NEW PRODUCT

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)\ MAX}$	I_D T_A = +25°C
12V	10mΩ @ V_{GS} = 4.5V	10.7A
	12mΩ @ V_{GS} = 2.5V	9.8A
	14mΩ @ V_{GS} = 1.8V	9.1A
	18mΩ @ V_{GS} = 1.5V	8.0A
	41mΩ @ V_{GS} = 1.2V	5.3A

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

- Load Switch
- DC-DC Converters
- Power Management Functions

Features

- Low On-Resistance
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

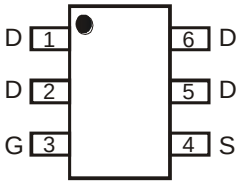
- Case: TSOT26
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)



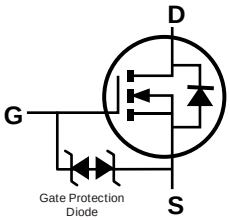
TSOT26



Top View



Top View
Pin Configuration



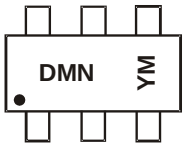
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN1019UVT-7	TSOT26	3,000/Tape & Reel
DMN1019UVT-13	TSOT26	10,000/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 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



DMN = Product Type Marking Code
YM or YM = Date Code Marking
Y or Y = Year (ex: C = 2015)
M = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022
Code	C	D	E	F	G	H	I	J

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

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	12	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	10.7 8.6	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	12.7 10.1	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	70	A
Maximum Body Diode Forward Current (Note 5)			I_S	2	A
Avalanche Current (Note 6) L = 0.1mH			I_{AS}	9.7	A
Avalanche Energy (Note 6) L =0.1mH			E_{AS}	4.7	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.73	W
	T_A = +70°C		1.11	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	72.2	°C/W
	t<10s		37.5	°C/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	14.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	12	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 12V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±2	µA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.35	0.53	0.8	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	7	10	mΩ	V_{GS} = 4.5V, I_D = 9.7A
		—	8	12		V_{GS} = 2.5V, I_D = 9A
		—	10	14		V_{GS} = 1.8V, I_D = 8.1A
		—	14	18		V_{GS} = 1.5V, I_D = 4.5A
		—	28	41		V_{GS} = 1.2V, I_D = 2.4A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 10A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2588	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	415	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	394	—	pF	
Gate Resistance	R_g	—	1.1	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 8V)	Q_g	—	50.4	—	nC	V_{DS} = 4V, I_D = 10A
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	28.0	—		
Gate-Source Charge	Q_{gs}	—	3.2	—		
Gate-Drain Charge	Q_{gd}	—	5.6	—		
Turn-On Delay Time	$t_{D(ON)}$	—	4.7	—	ns	V_{DD} = 4V, V_{GEN} = 5V, I_D = 10A, R_G = 1Ω, R_L = 0.4Ω
Turn-Off Delay Time	$t_{D(OFF)}$	—	32.2	—	ns	
Turn-On Rise Time	t_R	—	3.7	—	ns	
Turn-Off Fall Time	t_F	—	11.6	—	ns	
Body Diode Reverse Recovery Time	t_{RR}	—	20.55	—	ns	I_F = 10A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	—	4.5	—	nC	I_F = 10A, di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad.
6. I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

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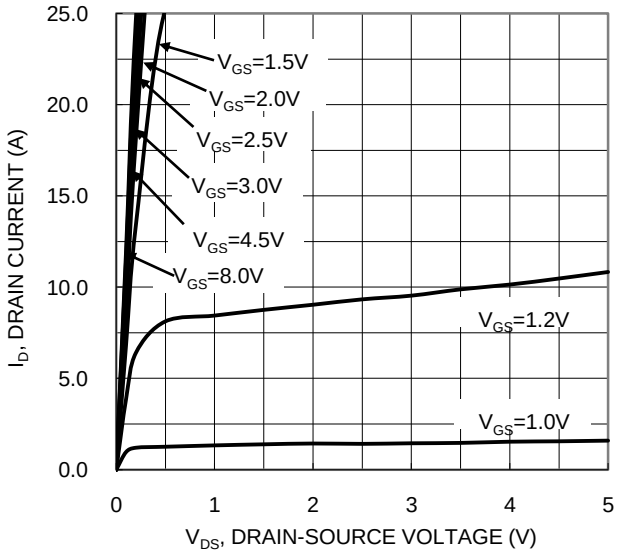

