

Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D Max $T_A = +25^\circ\text{C}$ (Notes 5 & 7)
Q1	30V	32m Ω @ $V_{GS} = 10\text{V}$	8.1A
		46m Ω @ $V_{GS} = 4.5\text{V}$	6.1A
Q2	-30V	39m Ω @ $V_{GS} = -10\text{V}$	-7A
		53m Ω @ $V_{GS} = -4.5\text{V}$	-5.6A

Description

This 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

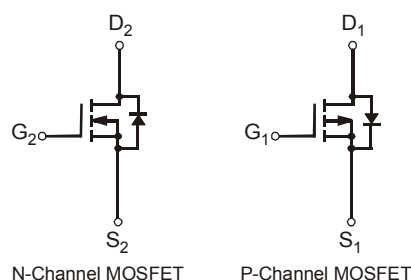
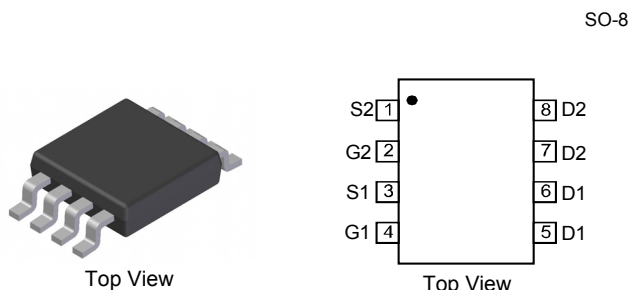
- Power Management Functions
- Analog Switch
- Load Switch

Features

- Low On-Resistance
- N-Channel: 32m Ω @ 10V
46m Ω @ 4.5V
- P-Channel: 39m Ω @ 10V
53m Ω @ 4.5V
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **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 ③
- Marking Information (See Page 2)
- Ordering Information
- Weight: 0.072 grams (approximate)

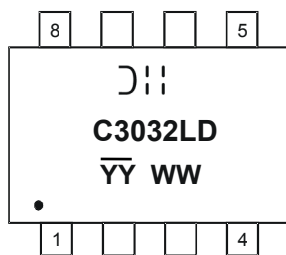
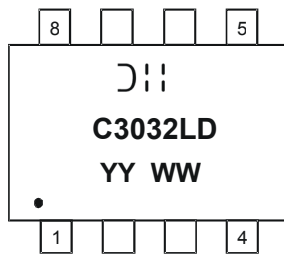


Ordering Information (Note 4)

Part Number	Case	Packaging
DMC3032LSD-13	SO-8	2,500/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


Chengdu A/T Site

Shanghai A/T Site

Diodes = Manufacturer's Marking
 C3032LD = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 14 = 2014)
 WW = Week (01 - 53)
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Maximum Ratings N-CHANNEL – Q1 @T_A = +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 5)	Steady State	T _A = +25°C	I _D	8.1	A
		T _A = +85°C		5.1	
Pulsed Drain Current (Note 6)			I _{DM}	25	A

Maximum Ratings P-CHANNEL – Q2 @T_A = +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 5)	Steady State	T _A = +25°C	I _D	-7.0	A
		T _A = +85°C		-4.5	
Pulsed Drain Current (Note 6)			I _{DM}	-25	A

Thermal Characteristics @T_A = +25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	50	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
 6. 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
OFF CHARACTERISTICS (Note 7)						
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	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
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	$R_{DS(ON)}$	-	23	32	m Ω	$V_{GS} = 10V, I_C = 7A$
			32	46		$V_{GS} = 4.5V, I_C = 5.6A$
Forward Transfer Admittance	$ Y_{fs} $	-	7.6	-	S	$V_{DS} = 5V, I_C = 7A$
Diode Forward Voltage (Note 7)	V_{SD}	-	0.7	1	V	$V_{GS} = 0V, I_S = 1A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	404.5	-	pF	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	51.8	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	45.1	-	pF	
Gate Resistance	R_g	-	1.5	-	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$
Total Gate Charge (10V)	Q_g	-	9.2	-	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 5.8A$
Gate-Source Charge	Q_{gs}	-	1.2	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.8	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	3.4	-	ns	$V_{GS} = 10V, V_{DS} = 15V, R_G = 3\Omega, R_L = 2.6\Omega$
Turn-On Rise Time	t_r	-	6.18	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	13.92	-	ns	
Turn-Off Fall Time	t_f	-	2.84	-	ns	

