N-Channel 60-V (D-S) Fast Switching MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.022 @ V_{GS} = 10 V	10.3
	0.031 @ V_{GS} = 4.5 V	8.7

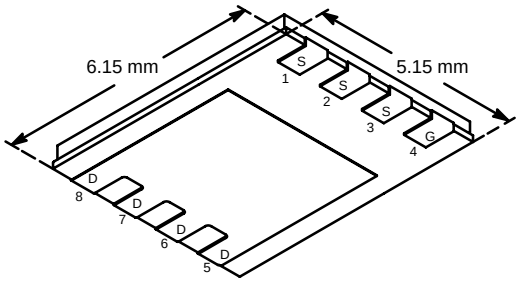
FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK™ Package with Low 1.07-mm Profile
- PWM Optimized for Fast Switching

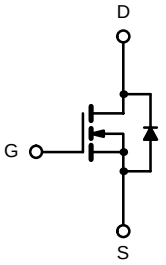
APPLICATIONS

- Primary Side Switch for 24-V DC/DC Applications
- Secondary Synchronous Rectifier

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}	60		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	10.3	6.2	A
	T_A = 85°C		7.5	4.5	
Continuous Source Current		I_S	3.7	1.5	
Pulsed Drain Current		I_{DM}	40		
Avalanche Current[b]		I_{AS}	15		
Single Avalanche Energy[b]		E_{AS}	11		mJ
Maximum Power Dissipation[a]	T_A = 25°C	P_D	4.5	1.8	W
	T_A = 85°C		2.3	0.9	
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}	22	28	°C/W
	Steady State		58	70	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	2.6	3.3	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.
b. Guaranteed by design, not subject to production testing.

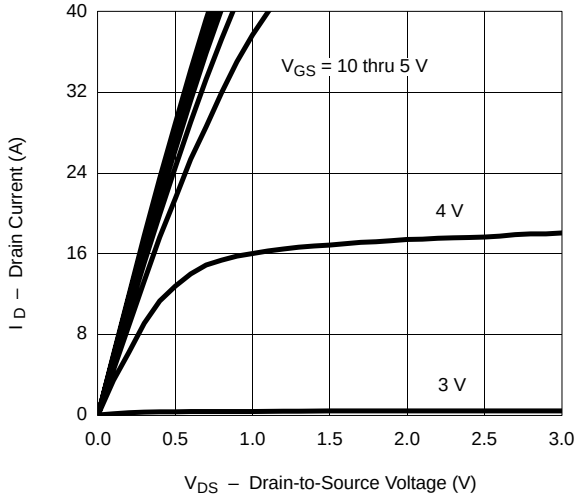
MOSFET SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 µA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	µA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 55°C			20	
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 = 10.3 A		0.018	0.022	Ω
		V_{GS} = 4.5 V, I_D = 8.7 A		0.025	0.031	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 10.3 A		26		S
Diode Forward Voltage[a]	V_{SD}	I_S = 3.8 A, V_{GS} = 0 V		0.85	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 10.3 A		18	27	nC
Gate-Source Charge	Q_{gs}			3.4		
Gate-Drain Charge	Q_{gd}			5.3		
Gate-Resistance	R_G			1.4		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V, R_L = 30 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		10	20	ns
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			25	50	
Fall Time	t_f			12	24	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 3.8 A, di/dt = 100 A/µs		50	80	

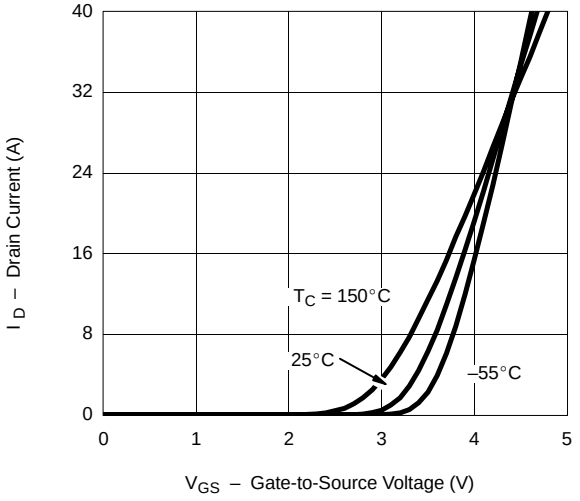
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

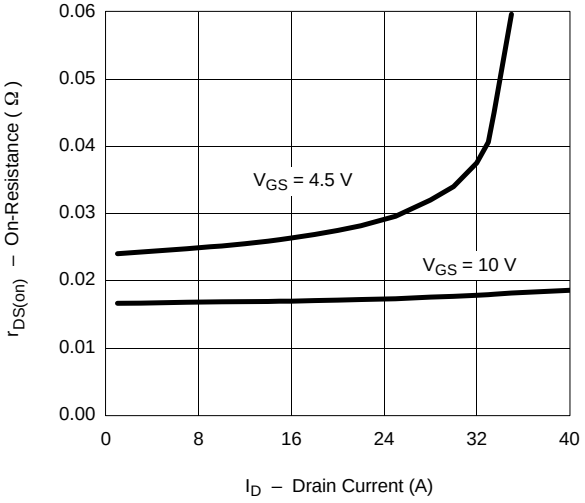


Transfer Characteristics

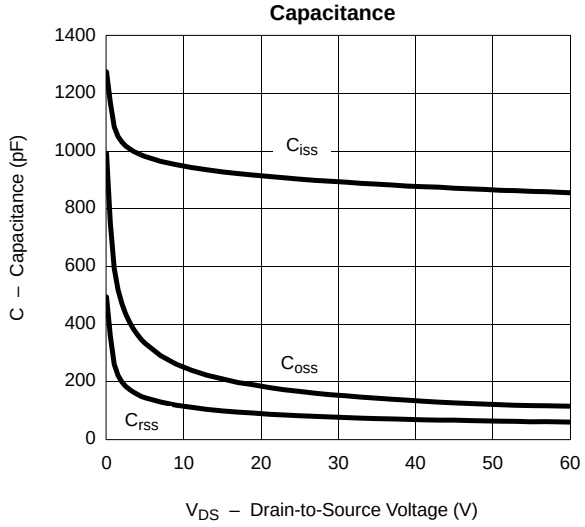


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

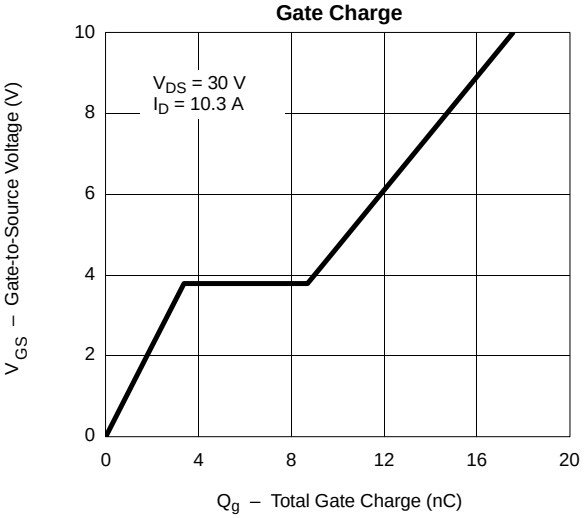
On-Resistance vs. Drain Current



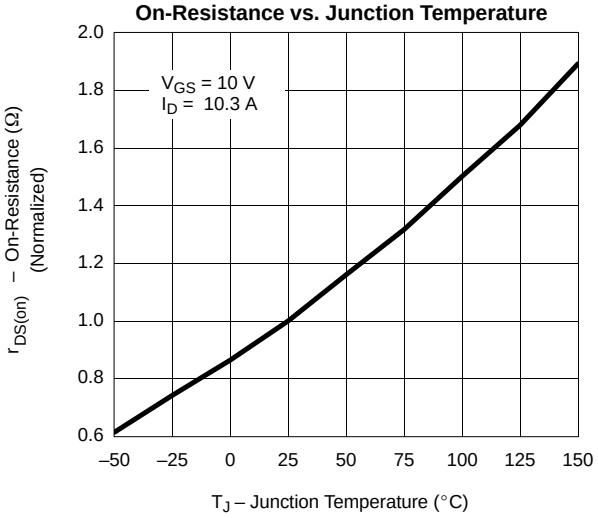
Capacitance



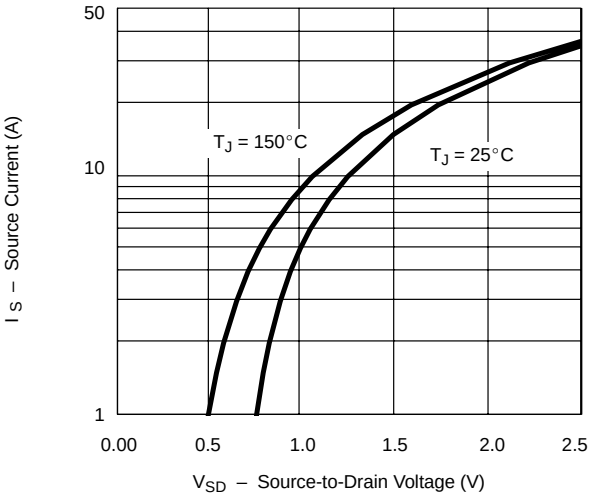
Gate Charge



