



P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

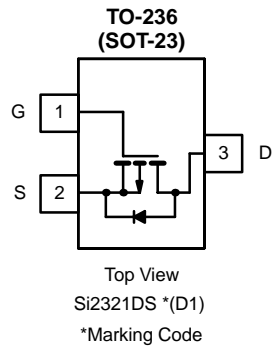
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.057 @ $V_{GS} = -4.5$ V	-3.3
	0.076 @ $V_{GS} = -2.5$ V	-2.8
	0.110 @ $V_{GS} = -1.8$ V	-2.3

FEATURES

- TrenchFET® Power MOSFETS

APPLICATIONS

- Load Switch
- PA Switch



Ordering Information: Si2321DS-T1

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	V_{DS}	-20		V	
Gate-Source Voltage	V_{GS}	± 8			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	-3.3	-2.9	A
		$T_A = 70^\circ\text{C}$	-2.6	-2.3	
Pulsed Drain Current ^a	I_{DM}	-12			
Continuous Source Current (Diode Conduction) ^a	I_S	-0.74	-0.59		
Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	0.89	0.71	W
		$T_A = 70^\circ\text{C}$	0.57	0.45	
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.	115	140	$^\circ\text{C/W}$
		Steady State	140	175	
Maximum Junction-to-Foot (Drain)	R_{thJF}	60	75		

Notes

- Surface Mounted on FR4 Board.
- $t \leq 5$ sec.

