N-Channel 30-V (D-S) MOSFET

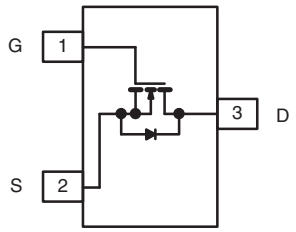
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
30	0.480 at V_{GS} = 10 V	0.64
	0.700 at V_{GS} = 4.5 V	0.53

FEATURES

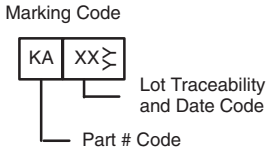
- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE Available

SC-70 (3-LEADS)



Top View



Ordering Information: Si1302DL-T1-E3 (Lead (Pb)-free)
Si1302DL-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}	30		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 150 °C)[a]	T_A = 25 °C	I_D	0.64	0.60	A
	T_A = 70 °C		0.51	0.48	
Pulsed Drain Current		I_{DM}	1.5		
Continuous Diode Current (Diode Conduction)[a]		I_S	0.26	0.23	
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	0.31	0.28	W
	T_A = 70 °C		0.20	0.18	
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 ≤ 5 s	R_{thJA}	355	400	°C/W
	Steady State		380	450	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	285	340	

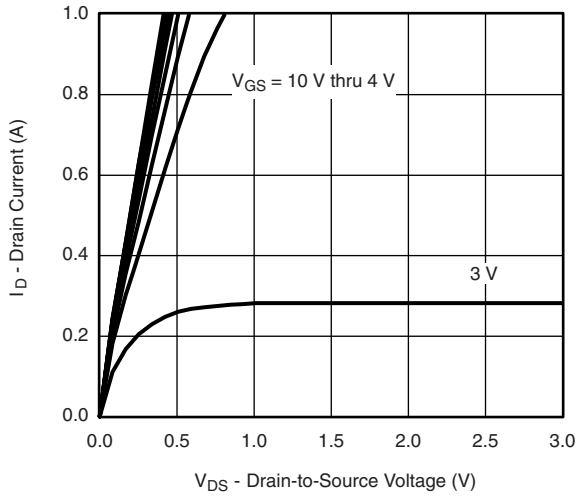
Notes:
a. Surface mounted on 1" x 1" FR4 board.

SPECIFICATIONS (T_J = 25 °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 µA	1		3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			1	µA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 70 °C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	1.5			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.6 A		0.410	0.480	Ω
		V_{GS} = 4.5 V, I_D = 0.2 A		0.600	0.700	
Forward Transconductance[a]	g_{fs}	V_{GS} = 15 V, I_D = 0.6 A		0.75		S
Diode Forward Voltage[a]	V_{SD}	I_S = 0.23 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 0.6 A		0.86	1.4	nC
Gate-Source Charge	Q_{gs}			0.24		
Gate-Drain Charge	Q_{gd}			0.08		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 30 Ω I_D ≅ 0.5 A, V_{GEN} = 10 V, R_g = 6 Ω		5	10	ns
Rise Time	t_r			8	15	
Turn-Off DelayTime	$t_{d(off)}$			8	15	
Fall Time	t_f			7	15	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.23 A, dI/dt = 100 A/µs		15	30	

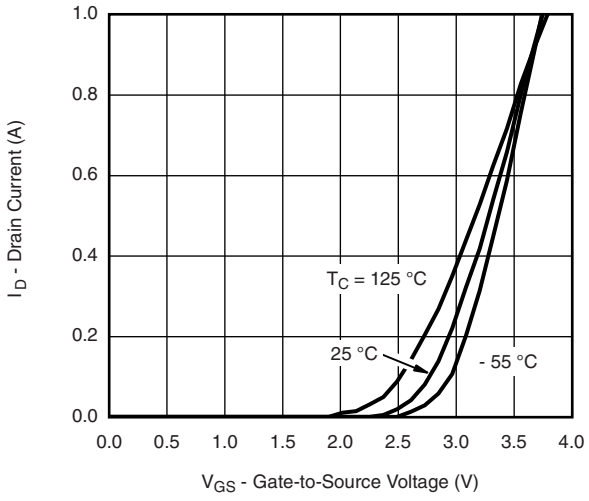
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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 otherwise noted)

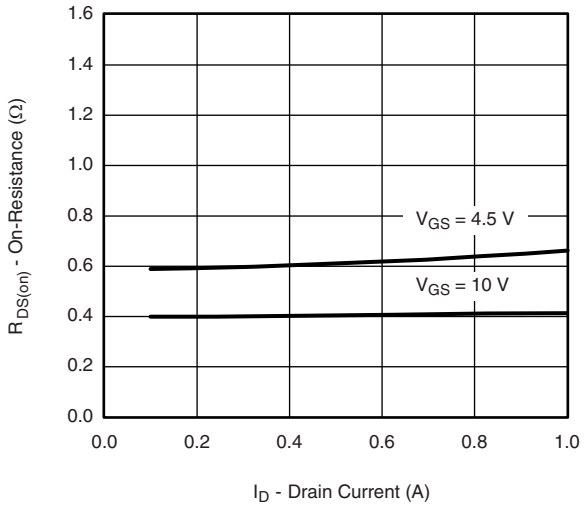


Output Characteristics

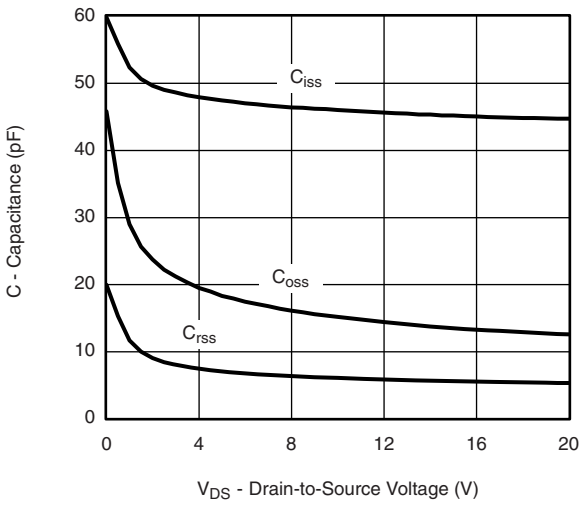


Transfer Characteristics

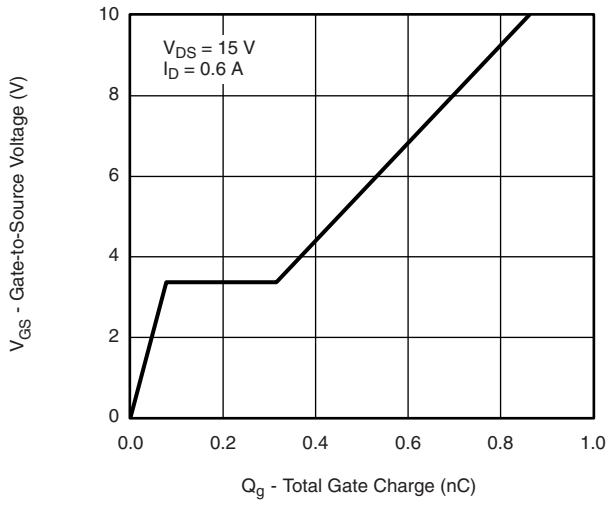
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