Figure 1 Typical Output Characteristic

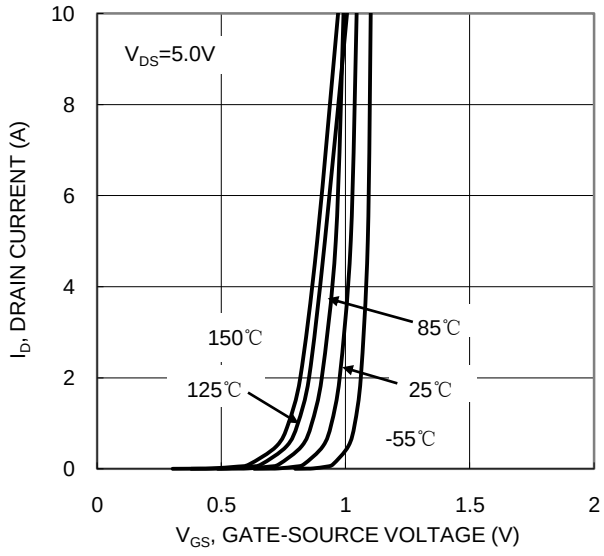

Figure 2 Typical Transfer Characteristic

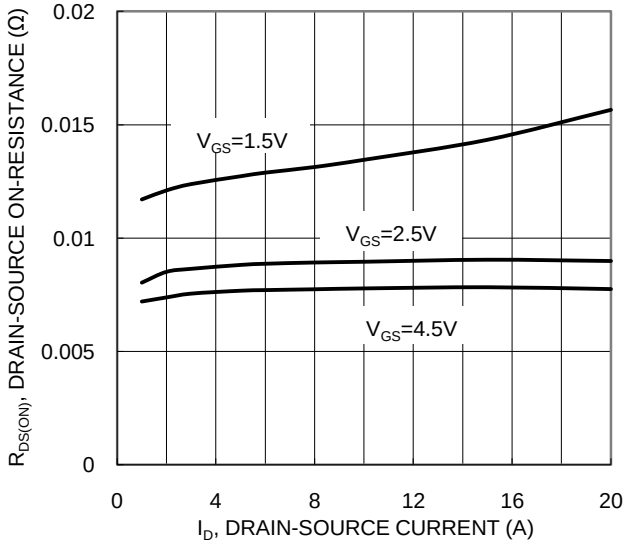

Figure 3 Typical On-Resistance vs Drain Current and Gate Voltage

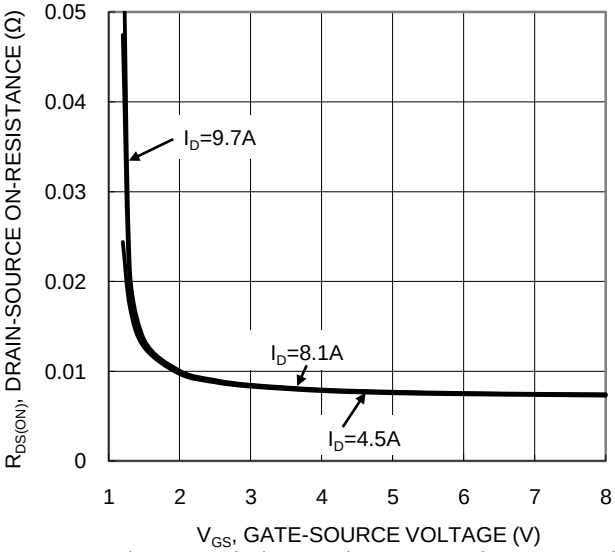

Figure 4 Typical On-Resistance vs Drain Current and Gate Voltage

