



# P-DUKE POWER

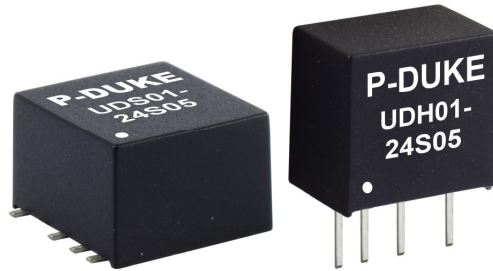
## UDS01 • UDH01 Series

DC-DC Converter  
Up to 1.08 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

UDS01 -	48	S	05
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
<b>UDS</b> : SMD type	05:4.5~13.2	S:Single	3P3:3.3
<b>UDH</b> : 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 VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
UDS(H)01-05S3P3	4.5 ~ 13.2	3.3	300	33	77	1680
UDS(H)01-05S05	4.5 ~ 13.2	5	200	33	79	820
UDS(H)01-05S09	4.5 ~ 13.2	9	112	33	80	630
UDS(H)01-05S12	4.5 ~ 13.2	12	90	33	81	470
UDS(H)01-05S15	4.5 ~ 13.2	15	70	33	82	330
UDS(H)01-05S24	4.5 ~ 13.2	24	45	36	83	160
UDS(H)01-05D05	4.5 ~ 13.2	±5	±100	36	79	±470
UDS(H)01-05D12	4.5 ~ 13.2	±12	±45	36	83	±330
UDS(H)01-05D15	4.5 ~ 13.2	±15	±35	36	80	±220
UDS(H)01-12S3P3	9 ~ 18	3.3	300	18	77	1680
UDS(H)01-12S05	9 ~ 18	5	200	18	80	820
UDS(H)01-12S09	9 ~ 18	9	112	18	81	630
UDS(H)01-12S12	9 ~ 18	12	90	18	81	470
UDS(H)01-12S15	9 ~ 18	15	70	18	83	330
UDS(H)01-12S24	9 ~ 18	24	45	22	83	160
UDS(H)01-12D05	9 ~ 18	±5	±100	22	79	±470
UDS(H)01-12D12	9 ~ 18	±12	±45	22	83	±330
UDS(H)01-12D15	9 ~ 18	±15	±35	22	80	±220
UDS(H)01-24S3P3	18 ~ 36	3.3	300	10	77	1680
UDS(H)01-24S05	18 ~ 36	5	200	10	81	820
UDS(H)01-24S09	18 ~ 36	9	112	10	82	630
UDS(H)01-24S12	18 ~ 36	12	90	10	82	470
UDS(H)01-24S15	18 ~ 36	15	70	10	83	330
UDS(H)01-24S24	18 ~ 36	24	45	10	82	160
UDS(H)01-24D05	18 ~ 36	±5	±100	10	79	±470
UDS(H)01-24D12	18 ~ 36	±12	±45	10	82	±330
UDS(H)01-24D15	18 ~ 36	±15	±35	10	80	±220
UDS(H)01-48S3P3	36 ~ 75	3.3	300	5	77	1680
UDS(H)01-48S05	36 ~ 75	5	200	5	78	820
UDS(H)01-48S09	36 ~ 75	9	112	5	79	630
UDS(H)01-48S12	36 ~ 75	12	90	5	80	470
UDS(H)01-48S15	36 ~ 75	15	70	5	81	330
UDS(H)01-48S24	36 ~ 75	24	45	5	81	160
UDS(H)01-48D05	36 ~ 75	±5	±100	5	78	±470
UDS(H)01-48D12	36 ~ 75	±12	±45	5	81	±330
UDS(H)01-48D15	36 ~ 75	±15	±35	5	79	±220

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	Single	-1.0		+1.0	%
		Dual	-1.0		+1.0	%
	10% Load to 90% Full Load	Single	-0.5		+0.5	%
		Dual	-0.8		+0.8	%
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-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

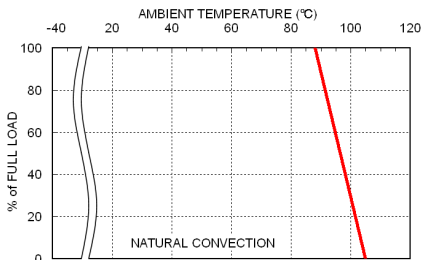
GENERAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance			75			pF
Switching frequency			100			kHz
Safety meets						IEC/ UL/ EN60950-1
Case material						Non-conductive black plastic
Base material						None
Potting material						Silicone (UL94 V-0)
Weight						2.1g(0.07oz)
MTBF	MIL-HDBK-217F, Full load					7.380 x 10 <sup>6</sup> 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

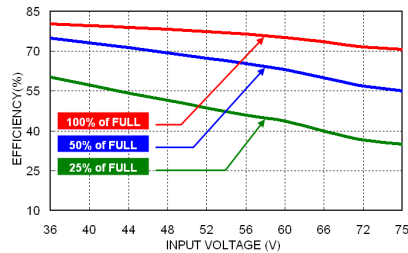
**EMC SPECIFICATIONS**

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

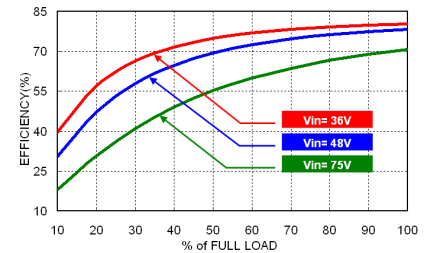
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


UDS(H)01-48S05 Derating Curve



UDS(H)01-48S05 Efficiency vs. Input Voltage



UDS(H)01-48S05 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.

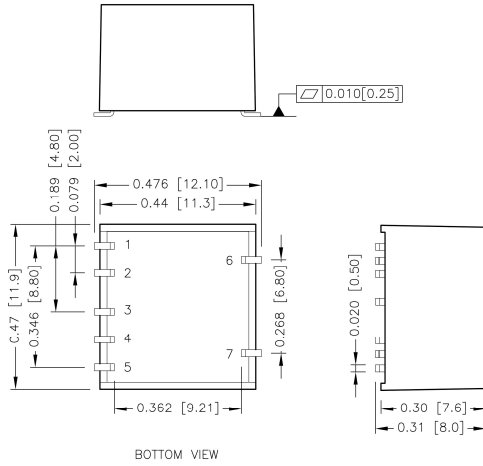
The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
UDS(H)01-05S□□、UDS(H)01-05D□□	0.5	Slow-Blow
UDS(H)01-12S□□、UDS(H)01-12D□□	0.315	Slow-Blow
UDS(H)01-24S□□、UDS(H)01-24D□□	0.16	Slow-Blow
UDS(H)01-48S□□、UDS(H)01-48D□□	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

### UDS01

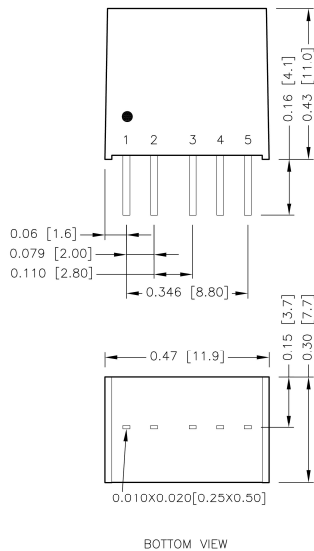


### PIN CONNECTION

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

### UDH01



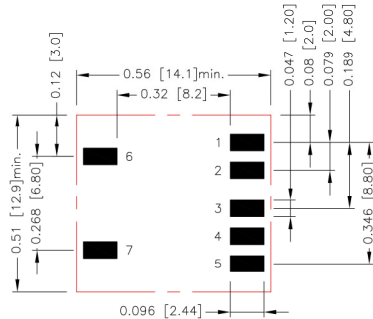
### PIN CONNECTION

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 pitch tolerance ±0.01 [0.25]
4. Pin dimension tolerance ±0.004 [0.10]

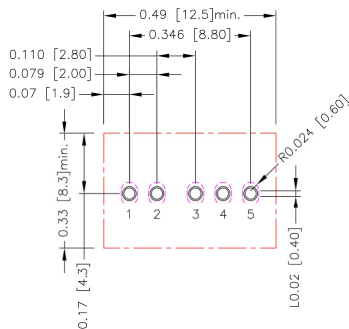
## RECOMMENDED PAD LAYOUT

### UDS01



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]

### UDH01



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.

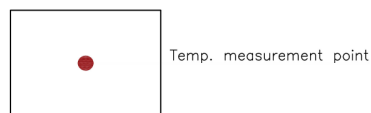
Heat is removed by conduction, convection, and radiation to the surrounding Environment.

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