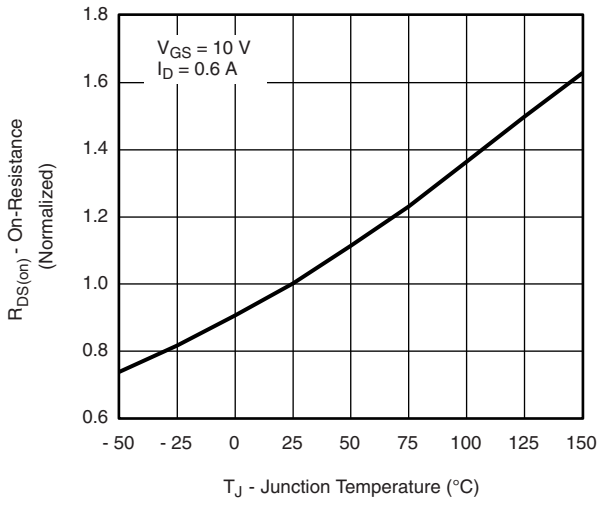
On-Resistance vs. Drain Current



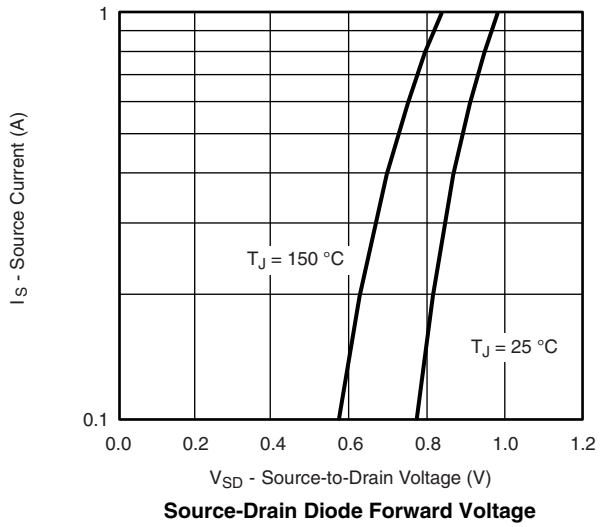
Capacitance



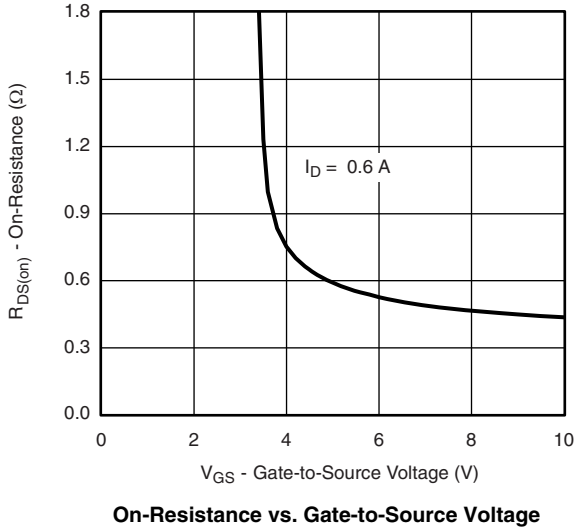
Gate Charge



On-Resistance vs. Junction Temperature

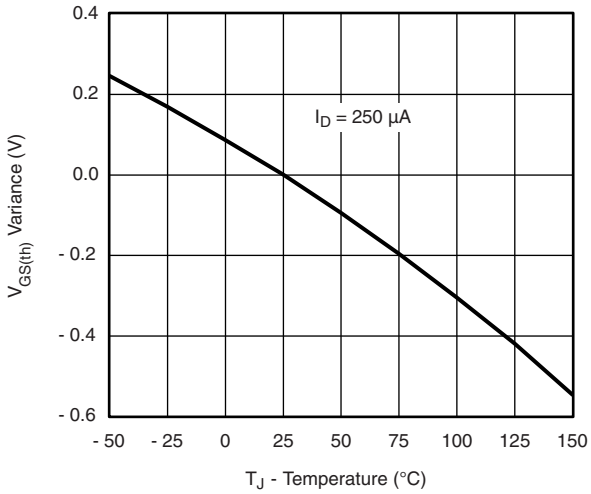


Source-Drain Diode Forward Voltage

