Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D max T_A = +25°C
-60V	110mΩ @ V_{GS} = -10V	-4.5A
	130mΩ @ V_{GS} = -4.5V	-4.2A

Description and Applications

This MOSFET has been 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.

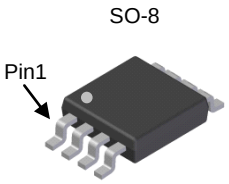
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

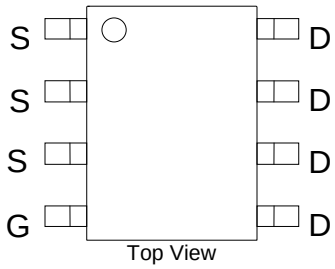
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/ Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

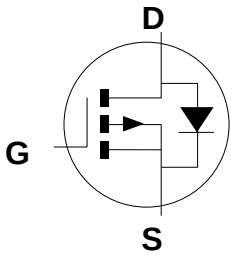
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.072g (Approximate)



Top View



Top View
Pin Configuration



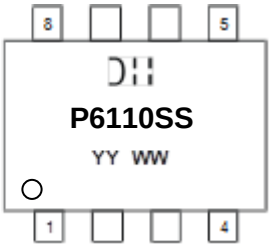
Equivalent Circuit

Ordering Information (Note 5)

Part Number	Case	Packaging
DMP6110SSSQ-13	SO-8	2500/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



= Manufacturer's Marking
P6110SS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year Code (ex: 14 = 2014)
WW = Week Code (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
Drain Current (Note 7) V_{GS} = -10V	t < 10s	T_A = +25°C T_A = +70°C	I_D	-4.5 -3.6	A
Maximum Body Diode Forward Current (Note 7)			I_S	-2.1	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	-19	A
Avalanche Current (Note 8) L = 0.1mH			I_{AS}	-17.6	A
Avalanche Energy (Note 8) L = 0.1mH			E_{AS}	15.4	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)		P_D	1.5	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	80	°C/W
	t<10s		48	°C/W
Total Power Dissipation (Note 7)		P_D	2.0	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	61	°C/W
	t<10s		37	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	6.4	°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 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -48V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1	—	-3	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	86	110	mΩ	V_{GS} = -10V, I_D = -4.5A
		—	98	130		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 10)						
Input Capacitance	C_{iss}	—	1030	—	pF	V_{DS} = -30V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	49.1	—		
Reverse Transfer Capacitance	C_{rss}	—	38.7	—		
Gate Resistance	R_G	—	13.6	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	9.5	—	nC	V_{DS} = -30V, I_D = -5A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	19.4	—		
Gate-Source Charge	Q_{gs}	—	2.3	—		
Gate-Drain Charge	Q_{gd}	—	3.6	—		
Turn-On Delay Time	$t_{D(ON)}$	—	3.7	—	ns	V_{GS} = -10V, V_{DS} = -30V, R_{GEN} = 6Ω, I_D = -5A
Turn-On Rise Time	t_R	—	6.3	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	58.7	—		
Turn-Off Fall Time	t_F	—	26.1	—		
Body Diode Reverse Recovery Time	t_{RR}	—	14.85	—	ns	I_S = -5A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	8.8	—	nC	I_S = -5A, dI/dt = 100A/µs

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. UIS in production with L = 0.1mH, starting T_A = +25°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

