



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

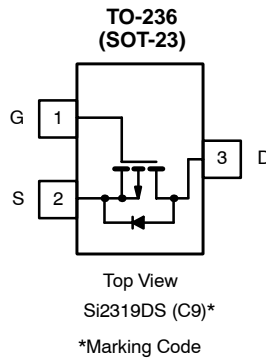
<b>PRODUCT SUMMARY</b>		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>b</sup>
-40	0.082 @ $V_{GS} = -10$ V	-3.0
	0.130 @ $V_{GS} = -4.5$ V	-2.4

**FEATURES**

- TrenchFET® Power MOSFET

**APPLICATIONS**

- Load Switch



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

<b>ABSOLUTE MAXIMUM RATINGS (<math>T_A = 25^\circ\text{C}</math> UNLESS OTHERWISE NOTED)</b>					
Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-40		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-3.0	-2.3	A
	$T_A = 70^\circ\text{C}$		-2.4	-1.85	
Pulsed Drain Current <sup>a</sup>		$I_{DM}$	-12		
Continuous Source Current (Diode Conduction) <sup>b</sup>		$I_S$	-1.0	-0.62	
Power Dissipation <sup>b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	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		$^\circ\text{C}$

<b>THERMAL RESISTANCE RATINGS</b>				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	75	100	$^\circ\text{C/W}$
Maximum Junction-to-Ambient <sup>c</sup>		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.
- Surface Mounted on FR4 Board.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

