

**FEATURES**

- High Efficiency up to 88%
- RoHS Directive Compliant
- Fixed Switching Frequency
- Six-Sided Continuous Shield
- 40 Watts Maximum Output power
- Single and Dual Outputs Available
- 4:1 Ultra Wide Input Voltage Range
- Standard 2.02" x 2.02" x 0.4" Package



**SPECIFICATIONS: DBW Series**

*All specifications apply @ 25°C ambient unless otherwise noted*

**INPUT SPECIFICATIONS**

Input Voltage Range .....	24V nominal input .....	9 - 36VDC
	48V nominal input .....	18 - 75VDC
Under Voltage Lockout		
24V nominal input.....	DC-DC ON .....	9 VDC
	DC-DC OFF .....	8 VDC
48V nominal input.....	DC-DC ON .....	18 VDC
	DC-DC OFF .....	16 VDC
Input Filter .....		Pi Type
Input Voltage Variation.....	dv/dt .....	5V/ms max (Complies with ETS300 132 part 4.4)
Input Surge Voltage (100ms max) .....	24V input .....	50VDC
	48V input .....	100VDC
Input Reflected Ripple Current (nominal Vin and FL) .....		20mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistive load)		
Power Up .....		20ms max.
Remote ON/OFF .....		20ms max.
Remote ON/OFF (See Note 4)		
Positive Logic .....	DC-DC ON .....	Open or 3V < Vr < 12V
	DC-DC OFF .....	Short or 0V < Vr < 1.2V
Negative Logic .....	DC-DC ON .....	Short or 0V < Vr < 1.2V
	DC-DC OFF .....	Open or 3V < Vr < 12V
Remote Off Input Current (nominal Vin) .....		3mA

**OUTPUT SPECIFICATIONS**

Output Voltage .....	see table
Voltage Accuracy (nom Vin and full load).....	±1%
Voltage Adjustability (See Note 1) .....	±10%
Output Current .....	see table
Output Power .....	40 watts max.
Line Regulation (LL to HL at FL).....	±0.2%
Load Regulation (See Note 2) .....	Single Output .....
(min. load to 100% load)	Dual Output .....
Load Cross Regulation (See Note 3).....	Dual Output .....
Minimum Load (See Note 8) .....	see table
Ripple/Noise (See Note 9) .....	see table
Transient Response Recovery Time.....	250us
(25% load step change)	

**PROTECTION SPECIFICATIONS**

Over Voltage Protection .....	3.3V Output .....	3.9V
(Zener diode clamp)	5V Output .....	6.2V
	12V Output .....	15V
	15V Output .....	18V
	±12V Output .....	±15V
	±15V Output .....	±18V
Over Load Protection (% of FL at nominal input) .....		150% max.
Short Circuit Protection.....		Hiccup, automatic recovery
Over Temperature Protection .....		110°C typ.

**GENERAL SPECIFICATIONS**

Efficiency .....	see table
Switching Frequency .....	300KHz typ.
Isolation Voltage (Input to Output).....	1600VDC min.
Isolation Voltage (Input/Output to Case) .....	1600VDC min.
Case Grounding (connect case to -Vin with decoupling Y cap) .....	TBD
Isolation Resistance .....	10 <sup>9</sup> ohms min.
Isolation Capacitance .....	1500pF max.

**ENVIRONMENTAL SPECIFICATIONS**

Operating Ambient Temperature.....	-40°C to +55°C (without derating)
	+55°C to +105°C (with derating)
Storage Temperature .....	-55°C ~ +125°C
Maximum Case Temperature .....	+105°C
Relative Humidity.....	5% to 95% RH
Temperature Coefficient.....	±0.02% / °C max.
Thermal Impedance (See Note 6)	
Without Heat-Sink.....	9.2°C / Watt
With Heat-Sink.....	7.6°C/Watt
Thermal Shock .....	MIL-STD-810D
Vibration .....	10~55Hz, 10G, 30 minutes along X, Y, and Z
MTBF (See Note 5) .....	Bellcore TR-NWT-000332 .....
	MIL-STD-217F .....
	1.105 x 10 <sup>6</sup> hrs
	1.511 x 10 <sup>5</sup> hrs

**SPECIFICATIONS (CONTINUED)**

*All specifications apply @ 25°C ambient unless otherwise noted*

**PHYSICAL SPECIFICATIONS**

Weight.....	60g (2.11 oz)
Dimensions .....	2.02 x 2.02 x 0.40 inches (51.3 x 51.3 x 10.2 mm)
Case Material.....	Nickel-coated copper
Base Material.....	Non-conductive black FR4
Potting material.....	Epoxy (UL94-V0)
Shielding .....	six – sided

