

Product Summary

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

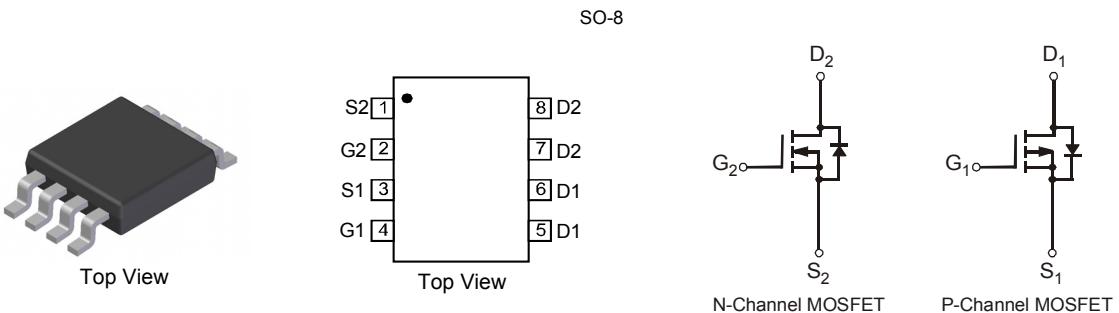
- Power Management Functions
- Analog Switch
- Load Switch

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 e3
- Marking Information (See Page 2)
- Ordering Information
- Weight: 0.072 grams (approximate)



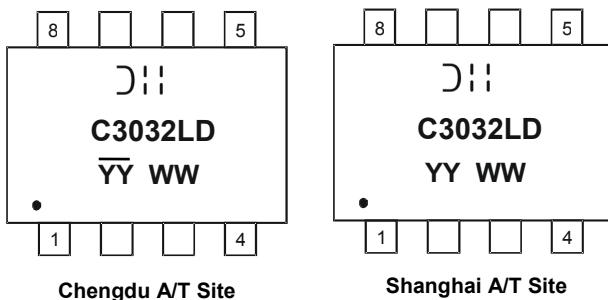
Ordering Information (Note 4)

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

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



DII = 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 @ $T_A = +25^\circ\text{C}$ 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	$T_A = +25^\circ\text{C}$ $T_A = +85^\circ\text{C}$	I_D	8.1 5.1	A
Pulsed Drain Current (Note 6)			I_{DM}	25	A

Maximum Ratings P-CHANNEL – Q2 @ $T_A = +25^\circ\text{C}$ unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +85^\circ\text{C}$	I_D	-7.0 -4.5	A
Pulsed Drain Current (Note 6)			I_{DM}	-25	A

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

Characteristic			Symbol	Value	Unit
Power Dissipation (Note 5)			P_D	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)			$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range			T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$	I_{DSS}	-	-	1	μA	$\text{V}_{\text{DS}} = 30\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$\text{V}_{\text{GS}} = \pm 20\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	1	1.45	2.1	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_C = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS (ON)}}$	-	23	32	$\text{m}\Omega$	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_C = 7\text{A}$
			32	46		$\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_C = 5.6\text{A}$
Forward Transfer Admittance	$ Y_{\text{fs}} $	-	7.6	-	S	$\text{V}_{\text{DS}} = 5\text{V}$, $\text{I}_C = 7\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	-	0.7	1	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	404.5	-	pF	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	51.8	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	45.1	-	pF	
Gate Resistance	R_{g}	-	1.5	-	Ω	$\text{V}_{\text{DS}} = 0\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Total Gate Charge (10V)	Q_{g}	-	9.2	-	nC	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{V}_{\text{DS}} = 15\text{V}$, $\text{I}_D = 5.8\text{A}$
Gate-Source Charge	Q_{gs}	-	1.2	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.8	-	nC	
Turn-On Delay Time	$\text{t}_{\text{D(on)}}$	-	3.4	-	ns	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{V}_{\text{DS}} = 15\text{V}$, $\text{R}_G = 3\Omega$, $\text{R}_L = 2.6\Omega$
Turn-On Rise Time	t_{r}	-	6.18	-	ns	
Turn-Off Delay Time	$\text{t}_{\text{D(off)}}$	-	13.92	-	ns	
Turn-Off Fall Time	t_{f}	-	2.84	-	ns	

