Size:
2.00 x 1.00 x 0.40 inches
(50.8 x 25.4 x 10.2 mm)

Applications:
- Wireless Networks
- Telecom/Datacom
- Industry Control Systems
- Distributed Power Architectures
- Semiconductor Equipment

FEATURES

- Input Under Voltage Protection
- High Efficiency up to 92%
- Remote ON/OFF Control
- 2:1 Wide Input Voltage Ranges
- Six-Sided Continuous Shielding
- Low Stand-by Power Consumption
- No Minimum Load Required
- Single and Dual Outputs
- 40 Watts Maximum Output Power
- 1600VDC I/O Isolation
- Short Circuit, Over Voltage, Over Load, & Over Temp. Protection
- Wide Operating Temperature Range: -40°C to +85°C
- CE Mark Meets 2006/95/EC, 2011/95/EC, & 2004/108/EC
- Compliant to RoHS EU Directive 2011/65/EU
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals
- Optional Heatsink Available (Suffix "HS")

DESCRIPTION

The CR series of DC/DC power converters provides 40 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 2:1 wide input voltage ranges of 9-18VDC, 18-36VDC, and 36-75VDC. Some features include high efficiency up to 92%, 1600VDC I/O isolation, six-sided shielding, and remote ON/OFF control. These converters are also protected against short circuit, over voltage, over load, and over temperature conditions. All models are RoHS compliant and have UL60950-1, EN60950-1, and IEC60950-1 safety approvals. This series is best suited for use in wireless networks, telecom/datacom, industry control systems, semiconductor equipment, and distributed power architectures.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage Range	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
CR12S33-33	12 VDC (9 - 18 VDC)	3.3 VDC	0mA	10A	75mVp-p	20mA	33W	90%	26600µF
CR12S05-40		5 VDC	0mA	8A	75mVp-p	20mA	40W	91%	20000µF
CR12S12-40		12 VDC	0mA	3.333A	100mVp-p	20mA	40W	91%	3900µF
CR12S15-40		15 VDC	0mA	2.666A	100mVp-p	20mA	40W	91%	2600µF
CR12S24-40		24 VDC	0mA	1.666A	150mVp-p	20mA	40W	91%	1300µF
CR24S33-33	24 VDC (18 - 36 VDC)	3.3 VDC	0mA	10A	75mVp-p	15mA	33W	91%	26600µF
CR24S05-40		5 VDC	0mA	8A	75mVp-p	15mA	40W	92%	20000µF
CR24S12-40		12 VDC	0mA	3.333A	100mVp-p	15mA	40W	92%	3900µF
CR24S15-40		15 VDC	0mA	2.666A	100mVp-p	15mA	40W	92%	2600µF
CR24S24-40		24 VDC	0mA	1.666A	150mVp-p	15mA	40W	91%	1300µF
CR48S33-33	48 VDC (36 - 75 VDC)	3.3 VDC	0mA	10A	75mVp-p	10mA	33W	91%	26600µF
CR48S05-40		5 VDC	0mA	8A	75mVp-p	10mA	40W	92%	20000µF
CR48S12-40		12 VDC	0mA	3.333A	100mVp-p	10mA	40W	92%	3900µF
CR48S15-40		15 VDC	0mA	2.666A	100mVp-p	10mA	40W	92%	2600µF
CR48S24-40		24 VDC	0mA	1.666A	150mVp-p	10mA	40W	92%	1300µF

DUAL OUTPUT MODELS

Model Number	Input Voltage Range	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
CR12D12-40	12 VDC (9 - 18 VDC)	±12 VDC	0mA	±1.666A	100mVp-p	20mA	40W	90%	±2600µF
CR12D15-40		±15 VDC	0mA	±1.333A	100mVp-p	20mA	40W	91%	±1600µF
CR12D24-40		±24 VDC	0mA	±0.833A	150mVp-p	20mA	40W	91%	±650µF
CR24D12-40	24 VDC (18 - 36 VDC)	±12 VDC	0mA	±1.666A	100mVp-p	15mA	40W	90%	±2600µF
CR24D15-40		±15 VDC	0mA	±1.333A	100mVp-p	15mA	40W	91%	±1600µF
CR24D24-40		±24 VDC	0mA	±0.833A	150mVp-p	15mA	40W	91%	±650µF
CR48D12-40	48 VDC (36 - 75 VDC)	±12 VDC	0mA	±1.666A	100mVp-p	10mA	40W	91%	±2600µF
CR48D15-40		±15 VDC	0mA	±1.333A	100mVp-p	10mA	40W	91%	±1600µF
CR48D24-40		±24 VDC	0mA	±0.833A	150mVp-p	10mA	40W	90%	±650µF

NOTES

1. The CR series can only meet EMI Class A or Class B with external components added. Please contact factory for more information.
2. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. For 12VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V) and a TVS (SMDJ58A, 58V, 3000 Watt peak pulse power) diode in parallel. For 24VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V) and a TVS (SMDJ64A, 64V, 3000 Watt peak pulse power) diode in parallel. For 48VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V) and a TVS (SMDJ120A, 120V, 3000 Watt peak pulse power) diode connected in parallel.
3. Both positive logic and negative logic remote ON/OFF control is available. Positive logic remote ON/OFF comes standard; for negative logic remote ON/OFF add the suffix "R" to the model number (Ex: CR48S05-40R).
4. Optional heatsink is available. Please call factory for ordering details.

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

TECHNICAL SPECIFICATIONS: CR 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	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	12VDC nominal input models		9	12	18	VDC
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Start-Up Voltage	12VDC nominal input models				9	VDC
	24VDC nominal input models				18	
	48VDC nominal input models				36	
Shutdown Voltage	12VDC nominal input models			8		VDC
	24VDC nominal input models			16		
	48VDC nominal input models			32		
Input Surge Voltage (1sec, max.)	12VDC nominal input models				25	VDC
	24VDC nominal input models				50	
	48VDC nominal input models				100	
Input Current	No Load		See Table			
Input Filter			Pi type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy			-1.0		+1.0	%
Line Regulation	Low line to high line at full load		-0.2		+0.2	%
Load Regulation	No load to full load	Single Output Models	-0.5		+0.5	%
		Dual Output Models	-1.0		+1.0	
Cross Regulation (Dual Output Models)	Asymmetrical load 25% / 100% FL		-5.0		+5.0	%
Voltage Adjustability	Single Output Models	3.3V, 5V, & 12V Output Models	-10		+10	%
		15V & 24V Outputs Models	-10		+20	
Output Power			See Table			
Output Current			See Table			
Minimum Load			0			%
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise	Measured by 20MHz bandwidth and with a 0.1µF/50V X7R MLCC capacitor	3.3V & 5V Output Models		75	100	mVp-p
		12V & 15V Output Models		100	125	
		24V Output Models		150	200	
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time	Constant resistive load	Power Up		60		ms
		Remote On/Off		60		
Temperature Coefficient			-0.02		+0.02	%/°C
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Over Load Protection	% of rated Iout; hiccup mode			150		%
Over Voltage Protection	Zener diode clamp	3.3V Output Models		3.9		VDC
		5V Output Models		6.2		
		12V Output Models		15		
		15V Output Models		20		
		24 V Output Models		30		
Over Temperature Protection				+115		°C
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency			225	250	275	kHz
Isolation Voltage	1 minute	Input to Output	1600			VDC
		Input to Case	1600			
		Output to Case	1600			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					1500	pF

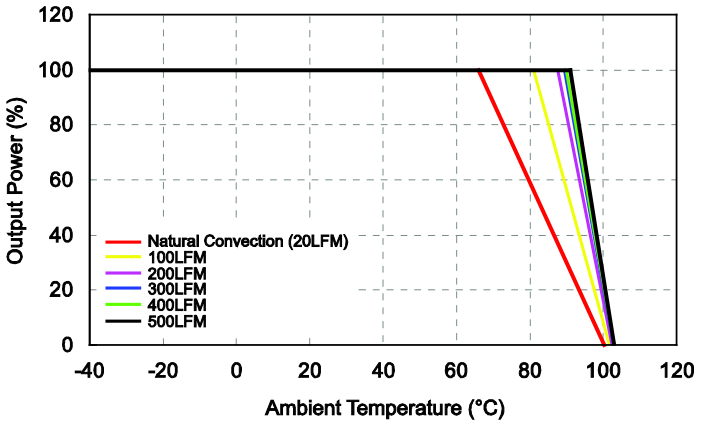
TECHNICAL SPECIFICATIONS: CR SERIES

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.

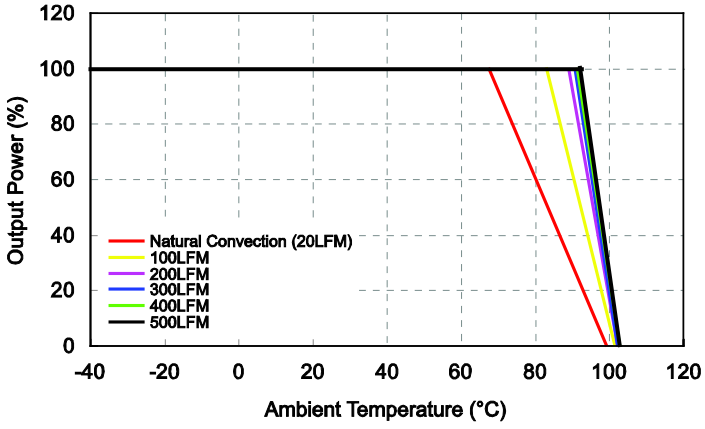
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
REMOTE ON/OFF (See Note 3)						
Positive Logic (standard)	Referenced to –Input pin	DC/DC ON	Open or 3V ~ 12 VDC			
		DC/DC OFF	Short or 0 ~ 1.2 VDC			
Negative Logic (optional)	Referenced to –Input pin	DC/DC ON	Short or 0 ~ 1.2 VDC			
		DC/DC OFF	Open or 3V ~ 12 VDC			
Input Current of Remote Control Pin	Nominal Vin		-0.5		+0.5	mA
Remote OFF State Input Current	Nominal Vin			3		mA
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	See derating curves		-40		+85	°C
Maximum Case Temperature					+105	°C
Storage Temperature			-55		+125	°C
Thermal Impedance (See Note 4)	Natural Convection (20LFM)	Without Heatsink		10.8		°C/W
		With Heatsink		10.3		
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
MTBF	BELLCORE TR-NWT-000332 Case 1: 50% Stress, Ta=40°C		2,137,000 hours			
	MIL-HDBK-217F Ta=25°C, full load (G/B, controlled environment)		192,200 hours			
PHYSICAL SPECIFICATIONS						
Weight			1.13oz (32g)			
Dimensions (L x W x H)			2.00x1.00x0.40 inch (50.8x25.4x10.2 mm)			
Case Material			copper			
Base Material			FR4 PCB			
Potting Material			Silicon (UL94-V0)			
Shielding			Six-sided			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals			IEC60950-1, UL60950-1, EN60950-1			
EMI (See Note 1)	EN55022		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 2)	EN61000-4-4	±2kV	Perf. Criteria A			
Surge (See Note 2)	EN61000-4-5	±2kV	Perf. Criteria A			
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A			

DERATING CURVES

CR48S05-40 Derating Curve

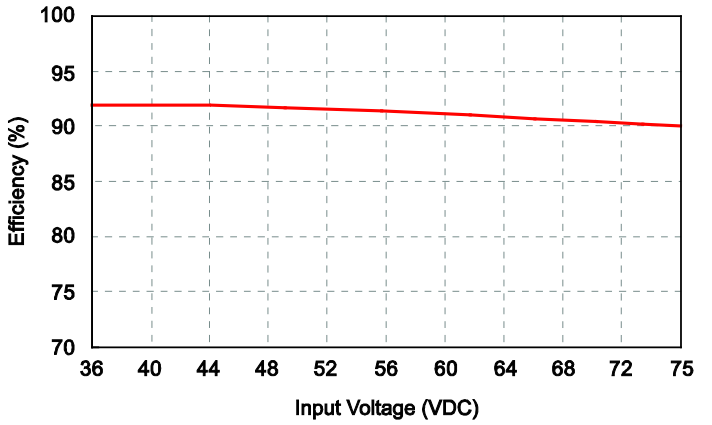


CR48S05-40 Derating Curve with Heatsink

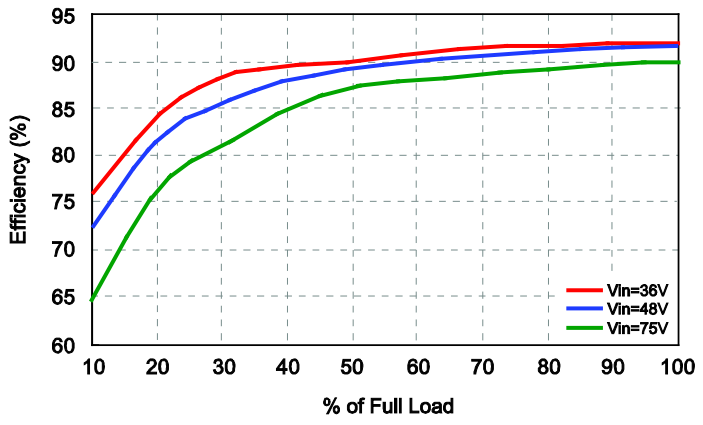


EFFICIENCY CURVES

CR48S12-40 Efficiency vs Input Voltage

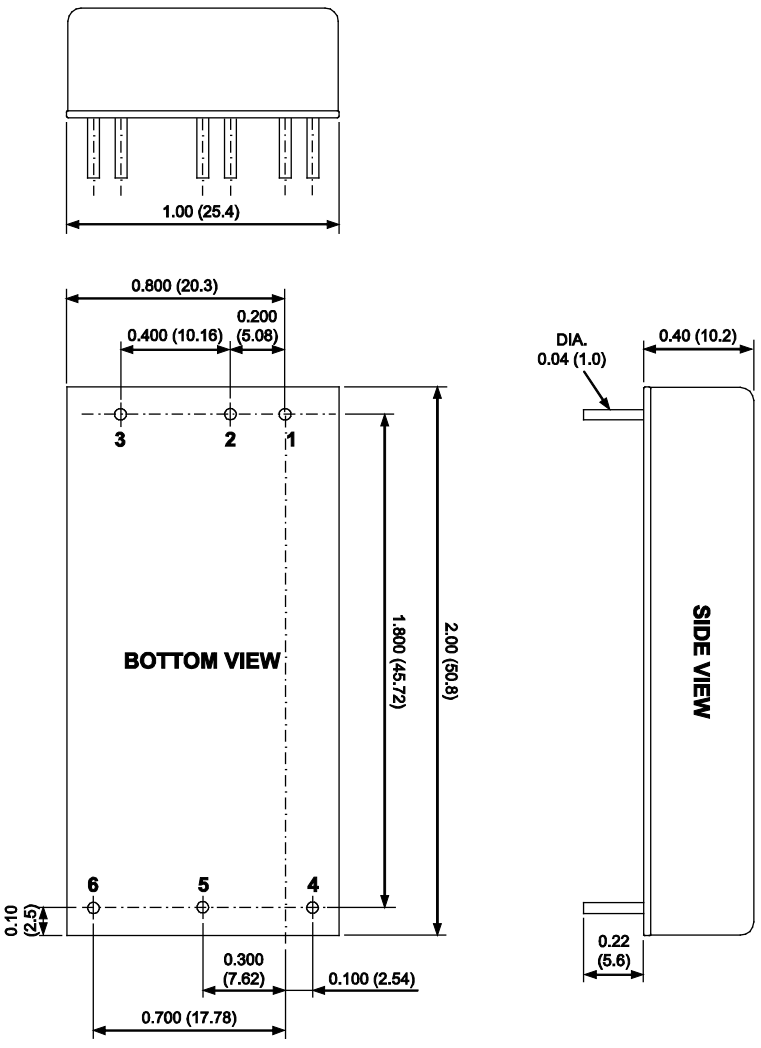


CR48S12-40 Efficiency vs Output Load



MECHANICAL DRAWING

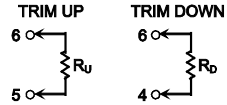
Unit: inches (mm)



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

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



NOTES

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: ±0.004 (±0.1)

MODEL NUMBER SETUP

CR	48	S	05	-	40	R	H
Series Name	Input Voltage	Output Quantity	Ouptut Voltage		Output Power	Remote ON/OFF	Heatsink
	12: 9-18 VDC **24:** 18-36 VDC **48:** 36-75 VDC	**S:** Single Output **D:** Dual Output	**33:** 3.3 VDC **05:** 5 VDC **12:** 12 VDC **15:** 15 VDC **24:** 24 VDC **12:** ±12 VDC **15:** ±15 VDC **24:** ±24 VDC		**33:** 33 Watts **40:** 40 Watts	**None:** Positive Logic **R:** Negative Logic	**None:** No Heatsink **H:** Heatsink **HC:** Heatsink with clamp

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 ISO9001-2008 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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