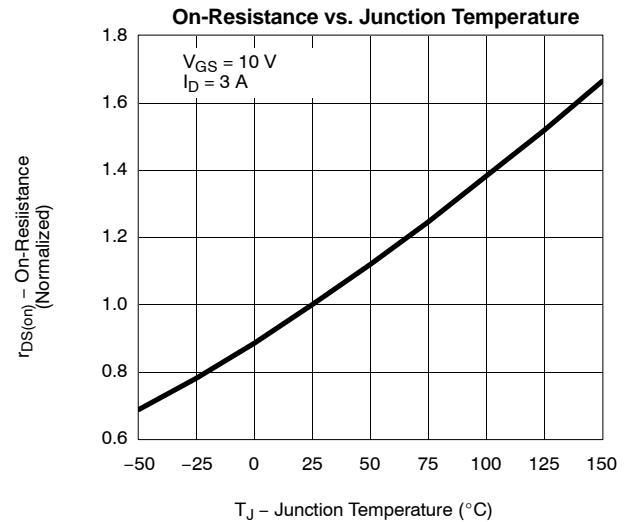
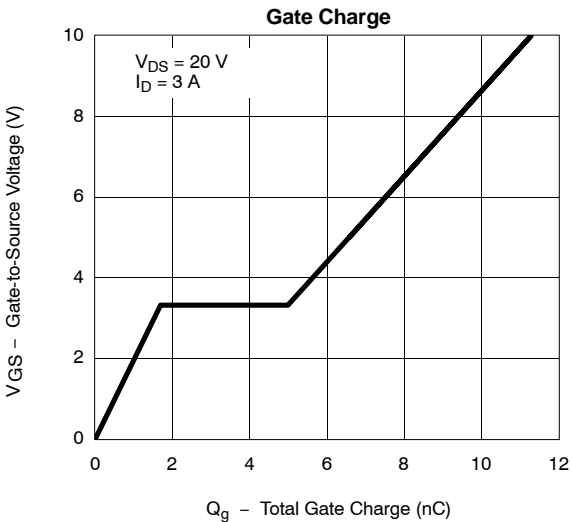
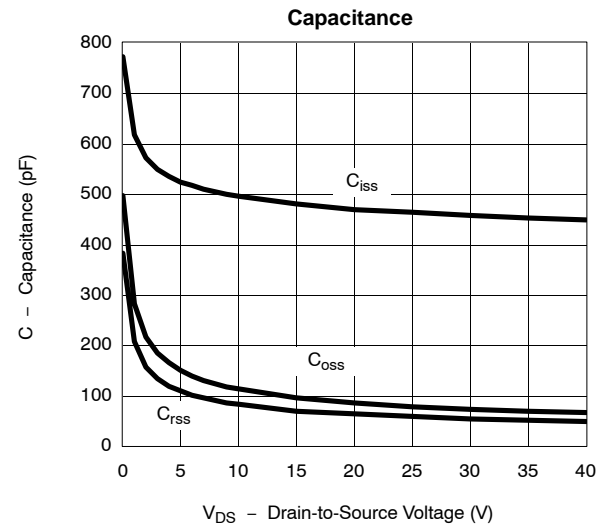
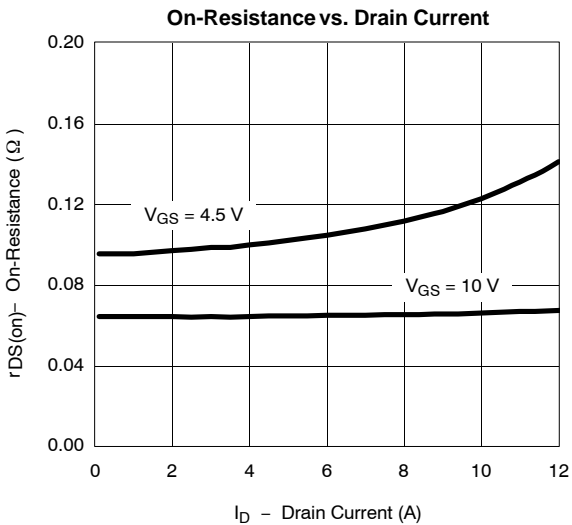
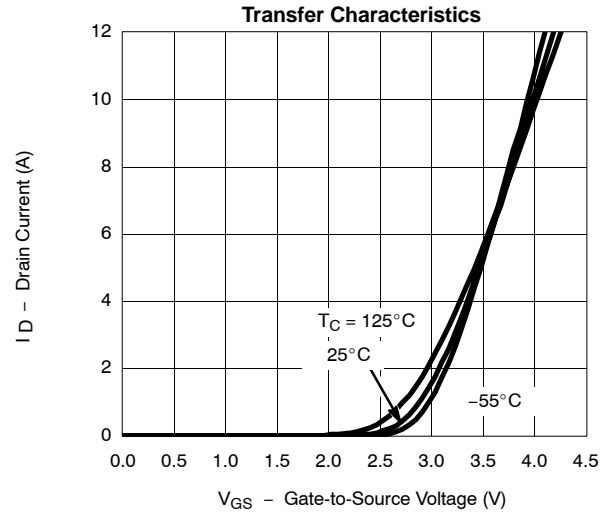
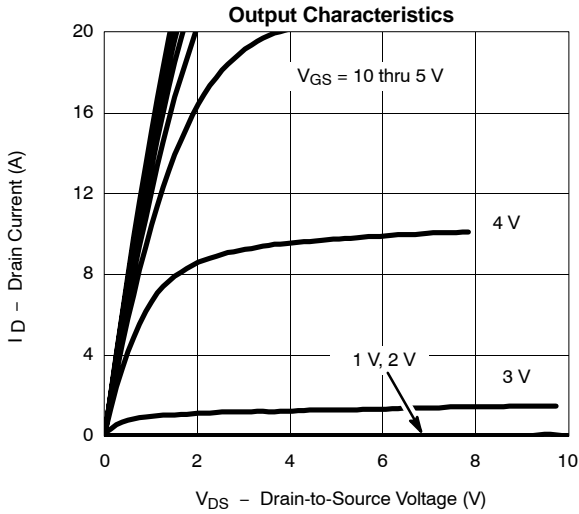
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-40			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1.0		-3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -40 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -40 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	-6			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -3.0 A		0.065	0.082	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.4 A		0.100	0.130	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -3.0 A		7.0		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.25 A, V <sub>GS</sub> = 0 V		-0.8	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = -10 V I <sub>D</sub> ≅ -3 A		11.3	17	nC
Gate-Source Charge	Q <sub>gs</sub>			1.7		
Gate-Drain Charge	Q <sub>gd</sub>			3.3		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0, f = 1 MHz		470		pF
Output Capacitance	C <sub>oss</sub>			85		
Reverse Transfer Capacitance	C <sub>rss</sub>			65		
<b>Switching<sup>c</sup></b>						
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -20 V, R <sub>L</sub> = 20 Ω I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V R <sub>g</sub> = 6 Ω		7	15	ns
	t <sub>r</sub>			15	25	
Turn-Off Time	t <sub>d(off)</sub>			25	40	
	t <sub>f</sub>			25	40	

## Notes

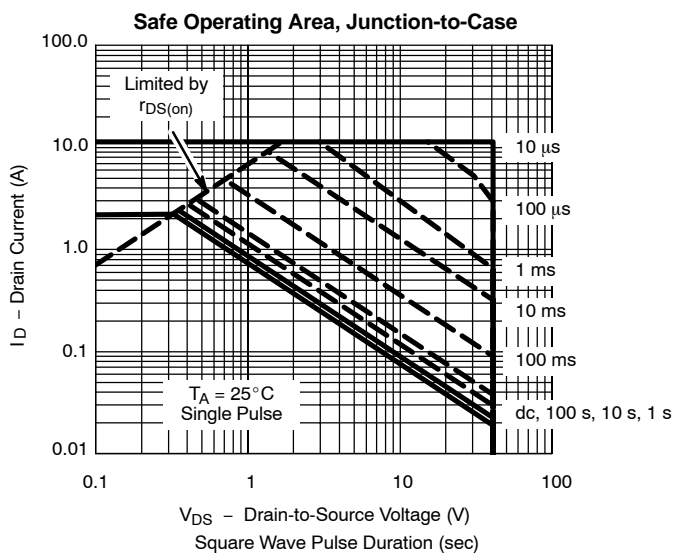
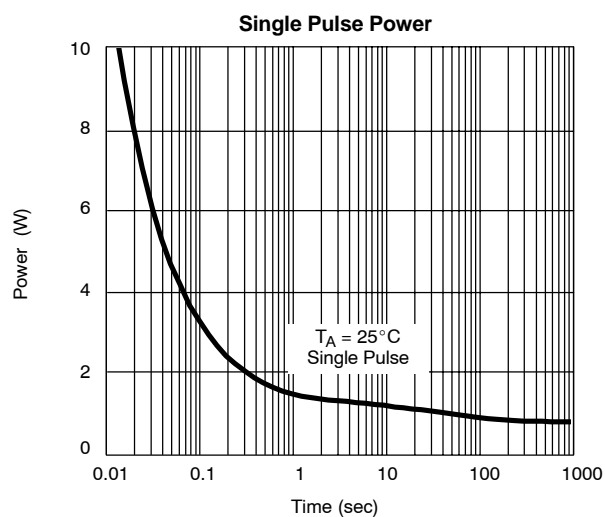
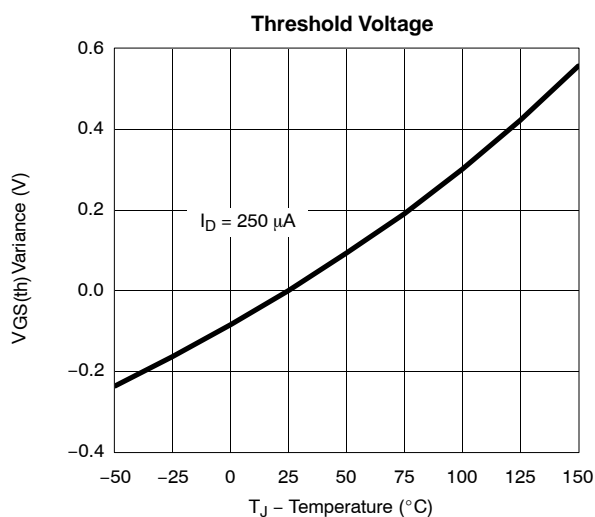
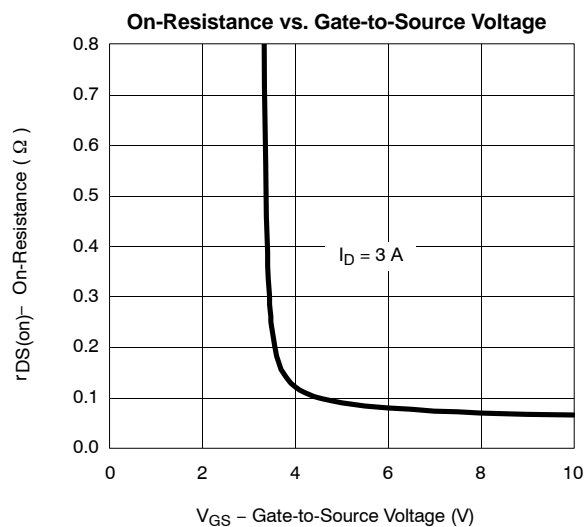
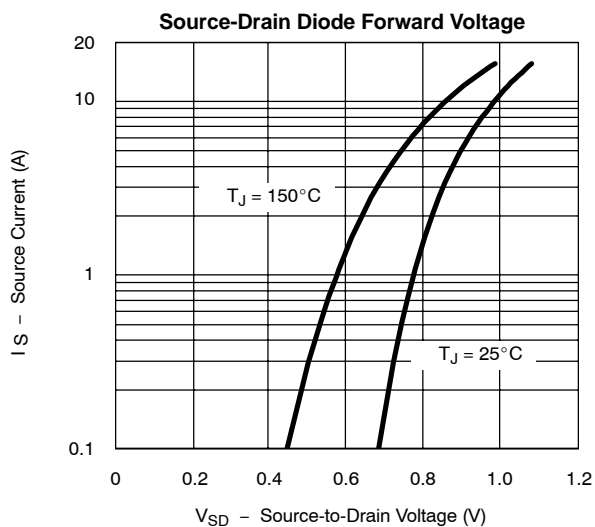
- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.  
 b. For DESIGN AID ONLY, not subject to production testing.  
 c. Switching time is essentially independent of operating temperature. • FaxBack 408-970-5600



