

**FEATURES**

- 15 Watts Output Power
- Output Current up to 4A
- High Efficiency up to 88%
- Fixed Switching Frequency
- Six-Sided Continuous Shield
- 2:1 Wide Input Voltage Range
- Standard 2 x 1 x 0.4 inch Package
- ISO9001 Certified Manufacturing Facilities
- Compliant to RoHS EU Directive 2002/95/EC
- Options: Positive Logic and Negative Logic Remote ON/OFF

**APPLICATIONS**

- Measurement
- Wireless Network
- Telecom/Datacom
- Industry Control System
- Semiconductor Equipment



**SPECIFICATIONS: DM Series**

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

**INPUT SPECIFICATIONS**

Input Voltage Range .....	12V nominal input .....	9 - 18 VDC
	24V nominal input .....	18 - 36 VDC
	48V nominal input .....	36 - 75 VDC
Input Filter .....		Pi Type
Input Surge Voltage (100ms max) .....	12V input .....	36 VDC
	24V input .....	50 VDC
	48V input .....	100 VDC
Input Reflected Ripple Current (Note 2).....		20mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistive load).....		20ms typ.
Remote ON/OFF (Option) (Note 7)		
(Positive Logic).....	DC-DC ON .....	Open or 3.5V < 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 3.5V < Vr < 12V
Input Current of Remote Control Pin (nominal Vin) .....		-0.5mA ~ +1mA
Remote Off State Input Current (nominal Vin).....		20mA

**OUTPUT SPECIFICATIONS**

Output Voltage .....		see table
Voltage Accuracy (nominal Vin and full load) .....		±1%
Output Current .....		see table
Output Power .....		15 watts max.
Line Regulation (LL to HL at FL).....		±0.5%
Load Regulation (min load to full load) ....	Single Output.....	±0.5%
	Dual Output.....	±1%
Cross Regulation (Dual) (Asymmetrical load 25% / 100% FL) .....		±5%
Minimum Load (See Note 6) .....		see table
Ripple/Noise (20 MHz BW) .....	Single Output.....	50mV <sub>p-p</sub>
	Dual Output .....	75mV <sub>p-p</sub>
Temperature Coefficient .....		±0.02% / °C max.
Transient Response Recovery Time (25% load step) .....		250us

**PROTECTION SPECIFICATIONS**

Over Voltage Protection.....	3.3V output .....	3.9V
(zener diode clamp)	5V output .....	6.2V
	12V output .....	15V
	15V output .....	18V
Over Load Protection (% of full load at nominal input).....		150% max.
Short Circuit Protection.....		Hiccup, automatic recovery

**GENERAL SPECIFICATIONS**

Efficiency .....		see table
Switching Frequency .....	Single Output .....	500KHz typ.
	Dual Output.....	300KHz typ.
Isolation Voltage (Input to Output).....		1600VDC min.
Isolation Resistance .....		10 <sup>9</sup> ohms min.
Isolation Capacitance .....		300pF max.

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature .....		-40°C ~ +85°C (with derating)
Storage Temperature .....		-55°C ~ +105°C
Maximum Case Temperature .....		100°C
Relative Humidity.....		5% to 95% RH
Thermal Impedance (Note 8)		
	Natural Convection .....	12°C / Watt
	Natural Convection with Heat-Sink.....	10°C / Watt
Thermal Shock .....		MIL-STD-810F
Vibration .....		10~55Hz, 10G, 30 minutes along X, Y, and Z
MTBF (See Note 1) .....		2.041 x 10 <sup>6</sup> hours

**PHYSICAL SPECIFICATIONS**

Weight .....		27g (0.95 oz)
Dimensions.....		2.0 x 1.0 x 0.40 inches (50.8 x 25.4 x 10.2 mm)
Case Material .....		Nickel-coated copper
Base Material.....		Non-conductive black plastic
Potting material.....		Epoxy (UL94-V0)
Shielding.....		six-sided

**SAFETY & EMC**

Approvals and Standards .....		IEC60950-1, UL60950-1, EN60950-1	
EMI (Note 9) .....		EN55022 .....	Class A
ESD .....	EN61000-4-2.....	Air ±8KV	Perf. Criteria B
		Contact ±6KV	
Radiated Immunity.....	EN61000-4-3 .....	10V/m	Perf. Criteria A
Fast Transient.....	EN61000-4-4 .....	±2KV	Perf. Criteria B
Surge (Note 10).....	EN61000-4-5 .....	±1KV	Perf. Criteria B
Conducted Immunity...EN61000-4-6.....		10 Vrms	Perf. Criteria A

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

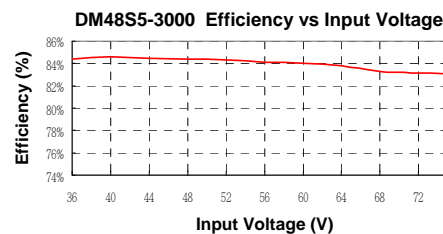
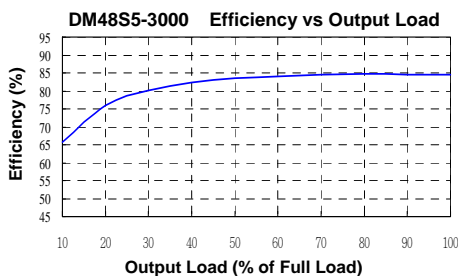
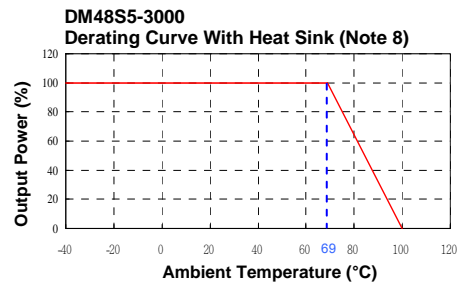
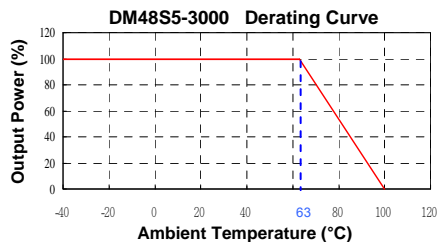
**OUTPUT VOLTAGE / CURRENT RATING CHART**

Model Number	Input Range	Output Voltage	Output Current		Output <sup>(4)</sup> Ripple & Noise	Input Current		Efficiency <sup>(4)</sup>	Capacitor <sup>(5)</sup> Load max
			Min. load	Full load		No load <sup>(3)</sup>	Full load <sup>(2)</sup>		
DM12S3.3-4000	12 VDC (9 - 18 VDC)	3.3 VDC	0mA	4000mA	50mVp-p	30mA	1467mA	79%	10200uF
DM12S5-3000		5 VDC	15mA	3000mA	50mVp-p	25mA	1603mA	82%	7050uF
DM12S12-1250		12 VDC	0mA	1250mA	50mVp-p	25mA	1524mA	86%	1035uF
DM12S15-1000		15 VDC	0mA	1000mA	50mVp-p	20mA	1524mA	86%	705uF
DM12D5-1500		± 5 VDC	0mA	± 1500mA	75mVp-p	20mA	1582mA	83%	± 1020uF
DM12D12-625		± 12 VDC	0mA	± 625mA	75mVp-p	30mA	1524mA	86%	± 495uF
DM12D15-500	24 VDC (18 - 36 VDC)	± 15 VDC	± 10mA	± 500mA	75mVp-p	35mA	1563mA	84%	± 165uF
DM24S3.3-4000		3.3 VDC	0mA	4000mA	50mVp-p	15mA	724mA	80%	10200uF
DM24S5-3000		5 VDC	15mA	3000mA	50mVp-p	10mA	781mA	84%	7050uF
DM24S12-1250		12 VDC	0mA	1250mA	50mVp-p	20mA	772mA	85%	1035uF
DM24S15-1000		15 VDC	10mA	1000mA	50mVp-p	15mA	772mA	85%	705uF
DM24D5-1500		± 5 VDC	0mA	± 1500mA	75mVp-p	15mA	781mA	84%	± 1020uF
DM24D12-625	48 VDC (36 - 75 VDC)	± 12 VDC	0mA	± 625mA	75mVp-p	25mA	762mA	86%	± 495uF
DM24D15-500		± 15 VDC	0mA	± 500mA	75mVp-p	25mA	762mA	86%	± 165uF
DM48S3.3-4000		3.3 VDC	0mA	4000mA	50mVp-p	10mA	357mA	81%	10200uF
DM48S5-3000		5 VDC	0mA	3000mA	50mVp-p	20mA	396mA	83%	7050uF
DM48S12-1250		12 VDC	10mA	1250mA	50mVp-p	15mA	377mA	87%	1035uF
DM48S15-1000		15 VDC	0mA	1000mA	50mVp-p	15mA	381mA	86%	705uF
DM48D5-1500	48 VDC (36 - 75 VDC)	± 5 VDC	0mA	± 1500mA	75mVp-p	10mA	386mA	85%	± 1020uF
DM48D12-625		± 12 VDC	0mA	± 625mA	75mVp-p	15mA	372mA	88%	± 495uF
DM48D15-500		± 15 VDC	0mA	± 500mA	75mVp-p	15mA	377mA	87%	± 165uF

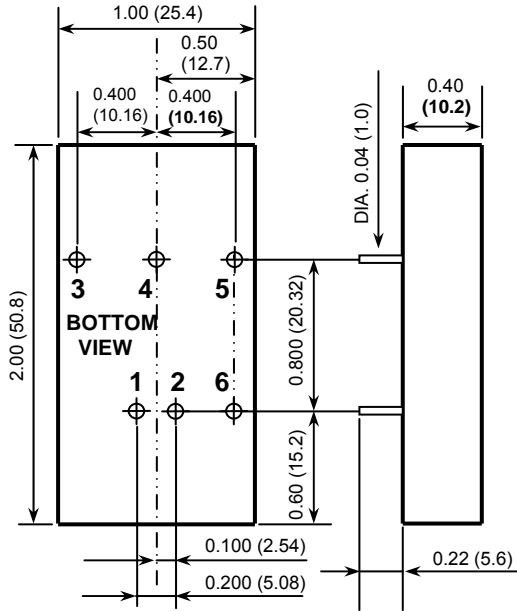
**NOTES**

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
- Maximum value at nominal input voltage and full load
- 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.
- The output requires 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.
- The ON/OFF control pin voltage is referenced to -Vin.  
To order positive logic ON-OFF control add the suffix P (Ex: DM48S5-3000P)  
To order negative logic ON-OFF control add the suffix R (Ex: DM48S5-3000R)
- Heat sink is optional, consult factory.
- The DM Series can meet EN55022 Class A with an external capacitor in parallel with the input pins.  
Recommended: 12Vin: 6.8µF/50V 24Vin: 2.2µF/50V 48Vin: 1.5µF/100V
- An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor Wall Industries suggests: Nippon chemi-con KY Series 220uF/100V ESR 48mΩ.

**DERATING CURVES & EFFICIENCY GRAPHS**



**MECHANICAL DRAWING**

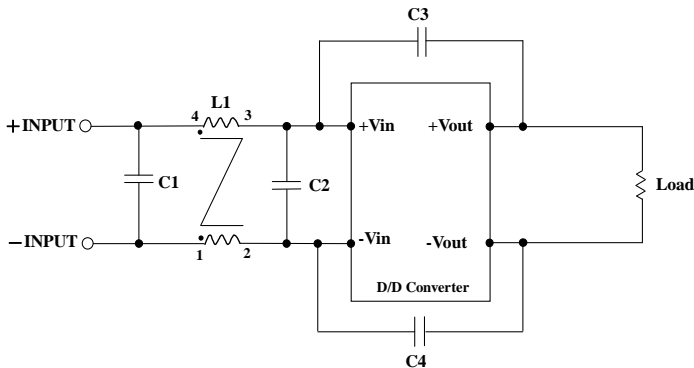


1. All dimensions in Inches (mm)  
Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	+OUTPUT	+OUTPUT
4	NO PIN	COMMON
5	-OUTPUT	-OUTPUT
6	CTRL (Option)	CTRL (Option)

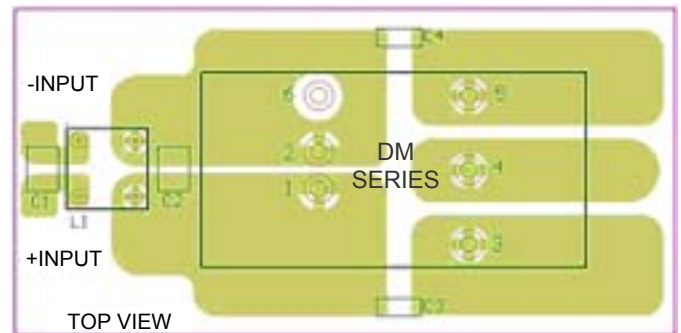
**FIGURE 1**

**Recommended Filter for EN55022 Class B Compliance**



**FIGURE 2**

**Recommended EN55022 Class B Filter Circuit Layout**



The components used in the Figure 1, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
DM12xxx-xxxx	4.7uF/50V	N/A	1000pF/2KV	1000pF/2KV	325uH Common Choke
DM24xxx-xxxx	3.3uF/50V	N/A	1000pF/2KV	1000pF/2KV	325uH Common Choke
DM48xxx-xxxx	2.2uF/100V	2.2uF/100V	1000pF/2KV	1000pF/2KV	325uH Common Choke