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

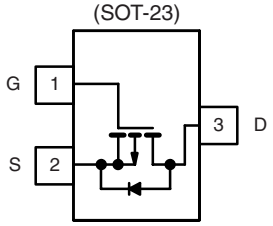
FEATURES

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

Pb-free Available

RoHS* COMPLIANT

TO-236
(SOT-23)



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]	T_A = 25 °C	I_D	- 3.85	- 3.0	A
	T_A = 70 °C		- 3.0	- 2.45	
Pulsed Drain Current[a]		I_{DM}	- 12		
Continuous Source Current (Diode Conduction)[a]		I_S	- 1.0	- 0.62	
Power Dissipation[a]	T_A = 25 °C	P_D	1.19	0.75	W
	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.

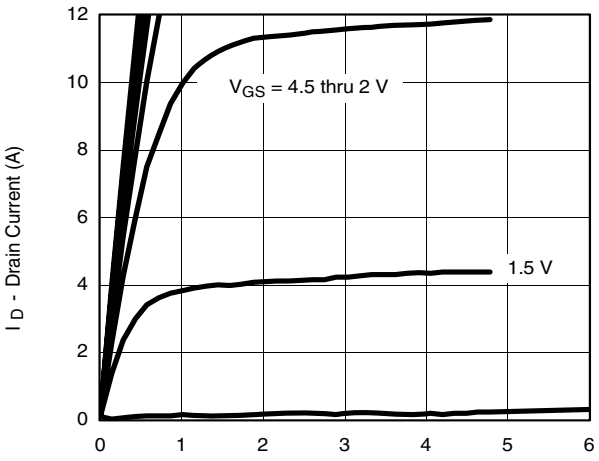
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = - 10 µA	- 12			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.45		- 0.90	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 12 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 12 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 4.5 V	- 6			A
		$V_{DS} \leq$ - 5 V, V_{GS} = - 2.5 V	- 3			
Drain-Source On Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 3.85 A		0.040	0.050	Ω
		V_{GS} = - 2.5 V, I_D = - 3.4 A		0.050	0.065	
		V_{GS} = - 1.8 V, I_D = - 2.7 A		0.071	0.100	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 3.85 A		7		S
Diode Forward Voltage[a]	V_{SD}	I_S = - 1.6 A, V_{GS} = 0 V			- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 6 V, V_{GS} = - 4.5 V $I_D \cong$ - 3.85 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 V, V_{GS} = 0 V, f = 1 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 V, R_L = 6 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 4.5 V R_G = 6 Ω		15	20	ns
	t_r			35	50	
Turn-Off Time	$t_{d(off)}$			50	70	
	t_f			50	75	

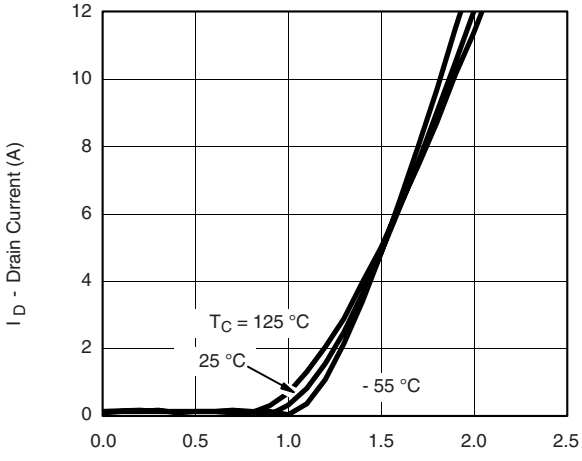
Notes:
a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤ 300 µs duty cycle ≤ 2 %.
c. Switching time is essentially independent of operating temperature.

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.

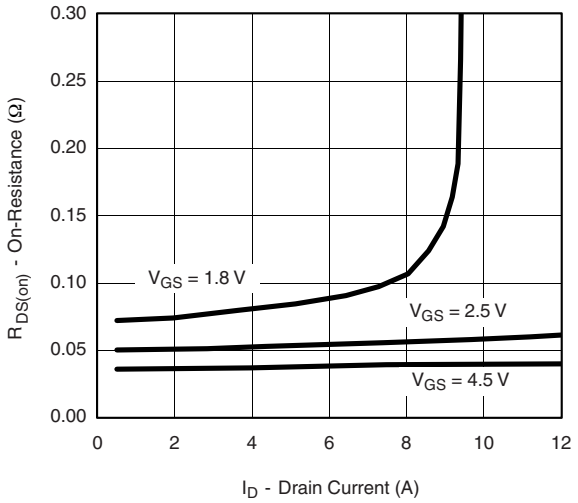
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



