



Size: 2in x 2in x 0.40in (50.8mm x 50.8mm x 10.2mm)

FEATURES

- Single Outputs
- High Efficiency up to 91%
- RoHS & REACH Compliant
- 1600VDC Isolation Voltage
- No Minimum Load Required
- Six-Sided Shielding
- 2:1 Wide Input Voltage Range
- Remote On/Off
- 60 Watts Maximum Output power
- IEC/UL/EN60950-1

APPLICATIONS

- Automation
- Datacom
- IPC
- Industrial
- Measurement
- Telecom

DESCRIPTION

The DD Series offers 60 watts of output power from a 2 x 2 x 0.4 inch package. The DD series operates off 2:1 wide input voltage ranges of 18-36VDC and 36-75VDC and features 1600VDC of isolation, short-circuit, over load, over temperature, and over-voltage protection, as well as six sided shielding. This series has IEC/UL/EN60950-1 safety approvals and is RoHS and REACH compliant.

MODEL SELECTION TABLE

Model Number	Input Range	Output Voltage	Output Current	Output Ripple & Noise	No Load Input Current	Efficiency	Max Capacitive Load
DD24S3.3-14000	24VDC (18 – 36 VDC)	3.3VDC	14,000mA	75mVp-p	100mA	89%	36000µF
DD24S5-12000		5VDC	12,000mA	75mVp-p	130mA	90%	20400µF
DD24S12-5000		12VDC	5000mA	100mVp-p	50mA	90%	3550µF
DD24S15-4000		15VDC	4000mA	100mVp-p	50mA	90%	2300µF
DD24S24-2500		24VDC	2500mA	200mVp-p	50mA	89%	885µF
DD48S3.3-14000	48VDC (36 – 75 VDC)	3.3 VDC	14,000mA	75mVp-p	80mA	89%	36000µF
DD48S5-12000		5 VDC	12,000mA	75mVp-p	90mA	91%	20400µF
DD48S12-5000		12 VDC	5000mA	100mVp-p	30mA	90%	3550µF
DD48S15-4000		15 VDC	4000mA	100mVp-p	30mA	90%	2300µF
DD48S24-2500		24VDC	2500mA	200mVp-p	30mA	90%	885µF

SPECIFICATIONS

All specifications are typical at 25°C, Nominal Input, and Full Load unless otherwise noted.
 We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS					
Operating Input Voltage Range	24Vin(nom)	18	24	36	VDC
	48Vin(nom)	36	48	75	
Start-Up Voltage	24Vin(nom)			18	VDC
	48Vin(nom)			36	
Shutdown Voltage	24Vin(nom)	14.5	15.5	17.5	VDC
	48Vin(nom)	31	32	35.5	
Start-Up Time	Constant resistive load	Power up		20	ms
		Remote ON/OFF		20	
Input Surge Voltage	100 ms, max.	24Vin(nom)		50	VDC
		48Vin(nom)		100	
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	-0.5		+0.5	%
Voltage Adjustability	24Vout	-10		+20	%
	Others	-10		+10	
Output Power				60	W
Output Current		See Table			
Maximum Capacitive Load		See Table			
Ripple & Noise	Measured by 20MHz bandwidth	See Table			
Transient Response Recovery Time	25% load step change		250		µs
Temperature Coefficient		-0.02		+0.02	%/°C