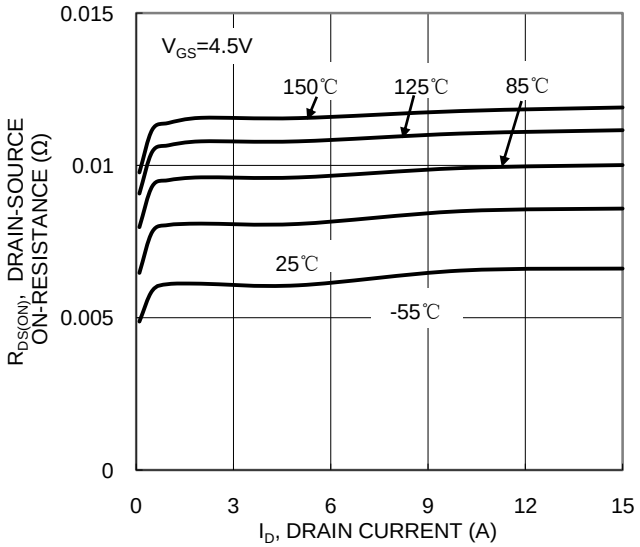

Figure 5 Typical On-Resistance vs Drain Current and Temperature

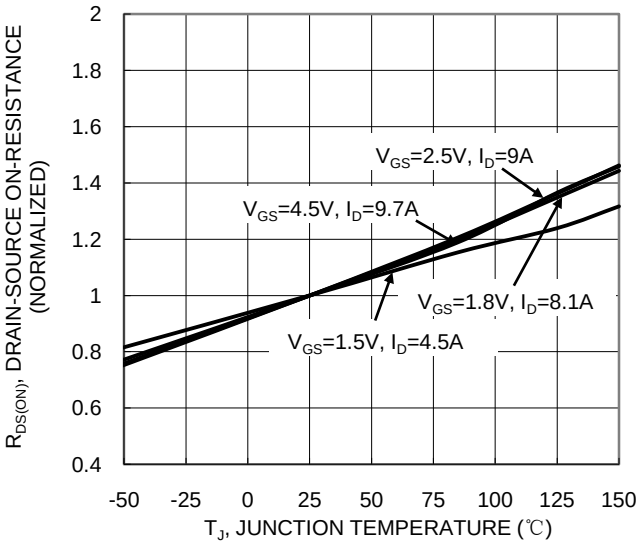

Figure 6 On-Resistance Variation with Temperature

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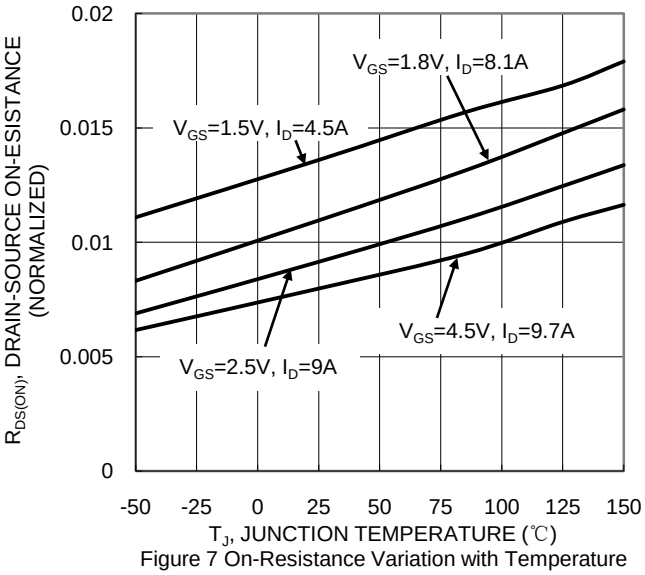

