P-Channel 20-V (D-S) MOSFET

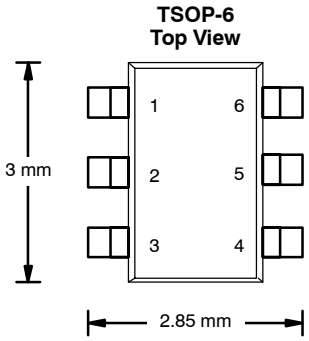
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.051 @ V_{GS} = -4.5 V	-5.1
	0.067 @ V_{GS} = -3.3 V	-4.5
	0.100 @ V_{GS} = -2.5 V	-3.7

FEATURES

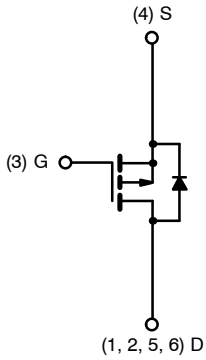
- TrenchFET® Power MOSFET
- PWM Optimized

APPLICATIONS

- DC/DC
  - HDD
  - Power Supplies
- Portable Devices Such As Cell Phones, PDA, DSC, and DVC



Ordering Information: Si3867DV-T1



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 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	-5.1	-3.9	A
	T_A = 85°C		-3.7	-2.8	
Pulsed Drain Current		I_{DM}	-20		
Continuous Diode Current (Diode Conduction)[a]		I_S	-1.7	-0.9	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.0	1.1	W
	T_A = 85°C		1.0	0.6	
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 ≤ 5 sec	R_{thJA}	45	62.5	°C/W
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	25	30	

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

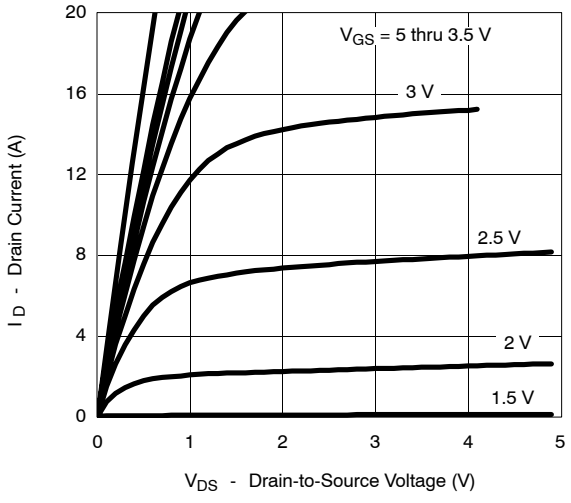
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 μA	-0.6		-1.4	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			-5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -4.5 V	-20			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -5.1 A		0.041	0.051	Ω
		V_{GS} = -3.3 V, I_D = -4.5 A		0.054	0.067	
		V_{GS} = -2.5 V, I_D = -2 A		0.081	0.100	
Forward Transconductance[a]	g_{fs}	V_{DS} = -5 V, I_D = -5.1 A		11		S
Diode Forward Voltage[a]	V_{SD}	I_S = -1.7 A, V_{GS} = 0 V		-0.7	-1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -5.1A		7	11	nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			1.6		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -10 V, R_L = 10 Ω I_D ≅ -1 A, V_{GEN} = -4.5 V, R_G = 6 Ω		17	30	ns
Rise Time	t_r			31	50	
Turn-Off Delay Time	$t_{d(off)}$			32	50	
Fall Time	t_f			30	50	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = -1.7 A, di/dt = 100 A/μs		25	50	

