

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

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
20	0.280 at $V_{GS} = 4.5$ V	1.28
	0.360 at $V_{GS} = 2.5$ V	1.13
	0.450 at $V_{GS} = 1.8$ V	1.0

FEATURES

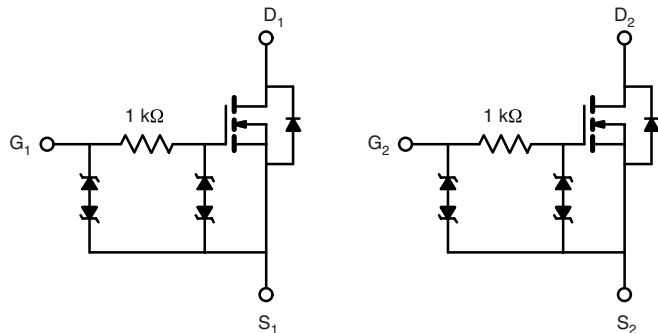
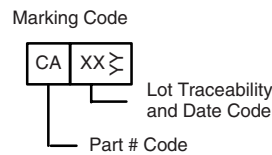
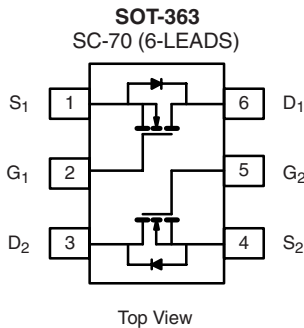
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFETs: 1.8 V Rated
- ESD Protected: 2000 V
- Thermally Enhanced SC-70 Package
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

- Load Switching
- PA Switch
- Level Switch



Ordering Information: Si1912EDH-T1-E3 (Lead (Pb)-free)
Si1912EDH-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}	± 12			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	1.28	1.13	A
		$T_A = 85$ °C	0.92	0.81	
Pulsed Drain Current	I_{DM}	4			
Continuous Diode-Current (Diode Conduction) ^a	I_S	0.61	0.48		
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	0.74	0.57	W
		$T_A = 85$ °C	0.38	0.30	
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}	$t \leq 5$ s	130	170	°C/W
		Steady State	170	220	
Maximum Junction-to-Foot (Drain)	R_{thJF}	80	100		

Notes:

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

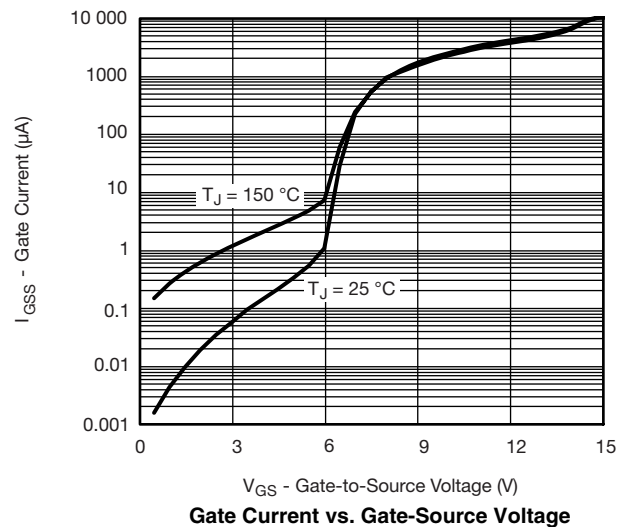
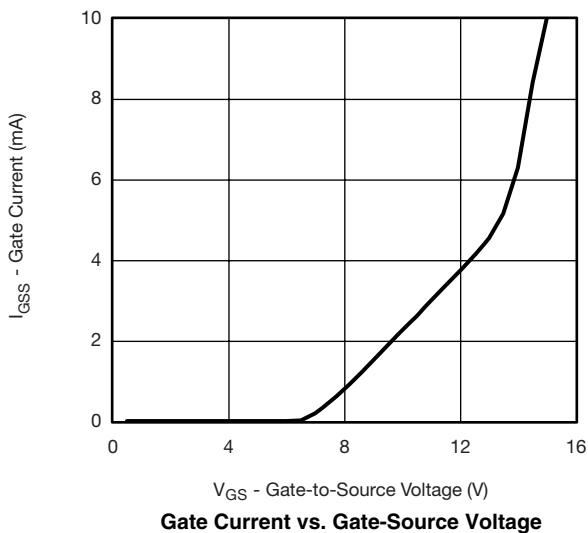
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 100\text{ }\mu\text{A}$	0.45			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 4.5\text{ V}$			± 1	μA
		$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 12\text{ V}$			± 10	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 16\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\text{ V}$, $V_{GS} = 4.5\text{ V}$	2			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}$, $I_D = 1.13\text{ A}$		0.220	0.280	Ω
		$V_{GS} = 2.5\text{ V}$, $I_D = 0.99\text{ A}$		0.281	0.360	
		$V_{GS} = 1.8\text{ V}$, $I_D = 0.2\text{ A}$		0.344	0.450	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}$, $I_D = 1.13\text{ A}$		2.6		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 0.48\text{ A}$, $V_{GS} = 0\text{ V}$		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 1.13\text{ A}$		0.65	1	nC
Gate-Source Charge	Q_{gs}			0.2		
Gate-Drain Charge	Q_{gd}			0.23		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}$, $R_L = 20\text{ }\Omega$ $I_D \cong 0.5\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 6\text{ }\Omega$		45	70	ns
Rise Time	t_r			85	130	
Turn-Off Delay Time	$t_{d(off)}$			350	530	
Fall Time	t_f			210	320	

