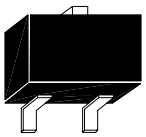
## Zener Diode Series

# ZD52XXBN3



SOT-23

## Thermal Characteristics

| Characteristics | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation FR-5 Board<br>TA=25°C, Derate above 25°C | PD | 225<br>1.8 | mW<br>mW/°C |
| Total Device Dissipation<br>Alumina Substrate**TA=25°C, Derate above 25°C | PD | 300<br>2.4 | mW<br>mW/°C |
| Thermal Resistance Junction to Ambient | RθJA | 417 | °C/W |
| Junction and Storage Temperature | Tj, Tstg | -55 to +150 | °C |

*FR-5 - 1.0×0.75×0.062 in. **Alumina - 0.4×0.3×0.024 in. 99.5% alumina.

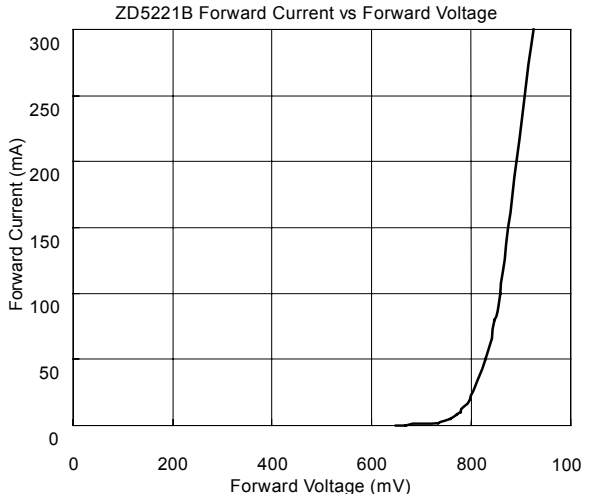
## Electrical Characteristic (VF=0.9V Max @IF=10mA for all types.)

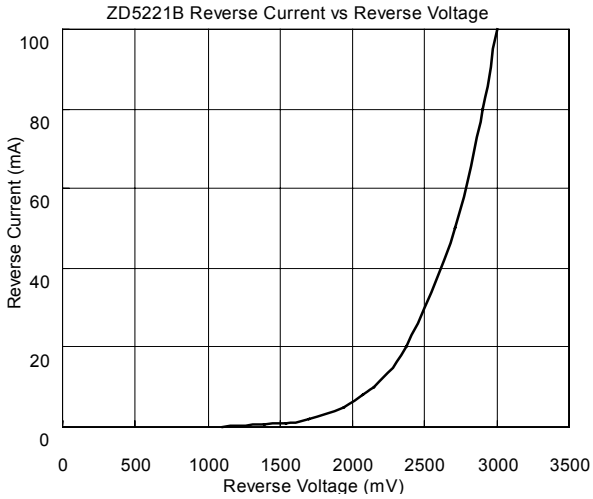
| Device | Marking Code | Test Current IZT(mA) | Zener Voltage VZ(V) | ZZK IZ=0.25mA (Ω,Max) | ZZT IZ=IZT (Ω,Max) | Max. Reverse Current IR(uA) | @VR(V) |
|---|---|---|---|---|---|---|---|
| ZD5221B | 18A | 20 | 2.4 ±5% | 1200 | 30 | 100 | 1.0 |
| ZD5222B | 18B | 20 | 2.5 ±5% | 1250 | 30 | 100 | 1.0 |
| ZD5223B | 18C | 20 | 2.7 ±5% | 1300 | 30 | 75 | 1.0 |
| ZD5225B | 18E | 20 | 3.0 ±5% | 1600 | 29 | 50 | 1.0 |
| ZD5226B | 8A | 20 | 3.3 ±5% | 1600 | 28 | 25 | 1.0 |
| ZD5227B | 8B | 20 | 3.6 ±5% | 1700 | 24 | 15 | 1.0 |
| ZD5228B | 8C | 20 | 3.9 ±5% | 1900 | 23 | 10 | 1.0 |
| ZD5229B | 8D | 20 | 4.3 ±5% | 2000 | 22 | 5.0 | 1.0 |
| ZD5230B | 8E | 20 | 4.7 ±5% | 1900 | 19 | 5.0 | 2.0 |
| ZD5231B | 8F | 20 | 5.1 ±5% | 1600 | 17 | 5.0 | 2.0 |
| ZD5232B | 8G | 20 | 5.6 ±5% | 1600 | 11 | 5.0 | 3.0 |
| ZD5233B | 8H | 20 | 6.0 ±5% | 1600 | 7.0 | 5.0 | 3.5 |
| ZD5234B | 8J | 20 | 6.2 ±5% | 1000 | 7.0 | 5.0 | 4.0 |
| ZD5235B | 8K | 20 | 6.8 ±5% | 750 | 5.0 | 3.0 | 5.0 |
| ZD5236B | 8L | 20 | 7.5 ±5% | 500 | 6.0 | 3.0 | 6.0 |
| ZD5237B | 8M | 20 | 8.2 ±5% | 500 | 8.0 | 3.0 | 6.5 |
| ZD5238B | 8N | 20 | 8.7 ±5% | 600 | 8.0 | 3.0 | 6.5 |
| ZD5239B | 8P | 20 | 9.1 ±5% | 600 | 10 | 3.0 | 7.0 |
| ZD5240B | KF5 | 20 | 10 ±5% | 600 | 17 | 3.0 | 8.0 |
| ZD5241B | 8R | 20 | 11 ±5% | 600 | 22 | 2.0 | 8.4 |
| ZD5242B | 8S | 20 | 12 ±5% | 600 | 30 | 1.0 | 9.1 |
| ZD5243B | 8T | 9.5 | 13 ±5% | 600 | 13 | 0.5 | 9.9 |
| ZD5244B | 8U | 9.0 | 14 ±5% | 600 | 15 | 0.1 | 10 |

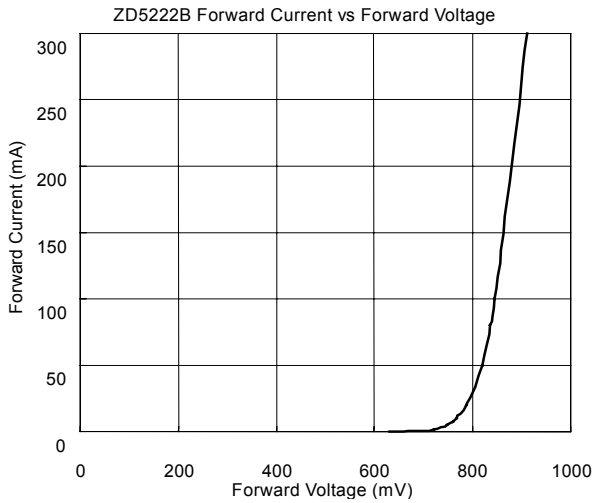
## Electrical Characteristic(Cont.)

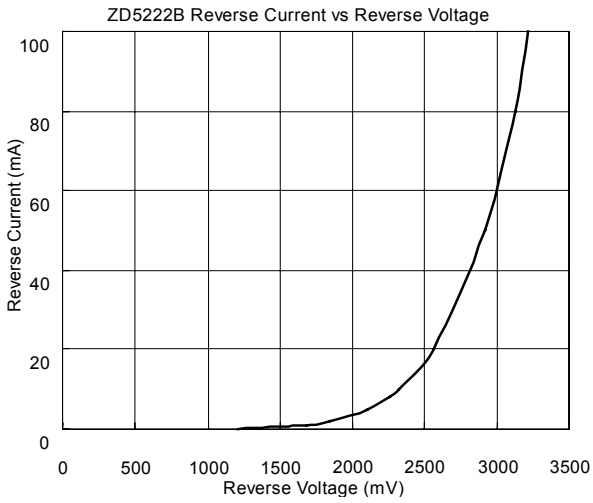
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ZD5245B | 8V | 8.5 | 15 ±5% | 600 | 16 | 0.1 | 11 |
| ZD5246B | 8W | 7.8 | 16 ±5% | 600 | 17 | 0.1 | 12 |
| ZD5247B | 8X | 7.4 | 17 ±5% | 600 | 19 | 0.1 | 13 |
| ZD5248B | 8Y | 7.0 | 18 ±5% | 600 | 21 | 0.1 | 14 |
| ZD5249B | 8Z | 6.6 | 19 ±5% | 600 | 23 | 0.1 | 14 |
| ZD5250B | 81A | 6.2 | 20 ±5% | 600 | 25 | 0.1 | 15 |
| ZD5251B | 81B | 5.6 | 22 ±5% | 600 | 29 | 0.1 | 17 |
| ZD5252B | 81C | 5.2 | 24 ±5% | 600 | 33 | 0.1 | 18 |
| ZD5253B | 81D | 5.0 | 25 ±5% | 600 | 35 | 0.1 | 19 |
| ZD5254B | 81E | 4.6 | 27 ±5% | 600 | 41 | 0.1 | 21 |
| ZD5255B | 81F | 4.5 | 28 ±5% | 600 | 44 | 0.1 | 21 |
| ZD5256B | 81G | 4.2 | 30 ±5% | 600 | 49 | 0.1 | 23 |
| ZD5257B | 81H | 3.8 | 33 ±5% | 700 | 58 | 0.1 | 25 |
| ZD5258B | 81J | 3.4 | 36 ±5% | 700 | 70 | 0.1 | 27 |

