

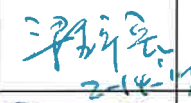
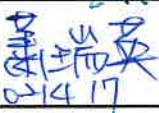
# SPECIFICATION

For

SWITCHING POWER SUPPLY

- **SNP-HF89**
- **SNP-HF89-A**
- **SNP-HF89-H**

STANDARD PRODUCT

Reviewed by Product Engineer						
Typed by Document Assistant						
<b>SKYNET ELECTRONIC</b>		<b>LAST REV. NO.</b>				

## 1.0 INTRODUCTIONS

SNP-HF89 series is an open frame 80W power supply with built-in:

- (1) Peak load (1.5 x rated current,  $V_o$ =rated for 5 sec)
- (2) Meet 2 x MOPP, Earth leakage current < 300uA and Touch current < 100uA for BF application
- (3) SNP-HF89 is with no load <0.1W green power feature, input class I
- (4) SNP-HF89-A is without burst sound, input class I
- (5) SNP-HF89-H is for home healthcare application, input class II and EMI class B
- (6) -40°C to +70°C operating temperature
- (7) 5,000m operation altitude

## 2.0 INPUT SPECIFICATIONS

### 2.1 Input voltage

Input voltage range : 90Vac to 264Vac

Nominal line voltage : 115Vac/230Vac

### 2.2 Input frequency

47Hz to 63Hz

### 2.3 Input current

$3A_{rms}$  max/115Vac,  $1.5A_{rms}$  max/230Vac

### 2.4 Inrush current

30A max/115Vac, 60A max/230Vac (EMI capacitors excluded, cold start at 25°C)

## 3.0 OUTPUT SPECIFICATIONS

All specs under item 3.0 except with special notes are defined and tested at nominal line input, rated load and 25°C

### 3.1 Load range

$V_o$	min. load	rated load	max load	peak load
+24V	0A	3.33A	4.6A	5.3A

#### 3.1.1 Factory adjustment

+23.8V to +24.2V (60% rated load, 115Vac)

#### 3.1.2 Peak load max duration

5sec. (duty cycle < 50%, average power < rated power)

#### 3.1.3 Cooling

Rated load for convection cooling ; max load for 18 CFM forced air cooling.

### 3.2 Ripple and noise

< 1% (20MHz bandwidth limited, 1X probe with 0.47uF parallel capacitor)

### 3.3 Line regulation

< ±0.5% (90Vac to 264Vac, compare with 115Vac)

### 3.4 Load regulation

< ±1% (20% to 100% rated load, compare with 60% rated load)

### 3.5 Capacitive load start-up

< 10,000uF

**4.0 GENERAL FEATURES**

All specs under item 4.0 except with special notes are defined and tested at nominal line input, rated load and 25°C

**4.1 Efficiency**

**SNP-HF89**

> 87% at 100% rated load

**SNP-HF89-A & SNP-HF89-H**

> 86% at 100% rated load

**4.2 Hold up time**

16 ms typical

**4.3 No load input power**

< 0.1 for SNP-HF89.

< 1.5W for SNP-HF89-A & SNP-HF89-H, skip burst mode for preventing audible noise.

**4.4 Protection**

**4.4.1 Over-voltage protection**

Trip point : +26V to +30V

Protection mode : Latch-off

**4.4.2 Short circuit and over-load protection**

Protection mode : Auto-recovery

**5.0 ENVIRONMENT SPECIFICATIONS**

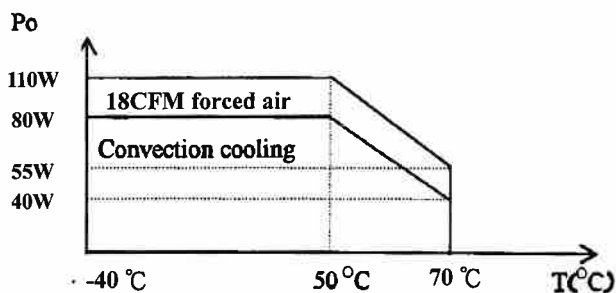
**5.1 Operating temperature**

-40°C to 70°C

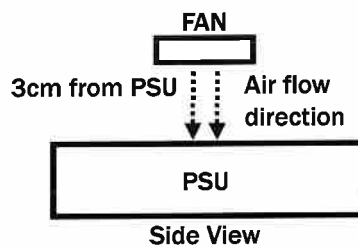
(For both rated and max load. output load derates linearly to 50% from 50°C to 70 °C)

(Rated load with convection cooling; max load with 18 CFM forced air cooling)

Output derating curve



Max load fan location



**5.2 Storage temperature**

-40°C to 85°C

**5.3 Operating humidity**

5% to 95% RH, non-condensing

**5.4 Altitude**

0 to 5000m

## 6.0 INTERNATIONAL STANDARDS

### 6.1 Safety standards

Label voltage: 100Vac to 240Vac

Designed to meet:

ITE:

UL 60950-1, 2nd Edition, 2014-10-14

CAN / CSA C22.2 No.60950-1-07 2nd Edition , 2014-10

IEC 60950-1:2005+A1+A2

EN 60950-1:2006+A11+A1+A12+A2

Medical:

3.1 Edition:

ANSI /AAMI ES60601-1(2005 / (R) 2012+A1:2012, C1:2009 / (R) 2012+A2:2010 / ( R) 2012)

CAN/CSA-C22.2 No.60601-1:14

IEC 60601-1:2005+A1

EN 60601-1:2006+A11+A1+A12

3rd Edition:

ANSI /AAMI ES 60601-1(2005+C1:09+A2:10)

CAN/CSA-C22.2 No. 60601-1(2008)

IEC 60601-1:2005

EN 60601-1:2006+A11+A12

2nd Edition:

UL 60601-1 , 1st Edition

CAN/CSA-C22.2 No.601.1-M90,2005

IEC 60601-1:1988+A1+A2

EN 60601-1:1990+A1+A2+A13

### 6.2 EMI standards

FCC docket 20780 curve "B"

EN55022, level "B"

EN55011, level "B"

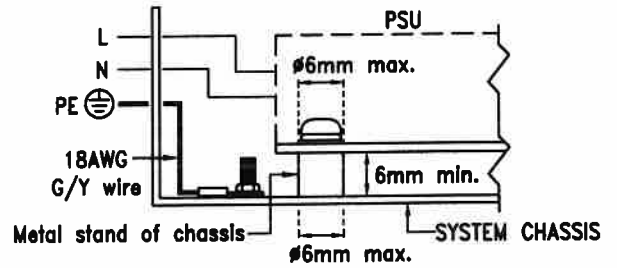
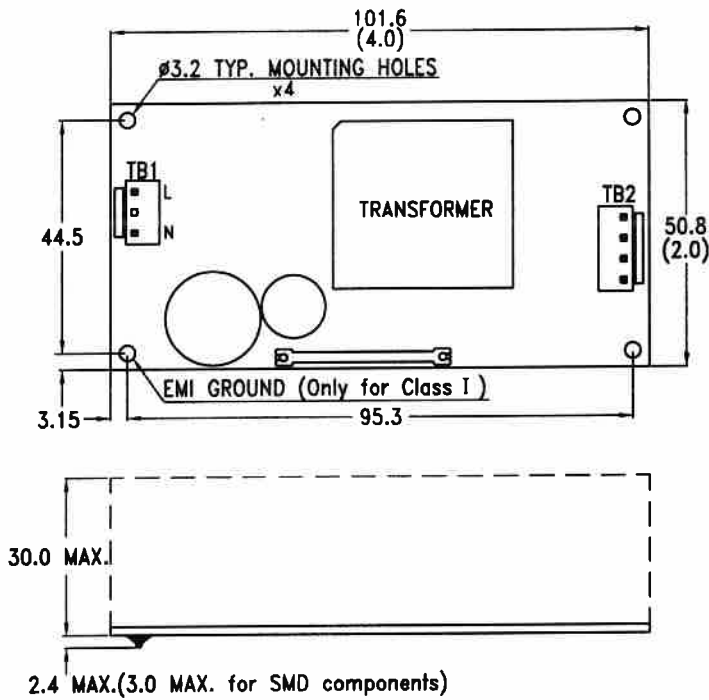
EN 61000-3-2 class "A"

EN 61000-3-3

### 6.3 EMS standards

EN61000-4-2	6kV/contact discharge, 8kV/air discharge	Criterion A
EN61000-4-3	10V/M with 80% AM	Criterion A
EN61000-4-4	2kV	Criterion A
EN61000-4-5	2kV/Line-Line, 4kV/Line-Earth	Criterion A
EN61000-4-6	10V with 80% AM	Criterion A
EN61000-4-8	10A/m	Criterion A
EN61000-4-11	100% dips 10ms,	Criterion A
	100% dips 20ms,	Criterion B
	30% dips 500ms,	Criterion A
	60% dips 200ms,	Criterion B
	100% dips 5000ms,	Criterion B

**7.0 MECHANICAL SPECIFICATION**



**Installation drawing**

Note :

To meet the requirement of safety and EMI, above installation must be followed.

