C&D TECHNOLOGIES
Power Solutions

NPH25S SERIES

Isolated 25W Single Output DC-DC Converters

FEATURES

- High Efficiency to 89%
- Power Density up to 1.78W/cm³ (28W/in³)
- 1.5kV Input to Output Isolation
- Industry Standard Pinout
- UL 1950 Recognised
- Non Latching Current Limit
- Constant 350kHz Frequency
- Versatile Control Options
- Continuous Rating to 30W at 60°C Without Heatsink
- Operation to Zero Load
- Protected Against All Load Faults
- Internal Over Temperature Protection
- Uses No Electrolytic Capacitors
- UL 94V-0 Package Materials

DESCRIPTION

The NPH25S series of DC-DC Converters combines ease of application with versatility. The pin pattern is based on the popular industry standard, but two additional pins may optionally be fitted to provide a variety of features not commonly found on units of this type. High efficiency enables full rating to be achieved in a small package without heatsinking, and a high surge capability will provide for start-up and transient loads, whilst being thermally protected against sustained overload. Overload protection of the "constant current" type ensures start-up into complex load conditions. The copper case achieves efficient heat transfer and screening. The product range has been recognised by Underwriters Laboratory (UL) to UL 1950 for operational insulation, file number E179522 applies.

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UL 1950 RECOGNISED
File Number E179522.

www.dc-dc.com

SELECTION GUIDE

	Nominal Input Voltage	Output Voltage	Output Current	Efficiency
Order Code[1]	(V)	(V)	(A)	(%)
NPH25S2403i	24	3.4	7.3	81
NPH25S2405i	24	5.1	5.0	84
NPH25S2412i	24	12.1	2.1	86
NPH25S2415i	24	15.1	1.7	87
NPH25S4803i	48	3.4	7.3	83
NPH25S4805i	48	5.1	5.0	85
NPH25S4812i	48	12.1	2.1	88
NPH25S4815i	48	15.1	1.7	89

INPUT CHARACTERISTICS

Parameter	Conditions	MIN	NOM	MAX	Units
Voltage Range	Continuous operation, 24V input types	18	24	36	V
	Continuous operation, 48V input types	36	48	75	

OUTPUT CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Voltage Set Point Error	50% load			0.5	%
Overall Voltage Error	Case temperature –40°C to 110°C Load 0% - 100% Input specified range			2.5	%
Temperature Coefficient of Output Voltage (slope)				250	ppm°C
Deviation of Output Voltage	Temperature MIN-MAX		0.5	1	%
Line Regulation	Operating voltage range, 50% load			0.1	%
Load Regulation	0% - 100% rated load[2]			0.5	%
Ripple	rms		70		mV

CONTROL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Voltage Trimming Range	At rated load, Trim control at either output	±10			%
Remote Switch Input[3] (voltage relative to input negative)	Not operating	-15	0	1.5	V
	Operating, open circuit voltage	9	10	11	
Start Delay	Time from application of valid input voltage to output being in specification		25	50	mS
Synchronisation[3]	Specified drive signal	320		440	kHz
Switching Frequency		330	350	395	kHz

ABSOLUTE MAXIMUM RATINGS

Input voltage, 24V input types	–0.5V to 40V[4]
Input voltage, 48V input types	–0.5V to 80V[4]
Output Voltage	–0.3V to regulated voltage
Output trim control	–1V to +30V
Synchronisation/shutdown control	±15V relative to input return

ISOLATION CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Isolation Voltage	Flash tested for 1 second	1500			VDC
Resistance	Viso=500VDC	1	4000		GΩ

1 1 If optional pins ADJ and SS are required (as indicated in the pin connections diagram) prefix the ending "i" with an E when ordering, e.g. NPH25S4803Ei.

2 A minimum load of 10% of rating is recommended for typical applications.

3 Optional where fitted.

4 Absolute maximum value for 30 seconds. Prolonged operation may damage the product.

All specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

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ENVIRONMENTAL

Parameter	Conditions	MIN	TYP	MAX	Units
Case Temperature	Full load	–40		110	°C
Storage	Absolute MAX internal temperature	–40		125	°C
Relative Humidity	Non condensing 85°C			85	%
Thermal Protection	Operates at case temperature	110			°C

THERMAL CHARACTERISTICS

UL 1950 recognition -

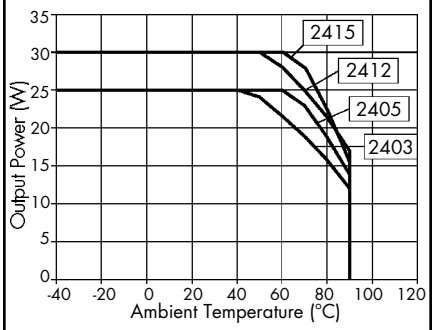
MAX permissible loads for a given ambient temperature for any NPH25S model

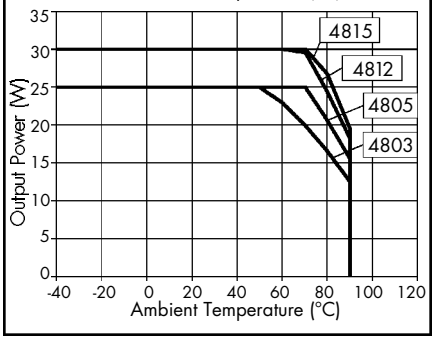
Temperature (°C)	Power (W)	Temperature (°C)	Power (W)
40	25.0	80	13.9
50	22.2	85	12.5
60	19.4	90	11.1
70	16.6		

MAX power rating with case temperature maintained by external means (eg forced air cooling)

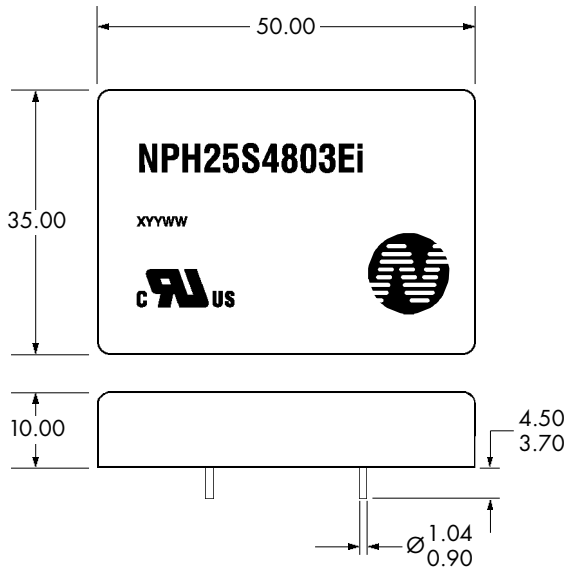
	Case Temperature			
Part Number	100°C	105°C	110°C	Units
NPH25S2403	24	20	15	W
NPH25S2405	25	22	18	
NPH25S2412	30	24	21	
NPH25S2415	30	27	22	
NPH25S4803	25	20	16	W
NPH25S4805	25	24	20	
NPH25S4812	30	29	24	
NPH25S4815	30	30	26	

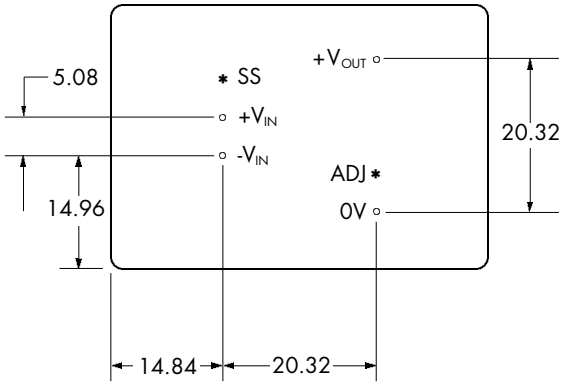
THERMAL PERFORMANCE





MECHANICAL DIMENSIONS





Weight: 45g
All dimensions in mm ±0.25mm
All pins on a 2.54mm pitch and within ±0.25mm of true position
* Optional

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