

## Product Summary

| $V_R$ (V) | $I_F$ (A) | $V_F$ max @ 400mA (V) | $I_R$ max @ 30V ( $\mu$ A) |
|-----------|-----------|-----------------------|----------------------------|
| 40        | 0.52      | 0.5                   | 10                         |

## Features and Benefits

- Low Equivalent On-Resistance
- Extremely Low Leakage (10 $\mu$ A @30v)
- High Current Capability ( $I_F = 0.52A$ )
- Low  $V_F$ , Fast Switching Schottky
- ZLLS400 Complements Low Temperature Equivalent ZHCS400
- Package Thermally Rated to +150°C
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified To AEC-Q101 Standards For High Reliability**

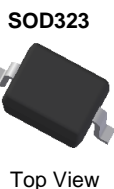
## Description and Applications

This compact SOD323 packaged Schottky diode offers users an excellent performance combination comprising high current operation, extremely low leakage and low forward voltage, ensuring suitability for applications requiring efficient operation at higher temperatures (above +85°C) see Operational Efficiency Chart on page 3.

- DC – DC Converters
- Mobile Telecoms
- Charging Circuits
- Motor Control

## Mechanical Data

- Case: SOD323
- Case Material: UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.004 grams (Approximate)



## Ordering Information (Note 4 & 5)

| Device     | Compliance | Packaging | Shipping           |
|------------|------------|-----------|--------------------|
| ZLLS400QTA | Automotive | SOD323    | 3,000/Tape & Reel  |
| ZLLS400QTC | Automotive | SOD323    | 10,000/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](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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
  5. 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/](http://www.diodes.com/quality/product_compliance_definitions/).

## Marking Information



40 = Product Type Marking Code

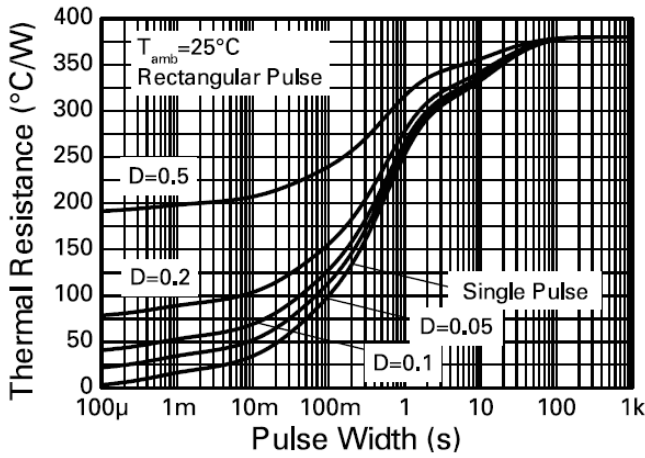
Top View

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

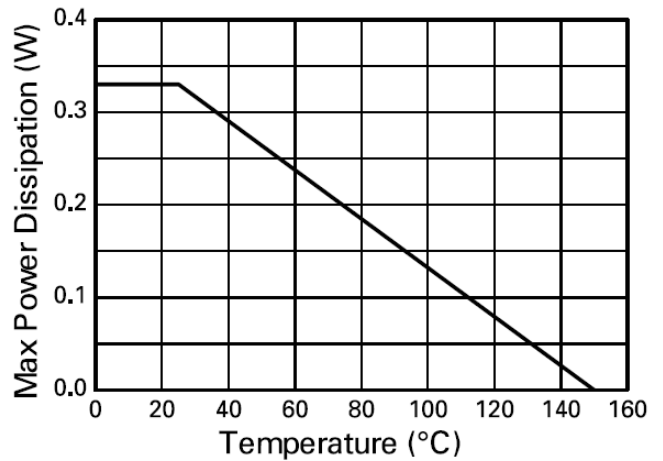
| Characteristic  | Symbol           | Value     | Units |
|---|------------------|-----------|-------|
| Continuous Reverse Voltage                                      | V <sub>R</sub>   | 40        | V     |
| Continuous Forward Current                                      | I <sub>F</sub>   | 0.52      | A     |
| Peak Repetitive Forward Current<br>Rectangular Pulse Duty Cycle | I <sub>FPK</sub> | 0.85      | A     |
| Non Repetitive Forward Current                                  | I <sub>FSM</sub> | t ≤ 100µs | 12    |
|   |                  | t ≤ 10ms  | 2.5   |

