

DC-DC CONVERTERS

REGULATED, 4:1 WIDE INPUT RANGE, 3 WATTS

EXTRA SMALL 0.52" X 0.36" X 0.40" SMD OR DIP PACKAGE

DSB(H)3 SERIES



FEATURES

- 4:1 Wide Input Voltage Range
- Extra Small SMD or DIP Package: 0.52" × 0.36" × 0.40"
- No Minimum Load Required
- Continuous Short Circuit Protection
- 3000Vdc Input to Output Isolation Available
- Safety Meets UL60950-1, EN60950-1 & IEC60950-1
- CE Mark
- Compliant to RoHS II and Reach

SELECTION GUIDE (SINGLE) All specifications are typical at nominal input, full load and 25°C, unless otherwise noted.

DSB" prefix=SMD Type. For DIP type, use prefix "DSH" instead of "DSB"

Input Voltage Range Vdc	Output Voltage Vdc	Output Current at Full Load mA	Input Current at No Load mA	Efficiency %	Model Number	Maximum Capacitor Load µF
4.5 - 18	3.3	700	35	76	DSB(H)3-12S33	4700
4.5 - 18	5	600	40	80	DSB(H)3-12S5	2530
4.5 - 18	12	250	40	83	DSB(H)3-12S12	1220
4.5 - 18	15	200	40	84	DSB(H)3-12S15	1000
4.5 - 18	24	125	40	82	DSB(H)3-12S24	470
9 - 36	3.3	700	20	77	DSB(H)3-24S33	4700
9 - 36	5	600	20	80	DSB(H)3-24S5	2530
9 - 36	12	250	25	83	DSB(H)3-24S12	1220
9 - 36	15	200	25	83	DSB(H)3-24S15	1000
9 - 36	24	125	25	82	DSB(H)3-24S24	470
18 - 75	3.3	700	12	77	DSB(H)3-48S33	4700
18 - 75	5	600	12	80	DSB(H)3-48S5	2530
18 - 75	12	250	13	83	DSB(H)3-48S12	1220
18 - 75	15	200	14	83	DSB(H)3-48S15	1000
18 - 75	24	125	14	82	DSB(H)3-48S24	470
4.5 - 18	±5	±300	40	80	DSB(H)3-12-5	±1470
4.5 - 18	±12	±125	40	82	DSB(H)3-12-12	±680
4.5 - 18	±15	±100	40	82	DSB(H)3-12-15	±470
9 - 36	±5	±300	25	80	DSB(H)3-24-5	±1470
9 - 36	±12	±125	25	82	DSB(H)3-24-12	±680
9 - 36	±15	±100	25	82	DSB(H)3-24-15	±470
18 - 75	±5	±300	14	80	DSB(H)3-48-5	±1470
18 - 75	±12	±125	14	82	DSB(H)3-48-12	±680
18 - 75	±15	±100	14	82	DSB(H)3-48-15	±470

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Input Specifications			Output Specifications		
Operating input voltage range, Vdc	4.5 Min., 12 Typ., 18 Max.	12Vin(nom)	Voltage accuracy, %	±1.0	
	9 Min., 24 Typ., 36 Max.	24Vin(nom)	Line regulation, %		Low Line to High Line at Full Load
	18 Min., 48 Typ., 75 Max.	48Vin(nom)		±0.2	
Start up time, ms		Constant resistive load	Load regulation, %		No Load to Full Load
	5 Min., 10 Max.	Power up		±1.0	Single
	5 Min., 10 Max.	Remote ON/OFF		±1.0	Dual
Input surge voltage, Vdc		1 second, max.		10% Load to 90% Load	
	25 Max.	12Vin(nom)	±0.5	Single	
	50 Max.	24Vin(nom)	±0.8	Dual	
Input filter		Capacitor type			
Input Reflected Ripple Current ⁽¹⁾ , mA _{p-p}	20 Typ.	12Vin(nom)	Cross regulation, %	±5	Asymmetrical load 25%/100%FL, Dual
	20 Typ.	24Vin(nom)	Ripple and noise, mV _{p-p}	50 Typ.	Measured by 20MHz bandwidth
	20 Typ.	48Vin(nom)	Temperature coefficient, %/°C	±0.02 Max.	
Remote ON/OFF		Ctrl pin applied current via 1kΩ	Transient response recovery time, μs	500 Typ.	25% load step change
	Open or high impedance	DC-DC ON	Short circuit protection	Continuous, automatic recovery	
	2 Min., 3 Typ., 4 Max.	DC-DC OFF			
	2.5 Max.	Remote off input current			

General Specifications					
Isolation voltage, Vdc	1 minute	Standard	1600 Min.		
		Suffix "H"	3000 Min.		
Isolation resistance, GΩ	500Vdc		1 Min.		
Isolation capacitance, pF		Standard			50 Max.
		Suffix "H"			50 Max.
Switching frequency, kHz			100 Min.		
Design meet safety standard	UL60950-1, EN60950-1, IEC60950-1				

Environmental Specifications					
Operating ambient temperature, °C	Without derating		-40 Min.		+71 Max.
	With derating		+71 Min.		+105 Max.
Storage temperature range, °C			-55 Min.		+125 Max.
Thermal shock			MIL-STD-810F		
Vibration			MIL-STD-810F		
Relative humidity			5% to 95% RH		

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Physical Specifications

Dimensions	0.52" × 0.36" × 0.40"
Case material	Non-conductive, black, plastic
Base material	Non-conductive, black, plastic
Potting material	Silicone (UL94 V-0)
Weight	2.7g (0.10oz)
MTBF	5.672×10 ⁶ hrs, MIL-HDBK-217F, Full load

EMC Specifications

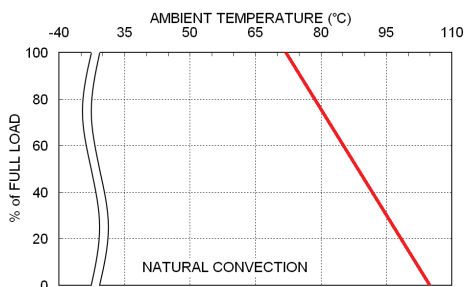
Specifications	Conditions	Level
EMI ⁽¹⁾	EN55022	Class A
		Class B
ESD	EN61000-4-2 Air ±8kV and Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10V/m	Perf. Criteria A
Fast transient ⁽²⁾	EN61000-4-4 ±2kV	Perf. Criteria A
Surge ⁽²⁾	EN61000-4-5 ±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10Vr.m.s	Perf. Criteria A

Note:

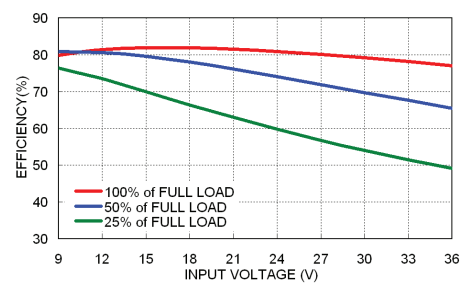
- The standard modules meet IMA Class A or Class B and input reflected ripple current with external components. For further information, please contact Polytron Devices, Inc.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor suggests: Nippon chemi-con KY series, 220 µF/100V.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

