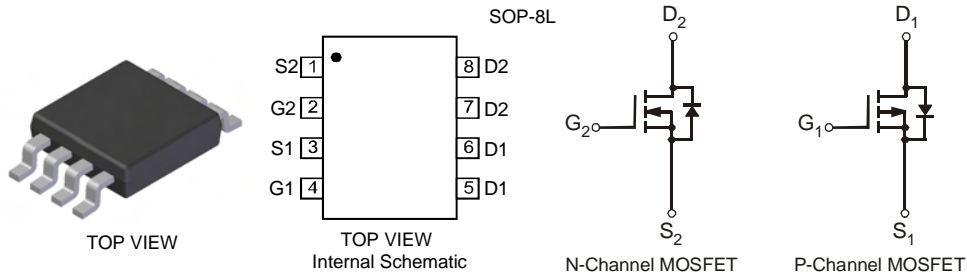


## Features

- Complementary Pair MOSFETs
- Low On-Resistance
  - N-Channel: 35mΩ @ 10V  
61mΩ @ 4.5V
  - P-Channel: 65mΩ @ -10V  
115mΩ @ -4.5V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 6
- Ordering Information: See Page 6
- Weight: 0.072g (approximate)



## Maximum Ratings N-CHANNEL @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (Note 1)	$I_D$	6.9 5.8	A
		$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	
Pulsed Drain Current (Note 4)	$I_{DM}$	30	A

## Maximum Ratings P-CHANNEL @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain Source Voltage	$V_{DSS}$	-30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (Note 1)	$I_D$	-5 -4.2	A
		$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	
Pulsed Drain Current (Note 4)	$I_{DM}$	-20	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1)	$P_D$	2	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. Device mounted on 2oz. copper pads on 2" x 2" FR4 PCB.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  4. Repetitive rating, pulse width limited by junction temperature.

