

P-Channel 1.8 V (G-S) MOSFET

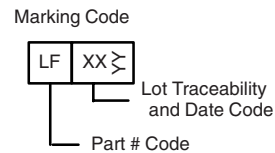
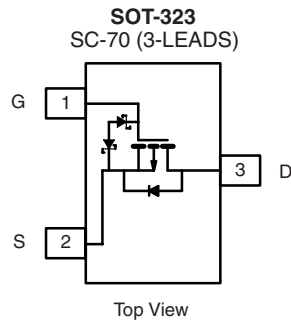
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 12	0.290 at $V_{GS} = - 4.5$ V	± 0.91
	0.435 at $V_{GS} = - 2.5$ V	± 0.74
	0.580 at $V_{GS} = - 1.8$ V	± 0.64

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- ESD Protection: 3000 V
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available



Ordering Information: Si1307EDL-T1-E3 (Lead (Pb)-free)
Si1307EDL-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}	- 12		V
Gate-Source Voltage	V_{GS}	± 8		
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	± 0.91	± 0.85
		$T_A = 70$ °C	± 0.72	± 0.68
Pulsed Drain Current	I_{DM}	± 3		A
Continuous Diode Current (Diode Conduction) ^a	I_S	- 0.28	- 0.24	
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	0.34	0.29
		$T_A = 70$ °C	0.22	0.19
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	$t \leq 5$ s	R_{thJA}	315	375	°C/W
	Steady State		360	430	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	285	340	

Notes:

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

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-0.45			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 4.5\ \text{V}$			± 1	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -9.6\ \text{V}, V_{GS} = 0\ \text{V}$			-1	
		$V_{DS} = -9.6\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-3			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\ \text{V}, I_D = -1\ \text{A}$		0.240	0.290	Ω
		$V_{GS} = -2.5\ \text{V}, I_D = -0.5\ \text{A}$		0.350	0.435	
		$V_{GS} = -1.8\ \text{V}, I_D = -0.3\ \text{A}$		0.480	0.580	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\ \text{V}, I_D = -1\ \text{A}$		3.5		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1\ \text{A}, V_{GS} = 0\ \text{V}$			-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -1\ \text{A}$		3.2	5	nC
Gate-Source Charge	Q_{gs}			0.69		
Gate-Drain Charge	Q_{gd}			0.61		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6\ \text{V}, R_L = 6\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_g = 6\ \Omega$		210	340	ns
Rise Time	t_r			450	720	
Turn-Off Delay Time	$t_{d(off)}$			910	1550	
Fall Time	t_f			1000	1600	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		540	860	

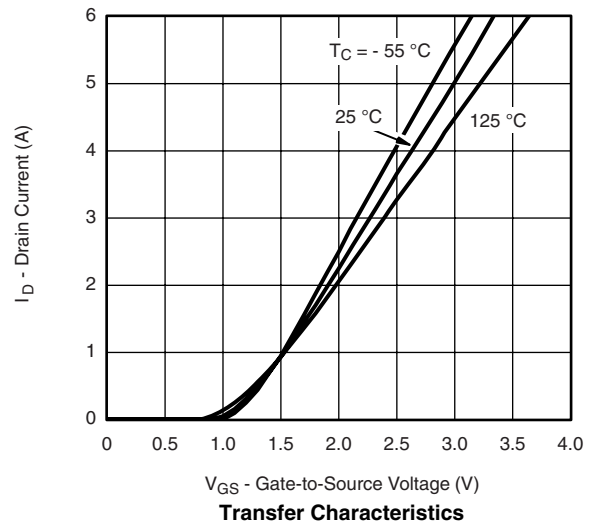
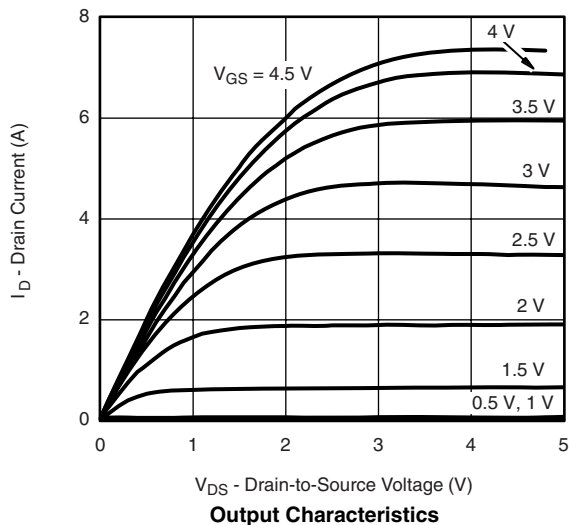
Notes:

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

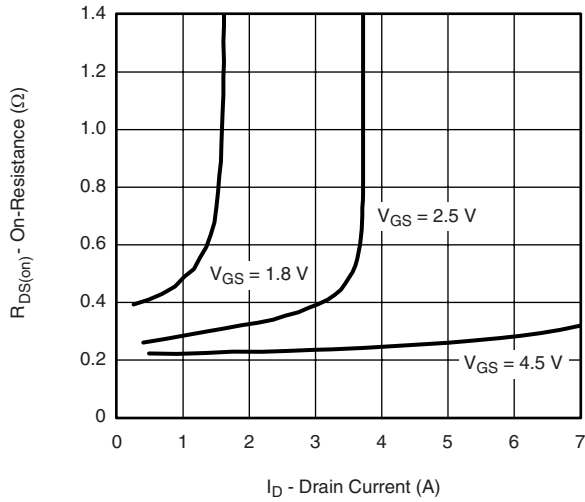
b. Guaranteed by design, not subject to production testing.

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.

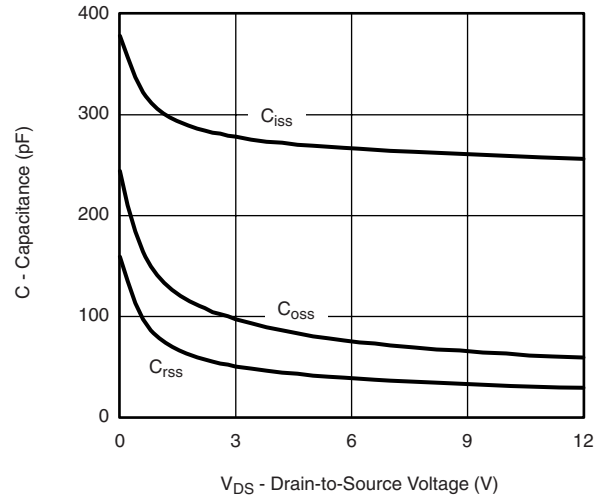
TYPICAL CHARACTERISTICS 25°C , unless otherwise noted



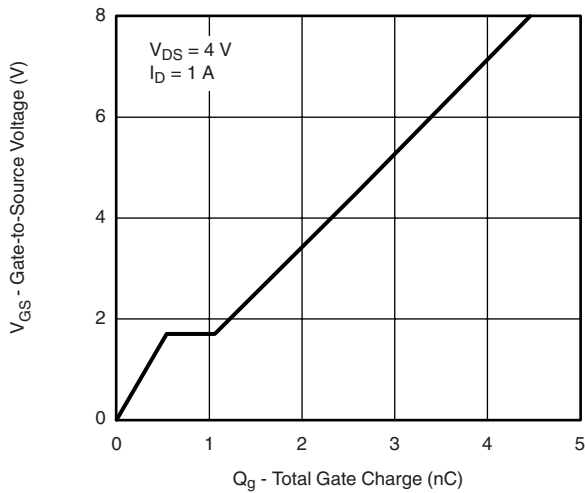
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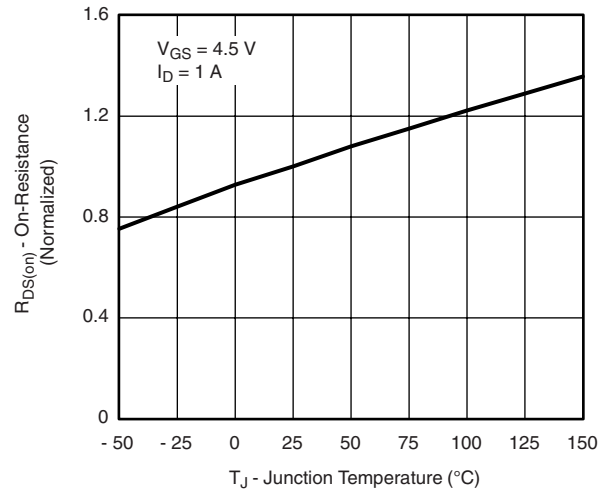
On-Resistance vs. Drain Current



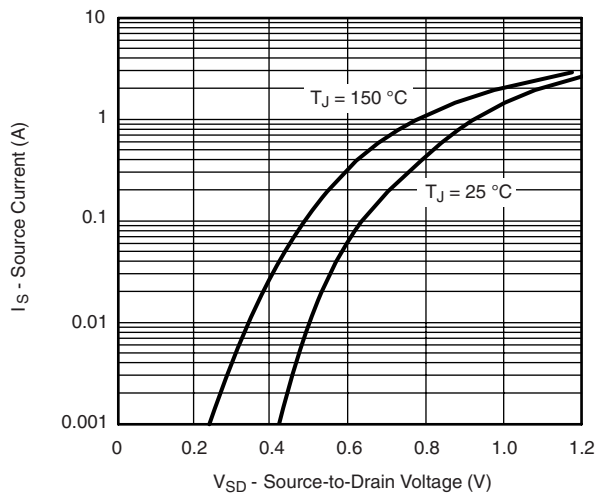
Capacitance



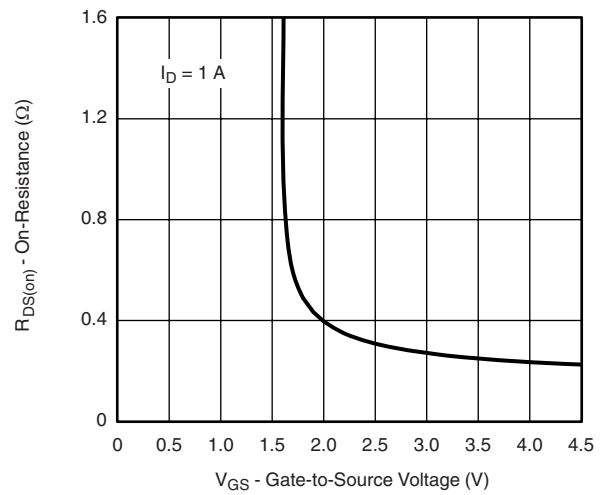
Gate Charge



On-Resistance vs. Junction Temperature

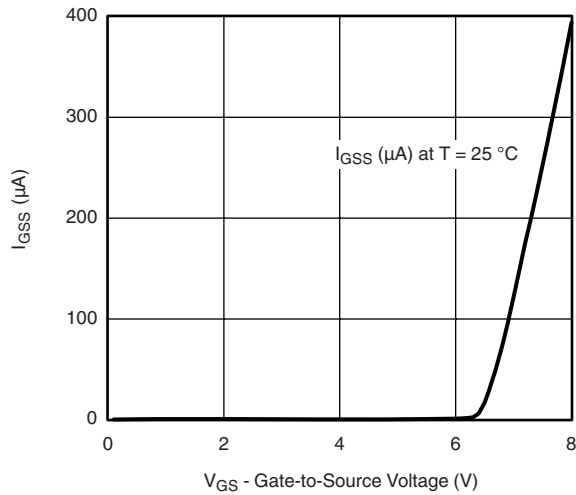


Source-Drain Diode Forward Voltage

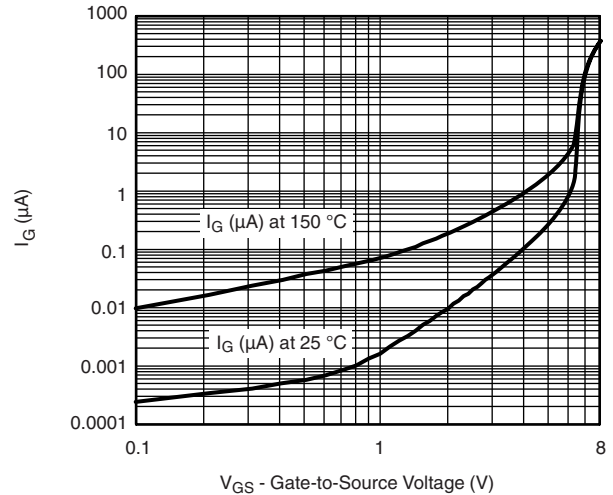


On-Resistance vs. Gate-Source Voltage

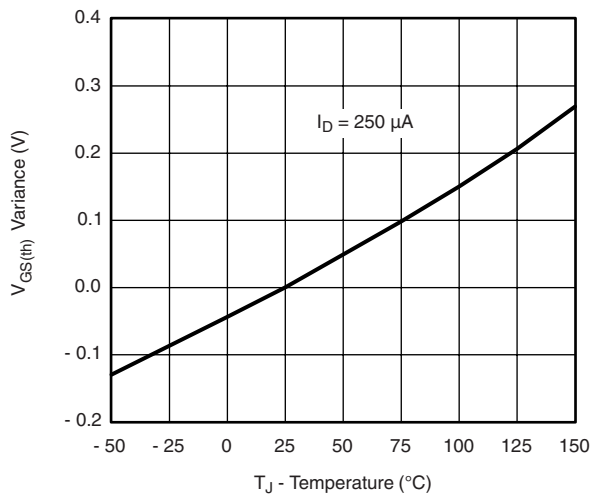
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



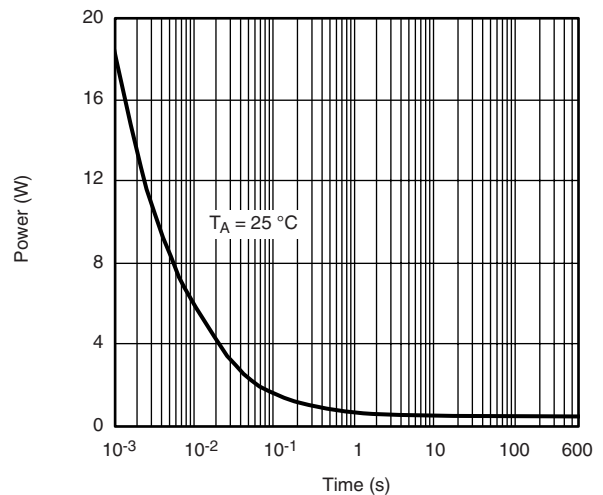
Gate-Current vs. Gate-to-Source Voltage



Gate-to-Source Voltage vs. Gate Current

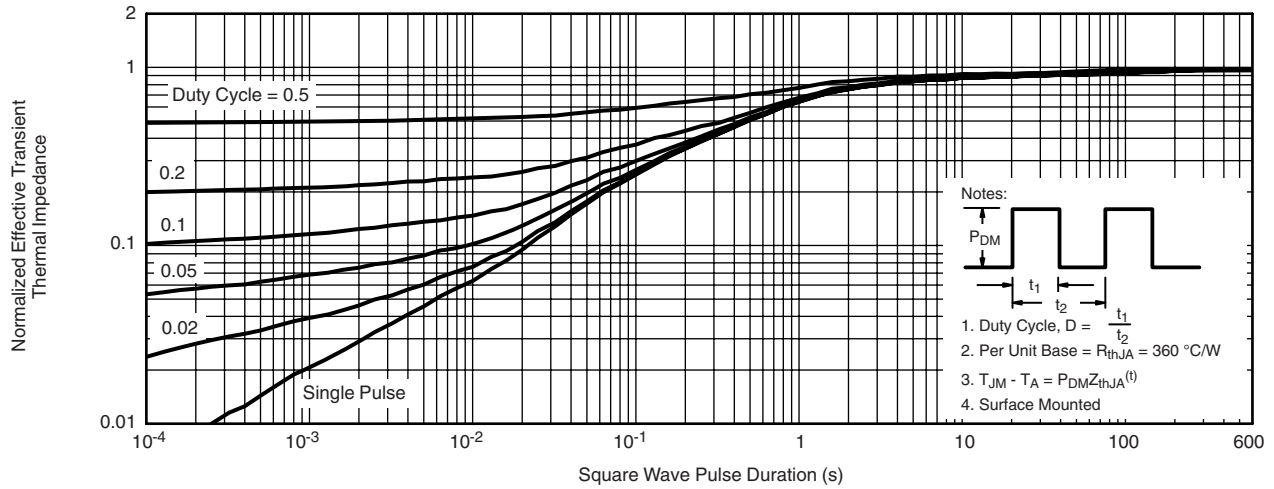


Threshold Voltage

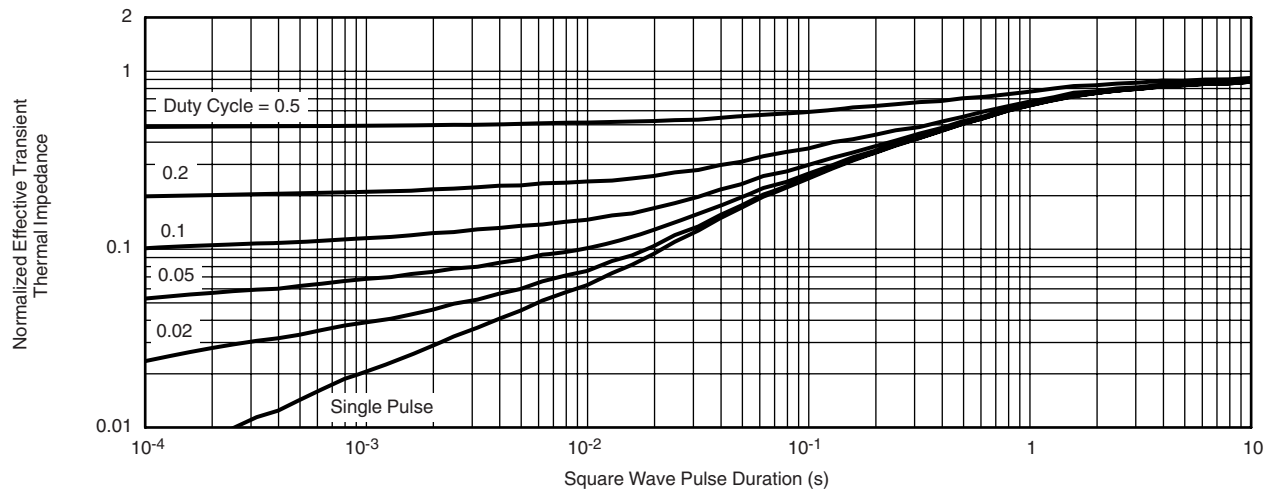


Single Pulse Power

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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