PH02S/D Sries

2W DC/DC CONVERTER, SIP-Package, 4:1 Ultra Wide Input Range

FEATURES

- Efficiency up to 80%
- SIP Package with Standard Pinout
- Fully Regulated Output
- Operating Temperature Range -40°C to +85°C
- Ultra-wide 4:1 Input Range
- Isolation Voltage 1500 VDC
- Short circuit protection
- Lead free, RoHs compliant
- 3 Years Product Warranty

Security Lab Medical Metro Data Center Telecom Industrial Network

The PH02S/D series are miniature, SIP Package, isolated 2W DC/DC converters with 1,500VDC isolation. The PH02S/D series features fully regulated output and wide 4:1 input voltage ranges. The most convenient advantage is the modules with a small footprint occupying only 2.4 cm2 (0.36 square in.) on the PCB. 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

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.)	uF	%
PH02S2403A	24 (9 ~ 36)	3.3	500	125	97	20	300	2200	71
PH02S2405A		5	400	100	110			1000	76
PH02S2412A		12	167	42	106			170	79
PH02S2415A		15	134	33	105			110	80
PH02D2405A		±5	±200	±50	114			470*	73
PH02D2412A		±12	±83	±21	108			100*	77
PH02D2415A		±15	±67	±17	106			47*	79
PH02S4803A	48 (18 ~ 75)	3.3	500	125	49	15	600	2200	70
PH02S4805A		5	400	100	58			1000	72
PH02S4812A		12	167	42	54			170	78
PH02S4815A		15	134	33	54			110	78
PH02D4805A		±5	±200	±50	60			470*	70
PH02D4812A		±12	±83	±21	55			100*	76
PH02D4815A		±15	±67	±17	55			47*	76

* For each output

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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 Voltage	24V Input Models	4.5	6	8.5	
	48V Input Models	8.5	12	17	
Under Voltage Shutdown	24V Input Models	---	---	8	
	48V Input Models	---	---	16	
Reverse Polarity Input Current	All Models	---	---	0.5	A
Short Circuit Input Power		---	---	1500	mW
Input Filter		Capacitor type			
Internal Power Dissipation		---	---	2500	mW

Output Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	±1.0	±2.0	%
Output Voltage Balance	Dual Output, Balanced Loads	---	±1.0	±2.0	%
Line Regulation	Vin=Min. to Max.	---	±0.3	±0.5	%
Load Regulation	Io=25% to 100%	---	±0.5	±0.75	%
Ripple & Noise (20MHz)		---	30	50	mV P-P
Ripple & Noise (20MHz)	Over Line, Load & Temp.	---	---	75	mV P-P
Ripple & Noise (20MHz)		---	---	15	mV rms
Transient Recovery Time	25% Load Step Change	---	100	300	uS
Transient Response Deviation		---	±3	±5	%
Temperature Coefficient		---	±0.01	±0.02	%/℃
Output Short Circuit	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	---	250	500	pF
Switching Frequency		---	300	---	KHz
MTBF (Calculated)	MIL-HDBK-217F@25℃, Ground Benign	1,000,000	---	---	Hours

Recommended Input Fuse

24V Input Models	48V Input Models
350mA Slow-Blow Type	135mA Slow-Blow Type

Remote On/Off Control

Parameter	Conditions	Min.	Typ.	Max.	Unit
Converter On	Under 0.6 VDC or Open Circuit, drops down to 0VDC by 2mV/℃				
Converter Off	2.9 to 15 VDC				
Standby Input Current		---	1	3	mA
Control Input Current (on)	Vin = 0V	---	---	-1	mA
Control Input Current (off)	Vin = 5.0V	---	---	1	mA
Control Common	Referenced to Negative Input				

Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature Range (with Derating)	Ambient	-40	+85	℃
Case Temperature		---	+90	℃
Storage Temperature Range		-55	+105	℃
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for		---	260	℃

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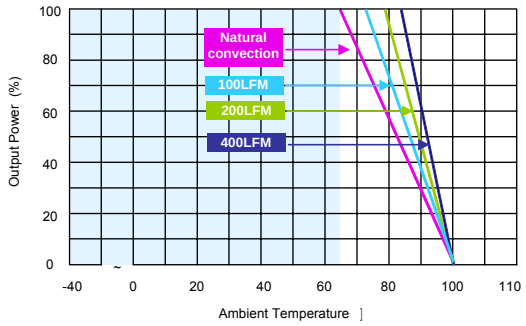
Power Derating Curve

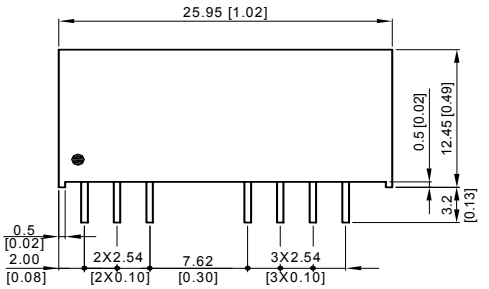


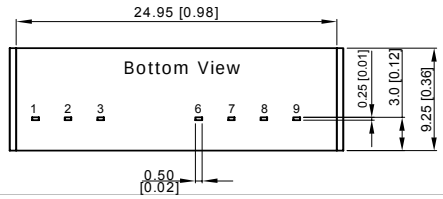
Notes

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 Ripple & Noise measurement bandwidth is 0-20 MHz.
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 Specifications subject to change without notice.

Mechanical Drawing

Mechanical Dimensions





Pin Connections

Pin	Single Output	Dual Output
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote	Remote
6	+Vout	+Vout
7	NC	Common
8	NC	NC
9	-Vout	-Vout

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)
- Pins ±0.1(±0.004)

Physical Outline

Case Size	:	25.95x9.25x12.45 mm (1.02x0.36x0.49 inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Weight	:	6.5g

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Part Numbering System

P	H	02	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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