

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
30V	60m $\Omega$ @ $V_{GS} = 10V$	3.5A
	100m $\Omega$ @ $V_{GS} = 4.5V$	2.8A

## Description and Applications

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.

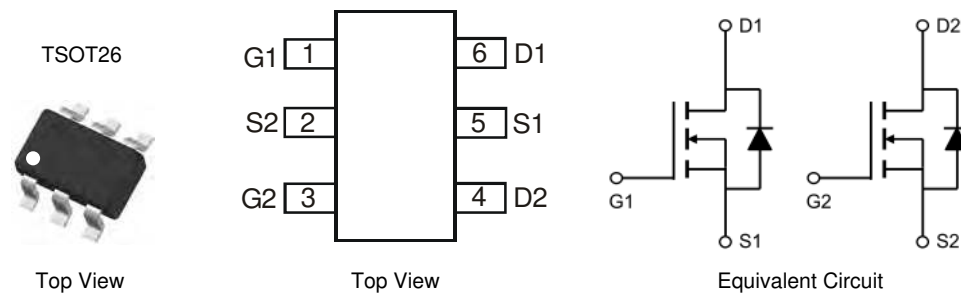
- Backlighting
- DC-DC Converters
- Power management functions

## 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)**
- **Qualified to AEC-Q101 standards for High Reliability**

## Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.013 grams (approximate)

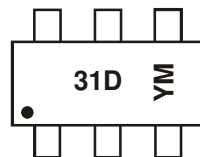


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3135LVT-7	TSOT26	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



31D = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016
Code	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** @  $T_A = 25^\circ\text{C}$  unless otherwise stated

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	3.5 2.7	A
	$t < 10\text{s}$	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	4.3 3.3	A
Continuous Drain Current (Note 6) $V_{GS} = 4.5\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	2.8 2.1	A
	$t < 10\text{s}$	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	3.4 2.6	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)			$I_{DM}$	25	A
Maximum Body Diode Forward Current (Note 5)			$I_S$	1.5	A

**Thermal Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise stated

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		$P_D$	0.84	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	155	$^\circ\text{C/W}$
	$t < 10\text{s}$		109	
Total Power Dissipation (Note 6)		$P_D$	1.27	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	102	$^\circ\text{C/W}$
	$t < 10\text{s}$		72	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	34	
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 stated

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1.0	$\mu\text{A}$	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1.3	1.8	2.2	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	35 54	60 100	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 3.1\text{A}$
		-	-	-		$V_{GS} = 4.5\text{V}, I_D = 2\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	-	4	-	S	$V_{DS} = 5\text{V}, I_D = 3.1\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.8	1	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	-	305	-	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	40	-		
Reverse Transfer Capacitance	$C_{rss}$	-	40	-		
Gate Resistance	$R_g$	-	1.4	-	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_g$	-	4.1	-	nC	$V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}, I_D = 3.1\text{A}$
Total Gate Charge	$Q_g$	-	9.0	-		
Gate-Source Charge	$Q_{gs}$	-	1.2	-		
Gate-Drain Charge	$Q_{gd}$	-	1.5	-		
Turn-On Delay Time	$t_{D(on)}$	-	2.6	-	ns	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V},$ $R_G = 3\Omega, R_L = 4.7\Omega$
Turn-On Rise Time	$t_r$	-	4.6	-		
Turn-Off Delay Time	$t_{D(off)}$	-	13.1	-		
Turn-Off Fall Time	$t_f$	-	2.5	-		

- 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 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

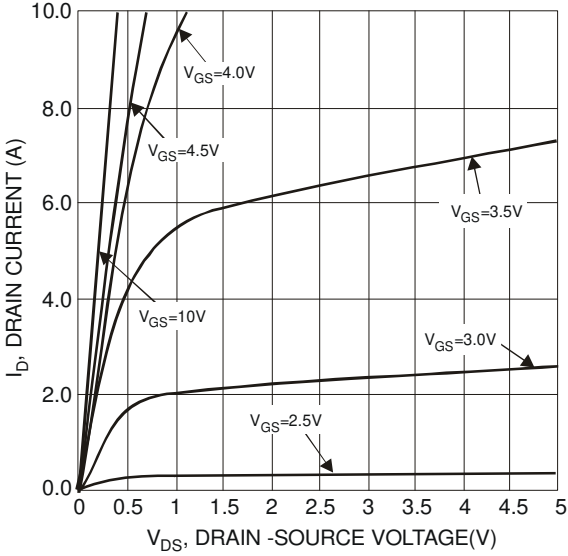


Fig. 1 Typical Output Characteristics

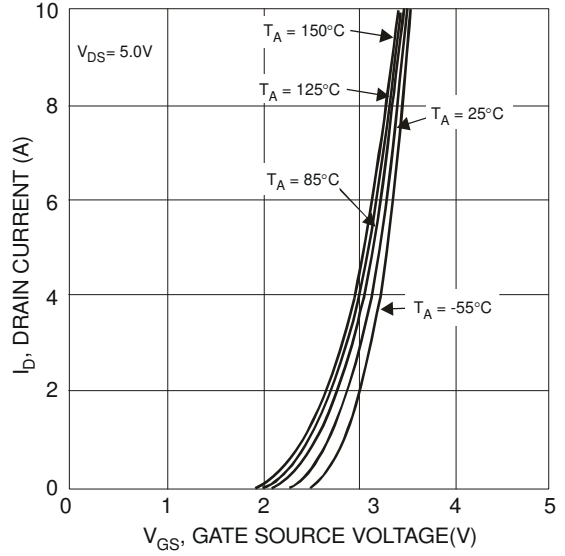


Fig. 2 Typical Transfer Characteristics

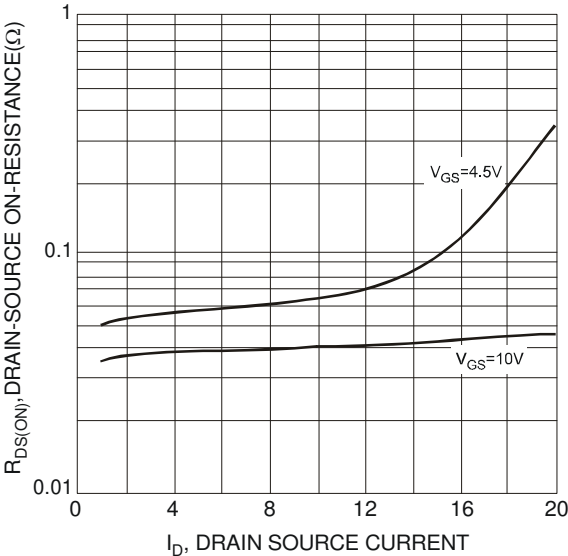


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

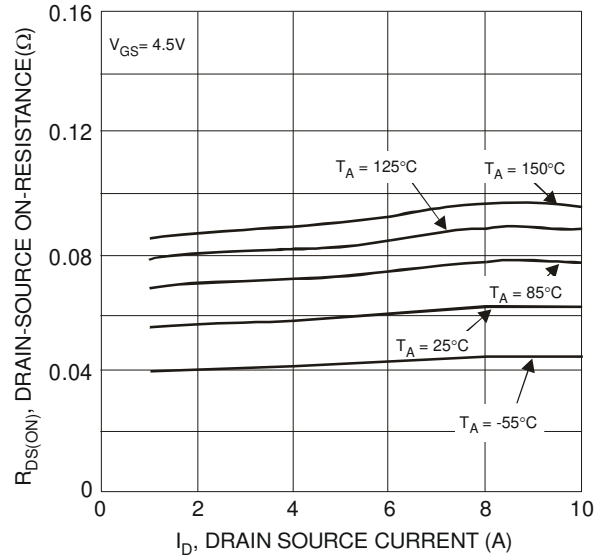


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

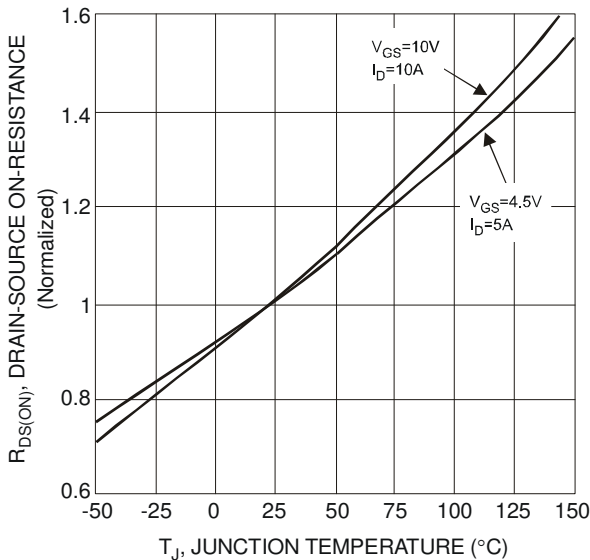


