



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

PRODUCT SUMMARY

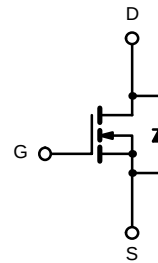
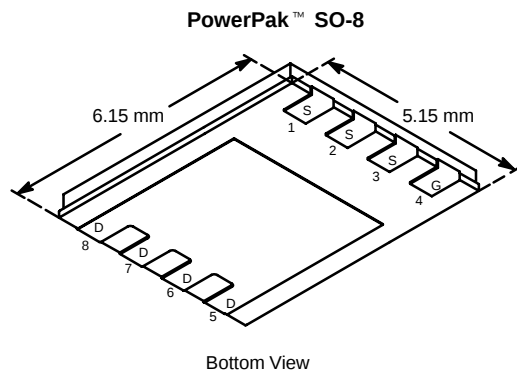
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.0045 @ $V_{GS} = 4.5$ V	22
	0.0075 @ $V_{GS} = 2.5$ V	19

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



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°C) ^a	T _A = 25°C	I _D	22	13.4	A
	T _A = 70°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	T _A = 25°C	P _D	5.2	1.9	W
	T _A = 70°C		3.3	1.2	
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	$t \leq 10$ sec	R_{thJA}	18	23	$^\circ\text{C/W}$
	Steady State		50	65	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.0	1.5	

Notes

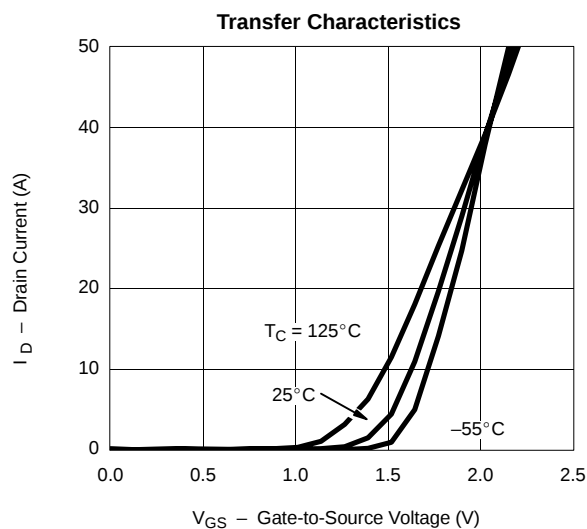
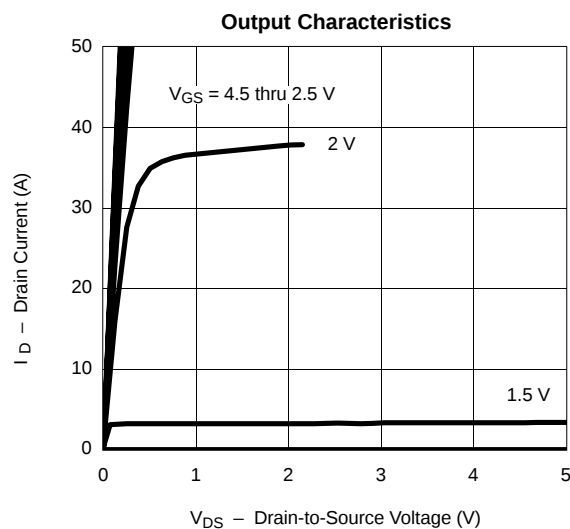
a. Surface Mounted on 1" x 1" FR4 Board.

