

# Features

- 4:1 Wide Input Range
- 3kVAC Reinforced Insulation for 110Vin  
2.25kVDC Basic Insulation for 24Vin & 48Vin
- Efficiency up to 90%
- No Minimum Load Required
- EN50155, IEC/EN60950-1 Pending

# Regulated Converters



## RP90Q-RW

90 Watt  
Quarter  
Brick  
Single Output



### Description

The quarter-brick RP90Q series DC/DC converters are designed for railway rolling stock and high voltage battery applications. Each series has three 4:1 input voltage range options to cover all input voltages from 9VDC up to 160VDC with isolated and regulated 5V to 48VDC outputs. The converters have high efficiencies and metal base-plates to permit a wide operating temperature range from -40°C to +85°C (when mounted on a suitable heatsink). 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 converters are EN50155 and IEC/EN60950 certified. The RP90Q-RW series have a three year warranty.

### Selection Guide

| Part Number    | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Input <sup>(1)</sup> Current [mA] | Output Power [W] | Efficiency <sup>(1)</sup> typ. [%] | Max. Capacitive Load [µF] |
|----------------|---------------------------|----------------------|---------------------|-----------------------------------|------------------|------------------------------------|---------------------------|
| RP90Q-2405SRW  | 9-36                      | 5                    | 18000               | 4213                              | 90               | 89                                 | 36000                     |
| RP90Q-2412SRW  | 9-36                      | 12                   | 7500                | 4213                              | 90               | 89                                 | 6250                      |
| RP90Q-2415SRW  | 9-36                      | 15                   | 6000                | 4213                              | 90               | 89                                 | 4000                      |
| RP90Q-2424SRW  | 9-36                      | 24                   | 3700                | 4157                              | 89               | 89                                 | 1540                      |
| RP90Q-2448SRW  | 9-36                      | 48                   | 1800                | 4090                              | 86.5             | 88                                 | 380                       |
| RP90Q-4805SRW  | 16.5-75                   | 5                    | 18000               | 2107                              | 90               | 89                                 | 36000                     |
| RP90Q-4812SRW  | 16.5-75                   | 12                   | 7500                | 2107                              | 90               | 89                                 | 6250                      |
| RP90Q-4815SRW  | 16.5-75                   | 15                   | 6000                | 2083                              | 90               | 90                                 | 4000                      |
| RP90Q-4824SRW  | 16.5-75                   | 24                   | 3700                | 2055                              | 89               | 90                                 | 1540                      |
| RP90Q-4848SRW  | 16.5-75                   | 48                   | 1800                | 2000                              | 86.5             | 90                                 | 380                       |
| RP90Q-11005SRW | 40-160                    | 5                    | 17000               | 868                               | 85               | 89                                 | 34000                     |
| RP90Q-11012SRW | 40-160                    | 12                   | 7000                | 858                               | 84               | 89                                 | 5830                      |
| RP90Q-11015SRW | 40-160                    | 15                   | 5500                | 843                               | 82.5             | 89                                 | 3670                      |
| RP90Q-11024SRW | 40-160                    | 24                   | 3500                | 944                               | 84               | 89                                 | 1460                      |
| RP90Q-11048SRW | 40-160                    | 48                   | 1800                | 971                               | 86.5             | 89                                 | 380                       |

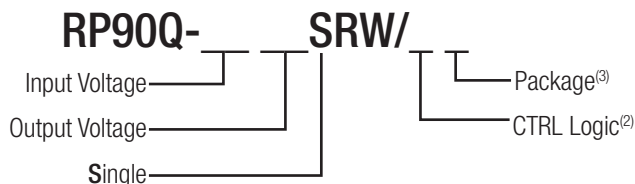
#### Notes:

Note1: Efficiency is tested by nominal Vin, full load and at 25°C.



EN50155 pending  
IEC/EN60950-1 pending

### Model Numbering



#### Ordering Examples

RP90Q-2405SRW/N = 24V Input, 5V Output, Single, Neg. CTRL function

RP90Q-11012SRW/P = 110V Input, 12V Output, Single, Pos. CTRL function

RP90Q-2405SRW/N-HC = 24V Input, 5V Output, Single, Neg. CTRL function, with premounted Heat-sink

#### Notes:

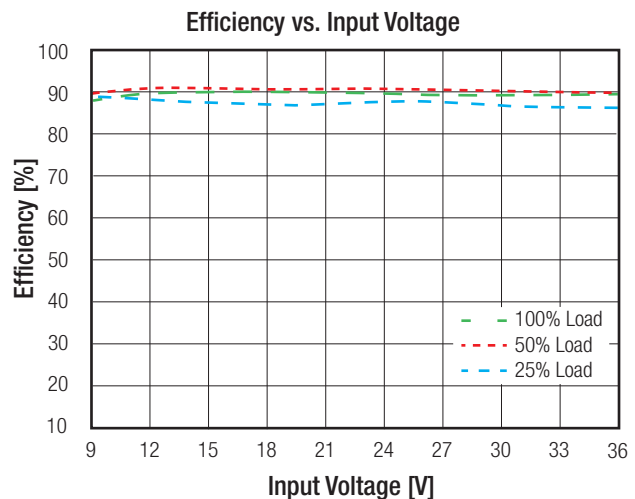
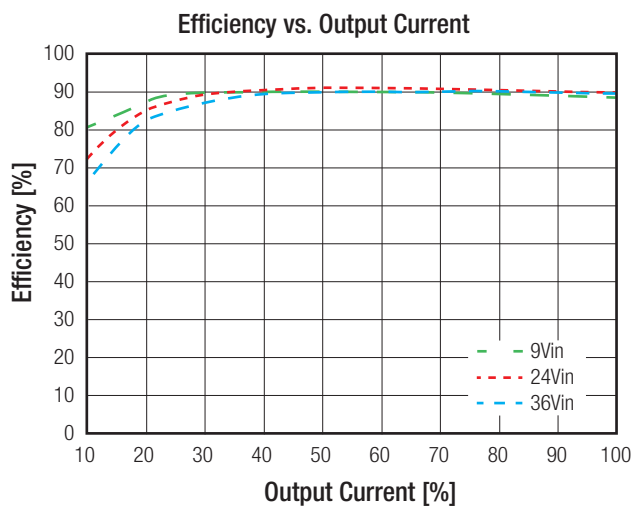
Note2: standard part is with suffix "P" for positive logic (1=ON, 0=OFF) or add suffix "N" instead for negative logic (0=ON, 1=OFF)

Note3: add suffix "-HC" for premounted Heat-sink (compatible with all other suffixes)

**Specifications** measured @ $t_a = 25^\circ\text{C}$ , resistive load, nominal  $V_{in}$  and rated  $I_{out}$  unless otherwise noted

| BASIC CHARACTERISTICS        |   |   |  |   |                           |
|------------------------------|---|---|--|---|---------------------------|
| Parameter                    | Condition   |   | Min.   | Typ.  | Max.                      |
| Internal Input Filter        |   |   | Pi-Type  |   |                           |
| Input Voltage Range          | nom $V_{in} = 24\text{V}$<br>nom $V_{in} = 48\text{V}$<br>nom $V_{in} = 110\text{V}$  |   | 9VDC<br>16.5VDC<br>40VDC   | 24VDC<br>48VDC<br>110VDC                    | 36VDC<br>75VDC<br>160VDC  |
| Input Surge Voltage          | $V_{in} = 24\text{V}$ , 1s max.<br>$V_{in} = 48\text{V}$ , 1s max.<br>$V_{in} = 110\text{V}$ , 1s max.  |   |  |   | 50VDC<br>100VDC<br>185VDC |
| Quiescent Current            | $V_{in} = 24\text{V}$<br>$V_{in} = 48\text{V}$<br>$V_{in} = 110\text{V}$  |   |  | 25ma<br>15mA<br>8mA                         |                           |
| Start-up time                | Power up<br>ON/OFF Control  |   |  | 75ms<br>75ms                                | 100ms<br>100ms            |
| Internal Operating Frequency |   |   | 270kHz   | 300kHz                                      | 330kHz                    |
| Minimum Load                 |   |   | 0%   |   |                           |
| Ripple and Noise             | Measured by 20MHz BW with a 22 $\mu\text{F}$ /25V X7R MLCC with a 22 $\mu\text{F}$ /25V X7R MLCC with a 4.7 $\mu\text{F}$ /50V X7R MLCC with a 2.2 $\mu\text{F}$ /100V X7R MLCC | 5 $V_{out}$<br>12, 15 $V_{out}$<br>24 $V_{out}$<br>48 $V_{out}$ |  | 75mVp-p<br>100mVp-p<br>200mVp-p<br>300mVp-p |                           |
| Under Voltage Lockout (UVLO) | $V_{in} = 24\text{V}$   | DC-DC ON<br>DC-DC OFF   | 7.3VDC   |   | 9VDC<br>8.1VDC            |
|                              | $V_{in} = 48\text{V}$   | DC-DC ON<br>DC-DC OFF   | 15.5VDC  |   | 18VDC<br>16.3VDC          |
|                              | $V_{in} = 110\text{V}$  | DC-DC ON<br>DC-DC OFF   | 33VDC  |   | 43VDC<br>36VDC            |
| ON/OFF Control               | Positive Logic  | DC-DC ON<br>DC-DC OFF   | Open or $3.0\text{V} < V_r < 12\text{V}$<br>Short or $0\text{V} < V_r < 1.2\text{V}$ |   |                           |
|                              | Negative Logic  | DC-DC ON<br>DC-DC OFF   | Short or $0\text{V} < V_r < 1.2\text{V}$<br>Open or $3.0\text{V} < V_r < 12\text{V}$ |   |                           |
| Input Current of CTRL pin    |   |   | -0.5mA   |   | 1mA                       |
| Standby Current              |   |   |  | 3mA   |                           |
| Output Trim                  |   |   | -20%   |   | +10%                      |
| Remote Sense                 | % of set $V_{out}$  |   |  |   | 10%                       |

