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

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

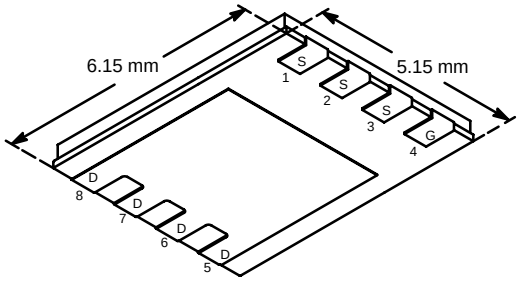
FEATURES

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

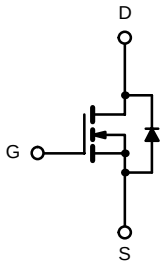
APPLICATIONS

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

PowerPak™ SO-8



Bottom View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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 ≤ 10 sec	R_{thJA}	19	24	°C/W
	Steady State		52	65	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.5	1.8	

Notes
a. Surface Mounted on 1” x 1” FR4 Board.

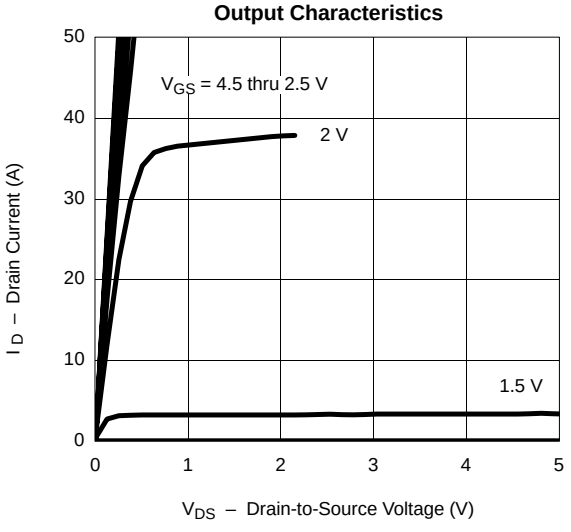
MOSFET SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

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			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		0.0054	0.0065	Ω
		V_{GS} = 2.5 V, I_D = 19 A		0.0075	0.009	
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	

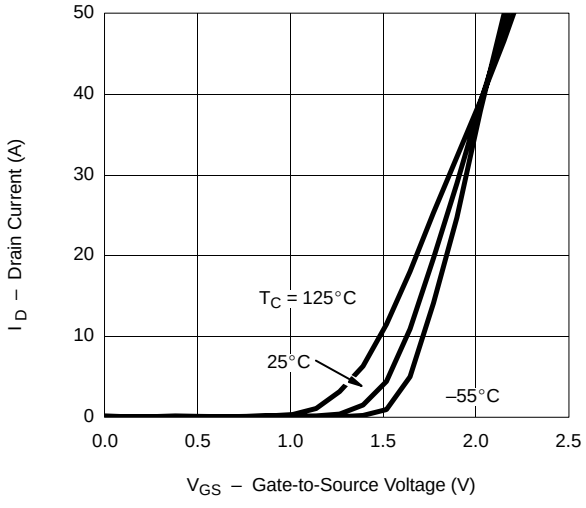
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

