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

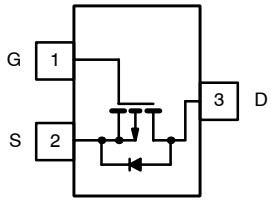
FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch

TO-236
(SOT-23)



Top View
Si2319DS (C9)*
*Marking Code

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

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C)[b]	T_A= 25°C	I_D	−3.0	−2.3	A
	T_A= 70°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°C	P_D	1.25	0.75	W
	T_A= 70°C		0.8	0.48	
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[b]	R_{thJA}	75	100	°C/W
Maximum Junction-to-Ambient[c]		120	166	
Maximum Junction-to-Foot (Drain)	R_{thJF}	40	50	

Notes
a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 Board, t ≤ 5 sec.
c. Surface Mounted on FR4 Board.

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

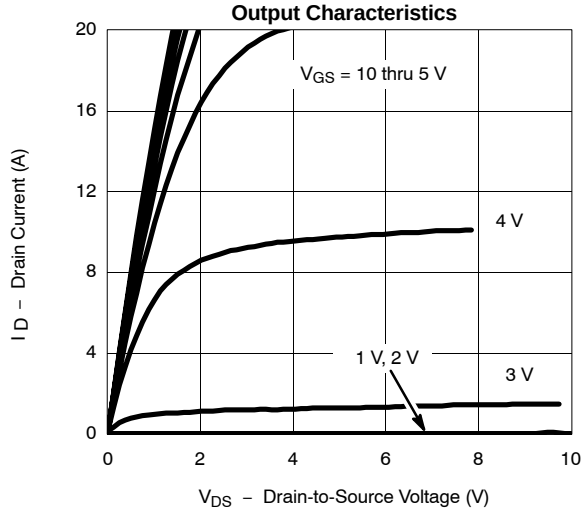
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
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	V
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	μA
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	Ω
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		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
Input Capacitance	C_{iss}	V_{DS} = −20 V, V_{GS} = 0, f = 1 MHz		470		pF
Output Capacitance	C_{oss}			85		pF
Reverse Transfer Capacitance	C_{rss}			65		pF
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	ns
Turn-Off Time	$t_{d(off)}$			25	40	ns
	t_f			25	40	ns

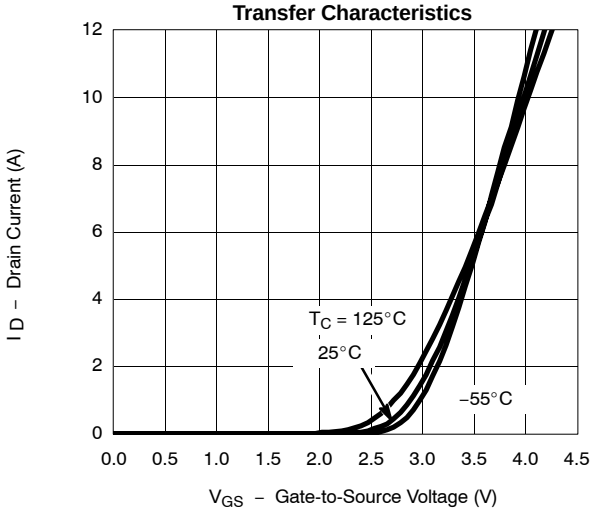
Notes
a. Pulse test: PW ≤300 μs duty cycle ≤2%.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature. • FaxBack 408-970-5600

