

P-Channel 2.5-V (G-S) MOSFET

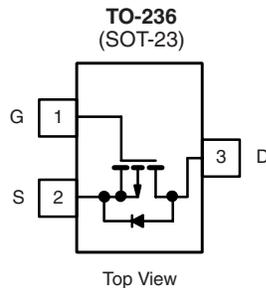
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^b
- 20	0.100 at $V_{GS} = - 4.5$ V	- 2.4
	0.150 at $V_{GS} = - 2.5$ V	- 2.0

FEATURES

- Halogen-free Option Available



Available
RoHS*
COMPLIANT



Top View
Si2301 BDS (L1)*
* Marking Code

Ordering Information: Si2301BDS-T1
Si2301BDS-T1-E3 (Lead (Pb)-free)
Si2301BDS-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}	- 20		V	
Gate-Source Voltage	V_{GS}	± 8			
Continuous Drain Current ($T_J = 150$ °C) ^b	I_D	$T_A = 25$ °C	- 2.4	- 2.2	A
		$T_A = 70$ °C	- 1.9	- 1.8	
Pulsed Drain Current ^a	I_{DM}	- 10			
Continuous Source Current (Diode Conduction) ^b	I_S	- 0.72	- 0.6		
Power Dissipation ^b	P_D	$T_A = 25$ °C	0.9	0.7	W
		$T_A = 70$ °C	0.57	0.45	
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}	120	145	°C/W
Maximum Junction-to-Ambient ^c		140	175	

Notes:

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 board, $t \leq 5$ s.
- Surface Mounted on FR4 board.

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.