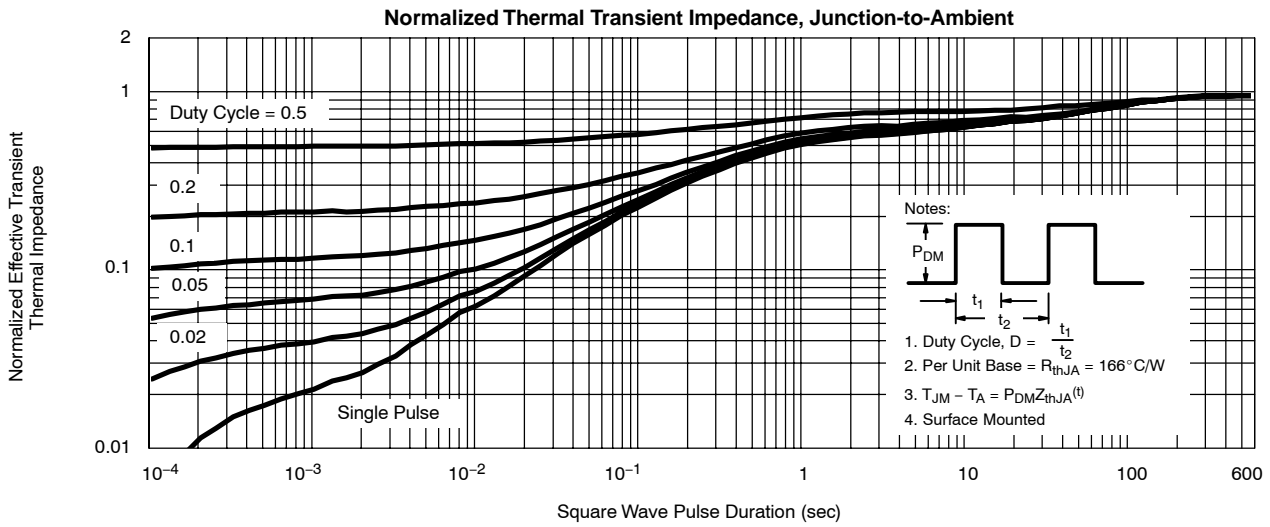
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



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