

Features

Switching Regulator

- Efficiency up to 93%, no need for heatsinks
- High voltage input range, up to 50V
- Short Circuit Protection, Thermal Shutdown
- All-in-one solution, no external components required

R-78HB/W

0.5 AMP SIP3 Wired Single Output



Description

The R-78HBxx/W-Series high efficiency, high input voltage switching regulators are ideally suited to replace 78xx linear regulators. The efficiency of up to 93% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs. A wide input voltage range allows the full stored energy utilization of standard 12, 24 and 36V batteries as well as COB LED drivers. No external components are required to make a complete regulated, short-circuit protected supply. A built-in protection diode allows high capacitive loads. Typical applications include Auxiliary fan CV power supplies powered from CC LED drivers, industrial, aerospace and battery powered applications.

Selection Guide

Part Number	Input Voltage Range ⁽²⁾ (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency typ @ min Vin. (%)	Max. Capacitive Load ⁽¹⁾ (µF)
R-78HB5.0-0.5/W	9-72	5.0	0.5	86	100/6800
R-78HB12-0.5/W	17-72	12	0.5	93	100/6800

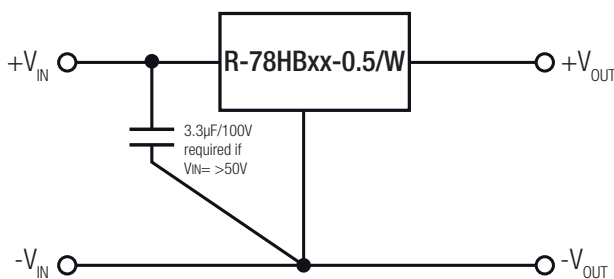
Notes:

Note1: with normal start-up time and no external components = 100µF
with <1S start-up time = 6800µF

Specifications (measured at TA= 25°C, full load, nominal input voltage and after warm-up)

BASIC CHARACTERISTICS					
Parameter	Condition	Min.	Typ.	Max.	
Input Voltage Range ⁽²⁾	5Vout 12Vout	9VDC 17VDC	48VDC 48VDC	72VDC 72VDC	
Short Circuit Input Current			15mA	25mA	
Quiescent Current	Vin = 48VDC, 10% load	1mA		5mA	
Internal Power Dissipation			0.65W		
Operating Frequency Range	full load	120kHz		800kHz	
Efficiency				see Selection Guide	
Minimum Load ⁽³⁾		10mA			
Output Ripple and Noise			20mVp-p	60mVp-p	

Typical Application Circuit



Notes:

Note2: The converter has built in soft start circuit. Rapidly changing the input voltage from VINmin to VINmax can bypass this circuit and damage the converter.

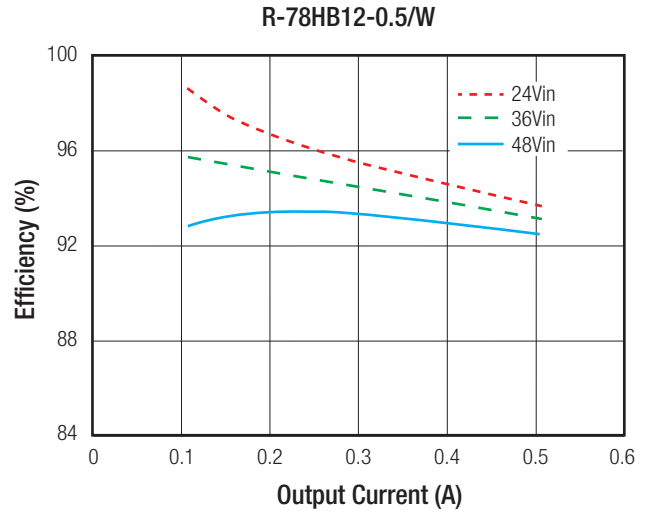
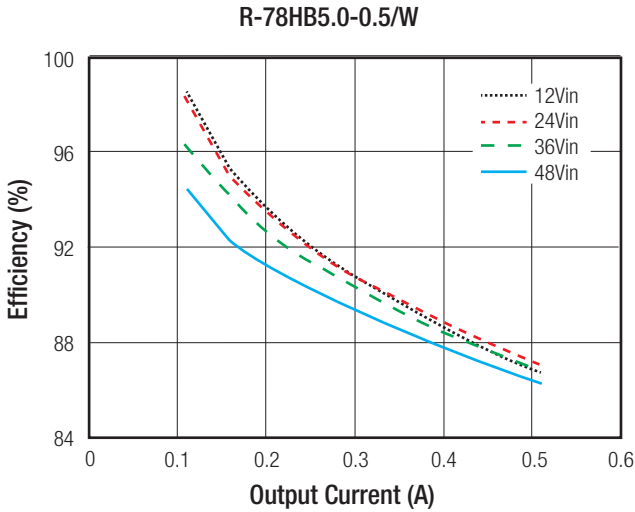
Note3: Operation under no load will not damage the devices, however they may not meet all specifications. A minimum load of 10mA is recommended.