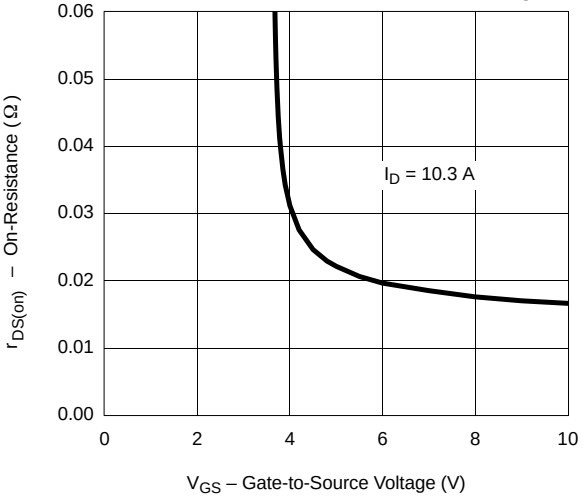
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

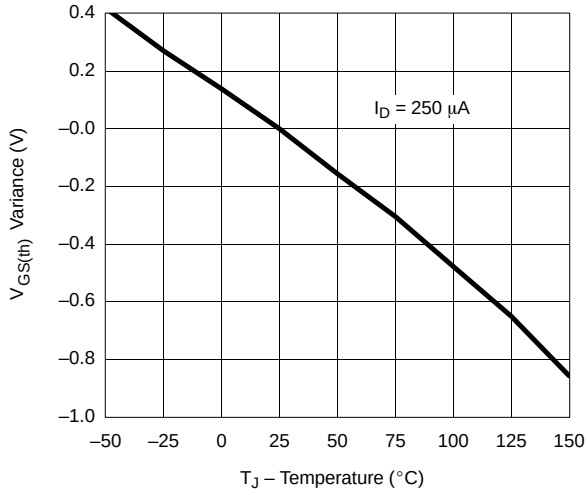


On-Resistance vs. Gate-to-Source Voltage

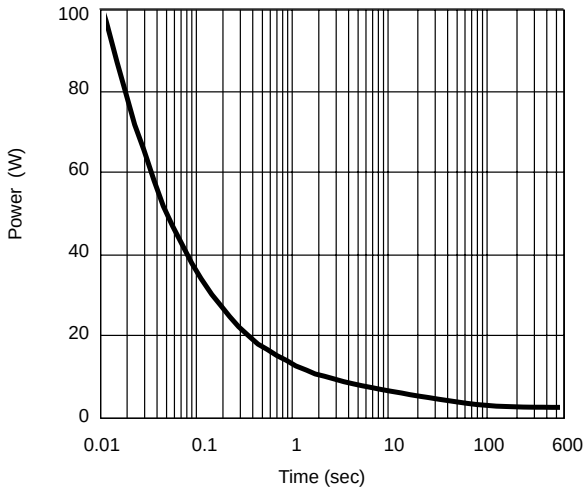


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

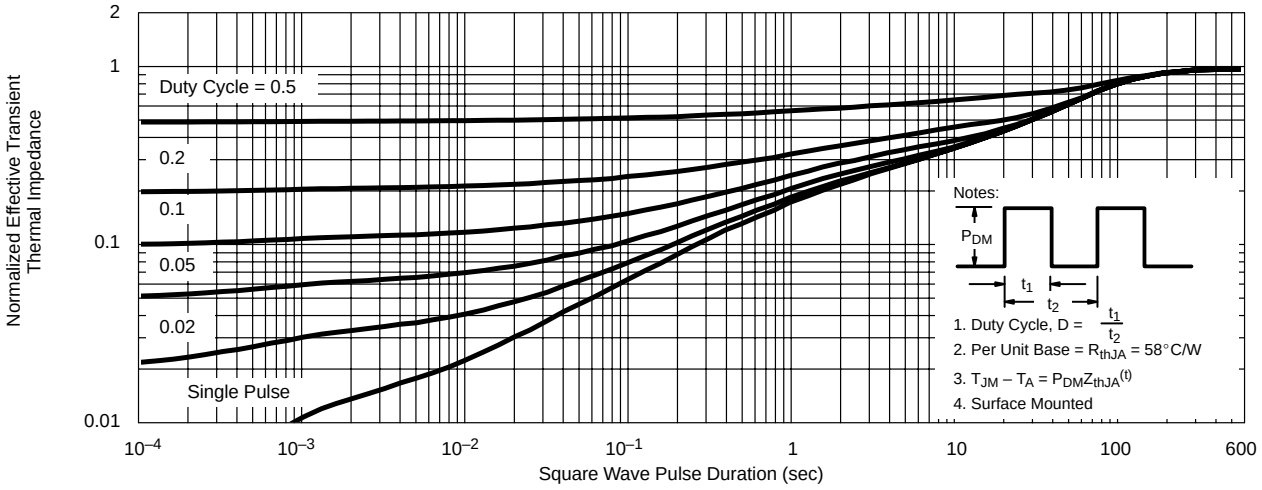
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case