Notes

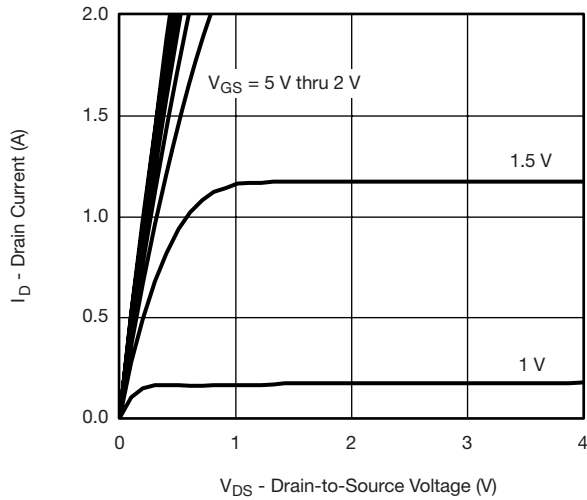
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

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

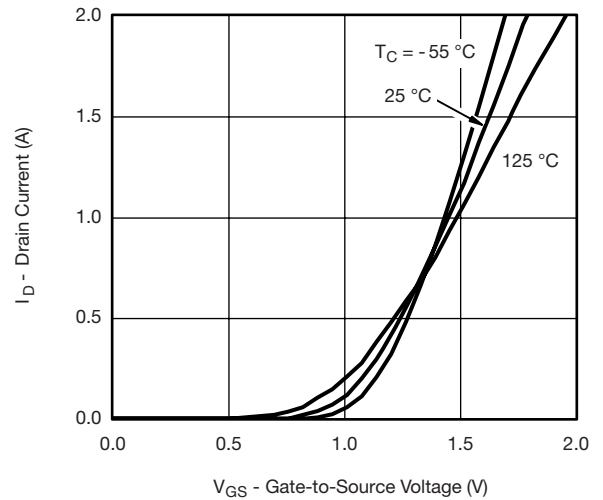
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS $25\text{ }^\circ\text{C}$, unless otherwise noted

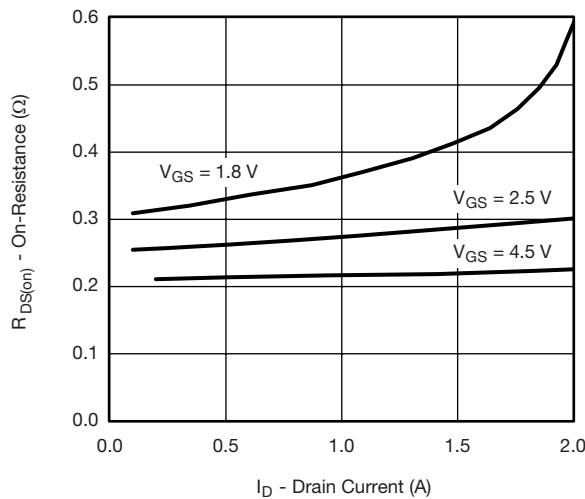
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



