

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

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

FEATURES

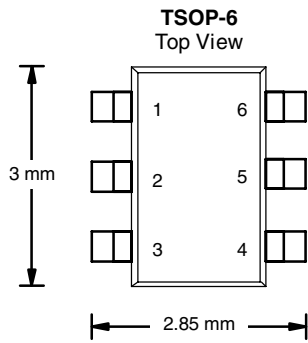
- TrenchFET[®] Power MOSFET
- PWM Optimized



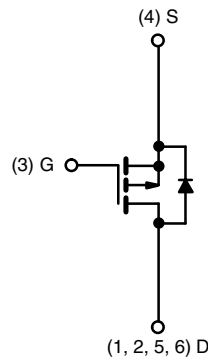
RoHS*
COMPLIANT

APPLICATIONS

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



Ordering Information: Si3867DV-T1
Si3867DV-T1-E3 (Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	V_{DS}	- 20		V	
Gate-Source Voltage	V_{GS}	± 12			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	- 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	P_D	$T_A = 25$ °C	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	$t \leq 5$ 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.

* Pb containing terminations are not RoHS compliant, exemptions may apply.



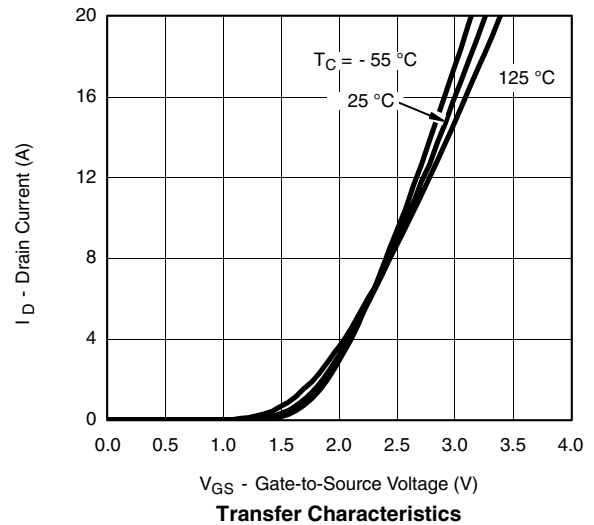
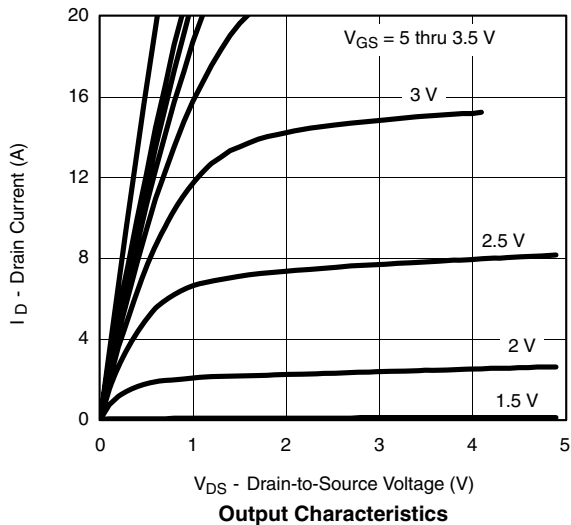
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-0.6		-1.4	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -4.5\text{ V}$	-20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -5.1\text{ A}$		0.041	0.051	Ω
		$V_{GS} = -3.3\text{ V}, I_D = -4.5\text{ A}$		0.054	0.067	
		$V_{GS} = -2.5\text{ V}, I_D = -2\text{ A}$		0.081	0.100	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -5.1\text{ A}$		11		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7\text{ A}, V_{GS} = 0\text{ V}$		-0.7	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -5.1\text{ A}$		7	11	nC
Gate-Source Charge	Q_{gs}		2.3			
Gate-Drain Charge	Q_{gd}		1.6			
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}, R_L = 10\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 6\text{ }\Omega$		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}	$I_F = -1.7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		25	50	

Notes:

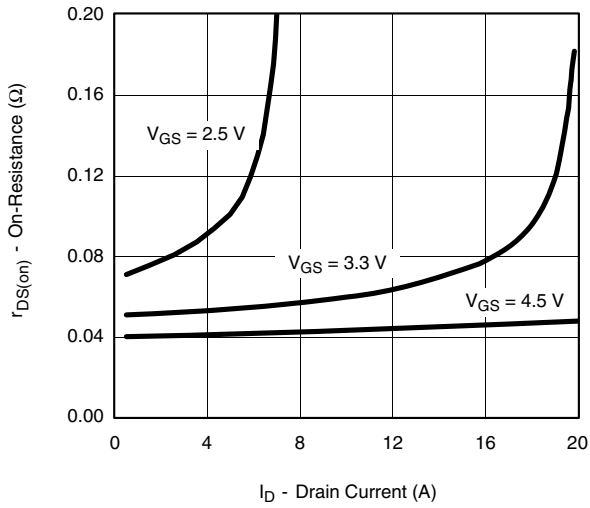
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

