



#### P-CHANNEL ENHANCEMENT MODE MOSFET

## **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C
	105mΩ @ V <sub>GS</sub> = -10V	-7.3A
-60V	130mΩ @ V <sub>GS</sub> = -4.5V	-6.5A

## **Description and Applications**

This MOSFET is designed to minimize the on-state resistance ( $R_{\rm DS(ON)}$ ) 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**

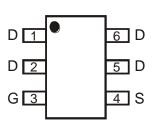
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

#### **Mechanical Data**

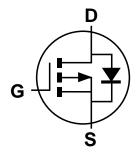
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
  Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.008 grams (Approximate)







**Device Schematic** 



**Equivalent Circuit** 

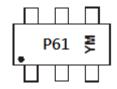
## **Ordering Information** (Note 4)

Part Number	Case	Packaging
DMP6110SVT-7	TSOT26	3,000/Tape & Reel
DMP6110SVT-13	TSOT26	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 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 http://www.diodes.com/products/packages.html.

## **Marking Information**



P61 = Product Type Marking Code YM or YM = Date Code Marking Y or Y = Year (ex: C = 2015) M = Month (ex: 9 = September)

#### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021
Code	С	D	E	F	G	Н	1

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	Ν	D



## **Maximum Ratings** (@T<sub>A</sub> = +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 6) V <sub>GS</sub> = -10V	ID	-7.3 -5.8	А	
Maximum Body Diode Forward Current (Note 6)		Is	-1.8	Α
Pulsed Drain Current (380µs Pulse, 1% Duty Cycle)	I <sub>DM</sub>	-24	Α	
Avalanche Current (Note 7) L = 0.1mH	I <sub>AS</sub>	-19	Α	
Repetitive Avalanche Energy (Note 7) L = 0.1mH	E <sub>AS</sub>	18	mJ	

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

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	р	1.2	W
Total Power Dissipation (Note 5)	$T_A = +70^{\circ}C$	$P_{D}$	0.75	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	D	105	°C/W
Themal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	60	°C/W
Total Power Dissipation (Note 6)	$T_A = +25$ °C	D-	1.8	W
Total Fower Dissipation (Note o)	$T_A = +70$ °C	P <sub>D</sub>	1.1	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	D.	69	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	39	°C/W
Thermal Resistance, Junction to Case (Note 6)	$R_{\thetaJC}$	15	°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	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)			•	•	•		
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-60	_	_	V	$V_{GS} = 0V, I_{D} = -250\mu A$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	-1	μΑ	$V_{DS} = -48V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	_	_	100	nA	$V_{GS} = \pm 16V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1	_	-3	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance		_	_	105	mΩ	$V_{GS} = -10V, I_D = -4.5A$	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	_	_	130	11177	$V_{GS} = -4.5V, I_D = -3.5A$	
Diode Forward Voltage	$V_{SD}$	_	-0.7	-1.2	V	$V_{GS} = 0V, I_{S} = -1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C <sub>iss</sub>		969	_		V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V, f = 1.0MHz	
Output Capacitance	Coss	_	57	_	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	_	44	_			
Gate Resistance	R <sub>G</sub>	_	13.7	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1.0MHz$	
Total Gate Charge (V <sub>GS</sub> = -4.5V)	$Q_g$	_	8.2	_			
Total Gate Charge (V <sub>GS</sub> = -10V)	$Q_g$	_	17.2	_	nC	201/ 1 404	
Gate-Source Charge	Qgs	_	3.0	_	nc nc	$V_{DS} = -30V, I_{D} = -12A$	
Gate-Drain Charge	$Q_{qd}$	_	3.1	_			
Turn-On Delay Time	t <sub>D(ON)</sub>	_	4.4	_			
Turn-On Rise Time	t <sub>R</sub>	_	23	_		$V_{GS} = -10V$ , $V_{DS} = -30V$ , $R_{GEN} = 3\Omega$ ,	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	34	_	ns	$I_D = -12A$	
Turn-Off Fall Time	t <sub>F</sub>	_	42	_			
Body Diode Reverse Recovery Time	t <sub>RR</sub>	_	13.2	_	ns	1 424 41/4 4004/	
Body Diode Reverse Recovery Charge	$Q_{RR}$		6.18	_	nC	$I_S = -12A$ , $dI/dt = 100A/\mu s$	

lotes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

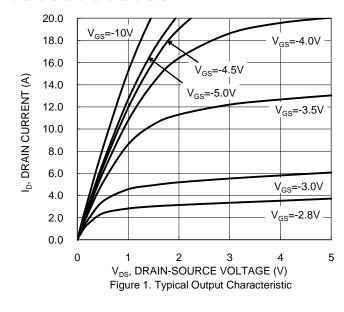
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

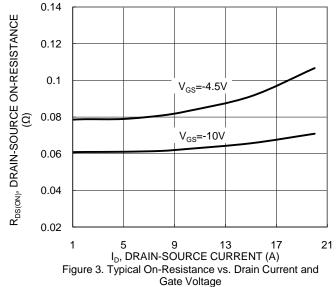
7.  $I_{AS}$  and  $E_{AS}$  rating are based on low frequency and duty cycles to keep  $T_J$  = +25°C.

