Features

Switching Regulator

- Efficiency up to 94%, no need for heatsinks
- Pin compatible with LM78XX linears
- Low profile (L/W/H=11.5 x 7.55 x 10.2mm)
- Wide input range
- Short circuit protection, thermal shutdown
- Low ripple and noise
- IEC/EN60950-1 certified

RECOM

DC/DC Converter

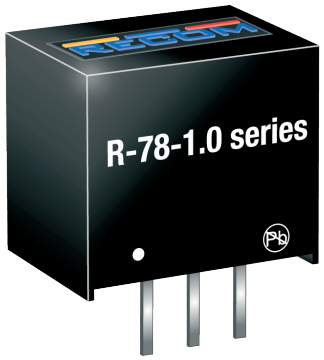
R-78-1.0

1.0 Amp SIP3 Single Output

3 YEAR warranty

Description

The R-78xx-1.0 series switching regulators are ideally suited to replace 1 Amp 78xx linear regulators and are pin compatible. Efficiencies of up to 94% mean that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs.



Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [A]	Efficiency @ min Vin [%]	Efficiency @ max. Vin [%]
R-781.8-1.0	4.75 - 18	1.8	1.0	82	76
R-782.5-1.0	4.75 - 18	2.5	1.0	87	81
R-783.3-1.0	4.75 - 18	3.3	1.0	90	84
R-785.0-1.0	6.5 - 18	5.0	1.0	94	89

Model Numbering

R-78__-1.0

Output Voltage — Output Current

IEC/EN60950-1 certified
EN55032 compliant

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

BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Quiescent Current	Vin = min. to max. at 0% load		5mA	7mA
Internal Power Dissipation				0.4W
Minimum Load (1)		0%		
Internal Operating Frequency		280kHz	350kHz	430kHz
Output Ripple and Noise	measured at 20MHz BW		20mVp-p	30mVp-p
Absolute Maximum Capacitive Load	1 second start up, no external components			220µF
	<1 second start up + diode protection circuit			6800µF

Notes:

Note1: 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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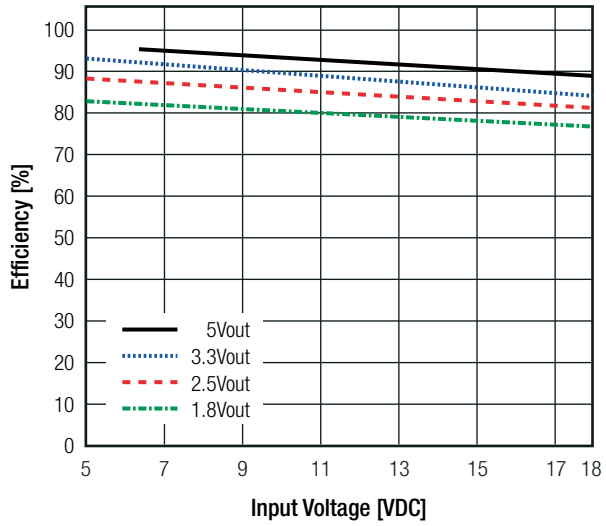
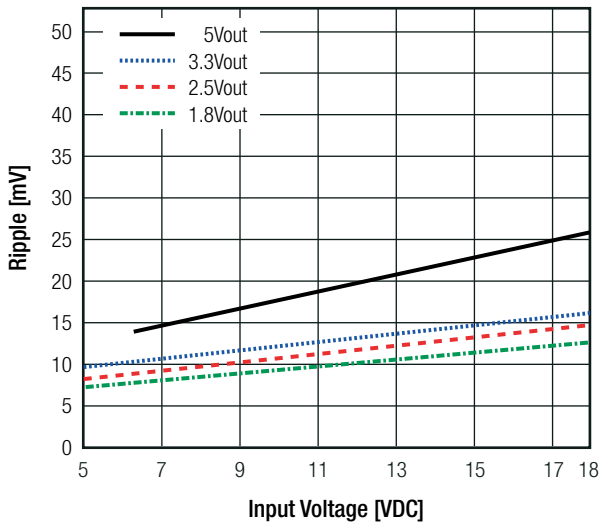
Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