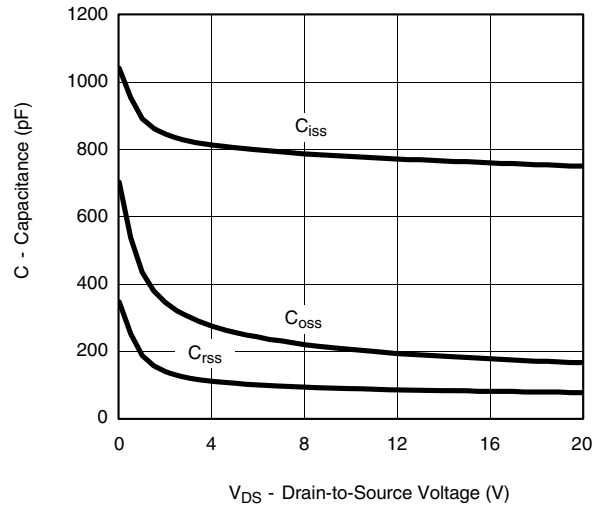
TYPICAL CHARACTERISTICS 25 °C unless noted



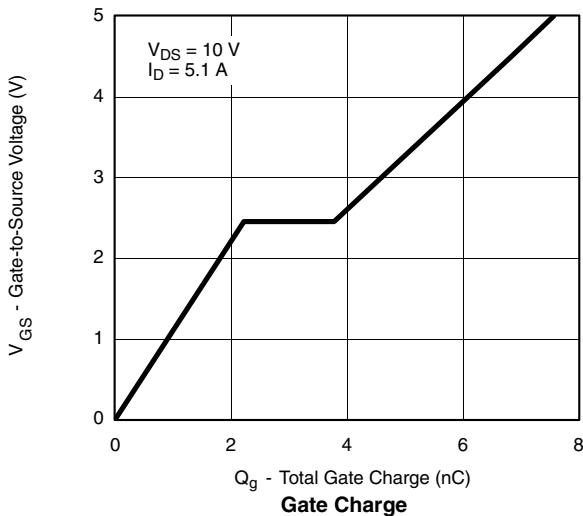
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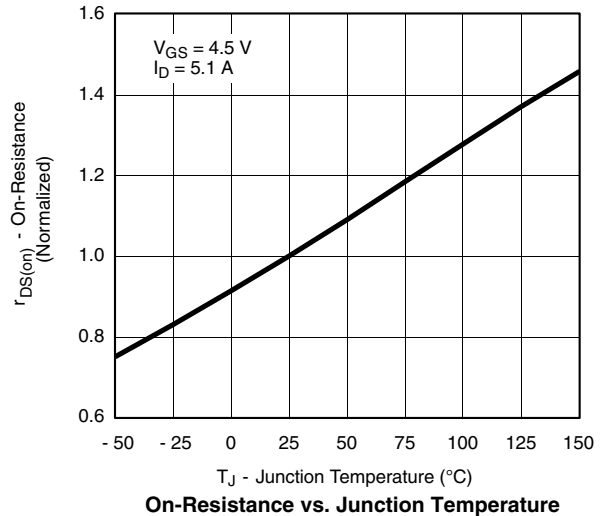
On-Resistance vs. Drain Current



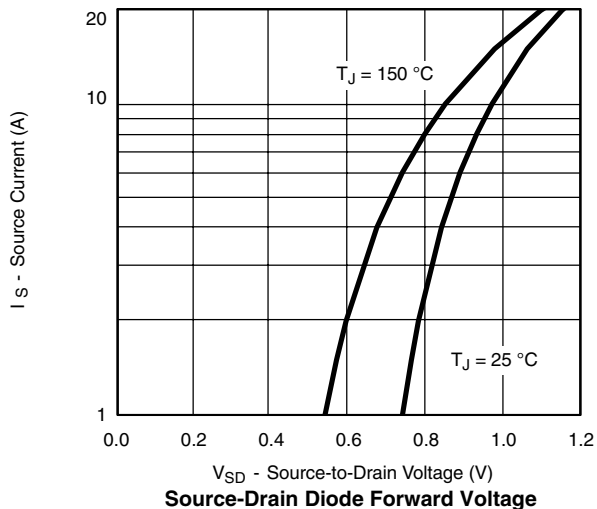
Capacitance



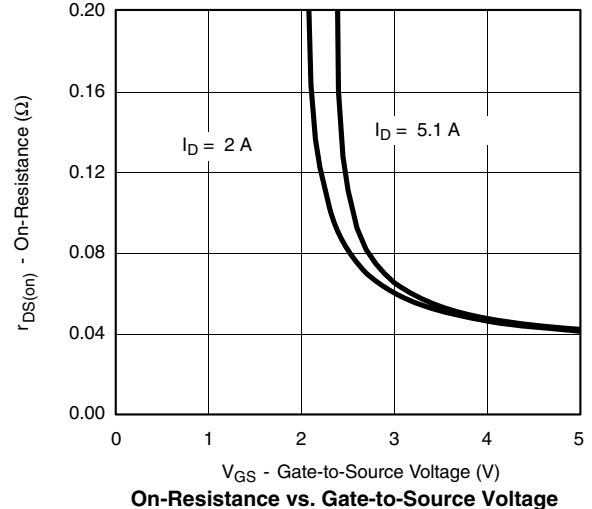
Gate Charge



On-Resistance vs. Junction Temperature

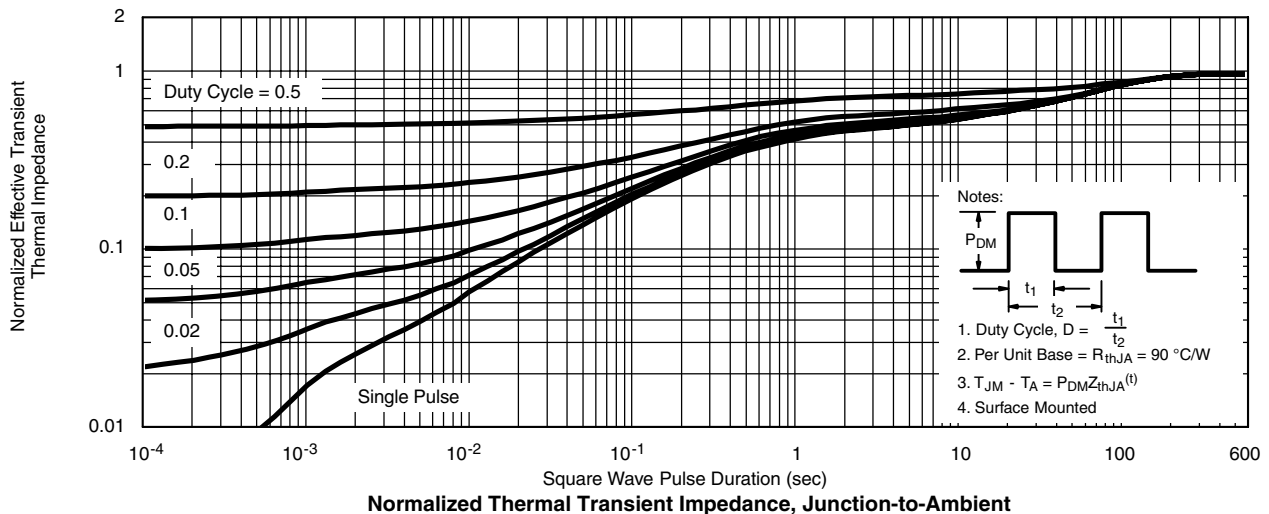
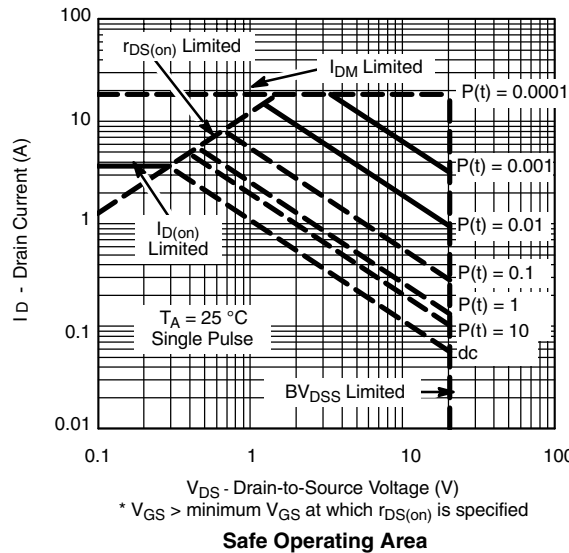
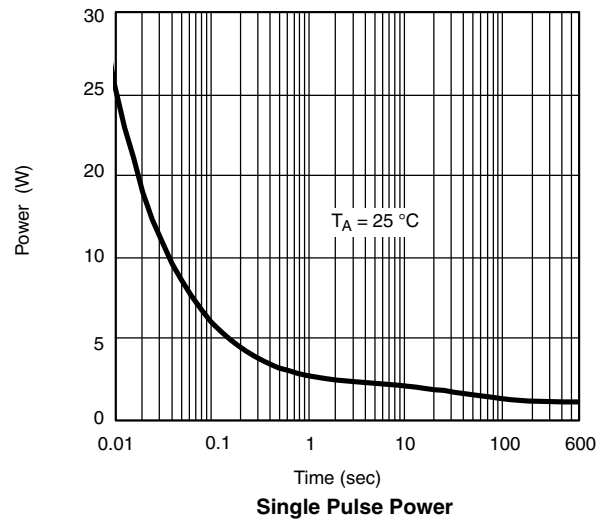
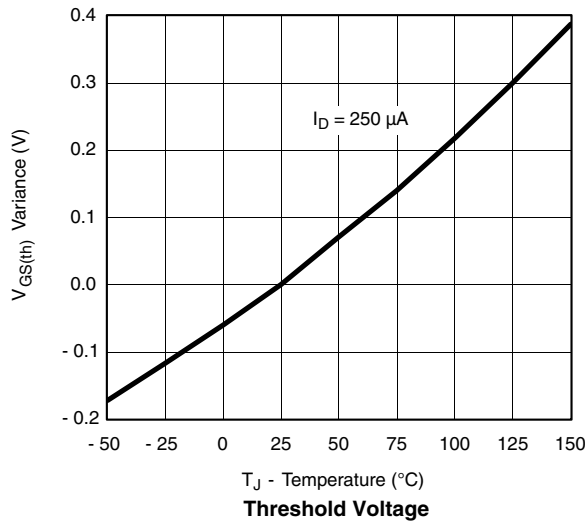


Source-Drain Diode Forward Voltage



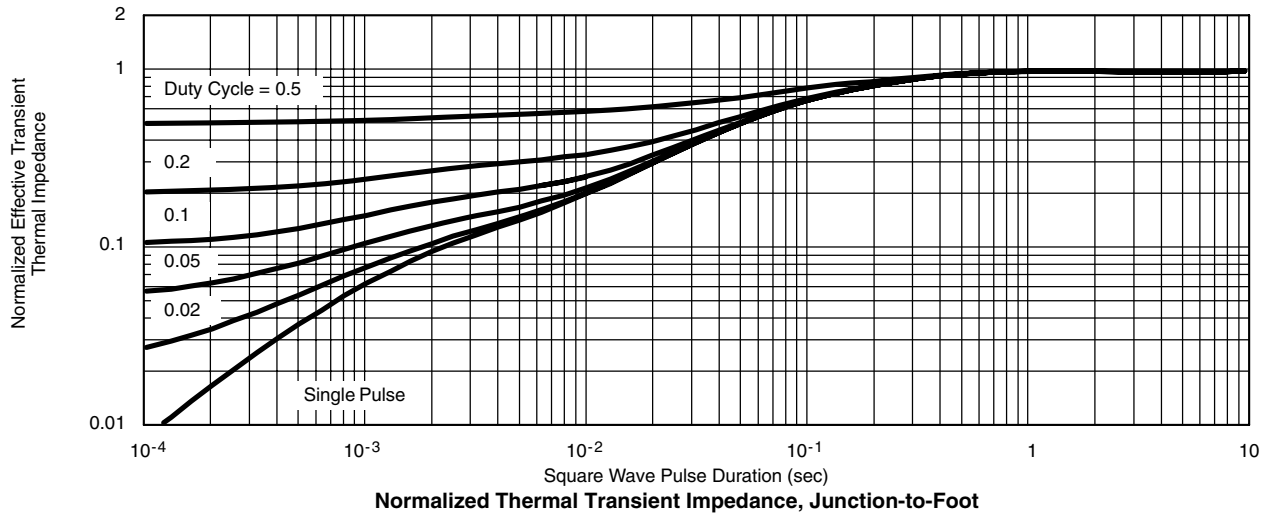
On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C unless noted





TYPICAL CHARACTERISTICS 25 °C unless noted



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