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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
- 20	0.070 at V_{GS} = - 4.5 V	± 3.5
	0.090 at V_{GS} = - 2.5 V	± 2

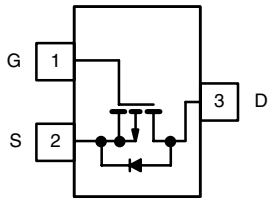
FEATURES

Power MOSFETs: 1.8 V Rated

Pb-free Available

RoHS* COMPLIANT

TO-236
(SOT-23)



Top View

2305

*Marking Code

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	- 20	V
Gate-Source Voltage		V_{GS}	± 12	
Continuous Drain Current (T_J = 150 °C)	T_A = 25 °C	I_D	± 3.5	A
	T_A = 70 °C		± 2.0	
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

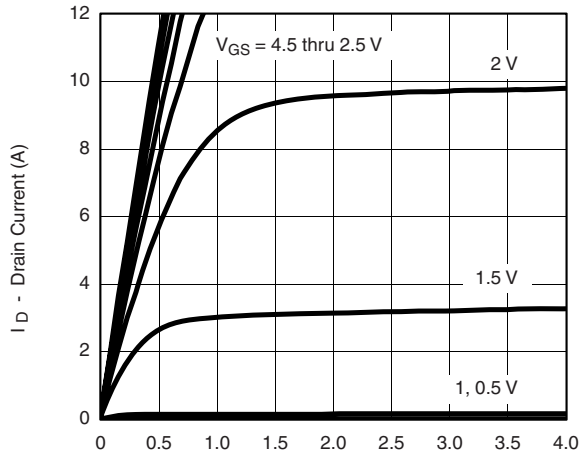
THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 5 sec	R_{thJA}		100	°C/W
	Steady State		130		

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

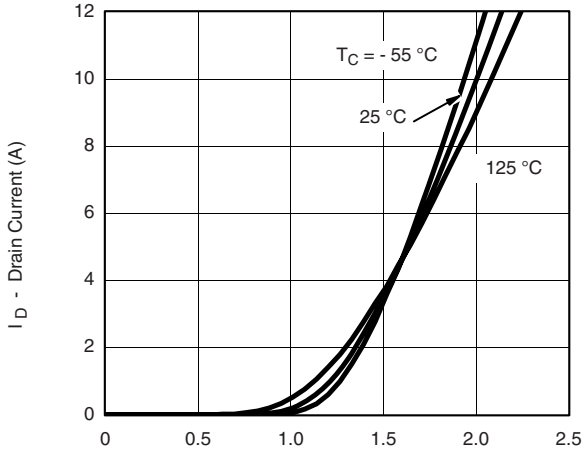
SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Limits**			**Unit**
			Min	**Typ**	**Max**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = - 10 µA	- 20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.45		- 1	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 16 V, V_{GS} = 0 V			- 50	nA
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	0.070	Ω
		V_{GS} = - 2.5 V, I_D = - 2 A		0.060	0.090	
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.

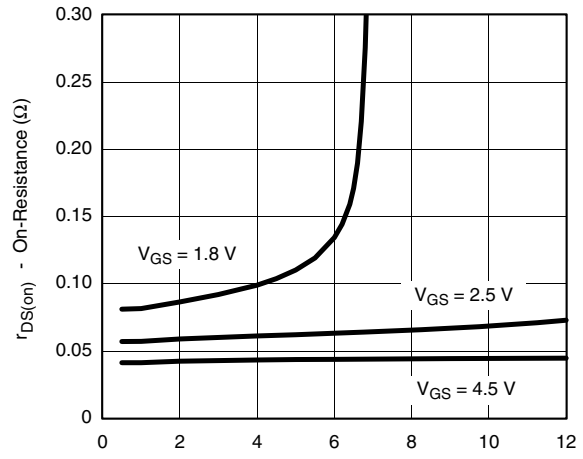
TYPICAL CHARACTERISTICS 25 °C, unless noted



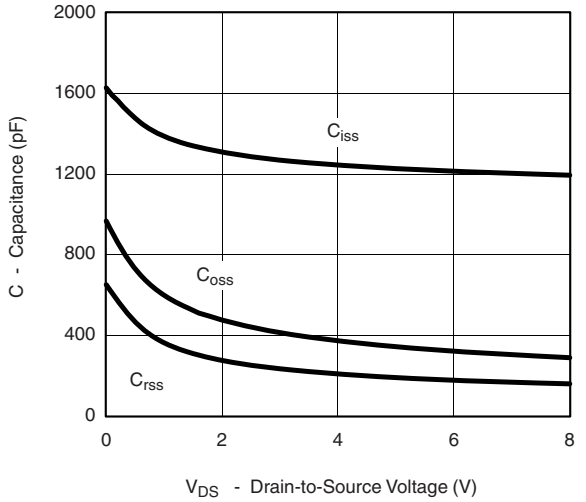
Output Characteristics



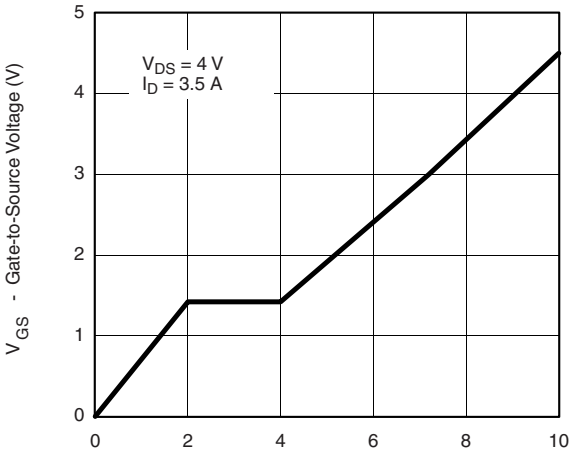
Transfer Characteristics



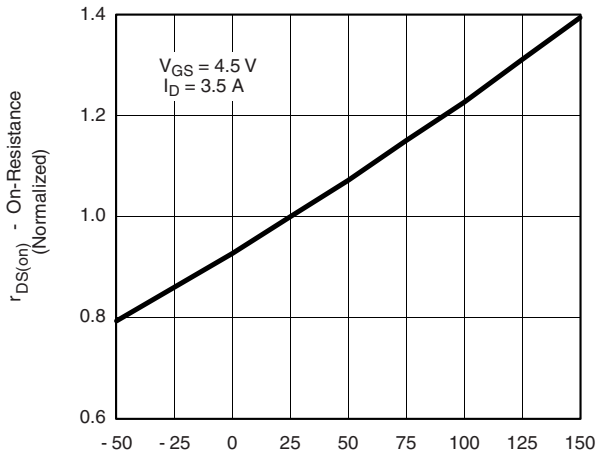
On-Resistance vs. Drain Current



Capacitance

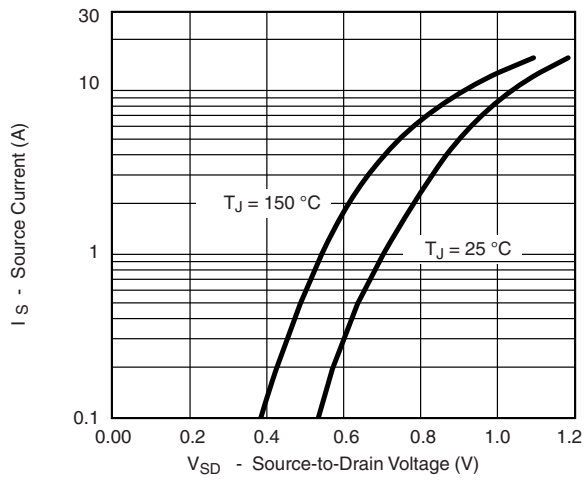


Gate Charge

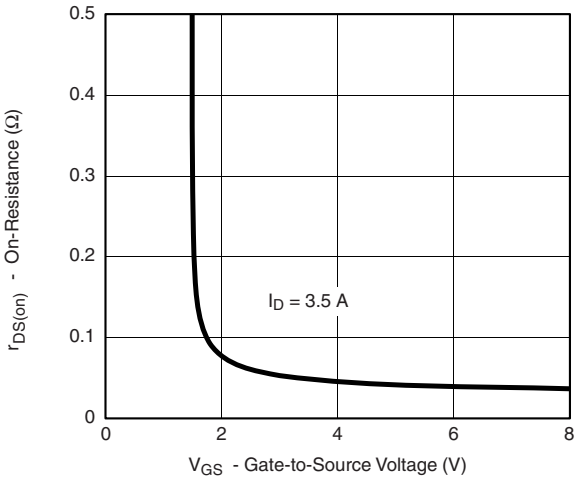