**SAFETY & EMC (See Note 7)**

Approvals and Standards .....	IEC60950-1, UL60950-1, EN60950-1
Conducted Emissions.....	EN55022 ..... Class A
Radiated Emissions.....	EN55022 ..... Class A
ESD .....	EN61000-4-2..... Perf. Criteria B
Radiated Immunity.....	EN61000-4-3..... Perf. Criteria A
Fast Transient.....	EN61000-4-4..... Perf. Criteria B
Surge .....	EN61000-4-5..... Perf. Criteria B
Conducted Immunity.....	EN61000-4-6..... Perf. Criteria A

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

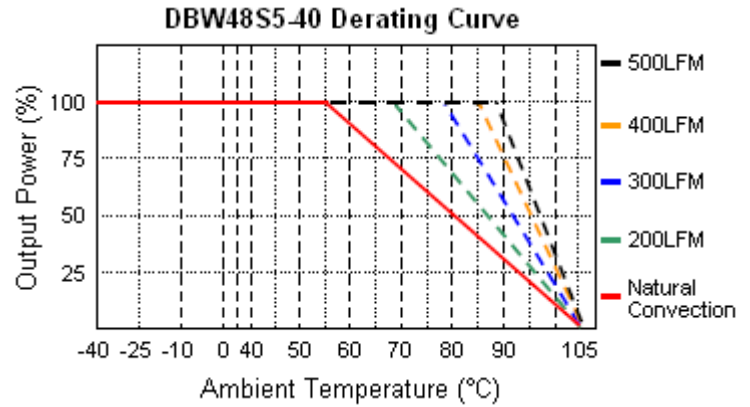
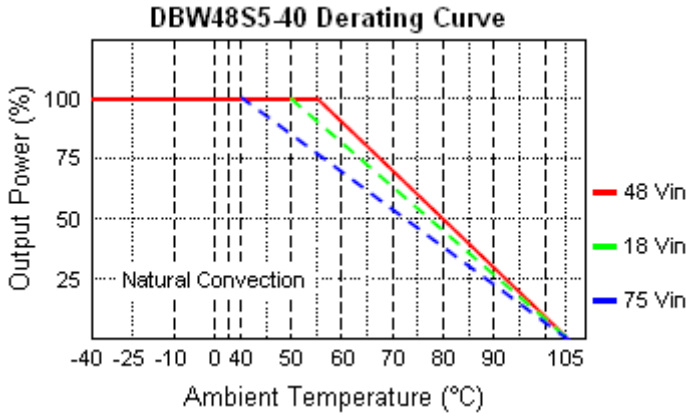
**OUTPUT VOLTAGE / CURRENT RATING CHART**

Model Number	Input Range	Output Voltage	Output Current		Output <sup>(9)</sup> Ripple & Noise	Input Current		Eff. <sup>(12)</sup>	Max Capacitive Load <sup>(13)</sup>
			Min. Load <sup>(6)</sup>	Full Load		No load <sup>(10)</sup>	Full Load <sup>(11)</sup>		
DBW24S3.3-33	24VDC (9 – 36 VDC)	3.3 VDC	0mA	10,000mA	50mVp-p	80mA	1677mA	86%	25,750µF
DBW24S5-40		5 VDC	0mA	8000mA	50mVp-p	100mA	1984mA	88%	13,600µF
DBW24S12-40		12 VDC	0mA	3333mA	75mVp-p	100mA	1984mA	88%	2360µF
DBW24S15-40		15 VDC	0mA	2666mA	75mVp-p	110mA	1984mA	88%	1510µF
DBW24D12-40		±12 VDC	±65mA	±1667mA	120mVp-p	30mA	1984mA	88%	±1200µF
DBW24D15-40		±15 VDC	±50mA	±1333mA	150mVp-p	30mA	1984mA	88%	±750µF
DBW48S3.3-33	48VDC (18 – 75 VDC)	3.3 VDC	0mA	10,000mA	50mVp-p	50mA	838mA	86%	25,750µF
DBW48S5-40		5 VDC	0mA	8000mA	50mVp-p	50mA	992mA	88%	13,600µF
DBW48S12-40		12 VDC	0mA	3333mA	75mVp-p	70mA	992mA	88%	2360µF
DBW48S15-40		15 VDC	0mA	2666mA	75mVp-p	70mA	992mA	88%	1510µF
DBW48D12-40		±12 VDC	±65mA	±1667mA	120mVp-p	20mA	992mA	88%	±1200µF
DBW48D15-40		±15 VDC	±60mA	±1333mA	150mVp-p	20mA	992mA	88%	±750µF

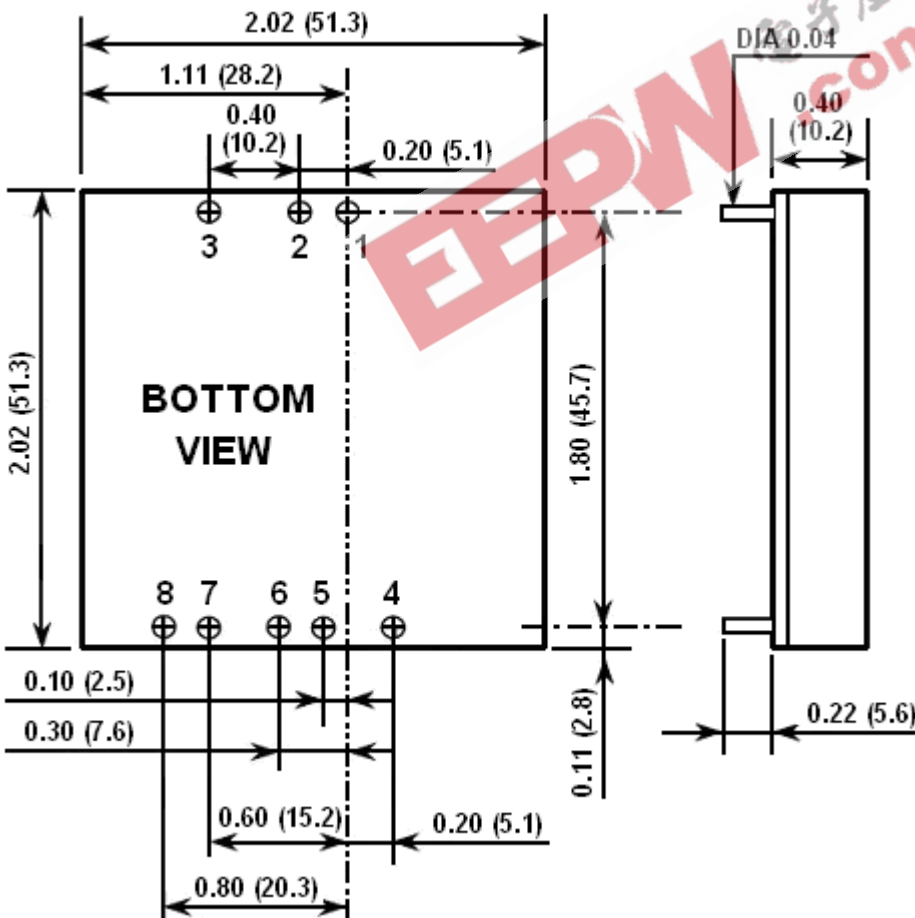
**NOTES**

- For single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +sense should be connected to its corresponding +OUTPUT and likewise the -sense should be connected to its corresponding –OUTPUT.
- Load regulation for dual output: Minimum load to 100% load balanced on all outputs.
- Cross regulation for dual output: asymmetrical load 25% / 100% full load.
- The ON/OFF control function: There are positive (standard) and negative logic (option). The pin voltage is referenced to negative input. To order negative logic ON/OFF control add the suffix “R” to the part number (Ex: DBW48S5-40R)
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment). MIL-STD-217F Notice2 @ Ta=25°C, Full Load (Ground, Benign, controlled environment).
- Heat sink is optional. Please call factory for ordering details.
- The DBW series required an external filter to meet EN55022 class A.
- The dual output required a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specifications.
- Output ripple & noise measured with a 0.1µF/50V MLCC.
- Typical Value at nominal input voltage.
- Maximum value at nominal input voltage and full load
- Typical Value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.

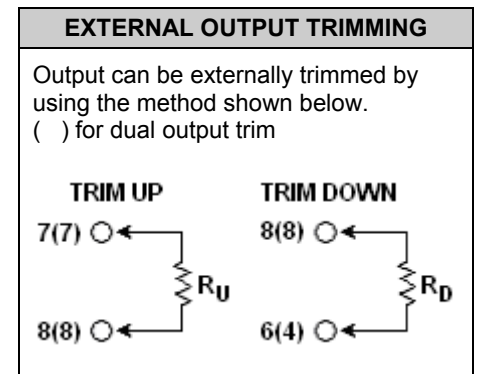
**DERATING CURVES & EFFICIENCY GRAPHS**



**MECHANICAL DRAWING**



PIN CONNECTION		
PIN	SINGLE	DUAL
1	+Input	+Input
2	-Input	-Input
3	CTRL	CTRL
4	-Sense	+Output
5	+Sense	COM
6	+Output	COM
7	-Output	-Output
8	Trim	Trim



- All dimensions in inches (mm)  
Tolerance: X.XX±0.02 (X.X±0.5)
- Pin pitch tolerance ±0.014 (0.35)