**Thermal Characteristics**

| Characteristic  | Symbol           | Value       | Unit |
|---|------------------|-------------|------|
| Power Dissipation, T <sub>A</sub> = +25°C<br>Single Die Continuous<br>Single Die Measured at t < 5 secs | P <sub>D</sub>   | 330<br>390  | mW   |
| Thermal Resistance, Junction to Ambient   | R <sub>θJA</sub> | (Note 6)    | 379  |
|   |                  | (Note 7)    | 317  |
| Junction Temperature  | T <sub>J</sub>   | +150        | °C   |
| Storage Temperature Range   | T <sub>STG</sub> | -55 to +150 | °C   |



**Transient Thermal Impedance**



**Derating Curve**

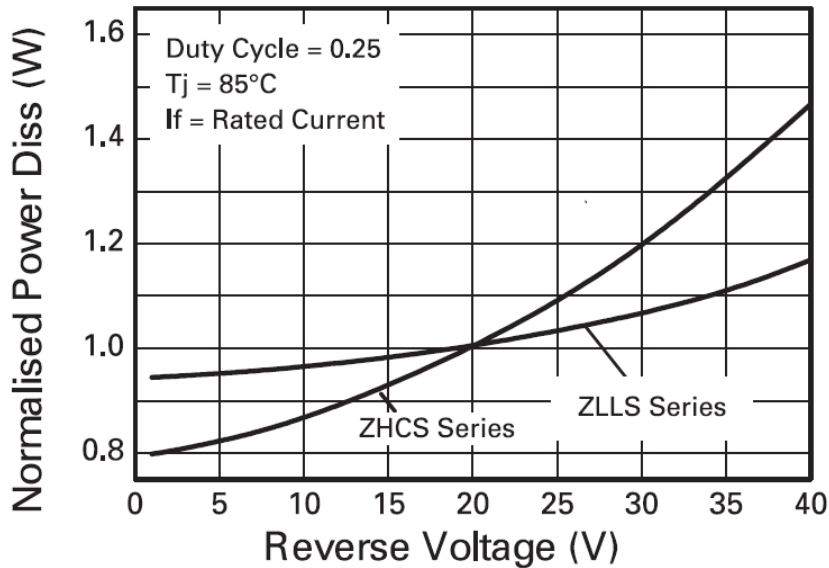
- Notes: 6. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.  
7. For a device surface mounted on FR4 PCB measured at t < 5 secs.

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

| Characteristic            | Symbol             | Min | Typ | Max | Unit | Test Condition   |
|---------------------------|--------------------|-----|-----|-----|------|--|
| Reverse Breakdown Voltage | V <sub>(BR)R</sub> | 40  | 60  | -   | V    | I <sub>R</sub> = 200µA   |
| Forward Voltage (Note 8)  | V <sub>F</sub>     | -   | 305 | 360 | mV   | I <sub>F</sub> = 50mA  |
|                           |                    | -   | 335 | 390 |      | I <sub>F</sub> = 100mA   |
|                           |                    | -   | 395 | 450 |      | I <sub>F</sub> = 250mA   |
|                           |                    | -   | 445 | 500 |      | I <sub>F</sub> = 400mA   |
|                           |                    | -   | 550 | 630 |      | I <sub>F</sub> = 750mA   |
|                           |                    | -   | 620 | 710 |      | I <sub>F</sub> = 1A  |
|                           |                    | -   | 710 | 800 |      | I <sub>F</sub> = 1.5A  |
|                           |                    | -   | 405 | -   |      | I <sub>F</sub> = 400mA, T <sub>A</sub> = +100°C  |
| Reverse Current           | I <sub>R</sub>     | -   | 6   | 10  | µA   | V <sub>R</sub> = 30V   |
|                           |                    | -   | 370 | -   |      | V <sub>R</sub> = 30V, T <sub>A</sub> = +85°C   |
| Diode Capacitance         | C <sub>D</sub>     | -   | 15  | -   | pF   | f = 1MHz, V <sub>R</sub> = 30V   |
| Reverse Recovery Time     | t <sub>rr</sub>    | -   | 3   | -   | ns   | Switched from I <sub>F</sub> = 500mA to V <sub>R</sub> = 5.5V Measured @ I <sub>R</sub> = 50mA |
| Reverse Recovery Charge   | Q <sub>rr</sub>    | -   | 210 | -   | pC   | di/dt = 500mA / ns<br>R <sub>source</sub> = 6Ω; R <sub>load</sub> = 10Ω                        |

