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[SI1406DH-T1-GE3](#)

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Si1406DH
 Vishay Siliconix

N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
20	0.065 at V _{GS} = 4.5 V	3.9
	0.075 at V _{GS} = 2.5 V	3.6
	0.096 at V _{GS} = 1.8 V	3.2

FEATURES

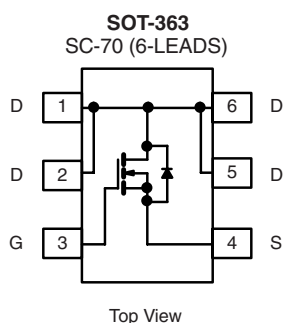
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETs: 1.8 V Rated
- Thermally Enhanced SC-70 Package
- Compliant to RoHS Directive 2002/95/EC



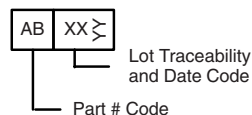
RoHS
 COMPLIANT
 HALOGEN
FREE
 Available

APPLICATIONS

- Load Switching
- PA Switch
- Level Switch



Marking Code



Ordering Information: Si1406DH-T1-E3 (Lead (Pb)-free)
 Si1406DH-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	T _A = 25 °C	3.9	3.1
		T _A = 85 °C	2.8	2.2
Pulsed Drain Current	I _{DM}	10		A
Continuous Source Current (Diode Conduction) ^a	I _S	1.4	0.9	
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
		Steady State	100	125
Maximum Junction-to-Foot (Drain)	R _{thJF}	34	45	°C/W

Note:

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

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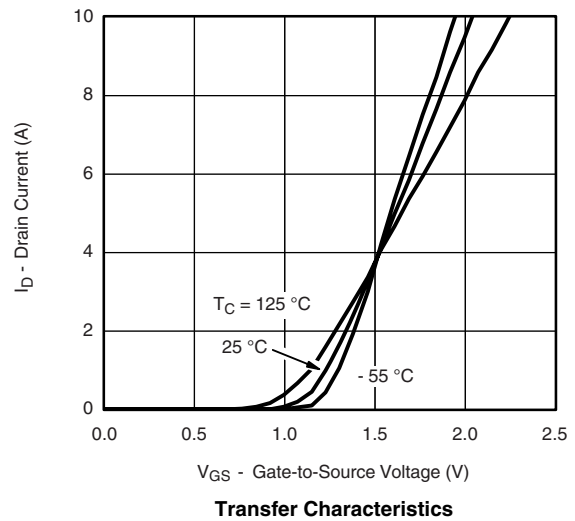
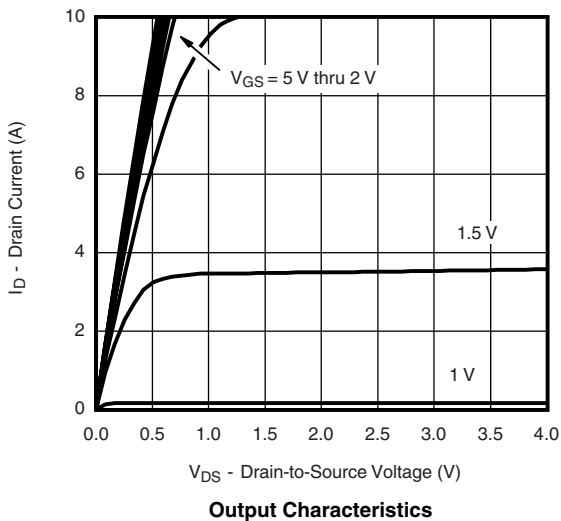
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.45		1.2	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$			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	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 20\text{ }\Omega$ $I_D \cong 0.5\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 6\text{ }\Omega$		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}	$I_F = 1.4\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		35	60	

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.