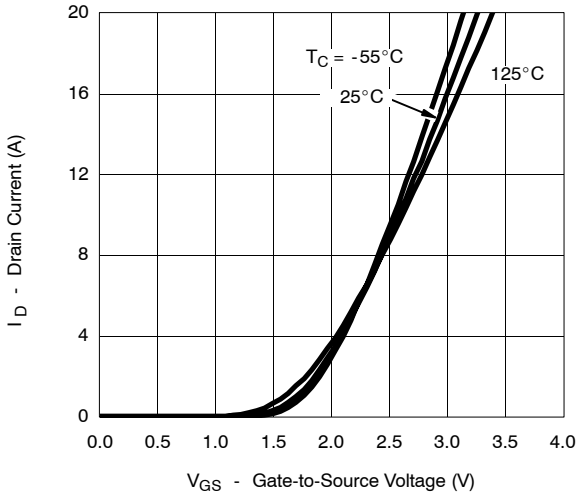
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

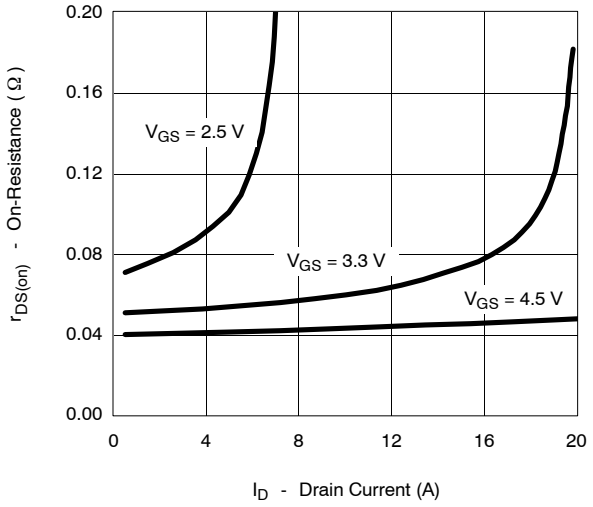


Transfer Characteristics

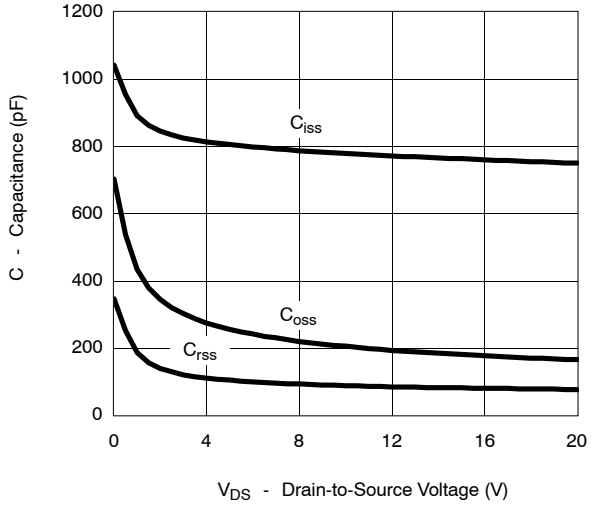


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

