

## Features

## Regulated Converters

Rev.1

- 2kV, 4kVDC & 6kVDC Isolation
- Industry Standard 3W DIP24 Package
- Feedback Regulated Output
- Continuous Short Circuit Protection
- Wide Input 2:1 & 4:1
- Medical Approvals (4kV/6kV Versions)
- EN and UL Certificates
- 3 Pinout Options, 3 Case Styles
- Control Pin Option
- Efficiency to 86%

## Description

Besides the standard isolation of 2kVDC, this series offers options of 4kVDC (= "/H4") or 6kVDC (= "/H6") making it suitable for medical applications and other sophisticated industrial applications. Packaging can be either DIP-24 plastic or 5-side-shielded DIP24 metal case (= option "/M") as well as SMD pinning (= option "/SMD"). For all the above variants, 2 industry-standard pinouts (= option "/A" or "/C") are available, and B pinning is available with 1.6kVDC isolation. Remote on/off control is possible with the /CTRL option (A pinning only)

## Selection Guide

Part Number DIP24 (SMD)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	Max. Cap. Load
REC3-xx3.3SRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	3.3	900	66-76	2200µF
REC3-xx05SRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	5	600	71-79	1000µF
REC3-xx09SRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	9	330	74-83	470µF
REC3-xx12SRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	12	250	75-85	220µF
REC3-xx15SRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	15	200	75-86	120µF
REC3-xx05DRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	±5	±300	74-83	±470µF
REC3-xx12DRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	±12	±125	75-85	±100µF
REC3-xx15DRW/H*	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	±15	±100	75-86	±68µF
REC3-xx3.3SRWZ/H*	9 - 36, 18 - 72	3.3	900	77-79	2200µF
REC3-xx05SRWZ/H*	9 - 36, 18 - 72	5	600	78-80	1000µF
REC3-xx09SRWZ/H*	9 - 36, 18 - 72	9	330	80-83	470µF
REC3-xx12SRWZ/H*	9 - 36, 18 - 72	12	250	83-85	220µF
REC3-xx15SRWZ/H*	9 - 36, 18 - 72	15	200	83-85	120µF
REC3-xx05DRWZ/H*	9 - 36, 18 - 72	±5	±300	77-80	±470µF
REC3-xx12DRWZ/H*	9 - 36, 18 - 72	±12	±125	83-85	±100µF
REC3-xx15DRWZ/H*	9 - 36, 18 - 72	±15	±100	83-85	±68µF

H\* = H2, H4 or H6 for A or C pinning options with 2kVDC, 4kVDC or 6kVDC isolation. H\*

= H for B pinning option with 1.6kVDC isolation only.

<b>2:1 Input</b> (REC3-S/DRWH4/H6)	<b>4:1 Input</b> (REC3-S/DRWZ(H4/H6))	* add suffix "/A", "/B" or "/C" for pinning options, see next page and Isolation Restrictions.
xx = 4.5-9Vin = 05	xx = 9-36Vin = 24	* add suffix "/M" for metal case.
xx = 9-18Vin = 12	xx = 18-72Vin = 48	* add suffix "/SMD" for SMD package.
xx = 18-36Vin = 24		* add suffix "/CTRL" for control pin option (A Pinning only)
xx = 36-72Vin = 48		

## Ordering Examples:

REC3-0512DRW/H2/A/CTRL = 2:1 input, 5V Vin, ±12V Vout, 2kVDC, pinout "A", plastic case, control pin  
 REC3-4812SRWZ/H4/A/M = 4:1 input, 48V Vin, 12V Vout, 4kVDC, pinout "A", metal case, no control pin  
 REC3-1212DRWZ/H/B = 4:1 input, 12V Vin, ±12V Vout, 1.6kVDC, pinout "B", plastic case, no control pin  
 REC3-0505SRW/H6/C/SMD = 2:1 input, 5V Vin, 5V Vout, 6kVDC, SMD pinout "C", plastic case, no control pin

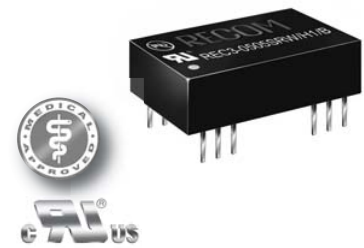
## ECONOLINE

DC/DC-Converter

# REC3-S\_DRW(Z) /H\* Series

3 Watt

DIP24 & SMD  
Single & Dual  
Output



EN-60950-1 Certified  
UL-60950-1 Certified  
EN-60601-1 Certified

RECOM

## Isolation Restrictions

"B" Pinning is restricted to 1.6kV isolation due to the closeness of the input and output pins.