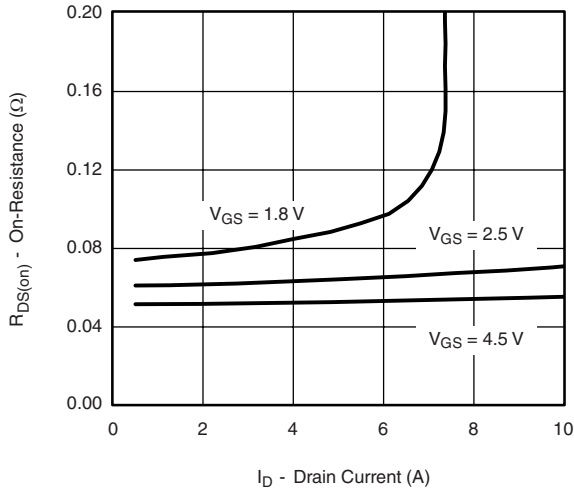
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



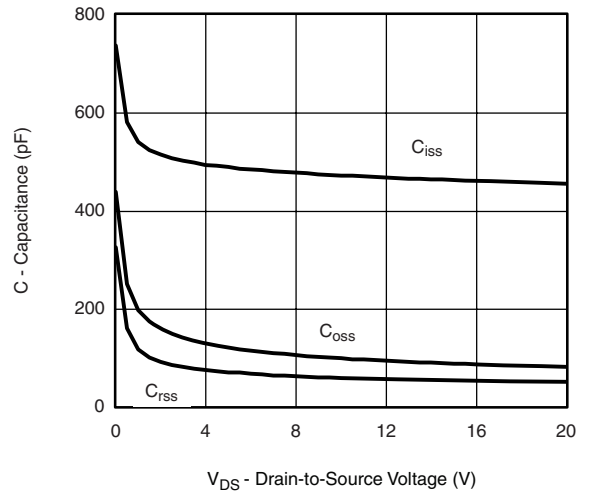


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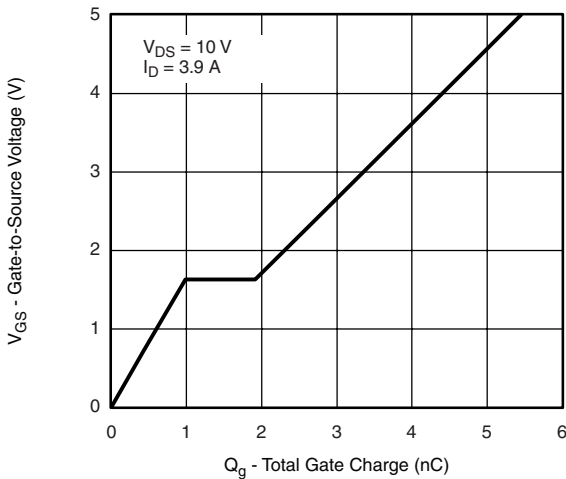
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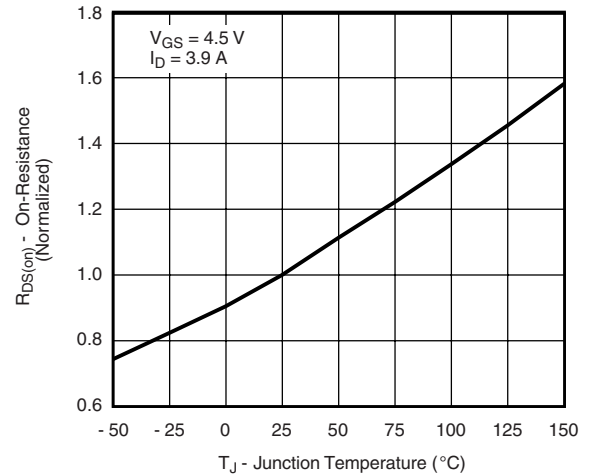
On-Resistance vs. Drain Current



