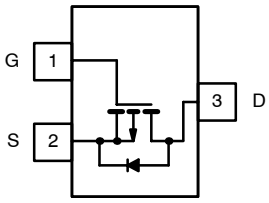
P-Channel 1.25-W, 2.5-V MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.130 @ V_{GS} = -4.5 V	-2.3
	0.190 @ V_{GS} = -2.5 V	-1.9

TO-236
(SOT-23)



Top View

Si2301DS (A1)*

*Marking Code

Ordering Information: Si2301DS-T1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current (T_J = 150°C)[b]	T_A= 25°C	I_D	-2.3	A
	T_A= 70°C		-1.5	
Pulsed Drain Current[a]		I_{DM}	-10	
Continuous Source Current (Diode Conduction)[b]		I_S	-1.6	
Power Dissipation[b]	T_A= 25°C	P_D	1.25	W
	T_A= 70°C		0.8	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[b]	R_{thJA}	100	°C/W
Maximum Junction-to-Ambient[c]		166	

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

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

Downloaded from Arrow.com.

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

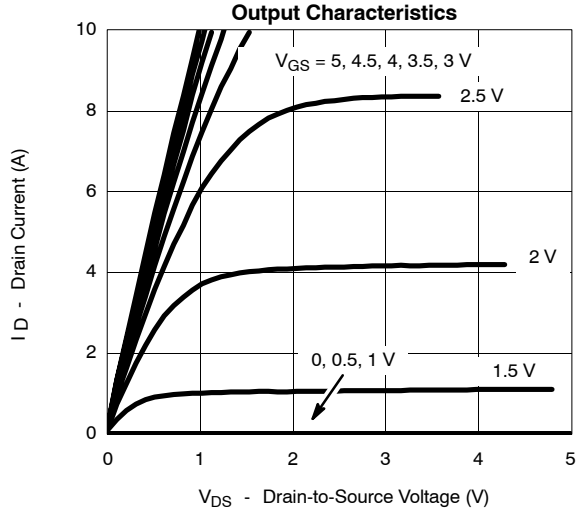
Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = -250 µA	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-0.45			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20 V, V_{GS} = 0 V			-1	µA
		V_{DS} = -20 V, V_{GS} = 0 V, T_J = 55°C			-10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ -5 V, V_{GS} = -4.5 V	-6			A
		V_{DS} ≤ -5 V, V_{GS} = -2.5 V	-3			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -2.8 A		0.105	0.130	Ω
		V_{GS} = -2.5 V, I_D = -2.0 A		0.145	0.190	
Forward Transconductance[a]	g_{fs}	V_{DS} = -5 V, I_D = -2.8 A		6.5		S
Diode Forward Voltage	V_{SD}	I_S = -1.6 A, V_{GS} = 0 V		-0.80	-1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -6 V, V_{GS} = -4.5 V I_D ≅ -2.8 A		5.8	10	nC
Gate-Source Charge	Q_{gs}			0.85		
Gate-Drain Charge	Q_{gd}			1.70		
Input Capacitance	C_{iss}	V_{DS} = -6 V, V_{GS} = 0, f = 1 MHz		415		pF
Output Capacitance	C_{oss}			223		
Reverse Transfer Capacitance	C_{rss}			87		
Switching[c]						
Turn-On Time	$t_{d(on)}$	V_{DD} = -6 V, R_L = 6 Ω I_D ≅ -1.0 A, V_{GEN} = -4.5 V R_G = 6 Ω		13.0	25	ns
	t_r			36.0	60	
Turn-Off Time	$t_{d(off)}$			42	70	
	t_f			34	60	

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

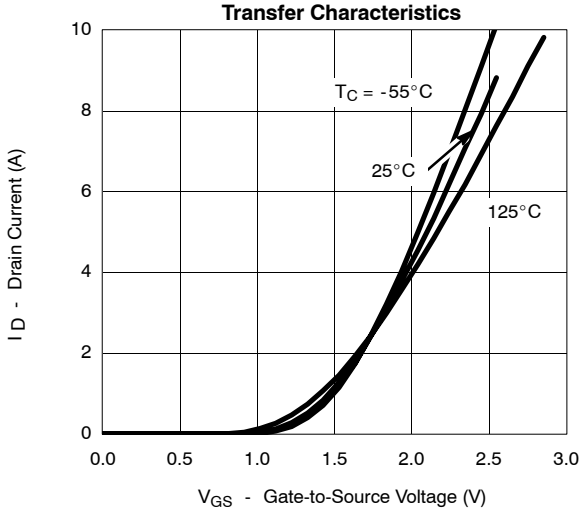
Downloaded from Arrow.com.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

