

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = +25^\circ C$
30V	52mΩ @ $V_{GS} = 10V$	4A
	65mΩ @ $V_{GS} = 4.5V$	3A
	85mΩ @ $V_{GS} = 2.5V$	2A

Features

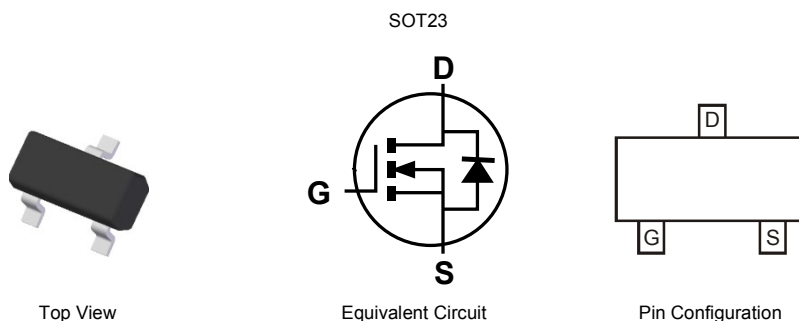
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at**
<https://www.diodes.com/products/automotive/automotive-products/>.
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>

Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays

Mechanical Data

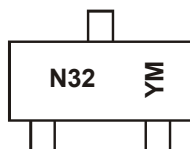
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208 
- Terminal Connections: See Diagram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


Ordering Information (Note 4)

Part Number	Case	Packaging
DMG3402L-7	SOT23	3000/Tape & Reel
DMG3402L-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



N32 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: I = 2021)
 M = Month (ex: 9 = September)

Date Code Key

Year	2012		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	Z		I	J	K	L	M	N	O	P	R	S

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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	±12	V
Drain Current (Note 5)	I _D	4.0	A
Body-Diode Continuous Current (Note 5)	I _S	1.5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.4	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	90	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Body Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	—	1.4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	52 65 85	m Ω	$V_{GS} = 10V, I_D = 4A$ $V_{GS} = 4.5V, I_D = 3A$ $V_{GS} = 2.5V, I_D = 2A$
Forward Transconductance	$ Y_{fs} $	—	6.6	—	S	$V_{DS} = 5V, I_D = 3.1A$
Source-Drain Diode Forward Voltage	V_{SD}	—	—	1.16	V	$V_{GS} = 0V, I_S = 2.0A$
DYNAMIC CHARACTERISTICS (Note 7)						
Gate Resistance	R_g	—	2.2	—	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$
Total Gate Charge (10V)	Q_g	—	11.7	—	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 4A$
Total Gate Charge (4.5V)	Q_g	—	5.5	—	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 4A$
Gate-Source Charge	Q_{gs}	—	1.1	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.8	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	1.9	—	ns	$V_{DD} = 15V, V_{GEN} = 10V, R_{GEN} = 3\Omega, R_L = 3.75\Omega$
Turn-On Rise Time	t_r	—	1.6	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	10.3	—	ns	
Turn-Off Fall Time	t_f	—	2.0	—	ns	
Input Capacitance	C_{iss}	—	464	—	pF	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz$
Output Capacitance	C_{oss}	—	49.5	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	43.8	—	pF	

Notes: 5. Device mounted on FR-4 PCB. $t \leq 5$ sec.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

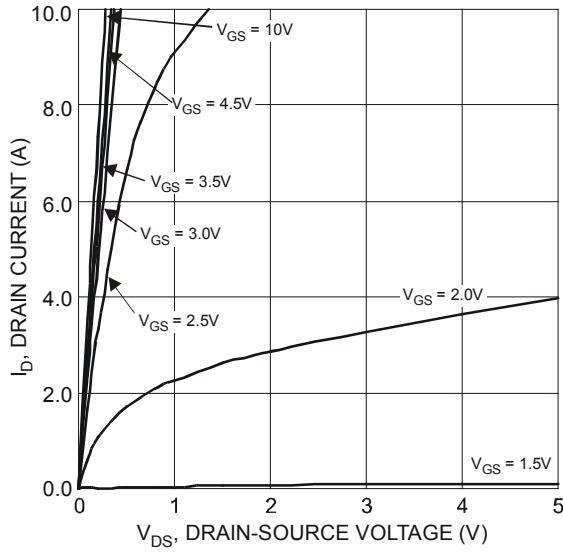


Figure 1 Typical Output Characteristics

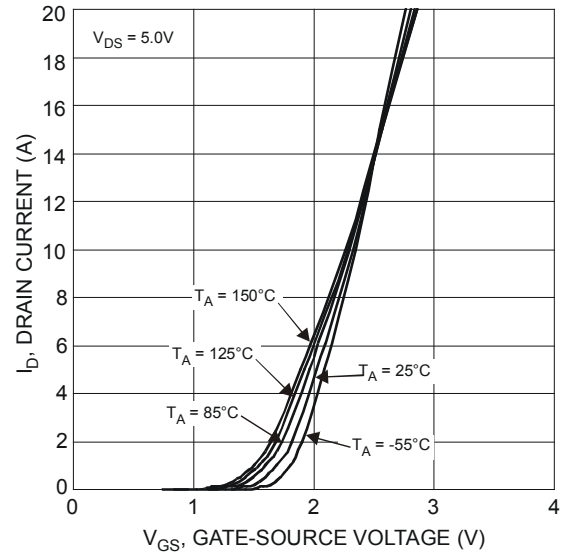


Figure 2 Typical Transfer Characteristics

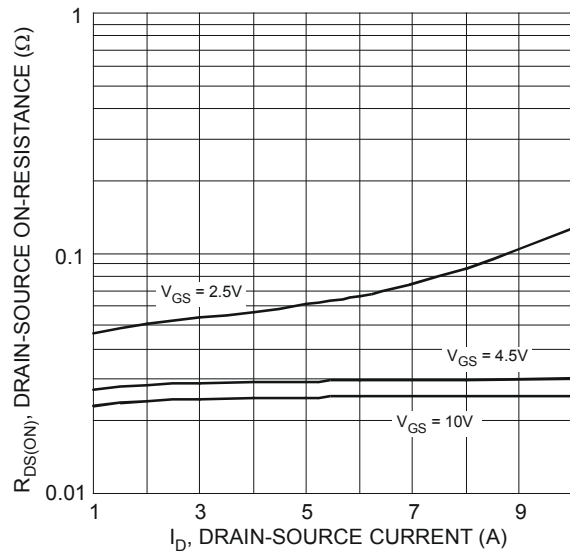


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

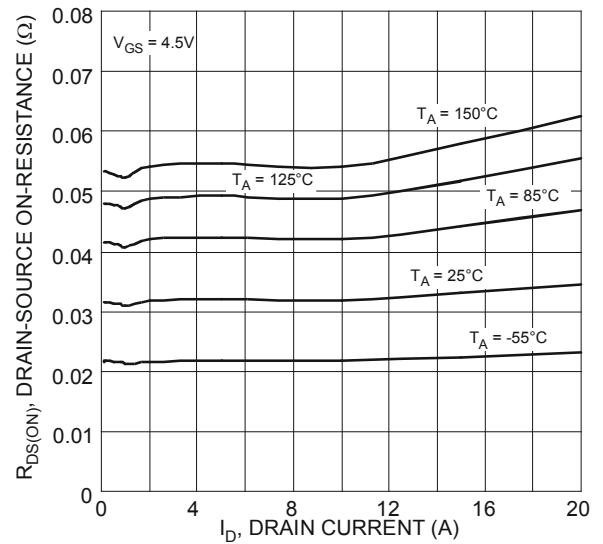


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

