

Features

Regulated Converters

- High 4kVDC & 6kVDC Isolation
- 5W DIP24 Industry Standard Package
- Feedback Regulated Output
- Continuous Short Circuit Protection
- Wide Inputs 2:1 & 4:1
- Approved for Medical Applications
- UL and EN Safety Approvals
- 2 Pinout Options, 3 Case Styles
- Efficiency to 86 %

ECONOLINE

DC/DC-Converter

RECOM

Description

This series offers standard isolation of 2kVDC with 4kVDC or 6kVDC options making it ideal for both industrial, medical and other sophisticated high end applications. Packaging can be either DIP-24 non-conductive plastic or 5-side-shielded DIP24 metal case (= option "/M") as well as DIP24-SMD case (= option "/SMD"). For all the above variants, 2 industry-standard pinouts (= option "/A" or "/C") are available. "B" pinning is also available with "/H" isolation of 1.6kVDC. 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
REC5-xx3.3SRW/H*	9 - 18, 18 - 36, 36 - 72	3.3	1000	75-77	2200µF
REC5-xx05SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	5	1000	79-81 72	1000µF
REC5-xx09SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	9	556	82-83 73	470µF
REC5-xx12SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	12	420	84-85 74	220µF
REC5-xx15SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	15	340	85-86 75	120µF
REC5-xx05DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±5	±500	79-81 72	±470µF
REC5-xx09DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±9	±278	82-84 74	±220µF
REC5-xx12DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±12	±210	84-85 75	±100µF
REC5-xx15DRW/H*	9 - 18, 18 - 36, 36 - 72	±15	±170	85-86	±68µF
REC5-xx3.3SRWZ/H*	9 - 36**, 18 - 72	3.3	1000	75-76	2200µF
REC5-xx05SRWZ/H*	9 - 36**, 18 - 72	5	1000	81-82	1000µF
REC5-xx09SRWZ/H*	9 - 36, 18 - 72	9	556	82-83	470µF
REC5-xx12SRWZ/H*	9 - 36, 18 - 72	12	420	83-84	220µF
REC5-xx15SRWZ/H*	9 - 36, 18 - 72	15	340	84-85	120µF
REC5-xx05DRWZ/H*	9 - 36**, 18 - 72	±5	±500	81-82	±470µF
REC5-xx09DRWZ/H*	9 - 36, 18 - 72	±9	±278	82-84	±220µF
REC5-xx12DRWZ/H*	9 - 36, 18 - 72	±12	±210	82-83	±100µF
REC5-xx15DRWZ/H*	9 - 36, 18 - 72	±15	±170	84-85	±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.

2:1 Input

(REC5-S/DRW)

xx = 4.5-9Vin = 05

xx = 9-18Vin = 12

xx = 18-36Vin = 24

xx = 36-72Vin = 48

4:1 Input

(REC5-S/DRWZ)

xx = 9-36Vin = 24

xx = 18-72Vin = 48

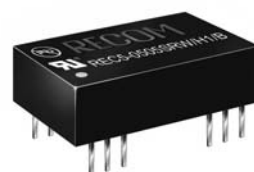
* add suffix "/A", "/B" or "/C" for pinning options, see next page and Isolation Restrictions.

* add suffix "/M" for metal case.

* add suffix "/SMD" for SMD package.

* add suffix "/CTRL" for control pin option (A Pinning only)

5 Watt DIP24 & SMD Single & Dual Output



E-224736

EN-60950-1 Certified

UL-60950-1 Certified

EN-60601-1 Certified

REC 5

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.

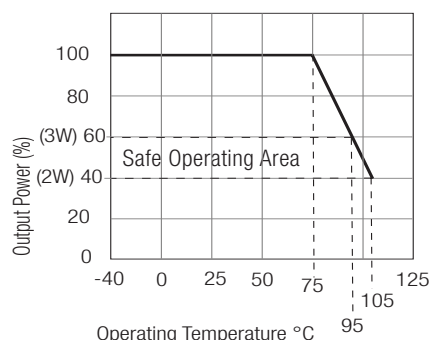
DIP-24 through-hole case and SMD-plastic case are not affected and offer the full isolation barriers of 2kV through to 6kVDC.

