



N-Channel 20-V (D-S) Fast Switching MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.0045 @ $V_{GS} = 4.5$ V	22
	0.0075 @ $V_{GS} = 2.5$ V	19

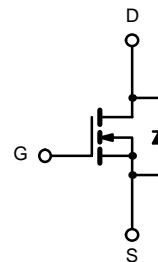
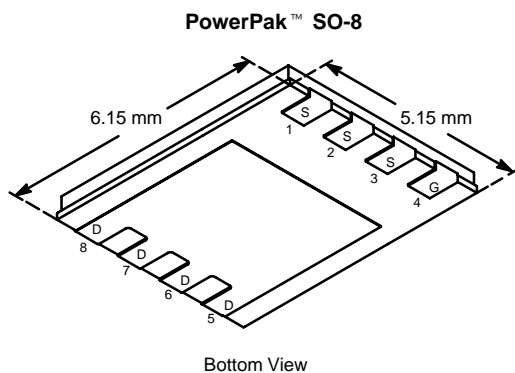
FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK™ Package with Low 1.07-mm Profile

APPLICATIONS

- Synchronous Rectifier—Low Output Voltage
- Portable Computer Battery Selection or Protection

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N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V_{DS}	20		V	
Gate-Source Voltage	V_{GS}	± 12			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	22	13.4	A
		$T_A = 70^\circ\text{C}$	17.6	10.7	
Pulsed Drain Current	I_{DM}	50			
Continuous Source Current (Diode Conduction) ^a	I_S	4.3	1.6		
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	5.2	1.9	W
		$T_A = 70^\circ\text{C}$	3.3	1.2	
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 ^a	R_{thJA}	$t \leq 10$ sec	18	23	$^\circ\text{C}/\text{W}$
		Steady State	50	65	
Maximum Junction-to-Case (Drain)	R_{thJC}	1.0	1.5		

Notes

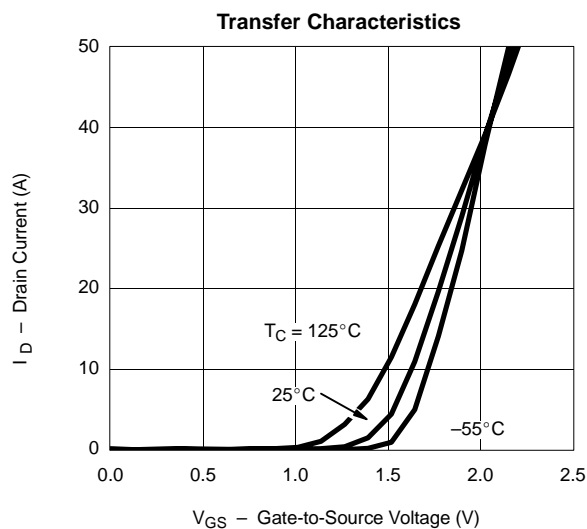
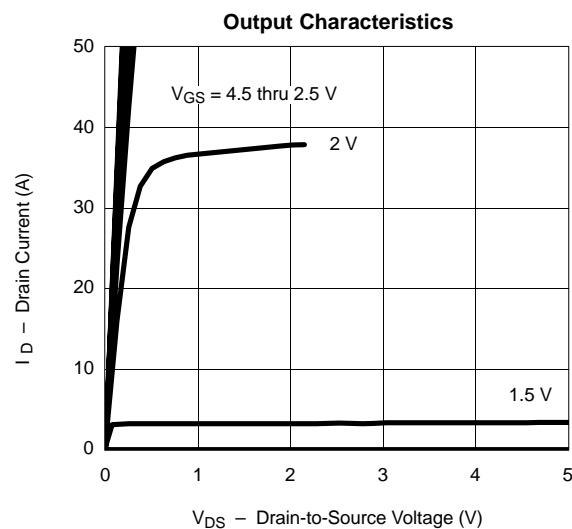
a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.6		1.4	V
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			1	μA
		V _{DS} = 16 V, V _{GS} = 0 V, T _J = 85 °C			20	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	50			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 22 A		0.0035	0.0045	Ω
		V _{GS} = 2.5 V, I _D = 19 A		0.006	0.0075	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 22 A		90		S
Diode Forward Voltage ^a	V _{SD}	I _S = 3 A, V _{GS} = 0 V		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 21 A		38	50	nC
Gate-Source Charge	Q _{gs}			8		
Gate-Drain Charge	Q _{gd}			8.5		
Gate-Resistance	R _G			0.9		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 10 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		22	35	ns
Rise Time	t _r			22	35	
Turn-Off Delay Time	t _{d(off)}			125	190	
Fall Time	t _f			60	90	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 3 A, di/dt = 100 A/μs		60	90	

