



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-60V	$105m\Omega$ @ $V_{GS} = -10V$	-3.3A
	$130 \text{m}\Omega @ V_{GS} = -4.5 \text{V}$	-3.0A

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:

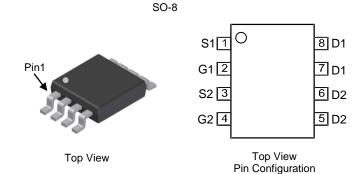
- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

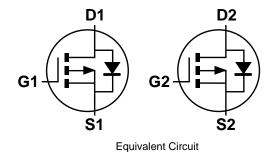
Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- 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: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.074 grams (Approximate)





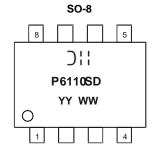
Ordering Information (Note 5)

Part Number	Case	Packaging
DMP6110SSDQ-13	SO-8	2,500/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. Refer to 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



O!! = Manufacturer's Marking
P6110SD = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 16 = 2016)
WW = Week (01 to 53)



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V _{DSS}	-60	V	
Gate-Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current (Note 7) \	$T_C = +25$ °C $T_C = +70$ °C	I _D	-7.8 -6.3	А
Continuous Drain Current (Note 7) V _{GS} = -10V	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-3.3 -2.7	А
Pulsed Drain Current (380µs Pulse, 1% Duty Cycle)	I _{DM}	-24	Α	
Maximum Continuous Body Diode Forward Current (Note 7)	Is	-1.8	Α	
Avalanche Current (Note 10) L = 0.1mH	I _{AS}	-19	Α	
Avalanche Energy (Note 10) L = 0.1mH	E _{AS}	18	mJ	

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Notes 6 & 8)	T _A = +25°C		1.2	W
Total Power Dissipation (Notes 6 & 6)	T _A = +70°C	P_{D}	0.9	
Total Power Dissipation (Notes 6 & 9)	T _A = +25°C		1.2	
Thermal Resistance, Junction to Ambient (Notes 6 & 8)	Steady State		104	°C/W
Thermal Resistance, Junction to Ambient (Notes 6 & 6)	t<10s	$R_{ hetaJA}$	45	
Thermal Resistance, Junction to Ambient (Notes 6 & 9)	Steady State		100	
Total Power Dissipation (Notes 7 & 8)	T _A = +25°C		1.7	W
Total Fower Dissipation (Notes 7 & 6)	$T_A = +70^{\circ}C$	P_{D}	1.1	
Total Power Dissipation (Notes 7 & 9)	T _A = +25°C		1.8	
Thermal Resistance, Junction to Ambient (Notes 7 & 8)	Steady State		74	°C/W
Thermal Resistance, Junction to Ambient (Notes 7 & 6)	t<10s	$R_{ hetaJA}$	37	
Thermal Resistance, Junction to Ambient (Notes 7 & 9)	Steady State		71	
Thermal Resistance, Junction to Case (Notes 7 & 8)		$R_{ heta JC}$	15	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes

- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
- 8. For a dual device with one active die.
- 9. For a device with two active die running at equal power.
- 10. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.



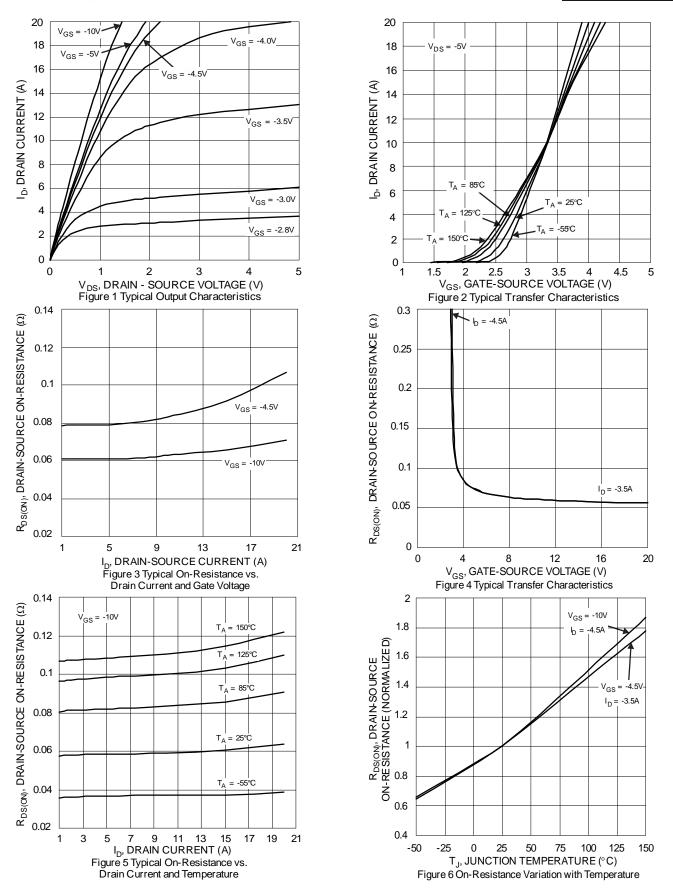
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 11)						•	
Drain-Source Breakdown Voltage	BV _{DSS}	-60	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	-1	μΑ	$V_{DS} = -48V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}		_	100	nA	$V_{GS} = \pm 16V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 11)							
Gate Threshold Voltage	V _{GS(TH)}	-1		-3	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance			80	105	105 mΩ	$V_{GS} = -10V, I_D = -4.5A$	
Static Dialii-Source Oil-Resistance	R _{DS(ON)}		95	130	11122	$V_{GS} = -4.5V, I_D = -3.5A$	
Diode Forward Voltage	V_{SD}		-0.7	-1.2	V	$V_{GS} = 0V$, $I_S = -1A$	
DYNAMIC CHARACTERISTICS (Note 12)							
Input Capacitance	C _{ISS}		969	_	pF		
Output Capacitance	Coss		57	_	pF	$V_{DS} = -30V, V_{GS} = 0V, f = 1.0MHz$	
Reverse Transfer Capacitance	C _{RSS}		44	_	pF		
Gate Resistance	R_G		13.7	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = -4.5V)	Q_{G}		8.2	_	nC	$V_{DS} = -30V, I_{D} = -12A$	
Total Gate Charge (V _{GS} = -10V)	Q_{G}		17.2	_	nC		
Gate-Source Charge	Q_{GS}		3.0	_	nC	$V_{DS} = -30V, I_{D} = -12A$	
Gate-Drain Charge	Q_{GD}		3.1	_	nC	T	
Turn-On Delay Time	t _{D(ON)}	_	4.4	_	ns		
Turn-On Rise Time	t _R	_	23		ns	$V_{GS} = -10V, V_{DS} = -30V,$	
Turn-Off Delay Time	t _{D(OFF)}	_	34	_	ns	$R_{GEN} = 3\Omega$, $I_{D} = -12A$	
Turn-Off Fall Time	t _F	_	42	_	ns	1	
Body Diode Reverse Recovery Time	t _{RR}	_	13.2	_	ns	1 100 11/14 1000///-	
Body Diode Reverse Recovery Charge	Q_{RR}	_	6.18	_	nC	I _S = -12A, di/dt = 100A/μs	

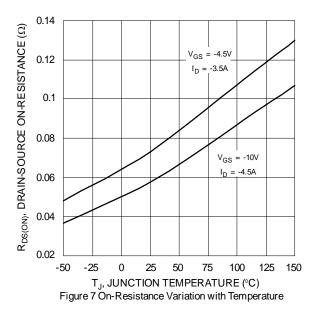
Notes:

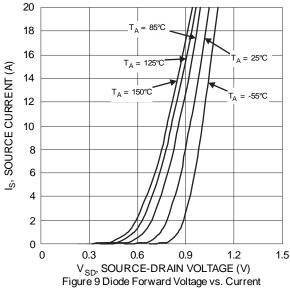
^{11.} Short duration pulse test used to minimize self-heating effect.12. Guaranteed by design. Not subject to product testing.

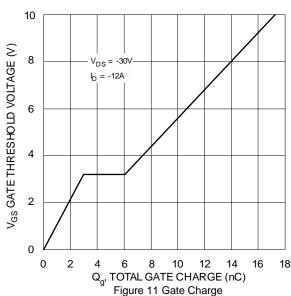


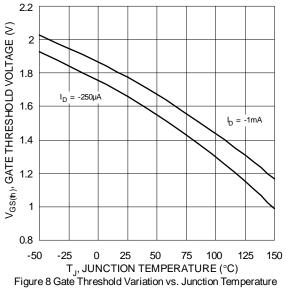


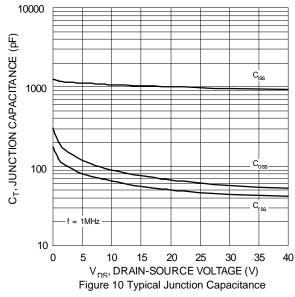


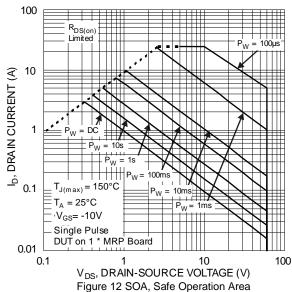




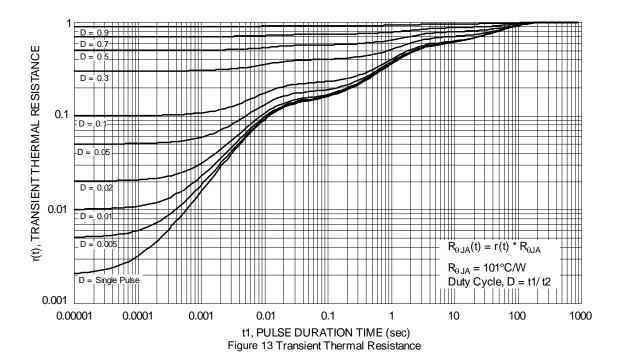










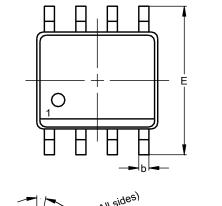


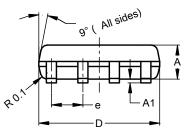


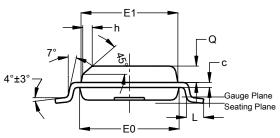
Package Outline Dimensions

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

SO-8





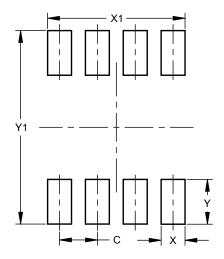


SO-8						
Dim	Min	Max	Тур			
Α	1.40	1.50	1.45			
A1	0.10	0.20	0.15			
b	0.30	0.50	0.40			
С	0.15	0.25	0.20			
D	4.85	4.95	4.90			
Е	5.90	6.10	6.00			
E1	3.80	3.90	3.85			
E0	3.85	3.95	3.90			
е	e 1.27					
h	-		0.35			
L	0.62	0.82	0.72			
ø	0.60	0.70	0.65			
All Dimensions in mm						

Suggested Pad Layout

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

SO-8



Dimensions	Value (in mm)				
С	1.27				
Х	0.802				
X1	4.612				
Y	1.505				
Y1	6.50				



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