

# Features

## Switching Regulator

- Efficiency up to 96%, no heatsinks required
- Pin-out compatible with LM78XX linears
- Low profile (L/W/H=11.5 x 8.5 x 17.5mm)
- High input voltage range, up to 72V
- Short circuit protection, thermal shutdown
- Low ripple and noise
- „L“ version with 90° pins

**RECOM**  
DC/DC Converter

## R-78HB-0.5(L)

**0.5 Amp  
SIP3  
Single Output**



IEC/EN60950-1 certified  
EN55032 compliant

## Description

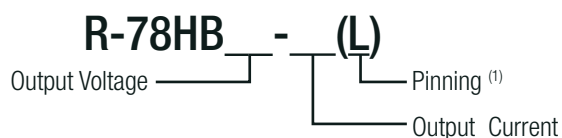
The R-78HBxx-Series high efficiency, high input voltage switching regulators are ideally suited to replace 78xx linear regulators and are pin compatible. The efficiency of up to 96% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs.

An input voltage range of up to 8:1 is unsurpassed by any other converter and allows the full stored energy utilization of standard and high voltage batteries. The fully protected output is ideal for industrial applications (especially for industry standard 24VDC bus supplies) and the L-Version with 90° pins allows direct replacement for laid-flat regulators where component height is at a premium. Low ripple and noise figures and a short circuit input current of typically only 15mA round off the specifications of this versatile converter series. Typical applications include telecommunication, automotive, industrial, aerospace and battery powered applications.

## Selection Guide

| Part Number   | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [A] | Efficiency    |                |
|---------------|---------------------------|----------------------|--------------------|---------------|----------------|
|               |                           |                      |                    | @ min Vin [%] | @ max. Vin [%] |
| R-78HB3.3-0.5 | 9 - 72                    | 3.3                  | 0.5                | 82            | 76             |
| R-78HB5.0-0.5 | 9 - 72                    | 5.0                  | 0.5                | 87            | 81             |
| R-78HB6.5-0.5 | 9 - 72                    | 6.5                  | 0.5                | 91            | 84             |
| R-78HB9.0-0.5 | 14 - 72                   | 9.0                  | 0.5                | 92            | 86             |
| R-78HB12-0.5  | 17 - 72                   | 12                   | 0.5                | 94            | 89             |
| R-78HB15-0.5  | 20 - 72                   | 15                   | 0.5                | 95            | 91             |
| R-78HB24-0.3  | 36 - 72                   | 24                   | 0.3                | 96            | 92             |

## Model Numbering



### Notes:

Note1: add suffix „L“ for 90° bent pins, e.g. R-78B5.0-1.0L

## Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

### BASIC CHARACTERISTICS

| Parameter                      | Condition       | Min. | Typ. | Max.          |
|--------------------------------|-----------------|------|------|---------------|
| Internal Input Filter          |                 |      |      | 1µF capacitor |
| Absolute Maximum Input Voltage |                 |      |      | 75VDC         |
| Quiescent Current              | nom. Vin= 48VDC |      | 1mA  | 5mA           |
| Internal Power Dissipation     |                 |      |      | 0.65W         |
| Minimum Load <sup>(2)</sup>    |                 | 2%   |      |               |

### Notes:

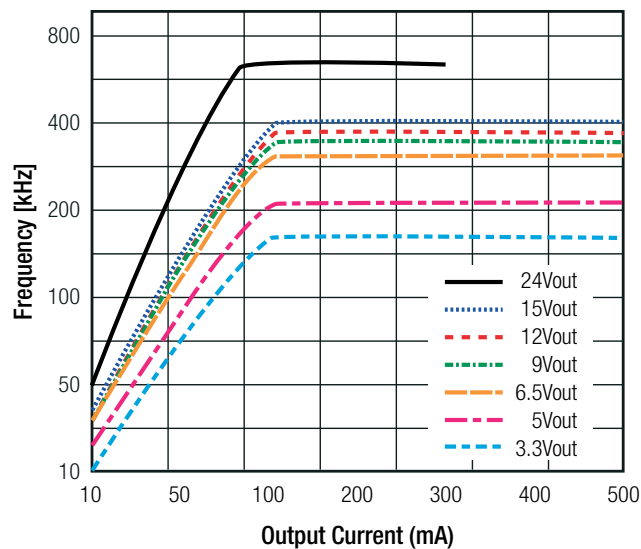
Note2: Operation under no load will not harm the converter, but specifications may not be met  
A minimum load of 10mA is recommended

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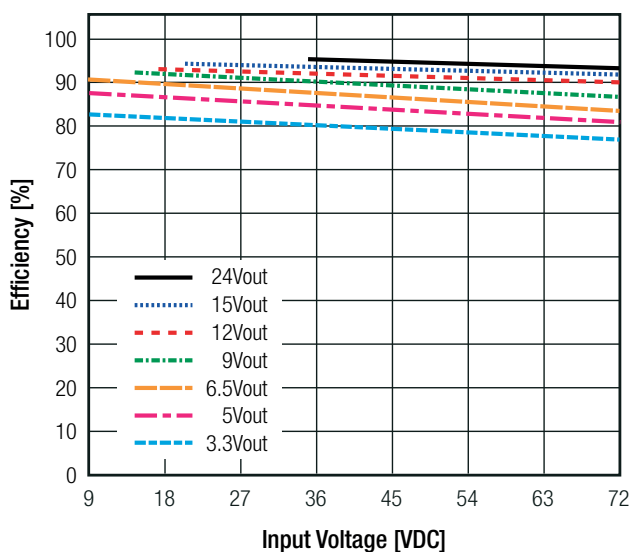
**Specifications** (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

| Parameter                        | Condition                                                                                  | Min.   | Typ.    | Max.            |
|----------------------------------|--------------------------------------------------------------------------------------------|--------|---------|-----------------|
| Internal Operating Frequency     | nom. Vin= 48VDC                                                                            | 120kHz |         | 800kHz          |
| Output Ripple and Noise          | 20MHz BW (10 - 100% load)                                                                  |        | 20mVp-p | 60mVp-p         |
| Absolute Maximum Capacitive Load | 1 second start up, no external components<br><1 second start up + diode protection circuit |        |         | 100μF<br>6800μF |

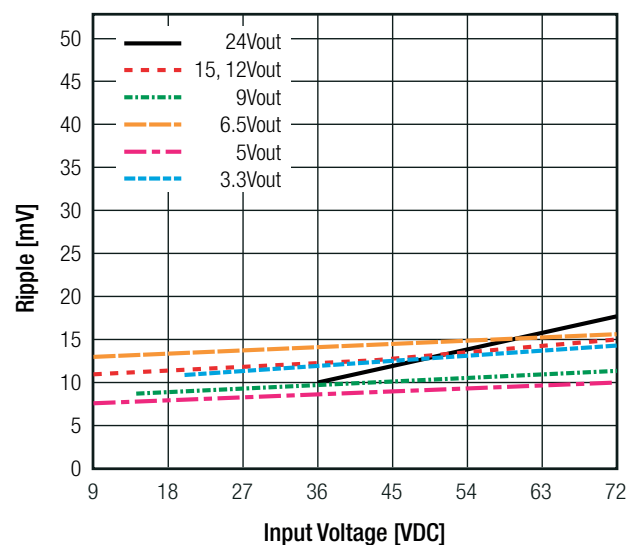
**Switching Frequency vs. Load**



**Efficiency vs. Vin (full load)**



**Ripple vs. Vin (full load)**



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