SPECIFICATIONS

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SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
REMOTE ON/OFF CONTROL⁽¹⁾						
Positive Logic (Standard)	DC-DC ON				Open or 3~12VDC	
	DC-DC OFF				Short or 0~1.2VDC	
Negative Logic (Optional)	DC-DC ON				Short or 0~1.2VDC	
	DC-DC OFF				Open or 3~12VDC	
Input Current of Ctrl Pin			-0.5		+1.0	mA
Remote Off Input Current				4.0		mA
PROTECTION						
Short Circuit Protection	Continuous				Automatic Recovery	
Over Load Protection	% of Iout Rated				150	%
Over Voltage Protection	3.3Vout		3.7		5.4	VDC
	5Vout		5.6		7.0	
	12Vout		13.8		17.5	
	15Vout		16.8		20.5	
	24Vout		30.0		33.0	
Over Temperature Protection				+120		°C
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature	Without Derating		-40		+40	°C
	With Derating		+40		+110	
Maximum Case Temperature					+110	°C
Storage Temperature Range			-55		+125	°C
Relative Humidity			5		95	%RH
Thermal Impedance	Without Heatsink			10.5		°C/W
	With Heatsink			8.4		
Thermal Shock				MIL-STD-810F		
Vibration				MIL-STD-810F		
MTBF	MIL-HDBK-217F, Full Load			408,900		Hours
GENERAL SPECIFICATIONS						
Efficiency				See Table		
Switching Frequency			270	300	330	kHz
Isolation Voltage	1 minute	Input to Output	1600			VDC
		Input (Output) to Case	1600			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					1500	pF
PHYSICAL SPECIFICATIONS						
Weight				60g (2.11oz)		
Dimensions (L x W x H)				2in x 2in x 0.4in (50.8mm x 50.8mm x 10.2mm)		
Case Material				Nickel-Coated Copper		
Base Material				FR4 PCB		
Potting Material				Epoxy (UL94 V-0)		
Shielding				Six-Sided		
Case Grounding				Connect Case to -Vin with decoupling Y Cap		
SAFETY CHARACTERISTICS						
Safety Approvals			IEC/UL/EN60950-1 ⁽²⁾			CB: UL (Demko)
EMI	EN55032	With external components				Class A, Class B
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	EN61000-4-4	±2kV ⁽³⁾				Perf. Criteria A
Surge	EN61000-4-5	±1kV ⁽³⁾				Perf. Criteria A
Conducted Immunity	EN61000-4-6	10Vr.m.s				Perf. Criteria A
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second				Perf. Criteria A

