

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 at V _{GS} = - 10 V	- 0.69	7.7			
	1.3 at V _{GS} = - 6.0 V	- 0.66	7.7			

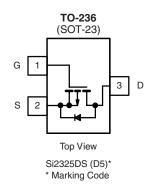
FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET[®] Power MOSFET
- Ultra Low On-Resistance
- Small Size



APPLICATIONS

• Active Clamp Circuits in DC/DC Power Supplies



Ordering Information: Si2325DS -T1-E3 (Lead (Pb)-free)

Si2325DS -T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted					
Parameter	Symbol	5 s	Steady State	Unit	
Drain-Source Voltage		V _{DS}	- 150		٧
Gate-Source Voltage		V _{GS}	± 20		
Continuous Brain Comment /T 450 9008 b	T _A = 25 °C	I _D	- 0.69	- 0.53	
Continuous Drain Current (T _J = 150 °C) ^{a, b}	T _A = 70 °C		- 0.55	- 0.43	
Pulsed Drain Current		I _{DM}	- 1.6		Α
Continuous Source Current (Diode Conduction) ^{a, b}		I _S	- 1.0	- 0.6	
Single Pulse Avalanche Current	L = 1.0 mH	I _{AS}	4	.5	
Single Pulse Avalanche Energy	L = 1.0 MH	E _{AS}	1.01		mJ
Mariana Barra Biratani a h	T _A = 25 °C	P _D	1.25	0.75	W
Maximum Power Dissipation ^{a, b}	T _A = 70 °C	1 'D	0.8	0.48	VV
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 ·	to 150	°C	

THERMAL RESISTANCE RATINGS						
Parameter	Symbol	Typical	Maximum	Unit		
Maniana Indiana ka Anakina la	t ≤ 5 s	D	75	100		
Maximum Junction-to-Ambient ^a	Steady State	R_{thJA}	120	166	°C/W	
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.

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SPECIFICATIONS T _J = 25 °C, unless otherwise noted							
			Limits				
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	$V_{GS} = 0 \text{ V}, I_{D} = -250 \mu\text{A}$	- 150			V	
Gate-Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = -250 \mu A$	- 2.5		- 4.5	v	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
Zero Gate Voltage Drain Current	laco	$V_{DS} = -150 \text{ V}, V_{GS} = 0 \text{ V}$			- 1	4	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 150 V, V _{GS} = 0 V, T _J = 55 °C			- 10	μΑ	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le$ - 15 V, $V_{GS} = 10 \text{ V}$	- 1.6			Α	
Durin Course On Beninters of	B	V _{GS} = - 10 V, I _D = - 0.5 A		1.0	1.2		
Drain-Source On-Resistance ^a	R _{DS(on)}	$V_{GS} = -6.0 \text{ V}, I_D = -0.5 \text{ A}$		1.05	1.3	Ω	
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 0.5 A		2.2		S	
Diode Forward Voltage	V_{SD}	I _S = - 1.0 A, V _{GS} = 0 V		0.7	- 1.2	V	
Dynamic ^b							
Total Gate Charge	Q_g	$V_{DS} = -75 \text{ V}, V_{GS} = 10 \text{ V},$		7.7	12		
Gate-Source Charge	Q_{gs}	$V_{DS} = -75 \text{ V}, V_{GS} = 10 \text{ V},$ $I_{D} \cong -0.5 \text{ A}$		1.5		nC	
Gate-Drain Charge	Q_{gd}	.D = 0.0 / t		2.5			
Gate Resistance	R_{g}	f = 1.0 MHz		9		Ω	
Input Capacitance	C _{iss}			340	510		
Output Capacitance	C _{oss}	$V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		30		pF	
Reverse Transfer Capacitance	C _{rss}			16			
Switching ^c							
Turn-On Time	t _{d(on)}	V 75 V D 75 O		7	11	ns	
Turn-On Time	t _r	V_{DD} = - 75 V, R_L = 75 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 10 V		11	17		
Turn-Off Time	t _{d(off)}	$R_{g} = 6 \Omega$		16	25	Tis	
Turr-Oil Tillie	t _f	y -		11	17		
Body Diode Reverse Recovery Charge	Q _{rr}	$I_F = 0.5 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}$		90	135	nC	

Notes:

