

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
-450V	21Ω @ V _{GS} = -10V	-0.27A

Description

This 450V enhancement mode p-channel MOSFET provides users with a competitive specification offering efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of telecom and general high-voltage switching circuits.

Applications

- Load switching
- Uninterrupted power supplies

Features and Benefits

- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully 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](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

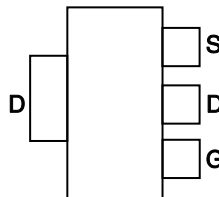
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 
- Weight: 0.112 grams (Approximate)

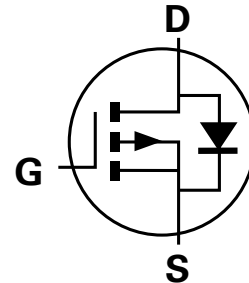
SOT223



Top View



Pinout - Top View



Equivalent Circuit

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMP45H21DHE-13	SOT223	2,500	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://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/>.

Marking Information



DII = Manufacturer's Marking
 P450HE = Product Type Marking Code
 YWW = Date Code Marking
 Y or Y = Year (ex: 5 = 2025)
 WW = Week (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-450	V
Gate-Source Voltage	V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = 10V	T _A = +25°C	I _D	-0.27
	T _A = +70°C	I _D	-0.22
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) (Note 6)	I _{DM}	-1.2	A
Maximum Body Diode Continuous Current (Note 5)	I _S	-0.27	A
Avalanche Energy (Note 7), L = 60mH	E _{AS}	30	mJ
Avalanche Current (Note 7), L = 60mH	I _{AS}	-1	A
Peak Diode Recovery dv/dt (I _{SD} ≤ 1.0A, di/dt ≤ 100A/µs)	dv/dt	26	V/ns

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	T _A = +25°C	2.4
		T _A = +70°C	1.5
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	102
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	53
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-450	—	—	V	V _{GS} = 0, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	µA	V _{DS} = -450V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±30V, V _{DS} = 0
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-3.0	-4	-5.0	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	13	21	Ω	V _{GS} = -10V, I _D = -0.3A
Diode Forward Voltage	V _{SD}	—	-0.84	-1.2	V	V _{GS} = 0, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	1,003	—	pF	V _{DS} = -25V, V _{GS} = 0, f = 1.0MHz
Output Capacitance	C _{oss}	—	25.5	—		
Reverse Transfer Capacitance	C _{rss}	—	2.3	—		
Gate Resistance	R _G	—	615	—	Ω	V _{DS} = 0, V _{GS} = 0, f = 1.0MHz
Total Gate Charge	Q _g	—	4.2	—	nC	V _{DS} = -225V, I _D = -1A, V _{GS} = -10V
Gate-Source Charge	Q _{gs}	—	1.1	—		
Gate-Drain Charge	Q _{gd}	—	2.1	—		
Turn-On Delay Time	t _{D(ON)}	—	17	—	ns	V _{DD} = -225V, R _G = 3.0Ω, I _D = -1A
Turn-On Rise Time	t _R	—	22	—		
Turn-Off Delay Time	t _{D(OFF)}	—	18	—		
Turn-Off Fall Time	t _F	—	21	—		
Body Diode Reverse-Recovery Time	t _{RR}	—	113	—	ns	V _{GS} = 0, V _{DD} = -200V, I _S = -1A di/dt = 100A/µs
Body Diode Reverse-Recovery Charge	Q _{RR}	—	540	—	nC	V _{GS} = 0, V _{DD} = -200V, I _S = -1A di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Guaranteed by design. Not subject to production testing.
8. Short duration pulse test used to minimize self-heating effect.

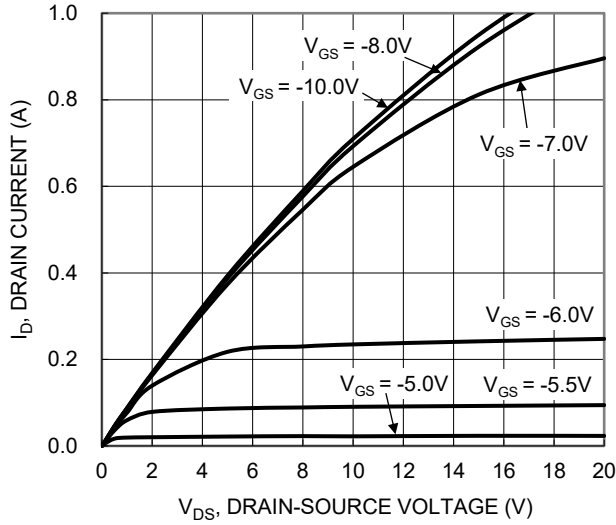


Figure 1. Typical Output Characteristic

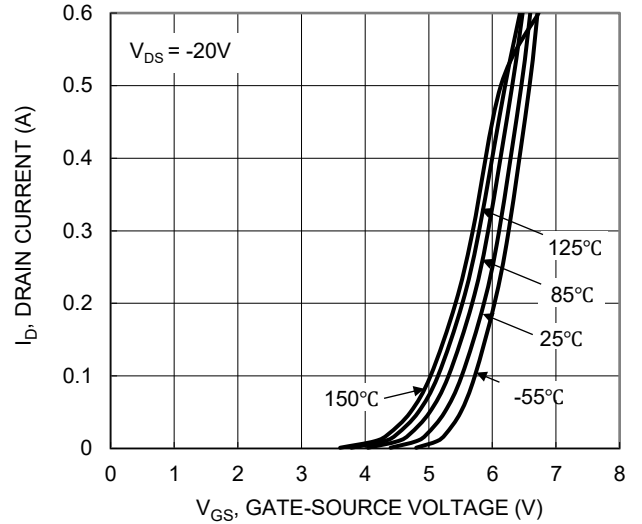


Figure 2. Typical Transfer Characteristic

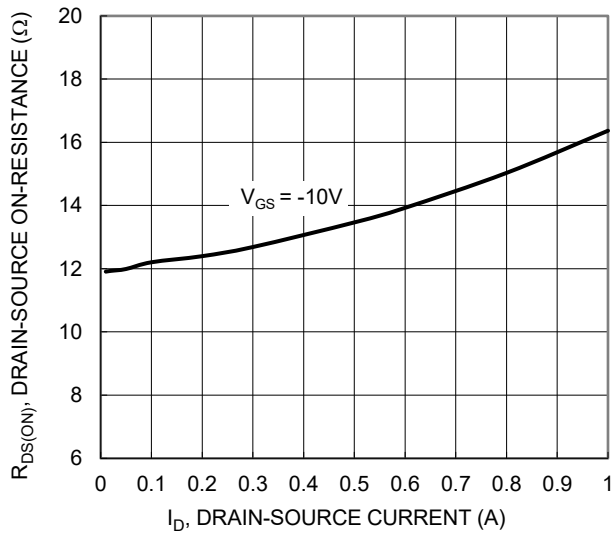


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

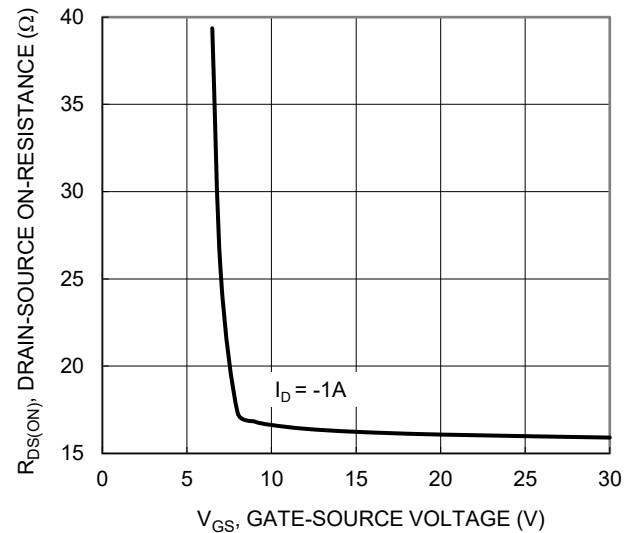


Figure 4. Typical Transfer Characteristic

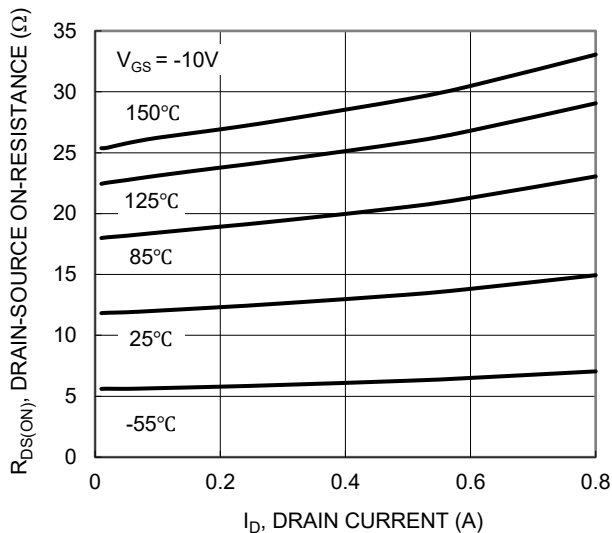


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

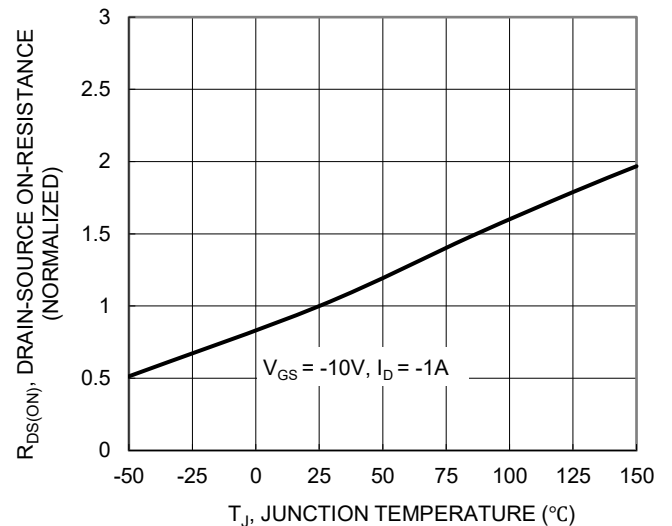


Figure 6. On-Resistance Variation with Temperature

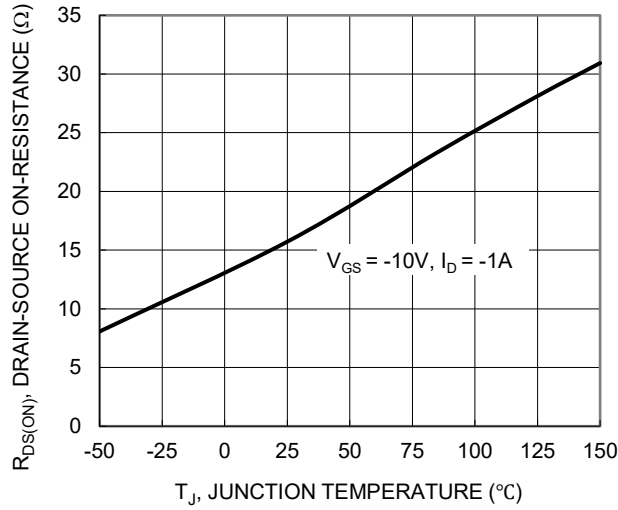


Figure 7. On-Resistance Variation with Temperature

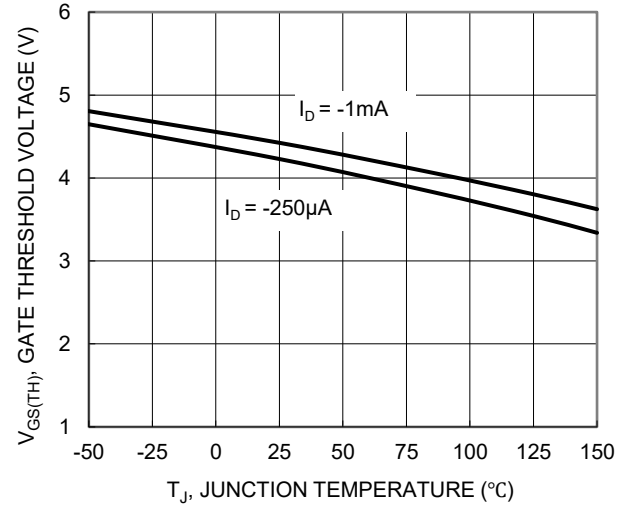


Figure 8. Gate Threshold Variation vs. Junction Temperature

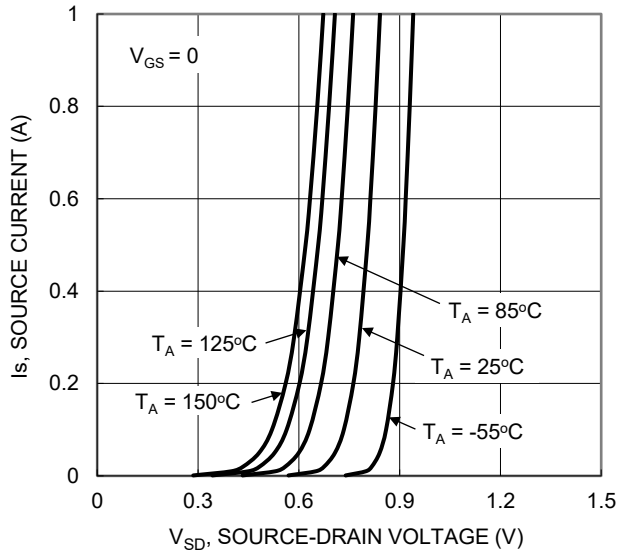


Figure 9. Diode Forward Voltage vs. Current

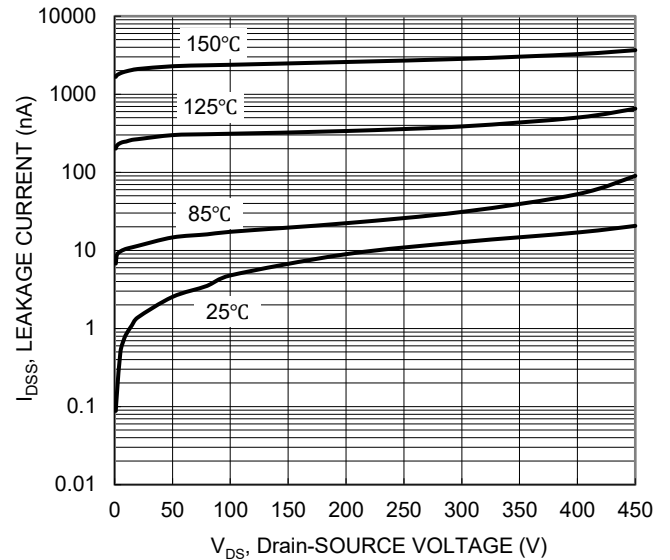


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

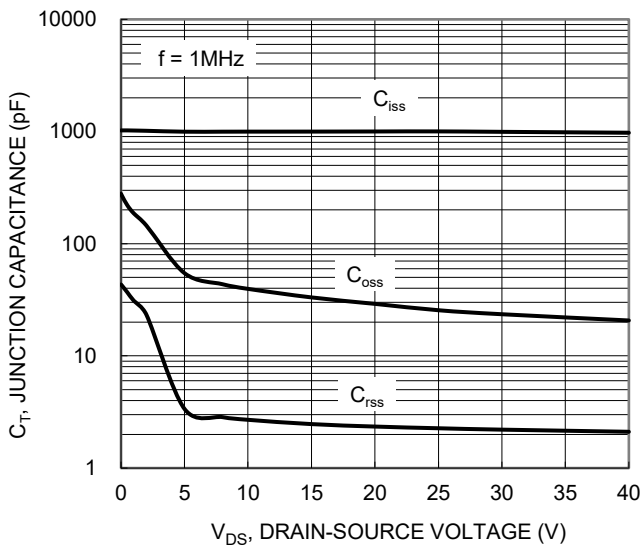


Figure 11. Typical Junction Capacitance

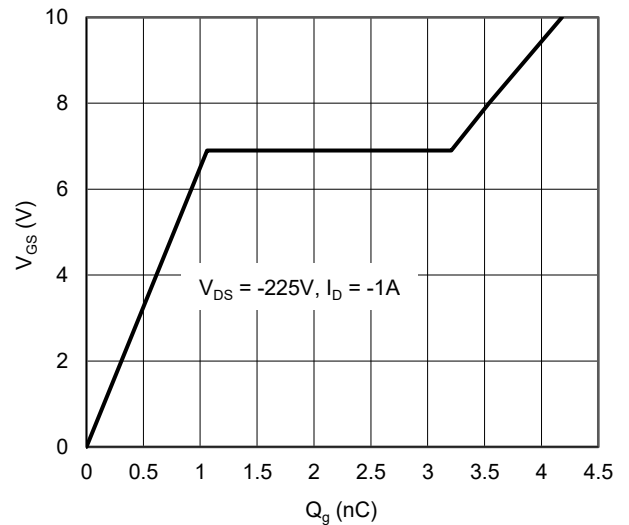
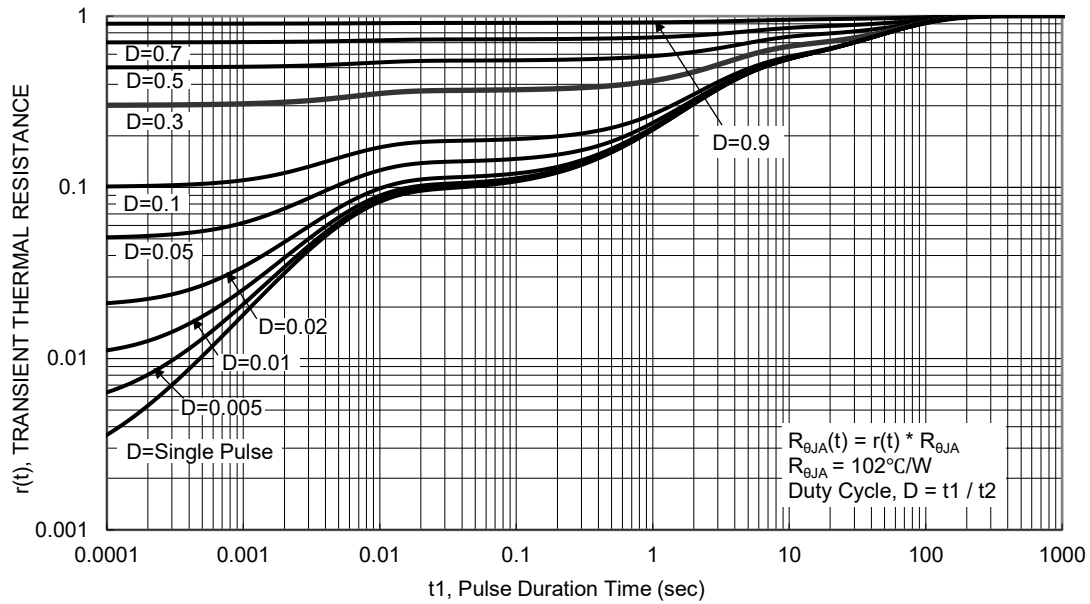
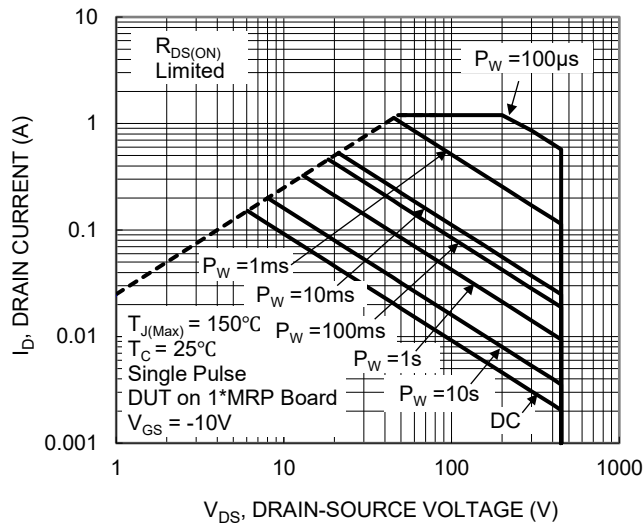


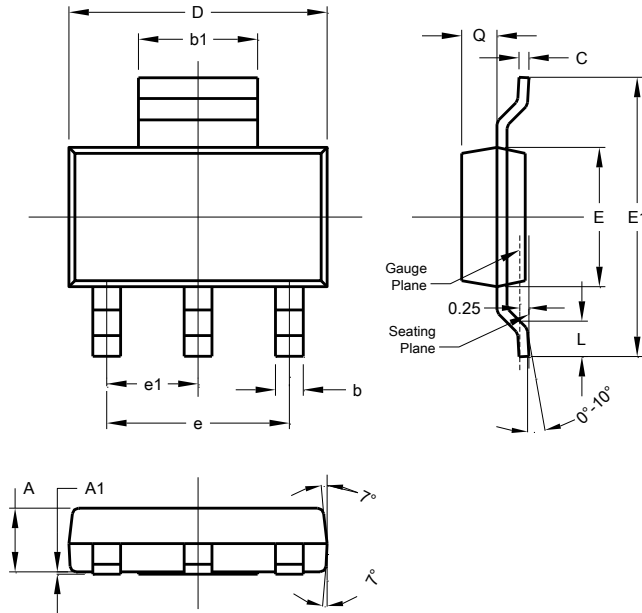
Figure 12. Gate Charge



Package Outline Dimensions

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

SOT223

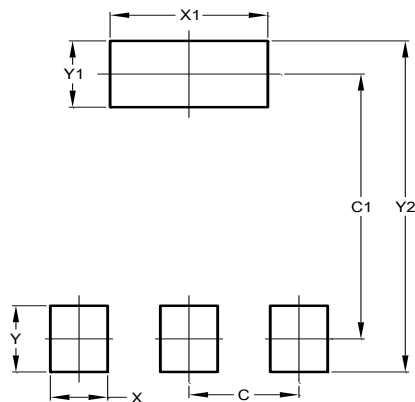


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

SOT223



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

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