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

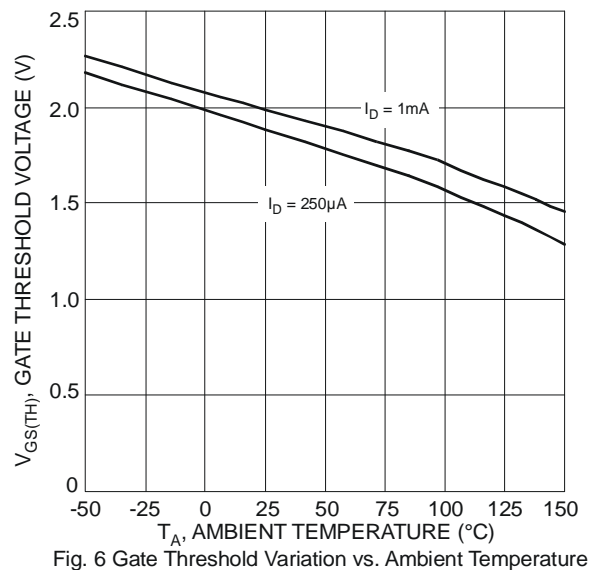
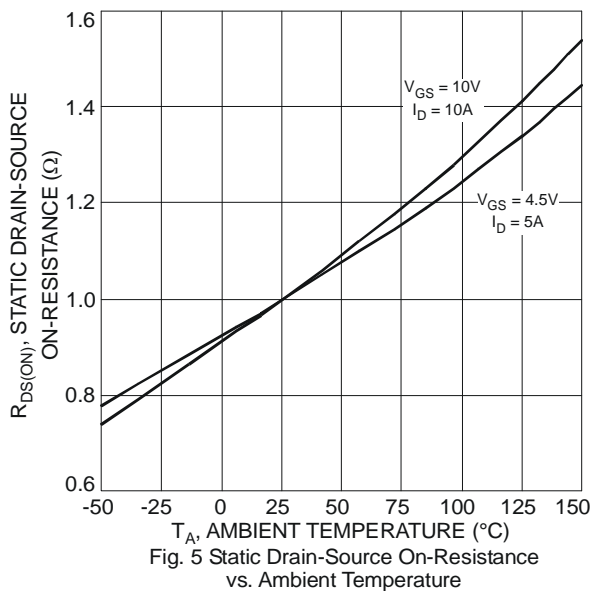
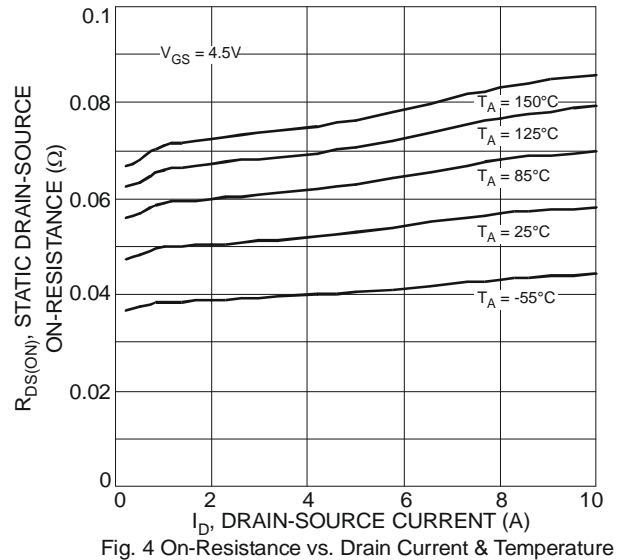
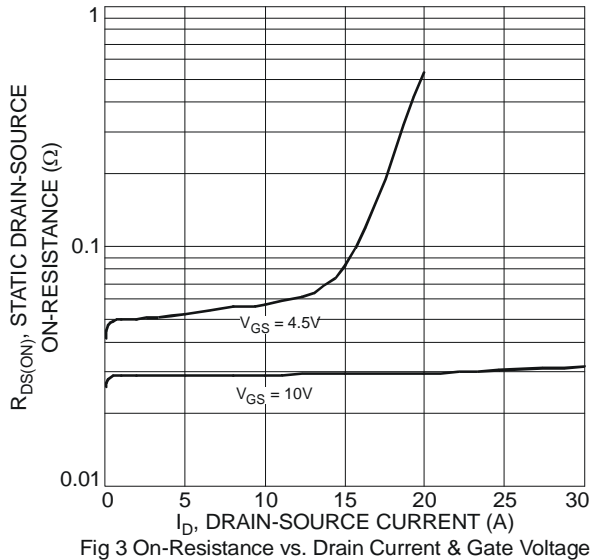
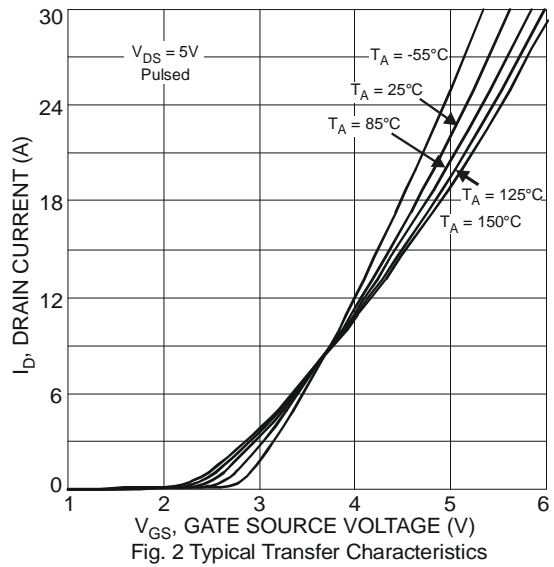
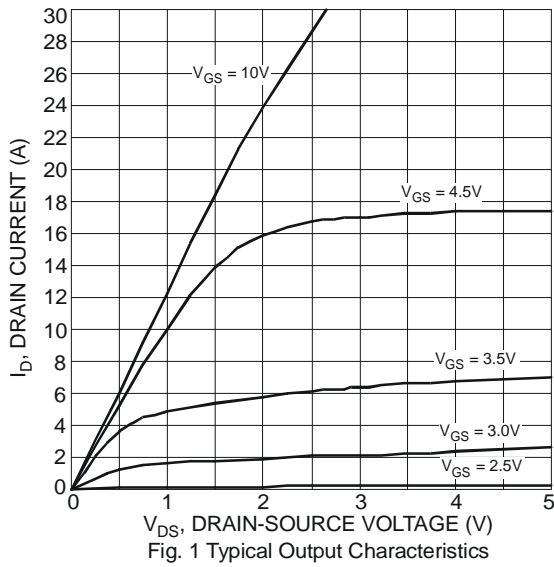
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	28 51	35 61	m $\Omega$	$V_{GS} = 10V, I_D = 6.9A$ $V_{GS} = 4.5V, I_D = 5.0A$
Forward Transfer Admittance	$ Y_{fs} $	—	7.7	—	S	$V_{DS} = 5V, I_D = 6.9A$
Diode Forward Voltage (Note 5)	$V_{SD}$	0.5	—	1.2	V	$V_{GS} = 0V, I_S = 1A$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{iss}$	—	384	—	pF	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	67	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	48	—	pF	
Gate Resistance	$R_G$	—	1.3	—	$\Omega$	$V_{GS} = 0V, V_{DS} = 0V, f = 1\text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	$Q_g$	—	4.3 8.6	—	nC	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 10A$ $V_{DS} = 10V, V_{GS} = 10V, I_D = 10A$
Gate-Source Charge	$Q_{gs}$	—	1.2	—		$V_{DS} = 10V, V_{GS} = 10V, I_D = 10A$
Gate-Drain Charge	$Q_{gd}$	—	2.5	—		$V_{DS} = 10V, V_{GS} = 10V, I_D = 10A$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1.0	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	-2.1	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	56 98	65 115	m $\Omega$	$V_{GS} = -10V, I_D = -5A$ $V_{GS} = -4.5V, I_D = -4A$
Forward Transfer Admittance	$ Y_{fs} $	—	—	5.2	S	$V_{DS} = -10V, I_D = -5A$
Diode Forward Voltage (Note 5)	$V_{SD}$	-0.5	—	-1.2	V	$V_{GS} = 0V, I_S = -2.6A$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{iss}$	—	336	—	pF	$V_{DS} = -25V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	70	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	49	—	pF	
Gate Resistance	$R_G$	—	4.6	—	$\Omega$	$V_{GS} = 0V, V_{DS} = 0V, f = 1\text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	$Q_g$	—	4.0 7.8	—	nC	$V_{DS} = 15V, V_{GS} = -4.5V, I_D = -5A$ $V_{DS} = 15V, V_{GS} = -10V, I_D = -5A$
Gate-Source Charge	$Q_{gs}$	—	1.0	—		$V_{DS} = 15V, V_{GS} = -10V, I_D = -5A$
Gate-Drain Charge	$Q_{gd}$	—	2.5	—		$V_{DS} = 15V, V_{GS} = -10V, I_D = -5A$

