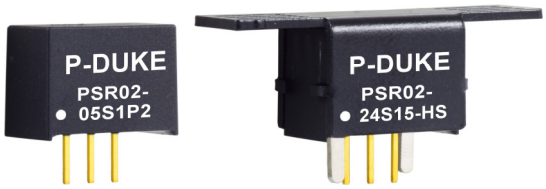
3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT



Automation | Datacom | IPC

Industry | Measurement | Telecom

Automobile | Boat | Charger

Medical | PV | Railway

CE

NON -isolation | LOW Standby Power | NO Min. Load Required | OCP | OTP | SCP

PART NUMBER STRUCTURE

PSR02 - 12 S 05 - HS

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Heat-sink
	05:3.0~5.5 **12:**4.6~36 **24:**12~36 * See table as below	**S:**Single	**1P2:**1.2 **1P5:**1.5 **1P8:**1.8 **2P5:**2.5 **3P3:**3.3 **05:**5 **6P5:**6.5 **09:**9 **12:**12 **15:**15	□: No Heat-sink **HS** Heat-sink

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	A	mA	Min. Vin	Max. Vin	μF
PSR02-05S1P2	3.0 ~ 5.5	1.2	2	1	90	86	2500
PSR02-05S1P5	3.0 ~ 5.5	1.5			91	88	2000
PSR02-05S1P8	3.0 ~ 5.5	1.8			92	90	1600
PSR02-05S2P5	3.8 ~ 5.5	2.5			95	92	1200
PSR02-12S1P2	4.6 ~ 36	1.2			84	75	2500
PSR02-12S1P5	4.6 ~ 36	1.5			86	77	2000
PSR02-12S1P8	4.6 ~ 36	1.8			87	79	1600
PSR02-12S2P5	4.6 ~ 36	2.5			89	83	1200
PSR02-12S3P3	4.75 ~ 36	3.3			91	86	900
PSR02-12S05	6.5 ~ 36	5.0			94	89	600
PSR02-12S6P5	9.0 ~ 36	6.5			94	91	470
PSR02-24S09	12 ~ 36	9.0			95	92	330
PSR02-24S12	15 ~ 36	12			95	93	270
PSR02-24S15	18 ~ 36	15			96	94	200

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		PSR02-05S1P2	3.0	5.0	5.5	VDC
		PSR02-05S1P5	3.0	5.0	5.5	
		PSR02-05S1P8	3.0	5.0	5.5	
		PSR02-05S2P5	3.8	5.0	5.5	
		PSR02-12S1P2	4.6	12	36	
		PSR02-12S1P5	4.6	12	36	
		PSR02-12S1P8	4.6	12	36	
		PSR02-12S2P5	4.6	12	36	
		PSR02-12S3P3	4.75	12	36	
		PSR02-12S05	6.5	12	36	
		PSR02-12S6P5	9.0	12	36	
		PSR02-24S09	12	24	36	
		PSR02-24S12	15	24	36	
		PSR02-24S15	18	24	36	
	For PSR02-12S□□ and PSR02-24S□□, only if the input will be switched electromechanically, the input should install an external 22μF/50V E/C.					
Start up time	Constant resistive load	Power up		5		ms
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			-0.5		+0.5	%
Load regulation	No Load to Full Load			-1.0		+1.0	%
Ripple and noise	Measured by 20MHz bandwidth		Vout≦6.5V		50		mVp-p
			Vout≧9.0V		75		
Temperature coefficient				-0.02		+0.02	%/℃
Dynamic load response	50% load step change	Peak deviation	24S□□		300		mV
			Others		150		mV
		Recovery time	All		150		μs
Over load protection	% of Iout rated; Hiccup mode		05S□□		8		A
			Others		3.6		
Short circuit protection					Continuous, automatics recovery		

GENERAL SPECIFICATIONS

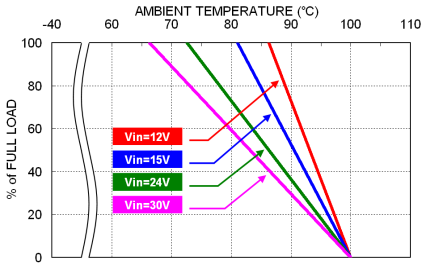
Parameter	Conditions		Min.	Typ.	Max.	Unit
Switching frequency		05S□□		1200		kHz
		Others		410		
Safety meets					IEC /UL/ EN60950-1	
Case material					Non-conducted black plastic	
Potting material					Silicone (UL94 V-0)	
Weight					2.6g(0.092oz)	
MTBF	MIL-HDBK-217F, Full load				$1.352x10^7$ hrs	

ENVIRONMENTAL SPECIFICATIONS

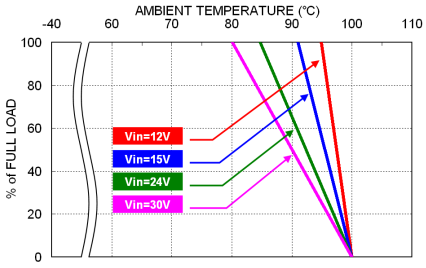
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating		-40		+100	℃
	* For high output power of PSR02-24S□□ has an optional heat-sink with suffix HS, which is able to be operated at least 50℃ ambient temperature without derating when applied input voltage doesn't exceed 30V. Other models can meet this condition without heat-sink, and can install the heat-sink for higher operating ambient temperature as well.					
Maximum case temperature					+105	℃
Over temperature protection	Internal IC junction			+150		℃
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.

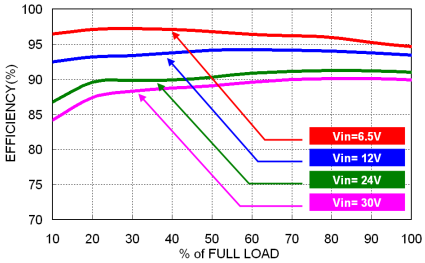
CHARACTERISTIC CURVE



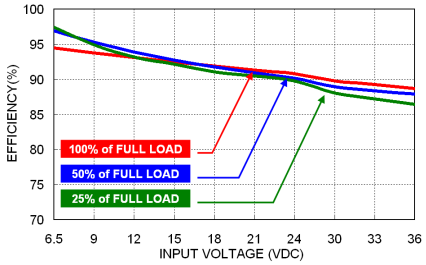
PSR02-12S05 Derating Curve



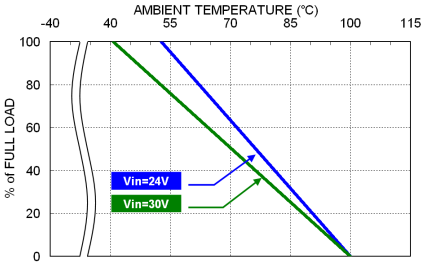
PSR02-12S05-**HS** Derating Curve



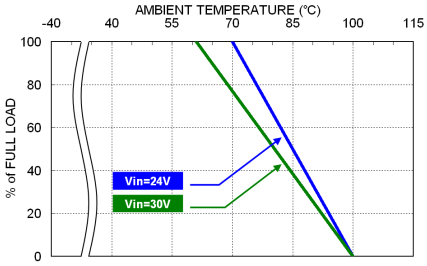
PSR02-12S05 Efficiency vs. Output Load



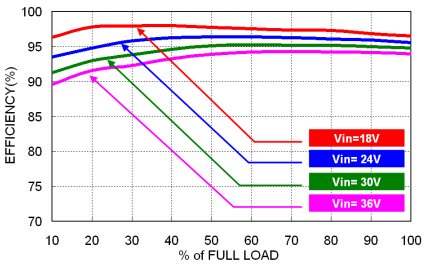
PSR02-12S05 Efficiency vs. Input Voltage



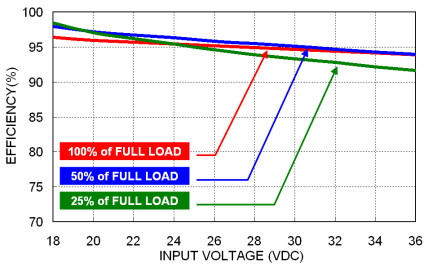
PSR02-24S15 Derating Curve



PSR02-24S15-**HS** Derating Curve



PSR02-24S15 Efficiency vs. Output Load



PSR02-24S15 Efficiency vs. Input Voltage

FUSE CONSIDERATION

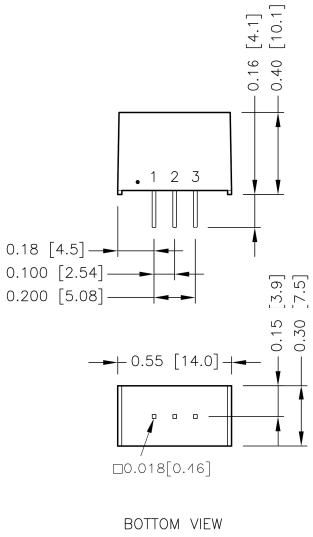
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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
PSR02-05S□□	2	Slow-Blow
PSR02-12S1P2、12S1P5、12S1P8	1.6	Slow-Blow
PSR02-12S2P5、12S3P3、12S05、12S6P5	2.5	Slow-Blow
PSR02-24S□□	3.15	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

