



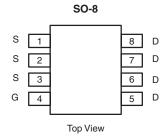
## P-Channel 1.8-V (G-S) MOSFET

PRODUCT SUMMARY				
V <sub>DS</sub> (V)	$R_{DS(on)}\left(\Omega\right)$	I <sub>D</sub> (A)		
	0.017 at V <sub>GS</sub> = - 4.5 V	- 9.9		
- 20	0.023 at V <sub>GS</sub> = - 2.5 V	- 8.5		
	0.032 at V <sub>GS</sub> = - 1.8 V	- 7.2		

#### **FEATURES**

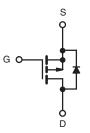
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET<sup>®</sup> Power MOSFETs
- Compliant to RoHS Directive 2002/95/EC





Ordering Information: Si4403BDY-T1-E3 (Lead (Pb)-free)

Si4403BDY-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	- 20		V
Gate-Source Voltage		$V_{GS}$	± 8		
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	T <sub>A</sub> = 25 °C	l <sub>D</sub>	- 9.9	- 7.3	Δ.
	T <sub>A</sub> = 70 °C		- 7.9	- 5.8	
Pulsed Drain Current		I <sub>DM</sub>	- 30		Α
Continuous Source Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	- 2.3	- 1.3	
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25 °C	P <sub>D</sub>	2.5	1.35	W
	T <sub>A</sub> = 70 °C		1.6	0.87	
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>	t ≤ 10 s	R <sub>thJA</sub>	43	50		
Maximum Junction-to-Ambient*	Steady State		71	92	°C/W	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	19	25		

#### Notes:

a. Surface Mounted on 1" x 1" FR4 board.

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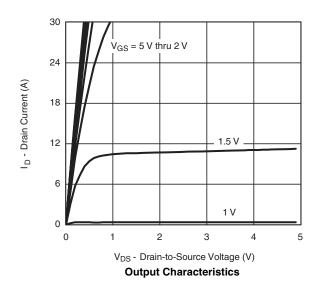


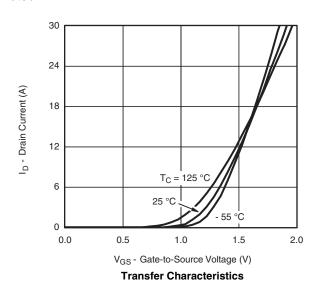
<b>SPECIFICATIONS</b> T <sub>J</sub> = 25 °C, unless otherwise noted								
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit		
Static								
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}$ , $I_D = -350 \mu A$	- 0.45		- 1.0	V		
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			± 100	nA		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = - 20 V, V <sub>GS</sub> = 0 V			- 1			
		V <sub>DS</sub> = - 20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C	- 10			μΑ		
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	20			Α		
		$V_{GS} = -4.5 \text{ V}, I_D = -9.9 \text{ A}$	0.014 0.01		0.017	Ω		
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = -2.5 \text{ V}, I_D = -8.5 \text{ A}$ 0.01		0.018	0.023			
		V <sub>GS</sub> = - 1.8 V, I <sub>D</sub> = - 3.1 A		0.024	0.032			
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 9.9 A		36		S		
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	I <sub>S</sub> = - 2.3 A, V <sub>GS</sub> = 0 V		- 0.8	- 1.1	V		
Dynamic <sup>b</sup>								
Total Gate Charge	$Q_g$			33	50			
Gate-Source Charge	Q <sub>gs</sub>	$V_{DS}$ = - 10 V, $V_{GS}$ = - 5 V, $I_D$ = - 9.9 A		4.2		nC		
Gate-Drain Charge	$Q_{gd}$			7.6		]		
Turn-On Delay Time	t <sub>d(on)</sub>			25	40			
Rise Time	t <sub>r</sub>	$V_{DD}$ = - 10 V, $R_L$ = 15 $\Omega$		45	70	ns		
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D\cong$ - 1 A, $V_{GEN}=$ - 4.5 V, $R_g=$ 6 $\Omega$		150	225			
Fall Time	t <sub>f</sub>			70	110			
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = - 2.3 A, dl/dt = 100 A/μs		40	60			

- Notes: a. Pulse test; pulse width  $\leq$  300  $\mu$ s, duty cycle  $\leq$  2 %. b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



