



New Product

**Si2321DS**  
Vishay Siliconix

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

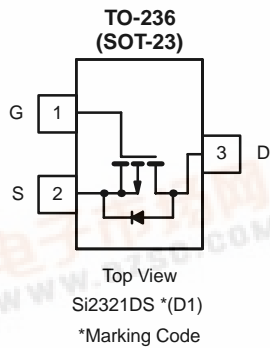
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
-20	0.057 @ V <sub>GS</sub> = -4.5 V	-3.3
	0.076 @ V <sub>GS</sub> = -2.5 V	-2.8
	0.110 @ V <sub>GS</sub> = -1.8 V	-2.3

**FEATURES**

- TrenchFET® Power MOSFETS

**APPLICATIONS**

- Load Switch
- PA Switch



Ordering Information: Si2321DS-T1

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	5 sec	Steady State	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20		V
Gate-Source Voltage	V <sub>GS</sub>	± 8		
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	T <sub>A</sub> = 25 °C	-3.3	-2.9	A
	T <sub>A</sub> = 70 °C	-2.6	-2.3	
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	-12		
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	-0.74	-0.59	
Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25 °C	0.89	0.71	W
	T <sub>A</sub> = 70 °C	0.57	0.45	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	t ≤ 5 sec.	115	°C/W
		Steady State	140	
Maximum Junction-to-Foot (Drain)	R <sub>thJF</sub>	60	75	

Notes:  
 a. Surface Mounted on FR4 Board.  
 b. t = 5 sec.  
 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> = -10 μA	-20			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.40		-0.90	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = 16 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> = -4.5 V	-6			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.3 A		0.044	0.057	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -2.8 A		0.061	0.076	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.3 A		0.084	0.110	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -3.3 A		3		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.6 A, V <sub>GS</sub> = 0 V			-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V I <sub>D</sub> ≅ -3.3 A		8	13	nC
Gate-Source Charge	Q <sub>gs</sub>			1.2		
Gate-Drain Charge	Q <sub>gd</sub>			2.2		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = 0, f = 1 MHz		715		pF
Output Capacitance	C <sub>oss</sub>			170		
Reverse Transfer Capacitance	C <sub>rss</sub>			120		
<b>Switching<sup>b</sup></b>						
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V R <sub>G</sub> = 6 Ω		15	25	ns
	t <sub>r</sub>			35	55	
Turn-Off Time	t <sub>d(off)</sub>			60	90	
	t <sub>f</sub>			40	60	

