

DC-DC CONVERTERS

REGULATED, 4:1 WIDE INPUT RANGE, 2 WATTS

EXTRA SMALL 0.52" X 0.36" X 0.40" SMD OR DIP PACKAGE
DSB(H)2 SERIES



FEATURES

- 4:1 Wide Input Voltage Range
- Extra Small SMD or DIP Package: 0.52" x 0.36" x 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	500	25	77	DSB(H)2-12S33	2200
4.5 - 18	5	400	30	80	DSB(H)2-12S5	1000
4.5 - 18	12	167	30	83	DSB(H)2-12S12	550
4.5 - 18	15	134	30	84	DSB(H)2-12S15	440
4.5 - 18	24	83	30	84	DSB(H)2-12S24	200
9 - 36	3.3	500	15	76	DSB(H)2-24S33	2200
9 - 36	5	400	18	79	DSB(H)2-24S5	1000
9 - 36	12	167	18	82	DSB(H)2-24S12	550
9 - 36	15	134	18	83	DSB(H)2-24S15	440
9 - 36	24	83	18	82	DSB(H)2-24S24	200
18 - 75	3.3	500	8	75	DSB(H)2-48S33	2200
18 - 75	5	400	8	81	DSB(H)2-48S5	1000
18 - 75	12	167	11	83	DSB(H)2-48S12	550
18 - 75	15	134	11	82	DSB(H)2-48S15	440
18 - 75	24	83	11	82	DSB(H)2-48S24	200
4.5 - 18	±5	±200	30	80	DSB(H)2-12-5	±660
4.5 - 18	±12	±83	30	84	DSB(H)2-12-12	±330
4.5 - 18	±15	±67	30	84	DSB(H)2-12-15	±220
9 - 36	±5	±200	18	80	DSB(H)2-24-5	±660
9 - 36	±12	±83	18	82	DSB(H)2-24-12	±330
9 - 36	±15	±67	18	81	DSB(H)2-24-15	±220
18 - 75	±5	±200	11	79	DSB(H)2-48-5	±660
18 - 75	±12	±83	11	82	DSB(H)2-48-12	±330
18 - 75	±15	±67	11	83	DSB(H)2-48-15	±220

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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	Cross regulation, %	±5	Asymmetrical load 25%/100%FL, Dual
	20 Typ.	12Vin(nom)	Ripple and noise, mVp-p	50 Typ.	Measured by 20MHz bandwidth
	20 Typ.	24Vin(nom)	Temperature coefficient, %/°C	±0.02 Max.	
Input Reflected Ripple Current ⁽¹⁾ , mAp-p	20 Typ.	48Vin(nom)	Transient response recovery time, µs	500 Typ.	25% load step change
		Ctrl pin applied current via 1kΩ	Short circuit protection	Continuous, automatic recovery	
	Open or high impedance	DC-DC ON			
Remote ON/OFF	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.		+80 Max.
	With derating	+80 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	6.204×10 ⁶ hrs, MIL-HDBK-217F, Full load

EMC Specifications

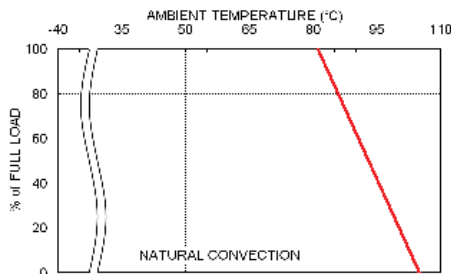
Specifications	Conditions	Level
EMI ⁽¹⁾	EN55022	Class A Class B
ESD	EN61000-4-2 Air ±8kV and Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10V/m	Perf. Criteria A
Fast transient ⁽²⁾	EN61000-4-4 ±2kV	Perf. Criteria A
Surge ⁽²⁾	EN61000-4-5 ±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6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

Note:

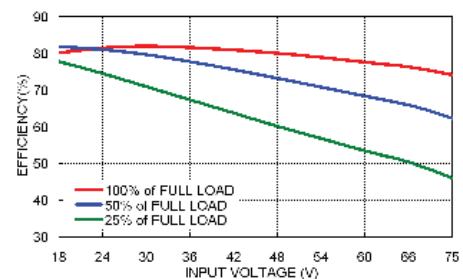
- The standard modules meet IMA Class A or Class B and input reflected ripple current with external components. For further information, please contact Polytron Devices, Inc.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor suggests: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

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

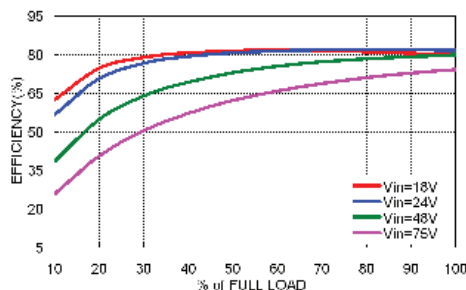
Characteristic Curve



DSB(H)2-48S5 Derating Curve



DSB(H)2-48S5 Efficiency vs. Input Voltage

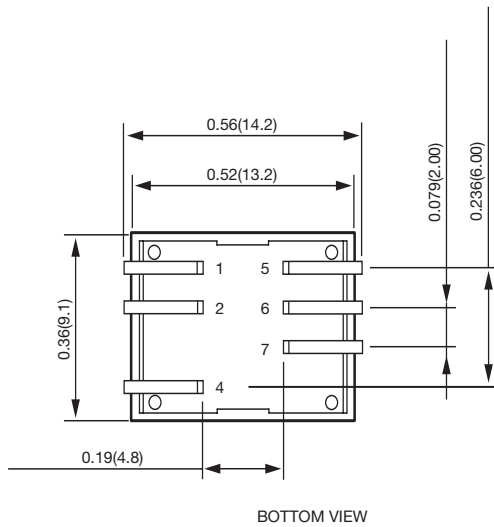


DSB(H)2-48S5 Efficiency vs. Output Current

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Mechanical Drawing

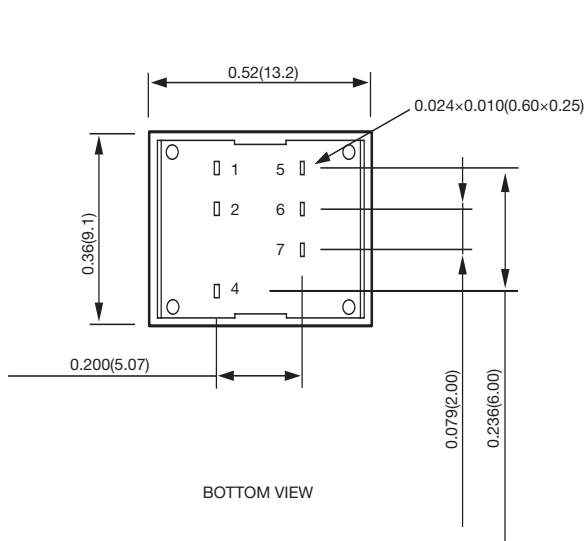
DSB2 SMD Type



PIN CONNECTION

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

DHB2 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)