

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)}	Package	I _D T _A = +25°C
-20V	110mΩ @ V _{GS} = -4.5V	SOT23	-2.6A
	225mΩ @ V _{GS} = -2.5V		-2.0A

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

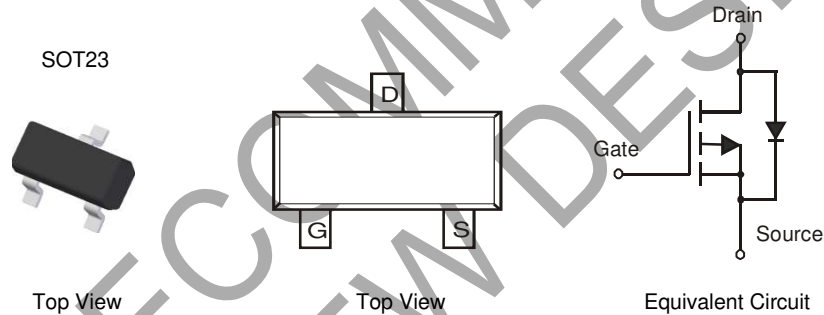
- General Purpose Interfacing Switch
- Power Management Functions

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- 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 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 ^{e3}
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

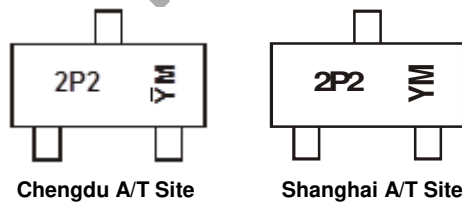


Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
DMP2225L-7	Standard	SOT-23	3000/Tape & Reel
DMP2225LQ-7	Automotive	SOT-23	3000/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 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. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



2P2 = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 ȲM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or Ȳ = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	~	2017	2018	2019	2020	2021
Code	V	W	~	E	F	G	H	I

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_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-20	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Drain Current (Note 6)	Steady State	T _A = +25°C T _A = +70°C	I _D	-2.6 -2	A
Pulsed Drain Current (Note 7)			I _{DM}	8	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P _D	1.08	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6)	R _{θJA}	115	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-800	nA	V _{DS} = -20V, V _{GS} = 0V
On-State Drain Current	I _{D(ON)}	-6	—	—	A	V _{DS} ≤ -5V, V _{GS} = -4.5V
		-3	—	—		V _{DS} ≤ -5V, V _{GS} = -2.5V
Gate-Source Leakage	I _{GSS}	—	—	±80	nA	V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.45	—	-1.25	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	80	110	mΩ	V _{GS} = -4.5V, I _D = -2.6A
		—	165	225		V _{GS} = -2.5V, I _D = -2.0A
Forward Transfer Admittance	Y _{fs}	—	4	—	s	V _{DS} = -5V, I _D = -2.6A
Diode Forward Voltage (Note 7)	V _{SD}	—	—	-1.26	V	V _{GS} = 0V, I _S = -2.6A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	250	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	88	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	58	—	pF	
Gate Resistance	R _g	—	12	16	Ω	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	4.3	5.3	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -2.7A
Gate-Source Charge	Q _{gs}	—	0.9	—		
Gate-Drain Charge	Q _{gd}	—	2.1	—		

- Notes:
6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 7. Repetitive rating, pulse width limited by junction temperature.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to production testing.

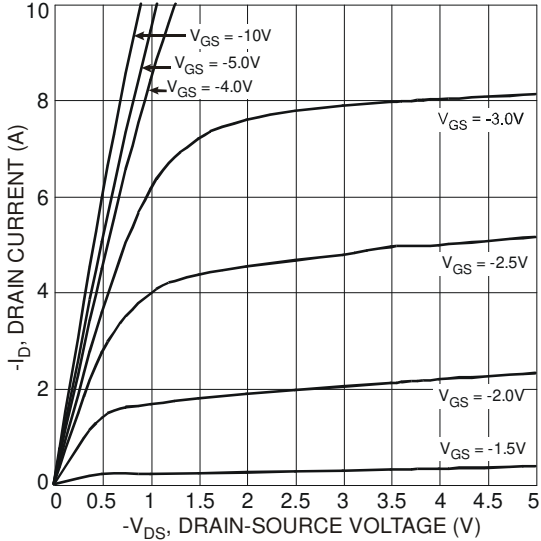


Figure 1 Typical Output Characteristics

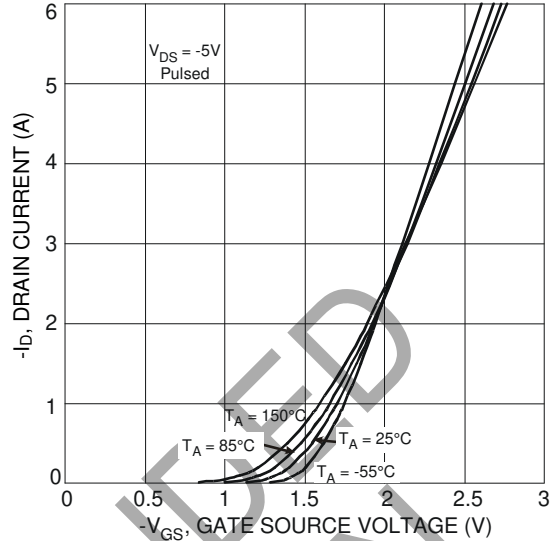


Figure 2 Typical Transfer Characteristics

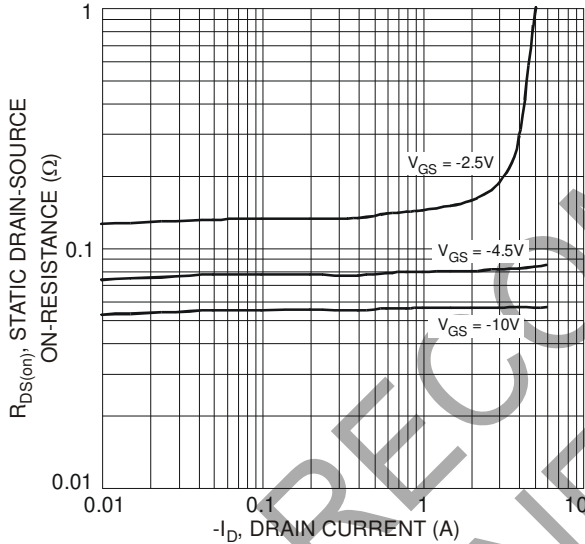


Figure 3 On-Resistance vs. Drain Current and Gate Voltage

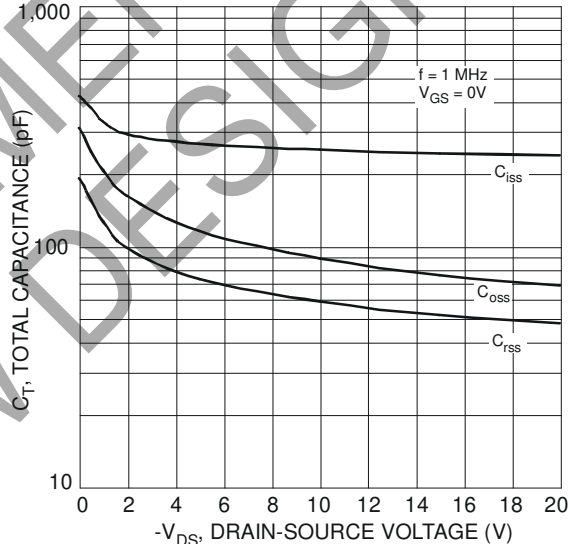


Figure 4 Typical Total Capacitance

