

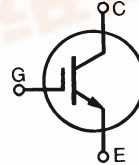


Preliminary data

HiPerFAST™ IGBT

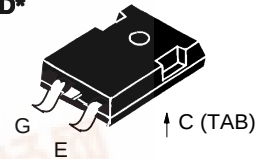
IXGH22N50B IXGH22N50BS

$$\begin{aligned} V_{CES} &= 500 \text{ V} \\ I_{C(25)} &= 44 \text{ A} \\ V_{CE(sat)typ} &= 2.1 \text{ V} \\ t_{fi(typ)} &= 55 \text{ ns} \end{aligned}$$

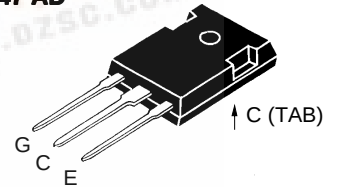


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	500	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	500	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	44	A
I_{C90}	$T_C = 90^\circ\text{C}$	22	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	88	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 44 \text{ A}$ @ $0.8 V_{CES}$	
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	$^\circ\text{C}$
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight	TO-247 AD	6	g
	TO-247 SMD	4	g

TO-247 SMD*



TO-247 AD



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

Features

- International standard packages
JEDEC TO-247 SMD surface mountable and JEDEC TO-247 AD
- High frequency IGBT
- High current handling capability
- HiPerFAST™ HDMOS™ process
- MOS Gate turn-on
- drive simplicity

Applications

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

Advantages

- High power density
- Very low switching losses for high frequency applications
- Easy to mount with 1 screw, TO-247 (insulated mounting screw hole)

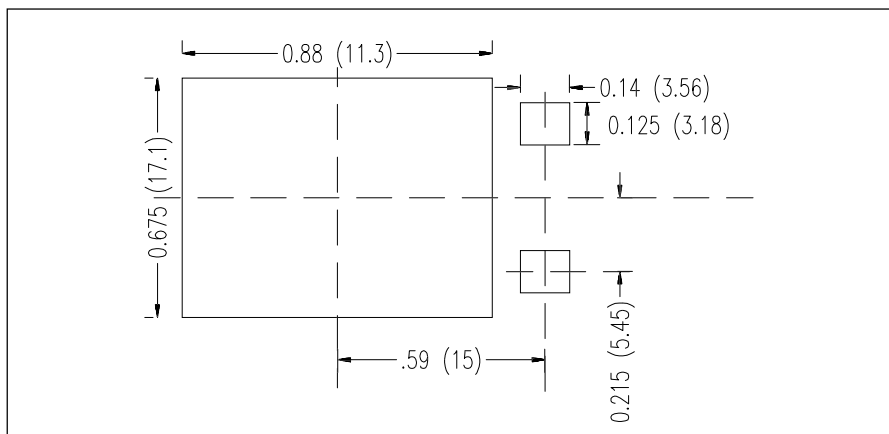
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	500		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	2.5		V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$			$200 \mu\text{A}$ 1 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$		± 100	nA
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15 \text{ V}$		2.1	2.5 V



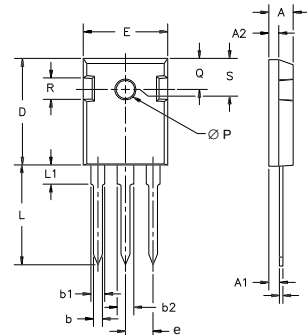
Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}, V_{CE} = 10 \text{ V}$, Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$	9	16	S
C_{ies}	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$	120	1450	pF
C_{oes}			37	pF
C_{res}				
Q_{gs}	$I_C = I_{C90}, V_{GE} = 15 \text{ V}, V_{CE} = 0.5 V_{CES}$		90	nC
Q_{ge}			11	nC
Q_{gc}			30	nC
$t_{d(on)}$	Inductive load, T_J = 25°C $I_C = I_{C90}, V_{GE} = 15 \text{ V}, L = 100 \mu\text{H}$, $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10 \Omega$ Note 1		15	ns
$t_{r(on)}$			30	ns
E_{on}			0.15	mJ
$t_{d(off)}$			100	ns
$t_{r(off)}$			55	ns
E_{off}			0.3	mJ
$t_{d(on)}$	Inductive load, T_J = 125°C $I_C = I_{C90}, V_{GE} = 15 \text{ V}, L = 100 \mu\text{H}$, $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10 \Omega$ Note 1		15	ns
$t_{r(on)}$			30	ns
E_{on}			0.15	mJ
$t_{d(off)}$			140	ns
$t_{r(off)}$			100	ns
E_{off}			0.6	mJ
R_{thJC}				0.83 K/W
R_{thCK}			0.25	K/W

Note 1: Switching times may increase for $V_{CE} \text{ (Clamp)} > 0.8 \cdot V_{CES}$, higher T_J or increased R_G

Min. Recommended Footprint (Dimensions in inches and mm)

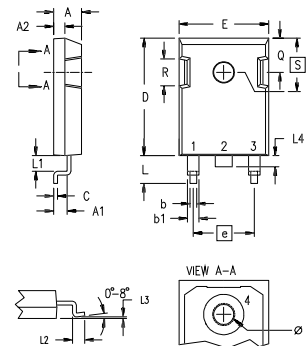


TO-247 AD Outline



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-247 SMD Outline



1. Gate
2. Collector
3. Emitter
4. Collector

Dim.	Millimeter	Inches
	Min. Max.	Min. Max.
A	4.83 5.21	.190 .205
A ₁	2.29 2.54	.090 .100
A ₂	1.91 2.16	.075 .085
b	1.14 1.40	.045 .055
b ₁	1.91 2.13	.075 .084
C	0.61 0.80	.024 .031
D	20.80 21.34	.819 .840
E	15.75 16.13	.620 .635
e	5.45 BSC	.215 BSC
L	4.90 5.10	.193 .201
L1	2.70 2.90	.106 .114
L2	2.10 2.30	.083 .091
L3	0.00 0.10	.00 .004
L4	1.90 2.10	.075 .083
ØP	3.55 3.65	.140 .144
Q	5.59 6.20	.220 .244
R	4.32 4.83	.170 .190
S	6.15 BSC	.242 BSC