

**DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = 25^\circ C$
60V	1.8Ω @ $V_{GS} = 10V$	440mA
	2.1Ω @ $V_{GS} = 4.5V$	410mA

**Description**

This new generation 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.

**Applications**

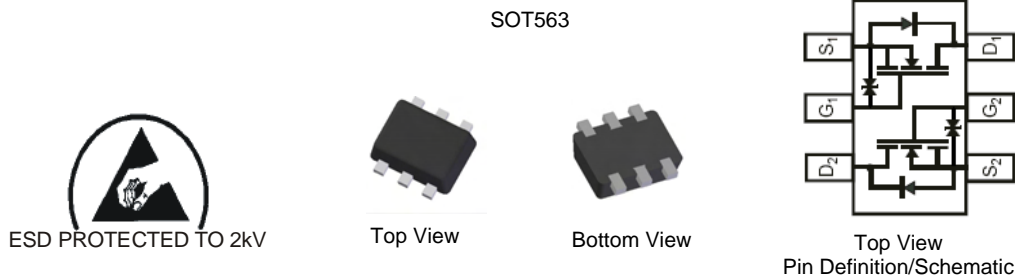
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- DC-DC Converters
- Power management functions

**Features**

- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

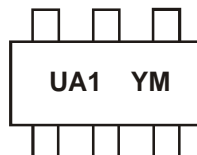
**Mechanical Data**

- Case: SOT563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.006 grams (approximate)


**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMG1026UV-7	SOT563	3000 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> 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 <http://www.diodes.com>.

**Marking Information**


UA1 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015	2016
Code	W	X	Y	Z	A	B	C	D

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 85°C	I <sub>D</sub>	410 300	mA
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	t ≤ 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 85°C	I <sub>D</sub>	440 320	mA
Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 85°C	I <sub>D</sub>	380 270	mA
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	t ≤ 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 85°C	I <sub>D</sub>	410 295	mA
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	1.0	A

**Thermal Characteristics**

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	0.58	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = 25°C (Note 5)	R <sub>θJA</sub>	213	°C/W
Power Dissipation (Note 6) t ≤ 10s	P <sub>D</sub>	0.65	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = 25°C (Note 6) t ≤ 10s	R <sub>θJA</sub>	192	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	1.0	μA	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±50	nA	V <sub>GS</sub> = ±5V, V <sub>DS</sub> = 0V
		-	-	±150	nA	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.8	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	1.2	1.8	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA
		-	1.4	2.1	Ω	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 200mA
Forward Transfer Admittance	Y <sub>fs</sub>	80	580	-	mS	V <sub>DS</sub> = 10V, I <sub>D</sub> = 200mA
Continuous Source Current (Note 8)	I <sub>S</sub>	-	-	200	mA	-
Diode Forward Voltage	V <sub>SD</sub>	-	0.8	1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 200mA
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	-	32	-	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	4.4	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	2.9	-		
Gate Resistance	R <sub>g</sub>	-	126	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	-	0.45	-	pC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 250mA
Gate-Source Charge	Q <sub>gs</sub>	-	0.08	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	0.08	-		
Turn-On Delay Time	t <sub>D(on)</sub>	-	3.4	-	ns	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 30V, R <sub>L</sub> = 150Ω, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 200mA
Turn-On Rise Time	t <sub>r</sub>	-	3.4	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	26.4	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	16.3	-	ns	

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 PCB with minimum recommended pad layout, measured in t ≤ 10s.
  - Repetitive rating, pulse width limited by junction temperature, 10μs pulse, duty cycle = 1%
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

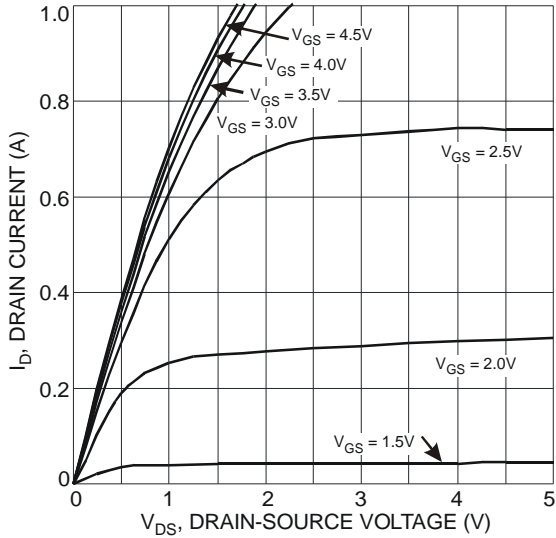


Figure 1 Typical Output Characteristic

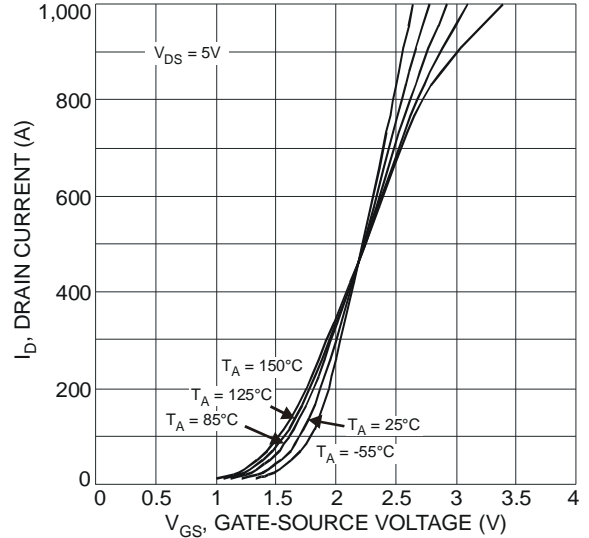


Figure 2 Typical Transfer Characteristic

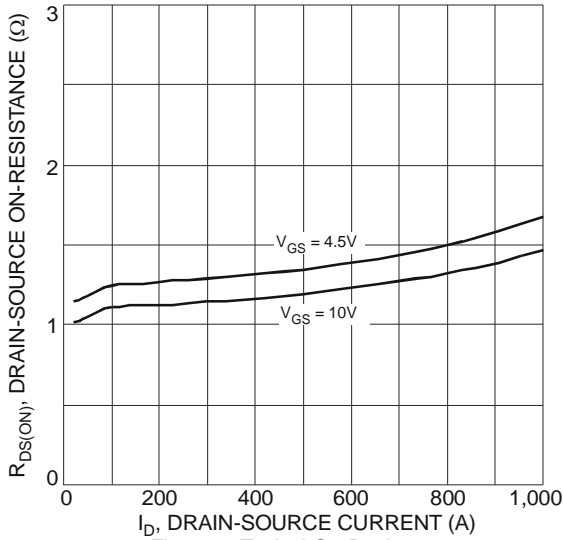


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

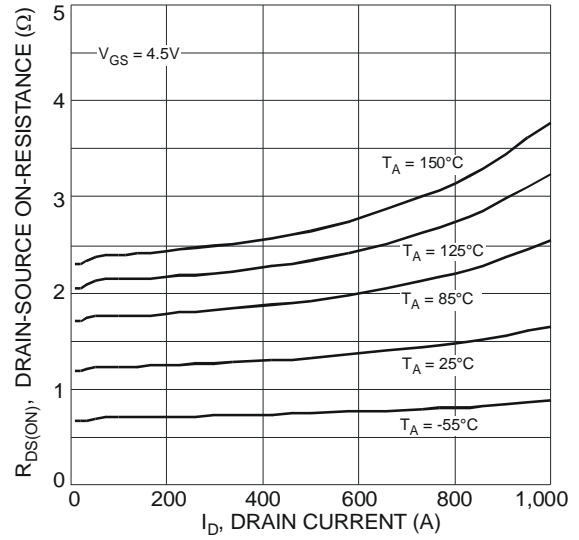


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

