

Product Summary

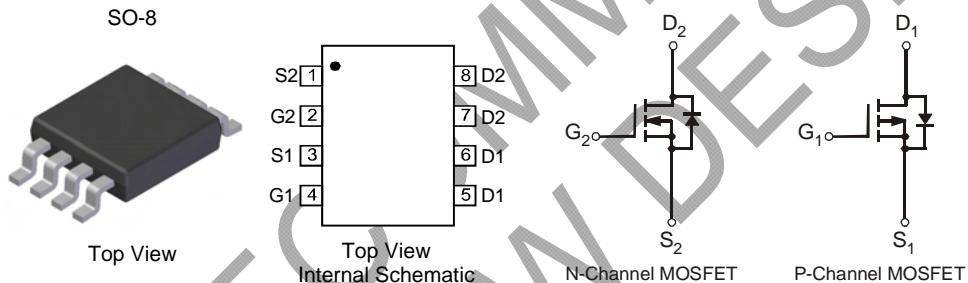
Device	$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	Package	I_D $T_A = +25^\circ\text{C}$
N-CH	30V	36mΩ @ $V_{GS} = 10\text{V}$	SO-8	6.9A
		61mΩ @ $V_{GS} = 4.5\text{V}$		5.1A
P-CH	-30V	36mΩ @ $V_{GS} = -10\text{V}$		-6.0A
		64mΩ @ $V_{GS} = -4.5\text{V}$		-5.0

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



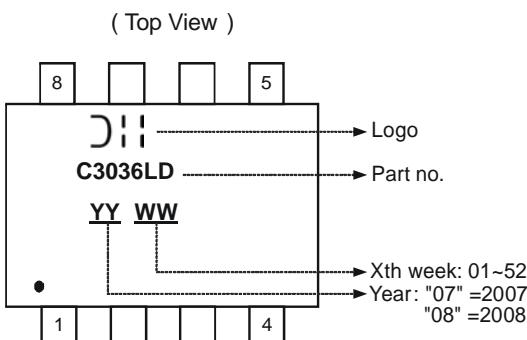
Ordering Information (Note 4)

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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	5.0 4.0	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	6.9 5.8	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	2	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	24	A

Maximum Ratings P-CHANNEL (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-4.5 -3.5	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-6 -5	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	-2	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	-21	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	Steady State	P_D	1.5	W
	$t < 10\text{s}$		2.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	83	°C/W
	$t < 10\text{s}$		49	
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	15	°C
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	

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

Electrical Characteristics N-CHANNEL (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
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	I_{DSS}	—	—	1	μA	$\text{V}_{\text{DS}} = 24\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
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 6)						
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	1	—	2.1	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS (ON)}}$	— 51	28 51	36 61	$\text{m}\Omega$	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 6.9\text{A}$ $\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 5.0\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	—	7.7	—	S	$\text{V}_{\text{DS}} = 5\text{V}$, $\text{I}_D = 6.9\text{A}$
Diode Forward Voltage	V_{SD}	0.5	—	1.2	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	431	—	pF	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	55	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	48	—	pF	
Gate Resistance	R_{G}	—	1.3	—	Ω	
SWITCHING CHARACTERISTICS (Note 7)						
Total Gate Charge	Q_{g}	—	3.8 7.9	—	nC	$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 10\text{A}$ $\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 10\text{A}$
Gate-Source Charge	Q_{gs}	—	1.4	—	nC	$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 10\text{A}$
Gate-Drain Charge	Q_{gd}	—	1.7	—	nC	$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 10\text{A}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
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	I_{DSS}	—	—	-1.0	μA	$\text{V}_{\text{DS}} = -24\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
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 6)						
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	-1	—	-2.2	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS (ON)}}$	— 53	30 64	36	$\text{m}\Omega$	$\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = -6\text{A}$ $\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{I}_D = -5\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	—	8.8	—	S	$\text{V}_{\text{DS}} = -5\text{V}$, $\text{I}_D = -6\text{A}$
Diode Forward Voltage	V_{SD}	-0.5	—	-1.2	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = -1\text{A}$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	977	—	pF	$\text{V}_{\text{DS}} = -15\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	129	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	116	—	pF	
Gate Resistance	R_{G}	—	13.1	—	Ω	
SWITCHING CHARACTERISTICS (Note 7)						
Total Gate Charge	Q_{g}	—	10.1 21.1	—	nC	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{I}_D = 6\text{A}$ $\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = 6\text{A}$
Gate-Source Charge	Q_{gs}	—	2.8	—	nC	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = 6\text{A}$
Gate-Drain Charge	Q_{gd}	—	3.2	—	nC	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = 6\text{A}$

