

P-Channel 1.25-W, 1.8-V (G-S) MOSFET

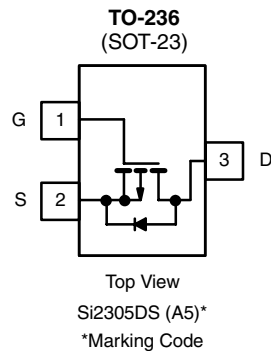
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
- 8	0.052 at $V_{GS} = - 4.5$ V	± 3.5
	0.071 at $V_{GS} = - 2.5$ V	± 3
	0.108 at $V_{GS} = - 1.8$ V	± 2

FEATURES

- TrenchFET[®] Power MOSFETs: 1.8 V Rated



RoHS*
COMPLIANT



Ordering Information: Si2305DS-T1
Si2305DS-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 8	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_A = 25$ °C	± 3.5
		$T_A = 70$ °C	± 2.8
Pulsed Drain Current	I_{DM}	± 12	A
Continuous Source Current (Diode Conduction) ^{a, b}	I_S	- 1.6	
Maximum Power Dissipation ^{a, b}	P_D	$T_A = 25$ °C	1.25
		$T_A = 70$ °C	0.8
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 5$ sec		100	°C/W
		Steady State	130		

Notes:

a. Surface Mounted on FR4 Board.

b. $t \leq 5$ sec.

* Pb containing terminations are not RoHS compliant, exemptions may apply.

