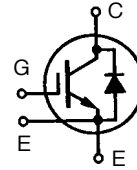


IGBT with Diode

IXSN 80N60BD1

Short Circuit SOA Capability

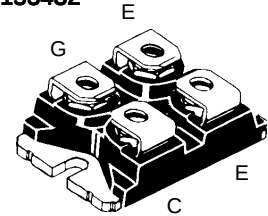
$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 160 \text{ A} \\ V_{CE(sat)} &= 2.5 \text{ V} \end{aligned}$$



Symbol	Test Conditions	Maximum	Ratings
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	600	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$	600	A
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	160	A
I_{C90}	$T_C = 90^\circ\text{C}$	80	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	300	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 5 \Omega$ Clamped inductive load	$I_{CM} = 160$ @ $0.8 V_{CES}$	A
t_{SC} (SCSOA)	$V_{GE} = 15 \text{ V}$, $V_{CE} = 360 \text{ V}$, $T_J = 125^\circ\text{C}$ $R_G = 22 \Omega$, non repetitive	10	μs
P_c	$T_C = 25^\circ\text{C}$	420	W
V_{ISOL}	50/60 Hz $I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ min}$ 2500	V~
		$t = 1 \text{ s}$ 3000	V~
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	0.4/6 Nm/lb.in.	
Weight		30	g

miniBLOC, SOT-227 B

Ⓢ E153432



E = Emitter ①, C = Collector
G = Gate, E = Emitter ①

① Either Emitter terminal can be used as Main or Kelvin Emitter

Features

- International standard package miniBLOC (ISOTOP) compatible
- Aluminium-nitride isolation
 - high power dissipation
- Isolation voltage 3000 V~
- UL registered E 153432
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- Fast Recovery Epitaxial Diode
 - short t_{rr} and I_{RM}
- Low collector-to-case capacitance (< 60 pF)
 - reduced RFI
- Low package inductance (< 10 nH)
 - easy to drive and to protect

Applications

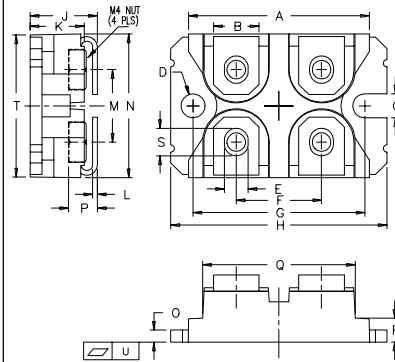
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Advantages

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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 500 \mu\text{A}$, $V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 8 \text{ mA}$, $V_{CE} = V_{GE}$	4		8 V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		200 μA
				2 mA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 200 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15 \text{ V}$			2.5 V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = 60\text{ A}$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$		46	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		8500	pF
C_{oes}			650	pF
C_{res}			120	pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		335	nC
Q_{ge}			88	nC
Q_{gc}			158	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = 2.7\text{ }\Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G		140	ns
t_{ri}			220	ns
$t_{d(off)}$			300	600 ns
t_{fi}			450	600 ns
E_{off}			10	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = 2.7\text{ }\Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G		140	ns
t_{ri}			220	ns
E_{on}			8	mJ
$t_{d(off)}$			520	ns
t_{fi}			550	ns
E_{off}			13	mJ
R_{thJC}				0.30 K/W
R_{thCK}			0.05	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	38.00	38.23	1.496	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

Reverse Diode (FRED)

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

Symbol	Test Conditions	typ.	max.
I_R	$T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$ $T_{VJ} = 150^\circ\text{C}$		650 μA 2.5 mA
V_F	$I_F = 60\text{ A}$ Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $d \leq 2\%$		1.75 V 2.40 V
I_{RM}	$I_F = I_{C90}$, $V_{GE} = 0\text{ V}$, $-di_F/dt = 100\text{ A}/\mu\text{s}$ $V_R = 540\text{ V}$, $T_J = 100^\circ\text{C}$		8.0 A
t_{rr}	$I_F = 1\text{ A}$, $-di/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	35	ns
R_{thJC}			0.85 K/W

IXYS reserves the right to change limits, test conditions, and dimensions.