

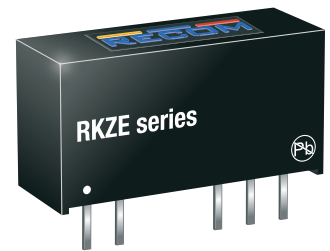
# Features

# Unregulated Converters

- Low cost 2W converter
- Industry standard SIP7 package
- 3kVDC or 4kVDC isolation options
- Single or dual outputs
- Short circuit protected (/P versions)
- IEC/EN62368-1 certified

# RKZE

**2 Watt  
SIP7  
Single and Dual  
Output**



## Description

The RKZE series are low cost 2W DC/DC converters in a standard SIP7 footprint. This makes them suitable for price sensitive industrial, test and measurement and high volume applications. The RKZE converters are pin-compatible with the RK and RH converter series, offering a simple way to upgrade a 1W high isolation supply to 2W. Standard isolation is 3kVDC with a /H version factory tested to 4kVDC. The RKZE is available with single or dual outputs with optional continuous short circuit protection (/P suffix).

## Selection Guide

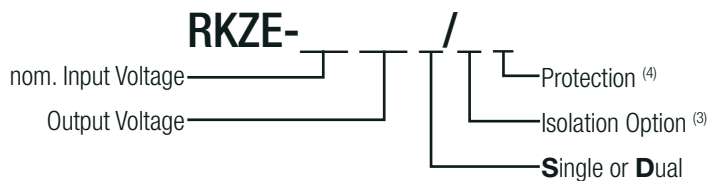
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
RKZE-xx05S <sup>(3,4)</sup>	5, 12, 15, 24	5	400	81-83	1500
RKZE-xx09S <sup>(3,4)</sup>	5, 12, 15, 24	9	222	84-85	680
RKZE-xx12S <sup>(3,4)</sup>	5, 12, 15, 24	12	167	82-88	330
RKZE-xx15S <sup>(3,4)</sup>	5, 12, 15, 24	15	133	84-86	330
RKZE-xx05D <sup>(3,4)</sup>	5, 12, 15, 24	±5	±200	83-85	±680
RKZE-xx12D <sup>(3,4)</sup>	5, 12, 15, 24	±12	±84	84-85	±220
RKZE-xx15D <sup>(3,4)</sup>	5, 12, 15, 24	±15	±66	83-86	±220

### 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

IEC/EN62368-1 certified  
 EN55032 compliant  
 EN55024 compliant

## Model Numbering



### Notes:

Note3: standard part is without suffixes  
 without suffix, standard isolation voltage (3kVDC/1 second)  
 add suffix „/H“ for 4kVDC isolation (refer to “Isolation Voltage<sup>(6)</sup>”)  
 Note4: add suffix „/P“ for Continuous Short Circuit Protection (refer to “Short Circuit Protection (SCP)”  
 or add suffix „/HP“ for 4kVDC Isolation and Continuous Short Circuit Protection

### Ordering Examples

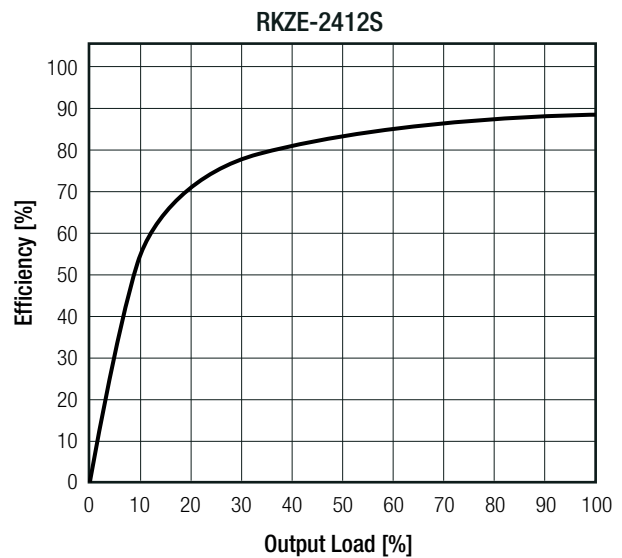
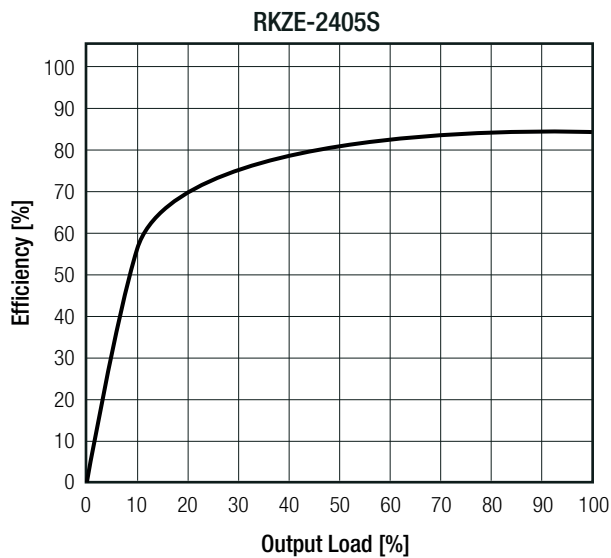
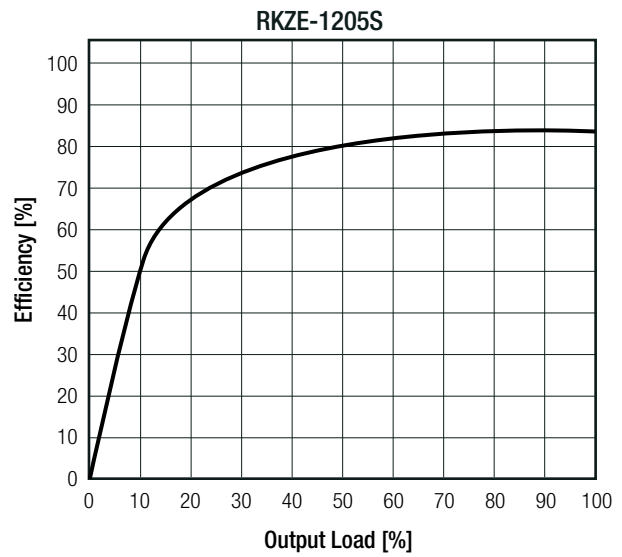
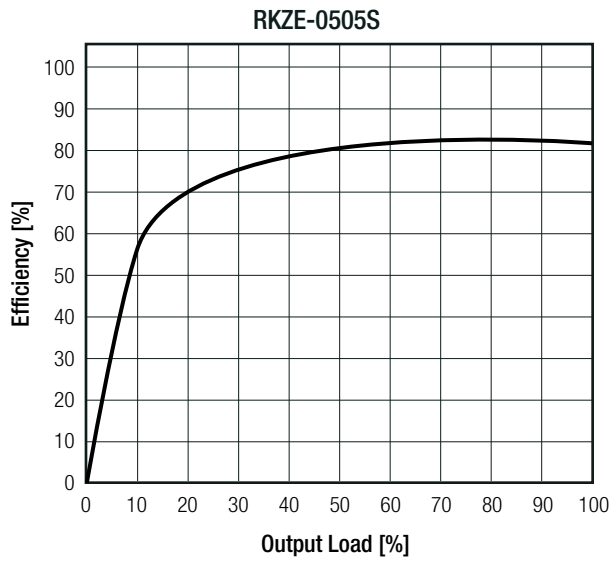
- RKZE-1205S = 12V Input Voltage, 5V Output Voltage, Single Output with 3kVDC Isolation
- RKZE-1509S/H = 15V Input Voltage, 9V Output Voltage, Single Output with 4kVDC Isolation
- RKZE-0505D/P = 5V Input Voltage, 5V Output Voltage, Dual Output with 3kVDC Isolation and SCP protection
- RKZE-2415D/HP = 24V Input Voltage, 15V Output Voltage, Dual Output with 4kVDC Isolation and SCP protection

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**BASIC CHARACTERISTICS**

Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitor type
Input Voltage Range			±10%	
Input Current	nom. Vin= 5VDC 12VDC 15VDC 24VDC		500mA 200mA 160mA 100mA	
Quiescent Current	nom. Vin= 5VDC 12VDC 15VDC 24VDC		30mA 15mA 12mA 7mA	
Minimum Load		0%		
Start-up Time			10ms	
Rise Time			2ms	
Internal Operating Frequency		20kHz		
Output Ripple and Noise	20MHz BW		75mVp-p	150mVp-p

