

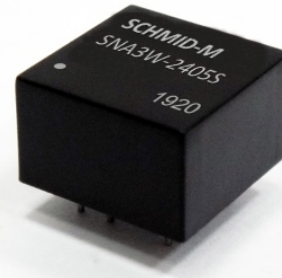
# SNA3W-3W

3W 4:1 Regulated Single & Dual output

# SCHMID-M

## Features

- Highest Power Density In 8 Pin DIL PackageWide
- 4:1 Input RangeSmallest Footprint 3W Converter
- Full SMD Technology
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- Under Voltage Lock-Out Circuit
- Remote on/off Control
- Efficiency up to 84%
- -40 ~ 80°C Operation Temperature Range



The SNA3W series is a family of cost effective and high performed 3W single & dual output DC-DC converters. These converters are built in non-conductive black plastic package in a 8-pin DIL miniature compact case with high performance features wide range devices operate over 4:1 input voltage range providing stable output voltage. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24, 48 Vdc with output voltage of 3.3, 5, 12, 15,  $\pm 5$ ,  $\pm 12$ ,  $\pm 15$  Vdc. High performance features include high efficiency operation up to 84% and output voltage accuracy of  $\pm 1\%$  maximum.

All specifications typical at  $T_a=25^\circ\text{C}$ , nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage Accuracy	$\pm 1\%$
Maximum Output Current	See table
Line Regulation	$\pm 0.2\%$ , max.
Load Regulation (From 0% to 100% Load)	$\pm 1.0\%$ , max.
Cross Regulation (Dual Output) (1)	$\pm 5\%$
Ripple & Noise (20 MHz bandwidth)(2)	Single 150mVpp, max. Dual 100mVpp, max.
Short Circuit Protection	Indefinite (Automatic Recovery)
Temperature Coefficient	$\pm 0.02\%/^\circ\text{C}$
Capacitive Load(3)	See table
Transient Recovery Time (4)	500us, typ.
Transient Response Deviation(4)	$\pm 3\%$ , max. Single Output 3.3V, 5V: $\pm 5\%$ , max.

INPUT SPECIFICATIONS	
Voltage Range	See table
Start up Time(Nominal $V_{in}$ and constant resistive load)	30mS, typ.
Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current(5)	20mA pk-pk
Remote on/off	
ON:	open or high impedance
OFF:	2-4mA input current (via 1K)
Off stand by input current(Nominal $V_{in}$ )	2.5mA, max.
Under Voltage Lockout	
12V Modes	Module ON / OFF 4.2Vdc / 3.5Vdc, typ.
24V Modes	Module ON / OFF 8.5Vdc / 7.0Vdc, typ.
48V Modes	Module ON / OFF 17.5Vdc / 15.5Vdc, typ.

GENERAL SPECIFICATIONS	
Efficiency	See table, typ.
I/O Isolation Voltage (60 sec)	1600Vdc
I/O Isolation Capacity	2000 pF, typ.
I/O Isolation Resistance	1000M Ohm, min.
Switching Frequency	100kHz, min.
Humidity	95%relH
Reliability Calculated MTBF (MIL-HDBK-217 F)	>820Khrs@25°C
Safety Standard(designed to meet)	IEC/UL/EN 60950-1 IEC/UL/EN 62368-1

PHYSICAL SPECIFICATIONS	
Case Material	Non conductive black plastic(UL94V-0 rated)
Base Material	Non conductive black plastic(UL94V-0 rated)
Potting Material	Silicon (UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Weight	3.6g
Dimensions	0.55"x0.55"x0.32"

ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~80°C (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-55°C~125°C
Cooling(6)	Nature Convection

ABSOLUTE MAXIMUM RATINGS(7)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100ms max)	
12 Models	25Vdc, max.
24 Models	50Vdc, max.
48 Models	100Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

EMC CHARACTERISTICS		
Radiated Emissions	EN55032	CLASS A
Conducted Emissions(8)	EN55032	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(9)	IEC61000-4-4	Perf. Criteria A
Surge(9)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

