

Product Summary

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

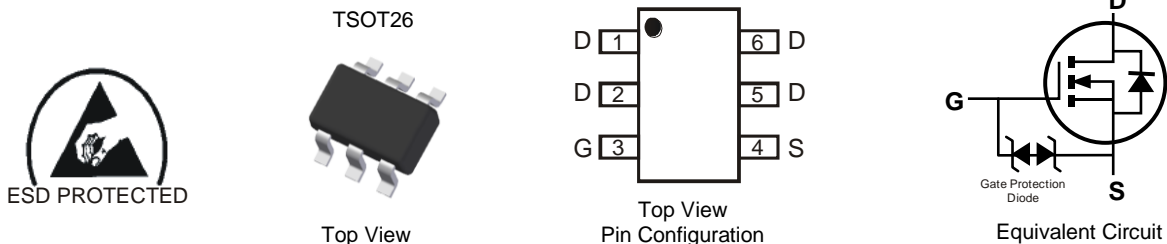
- Load Switch
- DC-DC Converters
- Power Management Functions

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 
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

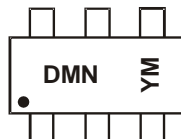


Ordering Information (Note 4)

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

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 _{θJA}	72.2	°C/W
	t < 10s		37.5	
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	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:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad.
 - I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

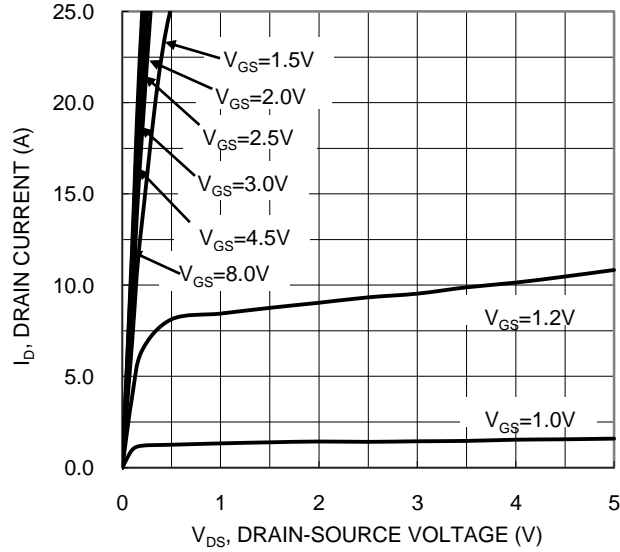


Figure 1 Typical Output Characteristic

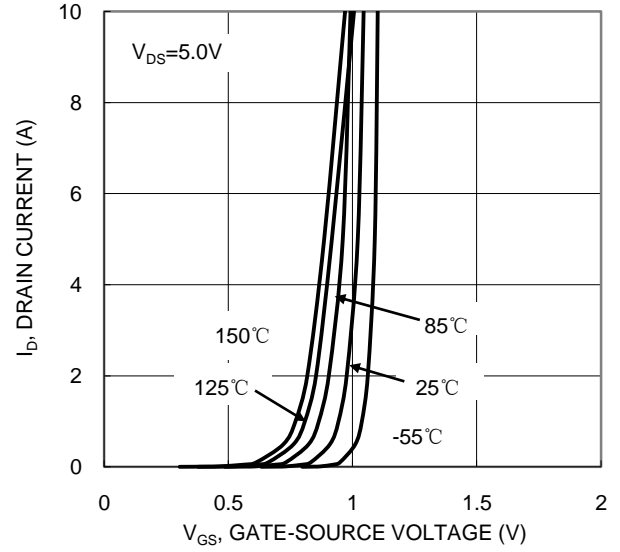


Figure 2 Typical Transfer Characteristic

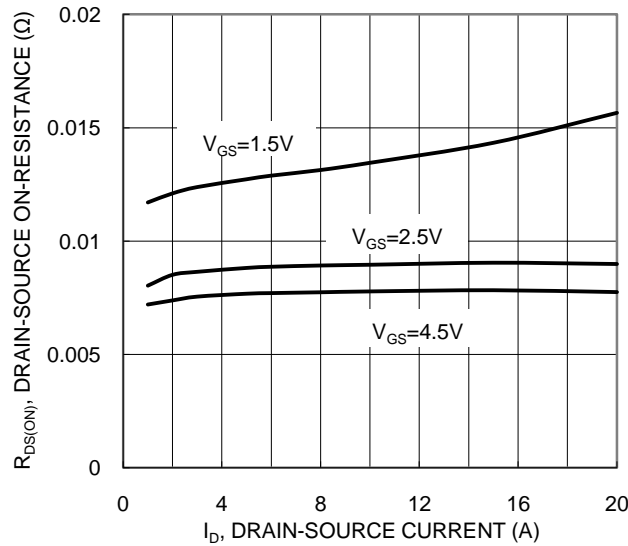


Figure 3 Typical On-Resistance vs Drain Current and Gate Voltage

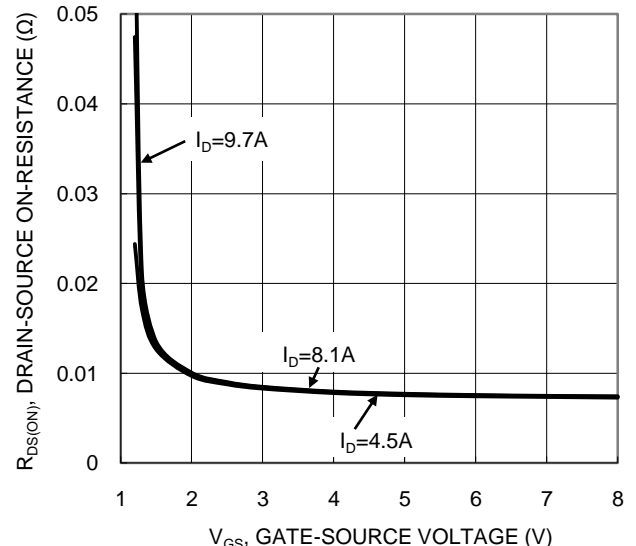


Figure 4 Typical On-Resistance vs Drain Current and Gate Voltage

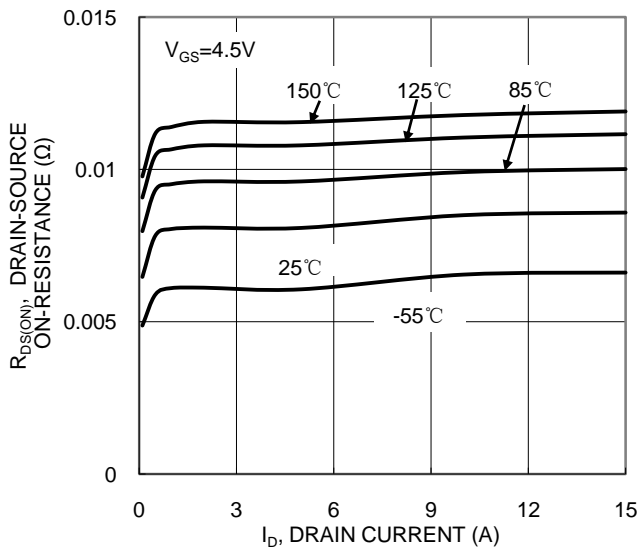


Figure 5 Typical On-Resistance vs Drain Current and Temperature

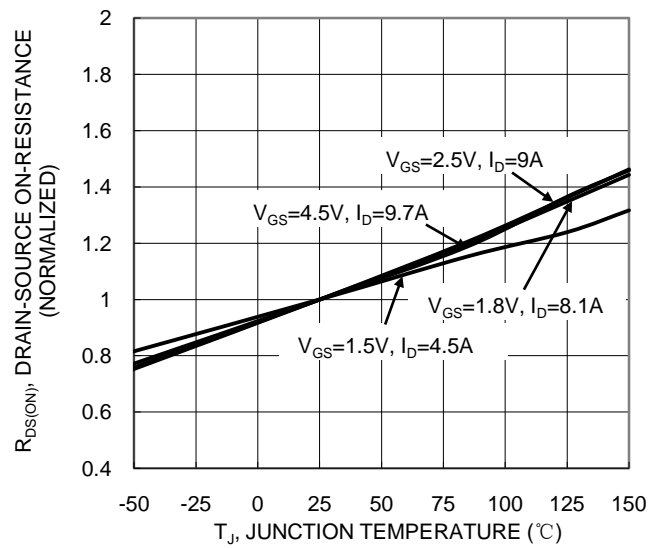


Figure 6 On-Resistance Variation with Temperature

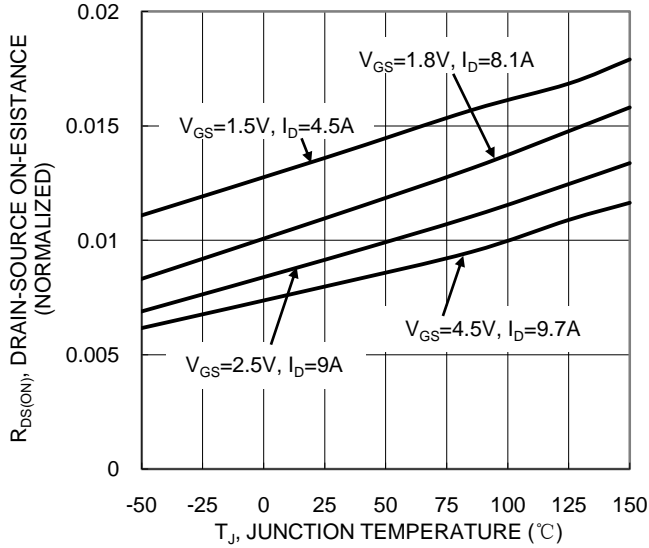


Figure 7 On-Resistance Variation with Temperature

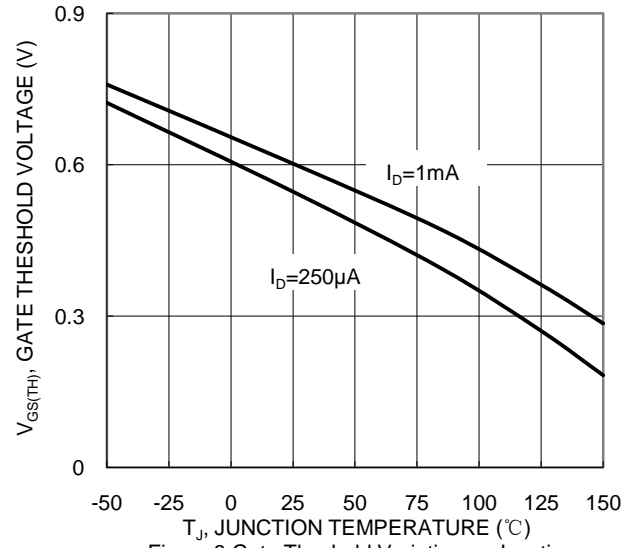


Figure 8 Gate Threshold Variation vs Junction Temperature

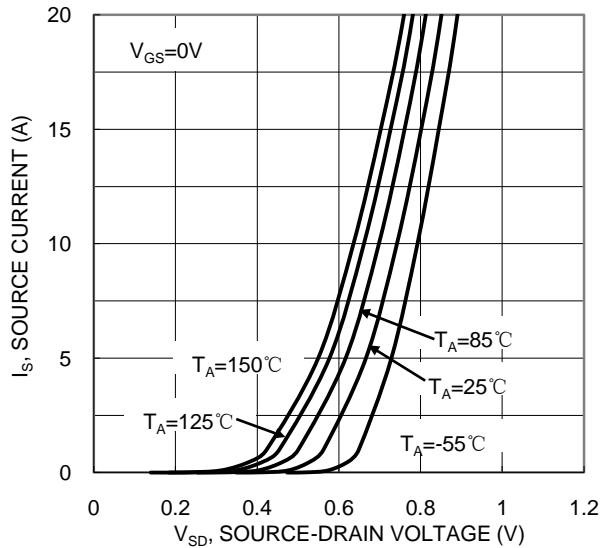


Figure 9 Diode Forward Voltage vs Current

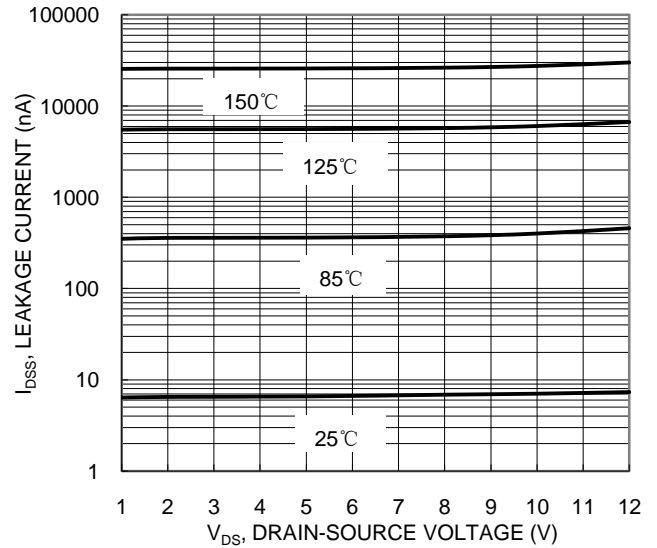


Figure 10 Typical Drain-Source Leakage Current vs Voltage

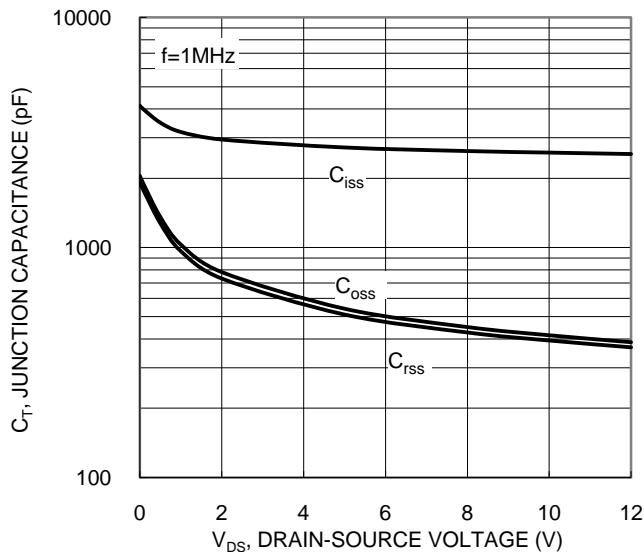


Figure 11 Typical Junction Capacitance

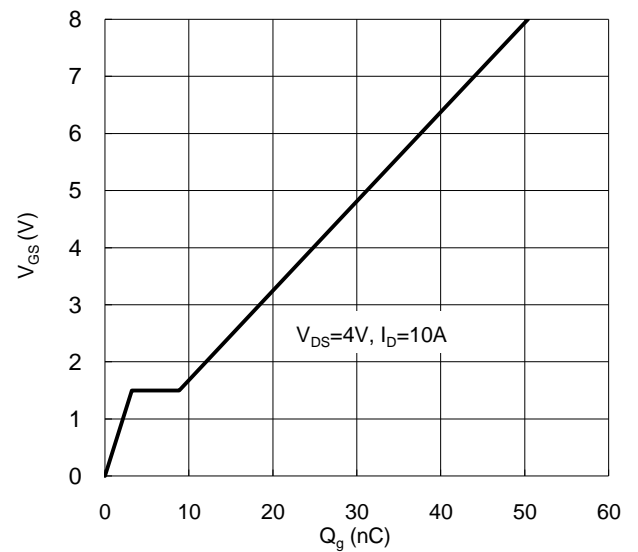