**Efficiency vs. Load**



**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

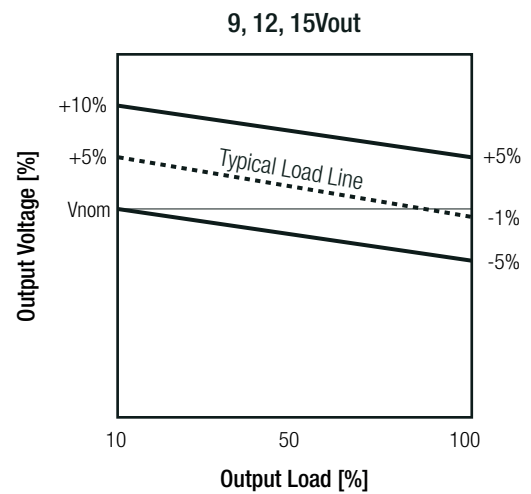
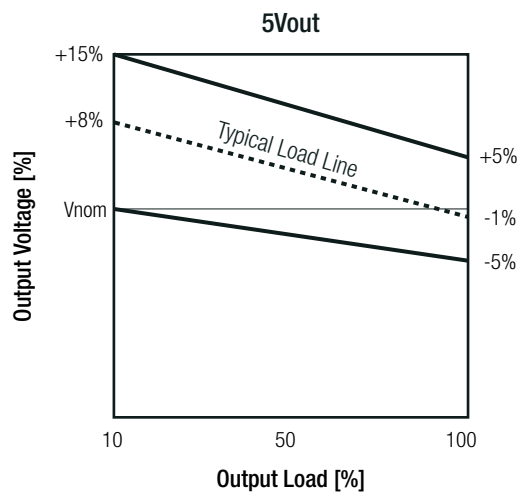
**REGULATIONS**

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line		±1.2% typ. / 1.0% max.
Load Regulation <sup>(5)</sup>	10% to 100% load	5Vout 9, 12, 15Vout	15% max. 10% max.
Cross Regulation	dual output only		±5.0% typ.

**Notes:**

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

**Tolerance Envelope**



**PROTECTIONS**

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ, "/P" suffix		continuous
Isolation Voltage <sup>(6)</sup>	I/P to O/P	standard part	tested for 1 second rated for 1 minute 3kVDC 1.5kVAC
		"/H" suffix	tested for 1 second rated for 1 minute 4kVDC 1.8kVAC
Isolation Resistance			10GΩ min.
Isolation Capacitance			120pF max.
Leakage Current			0.3μA max.
Insulation Grade			functional

**Notes:**

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

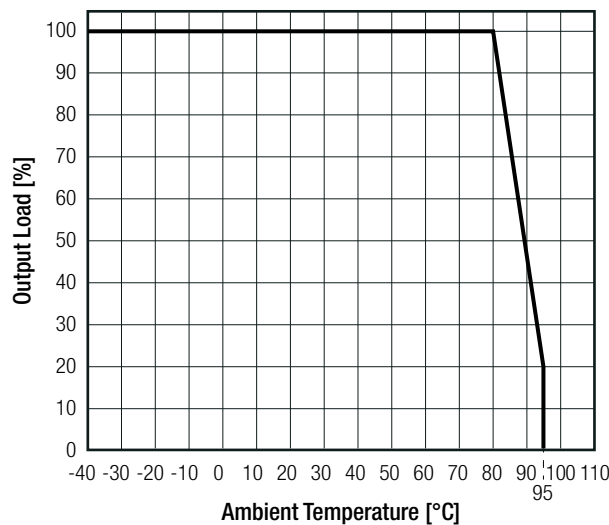
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**ENVIRONMENTAL**

Parameter	Condition	Value
Operating Temperature Range	full load @ natural convection 0.1m/s	-40°C to +80°C
Maximum Case Temperature		+110°C
Temperature Coefficient		±0.01%/K
Thermal Impedance	0.1m/s, horizontal	46K/W
Operating Altitude		5000m
Operating Humidity	non-condensing	5% - 95% RH
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +80°C 18300 x 10 <sup>3</sup> hours 8070 x 10 <sup>3</sup> hours

**Derating Graph**

(@ Chamber and natural convection 0.1 m/s)



