

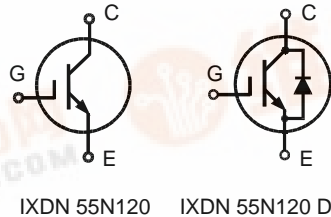


High Voltage IGBT with optional Diode

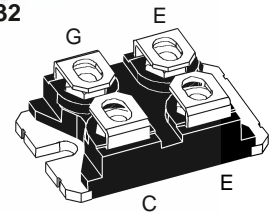
IXDN 55N120
IXDN 55N120 D1

$V_{CES} = 1200\text{ V}$
 $I_{C25} = 100\text{ A}$
 $V_{CE(sat) typ} = 2.3\text{ V}$

Short Circuit SOA Capability
Square RBSOA



miniBLOC, SOT-227 B
E153432



Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 20\text{ k}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	100	A
I_{C90}	$T_C = 90^\circ\text{C}$	62	A
I_{CM}	$T_C = 90^\circ\text{C}, t_p = 1\text{ ms}$	124	A
RBSOA	$V_{GE} = \pm 15\text{ V}, T_J = 125^\circ\text{C}, R_G = 22\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$	$I_{CM} = 100$ $V_{CEK} < V_{CES}$	A
t_{SC} (SCSOA)	$V_{GE} = \pm 15\text{ V}, V_{CE} = V_{CES}, T_J = 125^\circ\text{C}$ $R_G = 22\ \Omega$, non repetitive	10	μs
P_C	$T_C = 25^\circ\text{C}$	IGBT	450 W
		Diode	220 W
V_{ISOL}	50/60 Hz; $I_{ISOL} \leq 1\text{ mA}$	2500	V~
T_J		-40 ... +150	$^\circ\text{C}$
T_{stg}		-40 ... +150	$^\circ\text{C}$
M_d	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

E = Emitter ①, C = Collector
G = Gate, E = Emitter ①
① Either Emitter terminal can be used as Main or Kelvin Emitter

Features

- NPT IGBT technology
- low saturation voltage
- low switching losses
- square RBSOA, no latch up
- high short circuit capability
- positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- optional ultra fast diode
- International standard package miniBLOC

Advantages

- Space savings
- Easy to mount with 2 screws
- High power density

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{(BR)CES}$	$V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 2\text{ mA}, V_{CE} = V_{GE}$	4.5		V
I_{CES}	$V_{CE} = V_{CES}$	$T_J = 25^\circ\text{C}$		3.8 mA
		$T_J = 125^\circ\text{C}$	6	mA
I_{GES}	$V_{CE} = 0\text{ V}, V_{GE} = \pm 20\text{ V}$			$\pm 500\text{ nA}$
$V_{CE(sat)}$	$I_C = 55\text{ A}, V_{GE} = 15\text{ V}$	2.3	2.8	V

Typical Applications

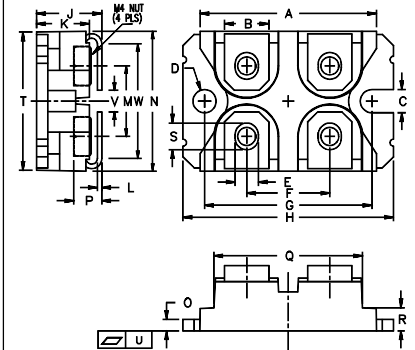
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies



Symbol	Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
C _{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		3300	pF
C _{oes}			500	pF
C _{res}			220	pF
Q _g	I _C = 50 A, V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		240	nC
t _{d(on)}	Inductive load, T _J = 125°C I _C = 55 A, V _{GE} = ±15 V, V _{CE} = 600 V, R _G = 22 Ω		100	ns
t _r			70	ns
t _{d(off)}			500	ns
t _f			70	ns
E _{on}				8.4
E _{off}			6.2	mJ
R _{thJC}	Package with heatsink compound			0.28 K/W
R _{thCK}			0.1	K/W

