

# Features

## Unregulated Converters

- High power density 3W Converter in SIP7 case
- 3kVDC and 4kVDC Isolation Options
- Efficiency to 90%
- Certified to EN62368 (pending)

### Description

The RKZ3 series of 3W high isolation DC/DC converters are suitable for demanding industrial applications such as bus isolators, breaking ground loops or separating multi-channel inputs which require more power than currently available in standard SIP7 isolated DC/DC converters. The RKZ3 converters are pin-compatible with the RK and RKZ converter series, offering a simple way to upgrade an existing high isolation design from 1W or 2W up to 3W. The converters are safety certified to EN62368.

### Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
RKZ3-0505S <sup>(3)</sup>	5	5	600	85	2000
RKZ3-1205S <sup>(3)</sup>	12	5	600	84	2000
RKZ3-2405S <sup>(3)</sup>	24	5	600	86	2000
RKZ3-2412S <sup>(3)</sup>	24	12	250	90	1000

#### Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load

### Model Numbering



#### Notes:

Note3: add suffix "H" for 4kVDC/1second isolation, without suffix standard 3kVDC/1second isolation

### Specifications (measured @ ta= 25°C, nom. Vin, full load unless otherwise specified)

BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter			Capacitor		
Input Voltage Range	nom. Vin=	5VDC	4.5VDC	5VDC	5.5VDC
		12VDC	10.8VDC	12VDC	13.2VDC
		24VDC	21.6VDC	24VDC	26.4VDC

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## RKZ3

**3 Watt**  
**SIP7**  
**Single Output**



EN62368-1 (pending)

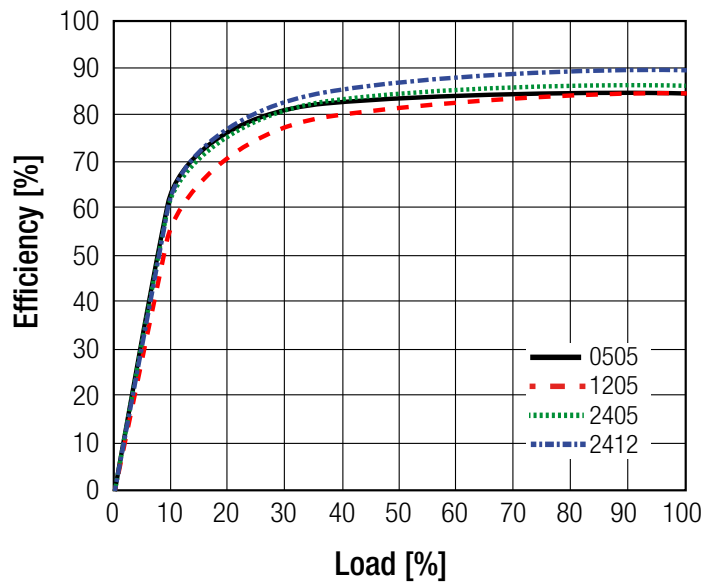
**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise specified)

Parameter	Condition	Min.	Typ.	Max.
Start-up time			0.3ms	250ms
Rise time			0.3ms	0.5ms
Internal Operating Frequency		20kHz		
Minimum Load		0%		
Output Ripple and Noise <sup>(5)</sup>	20MHz BW			100mVp-p

**Notes:**

Note5: Measurements are made with a 1.0 $\mu\text{F}$  MLCC across output. (low ESR)

