MODEL : SHP-10K-55 (Water cooling)

Inlet temperature : 15℃ · Flow rate (minimum) : 4 LPM

1. ROOM AMBIENT BURN-IN : 2 HRS

I/P : 400VAC O/P : FULL LOAD Ta= 25 °C

2. HIGH AMBIENT BURN-IN : 2HRS

I/P : 400VAC O/P : FULL LOAD Ta= 50 °C

NO	Position	ROOM AMBIENT Ta= 25℃	HIGH AMBIENT Ta= 50℃
1	L5	44.8℃	52.1℃
2	Q161	41.7℃	43.9℃
3	Q163	43.6℃	46.1℃
4	Q165	42.5℃	45.2℃
5	C173	54.7℃	63.2℃
6	LF2	48.3℃	53.7℃
7	L2	40℃	48℃
8	C435	74.4℃	82.3℃
9	Q404	43.8℃	46.5℃
10	T1 core	85.6℃	93.1℃
11	T1 wire	106.5℃	113.4℃
12	T2 core	92.4℃	100.1℃
13	T2 wire	96.3℃	104.2℃
14	L40 core	73.8℃	82.2℃
15	L40 wire	68.6℃	77.7℃
16	D611	37.5℃	40.4℃
17	D619	38.9℃	41.7℃
18	RT61	51.3℃	57℃
19	RT63	51.2℃	55.4℃
20	RT64	47℃	51℃
21	RT65	43.5℃	49.2℃
22	RTH6	61.3℃	69.1℃
23	RTH7	79.4℃	86.6℃
24	C641	88.4℃	97.3℃
25	T900	78.8℃	87.2℃
26	Q930	59.8℃	69.3℃
27	C439	66.7℃	75℃

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 400 VAC O/P : 103%LOAD Ta : 25℃	TEST : OK
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3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 530VAC/340VAC O/P : 100 %LOAD Ta= -35°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 : 540 VAC O/P : FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	$\pm$ 0.03 %/°C(0~50°C)	I/P : 400 VAC O/P : FULL LOAD	$\pm$ 0.008 %/°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:380V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:380V/ 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 : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C641 IS THE MOST CRITICAL COMPONENT 1. Forced air cooling (1) I/P : 400VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 400VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 400VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 400VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME		(1) 1216239HRS (2) 182052HRS (3) 326009HRS (4) 455538HRS
		2. Water cooling (1) I/P : 400VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 400VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 400VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 400VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME		(1) 1216239HRS (2) 17487HRS (3) 124393HRS (4) 630971HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 281.2K hrs min. Telcordia SR-332 (Bellcore) ; 28K hrs min. MIL-HDBK-217F (25°C)		
11	Ongoing Reliability Test	I/P : 380VAC 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



10KW 3 ψ 3W High Efficiency Digital Power Supply

SHP-10K series

2020.10.1 TAG-QA-009