

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = +25^\circ\text{C}$
250V	8.5Ω @ $V_{GS} = 10\text{V}$	240mA

## Description

This new generation MOSFET is designed to minimize the on-state resistance ( $R_{DS(ON)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

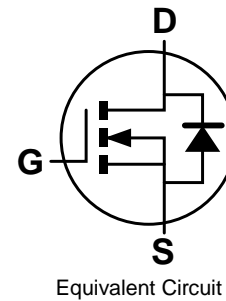
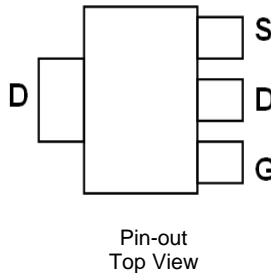
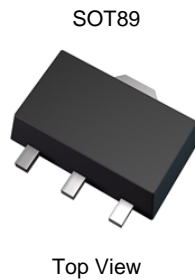
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

## Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish Annealed over Copper Lead frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.052 grams (Approximate)

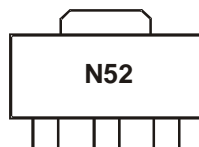


## Ordering Information (Note 4)

Part Number	Compliance	Case	Quantity per Reel
ZVN4525ZTA	Standard	SOT89	1,000

- 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>.

## Marking Information



N52 = Marking Code

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	250	V
Gate-Source Voltage			V <sub>GSS</sub>	±40	V
Continuous Drain Current, V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C (Note 5)	I <sub>D</sub>	240	mA
		T <sub>A</sub> = +70°C (Note 5)		192	
Maximum Body Diode Forward Current			I <sub>S</sub>	1.1	A
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	1.44	A
Pulsed Source Current (Note 7)			I <sub>SM</sub>	1.44	A

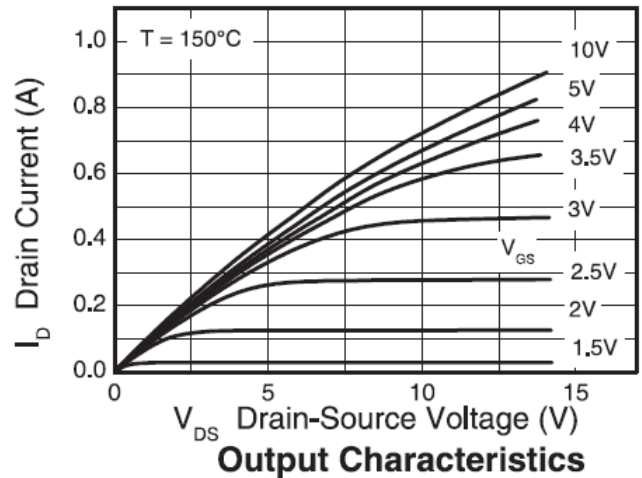
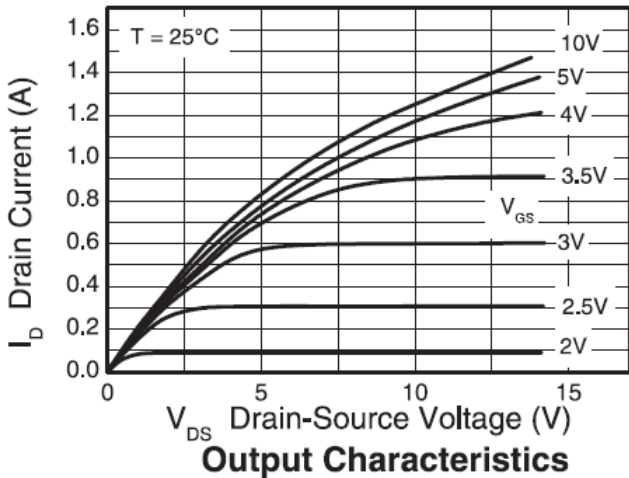
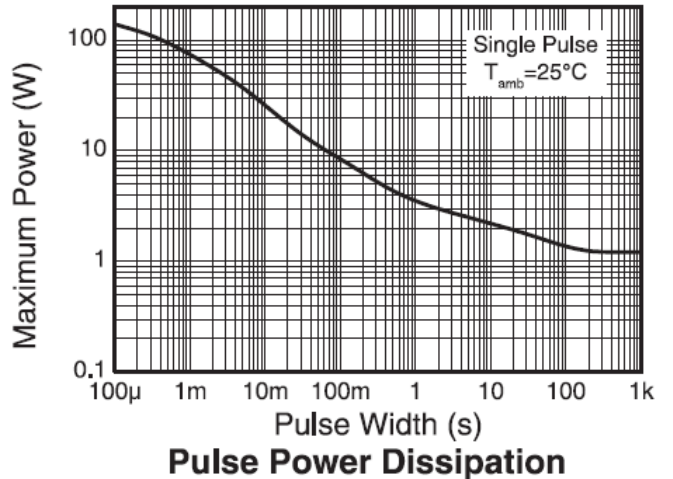
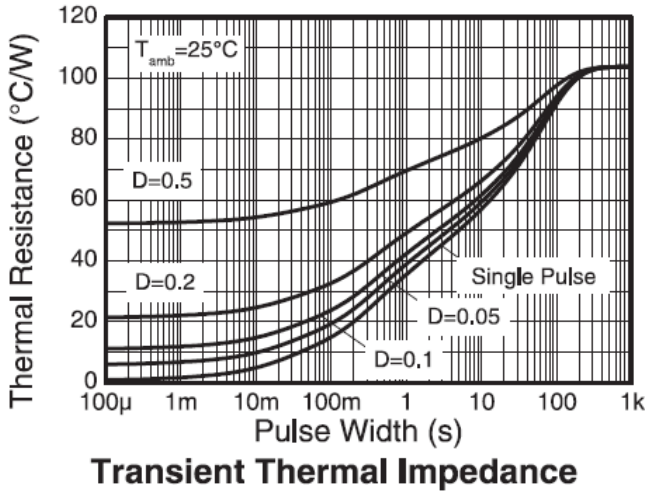
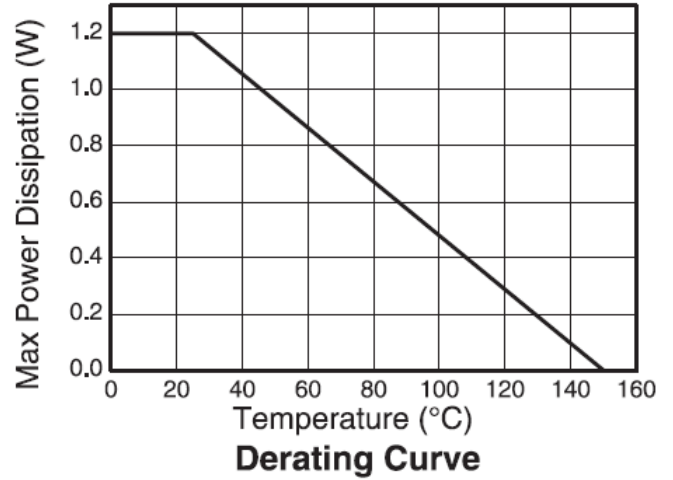
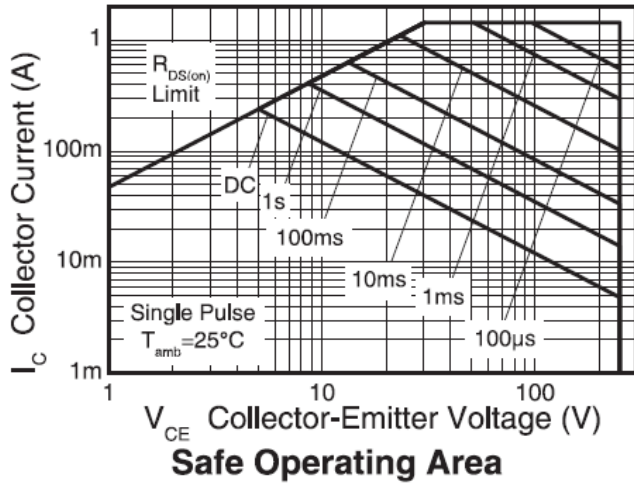
**Thermal Characteristics**

