

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

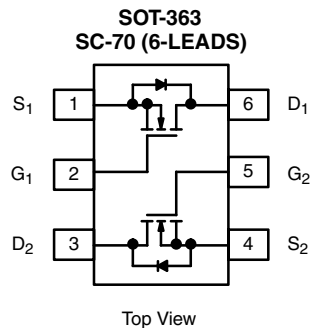
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.385 at $V_{GS} = 4.5$ V	0.70
	0.630 at $V_{GS} = 2.5$ V	0.54

FEATURES

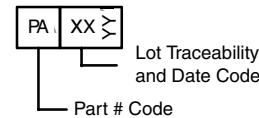
- TrenchFET[®] Power MOSFETS: 2.5 V Rated



RoHS*
COMPLIANT



Marking Code



Ordering Information: Si1902DL-T1 (with Tape and Reel)
Si1902DL-T1-E3 (Lead (Pb)-free with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	5 secs	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	0.70	0.66	A
		$T_A = 85$ °C	0.50	0.48	
Pulsed Drain Current	I_{DM}	1.0			
Continuous Source Current (Diode Conduction) ^a	I_S	0.25	0.23		
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	0.30	0.27	W
		$T_A = 85$ °C	0.16	0.14	
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}	$t \leq 5$ sec	360	415	°C/W
		Steady State	400	460	
Maximum Junction-to-Foot (Drain)	R_{thJF}	300	350		

Notes

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

* Pb containing terminations are not RoHS compliant, exemptions may apply

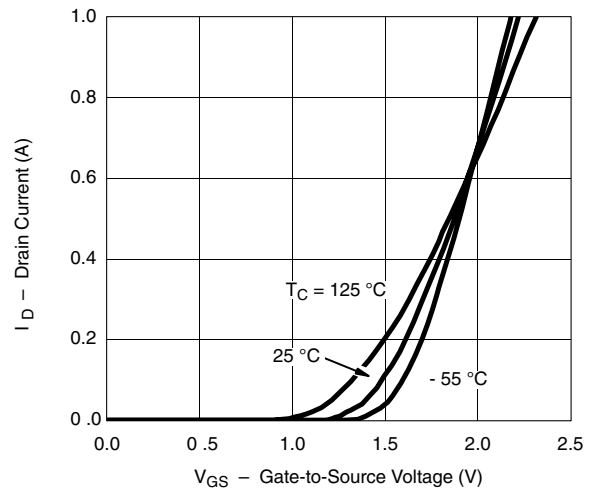
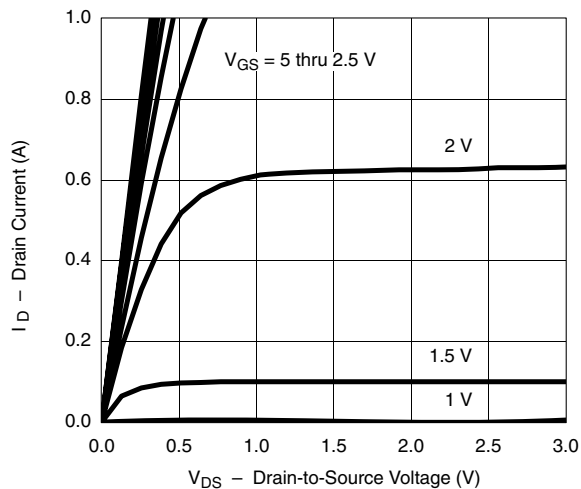
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.6		1.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 12\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 16\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 4.5\text{ V}$	1.0			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}$, $I_D = 0.66\text{ A}$		0.320	0.385	Ω
		$V_{GS} = 2.5\text{ V}$, $I_D = 0.40\text{ A}$		0.560	0.630	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}$, $I_D = 0.66\text{ A}$		1.5		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 0.23\text{ A}$, $V_{GS} = 0\text{ V}$		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 0.66\text{ A}$		0.8	1.2	nC
Gate-Source Charge	Q_{gs}			0.06		
Gate-Drain Charge	Q_{gd}			0.30		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}$, $R_L = 20\text{ }\Omega$ $I_D \cong 0.5\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_G = 6\text{ }\Omega$		10	20	ns
Rise Time	t_r			16	30	
Turn-Off Delay Time	$t_{d(off)}$			10	20	
Fall Time	t_f			10	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 0.23\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		20	40	

Notes:

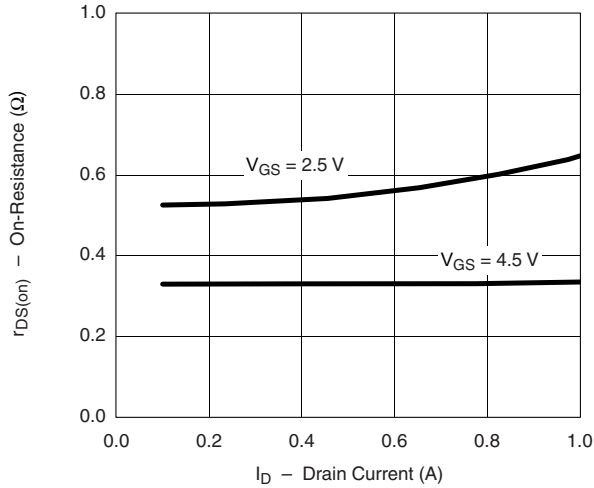
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

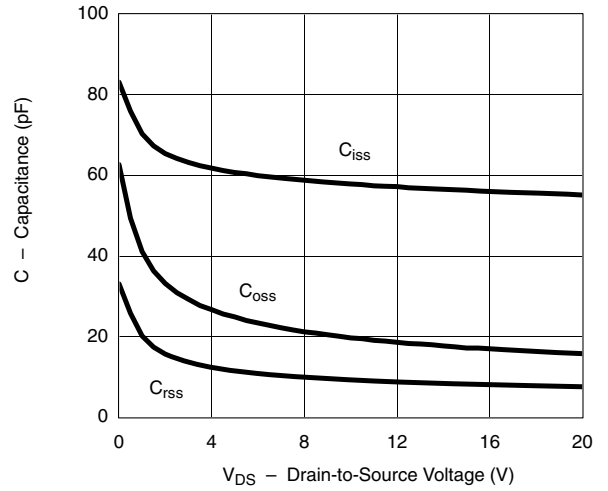
TYPICAL CHARACTERISTICS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted



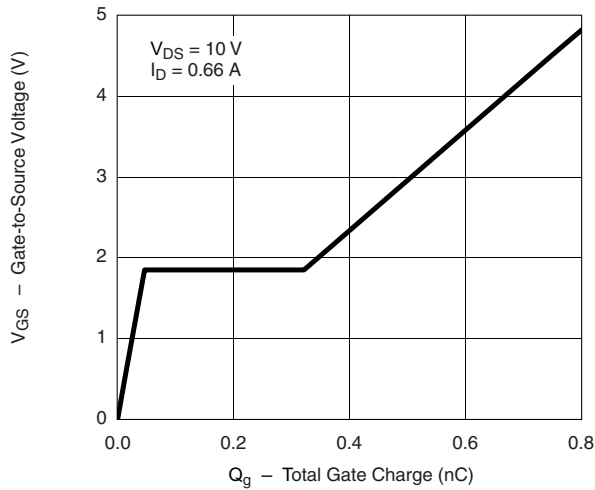
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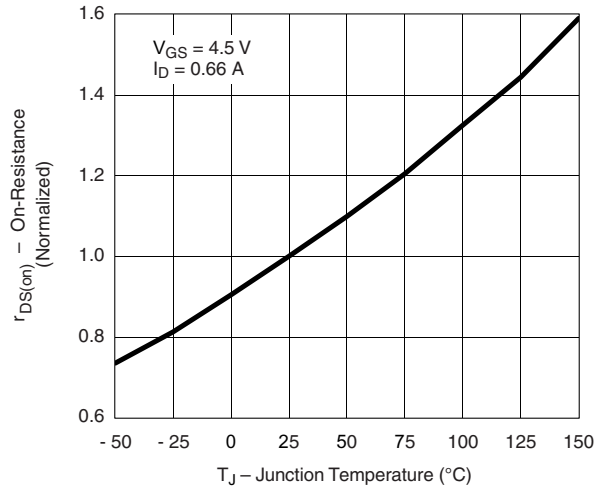
On-Resistance vs. Drain Current



