



**THE DATASHEET OF  
RGZ-1212D/H**



# Features

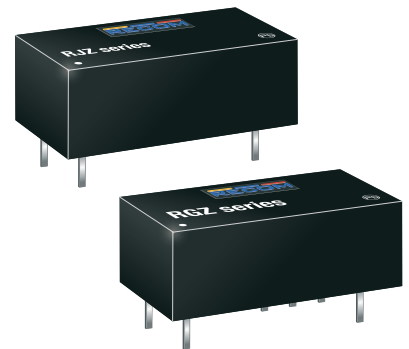
# Unregulated Converters

- 2W single and dual outputs in DIP14
- 3kVDC/1s or 4kVDC/1s isolation
- Optional continuous short circuit protection
- UL94V-0 package material
- Efficiency up to 85%
- Suitable for IGBT applications



## RJZ & RGZ

**2 Watt  
DIP14  
Single and Dual  
Output**



IEC/EN60950-1 certified  
IEC/EN60601-1 certified

### 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

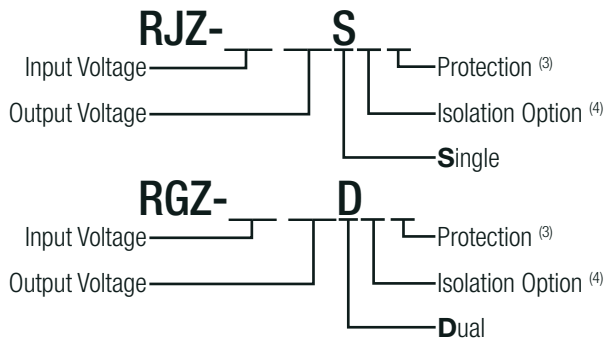
| Part Number                  | nom. Input Voltage [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. <sup>(1)</sup> [%] | max. Capacitive Load <sup>(2)</sup> [µF] |
|------------------------------|--------------------------|----------------------|---------------------|------------------------------------|--|
| RJZ-xx3.3S <sup>(3,4)</sup>  | 3.3, 5, 9, 12, 15, 24    | 3.3                  | 606                 | 70-75                              | 3300                                     |
| RJZ-xx05S <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | 5                    | 400                 | 78-85                              | 1200                                     |
| RJZ-xx09S <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | 9                    | 222                 | 78-84                              | 1200                                     |
| RJZ-xx12S <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | 12                   | 166                 | 80-85                              | 680                                      |
| RJZ-xx15S <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | 15                   | 133                 | 82-85                              | 680                                      |
| RJZ-xx24S <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | 24                   | 83                  | 80-85                              | 220                                      |
| RGZ-xx3.3D <sup>(3,4)</sup>  | 3.3, 5, 9, 12, 15, 24    | ±3.3                 | ±303                | 75                                 | ±1500                                    |
| RGZ-xx05D <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | ±5                   | ±200                | 75-82                              | ±470                                     |
| RGZ-xx09D <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | ±9                   | ±111                | 75-80                              | ±470                                     |
| RGZ-xx12D <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | ±12                  | ±84                 | 78-82                              | ±220                                     |
| RGZ-xx15D <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | ±15                  | ±66                 | 80-84                              | ±220                                     |
| RGZ-xx24D <sup>(3,4)</sup>   | 3.3, 5, 9, 12, 15, 24    | ±24                  | ±42                 | 82-84                              | ±100                                     |
| RGZ-xx1509D <sup>(3,4)</sup> | 5, 12, 24                | +15/-9               | +67/-111            | 70-81                              | ±330                                     |

#### 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 and is defined as the capacitive load that will allow start up in under 1s without damage to the converter

### Model Numbering



#### Notes:

Note3: standard part is without continuous short circuit protection  
add suffix „P“ for continuous short circuit protection

Note4: add suffix “/H” for 4kVDC/1s isolation  
or add suffix “/HP” for continuous short circuit protection and 4kVDC/1s isolation

#### Ordering Examples

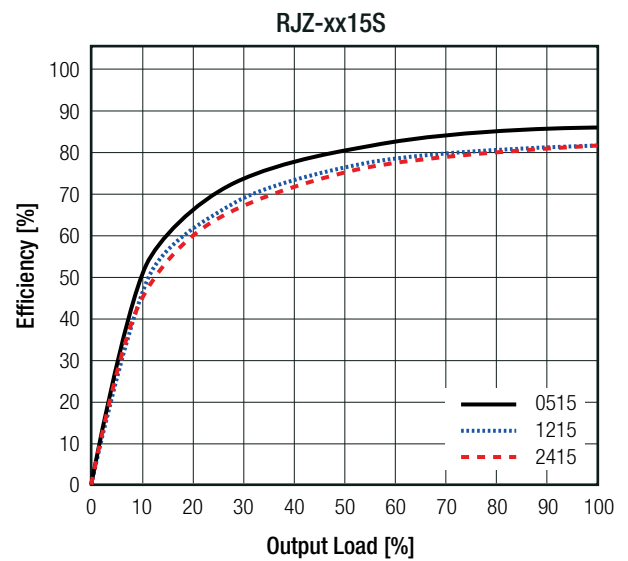
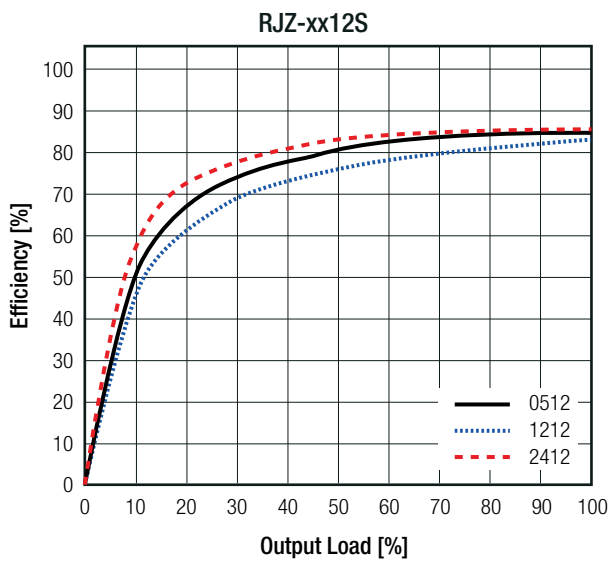
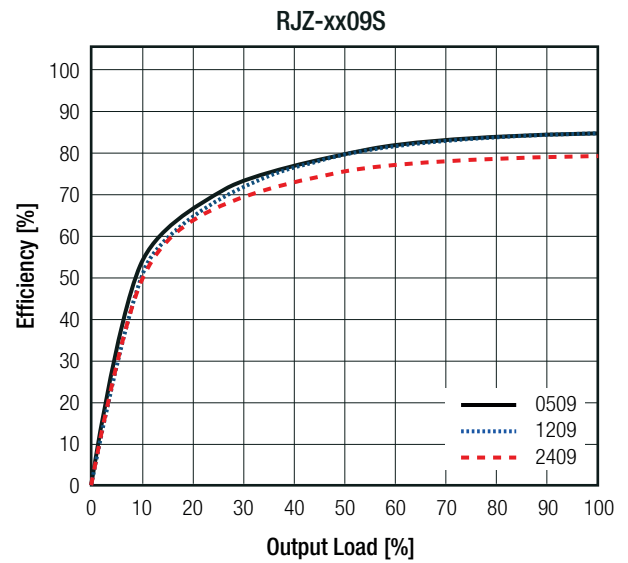
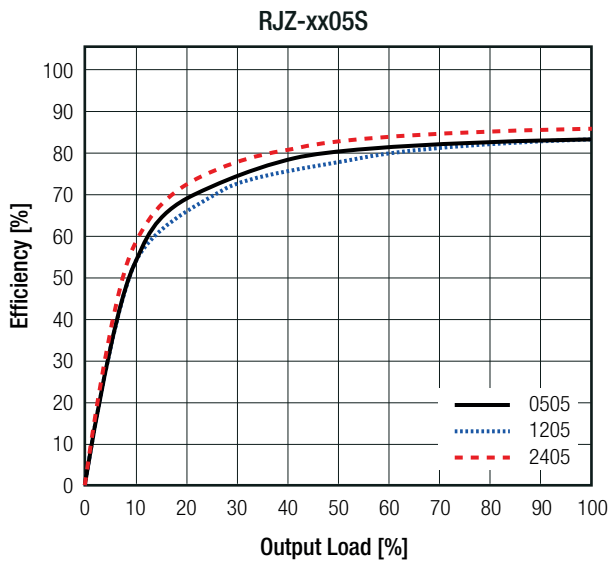
- RJZ-1212S = 12V Input, 12V Output, Single
- RJZ-0505S/P = 5V Input, 5V Output, Single, continuous short circuit protection
- RGZ-0505D/HP = 5V Input, 5V Output, Dual, 4kVDC/1s isolation and continuous short circuit protection

