

# 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
- IEC/EN60950-1 + AM:2 certified



## R-78HB/W

0.5 Amp  
SIP3 Wired  
Single Output



IEC60950-1 certified  
EN60950-1 certified  
EN55032 compliant

### 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.

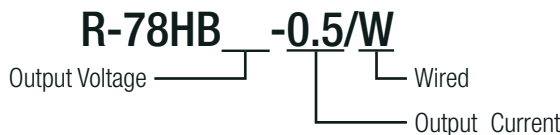
### Selection Guide

Part Number	Input Voltage Range <sup>(2)</sup> [VDC]	Output Voltage [VDC]	Output Current [A]	Efficiency typ @ min Vin. [%]	Max. Capacitive Load <sup>(1)</sup> [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: Max. Cap Load is tested at nominal input and full resistive load with 1 second start-up time and no external components = 100μF, with <1s start-up time = 6800μF

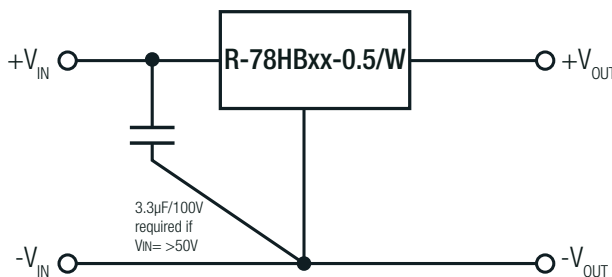
### Model Numbering



### Specifications (measured @Ta= 25°C, full load, nominal input voltage and after warm-up)

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range <sup>(2)</sup>	nom. Vin = 48VDC	9VDC	48VDC	72VDC
Quiescent Current	nom. Vin = 48VDC, 10% load	1mA		5mA
Internal Power Dissipation			0.65W	
Internal Operating Frequency	full load	120kHz		800kHz
Minimum Load <sup>(3)</sup>		10mA		
Output Ripple and Noise	20MHz BW limited		20mVp-p	60mVp-p

#### Typical Application Circuit



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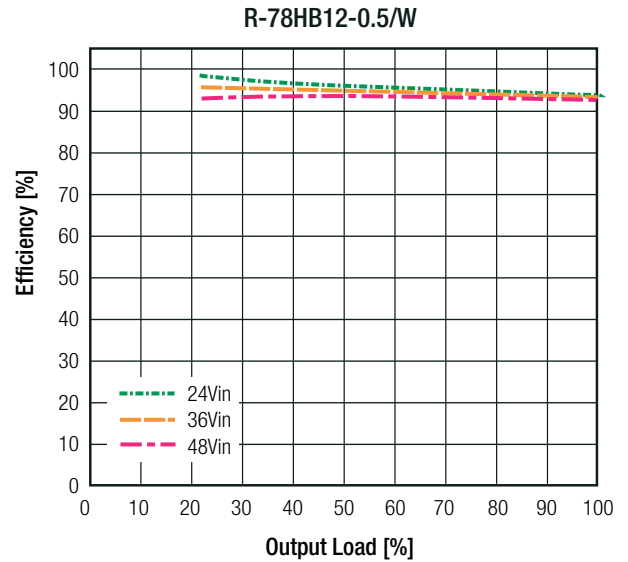
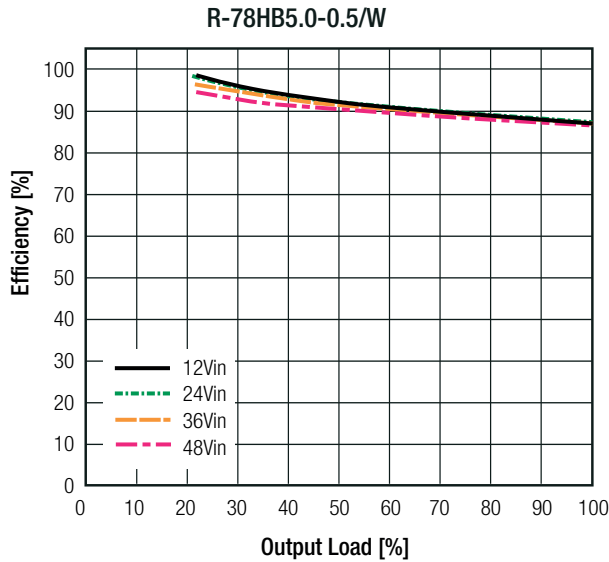
**Specifications** (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

**Notes:**

Note2: The converter has built in soft start circuit. Rapidly changing the input voltage from  $V_{INmin}$  to  $V_{INmax}$  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

**Efficiency vs. Load**



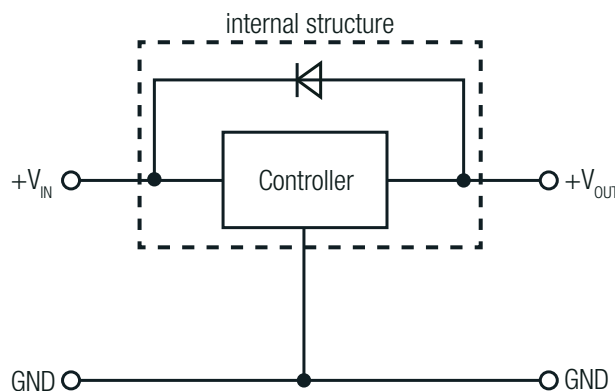
**REGULATIONS**

Parameter	Condition	Value
Output Voltage Accuracy	100% load	±2.0% typ. / ±3.0% max.
Line Voltage Regulation	$V_{in}$ = min. to max., full load	0.4% typ. / 1.0% max.
Load Voltage Regulation	10% to 100% load	0.3% typ. / 0.6% max.
Transient Response	with 100µF output capacitor, 100% <-> 50% load	±75mV typ. / ±100mV max.

