

# Features

# Regulated Converters

- 2:1 Input Range Voltage
- Efficiency Up To 81%
- EMI Class A Without External Components
- Continuous Short Circuit Protection
- No Minimum Load Required

## Description

The REC3A series is cost efficient, general purpose isolated DC/DC converter containing a built in Class A EMC filter. The converter is designed to run from industry standard 24V or 5V unregulated supplies and is typically used to provide an isolated, regulated, short circuit protected output. Under Voltage Lockout is available as an option. These converters are designed for industrial applications, can drive high capacitive loads and operate over the full -40°C to +85°C temperature range without derating.

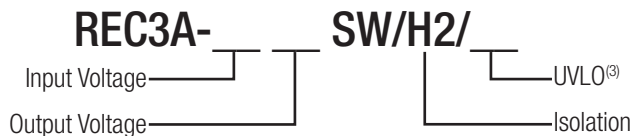
## Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
REC3A-0505SW/H2 <sup>(3)</sup>	4.5-9	5	600	76	6800
REC3A-2405SW/H2 <sup>(3)</sup>	18-36	5	600	81	6800

### Notes:

- Note1: Efficiency is test by nominal input and full load at +25°C ambient.  
 Note2: Max Cap Load is test by nominal input and full resistive load.

## Model Numbering



### Ordering Examples:

- REC3A-0505SW/H2: Single Output, 4.5-9Vin (2:1) and 5Vout, 2kVDC Isolation  
 REC3A-2405SW/H2/X1: Single Output, 18-36Vin (2:1) and 5Vout, 2kVDC Isolation, UVLO Option

### Notes:

- Note3: add suffix "/X1" for optional Under Voltage Lockout  
 without suffix is without Under Voltage Lockout Option

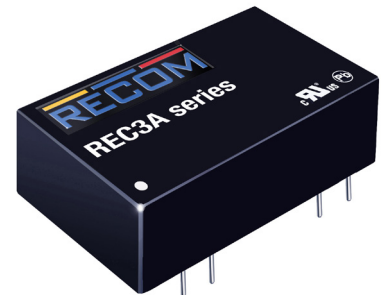
## Specifications measured at T<sub>a</sub> = 25°C, nominal input voltage, full load, otherwise noted

BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter	Pi Type				
Input Voltage Range	nom. Vin = 5V nom. Vin = 24V		4.5VDC 18VDC		9VDC 36VDC
Input Surge Voltage	Vin = 5V Vin = 24V				10VDC 50VDC
Quiescent Current	Vin = 5V Vin = 24V			35mA 12mA	
Start-up Time				10ms	
Internal Operating Frequency				120kHz	
Minimum Load			0%		
Output Ripple and Noise	measured with 20MHz bandwidth and a 0.47µF ceramic capacitor				50mVp-p
Under Voltage Lockout <sup>(3)</sup>	Vin = 5V	DC-DC ON		3.0VDC	3.2VDC
		DC-DC OFF			
	Vin = 24V	DC-DC ON		15.6VDC	16.5VDC
		DC-DC OFF			

continued on next page

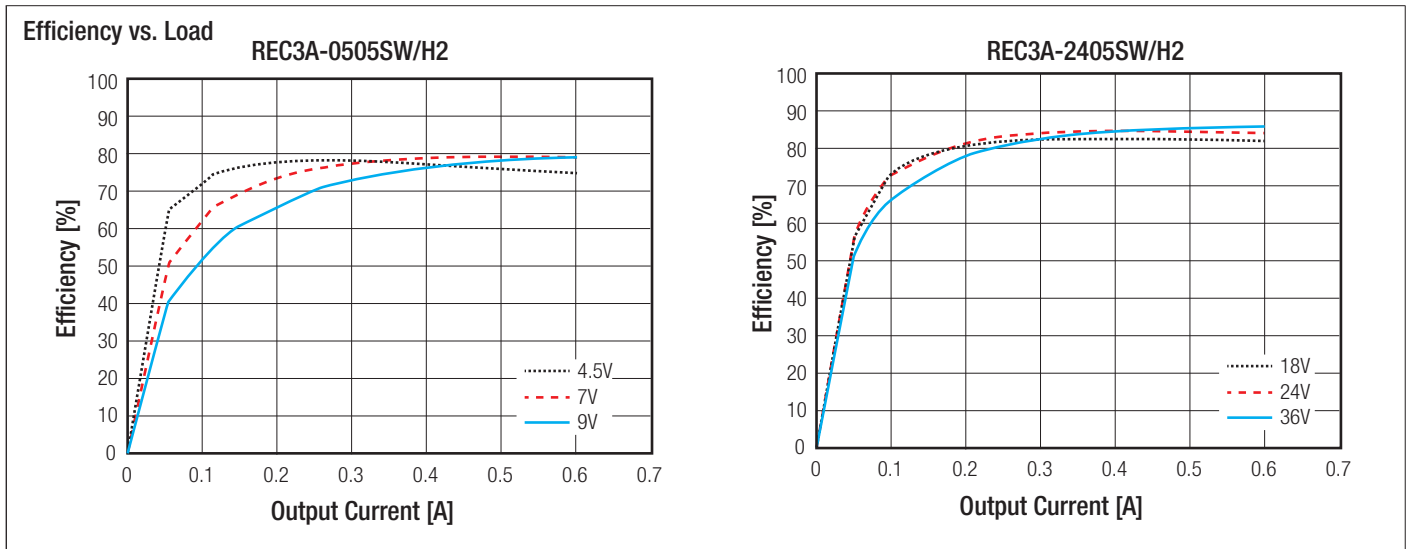
## REC3A

# 3 Watt DIP24 Package

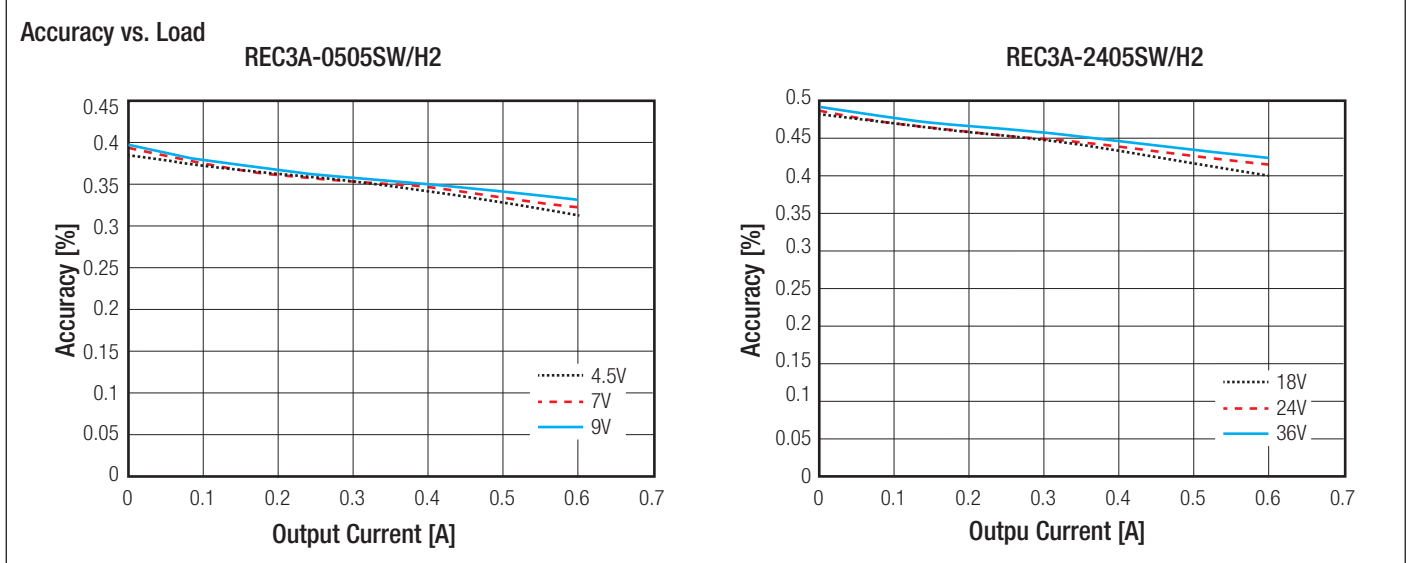


UL60950 Certified  
 UL62368 Certified  
 IEC/EN62368-1 Certified

Specifications measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load, otherwise noted



REGULATION		
Parameter	Condition	Values
Output Accuracy		$\pm 2.0\%$ typ.
Line Regulation	low line to high line	$\pm 0.3\%$ max.
Load Regulation	10% to 100% load	$\pm 0.6\%$ max.



PROTECTION		
Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Load Protection (OLP)		140% min. to 155% typ.
Isolation Voltage <sup>(4)</sup>	tested for 1second	2kVDC
Isolation Capacitance		2200pF max.
Isolation Resistance		1G $\Omega$ min.
Insulation Grade		functional

