N-CHANNEL ENHANCEMENT MODE FIELD MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$	Package	I_D T_A = +25°C
600V	100Ω @ V_{GS} = 10V	SOT23	80mA

Description

This new generation uses advanced planar technology MOSFET, provides excellent high voltage and fast switching, making it ideal for small-signal and level shift applications.

Features

- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage
- **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 or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Applications

- Motor controls
- Backlighting
- DC-DC converters
- Power-management functions

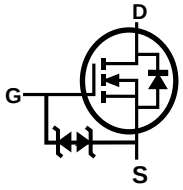
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

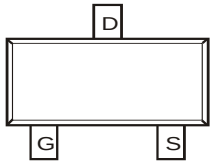

ESD PROTECTED

SOT23


Top View



Equivalent Circuit



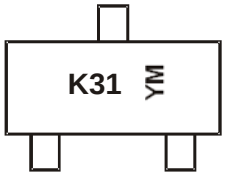
Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN60H080DS-7	SOT23	3000	Tape & Reel
DMN60H080DS-13	SOT23	10000	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



K31 = Product Type Marking Code
YM or $\overline{Y}$M = Date Code Marking
Y or $\overline{Y}$ = Year (ex: L = 2024)
M = Month (ex: 9 = September)

Date Code Key

Year	2017	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	E	-	L	M	N	P	R	S	T	U	V	W

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

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	600	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	70 56	mA
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	80 70	mA
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	40 32	mA
Continuous Drain Current (Note 6) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	50 40	mA
Pulsed Drain Current @ T_{SP} = +25°C (Note 7)			I_{DM}	0.2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @T_A = +25°C (Note 5)	P_D	0.70	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	174	°C/W
Power Dissipation, @T_A = +25°C (Note 6)	P_D	1.10	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 6)	$R_{\theta JA}$	99	°C/W
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}	600	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1	µA	V_{DS} = 600V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.5	—	3.0	V	V_{DS} = V_{GS}, I_D = 250µA
		1.5	—	2.6	V	V_{DS} = V_{GS}, I_D = 8µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	67	100	Ω	V_{GS} = 10V, I_D = 60mA
		—	95	290		V_{GS} = 4.5V, I_D = 60mA
Forward Transfer Admittance	$\|Y_{fs}\|$	—	76	—	ms	V_{DS} = 10V, I_D = 60mA
Diode Forward Voltage	V_{SD}	—	—	1.5	V	V_{GS} = 0V, I_S = 50mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	25	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	5.2	—		
Reverse Transfer Capacitance	C_{rss}	—	1.4	—		
Total Gate Charge	Q_g	—	1.7	—	nC	V_{GS} = 10V, V_{DD} = 300V I_D = 0.01A
Gate-Source Charge	Q_{gs}	—	0.3	—		
Gate-Drain Charge	Q_{gd}	—	0.9	—		
Turn-On Delay Time	$t_{D(ON)}$	—	7	—	ns	V_{DD} = 300V, V_{GS} = 10V R_{GEN} = 3.3Ω I_D = 60mA
Turn-On Rise Time	t_R	—	10	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	21	—	ns	
Turn-Off Fall Time	t_F	—	158	—	ns	
Reverse Recovery Time	t_{RR}	—	189.1	—	ns	V_R =300V, I_F =0.06A di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	32	—	nC	

Notes:
5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. copper, single sided.
7. Repetitive rating, pulse width limited by junction temperature, 10µs pulse, duty cycle = 1%.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

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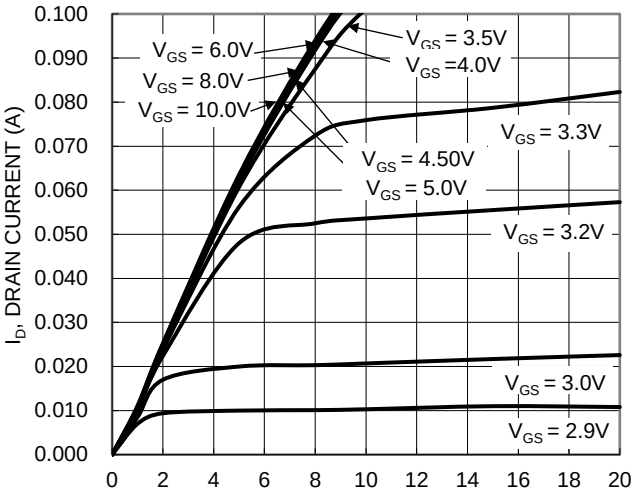


Figure 1. Typical Output Characteristic

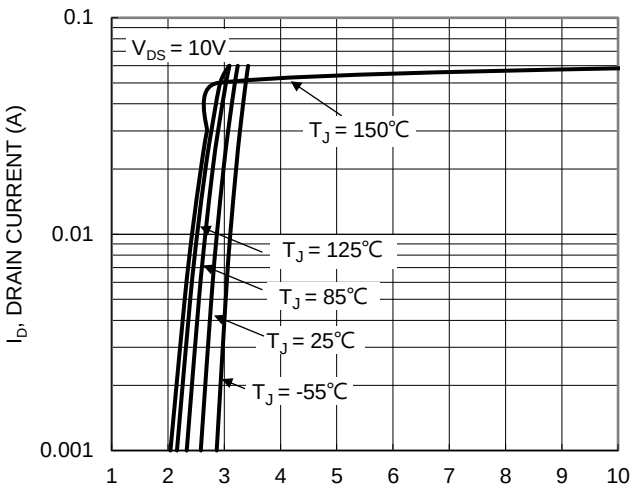


Figure 2. Typical Transfer Characteristic

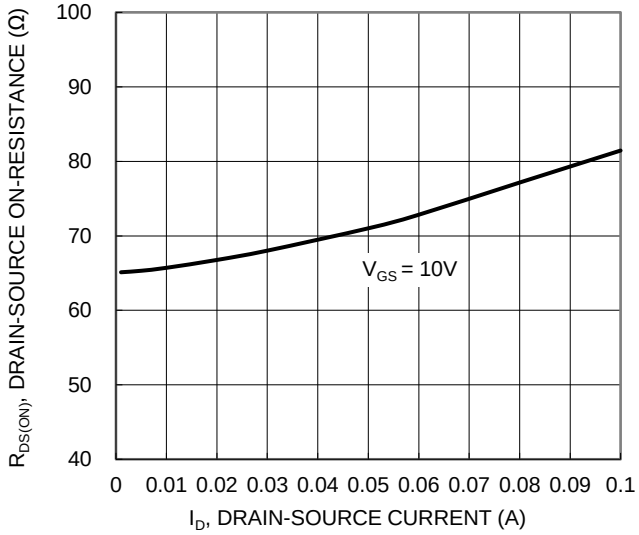


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

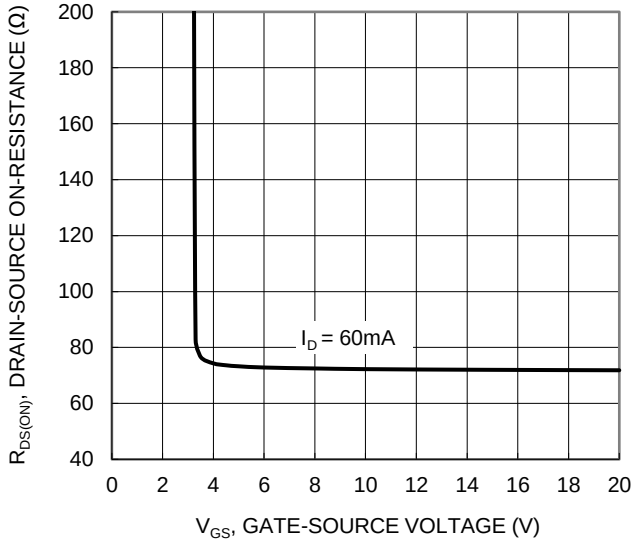


Figure 4. Typical Transfer Characteristic

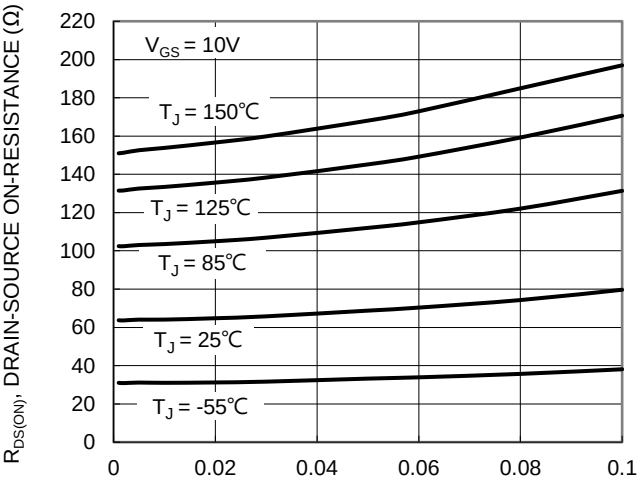


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

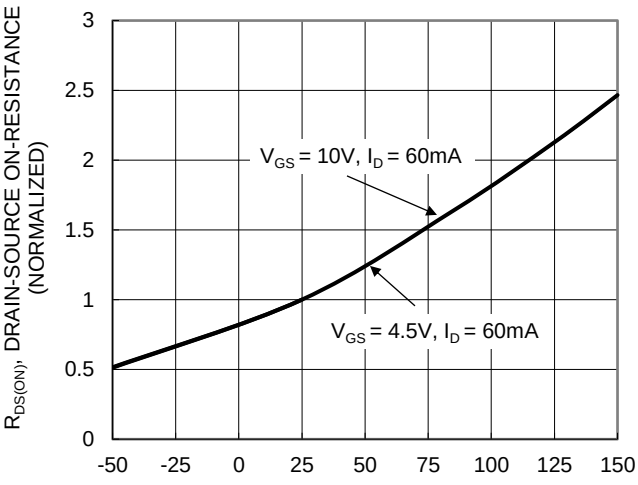


Figure 6. On-Resistance Variation with Temperature

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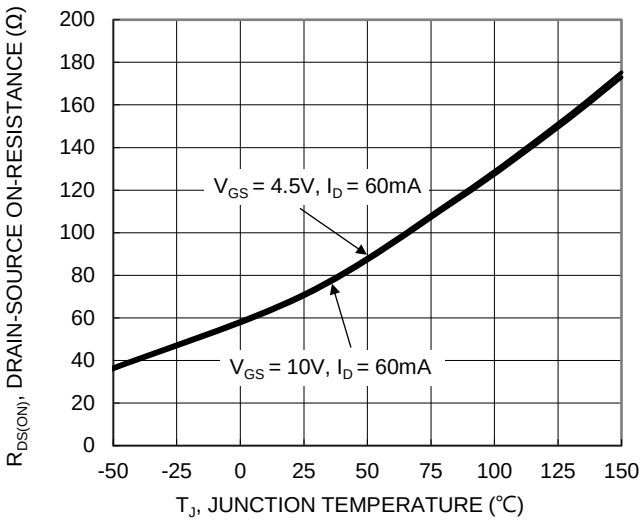