Refer to Application Notes

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			±2% max.	
Line Regulation (HL-LL)			±0.3% max.	
Load Regulation (for output load current change from 20% to 100%)			±0.6% max.	
Output Ripple and Noise (0,1µF capacitor on output, 20MHz BW)			50mVp-p max.	
Operating Frequency at Full Load (at nominal input voltage)	2:1 input	120kHz typ.		
	4:1 input	200kHz typ.		
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			60pF typ.	
Isolation Resistance			1 GΩ min.	
Short Circuit Protection			Continuous, Auto Restart	
Operating Temperature (free air convection)			-40°C to +75°C (see Graph)	
Storage Temperature Range			-55°C to +125°C	
Relative Humidity			95% RH	
Case Material			Non-Conductive Plastic or Metal	
Thermal Impedance		Natural convection	20°C/W for plastic case 12°C/W for metal case	
Package Weight			13g	
MTBF (+25°C)		Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	850 x 10 ³ hours
(+75°C)				using MIL-HDBK 217F

Derating-Graph (Ambient Temperature)

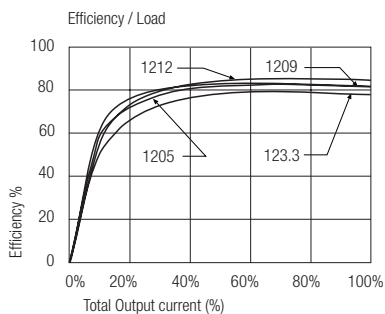


Ordering Examples:

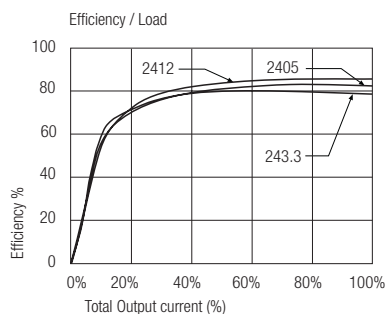
REC5-0512DRW/H2/A/CTRL = 2:1 input, 5V V_{in} , $\pm 12\text{V}$ V_{out} , 2kVDC, pinout "A", plastic case, control pin
 REC5-4812SRWZ/H4/A/M = 4:1 input, 48V V_{in} , 12V V_{out} , 4kVDC, pinout "A", metal case, no control pin
 REC5-1212DRWZ/H/B = 4:1 input, 12V V_{in} , $\pm 12\text{V}$ V_{out} , 1.6kVDC, pinout "B", plastic case, no control pin
 REC5-0505SRW/H6/C/SMD = 2:1 input, 5V V_{in} , 5V V_{out} , 6kVDC, SMD pinout "C", plastic case, no control pin

Typical Characteristics

12V Single 2:1

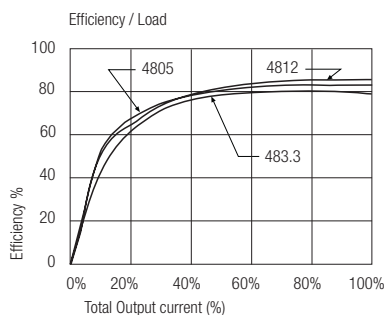


24V Single 2:1

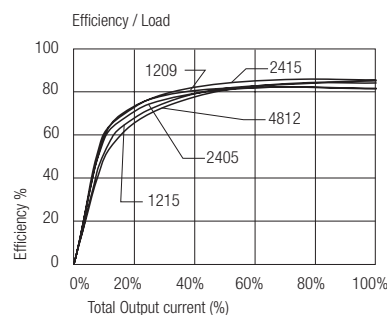


Typical Characteristics

48V Single 2:1



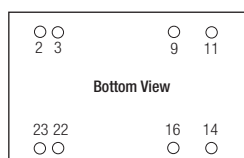
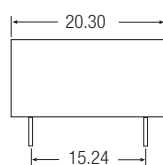
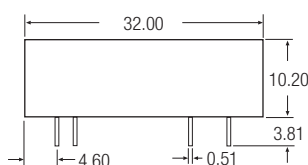
Dual 4:1



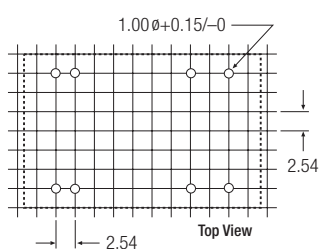
Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

"A" Pinning

/H2, /H4 & /H6



Recommended Footprint Details



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

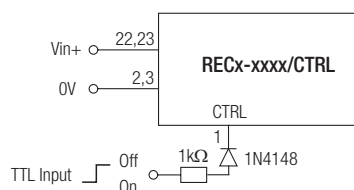
NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

CTRL Option

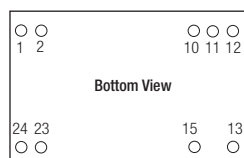
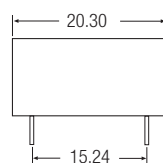
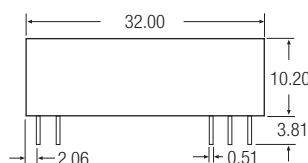
ON = Open or $0V < V_{ctrl} < 1.2V$

