

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

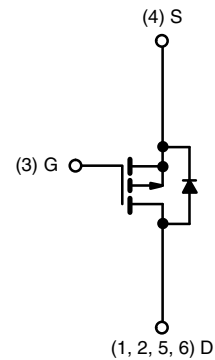
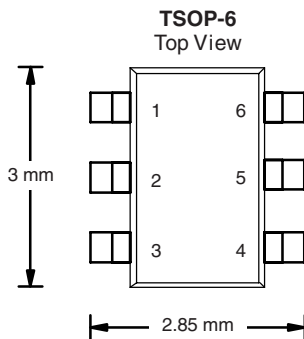
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- PWM Optimized
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

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



P-Channel MOSFET

Ordering Information: Si3867DV-T1-E3 (Lead (Pb)-free)
Si3867DV-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	5 s	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	R_{thJA}	$t \leq 5$ s	45	62.5	°C/W
		Steady State	90	110	
Maximum Junction-to-Foot (Drain)	R_{thJF}	25	30		

Notes:

a. Surface Mounted on 1" x 1" FR4 board.

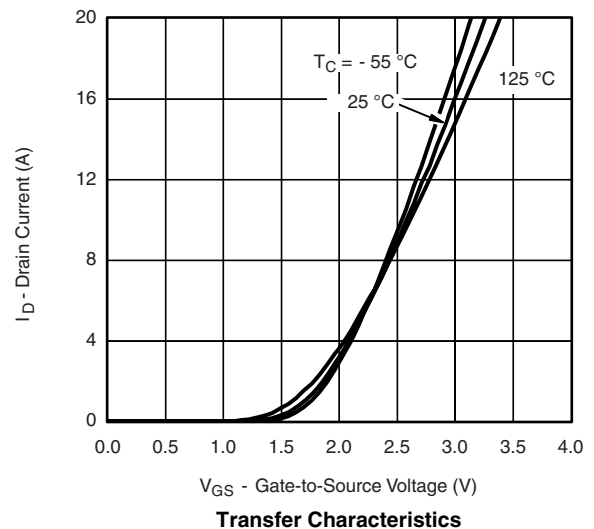
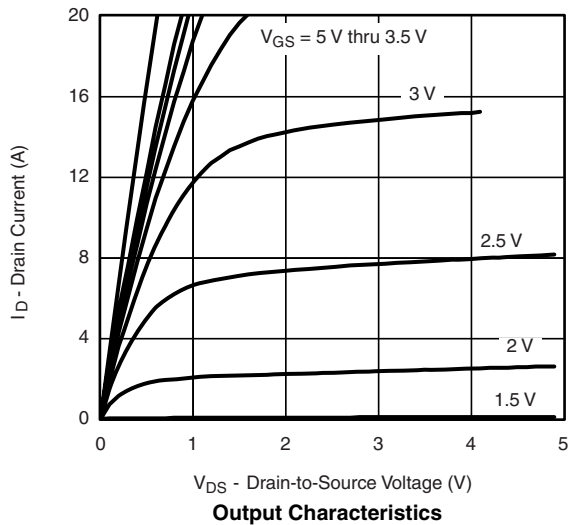
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-0.6		-1.4	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 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:

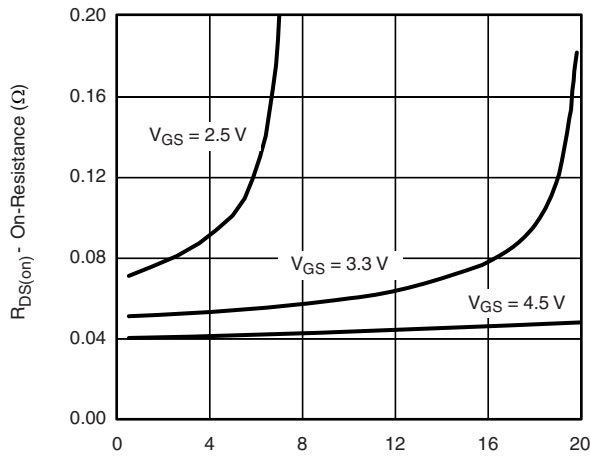
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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.

