

# Features

# Unregulated Converters

- Twin independent outputs
- 1kVDC or 2kVDC input/output basic isolation
- 1kVDC output/output isolation
- Power sharing on outputs
- Standard and miniature versions
- Optional continued short circuit protected
- Efficiency up to 76%



# RU/RUM

**1 Watt  
SIP7  
Isolated  
Dual Output**



IEC60950-1 certified  
EN60950-1 certified

## Description

The RU DC/DC converter offers two independent isolated outputs. Typical applications include multiple channel circuits where inter-channel isolation is also required. The RUM offers similar specifications in a miniature case for applications where space is at a premium. Both converters offer 1kVDC input/output isolation and 1kVDC output/output isolation. The /H versions offer 2kVDC isolation between input and outputs.

## Selection Guide

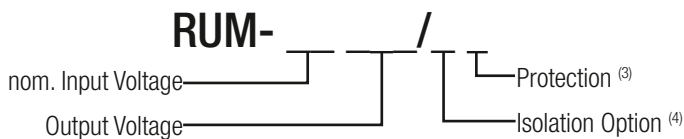
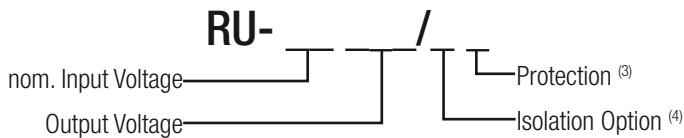
| Part Number                  | nom. Input Voltage | Output Voltage V1 | Output Voltage V2 | Output Current | Efficiency typ. <sup>(1)</sup> | max. Capacitive Load <sup>(2)</sup> |
|------------------------------|--------------------|-------------------|-------------------|----------------|--------------------------------|-------------------------------------|
|                              | [VDC]              | [VDC]             | [VDC]             | [mA]           | [%]                            | [μF]                                |
| RU-3.30505 <sup>(3,4)</sup>  | 3.3                | 5                 | 5                 | 100/100        | 76                             | 470/470                             |
| RU-050505 <sup>(3,4)</sup>   | 5                  | 5                 | 5                 | 100/100        | 72                             | 470/470                             |
| RUM-3.30505 <sup>(3,4)</sup> | 3.3                | 5                 | 5                 | 100/100        | 78                             | 470/470                             |
| RUM-050505 <sup>(3,4)</sup>  | 5                  | 5                 | 5                 | 100/100        | 72                             | 470/470                             |

### 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 2kVDC isolation  
or add suffix „/HP“ for 2kVDC isolation and continuous short circuit protection

### Ordering Examples:

RU-050505/P= 5V Input Voltage, 5V Output Voltage (V1VDC), 5V Output Voltage (V2VDC) with continuous short circuit protection

RUM-3.30505/HP= 12V Input Voltage, 24V Output Voltage (V1VDC), 24V Output Voltage (V2VDC) with 2kVDC isolation and continuous short circuit protection

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

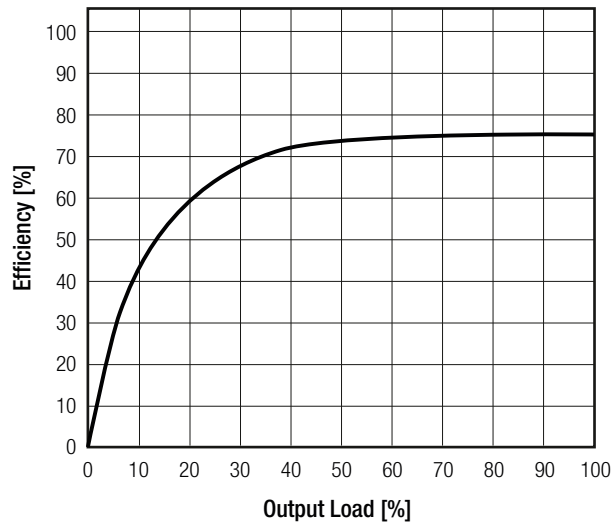
**BASIC CHARACTERISTICS**

| Parameter                    | Condition |           | Min.  | Typ.  | Max.                |
|------------------------------|-----------|-----------|-------|-------|---------------------|
| Input Voltage Range          |           |           |       | ±10%  |                     |
| Minimum Load <sup>(5)</sup>  |           |           | 0%    |       |                     |
| Internal Operating Frequency |           |           | 20kHz | 70kHz | 105kHz              |
| Output Ripple and Noise      | 20MHz BW  | RU<br>RUM |       |       | 75mVp-p<br>100mVp-p |

