

**P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**
**Features**

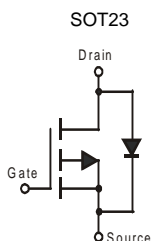
- Low  $R_{DS(ON)}$ 
  - $72m\Omega$  @  $V_{GS} = -4.5V$
  - $108m\Omega$  @  $V_{GS} = -2.7V$
  - $123m\Omega$  @  $V_{GS} = -2.5V$
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

**Mechanical Data**

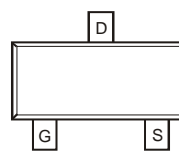
- Case: SOT23
- Case Material - Molded Plastic, "Green" Molding Compound.  
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper  
Leadframe. Solderable per MIL-STD-202, Method 208 (B3)
- Terminal Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)



Top View



Internal Schematic

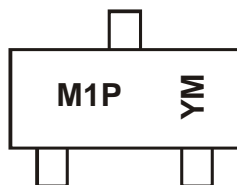


Top View

**Ordering Information** (Note 5)

Part Number	Case	Packaging
DMP2123LQ-7	SOT23	3,000/Tape & Reel
DMP2123LQ-13	SOT23	10,000/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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive products are AEC-Q101 qualified and are PPAP capable. For more information, please refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**


M1P = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: C = 2015)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2007	...	2015	2016	2017	2018	2019	2020	2021	2022	2023
Code	U	...	C	D	E	F	G	H	I	J	K

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	-20	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Drain Current (Note 6) Continuous T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-3.0 -2.4	A
Pulsed Drain Current (Note 7)	I <sub>DM</sub>	-15	A
Body-Diode Continuous Current (Note 6)	I <sub>S</sub>	-2.0	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.4	W
Thermal Resistance, Junction to Ambient (Note 6); Steady-State	R <sub>θJA</sub>	90	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
Gate-Body Leakage Current	I <sub>GSS</sub>	—	—	±100	nA	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.6	—	-1.25	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
On State Drain Current (Note 8)	I <sub>D(ON)</sub>	-15	—	—	A	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -5V
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	51 87 99	72 108 123	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A V <sub>GS</sub> = -2.7V, I <sub>D</sub> = -3.0A V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.6A
Forward Transconductance (Note 8)	g <sub>FS</sub>	—	7.3	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A
Diode Forward Voltage (Note 6)	V <sub>SD</sub>	—	-0.79	-1.26	V	I <sub>S</sub> = -1.7A, V <sub>GS</sub> = 0V
Maximum Body-Diode Continuous Current (Note 6)	I <sub>S</sub>	—	—	-1.7	A	—
<b>DYNAMIC PARAMETERS (Note 9)</b>						
Total Gate Charge	Q <sub>g</sub>	—	7.3	—	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A
Gate-Source Charge	Q <sub>gs</sub>	—	2.0	—	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A
Gate-Drain Charge	Q <sub>gd</sub>	—	1.9	—	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.0A
Turn-On Delay Time	t <sub>D(ON)</sub>	—	12	—	ns	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, R <sub>L</sub> = 10Ω, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>R</sub>	—	20	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	38	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	41	—	ns	
Input Capacitance	C <sub>iss</sub>	—	443	—	pF	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	128	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	101	—	pF	

- Notes:
6. Device mounted on 1" x 1", FR-4 PC board with 2 oz. copper and test pulse width t ≤ 10s.
  7. Repetitive Rating, pulse width limited by junction temperature.
  8. Test pulse width t = 300μs.
  9. Guaranteed by design. Not subject to product testing.

