



N-Channel 40-V (D-S) MOSFET

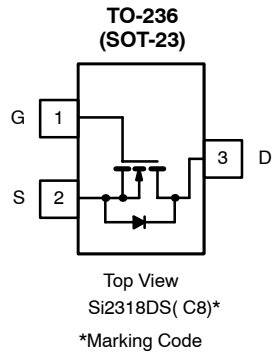
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.045 @ $V_{GS} = 10$ V	3.9
	0.058 @ $V_{GS} = 4.5$ V	3.5

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Stepper Motors
- Load Switch



Ordering Information: Si2318DS-T1 (with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	V_{DS}	40		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^{a, b}	I_D	$T_A = 25^\circ\text{C}$	3.9	3.0	A
		$T_A = 70^\circ\text{C}$	3.1	2.4	
Pulsed Drain Current ^b	I_{DM}	16			
Continuous Source Current (Diode Conduction) ^{a, b}	I_S	0.8			
Power Dissipation ^{a, b}	P_D	$T_A = 25^\circ\text{C}$	1.25	0.75	W
		$T_A = 70^\circ\text{C}$	0.8	0.48	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 5$ sec	75	100	$^\circ\text{C}/\text{W}$
		Steady State	120	166	
Maximum Junction-to-Foot (drain)	R_{thJF}	40	50		

Notes

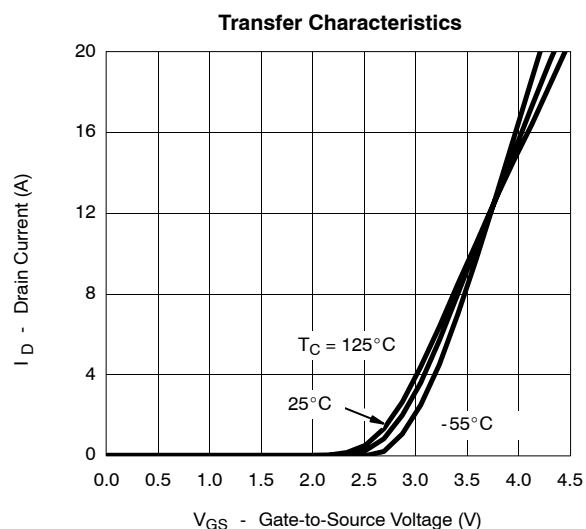
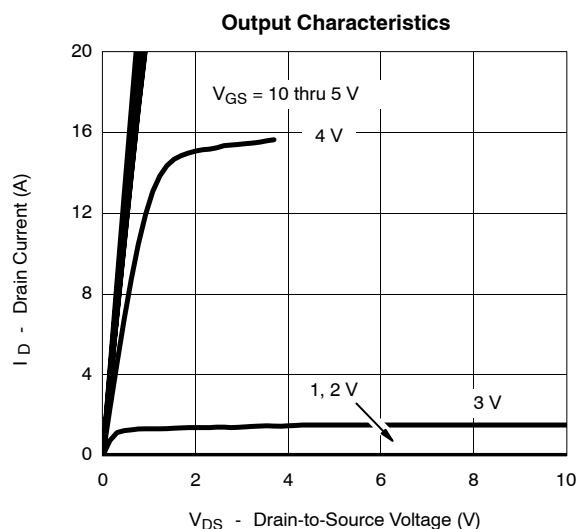
- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

SPECIFICATIONS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	40			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32 V, V _{GS} = 0 V			0.5	μA
		V _{DS} = 32 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 4.5 V, V _{GS} = 10 V	6			A
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 3.9 A		0.036	0.045	Ω
		V _{GS} = 4.5 V, I _D = 3.5 A		0.045	0.058	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 3.9 A		11		S
Diode Forward Voltage	V _{SD}	I _S = 1.25 A, V _{GS} = 0 V		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 3.9 A		10	15	nC
Gate-Source Charge	Q _{gs}			1.6		
Gate-Drain Charge	Q _{gd}			2.1		
Gate Resistance	R _g			1.8		Ω
Input Capacitance	C _{iss}	V _{DS} = 20 V, V _{GS} = 0 V, f = 1 MHz		540		pF
Output Capacitance	C _{oss}			80		
Reverse Transfer Capacitance	C _{rss}			45		
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = 20 V, R _L = 20 Ω I _D ≅ 1.0 A, V _{GEN} = 10 V, R _G = 6 Ω		5	10	ns
Rise Time	t _r			12	20	
Turn-Off Delay Time	t _{d(off)}			20	30	
Fall-Time	t _f			15	25	

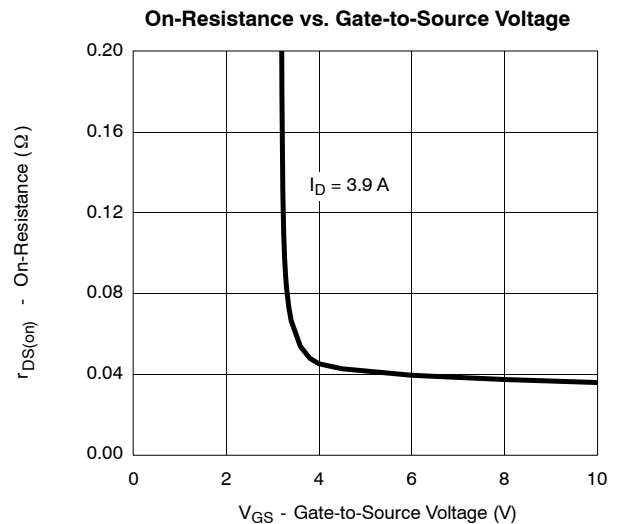
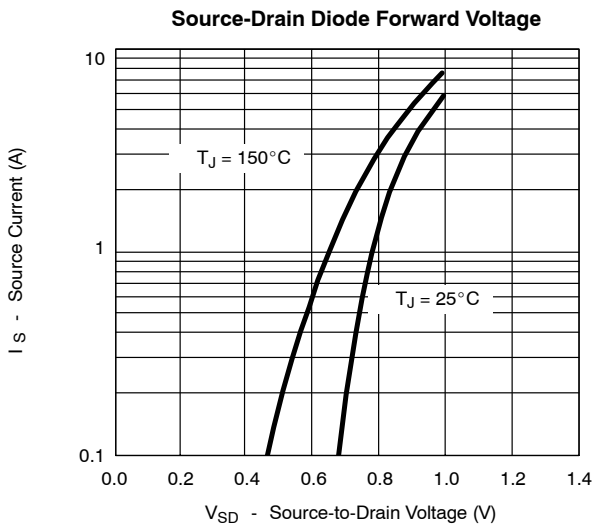
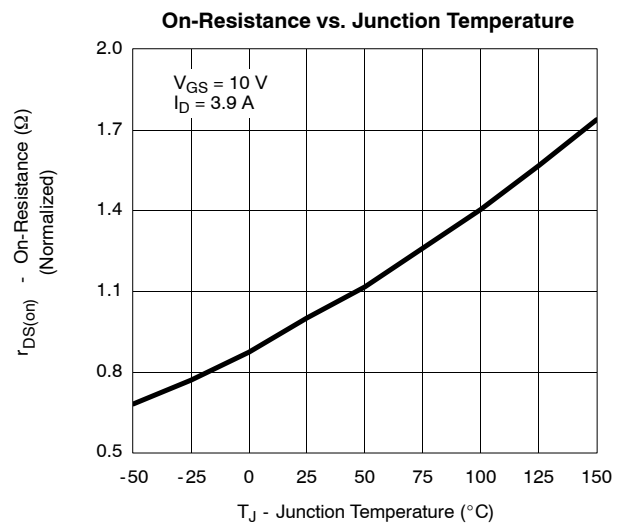
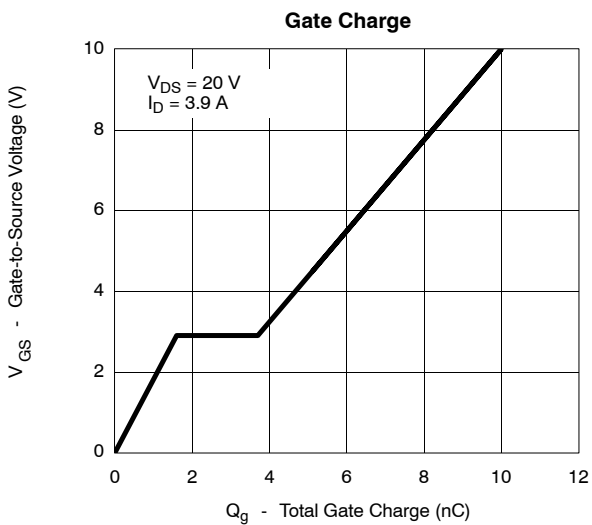
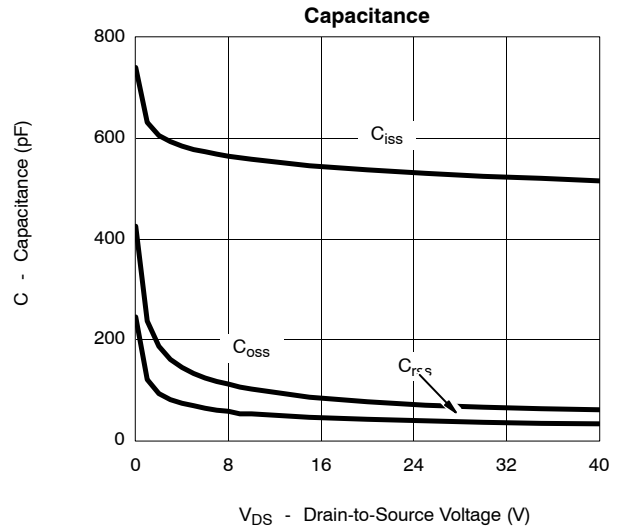
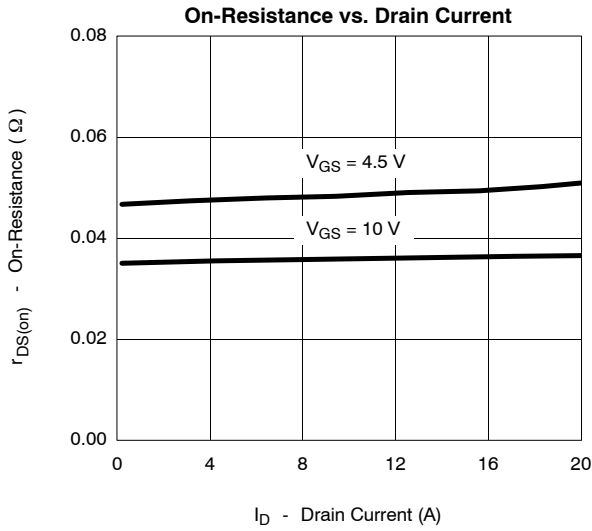
Notes

- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

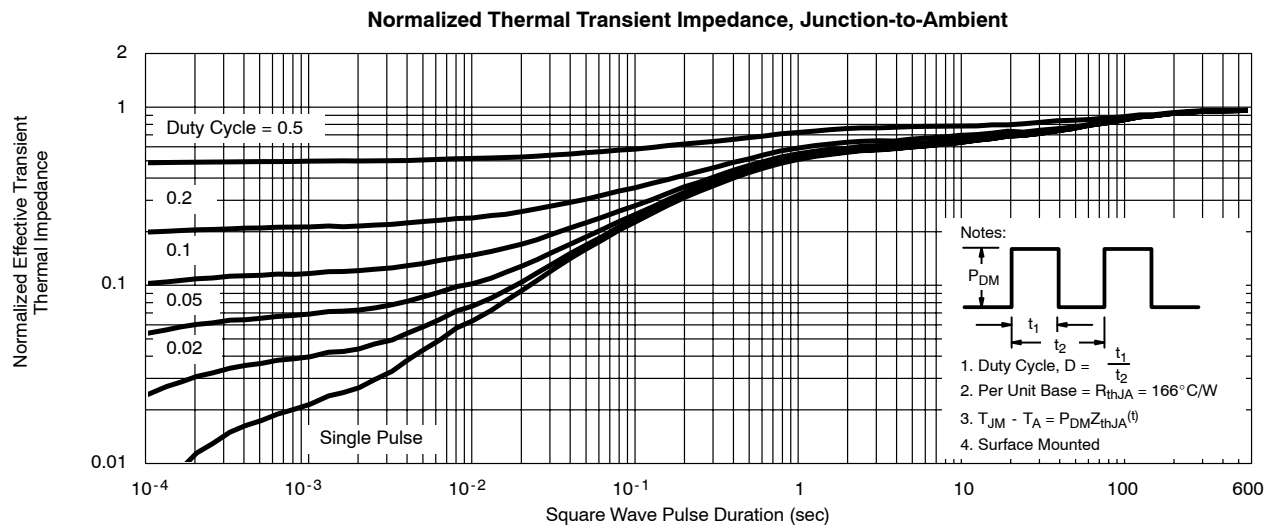
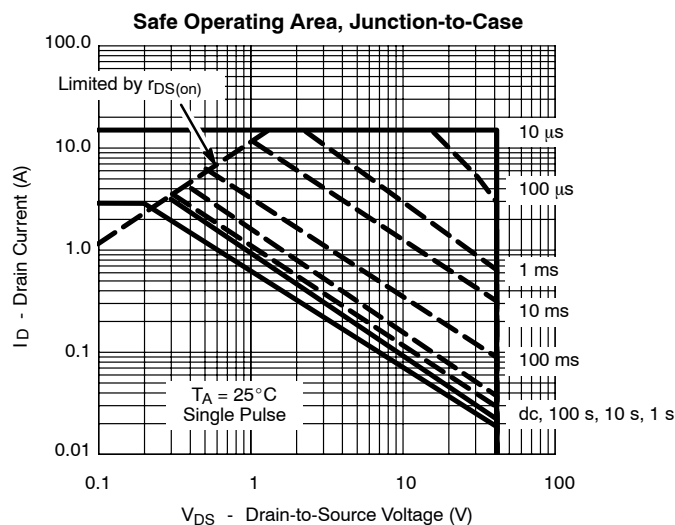
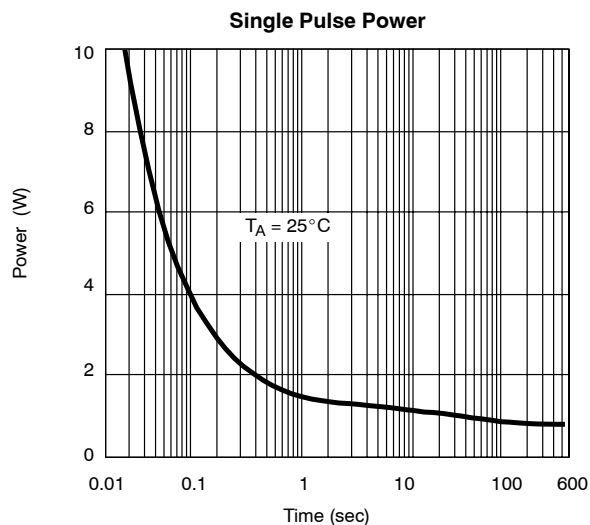
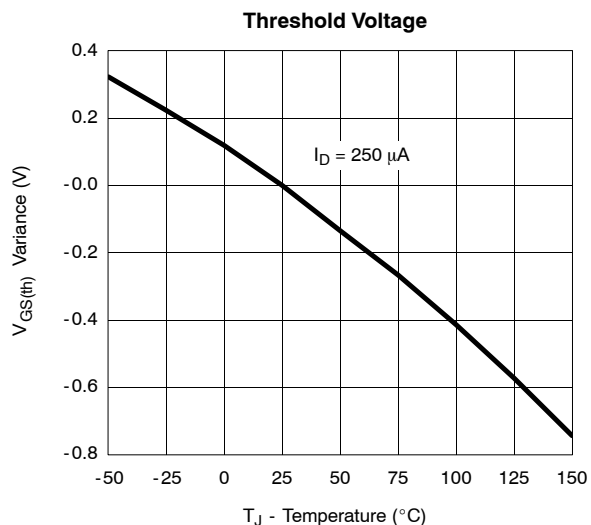
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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