P-Channel 30-V (D-S) MOSFET

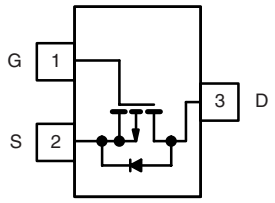
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[b]
- 30	0.078 at V_{GS} = - 10 V	- 3.2
	0.130 at V_{GS} = - 4.5 V	- 2.5

FEATURES

- **Halogen-free Option Available**
- TrenchFET® Power MOSFET

Pb-free
RoHS COMPLIANT

TO-236
(SOT-23)



Top View

Si2307BDS (L7)*
* Marking Code

Ordering Information: Si2307BDS-T1-E3 (Lead (Pb)-free)
Si2307BDS-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}	- 30		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 150 °C)[b]	T_A = 25 °C	I_D	- 3.2	- 2.5	A
	T_A = 70 °C		- 2.6	- 2.0	
Pulsed Drain Current[a]		I_{DM}	- 12		
Continuous Source Current (Diode Conduction)[b]		I_S	- 1.25	- 0.75	
Power Dissipation[b]	T_A = 25 °C	P_D	1.25	0.75	W
	T_A = 70 °C		0.8	0.48	
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[b]	R_{thJA}	80	100	°C/W
Maximum Junction-to-Ambient[c]		130	166	

Notes:
a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 board, t ≤ 5 s.
c. Surface Mounted on FR4 board.

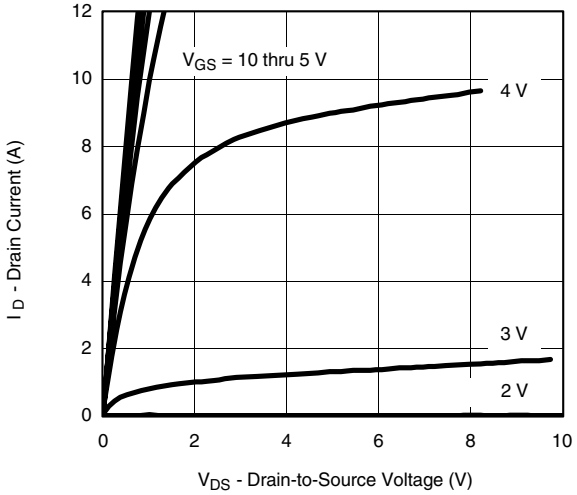
For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 10 µA	- 30			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.0		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 10 V, V_{GS} = - 10 V	- 6			A
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 3.2 A		0.063	0.078	Ω
		V_{GS} = - 4.5 V, I_D = - 2.5 A		0.105	0.130	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 3.2 A		5.0		S
Diode Forward Voltage	V_{SD}	I_S = - 0.75 A, V_{GS} = 0 V		- 0.85	- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V $I_D \cong$ - 1.7 A		9.0	15	nC
Gate-Source Charge	Q_{gs}			1.4		
Gate-Drain Charge	Q_{gd}			2.4		
Gate Resistance	R_g	f = 1.0 MHz		8.0		Ω
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		380		pF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			75		
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 15 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 4.5 V R_g = 6 Ω		9	20	ns
	t_r			12	20	
Turn-Off Time	$t_{d(off)}$			25	40	
	t_f			14	21	

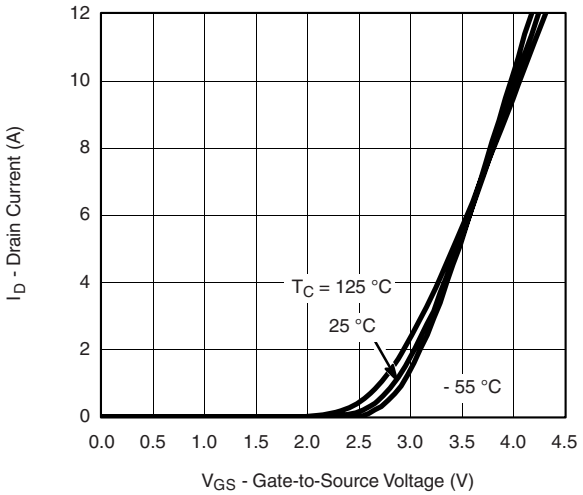
Notes:
a. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

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.

