

# Features

## Regulated Converter

- 10:1 ultra wide input voltage range
- 3kVAC/1 minute reinforced insulation
- UL/IEC/EN60950-1 certified
- CE marked, CB report
- Efficiency up to 93%
- -40°C to +93.5°C baseplate temperature range

**RECOM**  
DC/DC Converter

## RPA200H-RUW

**200 Watt  
Half Brick  
Single Output**



**UL**  
E224736

UL60950-1 certified  
CAN/CSA No. 60950-1-07  
IEC/EN60950-1 certified\*  
EN50155 compliant  
CB report

\* 15Vout and 48Vout pending

## Description

The half-brick RPA200H series DC/DC converter is designed for railway rolling stock and high voltage battery applications. It has a 10:1 input voltage range to cover all input voltages from nominal 24VDC up to 110VDC in a single product (including EN50155 transients) and offers isolated and regulated 12V, 15V, 24V or 48VDC outputs. The converter has a consistently high efficiency over the entire input voltage range and comes with a metal baseplate to permit a wide operating temperature range from -40°C to +93.5°C (when baseplate cooled). The case is fitted with threaded inserts to allow secure mounting to the PCB or bulkhead for use in high shock and vibration environments. The converter is certified to UL/IEC/EN60950 and comes with a three year warranty.

## Selection Guide

| Part Number                      | Input Voltage Range <sup>(1)</sup><br>[VDC] | Output Voltage<br>[VDC] | Output Current<br>[A] | Efficiency typ. <sup>(2)</sup><br>[%] | Max. Capacitive Load <sup>(3)</sup><br>[μF] |
|----------------------------------|---------------------------------------------|-------------------------|-----------------------|---------------------------------------|---------------------------------------------|
| RPA200H-11012SRUW <sup>(4)</sup> | 16.5-140                                    | 12                      | 16.7                  | 90                                    | 2200                                        |
| RPA200H-11015SRUW <sup>(4)</sup> | 16.5-140                                    | 15                      | 13.5                  | 93                                    | 2200                                        |
| RPA200H-11024SRUW <sup>(4)</sup> | 16.5-140                                    | 24                      | 8.5                   | 88                                    | 1000                                        |
| RPA200H-11048SRUW <sup>(4)</sup> | 16.5-140                                    | 48                      | 4.2                   | 90                                    | 100                                         |

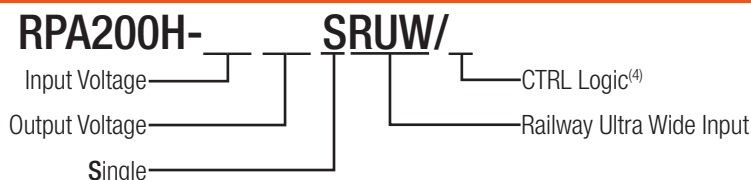
### Notes:

Note1: Refer to input voltage graph on page PB-3

Note2: Efficiency is tested at nominal input (110V) and full load at +25°C ambient

Note3: Max. Cap Load is tested at nominal input and full resistive load

## Model Numbering



### Ordering Examples

RPA200H-11012SRUW/P = 110V Input, 12V Output, Single, Pos. CTRL function

RPA200H-11012SRUW/N = 110V Input, 12V Output, Single, Neg. CTRL function

### Notes:

Note4: add suffix "P" for positive logic (1=ON, 0=OFF) or add suffix "N" instead for negative logic (0=ON, 1=OFF)

## Specifications (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

### BASIC CHARACTERISTICS

| Parameter                                   | Condition   | Min.                     | Typ.         | Max.         |
|---------------------------------------------|-------------|--------------------------|--------------|--------------|
| Internal Input Filter                       |             |                          |              | Pi-Type      |
| Input Voltage Range                         |             | 16.5VDC                  | 110VDC       | 140VDC       |
| Input Surge Voltage                         | <1s         |                          |              | 156VDC       |
| Under Voltage Lockout (UVLO) <sup>(5)</sup> | DC-DC ON    | 15.6VDC                  | 16.0VDC      | 16.4VDC      |
|                                             | DC-DC OFF   | 13.6VDC                  | 14.0VDC      | 14.4VDC      |
| Over Voltage Lockout (OVLO)                 | DC-DC ON    | 142VDC                   | 146VDC       | 150VDC       |
|                                             | DC-DC OFF   | 154VDC                   | 156VDC       | 160VDC       |
| Input Current Range                         | Vin = 16.5V | 12, 15Vout<br>24, 48Vout | 13.5A<br>14A | 14.5A<br>15A |

### Notes:

Note5: please refer to Under Voltage Lockout Adjustability on page PB-3

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**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , nom.  $V_{in}$  (110V), full load and after warm-up unless otherwise stated)

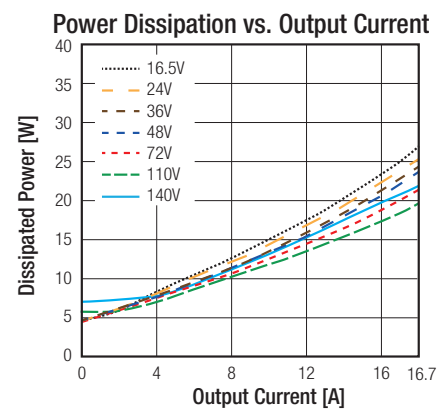
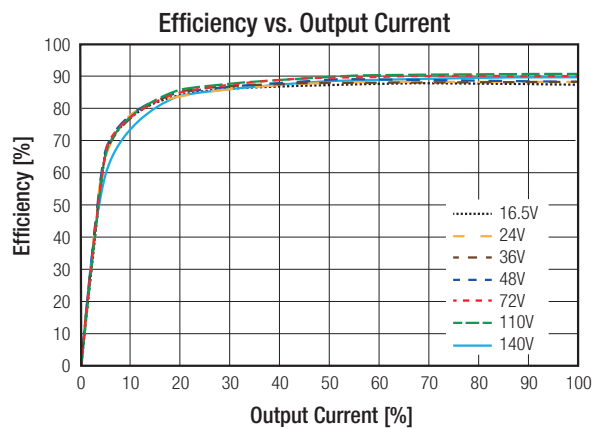
### BASIC CHARACTERISTICS