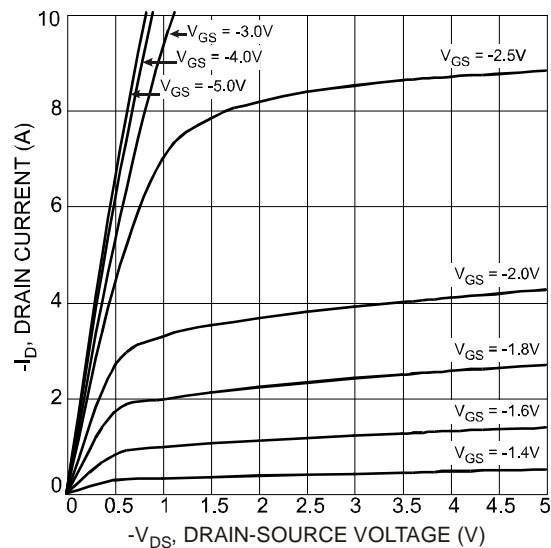


Fig. 1 Typical Output Characteristics

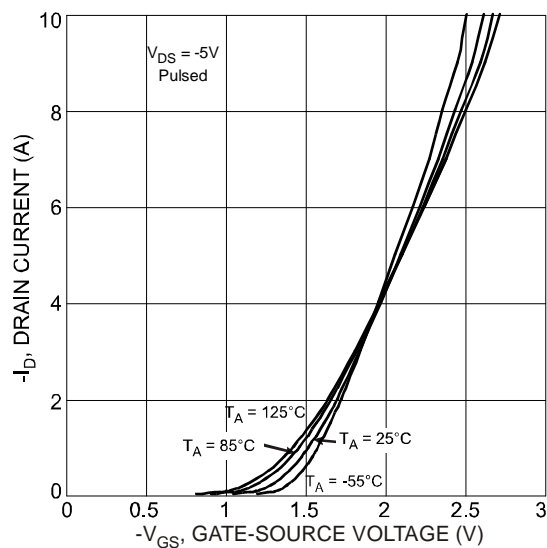


Fig. 2 Typical Transfer Characteristics

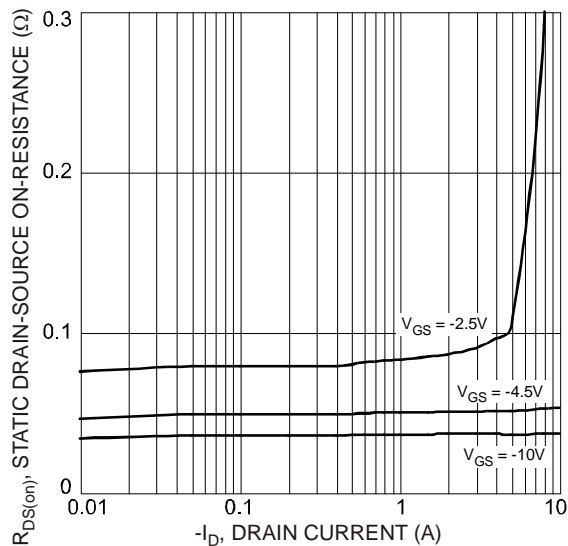


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

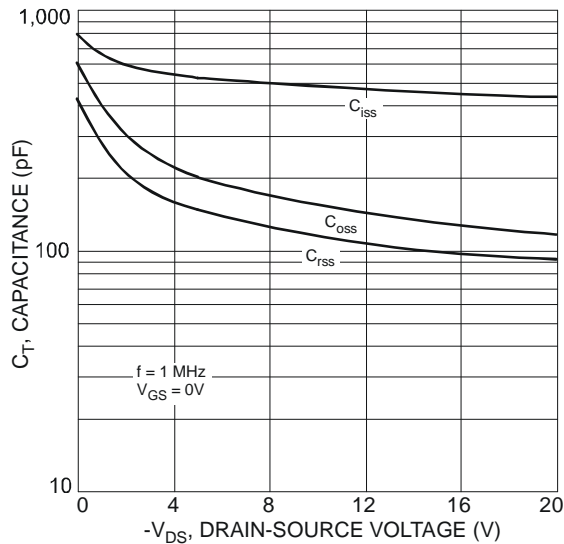


Fig. 4 Typical Total Capacitance

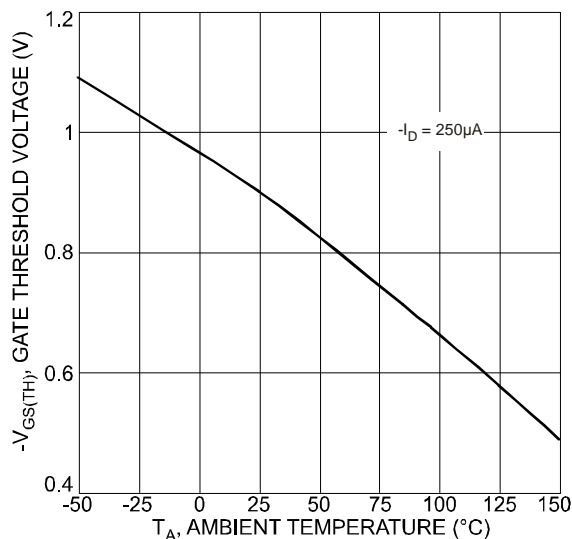


Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

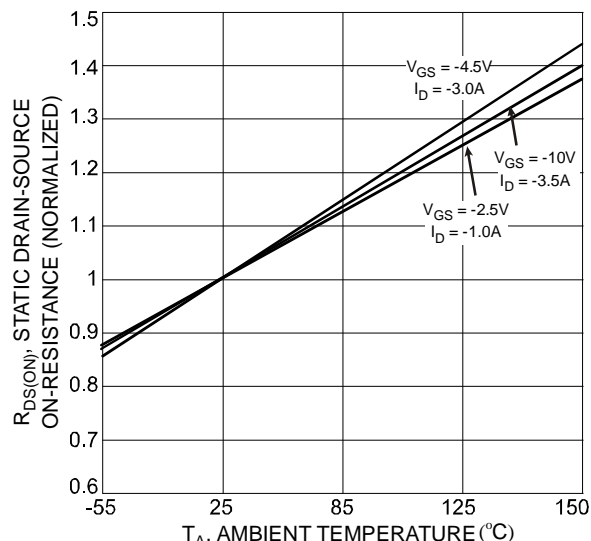


Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

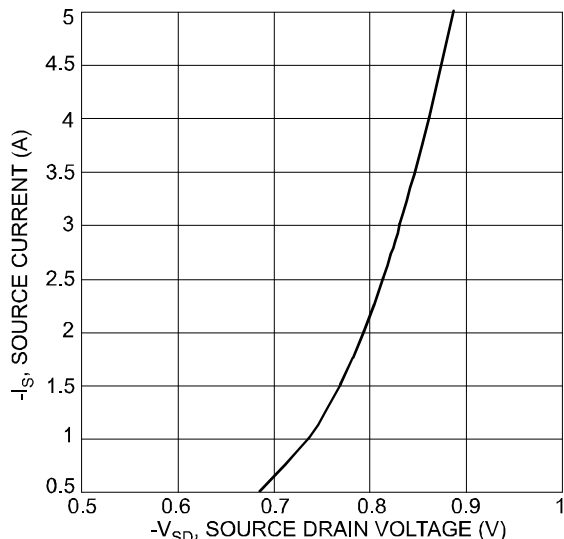


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

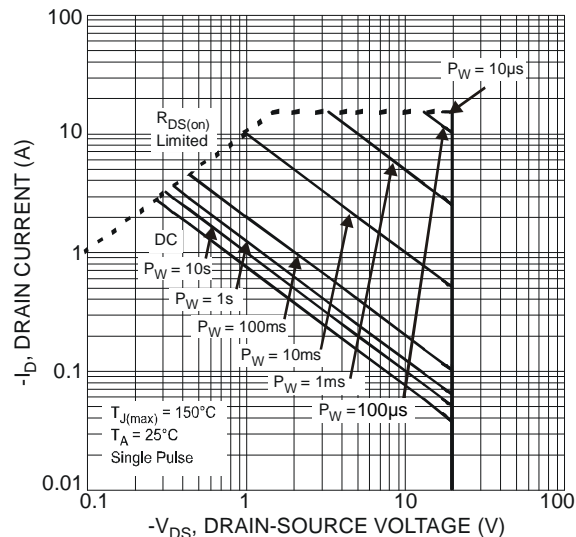
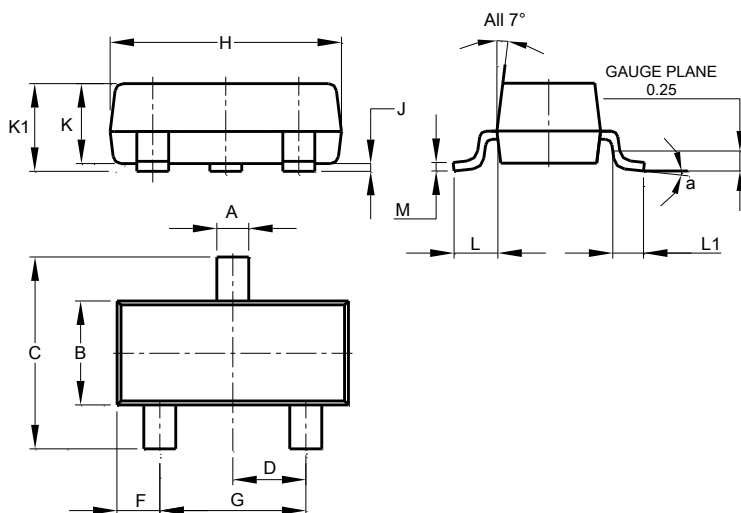


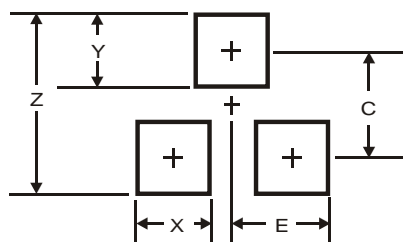
Fig. 8 SOA, Safe Operation Area

## Package Outline Dimensions

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


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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