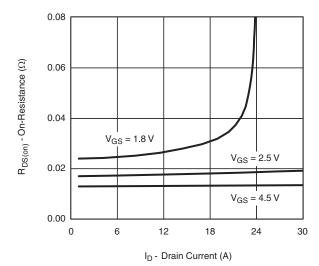




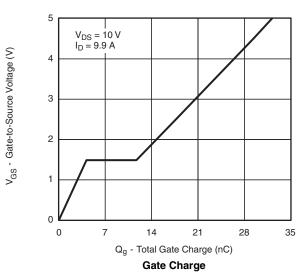


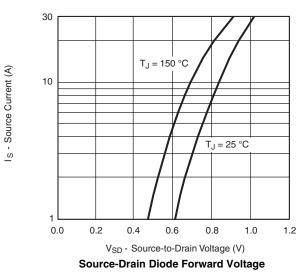


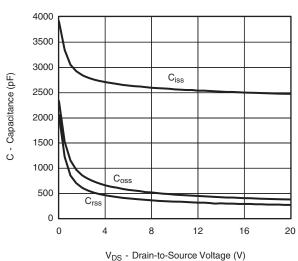
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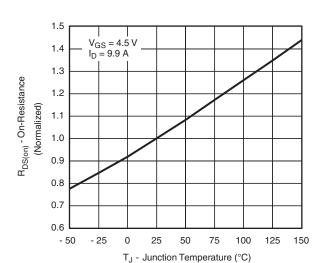
#### On-Resistance vs. Drain Current



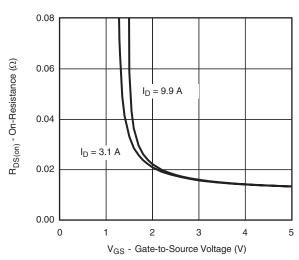




Capacitance



#### On-Resistance vs. Junction Temperature

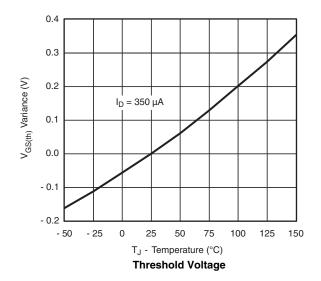


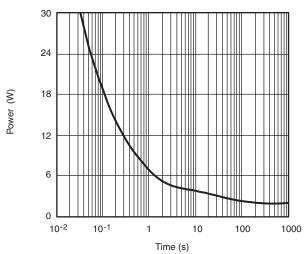
On-Resistance vs. Gate-to-Source Voltage

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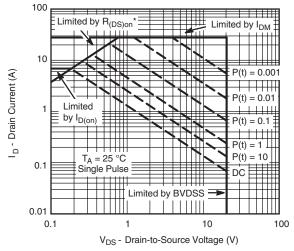
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#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



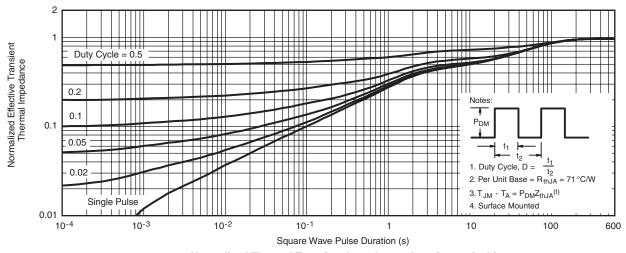


Single Pulse Power, Junction-to-Ambient



 $^{\star}$   $V_{GS}$  > minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

#### Safe Operating Area

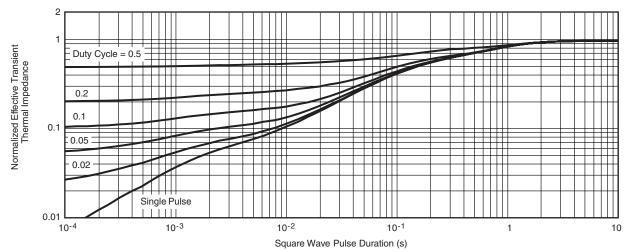


Normalized Thermal Transient Impedance, Junction-to-Ambient





#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Foot

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