DUR01 Series

Unregulated DC-DC Converter
1 Watts Output Power

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT

Automation
Datacom
IPC
Industry
Measurement
Telecom
Automobile
Boat
Charger
Medical
PV
Railway

CE

PART NUMBER STRUCTURE

DUR01 - 05 S 05

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
	33:3.0~3.6 **05:**4.5~5.5 **09:**8.1~9.9 **12:**10.8~13.2 **15:**13.5~16.5 **24:**21.6~26.4	**S:**Single	**33:**3.3 **05:**5 **09:**9 **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		Input Current @ No Load	Efficiency	Maximum Capacitor Load
			@Min.Load	@FullLoad			
	VDC	VDC	mA	mA	mA	%	μF
DUR01-33S33	3.0 ~ 3.6	3.3	30.3	303	42	68	150
DUR01-33S05	3.0 ~ 3.6	5	20	200	38	70	100
DUR01-33S09	3.0 ~ 3.6	9	11.1	111	45	71	22
DUR01-33S12	3.0 ~ 3.6	12	8.4	84	45	72	47
DUR01-33S15	3.0 ~ 3.6	15	6.6	66	45	75	33
DUR01-05S33	4.5 ~ 5.5	3.3	30.3	303	25	68	150
DUR01-05S05	4.5 ~ 5.5	5	20	200	25	70	100
DUR01-05S09	4.5 ~ 5.5	9	11.1	111	25	74	22
DUR01-05S12	4.5 ~ 5.5	12	8.4	84	25	78	47
DUR01-05S15	4.5 ~ 5.5	15	6.6	66	24	80	33
DUR01-09S09	8.1 ~ 9.9	9	11.1	111	20	74	22
DUR01-12S33	10.8 ~ 13.2	3.3	30.3	303	14	68	150
DUR01-12S05	10.8 ~ 13.2	5	20	200	10	70	100
DUR01-12S09	10.8 ~ 13.2	9	11.1	111	13	74	22
DUR01-12S12	10.8 ~ 13.2	12	8.4	84	14	78	47
DUR01-12S15	10.8 ~ 13.2	15	6.6	66	13	80	33
DUR01-15S33	13.5 ~ 16.5	3.3	30.3	303	9	68	150
DUR01-15S05	13.5 ~ 16.5	5	20	200	9	70	100
DUR01-15S09	13.5 ~ 16.5	9	11.1	111	9	74	22
DUR01-15S12	13.5 ~ 16.5	12	8.4	84	8	78	47
DUR01-15S15	13.5 ~ 16.5	15	6.6	66	9	80	33
DUR01-24S33	21.6 ~ 26.4	3.3	30.3	303	6	70	150
DUR01-24S05	21.6 ~ 26.4	5	20	200	6	70	100
DUR01-24S09	21.6 ~ 26.4	9	11.1	111	6	74	22
DUR01-24S12	21.6 ~ 26.4	12	8.4	84	5	78	47
DUR01-24S15	21.6 ~ 26.4	15	6.6	66	6	80	33

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	3.3Vin(nom)	3.0	3.3	3.6	VDC
	5Vin(nom)	4.5	5	5.5	
	9Vin(nom)	8.1	9	9.9	
	12Vin(nom)	10.8	12	13.2	
	15Vin(nom)	13.5	15	16.5	
	24Vin(nom)	21.6	24	26.4	
Input filter		C type			

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-5.0		+5.0	%
Line regulation	Low Line to High Line at Full Load	3.3Vout, 5Vout			1.3%,max / 1% of Vin	
		Others			1.2%,max / 1% of Vin	
Load regulation	10% to 100% Load	3.3Vout, 5Vout	-15		+15	%
		Others	-10		+10	
Ripple and noise	Measured by 20MHz bandwidth			100		mVp-p
Temperature coefficient			-0.1		+0.1	%/℃
Short circuit protection				1 Second, max.		

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1000			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					80	pF
Switching frequency				90		kHz
Safety meets						IEC/ UL/ EN60950-1
Case material						Non-conductive black plastic
Base material						None
Potting material						Epoxy (UL94 V-0)
Weight						1.5g (0.053oz)
MTBF	MIL-HDBK-217F, Full load					9.850 x 10^5 hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature		Without derating	-40		+85	℃
Storage temperature range			-55		+125	℃
Thermal shock						MIL-STD-810F
Vibration						MIL-STD-810F
Relative humidity						5% to 95% RH

ENVIRONMENTAL SPECIFICATIONS

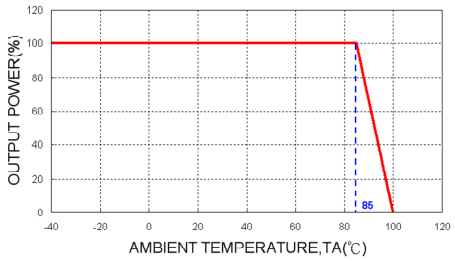
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating temperature range		-40		+85	℃
Over temperature protection	Internal IC junction		+165		℃
Storage temperature range		-55		+125	℃
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

Note:

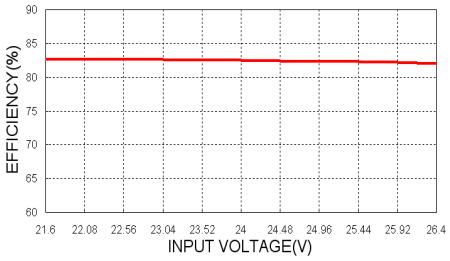
1. The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices; however they may not meet all listed specification.

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

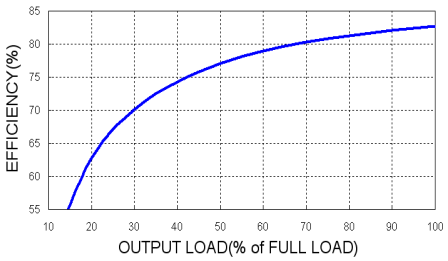
CHARACTERISTIC CURVE



DUR01-24S12 Derating Curve



DUR01-24S12 Efficiency vs. Input Voltage



DUR01-24S12 Efficiency vs. Output Load

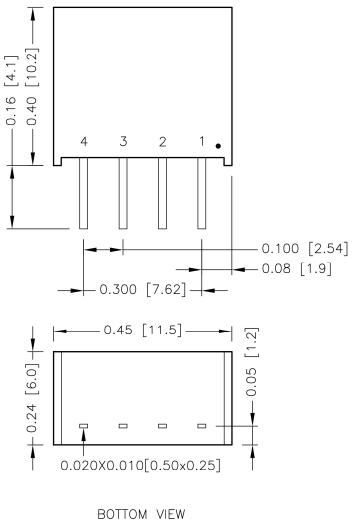
FUSE CONSIDERATION

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
DUR01-33□□□	0.8	Slow-Blow
DUR01-05□□□	0.5	Slow-Blow
DUR01-09□□□、DUR01-12□□□	0.315	Slow-Blow
DUR01-15□□□、DUR01-24□□□	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

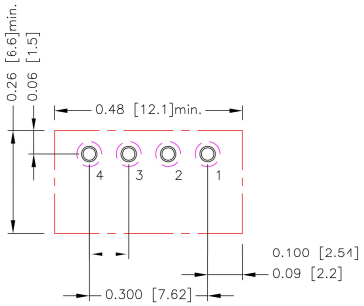


PIN CONNECTION

PIN	DEFINE
1	-Vin
2	+Vin
3	-Vout
4	+Vout

1. All dimensions in Inch [mm]
   Tolerance: X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. Pin pitch tolerance ±0.01[0.25]
3. Pin dimension tolerance ±0.004 [0.10]

RECOMMENDED PAD LAYOUT

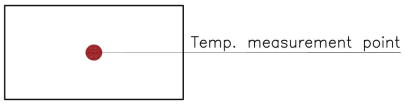


All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3.4:Φ0.031[0.80]
Top view pad 1.2.3.4:Φ0.039[1.00]
Bottom view pad 1.2.3.4:Φ0.063[1.60]

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 85℃.
When Operating, adequate cooling must be provided to maintain the test point temperature at or below 85℃.
Although the maximum point Temperature of the power modules is 85℃,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

P-DUKE Technology Co., Ltd.
Tel +886-4-2359-0668
Fax +886-4-2359-1337
Email sale@pduke.com
Web www.pduke.com
Add No. 36, 22nd Rd., Taichung Industrial Park, Taichung, Taiwan, R.O.C.