

**N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**
**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
30V	52mΩ @ V <sub>GS</sub> = 10V	4A
	65mΩ @ V <sub>GS</sub> = 4.5V	3A
	85mΩ @ V <sub>GS</sub> = 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)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**  
<https://www.diodes.com/quality/product-definitions/>
- **An automotive-compliant part is available under separate datasheet (DMG3402LQ)**

**Mechanical Data**

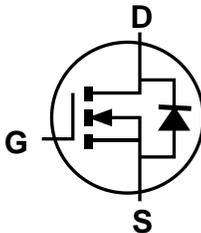
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208③
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

**Applications**

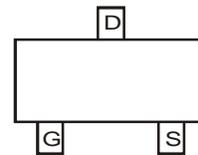
- DC-DC converters
- Power-management functions
- Battery operated systems and solid-state relays

**SOT23 (Standard)**


Top View



Equivalent Circuit

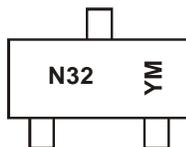


Pin Configuration

**Ordering Information** (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMG3402L-7	SOT23 (Standard)	3000	Tape & Reel
DMG3402L-13	SOT23 (Standard)	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: K = 2023)  
 M = Month (ex: 9 = September)

**Date Code Key**

Year	2013	...	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	A	...	K	L	M	N	P	R	S	T	U	V

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	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 @ $T_A = +25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	0.6	—	1.4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	52 65 85	m $\Omega$	$V_{GS} = 10V, I_D = 4A$ $V_{GS} = 4.5V, I_D = 3A$ $V_{GS} = 2.5V, I_D = 2A$
Forward Transconductance	$ Y_{fs} $	—	6.6	—	S	$V_{DS} = 5V, I_D = 3.1A$
Source-Drain Diode Forward Voltage	$V_{SD}$	—	—	1.16	V	$V_{GS} = 0V, I_S = 2.0A$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Gate Resistance	$R_g$	—	2.2	—	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V,$ $f = 1\text{MHz}$
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	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	49.5	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	43.8	—	pF	

- Notes:
- Device mounted on FR-4 PCB.  $t \leq 5\text{sec}$ , 2oz copper 1inch FR-4 board with minimum recommend pad layout.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

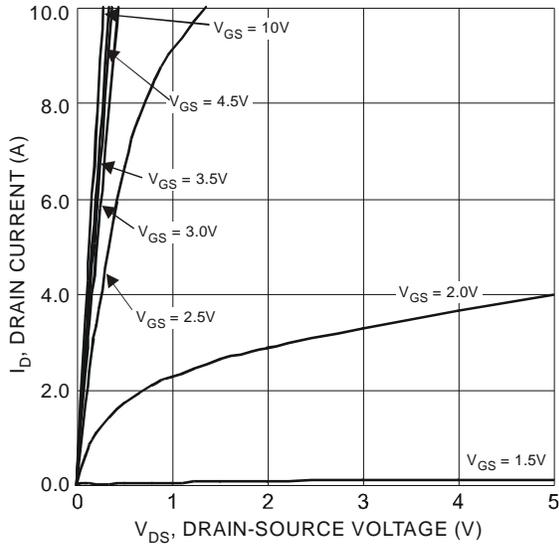


Figure 1 Typical Output Characteristics

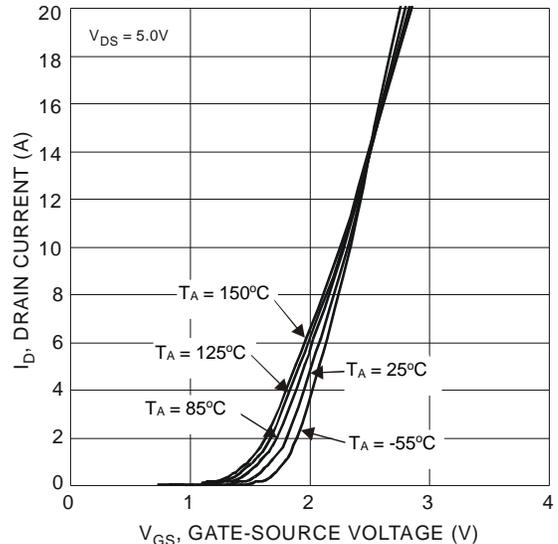


Figure 2 Typical Transfer Characteristics

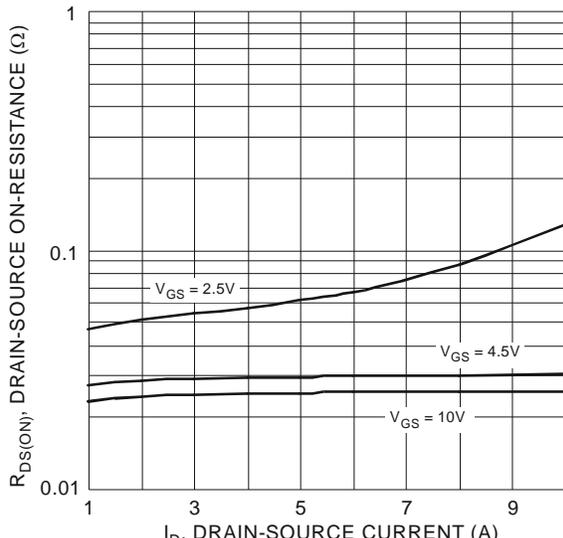


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

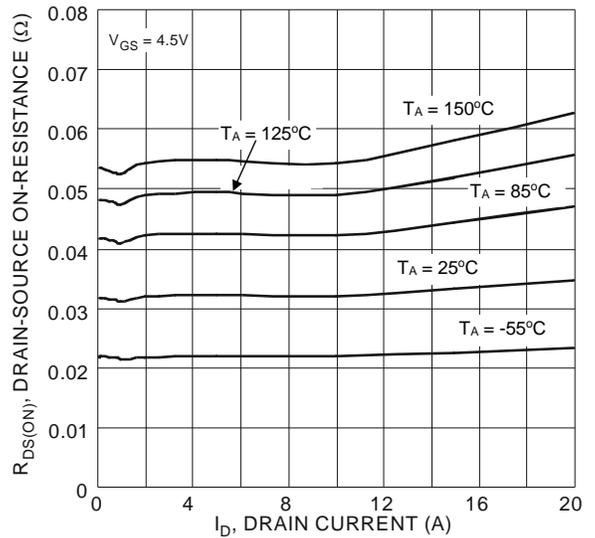


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

