Features

Switching Regulator

- Efficiency up to 95%, no need for heatsinks
- High reflow temperature SMD package
- Adjustable output voltage buck converter
- Wide input range (4.74V - 32V)
- Short circuit protection, thermal shutdown
- Remote on/off control
- Very low shutdown current

RECOM

DC/DC Converter

R-78AA-0.5

0.5 Amp SMD Single Output

3 YEAR Warranty

Description

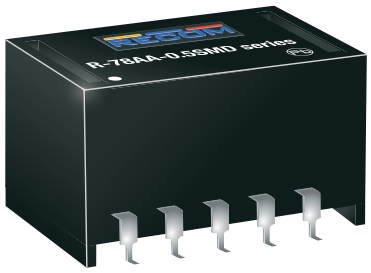
The R-78AAxx-0.5SMD series are adjustable output non-isolated buck converters that meet the requirements for RoHS 10/10 as well as the reflow soldering temperatures associated with vapor phase soldering, making these high efficiency switching regulators ideally suited to modern pick-and-place mass production. The efficiency of up to 97% means that very little energy is wasted as heat. The additional features of remote on/off control, continuous short circuit protection and adjustable output voltages will find many uses in the battery-powered, industrial, medical and automotive markets.

Selection Guide

Part Number	Input Voltage Range [VDC] (1)	Output Voltage [VDC]	Vout Adjust Range [VDC]	Output Current [mA]	Efficiency @ min Vin [%]	Efficiency @ max. Vin [%]
R-78AA1.5-0.5SMD	4.75 - 30	1.5	fixed	0.5	73	63
R-78AA1.8-0.5SMD	4.75 - 32	1.8	1.5 - 3.0	0.5	82	71
R-78AA2.5-0.5SMD	4.75 - 32	2.5	1.5 - 3.0	0.5	87	77
R-78AA3.3-0.5SMD	4.75 - 32	3.3	3.0 - 5.5	0.5	91	81
R-78AA5.0-0.5SMD	6.5 - 32	5.0	3.0 - 8.0	0.5	94	86
R-78AA6.5-0.5SMD	8.0 - 32	6.5	3.3 - 11.0	0.5	95	88
R-78AA9.0-0.5SMD	11 - 32	9.0	4.5 - 12.6	0.5	96	92
R-78AA12-0.5SMD	15 - 32	12	4.5 - 12.6	0.5	97	94
R-78AA15-0.5SMD	18 - 32	15	fixed	0.5	97	95

Notes:

Note1: Input voltage ranges valid for nominal output voltages
Vin must be higher than Vout including adjust range and dropout voltage



RoHS 2+ compliant 10 from 10

REACH compliant

EAC

EN60950-1 certified
IEC60950-1 certified

Model Numbering

R-78AA__-0.5 SMD-

- nom. Output Voltage
- Output Current
- Package
- Packaging (2)

Notes:

Note2: add suffix -R for tape & reel packaging

Ordering Examples:

R-78AA5.0-0.5SMD-R = 5.0VDC Output Voltage, 0.5A, SMD, tape and reel packaging
R-78AA2.5-0.5SMD = 2.5VDC Output Voltage, 0.5A, SMD, tube

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

BASIC CHARACTERISTICS					
Parameter	**Condition**		**Min.**	**Typ.**	**Max.**
Absolute Maximum Input Voltage					34VDC
Quiescent Current	Vin= min. to max.			5mA	7mA
Internal Power Dissipation					0.4W
Output Voltage Adjustability					see calculation
Minimum Load (3)			0%		
Start-up time	ON/OFF CTRL			50ms	
ON/OFF CTRL	DC-DC ON DC-DC OFF				Open or 2.8VDC<Vr<5VDC GND or 0VDC<Vr<0.8VDC
Input Current of CTRL Pin	DC-DC OFF			1.8µA	
Standby Current				20µA	30µA
CTRL Thereshold Voltage			2.4VDC	2.6VDC	2.8VDC
CTRL Voltage Hysterese				250mV	
Internal Operating Frequency			280kHz	330kHz	380kHz
Output Ripple and Noise	20MHz BW	1.5VDC tp 6.5VDC 9VDC to 15VDC		20mVp-p 30mVp-p	30mVp-p 40mVp-p
Maximum Capacitive Load	with normal start-up time, no external components				470µF
	with <1 second start-up time + diode protection circuit				6800µF

Notes:

Note3: Operation under no load will not harm the converter, but specifications may not be met. A minimum load of 6mA is recommended

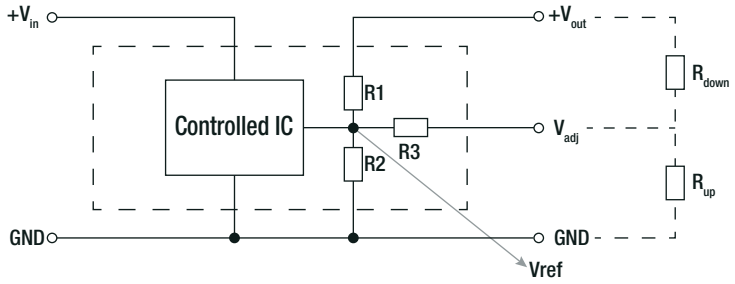
Output Voltage Adjustability

Adjustment Resistor Values

V0	R1	R2	R3	Vref(V)
1.8V	10kΩ	21kΩ	5.6kΩ	1.23
2.5V	22kΩ	21kΩ	5.6kΩ	1.23
3.3V	16.9kΩ	10kΩ	5.6kΩ	1.23
5.0V	30.9kΩ	10kΩ	10kΩ	1.23
6.5V	43kΩ	10kΩ	10kΩ	1.23
9V	63.4kΩ	10kΩ	22.1kΩ	1.23
12V	88.7kΩ	10kΩ	22.1kΩ	1.23

$$Rdown = \frac{R2(R1 + R3) \times (Vref - Vo) + Vref \times R1R3}{R2Vo - Vref\,(R1 + R2)}$$

$$Rup = \frac{R2R3\,(Vref - Vo) + Vref\,R1\,(R2 + R3)}{R2\,(Vo - Vref) - Vref\,R1}$$



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