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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
- 20	0.150 at V_{GS} = 4.5 V	1.7
	0.235 at V_{GS} = 2.5 V	1.3

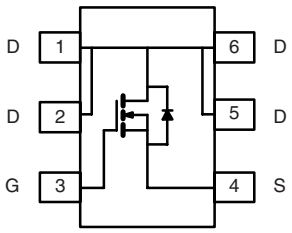
FEATURES

- TrenchFET® Power MOSFET: 2.5 V Rated

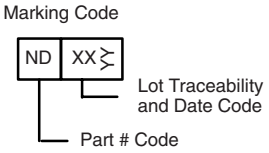
Pb-free Available

RoHS* COMPLIANT

SOT-363
SC-70 (6-LEADS)



Top View



Ordering Information: Si1400DL-T1
Si1400DL-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °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	1.7	1.6	A
	T_A = 85 °C		1.2	1.0	
Pulsed Drain Current		I_{DM}	5		
Continuous Source 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		0.40	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]	t ≤ 5 s	R_{thJA}	165	200	°C/W
	Steady State		180	220	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	105	130	

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

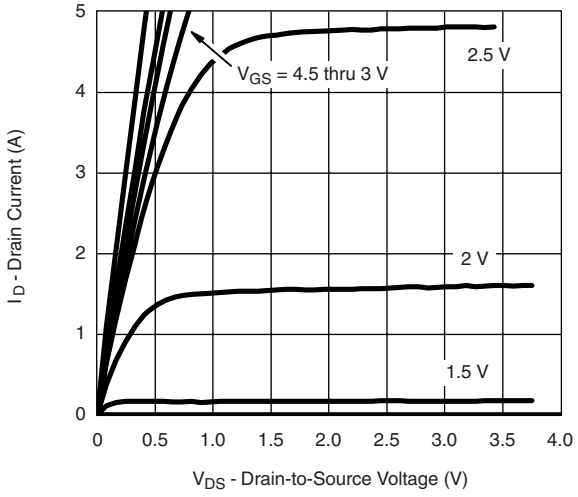
* Pb containing terminations are not RoHS compliant, exemptions may apply.

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			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, V_{GS} = 0 V, T_J = 85 °C			5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = 4.5 V	2			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 1.7 A		0.123	0.150	Ω
		V_{GS} = 2.5 V, I_D = 1.3 A		0.195	0.235	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 1.7 A		5		S
Diode Forward Voltage[a]	V_{SD}	I_S = 0.8 A, V_{GS} = 0 V		0.78	1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1.7 A		2.1	4.0	nC
Gate-Source Charge	Q_{gs}			0.3		
Gate-Drain Charge	Q_{gd}			0.4		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 20 Ω $I_D \cong$ 1 A, V_{GEN} = 4.5 V, R_g = 6 Ω		10	17	ns
Rise Time	t_r			30	50	
Turn-Off Delay Time	$t_{d(off)}$			14	25	
Fall Time	t_f			8	15	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.8 A, di/dt = 100 A/µs		30	50	

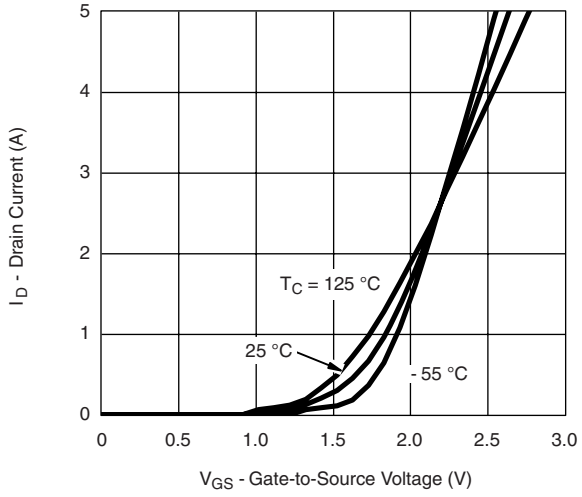
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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

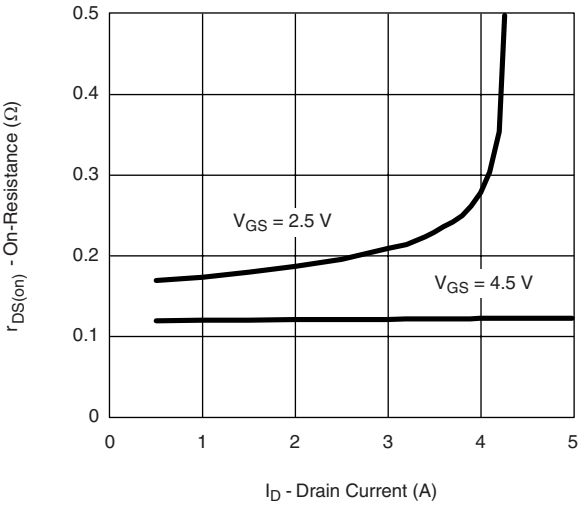


Output Characteristics

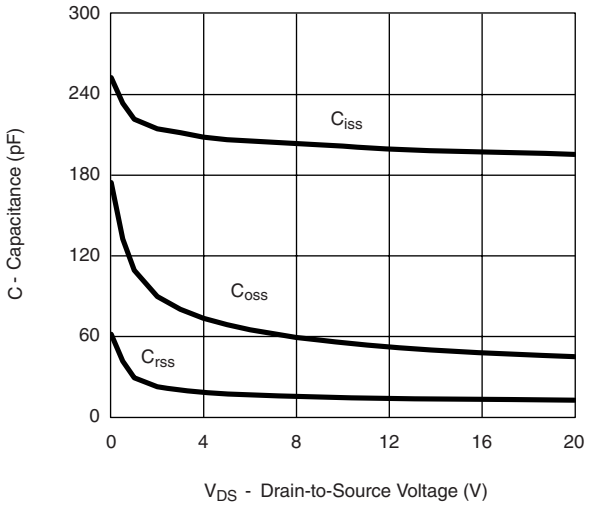


Transfer Characteristics

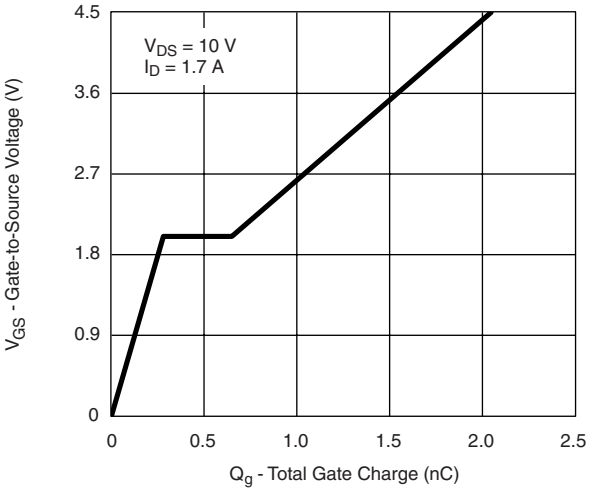
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



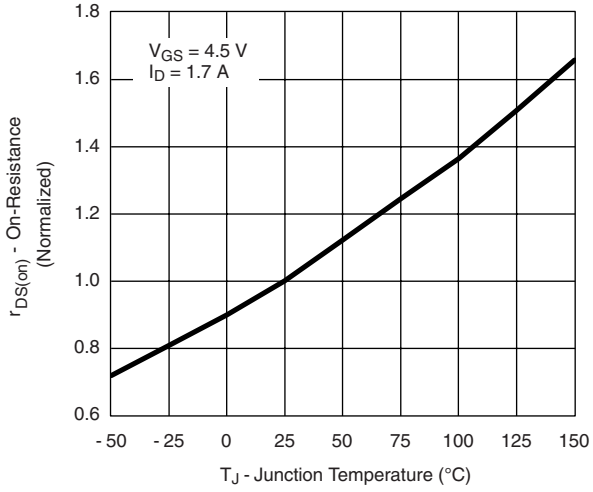
On-Resistance vs. Drain Current



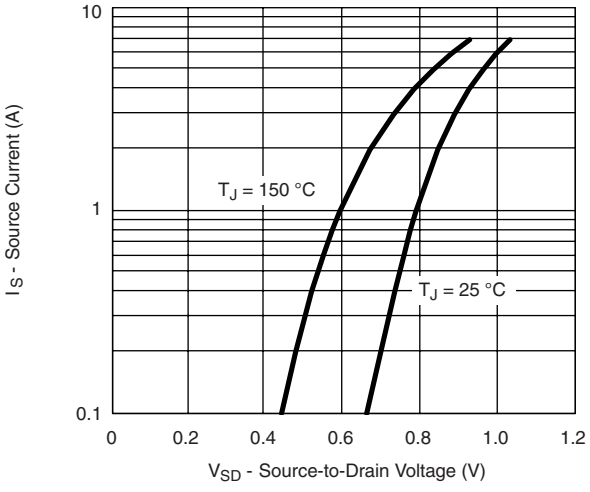
Capacitance



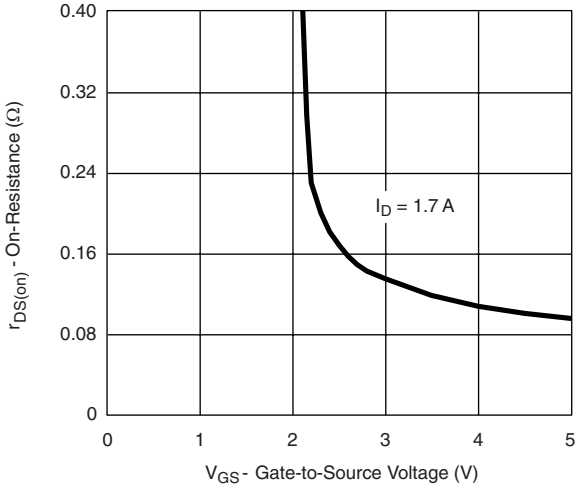
Gate Charge



On-Resistance vs. Junction Temperature

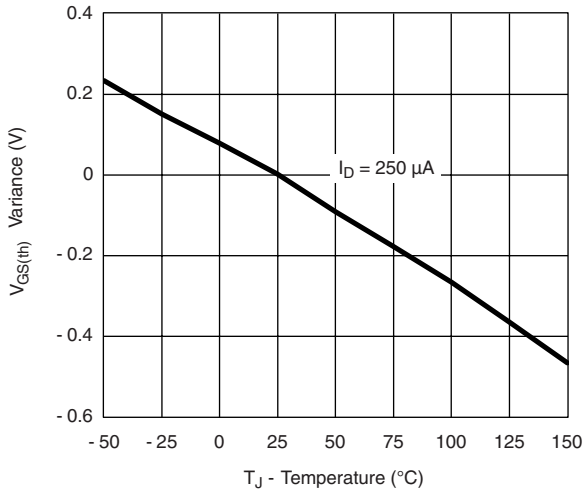


Source-Drain Diode Forward Voltage

