

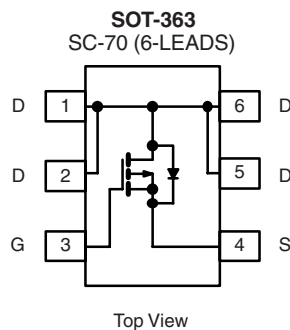
P-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY

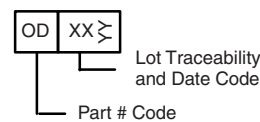
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
- 20	0.150 at $V_{GS} = - 4.5$ V	- 1.5	2.9
	0.175 at $V_{GS} = - 3.6$ V	- 1.4	
	0.265 at $V_{GS} = - 2.5$ V	- 1.2	

FEATURES

- TrenchFET® Power MOSFET


RoHS
COMPLIANT


Marking Code


Ordering Information: Si1403BDL-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, 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	T _A = 25 °C	I _D	- 1.5	- 1.4	A
	T _A = 85 °C		- 1.2	- 1.0	
Pulsed Drain Current		I _{DM}	- 5		
Continuous Diode Current (Diode Conduction) ^a		I _S	- 0.8	- 0.8	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	0.625	0.568	W
	T _A = 85 °C		0.400	0.295	
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}	165	200	$^\circ\text{C/W}$
		180	220	
Maximum Junction-to-Foot (Drain)	R_{thJF}	105	130	

Notes:

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

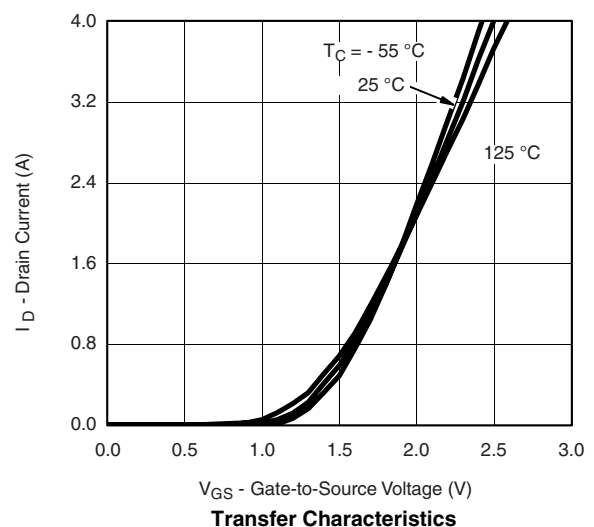
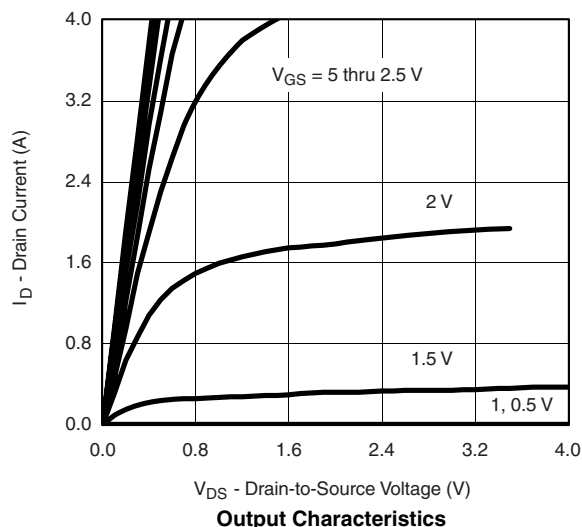
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	-0.6		-1.3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 12\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20\text{ V}$, $V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -20\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^{\circ}\text{C}$			-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	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}$, $I_D = -1.5\text{ A}$		0.120	0.150	Ω
		$V_{GS} = -3.6\text{ V}$, $I_D = -1.4\text{ A}$		0.140	0.175	
		$V_{GS} = -2.5\text{ V}$, $I_D = -0.8\text{ A}$		0.220	0.265	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}$, $I_D = -1.5\text{ A}$		3.4		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -0.8\text{ A}$, $V_{GS} = 0\text{ V}$		-0.8	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10\text{ V}$, $V_{GS} = -4.5\text{ V}$, $I_D = -1.5\text{ A}$		29	4.5	nC
Gate-Source Charge	Q_{gs}			0.65		
Gate-Drain Charge	Q_{gd}			1.0		
Gate Resistance	R_g	$f = 1.0\text{ MHz}$		9		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}$, $R_L = 10\text{ }\Omega$ $I_D \cong -1\text{ A}$, $V_{GEN} = -4.5\text{ V}$, $R_g = 6\text{ }\Omega$		13	20	ns
Rise Time	t_r			30	45	
Turn-Off Delay Time	$t_{d(off)}$			28	42	
Fall Time	t_f			13	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -0.8\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		12	25	nC
Body Diode Reverse Recovery Charge	Q_{rr}			4	8	