| Parameter                     | Condition       |                           | Min.                                                    | Typ.           | Max.           |
|-------------------------------|-----------------|---------------------------|---------------------------------------------------------|----------------|----------------|
| Quiescent Current             | $V_{in} = 110V$ | 12, 15, 24Vout<br>48Vout  | 30mA<br>50mA                                            | 60mA<br>80mA   | 90mA<br>150mA  |
| Output Voltage Trimming       |                 |                           | -20%                                                    |                | +10%           |
| Minimum Load                  |                 |                           | 0%                                                      |                |                |
| Start-up time                 |                 |                           | 200ms                                                   |                | 460ms          |
| Rise Time                     |                 | $V_{out}$ from 10% to 90% |                                                         | 50ms           | 100ms          |
| ON/OFF Control <sup>(6)</sup> | Positive Logic  | DC-DC ON<br>DC-DC OFF     | Open or $3 < V_r < 5VDC$<br>Short or $0 < V_r < 0.4VDC$ |                |                |
|                               | Negative Logic  | DC-DC ON<br>DC-DC OFF     | Short or $0 < V_r < 0.4VDC$<br>Open or $3 < V_r < 5VDC$ |                |                |
| Input Current of CTRL pin     |                 | DC-DC ON<br>DC-DC OFF     |                                                         | 0.1mA<br>0.1mA | 0.2mA<br>0.2mA |
| Standby Current               |                 |                           |                                                         | 20mA           |                |
| Internal Operating Frequency  |                 |                           |                                                         | 140kHz         |                |
| Output Ripple and Noise       |                 | 20MHz BW limited          |                                                         | 350mVp-p       |                |
| Remote Sense <sup>(6)</sup>   |                 |                           |                                                         |                | $\pm 10\%$     |

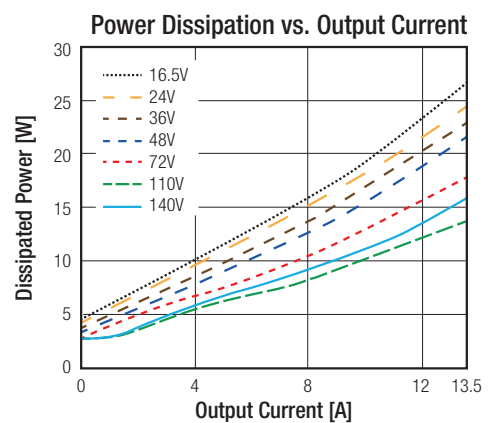
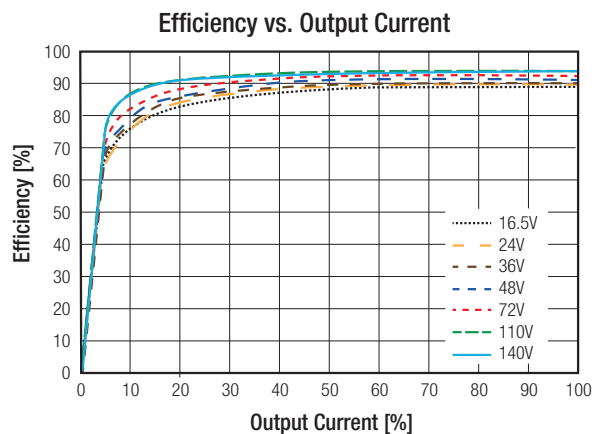
#### Notes:

Note6: see page PB-5

### RPA200H-11012SRUW



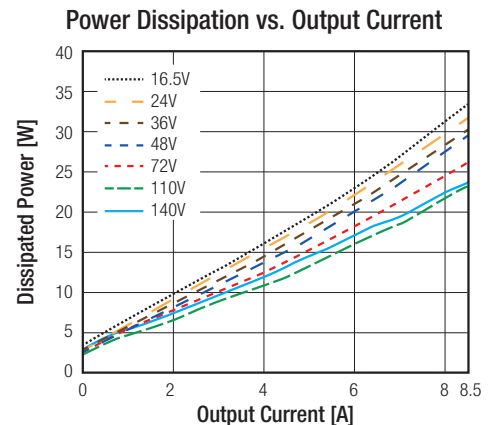
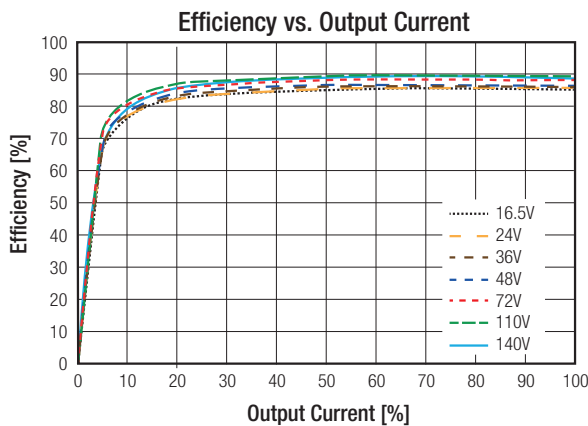
### RPA200H-11015SRUW



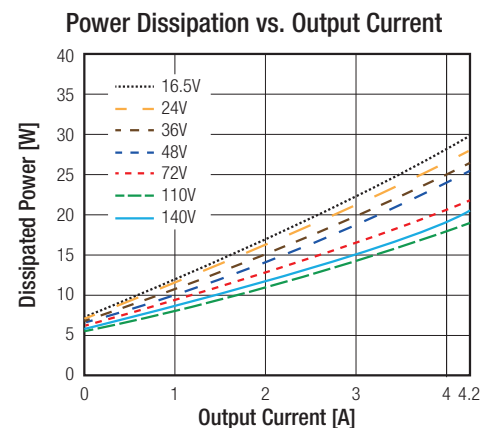
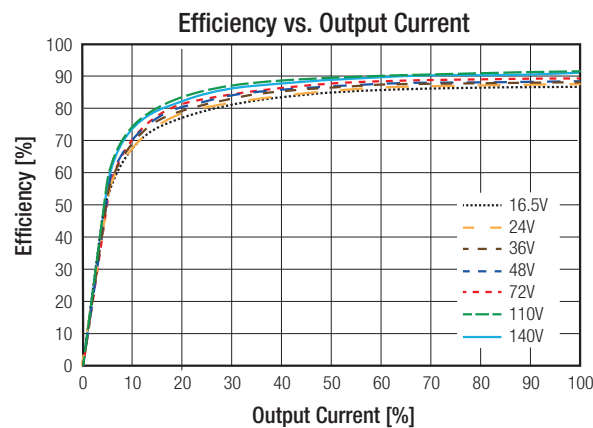
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**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , nom.  $V_{in}$  (110V), full load and after warm-up unless otherwise stated)