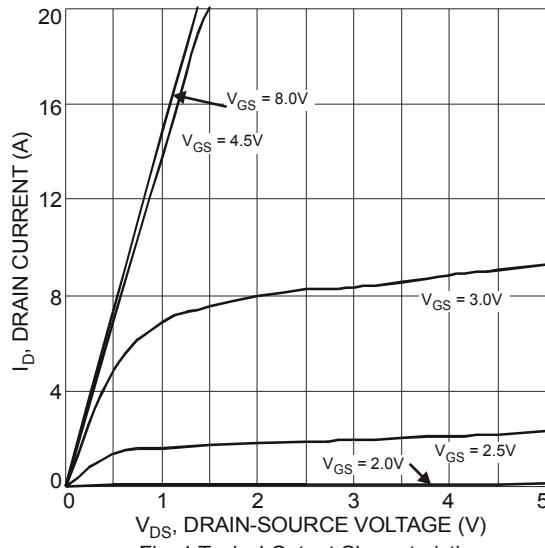


Fig. 1 Typical Output Characteristics

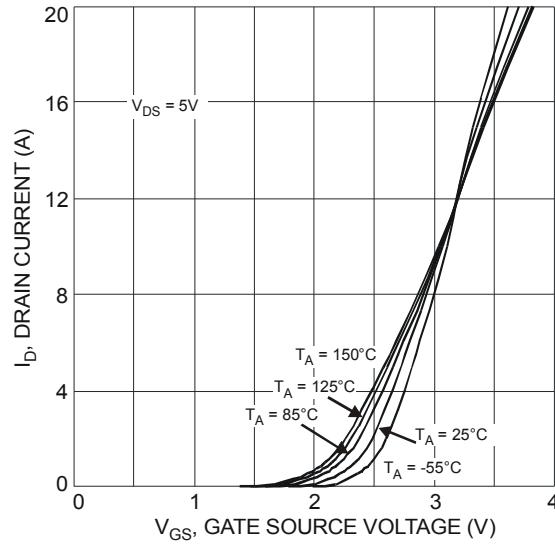


Fig. 2 Typical Transfer Characteristics

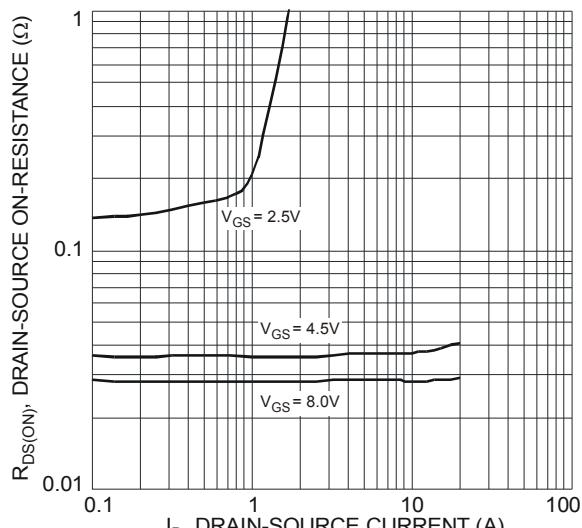


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

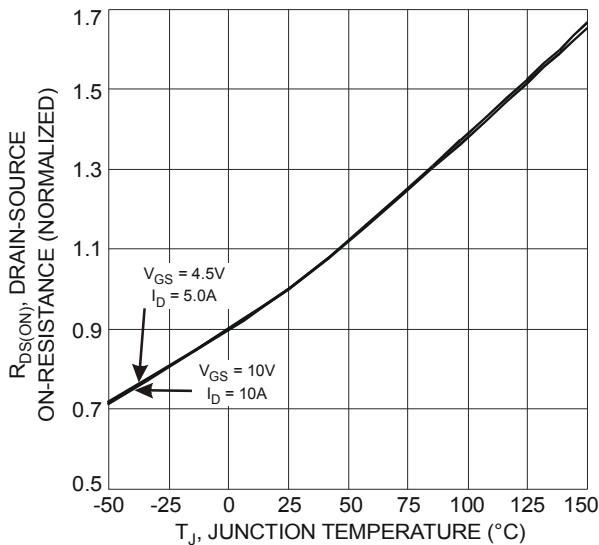


Fig. 5 On-Resistance Variation with Temperature

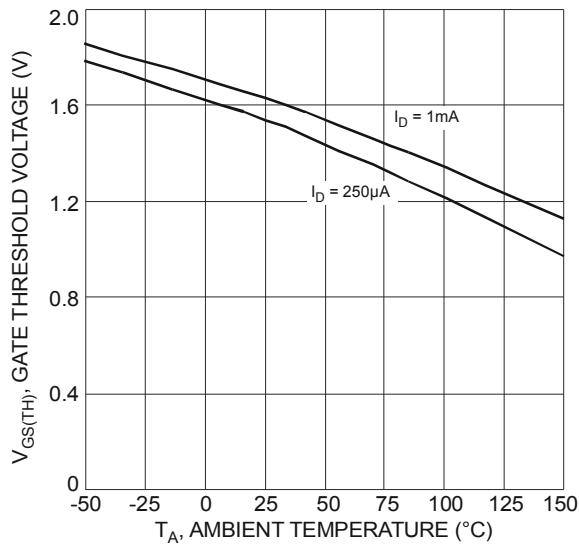


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

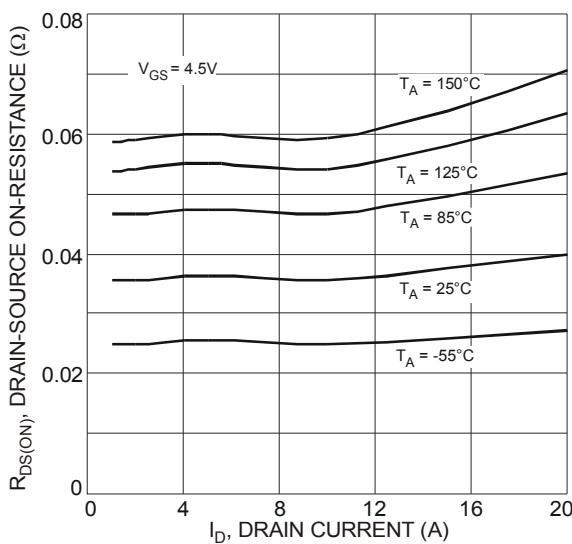


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

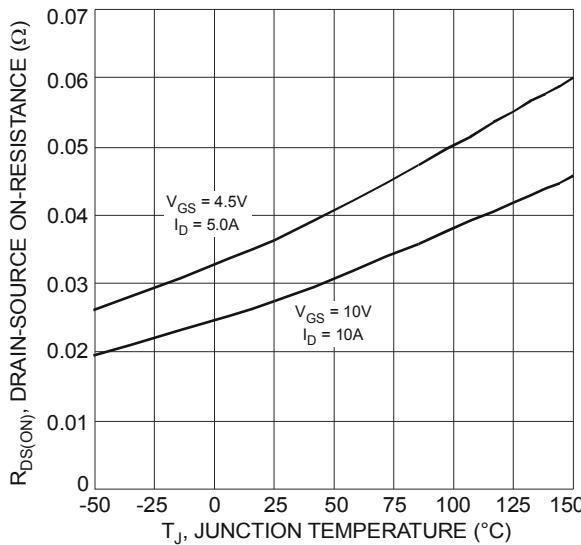


Fig. 6 On-Resistance Variation with Temperature

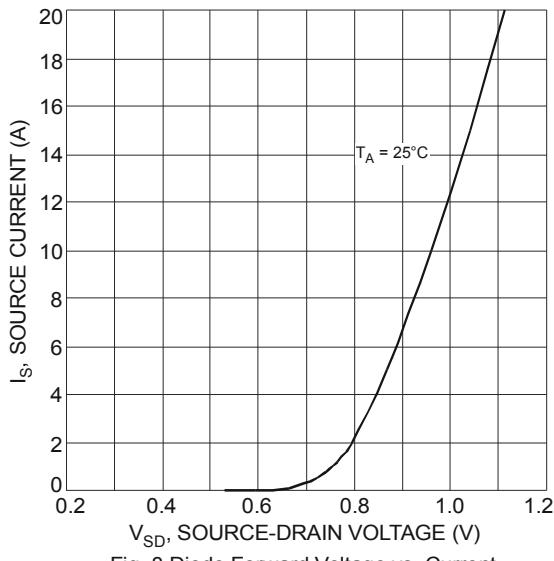


Fig. 8 Diode Forward Voltage vs. Current

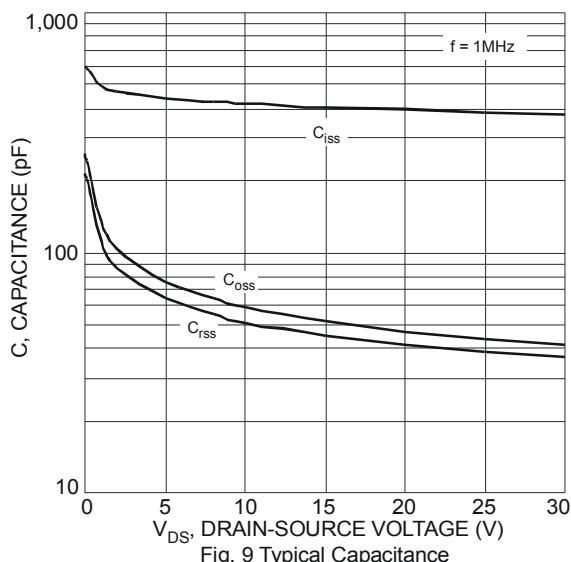


Fig. 9 Typical Capacitance