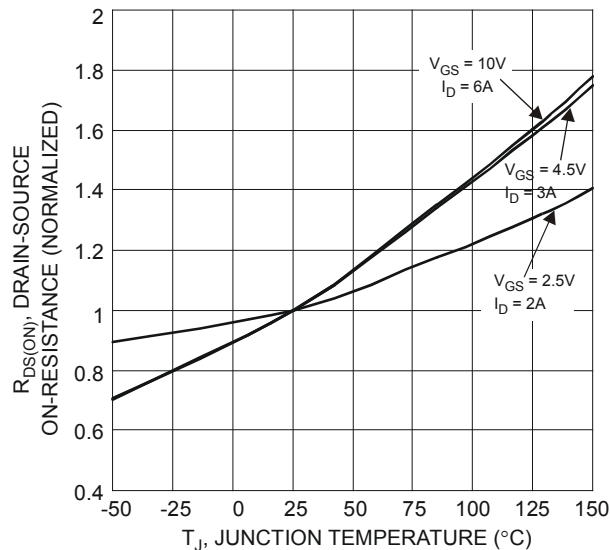


Figure 5 On-Resistance Variation with Temperature

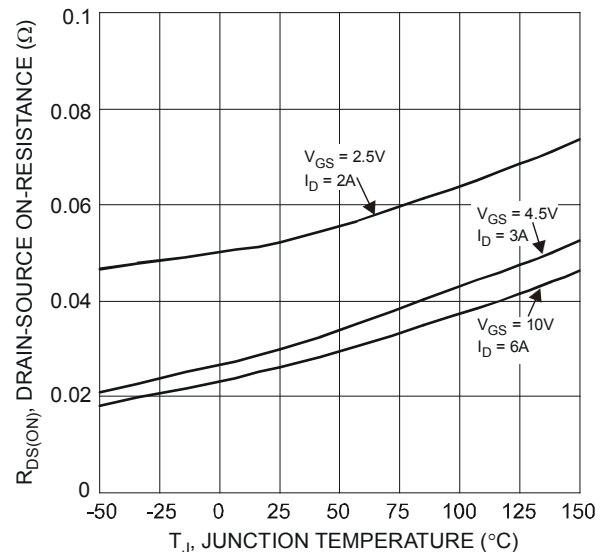


Figure 6 On-Resistance Variation with Temperature

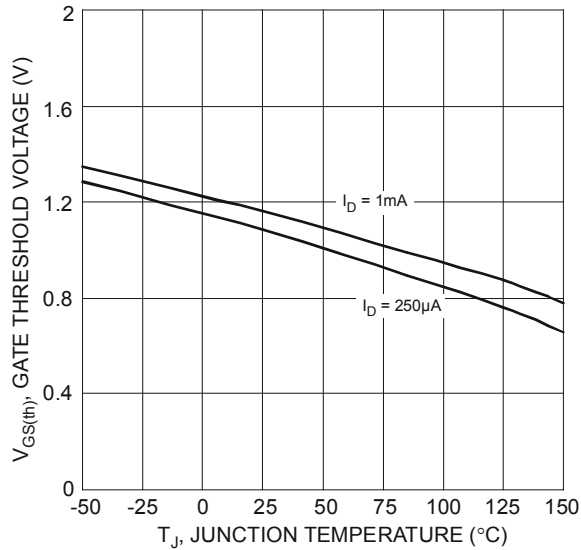


Figure 7 Gate Threshold Variation vs. Ambient Temperature

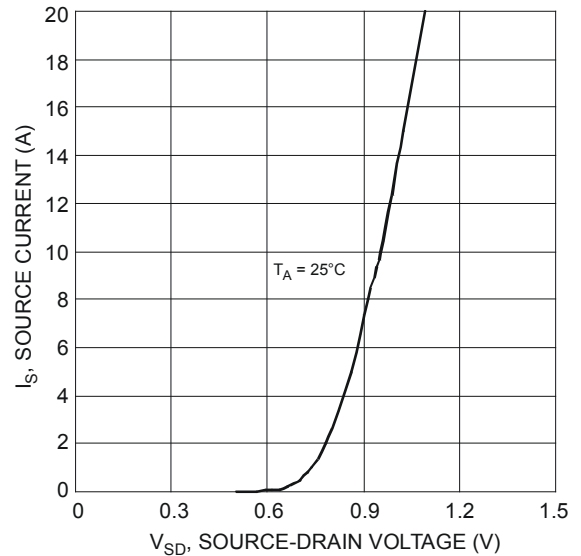