8. Short duration pulse test used to minimize self-heating effect.

9. Guaranteed by design. Not subject to product testing.







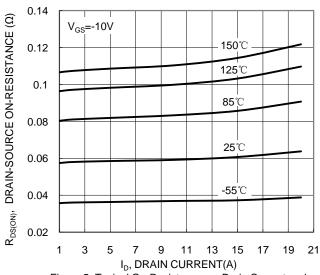
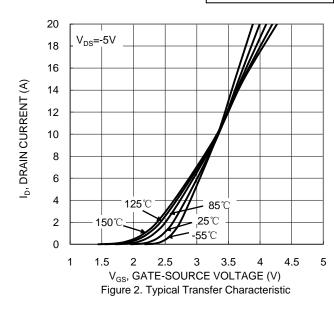
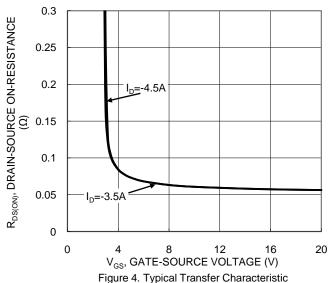


Figure 5. Typical On-Resistance vs. Drain Current and Temperature





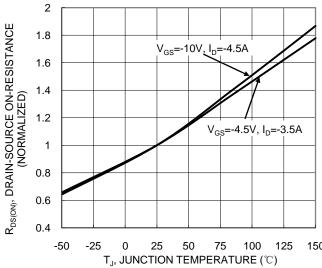


Figure 6. On-Resistance Variation with Temperature



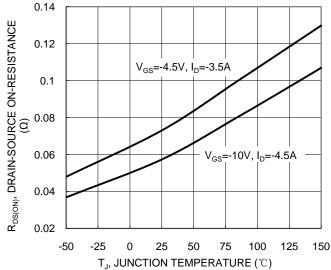
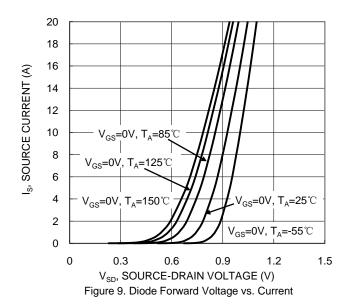
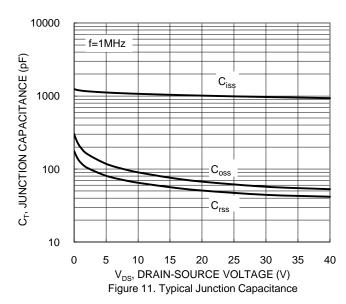
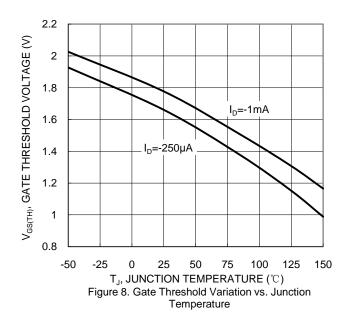
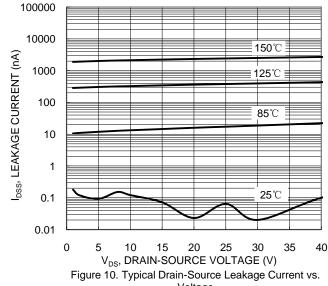


Figure 7. On-Resistance Variation with Temperature

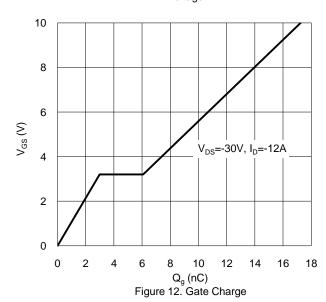




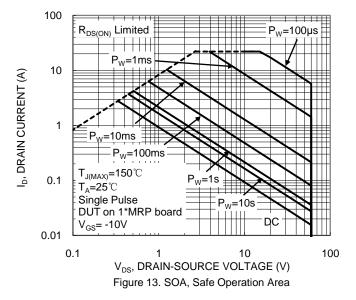




Voltage







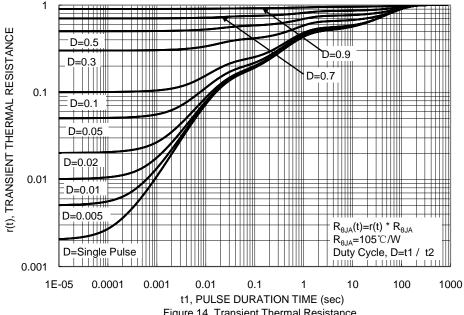
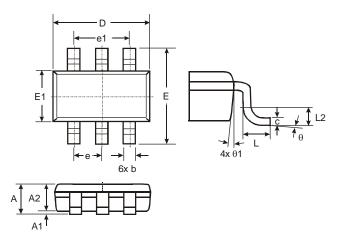


Figure 14. Transient Thermal Resistance



# **Package Outline Dimensions**

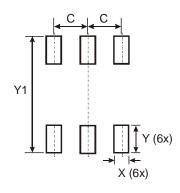
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



	TSOT26								
Dim	Min	Max	Тур						
Α	-	1.00	_						
A1	0.01	0.10	-						
A2	0.84	0.90	-						
D	_	_	2.90						
Е	_	-	2.80						
E1	-	_	1.60						
b	0.30	0.45	_						
С	0.12	0.20	-						
е	_	_	0.95						
e1	_	-	1.90						
L	0.30	0.50							
L2	_	_	0.25						
θ	0°	8°	4°						
θ1	4°	12°	_						
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)
С	0.950
Х	0.700
Y	1.000
Y1	3.199



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