

60V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	RDS(ON) Max	I _D T _C = +25°C
-60V	250mΩ @ $V_{GS} = -10V$	-6.1A
	300mΩ @ V _{GS} = -4.5V	-5.6A

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The DMP6250SEQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

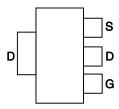
Mechanical Data

- Case: SOT223
- 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 Below
- Terminals: Finish Matte Tin Annealed over Copper Lead Frame.
 Solderable per MIL-STD-202, Method 208 (©3)
- Weight: 0.112 grams (Approximate)

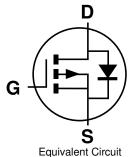




Top View



Pin Out - Top View



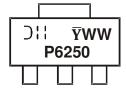
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP6250SEQ-13	SOT223	2,500 / Tape & Reel

Notes:

- $1.\ No\ purposely\ added\ lead.\ Fully\ EU\ Directive\ 2002/95/EC\ (RoHS),\ 2011/65/EU\ (RoHS\ 2)\ \&\ 2015/863/EU\ (RoHS\ 3)\ compliant.$
- 2. See https://www.diodes.com/quality/lead-free/ 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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



 $\begin{array}{ll} \text{OH} &= \text{Manufacturer's Marking} \\ \text{P6250} &= \text{Marking Code} \\ \overline{\text{Y}} \text{WW} &= \text{Date Code Marking} \\ \overline{\text{Y}} &= \text{Year (ex: 0 = 2020)} \\ \text{WW} &= \text{Week (01 to 53)} \end{array}$



Maximum Ratings (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Note 5) VGS = -10V	lο	-6.1 -4.9	А
Maximum Body Diode Continuous Current	Is	-6.1	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-14	Α
Single Pulsed Avalanche Current (Note 6) L = 0.1mH	I _{AS}	-12	Α
Single Pulsed Avalanche Energy (Note 6) L = 0.1mH	Eas	8	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	PD	1.8	W
Thermal Resistance, Junction to Ambient (Note 5)		Reja	69	°C/W
Total Power Dissipation (Note 5) $T_C = +25^{\circ}C$		P_{D}	14	W
Thermal Resistance, Junction to Case (Note 5)		Rejc	8.7	°C/W
Operating and Storage Temperature Range		TJ, TSTG	-55 to +150	°C

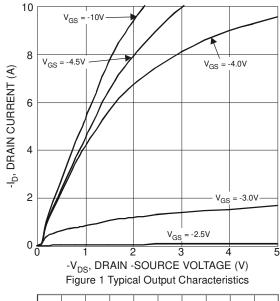
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

	l I			I			
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BVDSS	-60	_	_	V	$I_D = -250 \mu A$, $V_{GS} = 0 V$	
Zero Gate Voltage Drain Current	IDSS	_	_	-1	μΑ	$V_{DS} = -60V$, $V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_		±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	-1		-3	V	$V_{DS} = V_{GS}$, $I_D = -250 \mu A$	
Static Drain-Source On-Resistance	Process.		128	250	mΩ	$V_{GS} = -10V$, $I_{D} = -1.0A$	
Static Drain-Source On-Nesistance	RDS(ON)	_	156	300	11122	$V_{GS} = -4.5V$, $I_{D} = -0.5A$	
Diode Forward Voltage	V_{SD}	_	-0.8	-1.2	٧	$V_{GS} = 0V$, $I_S = -2.0A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	Ciss	_	551	_	рF	V 00V V 0V	
Output Capacitance	Coss	_	25.7	_	рF	V _{DS} = -30V, V _{GS} = 0V f= 1MHz	
Reverse Transfer Capacitance	Crss	_	19.1	_	рF		
Gate Resistance	R_g	_	12.1	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (VGS = -4.5V)	Qg	_	4.8	_	nC		
Total Gate Charge (V _{GS} = -10V)	Q_g	_	9.7	_	nC	V _{DS} = -30V, I _D = -2A	
Gate-Source Charge	Qgs	_	1.5	_	nC	VDS = -30V, ID = -2A	
Gate-Drain Charge	Q_{gd}	_	1.6	_	nC		
Turn-On Delay Time	tD(ON)	_	6.3	_	ns		
Turn-On Rise Time	tr	_	10.3	_	ns	$V_{DS} = -30V$, $V_{GS} = -10V$, $R_{G} = 50\Omega$, $I_{D} = -1A$	
Turn-Off Delay Time	t _{D(OFF)}	_	91.4	_	ns		
Turn-Off Fall Time	tr	_	39.8	_	ns		
Reverse Recovery Time	trr	_	9.2	_	ns	1- 10-11/11 1000/	
Reverse Recovery Charge	Q _{RR}	_	3.9	_	nC	$I_S = -1A$, di/dt= 100A/ μ s	

Notes:

- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
- 6. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25$ °C.
- 7. Short duration pulse test used to minimize self-heating effect.
- 8. For design aid only, not subject to production testing.





