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# Features

# Regulated Converter

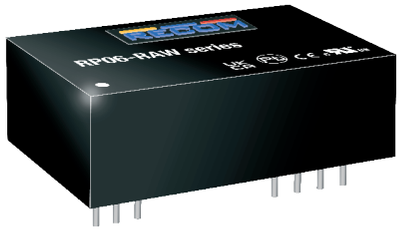
- Ultra wide 4:1 input range (36-160VDC)
- Certified for Railway applications (EN50155)
- -40°C to +105°C operating temperature with derating
- Input under voltage lockout
- Output OVLO, short circuit and OLP
- 3kVAC/1min. reinforced isolation
- Remote On/Off

RECOM
DC/DC Converter

# RP06-RAW

## 6 Watt DIP24 Single and Dual Output

3 YEAR warranty




UL62368-1 certified
CAN/CSA-C22.2 No. 62368-1-14 certified
IEC/EN62368-1-1 certified
EN50155 compliant
EN50121-3-2 compliant
EN55032 compliant

## Description

The RP06-RAW series DC/DC converters are designed for railway rolling stock applications with an extra wide continuous input voltage range of 36-160VDC (200VDC for 1s), making them suitable for 72V, 96V and 110VDC railway systems, but they are also suitable for non-railway high voltage battery applications. They offer single or dual outputs from 3.3V up to ±15V. The high efficiency permits an ambient temperature range from -40°C to more than 85°C without derating, forced cooling, or the need for heatsinks. The RP06-RAW series features UVLO, OVP, SCP, and OLP making them ideal for any harsh railway and industrial applications such as powering IoT sensors, battery management systems, or electric fork-lift trucks. The RP06-RAW is available in an industry standard, compact DIP24 package and comes with a 3 year warranty.

## Selection Guide

| Part Number | Input Voltage Range [VDC] | nom. Output Voltage [VDC] | Output Current [mA] | Efficiency typ. (1) [%] | max. Capacitive Load (2) [µF] |
|---|---|---|---|---|---|
| RP06-1103.3SRAW | 36-160 | 3.3 | 1800 | 80 | 1050 |
| RP06-11005SRAW | 36-160 | 5 | 1200 | 81.5 | 750 |
| RP06-11012SRAW | 36-160 | 12 | 500 | 84.5 | 130 |
| RP06-11015SRAW | 36-160 | 15 | 400 | 84 | 100 |
| RP06-11024SRAW | 36-160 | 24 | 250 | 85 | 39 |
| RP06-11005DRAW | 36-160 | ±5 | ±600 | 81 | ±430 |
| RP06-11012DRAW | 36-160 | ±12 | ±250 | 85 | ±75 |
| RP06-11015DRAW | 36-160 | ±15 | ±200 | 85 | ±56 |

**Notes:**

Note1: Efficiency is tested at nominal $V_{IN}$, full load and 25°C

Note2: Max. Cap load is tested at minimum input and constant resistive load

## Model Numbering

RP06-110 __ _RAW

- 110 — nom. Input Voltage
- __ — nom. Output Voltage
- _RAW — Single or Dual

**Ordering Examples**

| | | | |
|---|---|---|---|
| RP06-1103.3SRAW | nom. $V_{IN}$= 110VDC | nom. $V_{OUT}$= 3.3VDC | single output |
| RP06-11012DRAW | nom. $V_{IN}$= 110VDC | nom. $V_{OUT}$= ±12VDC | dual output |