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

N-CHANNEL

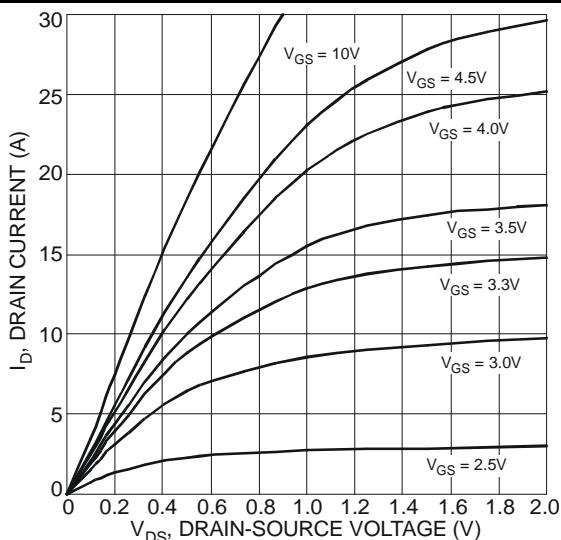


Figure 1 Typical Output Characteristic

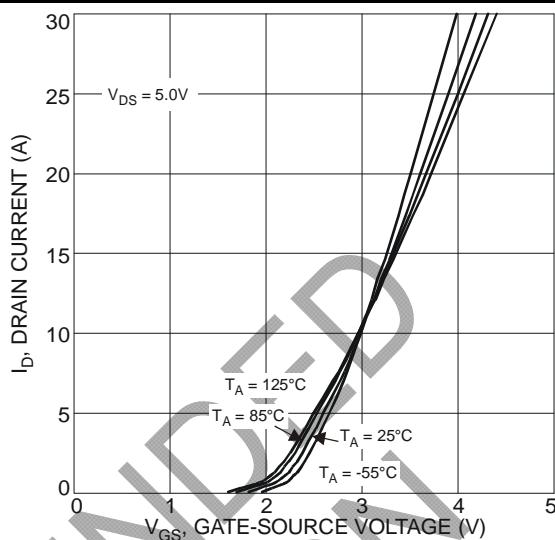


Figure 2 Typical Transfer Characteristics

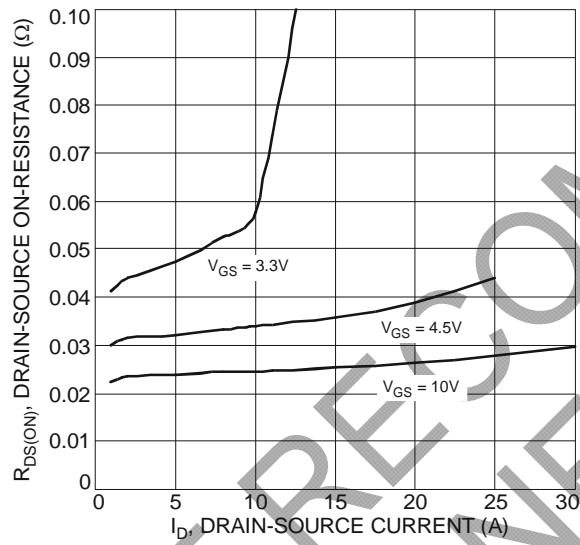


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

