

Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

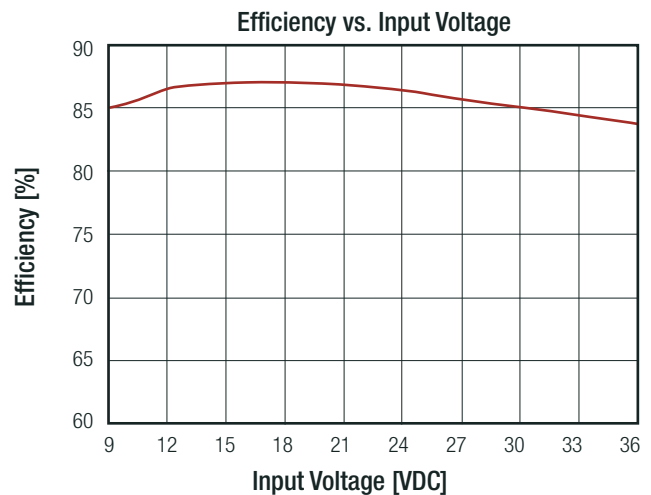
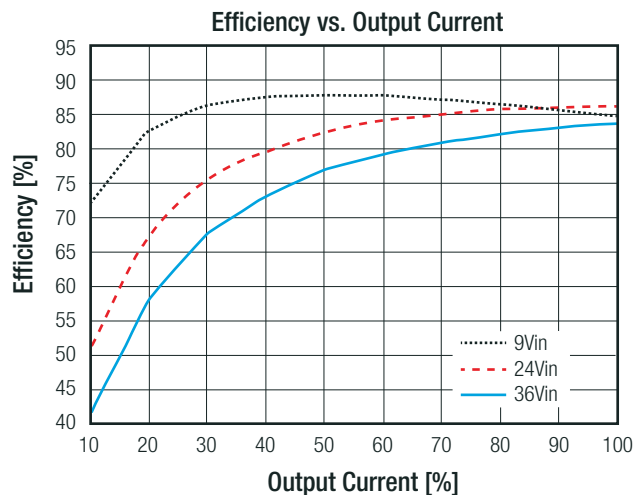
| BASIC CHARACTERISTICS | | | | | |
|---|--|--------------------------------------|--|----------------------|-----------------|
| Parameter | Condition | | Min. | Typ. | Max. |
| Input Filter | | | | | Pi-Type |
| Input Voltage Range | nom. Vin = 24VDC nom. Vin = 48VDC | | 9VDC 18VDC | 24VDC 48VDC | 36VDC 75VDC |
| Input Surge Voltage | 100ms max. | nom. Vin = 24VDC nom. Vin = 48VDC | | | 50VDC 100VDC |
| Under Voltage Lockout (UVLO) | nom. Vin = 24VDC | DC-DC ON DC-DC OFF | | 8VDC | 9VDC |
| | nom. Vin = 48VDC | DC-DC ON DC-DC OFF | | 16VDC | 18VDC |
| Output Voltage Trimming | refer to "OUTPUT VOLTAGE TRIMMING" | | -10% | | +10% |
| Input Reflected Ripple ⁽⁴⁾ | nominal Vin and full load | | | 30mA _{p-p} | |
| Minimum Load | | | 0% | | |
| Start-up time | Power up | | | | 30ms |
| | Remote ON/OFF | | | | 30ms |
| ON/OFF CTRL ⁽⁵⁾ refer to "ON/OFF CTRL" | Positive Logic | DC-DC ON DC-DC OFF | Open or 3.0VDC < V _{CTRL} < 15VDC Short or 0VDC < V _{CTRL} < 1.2VDC | | |
| | Negative Logic | DC-DC ON DC-DC OFF | Short or 0VDC < V _{CTRL} < 1.2VDC Open or 3.0VDC < V _{CTRL} < 15VDC | | |
| Input Current of CTRL pin | drive current | I _{CTRL} | -0.5mA | | +1.0mA |
| Standby Current | DC-DC OFF | I _{in} | | 2.5mA | |
| Internal Operating Frequency | 3.3Vout, 5Vout | | 315kHz | 350kHz | 385kHz |
| | 12Vout, 15Vout | | 360kHz | 400kHz | 440kHz |
| Output Ripple and Noise | measured at 20MHz BW with a 1µF M/C X7R and 10µF T/C | | | 100mV _{p-p} | |

Notes:

Note4: Simulated source impedance of 12µH. 12µH inductor in series with +Vin.

