

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

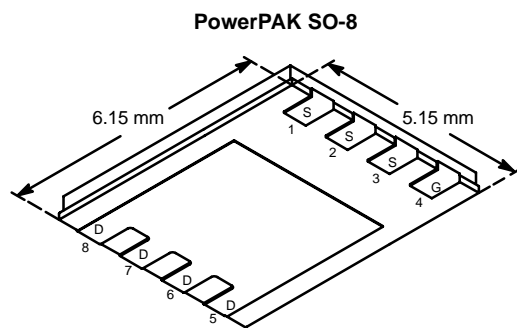
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
20	0.0065 @ $V_{GS} = 4.5$ V	22
	0.009 @ $V_{GS} = 2.5$ V	19

### FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- 100%  $R_g$  Tested

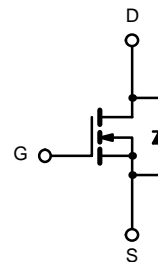
### APPLICATIONS

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



Bottom View

Ordering Information: Si7448DP-T1



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	$V_{GS}$	$\pm 12$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	22	13.4
		$T_A = 70^\circ\text{C}$	17.6	10.7
Pulsed Drain Current	$I_{DM}$	50		A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	4.3	1.6	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	5.2	1.9
		$T_A = 70^\circ\text{C}$	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 <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	19	24
		Steady State	52	65
Maximum Junction-to-Case (Drain)	$R_{thJC}$	1.5	1.8	$^\circ\text{C}/\text{W}$

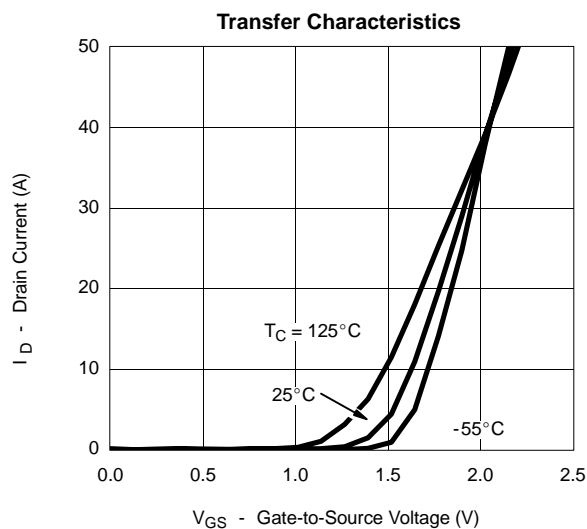
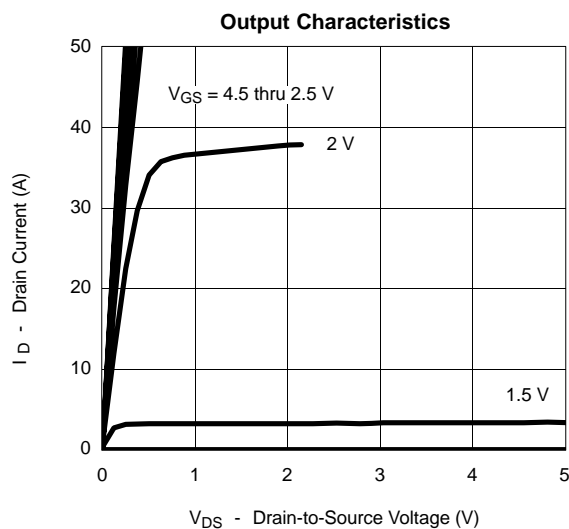
Notes

