

P-Channel 1.8-V (G-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 8	0.045 at V _{GS} = - 4.5 V	- 3.5
	0.072 at V _{GS} = - 2.5 V	- 2.8
	0.120 at V _{GS} = - 1.8 V	- 2.0

FEATURES

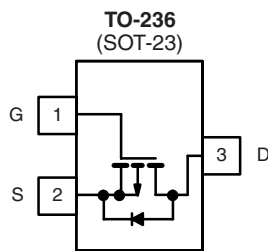
- Halogen-free Option Available
- TrenchFET[®] Power MOSFET

APPLICATIONS

- Load Switch



RoHS
COMPLIANT



Top View
Si2311DS (C1)*
* Marking Code

Ordering Information: Si2311DS-T1-E3 (Lead (Pb)-free)
Si2311DS-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}	- 8		V
Gate-Source Voltage	V _{GS}	± 8		
Continuous Drain Current (T _J = 150 °C) ^{a, b}	I _D	T _A = 25 °C	- 3.5	- 3.0
		T _A = 70 °C	- 2.8	- 2.4
Pulsed Drain Current	I _{DM}	- 10		A
Continuous Source Current (Diode Conduction) ^{a, b}	I _S	- 0.8	- 0.6	
Maximum Power Dissipation ^{a, b}	P _D	T _A = 25 °C	0.96	0.71
		T _A = 70 °C	0.62	0.46
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	t ≤ 5 s	R _{thJA}	100	130	°C/W
	Steady State		140	175	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	60	75	

Notes:

- a. Surface Mounted on FR4 board.
b. Pulse width limited by maximum junction temperature.

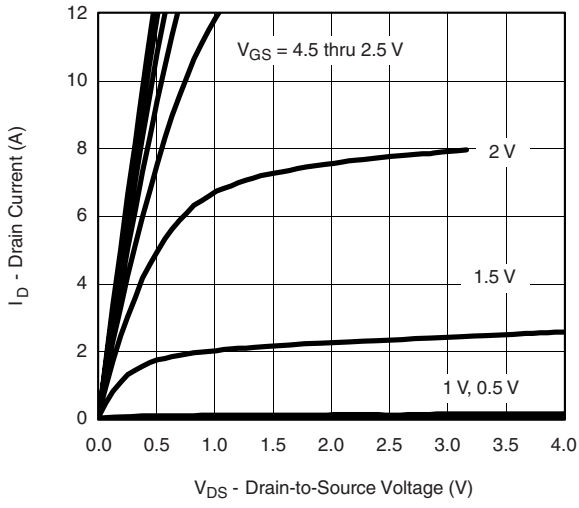
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$	- 8			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 0.45		- 0.8	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			- 10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	- 6			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -2.5\text{ V}$	- 3			
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -3.5\text{ A}$		0.036	0.045	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -3\text{ A}$		0.058	0.072	
		$V_{GS} = -1.8\text{ V}, I_D = -0.7\text{ A}$		0.096	0.120	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -3.5\text{ A}$		9.0		S
Diode Forward Voltage	V_{SD}	$I_S = -0.8\text{ A}, V_{GS} = 0\text{ V}$			- 1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -4\text{ V}, V_{GS} = -4.5\text{ V}$ $I_D \cong -3.5\text{ A}$		8.5	12	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			2.1		
Input Capacitance	C_{iss}	$V_{DS} = -4\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		970		pF
Output Capacitance	C_{oss}			485		
Reverse Transfer Capacitance	C_{rss}			160		
Switching^b						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -4\text{ V}, R_L = 4\text{ }\Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_G = 6\text{ }\Omega$		18	25	ns
	t_r			45	65	
Turn-Off Time	$t_{d(off)}$			40	60	
	t_f			45	65	

Notes:

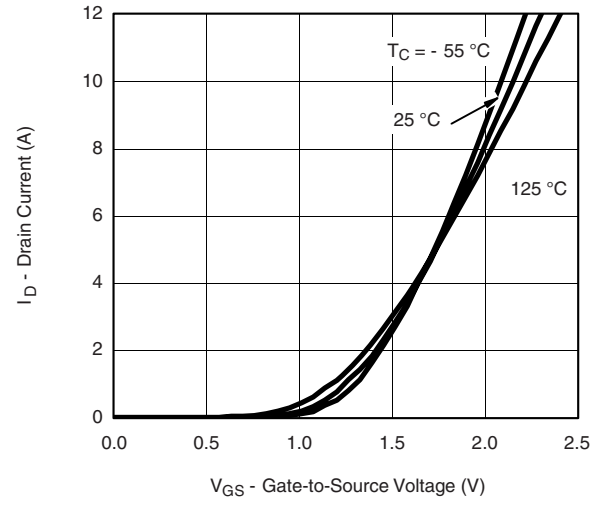
- a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
c. Switching time is essentially independent of operating temperature.

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.