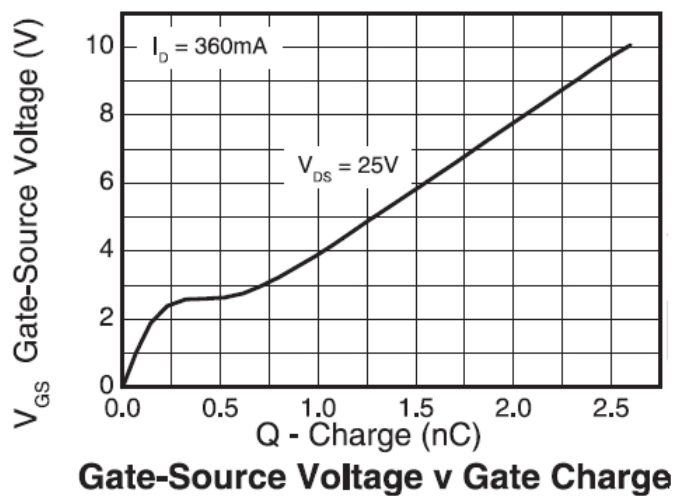
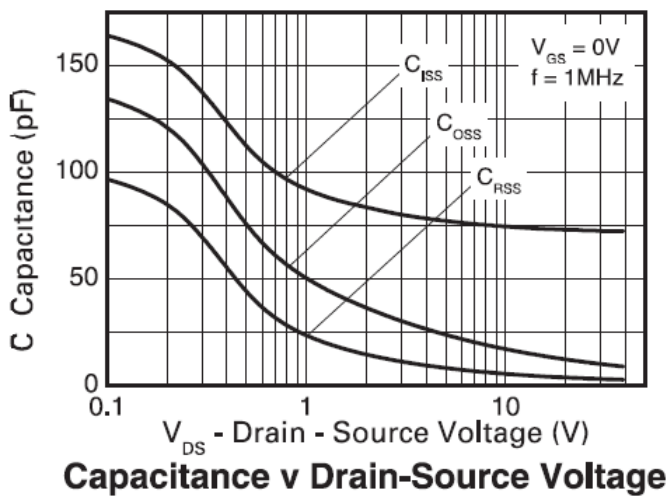
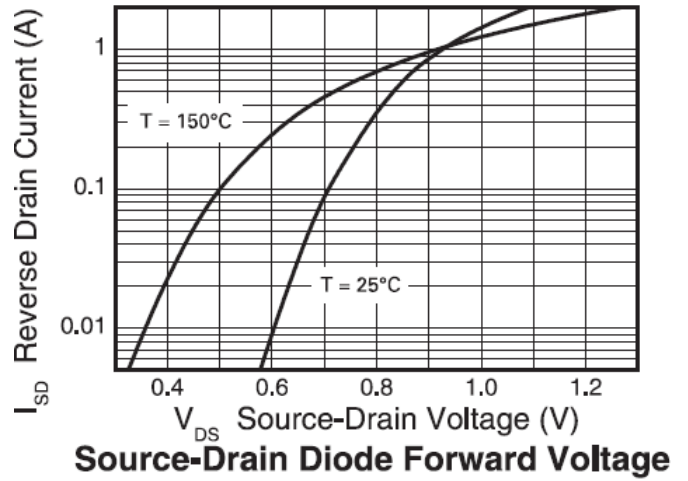
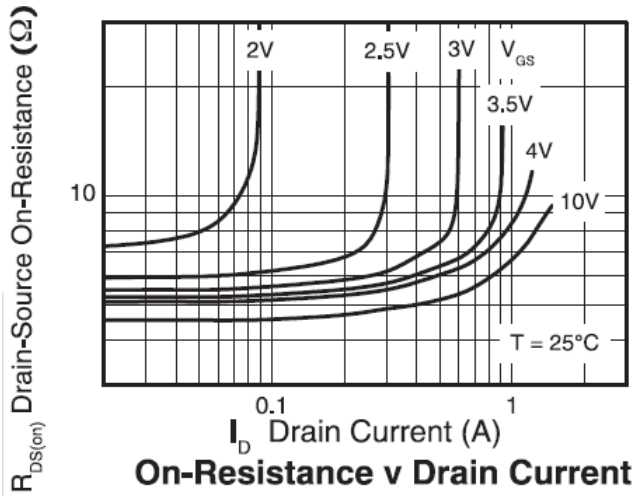
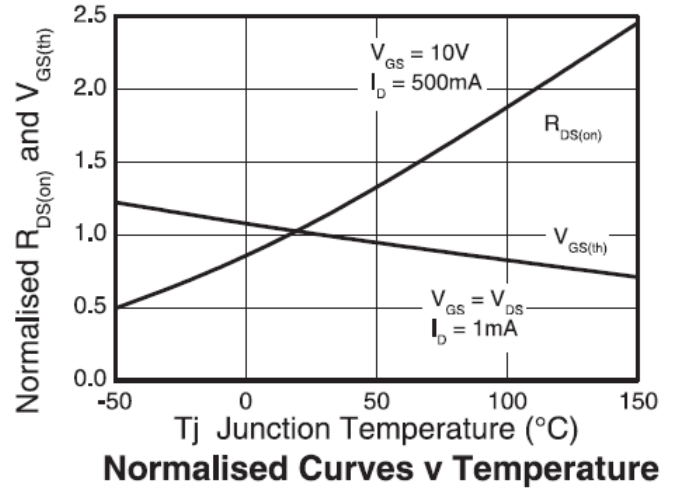
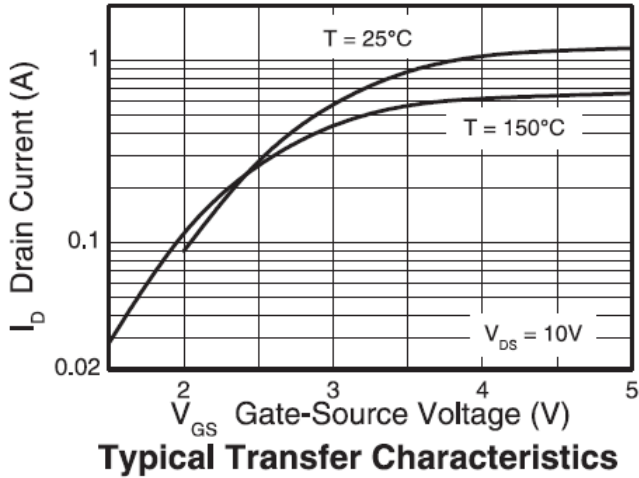
Characteristic		Symbol	Value	Unit
Total Power Dissipation	T <sub>A</sub> = +25°C (Note 5)	P <sub>D</sub>	1.2	W
Linear Derating Factor			9.6	mW/°C
Thermal Resistance, Junction to Ambient	Steady State (Note 5)	R <sub>θJA</sub>	103	°C/W
			Steady State (Note 6)	50
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