On-Resistance vs. Junction Temperature

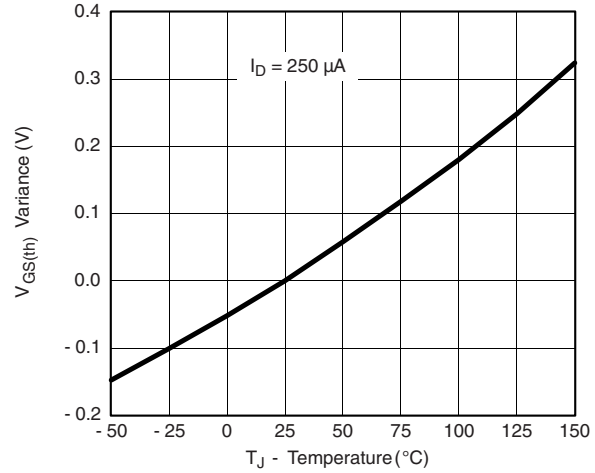
TYPICAL CHARACTERISTICS 25 °C, unless noted



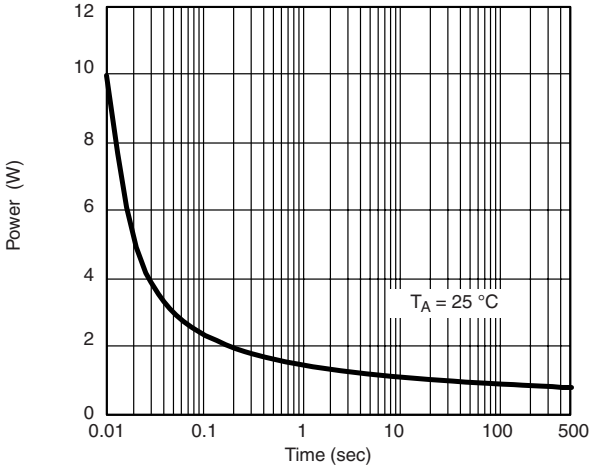
Source-Drain Diode Forward Voltage



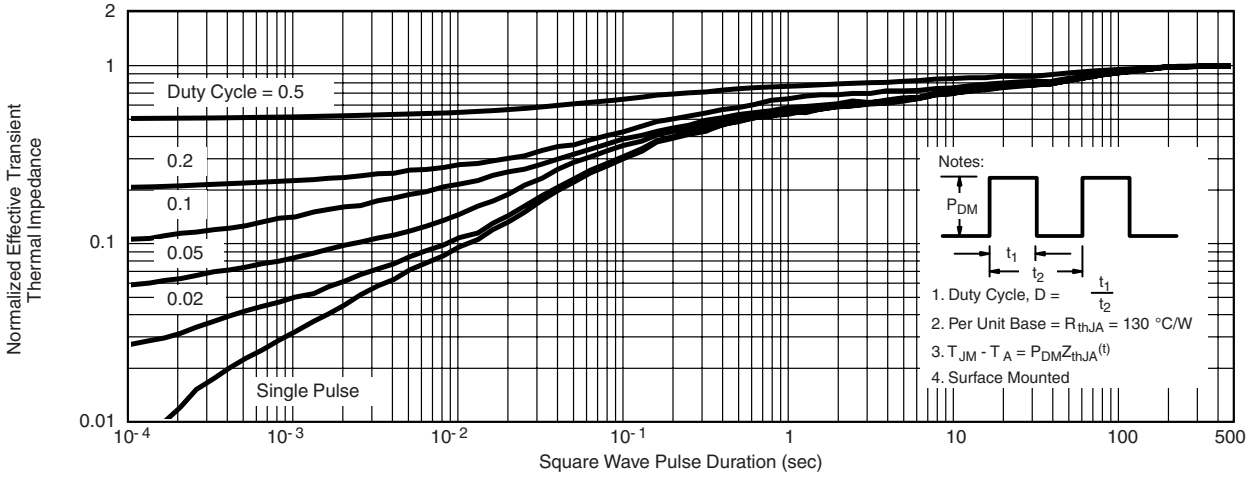
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient