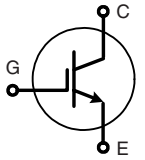
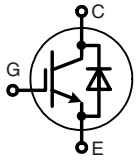
NPT³ IGBT
in miniBLOC package

I_{C25} = 100 A
V_{CES} = 1200 V
$V_{CE(sat)\,typ.}$ = 2.1 V

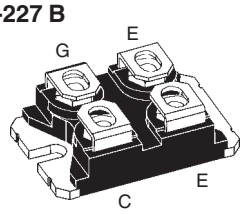


IXEN 60N120



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°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	100	A
I_{C90}	T_C = 90°C	65	A
I_{CM}	V_{GE} = ±15 V; R_G = 22 Ω; T_{VJ} = 125°C	100	A
V_{CEK}	RBSOA, Clamped inductive load; L = 100 µH	V_{CES}	
t_{SC} (SCSOA)	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 22 Ω; T_{VJ} = 125°C non-repetitive	10	µs
P_{tot}	T_C = 25°C	445	W

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

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Diode (D1 version only)

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	110	A
I_{F90}	T_C = 90°C	60	A

Characteristic Values
(T_J = 25°C, unless otherwise specified)

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

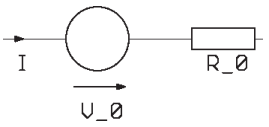
Component

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

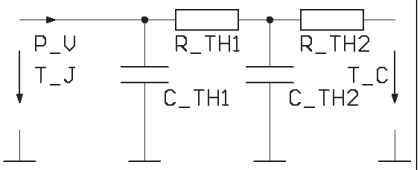
Conduction



IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_0 = 0.99 V; R_0 = 25 mΩ

Diode (typ. at T_J = 125°C)
V_0 = 1.3 V; R_0 = 7 mΩ

Thermal Response



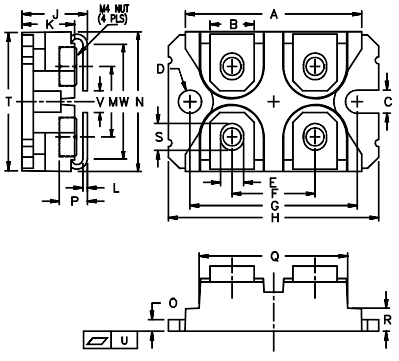
IGBT (typ.)

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

Diode (typ.)

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

miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter Min.	Max.	Inches 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	19.81	21.08

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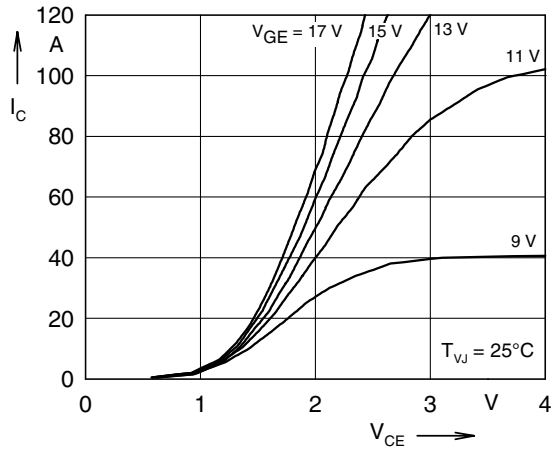

Fig. 1 Typ. output characteristics

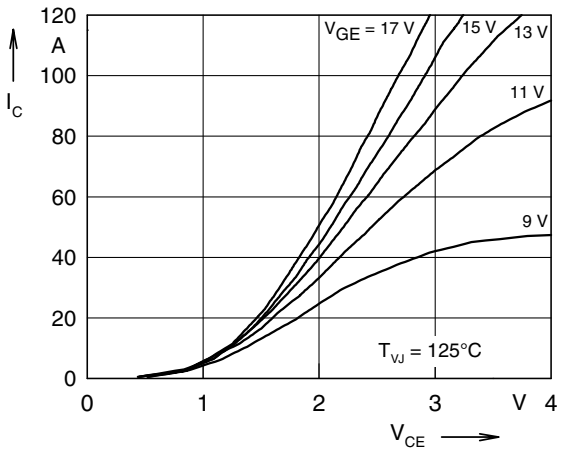

Fig. 2 Typ. output characteristics

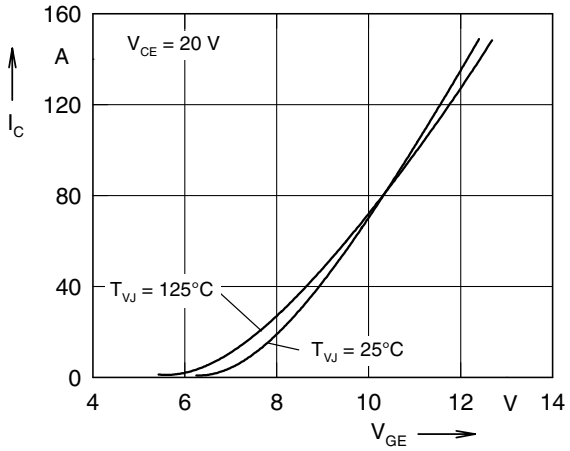

Fig. 3 Typ. transfer characteristics

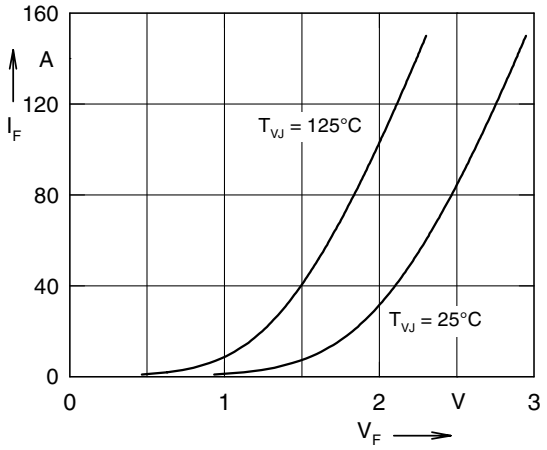

Fig. 4 Typ. forward characteristics of free wheeling diode

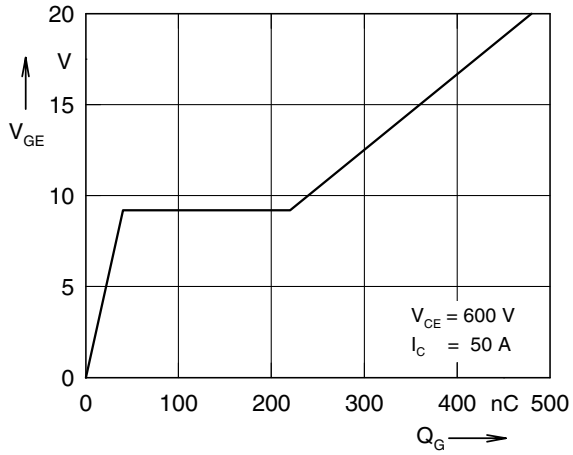

Fig. 5 Typ. turn on gate charge

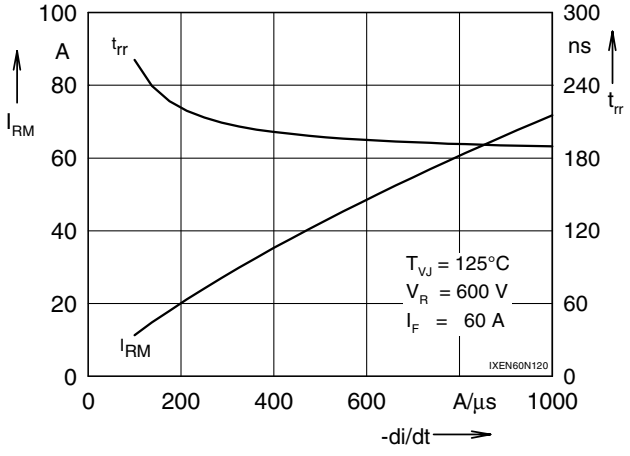

Fig. 6 Typ. turn off characteristics of free wheeling diode

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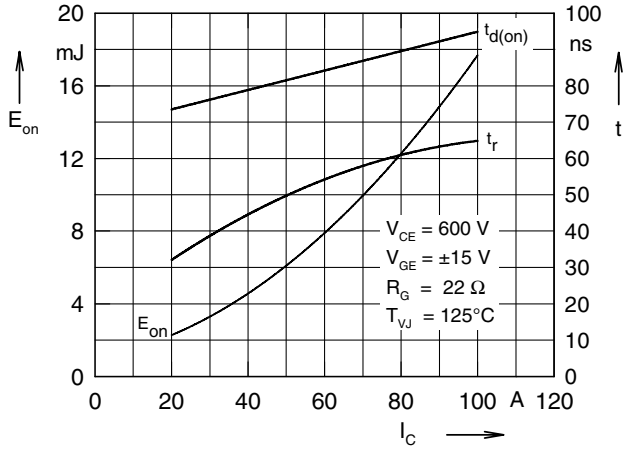