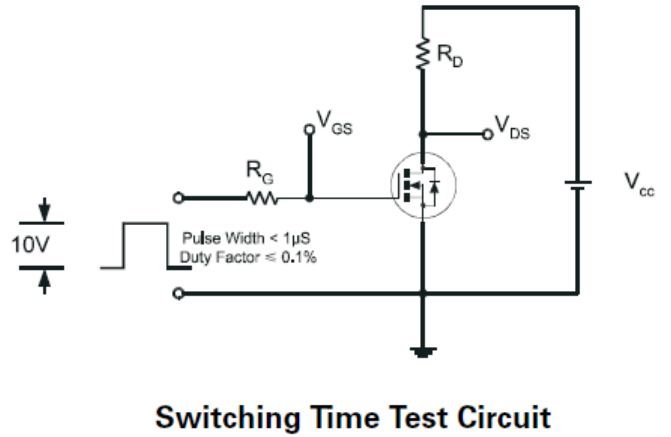
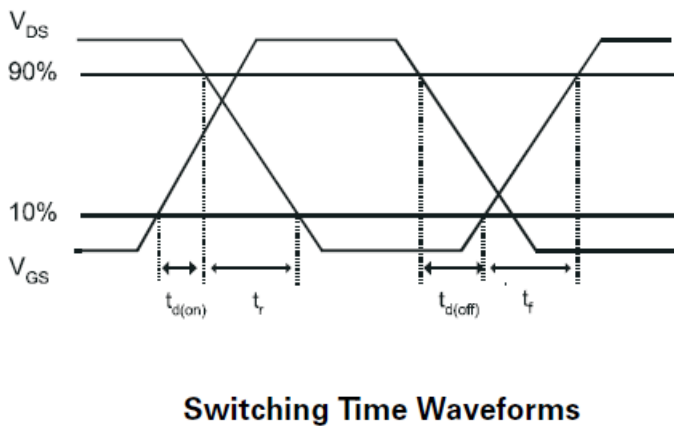
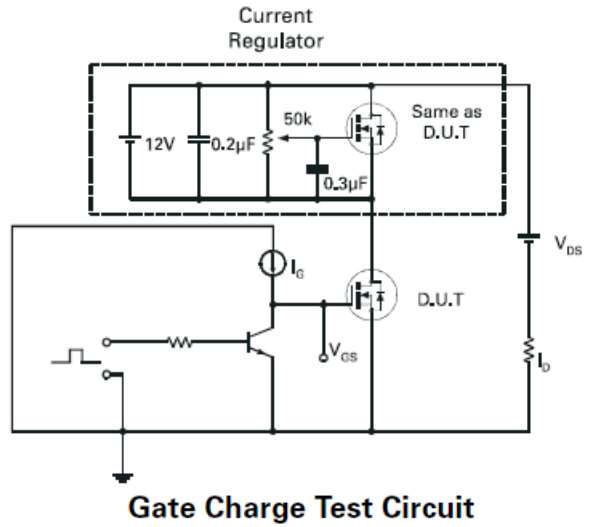
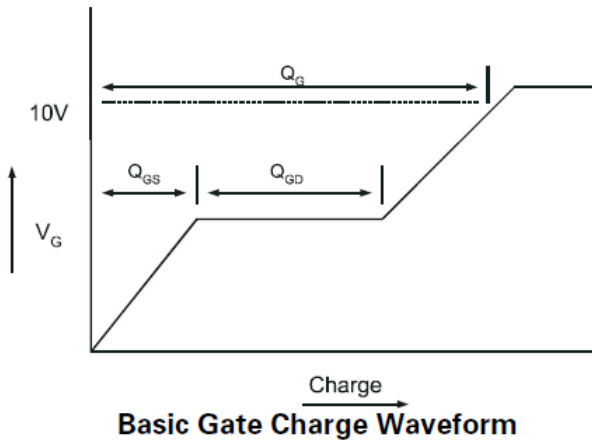
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	250	285	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	35	500	nA	V <sub>DS</sub> = 250V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	±1	±100	nA	V <sub>GS</sub> = ±40V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.8	1.4	1.8	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	5.6	8.5	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA
		—	5.9	9.0		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 360mA
		—	6.4	9.5		V <sub>GS</sub> = 2.4V, I <sub>D</sub> = 20mA
		—	—	—		—
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	—	0.97	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 360mA
Forward Transconductance (Note 10)	g <sub>fs</sub>	0.3	475	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.3A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	—	72	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	11	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	3.6	—		
Total Gate Charge	Q <sub>g</sub>	—	2.6	3.65	nC	V <sub>DS</sub> = 25V, I <sub>D</sub> = 360mA, V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	0.2	0.28		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.5	0.70		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.25	—	ns	V <sub>DD</sub> = 50V, R <sub>G</sub> = 6.0Ω, I <sub>D</sub> = 200mA, R <sub>D</sub> = 4.4Ω
Turn-On Rise Time	t <sub>R</sub>	—	1.70	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	11.40	—		
Turn-Off Fall Time	t <sub>F</sub>	—	3.50	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	186	260	ns	I <sub>F</sub> = 360mA, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	34	48	nC	

