



P-Channel 1.8 V (G-S) MOSFET

PRODUCT SUMMARY

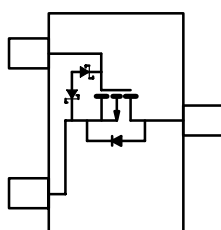
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 12	0.290 at $V_{GS} = - 4.5$ V	± 0.91
	0.435 at $V_{GS} = - 2.5$ V	± 0.74
	0.580 at $V_{GS} = - 1.8$ V	± 0.64

FEATURES

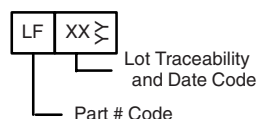
- Halogen-free According to IEC 61249-2-21 Definition
- ESD Protection: 3000 V
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available



Marking Code



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

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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	T _A = 25 °C	I _D	± 0.91	± 0.85	A
	T _A = 70 °C		± 0.72	± 0.68	
Pulsed Drain Current		I _{DM}	± 3		
Continuous Diode Current (Diode Conduction) ^a		I _S	- 0.28	- 0.24	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	0.34	0.29	W
	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	°C/W
	Steady State		360	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	285	

Notes:

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

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted

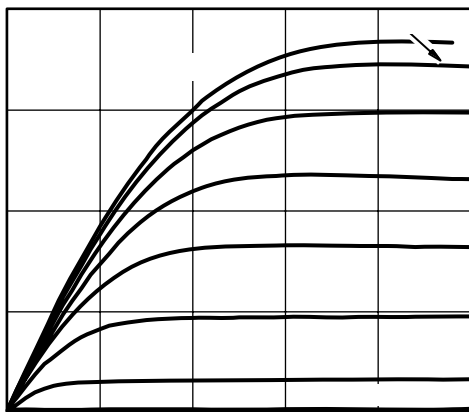
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	- 0.45			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 4.5\text{ V}$			± 1	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -9.6\text{ V}$, $V_{GS} = 0\text{ V}$ $V_{DS} = -9.6\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 70\text{ }^{\circ}\text{C}$			- 1 - 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	$t_{d(on)}$	$V_{DD} = -6\text{ V}$, $R_L = 6\text{ }\Omega$ $I_D \cong -1\text{ A}$, $V_{GEN} = -4.5\text{ V}$, $R_g = 6\text{ }\Omega$		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:

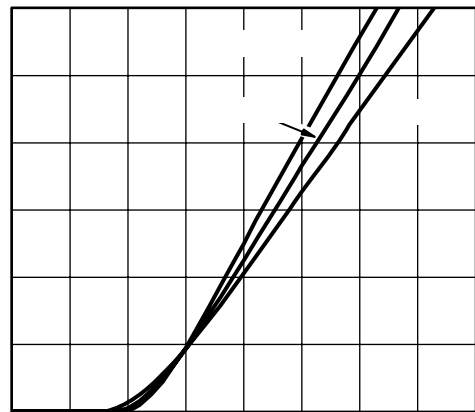
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

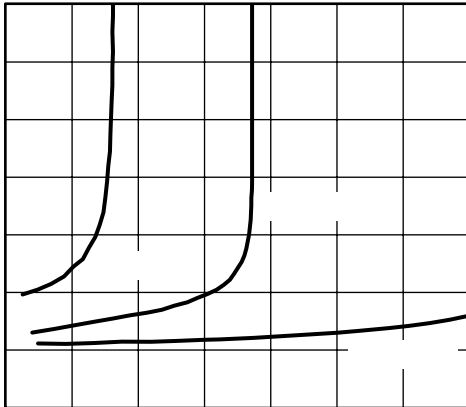
TYPICAL CHARACTERISTICS $25\text{ }^{\circ}\text{C}$, unless otherwise noted