**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%           |          |
| Minimum Load                 |             | 0%             |                |          |
| Internal Operating Frequency | RGZ-xx1509D | 20kHz<br>20kHz | 50kHz<br>45kHz | 90kHz    |
| Output Ripple and Noise      | 20MHz BW    |                |                | 150mVp-p |

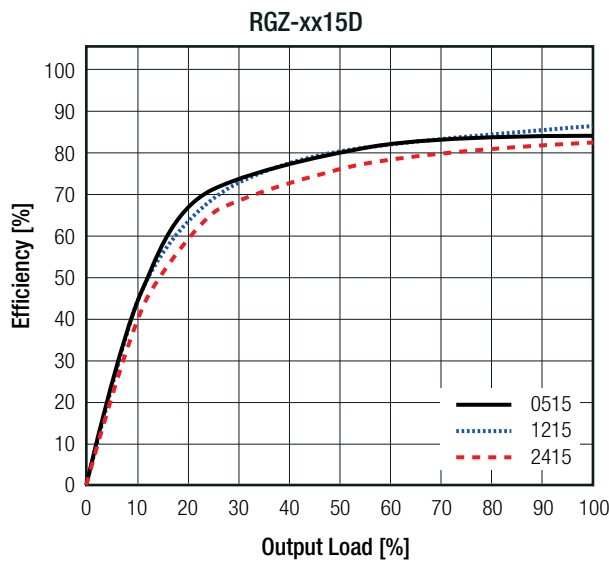
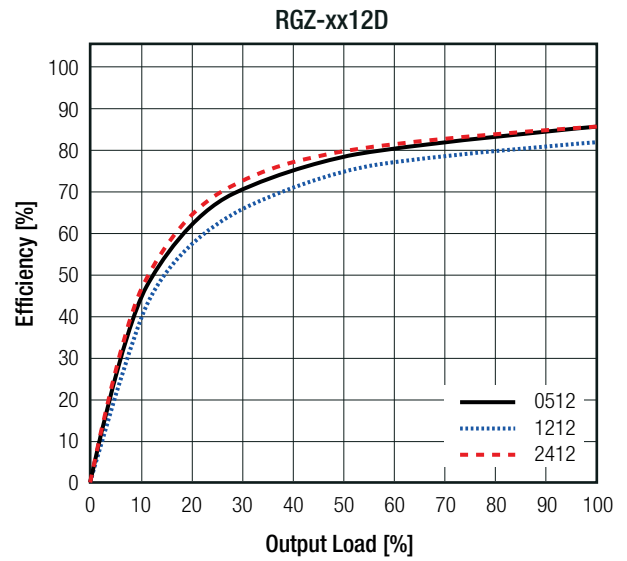
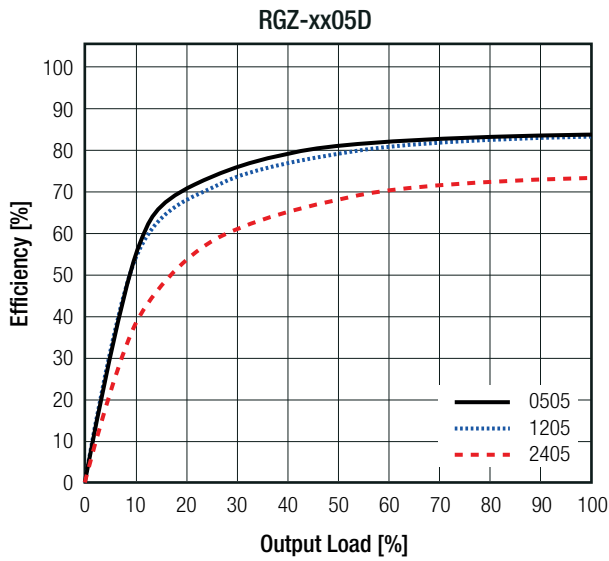
**Efficiency vs. Load**



