

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = +25^\circ\text{C}$
-30V	90m $\Omega$ @ $V_{GS} = -10\text{V}$	-3.8A
	134m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-3.1A

## Description and Applications

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

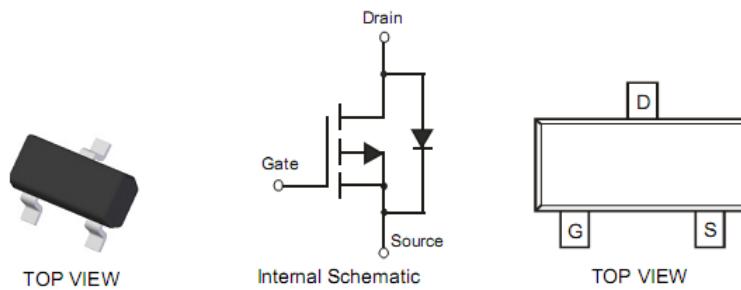
- General Purpose Interfacing Switch
- Power Management Functions
- Load Switch for Portable Devices

## 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)**
- Qualified to AEC-Q101 standards for High Reliability**

## Mechanical Data

- Case: SOT-23
- 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
- Weight: 0.08 grams (approximate)



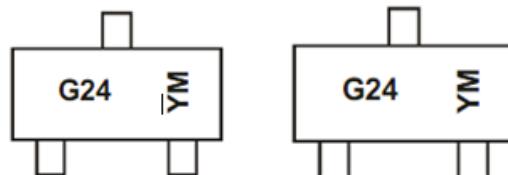
## Ordering Information (Notes 4 & 5)

Part Number	Compliance	Case	Packaging
DMG2307L-7	Standard	SOT-23	3000Tape & Reel
DMG2307LQ-7	Automotive	SOT-23	3000Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



G24 = Product Type Marking Code  
YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)  
Y or YM = Year (ex: A = 2013)  
M = Month (ex: 9 = September)

Chengdu A/T Site

Shanghai A/T Site

Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Code	W	X	Y	Z	A	B	C	D	E	F
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Code	1	2	3	4	5	6	7	8	9	O
Month	Nov	Dec								
Code										

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-2.5 -2.0	A
Continuous Drain Current (Note 7) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-3.8 -3.0	A
Continuous Drain Current (Note 7) $V_{GS} = -10\text{V}$	$t \leq 10\text{sec}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-4.6 -3.6	A
Continuous Drain Current (Note 7) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-3.1 -2.5	A
Pulsed Drain Current (Note 7)			$I_{DM}$	-20	A

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	$P_D$	0.76	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	159	°C/W
Total Power Dissipation (Note 7)	$P_D$	1.36	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	94	°C/W
Total Power Dissipation (Note 7) $t \leq 10\text{sec}$	$P_D$	1.9	W
Thermal Resistance, Junction to Ambient (Note 7) $t \leq 10\text{sec}$	$R_{\theta JA}$	65.8	°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.)

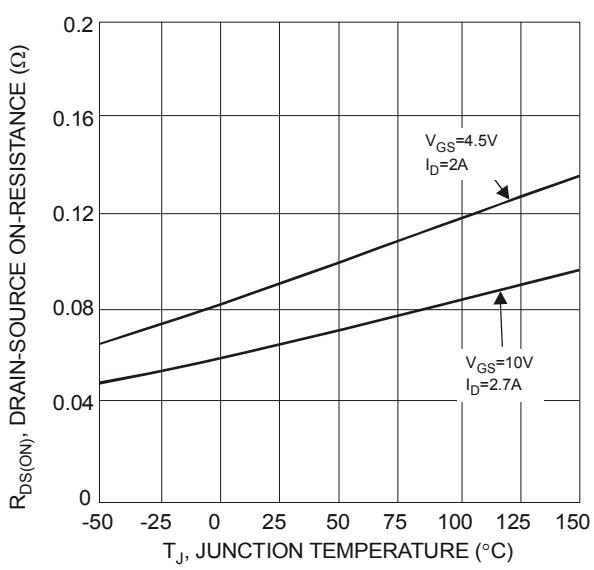
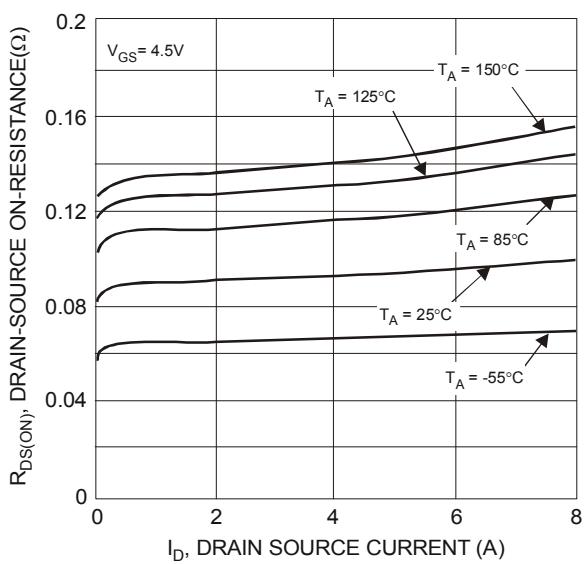
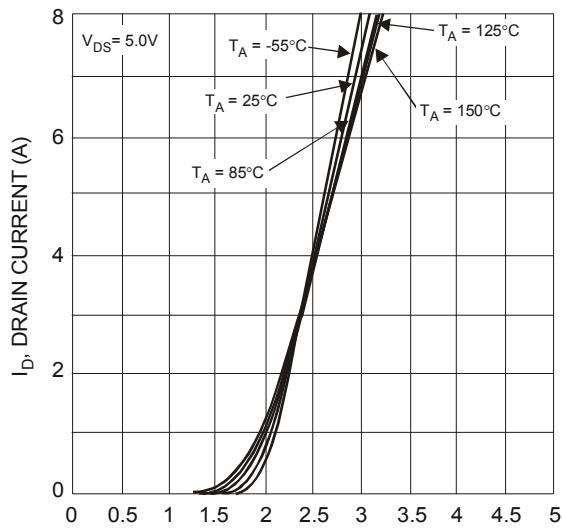
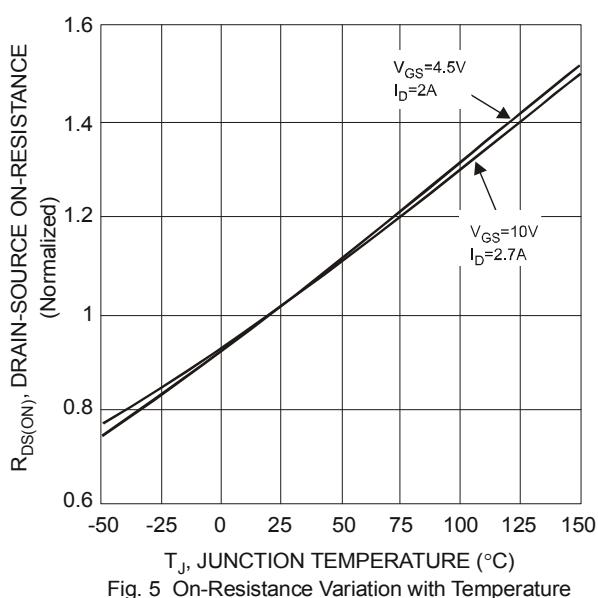
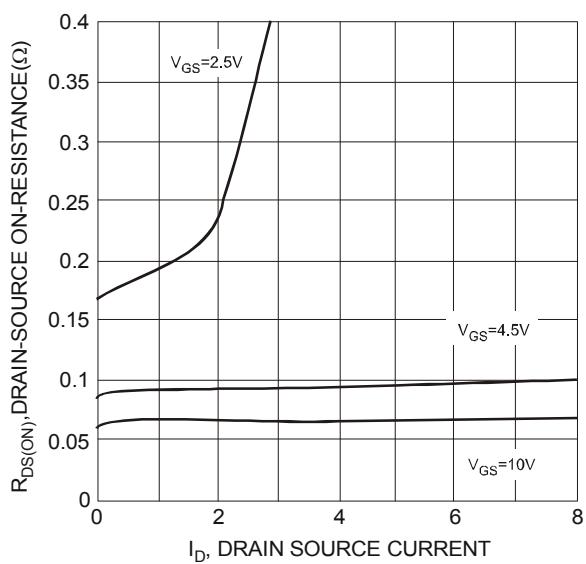
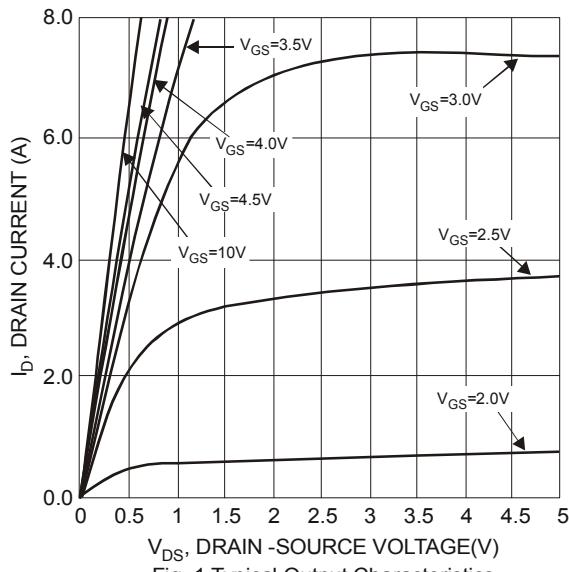
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current @ $T_C = +25^\circ\text{C}$	$I_{DSS}$	—	—	-1.0	$\mu\text{A}$	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	$V_{GS(\text{th})}$	-1.0	—	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	70	90	$\text{m}\Omega$	$V_{GS} = -10\text{V}, I_D = -2.5\text{A}$
		—	105	134		$V_{GS} = -4.5\text{V}, I_D = -2.5\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	4.8	—	S	$V_{DS} = -10\text{V}, I_D = -2.5\text{A}$
Diode Forward Voltage (Note 7)	$V_{SD}$	—	-0.75	-1.0	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	$C_{iss}$	—	371.3	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	51.3	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	45.9	—	pF	
Gate Resistance	$R_g$	—	17	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = -4.5\text{V}$ )	$Q_g$	—	4.0	—	nC	$V_{GS} = -10\text{V}, V_{DS} = -15\text{V}, I_D = -3\text{A}$
Total Gate Charge ( $V_{GS} = -10\text{V}$ )	$Q_g$	—	8.2	—	nC	
Gate-Source Charge	$Q_{gs}$	—	0.9	—	nC	
Gate-Drain Charge	$Q_{qd}$	—	1.2	—	nC	
Turn-On Delay Time	$t_{D(\text{on})}$	—	4.8	—	ns	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, R_L = 15\Omega, R_G = 6\Omega, I_D = -1\text{A}$
Turn-On Rise Time	$t_r$	—	7.3	—	ns	
Turn-Off Delay Time	$t_{D(\text{off})}$	—	22.4	—	ns	
Turn-Off Fall Time	$t_f$	—	13.4	—	ns	

