20 Watts
RDC Series

- 72 & 110 VDC Input for Railway Applications
- Single and Dual Outputs
- 1500 VAC Basic Isolation
- High Power Density
- High Efficiency – Up to 88%
- Remote On/Off
- 3 Year Warranty

Specification

Input

Input Voltage Range	• 72 V (36-140 VDC), 110 V (55-176 VDC)
Input Current	• See table
Input Reflected Ripple	• 20 mA pk-pk through 12 µH inductor
Input Filter	• Pi network
Undervoltage Lockout	• 72 V models: ON 33.5 V, OFF 30.5 V typ. 110 V models: ON 52.5 V, OFF 48.5 V typ.
Input Surge	• 72 V models 150 VDC for 100 ms 110 V models 185 VDC for 100 ms

Output

Output Voltage	• See table
Output Voltage Trim	• ±10% on single outputs models only
Minimum Load	• No minimum load required
Line Regulation	• ±0.2% max
Load Regulation	• Single output models: ±0.5% max, Dual output models: ±1% max balanced outputs
Cross Regulation	• ±5% (see note 2)
Setpoint Accuracy	• ±1%
Start Up Time	• 30 ms typical
Ripple & Noise	• 100 mV or 1% pk-pk for single output models, 150 mV or 1% pk-pk for dual output model, whichever is greater, 20 MHz bandwidth (see note 3)
Transient Response	• 4% max deviation, recovery to within 1% in <500 µs for a 25% load change
Temp. Coefficient	• 0.02%/°C
Overvoltage Protection	• 3.3 V models: 3.9 V typical, 5 V models: 6.2 V typical, 12 V models: 15 V typical 15 V models: 18 V typical, ±5 V models: ±6.2 V typical, ±12 V models: ±15 V typical ±15 V models: ±18 V typical
Overload Protection	• >150% of full load
Short Circuit Protection	• Trip & restart (hiccup mode), auto recovery
Overtemperature Protection	• 115 °C typical
Remote On/Off	• On = Logic High (>3.0) or Open Off = Logic Low (<1.2 V) or short pin 2 to 3
Maximum Capacitive Load	• See table

General

Efficiency	• See table
Isolation Voltage	• 1500 VAC Input to Output 1600 VDC Input to Case 1600 VDC Output to Case
Isolation Capacitance	• 2000 pF
Switching Frequency	• 270 kHz typical
Power Density	• 25 W/in^3
MTBF	• 400 kHrs min to MIL-HDBK-217F at 25 °C, GB

Environmental

Operating Temperature	• -40 °C to +85 °C (see derating curve)
Case Temperature	• +105 °C max
Cooling	• Convection-cooled
Operating Humidity	• 5-95% RH, non-condensing
Storage Temperature	• -40 °C to +125 °C

EMC

General	• Complies with EN50121-3-2, Railway Applications - Electromagnetic Compatibility for Rolling Stock Apparatus
Emissions	• EN55011, 79 dBµV (0.15-0.5 MHz) 73 dBµV (0.5-30 MHz)
ESD Immunity	• EN61000-4-2, level 3, Perf Criteria A
Radiated Immunity	• EN61000-4-3 20 V/m Perf Criteria A*
EFT/Burst	• EN61000-4-4 level 3, Perf Criteria A*
Surge	• EN61000-4-5 level 2, Perf Criteria A
Conducted Immunity	• EN61000-4-6 10 V/rms, Perf Criteria A
Magnetic Field	• EN61000-4-8 10 A/m, Perf Criteria A

*External input capacitor required 220 µF/250 V

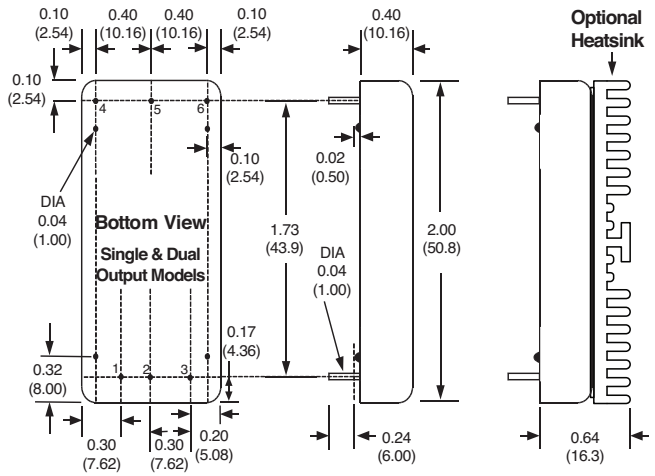
Models and Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load	Efficiency	Model Number[4]
			No Load	Full Load			
36-140 VDC	3.3 V	6.00 A	20 mA	312 mA	10000 µF	88.0%	RDC2072S3V3
	5.0 V	4.00 A	25 mA	313 mA	6800 µF	88.5%	RDC2072S05
	12.0 V	1.65 A	15 mA	318 mA	1000 µF	86.5%	RDC2072S12
	15.0 V	1.33 A	20 mA	318 mA	700 µF	87.0%	RDC2072S15
	±5.0 V	±2.00 A	35 mA	319 mA	±1000 µF	87.0%	RDC2072D05
	±12.0 V	±0.83 A	20 mA	323 mA	±470 µF	85.5%	RDC2072D12
	±15.0 V	±0.67 A	20 mA	324 mA	±330 µF	86.0%	RDC2072D15
55-176 VDC	3.3 V	6.00 A	15 mA	208 mA	10000 µF	86.5%	RDC20110S3V3
	5.0 V	4.00 A	20 mA	209 mA	6800 µF	87.0%	RDC20110S05
	12.0 V	1.65 A	15 mA	212 mA	1000 µF	85.0%	RDC20110S12
	15.0 V	1.33 A	15 mA	211 mA	700 µF	86.0%	RDC20110S15
	±5.0 V	±2.00 A	30 mA	211 mA	±1000 µF	86.0%	RDC20110D05
	±12.0 V	±0.83 A	15 mA	215 mA	±470 µF	84.0%	RDC20110D12
	±15.0 V	±0.67 A	15 mA	215 mA	±330 µF	85.0%	RDC20110D15

Notes

1. *Input current specified at nominal 72 V or 110 V input.*
2. *Cross regulation for duals is ±5% when one output is at 100% and the other is varied between 25% and 100%.*
3. *Measured with 1 µF ceramic capacitor in parallel with 10 µF electrolytic capacitor across output rails.*
4. *Add suffix '-HK' for optional heatsink.*

Mechanical Details



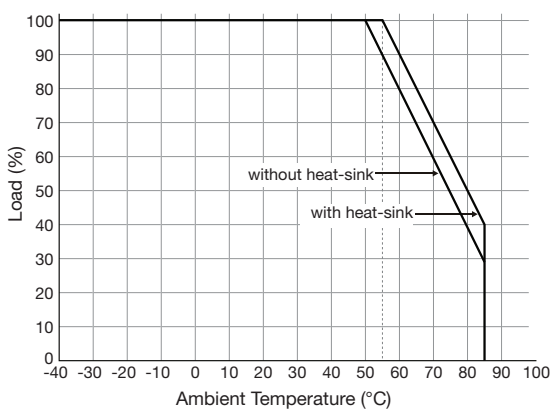
PIN CONNECTIONS		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote On/Off	Remote On/Off
4	+Vout	+Vout
5	-Vout	Com
6	Trim	-Vout

Notes

1. All dimensions are in inches (mm).
2. Weight: 0.07 lbs (30 g) approx
3. Pin diameter: 0.04 ±0.002 (1.0 ±0.05)
4. Pin pitch tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)

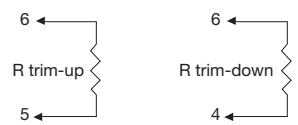
Application Notes

Derating Curve



External Output Trim

On single output versions only.



Output can be externally trimmed using this method.

Contact sales for details.

Typical Resistor				
	S3V3	S05	S12	S15
Trim Down 10%	15.3 kΩ	5.31 kΩ	5.3 kΩ	5.8 kΩ
Trim Up 10%	10.3 kΩ	10.6 kΩ	22.1 kΩ	20.0 kΩ