

COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D Max $T_A = +25^\circ C$
Q2	30V	20m Ω @ $V_{GS} = 10V$	9.1A
		32m Ω @ $V_{GS} = 4.5V$	7.2A
Q1	-30V	45m Ω @ $V_{GS} = -10V$	-6A
		65m Ω @ $V_{GS} = -4.5V$	-5A

Description

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.

Applications

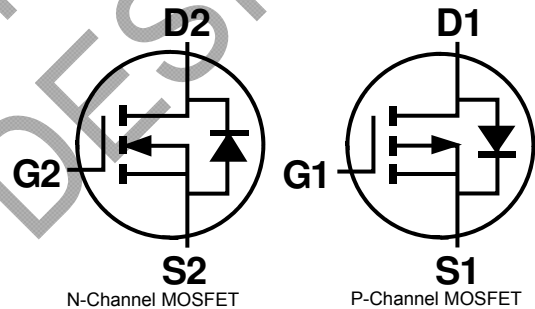
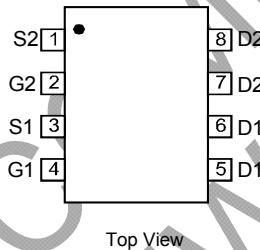
- Power Management Functions
- Analog Switch
- Load Switch

Features

- Complementary Pair MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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:
- 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
- Weight: 0.072g (approximate)

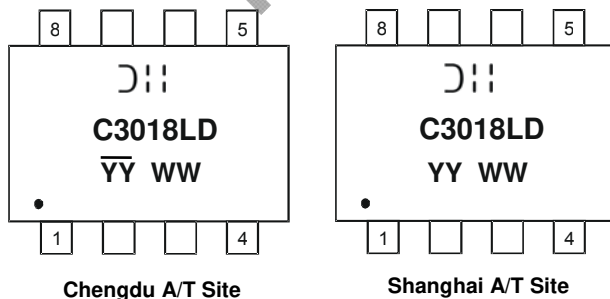


Ordering Information (Note 4)

Part Number	Case	Packaging
DMC3018LSD-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



- ☺ :: = Manufacturer's Marking
- C3018LD = 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 – 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	
Drain Current (Note 5)	I _D	T _A = +25°C T _A = +70°C	9.1 7.7	A
Pulsed Drain Current (Note 6)		I _{DM}	32	A

Maximum Ratings P-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	
Drain Current (Note 5)	I _D	T _A = +25°C T _A = +70°C	-6 -5	A
Pulsed Drain Current (Note 6)		I _{DM}	-21	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	R _{θJA}	50	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics N-CHANNEL – Q2 (@T_A = +25°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 = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	± 100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	1	1.9	2.1	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	18 29	20 32	mΩ	V _{GS} = 10V, I _D = 6.9A V _{GS} = 4.5V, I _D = 5.0A
Forward Transfer Admittance	Y _{fs}	—	10	—	S	V _{DS} = 5V, I _D = 6.9A
Diode Forward Voltage (Note 7)	V _{SD}	0.5	—	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	—	631	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	147	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	99	—	pF	
Gate Resistance	R _G	—	0.9	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _g	—	5.9 12.4	—	nC	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 7A V _{DS} = 15V, V _{GS} = 10V, I _D = 9A
Gate-Source Charge	Q _{gs}	—	1.8	—		V _{DS} = 15V, V _{GS} = 10V, I _D = 9A
Gate-Drain Charge	Q _{gd}	—	3.4	—		V _{DS} = 15V, V _{GS} = 10V, I _D = 9A

- Notes:
- Device mounted on FR-4 PCB, on 2oz. Copper pads with R_{θJA} = 50°C/W
 - Repetitive rating, pulse width limited by junction temperature.
 - Short duration pulse test used to minimize self-heating effect.

Electrical Characteristics P-CHANNEL – Q1 (@T_A = +25°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 = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	± 100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	-1	-1.7	-2.1	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS (ON)}	—	35	45	mΩ	V _{GS} = -10V, I _D = -6A
		—	56	65		V _{GS} = -4.5V, I _D = -5.0A
Forward Transfer Admittance	Y _{fs}	—	8.2	—	S	V _{DS} = -5V, I _D = -6A
Diode Forward Voltage (Note 7)	V _{SD}	-0.5	—	-1.2	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	—	722	—	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	92	—	pF	
Gate Resistance	R _G	—	1.9	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _g	—	7.0	—	nC	V _{DS} = -15V, V _{GS} = -4.5V, I _D = -6A
		—	13.7	—		V _{DS} = -15V, V _{GS} = -10V, I _D = -6A
Gate-Source Charge	Q _{gs}	—	1.7	—	nC	V _{DS} = -15V, V _{GS} = -4.5V, I _D = -6A
Gate-Drain Charge	Q _{gd}	—	4.1	—		V _{DS} = -15V, V _{GS} = -4.5V, I _D = -6A

NOT RECOMMENDED FOR NEW DESIGN

N-CHANNEL

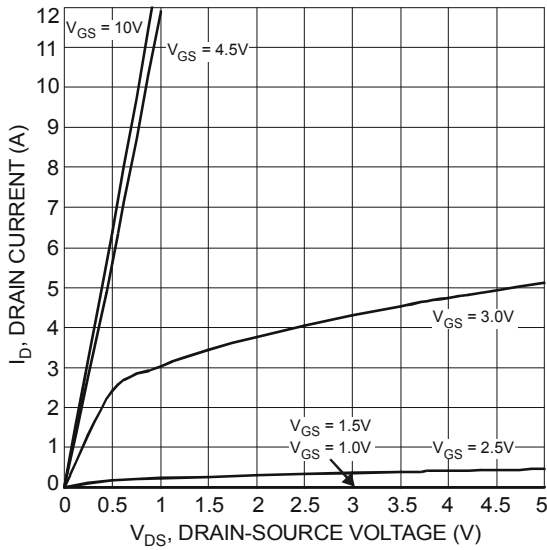


Fig. 1 Typical Output Characteristics

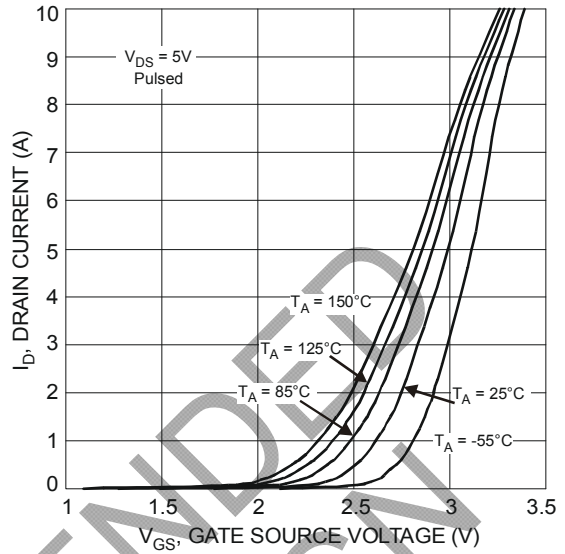


Fig. 2 Typical Transfer Characteristics

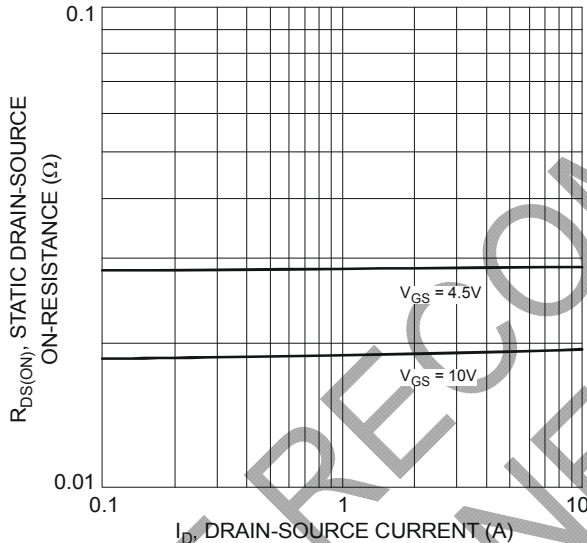


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

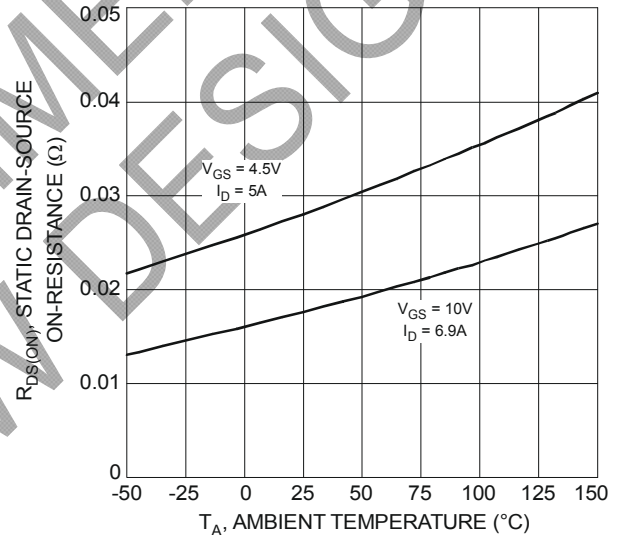


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

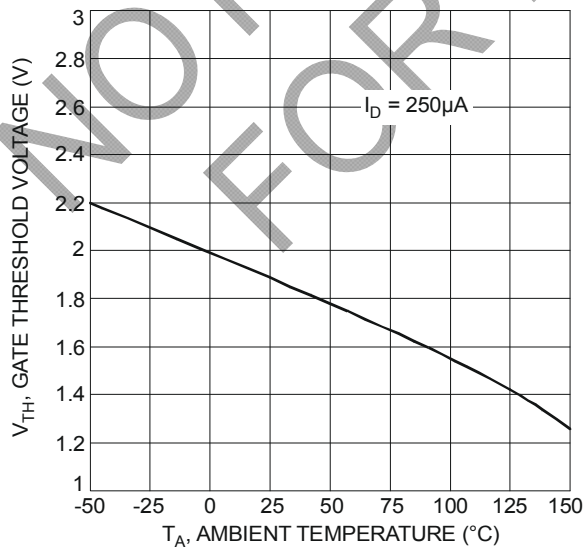


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

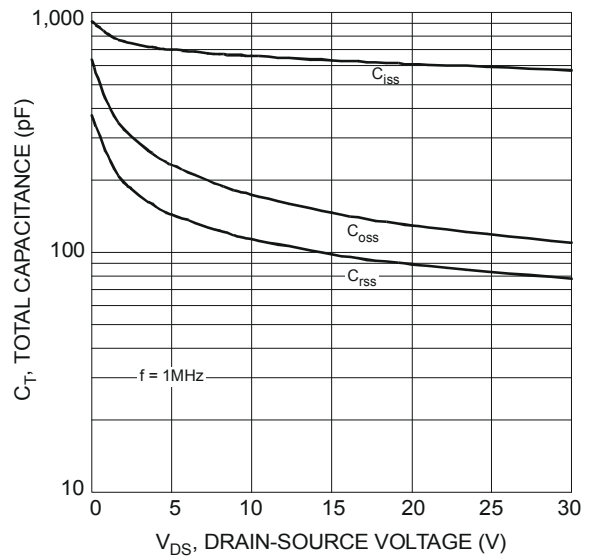


Fig. 6 Typical Total Capacitance

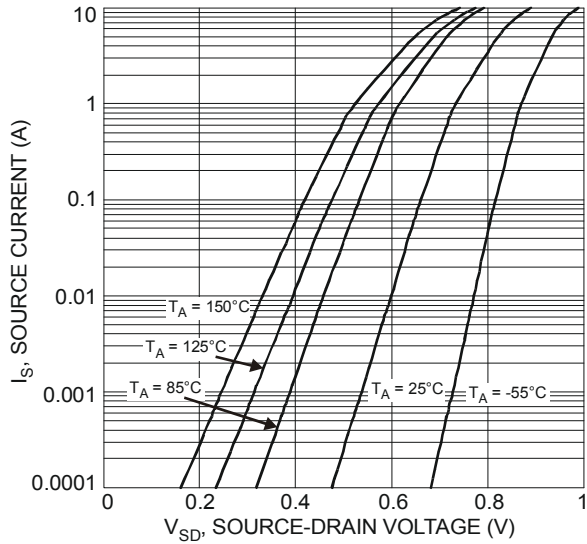


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

NOT RECOMMENDED
FOR NEW DESIGN

P-CHANNEL

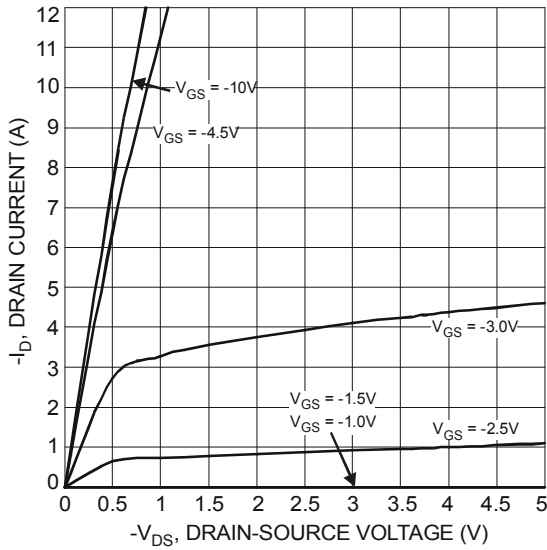


Fig. 8 Typical Output Characteristics

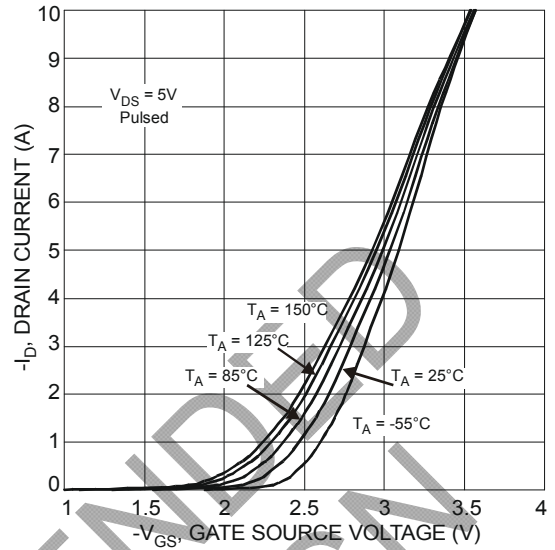


Fig. 9 Typical Transfer Characteristics

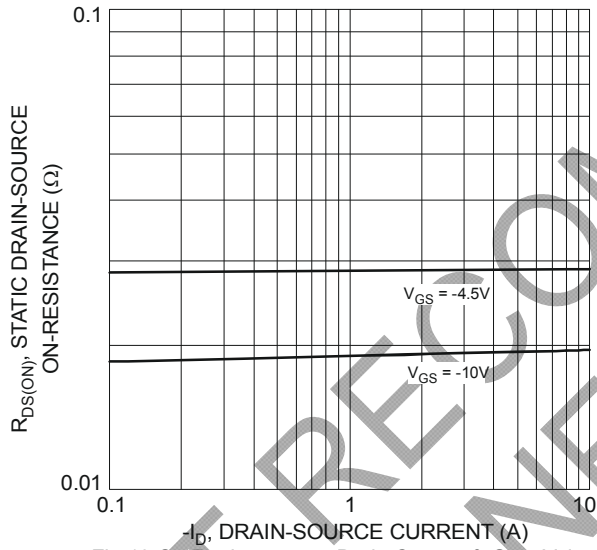


Fig. 10 On-Resistance vs. Drain Current & Gate Voltage

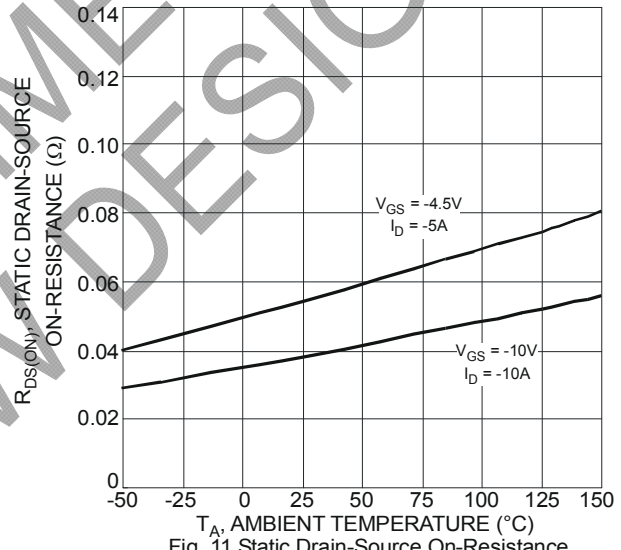


Fig. 11 Static Drain-Source On-Resistance vs. Ambient Temperature

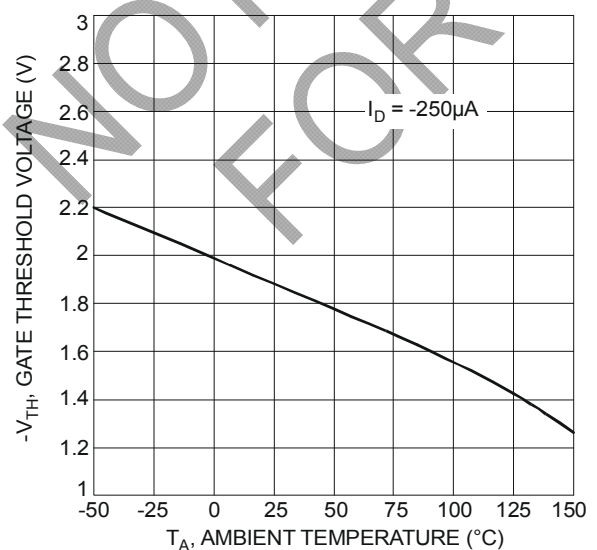


Fig. 12 Gate Threshold Variation vs. Ambient Temperature

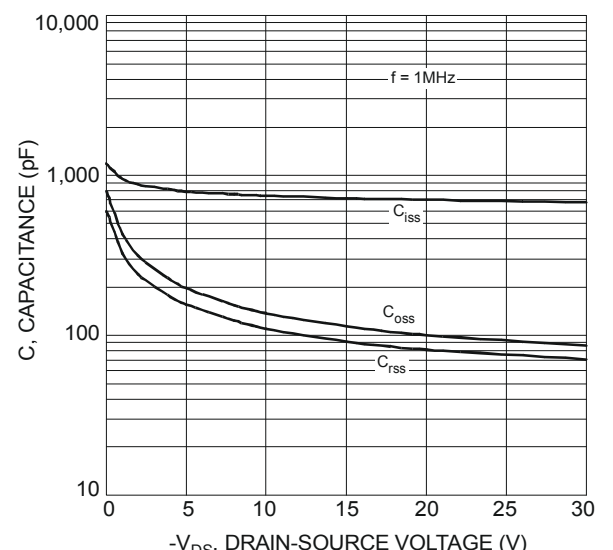


Fig. 13 Typical Total Capacitance

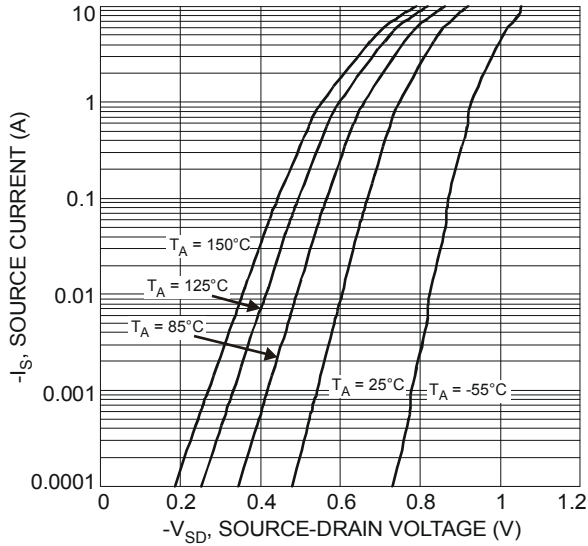
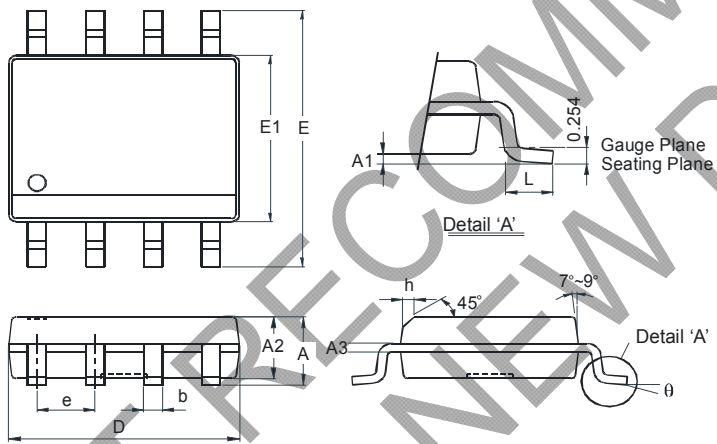


Fig. 14 Reverse Drain Current vs. Source-Drain Voltage

Package Outline Dimensions

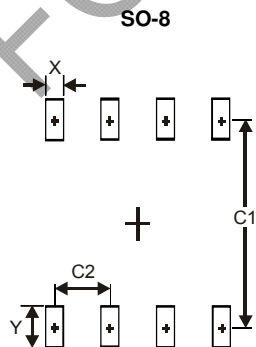
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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.



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

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