

**DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
20V	0.48Ω @ V <sub>GS</sub> = 5V	1.33A
	0.7Ω @ V <sub>GS</sub> = 2.5V	1.2A

**Description**

This new generation MOSFET has been 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**

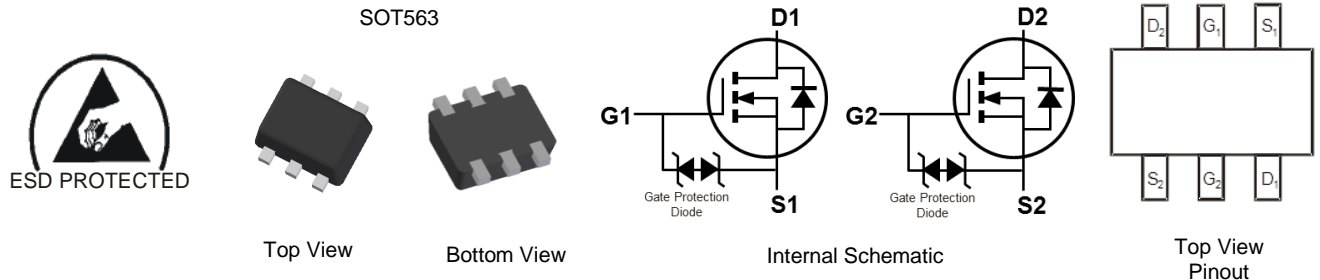
- Power-management functions
- Battery-operated systems and solid-state relays
- Load switches

**Features and Benefits**

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>

**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
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.003 grams (Approximate)

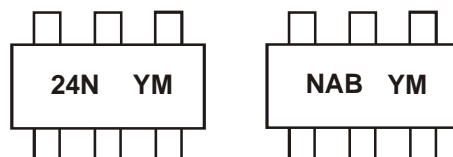


**Ordering Information (Note 4)**

Part Number	Package	Packing	
		Qty.	Carrier
DMN2400UV-7	SOT563	3,000	Tape & Reel
DMN2400UV-13	SOT563	10,000	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**



24N and NAB = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: L = 2024)  
M = Month (ex: 9 = September)

**Date Code Key**

Year	2009	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	W	-	L	M	N	P	R	S	T	U	V	W

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>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5)	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	1.33	A
		T <sub>A</sub> = +85°C		0.84	
Pulsed Drain Current			I <sub>DM</sub>	3	A

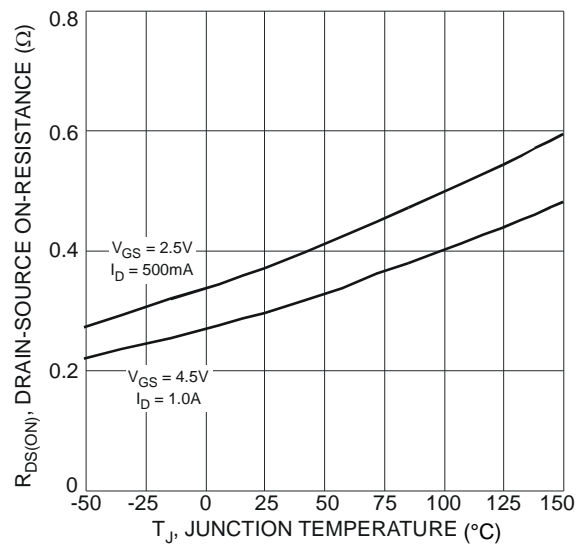
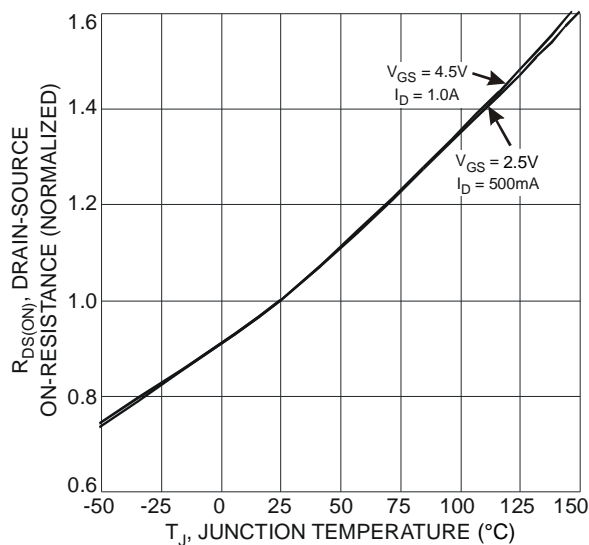
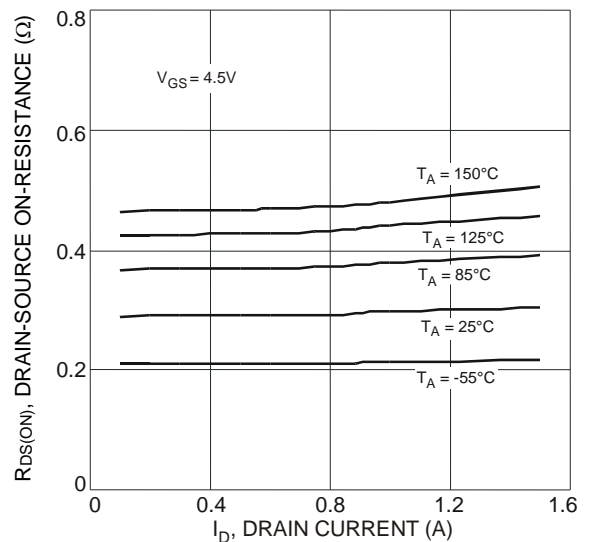
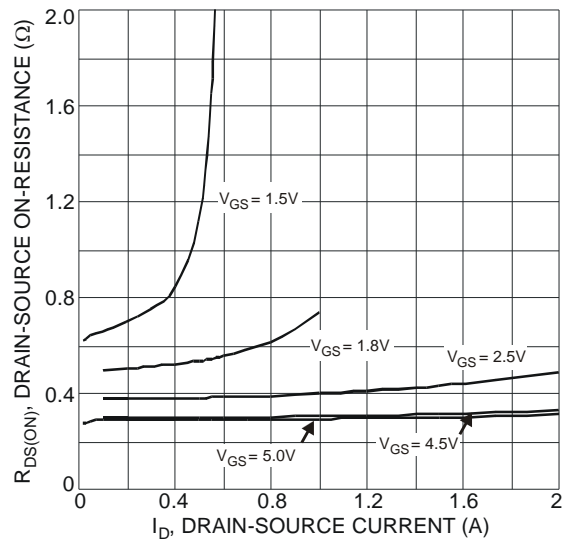
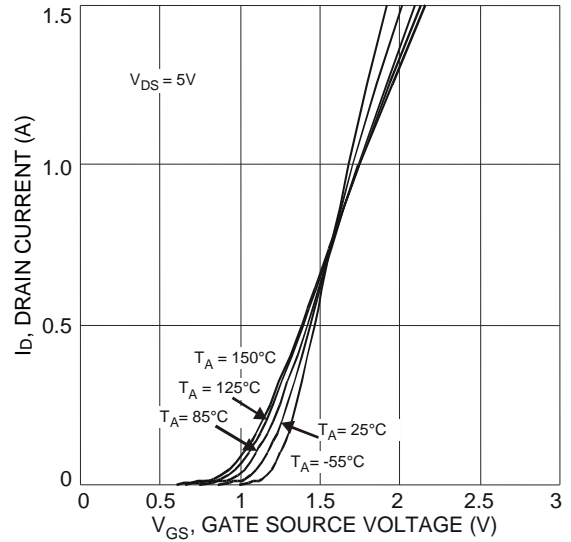
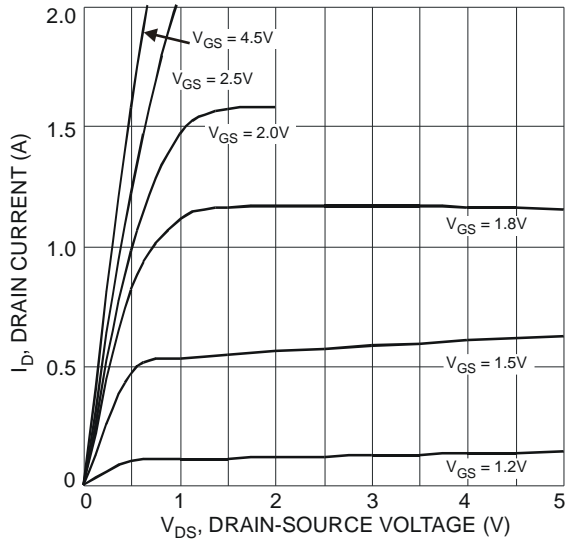
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	530	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	233.8	°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
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	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>	—	—	100	nA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±1.0	μA	V <sub>GS</sub> = ±4.5V, V <sub>DS</sub> = 0V
		—	—	±50		V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.5	—	0.9	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	0.3	0.48	Ω	V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 200mA
		—	0.35	0.5		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 600mA
		—	0.45	0.7		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 500mA
		—	0.55	0.9		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 350mA
		—	0.65	1.5		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 50mA
Forward Transfer Admittance	Y <sub>fs</sub>	—	1.4	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 400mA
Diode Forward Voltage (Note 6)	V <sub>SD</sub>	—	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 150mA, f = 1.0MHz
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C <sub>iss</sub>	—	36.0	—	pF	V <sub>DS</sub> =16V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	5.7	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	4.2	—	pF	
Gate Resistance	R <sub>g</sub>	—	68	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V
Total Gate Charge	Q <sub>g</sub>	—	0.5	—	nC	V <sub>GS</sub> =4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> =250mA
Gate-Source Charge	Q <sub>gs</sub>	—	0.07	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.1	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	4.06	—	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V, R <sub>L</sub> = 47Ω, R <sub>G</sub> = 10Ω, I <sub>D</sub> = 200mA
Turn-On Rise Time	t <sub>r</sub>	—	7.28	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	13.74	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	10.54	—	ns	

Notes: 5. Device soldered onto FR-4 PCB, minimum recommended soldering pad dimensions (25.4mm x 25.4mm x 1.6mm, 2oz Cu pad: 0.18mm<sup>2</sup> x 6).  
6. Short duration pulse test used to minimize self-heating effect.  
7. Guaranteed by design. Not subject to product testing.



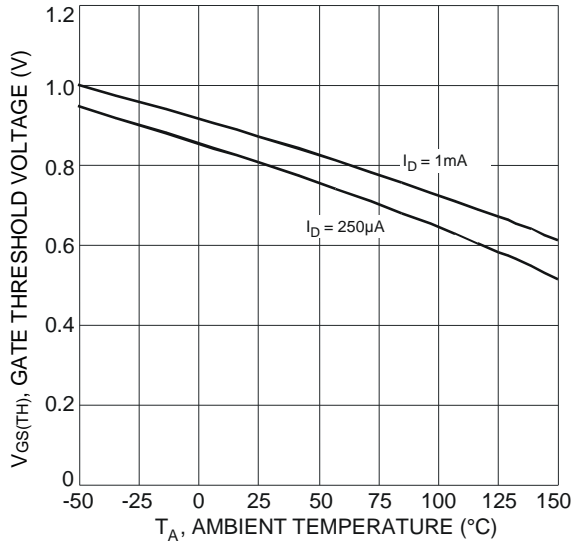


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

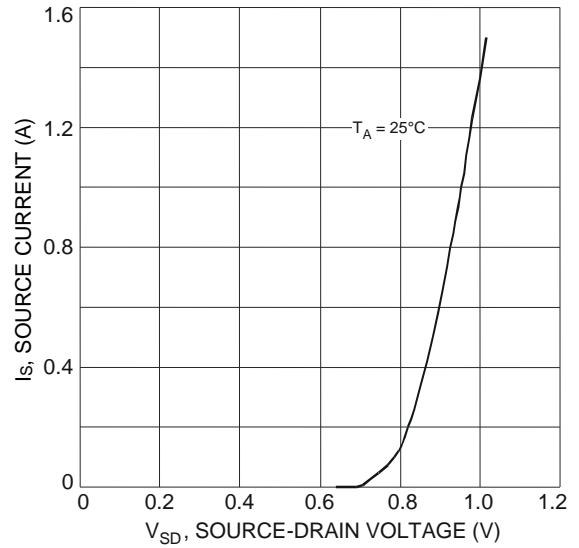


Fig. 8 Diode Forward Voltage vs. Current

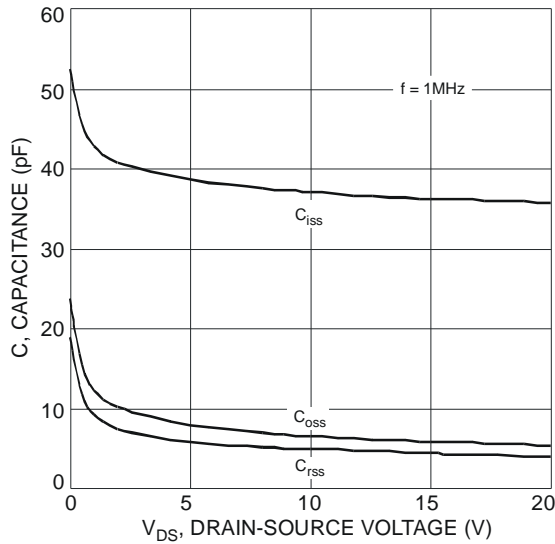


Fig. 9 Typical Capacitance

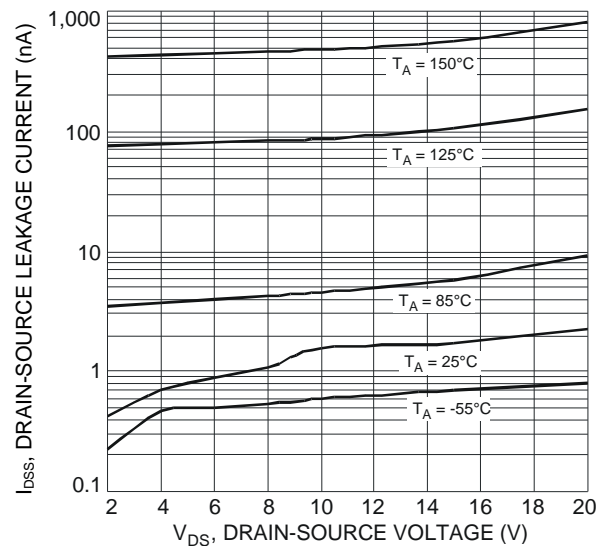


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

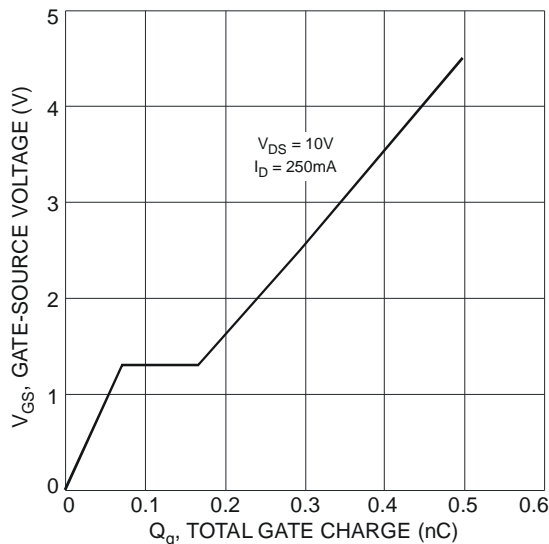