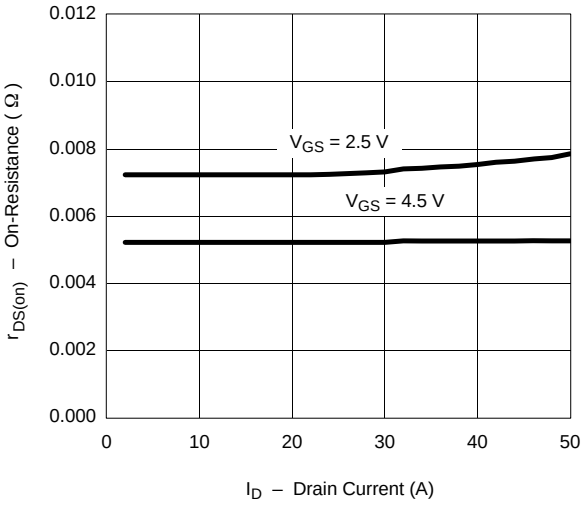


Transfer Characteristics

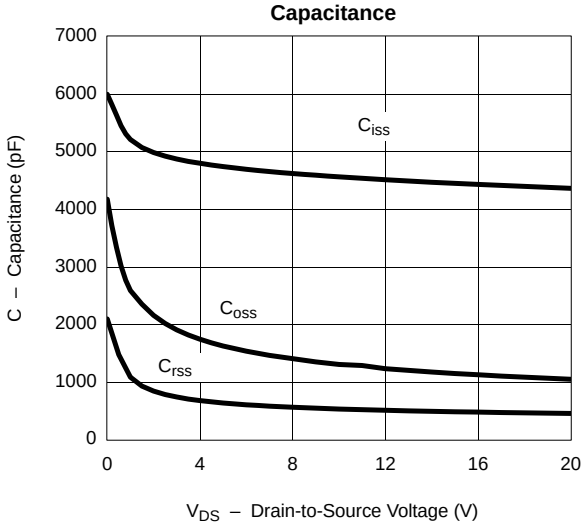


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

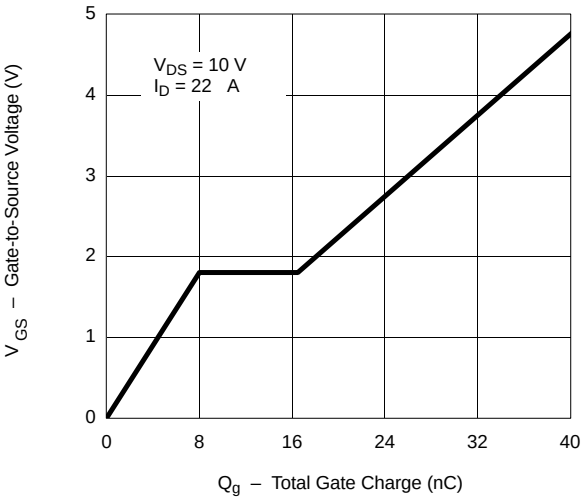
On-Resistance vs. Drain Current



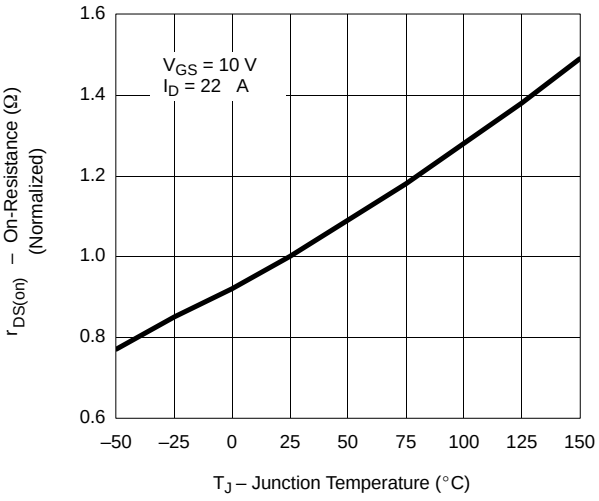
Capacitance



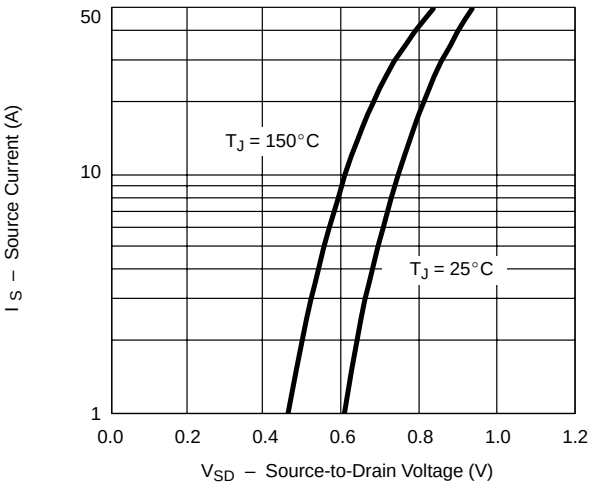
Gate Charge



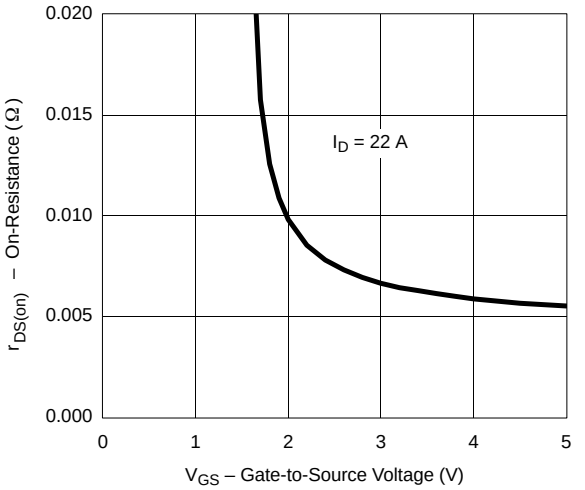
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

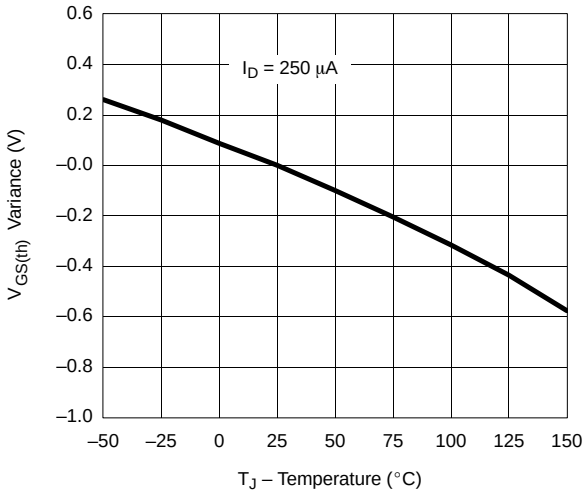


On-Resistance vs. Gate-to-Source Voltage

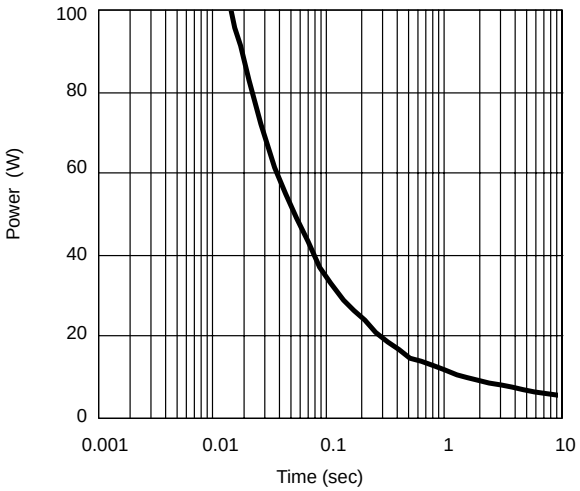


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

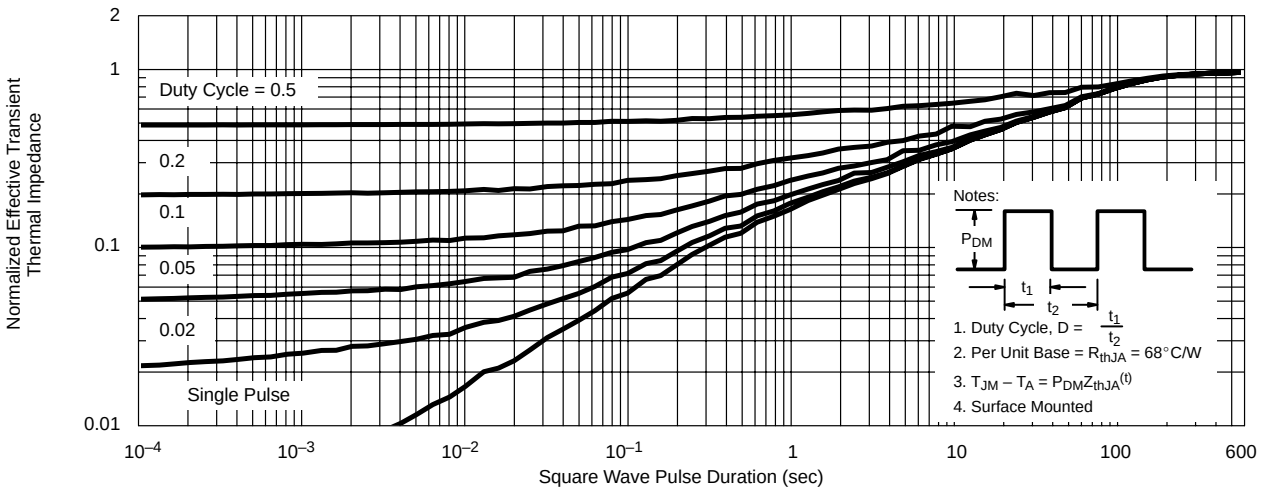
Threshold Voltage



Single Pulse Power, Juncion-To-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case