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# RP06-RAW Series

## Specifications (measured @ Ta= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### BASIC CHARACTERISTICS

| Parameter | Condition | | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| Internal Input Filter | | | | | Pi-Type |
| Input Voltage Range | nom. $V_{IN}$= 110VDC | | 36VDC | 110VDC | 160VDC |
| Input Surge Voltage | 1s max. | | | | 200VDC |
| Under Voltage Lockout (UVLO) | DC-DC ON | | | | 36VDC |
| | DC-DC OFF | | 32VDC | 34VDC | 35.8VDC |
| Quiescent Current | | | | 4mA | |
| Output Voltage Trimming | refer to **"OUTPUT VOLTAGE TRIMMING"** | others | -10% | | +10% |
| | | nom. $V_{OUT}$= 15/24VDC | -10% | | +20% |
| Minimum Load | | | 0% | | |
| Start-up Time | constant resistive load | Power up | | 30ms | 60ms |
| | | CTRL ON/OFF | | 30ms | 60ms |
| ON/OFF CTRL (3) refer to **"ON/OFF CTRL"** | DC-DC ON | | Open or 3VDC < $V_{CTRL}$< 12VDC | | |
| | DC-DC OFF | | Short or 0VDC < $V_{CTRL}$< 1.2VDC | | |
| Input Current of CTRL pin | | | -0.5mA | | +0.5mA |
| Standby Current | DC-DC OFF | | | 2.5mA | |
| Internal Operating Frequency | | | 270kHz | 300kHz | 330kHz |
| Output Ripple and Noise (4) | 20MHz BW | nom. $V_{OUT}$= 3.3/5VDC | | 50mVp-p | |
| | | nom. $V_{OUT}$= 12/15VDC | | 75mVp-p | |
| | | nom. $V_{OUT}$= 24VDC | | 75mVp-p | |

**Notes:**

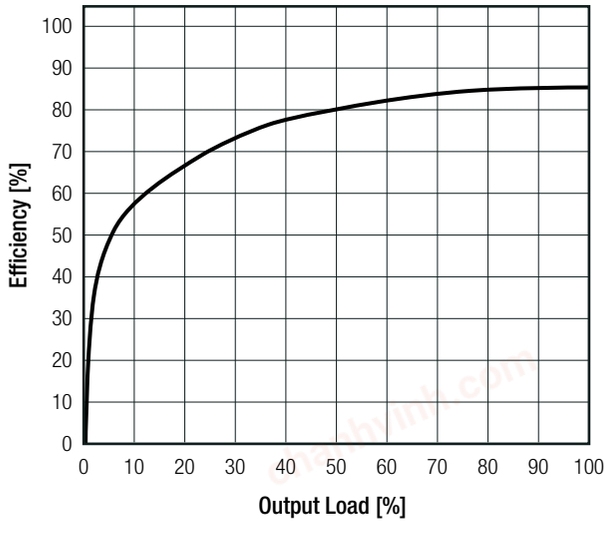
Note3: The ON/OFF control function is positive logic. The pin voltage is referenced to -Vin pin

Note4: Measured with: nom. $V_{OUT}$= 3.3/5/12/15VDC = 10µF/25V X7R MLCC
nom. $V_{OUT}$= 24VDC = 4.7µF/50V X7R MLCC

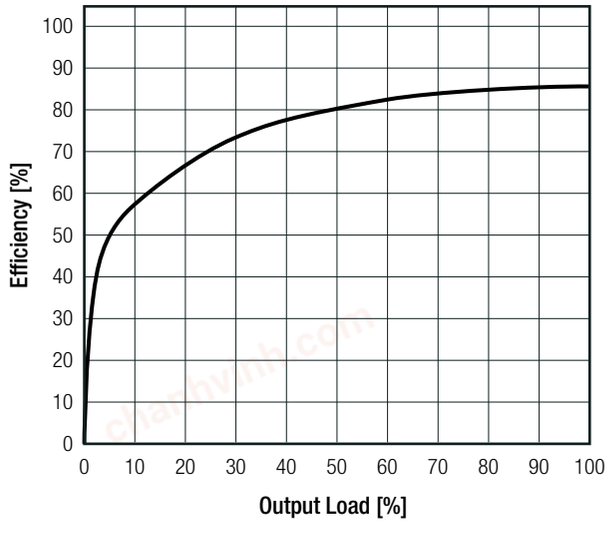
### Efficiency vs. Load

(@ nom. $V_{IN}$= 110VDC)

