SINGLE P-CHANNEL ENHANCEMENT MODE MOSFET

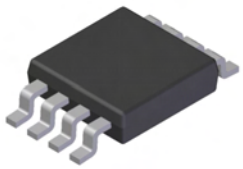
Features

- 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 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

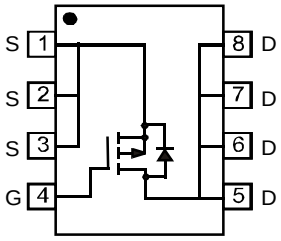
Mechanical Data

- 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
- Weight: 0.072g (approximate)

SO-8



Top View



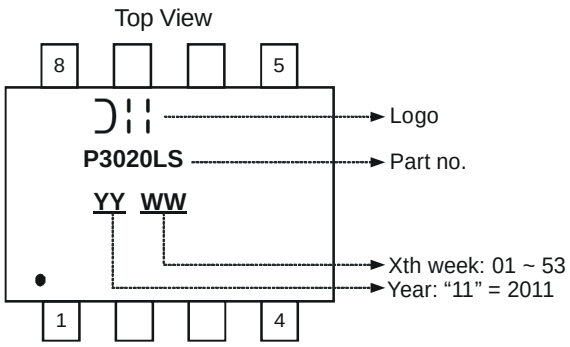
Top View
Internal Schematic

Ordering Information (Note 3)

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

Notes: 1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com.
3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



Maximum Ratings @T_A = 25°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 4)	Steady State	T_A = 25°C T_A = 70°C	I_D	-12 -6	A
Pulsed Drain Current (Note 5)			I_{DM}	-40	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 4)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
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} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
		—	—	±800		V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	-2	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	— —	11.6 18.6	14 25	mΩ	V_{GS} = -10V, I_D = -8A V_{GS} = -4.5V, I_D = -5A
Forward Transconductance	g_{fs}	—	12	—	S	V_{DS} = -10V, I_D = -12A
Diode Forward Voltage (Note 6)	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 = 1.0MHz
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 = MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	15.3 30.7	—	nC	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -8A V_{DS} = -15V, V_{GS} = -10V, I_D = -8A
Gate-Source Charge	Q_{gs}	—	3.5	—		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 = 15Ω, R_G = 6Ω
Rise Time	t_r	—	8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	46	—		
Fall Time	t_f	—	30	—		

Notes: 4. Device mounted on 2 oz. Copper pads on FR-4 PCB with $R_{\theta JA}$ = 50°C/W.
5. Pulse width ≤10μS, Duty Cycle ≤1%.
6. Short duration pulse test used to minimize self-heating effect.

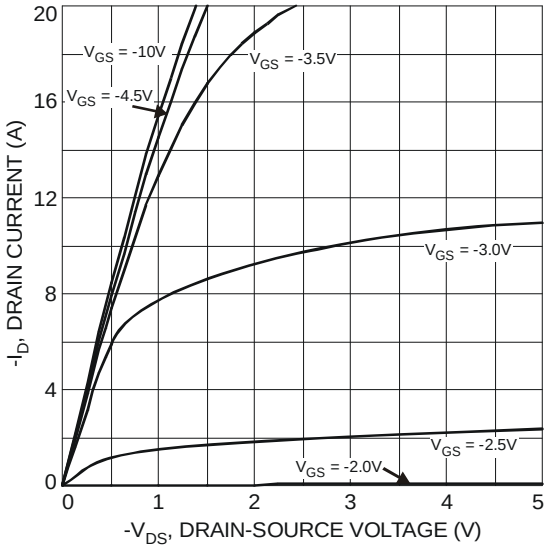


Fig. 1 Typical Output Characteristic

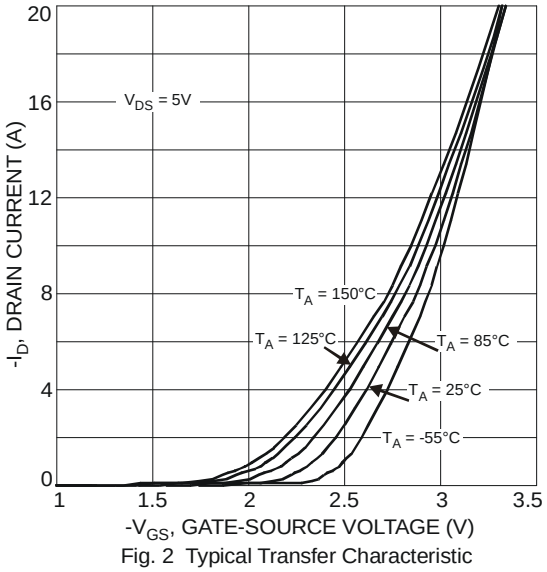


Fig. 2 Typical Transfer Characteristic

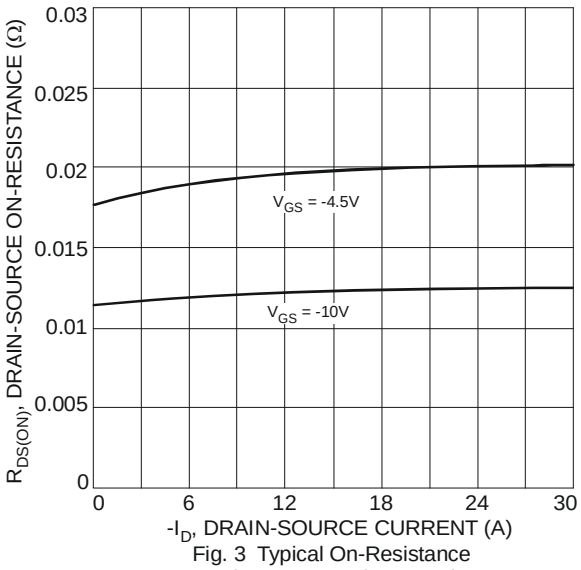


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

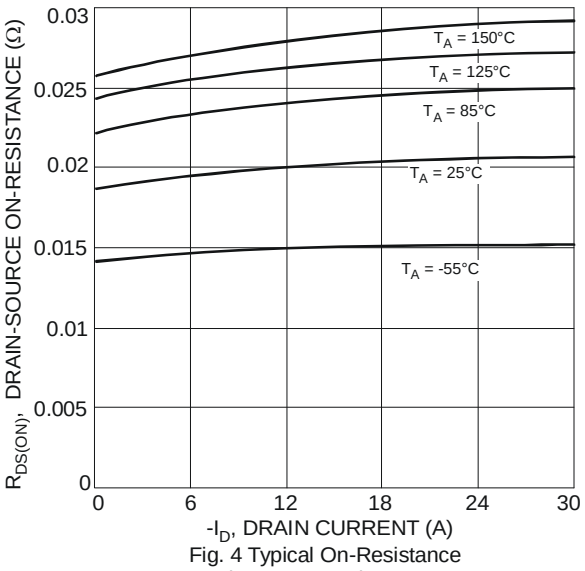


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

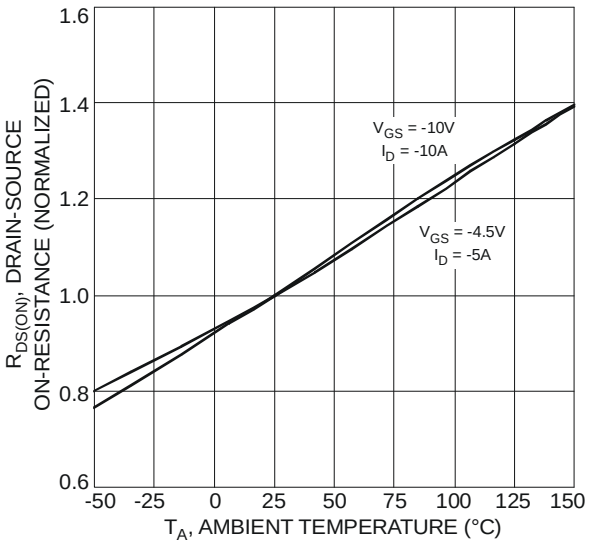


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

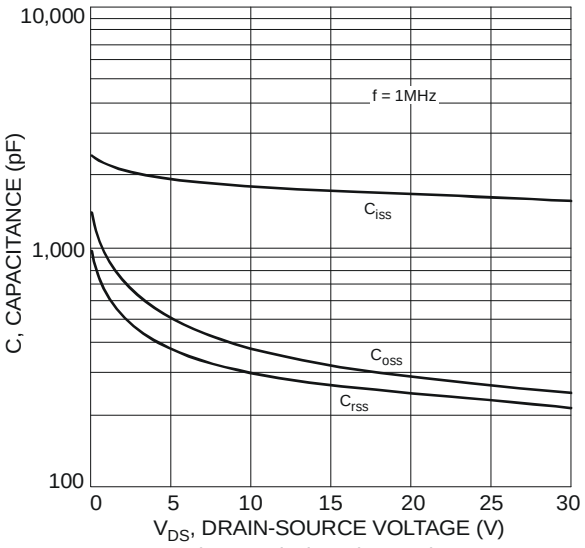


Fig. 6 Typical Total Capacitance

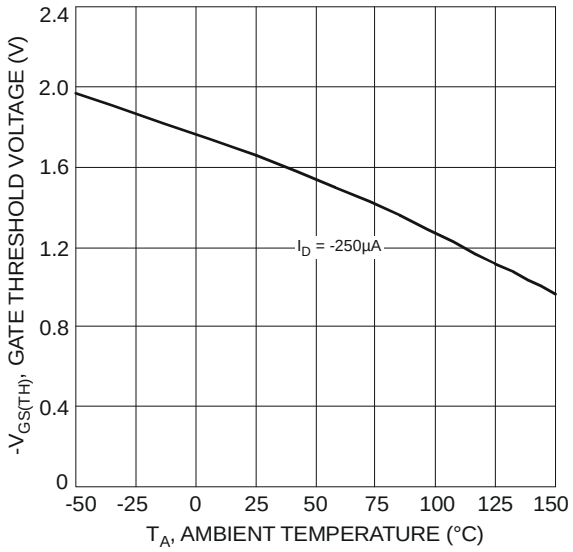


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

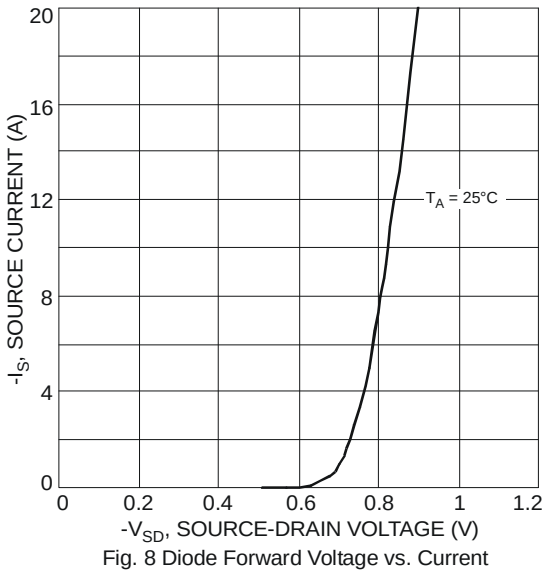


Fig. 8 Diode Forward Voltage vs. Current

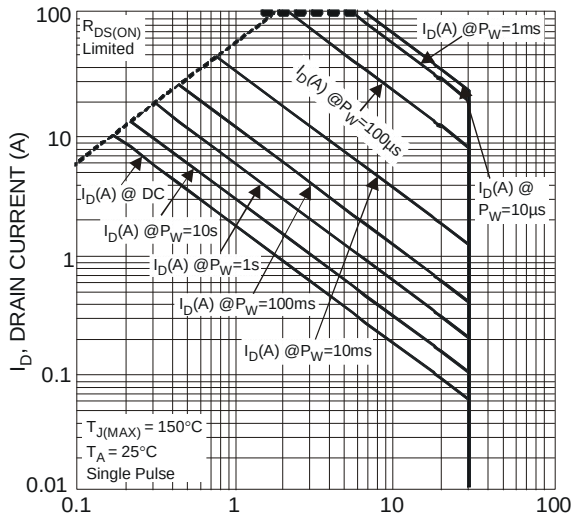


Fig. 9 SOA, Safe Operation Area

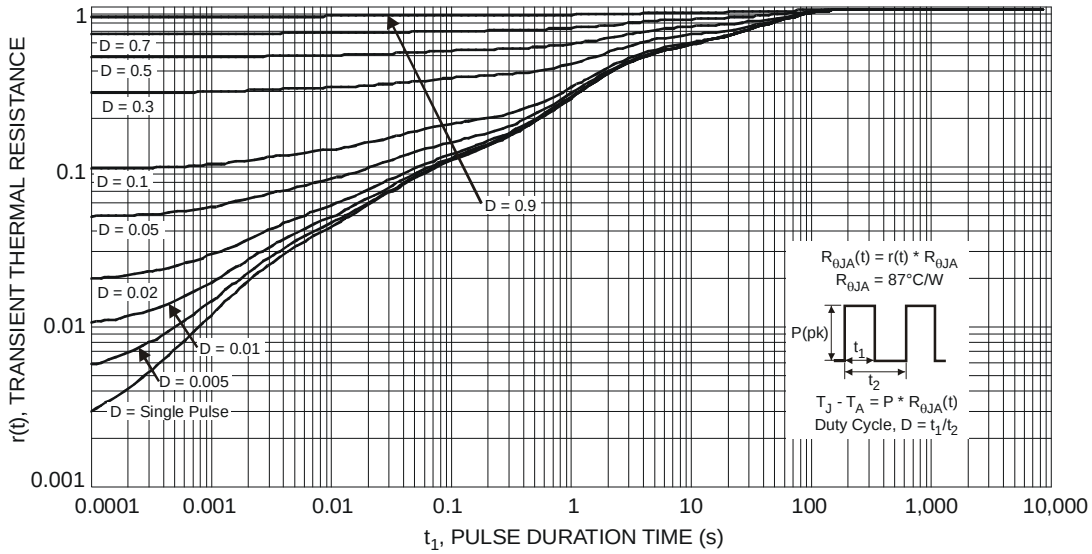
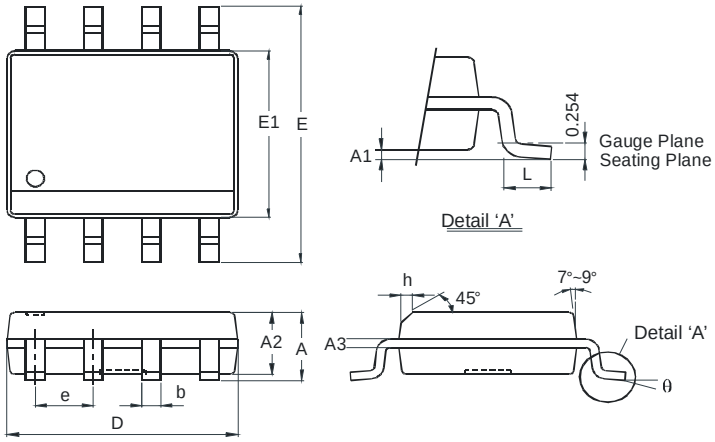


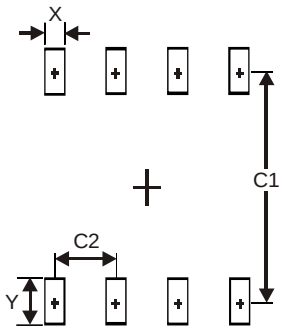
Fig. 10 Transient Thermal Response

Package Outline Dimensions



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



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

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