

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ $T_A = 25^\circ C$
45V	46m $\Omega$ @ $V_{GS} = 10V$	4.8A
	62m $\Omega$ @ $V_{GS} = 4.5V$	4.1A

## 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.

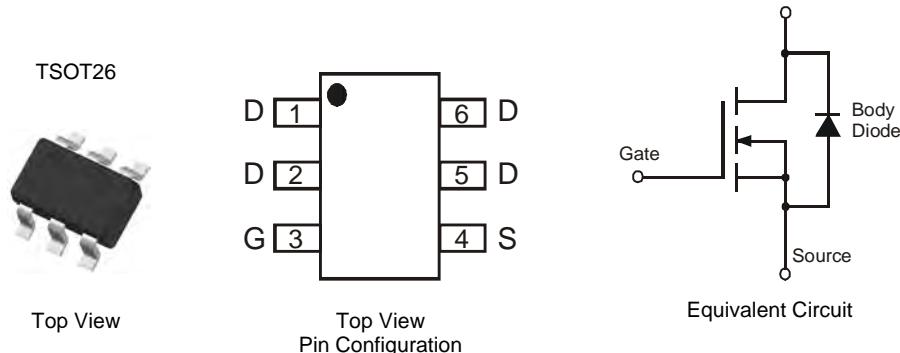
- DC-DC Converters
- Power management functions
- Backlighting

## Features and Benefits

- 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)



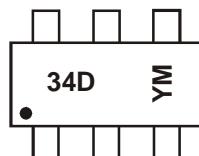
## Ordering Information (Note 3)

Part Number	Case	Packaging
DMN4060SVT-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



34D = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

### Date Code Key

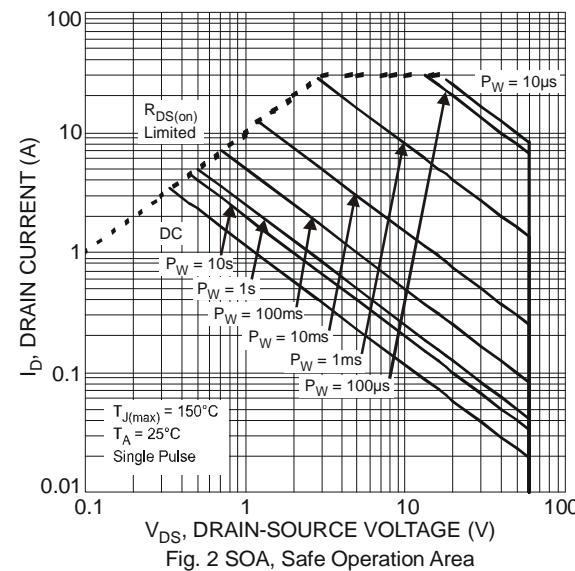
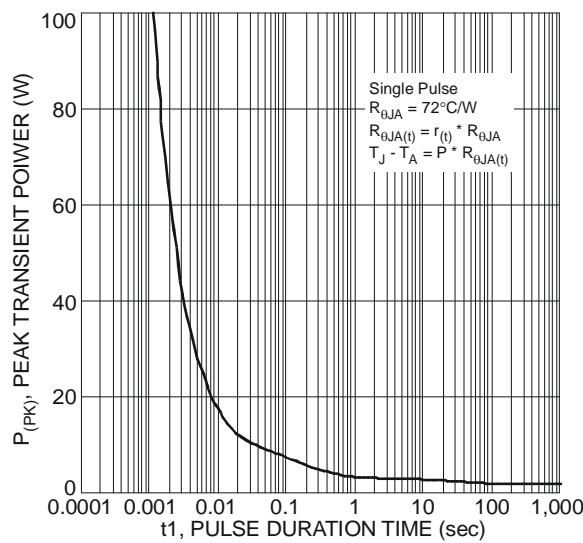
Year	2011	2012	2013	2014	2015	2016	2017					
Code	Y	Z	A	B	C	D	E					
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	45	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	4.8 3.8	A
	$t < 10\text{s}$	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	6.1 4.8	A
Continuous Drain Current (Note 5) $V_{GS} = 5\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	4.1 3.2	A
	$t < 10\text{s}$	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	5.2 4.1	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	
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	
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	$^\circ\text{C}$

