



P-DUKE POWER

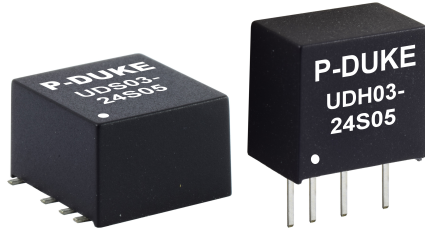
UDS03 • UDH03 Series

DC-DC Converter
Up to 3 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

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)03-05S3P3	4.5 ~ 13.2	3.3	700	65	75	4400
UDS(H)03-05S05	4.5 ~ 13.2	5	600	65	78	2200
UDS(H)03-05S09	4.5 ~ 13.2	9	333	65	79	1300
UDS(H)03-05S12	4.5 ~ 13.2	12	250	75	82	1000
UDS(H)03-05S15	4.5 ~ 13.2	15	200	75	80	820
UDS(H)03-05S24	4.5 ~ 13.2	24	125	75	80	330
UDS(H)03-05D05	4.5 ~ 13.2	±5	±300	75	77	±1200
UDS(H)03-05D12	4.5 ~ 13.2	±12	±125	75	80	±520
UDS(H)03-05D15	4.5 ~ 13.2	±15	±100	75	80	±440
UDS(H)03-12S3P3	9 ~ 18	3.3	700	35	76	4400
UDS(H)03-12S05	9 ~ 18	5	600	35	79	2200
UDS(H)03-12S09	9 ~ 18	9	333	35	80	1300
UDS(H)03-12S12	9 ~ 18	12	250	40	84	1000
UDS(H)03-12S15	9 ~ 18	15	200	40	83	820
UDS(H)03-12S24	9 ~ 18	24	125	40	82	330
UDS(H)03-12D05	9 ~ 18	±5	±300	40	78	±1200
UDS(H)03-12D12	9 ~ 18	±12	±125	40	82	±520
UDS(H)03-12D15	9 ~ 18	±15	±100	40	81	±440
UDS(H)03-24S3P3	18 ~ 36	3.3	700	18	76	4400
UDS(H)03-24S05	18 ~ 36	5	600	18	78	2200
UDS(H)03-24S09	18 ~ 36	9	333	18	80	1300
UDS(H)03-24S12	18 ~ 36	12	250	18	84	1000
UDS(H)03-24S15	18 ~ 36	15	200	18	84	820
UDS(H)03-24S24	18 ~ 36	24	125	20	83	330
UDS(H)03-24D05	18 ~ 36	±5	±300	20	79	±1200
UDS(H)03-24D12	18 ~ 36	±12	±125	20	83	±520
UDS(H)03-24D15	18 ~ 36	±15	±100	20	82	±440
UDS(H)03-48S3P3	36 ~ 75	3.3	700	10	75	4400
UDS(H)03-48S05	36 ~ 75	5	600	10	79	2200
UDS(H)03-48S09	36 ~ 75	9	333	10	80	1300
UDS(H)03-48S12	36 ~ 75	12	250	12	83	1000
UDS(H)03-48S15	36 ~ 75	15	200	12	83	820
UDS(H)03-48S24	36 ~ 75	24	125	12	82	330
UDS(H)03-48D05	36 ~ 75	±5	±300	12	77	±1200
UDS(H)03-48D12	36 ~ 75	±12	±125	12	82	±520
UDS(H)03-48D15	36 ~ 75	±15	±100	12	80	±440

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, automatics 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/ EN/ UL62368-1	
Case material					Non-conductive black plastic	
Base material					None	
Potting material					Potting compound (UL94 V-0)	
Weight					2.1g (0.07oz)	
MTBF	MIL-HDBK-217F, Full load				4.406 x 10 ⁶ hrs	

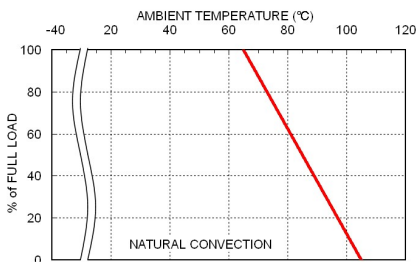
ENVIRONMENTAL SPECIFICATIONS

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	
Lead-free reflow solder process		Only for SMD type			IPC J-STD-020E	
Moisture sensitivity level(MSL)		Only for SMD type			IPC J-STD-033C Level 2	

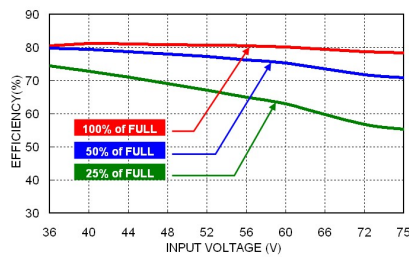
EMC SPECIFICATIONS			
Parameter	Conditions		Level
EMI	EN55032	With external components.	Class A · Class B
EMS	EN55024		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	±2kV	Perf. Criteria A
Surge	EN61000-4-5	With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)	Perf. Criteria A
		±1kV	
Conducted immunity	EN61000-4-6	With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)	Perf. Criteria A
		10 Vr.m.s	
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.