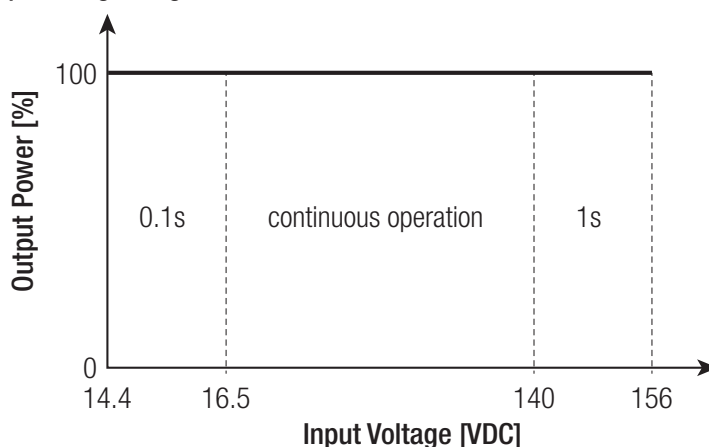
### RPA200H-11024SRUW



### RPA200H-11048SRUW



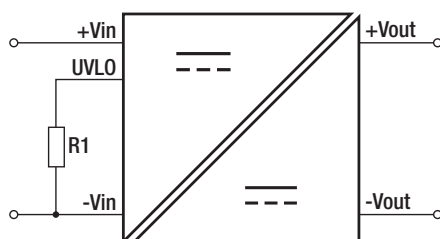
### Input Voltage Range



Continuous full power operation is rated between 16.5V and 140V, including full load start-up.

Once running, the converter will operate for short periods of time over an extended input voltage range down to 14.4V and up to 156V, thus covering all EN50155 under-voltage and over-voltage transient conditions.

### UNDER VOLTAGE LOCKOUT ADJUSTABILITY



The RPA200H series has an adjustable under voltage lockout which will shut down the converter according to following settings.

| Nom. Input Voltage [VDC]  | 24                   | 36                   | 48                   | 72                   | 110                |
|---------------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Turn Off Threshold [VDC]  | $14 \pm 0.4\text{V}$ | $20.6 \pm 1\text{V}$ | $27.5 \pm 1\text{V}$ | $40 \pm 1\text{V}$   | $64 \pm 2\text{V}$ |
| Turn On Threshold [VDC]   | $16 \pm 0.4\text{V}$ | $24 \pm 1\text{V}$   | $32 \pm 1\text{V}$   | $46.5 \pm 1\text{V}$ | $74 \pm 2\text{V}$ |
| Resistor R1 [k $\Omega$ ] | open                 | 24.9                 | 12.4                 | 6.19                 | 3.48               |

**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

### OUTPUT VOLTAGE TRIMMING

#### Output Voltage Trimming

RPA200H-RUW converters 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.

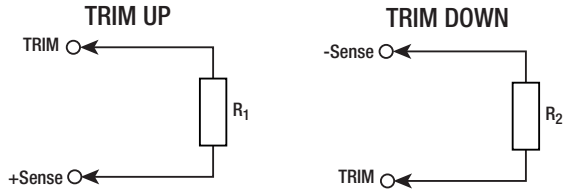
#### Trim Calculation

Vout = nom. Output Voltage

ΔVout = Output Voltage Change in %

Rup = trim up resistor

Rdown = trim down resistor



#### Trim up

$$R_{up} = \left[ \frac{45}{\Delta V_{out}} + 40 \right] k\Omega$$

$$R_{up} = \left[ \frac{95}{\Delta V_{out}} + 90 \right] k\Omega$$

$$R_{up} = \left[ \frac{57.46}{\Delta V_{out}} + 52.35 \right] k\Omega$$

$$R_{up} = \left[ \frac{195}{\Delta V_{out}} + 190 \right] k\Omega$$

#### Trim down

$$R_{down} = \left[ \frac{5.11}{\Delta V_{out}} - 10.22 \right] k\Omega$$

#### Practical Example

##### Trim Up:

Vout = 12V, ΔVout = +10% (13.2V)

$$R_{up} = \left[ \frac{45}{10\%} + 40 \right] k\Omega = 490k\Omega \quad (E96 = 490)$$

##### Trim down:

Vout = 24V, ΔVout = -8% (22V)

$$R_{down} = \left[ \frac{5.11}{8\%} - 10.22 \right] k\Omega = 53.66k\Omega \quad (E96 = 53.6)$$

#### Trim up

##### RPA200H-11012SRUW

| Trim up          | [%]   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vout =           | [VDC] | 12.12 | 12.24 | 12.36 | 12.48 | 12.60 | 12.72 | 12.84 | 12.96 | 13.08 | 13.20 |
| R <sub>1</sub> = | [kΩ]  | 4530  | 2320  | 1540  | 1150  | 931   | 787   | 681   | 604   | 536   | 487   |

##### RPA200H-11015SRUW

| Trim up          | [%]   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vout =           | [VDC] | 15.15 | 15.30 | 15.45 | 15.60 | 15.75 | 15.90 | 16.05 | 16.20 | 16.35 | 16.50 |
| R <sub>1</sub> = | [kΩ]  | 5760  | 2940  | 1960  | 1500  | 1210  | 1010  | 866   | 768   | 681   | 619   |

##### RPA200H-11024SRUW

| Trim up          | [%]   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vout =           | [VDC] | 24.24 | 24.48 | 24.72 | 24.96 | 25.20 | 25.44 | 25.68 | 25.92 | 26.16 | 26.40 |
| R <sub>1</sub> = | [kΩ]  | 9530  | 4870  | 3240  | 2490  | 2000  | 1690  | 1430  | 1270  | 1150  | 1050  |

