YOKOWO's YSD Series diodes are gallium arsenide Schottky barrier diodes designed for use through K, U, V, E and W-bands.

Typical applications are:
- Mixers in communication equipment
- Detectors in sensors and ITS radars
- Switches for millimeter-wave signal control in transceivers.

The diodes can be assembled easily by flip-chip bonding.
SMT packaged part is available.

### Features
- Low Series Resistance
- Low Capacitance
- High Cut-off frequency

### Description

**Absolute Maximum Ratings, Tj \(=25^\circ\text{C}\), Single Diode**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junction Temperature</td>
<td>(T_j)</td>
<td>°C</td>
<td>125</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>(T_{stg})</td>
<td>°C</td>
<td>-55 to +125</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>(R_{th})</td>
<td>°C/W</td>
<td>500</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>(V_r)</td>
<td>V</td>
<td>5</td>
</tr>
</tbody>
</table>

**Electrical Specifications \(T_j =25^\circ\text{C}\), Single Diode**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Symbol</th>
<th>Units</th>
<th>Parts No.</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Capacitance</td>
<td>(V = 0\text{V at 1 MHz})</td>
<td>(C_T)</td>
<td>fF</td>
<td>YSD040</td>
<td>45 60 75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD080</td>
<td>30 45 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD110</td>
<td>25 40 55</td>
</tr>
<tr>
<td>Junction Capacitance</td>
<td>(V = 0\text{V at 1 MHz})</td>
<td>(C_j)</td>
<td>fF</td>
<td>YSD040</td>
<td>--- 30 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD080</td>
<td>600 700 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD110</td>
<td>--- 5 8</td>
</tr>
<tr>
<td>Forward Turn-on Voltage</td>
<td>(I_F = 1\text{mA})</td>
<td>(V_F)</td>
<td>mV</td>
<td>YSD040</td>
<td>600 700 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD080</td>
<td>--- 5 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD110</td>
<td>--- 5 8</td>
</tr>
<tr>
<td>Series Resistance</td>
<td>(I_{\text{max}} = 10\text{mA})</td>
<td>(R_S)</td>
<td>Ω</td>
<td>YSD040</td>
<td>--- 30 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD080</td>
<td>600 700 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD110</td>
<td>--- 5 8</td>
</tr>
<tr>
<td>Reverse Breakdown Voltage</td>
<td>(I_R = 10\text{\muA})</td>
<td>(V_R)</td>
<td>V</td>
<td>YSD040</td>
<td>7 10 ---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD080</td>
<td>--- 5 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YSD110</td>
<td>--- 5 8</td>
</tr>
</tbody>
</table>
Outline Drawings

Package Outline Unit: mm

Chip Dimensions Unit: mm

Cathode Index

CV Curve

Total Capacitance [fF] Voltage [V]
GaAs Schottky Barrier Diode: YSD Series

Parts Number: YSD040SLPP01 YSD080SLBD01 YSD110SLBD01

Forward Current vs. Forward Voltage  Parameter: Temperature

Reverse Current vs. Reverse Voltage  Parameter: Temperature
GaAs Schottky Barrier Diode: YSD Series

Parts Number: YSD040SLPP01

S-Parameters: Single Diode, Packaged Device

Port 1

- $V_a = +0.75\, V$
- $0.0\, V$
- $-4.0\, V$

$f = 1 \sim 67\, \text{GHz}, 5\, \text{GHz step}$

S-Parameters: $S_{11}$

S-Parameters: $S_{21}$
GaAs Schottky Barrier Diode: YSD Series

Parts Number: YSD080SLBD01

S-Parameters: Single Diode, Bare Chip

Port 1  Port 2

- \( V_a = +0.75 \text{ V} \)
- \( 0.0 \text{ V} \)
- \( -4.0 \text{ V} \)

\( f = 1 \sim 86\text{GHz}, 5\text{GHz} \text{ step} \)

S-Parameters: S11

S-Parameters: S21
Parts Number: YSD110SLBD01

S-Parameters: Single Diode, Bare Chip

Port 1

Port 2

- $V_a = +0.75 \text{ V}$
- $0.0 \text{ V}$
- $-4.0 \text{ V}$

$f = 1 \sim 110\text{GHz}, 5\text{GHz step}$

S-Parameters: $S_{11}$
GaAs Schottky Barrier Diode: YSD Series

Parts Number : YSD040SLPP01

Equivalent Circuit : Valid up to 67 GHz

Typical SPICE Parameters

<table>
<thead>
<tr>
<th>( I_S ) (A)</th>
<th>( R_S ) (Ω)</th>
<th>( N )</th>
<th>( C_{JO} ) (fF)</th>
<th>( M )</th>
<th>( V_j ) (V)</th>
<th>( F_C )</th>
<th>( B_V ) (V)</th>
<th>( I_{BV} ) (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0E-14</td>
<td>4.9</td>
<td>1.13</td>
<td>39</td>
<td>0.22</td>
<td>0.70</td>
<td>0.40</td>
<td>10</td>
<td>1.0E-05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( I_{SR} ) (A)</th>
<th>( N_R )</th>
<th>( C_P ) (fF)</th>
<th>( T_T ) (psec)</th>
<th>( X_{ni} )</th>
<th>( E_g ) (eV)</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0E-09</td>
<td>2</td>
<td>2</td>
<td>0.005</td>
<td>2</td>
<td>0.85</td>
<td>1</td>
</tr>
</tbody>
</table>
GaAs Schottky Barrier Diode: YSD Series

Parts Number: YSD040SLPP01

Recommended PCB Layout

PCB: MSL
Material: RO4350B
\((\varepsilon=3.48, \tan\delta=0.0037)\)
Thickness: 0.254mm
Metalize: Cu \(t=18\mu m\)

Part Number Rule

<table>
<thead>
<tr>
<th>Model Number</th>
<th>YSD 110 SL BD 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Usable Frequency in GHz</td>
<td></td>
</tr>
<tr>
<td>Configuration (Single type)</td>
<td></td>
</tr>
<tr>
<td>Technology Generation Number</td>
<td></td>
</tr>
<tr>
<td>Outline Code</td>
<td>BD : Bare Die PP : Polymer Package</td>
</tr>
</tbody>
</table>

Ordering Contact

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