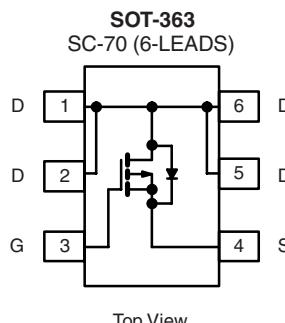


P-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 20	0.115 at $V_{GS} = - 4.5$ V	- 2.9
	0.155 at $V_{GS} = - 2.5$ V	- 2.4
	0.220 at $V_{GS} = - 1.8$ V	- 2.0

FEATURES

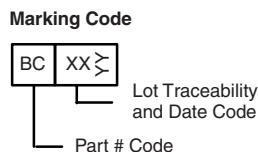
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETs: 1.8 V Rated
- Thermally Enhanced SC-70 Package
- Compliant to RoHS Directive 2002/95/EC



Top View

APPLICATIONS

- Load Switching
- PA Switch
- Level Switch



Ordering Information: Si1413DH-T1-E3 (Lead (Pb)-free)
Si1413DH-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}	± 8			
Continuous Drain Current ($T_J = 150$ °C) ^a		I_D	- 2.9	- 2.3	A	
			- 2.0	- 1.6		
Pulsed Drain Current		I_{DM}	- 8			
Continuous Diode Current (Diode Conduction) ^a		I_S	- 1.4	- 0.9		
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		°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 5$ s	R_{thJA}	60	80	°C/W
	Steady State		100	125	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	34	45	

Note:

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

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

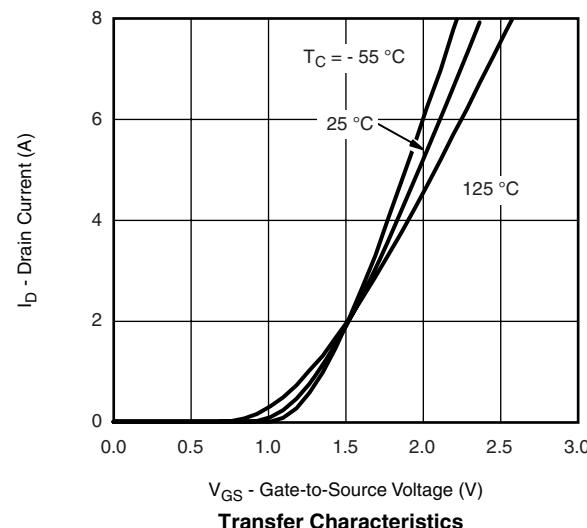
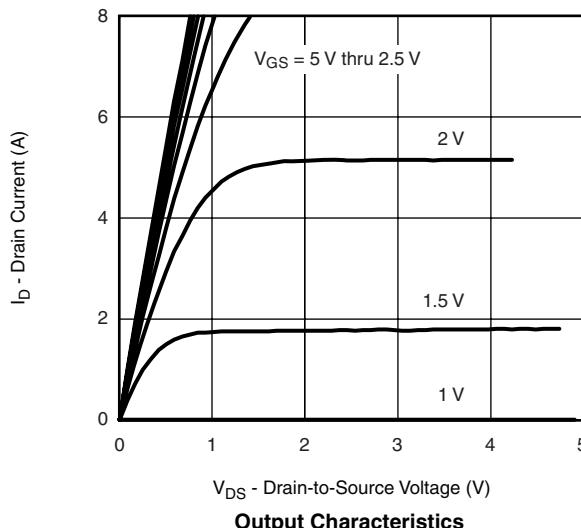
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -100 \mu\text{A}$	- 0.45		- 0.8	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 8 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16 \text{ V}$, $V_{GS} = 0 \text{ V}$			- 1	μA
		$V_{DS} = -16 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 85^\circ\text{C}$			- 5	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} = -5 \text{ V}$, $V_{GS} = -4.5 \text{ V}$	- 4			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -4.5 \text{ V}$, $I_D = -2.9 \text{ A}$		0.095	0.115	Ω
		$V_{GS} = -2.5 \text{ V}$, $I_D = -2.4 \text{ A}$		0.125	0.155	
		$V_{GS} = -1.8 \text{ V}$, $I_D = -1.0 \text{ A}$		0.180	0.220	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10 \text{ V}$, $I_D = -2.9 \text{ A}$		6		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.4 \text{ A}$, $V_{GS} = 0 \text{ V}$		- 0.8	- 1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10 \text{ V}$, $V_{GS} = -4.5 \text{ V}$, $I_D = -2.9 \text{ A}$		6	8.5	nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			1.2		
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -10 \text{ V}$, $R_L = 10 \Omega$ $I_D \equiv -1 \text{ A}$, $V_{GEN} = -4.5 \text{ V}$, $R_g = 6 \Omega$		13	20	ns
Rise Time	t_r			32	50	
Turn-Off Delay Time	$t_{d(\text{off})}$			34	50	
Fall Time	t_f			42	65	