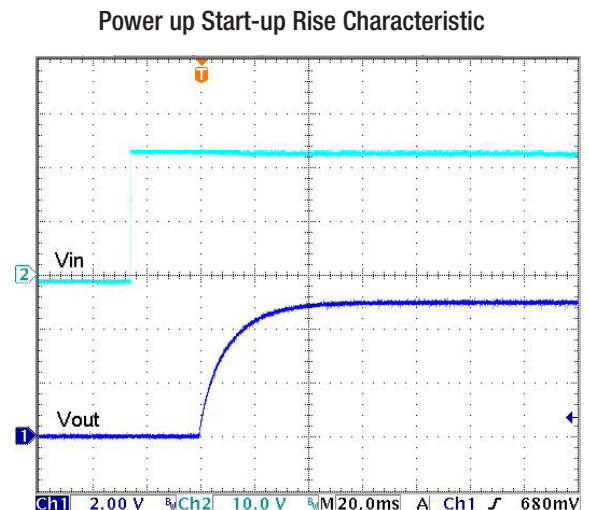
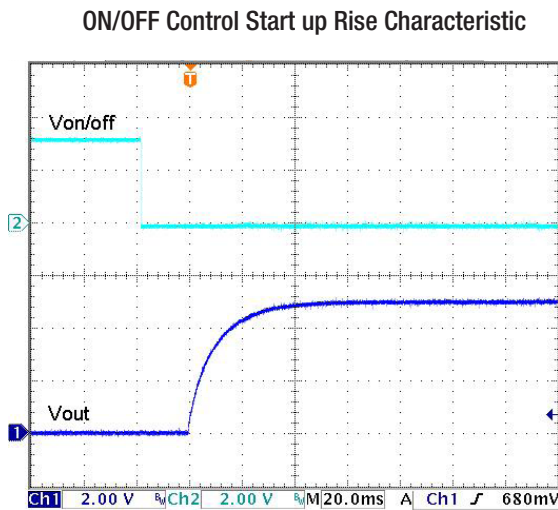
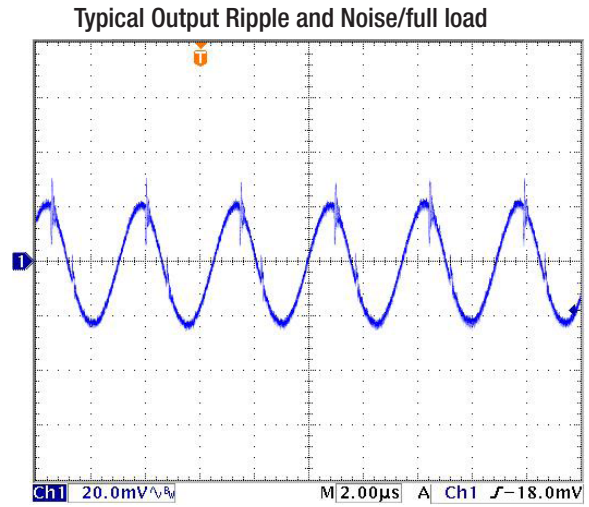
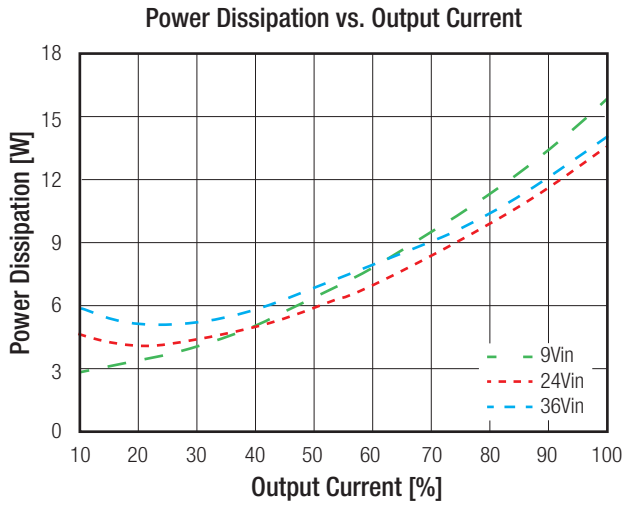
### RP90Q-2405SRW



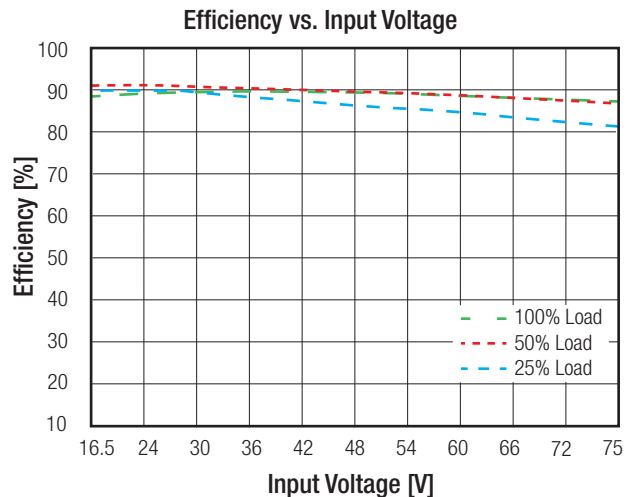
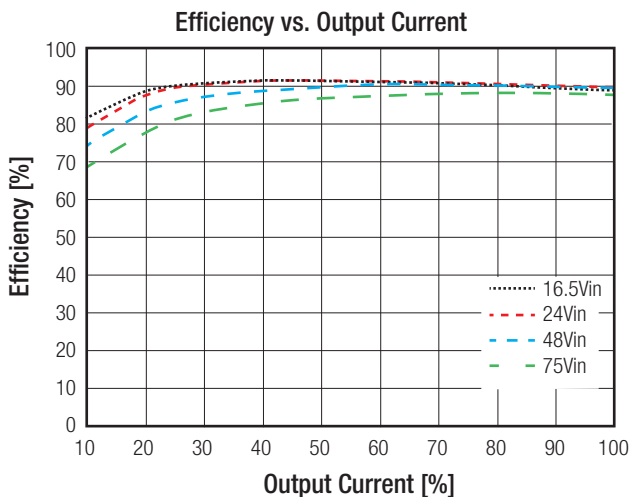
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Specifications measured @ $t_a = 25^\circ\text{C}$ , resistive load, nominal  $V_{in}$  and rated lout unless otherwise noted

RP90Q-2405SRW



RP90Q-4805SRW

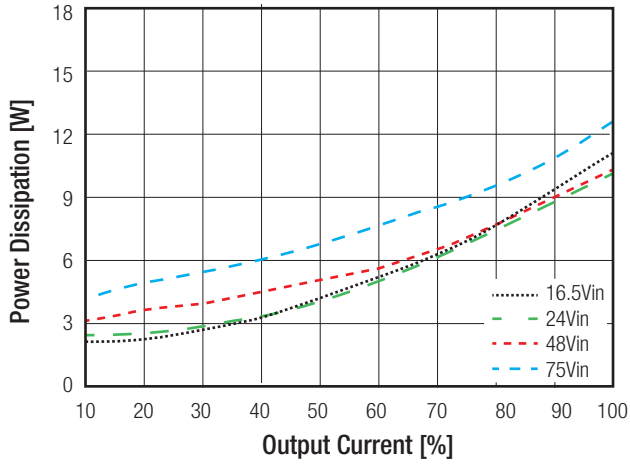


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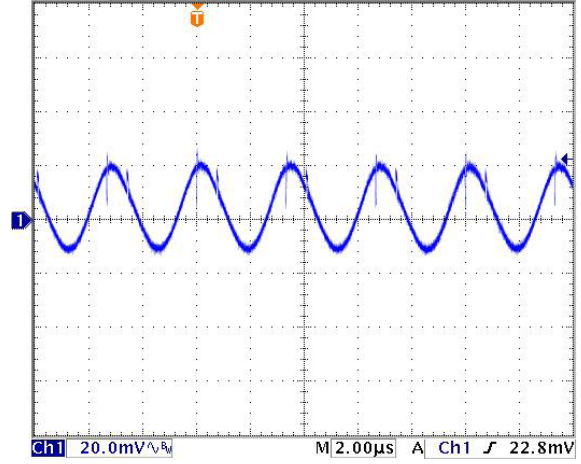
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## RP90Q-4805SRW

