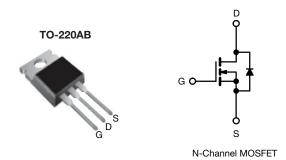
Vishay Siliconix

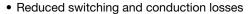
E Series Power MOSFET



PRODUCT SUMMARY				
V _{DS} (V) at T _J max.	850			
R _{DS(on)} typ. (Ω) at 25 °C	$V_{GS} = 10 \text{ V}$	0.250		
Q _g max. (nC)	62			
Q _{gs} (nC)	8			
Q _{gd} (nC)	18			
Configuration	Single			

FEATURES

- Low figure-of-merit (FOM) Ron x Qa
- Low effective capacitance (Co(er))



Avalanche energy rated (UIS)

 Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>



APPLICATIONS

- · Server and telecom power supplies
- Switch mode power supplies (SMPS)
- Power factor correction power supplies (PFC)
- Lighting
 - High-intensity discharge (HID)
 - Fluorescent ballast lighting
- Industrial
 - Welding
 - Induction heating
 - Motor drives
 - Battery chargers
 - Solar (PV inverters)

ORDERING INFORMATION	
Package	TO-220AB
Lead (Pb)-free and halogen-free	SiHP17N80AE-GE3

PARAMETER			SYMBOL	LIMIT	UNIT	
Drain-source voltage			V _{DS}	800	.,,	
Gate-source voltage			V_{GS}	± 30	V	
Continuous drain current (T _J = 150 °C)	V _{GS} at 10 V	$T_C = 25 ^{\circ}C$ $T_C = 100 ^{\circ}C$	- I _D	15		
	V _{GS} at 10 V	T _C = 100 °C		10	Α	
Pulsed drain current a			I _{DM}	32		
Linear derating factor				1.4	W/°C	
Single pulse avalanche energy b			E _{AS}	127	mJ	
Maximum power dissipation			P_{D}	179	W	
Operating junction and storage temperature range			T _J , T _{stg}	-55 to +150	°C	
Drain-source voltage slope	slope T _J = 125 °C		dv/dt	100	1//	
Reverse diode dv/dt ^d				17	V/ns	
Soldering recommendations (peak temperature) c For 10 s			260	°C		

Notes

- a. Repetitive rating; pulse width limited by maximum junction temperature
- b. V_{DD} = 140 V, starting T_J = 25 °C, L = 28.2 mH, R_q = 25 Ω , I_{AS} = 3 A
- c. 1.6 mm from case
- d. $I_{SD} \le I_D$, di/dt = 100 A/ μ s, starting $T_J = 25$ °C



Vishay Siliconix

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum junction-to-ambient	R _{thJA}	-	62	°C/W
Maximum junction-to-case (drain)	R_{thJC}	-	0.7	C/VV