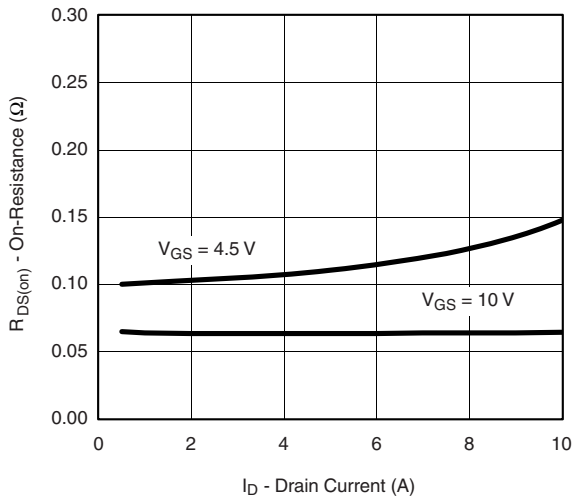
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



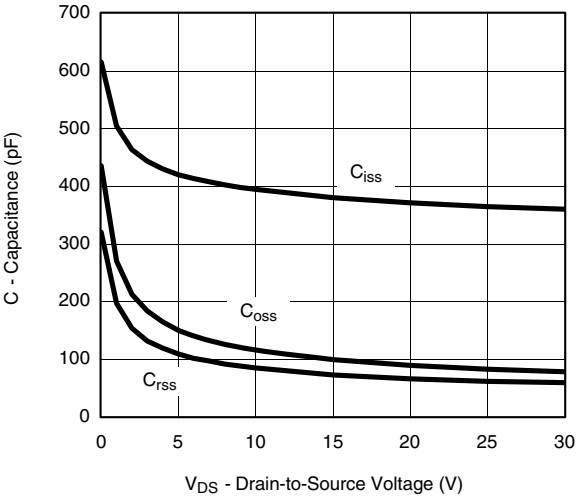
Output Characteristics



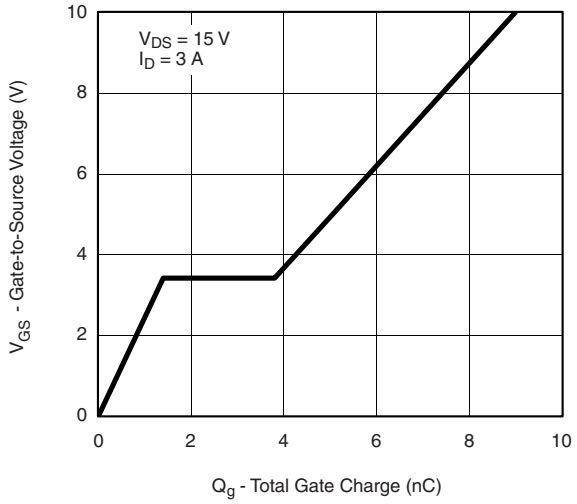
Transfer Characteristics



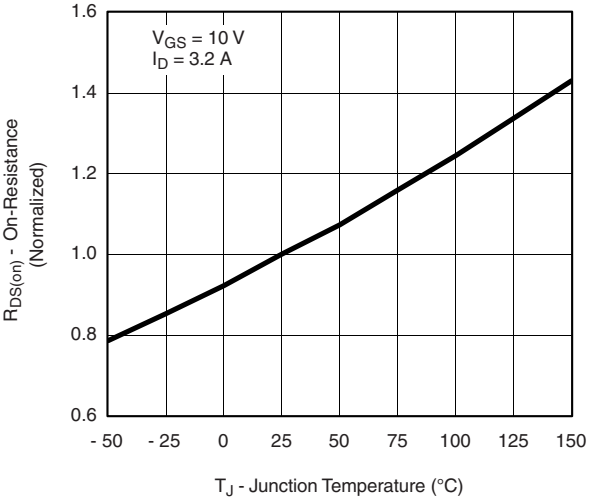