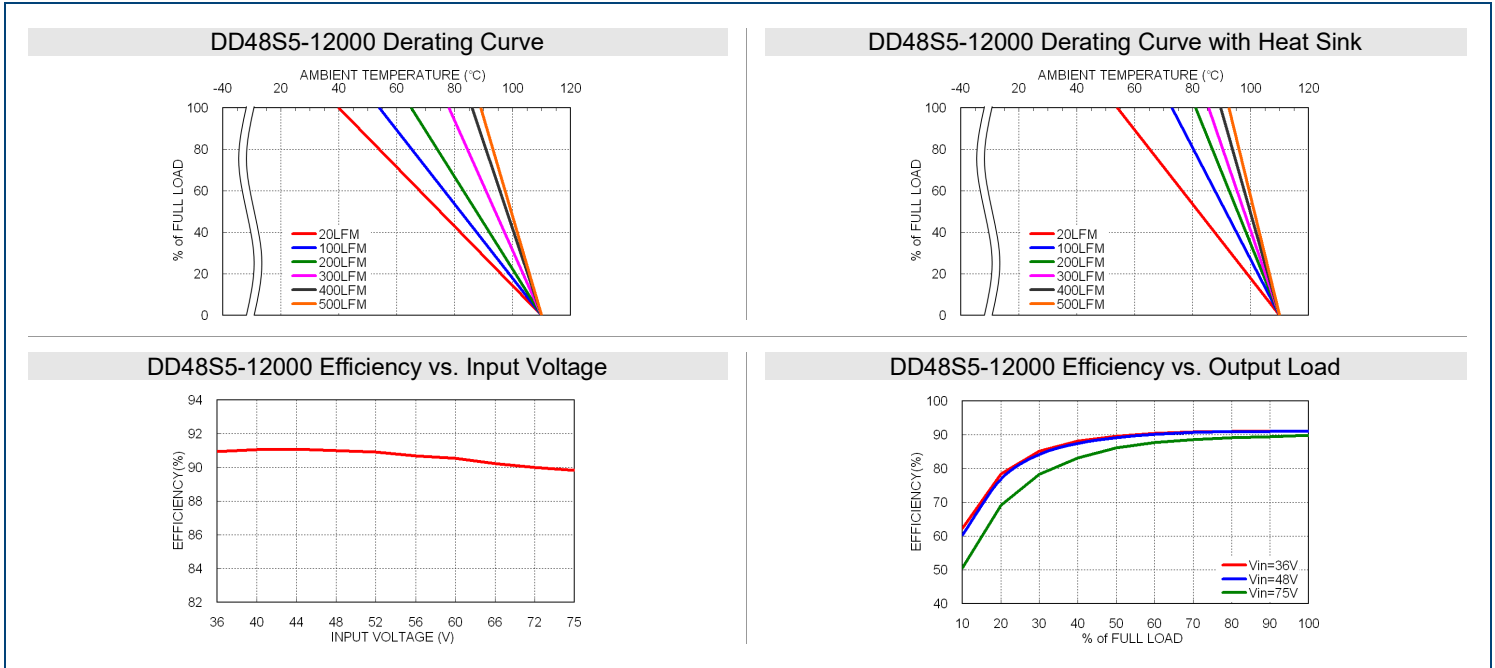
NOTES

1. Referred to -Vin pin
2. This product is Listed to applicable standards and requirements by UL.
3. With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V).

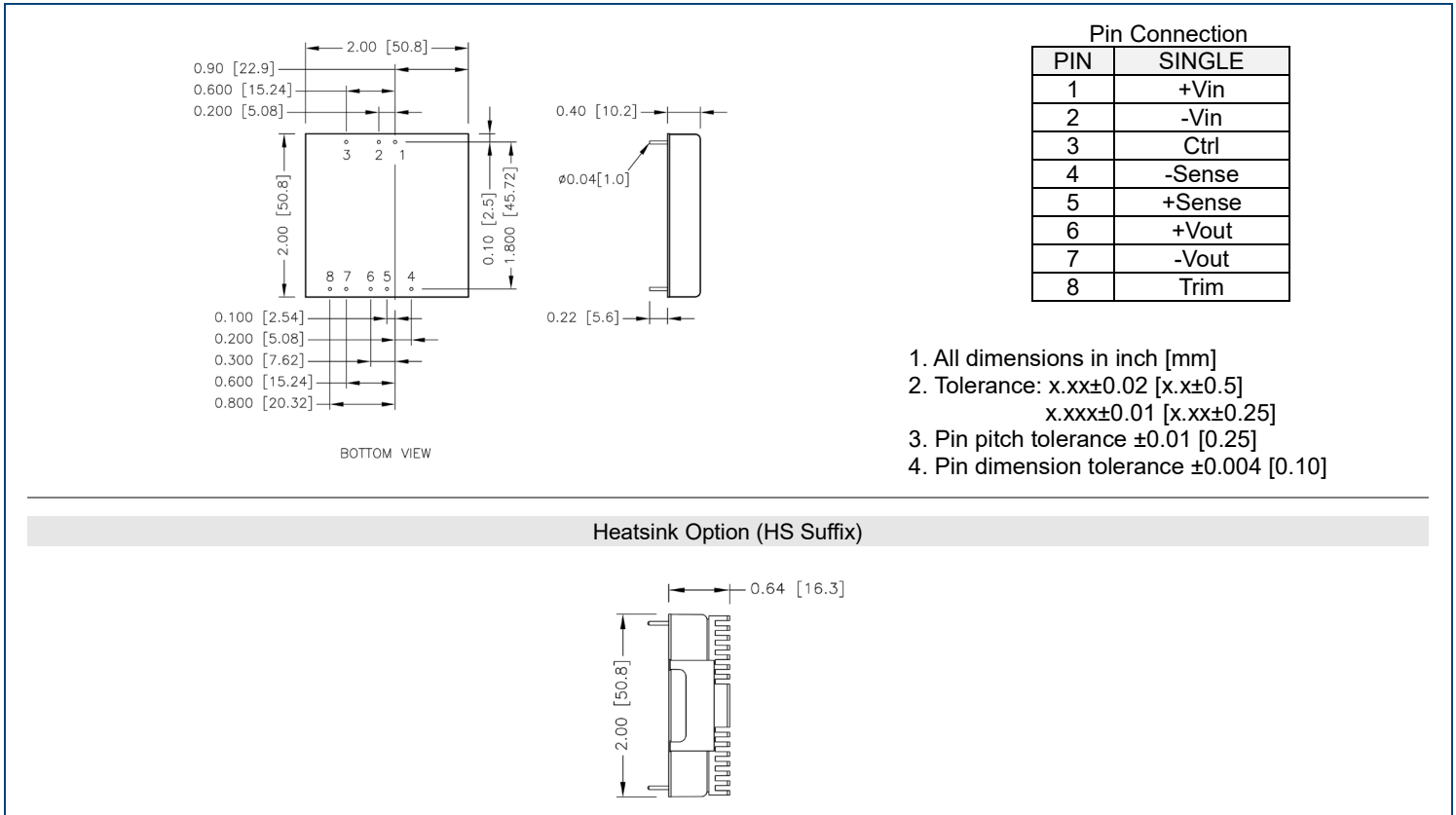
CAUTION: This power module is not internally fused. An input line fuse must always be used.