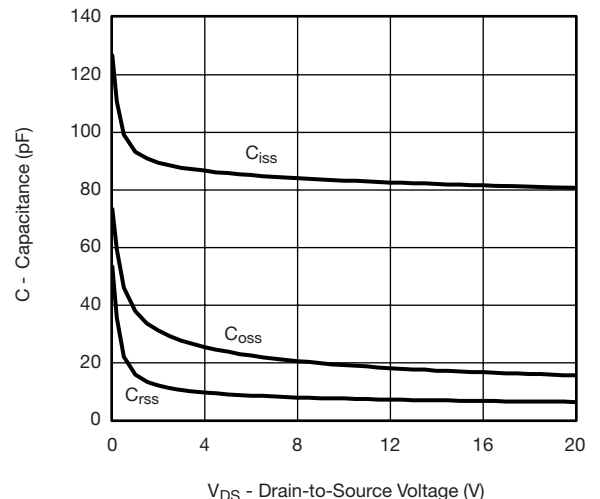
Output Characteristics



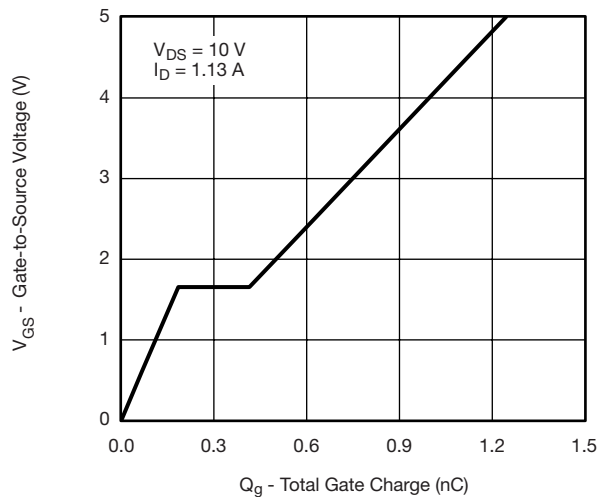
Transfer Characteristics



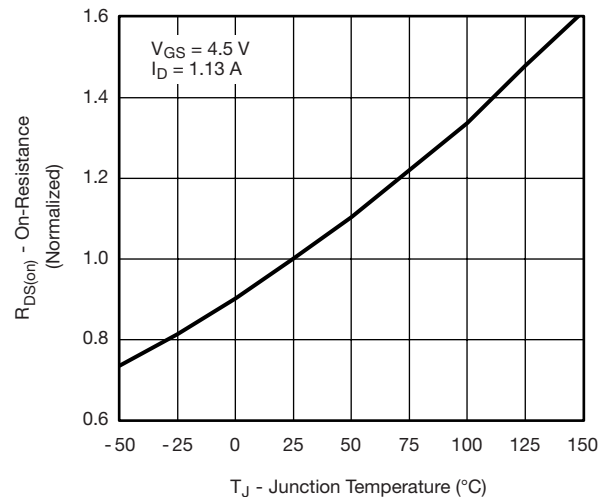
On-Resistance vs. Drain Current



