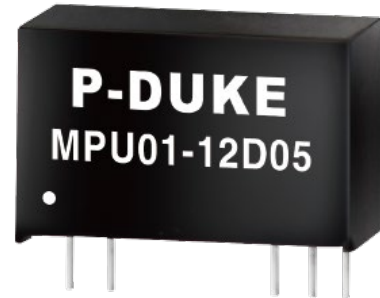


Features

- Input Range 4.5~28.8VDC
- Isolation Voltage: 5000V DC
- Operating Temperature Range: -40~85°C
- Approved to cURus, UKCA, CE, RoHS, REACH
- Safety standards to IEC/EN/UL 62368-1 & 60601-1
- Efficiency up to 85%
- EMC Class A & B Certified



Ideal Power's 43MPU01-xyz 1W Series SIP DC/DC Converters are certified to cURus, UKCA, CE, FCC, CB, RoHS, REACH & IEC/EN/ANSI/AAMI ES 60601-1, IEC/EN/UL 62368-1 Standards and comply with the relevant Efficiency Regulations. These are primarily used in ITE, Video & Audio, Medical Industries and customised solutions are available upon request.

Part Number Structure

MPU01	-	05	S	05
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
		05: 4.5 ~ 5.5	S: Single	3P3: 3.3
		12: 9.6 ~ 14.4		05: 5
		12: 12 ~ 18		12: 12
		24: 9 ~ 36		15: 15
			D: Dual	05: ±5
				12: ±12
				15: ±15

Models

Model Number	Input Range V DC	Output Voltage V DC	Output current @ Full Load A	Input Current @ No Load A	Efficiency %	Maximum Capacitor Load µF
43MPU01-05S3P3	4.5 ~ 5.5	3.3	303	30	80	2000
43MPU01-05S05	4.5 ~ 5.5	5	200	30	82	820
43MPU01-05S12	4.5 ~ 5.5	12	83	30	85	470
43MPU01-05S15	4.5 ~ 5.5	15	67	30	84	470
43MPU01-05D05	4.5 ~ 5.5	±5	±100	30	85	±470
43MPU01-05D12	4.5 ~ 5.5	±12	±42	30	85	±220
43MPU01-05D15	4.5 ~ 5.5	±15	±34	30	84	±220
43MPU01-12S3P3	9.6 ~ 14.4	3.3	303	30	80	2000
43MPU01-12S05	9.6 ~ 14.4	5	200	30	82	820
43MPU01-12S12	9.6 ~ 14.4	12	83	30	84	470
43MPU01-12S15	9.6 ~ 14.4	15	67	30	83	470
43MPU01-12D05	9.6 ~ 14.4	±5	±100	30	82	±470
43MPU01-12D12	9.6 ~ 14.4	±12	±42	30	83	±220
43MPU01-12D15	9.6 ~ 14.4	±15	±34	30	83	±220
43MPU01-15S3P3	12 ~ 18	3.3	303	15	79	2000
43MPU01-15S05	12 ~ 18	5	200	15	83	820
43MPU01-15S12	12 ~ 18	12	83	15	84	470
43MPU01-15S15	12 ~ 18	15	67	15	84	470
43MPU01-15D05	12 ~ 18	±5	±100	15	82	±470
43MPU01-15D12	12 ~ 18	±12	±42	15	83	±220
43MPU01-15D15	12 ~ 18	±15	±34	15	83	±220
43MPU01-24S3P3	19.2 ~ 28.8	3.3	303	10	78	2000
43MPU01-24S05	19.2 ~ 28.8	5	200	10	82	820
43MPU01-24S12	19.2 ~ 28.8	12	83	10	83	470
43MPU01-24S15	19.2 ~ 28.8	15	67	10	83	470
43MPU01-24D05	19.2 ~ 28.8	±5	±100	10	80	±470
43MPU01-24D12	19.2 ~ 28.8	±12	±42	10	81	±220

Input Specifications

Parameter	Conditions	Min	Typ	Max	Unit
Operating input voltage range	5Vin(nom)	4.5	5	5.5	VDC
	12Vin(nom)	9.6	12	14.4	
	15Vin(nom)	12	15	18	
	24Vin(nom)	19.2	24	28.8	
Input surge voltage	1 second, max. 5Vin(nom)	--	--	6	VDC
	12Vin(nom)	--	--	25	
	15Vin(nom)	--	--	25	
	24Vin(nom)	--	--	40	

*Only for 5Vin items
 If the input will be switched electromechanically, the input should install an external 100µF/10V E/C. to avoid voltage transient.

Output Specifications

Parameter	Conditions	Min	Typ	Max	Unit
Voltage accuracy	Measured by nominal input & 60% FL 3.3Vout,5Vout, ±5Vout Measured by nominal input & 90% FL Others	-3.5	--	+3.5	
Line regulation	Measured by each 1% of Vin	--	--	0.2	%
Load regulation	10% Load to 100% Load 3.3Vout,5Vout, ±5Vout Others	--	--	10 7	
Minimum Load	Reference Characteristic Curve	0	--	--	
Cross regulation	Asymmetrical load 25%/100% FL Dual	--	±4	--	
Ripple and noise	Measured by 20MHz bandwidth	--	75	100	mVp-p
Temperature coefficient		-0.03	--	+0.03	%/°C
Short circuit protection		Continuous, automatic recovery			