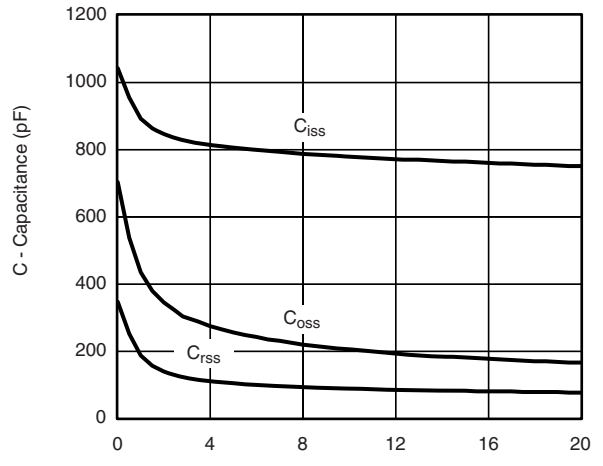
TYPICAL CHARACTERISTICS $25\text{ }^\circ\text{C}$, unless otherwise noted



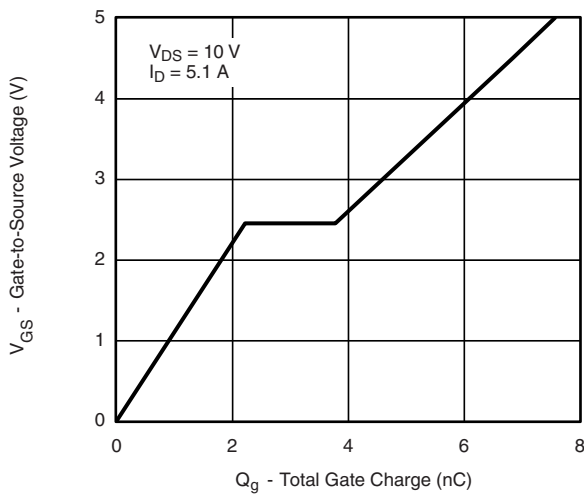
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



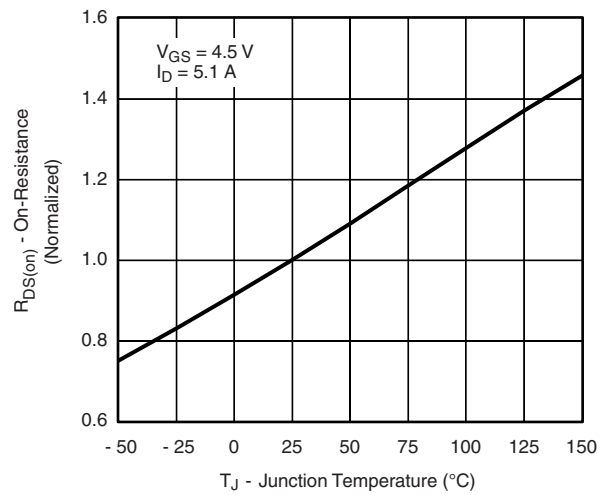
I_D - Drain Current (A)
On-Resistance vs. Drain Current



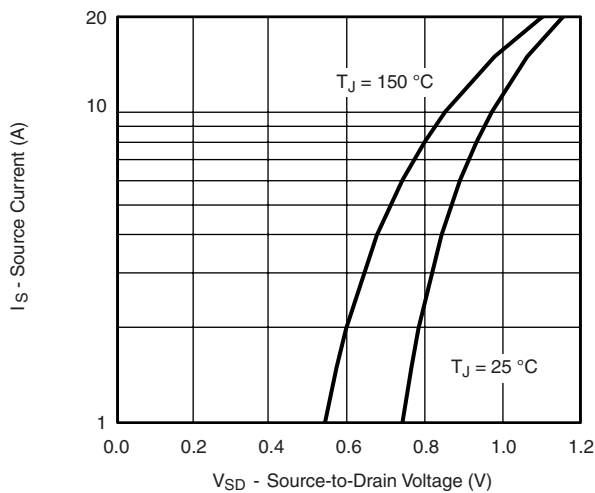
V_{DS} - Drain-to-Source Voltage (V)
Capacitance



