

## P-Channel 150-V (D-S) MOSFET

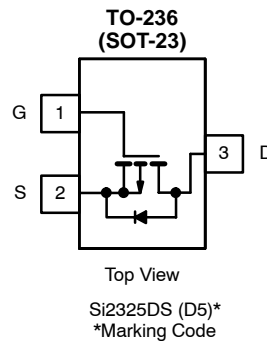
PRODUCT SUMMARY			
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)	$Q_g$ (Typ)
-150	1.2 @ $V_{GS} = -10$ V	-0.69	7.7
	1.3 @ $V_{GS} = -6.0$ V	-0.66	

### FEATURES

- TrenchFET® Power MOSFET
- Ultra Low On-Resistance
- Small Size

### APPLICATIONS

- Active Clamp Circuits in DC/DC Power Supplies



Ordering Information: Si2325DS -T1—E3

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-150		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a, b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-0.69	-0.53	A
		$T_A = 70^\circ\text{C}$	-0.55	-0.43	
Pulsed Drain Current	$I_{DM}$	-1.6			
Continuous Source Current (Diode Conduction) <sup>a, b</sup>	$I_S$	-1.0	-0.6		
Single-Pulse Avalanche Current	$I_{AS}$	4.5		mJ	
Single-Pulse Avalanche Energy		$E_{AS}$	1.01		
Maximum Power Dissipation <sup>a, b</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.25	0.75	W
		$T_A = 70^\circ\text{C}$	0.8	0.48	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	75	100	$^\circ\text{C/W}$
		Steady State	120	166	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	40	50		

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature.

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-150			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-2.5		-4.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -150 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -15 V, V <sub>GS</sub> = 10 V	-1.6			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.5 A		1.0	1.2	Ω
		V <sub>GS</sub> = -6.0 V, I <sub>D</sub> = -0.5 A		1.05	1.3	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -0.5 A		2.2		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.0 A, V <sub>GS</sub> = 0 V		0.7	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -75 V, V <sub>GS</sub> = 10 V I <sub>D</sub> ≅ -0.5 A		7.7	12	nC
Gate-Source Charge	Q <sub>gs</sub>			1.5		
Gate-Drain Charge	Q <sub>gd</sub>			2.5		
Gate Resistance	R <sub>g</sub>	f = 1.0 MHz		9		Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -25 V, V <sub>GS</sub> = 0, f = 1 MHz		340	510	pF
Output Capacitance	C <sub>oss</sub>			30		
Reverse Transfer Capacitance	C <sub>rss</sub>			16		
<b>Switching<sup>c</sup></b>						
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -75 V, R <sub>L</sub> = 75 Ω I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -10 V R <sub>g</sub> = 6 Ω		7	11	ns
	t <sub>r</sub>			11	17	
Turn-Off Time	t <sub>d(off)</sub>			16	25	
	t <sub>f</sub>			11	17	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = 0.5 A, di/dt = 100 A/μs		90	135	nC

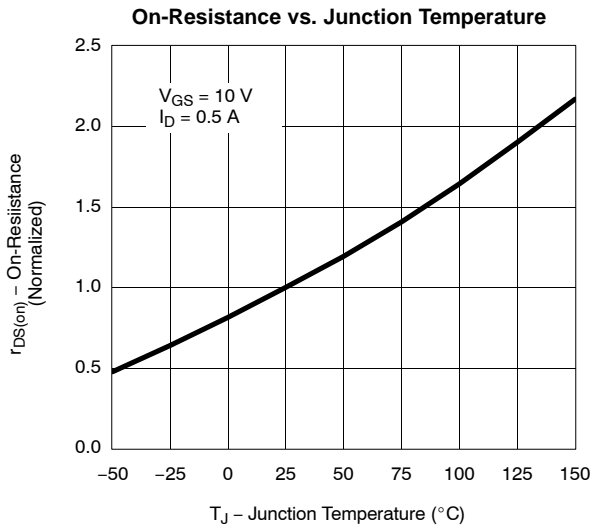
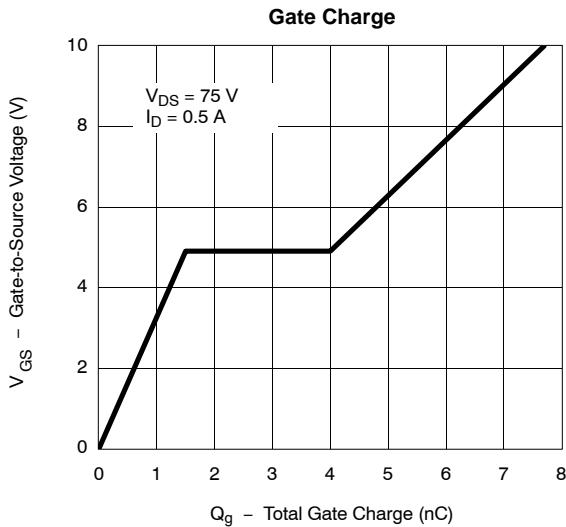
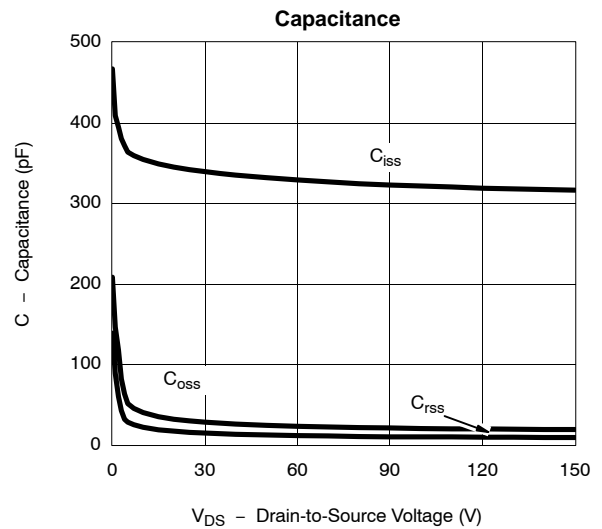
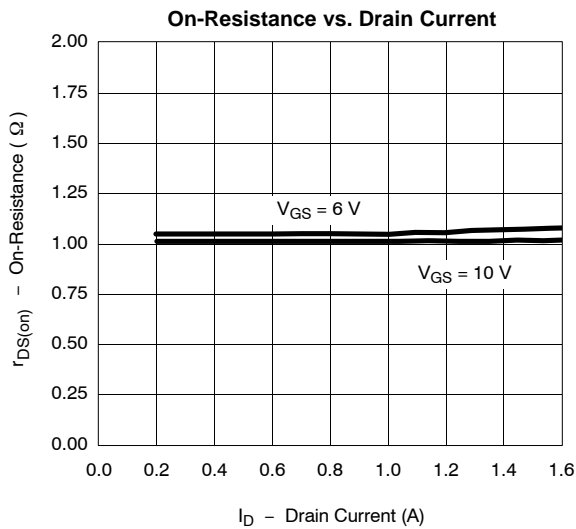
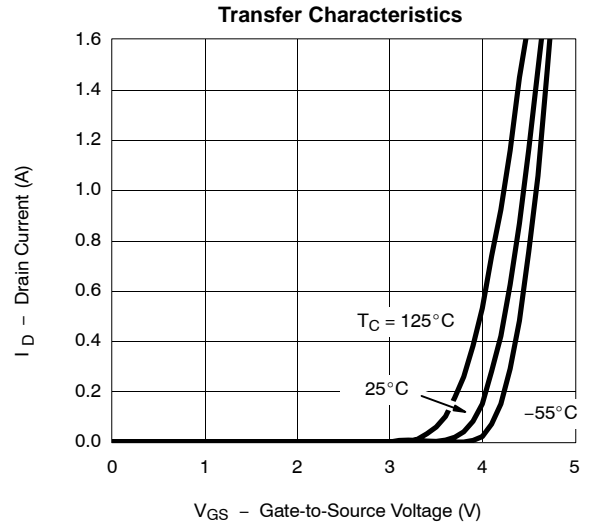
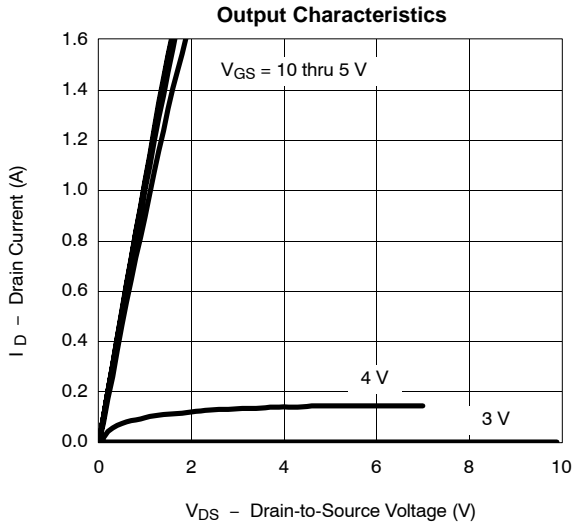
## Notes

- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.  
b. For DESIGN AID ONLY, not subject to production testing.  
c. 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.

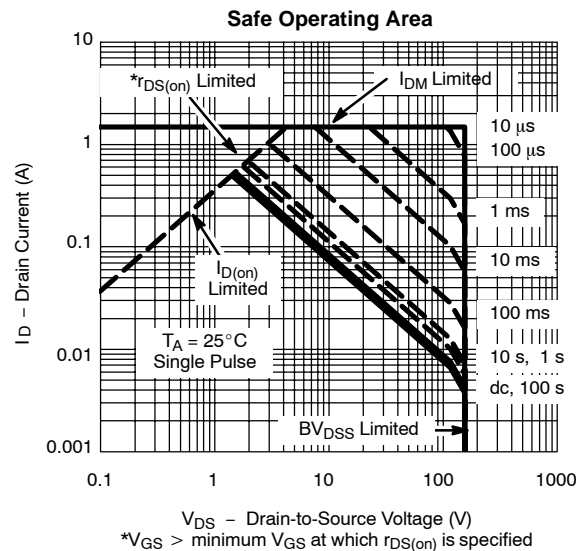
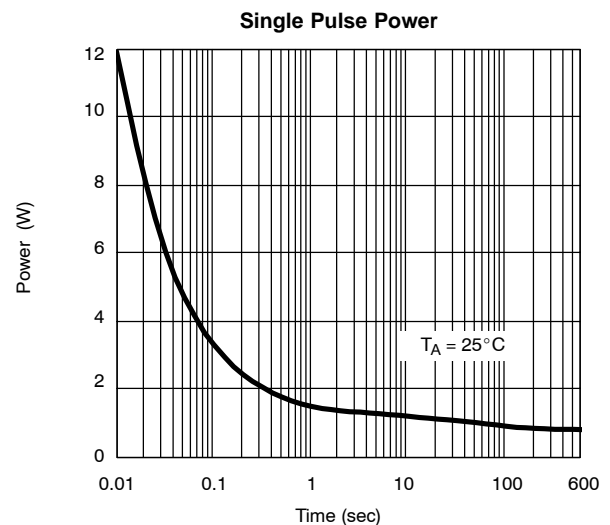
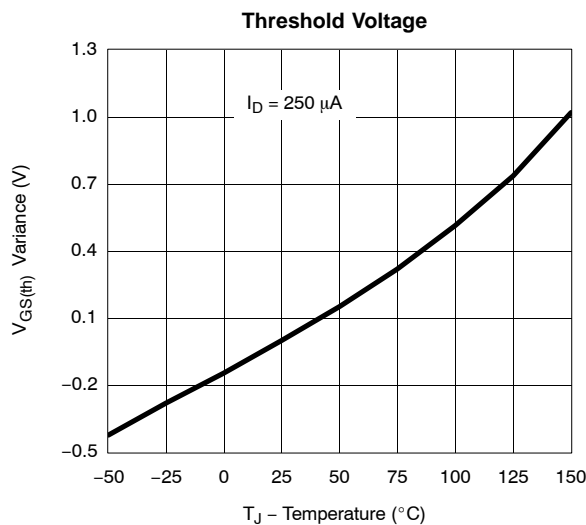
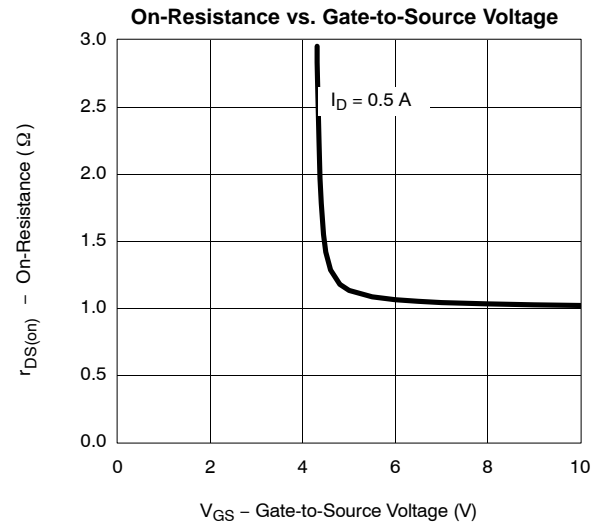
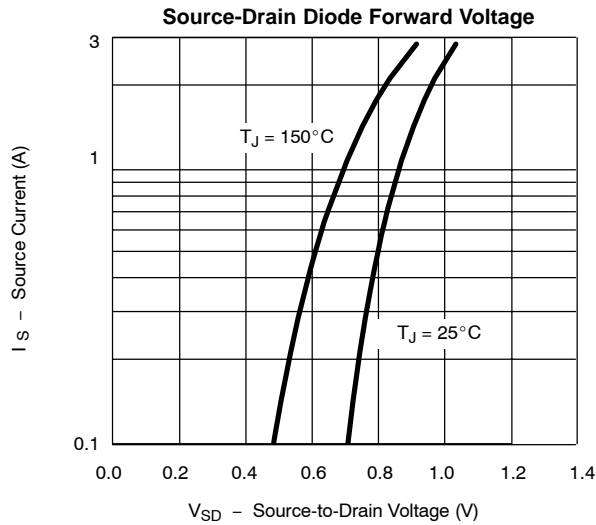


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



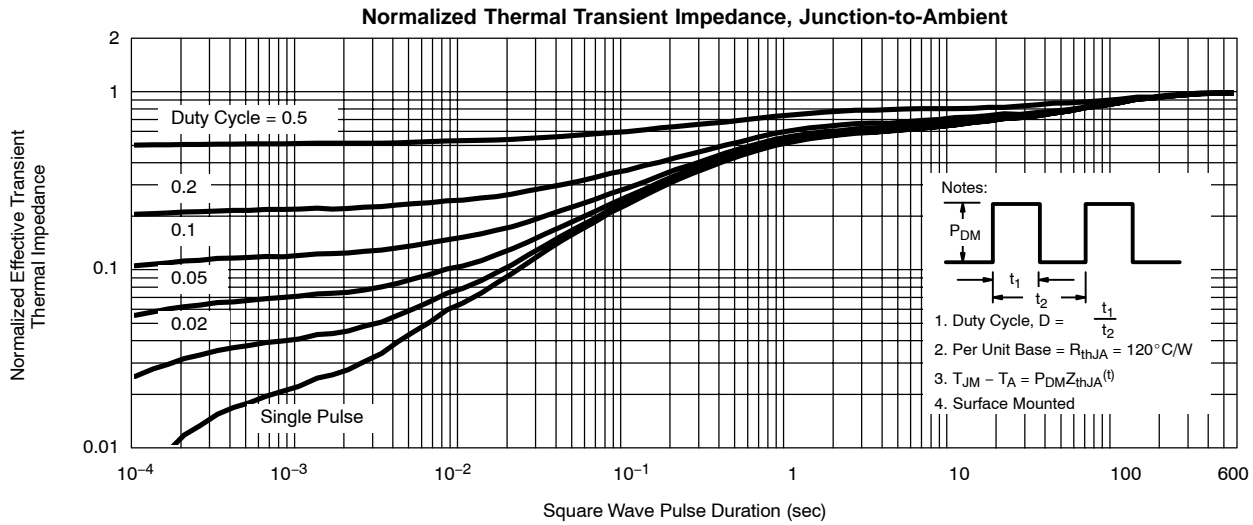


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