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

CHARACTERISTIC CURVES



MECHANICAL DRAWINGS



*All dimensions in inch [mm]

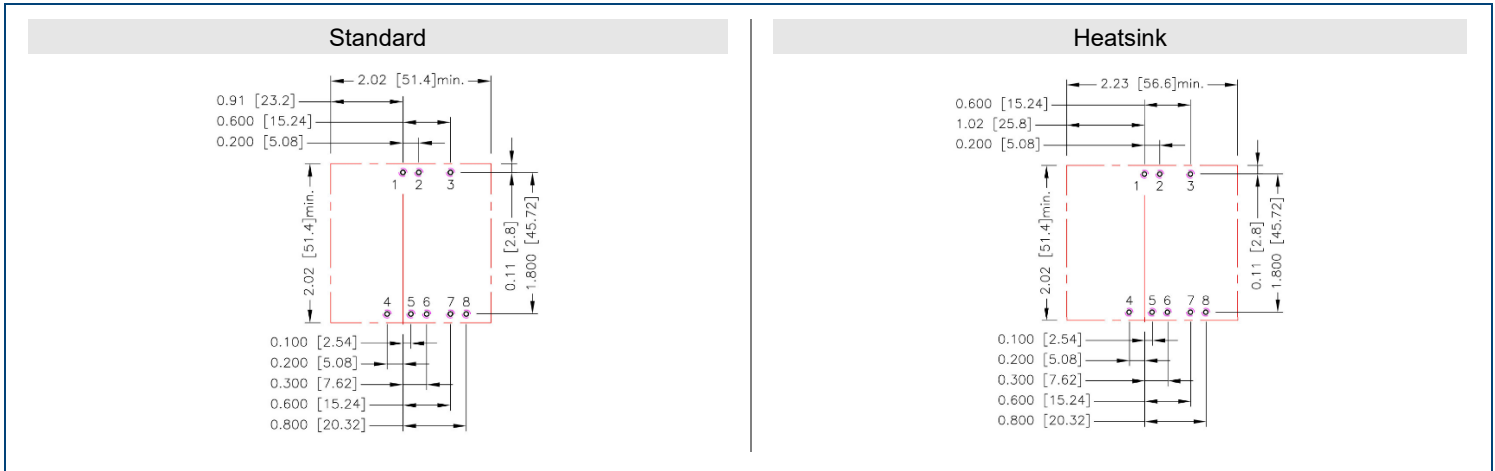
FUSE CONSIDERATION

The power module is not internally fused. An input line fuse must always be used. The encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse. The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
DD24S□□	6.3	Slow-Blow
DD48S□□	3.15	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

