

# POWERLINE - DC/DC-Converter

EW-Series, 15W, 1.6 kV Isolation, 4:1 Wide Input Range (Single & Dual Output)

# RECOM

## Features

- 15 Watts Output Power
- 4:1 Wide Input Voltage Range
- International Safety Standard Approvals
- Six-Sided Continuous Shield
- High Efficiency up to 82%
- Standard 50.8 x 40.6 x 10.2 Package
- Fixed Switching Frequency
- UL 1950 Component Recognised

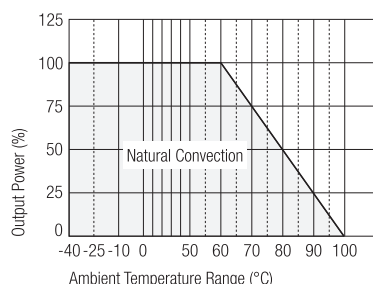


## Selection Guide 24V and 48V Input Types

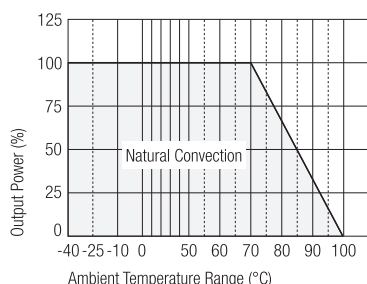
| Part Number  | Input Voltage | Output Voltage | Output Current | Input Current (see note 6) | Efficiency (see note 7) | Capacitive Load max. $\mu$ F |
|--------------|---------------|----------------|----------------|----------------------------|-------------------------|------------------------------|
|              | VDC           | VDC            | mA             | mA                         | %                       |                              |
| RP15-2405SEW | 9-36          | 5              | 3000           | 822                        | 80                      | 6800                         |
| RP15-2412SEW | 9-36          | 12             | 1250           | 801                        | 82                      | 890                          |
| RP15-2415SEW | 9-36          | 15             | 1000           | 801                        | 82                      | 570                          |
| RP15-2405DEW | 9-36          | $\pm$ 5        | $\pm$ 1500     | 822                        | 80                      | $\pm$ 1700                   |
| RP15-2412DEW | 9-36          | $\pm$ 12       | $\pm$ 625      | 801                        | 82                      | $\pm$ 300                    |
| RP15-2415DEW | 9-36          | $\pm$ 15       | $\pm$ 500      | 801                        | 82                      | $\pm$ 200                    |
| RP15-4805SEW | 18-75         | 5              | 3000           | 411                        | 80                      | 6800                         |
| RP15-4812SEW | 18-75         | 12             | 1250           | 401                        | 82                      | 890                          |
| RP15-4815SEW | 18-75         | 15             | 1000           | 401                        | 82                      | 570                          |
| RP15-4805DEW | 18-75         | $\pm$ 5        | $\pm$ 1500     | 411                        | 80                      | $\pm$ 1700                   |
| RP15-4812DEW | 18-75         | $\pm$ 12       | $\pm$ 625      | 401                        | 82                      | $\pm$ 300                    |
| RP15-4815DEW | 18-75         | $\pm$ 15       | $\pm$ 500      | 401                        | 82                      | $\pm$ 200                    |

## RP15-4805SEW: Derating & Efficiency Curves

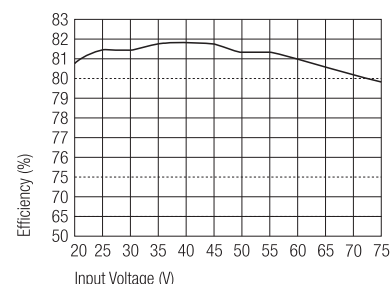
RP15-4805SEW Derating Curve



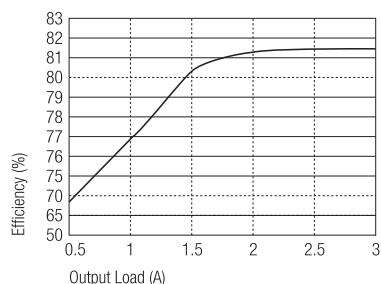
RP15-4805SEW Derating Curve with Heat Sink (see note 3)



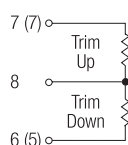
RP15-4805SEW Efficiency vs Input Voltage



RP15-4805SEW Efficiency vs Output



External Output Trimming



Pin 6, 7,8 –  
Single Output

Pin 5, 7,8 –  
Dual Output

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## Specifications (typical at nominal input and 25°C unless otherwise noted)

|                                                                    |                        |                         |                                |
|--------------------------------------------------------------------|------------------------|-------------------------|--------------------------------|
| Output Power                                                       |                        |                         | 15W max.                       |
| Voltage Accuracy (full Load and nominal Vin)                       |                        |                         | ±2%                            |
| Voltage Adjustability                                              |                        |                         | ±10%                           |
| Minimum Load (see note 1)                                          |                        |                         | 10% of FL                      |
| Line Regulation (LL-HL at full load)                               |                        |                         | ±0.5%                          |
| Load Regulation (10% to 100% FL)                                   | Single                 |                         | ±1%                            |
|                                                                    | Dual                   |                         | ±5%                            |
| Cross Regulation (asymmetrical load 25%/100% FL)                   | Dual                   |                         | ±5%                            |
| Ripple and Noise (20MHz bandwidth)                                 | Single                 |                         | 75mVp-p                        |
| Temperature Coefficient                                            |                        |                         | ±0.02%/°C, max.                |
| Transient Response (25% load step change)                          |                        |                         | 500µsec                        |
| Over Voltage Protection (with zener diode clamp)                   | 5V output              |                         | 6.2V                           |
|                                                                    | 12V output             |                         | 15V                            |
|                                                                    | 15V output             |                         | 18V                            |
| Over Load Protection (% of full load at nominal Vin)               |                        |                         | 150% max.                      |
| Short Circuit Protection                                           |                        |                         | Hiccup, automatic recovery     |
| Input Voltage Range                                                | RP15 24V nominal input |                         | 9-36VDC                        |
|                                                                    | RP15 48V nominal input |                         | 18-75VDC                       |
| Input Filter                                                       |                        |                         | Pi Type                        |
| Input Surge Voltage (100 ms max.)                                  | 24V input              |                         | 50VDC                          |
|                                                                    | 48V input              |                         | 100VDC                         |
| Input Reflected Ripple (nominal Vin and full load, see note 2)     |                        |                         | 20mA <sub>p-p</sub>            |
| Start Up Time (nominal Vin and constant resistor load)             |                        |                         | 20ms typ.                      |
| Remote ON/OFF (see note 3)                                         | DC-DC ON               | Open or 3.5V < Vr < 12V |                                |
| Remote off input current                                           | DC-DC OFF              | Short or 0V < Vr < 1.2V |                                |
|                                                                    | Nominal input          | 20mA                    |                                |
| Efficiency                                                         |                        |                         | see „Selection Guide“ table    |
| Isolation Voltage                                                  |                        |                         | 1600VDC min.                   |
| Isolation Resistance                                               |                        |                         | 10 <sup>9</sup> Ω min.         |
| Isolation Capacitance                                              |                        |                         | 300pF max.                     |
| Switching Frequency                                                |                        |                         | 270kHz typ.                    |
| Approved to Safety Standards                                       |                        |                         | UL 1950, EN60950               |
| Case Material                                                      |                        |                         | Nickel-coated copper           |
| Base Material                                                      |                        |                         | Non-conducted black plastic    |
| Potting Material                                                   |                        |                         | Epoxy (UL94-V0)                |
| Weight                                                             |                        |                         | 48g                            |
| Dimensions                                                         |                        |                         | 50.8 x 40.6 x 10.2 mm          |
| MTBF (see note 4)                                                  |                        |                         | 2.041 x 10 <sup>6</sup> Hours  |
| Operating Temperature Range (see derating curves on previous page) |                        |                         | -40°C to +85°C (with derating) |
| Maximum Case Temperature                                           |                        |                         | +100°C                         |
| Storage Temperature Range                                          |                        |                         | -55°C to +105°C                |

continued on next page

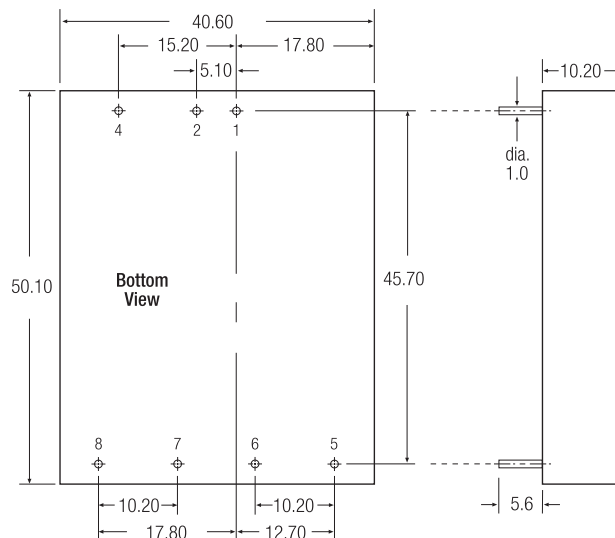
## Specifications continued (typical at nominal input and 25°C unless otherwise noted)

|                                |                    |                                       |
|--------------------------------|--------------------|---------------------------------------|
| Thermal Impedance (see note 5) | Natural convection | 10°C/Watt                             |
| Thermal Shock                  |                    | MIL-STD-810D                          |
| Vibration                      |                    | 10-55Hz, 2G, 30 Min. along X, Y and Z |
| Relative Humidity              |                    | 5% to 95% RH                          |
| Conducted Emissions            | EN55022            | Level A                               |
| Radiated Emissions             | EN55022            | Level A                               |
| Conducted Immunity             | EN61000-4-6        | Perf. Criteria 2                      |
| Radiated Immunity              | EN61000-4-3        | Perf. Criteria 2                      |
| Surge                          | EN61000-4-5        | Perf. Criteria 2                      |
| Fast Transient                 | EN61000-4-4        | Perf. Criteria 2                      |
| ESD                            | EN61000-4-2        | Perf. Criteria 2                      |

### Notes

- The RP15 E series requires a minimum of 10% loading on the output to maintain specified regulation.  
Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
- Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
- The ON/OFF control is referenced to negative input.
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40 °C. (Ground fixed and controlled environment).
- Heat sink is optional. Thermal impedance is 8.24°C/Watt for natural convection and the P/N is 7G-0011A.
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and full load.

## Package Style and Pinning (mm)



### Pin Connections

| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | +Vin   | +Vin   |
| 2     | -Vin   | -Vin   |
| 4     | CTRL   | CTRL   |
| 5     | No Pin | +Vout  |
| 6     | +Vout  | Common |
| 7     | -Vout  | -Vout  |
| 8     | Trim   | Trim   |

Pin Pitch Tolerance  $\pm 0.35$  mm