Output Characteristics

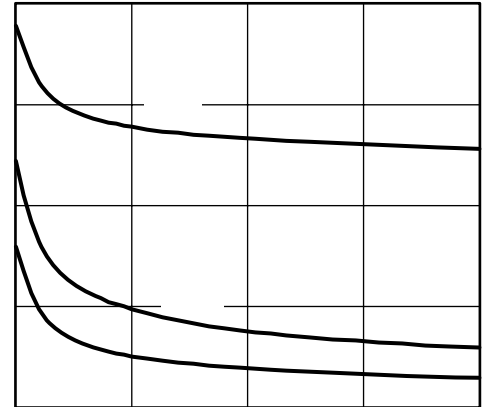


Transfer Characteristics

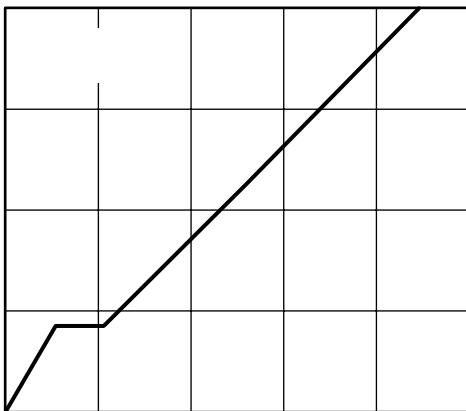
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



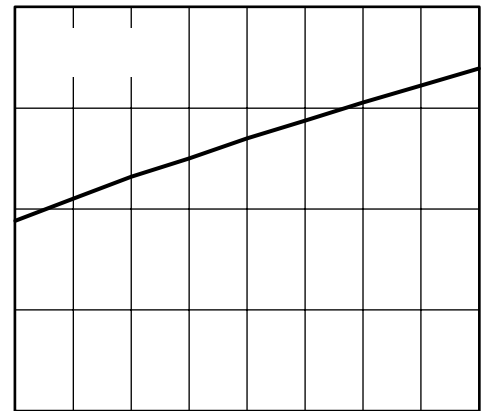
On-Resistance vs. Drain Current



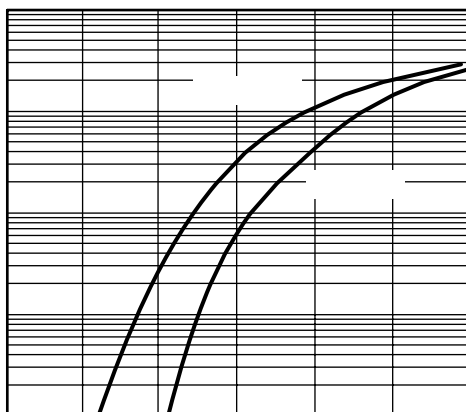
Capacitance



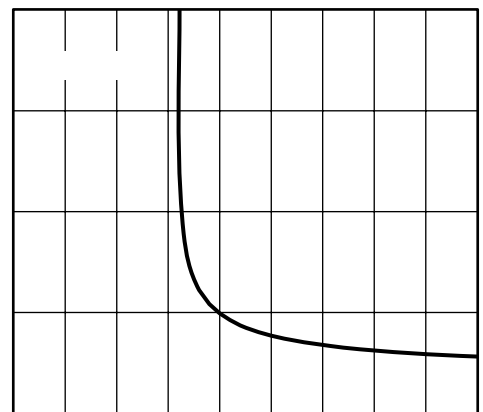
Gate Charge



On-Resistance vs. Junction Temperature

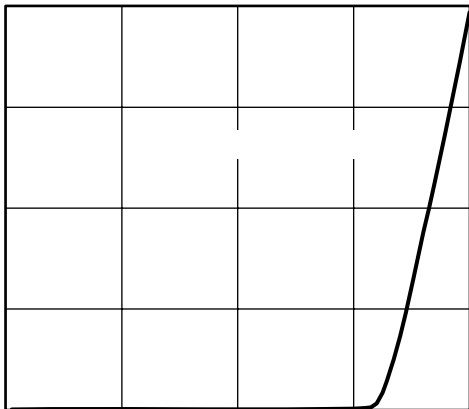


Source-Drain Diode Forward Voltage

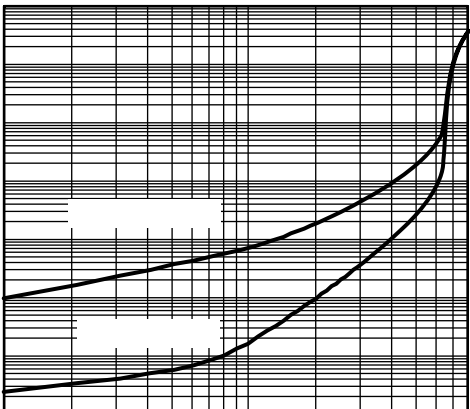


On-Resistance vs. Gate-Source Voltage

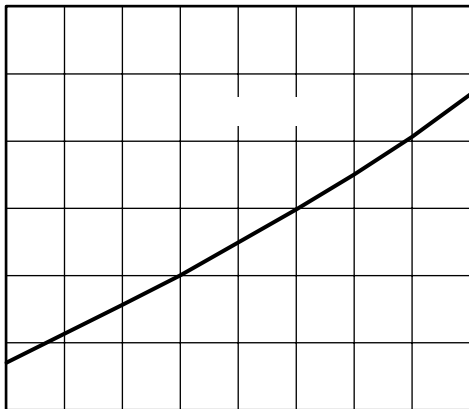
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



