

RoHS

COMPLIANT HALOGEN

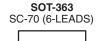
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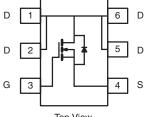
Vishay Siliconix

N-Channel 20 V (D-S) MOSFET

Marking Code AG XX≿

PRODUCT SUMMARY				
V _{DS} (V)	R_{DS(on)} (Ω)	I _D (A)	Q _g (Тур.)	
20	0.049 at V _{GS} = 4.5 V	6.1 ^a		
	0.056 at V _{GS} = 2.5 V	5.7	6.0	
	0.065 at V _{GS} = 1.8 V	5.3		





Top View

Ordering Information: Si1488DH-T1-E3 (Lead (Pb)-free) Si1488DH-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATING	S T _A = 25 °C, unl	ess otherwise	noted	
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	20	v
Gate-Source Voltage		V _{GS}	± 8	V
	T _C = 25 °C		6.1	
Continuous Drain Current (T. $-150 ^{\circ}\text{C})^{a}$	T _C = 70 °C		4.9	
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	4.6 ^{b, c}	A
	T _A = 70 °C		3.7 ^{b, c}	A
Pulsed Drain Current		I _{DM}	20	
Avalanche Current	L = 0.1 mH	I _{AS}	10	
Repetitive Avalanche Energy	L = 0.1 mm	E _{AS}	5	mJ
Continuous Source-Drain Diode Current	T _C = 25 °C		2.3	А
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	1.3 ^{b, c}	A
	T _C = 25 °C		2.8	
Maximum Power Dissipation ^a	T _C = 70 °C		1.8	w
	T _A = 25 °C	• P _D	1.5 ^{b, c}	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	T _A = 70 °C		1.0 ^{b, c}	
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 ^{b, d}	t ≤ 5 s	R _{thJA}	60	80	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	34	45	0/10

Notes:

a. Based on $T_C = 25$ °C.

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

c. t = 5 s. d. Maximum under steady state conditions is 125 °C/W.

FEATURES

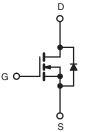
Lot Traceability and Date Code

Part # Code

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- 100 % $\rm R_{g}$ and UIS Tested
- Compliant to RoHS Directive 2002/95/EC

APPLICATIONS

• Load Switch for Portable Devices



N-Channel MOSFET

Si1488DH

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	•		•		•		
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 V, I_D = 250 \mu A$	20			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	1 050 4		20.2		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/$	I _D = 250 μA		- 2.75			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = 250 \ \mu A$	0.45		0.95	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			± 100	nA	
Zana Oaka Malkana Durin Ormani	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	μA	
Zero Gate Voltage Drain Current		$V_{DS} = 20 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 85 ^{\circ}\text{C}$			10	μA	
On-State Drain Current ^a	I _{D(on)}	V_{DS} = \geq 5 V, V_{GS} = 4.5 V	20			Α	
		V _{GS} = 4.5 V, I _D = 4.6 A		0.041	0.049		
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 2.5 \text{ V}, \text{ I}_{D} = 4.3 \text{ A}$		0.047	0.056	Ω	
	20(01)	V _{GS} = 1.8 V, I _D = 3.9 A		0.054	0.065		
Forward Transconductance	9 _{fs}	V _{DS} = 10 V, I _D = 4.6 A		15		mS	
Dynamic ^b						1	
Input Capacitance	C _{iss}			530		pF	
Output Capacitance	C _{oss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz		100			
Reverse Transfer Capacitance	C _{rss}			48			
	Qg	$V_{DS} = 10 \text{ V}, V_{GS} = 5 \text{ V}, I_{D} = 4.6 \text{ A}$		6.6	10	pC	
Total Gate Charge				6	9		
Gate-Source Charge	Q _{qs}	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 4.6 A		1.5			
Gate-Drain Charge	Q _{qd}			0.9			
Gate Resistance	R _q	f = 1 MHz		7.3	11	Ω	
Turn-On Delay Time	t _{d(on)}			8.5	13		
Rise Time	t _r	V_{DD} = 10 V, R _L = 2.7 Ω		45	68	- ns	
Turn-Off DelayTime	t _{d(off)}	$I_D \cong 3.7 \text{ A}, V_{\text{GEN}} = 4.5 \text{ V}, \text{R}_{\text{g}} = 1 \Omega$		35	53		
Fall Time	t _f			82	123		
Drain-Source Body Diode Characteristic	s						
Continous Source-Drain Diode Current	۱ _S	T _C = 25 °C			2.3		
Pulse Diode Forward Current ^a	I _{SM}	~			20	A	
Body Diode Voltage	V _{SD}	I _S = 2.2 A		0.8	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			10.6	16	nC	
Body Diode Reverse Recovery Charge	Q _{rr}			3.7	5.7		
Reverse Recovery Fall Time	t _a	I _F = 3.2 A, dI/dt = 100 A/μs		6.2		ns	
Reverse Recovery Rise Time	t _b			4.4			

Notes:

a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

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

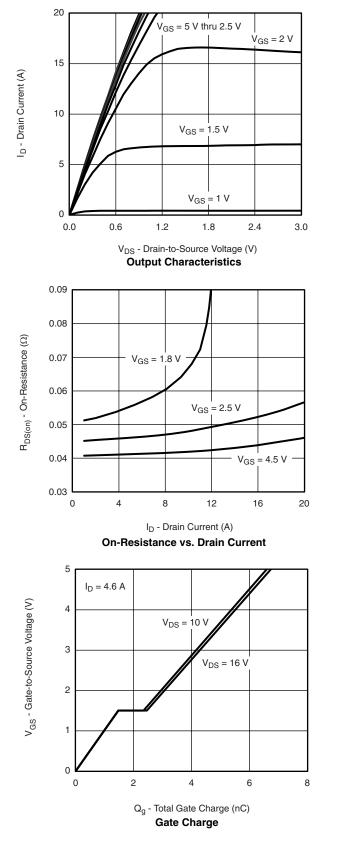
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

