TEMIC
Semiconductors

Si2301DS

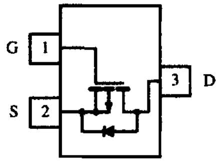
P-Channel 1.25-W, 2.5-V Rated MOSFET

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−12 *	0.130 @ $V_{GS} = -4.5$ V	−2.3
	0.190 @ $V_{GS} = -2.5$ V	−1.9

*−20-V V_{DS} version of the Si2301DS, available Q4'97. Contact Product Marketing for further information.

TO-236
(SOT-23)



Top View
Si2301DS (A1)*
*Marking Code

Absolute Maximum Ratings ($T_A = 25°C$ Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	−12	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.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70627.

Specifications[a]

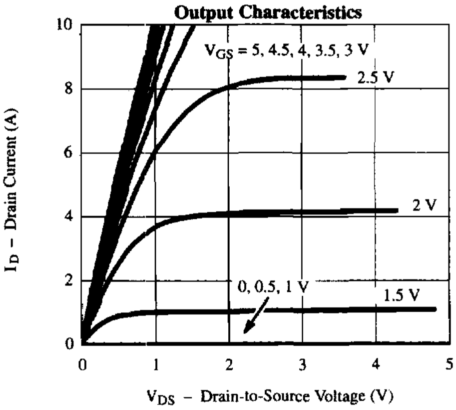
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	**Typ**	**Max**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0$ V, $I_D = -10$ μA	−12			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250$ μA	−0.45			
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 8$ V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12$ V, $V_{GS} = 0$ V			−1	μA
		$T_J = 55$°C			−10	
On-State Drain Current[c]	$I_{D(on)}$	$V_{DS} \leq -5$ V, $V_{GS} = -4.5$ V	−6			A
		$V_{DS} \leq -5$ V, $V_{GS} = -2.5$ V	−3			
Drain-Source On-Resistance[c]	$r_{DS(on)}$	$V_{GS} = -4.5$ 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[c]	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 $I_D \cong -2.8$ 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[d]						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6$ V, $R_L = 6$ Ω $I_D \cong -1.0$ 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	

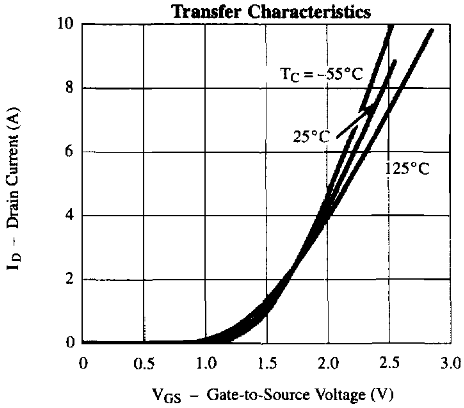
Notes

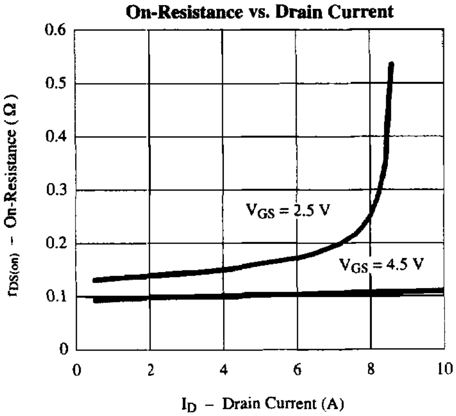
VPLR01

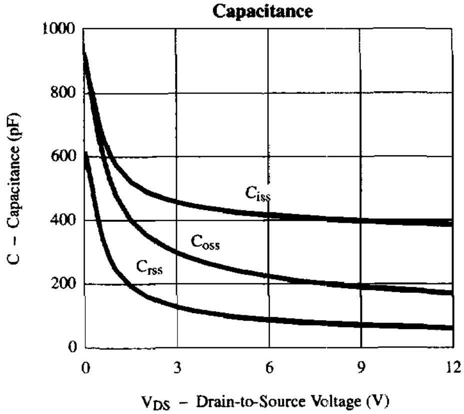
a. $T_A = 25$°C unless otherwise noted.
b. For DESIGN AID ONLY, not subject to production testing.
c. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
d. Switching time is essentially independent of operating temperature.