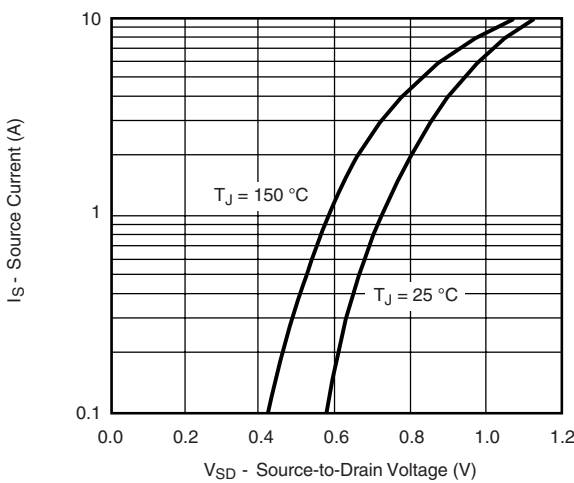
Capacitance



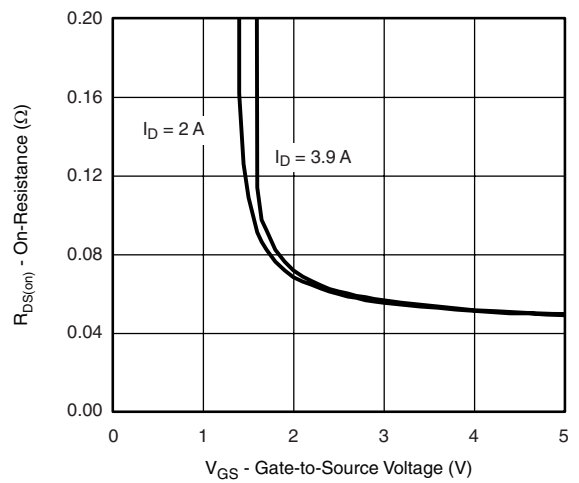
Gate Charge



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



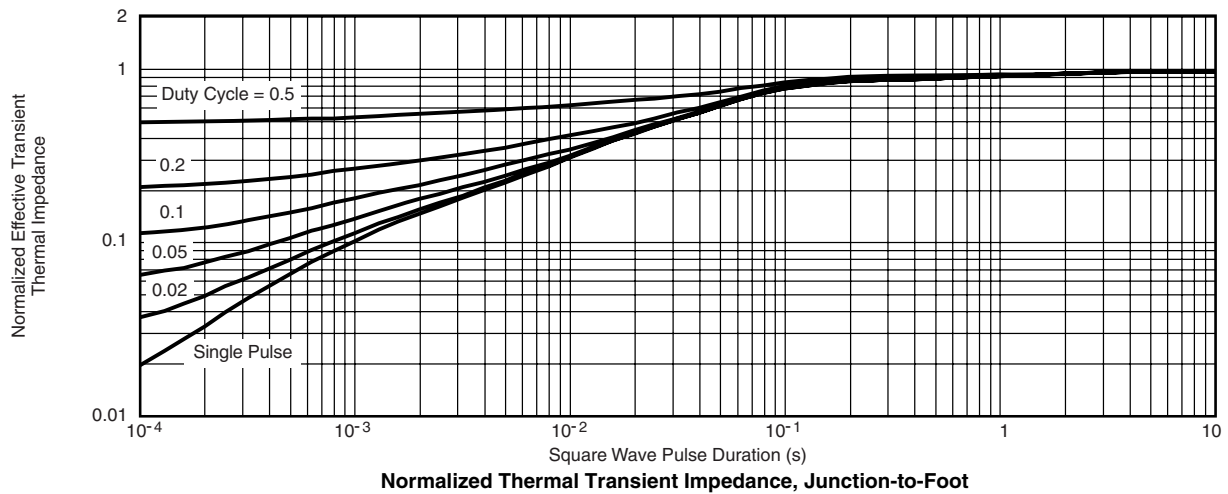
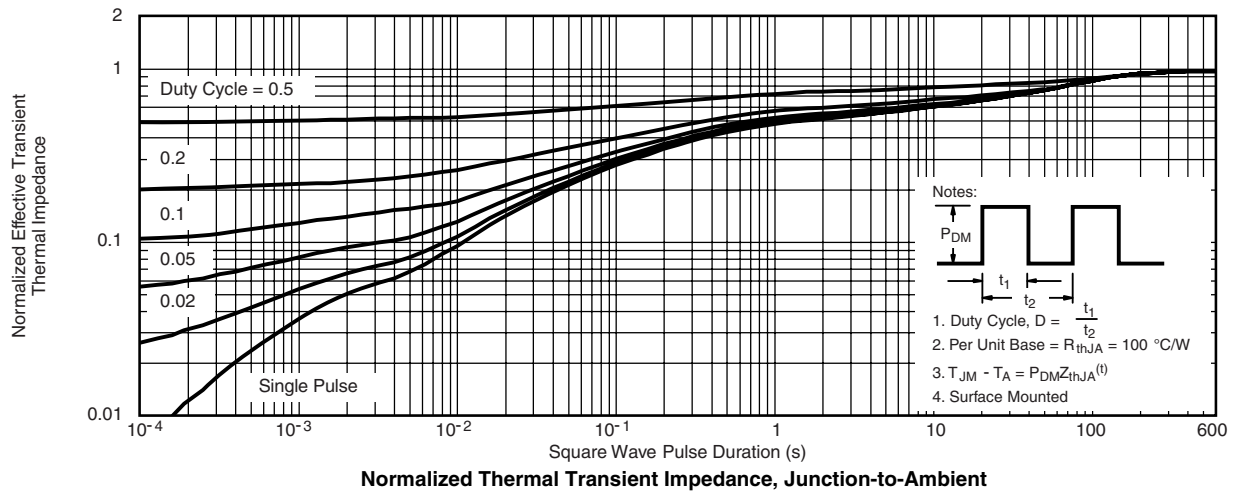