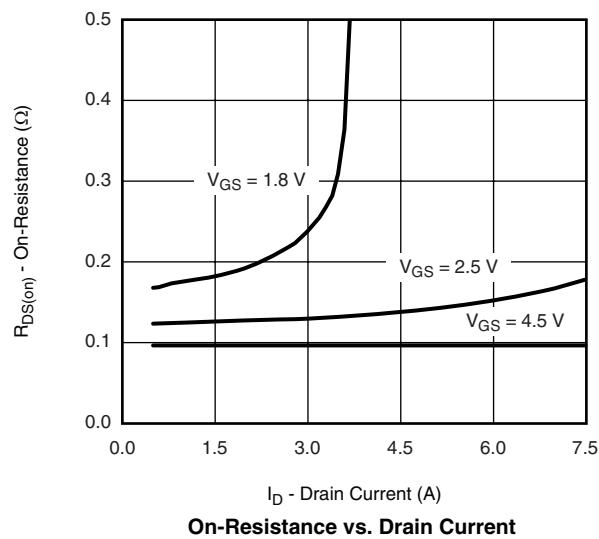
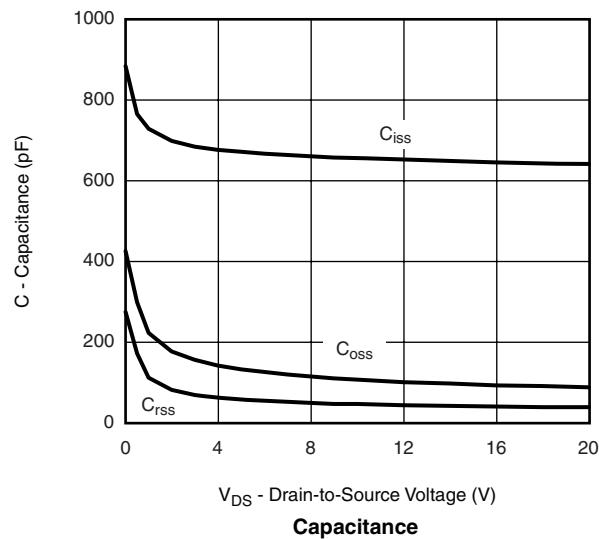
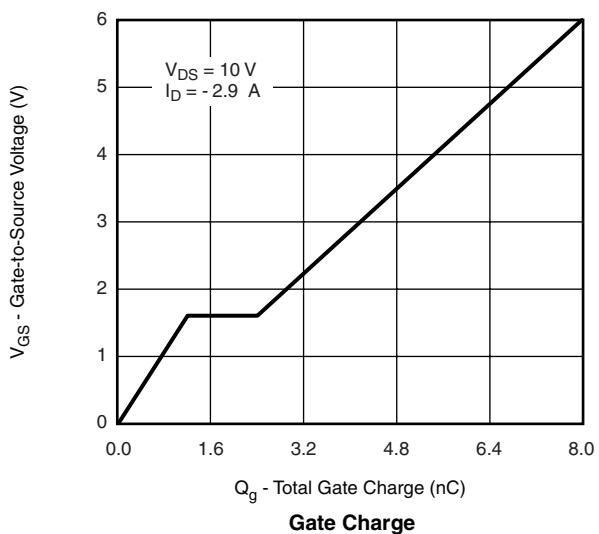