PARAMETER	SYMBOL	TES	MIN.	TYP.	MAX.	UNIT	
Static							
Drain-source breakdown voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$		800	-	-	V
V _{DS} temperature coefficient	$\Delta V_{DS}/T_{J}$	Reference to 25 °C, I _D = 1 mA		-	0.8	-	V/°C
Gate-source threshold voltage (N)	V _{GS(th)}	V _{DS} =	V _{DS} = V _{GS} , I _D = 250 μA		-	4	V
Onto anima lankana	I _{GSS}	$V_{GS} = \pm 20 \text{ V}$		-	-	± 100	nA
Gate-source leakage		,	$V_{GS} = \pm 30 \text{ V}$	-	-	± 1	μΑ
Zava sata valtasa duain ayuwant		V _{DS} = 800 V, V _{GS} = 0 V		-	-	1	
Zero gate voltage drain current	I _{DSS}	V _{DS} = 640 V	V _{DS} = 640 V, V _{GS} = 0 V, T _J = 125 °C		-	10	μA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} = 10 V	I _D = 8.5 A	-	0.250	0.290	Ω
Forward transconductance a	9 _{fs}	V _{DS} = 10 V, I _D = 8.5 A		-	7.1	-	S
Dynamic							
Input capacitance	C _{iss}	V _{GS} = 0 V,		-	1260	-	pF
Output capacitance	C _{oss}	1	V _{DS} = 100 V,		56	-	
Reverse transfer capacitance	C _{rss}	f = 1 MHz		-	5	-	
Effective output capacitance, energy related	C _{o(er)}	V _{DS} = 0 V to 480 V, V _{GS} = 0 V		-	40	-	
Effective output capacitance, time related	C _{o(tr)}			-	245	-	
Total gate charge	Qg			-	41	62	
Gate-source charge	Q _{gs}	V _{GS} = 10 V	$V_{GS} = 10 \text{ V}$ $I_D = 8.5 \text{ A}, V_{DS} = 640 \text{ V}$		8	-	nC
Gate-drain charge	Q _{gd}				18	-	
Turn-on delay time	t _{d(on)}	$V_{DD} = 640 \text{ V}, I_{D} = 8.5 \text{ A}, V_{GS} = 10 \text{ V}, R_{g} = 9.1 \Omega$		-	21	42	
Rise time	t _r			-	23	46	
Turn-off delay time	t _{d(off)}			=.	45	90	ns
Fall time	t _f			-	31	62	
Gate input resistance	R_g	f = 1 MHz, open drain		0.2	0.5	1.1	Ω
Drain-Source Body Diode Characteristic	s						
Continuous source-drain diode current	I _S	MOSFET symbol showing the integral reverse p - n junction diode		-	-	15	
Pulsed diode forward current	I _{SM}			-	-	32	A
Diode forward voltage	V _{SD}	T _J = 25 °C, I _S = 8.5 A, V _{GS} = 0 V		-	-	1.2	V
Reverse recovery time	t _{rr}	T _J = 25 °C, I _F = I _S = 8.5 A, di/dt = 100 A/ μ s, V _R = 25 V		-	314	628	ns
Reverse recovery charge	Q _{rr}			-	4	8	μC
Reverse recovery current	I _{RRM}			-	21	-	A



