

# SI2325DS-T1-E3-VB Datasheet

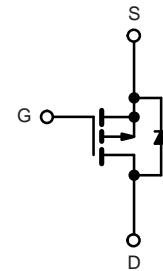
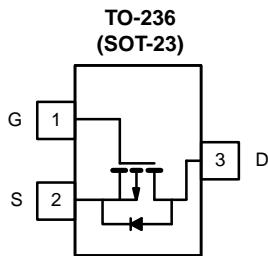
## P-Channel 60 V (D-S) MOSFET

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$V_{GS(th)}$ (V)	$I_D$ (mA)
- 60	3 at $V_{GS} = -10$ V	- 1 to - 3	-500

### FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Trench Power MOSFET
- High-Side Switching
- Low On-Resistance: 3  $\Omega$
- Low Threshold: - 2 V (typ.)
- Fast Switching Speed: 20 ns (typ.)
- Low Input Capacitance: 20 pF (typ.)
- Compliant to RoHS Directive 2002/95/EC


**RoHS**  
 COMPLIANT


P-Channel MOSFET

### ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	- 60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$I_D$	- 500	mA
		- 350	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-1500	
Power Dissipation <sup>a</sup>	$P_D$	460	mW
		240	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	350	°C/W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150	°C

Notes:

a. Surface mounted on FR4 board.

b. Pulse width limited by maximum junction temperature.