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IEC60950-1 Certified
EN60950-1 Certified
EN55022 Certified

Specifications (measured at $T_A = 25^\circ\text{C}$, full load, nominal input voltage and after warm-up)

Efficiency vs. Load



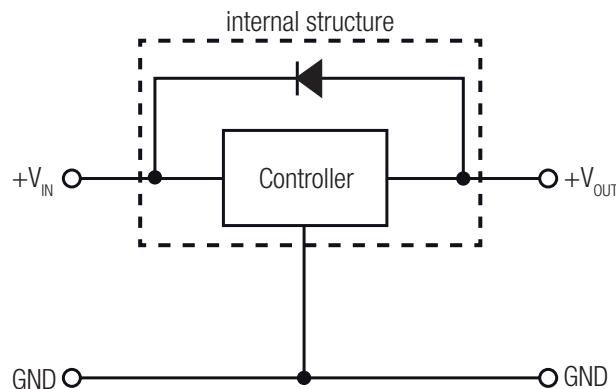
REGULATIONS

Parameter	Condition	Value
Output Voltage Accuracy	100% load	$\pm 2\%$ typ. / $\pm 3\%$ max.
Line Voltage Regulation	$V_{in} = \text{min. to max.}$, full load	0.4% typ. / 1% max.
Load Voltage Regulation	10% to 100% load	0.3% typ. / 0.6% max.
Dynamic Load Stability	with 100 μF output Capacitor, 100% \leftrightarrow 50% load	$\pm 75\text{mV}$ typ. / $\pm 100\text{mV}$ max.

PROTECTIONS

Parameter	Condition	Value
Internal Input Filter		1 μF Capacitor
Short Circuit Protection (SCP)		continuous, automatic recovery

Optional Protection Circuit

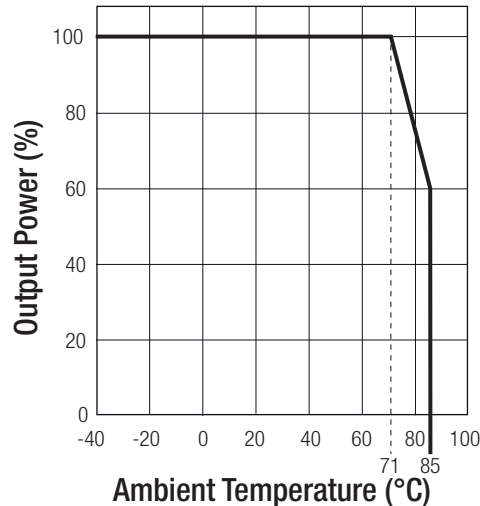


Specifications (measured at $T_A=25^\circ\text{C}$, full load, nominal input voltage and after warm-up)

ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	with derating (see graph)	-40°C to $+85^\circ\text{C}$
Maximum Case Temperature		$+100^\circ\text{C}$
Case Thermal Impedance		55°C/W
MTBF	MIL-HDBK 217F, $+25^\circ\text{C}$	7395×10^3 hours
	MIL-HDBK 217F, $+71^\circ\text{C}$	1242×10^3 hours

