

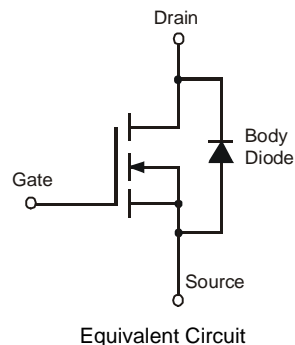
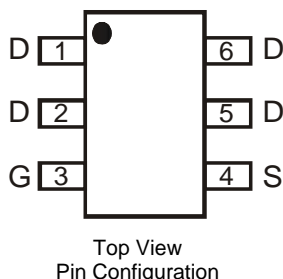
## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = 25^\circ\text{C}$
60V	44m $\Omega$ @ $V_{GS} = 10\text{V}$	5.0A
	60m $\Omega$ @ $V_{GS} = 4.5\text{V}$	4.3A

## 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.

- DC-DC Converters
- Power management functions
- Backlighting



## Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- **Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

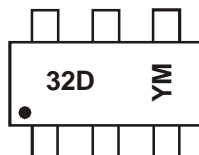
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208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

## Ordering Information (Note 3)

Part Number	Case	Packaging
DMN6040SVT-7	TSOT26	3,000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



32D = 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

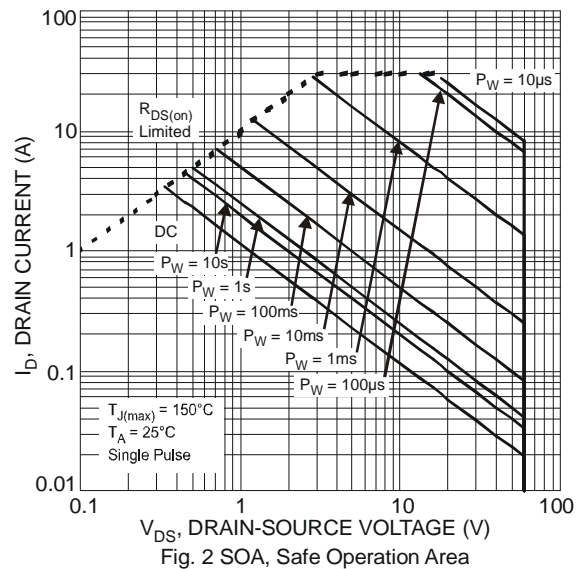
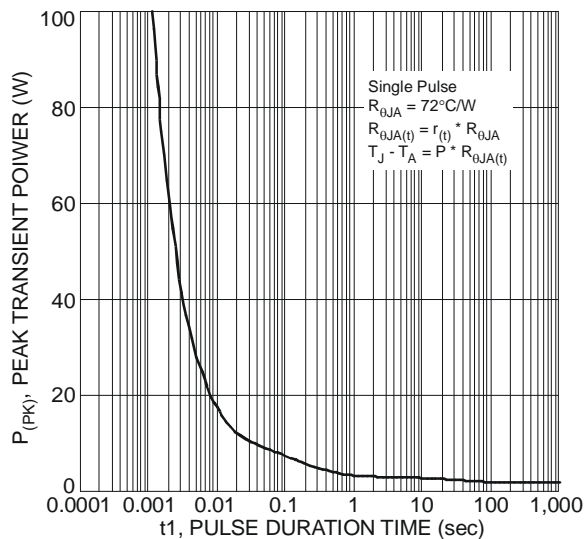
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

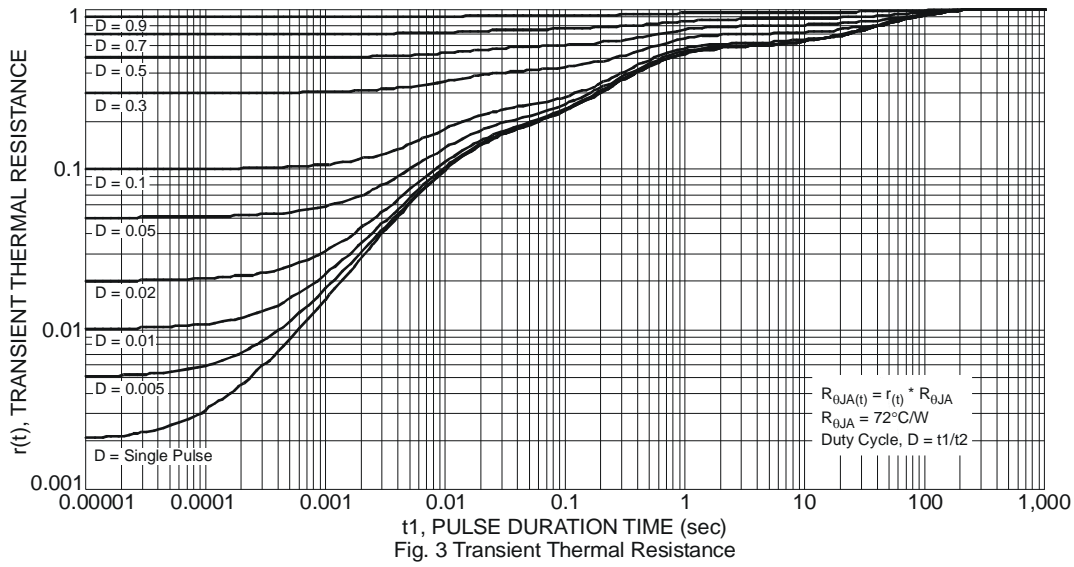
**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$I_D$	$T_A = 25^\circ\text{C}$ 5.0 $T_A = 70^\circ\text{C}$ 4.0	A
	$t < 10\text{s}$	$I_D$	$T_A = 25^\circ\text{C}$ 6.3 $T_A = 70^\circ\text{C}$ 5.0	A
Continuous Drain Current (Note 5) $V_{GS} = 5\text{V}$	Steady State	$I_D$	$T_A = 25^\circ\text{C}$ 4.3 $T_A = 70^\circ\text{C}$ 3.4	A
	$t < 10\text{s}$	$I_D$	$T_A = 25^\circ\text{C}$ 5.4 $T_A = 70^\circ\text{C}$ 4.3	A
Maximum Body Diode Forward Current (Note 5)		$I_S$	2.1	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)		$I_{DM}$	30	A
Avalanche Current (Note 6) $L = 0.1\text{mH}$		$I_{AR}$	14.2	A
Avalanche Energy (Note 6) $L = 0.1\text{mH}$		$E_{AR}$	10	mJ

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)	$T_A = 25^\circ\text{C}$	$P_D$	1.2	W
	$T_A = 70^\circ\text{C}$		0.75	
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	$R_{\theta JA}$	106	$^\circ\text{C/W}$
	$t < 10\text{s}$		69	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)	$T_A = 25^\circ\text{C}$	$P_D$	1.8	W
	$T_A = 70^\circ\text{C}$		1.1	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	68	$^\circ\text{C/W}$
	$t < 10\text{s}$		44	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	20	$^\circ\text{C/W}$
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$





**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>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	100	nA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	—	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	30	44	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.3A
		—	35	60		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4A
Forward Transfer Admittance	Y <sub>fs</sub>	—	4.5	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 4.3A
Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	1287	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	57	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	44	—		
Gate Resistance	R <sub>G</sub>	—	1.2	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	22.4	—	nC	V <sub>DS</sub> = 30V, I <sub>D</sub> = 4.3A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	10.4	—		
Gate-Source Charge	Q <sub>gs</sub>	—	4.9	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	3.0	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	6.6	—	nS	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 30V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 4.3A
Turn-On Rise Time	t <sub>r</sub>	—	8.1	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	20.1	—		
Turn-Off Fall Time	t <sub>f</sub>	—	4.0	—		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	—	18	—	nS	I <sub>S</sub> = 4.3A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	—	11.9	—	nC	I <sub>S</sub> = 4.3A, dI/dt = 100A/μs

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

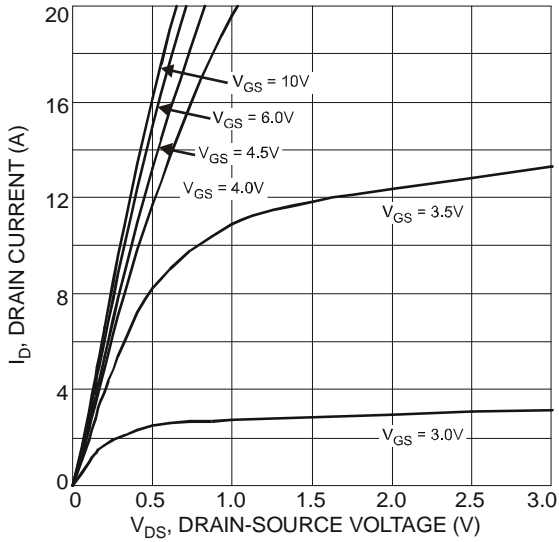


Fig. 4 Typical Output Characteristic

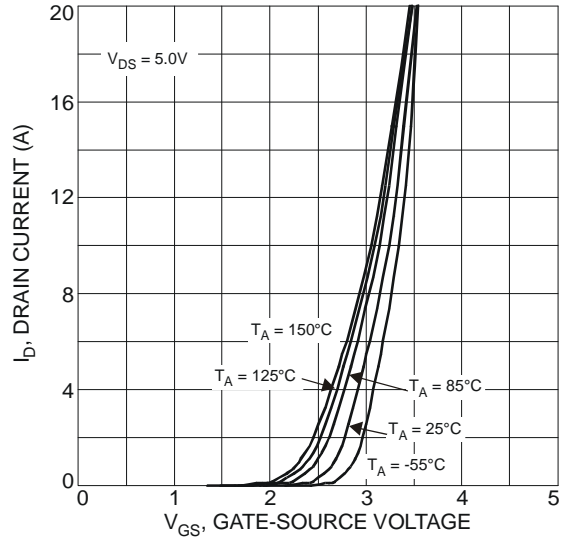


Fig. 5 Typical Transfer Characteristics

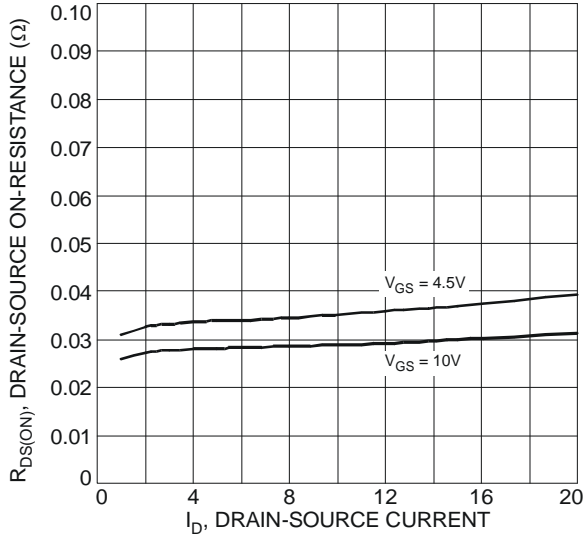


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

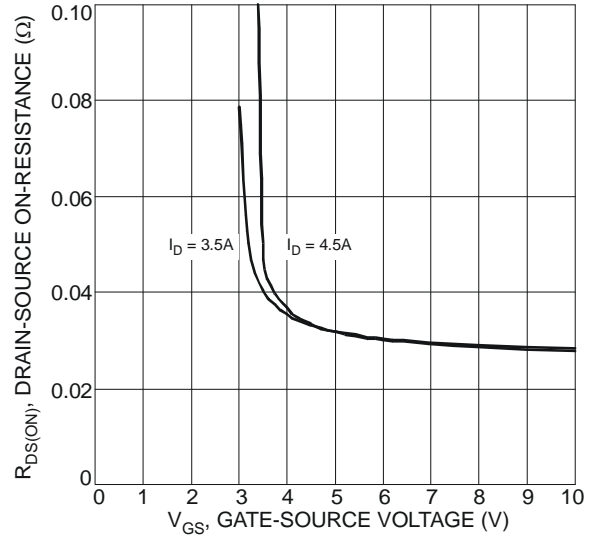


Fig. 7 Typical On-Resistance vs. Drain Current and Gate Voltage

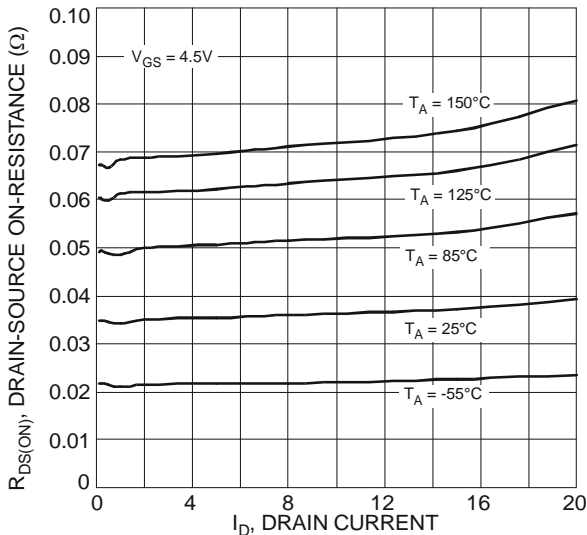


Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

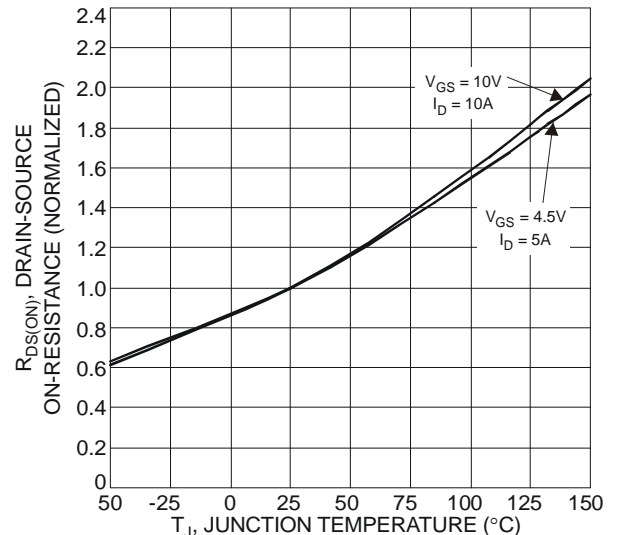


Fig. 9 On-Resistance Variation with Temperature

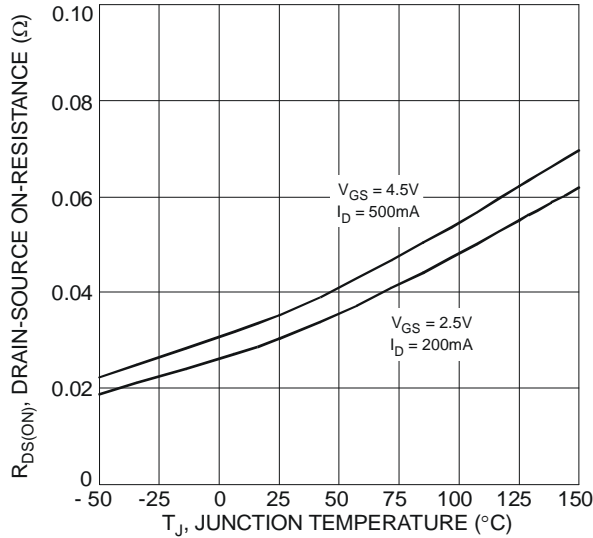


Fig. 10 On-Resistance Variation with Temperature

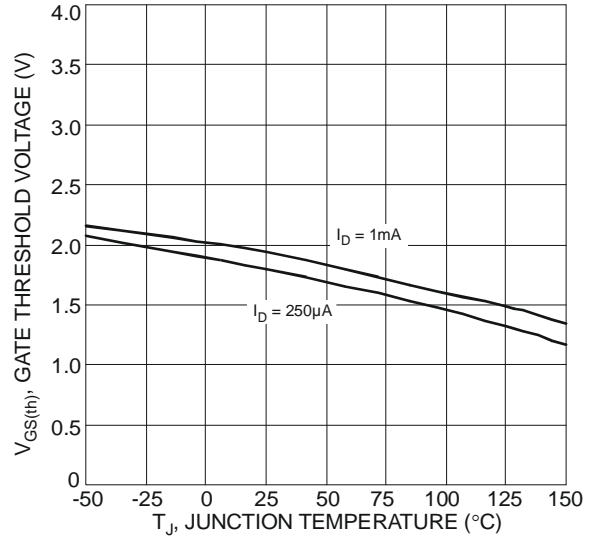


Fig. 11 Gate Threshold Variation vs. Ambient Temperature

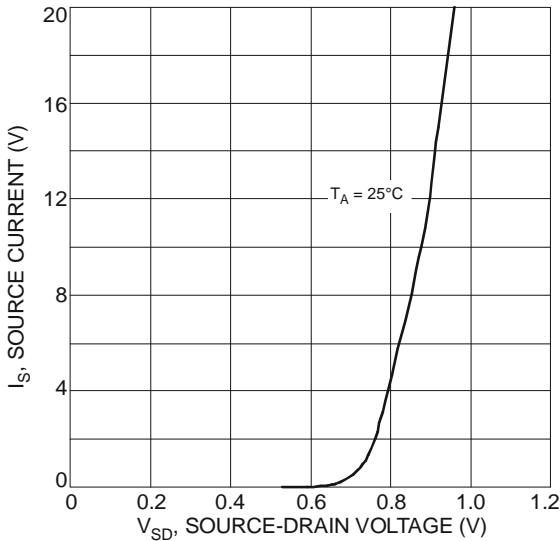


Fig. 12 Diode Forward Voltage vs. Current

