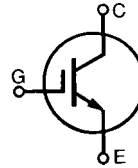


High Speed IGBT

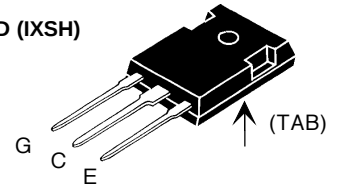
Short Circuit SOA Capability

$$\begin{aligned} \text{IXSH } 24\text{N60B } V_{\text{CES}} &= 600 \text{ V} \\ \text{IXST } 24\text{N60B } I_{\text{C25}} &= 48 \text{ A} \\ V_{\text{CE(sat)}} &= 2.5 \text{ V} \\ t_{\text{fi typ}} &= 170 \text{ ns} \end{aligned}$$

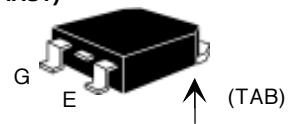


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{\text{GE}} = 1 \text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	48	A
I_{C90}	$T_C = 90^\circ\text{C}$	24	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	96	A
SSOA (RBSOA)	$V_{\text{GE}} = 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 33 \Omega$ Clamped inductive load, $V_{\text{CC}} = 0.8 V_{\text{CES}}$	$I_{\text{CM}} = 48$ @ $0.8 V_{\text{CES}}$	A
t_{SC} (SCSOA)	$V_{\text{GE}} = 15 \text{ V}, V_{\text{CE}} = 360 \text{ V}, T_J = 125^\circ\text{C}$ $R_G = 33 \Omega$, non repetitive	10	μs
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	1.13/10 Nm/lb.in.	
Weight		6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

TO-247 AD (IXSH)



TO-268 (D3) (IXST)



G = Gate
E = Emitter

TAB = Collector

Features

- International standard packages
- Guaranteed Short Circuit SOA capability
- Low $V_{\text{CE(sat)}}$
 - for low on-state conduction losses
- High current handling capability
- MOS Gate turn-on
 - drive simplicity
- Fast Fall Time for switching speeds up to 50 kHz

Applications

- AC and DC motor speed control
- Uninterruptible power supplies (UPS)
- Welding

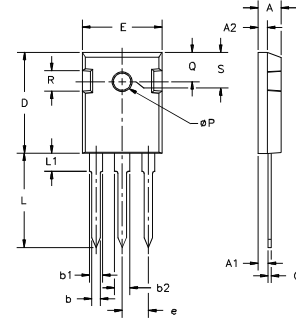
Advantages

- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250 \mu\text{A}, V_{\text{GE}} = 0 \text{ V}$	600		V
$V_{\text{GE(th)}}$	$I_C = 1.5 \text{ mA}, V_{\text{CE}} = V_{\text{GE}}$	3.5		6.5 V
I_{CES}	$V_{\text{CE}} = 0.8 V_{\text{CES}}, T_J = 25^\circ\text{C}$ $V_{\text{GE}} = 0 \text{ V}, T_J = 125^\circ\text{C}$			25 μA 1 mA
I_{GES}	$V_{\text{CE}} = 0 \text{ V}, V_{\text{GE}} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{\text{CE(sat)}}$	$I_C = I_{\text{C90}}, V_{\text{GE}} = 15 \text{ V}$			2.5 V

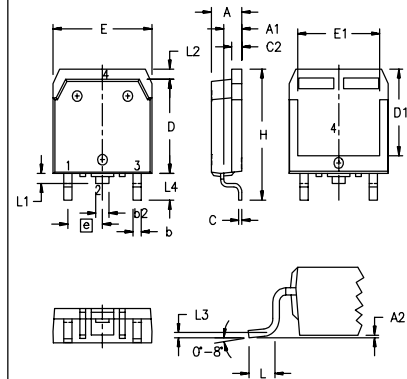
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	9	13	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		1450	pF
C_{oes}			130	pF
C_{res}			37	pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		41	nC
Q_{ge}			18	nC
Q_{gc}			18	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = 33\text{ }\Omega$		50	ns
t_{ri}			50	ns
$t_{d(off)}$			150	ns
t_{fi}			170	ns
E_{off}			1.3	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.8 V_{CES}$, $R_G = 33\text{ }\Omega$		55	ns
t_{ri}			75	ns
E_{on}			1.2	mJ
$t_{d(off)}$			190	ns
t_{fi}			280	ns
E_{off}			2.4	mJ
R_{thJC}		0.25	0.83 K/W	
R_{thCK}			K/W	

TO-247 AD Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	.242	BSC

TO-268 Outline



Dim.	Millimeter		Inches	
	Min.	Max.	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	.075	.083
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

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 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025