Derating Graph



SAFETY AND CERTIFICATIONS

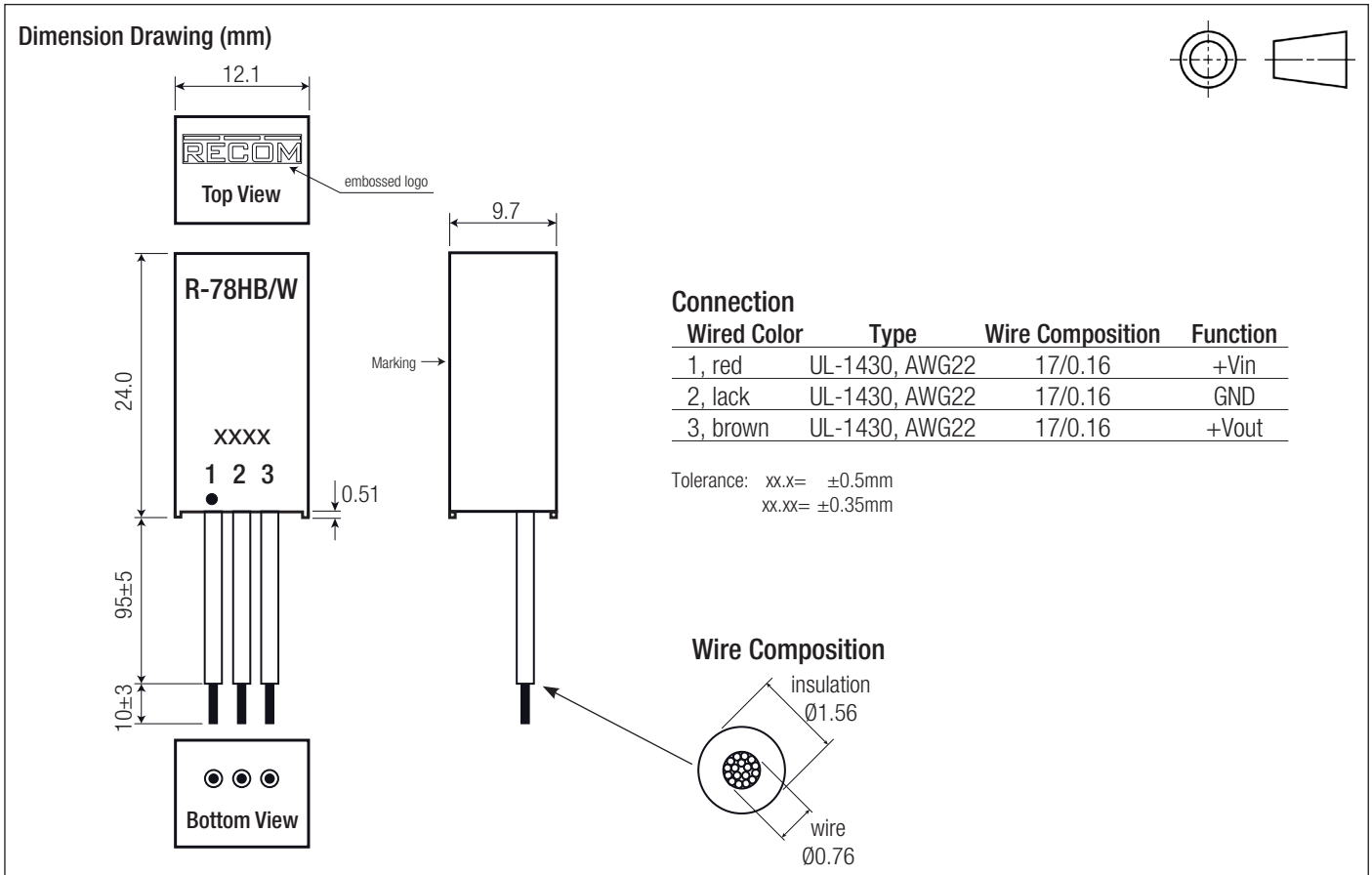
Certificate Type	Report / File Number	Standard
IEC/EN General Safety	SPCLVD1407030-1	IEC/EN-60950-1, 2nd Edition
EMI Compliance	Condition	Standard / Criterion
EMC Conducted and Radiated		EN55022, Class B
ESD		EN61000-4-2, Criteria A

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Case Material		non-conductive black plastic (UL94V-0)
Potting Material		epoxy (UL94V-0)
Package Dimension (LxWxH)		12.1 x 9.7 x 24.0mm
Package Weight		4.5g

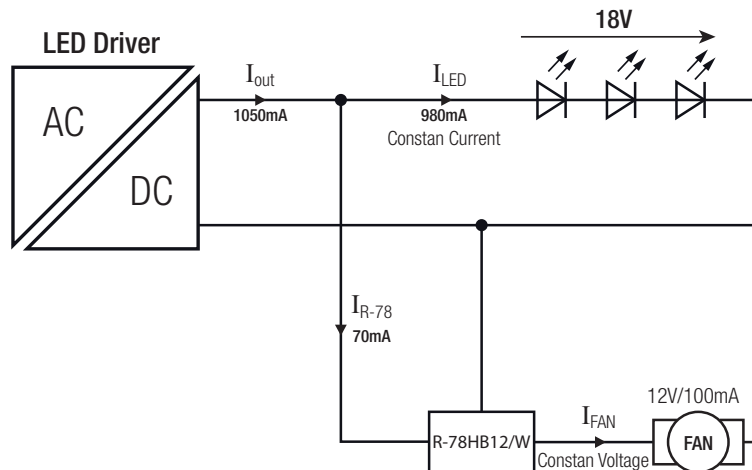
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Specifications (measured at $T_A = 25^\circ\text{C}$, full load, nominal input voltage and after warm-up)



APPLICATION

Standard Application



PACKAGING INFORMATION

Packaging Dimension (LxWxH)	cardboard box	140.0 x 130.0 x 65.0mm
Packaging Quantity		25pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95%, RH max.

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