**SPECIFICATIONS**  $T_A = 25^\circ\text{C}$ , unless otherwise noted

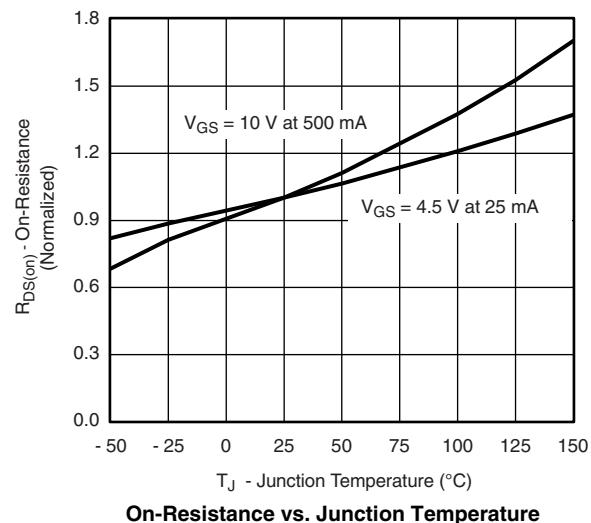
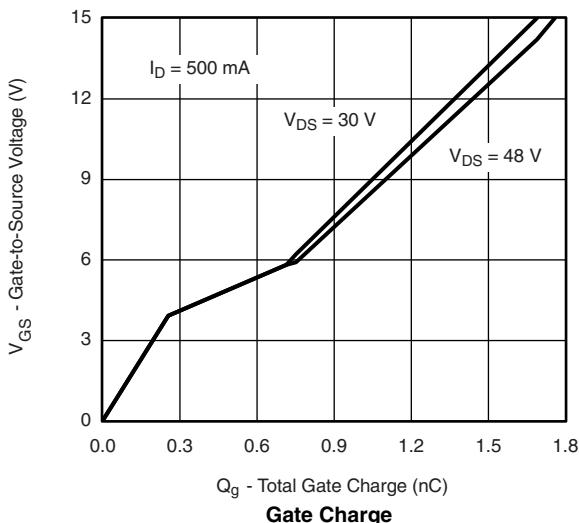
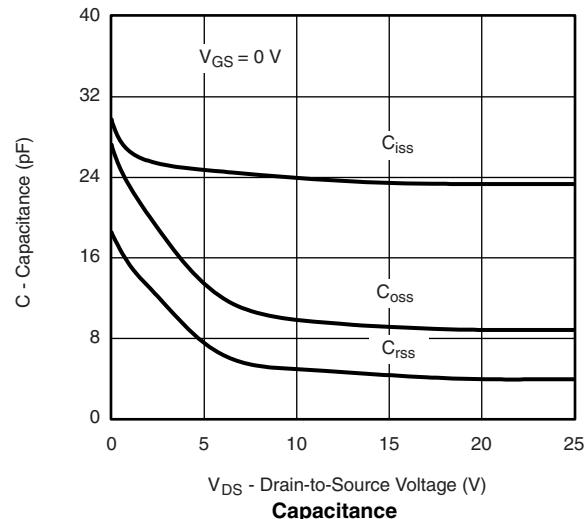
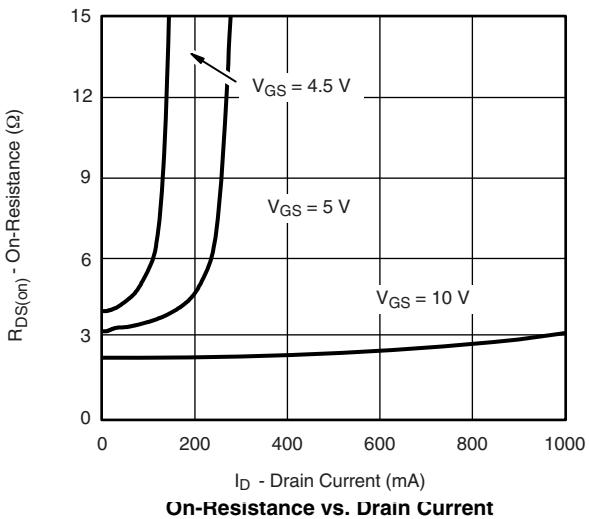
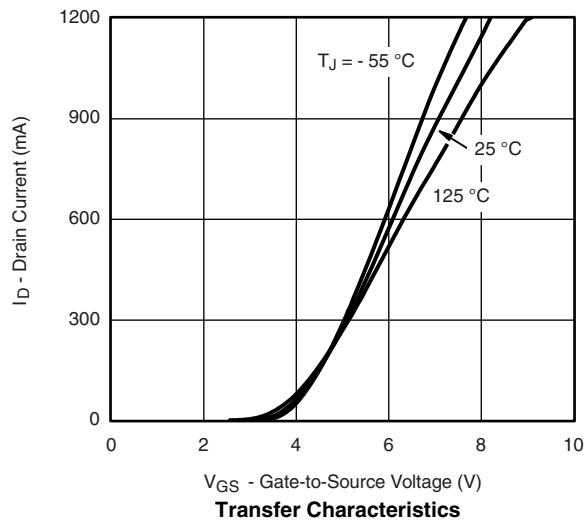
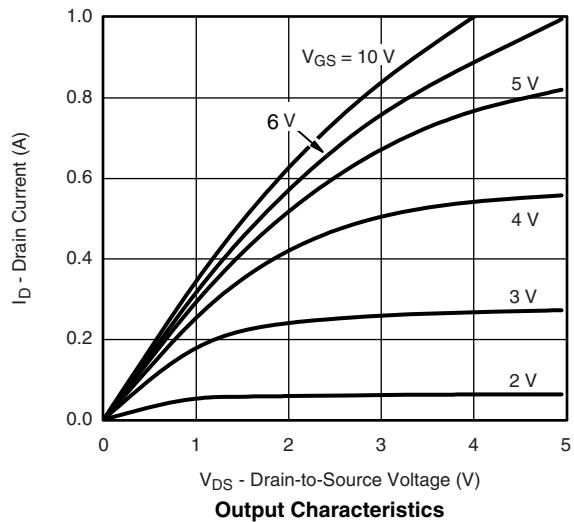
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ. <sup>a</sup>	Max.	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0 \text{ V}, I_D = -10 \mu\text{A}$	-60			V
Gate-Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1		-3	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			$\pm 10$	$\mu\text{A}$
		$V_{DS} = 0 \text{ V}, V_{GS} = \pm 10 \text{ V}$			$\pm 200$	
		$V_{DS} = 0 \text{ V}, V_{GS} = \pm 10 \text{ V}, T_J = 85^\circ\text{C}$			$\pm 500$	
		$V_{DS} = 0 \text{ V}, V_{GS} = \pm 5 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}$			-25	
		$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			-250	
On-State Drain Current <sup>a</sup>	$I_{D(\text{on})}$	$V_{GS} = -10 \text{ V}, V_{DS} = -4.5 \text{ V}$	-50			
		$V_{GS} = -10 \text{ V}, V_{DS} = -10 \text{ V}$	-600			mA
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(\text{on})}$	$V_{GS} = -4.5 \text{ V}, I_D = -25 \text{ mA}$		4		
		$V_{GS} = -10 \text{ V}, I_D = -100 \text{ mA}$		3		
		$V_{GS} = -10 \text{ V}, I_D = -100 \text{ mA}, T_J = 125^\circ\text{C}$		9		$\Omega$
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -10 \text{ V}, I_D = -100 \text{ mA}$	80			mS
Diode Forward Voltage	$V_{SD}$	$I_S = -100 \text{ mA}, V_{GS} = 0 \text{ V}$			-1.4	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -30 \text{ V}, V_{GS} = -15 \text{ V}$ $I_D \approx -100 \text{ mA}$		2.0		
Gate-Source Charge	$Q_{gs}$			1.2		
Gate-Drain Charge	$Q_{gd}$			0.8		nC
Input Capacitance	$C_{iss}$	$V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$		23		
Output Capacitance	$C_{oss}$			10		
Reverse Transfer Capacitance	$C_{rss}$			5		pF
<b>Switching<sup>b</sup></b>						
Turn-On Time	$t_{d(\text{on})}$	$V_{DD} = -25 \text{ V}, R_L = 150 \Omega$ $I_D \approx -200 \text{ mA}, V_{GEN} = -10 \text{ V}, R_g = 10 \Omega$		20		
Turn-Off Time	$t_{d(\text{off})}$			35		ns

