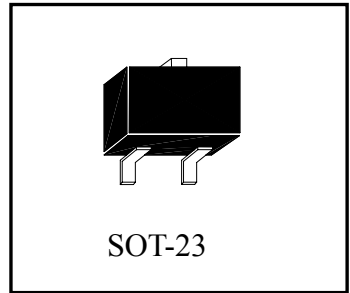




Zener Diode Series

# ZD52XXAN3



## Thermal Characteristics

| Characteristics   | Symbol                            | Max         | Unit  |
|---|-----------------------------------|-------------|-------|
| Total Device Dissipation FR-5 Board<br>TA=25°C, Derate above 25°C         | P <sub>D</sub>                    | 225         | mW    |
|   |                                   | 1.8         | mW/°C |
| Total Device Dissipation<br>Alumina Substrate**TA=25°C, Derate above 25°C | P <sub>D</sub>                    | 300         | mW    |
|   |                                   | 2.4         | mW/°C |
| Thermal Resistance Junction to Ambient                                    | R <sub>θJA</sub>                  | 417         | °C/W  |
| Junction and Storage Temperature  | T <sub>j</sub> , T <sub>stg</sub> | -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 (V<sub>F</sub>=0.9V Max @I<sub>F</sub>=10mA for all types.)

| Device  | Marking Code | Nom. Zener Voltage                |       |       | Max. Zener Impedance |                 |                 |                 | Max. Zener Current            | Max. Reverse Leakage Current |                |
|---------|--------------|-----------------------------------|-------|-------|----------------------|-----------------|-----------------|-----------------|-------------------------------|------------------------------|----------------|
|         |              | V <sub>Z@I<sub>ZT</sub></sub> (V) |       |       | Z <sub>zT</sub>      | I <sub>zT</sub> | Z <sub>zK</sub> | I <sub>zK</sub> | I <sub>ZM@T<sub>a</sub></sub> | I <sub>R</sub>               | V <sub>R</sub> |
|         |              | Nom.                              | Min   | Max   | (Ω)                  | (mA)            | (Ω)             | (mA)            | (mA)                          | (μA)                         | (V)            |
| ZD5229A | 8D           | 4.3                               | 4.21  | 4.39  | 22                   | 20              | 2000            | 0.25            | 106                           | 5.0                          | 1.0            |
| ZD5230A | 8E           | 4.7                               | 4.61  | 4.79  | 19                   | 20              | 1900            | 0.25            | 97                            | 5.0                          | 2.0            |
| ZD5231A | 8F           | 5.1                               | 5.00  | 5.20  | 17                   | 20              | 1600            | 0.25            | 89                            | 5.0                          | 2.0            |
| ZD5232A | 8G           | 5.6                               | 5.49  | 5.71  | 11                   | 20              | 1600            | 0.25            | 81                            | 5.0                          | 3.0            |
| ZD5233A | 8H           | 6.0                               | 5.88  | 6.12  | 7.0                  | 20              | 1600            | 0.25            | 76                            | 5.0                          | 3.5            |
| ZD5234A | 8J           | 6.2                               | 6.08  | 6.32  | 7.0                  | 20              | 1000            | 0.25            | 73                            | 5.0                          | 4.0            |
| ZD5235A | 8K           | 6.8                               | 6.66  | 6.94  | 5.0                  | 20              | 750             | 0.25            | 67                            | 3.0                          | 5.0            |
| ZD5236A | 8L           | 7.5                               | 7.35  | 7.65  | 6.0                  | 20              | 500             | 0.25            | 61                            | 3.0                          | 6.0            |
| ZD5237A | 8M           | 8.2                               | 8.04  | 8.36  | 8.0                  | 20              | 500             | 0.25            | 55                            | 3.0                          | 6.5            |
| ZD5238A | 8N           | 8.7                               | 8.53  | 8.87  | 8.0                  | 20              | 600             | 0.25            | 55                            | 3.0                          | 6.5            |
| ZD5239A | 8P           | 9.1                               | 8.92  | 9.28  | 10                   | 20              | 600             | 0.25            | 50                            | 3.0                          | 7.0            |
| ZD5240A | KF5          | 10                                | 9.80  | 10.20 | 17                   | 20              | 600             | 0.25            | 45                            | 3.0                          | 8.0            |
| ZD5241A | 8R           | 11                                | 10.78 | 11.22 | 22                   | 20              | 600             | 0.25            | 41                            | 2.0                          | 8.4            |
| ZD5242A | 8S           | 12                                | 11.76 | 12.24 | 30                   | 20              | 600             | 0.25            | 38                            | 1.0                          | 9.1            |
| ZD5243A | 8T           | 13                                | 12.74 | 13.26 | 13                   | 9.5             | 600             | 0.25            | 35                            | 0.5                          | 9.9            |
| ZD5245A | 8V           | 15                                | 14.70 | 15.30 | 16                   | 8.5             | 600             | 0.25            | 30                            | 0.1                          | 11             |
| ZD5246A | 8W           | 16                                | 15.68 | 16.32 | 17                   | 7.8             | 600             | 0.25            | 28                            | 0.1                          | 12             |

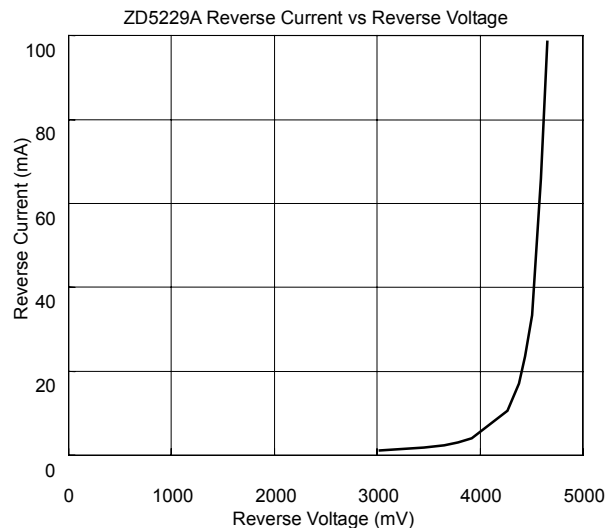
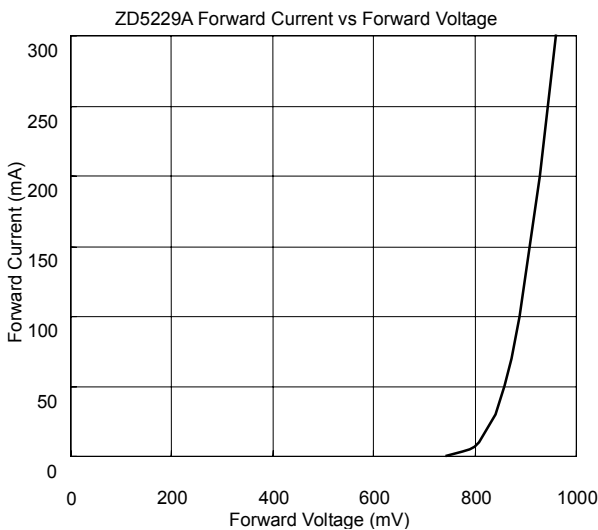