General Specifications

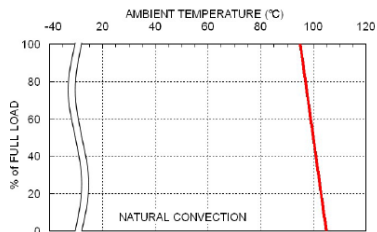
Parameter	Conditions	Min	Typ	Max	Unit
Isolation voltage	1 minute Input to Output	5000	--	--	V AC
Isolation resistance	500V DC	10	--	--	GΩ
Isolation capacitance		--	15	20	pF
Leakage current	240V AC, 60Hz	--	--	2	μA
Switching frequency		225	--	380	kHz
Clearance/Creepage		8	--	--	mm
Safety approvals	EC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 62368-1				UL:E360199 UL:E193009 CB:UL(Demko)
Case material		Non-conductive black plastic			
Base material		None			
Potting material		Silicone (UL94 V-0)			
Weight		4.8g (0.17oz)			
MTBF	MIL-HDBK-217F, Full Load	1.936 x 10 ⁷ hrs			

Environmental Specifications

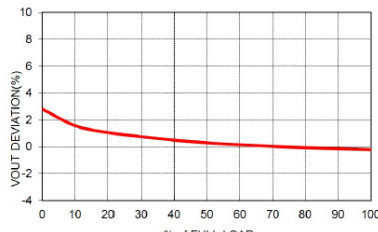
Parameter	Conditions	Min	Typ	Max	Unit
Operating ambient temperature	With derating	-40	--	+95	°C
Maximum case temperature		--	--	105	°C
Storage temperature range		-55	--	+125	°C
Operating altitude		--	--	5000	m
Thermal Shock		MIL-STD-810F			
Shock		MIL-STD-810F			
Vibration		MIL-STD-810F			
Relative humidity		5% to 95% RH			

EMC Specifications

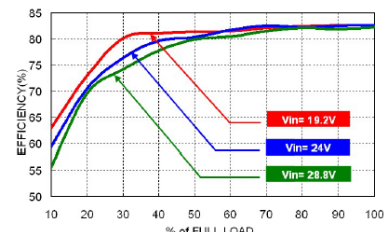
Parameter	Conditions		Level
EMI	EN55011, EN55032, EN60601-1-2	With external components	Class A, Class B
EMS	EN55024 and EN60601-1-2		Perf. Criteria A
ESD	EN61000-4-2	Air $\pm 15\text{kV}$ and Contact $\pm 8\text{kV}$	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm 2\text{kV}$	Perf. Criteria A
	External input filter circuit is required, for further information.		
Surge	EN61000-4-5	$\pm 2\text{kV}$	Perf. Criteria A
	External input filter circuit is required, for further information.		
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

Characteristic Curve


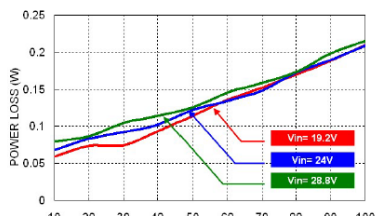
43MPU01-24S05 Derating Curve



43MPU01-24S05 Vout Deviation vs. Output Load



43MPU01-24S05 Efficiency vs. Output Load



43MPU01-24S05 Power Dissipation vs. Output Load

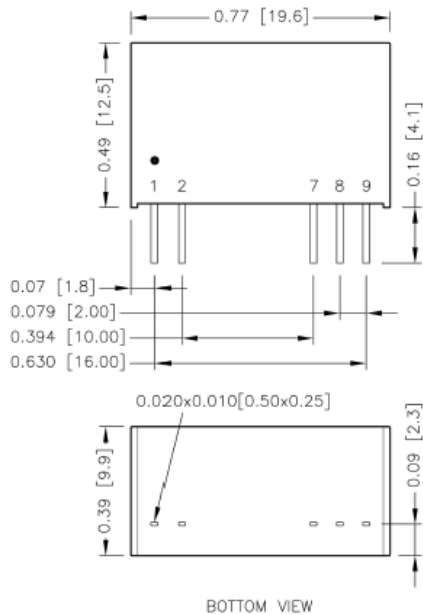
Fuse Considerations

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
43MPU01-05S□□, 43MPU01-05D□□	0.5	Slow-Blow
43MPU01-12S□□, 43MPU01-12D□□	0.315	Slow-Blow
43MPU01-15S□□, 43MPU01-15D□□	0.315	Slow-Blow
43MPU01-24S□□, 43MPU01-24D□□	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

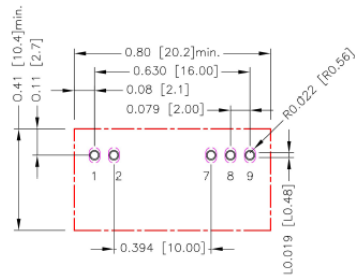


1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]

Pin Connection

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
7	-Vout	-Vout
8	No pin	Common
9	+Vout	+Vout
1	+Vin	+Vin

Recommended Pad Layout



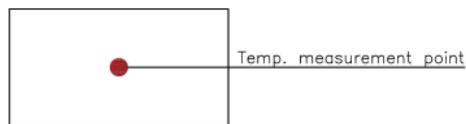
- * There should be at least 8mm distance between primary and secondary circuit.
- ** For further information, please contact P-DUKE.

All dimensions in inch[mm]
 Pad size(lead free recommended)
 Through hole 1.2.7.8.9: $\varnothing 0.031[0.80]$
 Top view pad 1.2.7.8.9: $\varnothing 0.039[1.00]$
 Bottom view pad 1.2.7.8.9:
 Groove R0.022[0.56] L0.019[0.48]

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.

- Thermal test condition with vertical direction by natural convection (20LFM).



TOP VIEW