

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

PRODUCT SUMMARY

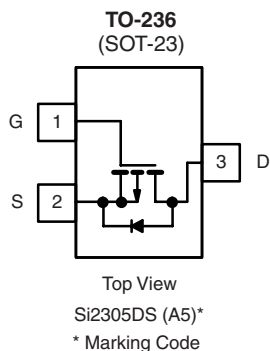
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 8	0.052 at $V_{GS} = - 4.5$ V	± 3.5
	0.071 at $V_{GS} = - 2.5$ V	± 3
	0.108 at $V_{GS} = - 1.8$ V	± 2

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFETs: 1.8 V Rated



RoHS*
COMPLIANT
HALOGEN
FREE
Available



Ordering Information: Si2305DS-T1
Si2305DS-T1-E3 (Lead (Pb)-free)
Si2305DS-T1-GE3 (Lead (Pb)-free and Halogen-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	A
		$T_A = 70$ °C ± 2.8	
Pulsed Drain Current	I_{DM}	± 12	
Continuous Source Current (Diode Conduction) ^{a, b}	I_S	- 1.6	
Maximum Power Dissipation ^{a, b}	P_D	$T_A = 25$ °C 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	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 5$ s	100	°C/W
		Steady State	130	

Notes:

a. Surface Mounted on FR4 board.

b. $t \leq 5$ s.

* 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	
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	

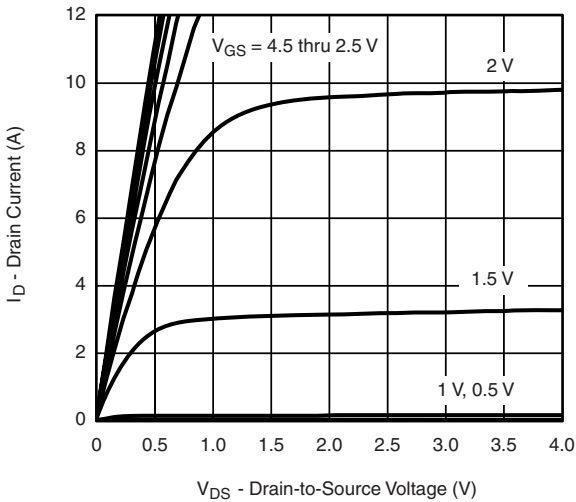
Notes:

- 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.

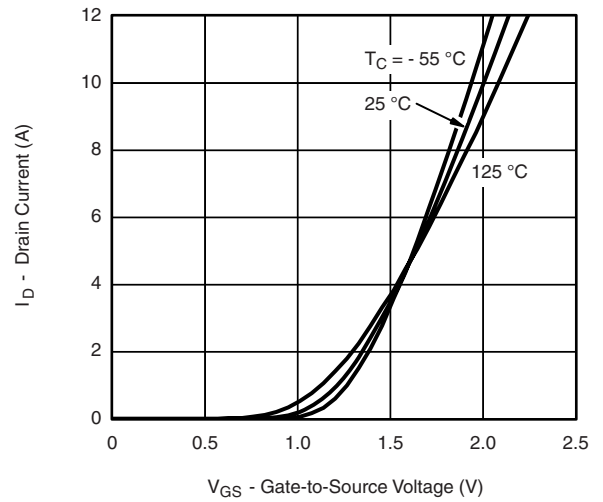
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



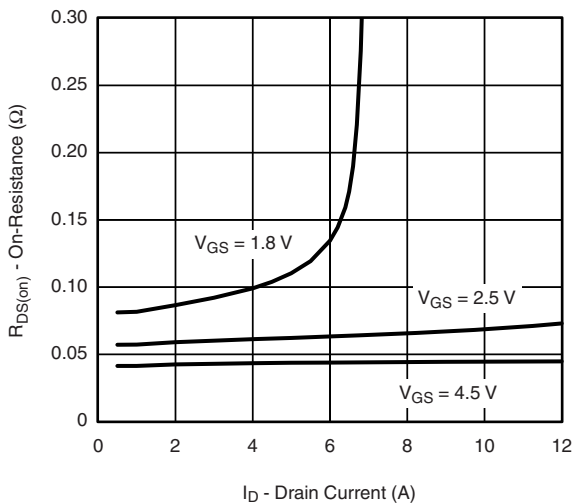
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



