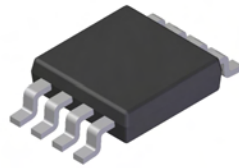


Features

- Low On-Resistance
 - 14mΩ @ $V_{GS} = -10V$
 - 25mΩ @ $V_{GS} = -4.5V$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

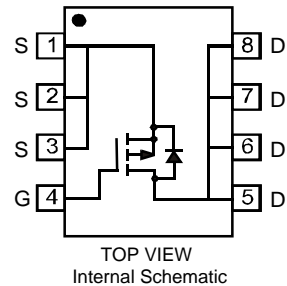


TOP VIEW

Mechanical Data

- Case: SOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072g (approximate)

SOP-8L


 TOP VIEW
Internal Schematic

Maximum Ratings @ $T_A = 25^\circ C$ unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	± 25	V
Drain Current (Note 1)	Steady State	$T_A = 25^\circ C$	I_D	-12	A
		$T_A = 70^\circ C$		-6	A
Pulsed Drain Current (Note 3)			I_{DM}	-40	A

Thermal Characteristics

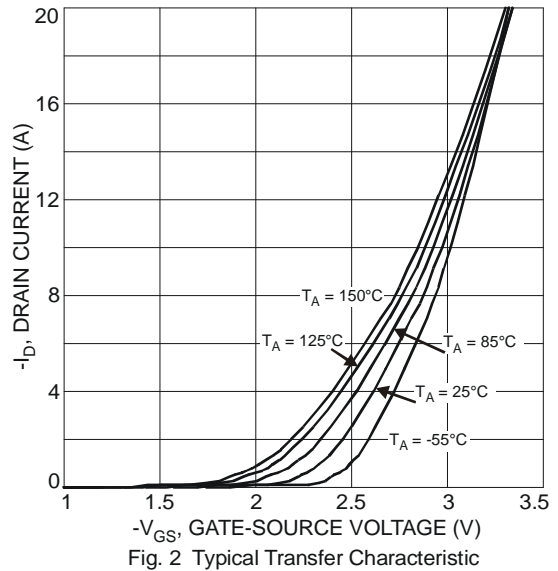
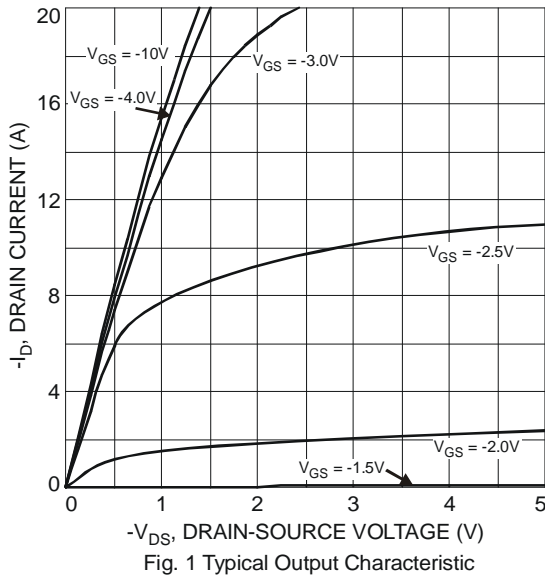
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

- Notes:
1. Device mounted on 2 oz. Copper pads on FR-4 PCB with $R_{\theta JA} = 50^\circ C/W$.
 2. No purposefully added lead.
 3. Pulse width $\leq 10\mu S$, Duty Cycle $\leq 1\%$.
 4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
		—	—	± 800		$V_{GS} = \pm 25V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	-2	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	11.6	14	m Ω	$V_{GS} = -10V, I_D = -8A$
		—	18.6	25		$V_{GS} = -4.5V, I_D = -5A$
Forward Transconductance	g_{fs}	—	12	—	S	$V_{DS} = -10V, I_D = -12A$
Diode Forward Voltage (Note 5)	V_{SD}	-0.5	—	-1.1	V	$V_{GS} = 0V, I_S = -2A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	1802	—	pF	$V_{DS} = -15V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	415	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	295	—	pF	
Gate Resistance	R_G	—	2.3	—	Ω	$V_{GS} = 0V, V_{DS} = 0V, f = \text{MHz}$
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	15.3	—	nC	$V_{DS} = -15V, V_{GS} = -4.5V, I_D = -8A$
		—	30.7	—		$V_{DS} = -15V, V_{GS} = -10V, I_D = -8A$
Gate-Source Charge	Q_{gs}	—	3.5	—	ns	$V_{DS} = -15V, V_{GS} = -10V, I_D = -8A$
Gate-Drain Charge	Q_{gd}	—	7.9	—		$V_{DS} = -15V, V_{GS} = -10V, I_D = -8A$
Turn-On Delay Time	$t_{d(on)}$	—	5.1	—	ns	$V_{GS} = -10V, V_{DS} = -15V, R_D = 15\Omega, R_G = 6\Omega$
Rise Time	t_r	—	8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	46	—		
Fall Time	t_f	—	30	—		

Notes: 5. Short duration pulse test used to minimize self-heating effect.



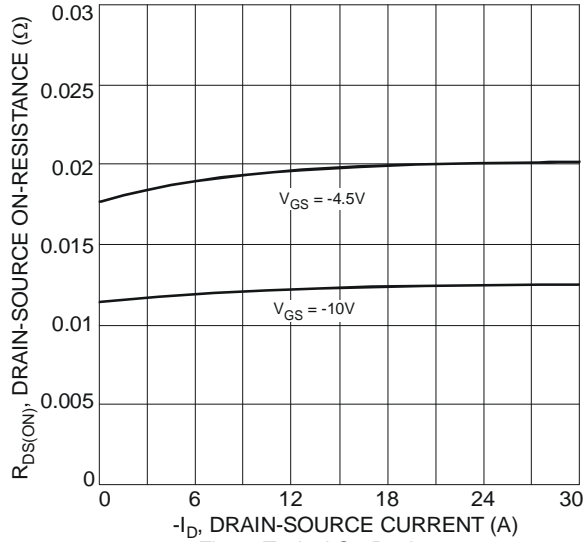


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

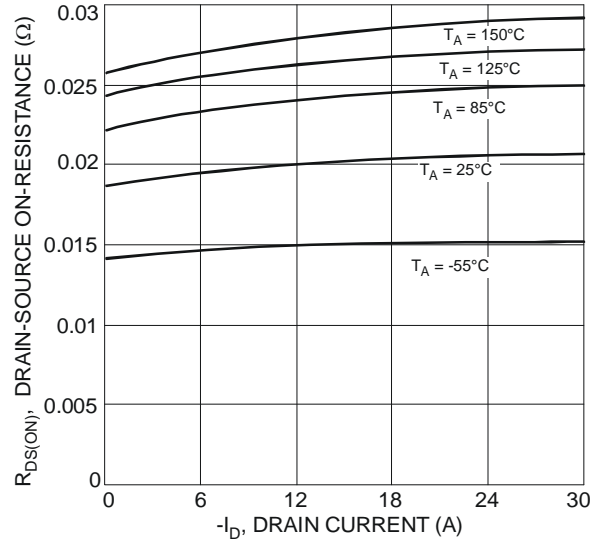


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

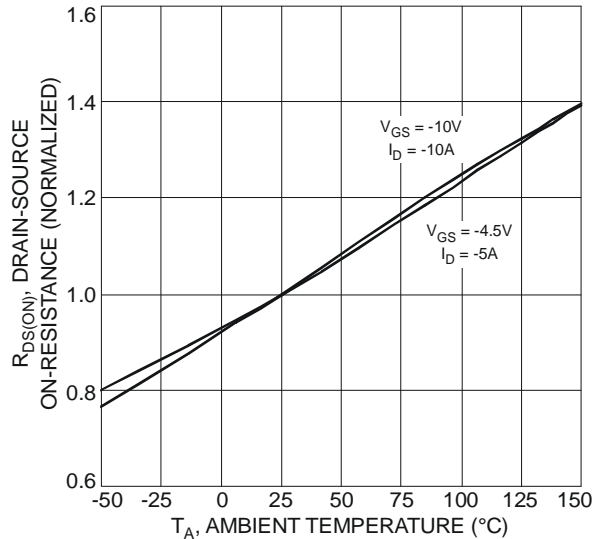


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

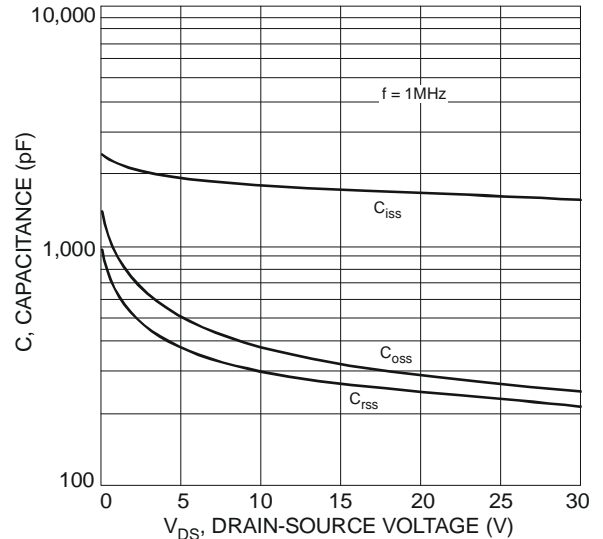


Fig. 6 Typical Total Capacitance

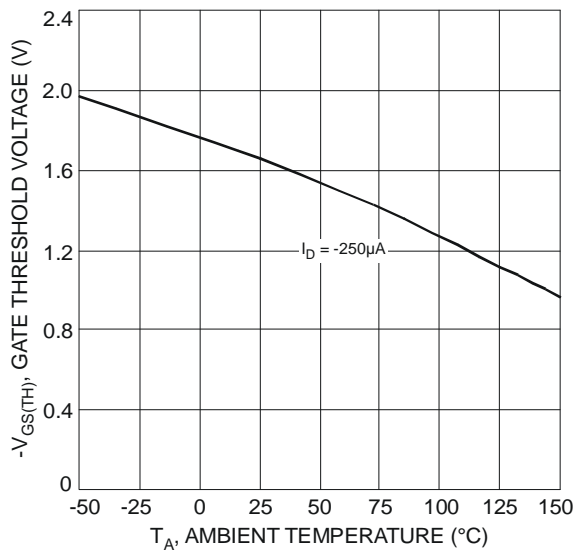


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

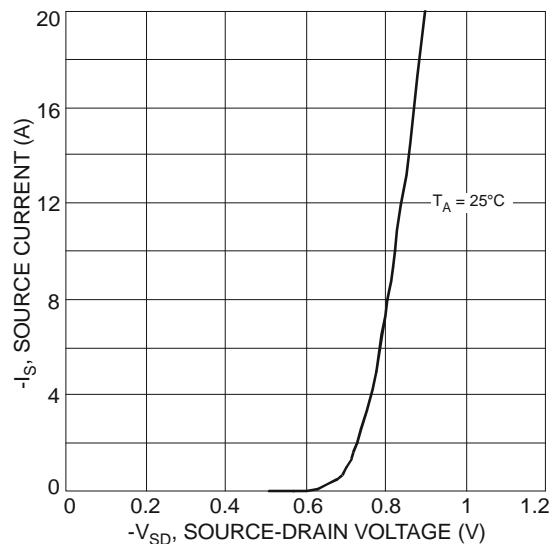


Fig. 8 Diode Forward Voltage vs. Current

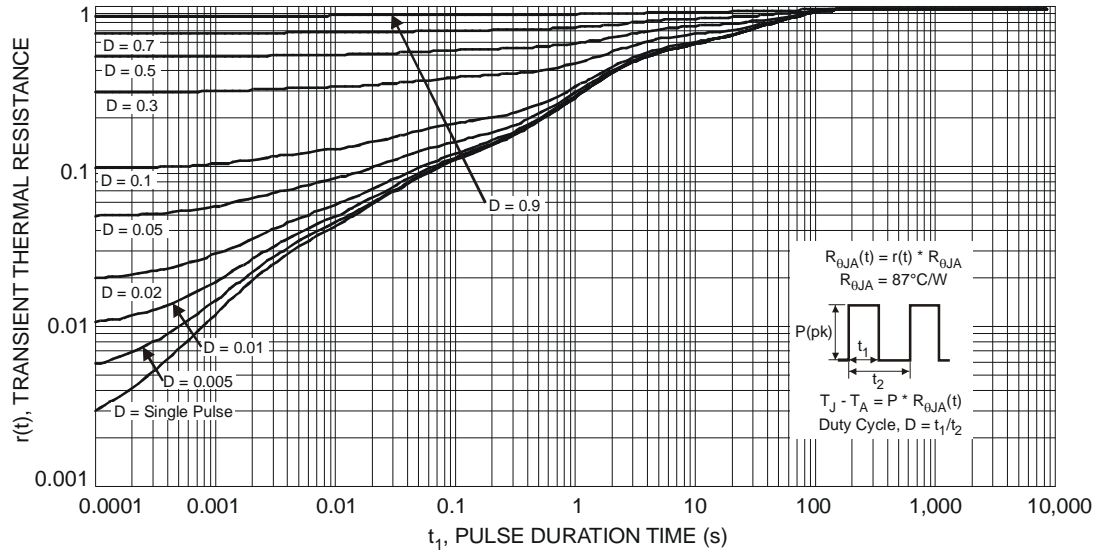


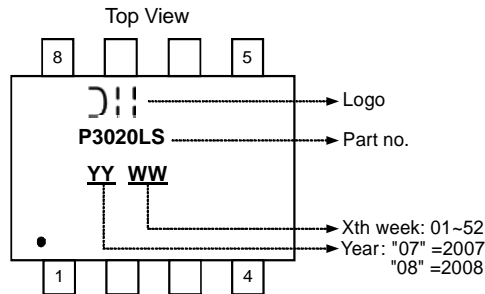
Fig. 9 Transient Thermal Response

Ordering Information (Note 6)

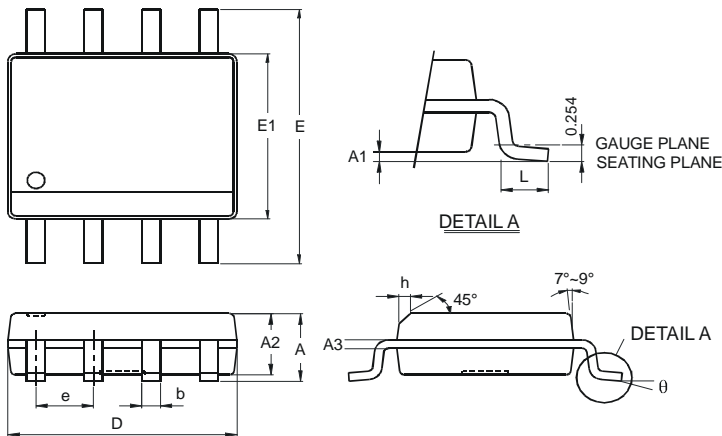
Part Number	Case	Packaging
DMP3020LSS-13	SOP-8L	2500/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

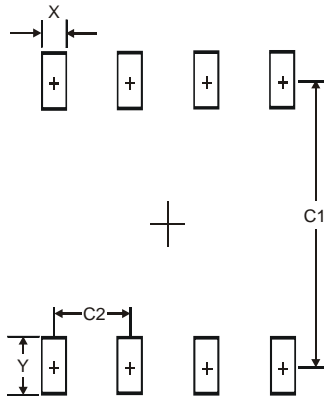


Package Outline Dimensions



SOP-8L		
Dim	Min	Max
A	—	1.75
A1	0.08	0.25
A2	1.30	1.50
A3	0.20 Typ.	
b	0.3	0.5
D	4.80	5.30
E	5.79	6.20
E1	3.70	4.10
e	1.27 Typ.	
h	—	0.35
L	0.38	1.27
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout



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

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