



P-DUKE POWER

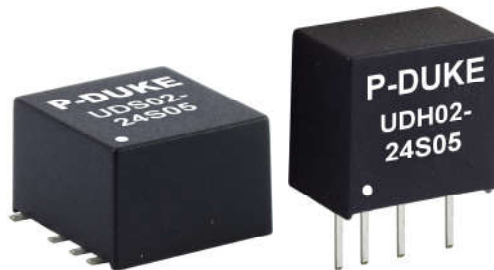
UDS02 · UDH02 Series

DC-DC Converter
Up to 2.01 Watts

3
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway



1600
VDC
Isolation
Voltage

2 : 1
Input
Range

NO
Min. Load
Required

SCP

PART NUMBER STRUCTURE

UDS02 -	48	S	05
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
UDS: SMD type	05:4.5~13.2	S:Single	3P3:3.3
UDH: SIP type	12:9~18		05:5
	24:18~36		09:9
	48:36~75		12:12
			15:15
			24:24
		D: Dual	05:± 5
			12:±12
			15:±15

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	μF
UDS(H)02-05S3P3	4.5 ~ 13.2	3.3	500	55	77	3300
UDS(H)02-05S05	4.5 ~ 13.2	5	400	55	80	1680
UDS(H)02-05S09	4.5 ~ 13.2	9	222	55	80	1000
UDS(H)02-05S12	4.5 ~ 13.2	12	167	65	83	820
UDS(H)02-05S15	4.5 ~ 13.2	15	134	65	82	680
UDS(H)02-05S24	4.5 ~ 13.2	24	83	65	82	220
UDS(H)02-05D05	4.5 ~ 13.2	±5	±200	65	78	±1000
UDS(H)02-05D12	4.5 ~ 13.2	±12	±83	65	82	±470
UDS(H)02-05D15	4.5 ~ 13.2	±15	±67	65	80	±330
UDS(H)02-12S3P3	9 ~ 18	3.3	500	25	77	3300
UDS(H)02-12S05	9 ~ 18	5	400	25	80	1680
UDS(H)02-12S09	9 ~ 18	9	222	25	80	1000
UDS(H)02-12S12	9 ~ 18	12	167	25	84	820
UDS(H)02-12S15	9 ~ 18	15	134	32	83	680
UDS(H)02-12S24	9 ~ 18	24	83	32	83	220
UDS(H)02-12D05	9 ~ 18	±5	±200	32	79	±1000
UDS(H)02-12D12	9 ~ 18	±12	±83	32	83	±470
UDS(H)02-12D15	9 ~ 18	±15	±67	32	81	±330
UDS(H)02-24S3P3	18 ~ 36	3.3	500	15	77	3300
UDS(H)02-24S05	18 ~ 36	5	400	15	78	1680
UDS(H)02-24S09	18 ~ 36	9	222	15	80	1000
UDS(H)02-24S12	18 ~ 36	12	167	15	84	820
UDS(H)02-24S15	18 ~ 36	15	134	15	84	680
UDS(H)02-24S24	18 ~ 36	24	83	15	82	220
UDS(H)02-24D05	18 ~ 36	±5	±200	15	80	±1000
UDS(H)02-24D12	18 ~ 36	±12	±83	15	83	±470
UDS(H)02-24D15	18 ~ 36	±15	±67	15	82	±330
UDS(H)02-48S3P3	36 ~ 75	3.3	500	8	76	3300
UDS(H)02-48S05	36 ~ 75	5	400	8	79	1680
UDS(H)02-48S09	36 ~ 75	9	222	8	80	1000
UDS(H)02-48S12	36 ~ 75	12	167	8	83	820
UDS(H)02-48S15	36 ~ 75	15	134	8	83	680
UDS(H)02-48S24	36 ~ 75	24	83	8	82	220
UDS(H)02-48D05	36 ~ 75	±5	±200	8	78	±1000
UDS(H)02-48D12	36 ~ 75	±12	±83	8	82	±470
UDS(H)02-48D15	36 ~ 75	±15	±67	8	80	±330

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		5Vin(nom)	4.5	5	13.2	VDC
		12Vin(nom)	9	12	18	
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Start up time	Constant resistive load	Power up	5		15	ms
Input surge voltage	1 second, max.	5Vin(nom)			15	VDC
		12Vin(nom)			25	
		24Vin(nom)			50	
		48Vin(nom)			100	
Input filter			Capacitor type			

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	-1.0		+1.0	%
	Single				
	Dual				
	10% Load to 90% Full Load	-0.5		+0.5	%
	Single				
	Dual				
Cross regulation	Asymmetrical load 25%/100% FL	-5.0		+5.0	%
Ripple and noise	Measured by 20MHz bandwidth		50		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		500		μs
Short circuit protection		Continuous, automatic recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output		1600	VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				75	pF
Switching frequency		100			kHz
Safety meets		IEC/ UL/ EN60950-1, 62368-1			
Case material		Non-conductive black plastic			
Base material		None			
Potting material		Silicone (UL94 V-0)			
Weight		2.1g(0.07oz)			
MTBF	MIL-HDBK-217F, Full load	5.735 x 10 ⁶ hrs			

ENVIRONMENTAL SPECIFICATIONS

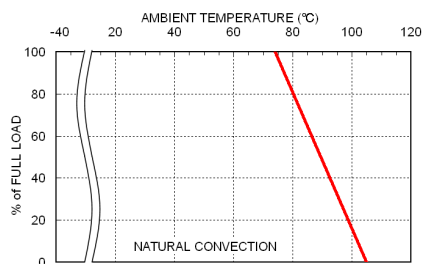
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+105	°C
Maximum case temperature				105	°C
Storage temperature range		-55		+125	°C
Thermal shock		MIL-STD-810F			
Vibration		MIL-STD-810F			
Relative humidity		5% to 95% RH			

EMC SPECIFICATIONS

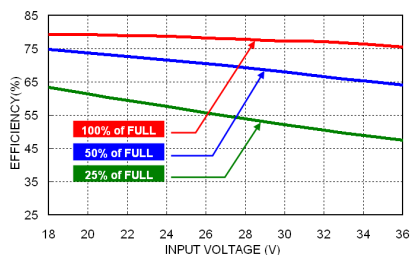
Parameter	Conditions		Level
EMI	EN55032	With external components.	Class A + Class B
ESD	EN61000-4-2	Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm 2\text{kV}$	Perf. Criteria A
Surge	EN61000-4-5	With an external input filter capacitor (Nippon chemi-con KY series, $220\mu\text{F}/100\text{V}$)	Perf. Criteria A
		$\pm 1\text{kV}$	
Conducted immunity	EN61000-4-6	10 V/m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

CAUTION: This power module is not internally fused. An input line fuse must always be used

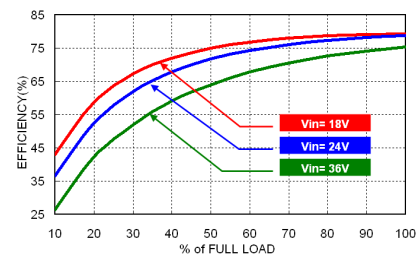
CHARACTERISTIC CURVE



UDS(H)02-24S05 Derating Curve



UDS(H)02-24S05 Efficiency vs. Input Voltage



UDS(H)02-24S05 Efficiency vs. Output Load

FUSE CONSIDERATION

This power module is not internally fused. An input line fuse must always be used.

This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.

To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

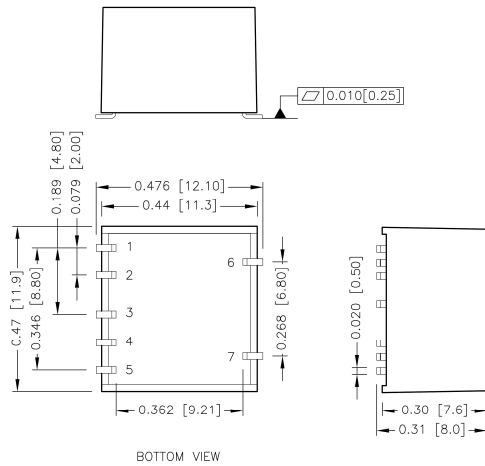
The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
UDS(H)02-05S□□ 、 UDS(H)02-05D□□	1	Slow-Blow
UDS(H)02-12S□□ 、 UDS(H)02-12D□□	0.5	Slow-Blow
UDS(H)02-24S□□ 、 UDS(H)02-24D□□	0.315	Slow-Blow
UDS(H)02-48S□□ 、 UDS(H)02-48D□□	0.16	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

MECHANICAL DRAWING

UDS02

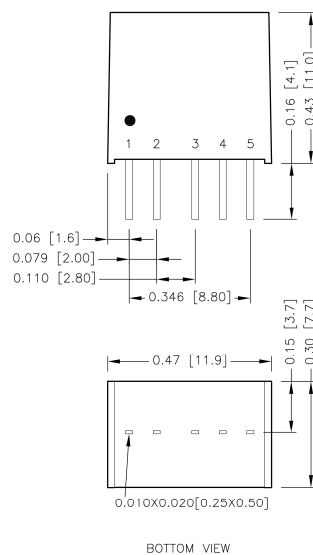


PIN CONNECTION

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout
6	* NC	* NC
7	* NC	* NC

* NC : No electrical characteristics

UDH02



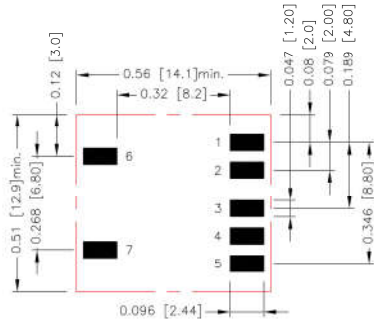
PIN CONNECTION

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout

1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004 [0.10]

RECOMMENDED PAD LAYOUT

UDS02

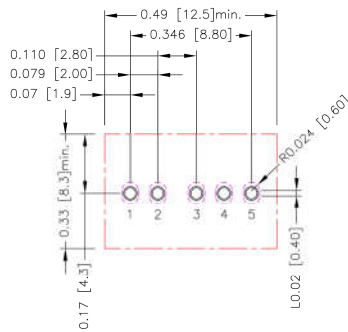


All dimensions in inch[mm]

Pad size(lead free recommended)

Top view pad 1.2.3.4.5.6.7:0.096x0.047[2.44x1.20]

UDH02



All dimensions in inch[mm]

Pad size(lead free recommended)

Through hole 1.2.3.4.5: $\Phi 0.031$ [0.80]

Top view pad 1.2.3.4.5: $\Phi 0.039$ [1.00]

Bottom view pad 1.2.3.4.5:

Groove R0.024[0.60]L0.02[0.40]

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments.

However, sufficient cooling should be provided to help ensure reliable operation of the unit.

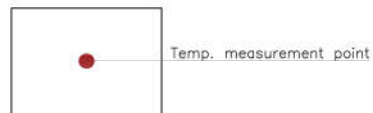
Heat is removed by conduction, convection, and radiation to the surrounding Environment.

Proper cooling can be verified by measuring the point as the figure below.

The temperature at this location should not exceed "Maximum case temperature".

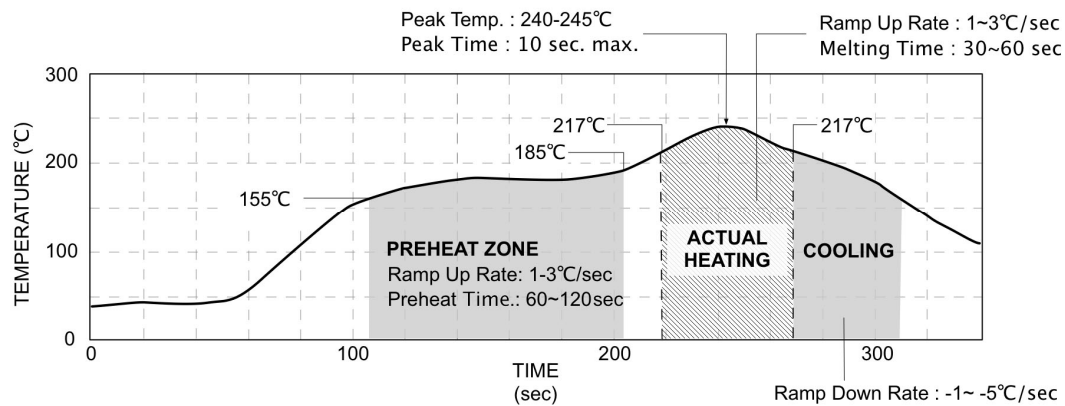
When Operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature".

You can limit this Temperature to a lower value for extremely high reliability.



TOP VIEW

LEAD FREE REFLOW PROFILE For SMD Type



*The curves define the maximum peak reflow temperature permissible measured on pin1 or Vin pin.