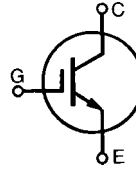


# HIGH Voltage IGBT

**IXSA 15N120B**  
**IXSP 15N120B**

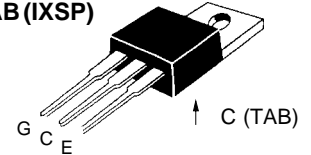
$V_{CES} = 1200 \text{ V}$   
 $I_{C25} = 30 \text{ A}$   
 $V_{CE(sat)} = 3.4 \text{ V}$

"S" Series - Improved SCSOA Capability

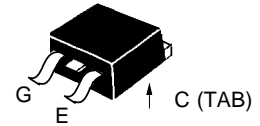


Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
$V_{CGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	1200	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	30	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	15	A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	60	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 10 \Omega$ Clamped inductive load	$I_{CM} = 40$ @ $0.8 V_{CES}$	A
$t_{SC}$	$T_J = 125^\circ\text{C}, V_{GE} = 720 \text{ V}; V_{GE} = 15 \text{ V}, R_G = 10 \Omega$ Non repetitive	10	$\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$	150	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$M_d$	Mounting torque	(TO-247)	1.13/10 Nm/lb.in.
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
Maximum tab temperature for soldering		(TO-263)	260 $^\circ\text{C}$
<b>Weight</b>		TO-220	4 g
		TO-263	2 g

TO-220AB (IXSP)



TO-263 AA (IXSA)



## Features

- International standard packages JEDEC TO-220AB and TO-263AA
- Low switching losses, low  $V_{(sat)}$
- MOS Gate turn-on - drive simplicity

## Applications

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

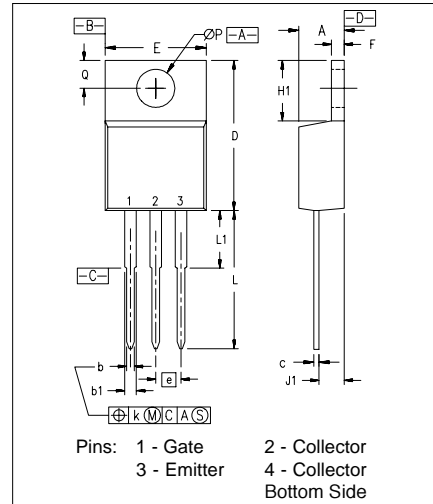
## Advantages

- Easy to mount with one screw
- Reduces assembly time and cost
- High power density

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	3		V
$I_{CES}$	$V_{CE} = V_{CES}, T_J = 25^\circ\text{C}$			50 $\mu\text{A}$
	$V_{GE} = 0 \text{ V}, T_J = 125^\circ\text{C}$			2.5 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{CE90}, V_{GE} = 15$ $T_J = 125^\circ\text{C}$		3.0	V
			2.8	V

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
$g_{fs}$	$I_C = I_{C90}$ ; $V_{CE} = 10\text{ V}$ , Note2	7	9.5	S	
$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		1400	pF	
$C_{oes}$			98	pF	
$C_{res}$			37	pF	
$Q_g$	$I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5 V_{CES}$		57	nC	
$Q_{ge}$			14	nC	
$Q_{gc}$			25	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ $V_{CE} = 960\text{ V}$ , $R_G = R_{off} = 10\ \Omega$ Note3		30	ns	
$t_{ri}$			25	ns	
$t_{d(off)}$			148	280	ns
$t_{fi}$			160	320	ns
$E_{off}$			1.75	3.0	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ $V_{CE} = 960\text{ V}$ , $R_G = R_{off} = 10\ \Omega$ Note3		30	ns	
$t_{ri}$			25	ns	
$E_{on}$			1.1	mJ	
$t_{d(off)}$			265	ns	
$t_{fi}$			298	ns	
$E_{off}$		3.1	mJ		
$R_{thJC}$	TO-220		0.83	K/W	
$R_{thCK}$			0.5	K/W	

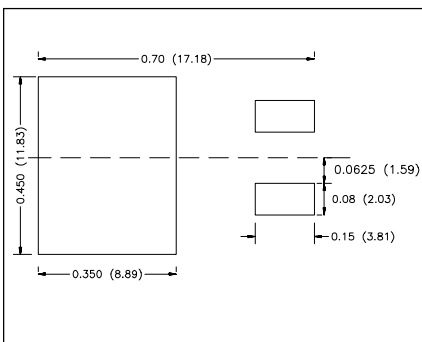
### TO-220 AB Dimensions



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
$\varnothing P$	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

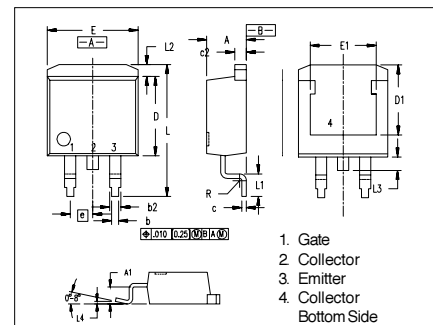
NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-220 AB.

- Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.
2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$
3. Switching times may increase for  $V_{CE}(\text{Clamp}) > 0.8 V_{CES}$ , higher  $T_J$  or increased  $R_G$ .



### Min. Recommended Footprint (Dimensions in inches and mm)

### TO-263 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592 4,881,106 5,017,508  
4,850,072 4,931,844 5,034,796

5,049,961 5,187,117  
5,063,307 5,237,481

5,486,715 6,306,728B1  
5,381,623