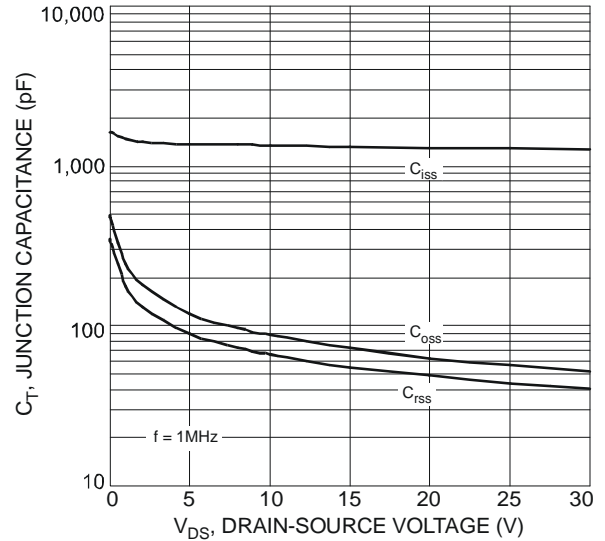


Fig. 13 Typical Junction Capacitance

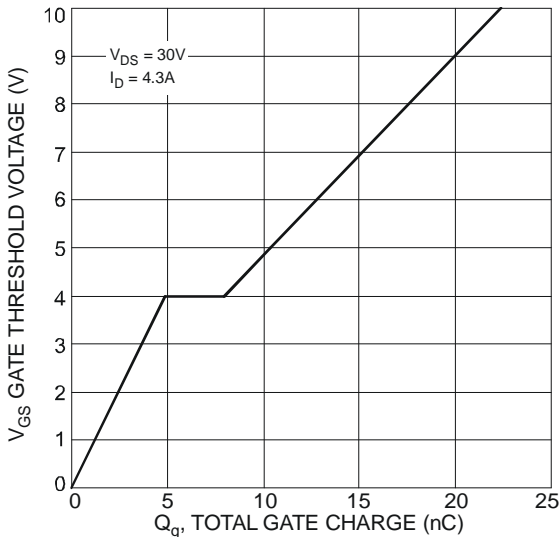
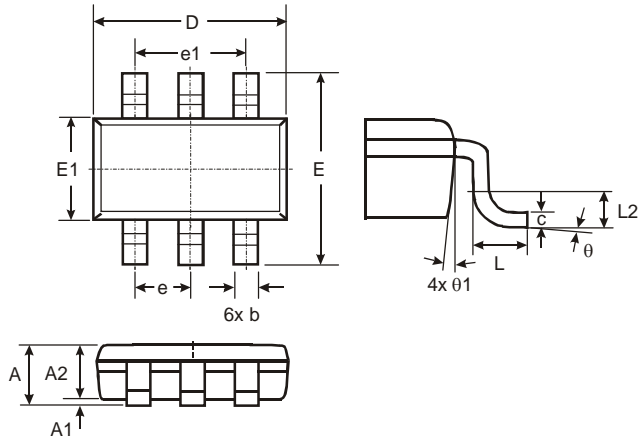


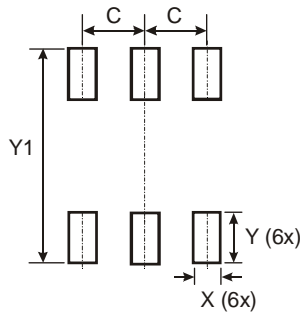
Fig. 14 Gate Charge

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

**Suggested Pad Layout**



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

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