

SB-6W Series

6W 2:1 Regulated Single & Dual output

Features

- Highest Power Density In 8 Pin SIL Package
- Wide 2:1 Input Range
- Smallest Footprint 6W Converter
- No Minimum Load Required
- 1500 VDC Isolation , Up to 3000VDC
- Continuous Short Circuit Protection
- Efficiency up to 86%
- -40°C ~+ 65°C Operation Temperature Range
- Remote on/off Control (Optional)

SCHMID-M



The SB-6W series is a family of high performed 6W single & dual output DC-DC converters. These converters are built in non-conductive black plastic package in a 8-pin SIL miniature compact case with high performance features wide range devices operate over 2:1 input voltage range providing stable output voltage which is much smaller than package of DIL 24- Same power rating but only 43% of the traditional volume. Devices are encapsulated using flame retardant resin. Input voltages of 5, 12, 24, 48 with output voltage of 3.3, 5, 9, 12, 15, 24, ± 5 , ± 12 , ± 15 Vdc. Featuring new PFM construction, no minimum load required and precise 1% output voltage accuracy.

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

OUTPUT SPECIFICATIONS	
Voltage Accuracy	$\pm 1\%$
Maximun Output Current	See table
Line Regulation	$\pm 0.2\%$, max.
Load Regulation	Single (From 0% to 100% Load) $\pm 1.0\%$, max. Dual (From 0% to 100% Load) $\pm 1.0\%$, max.
Cross Regulation (Dual Output) (1)	$\pm 5\%$
Ripple & Noise (20 MHz bandwidth)(2)	75mVpp, 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. 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
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current(5)	20mA _{pk-pk} , typ
Remote on/off	
ON:	Open or high impedance
OFF:	2-4mA input current (via 1K Ω).
Off stand by input current(Nominal V_{in})	2.5mA, typ

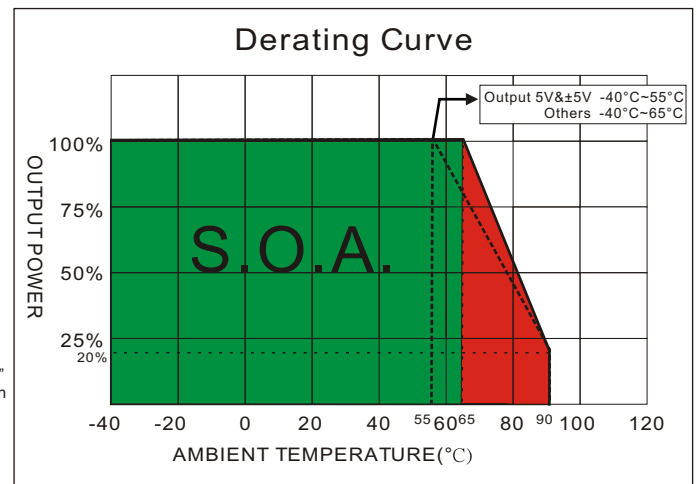
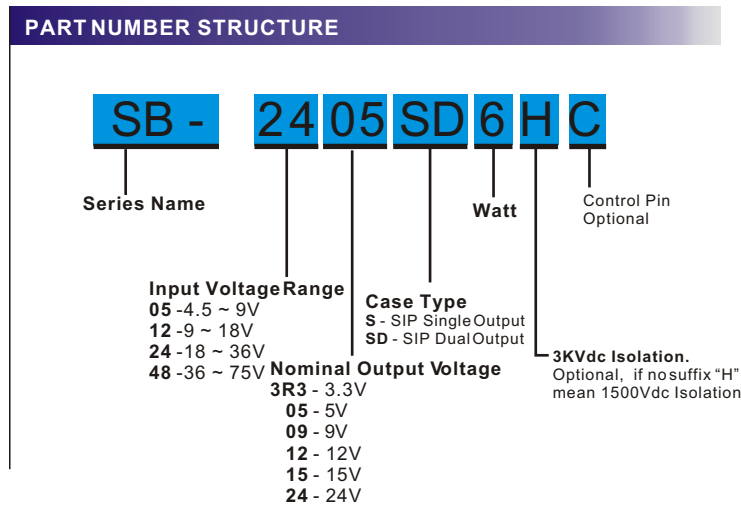
GENERAL SPECIFICATIONS	
Efficiency	See table, typ.
I/O Isolation Voltage (tested for 3 sec)	1500~3000Vdc
I/O Isolation Capacity	50 pF, max.
I/O Isolation Resistance	1G Ohm, min.
Switching Frequency	100kHz, min.
Humidity	95%relH
Reliability Calculated MTBF (MIL-HDBK-217 F)	TBD
Safety Standard(designed to meet)	IEC60950-1
Environmental compliance (designed to meet)	RoHS

PHYSICAL SPECIFICATIONS	
Case Material	Non conductive black plastic
Potting Material	Silicon (UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Weight	5.0g, typ.
Dimensions	0.86"x0.36"x0.44"

ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~65°C
	Output 5V& ± 5 V : -40°C~55°C
Maximum Case Temperature	105°C
Storage Temperature	- 55°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(6)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100ms max)	
05 Models	15Vdc, max.
12 Models	25Vdc, max.
24 Models	50Vdc, max.
48 Models	100Vdc, max.
Soldering Temperature (1.5mm from case 10sec. max.)	260°C max.

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MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(µF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
SB-053R3S6	4.5-9	105	1114	3.3	0	1300	77	6600µF
SB-0505S6	4.5-9	105	1481	5	0	1200	81	3300µF
SB-0509S6	4.5-9	105	1445	9	0	666	83	2000µF
SB-0512S6	4.5-9	105	1428	12	0	500	84	1600µF
SB-0515S6	4.5-9	105	1428	15	0	400	84	1400µF
SB-0524S6	4.5-9	105	1428	24	0	250	84	680µF
SB-05 05SD6	4.5-9	105	1481	±5	0	±600	81	±2000µF
SB-05 12SD6	4.5-9	105	1428	±12	0	±250	84	±900µF
SB-05 15SD6	4.5-9	105	1428	±15	0	±200	84	±660µF
SB-123R3S6	9-18	55	458	3.3	0	1300	78	6600µF
SB-1205S6	9-18	55	602	5	0	1200	83	3300µF
SB-1209S6	9-18	55	595	9	0	666	84	2000µF
SB-1212S6	9-18	55	588	12	0	500	85	1600µF
SB-1215S6	9-18	55	588	15	0	400	85	1400µF
SB-1224S6	9-18	55	595	24	0	250	84	680µF
SB-12 05SD6	9-18	55	609	±5	0	±600	82	±2000µF
SB-12 12SD6	9-18	55	595	±12	0	±250	84	±900µF
SB-12 15SD6	9-18	55	595	±15	0	±200	84	±660µF
SB-243R3S6	18-36	30	229	3.3	0	1300	78	6600µF
SB-2405S6	18-36	30	301	5	0	1200	83	3300µF
SB-2409S6	18-36	30	294	9	0	666	85	2000µF
SB-2412S6	18-36	30	294	12	0	500	85	1600µF
SB-2415S6	18-36	30	290	15	0	400	86	1400µF
SB-2424S6	18-36	30	294	24	0	250	85	680µF
SB-24 05SD6	18-36	30	304	±5	0	±600	82	±2000µF
SB-24 12SD6	18-36	30	297	±12	0	±250	84	±900µF
SB-24 15SD6	18-36	30	297	±15	0	±200	84	±660µF
SB-483R3S6	36-75	15	114	3.3	0	1300	78	6600µF
SB-4805S6	36-75	15	152	5	0	1200	82	3300µF
SB-4809S6	36-75	15	148	9	0	666	84	2000µF
SB-4812S6	36-75	15	147	12	0	500	85	1600µF
SB-4815S6	36-75	15	145	15	0	400	86	1400µF
SB-4824S6	36-75	15	148	24	0	250	84	680µF
SB-48 05SD6	36-75	15	152	±5	0	±600	82	±2000µF
SB-48 12SD6	36-75	15	147	±12	0	±250	85	±900µF
SB-48 15SD6	36-75	15	147	±15	0	±200	85	±660µF

Suffix "H" means 3KVdc isolation

Suffix "C" means with control pin

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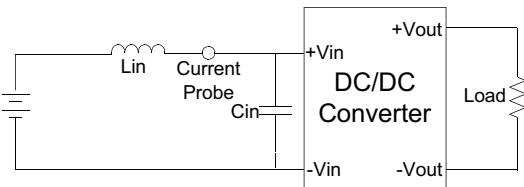
NOTE

1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within $\pm 5\%$.
2. Measured with a 0.1 μ F ceramic capacitor.
3. Test by minimal V_{in} and constant resistive load.
4. Test by normal V_{in} and 100%-25% load, 25% load step change.
5. Measured Input reflected ripple current with a simulated source inductance of 12 μ H and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100KHz).
6. Exceeding the absolute ratings of the unit could cause damage. It's not allowed for continuous operating ratings.

TEST CONFIGURATIONS

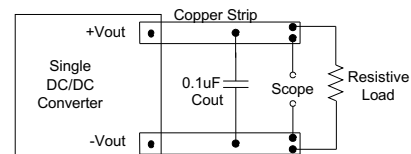
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100KHz) at nominal input and full load.

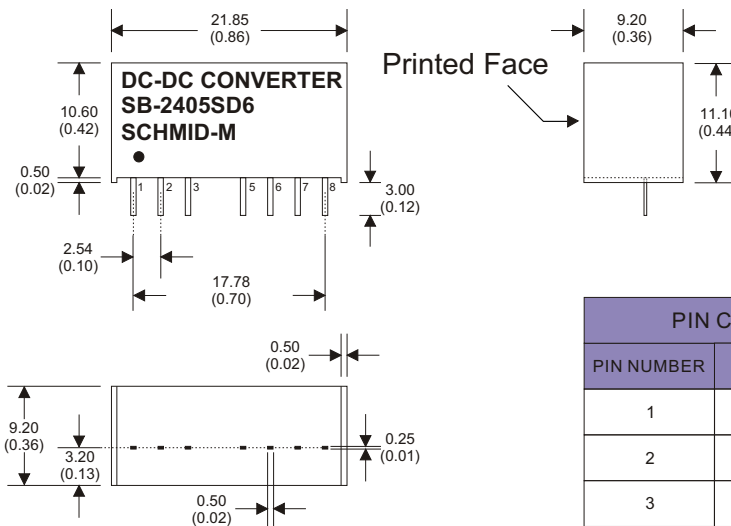


Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (0.1 μ F) measurement. The Scope measurement bandwidth is 0-20MHz.



MECHANICAL SPECIFICATIONS



8 Pin SIL Package

- Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 \pm 0.05 (0.02 \pm 0.002)
 2. Pin pitch and length tolerance: \pm 0.35 (\pm 0.014)
 3. Pin to case tolerance: \pm 0.5 (\pm 0.02)
 4. Case Tolerance: \pm 0.5 (\pm 0.02)
 5. Stand-off tolerance: \pm 0.1 (\pm 0.004)

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

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