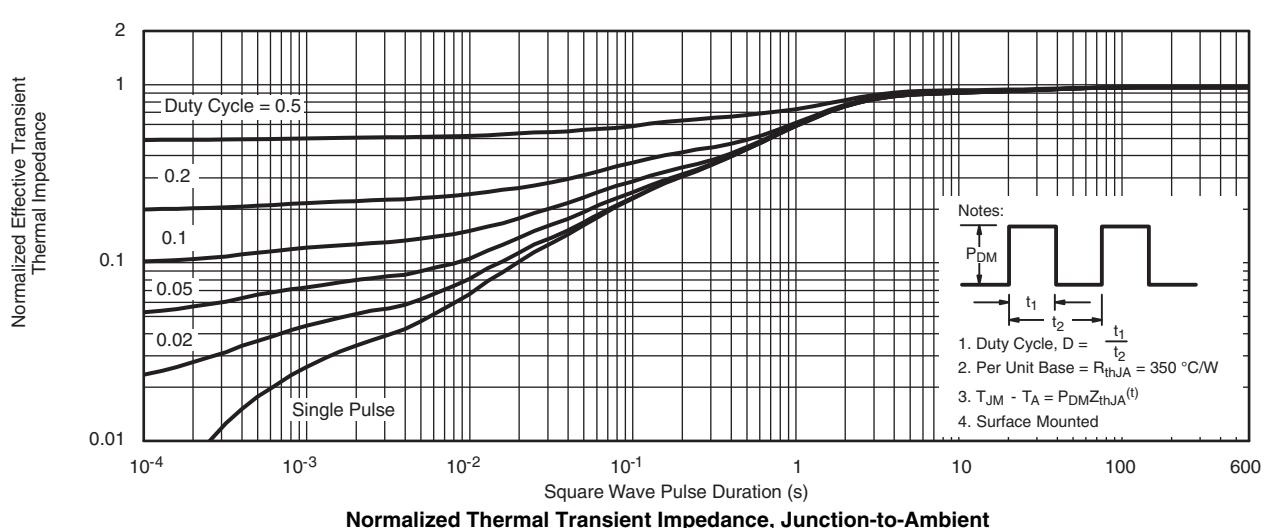
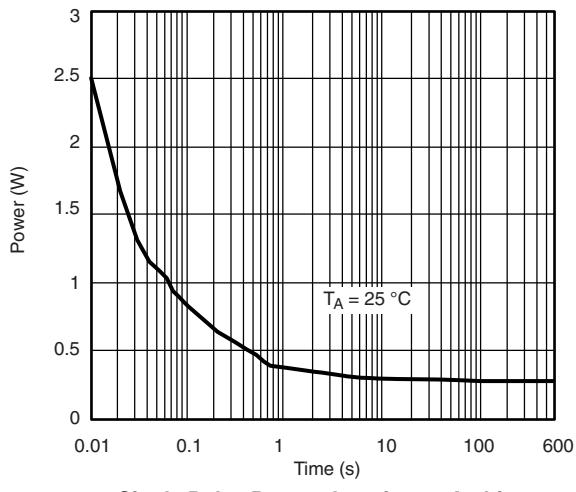
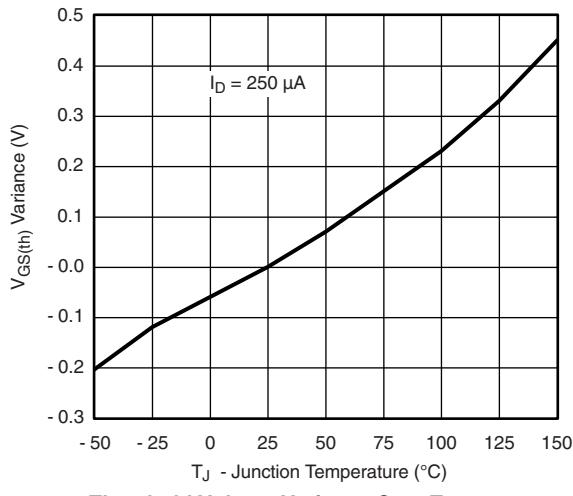
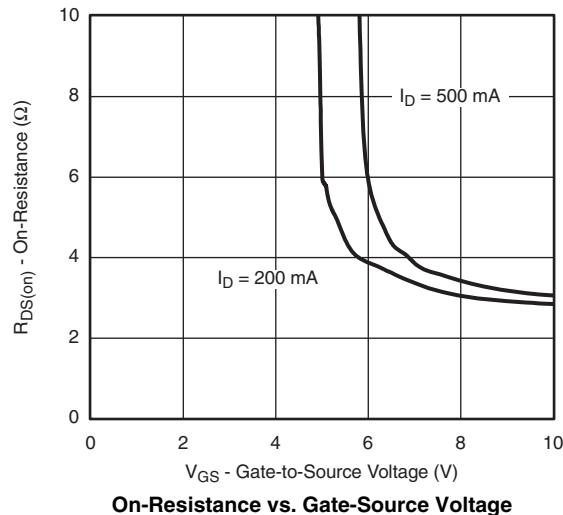
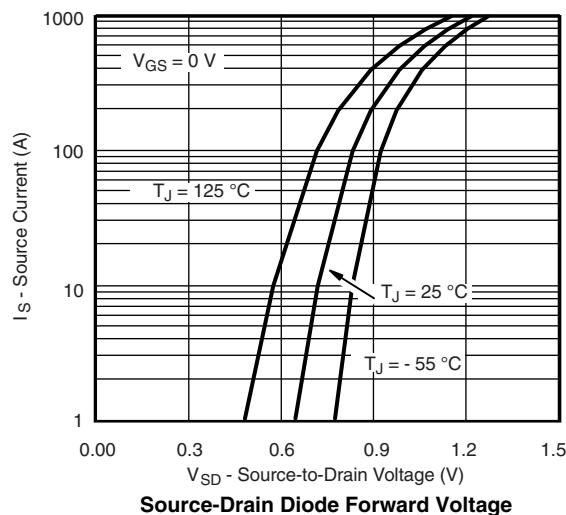
Notes:

a. Pulse test:  $PW \leq 300 \mu\text{s}$  duty cycle  $\leq 2\%$ .

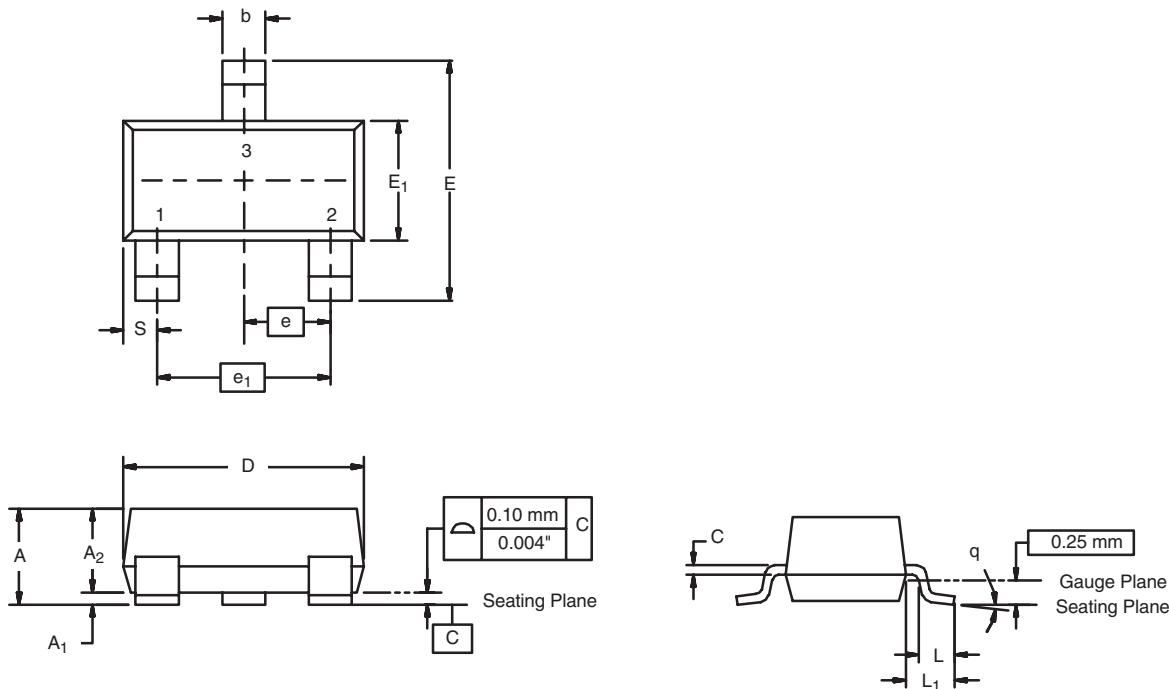
b. Switching time is essentially independent of operating temperature.

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.

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


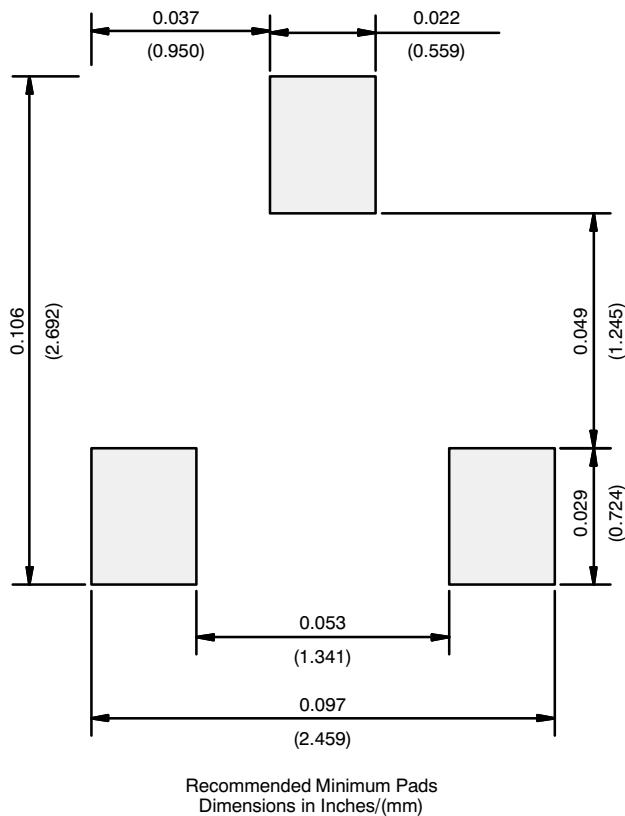
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted


## **SOT-23 (TO-236): 3-LEAD**



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A <sub>1</sub>	0.01	0.10	0.0004	0.004
A <sub>2</sub>	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E <sub>1</sub>	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e <sub>1</sub>	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L <sub>1</sub>	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

## RECOMMENDED MINIMUM PADS FOR SOT-23



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