Note5: If no suffix is specified, the control pin will be omitted. If fitted, the ON/OFF control function can be positive or negative logic. The pin voltage is referenced to -Vin

RP15-2405S0FW

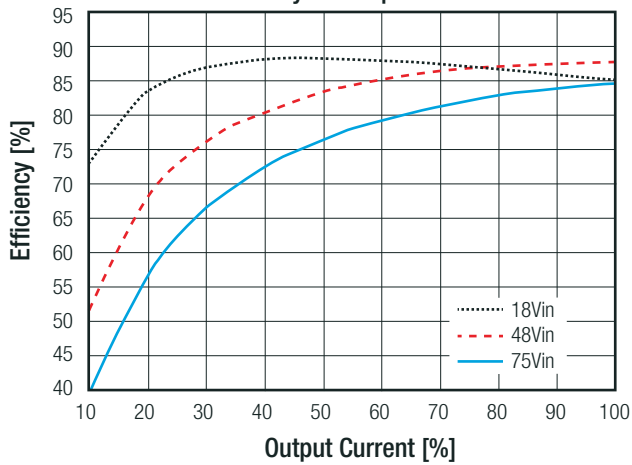


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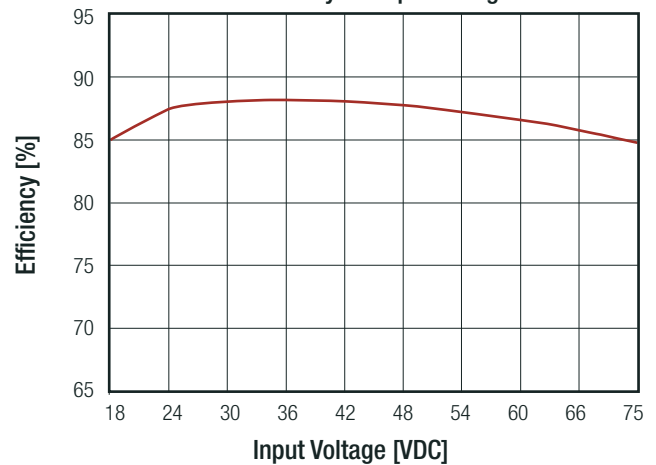
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

RP15-4805S0FW

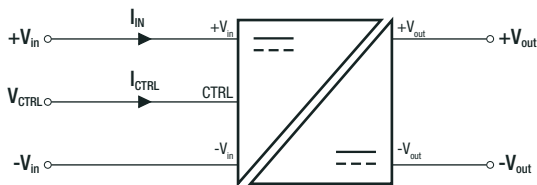
Efficiency vs. Output Current



Efficiency vs. Input Voltage



ON/OFF CTRL

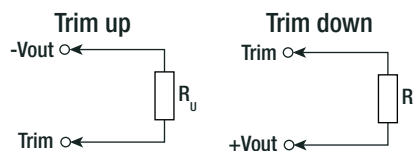


| | | |
|----------------|-----------|--|
| Positive Logic | DC-DC ON | Open or 3.0VDC < V _{CTRL} < 15VDC |
| | DC-DC OFF | Short or 0VDC < V _{CTRL} < 1.2VDC |
| Negativ Logic | DC-DC ON | Short or 0VDC < V _{CTRL} < 1.2VDC |
| | DC-DC OFF | Open or 3.0VDC < V _{CTRL} < 15VDC |

OUTPUT VOLTAGE TRIMMING

Output Voltage Trimming

Single output Powerline converters offer the feature of trimming the output voltage over a certain range around the nominal value by using external trim resistors. No general equation can be given for calculating the trim resistors, but the following trimtables give typical values for choosing these trimming resistors. If voltages between the given trim points are required, extrapolate between the two nearest given values to work out the resistor required or use a variable resistor to set the output voltage. Output can be externally trimmed by using the method shown below.



RP15-xx3.3S0FW

| | | | | | | | | | | | |
|------------------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 3.333 | 3.366 | 3.399 | 3.432 | 3.465 | 3.498 | 3.531 | 3.564 | 3.597 | 3.63 | [VDC] |
| R _u = | 385.07 | 191.51 | 126.99 | 94.73 | 75.37 | 62.47 | 53.25 | 46.34 | 40.96 | 36.66 | [kΩ] |
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 3.267 | 3.234 | 3.201 | 3.168 | 3.135 | 3.102 | 3.069 | 3.036 | 3.003 | 2.97 | [VDC] |
| R _d = | 116.72 | 54.78 | 34.13 | 23.81 | 17.62 | 13.49 | 10.54 | 8.32 | 6.60 | 5.23 | [kΩ] |

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Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

| RP15-xx05S0FW | | | | | | | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 5.05 | 5.10 | 5.15 | 5.20 | 5.25 | 5.30 | 5.35 | 5.4 | 5.45 | 5.50 | [VDC] |
| R _u = | 253.45 | 125.70 | 83.12 | 61.82 | 49.05 | 40.53 | 34.45 | 29.89 | 26.34 | 23.50 | [kΩ] |
| | | | | | | | | | | | |
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 4.95 | 4.90 | 4.85 | 4.80 | 4.75 | 4.70 | 4.65 | 4.60 | 4.55 | 4.50 | [VDC] |
| R _d = | 248.34 | 120.59 | 78.01 | 56.71 | 43.94 | 35.42 | 29.34 | 24.78 | 21.23 | 18.39 | [kΩ] |
| | | | | | | | | | | | |
| RP15-xx12S0FW | | | | | | | | | | | |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 12.12 | 12.24 | 12.36 | 12.48 | 12.60 | 12.72 | 12.84 | 12.96 | 13.08 | 13.20 | [VDC] |
| R _u = | 203.22 | 99.06 | 64.33 | 46.97 | 36.56 | 29.61 | 24.65 | 20.93 | 18.04 | 15.72 | [kΩ] |
| | | | | | | | | | | | |
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 11.88 | 11.76 | 11.64 | 11.52 | 11.40 | 11.28 | 11.16 | 11.04 | 10.92 | 10.8 | [VDC] |
| R _d = | 776.56 | 380.72 | 248.78 | 182.81 | 143.22 | 116.83 | 97.98 | 83.85 | 72.85 | 64.06 | [kΩ] |
| | | | | | | | | | | | |
| RP15-xx15S0FW | | | | | | | | | | | |
| Trim up | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 15.15 | 15.3 | 15.45 | 15.60 | 15.75 | 15.90 | 16.05 | 16.20 | 16.35 | 16.50 | [VDC] |
| R _u = | 161.56 | 78.22 | 50.45 | 36.56 | 28.22 | 22.67 | 18.70 | 15.72 | 13.41 | 11.56 | [kΩ] |
| | | | | | | | | | | | |
| Trim down | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [%] |
| Vout = | 14.85 | 14.70 | 14.55 | 14.40 | 14.25 | 14.10 | 13.95 | 13.80 | 13.65 | 13.50 | [VDC] |
| R _d = | 818.22 | 401.56 | 262.67 | 193.22 | 151.56 | 123.78 | 103.94 | 89.06 | 77.48 | 68.22 | [kΩ] |

| REGULATIONS | | |
|----------------------------------|----------------------------------|-------|
| Parameter | Condition | Value |
| Output Accuracy | | ±1.0% |
| Line Regulation | low line to high line, full load | ±0.2% |
| Load Regulation | 0% to 100% load | ±0.2% |
| Transient Response Recovery Time | 25% load step change | 250µs |

| PROTECTIONS | | |
|----------------------------------|-------------------|--|
| Parameter | Condition | Value |
| Short Circuit Protection (SCP) | | continuous, automatic recovery |
| Over Voltage Protection (OVP) | zener diode clamp | 3.3Vout 5Vout 12Vout 15Vout 3.7 - 5.4VDC 5.6 - 7.0VDC 13.8 - 17.5VDC 16.8 - 20.5VDC |
| Over Load Protection (OLP) | % of Iout rated | 150% typ., Hiccup mode |
| Isolation Voltage ⁽⁶⁾ | I/P to O/P | 2.25kVDC/1 minute |
| Isolation Resistance | Viso= 500VDC | 1GΩ min. |
| Isolation Capacitance | | 1500pF typ. |

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

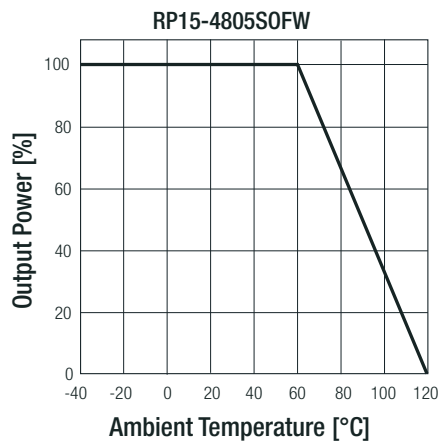
Note7: This power module is not internally fused. An input line fuse must always be used

Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

ENVIRONMENTAL

| Parameter | Condition | Value |
|----------------------------------|---------------------------------------|------------------------------|
| Lead-free reflow solder process | | IPC J-STD-020D |
| Moisture sensitivity level (MSL) | | IPC J-STD-03B level 2a |
| Operating Temperature Range | without derating | -40°C to +70°C |
| | with derating | -40°C to +120°C |
| Temperature Coefficient | | ±0.02%/K max. |
| Thermal Impedance | | 18.2K/W |
| Operating Humidity | non-condensing | 5% - 95% RH |
| Thermal Shock | | according to MIL-STD-810F |
| Vibration | | according to MIL-STD-810F |
| MTBF | MIL-HDBK-217F, G.B. ⁽⁸⁾ | 2444 x 10 ³ hours |
| | Bellcore TR-NWT-000332 ⁽⁸⁾ | 1322 x 10 ³ hours |

Derating Graph ⁽⁹⁾



Notes:

- Note8: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C
MIL-HDBK 217F Notice 2. Ta = 25°C, full load, (Ground, Benign, controlled environment)
- Note9: 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 RECOM Techsupport for detailed information

SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Condition | Standard |
|---|----------------|---|
| Information Technology Equipment, General Requirements for Safety | E196683 | UL60950-1, 1st Edition, 2007 CAN/CSA-C22.2 No. 60950-1-03, 1st Edition, 2006 |
| EAC | RU-AT.49.09571 | TP TC 004/2011 |
| RoHS 2 | | RoHS-2011/65/EU + AM-2015/863 |

| EMC Compliance | Condition | Standard / Criterion |
|---|---|-------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter (see filter suggestion below) | EN55032, Class A and B |
| Radiated, radio-frequency, electromagnetic field immunity test | 10 V/m | EN61000-4-3, Criteria A |
| Fast Transient and Burst Immunity ⁽¹⁰⁾ | ±2kV | EN61000-4-4, Criteria B |
| Surge Immunity ⁽¹⁰⁾ | ±1kV | EN61000-4-5, Criteria A |
| Immunity to conducted disturbances, induced by radio-frequency fields | 10 Vr.m.s | EN61000-4-6, Criteria A |
| Power Magnetic Field Immunity | 100A/m continuous; 1000A/m 1s | EN61000-4-8, Criteria A |

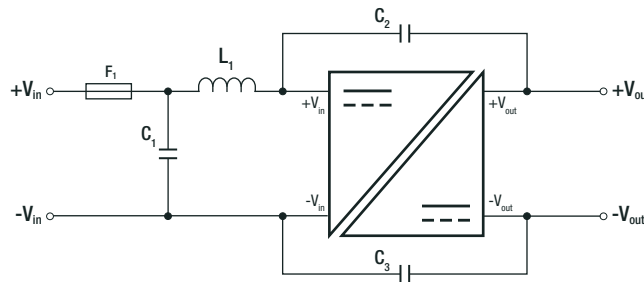
Notes:

- Note10: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5
Recom suggests Nippon chemi-con KY series 220µF/100V