Fig. 5 On-Resistance Variation with Temperature

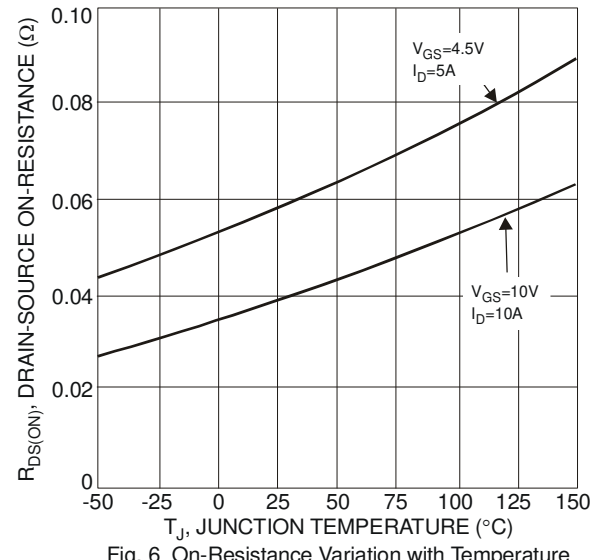


Fig. 6 On-Resistance Variation with Temperature

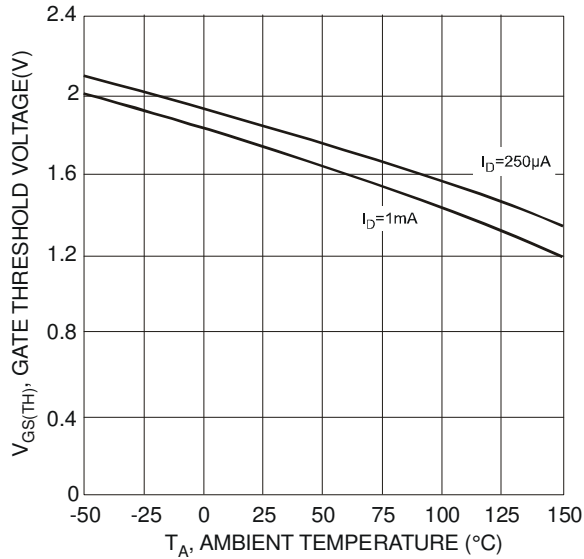


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

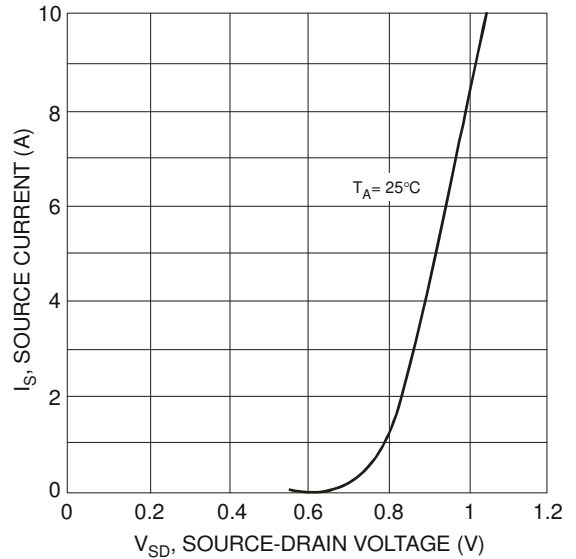


Fig. 8 Diode Forward Voltage vs. Current

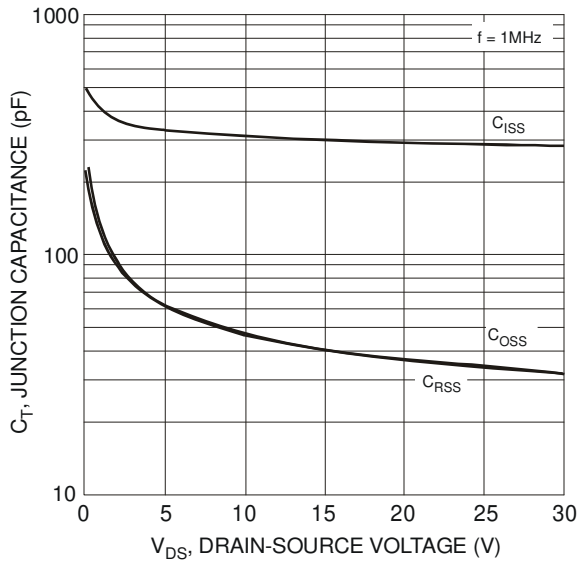


Fig. 9 Typical Junction Capacitance