**7.1 Dimensions**

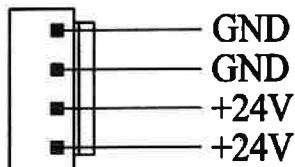
Dimensions shown in mm (inch) as above. Tolerance specified is  $\pm 0.4\text{mm}$  (0.016 inch).

**7.2 Connectors**

TB1--AC Input : JST B2P3-VH or equivalent.

TB2--DC Output : JST B4P-VH or equivalent.

**7.3 DC Output pin assignment**

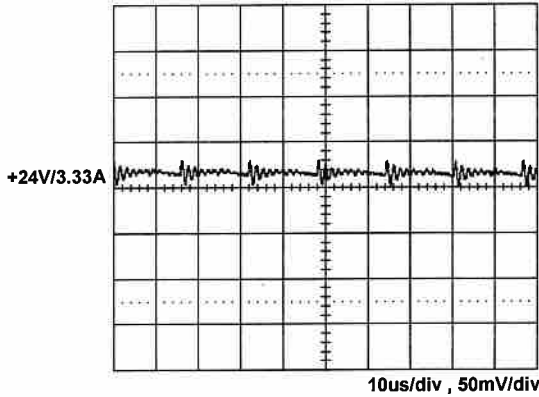


**7.4 Packing**

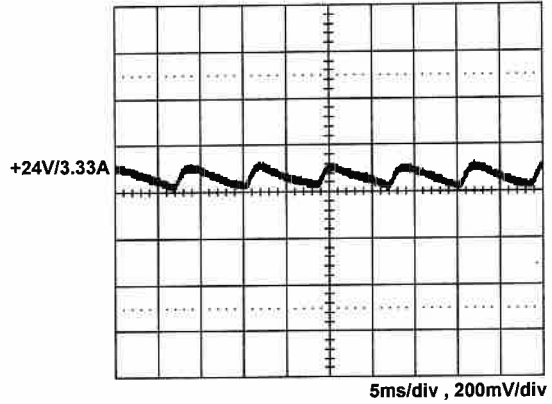
- Net weight : 160g approx. / unit
- Carton size(mm) : 382(L) x 374(W) x 277(H)
- Quantity : 80 units / carton
- Gross weight : 15.0kg approx. / carton

8.0 PERFORMANCE (input voltage is 115VAC, unless others specified)

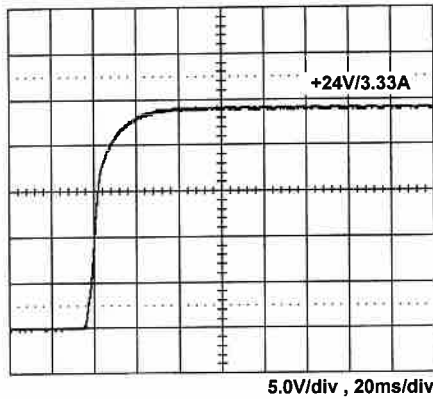
8.1 Switching frequency ripple



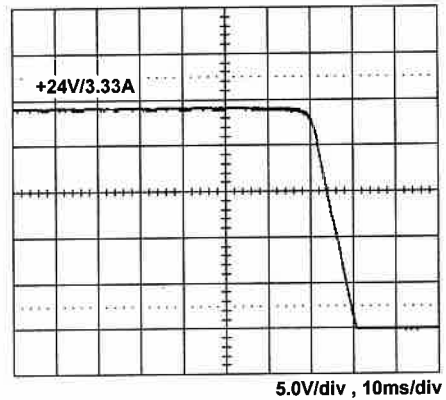
8.2 Line frequency ripple



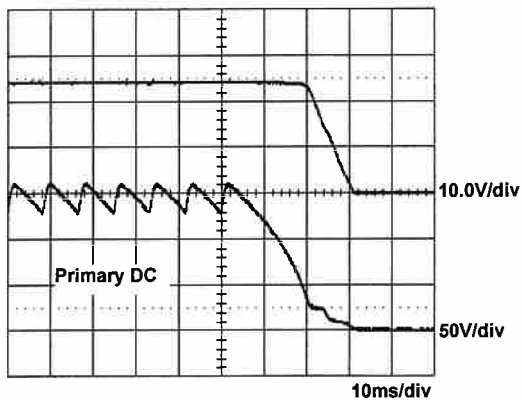
8.3 Output turn on wave form



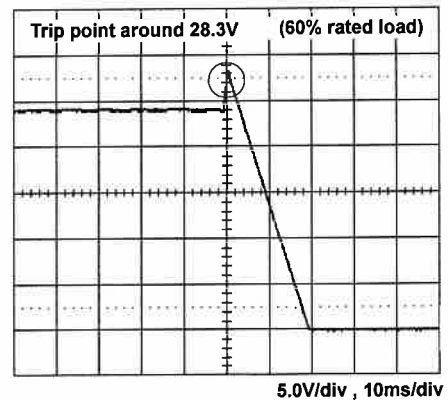
8.4 Output turn off wave form



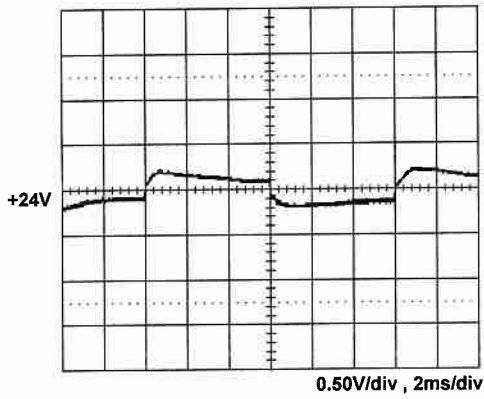
8.5 Hold-up time



8.6 Over voltage protection

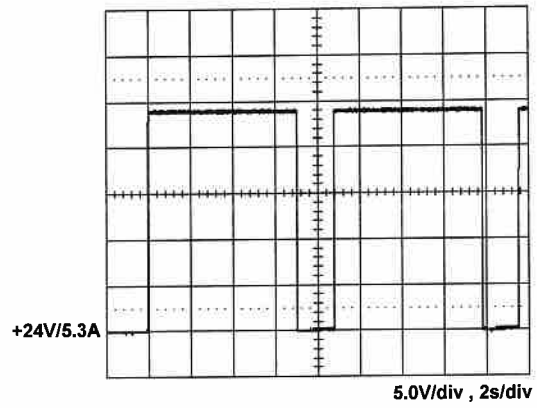


8.7 +24V Step response

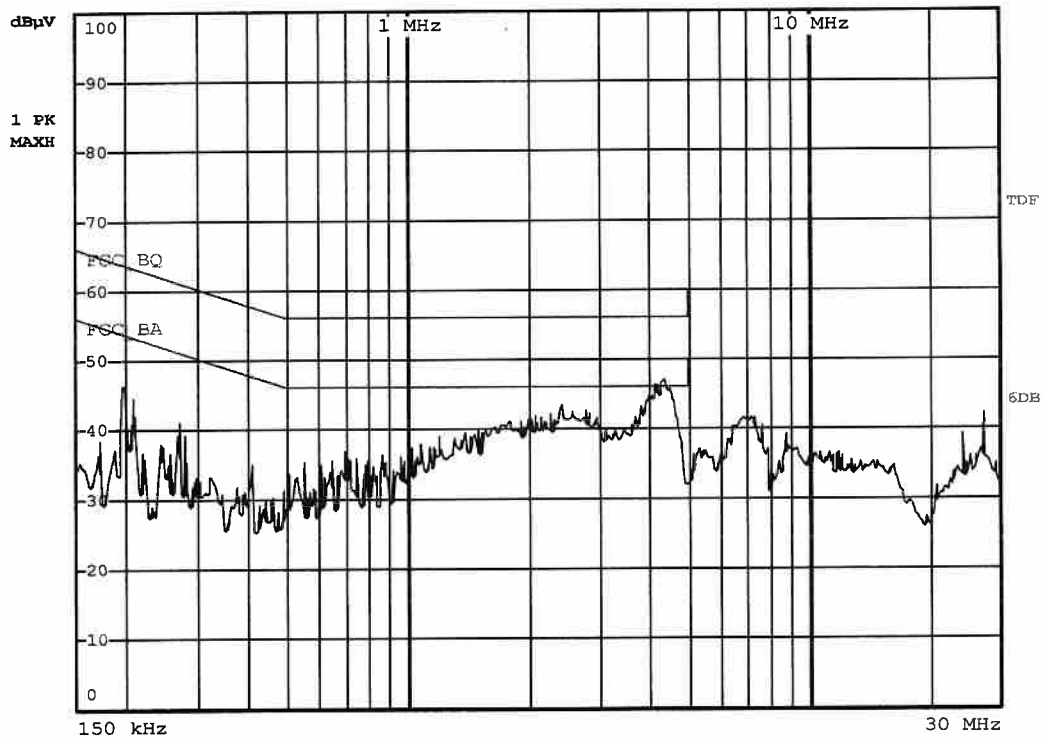


+24V step from 0.67A to 3.33A

8.8 Peak load



8.9 FCC "B" QP performance



8.10 EN55022 "B" QP performance

