

DMG3406L-13 Datasheet



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DiGi Electronics Part Number	DMG3406L-13-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMG3406L-13
Description	MOSFET N-CH 30V 3.6A SOT23
Detailed Description	N-Channel 30 V 3.6A (Ta) 770mW (Ta) Surface Mount SOT-23-3



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Purchase and inquiry

Manufacturer Product Number:

DMG3406L-13

Series:

-

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

30 V

Drive Voltage (Max Rds On, Min Rds On):

4.5V, 10V

Vgs(th) (Max) @ Id:

2V @ 250µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 150°C (Tj)

Supplier Device Package:

SOT-23-3

Base Product Number:

DMG3406

Manufacturer:

Diodes Incorporated

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

3.6A (Ta)

Rds On (Max) @ Id, Vgs:

50mOhm @ 3.6A, 10V

Gate Charge (Qg) (Max) @ Vgs:

11.2 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

495 pF @ 15 V

Power Dissipation (Max):

770mW (Ta)

Mounting Type:

Surface Mount

Package / Case:

TO-236-3, SC-59, SOT-23-3

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ\text{C}$
30V	50m Ω @ $V_{GS} = 10\text{V}$	3.6A
	70m Ω @ $V_{GS} = 4.5\text{V}$	2.8A

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.

- Battery Charging
- Power Management Functions
- DC-DC Converters
- Portable Power Adaptors

Features and Benefits

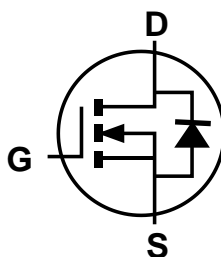
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

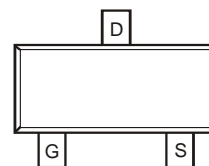
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Terminals Connections: See Diagram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



Top View



Internal Schematic

Top View
Pin Out

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG3406L-7	SOT23	3000/Tape & Reel
DMG3406L-13	SOT23	10000/Tape & 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 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.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



N36 = Product Type Marking Code
 YM = Date Code Marking
 Y or Ȳ = Year (ex: C = 2015)
 M = Month (ex: 9 = September)

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020					
Code	B	C	D	E	F	G	H					
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



DMG3406L

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

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	T _A = +25°C	3.6
		T _A = +70°C	2.9
Pulsed Drain Current (Note 6) (Pulse width ≤10μS, Duty Cycle ≤1%)	I _{DM}	30	A
Maximum Body Diode Forward Current (Note 6)	I _S	1.4	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	0.77	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	164	°C/W
Power Dissipation (Note 6)	P _D	1.4	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6)	R _{θJA}	90	°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 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	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	—	2.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	25	50	mΩ	V _{GS} = 10V, I _D = 3.6A
		—	31	70		V _{GS} = 4.5V, I _D = 2.8A
Diode Forward Voltage	V _{SD}	—	0.75	1.0	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	495	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	50	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	43	—	pF	
Gate Resistance	R _g	—	2.0	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.3	—	nC	V _{DS} = 15V, I _D = 3.6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	11.2	—	nC	
Gate-Source Charge	Q _{gs}	—	1.2	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.9	—	nC	
Turn-On Delay Time	t _{d(ON)}	—	2.3	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _L = 2.2Ω, R _G = 3Ω
Turn-On Rise Time	t _r	—	3.3	—	ns	
Turn-Off Delay Time	t _{d(OFF)}	—	10.3	—	ns	
Turn-Off Fall Time	t _f	—	2.3	—	ns	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.