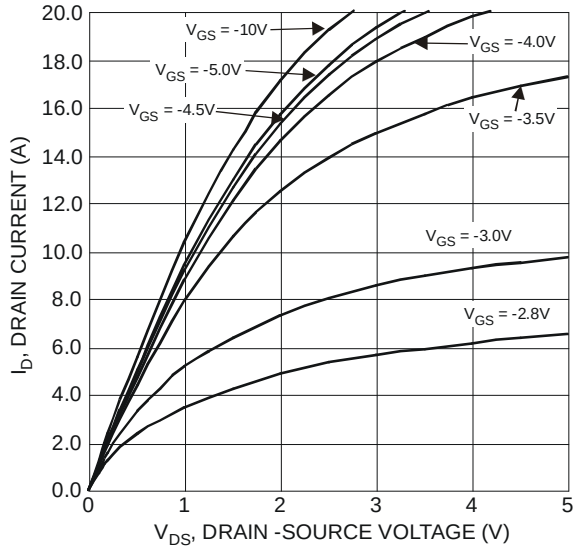


Figure 1 Typical Output Characteristics

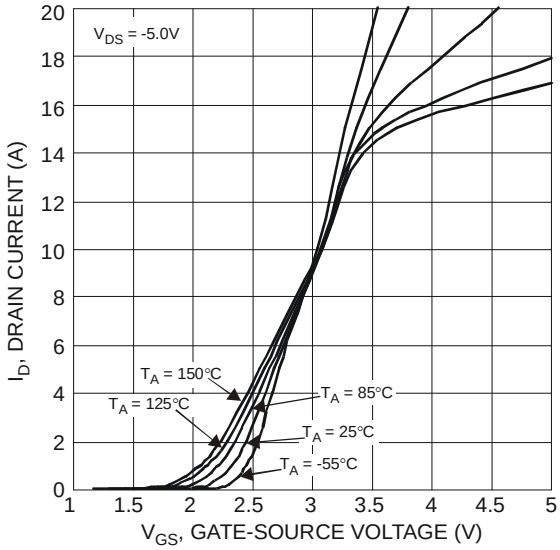


Figure 2 Typical Transfer Characteristics

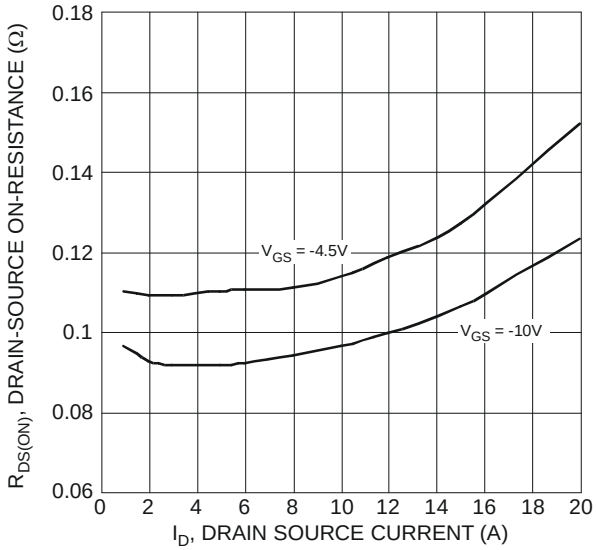


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

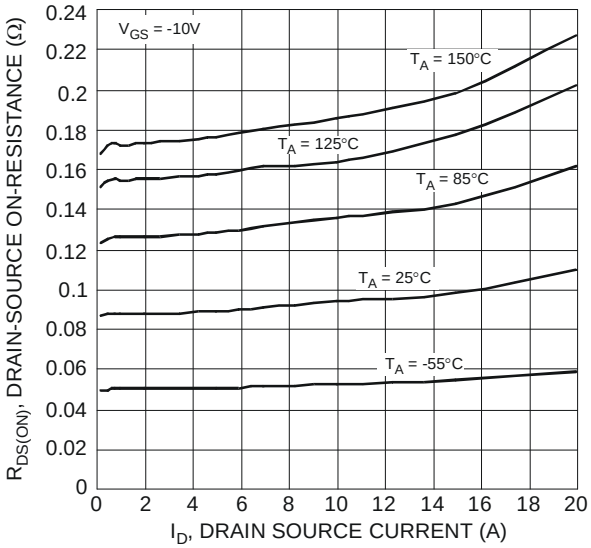


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