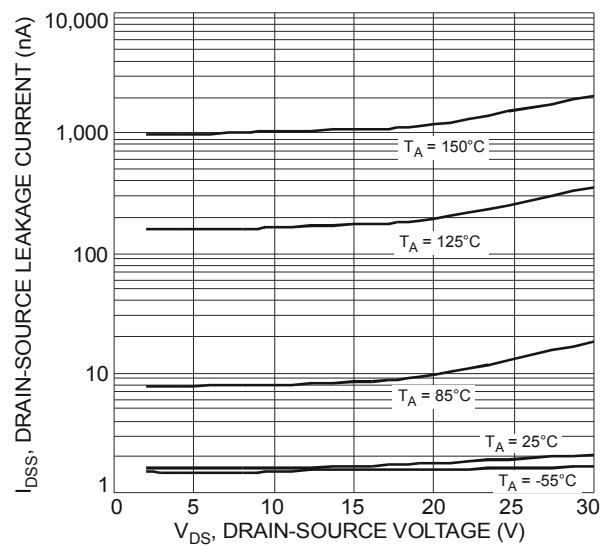


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

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	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$	I_{DSS}	-	-	-1	μA	$\text{V}_{\text{DS}} = -30\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$\text{V}_{\text{GS}} = \pm 20\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	-1	-1.7	-2.2	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS (ON)}}$	-	30	39	$\text{m}\Omega$	$\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = -4.3\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	-	7	-	S	$\text{V}_{\text{DS}} = -5\text{V}$, $\text{I}_D = -4.3\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	-	-0.75	-1	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = -1.7\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1002	-	pF	$\text{V}_{\text{DS}} = -15\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	125	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	118	-	pF	
Gate Resistance	R_{g}	-	13	-	Ω	
Total Gate Charge (4.5V)	Q_{g}	-	10.1	-	nC	
Total Gate Charge (10V)	Q_{g}	-	21.1	-	nC	
Gate-Source Charge	Q_{gs}	-	2.8	-	nC	$\text{V}_{\text{GS}} = -4.5\text{V}/-10\text{V}$, $\text{V}_{\text{DS}} = -15\text{V}$, $\text{I}_D = -6\text{A}$
Gate-Drain Charge	Q_{gd}	-	3.2	-	nC	
Turn-On Delay Time	$\text{t}_{\text{D(on)}}$	-	10.1	-	ns	
Turn-On Rise Time	t_{r}	-	6.5	-	ns	
Turn-Off Delay Time	$\text{t}_{\text{D(off)}}$	-	50.1	-	ns	$\text{V}_{\text{GS}} = -10\text{V}$, $\text{V}_{\text{DS}} = -15\text{V}$, $\text{R}_G = 6\Omega$, $\text{I}_D = -1\text{A}$
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.

