

P-Channel 200 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
- 200	5.0 at V _{GS} = - 10 V	- 0.38	4.1
	5.1 at V _{GS} = - 6 V	- 0.37	

FEATURES

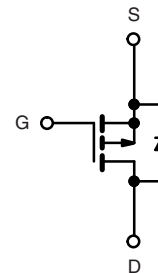
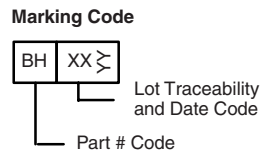
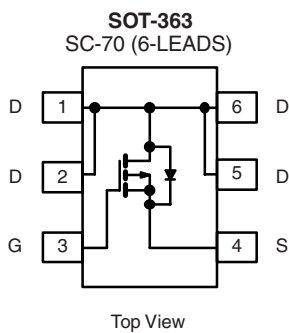
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETS
- Small, Thermally Enhanced SC-70 Package
- Ultra Low On-Resistance
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

- Active Clamp Circuits in dc-to-dc Power Supplies



P-Channel MOSFET

Ordering Information: Si1419DH-T1-E3 (Lead (Pb)-free)
Si1419DH-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}	- 200		V
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	- 0.38	- 0.3
		T _A = 85 °C	- 0.27	- 0.22
Pulsed Drain Current	I _{DM}	- 0.5		A
Continuous Diode Current (Diode Conduction) ^a	I _S	- 1.3	- 0.83	
Single Pulse Avalanche Current	I _{AS}	- 1.9		mJ
Single Pulse Avalanche Energy		E _{AS}	0.18	
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	1.56	1.0
		T _A = 85 °C	0.81	0.52
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 ≤ 5 s	60	80	°C/W
		Steady State	100	125	
Maximum Junction-to-Foot (Drain)	R _{thJF}	34	45		

Notes:

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

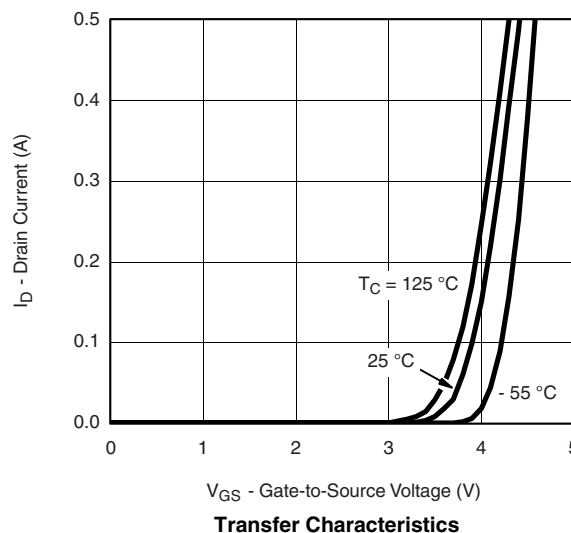
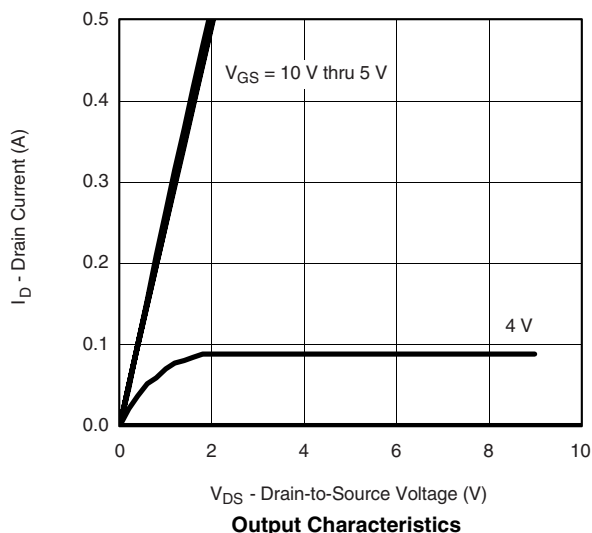
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -100\text{ }\mu\text{A}$	-2.5		-4.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -200\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -200\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}$	-0.5			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -0.4\text{ A}$		3.98	5.0	Ω
		$V_{GS} = -6\text{ V}, I_D = -0.4\text{ A}$		4.06	5.1	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -0.4\text{ A}$		1.0		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -0.4\text{ A}, V_{GS} = 0\text{ V}$		-0.80	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -100\text{ V}, V_{GS} = -10\text{ V}, I_D = -0.4\text{ A}$		4.1	6.2	nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			1.3		
Gate Resistance	R_g	$f = 1.0\text{ MHz}$		17		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -100\text{ V}, R_L = 100\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 6\text{ }\Omega$		6	9	ns
Rise Time	t_r			12	18	
Turn-Off Delay Time	$t_{d(off)}$			12	18	
Fall Time	t_f			12	18	
Reverse Recovery Time	t_{rr}	$I_F = -0.4\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		55	83	ns
Body Diode Reverse Recovery Charge	Q_{rr}			130	200	

Notes:

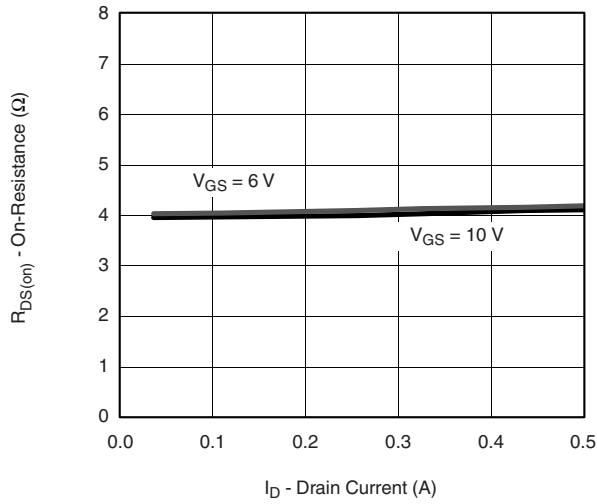
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

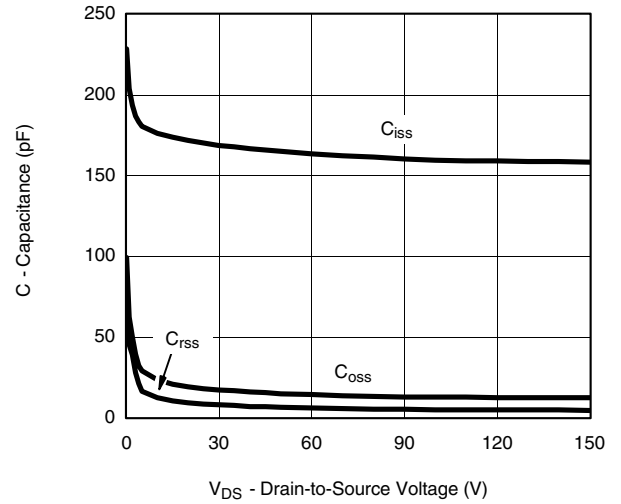
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

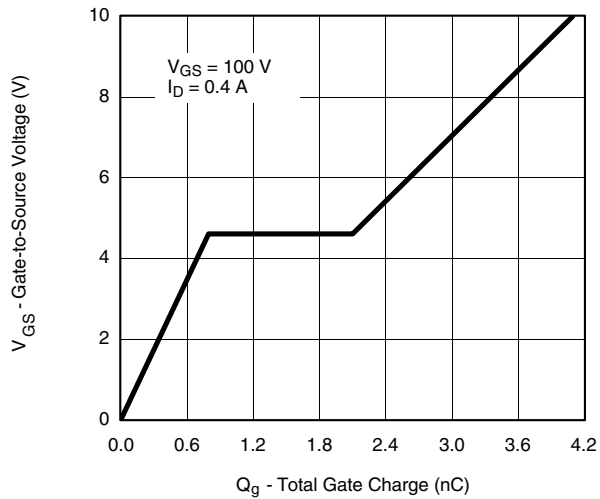
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



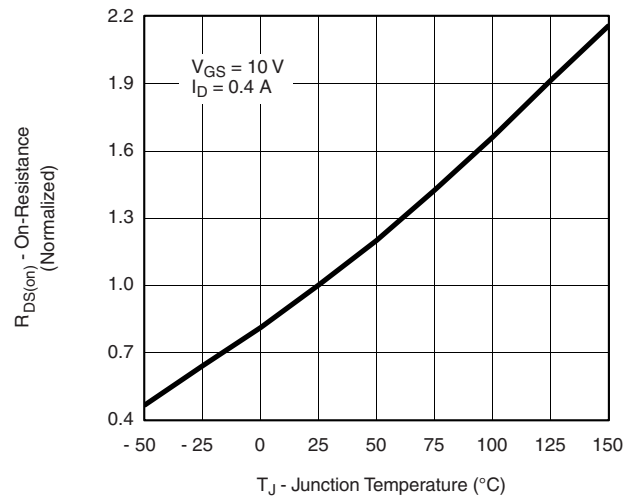
On-Resistance vs. Drain Current



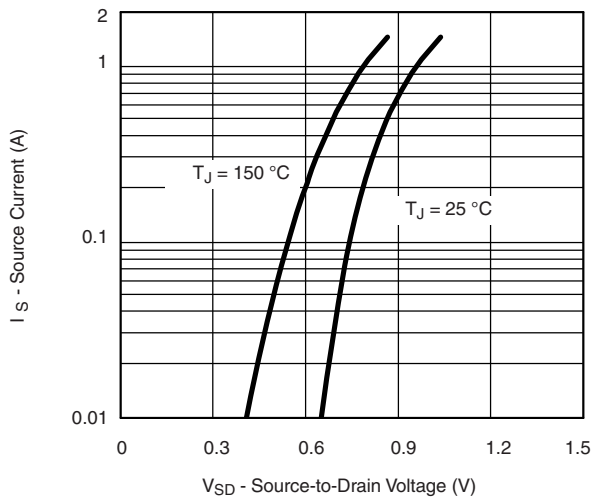
Capacitance



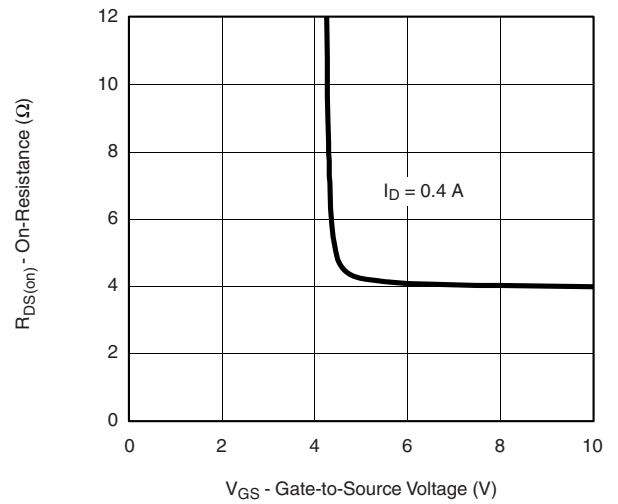
Gate Charge



On-Resistance vs. Junction Temperature

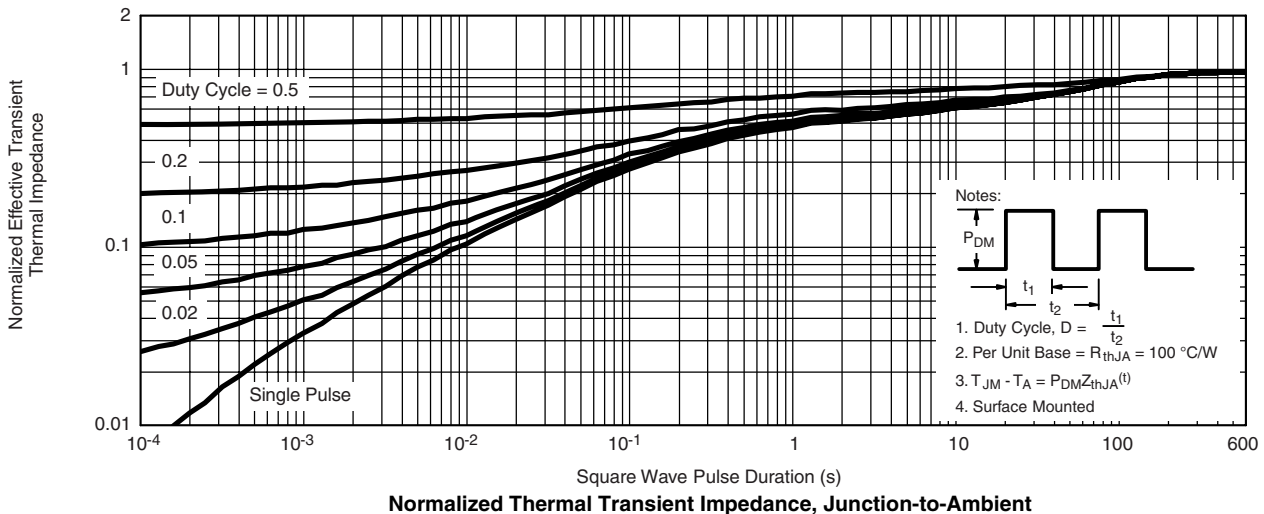
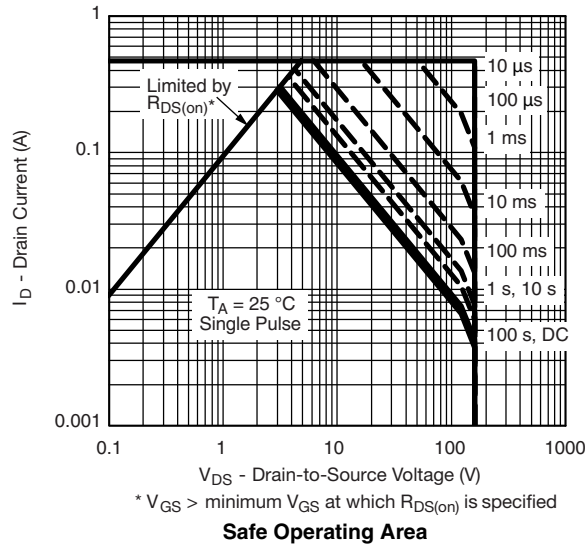
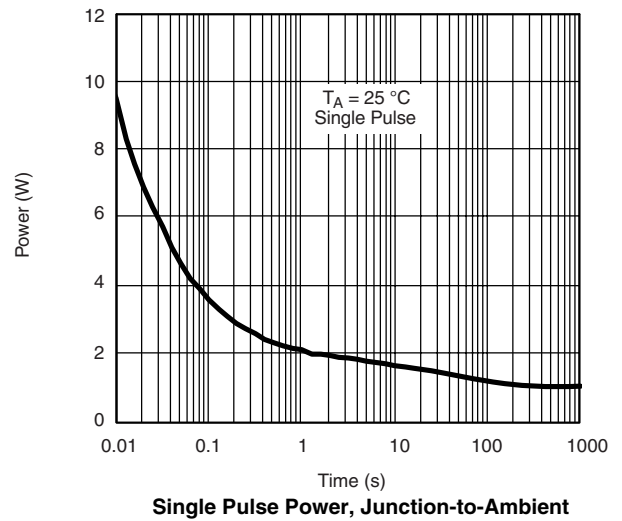
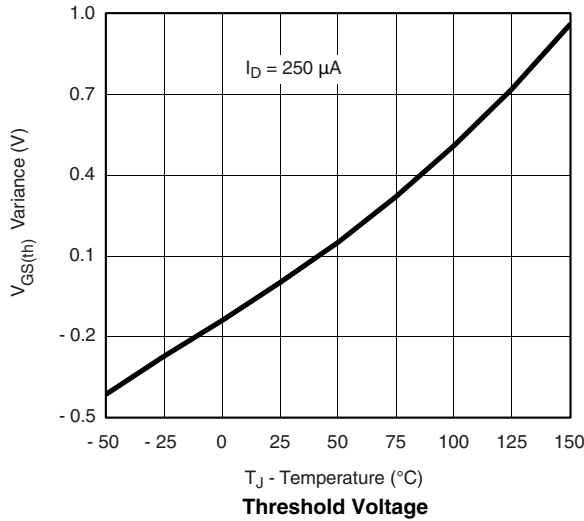


