

## Features

## Unregulated Converters

- 2W Single and Dual Outputs in DIP 14
- 3kVDC or 4kVDC Isolation
- Optional Continuous Short Circuit Protected
- Custom Solutions Available
- UL94V-0 Package Material
- Efficiency up to 85 %
- Suitable for IGBT Applications

### Description

The RJZ and RGZ series converters are available in DIP14 packages, so can be used for applications where component height is restricted. The wide selection of input voltage and output voltage options plus an I/O-Isolation of 3kVDC or 4kVDC as standard makes these converters suitable for many industrial, medical and IGBT applications.

### Selection Guide

| Part Number  |     | Input Voltage    | Output Voltage | Output Current | Efficiency | Max Capacitive Load <sup>(1)</sup> |
|--------------|-----|------------------|----------------|----------------|------------|------------------------------------|
| DIP 14       | 4kV | (VDC)            | (VDC)          | (mA)           | (%)        |                                    |
| RJZ-xx3.3S*  | (H) | 3.3,5,9,12,15,24 | 3.3            | 606            | 70-75      | 3300μF                             |
| RJZ-xx05S*   | (H) | 3.3,5,9,12,15,24 | 5              | 400            | 78-85      | 1200μF                             |
| RJZ-xx09S*   | (H) | 3.3,5,9,12,15,24 | 9              | 222            | 78-84      | 1200μF                             |
| RJZ-xx12S*   | (H) | 3.3,5,9,12,15,24 | 12             | 166            | 80-85      | 680μF                              |
| RJZ-xx15S*   | (H) | 3.3,5,9,12,15,24 | 15             | 133            | 82-85      | 680μF                              |
| RJZ-xx24S*   | (H) | 3.3,5,9,12,15,24 | 24             | 83             | 80-85      | 220μF                              |
| RGZ-xx3.3D*  | (H) | 3.3,5,9,12,15,24 | ±3.3           | ±303           | 75         | ±1500μF                            |
| RGZ-xx05D*   | (H) | 3.3,5,9,12,15,24 | ±5             | ±200           | 75-82      | ±470μF                             |
| RGZ-xx09D*   | (H) | 3.3,5,9,12,15,24 | ±9             | ±111           | 75-80      | ±470μF                             |
| RGZ-xx12D*   | (H) | 3.3,5,9,12,15,24 | ±12            | ±84            | 78-82      | ±220μF                             |
| RGZ-xx15D*   | (H) | 3.3,5,9,12,15,24 | ±15            | ±66            | 80-84      | ±220μF                             |
| RGZ-xx24D*   | (H) | 3.3,5,9,12,15,24 | ±24            | ±42            | 82-84      | ±100μF                             |
| RGZ-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. RGZ-0524D/P, RJZ-0505S/HP

### 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                                             | 1.2%/1% of $V_{in}$ typ.                        |
| Load Voltage Regulation                                             | 3.3V Types ±20% max.                            |
| (10% to 100% full load)                                             | 5V Types ±15% max.                              |
|                                                                     | All other Types, RGZ-xx1509D ±10% max.          |
| Output Ripple and Noise (20MHz limited)                             | ±150mVp-p max.                                  |
| Temperature Coefficient                                             | 0.02%/°C max.                                   |
| Operating Frequency                                                 | 20kHz min. / 50kHz typ. / 90kHz max.            |
|                                                                     | RGZ-xx1509D 20kHz min. / 45kHz 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 min.     |
|                                                                     | H-Suffix (rated for 1 minute) 2000VAC / 60Hz    |
| Isolation Capacitance                                               | 120pF max.                                      |
| Isolation Resistance                                                | 15GΩ min.                                       |
| Short Circuit Protection                                            | 1 Second                                        |
| P-Suffix                                                            | Continuous                                      |
| Operating Temperature Range (free air convection, without derating) | -40°C to +90°C (see Graph)                      |
| Case Temperature                                                    | 110°C max.                                      |

continued on next page

## ECONOLINE

## DC/DC-Converter

with 3 year Warranty

RECOM

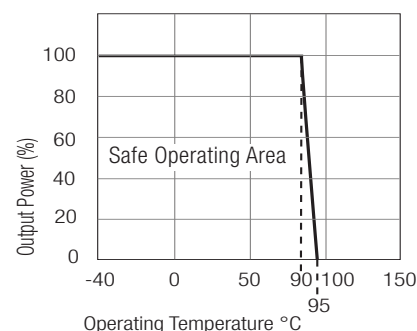
## 2 Watt DIP14 Single & Dual Output



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

# RJZ\_RGZ

## 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)

|                           |                                                              |           |                             |
|---------------------------|--------------------------------------------------------------|-----------|-----------------------------|
| Storage Temperature Range | -55°C to +125°C                                              |           |                             |
| Relative Humidity         | 95% RH                                                       |           |                             |
| Thermal Impedance         | 56.66°C / W                                                  |           |                             |
| Package Weight            | 2.8g                                                         |           |                             |
| Packing Quantity          | 24 pcs per Tube                                              |           |                             |
| MTBF (+25°C)              | using MIL-HDBK 217F                                          | RJZ types | 893 x 10 <sup>3</sup> hours |
| (+85°C)                   | Detailed Information see<br>Application Notes chapter "MTBF" | RGZ types | 810 x 10 <sup>3</sup> hours |
|                           |                                                              | RJZ types | 208 x 10 <sup>3</sup> hours |
|                           | using MIL-HDBK 217F                                          | RGZ types | 151 x 10 <sup>3</sup> hours |

### Certifications

EN General Safety

Report: SPCLVD1109103

EN60950-1:2006 + A12:2011

EN Medical Safety

Report: SPCMD120598-4

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.