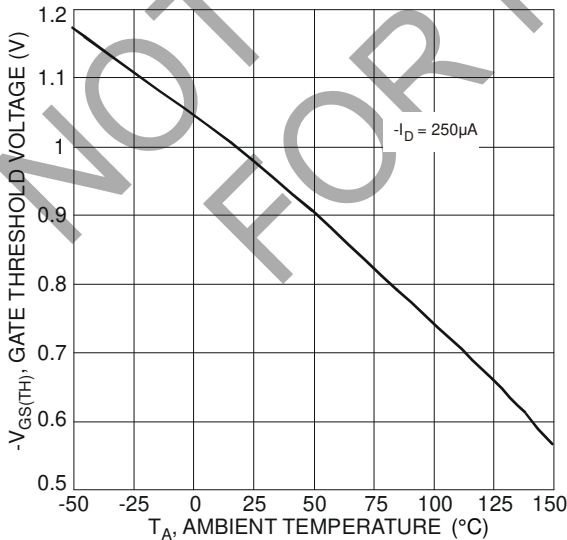


Figure 5 Gate Threshold Voltage vs. Ambient Temperature

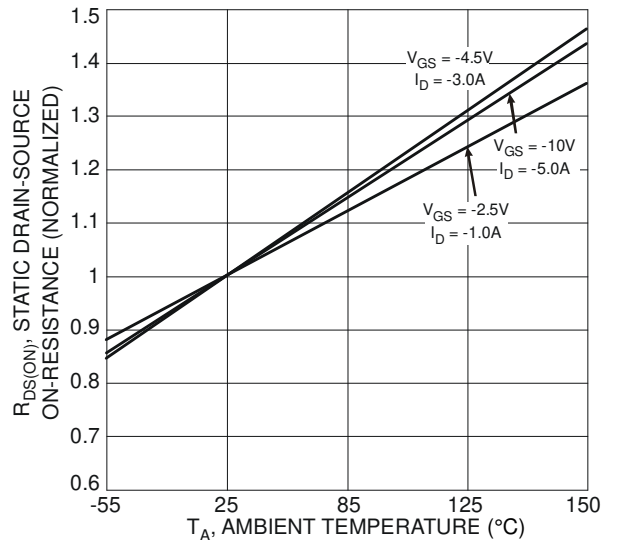


Figure 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

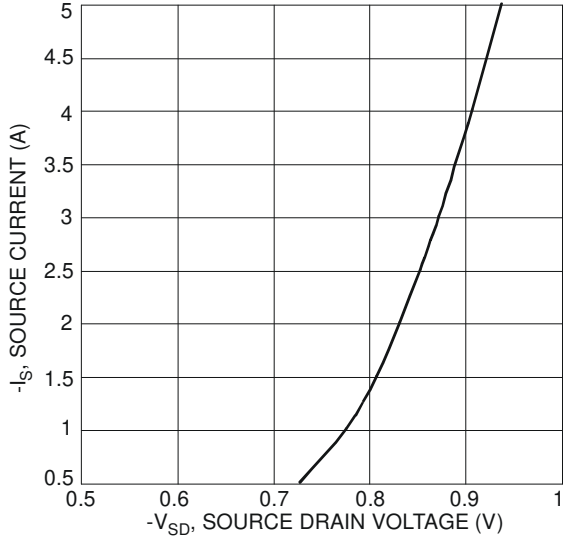


Figure 7 Reverse Drain Current vs. Source-Drain Voltage

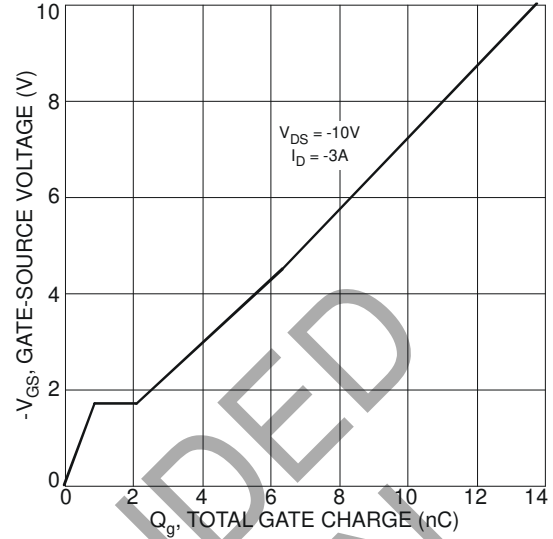


Figure 8 Gate-Charge Characteristics