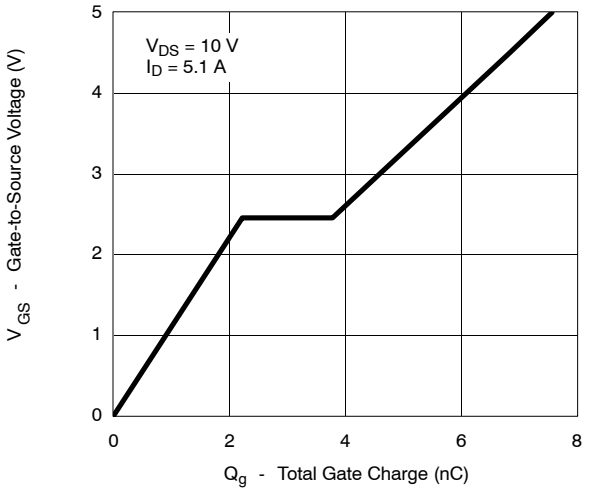
On-Resistance vs. Drain Current



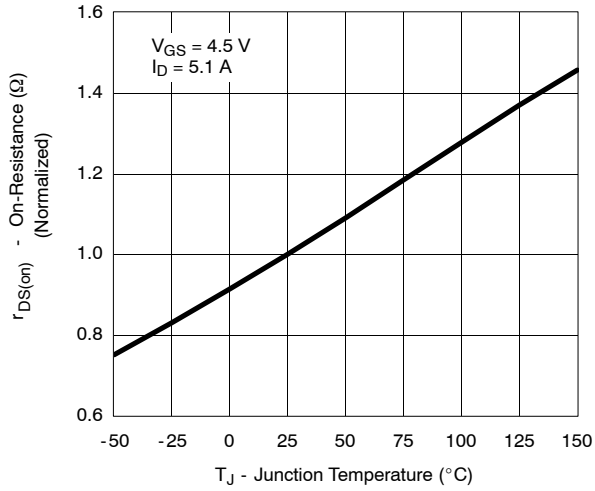
Capacitance



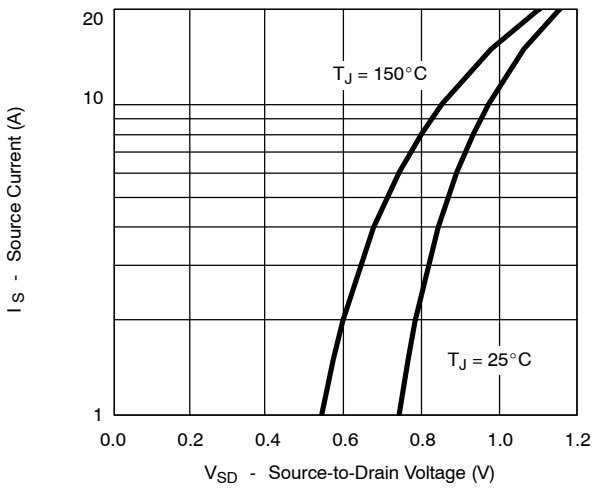
Gate Charge



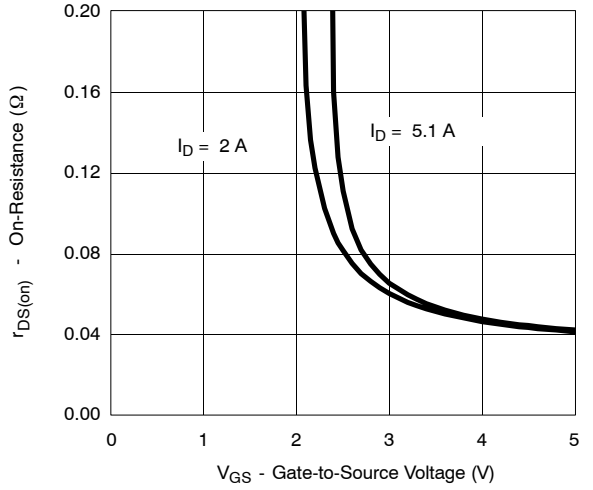
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