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

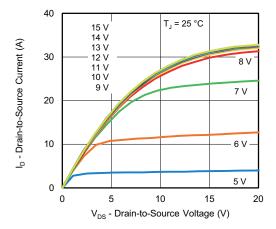


Fig. 1 - Typical Output Characteristics

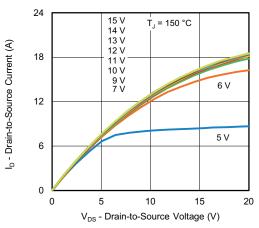


Fig. 2 - Typical Output Characteristics

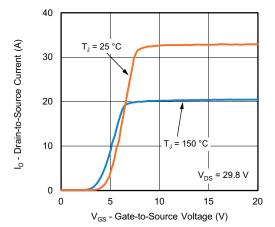


Fig. 3 - Typical Transfer Characteristics

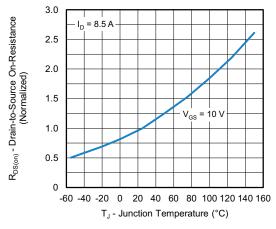


Fig. 4 - Normalized On-Resistance vs. Temperature

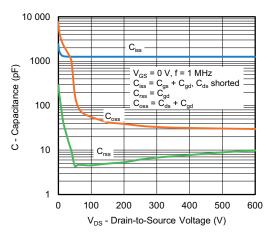


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

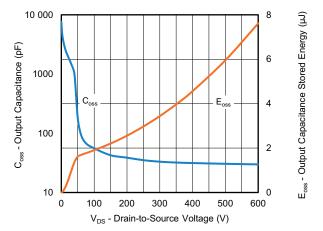


Fig. 6 - Coss and Eoss vs. VDS



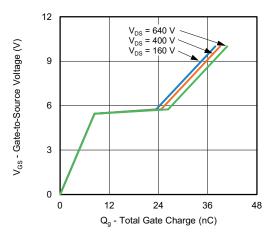


Fig. 7 - Typical Gate Charge vs. Gate-to-Source Voltage

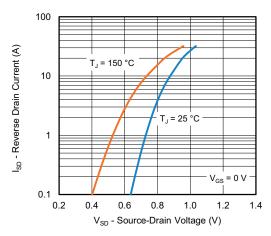


Fig. 8 - Typical Source-Drain Diode Forward Voltage

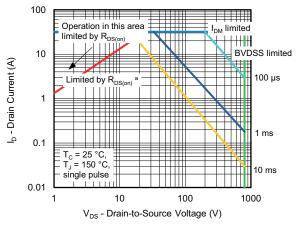


Fig. 9 - Maximum Safe Operating Area

Note

a. V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

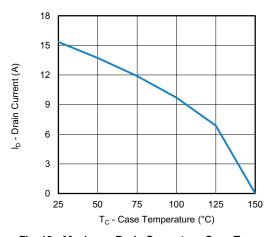


Fig. 10 - Maximum Drain Current vs. Case Temperature

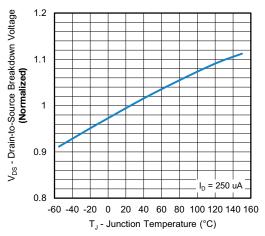


Fig. 11 - Temperature vs. Drain-to-Source Voltage



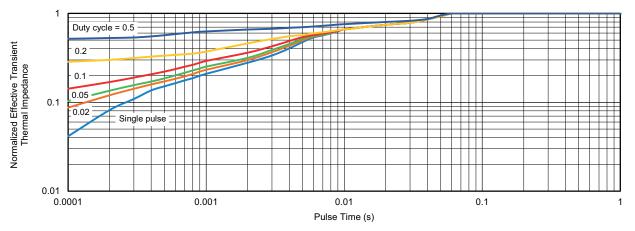


Fig. 12 - Normalized Transient Thermal Impedance, Junction-to-Case

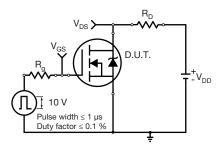


Fig. 13 - Switching Time Test Circuit

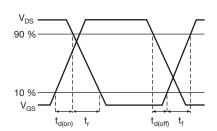


Fig. 14 - Switching Time Waveforms

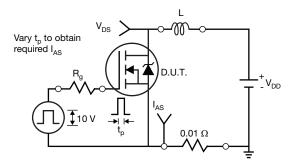


Fig. 15 - Unclamped Inductive Test Circuit

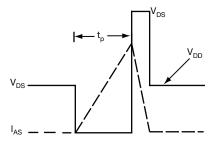


Fig. 16 - Unclamped Inductive Waveforms

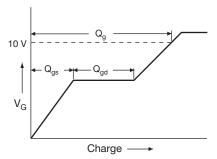


Fig. 17 - Basic Gate Charge Waveform

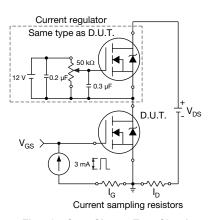


Fig. 18 - Gate Charge Test Circuit



Peak Diode Recovery dv/dt Test Circuit



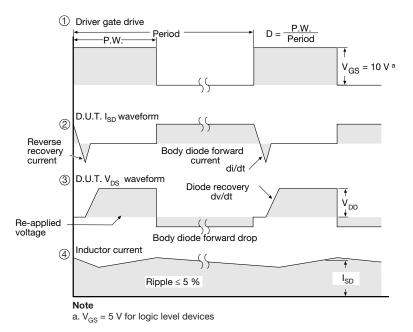


Fig. 19 - For N-Channel

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