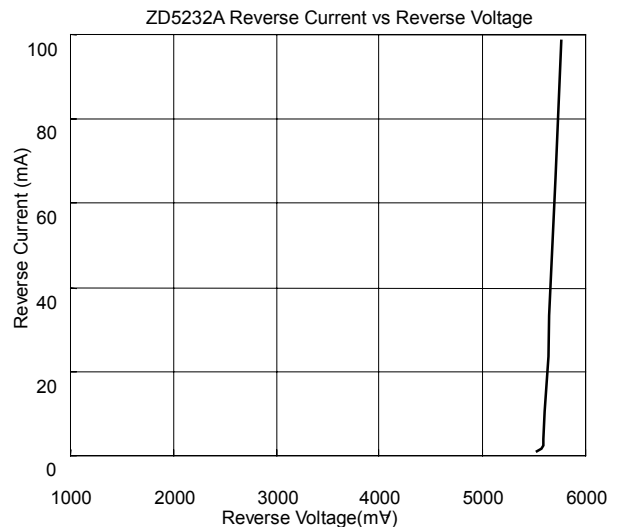
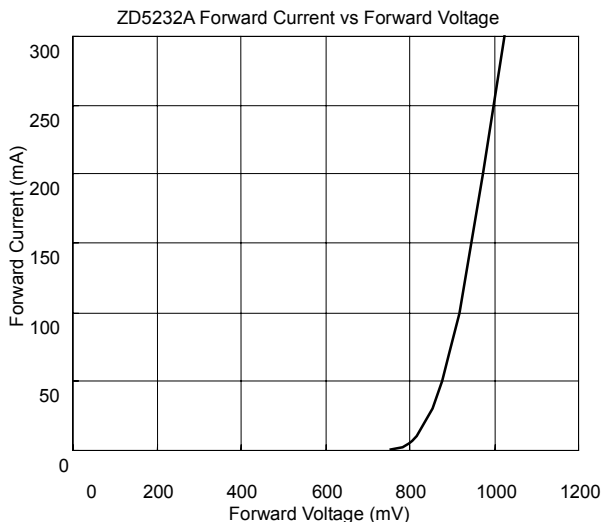
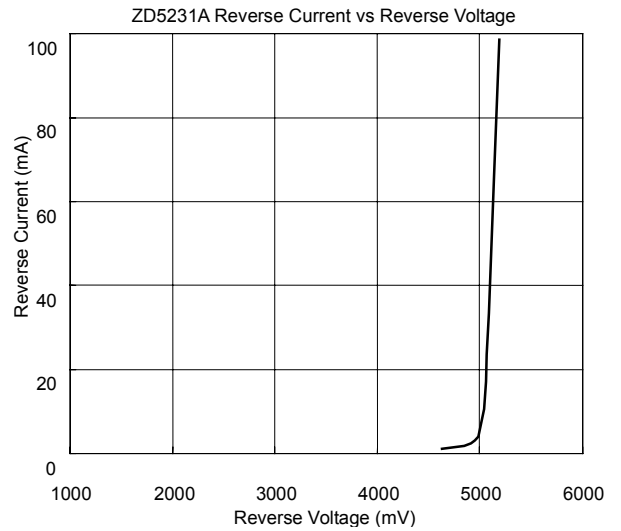
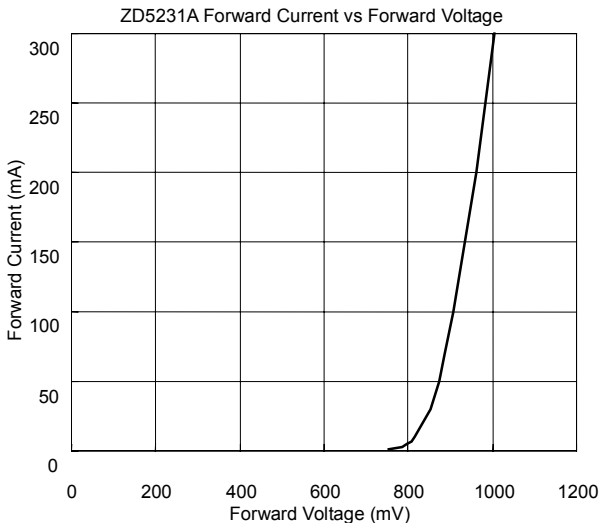
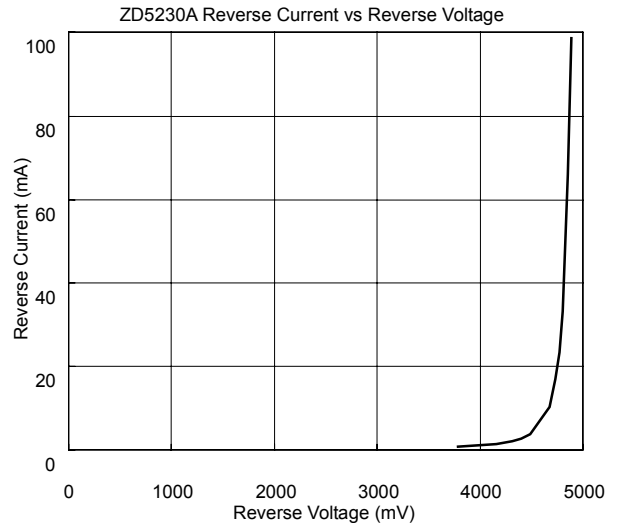
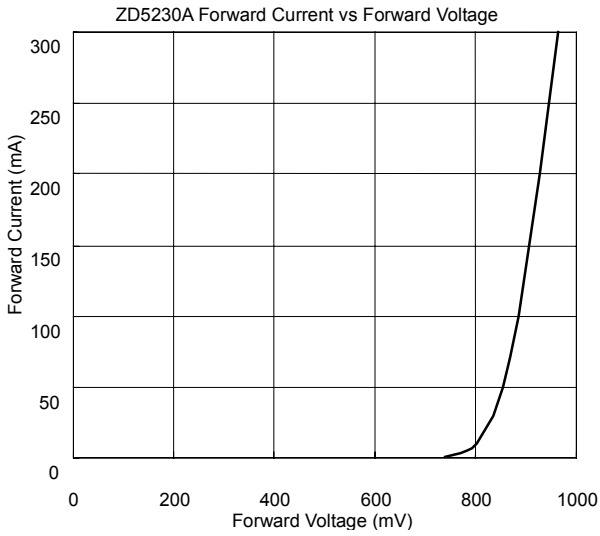
**Electrical Characteristic(Cont.)**

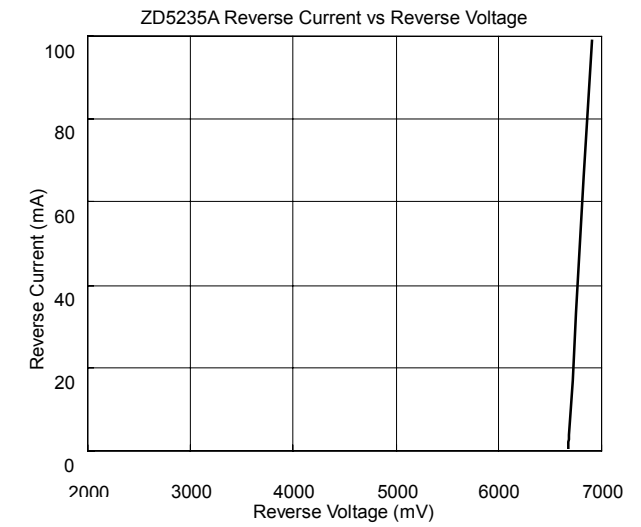
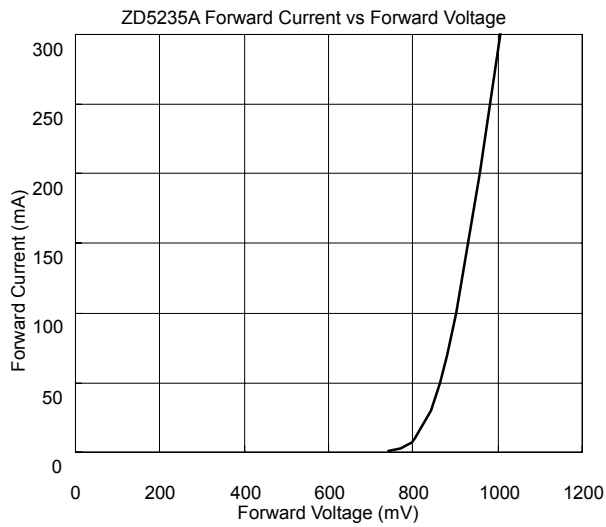
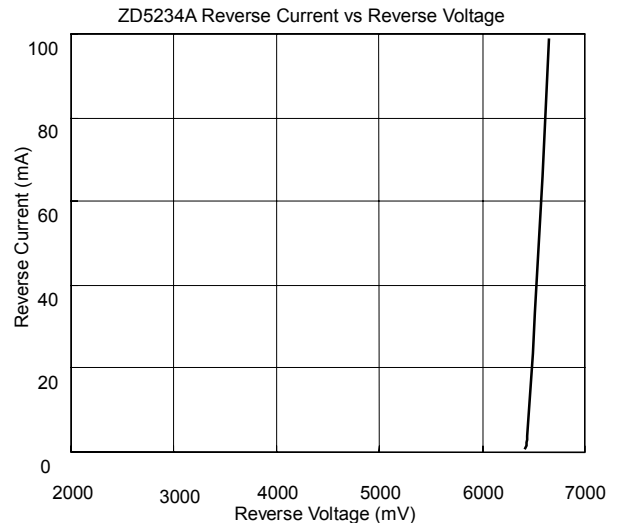
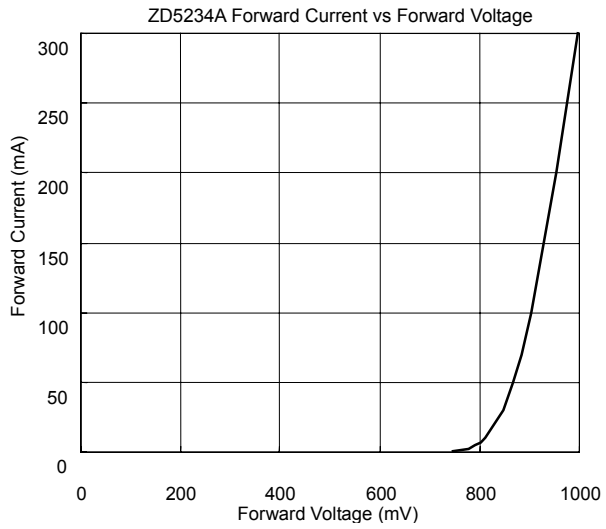
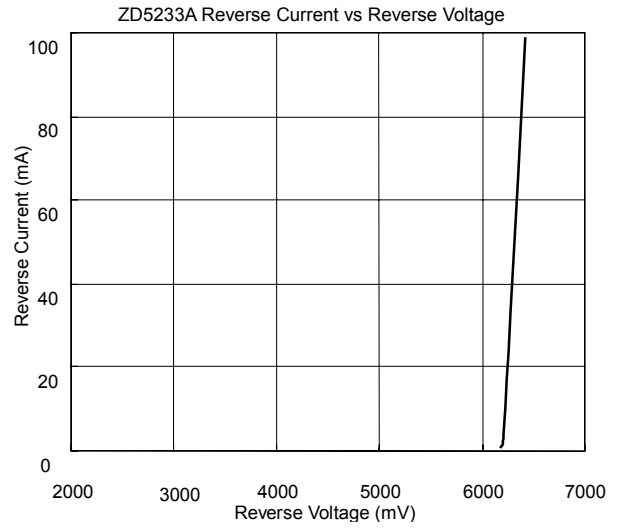
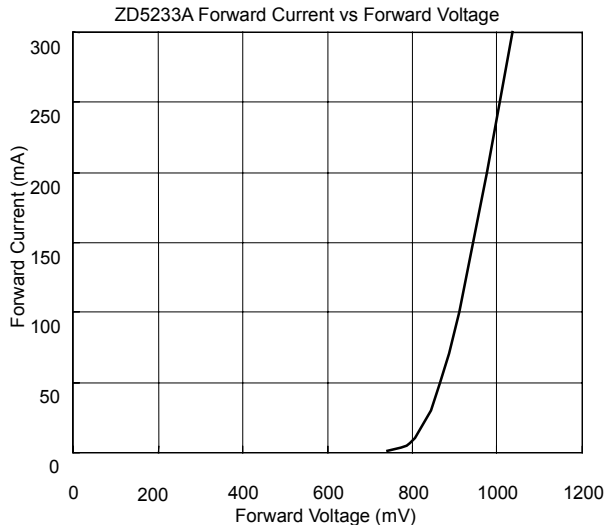
| Device  | Type Code | Nom. Zener Voltage |       |       | Max. Zener Impedance |      |     |      | Max. Zener Current | Max. Reverse Leakage Current |     |
|---------|-----------|--------------------|-------|-------|----------------------|------|-----|------|--------------------|------------------------------|-----|
|         |           | Vz@IzT(V)          |       |       | ZzT                  | IzT  | ZzK | IzK  | IzM@Ta             | IR                           | VR  |
|         |           | Nom.               | Min   | Max   | (Ω)                  | (mA) | (Ω) | (mA) | (mA)               | (μA)                         | (V) |
| ZD5248A | 8Y        | 18                 | 17.64 | 18.36 | 21                   | 7.0  | 600 | 0.25 | 25                 | 0.1                          | 14  |
| ZD5250A | 81A       | 20                 | 19.60 | 20.40 | 25                   | 6.2  | 600 | 0.25 | 23                 | 0.1                          | 15  |
| ZD5251A | 81B       | 22                 | 21.56 | 22.44 | 29                   | 5.6  | 600 | 0.25 | 21                 | 0.1                          | 17  |
| ZD5252A | 81C       | 24                 | 23.52 | 24.48 | 33                   | 5.2  | 600 | 0.25 | 19.1               | 0.1                          | 18  |
| ZD5254A | 81E       | 27                 | 26.46 | 27.54 | 41                   | 5.0  | 600 | 0.25 | 16.8               | 0.1                          | 21  |
| ZD5255A | 81F       | 28                 | 27.44 | 28.56 | 44                   | 4.5  | 600 | 0.25 | 16.2               | 0.1                          | 21  |
| ZD5256A | 81G       | 30                 | 29.40 | 30.60 | 49                   | 4.2  | 600 | 0.25 | 15.1               | 0.1                          | 23  |
| ZD5257A | 81H       | 33                 | 32.34 | 33.66 | 58                   | 3.8  | 700 | 0.25 | 13.8               | 0.1                          | 25  |
| ZD5258A | 81J       | 36                 | 35.28 | 36.72 | 70                   | 3.4  | 700 | 0.25 | 12.6               | 0.1                          | 27  |
| ZD5259A | 81K       | 39                 | 38.22 | 39.78 | 80                   | 3.2  | 800 | 0.25 | 11.6               | 0.1                          | 30  |
| ZD5260A | 81L       | 43                 | 42.14 | 43.86 | 93                   | 3    | 900 | 0.25 | 10.6               | 0.1                          | 33  |

