Features

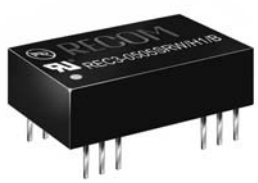
Regulated Converters

- 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%

ECONOLINE
DC/DC-Converter

RECOM

3 Watt DIP24 & SMD Single & Dual Output



E-224736
EN-60950-1 Certified
UL-60950-1 Certified
EN-60601-1 Certified

REC3-H*

Description

Besides the standard isolation of 2kVDC, this series offers options of 4kVDC (= "/H4") or 6kVDC (= "/H6") makingit 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.

2:1 Input (REC3-S/DRWH4/H6)
xx = 4.5-9Vin = 05
xx = 9-18Vin = 12
xx = 18-36Vin = 24
xx = 36-72Vin = 48

4:1 Input (REC3-S/DRWZ(H4/H6))
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)

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

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.

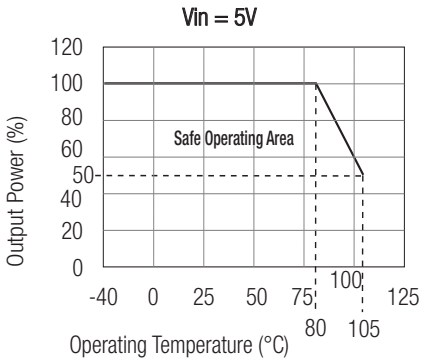
Refer to Application Notes

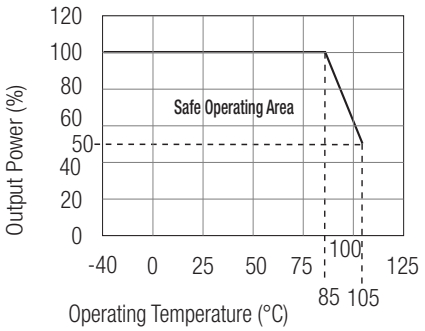
REC3-S_DRW(Z) /H* Series

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)			±0.4% 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.
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 GΩ min.
Short Circuit Protection			Continuous, Auto Restart
Operating Temperature Range		5V input types	-40°C to +80°C (see Graph)
(free air convection)		others	-40°C to +85°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	1043 x 10^3 hours
(+85°C)		using MIL-HDBK 217F	186 x 10^3 hours

Derating-Graph (Ambient Temperature)