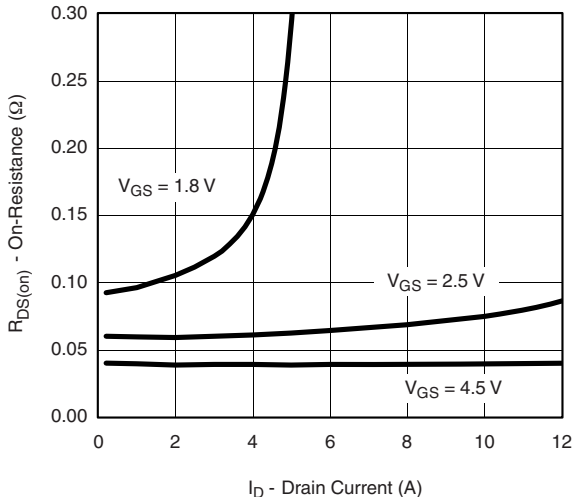
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



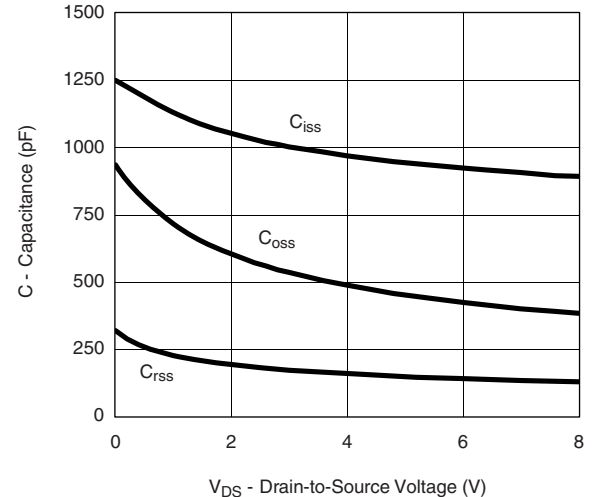
Output Characteristics



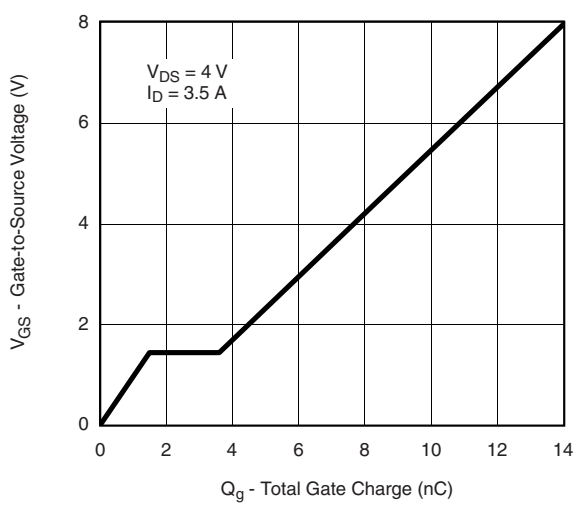
Transfer Characteristics



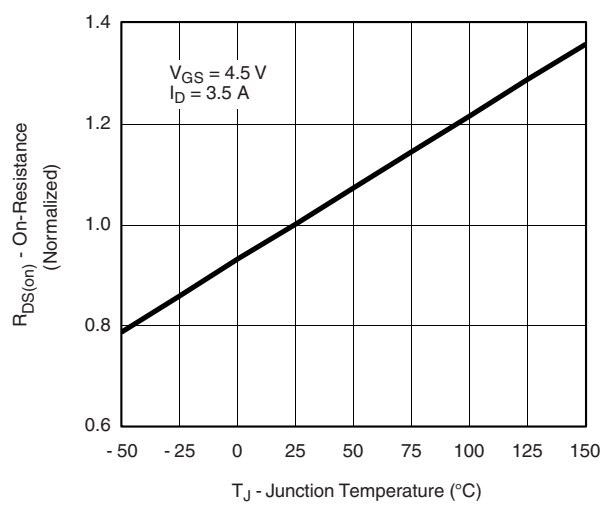
On-Resistance vs. Drain Current



Capacitance

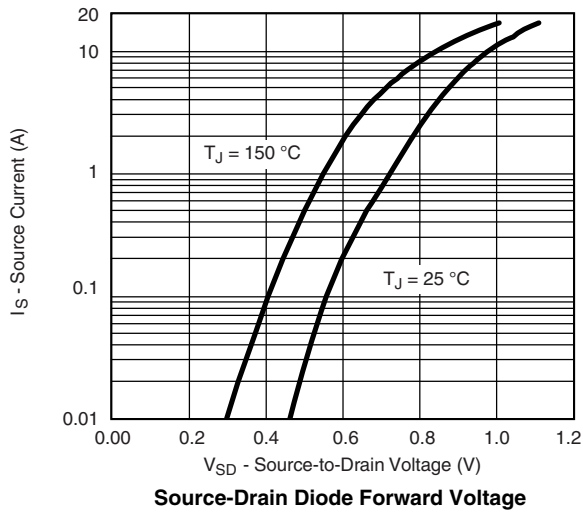


Gate Charge

