IXYS

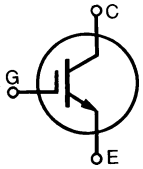
High Voltage IGBT

IXSH 45N120B
IXST 45N120B

"S" Series - Improved SCSOA Capability

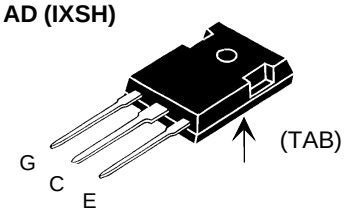
I_{C25} = 75 A
V_{CES} = 1200 V
$V_{CE(sat)}$ = 3.0 V

Preliminary data

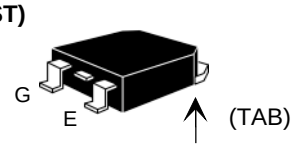


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (limited by leads)	75	A
I_{C90}	T_C = 90°C	45	A
I_{CM}	T_C = 25°C, 1 ms	180	A
SSOA (RBSOA)	V_{GE} = 15 V, T_J = 125°C, R_G = 5 Ω Clamped inductive load	I_{CM} = 90 @ 0.8 V_{CES}	A
t_{SC}	T_J = 125°C, V_{GE} = 720 V; V_{GE} = 15 V, R_G = 5 Ω	10	µs
P_C	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°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	°C
Weight	TO-247	6	g

TO-247 AD (IXSH)



TO-268 (IXST)



G = Gate C = Collector
S = Emitter TAB = Collector

Features

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

Applications

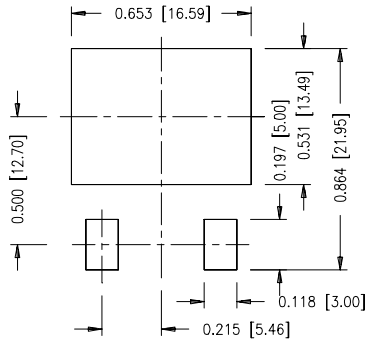
- AC motor speed control
- DC servo and robot drives
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- Welding

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 1.0 mA, V_{GE} = 0 V		1200			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}		3		6	V
I_{CES}	V_{CE} = 0.8 • V_{CES}				50	µA
	Note 1	T_J = 125°C			2.5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V			2.5	3.0	V
	Note 2	T_J = 125°C		2.6		V

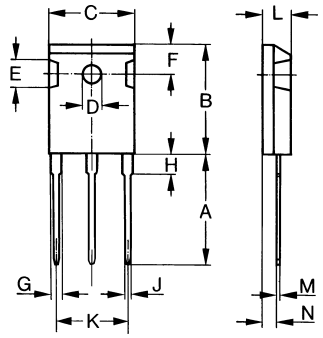
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 10 V, Note 2	16	23		S
C_{ies}			3300		pF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		240		pF
C_{res}			65		pF
Q_g			120		nC
Q_{ge}	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		40		nC
Q_{gc}			45		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		36		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		27		ns
$t_{d(off)}$	R_G = 5 Ω		360	500	ns
t_{fi}	V_{CE} = 0.8 V_{CES}		380	750	ns
E_{off}	Note 3		13	22	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		38		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		29		ns
E_{on}	R_G = 5 Ω, V_{CE} = 0.8 V_{CES}		2.9		mJ
$t_{d(off)}$	Note 3		440		ns
t_{fi}			700		ns
E_{off}			22		mJ
R_{thJC}				0.42	K/W
R_{thCK}	(TO-247)		0.25		K/W

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

Min. Recommended Footprint

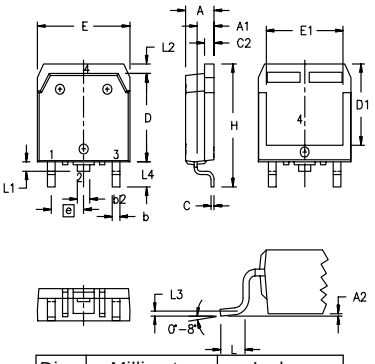


TO-247 AD (IXSH) Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

TO-268AA (D^3 PAK)



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	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
E_1	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

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