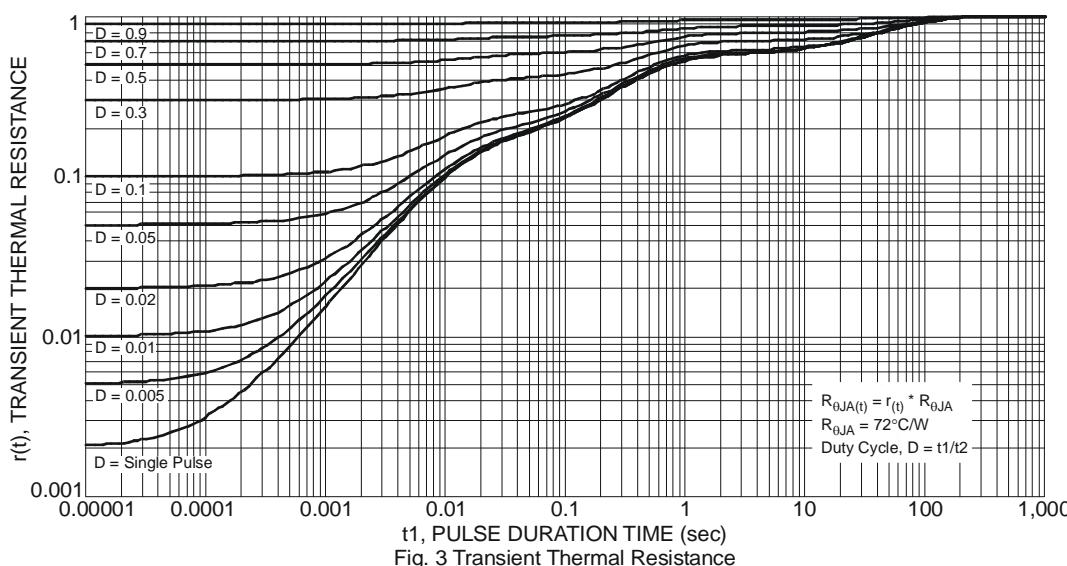


**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	45	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}$ , $\text{I}_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$\text{I}_{\text{DSS}}$	—	—	100	nA	$\text{V}_{\text{DS}} = 45\text{V}$ , $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	$\text{I}_{\text{GSS}}$	—	—	$\pm 100$	nA	$\text{V}_{\text{GS}} = \pm 20\text{V}$ , $\text{V}_{\text{DS}} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	1	—	3	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$ , $\text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	—	37	46	$\text{m}\Omega$	$\text{V}_{\text{GS}} = 10\text{V}$ , $\text{I}_D = 4.3\text{A}$
		—	52	62		$\text{V}_{\text{GS}} = 4.5\text{V}$ , $\text{I}_D = 4\text{A}$
Forward Transfer Admittance	$ Y_{\text{fs} }$	—	4.5	—	S	$\text{V}_{\text{DS}} = 10\text{V}$ , $\text{I}_D = 4.3\text{A}$
Diode Forward Voltage	$\text{V}_{\text{SD}}$	—	0.7	1.2	V	$\text{V}_{\text{GS}} = 0\text{V}$ , $\text{I}_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$\text{C}_{\text{iss}}$	—	1287	—	$\text{pF}$	$\text{V}_{\text{DS}} = 25\text{V}$ , $\text{V}_{\text{GS}} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$\text{C}_{\text{oss}}$	—	57	—		
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$	—	44	—		
Gate Resistance	$\text{R}_{\text{G}}$	—	1.2	—	$\Omega$	$\text{V}_{\text{DS}} = 0\text{V}$ , $\text{V}_{\text{GS}} = 0\text{V}$ , $f = 1.0\text{MHz}$
Total Gate Charge ( $\text{V}_{\text{GS}} = 10\text{V}$ )	$\text{Q}_{\text{g}}$	—	22.4	—	$\text{nC}$	$\text{V}_{\text{DS}} = 30\text{V}$ , $\text{I}_D = 4.3\text{A}$
Total Gate Charge ( $\text{V}_{\text{GS}} = 4.5\text{V}$ )	$\text{Q}_{\text{g}}$	—	10.4	—		
Gate-Source Charge	$\text{Q}_{\text{gs}}$	—	4.9	—		
Gate-Drain Charge	$\text{Q}_{\text{gd}}$	—	3.0	—		
Turn-On Delay Time	$\text{t}_{\text{D(on)}}$	—	6.6	—	$\text{nS}$	$\text{V}_{\text{GS}} = 10\text{V}$ , $\text{V}_{\text{DD}} = 30\text{V}$ , $\text{R}_{\text{G}} = 6\Omega$ , $\text{I}_D = 4.3\text{A}$
Turn-On Rise Time	$\text{t}_{\text{r}}$	—	8.1	—		
Turn-Off Delay Time	$\text{t}_{\text{D(off)}}$	—	20.1	—		
Turn-Off Fall Time	$\text{t}_{\text{f}}$	—	4.0	—		
Body Diode Reverse Recovery Time	$\text{t}_{\text{rr}}$	—	18	—	$\text{nS}$	$\text{I}_S = 4.3\text{A}$ , $\text{dI}/\text{dt} = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$\text{Q}_{\text{rr}}$	—	11.9	—	$\text{nC}$	$\text{I}_S = 4.3\text{A}$ , $\text{dI}/\text{dt} = 100\text{A}/\mu\text{s}$

