

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	$I_D$ max $T_A = +25^\circ\text{C}$
60V	$2\Omega @ V_{GS} = 10V$	250mA
	$3\Omega @ V_{GS} = 5V$	

## Description

This MOSFET is 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

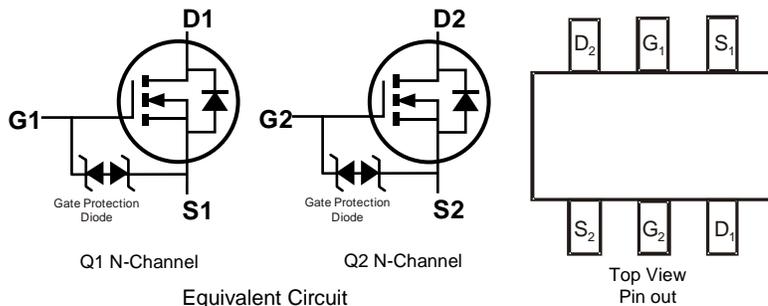
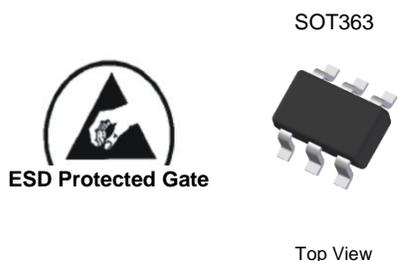
- Motor Control
- Power Management Functions

## Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **ESD Protected Gate**
- **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: SOT363
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

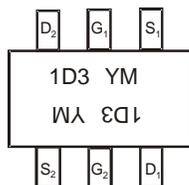


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN63D1LDW-7	SOT363	3000/Tape & Reel
DMN63D1LDW-13	SOT363	10000/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/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.
  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/products/packages.html>.

## Marking Information



1D3 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	B	C	D	E	F	G	H	I	J	K	L	M
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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	$I_D$	250	mA
Steady State $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$		200	
Maximum Continuous Body Diode Forward Current (Note 6)	$I_S$	0.5	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%) (Note 6)	$I_{DM}$	1.2	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	310	mW
Thermal Resistance, Junction to Ambient (Note 5)	Steady State $R_{\theta JA}$	414	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	$P_D$	390	mW
Thermal Resistance, Junction to Ambient (Note 6)	Steady State $R_{\theta JA}$	324	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 10\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1.0	$\mu\text{A}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	1.6	2.5	V	$V_{DS} = 10\text{V}, I_D = 1\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	2.0	$\Omega$	$V_{GS} = 10\text{V}, I_D = 0.5\text{A}$
		—	—	3.0		$V_{GS} = 5\text{V}, I_D = 0.05\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	80	—	—	mS	$V_{DS} = 10\text{V}, I_D = 0.2\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.75	1.1	V	$V_{GS} = 0\text{V}, I_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	30	—	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	4.2	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	2.9	—	pF	
Gate Resistance	$R_g$	—	133	—	$\Omega$	$f = 1\text{MHz}, V_{GS} = 0\text{V}, V_{DS} = 0\text{V}$
Total Gate Charge	$Q_g$	—	304	—	pC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V},$ $I_D = 250\text{mA}$
Gate-Source Charge	$Q_{gs}$	—	203	—	pC	
Gate-Drain Charge	$Q_{gd}$	—	84	—	pC	
Turn-On Delay Time	$t_{D(ON)}$	—	3.9	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V},$ $R_G = 25\Omega, I_D = 200\text{mA}$
Turn-On Rise Time	$t_R$	—	3.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	15.7	—	ns	
Turn-Off Fall Time	$t_F$	—	9.9	—	ns	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

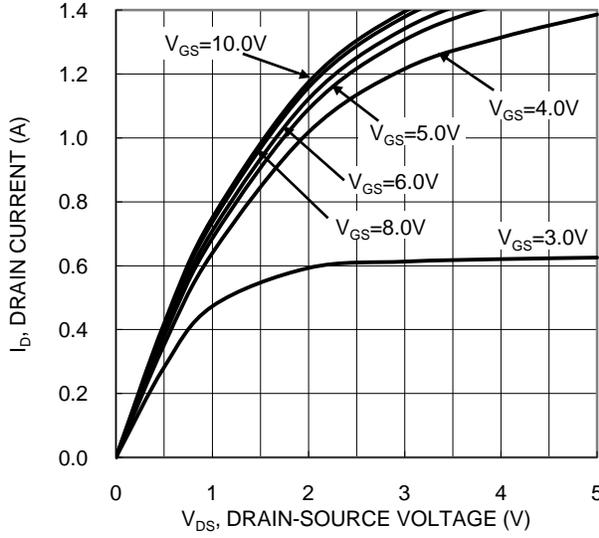


Figure 1. Typical Output Characteristic

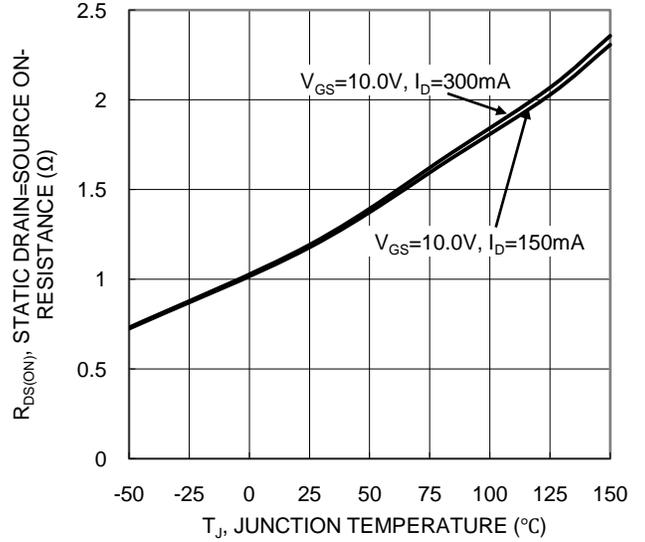


Figure 2. On-Resistance Variation with Temperature

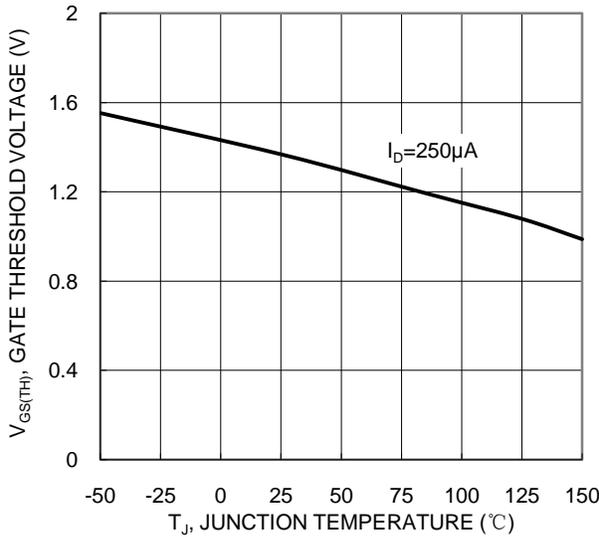


Figure 3. Gate Threshold Variation with Temperature

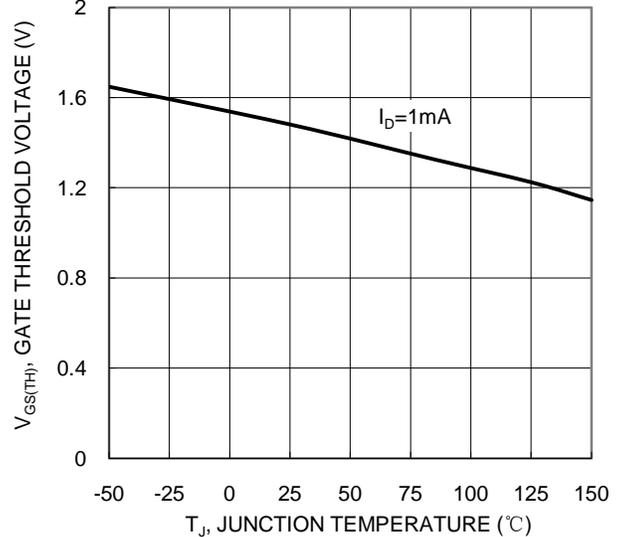


Figure 4. Gate Threshold Variation with Temperature

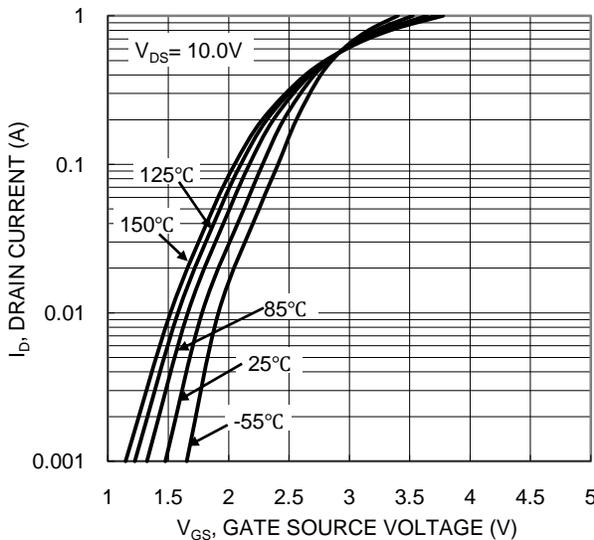


Figure 5. Typical Transfer Characteristics

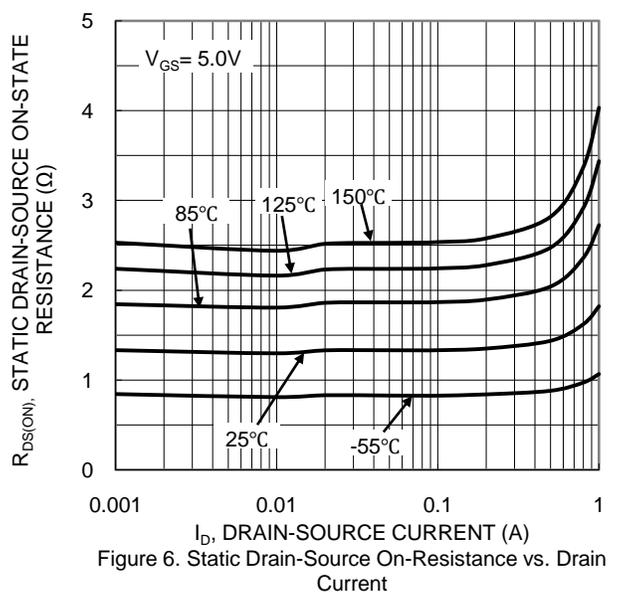


Figure 6. Static Drain-Source On-Resistance vs. Drain Current

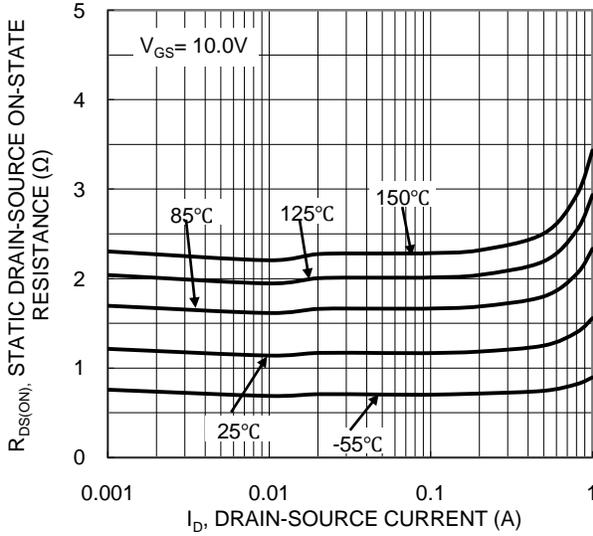


Figure 7. Static Drain-Source On-Resistance vs. Drain Current

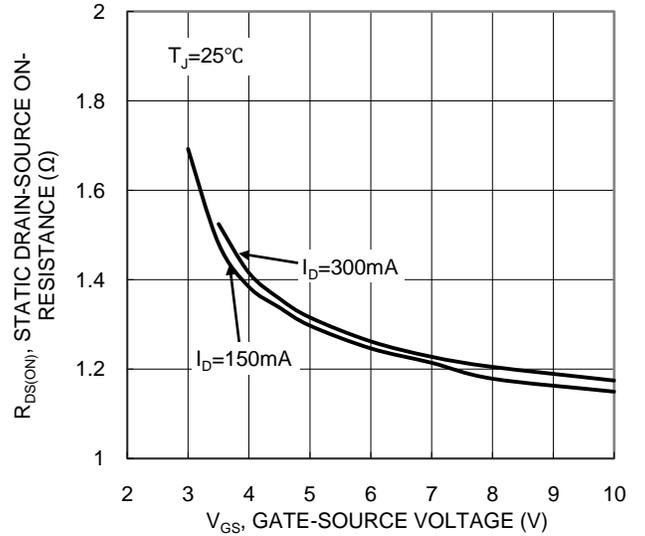


Figure 8. Static Drain-Source On-Resistance vs. Gate-Source Voltage

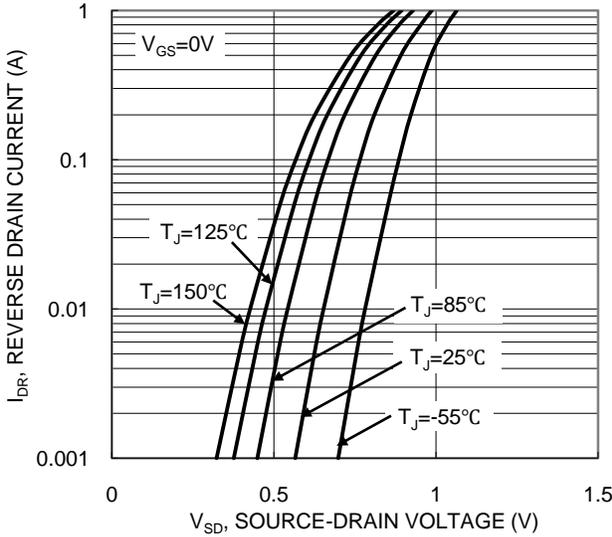


Figure 9. Reverse Drain Current

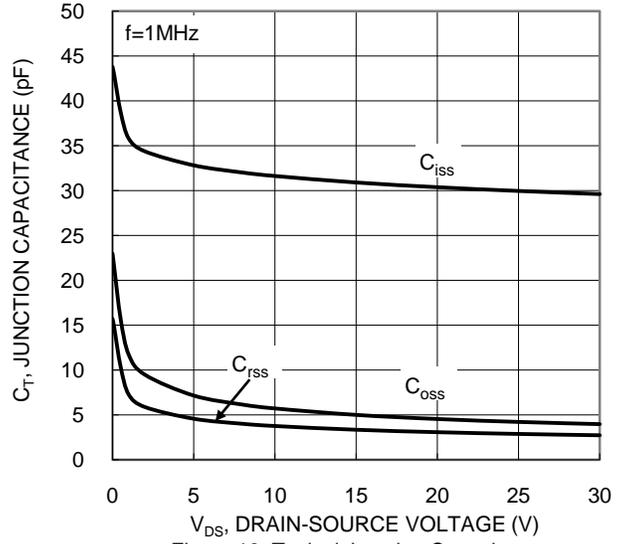


Figure 10. Typical Junction Capacitance

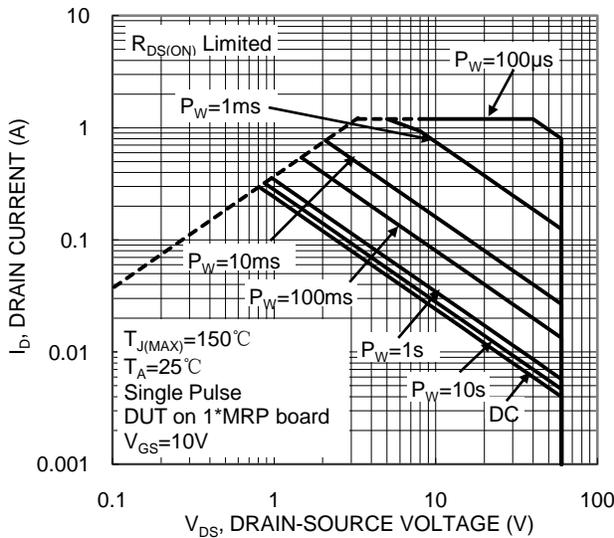
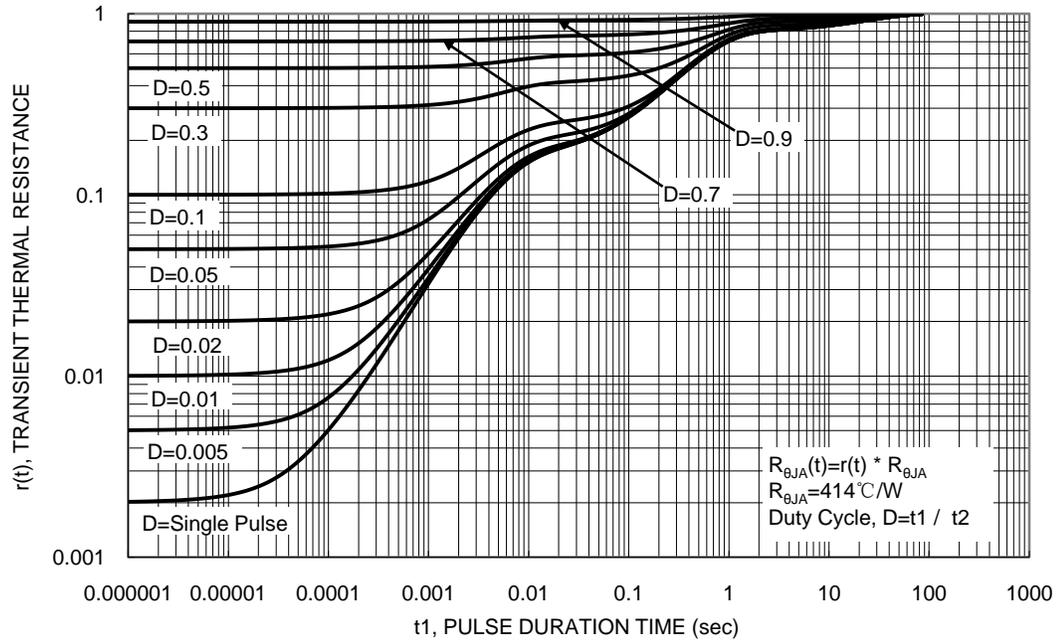
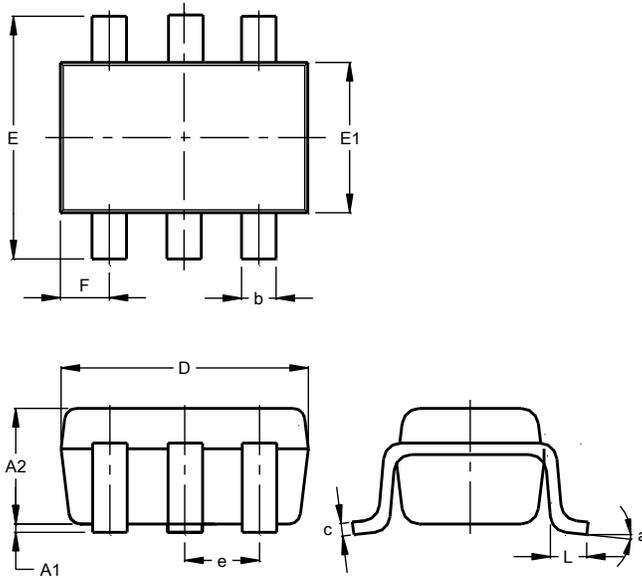


Figure 11. SOA, Safe Operation Area



**Package Outline Dimensions**

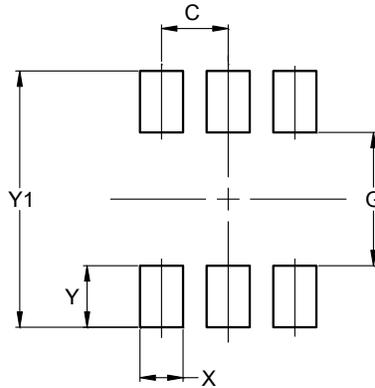
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT363			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	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)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

NEW PRODUCT

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