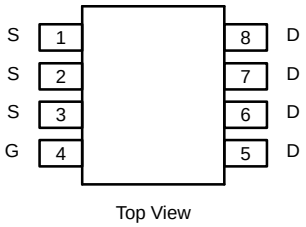
N-Channel Reduced Q_g, Fast Switching MOSFET

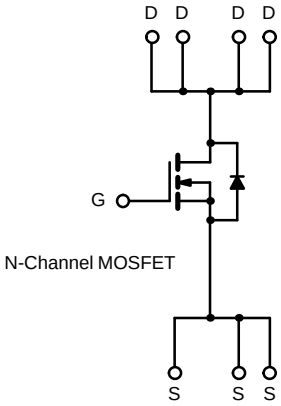
TrenchFET®
Power MOSFETs
High-Efficiency
PWM Optimized

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.010 @ V_{GS} = 10 V	13
	0.0135 @ V_{GS} = 4.5 V	11

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}	30		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	13	9.5	A
	T_A = 70°C		10.5	7.6	
Pulsed Drain Current		I_{DM}	±50		
Continuous Source Current (Diode Conduction)[a]		I_S	2.60	1.40	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.95	1.56	W
	T_A = 70°C		1.90	1.0	
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 (MOSFET)[a]	t ≤ 10 sec	R_{thJA}	35	42	°C/W
	Steady State		68	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	18	23	

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

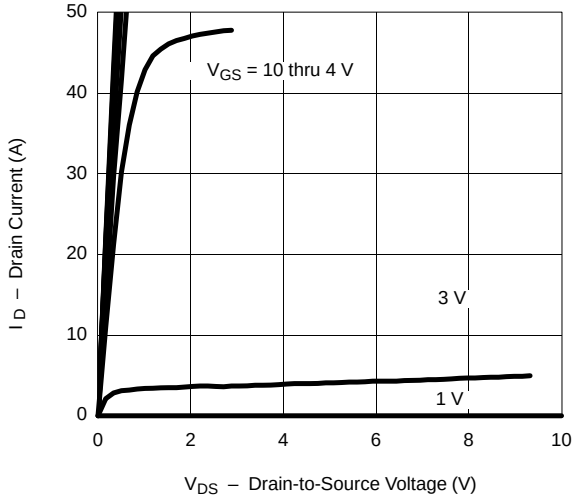
MOSFET SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.80			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V			1	μA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 70°C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	40			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 13 A		0.0078	0.010	Ω
		V_{GS} = 4.5 V, I_D = 11 A		0.0105	0.0135	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 13 A		38		S
Diode Forward Voltage[a]	V_{SD}	I_S = 2.6 A, V_{GS} = 0 V		0.74	1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 5.0 V, I_D = 13 A		14.5	20	nC
Gate-Source Charge	Q_{gs}			3.2		
Gate-Drain Charge	Q_{gd}			4.3		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		14	20	ns
Rise Time	t_r			5	10	
Turn-Off Delay Time	$t_{d(off)}$			42	80	
Fall Time	t_f			18	30	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 2.6 A, di/dt = 100 A/μs		40	70	

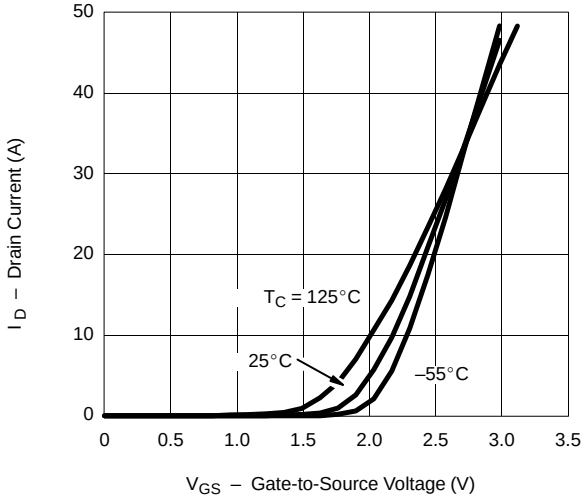
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