On-Resistance vs. Drain Current



Capacitance

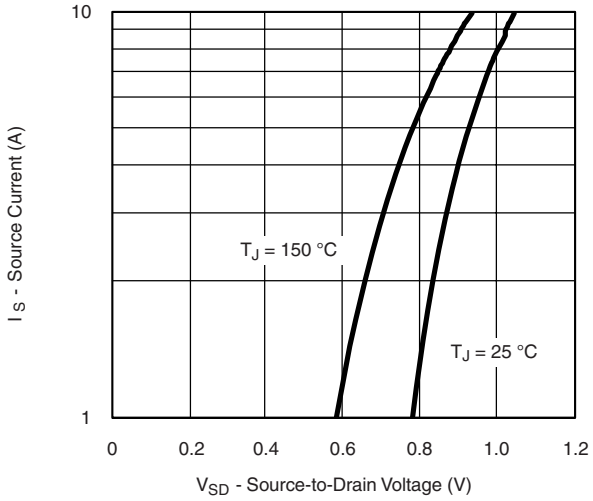


Gate Charge

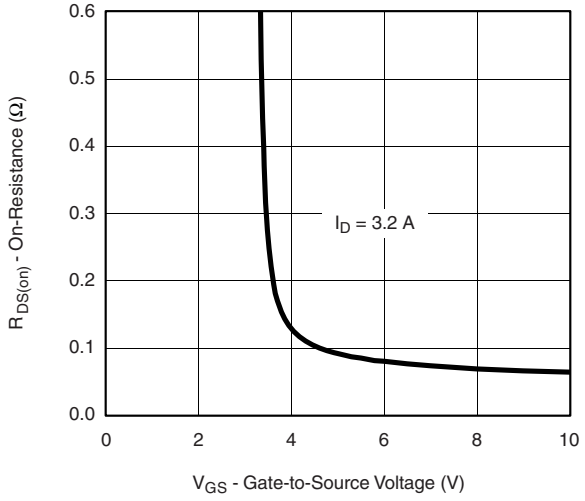


On-Resistance vs. Junction Temperature

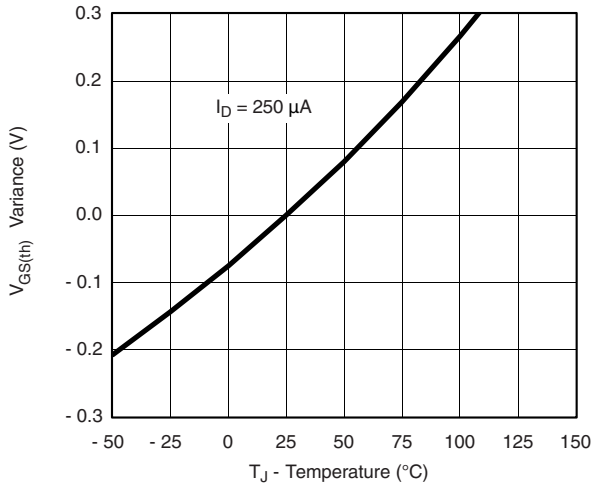
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