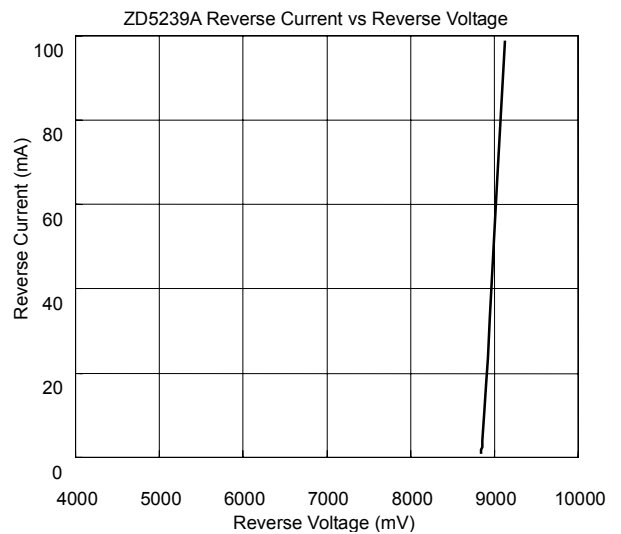
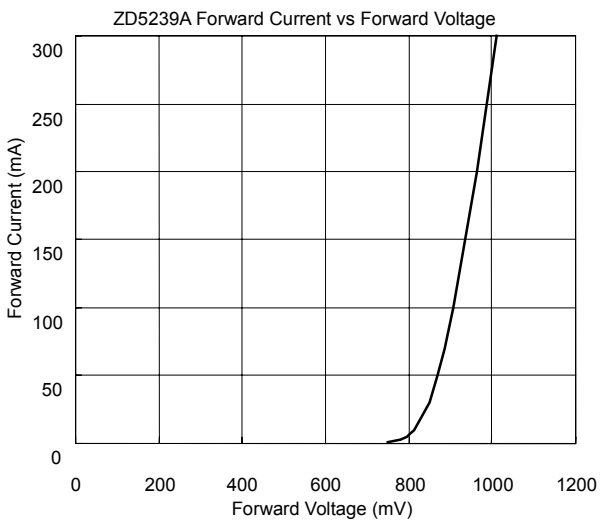
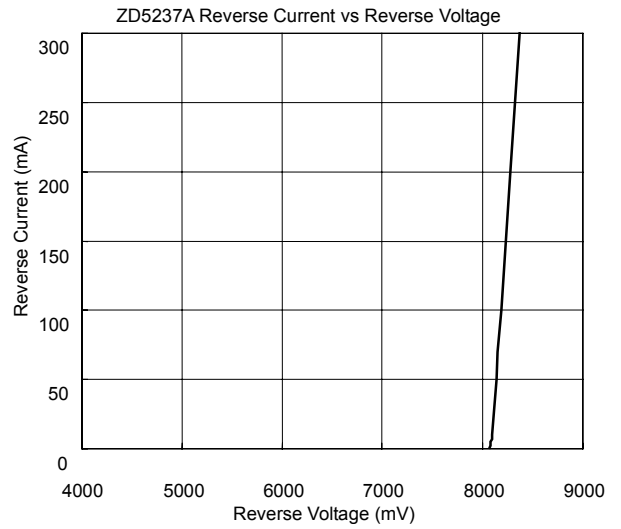
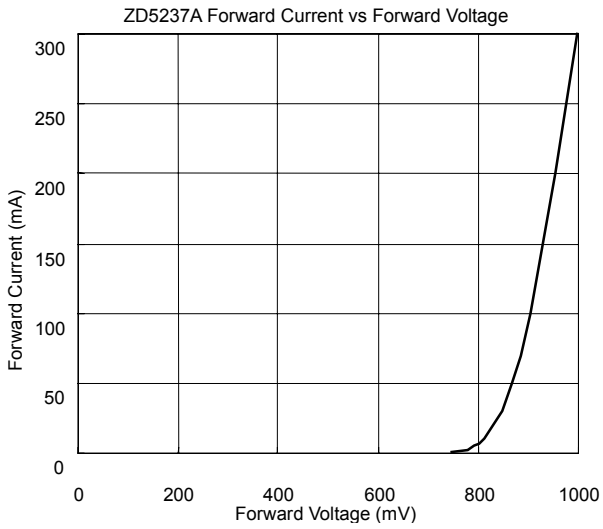
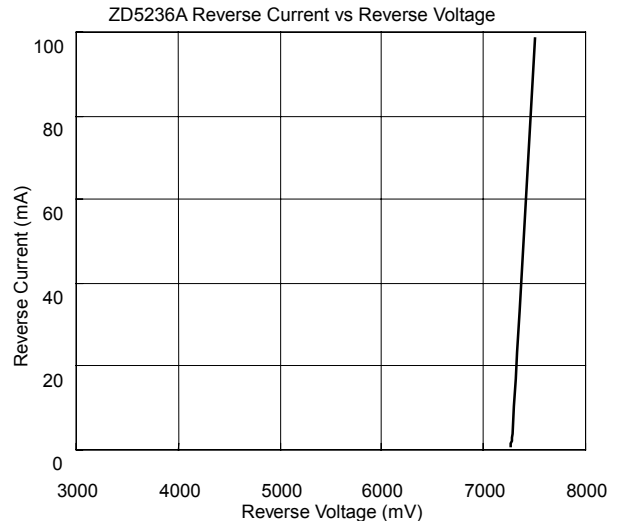
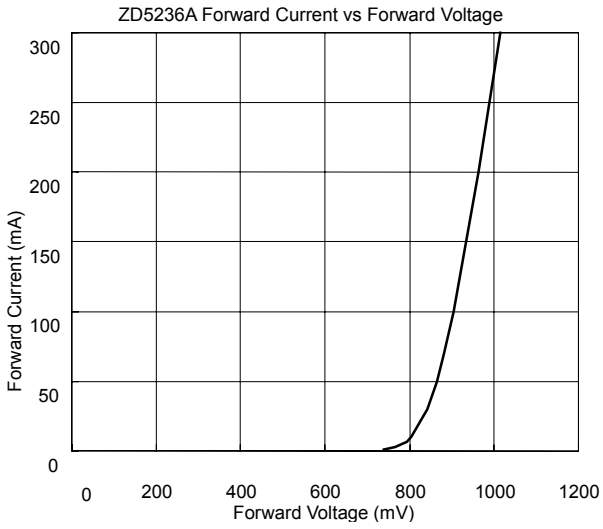
\* The Vz tolerance is ±2%.