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

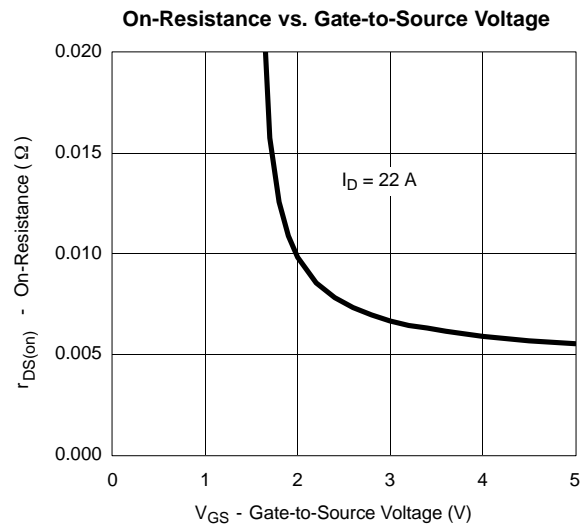
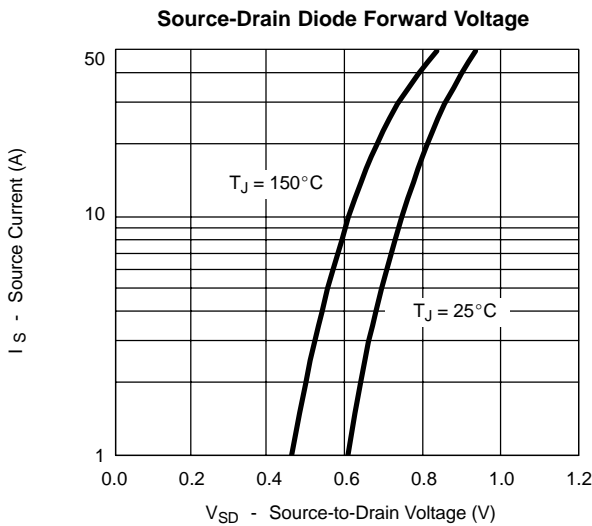
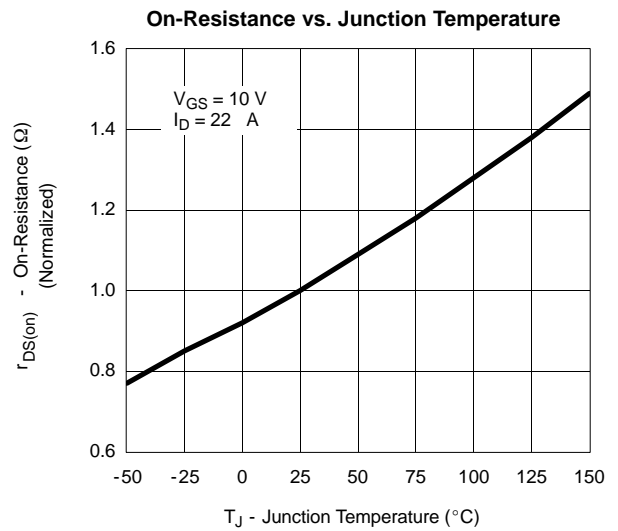
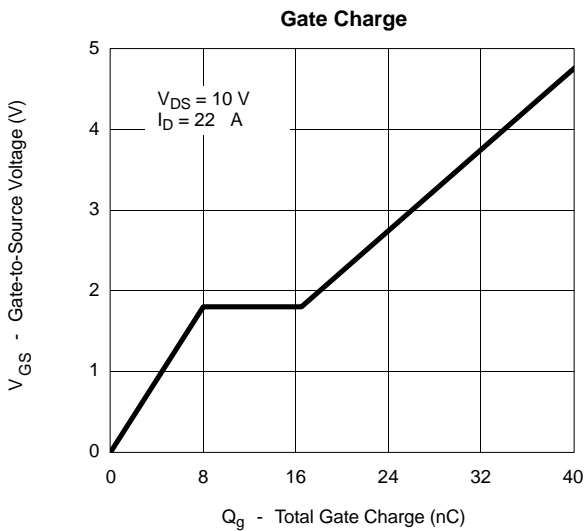
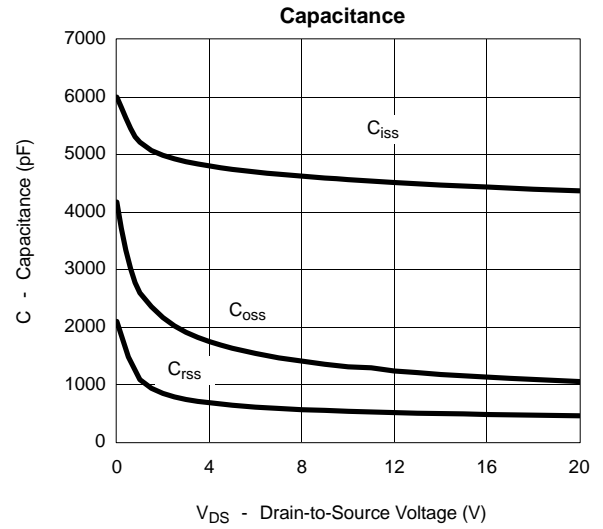
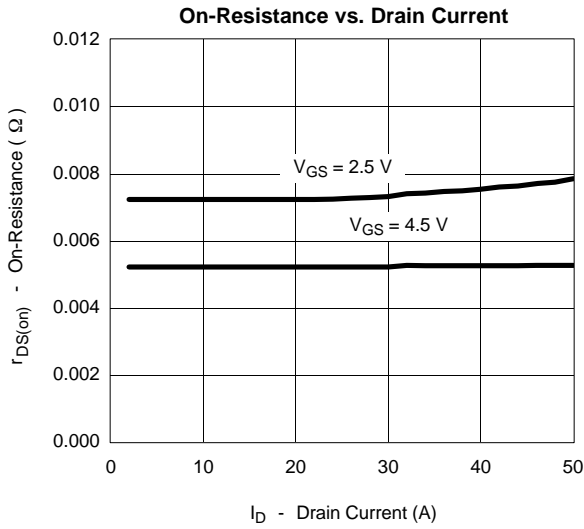
MOSFET SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	0.6			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			20	
On-State Drain Current <sup>NO TAG</sup>	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	50			A
Drain-Source On-State Resistance <sup>NO TAG</sup>	$r_{DS(on)}$	$V_{GS} = 4.5 \text{ V}, I_D = 22 \text{ A}$		0.0054	0.0065	$\Omega$
		$V_{GS} = 2.5 \text{ V}, I_D = 19 \text{ A}$		0.0075	0.009	
Forward Transconductance <sup>NO TAG</sup>	$g_{fs}$	$V_{DS} = 15 \text{ V}, I_D = 22 \text{ A}$		90		S
Diode Forward Voltage <sup>NO TAG</sup>	$V_{SD}$	$I_S = 3 \text{ A}, V_{GS} = 0 \text{ V}$		0.8	1.2	V
<b>Dynamic<sup>NO TAG</sup></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	$R_g$		0.2	0.9	1.1	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10 \text{ V}, R_L = 10 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 6 \Omega$		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

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

**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**


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