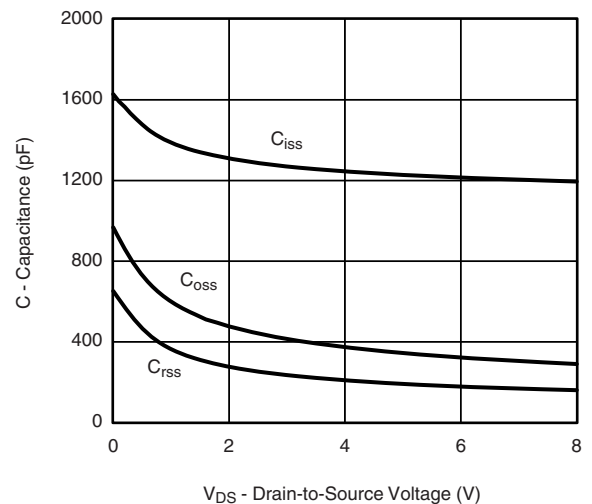
Output Characteristics



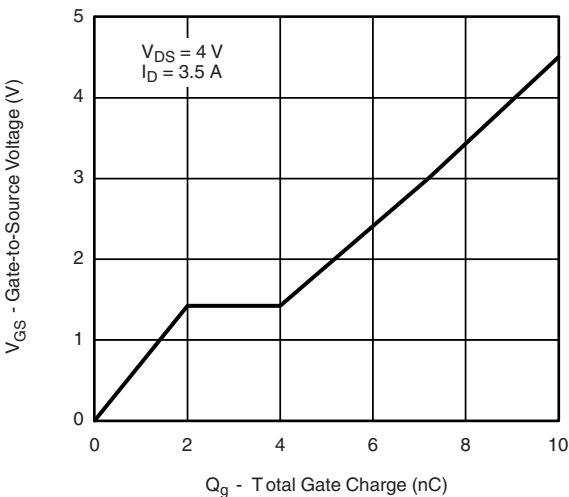
Transfer Characteristics



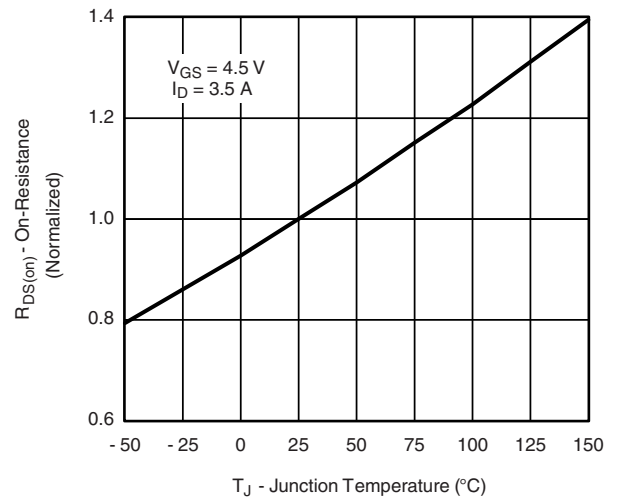
On-Resistance vs. Drain Current



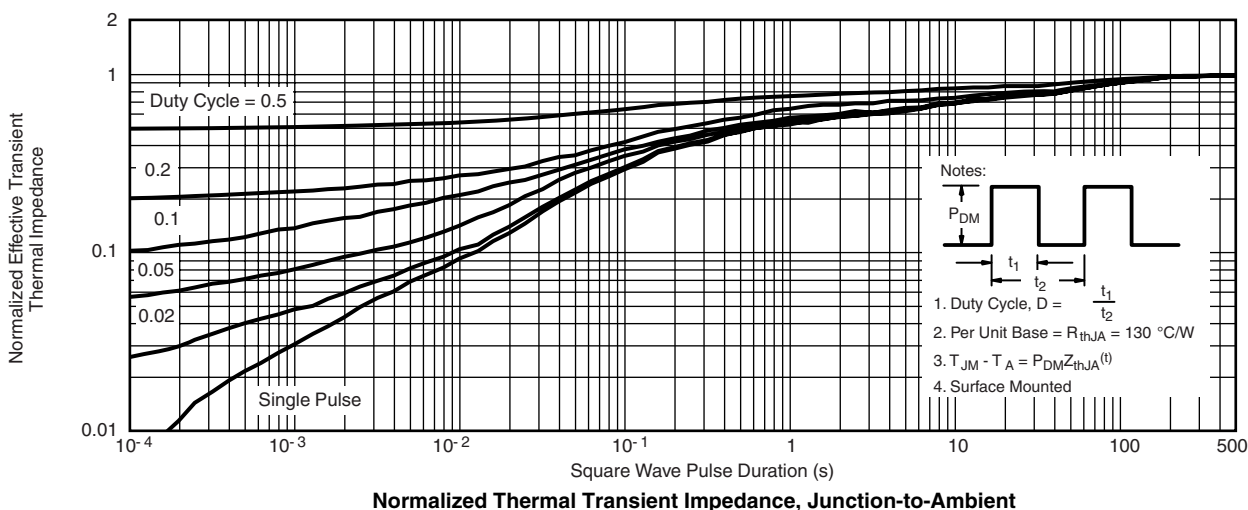
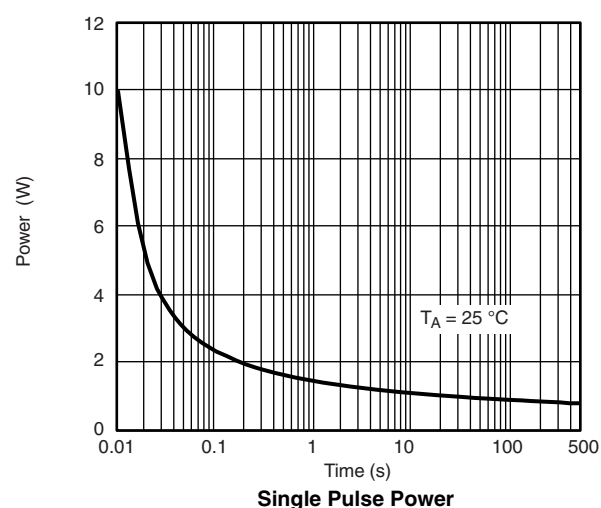
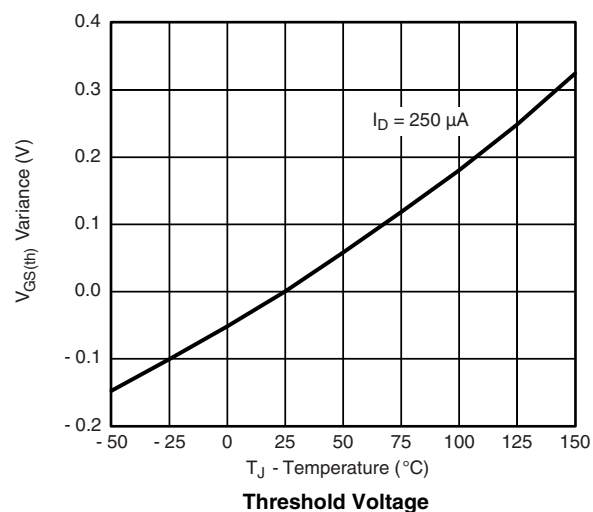
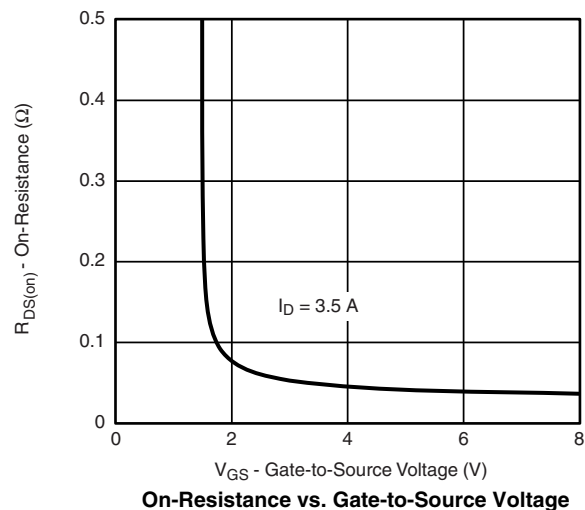
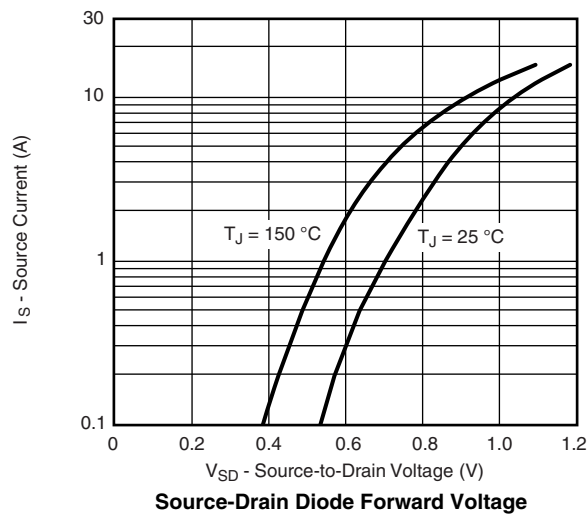
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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