Notes:

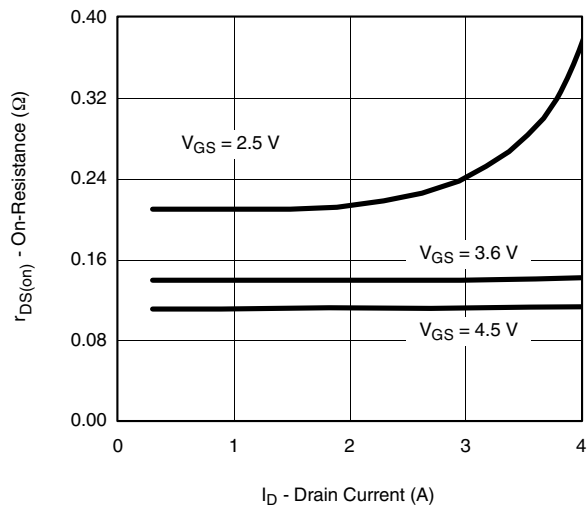
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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

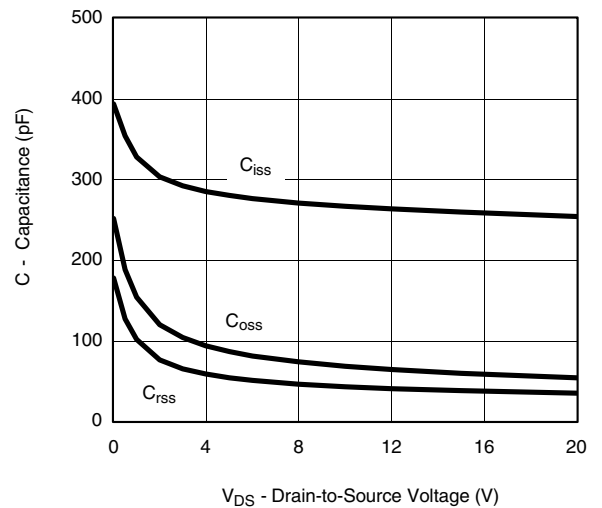
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

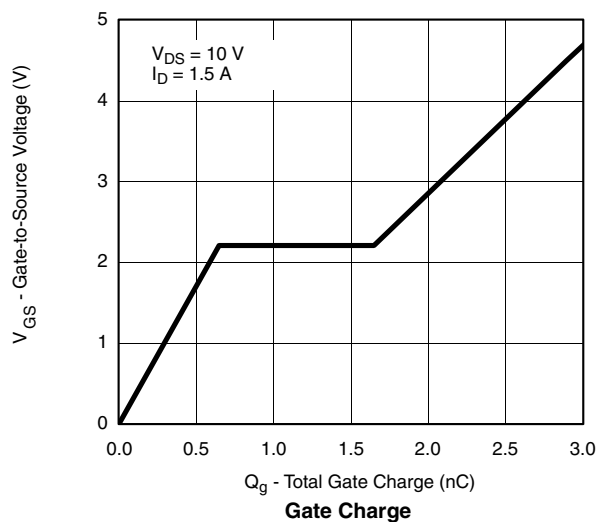
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



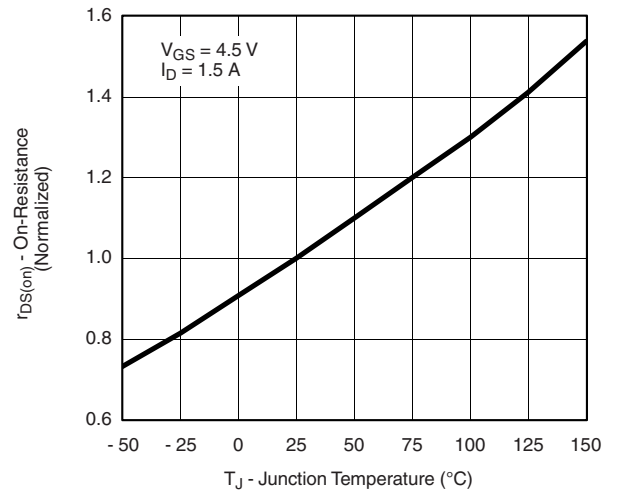
On-Resistance vs. Drain Current



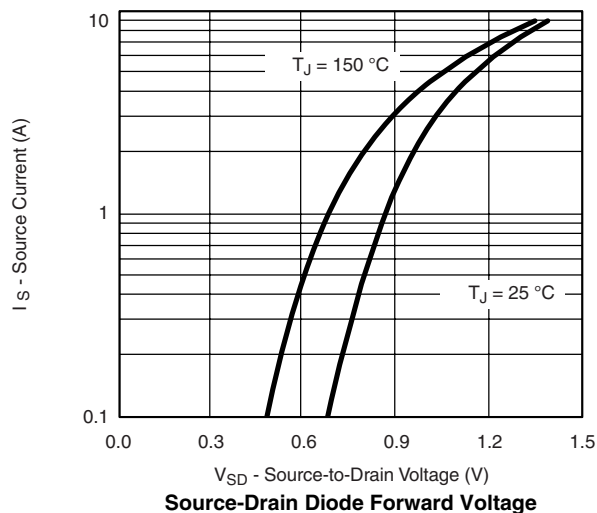
Capacitance



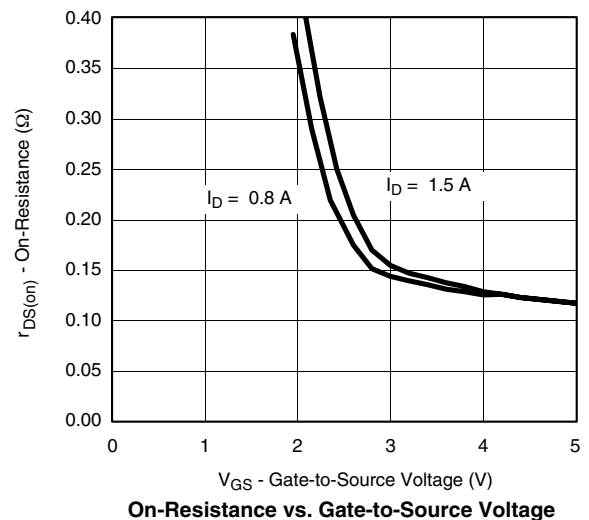
Gate Charge



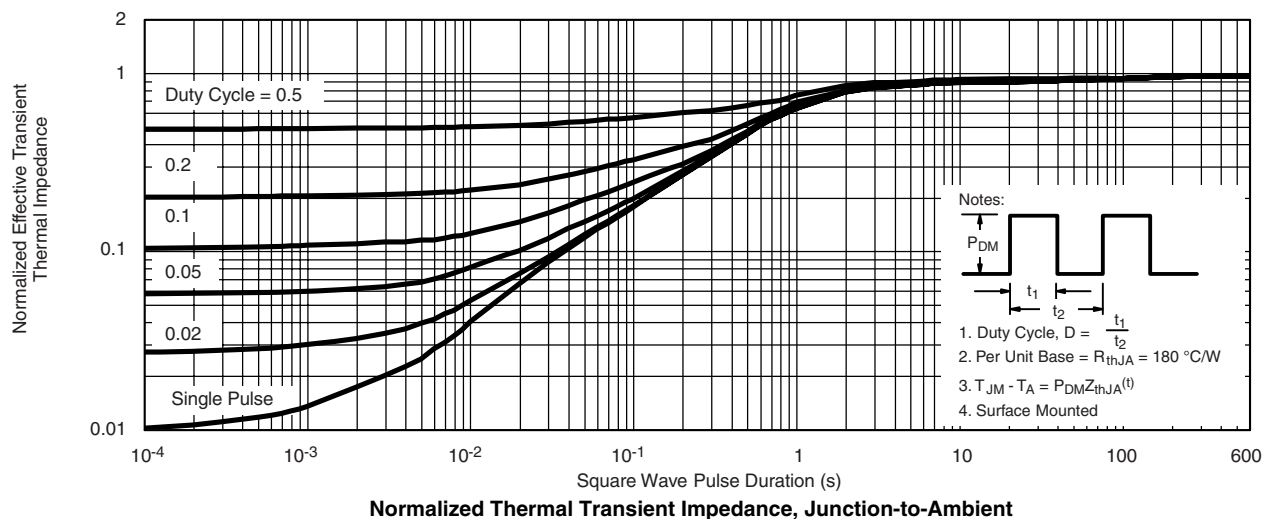
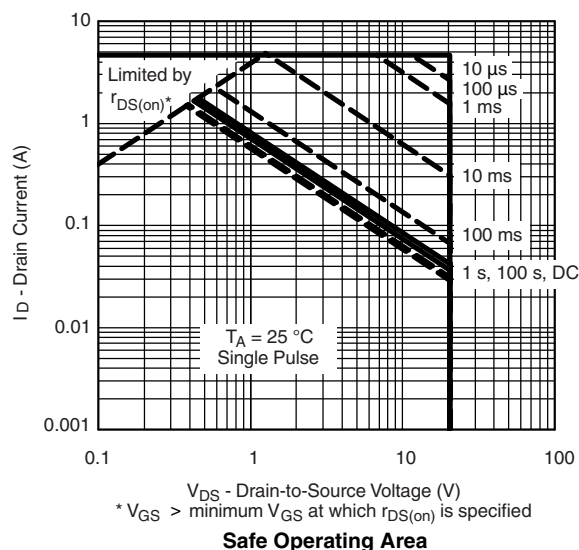
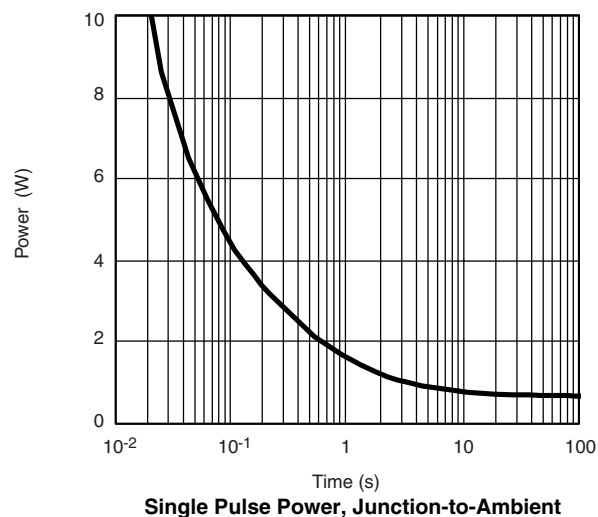
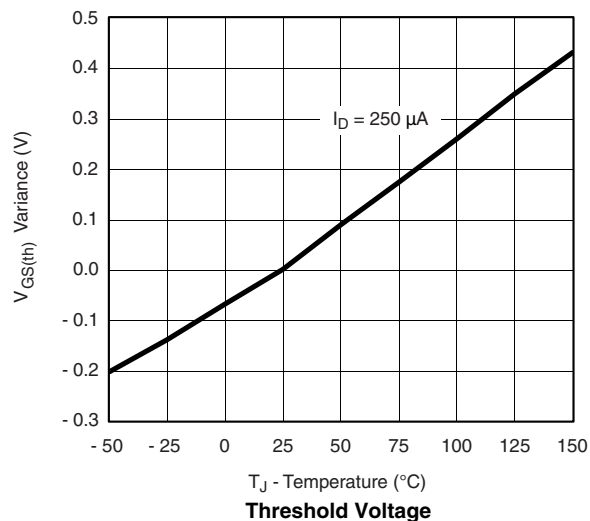
On-Resistance vs. Junction Temperature



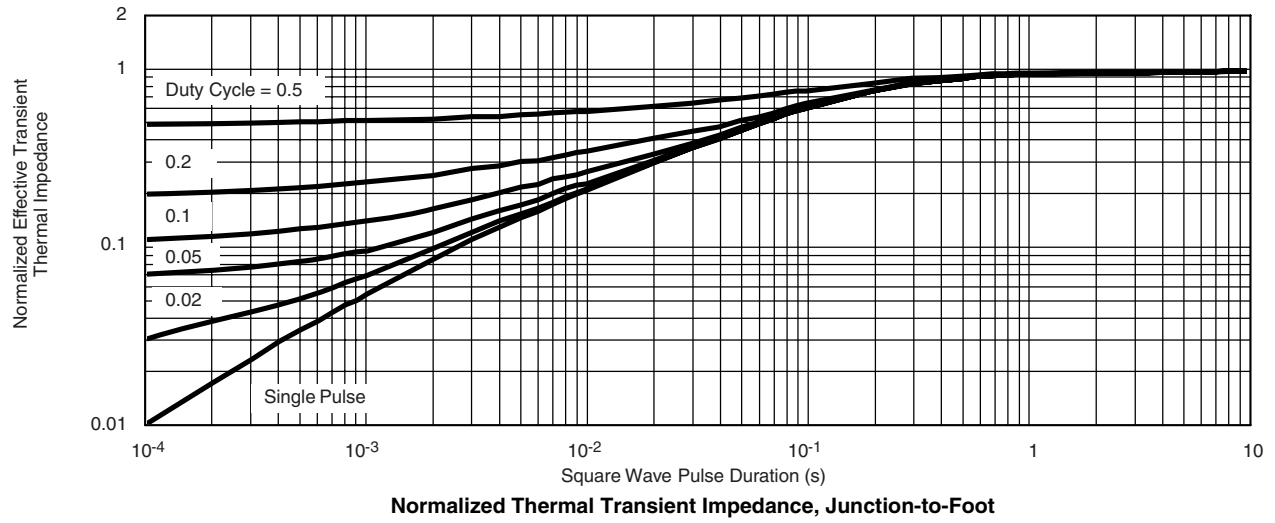
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

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