

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

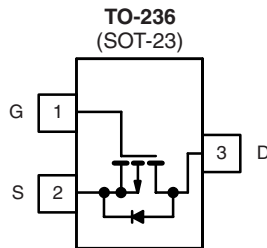
PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 12	0.050 at V _{GS} = - 4.5 V	- 3.85
	0.065 at V _{GS} = - 2.5 V	- 3.4
	0.100 at V _{GS} = - 1.8V	- 2.7

FEATURES

- Halogen-free Option Available
- TrenchFET® Power MOSFETs: 1.8 V Rated



Available
RoHS*
COMPLIANT



Top View

Si2315BDS *(M5)

* Marking Code

Ordering Information: Si2315BDS-T1
Si2315BDS-T1-E3 (Lead (Pb)-free)
Si2315BDS-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}	- 12		V
Gate-Source Voltage	V _{GS}	± 8		
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	- 3.85	- 3.0
		T _A = 70 °C	- 3.0	- 2.45
Pulsed Drain Current ^a	I _{DM}	- 12		A
Continuous Source Current (Diode Conduction) ^a	I _S	- 1.0	- 0.62	
Power Dissipation ^a	P _D	T _A = 25 °C	1.19	0.75
		T _A = 70 °C	0.76	0.48
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient ^a	t ≤ 5 s	R _{thJA}	85	105	°C/W
	Steady State		130	166	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	60	75	

Notes:

a. Surface Mounted on FR4 board.

b. t ≤ 5 s.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>.

* Pb containing terminations are not RoHS compliant, exemptions may apply.

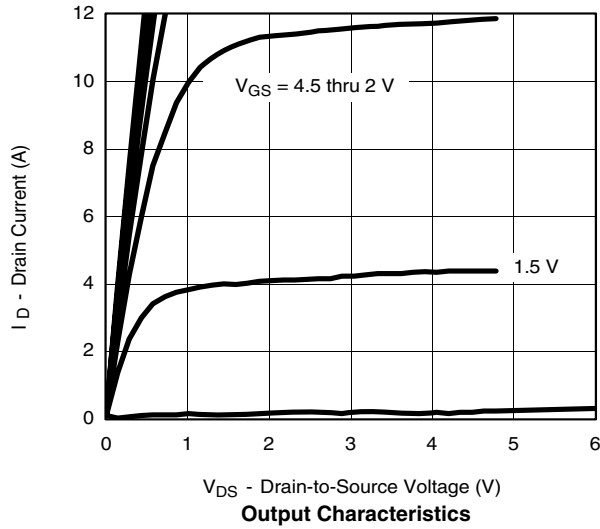
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = -10\text{ }\mu\text{A}$	-12			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	-0.45		-0.90	
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}	$V_{DS} = -12\text{ V}$, $V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -12\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^\circ\text{C}$			-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	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}$, $I_D = -3.85\text{ A}$		0.040	0.050	Ω
		$V_{GS} = -2.5\text{ V}$, $I_D = -3.4\text{ A}$		0.050	0.065	
		$V_{GS} = -1.8\text{ V}$, $I_D = -2.7\text{ A}$		0.071	0.100	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}$, $I_D = -3.85\text{ A}$		7		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.6\text{ A}$, $V_{GS} = 0\text{ V}$			-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6\text{ V}$, $V_{GS} = -4.5\text{ V}$ $I_D \cong -3.85\text{ A}$		8	15	nC
Gate-Source Charge	Q_{gs}			1.1		
Gate-Drain Charge	Q_{gd}			2.3		
Input Capacitance	C_{iss}	$V_{DS} = -6\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		715		pF
Output Capacitance	C_{oss}			275		
Reverse Transfer Capacitance	C_{rss}			200		
Switching^b						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}$, $R_L = 6\text{ }\Omega$ $I_D \cong -1.0\text{ A}$, $V_{GEN} = -4.5\text{ V}$ $R_G = 6\text{ }\Omega$		15	20	ns
	t_r			35	50	
Turn-Off Time	$t_{d(off)}$			50	70	
	t_f			50	75	

Notes:

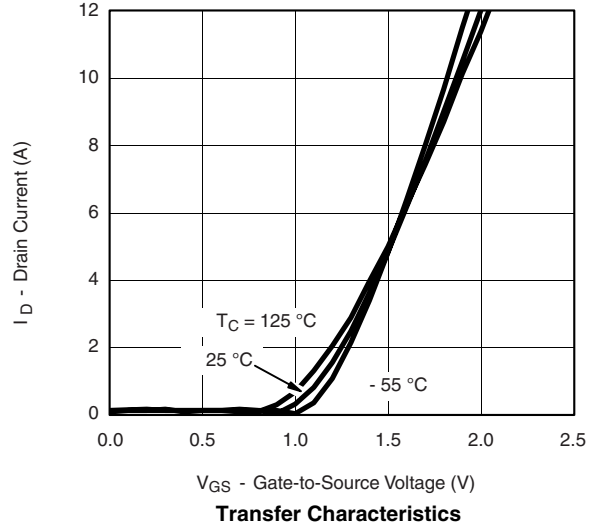
- a. For DESIGN AID ONLY, not subject to production testing.
 b. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
 c. Switching time is essentially independent of operating temperature.

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.

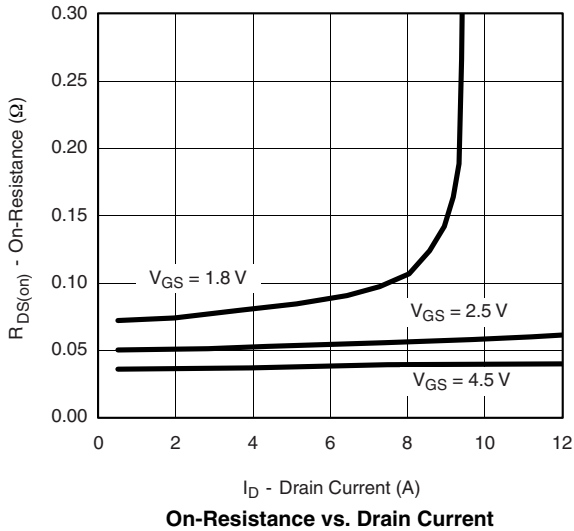
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



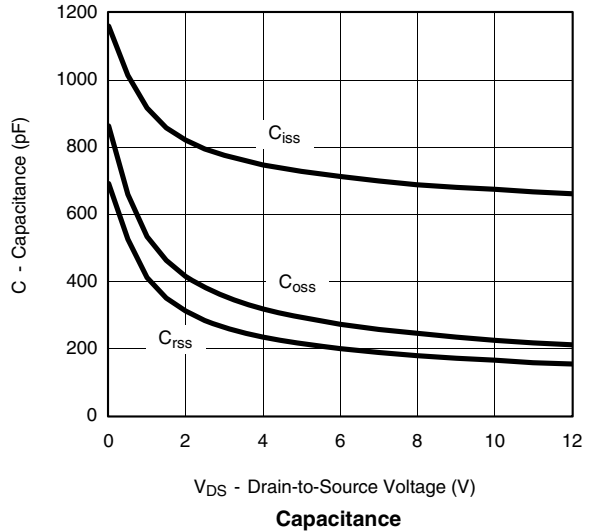
Output Characteristics



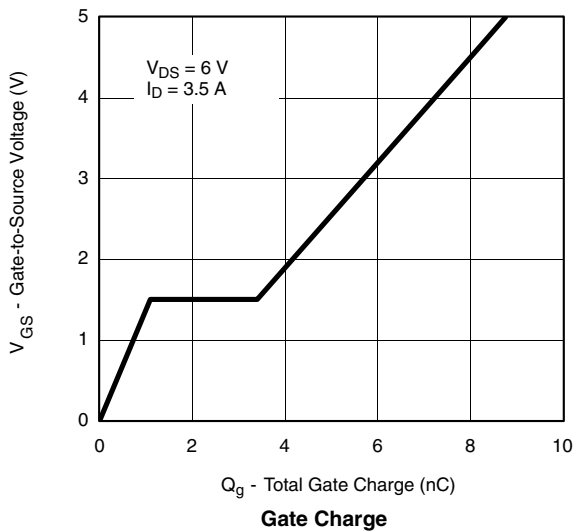
Transfer Characteristics



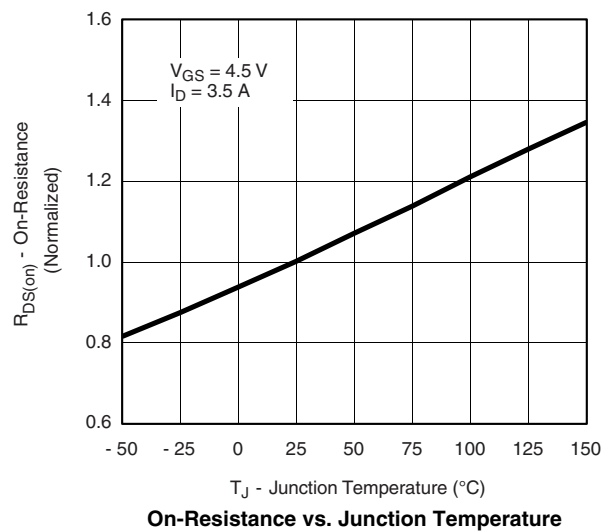
On-Resistance vs. Drain Current



Capacitance

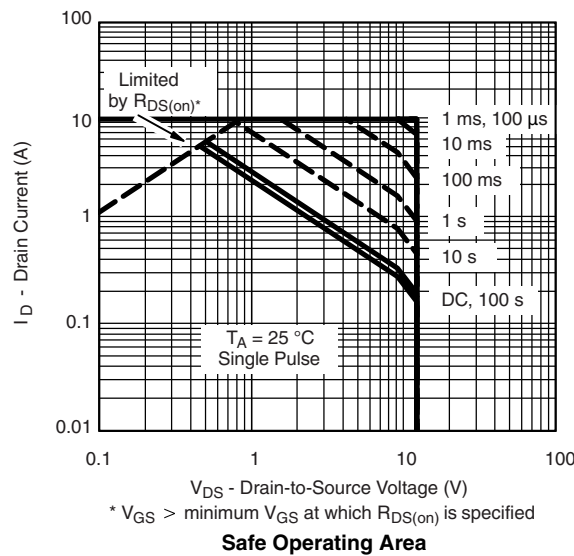
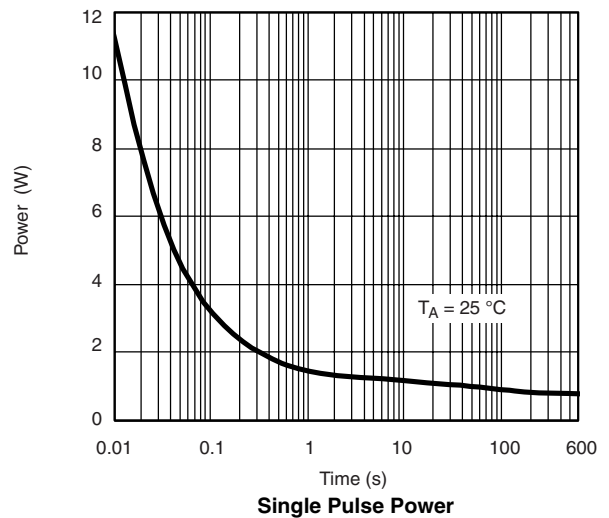
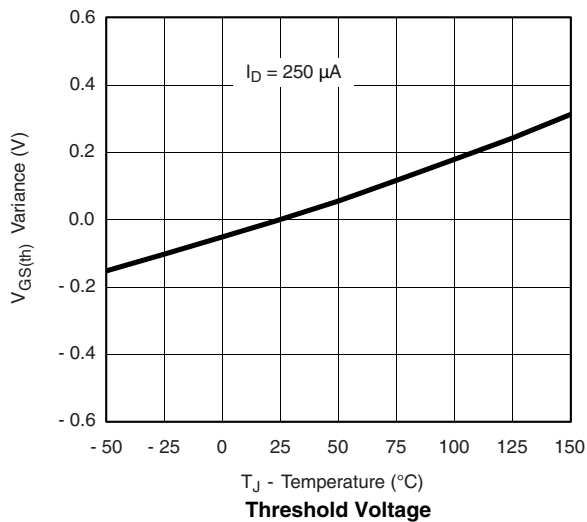
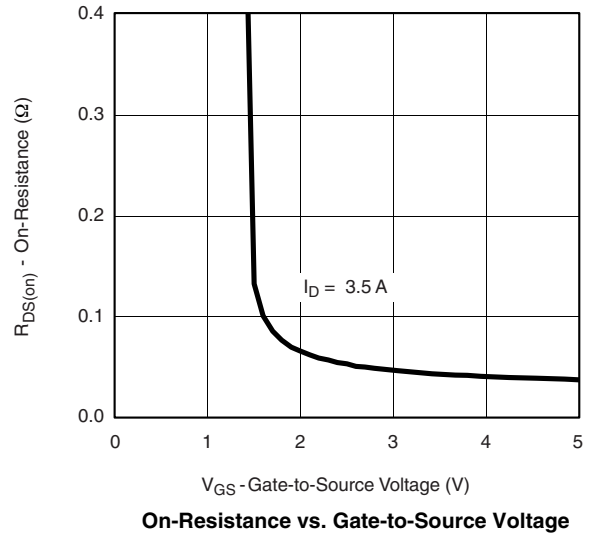
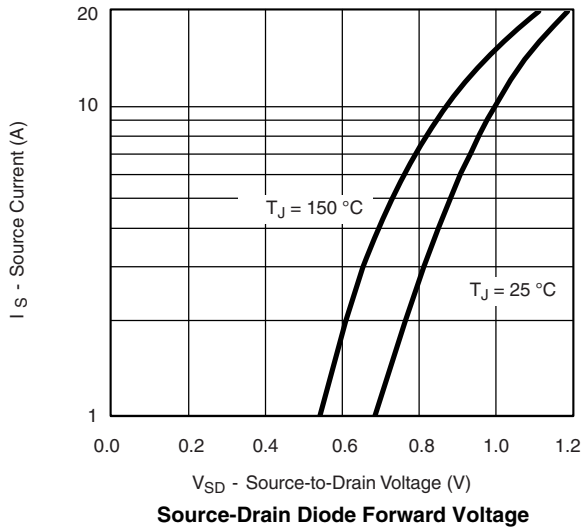


Gate Charge

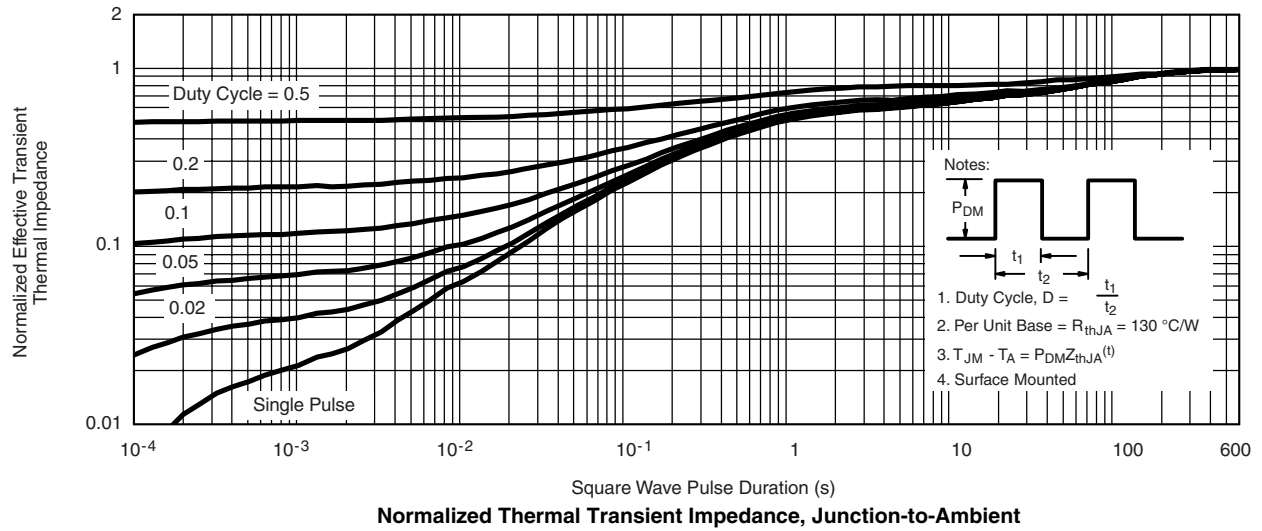


On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise 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?72014>.



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.