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

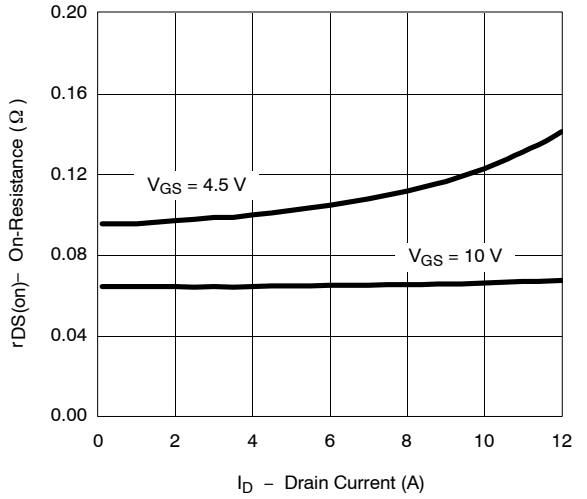
Output Characteristics



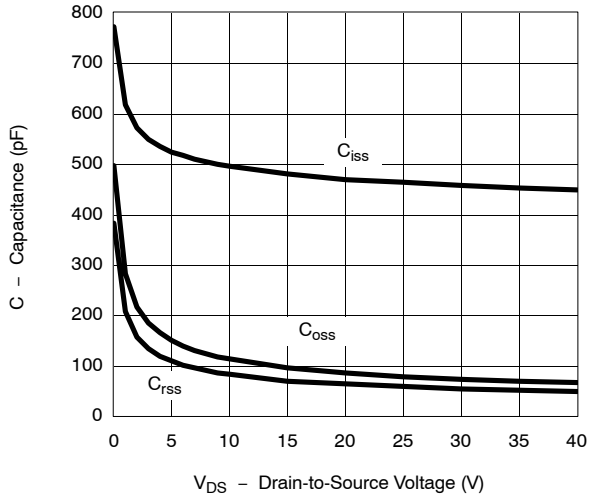
Transfer Characteristics



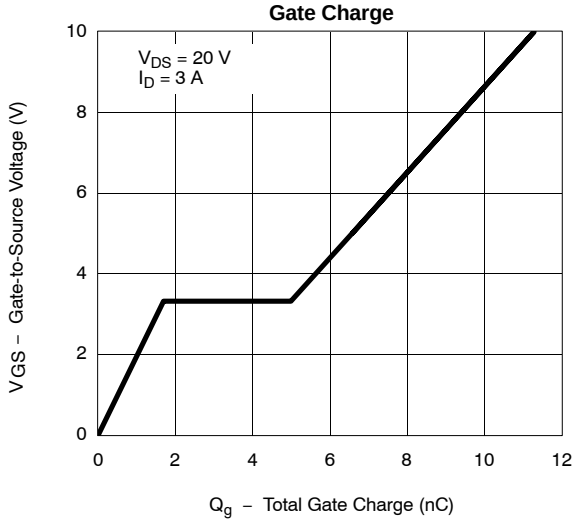
On-Resistance vs. Drain Current



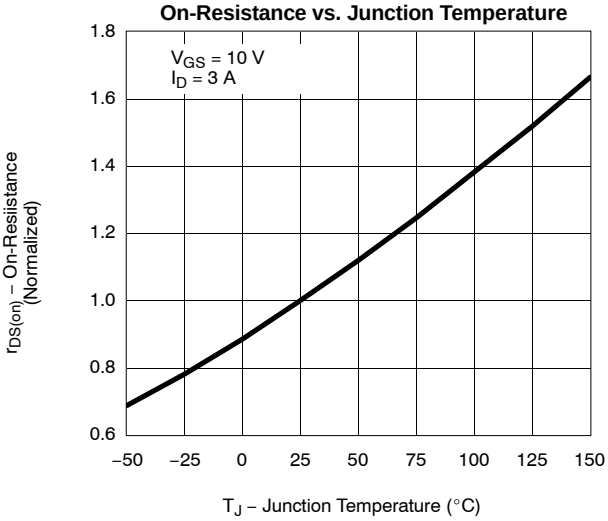
Capacitance



Gate Charge

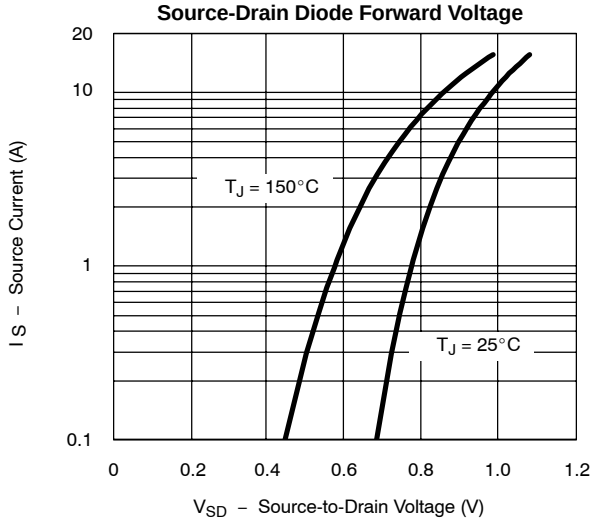


On-Resistance vs. Junction Temperature

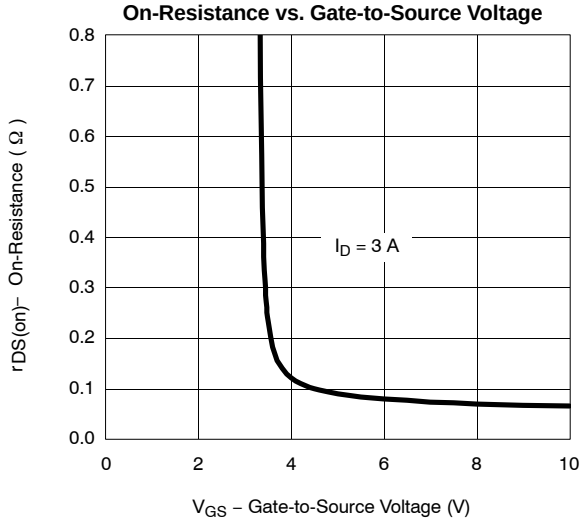