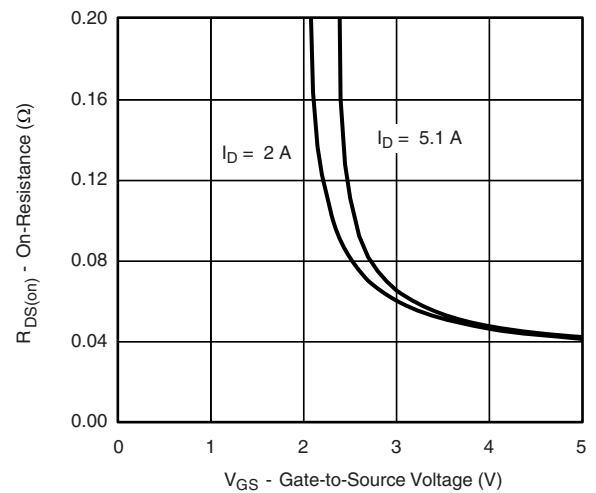
Q_g - Total Gate Charge (nC)
Gate Charge



T_J - Junction Temperature ($^{\circ}\text{C}$)
On-Resistance vs. Junction Temperature

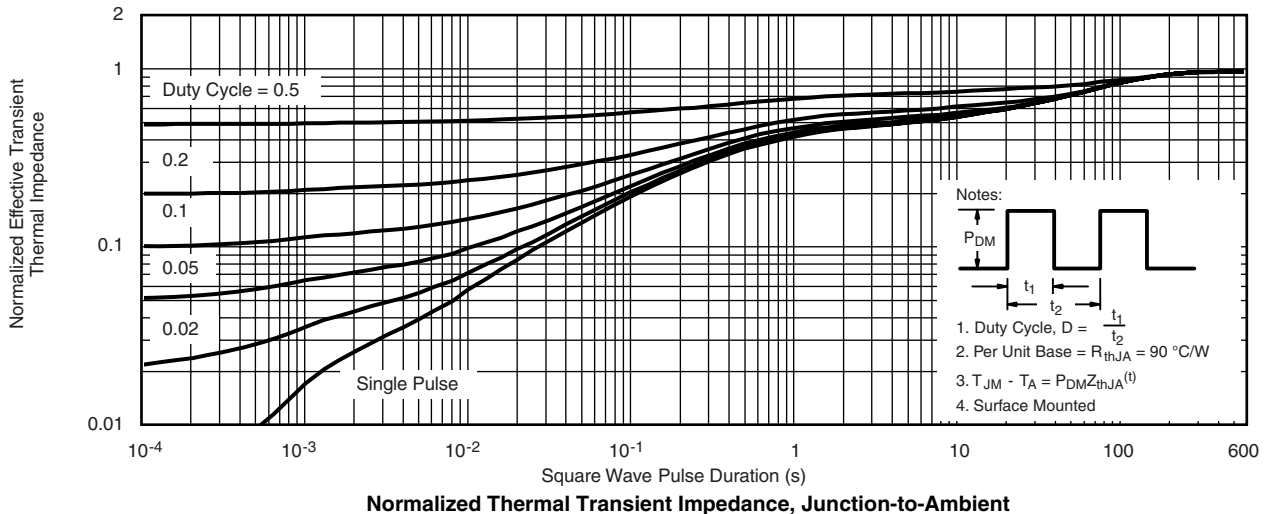
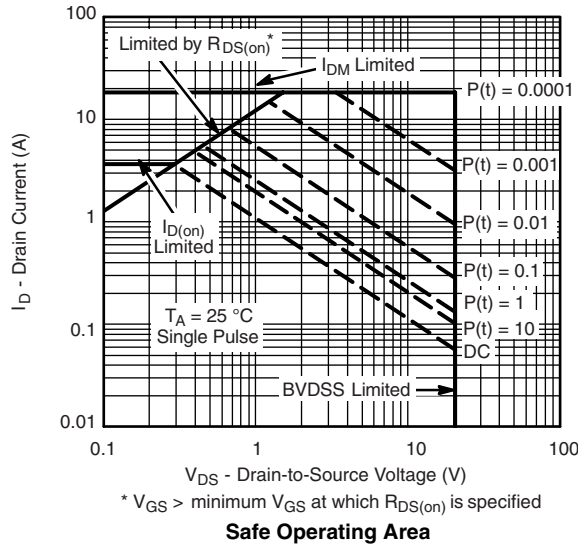
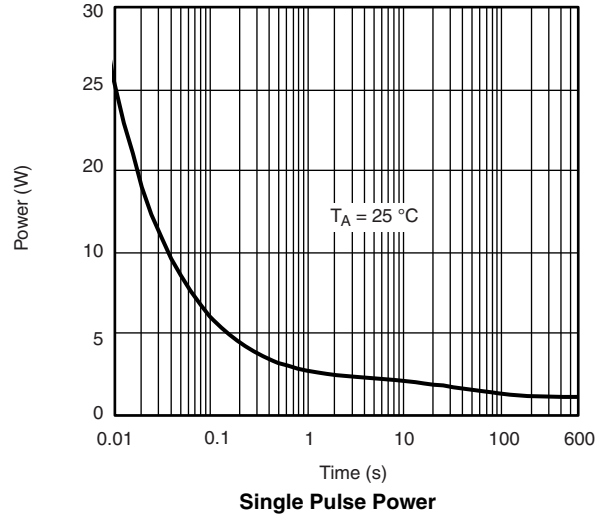
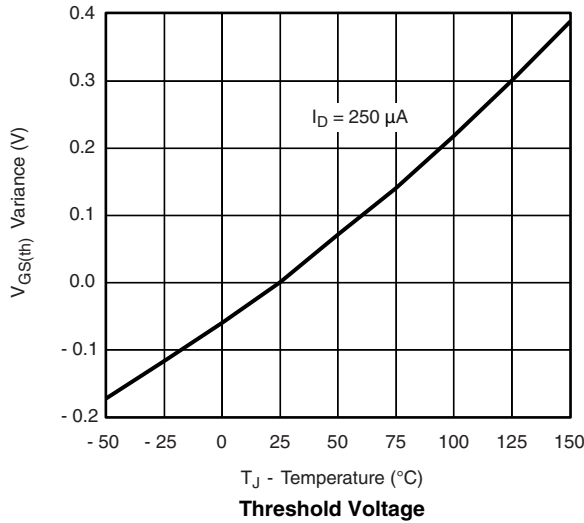