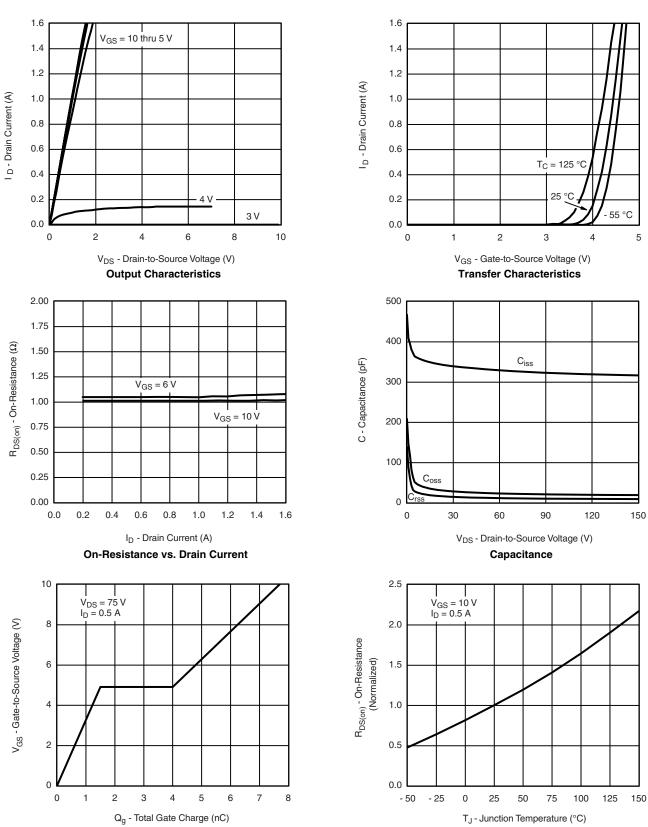
- a. Pulse test: PW \leq 300 μs duty cycle \leq 2 %.
- b. For DESIGN AID ONLY, not subject to production testing.
- c. Switching time is essentially independent of operating temperature.

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 otherwise noted



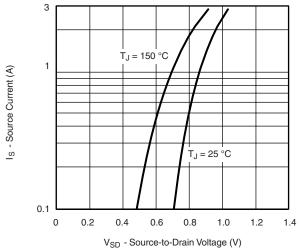
Gate Charge

On-Resistance vs. Junction Temperature

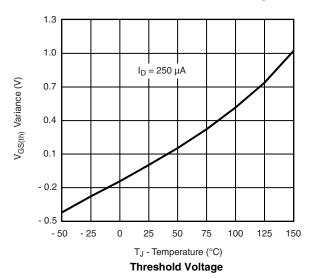
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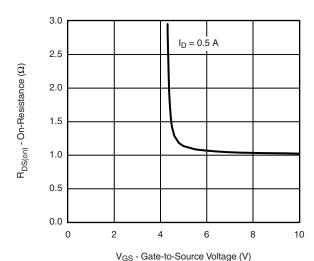
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TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

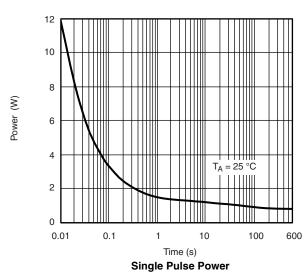


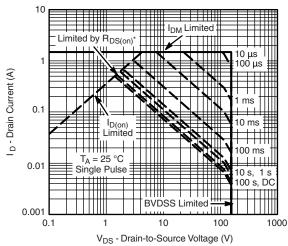
Source-Drain Diode Forward Voltage





On-Resistance vs. Gate-to-Source Voltage



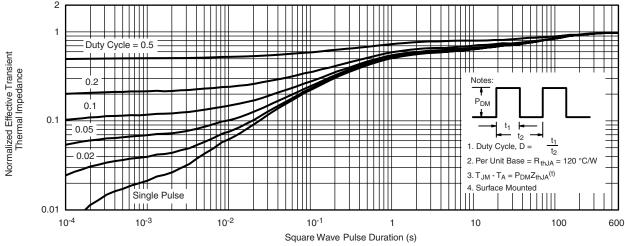


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



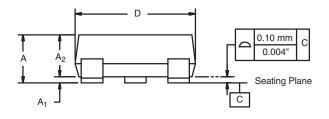
Normalized Thermal Transient Impedance, Junction-to-Ambient

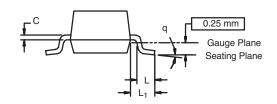
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SOT-23 (TO-236): 3-LEAD







Dim -	MILLIN	IETERS	INCHES		
	Min	Max	Min	Max	
Α	0.89	1.12	0.035	0.044	
A ₁	0.01	0.10	0.0004	0.004	
A ₂	0.88	1.02	0.0346	0.040	
b	0.35	0.50	0.014	0.020	
С	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 ₁	1.20	1.40	0.047	0.055	
е	0.95 BSC		0.0374 Ref		
e ₁	1.90 BSC		0.0748 Ref		
L	0.40	0.60	0.016	0.024	
L ₁	0.64 Ref		0.025	25 Ref	
S	0.50 Ref		0.020) Ref	
q	3°	8°	3°	8°	
ECN: S-03946-Rev. K. 09-	Jul-01				

DWG: 5479

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RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads Dimensions in Inches/(mm)

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APPLICATION NOTE

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