

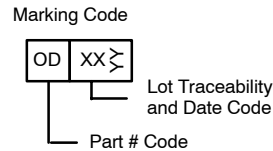
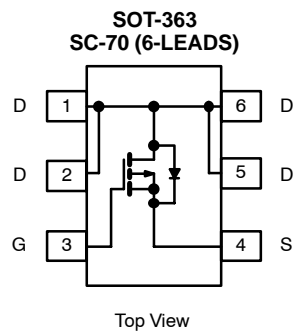


## P-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY			
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)	$Q_g$ (Typ)
-20	0.150 @ $V_{GS} = -4.5$ V	-1.5	2.9
	0.175 @ $V_{GS} = -3.6$ V	-1.4	
	0.265 @ $V_{GS} = -2.5$ V	-1.2	

### FEATURES

- TrenchFET® Power MOSFET



Ordering Information: Si1403BDL-T1—E3

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-20		V
Gate-Source Voltage		$V_{GS}$	$\pm 12$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-1.5	-1.4	A
	$T_A = 85^\circ\text{C}$		-1.2	-1.0	
Pulsed Drain Current		$I_{DM}$	-5		
Continuous Diode Current (Diode Conduction) <sup>a</sup>		$I_S$	-0.8	-0.8	
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	0.625	0.568	W
	$T_A = 85^\circ\text{C}$		0.400	0.295	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	165	200	$^\circ\text{C/W}$
	Steady State		180	220	
Maximum Junction-to-Foot (Drain)		$R_{thJF}$	105	130	

Notes

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

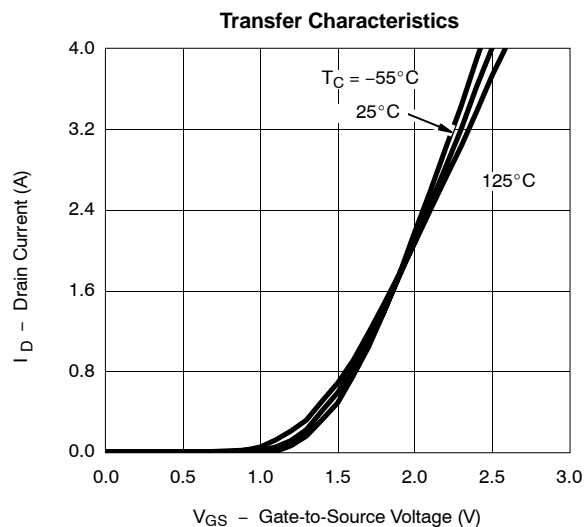
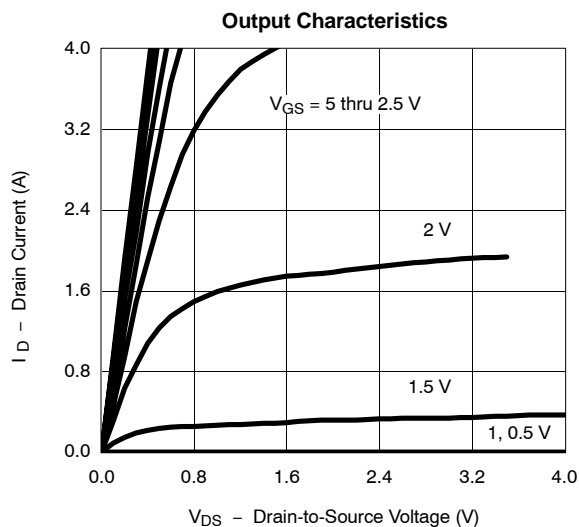
**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.6		-1.3	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	-2			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -1.5 A		0.120	0.150	Ω
		V <sub>GS</sub> = -3.6 V, I <sub>D</sub> = -1.4 A		0.140	0.175	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -0.8 A		0.220	0.265	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1.5 A		3.4		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -0.8 A, V <sub>GS</sub> = 0 V		-0.8	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -1.5 A		2.9	4.5	nC
Gate-Source Charge	Q <sub>gs</sub>		0.65			
Gate-Drain Charge	Q <sub>gd</sub>		1.0			
Gate Resistance	R <sub>g</sub>	f = 1.0 MHz		9		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>g</sub> = 6 Ω		13	20	ns
Rise Time	t <sub>r</sub>		30	45		
Turn-Off Delay Time	t <sub>d(off)</sub>		28	42		
Fall Time	t <sub>f</sub>		13	20		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		12	25		
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = -0.8 A, di/dt = 100 A/μs		4	8	nC

## Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

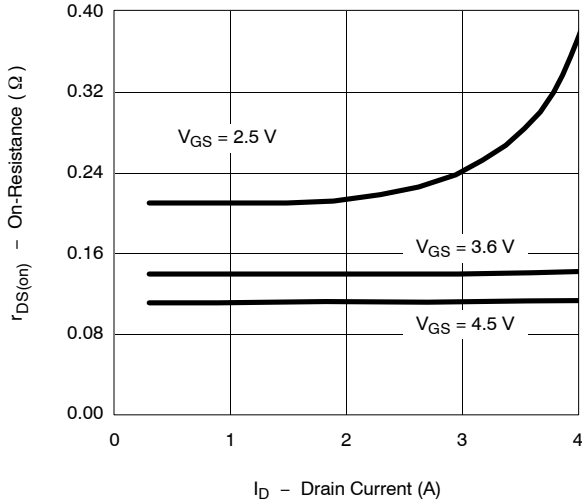
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

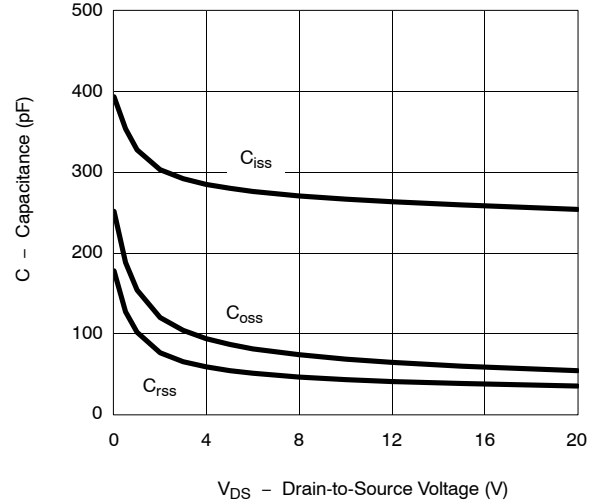


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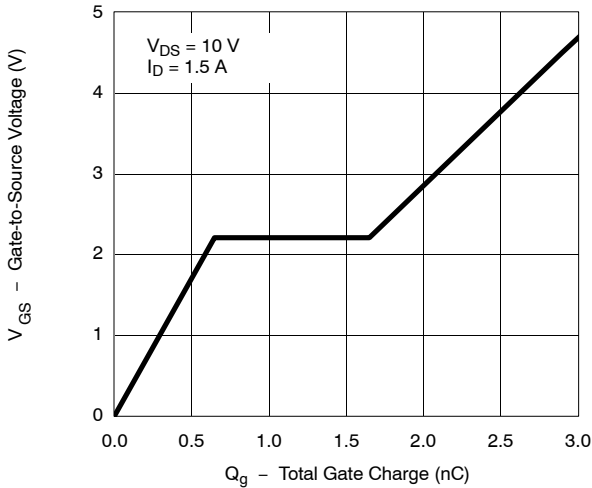
On-Resistance vs. Drain Current



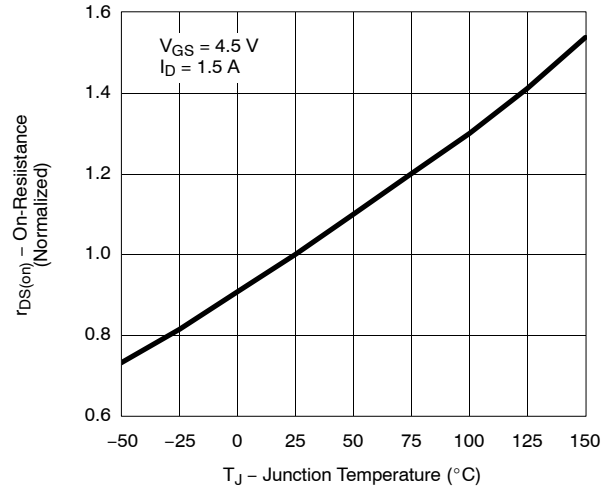
Capacitance



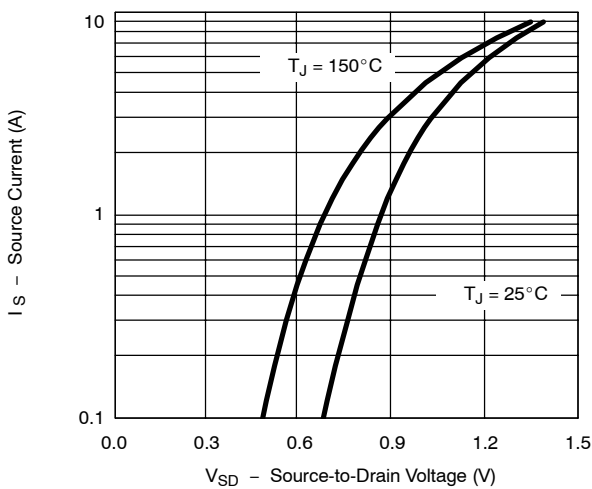
Gate Charge



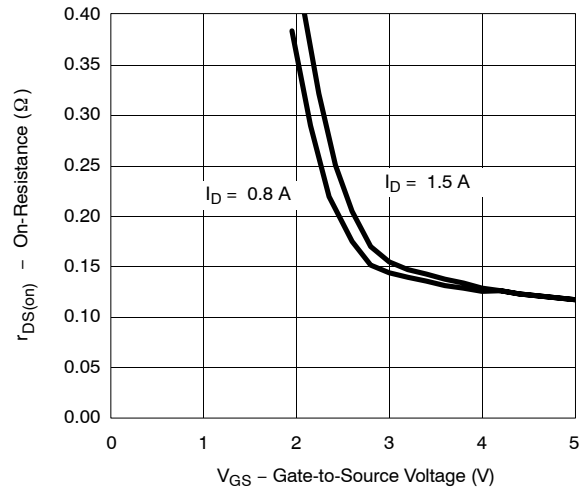
On-Resistance vs. Junction Temperature



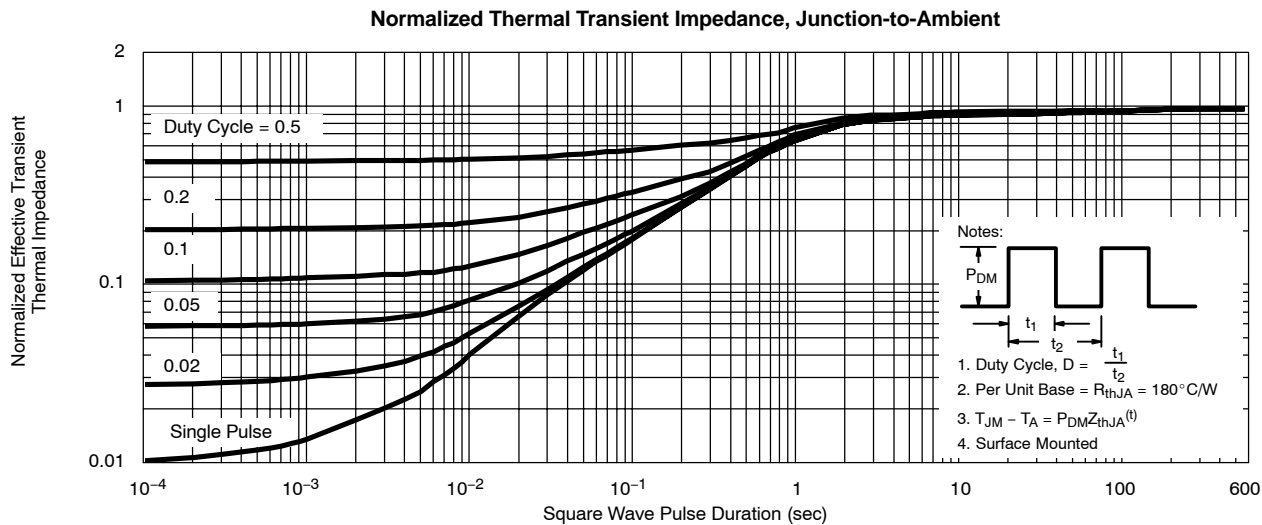
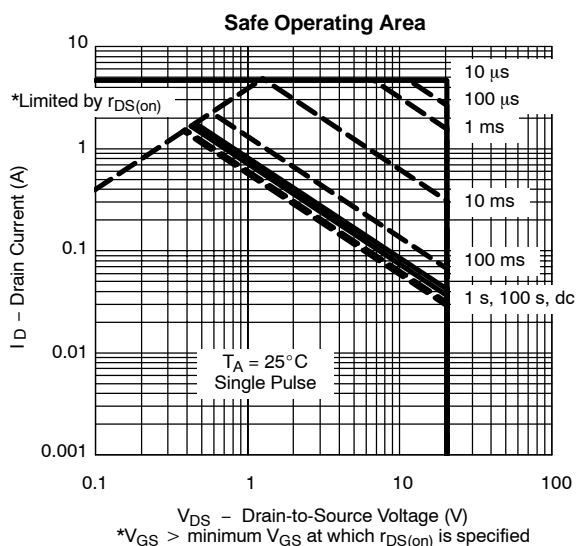
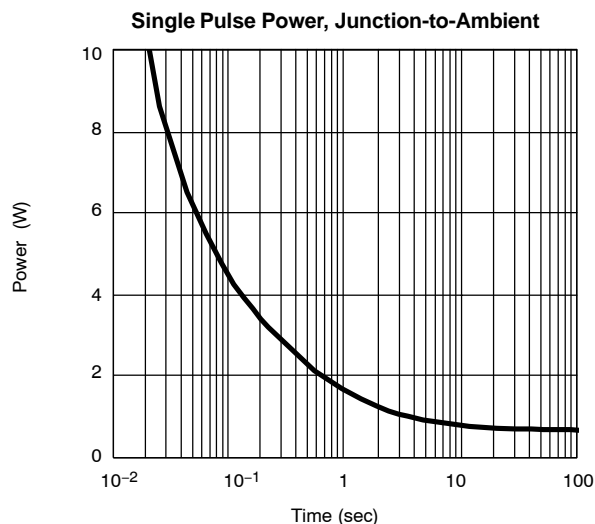
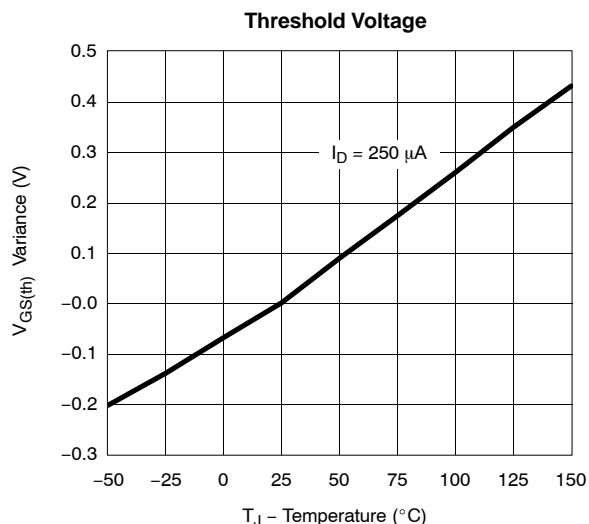
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