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

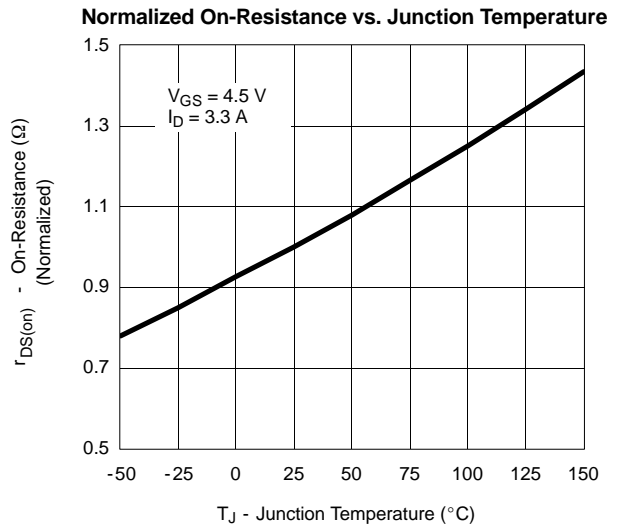
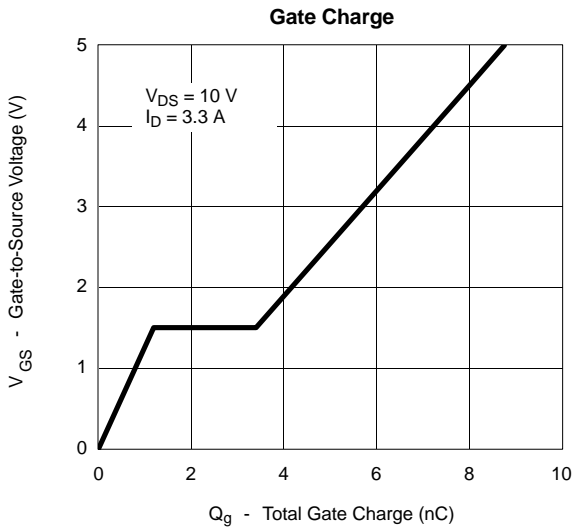
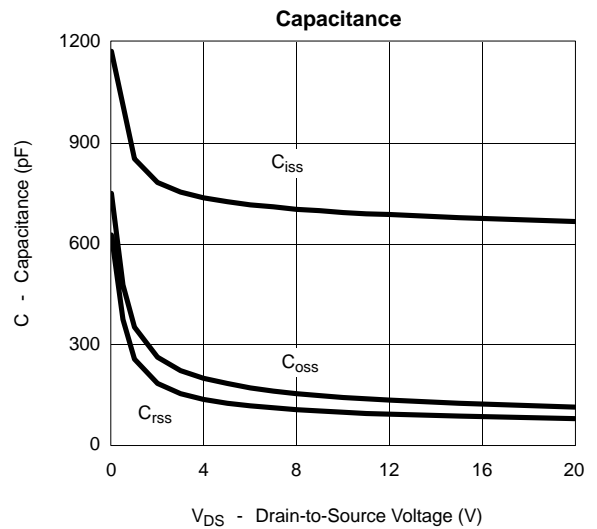
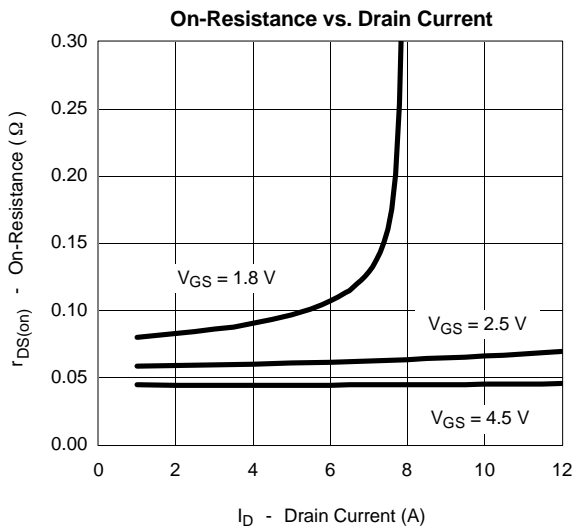
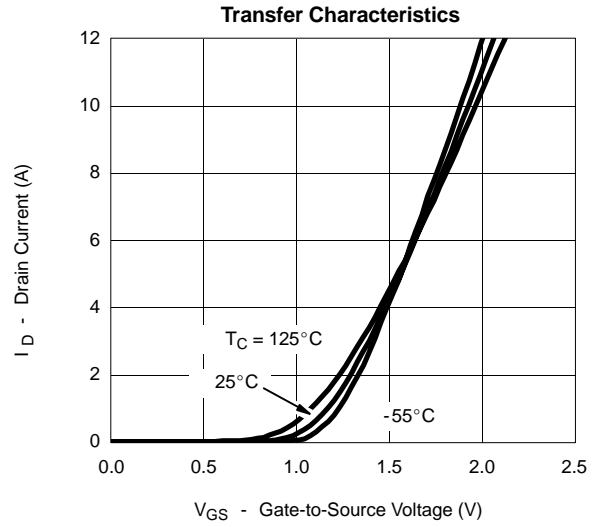
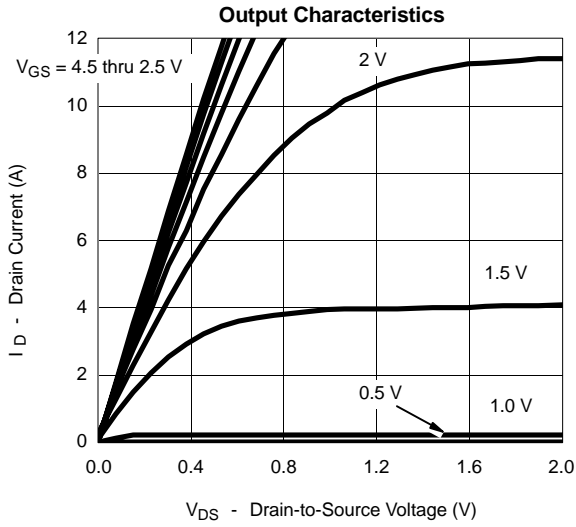
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\ \mu\text{A}$	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-0.40		-0.90	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	-6			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -3.3\text{ A}$		0.044	0.057	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -2.8\text{ A}$		0.061	0.076	
		$V_{GS} = -1.8\text{ V}, I_D = -2.3\text{ A}$		0.084	0.110	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -3.3\text{ A}$		3		S
Diode Forward Voltage	V_{SD}	$I_S = -1.6\text{ A}, V_{GS} = 0\text{ V}$			-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}$ $I_D \cong -3.3\text{ A}$		8	13	nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			2.2		
Input Capacitance	C_{iss}	$V_{DS} = -6\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$		715		pF
Output Capacitance	C_{oss}			170		
Reverse Transfer Capacitance	C_{rss}			120		
Switching^b						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}, R_L = 6\ \Omega$ $I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_G = 6\ \Omega$		15	25	ns
	t_r			35	55	
Turn-Off Time	$t_{d(off)}$			60	90	
	t_f			40	60	

Notes

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

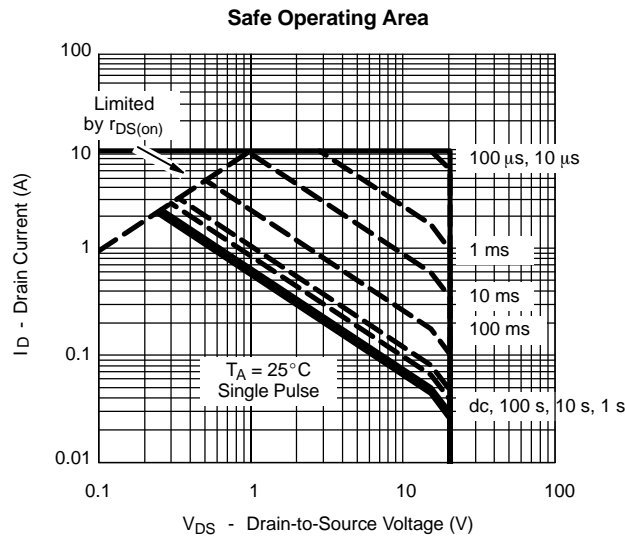
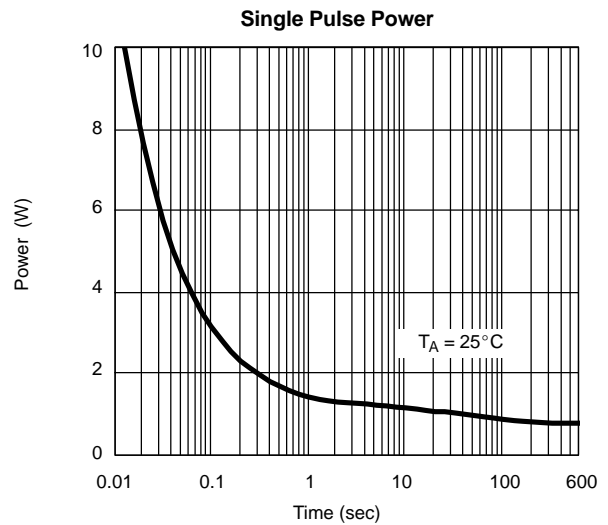
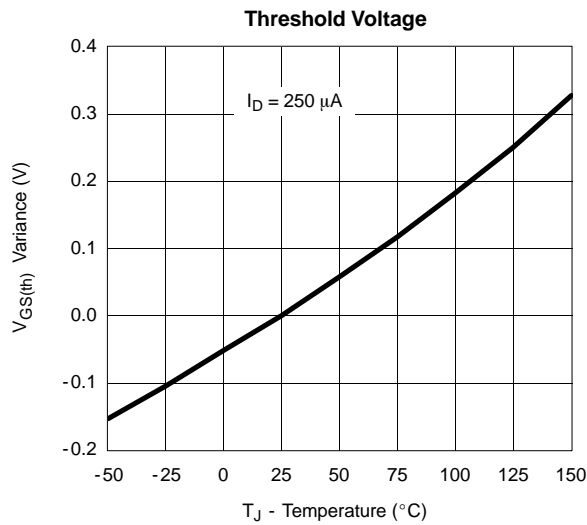
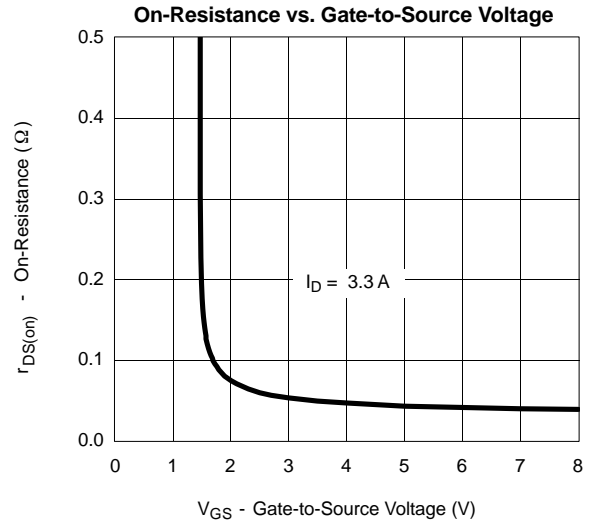
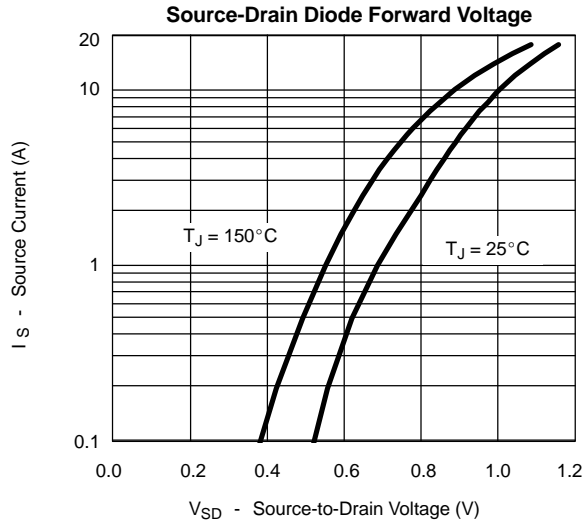


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





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