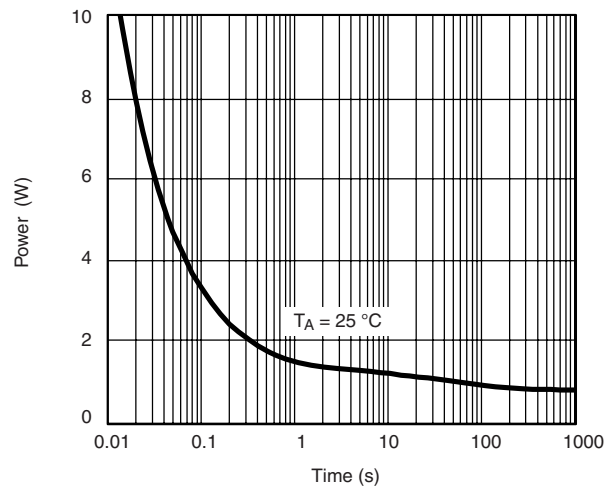
Source-Drain Diode Forward Voltage



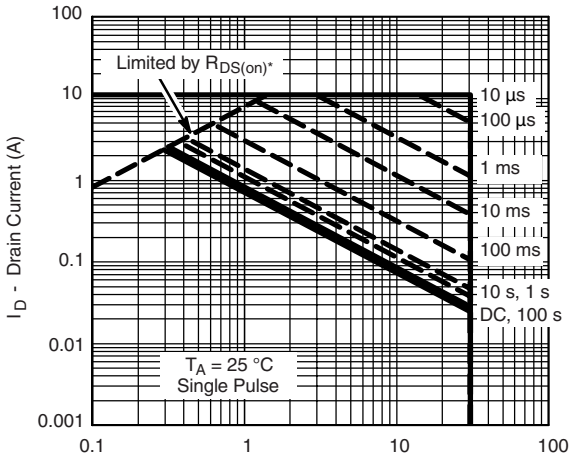
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

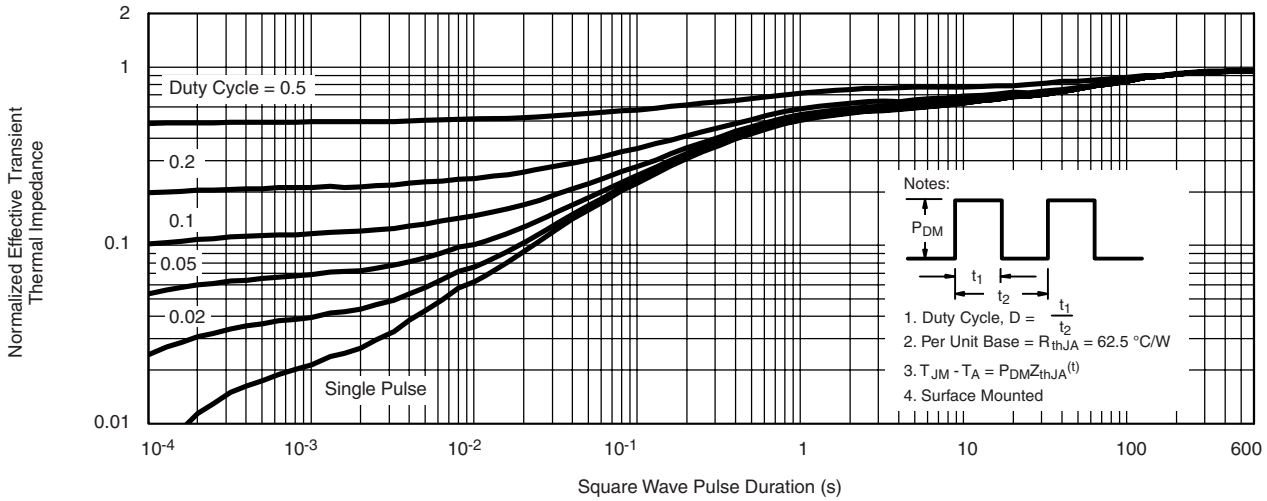


Single Pulse Power



Safe Operating Area, Junction-to-Case

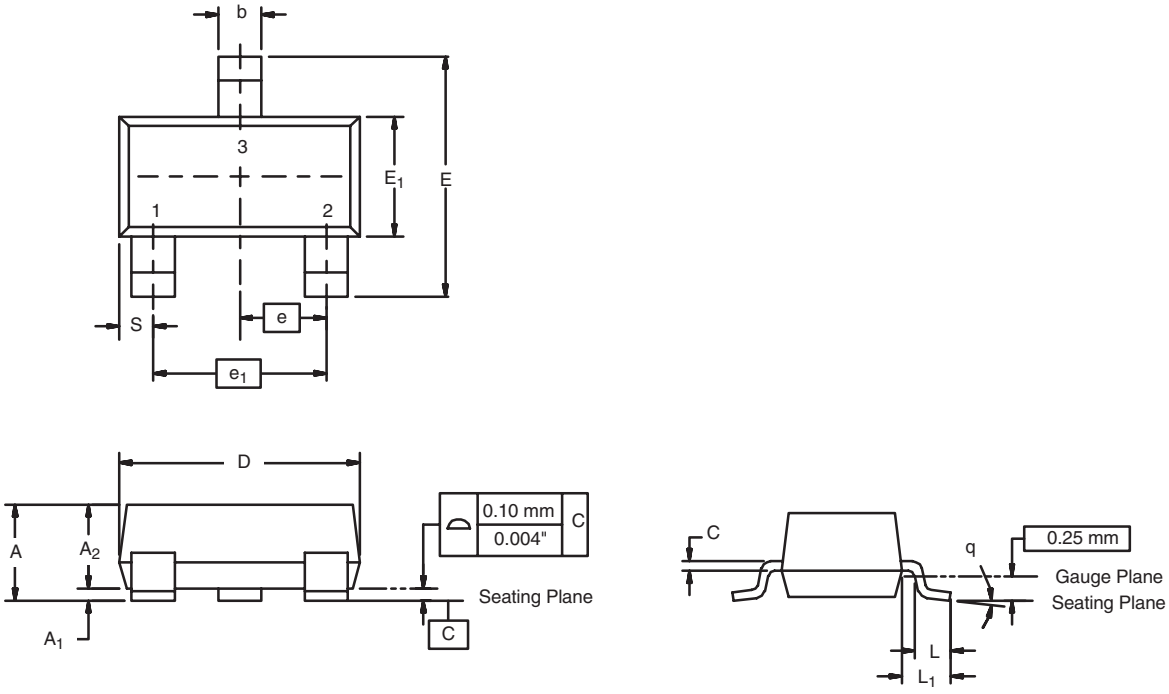
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient

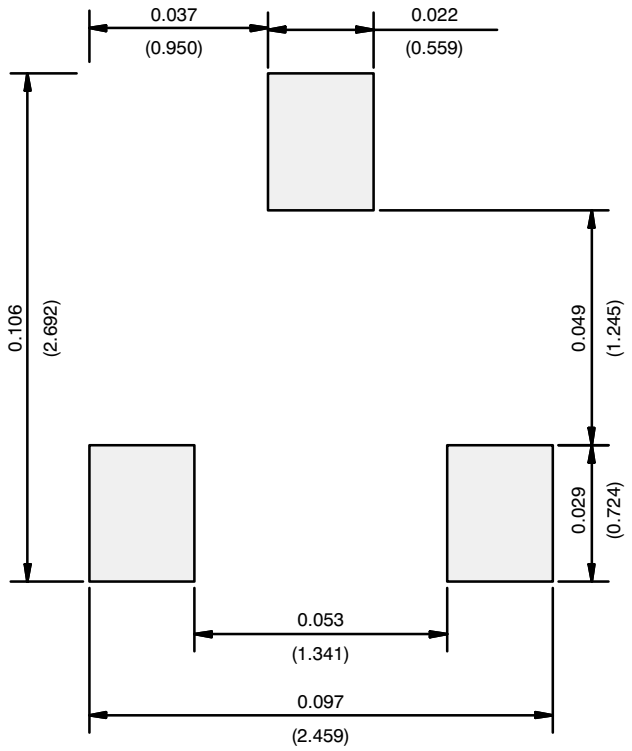
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SOT-23 (TO-236): 3-LEAD



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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