

8 Watts

- Wide Input Range for Railway Applications
- Single and Dual Outputs
- DIP24 Package
- -40 °C to +85 °C Operation
- Full Load at 70 °C Ambient
- 3000 VDC Isolation
- MTBF >800 kHrs
- 3 Year Warranty
- EN50155 Approval for Railway Applications
- EN50121-3-2 EMC for Railway Applications



Dimensions:

RDD:

1.25 x 0.80 x 0.42" (31.8 x 20.3 x 10.7 mm)

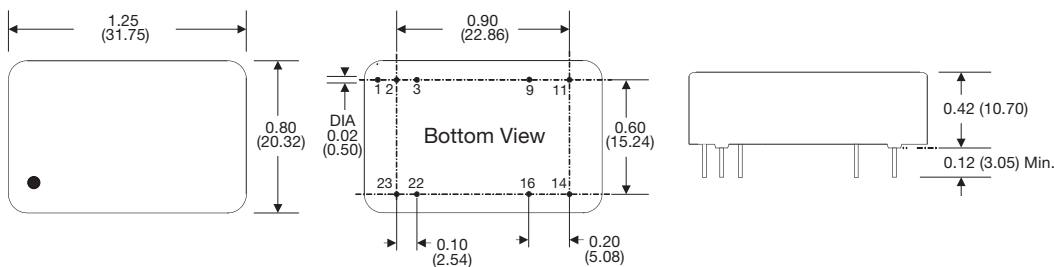
Models & Ratings

| Input Voltage | Output Voltage | Output Current | Overvoltage level | Input current ⁽¹⁾ | | Maximum capacitive load | Efficiency ⁽²⁾ | Model Number |
|---------------|----------------|----------------|-------------------|------------------------------|-----------|-------------------------|---------------------------|--------------|
| | | | | No Load | Full Load | | | |
| 13-70 V | 3V3 | 2400 mA | 3.9 V | 30 mA | 398 mA | 1330 µF | 83% | RDD0824S3V3 |
| | 5 V | 1600 mA | 6.2 V | 20 mA | 388 mA | 1330 µF | 86% | RDD0824S05 |
| | 12 V | 665 mA | 15 V | 10 mA | 392 mA | 330 µF | 85% | RDD0824S12 |
| | 15 V | 535 mA | 18 V | 10 mA | 389 mA | 220 µF | 86% | RDD0824S15 |
| | ±5 V | ±800 mA | ±6.2 V | 10 mA | 402 mA | ±900 µF | 83% | RDD0824D05 |
| | ±12 V | ±335 mA | ±15 V | 10 mA | 395 mA | ±220 µF | 85% | RDD0824D12 |
| | ±15 V | ±265 mA | ±18 V | 10 mA | 386 mA | ±100 µF | 86% | RDD0824D15 |
| 42-176 V | 3V3 | 2400 mA | 3.9 V | 10 mA | 89 mA | 1330 µF | 81% | RDD08110S3V3 |
| | 5 V | 1600 mA | 6.2 V | 10 mA | 87 mA | 1330 µF | 84% | RDD08110S05 |
| | 12 V | 665 mA | 15 V | 5 mA | 87 mA | 330 µF | 84% | RDD08110S12 |
| | 15 V | 535 mA | 18 V | 5 mA | 88 mA | 220 µF | 83% | RDD08110S15 |
| | ±5 V | ±800 mA | ±6.2 V | 5 mA | 91 mA | ±900 µF | 80% | RDD08110D05 |
| | ±12 V | ±335 mA | ±15 V | 5 mA | 90 mA | ±220 µF | 82% | RDD08110D12 |
| | ±15 V | ±265 mA | ±18 V | 5 mA | 88 mA | ±100 µF | 83% | RDD08110D15 |

Notes

1. Input currents measured at nominal input voltage.
2. Typical value at full load and nominal input

Mechanical Details



Pin Connections

| Pin | Single | Dual |
|-----|---------------|---------------|
| 1 | Remote On/Off | Remote On/Off |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | No Pin | Common |
| 11 | N.C. | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Common |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.039 lbs (18 g) approx.
3. Pin diameter: 0.02±0.002 (0.5±0.05)
4. Pin pitch tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)

Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------------|---------|---------|---------|-----------------|------------------------------------------------------|
| Input Voltage Range | 13 | | 70 | VDC | 24 V nominal |
| | 42 | | 176 | VDC | 110 V nominal |
| Input Filter | Pi type | | | | |
| Input Reflected Ripple Current | | 20 | | mA pk-pk | Through 12 μ H inductor and 33 μ F capacitor |
| Input Surge | | | 100 | VDC for 1000 ms | 24 V models |
| | | | 185 | VDC for 1000 ms | 110 V models |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------|-----------|----------|-----------------------------------------------------------------------------------------------------|
| Output Voltage | 3.3 | | 15 | VDC | See Models and Ratings table |
| Initial Set Accuracy | | | ± 1 | % | At 70% load |
| Minimum Load | 0 | | | % | Minimum load required to meet specification. Operation at no load will not cause damage. |
| Line Regulation | | | ± 0.5 | % | |
| Load Regulation | | | ± 0.5 | % | From 0% to full load |
| Cross Regulation | | | ± 5 | % | On dual output models, when one output is at 25% load and other is varied from no load to full load |
| Ripple & Noise | | | 75 | mV pk-pk | 20 MHz bandwidth. Measured using 0.1 μ F ceramic capacitor |
| Short Circuit Protection | | | | | Continuous hiccup mode, with auto recovery |
| Maximum Capacitive Load | | | | | See Models and Ratings table |
| Temperature Coefficient | | | 0.02 | %/°C | |
| Overload Protection | | 160 | | % | Of nominal output current |
| Overvoltage Protection | | | | | See Models and Ratings table |
| Remote On/Off | Output turns off if remote on/off (pin 1) is shorted to -Vin (pin 2,3) Output is on if remote on/off (pin 1) is open or >3 V | | | | |
| Start Up Time | | 30 | 40 | ms | Nominal Vin and constant resistive load |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|----------------------------|-----------------|------------|---------|------------------|------------------------------|
| Efficiency | 80 | | 86 | % | See Models and Ratings table |
| Isolation: Input to Output | 3000 | | | VDC | |
| Switching Frequency | | 330/220 | | kHz | 24 V / 110 V models |
| Isolation Resistance | 10 ⁹ | | | Ω | |
| Isolation Capacitance | | 1000 | | pF | |
| Power Density | | | 14 | Win ³ | |
| Mean Time Between Failure | 800 | | | kHrs | MIL-HDBK-217F, +25 °C GB |
| Weight | | 0.039 (18) | | lb (g) | |

Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|---------|---------|---------|-------|--------------------------------------------------|
| Operating Temperature | -40 | | +85 | °C | Derate from 100% load at +70 °C to 50% at +85 °C |
| Storage Temperature | -55 | | +125 | °C | |
| Case Temperature | | | +105 | °C | |
| Humidity | | | 95 | %RH | Non-condensing |
| Cooling | | | | | Natural convection |

Safety Approvals

| Safety Agency | Safety Standard | |
|---------------|-----------------|------------------------|
| EN | EN50155 | Railway Applications |
| | LVD | Evaluated to EN62368-1 |

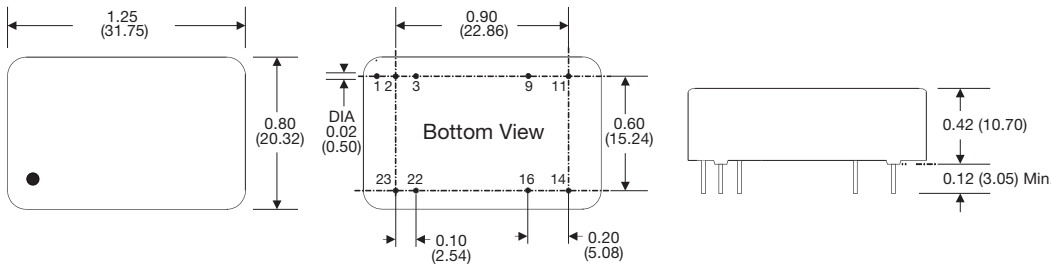
EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & Conditions |
|------------|-------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Conducted | EN50121-3-2 | 0.15-0.50 MHz, 99 dB μ V 0.50-30.0 MHz, 93 dB μ V | RDD0824 models also meet EN55022 Class A. See application note to meet EN55022 Class A for RDD08110 models. |
| Radiated | | 30.0-230.0 MHz, 40 dB μ V 230.0-1000.0 MHz, 47 dB μ V | |

EMC: Immunity

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|--------------------|-------------|------------------------------------|----------|---------------------------------------------------------|
| ESD Immunity | EN50121-3-2 | Air \pm 8 kV, Contact \pm 6 kV | A | |
| Radiated Immunity | EN50121-3-2 | 20 Vrms/m | A | |
| EFT/Burst | EN50121-3-2 | 2 kV | A | External input capacitor required, see application note |
| Surges | EN50121-3-2 | 2 kV | A | External input capacitor required, see application note |
| Conducted Immunity | EN50121-3-2 | 10 V | A | |
| Magnetic Fields | EN61000-4-8 | 10 A/m | A | |

Mechanical Details



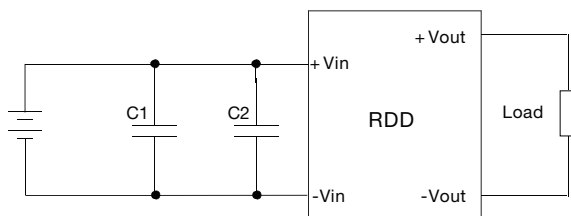
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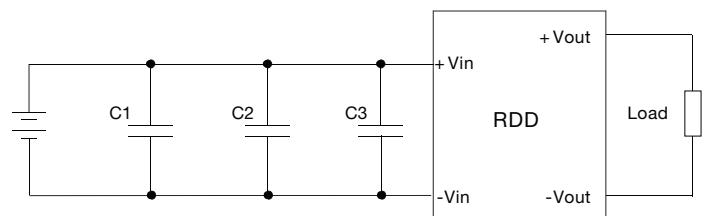
Application Note

External Filter for Surge and EFT



For RDD0824 models, C1 = 330 μ F, 100 V and C2 not fitted
 For RDD08110 models, C1 and C2 = 100 μ F, 250 V

EMI Filter for RDD08110 models



C1, C2, & C3 are 1 μ F, 250 V multilayer ceramic Chip Capacitor, placed as close as possible to the input pins