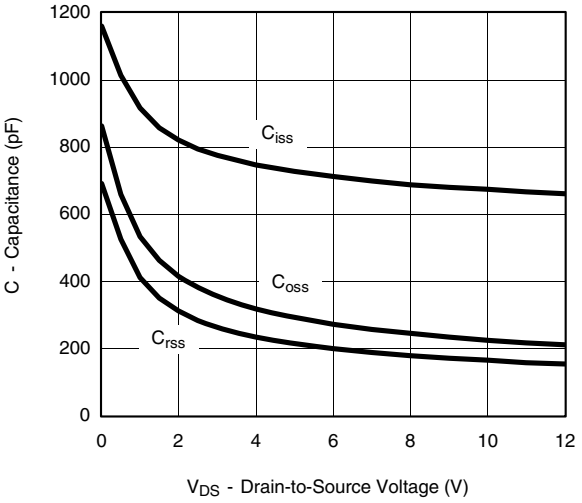
Output Characteristics



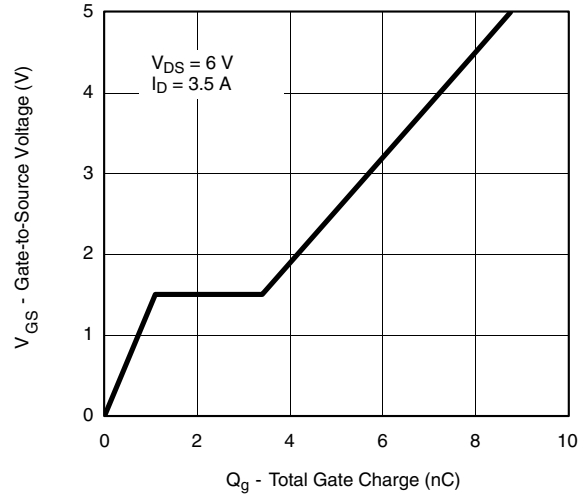
Transfer Characteristics



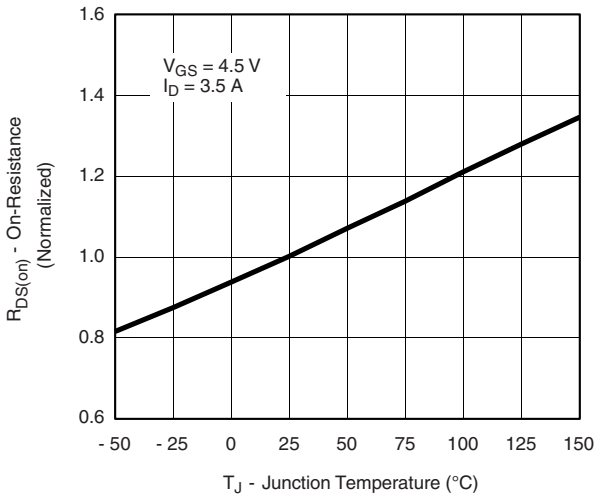
On-Resistance vs. Drain Current



Capacitance

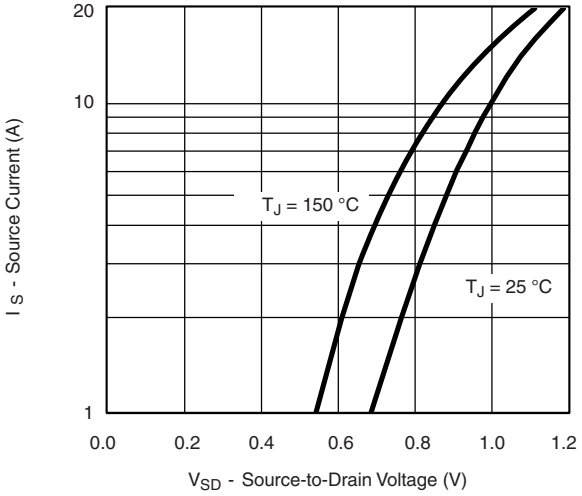


Gate Charge

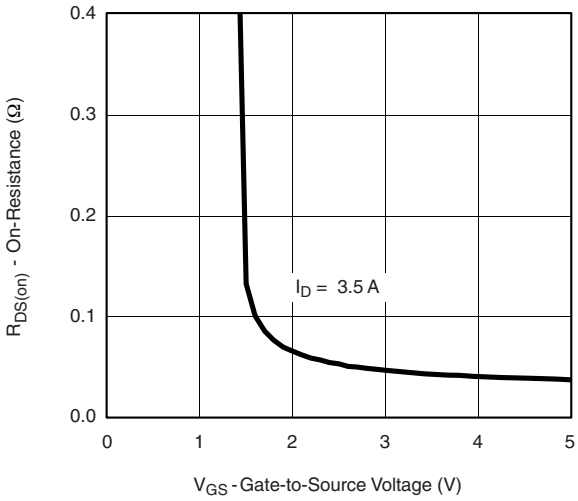


On-Resistance vs. Junction Temperature

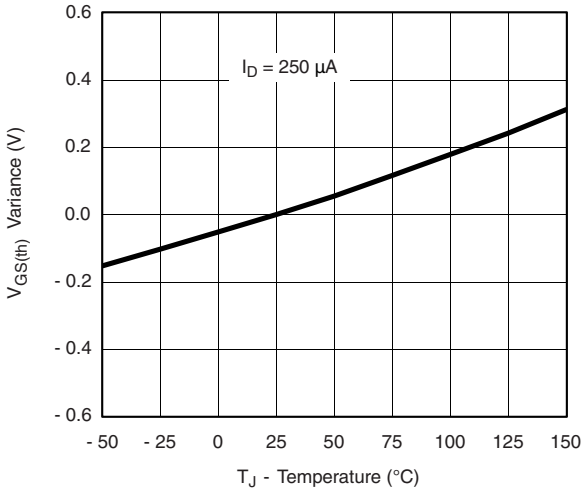
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



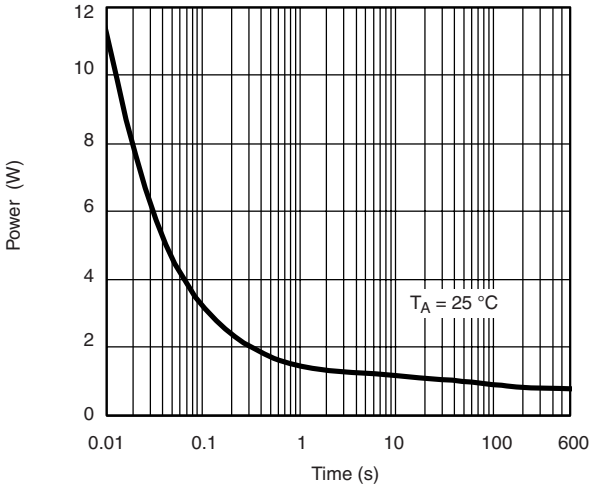
Source-Drain Diode Forward Voltage



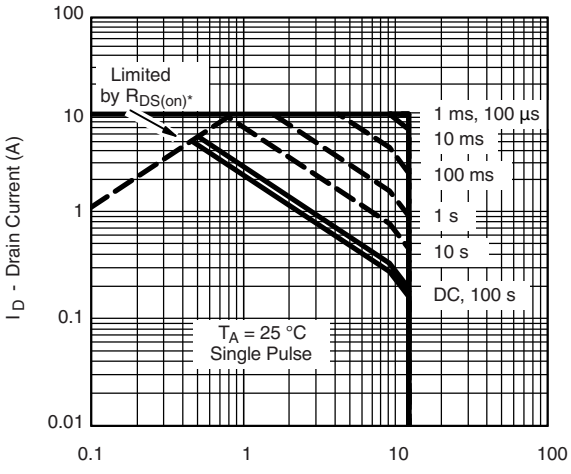
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



