

**60V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**

### Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
60V	1.8Ω @ V <sub>GS</sub> = 10V	440mA
	2.1Ω @ V <sub>GS</sub> = 4.5V	410mA

### Description

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

### Applications

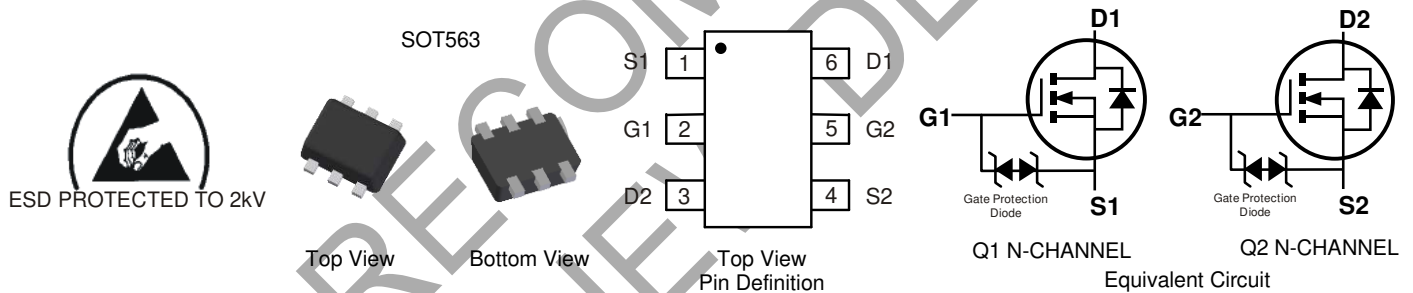
- Battery operated systems and solid-state relays
- Drivers: relays, solenoids, lamps, hammers, displays, memories, transistors, etc.
- DC-DC converters
- Power management functions

### 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)**
- 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 (DMG1026UVQ)**

### Mechanical Data

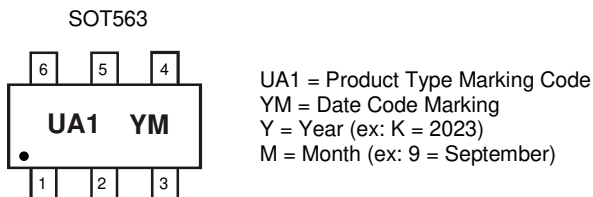
- Package: SOT563
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 Ⓔ3
- Terminal Connections: See Diagram Below
- Weight: 0.006 grams (Approximate)



### Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMG1026UV-7	SOT563	3,000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  - 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.
  - 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information** (Note 5)


## Date Code Key

Year	2011	....	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	Y	....	K	L	M	N	O	P	R	S	T	U

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

Note: 5. Products manufactured with date code D9 (September, 2016) and newer are built with additional Pin 1 dot in marking information. Products manufactured prior to date code D9 are built without Pin 1 dot.

**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 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	T <sub>A</sub> = +25°C	410
		T <sub>A</sub> = +85°C	300
Continuous Drain Current (Note 7) V <sub>GS</sub> = 10V	I <sub>D</sub>	T <sub>A</sub> = +25°C	440
		T <sub>A</sub> = +85°C	320
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	I <sub>D</sub>	T <sub>A</sub> = +25°C	380
		T <sub>A</sub> = +85°C	270
Continuous Drain Current (Note 7) V <sub>GS</sub> = 4.5V	I <sub>D</sub>	T <sub>A</sub> = +25°C	410
		T <sub>A</sub> = +85°C	295
Pulsed Drain Current (Note 8)	I <sub>DM</sub>	1.0	A

**Thermal Characteristics**

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	0.58	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 6)	R <sub>θJA</sub>	213	°C/W
Power Dissipation (Note 7) t ≤ 10s	P <sub>D</sub>	0.65	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 7) 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

Notes: 6. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.  
 7. Device mounted on FR-4 PCB with minimum recommended pad layout, measured in t ≤ 10s.  
 8. Repetitive rating, pulse width limited by junction temperature, 10μs pulse, duty cycle = 1%.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</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 9)</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		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 9)	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 10)</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	
		—	16.3	—		

Notes: 9. Short duration pulse test used to minimize self-heating effect.  
10. Guaranteed by design. Not subject to production testing.

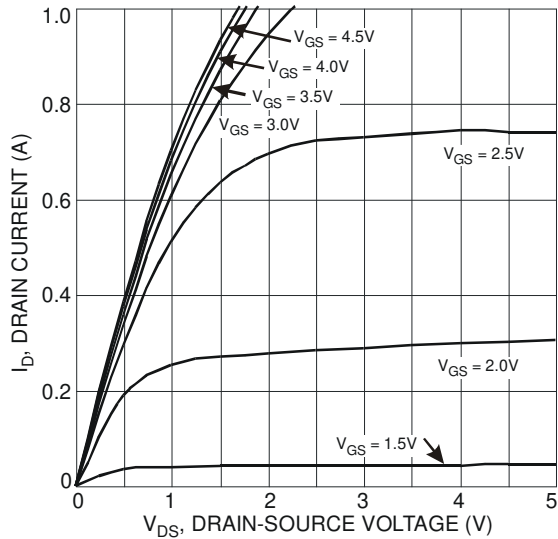


Figure 1 Typical Output Characteristic

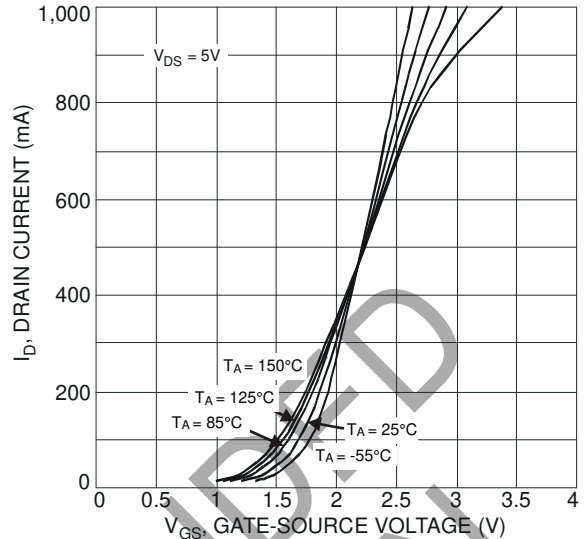


Figure 2 Typical Transfer Characteristic

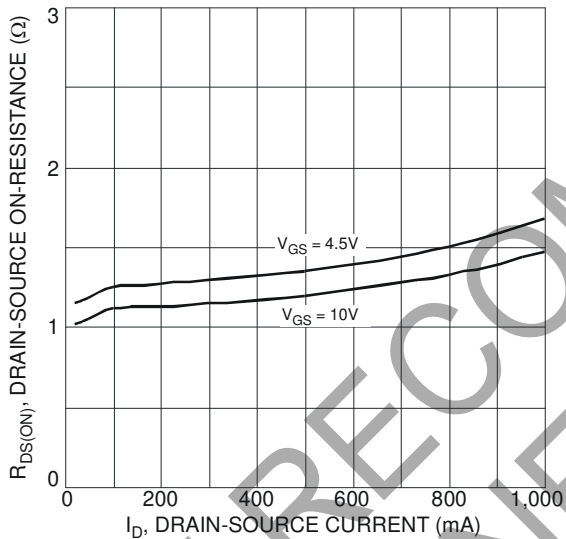


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

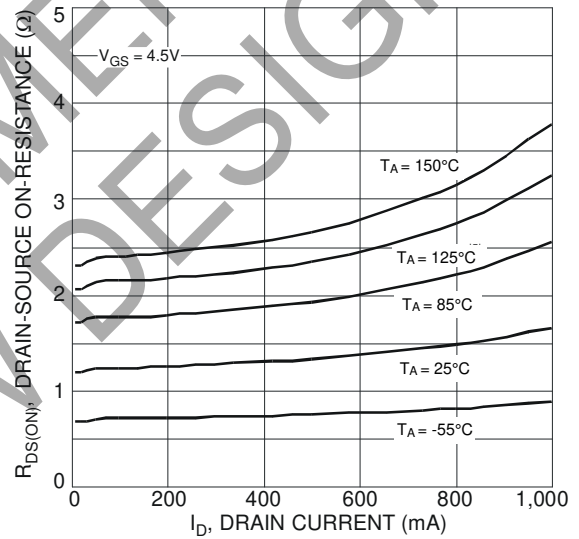


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

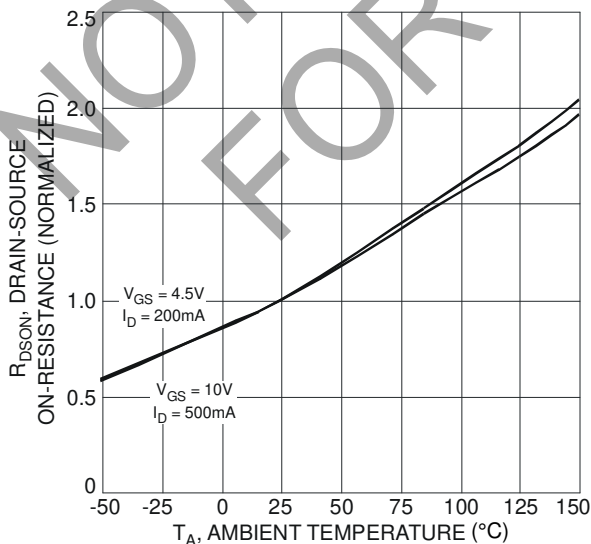


Figure 5 On-Resistance Variation with Temperature

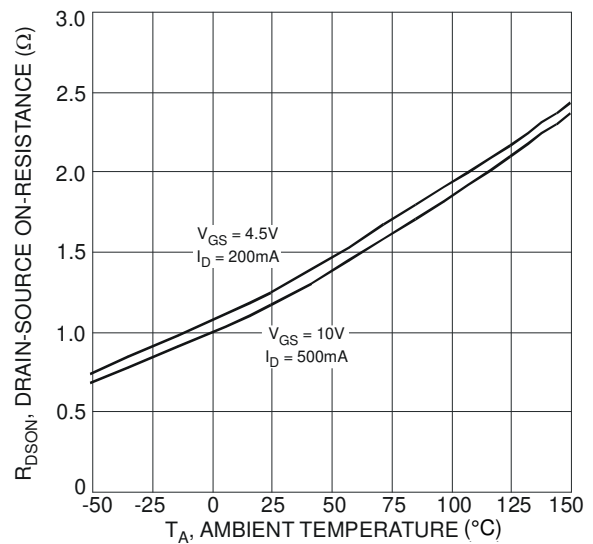


Figure 6 On-Resistance Variation with Temperature

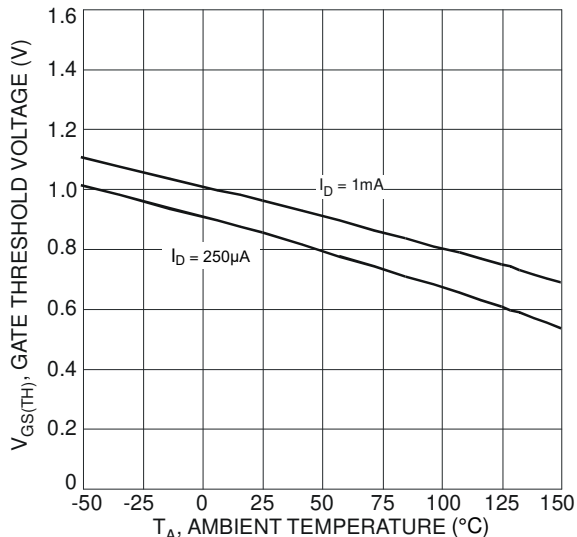


Figure 7 Gate Threshold Variation vs. Ambient Temperature

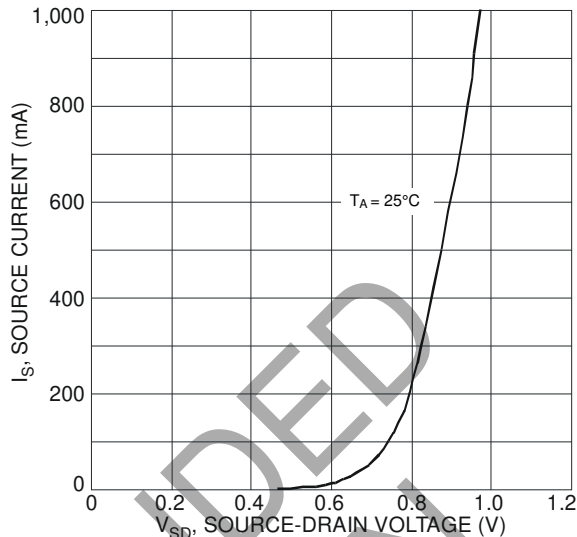


Figure 8 Diode Forward Voltage vs. Current

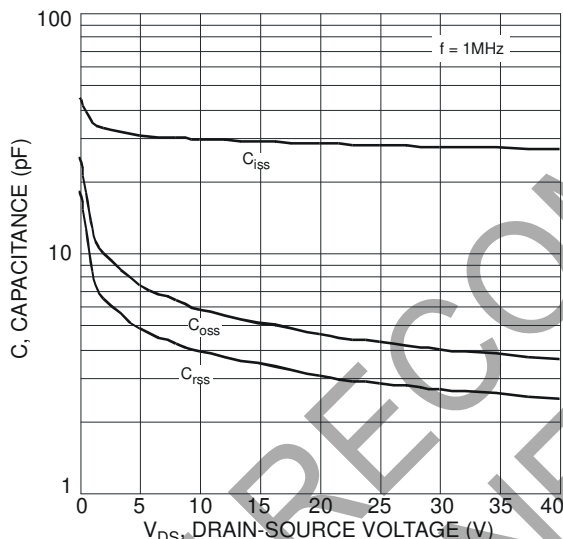


Figure 9 Typical Total Capacitance

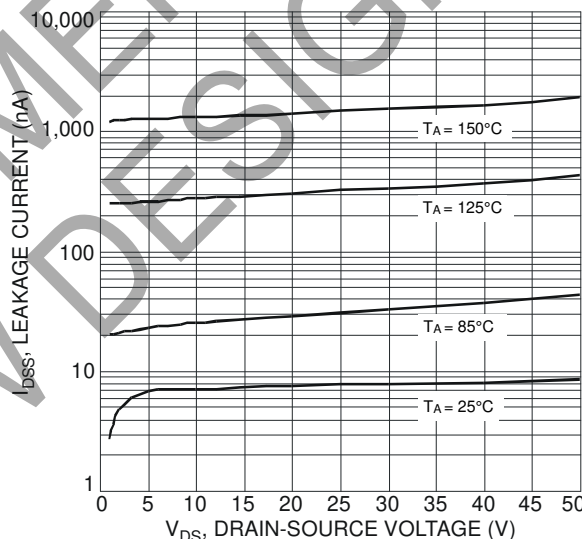


Figure 10 Typical Leakage Current vs. Drain-Source Voltage

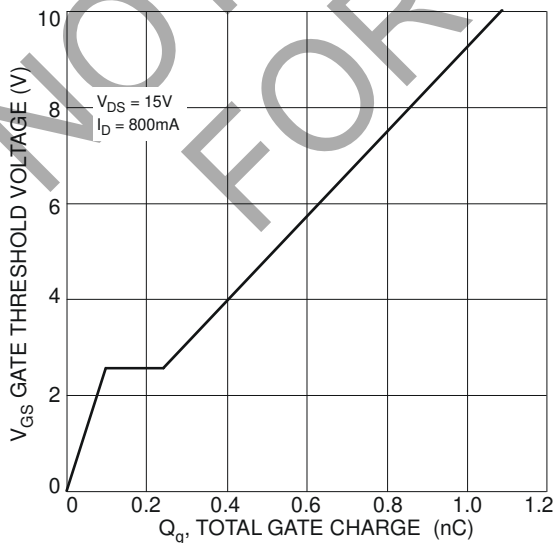


Figure 11 Gate Charge

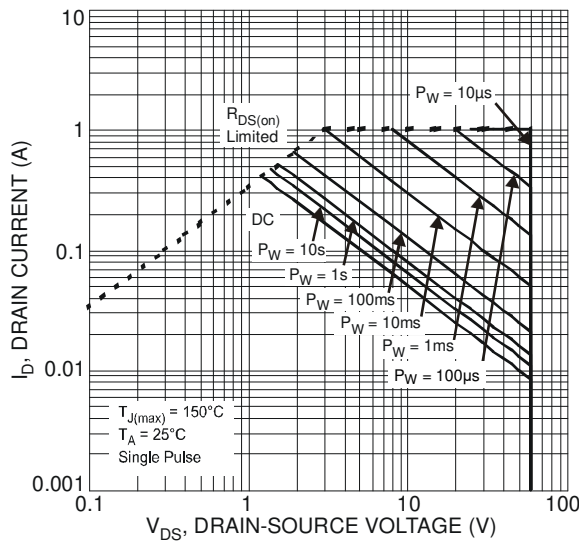
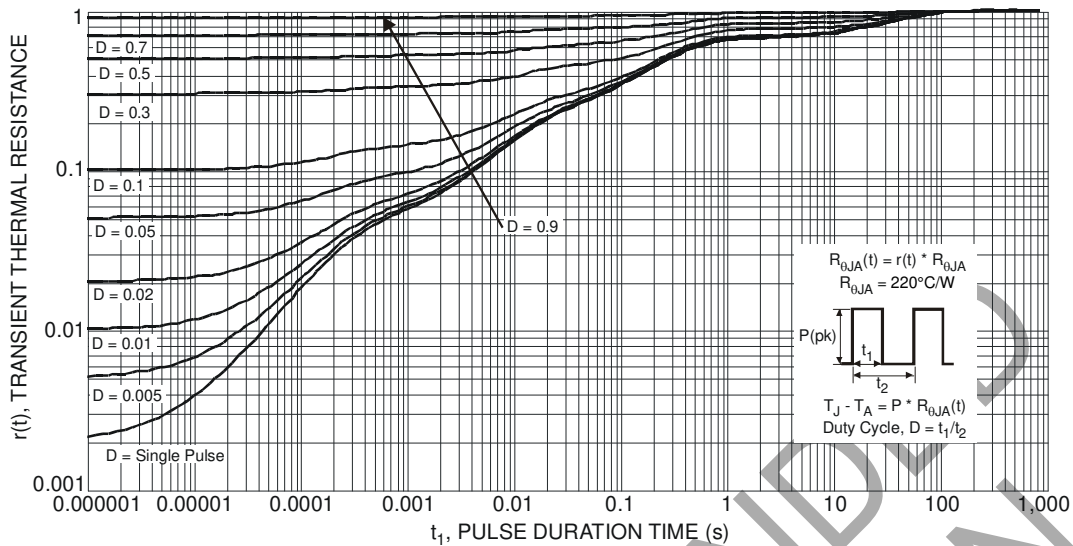


Figure 12 SOA, Safe Operation Area