## SNA3W - 3W 4:1 Regulated Single & Dual output

### PART NUMBER STRUCTURE

**SNA3W - 24 05 S**

Series Name

Input Voltage Range

12 - 4.5 ~ 18V

24 - 9 ~ 36V

48 - 18 ~ 75V

Case Type

S - Single Output

D - Dual Output

Nominal Output Voltage

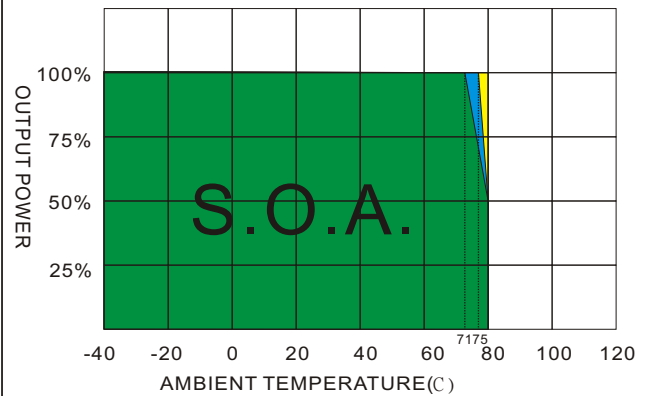
3R3 - 3.3V

5 - 5V

12 - 12V

15 - 15V

### Derating Curve



Green Zone : Efficiency under 80% models

Blue Zone : Others

Yellow Zone : Efficiency over 83% models

### MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (% ,typ)	Capacitor Load @FL (uF,max)
		No-Load (mA,max)	Full Load (mA,typ.)		Min. load (mA)	Full load (mA)		
SNA3W-123R3S	12 ( 4.5-18 )	30	257	3.3	0	700	75	3300
SNA3W-1205S	12 ( 4.5-18 )	45	309	5	0	600	81	1680
SNA3W-1212S	12 ( 4.5-18 )	55	301	12	0	250	83	470
SNA3W-1215S	12 ( 4.5-18 )	60	301	15	0	200	83	330
SNA3W-1205D	12 ( 4.5-18 )	30	313	±5	0	±300	80	±1000
SNA3W-1212D	12 ( 4.5-18 )	55	305	±12	0	±125	82	±220
SNA3W-1215D	12 ( 4.5-18 )	60	301	±15	0	±100	83	±220
SNA3W-243R3S	24 ( 9-36 )	25	127	3.3	0	700	76	3300
SNA3W-2405S	24 ( 9-36 )	20	152	5	0	600	82	1680
SNA3W-2412S	24 ( 9-36 )	30	149	12	0	250	84	470
SNA3W-2415S	24 ( 9-36 )	35	149	15	0	200	84	330
SNA3W-2405D	24 ( 9-36 )	25	154	±5	0	±300	81	±1000
SNA3W-2412D	24 ( 9-36 )	30	151	±12	0	±125	83	±220
SNA3W-2415D	24 ( 9-36 )	35	149	±15	0	±100	84	±220
SNA3W-483R3S	48 ( 18-75 )	10	65	3.3	0	700	74	3300
SNA3W-4805S	48 ( 18-75 )	10	77	5	0	600	81	1680
SNA3W-4812S	48 ( 18-75 )	15	77	12	0	250	81	470
SNA3W-4815S	48 ( 18-75 )	15	76	15	0	200	82	330
SNA3W-4805D	48 ( 18-75 )	20	79	±5	0	±300	79	±1000
SNA3W-4812D	48 ( 18-75 )	20	78	±12	0	±125	80	±220
SNA3W-4815D	48 ( 18-75 )	25	78	±15	0	±100	80	±220

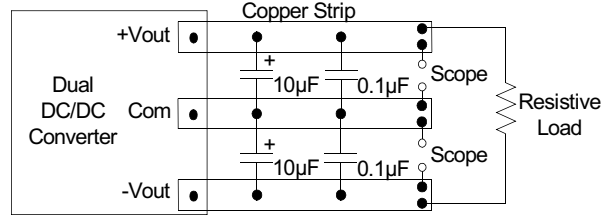
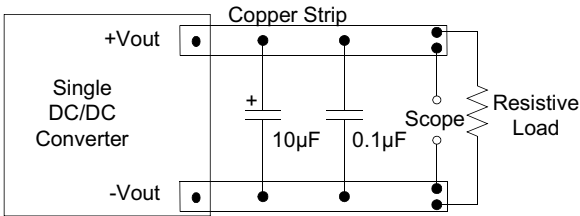
### NOTE

- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Ripple/Noise measured with a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
- Test by minimal Vin and constant resistive load.
- Test by normal Vin and 100%-25% load, 25% load step change.
- Measured Input reflected ripple current with a simulated source inductance of 27μH and a source capacitor Cin(47μF, ESR<1.0Ω at 100KHz).
- "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
- Exceeding the absolute ratings of the unit could cause damage. It's not allowed for continuous operating ratings.
- Input filter components are required to help meet conducted emission class A, Which application refer to the EMI Filter(Conducted Emissions).
- An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5. The filter capacitor SCHMID-M suggest: Nippon - chemi - con KY series, 220μF/100V.