## Characteristic Curves

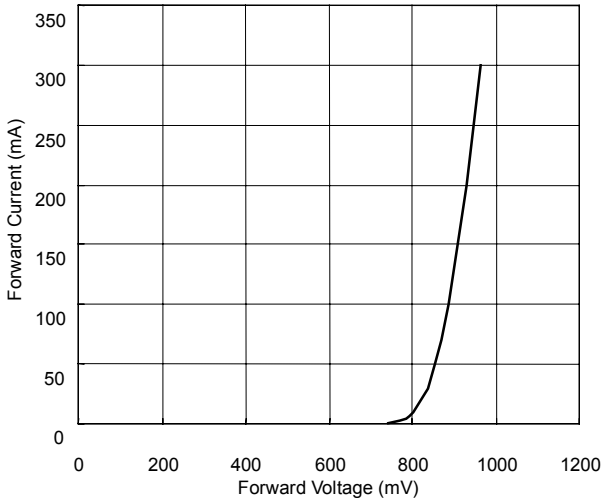


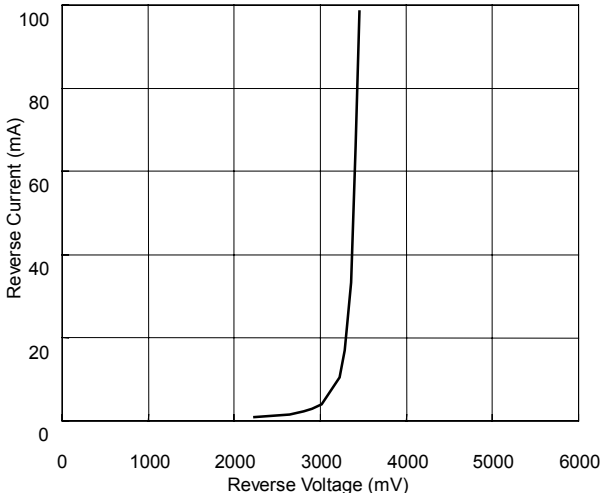



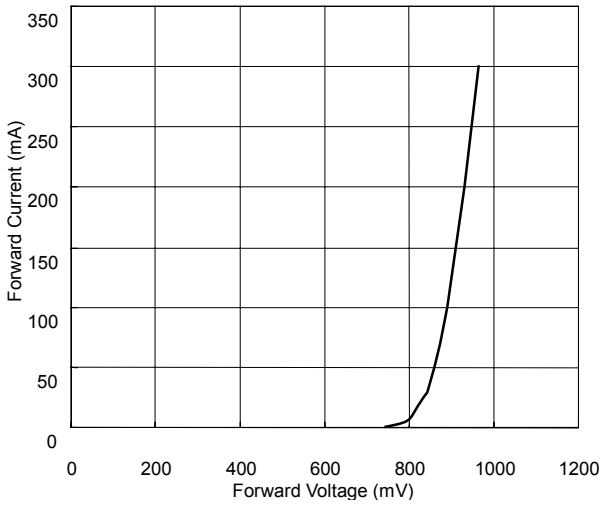
ZD5226B Forward Current vs Forward Voltage



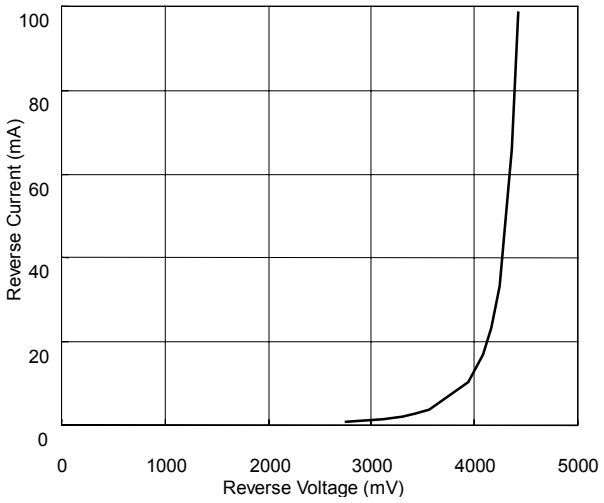

ZD5226B Reverse Current vs Reverse Voltage



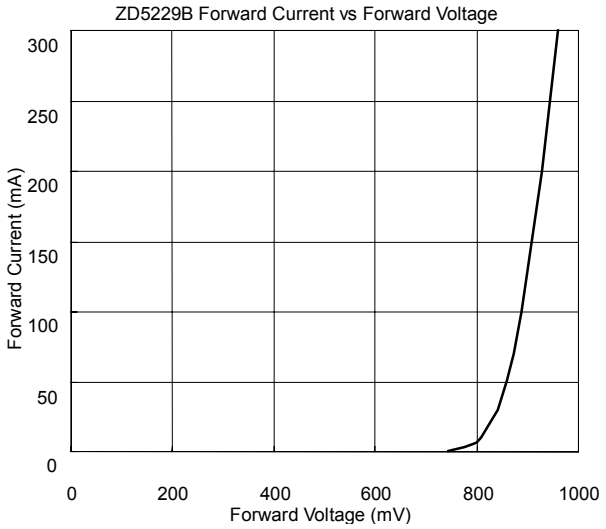

ZD5228B Forward Current vs Forward Voltage



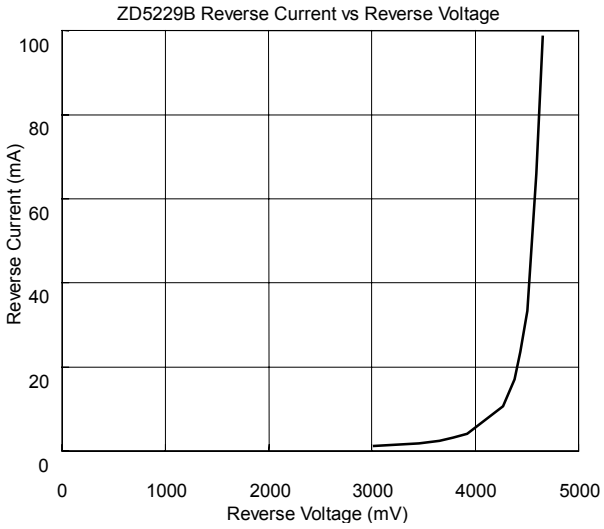

ZD5228B Reverse Current vs Reverse Voltage



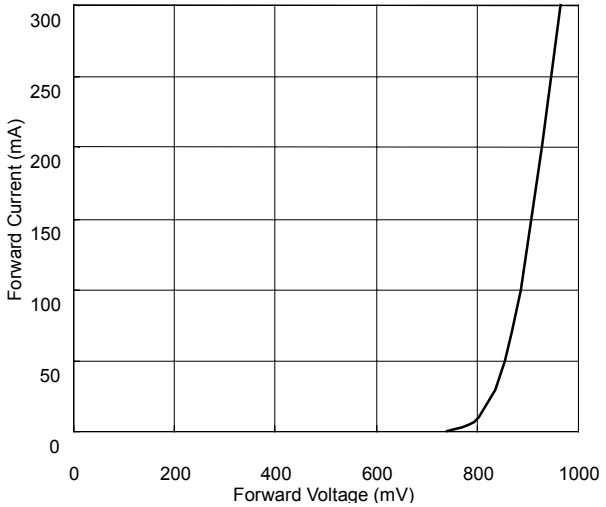

ZD5229B Forward Current vs Forward Voltage



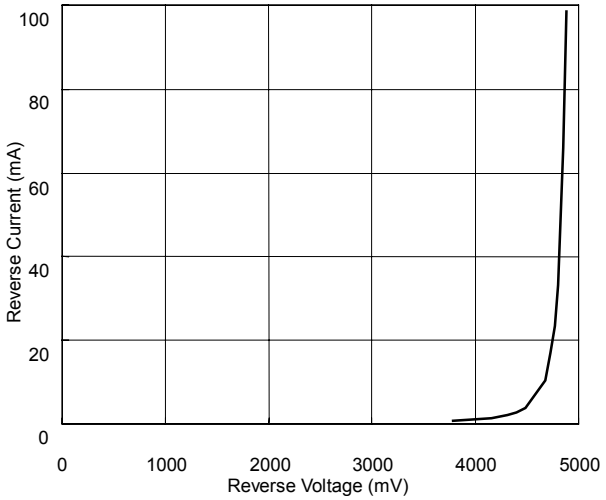

ZD5229B Reverse Current vs Reverse Voltage



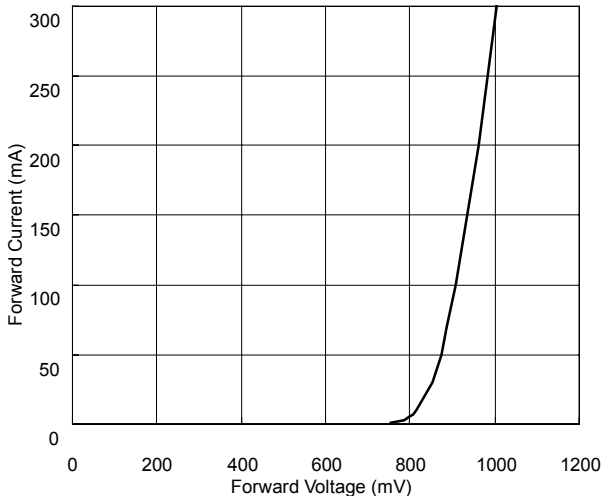
ZD5230B Forward Current vs Forward Voltage



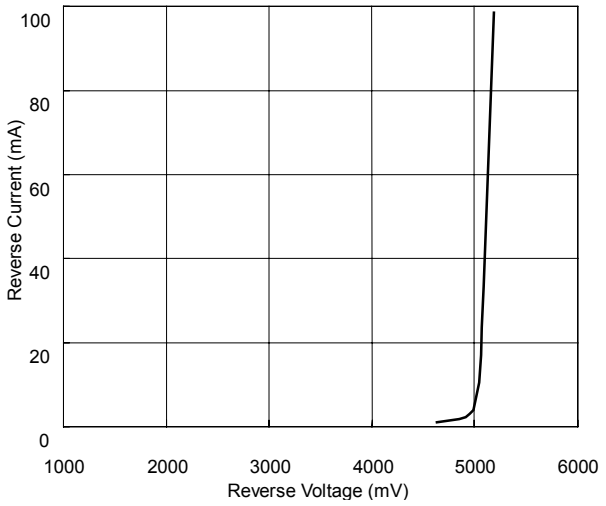

ZD5230B Reverse Current vs Reverse Voltage



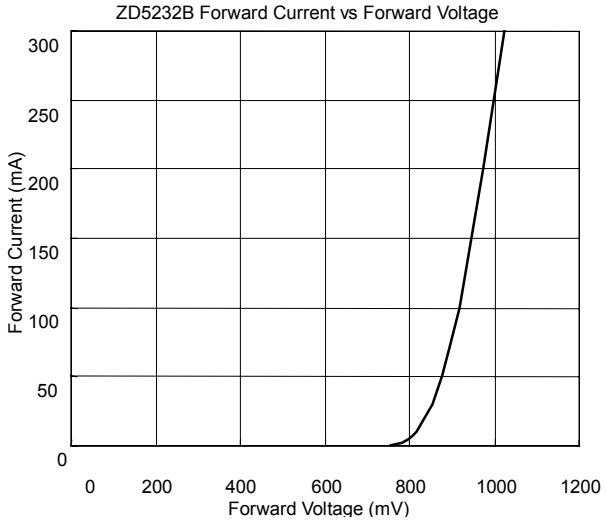

ZD5231B Forward Current vs Forward Voltage



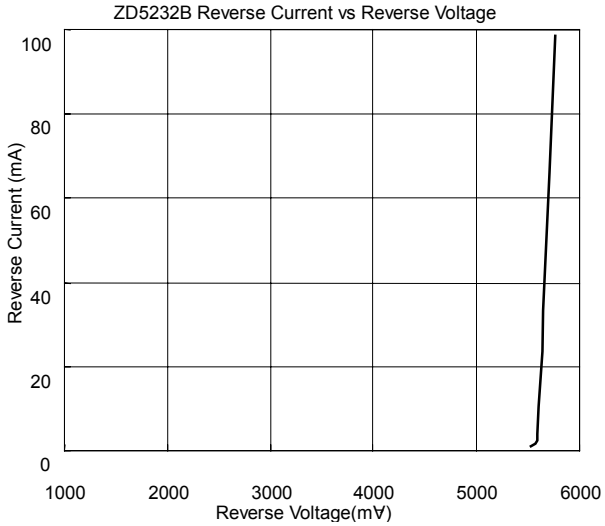

ZD5231B Reverse Current vs Reverse Voltage



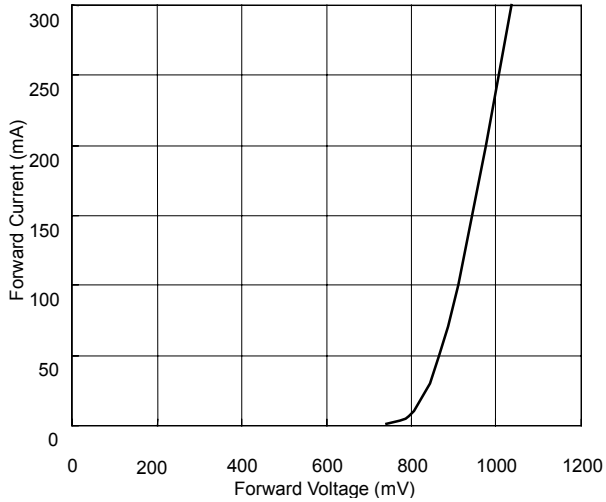

ZD5232B Forward Current vs Forward Voltage



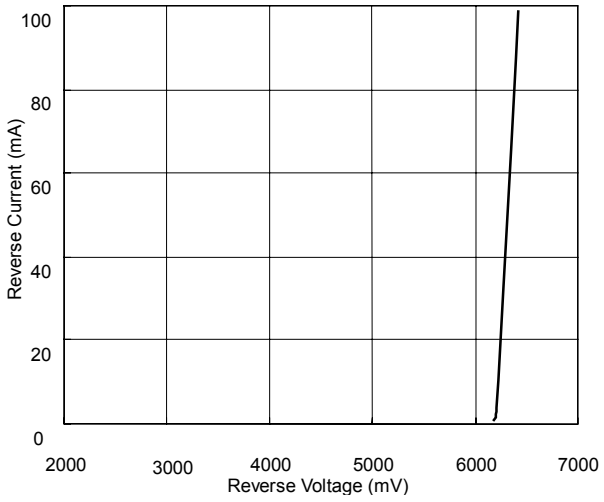

ZD5232B Reverse Current vs Reverse Voltage



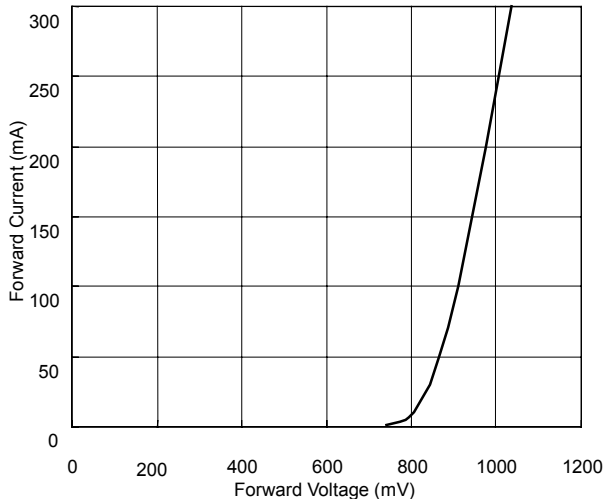
ZD5233B Forward Current vs Forward Voltage



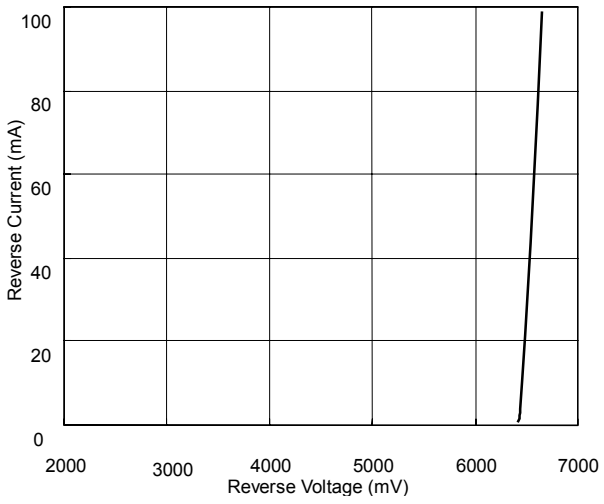

ZD5233B Reverse Current vs Reverse Voltage



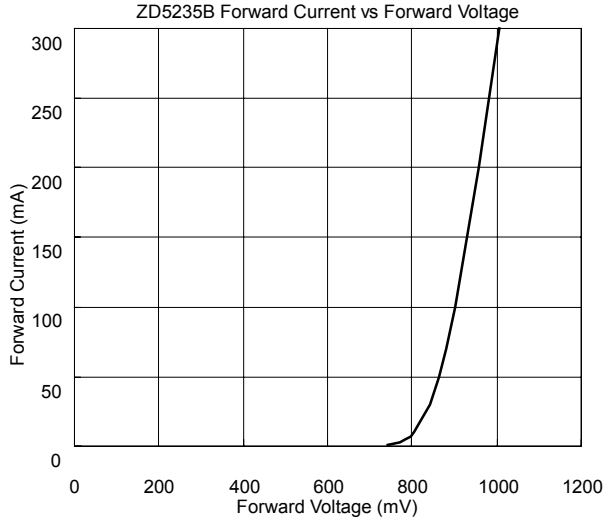

ZD5234B Forward Current vs Forward Voltage



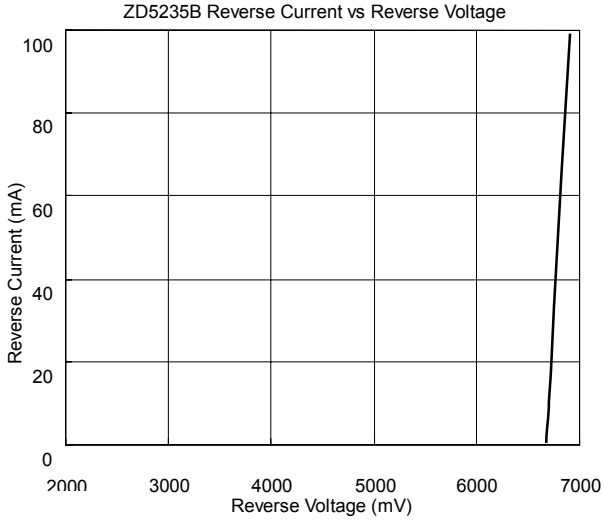

ZD5234B Reverse Current vs Reverse Voltage



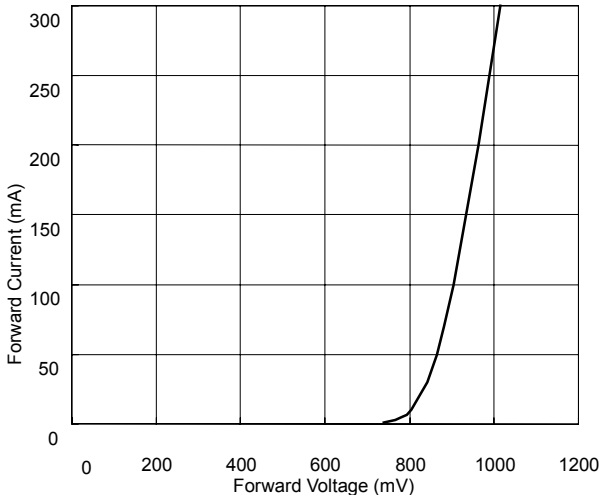

ZD5235B Forward Current vs Forward Voltage



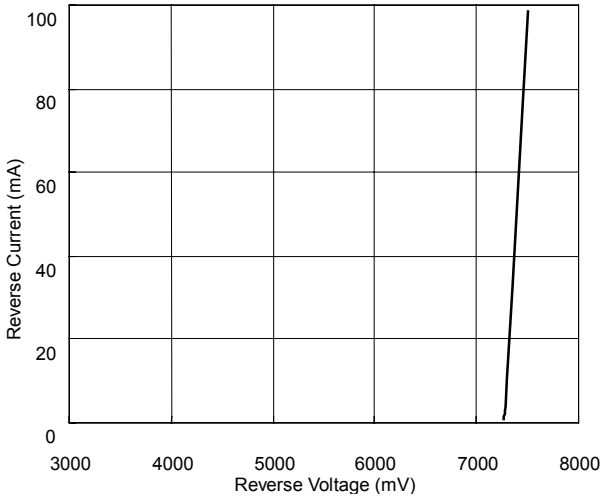

ZD5235B Reverse Current vs Reverse Voltage



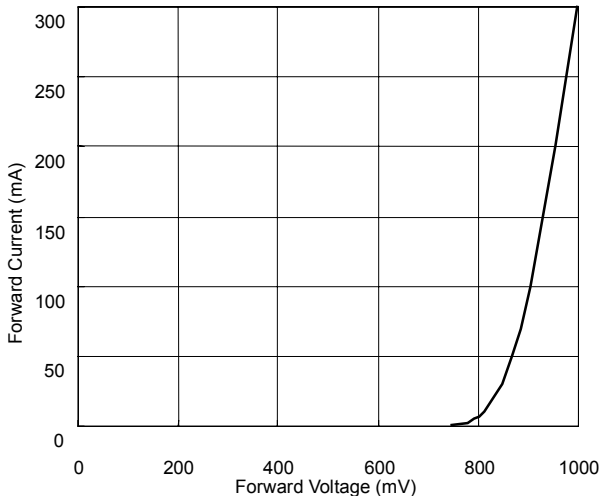
ZD5236B Forward Current vs Forward Voltage



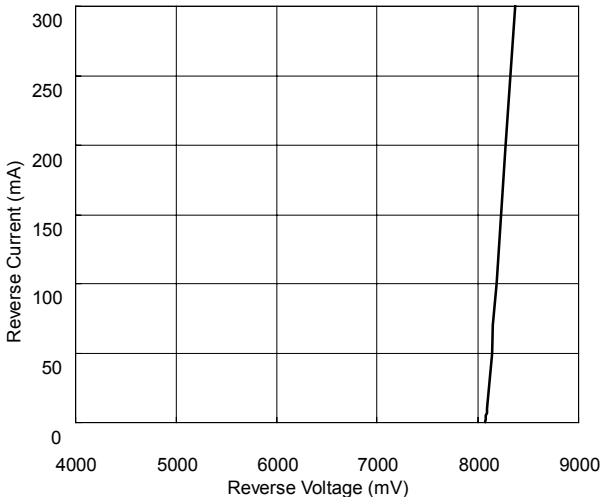

ZD5236B Reverse Current vs Reverse Voltage



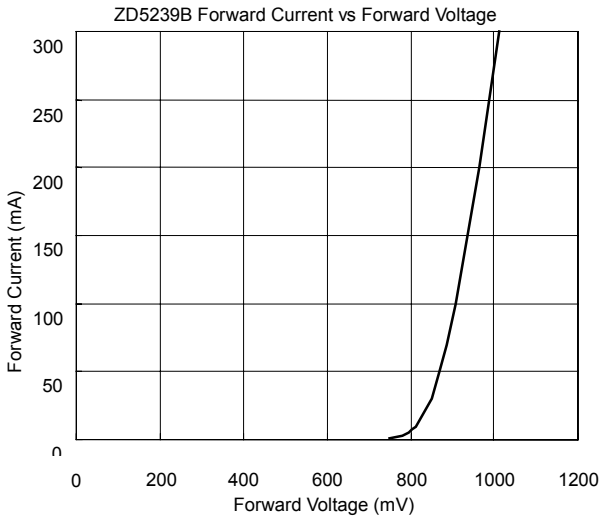

ZD5237B Forward Current vs Forward Voltage



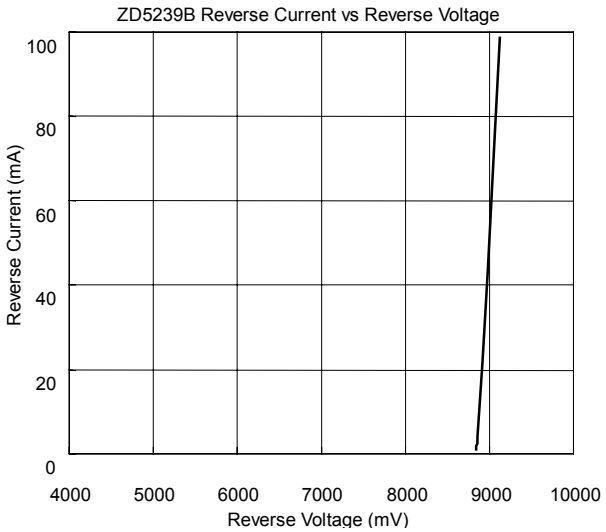

ZD5237B Reverse Current vs Reverse Voltage



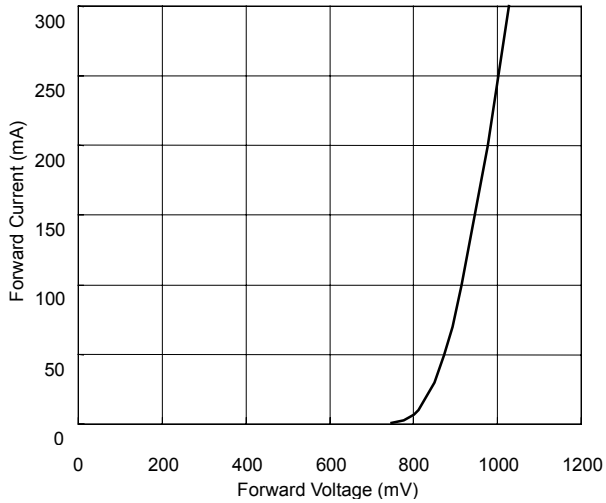

ZD5239B Forward Current vs Forward Voltage



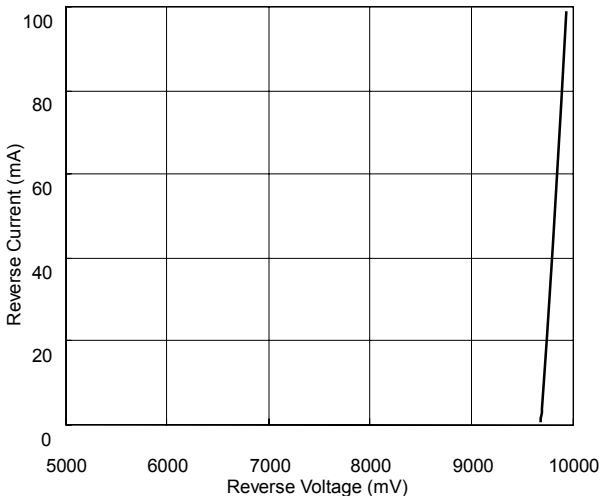

ZD5239B Reverse Current vs Reverse Voltage



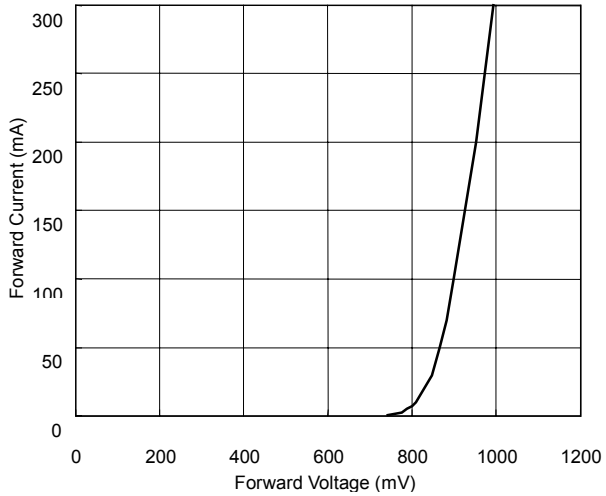
ZD5240B Forward Current vs Forward Voltage



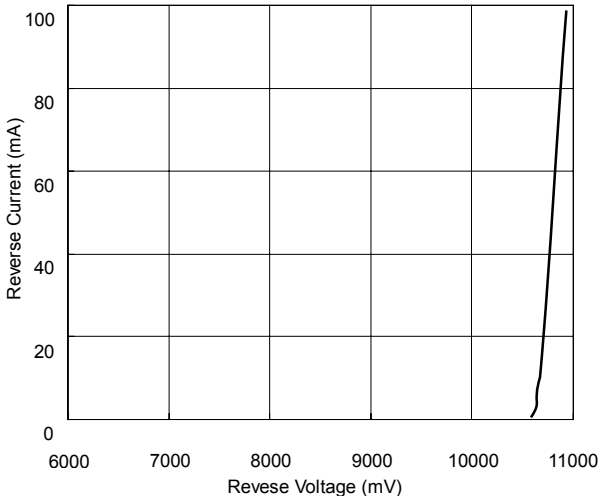

ZD5240B Reverse Current vs Reverse Voltage



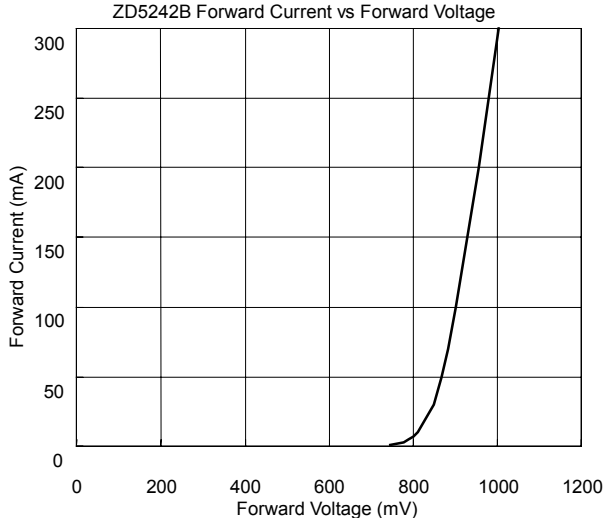

ZD5241B Forward Current vs Forward Voltage



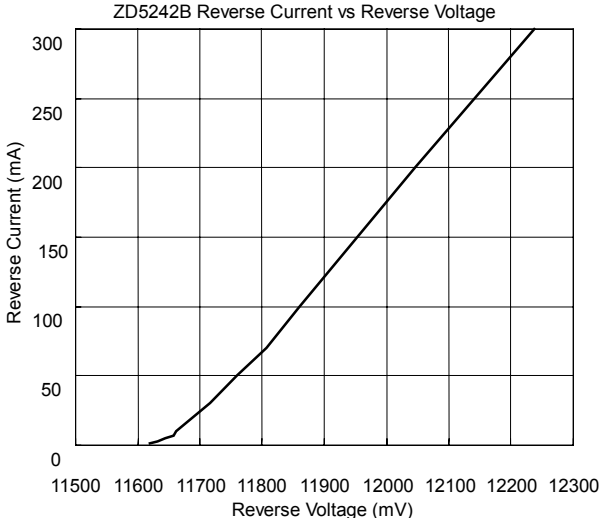

ZD5241B Reverse Current vs Reverse Voltage



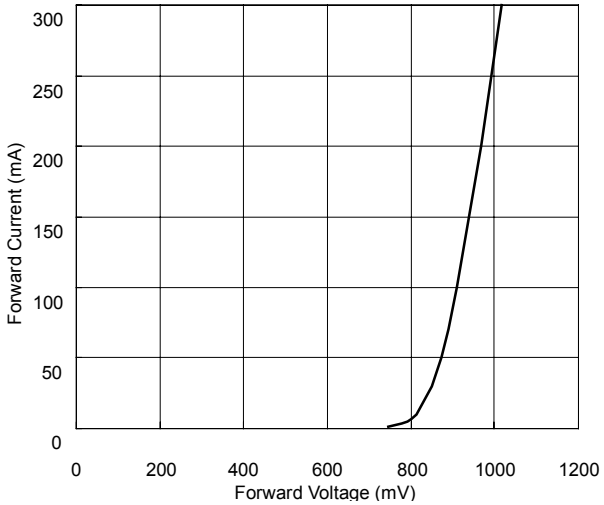

ZD5242B Forward Current vs Forward Voltage



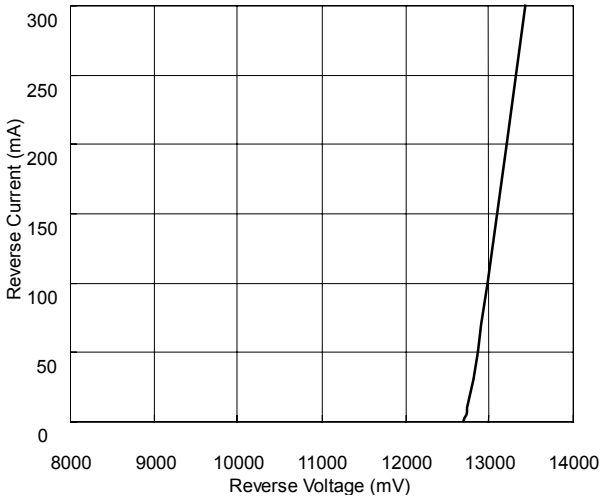

ZD5242B Reverse Current vs Reverse Voltage



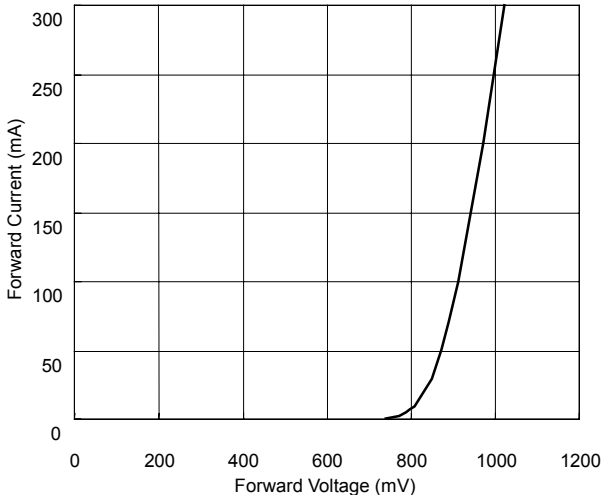
ZD5243B Forward Current vs Forward Voltage



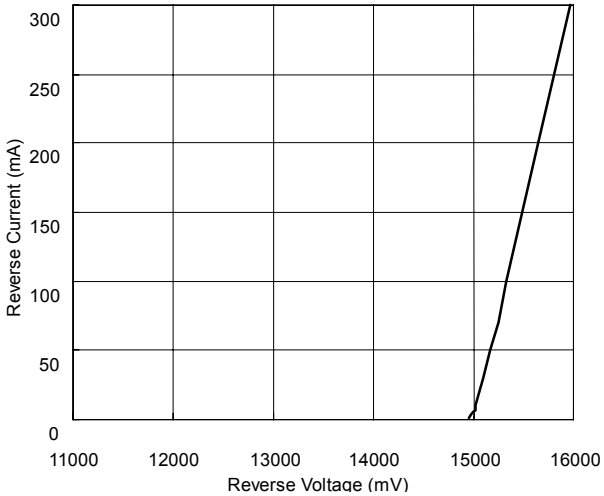

ZD5243B Reverse Current vs Reverse Voltage



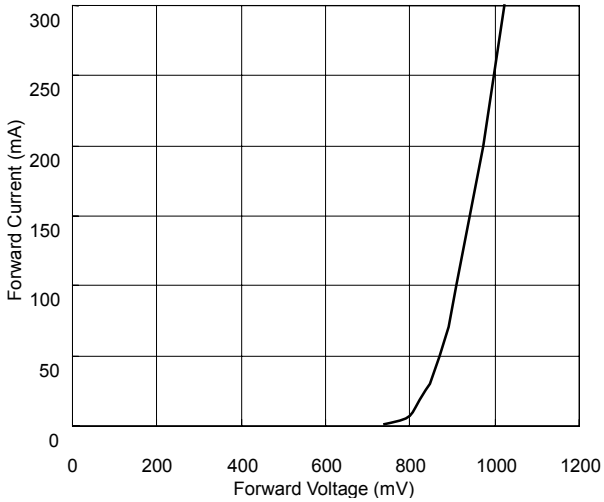

ZD5245B Forward Current vs Forward Voltage



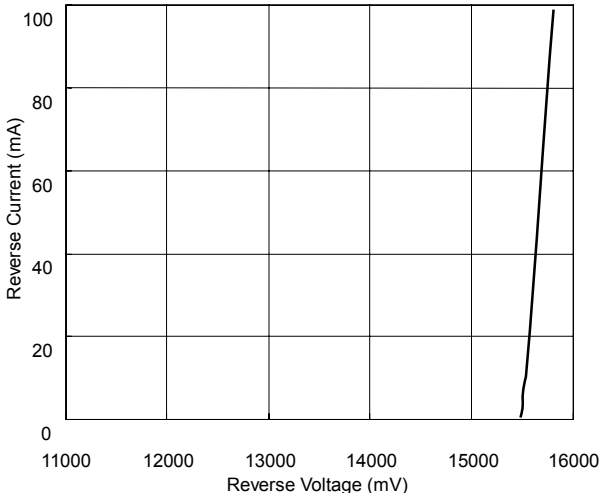

ZD5245B Reverse Current vs Reverse Voltage



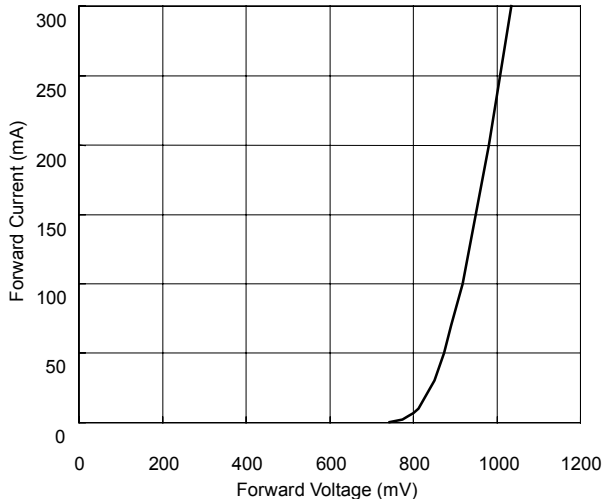

ZD5246B Forward Current vs Forward Voltage



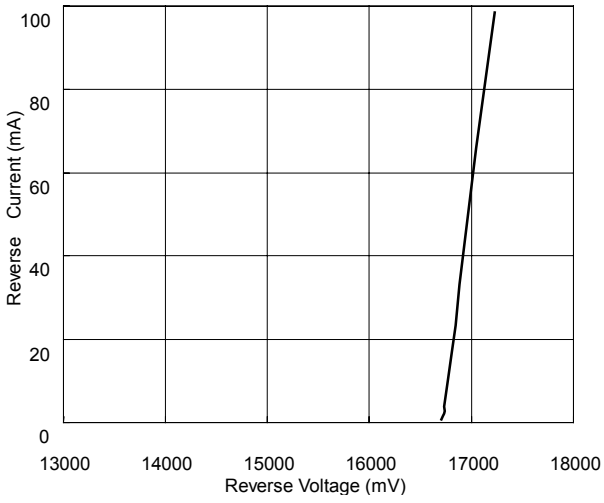

ZD5246B Reverse Current vs Reverse Voltage



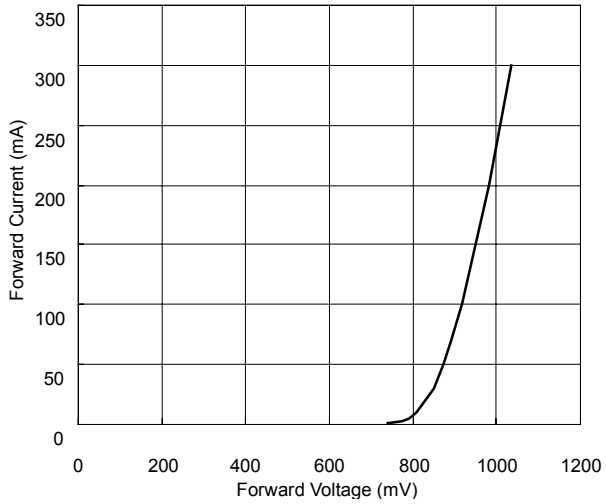
ZD5247B Forward Current vs Forward Voltage



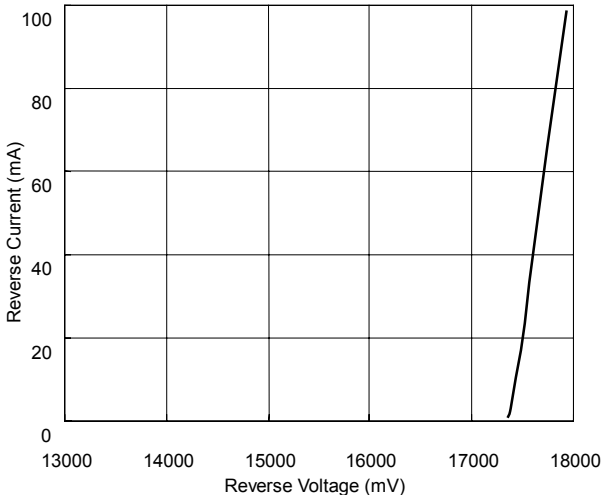

ZD5247B Reverse Current vs Reverse Voltage



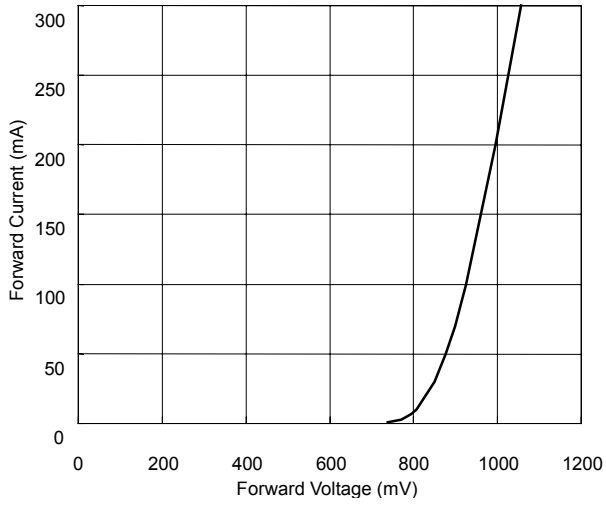

ZD5248B Forward Current vs Forward Voltage



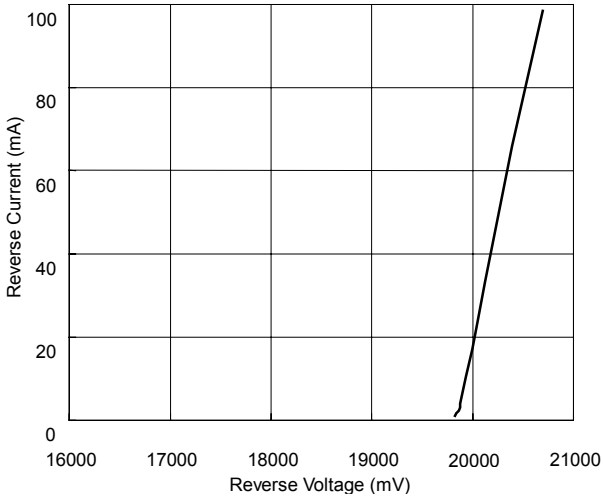

ZD5248B Reverse Current vs Reverse Voltage



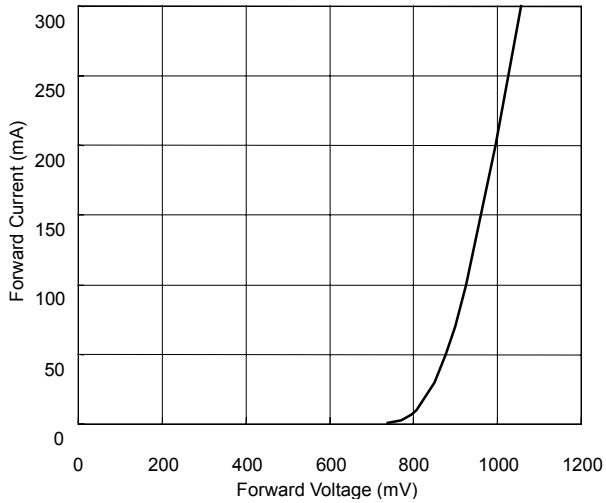

ZD5250B Forward Current vs Forward Voltage



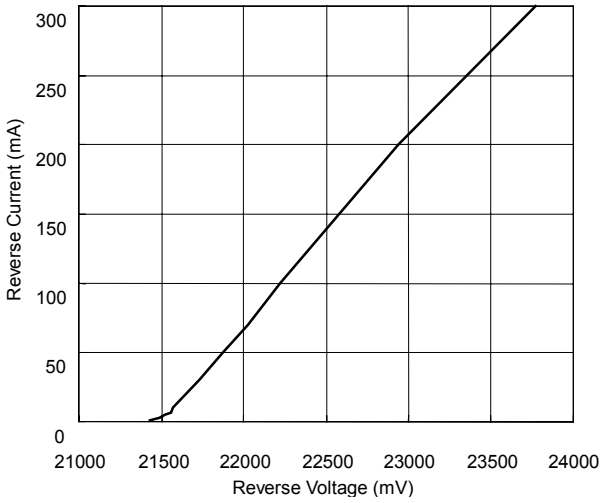

ZD5250B Reverse Current vs Reverse Voltage



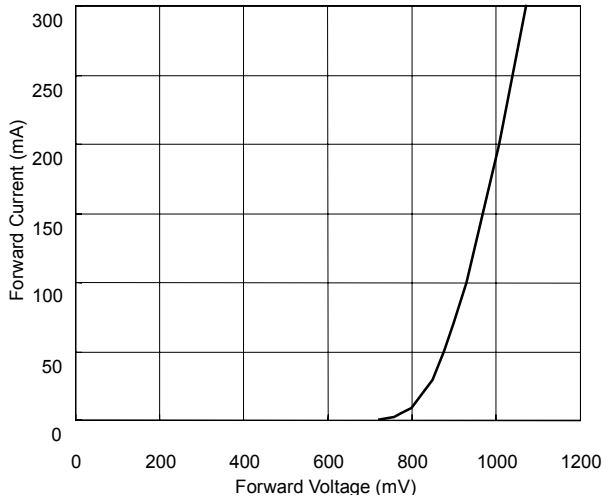
ZD5251B Forward Current vs Forward Voltage



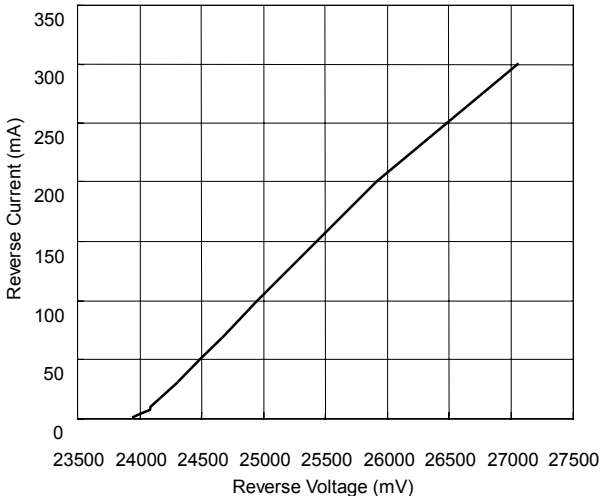

ZD5251B Reverse Current vs Reverse Voltage



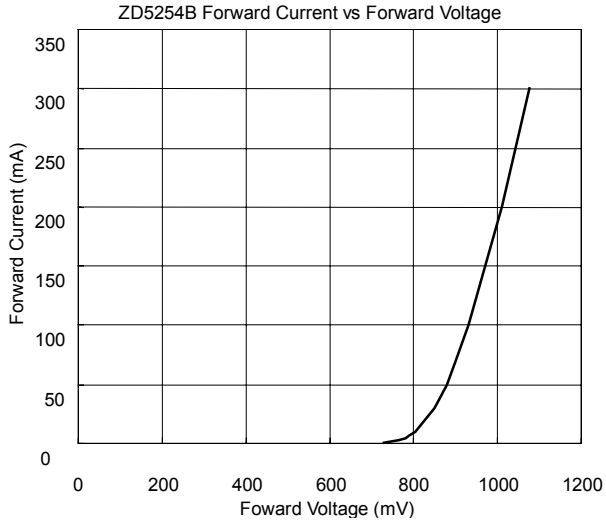

ZD5252B Forward Current vs Forward Voltage



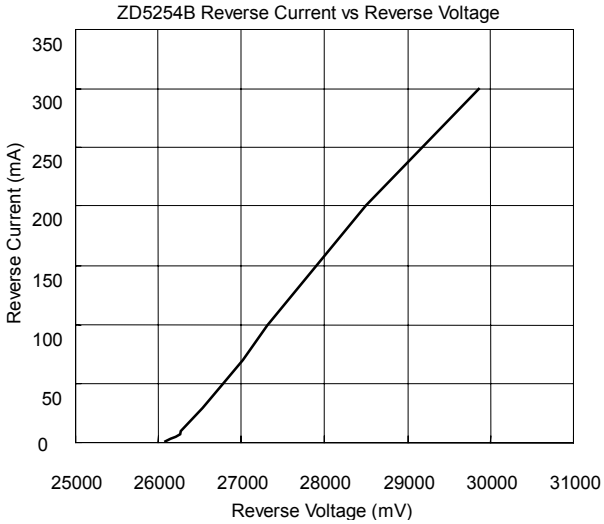

ZD5252B Reverse Current vs Reverse Voltage



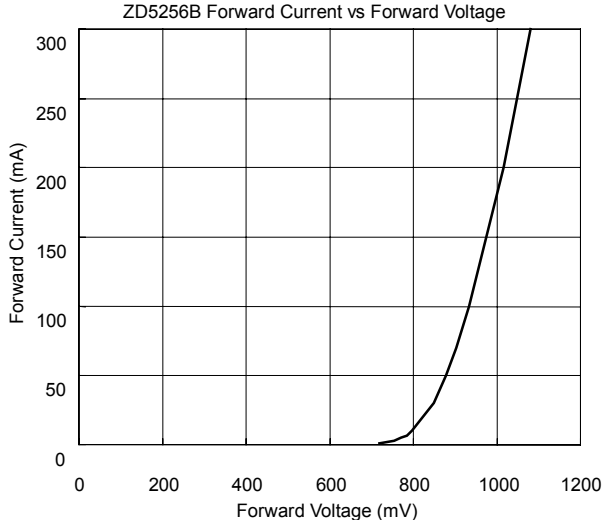

ZD5254B Forward Current vs Forward Voltage



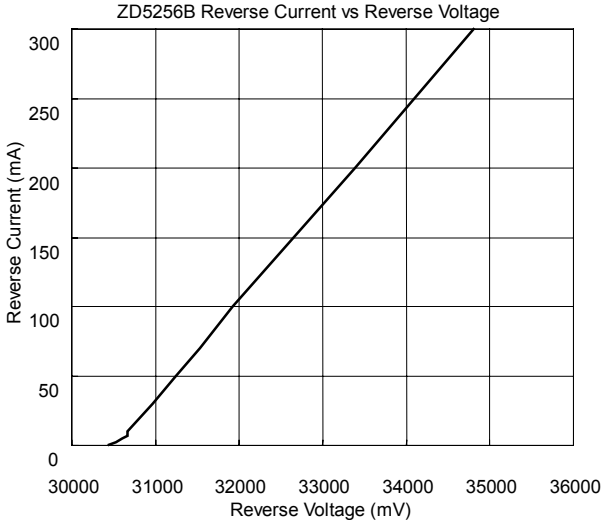

ZD5254B Reverse Current vs Reverse Voltage



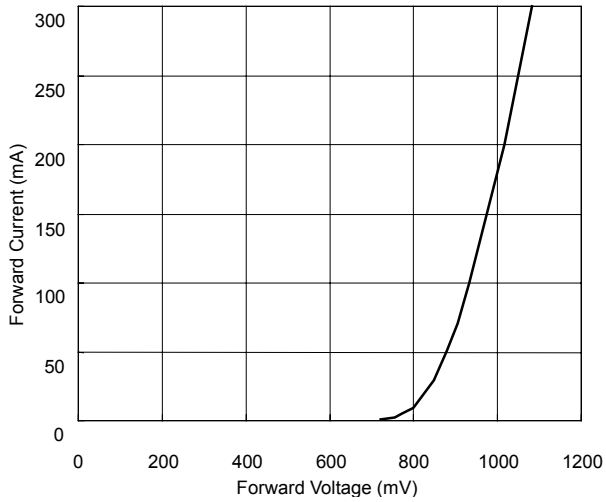
ZD5256B Forward Current vs Forward Voltage



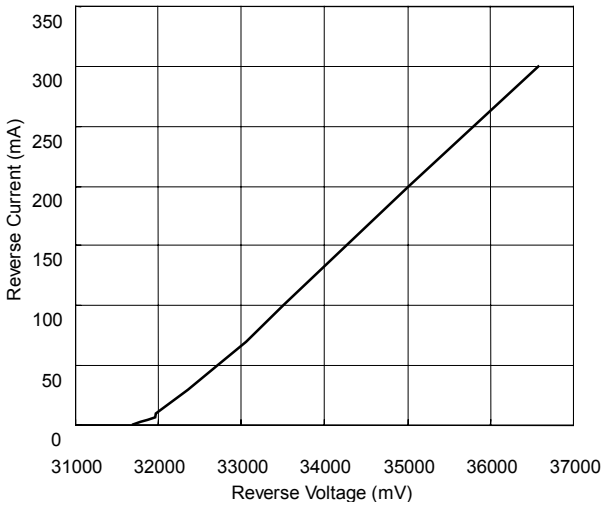

ZD5256B Reverse Current vs Reverse Voltage



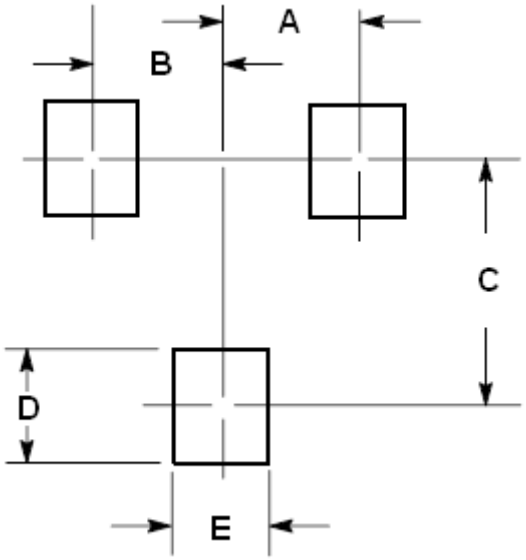

ZD5257B Forward Current vs Forward Voltage




ZD5257B Reverse Current vs Reverse Voltage



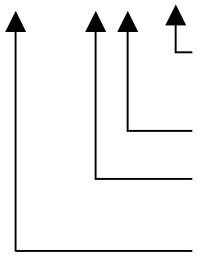
## Recommended Footprint




| DIM | Inches | Millimeters |
|---|---|---|
| | Typ | Typ |
| A | 0.039 | 1.0 |
| B | 0.039 | 1.0 |
| C | 0.079 | 2.0 |
| D | 0.035 | 0.9 |
| E | 0.031 | 0.8 |

## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| ZD52XXBN3-0-T1-G | SOT-23<br>(Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel |



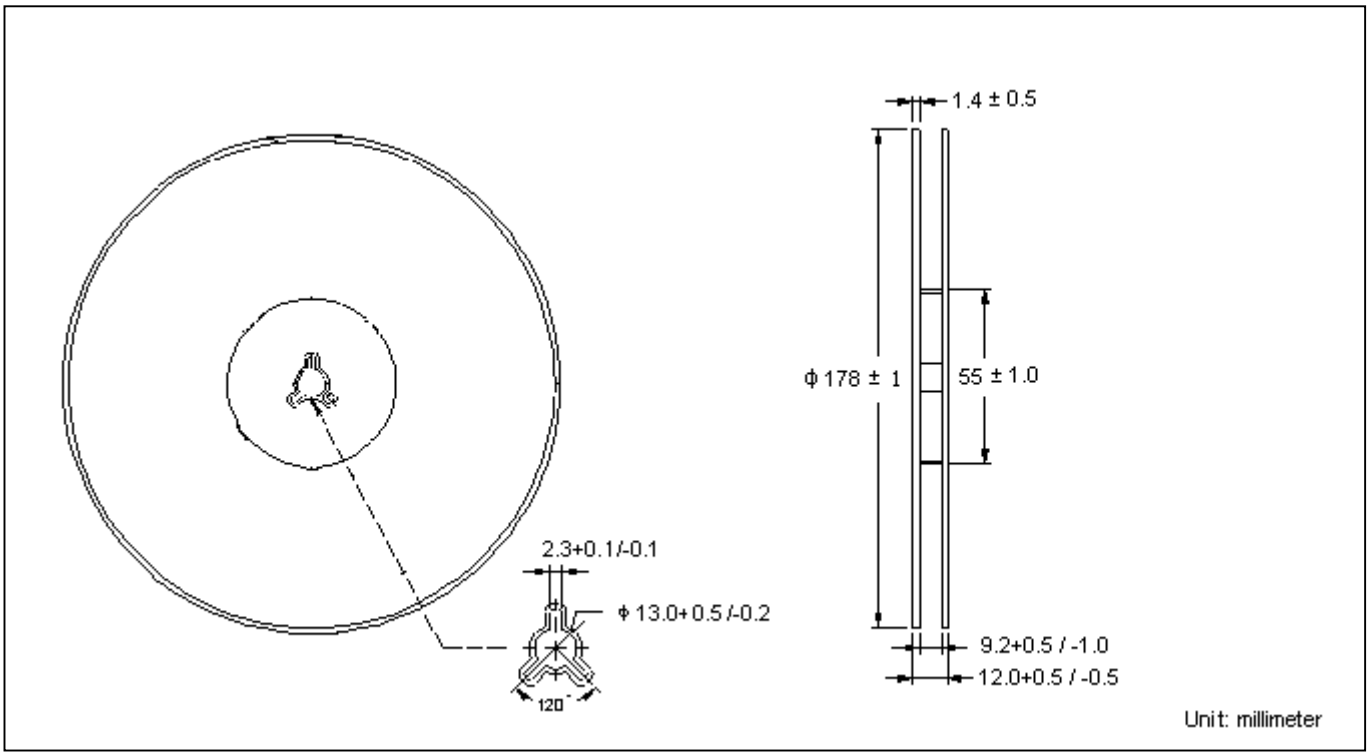
Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

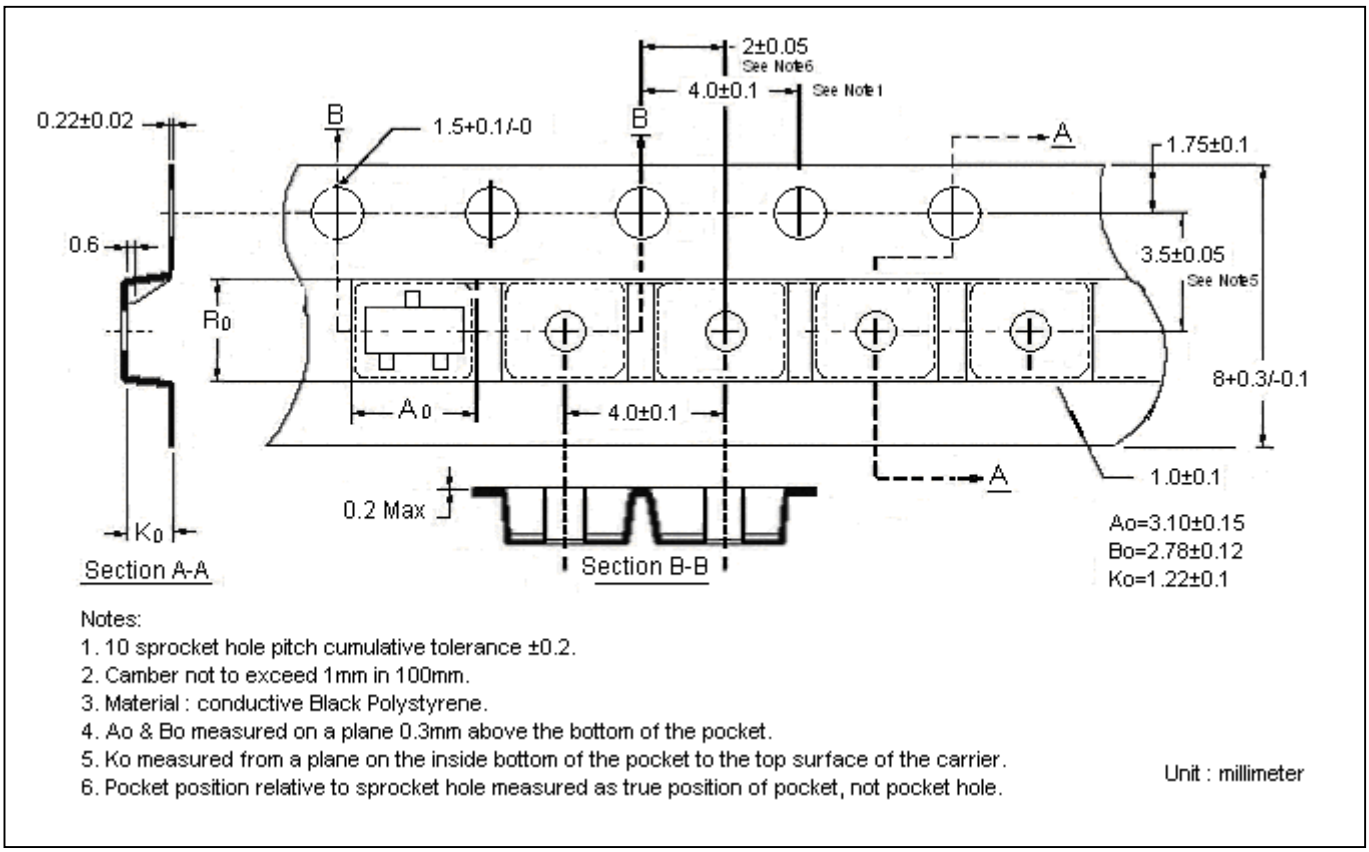
Product rank, zero for no rank products

Product name

## Reel Dimension




## Carrier Tape Dimension



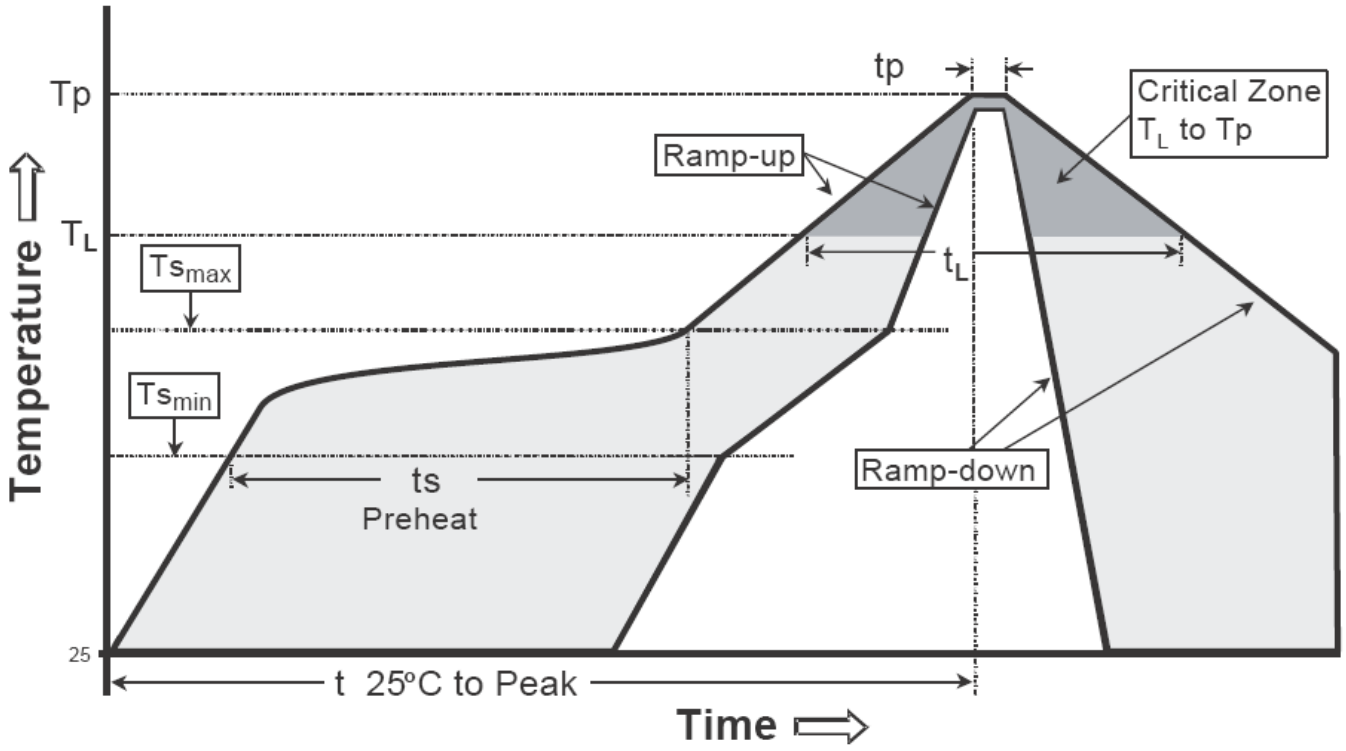

Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

## Recommended wave soldering condition

| Product | Peak Temperature | Soldering Time |
|---|---|---|
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

## Recommended temperature profile for IR reflow




| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|---|---|
| Average ramp-up rate (Tsmax to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat<br>−Temperature Min($T_S$ min)<br>−Temperature Max($T_S$ max)<br>−Time($t_{s\ min}$ to $t_{s\ max}$) | <br>100°C<br>150°C<br>60-120 seconds | <br>150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature ($T_L$)<br>− Time ($t_L$) | <br>183°C<br>60-150 seconds | <br>217°C<br>60-150 seconds |
| Peak Temperature($T_P$) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

Note : All temperatures refer to topside of the package, measured on the package body surface.

## SOT-23 Dimension

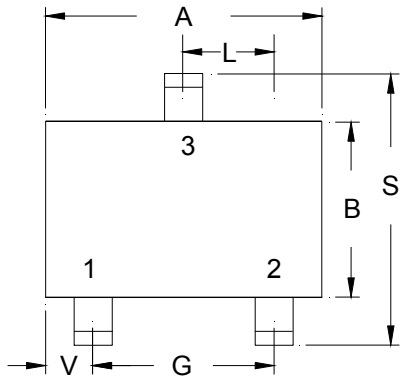
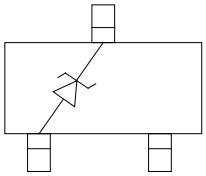
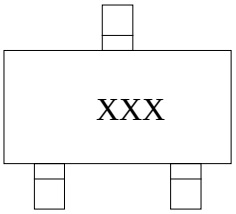



Diagram:

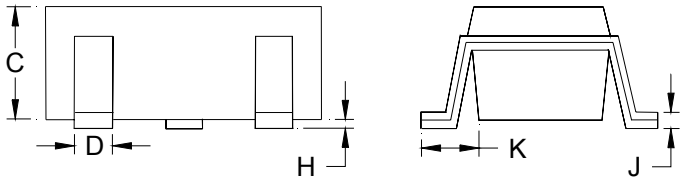


Marking:




3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek Package Code: N3

Style: Pin 1.Anode 2.NC 3.Cathode




*: Typical

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.1102 | 0.1204 | 2.80 | 3.04 | J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| B | 0.0472 | 0.0630 | 1.20 | 1.60 | K | 0.0128 | 0.0266 | 0.32 | 0.67 |
| C | 0.0335 | 0.0512 | 0.89 | 1.30 | L | 0.0335 | 0.0453 | 0.85 | 1.15 |
| D | 0.0118 | 0.0197 | 0.30 | 0.50 | S | 0.0830 | 0.1083 | 2.10 | 2.75 |
| G | 0.0669 | 0.0910 | 1.70 | 2.30 | V | 0.0098 | 0.0256 | 0.25 | 0.65 |
| H | 0.0005 | 0.0040 | 0.013 | 0.10 | | | | | |

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

***Important Notice:***

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek ***semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.***
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.