SNB3R5HW Series

3.5W 4:1 Regulated Single & Dual output

Features

- Compact DIP-16-package
- Wide 4:1 Input Range
- Isolation Voltage up to 5000VAC
- Reinforced Insulation for 250Vrms Working Voltage
- Continuous Short Circuit Protection
- Under Voltage Protection
- Remote On/Off Control
- Efficiency up to 84%
- -40 ~ 90°C Operation Temperature Range

PART NUMBER STRUCTURE

SNB 3R5 H W - 24 05 S
(1) (2) (3) (4) (5) (6) (7)

(1) Series

(2) Watt
3R5 - 3.5 W

(3) High Isolation

(4) Wide Input Range
W - 4：1

(5) Input Voltage Range
12 - 4.5-18 V
24 - 9-36 V
48 - 18-75 V

(6) Output Voltage
05 - 5.0 V
12 - 12 V
15 - 15 V

(7) Output Type
S - Single Output
D - Dual Output

ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current		EFFICIENCY	Capacitive
	Voltage Range (VDC)	No-Load (mA, max.)	Full Load (mA, typ.)	Voltage (VDC)	Min. load (mA)	Full load (mA)	@FL (%, typ.)	Load @FL (μF, max.)
SNB3R5HW-1205S	4.5-18	25	374	5	0	700	78	1470
SNB3R5HW-1212S	4.5-18	50	352	12	0	292	83	470
SNB3R5HW-1215S	4.5-18	45	352	15	0	234	83	330
SNB3R5HW-1212D	4.5-18	50	356	±12	0	±146	82	±220
SNB3R5HW-1215D	4.5-18	60	356	±15	0	±117	82	±160
SNB3R5HW-2405S	9-36	20	185	5	0	700	79	1470
SNB3R5HW-2412S	9-36	25	174	12	0	292	84	470
SNB3R5HW-2415S	9-36	30	176	15	0	234	83	330
SNB3R5HW-2412D	9-36	30	174	±12	0	±146	84	±220
SNB3R5HW-2415D	9-36	30	176	±15	0	±117	83	±160
SNB3R5HW-4805S	18-75	15	94	5	0	700	78	1470
SNB3R5HW-4812S	18-75	15	89	12	0	292	82	470
SNB3R5HW-4815S	18-75	20	89	15	0	234	82	330
SNB3R5HW-4812D	18-75	20	92	±12	0	±146	80	±220
SNB3R5HW-4815D	18-75	20	91	±15	0	±117	81	±160

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	12V Input		4.5	12	18	VDC
	24V Input		9	24	36	
	48V Input		18	48	75	
Under Voltage Protection	12V Input	Module ON		4.2		VDC
		Module OFF		3.5		
	24V Input	Module ON		8.5		
		Module OFF		7.0		
	48V Input	Module ON		17.5		
		Module OFF		15.5		
Input Filter			Capacitive Type			
Input Reflected Ripple Current (1)				20		mApk-pk
Start up Time	Nominal Vin and constant resistive load			30		ms
Remote ON/OFF Control	Module ON		(Open or high impedance)			
	Module OFF		2 - 4 mA current applied via 1kOhm resistor			
	OFF idle current			2.5		mA
Recommended input fuse (slow blow)	12V Input		1.6			A
	24V Input		0.8			
	48V Input		0.5			

Note：

1. Measured with a simulated source inductance of 27μH and a source capacitor Cin(47μF, ESR<1.0Ω at 100kHz).

ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	12V Input			25	VDC
	24V Input			50	
	48V Input			100	
Soldering Temperature	1.5mm from case 10sec max.			260	°C
Note：These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.					

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			-1.0		+1.0	%
Line Regulation			-0.5		+0.5	%
Load Regulation	From 0% to 100% Load	Single Output	-1.0		+1.0	%
		Dual Output	-1.0		+1.0	
Cross Regulation	Asymmetrical Load 25% / 100% for Dual Output		-5		+5	%
Ripple & Noise (1)	20MHz bandwidth	Single Output		50	100	mVpk-pk
		Dual Output		75	100	
Short Circuit Protection			Indefinite(Automatic Recovery)			
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			
Transient Recovery Time	Nominal Vin and 25% load step change (75%-50%-25% of Io)	All models		500		µs
Transient Response Deviation		5 V Output	-5		+5	%
		Others Output	-3		+3	
Note： 1. Measured with a 0.1µF ceramic capacitor.						

GENERAL SPECIFICATIONS

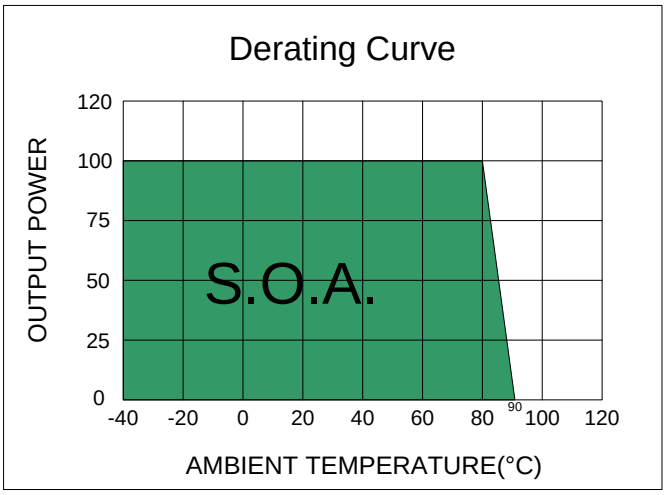
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	5000			VAC
Isolation Resistance	Input-output	1000			MΩ
Isolation Capacitance	Input-output		10	20	pF
Leakage Current	240VAC, 60Hz		2.0		µA
Clearance/Creepage		8			mm
Switching Frequency		100			kHz
MTBF	MIL-HDBK-217 F @ 25°C	777			k hours
Safety Standard	IEC / EN / UL 62368-1				
Insulation System		Reinforced Insulation			
Environmental compliance		RoHS			

ENVIRONMENT SPECIFICATIONS					
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Operating Ambient Temperature	See Power Derating Curve	-40		90	°C
Maximum Case Temperature				105	°C
Thermal Impedance		27			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

EMC SPECIFICATIONS			
Parameter	**Standard**	**Condition**	Criterion
Conducted Emissions	EN55032	with external components	B
Radiated Emissions	EN55032	without external components	B
ESD	IEC 61000-4-2	Air ± 8kV, Contact ± 6kV	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±2kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	100A/m	A

PHYSICAL SPECIFICATIONS	
Parameter	**Value**
Case Material	Non conductive black plastic(UL94V-0 rated)
Base Material	Non conductive black plastic(UL94V-0 rated)
Pin Material	Φ0.5mm Brass Solder-coated
Potting Material	Silicone (UL94V-0 rated)
Weight	7.27 g, typ.
Dimensions	0.96”x0.58”x0.43”

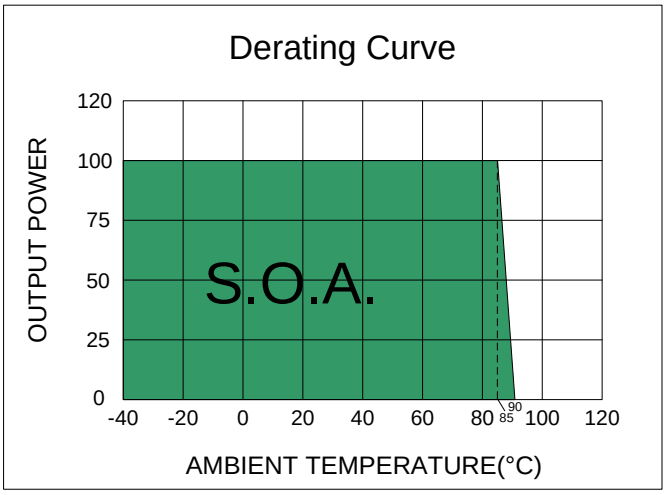
ELECTRICAL CHARACTERISTIC CURVES



Models:

SNB3R5HW-1205S、SNB3R5HW-2405S、SNB3R5HW-4805S

SNB3R5HW-4812D、SNB3R5HW-4815D



Models:

SNB3R5HW-1212S、SNB3R5HW-1215S、SNB3R5HW-1212D

SNB3R5HW-1215D、SNB3R5HW-2412S、SNB3R5HW-2415S

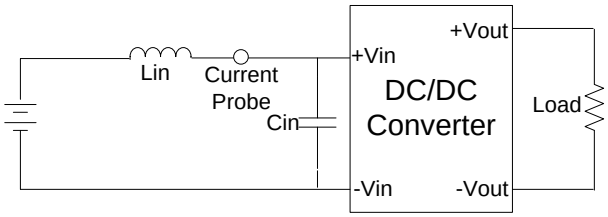
SNB3R5HW-2412D、SNB3R5HW-2415D、SNB3R5HW-4812S

SNB3R5HW-4815S

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

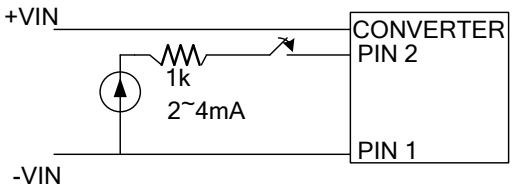
Input reflected ripple current is measured with a source inductor Lin(27μH) and a source capacitor Cin(47μF, ESR<1.0Ω at 100kHz) at nominal input and full load.