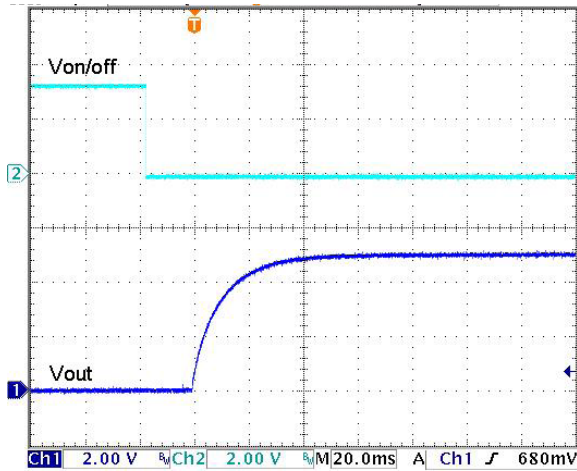
Power Dissipation vs. Output Current



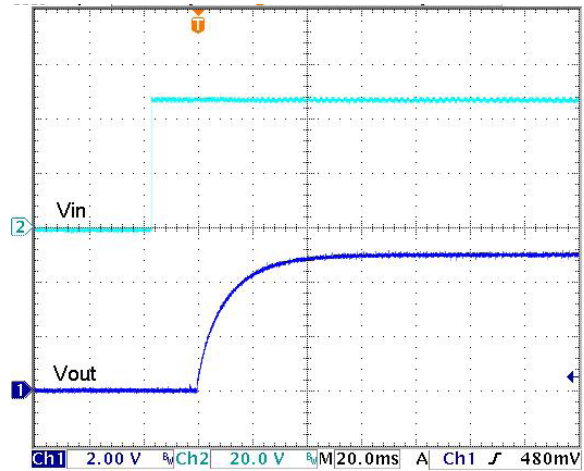
Typical Output Ripple and Noise/full load



ON/OFF Control Start up Rise Characteristic

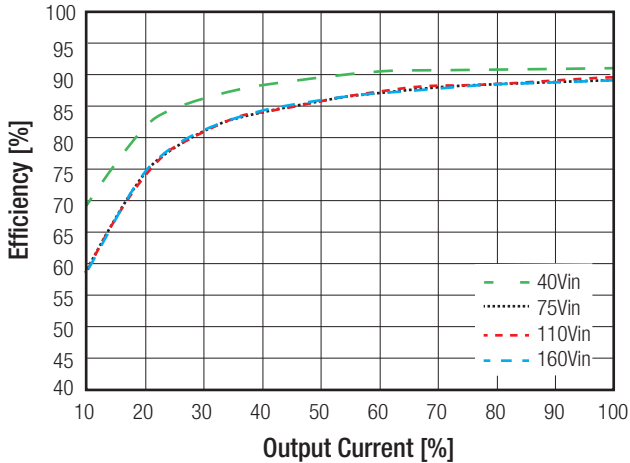


Power up Start-up Rise Characteristic

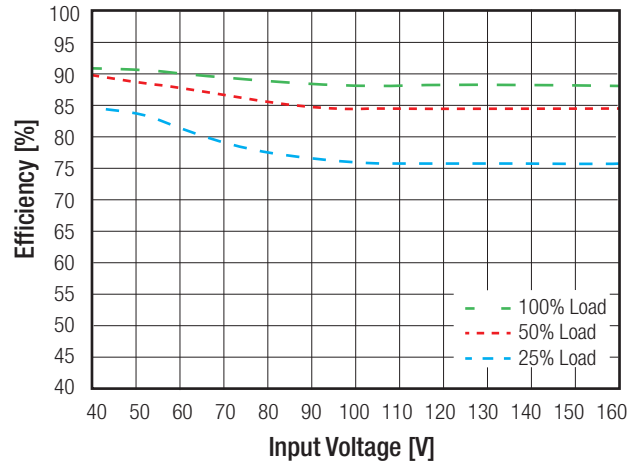


## RP90Q-11005SRW

Efficiency vs. Output Current



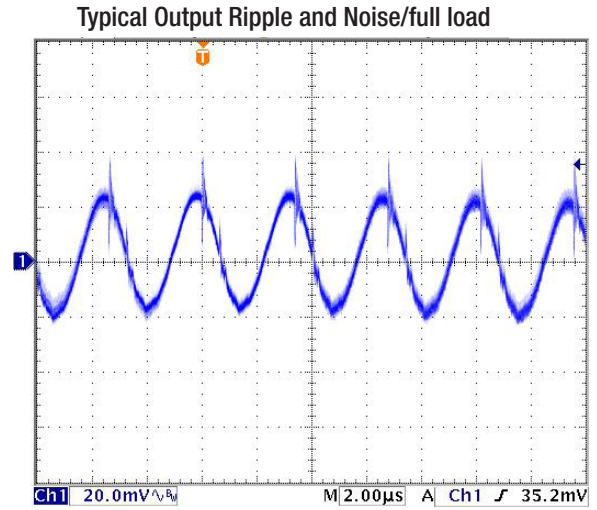
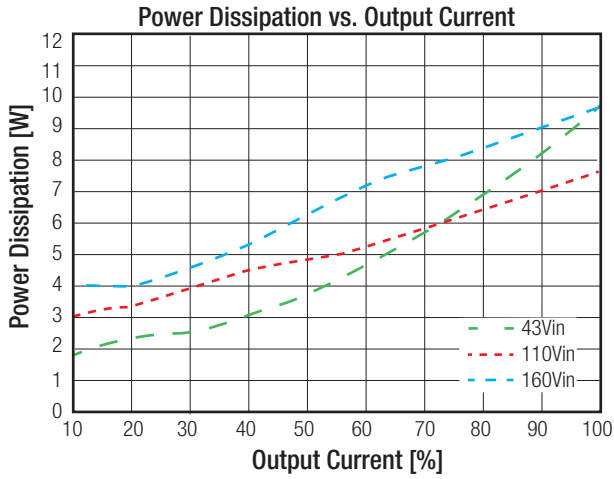
Efficiency vs. Input Voltage



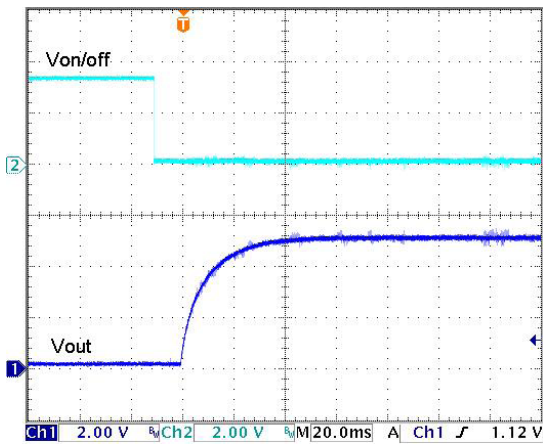
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Specifications measured @ $t_a = 25^\circ\text{C}$ , resistive load, nominal  $V_{in}$  and rated  $I_{out}$  unless otherwise noted

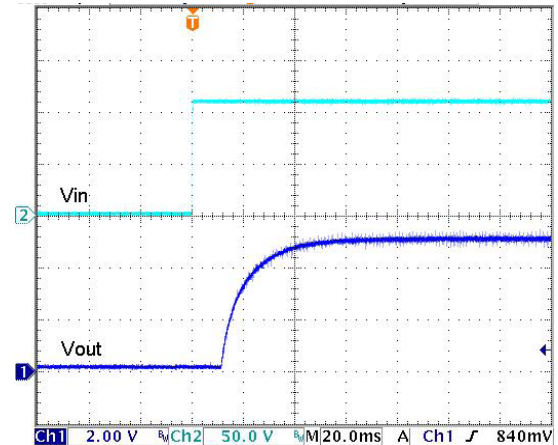
RP90Q-11005SRW



**ON/OFF Control Start up Rise Characteristic**



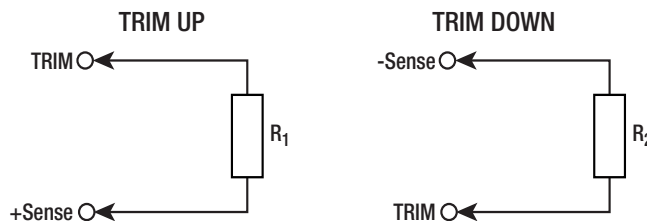
**Power up Start-up Rise Characteristic**



**OUTPUT TRIM**

**Output Voltage Trimming**

RP90Q-RW 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.



Specifications (measured @ ta= 25°C, nominal input voltage, full load and after warm-up)

## OUTPUT TRIM

### Trim Calculation

$$R_1 = \left[ \frac{511 \cdot V_{out} + 5.11 \Delta V_{out} \cdot V_{out}}{1.225 \cdot \Delta V_{out}} - \frac{(511 + 10.22 \Delta V_{out})}{\Delta V_{out}} \right] k\Omega$$

$$R_2 = \left[ \frac{511}{\Delta V_{out}} - 10.22 \right] k\Omega$$

V<sub>out</sub> = Output Voltage  
 ΔV<sub>out</sub> = Output Voltage Trim in %  
 R<sub>1</sub> = trim up resistor  
 R<sub>2</sub> = trim down resistor

### Practical Example:

#### Trim Up:

V<sub>out</sub> = 5V, ΔV<sub>out</sub> = 10% (5.5V)

$$R_1 = \left[ \frac{511 \cdot V_{out} + 5.11 \Delta V_{out} \cdot V_{out}}{1.225 \cdot \Delta V_{out}} - \frac{(511 + 10.22 \Delta V_{out})}{\Delta V_{out}} \right] k\Omega = \frac{511 \cdot 5 + 5.11 \cdot 10 \cdot 5}{1.225 \cdot 10} - \frac{511 + 10.22 \cdot 10}{10} = 229.43 - 61.32 = 169 k\Omega$$

#### Trim down:

V<sub>out</sub> = 5V, ΔV<sub>out</sub> = -10% (4.5V)

$$R_2 = \left[ \frac{511}{\Delta V_{out}} - 10.22 \right] k\Omega = \frac{511}{10} - 10.22 = 41.2 k\Omega$$

### RP90Q-xx05SRW

| Trim up            | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8   | 9    | 10   | %     |
|--------------------|------|------|------|------|------|------|------|-----|------|------|-------|
| V <sub>out</sub> = | 5.05 | 5.10 | 5.15 | 5.20 | 5.25 | 5.30 | 5.35 | 5.4 | 5.45 | 5.50 | Volts |
| R <sub>1</sub> =   | 1580 | 806  | 536  | 402  | 324  | 247  | 237  | 205 | 187  | 169  | KOhms |