**Notes:**

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

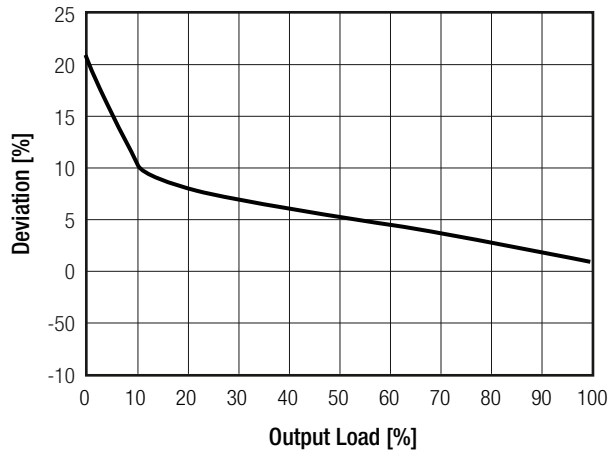
**Efficiency vs. Load**



**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 | 10% to 100% load      | 3.3, 5Vout     | 15.0% max.             |
|                 |                       | 12, 15, 24Vout | 10.0% max.             |

**Deviation vs. Load**



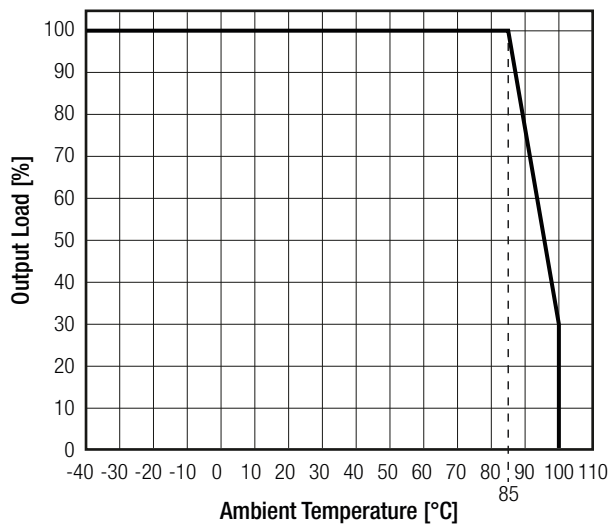
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**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

| 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 | 1kVDC<br>500VAC / 60Hz |
|  |                                    | with suffix<br>"/H" | tested for 1 second<br>rated for 1 minute | 2kVDC<br>1kVAC / 60Hz  |
|  | O/P1 to O/P2                       |                     | tested for 1 second                       | 1kVDC                  |
| Isolation Resistance   |                                    |                     |   | 10GΩ min.              |
| Isolation Capacitance  |                                    |                     |   | 20pF min. / 94pF max.  |
| Insulation Grade   |                                    |                     |   | basic                  |
| <b>Notes:</b>  |                                    |                     |   |                        |
| Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage  |                                    |                     |   |                        |
| Note7: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: T1A slow blow type |                                    |                     |   |                        |

| ENVIRONMENTAL               |   |       |                              |
|-----------------------------|---|-------|------------------------------|
| Parameter                   | Condition                                   |       | Value                        |
| Operating Temperature Range | full load @ free air convection (see graph) |       | -40°C to + 85°C              |
| Operating Altitude          |   |       | 2000m                        |
| Operating Humidity          | non-condensing                              |       | 95% RH max.                  |
| Pollution Degree            |   |       | PD2                          |
| MTBF                        | according to MIL-HDBK-217F, G.B.            | +25°C | 1012 x 10 <sup>3</sup> hours |
|                             |   | +85°C | 151 x 10 <sup>3</sup> hours  |

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



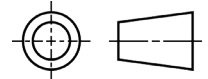
| SAFETY AND CERTIFICATIONS   |                      |  |
|---|----------------------|--|
| Certificate Type (Safety)   | Report / File Number | Standard   |
| Information Technology Equipment, General Requirements for Safety | 1602031              | IEC60950-1:2005, 2nd Edition + A2:2013<br>EN60950-1:2006 + A2:2013 |
| EAC   | RU-AT.49.09571       | TP TC 004/2011   |
| RoHS 2+   |                      | RoHS-2011/65/EU + AM-2015/863                                      |

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

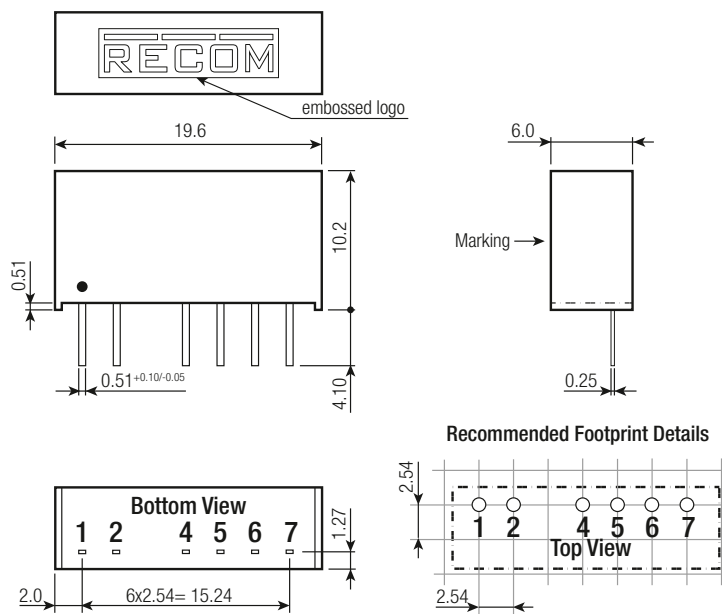
| DIMENSION AND PHYSICAL CHARACTERISTICS |         |   |
|--|---------|---|
| Parameter                              | Type    | Value                                   |
| Material                               | case    | non-conductive black plastic (JL94 V-1) |
|  | potting | epoxy, (JL94 V-0)                       |
|  | PCB     | FR4, (JL94 V-1)                         |
| Package Dimension (LxWxH)              | RU      | 19.65 x 7.0 x 10.2mm                    |
|  | RUM     | 16.55 x 6.0 x 7.7mm                     |
| Package Weight                         |         | 2.7g typ.                               |