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.  $\text{I}_{\text{AR}}$  and  $\text{E}_{\text{AR}}$  rating are based on low frequency and duty cycles to keep  $\text{T}_J = 25^\circ\text{C}$
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.



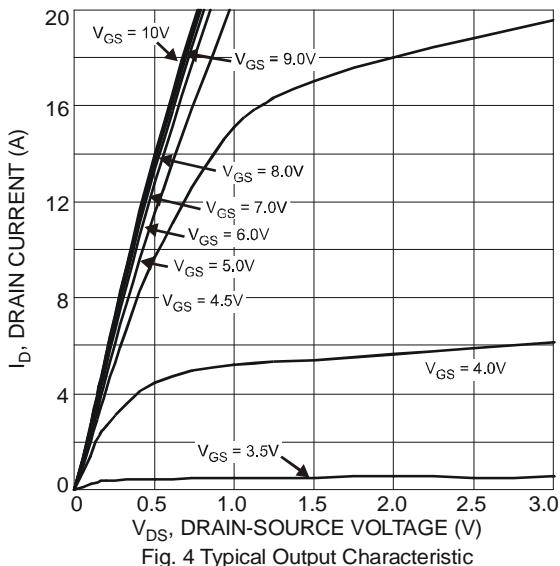


Fig. 4 Typical Output Characteristic

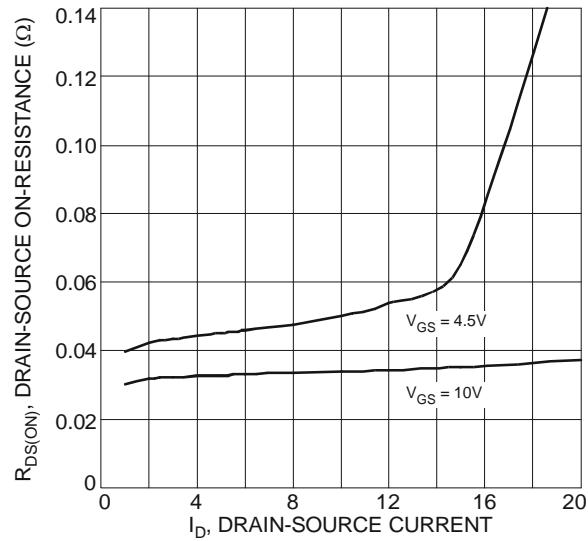