TEST CONFIGURATIONS

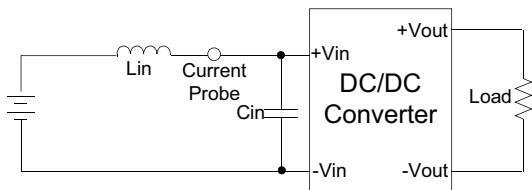
### Output Ripple & Noise Measurement Test

Use a 10 $\mu$ F electrolytic capacitor and 0.1 $\mu$ F ceramic capacitor.  
The Scope measurement bandwidth is 20MHz.



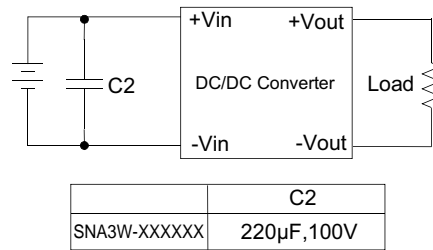
### Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor  $L_{in}$ (27 $\mu$ H) and a source capacitor  $C_{in}$ (47 $\mu$ F, ESR<1.0 $\Omega$  at 100KHz) at nominal input and full load.



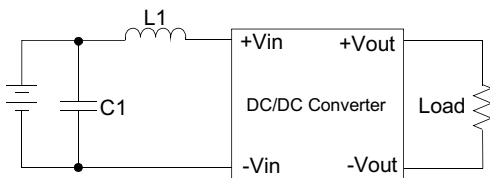
### EFT/Surge Filter

Input filter components (C2) is used to help meet IEC61000-4-4 and IEC61000-4-5 .



### EMI Filter(Conducted Emissions)

Input filter components (C1,L1) are used to meet EMI test criterial A.  
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

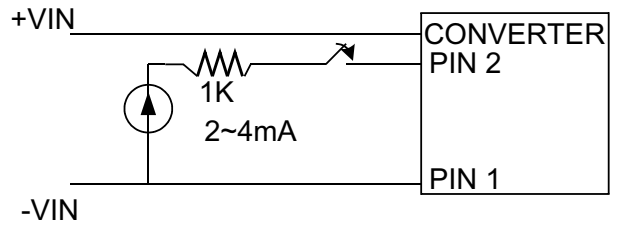


	C1	L1
SNA3W-12XXXX	1210,10 $\mu$ F,35V	2.2 $\mu$ H
SNA3W-24XXXX	1210,2.2 $\mu$ F,100V	
SNA3W-48XXXX	1210,4.7 $\mu$ F,100V	

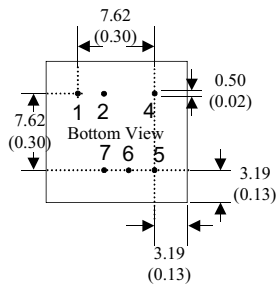
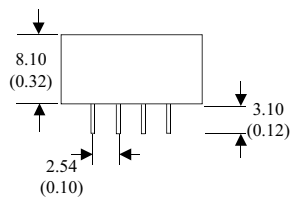
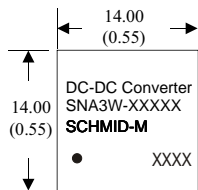
TEST CONFIGURATIONS

Remote ON / OFF Test Step

Input current(2~4mA) via 1KΩ to Pin2 , converter OFF.  
open or high impedance , converter ON.



MECHANICAL SPECIFICATION



8 Pin DIL Package

- Notes : All dimensions are typical in millimeters ( inches ).
1. Pin diameter: 0.5±0.05 ( 0.02±0.002 )
  2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )
  3. Pin to case tolerance: ±0.5 ( ±0.02 )
  4. Case Tolerance: ±0.5 ( ±0.02 )

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	Remote On/Off	Remote On/Off
4	+V Input	+V Input
5	+V Output	+V Output
6	N.P.	Common
7	-V Output	-V Output