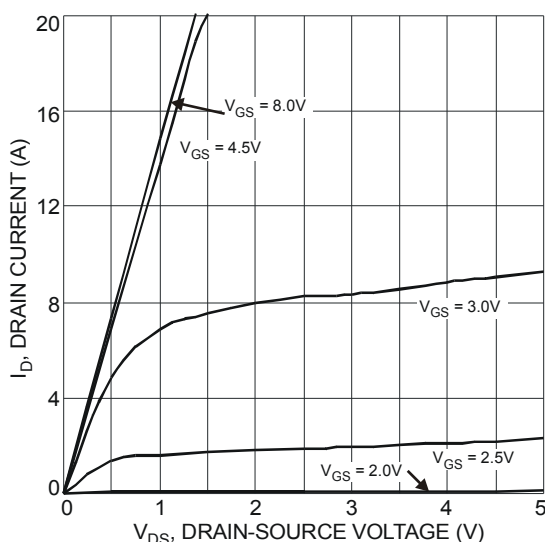


Fig. 1 Typical Output Characteristics

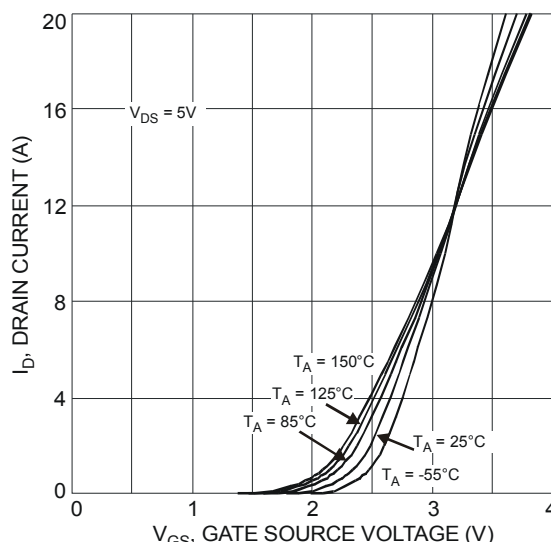


Fig. 2 Typical Transfer Characteristics

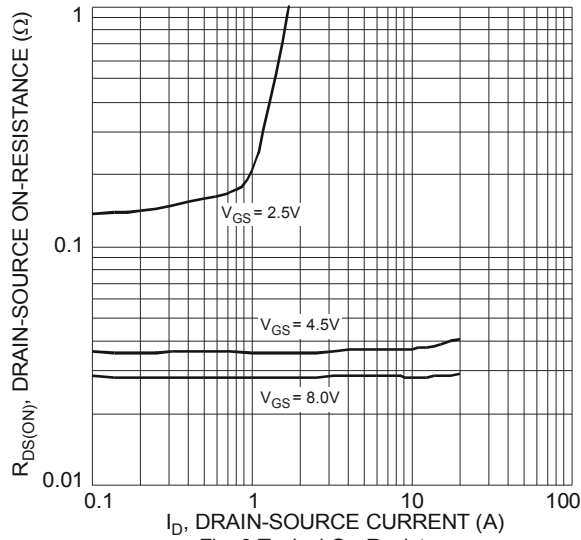


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

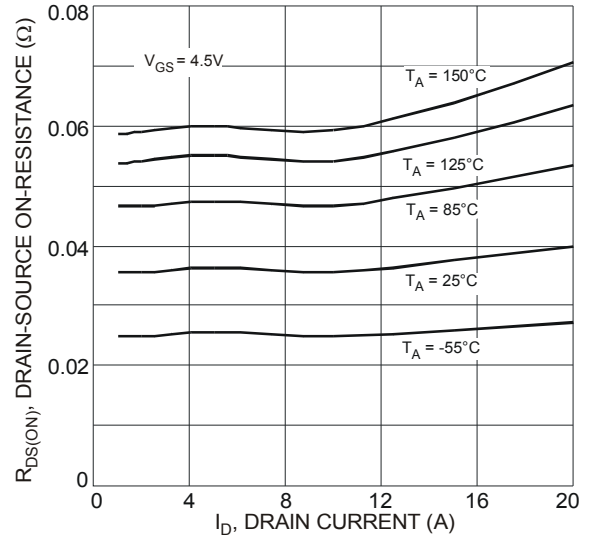


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

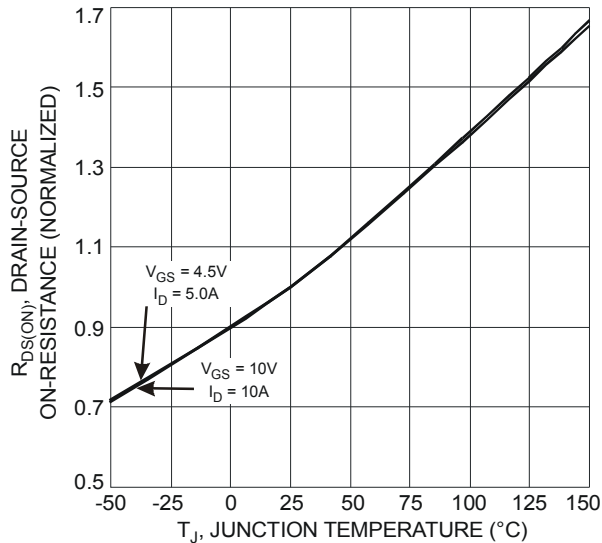


Fig. 5 On-Resistance Variation with Temperature

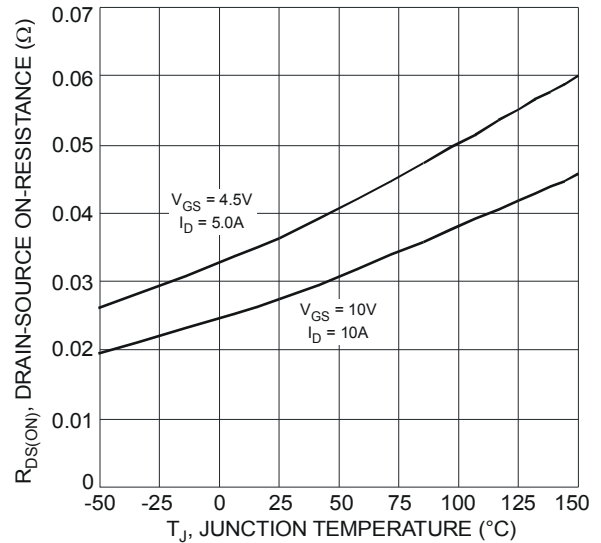


Fig. 6 On-Resistance Variation with Temperature

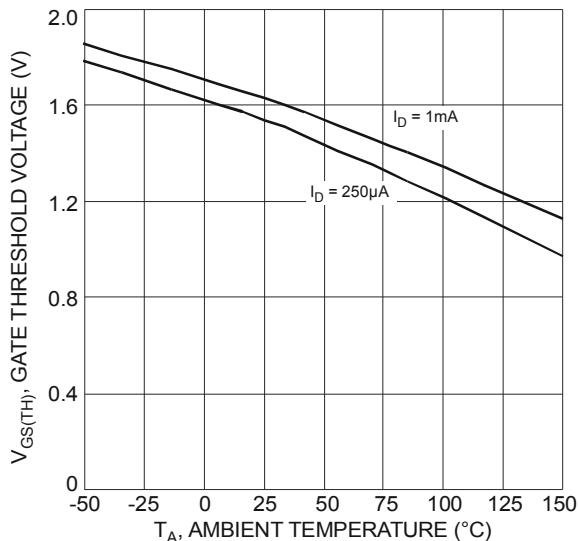


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

