30 Watts

RDC Series

- 72 & 110 VDC Input for Railway Applications
- Single, Dual and Triple Outputs
- 1500 VAC Basic Isolation
- High Power Density
- High Efficiency – Up to 91%
- 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 for single and dual output models, 10% required on all outputs for triple output models
Line Regulation	• ±0.2% max for single and dual output models, ±1.0% main, ±5% auxiliary for triple output models
Load Regulation	• Single output models: ±0.5% max. Dual output models: ±1% max balanced outputs. Triple output models: ±1% max main, ±5% auxiliaries
Cross Regulation	• ±5% for dual and triple outputs (see note 2)
Setpoint Accuracy	• ±1% (±5% for triple auxiliaries)
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, 50/75 mV pk-pk main/auxiliary outputs of triple output models, 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	• 37.5 W/in^3
MTBF	• 435 kHrs for single/dual output, 320 kHrs for triple output, min to MIL-HDBK-217F at 25 °C, GB

Environmental

Operating Temperature	• -40 °C to +75 °C (80 °C with optional heatsink) 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

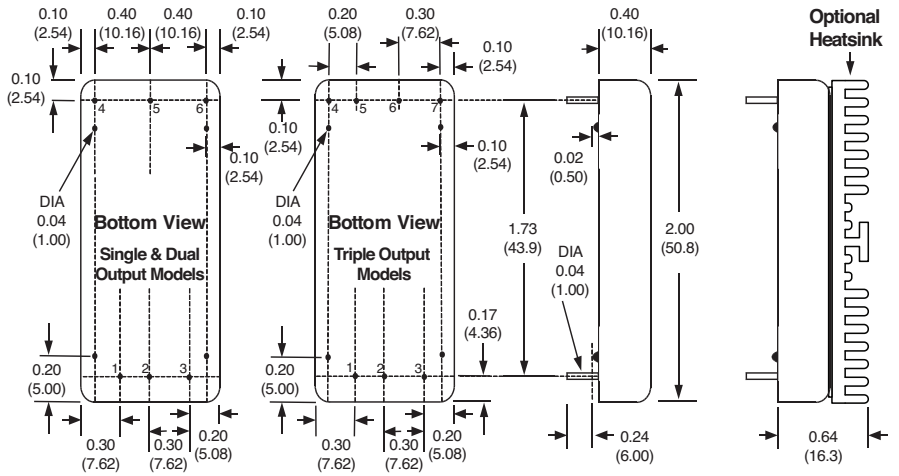
Models and Ratings

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	7.50 A	25 mA	386 mA	20000 µF	89%	RDC3072S3V3
	5.0 V	6.00 A	25 mA	458 mA	14000 µF	91%	RDC3072S05
	12.0 V	2.50 A	20 mA	470 mA	2000 µF	88%	RDC3072S12
	15.0 V	2.00 A	20 mA	466 mA	2000 µF	89%	RDC3072S15
	±5.0 V	±3.00 A	40 mA	468 mA	±3000 µF	89%	RDC3072D05
	±12.0 V	±1.25 A	25 mA	471 mA	±1300 µF	88%	RDC3072D12
	±15.0 V	±1.00 A	20 mA	471 mA	±1300 µF	88%	RDC3072D15
	+3.3 V, ±12.0 V	5.00 A, ±0.42 A	25 mA	414 mA	15000, ±220 µF	89%	RDC3072T0312
	+3.3 V, ±15.0 V	5.00 A, ±0.33 A	25 mA	414 mA	15000, ±220 µF	88%	RDC3072T0315
	+5.0 V, ±12.0 V	4.00 A, ±0.42 A	25 mA	464 mA	8000, ±220 µF	90%	RDC3072T0512
	+5.0 V, ±15.0 V	4.00 A, ±0.33 A	25 mA	464 mA	8000, ±220 µF	90%	RDC3072T0515
55-176 VDC	3.3 V	7.50 A	20 mA	254 mA	20000 µF	88%	RDC30110S3V3
	5.0 V	6.00 A	25 mA	303 mA	14000 µF	90%	RDC30110S05
	12.0 V	2.50 A	20 mA	310 mA	2000 µF	88%	RDC30110S12
	15.0 V	2.00 A	20 mA	308 mA	2000 µF	88%	RDC30110S15
	±5.0 V	±3.00 A	35 mA	308 mA	±3000 µF	88%	RDC30110D05
	±12.0 V	±1.25 A	25 mA	310 mA	±1300 µF	88%	RDC30110D12
	±15.0 V	±1.00 A	20 mA	311 mA	±1300 µF	87%	RDC30110D15
	+3.3 V, ±12.0 V	5.00 A, ±0.42 A	20 mA	274 mA	15000, ±220 µF	88%	RDC30110T0312
	+3.3 V, ±15.0 V	5.00 A, ±0.33 A	20 mA	274 mA	15000, ±220 µF	87%	RDC30110T0315
	+5.0 V, ±12.0 V	4.00 A, ±0.42 A	25 mA	307 mA	8000, ±220 µF	89%	RDC30110T0512
	+5.0 V, ±15.0 V	4.00 A, ±0.33 A	25 mA	307 mA	8000, ±220 µF	88%	RDC30110T0515

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%. Cross regulation for triples is ±5% when main output and one auxiliary is at 25% 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



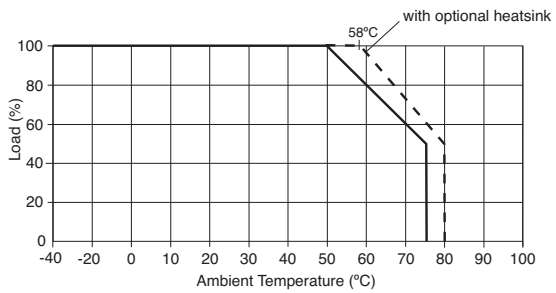
PIN CONNECTIONS			
Pin	Single	Dual	Triple
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
3	Remote On/Off	Remote On/Off	Remote On/Off
4	+Vout	+Vout	+Vout 2
5	-Vout	Com	-Vout 3
6	Trim	-Vout	Com
7			+Vout 1

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)

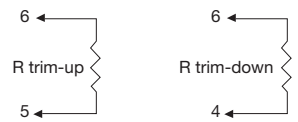
Application Notes

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	15.3 kΩ	5.3 kΩ	5.8 kΩ
Trim Up 10%	10.3 kΩ	15.3 kΩ	22.1 kΩ	20.0 kΩ