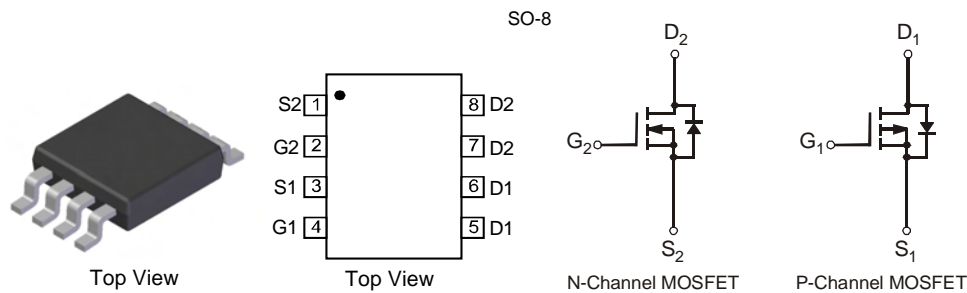


## Features

- Low On-Resistance
- N-Channel: 21mΩ @ 10V  
32mΩ @ 4.5V
- P-Channel: 39mΩ @ 10V  
53mΩ @ 4.5V
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- 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: 0.072 grams (approximate)



## Maximum Ratings N-CHANNEL – Q1 @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	±20	V
Continuous Drain Current (Note 3)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	8.5	A
		$T_A = 85^\circ\text{C}$		7.1	
Pulsed Drain Current (Note 4)			$I_{DM}$	26	A

## Maximum Ratings P-CHANNEL – Q2 @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	-30	V
Gate-Source Voltage			$V_{GSS}$	±20	V
Continuous Drain Current (Note 3)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	-7.0	A
		$T_A = 85^\circ\text{C}$		-4.5	
Pulsed Drain Current (Note 4)			$I_{DM}$	-25	A

## Thermal Characteristics @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient (Note 3)	$R_{\theta JA}$	50	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

- Notes:
1. No purposefully added lead.
  2. 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).
  3. Device mounted on FR-4 PCB, with minimum recommended pad layout.
  4. Repetitive rating, pulse width limited by junction temperature.

**Electrical Characteristics N-CHANNEL – Q1** @ $T_A = 25^\circ\text{C}$  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 $T_J = 25^\circ\text{C}$	$I_{DSS}$	-	-	1.0	$\mu A$	$V_{DS} = 30V, V_{GS} = 0V$
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	1.45	2.1	V	$V_{DS} = V_{GS}, I_C = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	14	21	m $\Omega$	$V_{GS} = 10V, I_C = 7A$
			18	32		$V_{GS} = 4.5V, I_C = 5.6A$
Forward Transfer Admittance	$ Y_{fs} $	-	8.1	-	S	$V_{DS} = 5V, I_C = 7A$
Diode Forward Voltage (Note 5)	$V_{SD}$	-	0.7	1.0	V	$V_{GS} = 0V, I_S = 1A$
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	$C_{iss}$	-	767	-	pF	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	110	-	pF	
Reverse Transfer Capacitance	$C_{rss}$	-	105	-	pF	
Gate Resistance	$R_g$	-	1.4	-	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$
Total Gate Charge (4.5V)	$Q_g$	-	7.8	-	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 9A$
Total Gate Charge (10V)	$Q_g$	-	16.1	-	nC	
Gate-Source Charge	$Q_{gs}$	-	1.8	-	nC	
Gate-Drain Charge	$Q_{gd}$	-	2.5	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	5.0	-	ns	$V_{GS} = 10V, V_{DS} = 15V, R_G = 6\Omega, I_D = 1A$
Turn-On Rise Time	$t_r$	-	4.5	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	26.3	-	ns	
Turn-Off Fall Time	$t_f$	-	8.55	-	ns	

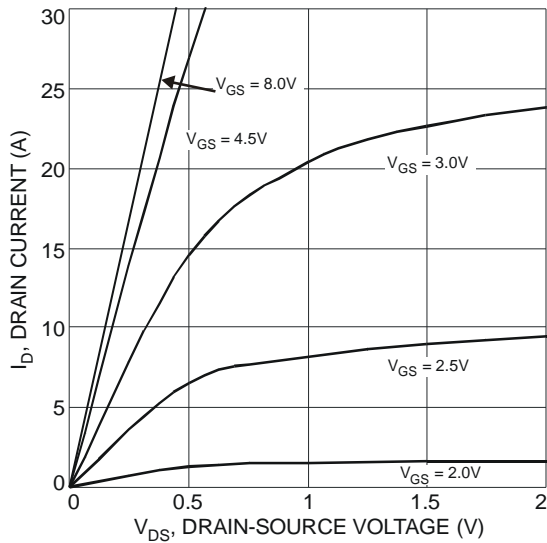


Fig. 1 Typical Output Characteristics

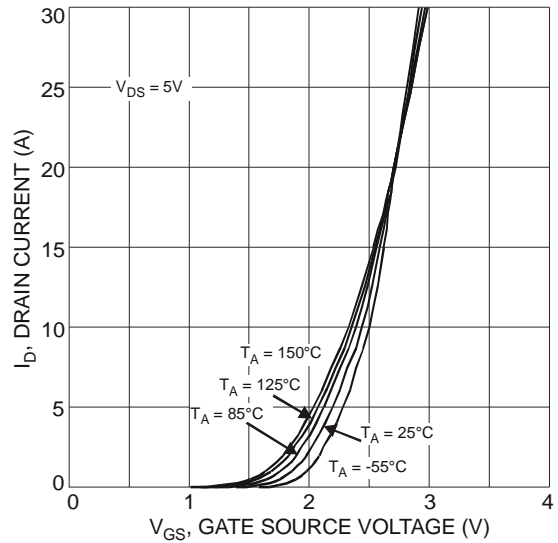


Fig. 2 Typical Transfer Characteristics

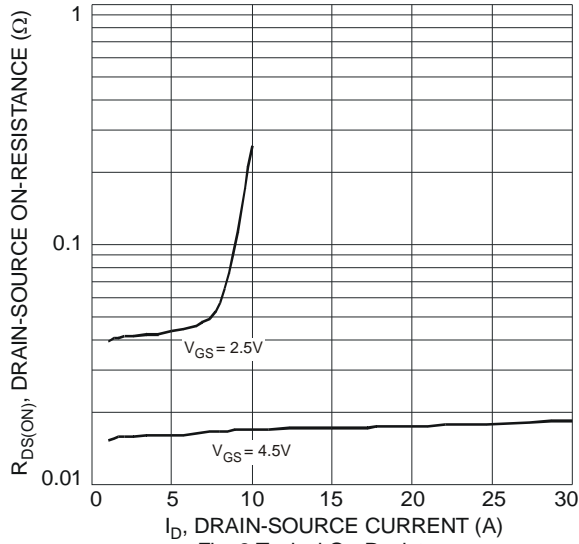


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

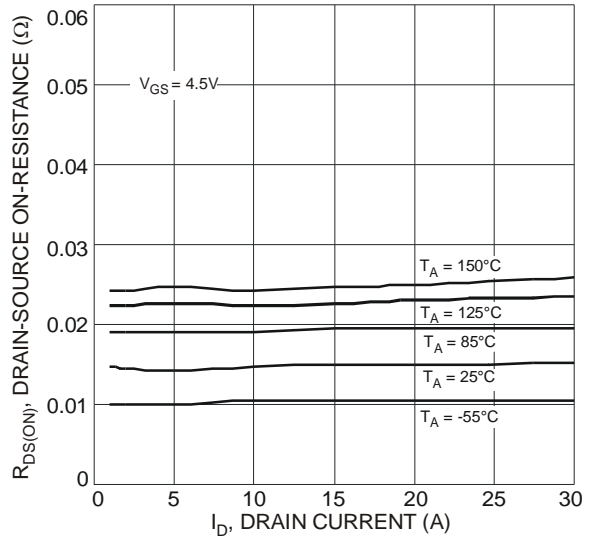


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

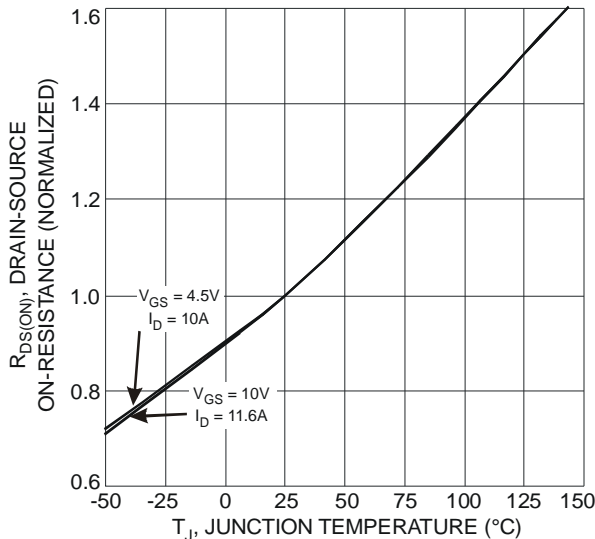


Fig. 5 On-Resistance Variation with Temperature

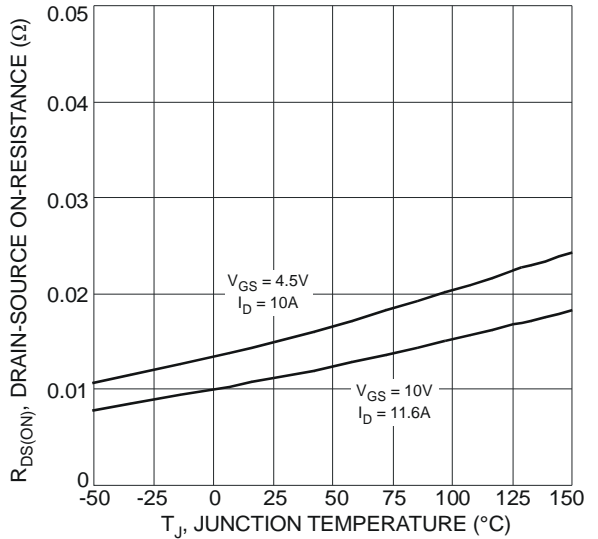


Fig. 6 On-Resistance Variation with Temperature

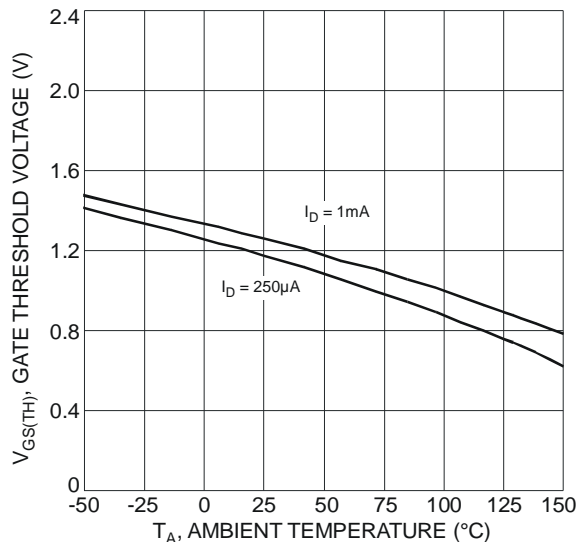


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

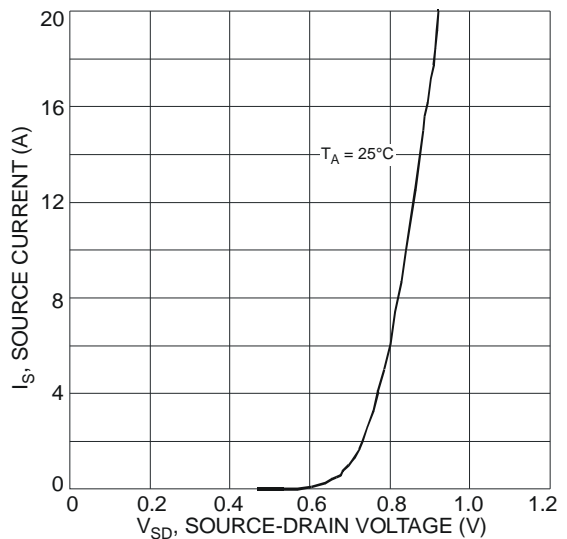
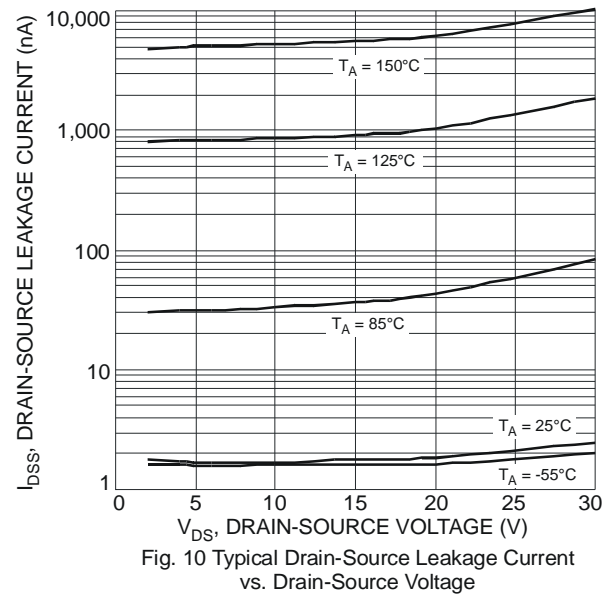
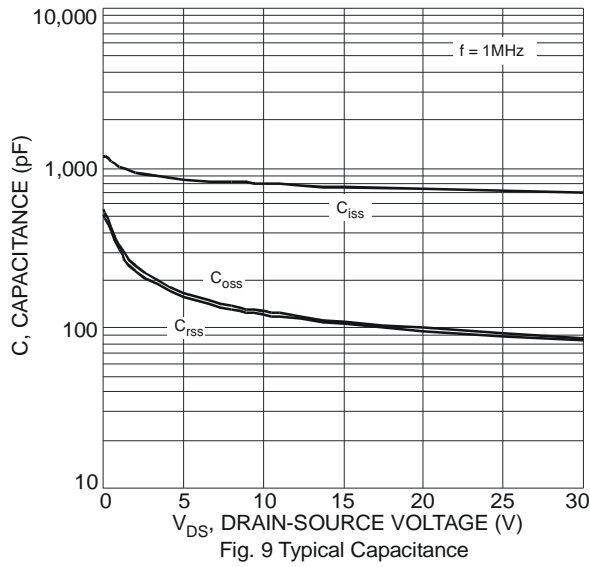


Fig. 8 Diode Forward Voltage vs. Current



**Electrical Characteristics P-CHANNEL** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = 25°C	I <sub>DSS</sub>	-	-	-1.0	μA	V <sub>DS</sub> = -30V, 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 5)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1	-1.7	-2.2	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	39	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.3A
			42	53		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.7A
Forward Transfer Admittance	Y <sub>fs</sub>	-	7	-	S	V <sub>DS</sub> = -5V, I <sub>D</sub> = -4.3A
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	-	-0.75	-1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.7A
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	-	1002	-	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	125	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	118	-	pF	
Gate Resistance	R <sub>g</sub>	-	13	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (4.5V)	Q <sub>g</sub>	-	10.1	-	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -15V, I <sub>D</sub> = -6A
Total Gate Charge (10V)	Q <sub>g</sub>	-	21.1	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	2.8	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	3.2	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	10.1	-	ns	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = -1A
Turn-On Rise Time	t <sub>r</sub>	-	6.5	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	50.1	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	22.2	-	ns	

Notes: 5. Short duration pulse test used to minimize self-heating effect.  
6. Guaranteed by design. Not subject to production testing.

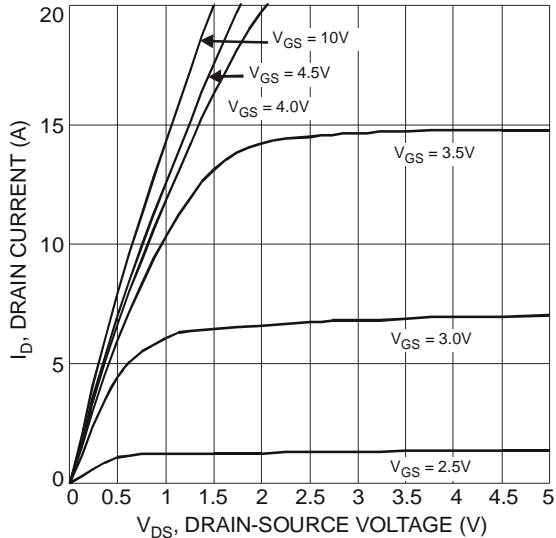


Fig. 11 Typical Output Characteristics

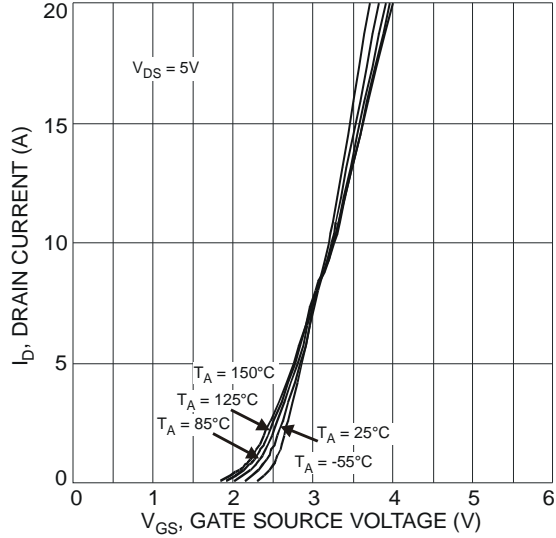


Fig. 12 Typical Transfer Characteristics

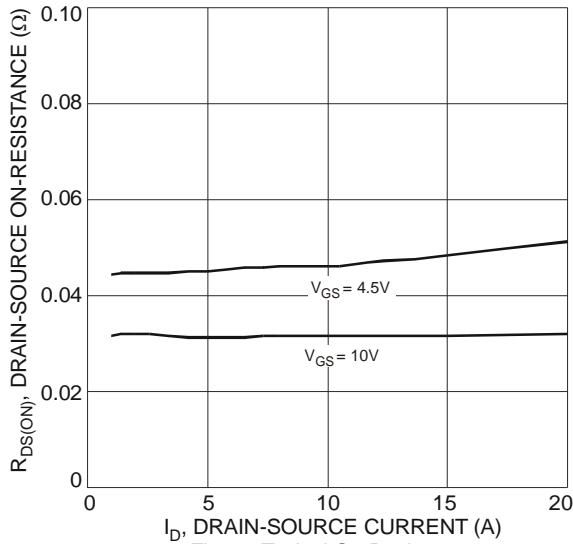


Fig. 13 Typical On-Resistance vs. Drain Current and Gate Voltage

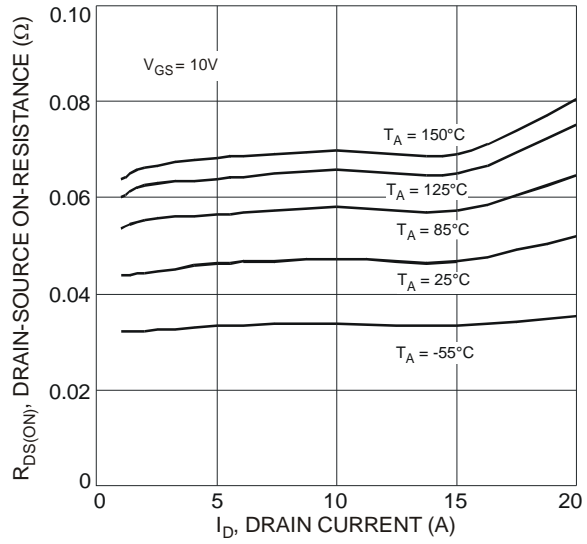


Fig. 14 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

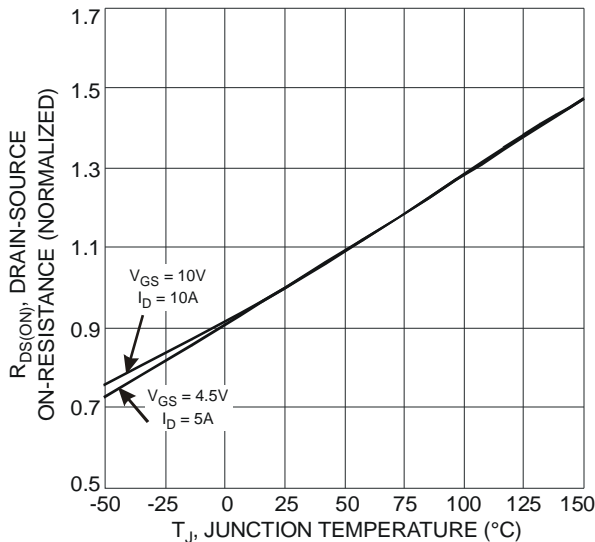


Fig. 15 On-Resistance Variation with Temperature

