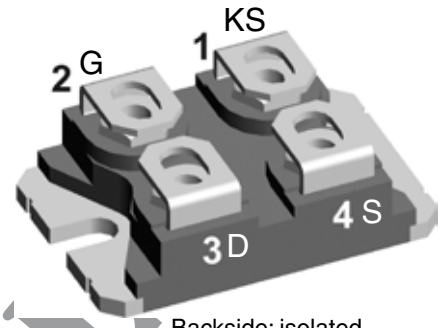
SiC Power MOSFET

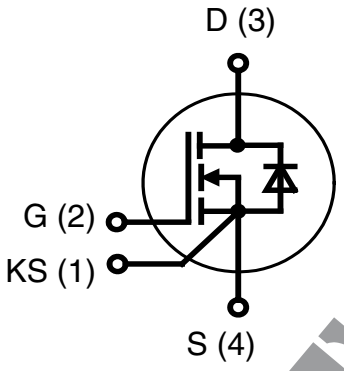
I_{D25} = 48 A
V_{DSS} = 1200 V
$R_{DS(on)\ max}$ = 50 mΩ

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

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

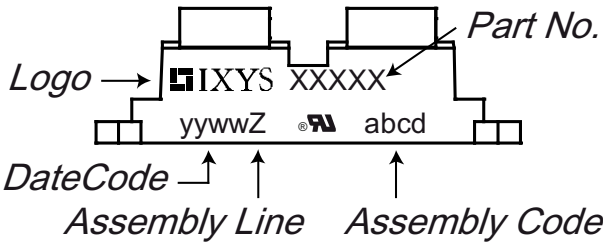
Source-Drain Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
I_{S25}	*continuous source current*	V_{GS} = -5 V	T_C = 25°C				A
I_{S80}			T_C = 80°C				A
V_{SD}	*forward voltage drop*	I_F = 20 A; V_{GS} = -5 V	T_{VJ} = 25°C		3.3		V
			T_{VJ} = 150°C		3.1		V
t_{rr}	*reverse recovery 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

Package SOT-227B (minibloc)

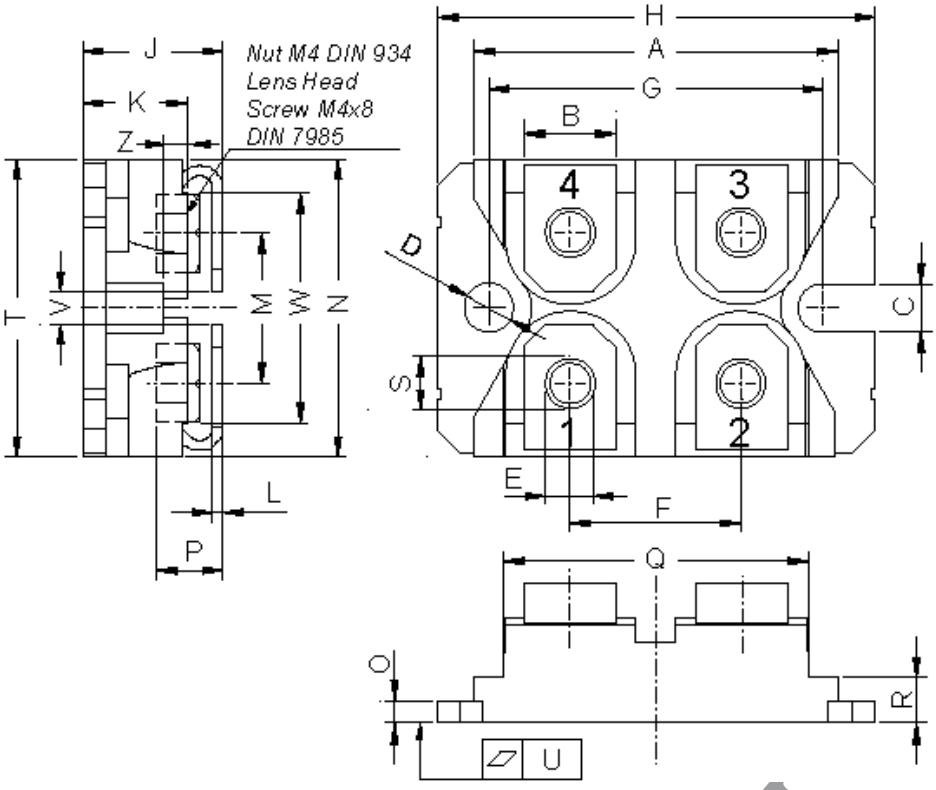
Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					A
T_{stg}	*storage temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		150	°C
T_{VJ}	*virtual junction temperature*			-40		175	°C
Weight					30		g
M_D	*mounting torque*			1.1		1.5	Nm
M_T	*terminal 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

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