Test Report: SHP-30K-380

30KW 3ψ 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

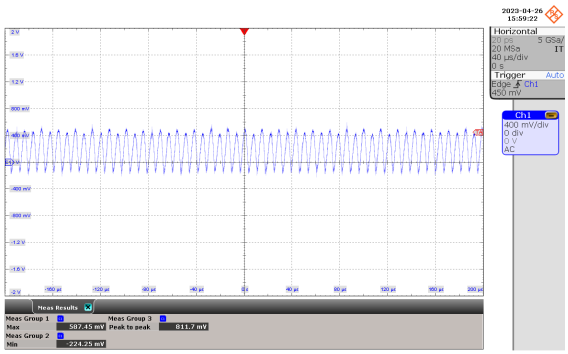
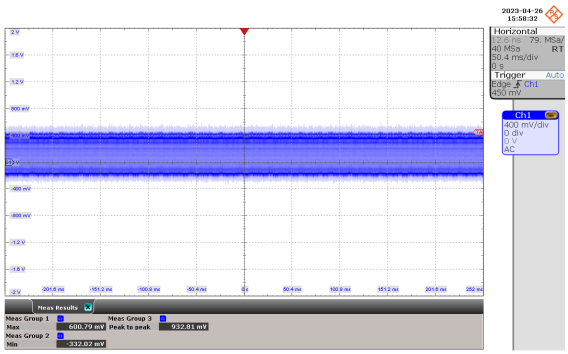
Safety Test
E.M.C. Test

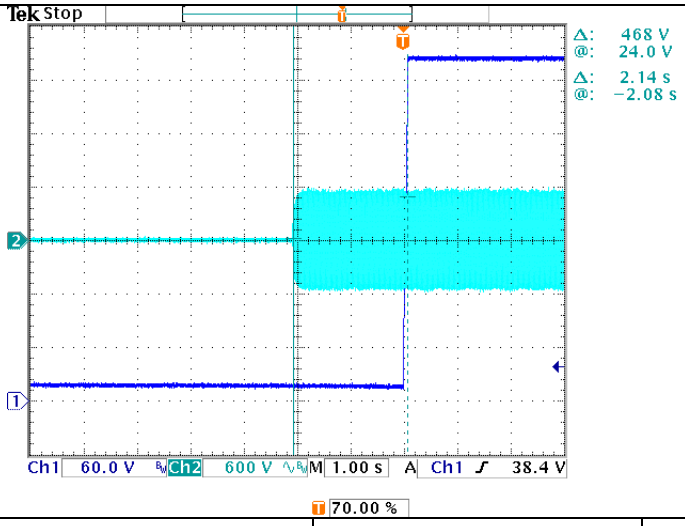
■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

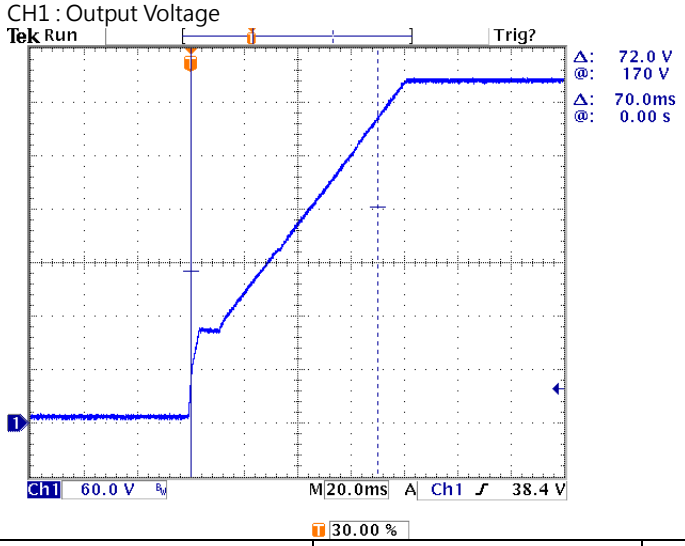
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 260V~ 400V	I/P： 400 VAC I/P： 340 VAC O/P：MIN LOAD Ta：25℃	253.16V~413.39V/400VAC 253.16V~413.33V/340VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: 1%~ -1%	I/P: 340VAC /530VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1: 0.01 %~0.018%
3	LINE REGULATION	V1: 0.5%~ -0.5%	I/P: 340VAC~ 530VAC O/P:FULL LOAD Ta:25℃	V1: 0.002%~-0.005%
4	LOAD REGULATION	V1: 0.5%~ -0.5%	I/P: 400VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.01%~-0.018%
5	OVER/UNDERSHOOT TEST	<± 10%	I/P: 400VAC O/P:FULL LOAD Ta:25℃	-2.7%~1.165%
6	RIPPLE & NOISE (Max)	V1: 2000mVp-p	I/P:400VAC O/P:FULL LOAD Ta:25℃	V1: 932.81mVp-p
	high frequency： 		low frequency： 	
7	SET UP TIME(Max)	400VAC/3000ms	I/P： 400 VAC O/P：FULL LOAD Ta：25℃	2140ms
	INPUT=400VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage			



