

# Features

## Unregulated Converters

- Power sharing
- High isolation 3kVDC & 4kVDC for 1 second
- Efficiency up to 87%
- Wide operating temperature range from -40°C to +85°C
- UL60950 certified
- IEC/EN60950-1 certified

**RECOM**  
DC/DC Converter

## RKZ-xx2005D

2 Watt  
SIP7 for  
SIC Application



UL US  
E358085



UL60950-1 certified  
CSA C22.2 No. 60950-1-07 certified  
IEC/EN60950-1 certified  
EN55032 compliant

## Description

The RKZ-xx2005D series features DC/DC converters which are especially designed for SiC mosfet drivers. The modules are available with input voltages of 5, 12, 15, or 24VDC with two asymmetric outputs of +20VDC and -5VDC. A special feature of this converter is output power sharing: the RKZ-xx2005D can be used with equal power (asymmetrical current) or equal current (asymmetrical power) loads. The modules offer 3kVDC or 4kVDC isolation. The operating temperature range of -40C to +100°C (with derating) meets harsh environmental requirements.

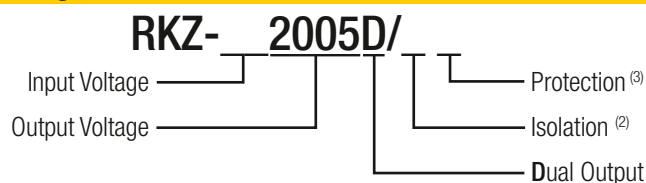
## Selection Guide

| Part Number | nom. Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency typ. typ. (%) | max. Capacitive Load <sup>(1)</sup> (μF) |
|-------------|--------------------------|----------------------|---------------------|--------------------------|------------------------------------------|
| RKZ-052005D | 5                        | 20/-5                | 50/-200<br>+/-80    | 86<br>85                 | 100/1500                                 |
| RKZ-122005D | 12                       | 20/-5                | 50/-200<br>+/-80    | 86                       | 100/1500                                 |
| RKZ-152005D | 15                       | 20/-5                | 50/-200<br>+/-80    | 86                       | 100/1500                                 |
| RKZ-242005D | 24                       | 20/-5                | 50/-200<br>+/-80    | 87                       | 100/1500                                 |

### Notes:

Note1: Max. capacitive load is tested at nominal input voltage and full load

## Model Numbering



### Notes:

Note2: without suffix, standard 3kVDC isolation  
add suffix "/H" for higher 4kVDC isolation

Note3: without suffix, without Short Circuit Protection  
add suffix "/P" for continuous short circuit protection

### Examples:

RKZ-052005D = 5Vin, 20/-5Vout, without SCP function + standard 3kVDC isolation  
RKZ-12005D/HP = 12Vin, 20/-5Vout, with continuous SCP function + high 4kVDC isolation

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

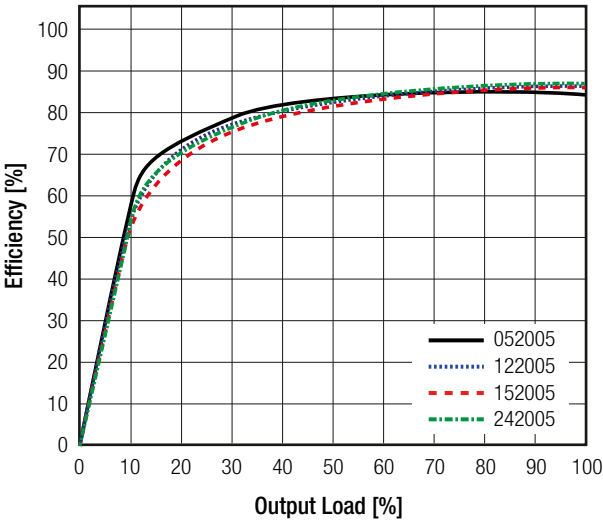
| BASIC CHARACTERISTICS                                                                                     |           |       |         |          |
|-----------------------------------------------------------------------------------------------------------|-----------|-------|---------|----------|
| Parameter                                                                                                 | Condition | Min.  | Typ.    | Max.     |
| Input Voltage Range                                                                                       |           |       | ±10%    |          |
| Internal Operating Frequency                                                                              |           | 20kHz |         |          |
| Minimum Load                                                                                              |           |       | 0%      |          |
| Output Ripple and Noise <sup>(4)</sup>                                                                    |           |       | 70mVp-p | 150mVp-p |
| <b>Notes:</b><br>Note4: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1μF ceramic capacitor |           |       |         |          |
| continued on next page                                                                                    |           |       |         |          |