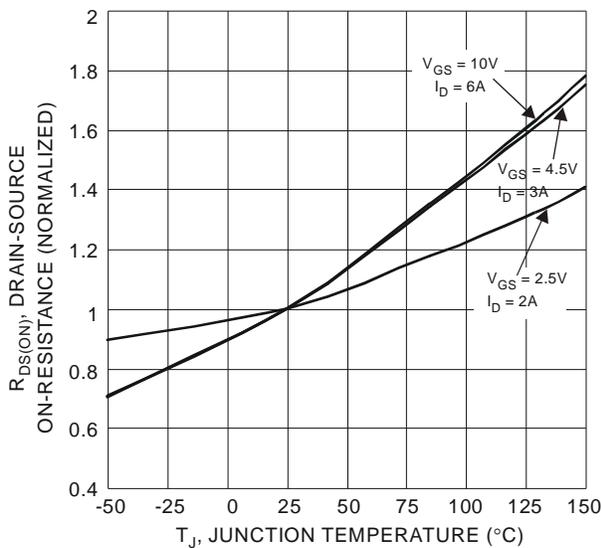


Figure 5 On-Resistance Variation with Temperature

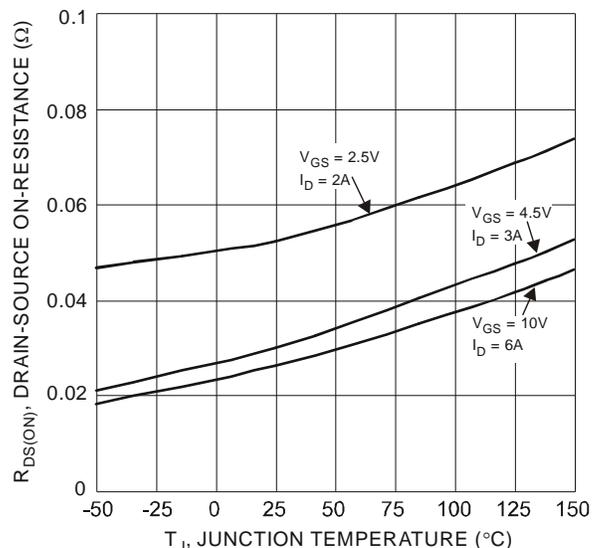


Figure 6 On-Resistance Variation with Temperature

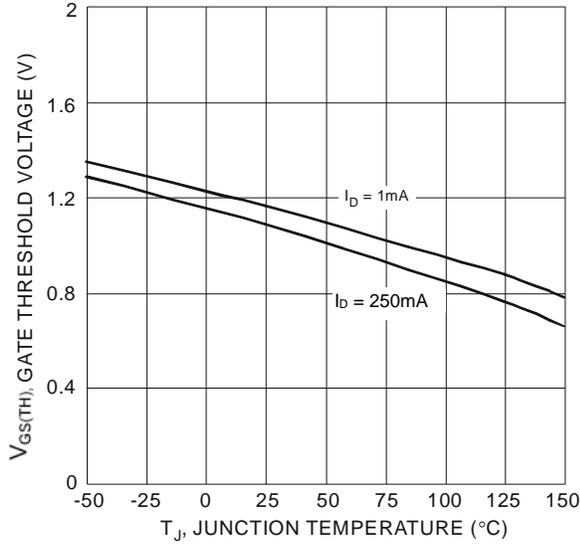


Figure 7 Gate Threshold Variation vs. Ambient Temperature

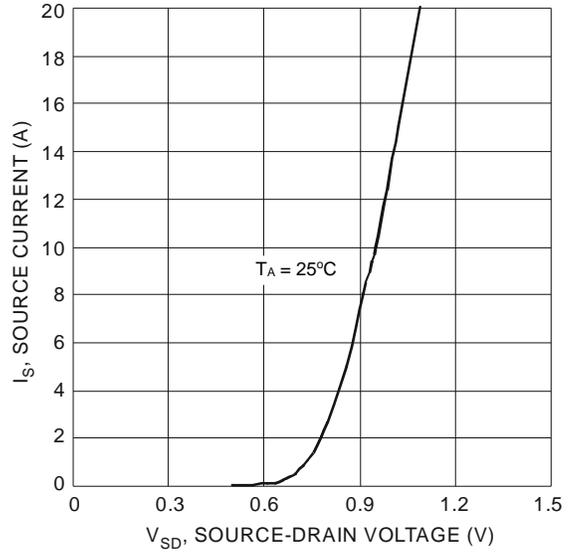