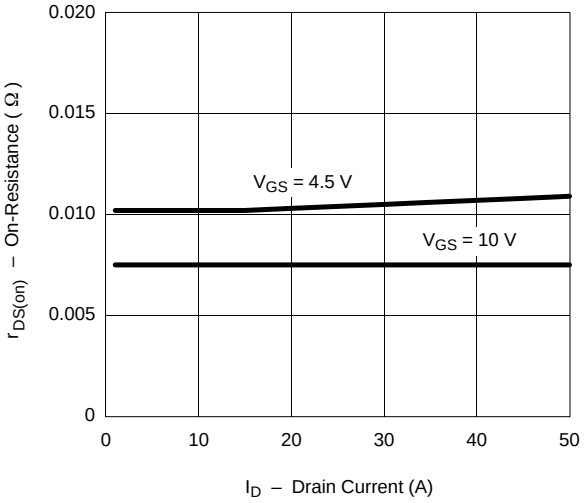


Transfer Characteristics

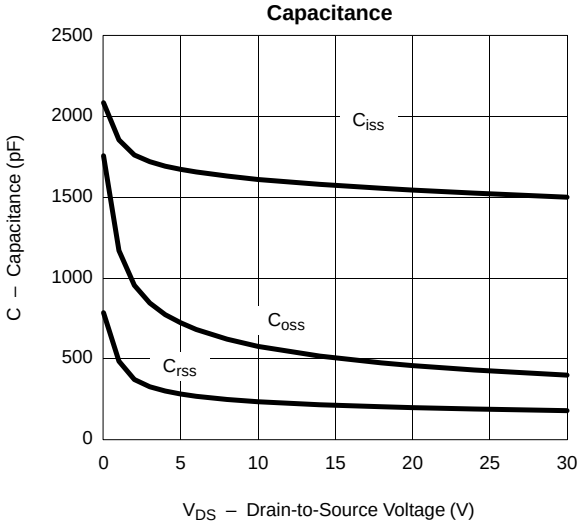


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

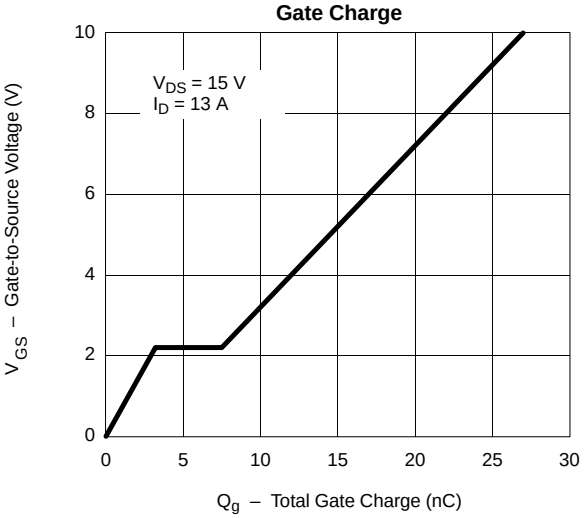
On-Resistance vs. Drain Current



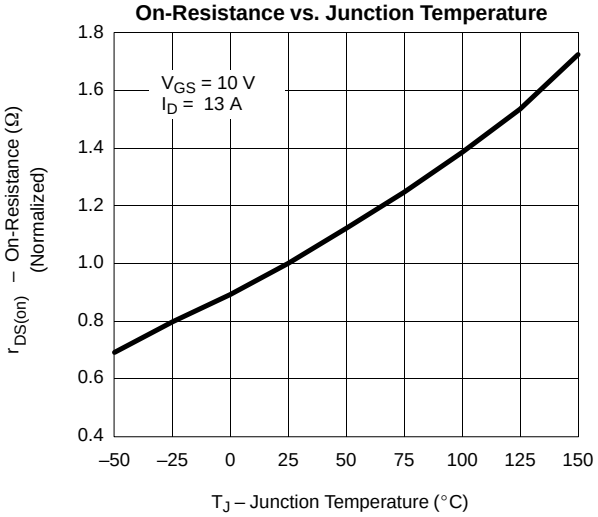
Capacitance



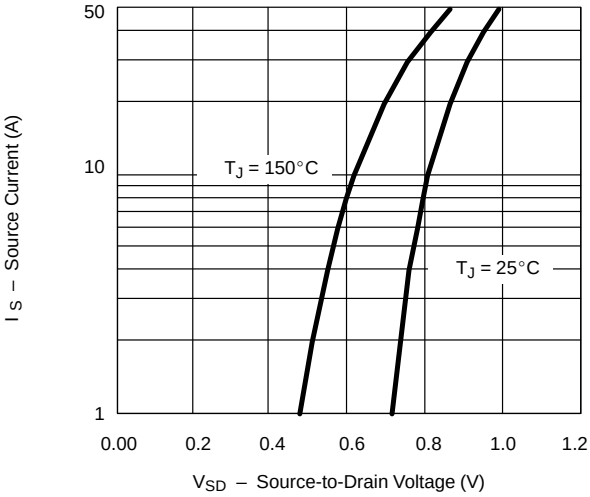
Gate Charge



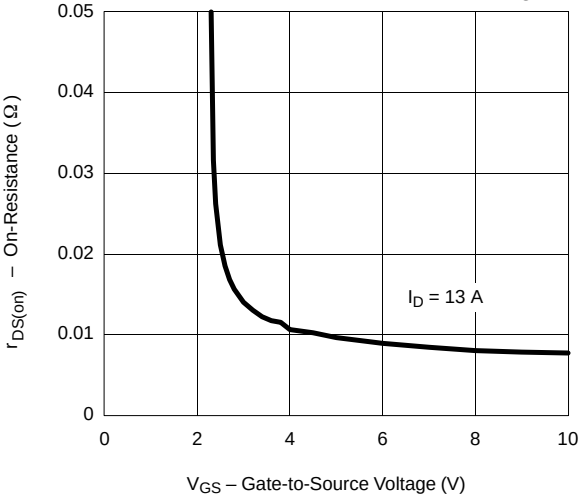
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