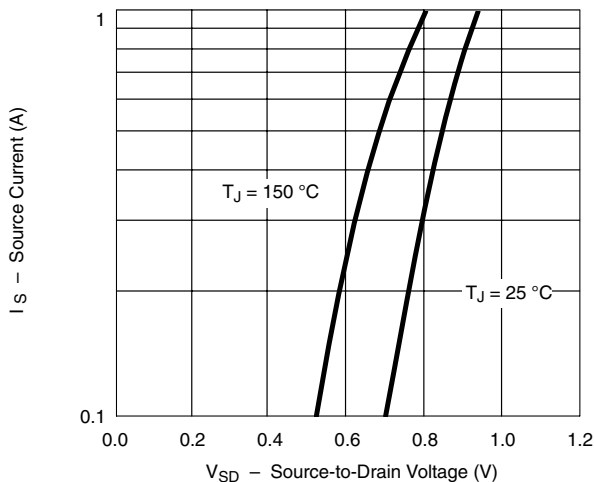
Capacitance



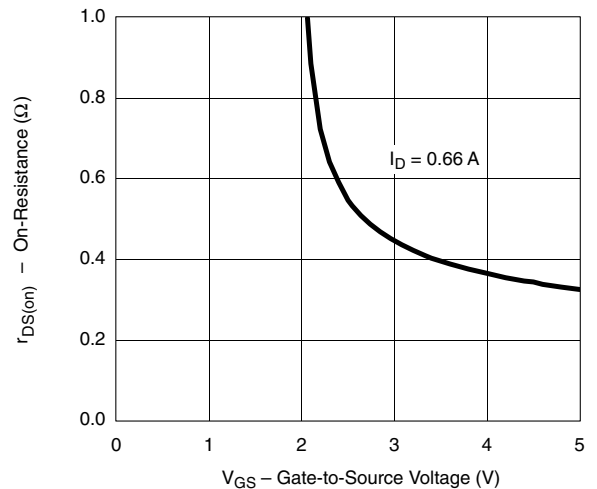
Gate Charge



On-Resistance vs. Junction Temperature

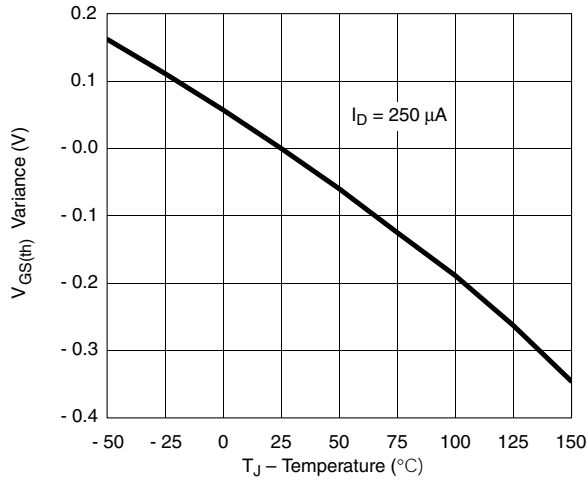


Surge-Drain Diode Forward Voltage

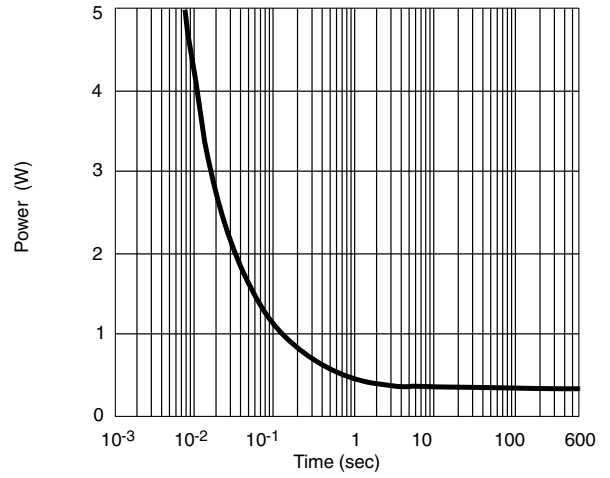