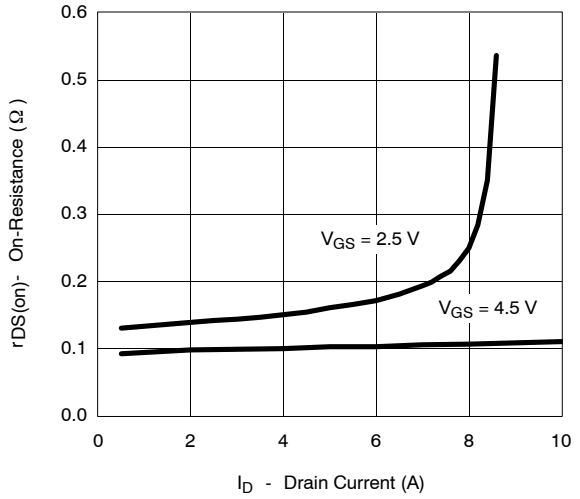
Output Characteristics



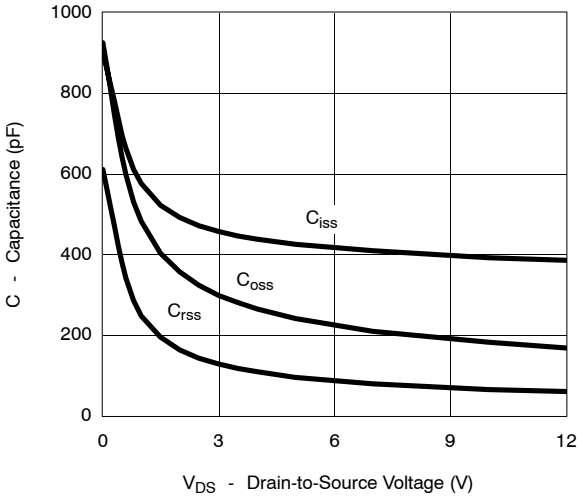
Transfer Characteristics



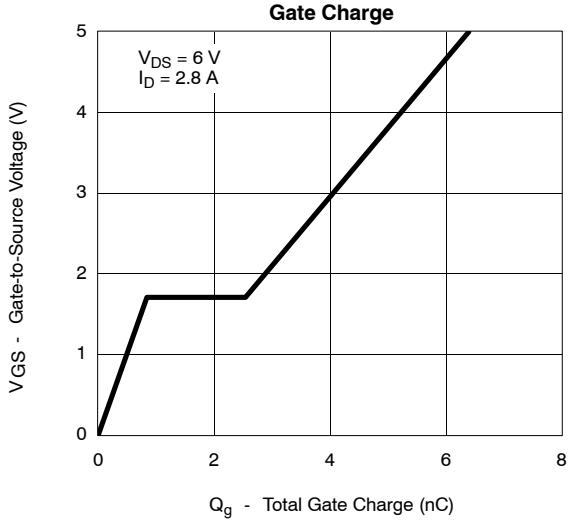
On-Resistance vs. Drain Current



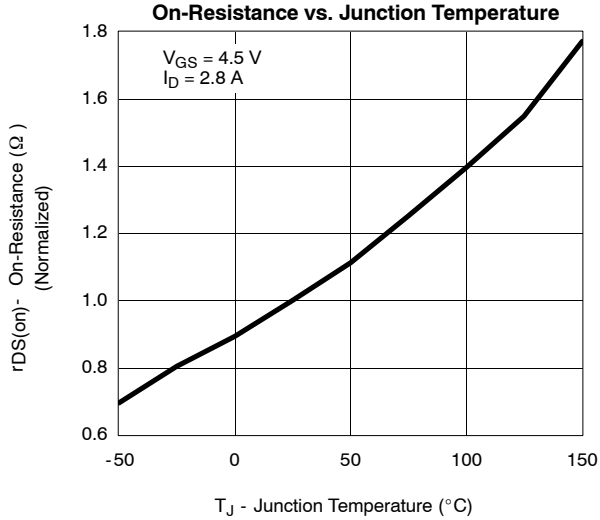
Capacitance



Gate Charge



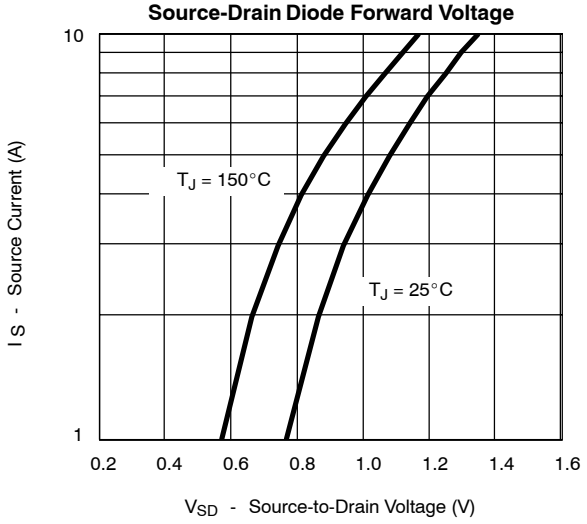
On-Resistance vs. Junction Temperature



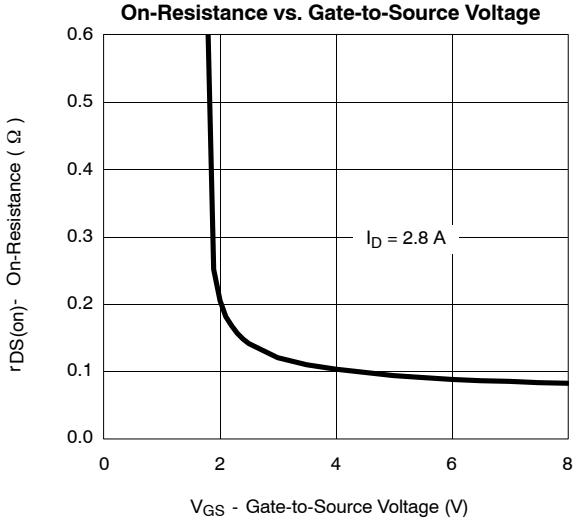
Downloaded from Arrow.com.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

