



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

Weight:
1.07oz (30.5g)

- Options:**
- Negative Logic Remote On/Off
 - Heatsink

FEATURES

- High Efficiency up to 91%
- Remote ON/OFF Control
- 1600VDC I/O Isolation
- Six-Sided Continuous Shielding
- Single, Dual, and Triple Outputs
- Fixed Switching Frequency
- 4:1 Ultra Wide Input Voltage Ranges
- Protection: SCP / OVP / OLP / OTP
- Up to 30 Watts Output Power
- Standard 2.00" x 1.00" x 0.40" Package
- Wide Operating Temperature Range: -40°C to +85°C
- Compliant to RoHS EU Directive 2011/65/EU
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals
- CE Marked

DESCRIPTION

The CBW series of DC/DC power converters offers up to 30 Watts of output power in an industry standard 2.00" x 1.00" x 0.40" package. This series has single, dual, and triple output models with 4:1 ultra wide input voltage ranges of 9-36VDC and 18-75VDC. Some features include high efficiency up to 91%, 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, measurement equipment, and semiconductor equipment.

MODEL SELECTION TABLE
SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		No Load Input Current	Ripple & Noise	Output Power	Maximum Capacitive Load	Efficiency
			Min. load	Full load					
CBW24S1.5-8500	24 VDC (9 - 36 VDC)	1.5 VDC	0mA	8500mA	70mA	100mVp-p	12.75W	20000µF	80%
CBW24S2.5-8000		2.5 VDC	0mA	8000mA	70mA	100mVp-p	20W	20000µF	83%
CBW24S3.3-7500		3.3 VDC	0mA	7500mA	70mA	100mVp-p	24.75W	20000µF	86%
CBW24S5-6000		5 VDC	0mA	6000mA	105mA	100mVp-p	30W	14400µF	88%
CBW24S5.1-6000		5.1 VDC	0mA	6000mA	105mA	100mVp-p	30.6W	14400µF	88%
CBW24S12-2500		12 VDC	0mA	2500mA	20mA	150mVp-p	30W	3000µF	89%
CBW24S15-2000		15 VDC	0mA	2000mA	30mA	150mVp-p	30W	2000µF	89%
CBW48S1.5-8500	48 VDC (18 - 75 VDC)	1.5 VDC	0mA	8500mA	30mA	100mVp-p	12.75W	20000µF	80%
CBW48S2.5-8000		2.5 VDC	0mA	8000mA	45mA	100mVp-p	20W	20000µF	84%
CBW48S3.3-7500		3.3 VDC	0mA	7500mA	45mA	100mVp-p	24.75W	20000µF	86%
CBW48S5-6000		5 VDC	0mA	6000mA	65mA	100mVp-p	30W	14400µF	88%
CBW48S5.1-6000		5.1 VDC	0mA	6000mA	65mA	100mVp-p	30.6W	14400µF	88%
CBW48S12-2500		12 VDC	0mA	2500mA	60mA	150mVp-p	30W	3000µF	90%
CBW48S15-2000		15 VDC	0mA	2000mA	50mA	150mVp-p	30W	2000µF	91%

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		No Load Input Current	Ripple & Noise	Output Power	Maximum Capacitive Load	Efficiency
			Min. load	Full load					
CBW24D5-3000	24 VDC	±5 VDC	0mA	±3000mA	90mA	100mVp-p	30W	±3000µF	88%
CBW24D12-1250	9 - 36 VDC	±12 VDC	0mA	±1250mA	25mA	150mVp-p	30W	±2000µF	87%
CBW24D15-1000		±15 VDC	0mA	±1000mA	25mA	150mVp-p	30W	±1300µF	87%
CBW48D5-3000	48 VDC	±5 VDC	0mA	±3000mA	50mA	100mVp-p	30W	±3000µF	88%
CBW48D12-1250	18 - 75 VDC	±12 VDC	0mA	±1250mA	15mA	150mVp-p	30W	±2000µF	88%
CBW48D15-1000		±15 VDC	0mA	±1000mA	15mA	150mVp-p	30W	±1300µF	88%

TRIPLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		No Load Input Current	Ripple & Noise	Output Power	Maximum Capacitive Load	Efficiency
			Min. load	Full load					
CBW24T3.312-26	24 VDC (9 - 36 VDC)	3.3 / ±12 VDC	500mA / ±42mA	5000mA / ±416mA	105mA	50 / 75 mVp-p	26.5W	15000µF / ±340µF	87%
CBW24T3.315-26		3.3 / ±15 VDC	500mA / ±33mA	5000mA / ±333mA	105mA	50 / 75 mVp-p	26.5W	15000µF / ±220µF	87%
CBW24T512-30		5 / ±12 VDC	400mA / ±42mA	4000mA / ±416mA	105mA	50 / 75 mVp-p	30W	8000µF / ±340µF	88%
CBW24T515-30		5 / ±15 VDC	400mA / ±33mA	4000mA / ±333mA	105mA	50 / 75 mVp-p	30W	8000µF / ±220µF	88%
CBW48T3.312-26	48 VDC (18 - 75 VDC)	3.3 / ±12 VDC	500mA / ±42mA	5000mA / ±416mA	55mA	50 / 75 mVp-p	26.5W	15000µF / ±340µF	87%
CBW48T3.315-26		3.3 / ±15 VDC	500mA / ±33mA	5000mA / ±333mA	55mA	50 / 75 mVp-p	26.5W	15000µF / ±220µF	87%
CBW48T512-30		5 / ±12 VDC	400mA / ±42mA	4000mA / ±416mA	55mA	50 / 75 mVp-p	30W	8000µF / ±340µF	88%
CBW48T515-30		5 / ±15 VDC	400mA / ±33mA	4000mA / ±333mA	55mA	50 / 75 mVp-p	30W	8000µF / ±220µF	88%

SPECIFICATIONS: CBW 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	24VDC nominal input models		9	24	36	VDC
	48VDC nominal input models		18	48	75	
Start-Up Voltage	24VDC nominal input models				9	VDC
	48VDC nominal input models				18	
Shutdown Voltage	24VDC nominal input models			8		VDC
	48VDC nominal input models			16		
Input Surge Voltage (100ms)	24VDC nominal input models				50	VDC
	48VDC nominal input models				100	
Input Current	No Load		See Table			
Input Filter			Pi type			
Input Reflected Ripple Current				20		mAp-p
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Single Output Models		-1.0		+1.0	%
	Dual Output Models		-1.0		+1.0	%
	Triple Output Models	Main	-1.0		+1.0	%
Auxiliary		-5.0		+5.0	%	
Line Regulation	Low line to high line at full load	Single Output Models	-0.2		+0.2	%
		Dual Output Models	-0.2		+0.2	%
		Triple Output Models	Main	-1.0		+1.0
Auxiliary	-5.0			+5.0	%	
Load Regulation	Min load to full load	Single Output Models	-0.5		+0.5	%
		Dual Output Models	-1.0		+1.0	%
		Triple Output Models	Main	-1.0		+1.0
Auxiliary	-5.0			+5.0	%	
Cross Regulation (Dual Output Models)	Asymmetrical load 25% / 100% full load		-5.0		+5.0	%
Voltage Adjustability (Single Output Only)	See page 4		-10		+10	%
Output Power			See Table			
Output Current			See Table			
Minimum Load	See Note 3		See Table			
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise	20MHz BW and with a 1µF/50V MLCC		Single Output Models		See Table	
	20MHz BW and with a 1µF/50V MLCC		Dual Output Models		See Table	
	20MHz BW and with a 0.1µF/50V MLCC		Triple Output Models		See Table	
Transient Response Recovery Time	25% load step change				250	µs
Start-Up Time	Nominal input and constant resistive load	Power Up		30		ms
		Remote On/Off		30		
Temperature Coefficient			-0.02		+0.02	%/°C
REMOTE ON/OFF CONTROL (See Note 2)						
Positive Logic (standard)	The CTRL pin voltage is referenced to -Input	DC/DC ON	Open or $3V < V_r < 12V$			
		DC/DC OFF	Short or $0 < V_r < 1.2VDC$			
Negative Logic (optional)	The CTRL pin voltage is referenced to -Input	DC/DC ON	Short or $0 < V_r < 1.2VDC$			
		DC/DC OFF	Open or $3V < V_r < 12V$			
Input Current of remote Control Pin	Nominal input		-0.5		+0.5	mA
Remote OFF State Input Current	Nominal input			3		mA
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Over Load Protection	% of full load at nominal input			150		%
Over Voltage Protection	Zener diode clamp	1.5V output models		2.0		VDC
		2.5V output models		3.3		VDC
		3.3V output models		3.9		VDC
		5V, 5.1V, and ±5V output models		6.2		VDC
		12V & ±12V output models		15		VDC
		15V & ±15V output models		18		VDC
Over Temperature Protection				+115		°C

