

#### 5A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER POWERDI®5

### **Product Summary**

V <sub>R</sub>	Ι <sub>F</sub>	V <sub>F MAX</sub> (V)	I <sub>R MAX</sub> (mA)
(V)	( <b>A</b> )	@ +25°C	@ +25°C
100	5.0	0.71	

#### **Features and Benefits**

- · Guard Ring Die Construction for Transient Protection
- High Maximum Junction Temperature
- Very Low Leakage Current
- Highly Stable Oxide Passivated Junction
- Low Forward Voltage Drop
- High Forward Surge Current Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (See Note 4)

## **Description and Applications**

This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as:

- Polarity Protection Diode
- · Re-circulating Diode
- Switching Diode

#### **Mechanical Data**

- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin annealed over Copper leadframe Solderable per MIL-STD-202, Method 208<sup>3</sup>
- Polarity: See Diagram
- Weight: 0.096 grams (approximate)

#### POWERDI5







**Bottom View** 

RIGHT PIN O BOTTOMSIDE HEAT SINK

Note: Pins Left & Right must be electrically connected at the printed circuit board.

#### Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
PDS5100H-13	AEC-Q101	POWERDI5	5000/Tape & Reel
PDS5100HQ-13	Automotive	POWERDI5	5000/Tape & Reel
PDS5100HQ-13D (Note 6)	Automotive	POWERDI5	5000/Tape & Reel

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product\_compliance\_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.
- 6. Suffix -13D is designated for 12mm tape width.

## **Marking Information**



S5100H = Product type marking code

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| YY = Last two digits of year (ex: 14 for 2014)
| WW = Week code (01 - 53)
| K = Factory Designator



## **Maximum Ratings** (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitance load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	100	<b>V</b>
RMS Reverse Voltage	$V_{R(RMS)}$	71	V
Average Rectified Output Current	lo	5	Α
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	IFSM	250	Α

## **Thermal Characteristics**

Characteristic	Symbol	Тур	Max	Unit
Typical Power Dissipation (Note 9)	Po	2.5	_	W
Thermal Resistance Junction to Case (Note 11)	Rejc	_	5	°C/W
Thermal Resistance Junction to Soldering Point	R <sub>0JS</sub>	_	2.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 7) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	85	_	°C/W
Thermal Resistance Junction to Ambient Air (Note 8) T <sub>A</sub> = +25°C	$R_{\theta JA}$	70	_	°C/W
Thermal Resistance Junction to Ambient Air (Note 9) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	45	_	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to	+175	°C

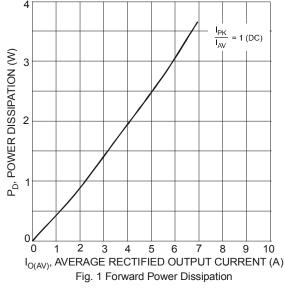
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

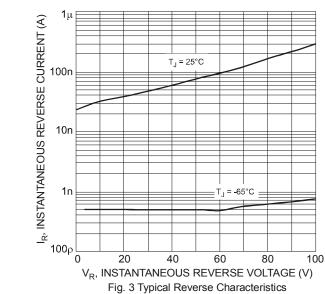
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 10)	$V_{(BR)R}$	100	_	_	V	I <sub>R</sub> = 3.5μA
Forward Voltage	V <sub>F</sub>		0.67 0.55 0.75 0.62	0.71 0.58 0.80 0.66	٧	$\begin{split} I_F &= 5\text{A},  T_S = +25^{\circ}\text{C} \\ I_F &= 5\text{A},  T_S = +125^{\circ}\text{C} \\ I_F &= 10\text{A},  T_S = +25^{\circ}\text{C} \\ I_F &= 10\text{A},  T_S = +125^{\circ}\text{C} \end{split}$
Reverse Leakage Current (Note 10)	I <sub>R</sub>	_	0.3 0.5	3.5 4.5		T <sub>S</sub> = +25°C, V <sub>R</sub> = 100V T <sub>S</sub> = +125°C, V <sub>R</sub> = 100V

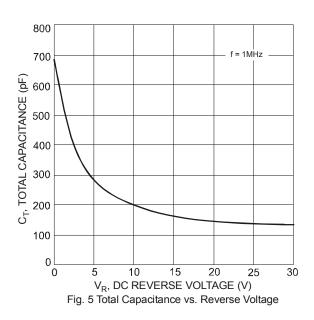
Notes:

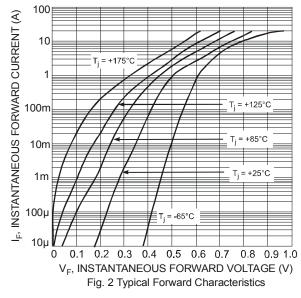
- 7. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
- Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
   Polymide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
- 10. Short duration pulse test used to minimize self-heating effect.
  11. Device mounted on Polymide 10cm x 10cm copper PC board,

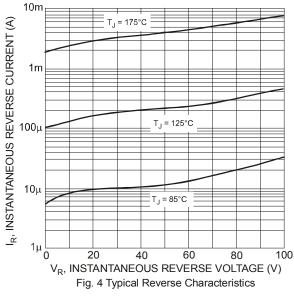


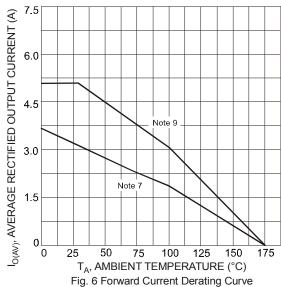




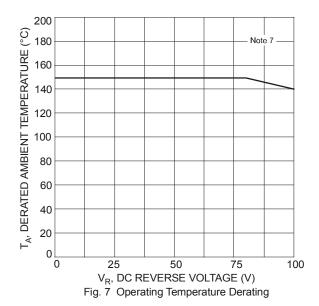






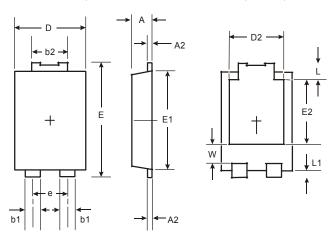






## **Package Outline Dimensions**

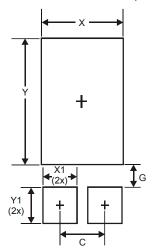
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI5				
Dim	Min	Max		
Α	1.05	1.15		
A2	0.33	0.43		
b1	0.80	0.99		
b2	1.70	1.88		
D	3.90 4.0			
D2	3.054 Typ			
Е	<b>E</b> 6.40			
е	1.84 Typ			
<b>E1</b> 5.30 5.4		5.45		
E2	3.549 Typ			
L	0.75	0.95		
L1	0.50	0.65		
W	1.10 1.41			
All Dimensions in mm				

## **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400



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Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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### Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru\_6 moschip.ru 4 moschip.ru 9