

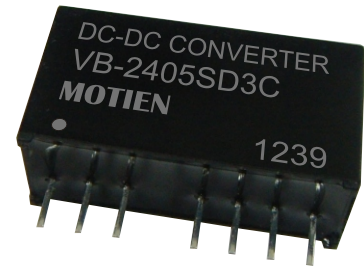
VB-3W Series

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)



CE CB

The VB 3W series is an improved version from VB 2W family. With the same package size and pin configuration, VB 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!

VB 3W series is a good substitution of traditional DC/DC converter 3W in DIL-24 package.

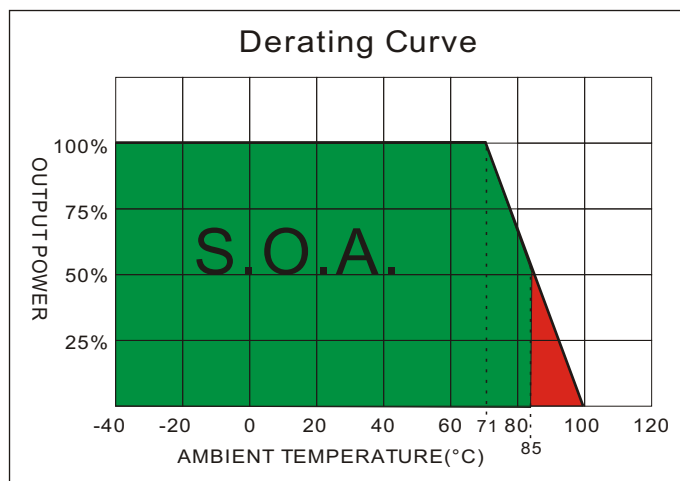
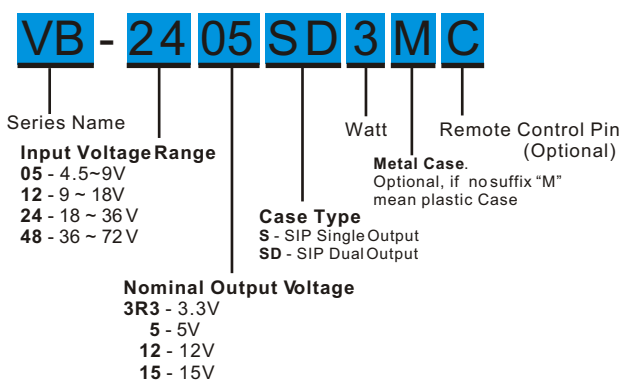
Single output models contain: 3.3V, 5V, 12V, 15V and dual output models contain: $\pm 5V$, $\pm 12V$ and $\pm 15V$ dc.

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

OUTPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Voltage Accuracy	$\pm 1\%$	Case Material	Non conductive black plastic
Maximum Output Current	See table	Potting Material	Epoxy (UL94V-0 rated)
Line Regulation	$\pm 0.5\%$, max	Pin Material	C5191R-H Solder-coated
Load Regulation (1)	(From 25% to 100% Loading) $\pm 1\%$, max	Weight	4.8g, typ
Cross Regulation (Dual Output) (2)	$\pm 5\%$	Dimensions	0.86"x0.36"x0.44"
Ripple & Noise (20 Mhz bandwidth)(3)	75mVpp, max	ENVIRONMENT SPECIFICATIONS	
Short Circuit Protection	Indefinite (Automatic Recovery)	Operating Temperature	-40°C ~ 71°C
Temperature Coefficient	$\pm 0.02\%/^\circ\text{C}$	Maximum Case Temperature	100°C
Capacitive Load (4)	See table	Storage Temperature	-40°C ~ 125°C
Transient Recovery Time (5)	300us, typ	Cooling	Nature Convection
Transient Response Deviation (5)	$\pm 3\%$, max	ABSOLUTE MAXIMUM RATINGS (8)	
INPUT SPECIFICATIONS		These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Voltage Range	See table	Input Surge Voltage (100ms max)	
Start up Time (Nominal V_{in} and constant resistive load)	20mS, typ	05 Models	15 Vdc, max.
Max. Input Current	See table	12 Models	36 Vdc, max.
No-Load Input Current	See table	24 Models	50 Vdc, max.
Input Filter	Capacitor	48 Models	100 Vdc, max.
Input Reflected Ripple Current (6)	35mA pk-pk	Soldering Temperature	260°C max.
		(1.5mm from case 10 sec. max.).	
GENERAL SPECIFICATIONS		EMI CHARACTERISTICS	
Efficiency	See table, typ	Conducted Emissions (10) EN55022	CLASS A
I/O Isolation Voltage (tested for 3 sec)	1600Vdc	Radiated Emissions	EN55022 CLASS A
I/O Isolation Capacity	680 pF, max	ESD	IEC 61000-4-2 Perf. Criteria B
I/O Isolation Resistance	1000M Ohm, min	RS	IEC 61000-4-3 Perf. Criteria A
Switching Frequency	100~650kHz	EFT (11)	IEC 61000-4-4 Perf. Criteria B
Humidity	95%relH	Surge (11)	IEC 61000-4-5 Perf. Criteria B
Reliability Calculated MTBF (MIL-HDBK-217 F)	>1.34 Mhrs	CS	IEC 61000-4-6 Perf. Criteria A
Safety Standard	IEC/EN 60950-1	PFMF	IEC 61000-4-8 Perf. Criteria A
Safety Approvals	CB		
Remote on/off control (7)			
ON:	open or high impedance		
OFF:	3-6mA input current (via 1K)		
Off stand by input current (Nominal V_{in})	3mA max		