SPECIFICATIONS: CBW 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
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency	Single & Dual output models		387	430	473	kHz
	Triple output models		360	400	440	
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
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With derating		-40		+50	°C
	Without derating		+50		+85	
Maximum Case Temperature					+105	°C
Storage Temperature			-55		+125	°C
Thermal Impedance (See Note 1)	Natural convection			12		°C/W
	Natural convection with heatsink			10		
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
MTBF	Single & Dual Output Models	BELLCORE TR-NWT-000332 Case 1: 50% Stress, Ta=40°C	3,163,000			hours
		MIL-HDBK-217F Notice 2, Ta=25°C, full load (G/B, controlled environment)	434,700			
	Triple Output Models	BELLCORE TR-NWT-000332 Case 1: 50% Stress, Ta=40°C	2,904,000			hours
		MIL-HDBK-217F Notice 2, Ta=25°C, full load (G/B, controlled environment)	318,400			
PHYSICAL SPECIFICATIONS						
Weight			1.07oz (30.5g)			
Dimensions (L x W x H)			2.00 x 1.00 x 0.40 inch (50.8 x 25.4 x 10.2 mm)			
Case Material			Nickel-coated copper			
Base Material			FR4 PCB			
Potting Material			Epoxy (UL94-V0)			
Shielding			Six-sided			
Case Grounding			Connect case to -Input with decoupling Y Cap			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals			IEC60950-1, UL60950-1, EN60950-1			
EMI (See Note 4)	EN55022		Class A			
ESD	EN61000-4-2	Air ±8kV and Contact ±6kV	Perf. Criteria A			
Radiated Immunity	EN61000-4-3	10 V/m	Perf. Criteria A			
Fast Transient (See Note 5)	EN61000-4-4	±2kV	Perf. Criteria A			
Surge (See Note 5)	EN61000-4-5	±1kV	Perf. Criteria A			
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A			

NOTES

- Heat sink is optional. To order the module with a heatsink please add the suffix "HS" to the model number (Ex: CBW24S12-2500HS).
- Positive remote on/off control is standard; for negative remote on/off please add the suffix "R" to the model number (Ex: CBW24S12-2500R).
- Triple output models require a minimum loading on the output to maintain all specified regulations. Operation under no-load conditions will not damage these devices; however, they may not meet all listed specifications.
- The CBW series standard models can only meet EN55022 Class A and Class B with external components added.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
 - 24VDC nominal input models: Nippon chemi-con KY series, 330µF/50V
 - 48VDC nominal input models: Nippon chemi-con KY series, 220µF/100V

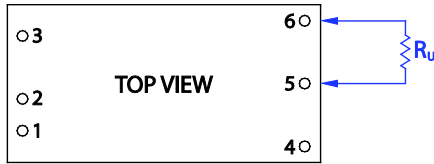
CAUTION: This power converter is not internally fused. An input line fuse must always be used.

Due to advances in technology, specifications subject to change without notice.

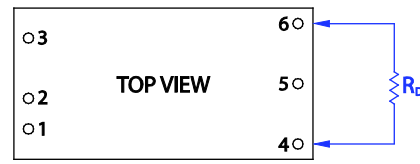
OUTPUT VOLTAGE ADJUSTMENT

Output voltage adjustability is for single output models only. Output voltage set-point adjustment allows the user to increase or decrease the output voltage set-point of a module. This is accomplished by connecting an external resistor between the TRIM pin and either the +OUTPUT or -OUTPUT pins. With an external resistor between the TRIM and -OUTPUT pins, the output voltage set-point increases. With an external resistor between the TRIM and +OUTPUT pins, the output voltage set-point decreases. The external TRIM resistor needs to be at least 1/16W resistance.

