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[Vishay/Siliconix](#)  
[SI2311DS-T1-E3](#)

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**Si2311DS**  
Vishay Siliconix

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

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (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

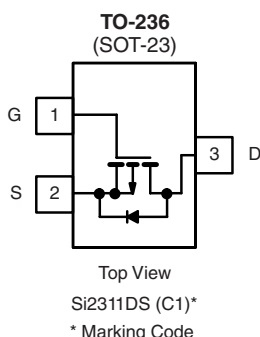
- Halogen-free Option Available
- TrenchFET® Power MOSFET

### APPLICATIONS

- Load Switch



**RoHS**  
COMPLIANT



Ordering Information: Si2311DS-T1-E3 (Lead (Pb)-free)  
Si2311DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

### ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ , unless otherwise noted

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Parameter		Symbol	5 s	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	- 8		V
Gate-Source Voltage		$V_{GS}$	$\pm 8$		
Continuous Drain Current ( $T_J = 150\text{ }^{\circ}\text{C}$ ) <sup>a, b</sup>	$T_A = 25\text{ }^{\circ}\text{C}$	$I_D$	- 3.5	- 3.0	A
	$T_A = 70\text{ }^{\circ}\text{C}$		- 2.8	- 2.4	
Pulsed Drain Current		$I_{DM}$	- 10		
Continuous Source Current (Diode Conduction) <sup>a, b</sup>		$I_S$	- 0.8	- 0.6	
Maximum Power Dissipation <sup>a, b</sup>	$T_A = 25\text{ }^{\circ}\text{C}$	$P_D$	0.96	0.71	W
	$T_A = 70\text{ }^{\circ}\text{C}$		0.62	0.46	
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>	$R_{thJA}$	100	130	$^\circ\text{C/W}$
		140	175	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	60	75	

Notes:

a. Surface Mounted on FR4 board.

b. Pulse width limited by maximum junction temperature.

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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	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}$			- 1	$\mu\text{A}$
		$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^{\circ}\text{C}$			- 10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	- 6			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -2.5\text{ V}$	- 3			
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -3.5\text{ A}$		0.036	0.045	$\Omega$
		$V_{GS} = -2.5\text{ V}, I_D = -3\text{ A}$		0.058	0.072	
		$V_{GS} = -1.8\text{ V}, I_D = -0.7\text{ A}$		0.096	0.120	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5\text{ V}, I_D = -3.5\text{ A}$		9.0		S
Diode Forward Voltage	$V_{SD}$	$I_S = -0.8\text{ A}, V_{GS} = 0\text{ V}$			- 1.2	V
Dynamic <sup>b</sup>						
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 <sup>b</sup>						
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.

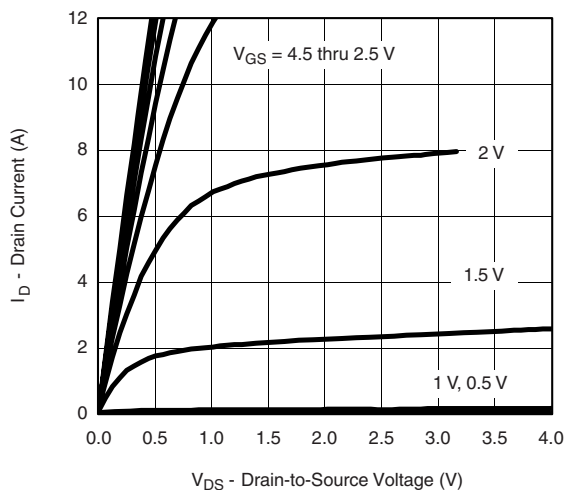
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



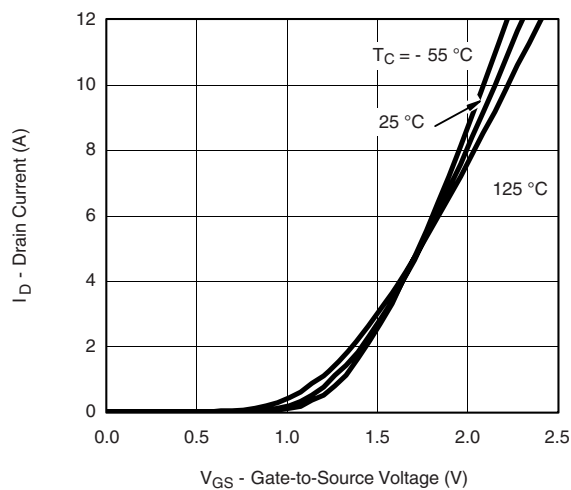
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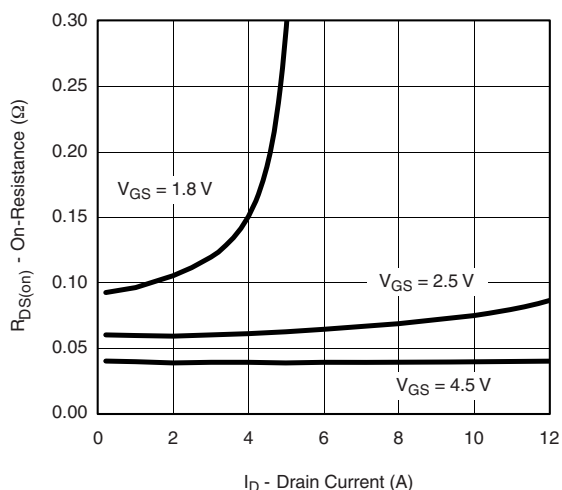
## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



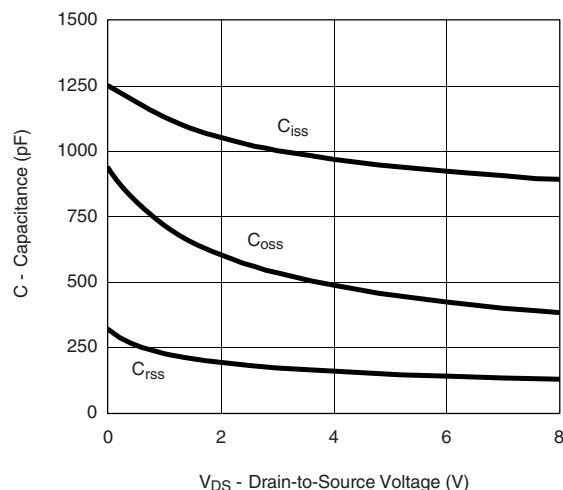
**Output Characteristics**



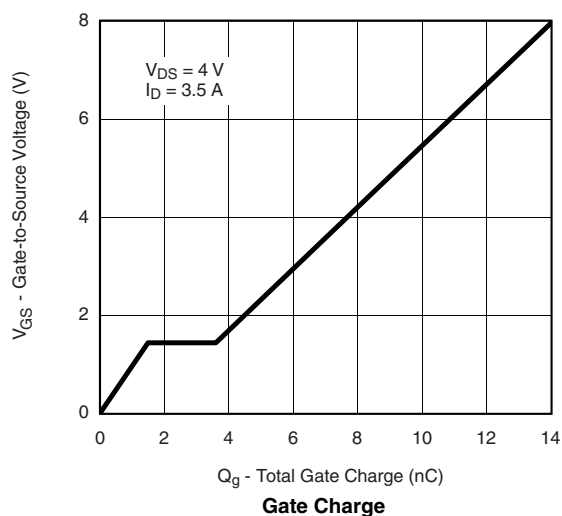
**Transfer Characteristics**



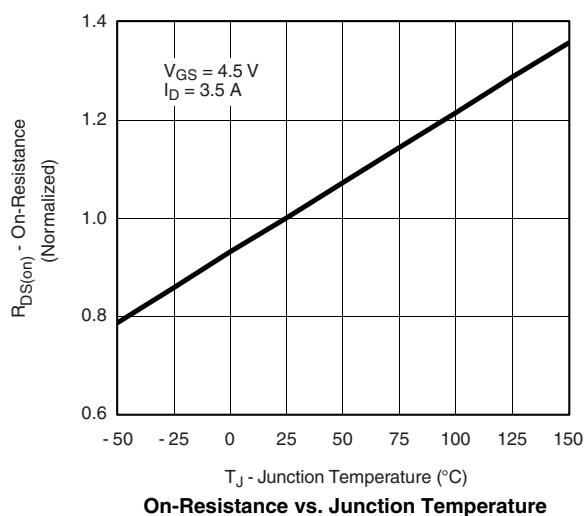
**On-Resistance vs. Drain Current**



**Capacitance**



**Gate Charge**



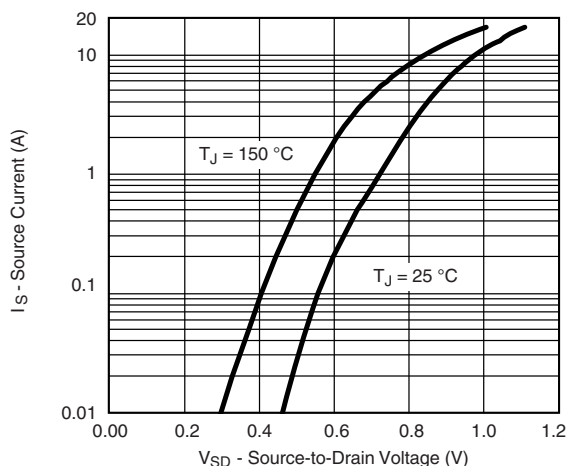
**On-Resistance vs. Junction Temperature**

# Si2311DS

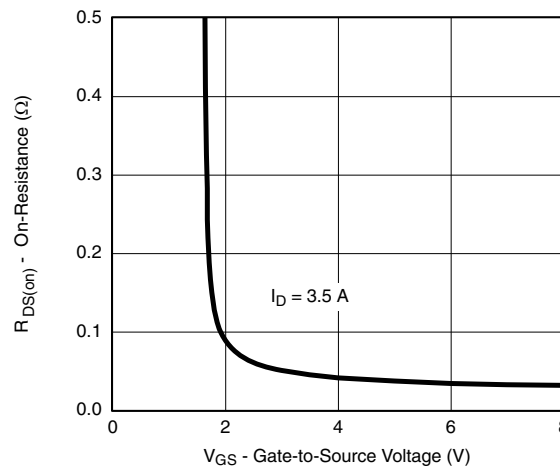
Vishay Siliconix



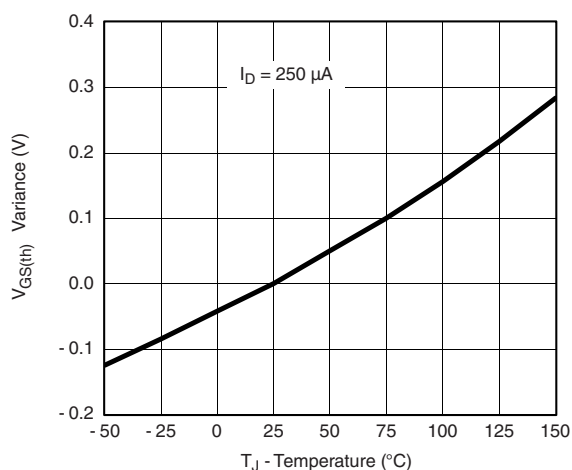
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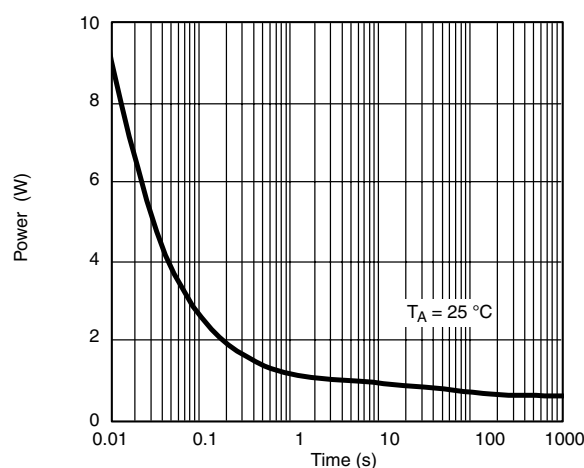
Source-Drain Diode Forward Voltage



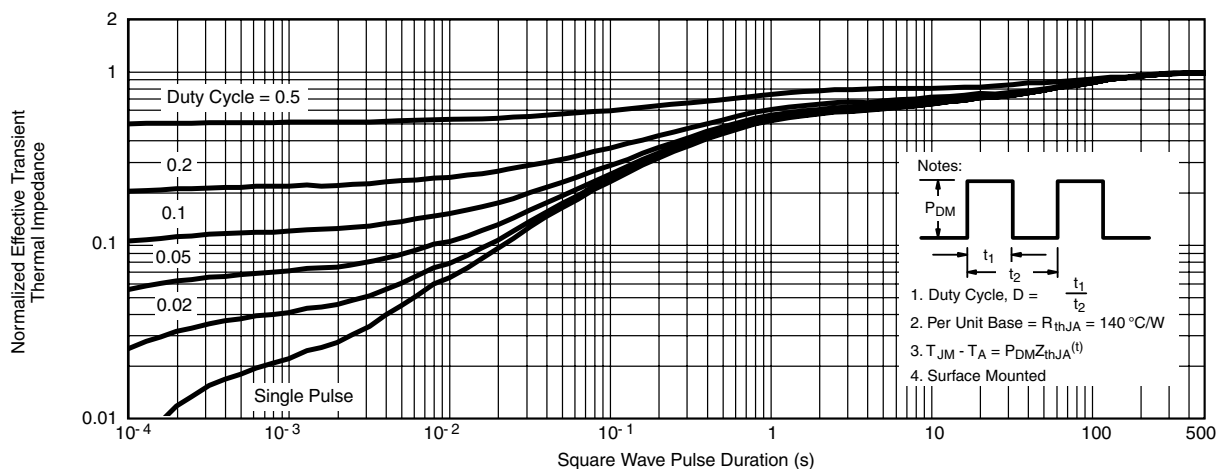
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

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/ppg71813>.



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