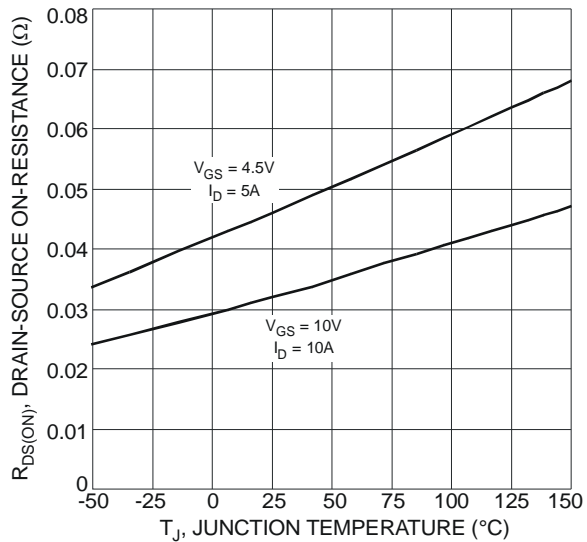


Fig. 16 On-Resistance Variation with Temperature

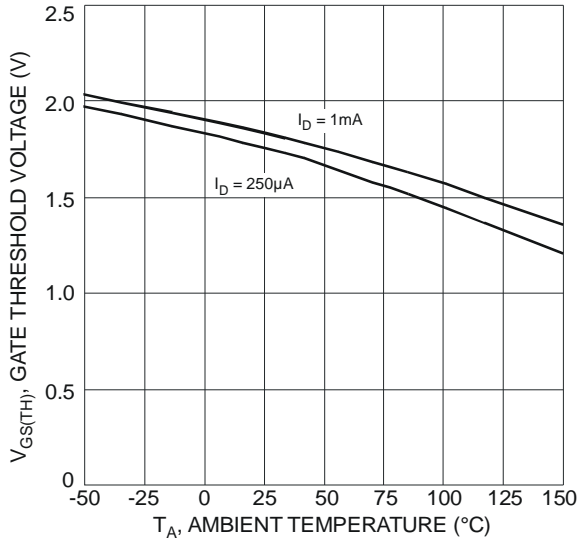


Fig. 17 Gate Threshold Variation vs. Ambient Temperature

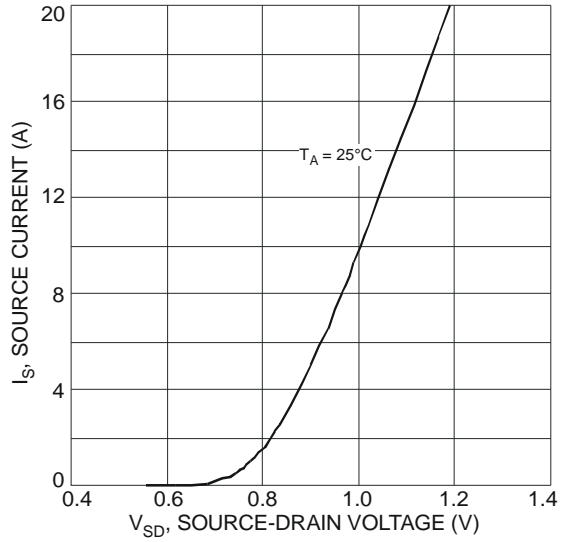


Fig. 18 Diode Forward Voltage vs. Current

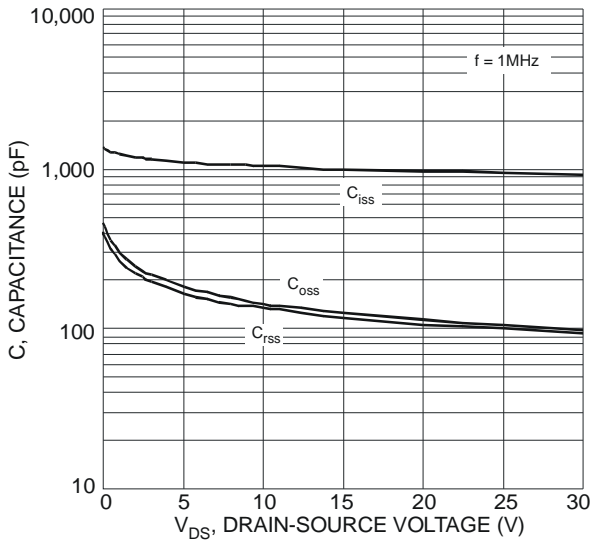


Fig. 19 Typical Capacitance

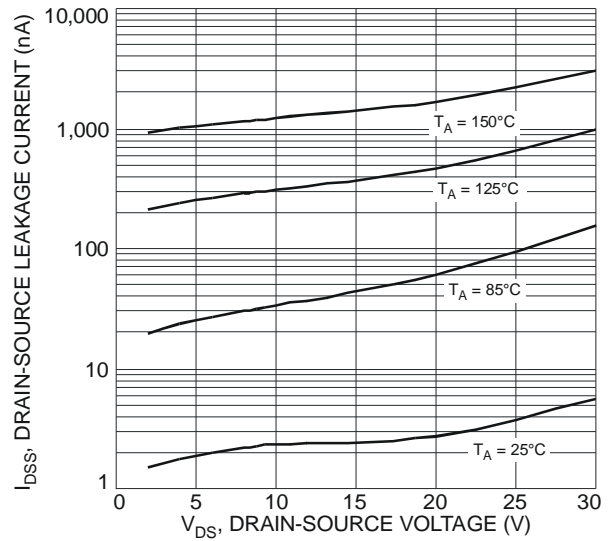


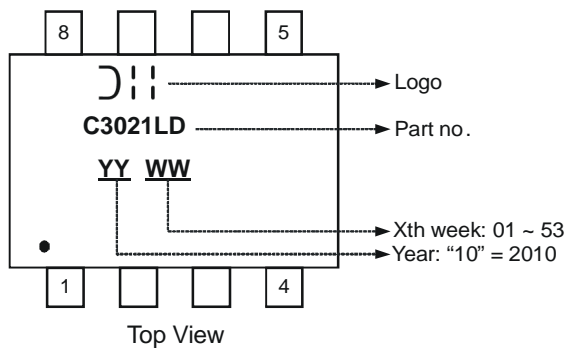