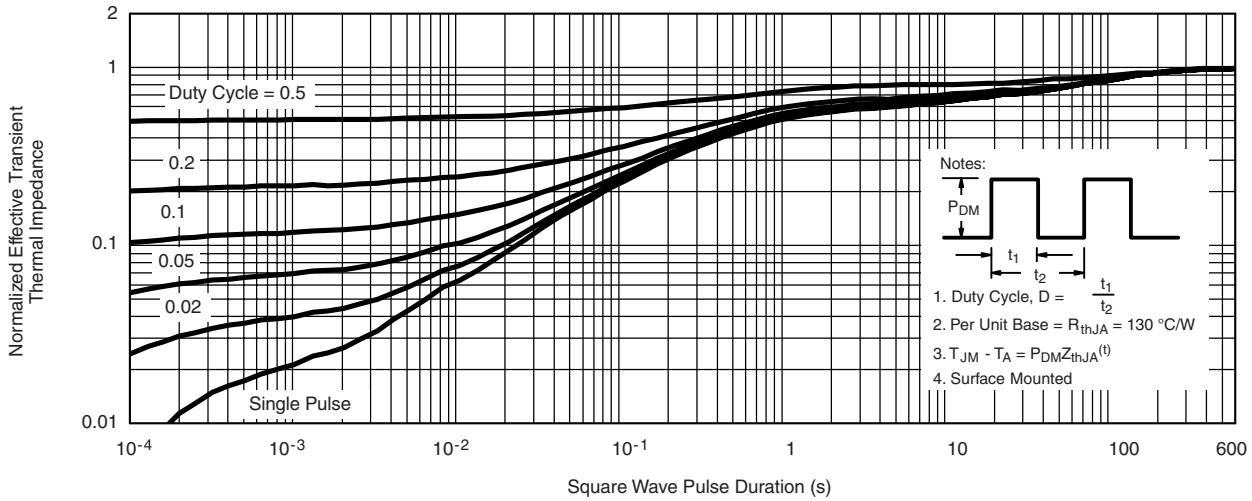
Single Pulse Power



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

Safe Operating Area

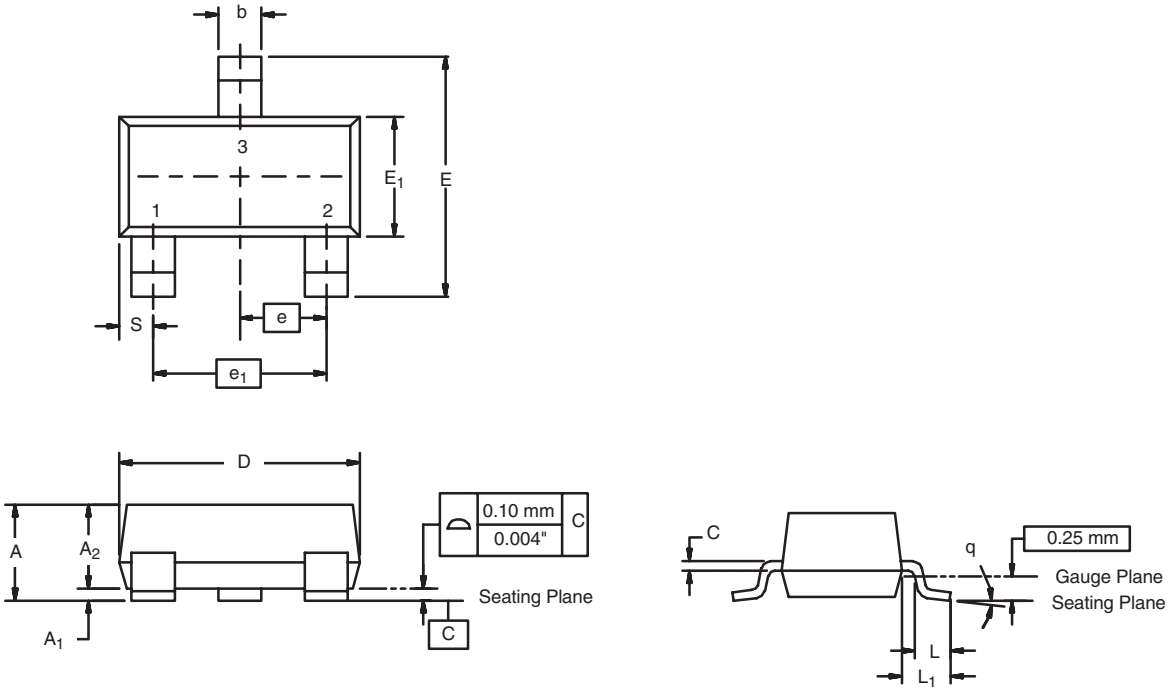
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient

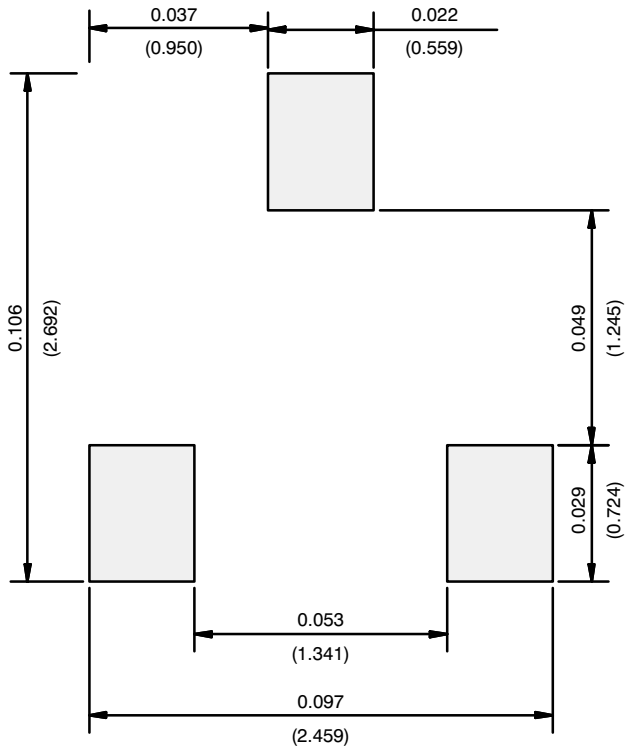
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SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	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
c	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
e	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 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°
ECN: S-03946-Rev. K, 09-Jul-01 DWG: 5479				

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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