Figure 8 Diode Forward Voltage vs. Current

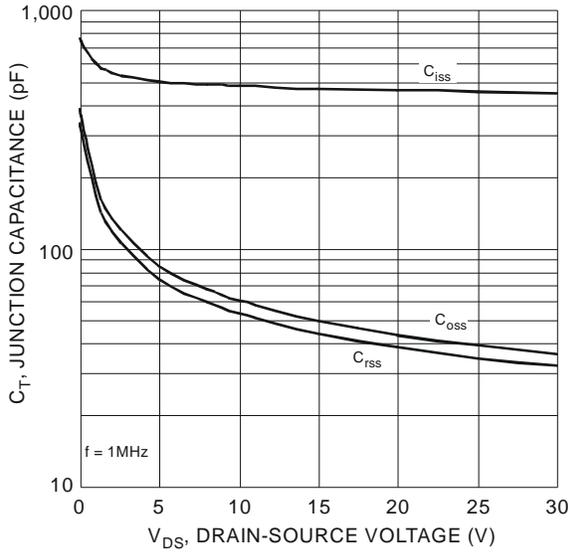


Figure 9 Typical Junction Capacitance

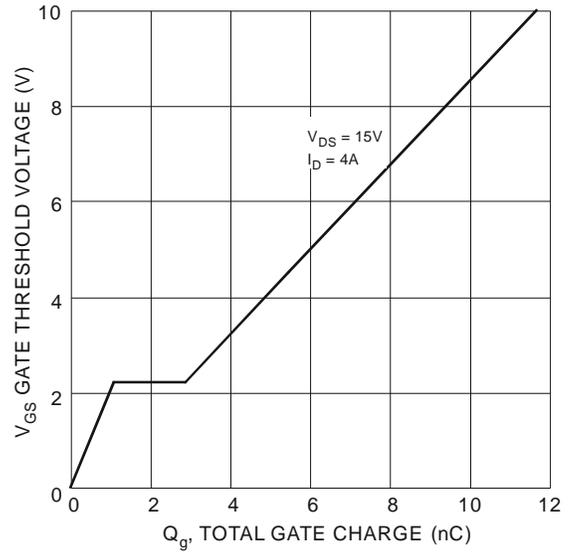


Figure 10 Gate Charge

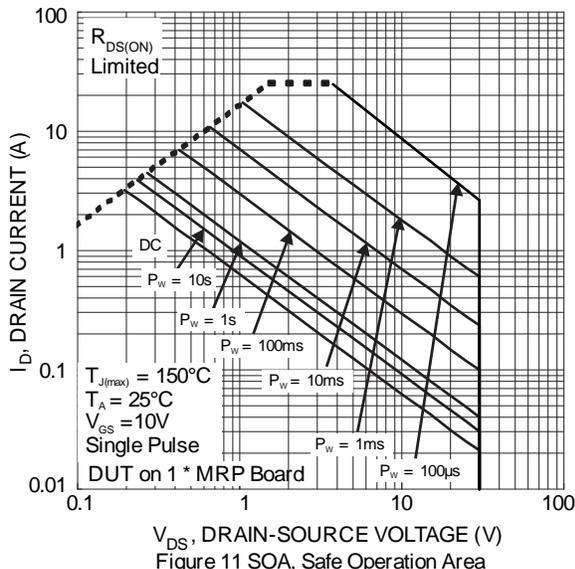


Figure 11 SOA, Safe Operation Area

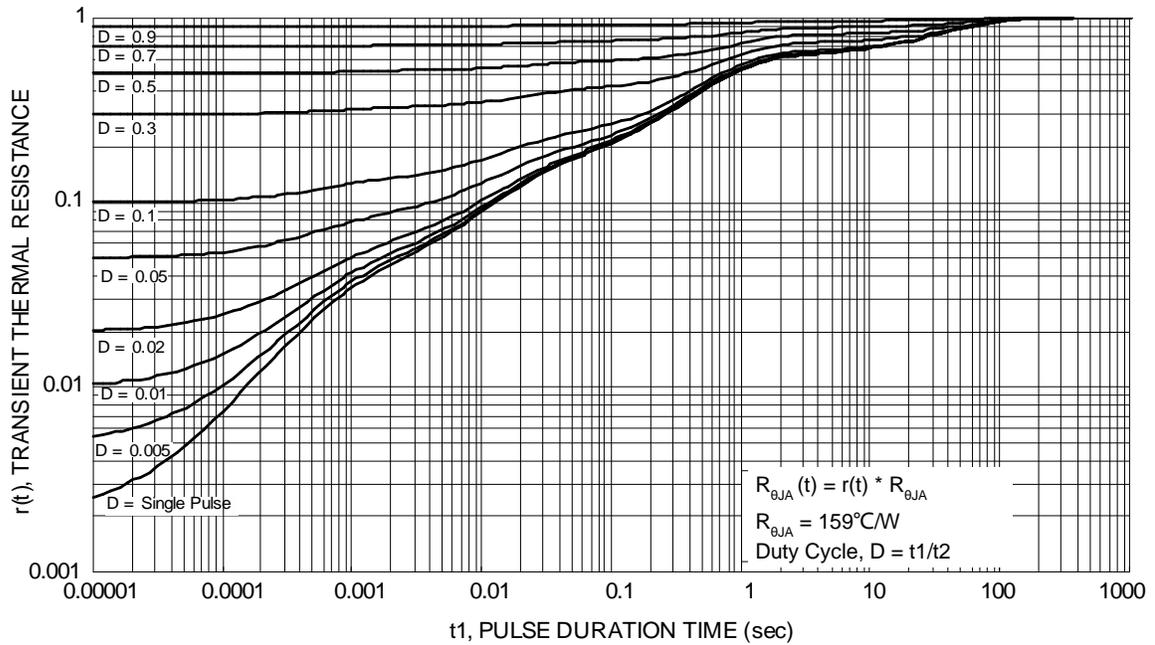
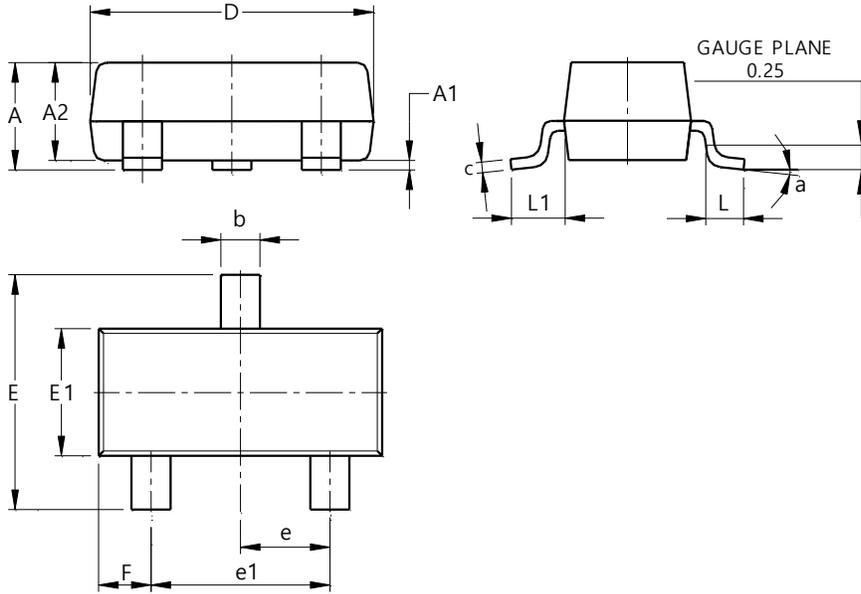


Figure 12 Transient Thermal Resistance

## Package Outline Dimensions

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

### SOT23 (Standard)

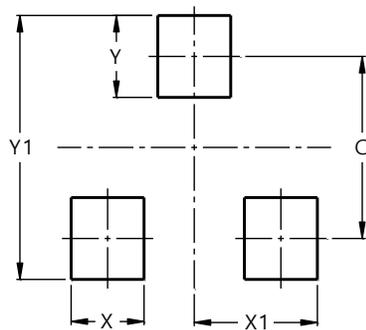


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

## 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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