

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) MAX}$	$I_D$ $T_A = +25^\circ C$
12V	10m $\Omega$ @ $V_{GS} = 4.5V$	10.7A
	12m $\Omega$ @ $V_{GS} = 2.5V$	9.8A
	14m $\Omega$ @ $V_{GS} = 1.8V$	9.1A
	18m $\Omega$ @ $V_{GS} = 1.5V$	8.0A
	41m $\Omega$ @ $V_{GS} = 1.2V$	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  $\text{e3}$
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

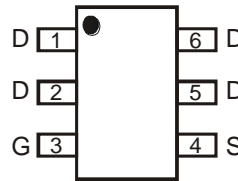
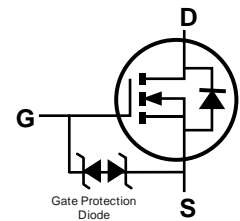
**NEW PRODUCT**


ESD PROTECTED

TSOT26



Top View


 Top View  
Pin Configuration


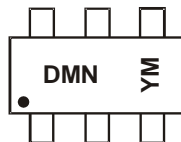
Equivalent Circuit

## 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](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

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

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

**Thermal Characteristics**

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C		P <sub>D</sub>	1.73	W
	T <sub>A</sub> = +70°C			1.11	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R <sub>θJA</sub>	72.2	°C/W
	t < 10s			37.5	
Thermal Resistance, Junction to Case (Note 5)			R <sub>θJC</sub>	14.4	°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
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	12	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 12V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	±2	µA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.35	0.53	0.8	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	7	10	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 9.7A
		—	8	12		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 9A
		—	10	14		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 8.1A
		—	14	18		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 4.5A
		—	28	41		V <sub>GS</sub> = 1.2V, I <sub>D</sub> = 2.4A
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>ISS</sub>	—	2588	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>OSS</sub>	—	415	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	394	—	pF	
Gate Resistance	R <sub>g</sub>	—	1.1	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 8V)	Q <sub>g</sub>	—	50.4	—	nC	V <sub>DS</sub> = 4V, I <sub>D</sub> = 10A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	28.0	—		
Gate-Source Charge	Q <sub>gs</sub>	—	3.2	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	5.6	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	4.7	—	ns	V <sub>DD</sub> = 4V, V <sub>GEN</sub> = 5V, I <sub>D</sub> = 10A, R <sub>G</sub> = 1Ω, R <sub>L</sub> = 0.4Ω
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	32.2	—	ns	
Turn-On Rise Time	t <sub>R</sub>	—	3.7	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	11.6	—	ns	
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	20.55	—	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	—	4.5	—	nC	I <sub>F</sub> = 10A, di/dt = 100A/µs

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad.
  - I<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

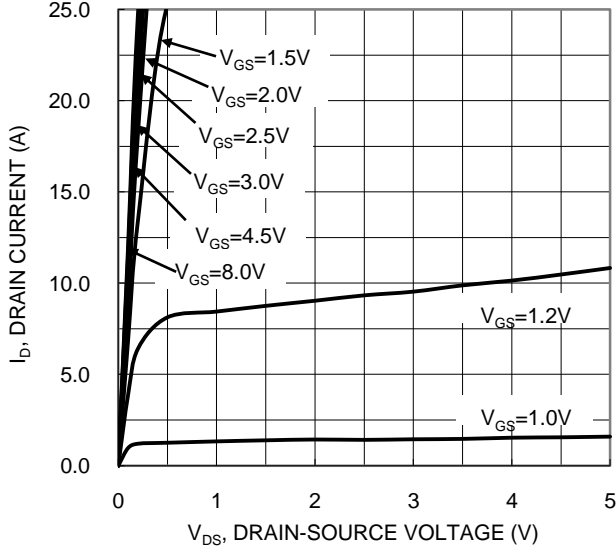


Figure 1 Typical Output Characteristic

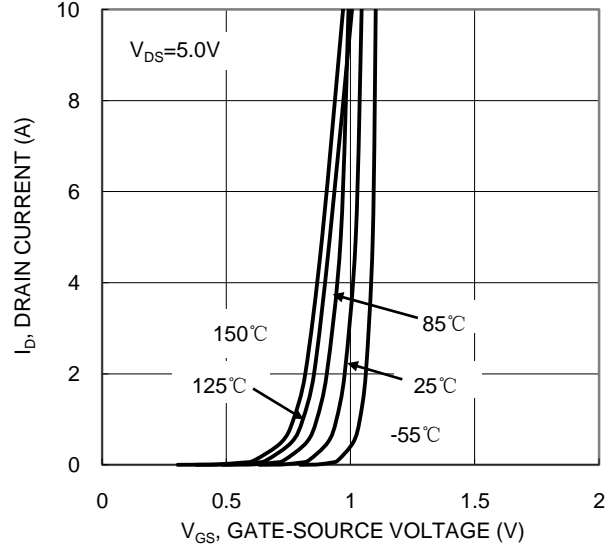


Figure 2 Typical Transfer Characteristic

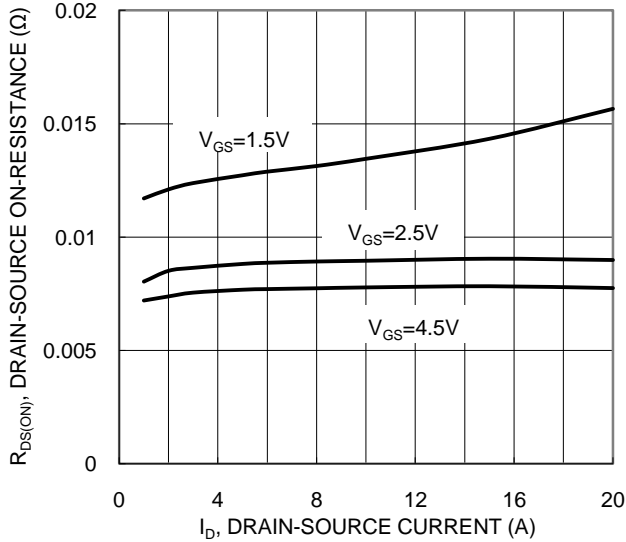


Figure 3 Typical On-Resistance vs Drain Current and Gate Voltage

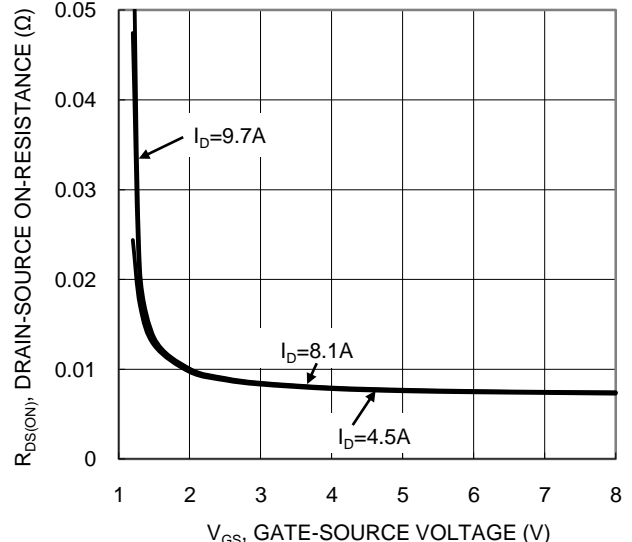


Figure 4 Typical On-Resistance vs Drain Current and Gate Voltage

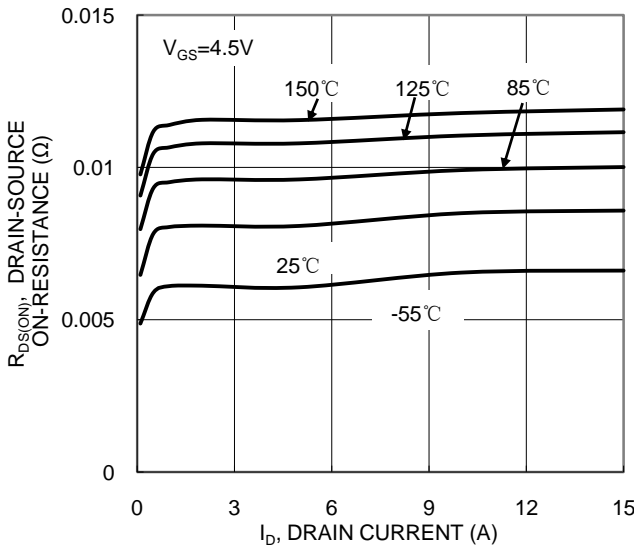


Figure 5 Typical On-Resistance vs Drain Current and Temperature

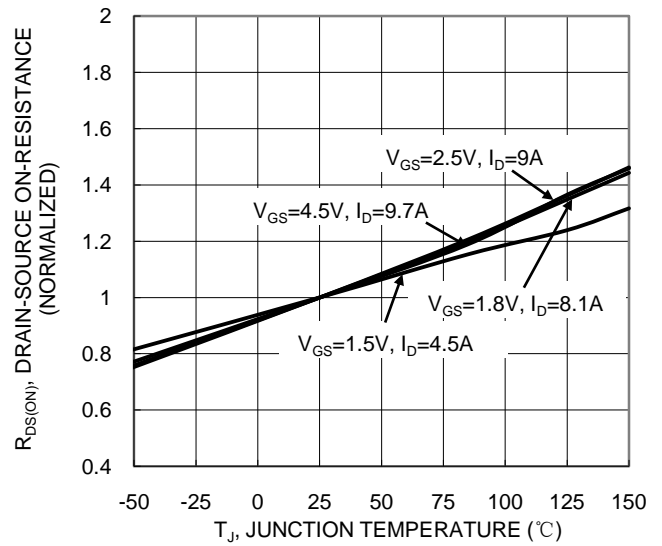


Figure 6 On-Resistance Variation with Temperature

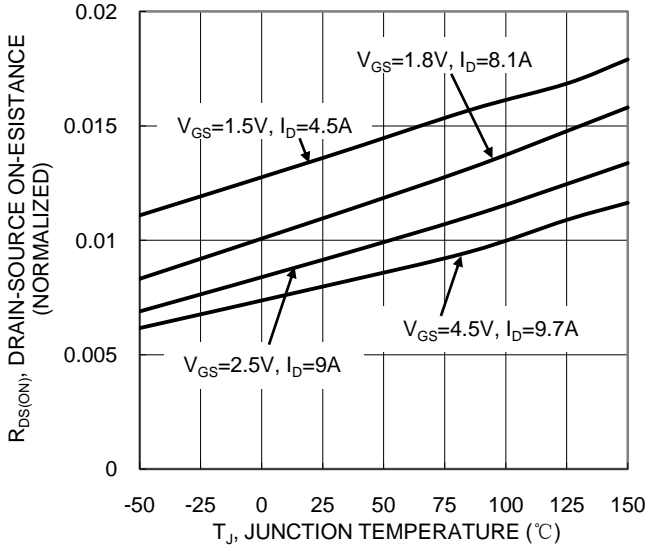


Figure 7 On-Resistance Variation with Temperature

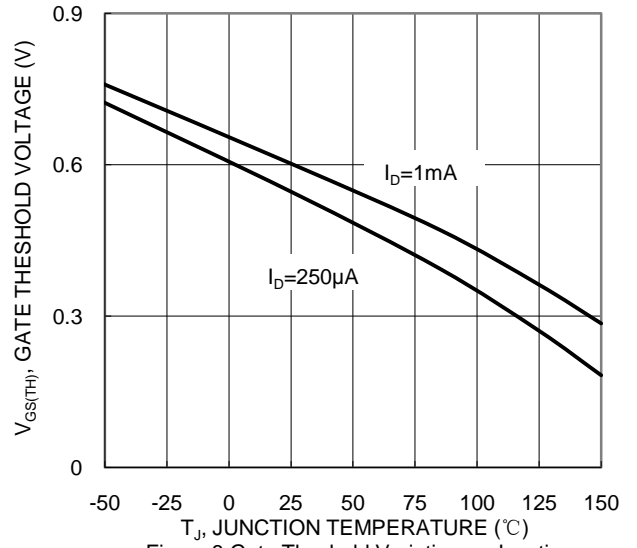


Figure 8 Gate Threshold Variation vs Junction Temperature