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

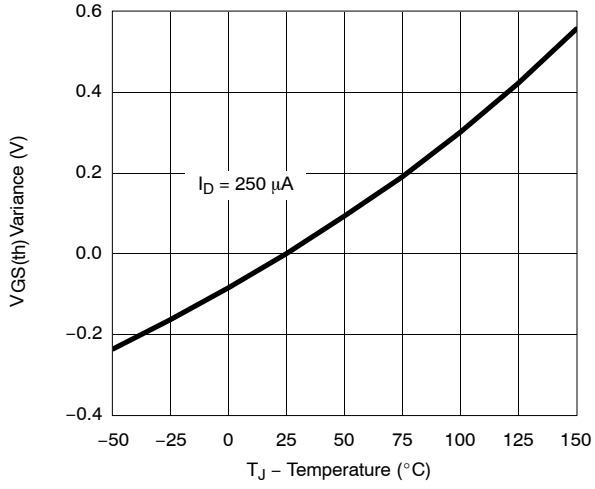
Source-Drain Diode Forward Voltage



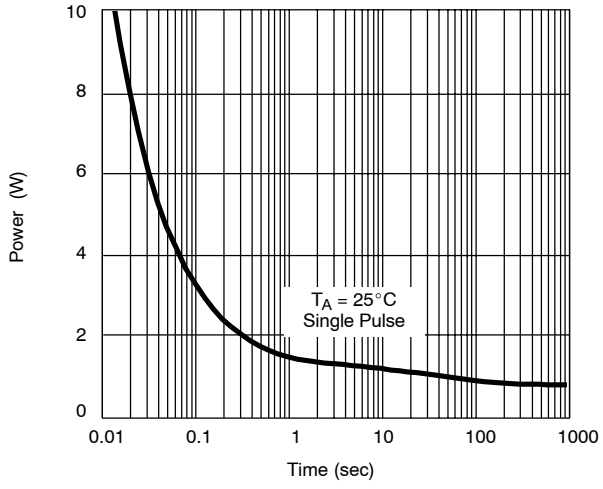
On-Resistance vs. Gate-to-Source Voltage



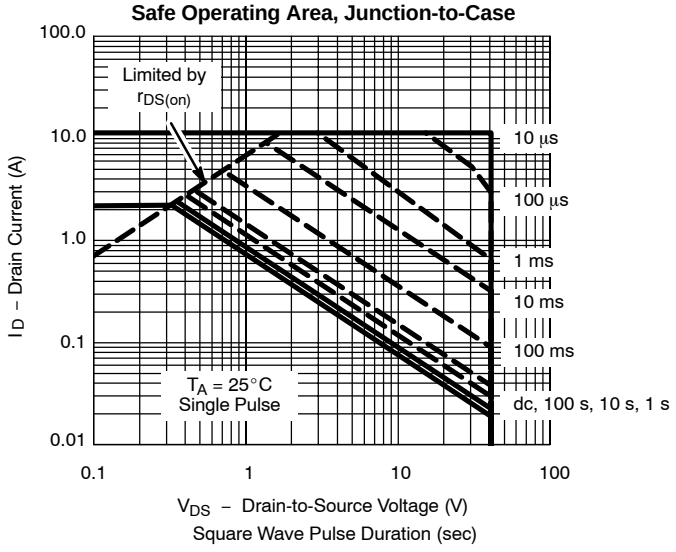
Threshold Voltage



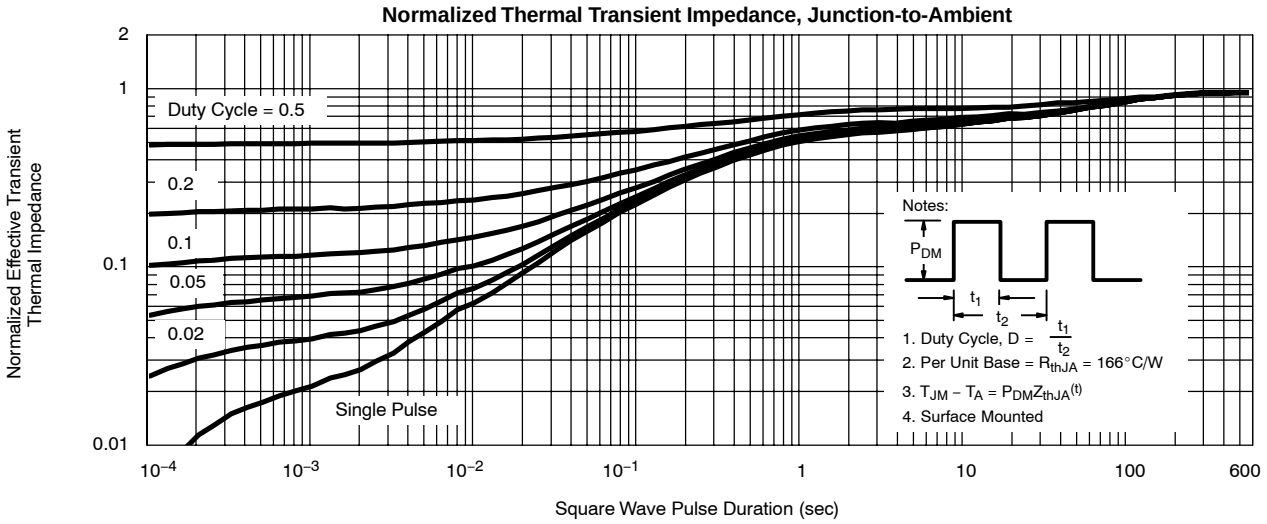
Single Pulse Power



Safe Operating Area, Junction-to-Case



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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