

## Features

### Unregulated Converters

- High Isolation 2W Converter
- Approved for Medical Applications
- Custom Solutions Available
- 3kVDC and 4kVDC Isolation Options
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- Efficiency to 84 %
- Suitable for IGBT Applications

#### Description

The RKZ Series of 2W DC/DC Converters are certified to EN 60950-1 and to the medical standard EN-60601-1. This makes them suitable for high end industrial applications such as IGBT driver circuitry as well as standard medical applications.

The RKZ converters are pin-compatible with the RK and RH converter series, offering a simple way to upgrade a 1W high isolation supply to 2W.

#### Selection Guide

| Part Number  | 4kV | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency (%) | Max Capacitive Load <sup>(1)</sup> |
|--------------|-----|---------------------|----------------------|---------------------|----------------|------------------------------------|
| RKZ-xx05S*   | (H) | 5, 12, 24           | 5                    | 400                 | 82-84          | 1500µF                             |
| RKZ-xx12S*   | (H) | 5, 12, 24           | 12                   | 168                 | 82-87          | 330µF                              |
| RKZ-xx15S*   | (H) | 5, 12, 24           | 15                   | 132                 | 82-84          | 330µF                              |
| RKZ-xx05D*   | (H) | 5, 12, 24           | ±5                   | ±200                | 70-83          | ±680µF                             |
| RKZ-xx12D*   | (H) | 5, 12, 24           | ±12                  | ±84                 | 82-84          | ±220µF                             |
| RKZ-xx15D*   | (H) | 5, 12, 24           | ±15                  | ±66                 | 82-88          | ±220µF                             |
| RKZ-xx1509D* | (H) | 5, 12, 24           | +15/-9               | +67/-111            | 70-81          | ±330µF                             |

xx = Input Voltage. Other input and output voltage combinations available on request.

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RKZ-0515D/P,

\* add Suffix „H" for 4kV Isolation, e.g. RKZ-0515D/HP has 4kV Isolation and is Short Circuit Protected.

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

|                                                                     |                                                           |                                                   |
|---------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|
| Input Voltage Range                                                 | ±10%                                                      |                                                   |
| Output Voltage Accuracy                                             | ±5%                                                       |                                                   |
| Line Voltage Regulation                                             | low line to high line @ 100% load                         | 1.2%/1% of $V_{in}$ typ.                          |
| Load Voltage Regulation                                             | 5V type                                                   | 15% max.                                          |
| (10% to 100% load)                                                  | Other types, RKZ-xx1509D                                  | 10% max.                                          |
| Output Ripple and Noise                                             | 20MHz limited                                             | 150mVp-p max.                                     |
| Operating Frequency                                                 | 20kHz min. / 50kHz typ. / 85kHz max.                      |                                                   |
|                                                                     | RKZ-xx1509D                                               | 20kHz min. / 51kHz typ.                           |
| Efficiency at Full Load                                             | 70% min. / 80% typ.                                       |                                                   |
| Minimum Load = 0%                                                   | Specifications valid for 10% minimum load only.           |                                                   |
| Isolation Voltage                                                   | (tested for 1 second)                                     | 3000VDC                                           |
|                                                                     | (rated for 1 minute**)                                    | 1500VAC / 60Hz                                    |
| Isolation Voltage                                                   | H-Suffix (tested for 1 second)                            | 4000VDC                                           |
|                                                                     | H-Suffix (rated for 1 minute**)                           | 2000VAC / 60Hz                                    |
| Isolation Capacitance                                               | 120pF max.                                                |                                                   |
| Isolation Resistance                                                | 10 GΩ min.                                                |                                                   |
| Short Circuit Protection                                            | only with „P"-Suffix                                      | continuous                                        |
| Operating Temperature Range (free air convection, without derating) | -40°C to +85°C (see Graph)                                |                                                   |
| Storage Temperature Range                                           | -55°C to +125°C                                           |                                                   |
| Relative Humidity                                                   | 5% - 95% RH                                               |                                                   |
| Package Weight                                                      | 2.8g                                                      |                                                   |
| Material                                                            | Case                                                      | UL94V-0, black plastic                            |
|                                                                     | Potting                                                   | UL94V-0, Epoxy                                    |
| Packing Quantity                                                    | 25 pcs per Tube                                           |                                                   |
| MTBF (+25°C)                                                        | Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F 18300 x 10 <sup>3</sup> hours |
| (+85°C)                                                             |                                                           | using MIL-HDBK 217F 8070 x 10 <sup>3</sup> hours  |