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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             |                              | Value                  |
|--------------------------------|-----------------------|------------------------------|------------------------|
| Output Accuracy                |                       |                              | ±5.0% max.             |
| Line Regulation                | low line to high line |                              | ±1.2% of 1.0% Vin typ. |
| Load Regulation <sup>(5)</sup> | 10% to 100% load      | 3.3Vout                      | 20.0% max.             |
|                                |                       | 5Vout                        | 15.0% max.             |
|                                |                       | 9, 12, 15, 24 and +15/-9Vout | 10.0% max.             |

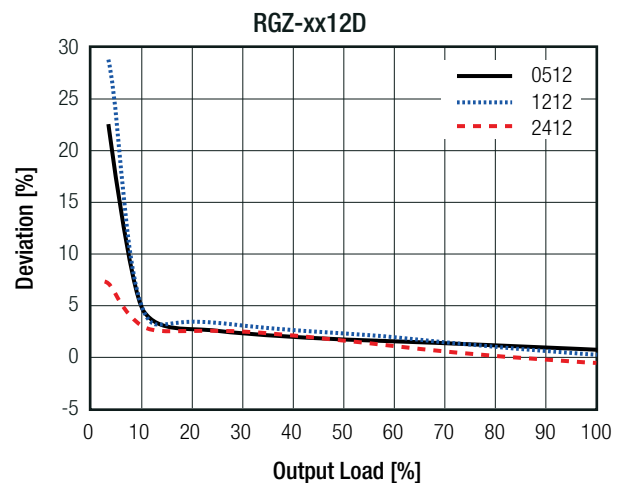
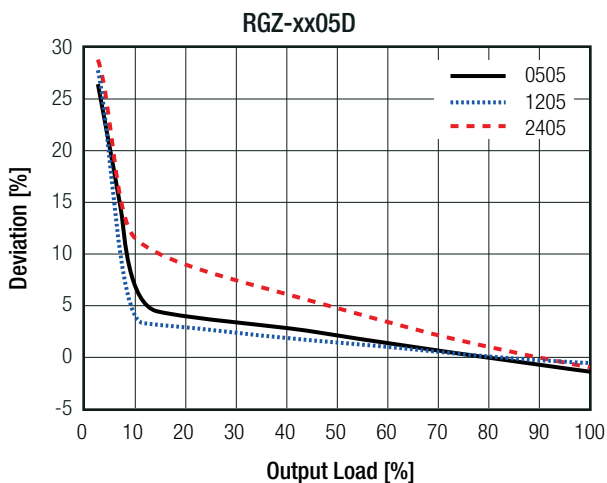
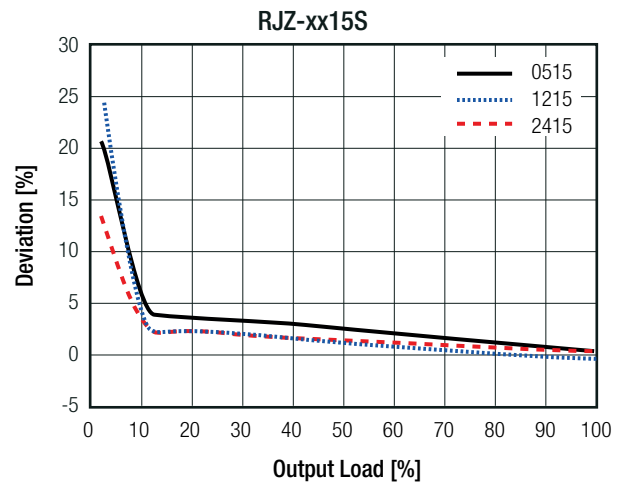
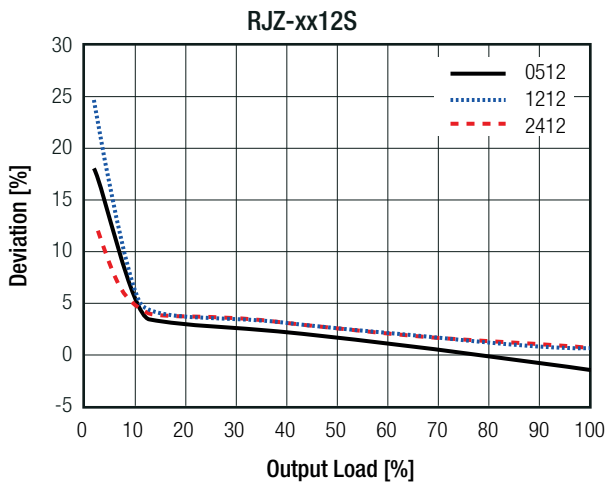
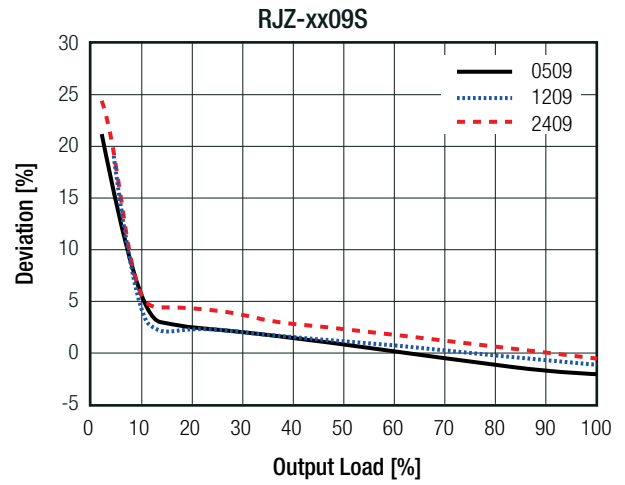
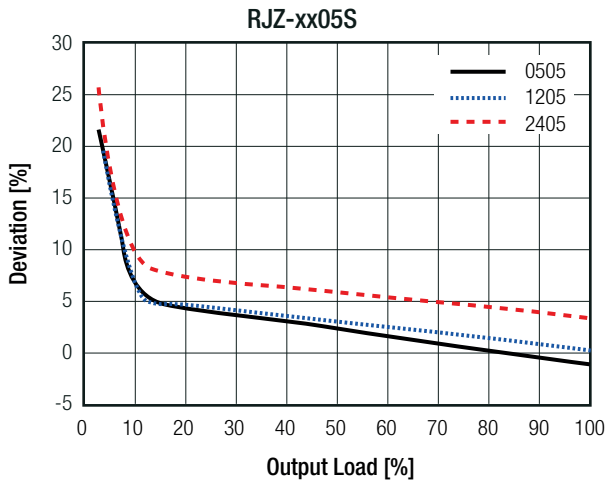
**Notes:**