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NEW PRODUCT

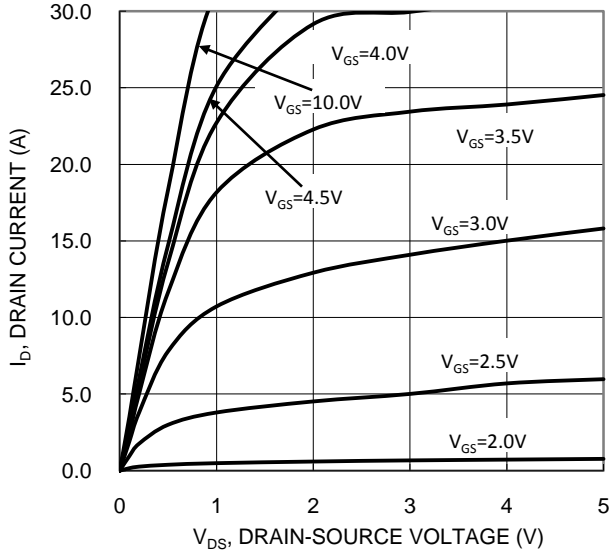


Figure 1. Typical Output Characteristic

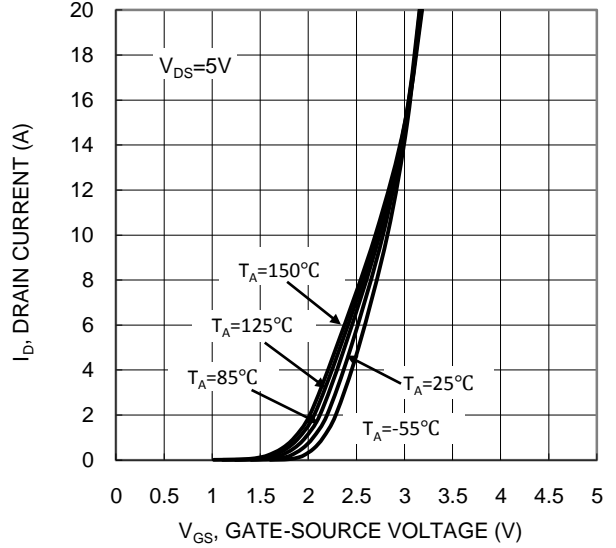


Figure 2. Typical Transfer Characteristic

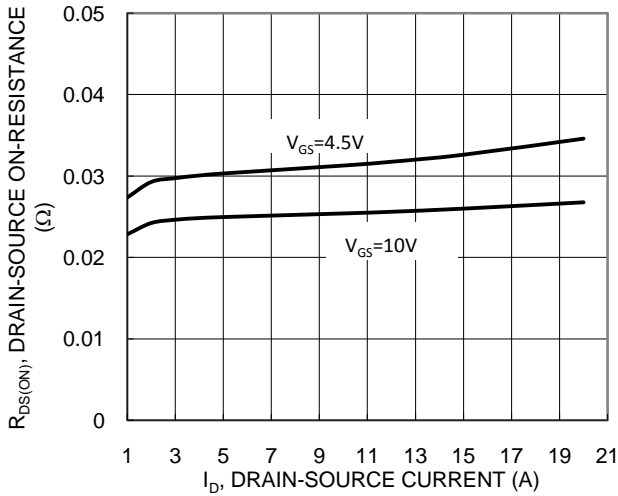


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

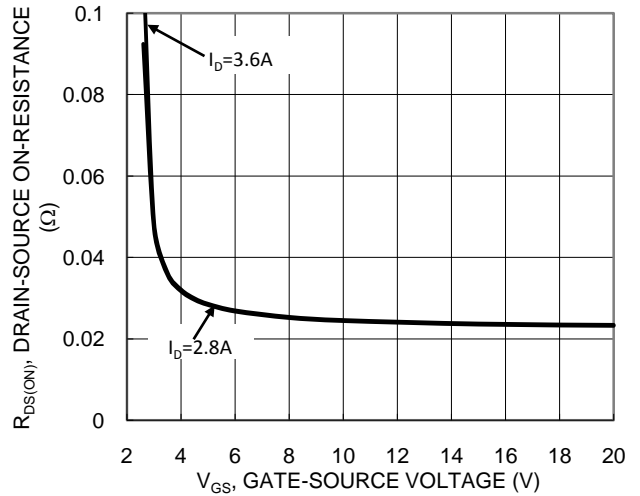


Figure 4. Typical Transfer Characteristic

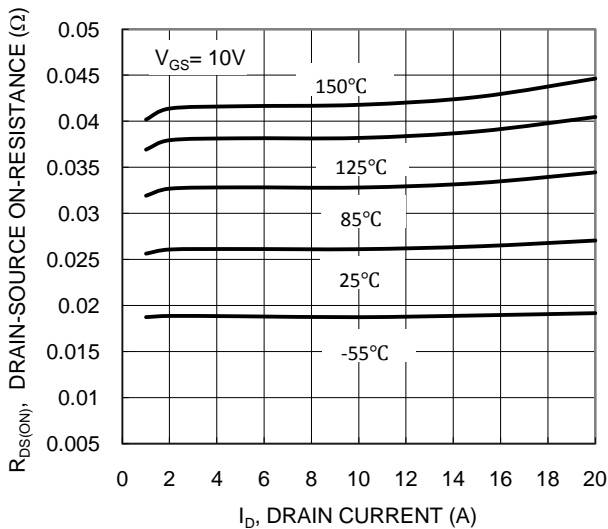


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

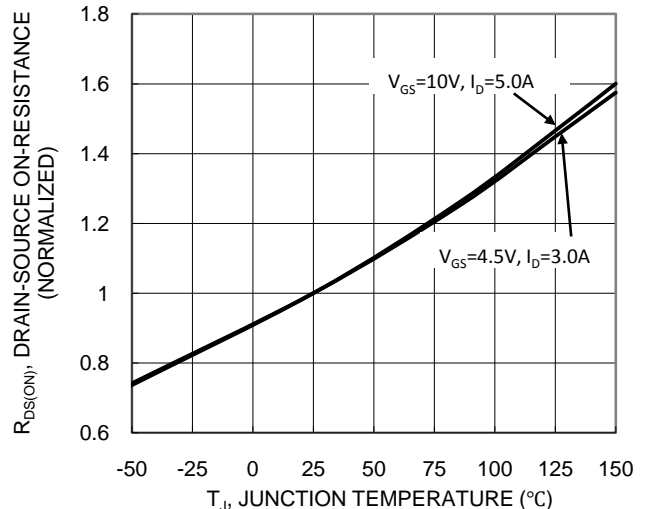


Figure 6. On-Resistance Variation with Temperature



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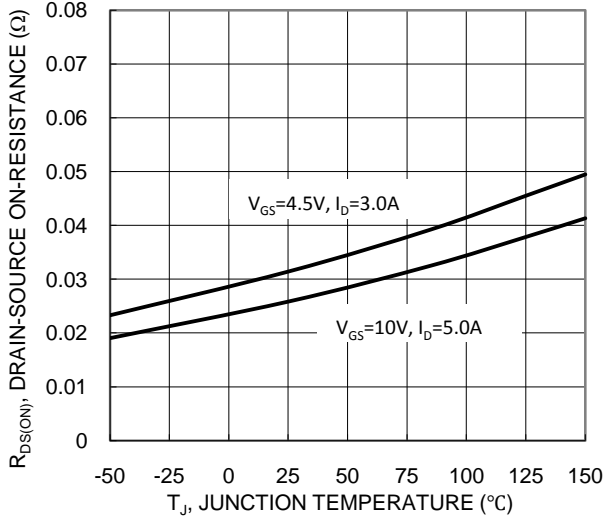


Figure 7. On-Resistance Variation with Temperature

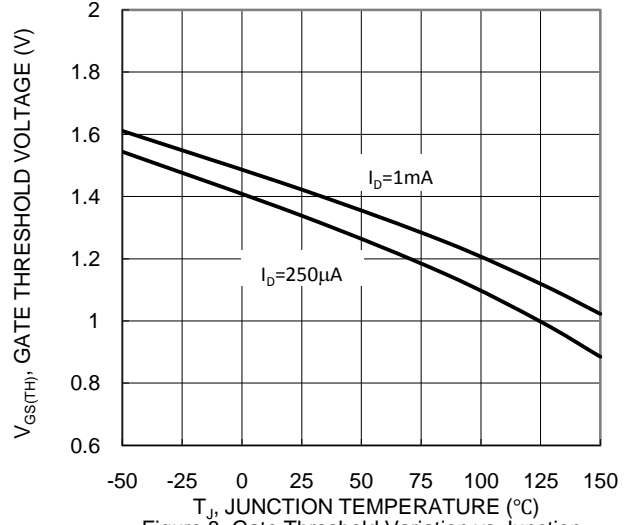


Figure 8. Gate Threshold Variation vs Junction Temperature

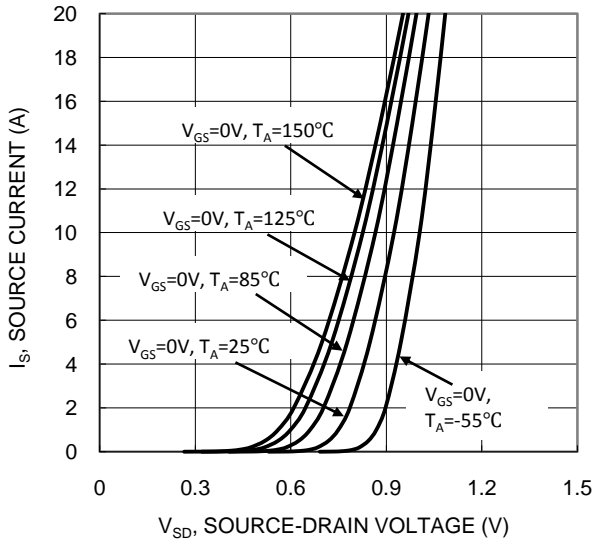


Figure 9. Diode Forward Voltage vs. Current

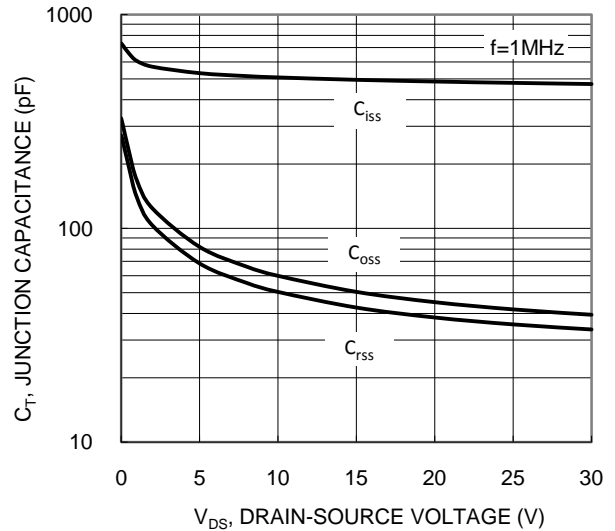


Figure 10. Typical Junction Capacitance

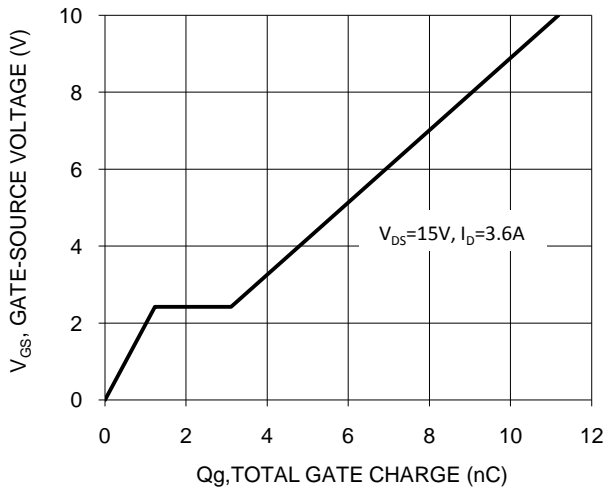


Figure 11. Gate Charge

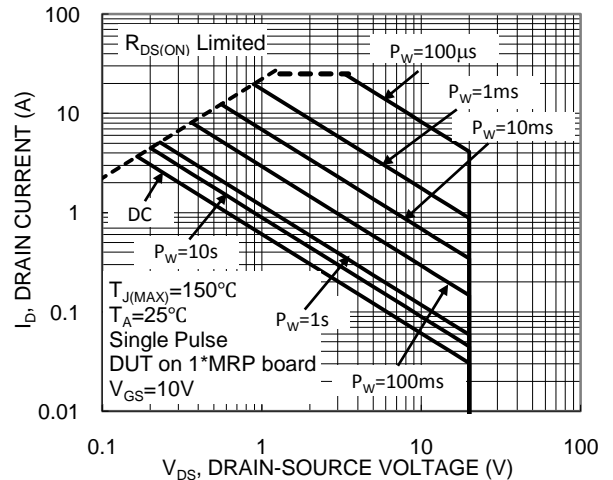