Figure 7 On-Resistance Variation with Temperature

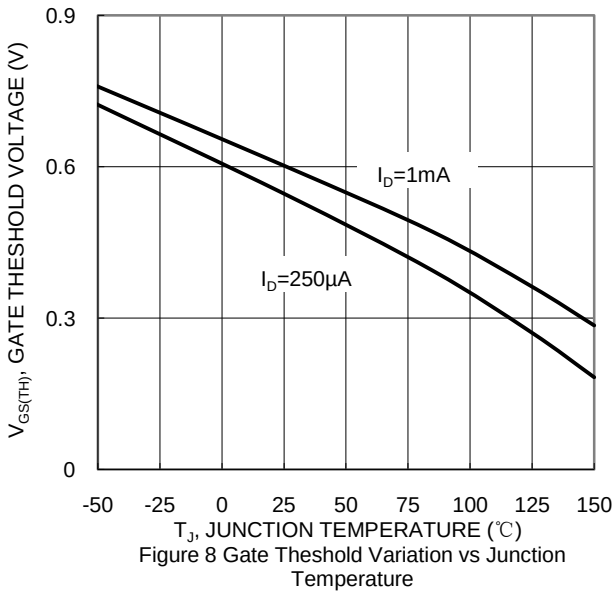

Figure 8 Gate Theshold Variation vs Junction Temperature

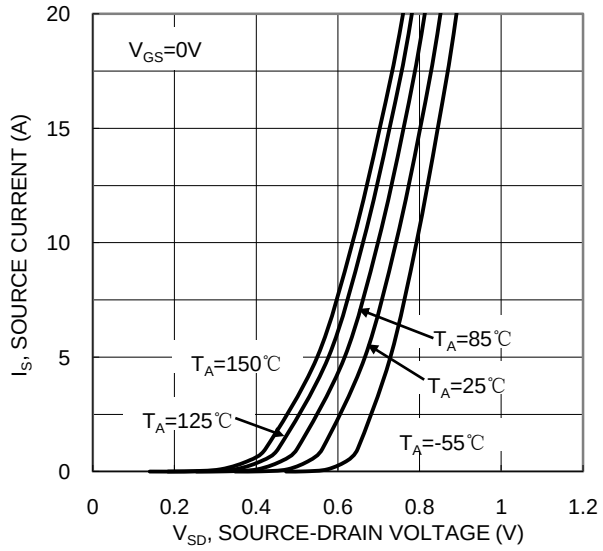

Figure 9 Diode Forward Voltage vs Current

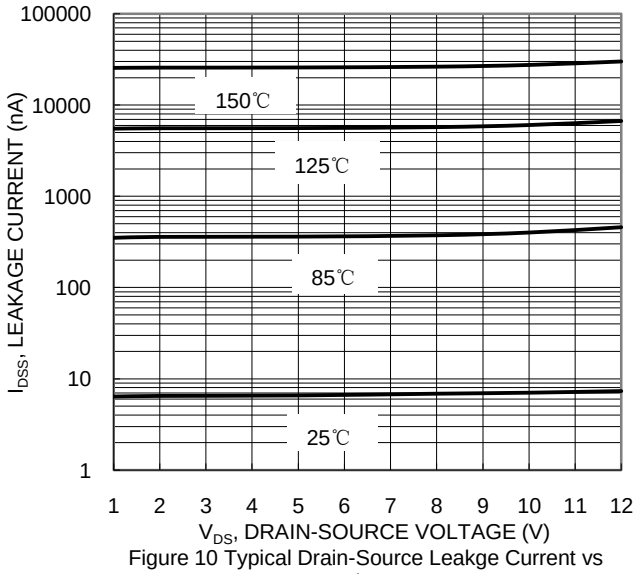

