Features

- Efficiency up to 97%,Non isolated, no need for heatsinks
- **Pin-out compatible with LM78XX Linears**
- Very low profile(L*W*H=11.5*7.5*10.2)
- Wide input range.(4.75V ~ 34V)
- **Short circuit protection, Thermal shutdown**
- **Non standard outputs available as specials**
- **Low ripple and noise**
- **UL94V-0 Package Material**
- **EMC Certified**
- **See Positive-to Negative Converter Application Note for use as a voltage inverter (alternative to LM79xx Linear)**

Rev.0

INNOLINE
DC/DC-Converter

R-78xx-0.5 Series

0.5 AMP
SIP3
Single Output

EN-55022 Certified
EN-55024 Certified
EN-60601-1-2 Certified

RECOM

Description

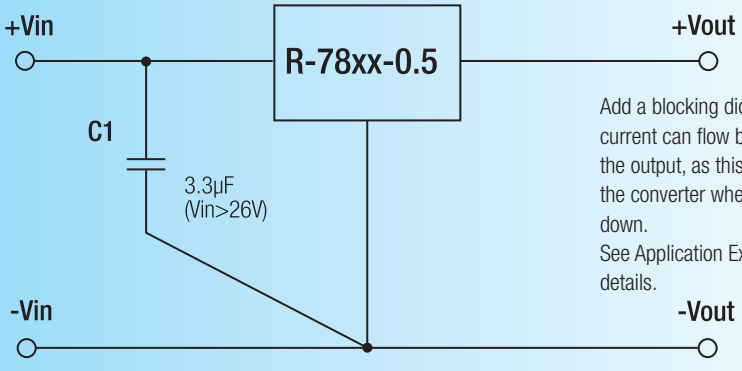
The R-78xx-Series high efficiency switching regulators are ideally suited to replace 78xx linear regulators and are pin compatible. The efficiency of up to 97% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs. Low ripple and noise figures and short circuit , overload and over-temperature protection round off the specifications of this versatile converter series.
This R-78xx-0.5 is fully certified to EN 60601-1-2 (Medical Equipment), EN 55022 (Emissions), and EN55024 (Immunity) EMC Standards.

Selection Guide

Part Number SIP3	Input Range (1) (V)	Output Voltage (V)	Output Current (A)	Efficiency Min. Vin (%)	Efficiency Max. Vin (%)
R-781.5-0.5	4.75 – 30	1.5	0.5	73	63
R-781.8-0.5	4.75 – 34	1.8	0.5	82	71
R-782.5-0.5	4.75 – 34	2.5	0.5	87	77
R-783.3-0.5	4.75 – 34	3.3	0.5	91	81
R-785.0-0.5	6.5 – 34	5.0	0.5	94	86
R-786.5-0.5	8.0 – 34	6.5	0.5	95	88
R-789.0-0.5	11 – 34	9.0	0.5	96	92
R-7812-0.5	15 – 34	12	0.5	97	94
R-7815-0.5	18 – 34	15	0.5	97	95

Note 1:1.5V Output can be unstable with Vin>30VDC

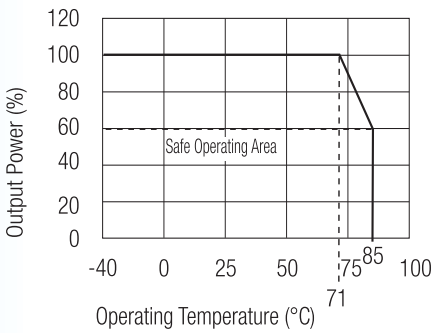
Standard Application Circuit



Add a blocking diode to Vout if current can flow backwards into the output, as this can damage the converter when it is powered down.
See Application Examples for details.

Input capacitor needed only if Vin>26VDC.