## Notes

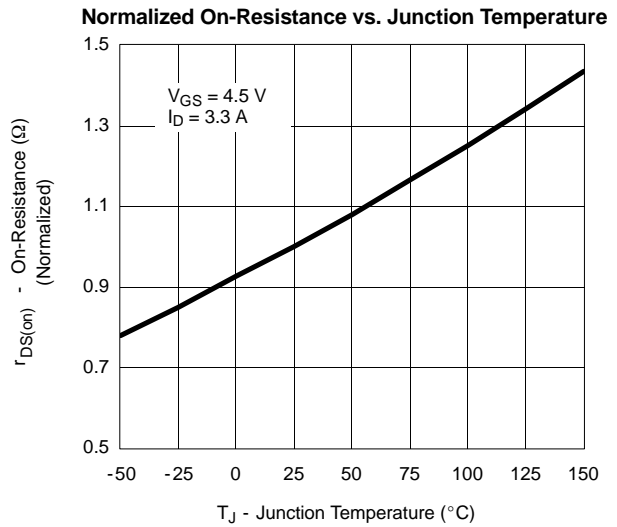
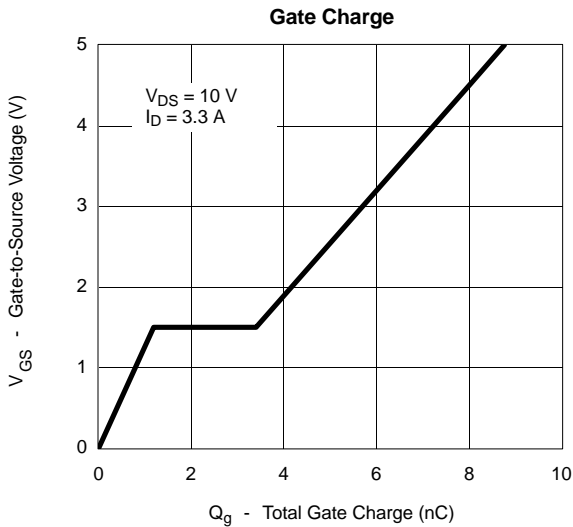
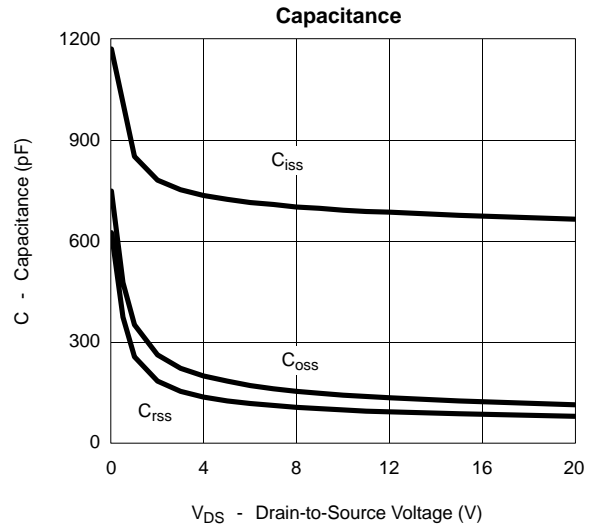
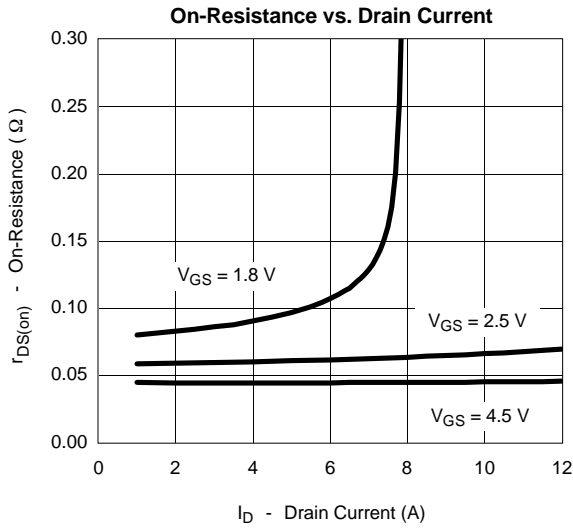
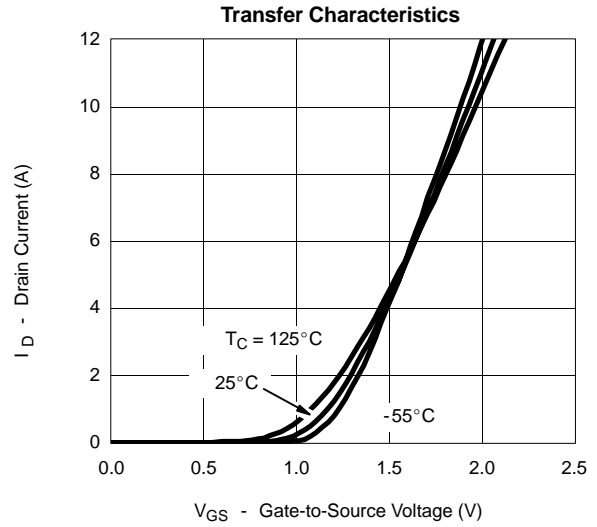
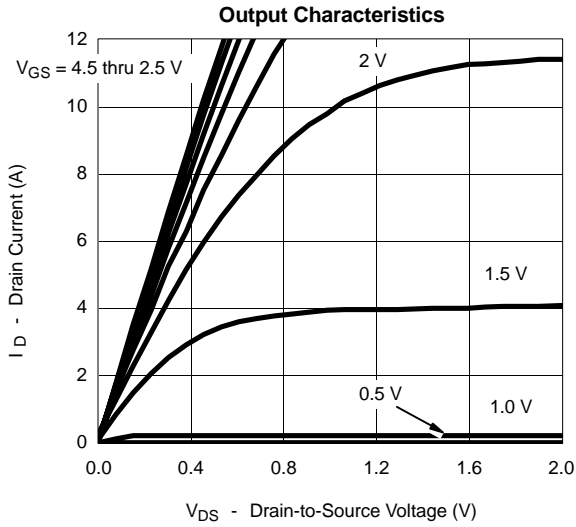
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- Switching time is essentially independent of operating temperature.



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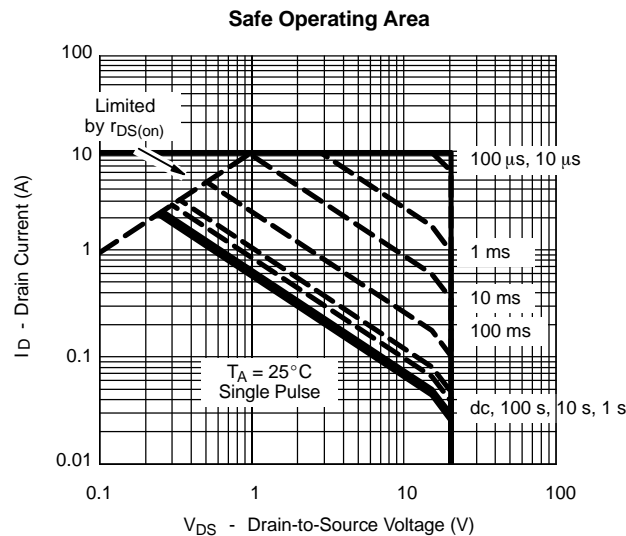
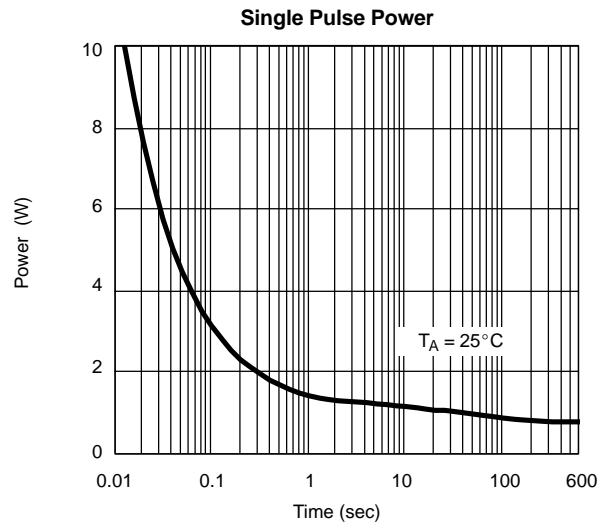
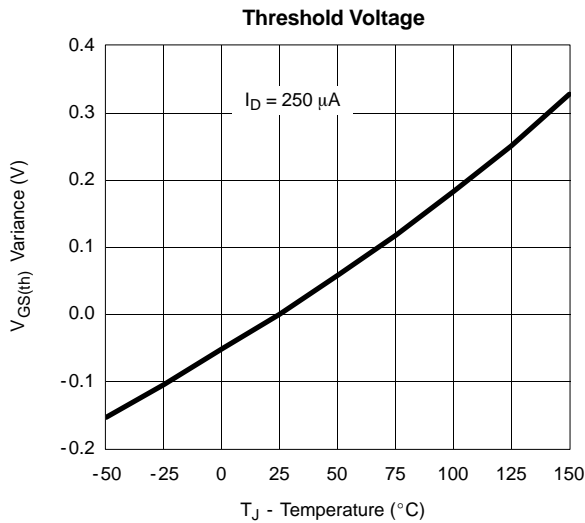
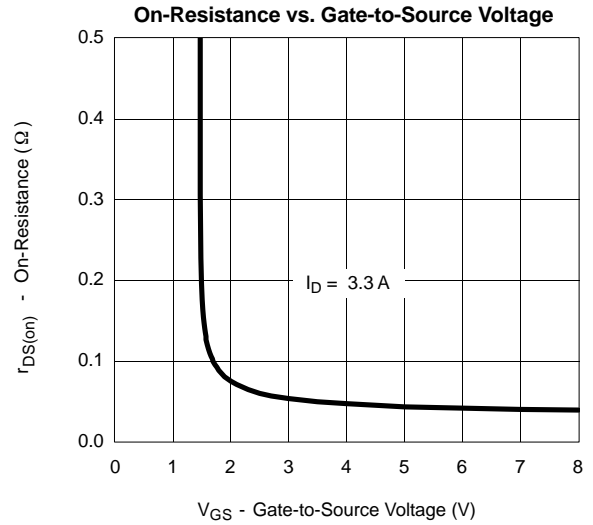
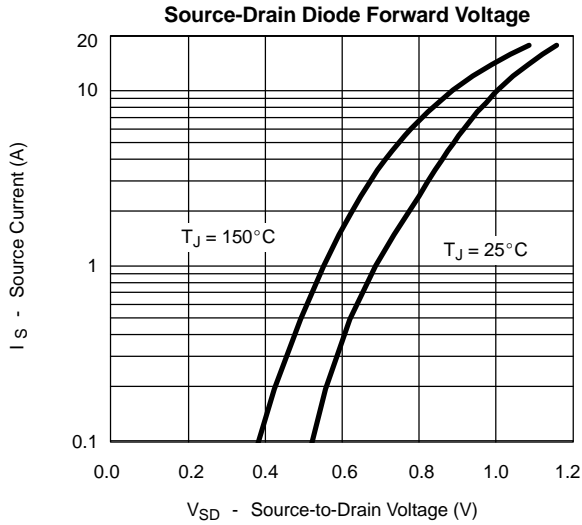
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**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





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