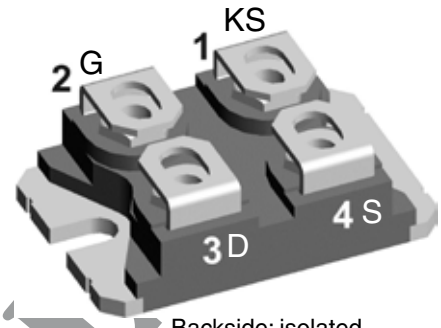
SiC Power MOSFET

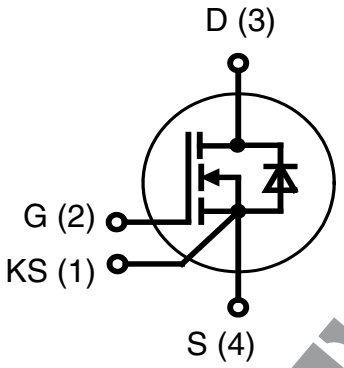
I_{D25} = 48 A
V_{DSS} = 1200 V
$R_{DS(on)\ max}$ = 50 mΩ

Kelvin Source gate connection

Part number
IXFN50N120SK



Backside: isolated
E153432



Features / Advantages:
- High speed switching with low capacitances
- High blocking voltage with low $R_{DS(on)}$
- Easy to parallel and simple to drive
- Resistant to latch-up
- Real Kelvin source connection

Applications:
- Solar inverters
- High voltage DC/DC converters
- Motor drives
- Switch mode power supplies
- UPS
- Battery chargers
- Induction heating

Package: SOT-227B (minibloc)
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate with Aluminium nitride insolation
- Advanced power cycling

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Terms & Conditions of usage
The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.
Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, test conditions and dimensions.

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MOSFET				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
$V_{DS(max)}$	*max drain source voltage*					1200	V
$V_{GS(max)}$	*max transient gate source voltage*			-10		+25	V
V_{GS}	*continous gate source voltage*	recommended operational value		-5		+20	V
I_{D25}	*drain current*	V_{GS} = 20 V	T_C = 25°C			48	A
I_{D80}			T_C = 80°C			38	A
I_{D100}			T_C = 100°C			33	A
R_{DSon}	*static drain source on resistance*	I_D = 40 A; V_{GS} = 20 V	T_{VJ} = 25°C		40	52	mΩ
			T_{VJ} = 150°C		84		mΩ
$V_{GS(th)}$	*gate threshold voltage*	I_D = 10 mA; V_{GS} = V_{DS}	T_{VJ} = 25°C	2.4	2.8	tbd	V
			T_{VJ} = 150°C		2.0		V
I_{DSS}	*drain source leakage current*	V_{DS} = 1200 V; V_{GS} = 0 V	T_{VJ} = 25°C		1	100	µA
I_{GSS}	*gate source leakage current*	V_{DS} = 0 V; V_{GS} = 20 V	T_{VJ} = 25°C			0.25	µA
R_G	*internal gate resistance*	f = 1 MHz, V_{AC} = 25 mV			1.8		Ω
C_{iss}	*input capacitance*	V_{DS} = 1000 V; V_{GS} = 0 V; f = 1 MHz	T_{VJ} = 25°C		1895		pF
C_{oss}	*output capacitance*				150		pF
C_{rss}	*reverse transfer (Miller) capacitance*				10		pF
Q_g	*total gate charge*	V_{DS} = 800 V; I_D = 40 A; V_{GS} = -5/20 V	T_{VJ} = 25°C		115		nC
Q_{gs}	*gate source charge*				28		nC
Q_{gd}	*gate drain (Miller) charge*				37		nC
$t_{d(on)}$	*turn-on delay time*	Inductive switching	T_{VJ} = 125°C				ns
t_r	*current rise time*	Free Wheeling Diode: Body Diode @ V_{GS} = -5V					ns
$t_{d(off)}$	*turn-off delay time*	V_{DS} = 800 V; I_D = 40A					ns
t_f	*current fall time*	V_{GS} = -5/20 V; R_G = 2.5 Ω (external)					ns
E_{on}	*turn-on energy per pulse*						mJ
E_{off}	*turn-off energy per pulse*						mJ
R_{thJC}	*thermal resistance junction to case*					0.6	K/W
R_{thJH}	*thermal resistance junction to heatsink*	with heatsink compound; IXYS test setup			0.72		K/W