Reverse Diode (FRED) [D1 version only]
Characteristic Values
(T_J = 25°C, unless otherwise specified)

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V _F	I _F = 55 A, V _{GE} = 0 V	2.4	2.6	V
	I _F = 55 A, V _{GE} = 0 V, T _J = 125°C	1.9		V
I _F	T _C = 25°C		110	A
	T _C = 90°C		60	A
I _{RM}	I _F = 55 A, -di _F /dt = 400 A/μs, V _R = 600 V		40	A
t _{rr}	V _{GE} = 0 V, T _J = 125°C		200	ns
t _{rr}	I _F = 1 A, -di _F /dt = 100 A/μs, V _R = 30 V, V _{GE} = 0 V		40	ns
R _{thJC}				0.6 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

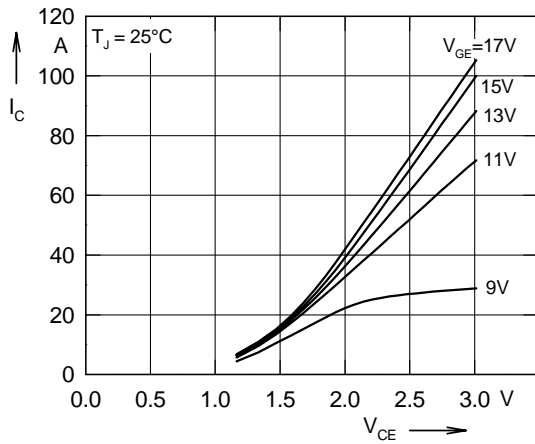