On-Resistance vs. Gate-to-Source Voltage

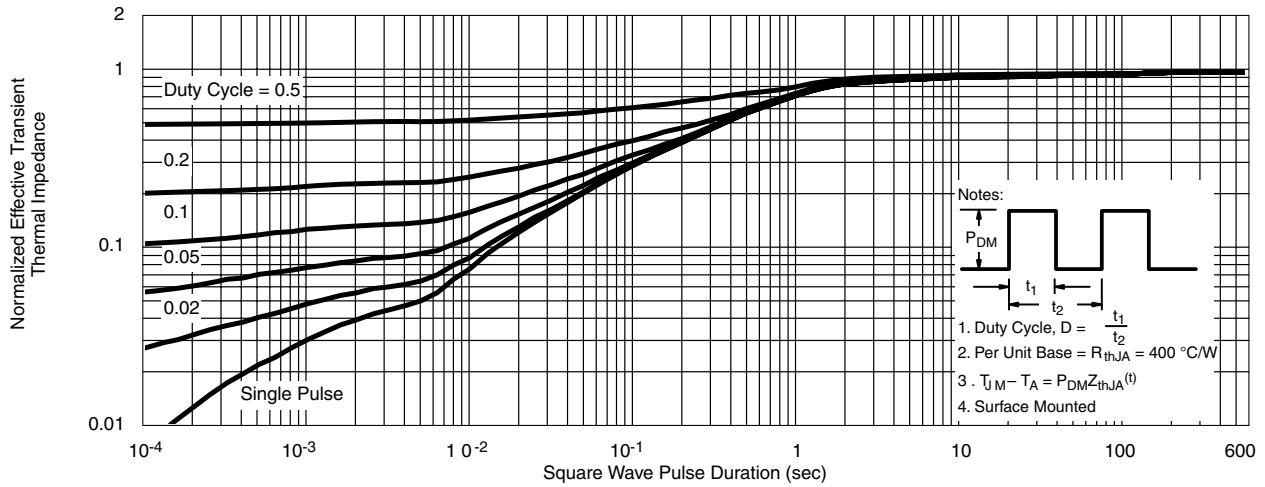
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Threshold Voltage



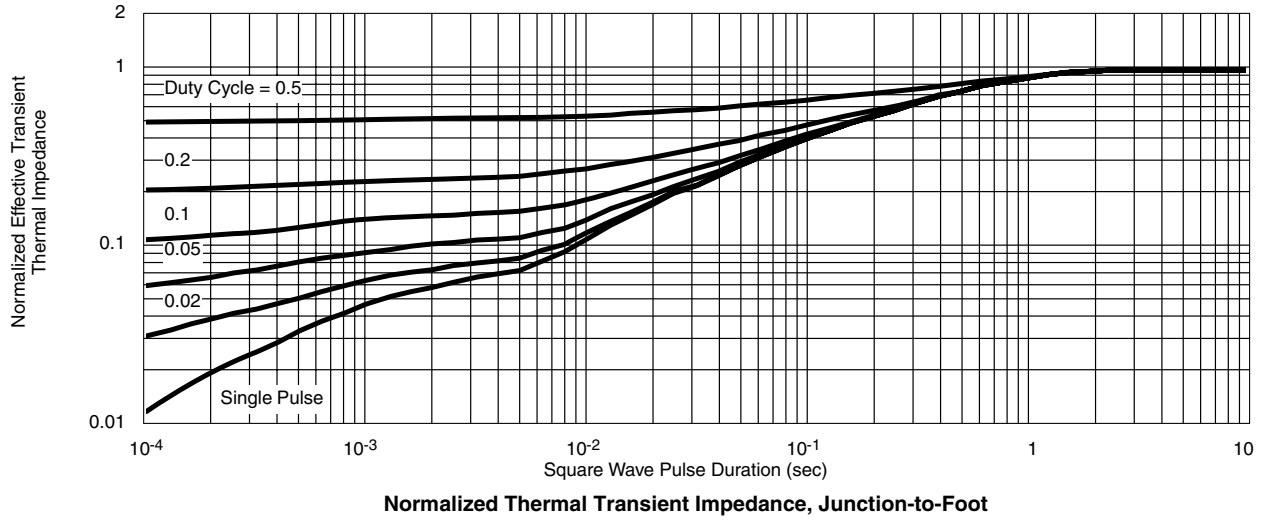
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



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