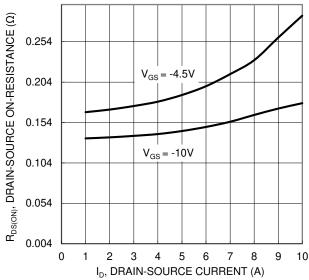


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

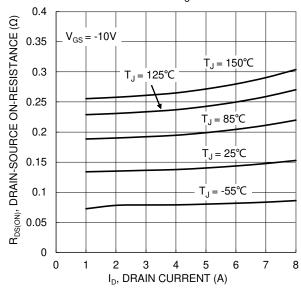
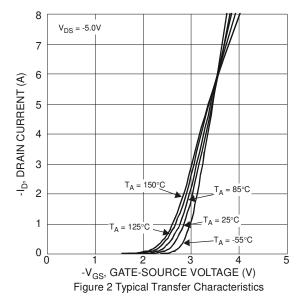
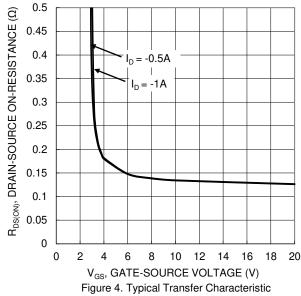


Figure 5. Typical On-Resistance vs. Drain Current and Temperature





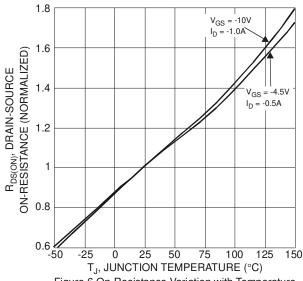
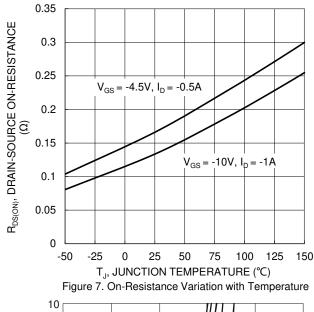
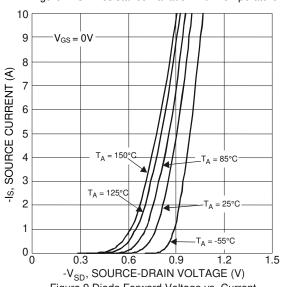
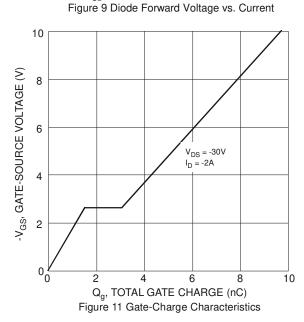


Figure 6 On-Resistance Variation with Temperature









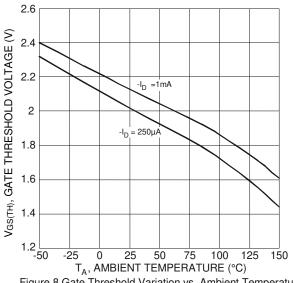
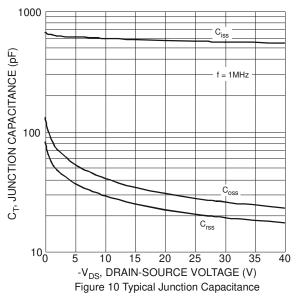
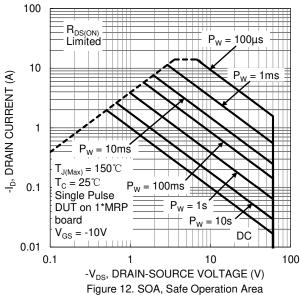


Figure 8 Gate Threshold Variation vs. Ambient Temperature







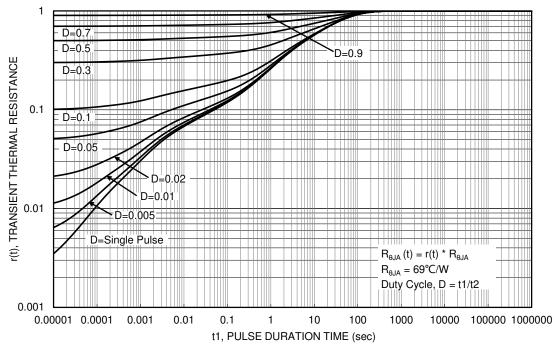


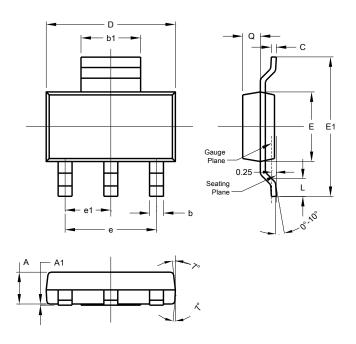
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

SOT223

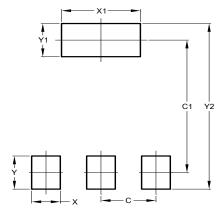


SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
A1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
C	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Ø	0.84	0.94	0.89		
All Dimensions in mm					

Suggested Pad Layout

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

SOT223



Dimensions	Value (in mm)			
С	2.30			
C1	6.40			
Х	1.20			
X1	3.30			
Υ	1.60			
Y1	1.60			
Y2	8.00			



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