

Wall Industries, Inc.

DCREDUW20 SERIES

**4:1 Ultra Wide Input Voltage Range
Single and Dual Outputs
Standard 2.0" x 1.0" x 0.4" Package
20 Watt DC/DC Power Converters**



FEATURES

- Railway Applications
- Single and Dual Outputs
- Industry Standard 2.00" x 1.00" x 0.40" Package
- 20 Watts Maximum Output Power
- 4:1 Ultra Wide Input Voltage Range
- High Efficiency up to 89%
- 1600VDC I/O Isolation
- Output Current up to 4.5A
- Positive Logic Remote On/Off
- Fixed Switching Frequency
- Over Voltage, Over Current, and Short Circuit Protection
- Ultra Low Quiescent Current
- Six-Sided Continuous Shield
- CE Mark Meets 2006/95/EC, 93/68/EEC, and 2004/108/EC
- Compliant to RoHS EU Directive 2002/95/EC
- UL60950-1, EN60950-1, IEC60950-1, and EN50155 Safety Approvals (Pending)

APPLICATIONS

- Railway Systems
- Wireless Networks
- Telecom / Datacom
- Measurement Equipment
- Industry Control Systems
- Semiconductor Equipment

OPTIONS

- Without Trim Pin
- Without OnOff Pin
- Negative Logic Remote On/Off

DESCRIPTION

The DCREDUW20 series of DC/DC power converters provides up to 20 Watts of output power in an industry standard 2.00" x 1.00" x 0.40" package and footprint. This series has single and dual output models with 4:1 ultra wide input voltage ranges of 9-36VDC, 18-75VDC, and 43-160VDC. Some features include high efficiency, 1600VDC I/O isolation, six-sided shielding, and positive logic remote ON/OFF. These converters are also protected against over voltage, over current, and short circuit conditions. All models are RoHS compliant and have UL60950-1, EN60950-1, and IEC60950-1, and EN50155 safety approvals (pending). This series is best suited for use in wireless networks, telecom/datacom, measurement equipment, industry control systems, semiconductor equipment, and railway systems.

SPECIFICATIONS: DCREDUW20 Series						
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.						
SPECIFICATION	TEST CONDITIONS		Min	Nom	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	24VDC nominal input models		9	24	36	VDC
	48VDC nominal input models		18	48	75	
	110VDC nominal input models		43	110	160	
Input Surge Voltage (1 sec max)	24VDC nominal input models				50	VDC
	48VDC nominal input models				100	
	110VDC nominal input models				170	
Start-Up Voltage	24VDC nominal input models				9	VDC
	48VDC nominal input models				18	
	110VDC nominal input models				43	
Shutdown Voltage	24VDC nominal input models			8		VDC
	48VDC nominal input models			16		
	110VDC nominal input models			40		
Input Filter	24VDC & 48VDC nominal input models		Common choke			
Input Reflected Ripple Current	110VDC nominal input models		Pi filter			
	Nominal Vin and full load			30		mAp-p
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Line Regulation	Low line to high line at full load	Single Output	-0.2		+0.2	%
		Dual Output	-0.5		+0.5	
Load Regulation	No load to full load	Single Output	-0.2		+0.2	%
		Dual Output	-1.0		+1.0	
	10% Load to 90% Load	Single Output	-0.1		+0.1	%
		Dual Output	-0.8		+0.8	
Cross Regulation (Dual Outputs)	Asymmetrical load 25%/100% full load		-5		+5	%
Voltage Accuracy	Full load an nominal Vin		-1.0		+1.0	%
Voltage Adjustability (See Note 5)			-10		+10	%
Output Power					20	W
Output Current			See Table			
Ripple & Noise (20MHz)	Measured with a 1µF/50V MLCC		See Table			
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time	Nominal Vin and constant resistive load	Power Up			30	ms
		Remote On/Off			30	
Minimum Load			0			%
Temperature Coefficient			-0.02		+0.02	%/°C
PROTECTION						
Over Load Protection	% of full load at nominal input			150		%
Short Circuit Protection			Hiccup, automatic recovery			
Over Voltage Protection			See Table			
GENERAL SPECIFICATIONS						
Efficiency	Nominal Vin and full load		See Table			
Switching Frequency				330		KHz
Isolation Voltage	Input to Output		1600			VDC
	Input to Case		1000			
	Output to Case		1000			
Isolation Resistance			10			GΩ
Isolation Capacitance					3000	pF
REMOTE ON/OFF (See Note 6)						
Positive Logic (standard)	DC/DC ON		Open or 3V < Vr < 15V			
	DC/DC OFF		Short or 0V < Vr < 1.2V			
Negative Logic (optional)	DC/DC ON		Short or 0V < Vr < 1.2V			
	DC/DC OFF		Open or 3V < Vr < 15V			
Input Current of Remote Control Pin	Nominal Vin		-0.5		+1.0	mA
Remote Off State Input Current	Nominal Vin			2.5		mA
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature (See Note 7)	With derating		-40		+101	°C
Maximum Case Temperature					+105	°C
Storage Temperature			-55		+125	°C
Relative Humidity			5		95	% RH
Thermal Shock			EN61373, MIL-STD-810F			
Vibration			EN61373, MIL-STD-810F			
Thermal Impedance (See Note 8)	Natural Convection			12		°C/Watt
	Natural Convection with Heatsink			10		
	BELLCORE TR-NWT-000332				1,630,000 hours	
MTBF (See Note 1)	MIL-HDBK-217F				295,000 hours	
PHYSICAL SPECIFICATIONS						
Weight			1.06oz (30g)			
Case Material			Nickel-coated copper			
Base Material			FR4 PCB			
Potting Material			Silicon (UL94-V0)			
Dimensions (L x W x H)			2.00 x 1.00 x 0.40 inches (50.8 x 25.4 x 10.2 mm)			
Shielding			Six-sided			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals (pending)			UL60950-1 ⁽¹⁾ , EN60950-1, IEC60950-1, EN50155			
EMI (See Note 9)	EN55022, EN55011	24VDC & 48VDC nominal input models 110VDC nominal input models				Class B Class A
ESD	EN61000-4-2	Air ±8KV Contact ±6KV				Perf. Criteria A
Radiated Immunity	EN61000-4-3	20 V/m				Perf. Criteria A
Fast Transient (See Note 10)	EN61000-4-4	+2KV				Perf. Criteria A
Surge (See Note 10)	EN61000-4-5	+2KV				Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vrms				Perf. Criteria A

MODEL SELECTION TABLES

SINGLE OUTPUT MODELS										
Model Number	Input Voltage Range	Output Voltage	Output Current		Input ⁽²⁾ Current	Over Voltage Protection	Ripple & Noise ⁽³⁾	Output Power	Efficiency ⁽³⁾	Maximum ⁽⁴⁾ Capacitive Load
			Min. Load	Full Load						
DCRED24S33UW20	24 VDC (9 – 36 VDC)	3.3 VDC	0mA	4500mA	6mA	3.7 - 5.4 VDC	75mVp-p	14.8W	85%	7000µF
DCRED24S5UW20		5 VDC	0mA	4000mA	6mA	5.6 - 7.0 VDC	75mVp-p	20W	88%	5000µF
DCRED24S12UW20		12 VDC	0mA	1670mA	6mA	13.5 - 19.6 VDC	100mVp-p	20W	89%	850µF
DCRED24S15UW20		15 VDC	0mA	1330mA	6mA	16.8 - 20.5 VDC	100mVp-p	20W	88%	700µF
DCRED48S33UW20	48 VDC (18 – 75 VDC)	3.3 VDC	0mA	4500mA	4mA	3.7 - 5.4 VDC	75mVp-p	14.8W	85%	7000µF
DCRED48S5UW20		5 VDC	0mA	4000mA	4mA	5.6 - 7.0 VDC	75mVp-p	20W	88%	5000µF
DCRED48S12UW20		12 VDC	0mA	1670mA	4mA	13.5 - 19.6 VDC	100mVp-p	20W	89%	850µF
DCRED48S15UW20		15 VDC	0mA	1330mA	4mA	16.8 - 20.5 VDC	100mVp-p	20W	89%	700µF
DCRED110S33UW20	110 VDC (43 – 160 VDC)	3.3 VDC	0mA	4500mA	3mA	3.7 - 5.4 VDC	75mVp-p	14.8W	85%	7000µF
DCRED110S5UW20		5 VDC	0mA	4000mA	3mA	5.6 - 7.0 VDC	75mVp-p	20W	87%	5000µF
DCRED110S12UW20		12 VDC	0mA	1670mA	3mA	13.5 - 19.6 VDC	100mVp-p	20W	88%	850µF
DCRED110S15UW20		15 VDC	0mA	1330mA	3mA	16.8 - 20.5 VDC	100mVp-p	20W	89%	700µF

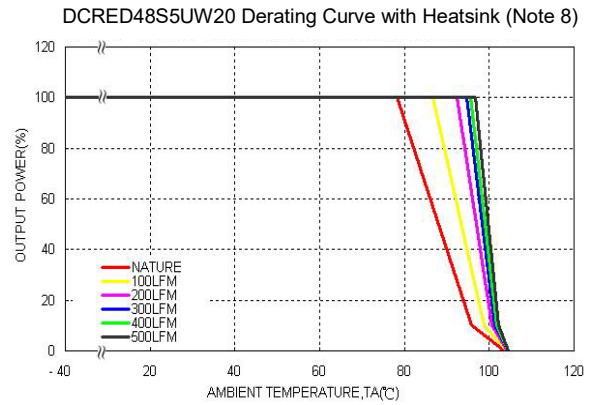
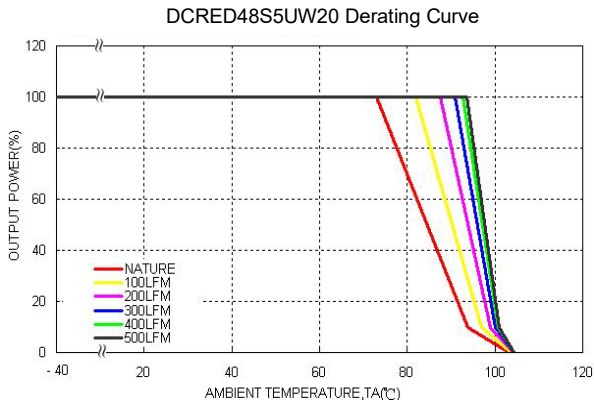
DUAL OUTPUT MODELS										
Model Number	Input Voltage Range	Output Voltage	Output Current		No load ⁽²⁾ Input Current	Ripple & Noise ⁽³⁾	Output Power	Efficiency ⁽³⁾	Maximum ⁽⁴⁾ Capacitive Load	
			Min. Load	Full Load						
DCRED24D12UW20	24 VDC (9 – 36 VDC)	±12 VDC	0mA	±833mA	6mA	100mVp-p	20W	88%	±500µF	
DCRED24D15UW20		±15 VDC	0mA	±667mA	6mA	100mVp-p	20W	89%	±350µF	
DCRED48D12UW20	48 VDC (18 – 75 VDC)	±12 VDC	0mA	±833mA	4mA	100mVp-p	20W	88%	±500µF	
DCRED48D15UW20		±15 VDC	0mA	±667mA	4mA	100mVp-p	20W	89%	±350µF	
DCRED110D12UW20	110 VDC (43 – 160 VDC)	±12 VDC	0mA	±833mA	3mA	100mVp-p	20W	88%	±500µF	
DCRED110D15UW20		±15 VDC	0mA	±667mA	3mA	100mVp-p	20W	89%	±350µF	

NOTES

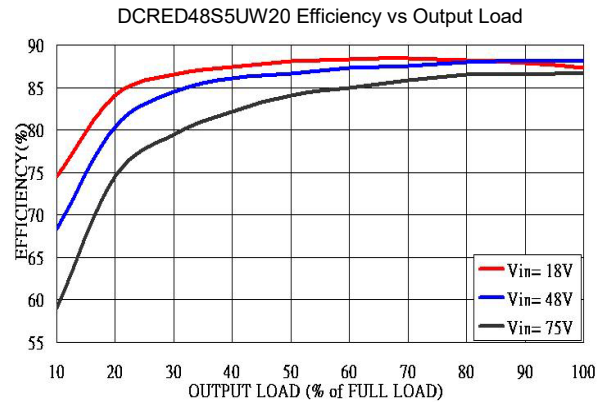
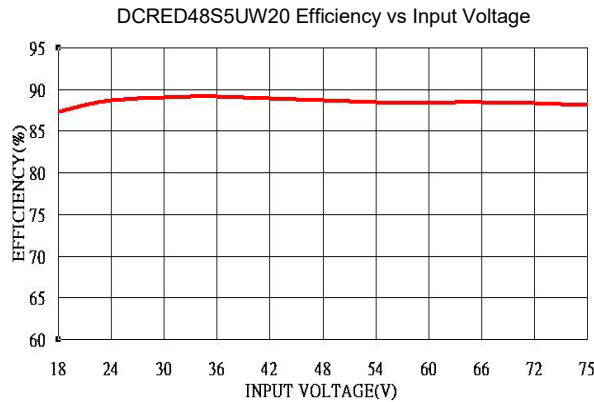
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load (Ground, Benign, controlled environment).
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either the +Vout pin or the -Vout pin.
- The ON/OFF control pin voltage is reference to -Vin. Positive Logic comes standard and to order negative logic remote on/off add the suffix "R" to the model number.
- Operating Temperature:
These converters can meet the railway T2 and TX temperature requirements.
T2: -40°C to +70°C for all models, TX: -40°C to +85 with power derating to 55% output power. (With heatsink the power derates to 70% output power).
Test conditions with vertical direction by natural convection (20LFM).
- Heatsink is optional and P/N: 7G-0020C-F. See "Product Standard Table" on page 5 for ordering information.
- EN55022 and EN55011
1) 24Vin and 48Vin Models: To meet Class B the modules do not need an external filter.
2) 110Vin Models: To meet Class A the modules do not need an external filter.
- An external input filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
The filter capacitor suggested for 24Vin and 48Vin models is Nippon chemi-con KY series, 220µF /100V, ESR 48mΩ.
The filter capacitor suggested for 110Vin models is Rubycon BXF series, 100µF /250V.
- There are several different options available for this series. Please see the "Product Standard Table" on page 4 for all options and ordering information.
- This product is Listed to applicable standards and requirements by UL.

CAUTION: This power converter is not internally fused. An input line fuse must always be used.
Due to advances in technology, specifications subject to change without notice.

DERATING CURVES

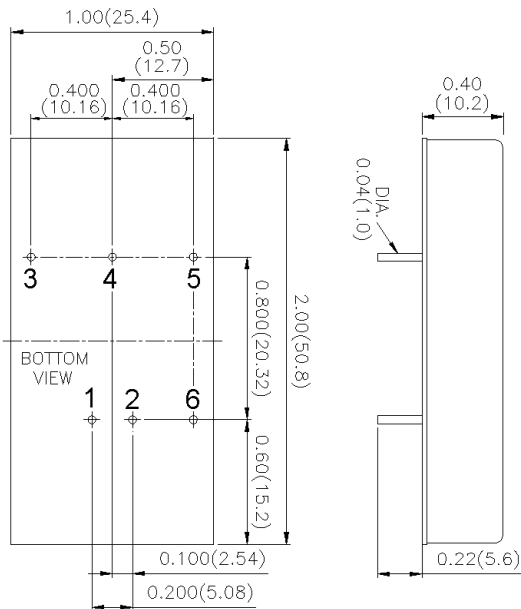


CHARACTERISTICS

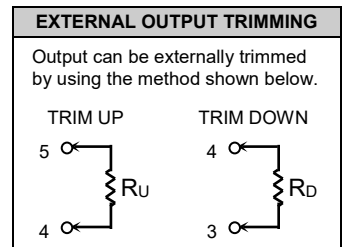


MECHANICAL DRAWING

Unit: inches (mm)



PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	+OUTPUT	+OUTPUT
4	TRIM	COMMON
5	-OUTPUT	-OUTPUT
6	CTRL	CTRL



1. Tolerance: x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
2. Pin Pitch Tolerance: ±0.01 (0.25)
3. Pin Dimension Tolerance: ±0.01 (0.25)

PRODUCT STANDARD TABLE	
Option	Suffix
Positive Remote ON/OFF (standard)	No Suffix
Negative Remote ON/OFF	R
Without ON/OFF Pin	D
Without ON/OFF & Trim Pin	G
Positive Remote ON/OFF without Trim Pin	F
Negative Remote ON/OFF without Trim Pin	RF
Heatsink	HS

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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