



# SI2325DS

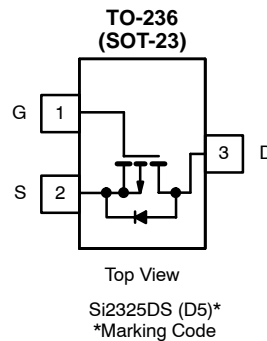
PRODUCT SUMMARY			
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)	$Q_g$ (Typ)
-150	1.2 @ $V_{GS} = -10$ V	-0.69	7.7
	1.3 @ $V_{GS} = -6.0$ V	-0.66	

## 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	$L = 1.0$ mH	$I_{AS}$	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

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



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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.