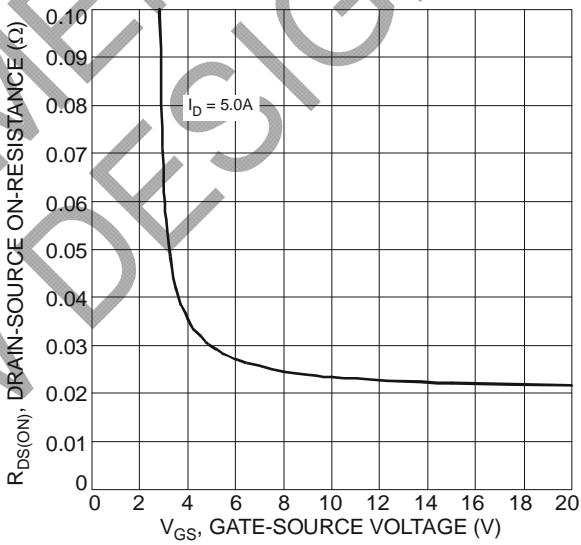


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

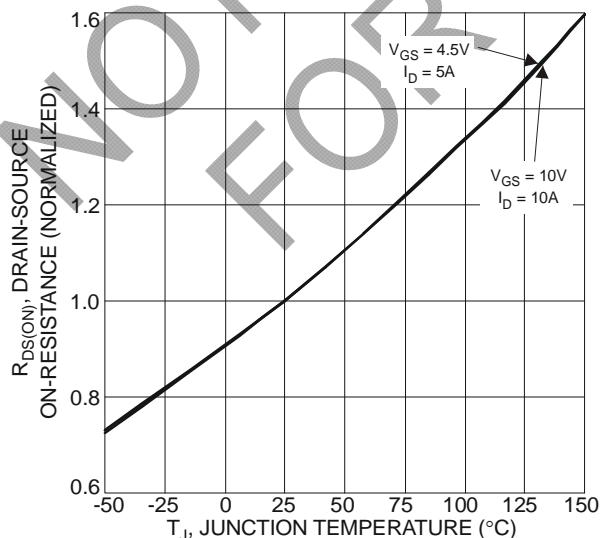


Figure 5 On-Resistance Variation with Temperature

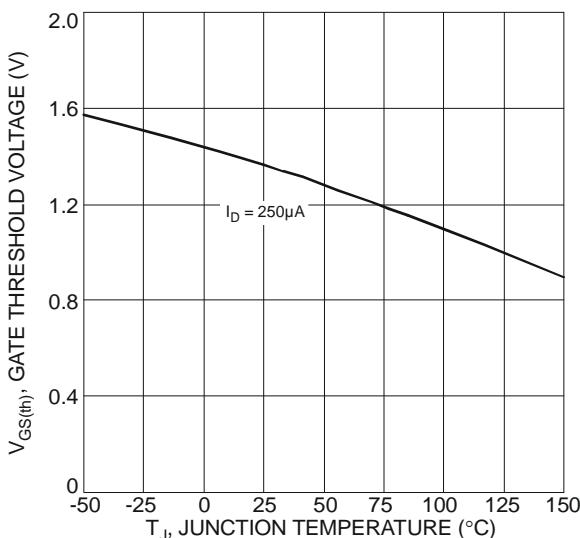
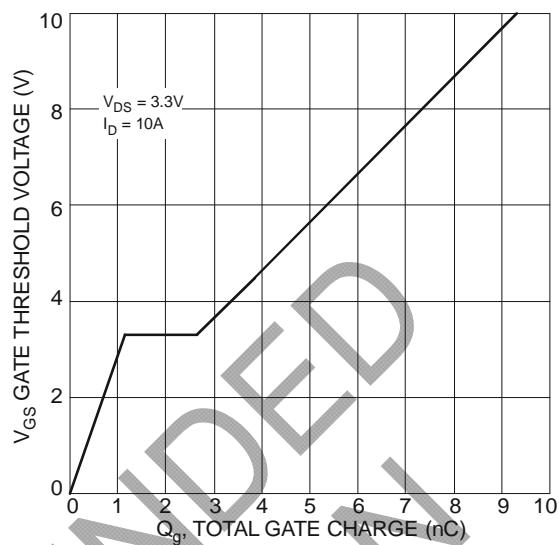
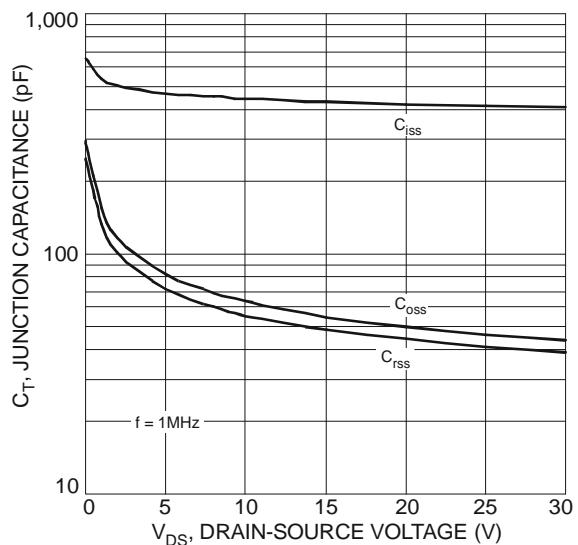