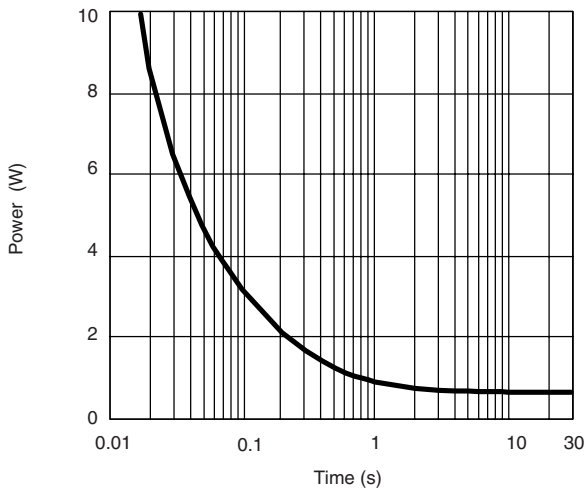


On-Resistance vs. Gate-to-Source Voltage

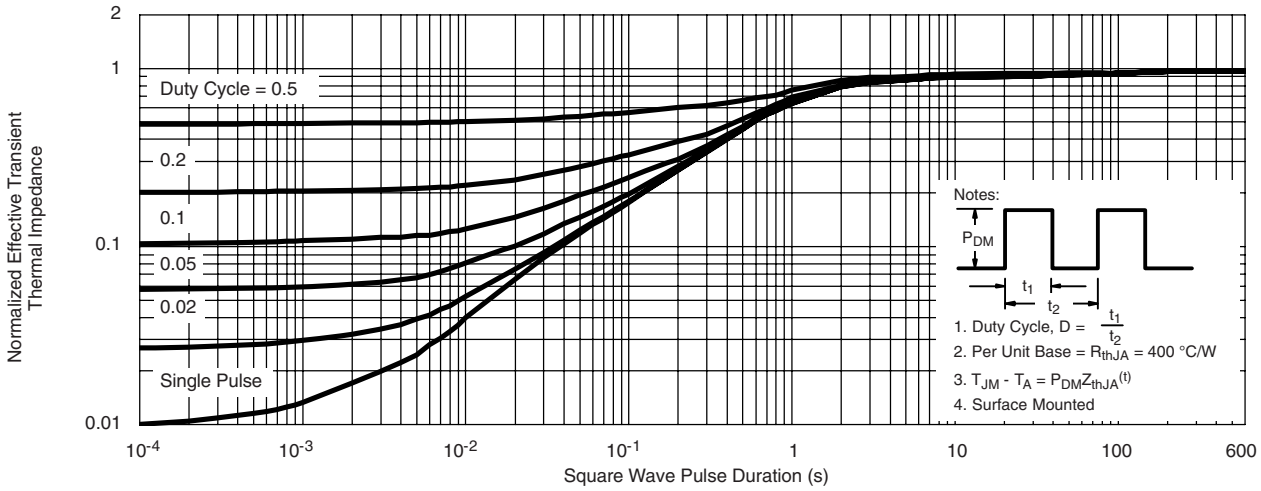
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



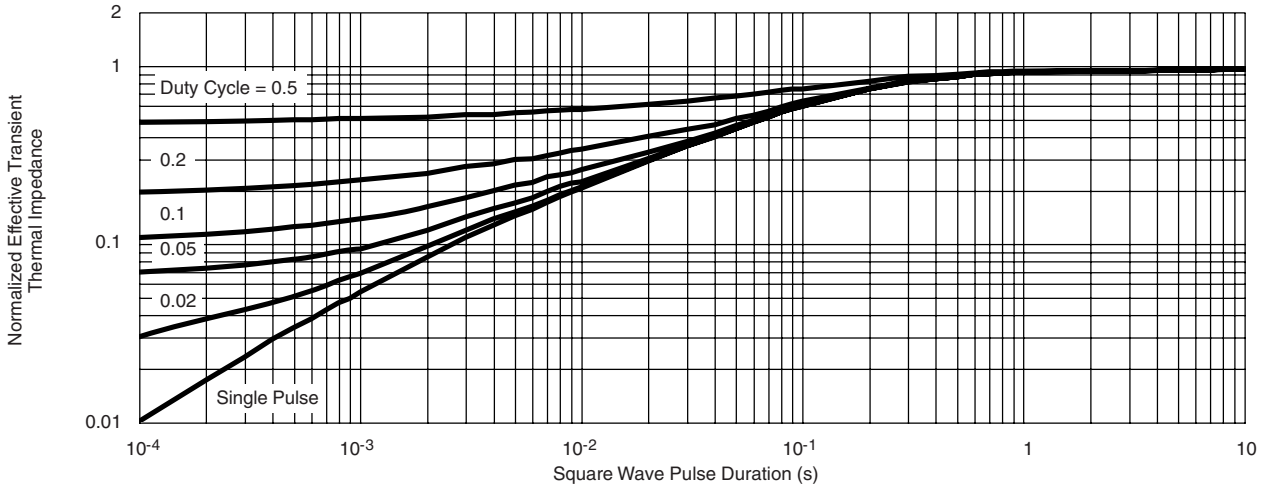
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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