

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
-30V	90mΩ @ V _{GS} = -10V	-3.8A
	134mΩ @ V _{GS} = -4.5V	-3.1A

Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- General purpose interfacing switches
- Power management functions
- Load switch for portable devices

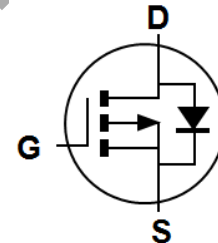
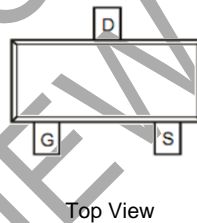
Features and Benefits

- 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)**
- **The DMG2307LQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

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
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.08 grams (Approximate)



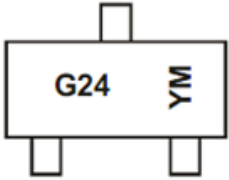
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMG2307LQ-7	SOT23	3,000	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



G24 = Product Type Marking Code
 YM = Date Code Marking
 Y or Ȳ = Year (ex: J = 2022)
 M = Month (ex: 9 = September)

Date Code Key

Year	2018	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	F	J	K	L	M	N	O	P	R	S	T
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}	±20	V
Continuous Drain Current (Note 5) V _{GS} = -10V	Steady State	T _A = +25°C T _A = +70°C	I _D	-2.5 -2.0	A
Continuous Drain Current (Note 6) V _{GS} = -10V	Steady State	T _A = +25°C T _A = +70°C	I _D	-3.8 -3.0	A
Continuous Drain Current (Note 6) V _{GS} = -10V	t ≤ 10sec	T _A = +25°C T _A = +70°C	I _D	-4.6 -3.6	A
Continuous Drain Current (Note 6) V _{GS} = -4.5V	Steady State	T _A = +25°C T _A = +70°C	I _D	-3.1 -2.5	A
Pulsed Drain Current (Note 6)			I _{DM}	-20	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.76	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	159	°C/W
Total Power Dissipation (Note 6)	P _D	1.36	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	94	°C/W
Total Power Dissipation (Note 6) t ≤ 10sec	P _D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6) t ≤ 10sec	R _{θJA}	65.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1 inch square copper plate.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-3.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	70	90	mΩ	V _{GS} = -10V, I _D = -2.5A
		—	105	134		V _{GS} = -4.5V, I _D = -2.5A
Forward Transfer Admittance	Y _{fs}	—	4.8	—	S	V _{DS} = -10V, I _D = -2.5A
Diode Forward Voltage	V _{SD}	—	-0.75	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	371.3	—	pF	V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	51.3	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	45.9	—	pF	
Gate Resistance	R _g	—	17	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	4.0	—	nC	V _{DS} = -15V, I _D = -3A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	8.2	—	nC	
Gate-Source Charge	Q _{gs}	—	0.9	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.2	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.8	—	ns	
Turn-On Rise Time	t _R	—	7.3	—	ns	V _{DS} = -15V, V _{GS} = -10V R _L = 15Ω, R _G = 6Ω I _D = -1A
Turn-Off Delay Time	t _{D(OFF)}	—	22.4	—	ns	
Turn-Off Fall Time	t _F	—	13.4	—	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