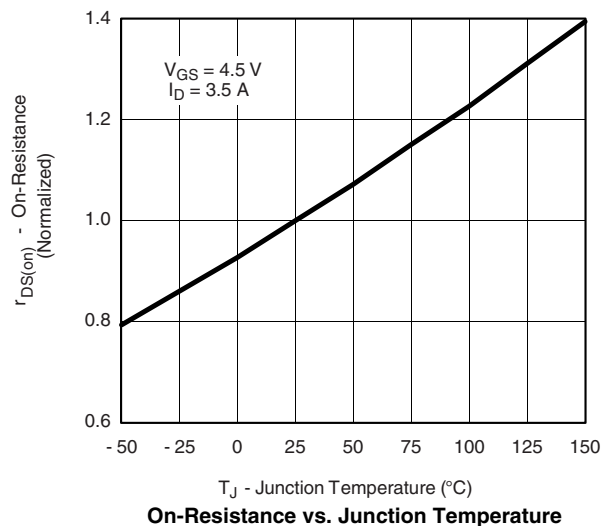
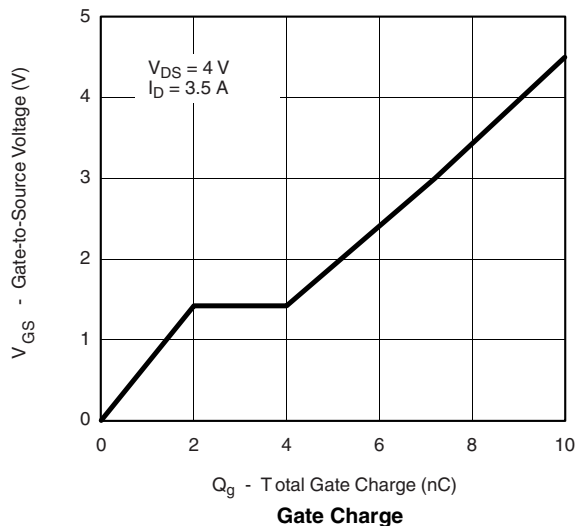
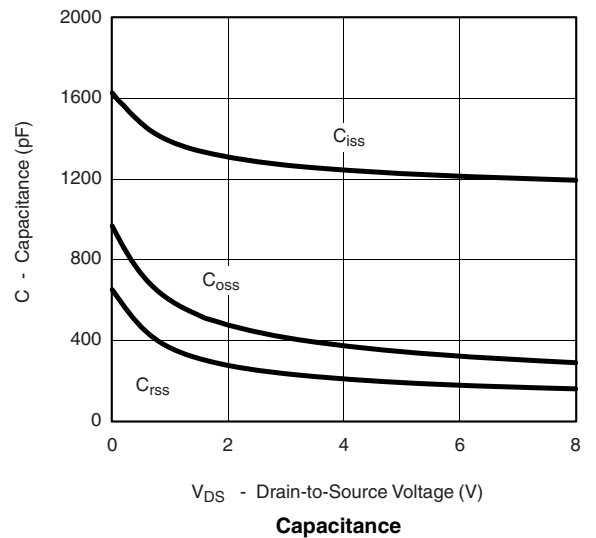
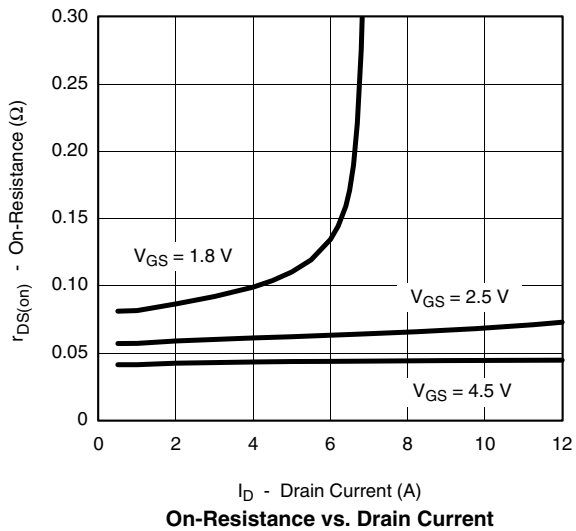
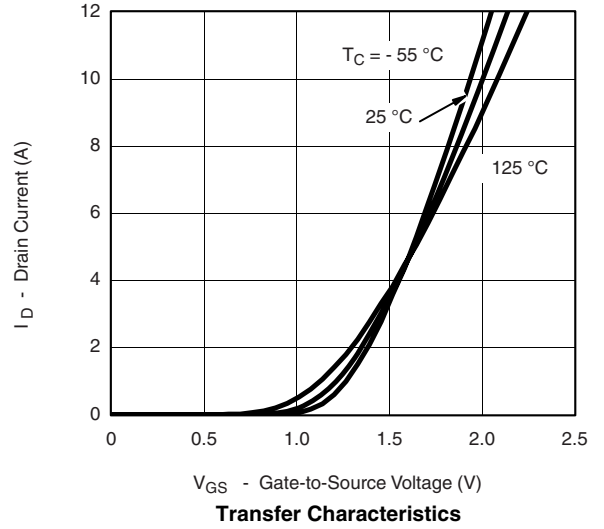
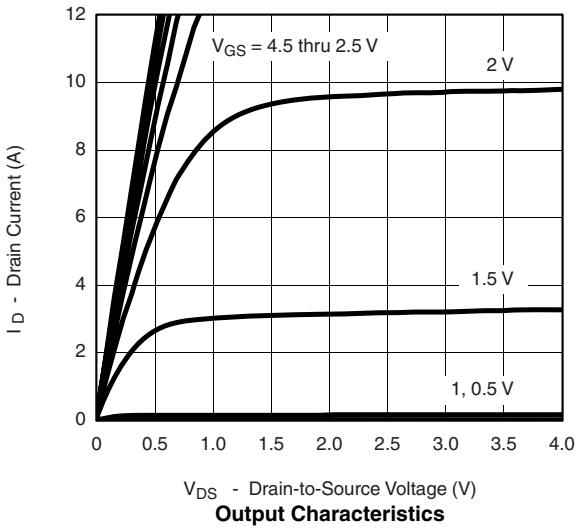
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$	- 8			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 0.45		- 0.8	V
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}	$V_{DS} = -8\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -8\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			- 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-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -3.5\text{ A}$		0.044	0.052	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -3\text{ A}$		0.060	0.071	
		$V_{GS} = -1.8\text{ V}, I_D = -2\text{ A}$		0.087	0.108	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -3.5\text{ A}$		8.5		S
Diode Forward Voltage	V_{SD}	$I_S = -1.6\text{ A}, V_{GS} = 0\text{ V}$			- 1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -4\text{ V}, V_{GS} = -4.5\text{ V}, I_D \cong -3.5\text{ A}$		10	15	nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2		
Input Capacitance	C_{iss}	$V_{DS} = -4\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1245		pF
Output Capacitance	C_{oss}			375		
Reverse Transfer Capacitance	C_{rss}			210		
Switching^b						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -4\text{ V}, R_L = 4\text{ }\Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 6\text{ }\Omega$		13	20	ns
	t_r			25	40	
Turn-Off Time	$t_{d(off)}$			55	80	
	t_f			19	35	

Notes:

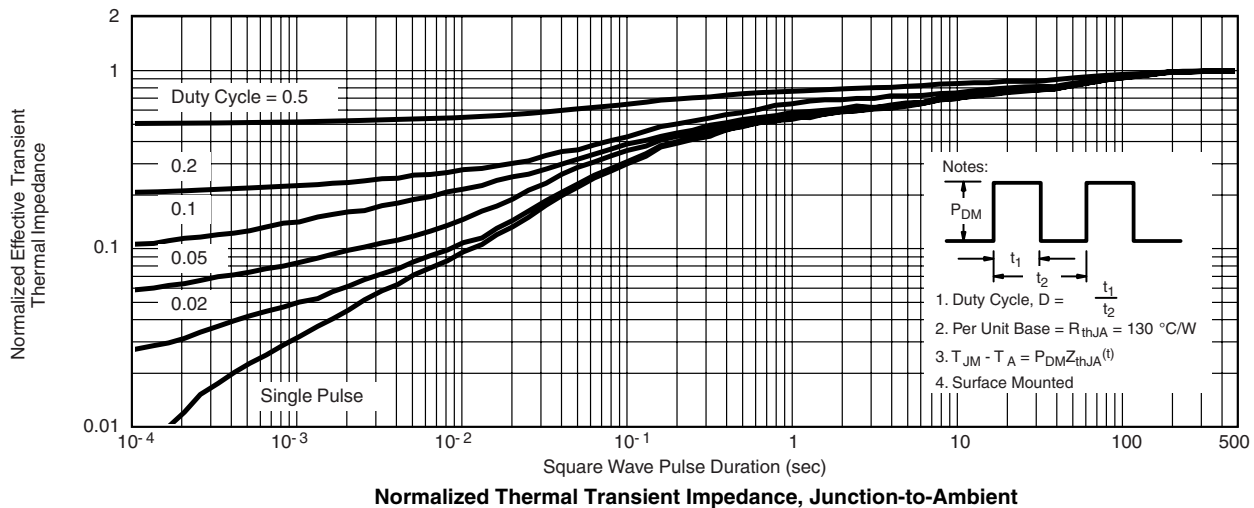
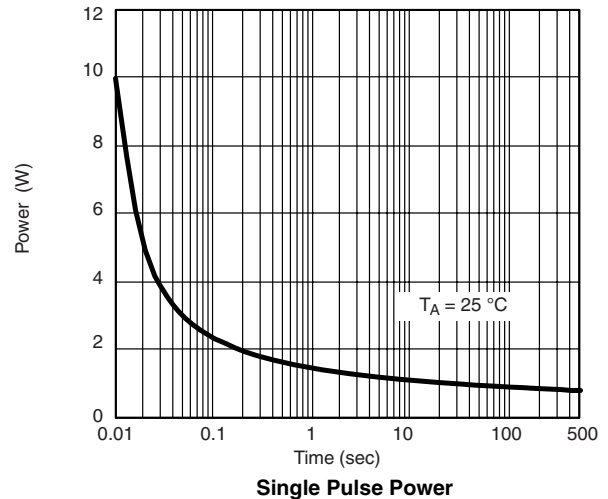
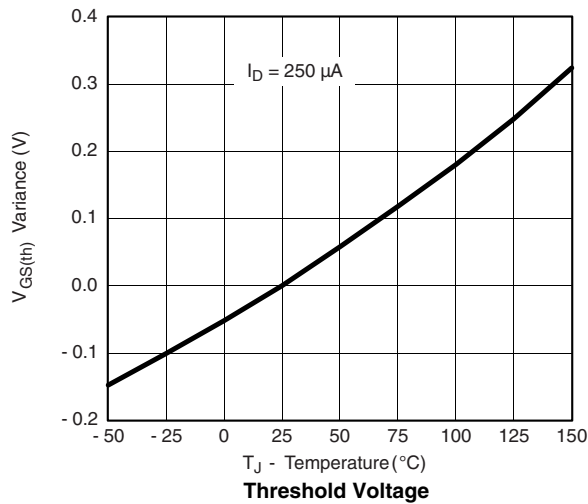
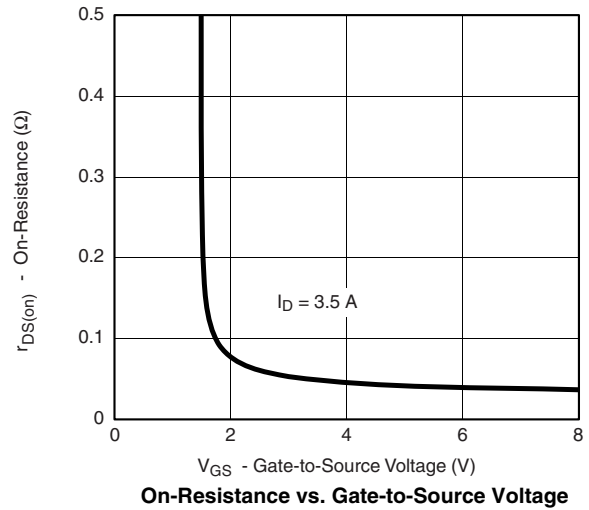
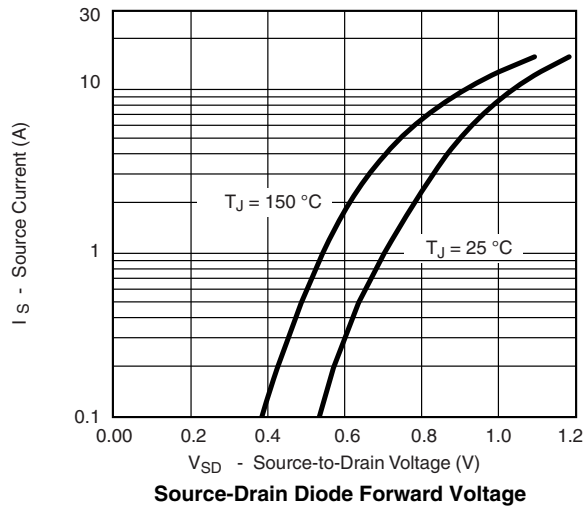
- a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
c. Switching time is essentially independent of operating temperature.

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 noted



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