DL03S/D Series

3W DC/DC CONVERTER, DIP-Package, 4:1 Wide Input Range

FEATURES

- Efficiency up to 84%
  DIP Package with Industry Standard Pinout
- Ultra-wide 4:1 Input Range
- Isolation Volage 1500VDC
- Operating Temperature Range –40°C to +85°C
- Complies with EN55022 Class A
- Short Circuit Protection
- CSA 60950-1 Safety Approval
- 3 Years Product Warranty

The DL03S/D series are miniature, DIP Package, isolated 3W DC/DC converters with 1,500VDC isolation. The DL03S/D series feature fully regulated output and ultra wide 4:1 input voltage ranges. It offers short circuit protection and allows a wide operating temperature range of –40°C to +85°C. These isolated DC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. With creative design technology and optimization of component placement, these converters possess outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions.

Model List

Model Number	Input Voltage (Range)	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Max. capacitive Load	Efficiency (typ.)
			Max.	Min.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA	mA(typ.)	mA(typ.)	mA(typ.)	μF	%
DL03S2403A	24 (9 ~ 36)	3.3	750	93	138	20	15	680	75
DL03S2405A		5	600	75	158			470	79
DL03S2412A		12	250	32	154			330	81
DL03S2415A		15	200	25	152			220	82
DL03D2412A		±12	±125	±16	156			150*	80
DL03D2415A		±15	±100	±13	156			100*	80
DL03S4803A	48 (18 ~ 75)	3.3	750	93	68	10	10	680	76
DL03S4805A		5	600	75	78			470	80
DL03S4812A		12	250	32	75			330	83
DL03S4815A		15	200	25	74			220	84
DL03D4812A		±12	±125	±16	76			150*	82
DL03D4815A		±15	±100	±13	76			100*	82

* For each output

Input Characteristics

Parameter	Model	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	24V Input Models	-0.7	---	50	VDC
	48V Input Models	-0.7	---	100	
Start-Up Threshold Voltage	24V Input Models	6	7.5	9	
	48V Input Models	12	15	18	
Under Voltage Shutdown	24V Input Models	---	---	8.5	
	48V Input Models	---	---	16	
Reverse Polarity Input Current	All Models	---	---	0.5	A
Short Circuit Input Power		---	---	2000	mW
Internal Power Dissipation		---	---	2500	mW
Conducted EMI		Compliance to EN 55022,class A and FCC part 15,class A			

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Output Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Setting Accuracy	At 50% Load and Nominal Vin	---	---	±2.0	%Vom.
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.5	±3.0	%
Line Regulation	Vin=Min. to Max.	---	±0.2	±1.0	%
Load Regulation	Io=Min. to Max.	---	±0.3	±1.0	%
Ripple & Noise (20MHz)		---	40	75	mV_{P-P}
Transient Recovery Time	25% Load Step Change	---	150	500	µsec
Transient Response Deviation		---	±3	---	%
Temperature Coefficient		---	±0.01	±0.02	%/℃
Over Load Protection	Foldback	110	300	---	%
Short Circuit Protection	Continuous				

General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	1500	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V	---	380	500	pF
Switching Frequency		---	350	---	KHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	1,000,000	---	---	Hours
Safety Approvals	UL/cUL 60950-1 recognition(CSA certificate), IEC/EN 60950-1				

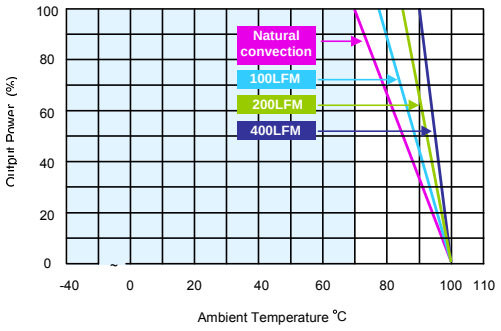
Recommended Iput Fuse

24V Input Models	48V Input Models
1000mA Slow-Blow Type	500mA Slow-Blow Type

Environmental Characteristics

Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	Natural Convection	-40	+85	℃
Case Temperature		---	+90	℃
Storage Temperature Range		-50	+125	℃
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	℃

Power Derating Curve



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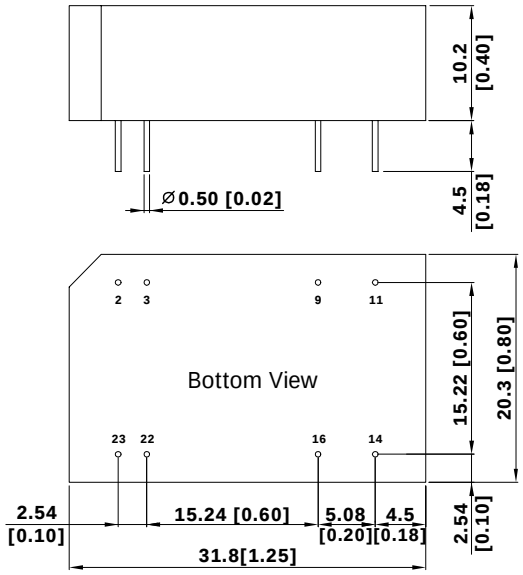
Notes

1 Specifications typical at Ta=+25℃, resistive load, nominal input voltage and rated output current unless otherwise noted.
2 Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%
3 Ripple & Noise measurement bandwidth is 0-20MHz.
4 These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
5 All DC/DC converters should be externally fused at the front end for protection.
6 That “natural convection” is about 20LFM but is not equal to still air (0 LFM).
7 Specifications subject to change without notice.

Package Specifications

Mechanical Dimensions



Pin Connections

Pin	Single Output	Dual Output
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

NC: No Connection

▶All dimensions in mm (inches)
▶Tolerance: X.X±0.25 (X.XX±0.01)
X.XX±0.13 (X.XXX±0.005)
▶Pin diameter ⇔ 0.5 ±0.05 (0.02±0.002)

Physical Outline

Case Size	:	31.8x20.3x10.2mm (1.25x0.80x0.40 inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Pin Material	:	phosphor bronze
Weight	:	12.2g

Part Numbering System

D	L	03	S	24	05	A
Form factor	Family series	Watt	Number of Outputs	Input Voltage	Output Voltage	Option Code
D-DIP	A~Z	01:1W	S - Single	03:3.3V	03:3.3V	A - Std. Functions
P-SIP		02:2W	D- Dual	05: 5V	05: 5V	
S-SMD		03:3W		12:12V	12:12V	
		04:4W		24: 24V	15: 15V	
		06:6W		48:48V	24: 24V	

WARRANTY

Delta offers a three(3) years limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

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