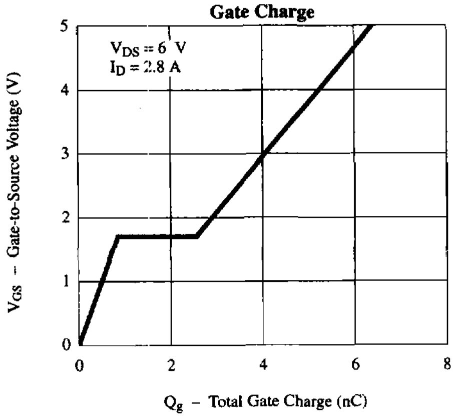
Typical Characteristics (25 °C Unless Otherwise Noted)

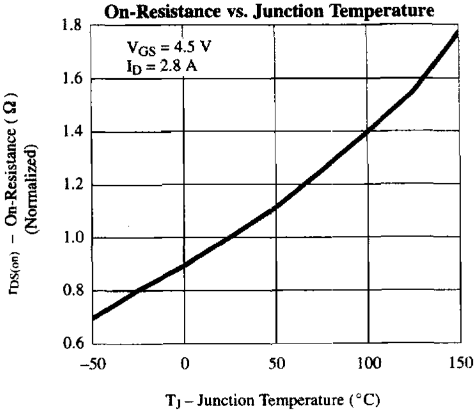

Output Characteristics


Transfer Characteristics

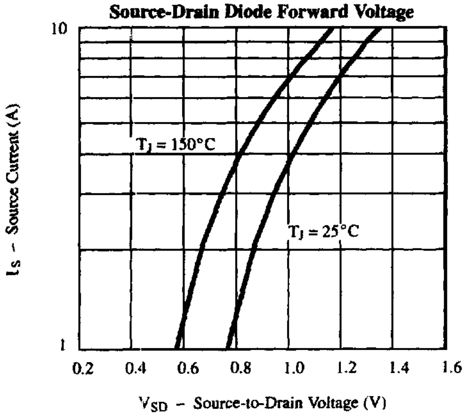

On-Resistance vs. Drain Current

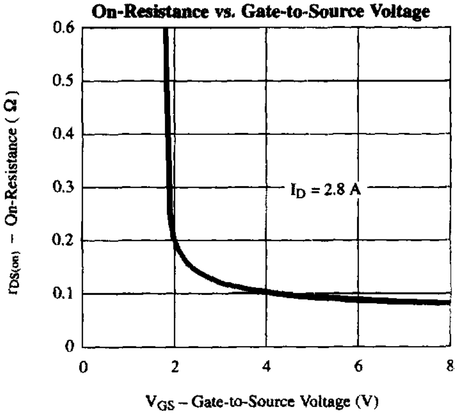

Capacitance

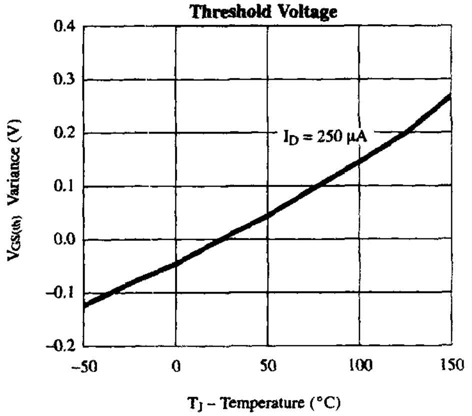

Gate Charge

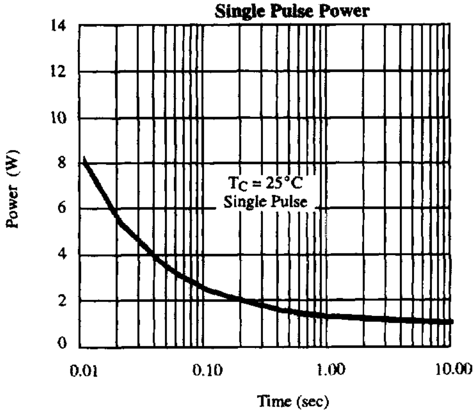

On-Resistance vs. Junction Temperature

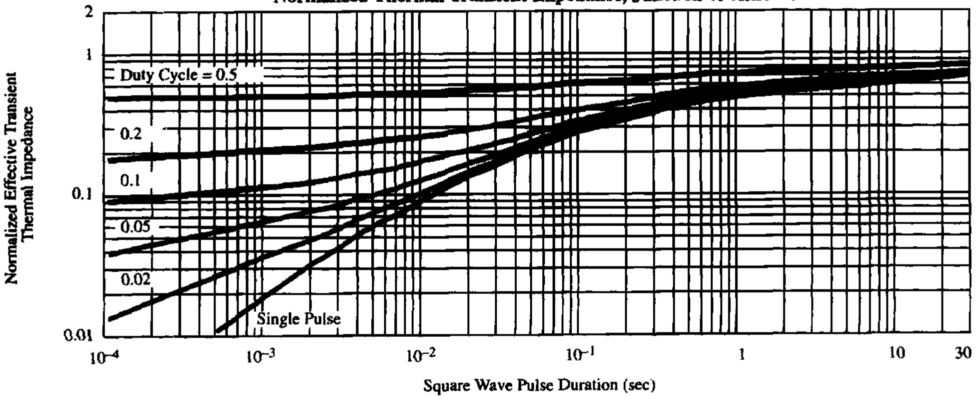
Typical Characteristics (25° C Unless Otherwise Noted)


Source-Drain Diode Forward Voltage


On-Resistance vs. Gate-to-Source Voltage


Threshold Voltage


Single Pulse Power


Normalized Thermal Transient Impedance, Junction-to-Ambient