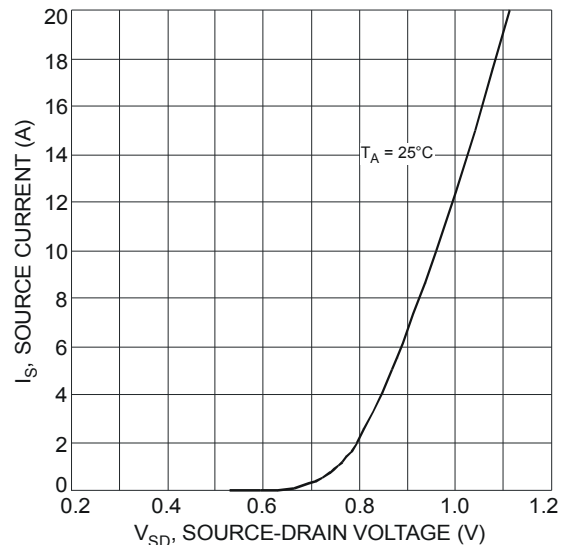


Fig. 8 Diode Forward Voltage vs. Current

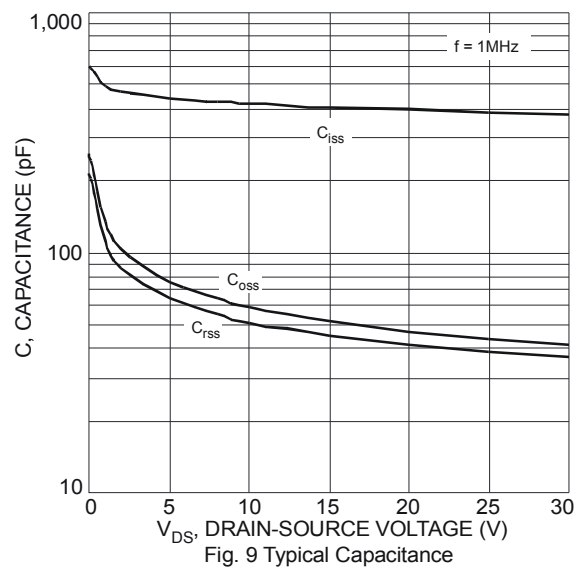


Fig. 9 Typical Capacitance

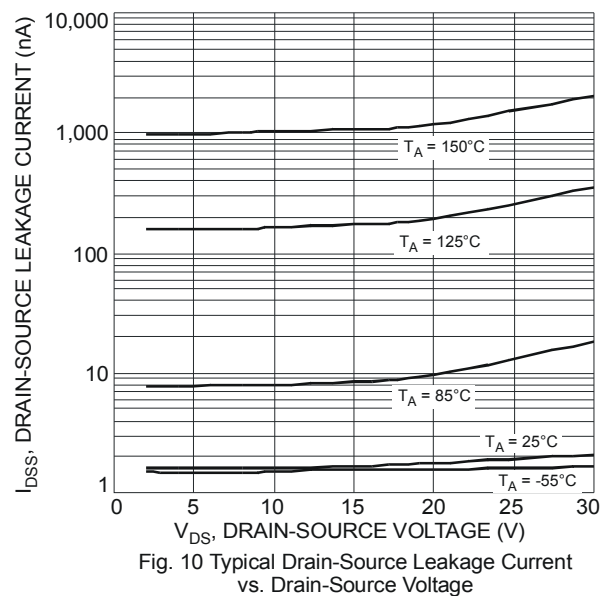


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1.7	-2.2	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	30	39	m Ω	$V_{GS} = -10V, I_D = -4.3A$
			42	53		$V_{GS} = -4.5V, I_D = -3.7A$
Forward Transfer Admittance	$ Y_{fs} $	-	7	-	S	$V_{DS} = -5V, I_D = -4.3A$
Diode Forward Voltage (Note 7)	V_{SD}	-	-0.75	-1	V	$V_{GS} = 0V, I_S = -1.7A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1002	-	pF	$V_{DS} = -15V, V_{GS} = 0V, f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	125	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	118	-	pF	
Gate Resistance	R_g	-	13	-	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$
Total Gate Charge (4.5V)	Q_g	-	10.1	-	nC	$V_{GS} = -4.5V/-10V, V_{DS} = -15V, I_D = -6A$
Total Gate Charge (10V)	Q_g	-	21.1	-	nC	
Gate-Source Charge	Q_{gs}	-	2.8	-	nC	
Gate-Drain Charge	Q_{gd}	-	3.2	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	10.1	-	ns	$V_{GS} = -10V, V_{DS} = -15V, R_G = 6\Omega, I_D = -1A$
Turn-On Rise Time	t_r	-	6.5	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	50.1	-	ns	
Turn-Off Fall Time	t_f	-	22.2	-	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

