

# Features

# Switching Regulator

- Efficiency up to 95%, no need for heatsinks
- Industry standard pin-out
- 1.5A start-up overload capacity
- Non-isolated regulator, very low standby current
- Wide input range (7V -42VDC)
- Short circuit protection
- Fixed switching frequency (350kHz), shielded magnetics



## R-78T-1.0

1.0 Amp  
SMD  
Single Output

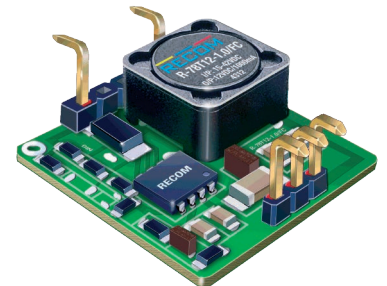
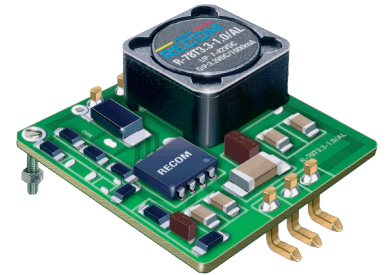
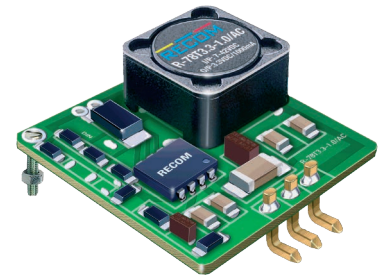


### Description

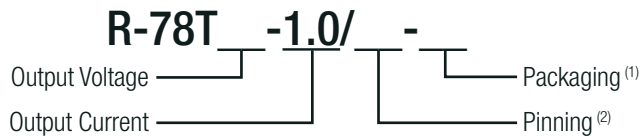
The R-78T is a switching regulator with a wide input voltage range and a low profile SMD package. Three output voltages are available as standard: 3.3V, 5V and 12V. Due to the 1.5A start-up overload capability, the R-78T can be used to replace 1A or 1.5A regulators in many applications. These modules come with three different styles to be pin-compatible with existing solutions, but at a lower cost.

### Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency	
				@ min Vin [%]	@ max. Vin [%]
R-78T3.3-1.0	7 - 42	3.3	1000	88	79
R-78T5.0-1.0	8 - 42	5.0	1000	92	85
R-78T12-1.0	15 - 42	12	1000	95	92



### Model Numbering



#### Notes:

Note1: add suffix „-R“ for tape & reel packaging or „-Tray“ for tray packaging

Note2: add suffix „/FC“, „/AC“ or „/AL“ for required pinning option, for more information refer to „*DIMENSION AND PHYSICAL CHARACTERISTICS*“

#### Ordering Examples:

R-78T3.3-1.0/FC-R = 3.3VDC Output Voltage, 1.0A, FC pinning, tape and reel packaging

R-78T5.0-1.0/AC-Tray = 5.0VDC Output Voltage, 1.0A, AC pinning, tray packaging



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

**BASIC CHARACTERISTICS**

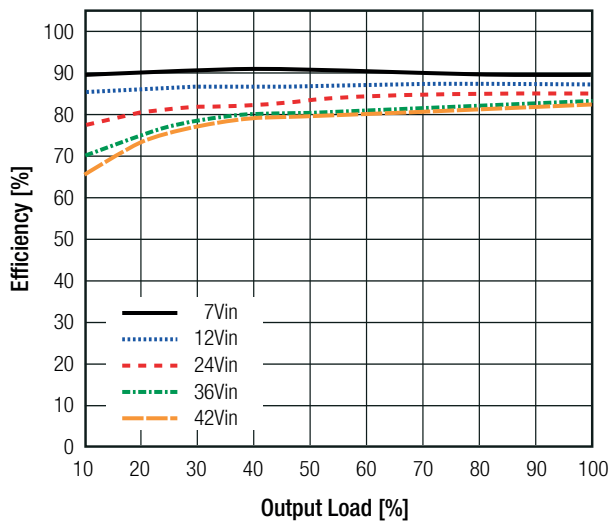
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				C filter
Input Voltage Range	nom. Vin= 3.3VDC nom. Vin= 5.0VDC nom. Vin= 12VDC	7VDC 8VDC 15VDC		42VDC 42VDC 42VDC
Overload Capability <sup>(3)</sup>	peak duty cycle 10%			150%, 10s
Quiescent Current			1mA	
Minimum Load		10%		
Internal Operating Frequency			350kHz	
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