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

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

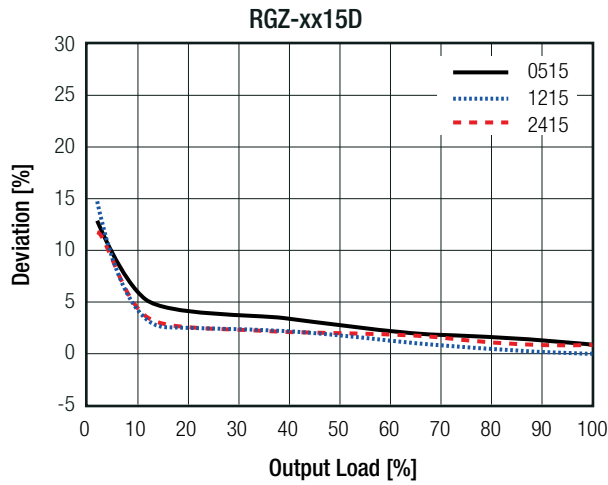
Deviation vs. Load



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

**Deviation vs. Load**



**PROTECTIONS**

| Parameter                        | Type                               |                     | Value  |
|----------------------------------|------------------------------------|---------------------|--|
| Short Circuit Protection (SCP)   | without suffix<br>with suffix "/P" |                     | 1 second<br>continuous   |
| Isolation Voltage <sup>(6)</sup> | I/P to O/P                         | without suffix      | tested for 1 second<br>rated for 1 minute<br>3kVDC<br>1.5kVAC/60Hz |
|                                  |                                    | with suffix<br>"/H" | tested for 1 second<br>rated for 1 minute<br>4kVDC<br>2kVAC/60Hz   |
| Isolation Resistance             |                                    |                     | 15GΩ min.  |
| Isolation Capacitance            |                                    |                     | 120pF max.   |
| Insulation Grade                 |                                    |                     | basic (IEC/EN60950-1)<br>functional (IEC/EN60601-1)                |

