



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

## PRODUCT SUMMARY

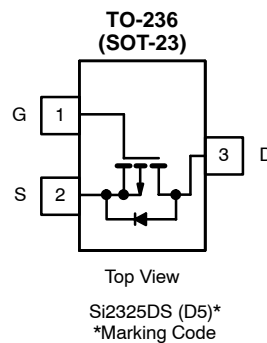
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)	$Q_g$ (Typ)
-150	1.2 @ $V_{GS} = -10$ V	-0.69	7.7
	1.3 @ $V_{GS} = -6.0$ V	-0.66	

## 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 <sub>DS</sub>	−150		V
Gate-Source Voltage		V <sub>GS</sub>	± 20		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a, b</sup>	T <sub>A</sub> = 25°C	I <sub>D</sub>	−0.69	−0.53	A
	T <sub>A</sub> = 70°C		−0.55	−0.43	
Pulsed Drain Current		I <sub>DM</sub>	−1.6		
Continuous Source Current (Diode Conduction) <sup>a, b</sup>		I <sub>S</sub>	−1.0	−0.6	
Single-Pluse Avalanche Current	L = 1.0 mH	I <sub>AS</sub>	4.5		mJ
Single-Pulse Avalanche Energy		E <sub>AS</sub>	1.01		
Maximum Power Dissipation <sup>a, b</sup>	T <sub>A</sub> = 25°C	P <sub>D</sub>	1.25	0.75	W
	T <sub>A</sub> = 70°C		0.8	0.48	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	−55 to 150		°C

## THERMAL RESISTANCE RATINGS

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

## Notes

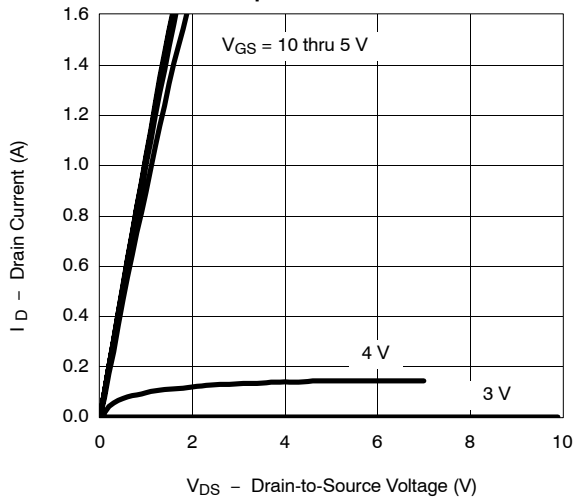
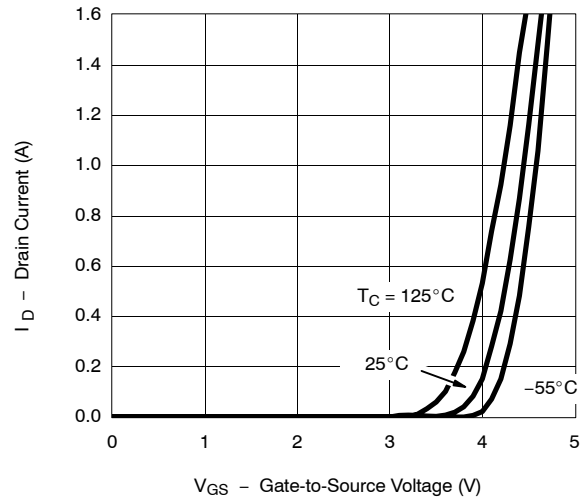
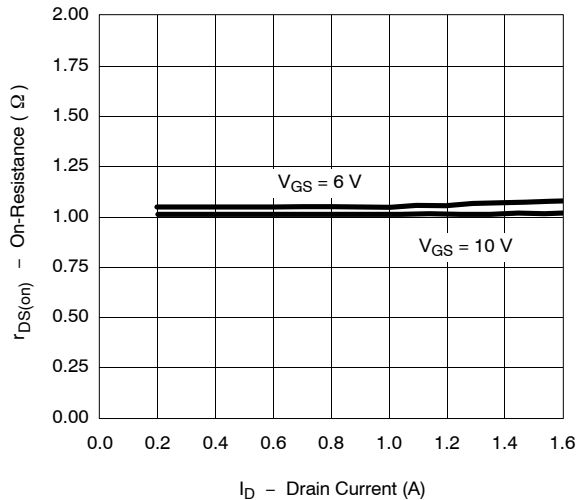
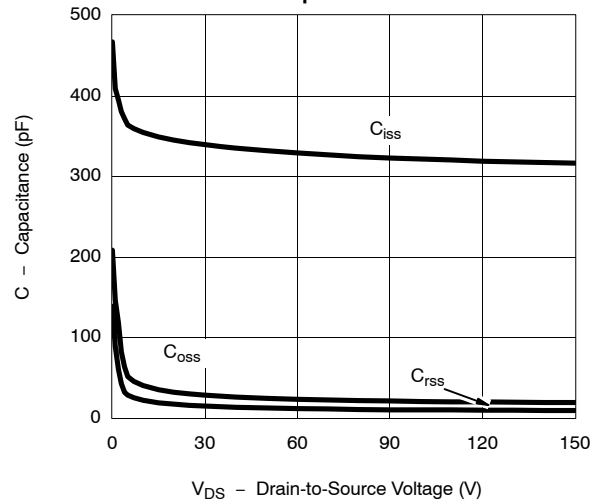
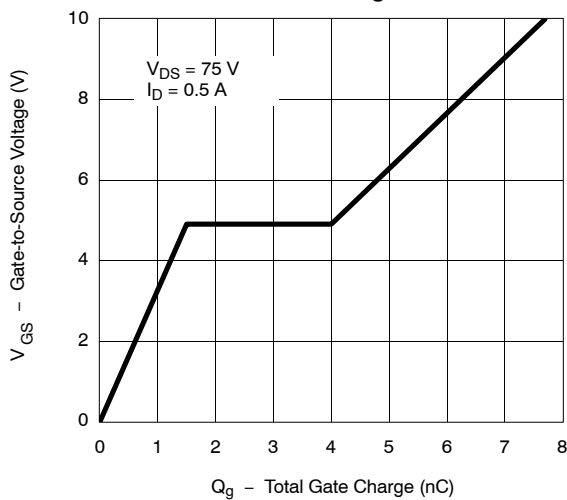
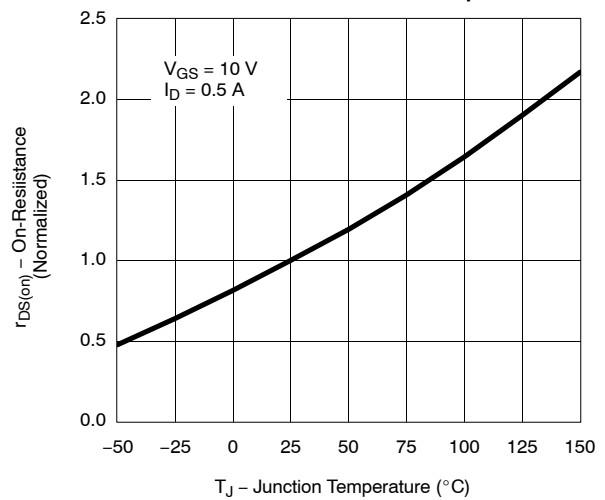
- a. Surface Mounted on 1" x 1" FR4 Board.  
b. Pulse width limited by maximum junction temperature.

