

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

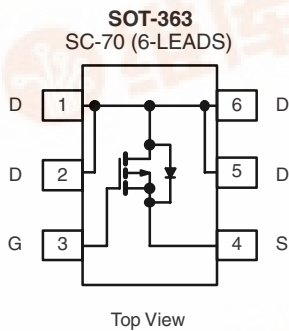
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETS
- Small, Thermally Enhanced SC-70 Package
- Ultra Low On-Resistance
- Compliant to RoHS Directive 2002/95/EC



RoHS
 COMPLIANT
 HALOGEN
FREE
 Available

APPLICATIONS

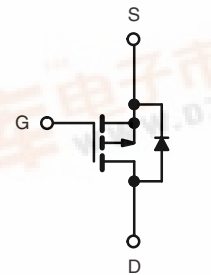
- Active Clamp Circuits in dc-to-dc Power Supplies



Marking Code



Ordering Information: Si1419DH-T1-E3 (Lead (Pb)-free)
 Si1419DH-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, 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 ($T_J = 150^\circ\text{C}$) ^a	I_D	- 0.38	- 0.3	A
		- 0.27	- 0.22	
Pulsed Drain Current	I_{DM}	- 0.5		
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	1.56	1.0	W
		0.81	0.52	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	60	80	$^\circ\text{C/W}$
		100	125	
Maximum Junction-to-Foot (Drain)	R_{thJF}	34	45	

Notes:

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

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

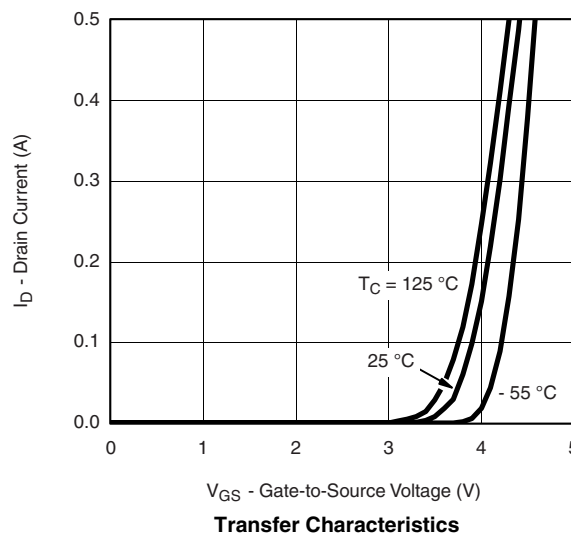
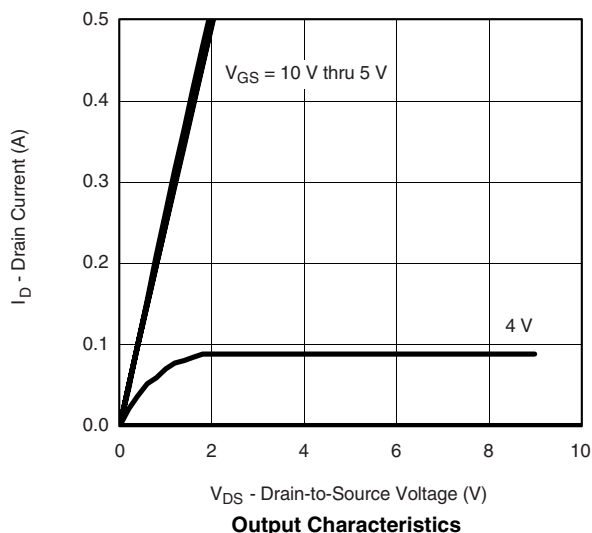
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -100\ \mu\text{A}$	-2.5		-4.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -200\ \text{V}$, $V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -200\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 85^\circ\text{C}$			-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	$t_{d(on)}$	$V_{DD} = -100\ \text{V}$, $R_L = 100\ \Omega$ $I_D \cong -1\ \text{A}$, $V_{GEN} = -4.5\ \text{V}$, $R_g = 6\ \Omega$		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	
Body Diode Reverse Recovery Charge	Q_{rr}			130	200	

Notes:

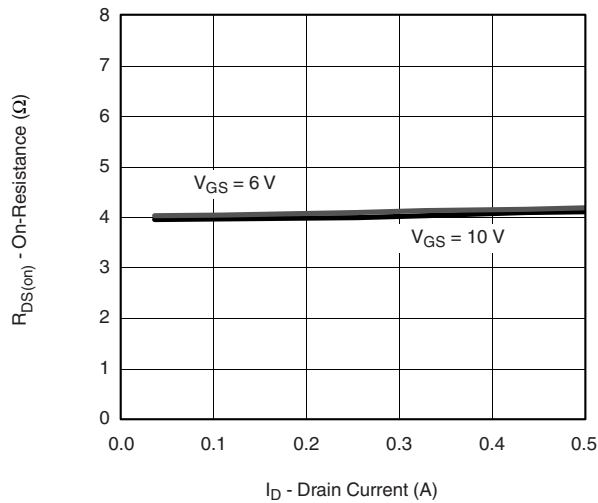
a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

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

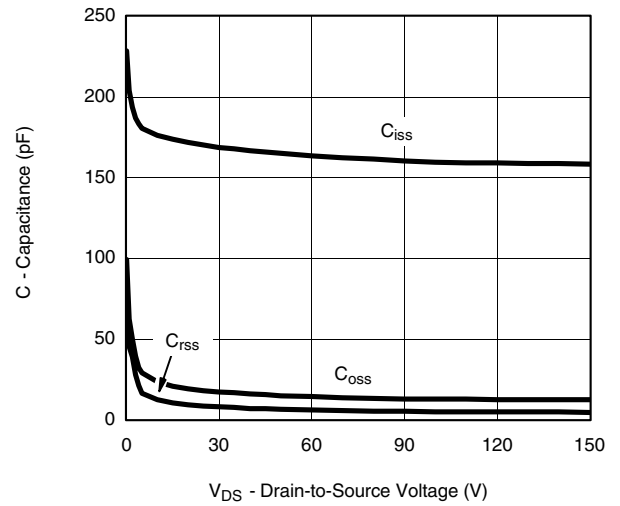
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS 25°C , unless otherwise noted

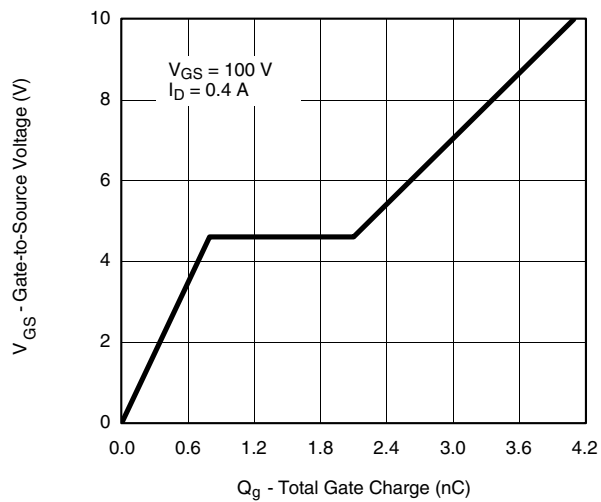
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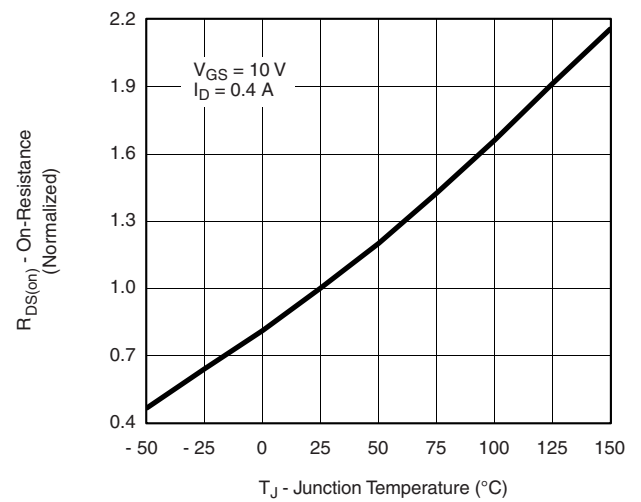
On-Resistance vs. Drain Current