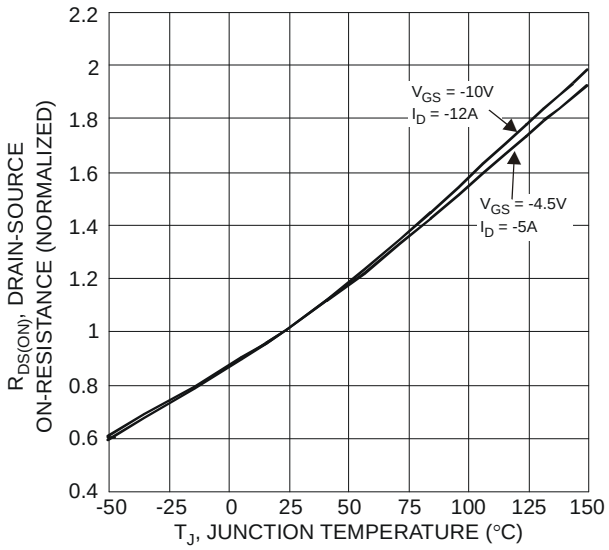


Figure 5 On-Resistance Variation with Temperature

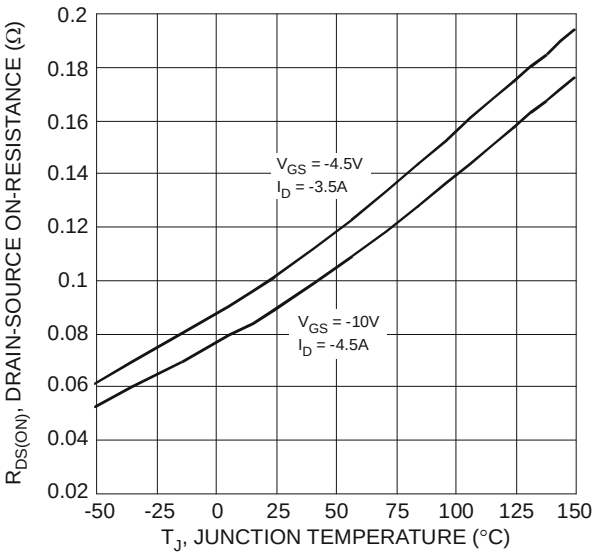


Figure 6 On-Resistance Variation with Temperature

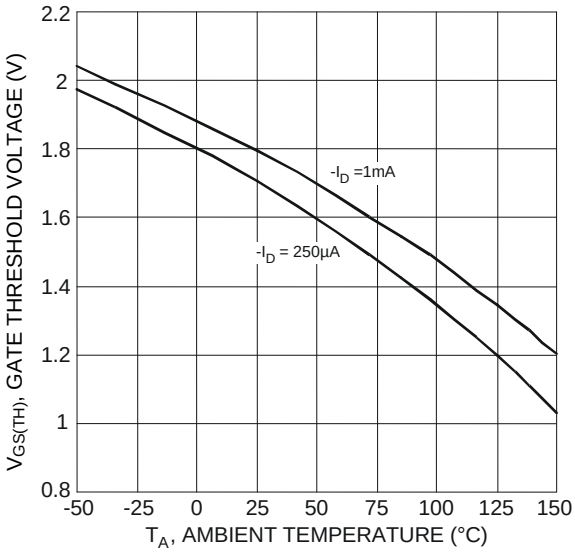


Figure 7 Gate Threshold Variation vs. Ambient Temperature

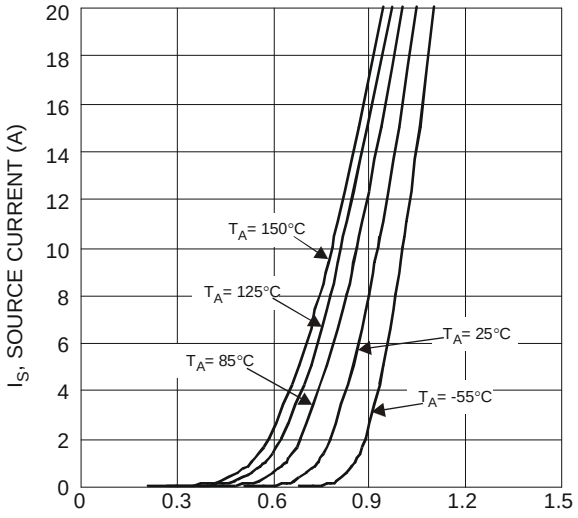


Figure 8 Diode Forward Voltage vs. Current