Figure 10 Typical Drain-Source Leakge Current vs Voltage

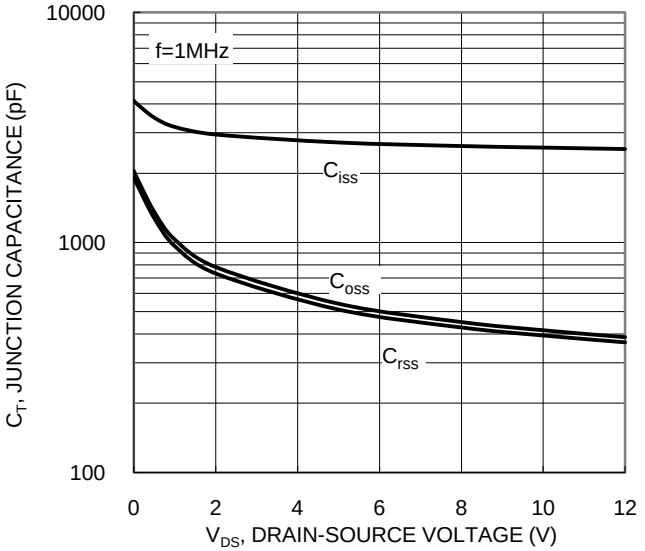

Figure 11 Typical Junction Capacitance

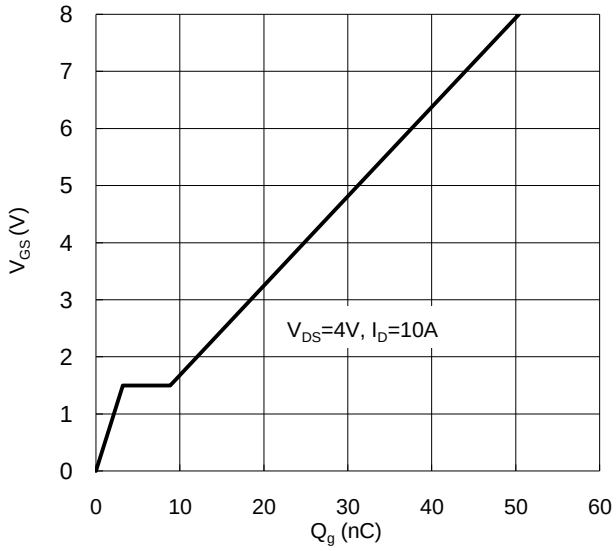

Figure 12 Gate Charge

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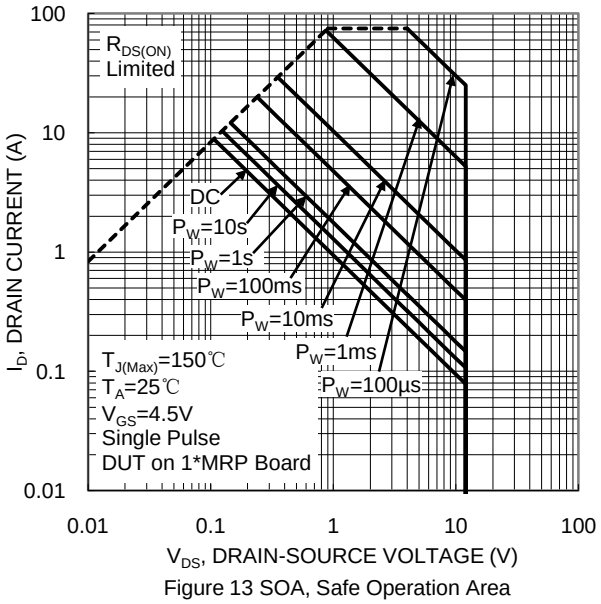