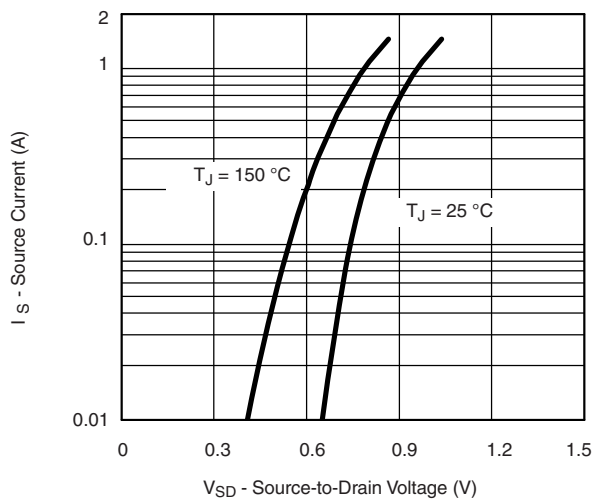
Capacitance



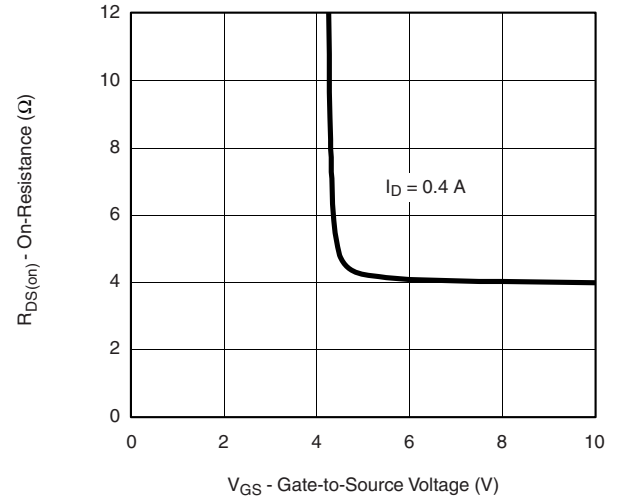
Gate Charge



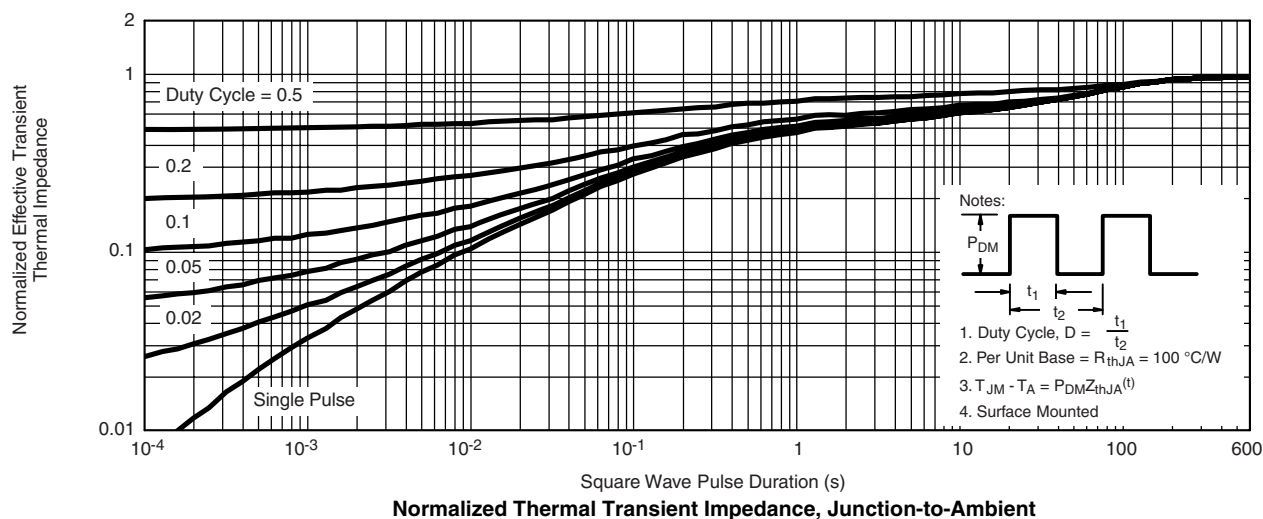
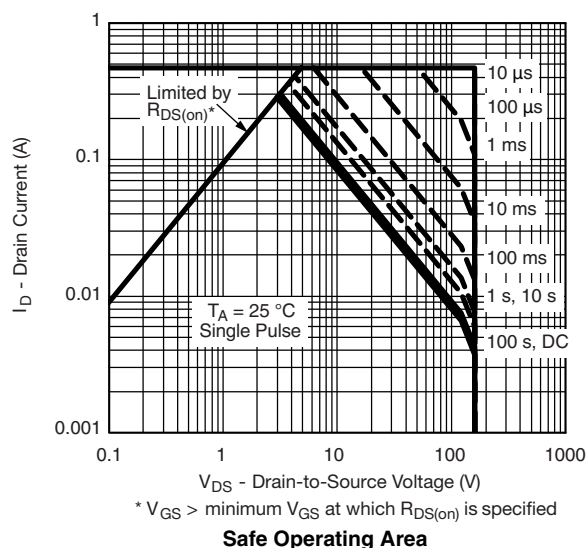
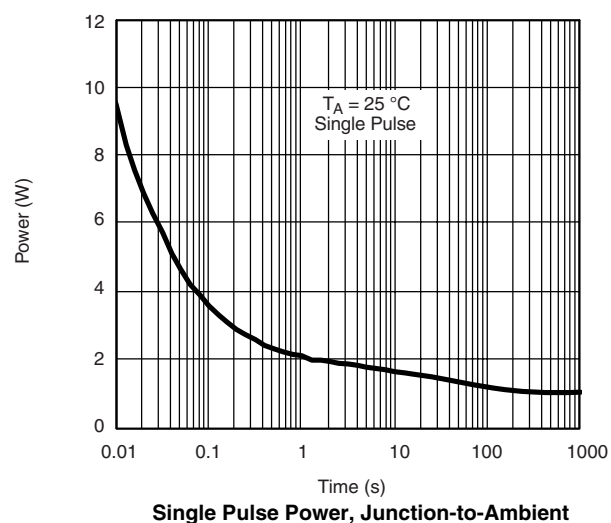
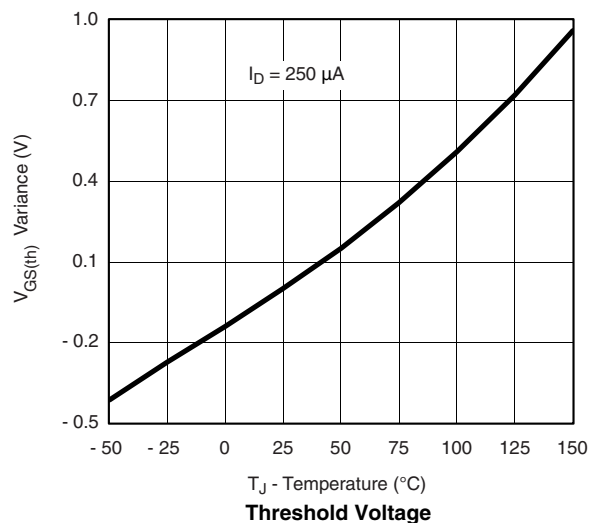
On-Resistance vs. Junction Temperature