##### RPA200H-11048SRUW

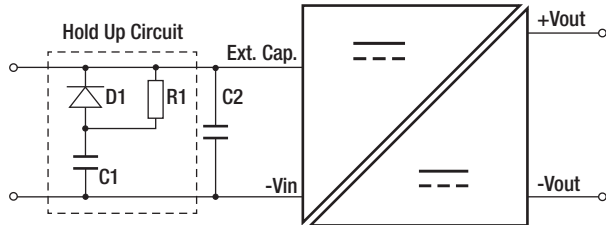
| Trim up          | [%]   | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vout =           | [VDC] | 48.48 | 48.96 | 49.44 | 49.92 | 50.40 | 50.88 | 51.36 | 51.84 | 52.32 | 52.80 |
| R <sub>1</sub> = | [kΩ]  | 19600 | 9880  | 6650  | 5110  | 4120  | 3480  | 3010  | 2610  | 2370  | 2150  |

#### Trim down RPA200H series

| Trim down        | [%]  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
|------------------|------|------|------|------|------|------|------|------|------|------|------|
| R <sub>2</sub> = | [kΩ] | 499  | 243  | 162  | 118  | 90.9 | 75   | 63.4 | 53.6 | 46.4 | 41.2 |
| Trim down        | [%]  | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
| R <sub>2</sub> = | [kΩ] | 36.5 | 32.4 | 28.7 | 26.1 | 23.7 | 22.1 | 20   | 18.2 | 16.5 | 15.4 |

**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , nom.  $V_{in}$  (110V), full load and after warm-up unless otherwise stated)

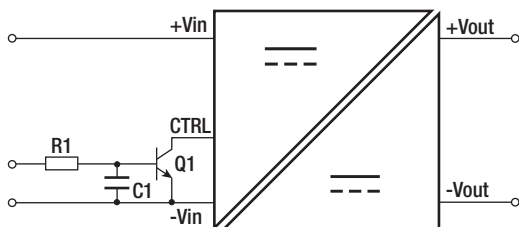
### EXTERNAL CAPACITOR



A 240 $\mu\text{F}$ /200V capacitor (C2) is required for normal operation.  
To meet power supply interruptions, an external circuit comprised of a capacitor (C1), a 100 $\Omega$ /10W resistor (R1) and diode (D1) is required.

| C1       | 24Vin               | 36Vin               | 48Vin               | 72Vin               | 96Vin              | 110Vin             |
|----------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| For 10ms | 3600 $\mu\text{F}$  | 3600 $\mu\text{F}$  | 3600 $\mu\text{F}$  | 3600 $\mu\text{F}$  | 1000 $\mu\text{F}$ | 600 $\mu\text{F}$  |
| For 30ms | 10800 $\mu\text{F}$ | 10800 $\mu\text{F}$ | 10800 $\mu\text{F}$ | 10800 $\mu\text{F}$ | 3000 $\mu\text{F}$ | 1800 $\mu\text{F}$ |

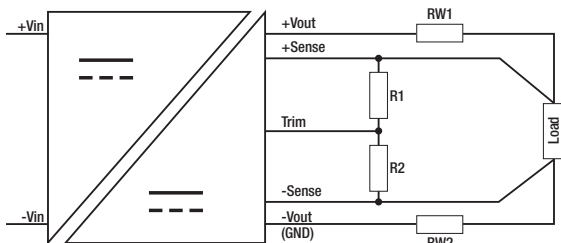
### ON/OFF CONTROL



For negative logic, if the remote on/off feature is not used, short the on/off pin to -Vin.

For positive logic, if the remote on/off feature is not used, leave the on/off pin floating.

### REMOTE SENSE



The output voltage can be adjusted by both trim and remote sense. The maximum combined adjustment range is  $\pm 10\%$ . Derate the maximum output power if using the trim or sense function to increase the output voltage.

$R_{W1}$  ... wire losses +  
 $R_{W2}$  ... wire losses -  
 $R_1$  ... trim up resistor  
 $R_2$  ... trim down resistor

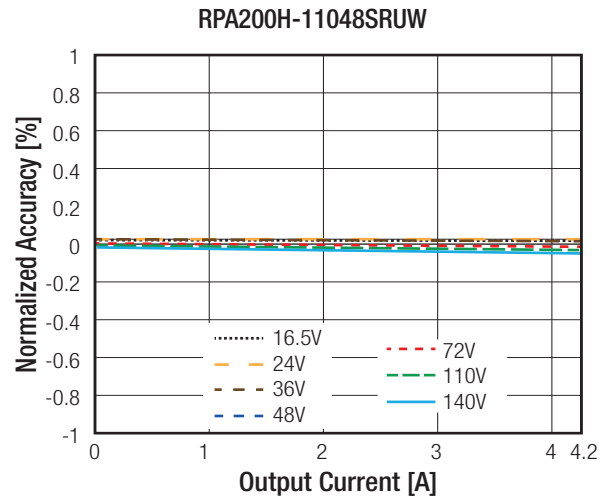
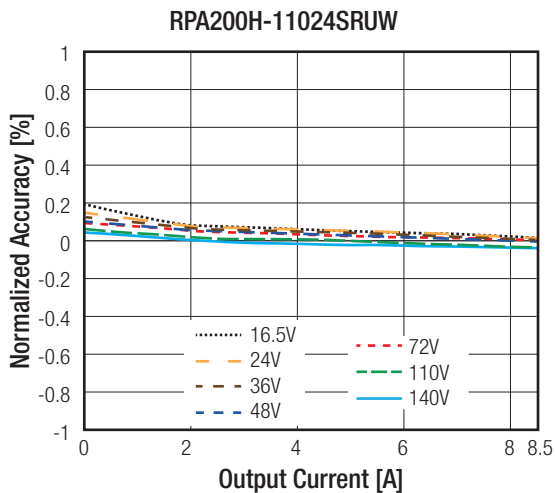
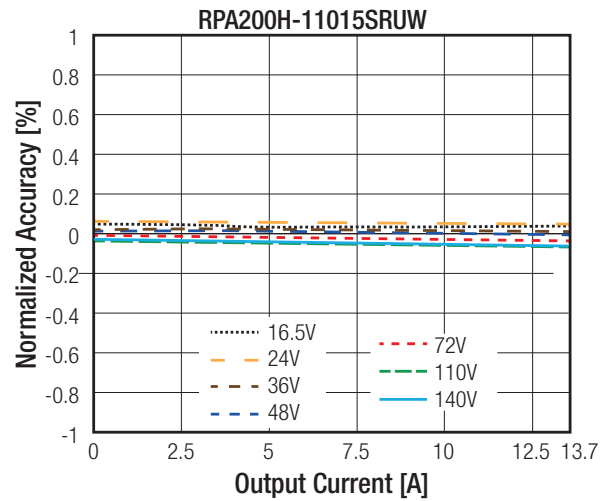
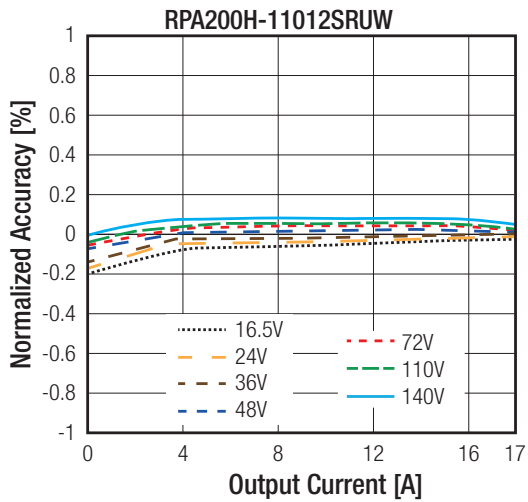
### REGULATION