- Notes:
5. For a device surface mounted on 25mm X 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air condition.
  6. For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.
  7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal.
  8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
  9. Short duration pulse test used to minimize self-heating effect.
  10. Guaranteed by design. Not subject to product testing.

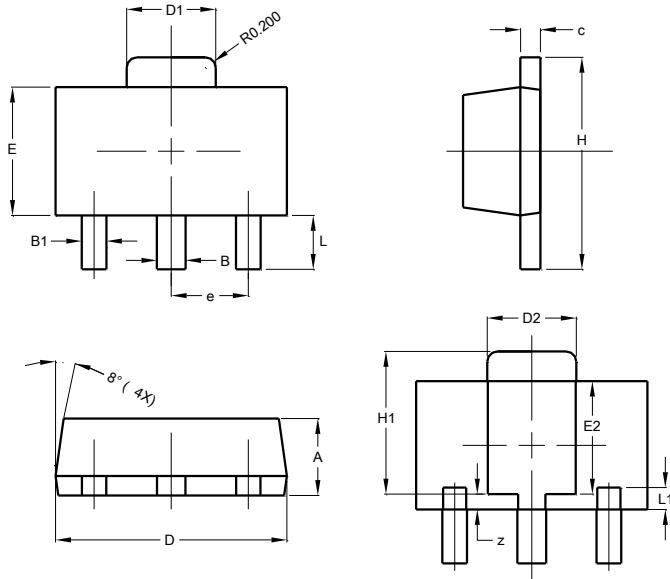






**Package Outline Dimensions**

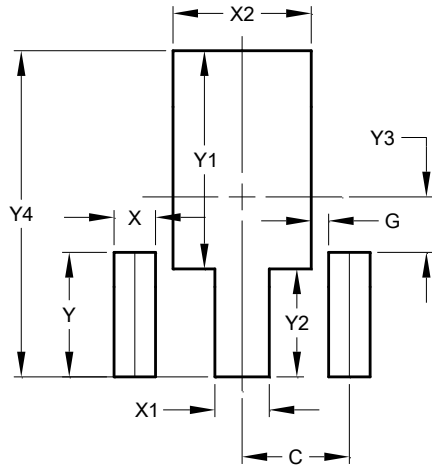
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.427 REF		
Z	0.30 REF		
All Dimensions in mm			

**Suggested Pad Layout**

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



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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