**SAFETY AND CERTIFICATIONS**

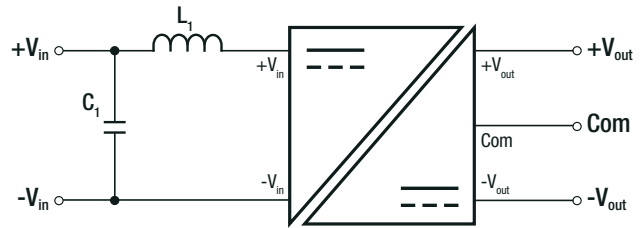
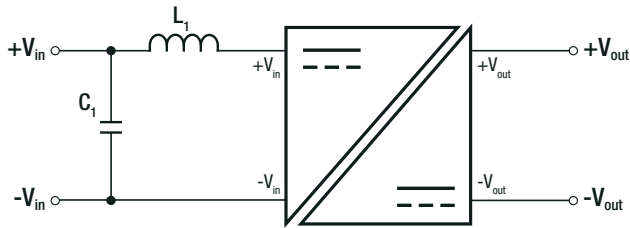
Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements	WD-SE-R-180474-A0	IEC62368-1:2014 2nd Edition EN62368-1:2014 + AC:2015
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements	with external components	EN55032:2015, Class B
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air: ±2, 4, 8kV Contact: ±2, 4kV	IEC61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	±0.5kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	±0.5kV	IEC61000-4-5:2014 + A1:2017, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	3V	IEC61000-4-6:2013 + Cor1:2015, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	IEC61000-4-8:2010, Criteria A

continued on next page

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**EMC Filter Suggestion according to EN55032**



**Component List Class A**

MODEL	C1
RKZE-2405S, RKZE-1209S	10µF 50V
RKZE-0515S	
RKZE-2405D, RKZE-0515D	

**Component List Class B**

MODEL	C1	L1
RKZE-2405S, RKZE-1209S	10µF 50V	<a href="#">12µH choke RLS-126</a>
RKZE-0515S		
RKZE-2405D, RKZE-0515D		

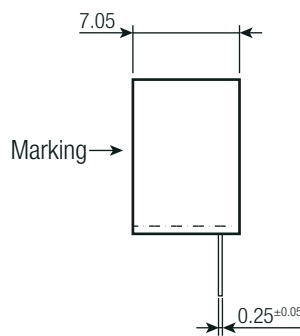
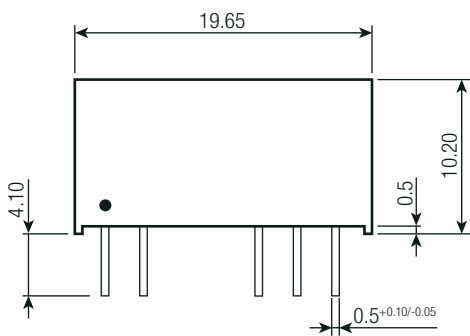
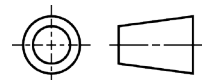
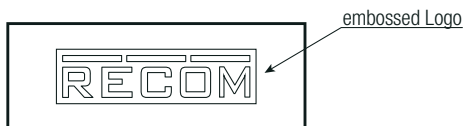
**Notes:**

Note8: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

**DIMENSION and PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	case potting	black plastic, (UL94V-0) epoxy, (UL94V-0)
Dimension (LxWxH)		19.65 x 7.05 x 10.20mm
Weight		2.8g typ.

**Dimension Drawing (mm)**

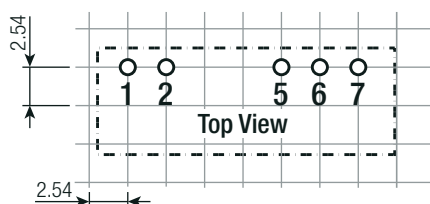
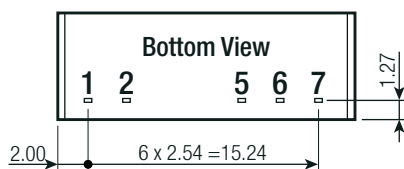


**Pin Information**

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Com
7	+Vout	+Vout

xx.x ± 0.5mm  
xx.xx ± 0.25mm

**Recommended Footprint Details**



**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 16.0 x 9.0mm
Packaging Quantity		25pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		5% to 95% RH

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