V_{SD} - Source-to-Drain Voltage (V)
Source-Drain Diode Forward Voltage

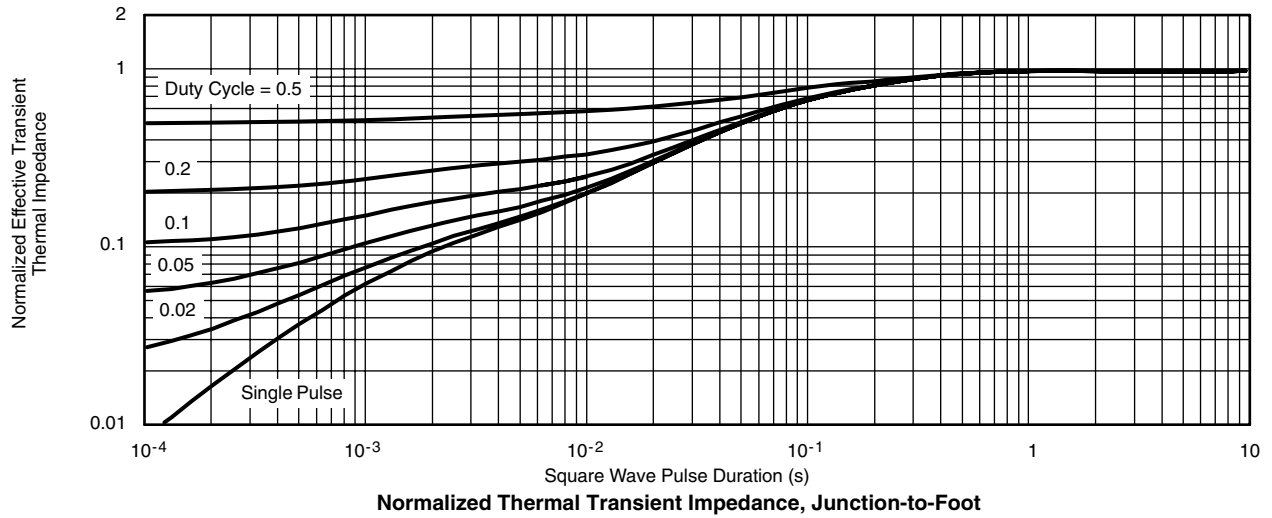


V_{GS} - Gate-to-Source Voltage (V)
On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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