TY Semicondutor®

Product specification

DMP3120L

P-CHANNEL ENHANCEMENT MODE MOSFET

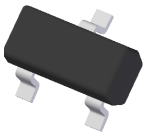
Features

- Low On-Resistance:
  $R_{DS(ON)}$ < 120mΩ @ V_{GS} = -4.5V
  $R_{DS(ON)}$ < 240mΩ @ V_{GS} = -2.5V
- 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 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

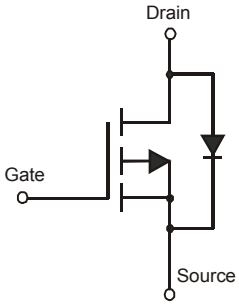
Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

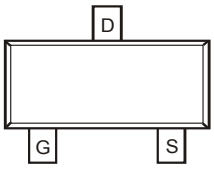
SOT-23



Top View



Equivalent Circuit



Top View

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Drain Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Note 1)	T_A = 25°C T_A = 70°C	I_D	-2.8 -2.2	A
Drain Current (Note 1)	Pulsed	I_{DM}	-9	A
Body-Diode Continuous Current (Note 1)		I_S	-2.0	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	1.4	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 1)	$R_{\theta JA}$	90	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 1. Device mounted on FR-4 PCB. t ≤5 sec.
2. No purposefully added lead.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
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-Body Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 4)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.6	—	-1.4	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	— —	— —	120 240	mΩ	V_{GS} = -4.5V, I_D = -2.8A V_{GS} = -2.5V, I_D = -1.8A
Forward Transconductance	g_{fs}	—	5	—	S	V_{DS} = -5V, I_D = -2.8A
Source-Drain Diode Forward Voltage	V_{SD}	—	—	-1.1	V	V_{GS} = 0V, I_S = -2.0A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	285	—	pF	V_{DS} = -15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	56	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	40	—	pF	
Gate Resistance	R_G	—	13	—	Ω	V_{DS} = 0V, V_{GS} = 0V f = 1.0MHz
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(on)}$	—	5.6	—	ns	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -1A, R_G = 6.0Ω
Rise Time	t_r	—	6.8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	35.3	—		
Fall Time	t_f	—	19.2	—		
Total Gate Charge	Q_G	—	6.7 3.0	—	nC	V_{DS} = -15V, V_{GS} = -10V, I_D = -1.0A V_{DS} = -15V, V_{GS} = -4.5V, I_D = -1.0A
Gate-Source Charge	Q_{GS}	—	0.8	—		
Gate-Drain Charge	Q_{GD}	—	0.5	—		

Notes: 3. Short duration pulse test used to minimize self-heating effect.