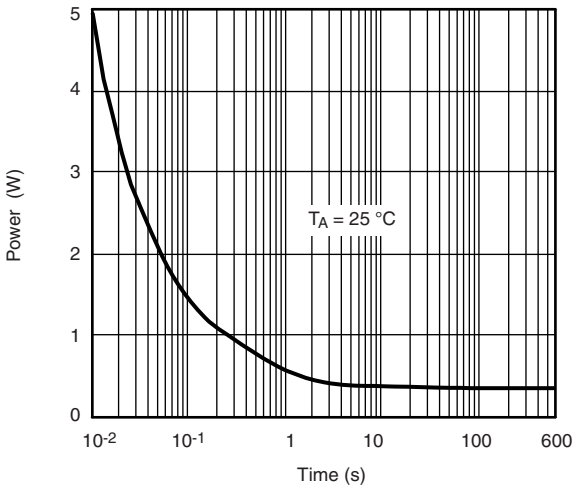


On-Resistance vs. Gate-to-Source Voltage

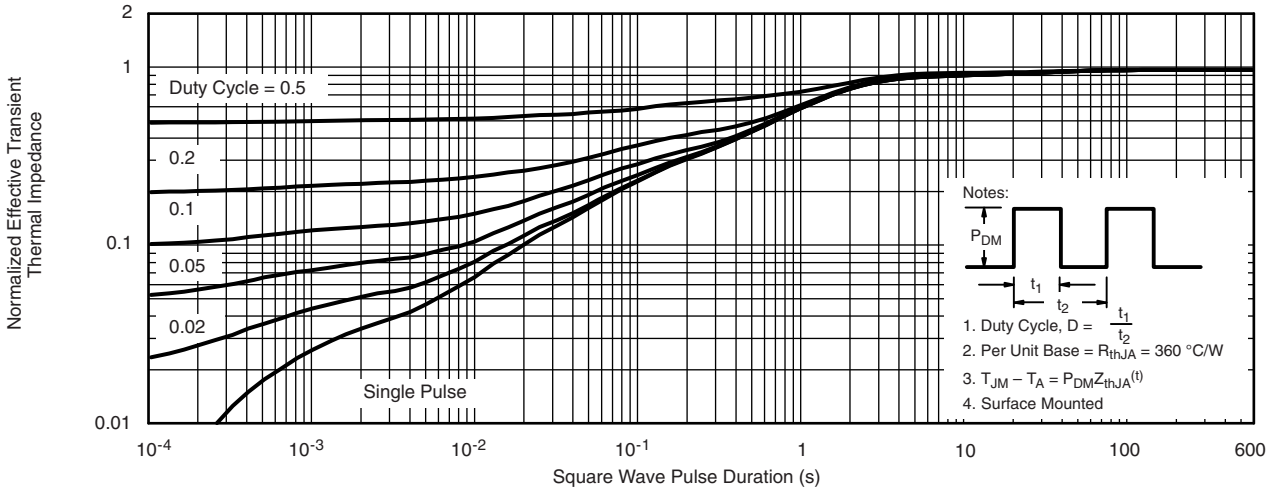
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



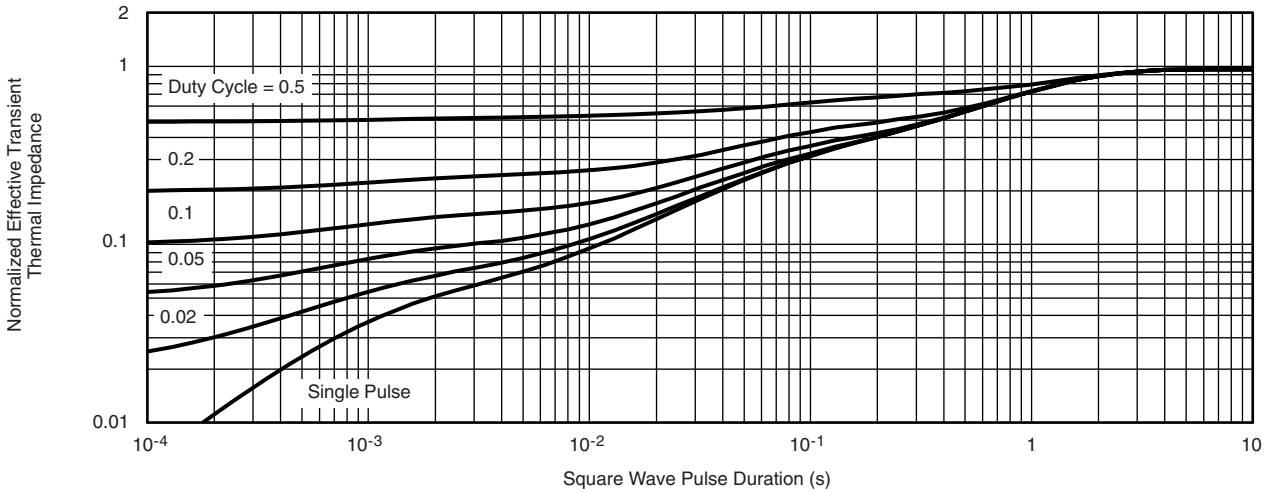
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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