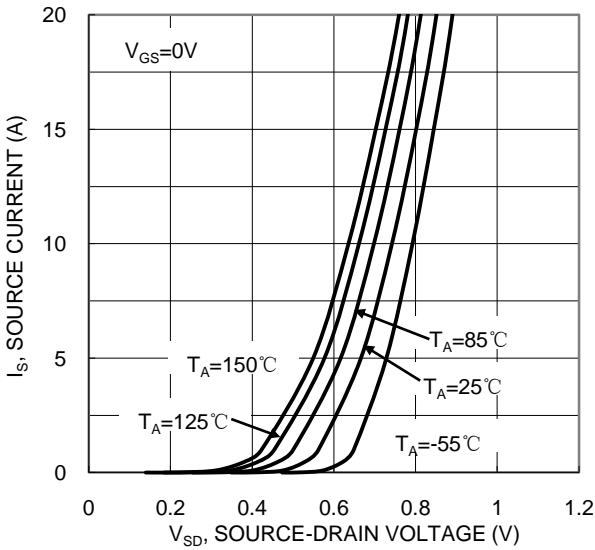


Figure 9 Diode Forward Voltage vs Current

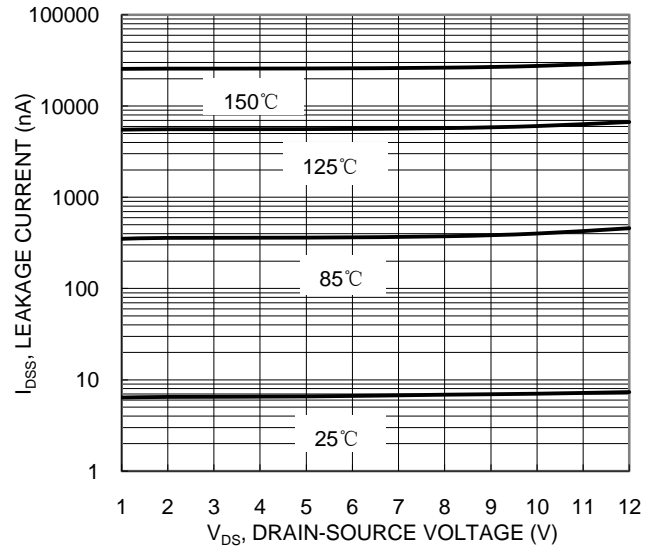


Figure 10 Typical Drain-Source Leakage Current vs Voltage

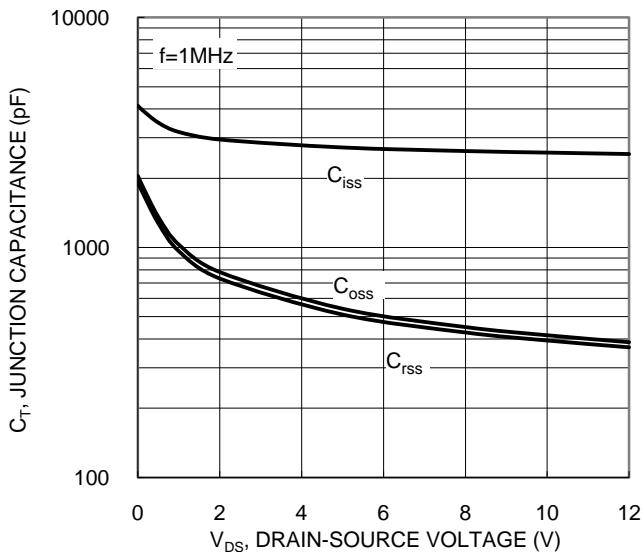


Figure 11 Typical Junction Capacitance

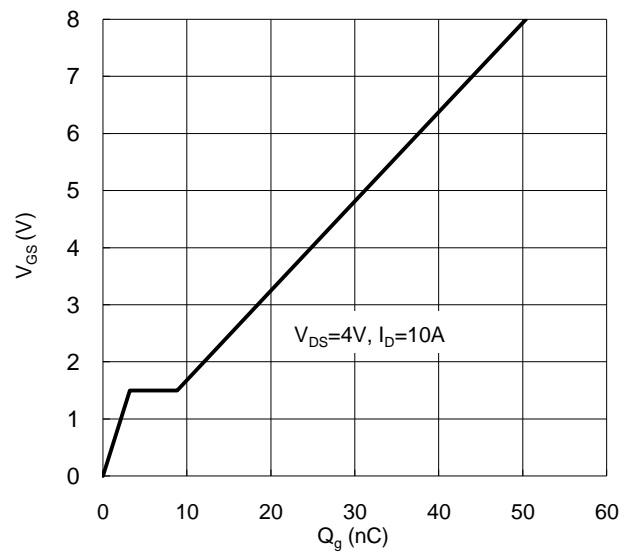
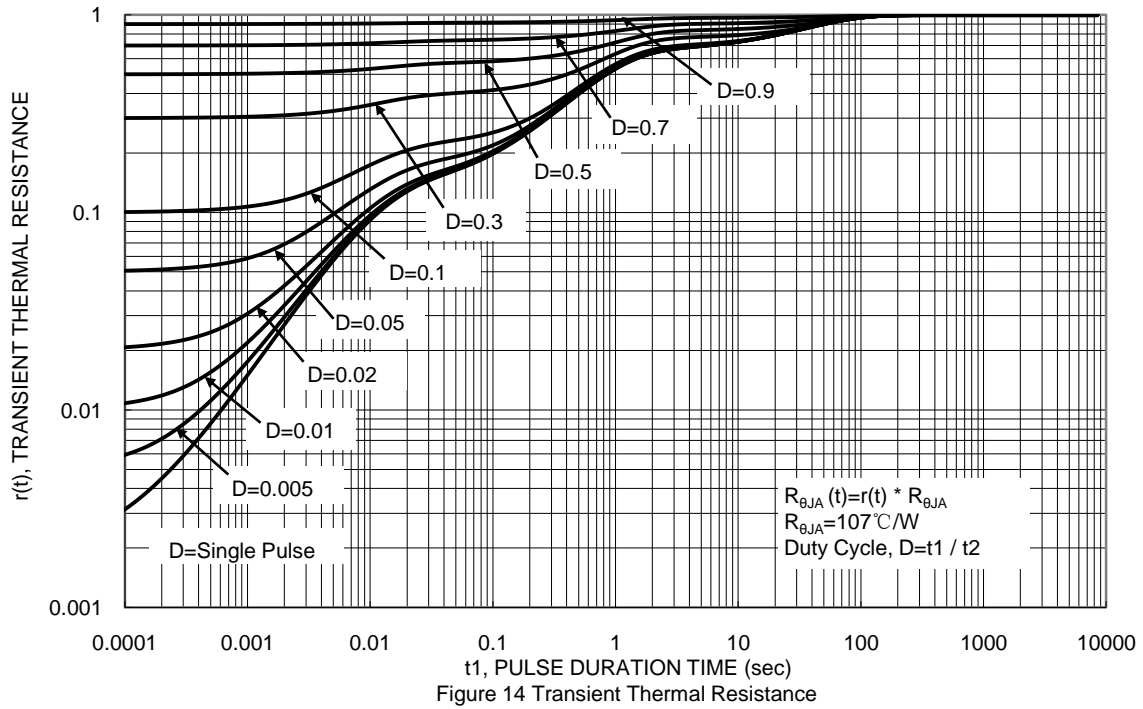
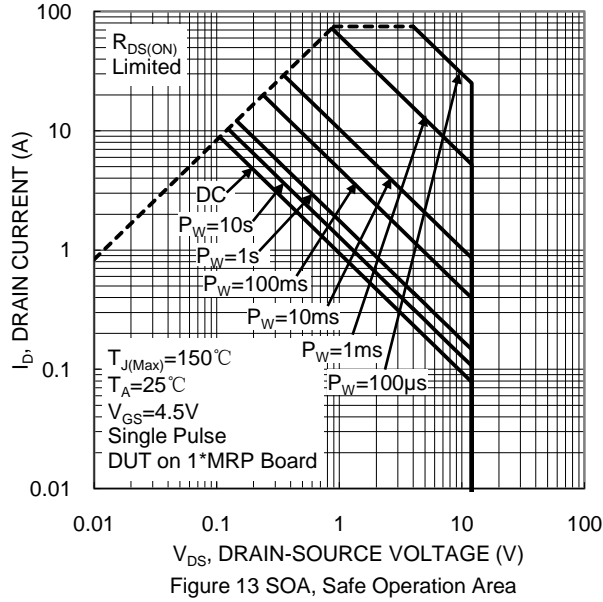