RP06-1103.3SRAW




RP06-11005SRAW




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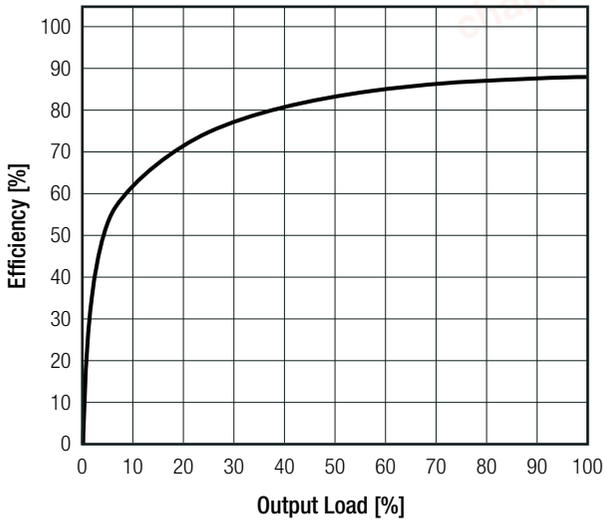
# RP06-RAW Series

## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### Efficiency vs. Load

(@ nom. $V_{IN}$= 110VDC)

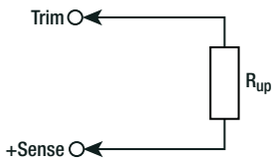
RP06-11012SRAW



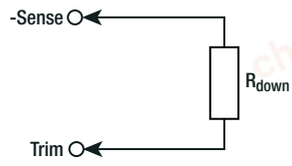

## OUTPUT VOLTAGE TRIMMING

RP06-RAW converter offer the feature of trimming the output voltage over a certain range around the nominal value by using external trim resistors.
The values for trim resistors shown in trim tables below are according to standard E96 values; therefore, the specified voltage may slightly vary; they also can be calculated with below shown equation.

Trim up




Trim down




| | | |
|---|---|---|
| $Vout_{nom}$ | = nominal output voltage | [VDC] |
| $Vout_{set}$ | = output voltage change | [VDC] |
| $V_{ref}$ | = reference voltage | [VDC] |
| $R_{up}$ | = trim up resistor | [Ω] |
| $R_{down}$ | = trim down resistor | [Ω] |
| $R_1, R_2, R_3$ | = internal resistors | [Ω] |

**Calculation:**

$$R_{up} = \frac{(R_1 \times V_{ref})}{(Vout_{set} - V_{ref} - R_3)} - R_2$$

$$R_{down} = \frac{(Vout_{set} - V_{ref}) \times R_1}{(Vout_{nom} - Vout_{set})} - R_2$$

### Single Output

| $Vout_{nom}$ | $R_1$ [Ω] | $R_2$ [Ω] | $R_3$ [Ω] | $V_{ref}$ [VDC] |
|---|---|---|---|---|
| 3.3VDC | 5110 | 2050 | 0.8 | 2.5 |
| 5VDC | | | 2.5 | |
| 12VDC | 10000 | 5110 | 9.5 | |
| 15VDC | | | 12.5 | |
| 24VDC | 56000 | 13000 | 21.5 | |

### Dual Output

| $Vout_{nom}$ | $R_1$ [Ω] | $R_2$ [Ω] | $R_3$ [Ω] | $V_{ref}$ [VDC] |
|---|---|---|---|---|
| 5VDC | 3000 | 3000 | 7.5 | 2.5 |
| 12VDC | 56000 | 13000 | 21.5 | |
| 15VDC | 30000 | 13000 | 27.5 | |

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# RP06-RAW Series

## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### OUTPUT VOLTAGE TRIMMING

**Practical Example RP06-1103.3SRAW trim up +1%**

$Vout_{nom}$= 3.3V, $Vout_{set}$= +1% (3.333VDC)

$$R_{up} = \frac{(5110 \times 2.5)}{(3.333 - 2.5 - 0.8)} - 2050 = \mathbf{385071\Omega}$$