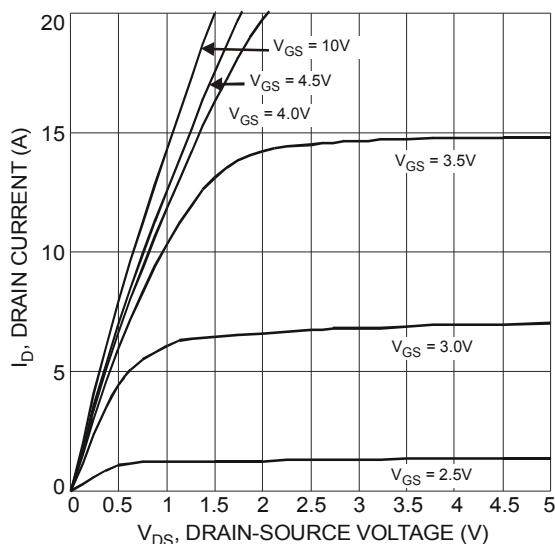


Fig. 11 Typical Output Characteristics

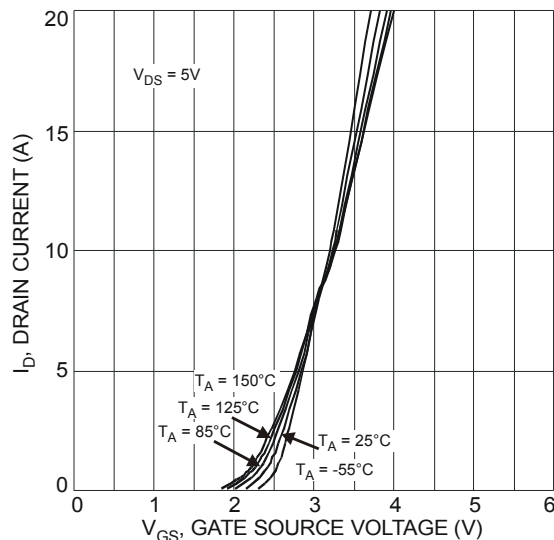


Fig. 12 Typical Transfer Characteristics

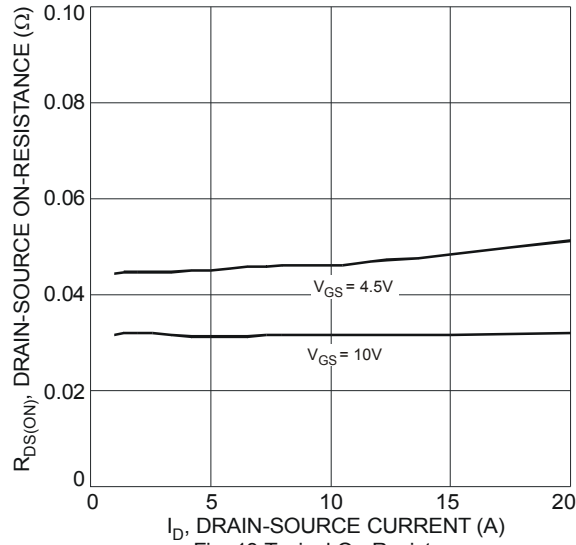


Fig. 13 Typical On-Resistance vs. Drain Current and Gate Voltage

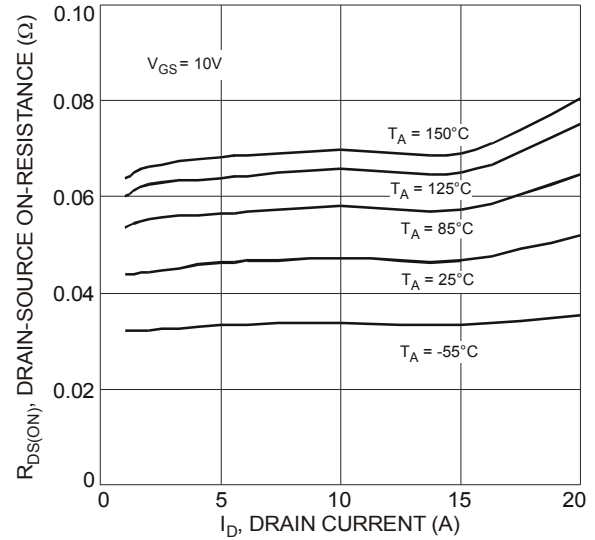


Fig. 14 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