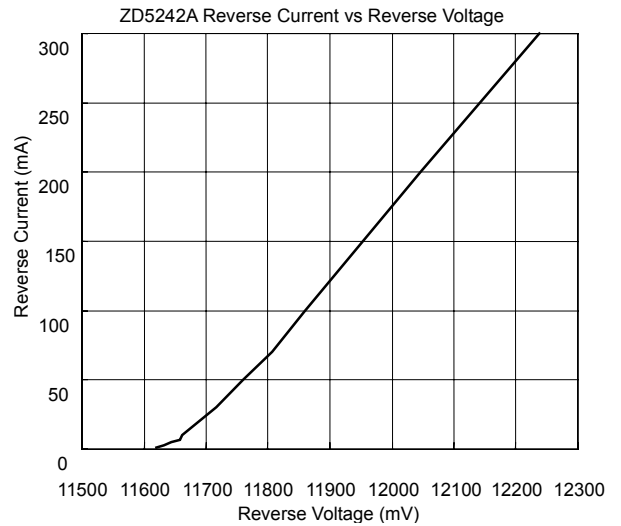
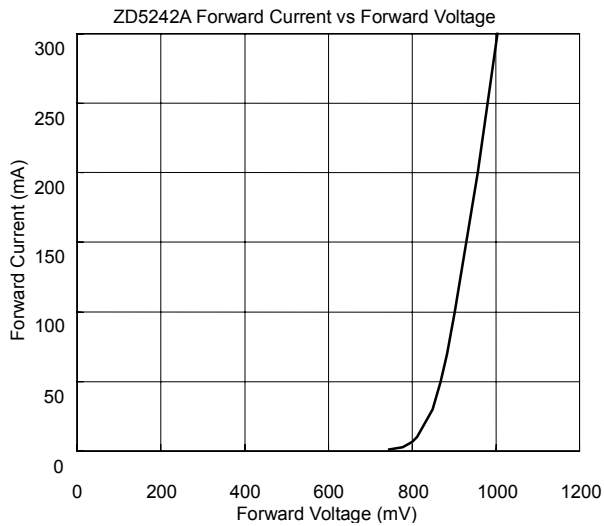
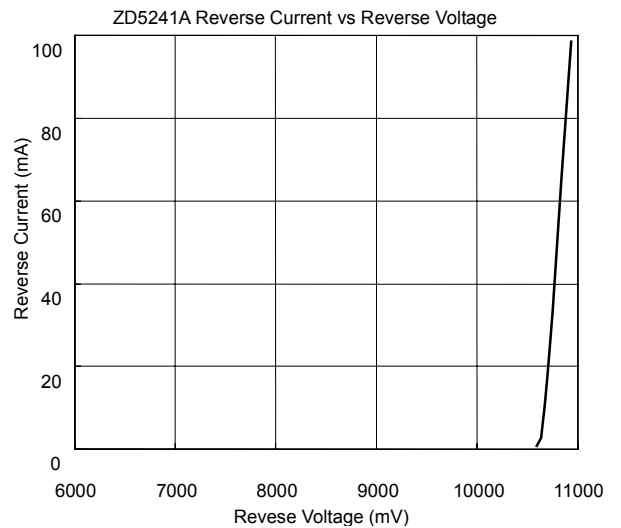
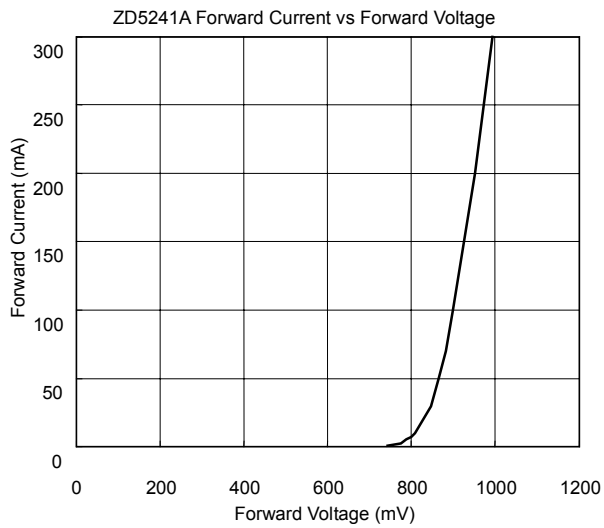
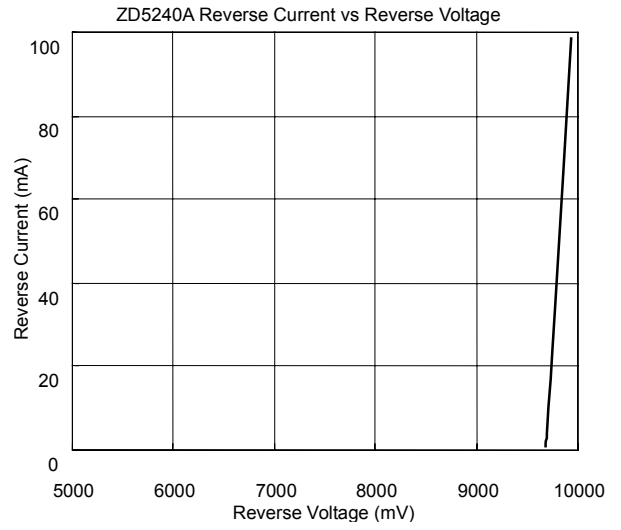
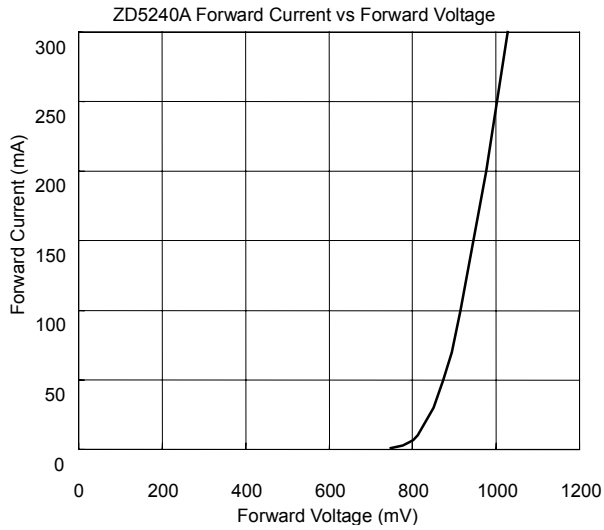
**Typical Characteristics**