Source-Drain Diode Forward Voltage

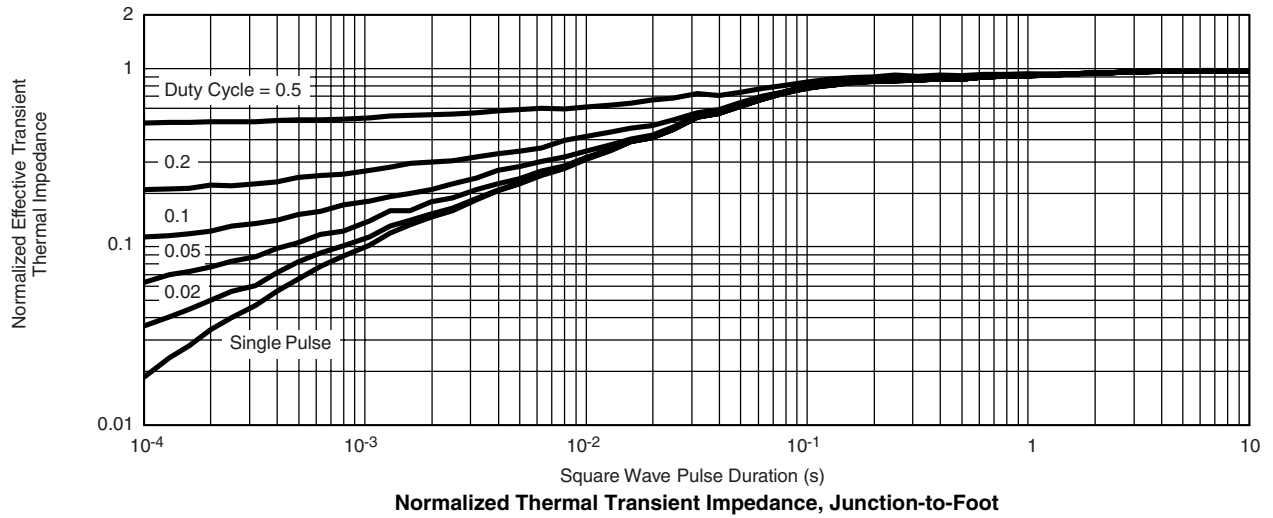


On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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