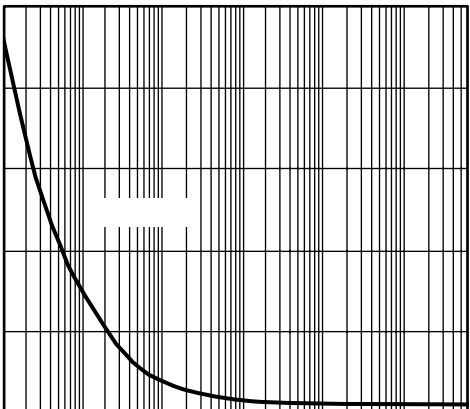
Gate-Current vs. Gate-to-Source Voltage



Gate-to-Source Voltage vs. Gate Current

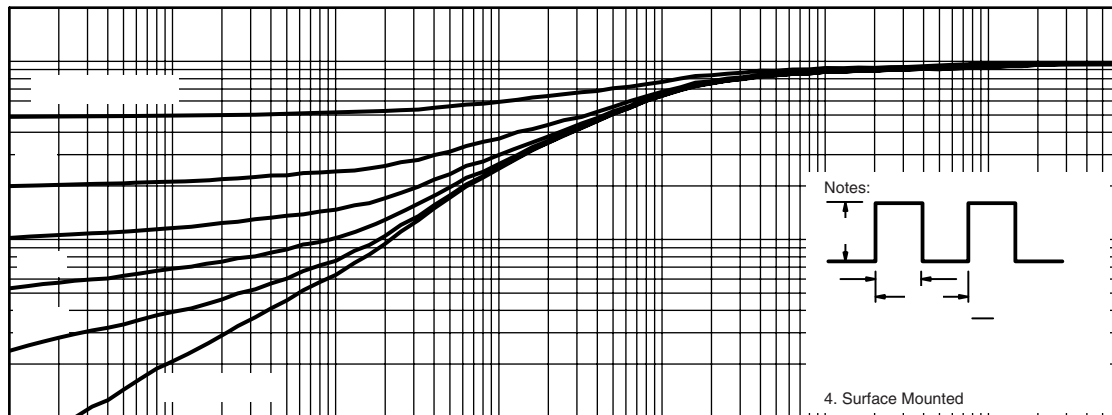


Threshold Voltage

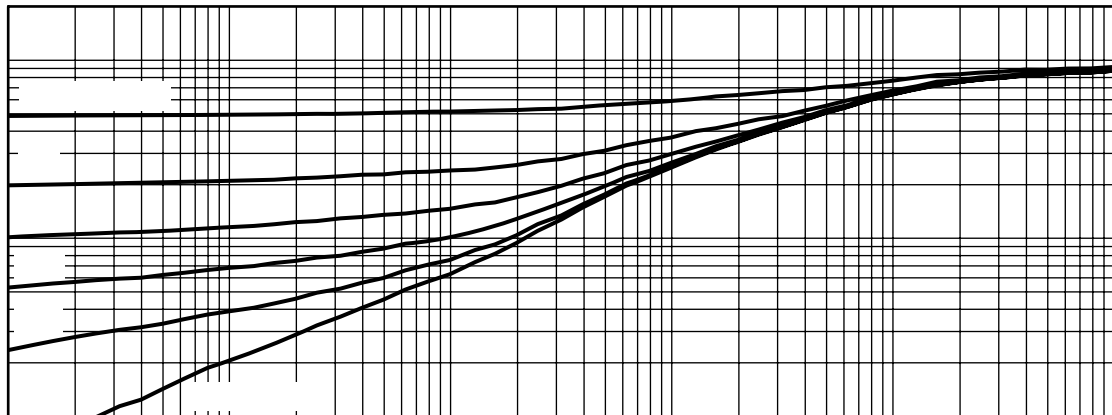


Single Pulse Power

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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