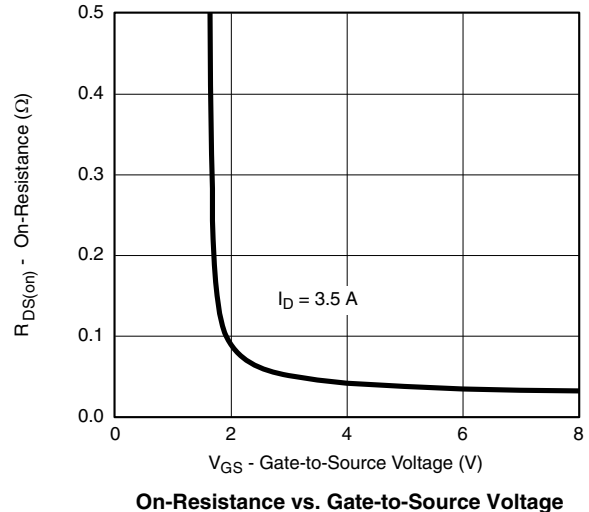


On-Resistance vs. Junction Temperature

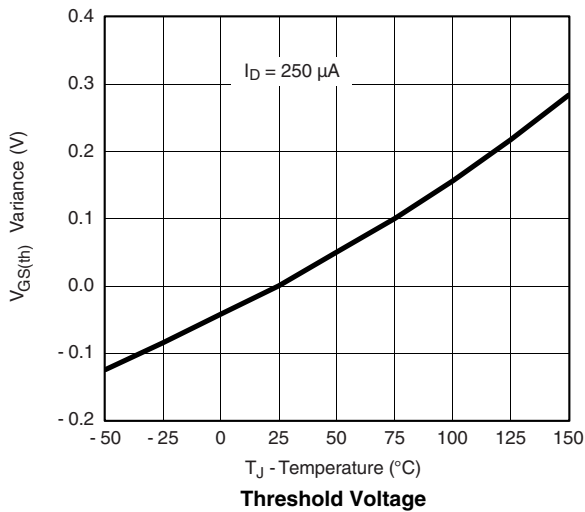
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



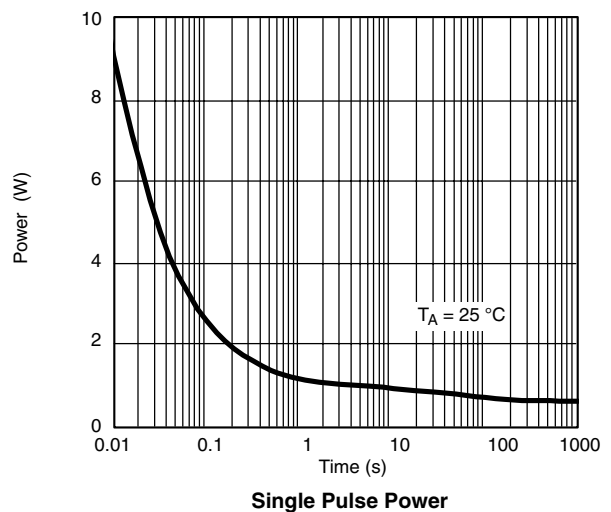
Source-Drain Diode Forward Voltage



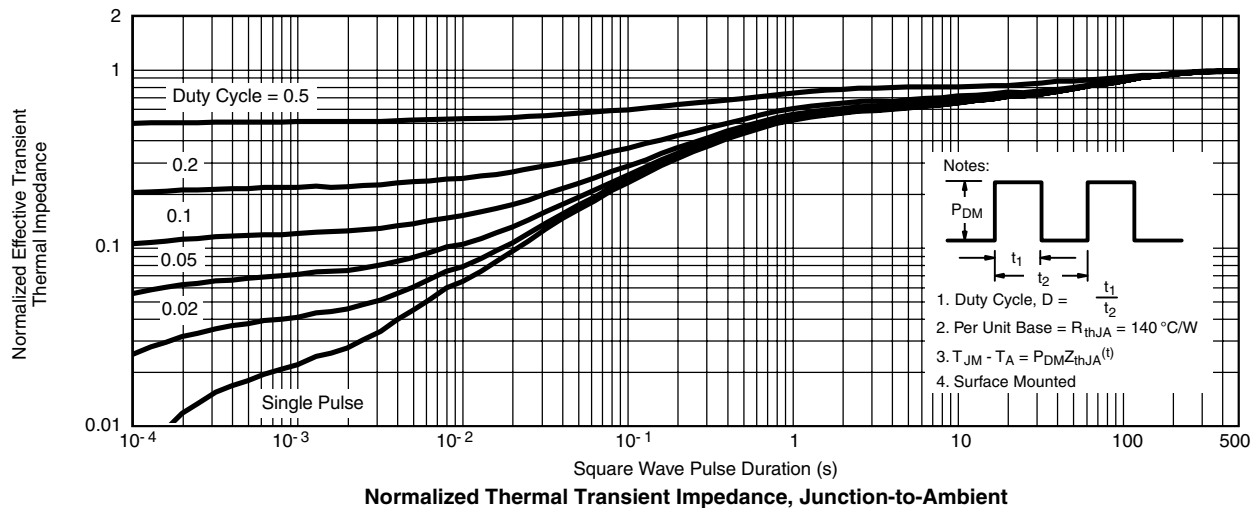
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

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