**PROTECTIONS**

Parameter	Condition	Value
Internal Input Filter		1µF capacitor
Short Circuit Protection (SCP)		continuous, automatic recovery
Short Circuit Input Current		15mA typ. / 25mA max.

**Optional Protection Circuit**

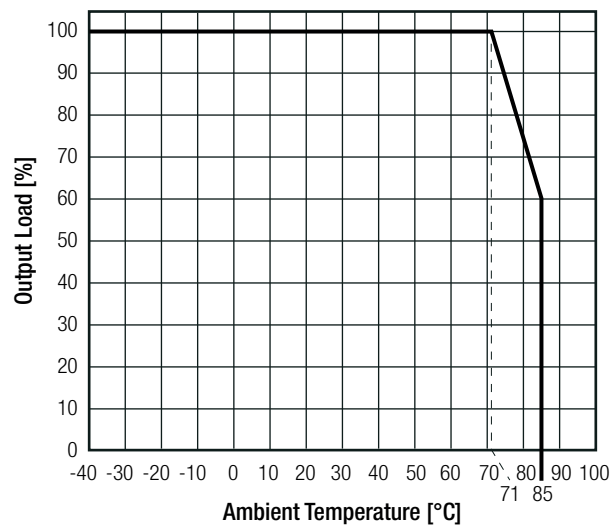


**Specifications** (measured @ Ta= 25°C, full load, nominal input voltage and after warm-up)

**ENVIRONMENTAL**

Parameter	Condition		Value
Operating Temperature Range	with derating @ natural convection 0.1m/s (see graph)		-40°C to +85°C
Maximum Case Temperature			+100°C
Thermal Impedance			55°C/W typ.
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	7395 x 10 <sup>3</sup> hours
		+71°C	1242 x 10 <sup>3</sup> hours

**Derating Graph**



**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	1603123	IEC60950-1:2005, 2nd Edition + AM 2:2013 EN60950-1:2006 + AM 2:2013
EAC	RU-AT.49.09571	TP TC 004/2011
RoHs 2+		RoHS 2011/65/EU + AM2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external components	EN55032, Class B
ESD Electrostatic discharge immunity test	Air ±8kV, Contact ±4kV	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A

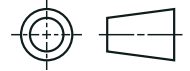
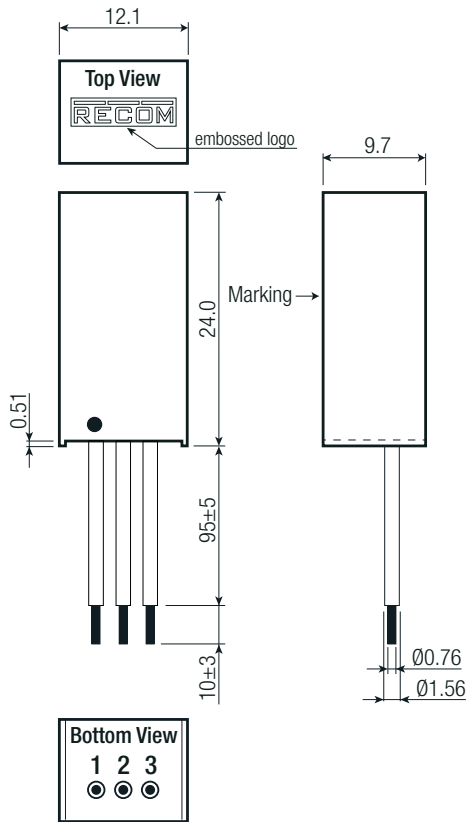
**DIMENSION and PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	case potting	non-conductive black plastic, (UL94 V-0) epoxy, (UL94 V-0)
Package Dimension (LxWxH)		12.1 x 9.7 x 24.0mm
Package Weight		4.5g

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**Dimension Drawing (mm)**



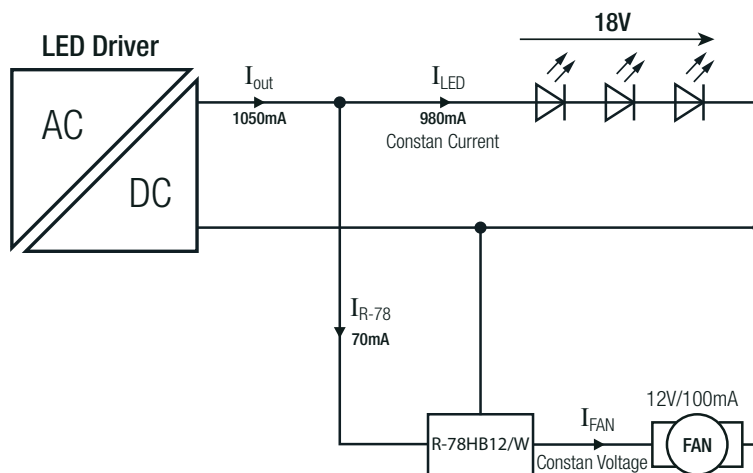
**Wire/cable information**

#	Function	Wire color	Type	AWG	Strands
1	+Vin	red	UL-1430	22	17/0.16
2	GND	black	UL-1430	22	17/0.16
3	+Vout	brown	UL-1430	22	17/0.16

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.25mm

**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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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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