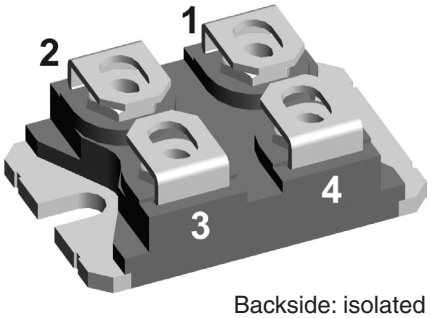
SiC Schottky Diode

V_{RRM} = 650 V
I_{FAV} = 2x 80 A

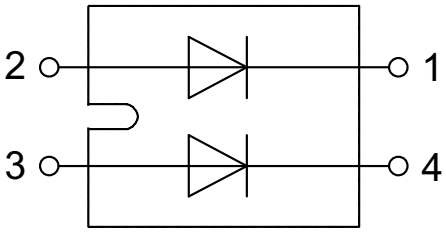
Ultra fast switching
Zero reverse recovery

Part number
DCG160X650NA



Backside: isolated

E72873



Features / Advantages:
- Ultra fast switching
- Zero reverse recovery
- Zero forward recovery
- Temperature independent switching behavior
- Positive temperature coefficient of forward voltage
- T_{VJM} = 175°C

Applications:
- Solar inverter
- Uninterruptible power supply (UPS)
- Welding equipment
- Switched-mode power supplies
- Medical equipment
- High speed rectifier

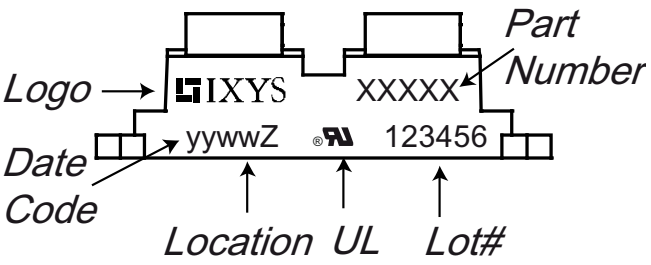
Package: SOT-227B (minibloc)
- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate with Aluminium nitride isolation for low thermal resistance
- Advanced power cycling

SiC Diode				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			650	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			650	V
I_R	*reverse current*	$V_R = V_{RRM}$	T_{VJ} = 25°C		0.1	1.0	mA
			T_{VJ} = 175°C		0.4	2.0	mA
V_F	*forward voltage*	I_F = 50 A	T_{VJ} = 25°C		1.25		V
		I_F = 100 A			1.55	1.85	V
		I_F = 50 A	T_{VJ} = 175°C		1.35		V
		I_F = 100 A			1.9	2.3	V
I_{FAV}	*average forward current*	T_C = 75°C, rectangular, d = 0.5	T_{VJ} = 175°C			80	A
		T_C = 100°C, rectangular, d = 0.5				67	A
I_{F25}	*forward current*	based on typ. V_{F0} and r_F	T_C = 25°C			134	A
I_{F80}			T_C = 80°C			101	A
I_{F100}			T_C = 100°C			87	A
I_{FSM}	*max forward surge current*	t = 10 ms,half sine (50 Hz)	T_{VJ} = 25°C			650	A
		t_P = 10 µs, pulse; V_R = 0V				3200	A
V_{F0}	*threshold voltage*	*for power loss calculation*	T_{VJ} = 125°C		0.83		V
			175°C		0.77		V
r_F	*slope resistance*		T_{VJ} = 125°C		9.5		mΩ
			175°C		11.3		mΩ
Q_C	*total capacitive charge*	V_R = 400 V, I_F = 100A	T_{VJ} = 25°C		220		nC
C	*total capacitance*	V_R = 0 V, f = 1 MHz	T_{VJ} = 25°C		3950		pF
		V_R = 200 V, f = 1 MHz	T_{VJ} = 25°C		400		pF
		V_R = 400 V, f = 1 MHz	T_{VJ} = 25°C		360		pF
R_{thJC}	*thermal resistance junction to case*					0.49	K/W
R_{thJH}	*thermal resistance junction to heatsink*	with heatsink compound; IXYS test setup			0.62		K/W

