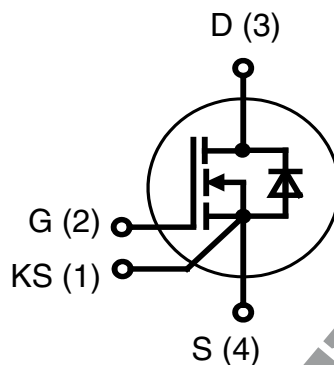
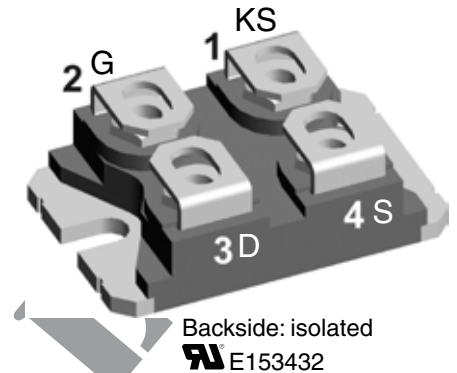


# SiC Power MOSFET

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

Kelvin Source gate connection

**Part number**  
 IXFN50N120SK



### 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 insulation
- Advanced power cycling

### 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 life 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.

20160225

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	$V_{GS} = 20\text{ V}$		$T_C = 25^\circ\text{C}$		48	A			
$I_{D80}$								$T_C = 80^\circ\text{C}$	38	A
$I_{D100}$								$T_C = 100^\circ\text{C}$	33	A
$R_{DSon}$	static drain source on resistance	$I_D = 40\text{ A}; V_{GS} = 20\text{ V}$		$T_{VJ} = 25^\circ\text{C}$	40	52	m $\Omega$			
				$T_{VJ} = 150^\circ\text{C}$	84	m $\Omega$				
$V_{GS(th)}$	gate threshold voltage	$I_D = 10\text{ mA}; V_{GS} = V_{DS}$		$T_{VJ} = 25^\circ\text{C}$	2.4	2.8	tbd			
				$T_{VJ} = 150^\circ\text{C}$	2.0	V				
$I_{DSS}$	drain source leakage current	$V_{DS} = 1200\text{ V}; V_{GS} = 0\text{ V}$		$T_{VJ} = 25^\circ\text{C}$	1	100	$\mu\text{A}$			
$I_{GSS}$	gate source leakage current	$V_{DS} = 0\text{ V}; V_{GS} = 20\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		0.25	$\mu\text{A}$			
$R_G$	internal gate resistance	$f = 1\text{ MHz}; V_{AC} = 25\text{ mV}$			1.8		$\Omega$			
$C_{iss}$	input capacitance	$V_{DS} = 1000\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		1895	pF			
$C_{oss}$	output capacitance							150	pF	
$C_{rss}$	reverse transfer (Miller) capacitance							10	pF	
$Q_g$	total gate charge	$V_{DS} = 800\text{ V}; I_D = 40\text{ A}; V_{GS} = -5/20\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		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 Free Wheeling Diode: Body Diode @ $V_{GS} = -5\text{ V}$ $V_{DS} = 800\text{ V}; I_D = 40\text{ A}$ $V_{GS} = -5/20\text{ V}; R_G = 2.5\ \Omega$ (external)		$T_{VJ} = 125^\circ\text{C}$			ns			
$t_r$	current rise time							ns		
$t_{d(off)}$	turn-off delay time							ns		
$t_f$	current fall time							ns		
$E_{on}$	turn-on energy per pulse							mJ		
$E_{off}$	turn-off energy per pulse							mJ		
$R_{thJC}$	thermal resistance junction to case	with heatsink compound; IXYS test setup				0.6	K/W			
$R_{thJH}$	thermal resistance junction to heatsink						K/W			

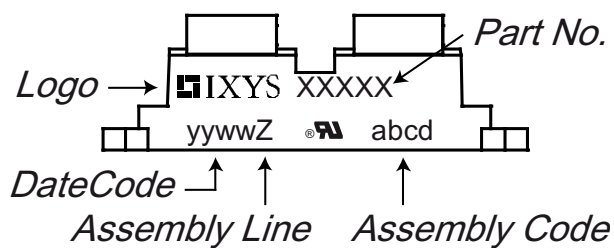
Source-Drain Diode				Ratings					
Symbol	Definitions	Conditions	min.	typ.	max.				
$I_{S25}$	continuous source current	$V_{GS} = -5\text{ V}$		$T_C = 25^\circ\text{C}$			A		
$I_{S80}$				$T_C = 80^\circ\text{C}$			A		
$V_{SD}$	forward voltage drop	$I_F = 20\text{ A}; V_{GS} = -5\text{ V}$		$T_{VJ} =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

**Note:**

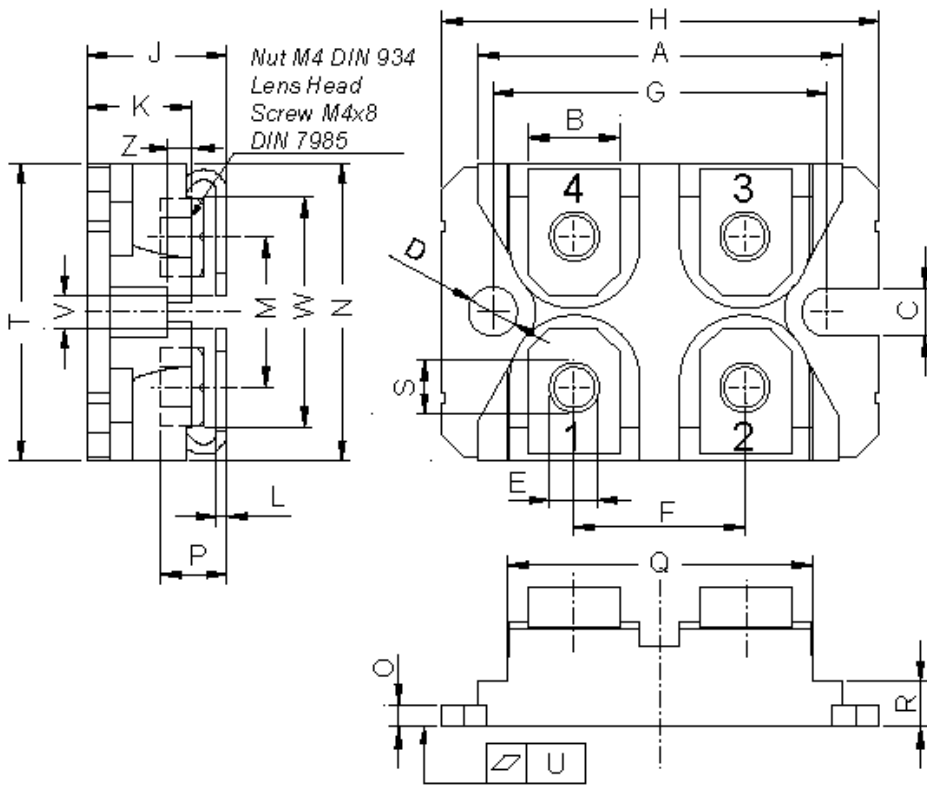
 When using SiC Body Diode the maximum recommended  $V_{GS} = -5\text{ V}$

**Package SOT-227B (minibloc)**

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	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
<b>Weight</b>				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
$d_{Spb/Appb}$		terminal to terminal	8.6 / 6.8			mm
$V_{ISOL}$	isolation voltage	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}, t = 1 \text{ sec.}$	3000			V
		$t = 1 \text{ minute}$	2500			V

**Product Marking**


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

**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