Figure 8 Diode Forward Voltage vs. Current

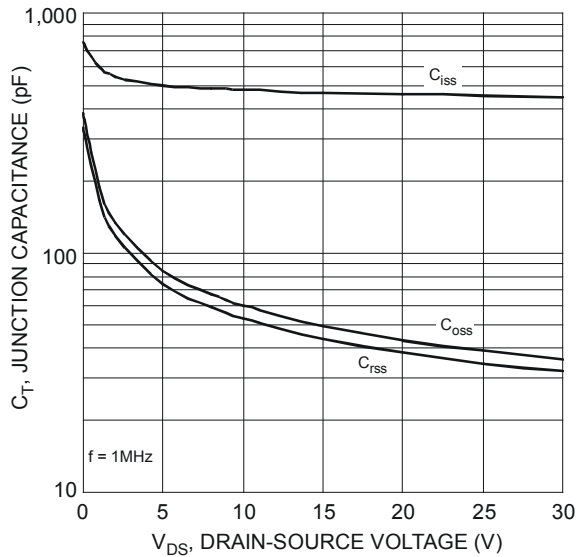


Figure 9 Typical Junction Capacitance

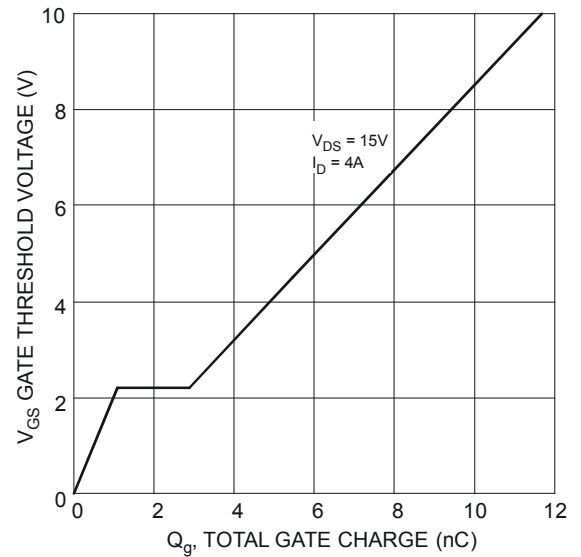


Figure 10 Gate Charge

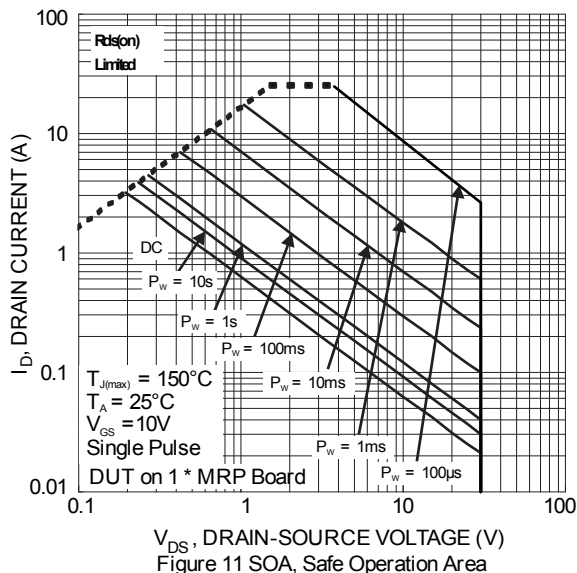


Figure 11 SOA, Safe Operation Area

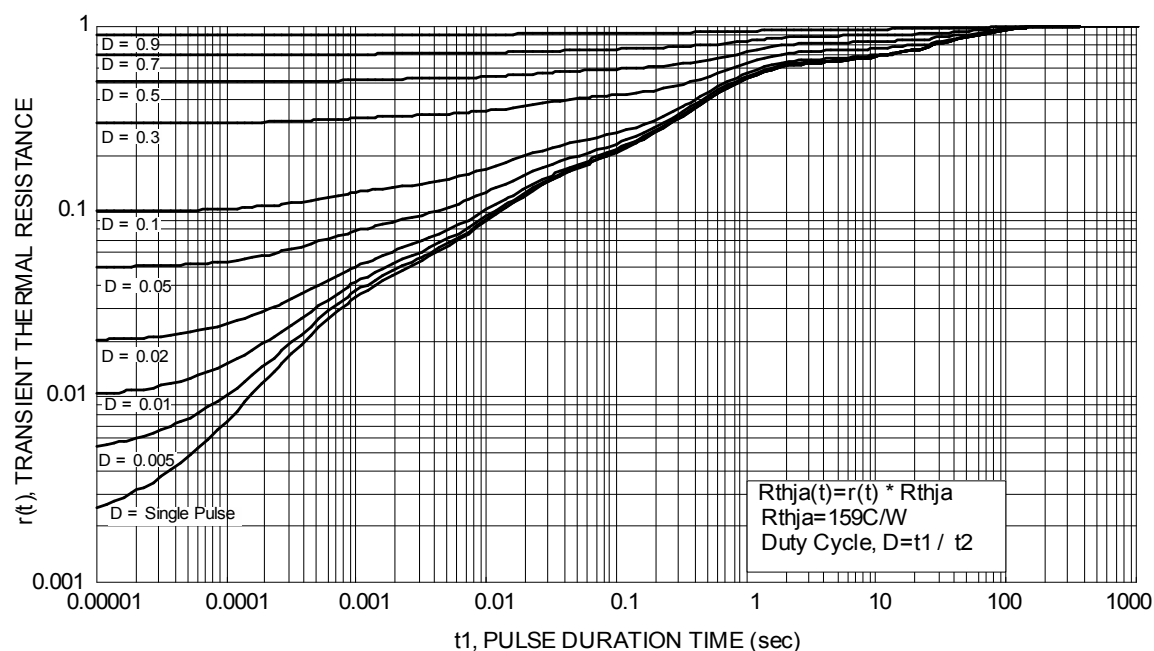
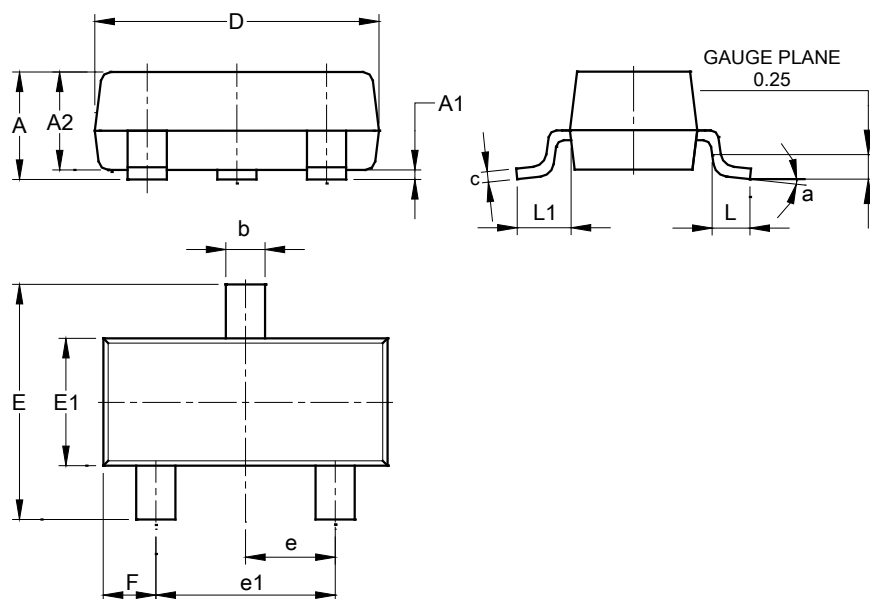


Figure 12 Transient Thermal Resistance

Package Outline Dimensions

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

SOT23 (Standard)

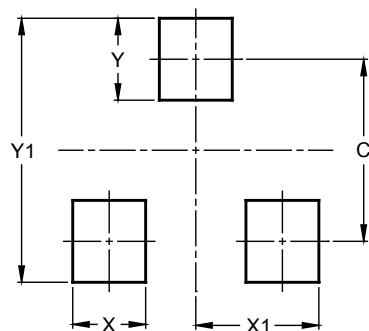


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23 (Standard)



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

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