



## P-Channel 150-V (D-S) MOSFET



Product Is Completely Pb-free

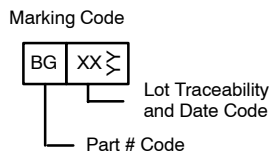
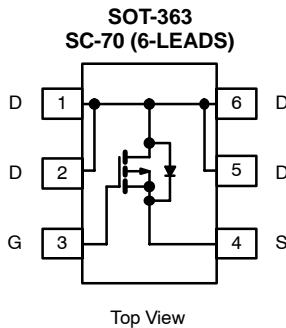
PRODUCT SUMMARY			
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)	$Q_g$ (Typ)
-150	2.6 @ $V_{GS} = -10$ V	-0.52	4.2 nC
	2.7 @ $V_{GS} = -6$ V	-0.51	

### FEATURES

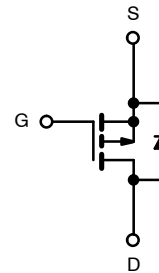
- TrenchFET® Power MOSFETS
- Small, Thermally Enhanced SC-70 Package
- Ultra Low On-Resistance

### APPLICATIONS

- Active Clamp Circuits in DC/DC Power Supplies



Ordering Information: Si1411DH-T1—E3



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-150		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-0.52	-0.42	A
		$T_A = 85^\circ\text{C}$	-0.38	-0.3	
Pulsed Drain Current	$I_{DM}$	-0.8			
Continuous Diode Current (Diode Conduction) <sup>a</sup>	$I_S$	-1.3	-0.83		
Single Pulse Avalanche Current	$L = 0.1$ mH	$I_{AS}$	-2.1		
Single Pulse Avalanche Energy			$E_{AS}$	0.22	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.56	1.0	W
		$T_A = 85^\circ\text{C}$	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 <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	60	80	$^\circ\text{C}/\text{W}$
		Steady State	100	125	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	34	45		

Notes

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

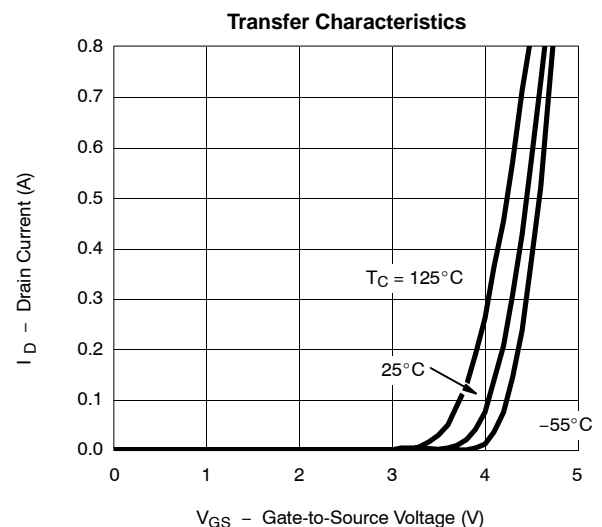
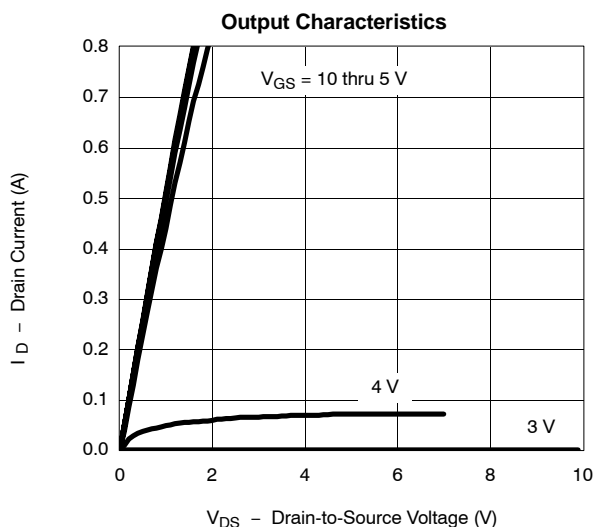
**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -100 μA	-2.5		-4.5	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -150 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V	-0.8			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.5 A		2.05	2.6	Ω
		V <sub>GS</sub> = -6 V, I <sub>D</sub> = -0.5 A		2.14	2.7	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -0.5 A		1.5		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -1.4 A, V <sub>GS</sub> = 0 V		-0.80	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -75 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.5 A		4.2	6.3	nC
Gate-Source Charge	Q <sub>gs</sub>			0.9		
Gate-Drain Charge	Q <sub>gd</sub>			1.3		
Gate Resistance	R <sub>g</sub>	f = 1.0 MHz		8.5		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -75 V, R <sub>L</sub> = 75 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>g</sub> = 6 Ω		4.5	7	ns
Rise Time	t <sub>r</sub>			11	17	
Turn-Off Delay Time	t <sub>d(off)</sub>			9	14	
Fall Time	t <sub>f</sub>			11	17	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -0.5 A, di/dt = 100 A/μs		36	55	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			65	100	

