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DATA SHEET
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Axial-Lead Glass Passivated Standard Recovery Rectifiers

1N4001, 1N4002, 1N4003, 1N4004, 1N4005, 1N4006, 1N4007

This data sheet provides information on subminiature size, axial lead mounted rectifiers for general−purpose low−power applications.

Features

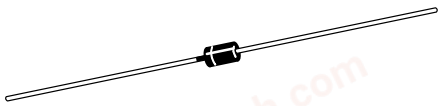
- Shipped in Plastic Bags, 1000 per bag
- Available Tape and Reeled, 5000 per reel, by adding a “RL” suffix to the part number
- Available in Fan−Fold Packaging, 3000 per box, by adding a “FF” suffix to the part number
- Pb−Free Packages are Available

Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 0.4 gram (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds, 1/16 in. from case
- Polarity: Cathode Indicated by Polarity Band

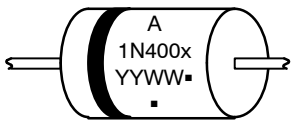
*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

LEAD MOUNTED RECTIFIERS
50−1000 VOLTS
DIFFUSED JUNCTION



CASE 59−10
AXIAL LEAD
PLASTIC

MARKING DIAGRAM



A = Assembly Location
1N400x = Device Number
x = 1, 2, 3, 4, 5, 6 or 7
YY = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 5.

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MAXIMUM RATINGS

Rating	Symbol	1N4001	1N4002	1N4003	1N4004	1N4005	1N4006	1N4007	Unit
†Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	50	100	200	400	600	800	1000	V
†Non−Repetitive Peak Reverse Voltage (halfwave, single phase, 60 Hz)	V_{RSM}	60	120	240	480	720	1000	1200	V
†RMS Reverse Voltage	$V_{R(RMS)}$	35	70	140	280	420	560	700	V
†Average Rectified Forward Current (single phase, resistive load, 60 Hz, T_A = 75°C)	I_O	1.0							A
†Non−Repetitive Peak Surge Current (surge applied at rated load conditions)	I_{FSM}	30 (for 1 cycle)							A
Operating and Storage Junction Temperature Range	T_J T_{stg}	−65 to +150							°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
†Indicates JEDEC Registered Data

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Maximum Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	Note 1	°C/W

ELECTRICAL CHARACTERISTICS†

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage Drop, (i_F = 1.0 Amp, T_J = 25°C)	v_F	0.93	1.1	V
Maximum Full−Cycle Average Forward Voltage Drop, (I_O = 1.0 Amp, T_L = 75°C, 1 inch leads)	$V_{F(AV)}$	–	0.8	V
Maximum Reverse Current (rated DC voltage) (T_J = 25°C) (T_J = 100°C)	I_R	 0.05 1.0	 10 50	μA
Maximum Full−Cycle Average Reverse Current, (I_O = 1.0 Amp, T_L = 75°C, 1 inch leads)	$I_{R(AV)}$	–	30	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
†Indicates JEDEC Registered Data

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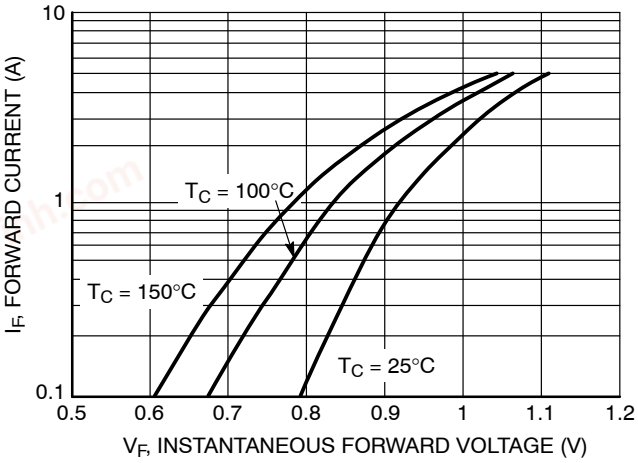

Figure 1. Typical Forward Voltage

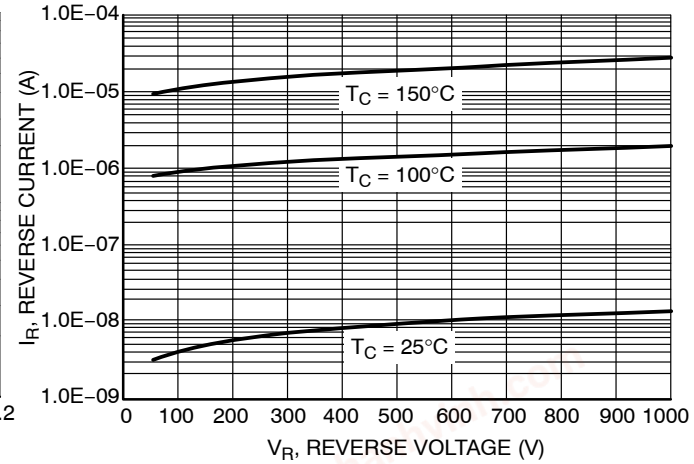

Figure 2. Typical Reverse Current

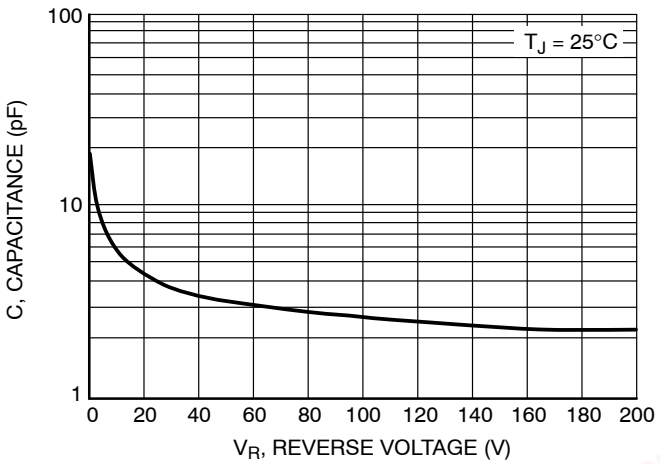

Figure 3. Typical Capacitance

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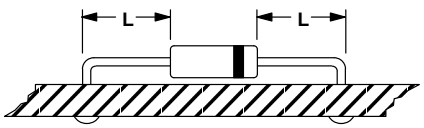
NOTE 1. – AMBIENT MOUNTING DATA

Data shown for thermal resistance, junction–to–ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

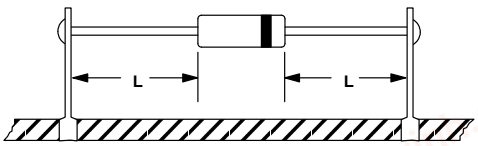
TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

Mounting Method		Lead Length, L			Units
		1/8	1/4	1/2	
1	$R_{\theta JA}$	52	65	72	°C/W
2		67	80	87	°C/W
3		50			°C/W

MOUNTING METHOD 1

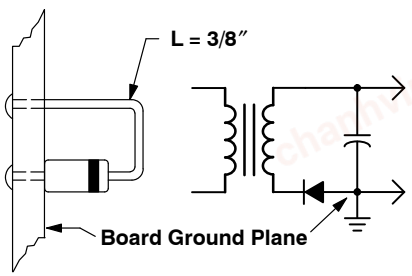


MOUNTING METHOD 2



Vector Pin Mounting

MOUNTING METHOD 3



P.C. Board with
1–1/2″ X 1–1/2″ Copper Surface

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ORDERING INFORMATION

Device	Package	Shipping†
1N4001G	Axial Lead* (Pb−Free)	1000 Units/Bag
1N4001RLG		5000/Tape & Reel
1N4002G		1000 Units/Bag
1N4002RLG		5000/Tape & Reel
1N4003G		1000 Units/Bag
1N4003RLG		5000/Tape & Reel
1N4004G		1000 Units/Bag
1N4004RLG		5000/Tape & Reel
1N4005G		1000 Units/Bag
1N4005RLG		5000/Tape & Reel
1N4006G		1000 Units/Bag
1N4006RLG		5000/Tape & Reel
1N4007G		1000 Units/Bag
1N4007FFG		3000 Units/Box
1N4007RLG		5000/Tape & Reel

DISCONTINUED (Note 1)

1N4001	Axial Lead*	1000 Units/Bag
1N4001RL	Axial Lead*	5000/Tape & Reel
1N4002	Axial Lead*	1000 Units/Bag
1N4002RL	Axial Lead*	5000/Tape & Reel
1N4003	Axial Lead*	1000 Units/Bag
1N4003RL	Axial Lead*	5000/Tape & Reel
1N4004	Axial Lead*	1000 Units/Bag
1N4004RL	Axial Lead*	5000/Tape & Reel
1N4005	Axial Lead*	1000 Units/Bag
1N4005RL	Axial Lead*	5000/Tape & Reel
1N4006	Axial Lead*	1000 Units/Bag
1N4006FFG	Axial Lead* (Pb−Free)	3000 Units/Box
1N4006RL	Axial Lead*	5000/Tape & Reel
1N4007	Axial Lead*	1000 Units/Bag
1N4007RL	Axial Lead*	5000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*This package is inherently Pb−Free.

1. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

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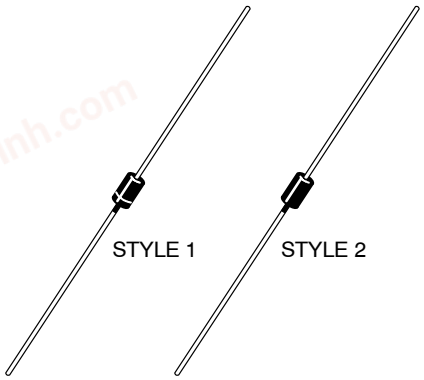
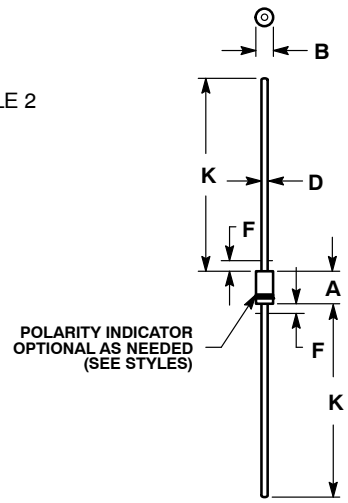
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

AXIAL LEAD
CASE 59–10
ISSUE U

DATE 15 FEB 2005



SCALE 1:1



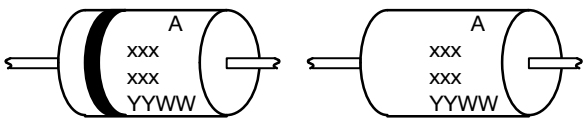
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO–41 OUTLINE SHALL APPLY
4. POLARITY DENOTED BY CATHODE BAND.
5. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.161	0.205	4.10	5.20
B	0.079	0.106	2.00	2.70
D	0.028	0.034	0.71	0.86
F	---	0.050	---	1.27
K	1.000	---	25.40	---

STYLE 1:
PIN 1. CATHODE (POLARITY BAND)
2. ANODE

STYLE 2:
NO POLARITY

GENERIC MARKING DIAGRAM*



STYLE 1 STYLE 2

xxx = Specific Device Code
A = Assembly Location
YY = Year
WW = Work Week

*This information is generic. Please refer to device data sheet for actual part marking. Pb–Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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DESCRIPTION:	AXIAL LEAD	PAGE 1 OF 1

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