P-DUKE POWER

ASR01 Series

DC-DC Converter
Up to 15 Watts

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT

Automation | Datacom | IPC

Industry | Measurement | Telecom

Automobile | Boat | Charger

Medical | PV | Railway

CE

NON -isolation | LOW Standby Power | OCP | OTP | SCP

PART NUMBER STRUCTURE

ASR01 - 12 S 05 - A

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Assembly Option
	12:-7~-32 -8~-32 -10.5~-32 **24:**-11.5~-32 -15~-32 -18~-32	**S:**Single	**05:**-5 **5P2:**-5.2 **06:**-6 **08:**-8 **09:**-9 **12:**-12 **15:**-15	Standard **A:** Horizontal type

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		Min.Vin	Max.Vin	
	VDC	VDC	A	A	mA	%	%	μF
ASR01-12S05	-7 ~ -32	-5	-0.1	-1	-3	91.5	84.5	1600
ASR01-12S5P2	-7 ~ -32	-5.2	-0.1	-1	-3	92.0	85.0	1600
ASR01-12S06	-8 ~ -32	-6	-0.1	-1	-3	92.5	86.5	1000
ASR01-12S08	-10.5 ~ -32	-8	-0.1	-1	-3	94.0	89.0	1000
ASR01-24S09	-11.5 ~ -32	-9	-0.1	-1	-3	94.5	90.5	1000
ASR01-24S12	-15 ~ -32	-12	-0.1	-1	-3	96.0	92.0	470
ASR01-24S15	-18 ~ -32	-15	-0.1	-1	-3	96.0	93.5	470

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		ASR01-12S05	-7	-12	-32	VDC
		ASR01-12S5P2	-7	-12	-32	
		ASR01-12S06	-8	-12	-32	
		ASR01-12S08	-10.5	-12	-32	
		ASR01-24S09	-11.5	-24	-32	
		ASR01-24S12	-15	-24	-32	
		ASR01-24S15	-18	-24	-32	
Start up time	Constant resistive load	Power up		15		ms
Rise time	Time for Vo to rise from 10% to 90% of Vo			10		ms
Maximum input current	Vin=Vin(min); Io=Io(max)				-1	A
Input filter				Capacitor type		

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-2.0		+2.0	%
Line regulation	Low Line to High Line at Full Load		-1.0		+1.0	%
Load regulation	10% Full Load to Full Load	Standard type	-0.5		+0.5	%
		Suffix-A	-0.6		+0.6	
Ripple and noise	Measured by 20MHz bandwidth	-5Vout		50		mVp-p
		-5.2Vout		50		
		-6Vout		75		
		-8Vout		75		
		-9Vout		75		
		-12Vout		75		
		-15Vout		75		
Temperature coefficient			-0.015		+0.015	%/℃
Dynamic load response	50% load step change	Peak deviation		5		%Vo
		Recovery time		250		μs
Over load protection	% of Iout rated; Hiccup mode			-2.0		A
Short circuit protection				Continuous, automatics recovery		

GENERAL SPECIFICATIONS

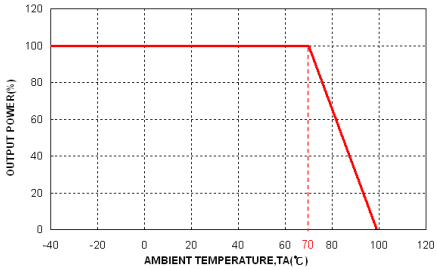
Parameter	Conditions		Min.	Typ.	Max.	Unit
Switching frequency		12S05,12S5P2	323	380	437	kHz
		Others	425	500	575	
Safety meets						IEC/ UL/ EN60950-1
Case material						Non-conductive black plastic
Potting material						Silicone (UL94 V-0)
Weight						3.1g(0.11oz)
MTBF	MIL-HDBK-217F, Full load					8.475 x 10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

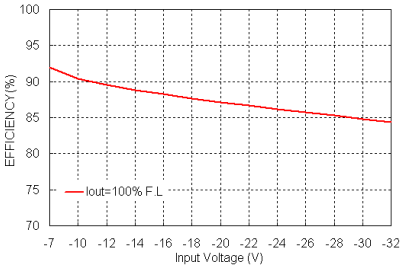
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating temperature range		-40		+85	℃
Over temperature protection	Internal IC junction		+165		℃
Storage temperature range		-55		+125	℃
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	

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

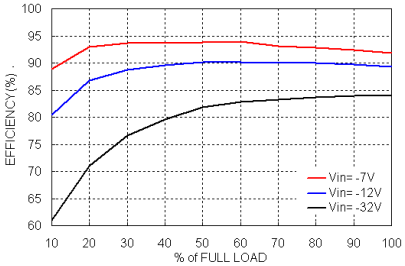
CHARACTERISTIC CURVE



ASR01-12S05 Derating Curve



ASR01-12S05 Efficiency VS Input Voltage



ASR01-12S05 Efficiency VS Output Load

FUSE CONSIDERATION

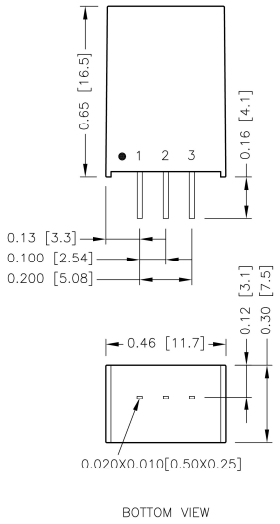
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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
ASR01-12□□□	1.6	Slow-Blow
ASR01-24□□□	1.6	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

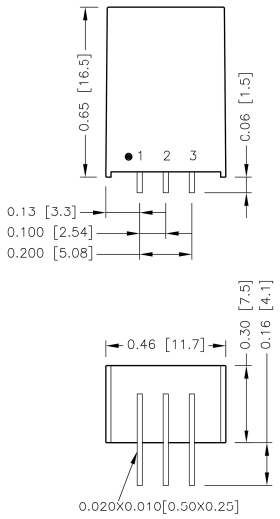
MECHANICAL DRAWING

STARDANDS ASR01-□□S□□
Vertical SIP type



BOTTOM VIEW

SUFFIX-A ASR01-□□S□□-A
Horizontal SIP type



BOTTOM VIEW

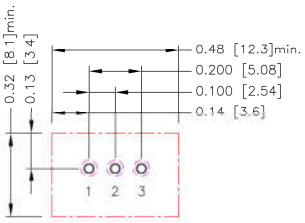
PIN CONNECTION

PIN	DEFINE
1	GND
2	-Vin
3	-Vout

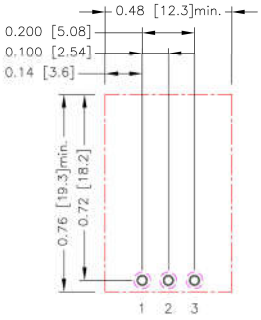
1. All dimensions in Inch [mm]
   Tolerance: X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. Pin pitch tolerance ±0.01[0.25]
3. Pin dimension tolerance ±0.004 [0.10]

RECOMMENDED PAD LAYOUT

STARDANDS
ASR01-□□S□□ Vertical SIP type



SUFFIX-A
ASR01-□□S□□-A Horizontal SIP type

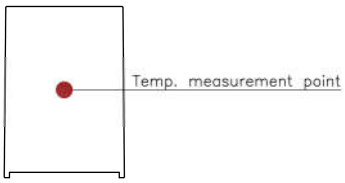


All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3: Φ0.031[0.80]
Top view pad 1.2.3: Φ0.039[1.00]
Bottom view pad 1.2.3: Φ0.063[1.60]

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 100℃.
When Operating, adequate cooling must be provided to maintain the test point temperature at or below 100℃.
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).



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