Trim Up



Trim Down



CBWXXS1.5-8500		
Trim	V _{out,up}	R _U
1%	1.515V	4.578kΩ
2%	1.530V	2.065kΩ
3%	1.545V	1.227kΩ
4%	1.560V	0.808kΩ
5%	1.575V	0.557kΩ
6%	1.590V	0.389kΩ
7%	1.605V	0.270kΩ
8%	1.620V	0.180kΩ
9%	1.635V	0.110kΩ
10%	1.650V	0.054kΩ

CBWXXS2.5-8000		
Trim	V _{out,up}	R _U
1%	2.525V	37.076kΩ
2%	2.550V	16.675kΩ
3%	2.575V	9.874kΩ
4%	2.600V	6.474kΩ
5%	2.625V	4.434kΩ
6%	2.650V	3.074kΩ
7%	2.675V	2.102kΩ
8%	2.700V	1.374kΩ
9%	2.725V	0.807kΩ
10%	2.750V	0.354kΩ

CBWXXS1.5-8500		
Trim	V _{out,down}	R _D
1%	1.485V	5.704kΩ
2%	1.470V	2.571kΩ
3%	1.455V	1.527kΩ
4%	1.440V	1.005kΩ
5%	1.425V	0.692kΩ
6%	1.410V	0.483kΩ
7%	1.395V	0.334kΩ
8%	1.380V	0.222kΩ
9%	1.365V	0.135kΩ
10%	1.350V	0.065kΩ

CBWXXS2.5-8000		
Trim	V _{out,down}	R _D
1%	2.475V	49.641kΩ
2%	2.450V	22.481kΩ
3%	2.425V	13.428kΩ
4%	2.400V	8.902kΩ
5%	2.375V	6.186kΩ
6%	2.350V	4.375kΩ
7%	2.325V	3.082kΩ
8%	2.300V	2.112kΩ
9%	2.275V	1.358kΩ
10%	2.250V	0.754kΩ

CBWXXS3.3-7500		
Trim	V _{out,up}	R _U
1%	3.333V	57.930kΩ
2%	3.366V	26.465kΩ
3%	3.399V	15.577kΩ
4%	3.432V	10.283kΩ
5%	3.465V	7.106kΩ
6%	3.498V	4.988kΩ
7%	3.531V	3.476kΩ
8%	3.564V	2.341kΩ
9%	3.597V	1.459kΩ
10%	3.630V	0.753kΩ

CBWXXS5-6000		
Trim	V _{out,up}	R _U
1%	5.050V	36.570kΩ
2%	5.100V	16.580kΩ
3%	5.150V	9.917kΩ
4%	5.200V	6.585kΩ
5%	5.250V	4.586kΩ
6%	5.300V	3.253kΩ
7%	5.350V	2.302kΩ
8%	5.400V	1.588kΩ
9%	5.450V	1.032kΩ
10%	5.500V	0.588kΩ

CBWXXS3.3-7500		
Trim	V _{out,down}	R _D
1%	3.267V	69.470kΩ
2%	3.234V	31.235kΩ
3%	3.201V	18.490kΩ
4%	3.168V	12.117kΩ
5%	3.135V	8.294kΩ
6%	3.102V	5.745kΩ
7%	3.069V	3.924kΩ
8%	3.036V	2.559kΩ
9%	3.003V	1.497kΩ
10%	2.970V	0.647kΩ

CBWXXS5-6000		
Trim	V _{out,down}	R _D
1%	4.950V	45.533kΩ
2%	4.900V	20.612kΩ
3%	4.850V	12.306kΩ
4%	4.800V	8.152kΩ
5%	4.750V	5.660kΩ
6%	4.700V	3.999kΩ
7%	4.650V	2.812kΩ
8%	4.600V	1.922kΩ
9%	4.550V	1.230kΩ
10%	4.500V	0.676kΩ

CBWXXS5.1-6000		
Trim	V _{out,up}	R _U
1%	5.151V	38.135kΩ
2%	5.202V	17.368kΩ
3%	5.253V	10.446kΩ
4%	5.304V	6.985kΩ
5%	5.355V	4.908kΩ
6%	5.406V	3.524kΩ
7%	5.457V	2.535kΩ
8%	5.508V	1.793kΩ
9%	5.559V	1.217kΩ
10%	5.610V	0.755kΩ

CBWXXS12-2500		
Trim	V _{out,up}	R _U
1%	12.120	367.908kΩ
2%	12.240	165.954kΩ
3%	12.360	98.636kΩ
4%	12.480	64.977kΩ
5%	12.600	44.782kΩ
6%	12.720	31.318kΩ
7%	12.840	21.701kΩ
8%	12.960	14.488kΩ
9%	13.080	8.879kΩ
10%	13.200	4.391kΩ

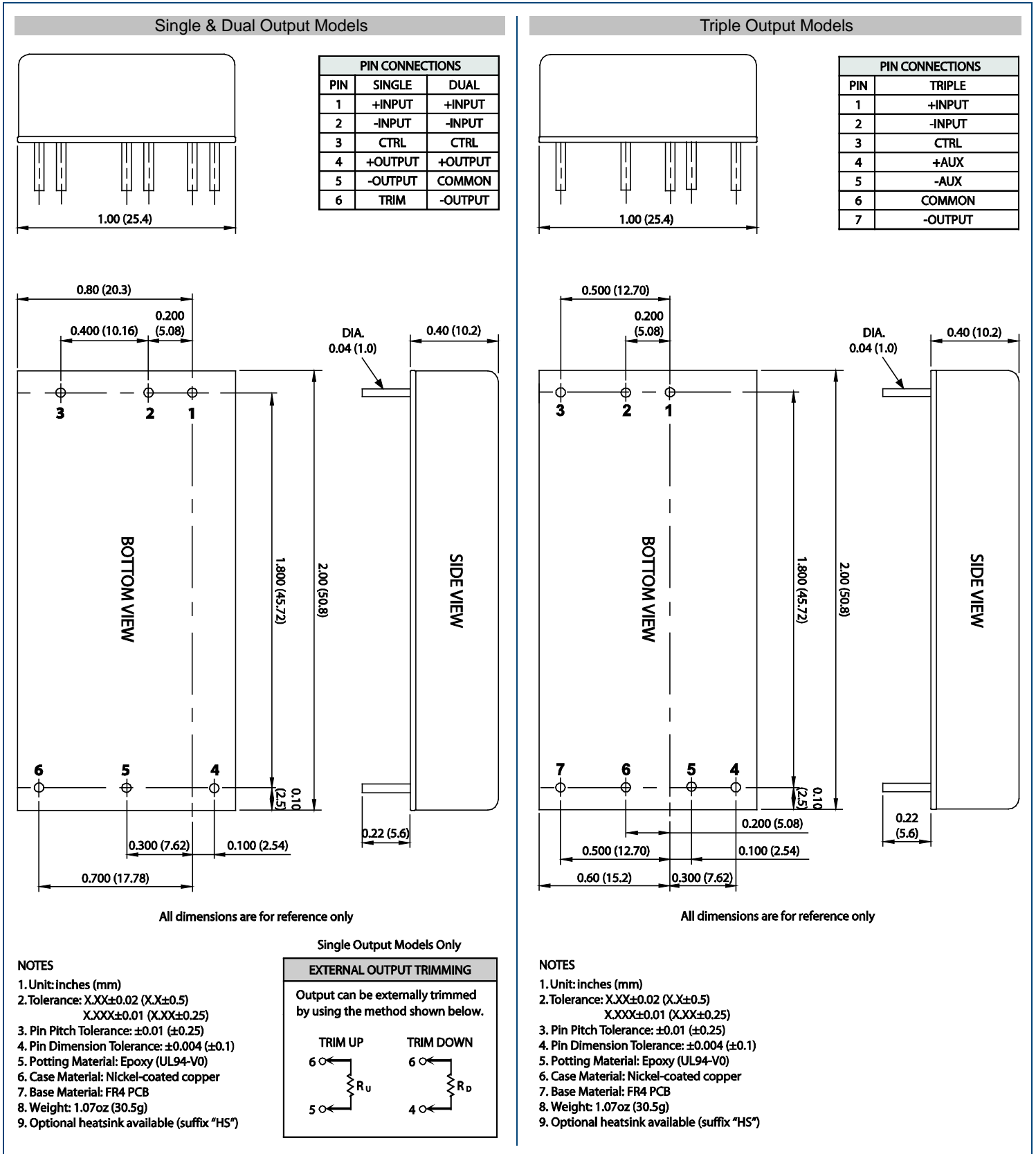
CBWXXS5.1-6000		
Trim	V _{out,down}	R _D
1%	5.049V	47.191kΩ
2%	4.998V	21.431kΩ
3%	4.947V	12.844kΩ
4%	4.896V	8.551kΩ
5%	4.845V	5.975kΩ
6%	4.794V	4.258kΩ
7%	4.743V	3.031kΩ
8%	4.692V	2.111kΩ
9%	4.641V	1.396kΩ
10%	4.590V	0.823kΩ

