

**POWER MOSFETs**

SiHP12N50C, SiHB12N50C, SiHF12N50C

MOSFETs - 500 V with Max $R_{DS(on)}$ of 0.555 Ω at $V_{GS} = 10$ V**High-Voltage MOSFETs - 500 V N-Channel Power MOSFETs
in TO-220AB, TO-220 FULLPAK, and D²PAK Packages****KEY BENEFITS**

- Maximum $R_{DS(on)}$ of 0.555 Ω at $V_{GS} = 10$ V
- Low gate charge, Q_g max = 48 nC
- $R_{DS(on)} * Q_g$ FOM of 26.64 Ω -nC
- 100 % avalanche tested
- Improved T_{rr} / Q_{rr}

APPLICATIONS

- Lighting
- Welding
- NB adapters

RESOURCES

- Datasheet: SiP12N50C, SiB12N50C, SiF12N50C - <http://www.vishay.com/doc?91388>
- More featured products: <http://www.vishay.com/ref/featuredmosfets>
- For technical questions contact hvm@vishay.com
- Material categorization: For definitions of compliance please see <http://www.vishay.com/doc?99912>

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POWER MOSFETs

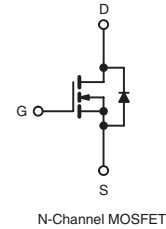
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High-Voltage MOSFETs - 500 V N-Channel Power MOSFETs in TO-220AB, TO-220 FULLPAK, and D²PAK Packages

PRODUCT SUMMARY	
V _{DS} (V) at T _J max.	560 V
R _{DS(on)} (Ω)	V _{GS} = 10 V 0.555
Q _g (Max.) (nC)	48
Q _{gs} (nC)	12
Q _{gd} (nC)	15
Configuration	Single



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)				
PARAMETER	SYMBOL	LIMIT		UNIT
		TO220-AB D ² PAK (TO-263)	TO-220 FULLPAK	
Drain-Source Voltage	V _{DS}	500		V
Gate-Source Voltage	V _{GS}	± 30		
Continuous Drain Current (T _J = 150 °C) ^a	V _{GS} at 10 V	T _C = 25 °C	12	A
		T _C = 100 °C	7.5	
Pulsed Drain Current ^c	I _{DM}	28		
Linear Derating Factor		1.67	0.28	W/°C
Single Pulse Avalanche Energy ^b	E _{AS}	180		mJ
Maximum Power Dissipation	P _D	208	36	W
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to + 150		°C
Soldering Recommendations (Peak Temperature) ^d	for 10 s	300		

Note
a. Limited by maximum junction temperature.
b. V_{dd} = 50 V, starting T_J = 25 °C, L = 2.5 mH, R_g = 25 Ω, I_{AS} = 12 A.
c. Repetitive rating; pulse width limited by maximum junction temperature.
d. 1.6 mm from case.

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	TO220-AB D ² PAK (TO-263)	TO-220 FULLPAK	UNIT
Maximum Junction-to-Ambient	R _{thJA}	62	65	°C/W
Maximum Junction-to-Case (Drain)	R _{thJC}	0.6	3.5	
Junction-to-Ambient (PCB mount) ^a	R _{thJA}	40	-	

Note
a. When mounted on 1" square PCB (FR-4 or G-10 material).

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	500	-	-	V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	Reference to 25 °C, I _D = 1 mA	-	0.6	-	V/°C
Gate-Source Threshold Voltage (N)	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	3.0	-	5.0	V
Gate-Source Leakage	I _{GSS}	V _{GS} = ± 30 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 500 V, V _{GS} = 0 V	-	-	50	μA
		V _{DS} = 400 V, V _{GS} = 0 V, T _J = 125 °C	-	-	250	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 4 A	-	0.46	0.555	Ω
Forward Transconductance	g _{fs}	V _{DS} = 50 V, I _D = 3 A	-	3	-	S
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1.0 MHz	-	1375	-	pF
Output Capacitance	C _{oss}		-	165	-	
Reverse Transfer Capacitance	C _{rss}		-	17	-	
Total Gate Charge	Q _g	V _{GS} = 10 V, I _D = 10 A, V _{DS} = 400 V	-	32	48	nC
Gate-Source Charge	Q _{gs}		-	12	-	
Gate-Drain Charge	Q _{gd}		-	15	-	
Turn-On Delay Time	t _{d(on)}		-	18	-	
Rise Time	t _r	V _{DD} = 250 V, I _D = 10 A, R _g = 4.3 Ω, V _{GS} = 10 V	-	35	-	ns
Turn-Off Delay Time	t _{d(off)}		-	23	-	
Fall Time	t _f		-	6	-	
Gate Input Resistance	R _g	f = 1 MHz, open drain	-	1.1	-	Ω
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode	-	-	12	A
Pulsed Diode Forward Current	I _{SM}		-	-	28	
Body Diode Voltage	V _{SD}	T _J = 25 °C, I _S = 10 A, V _{GS} = 0 V	-	-	1.8	V
Body Diode Reverse Recovery Time	t _{rr}	T _J = 25 °C, I _F = I _S , dI/dt = 100 A/μs, V _R = 20 V	-	580	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	4.3	-	μC
Body Diode Reverse Recovery Current	I _{RRM}		-	13	-	A

Note
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