Package	Outlines SOT-227B (minibloc)			Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				100	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]	screws to heatsink terminal connection screws				1.5 1.3	Nm Nm
d_{Spp} d_{Spb}	*creepage distance on surface*	terminal to terminal terminal to backside		10.5 8.5			mm mm
d_{App} d_{Apb}	*striking distance through air*	terminal to terminal terminal to backside		3.2 6.8			mm mm
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq 1$ mA; 50/60 Hz	t = 1 sec. t = 1 minute	3000 2500			V V
C_P	*coupling capacity per switch*	between shorted terminals of one diode and back side metallization			20		pF

[1] further information see application note IXAN0073 on www.ixys.com/TechnicalSupport/appnotes.aspx (General / Isolation, Mounting, Soldering, Cooling)

Product Marking

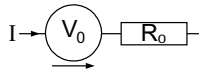


Part description

D = Diode
C = SiC
G = Extreme fast
160 = Current Rating [A]
X = Parallel legs
650 = Reverse Voltage [V]
NA = SOT-227 (minibloc)

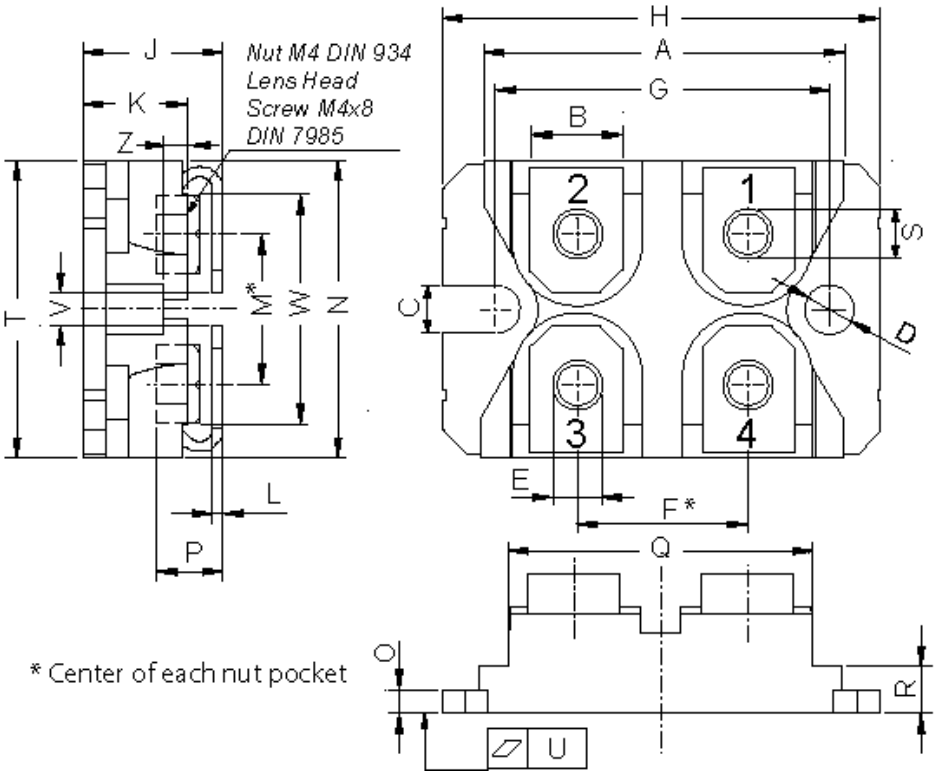
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	DCG160X650NA	DCG160X650NA	Tube	10	DCG160X650NA

Equivalent Circuits for Simulation **on die level*

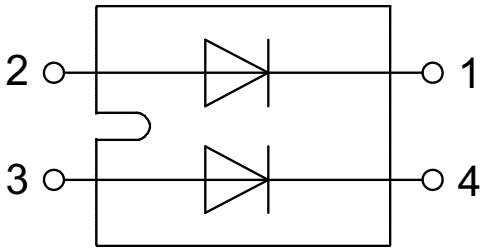


		T_{VJ} = 125°C	T_{VJ} = 175°C	
$V_{0\ max}$	*threshold voltage*	0.83	0.77	V
$R_{0\ max}$	*slope resistance* *	9.5	11.3	mΩ

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



SiC Diode (per leg)

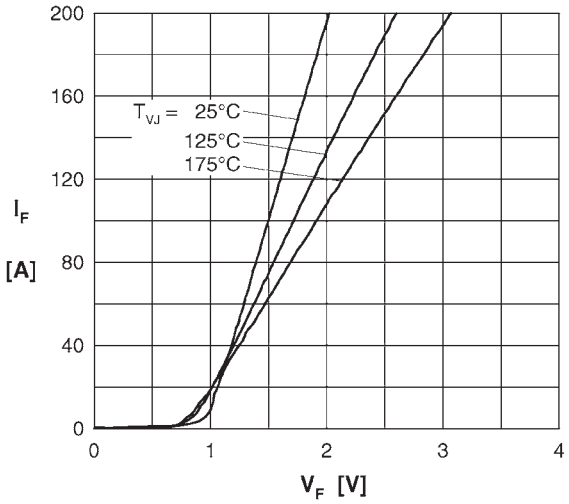


Fig. 1 Typ. forward characteristics

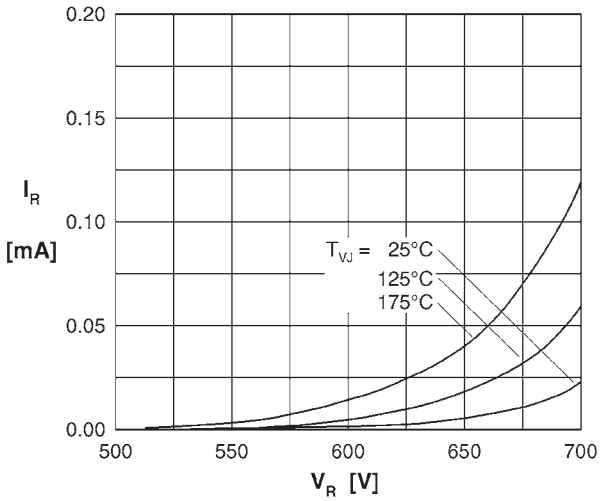


Fig. 2 Typ. reverse characteristics