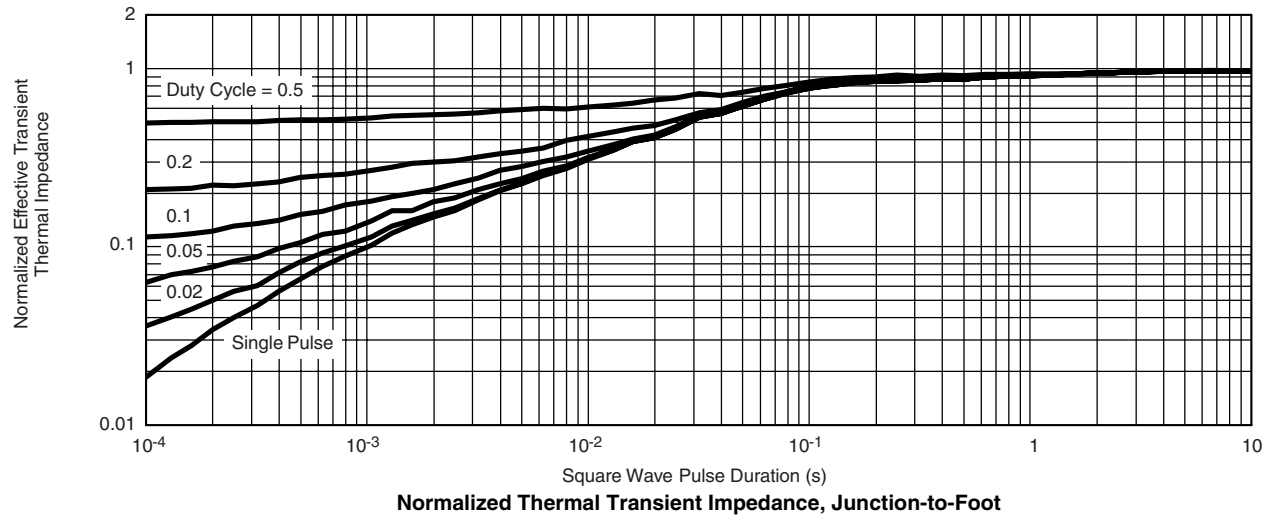
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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