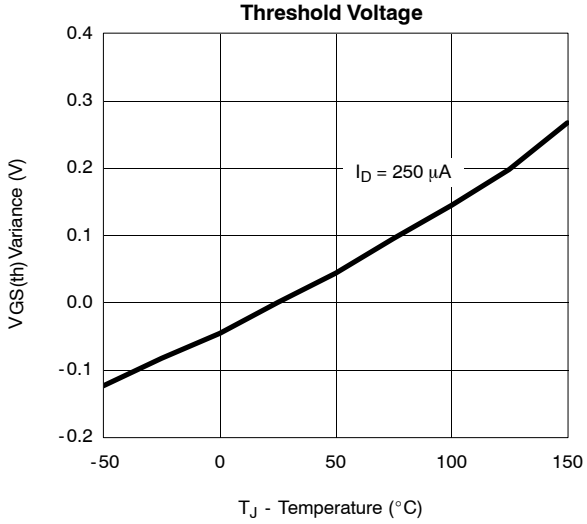
Source-Drain Diode Forward Voltage



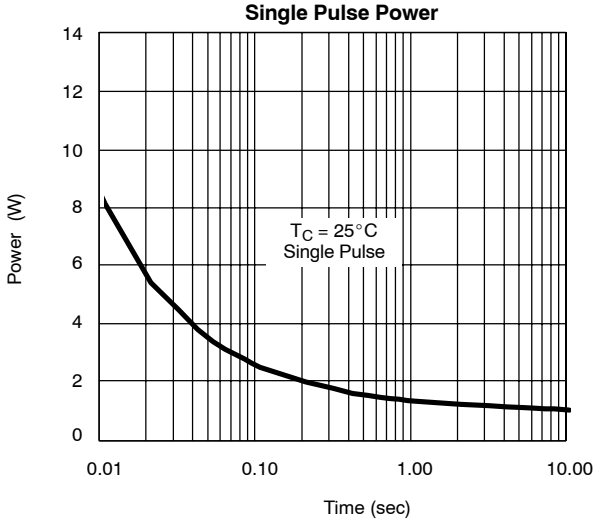
On-Resistance vs. Gate-to-Source Voltage



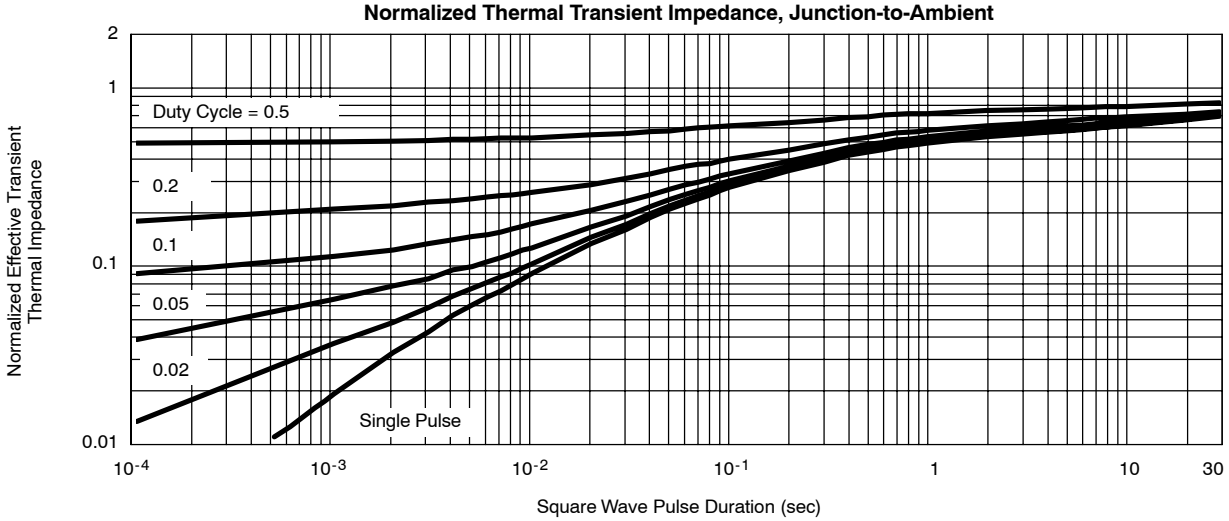
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Downloaded from Arrow.com.

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.

Downloaded from Arrow.com.