

# POWERLINE - DC/DC-Converter

E-Series, 60 Watt, 1.6 kV Isolation & Wide Input Range (Single & Dual Output)

RECOM

## Features

- 2:1 Input Range
- Efficiency up to 90%
- Low Profile Case, 19 mm
- ON/OFF Control
- Over-Voltage Protection
- Six-Sided Shield
- Pi Input Filter
- Including 3.3/5.0VDC Output
- MTBF 1.250 x 10<sup>5</sup> Hours
- 2 Year Warranty



## Selection Guide 12V, 24V and 48V Input Types

| Part Number     | Input Range (VDC) | Output Voltage (VDC) | Output Current (A) | Efficiency (%) |
|-----------------|-------------------|----------------------|--------------------|----------------|
| RP60-1233SE     | 9-18              | 3.3                  | 15                 | 78             |
| RP60-1205SE     | 9-18              | 5                    | 12                 | 81             |
| RP60-1212SE     | 9-18              | 12                   | 5                  | 82             |
| RP60-1215SE     | 9-18              | 15                   | 4                  | 82             |
| RP60-1205DE     | 9-18              | ±5                   | +10 / -2           | 81             |
| RP60-1212DE     | 9-18              | ±12                  | ±2.5               | 82             |
| RP60-1215DE     | 9-18              | ±15                  | ±2.0               | 82             |
| RP60-123305DE   | 9-18              | 3.3 / 5              | 6/6                | 78             |
| RP60-2433SE     | 18-36             | 3.3                  | 15                 | 79             |
| RP60-2405SE     | 18-36             | 5                    | 12                 | 83             |
| RP60-2412SE     | 18-36             | 12                   | 5                  | 84             |
| RP60-2415SE     | 18-36             | +15                  | 4                  | 84             |
| RP60-2405DE     | 18-36             | ±5                   | +10 / -2           | 83             |
| RP60-2412DE     | 18-36             | ±12                  | ±2.5               | 87             |
| RP60-2415DE     | 18-36             | ±15                  | ±2.0               | 87             |
| RP60-243305DE   | 18-36             | 3.3 / 5              | 6 / 6              | 80             |
| RP60-4833SE     | 36-75             | 3.3                  | 15                 | 80             |
| RP60-4805SE     | 36-75             | 5                    | 12                 | 84             |
| RP60-4812SE     | 36-75             | 12                   | 5                  | 89             |
| RP60-4815SE     | 36-75             | 15                   | 4                  | 89             |
| RP60-4805DE     | 36-75             | ±5                   | +10 / -2           | 84             |
| RP60-4812DE     | 36-75             | ±12                  | ±2.5               | 89             |
| RP60-4815DE     | 36-75             | ±15                  | ±2.0               | 89             |
| RP60-483305DE   | 36-75             | 3.3 / 5.0            | 6 A/6              | 81             |
| <b>Specials</b> |                   |                      |                    |                |
| RP60-485.5DEC   | 36-72             | +5.5 / -5.4          | +8 / -1.5          | -              |

## Maximum Capacitive Load

|               |                                  |
|---------------|----------------------------------|
| RP60-xx05SE   | 20400µF                          |
| RP60-xx12SE   | 3550µF                           |
| RP60-xx15SE   | 3300µF                           |
| RP60-xx33SE   | 38700µF                          |
| RP60-xx05DE   | 17000µF (+5V)<br>3400µF (-5V)    |
| RP60-xx12DE   | 900µF                            |
| RP60-xx15DE   | 600µF                            |
| RP60-xx3305DE | 16000µF (+3.3V)<br>10200µF (+5V) |

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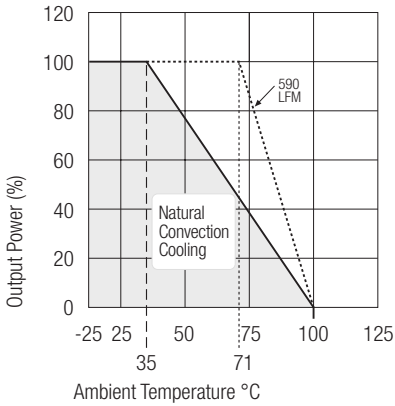
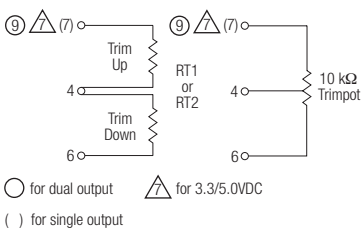
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### Specifications (typical at nominal input and 25°C unless otherwise noted)

