



**THE DATASHEET OF  
DMC3036LSD-13**



**COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET**

**Product Summary**

Device	$V_{(BR)DSS}$	$R_{DS(ON) max}$	Package	$I_D$ $T_A = +25^\circ C$
N-CH	30V	36m $\Omega$ @ $V_{GS} = 10V$	SO-8	6.9A
		61m $\Omega$ @ $V_{GS} = 4.5V$		5.1A
P-CH	-30V	36m $\Omega$ @ $V_{GS} = -10V$		-6.0A
		64m $\Omega$ @ $V_{GS} = -4.5V$		-5.0

**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**

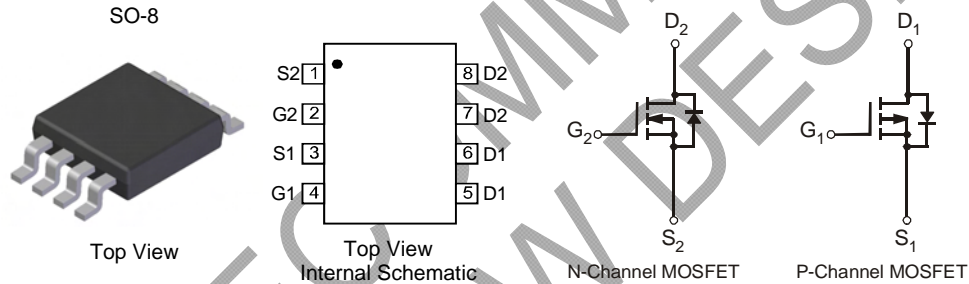
- Motor control
- Power Management Functions
- DC-DC Converters
- Inverter

**Features**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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)
- Weight: 0.072g (approximate)

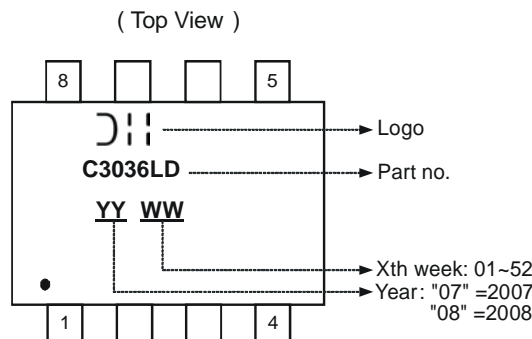


**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMC3036LSD-13	SO-8	2500/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> 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>.

**Marking Information**



**Maximum Ratings N-CHANNEL** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	5.0 4.0	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	6.9 5.8	A
Maximum Continuous Body Diode Forward Current (Note 5)			I <sub>S</sub>	2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I <sub>DM</sub>	24	A

**Maximum Ratings P-CHANNEL** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-4.5 -3.5	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-6 -5	A
Maximum Continuous Body Diode Forward Current (Note 5)			I <sub>S</sub>	-2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I <sub>DM</sub>	-21	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	Steady State	P <sub>D</sub>	1.5	W
	t < 10s		2.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	83	°C/W
	t < 10s		49	
Thermal Resistance, Junction to Case (Note 5)		R <sub>θJC</sub>	15	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

### Electrical Characteristics N-CHANNEL (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</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	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 24V, 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 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	—	2.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	28 51	36 61	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 6.9A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5.0A
Forward Transfer Admittance	Y <sub>fs</sub>	—	7.7	—	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.9A
Diode Forward Voltage	V <sub>SD</sub>	0.5	—	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	—	431	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	55	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	48	—	pF	
Gate Resistance	R <sub>G</sub>	—	1.3	—	Ω	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS (Note 7)</b>						
Total Gate Charge	Q <sub>g</sub>	—	3.8 7.9	—	nC	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A
Gate-Source Charge	Q <sub>gs</sub>	—	1.4	—		V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A
Gate-Drain Charge	Q <sub>gd</sub>	—	1.7	—		V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A