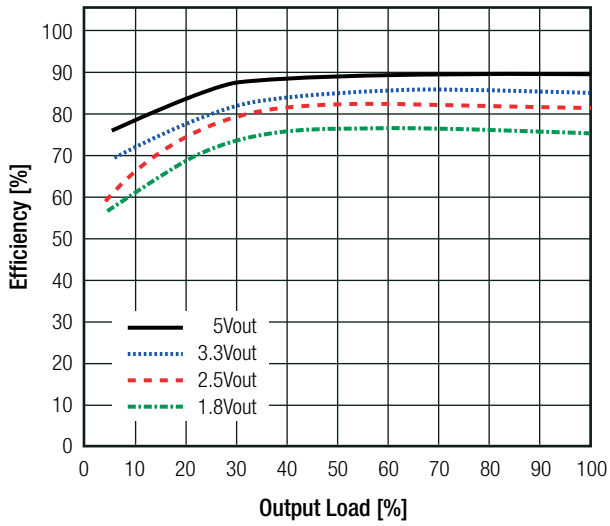
Efficiency vs. Vin (full load)



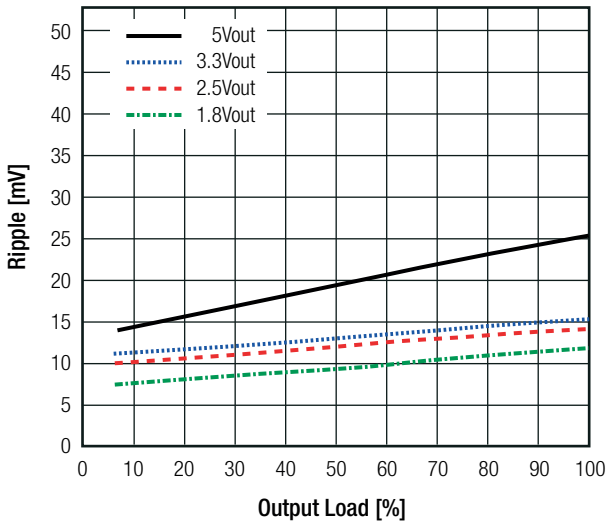
Ripple vs. Vin (full load)



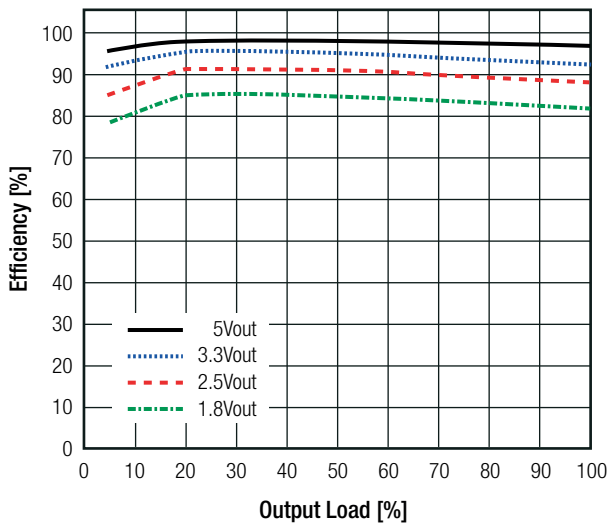
Efficiency vs. Load (max. Vin)



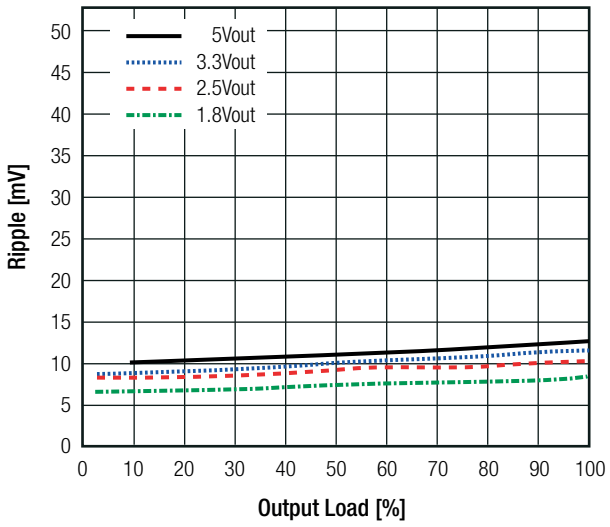
Ripple vs. Load (max. Vin)



Efficiency vs. Load (min. Vin)



Ripple vs. Load (min. Vin)



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

REGULATIONS

Parameter	Condition	Value
Output Accuracy	100% load	±2.0% typ / ±3.0% max.
Line Regulation	low line to high line, 100% load	±0.2% typ. / ±0.4% max.
Load Regulation	10% to 100% load	±0.4% typ. / ±0.6% max.
Transient Response	100% <-> 50% load	±85mV typ. / ±100mV max.