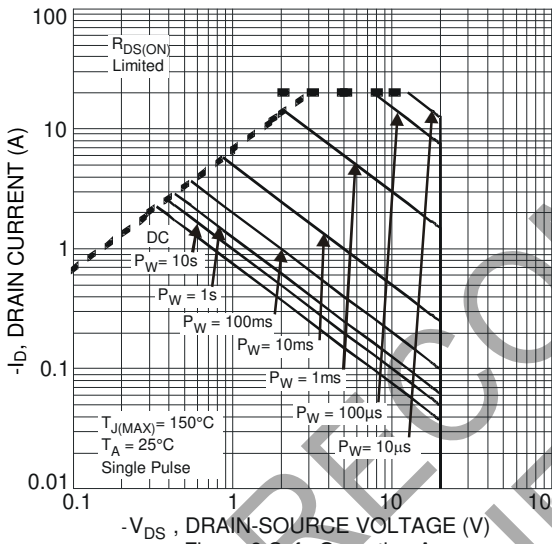


Figure 9 Safe Operation Area

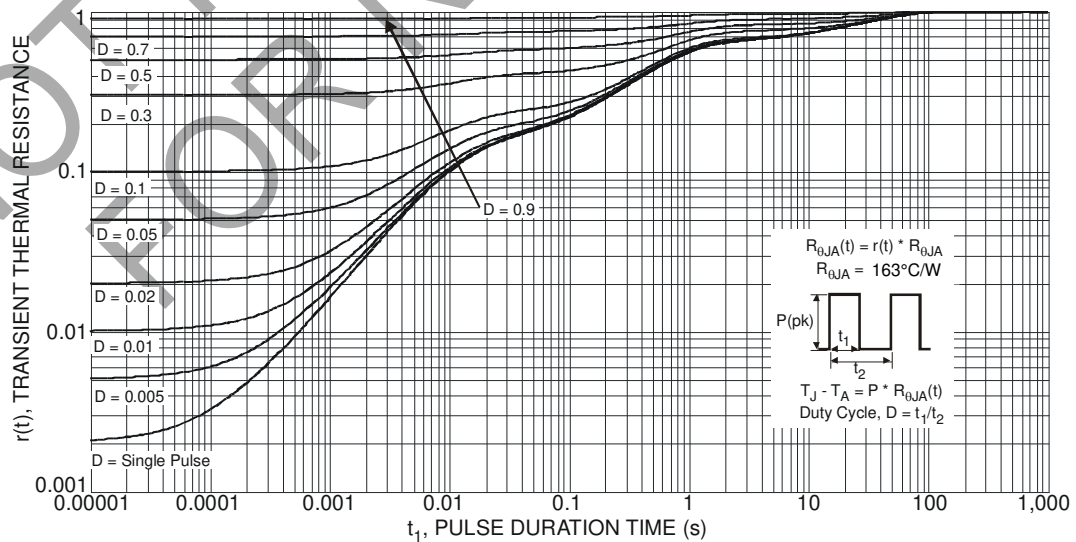
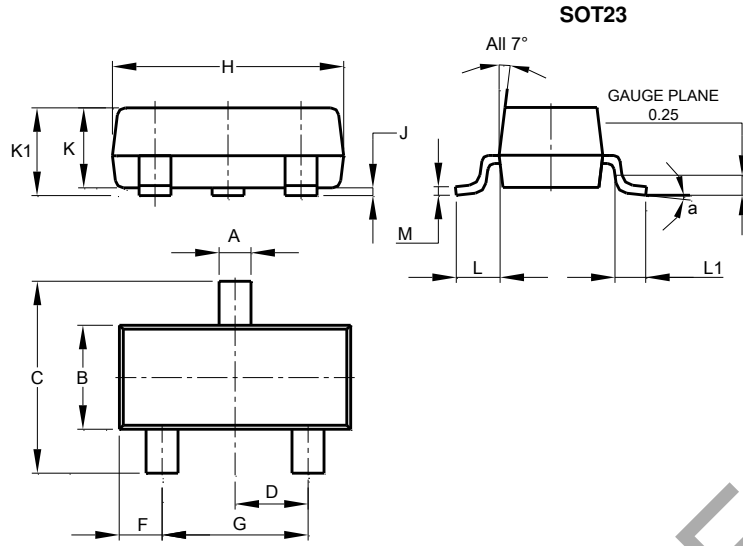


Figure 10 Transient Thermal Response

Package Outline Dimensions

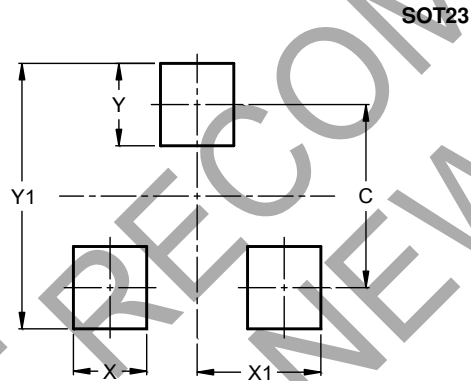
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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