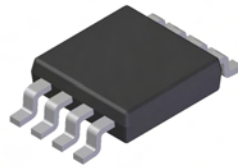


## Features

- 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**

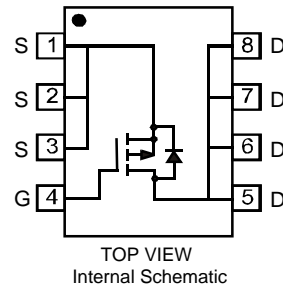


TOP VIEW

## 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			$V_{GSS}$	$\pm 25$	V
Drain Current (Note 1)	Steady State	$T_A = 25^\circ C$	$I_D$	-12	A
		$T_A = 70^\circ C$		-6	
Pulsed Drain Current (Note 3)			$I_{DM}$	-40	A

## Thermal Characteristics

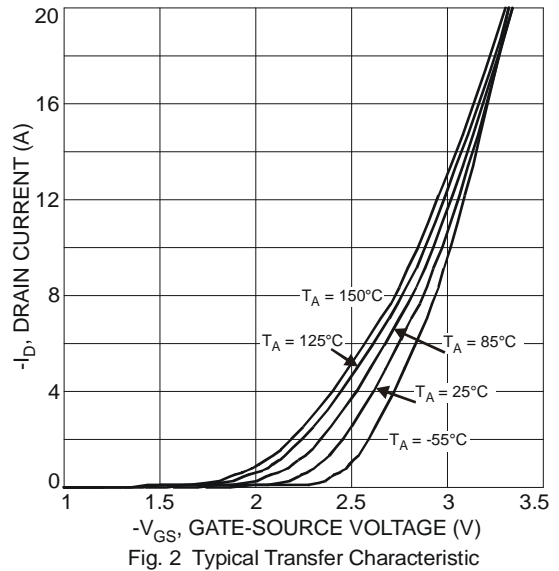
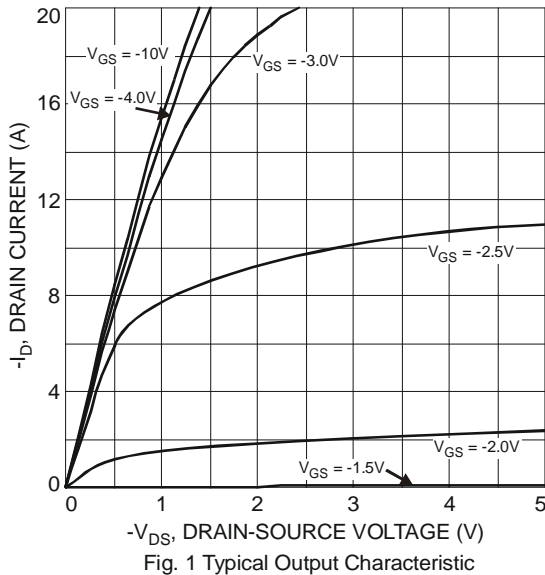
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

- 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](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
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu A$	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
		—	—	$\pm 800$		$V_{GS} = \pm 25V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 5)</b>						
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 $\Omega$	$V_{GS} = -10V, I_D = -8A$
		—	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	$V_{GS} = 0V, I_S = -2A$
<b>DYNAMIC CHARACTERISTICS</b>						
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	—	$\Omega$	$V_{GS} = 0V, V_{DS} = 0V, f = \text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>						
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	—	nC	$V_{DS} = -15V, V_{GS} = -10V, I_D = -8A$
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.



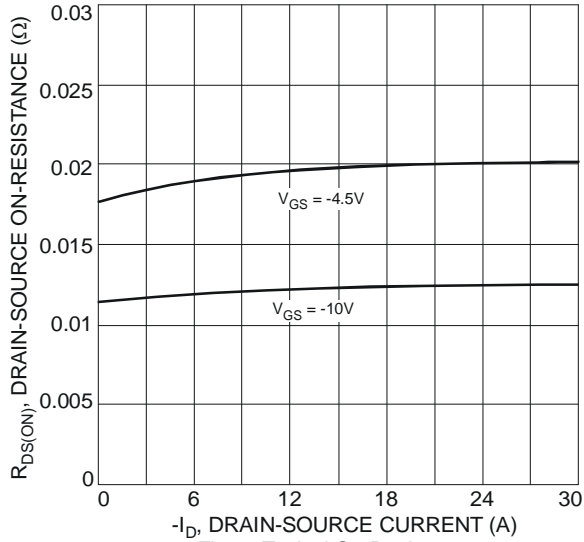


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

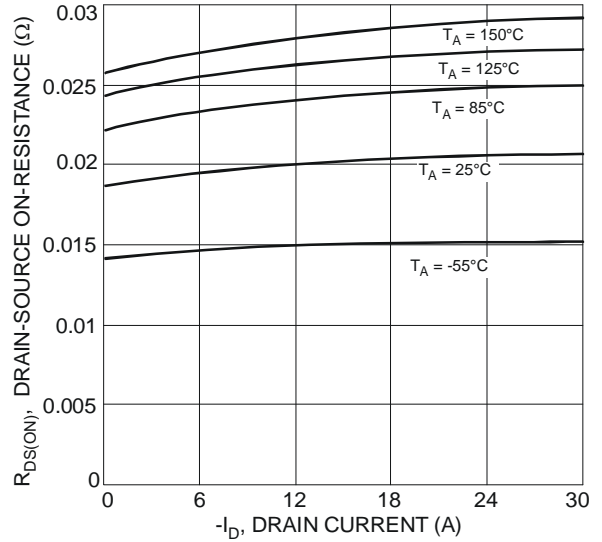


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

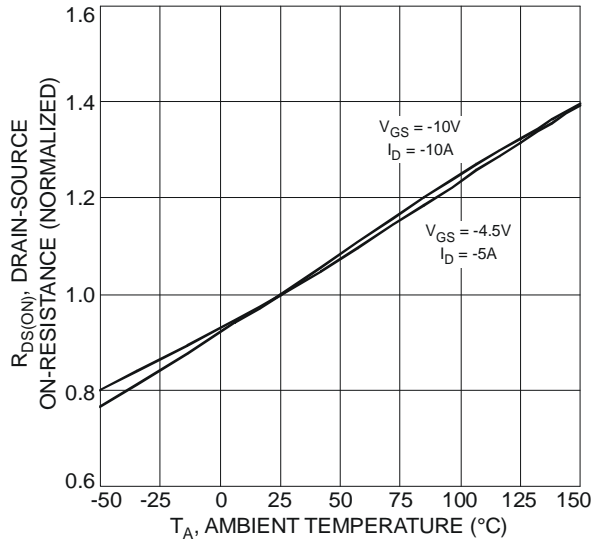


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

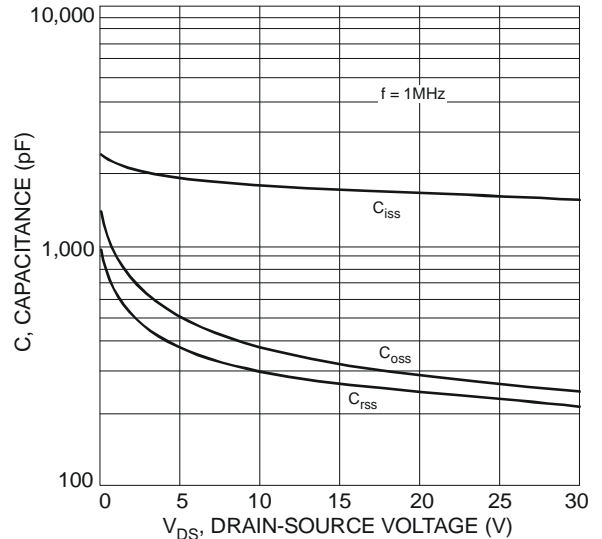


Fig. 6 Typical Total Capacitance

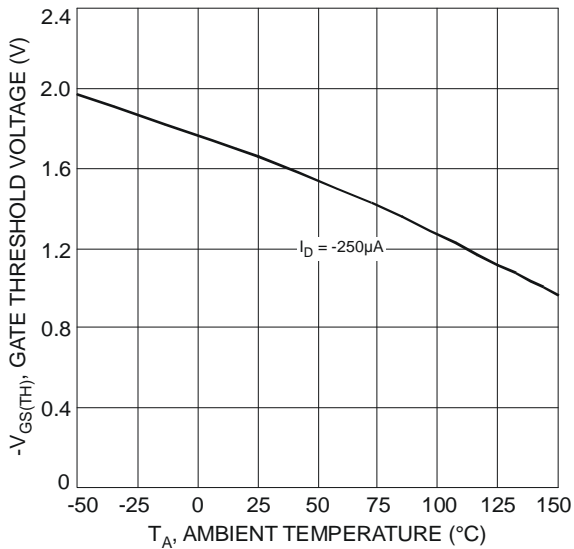


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

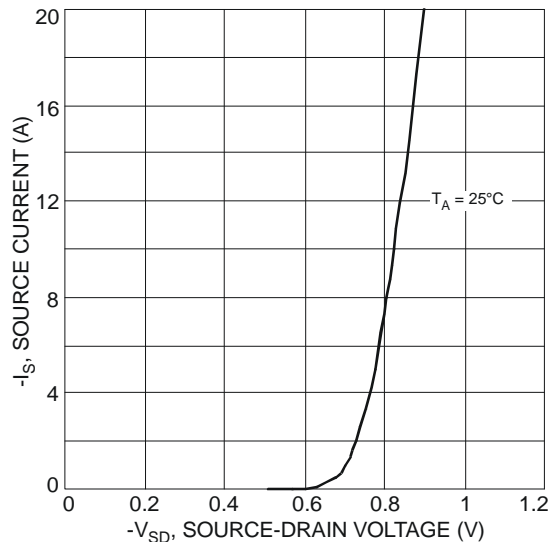


Fig. 8 Diode Forward Voltage vs. Current

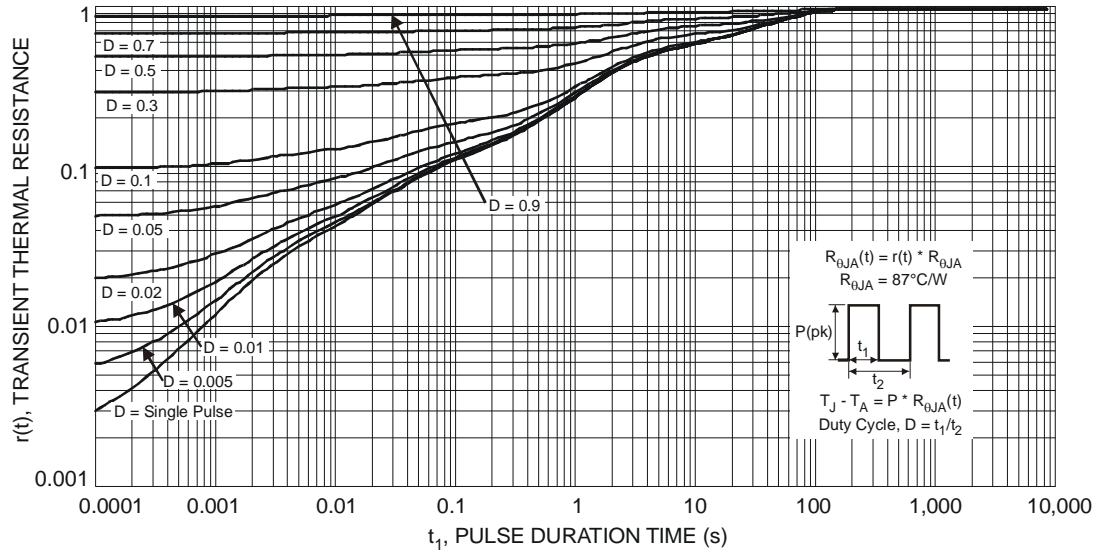


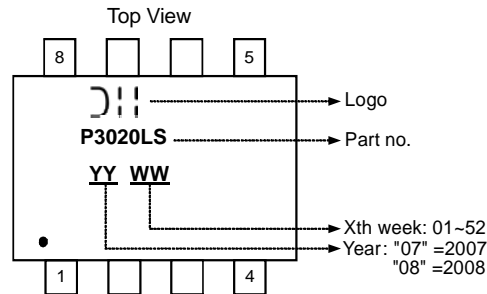
Fig. 9 Transient Thermal Response

**Ordering Information** (Note 6)

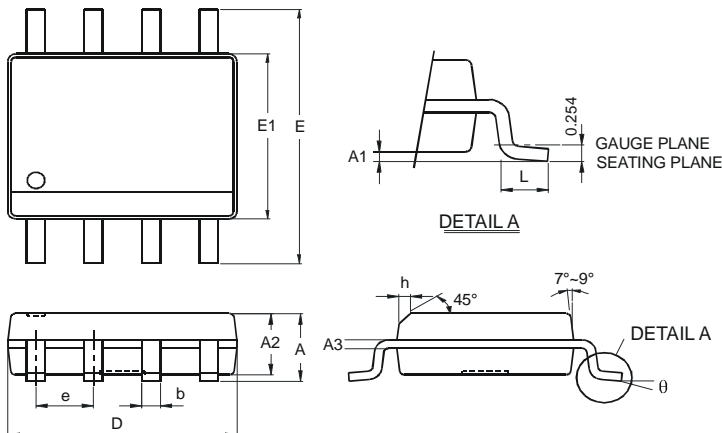
Part Number	Case	Packaging
DMP3020LSS-13	SOP-8L	2500/Tape & Reel

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

**Marking Information**

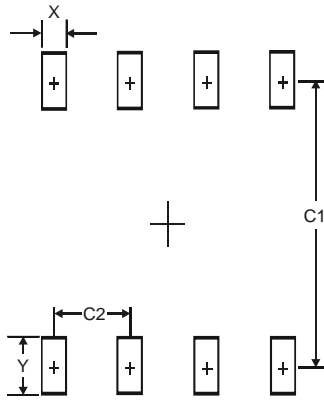


**Package Outline Dimensions**



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)
<b>X</b>	0.60
<b>Y</b>	1.55
<b>C1</b>	5.4
<b>C2</b>	1.27

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