PROTECTIONS

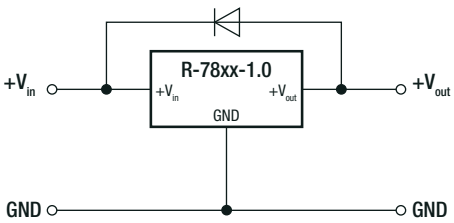
Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Short Circuit Input Current	nom. Vin= 12VDC	100mA max.

Optional Diode Protection Circuit

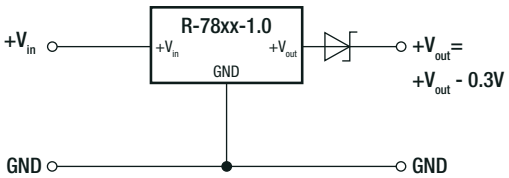
Add a blocking diode to Vout if current can flow backwards into the output, as this can damage the converter when it is powered down.

The diode can either be fitted across the device if the source is low impedance or fitted in series with the output (recommended).

Optional Protection 1:



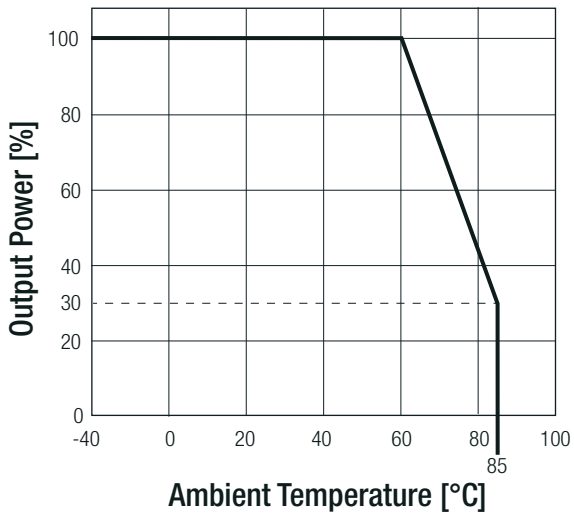
Optional Protection 2:



ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	with derating (see graph)		-40°C to +85°C
Maximum Case Temperature			+100°C
Temperature Coefficient			±0.015%/K
Thermal Impedance	0.1m/s, vertical		70K/W
Operating Altitude			2000m
Operating Humidity	non-condesing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +71°C	13338 x 10^3 hours 3880 x 10^3 hours

Derating Graph



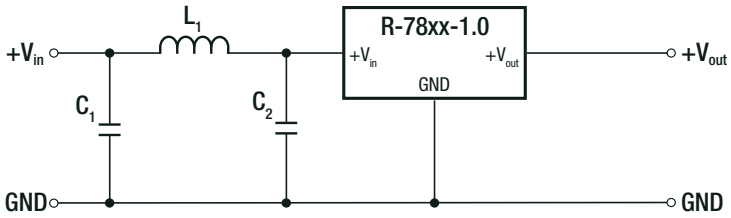
Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

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 filter (see filter suggestion below)	EN55032, Class A and B
ESD Electrostatic discharge immunity test	Contact ±6kV	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	±1.0kV	EN61000-4-4, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	3V	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	50Hz, 3A/m	EN61000-4-8, Criteria A

EMC Filter Suggestion according to EN55032



Component List Class A

MODEL	C1	L1
R-783.3-1.0	10µF 100V MLCC	3.9µH choke RLS-397
R-785.0-1.0		

Component List Class B

MODEL	C1	C2	L1
R-783.3-1.0	10µF 100V MLCC	2.2µF 100V MLCC	5.6µH choke RLS-567
R-785.0-1.0			

Notes:

Note2: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) silicone, (UL94 V-0) FR4, (UL94 V-0)
Package Dimension (LxWxH)		11.5 x 7.55 x 10.2mm
Package Weight		1.9g typ.

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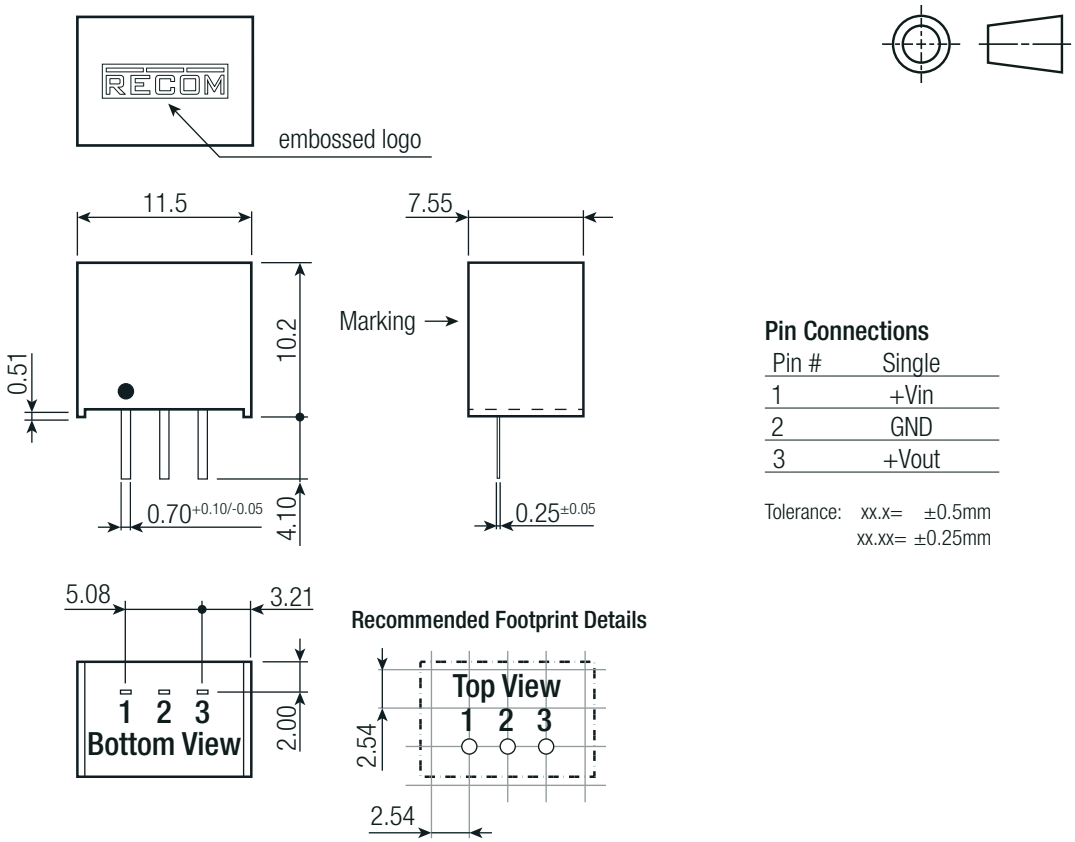
Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

Dimension Drawing (mm)



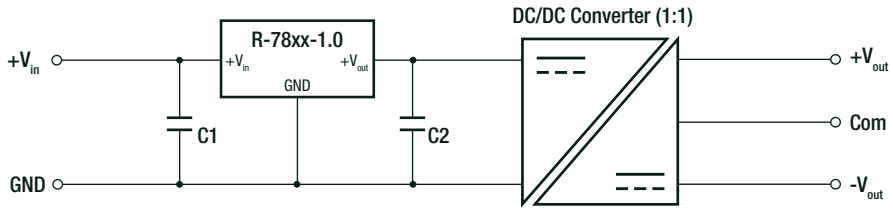
Pin Connections

Pin #	Single
1	+Vin
2	GND
3	+Vout

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

INSTALLATION AND APPLICATION

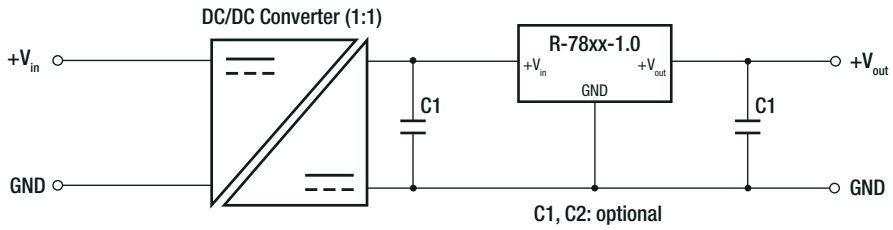
High Efficiency, Isolated, Dual Unregulated Output



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

- Medical grade isolated dual outputs
- Wide input range 6.5V to 18V
- High efficiency, suitable for 12V battery powered devices

Isolated (up to 6kVDC), Wide Input Range Regulated Output



- High isolation voltage
- Improved load / line Regulation
- Wide input voltage
- Point-of-load architecture

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

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	520.0 x 10.4 x 17.7mm
Packaging Quantity	tube	42pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.