$R_{up}$ according to E96 ≈ **383kΩ**

**Practical Example RP06-11015SRAW trim down -8%**

$Vout_{nom}$= 15V, $Vout_{set}$= -8% (13.8VDC)

$$R_{down} = \frac{(13.8 - 2.5) \times 10000}{(15 - 13.8)} - 5110 = \mathbf{89057\Omega}$$

$R_{down}$ according to E96 ≈ **88k7Ω**

#### RP06-1103.3SRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 3.333 | 3.366 | 3.399 | 3.432 | 3.465 | 3.498 | 3.531 | 3.564 | 3.597 | 3.63 | [VDC] |
| $R_{up}$ (E96) ≈ | 383k | 191k | 127k | 95k3 | 75k | 61k9 | 53k6 | 46k4 | 41k2 | 36k5 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 3.267 | 3.234 | 3.201 | 3.168 | 3.135 | 3.102 | 3.069 | 3.036 | 3.003 | 2.97 | [VDC] |
| $R_{up}$ (E96) ≈ | 118k | 54k9 | 34k | 23k7 | 17k4 | 13k3 | 10k5 | 8k25 | 6k65 | 5k23 | [Ω] |

#### RP06-11005SRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 5.05 | 5.10 | 5.15 | 5.20 | 5.25 | 5.30 | 5.35 | 5.4 | 5.45 | 5.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 255k | 127k | 82k5 | 61k9 | 48k7 | 40k2 | 34k8 | 30k1 | 26k1 | 23k7 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 4.95 | 4.90 | 4.85 | 4.80 | 4.75 | 4.70 | 4.65 | 4.60 | 4.55 | 4.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 249k | 121k | 78k7 | 56k2 | 44k2 | 35k7 | 29k4 | 24k9 | 21k | 18k2 | [Ω] |

#### RP06-11012SRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 12.12 | 12.24 | 12.36 | 12.48 | 12.60 | 12.72 | 12.84 | 12.96 | 13.08 | 13.20 | [VDC] |
| $R_{up}$ (E96) ≈ | 205k | 100k | 64k9 | 47k5 | 36k5 | 29k4 | 24k9 | 21k | 17k9 | 15k8 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 11.88 | 11.76 | 11.64 | 11.52 | 11.40 | 11.28 | 11.16 | 11.04 | 10.92 | 10.8 | [VDC] |
| $R_{up}$ (E96) ≈ | 768k | 383k | 249k | 182k | 143k | 118k | 97k6 | 84k5 | 73k2 | 63k4 | [Ω] |

#### RP06-11015SRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 15.15 | 15.3 | 15.45 | 15.60 | 15.75 | 15.90 | 16.05 | 16.20 | 16.35 | 16.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 162k | 78k7 | 49k9 | 36k5 | 28k | 22k6 | 1k87 | 15k8 | 13k3 | 11k5 | [Ω] |

| Trim up | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 16.650 | 16.800 | 16.950 | 17.100 | 17.250 | 17.400 | 17.550 | 17.700 | 17.850 | 18.000 | [VDC] |
| $R_{up}$ (E96) ≈ | 10k | 8k87 | 7k68 | 6k81 | 6k04 | 5k36 | 4k64 | 4k12 | 3k65 | 3k24 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 14.85 | 14.70 | 14.55 | 14.40 | 14.25 | 14.1 | 13.95 | 13.8 | 13.65 | 13.5 | [VDC] |
| $R_{up}$ (E96) ≈ | 825k | 402k | 261k | 191k | 150k | 124k | 105 | 88k7 | 76k8 | 68k1 | [Ω] |

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# RP06-RAW Series

## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### OUTPUT VOLTAGE TRIMMING