| Parameter          | Condition                                                   | Value                                 |
|--------------------|-------------------------------------------------------------|---------------------------------------|
| Output Accuracy    |                                                             | $\pm 1.0\%$ max.                      |
| Line Regulation    | $V_{in} = 16.5$ to $140\text{V}$ , $I_o = \text{full load}$ | $\pm 0.01\%$ typ. to $\pm 0.2\%$ max. |
| Load Regulation    | 10 - 90% load                                               | $\pm 0.05\%$ typ. to $\pm 0.2\%$ max. |
| Transient Response | 25% load step change                                        | 12Vout: 450mV/40 $\mu\text{s}$ typ.   |
|                    |                                                             | 15Vout: 450mV/30 $\mu\text{s}$ typ.   |
|                    |                                                             | 24Vout: 500mV/20 $\mu\text{s}$ typ.   |
|                    |                                                             | 48Vout: 600mV/10 $\mu\text{s}$ typ.   |

continued on next page

**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

### Accuracy vs. Load



### PROTECTION

| Parameter                         | Condition                       |                    |                | Value                                         |
|-----------------------------------|---------------------------------|--------------------|----------------|-----------------------------------------------|
| Over Voltage Protection (OVP)     |                                 |                    |                | 110-130%, automatic recovery                  |
| Over Current Protection (OCP)     |                                 |                    |                | hiccup mode, automatic recovery               |
| Over Temperature Protection (OTP) | @ tc point                      |                    |                | +105°C, automatic recovery after cooling down |
| Isolation Voltage <sup>(7)</sup>  | I/P to O/P,<br>O/P to baseplate | rated for 1 minute | 12, 15, 24Vout | 4.242kVDC                                     |
|                                   |                                 |                    | 48Vout         | 3kVDC                                         |
| Isolation Resistance              |                                 |                    |                | 10MΩ typ.                                     |
| Isolation Capacitance             |                                 |                    |                | 500pF                                         |
| Leakage Current                   |                                 |                    |                | 0.42mA                                        |
| Insulation Grade                  |                                 |                    |                | reinforced                                    |

#### Notes:

Note7: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note8: An input fuse is required if the mains supply is not over-current protected. Recommended fuse T40A slow blow type

**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

### ENVIRONMENTAL

| Parameter                           | Condition                                           | Value                           |
|-------------------------------------|-----------------------------------------------------|---------------------------------|
| Operating Temperature Range         | refer to derating graphs                            | -40°C to +93.5°C                |
| Maximum Baseplate Temperature       |                                                     | +100°C                          |
| Temperature Coefficient             |                                                     | 0.007%/°C                       |
| Thermal Impedance                   |                                                     | refer to Rth tables             |
| Operating Altitude                  |                                                     | 5000m                           |
| Operating Humidity                  |                                                     | 5%-95% RH                       |
| Pollution Degree (PD)               |                                                     | PD2                             |
| Fire protection on Railway Vehicles | refer to page PB-9                                  | according to EN45545-2 standard |
| MTBF                                | according to Telcordia SR332 Issue 2 Method I, 25°C | 1480 x 10 <sup>3</sup> hours    |

#### Notes:

Note9: Following calculations are made with RPA200H-11012SRUW/P.  
Test PCB: Eurocard 160x100mm 105µm copper, double layer

### Thermal Derating with Fan Cooling, Double Layer PCB and Heat-sink

| Thermal Impedance |               |
|-------------------|---------------|
| airflow<br>[m/s]  | Rth<br>[°C/W] |
| 0.1               | 3.3           |
| 0.2               | 2.62          |
| 0.5               | 2.0           |
| 0.8               | 1.57          |
| 1.0               | 1.22          |
| 1.5               | 0.75          |

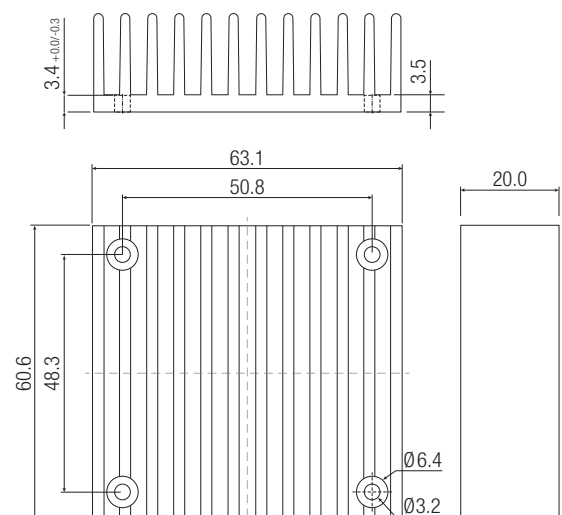
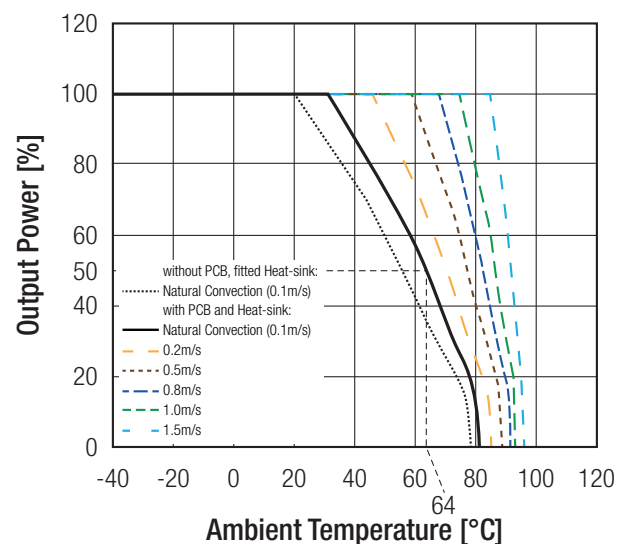
### Thermal Calculation Example