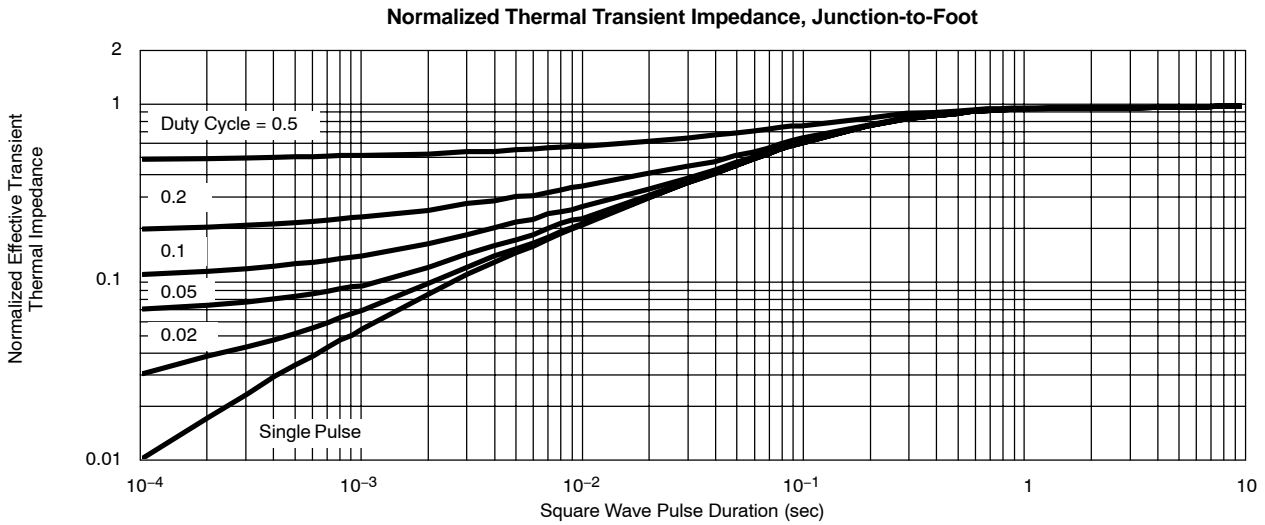


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