Features

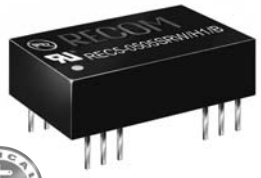
Regulated Converters

- 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
with 3 year Warranty

RECOM

5 Watt DIP24 & SMD Single & Dual Output



RoHS 2011/65/EU 6/6

E358085

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

REC 5

Description

This series offers standard isolation of 2kDC 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). The converters can deliver 140% rated power for short periods of time to cope with applications with large capacitive loads or high start up currents.

Selection Guide

Part Number DIP24 (SMD)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	Max Capacitive Load [1]
REC5-xx3.3SRW/H*	9 - 18, 18 - 36, 36 - 72	3.3	1000	75-77	6800µF
REC5-xx05SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	5	1000	79-81 72	6800µF
REC5-xx09SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	9	556	82-83 73	6800µF
REC5-xx12SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	12	420	84-85 74	6800µF
REC5-xx15SRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	15	340	85-86 75	6800µF
REC5-xx05DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±5	±500	79-81 72	±2200µF
REC5-xx09DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±9	±278	82-84 74	±2200µF
REC5-xx12DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±12	±210	84-85 75	±2200µF
REC5-xx15DRW/H*	9 - 18, 18 - 36, 36 - 72 4.5 - 9V	±15	±170	85-86 75	±2200µF
REC5-xx3.3SRWZ/H*	9 - 36**, 18 - 72	3.3	1000	75-76	6800µF
REC5-xx05SRWZ /H*	9 - 36**, 18 - 72	5	1000	81-82	6800µF
REC5-xx09SRWZ/H*	9 - 36, 18 - 72	9	556	82-83	6800µF
REC5-xx12SRWZ /H*	9 - 36, 18 - 72	12	420	83-84	6800µF
REC5-xx15SRWZ/H*	9 - 36, 18 - 72	15	340	84-85	6800µF
REC5-xx05DRWZ/H*	9 - 36**, 18 - 72	±5	±500	81-82	±2200µF
REC5-xx09DRWZ/H*	9 - 36, 18 - 72	±9	±278	82-84	±2200µF
REC5-xx12DRWZ /H*	9 - 36, 18 - 72	±12	±210	82-83	±2200µF
REC5-xx15DRWZ /H*	9 - 36, 18 - 72	±15	±170	84-85	±2200µF

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. ** Derate to 900mA (±450mA) max. at Vin=9V

Note 1: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

* 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)
* add suffix **-R** for Tape and Reel packaging

2:1 Input (REC5-S/DRW)	**4:1** Input (REC5-S/DRWZ)
xx = 4.5-9Vin = 05	xx = 9-36Vin = 24
xx = 9-18Vin = 12	xx = 18-72Vin = 48
xx = 18-36Vin = 24	
xx = 36-72Vin = 48	

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.

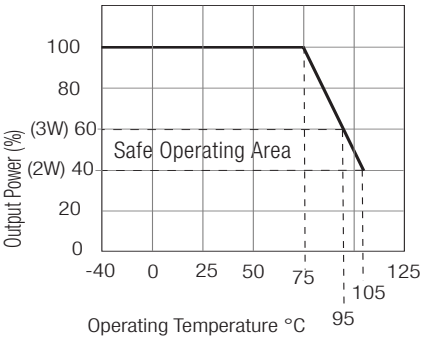
Refer to Application Notes

REC5-S_DRW(Z) /H* Series

Specifications (measured at T_A = 25°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.
Minimum Load			0%
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 4:1 input	120kHz typ. 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) (rated for 1 minute)	2000VDC 1000VAC / 60Hz
Isolation Voltage	H4 types	(tested for 1 second) (rated for 1 minute)	4000VDC 2000VAC / 60Hz
Isolation Voltage	H6 types	(tested for 1 second) (rated for 1 minute)	6000VDC 3000VAC / 60Hz
Isolation Capacitance			60pF typ.
Isolation Resistance			1 GΩ min.
Short Circuit Protection (Max temp. = 50°C during short circuit conditions)			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
Packing Quantity			15 pcs per Tube 100 pcs per Reel
MTBF (+25°C) *Detailed Information see Application Notes chapter "MTBF"*		using MIL-HDBK 217F	850 x 10^3hours
(+75°C)		using MIL-HDBK 217F	206 x 10^3hours
Certifications	UL General Safety	Report: E358085	UL 60950-1 1st Ed. C22.2 No. 60950-1-03
	EN General Safety	Report: SPCLVD1212007	EN60950-1:2006 + 9+A1:2010+A12:2011
	EN Medical Safety	Report: MDD1205098-3 + RM1205098-3	
	IEC/EN 60601-1 3rd Edition, Medical Report + ISO14971 Risk Assessment		

Derating-Graph
(Ambient Temperature)



Ordering Examples:

REC5-0512DRW/H2/A/CTRL= 2:1 input, 5V Vin, ±12V Vout, 2kVDC, pinout "A",plastic case, control pin

REC5-4812SRWZ/H4/A/M = 4:1 input, 48V Vin, 12V Vout, 4kVDC, pinout "A",metal case, no control pin

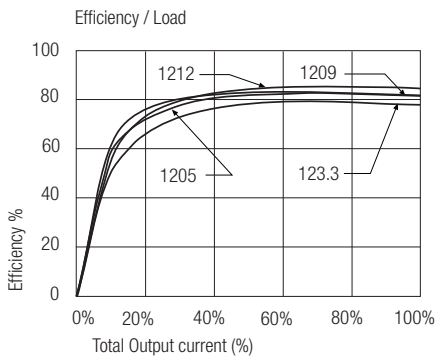
REC5-1212DRWZ/H/B = 4:1 input, 12V Vin, ±12V Vout, 1.6kVDC, pinout "B",plastic case, no control pin

REC5-0505SRW/H6/C/SMD = 2:1 input, 5V Vin, 5V Vout, 6kVDC, SMD pinout "C",plastic case, no control pin

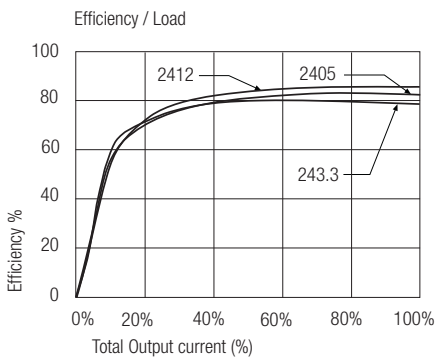
REC5

Typical Characteristics

12V Single 2:1



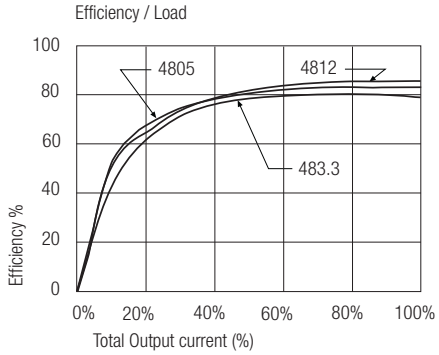
24V Single 2:1



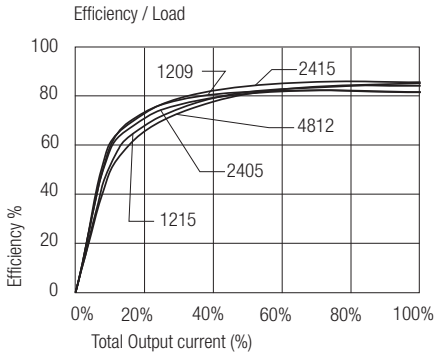
REC5-S_DRW(Z) /H* Series

Typical Characteristics

48V Single 2:1



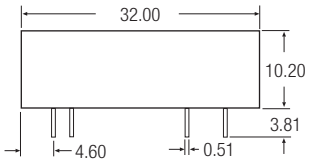
Dual 4:1

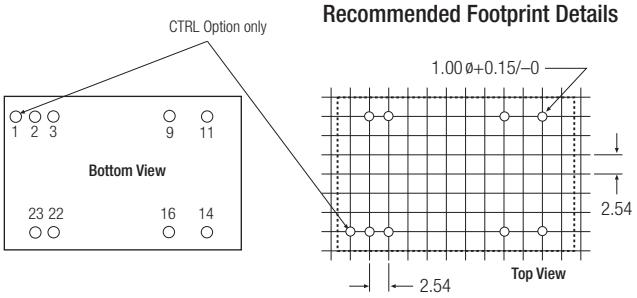


Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

3rd angle projection

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





Pin Connections

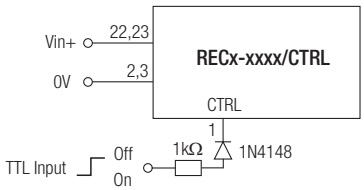
Pin #	Single	Dual
1 (option)	CTRL	CTRL
2	–Vin	–Vin
3	–Vin	–Vin
9	NC	Com
11	NC	–Vout
14	+Vout	+Vout
16	–Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

NC = No Connection

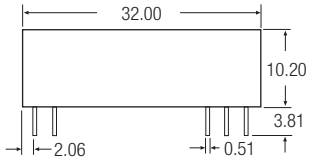
XX.X ± 0.5 mm
XX.XX ± 0.25 mm

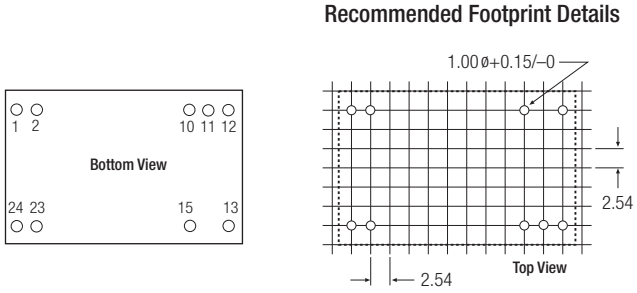
CTRL Option

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

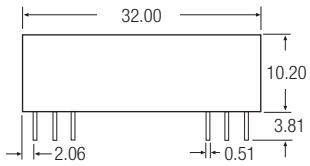
REC5

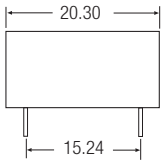
REC5-S_DRW(Z) /H* Series

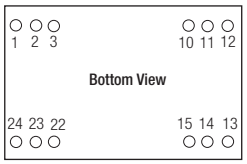
Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

3rd angle projection

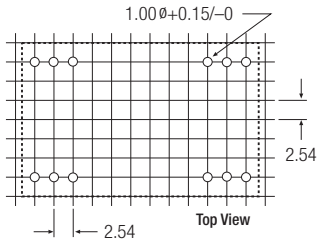
"B" Pinning /H (1.6kV Only)







Recommended Footprint Details



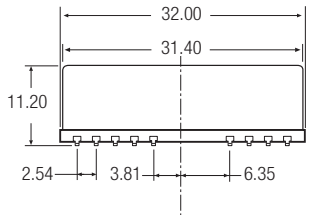
Pin Connections

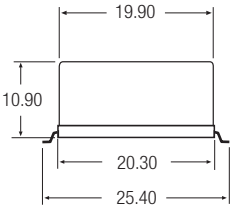
Pin #	Single	Dual
1	+Vin	+Vin
2	No Pin	–Vout
3	No Pin	Com
10	–Vout	Com
11	+Vout	+Vout
12	–Vin	–Vin
13	–Vin	–Vin
14	+Vout	+Vout
15	–Vout	Com
22	No Pin	Com
23	No Pin	–Vout
24	+Vin	+Vin

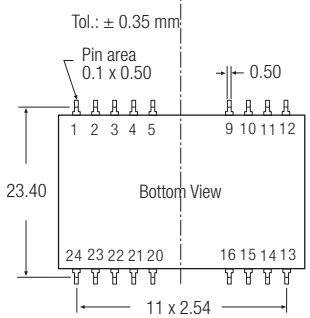
NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

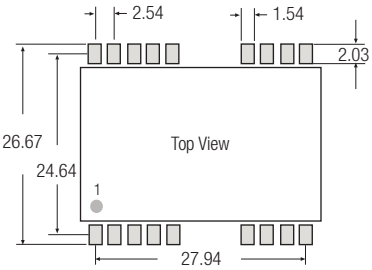
SMD Pinning







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

Pin Connections

Pin #	Single	Dual
1 (Option)	CTRL	CTRL
2	–Vin	–Vin
3	–Vin	–Vin
4	NC	NC
5	NC	NC
9	NC	Com
10	NC	NC
11	NC	-Vout
12	NC	NC

Pin Connections

Pin #	Single	Dual
13	NC	NC
14	+Vout	+Vout
15	NC	NC
16	-Vout	Com
20	NC	NC
21	NC	NC
22	+Vin	+Vin
23	+Vin	+Vin
24	NC	NC

/B/SMD Pinning

Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	NC	–Vout
3	NC	Com
4	NC	NC
5	NC	NC
9	NC	NC
10	-Vout	Com
11	+Vout	+Vout
12	-Vin	-Vin

Pin Connections

Pin #	Single	Dual
13	-Vin	-Vin
14	+Vout	+Vout
15	-Vout	Com
16	NC	NC
20	NC	NC
21	NC	NC
22	NC	Com
23	NC	-Vout
24	+Vin	+Vin

/C/SMD Pinning

Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	+Vin	+Vin
3	NC	NC
4	NC	NC
5	NC	NC
9	NC	NC
10	NC	Com
11	NC	Com
12	-Vout	NC

Pin Connections

Pin #	Single	Dual
13	+Vout	-Vout
14	NC	NC
15	NC	+Vout
16	NC	NC
20	NC	NC
21	NC	NC
22	NC	NC
23	-Vin	-Vin
24	-Vin	-Vin