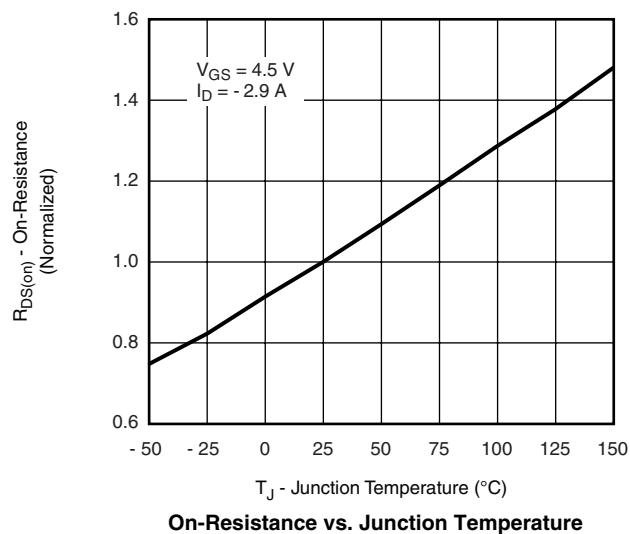
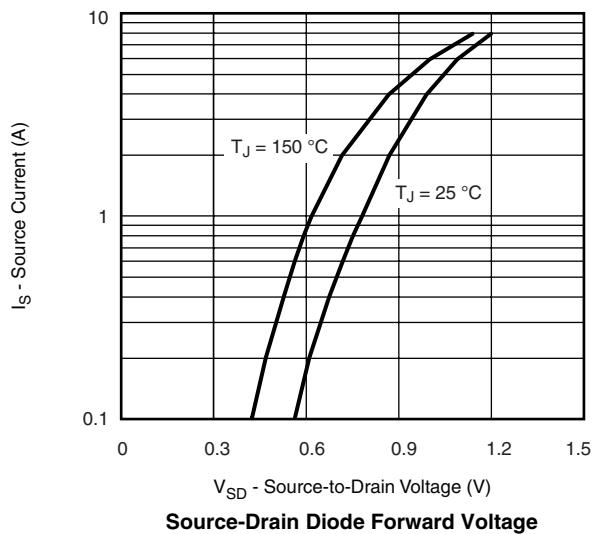
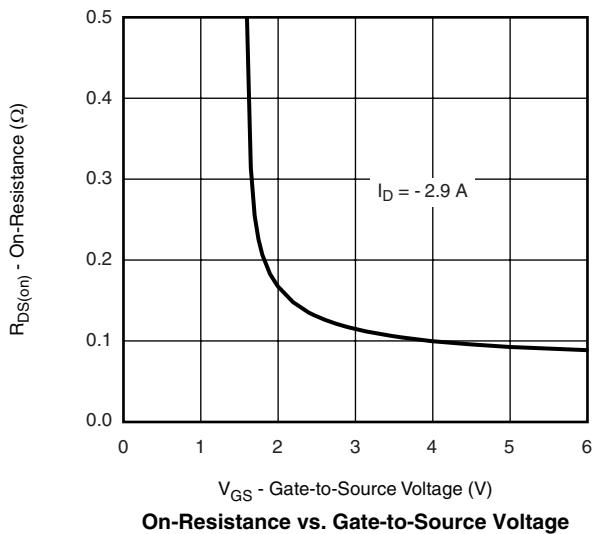
Notes:

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

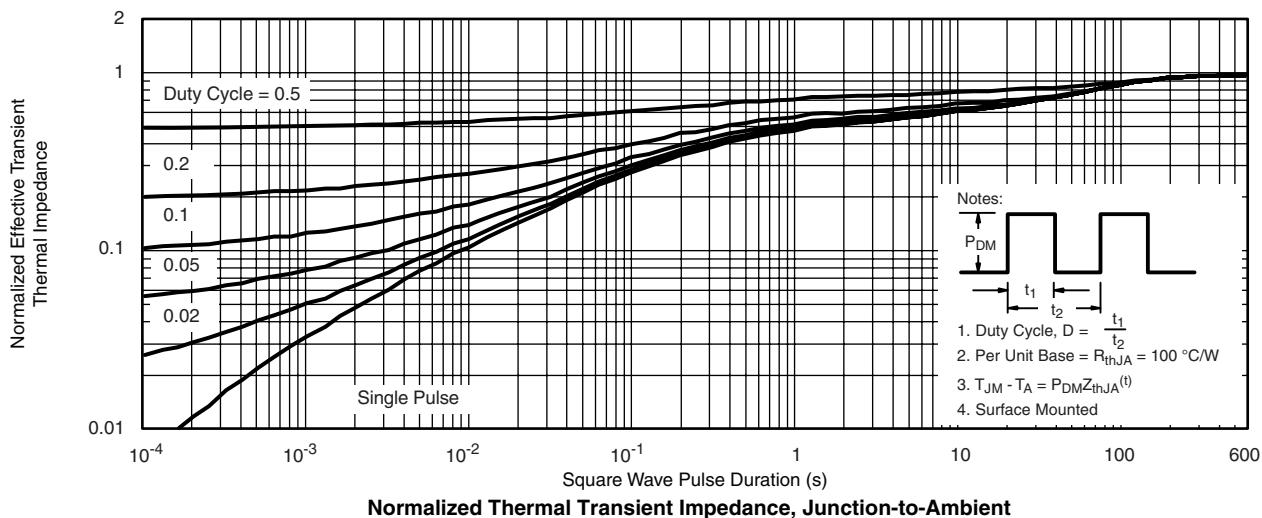
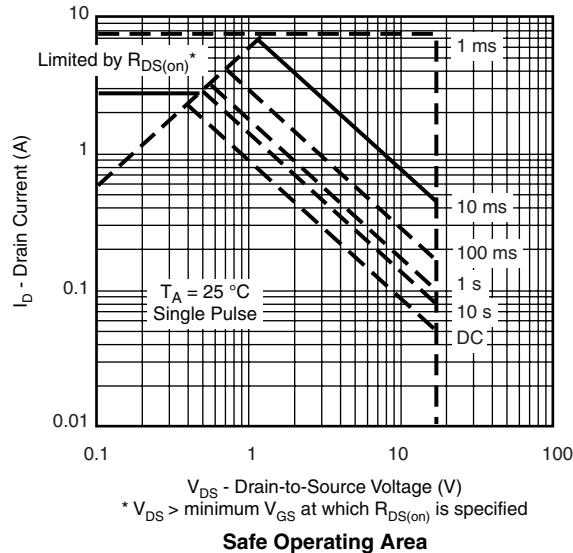
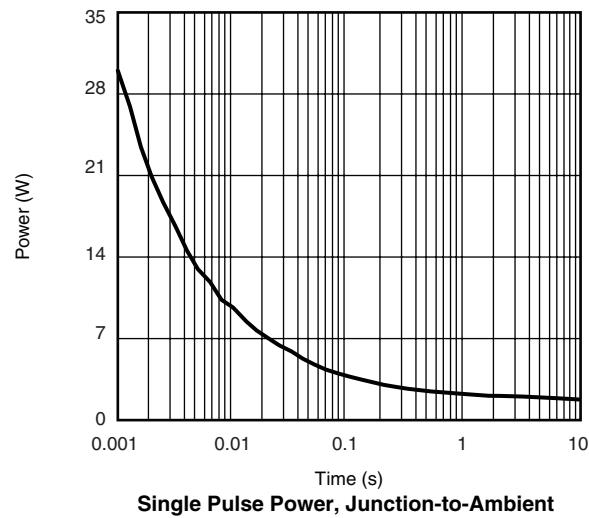
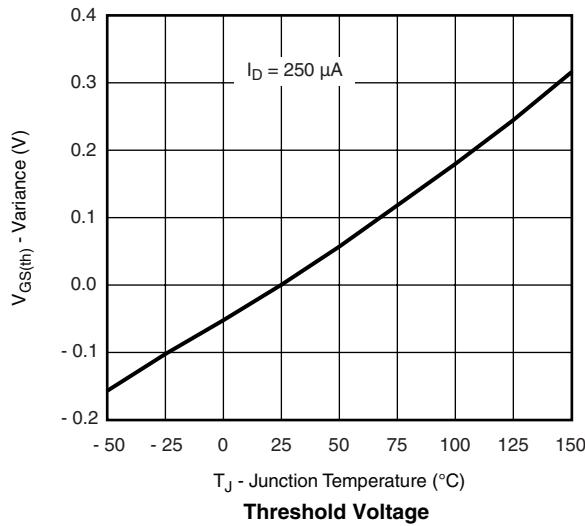
b. Guaranteed by design, not subject to production testing.