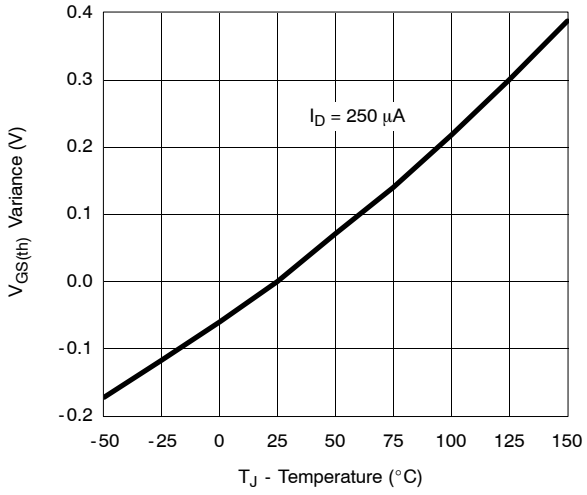


On-Resistance vs. Gate-to-Source Voltage

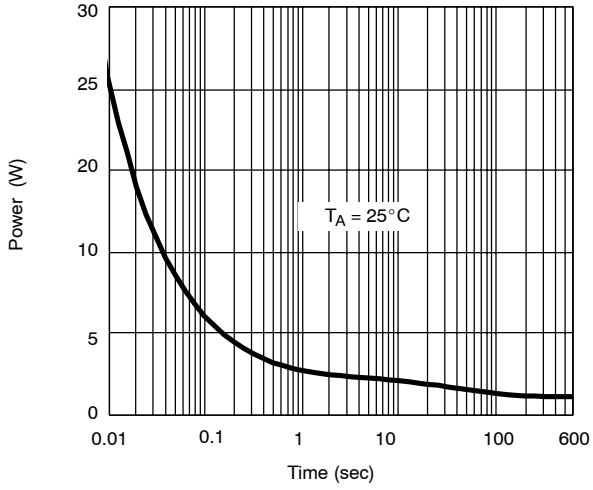


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

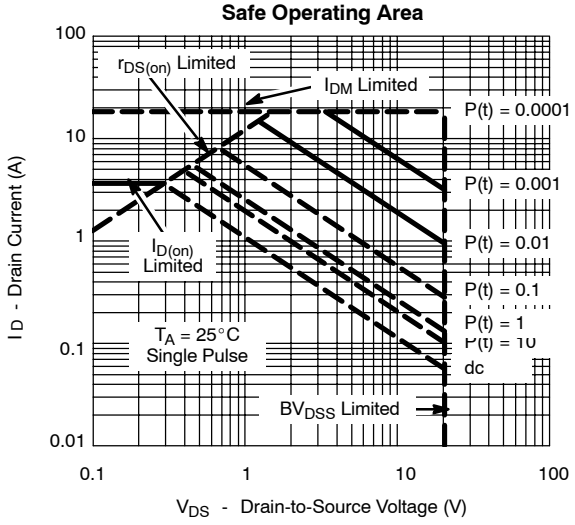
Threshold Voltage



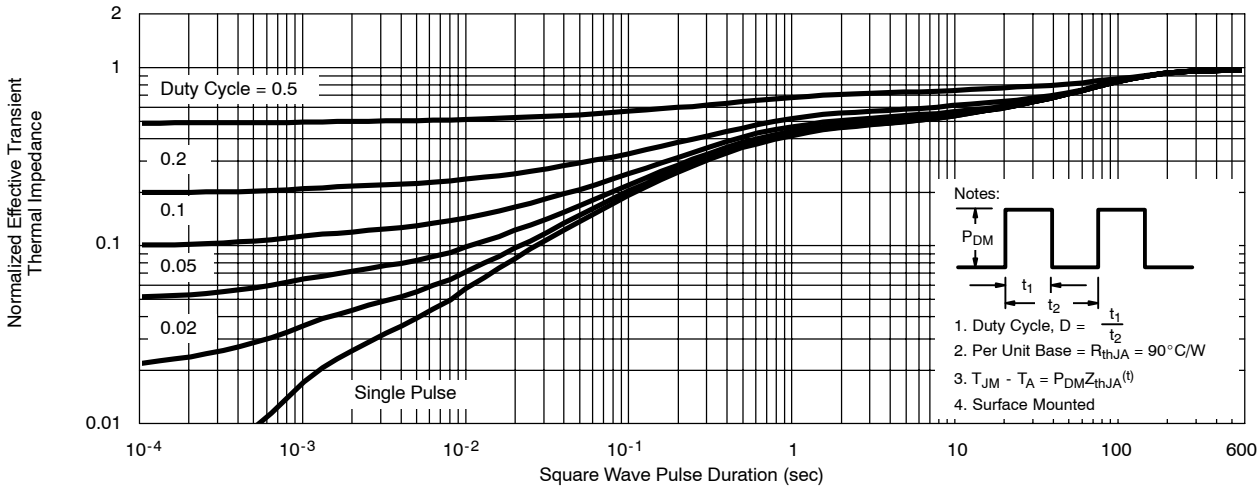
Single Pulse Power



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Foot