Figure 12. SOA, Safe Operation Area



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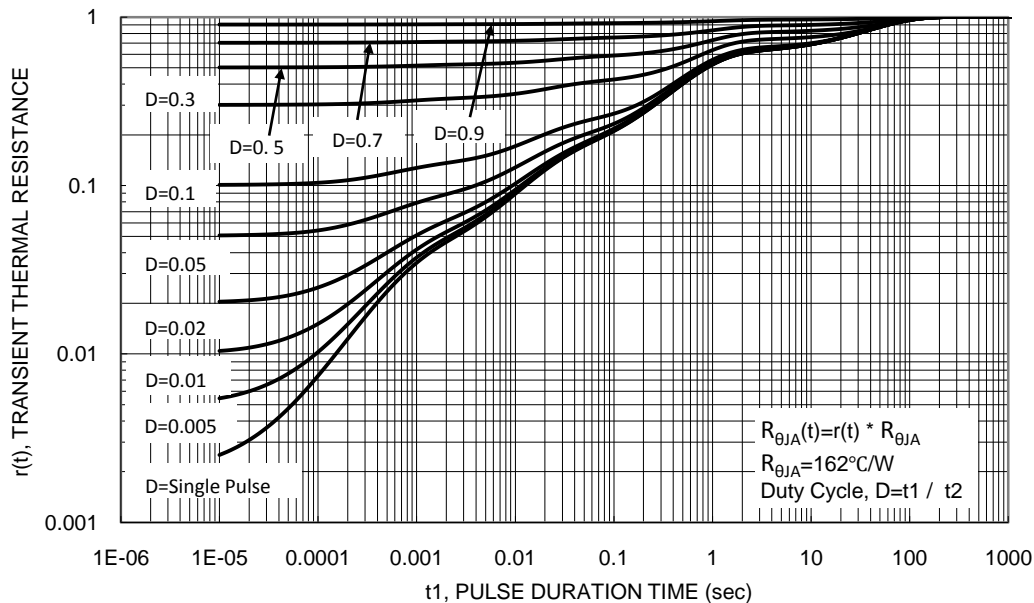
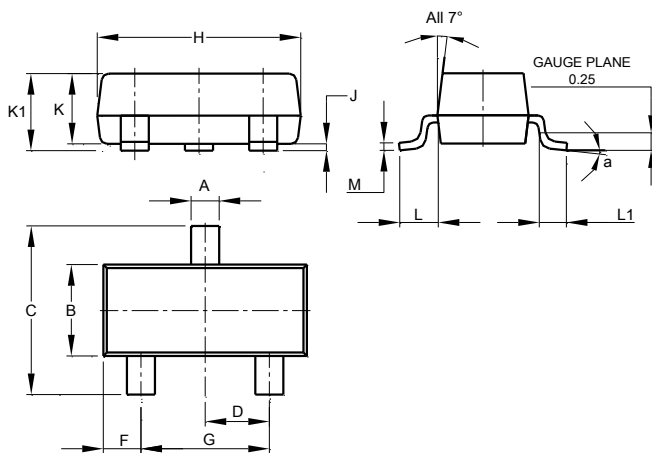


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

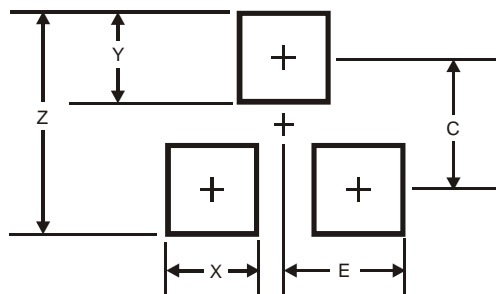
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
α	8°		
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35



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