#### RP06-11024SRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 24.240 | 24.480 | 24.720 | 24.960 | 25.200 | 25.440 | 25.680 | 25.920 | 26.160 | 26.400 | [VDC] |
| $R_{up}$ (E96) ≈ | 576k | 280k | 182k | 133k | 105k | 84k5 | 69k8 | 60k4 | 52k3 | 45k3 | [Ω] |

| Trim up | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 26.640 | 26.880 | 27.120 | 27.360 | 27.600 | 27.840 | 28.080 | 28.320 | 28.560 | 28.800 | [VDC] |
| $R_{up}$ (E96) ≈ | 40k2 | 35k7 | 31k6 | 28k7 | 26k1 | 23k7 | 21k5 | 19k6 | 17k9 | 16k2 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | 23.760 | 23.520 | 23.280 | 23.040 | 22.800 | 22.560 | 22.320 | 22.080 | 21.840 | 21.600 | [VDC] |
| $R_{up}$ (E96) ≈ | 4990k | 2430k | 1620k | 1180k | 931k | 768k | 649k | 562k | 487k | 432k | [Ω] |

#### RP06-11005DRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±5.05 | ±5.10 | ±5.15 | ±5.20 | ±5.25 | ±5.30 | ±5.35 | ±5.4 | ±5.45 | ±5.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 71k5 | 34k8 | 22k1 | 15k8 | 12k1 | 95k3 | 7k68 | 6k34 | 5k36 | 4k53 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±4.95 | ±4.90 | ±4.85 | ±4.80 | ±4.75 | ±4.70 | ±4.65 | ±4.60 | ±4.55 | ±4.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 221k | 107k | 69k8 | 49k9 | 39k2 | 31k6 | 26k1 | 22k1 | 19k1 | 16k5 | [Ω] |

#### RP06-11012DRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±12.12 | ±12.24 | ±12.36 | ±12.48 | ±12.60 | ±12.72 | ±12.84 | ±12.96 | ±13.08 | ±13.20 | [VDC] |
| $R_{up}$ (E96) ≈ | 576k | 280k | 182k | 133k | 105k | 84k5 | 69k8 | 60k4 | 52k3 | 45k3 | [Ω] |

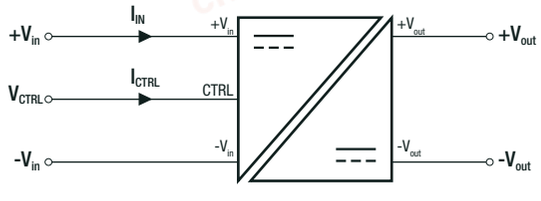
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±11.88 | ±11.76 | ±11.64 | ±11.52 | ±11.40 | ±11.28 | ±11.16 | ±11.04 | ±10.92 | ±10.8 | [VDC] |
| $R_{up}$ (E96) ≈ | 4990k | 2430k | 1620k | 1180k | 931k | 768k | 649k | 562k | 487k | 432k | [Ω] |

#### RP06-11015DRAW

| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±15.15 | ±15.3 | ±15.45 | ±15.60 | ±15.75 | ±15.90 | ±16.05 | ±16.20 | ±16.35 | ±16.50 | [VDC] |
| $R_{up}$ (E96) ≈ | 237k | 113k | 69k8 | 49k9 | 37k4 | 28k7 | 22k6 | 18k2 | 14k7 | 12k1 | [Ω] |

| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $Vout_{set}$ = | ±14.85 | ±14.70 | ±14.55 | ±14.40 | ±14.25 | ±14.1 | ±13.95 | ±13.8 | ±13.65 | ±13.5 | [VDC] |
| $R_{up}$ (E96) ≈ | 2740k | 1330k | 866k | 649k | 511k | 412k | 348k | 301k | 261k | 232k | [Ω] |

### ON/OFF CTRL




| | | |
|---|---|---|
| **Positive Logic** | DC-DC ON | Open or 3VDC<VCTRL<12VDC |
| | DC-DC OFF | Open or 0VDC<VCTRL<1.2VDC |

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# RP06-RAW Series

## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### REGULATIONS

| Parameter | Condition | | Value |
|---|---|---|---|
| Output Accuracy | | | ±1.0% |
| Line Regulation | low line to high line, full load | Single | ±0.2% |
| | | Dual | ±0.5% |
| Load Regulation | 0% to 100% load | Single | ±0.2% |
| | | Dual | ±1.0% |
| Cross Regulation | asymmetrical 25%-100% load | | ±5.0% |
| Transient Response Recovery Time | 25% load step change | | 250µs typ. |

### PROTECTIONS

| Parameter | Condition | | | Value |
|---|---|---|---|---|
| Short Circuit Protection (SCP) | | | | continuous, automatic recovery |
| Over Voltage Protection (OVP) | zener diode clamp | Single | nom. $V_{OUT}$= 3.3VDC | 3.7-5VDC |
| | | | nom. $V_{OUT}$= 5VDC | 5.6-7VDC |
| | | | nom. $V_{OUT}$= 12VDC | 13.5-16VDC |
| | | | nom. $V_{OUT}$= 15VDC | 18.3-22VDC |
| | | | nom. $V_{OUT}$= 24VDC | 29.1-34.5VDC |
| | | Dual | nom. $V_{OUT}$= ±5VDC | 5.6-7VDC |
| | | | nom. $V_{OUT}$= ±12VDC | 13.5-18.2VDC |
| | | | nom. $V_{OUT}$= ±15VDC | 17-22VDC |
| Over Load Protection (OLP) | % of Iout rated; Hiccup mode | | | 150% typ. |
| Isolation Voltage (5) | I/P to O/P | 1 minute | | 3kVAC |
| Isolation Resistance | $V_{ISO}$= 500VDC | | | 1GΩ min. |
| Isolation Capacitance | | | | 1000pF max. |
| Insulation Grade | | | | reinforced |

**Notes:**

Note4: This power module is not internally fused. An input line fuse must always be used. Recom suggests: nom. $V_{IN}$= 110VDC = T0.5A slow blow

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

### ENVIRONMENTAL

| Parameter | Condition | Value |
|---|---|---|
| Operating Temperature Range | with derating (refer to **"Derating Graph"** ) | -40°C to +105°C |
| Maximum Case Temperature | no load | +105°C |
| Temperature Coefficient | | ±0.02%/K |
| Thermal Impedance | @ natural convection 0.1m/s | 18.91K/W typ. |
| Operating Humidity | | 5% - 95% RH max. |
| Pollution Degree (PD) | | PD2 |
| Shock | | according to MIL-STD-810F |
| Thermal Shock | | according to EN61373, MIL-STD-810F |
| Vibration | | according to EN61373, MIL-STD-810F |
| Environmental testing Part 2-1: Tests – Test A: Cold | Low temperature start-up test<br>Class OT4: -40°C to +70°C | according to EN60068-2-1:2007 |
| Environmental testing Part 2-2: Tests – Test B: Dry heat | Dry Heat Test<br>Class OT4: -40°C to +70°C<br>Class ST1: Test cycle B | according to EN60068-2-2:2007 |

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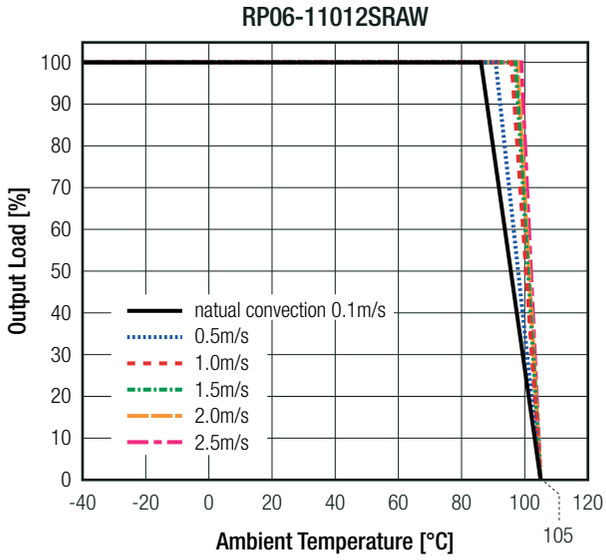


## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### ENVIRONMENTAL

| Parameter | Condition | Value |
|---|---|---|
| Environmental testing Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) | Damp Heat Test<br>Temperature: +25 to +55°C<br>Humidity: 95% ±5% RH<br>Test Duration: 48 hours | according to EN60068-2-30:2005 |
| Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components | | EN45545-2 |
| Railway applications – Rolling stock equipment – Shock and vibration tests | | EN61373:2010 |
| MTBF | according to MIL-HDBK-217F, G.B | 3036 x $10^3$ hours |

**Derating Graph**
(@ Chamber and natural convection 0.1m/s)




### SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Condition | Standard |
|---|---|---|
| Audio/video, information, and communication technology equipment. Safety requirements (CB) | 221005301 | IEC62368-1:2014 2nd Edition |
| Audio/video, information, and communication technology equipment. Safety requirements (LVD) | | EN62368-1:2014+A11:2017 |
| Audio/video, information, and communication technology equipment. Safety requirements | E196683 | UL62368-1:2014 2nd Edition |
| | | CAN/CSA-C22.2 No. 62368-1-14 2nd Edition |
| Railway applications - Electronic equipment used on rolling stock | | EN50155:2017 |
| RoHS2 | | RoHS 2011/65/EU + AM2015/863 |

| EMC Compliance according to EN50121-3-2 | Condition | Standard / Criterion |
|---|---|---|
| Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus | without external components | EN50121-3-2 |
| ESD Electrostatic discharge immunity test | Air: ± 8kV; Contact ±6kV | EN61000-4-2, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test | 20V/m | EN61000-4-3, Criteria A |
| Fast Transient and Burst Immunity (6) | ±2kV | EN61000-4-4, Criteria A |
| Surge Immunity (6) | ±2kV | EN61000-4-5, Criteria A |
| Immunity to conducted disturbances, induced by radio-frequency fields | 10Vrms | EN61000-4-6, Criteria A |
| Power frequency magnetic field | 100A/m cont.; 1000A/m 1sec | EN61000-4-8, Criteria A |

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## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

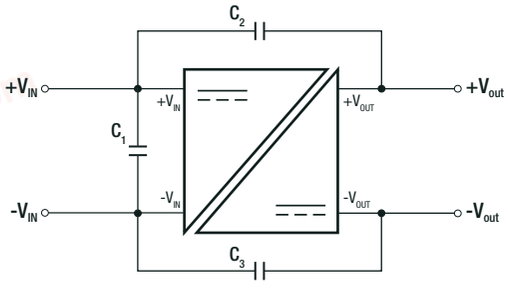
### SAFETY AND CERTIFICATIONS

| EMC Compliance according to EN55032/35 | Condition | Standard / Criterion |
|---|---|---|
| Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements | without external components | EN55032, Class A |
| | refer to **"EMC Filtering"** | EN55032, Class B |
| Electromagnetic compatibility of multimedia equipment – Immunity requirements | | EN55035:2017 |
| ESD Electrostatic discharge immunity test | Air: ± 8kV; Contact ±6kV | EN61000-4-2, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test | 20V/m | EN61000-4-3, Criteria A |
| Fast Transient and Burst Immunity (6) | ±2kV | EN61000-4-4, Criteria A |
| Surge Immunity (6) | ±2kV | EN61000-4-5, Criteria A |
| Immunity to conducted disturbances, induced by radio-frequency fields | 10Vrms | EN61000-4-6, Criteria A |
| Power frequency magnetic field | 100A/m cont.; 1000A/m 1sec | EN61000-4-8, Criteria A |

**Notes:**

Note6: An external input filter capacitor + TVS diode is required if the module has to meet EN61000-4-4 and EN61000-4-5.
2pcs of aluminum E-cap to connect in parallel (220µF/200V), Recom suggest: Nippon Chemi-con KXJ series and TVS: 220V/600W

### EMC Filtering Suggestions according to EN55032/35



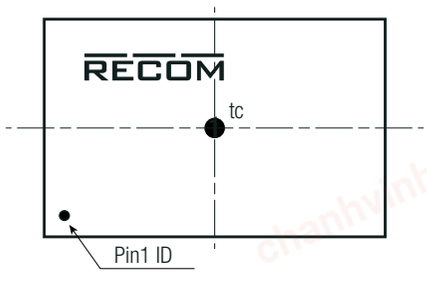

**Component List Class B**

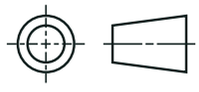
| C1 | C2 | C3 |
|---|---|---|
| 1µF | 330pF | 680pF |