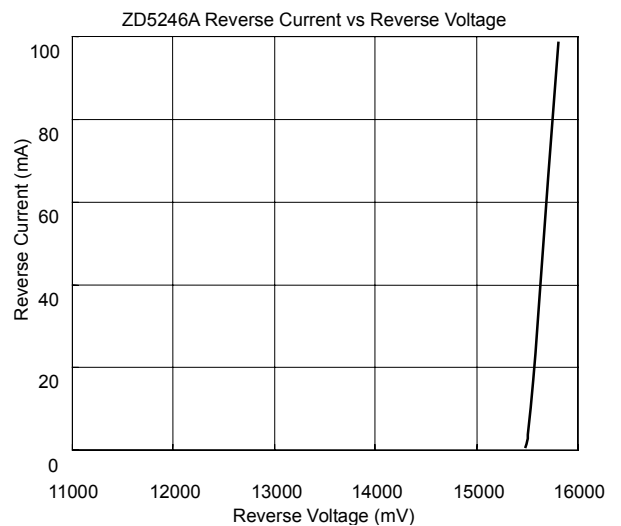
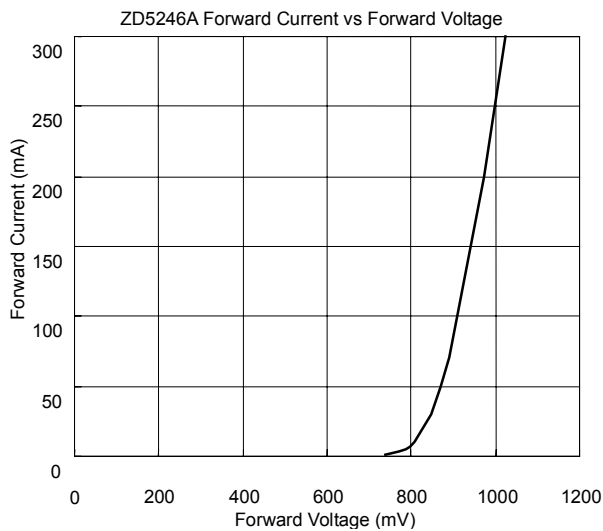
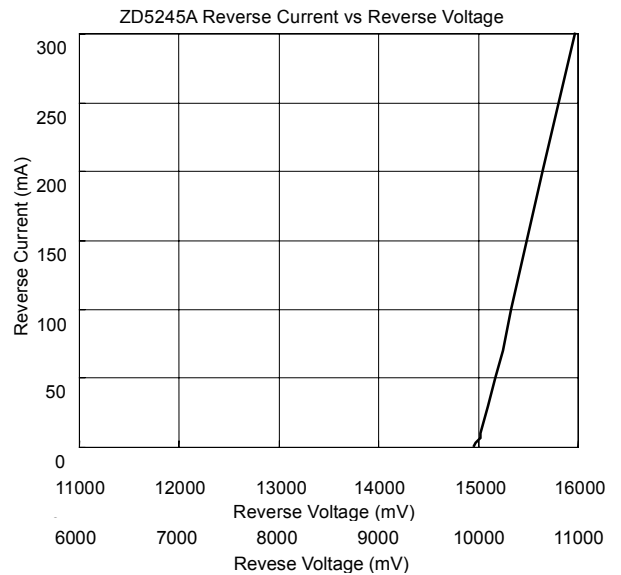
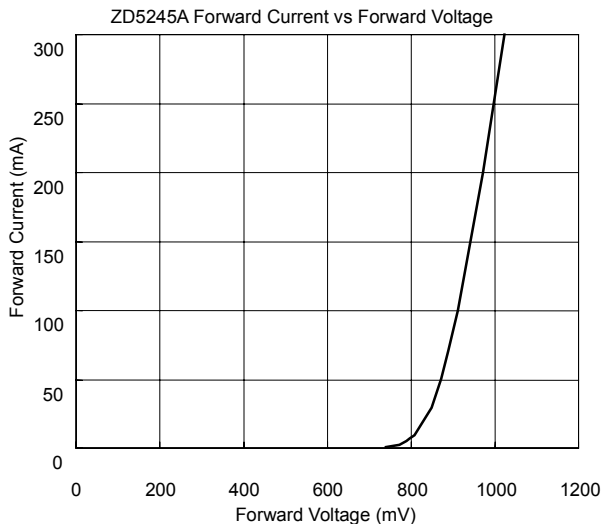
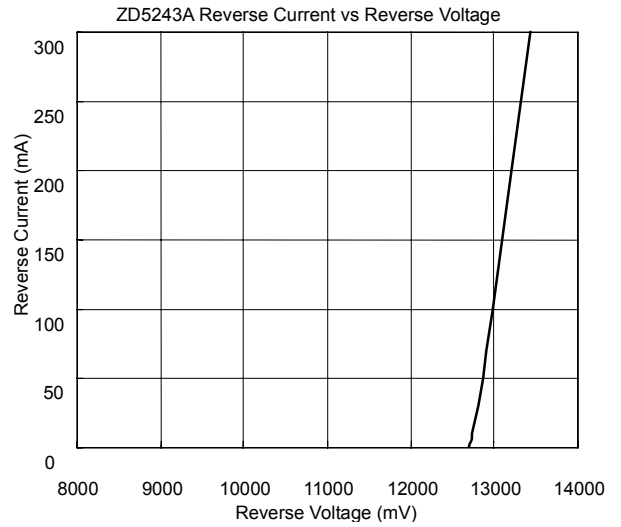
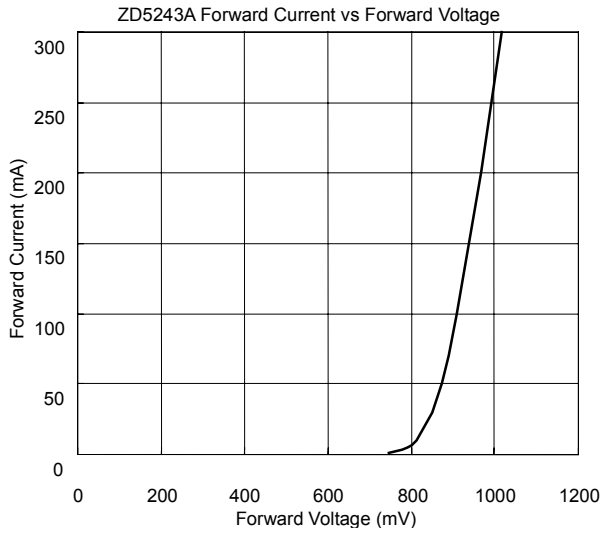


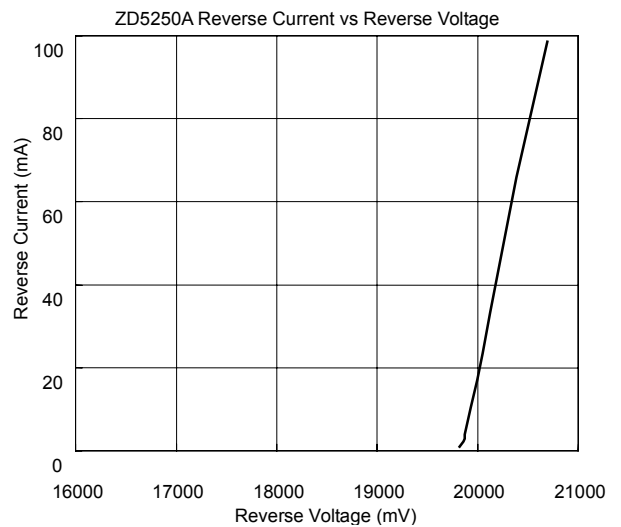
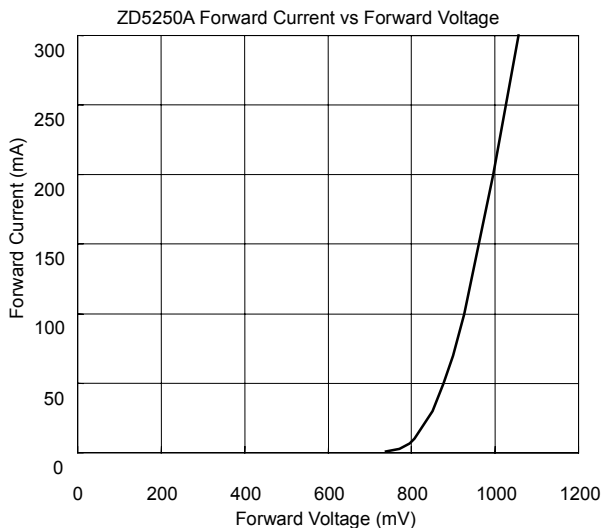
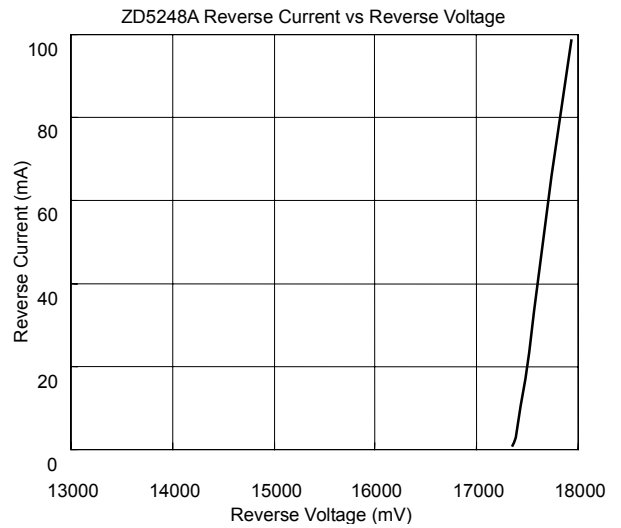
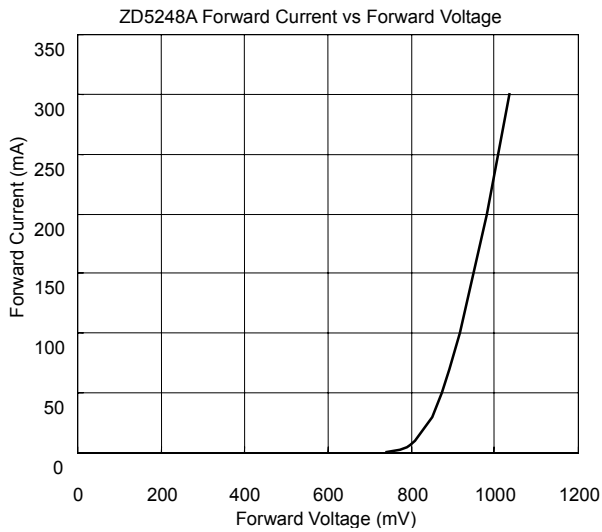
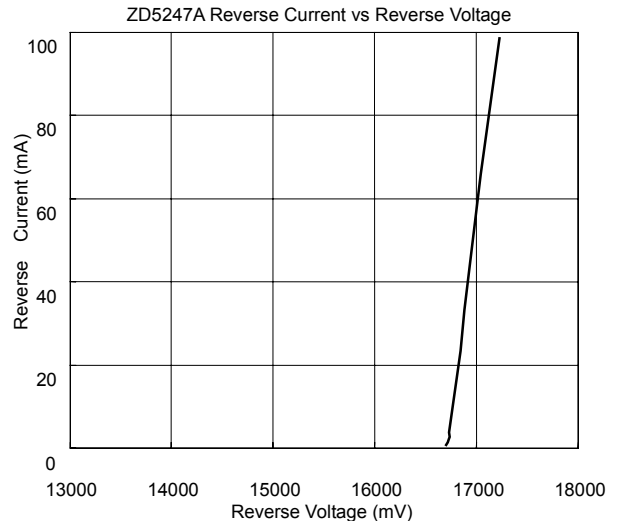
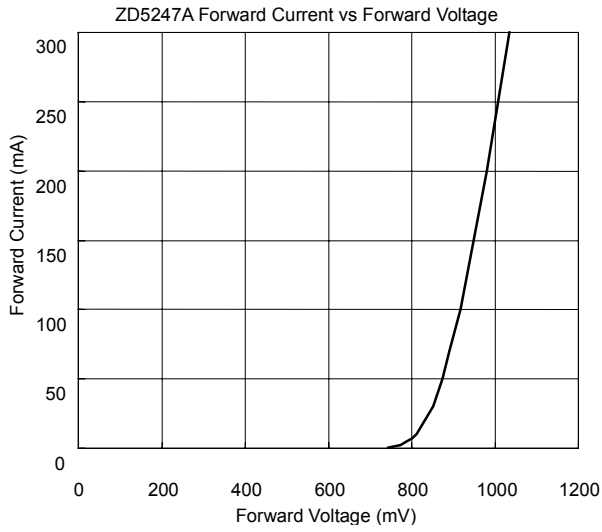