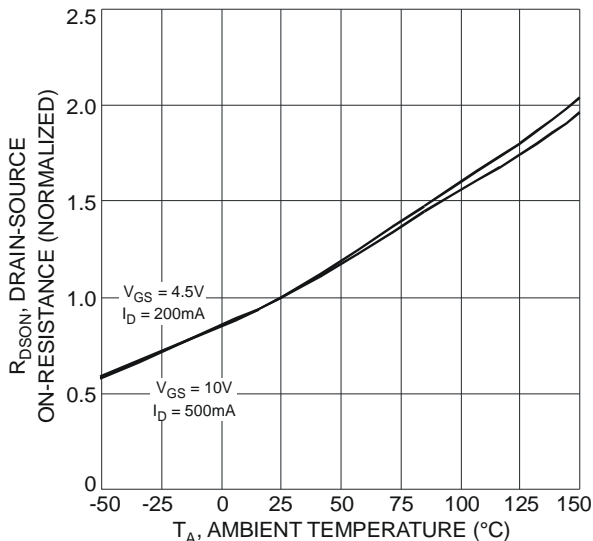


Figure 5 On-Resistance Variation with Temperature

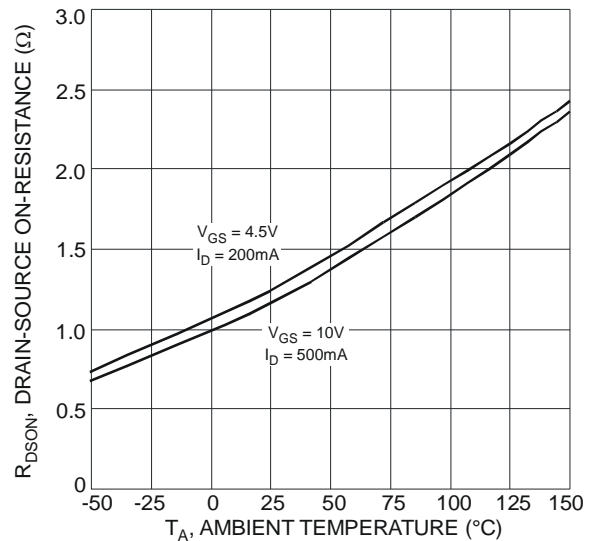


Figure 6 On-Resistance Variation with Temperature

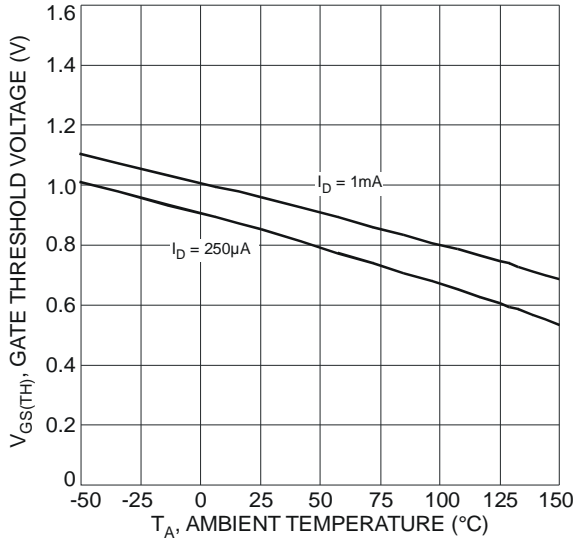


Figure 7 Gate Threshold Variation vs. Ambient Temperature

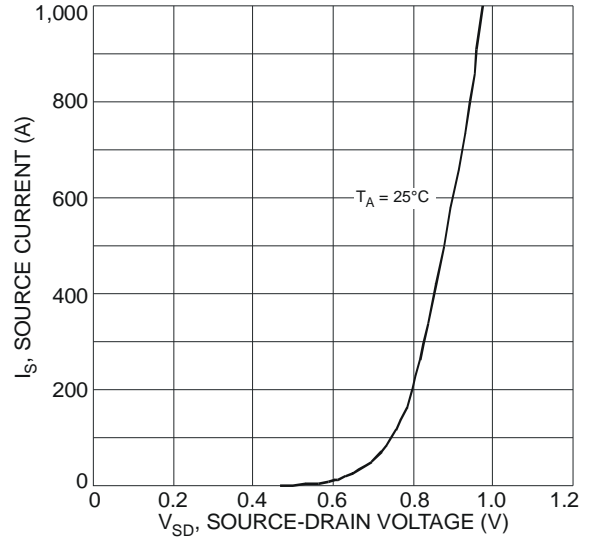


Figure 8 Diode Forward Voltage vs. Current