### DIMENSIONS AND PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|---|---|---|
| Material | case/baseplate | non-conductive black plastic |
| | potting | silicone, (UL94 V-0) |
| Dimensions (LxWxH) | | 31.8 x 20.3 x 10.6mm |
| Weight | | 14g typ. |

**Dimension Drawing (mm)**



Tolerance: xx.x ±0.5mm
xx.xx ±0.25mm

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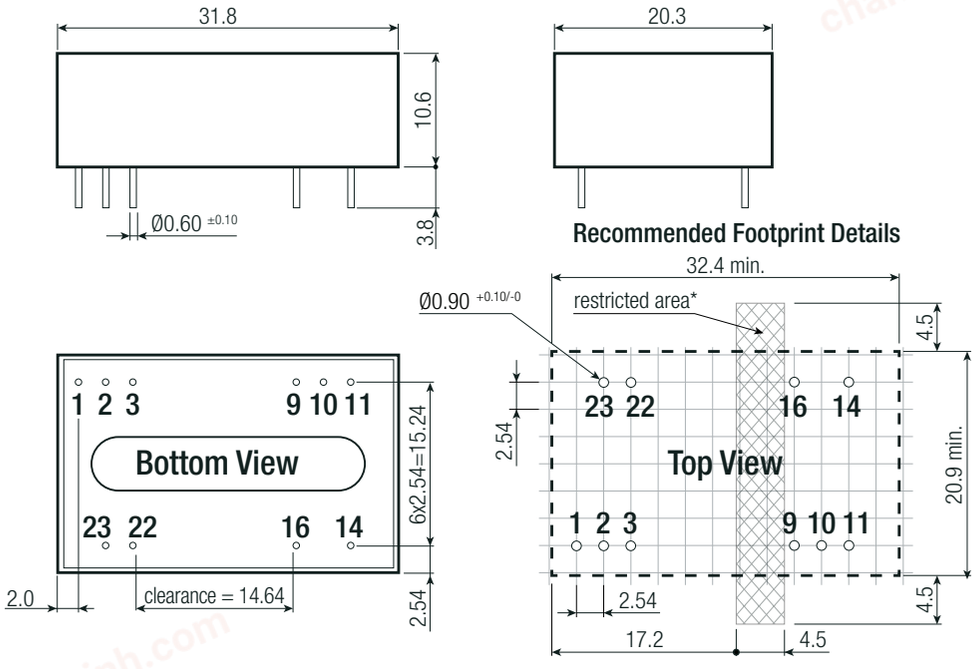
RECOM

DC/DC Converter

# RP06-RAW Series

## Specifications (measured @ $T_{amb}$= 25°C, nom. $V_{IN}$, full load unless otherwise stated)

### Dimension Drawing (mm)




### Pinning Information

| Pin # | Single | Dual |
|---|---|---|
| 1 | CTRL (3) | CTRL (3) |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | NC | Com |
| 10 | Trim | Trim |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |

NC= No Connection
Tolerance: xx.x ±0.5mm
xx.xx ±0.25mm

*A minimum of 4.5mm clearance and creepage is required between primary and secondary circuit to meet 2MOPP under IEC60601-1. No copper traces and/or components are allowed in this area if 2MOPP is required.

| PACKAGING INFORMATION | | |
|---|---|---|
| **Parameter** | **Type** | **Value** |
| Packaging Dimension (LxWxH) | tube | 255.0 x 21.8 x 16.5mm |
| Packaging Quantity | | 7pcs |
| Storage Temperature Range | | -55°C to +125°C |
| Storage Humidity | non-condensing | 5% - 95% RH |

The product information and specifications may be subject to changes even without prior written notice.The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.