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PARTNUMBER STRUCTURE



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)		
VB-053R3S3C	4.5-9	65	640	3.3	175	700	74	2200
VB-0505S3C	4.5-9	70	800	5	150	600	76	1000
VB-0512S3C	4.5-9	75	750	12	62.5	250	82	470
VB-0515S3C	4.5-9	75	750	15	50	200	82	220
VB-123R3S3C	9-18	25	260	3.3	175	700	76	2200
VB-1205S3C	9-18	15	320	5	150	600	81	1000
VB-1212S3C	9-18	35	305	12	62.5	250	84	470
VB-1215S3C	9-18	35	305	15	50	200	84	220
VB-243R3S3C	18-36	15	133	3.3	175	700	74	2200
VB-2405S3C	18-36	15	160	5	150	600	79	1000
VB-2412S3C	18-36	20	156	12	62.5	250	82	470
VB-2415S3C	18-36	20	152	15	50	200	84	220
VB-483R3S3C	36-72	10	66	3.3	175	700	75	2200
VB-4805S3C	36-72	10	82	5	150	600	78	1000
VB-4812S3C	36-72	15	78	12	62.5	250	81	470
VB-4815S3C	36-72	15	78	15	50	200	81	220
VB-0505SD3C	4.5-9	90	800	±5	±75	±300	77	±470
VB-0512SD3C	4.5-9	90	760	±12	±31.25	±125	81	±220
VB-0515SD3C	4.5-9	90	750	±15	±25	±100	82	±100
VB-1205SD3C	9-18	45	320	±5	±75	±300	80	±470
VB-1212SD3C	9-18	45	308	±12	±31.25	±125	83	±220
VB-1215SD3C	9-18	45	312	±15	±25	±100	82	±100
VB-2405SD3C	18-36	20	160	±5	±75	±300	80	±470
VB-2412SD3C	18-36	20	154	±12	±31.25	±125	83	±220
VB-2415SD3C	18-36	20	154	±15	±25	±100	83	±100
VB-4805SD3C	36-72	15	82	±5	±75	±300	78	±470
VB-4812SD3C	36-72	20	80	±12	±31.25	±125	80	±220
VB-4815SD3C	36-72	15	78	±15	±25	±100	81	±100

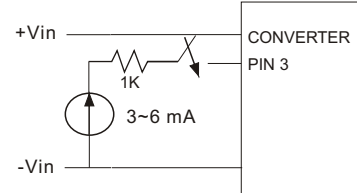
Suffix "C" means with control pin

Suffix "M" means with Metal Case

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NOTE

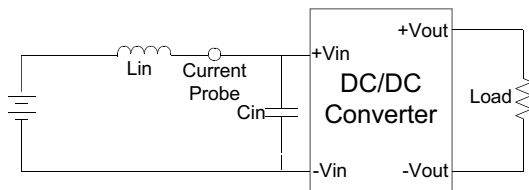
1. Operation at no load condition will not damage the produce ; however, it will not meet all specifications.
2. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within $\pm 5\%$.
3. Measured with 20MHz bandwidth .
4. Test by minimal V_{in} and constant resistive load.
5. Test by normal V_{in} 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 C_{in} (47uF, ESR<1.0 Ω 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 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 Motien suggest: Nippon - chemi - con KY series, 220uF/100V.



TEST CONFIGURATIONS

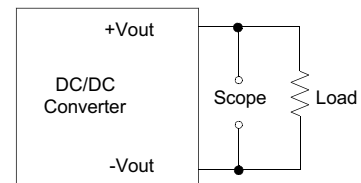
Input Reflected Ripple Current Test Step

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



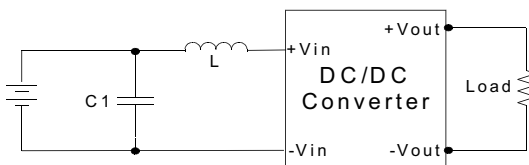
Output Ripple & Noise Measurement Test

The Scope measurement bandwidth is 20MHz.