Fig. 1 Typ. output characteristics

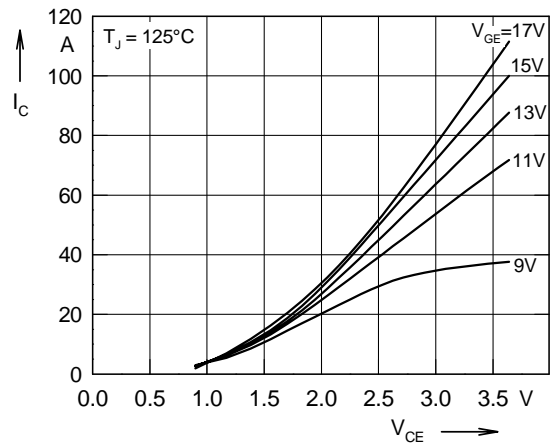


Fig. 2 Typ. output characteristics

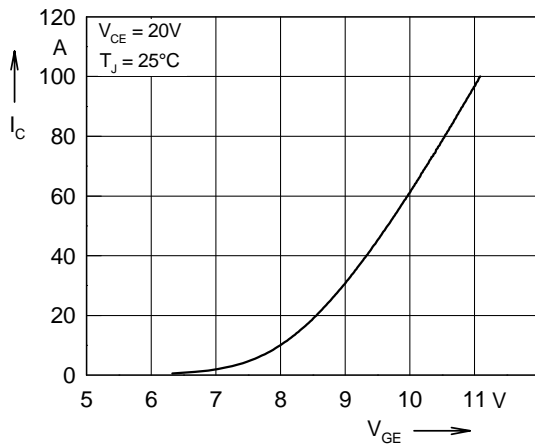


Fig. 3 Typ. transfer characteristics

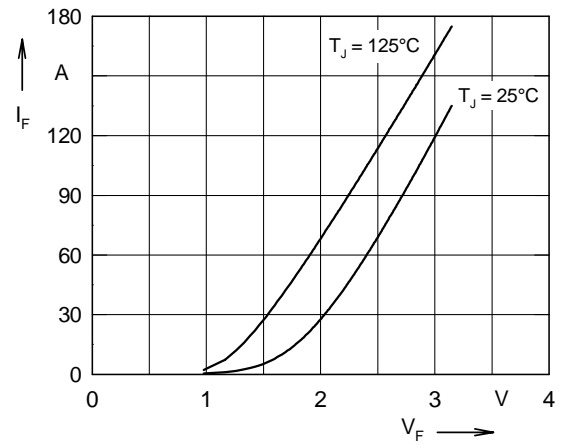


Fig. 4 Typ. forward characteristics of free wheeling diode

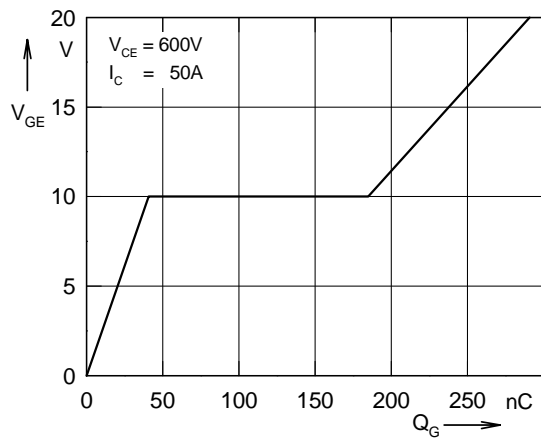


Fig. 5 Typ. turn on gate charge

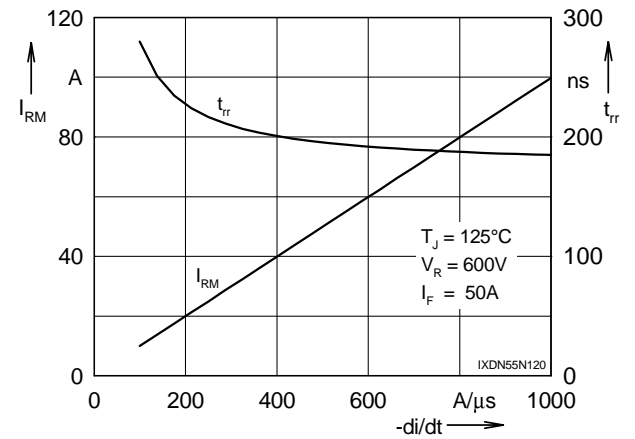


Fig. 6 Typ. turn off characteristics of free wheeling diode

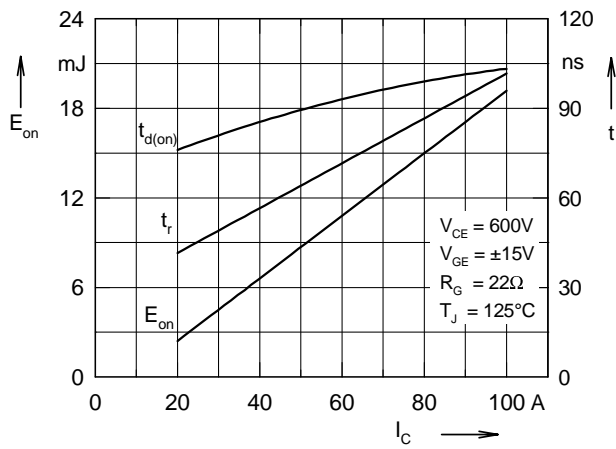