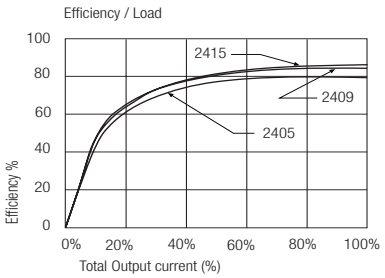




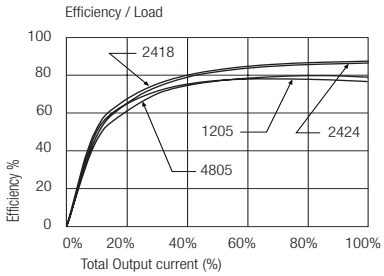
REC3-H*

Typical Characteristics

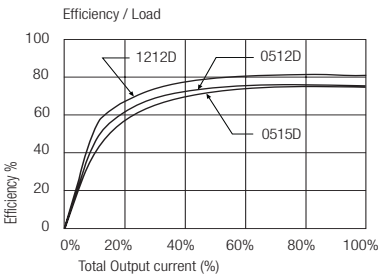
Single 2:1 Input



Single 2:1 Input

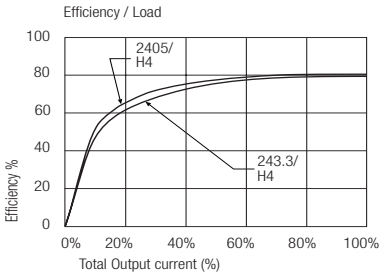


Dual 2:1 Input

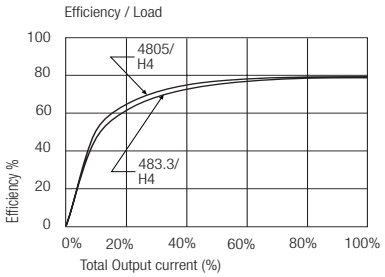


Typical Characteristics - Continued

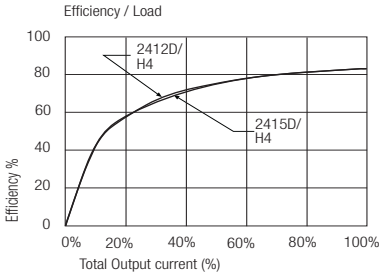
Single 4:1 Input



Single 4:1 Input



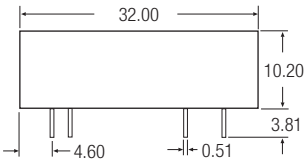
Dual 4:1 Input

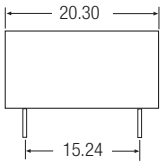


Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

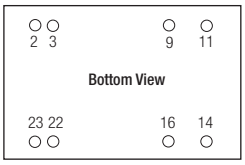
3rd angle projection

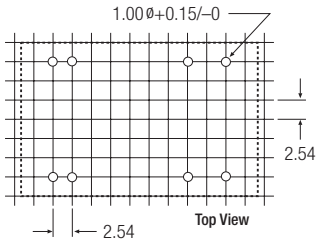
"A" Pinning /H2, /H4 & /H6





Recommended Footprint Details





Pin Connections

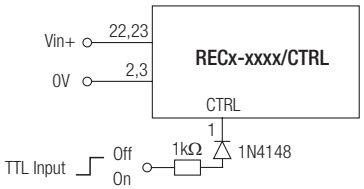
Pin #	Single	Dual
1 (option)	CTRL	CTRL
2	–Vin	–Vin
3	–Vin	–Vin
9	NC	Com
11	NC	–Vout
14	+Vout	+Vout
16	–Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

NC = No Connection

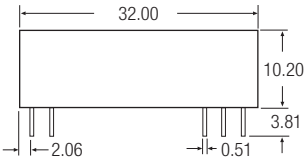
XX.X ± 0.5 mm
XX.XX ± 0.25 mm

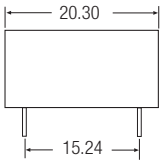
CTRL Option

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



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





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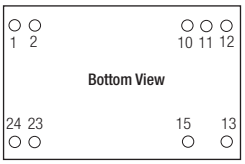
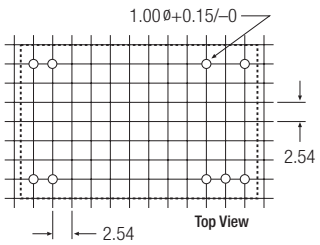




Pin Connections

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

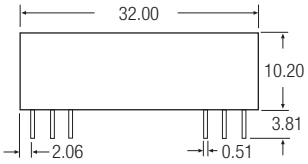
NC = No Connection

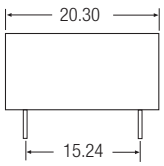
XX.X ± 0.5 mm
XX.XX ± 0.25 mm

REC3-S_DRW(Z) /H* Series

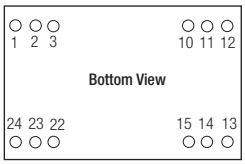
Package Style and Pinning (mm) DIP 24 , Wide Input 2:1 & 4:1

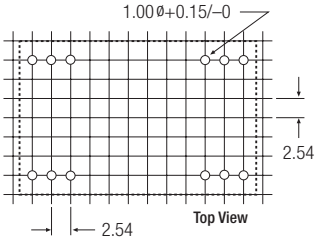
"B" Pinning /H (1.6kV Only)





Recommended Footprint Details





3rd angle projection

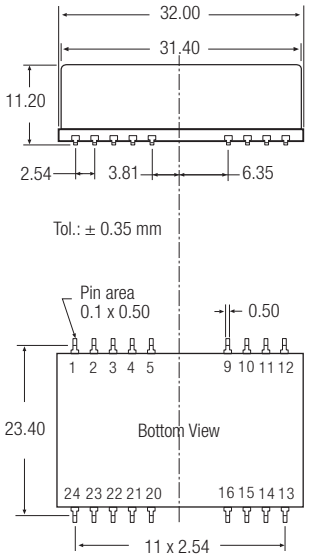
Pin Connections

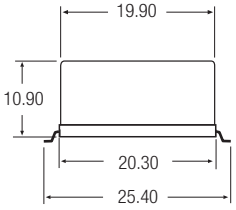
Pin #	Single	Dual
1	+Vin	+Vin
2	No Pin	–Vout
3	No Pin	Com
10	–Vout	Com
11	+Vout	+Vout
12	–Vin	–Vin
13	–Vin	–Vin
14	+Vout	+Vout
15	–Vout	Com
22	No Pin	Com
23	No Pin	–Vout
24	+Vin	+Vin

NC = No Connection

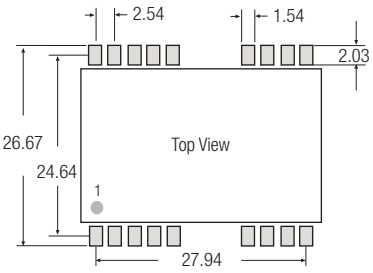
XX.X ± 0.5 mm
XX.XX ± 0.25 mm

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

/B/SMD Pinning

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

/C/SMD Pinning

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