

# SPD15P10PLG-VB Datasheet P-Channel 100 V (D-S) MOSFET

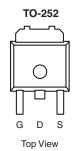
PRODUCT SUMMARY					
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω) I <sub>D</sub> (A)		Q <sub>g</sub> (Typ.)		
- 100	0.100 at V <sub>GS</sub> = - 10 V	- 16	11.7		
- 100	0.120 at $V_{GS}$ = - 4.5 V	- 15	11.7		

## **FEATURES**

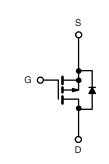
- Halogen-free According to IEC 61249-2-21
  Definition
- Trench Power MOSFET
- 100 %  $R_q$  and UIS Tested
- Compliant to RoHS Directive 2002/95/EC

#### **APPLICATIONS**

- Power Switch
- DC/DC Converters



Drain Connected to Tab



P-Channel MOSFET

<b>ABSOLUTE MAXIMUM RATINGS</b> $T_C = 25 \text{ °C}$ , unless otherwise noted					
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	- 100	v		
Gate-Source Voltage	V <sub>GS</sub>	± 20	v		
Continuous Drain Current ( $T_1 = 150 \ ^{\circ}C$ )	T <sub>C</sub> = 25 °C	1-	- 16		
Continuous Drain Current $(1) = 150^{\circ}$ C)	T <sub>C</sub> = 70 °C	I <sub>D</sub>	- 14	•	
Pulsed Drain Current		I <sub>DM</sub>	- 50	- A	
Avalanche Current		I <sub>AS</sub>	- 18		
Single Avalanche Energy <sup>a</sup>	L = 0.1 mH	E <sub>AS</sub>	16.2	mJ	
	T <sub>C</sub> = 25 °C	P	32.1 <sup>b</sup>		
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25 °C <sup>c</sup>	– P <sub>D</sub> –	2.5	- w	
Operating Junction and Storage Temperature Ra	inge	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Limit	Unit		
Junction-to-Ambient (PCB Mount) <sup>c</sup>	R <sub>thJA</sub>	50	°C/W		
Junction-to-Case (Drain)	R <sub>thJC</sub>	3.9	0/10		

Notes:

a. Duty cycle ≤ 1 %.

b. See SOA curve for voltage derating.

c. When Mounted on 1" square PCB (FR-4 material).



COMPLIANT HALOGEN

Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static		· · · · · · · · · · · · · · · · · · ·			1	•	
Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{DS}$ $V_{DS} = 0 V, I_{D} = -250 \mu A$				v	
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_{D} = -250 \ \mu A$	- 1		- 2.5	v	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 250	nA	
		$V_{DS} = -100 \text{ V}, V_{GS} = 0 \text{ V}$			- 1		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS}$ = - 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 125 °C			- 50	μA	
		$V_{DS}$ = - 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 150 °C			- 250		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \le$ - 10 V, $V_{GS}$ = - 10 V	- 15			A	
	B	V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 3.6 A		0.100		Ω	
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = - 4.5 V, I <sub>D</sub> = - 3.4 A		0.120			
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 3.6 A		12		S	
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			1055		pF	
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = - 50 V, f = 1 MHz		65			
Reverse Transfer Capacitance	C <sub>rss</sub>			41			
Total Gate Charge <sup>c</sup>	Qg	$V_{DS} = -50 \text{ V}, \text{ V}_{GS} = -10 \text{ V}, \text{ I}_{D} = -3.6 \text{ A}$		23.2	34.8	nC	
Total Gate Charge				11.7	17.6		
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{DS}$ = - 50 V, $V_{GS}$ = - 4.5 V, $I_{D}$ = - 3.6 A		3.5			
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			4.8			
Gate Resistance	Rg	f = 1 MHz	1.2	5.7	11.5	Ω	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			7	14		
Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD}$ = - 50 V, $R_L$ = 17.2 $\Omega$		12	18	ns	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$I_{D}\cong$ - 2.9 A, $V_{GEN}$ = - 10 V, $R_{g}$ = 1 $\Omega$		33	50	115	
Fall Time <sup>c</sup>	t <sub>f</sub>			9	18		
Drain-Source Body Diode Ratings an	nd Characteri	stics T <sub>C</sub> = 25 °C <sup>b</sup>					
Continuous Current	۱ <sub>S</sub>				- 8.8	Α	
Pulsed Current	I <sub>SM</sub>				- 15	A	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = - 2.9 A, V <sub>GS</sub> = 0 V		- 0.8	- 1.5	V	
Reverse Recovery Time	t <sub>rr</sub>			50	75	ns	
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>	I <sub>F</sub> = - 2.9 A, dl/dt = 100 A/μs		- 4	- 6	Α	
Reverse Recovery Charge	Q <sub>rr</sub>	1 [		98	147	nC	

