

## Product Summary

$V_R$ (V)	$I_F$ (mA)	$V_F$ Max (V) @ +25°C	$I_R$ Max ( $\mu$ A) @ +25°C
40V	0.75A	0.63	10

## Description

This compact SOT23-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.

## Applications

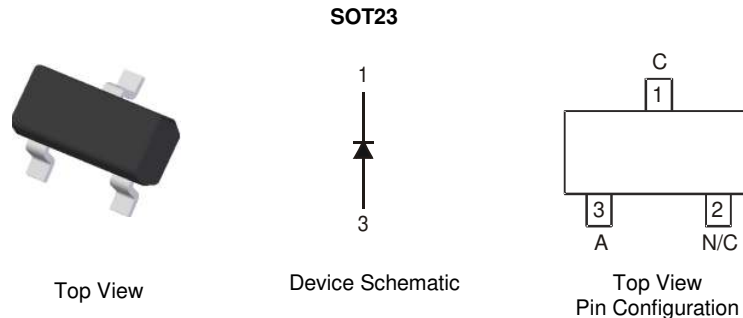
- DC-DC Converters
- Strobes
- Mobile Telecommunication
- Charging Circuits
- Motor Control

## Features and Benefits

- Extremely Low Leakage (10 $\mu$ A @30V)
- High Current Capability ( $I_F = 0.7A$ )
- Low  $V_F$ , Fast Switching Schottky
- ZLLS500 Complements Low Temperature Equivalent ZHCS500
- Package Thermally Rated to +150°C
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.008 grams (Approximate)

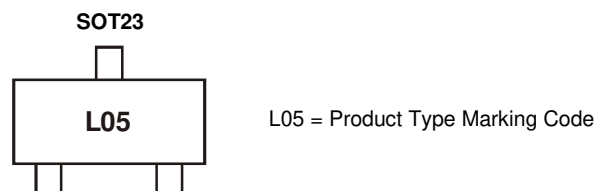


## Ordering Information (Note 5)

Device	Compliance	Packaging	Shipping
ZLLS500QTA	Automotive	SOT23	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



**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>	0.7	A	
Peak Repetitive Forward Current Rectangular Pulse Duty Cycle	I <sub>FPK</sub>	1.14	A	
Non Repetitive Forward Current		t ≤ 100μs	13	A
		t ≤ 10ms	3.2	A

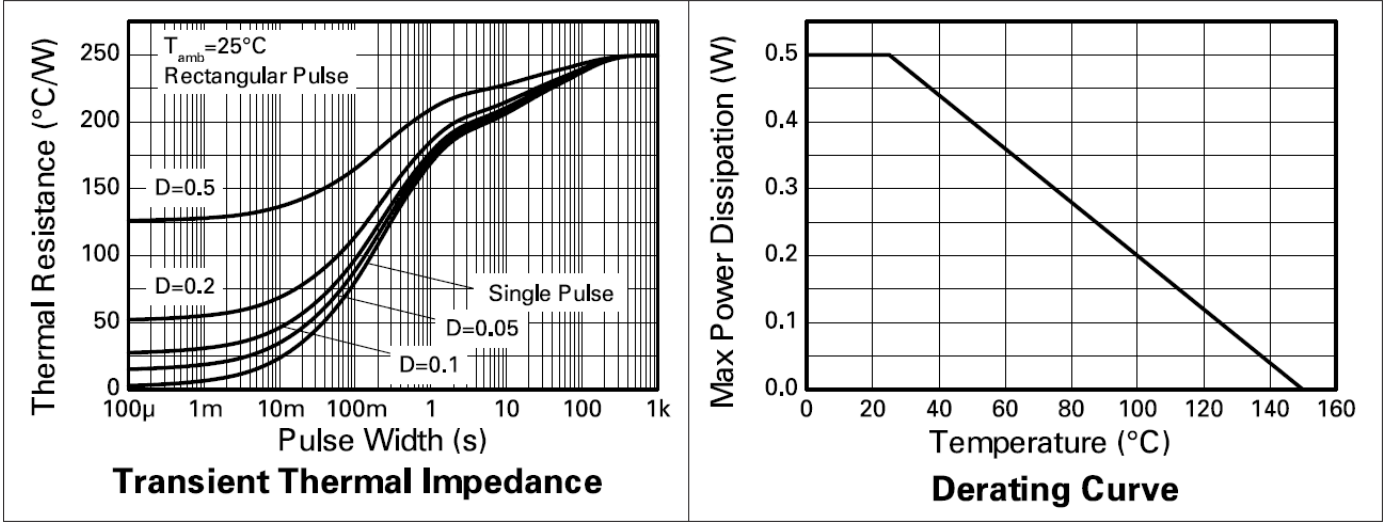
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation, T <sub>A</sub> = +25°C Single Die Continuous Single Die Measured at t < 5 seconds	P <sub>D</sub>	500 630	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	250 198	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

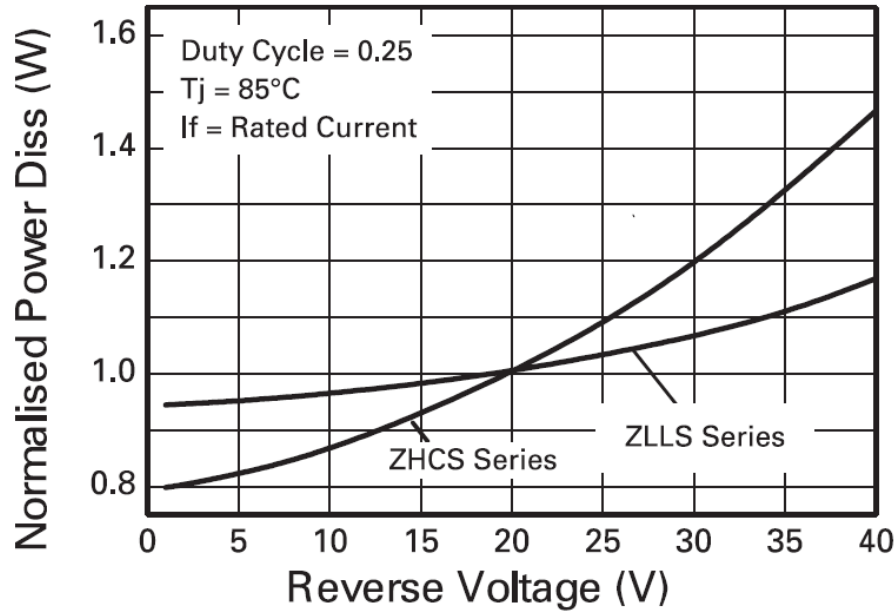
**Electrical Characteristics** (@T<sub>A</sub> = +25°C unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage	V <sub>(BR)R</sub>	40	—	—	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
		—	465	530		I <sub>F</sub> = 500mA
		—	550	630		I <sub>F</sub> = 750mA
		—	620	710		I <sub>F</sub> = 1A
		—	710	800		I <sub>F</sub> = 1.5A
		—	415	—		I <sub>F</sub> = 500mA, 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>	—	16	—	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 di/dt = 500mA/ns
Reverse Recovery Charge	Q <sub>RR</sub>	—	210	—	pC	R <sub>SOURCE</sub> = 6Ω; R <sub>LOAD</sub> = 10Ω

- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  - For a device surface mounted on FR4 PCB measured at t < 5 seconds.
  - Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