## Notes

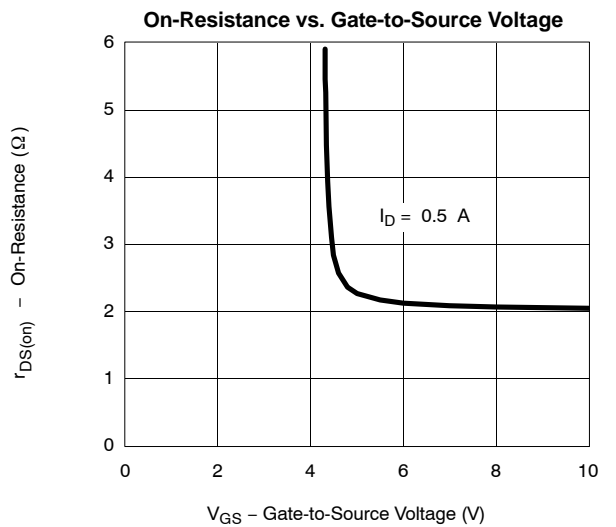
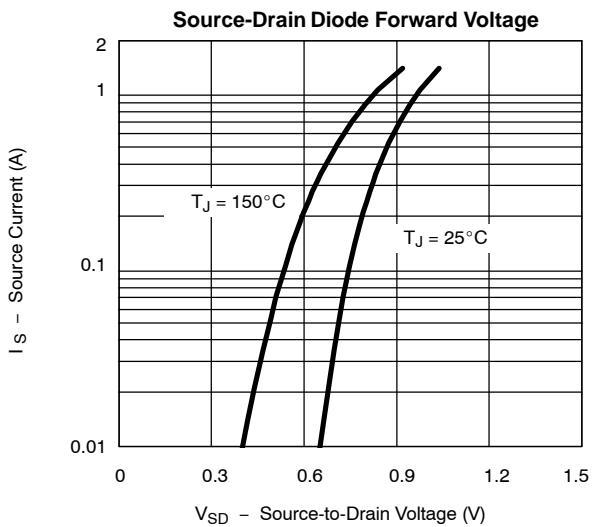
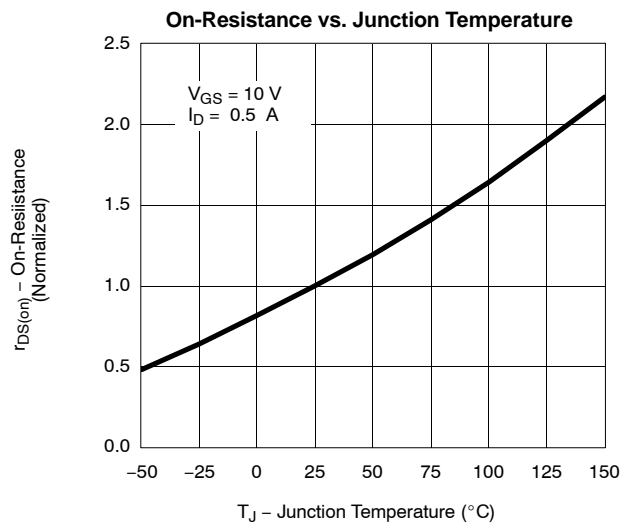
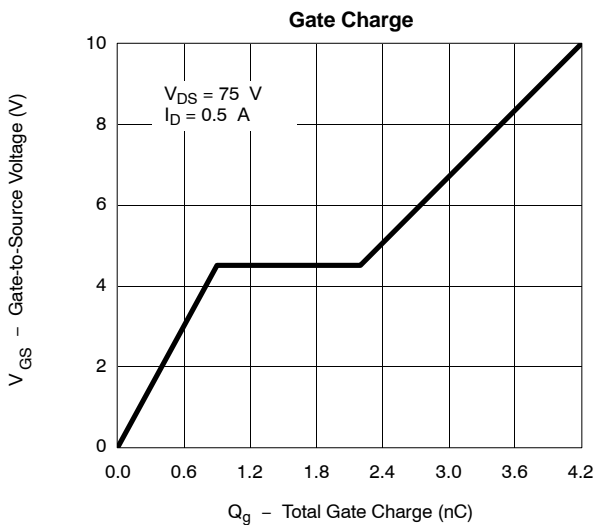
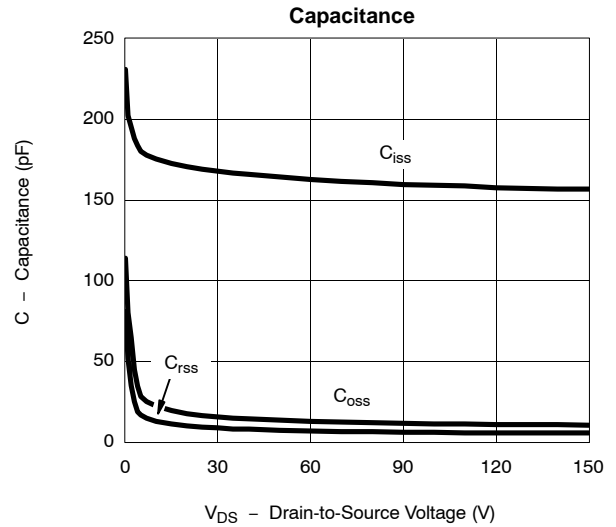
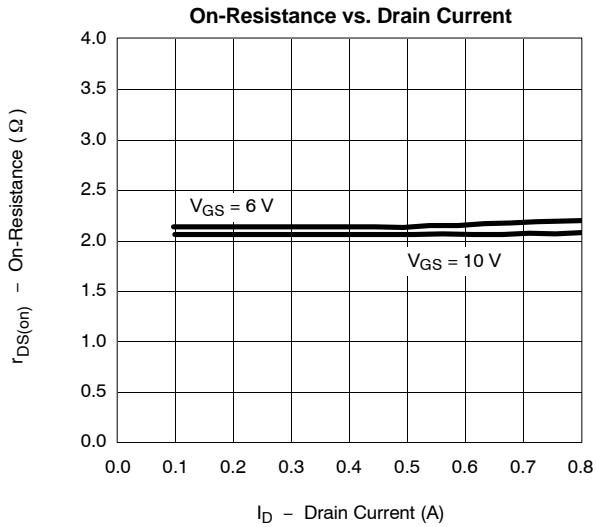
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