NOT RECOMMENDED FOR NEW DESIGN

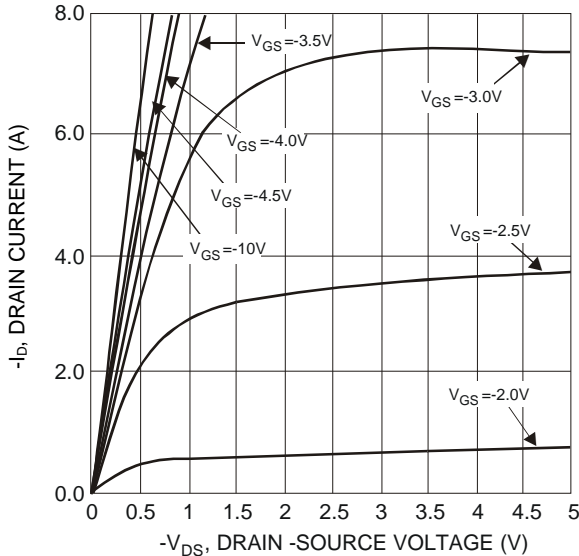


Fig. 1 Typical Output Characteristics

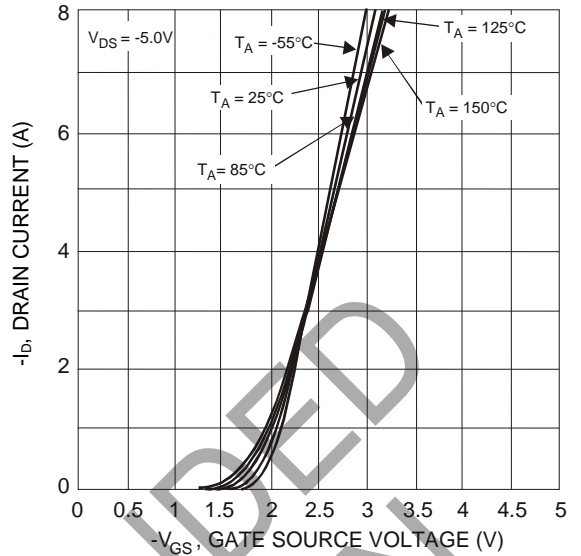


Fig. 2 Typical Transfer Characteristics

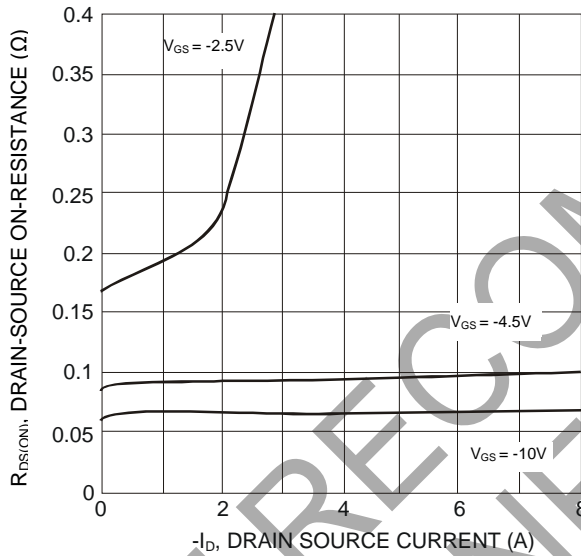


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

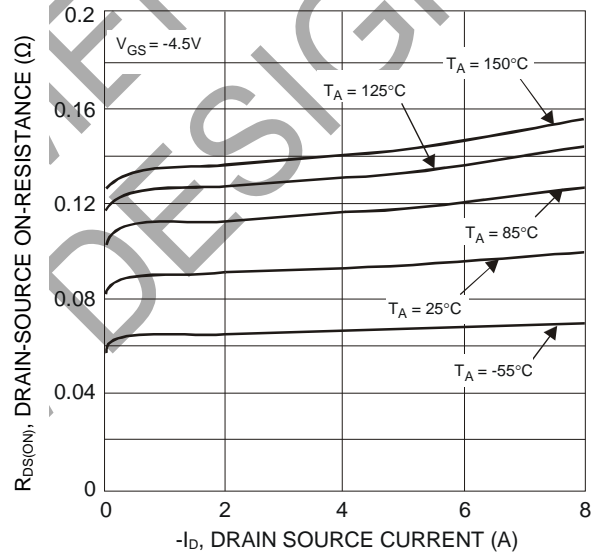