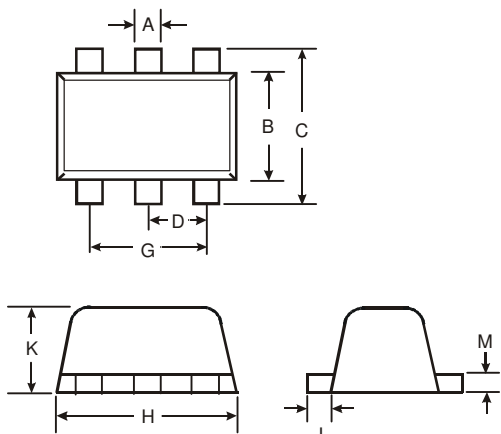


NOT RECOMMENDED FOR NEW DESIGN

**Package Outline Dimensions**

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

**SOT563**

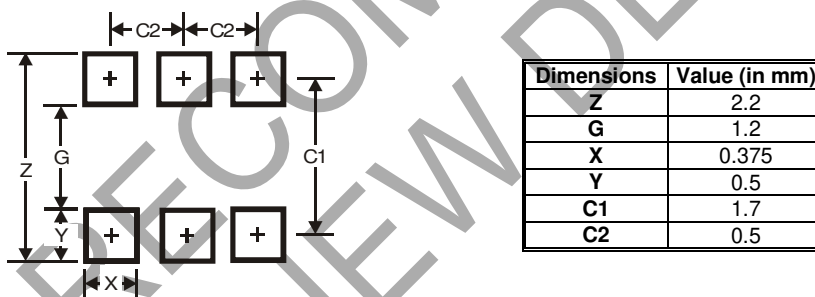


SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT563**



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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