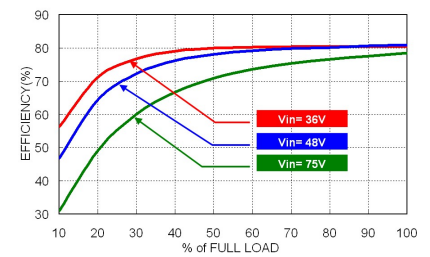
CHARACTERISTIC CURVE



UDS(H)03-48S05 Derating Curve



UDS(H)03-48S05 Efficiency vs. Input Voltage



UDS(H)03-48S05 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.

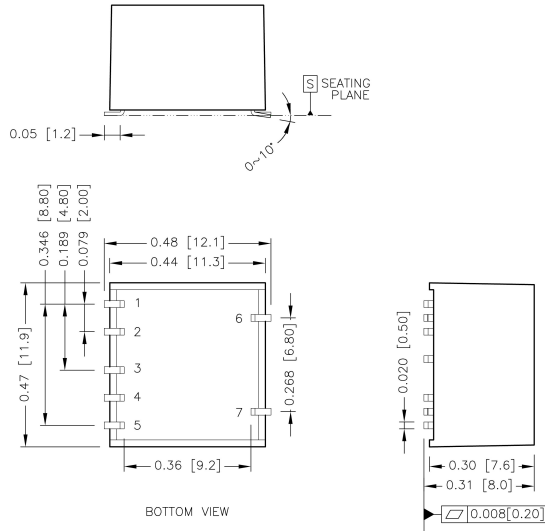
The input line fuse suggest as below :

Modules	Fuse Rating (A)	Fuse Type
UDS(H)03-05S□□、UDS(H)03-05D□□	1.6	Slow-Blow
UDS(H)03-12S□□、UDS(H)03-12D□□	0.8	Slow-Blow
UDS(H)03-24S□□、UDS(H)03-24D□□	0.5	Slow-Blow
UDS(H)03-48S□□、UDS(H)03-48D□□	0.315	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

UDS03

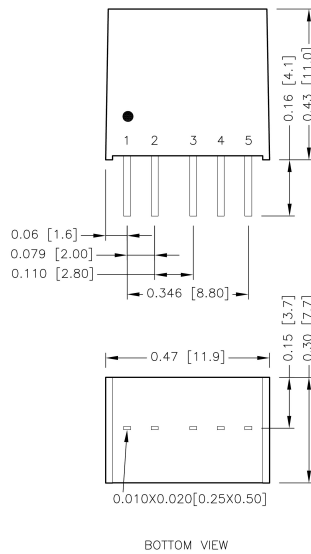


PIN CONNECTION

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

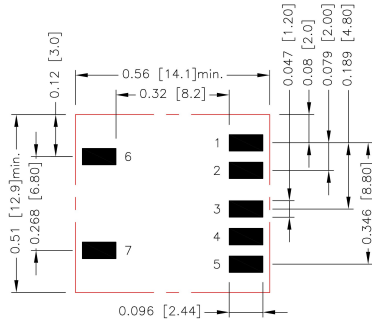
UDH03



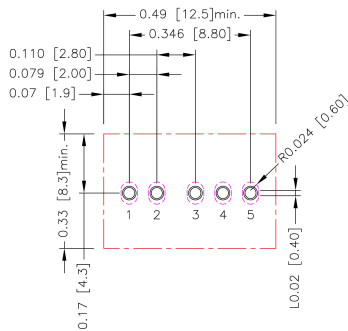
PIN CONNECTION

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
UDS03


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]

UDH03


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.

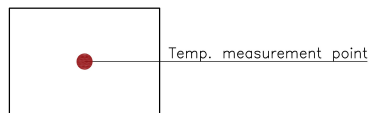
Heat is removed by conduction, convection, and radiation to the surrounding Environment.

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

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

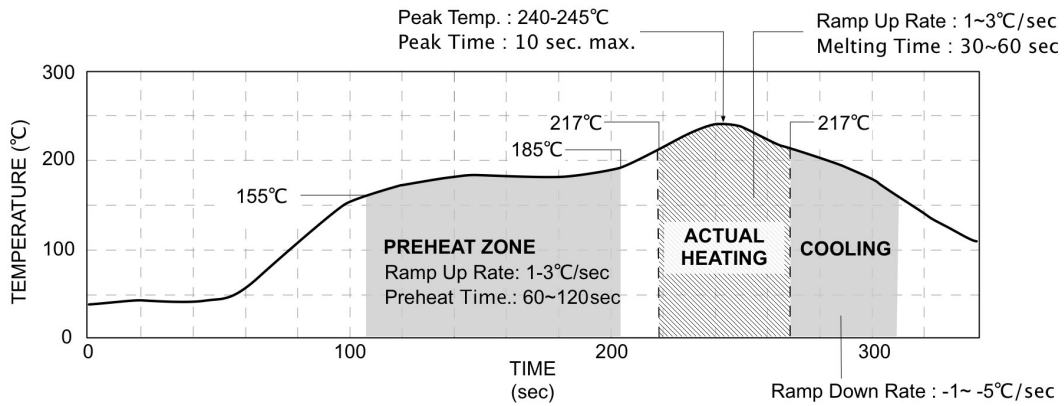
When Operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature".

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.