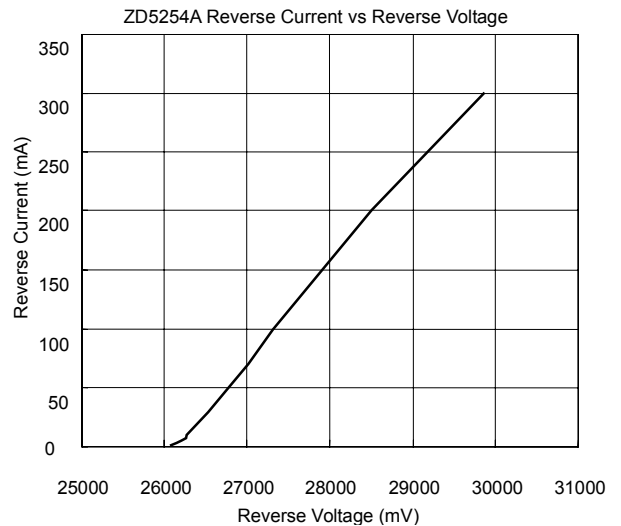
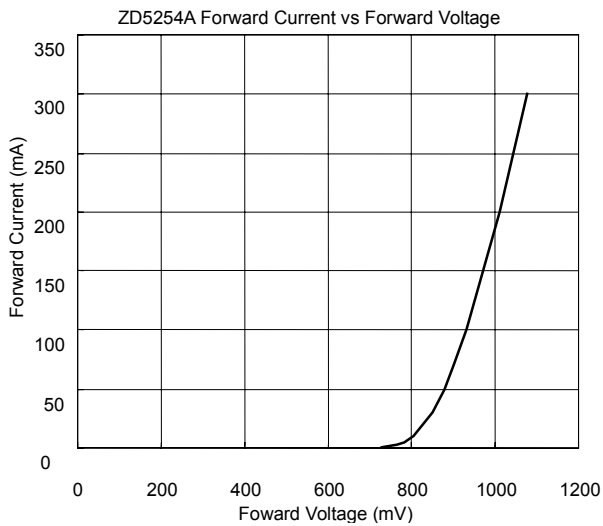
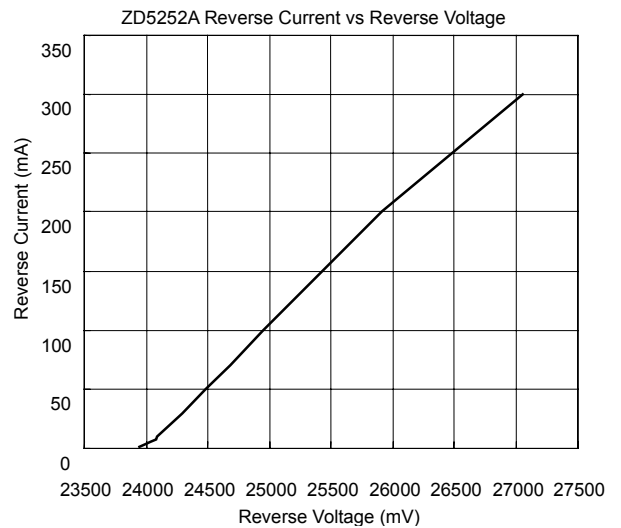
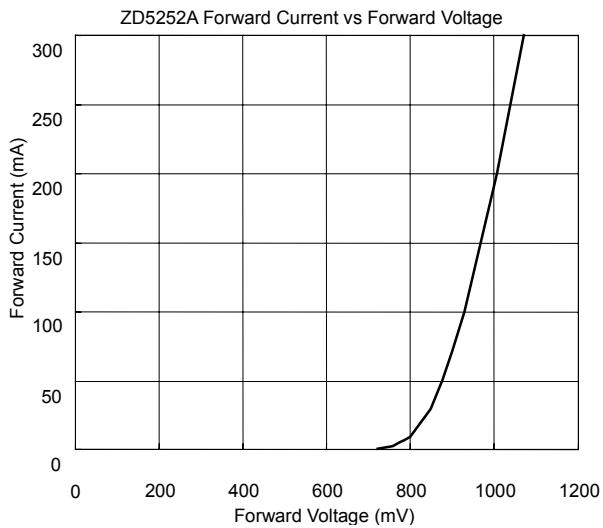
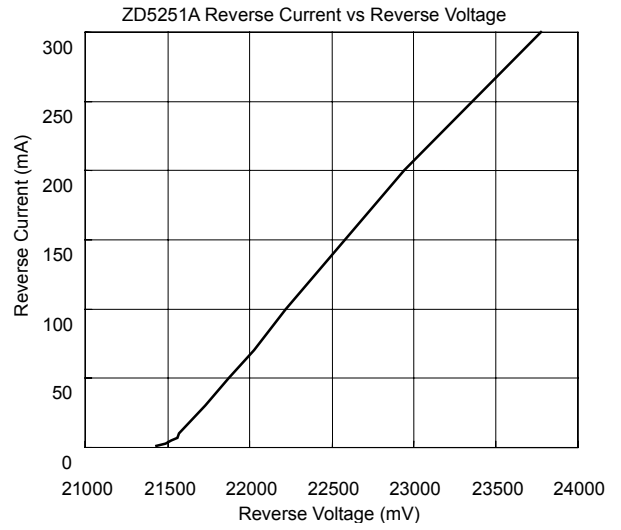
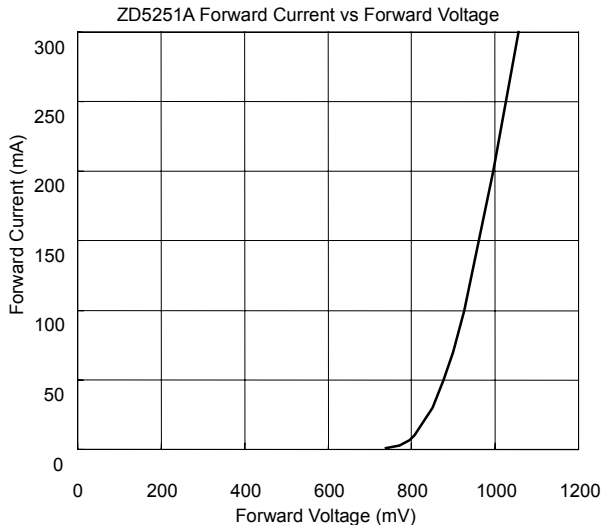