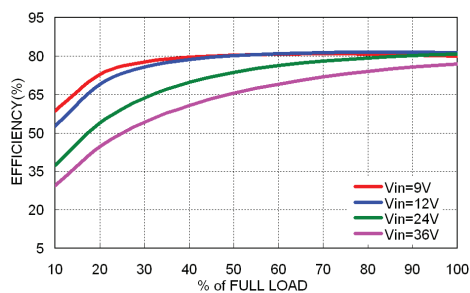
Characteristic Curve



DSB(H)3-48S5 Derating Curve



DSB(H)3-48S5 Efficiency vs. Input Voltage

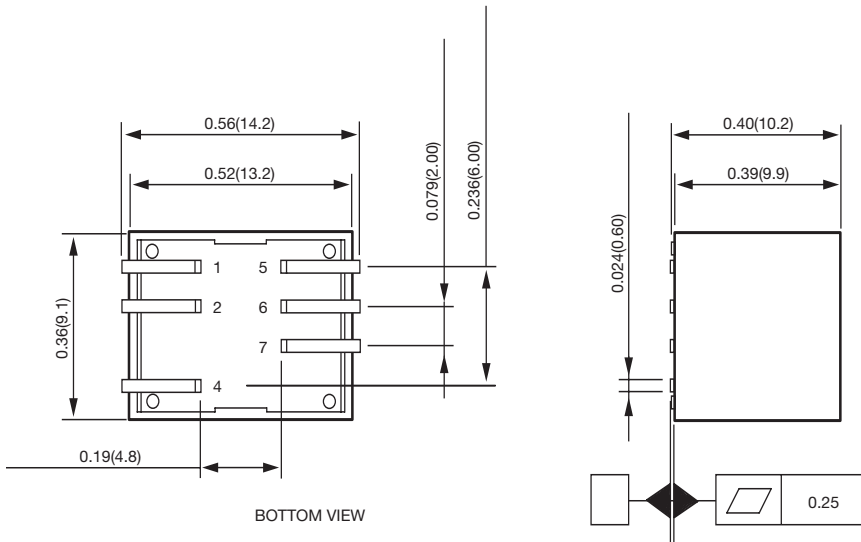


DSB(H)3-48S5 Efficiency vs. Output Current

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Mechanical Drawing

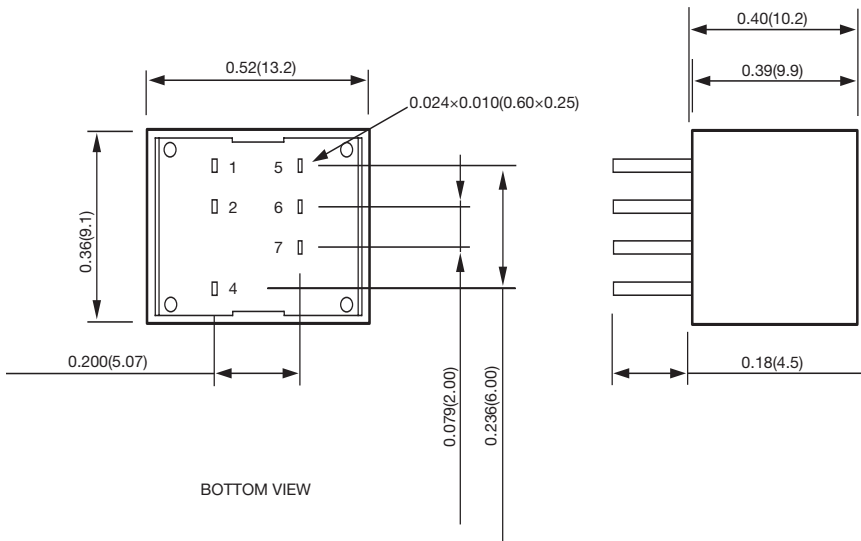
DSB3 SMD Type



PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
4	Ctrl	Ctrl
5	NC	-Vout
6	-Vout	Common
7	+Vout	+Vout

DHB3 DIP Type



1. All dimensions in inch (mm)
2. Tolerance: $x.xx \pm 0.02$ ($x.x \pm 0.5$) $x.xxx \pm 0.01$ ($x.xx \pm 0.25$)
3. Pin pitch tolerance ± 0.01 (0.25)
4. Pin dimension tolerance ± 0.004 (0.1)