PSR02-□□S□□



BOTTOM VIEW

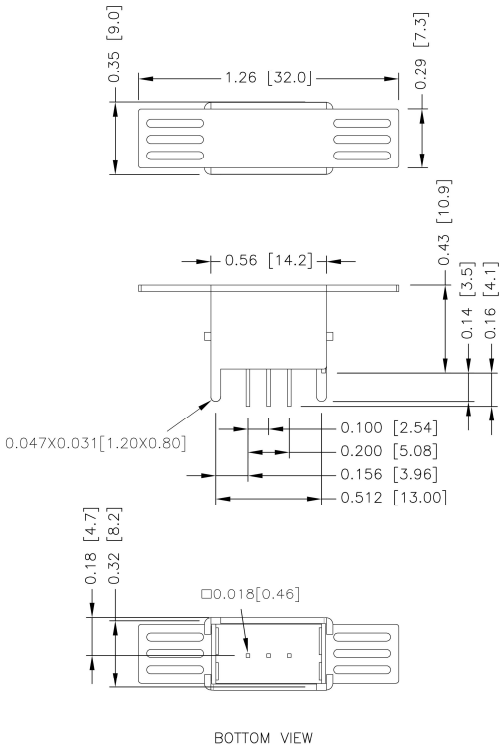
PIN CONNECTION

PIN	DEFINE
1	+Vin
2	GND
3	+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 pitch tolerance ±0.01 [0.25]
4. Pin dimension tolerance ±0.004[0.10]

MECHANICAL DRAWING(CONTINUED)

PSR02-□□S□□-HS



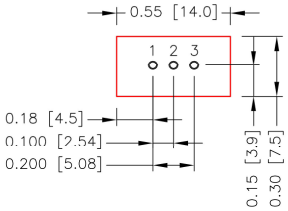
PIN CONNECTION

PIN	DEFINE
1	+Vin
2	GND
3	+Vout
4	Case
5	Case

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 pitch tolerance ±0.01 [0.25]
4. Pin dimension tolerance ±0.004[0.10]

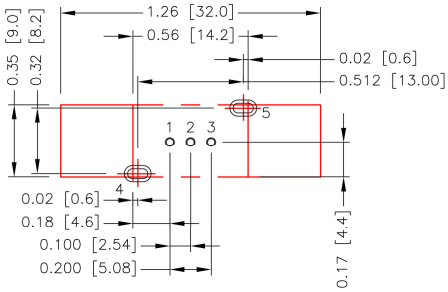
RECOMMENDED PAD LAYOUT

PSR02-□□S□□



All dimensions in inch[mm]
Pad size[lead free recommended]
Through hole1.2.3.: Φ0.035[0.90]
Top view pad1.2.3: Φ0.044[1.13]
Bottom view pad1.2.3: Φ0.071[1.80]

PSR02-□□S□□-HS

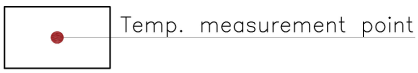


All dimensions in inch[mm]
Pad size[lead free recommended]
Through hole1.2.3.: Φ0.035[0.90]
Through hole4.5:0.098x0.047[2.50x1.20]
Top view pad1.2.3: Φ0.044[1.13]
Top view pad4.5:0.130x0.079[3.30x2.00]
Bottom view pad1.2.3: Φ0.071[1.80]
Top view pad4.5:0.130x0.079[3.30x2.00]

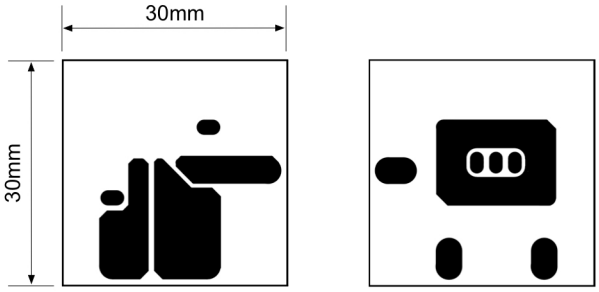
THERMAL CONSIDERATIONS

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 100℃, you can limit this Temperature to a lower value for extremely high reliability.
The unit will shutdown if the internal IC junction exceeds 150℃ (typical), but the thermal shutdown is not intended as a guarantee that the unit will survive temperature beyond its rating. The module will automatically restarts after it cools down.

■ Thermal test condition with vertical direction by natural convection (20LFM) and mounted on a 30x30mm PCB with 1oz copper and 0.8mm thickness.



TOP VIEW



Top View Bottom View

30 x 30 mm PCB

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