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

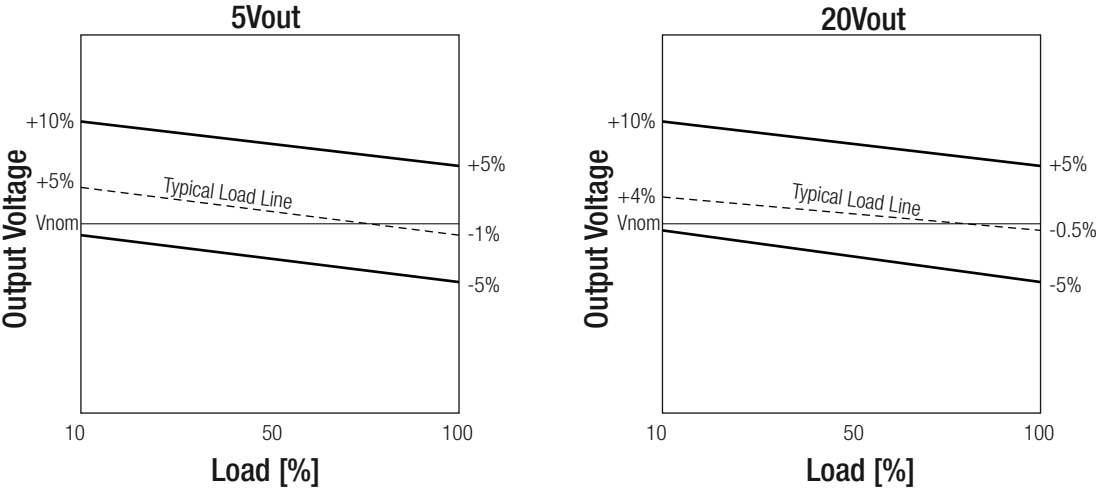
Efficiency vs. Load



**REGULATIONS**

| Parameter       | Condition                        | Values                 |
|-----------------|----------------------------------|------------------------|
| Output Accuracy |                                  | ±5.0% max.             |
| Line Regulation | low line to high line, full load | ±1.2% of 1.0% Vin typ. |
| Load Regulation | 10% to 100% load                 | ±5.0% typ. / ±10% max. |

Tolerance Envelope



**PROTECTIONS**

| Parameter                        | Condition            |                     |                                   | Value                                |
|----------------------------------|----------------------|---------------------|-----------------------------------|--------------------------------------|
| Short Circuit Protection (SCP)   | only with "P" suffix |                     |                                   | continuous, automatic recovery       |
| Isolation Voltage <sup>(5)</sup> | I/P to O/P           | tested for 1 second | without suffix<br>with suffix "H" | 3kVDC / 1 second<br>4kVDC / 1 second |
| Isolation Capacitance            |                      |                     |                                   | 135pF max.                           |
| Isolation Resistance             |                      |                     |                                   | 10GΩ min.                            |

**Notes:**

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note6: An input fuse is required if the mains supply is not over-current protected. Recommended fuse: T2A slow blow type

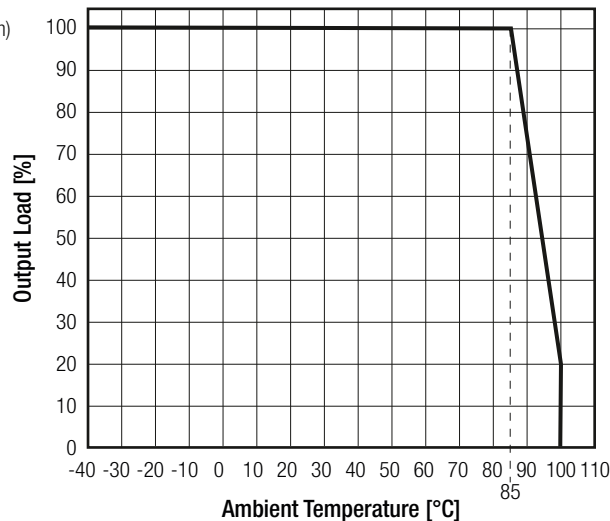
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### ENVIRONMENTAL

| Parameter                   | Condition                                       |                | Value                                                       |
|-----------------------------|-------------------------------------------------|----------------|-------------------------------------------------------------|
| Operating Temperature Range | with derating @ free air convection (see graph) |                | -40°C to +100°C                                             |
| Operating Humidity          | non-condensing                                  |                | 5% - 95% RH max.                                            |
| Vibration                   |                                                 |                | MIL-STD-202G                                                |
| MTBF                        | according to MIL-HDBK-217F                      | +25°C<br>+85°C | 1800 x 10 <sup>3</sup> hours<br>560 x 10 <sup>3</sup> hours |

### Derating Graph

(@ nominal Vin at chamber and free air convection)

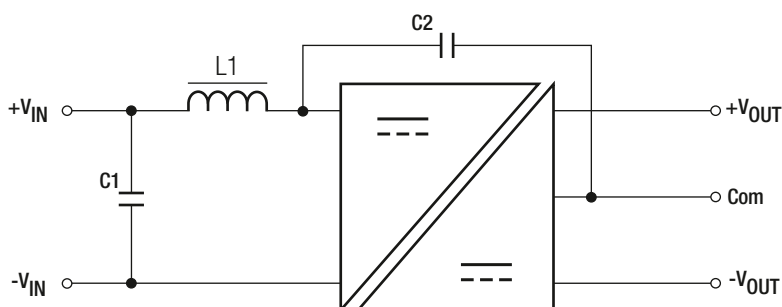


### SAFETY AND CERTIFICATIONS

| Certificate Type (Safety)                                                             | Report / File Number | Standard                                                                        |
|---------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------|
| Information Technology Equipment, General Requirements for Safety                     | 1602031              | EN60950-1:2006 + A2:2013<br>IEC60950-1:2005; 2nd Edition + A2:2013              |
| Information Technology Equipment, General Requirements for Safety                     | E358085              | UL60950-1, 2nd Edition, 2007<br>CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2006 |
| Medical Electric Equipment, General Requirements for Safety and Essential Performance | MDD1205098-4         | IEC60601-1, 3rd Edition, 2005<br>EN60601-1, 1st Edition, 2006                   |
| EAC                                                                                   | RU-AT.49.09571       | TP TC 004/2011                                                                  |
| RoHS 2+                                                                               |                      | RoHS-2011/65/EU + AM-2015/863                                                   |

| EMI Compliance                                                                | Condition            | Standard / Criterion |
|-------------------------------------------------------------------------------|----------------------|----------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter | EN55032, Class B     |

### EMC filter suggestion for EN55032 Class B



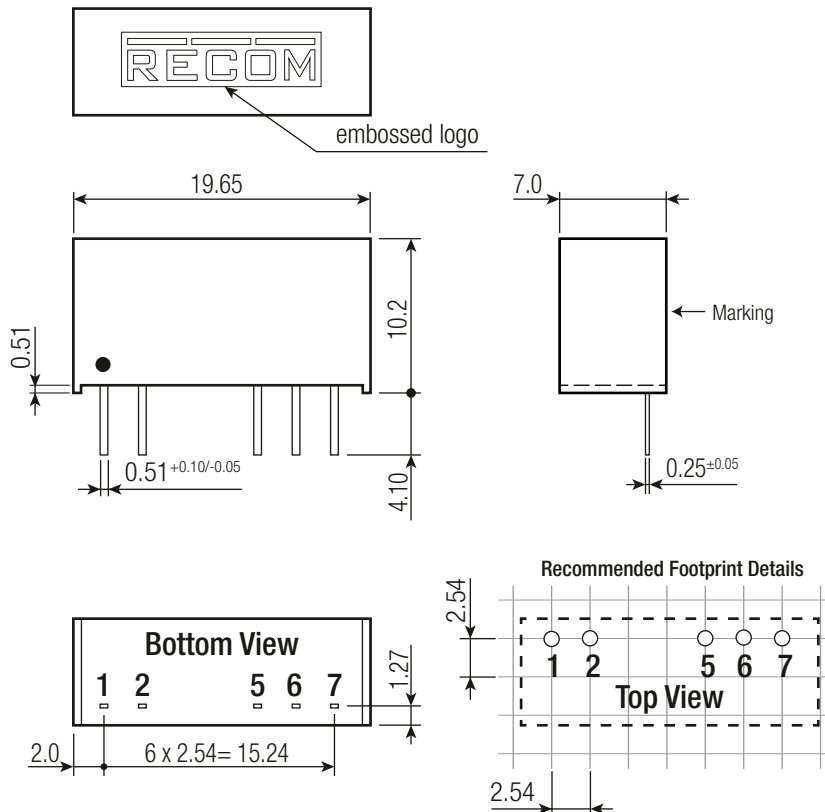
| MODEL       | C1    | C2           | L1    |
|-------------|-------|--------------|-------|
| RKZ-052005D | 10µF  | 470pF, 4kVDC | 4.7µH |
| RKZ-122005D | 4.7µF |              | 22µH  |
| RKZ-152005D | 4.7µF |              | 22µH  |
| RKZ-242005D | 2.2µF |              | 47µH  |

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

### DIMENSION and PHYSICAL CHARACTERISTICS

| Parameter                 | Type            | Value                                                         |
|---------------------------|-----------------|---------------------------------------------------------------|
| Material                  | case<br>potting | non-conductive black plastic, (UL94 V-0)<br>epoxy, (UL94 V-0) |
| Package Dimension (LxWxH) |                 | 19.65 x 7.05 x 10.2mm                                         |
| Package Weight            |                 | 2.8g                                                          |

#### Dimension Drawing (mm)



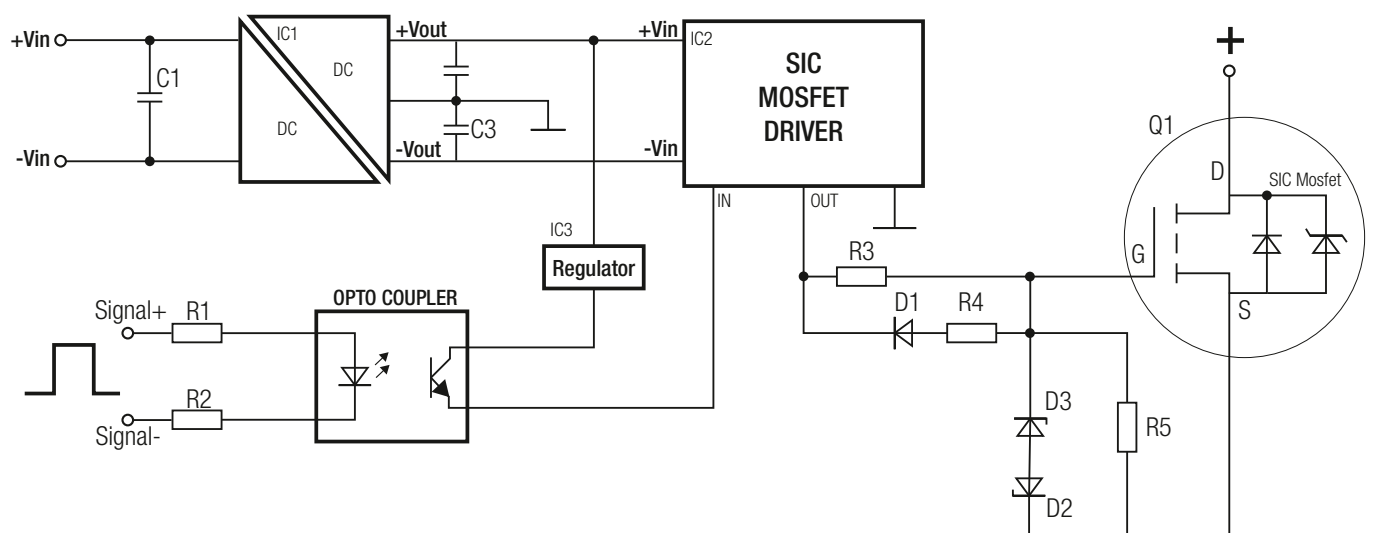
#### Pin Connections

| Pin # | Dual  |
|-------|-------|
| 1     | +Vin  |
| 2     | -Vin  |
| 5     | -Vout |
| 6     | Com   |
| 7     | +Vout |

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.35mm

### INSTALLATION AND APPLICATION

#### Typical Application Circuit



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

| PACKAGING INFORMATION       |      |                      |
|-----------------------------|------|----------------------|
| Packaging Dimension (LxWxH) | tube | 520.0 x 16.5 x 9.3mm |
| Packaging Quantity          |      | 25pcs                |
| Storage Temperature Range   |      | -55°C to +125°C      |
| Storage Humidity            |      | 5% to 95% RH         |

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