Derating-Graph
(Ambient Temperature)



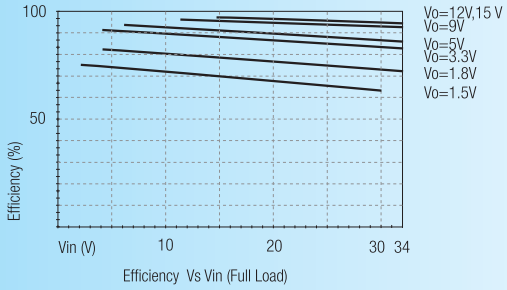
R-78xx-0.5 Series

Specifications (typical at 25°C, 10% minimum load, unless otherwise specified)

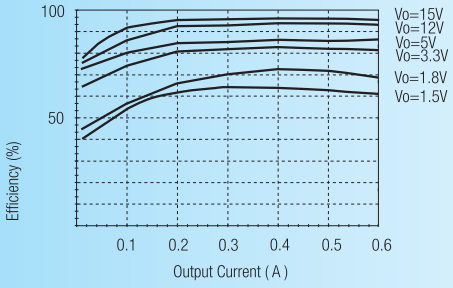
Characteristics	Conditions	Min.	Typ.	Max.
Input Voltage Range	1.5V	4.75		30.0V
	1.8V to 15.5V	4.75		34.0V
Output Voltage Range (for customized parts)	All Series	1.25		15.5V
Output Current (see note)	All Series	0*		500mA
Output Current Limit	All Series			2000mA
Short Circuit Input Current (Vin = 24V)	All Series			60mA
Internal Power Dissipation				0.4W
Short Circuit Protection				Continuous, automatic recovery
Output Voltage Accuracy (At 100% Load)	All Series		±2	±3%
Line Voltage Regulation (Vin = min. to max. at full load)	1.5V to 6.5V		0.2	0.4%
	9V to 15.5V		0.1	0.2%
Load Regulation (10 to 100% full load)	1.5V to 6.5V		0.4	0.6%
	9V to 15.5V		0.25	0.4%
Dynamic Load Stability	100% <-> 50% load		±75mV	
	100% <-> 10% load			±100mV
Ripple & Noise (without Output Capacitor)	1.5V to 6.5V		20mVp-p	30mVp-p
	9V to 15.5V		30mVp-p	40mVp-p
Ripple & Noise (with Output Capacitor=100µF)	1.5V to 6.5V		15mVp-p	20mVp-p
	9V to 15.5V		25mVp-p	35mVp-p
Temperature Coefficient	-40°C ~ +85°C ambient			0.015%/°C
Max capacitance Load				220µF
Switching Frequency		280	330	380kHz
Quiescent Current	Vin = min. to max. at 0% load		5	7mA
Operating Temperature Range		-40°C		+85°C
Operating Case Temperature				+100°C
Storage Temperature Range		-55°C		+125°C
Case Thermal Impendance				70°C / W
Thermal Shutdown	Internal IC junction			+160°C
Conducted Emissions	EN55022			Class B
Radiated Emissions	EN55022			Class B
ESD	EN61000-4-2			Class A
Radiated Immunity	EN61000-4-3			Class A
Fast Transient	EN61000-4-4			Class A
Conducted Immunity	EN61000-4-6			Class A
Magnetic Field Immunity	EN61000-4-8			Class A
Package Weiught				1.9g
MTBF (+25°C) *Detailed Information see Application Notes chapter "MTBF"*	using MIL-HDBK 217F			21098 x 10^3 hours
(+71°C)	using MIL-HDBK 217F			4212 x 10^3 hours

*Note: Operation under no load will not damage these devices, however they may not meet all specifications. A minimum load of 6mA is recommended

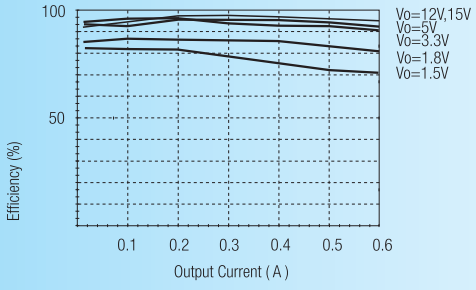
Efficiency



Efficiency Vs Vin (Full Load)

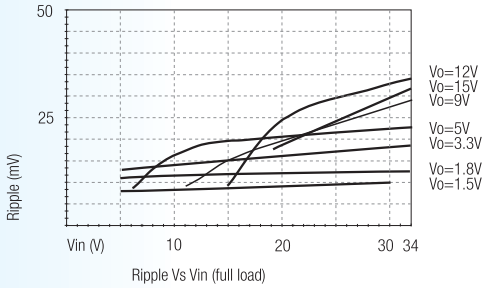


Efficiency Vs Load (Vin=Max)