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

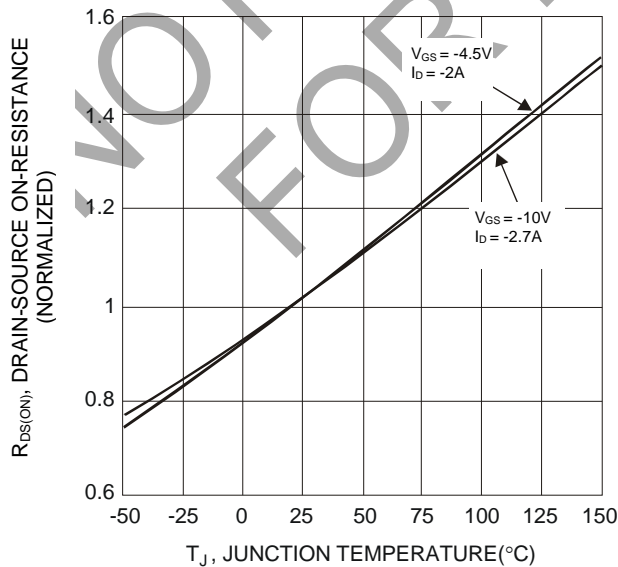


Fig. 5 On-Resistance Variation with Temperature

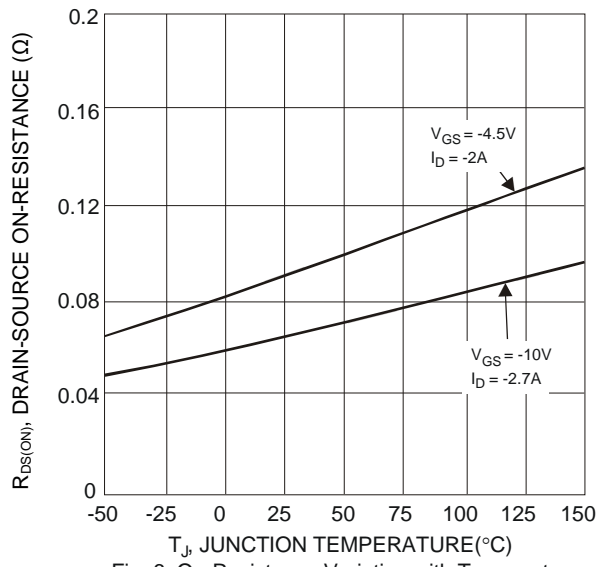


Fig. 6 On-Resistance Variation with Temperature

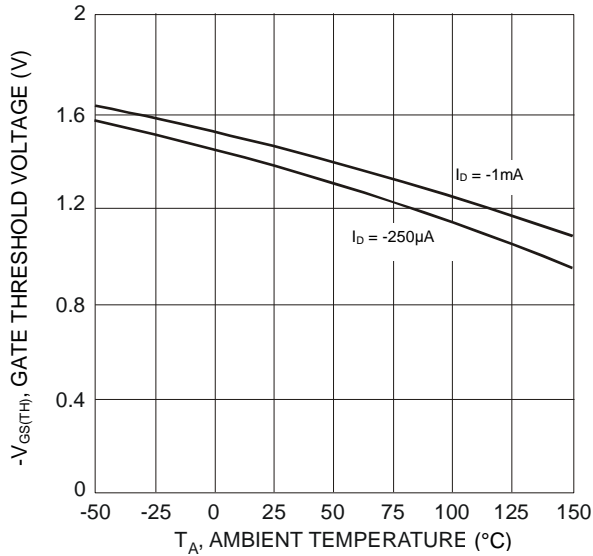


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

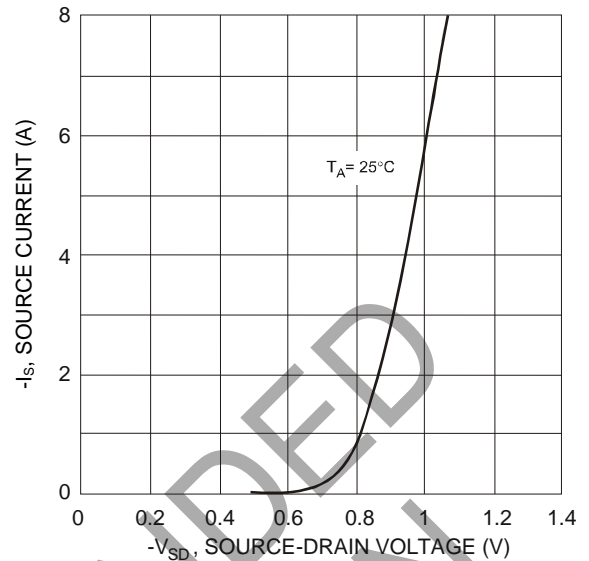