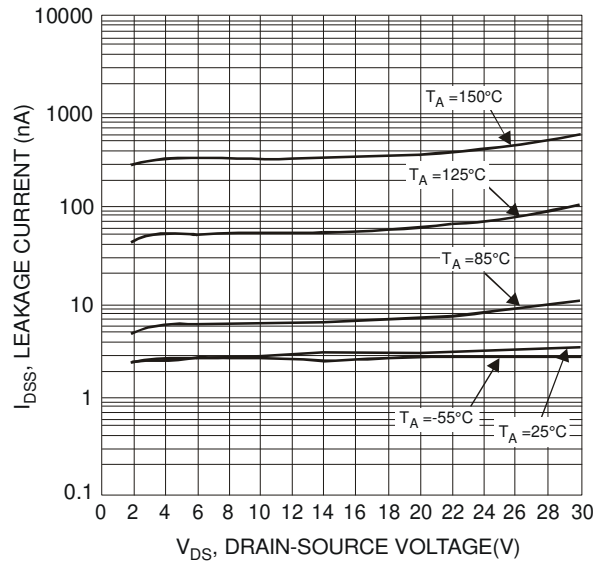


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

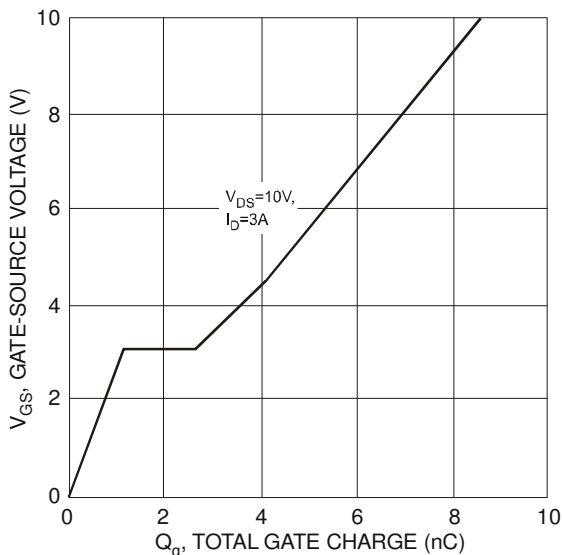


Fig. 11 Gate-Charge Characteristics

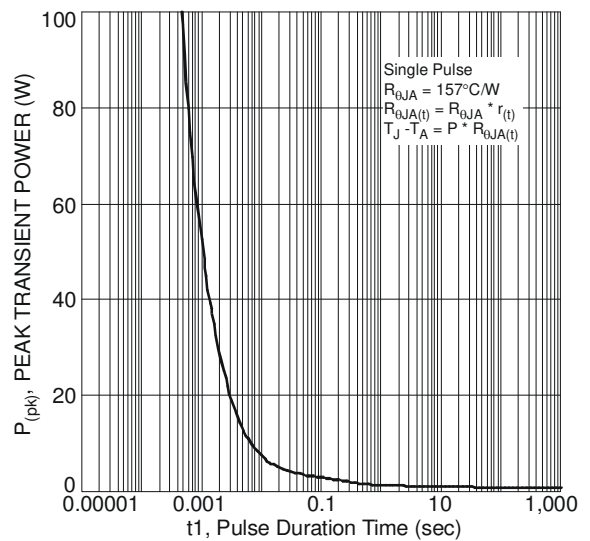
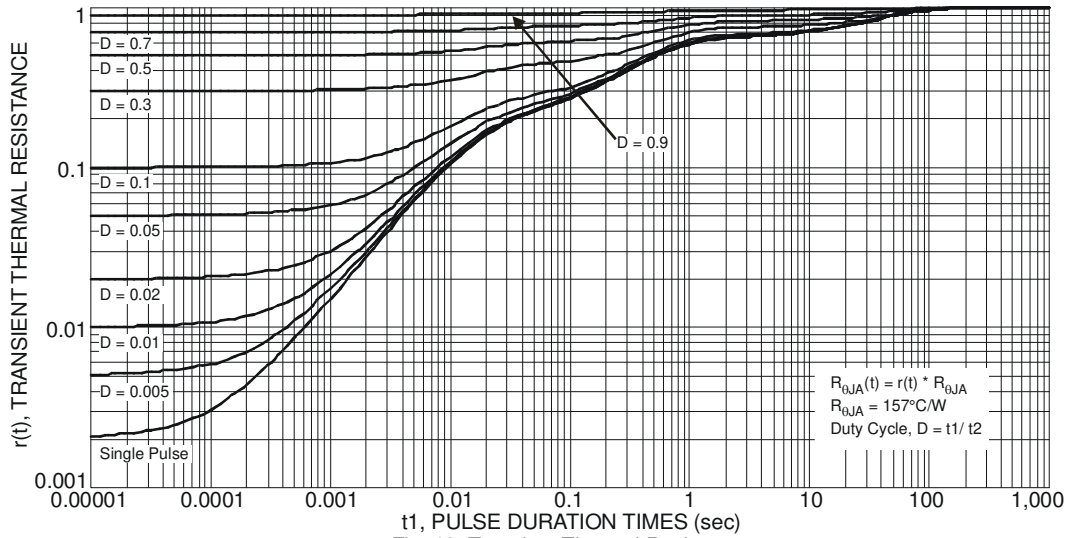
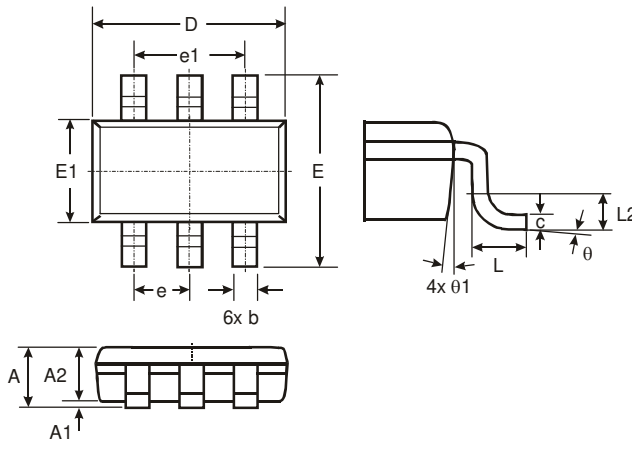


Fig. 12 Single Pulse Maximum Power Dissipation



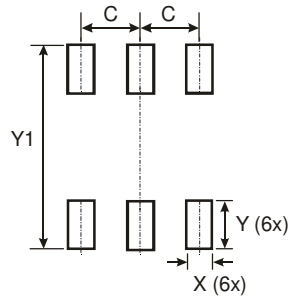
**Package Outline Dimensions**



TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.01	0.10	—
A2	0.84	0.90	—
D	—	—	2.90
E	—	—	2.80
E1	—	—	1.60
b	0.30	0.45	—
c	0.12	0.20	—
e	—	—	0.95
e1	—	—	1.90
L	0.30	0.50	—
L2	—	—	0.25
θ	0°	8°	4°
θ1	4°	12°	—

All Dimensions in mm

**Suggested Pad Layout**



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.199

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