**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 required. Recommended fuse: slow blow type

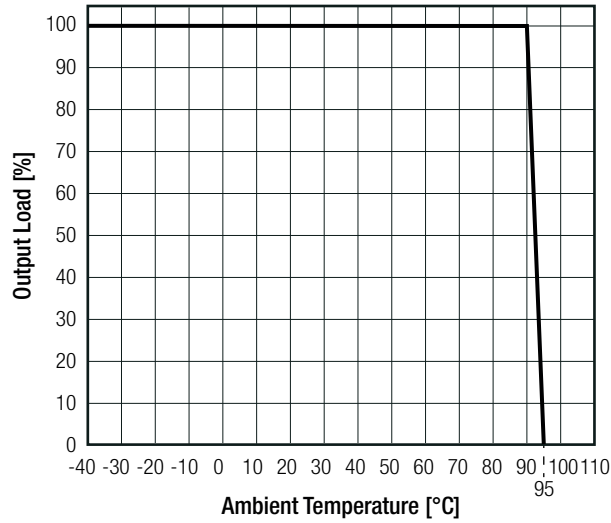
**ENVIRONMENTAL**

| Parameter                   | Condition                                   |     | Value          |                             |
|-----------------------------|---|-----|----------------|-----------------------------|
| Operating Temperature Range | full load @ free air convection (see graph) |     | -40°C to +90°C |                             |
| Maximum Case Temperature    |   |     | +110°C         |                             |
| Temperature Coefficient     |   |     | ±0.02%/K       |                             |
| Thermal Impedance           | 0.1m/s, horizontal                          |     | 56.66K/W       |                             |
| Operating Altitude          |   |     | 2000m          |                             |
| Operating Humidity          | non-condensing                              |     | 95% RH max.    |                             |
| Pollution Degree            |   |     | PD2            |                             |
| MTBF                        | according to MIL-HDBK-217F, G.B.            | RJZ | +25°C          | 893 x 10 <sup>3</sup> hours |
|                             |   |     | +85°C          | 208 x 10 <sup>3</sup> hours |
|                             |   | RGZ | +25°C          | 810 x 10 <sup>3</sup> hours |
|                             |   |     | +85°C          | 151 x 10 <sup>3</sup> hours |

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

**Derating Graph**  
(@ free air convection)



**SAFETY AND CERTIFICATIONS**

| Certificate Type (Safety)  | Report / File Number             | Standard  |
|--|----------------------------------|---|
| Information Technology Equipment, General Requirements for Safety                                    | SPCLVD1602031                    | IEC60950-1:2005, 2nd Edition + A2:2013<br>EN60950-1:2006 + A2:2013            |
| Information Technology Equipment, General Requirements for Safety                                    | E358085 <sup>(8)</sup>           | UL60950-1, 2nd Edition, 2007<br>CAN/CSA C22.2 NO. 60950-1, 2nd Edition, 2007  |
| Medical electrical equipment Part 1: General requirements for basic safety and essential performance | WD-SE-R-180676-A0 <sup>(9)</sup> | IEC60601-1:2005 + A1:2012, 3rd Edition<br>EN60601-1:2006 + A1:2013 + A12:2014 |
| EAC  | RU-AT.49.09571                   | TP TC 004/2011  |
| RoHS 2+  |                                  | RoHS-2011/65/EU + AM-2015/863   |

