N-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
12	0.003 @ V_{GS} = 4.5 V	25
	0.004 @ V_{GS} = 2.5 V	22
	0.005 @ V_{GS} = 1.8 V	19

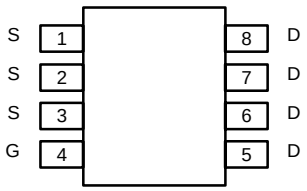
FEATURES

- TrenchFET® Power MOSFET
- PWM Optimized
- 100% R_G Tested

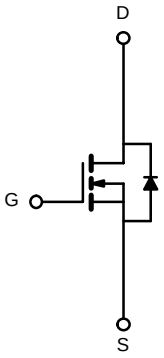
APPLICATIONS

- Low Voltage Synchronous Rectfication
- Low Voltage LDO Pass Transistor

SO-8



Top 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}	12		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	25	17	A
	T_A = 70°C		20	13	
Pulsed Drain Current (10 μs Pulse Width)		I_{DM}	60		
Continuous Source Current (Diode Conduction)[a]		I_S	2.9	1.3	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	3.5	1.6	W
	T_A = 70°C		2.2	1	
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}	29	35	°C/W
	Steady State		67	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	13	16	

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

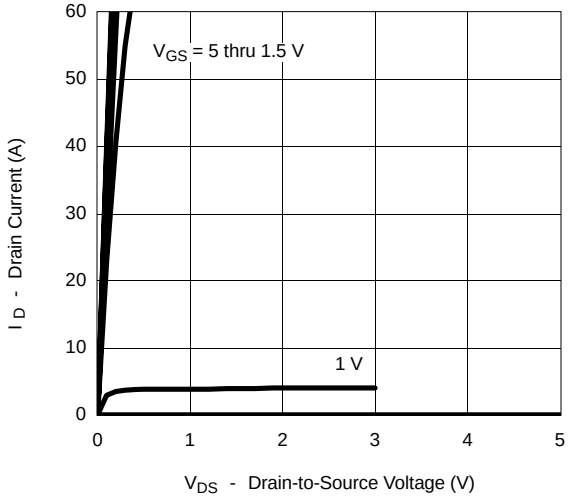
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.40			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 9.6 V, V_{GS} = 0 V			1	μA
		V_{DS} = 9.6 V, V_{GS} = 0 V, T_J = 55°C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	30			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 25 A		0.0025	0.003	Ω
		V_{GS} = 2.5 V, I_D = 22 A		0.0031	0.004	
		V_{GS} = 1.8 V, I_D = 19 A		0.004	0.005	
Forward Transconductance[a]	g_{fs}	V_{DS} = 6 V, I_D = 25 A		80		S
Diode Forward Voltage[a]	V_{SD}	I_S = 2.9 A, V_{GS} = 0 V		0.56	1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 6 V, V_{GS} = 4.5 V, I_D = 25 A		51	75	nC
Gate-Source Charge	Q_{gs}			6.6		
Gate-Drain Charge	Q_{gd}			9.1		
Gate Resistance	R_G		1.0	1.6	2.7	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 6 V, R_L = 6 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		35	55	ns
Rise Time	t_r			41	65	
Turn-Off Delay Time	$t_{d(off)}$			190	290	
Fall Time	t_f			115	175	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 2.9 A, di/dt = 100 A/μs		60	90	

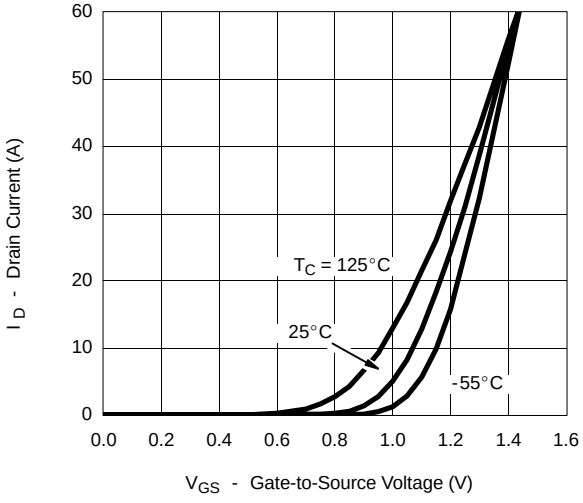
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics



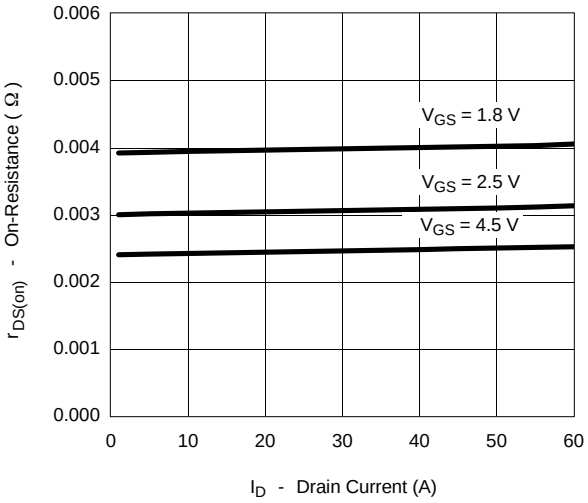
Transfer Characteristics



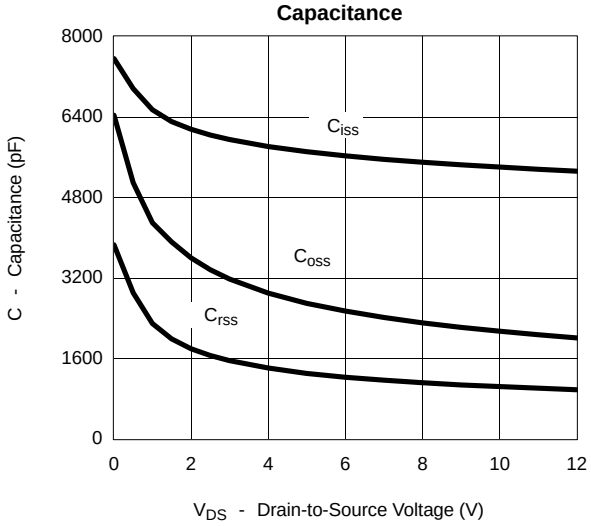
Document Number: 71692
S-03662—Rev. D, 14-Apr-03

