

Vishay Siliconix

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N-Channel 20 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY				
V _{DS} (V)	R _{DS(on)} (Ω) I _D (
20	0.0043 at V _{GS} = 10 V	34		
	0.006 at V _{GS} = 4.5 V	28		

TO-252



Ordering Information: SUD50N02-04P-E3 (Lead (Pb)-free)

FEATURES

- TrenchFET[®] Power MOSFET
- 175 °C Junction Temperature
- PWM Optimized for High Efficiency
- Material categorization: definitions compliance For of www.vishay.com/doc?99912

APPLICATIONS

- Synchronous Buck Converter
 - Low-Side
 - Desktop, Servers, Desknote
- Synchronous Rectification
 - POL

ABSOLUTE MAXIMUM RATINGS (T_A =	= 25 °C, unless othe	rwise noted)			
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V _{DS}	20	- V	
Gate-Source Voltage		V _{GS}	± 20		
	T _A = 25 °C	- I _D	34 ^a		
Continuous Drain Current ^a	T _C = 25 °C		50 ^b		
Pulsed Drain Current		I _{DM}	100	A	
Continuous Source Current (Diode Conduction) ^a		۱ _S	8.3 ^a		
Avalanche Current ^c	L = 0.1 mH	I _{AS}	50		
Avalanche Energy ^c	L = 0.1 mm	E _{AS}	125	mJ	
	T _A = 25 °C	P _D	8.3 ^a	W	
Maximum Power Dissipation	T _C = 25 °C		136] "	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	t ≤ 10 s	- R _{thJA}	15	18	°C/W
Maximum Junction-to-Ambient*	Steady State		40	50	
Maximum Junction-to-Case		R _{thJC}	0.85	1.1	

Notes:

a. Surface mounted on FR4 board, t \leq 10 s.

b. Limited by package.

c. Single pulse.

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Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	20			v
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \ \mu A$	0.8		3.0	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V V _{DS} = 20 V, V _{GS} = 0 V, T _J = 125 °C			1 50	μA
On-State Drain Current ^b	I _{D(on)}	$V_{DS} = 5 V, V_{GS} = 10 V$	50			Α
		V _{GS} = 10 V, I _D = 20 A		0.0035	0.0043	Ω
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C			0.0061	
	. ,	V _{GS} = 4.5 V, I _D = 20 A		0.0048	0.006	
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A	15			S
Dynamic ^a						
Input Capacitance	C _{iss}			5000		pF
Output Capacitance	C _{oss}	$V_{GS} = 0 V$, $V_{DS} = 10 V$, f = 1 MHz		1650		
Reverse Transfer Capacitance	C _{rss}			770		
Gate Resistance	Rg	f = 1 MHz		1.6		Ω
Total Gate Charge ^c	Qg			40	60	
Gate-Source Charge ^c	Q _{gs}	$V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 50 \text{ A}$		14		nC
Gate-Drain Charge ^c	Q _{gd}			13		
Turn-On Delay Time ^c	t _{d(on)}			20	30	
Rise Time ^c	t _r	V_{DD} = 10 V, R_L = 0.2 Ω		20	30	ns
Turn-Off Delay Time ^c	t _{d(off)}	$\text{I}_\text{D} \cong$ 50 A, V_GEN = 10 V, R_g = 2.5 Ω		50	75	
Fall Time ^c	t _f			15	25	
Source-Drain Diode Ratings and Cha	racteristics	T _C = 25 °C		·		
Pulsed Current	I _{SM}				100	А
Diode Forward Voltage ^b	V _{SD}	I _F = 50 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 50 A, dl/dt = 100 A/μs		45	70	ns

Notes:

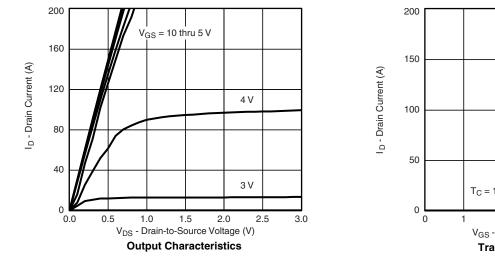
a. Guaranteed by design, not subject to production testing.

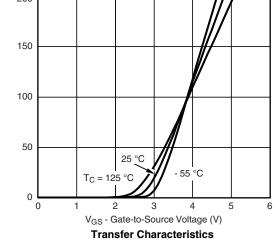
b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

c. Independent of operating temperature.

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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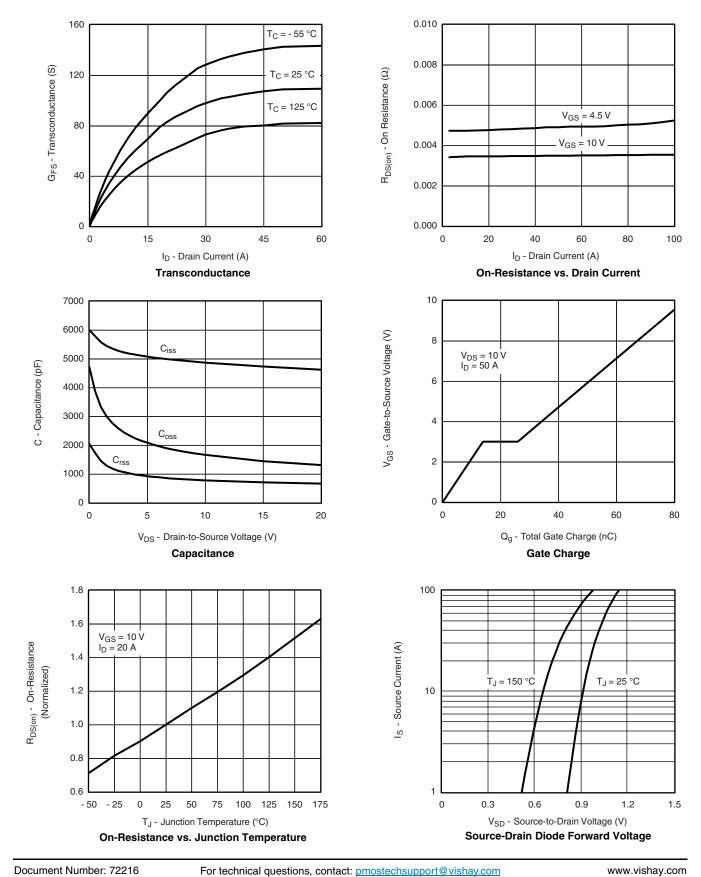
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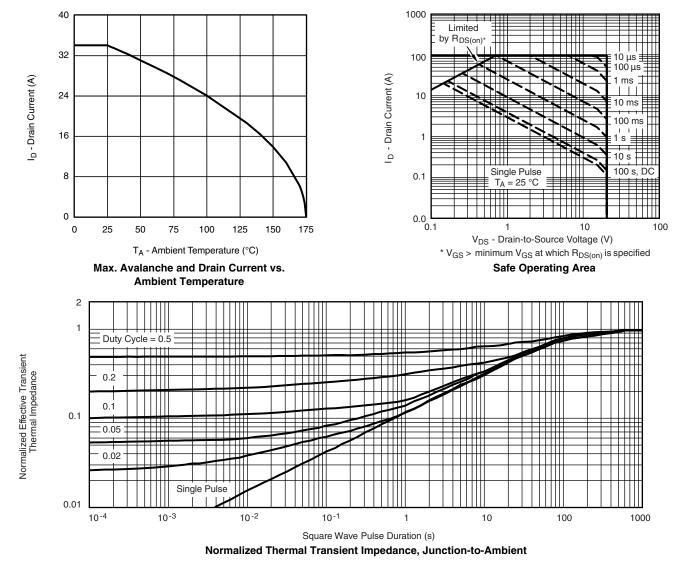




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