If the options "/M" for metal case and "/SMD" for SMD pinout are combined, the maximum allowed isolation voltage is 2kVDC because of the shorter distances between pins and the metal case.

DIP-24 through-hole case and SMD-plastic case are not affected and offer the full isolation barriers of 2kV through to 6kVDC.

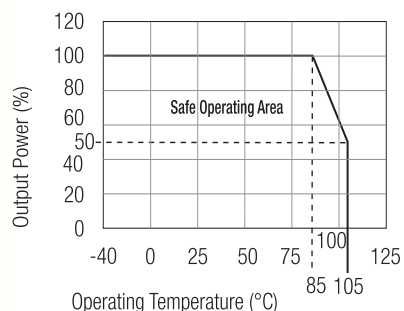
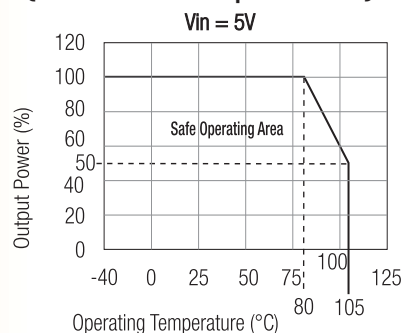
**Specifications** (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Input Voltage Range	2:1 & 4:1		
Output Voltage Accuracy	$\pm 2\%$ max.		
Line Regulation (HL-LL)	$\pm 0.4\%$ max.		
Load Regulation (for output load current change from 20% to 100%)	$\pm 0.6\%$ max.		
Output Ripple and Noise (0,1 $\mu\text{F}$ capacitor on output, 20MHz BW)	50mVp-p max.		
Switching Frequency at Full Load	2:1 Input types	90kHz min. / 150kHz max.	
and nominal Input Voltage	4:1 Input types	120kHz min. / 180kHz max.	
Input Filter	Pi Network		
Efficiency at Full Load	see above		
No Load Power Consumption	300mW max.		
Isolation Voltage	H2 types	(tested for 1 second)	2000VDC min.
Rated Working Voltage	(see note)	(long term isolation)	see Application Notes
Isolation Voltage	H4 types	(tested for 1 second)	4000VDC min.
Rated Working Voltage	(see note)	(long term isolation)	see Application Notes
Isolation Voltage	H6 types	(tested for 1 second)	6000VDC min.
Rated Working Voltage	(see note)	(long term isolation)	see Application Notes
Isolation Capacitance	2:1 Input types	20pF min. / 60pF max.	
	4:1 Input types	40pF min. / 80pF max.	
Isolation Resistance	1 G $\Omega$ min.		
Short Circuit Protection	Continuous, Auto Restart		
Operating Temperature Range (free air convection)	5V input types	-40 $^\circ\text{C}$ to +80 $^\circ\text{C}$ (see Graph)	
	others	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$ (see Graph)	
Storage Temperature Range	-55 $^\circ\text{C}$ to +125 $^\circ\text{C}$		
Relative Humidity	95% RH		
Case Material	Non-Conductive Plastic		
Thermal Impedance	Natural convection	20 $^\circ\text{C}/\text{W}$ for metal case	
Package Weight	13g		
MTBF (+25 $^\circ\text{C}$ )	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	1043 x 10 <sup>3</sup> hours
(+85 $^\circ\text{C}$ )		using MIL-HDBK 217F	186 x 10 <sup>3</sup> hours

**Ordering Examples:**

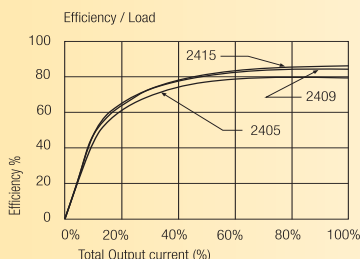
REC3-0512DRW/H2/A/CTRL= 2:1 input, 5V Vin,  $\pm 12\text{V}$  Vout, 2kVDC, pinout "A", plastic case, control pin  
 REC3-4812SRWZ/H4/A/M = 4:1 input, 48V Vin, 12V Vout, 4kVDC, pinout "A", metal case, no control pin  
 REC3-1212DRWZ/H/B = 4:1 input, 12V Vin,  $\pm 12\text{V}$  Vout, 1.6kVDC, pinout "B", plastic case, no control pin  
 REC3-0505SRW/H6/C/SMD = 2:1 input, 5V Vin, 5V Vout, 6kVDC, SMD pinout "C", plastic case, no control pin