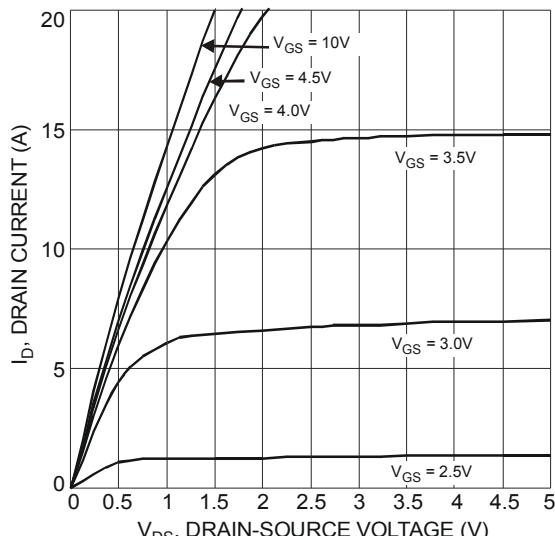


Fig. 11 Typical Output Characteristics

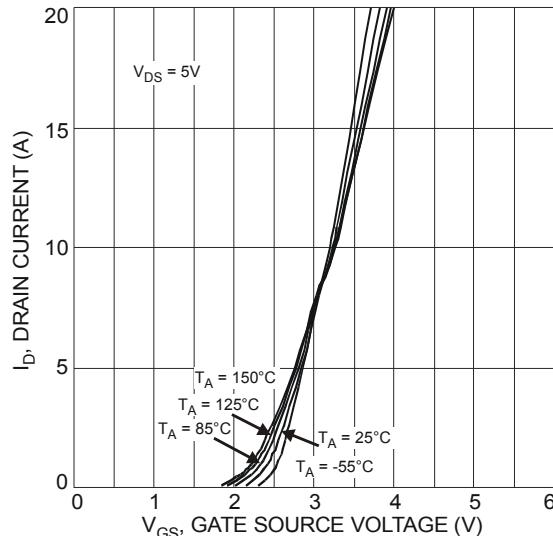


Fig. 12 Typical Transfer Characteristics

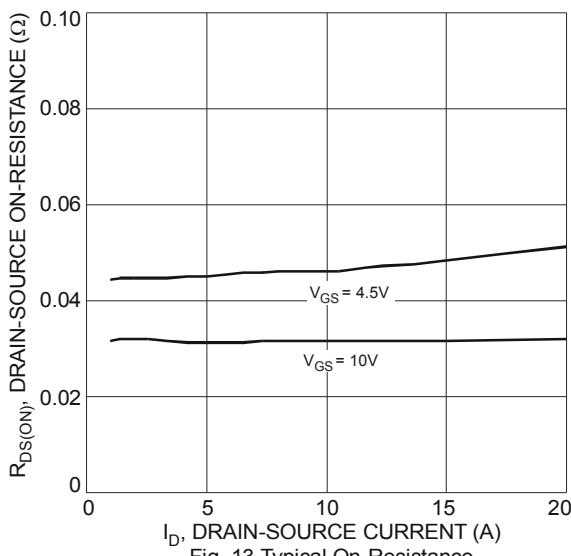


Fig. 13 Typical On-Resistance
vs. Drain Current and Gate Voltage

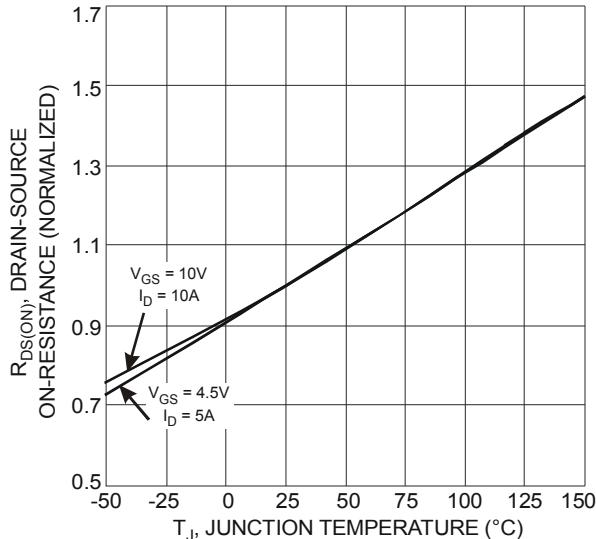


Fig. 15 On-Resistance Variation with Temperature