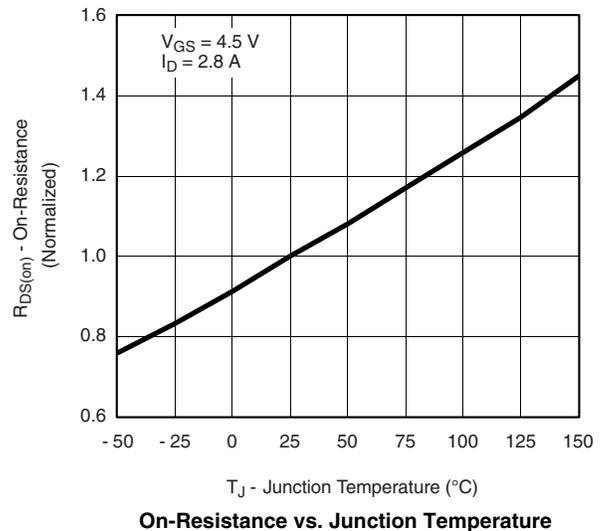
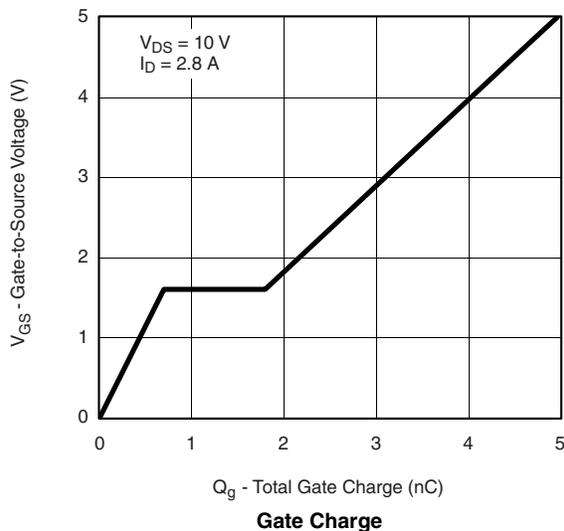
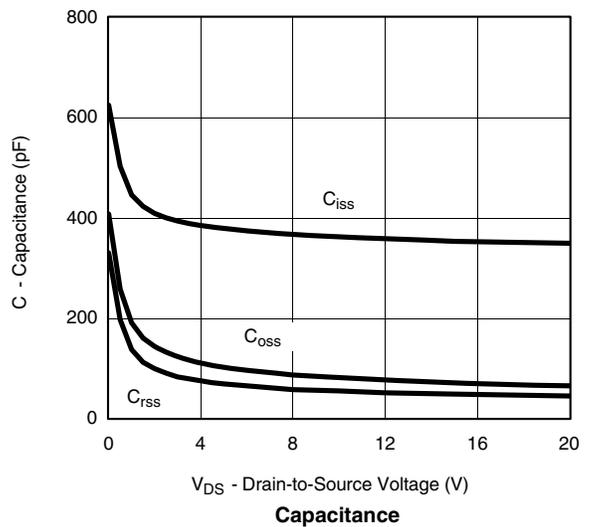
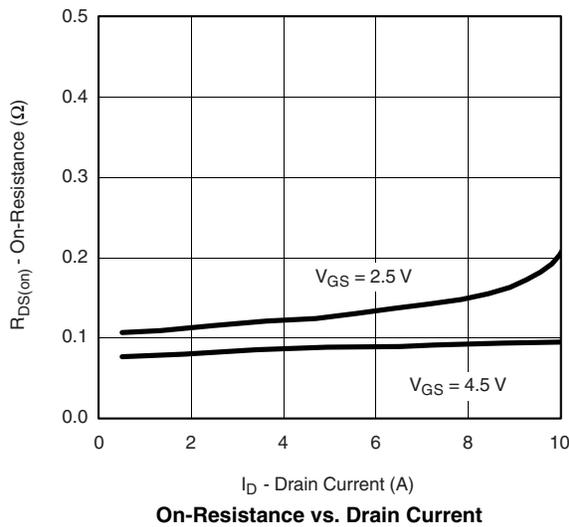
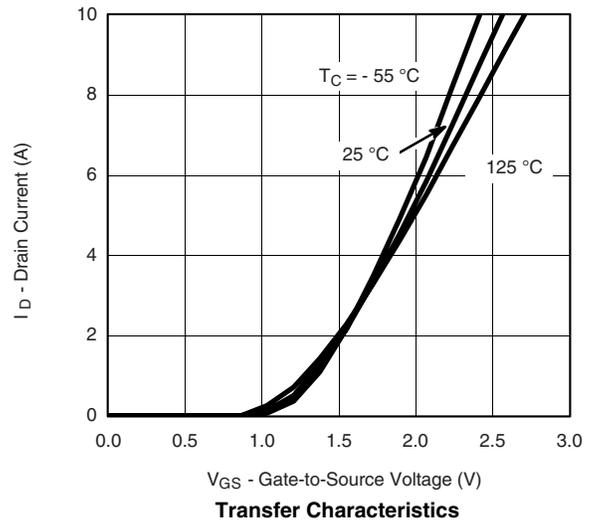
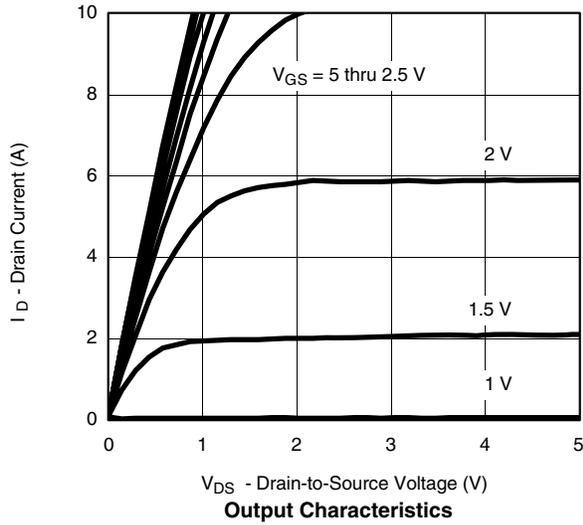
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 0.45		- 0.95	
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}	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			- 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-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -2.8\text{ A}$		0.080	0.100	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -2.0\text{ A}$		0.110	0.150	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -2.8\text{ A}$		6.5		S
Diode Forward Voltage	V_{SD}	$I_S = -0.75\text{ A}, V_{GS} = 0\text{ V}$		- 0.80	- 1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}$ $I_D \cong -2.8\text{ A}$		4.5	10	nC
Gate-Source Charge	Q_{gs}			0.7		
Gate-Drain Charge	Q_{gd}			1.1		
Input Capacitance	C_{iss}	$V_{DS} = -6\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		375		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			65		
Switching^c						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}, R_L = 6\text{ }\Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_g = 6\text{ }\Omega$		20	30	ns
	t_r			40	60	
Turn-Off Time	$t_{d(off)}$			30	45	
	t_f			20	30	

Notes:

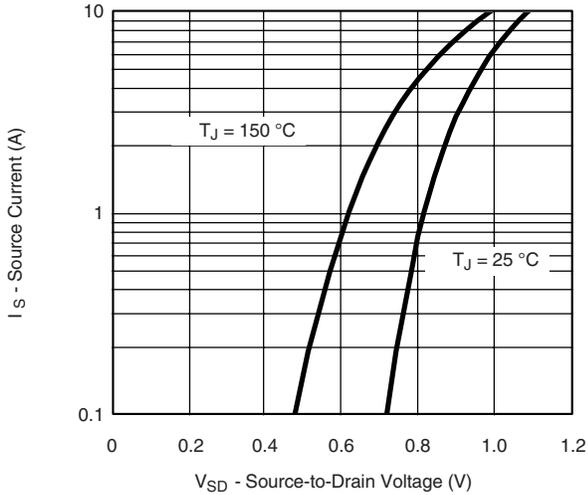
- a. Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

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.

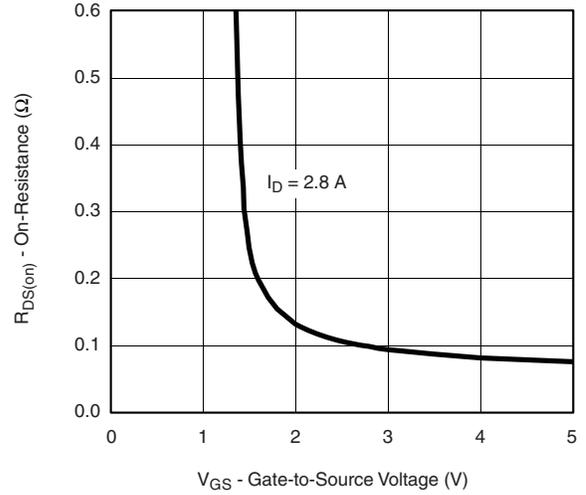
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



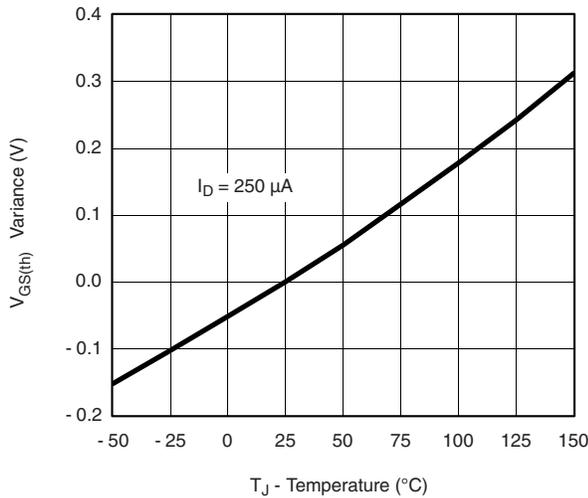
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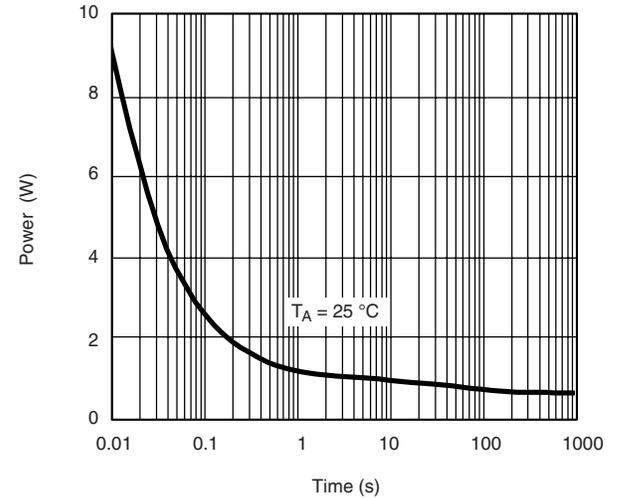
Source-Drain Diode Forward Voltage



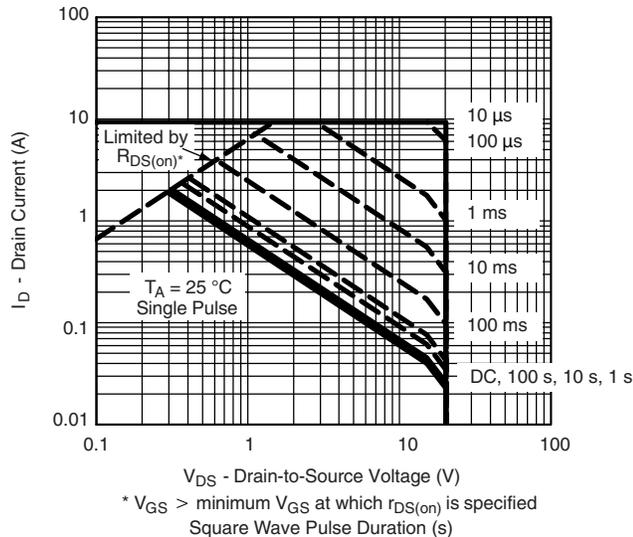
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



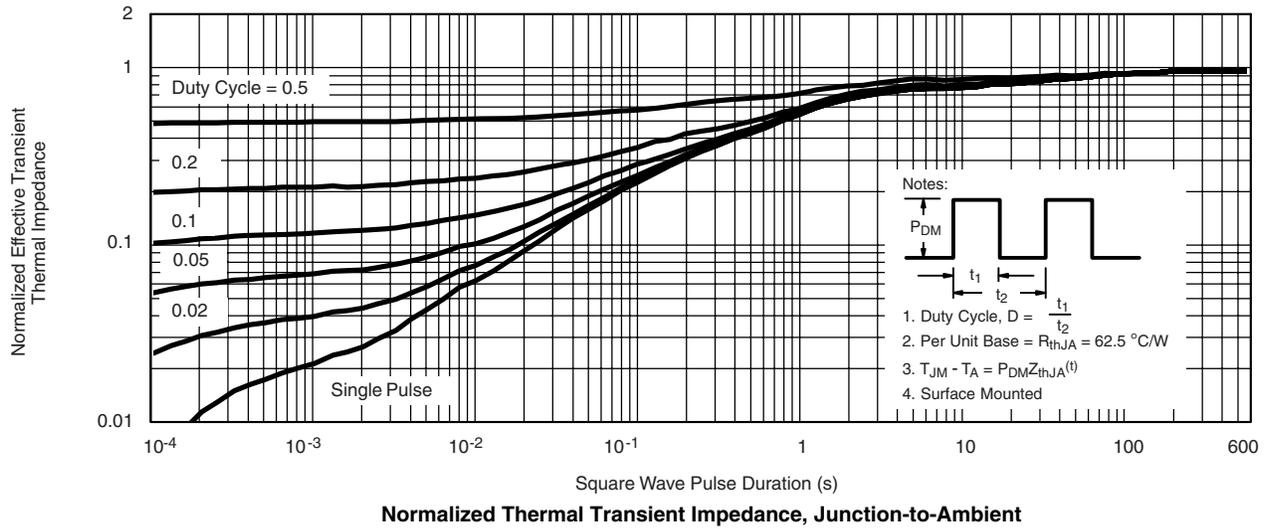
V_{DS} - Drain-to-Source Voltage (V)

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

Square Wave Pulse Duration (s)

Safe Operating Area

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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