

## Features

## Regulated Converters

- 10W in 2" x 1" Package
- 2kVDC and 3kVDC Isolation Options
- 2:1 or 4:1 Input Voltage Range
- Continuous Short Circuit Protection (power limiting)
- Synchronous Rectification on all Del outputs
- Full SMD internal design
- Remote Control Pin
- Efficiency to 87%

## Description

The REC10-xxxxS\_D/M -series offer single and dual regulated outputs in a 2"x1" package with 2kVDC or 3kVDC isolation options and are suitable for higher power industrial applications. Remote on/off control is standard. The converters can deliver 150% rated power for short periods of time to cope with applications with large capacitive loads or high start up currents.

## Selection Guide

Part Number	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (typ.) (%)	Max. Cap. Load
REC10-xx3.3S/H*/M	9-18, 18-36, 36-75	3.3	2000	83-84	2200 $\mu$ F
REC10-xx05S/H*/M	9-18, 18-36, 36-75	5	2000	86-87	2200 $\mu$ F
REC10-xx12S/H*/M	9-18, 18-36, 36-75	12	833	85-86	2200 $\mu$ F
REC10-xx15S/H*/M	9-18, 18-36, 36-75	15	667	85-86	2200 $\mu$ F
REC10-xx05D/H*/M	9-18, 18-36, 36-75	$\pm$ 5	$\pm$ 1000	82-83	$\pm$ 1000 $\mu$ F
REC10-xx12D/H*/M	9-18, 18-36, 36-75	$\pm$ 12	$\pm$ 416	85-86	$\pm$ 1000 $\mu$ F
REC10-xx15D/H*/M	9-18, 18-36, 36-75	$\pm$ 15	$\pm$ 333	85-86	$\pm$ 1000 $\mu$ F
REC10-xx3.3SZ/H*/M	9-36, 18-75	3.3	2000	82	2200 $\mu$ F
REC10-xx05SZ/H*/M	9-36, 18-75	5	2000	86	2200 $\mu$ F
REC10-xx12SZ/H*/M	9-36, 18-75	12	833	85	2200 $\mu$ F
REC10-xx15SZ/H*/M	9-36, 18-75	15	667	86	2200 $\mu$ F
REC10-xx05DZ/H*/M	9-36, 18-75	$\pm$ 5	$\pm$ 1000	82	$\pm$ 1000 $\mu$ F
REC10-xx12DZ/H*/M	9-36, 18-75	$\pm$ 12	$\pm$ 416	85	$\pm$ 1000 $\mu$ F
REC10-xx15DZ/H*/M	9-36, 18-75	$\pm$ 15	$\pm$ 333	86	$\pm$ 1000 $\mu$ F

\* Standard is /H2 for 2kVDC isolation, use /H3 for 3kVDC Isolation

2:1

xx = 9-18Vin = 12,  
xx = 18-36Vin = 24,  
xx = 36-75Vin = 48

4:1

xx = 9-36Vin = 24,  
xx = 18-75Vin = 48

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

Input Voltage Range	2:1 or 4:1	
Input Filter	PI Network	
Output Voltage Accuracy (the Output 3.3V is $\pm$ 1.2% max.)	$\pm$ 1.0% max.	
Line Voltage Regulation	$\pm$ 0.3% max.	
Load Voltage Regulation	Single	$\pm$ 0.5% max.
(25% to 100% full load)	Dual	$\pm$ 1.2% max.
Cross Regulation (100%: 25% to 100% full load)	$\pm$ 5% max.	
Output Ripple and Noise (with 100n output capacitor and 20MHz BW)	100mVp-p max.	
Start-up time (Nom. Vin at 100% Load)	25ms typ.	
Operating Frequency (Full Load)	300kHz typ.	
Efficiency (Nom. Vin at 100% Load)	see Selection Guide	
Minimum Load	0%	
Input Surge Voltage (100ms max.)	12V Input	36VDC
	24V Input	50VDC
	48V Input	100VDC

continued on next page

## ECONOLINE

DC/DC-Converter

with 3 year Warranty

# RECOM

## 10 Watt 2" x 1" Single & Dual Output



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

# REC10/M

\*\*Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

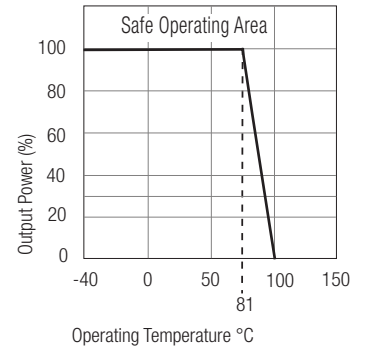
Refer to Application Notes

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

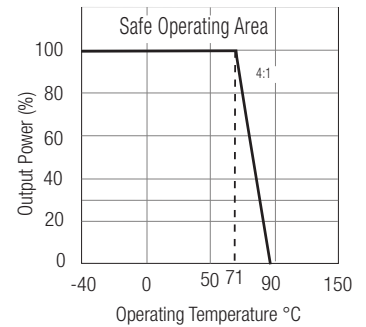
Isolation Voltage	H2-Suffix	(tested for 1 second)	2000VDC
		(rated for 1 minute)	1000VAC / 60Hz
	H3-Suffix	(tested for 1 second)	3000VDC
		(rated for 1 minute)	1500VAC / 60Hz
Under Voltage Lockout (2:1)	12V Input	DC-DC on 8.3VDC, DC-DC off 7.9VDC	
	24V Input	DC-DC on 17.4VDC, DC-DC off 16.7VDC	
	48V Input	DC-DC on 35.7VDC, DC-DC off 34.3VDC	
Under Voltage Lockout (4:1)	24V Input	DC-DC on 8.3VDC, DC-DC off 7.9VDC	
	48V Input	DC-DC on 17.4VDC, DC-DC off 16.7VDC	
Isolation Capacitance			1200pF typ.
Isolation Resistance			1 GΩ min.
Overload Protection			150% typ.
Short Circuit Protection			Continuous, Auto Restart
Operating Temperature Range	4:1		-40°C to +71°C (see Graph)
(free air convection)	2:1		-40°C to +81°C (see Graph)
Storage Temperature Range			-55°C to +105°C
Remote On/Off	DC/DC ON	Open or $3.5\text{V} < V_r < 12\text{V}$	
	DC/DC OFF	Short or $0\text{V} < V_r < 1.2\text{V}$	
Temperature Coefficient			$\pm 0.05\%$ max.
Relative Humidity			95% RH
Case Material		Nickel Plated Metal with Non-Conductive Base	
Thermal Impedance	Natural convection		12°C/W
Maximum Case Temperature			100°C
Vibration		10-55Hz, 2G, 30mins along X,Y & Z	
Package Weight			27g
Packing Quantity			10 pcs per Tube
MTBF (+25°C)	Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	>1000 x 10 <sup>3</sup> hours
(+71°C)		using MIL-HDBK 217F	>250 x 10 <sup>3</sup> hours
<b>Certifications</b>			
EN General Safety	Report: SPCLVD1211033-2	EN60950-1:2006 + A12:2011	
UL General Safety	Report: E224736	UL 60950-1 1st Ed.	
		C22.2 No. 60950-1-03	
EN Medical Safety	Report: MDD12060585 + RM1206085		
	IEC/EN 60601-1 3rd Edition; Medical Report + ISO14971 Risk Assessment		

## Derating-Graph (Ambient Temperature)

### 2:1 Converters

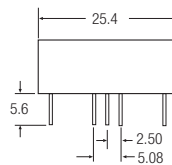
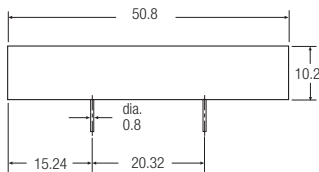


### 4:1 Converters



Note: Refer to Application Notes for EMC Class B Filter suggestion

## Package Style and Pinning (mm)

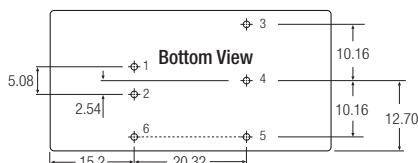


### Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Com
5	-Vout	-Vout
6	CTRL	CTRL

XX.X  $\pm 0.5$  mm  
XX.XX  $\pm 0.35$  mm

### 2" x 1" Package



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