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
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
Dynamic <sup>b</sup>						
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		
Switching <sup>c</sup>						
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

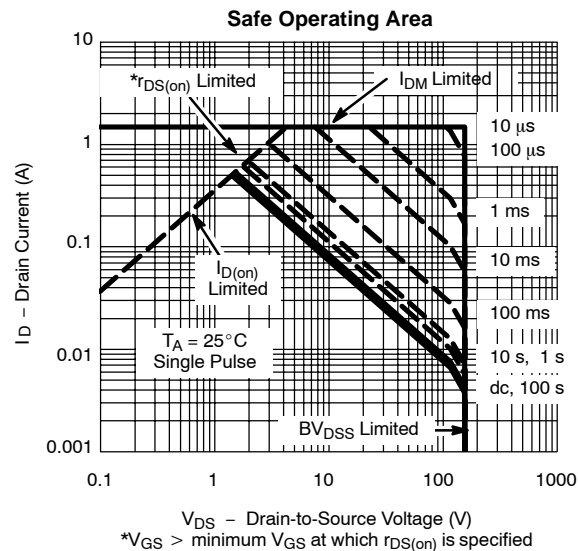
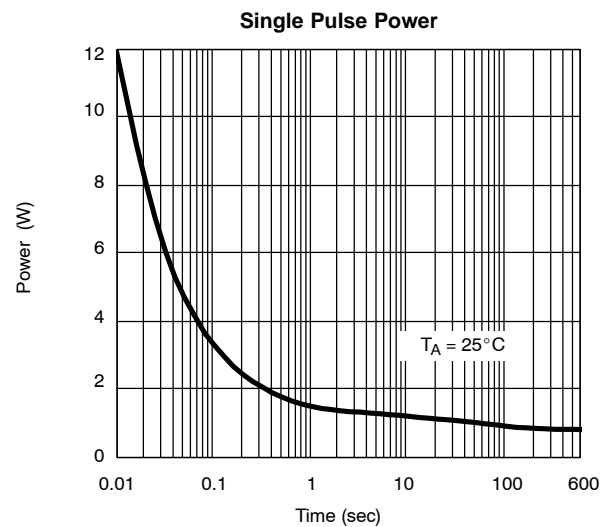
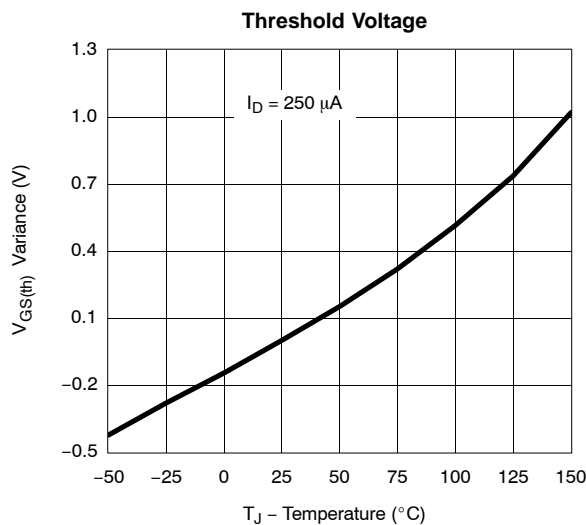
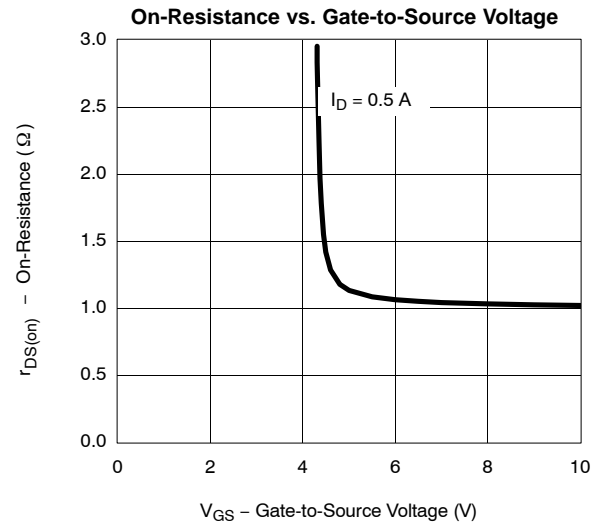
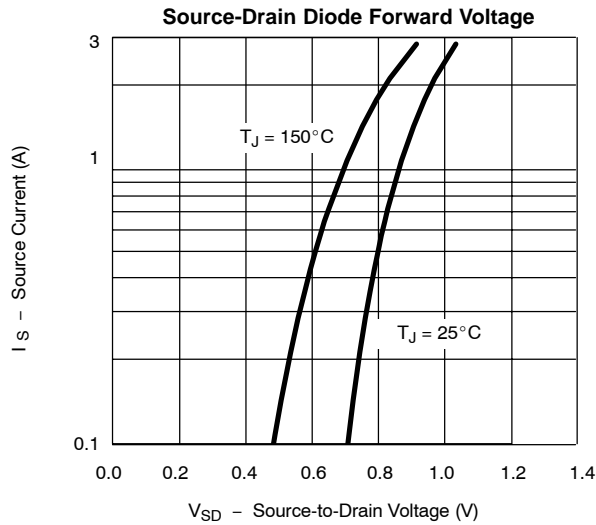
## Notes

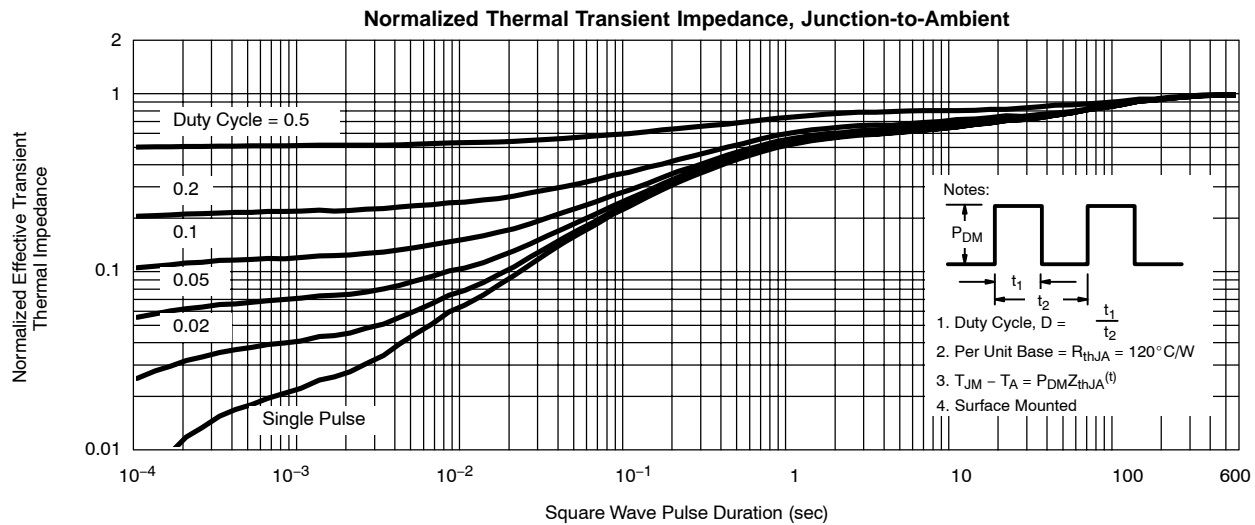
- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.  
b. For DESIGN AID ONLY, not subject to production testing.  
c. Switching time is essentially independent of operating temperature.

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)****Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance****Gate Charge****On-Resistance vs. Junction Temperature**

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <http://www.vishay.com/ppg?73238>.



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