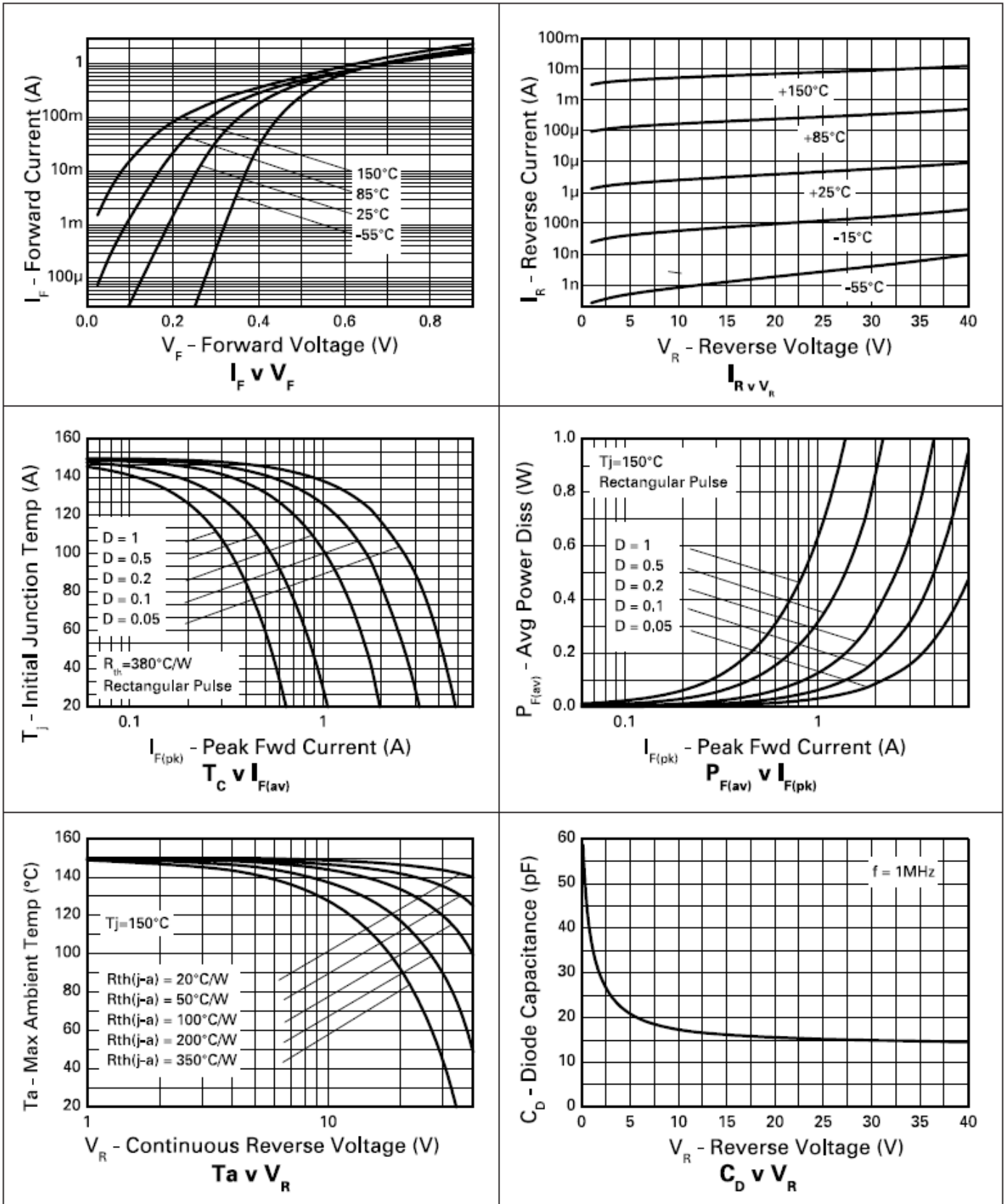


**Operational Efficiency Chart**



**Operational Efficiency Example**

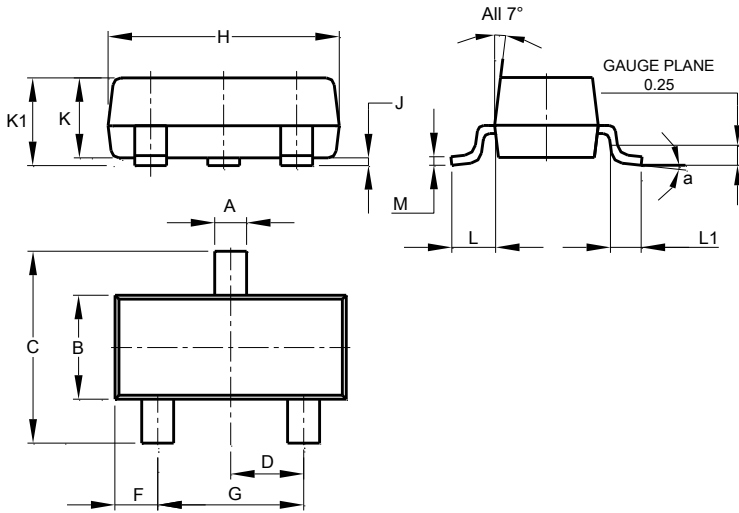
The operational efficiency chart indicates the beneficial use of the ZLLS series diodes in applications requiring higher voltage, higher temperature operation. Circuits requiring low voltage low temperature operation will benefit from using Zetex low  $V_F$  ZHCS series diodes.



**Package Outline Dimensions**

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

**SOT23**

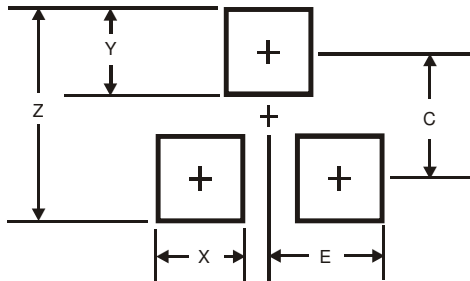


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT23**



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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