**Notes:**

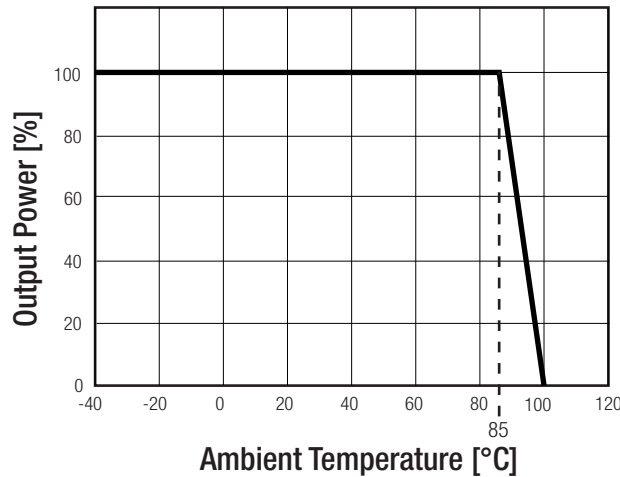
Note4: For repeat Hi-Pot testing, reduce the ime and/or the test voltage.

**Specifications** measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load, otherwise noted

ENVIRONMENTAL			
Parameter	Condition	Value	
Operating Temperature Range	without derating	-40°C to +85°C	
	with derating	-40°C to +100°C	
Maximum Case Temperature		+105°C	
Temperatur Coefficient		$\pm 0.05\%/^\circ\text{C}$	
Thermal Impedance		20°C/W	
Operating Altitude		2000m	
Operating Humidity	non-condensing	5% to 95% RH	
Pollution Degree		PD3	
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	2429 x 10 <sup>3</sup> h
		+85°C	593 x 10 <sup>3</sup> h

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)

