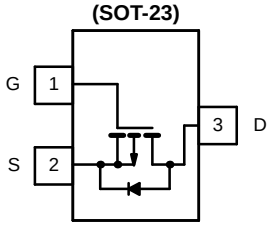
P-Channel 1.25-W, 1.8-V (G-S) MOSFET

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

TrenchFET® Power MOSFETs
1.8-V Rated

TO-236
(SOT-23)



Top View
Si2305DS (A5)*
*Marking Code

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.

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

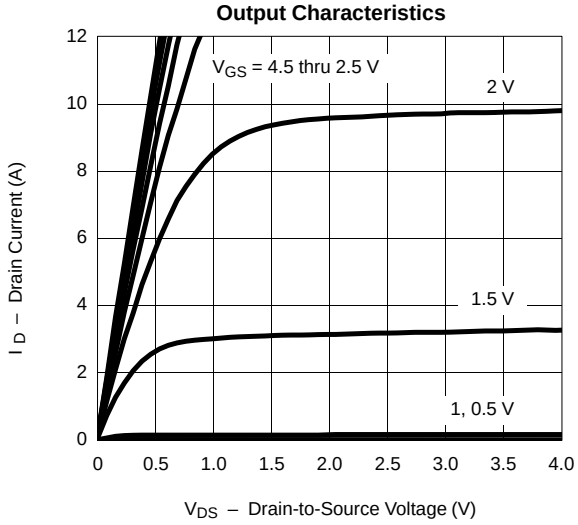
Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –10 μA	–8			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 μA	–0.45			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –6.4 V, V_{GS} = 0 V			–1	μA
		V_{DS} = –6.4 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 = –3.5 A		0.044	0.052	Ω
		V_{GS} = –2.5 V, I_D = –3 A		0.060	0.071	Ω
		V_{GS} = –1.8 V, I_D = –2 A		0.087	0.108	Ω
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 ≅ –3.5 A		10	15	nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			2		nC
Input Capacitance	C_{iss}	V_{DS} = –4 V, V_{GS} = 0, f = 1 MHz		1245		pF
Output Capacitance	C_{oss}			375		pF
Reverse Transfer Capacitance	C_{rss}			210		pF
Switching[b]						
Turn-On Time	$t_{d(on)}$	V_{DD} = –4 V, R_L = 4 Ω I_D ≅ –1.0 A, V_{GEN} = –4.5 V R_G = 6 Ω		13	20	ns
	t_r			25	40	ns
Turn-Off Time	$t_{d(off)}$			55	80	ns
	t_f			19	35	ns

Notes

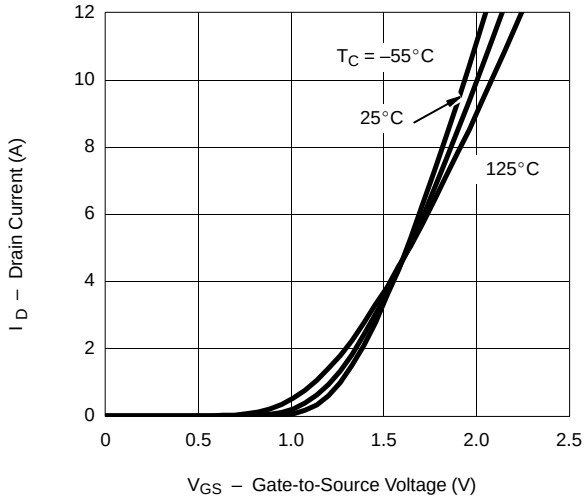
a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤300 μs duty cycle ≤2%.
c. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