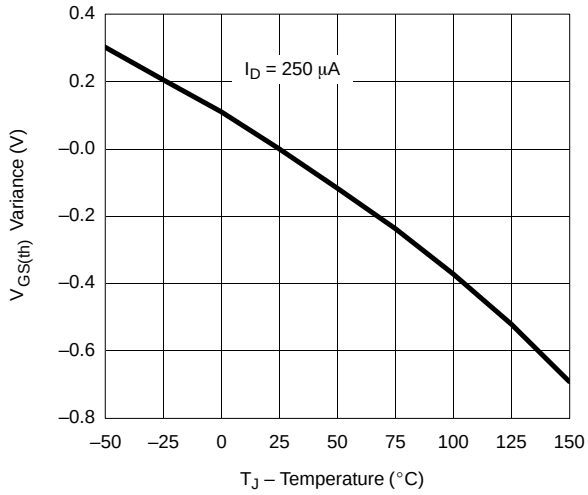


On-Resistance vs. Gate-to-Source Voltage

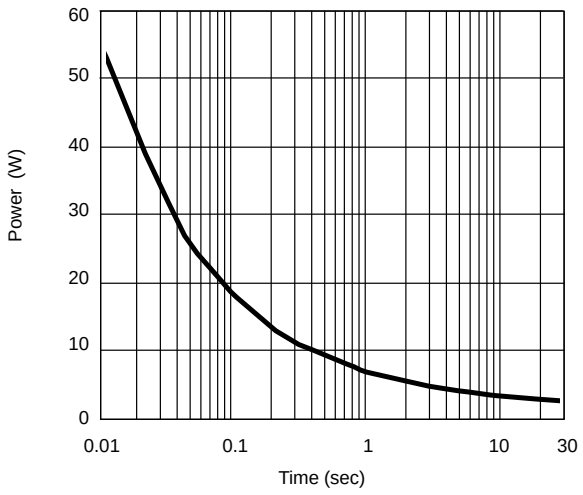


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

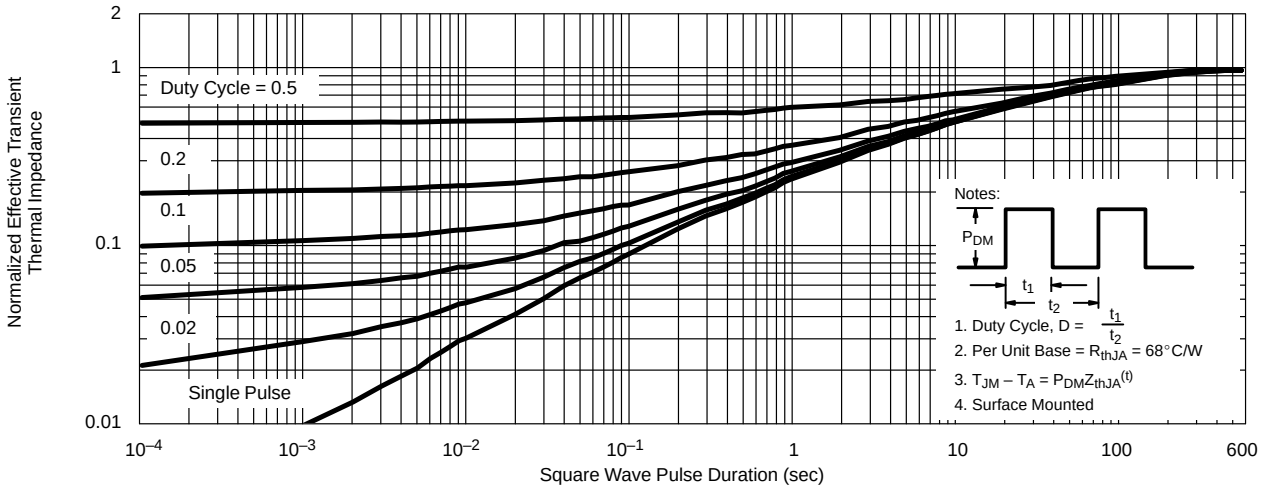
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot