SCHMID-M

SB Series

3W 2:1 Regulated Single & Dual output

Features

- 8 Pin SIL
- Wide 2:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 84%
- -40 ~ 71°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case
- Remote on/off Control (Optional)

The SB 3W series is an improved version from SB 2W family. With the same package size and pin configuration, SB 3W series provide higher efficiency and higher power rating. encapsulated in 8 pin SIL package , providing input/output isolation of 1600Vdc and higher efficiency up to 84% . Available in Single in Line to save the space on board , metal case is also optional for better RFI/EMI shielding.
2:1 Wide input range and long term short circuit protection - single/dual output models are both available!
SB 3W series is a good substitution of traditional DC/DC converter 3W in DIL-24 package.
Single output models contain : 3.3V,5V,12V,15V and dual output models contain : ±5V,±12V and ±15Vdc.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage Accuracy		±1%
Maximun Output Current		See table
Line Regulation		±0.5%,max
Load Regulation (1)	(From 25% to 100% Loading)	±1%,max
Cross Regulation (Dual Output) (2)		±5%
Ripple & Noise (20 Mhz bandwidth)(3)		75mVpp,max
Short Circuit Protection		Indefinite (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load(4)		See table
Transient Recovery Time (5)		300us, typ
Transient Response Deviation(5)		±3%, max

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time(Nominal Vin and constant resistive load)	20mS, typ
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current(6)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table,typ
I/O Isolation Voltage (tested for 3 sec)	1600Vdc
I/O Isolation Capacity	680 pF,max
I/O Isolation Resistance	1000M Ohm,min
Switching Frequency	100~650kHz
Humidity	95%relH
Reliability Calculated MTBF	>2.465 Mhrs@ 25°C
Safety Standard(designed to meet)	IEC60950
Remote on/off controll(7)	
ON:	open or high impedance
OFF:	3-6mA input current (via 1K)
Off stand by input current (Nominal Vin)	3mA max

PHYSICAL SPECIFICATIONS

Case Material	Non conductive black plastic
Potting Material	Epoxy (UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Weight	4.8g,typ
Dimensions	0.86"x0.36"x0.44"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~71°C
Maximum Case Temperature	100°C
Storage Temperature	- 40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(8)

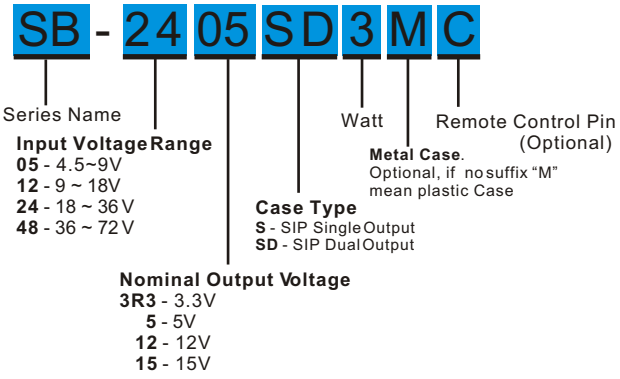
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

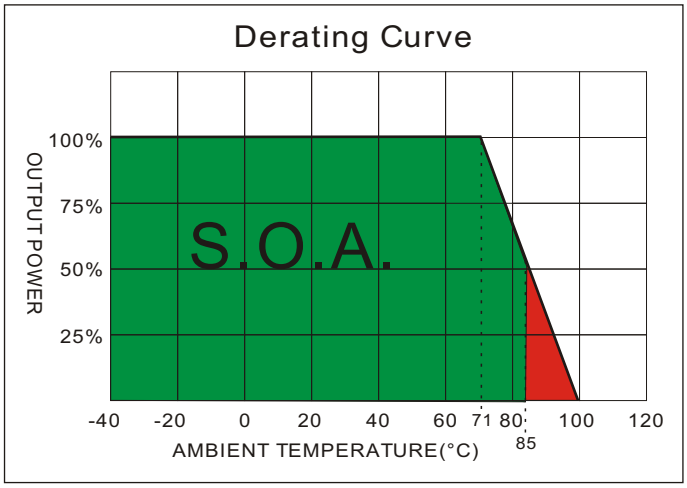
Input Surge Voltage(100ms max)	
05 Modes	-0.7~15 Vdc
12 Modes	-0.7~ 36Vdc
24 Modes	-0.7~ 50Vdc
48 Modes	-0.7~100Vdc
Lead Soldering Temperature (1.5mm from case 10 seconds).	260°C

EMI CHARACTERISTICS

Conducted Emissions (10)	EN55022	CLASS A
Radiated Emissions		
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT(11)	IEC 61000-4-4	Perf. Criteria B
Surge(11)	IEC 61000-4-5	Perf. Criteria B
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PART NUMBER STRUCTURE





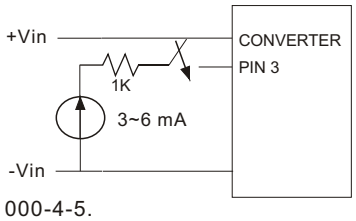
MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
SB-053R3S3C	4.5-9	65	640	3.3	175	700	74	2200
SB-0505S3C	4.5-9	70	800	5	150	600	76	1000
SB-0512S3C	4.5-9	75	750	12	62.5	250	82	470
SB-0515S3C	4.5-9	75	750	15	50	200	82	220
SB-123R3S3C	9-18	25	260	3.3	175	700	76	2200
SB-1205S3C	9-18	15	320	5	150	600	81	1000
SB-1212S3C	9-18	35	305	12	62.5	250	84	470
SB-1215S3C	9-18	35	305	15	50	200	84	220
SB-243R3S3C	18-36	15	133	3.3	175	700	74	2200
SB-2405S3C	18-36	15	160	5	150	600	79	1000
SB-2412S3C	18-36	20	156	12	62.5	250	82	470
SB-2415S3C	18-36	20	152	15	50	200	84	220
SB-483R3S3C	36-72	10	66	3.3	175	700	75	2200
SB-4805S3C	36-72	10	82	5	150	600	78	1000
SB-4812S3C	36-72	15	78	12	62.5	250	81	470
SB-4815S3C	36-72	15	78	15	50	200	81	220
SB-0505SD3C	4.5-9	90	800	±5	±75	±300	77	±470
SB-0512SD3C	4.5-9	90	760	±12	±31.25	±125	81	±220
SB-0515SD3C	4.5-9	90	750	±15	±25	±100	82	±100
SB-1205SD3C	9-18	45	320	±5	±75	±300	80	±470
SB-1212SD3C	9-18	45	308	±12	±31.25	±125	83	±220
SB-1215SD3C	9-18	45	312	±15	±25	±100	82	±100
SB-2405SD3C	18-36	20	160	±5	±75	±300	80	±470
SB-2412SD3C	18-36	20	154	±12	±31.25	±125	83	±220
SB-2415SD3C	18-36	20	154	±15	±25	±100	83	±100
SB-4805SD3C	36-72	15	82	±5	±75	±300	78	±470
SB-4812SD3C	36-72	20	80	±12	±31.25	±125	80	±220
SB-4815SD3C	36-72	15	78	±15	±25	±100	81	±100

Suffix "C" means with control pin Suffix "M" means with Metal Case

NOTE

1. Operation at no load condition will not damage the produce ; however, it will not meet all specifications.
2. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
3. Measured with 20MHz bandwidth .
4. Test by minimal Vin and constant resistive load.
5. Test by normal Vin and 100%-25% load,25% load step change .
6. Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
7. The Remote on/off controll:
   ON: open or high impedance
   OFF: 3.0~6.0mA input current (via 1K)
8. Exceeding the absolute ratings of the unit could cause damage.
   It's not allowed for continuous operating ratings.
9. 25% minimum loading is needed.
10. Input filter components are be required to help meet conducted emission class A, which application refer to the EMI Filter of design & feature configuration.

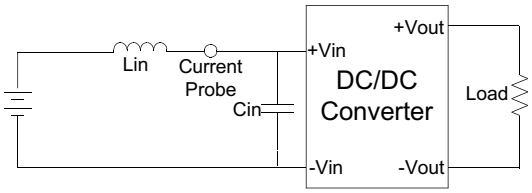


11. An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
    The filter capacitor Schmid-M suggest: Nippon - chemi - con KY series, 220uF/100V.

TEST CONFIGURATIONS

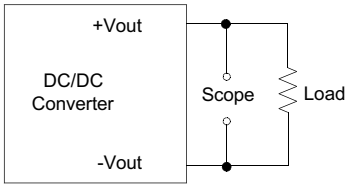
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



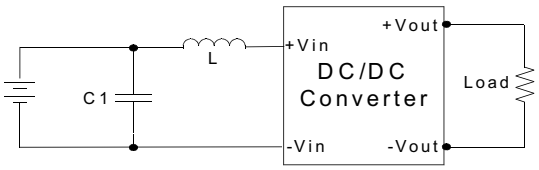
Output Ripple & Noise Measurement Test

The Scope measurement bandwidth is 20MHz.

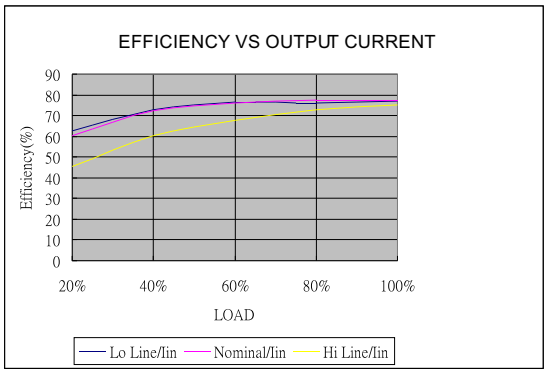


EMI Filter

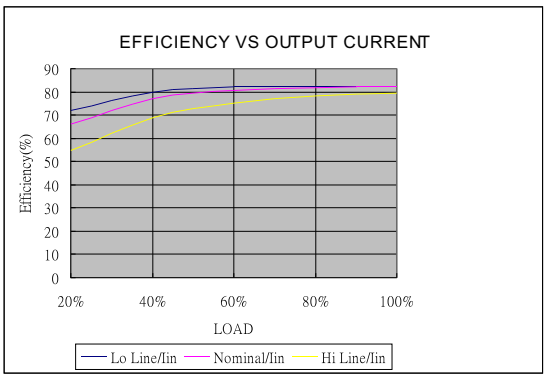
Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



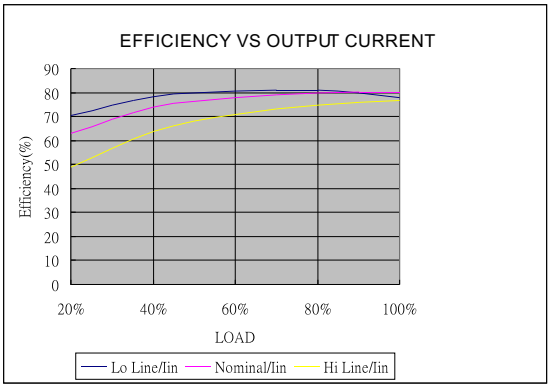
		C1	L
SB-05XXXXX		220uF/25V	5.6uH
SB-12XXXXX	Single	100uF/100V	18uH
	Dual	1210, 2.2uF/100V	
SB-24XXXXX		1210, 10uF/35V	18uH
SB-48XXXXX		100uF/100V	56uH



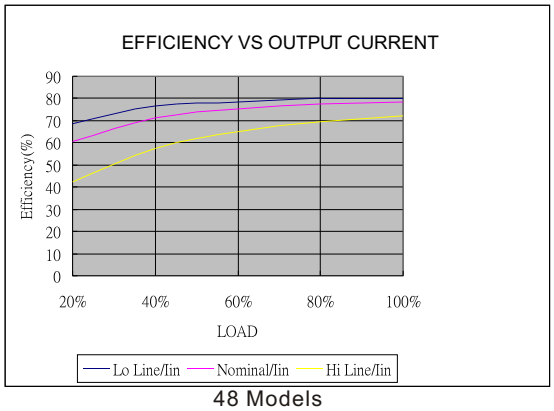
05 Models



12 Models

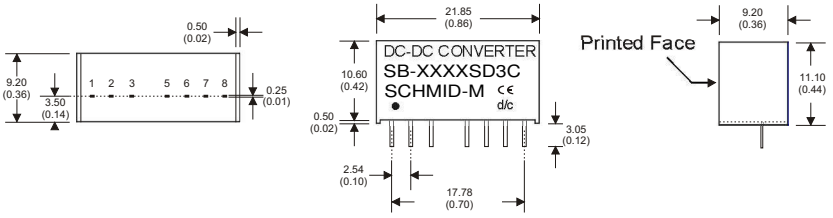


24 Models

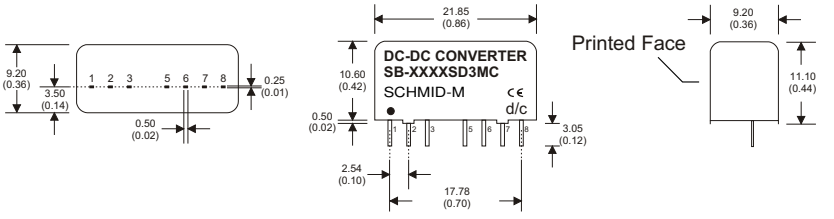


48 Models

MECHANICAL SPECIFICATIONS



8 Pin SIL Package
Non-Conductive Plastic



8 Pin SIL Package
Nickel-Coated Copper

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

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

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	+V Input	+V Input
3	N.P.	N.C.
5	N.P.	N.C.
6	+V Output	+V Output
7	-V Output	Common
8	N.C.	-V Output