Figure 7. On-Resistance Variation with Temperature

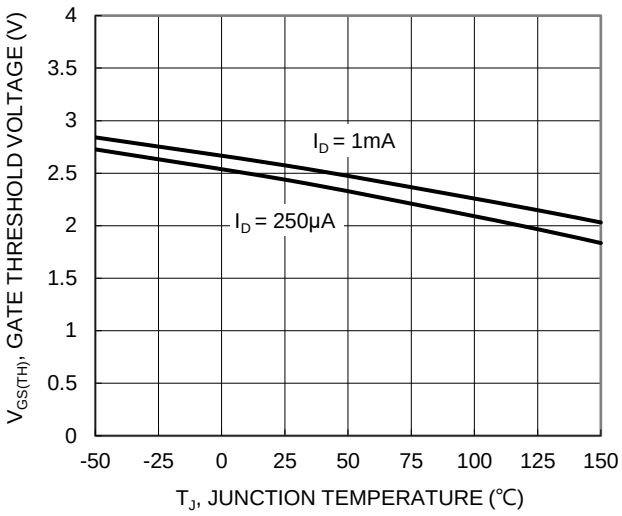


Figure 8. Gate Threshold Variation vs. Junction Temperature

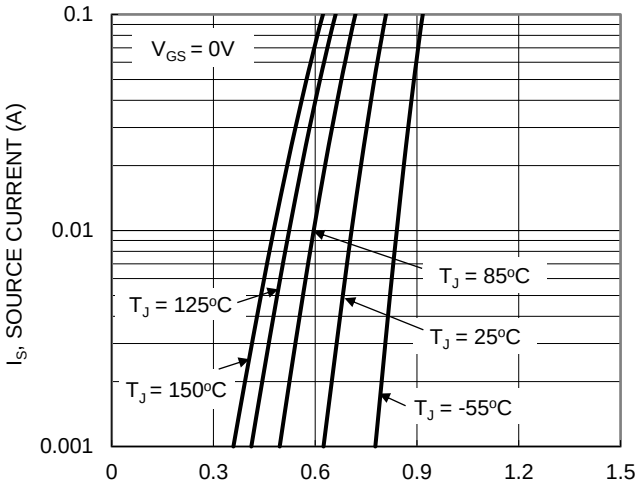


Figure 9. Diode Forward Voltage vs. Current

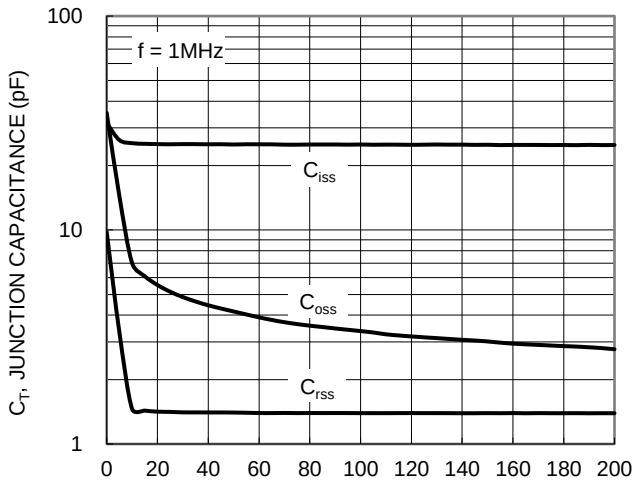


Figure 10. Typical Junction Capacitance

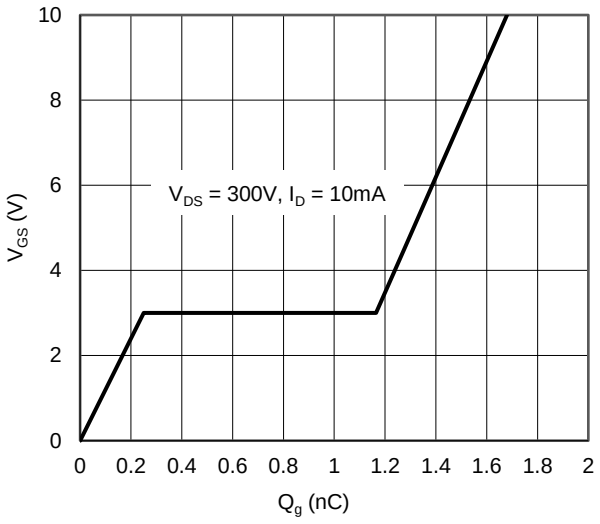


Figure 11. Gate Charge

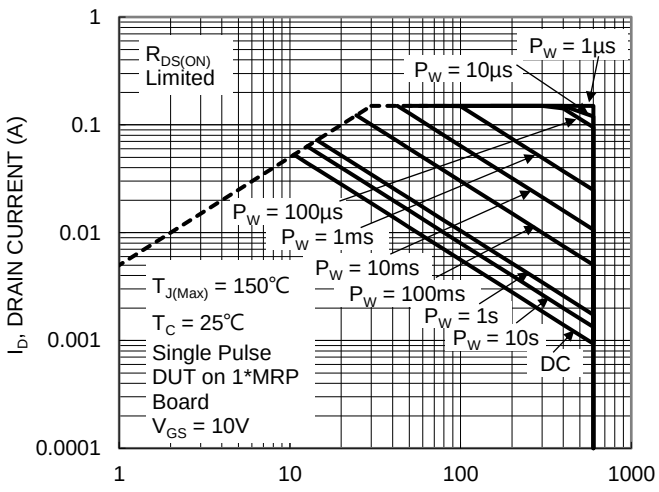


Figure 12. SOA, Safe Operation Area