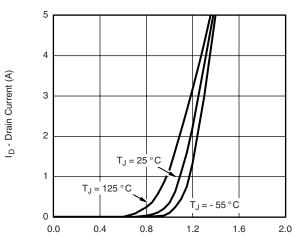


Si1488DH

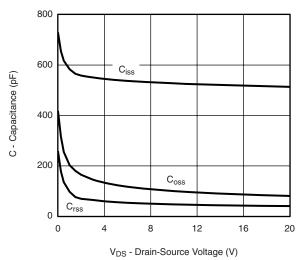
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TYPICAL CHARACTERISTICS $T_A = 25$ °C, unless otherwise noted

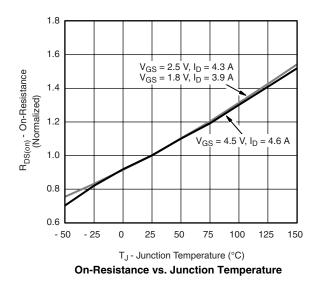




V_{GS} - Gate-to-Source Voltage (V) Transfer Characteristics Curves vs. Temperature



Capacitance



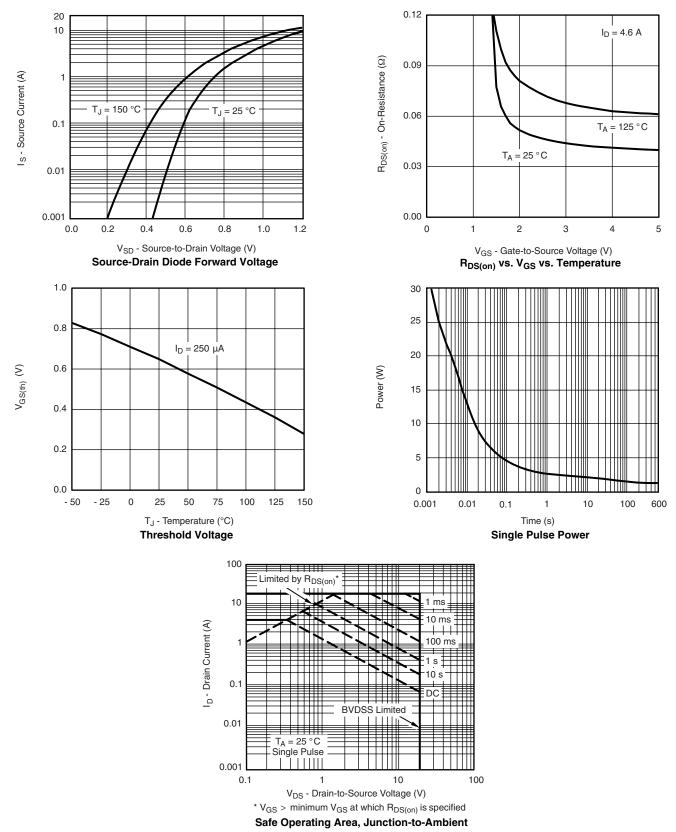
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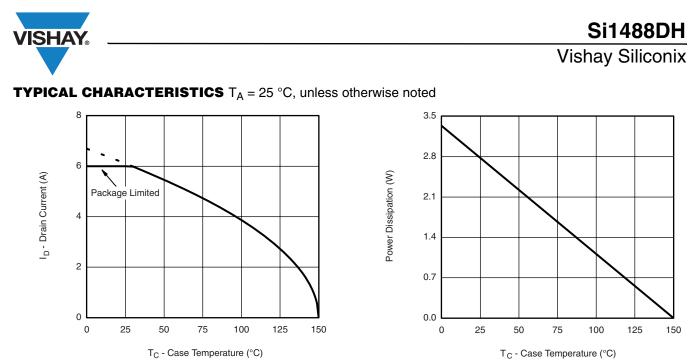
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Current Derating*

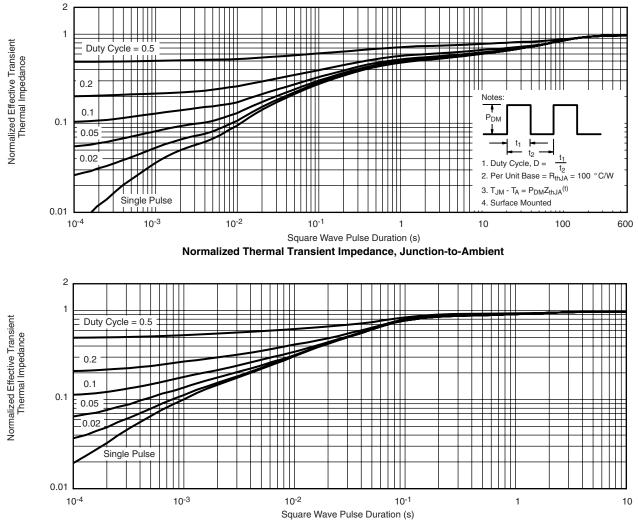
Power Derating

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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Normalized Thermal Transient Impedance, Junction-to-Foot

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?73788.



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