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

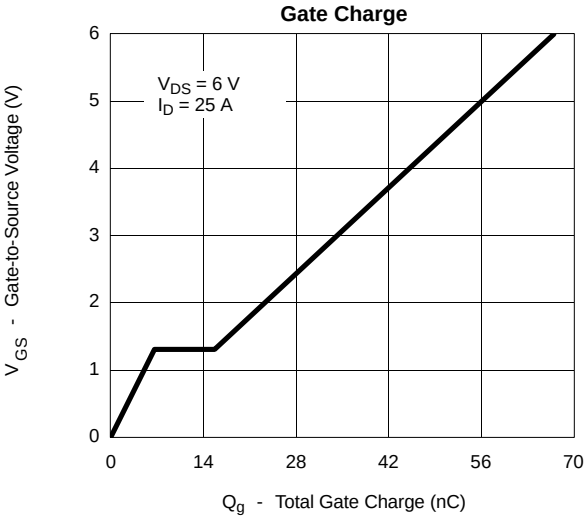
On-Resistance vs. Drain Current



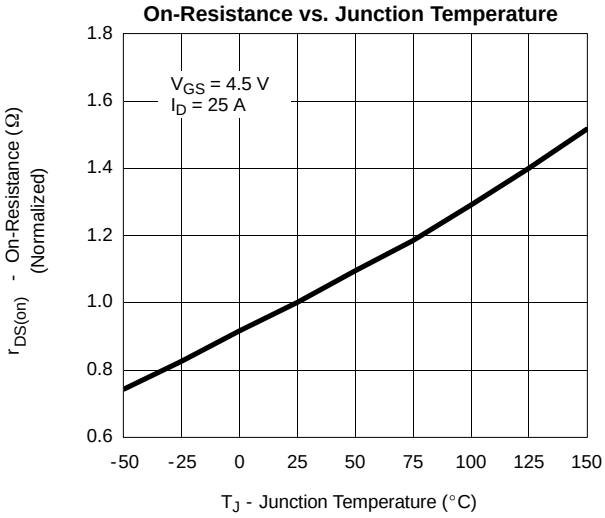
Capacitance



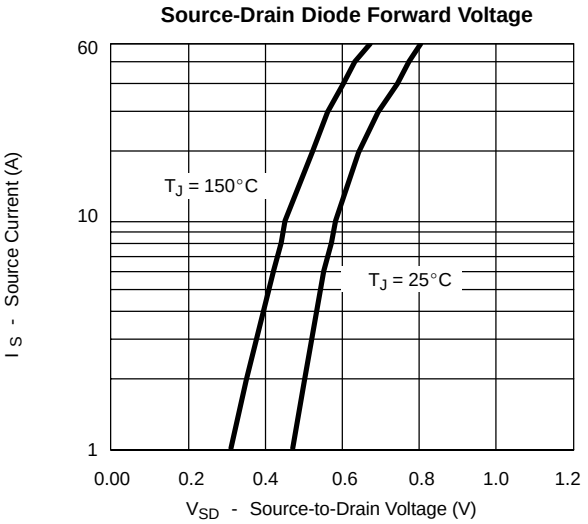
Gate Charge



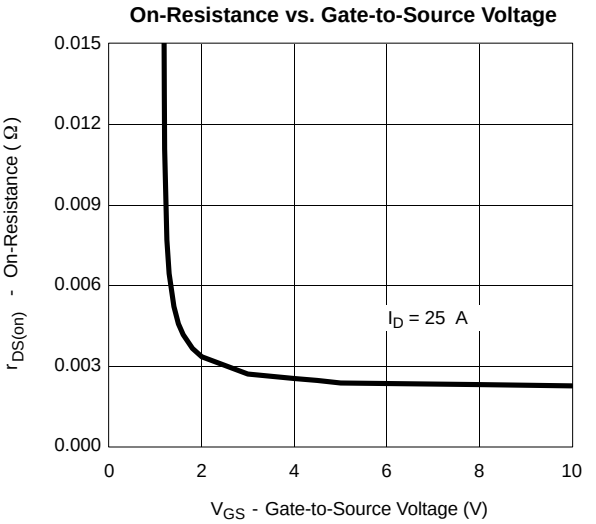
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

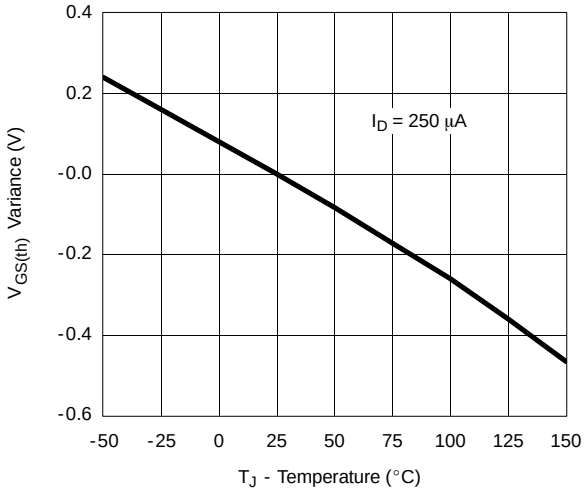


On-Resistance vs. Gate-to-Source Voltage

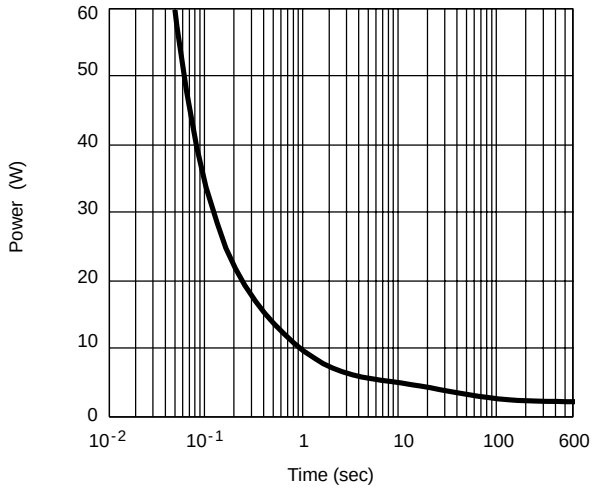


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

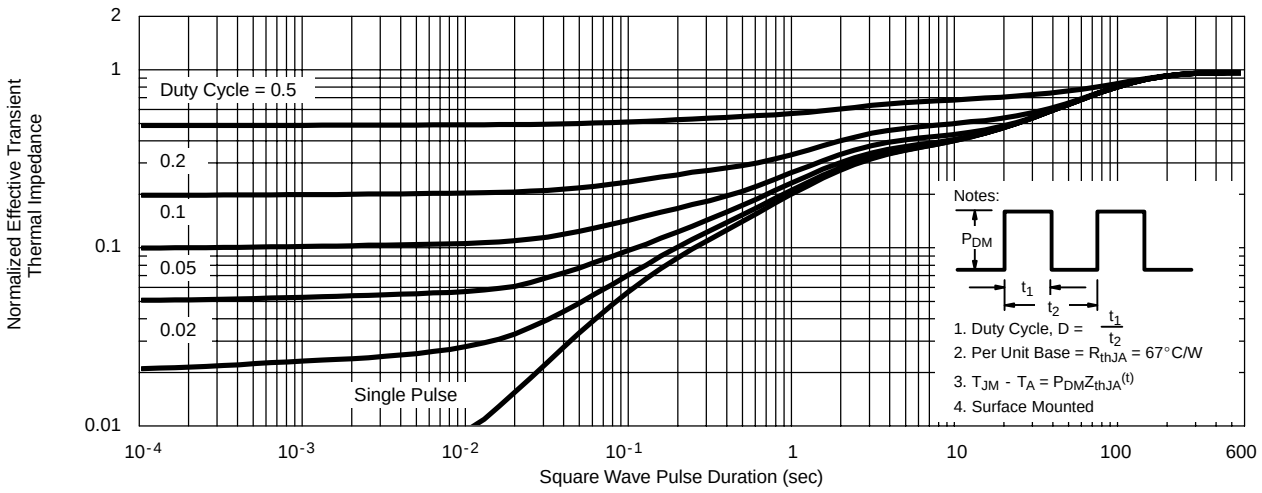
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot