

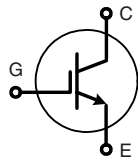
NPT³ IGBT

in miniBLOC package

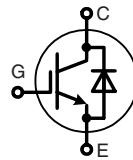
$$I_{C25} = 100 \text{ A}$$

$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 2.1 \text{ V}$$



IXEN 60N120

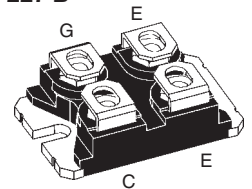


IXEN 60N120D1

miniBLOC, SOT-227 B



E153432



C = Collector
G = Gate
E = Emitter *

* Either Emitter terminal can be used as Main or Kelvin Emitter

IGBT

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	1200	V
V_{GES}		± 20	V
I_{C25}	$T_C = 25^{\circ}\text{C}$	100	A
I_{C90}	$T_C = 90^{\circ}\text{C}$	65	A
I_{CM} V_{CEK}	$V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	100 V_{CES}	A
t_{SC} (SCSOA)	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega; T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	445	W

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 60 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.1 2.5		2.7 V
$V_{GE(th)}$	$I_C = 2 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	0.8		0.8 mA mA
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			200 nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 60 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 22 \Omega$	80 50 680 30 7.2 4.8		ns ns ns ns mJ mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$	3.8		nF
Q_{Gon}	$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 50 \text{ A}$	350		nC
R_{thJC}				0.28 K/W

Features

- NPT³ IGBT
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance in resonant circuits
- optional HiPerFRED™ diode
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- miniBLOC package
 - isolated copper base plate
 - screw terminals
 - kelvin emitter terminal for easy drive
 - industry standard outline

Applications

- single switches
- choppers with complementary free wheeling diode
- phaselegs, H bridges, three phase bridges e.g. for
 - power supplies, UPS
 - AC, DC and SR drives
 - induction heating

Diode (D1 version only)

Symbol	Conditions	Maximum Ratings	
I_{F25}	$T_C = 25^\circ\text{C}$	110	A
I_{F90}	$T_C = 90^\circ\text{C}$	60	A

Characteristic Values

($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.
V_F	$I_F = 60\text{ A}$, $V_{GE} = 0\text{ V}$	2.3	2.7	V
	$I_F = 60\text{ A}$, $V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$	1.7		V
I_{RM}	$I_F = 60\text{ A}$, $-di_F/dt = 500\text{ A}/\mu\text{s}$, $V_R = 600\text{ V}$	41		A
t_{rr}	$V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$	200		ns
R_{thJC}			0.6	K/W

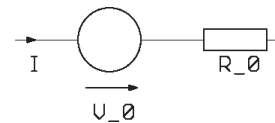
Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	$^\circ\text{C}$
T_{stg}		-40...+150	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}$; 50/60 Hz	2500	V~
M_D	mounting torque (M4)	1.5	Nm
	terminal connection torque (M4)	1.5	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R _{thCH}	with heatsink compound		0.1	K/W
Weight			30	g

Equivalent Circuits for Simulation

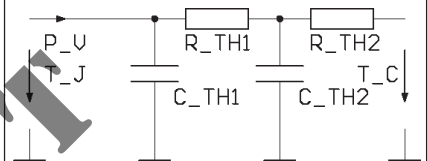
Conduction



IGBT (typ. at $V_{GE} = 15\text{ V}$; $T_J = 125^\circ\text{C}$)
 $V_0 = 0.99\text{ V}$; $R_0 = 25\text{ m}\Omega$

Diode (typ. at $T_J = 125^\circ\text{C}$)
 $V_0 = 1.3\text{ V}$; $R_0 = 7\text{ m}\Omega$

Thermal Response



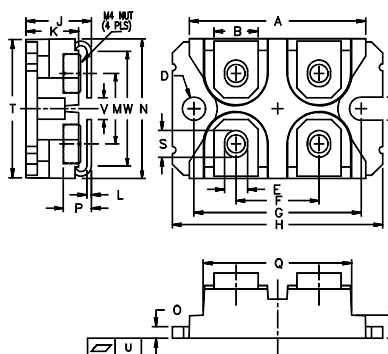
IGBT (typ.)

$C_{th1} = 0.14\text{ J/K}$; $R_{th1} = 0.20\text{ K/W}$
 $C_{th2} = 0.91\text{ J/K}$; $R_{th2} = 0.08\text{ K/W}$

Diode (typ.)

$C_{th1} = 0.08\text{ J/K}$; $R_{th1} = 0.45\text{ K/W}$
 $C_{th2} = 0.54\text{ J/K}$; $R_{th2} = 0.15\text{ K/W}$

miniBLOC, SOT-227 B



M4 screws (4x) supplied

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	38.20	1.489	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004
V	3.30	4.57	0.130	0.180
W	0.780	0.830	0.031	0.033

