Features

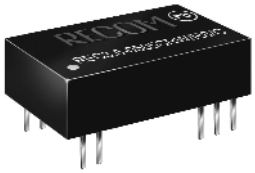
Regulated Converters

- 8kVDC & 10kVDC Reinforced Isolation
- Industry Standard DIP24 Package
- 6W Regulated Output
- Continuous Short Circuit Protection
- Wide Input 2:1
- Medical Approved
- EN, CSA and CB Certificates
- 2 Pinout Options
- Control Pin Option
- Efficiency to 86%

ECONOLINE
DC/DC-Converter

RECOM

6 Watt DIP24 Reinforced Single & Dual Output



RoHS 2002/95/EC 6/6

C US

C22.2-No. 60950 Certified
C22.2-601.1 Certified
UL Certification Pending

REC6/R

Description

The REC6 series uses a reinforced isolation transformer to offer exceptionally high isolation of 8kVDC (4kVAC/1 minute) or 10kVDC (5kVAC/1minute) making it suitable for HT monitoring circuits, mains power meters, IGBT isolated power supplies and other sophisticated industrial and medical applications. The isolation capacitance of only 20pF makes them also suitable for low leakage applications. The isolation transformer is recognised by CSA as reinforced isolated with a minimum internal clearance of 2.4mm and a minimum internal creepage clearance o f4.6mm. The REC6 is available in two industry-standard pinouts (= "/A" or "/C"). Remote on/off control is possible with the /CTRL option (A pinning only) and an optional undervoltage lockout function is also available (="/X1"). 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	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	Max. Cap. Load
REC6-xx05SRW/R*	9 - 18, 18 - 36, 36 - 75	5	1000	80, 81, 82	1000µF
	4.5 - 9			77	
REC6-xx09SRW/R*	9 - 18, 18 - 36, 36 - 75	9	667	81, 82, 83	470µF
	4.5 - 9		555	80	
REC6-xx12SRW/R*	9 - 18, 18 - 36, 36 - 75	12	500	82, 83, 84	470µF
	4.5 - 9		417	82	
REC6-xx15SRW/R*	9 - 18, 18 - 36, 36 - 75	15	400	84, 85, 86	220µF
	4.5 - 9		333	83	
REC6-xx24SRW/R*	9 - 18, 18 - 36, 36 - 75	24	250	83, 84, 85	220µF
	4.5 - 9		208	82	
REC6-xx05DRW/R*	9 - 18, 18 - 36, 36 - 75	±5	±500	80, 81, 82	±470µF
	4.5 - 9			77	
REC6-xx09DRW/R*	9 - 18, 18 - 36, 36 - 75	±9	±335	81, 82, 83	±220µF
	4.5 - 9		±278	80	
REC6-xx12DRW/R*	9 - 18, 18 - 36, 36 - 75	±12	±250	81, 82, 83	±100µF
	4.5 - 9		±208	82	
REC6-xx15DRW/R*	9 - 18, 18 - 36, 36 - 75	±15	±200	82, 83, 84	±100µF
	4.5 - 9		±167	80	

R* = R8 or R10 for 8kVDC or 10kVDC isolation.

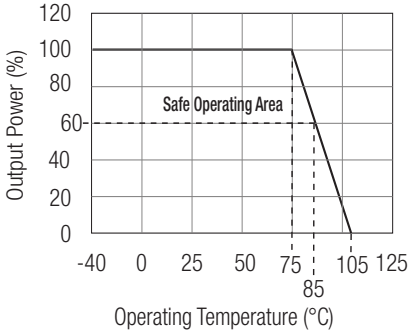
2:1 Input
(REC6-S_DRW/R8(R10)
xx = 4.5-9Vin = 05
xx = 9-18Vin = 12
xx = 18-36Vin = 24
xx = 36-75Vin = 48

* add suffix "/A" or "/C" for pinning options, see next page for details.
* add suffix "/CTRL" for control pin option (A Pinning only)
* add suffix "/X1" for Undervoltage Lockout
* add suffix -R for Tape and Reel packaging

Ordering Examples:

REC6-0512DRW/R8/A/CTRL= 5V Vin, ±12V Vout, 8kVDC isolation, pinout "A",control pin
REC6-4805SRW/R10/A = 48V Vin, 5V Vout, 10kVDC isolation, pinout "A"
REC6-1212DRW/R8/C/X1 = 12V Vin, ±12V Vout, 8kVDC isolation, pinout "C",UVL
REC6-0505SRW/R10/A/CTRL/X1 = 5V Vin, 5V Vout, 10kVDC isolation, pinout "A",control pin, UVL

Derating-Graph
(Ambient Temperature)



Refer to Application Notes

REC6-S_DRW /R* Series

Specifications (measured at T_A = 25°C, nominal input voltage, full load and after warm-up)

Input Voltage Range				2:1
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.
Input Surge	(1 minute)		5V types	16V max.
			12V types	25V max.
			24V types	50V max.
			48V types	100V max.
Undervoltage Lockout	(/X1 Versions)		5V types	3.5V typ. (±20%)
			12V types	7V typ. (±20%)
			24V types	15V typ. (±10%)
			48V types	32V typ. (±10%)
Output Ripple and Noise	(0,1µF capacitor on output, 20MHz BW limited)			200mVp-p max.
Transient Response	(25% step change)			1ms typ.
Switching Frequency	(Full load and nominal input voltage)			100kHz min. / 350kHz max.
Input Filter				Pi Network
Capacitors	All types			MLCC capacitors only
Minimum Load	(Operation under no load will not damage the converter, but it may not meet all specifications)			10% Full Load
No Load Power Consumption				400mW max.
Isolation Voltage	R8 types	(tested for 1 second)		8000VDC min.
		(rated for 1 minute)		4000VAC min.
Rated Working Voltage		(long term isolation)		see Application Notes
Isolation Voltage	R10 types	(tested for 1 second)		10000VDC min.
		(rated for 1 minute)		5000VAC min.
Rated Working Voltage		(long term isolation)		see Application Notes
Isolation Capacitance				20pF typ.
Isolation Resistance				10 GΩ min.
Short Circuit Protection		(Max operating temp. = 50°C during short circuit conditions)		Continuous, Auto Restart
Operating Temperature Range		(free air convection)		-40°C to +75°C (see Graph)
Case Temperature				105°C max.
Storage Temperature Range				-55°C to +125°C
Relative Humidity				95% RH
Case Material				Non-Conductive Plastic
Potting Material				Silicone
Thermal Impedance		Natural convection		20°C/W
Package Weight				14g
Packing Quantity				15 pcs per Tube
				100 pcs per Reel
MTBF (+25°C)	*Detailed Information see Application Notes chapter "MTBF"*		using MIL-HDBK 217F	953 x10³ hours
(+75°C)			using MIL-HDBK 217F	234 x10³ hours
EMC		Conducted Emissions	EN55022	Class A
(with 470µF//0.1µF capacitors across input)		Radiated Emissions	EN55022	Class A
Reinforced Isolation		Transformer Creepage	/R8 and /R10 Types	4.6 mm min.
		Transformer Clearance	/R8 and /R10 Types	2.4 mm min.
		PCB Creepage & Clearance	/R8 and /R10 Types	6.0 mm min.
		Optocoupler Creepage	/R8 and /R10 Types	6.0 mm min.
External Creepage and Clearance		Plastic Case	Input <> Output pins	14.2 mm min.
Certifications	CB Report	Medical Safety	Ref: CA/11158/CSA	IEC60601-1:1988 + A1: 1991 + A2:1995
	CSA	Medical Safety	Report: 2202478	C22.2 601-1 2nd Ed.
				UL 60601-1 1st Ed.
		General Safety	Report: 2219431	C22.2 No. 60950-1-03
				UL 60950-1 1st Ed.
		Recognised as Reinforced Isolation		Supplement to Report: 2219431

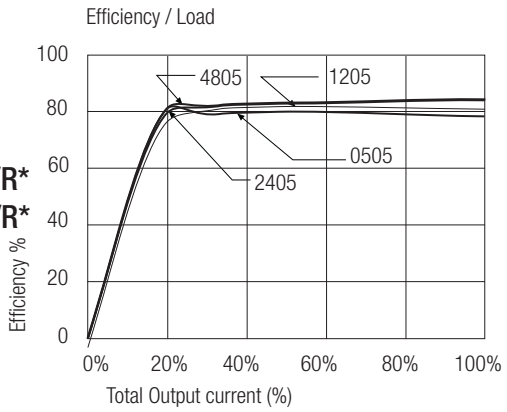
REC6-S_DRW /R* Series

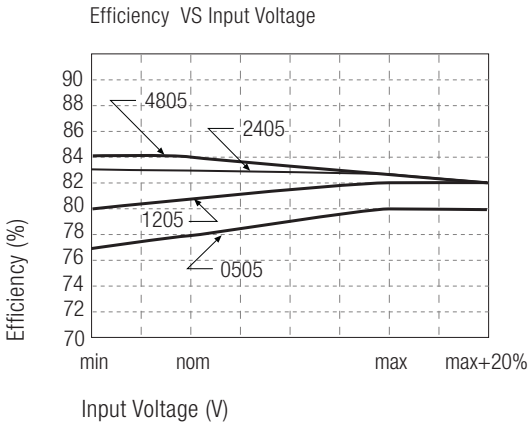
Typical Characteristics

Efficiency vs Load

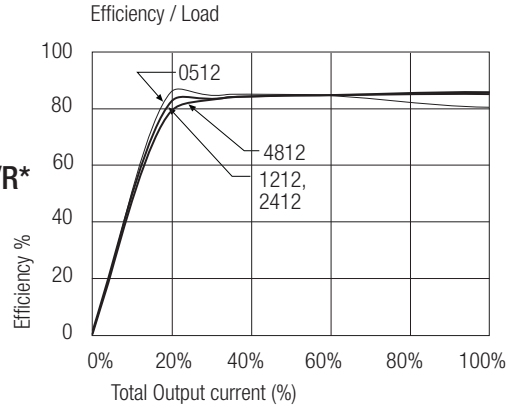
Efficiency vs Vin

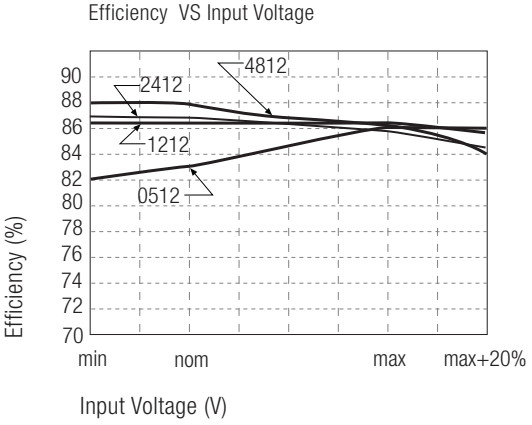
REC6-xx05SRW/R*
REC6-xx05DRW/R*



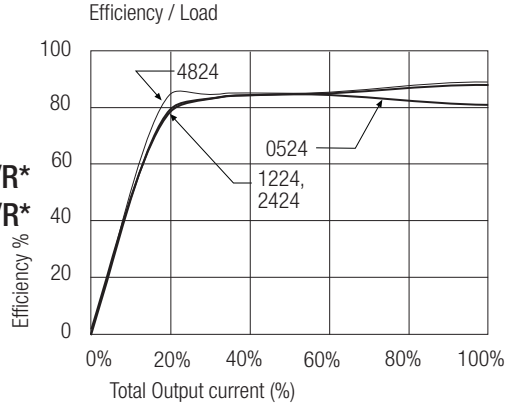


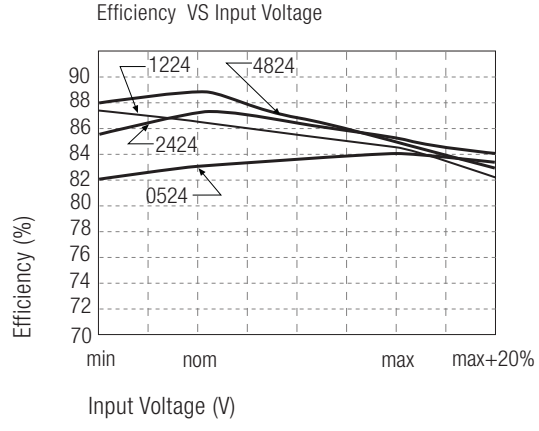
REC6-xx12SRW/R*





REC6-xx24SRW/R*
REC6-xx12DRW/R*



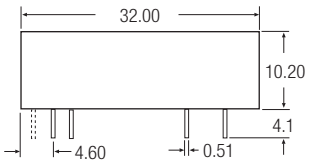


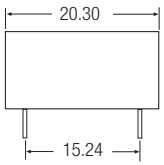
REC6/R

Package Style and Pinning (mm) DIP 24 (continued)

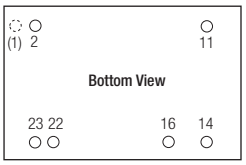
3rd angle projection

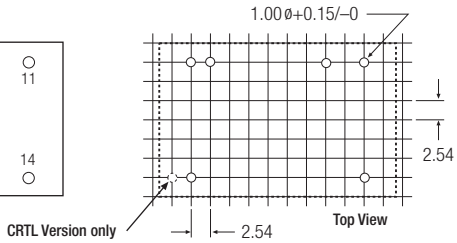
"A" Pinning /R8 & /R10





Recommended Footprint Details





Pin Connections

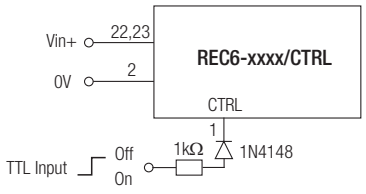
Pin #	Single	Dual
1 (option)	CTRL	CTRL
2	–Vin	–Vin
11	NC	–Vout
14	+Vout	+Vout
16	–Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

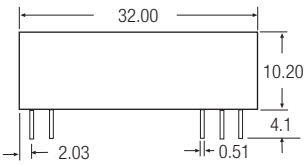
CTRL Option

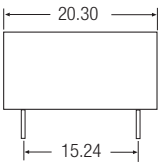
ON = Open or 0V< V_{ctrl} <1.2V
OFF = 2.2V< V_{ctrl} <12V



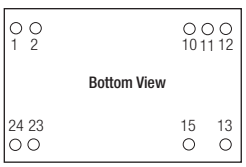
REC6/R

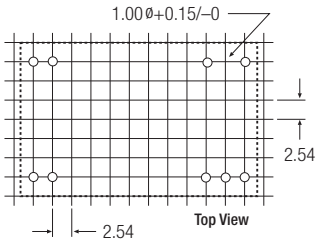
"C" Pinning /R8 & /R10





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