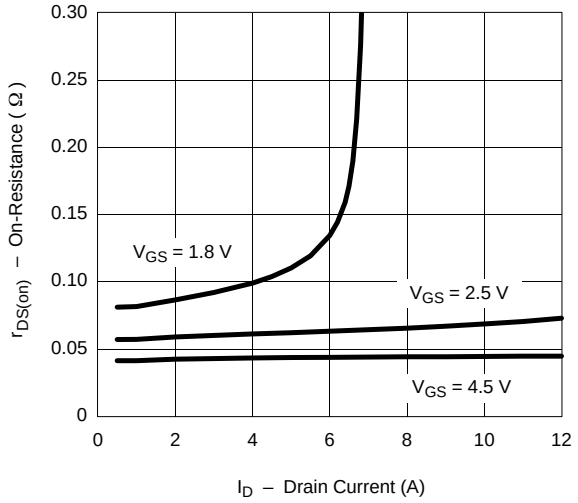
Output Characteristics



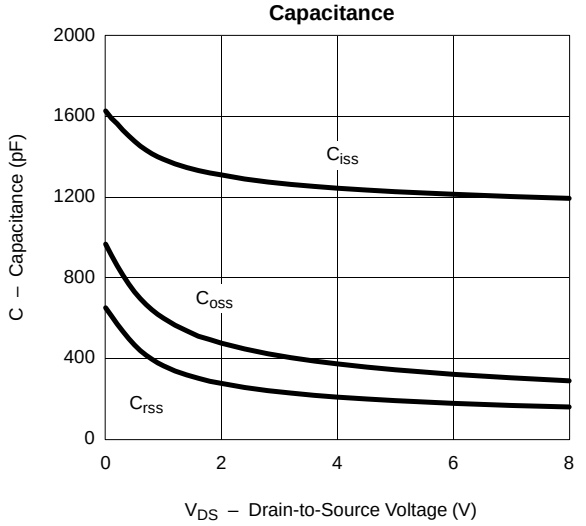
Transfer Characteristics



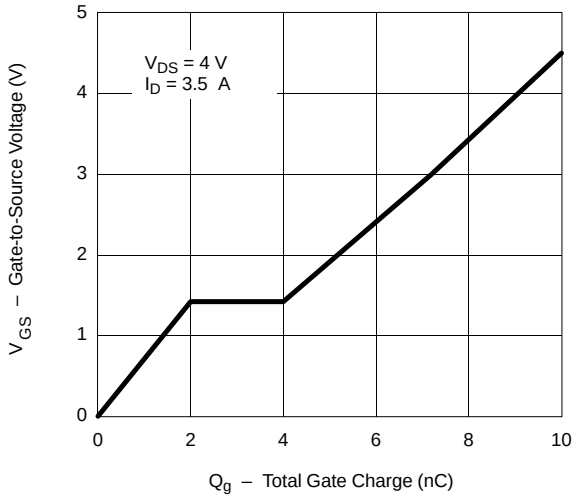
On-Resistance vs. Drain Current



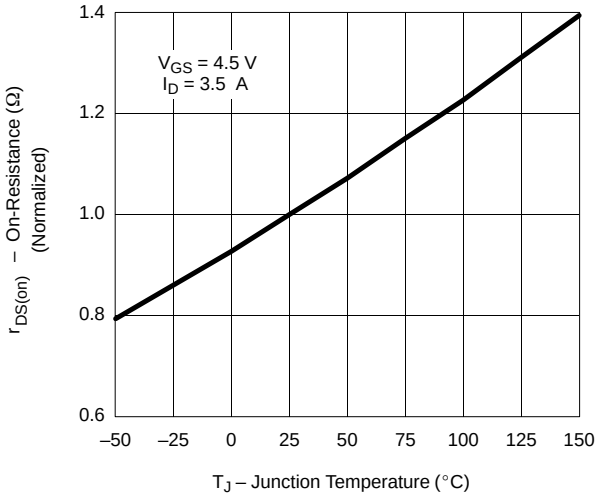
Capacitance



Gate Charge

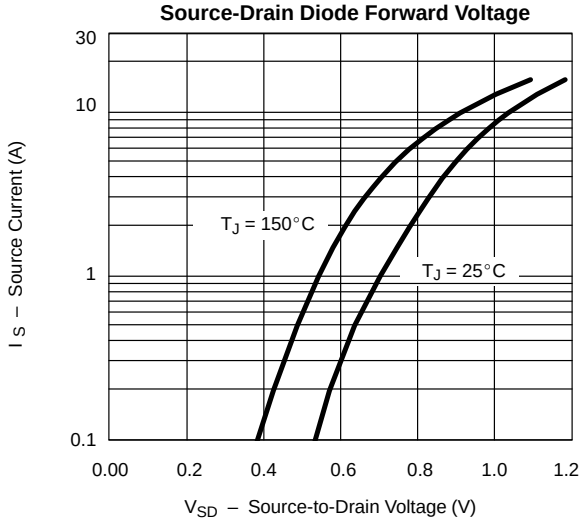


On-Resistance vs. Junction Temperature

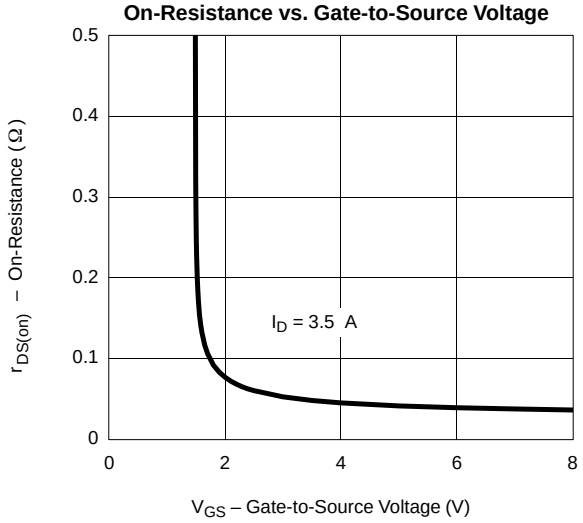


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

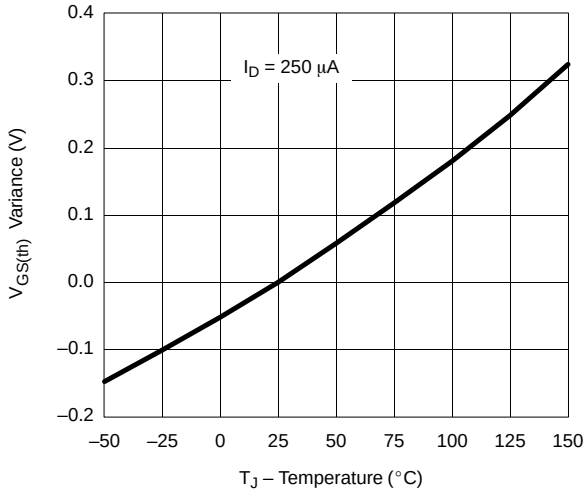
Source-Drain Diode Forward Voltage



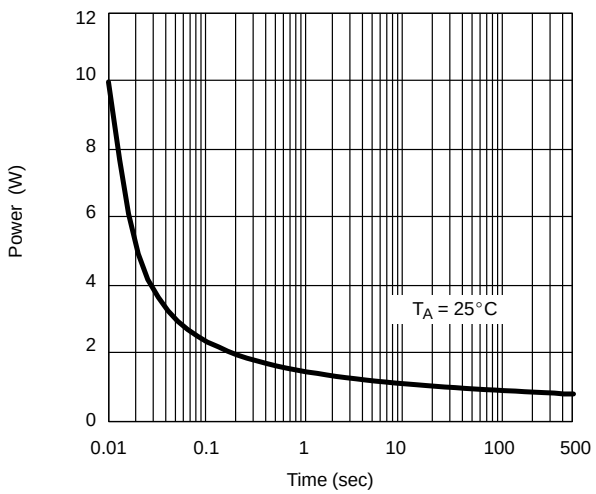
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