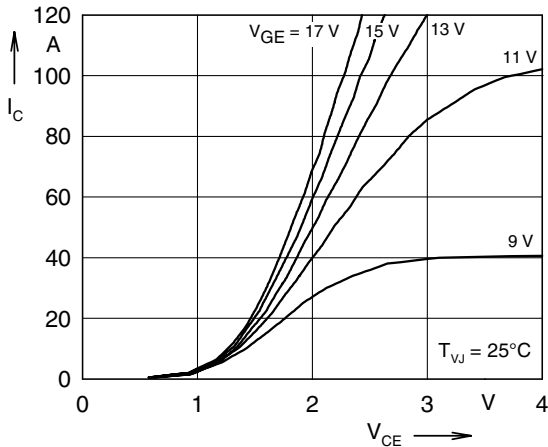


Fig. 1 Typ. output characteristics

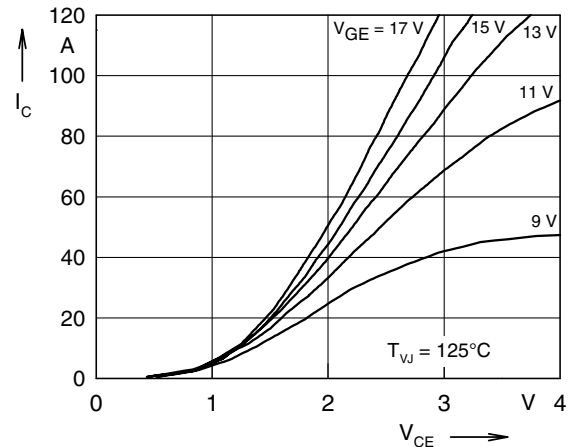


Fig. 2 Typ. output characteristics

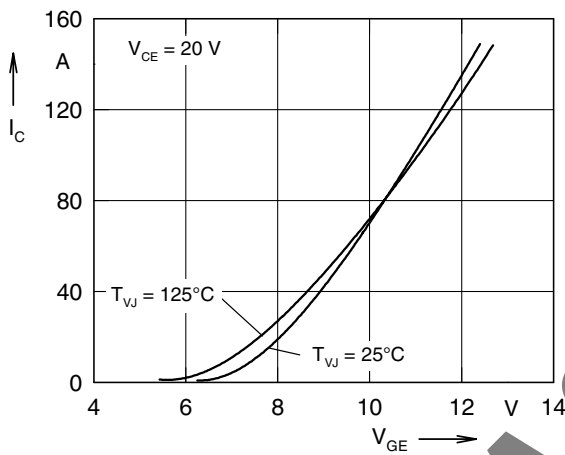


Fig. 3 Typ. transfer characteristics

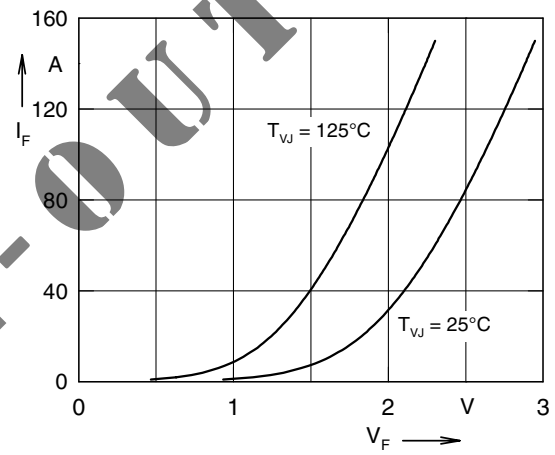


Fig. 4 Typ. forward characteristics of free wheeling diode

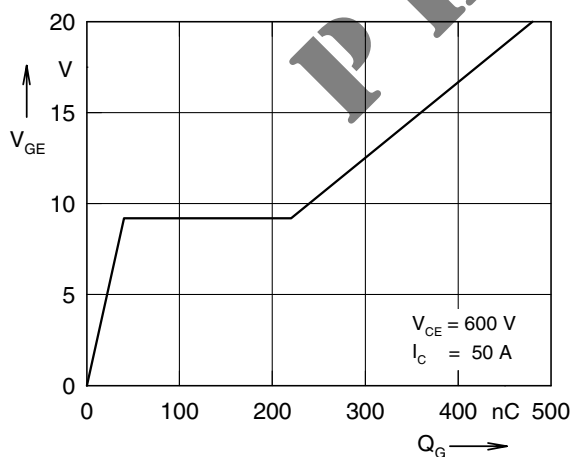


Fig. 5 Typ. turn on gate charge

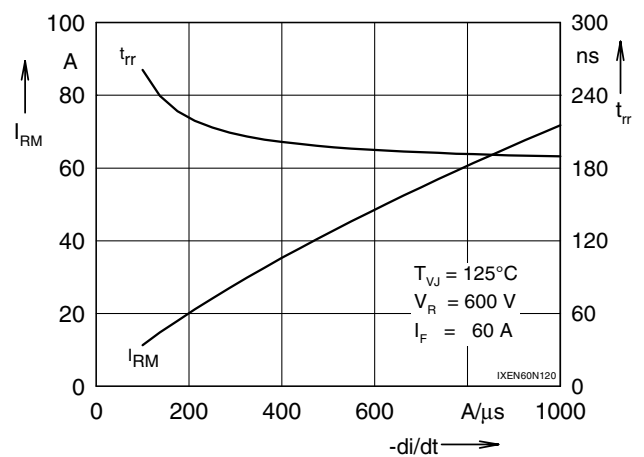


Fig. 6 Typ. turn off characteristics of free wheeling diode

