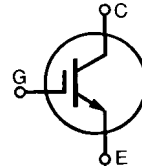


# IGBT

**IXSH 35N120B**  
**IXST 35N120B**

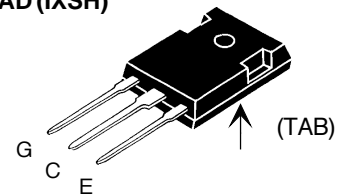
$I_{C25} = 70 \text{ A}$   
 $V_{CES} = 1200 \text{ V}$   
 $V_{CE(sat)} = 3.6 \text{ V}$

"S" Series - Improved SCSOA Capability

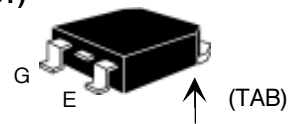


Symbol	Test Conditions	Maximum Ratings
$V_{CES}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200 V
$V_{CGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	1200 V
$V_{GES}$	Continuous	$\pm 20$ V
$V_{GEM}$	Transient	$\pm 30$ V
$I_{C25}$	$T_C = 25^\circ\text{C}$	70 A
$I_{C90}$	$T_C = 90^\circ\text{C}$	35 A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	140 A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 5 \Omega$ Clamped inductive load	$I_{CM} = 90$ @ $0.8 V_{CES}$ A
$t_{sc}$	$T_J = 125^\circ\text{C}, V_{CE} = 720 \text{ V}; V_{GE} = 15 \text{ V}, R_G = 22 \Omega$	10 $\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$	300 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 $^\circ\text{C}$
<b>Weight</b>	TO-247	6 g
	TO-268	4 g

TO-247 AD (IXSH)



TO-268 (IXST)



G = Gate  
E = Emitter

C = Collector  
TAB = Collector

## Features

- Epitaxial Silicon drift region
  - fast switching
  - small tail current
- MOS gate turn-on for drive simplicity

## Applications

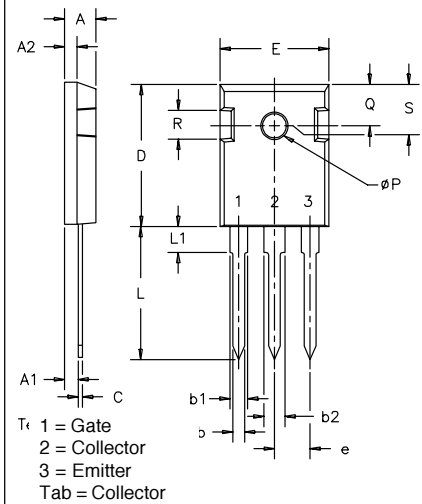
- AC motor speed control
- DC servo and robot drives
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- DC choppers

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$BV_{CES}$	$I_C = 1.0 \text{ mA}, V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	3		6 V
$I_{CES}$	$V_{CE} = 0.8 V_{CES}$ Note 1	$T_J = 25^\circ\text{C}$		50 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$		2.5 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15 \text{ V}$ Note 2	$T_J = 25^\circ\text{C}$		3.6 V
		$T_J = 125^\circ\text{C}$		2.9 V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$I_C = I_{C90}; V_{CE} = 10\text{ V}$ , Note 2	16	23	S
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		3600	pF
$C_{oes}$		260	pF	
$C_{res}$		75	pF	
$Q_g$	$I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		120	nC
$Q_{ge}$		33	nC	
$Q_{gc}$		49	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>		36	ns
$t_{ri}$	$I_C = I_{C90}, V_{GE} = 15\text{ V}$		27	ns
$t_{d(off)}$	$R_G = 5\ \Omega$		160	300 ns
$t_{fi}$	$V_{CE} = 0.8 V_{CES}$		180	300 ns
$E_{off}$	Note 3		5	9 mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>		38	ns
$t_{ri}$	$I_C = I_{C90}, V_{GE} = 15\text{ V}$		29	ns
$E_{on}$	$R_G = 5\ \Omega, V_{CE} = 0.8 V_{CES}$		2.5	mJ
$t_{d(off)}$	Note 3		240	ns
$t_{fi}$			340	ns
$E_{off}$			9	mJ
$R_{thJC}$	(TO-247)			0.42 K/W
$R_{thCK}$		0.25		K/W

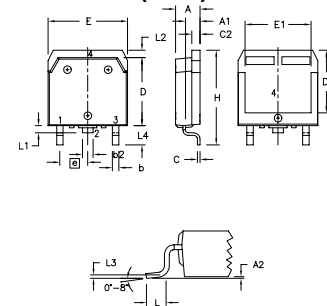
- Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.
2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$
3. Switching times may increase for  $V_{CE}$  (Clamp)  $> 0.8 V_{CES}$ , higher  $T_J$  or increased  $R_G$ .

### TO-247 AD Outline (IXSH)



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.7	5.3
A1	.087	.102	2.2	2.54
A2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b1	.065	.084	1.65	2.13
b2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.177		4.50	
$\phi P$	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

### TO-268 Outline (IXST)



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.9	5.1	.193	.201
A1	2.7	2.9	.106	.114
A2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

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

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