Fig. 11 Gate-Charge Characteristics

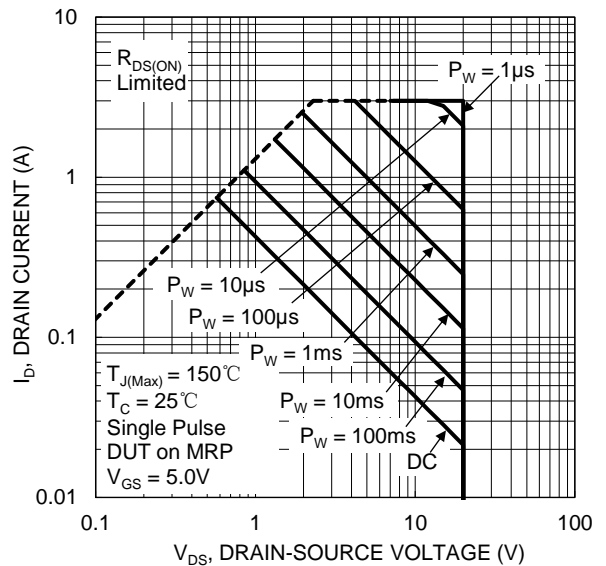


Fig. 12 SOA, Safe Operation Area

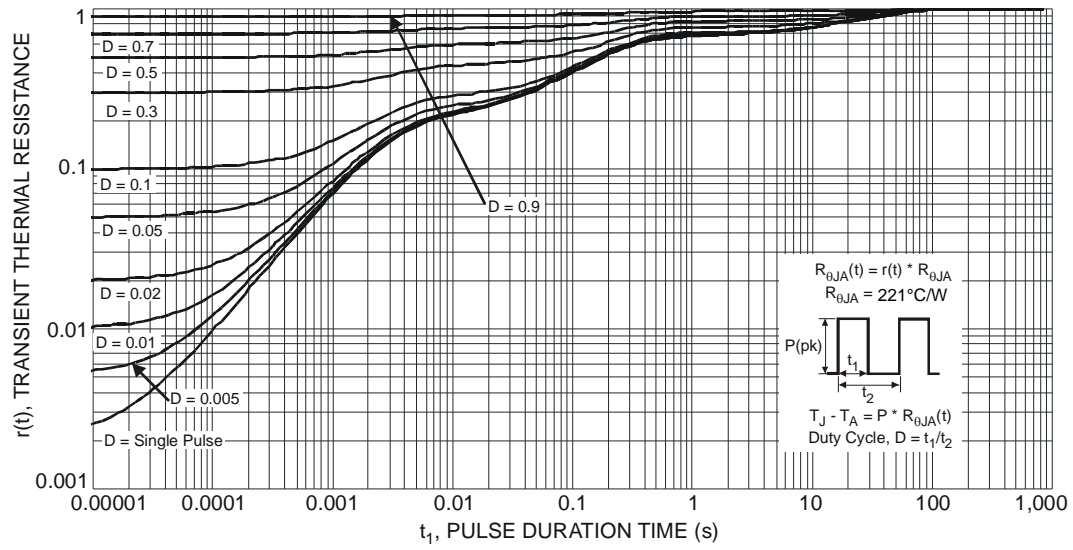
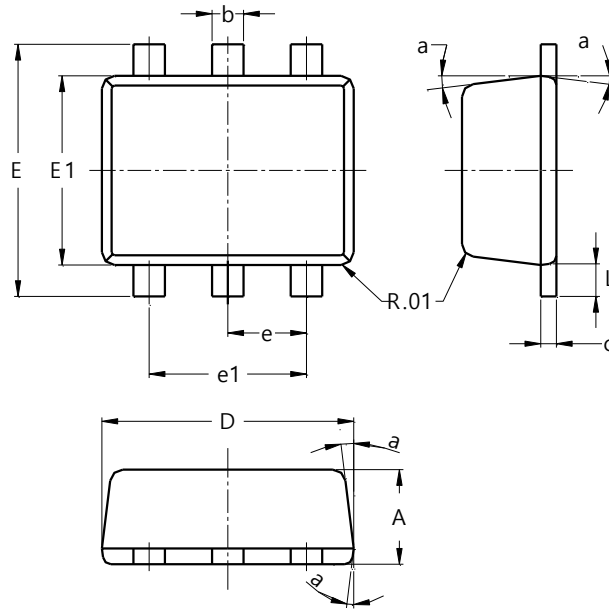


Fig.13 Transient Thermal Resistance

## Package Outline Dimensions

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

**SOT563**

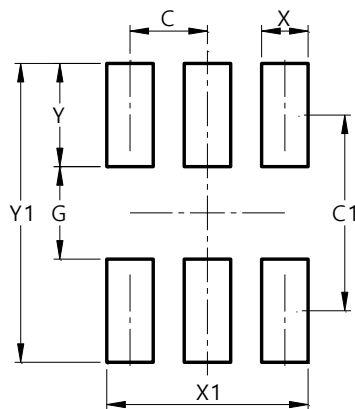


SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

## Suggested Pad Layout

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

**SOT563**



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940

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