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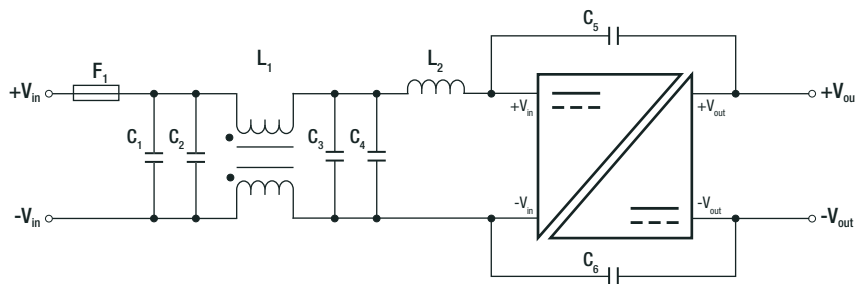
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

EMC Filtering Suggestions according to EN55032



Component List Class A

| MODEL | C1 | C2/C3 | L1 |
|---------------|-----------------------|----------------------|---|
| RP15-24xxSOFW | 6.8µF/50V, 1812 MLCC | 470pF/3kV, 1808 MLCC | 10µH 2.6A 0.04Ω 0705 SMD Inductor ref.: WE 744787330 |
| RP15-48xxSOFW | 2.2µF/100V, 1812 MLCC | 470pF/3kV, 1808 MLCC | 18µH 1.6A 0.1Ω 0705 SMD Inductor ref.: WE 744053180 |



Component List Class B

| MODEL | C1 | C2 | C3/C4 | C5/C6 | L1 | L2 |
|---------------|-------------------------|-------------------------|-------------------------|------------------------|---|--|
| RP15-24xxSOFW | N/A | 6.8µF/50V 1812 MLCC | 6.8µF/50V 1812 MLCC | 470pF/3kV 1808 MLCC | CMC: 145µH ref.: WE 7482210002 ref.: CMC-07 | 10µH 2.6A 0.04Ω 0705 SMD Inductor ref.: WE 744787330 |
| RP15-48xxSOFW | 2.2µF/100V 1812 MLCC | 2.2µF/100V 1812 MLCC | 2.2µF/100V 1812 MLCC | 470pF/3kV 1808 MLCC | CMC: 325µH ref.: WE 744290321 ref.: CMC-06 | 33µH 1.2A 0.13Ω 0504 SMD Inductor ref.: WE 744787100 |

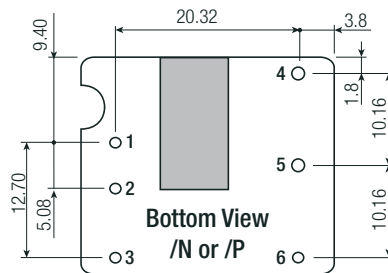
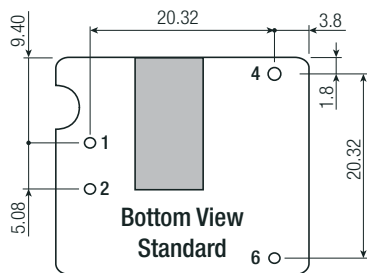
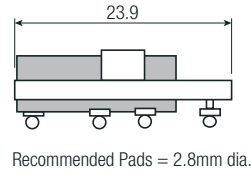
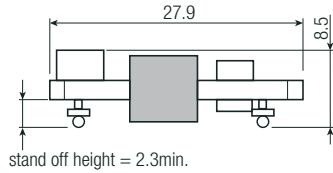
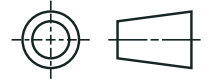
DIMENSION AND PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|--------------------|------|---------------------|
| Material | base | FR4 PCB |
| Dimensions (LxWxH) | | 27.9 x 23.9 x 8.5mm |
| Weight | | 10.5g |

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Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

Dimension Drawing (mm)



Pinning Information

| Pin # | Standard | with Suffix /P or /N |
|-------|----------|----------------------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | no Pin | CTRL |
| 4 | +Vout | +Vout |
| 5 | no Pin | Trim |
| 6 | -Vout | -Vout |

PCB Tolerance ±0.5mm
SMD Pin Pitch Tolerance ±0.25mm

PACKAGING INFORMATION

| Parameter | Type | Value |
|-----------------------------|----------------|-----------------------|
| Packaging Dimension (LxWxH) | tube | 255.0 x 29.0 x 12.0mm |
| Packaging Quantity | | 20pcs |
| Storage Temperature Range | | -55°C to +125°C |
| Storage Humidity | non-condensing | 5% - 95% RH |

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