Features

- Efficiency up to 96%, Non isolated, no need for heatsinks
- Pin-out compatible with LM78XX Linears
- Low profile(L*W*H=11.5*8.5*17.5mm)
- High voltage input range, up to 72V
- Short circuit protection, Thermal shutdown
- Non standard outputs available as specials between 3.3V~24V
- Low ripple and noise
- "L" version with 90° pins
- See Positive to Negative Converter Application Note for use as a voltage inverter (alternative to LM79xx Linear)

INNOLINE

DC/DC-Converter

R-78HBxx-O.5(L) Series O.5 AMP SIP3 Single Output

Selection Guide)					
Part	Input	Output	Output	Е	Efficiency	
Number	Range	Voltage	Current	Vmin.	30V	72V
SIP3	(V)	(V)	(A)	(%)	(%)	(%)
R-78HB3.3-0.5	9 - 72	3.3	0.5	82	80	76
R-78HB5.0-0.5	9 - 72	5.0	0.5	87	85	81
R-78HB6.5-0.5	9 - 72	6.5	0.5	91	87	84
R-78HB9.0-0.5	14 - 72	9.0	0.5	92	90	86
R-78HB12-0.5	17 - 72	12	0.5	94	93	89
R-78HB15-0.5	20 - 72	15	0.5	95	94	91
R-78HB24-0.3	36 - 72	24	0.3	96		92





Description

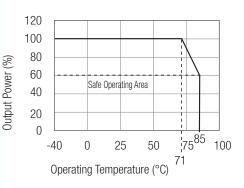
The R-78HBxx-Series high efficiency, high input voltage switching regulators are ideally suited to replace 78xx linear regulators and are pin compatible. The efficiency of up to 96% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and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

An input voltage range of up to 8:1is unsurpassed by any other converter and allows the full stored energy utilisation 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.

Derating-Graph

(Ambient Temperature)



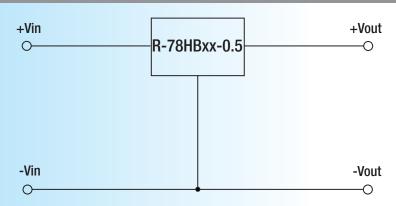
^{*} add Suffix "L" for 90° bent pins, e.g. R-78HB5.0-0.5L



R-78HBxx-0.5 (L) Series

Characteristics	Conditions	Min.	Тур.	Max.	
Input Voltage Range	See table	9	48	72V	
Output Voltage Range (for customized parts)	All Series	3.3		24V	
Output Current (see Note 1)	3.3V, 5V, 6.5V, 9V, 12V, 15V	10		500mA	
	24V	6		300mA	
Output Current Limit (Vin = 48VDC)	All Series		700	1200mA	
Short Circuit Input Current	All Series		15	25mA	
Internal Input Filter				1µF Capacitor	
Internal Power Dissipation				0.65W	
Short Circuit Protection			Continuous, auto	matic recovery	
Output Voltage Accuracy	At 100% Load		±2	±3%	
Line Voltage Regulation	Vin = min. to max. at full load		0.4	1%	
Load Regulation	10% to 100% full load		0.3	0.6%	
Dynamic Load Stability (with Output Capacitor=100µF)	100% <-> 50% load		±75mV	±100mV	
Ripple & Noise (without Output Capacitor)	10% to 100% full load		20mVp-p	60mVp-p	
Temperature Coefficient	-40°C ~ +85°C ambient			0.015%/°C	
Max capacitance Load				100µF	
Switching Frequency (See Graph)	Full Load	120	800kHz		
Quiescent Current	Vin = 48VDC. at minimum load	1	5mA		
Operating Temperature Range		-40°C		+85°C	
Operating Case Temperature				+100°C	
Storage Temperature Range		-55°C		+125°C	
Case Thermal Impendance				60°C / W	
Thermal Shutdown	Internal IC junction		+160°C		
Relative Humidity				95% RH	
Package Weight				4g	
Case Material			Non-Conductive	e Black Plastic	
Potting Material			Ep	ooxy (UL94V-0)	
Soldering Temperature			265°C	C max./10 sec.	
MTBF (+25°C)	using MIL-HDBK 217F		7395 x 10 ³ hours		
. (+71°C) Application Notes chapter "MTBF"	using MIL-HDBK 217F		1242 x 10 ³ hours		

Standard Application Circuit



The converter has a built in soft start circuit. Rapidly changing the input voltage from Vin(min) ← Vin(max) can bypass this circuit and damage the converter.

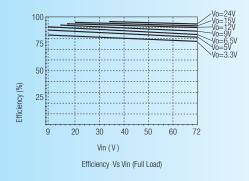
Add a blocking diode to Vout if current can flow backwards into the output, as this can damage the converter.



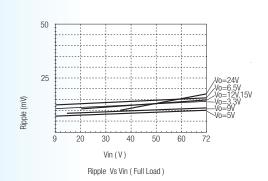
R-78HBxx-0.5 (L) Series

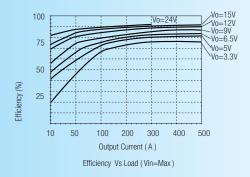
Typical Characteristics

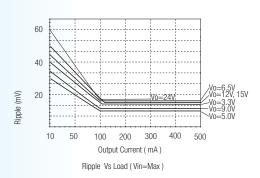
Efficiency

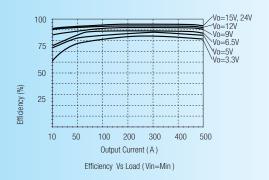


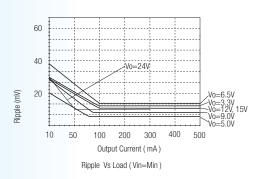
Ripple









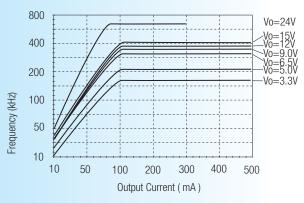


INNOLINEDC/DC-Converter

R-78HBxx-0.5 (L) Series

Typical Characteristics cont.

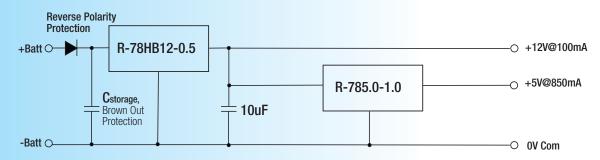
Switching Frequency



Switching Frequency Vs Load (Vin=30~72V)

Typical Application

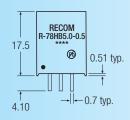
High Input Voltage Multiple Output Supply

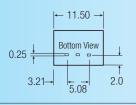


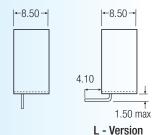
- Wide input range 18V to 72V can be used with 24V, 48V or 60V batteries
- +12V output for interface and display electronics
- +5V high current output for digital electronics
- Further decoupling filtering may be necessary between the converters

Package Style and Pinning (mm)

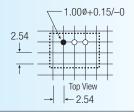
SIP3 PIN Package







Recommended Footprint Details









Pin Connections

Pin #	‡	
1		+Vin
2		GND
3		+Vout
XX X	+0.5mm	

 $xx.x \pm 0.5$ mm $xx.xx \pm 0.25$ mm