



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



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

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	%			
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	%/°C
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°C, 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	°C
Case Temperature		---	+100	°C
Storage Temperature Range		-50	+125	°C
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	°C

EMC Specifications

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

Power Derating Curve

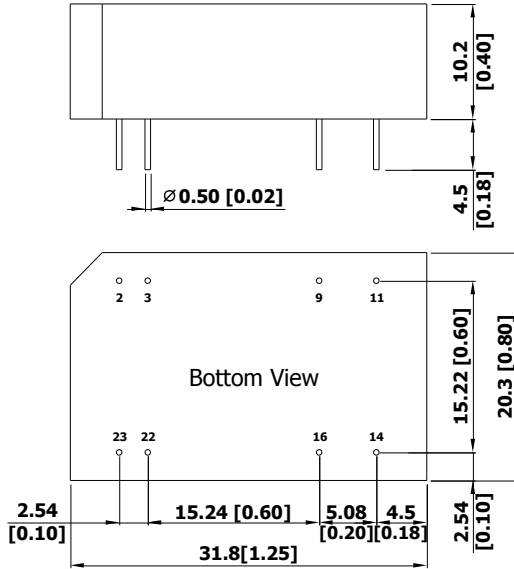


Notes

- Specifications typical at $T_a = +25^\circ\text{C}$, resistive load, nominal input voltage and rated output current unless otherwise noted.
- Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%
- We recommend to protect the converter by a slow blow fuse in the input supply line.
- Other input and output voltage may be available, please contact factory.
- To meet EN61000-4-4 & EN61000-4-5 an external capacitor across the input pins is required. Suggested capacitor: CHEMI-CON KY 220 $\mu\text{F}/100\text{V}$
- That "natural convection" is about 20LFM but is not equal to still air (0 LFM).
- 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 $\varnothing 0.5 \pm 0.05$ (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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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А