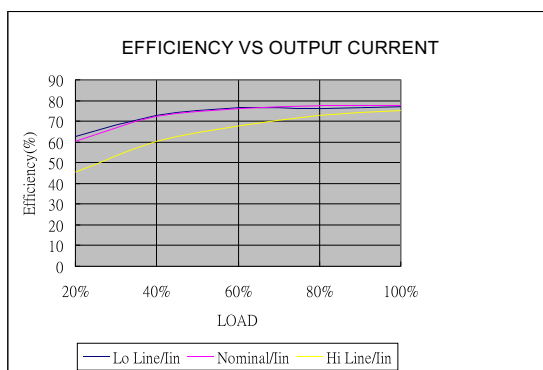


EMI Filter

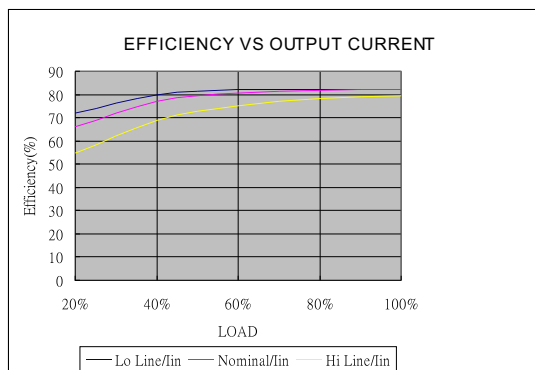
Input filter components (C_1 , L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



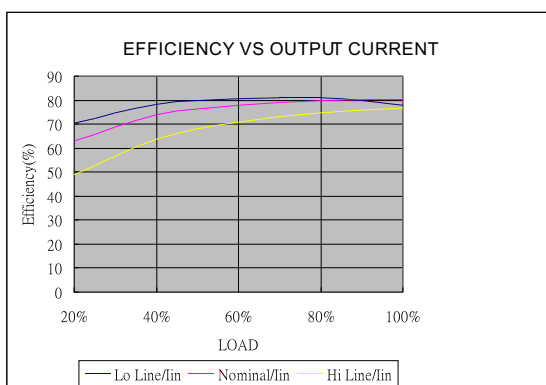
		C1	L
VB-05XXXXXX		220uF/25V	5.6uH
VB-12XXXXXX	Single	100uF/100V	18uH
	Dual	1210, 2.2uF/100V	
VB-24XXXXXX		1210, 10uF/35V	18uH
VB-48XXXXXX		100uF/100V	56uH



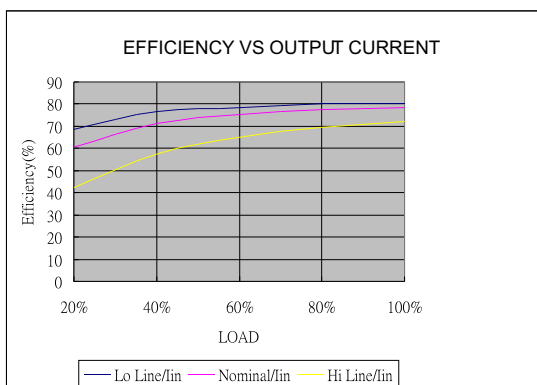
05 Models



12 Models

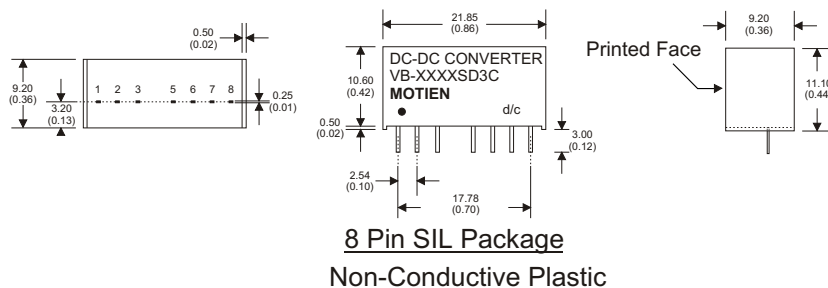


24 Models

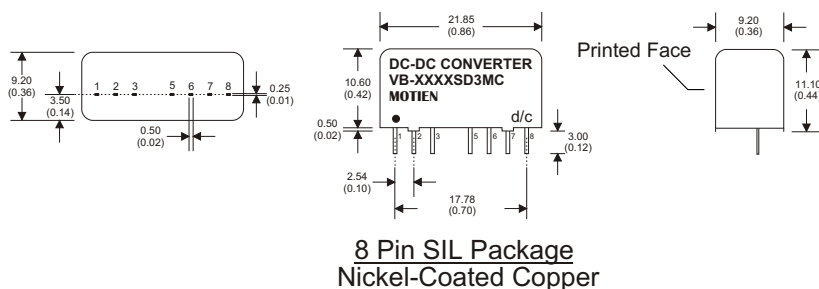


48 Models

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: 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 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