



N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.065 @ $V_{GS} = 4.5$ V	3.9
	0.075 @ $V_{GS} = 2.5$ V	3.6
	0.096 @ $V_{GS} = 1.8$ V	3.2

FEATURES

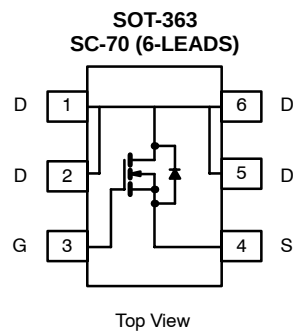
- TrenchFET® Power MOSFETS
- 1.8-V Rated
- Thermally Enhanced SC-70 Package



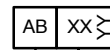
Pb-free
Available

APPLICATIONS

- Load Switching
- PA Switch
- Level Switch



Marking Code



Lot Traceability
and Date Code

Part # Code

Ordering Information: Si1406DH-T1
Si1406DH-T1—E3 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	±8		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	3.9	3.1	A
	T _A = 85°C		2.8	2.2	
Pulsed Drain Current		I _{DM}	10		
Continuous Diode Current (Diode Conduction) ^a		I _S	1.4	0.9	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	1.56	1.0	W
	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	$t \leq 5$ sec	R_{thJA}	60	80	$^\circ\text{C/W}$
	Steady State		100	125	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	34	45	

Notes

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

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

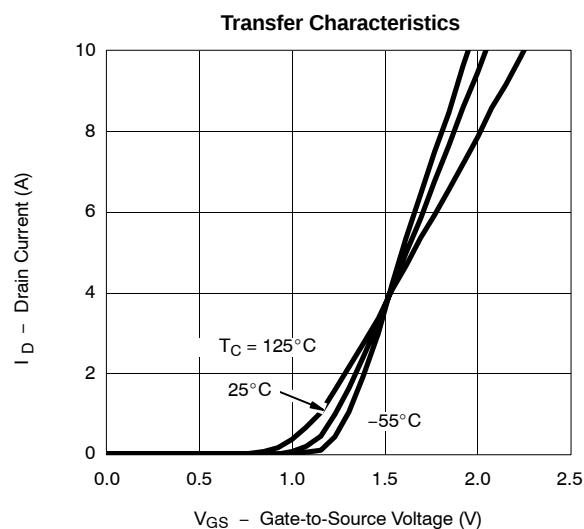
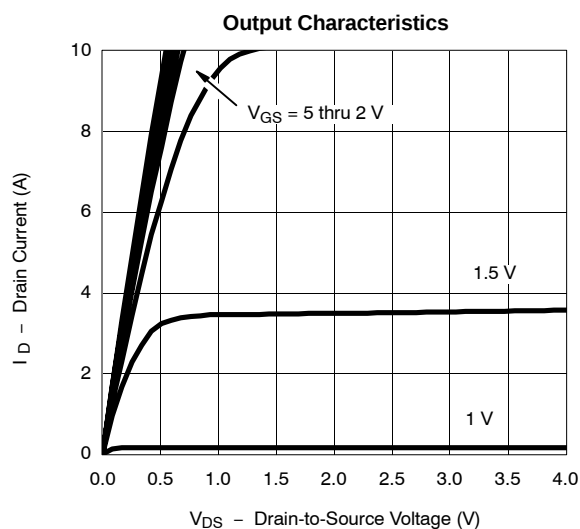
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.45		1.2	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 8\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 20\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 85^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\ \text{V}, V_{GS} = 4.5\ \text{V}$	8			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}, I_D = 3.9\ \text{A}$		0.053	0.065	Ω
		$V_{GS} = 2.5\ \text{V}, I_D = 3.6\ \text{A}$		0.062	0.075	
		$V_{GS} = 1.8\ \text{V}, I_D = 2\ \text{A}$		0.079	0.096	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\ \text{V}, I_D = 3.9\ \text{A}$		11		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.4\ \text{A}, V_{GS} = 0\ \text{V}$		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\ \text{V}, V_{GS} = 4.5\ \text{V}, I_D = 3.9\ \text{A}$		4.9	7.5	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			0.95		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\ \text{V}, R_L = 20\ \Omega$ $I_D \cong 0.5\ \text{A}, V_{GEN} = 4.5\ \text{V}, R_g = 6\ \Omega$		27	41	ns
Rise Time	t_r			47	71	
Turn-Off Delay Time	$t_{d(off)}$			54	81	
Fall Time	t_f			29	44	
Source-Drain Reverse Recovery	t_{rr}	$I_F = 1.4\ \text{A}, di/dt = 100/\mu\text{s}$		35	60	