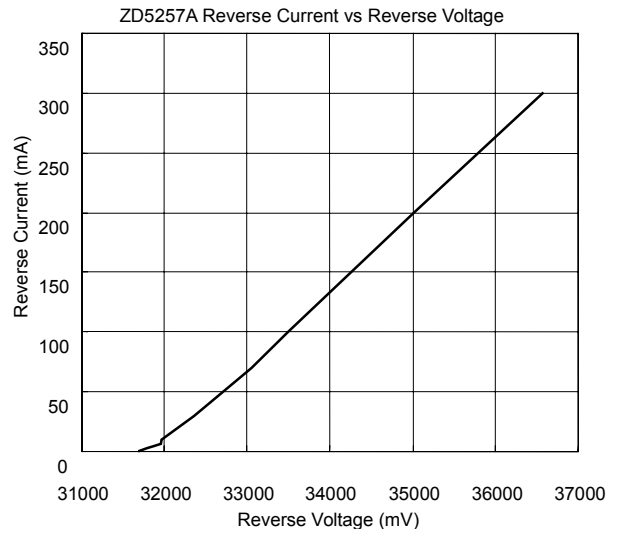
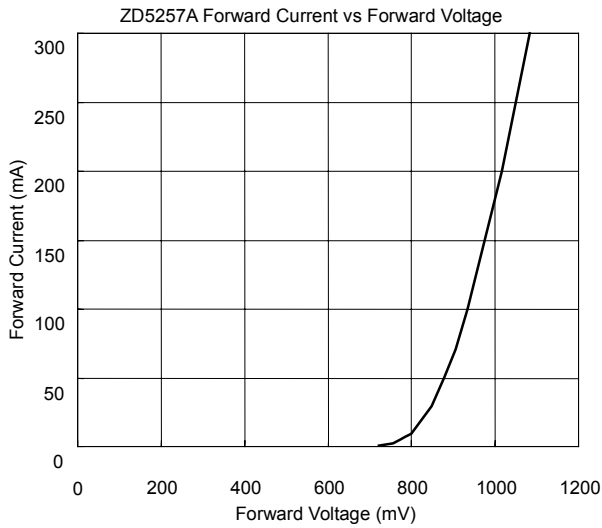
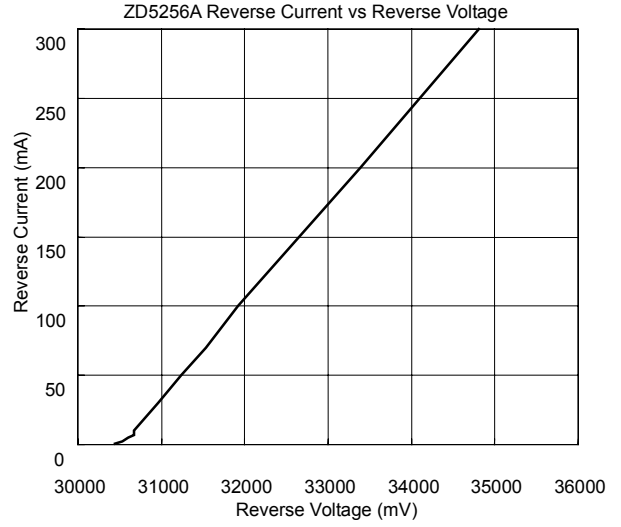
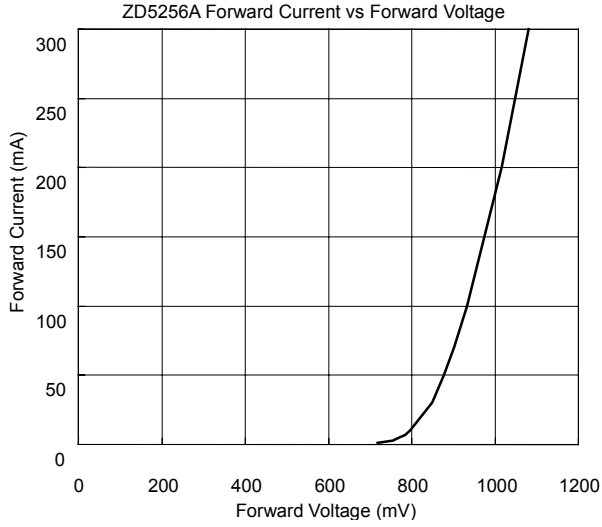




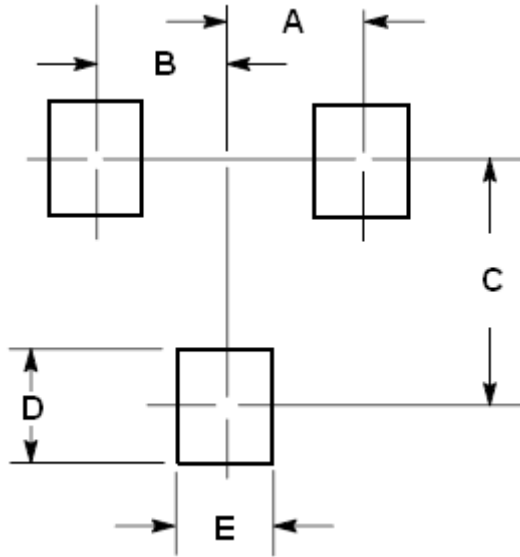








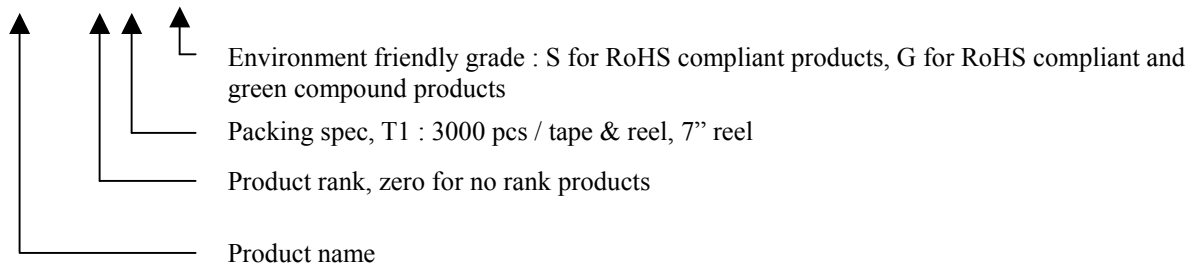
**Recommended Footprint**



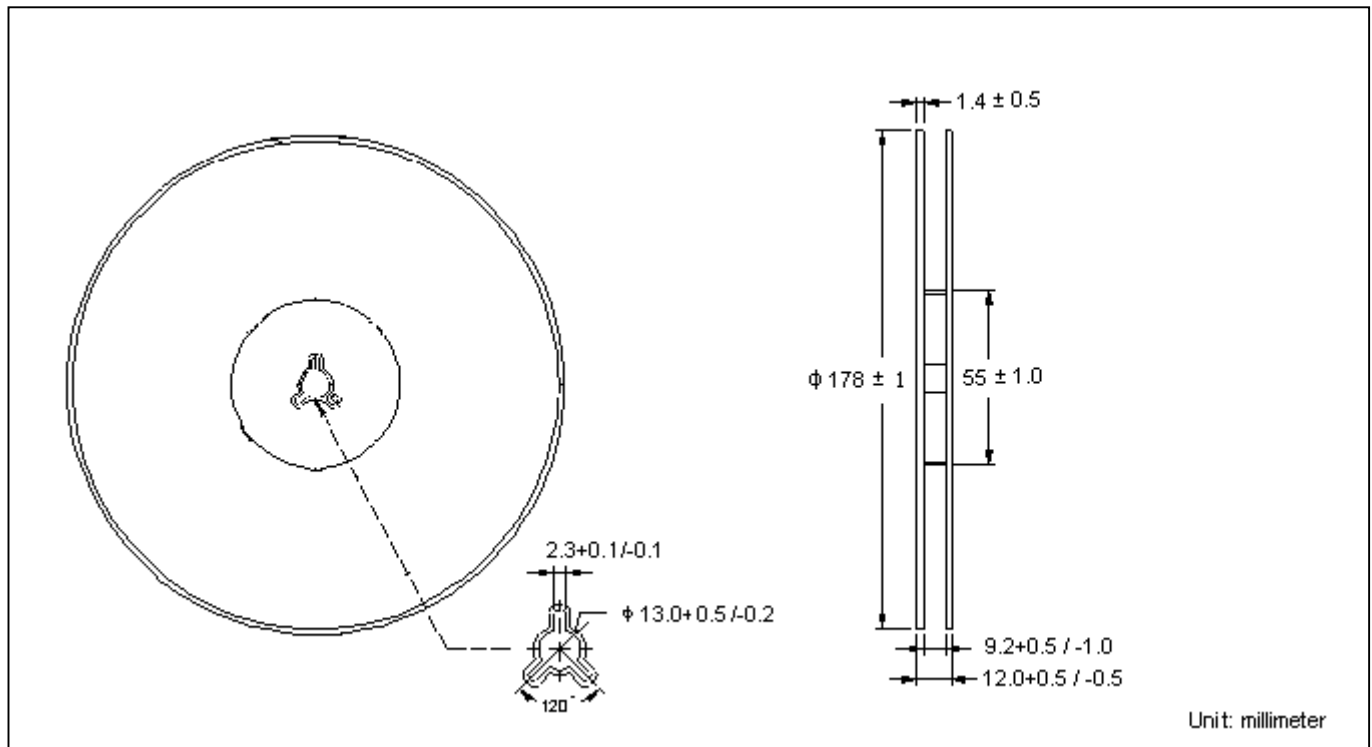
| DIM | Inches | Millimeters |
|-----|--------|-------------|
|     | Typ    | Typ         |
| A   | 0.039  | 1.0         |
| B   | 0.039  | 1.0         |
| C   | 0.079  | 2.0         |
| D   | 0.035  | 0.9         |
| E   | 0.031  | 0.8         |

**Ordering Information**

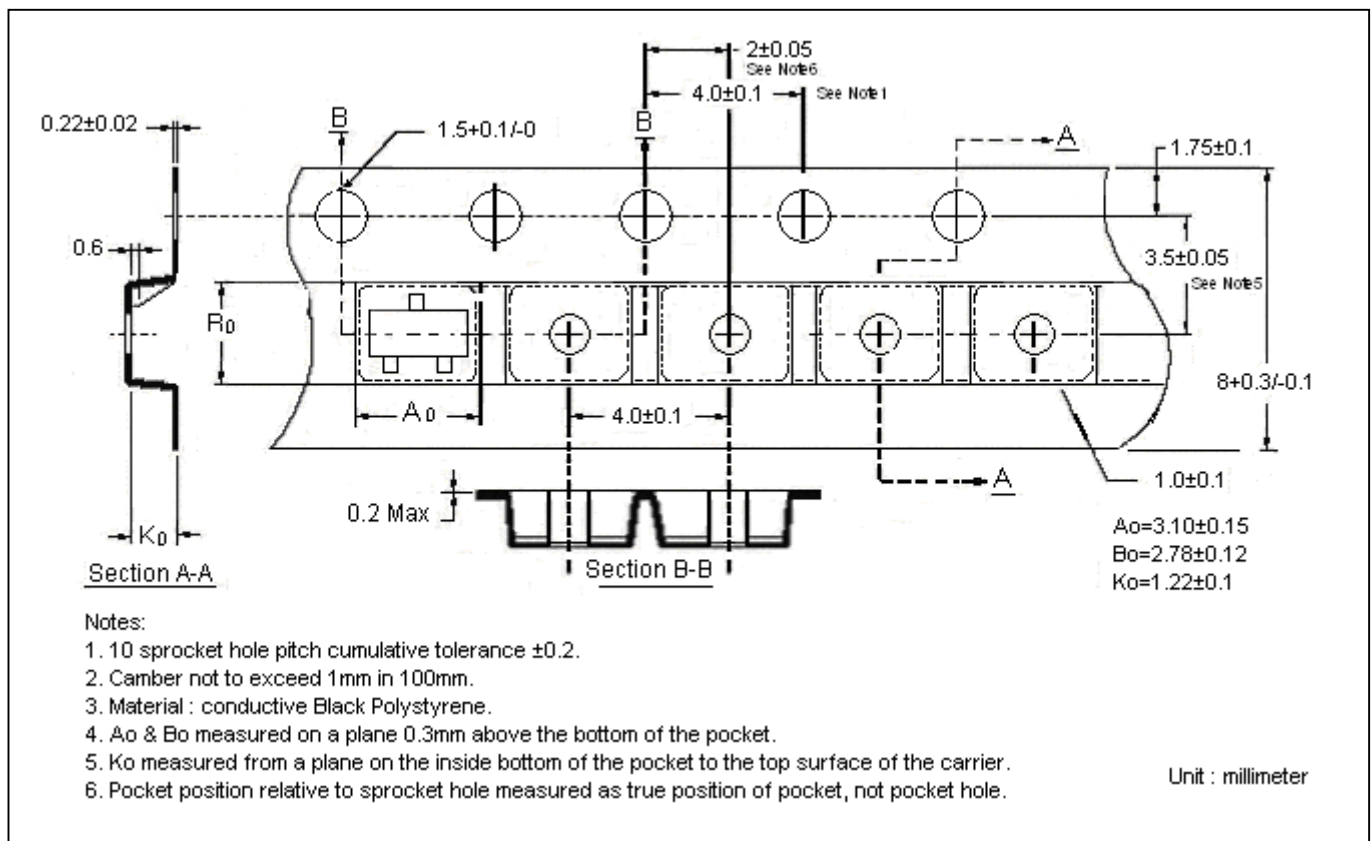
| Device           | Package   | Shipping               |
|------------------|---|------------------------|
| ZD52XXAN3-0-T1-G | SOT-23<br>(Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel |



**Reel Dimension**



**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

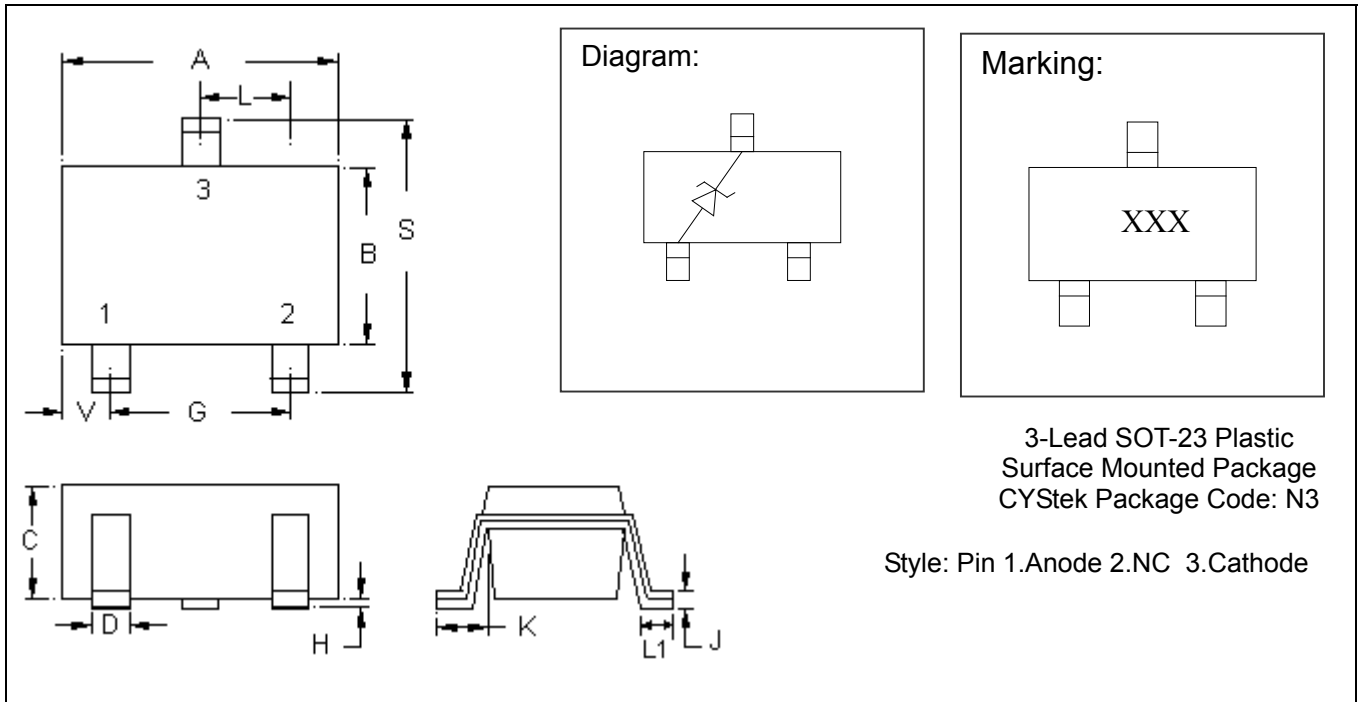
**Recommended temperature profile for IR reflow**



| 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  |                         |                  |
| -Temperature Min(Ts min)                       | 100°C                   | 150°C            |
| -Temperature Max(Ts max)                       | 150°C                   | 200°C            |
| -Time(ts min to ts max)                        | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                         |                         |                  |
| -Temperature (Tl)                              | 183°C                   | 217°C            |
| - Time (tl)                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(Tp)                           | 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**



The diagram shows various views of the SOT-23 package: a top view with dimensions A, B, C, D, G, H, L, S, V, and pin numbers 1, 2, 3; a side view with dimensions C, D, H, J; a perspective view with dimensions K, L1, L2, J; a schematic diagram labeled 'Diagram:' showing a diode symbol; and a marking diagram labeled 'Marking:' showing the 'XXX' marking on the package.

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   | 0.0032 | 0.0079 | 0.08        | 0.20 |
| B   | 0.0472 | 0.0551 | 1.20        | 1.40 | K   | 0.0118 | 0.0266 | 0.30        | 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 | 0.1004 | 2.10        | 2.55 |
| G   | 0.0669 | 0.0910 | 1.70        | 2.30 | V   | 0.0098 | 0.0256 | 0.25        | 0.65 |
| H   | 0.0000 | 0.0040 | 0.00        | 0.10 | L1  | 0.0118 | 0.0197 | 0.30        | 0.50 |

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.

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