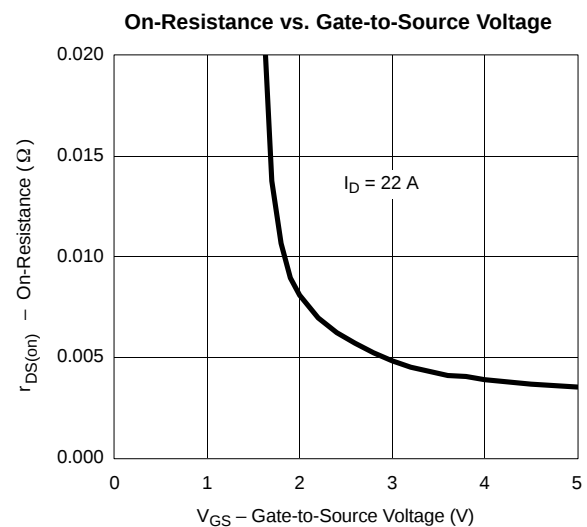
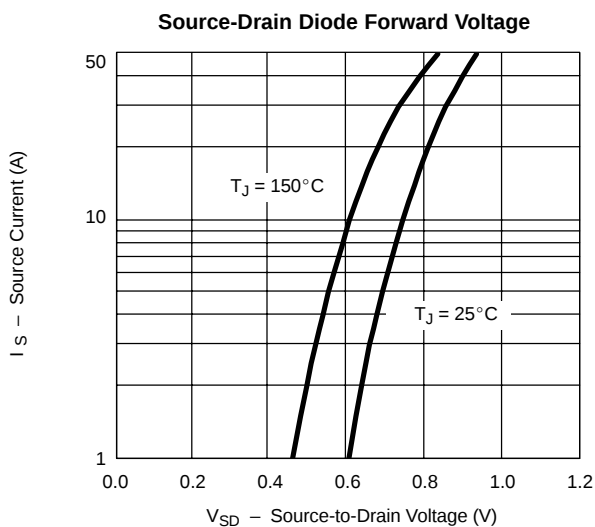
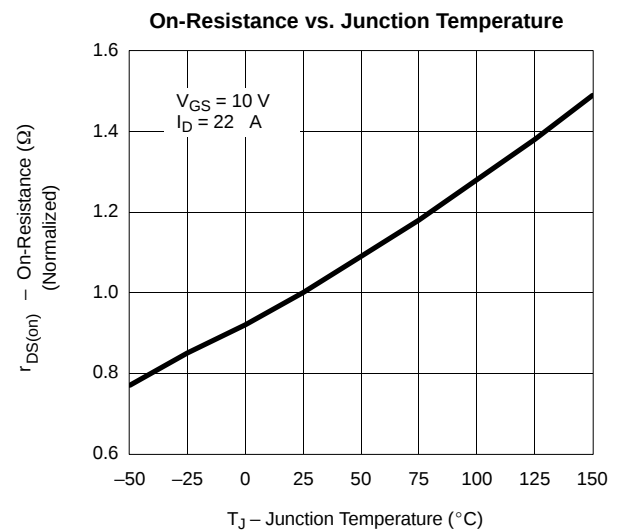
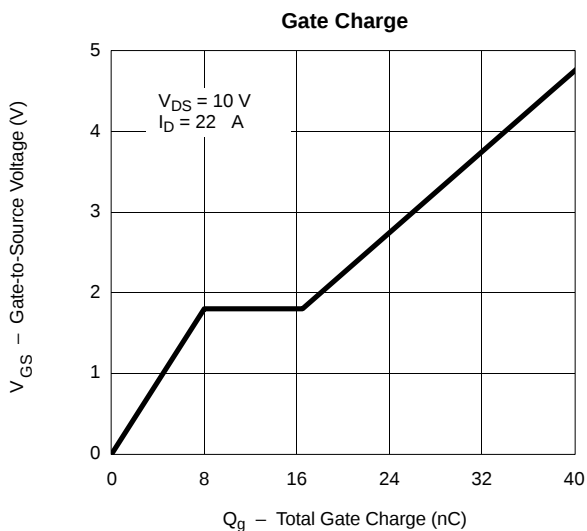
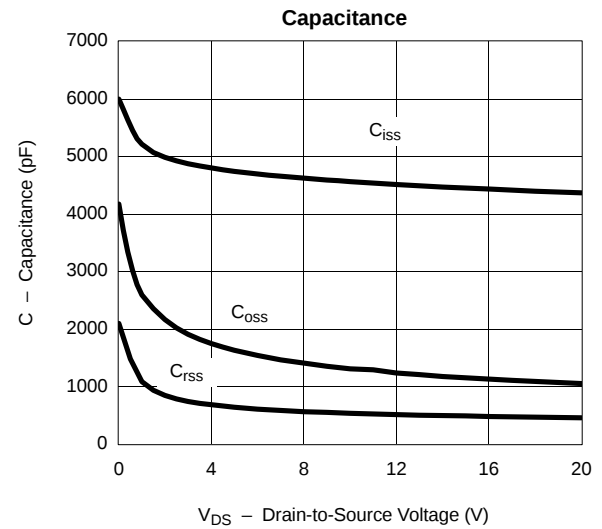
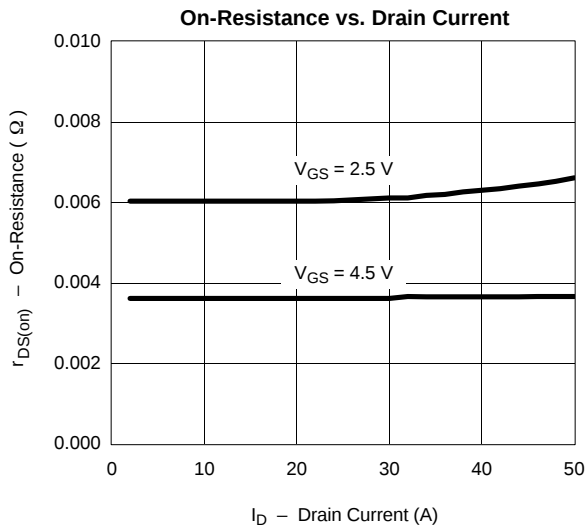
MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.6		1.4	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 12\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 16\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 85^\circ\text{C}$			20	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}, V_{GS} = 4.5\ \text{V}$	50			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}, I_D = 22\ \text{A}$		0.0035	0.0045	Ω
		$V_{GS} = 2.5\ \text{V}, I_D = 19\ \text{A}$		0.006	0.0075	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 22\ \text{A}$		90		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 3\ \text{A}, V_{GS} = 0\ \text{V}$		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\ \text{V}, V_{GS} = 4.5\ \text{V}, I_D = 21\ \text{A}$		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	$t_{d(on)}$	$V_{DD} = 10\ \text{V}, R_L = 10\ \Omega$ $I_D \approx 1\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 6\ \Omega$		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}	$I_F = 3\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		60	90	

Notes

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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