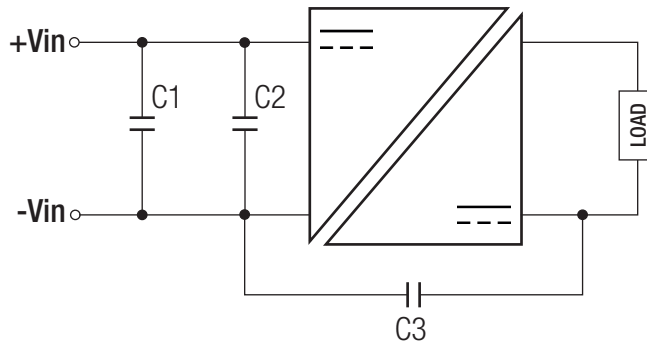


SAFETY AND CERTIFICATIONS		
Certificate Type	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1, 2nd Edition, 2014
Audio/Video, information and communication technology equipment	E224736	UL62368-1, 2nd Edition, 2014 CSA C22.2 No. 62368-1, 2014
Audio/video, information and communication technology equipment (CB Scheme)	L0339m35-CB-1-B1	IEC62368, 2nd Edition, 2014 EN62368, 1st Edition, 2014
RoHs 2		RoHS 10/10, 2011/65/EU + AM-2015/863
EMC Compliance		
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement <sup>(5)</sup>	Condition	Standard / Criterion
	with external components	EN55022, Class B
ESD Electrostatic discharge immunity test	Air $\pm 8\text{kV}$ and Contact $\pm 4\text{kV}$	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3 V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	$\pm 0.5\text{kV}$	EN61000-4-4, Criteria A
Surge Immunity	$\pm 0.5\text{kV}$	EN61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	3 Vr.m.s	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8, Criteria A
<p><b>Notes:</b> Note5: Meets Class A without external components. For Class B, please see filter suggestion below.</p>		

continued on next page

**Specifications** measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load, otherwise noted

### EMI Filtering according to EN55022 Class B

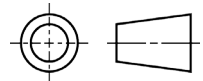
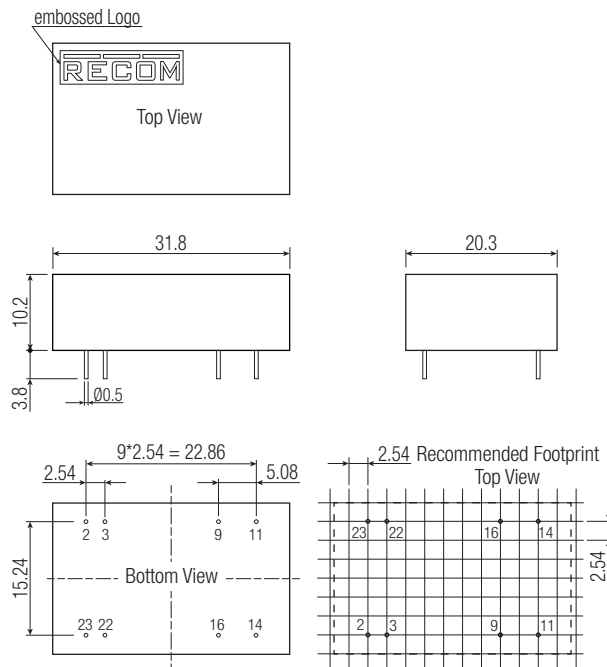


MODEL	C1	C2	C3
REC3A-0505SW/H2	22 $\mu$ F/50V	22 $\mu$ F/50V	N/A
REC3A-2405SW/H2	22 $\mu$ F/100V	22 $\mu$ F/100V	1000pF/3kV

### DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case	non-conductive black plastic (UL94V-0)
	Base	non-conductive black plastic (UL94V-0)
	Potting	Epoxy (UL94V-0)
Package Dimension (LxWxH)		31.8 x 20.3 x 10.2mm
Package Weight		13g

### Dimension Drawing (mm)



### Pin Connections

Pin #	function
2, 3	-Vin
9	NC
11	NC
14	+Vout
16	-Vout
22, 23	+Vin

Pin Pitch Tolerance  $\pm 0.25$  mm  
 Pin Dimension Tolerance  $\pm 0.1$  mm  
 Tolerance: X.X  $\pm 0.5$  mm  
 X.XX  $\pm 0.25$  mm

### PACKAGING INFORMATION

Packaging Dimension (LxWxH)	Tube	520 x 22.7 x 18.3mm
Packaging Quantity		15pcs
Storage Temperature Range		-55 $^\circ\text{C}$ to +125 $^\circ\text{C}$

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.