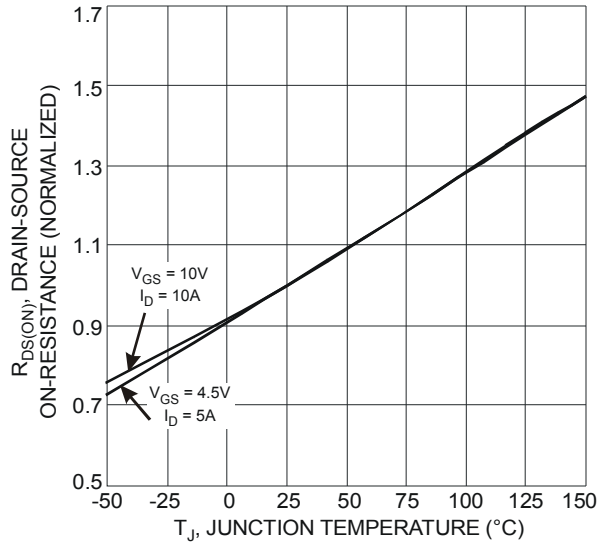


Fig. 15 On-Resistance Variation with Temperature

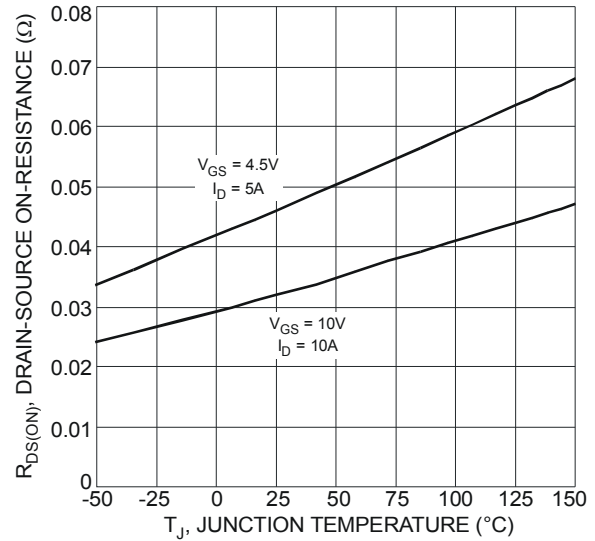


Fig. 16 On-Resistance Variation with Temperature

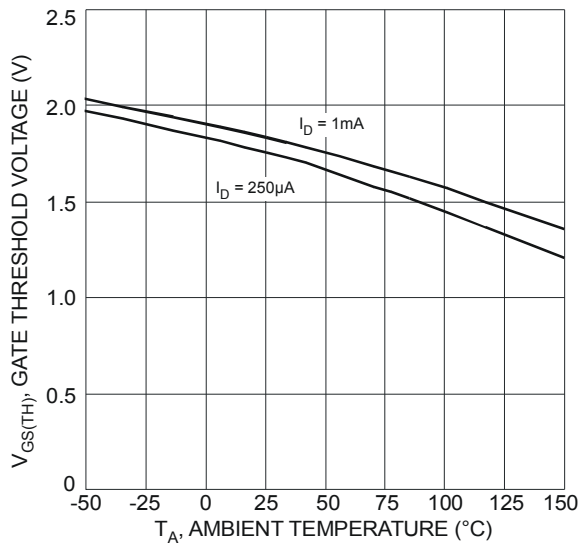


Fig. 17 Gate Threshold Variation vs. Ambient Temperature

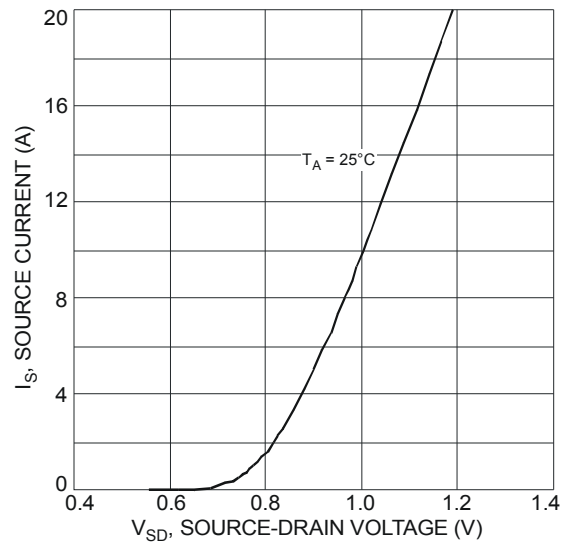


Fig. 18 Diode Forward Voltage vs. Current

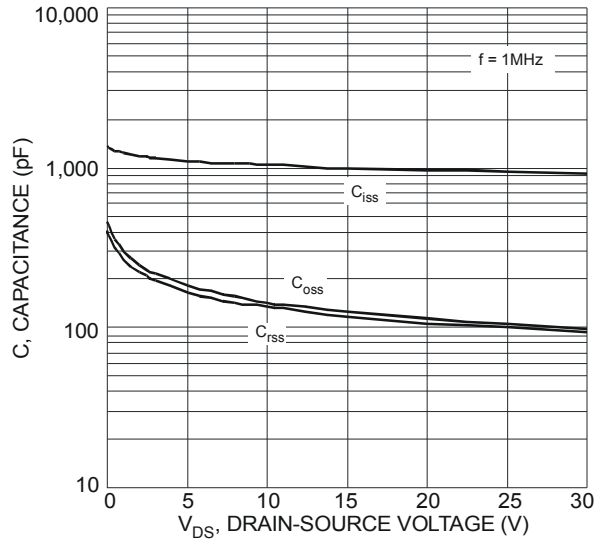