Fig. 6 Typical On-Resistance vs.  
Drain Current and Gate Voltage

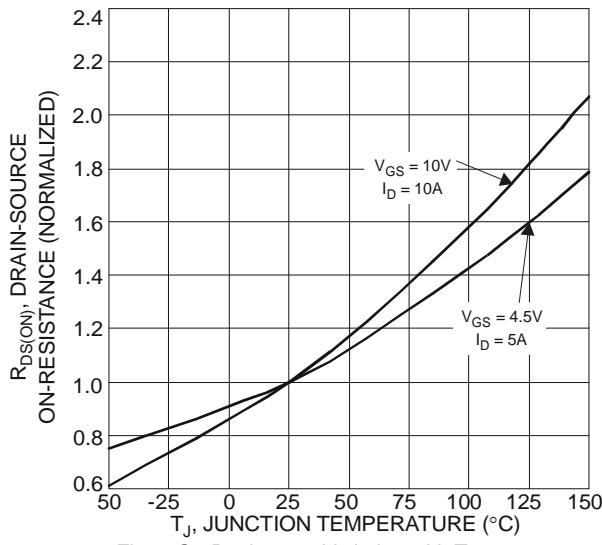


Fig. 8 On-Resistance Variation with Temperature

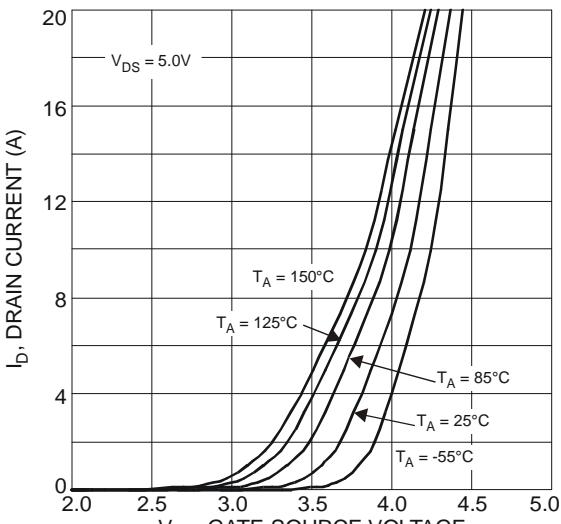


Fig. 5 Typical Transfer Characteristics

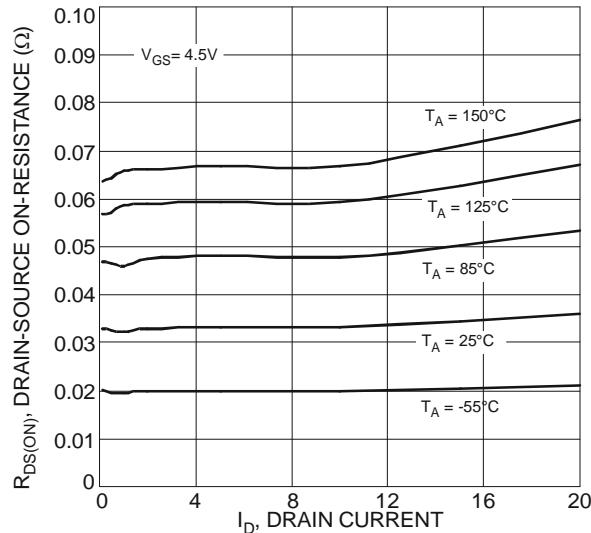


Fig. 7 Typical On-Resistance vs.  
Drain Current and Temperature

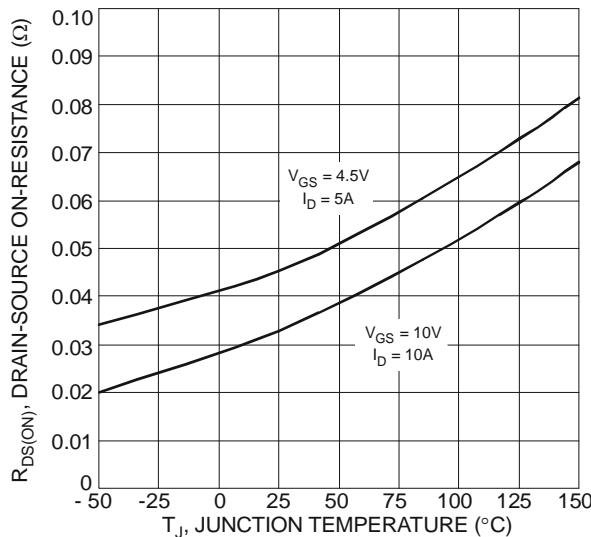


Fig. 9 On-Resistance Variation with Temperature

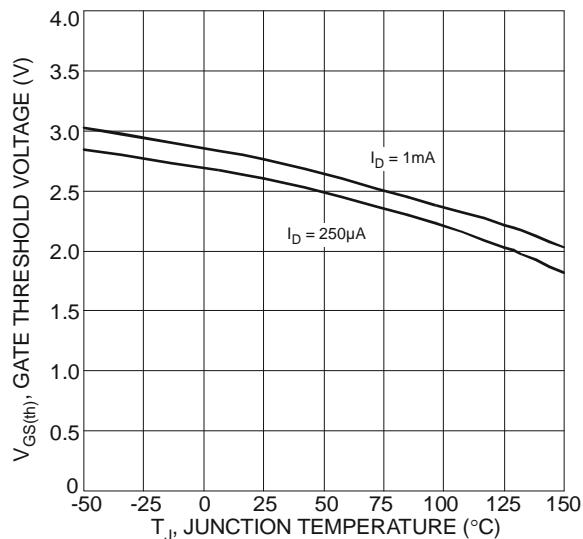


Fig. 10 Gate Threshold Variation vs. Ambient Temperature

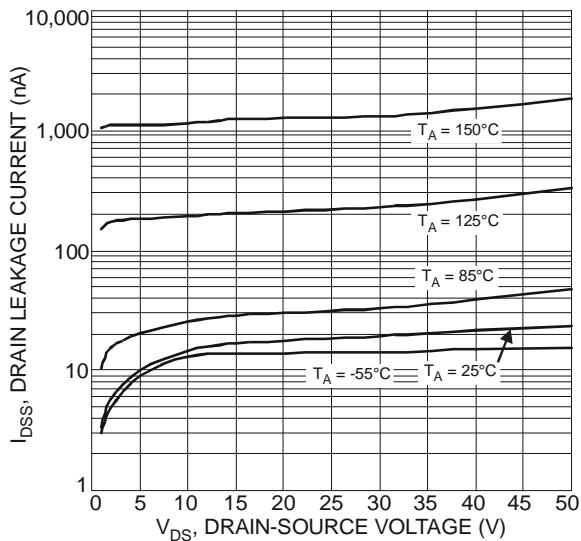


Fig. 12 Typical Drain-Source Leakage Current vs. Voltage

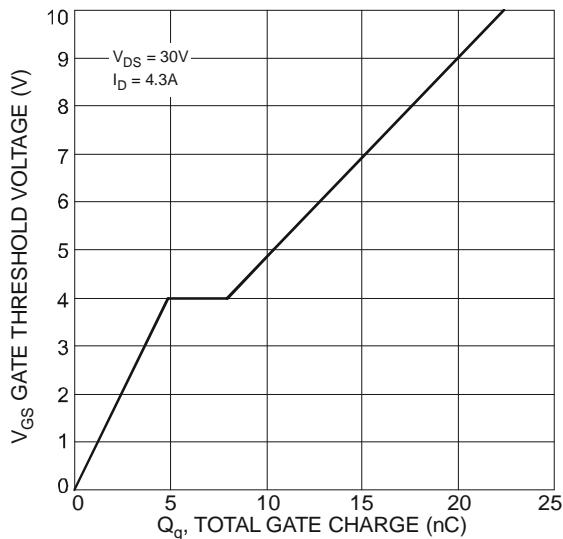


Fig. 14 Gate Charge

