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

CE

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)**
UDS: SMD type **UDH**: SIP type	**05:**4.5~13.2 **12:**9~18 **24:**18~36 **48:**36~75	**S:**Single	**3P3:**3.3 **05:**5 **09:**9 **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℃ 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)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	%/℃
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					7.380 x 10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

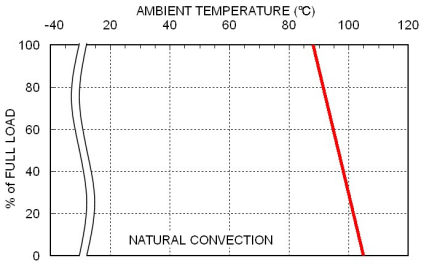
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature		With derating	-40		+105	℃
Maximum case temperature					105	℃
Storage temperature range			-55		+125	℃
Thermal shock						MIL-STD-810F
Vibration						MIL-STD-810F
Relative humidity						5% to 95% RH
Lead-free reflow solder process		Only for SMD type				IPC J-STD-020E
Moisture sensitivity level(MSL)		Only for SMD type				IPC J-STD-033C Level 2

EMC SPECIFICATIONS

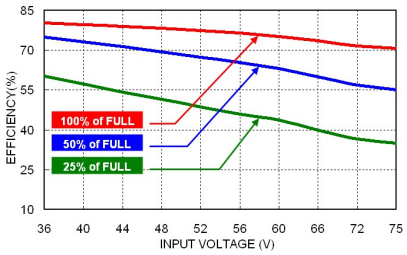
Parameter	Conditions		Level
EMI	EN55032	With external components	Class A，Class B
EMS	EN55024		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	±2kV With an external input filter capacitor (Nippon chemi-con KY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

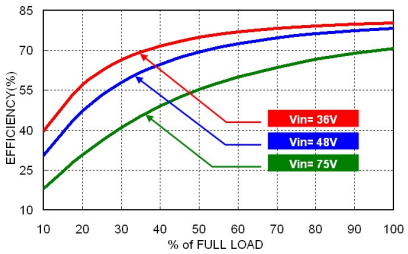
CHARACTERISTIC CURVE



UDS(H)01-48S05 Derating Curve



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



UDS(H)01-48S05 Efficiency vs. Output Load

FUSE CONSIDERATION

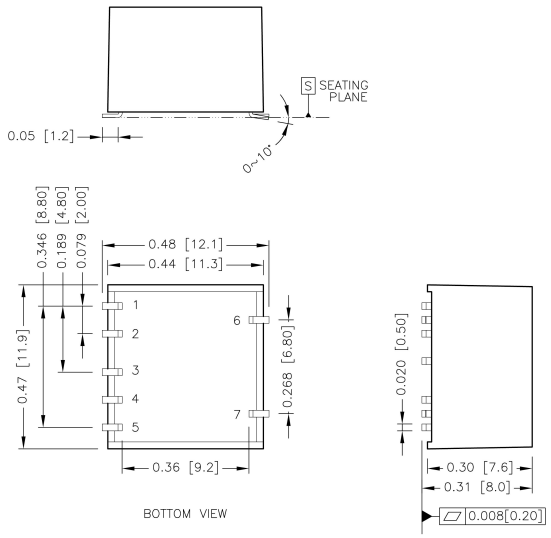
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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

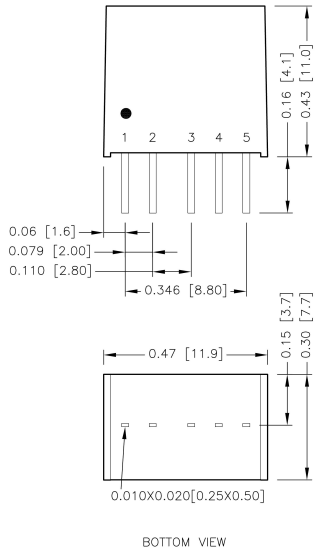


PIN CONNECTION

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



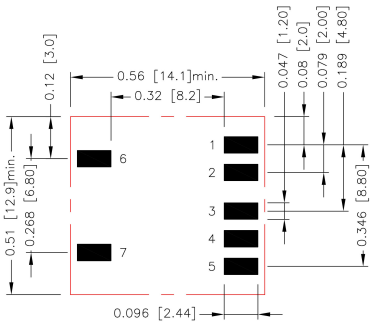
PIN CONNECTION

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 dimension tolerance ±0.004[0.10]

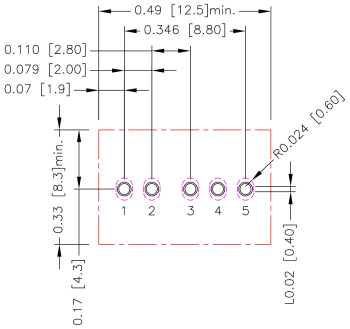
RECOMMENDED PAD LAYOUT

UDS01



All dimensions in inch[mm]
Pad size(lead free recommended)
Top view pad1.2.3.4.5.6.7:0.096x0.047[2.44x1.20]

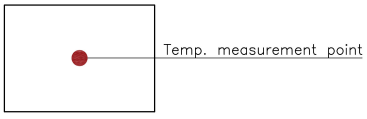
UDH01



All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3.4.5: Φ0.031[0.80]
Top view pad 1.2.3.4.5: Φ0.039[1.00]
Bottom view pad 1.2.3.4.5:
Groove R0.024[0.60]L0.02[0.40]

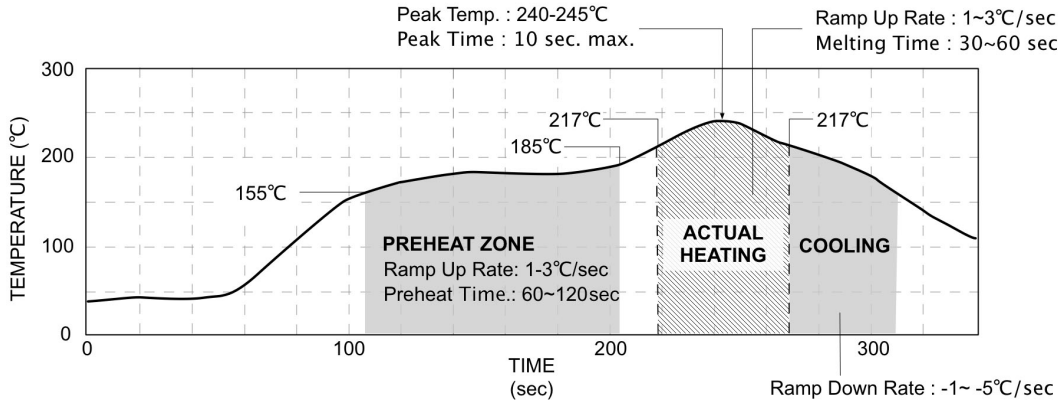
THERMAL CONSIDERATIONS

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.

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