Fig. 7 Typ. turn on energy and switching times versus collector current

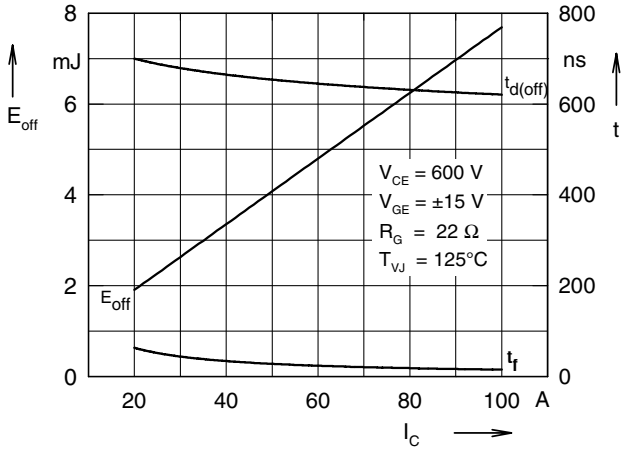

Fig. 8 Typ. turn off energy and switching times versus collector current

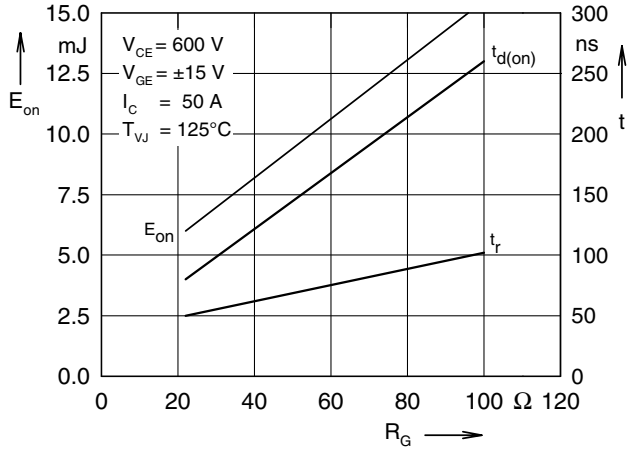

Fig. 9 Typ. turn on energy and switching times versus gate resistor

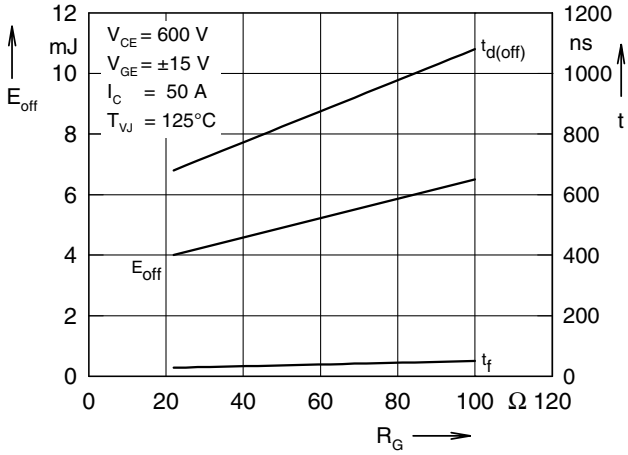

Fig.10 Typ. turn off energy and switching times versus gate resistor

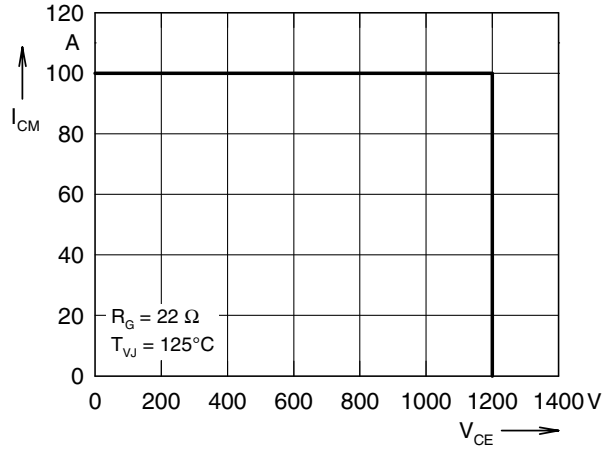

Fig. 11 Reverse biased safe operating area RBSOA

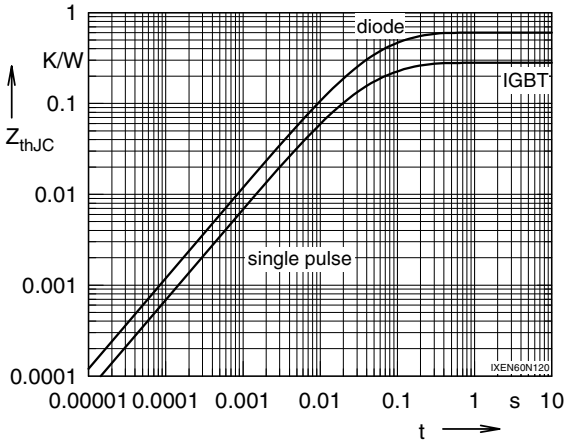

Fig. 12 Typ. transient thermal impedance

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