**Notes:**

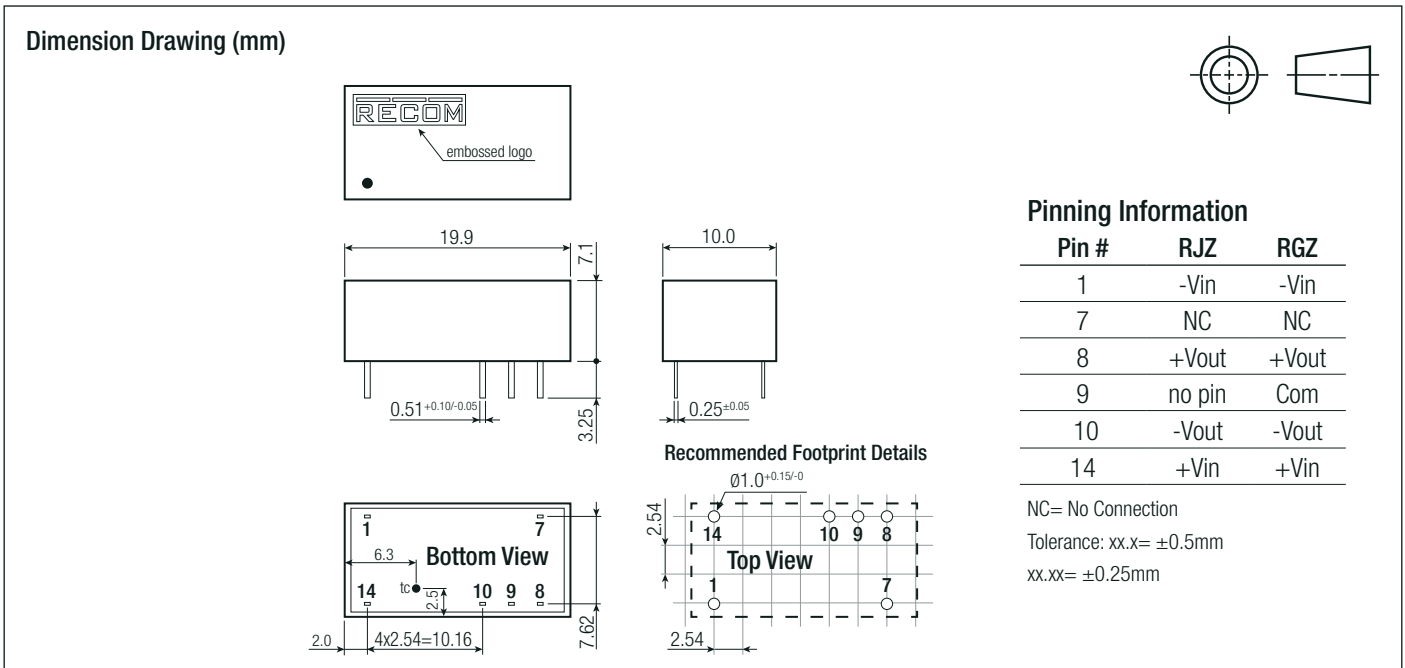
- Note8: only +15/-9 version
- Note9: excluded +15/-9 version

**DIMENSION AND PHYSICAL CHARACTERISTICS**

| Parameter         | Type                   | Value   |
|-------------------|------------------------|---|
| Material          | case<br>potting<br>PCB | non-conductive black plastic (UL94 V-0)<br>epoxy, (UL94 V-0)<br>FR4, (UL94 V-0) |
| Dimension (LxWxH) |                        | 19.9 x 10.0 x 7.1mm   |
| Weight            |                        | 2.8g typ.   |

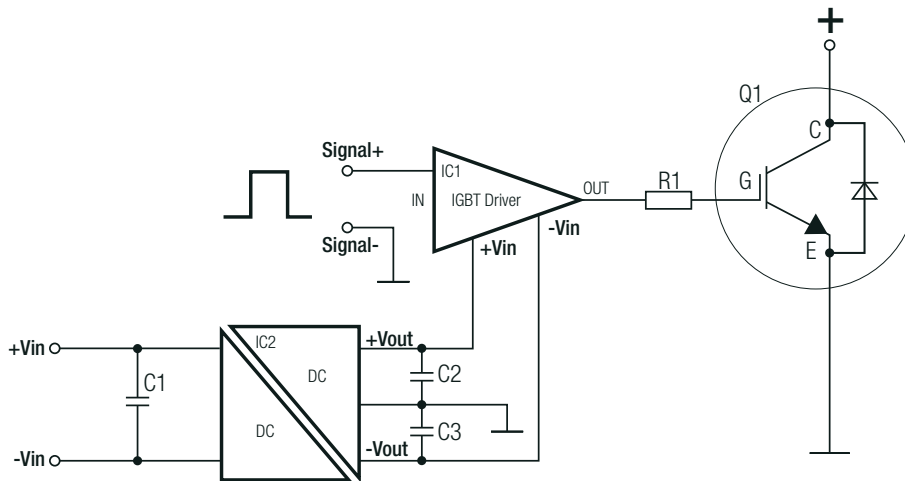
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**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)



### INSTALLATION AND APPLICATION

#### IGBT Application Circuit





### PACKAGING INFORMATION

| Parameter                   | Type           | Value                 |
|-----------------------------|----------------|-----------------------|
| Packaging Dimension (LxWxH) | tube           | 520.0 x 17.0 x 10.0mm |
| Packaging Quantity          | tube           | 24pcs                 |
| Storage Temperature Range   |                | -55°C to +125°C       |
| Storage Humidity            | non-condensing | 95% RH max.           |

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