Fig. 19 Typical Capacitance

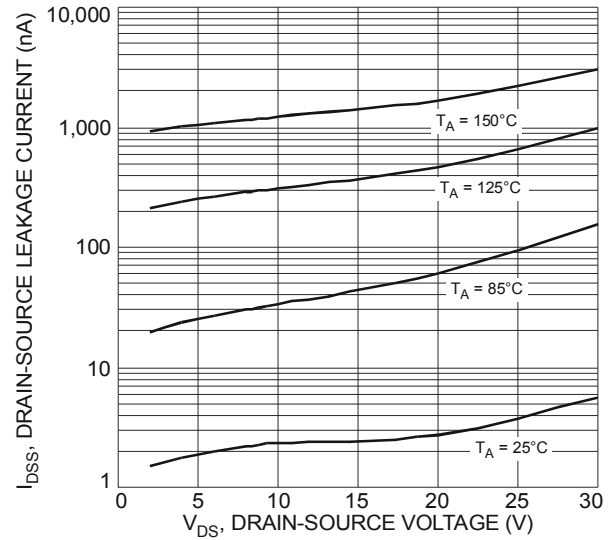
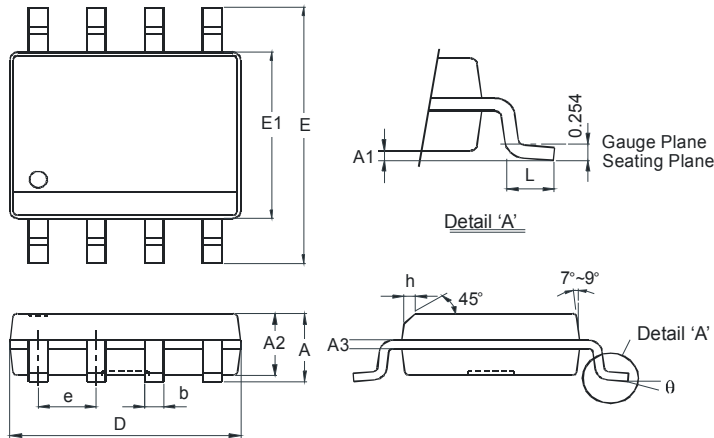


Fig. 20 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

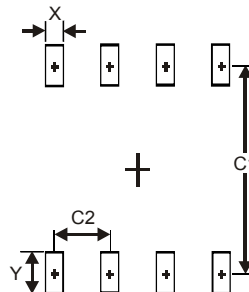


SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

SO-8



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

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