Figure 6 Gate Threshold Variation vs. Ambient Temperature



NOT RECOMMENDED
FOR NEW DESIGN

P-CHANNEL

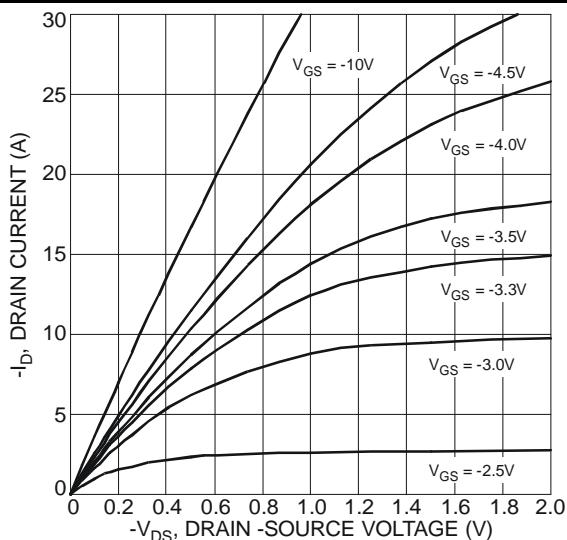


Figure 9 Typical Output Characteristics

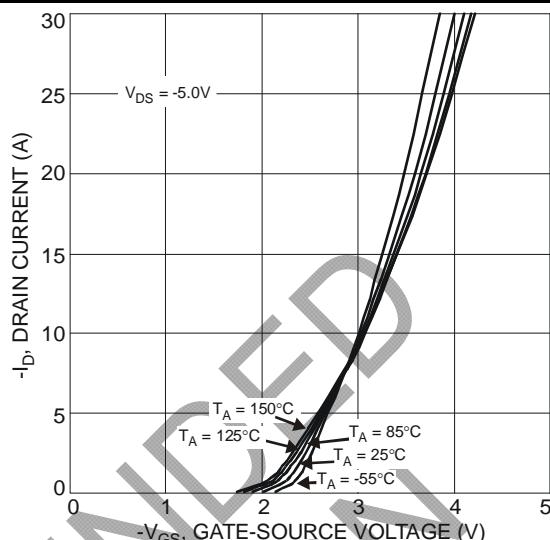


Figure 10 Typical Transfer Characteristics

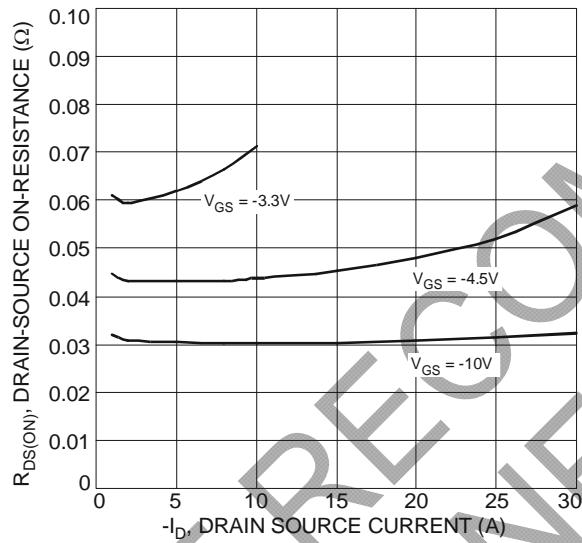


Figure 11 Typical On-Resistance vs.
Drain Current and Gate Voltage