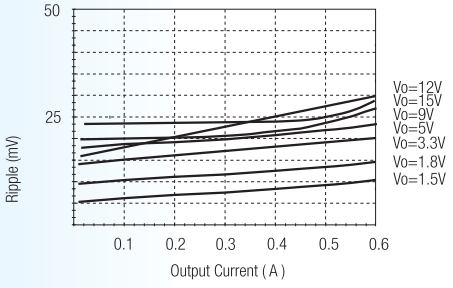


Efficiency Vs Load (Vin=Min)

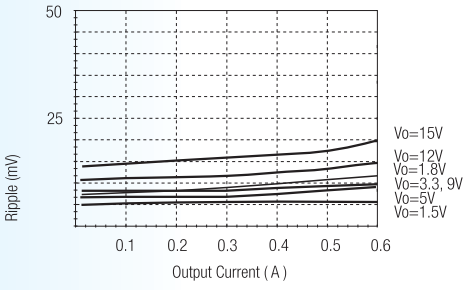
Ripple



Ripple Vs Vin (full load)



Ripple Vs Load (Vin=24V)

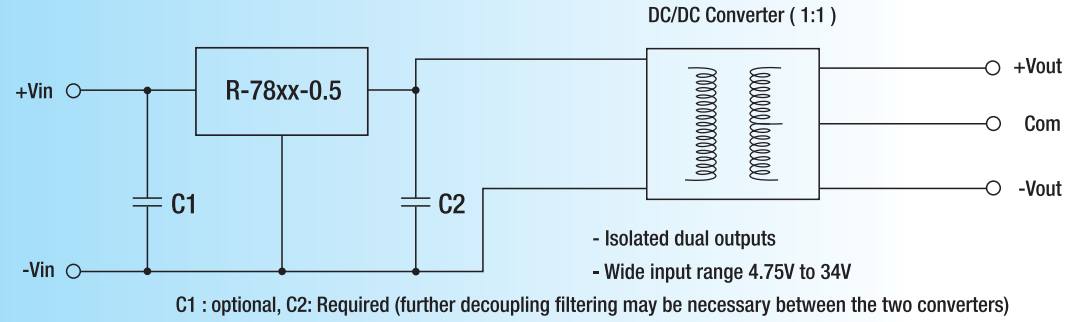


Ripple Vs Load (Vin=Min)

R-78xx-0.5 Series

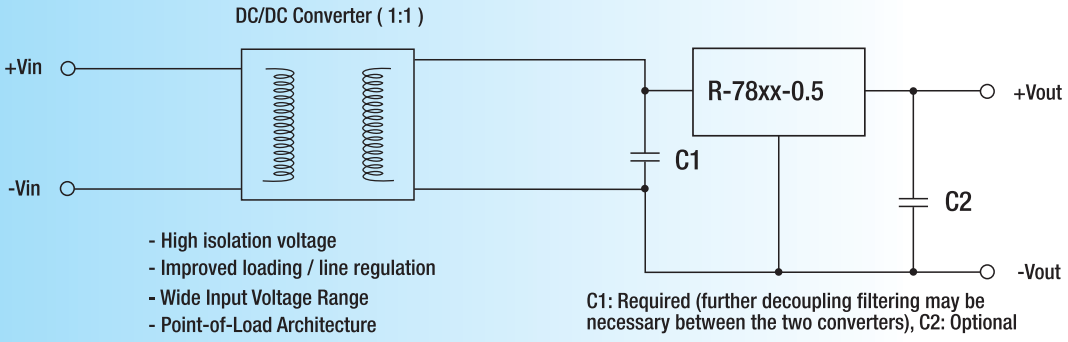
Application Examples

High efficiency, isolated, dual unregulated outputs



C1 : optional, C2: Required (further decoupling filtering may be necessary between the two converters)

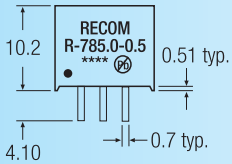
Isolated (up to 6KV), wide Input range regulated output

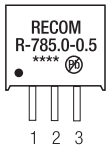


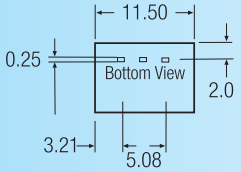
Package Style and Pinning (mm)

SIP3 PIN Package

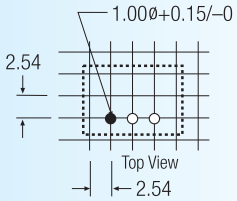
3rd angle projection







Recommended Footprint Details



Pin Connections

Pin #	
1	+Vin
2	GND
3	+Vout

xx.x ±0.5mm
xx.xx ±0.25mm