### RP90Q-xx12SRW

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

### RP90Q-xx15SRW

| Trim up            | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | %     |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| V <sub>out</sub> = | 15.15 | 15.30 | 15.45 | 15.60 | 15.75 | 15.90 | 16.05 | 16.20 | 16.35 | 16.50 | Volts |
| R <sub>1</sub> =   | 5760  | 2940  | 1960  | 1470  | 1210  | 1020  | 866   | 768   | 698   | 619   | KOhms |

### RP90Q-xx24SRW

| Trim up            | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | %     |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| V <sub>out</sub> = | 24.24 | 24.48 | 24.72 | 24.96 | 25.20 | 25.44 | 25.68 | 25.92 | 26.16 | 26.40 | Volts |
| R <sub>1</sub> =   | 9530  | 4870  | 3240  | 2940  | 2000  | 1690  | 1470  | 1270  | 1150  | 1050  | KOhms |

### RP90Q-xx48SRW

| Trim up            | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | %     |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| V <sub>out</sub> = | 48.48 | 48.96 | 49.44 | 49.92 | 50.40 | 50.88 | 51.36 | 51.84 | 52.32 | 52.80 | Volts |
| R <sub>1</sub> =   | 19600 | 9945  | 6650  | 5110  | 4120  | 3400  | 3010  | 2610  | 2370  | 2150  | KOhms |

### Trim Down all Vout's

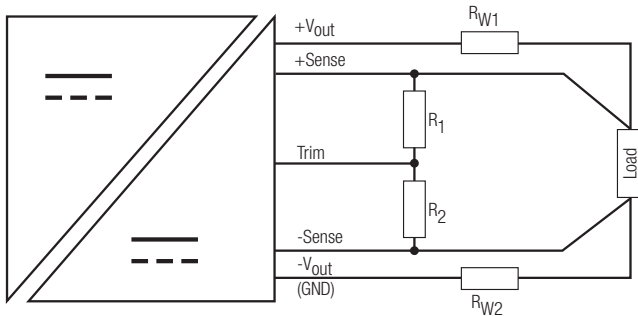
| Trim down        | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | %     |
|------------------|------|------|------|------|------|------|------|------|------|------|-------|
| R <sub>2</sub> = | 499  | 243  | 162  | 118  | 909  | 75   | 63.4 | 53.6 | 46.4 | 41.2 | KOhms |
| Trim down        | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | %     |
| R <sub>2</sub> = | 36.5 | 32.4 | 28.7 | 26.1 | 23.7 | 21.5 | 19.6 | 18.2 | 16.5 | 15.4 | KOhms |

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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

**Remote Sense**



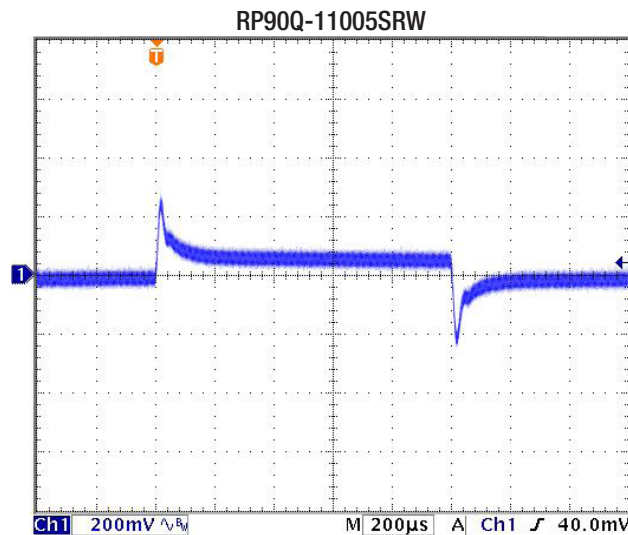
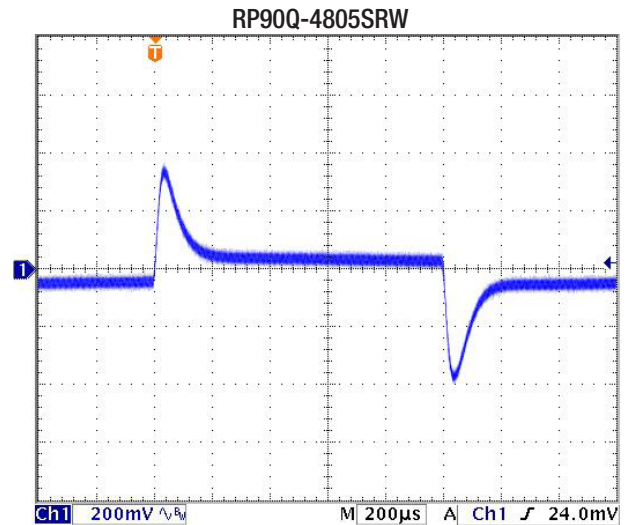
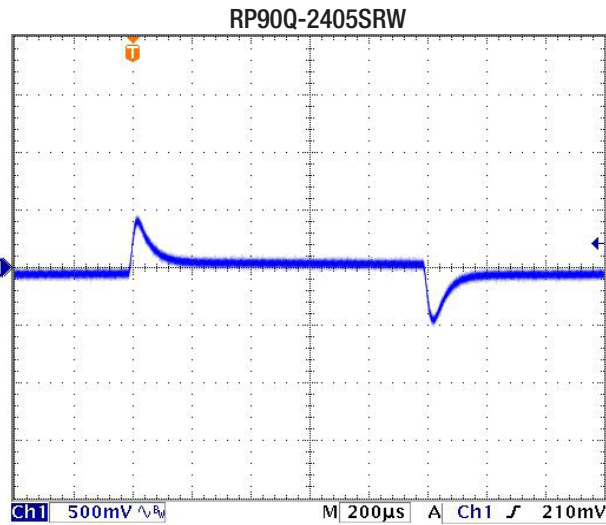
The output voltage can be adjusted by both trim and remote sense. The maximum combined adjustment range  $\pm 10\%$ . Derate the maximum output power if using the trim or sense function.

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

**REGULATIONS**

| Parameter          | Condition                          | Value  |
|--------------------|------------------------------------|--|
| Output Accuracy    |                                    | $\pm 1.0\%$                                  |
| Line Regulation    | low line to high line at full load | $\pm 0.1\%$                                  |
| Load Regulation    | 0% to 100% load                    | $5V_{out}$ $\pm 0.2\%$<br>others $\pm 0.1\%$ |
| Transient Response | 25% load step change               | 250 $\mu\text{s}$ typ.                       |

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load at nom.Vin



**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

| PROTECTIONS                       |                        |   |
|-----------------------------------|------------------------|---|
| Parameter                         | Condition              | Value                                     |
| Short Circuit Protection (SCP)    | below 100mΩ            | continuous, automatic recovery            |
| Over Voltage Protection (OVP)     | % of nom. Vout         | 115%-130%, Hiccup Mode                    |
| Over Load Protection (OLP)        | % Iout rated           | 110%-140%, Hiccup Mode                    |
| Over Temperature Protection (OTP) |                        | +110°C                                    |
| Isolation Voltage                 | 110Vin                 | I/P to O/P<br>I/P or O/P to Baseplate     |
|                                   | 24Vin, 48Vin           | I/P to O/P<br>I/P or O/P to Baseplate     |
| Isolation Resistance              | 500 VDC                | 1GΩ min.                                  |
| Isolation Capacitance             |                        | 1500pF max.                               |
| Isolation Grade                   | 110Vin<br>24Vin, 48Vin | Reinforced Insulation<br>Basic Insulation |

**Notes:**

Note4: An input fuse is required if the mains supply isn't over-current protected.  
Recommended fuse: 24Vin: 15A slow blow, 48Vin: 7.5A slow blow and 110Vin: 3A slow blow.

| ENVIRONMENTAL                         |   |                                       |
|---------------------------------------|---|---------------------------------------|
| Parameter                             | Condition   | Value                                 |
| Operating Baseplate Temperature Range |   | -40°C to +100°C                       |
| Maximum Case Temperature              |   | 100°C                                 |
| Temperature Coefficient               |   | ±0.02%/°C max.                        |
| Thermal Impedance                     | vertical direction by natural convection (0.1m/s) without Heat-sink<br>vertical direction by natural convection (0.1m/s) with Heat-sink | 9°C/W<br>7.5°C/W                      |
| Operating Humidity                    |   | 5% - 95% RH                           |
| Pollution Degree                      |   | PD2                                   |
| Shock                                 |   | according to EN61373 standard         |
| Thermal Shock                         |   | according to MIL-STD-810F standard    |
| Vibration                             |   | according to EN61373 standard         |
| Fire protection on railway vehicles   |   | according to EN45545-2, 2013 standard |
| MTBF                                  | according to MIL-HDBK-217F standard, 25°C   | 507.0 x 10 <sup>3</sup> hours         |