## IGBT Application Circuit



### Typical Characteristics

## RJZ-xx05S



## RJZ-xx09S

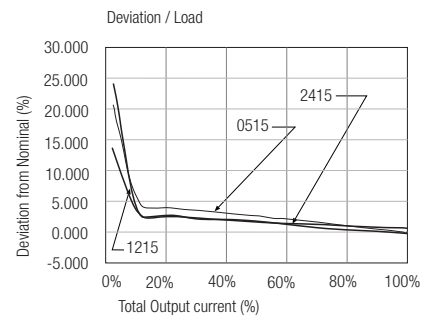
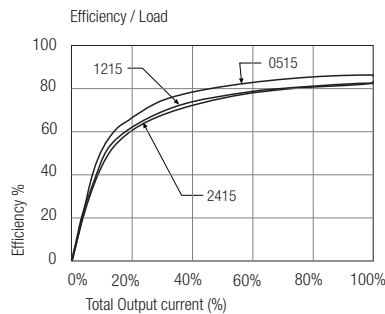


## RJZ-xx12S

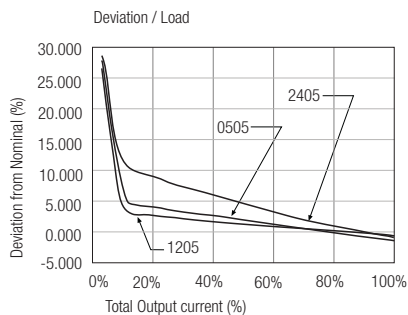
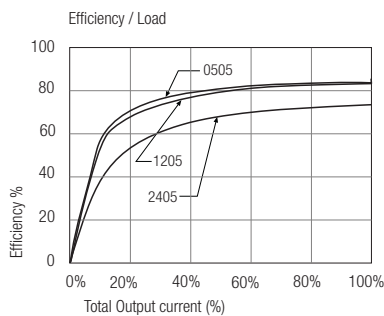


## Typical Characteristics

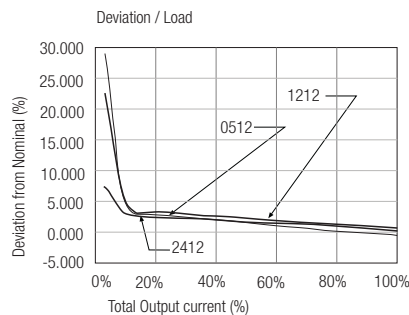
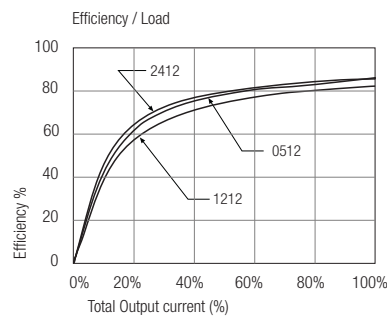
### RJZ-xx15S



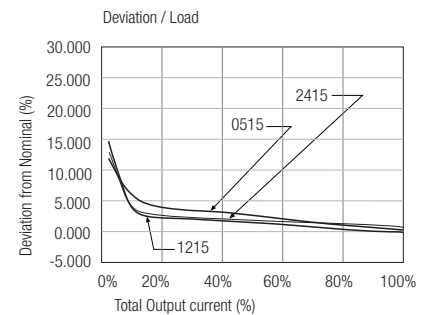
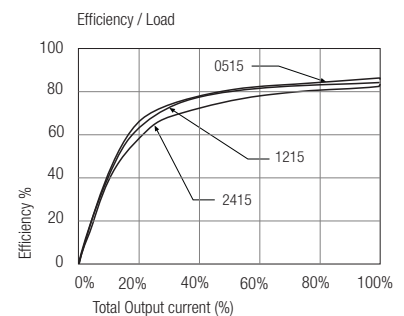
### RGZ-xx05D



### RGZ-xx12D

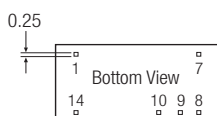
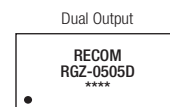
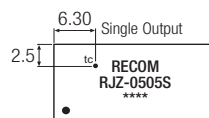
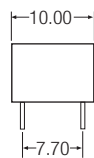
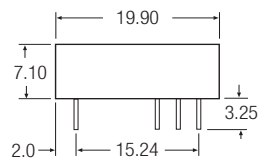


### RGZ-xx15D

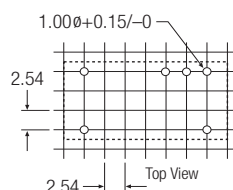


## Package Style and Pinning (mm)

### 14 PIN DIP Package



### Recommended Footprint Details



### Pin Connections

| Pin # | RJZ    | RGZ   |
|-------|--------|-------|
| 1     | -Vin   | -Vin  |
| 7     | NC     | NC    |
| 8     | +Vout  | +Vout |
| 9     | No Pin | Com   |
| 10    | -Vout  | -Vout |
| 14    | +Vin   | +Vin  |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm  
NC = No Connection