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)**

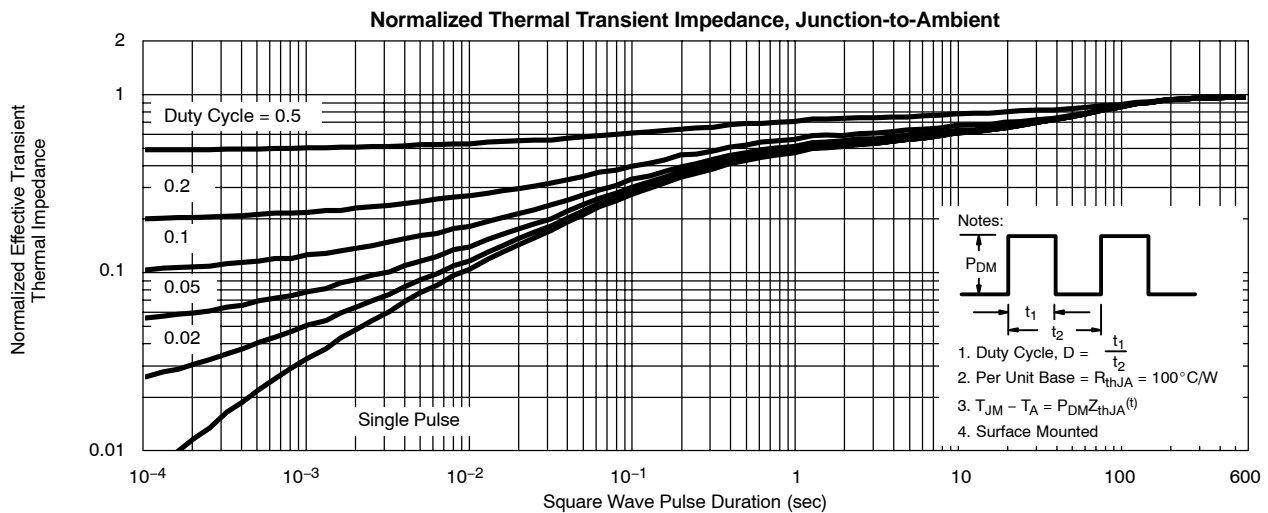
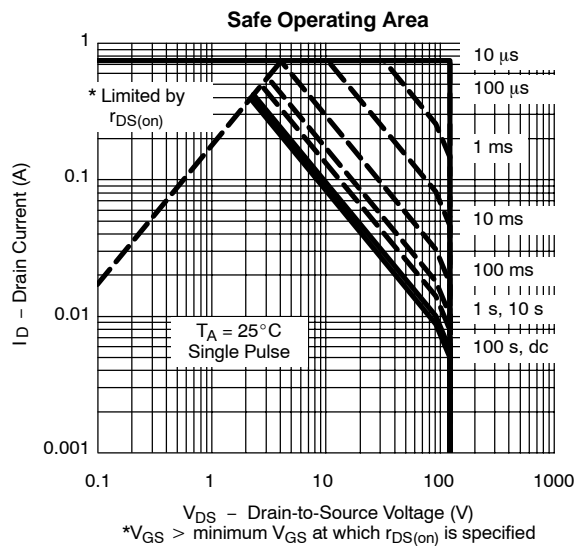
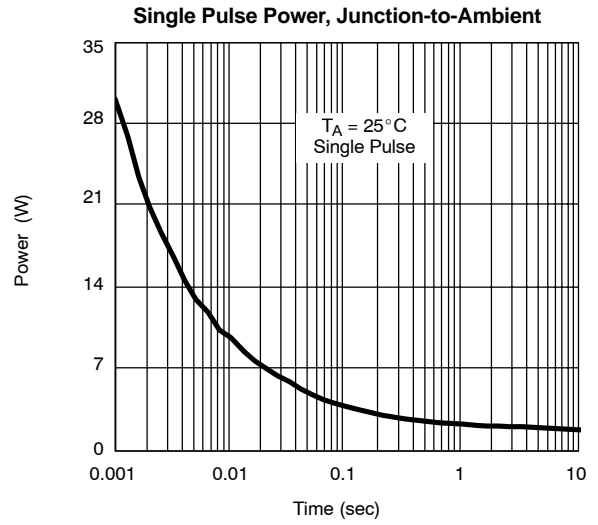
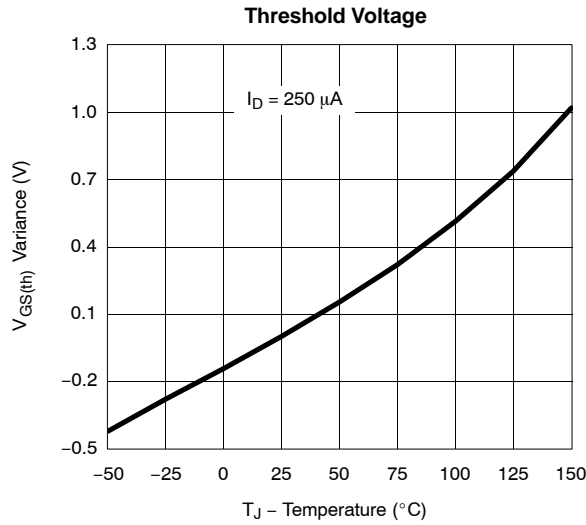