**Thermal Calculation**

$$R_{th\text{case-ambient}} = 9^\circ\text{C/W (vertical)}$$

$$R_{th\text{case-ambientHC}} = 7.5^\circ\text{C/W (vertical)}$$

$$R_{th\text{case-ambient}} = \frac{T_{\text{case}} - T_{\text{ambient}}}{P_{\text{dissipation}}}$$

$$P_{\text{dissipation}} = P_{\text{IN}} - P_{\text{OUT}} = \frac{P_{\text{OUTapp}}}{\eta} - P_{\text{OUTapp}}$$

|                             |   |   |
|-----------------------------|---|---|
| $T_{\text{case}}$           | = | Case Temperature                            |
| $T_{\text{ambient}}$        | = | Environment Temperature                     |
| $P_{\text{dissipation}}$    | = | Internal losses                             |
| $P_{\text{IN}}$             | = | Input Power                                 |
| $P_{\text{OUT}}$            | = | Output Power                                |
| $\eta$                      | = | Efficiency under given Operating Conditions |
| $R_{th\text{case-ambient}}$ | = | Thermal Impedance                           |

**Practical Example:**

Take the RP90Q-2405SRW with 9V input Voltage and 50% load. What is the maximum ambient operating temperature? Use converter vertical in application without airflow.

$$Eff_{\text{min}} = 89\% @ V_{\text{nom}}$$

$$P_{\text{OUT}} = 90\text{W}$$

$$P_{\text{OUTapp}} = 90 \times 0.5 = 45\text{W}$$

$$\eta = 91\% \text{ (Efficiency vs. Load Graph)}$$

$$P_{\text{dissipation}} = \frac{45}{0.91} - 45 = 4.45\text{W}$$

**without Heat-sink**

$$R_{th} = \frac{T_{\text{casemax}} - T_{\text{amb}}}{P_{\text{dissipation}}} \rightarrow 9^\circ\text{C/W} = \frac{100 - T_{\text{amb}}}{4.45\text{W}}$$

$$T_{\text{amb}} = 60^\circ\text{C}$$

**with Heat-sink**

$$R_{thHC} = \frac{T_{\text{casemax}} - T_{\text{amb}}}{P_{\text{dissipation}}} \rightarrow 7.5^\circ\text{C/W} = \frac{100 - T_{\text{amb}}}{4.45\text{W}}$$

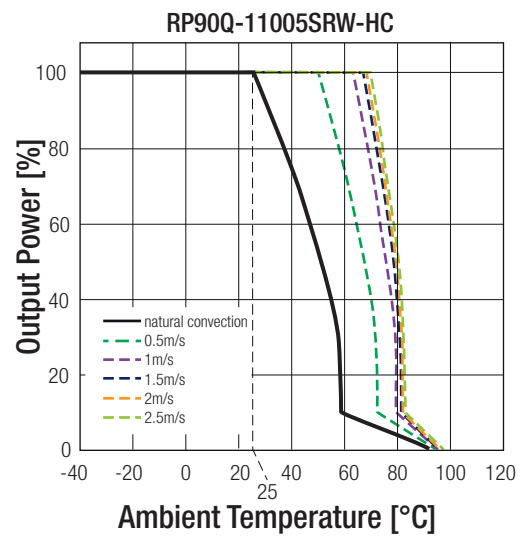
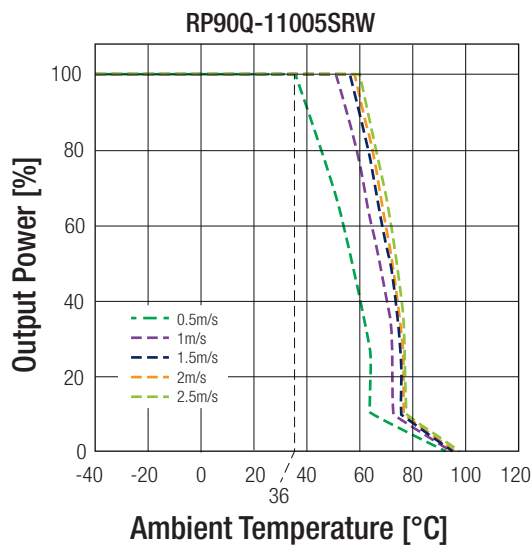
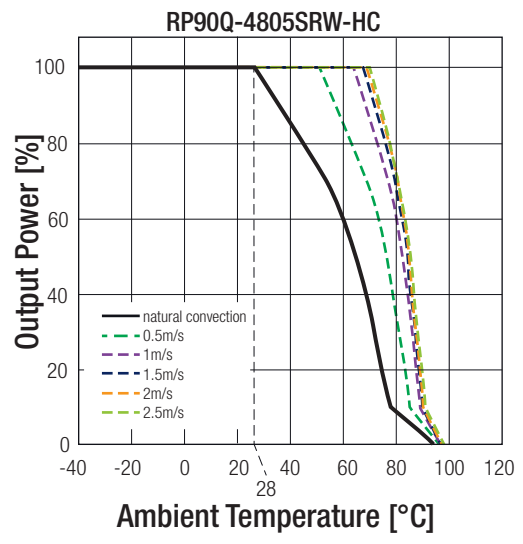
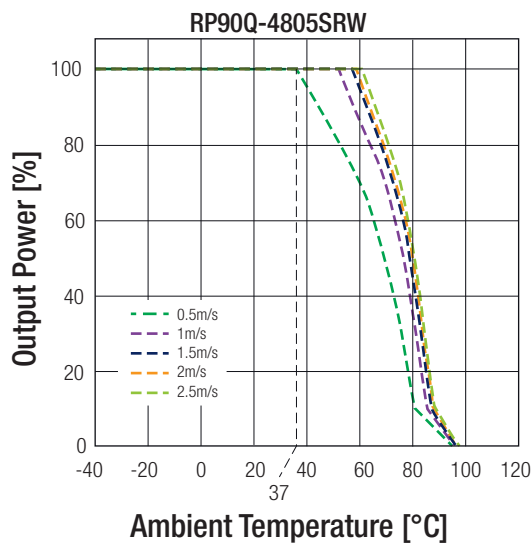
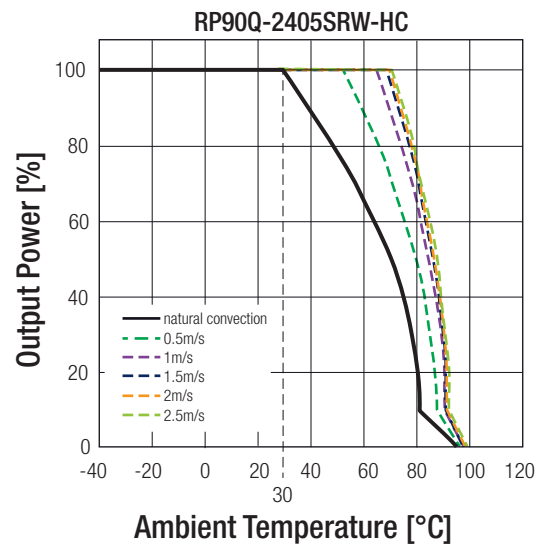
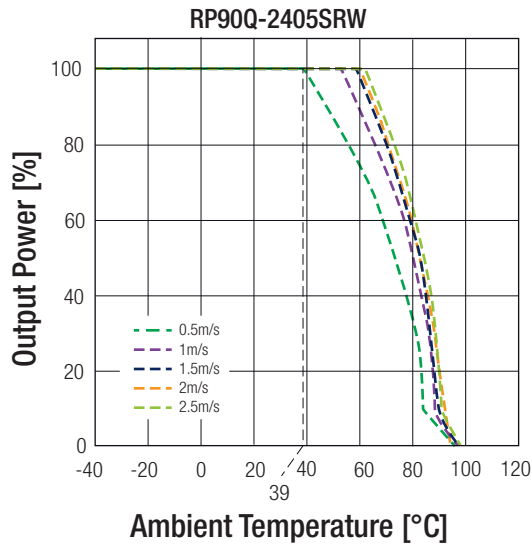
$$T_{\text{ambHC}} = 66^\circ\text{C}$$

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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Derating Graph<sup>5)</sup>  
(@ Chamber - tested with forced convection)



Notes:

Note5: Derating graphs are valid only for the shown part numbers. If you need detailed derating-information about a part-number not shown here please contact our technical support service at [techsupportAT@recom-power.com](mailto:techsupportAT@recom-power.com)

Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

| SAFETY AND CERTIFICATIONS  |   |                              |
|--|---|------------------------------|
| Certificate Type (Safety)  | Report / File Number  | Standard                     |
| IEC/EN Information Technology Equipment - General Requirements for Safety  | pending   | IEC/EN60950-1                |
| Railway Applications - Electrical Equipment used on rolling stock  | pending   | EN50155                      |
| EMI Compliance   | Condition   | Standard / Criterion         |
| Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement                       | with external filter  | EN55022, Class A and Class B |
| Industrial, scientific and medical equipment - Radio frequency disturbance characteristics - Limits and methods of measurement |   | EN55011, Class A and Class B |
| ESD Electrostatic discharge immunity test  | Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$<br>20 V/m<br>$\pm 2\text{kV}$<br>EN55024 & EN50155 $\pm 2\text{kV}$<br>10 Vr.m.s<br>100A/m continuous; 1000A/m 1s | EN61000-4-2, Criteria A      |
| Radiated, radio-frequency, electromagnetic field immunity test   |   | EN61000-4-3, Criteria A      |
| Fast Transient and Burst Immunity <sup>(9)</sup>   |   | EN61000-4-4, Criteria A      |
| Surge Immunity <sup>(9)</sup>  |   | EN61000-4-5, Criteria A      |
| Immunity to conducted disturbances, induced by radio-frequency fields  |   | EN61000-4-6, Criteria A      |
| Power Magnetic Field Immunity  |   | EN61000-4-8, Criteria A      |

