



## Dual P-Channel 2.5-V (G-S) MOSFET



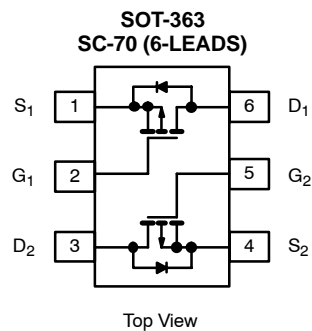
Available

### PRODUCT SUMMARY

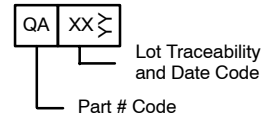
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-20	0.995 @ $V_{GS} = -4.5$ V	$\pm 0.44$
	1.190 @ $V_{GS} = -3.6$ V	$\pm 0.40$
	1.80 @ $V_{GS} = -2.5$ V	$\pm 0.32$

### FEATURES

- TrenchFET® Power MOSFET
- 2.5-V Rated
- Lead (Pb)-Free Version is RoHS Compliant



Marking Code



Ordering Information: Si1903DL-T1  
Si1903DL-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 <sub>DS</sub>	−20		V
Gate-Source Voltage		V <sub>GS</sub>	± 12		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	T <sub>A</sub> = 25°C	I <sub>D</sub>	± 0.44	± 0.41	A
	T <sub>A</sub> = 85°C		± 0.31	± 0.30	
Pulsed Drain Current		I <sub>DM</sub>	± 1.0		
Continuous Diode Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	−0.25	−0.23	
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25°C	P <sub>D</sub>	0.30	0.27	W
	T <sub>A</sub> = 85°C		0.16	0.14	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	−55 to 150		°C

### THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	360	415	$^\circ\text{C/W}$
	Steady State		400	460	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	300	350	

Notes

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

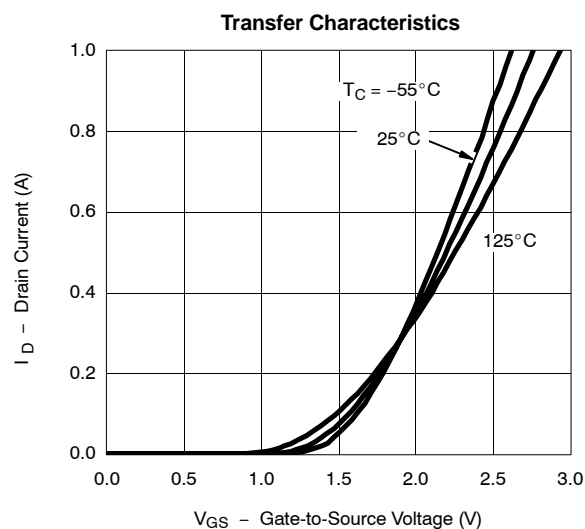
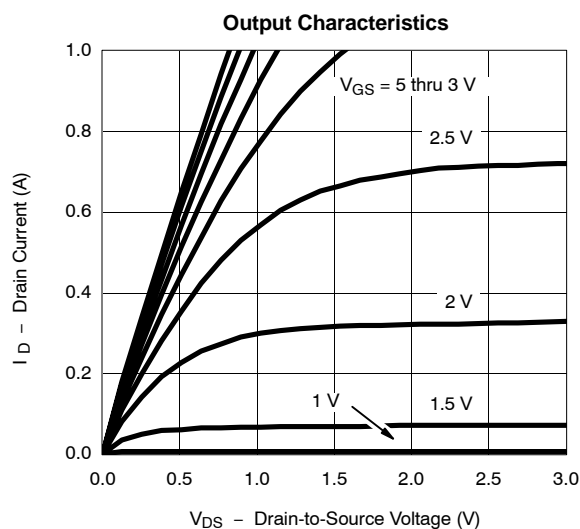
**SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\ \mu\text{A}$	-0.6		-1.5	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 12\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20\text{ V}$ , $V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -20\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 85^\circ\text{C}$			-5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}$ , $V_{GS} = -4.5\text{ V}$	-1.0			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}$ , $I_D = -0.41\text{ A}$		0.850	0.995	$\Omega$
		$V_{GS} = -3.6\text{ V}$ , $I_D = -0.38\text{ A}$		1.0	1.190	
		$V_{GS} = -2.5\text{ V}$ , $I_D = -0.25\text{ A}$		1.4	1.80	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -10\text{ V}$ , $I_D = -0.41\text{ A}$		0.8		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -0.23\text{ A}$ , $V_{GS} = 0\text{ V}$		-0.8	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -10\text{ V}$ , $V_{GS} = -4.5\text{ V}$ , $I_D = -0.41\text{ A}$		1.2	1.8	nC
Gate-Source Charge	$Q_{gs}$			0.45		
Gate-Drain Charge	$Q_{gd}$			0.25		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}$ , $R_L = 20\ \Omega$ $I_D \cong -0.5\text{ A}$ , $V_{GEN} = -4.5\text{ V}$ , $R_g = 6\ \Omega$		7.5	15	ns
Rise Time	$t_r$			20	40	
Turn-Off Delay Time	$t_{d(off)}$			8.5	17	
Fall Time	$t_f$			12	24	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -0.23\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$		25	40	

**Notes**

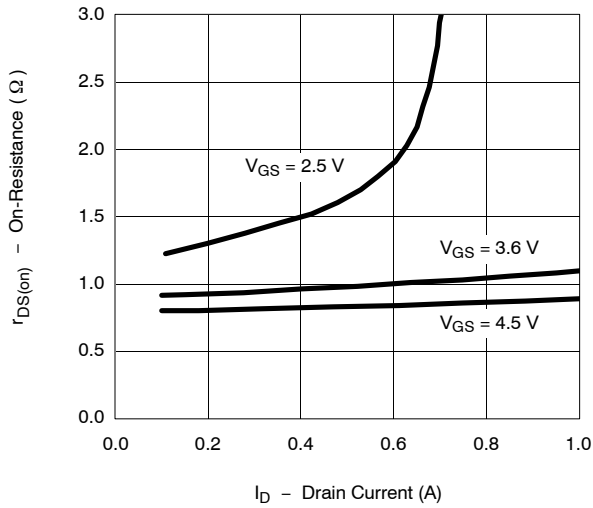
- a. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.

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.

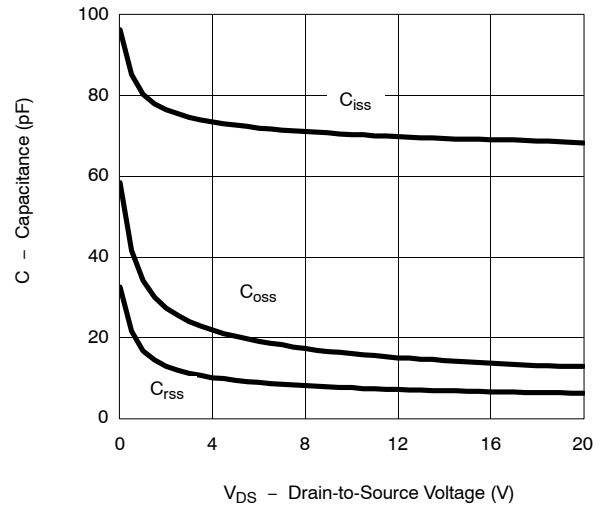
**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**

## TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

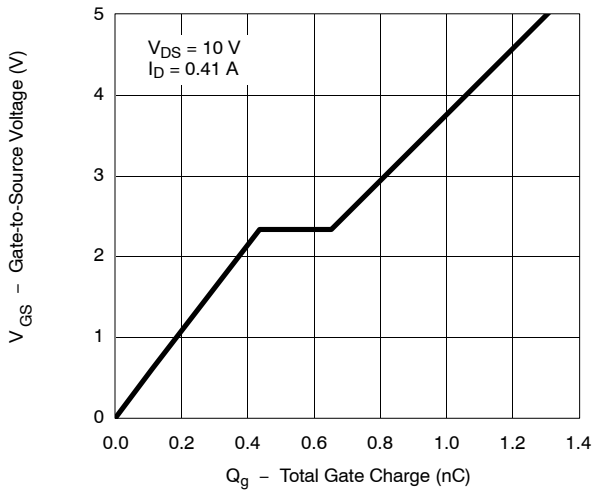
On-Resistance vs. Drain Current



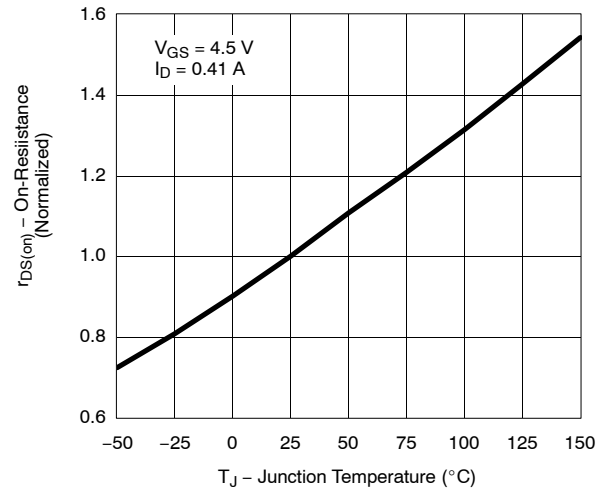
Capacitance



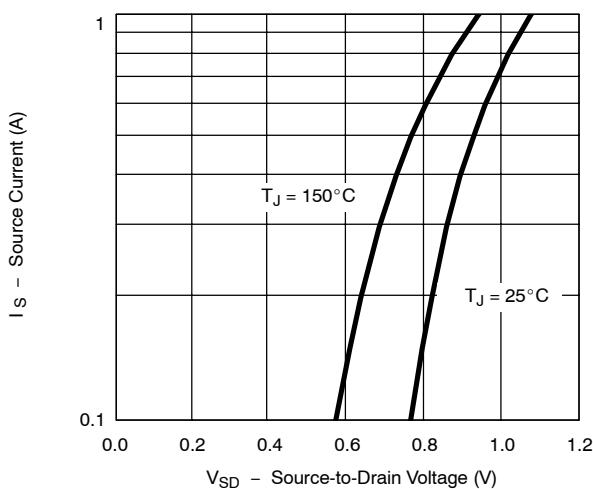
Gate Charge



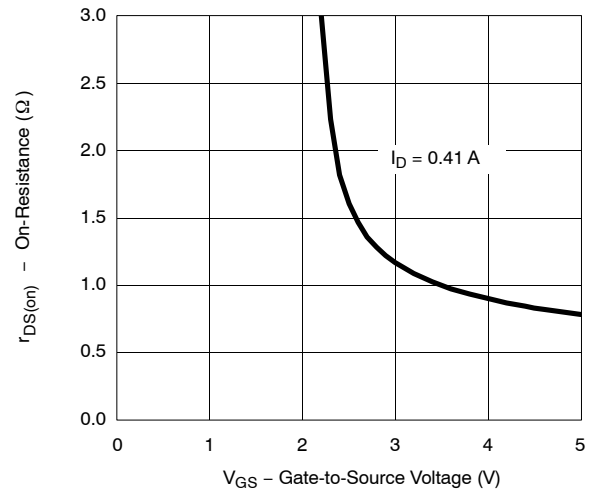
On-Resistance vs. Junction Temperature



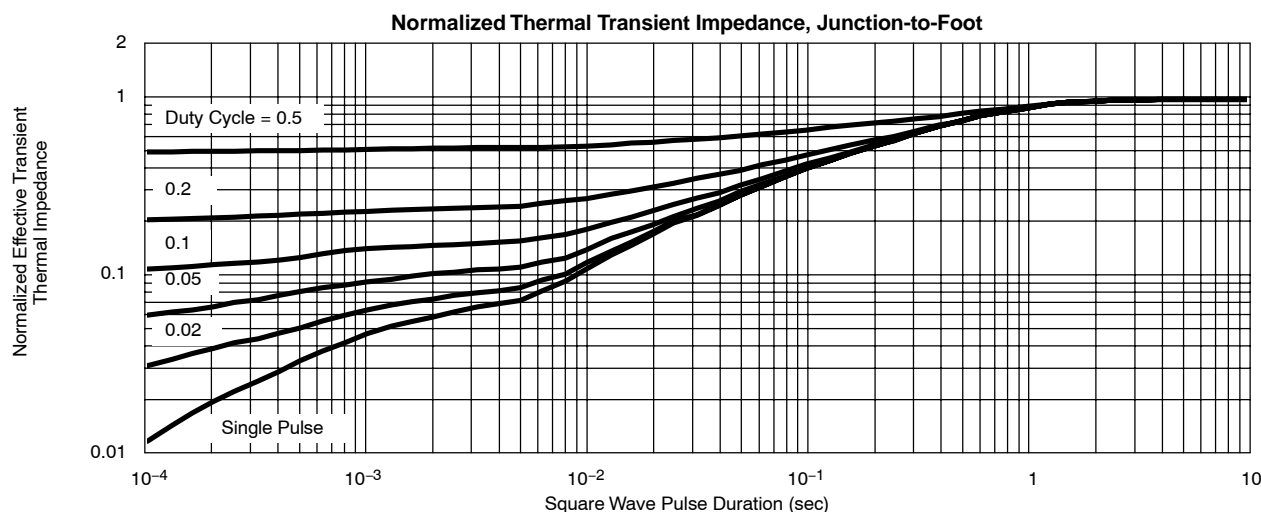
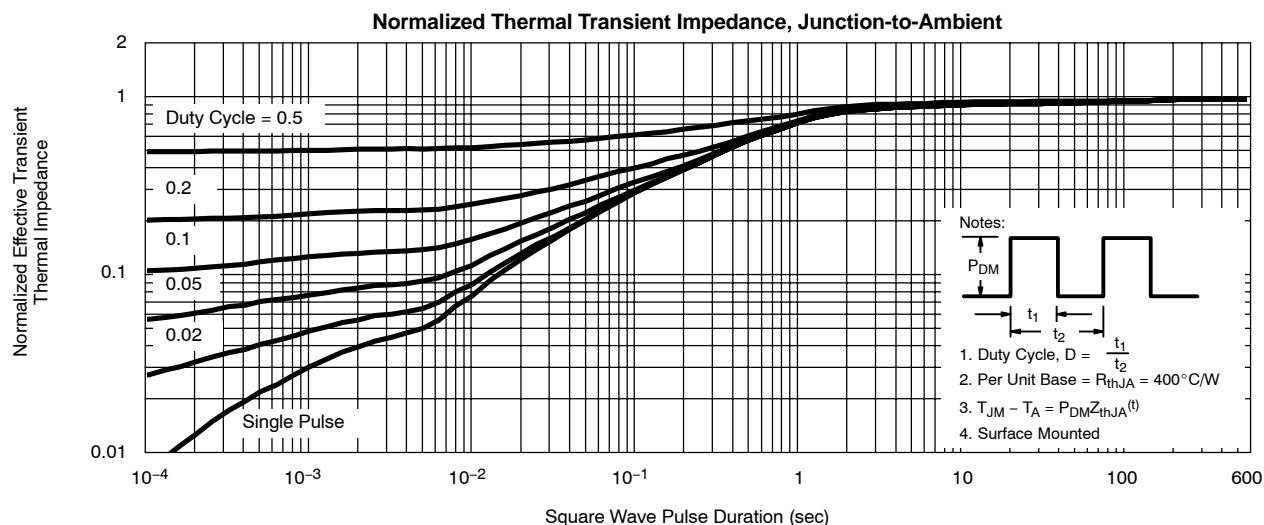
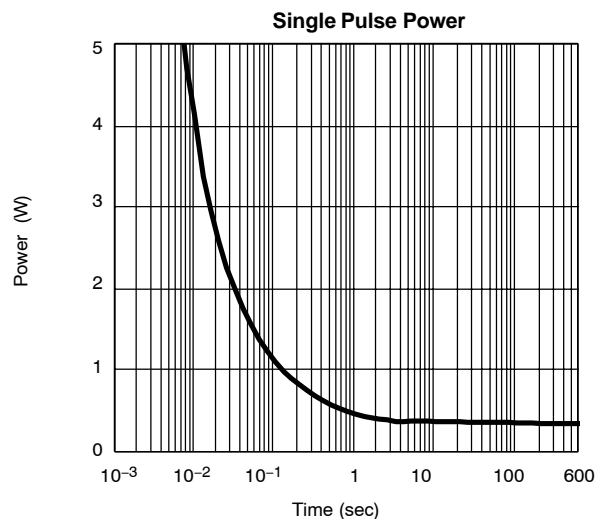
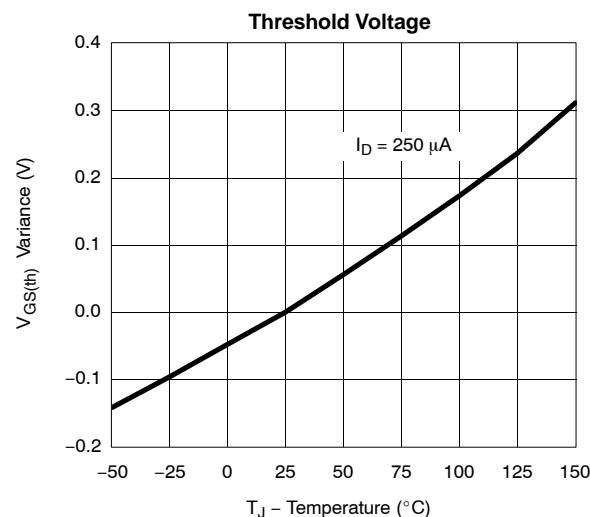
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



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