### 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 6)</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	I <sub>DSS</sub>	—	—	-1.0	μA	V <sub>DS</sub> = -24V, 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 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1	—	-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 53	36 64	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -6A V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A
Forward Transfer Admittance	Y <sub>fs</sub>	—	8.8	—	S	V <sub>DS</sub> = -5V, I <sub>D</sub> = -6A
Diode Forward Voltage	V <sub>SD</sub>	-0.5	—	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	—	977	—	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	129	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	116	—	pF	
Gate Resistance	R <sub>G</sub>	—	13.1	—	Ω	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS (Note 7)</b>						
Total Gate Charge	Q <sub>g</sub>	—	10.1 21.1	—	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = 6A V <sub>DS</sub> = 15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = 6A
Gate-Source Charge	Q <sub>gs</sub>	—	2.8	—		V <sub>DS</sub> = 15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = 6A
Gate-Drain Charge	Q <sub>gd</sub>	—	3.2	—		V <sub>DS</sub> = 15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = 6A

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

**N-CHANNEL**

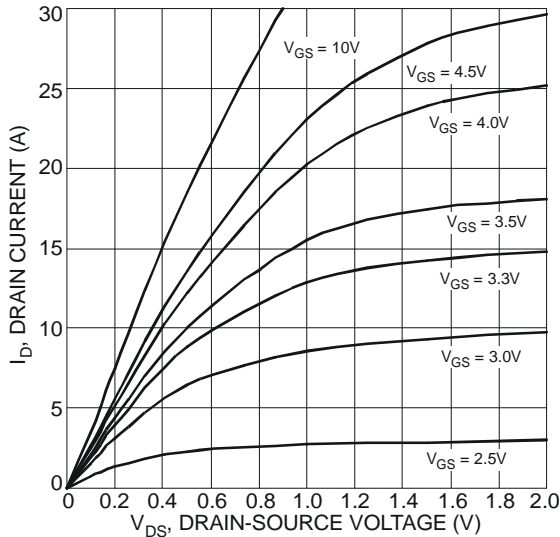


Figure 1 Typical Output Characteristic

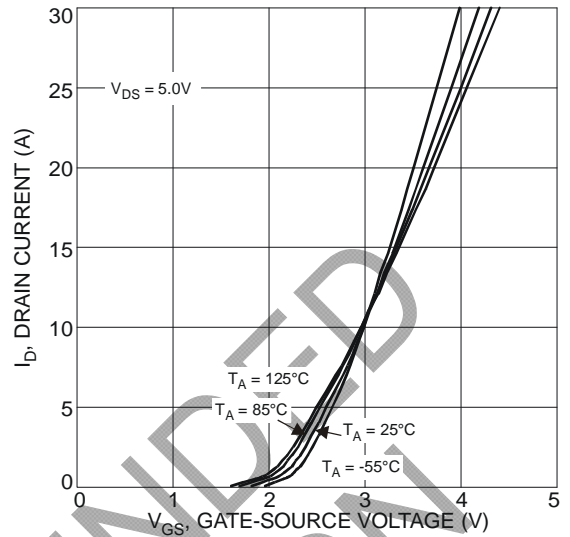


Figure 2 Typical Transfer Characteristics

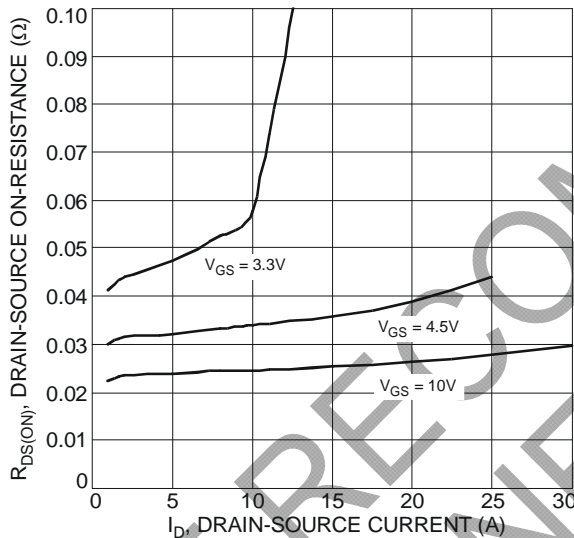


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

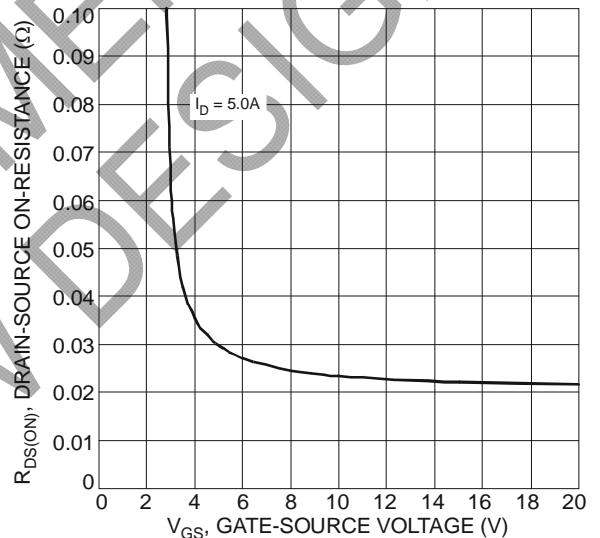


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

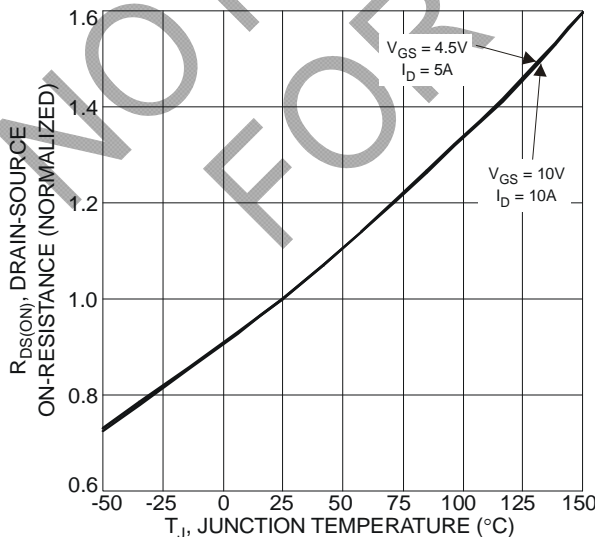


Figure 5 On-Resistance Variation with Temperature

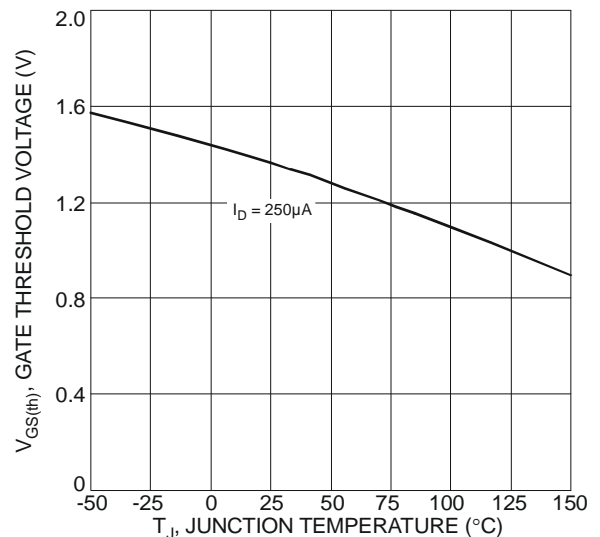
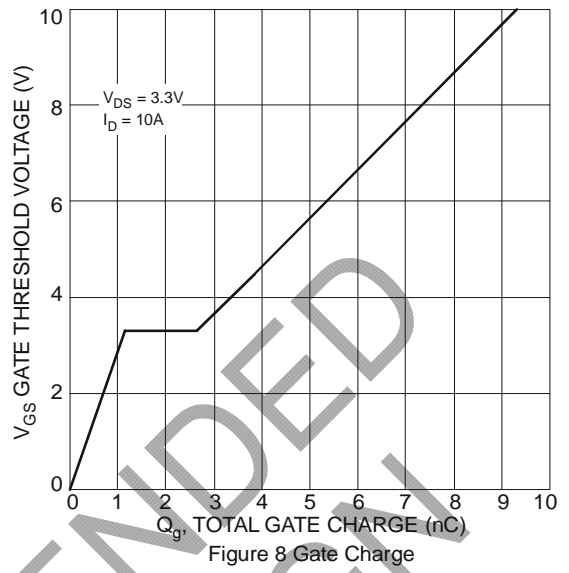
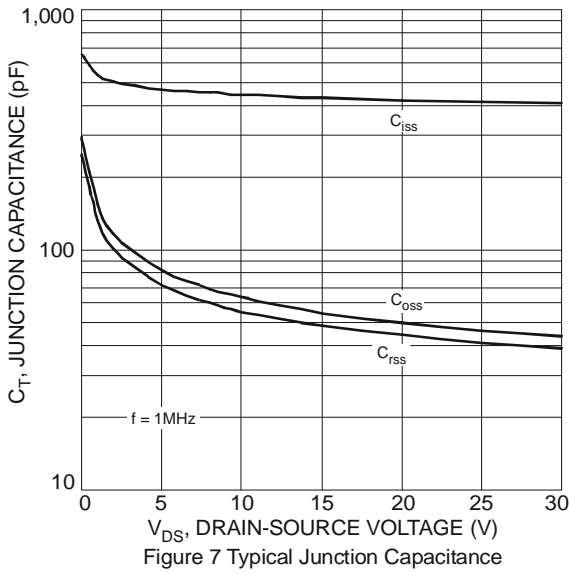


Figure 6 Gate Threshold Variation vs. Ambient Temperature



NOT RECOMMENDED FOR NEW DESIGN

**P-CHANNEL**

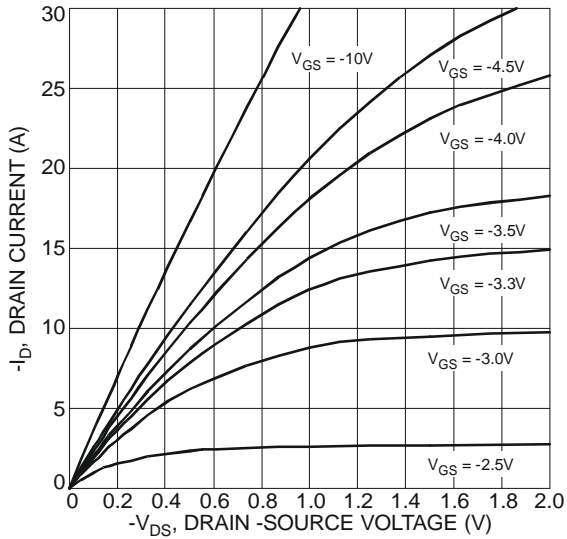


Figure 9 Typical Output Characteristics

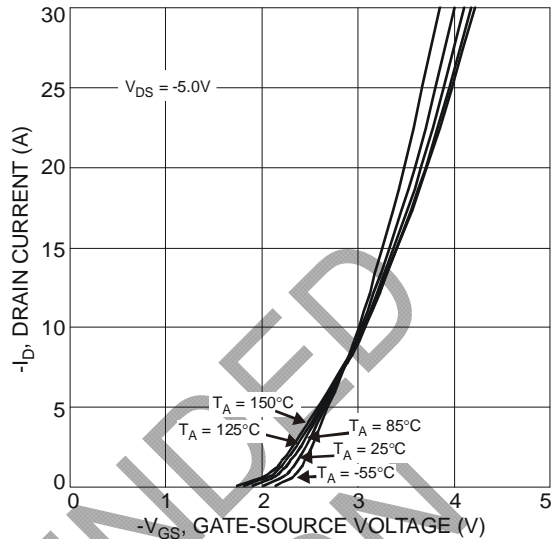


Figure 10 Typical Transfer Characteristics

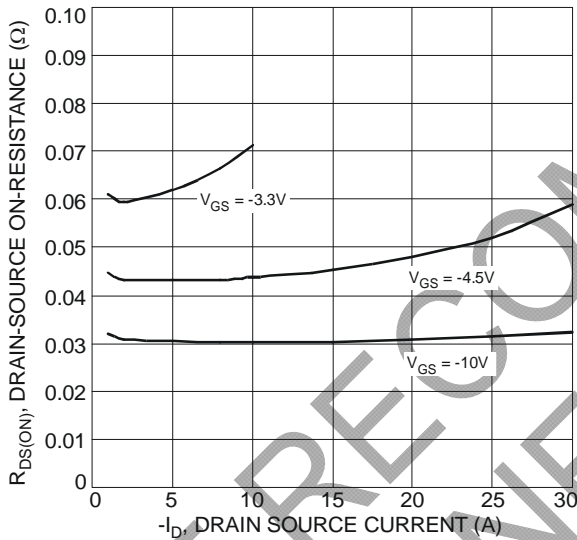


Figure 11 Typical On-Resistance vs. Drain Current and Gate Voltage

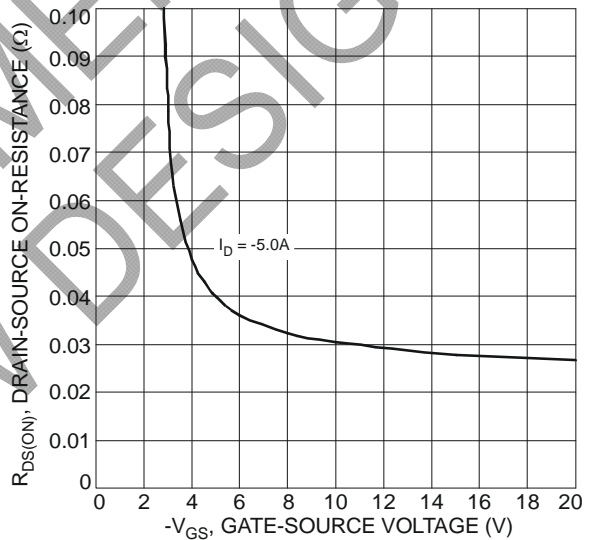


Figure 12 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

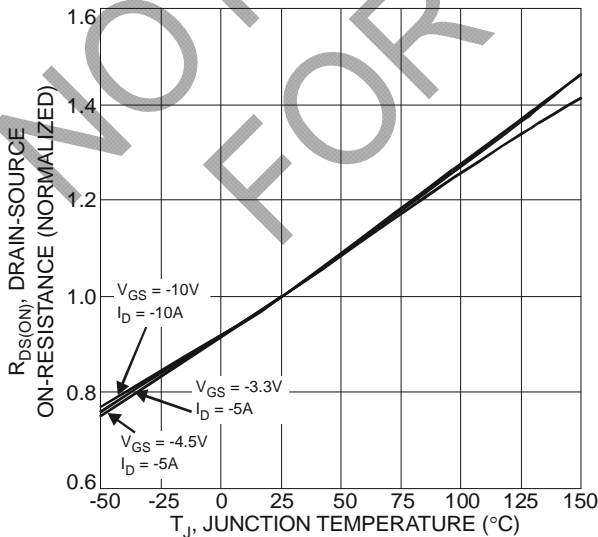


Figure 13 On-Resistance Variation with Temperature

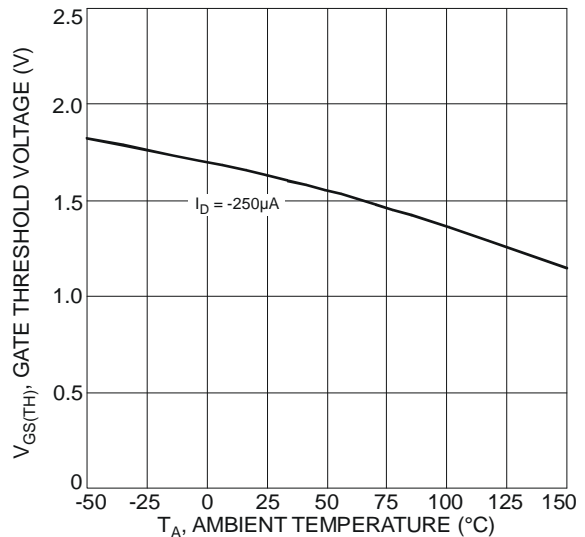
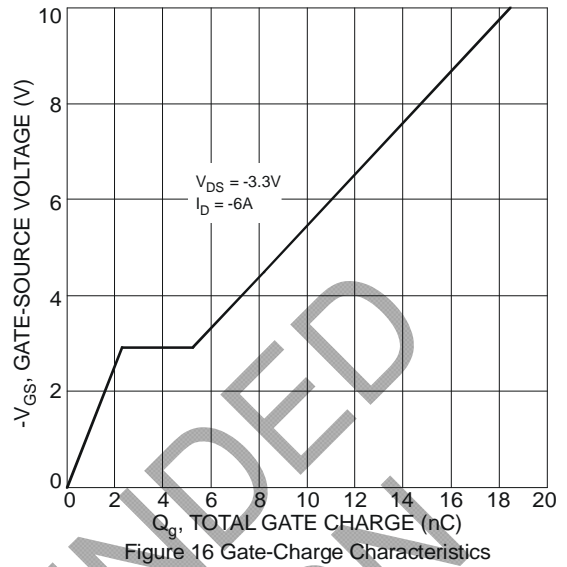
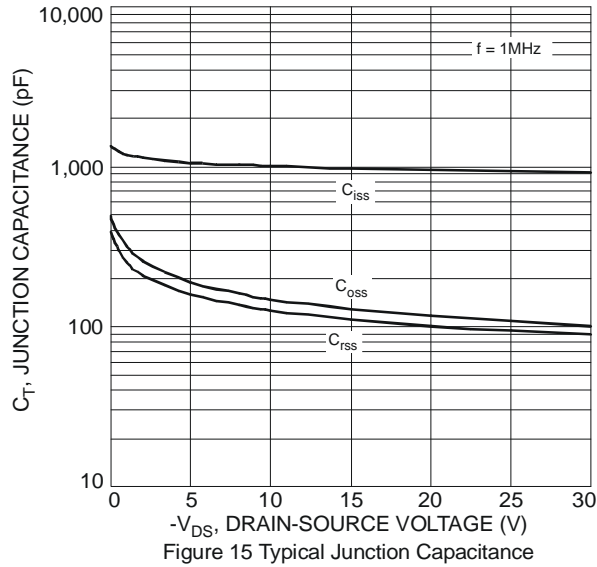
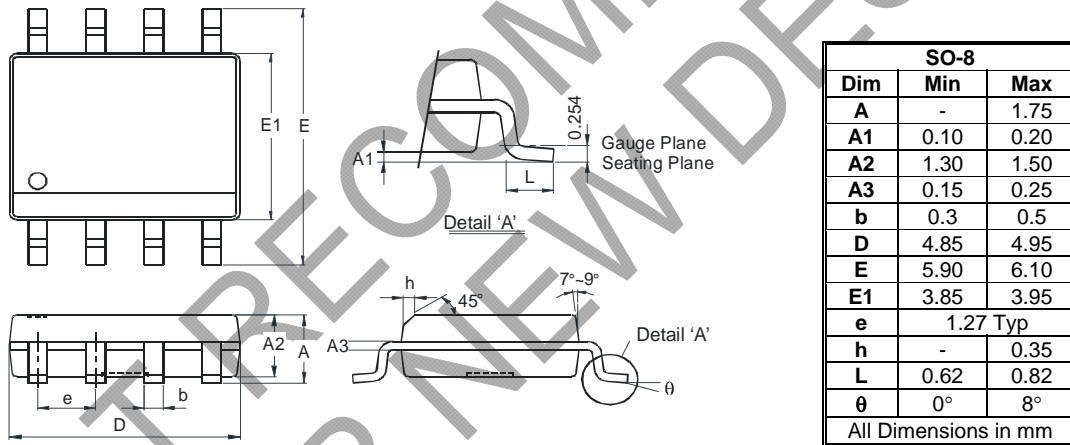


Figure 14 Gate Threshold Variation vs. Ambient Temperature



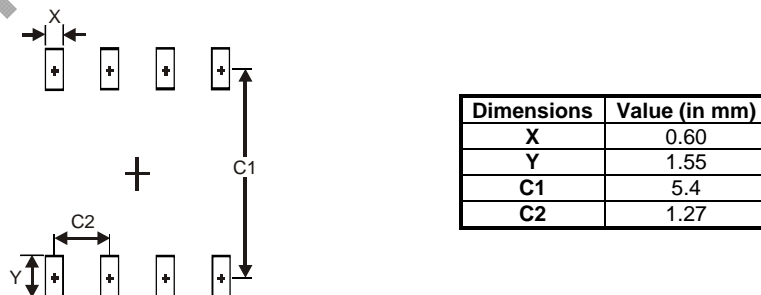
**Package Outline Dimensions**

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



**Suggested Pad Layout**

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