60V SELF-PROTECTED LOW-SIDE INTELLIFET® MOSFET SWITCH

Product Summary

- Continuous Drain-Source Voltage: V_{DS} = 60V
- On-State Resistance: 550mΩ
- Nominal Load Current (V_{IN} = 5V): 1.4A
- Clamping Energy: 550mJ

Description

The BSP75GTA/TC is a self-protected low-side MOSFET. It features monolithic overtemperature, overcurrent, overvoltage (active clamp) and ESD protected logic level functionality. It is intended as a general-purpose switch.

Applications

- Especially suited for loads with a high in-rush current such as lamps and motors
- All types of resistive, inductive and capacitive loads in switching applications
- µC compatible power switch for 12V and 24V DC applications
- Automotive rated
- Replaces electromechanical relays and discrete circuits
- Linear mode capability - the current-limiting protection circuitry is designed to de-activate at low V_{DS} to in order not to compromise the load current during normal operation. The maximum DC operating current is therefore determined by the thermal capability of the package/board combination, rather than by the protection circuitry.

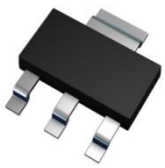
Features and Benefits

- Short-Circuit Protection with Auto Restart
- Overvoltage Protection (Active Clamp)
- Thermal Shutdown with Auto Restart
- Overcurrent Protection
- Input Protection (ESD)
- Load Dump Protection (Actively Protects Load)
- Logic Level Input
- High Continuous Current Rating
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

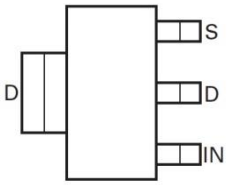
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish e3
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)



Top View



Top View
Pin Out

Note: The tab is connected to the drain pin, and must be electrically isolated from the source pin. Connection of significant copper to the tab is recommended for best thermal performance.

Ordering Information (Note 4)

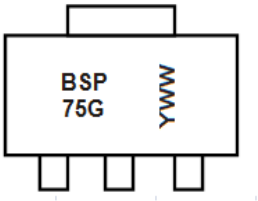
Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
BSP75GTA	SOT223 (Type DN)	BSP75G	7	12	1,000 Units	Reel
BSP75GTC	SOT223 (Type DN)	BSP75G	13	12	4,000 Units	Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

IntelliFET® is a registered trademark of Diodes Incorporated in the United States and other countries.

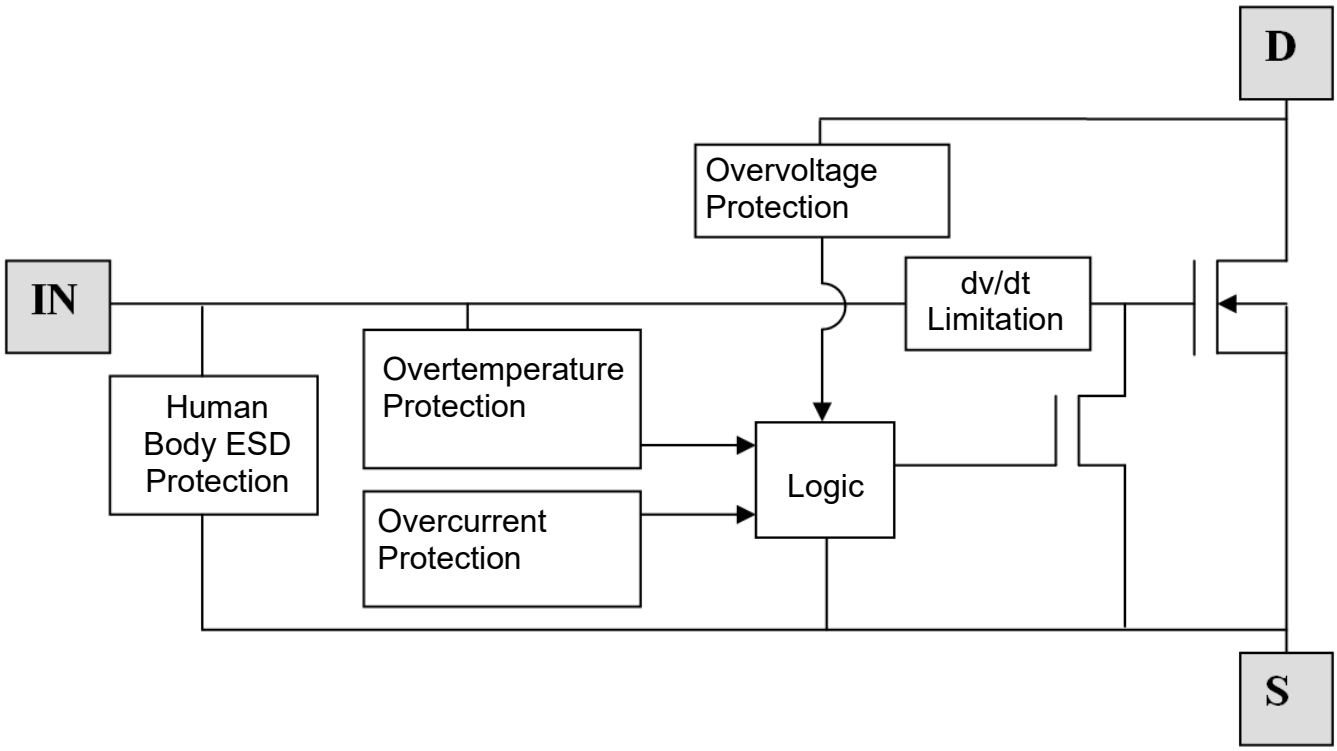
© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