**Notes:**

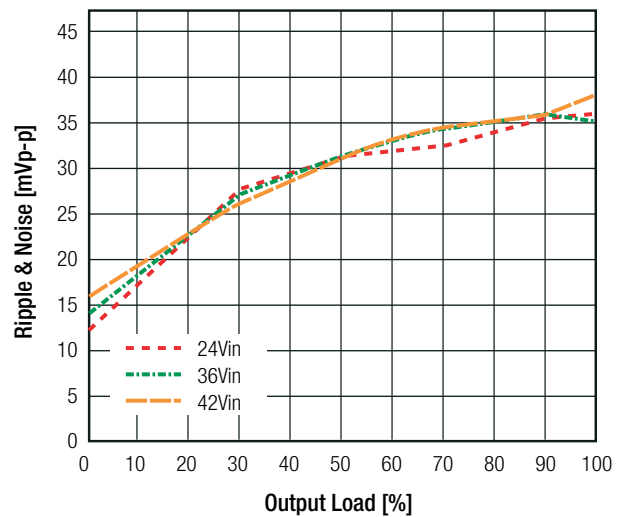
Note3: For more information, please refer to „*Overload Capability Graph*“

**R-78T3.3-1.0**

**Efficiency vs. Load**

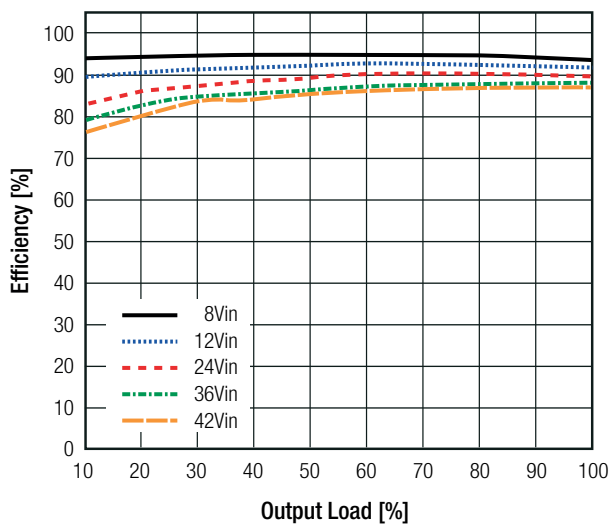


**Ripple vs. Load**

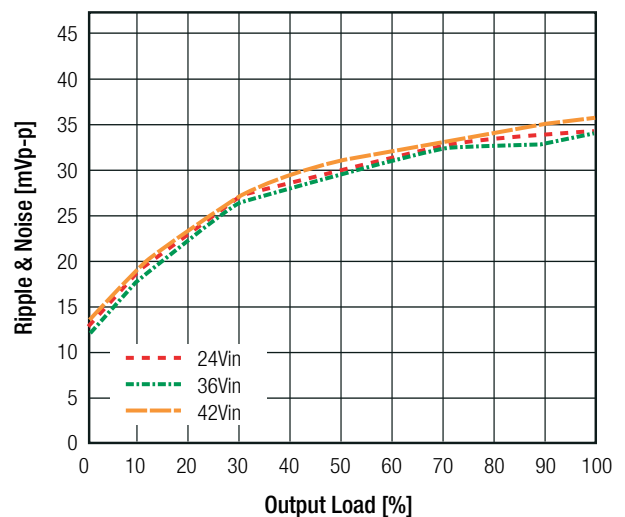


**R-78T5.0-1.0**

**Efficiency vs. Load**



**Ripple vs. Load**

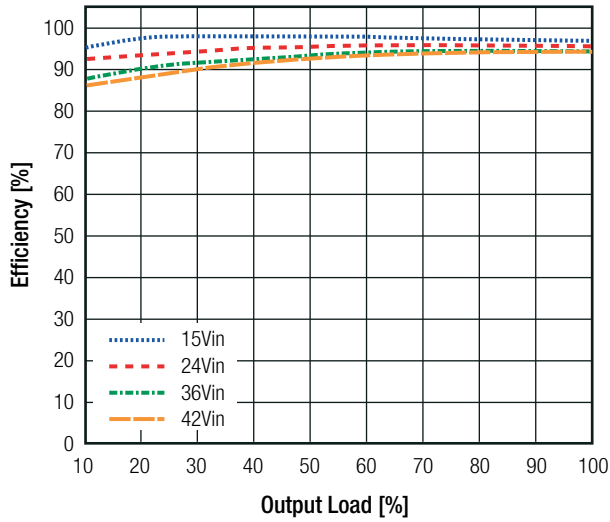


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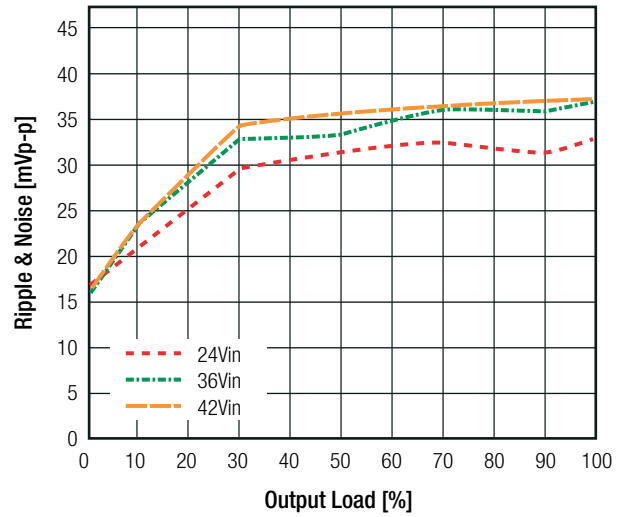
Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

R-78T12-1.0

Efficiency vs. Load



Ripple vs. Load



**REGULATIONS**

Parameter	Condition		Value
Output Accuracy	full load		±2.0% typ. / ±3.0% max.
Line Regulation	low line to high line, full load		±0.2% typ.
Load Regulation	10% to 100% load		±0.4% typ.
Transient Response	50mA/uS	100% - 50% load	±250mV max.

**PROTECTIONS**

Parameter	Condition	Value
Short Circuit Protection (SCP)		current limited to 3.5A typ.

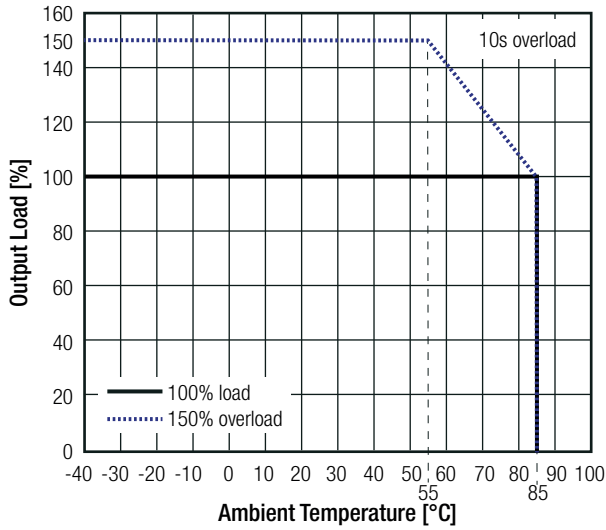
**ENVIRONMENTAL**

Parameter	Condition		Value
Operating Temperature Range	with derating @ free air convection (refer to "Derating Graph")		-40°C to +85°C
Operating Humidity	non-condensing		5% - 95% RH max.
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	6318 x 10 <sup>3</sup> hours

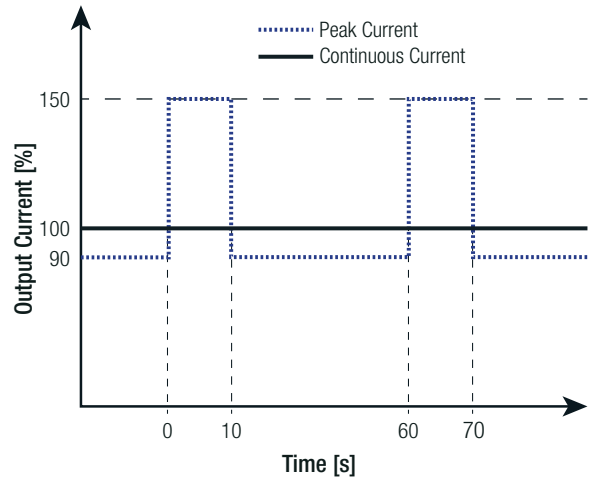
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**Specifications** (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

**Derating Graph**  
(@ Free air convection)



**Overload Capability Graph**



**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report / File Number	Standard
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863

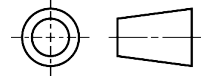
**DIMENSION AND PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	PCB	FR4, (UL94 V-0)
Dimension (LxWxH)	"/AC" or "/AL" "/FC"	23.0 x 27.2 x 10.0mm 23.0 x 29.4 x 8.0mm
Weight		4.5g typ.

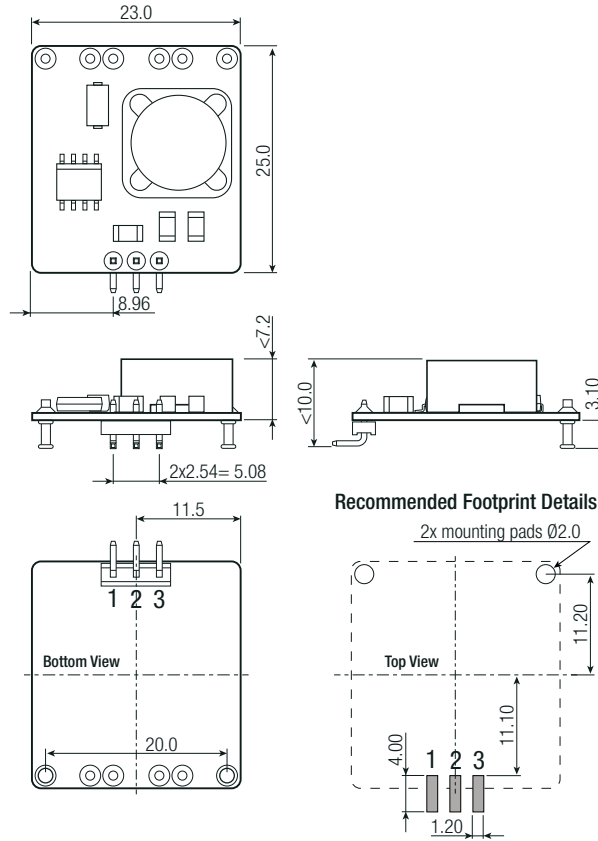
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Specifications (measured @ Ta= 25°C, 10% minimum load, unless otherwise stated)

Dimension Drawing (mm)



R-78Txx-1.0/AC

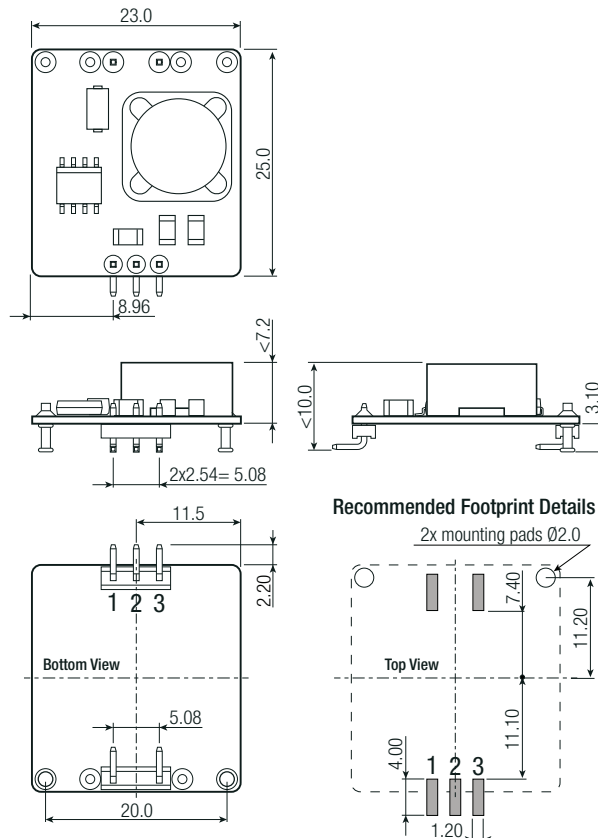


Pinning information

Pin #	Single
1	+Vin
2	GND
3	+Vout

Tolerance:  
xx.x =  $\pm 0.5$ mm  
xx.xx =  $\pm 0.25$ mm

R-78Txx-1.0/AL



Pinning information

Pin #	Single
1	+Vin
2	GND
3	+Vout

Tolerance:  
xx.x =  $\pm 0.5$ mm  
xx.xx =  $\pm 0.25$ mm

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

R-78Txx-1.0/FC

Pin #	Single
1	+Vin
2	GND
3	+Vout

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

**PACKAGING INFORMATION**

Parameter	Type	Value
Packaging Dimension (LxWxH)	tray	260.0 x 205.0 x 25.0mm
	tape and reel (carton)	385.0 x 375.0 x 70.0mm
Packaging Quantity	tray	25pcs
	tape and reel	150pcs
Tape Width		44mm
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.

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