

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

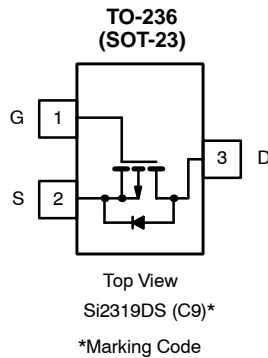
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b
-40	0.082 @ $V_{GS} = -10$ V	-3.0
	0.130 @ $V_{GS} = -4.5$ V	-2.4

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	W
Power Dissipation ^b	$T_A = 25^\circ\text{C}$	P_D	1.25	0.75	
	$T_A = 70^\circ\text{C}$		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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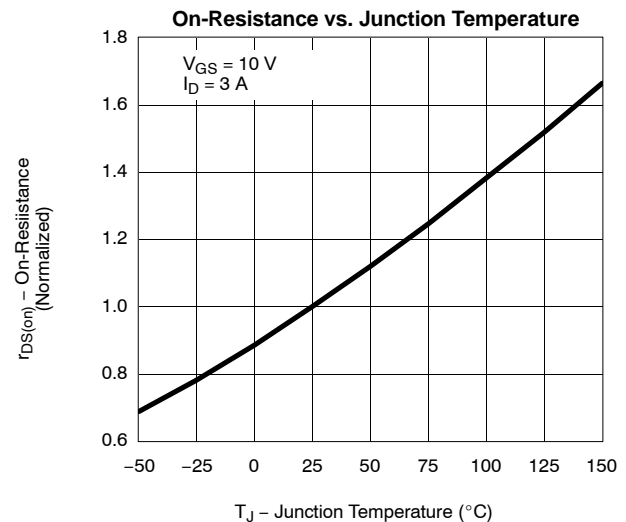
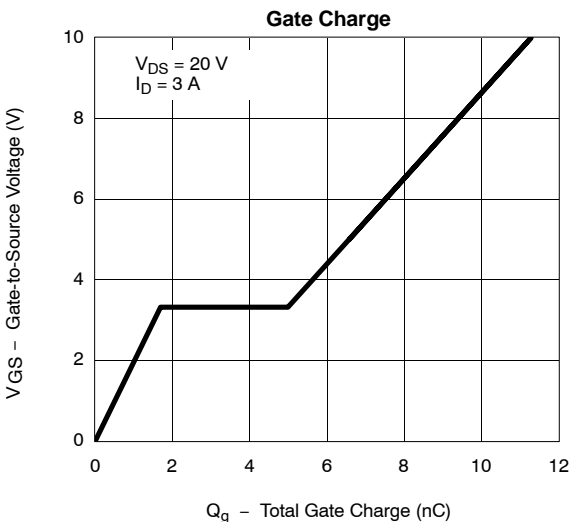
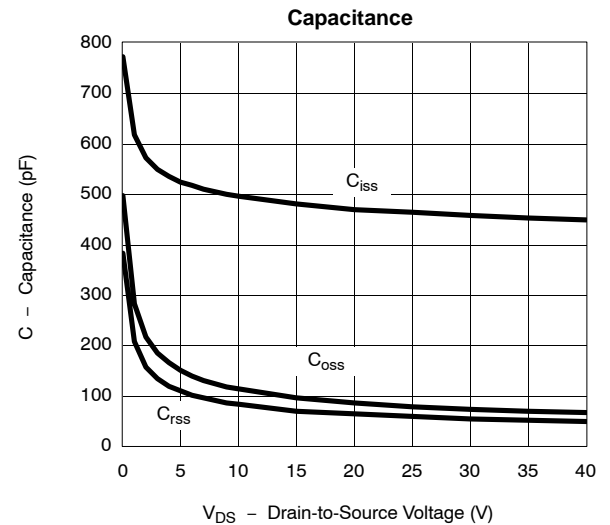
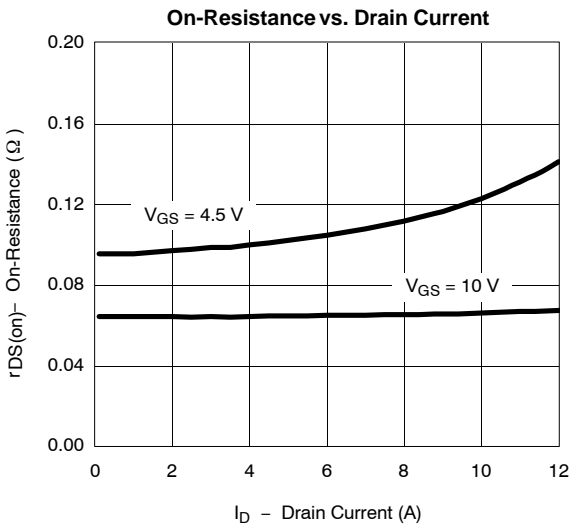
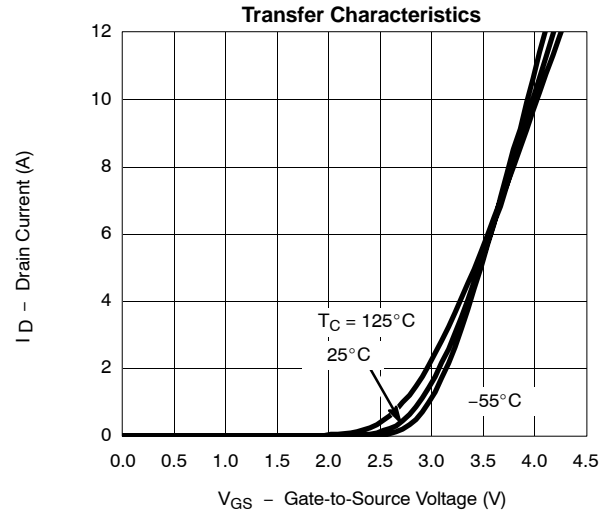
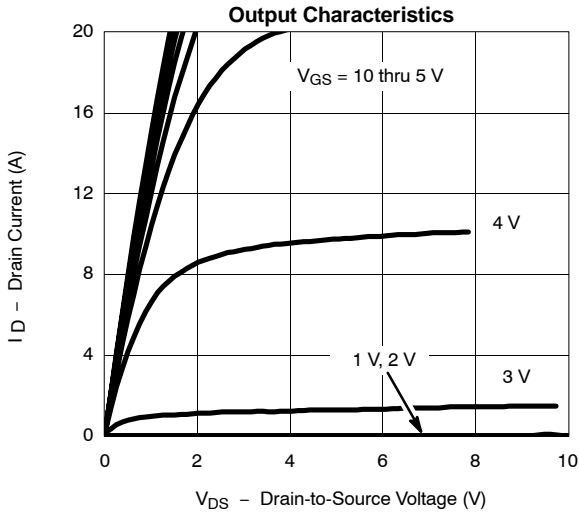
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

SPECIFICATIONS (T _J = 25 °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	-1.0		-3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -40 V, V _{GS} = 0 V, T _J = 55 °C			-10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -10 V	-6			A
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -3.0 A		0.065	0.082	Ω
		V _{GS} = -4.5 V, I _D = -2.4 A		0.100	0.130	
Forward Transconductance ^a	g _{fs}	V _{DS} = -5 V, I _D = -3.0 A		7.0		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 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 V, V _{GS} = 0, f = 1 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 V, R _L = 20 Ω I _D ≅ -1.0 A, V _{GEN} = -4.5 V R _g = 6 Ω		7	15	ns
	t _r			15	25	
Turn-Off Time	t _{d(off)}			25	40	
	t _f			25	40	

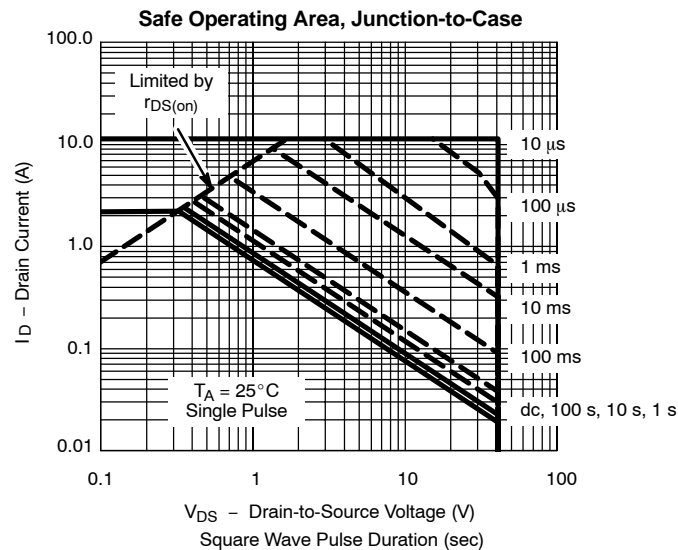
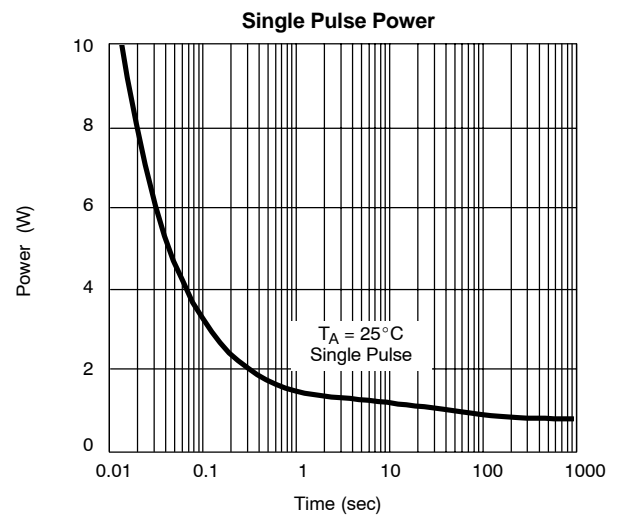
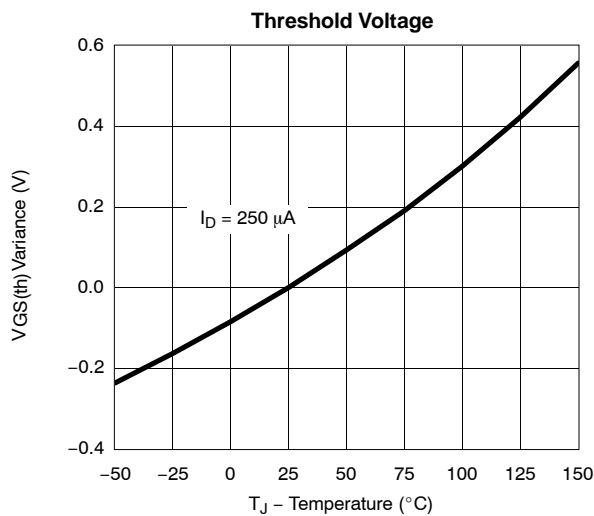
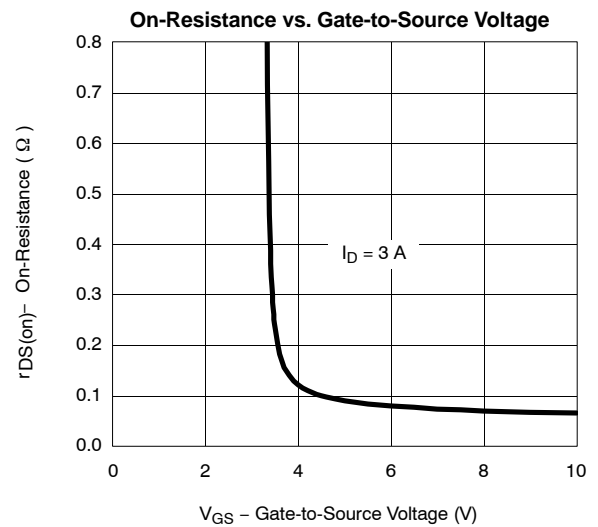
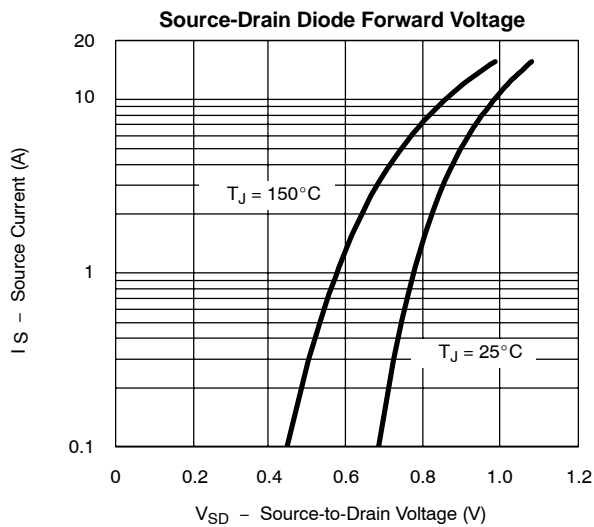
Notes

- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 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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