**Dimension Drawing (mm)**

**RU**



**SIP7 Package**



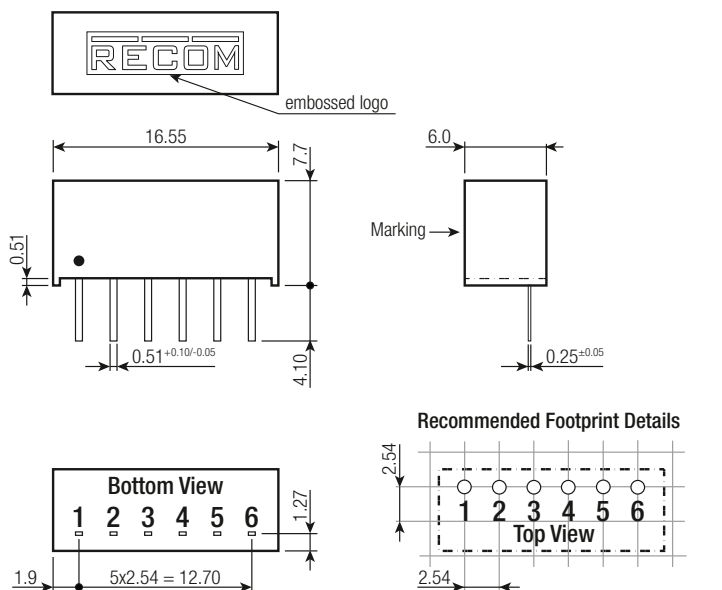
**Pinning information**

| Pin # | Single  |
|-------|---------|
| 1     | +Vin    |
| 2     | -Vin    |
| 4     | +Vout 1 |
| 5     | -Vout 1 |
| 6     | +Vout 2 |
| 7     | -Vout 2 |

Tolerance:  
xx.x= ±0.5mm  
xx.xx= ±0.25mm

**RUM**

**SIP6 Package**



**Pinning information**

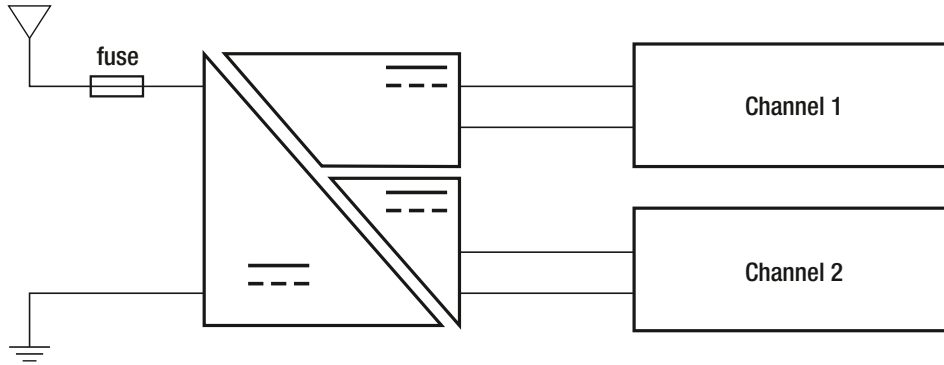
| Pin # | Single  |
|-------|---------|
| 1     | +Vin    |
| 2     | -Vin    |
| 3     | +Vout 1 |
| 4     | -Vout 1 |
| 5     | +Vout 2 |
| 6     | -Vout 2 |

Tolerance:  
xx.x= ±0.5mm  
xx.xx= ±0.25mm

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

**INSTALLATION AND APPLICATION**

Typical Application



**PACKAGING INFORMATION**

| Parameter                   | Type |           | Value                |
|-----------------------------|------|-----------|----------------------|
| Packaging Dimension (LxWxH) | tube |           | 520.0 x 16.0 x 9.0mm |
| Packaging Quantity          | tube | RU<br>RUM | 25pcs<br>30pcs       |
| Storage Temperature Range   |      |           | -55°C to + 125°C     |
| Storage Humidity            |      |           | 95% RH max.          |

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