Notes

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

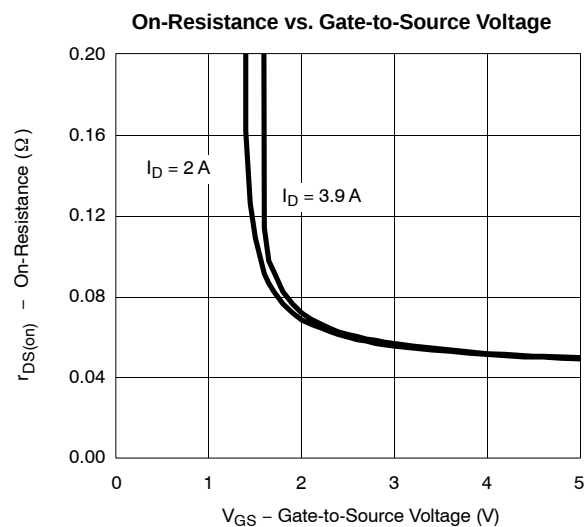
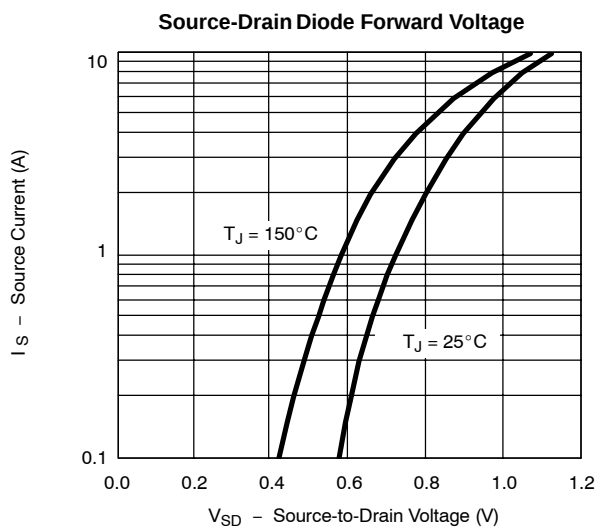
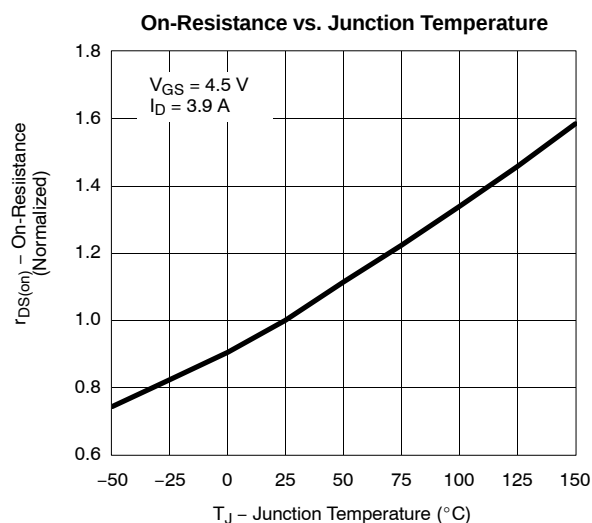