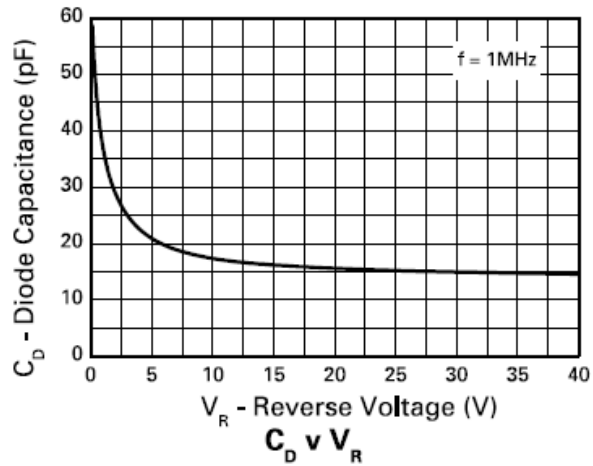
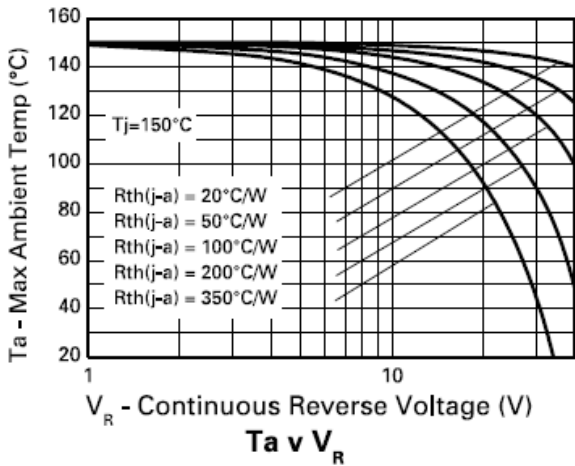
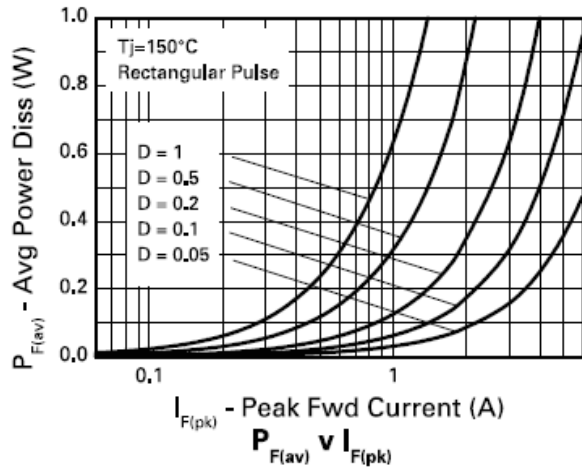
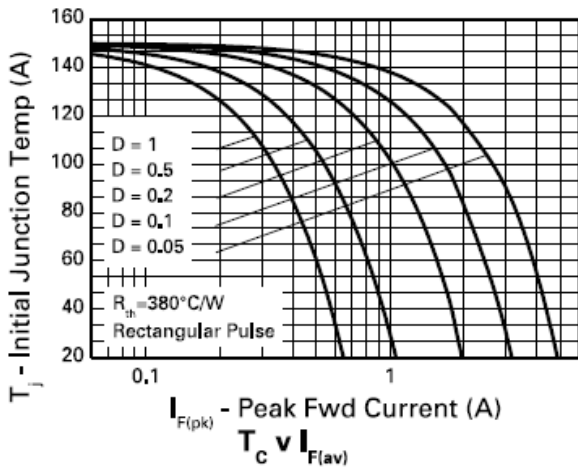
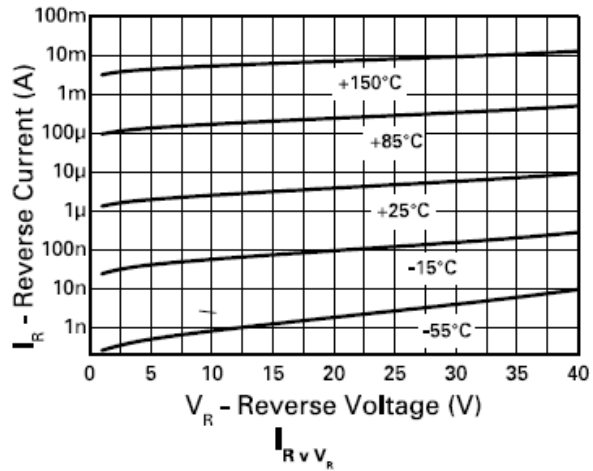
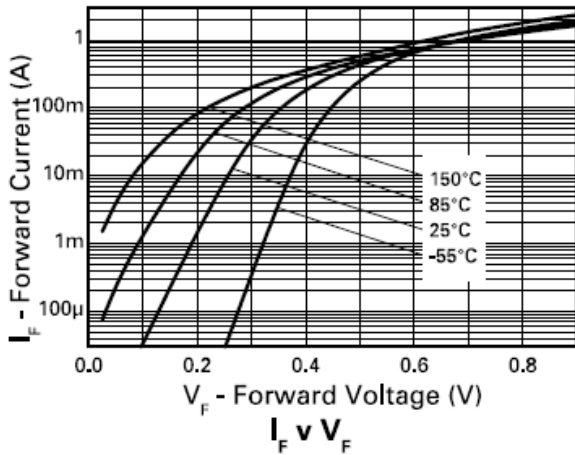
Note: 8. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.

**Operational Efficiency Chart**



**Operational Efficiency Example**

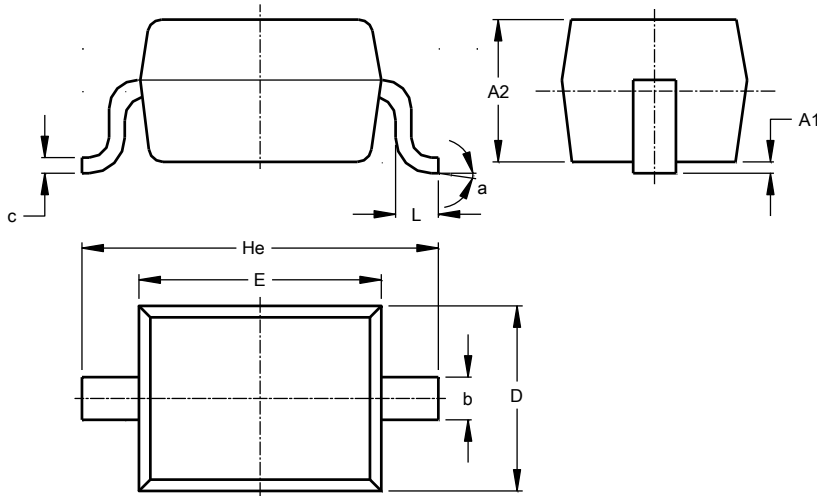
The operational efficiency chart indicates the beneficial use of the ZLLS series diodes in applications requiring higher voltage and higher temperature operation. Circuits requiring low voltage, low temperature operation will benefit from using Diodes' low V<sub>F</sub> ZHCS series.



**Package Outline Dimensions**

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

SOD323

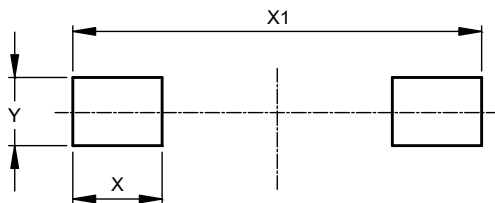


| SOD323               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A1                   | --   | 0.10 | 0.05 |
| A2                   | 1.00 | 1.10 | 1.05 |
| b                    | 0.25 | 0.35 | 0.30 |
| c                    | 0.10 | 0.15 | 0.11 |
| D                    | 1.20 | 1.40 | 1.30 |
| E                    | 1.60 | 1.80 | 1.70 |
| He                   | 2.30 | 2.70 | 2.50 |
| L                    | 0.20 | 0.40 | 0.30 |
| a                    | 8°   |      |      |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**

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

SOD323



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.590         |
| X1         | 2.700         |
| Y          | 0.450         |

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