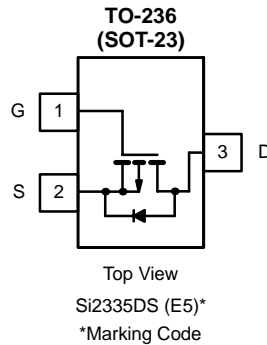




## P-Channel 12-V (D-S) MOSFET

**TrenchFET<sup>®</sup>**  
Power MOSFETs  
1.8-V Rated

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-12	0.051 @ $V_{GS} = -4.5$ V	-4.0
	0.070 @ $V_{GS} = -2.5$ V	-3.5
	0.106 @ $V_{GS} = -1.8$ V	-3.0



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-12		V
Gate-Source Voltage		$V_{GS}$	$\pm 8$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-4.0	-3.2	A
	$T_A = 70^\circ\text{C}$		-3.3	-2.6	
Pulsed Drain Current		$I_{DM}$	-15		
Continuous Source Current (Diode Conduction) <sup>a, b</sup>		$I_S$	-1.6		
Maximum Power Dissipation <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	1.25	0.75	W
	$T_A = 70^\circ\text{C}$		0.8	0.48	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	75	100	$^\circ\text{C/W}$
	Steady State		120	166	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	40	50	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature.