Capacitance

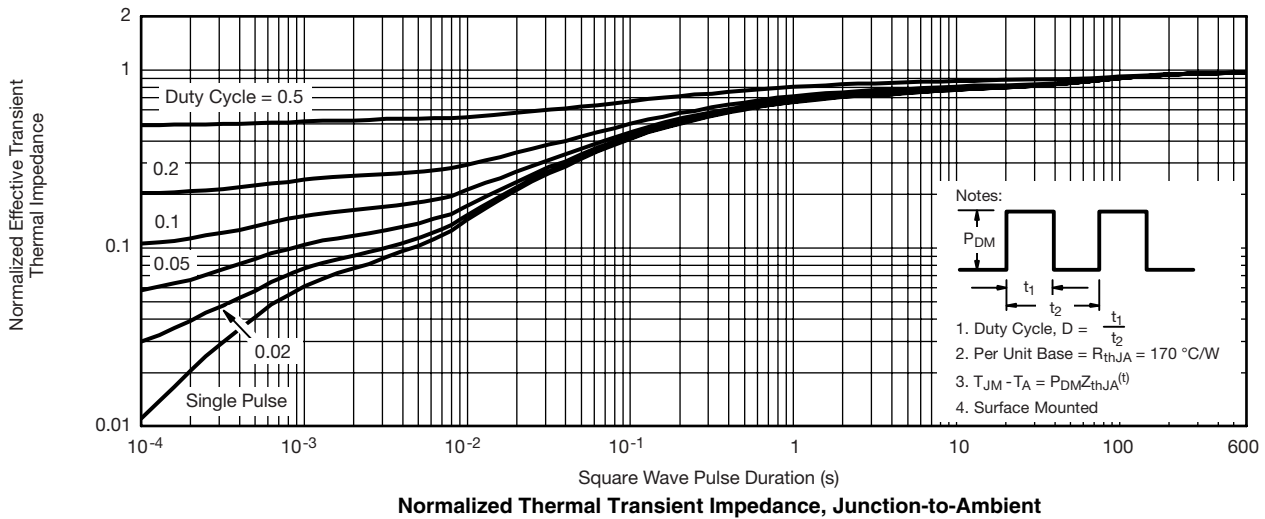
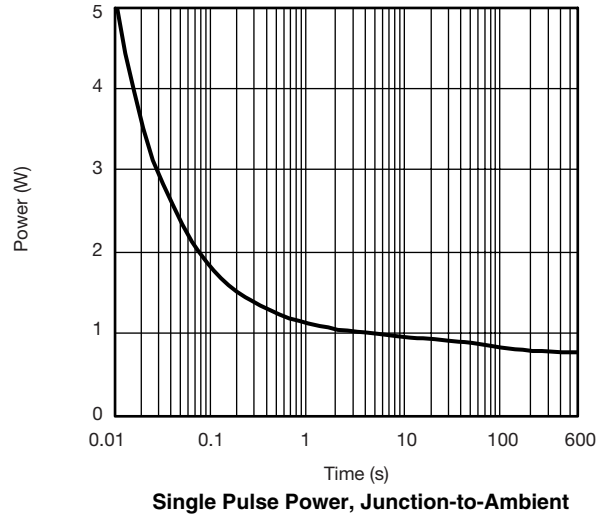
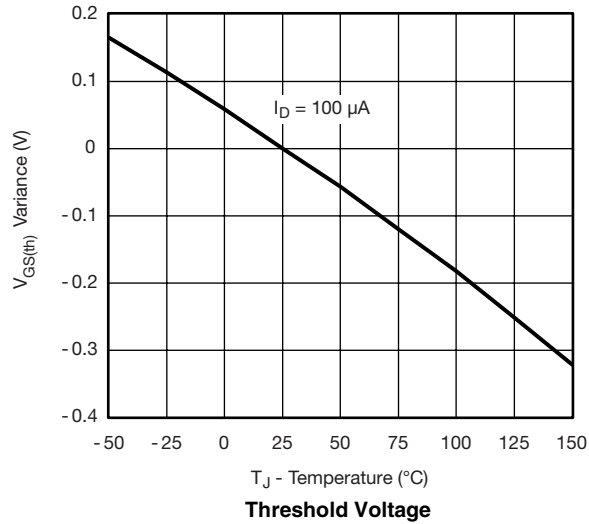
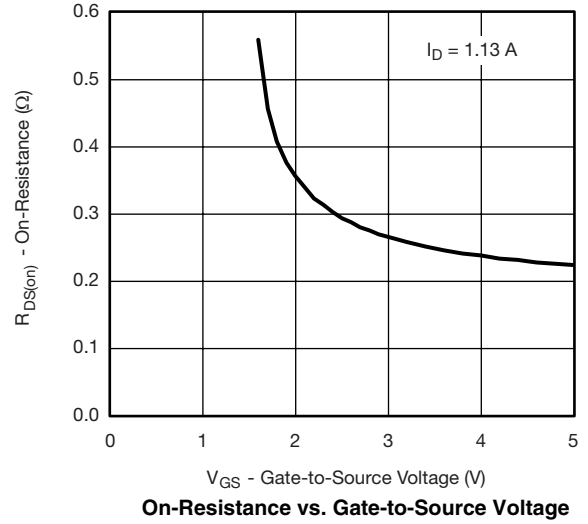
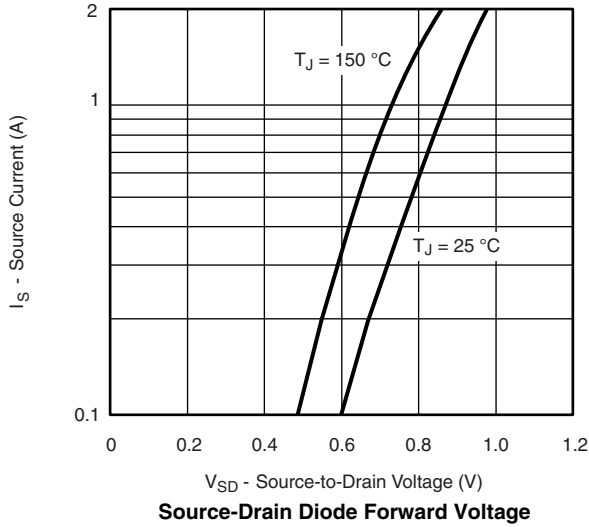


Gate Charge

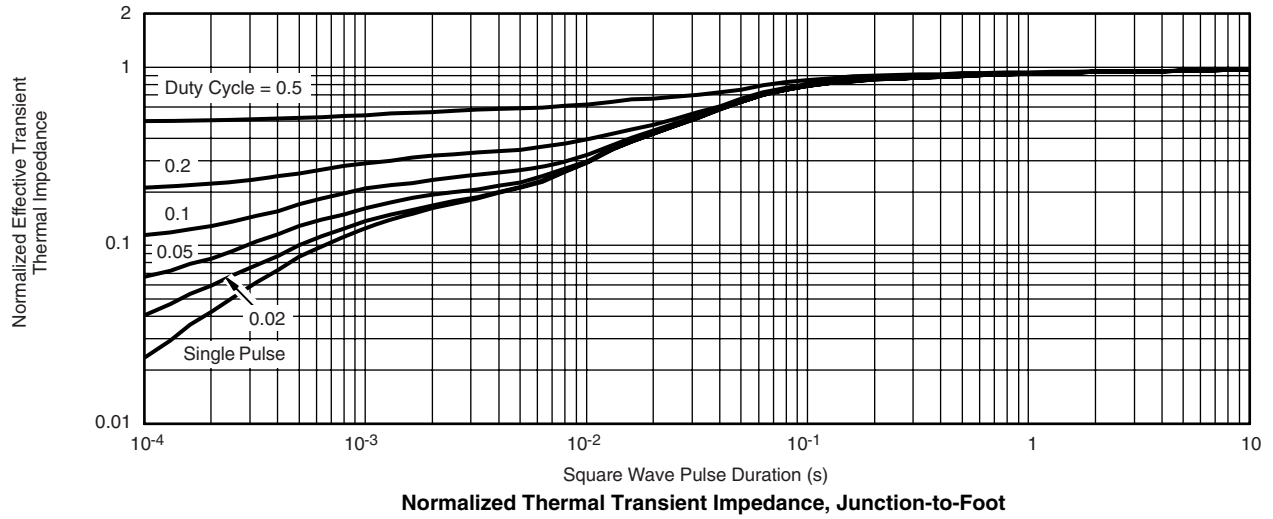


On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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