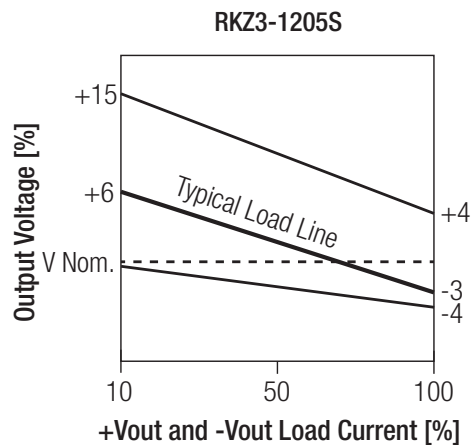
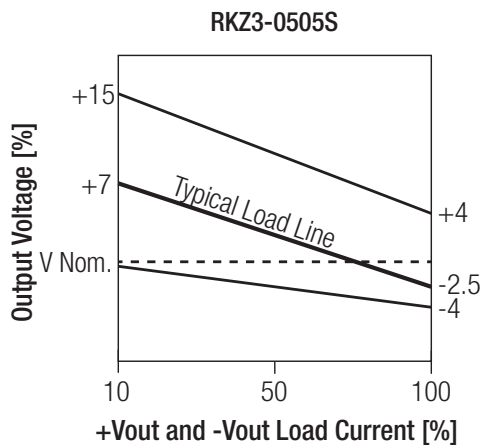
**Efficiency vs. Load**



**REGULATIONS**

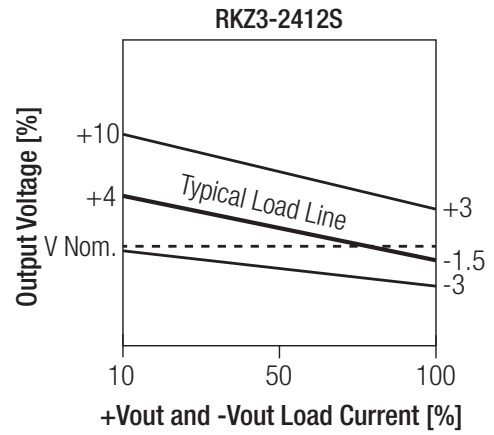
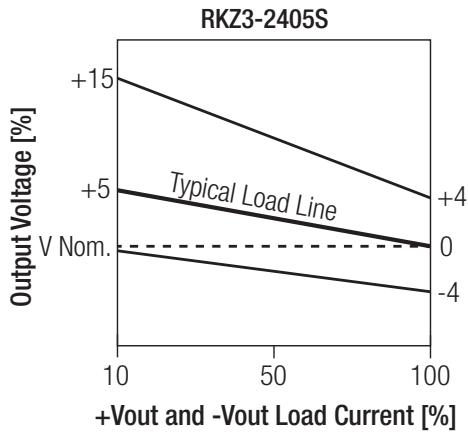
Parameter	Condition	Value
Output Accuracy	5Vout all others	$\pm 3.0\%$ typ. / $\pm 4.0\%$ max. $\pm 2.0\%$ typ. / $\pm 3.0\%$ max.
Line Regulation	low line to high line, full load	1.2% typ. @ 1% of $V_{in}$
Load Regulation	10% to 100% load 5Vout all others	15% max. 10% max

**Tolerance Envelope**

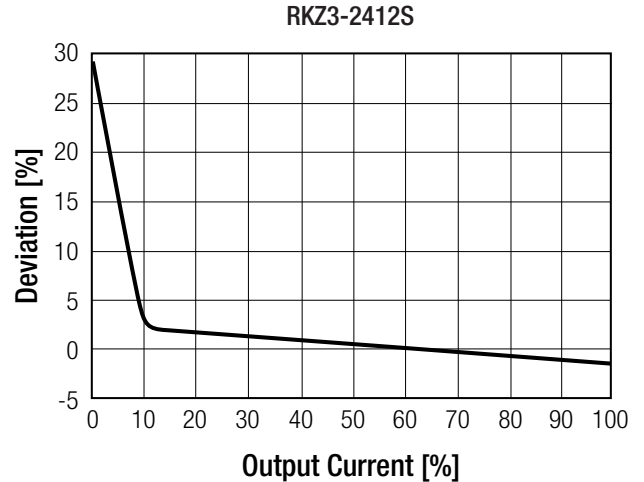
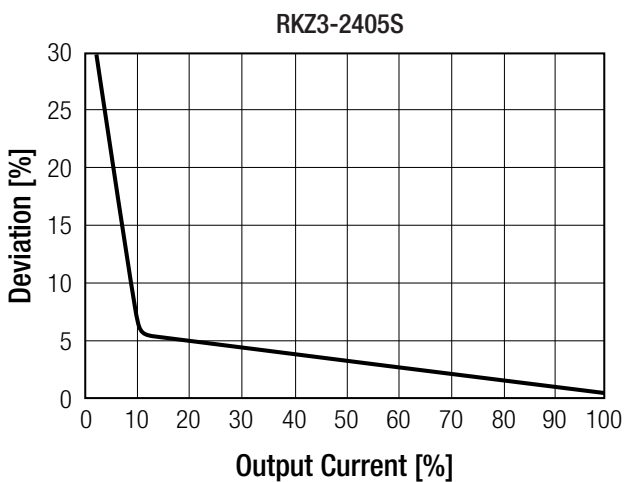
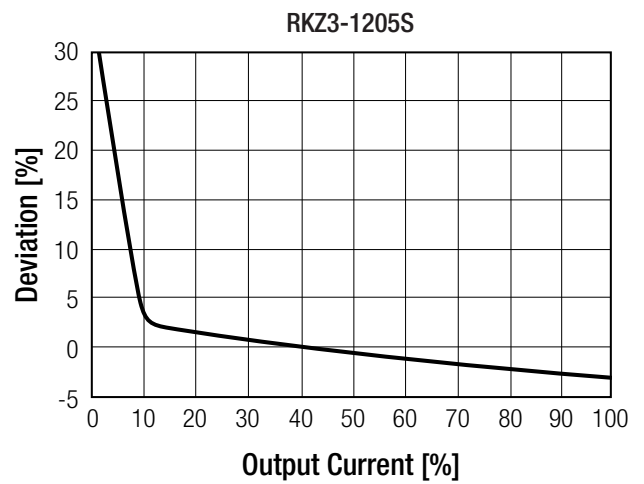
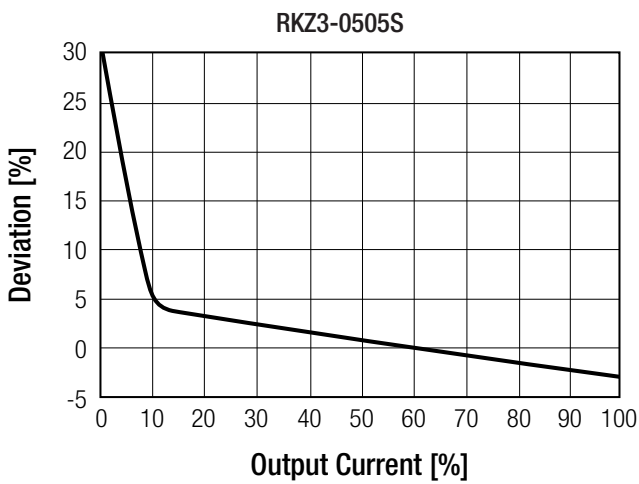


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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise specified)



Accuracy vs. Load



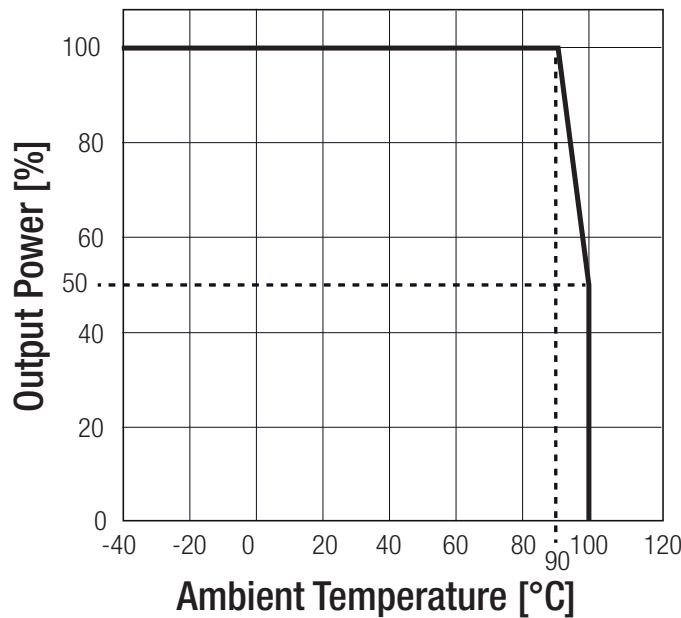
**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise specified)

PROTECTIONS			
Parameter	Type		Value
Isolation Voltage <sup>(6)</sup>	I/P to O/P	tested for 1 second	standard /H suffix 3kVDC 4kVDC
Isolation Resistance			15GΩ min.
Isolation Capacitance			130pF max.
<b>Notes:</b>			
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage			
Note7: An input fuse is required if the mains supply is not over-current protected. Recommended fuse: T2A slow blow type			

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	at natural convection and without derating (see graph)	-40°C to +90°C
Maximum Case Temperature		+115°C
Temperature Coefficient		±0.02%/°C
Operating Humidity	non-condensing	5% - 95% RH max.
Pollution Degree		PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C 17700 x 10 <sup>3</sup> hours +85°C 6200 x 10 <sup>3</sup> hours
Vibration		according to MIL-STD 202G

**Derating Graph**

(@ Chamber and natural convection 0.1 m/s)



SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Audio/video, information and communication technology equipment - Safety requirements	pending	EN62368-1
RoHs 2+		RoHS 10/10, 2011/65/EU + AM-2015/863

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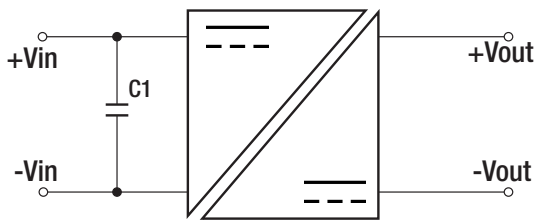
**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise specified)

EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	with external filter	EN55022, Class B
ESD Electrostatic discharge immunity test	Air: $\pm 8\text{kV}$ ; Contact: $\pm 6\text{kV}$	EN61000-4-2, Criteria B
Fast Transient and Burst Immunity	$\pm 2\text{kV}$	EN61000-4-4, Criteria B
Surge Immunity <sup>®</sup>	$\pm 1\text{kV}$	EN61000-4-5, Criteria A

**Notes:**

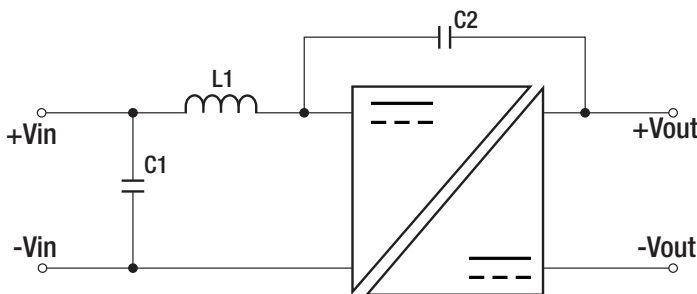
Note8: An external input filter capacitor is required if the model has to meet. EN61000-4-5. See below circuit:

**Surge Test Circuit**



Test Voltage	C1
$\pm 0.5\text{kV}$	100 $\mu\text{F}$ E-Cap
$\pm 1\text{kV}$	220 $\mu\text{F}$ E-Cap

**EMC Filtering according to EN55022**



**Component List Class B**

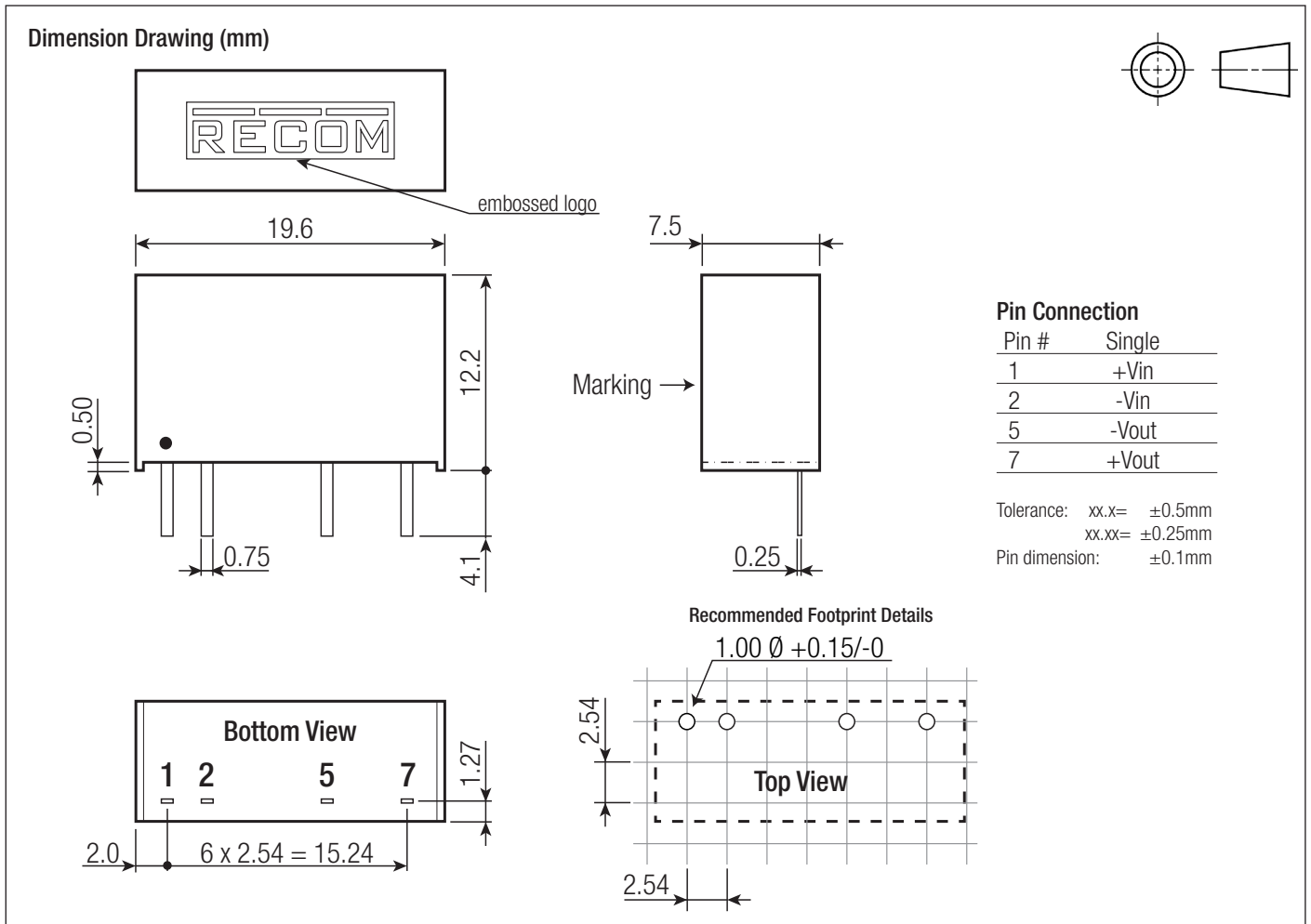
Input Voltage	C1	C2	L1
5Vin	4.7 $\mu\text{F}$ MLCC	470pF / 5kVDC	10 $\mu\text{H}$ Choke
12Vin			22 $\mu\text{H}$ Choke
24Vin	2.2 $\mu\text{F}$ MLCC		

**DIMENSION and PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	Case	black plasitc, (UL94V-0)
	Potting	silicone, (UL94V-0)
	PCB	FR4, (UL94V-0)
Package Dimension (LxWxH)		19.6 x 7.5 x 12.2mm
Package Weight		2.8g typ.

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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise specified)



### PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tube	520.0 x 22.1 x 10.2mm
Packaging Quantity		24pcs
Storage Temperature Range		-55°C to +125°C