## Derating-Graph (Ambient Temperature)

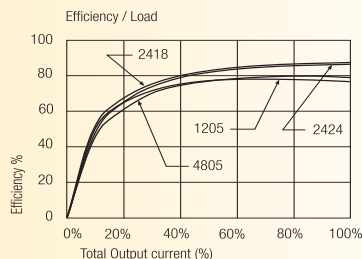


**Typical Characteristics**

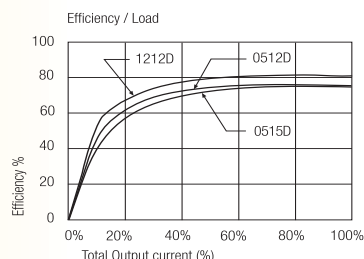
### Single 2:1 Input



### Single 2:1 Input

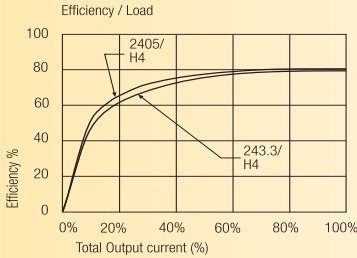


### Dual 2:1 Input

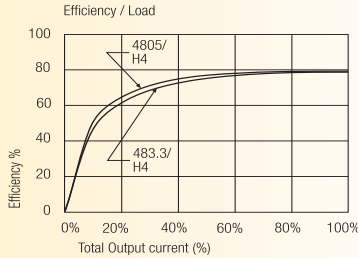


Typical Characteristics - Continued

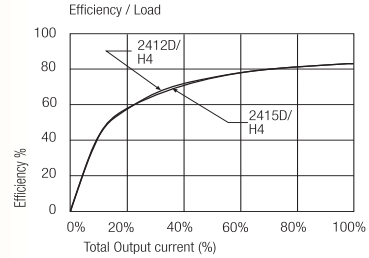
## Single 4:1 Input



## Single 4:1 Input

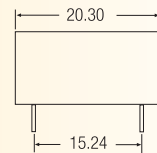
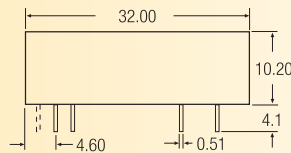


## Dual 4:1 Input



Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

**"A" Pinning**  
/H2, /H4 & /H6



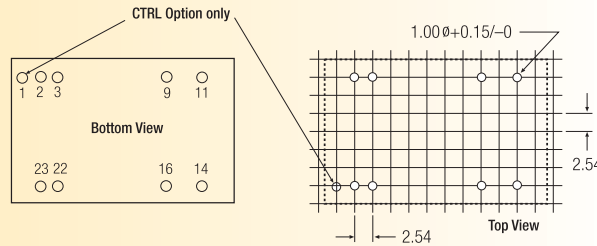
Pin Connections

Pin #	Single	Dual
1 (option)	CTRL	CTRL
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

NC = No Connection

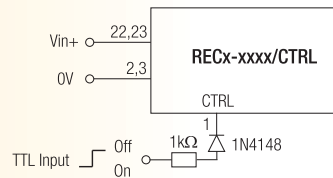
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

Recommended Footprint Details

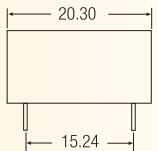
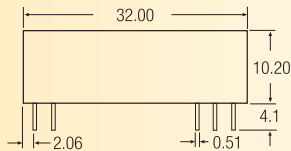


**CTRL Option**

ON = Open or  $0V < V_{ctrl} < 1.2V$   
OFF =  $2.2V < V_{ctrl} < 12V$



**"C" Pinning**  
/H2, /H4 & /H6



Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	+Vin	+Vin
10	NC	Com
11	NC	Com
12	-Vout	NC
13	+Vout	-Vout
15	NC	+Vout
23	-Vin	-Vin
24	-Vin	-Vin

NC = No Connection  
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

Recommended Footprint Details