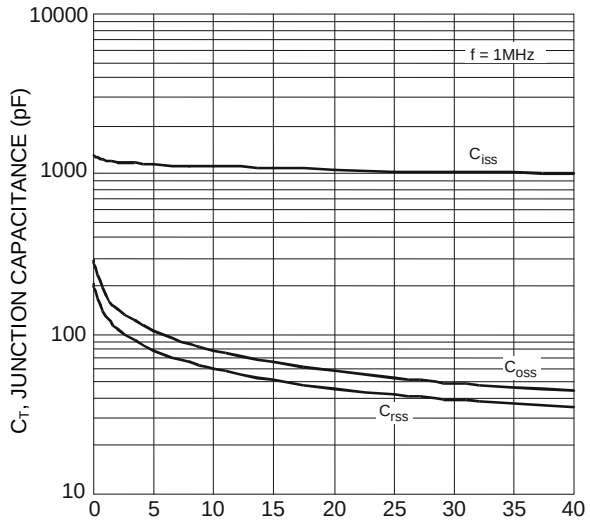


Figure 9 Typical Junction Capacitance

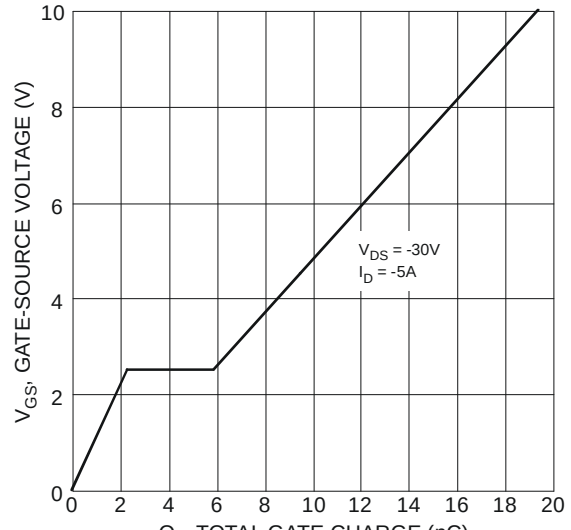


Figure 10 Gate-Charge Characteristics

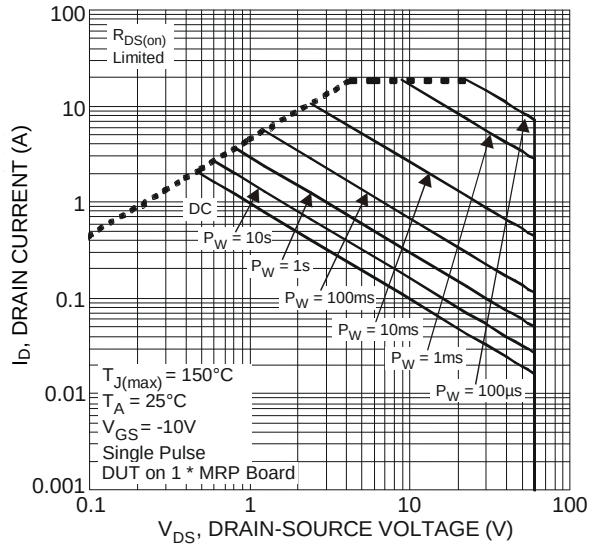


Figure 11 SOA, Safe Operation Area

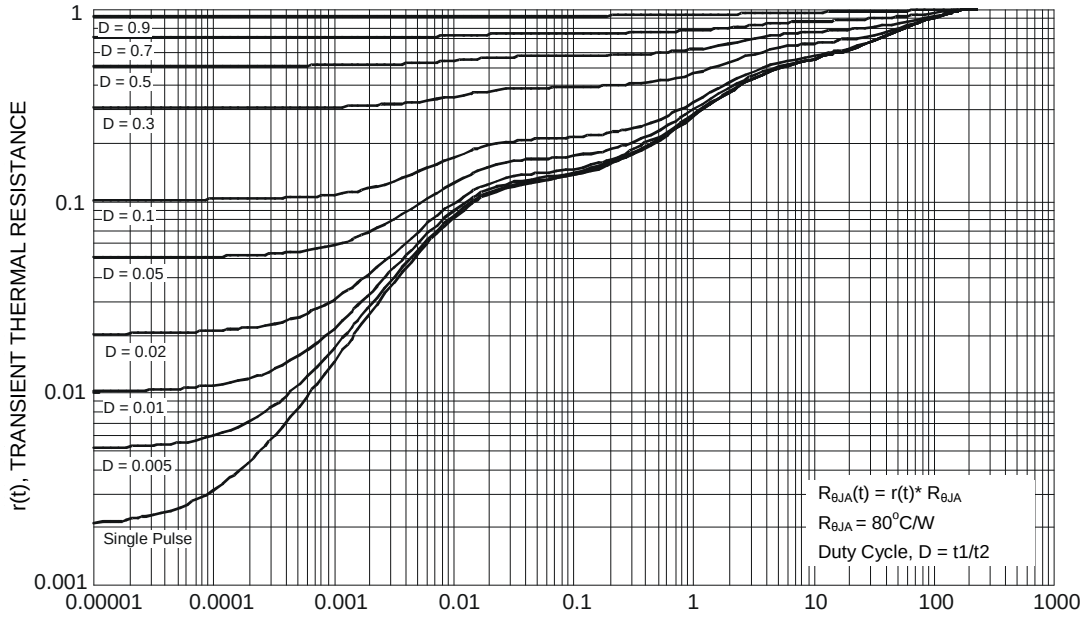
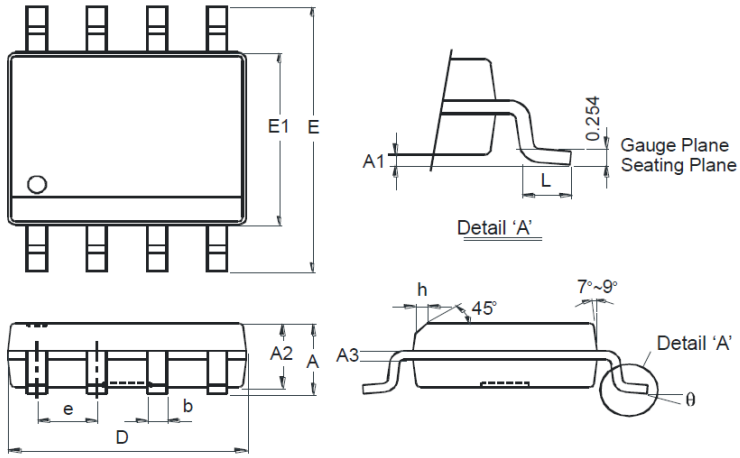


Figure 12 Transient Thermal Resistance

Package Outline Dimensions

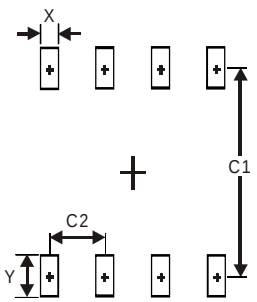
Please see http://www.diodes.com/package-outlines.html for the latest version.



SO-8		
Dim	**Min**	**Max**
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	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)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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