Notes: 6. Device mounted on FR-4 PCB, with minimum recommended pad layout.

7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.

8. Short duration pulse test used to minimize self-heating effect.

9. Guaranteed by design. Not subject to product testing.



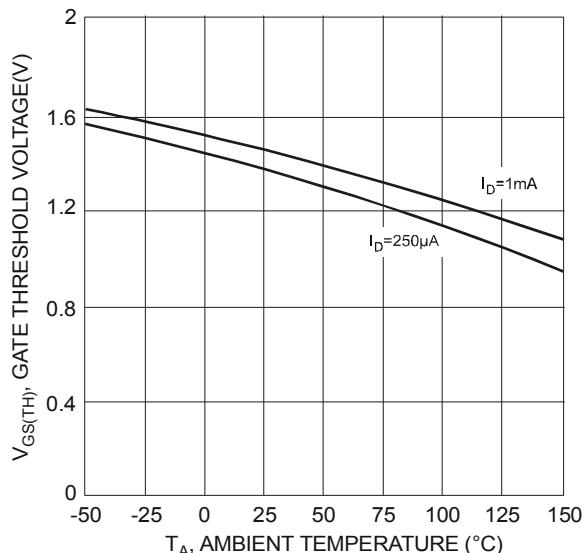


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

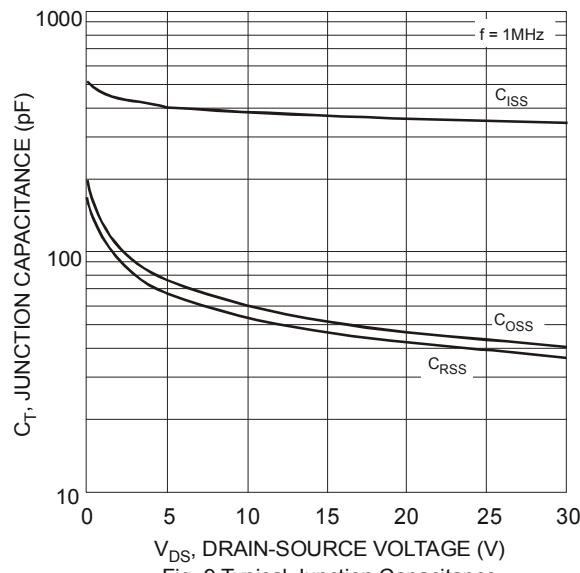


Fig. 9 Typical Junction Capacitance

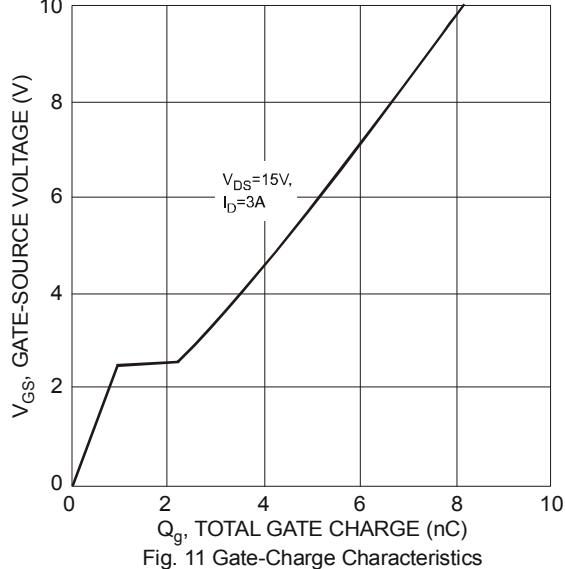


Fig. 11 Gate-Charge Characteristics

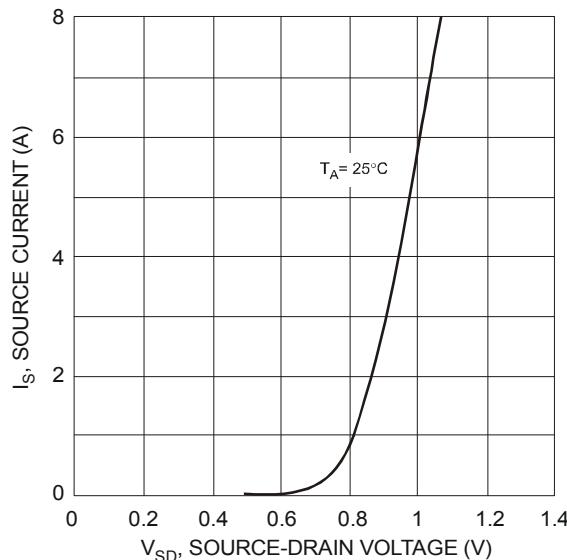


Fig. 8 Diode Forward Voltage vs. Current

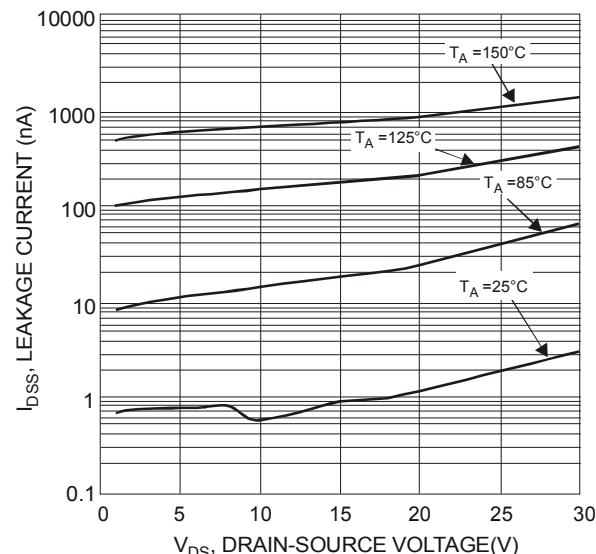


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