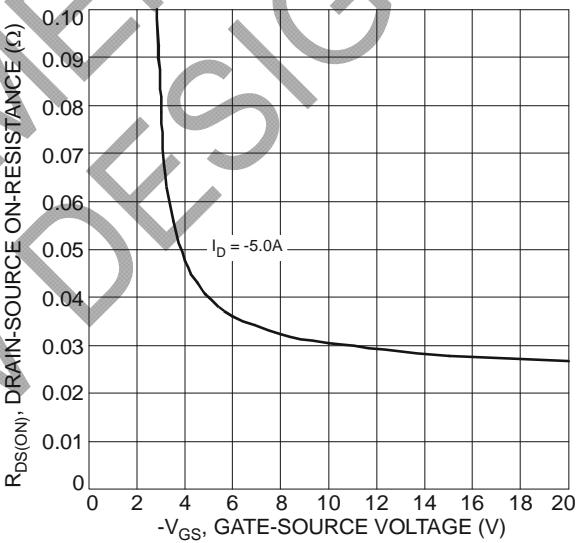


Figure 12 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

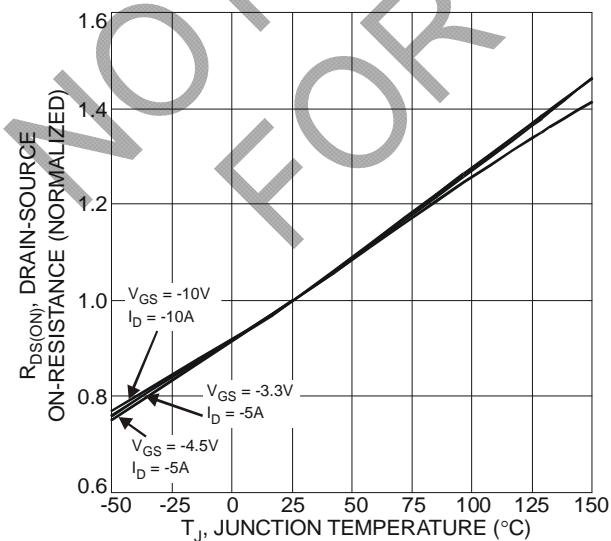


Figure 13 On-Resistance Variation with Temperature

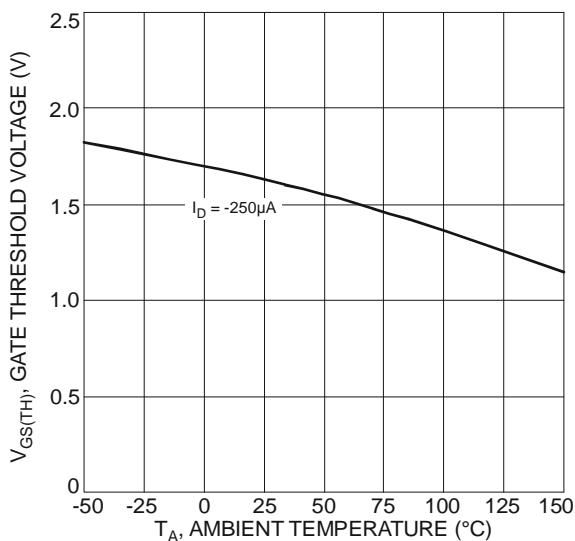


Figure 14 Gate Threshold Variation vs. Ambient Temperature

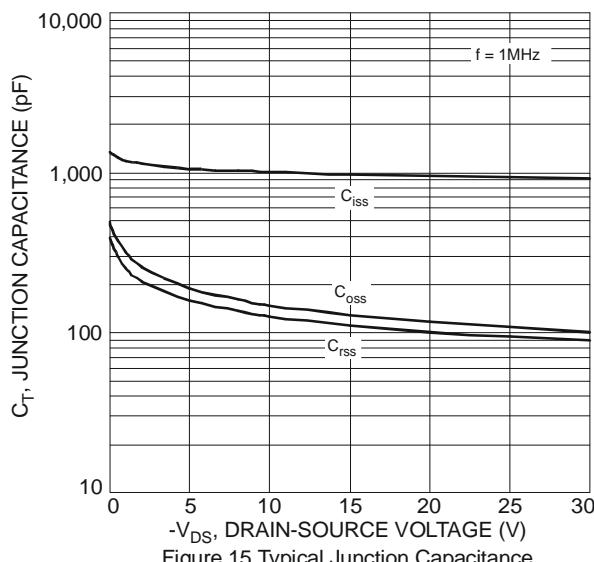


Figure 15 Typical Junction Capacitance

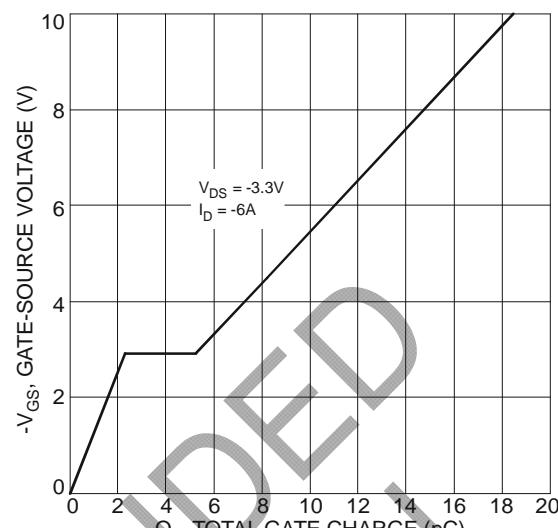
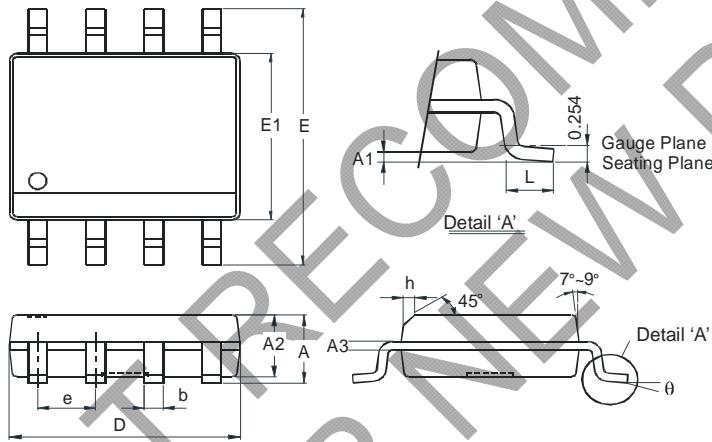


Figure 16 Gate-Charge Characteristics

Package Outline Dimensions

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

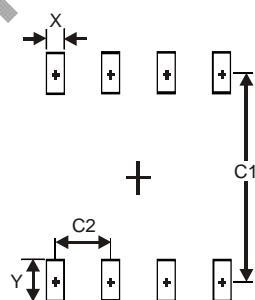


SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°

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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