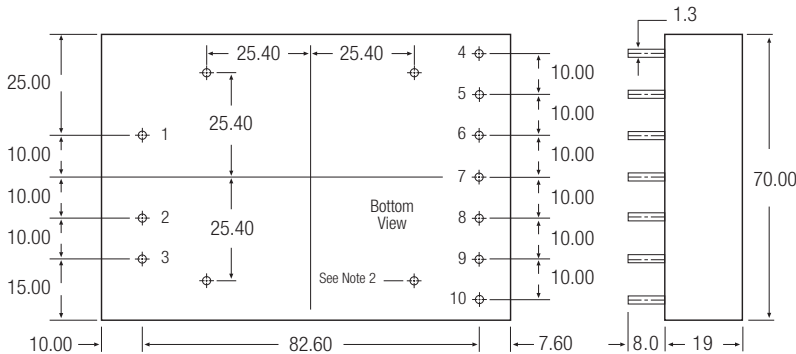
|                                                                         |                                               |             |
|-------------------------------------------------------------------------|-----------------------------------------------|-------------|
| Input Voltage Range                                                     | See „Selection Guide“ table                   |             |
| Input Filter                                                            | Pi Type                                       |             |
| Reflected Ripple Current                                                | 75mA, p-p                                     |             |
| Voltage Accuracy, Single, Dual Output Models                            | ±2.0%, max.                                   |             |
| Voltage Balance, Dual Output Models                                     | ±2%, max.                                     |             |
| Ripple & Noise, 20MHz BW                                                | 1% p-p of Vout                                |             |
| Line Regulation:                                                        | Single Output Models                          | ±0.5%, max. |
|                                                                         | Dual Output Models                            | ±0.5%, max. |
| Load Regulation (1/10 Load Full-Load)                                   | (xx3305DE) Models 3.3V                        |             |
| Minimum Output Current 800mA)                                           | Single Output Models                          | ±0.5%, max. |
|                                                                         | Dual Output Models                            | ±0.5%, max. |
| Temperature Coefficient                                                 | ±0.02%/°C                                     |             |
| Temp. Coefficient Balance                                               | ±1.0%                                         |             |
| Output Short Circuit Duration                                           | Continuous                                    |             |
| Short Circuit Protection. All outputs, by input Current limiting Output |                                               |             |
| Short Circuit Duration                                                  | Continuous                                    |             |
| Overvoltage Protection Threshold:                                       | 3.3V Output                                   | 3.9V        |
|                                                                         | 5.V Output                                    | 6.2V        |
|                                                                         | 12V Output                                    | 15V         |
|                                                                         | 15V Output                                    | 18V         |
| Control Voltage Referenced to Negative(-)Input Compatibility            | CMOS, TTL                                     |             |
| ON-Control                                                              | 4.8V min. or Open                             |             |
| OFF-Control                                                             | 0.4V max. or Short                            |             |
| Switching Frequency                                                     | 200kHz, typ.                                  |             |
| Isolation Voltage                                                       | 1600VDC, min                                  |             |
| Isolation Resistance                                                    | 10 <sup>9</sup> Ω                             |             |
| Operating Temperature Range                                             | -25°C to +71°C                                |             |
| Storage Temperature Range                                               | -55°C to +125°C                               |             |
| Cooling                                                                 | Free-air Convection                           |             |
| EMI/RFI                                                                 | Six-sided Continuous Shield                   |             |
| Case Material                                                           | Nickel-Coated Copper with Non-Conductive Base |             |
| Dimensions                                                              | 100 x 70 x 19 mm                              |             |
| MTBF (MIL-HDBK-217F TA = 25°C full load)                                | 1.250 x 10 <sup>5</sup> Hours                 |             |

### External Output Trimming

Output may optionally be externally trimmed (± 10%) with a fixed resistor or an external trimpot as shown.



### Package Style and Pinning (mm)



| Pin Connections |        |        |                   |
|-----------------|--------|--------|-------------------|
| Pin #           | Single | Dual   | 3.3 VDC / 5.0 VDC |
| 1               | +Vin   | +Vin   | +Vin              |
| 2               | -Vin   | -Vin   | -Vin              |
| 3               | On/Off | On/Off | On/Off            |
| 4               | Trim   | Trim   | Trim              |
| 5               | +Vout  | +Vout  | +3.3 Vout         |
| 6               | +Vout  | +Vout  | +3.3 Vout         |
| 7               | Ground | Ground | Common            |
| 8               | Ground | Ground | Common            |
| 9               | N/P    | -Vout  | +5.0 Vout         |
| 10              | N/P    | -Vout  | +5.0 Vout         |

Pin Pitch Tolerance ±0.5 mm