

Features

Switching Regulator

- Non-isolated
- Synchronous rectification design
- Adjustable output voltage
- 2, 3, 4 & 5AMP adjustable positive step down integrated switching regulator
- Over load protection
- Continuous short circuit protection
- Efficiency up to 96%

RECOM
DC/DC Converter

R-5xxxPA_DA

Description

The R-5xxxA series is a high performance 1.2V to 5.5V, 2Amp to 5Amp, 12-Pin SIP (single in-line package) integrated switching regulator (ISR). The synchronous - rectified design yields excellent efficiencies up to 96%. Short circuit protection reduces the short circuit input current to under 50mA. Autosense function compensates for any losses in long circuit loops.

Selection Guide

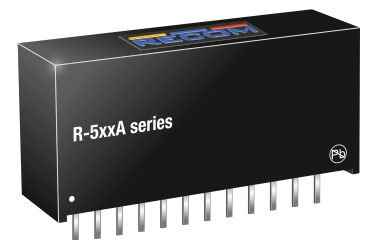
Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Vout Adjust Range ⁽¹⁾ [VDC]	Output Current [A]	Efficiency			Max. Capacitive Load ⁽²⁾ [μF]
					@ min Vin [%]	@ max. Vin [%]	12V [%]	
R-521.2xA	4.5 - 18	1.2	1.0 - 3.0	2	83	79	75	300/6800
R-521.8xA	4.5 - 18	1.8	1.1 - 4.5	2	88	85	82	300/6800
R-522.5xA	4.5 - 18	2.5	1.6 - 5.5	2	91	88	86	300/6800
R-523.3xA	4.5 - 18	3.3	1.6 - 5.5	2	92	90	89	300/6800
R-525.0xA	6.5 - 18	5.0	3.0 - 5.5	2	95	93	92	300/6800
R-531.2xA	4.5 - 18	1.2	1.0 - 3.0	3	85	84	82	300/6800
R-531.8xA	4.5 - 18	1.8	1.1 - 4.5	3	89	88	86	300/6800
R-532.5xA	4.5 - 18	2.5	1.6 - 5.5	3	92	91	89	300/6800
R-533.3xA	4.5 - 18	3.3	1.6 - 5.5	3	94	93	92	300/6800
R-535.0xA	6.5 - 18	5.0	3.0 - 5.5	3	96	95	94	300/6800
R-541.2xA	4.5 - 18	1.2	1.0 - 3.0	4	82	81	79	300/6800
R-541.8xA	4.5 - 18	1.8	1.1 - 4.5	4	87	86	85	300/6800
R-542.5xA	4.5 - 18	2.5	1.6 - 5.5	4	91	89	88	300/6800
R-543.3xA	4.5 - 18	3.3	1.6 - 5.5	4	93	92	91	300/6800
R-545.0xA	6.5 - 18	5.0	3.0 - 5.5	4	95	94	93	300/6800
R-551.2xA	4.4 - 18	1.2	1.0 - 3.0	5	81	80	78	300/6800
R-551.8xA	4.5 - 18	1.8	1.1 - 4.5	5	86	85	84	300/6800
R-552.5xA	4.5 - 18	2.5	1.6 - 5.5	5	90	89	88	300/6800
R-553.3xA	4.5 - 18	3.3	1.6 - 5.5	5	92	91	90	300/6800
R-555.0xA	7.0 - 18	5.0	3.0 - 5.5	5	94	93	92	300/6800

Notes:

Note1: $V_{in}-V_{out} \geq 1.5V \sim 4.0V$ depending on V_{out} if adjust function is used

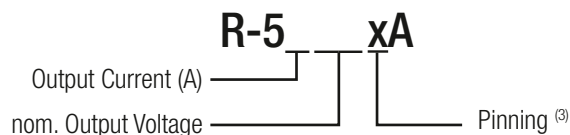
Note2: please refer to basic characteristics

**2,3,4,5 Amp
SIP12
Vertical &
Horizontal
Single Output**



IEC/EN60950-1 certified

Model Numbering



Notes:

Note3: x can be „P“= vertical through hole

x can be „D“ = bent for horizontal through hole mounting

Ordering Examples:

R-553.3PA Iout= 5A

nom. Vout= 3.3VDC

P= vertical through hole

R-522.5DA Iout= 2A

nom. Vout= 2.5VDC

D= bent for horizontal through hole mounting

Specifications (refer to standard application circuit, Ta= 25°C)

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Quiescent Current	min. Vin to max.			20mA
Internal Power Dissipation	ta<60°C			1.4W
Output Current Limit	R-52xx R-53xx R-54xx R-55xx		2.5A 3.75A 5.0A 6.0A	3.0A 4.25A 5.5A 6.5A
Minimum Load		10%		
ON/OFF CTRL ⁽⁴⁾	DC-DC ON DC-DC OFF	Open or high, 4.5V min. / 18V max. Low (Power OFF) 0.8V max.		
Input Current of CTRL Pin	DC-DC OFF			100µA
Internal Operating Frequency		270kHz	300kHz	330kHz
Output Ripple and Noise	R-52xx R-53xx & R-54xx & R-55xx		40mVp-p 80mVp-p	70mVp-p 120mVp-p
Maximum Capacitive Load	normal start-up time, no external diodes			300µF
	<1 second start-up time + diode protection circuit			6800µF

Notes:

Note4: ON/OFF pin driven by TTL (logic gate), open-collector bipolar transistor or open-drain MOSFET

How to calculate the max output current

The internal power dissipation (P_D) follows the equation:

$$P_D = I_{out} \times V_{out} \times (1 - \text{Eff}_{\max V_{in}})$$

$$I_{out} = \frac{P_D}{V_{out} \times (1 - \text{Eff}_{\max V_{in}})}$$

Example: R-545.0P

Calculation 1:

Vin = 18V

Vout = 5V

Eff_{max Vin} = 93%

P_D = 1.4W

T_{Ambient} = 60°C

$$I_{out} = \frac{1.4W}{5V \times (1 - 0.93)} = 4.0A$$

Calculation 2:

Vin = 18V

Vout = 5V

Eff_{max Vin} = 93%

P_D = 1W

T_{Ambient} = 85°C

$$I_{out} = \frac{1W}{5V \times (1 - 0.93)} = 2.857A$$

Calculation 3:

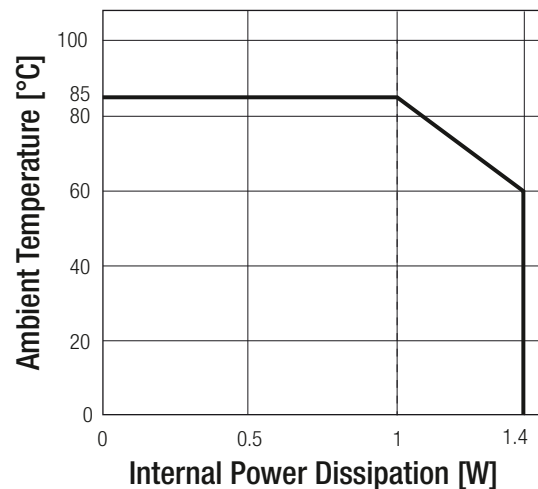
Vin = 12V

Eff_{max Vin} = 94%

P_D = 1.0W

T_{Ambient} = 85°C

$$I_{out} = \frac{1W}{5V \times (1 - 0.94)} = 3.33A$$



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