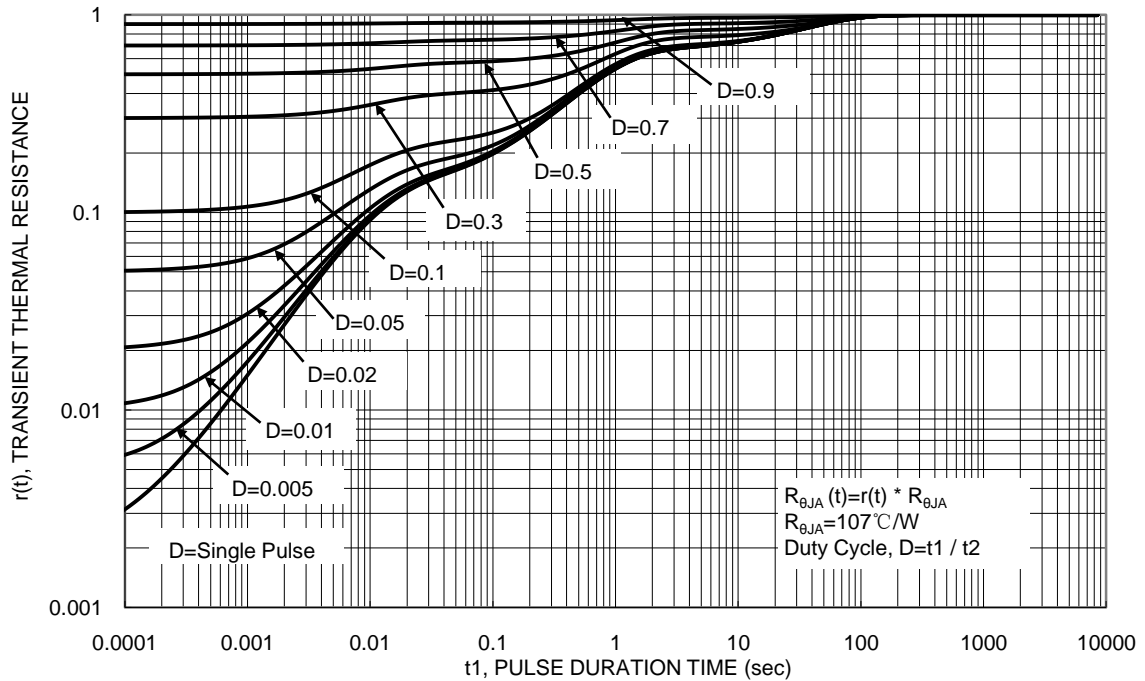
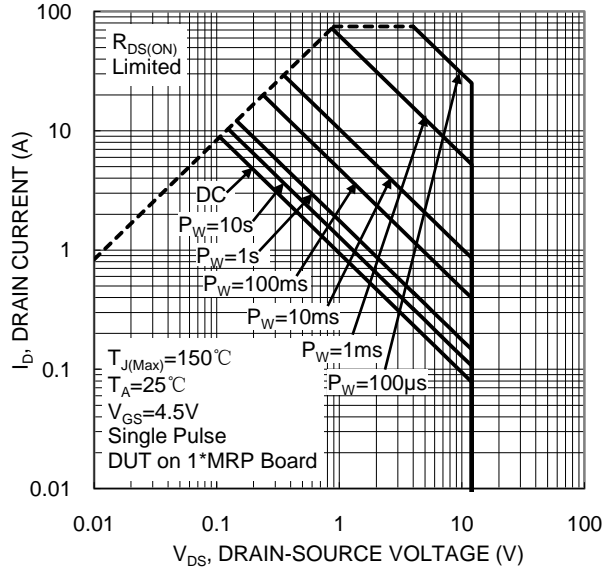
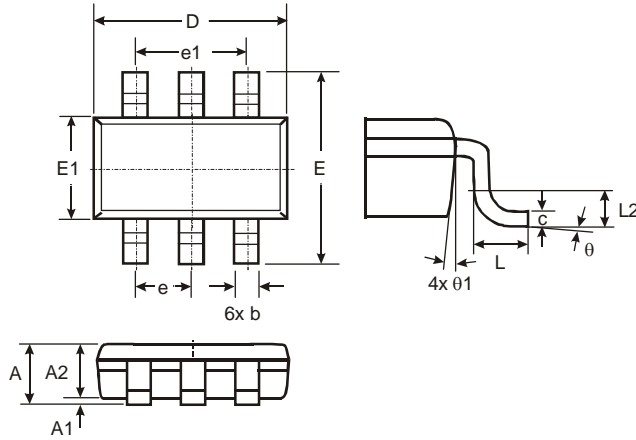


Figure 12 Gate Charge



Package Outline Dimensions

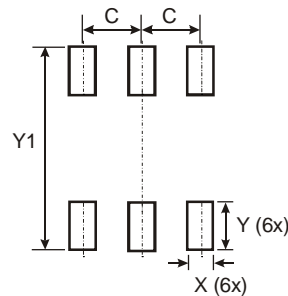
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
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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