DESIGN & FEATURE CONFIGURATIONS

Remote Module ON / OFF

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

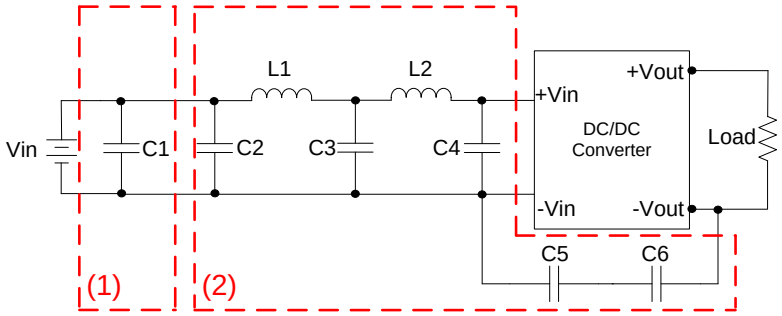


DESIGN & FEATURE CONFIGURATIONS

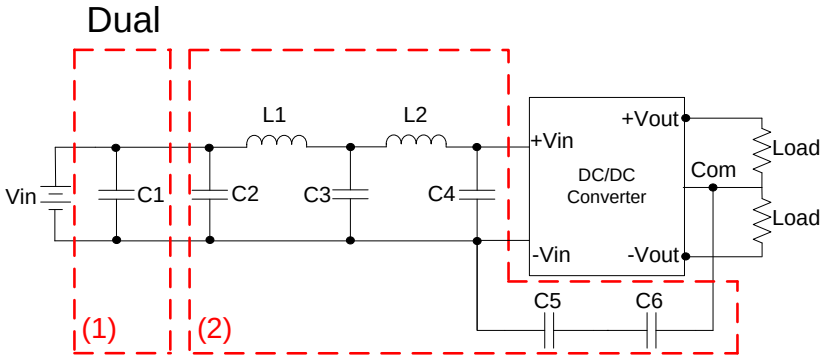
EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.

Single

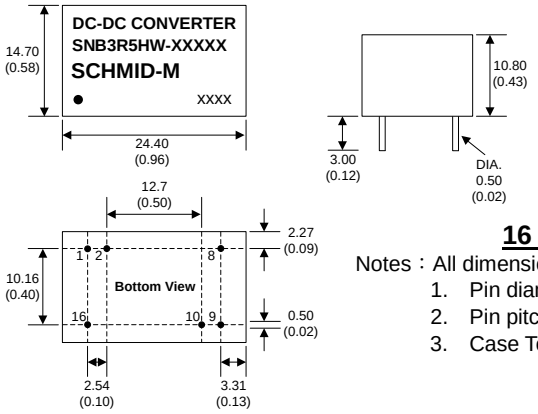


Dual



	C1	C2、C3、C4	C5	C6	L1	L2
SNB3R5HW-12XXS	NIPPON chemi-con KY series 220μF, 100V	MLCC 22μF, 35V	47pF / 400 VAC Y1	100pF / 400 VAC Y1	2.2μH	2.2μH
SNB3R5HW-24XXS		MLCC 10μF, 50V			33μH	33μH
SNB3R5HW-48XXS		MLCC 4.7μF, 100V			4.7μH	4.7μH

MECHANICAL SPECIFICATIONS



16 Pin DIL Package

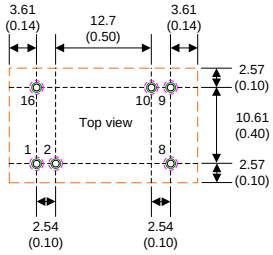
Notes：All dimensions are typical in millimeters (inches).

1. Pin diameter: 0.5 ± 0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ± 0.35 (±0.014)
3. Case Tolerance: ± 0.5 (±0.02)

PIN CONECTIONSN		
PIN NUMBER	SINGLE	DUAL
1	-Vin	-Vin
2	CTRL	CTRL
8	N.C.	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

*N.C.：No Connection

RECOMMEND FOOTPRINT DETAILS



Notes：1. All dimensions are typical in millimeters (inches).
Through hole (black) 1.2.8.9.10.16: Ø0.9 (0.035)
Top view pad (green) 1.2.8.9.10.16: Ø1.13 (0.044)
Bottom view pad (pink) 1.2.8.9.10.16: Ø1.8 (0.071)
2. There should be at least 8mm distance between primary and secondary circuit.