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

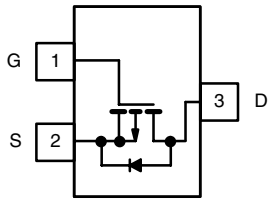
FEATURES

- TrenchFET® Power MOSFETs: 1.8 V Rated

Pb-free Available

RoHS* COMPLIANT

TO-236
(SOT-23)



Top View
Si2305DS (A5)*
*Marking Code

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)	T_A = 25 °C	I_D	± 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]	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**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 5 sec	R_{thJA}		100	°C/W
	Steady State		130		

Notes:
a. Surface Mounted on FR4 Board.
b. t ≤ 5 sec.

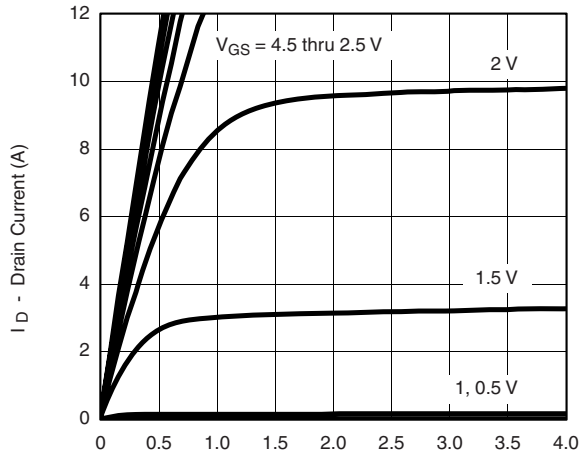
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
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	- 8			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.45		- 0.8	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 8 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 8 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 4.5 V	- 6			A
		$V_{DS} \leq$ - 5 V, V_{GS} = - 2.5 V	- 3			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 3.5 A		0.044	0.052	Ω
		V_{GS} = - 2.5 V, I_D = - 3 A		0.060	0.071	
		V_{GS} = - 1.8 V, I_D = - 2 A		0.087	0.108	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 3.5 A		8.5		S
Diode Forward Voltage	V_{SD}	I_S = - 1.6 A, V_{GS} = 0 V			- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 4 V, V_{GS} = - 4.5 V, $I_D \cong$ - 3.5 A		10	15	nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2		
Input Capacitance	C_{iss}	V_{DS} = - 4 V, V_{GS} = 0 V, f = 1 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 V, R_L = 4 Ω $I_D \cong$ - 1.0 A, V_{GEN} = - 4.5 V, R_G = 6 Ω		13	20	ns
	t_r			25	40	
Turn-Off Time	$t_{d(off)}$			55	80	
	t_f			19	35	

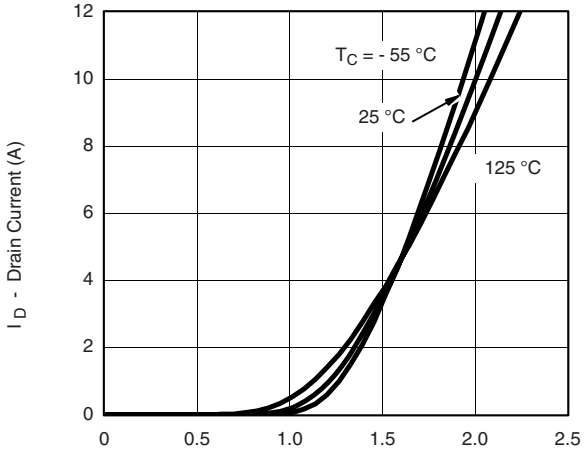
Notes:
a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤ 300 µs, duty cycle ≤ 2 %.
c. Switching time is essentially independent of operating temperature.

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.

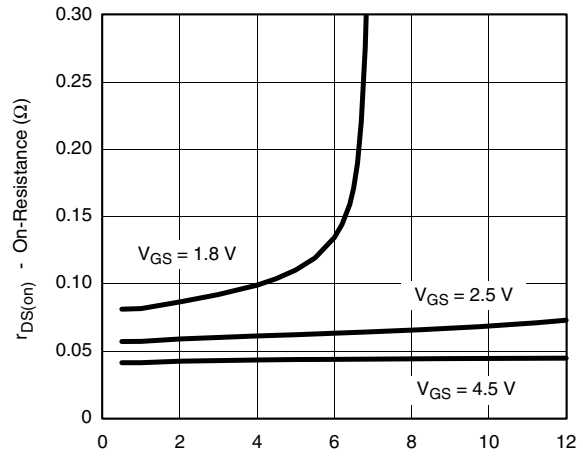
TYPICAL CHARACTERISTICS 25 °C, unless noted



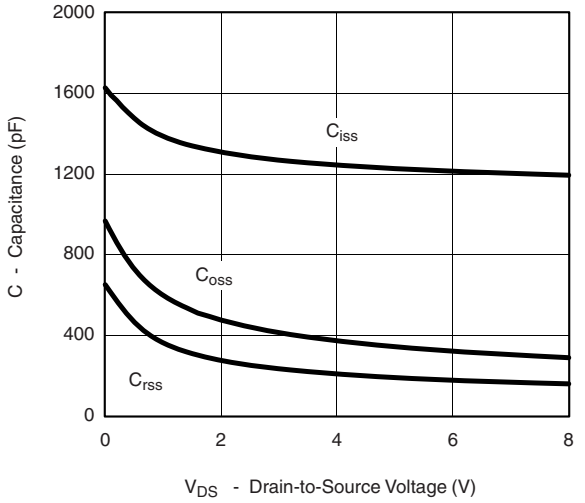
Output Characteristics



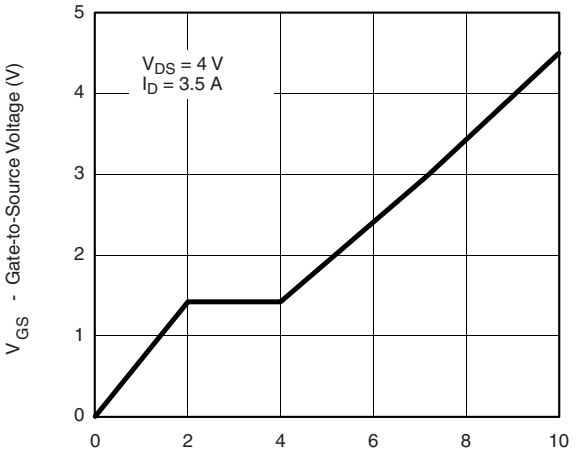
Transfer Characteristics



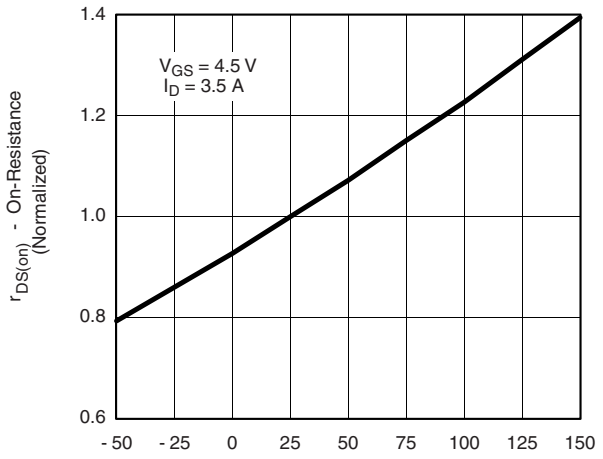
On-Resistance vs. Drain Current



Capacitance

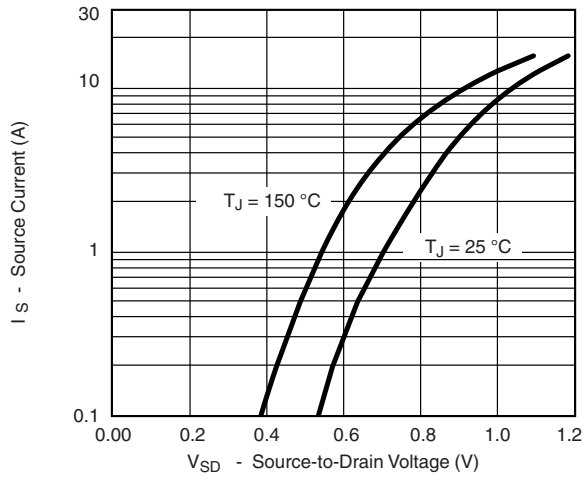


Gate Charge

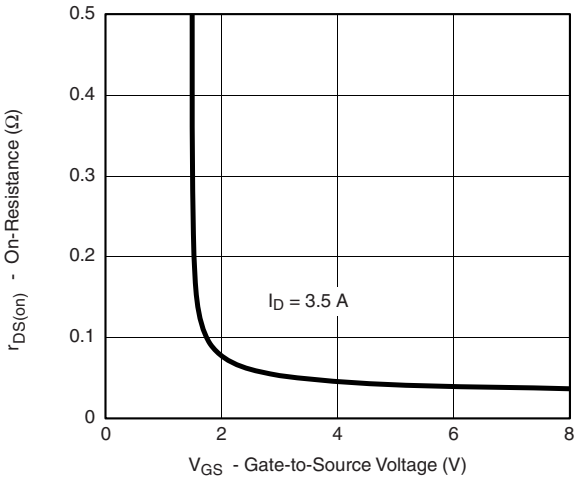