Figure 13 SOA, Safe Operation Area

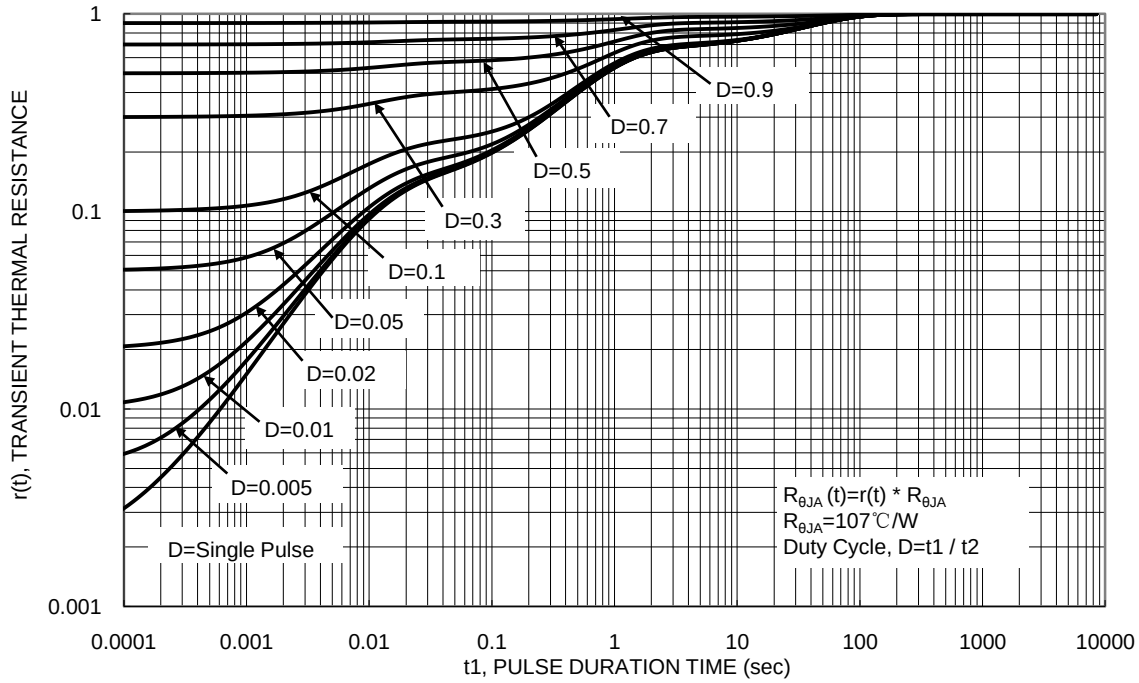

Figure 14 Transient Thermal Resistance

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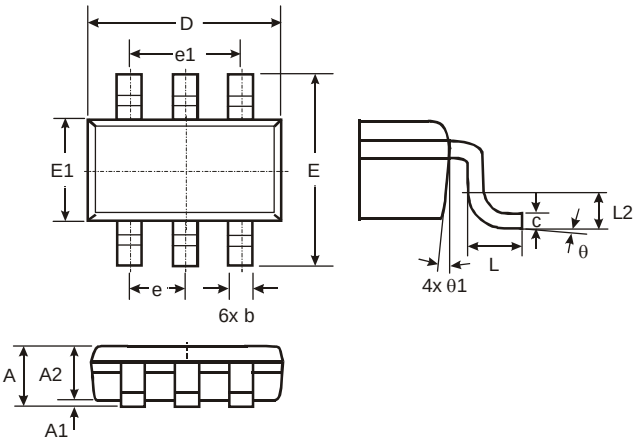
Package Outline Dimensions

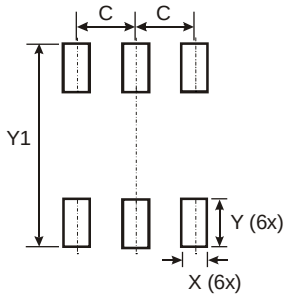
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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

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