$I_{out} = 50\%$   
 $R_{th} = 3.3^{\circ}\text{C/W}$   
 $P_{DISS} = 10.94\text{W}$   
 $T_{ICmax} = 100^{\circ}\text{C}$

$$T_{OVER} = R_{th} \times P_{DISS} = 3.3^{\circ}\text{C/W} \times 10.94\text{W} = +36^{\circ}\text{C}$$

$$T_{AMBmax} = T_{ICmax} - T_{OVER} = 100^{\circ}\text{C} - 36^{\circ}\text{C} = +64^{\circ}\text{C}$$

### Dimension Drawing Heat-sink (mm)



continued on next page

**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

### Thermal Derating with Fan Cooling and Double Layer PCB

| Thermal Impedance |                           |
|-------------------|---------------------------|
| airflow<br>[m/s]  | R <sub>th</sub><br>[°C/W] |
| 0.1               | 3.8                       |
| 0.2               | 3.12                      |
| 0.5               | 2.5                       |
| 0.8               | 2.07                      |
| 1.0               | 1.72                      |
| 1.5               | 1.25                      |

### Thermal Calculation Example

$I_{out} = 50\%$   
 $R_{th} = 2.5^{\circ}\text{C/W}$   
 $P_{DISS} = 10.94\text{W}$   
 $T_{ICmax} = 100^{\circ}\text{C}$

$$T_{OVER} = R_{th} \times P_{DISS} = 2.5^{\circ}\text{C/W} \times 10.94\text{W} = +27.4^{\circ}\text{C}$$

$$T_{AMBmax} = T_{ICmax} - T_{OVER} = 100^{\circ}\text{C} - 27.4^{\circ}\text{C} = +\underline{73^{\circ}\text{C}}$$

### Thermal Derating with Water Cooling

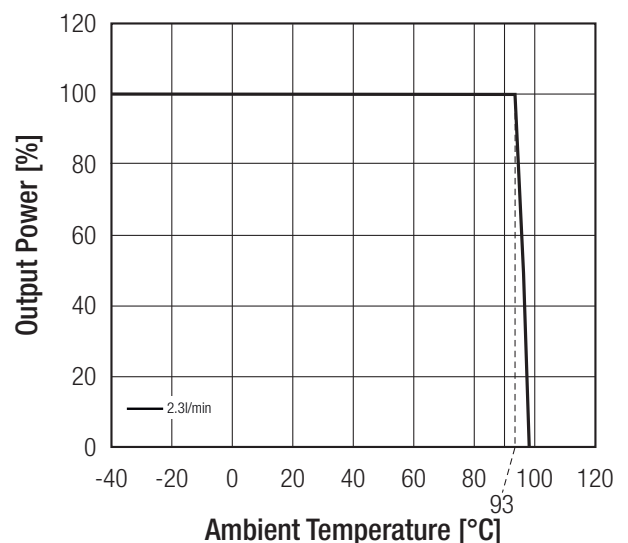
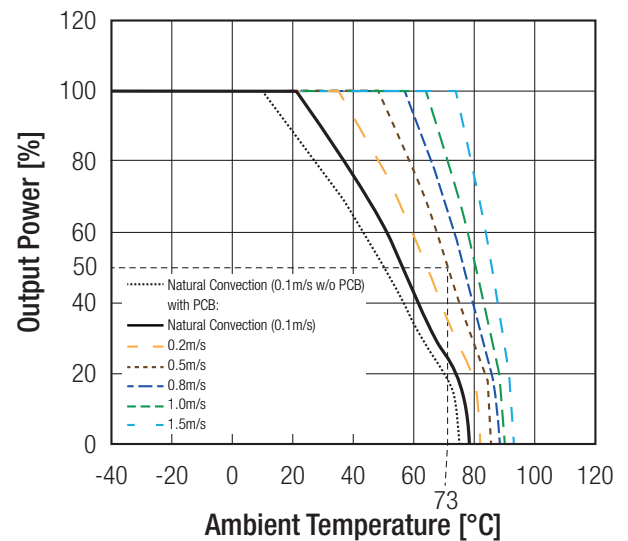
| Thermal Impedance      |                           |
|------------------------|---------------------------|
| liquid flow<br>[l/min] | R <sub>th</sub><br>[°C/W] |
| 2.3                    | 0.31                      |

### Thermal Calculation Example

$I_{out} = 100\%$   
 $R_{th} = 0.31^{\circ}\text{C/W}$   
 $P_{DISS} = 20.79\text{W}$   
 $T_{ICmax} = 100^{\circ}\text{C}$

$$T_{OVER} = R_{th} \times P_{DISS} = 0.31^{\circ}\text{C/W} \times 20.79\text{W} = +6.5^{\circ}\text{C}$$

$$T_{AMBmax} = T_{ICmax} - T_{OVER} = 100^{\circ}\text{C} - 6.5^{\circ}\text{C} = +\underline{93.5^{\circ}\text{C}}$$



### Notes:

Note10: For further details please contact our Tech Support Team techsupportAT@recom-power.com

## SAFETY AND CERTIFICATIONS

| Certificate Type (Safety)                                                             | Report / File Number        | Standard                                                                        |
|---------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------|
| Information Technology Equipment, General Requirements for Safety                     | E224736-A54 and E224736-A57 | UL60950-1, 2nd Edition: 2014<br>CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition: 2014 |
| IEC/EN Information Technology Equipment - General Requirements for Safety (CB Scheme) | E224736-A54-CB-1            | IEC60950-1: 2005, 2nd Edition + AM2: 2013                                       |
| IEC/EN Information Technology Equipment - General Requirements for Safety             | (15Vout and 48Vout pending) | EN60950-1: 2006 + A2: 2013                                                      |