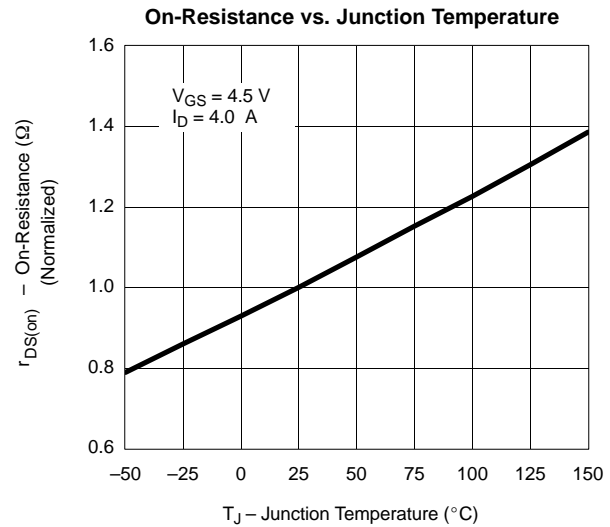
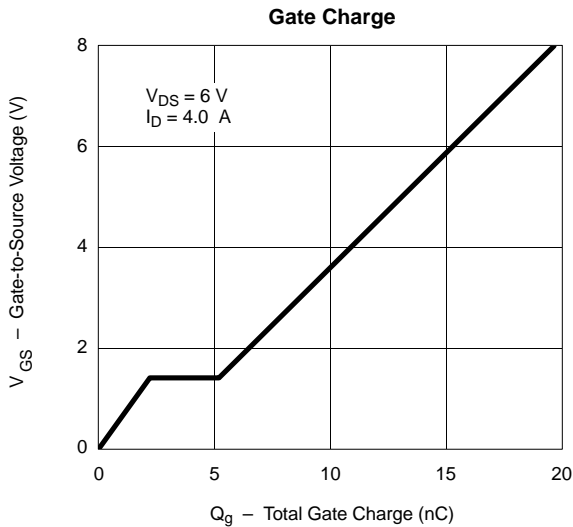
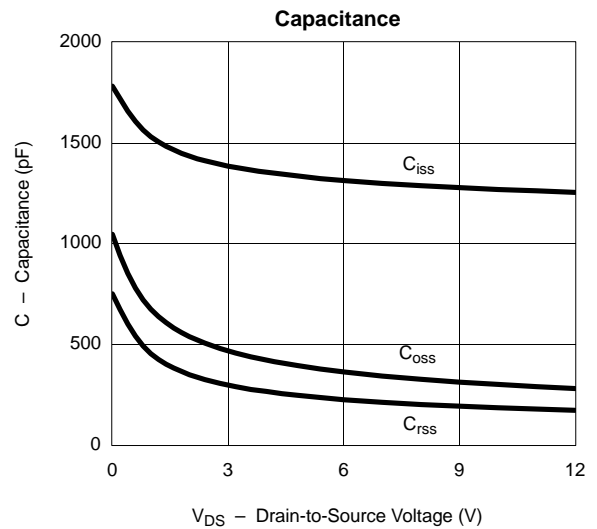
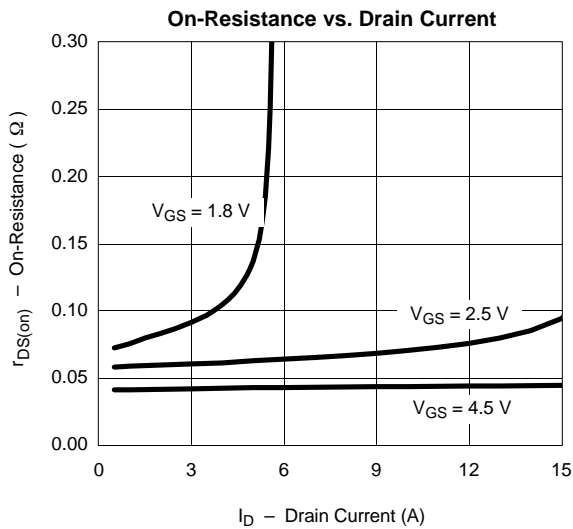
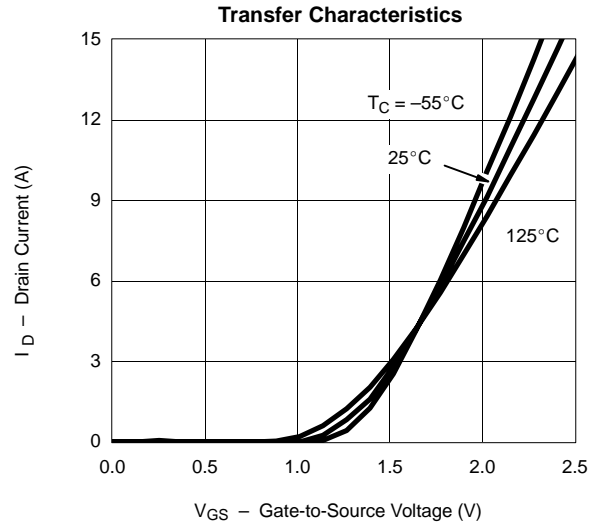
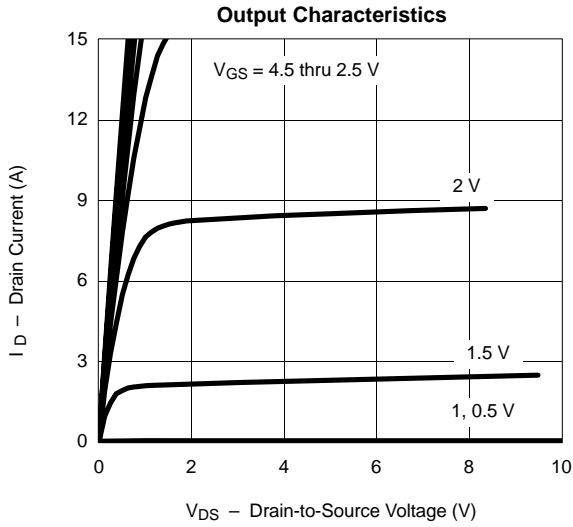
SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\ \mu\text{A}$	-12			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-0.45			
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -9.6\text{ V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -9.6\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	-15			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -2.5\text{ V}$	-6			
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -4.0\text{ A}$		0.042	0.051	$\Omega$
		$V_{GS} = -2.5\text{ V}, I_D = -3.5\text{ A}$		0.058	0.070	
		$V_{GS} = -1.8\text{ V}, I_D = -2.0\text{ A}$		0.082	0.106	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -5\text{ V}, I_D = -4.0\text{ A}$		7		S
Diode Forward Voltage	$V_{SD}$	$I_S = -1.6\text{ A}, V_{GS} = 0\text{ V}$			-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}$ $I_D \cong -4.0\text{ A}$		9	15	nC
Gate-Source Charge	$Q_{gs}$			1.9		
Gate-Drain Charge	$Q_{gd}$			1.5		
Input Capacitance	$C_{iss}$	$V_{DS} = -6\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$		1225		pF
Output Capacitance	$C_{oss}$			260		
Reverse Transfer Capacitance	$C_{rss}$			130		
<b>Switching<sup>c</sup></b>						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}, R_L = 6\ \Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_G = 6\ \Omega$		13.0	20	ns
	$t_r$			15	25	
Turn-Off Time	$t_{d(off)}$			50	70	
	$t_f$			19	35	

## Notes

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



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

