

## Product Summary

$BV_{DSS}$	$R_{DS(ON)}$ Max	$I_D$ Max $T_A = +25^\circ C$
30V	73m $\Omega$ @ $V_{GS} = 10V$	3.3A
	110m $\Omega$ @ $V_{GS} = 4.5V$	2.7A

## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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)**

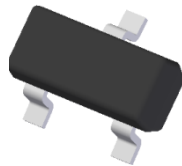
## Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

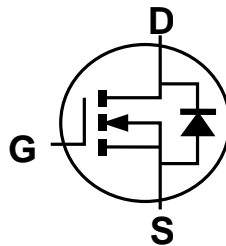
- General Purpose Interfacing Switch
- Power Management Functions
- Boost Application
- Analog Switch

## Mechanical Data

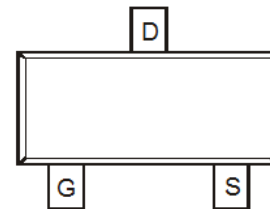
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>e3</sup>
- Weight: 0.027 grams (Approximate)



Top View



Equivalent Circuit



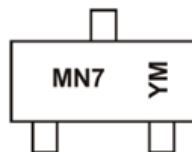
Top View

## Ordering Information (Note 5)

Part Number	Case	Packaging
DMN3110SQ-7	SOT23	3000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



MN7 = Product Type Marking Code  
 Y or  $\bar{Y}$  = Year (ex: G = 2019)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2007	~	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Code	U	~	F	G	H	I	J	K	L	M	N	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	2.5	A
		T <sub>A</sub> = +70°C		2.0	
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	3.3	A
		T <sub>A</sub> = +70°C		2.7	
Continuous Drain Current (Note 7) V <sub>GS</sub> = 10V	t ≤ 10sec	T <sub>A</sub> = +25°C	I <sub>D</sub>	3.8	A
		T <sub>A</sub> = +70°C		3.1	
Continuous Drain Current (Note 7) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	2.7	A
		T <sub>A</sub> = +70°C		2.1	
Pulsed Drain Current (Note 8)			I <sub>DM</sub>	25	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P <sub>D</sub>	0.74	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	173.4	°C/W
Total Power Dissipation (Note 7)	P <sub>D</sub>	1.3	W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	99.1	°C/W
Total Power Dissipation (Note 7) t ≤ 10sec	P <sub>D</sub>	1.8	W
Thermal Resistance, Junction to Ambient (Note 7) t ≤ 10sec	R <sub>θJA</sub>	72	°C/W
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>	30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current @T <sub>C</sub> = +25°C	I <sub>DSS</sub>	-	-	1.0	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	-	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	54	73	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.1A
		-	88	110		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2A
Forward Transfer Admittance	Y <sub>fs</sub>	-	4.8	-	mS	V <sub>DS</sub> = 10V, I <sub>D</sub> = 3.1A
Diode Forward Voltage (Note 7)	V <sub>SD</sub>	-	0.75	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	-	305.8	-	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	39.9	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	39.5	-	pF	
Gate Resistance	R <sub>g</sub>	-	1.4	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	-	4.1	-	nC	V <sub>DS</sub> = 10V, I <sub>D</sub> = 3A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	8.6	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	1.2	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	1.5	-	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	-	2.6	-	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 47Ω, R <sub>G</sub> = 3Ω
Turn-On Rise Time	t <sub>R</sub>	-	4.6	-	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	-	13.1	-	ns	
Turn-Off Fall Time	t <sub>F</sub>	-	2.5	-	ns	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, on 1inch square copper plate.
  - Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