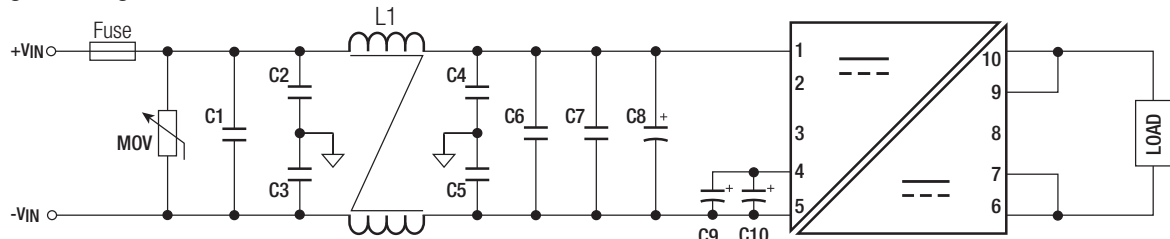
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**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

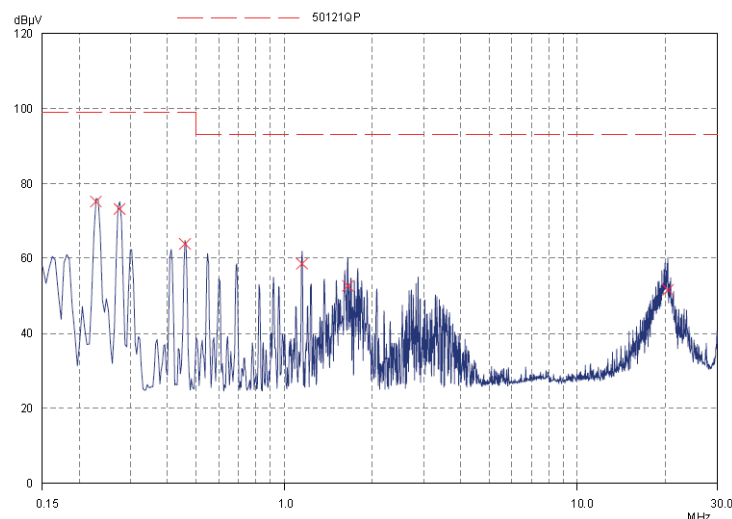
|                                                                                                                                   |                                              |                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------|
| Fire hazard testing - Part 11-10: Test flames - 50W horizontal and vertical flame test methods                                    | Vertical Flame Test                          | EN60695-11-10: 2013, HL1, HL2, HL3, V-0                                          |
| Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods; Glow-wire flammability test method for end-products         | Glow-Wire Flammability Test<br>30s ta, 850°C | EN60695-2-11:2000, HL1, HL2, HL3                                                 |
| Plastics - Determination of burning behaviour by oxygen index - Part 2: Ambient-temperature test                                  | OI% (min) 42.6%<br>OI% (min) 36.8%           | EN ISO 4589-2:2006, HL1, HL2, HL3<br>EN ISO 4589-2:1999 + A1:2006, HL1, HL2, HL3 |
| Railway Applications - Electrical Equipment used on rolling stock                                                                 |                                              | EN50155: 2007                                                                    |
| Railway applications - Fire protection on railway vehicles<br>Part 2: Requirements for fire behaviour of materials and components |                                              | EN45545-2:2013 + A1:2015                                                         |
| RoHS                                                                                                                              |                                              | RoHS 2011/65/EU                                                                  |

| EMC Compliance                                                                             | Condition                                                                            | Standard / Criterion    |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------|
| Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus | with external components                                                             | EN50121-3-2:2015        |
| ESD Electrostatic discharge immunity test                                                  | Air ±8kV, Contact ±6kV                                                               | EN61000-4-2, Criteria B |
| Radiated, radio-frequency, electromagnetic field immunity test                             | 80-1000MHz, 20V/m<br>800-1000MHz, 20V/m<br>1400-2100MHz, 10V/m<br>2100-2500MHz, 5V/m | EN61000-4-3, Criteria A |
| Fast Transient and Burst Immunity                                                          | ±2kV                                                                                 | EN61000-4-4, Criteria A |
| Surge Immunity                                                                             | ±1kV (diff), ±2kV (com)                                                              | EN61000-4-5, Criteria B |
| Immunity to conducted disturbances, induced by radio-frequency fields                      | 10V                                                                                  | EN61000-4-6, Criteria A |
| Electromagnetic compatibility of multimedia equipment - Emission requirements              | with external components                                                             | EN55032, Class B        |

**EMC Filtering according to EN50121-3-2**



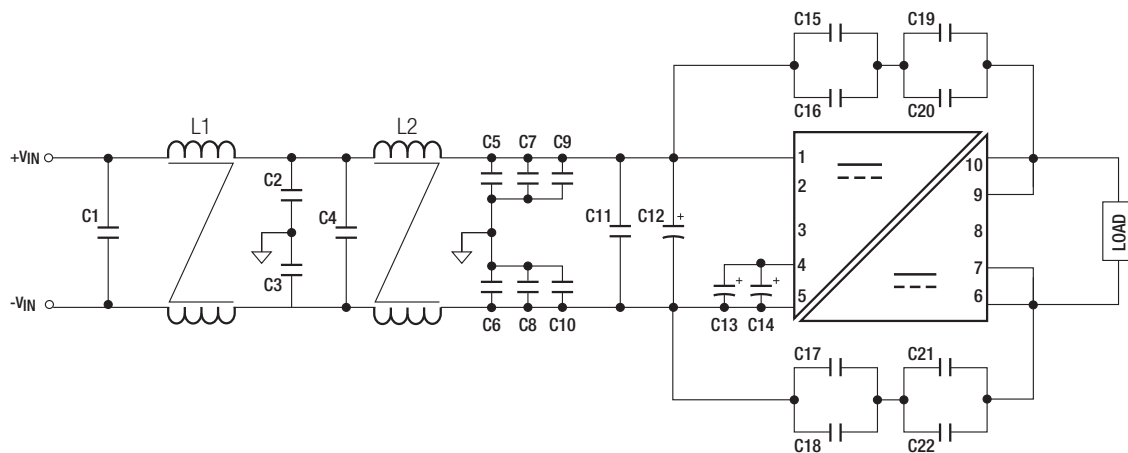
| MOV                      | C1              | C2, C3, C4, C5 | L1         | C6, C7         | C8            | C9, C10       |
|--------------------------|-----------------|----------------|------------|----------------|---------------|---------------|
| EPCOS<br>B72207S0131K101 | 100nF<br>275VAC | 1000pF, 300VAC | 1mH<br>CMC | 0.47µF<br>250V | 100µF<br>200V | 120µF<br>200V |