Fig. 7 Typ. turn on energy and switching times versus collector current

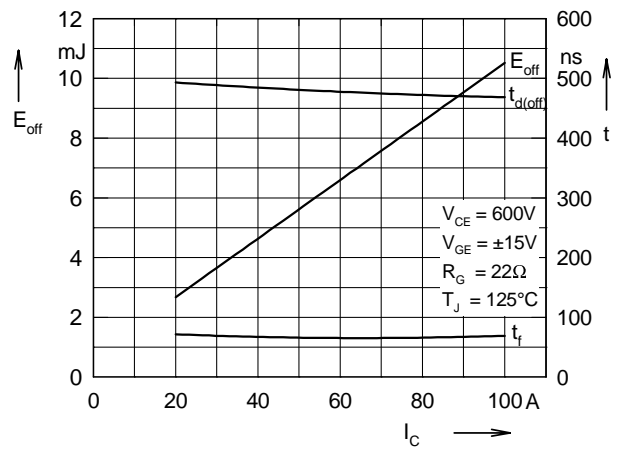


Fig. 8 Typ. turn off energy and switching times versus collector current

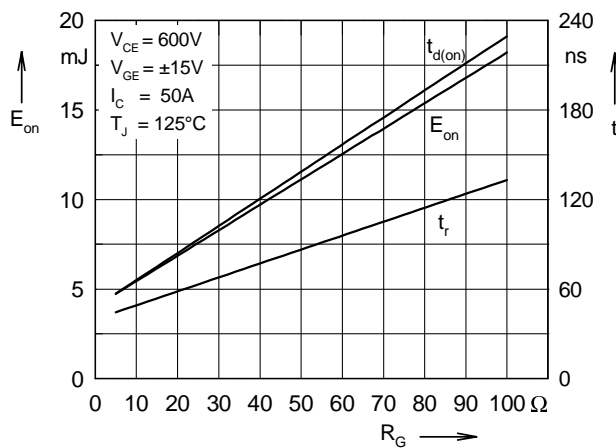


Fig. 9 Typ. turn on energy and switching times versus gate resistor

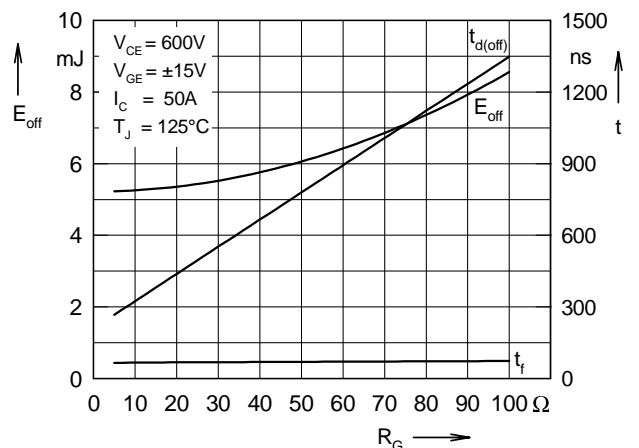


Fig. 10 Typ. turn off energy and switching times versus gate resistor

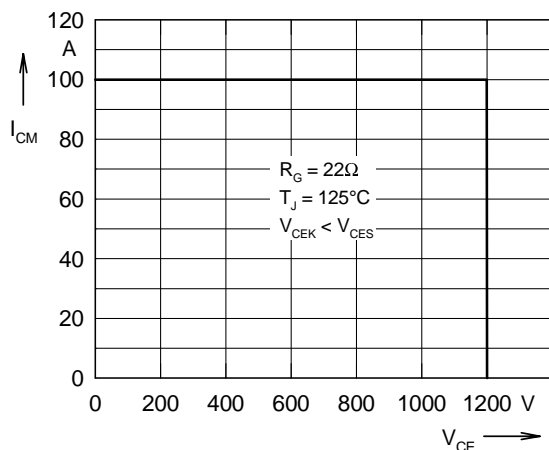


Fig. 11 Reverse biased safe operating area RBSOA

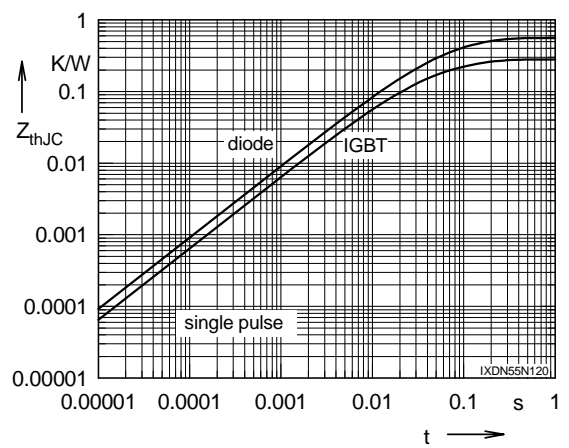


Fig. 12 Typ. transient thermal impedance