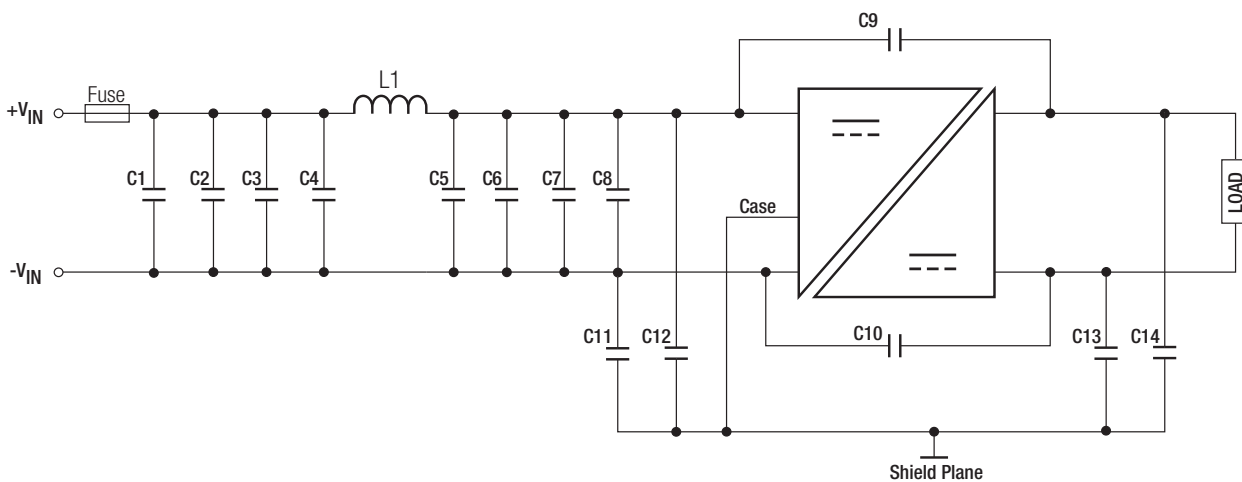
**Notes:**

Note6: An external input filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.

The **24Vin** and **48Vin** version recommend 2pcs of aluminium electrolytic capacitor to connect in parallel.  
Recom suggest: Nippon Chemi-con KY series, 220 $\mu\text{F}$ /100V.

The **110Vin** version recommend 2pcs of aluminium electrolytic capacitor to connect in parallel.  
Recom suggest: Nippon Chemi-con KXJ series, 150 $\mu\text{F}$ /200V

**EMI Filtering according to EN55022/11 Class A and EN50121-1 (24Vin and 48Vin)**



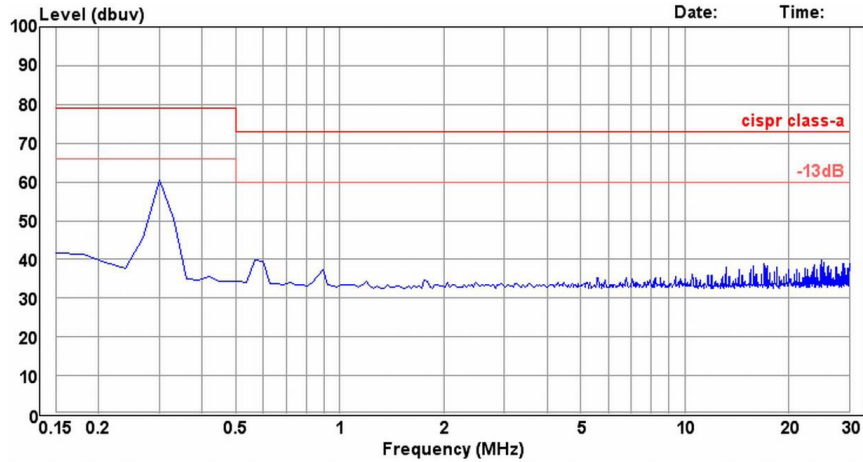
| MODEL         | C1                                    | C2, C3, C4                            | C5                                    | C6, C7, C8                            | C9 to C14                | L1                                       |
|---------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------|--|
| RP90Q-24xxSRW | N/A                                   | 6.8 $\mu\text{F}$ , 50V<br>1812 MLCC  | N/A                                   | 6.8 $\mu\text{F}$ , 50V<br>1812 MLCC  | 1000pF, 3kV<br>1808 MLCC | 0.68 $\mu\text{H}$ , 17A<br>SMD Inductor |
| RP90Q-48xxSRW | 4.7 $\mu\text{F}$ , 100V<br>1812 MLCC | 4.7 $\mu\text{F}$ , 100V<br>1812 MLCC | 4.7 $\mu\text{F}$ , 100V<br>1812 MLCC | 4.7 $\mu\text{F}$ , 100V<br>1812 MLCC | 1000pF, 3kV<br>1808 MLCC | 3.3 $\mu\text{H}$ , 10A<br>SMD Inductor  |

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Specifications (measured @ ta= 25°C, nominal input voltage, full load and after warm-up)

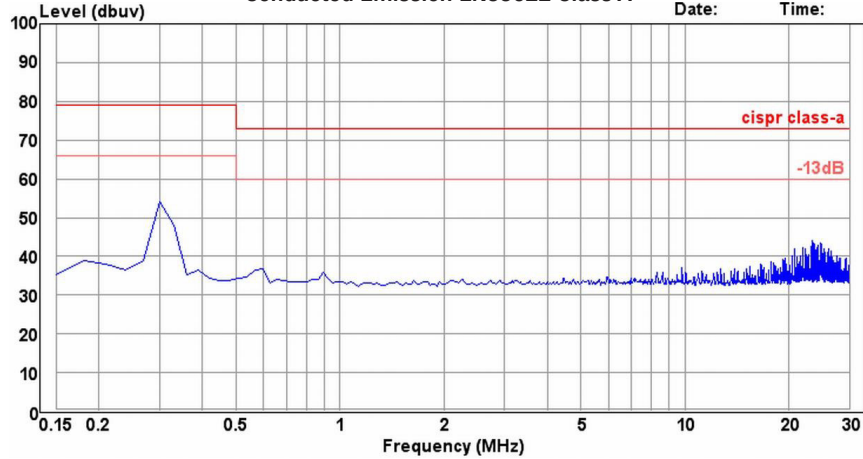
RP90Q-2405SRW

Conducted Emission EN55022 Class A

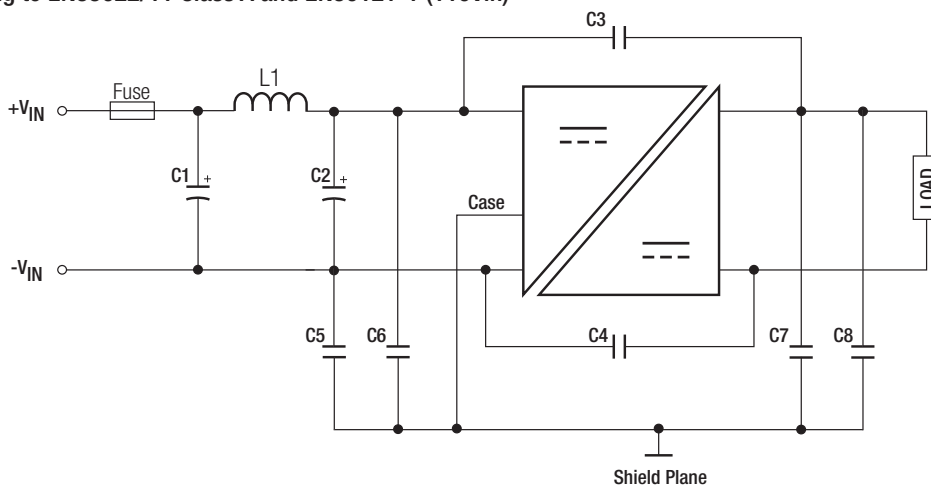


RP90Q-4805SRW

Conducted Emission EN55022 Class A



EMI Filtering according to EN55022/11 Class A and EN50121-1 (110Vin)

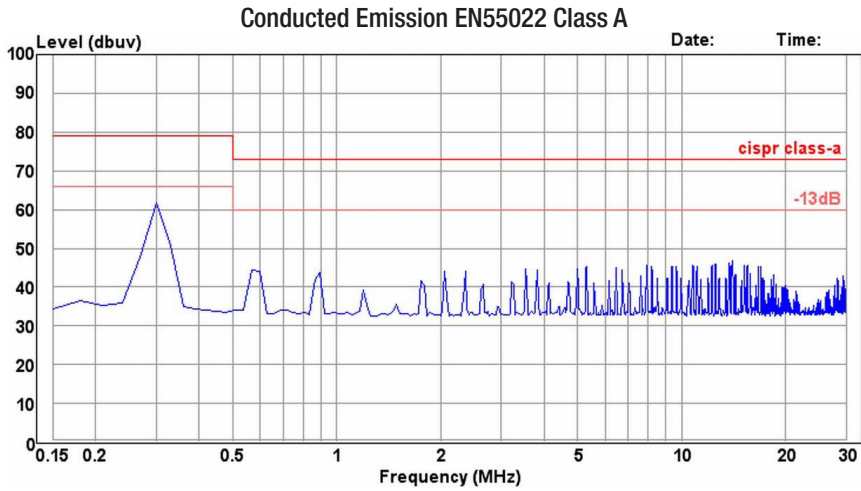


| MODEL          | C1, C2                                       | C3 to C8                 | L1                         |
|----------------|--|--------------------------|----------------------------|
| RP90Q-110xxSRW | 39µF, 250V<br>Al cap. (lie down) Rubycon BXF | 1000pF, 3kV<br>1808 MLCC | 30.1µH, 5A<br>SMD Inductor |

