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Vishay Siliconix

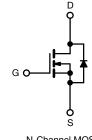


PRODUCT SUMMARY					
V _{DS} (V)	30				
$R_{DS(on)}$ max. (Ω) at V_{GS} = 10 V	0.047				
$R_{DS(on)}$ max. (Ω) at V_{GS} = 4.5 V	0.065				
Q _g typ. (nC)	3.0				
I _D (A)	4.0				
Configuration	Single				

FEATURES

N-Channel 30 V (D-S) MOSFET

- TrenchFET[®] power MOSFET
- 100 % $\rm R_g$ and UIS tested
- Material categorization:
- for definitions of compliance please see www.vishay.com/doc?99912





HALOGEN

FREE

N-Channel MOSFET

ORDERING INFORMATION	
Package	SOT-23 (TO-236)
Lead (Pb)-free	Si2306BDS-T1-E3
Lead (Pb)-free and halogen-free	Si2306BDS-T1-GE3

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unles	s otherwise note	d)	
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V _{DS}	30	V
Gate-source voltage		V _{GS}	± 20	v
Continuous drain current (T _J = 150 °C) ^{a, b}	T _A = 25 °C		4.0 °	
	T _A = 70 °C		3.5 ^c	
	T _A = 25 °C	I _D	3.16 ^d	
	T _A = 70 °C		2.7 ^d	А
Pulsed drain current		I _{DM}	20	
Continuous source-drain diode current ^{a, b}			1.04 ^c	
		I _S	0.62 d	
	T _A = 25 °C		1.25 °	
Maximum power dissipation ^{a, b}	T _A = 70 °C		0.8 °	14/
	T _A = 25 °C	P _D	0.75 ^d	W
	T _A = 70 °C		0.48 ^d	
Operating junction and storage temperature ran	ge	T _J , T _{stg}	-55 to +150	°C

Notes

- a. Surface mounted on 1" x 1" FR4 board, t \leq 5 s
- b. Pulse width limited by maximum junction temperature
- c. t = 5 s
- d. Steady state

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THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^a	t≤5 s	R _{thJA}	60	100	
	Steady state		130	166	°C/W
Maximum junction-to-foot (drain)	Steady state	R _{thJF}	60	75	

Note

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

PARAMETER	SYMBOL TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static			•	•		
Drain-source breakdown voltage	V _{DS}	$V_{GS} = 0 \text{ V}, \text{ I}_{D} = 250 \mu\text{A}$	30	-	-	V
Gate-source threshold voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = 250 \ \mu A$	1.0	-	3.0	V
Gate-body leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$	-	-	± 100	nA
Zara anto voltago droin ourrent		$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$	-	-	0.5	μA
Zero gate voltage drain current	IDSS	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$	-	-	10	
On-state drain current ^a	I _{D(on)}	$V_{DS} \ge 4.5$ V, V_{GS} = 10 V	6	-	-	А
Drain-source on-state resistance ^a	Р	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 3.5 \text{ A}$	$I_{GS} = 10 \text{ V}, I_D = 3.5 \text{ A}$ - 0.038 (0.047	
	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 2.8 \text{ A}$	-	0.052	0.065	Ω
Forward transconductance a	g _{fs}	$V_{DS} = 4.5 \text{ V}, \text{ I}_{D} = 2.5 \text{ A}$	-	7.0	-	S
Diode forward voltage	V _{SD}	$V_{GS} = 0 V, I_{S} = 1.25 A$	-	0.8	1.2	V
Dynamic			•			
Gate charge	Qg	$V_{DS} = 15 \text{ V}, V_{GS} = 5 \text{ V}, I_D = 2.5 \text{ A}$	-	3.0	4.5	
Total gate charge	Q _{gt}		-	6	9	nC
Gate-source charge	Q _{gs}	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 2.5 A	-	1.6	-	
Gate-drain charge	Q _{gd}		-	0.6	-	
Gate resistance	Rg	f = 1 MHz	2.0	5.0	7.5	Ω
Input capacitance	C _{iss}		-	305	-	
Output capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	-	65	-	pF
Reverse transfer capacitance	C _{rss}		-	29	-	
Switching			•	•	•	
Turn-on delay time	t _{d(on)}		-	7	11	
Rise time	t _r	$V_{DD} = 15 \text{ V}, \text{ R}_{\text{L}} = 15 \Omega, \text{ I}_{D} \cong 1 \text{ A},$	-	12	18	
Turn-off delay time	t _{d(off)}	$V_{\text{GEN}} = 0$ V, $R_g = 6 \Omega$	-	14	25	ns
Fall time	t _f		-	6	10	
Reverse recovery time	t _{rr}		-	14	21	
Body diode reverse recovery charge	Q _{rr}	I _F = 1.25 A, di/dt = 100 A/μs	-	6	10	nC

Notes

a. Pulse test; pulse width $\leq 300~\mu s,~duty~cycle \leq 2~\%$

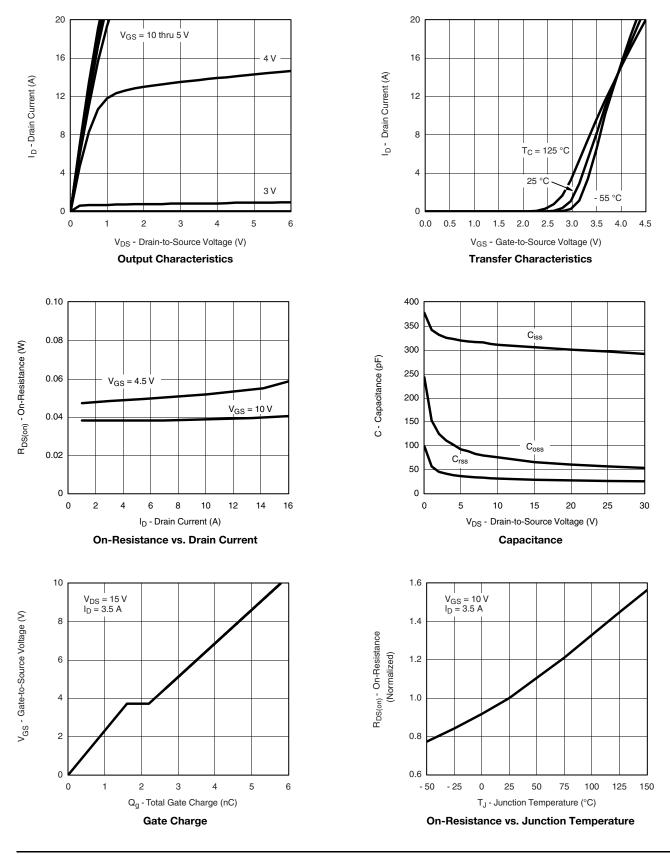
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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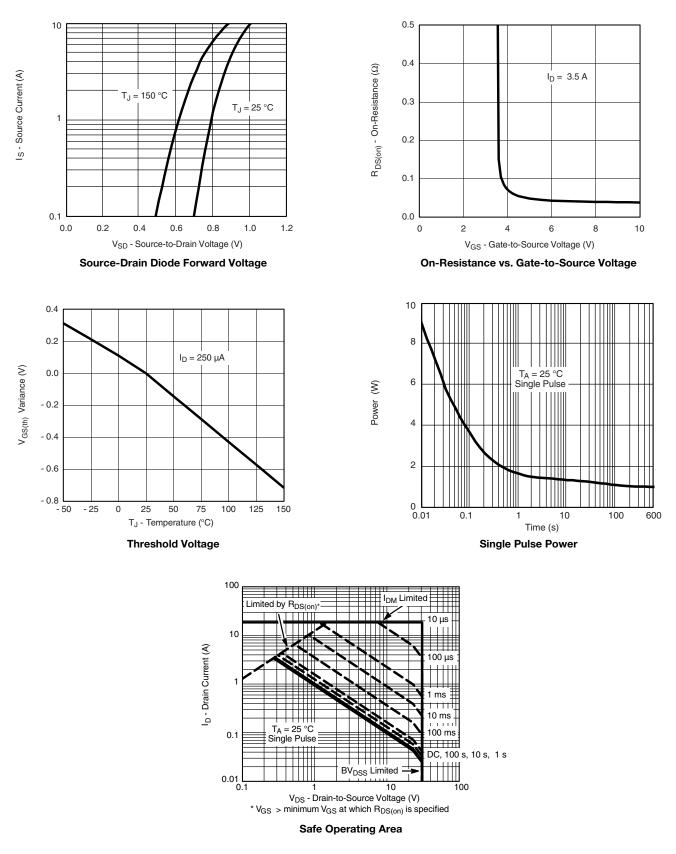
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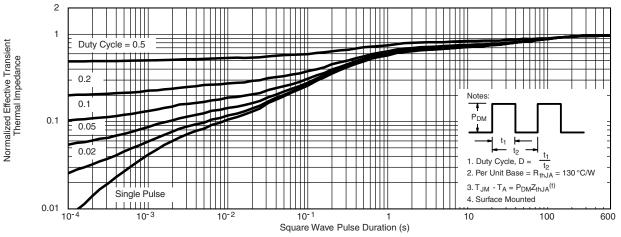
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package / tape drawings, part marking, and reliability data, see www.vishay.com/ppg?73234.



Package Information

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SOT-23 (TO-236): 3-LEAD







Dim —	MILLIN	METERS	INCHES		
	Min	Max	Min	Мах	
Α	0.89	1.12	0.035	0.044	
A ₁	0.01	0.10	0.0004	0.004	
A ₂	0.88	1.02	0.0346	0.040	
b	0.35	0.50	0.014	0.020	
С	0.085	0.18	0.003	0.007	
D	2.80	3.04	0.110	0.120	
E	2.10	2.64	0.083	0.104	
E ₁	1.20	1.40	0.047	0.055	
е	0.95 BSC		0.0374 Ref		
e ₁	1.90 BSC		0.0748 Ref		
L	0.40	0.60	0.016	0.024	
L ₁	0.64 Ref		0.025 Ref		
S	0.50 Ref		0.020 Ref		
q	3°	8°	3°	8°	



Application Note 826

Vishay Siliconix

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads Dimensions in Inches/(mm)

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