

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

PRODUCT SUMMARY

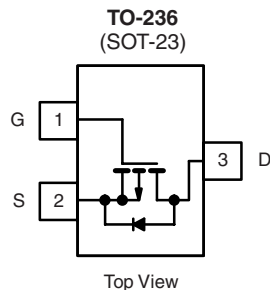
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^b
- 30	0.078 at $V_{GS} = - 10$ V	- 3.2
	0.130 at $V_{GS} = - 4.5$ V	- 2.5

FEATURES

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



RoHS
COMPLIANT



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	I_D	- 3.2	- 2.5	A
		- 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	P_D	1.25	0.75	W
		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, $t \leq 5$ s.
c. Surface Mounted on FR4 board.

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

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

Notes:

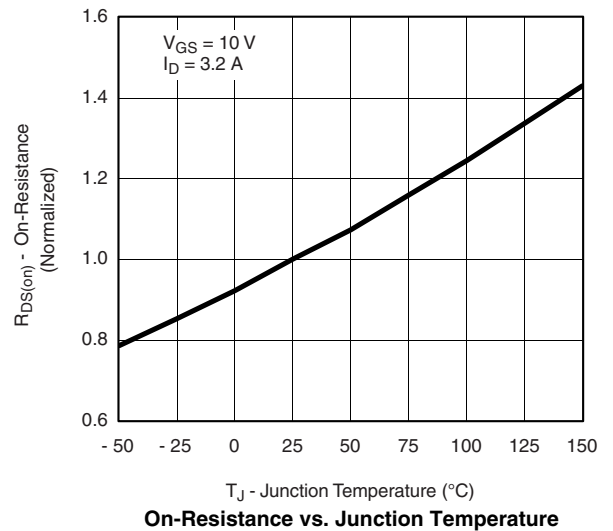
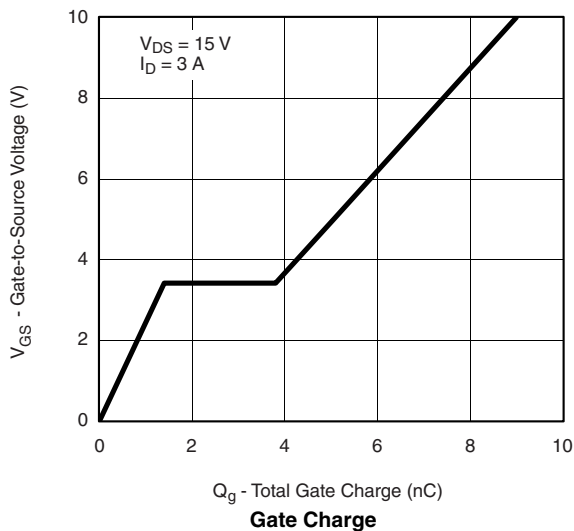
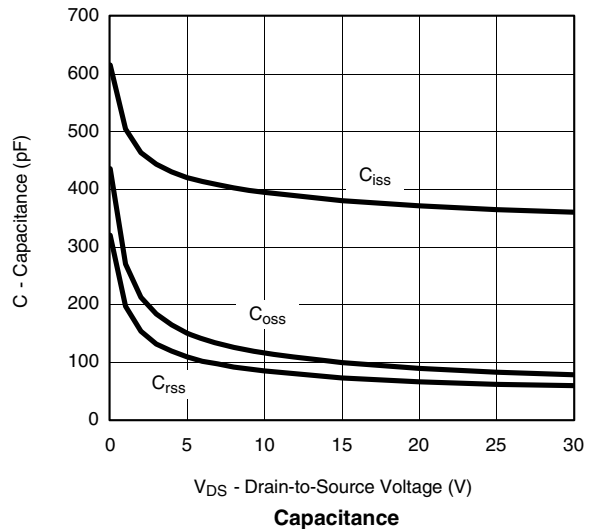
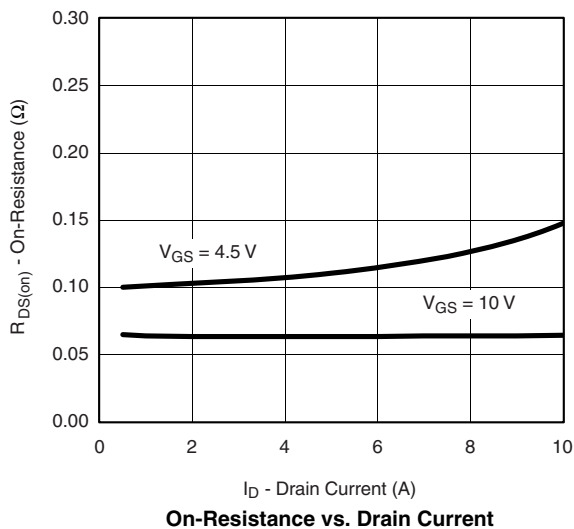
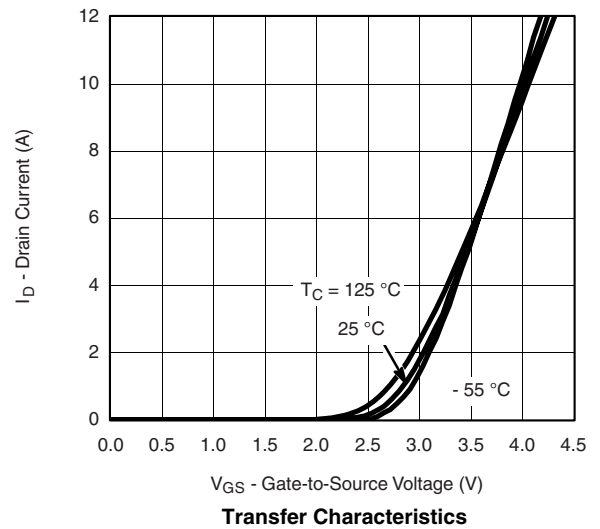
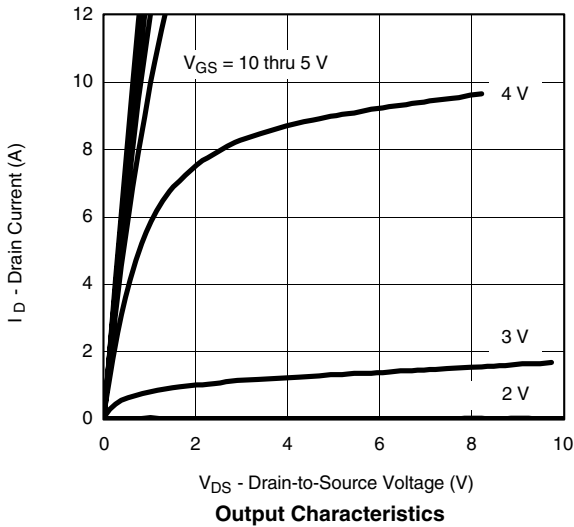
a. Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

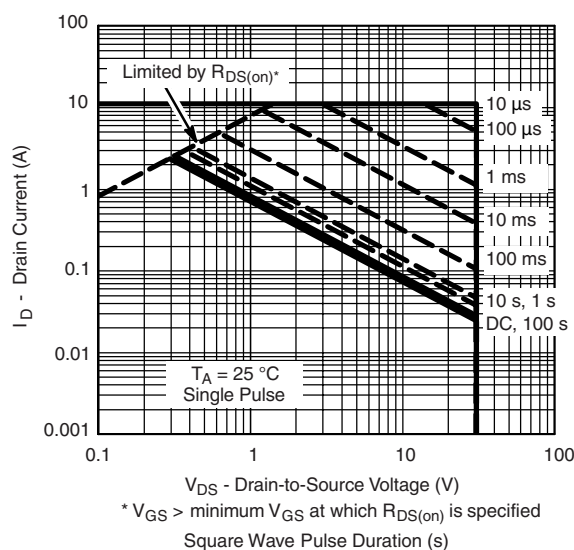
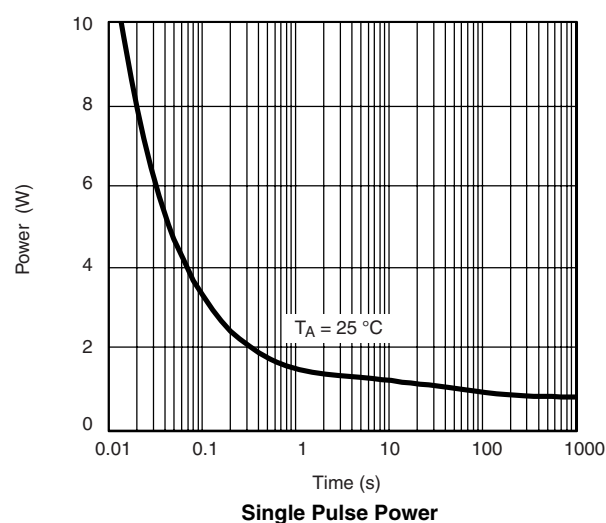
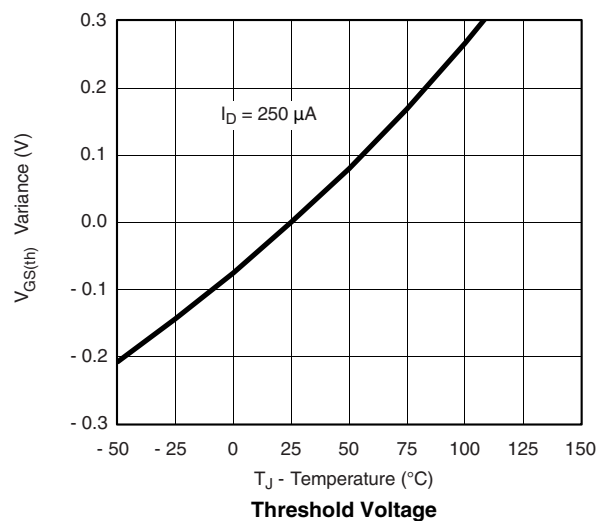
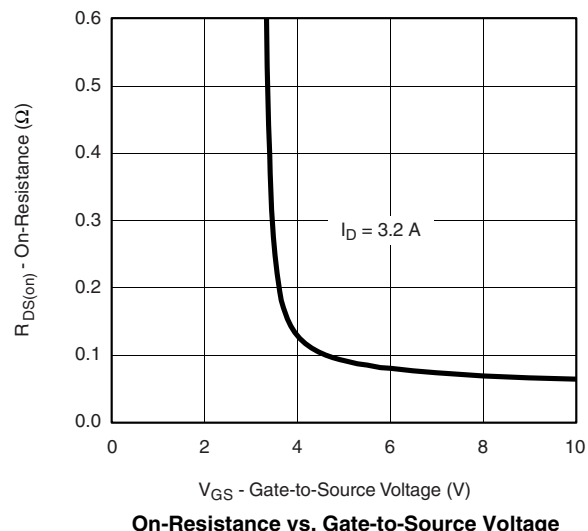
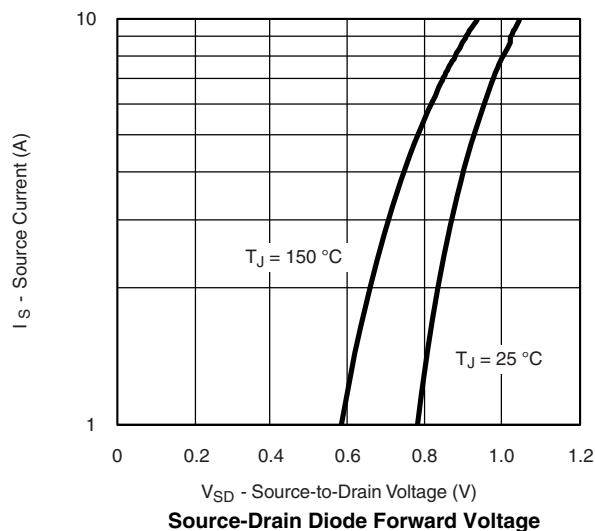
b. For DESIGN AID ONLY, not subject to production testing.

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



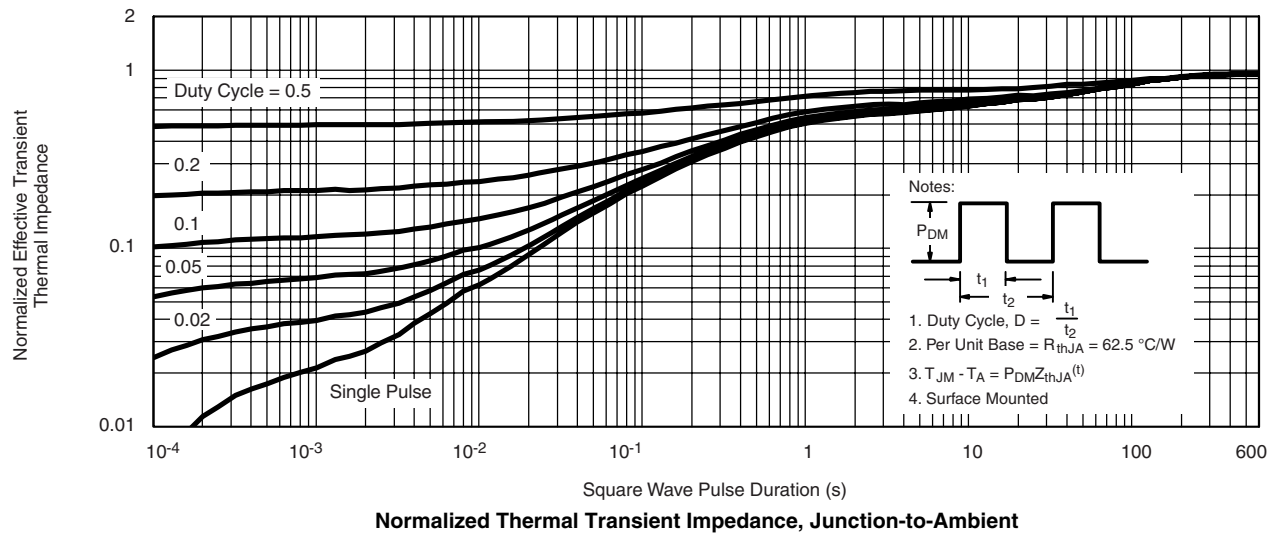
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified
Square Wave Pulse Duration (s)

Safe Operating Area, Junction-to-Case



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?72699>.

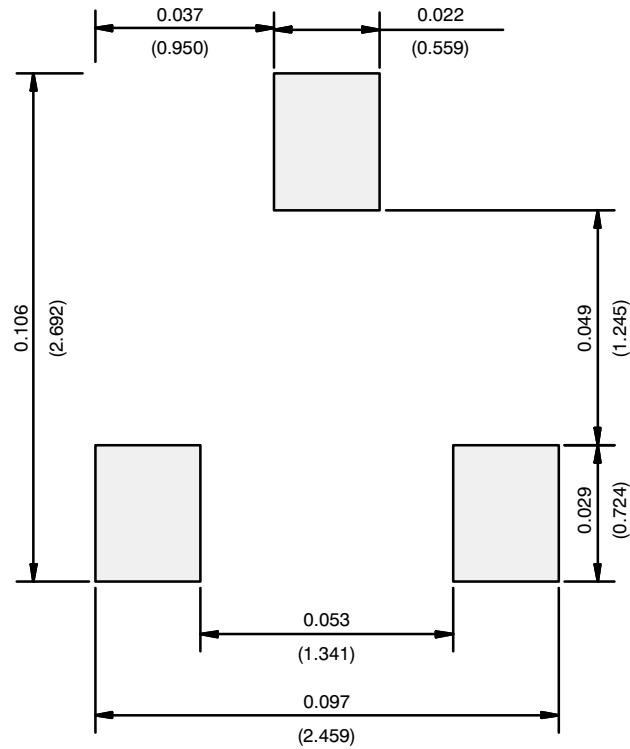
SOT-23 (TO-236): 3-LEAD



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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