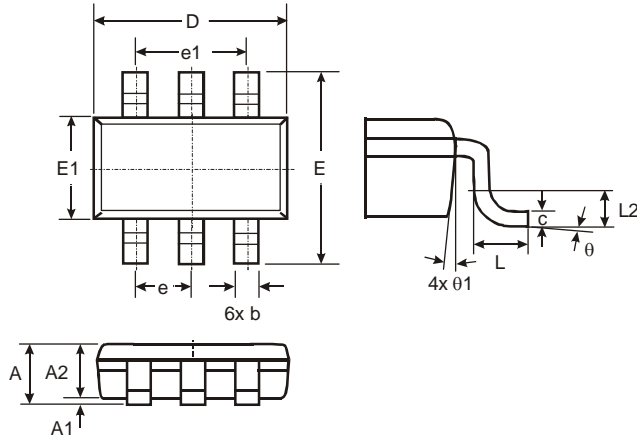


Figure 12 Gate Charge



**Package Outline Dimensions**

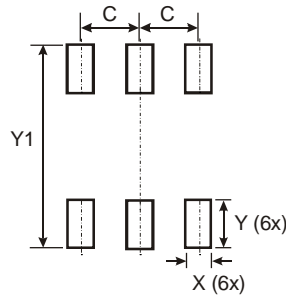
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
theta	0°	8°	4°
theta1	4°	12°	-
<b>All Dimensions in mm</b>			

**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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