Fig. 20 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

**Ordering Information** (Note 7)

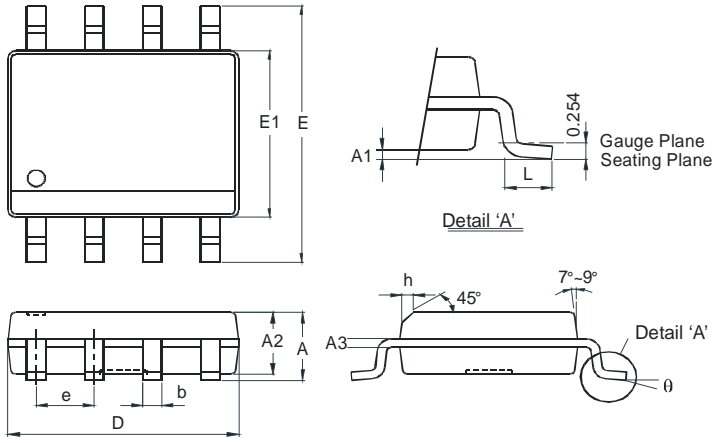
Part Number	Case	Packaging
DMC3021LSD-13	SO-8	2500/Tape & Reel

Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

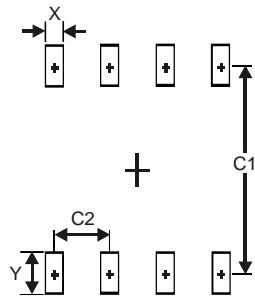


**Package Outline Dimensions**



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**



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

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