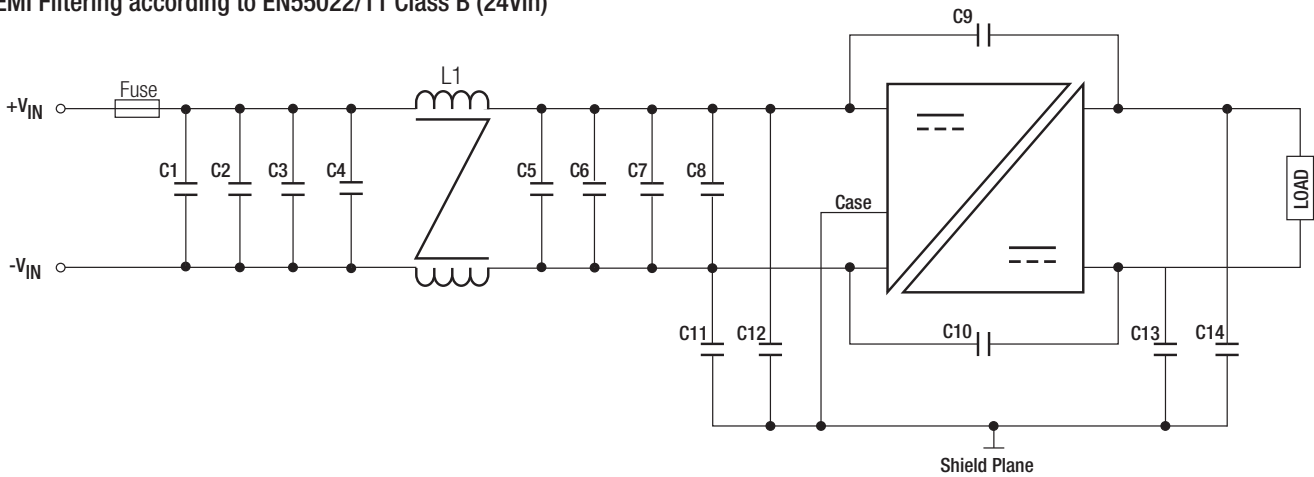
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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

RP90Q-11005SRW



EMI Filtering according to EN55022/11 Class B (24Vin)



| MODEL         | C1 to C8                            | C9, C10, C13, C14        | C11, C12                 | L1                       |
|---------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| RP90Q-24xxSRW | 10 $\mu\text{F}$ , 50V<br>1812 MLCC | 1000pF, 3kV<br>1808 MLCC | 2200pF, 3kV<br>1812 MLCC | 285 $\mu\text{H}$<br>CMC |

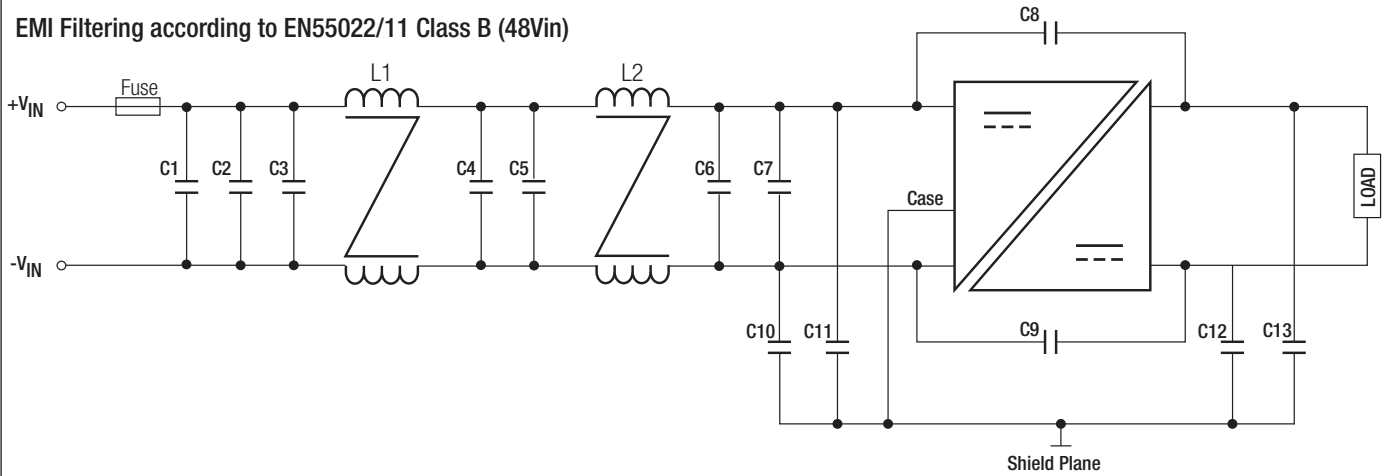
RP90Q-2405SRW



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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

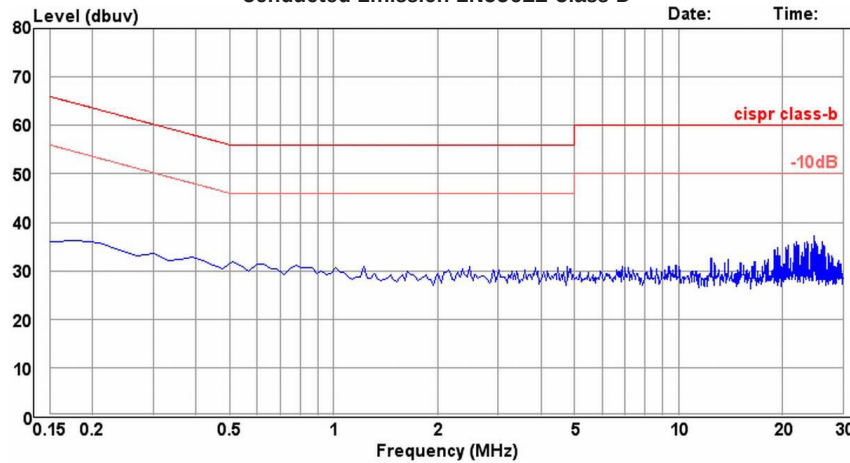
EMI Filtering according to EN55022/11 Class B (48Vin)



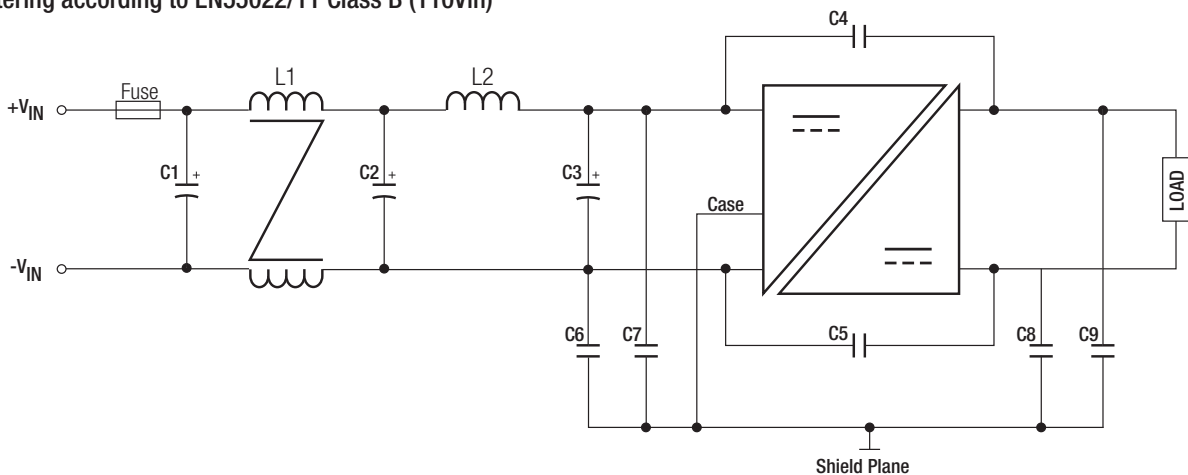
| MODEL         | C1 to C7                              | C8 to C13                | L1                       | L2                       |
|---------------|---------------------------------------|--------------------------|--------------------------|--------------------------|
| RP90Q-48xxSRW | 4.7 $\mu\text{F}$ , 100V<br>1812 MLCC | 1000pF, 3kV<br>1808 MLCC | 620 $\mu\text{H}$<br>CMC | 285 $\mu\text{H}$<br>CMC |

RP90Q-4805SRW

Conducted Emission EN55022 Class B



EMI Filtering according to EN55022/11 Class B (110Vin)



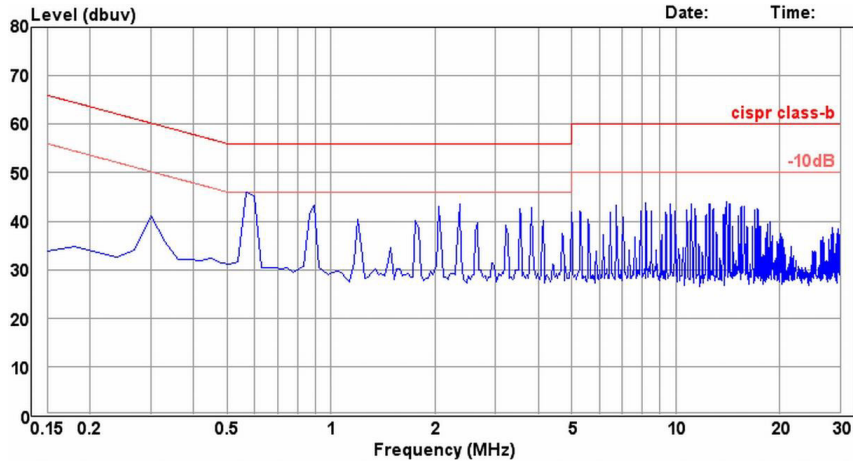
| MODEL          | C1, C2, C3  | C4 to C9                 | L1                       | L2                                      |
|----------------|---|--------------------------|--------------------------|---|
| RP90Q-110xxSRW | 39 $\mu\text{F}$ , 250V<br>Al cap. (lie down) Rubycon BXF | 1000pF, 3kV<br>1808 MLCC | 735 $\mu\text{H}$<br>CMC | 30.1 $\mu\text{H}$ , 5A<br>SMD Inductor |