CBWXXS12-2500		
Trim	V _{out,down}	R _D
1%	11.880V	460.992kΩ
2%	11.760V	207.946kΩ
3%	11.640V	123.597kΩ
4%	11.520V	81.423kΩ
5%	11.400V	56.118kΩ
6%	11.280V	39.249kΩ
7%	11.160V	27.199kΩ
8%	11.040V	18.162kΩ
9%	10.920V	11.132kΩ
10%	10.800V	5.509kΩ

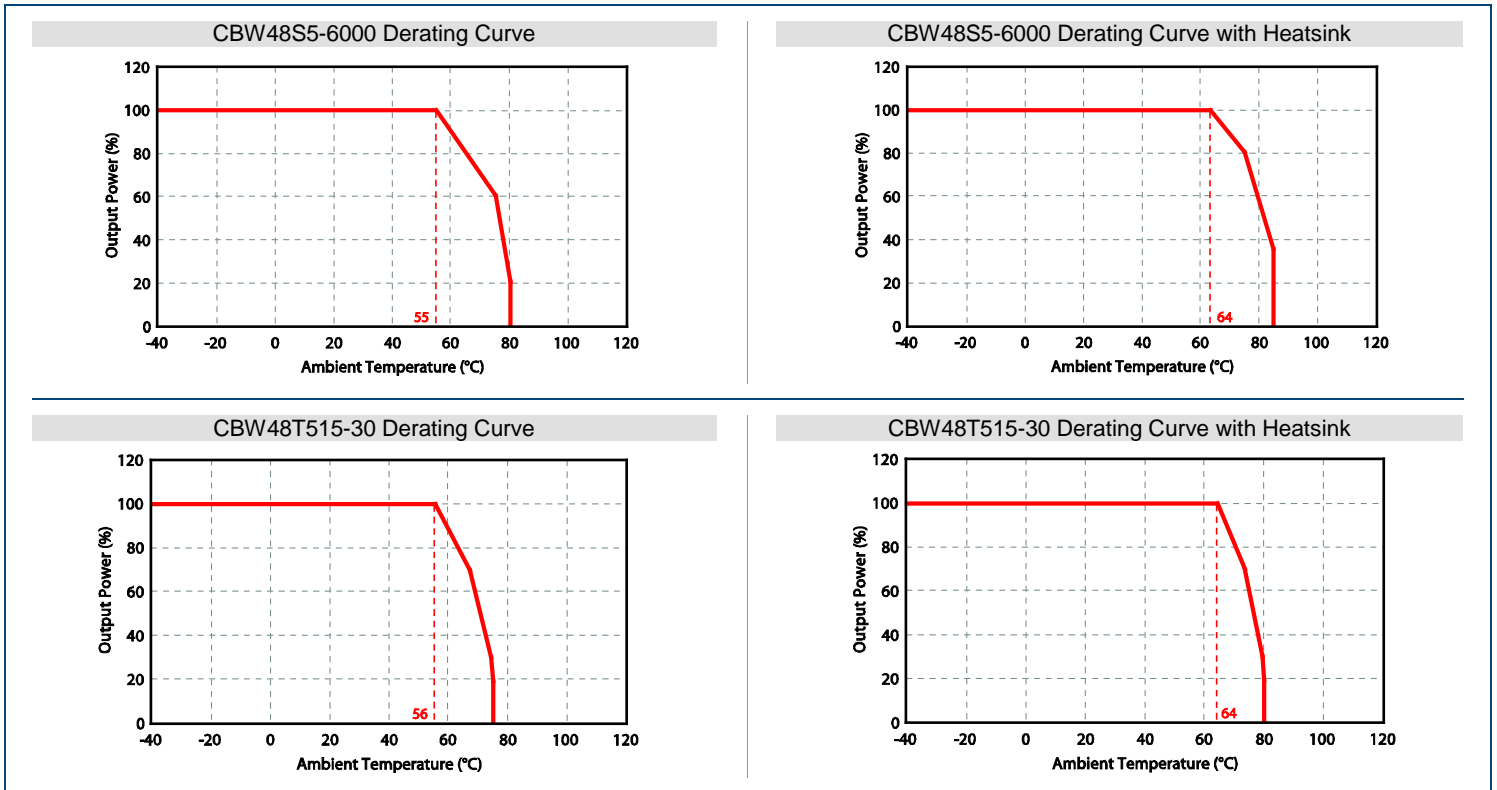
CBWXXS15-2000		
Trim	V _{out,up}	R _U
1%	15.150V	404.184kΩ
2%	15.300V	180.592kΩ
3%	15.450V	106.061kΩ
4%	15.600V	68.796kΩ
5%	15.750V	46.437kΩ
6%	15.900V	31.531kΩ
7%	16.050V	20.883kΩ
8%	16.200V	12.898kΩ
9%	16.350V	6.687kΩ
10%	16.500V	1.718kΩ

CBWXXS15-2000		
Trim	V _{out,down}	R _D
1%	14.850V	499.816kΩ
2%	14.700V	223.408kΩ
3%	14.550V	131.272kΩ
4%	14.400V	85.204kΩ
5%	14.250V	57.563kΩ
6%	14.100V	39.136kΩ
7%	13.950V	25.974kΩ
8%	13.800V	16.102kΩ
9%	13.650V	8.424kΩ
10%	13.500V	2.282kΩ

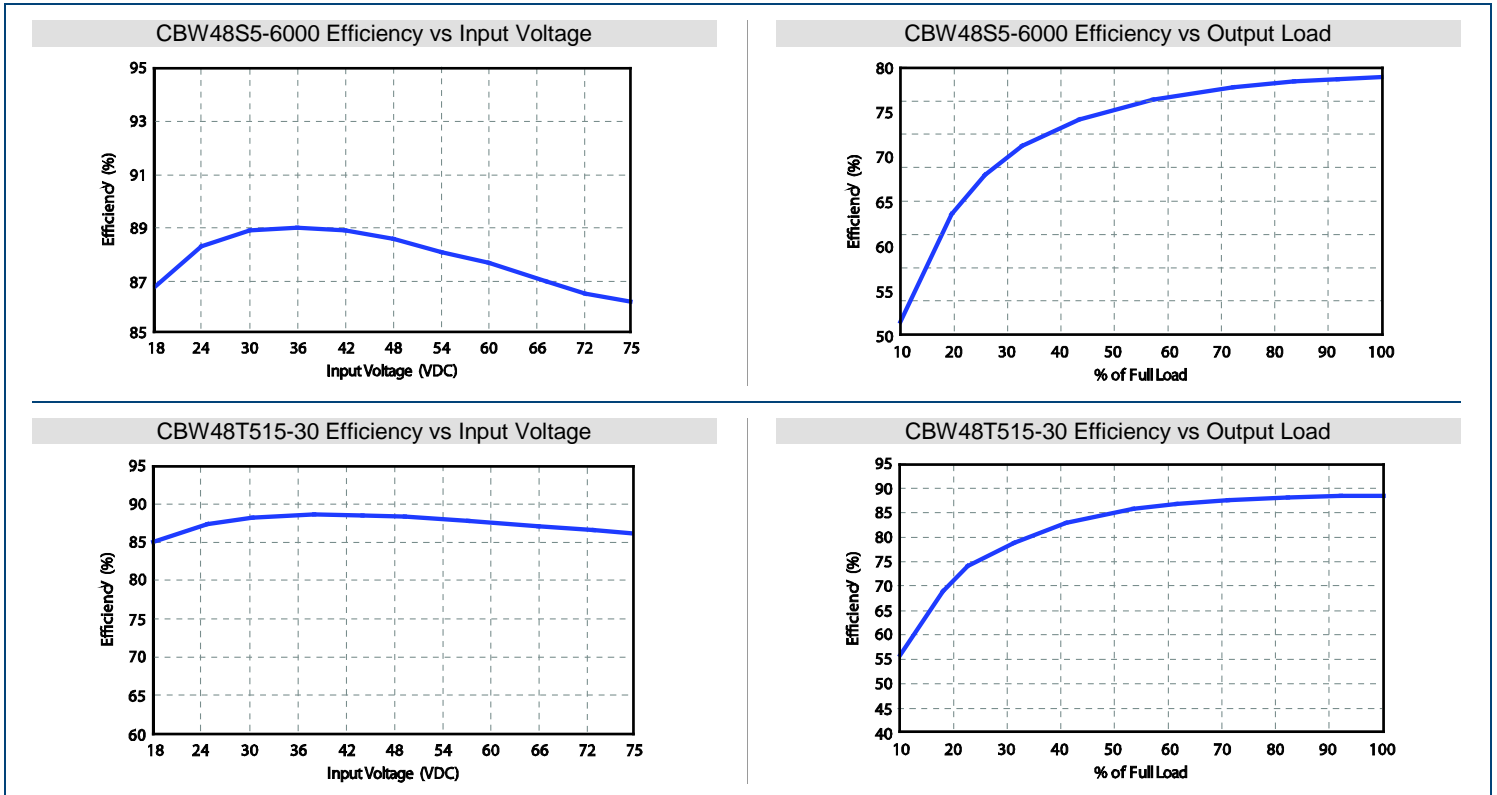
MECHANICAL DRAWING



DERATING CURVES



EFFICIENCY CURVES



MODEL NUMBER SETUP

Single Output Models

CBW	24	S	12	-	2500	R	HS
Series Name	Input Voltage	Output Quantity	Ouptut Voltage		Output Current	Remote On/Off	Heatsink
	24: 9 - 36 VDC 48: 18 - 75 VDC	S: Single Output	1.5 1.5V 2.5 2.5V 3.3: 3.3V 5: 5V 5.1 5.1V 12: 12V 15: 15V		2000: 2000mA 2500: 2500mA 6000: 6000mA 7500: 7500mA 8000: 8000mA 8500: 8500mA	None: positive Logic R: negative Logic	None: No Heatsink HS: With Heatsink

Dual Output Models

CBW	24	D	12	-	1250	R	HS
Series Name	Input Voltage	Output Quantity	Ouptut Voltage		Output Current	Remote On/Off	Heatsink
	24: 9 - 36 VDC 48: 18 - 75 VDC	D: Dual Output	5: ±5V 12: ±12V 15: ±15V		1000: ±1000mA 1250: ±1250mA 3000: ±3000mA	None: positive Logic R: negative Logic	None: No Heatsink HS: With Heatsink

Triple Output Models

CBW	24	T	512	-	30	R	HS
Series Name	Input Voltage	Output Quantity	Ouptut Voltage		Output Power	Remote On/Off	Heatsink
	24: 9 - 36 VDC 48: 18 - 75 VDC	T: Triple Output	3.312: 3.3V / ±12V 3.315: 3.3V / ±15V 512: 5V / ±12V 515: 5V / ±15V		26: 26.5 Watts 30: 30 Watts	None: positive Logic R: negative Logic	None: No Heatsink HS: With Heatsink

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.

Contact **Wall Industries** for further information:

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