Dual N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.385 at V_{GS} = 4.5 V	0.70
	0.630 at V_{GS} = 2.5 V	0.54

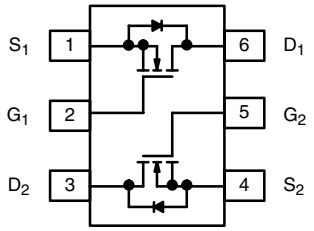
FEATURES

- TrenchFET® Power MOSFETS: 2.5 V Rated

Pb-free Available

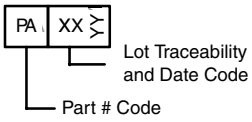
RoHS* COMPLIANT

SOT-363
SC-70 (6-LEADS)



Top View

Marking Code



Ordering Information: Si1902DL-T1 (with Tape and Reel)
Si1902DL-T1-E3 (Lead (Pb)-free with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**5 secs**	**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	0.70	0.66	A
	T_A = 85 °C		0.50	0.48	
Pulsed Drain Current		I_{DM}	1.0		
Continuous Source Current (Diode Conduction)[a]		I_S	0.25	0.23	
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	0.30	0.27	W
	T_A = 85 °C		0.16	0.14	
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 sec	R_{thJA}	360	415	°C/W
	Steady State		400	460	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	300	350	

Notes

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

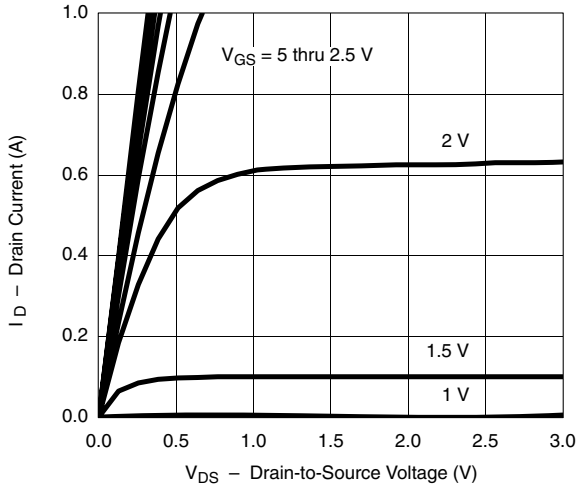
* Pb containing terminations are not RoHS compliant, exemptions may apply

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	0.6		1.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1	µA
		V_{DS} = 16 V_{GS} = 0 V, T_J = 85°C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	1.0			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.66 A		0.320	0.385	Ω
		V_{GS} = 2.5 V, I_D = 0.40 A		0.560	0.630	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 0.66 A		1.5		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} = 10 V, V_{GS} = 4.5 V, I_D = 0.66 A		0.8	1.2	nC
Gate-Source Charge	Q_{gs}			0.06		
Gate-Drain Charge	Q_{gd}			0.30		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 20 Ω I_D ≅ 0.5 A, V_{GEN} = 4.5 V, R_G = 6 Ω		10	20	ns
Rise Time	t_r			16	30	
Turn-Off DelayTime	$t_{d(off)}$			10	20	
Fall Time	t_f			10	20	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.23 A, di/dt = 100 A/µs		20	40	

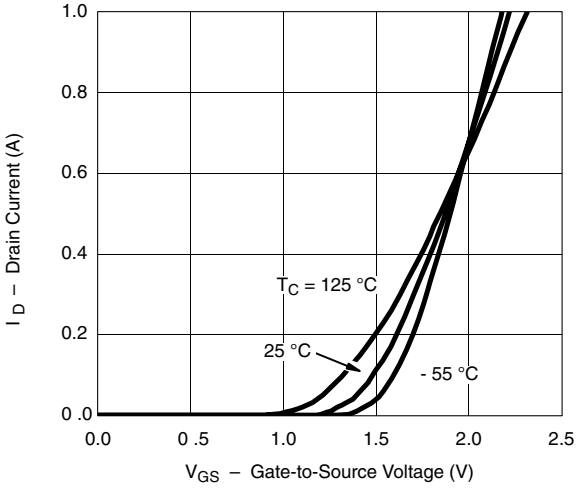
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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 T_A = 25 °C, unless otherwise noted

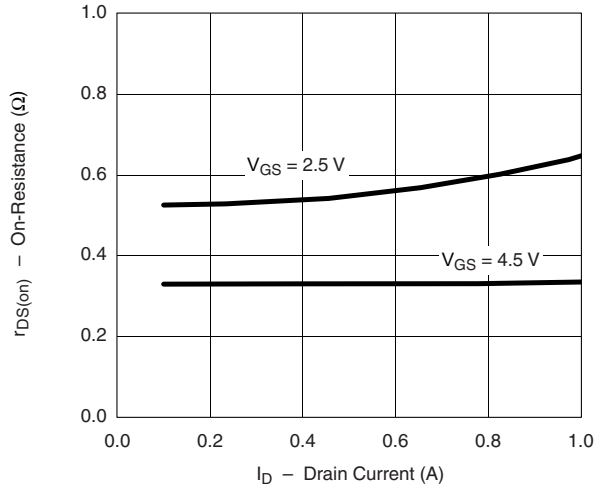


Output Characteristics

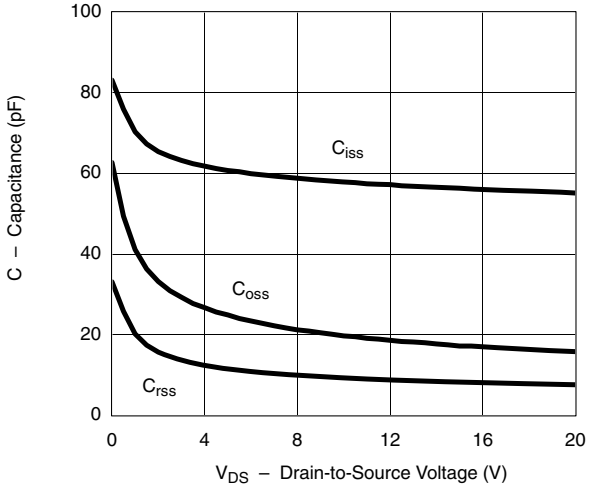


Transfer Characteristics

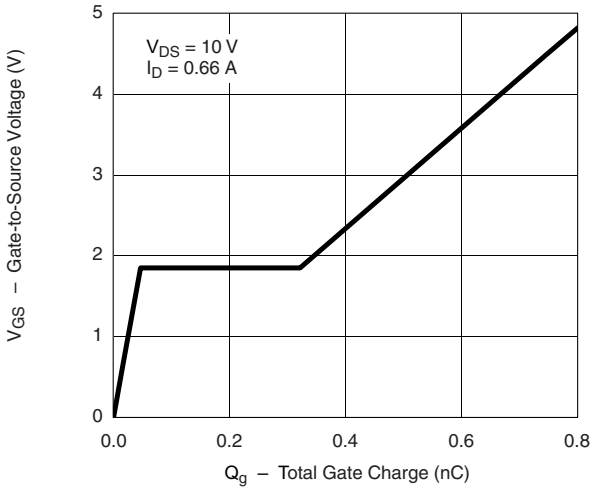
TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