On-Resistance vs. Junction Temperature

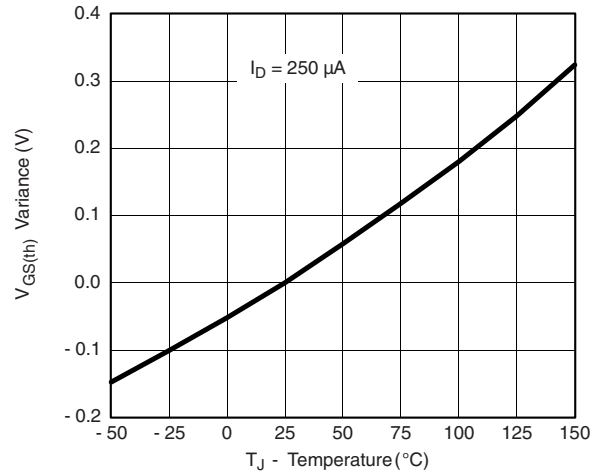
TYPICAL CHARACTERISTICS 25 °C, unless noted



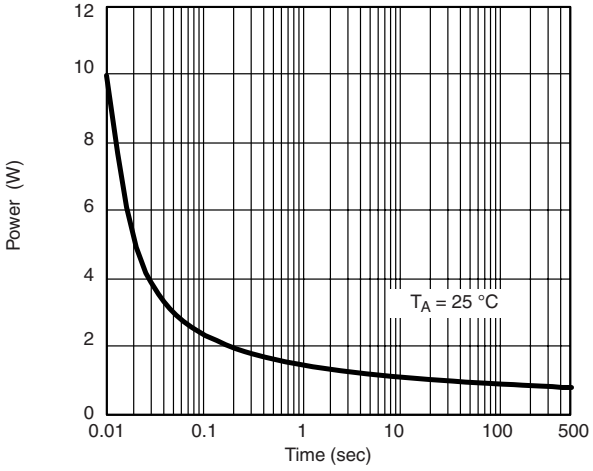
Source-Drain Diode Forward Voltage



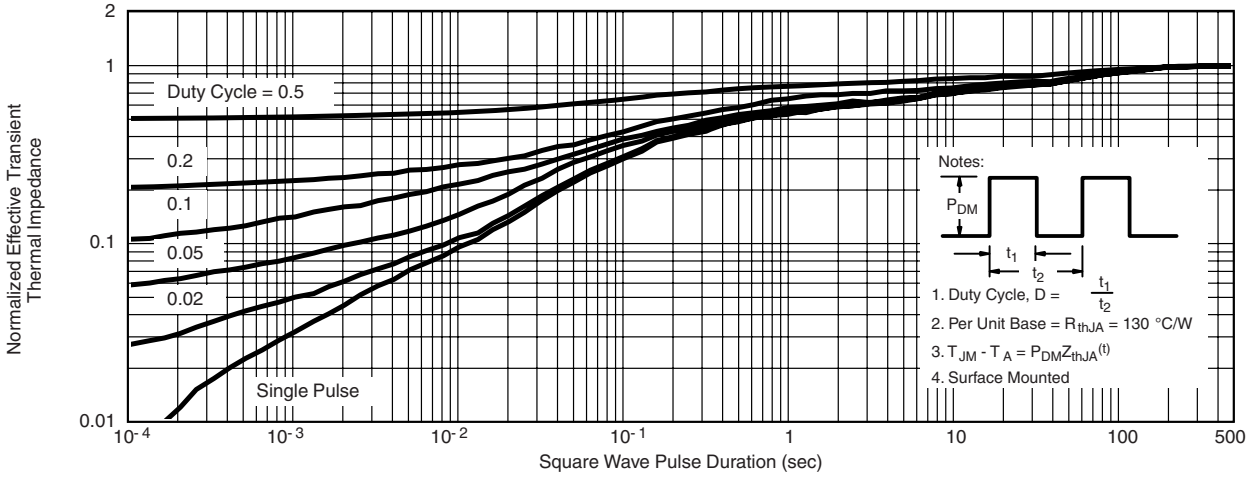
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

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