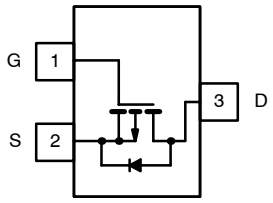
P-Channel 1.25-W, 2.5-V MOSFET

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

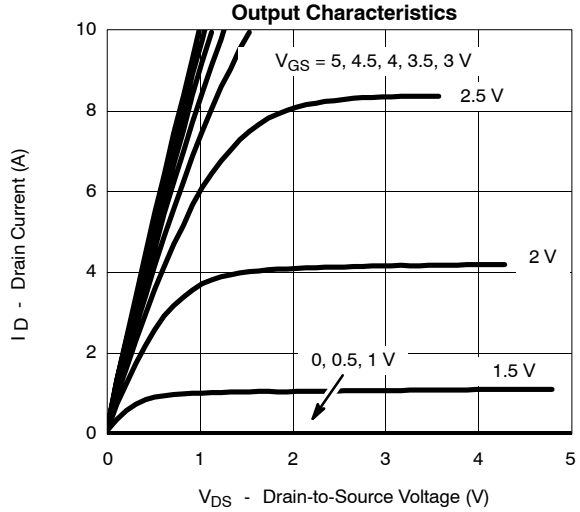
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

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			V
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	µA
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			A
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	Ω
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		nC
Gate-Drain Charge	Q_{gd}			1.70		nC
Input Capacitance	C_{iss}	V_{DS} = -6 V, V_{GS} = 0, f = 1 MHz		415		pF
Output Capacitance	C_{oss}			223		pF
Reverse Transfer Capacitance	C_{rss}			87		pF
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	ns
Turn-Off Time	$t_{d(off)}$			42	70	ns
	t_f			34	60	ns

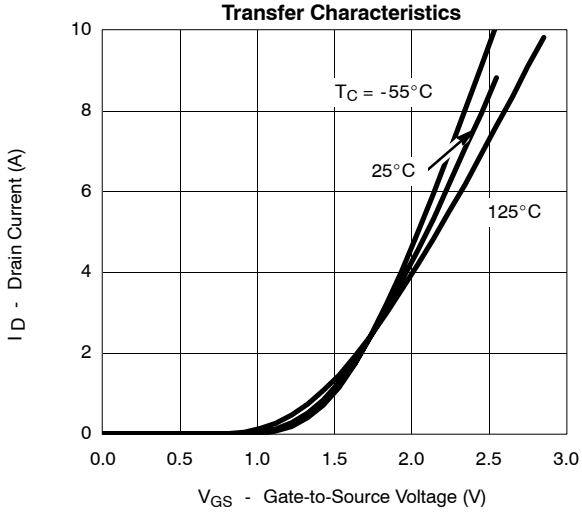
Notes
a. Pulse test: PW ≤300 µs duty cycle ≤2%.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

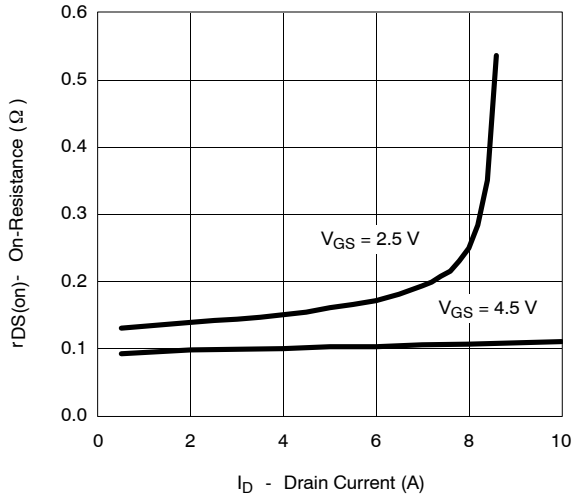
Output Characteristics



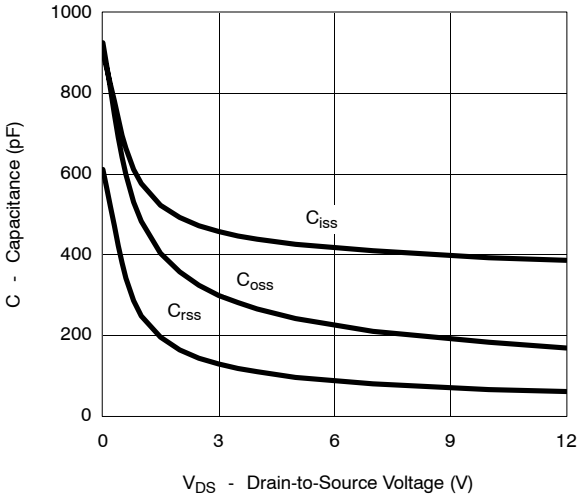
Transfer Characteristics



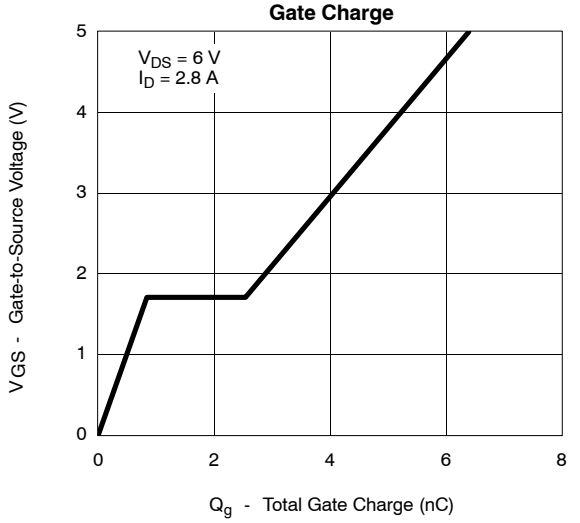
On-Resistance vs. Drain Current



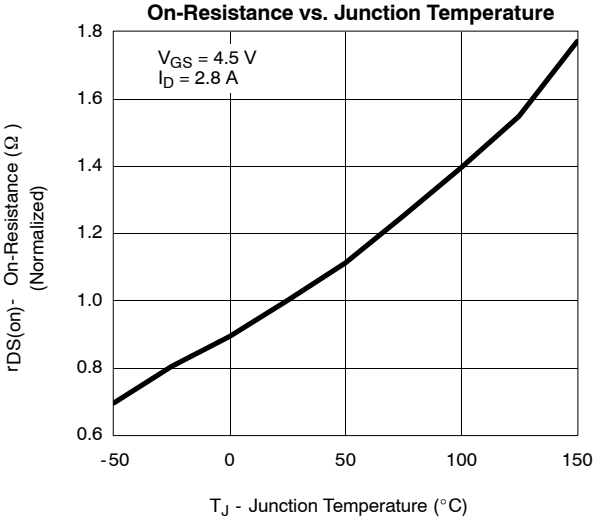
Capacitance



Gate Charge

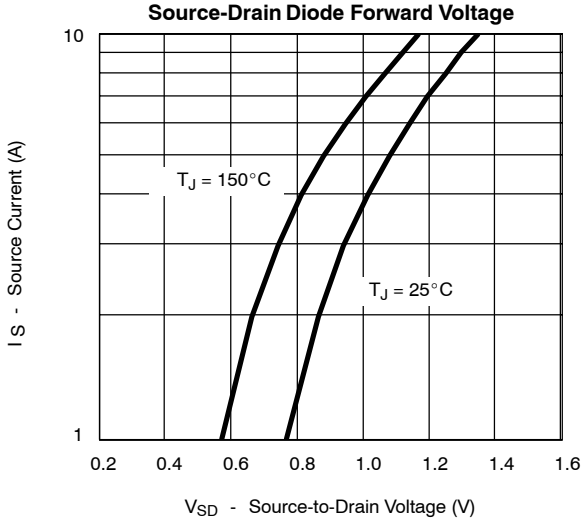


On-Resistance vs. Junction Temperature

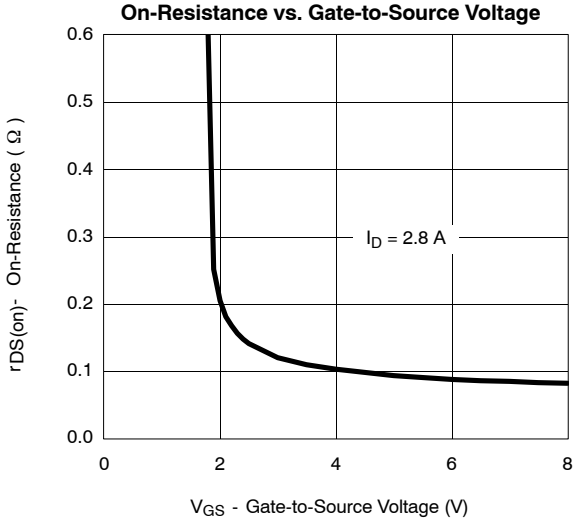


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

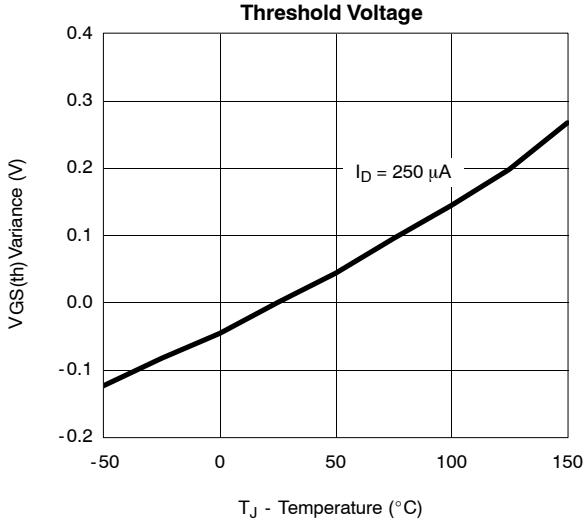
Source-Drain Diode Forward Voltage



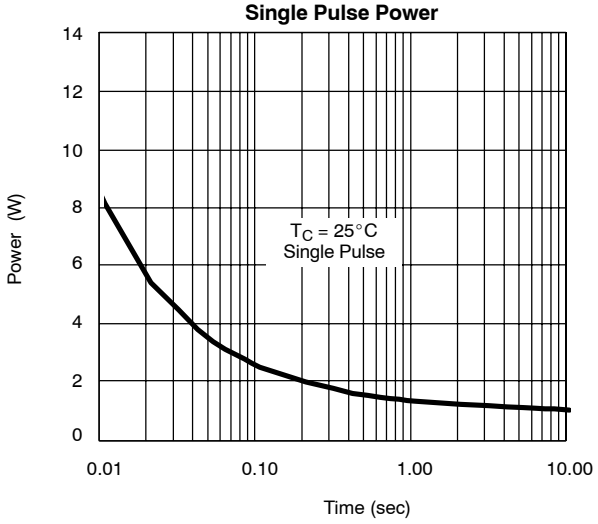
On-Resistance vs. Gate-to-Source Voltage



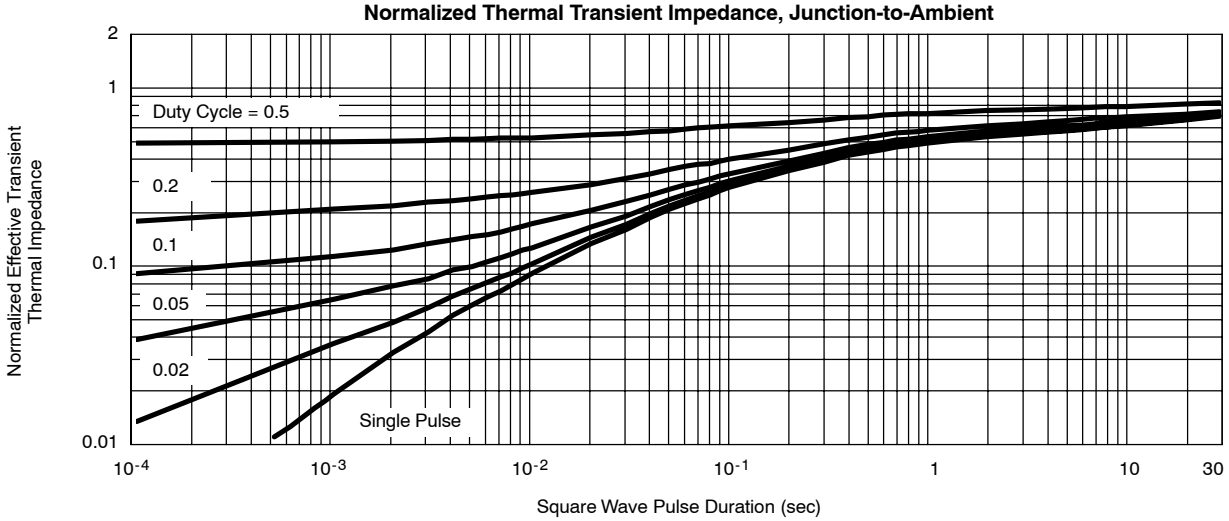
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



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