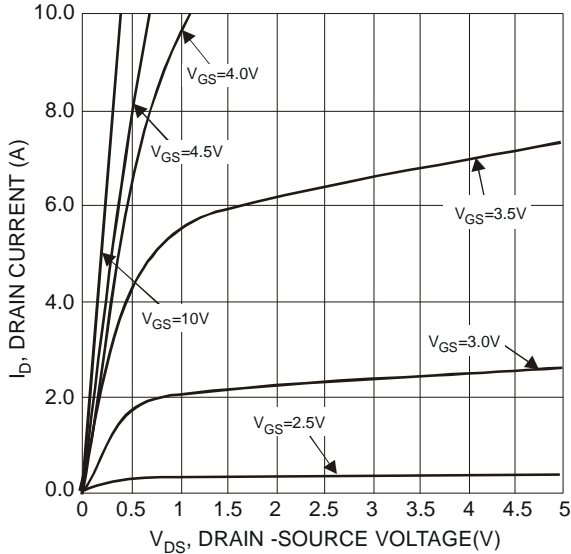


Fig. 1 Typical Output Characteristics

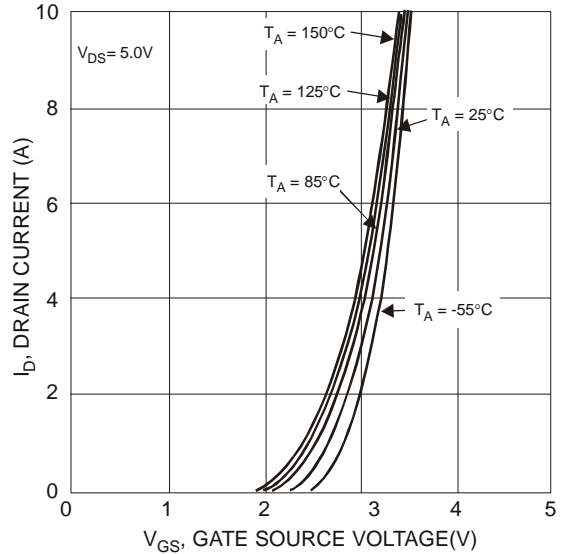


Fig. 2 Typical Transfer Characteristics

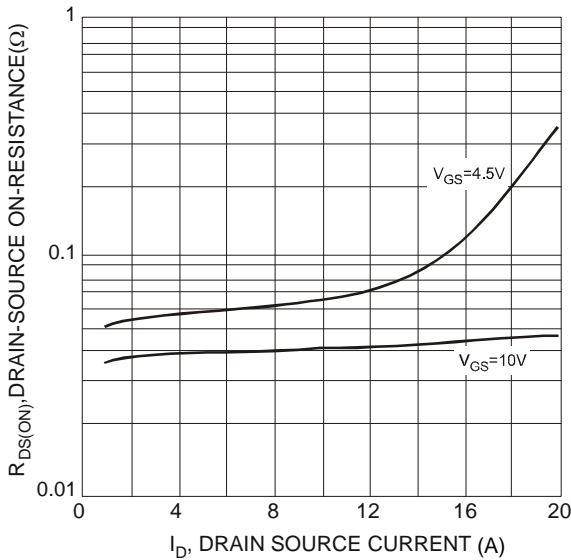


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

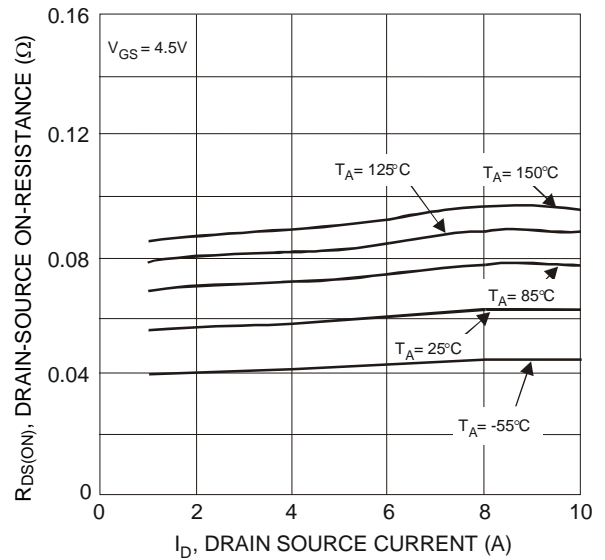


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

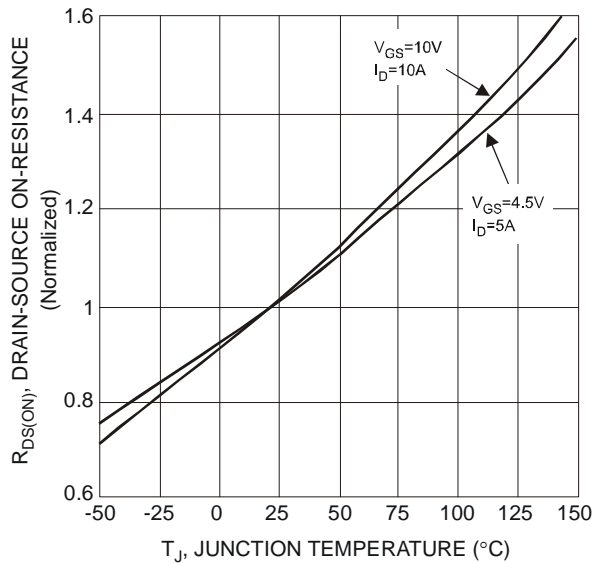


Fig. 5 On-Resistance Variation with Temperature

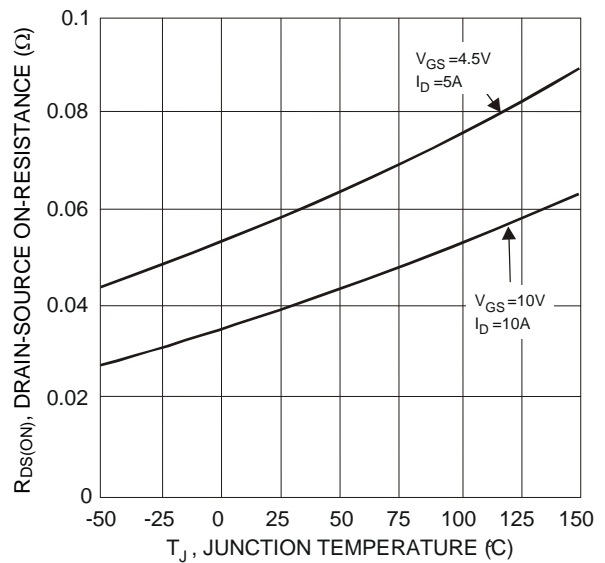


Fig. 6 On-Resistance Variation with Temperature

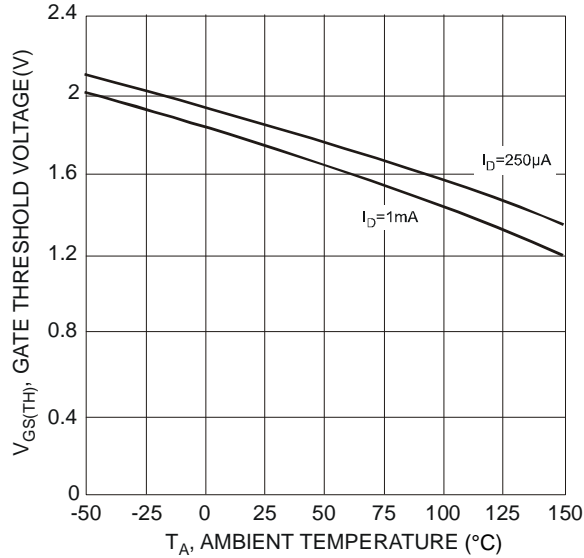


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

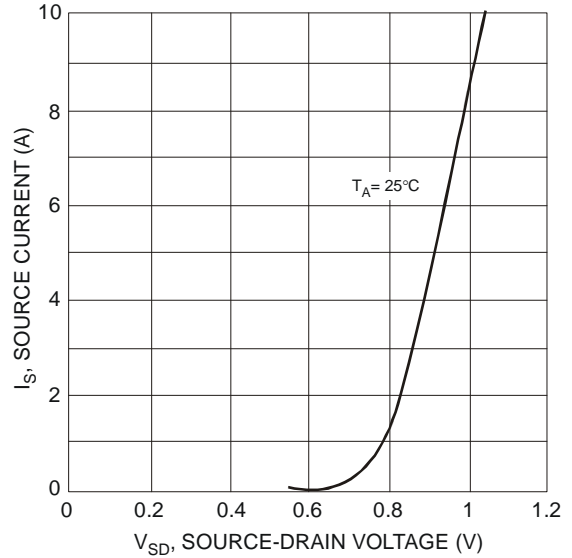


Fig. 8 Diode Forward Voltage vs. Current

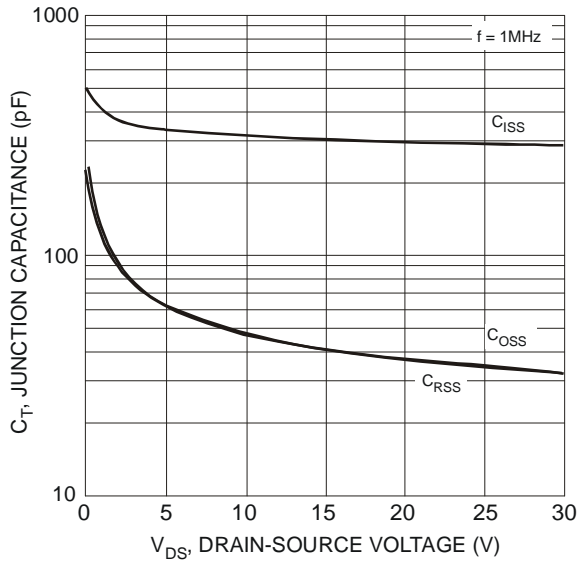


Fig. 9 Typical Junction Capacitance

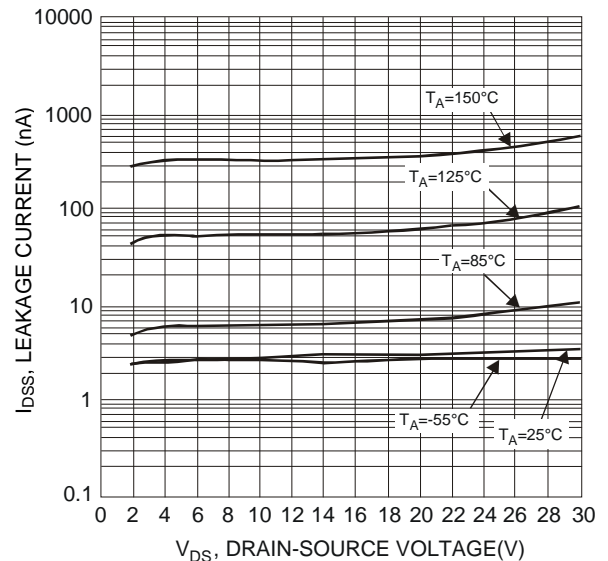


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

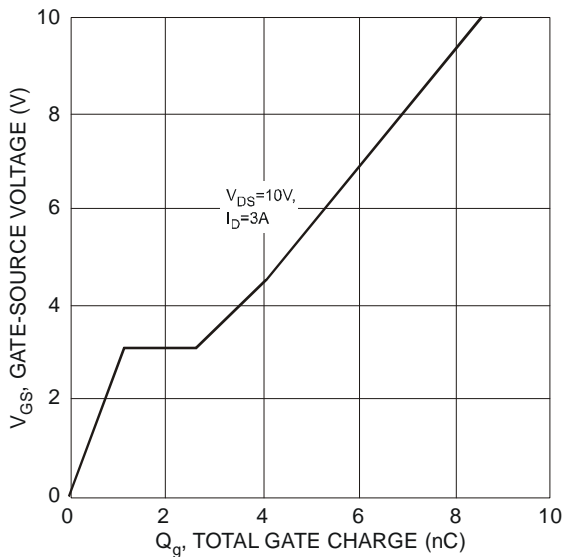
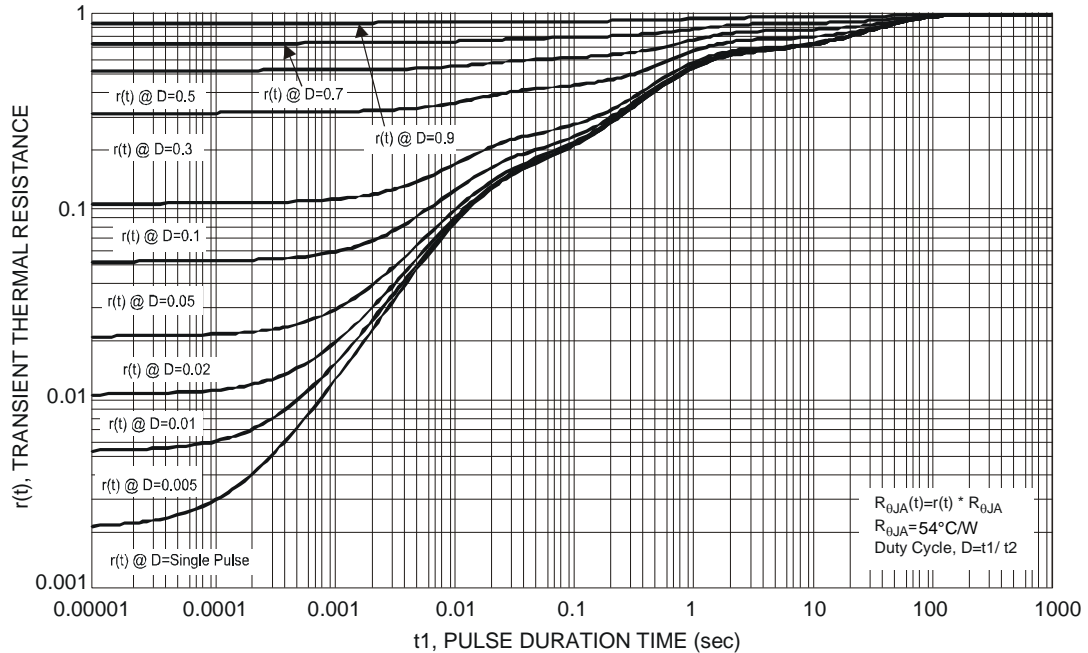


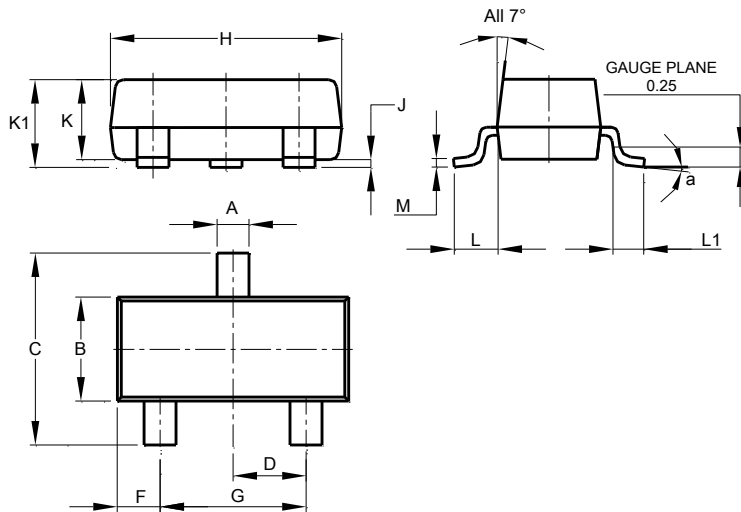
Fig. 11 Gate-Charge Characteristics



**Package Outline Dimensions**

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

**SOT23**

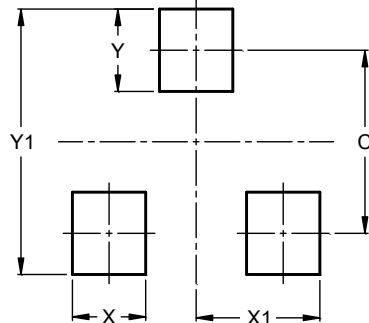


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

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

### SOT23



Dimensions	Value (in mm)
<b>C</b>	2.0
<b>X</b>	0.8
<b>X1</b>	1.35
<b>Y</b>	0.9
<b>Y1</b>	2.9

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