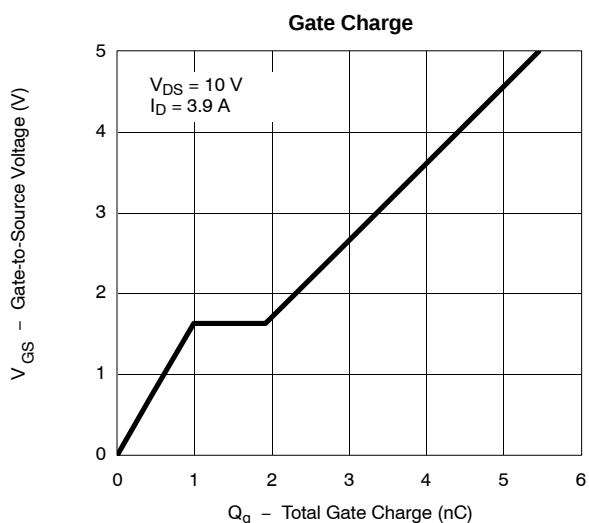
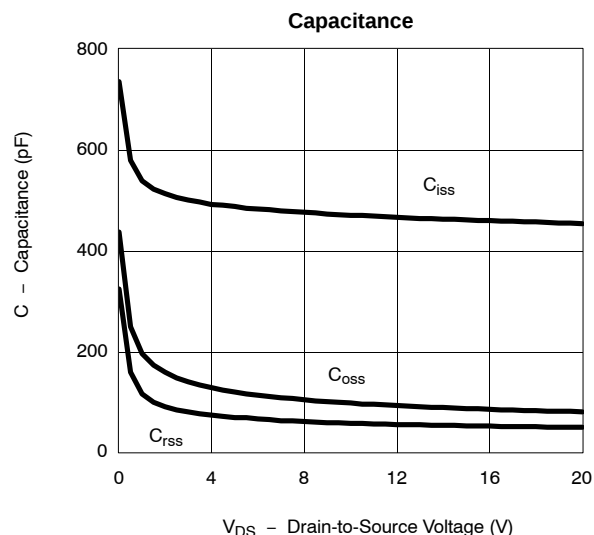
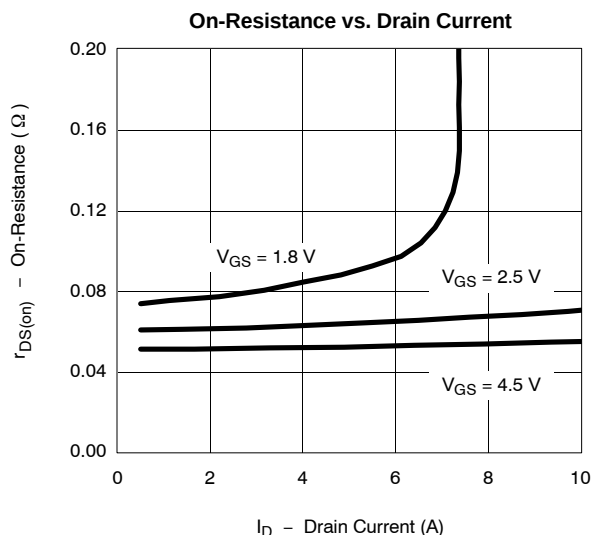
b. Guaranteed by design, not subject to production testing.

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.

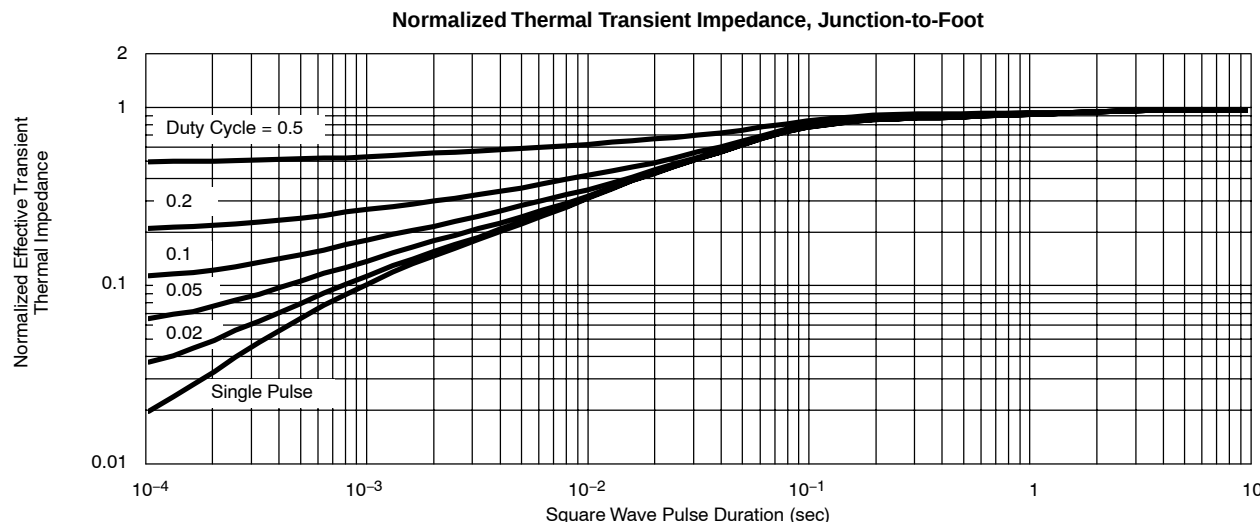
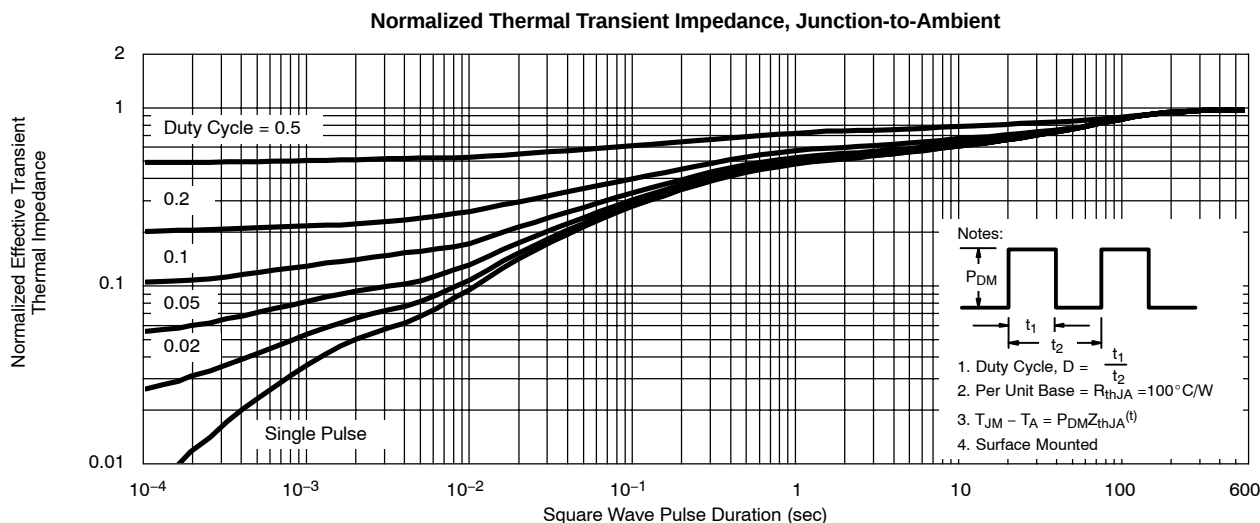
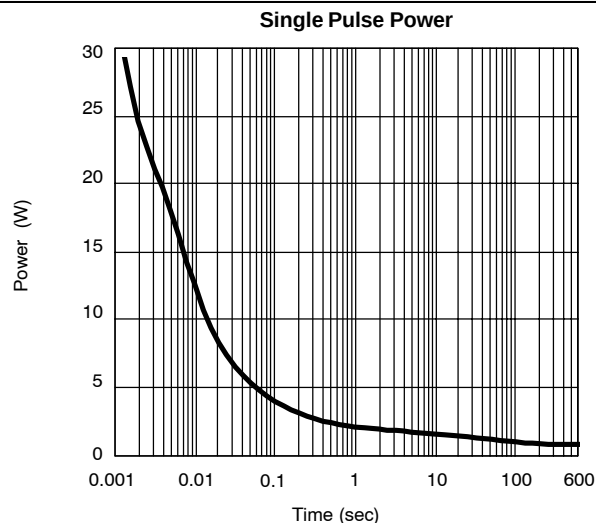
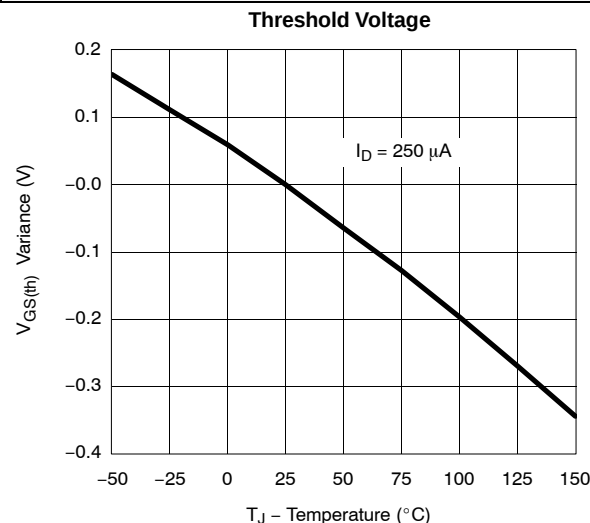
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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