continued on next page

## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

# RECOM

## 2 Watt

## SIP7

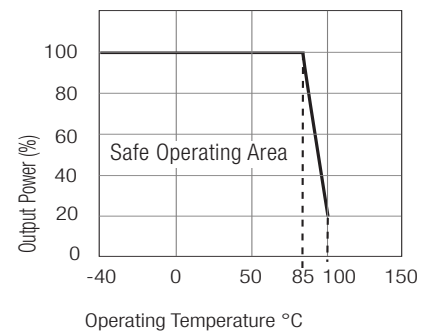
## Single & Dual Output



**EN-60950-1 Certified**  
**IEC/EN-60601-1 Certified\***  
**\* +15/-9 Version excluded**

# RKZ

## Derating-Graph (Ambient Temperature)



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

#### Certifications

EN General Safety

Report: SPCLVD1109103

EN60950-1:2006 + A12:2011

EN Medical safety

Report: SPCMDD1205098-4

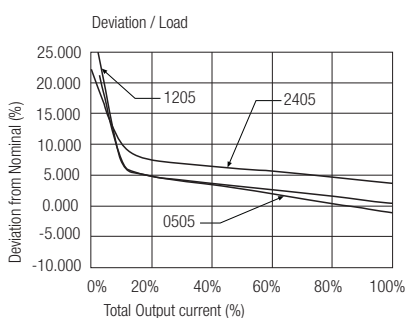
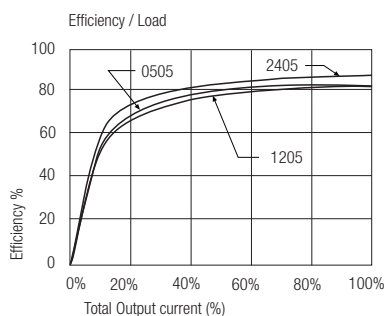
IEC/EN 60601-1:2006, 3rd Edition

#### Notes

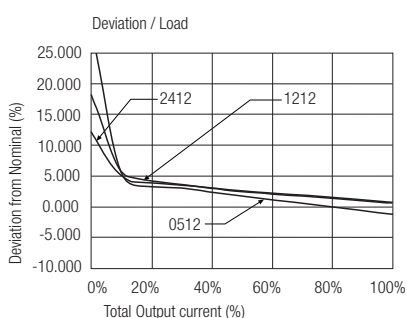
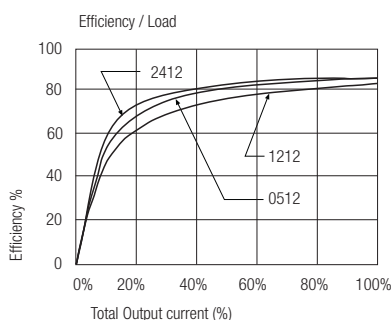
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Typical Characteristics

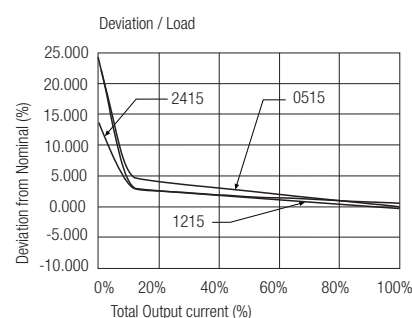
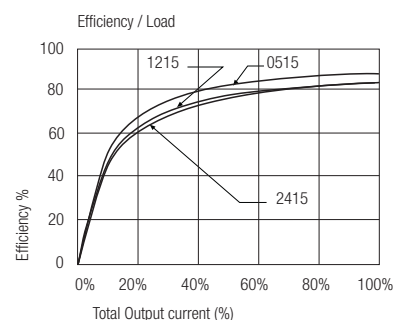
## RKZ-xx05S



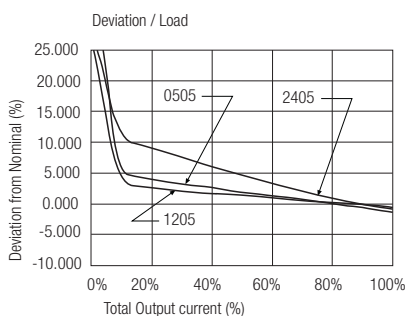
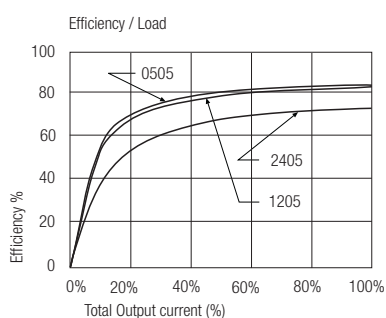
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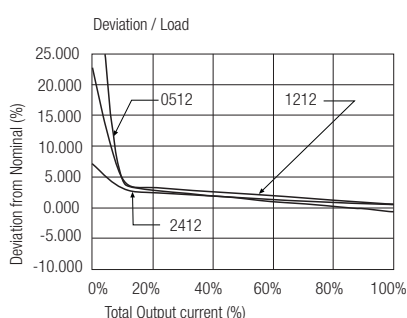
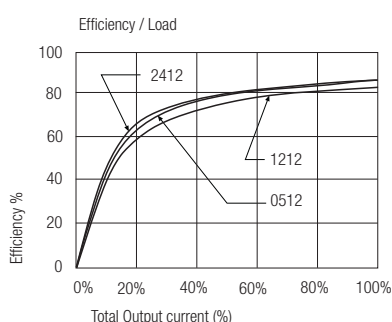
## RKZ-xx15S



