

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

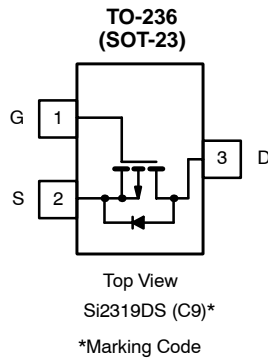
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b
-40	0.082 @ $V_{GS} = -10$ V	-3.0
	0.130 @ $V_{GS} = -4.5$ V	-2.4

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch



Ordering Information: Si2319DS-T1
Si2319DS-T1—E3 (Lead Free)

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 ($T_J = 150^\circ\text{C}$) ^b	$T_A = 25^\circ\text{C}$	I_D	-3.0	-2.3	A
	$T_A = 70^\circ\text{C}$		-2.4	-1.85	
Pulsed Drain Current ^a		I_{DM}	-12		
Continuous Source Current (Diode Conduction) ^b		I_S	-1.0	-0.62	
Power Dissipation ^b	$T_A = 25^\circ\text{C}$	P_D	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 ^b	R_{thJA}	75	100	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^c		120	166	
Maximum Junction-to-Foot (Drain)	R_{thJF}	40	50	

Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, $t \leq 5$ sec.
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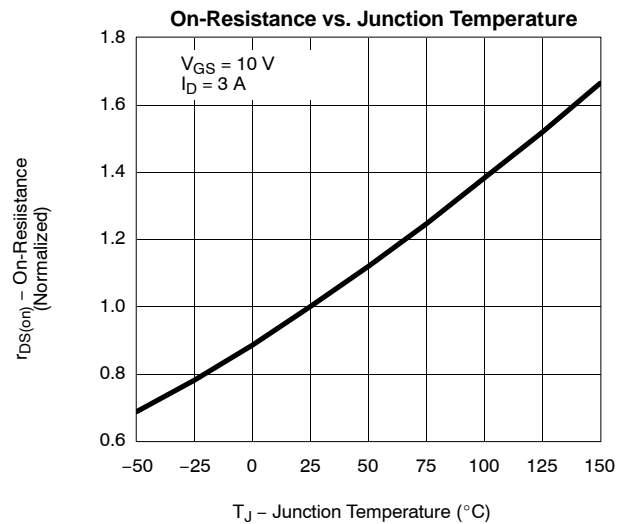
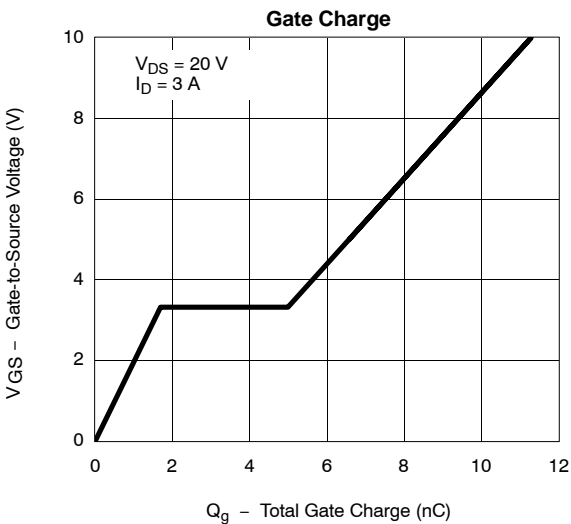
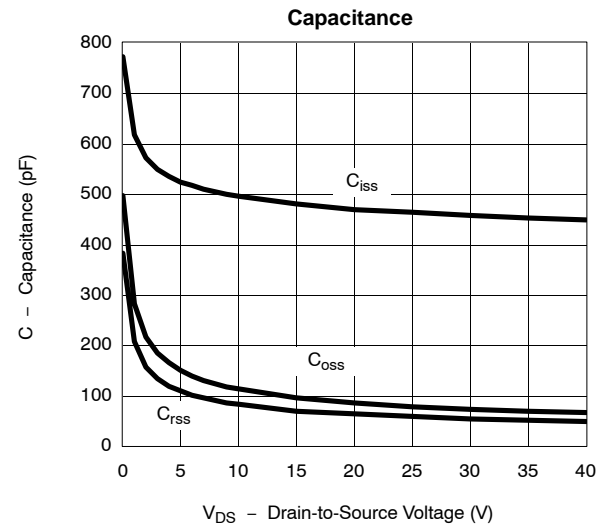
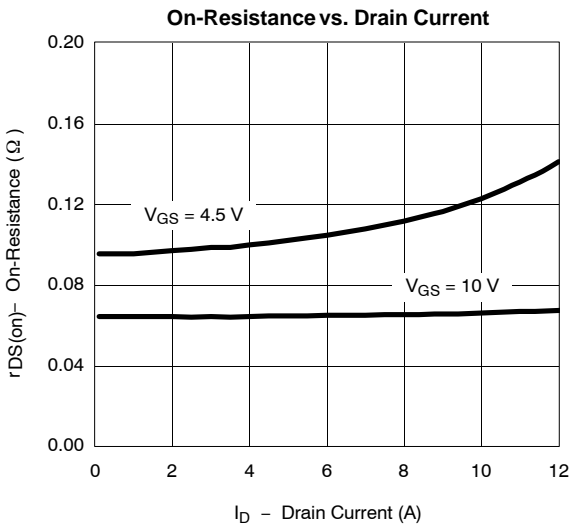
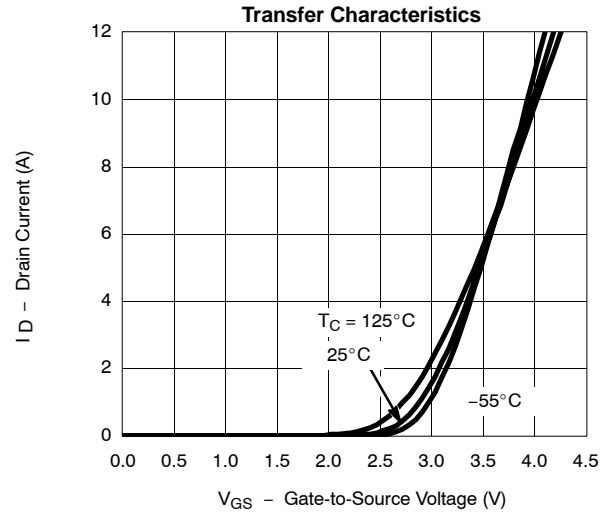
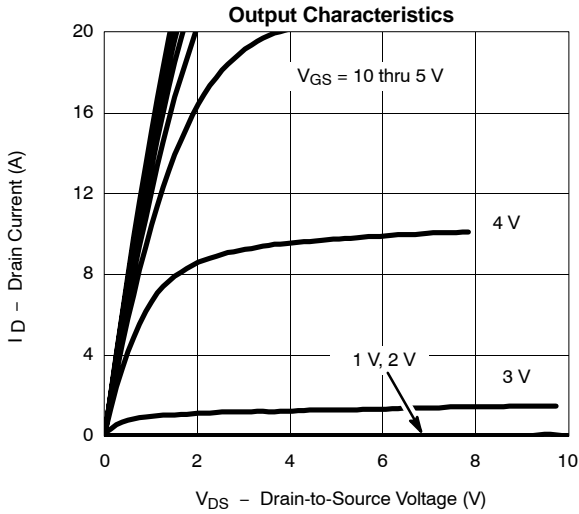
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-40			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.0		-3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	-6			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -3.0\text{ A}$		0.065	0.082	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -2.4\text{ A}$		0.100	0.130	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -3.0\text{ A}$		7.0		S
Diode Forward Voltage	V_{SD}	$I_S = -1.25\text{ A}, V_{GS} = 0\text{ V}$		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V}$ $I_D \cong -3\text{ A}$		11.3	17	nC
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}			3.3		
Input Capacitance	C_{iss}	$V_{DS} = -20\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$		470		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			65		
Switching^c						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 20\ \Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_g = 6\ \Omega$		7	15	ns
	t_r			15	25	
Turn-Off Time	$t_{d(off)}$			25	40	
	t_f			25	40	

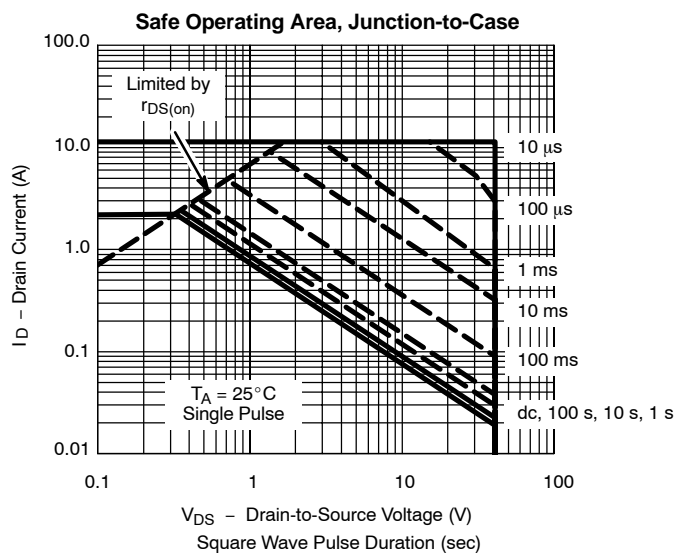
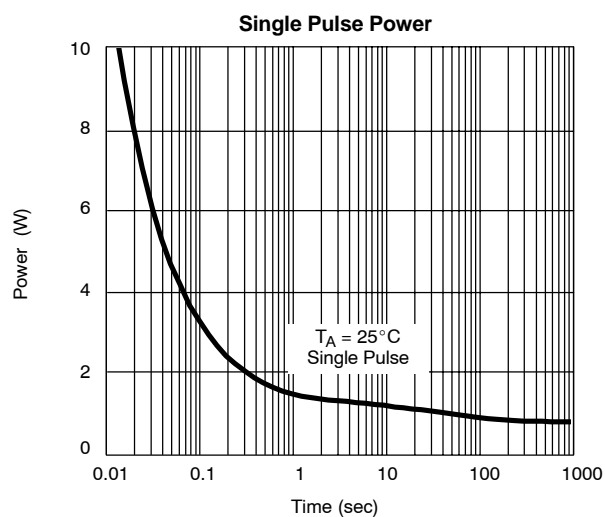
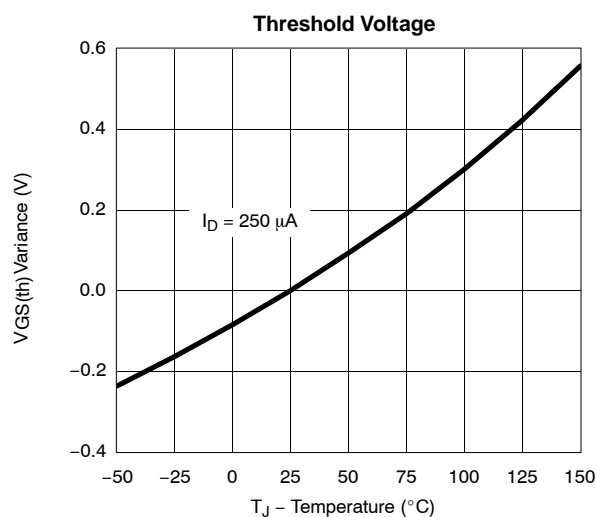
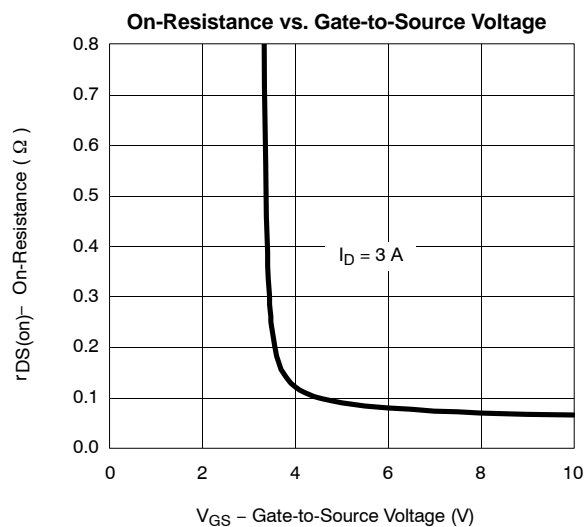
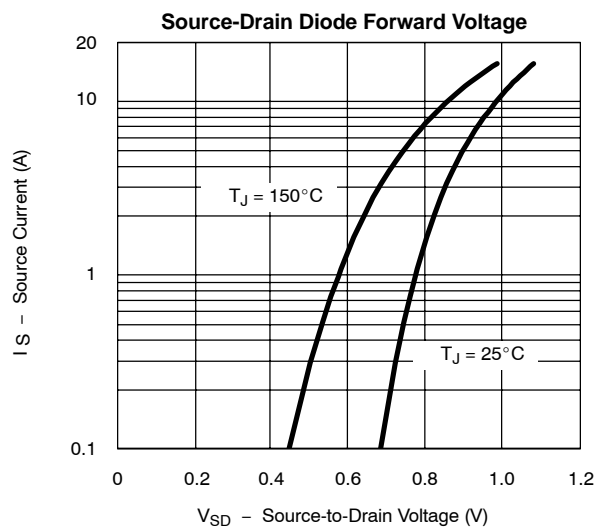
Notes

- a. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature. • FaxBack 408-970-5600

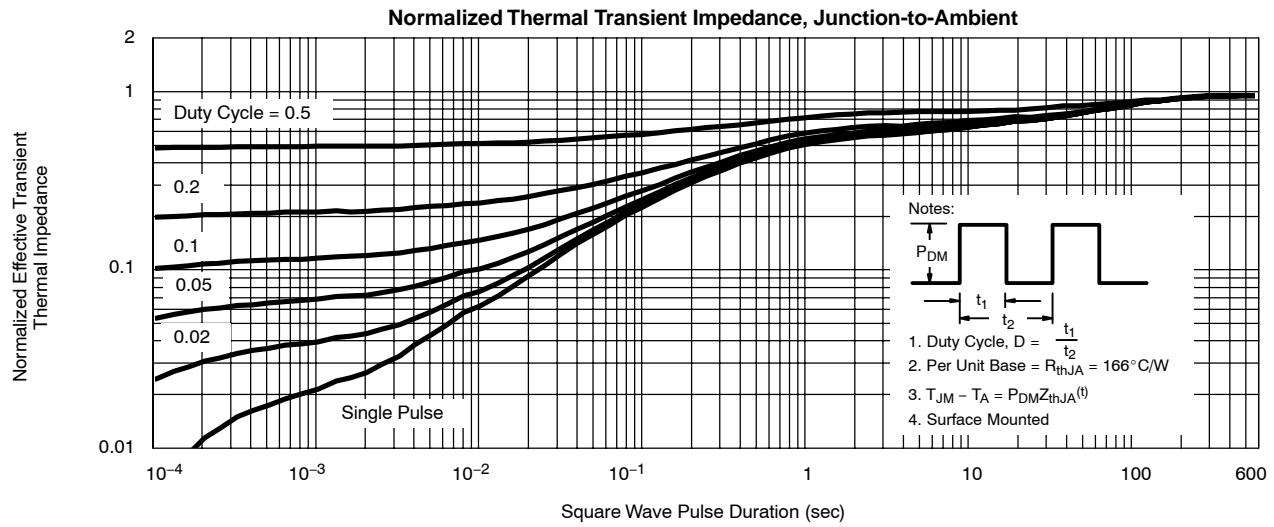
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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