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.

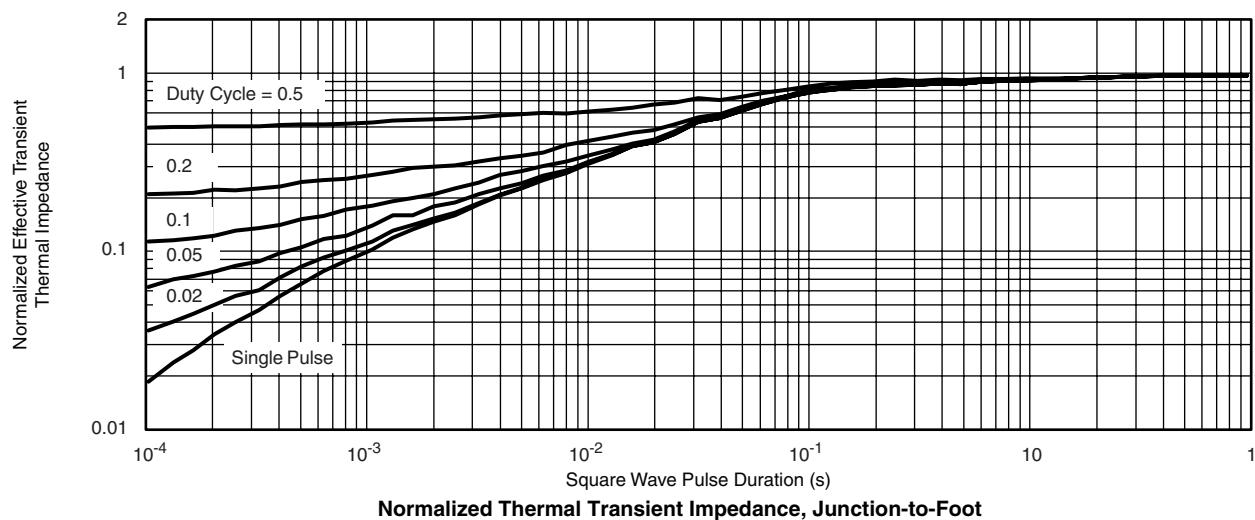
TYPICAL CHARACTERISTICS 25°C , unless otherwise noted


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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