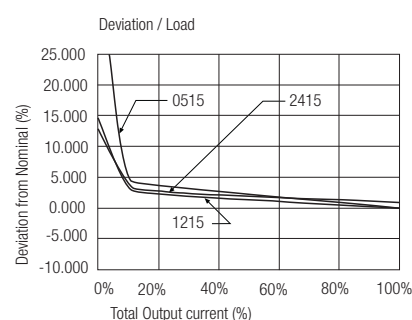
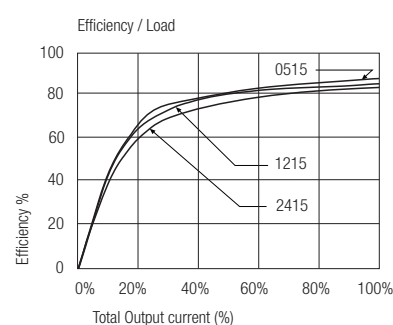
## RKZ-xx05D



## RKZ-xx12D

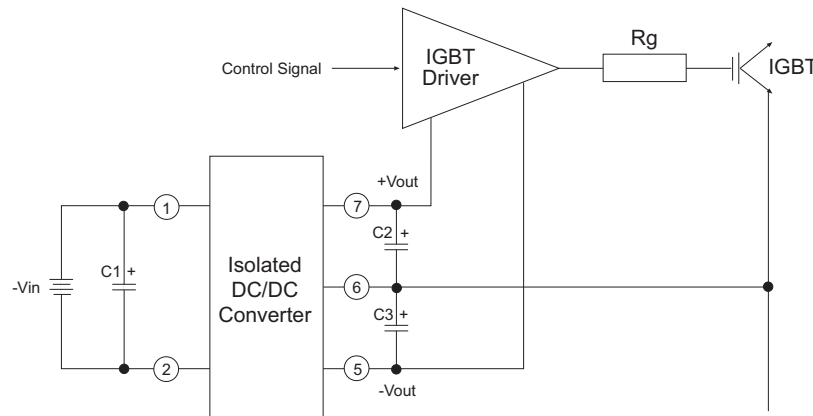


## RKZ-xx15D

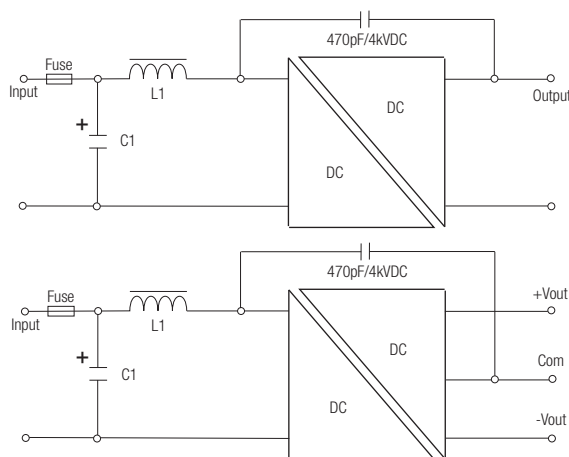


Application

## IGBT Application Circuit



## EMC Filter Suggestion for EN55022 Class B



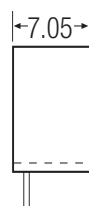
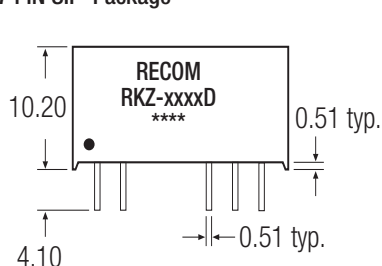
Standard and /H versions

| C1    | L1    | Vin |
|-------|-------|-----|
| 10µF  | 4.7µH | 5V  |
| 4.7µF | 22µH  | 12V |
| 2.2µF | 47µH  | 24V |

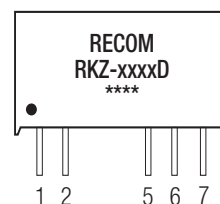
C1 = MLCC  
L1 = SMD Inductor

## Package Style and Pinning (mm)

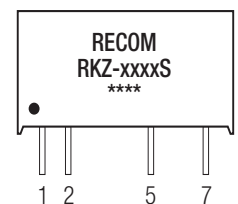
### 7 PIN SIP Package



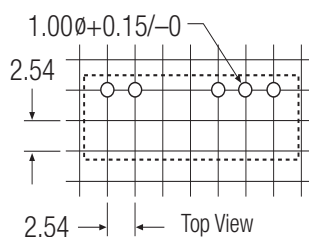
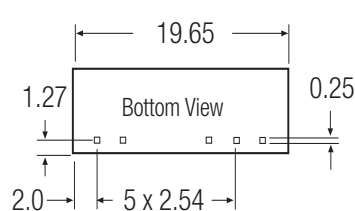
### Dual Output



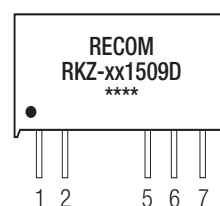
### Single Output



## Recommended Footprint Details



### +15/-9 Output



### Pin Connections

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

NC = No Connection

XX.X ± 0.5 mm

XX.XX ± 0.25 mm

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