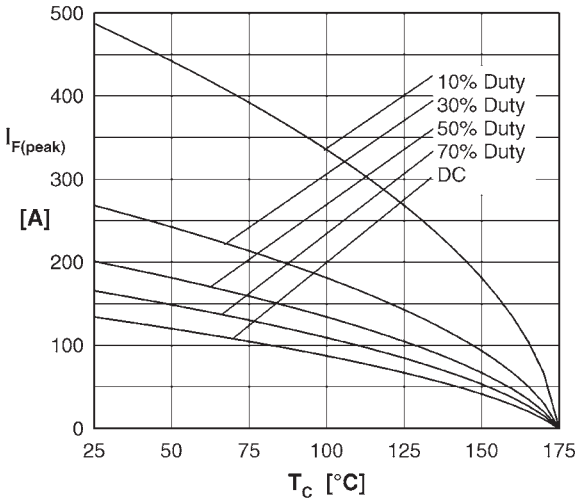


Fig. 3 Typ. current derating

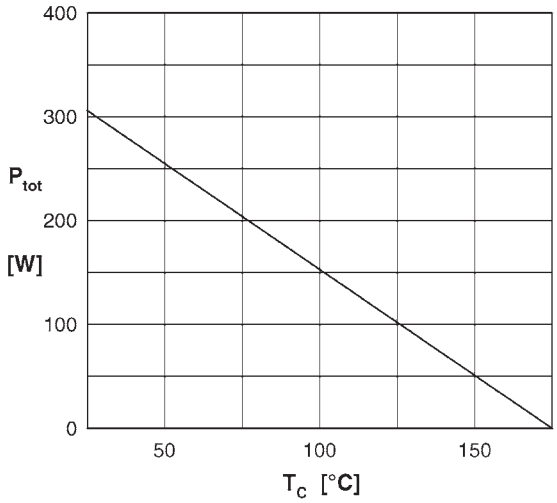


Fig. 4 Power derating

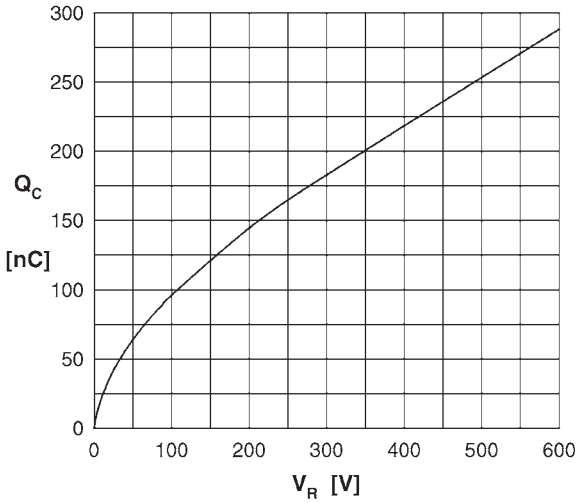


Fig. 5 Typ. recovery charge vs. reverse voltage

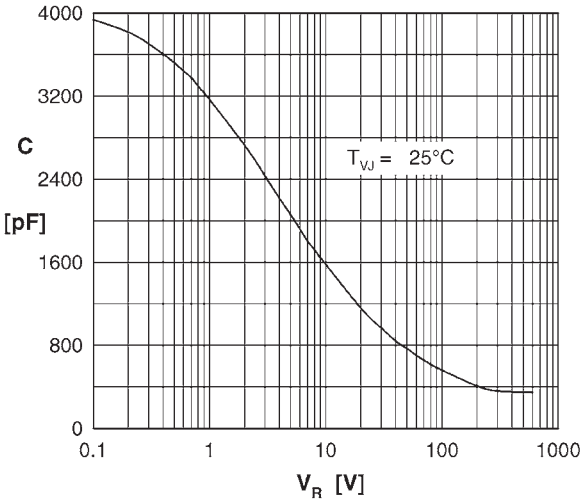


Fig. 6 Typ. junction capacitance vs. reverse Voltage

SiC Diode (per leg)

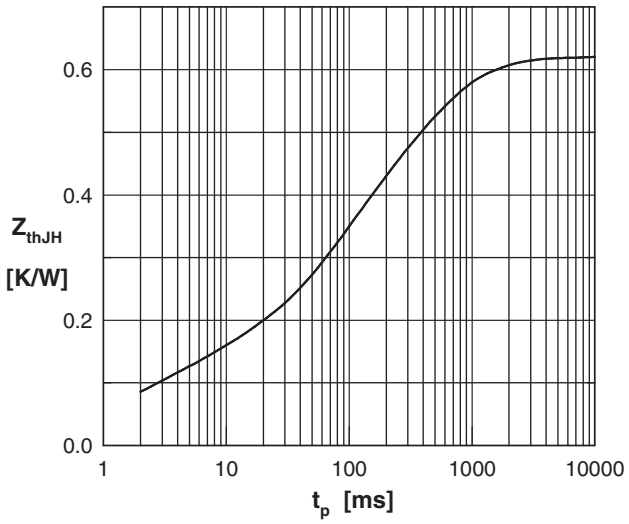


Fig. 7 Typ. transient thermal impedance