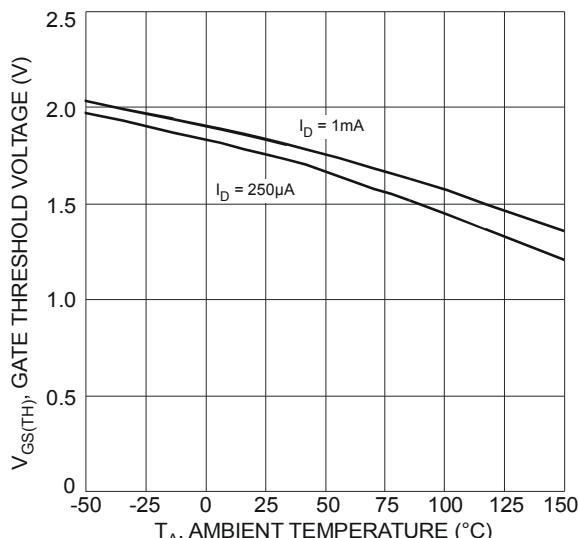


Fig. 17 Gate Threshold Variation vs. Ambient Temperature

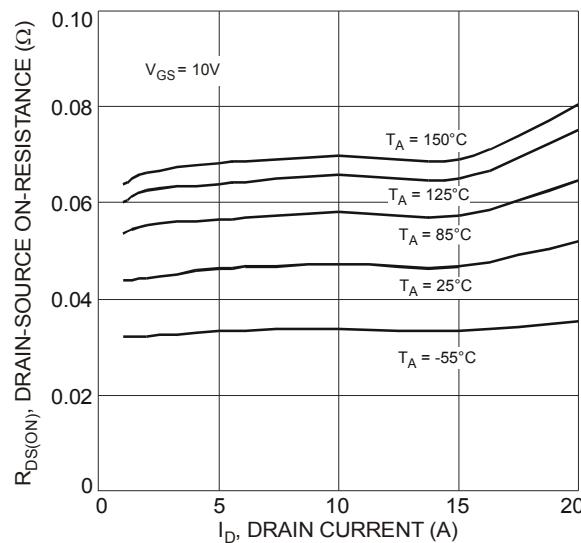


Fig. 14 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

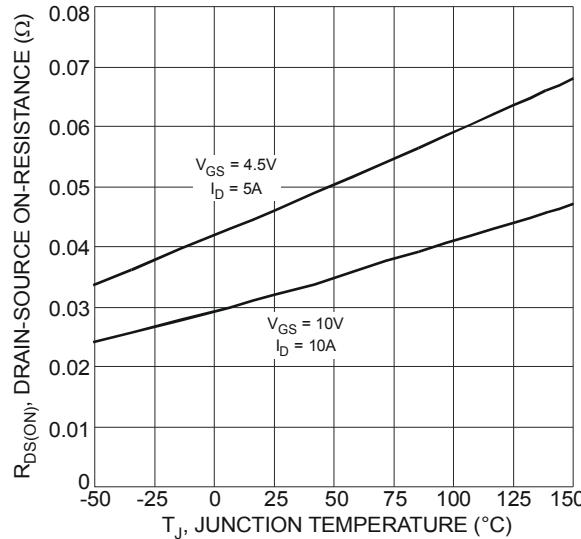


Fig. 16 On-Resistance Variation with Temperature

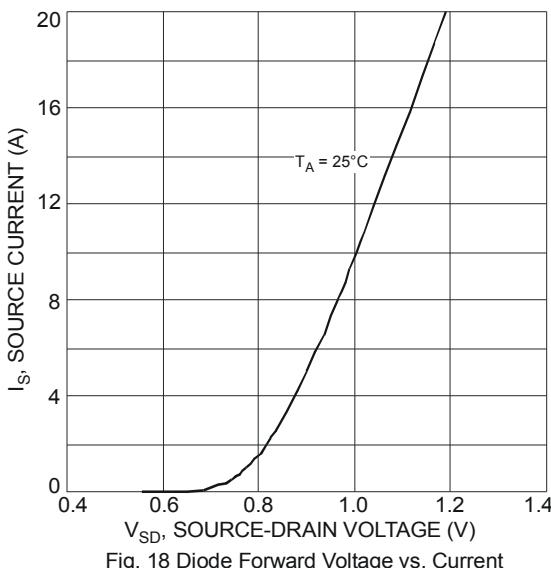
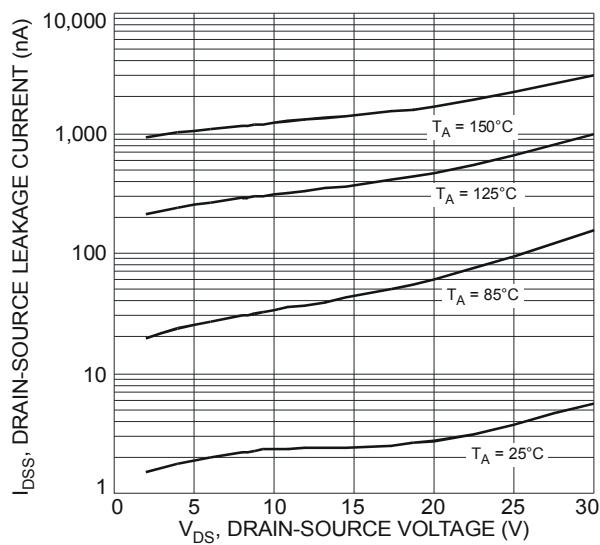