Fig. 8 Diode Forward Voltage vs. Current

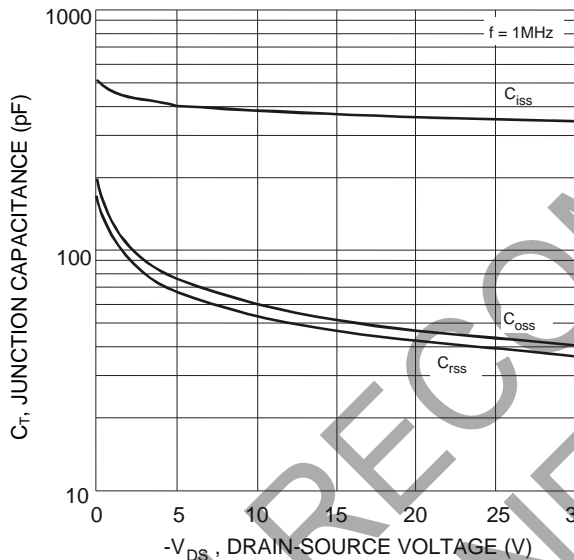


Fig. 9 Typical Junction Capacitance

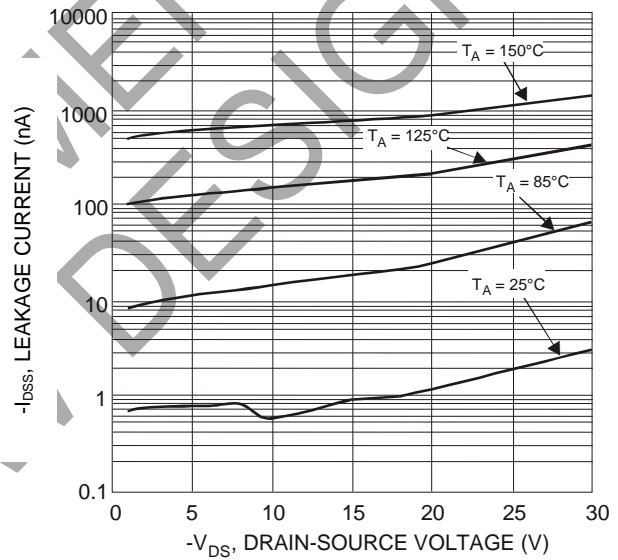


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

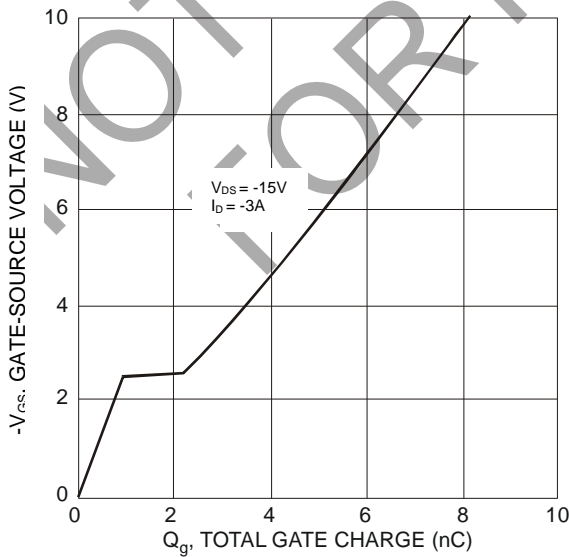


Fig. 11 Gate-Charge Characteristics

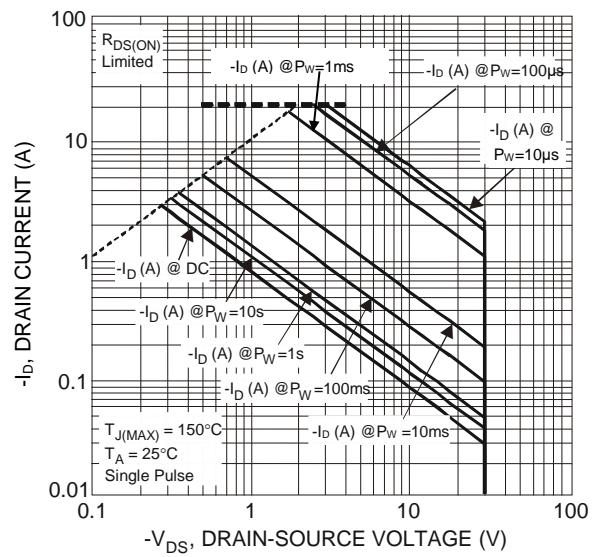
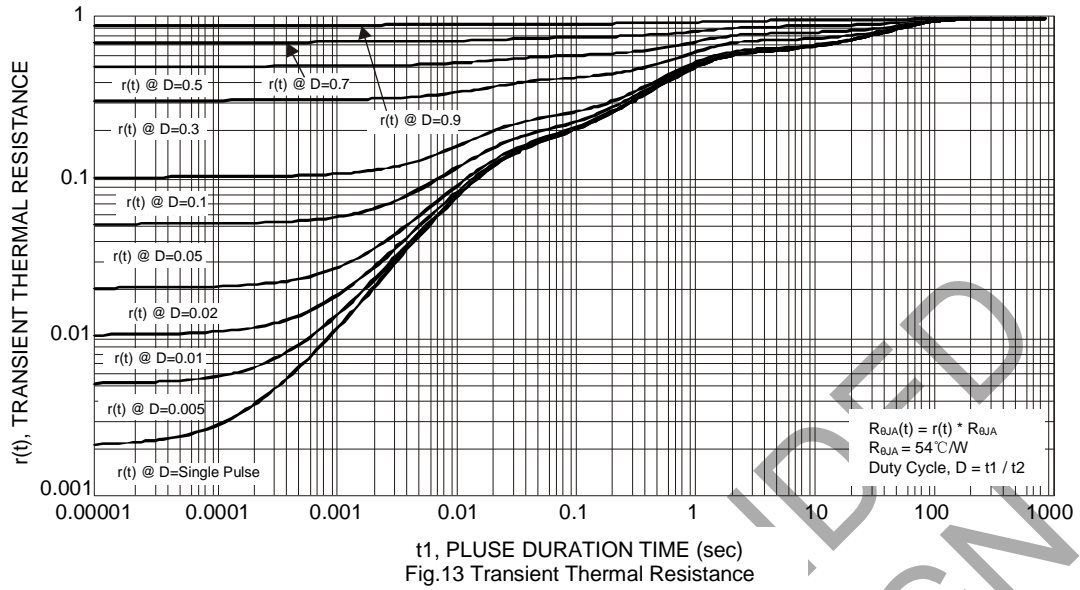