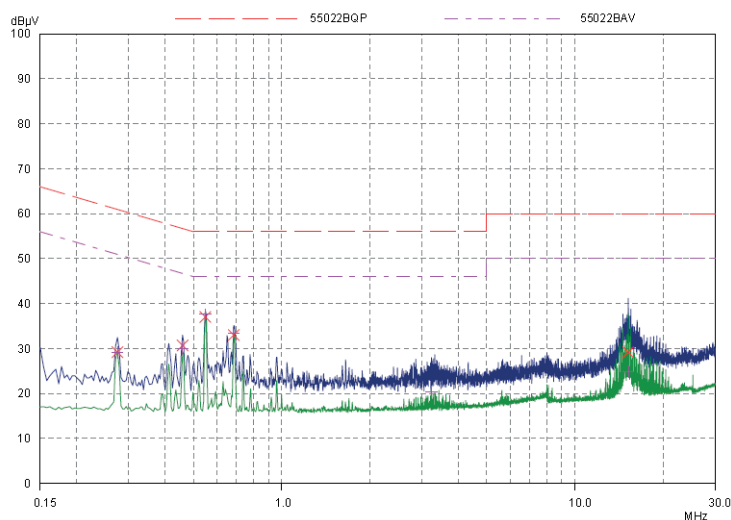
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**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

EMC Filtering according to EN55032 Class B



| C1, C4, C11          | L1, L2     | C2, C3, C5, C6, C7, C8, C9, C10 | C12           | C13, C14      | C15, C16, C17, C18, C19, C20, C21, C22, |
|----------------------|------------|---------------------------------|---------------|---------------|-----------------------------------------|
| 0.47µF, 250V<br>MLCC | 1mH<br>CMC | 1.5pF, 3kV                      | 100µF<br>200V | 120µF<br>200V | 6.8pF, 2kV                              |



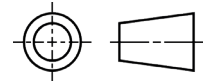
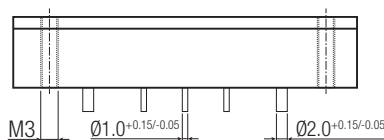
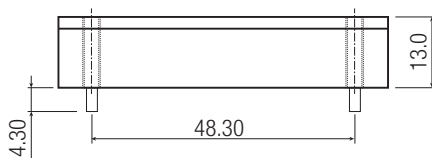
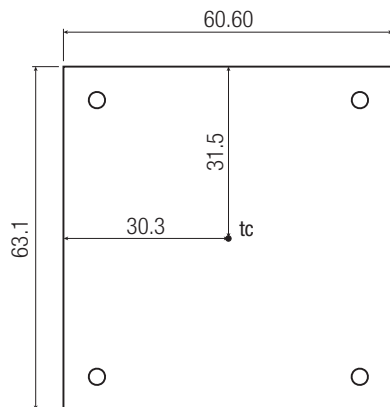
### DIMENSIONS and PHYSICAL CHARACTERISTICS

| Parameter                  | Type                         | Value                                                         |
|----------------------------|------------------------------|---------------------------------------------------------------|
| Material                   | baseplate<br>case<br>potting | aluminum<br>plastic (UL94V-2)<br>low smoke silicone (UL94V-0) |
| Package Dimensions (LxWxH) |                              | 60.6 x 63.1 x 13.0mm                                          |
| Package Weight             |                              | 125.0g typ.                                                   |

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**Specifications** (measured @ Ta = 25°C, nom. Vin (110V), full load and after warm-up unless otherwise stated)

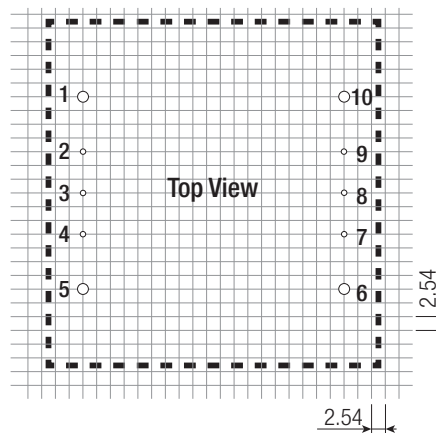
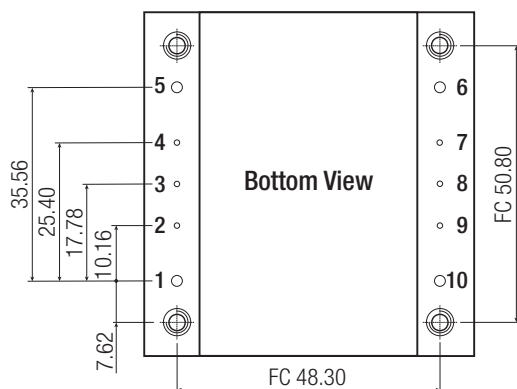
Dimension Drawing (mm)



Pin Connections

| Pin # | Single    |
|-------|-----------|
| 1     | +Vin      |
| 2     | UVLO      |
| 3     | CTRL      |
| 4     | Ext. Cap. |
| 5     | -Vin      |
| 6     | -Vout     |
| 7     | -Sense    |
| 8     | Trim      |
| 9     | +Sense    |
| 10    | +Vout     |

Recommended Footprint Details



XX.X ± 0.5mm  
XX.XX ± 0.25mm  
FC= fixing center

### PACKAGING INFORMATION

| Parameter                    | Type | Value                 |
|------------------------------|------|-----------------------|
| Packaging Dimensions (LxWxH) | tube | 355.0 x 63.5 x 20.6mm |
| Packaging Quantity           |      | 5pcs                  |
| Storage Temperature Range    |      | -55°C to +125°C       |
| Storage Humidity             |      | 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.