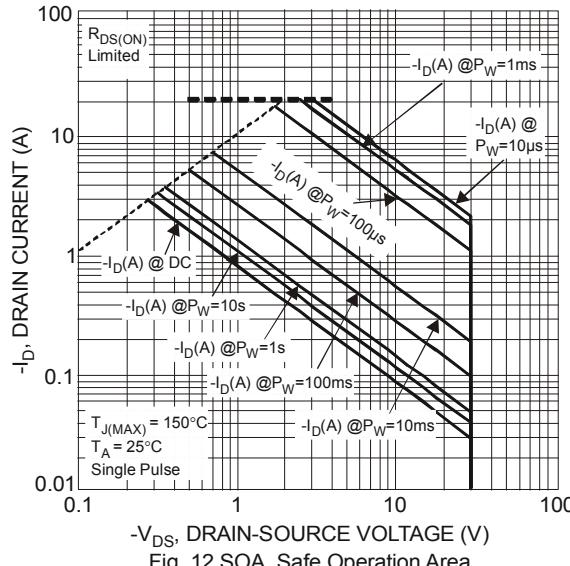


Fig. 12 SOA, Safe Operation Area

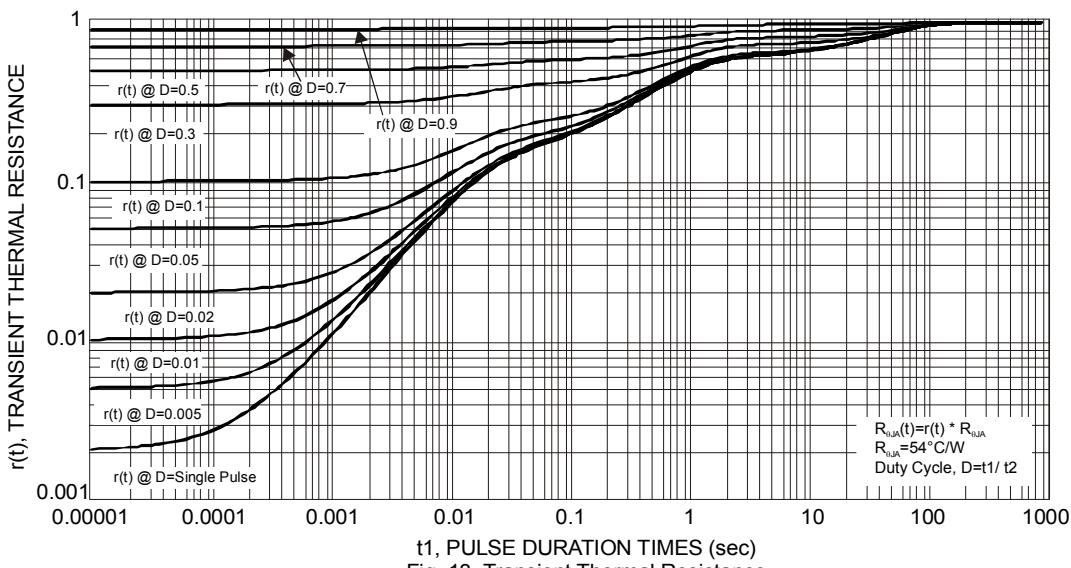
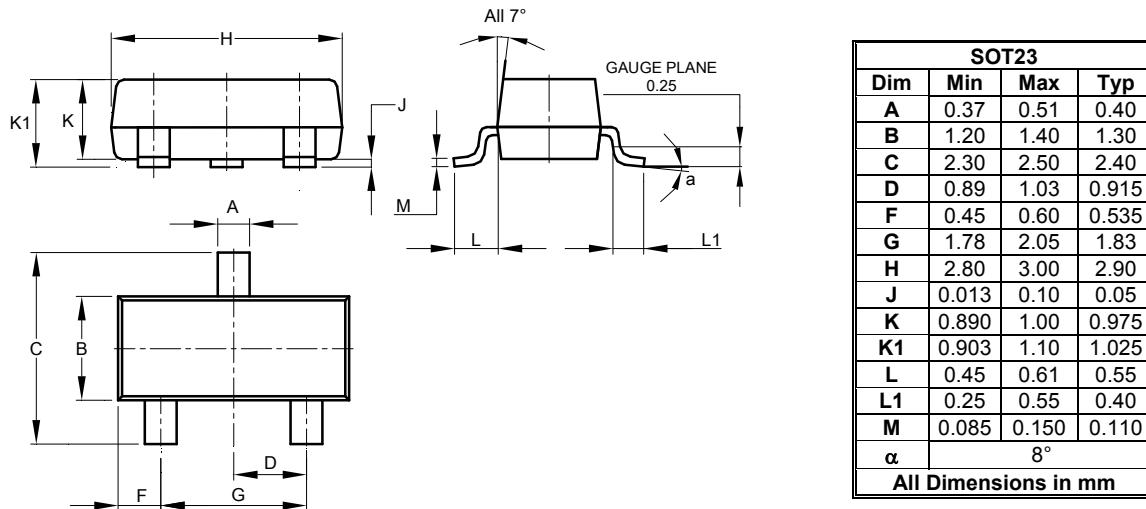


Fig. 13 Transient Thermal Resistance

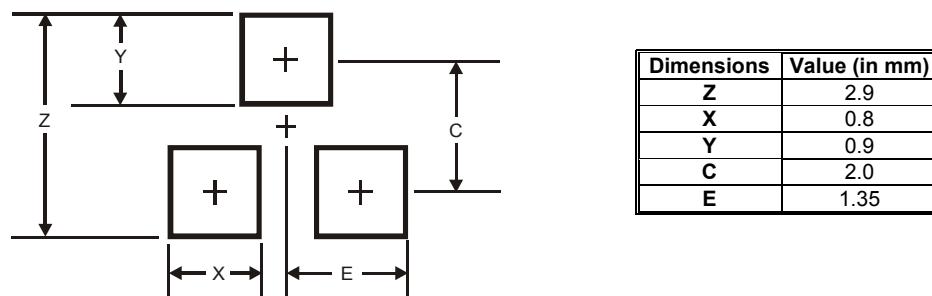
## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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