Notes: 5. Short duration pulse test used to minimize self-heating effect.

**N-CHANNEL**



**N-CHANNEL (continued)**

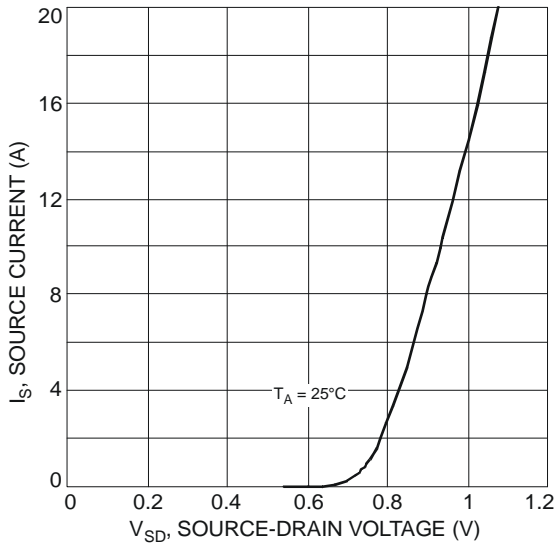


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

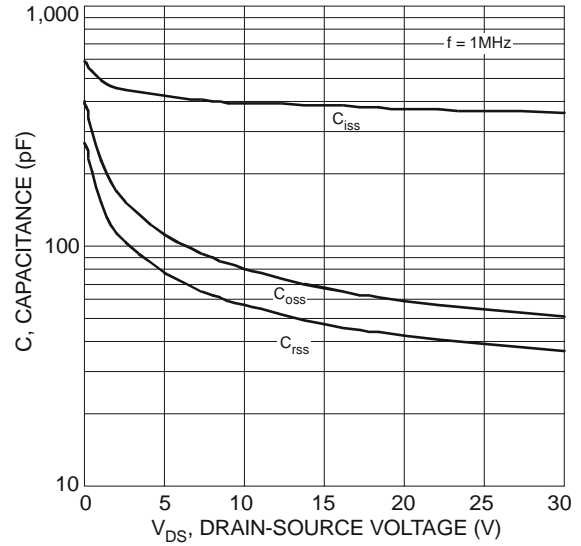


Fig. 8 Typical Total Capacitance

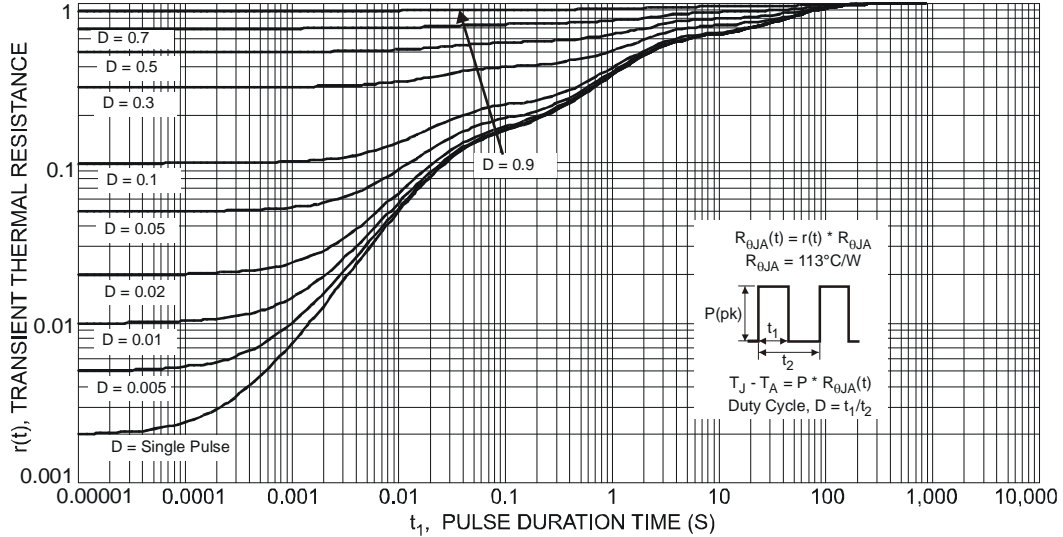


Fig. 9 Transient Thermal Resistance

**P-CHANNEL**

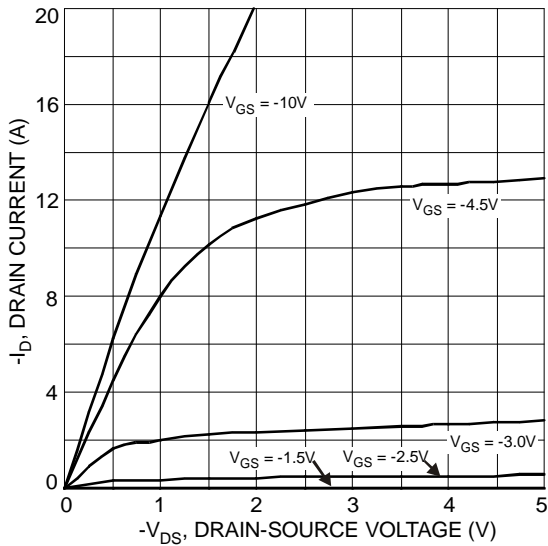


Fig. 10 Typical Output Characteristics

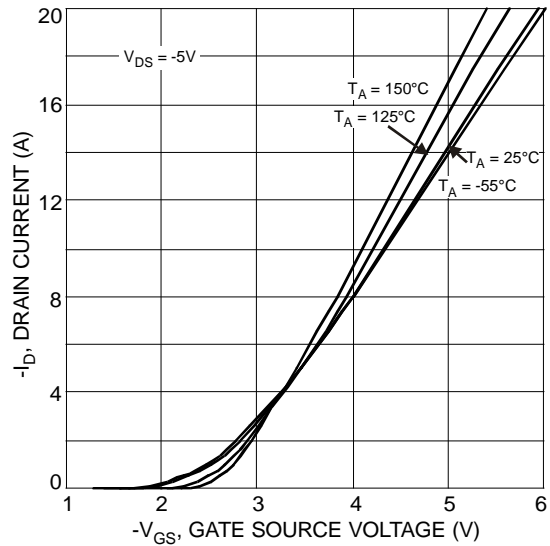


Fig. 11 Typical Transfer Characteristics

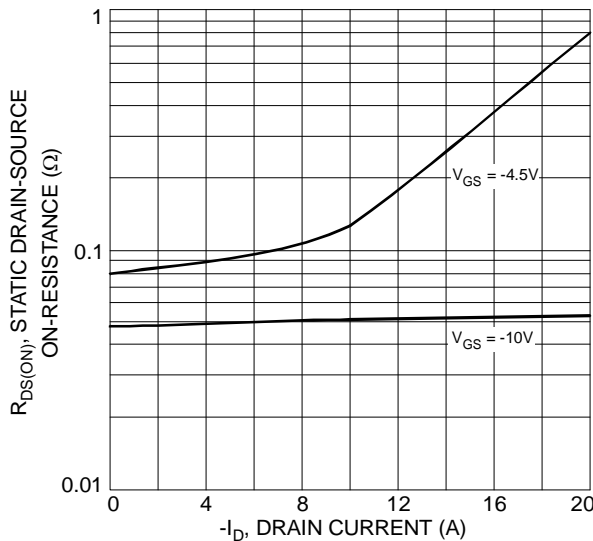


Fig. 12 Typical On-Resistance vs. Drain Current and Gate Voltage

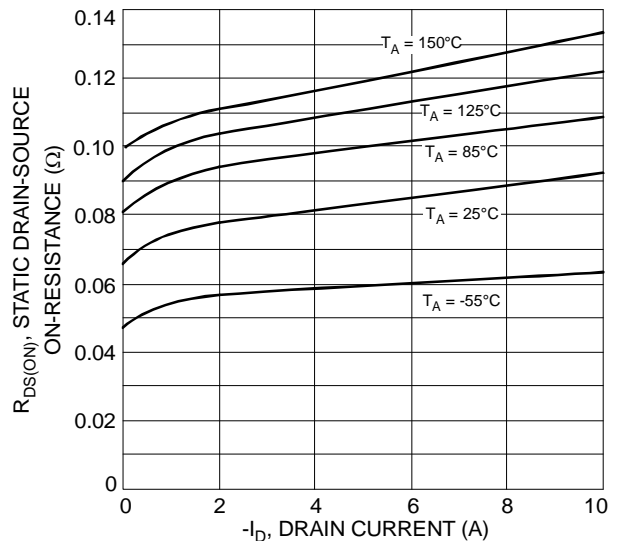


Fig. 13 Typical On-Resistance vs. Drain Current and Temperature

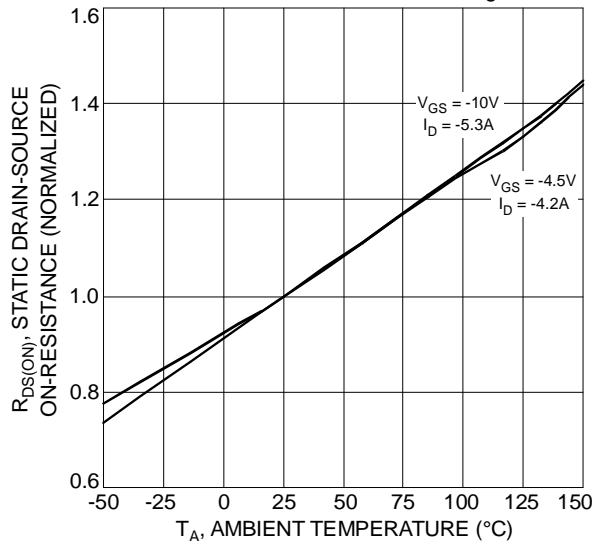


Fig. 14 On-Resistance Variation with Temperature

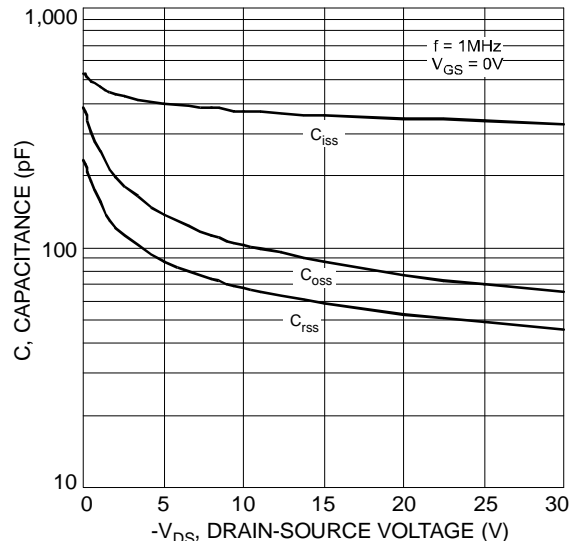


Fig. 15 Typical Capacitance

**P-CHANNEL (continued)**

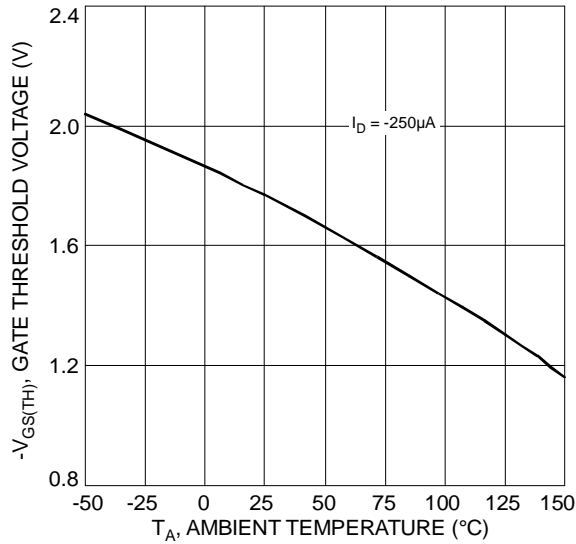


Fig. 16 Gate Threshold Variation vs. Ambient Temperature

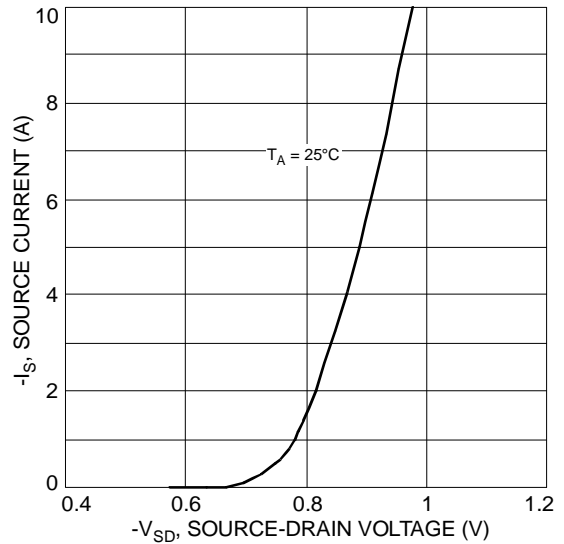


Fig. 17 Diode Forward Voltage vs. Current

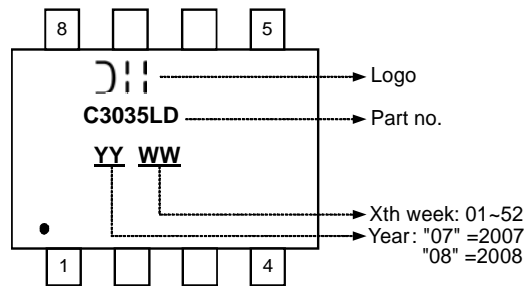
**Ordering Information** (Note 6)

Part Number	Case	Packaging
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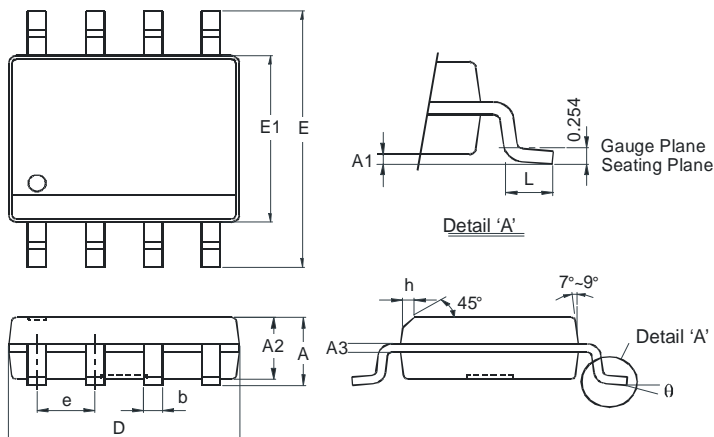
Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

( Top View )

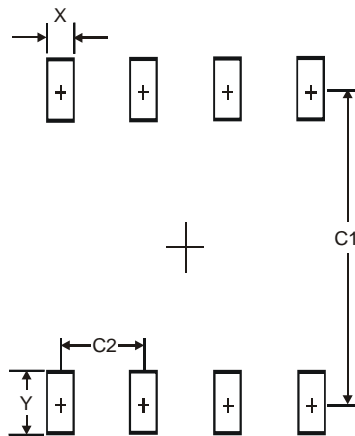


**Package Outline Dimensions**



SOP-8L		
Dim	Min	Max
A	-	1.75
A1	0.08	0.25
A2	1.30	1.50
A3	0.20	Typ
b	0.3	0.5
D	4.80	5.30
E	5.79	6.20
E1	3.70	4.10
e	1.27	Typ
h	-	0.35
L	0.38	1.27
θ	0°	8°
<b>All Dimensions in mm</b>		

**Suggested Pad Layout**



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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