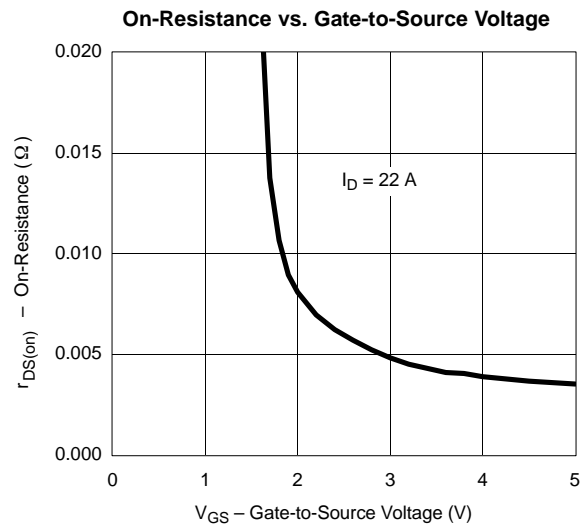
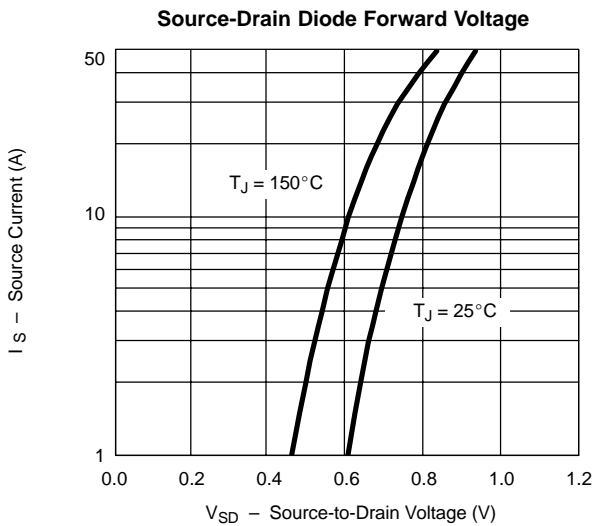
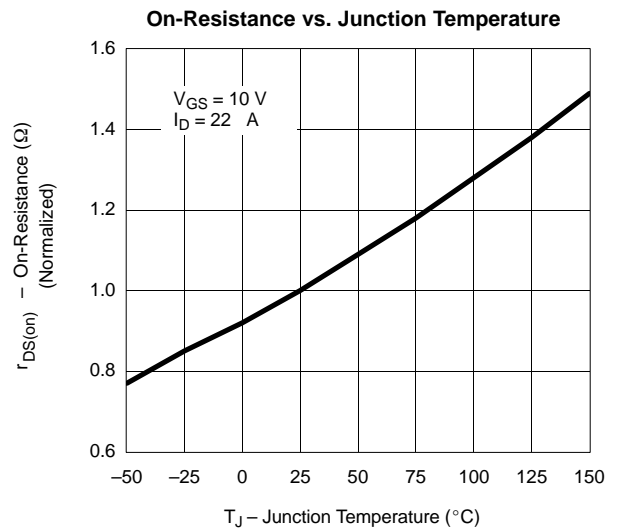
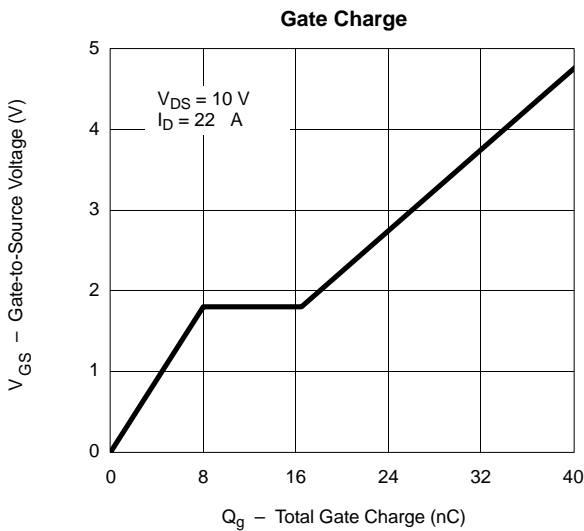
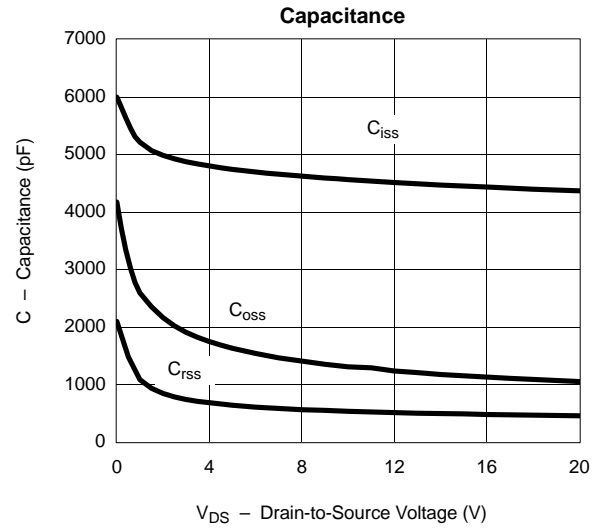
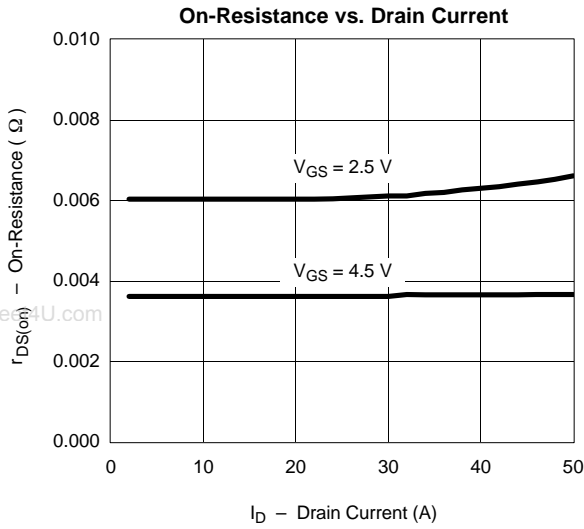
Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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