8	RISE TIME (Max)	400VAC/100ms	I/P： 400 VAC O/P：FULL LOAD Ta：25℃	70ms

INPUT=400VAC/50HZ @ FULL LOAD

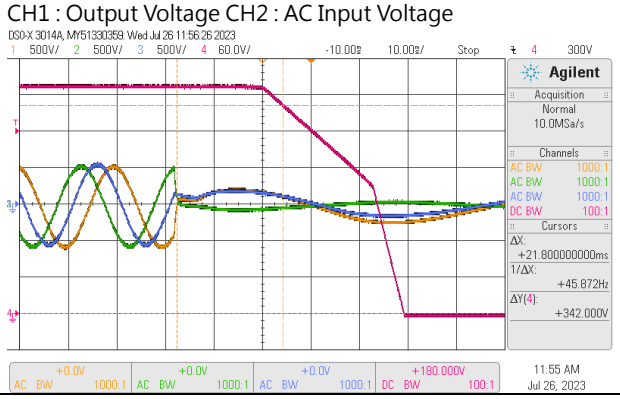
CH1 : Output Voltage



9	HOLD UP TIME (Typ.)	400VAC/16ms 400VAC/20ms	I/P： 400 VAC at Full Load I/P： 400 VAC at 75% Load Ta：25℃	21.8 ms / Full load 29.4ms / 75% Load

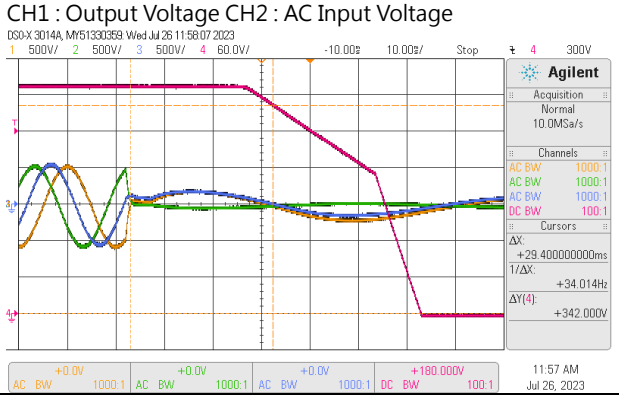
INPUT=400VAC/50HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



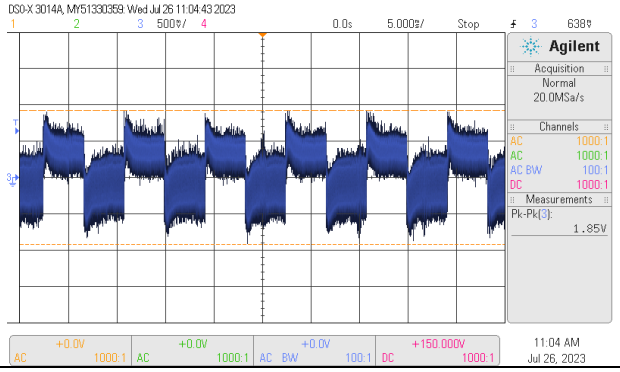
INPUT=400VAC/50HZ @ 75% LOAD

CH1 : Output Voltage CH2 : AC Input Voltage

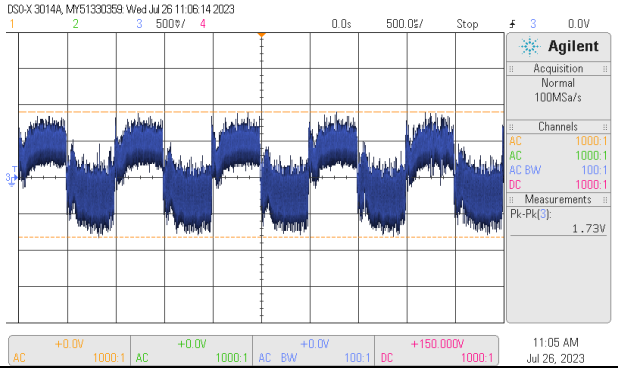


10	DYNAMIC LOAD	V1: 38Vp-p	I/P: 400VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25℃	 1.85 Vp-p 1.73Vp-p

FULL /50% LOAD 50%DUTY / 120HZ

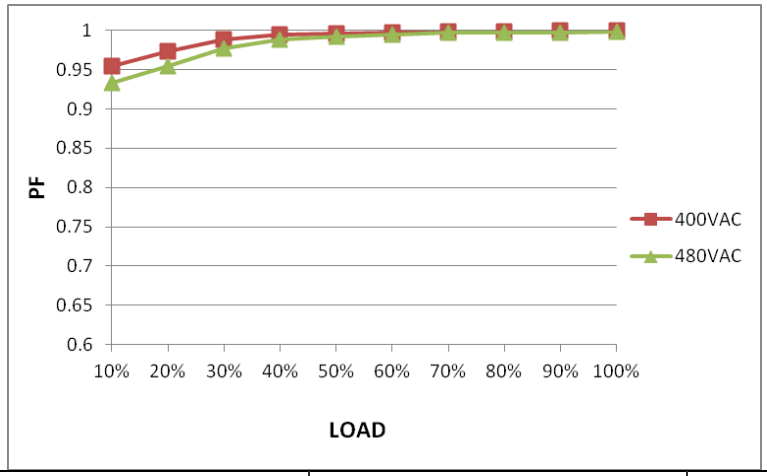
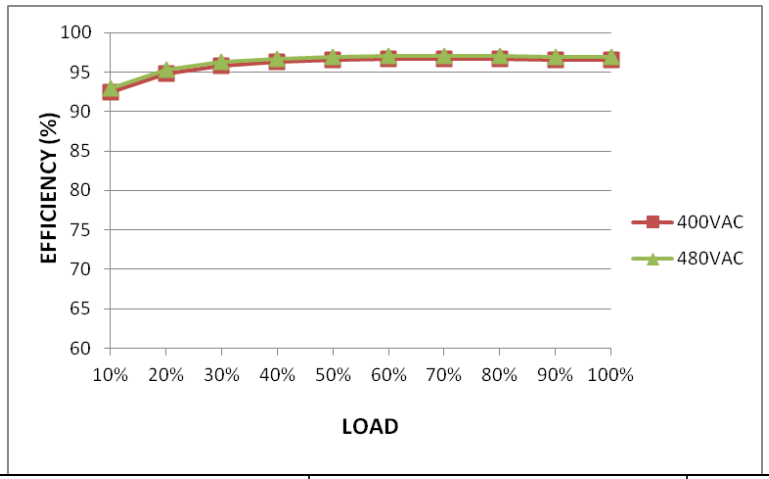
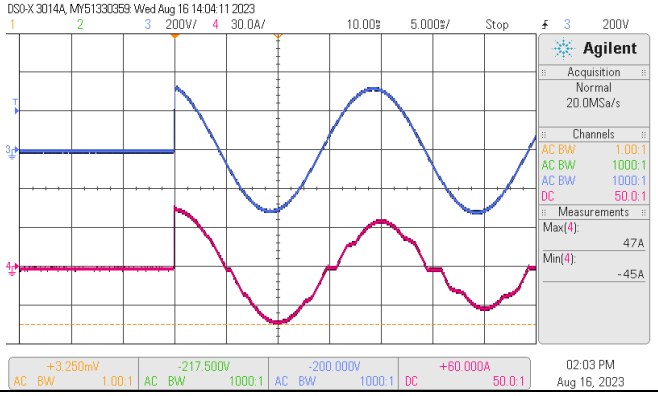
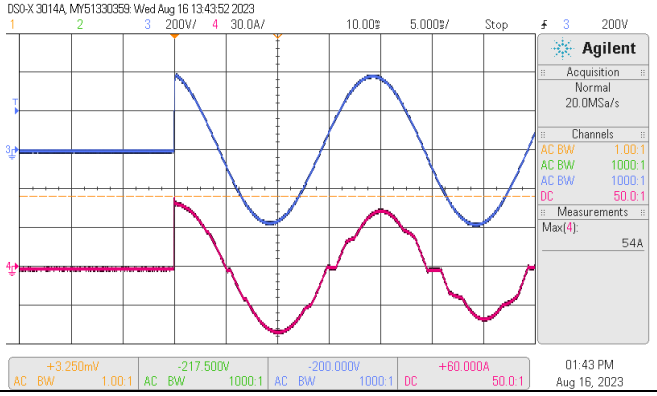


FULL /50% LOAD 50%DUTY / 1KHZ



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	340VAC~530VAC	(1) I/P:TESTING O/P:FULL LOAD Ta:25℃	(1) 318.96V~530V
			I/P: LOW-LINE-3V=337 V 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℃	TEST: PASS
3	INPUT CURRENT (Typ.)	400V/ 47A 480V/ 39A	I/P： 400 VAC I/P： 480 VAC O/P：FULL LOAD Ta：25℃	I =45.57A / 400VAC I =37.73A / 480VAC
4	LEAKAGE CURRENT	<14mA peak / 530VAC, <9mA rms / 530VAC	I/P： 530 VAC O/P：Min LOAD Ta：25℃	△： L1-FG：10.9mA peak / 6.58mA rms L2-FG：11mA peak / 6.58mA rms L3-FG：10.8mA peak / 6.48mA rms Y： N-FG：1.27mA peak / 0.84mA rms
5	POWER FACTOR (Typ.)	≧ 0.98 / 400VAC ≧ 0.98/ 480VAC	I/P： 400 VAC I/P： 480 VAC	PF=0.998/400VAC PF=0.997/480VAC

			O/P：FULL LOAD Ta：25℃	
	P.F vs LOAD			
6	EFFICIENCY(Typ.)	97%	I/P: 480 VAC O/P: 75% LOAD Ta:25℃	97.39%
	EFFICIENCY vs LOAD			
7	INRUSH CURRENT(Typ.)	400V/60A 480V/80A COLD START	I/P： 400 VAC I/P： 480 VAC O/P：FULL LOAD Ta：25℃	I =47A/ 400VAC I =54A/ 480VAC T50= 3.2 ms/400V T50= 3.2 ms/480V
	INPUT=400VAC/50HZ @ FULL LOAD CH3 : AC Input Voltage CH4 : Input current			
	INPUT=480VAC/ 50HZ @ 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: 530VAC I/P: 400VAC I/P: 340VAC O/P:TESTING Ta:25℃	103.08%/ 530VAC 103.08%/ 400VAC 102.1%/340VAC PROTECTION TYPE : Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover
2	OVER VOLTAGE PROTECTION	420V~480V Protection type : Shut down o/p voltage, re-power on to recover	I/P: 530VAC I/P: 400VAC I/P: 340VAC O/P:MIN LOAD Ta:25℃	430V/ 530VAC 430V/ 400VAC 431V/ 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: 530VAC I/P: 340VAC 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: 530VAC I/P: 340VAC O/P: FULL LOAD Ta:25℃	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)	+12V-AUX(pin 15 & 16) 1.Auxiliary voltage output, 11.4~12.6V, referenced to GND-AUX (pin 17 & 18). The maximum load current is 1.5A. This output is not controlled by "Remote ON-OFF.		

I/P : 400 VAC
O/P: FULL LOAD
Ta:25℃
Test Result : PASS

AUX	TOLERANCE	RIPPLE	TEST RESULT
12V / 1.5A	11.4~12.6 V	150mVp-p	No Load : 12.108V Full Load : 11.424V Ripple : 84mV

2	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

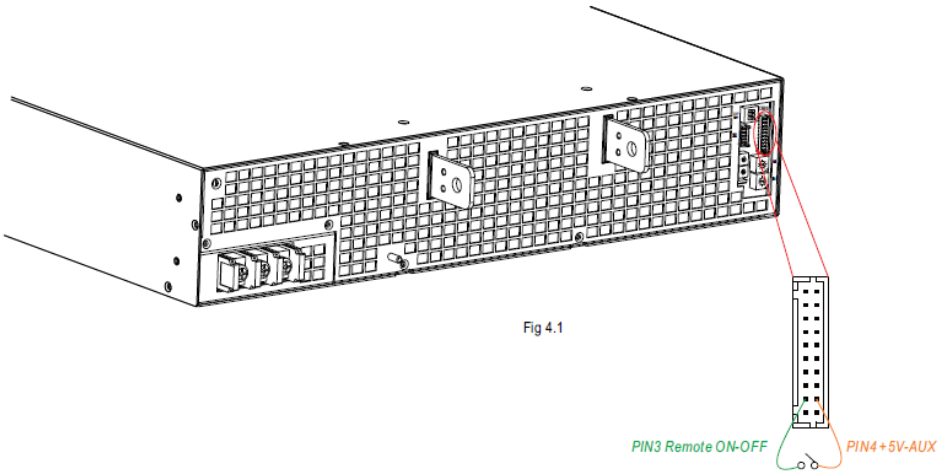


Fig 4.1

I/P：400 VAC

O/P：FULL LOAD

Ta：25℃

Test Result：PASS

Between *Remote ON-OFF*(*CN86 pin1*) and 5V-AUX(*CN86 pin2*)	Power Supply Status
SW SHORT	ON
SW OPEN	OFF

3 ALARM SIGNAL

※ 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.

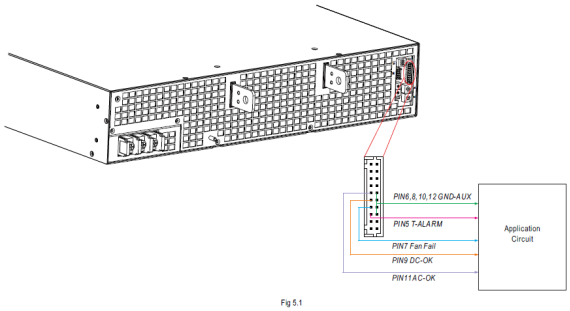


Fig 5.1

DC-OK & T-ALARM & Fan Fail Signal	Power Supply Status
"High" >3.5~5.5V	OFF
"Low" <-0.5~0.5V	ON

AC-OK Signal	Power Supply Status
"High" >3.5~5.5V	ON
"Low" <-0.5~0.5V	OFF

1. DC OK SIGNAL

High (3.5 ~ 5.5V) : When the Vout ≦ 80%±6%.

Low (-0.5 ~ 0.5V) : When Vout ≧ 80%±6%.

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

I/P: 400 VAC

O/P:FULL LOAD

Ta:25℃

Test Result：PASS

Spec.	Transition point	Spec.	DC OK SIGNAL
Vout ≦ 74%~86%	77.82%	High (3.5 ~ 5.5V)	3.82V
Vout ≧ 74%~86%	81.3%	Low (-0.5 ~ 0.5V)	0.00V

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)

Note: Isolated signal, referenced to (GND-AUX).

I/P: 400 VAC

O/P:FULL LOAD, T-Alarm/10mA Load

Ta:25℃

Test Result：

P.SU STATUS	T-ALARM SPEC	T-ALARM TEST
NORMAL	-0.5 ~0.5V	0.0011V
OTP	3.5~5.5V	3.84V

3. AC OK

High (3.5 ~ 5.5V): When AC input≧ 335±1.5%Vac, PSU works normally.

Low (-0.5 ~ 0.5V): When AC input≦ 320±1.5%Vac, PSU shut down.

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

I/P： 400 VAC

O/P: FULL LOAD, AC-OK/10mA Load

Ta : 25℃

Test Result：Pass

AC	Vin	AC OK SIGNAL
AC ≧335±1.5%	335.4	3.791V
AC ≦ 320±1.5%	319.9	0V

<table>
<tr><td></td><td></td><td>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.

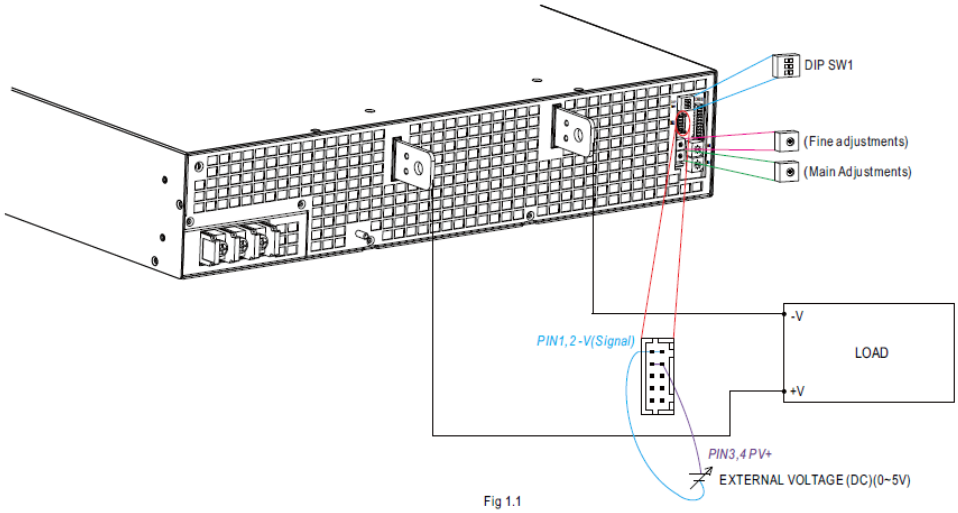
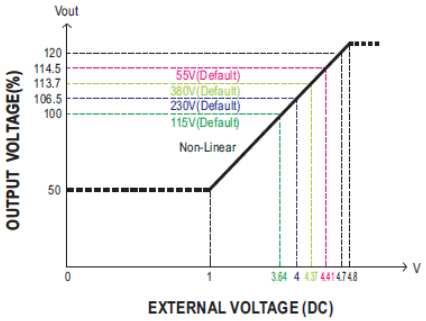
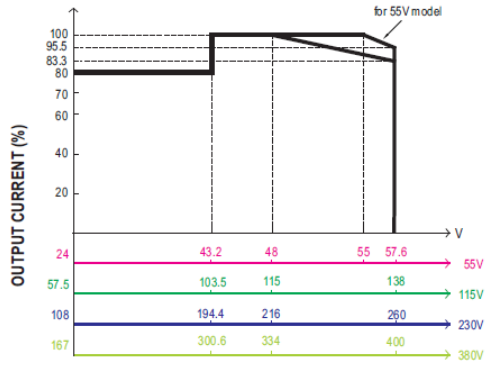
I/P： 400 VAC
O/P: FULL LOAD, Fan Fail/10mA Load
Ta：25℃
Test Result：Pass
<table><tr><th>FAN</th><th>FAN FAIL SIGNAL</th></tr><tr><td>Fan lock</td><td>3.82V</td></tr><tr><td>Fan works</td><td>0.0V</td></tr></table></td></tr>
<tr><td>4</td><td>OUTPUT VOLTAGE PROGRAMMABLE(PV)</td><td>(1)Default by potentiometer (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.
 

Fig 1.1
 

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

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

I/P：400 VAC
O/P：FULL LOAD
Ta：25℃
TEST RESULT：pass</td></tr>
</table>

External voltage(DC)	1V	5V
SPEC	167V±5%	400V±5%
Vout	164.28V	405.87V

5 OUTPUT CURRENT PROGRAMMABLE (PC)

(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 1~100% of the rated current by applying EXTERNAL VOLTAGE between *PC+* and *PC-* on CN53.

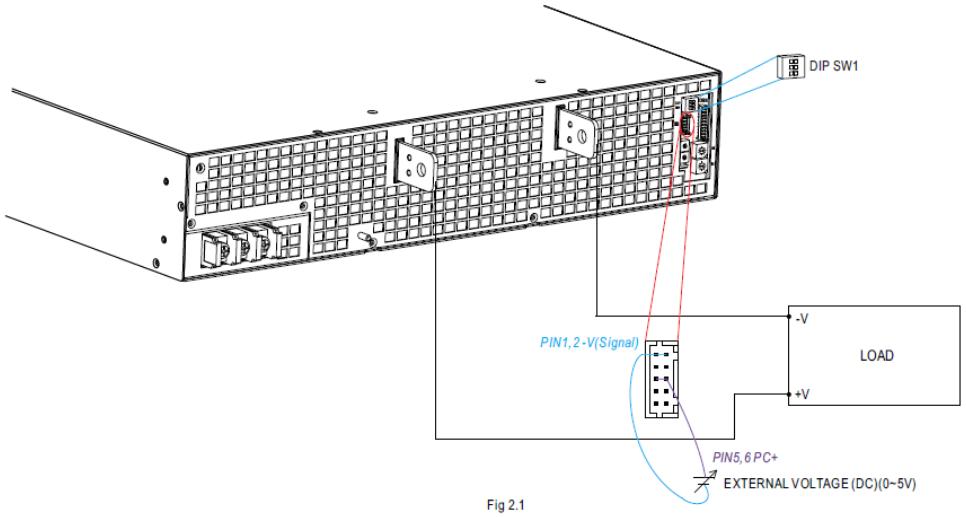
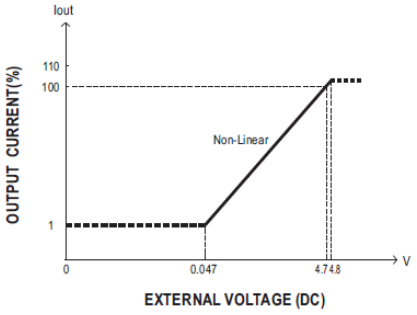
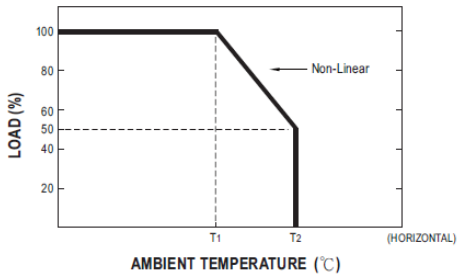


Fig 2.1

※ Under PC function at wattage < 10KW, 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.
$T_{1(Typ.)}$: Maximum ambient temperature of full load.
$T_{2(Typ.)}$: T1+5℃.





◎ The 100% output current is 346/261/139/90A.
◎ It might cause higher current ripple when the output current adjust below 20%(@<1V programming)

Fig 2.2

I/P：400 VAC
O/P：TESTING
Ta：25℃

External voltage(DC)	0.047V	1V	5V
SPEC	0.9A±10%	19.15A±10%	91.94A±10%
TEST	0.9A	18.8A	90A

6	CURRENT SHARING	CURRENT SHARING TOLERANCE <±10%	I/P： 400 VAC O/P：380V (factory default) 95/50% LOAD Ta：25℃	O/P：95% PSU1：74.87A PSU2：75.17A PSU3：74.72A PSU4：75.57A O/P：50% PSU1：39.98A PSU2：39.72A PSU3：39.99A PSU4：39.95A

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q301&Q308 Rated: 1200V/100A	AC ON/OFF I/P:High-Line +3V =533V 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	Q308 VDS: (1) 1008V/67.5A (2) 1020V/98A (3) 1009V/62A (4) 1010V/71A (5) 1009V/72.5A (6) 994V/73.5A	Q301 VDS: (1) 985V/67.5A (2) 996V/98A (3) 986V/62A (4) 986V/71A (5) 986V/72.5A (6) 1003V/73.5A
			Vo=334V O/P： (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz	(1) 970V/68.5A (2) 1020V/98A (3) 993V/73.7A	(1) 987V/68.5A (2) 956V/98A (3) 985V/73.7A
			Vo=400V O/P： (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz	(1) 994V/65.5A (2) 988V/98A (3) 1001V/72.5A	(1) 893V/65.5A (2) 988V/98A (3) 986V/72.5A
			I/P:Low-Line -3V = 337V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/	Q308 VDS: (1) 1017V/68.5A (2) 972V/98A (3) 1003V/72A (4) 994V/72A (5) 993V/72A	Q301 VDS: (1) 986V/68.5A (2) 996V/98A (3) 985V/72A (4) 986V/72A (5) 986V/72A

			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 Ta:25℃	(6) 992V/71A	(6) 1001V/71A
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q93 Rated: 650V/120A	I/P:High-Line +3V =533 V AC ON/OFF Vo=334V 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 I/P:Low-Line -3V = 337V 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 Ta:25℃	Q93 VDS: (1) 545V/42.5A (2) 534V/56.5A (3) 533V/35.5A * (4) 538V/35.5A (5) 538V/36A (6) 498V/30.5A VDS: (1) 580V/63A (2) 435V/51A (3) 572V/32A (4) 572V/33A (5) 576V/32A (6) 581V/33A	
3	P.F.C DIODE	D83 Rated : 15 A / 1500V	I/P:High-Line +3V =533 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 = 337V 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	D83 (1) 915V (2) 883V (3) 914V (4) 891V (1) 938V (2) 883V (3) 922V (4) 916V	

			Ta:25℃	
4	Diode Peak Voltage	DJ11 Rated: 15A/1200V DJ21 Rated: 15A/1200V DJ31 Rated: 15A/1200V DJ41 Rated: 15A/1200V DJ51 Rated: 15A/1200V DJ61 Rated: 15A/1200V	AC ON/OFF I/P:High-Line +3V =533 V Vo=380V 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)NO LOAD Vo=400V O/P： (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz Ta：25℃	Vo=380V DJ11: (1) 947V (2) 838V (3) 933V (4) 940V (5) 942V (6) 949V (7) 878V DJ31: (1) 939V (2) 839V (3) 939V (4) 948V (5) 948V (6) 941V (7) 886V DJ51: (1) 941V (2) 839V (3) 949V (4) 957V (5) 957V (6) 932V (7) 877V Vo=400V DJ11: (1) 973V (2) 886V (3) 988V DJ31: (1) 990V (2) 863V (3) 990V DJ51: (1) 966V (2) 885V (3) 988V	Vo=380V DJ21: (1) 933V (2) 839V (3) 941V (4) 948V (5) 948V (6) 932V (7) 893V DJ41: (1) 942V (2) 845V (3) 947V (4) 947V (5) 949V (6) 941V (7) 893V DJ61: (1) 950V (2) 847V (3) 956V (4) 964V (5) 966V (6) 940V (7) 893V Vo=400V DJ21: (1) 950V (2) 886V (3) 972V DJ41: (1) 989V (2) 870V (3) 988V DJ61: (1) 965V (2) 886V (3) 990V
5	Input Capacitor Voltage	C480-C497 Rated: 820μ / 450V*2=900V Surge voltage: 500V*2=1KV	I/P:High-Line +3V =533V O/P: (1)Full Load input on/off (2) Min load input on /Off	(1)891V (2)892V

			(3)Full Load /Min load Change (4)Full load continue Ta:25℃	(3)898V (4)868V
6	Control IC Voltage Test	PWM IC U982 Rated：8.9 V~ 15.5V AUX IC U571 Rated：-0.3V~28V	AC ON/OFF I/P:High-Line +3V =533 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℃	U982 U571 (1)13.2V (1)17.7V (2)13.4V (2)18.9V (3)12.8V (3)17.7V (4)12.5V (4)17.2V (5)12.6V (5)17.1V
8	TOP SWITCHING STAND BY POWER	Q519 Rated： 3.9A/ 800 V	AC ON/OFF I/P:High-Line +3V =533 V O/P: (1)Full Load (2)Remote On/Off I/P:Low-Line -3V =337 V O/P: (1)Full Load (2)Remote On/Off Ta:25℃	VDS： 1. 699V/1.86A 2. 711V/2.04A VDS： (1) 699 V/1.86A (2) 711V/2.04A

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4.25KVAC/min I/P-FG :3KVAC/min O/P-FG:3KVAC/min	I/P-O/P: 4.67KVAC/min I/P-FG: 3.6KVAC/min O/P-FG:3.6 KVAC/min Ta:25℃	I/P-O/P: 23.7mA I/P-FG: 21.26mA O/P-FG: 25.94m 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℃	I/P-O/P: **5.7GΩ** I/P-FG: **3.7GΩ** O/P-FG: **3.26GΩ** NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	120A / 4min Ta:25℃	6 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2	I/P: 400 VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS
2	CONDUCTED	EN55032 /EN55011 CLASS A	I/P： 400 VAC (50HZ) O/P：FULL Ta：25℃	PASS
3	RADIATED	EN55032 /EN55011 CLASS A	I/P： 400 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS
4	E.S.D	EN61000-4-2 INDUSTRY AIR：8KV / Contact：4KV	I/P： 400 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT： 2KV	I/P： 400 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N ：2KV L,N-PE：4KV	I/P： 400 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
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-30K-115 1. ROOM AMBIENT BURN-IN： 2HRS I/P： 400VAC O/P： FULL LOAD Ta= 25 ℃ 2. HIGH AMBIENT BURN-IN： 2HRS I/P： 400VAC O/P： FULL LOAD Ta= 50℃		

NO	Position	ROOM AMBIENT Ta=25℃	HIGH AMBIENT Ta=50℃
1	D70	71.1℃	101.5℃
2	D75	83.2℃	112.6℃
3	D93	85.7℃	111.7℃
4	Q81	73.9℃	96.6℃
5	Q103	84.8℃	108.4℃
6	Q121	94.6℃	119.9℃
7	RY30	46.7℃	69.5℃
8	L50	78.1℃	103.3℃
9	L60	84.0℃	113.2℃
10	U201	40.9℃	64.9℃
11	U262	45.6℃	68.9℃
12	C485	43.0℃	66.6℃
13	LF2	69.4℃	95.9℃
14	C318	55.5℃	79.9℃
15	C441	38.9℃	62.6℃
16	C451	35.4℃	60.1℃
17	Q303	53.8℃	77.6℃
18	Q307	68.1℃	91.5℃
19	T300	44.6℃	69.1℃
20	T531	39.5℃	63.6℃
21	T1	59.2℃	86.5℃
22	T2	80.8℃	100.3℃
23	T3	72.3℃	96.6℃
24	RT8	47.2℃	71.7℃
25	C510	39.5℃	62.7℃
26	DJ31	49.5℃	70.1℃
27	DJ51	62.4℃	81.5℃
28	RT50	63.3℃	87.7℃
29	RT51	56.2℃	80.7℃
30	RT52	30.6℃	54.1℃
31	C904	33.2℃	55.1℃
32	C934	32.2℃	56.0℃
33	T600	38.9℃	63.8℃
34	Q591	45.8℃	72.0℃
35	Q610	36.1℃	61.2℃
36	C613	33.6℃	58.6℃
37	L770	26.5℃	51.2℃
38	C991	25.9℃	50.0℃
39	RT71	25.2℃	49.9℃
40	RT13	79.9℃	104.8℃
41	L501	60.4℃	81.8℃
42	T1	69.4℃	95.4℃
43	T2	75.2℃	98.7℃
44	T3	69.7℃	95.7℃
45	L901	51.5℃	76.1℃
46	RT12	72.6℃	96.4℃

		47	RTH8	52.7℃	77.0℃
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 400 VAC O/P：101.5%LOAD Ta：25℃	TEST：OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 530VAC/340VAC O/P： 100%/90%LOAD Ta= -35℃	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： 540 VAC O/P：FULL LOAD Ta= 50 ℃ HUMIDITY= 95 %R.H	TEST：OK	
5	TEMPERATURE COEFFICIENT	± 0.03%/℃(0~50℃)	I/P： 400 VAC O/P：FULL LOAD	± 0.0069 %/℃(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: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℃		
9	CAPACITOR LIFE CYCLE	SUPPOSE C934 IS THE MOST CRITICAL COMPONENT (1) I/P： 400VAC O/P：FULL LOAD Ta= 25℃ LIFE TIME (2) I/P： 400VAC O/P：FULL LOAD Ta= 50℃ LIFE TIME (3) I/P： 400VAC O/P：75% LOAD Ta= 50℃ LIFE TIME (4) I/P： 400VAC O/P：50% LOAD Ta= 50℃ LIFE TIME		(1) 1582636HRS (2) 303828HRS (3) 509509HRS (4) 673427HRS	
10	MTBF	Conducted by Parts Stress Analysis Prediction 188.1K hrs min. Telcordia SR-332 (Bellcore) ; 20.9K hrs min. MIL-HDBK-217F (25℃)			
11	Ongoing Reliability Test	I/P：400VAC 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 TSENG

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