Source-Drain Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
I_{S25}	*continuous source current*	V_{GS} = -5 V	T_C = 25°C				A
I_{S80}			T_C = 80°C				A
V_{SD}	*forward voltage drop*	I_F = 20 A; V_{GS} = -5 V	T_{VJ} = 25°C		3.3		V
			T_{VJ} = 150°C		3.1		V
t_{rr}	*reverse recovery time*	V_{GS} = -5 V; I_F = 40 A	T_{VJ} = 25°C		54		ns
Q_{RM}	*reverse recovery charge (intrinsic diode)*	V_R = 800 V; -di$_F$/dt = 1000 A/µs			285		nC
I_{RM}	*max. reverse recovery current*				15		A

Note:
When using SiC Body Diode the maximum recommended V_{GS} = -5V

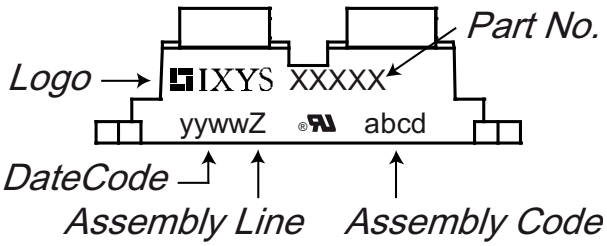
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Package SOT-227B (minibloc)

Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					A
T_{stg}	*storage temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		150	°C
T_{VJ}	*virtual junction temperature*			-40		175	°C
Weight					30		g
M_D	*mounting torque*			1.1		1.5	Nm
M_T	*terminal torque*			1.1		1.5	Nm
$d_{Spp/App}$	*creepage distance on surface / striking distance through air*		*terminal to backside*	10.5 / 3.2			mm
$d_{Spb/Apb}$			*terminal to terminal*	8.6 / 6.8			mm
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq 1$ mA; 50/60 Hz,	t = 1 sec.	3000			V
			t = 1 minute	2500			V

Product Marking

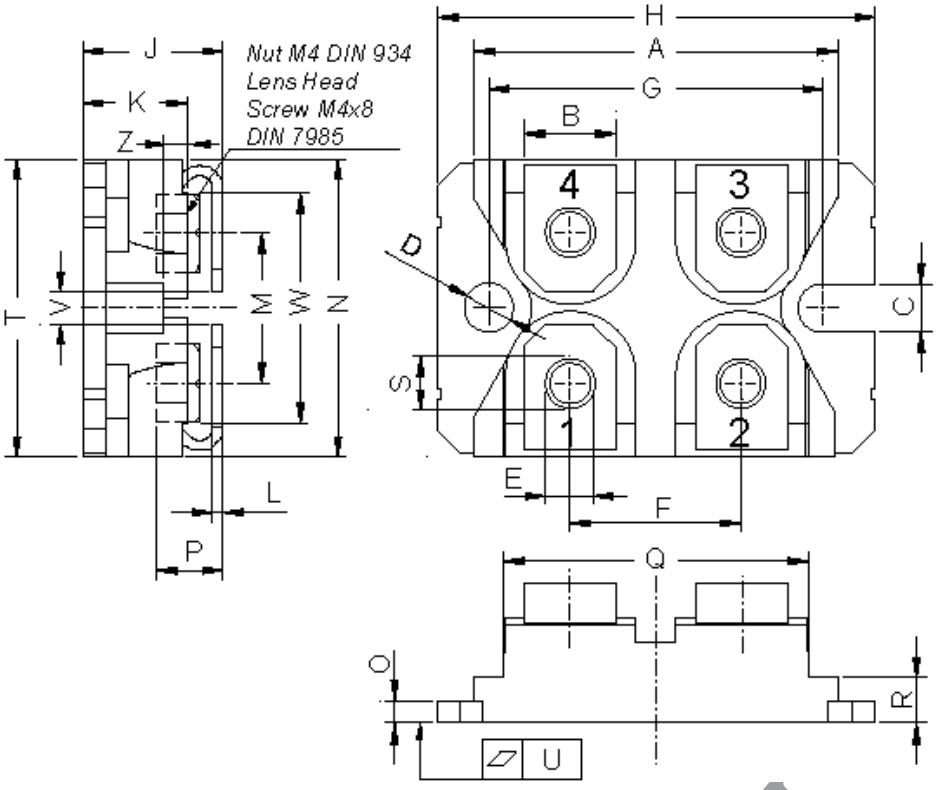


Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	IXFN50N120SK	IXFN50N120SK	Tube	10	517988

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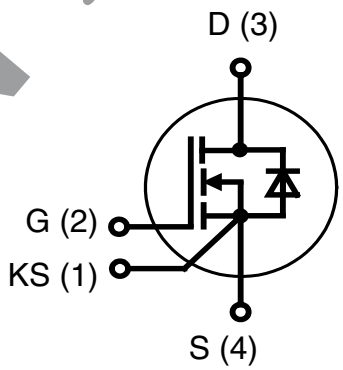
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Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

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