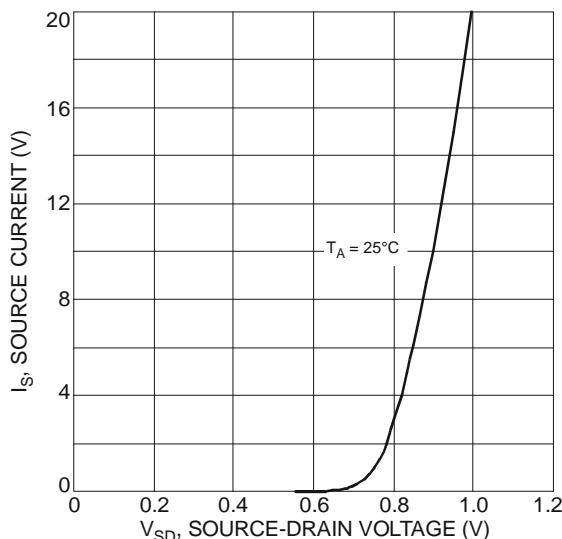


Fig. 11 Diode Forward Voltage vs. Current

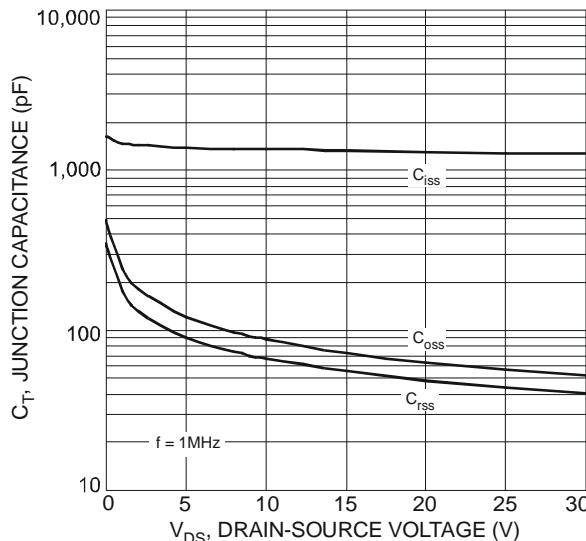
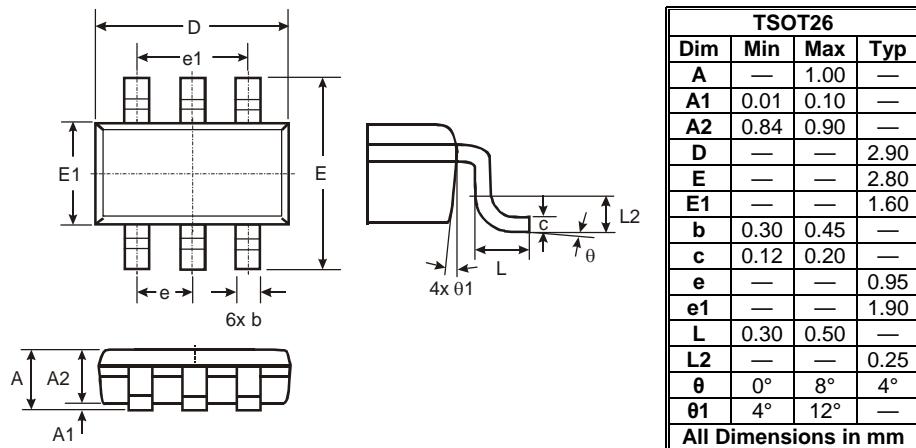
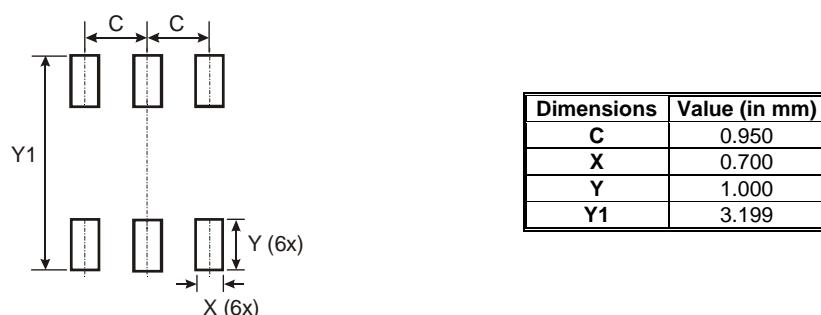


Fig. 13 Typical Junction Capacitance

## Package Outline Dimensions



## Suggested Pad Layout



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