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Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

RP90Q-110xxSRW

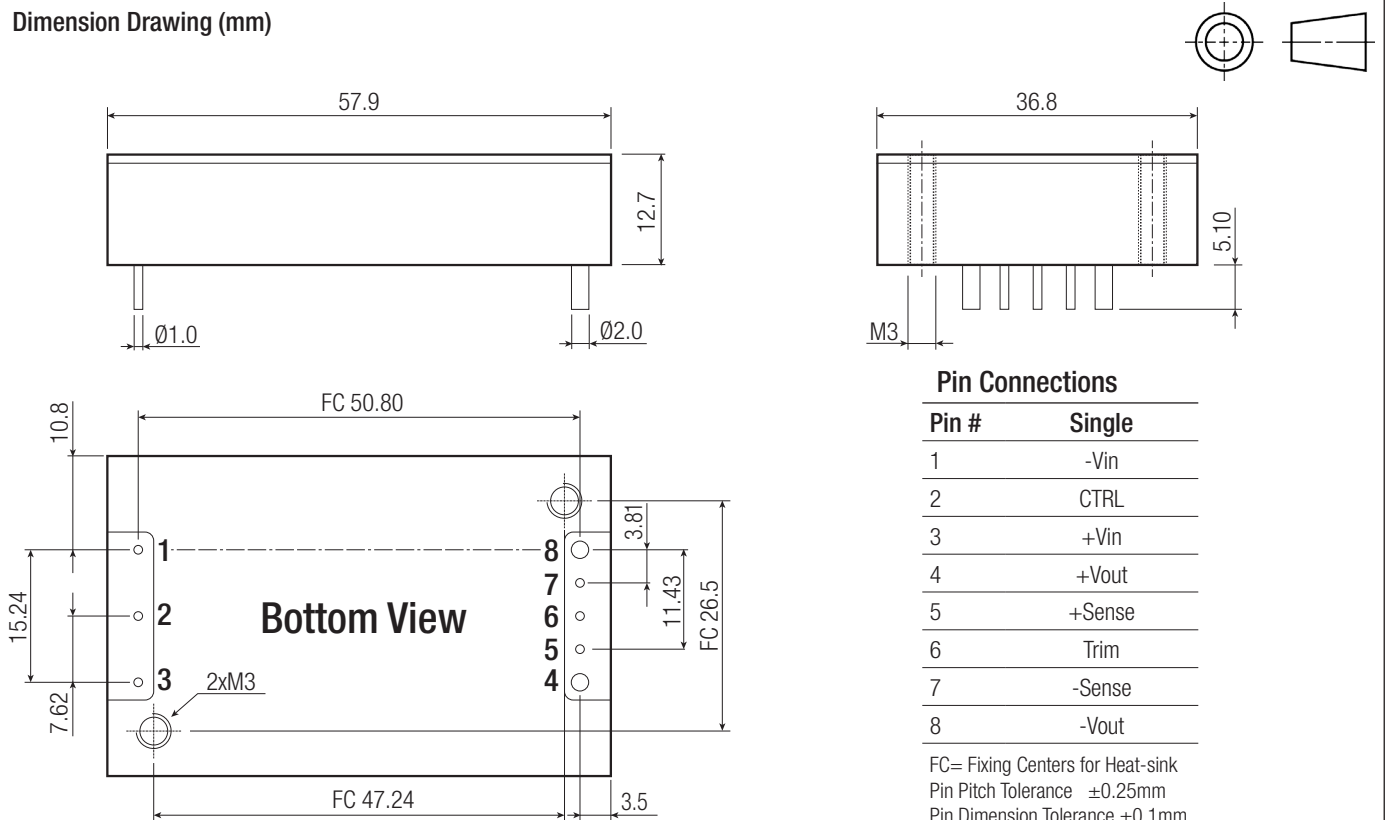
Conducted Emission EN55022 Class B



**DIMENSIONS and PHYSICAL CHARACTERISTICS**

| Parameter                   | Type              | Value                |
|-----------------------------|-------------------|----------------------|
| Material                    | Case              | Plastic              |
|                             | Baseplate         | Aluminium            |
|                             | Potting           | Silicone (UL94 V-0)  |
| Packaging Dimension (LxWxH) | without Heat-sink | 57.9 x 36.6 x 12.7mm |
|                             | with Heat-sink    | 57.9 x 36.6 x 18.8mm |
| Packaging Weight            | without Heat-sink | 64g                  |
|                             | with Heat-sink    | 88g                  |

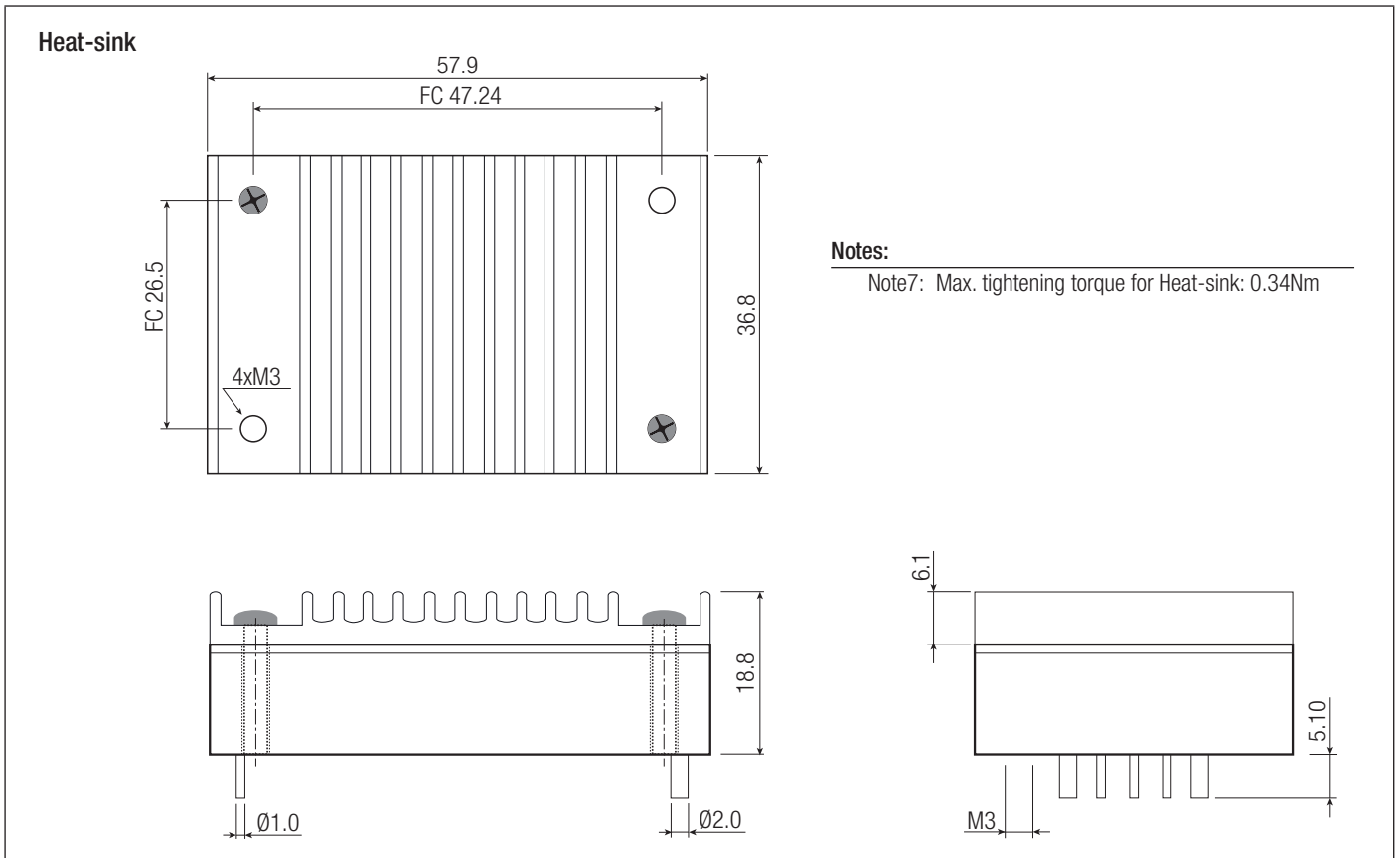
Dimension Drawing (mm)



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Specifications (measured @ ta= 25°C, nominal input voltage, full load and after warm-up)



**PACKAGING INFORMATION**

| Parameter                 | Type                   | Value                 |
|---------------------------|------------------------|-----------------------|
| Packaging Dimension       | Tray without Heat-sink | 157.0 x 88.0 x 12.8mm |
|                           | Tray with Heat-sink    | 157.0 x 88.0 x 24.8mm |
| Packaging Quantity        |                        | 2pcs                  |
| Storage Temperature Range |                        | -55°C to +125°C       |
| Storage Humidity          |                        | 5% - 95% RH           |



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Zertifiziert nach ISO 9001:2008

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