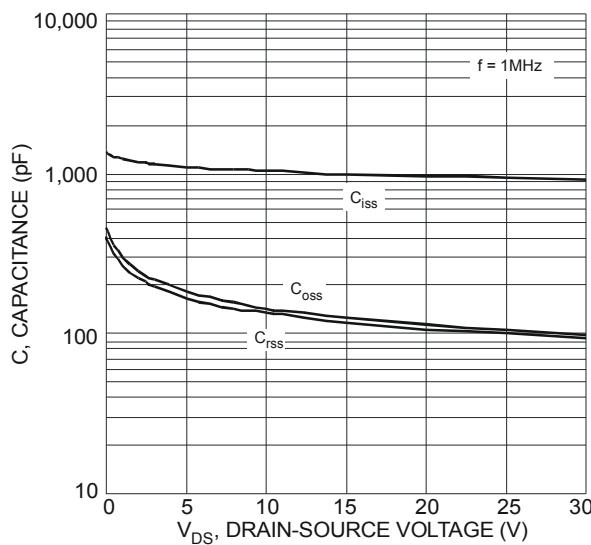
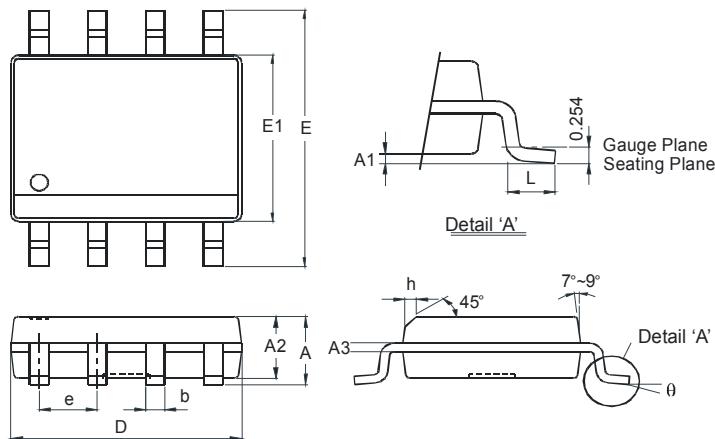


Fig. 18 Diode Forward Voltage vs. Current



Package Outline Dimensions

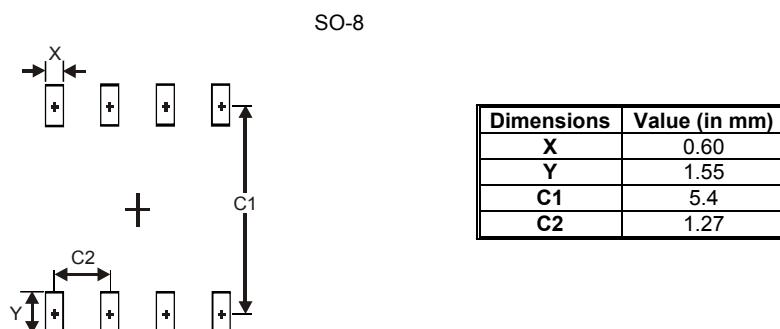
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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.



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