Marking Information



BSP75G = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 6 = 2026)
WW or $\overline{WW}$ = Week Code (01 to 53)

Functional Block Diagram



© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise stated.)

Parameter	Symbol	Limit	Unit
Continuous Drain-Source Voltage	V_{DS}	60	V
Drain-Source Voltage for Short-Circuit Protection, V_{IN} = 5V	$V_{DS(SC)}$	36	V
Continuous Input Voltage	V_{IN}	-0.2 to +10	V
Peak Input Voltage	V_{IN}	-0.2 to +20	V
Operating Temperature Range	T_J	-40 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Power Dissipation at T_A = +25°C (Note 5)	P_D	2.5	W
Continuous Drain Current @ V_{IN} =10V, T_A = +25°C (Note 5)	I_D	1.6	A
Continuous Drain Current @ V_{IN} =5V, T_A = +25°C (Note 5)	I_D	1.4	A
Pulsed Drain Current @ V_{IN} = 10V	I_{DM}	5	A
Continuous Source Current (Body Diode) (Note 5)	I_S	3	A
Pulsed Source Current (Body Diode)	I_S	5	A
Unclamped Single Pulse Inductive Energy	E_{AS}	550	mJ
Load Dump Protection	V_{LOAD_DUMP}	80	V
Electrostatic Discharge (Human Body Model)	V_{ESD}	4000	V
DIN Humidity Category, DIN 40 040	—	E	—
IEC Climatic Category, DIN IEC 68-1	—	40/150/56	—

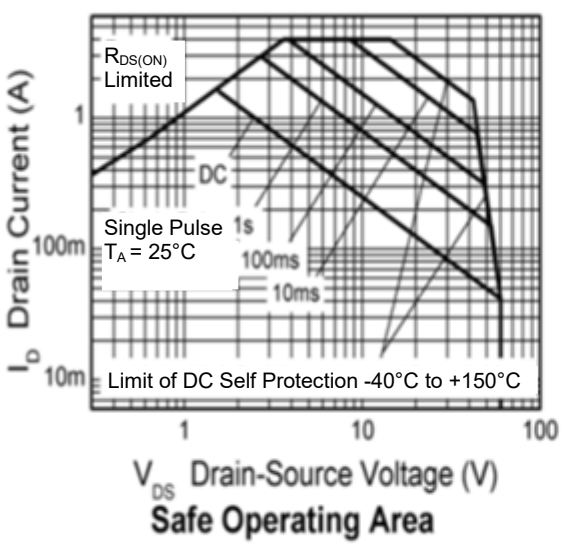
Thermal Resistance

Characteristic	Symbol	Limit	Unit
Junction to Ambient (Note 5)	$R_{\theta JA}$	50	°C/W
Junction to Ambient (Note 6)	$R_{\theta JA}$	24	°C/W
Junction to Ambient (Note 7)	$R_{\theta JA}$	208	°C/W

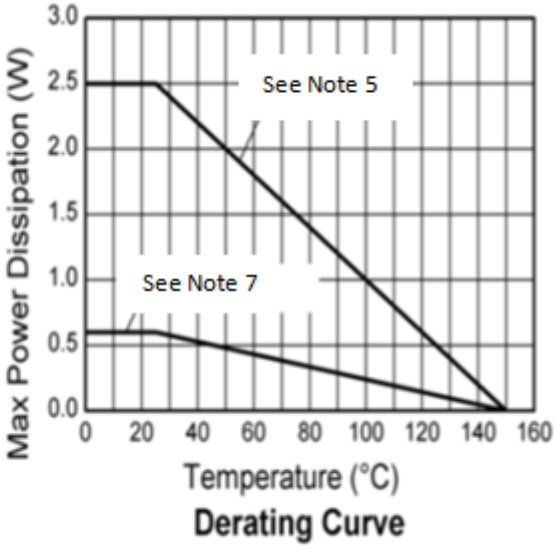
Notes: 5. For a device surface mounted on 37mm x 37mm x 1.6mm FR-4 board with a high coverage of single sided 2oz weight copper.
6. For a device surface mounted on FR-4 board and measured at t <= 10s.
7. For a device mounted on FR-4 board with the minimum copper required for electrical connections.

© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

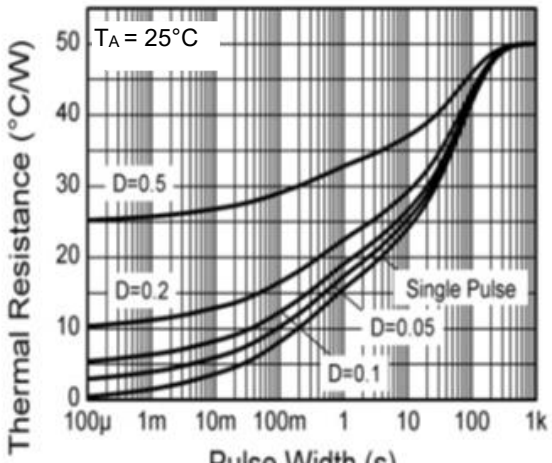
Typical Characteristics



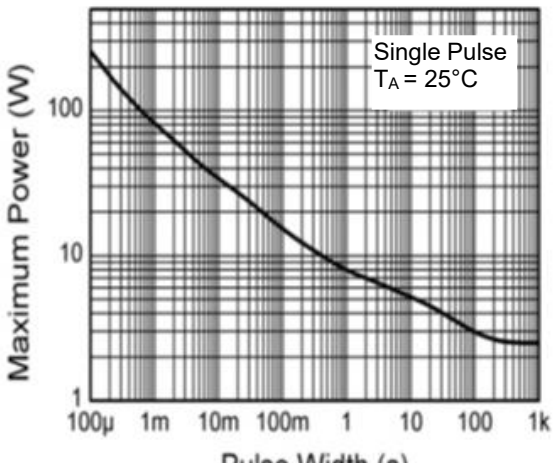
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

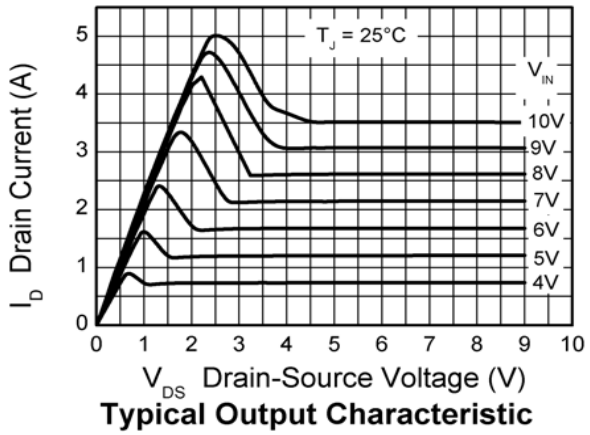
Electrical Characteristics (@T_A = +25°C, unless otherwise stated.)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Static Characteristics						
Drain-Source Clamp Voltage	$V_{DS(AZ)}$	60	70	75	V	I_D = 10mA
Off state Drain Current	I_{DSS}	—	0.1	3	µA	V_{DS} = 12V, V_{IN} = 0
Off state Drain Current	I_{DSS}	—	3	15	µA	V_{DS} = 32V, V_{IN} = 0
Input Threshold Voltage (Note 8)	$V_{IN(TH)}$	1	2.1	—	V	V_{DS} = V_{GS}, I_D = 1mA
Input Current	I_{IN}	—	0.7	1.2	mA	V_{IN} = 5V
Input Current	I_{IN}	—	1.5	2.7	mA	V_{IN} = 7V
Input Current	I_{IN}	—	4	7	mA	V_{IN} = 10V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	—	520	675	mΩ	V_{IN} = 5V, I_D = 0.7A
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	—	385	550	mΩ	V_{IN} = 10V, I_D = 0.7A
Current Limit (Note 9)	$I_{D(LIM)}$	0.7	1.1	1.75	A	V_{IN} = 5V, V_{DS} > 5V
Current Limit (Note 9)	$I_{D(LIM)}$	2	3	4	A	V_{IN} = 10V, V_{DS} > 5V
Dynamic Characteristics						
Turn-On Time (V_{IN} to 90% I_D)	t_{ON}	—	2.2	—	µs	R_L = 22Ω, V_{IN} = 0 to 10V, V_{DD} = 12V
Turn-Off Time (V_{IN} to 90% I_D)	t_{OFF}	—	13	—	µs	R_L = 22Ω, V_{IN} = 10V to 0, V_{DD} = 12V
Slew Rate On (70 to 50% V_{DD})	$-dv_{DS}/dt_{ON}$	—	10	—	V/µs	R_L = 22Ω, V_{IN} = 0 to 10V, V_{DD} = 12V
Slew Rate Off (50 to 70% V_{DD})	dv_{DS}/dt_{ON}	—	3.2	—	V/µs	R_L = 22Ω, V_{IN} = 10V to 0, V_{DD} = 12V
Protection Functions (Note 10)						
Minimum Input Voltage for Overtemperature Protection	V_{PROT}	4.5	—	—	V	—
Thermal Overload Trip Temperature	T_{JT}	+150	+175	—	°C	—
Thermal Hysteresis	—	—	+10	—	°C	—
Unclamped Single Pulse Inductive Energy, T_J = +25°C	E_{AS}	550	—	—	mJ	$I_{D(ISO)}$ = 0.7A, V_{DD} = 32V
Unclamped Single Pulse Inductive Energy, T_J = +150°C	E_{AS}	200	—	—	mJ	$I_{D(ISO)}$ = 0.7A, V_{DD} = 32V
Inverse Diode						
Source Drain Voltage	V_{SD}	—	—	1	V	V_{IN} = 0, $-I_D$ = 1.4A

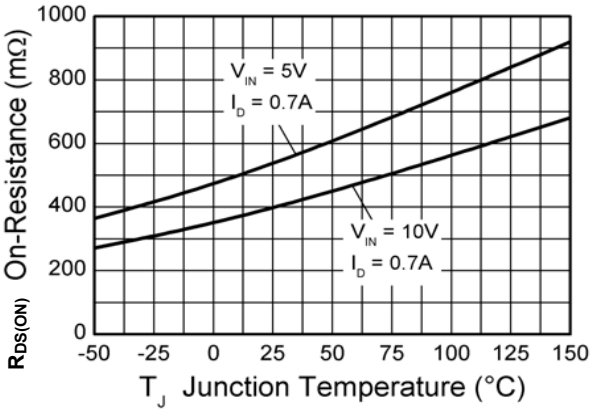
Notes:
8. Protection features may operate outside spec for V_{IN} < 4.5V.
9. The drain current is limited to a reduced value when V_{DS} exceeds a safe level.
10. Integrated protection functions are designed to prevent IC destruction under fault conditions described in the datasheet. Fault conditions are considered as "outside" normal operating range. Protection functions are not designed for continuous, repetitive operation.

© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

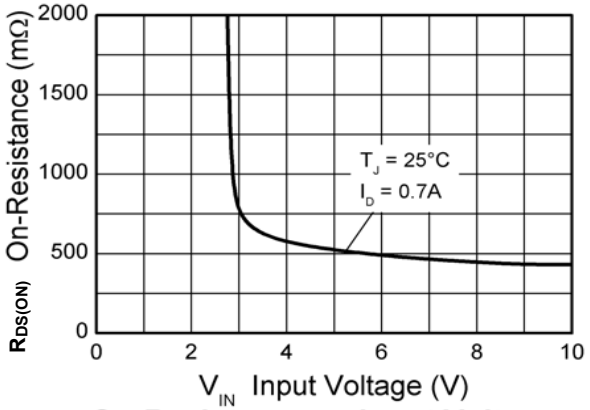
Characteristics



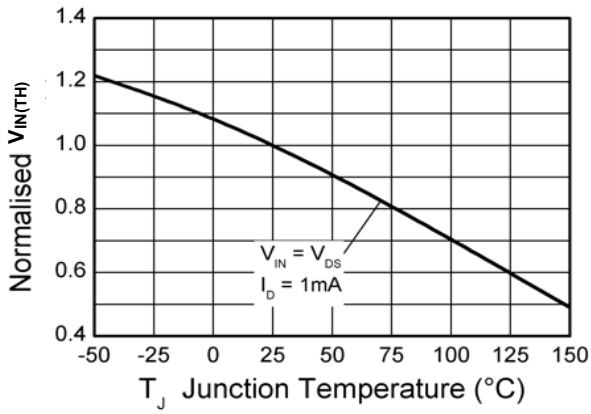
Typical Output Characteristic



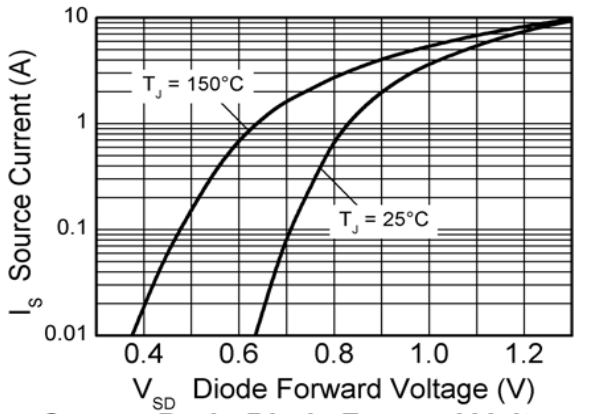
On-state Resistance vs Temperature



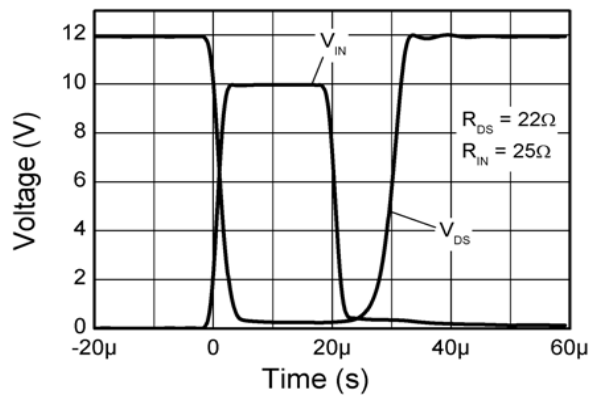
On-Resistance vs Input Voltage



Threshold Voltage vs Temperature



Source-Drain Diode Forward Voltage



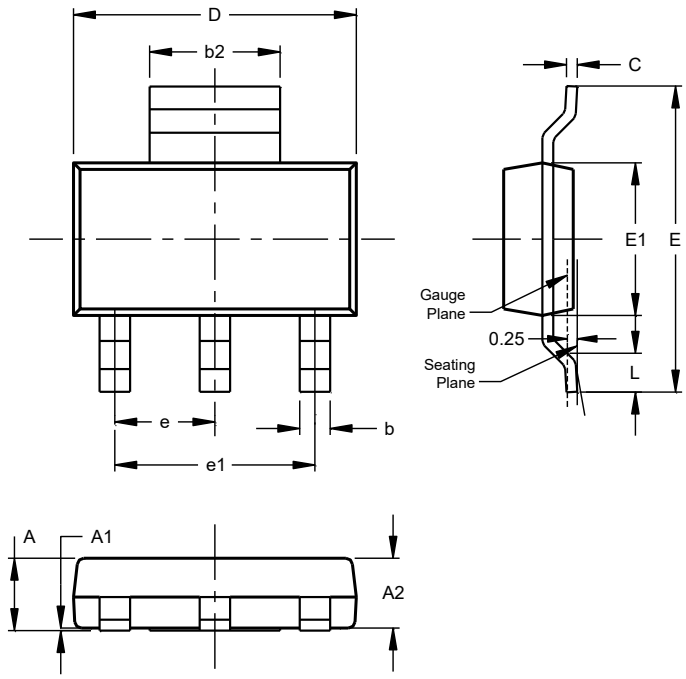
Switching Speed

© 2026 Copyright Diodes Incorporated. All Rights Reserved.
Downloaded from Arrow.com.

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)

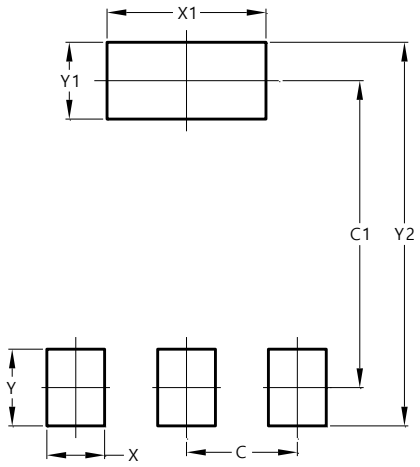


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

© 2026 Copyright Diodes Incorporated. All Rights Reserved.

Downloaded from Arrow.com.

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.
All other trademarks are the property of their respective owners.
© 2026 Diodes Incorporated. All Rights Reserved.

www.diodes.com

© 2026 Copyright Diodes Incorporated. All Rights Reserved.

Downloaded from Arrow.com.