DN03S/D Series

DC/DC CONVERTER 2-3W, DIP-Package



FEATURES

- DIP-24 Plastic Package
- Wide 2:1 Input Range
- Operating Temp.Range -40 to +85°C
- Overload Protection
- No Minimum Load Requirement
- Isolation voltage (optional)
  1500VDC for DN03S/DXXXXA
  3000VDC for DN03S/DXXXXH
- Input Filter meets EN55022,class A and FCC,level A
- Fully compatible with DE03S/D Series
- 3 Years Product Warranty

Security Lab Medical Metro Data Center Telecom Industrial Network

The DN03S/D series is a range of high performance dc-dc converter modules, designed as a cost optimized replacement for the highly popular DE03S/D series.The converter features wide 2:1 input ranges and tight output voltage regulation. Excellent efficiency allows an operating temperature up to +70°C at full load.The product comes in a DIP-24 plastic package with industry standard footprint. Typical applications for these economical priced dc-dc converters are industrial electronics,instrumentation or communication equipment.

Model Selection Guide

Model Number	Input Voltage (Range)	Output Voltage	Output Current	Input Current		Reflected Ripple Current	Max. capacitive Load	Efficiency (typ.)
			Max.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	mA(typ.)	μF	%
DN03S0503A DN03S0503H	5 (4.5 ~ 9)	3.3	600	514	65	100	680	77
DN03S0505A DN03S0505H		5	500	641			470	78
DN03S0512A DN03S0512H		12	250	732			330	82
DN03S0515A DN03S0515H		15	200	732			220	82
DN03S0524A DN03S0524H		24	125	741			100	81
DN03D0505A DN03D0505H		±5	±250	649			220#	77
DN03D0512A DN03D0512H		±12	±125	741			150#	81
DN03D0515A DN03D0515H		±15	±100	741			100#	81
DN03S1203A DN03S1203H	12 (9 ~ 18)	3.3	600	209	35	30	680	79
DN03S1205A DN03S1205H		5	500	257			470	81
DN03S1212A DN03S1212H		12	250	294			330	85
DN03S1215A DN03S1215H		15	200	294			220	85
DN03S1224A DN03S1224H		24	125	298			100	84
DN03D1205A DN03D1205H		±5	±250	260			220#	80
DN03D1212A DN03D1212H		±12	±125	298			150#	84
DN03D1215A DN03D1215H		±15	±100	298			100#	84

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			Max.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	mA(typ.)	μF	%
DN03S2403A DN03S2403H	24 (18 ~ 36)	3.3	600	104	20	15	680	79
DN03S2405A DN03S2405H		5	500	129			470	81
DN03S2412A DN03S2412H		12	250	147			330	85
DN03S2415A DN03S2415H		15	200	147			220	85
DN03S2424A DN03S2424H		24	125	149			100	84
DN03D2405A DN03D2405H		±5	±250	130			220#	80
DN03D2412A DN03D2412H		±12	±125	149			150#	84
DN03D2415A DN03D2415H		±15	±100	149			100#	84
DN03S4803A DN03S4803H	48 (36 ~75)	3.3	600	52	15	10	680	79
DN03S4805A DN03S4805H		5	500	64			470	81
DN03S4812A DN03S4812H		12	250	74			330	85
DN03S4815A DN03S4815H		15	200	74			220	85
DN03S4824A DN03S4824H		24	125	74			100	84
DN03D4805A DN03D4805H		±5	±250	65			220#	80
DN03D4812A DN03D4812H		±12	±125	74			150#	84
DN03D4815A DN03D4815H		±15	±100	74			100#	84

For each output

Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7	---	11	VDC
	12V Input Models	-0.7	---	25	
	24V Input Models	-0.7	---	50	
	48V Input Models	-0.7	---	100	
Start-Up Threshold Voltage	5V Input Models	---	---	4.5	
	12V Input Models	---	---	9	
	24V Input Models	---	---	18	
	48V Input Models	---	---	36	
Under Voltage Shutdown	5V Input Models	---	---	4	
	12V Input Models	---	---	8.5	
	24V Input Models	---	---	17.5	
	48V Input Models	---	---	35.5	
Internal Filter Type	All Models	Pi Filter			
Short Circuit Input Power		---	---	2000	mW
Internal Power Dissipation		---	---	1200	mW

Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Setting Accuracy		---	---	±2.0	%Vnom.
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.5	±2.0	%
Line Regulation	Vin=Min. to Max.	---	±0.3	±1.0	%
Load Regulation	Io=0% to 100%	---	±0.3	±1.0	%
Min.Load	No minimum Load Requirement				
Ripple & Noise	0-20 MHz Bandwidth	---	---	70	mV_{P-P}
Transient Recovery Time	25% Load Step Change	---	300	500	µsec
Transient Response Deviation		---	±3	±5	%
Temperature Coefficient		---	±0.01	±0.02	%/℃
Over Load Protection	Foldback	120	150	---	%
Short Circuit Protection	Continuous				

General Specifications

Parameter	Conditions		Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	Standard	1500	---	---	VDC
		Suffix H (6)	3000	---	---	VDC
I/O Isolation Resistance	500 VDC		1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V		---	---	300	pF
Switching Frequency			90	---	---	KHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign		1,000,000			Hours
Safety Approvals (Pending)	UL/cUL 60950-1 recognition(UL certificate), IEC/EN 60950-1					

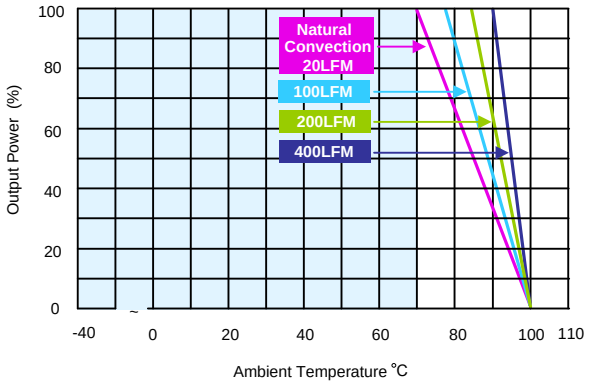
Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	Natural Convection	-40	+85	℃
Case Temperature		---	+100	℃
Storage Temperature Range		-50	+125	℃
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	℃

EMC Specifications

Parameter	Standards & Level	Performance
Conducted EMI	Compliance to EN 55022 and FCC part 15	Class A
ESD	EN61000-4-2 air ± 8KV , Contact ± 6KV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10V/m	Perf. Criteria A
Fast transient (5)	EN61000-4-4 ± 2KV	Perf. Criteria A
Surge (5)	EN61000-4-5 ±1KV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10V/m	Perf. Criteria A

Power Derating Curve

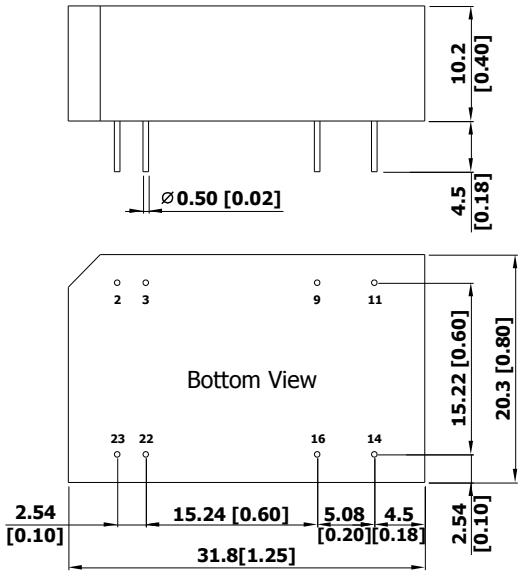


Notes

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. We recommend to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltage may be available, please contact factory.
5. To meet EN61000-4-4 & EN61000-4-5 an external capacitor across the input pins is required. Suggested capacitor: CHEMI-CON KY 220μF/100V
6. That “natural convection” is about 20LFM but is not equal to still air (0 LFM).
7. Specifications are 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±0.5 (X.XX±0.02)
  X.XX±0.25 (X.XXX±0.01)
- ▸Pin diameter ⇔ 0.5 ±0.05 (0.02±0.002)

Physical Characteristics

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	:	Copper Alloy with Gold Plate Over Nickel Subplate
Weight	:	12.8g

Part Numbering System

D	N	03	S	05	03	A
Product typ	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 - PCB Mount
P - SIP		02 - 2W	D - Dual	05 - 5V	05 - 5V	H - High Isolation
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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