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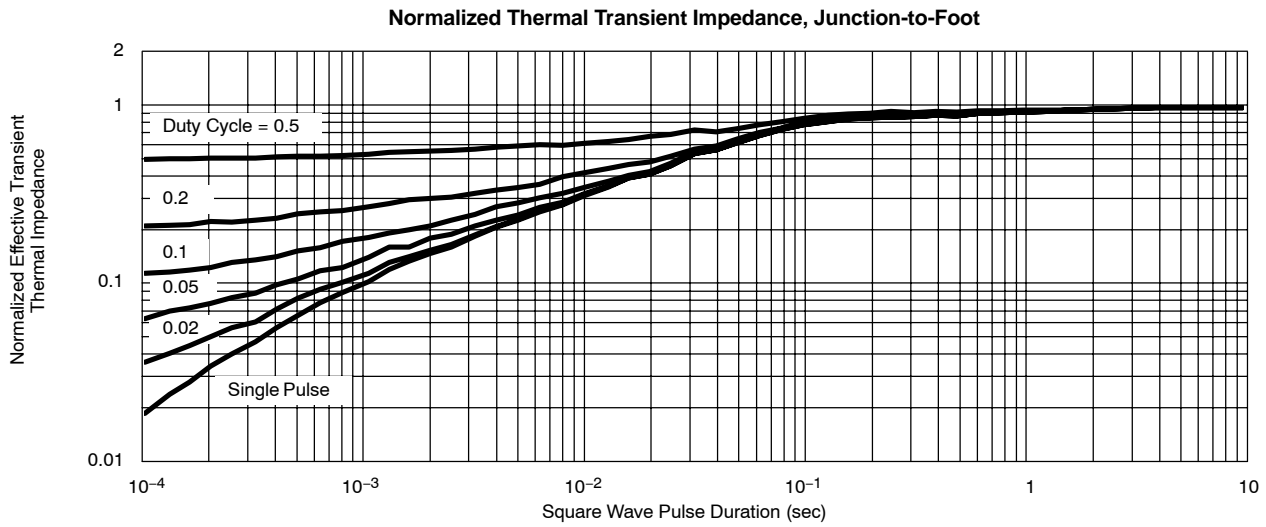


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