Notes:

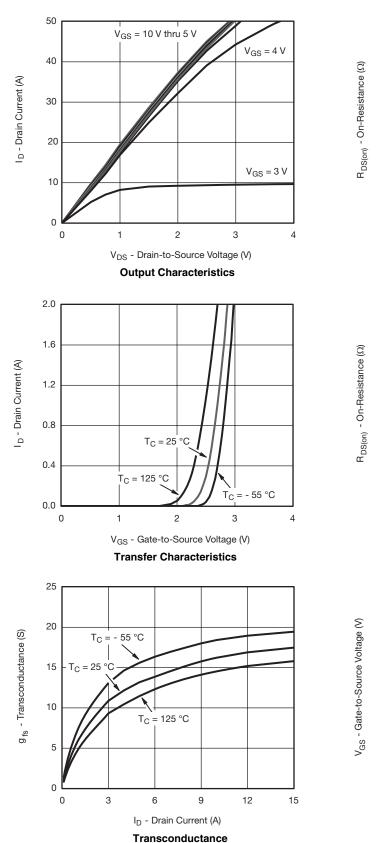
a. Pulse test; pulse width  $\leq$  300  $\mu s,$  duty cycle  $\leq$  2 %.

b. Guaranteed by design, not subject to production testing.c. Independent of operating temperature.

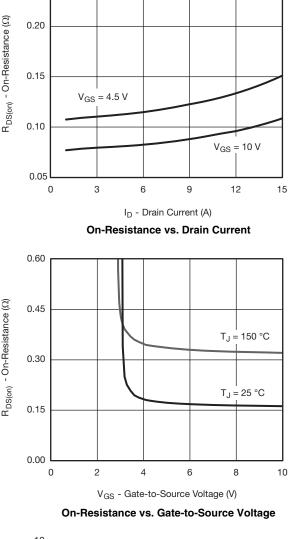
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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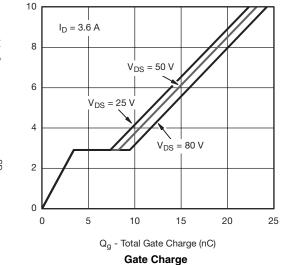




## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

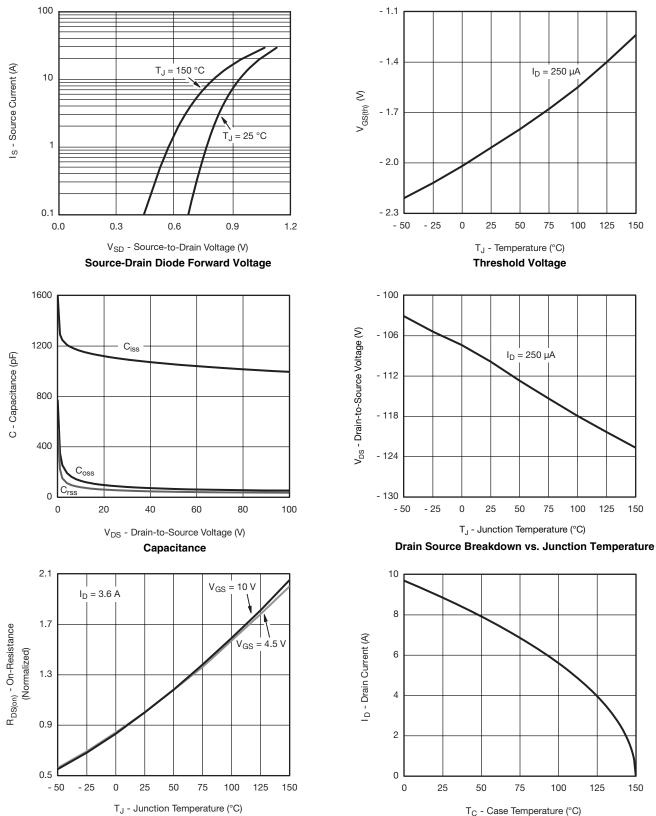


0.25





#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



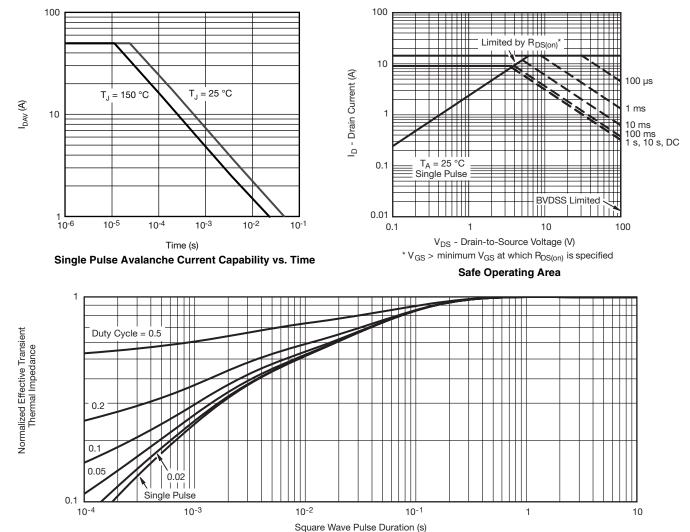
**On-Resistance vs. Junction Temperature** 



**Current Derating** 

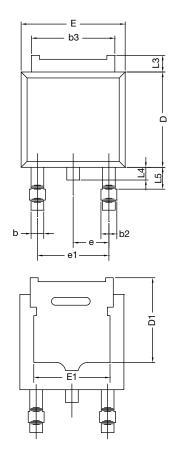


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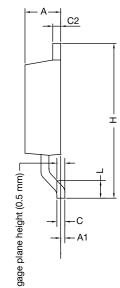


Normalized Thermal Transient Impedance, Junction-to-Case





# **TO-252AA Case Outline**



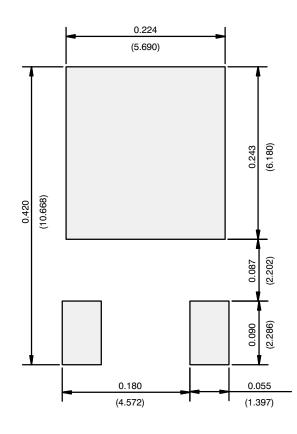
	MILLIMETERS		INC	HES
DIM.	MIN.	MAX.	MIN.	MAX.
А	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
С	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	4.10	-	0.161	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
Н	9.40	10.41	0.370	0.410
е	2.28	BSC 0.090 BSC		BSC
e1	4.56	BSC	0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.01	1.52	0.040	0.060
ECN: T16-0236-Rev. P, 16-May-16 DWG: 5347				

Notes

• Dimension L3 is for reference only.



## **RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)**



Recommended Minimum Pads Dimensions in Inches/(mm)



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