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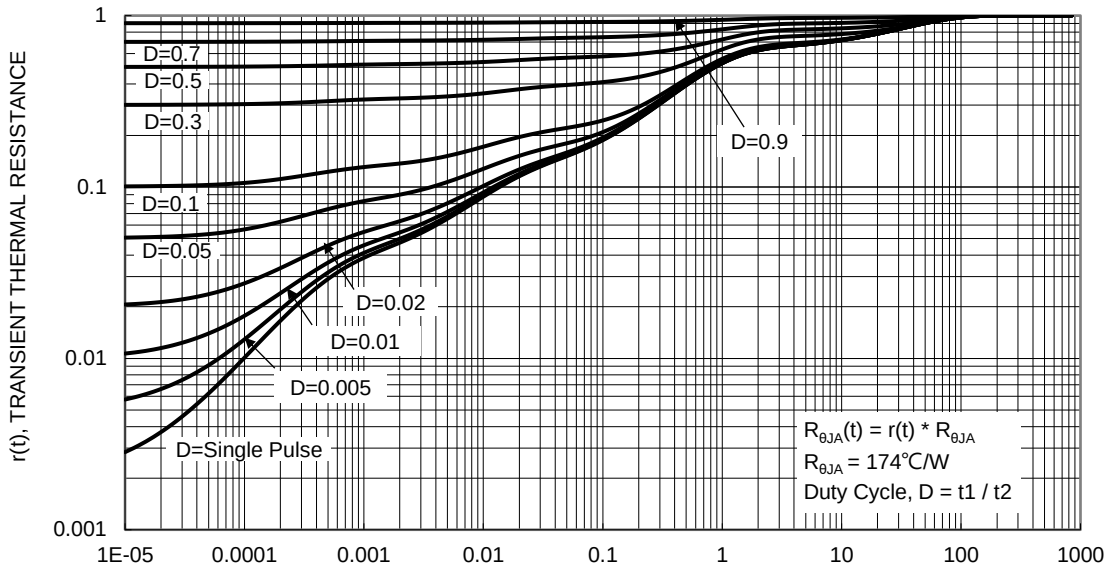


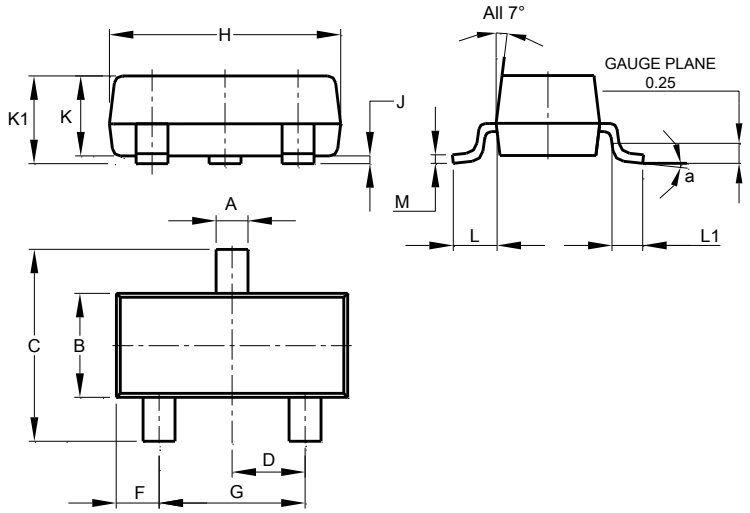
Figure 13. Transient Thermal Resistance

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Package Outline Dimensions

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

SOT23

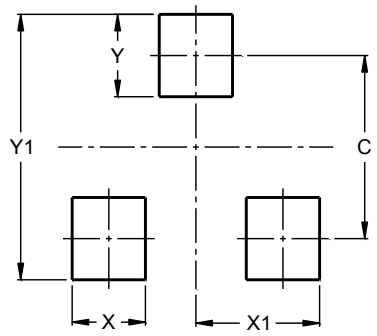


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



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

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