

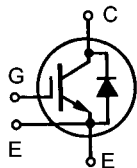
High Voltage IGBT with Diode

IXDN 50N120AU1

$V_{CES} = 1200 \text{ V}$
 $I_{C25} = 70 \text{ A}$
 $V_{CE(sat) \text{ typ}} = 2.5 \text{ V}$

Short Circuit SOA Capability

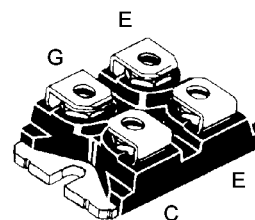
Preliminary Data



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	1200	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	70	A
I_{C90}	$T_C = 90^\circ\text{C}$	44	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	140	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 22 \Omega$ Clamped inductive load, $L = 30 \mu\text{H}$	$I_{CM} = 100$ @ V_{CES}	A
t_{SC} (SCSOA)	$V_{GE} = 15 \text{ V}$, $V_{CE} = V_{CES}$, $T_J = 125^\circ\text{C}$ $R_G = 22 \Omega$, non repetitive	10	μs
P_C	$T_C = 25^\circ\text{C}$	IGBT	350 W
P_D		Diode	165 W
V_{ISOL}	50/60 Hz $I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ min}$ $t = 1 \text{ s}$	2500 V~ 3000 V~
T_J		-40 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-40 ... +150	$^\circ\text{C}$
M_d	Mounting torque Terminal connection torque (M4)	1.5/13	Nm/lb.in. Nm/lb.in.
Weight		30	g

miniBLOC, SOT-227 B

E153432



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

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

Features

- Square RBSOA
- International standard package miniBLOC
- Isolation voltage 3000 V~
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- Fast Recovery Epitaxial Diode
 - short t_{tr} and I_{RM}
- Low collector-to-case capacitance (< 50 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

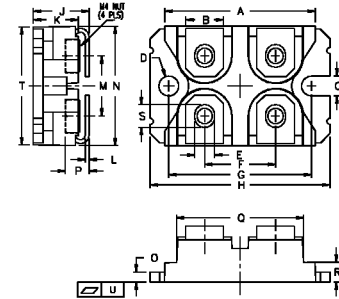
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 5 \text{ mA}$, $V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 4 \text{ mA}$, $V_{CE} = V_{GE}$	4	5.5	6.5 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$			500 μA 17 mA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 500 \text{ nA}$
$V_{CE(sat)}$	$I_C = 50$, $V_{GE} = 15 \text{ V}$		2.5	3 V

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

L214 (7/9)48

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		3300	pF	
C_{oes}			500	pF	
C_{res}			220	pF	
Q_g	$I_C = 50\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		240	nC	
Q_{ge}			TBD	nC	
Q_{gc}			TBD	nC	
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 50\text{ A}, V_{GE} = 15\text{ V},$ $V_{CE} = 600\text{ V}, R_{on/off} = 22\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_C		45	100	ns
t_{ri}			60	100	ns
$t_{d(off)}$			380	500	ns
t_{fi}			70	100	ns
E_{on}			TBD		mJ
E_{off}			4.5		mJ
R_{thJC}				0.35	K/W
R_{thCK}			0.1		K/W

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
V_F	$I_F = 50\text{ A}, V_{GE} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			2.1	V
I_{RM}	$I_F = 50\text{ A}, V_{GE} = 0\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $T_J = 100^\circ\text{C}$		25	30	A
t_{rr}	$I_F = 50\text{ A}, V_{GE} = 0\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $T_J = 100^\circ\text{C}$		250		ns
	$I_F = 1\text{ A}; -di/dt = 200\text{ A}/\mu\text{s}; V_R = 30\text{ V}$ $T_J = 25^\circ\text{C}$		40	60	ns
R_{thJC}				0.75	K/W

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M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.5	31.7	1.241	1.249
B	7.8	8.2	0.307	0.323
C	4.0	-	0.158	-
D	4.1	4.3	0.162	0.169
E	4.1	4.3	0.162	0.169
F	14.9	15.1	0.587	0.595
G	30.1	30.3	1.186	1.193
H	38.0	38.2	1.497	1.505
J	11.8	12.2	0.465	0.481
K	8.9	9.7	0.351	0.382
L	0.75	0.85	0.030	0.033
M	12.6	12.8	0.496	0.504
N	25.2	25.4	0.993	1.001
O	1.95	2.05	0.077	0.081
P	-	5.0	-	0.197