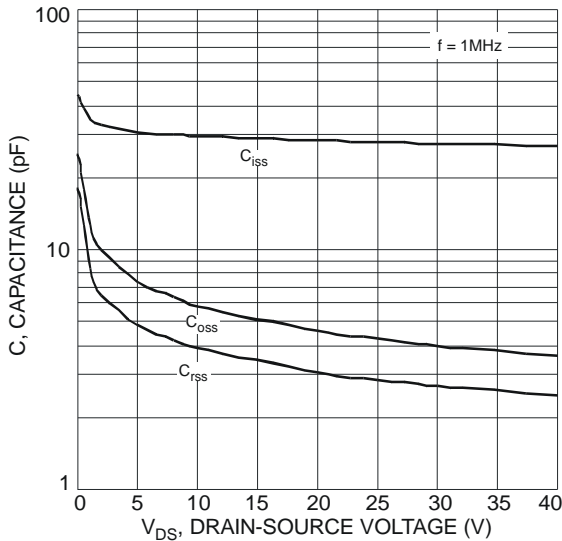


Figure 9 Typical Total Capacitance

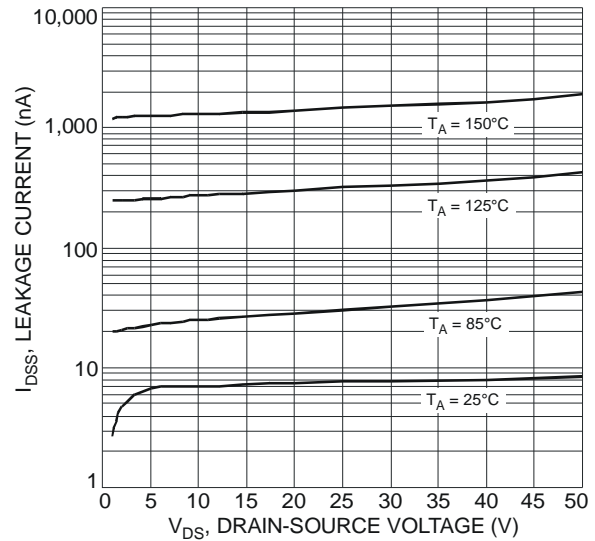


Figure 10 Typical Leakage Current vs. Drain-Source Voltage

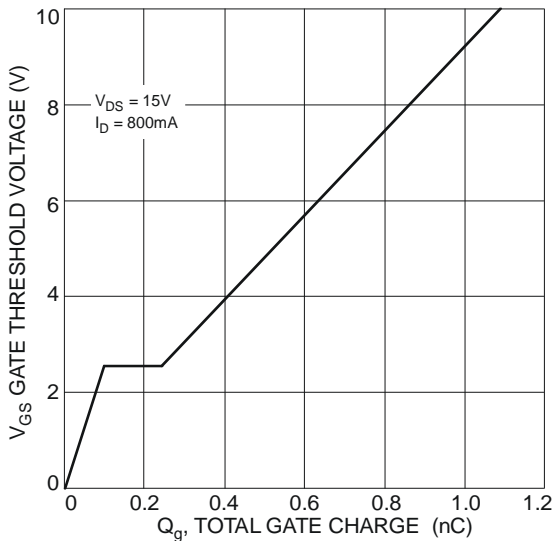


Figure 11 Gate Charge

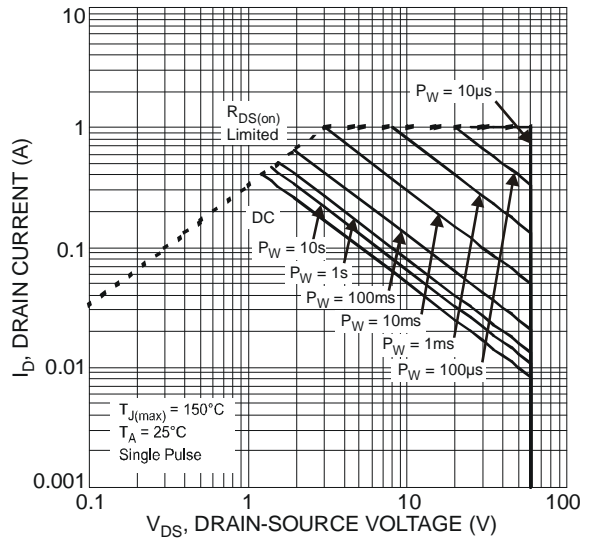


Figure 12 SOA, Safe Operation Area

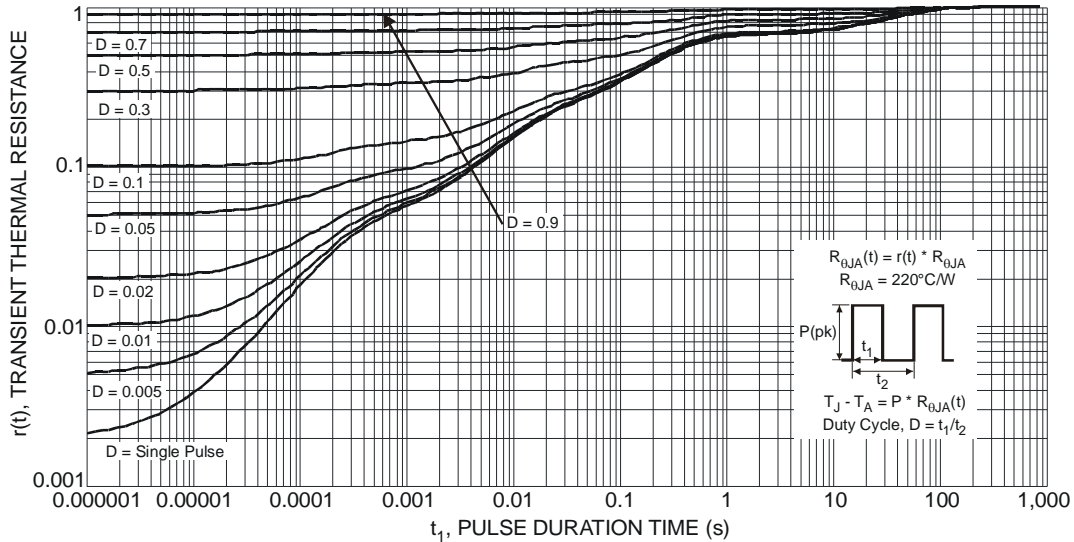
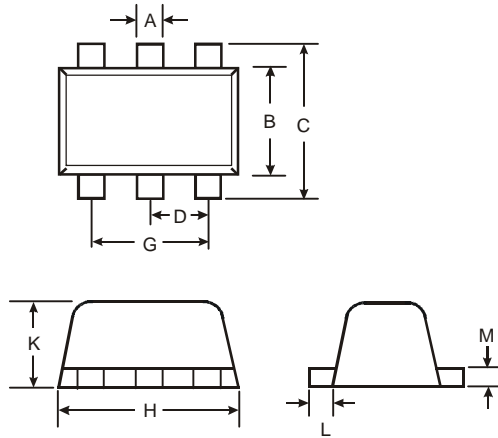


Figure 13 Transient Thermal Response

**Package Outline Dimensions**

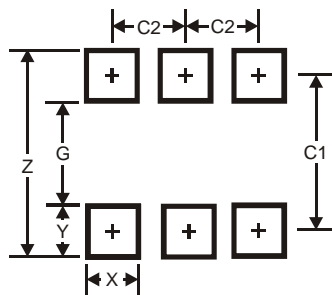
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
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	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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