OFF = $2.2V < V_{ctrl} < 12V$

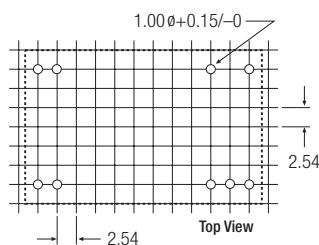


"C" Pinning

/H2, /H4 & /H6



Recommended Footprint Details



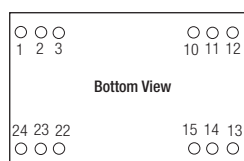
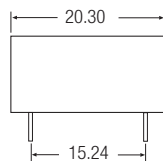
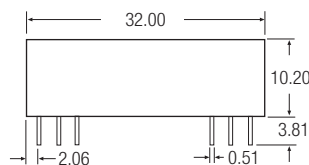
Pin Connections

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

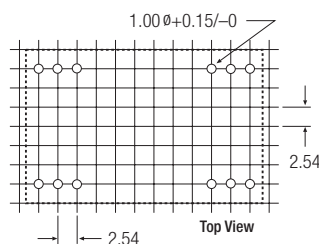
NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

"B" Pinning
/H (1.6kV Only)



Recommended Footprint Details



Pin Connections

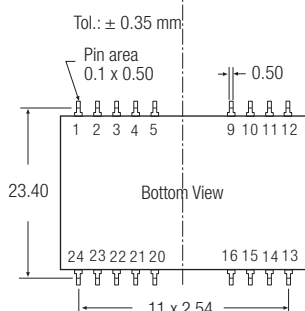
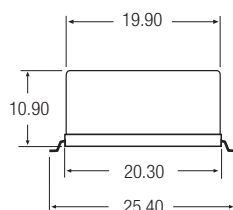
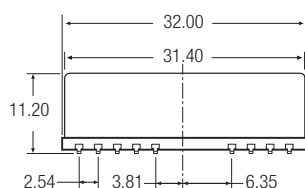
Pin #	Single	Dual
1	+Vin	+Vin
2	No Pin	-Vout
3	No Pin	Com
10	-Vout	Com
11	+Vout	+Vout
12	-Vin	-Vin
13	-Vin	-Vin
14	+Vout	+Vout
15	-Vout	Com
22	No Pin	Com
23	No Pin	-Vout
24	+Vin	+Vin

NC = No Connection

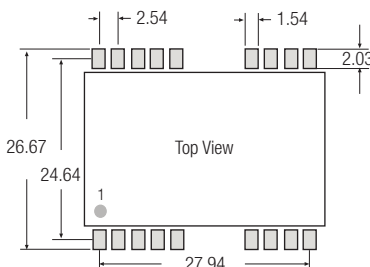
XX.X ± 0.5 mm

XX.XX ± 0.25 mm

SMD Pinning



Recommended Footprint Details



SMD pin connections follow standard package A (/A/SMD), B (/B/SMD) or C (/C/SMD) pinning.

All unused pins are NC (No Connection). See Below for detailed pinout lists

for all packages incl.SMD case the length of plastic case is 31,8 mm, length of metal case 32.0 mm

/A/SMD Pinning

/B/SMD Pinning

/C/SMD Pinning

Pin Connections			Pin Connections			Pin Connections			Pin Connections			Pin Connections			Pin Connections		
Pin #	Single	Dual	Pin #	Single	Dual	Pin #	Single	Dual	Pin #	Single	Dual	Pin #	Single	Dual	Pin #	Single	Dual
1 (Option)	CTRL	CTRL	13	NC	NC	1	+Vin	+Vin	13	-Vin	-Vin	1	+Vin	+Vin	13	+Vout	-Vout
2	-Vin	-Vin	14	+Vout	+Vout	2	NC	-Vout	14	+Vout	+Vout	2	+Vin	+Vin	14	NC	NC
3	-Vin	-Vin	15	NC	NC	3	NC	Com	15	-Vout	Com	3	NC	NC	15	NC	+Vout
4	NC	NC	16	-Vout	Com	4	NC	NC	16	NC	NC	4	NC	NC	16	NC	NC
5	NC	NC	20	NC	NC	5	NC	NC	20	NC	NC	5	NC	NC	20	NC	NC
9	NC	Com	21	NC	NC	9	NC	NC	21	NC	NC	9	NC	NC	21	NC	NC
10	NC	NC	22	+Vin	+Vin	10	-Vout	Com	22	NC	Com	10	NC	Com	22	NC	NC
11	NC	-Vout	23	+Vin	+Vin	11	+Vout	+Vout	23	NC	-Vout	11	NC	Com	23	-Vin	-Vin
12	NC	NC	24	NC	NC	12	-Vin	-Vin	24	+Vin	+Vin	12	-Vout	NC	24	-Vin	-Vin