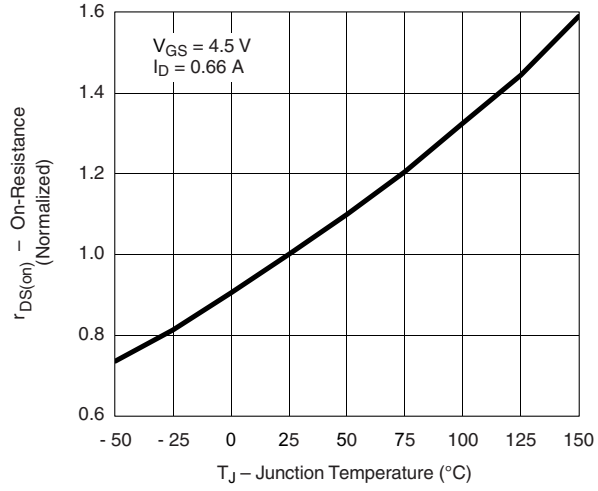
On-Resistance vs. Drain Current



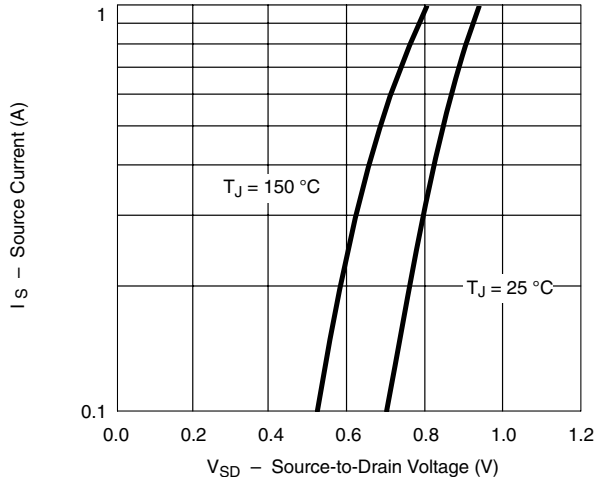
Capacitance



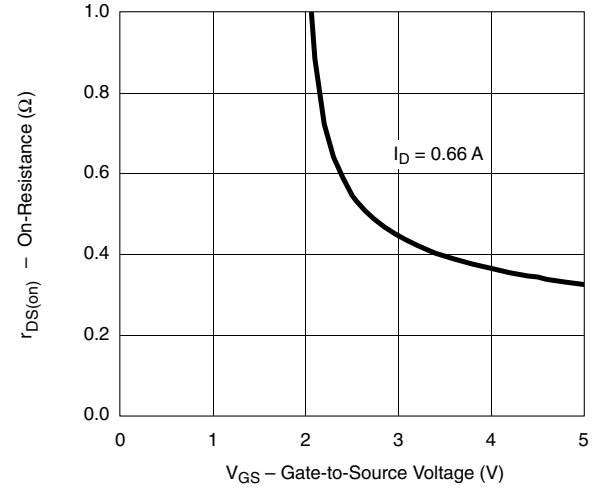
Gate Charge



On-Resistance vs. Junction Temperature

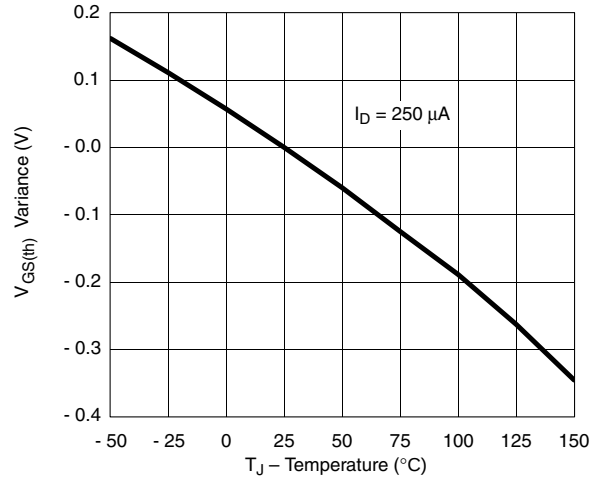


Surge-Drain Diode Forward Voltage

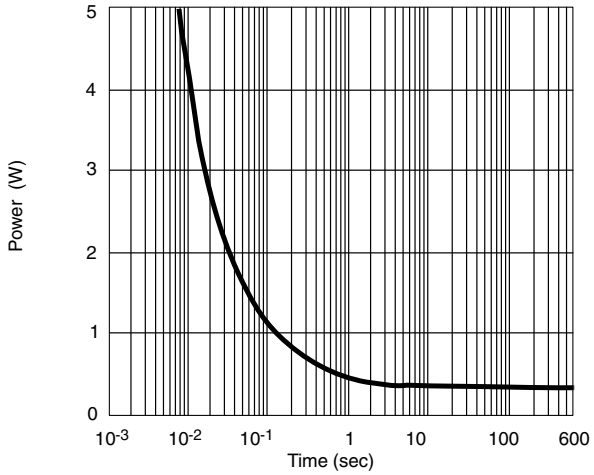


On-Resistance vs. Gate-to-Source Voltage

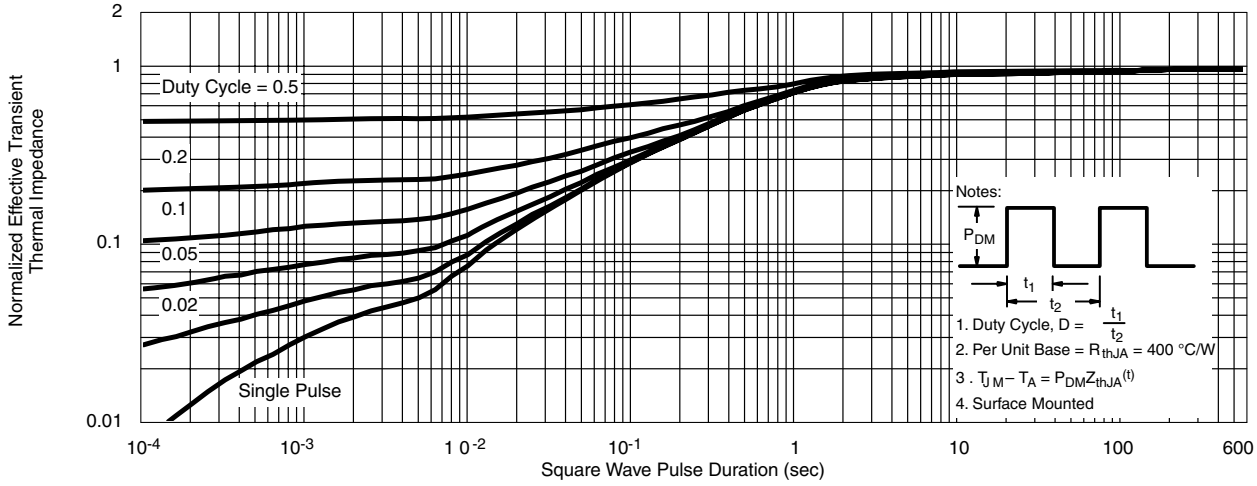
TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



Threshold Voltage

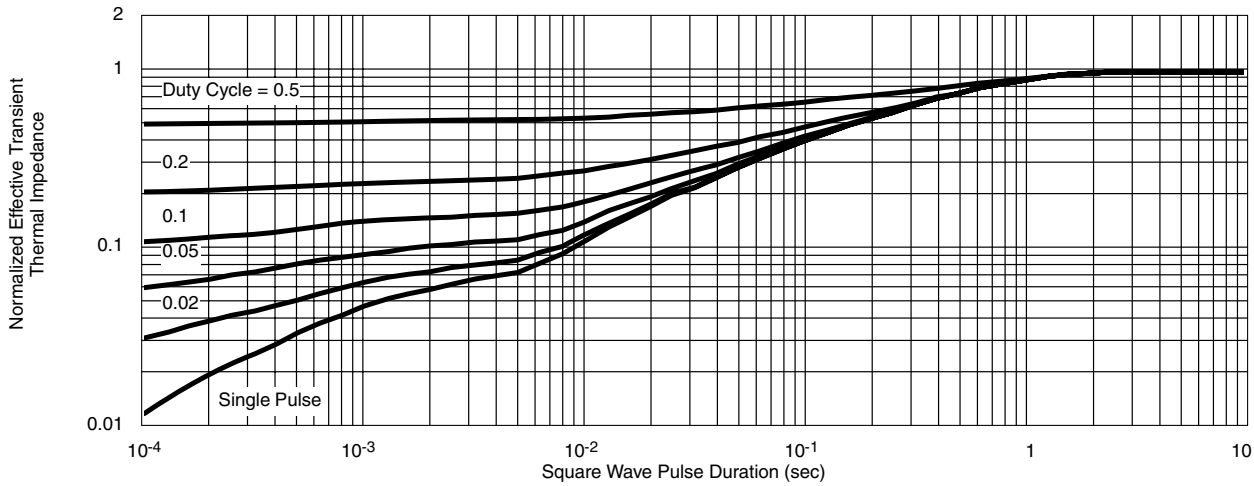


Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Foot

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