RECOMMENDED PAD LAYOUT

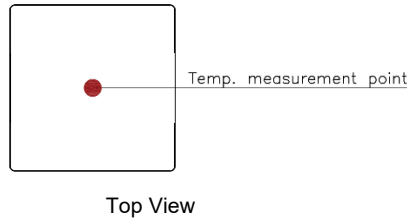


All dimensions in inch[mm]
 Pad size(lead free recommended)
 Through hole 1.2.3.4.5.6.7.8: Ø0.051[1.30]
 Top view pad 1.2.3.4.5.6.7.8: Ø0.064[1.63]
 Bottom view pad 1.2.3.4.5.6.7.8: Ø0.102[2.60]

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point in the figure below. The temperature at this location should not exceed 110°C. When operating, adequate cooling must be provided to maintain the test point temperature at or below 110°C. Although the maximum point temperature of the power modules is 110°C, you can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM).



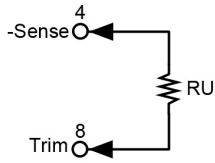
OUTPUT VOLTAGE ADJUSTMENT

Output voltage set point adjustment 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 +Sense or -Sense pins. With an external resistor between the Trim and -Sense, the output voltage set point increases. With an external resistor between the Trim and +Sense, the output voltage set point decreases. The external Trim resistor needs to be at least 1/16W resistors.

EXTERNAL OUTPUT TRIMMING

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

Trim-Up



3.3V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630
RU (k Ω)	57.930	26.165	15.577	10.283	7.106	4.988	3.476	2.341	1.459	0.753

5V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500
RU (k Ω)	36.570	16.580	9.917	6.585	4.586	3.253	2.302	1.588	1.032	0.588

12V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
RU (k Ω)	367.910	165.950	98.636	64.977	44.782	31.318	21.701	14.488	8.879	4.391

15V Output Models

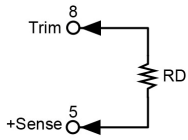
ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
RU (k Ω)	404.180	180.590	106.060	68.796	46.437	31.531	20.883	12.898	6.687	1.718

24V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	24.240	24.480	24.720	24.960	25.200	25.440	25.680	25.920	26.160	26.400
RU (k Ω)	1275.226	606.613	383.742	272.306	205.445	160.871	129.032	105.153	86.581	71.723

ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	26.640	26.880	27.120	27.360	27.600	27.840	28.080	28.320	28.560	28.800
RU (k Ω)	59.566	49.435	40.864	33.516	27.148	21.577	16.660	12.290	8.380	4.861

Trim-Down



3.3V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.970
RD (kΩ)	69.470	31.235	18.490	12.117	8.294	5.745	3.924	2.559	1.497	0.647

5V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	4.950	4.900	4.850	4.800	4.750	4.700	4.650	4.600	4.550	4.500
RD (kΩ)	45.533	20.612	12.306	8.152	5.660	3.999	2.812	1.922	1.230	0.676

12V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
RD (kΩ)	460.990	207.950	123.600	81.423	56.118	39.249	27.199	18.162	11.132	5.509

15V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500
RD (kΩ)	499.820	223.410	131.270	85.204	57.563	39.136	25.974	16.102	8.424	2.282

24V Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	23.760	23.520	23.280	23.040	22.800	22.560	22.320	22.080	21.840	21.600
RD (kΩ)	838.174	376.787	222.991	146.094	99.955	69.196	47.225	30.747	17.930	7.677

MODEL NUMBER SETUP

DD	24	S	5	-	12000	R	HS
Series Name	Input Voltage	Output Quantity	Output Voltage		Ouptut Current	Remote On/Off	Heatsink
	24: 24VDC 48: 48VDC	S: Single	3.3: 3.3 VDC 5: 5VDC 12: 12VDC 15: 15VDC 24: 24VDC		14000: 14,000mA 12000: 12,000mA 5000: 5000mA 4000: 4000mA 2500: 2500mA	Blank: Positive Logic R: Negative Logic	Blank: None HS: 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: 2015 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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