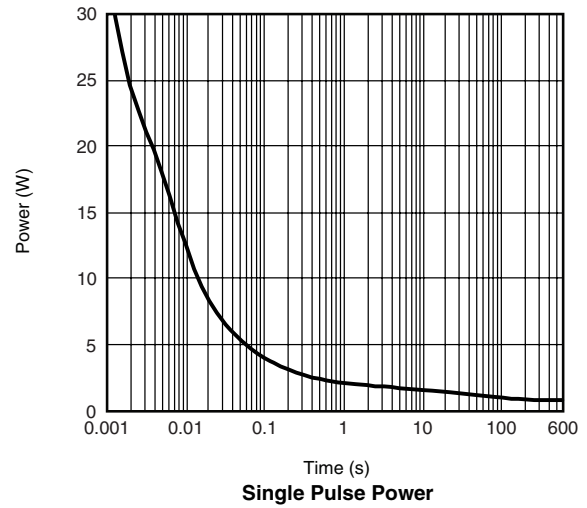
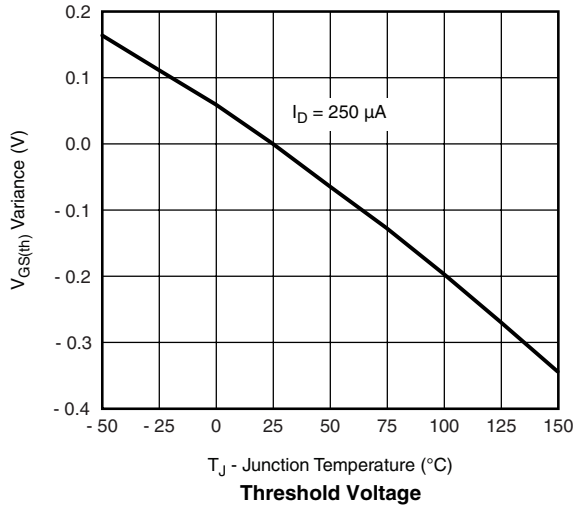
On-Resistance vs. Gate-to-Source Voltage

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TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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