Fig. 12 SOA, Safe Operation Area

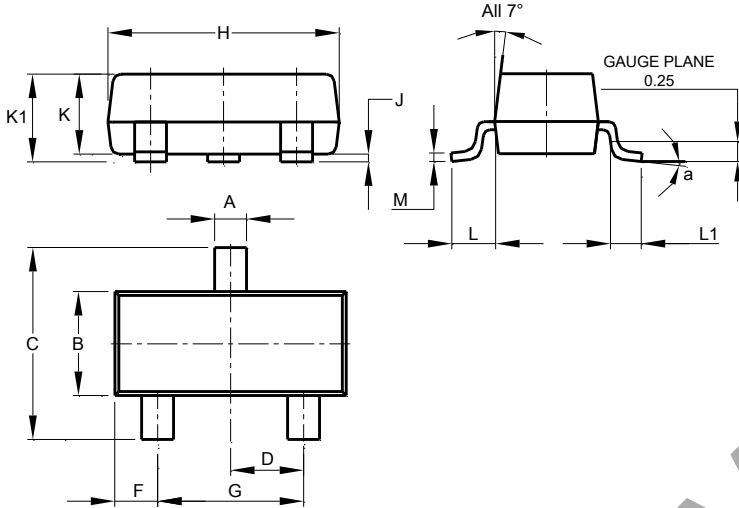


NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

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

SOT23

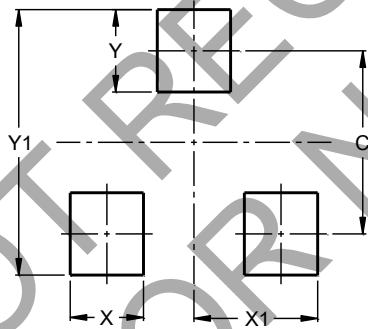


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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