

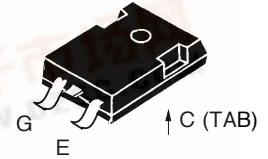


HiPerFAST™ IGBT

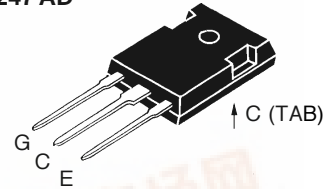
	V_{CES}	I_{C25}	$V_{CE(sat)}$	t_{fi}
IXGH 40N30/S	300 V	60 A	1.8 V	220ns
IXGH 40N30A/S	300 V	60 A	2.1 V	120ns
IXGH 40N30B/S	300 V	60 A	2.4 V	75 ns

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	300	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\ \text{M}\Omega$	300	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	60	A
I_{C90}	$T_C = 90^\circ\text{C}$	40	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	160	A
SSOA (RBSOA)	$V_{GE} = 15\ \text{V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$	$I_{CM} = 80$ @ $0.8\ V_{CES}$	A
P_c	$T_C = 25^\circ\text{C}$	200	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	$^\circ\text{C}$
	Maximum Tab temperature for soldering SMD devices for 10 s	260	$^\circ\text{C}$
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, E = Emitter, C = Collector, TAB = Collector
* Add suffix letter "S" for surface mountable package

Features

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

Applications

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

Advantages

- High power density
- Suitable for surface mounting
- Switching speed for high frequency applications
- Easy to mount with 1 screw, (isolated mounting screw hole)

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250\ \mu\text{A}$, $V_{GE} = 0\ \text{V}$	300		V
$V_{GE(th)}$	$I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$	2.5		V
I_{CES}	$V_{CE} = 0.8\ V_{CES}$, $V_{GE} = 0\ \text{V}$	$T_J = 25^\circ\text{C}$		200 μA
		$T_J = 125^\circ\text{C}$		1 mA
I_{GES}	$V_{CE} = 0\ \text{V}$, $V_{GE} = \pm 20\ \text{V}$			$\pm 100\ \text{nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15\ \text{V}$	40N30		1.8 V
		40N30A		2.1 V
		40N30B		2.4 V

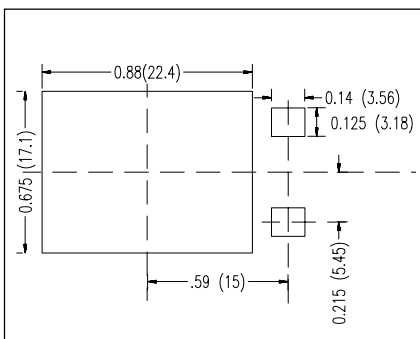




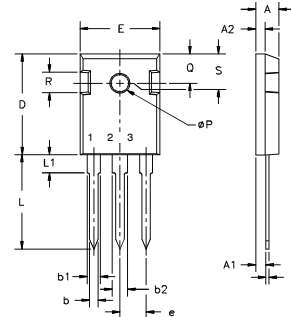
IXGH 40N30 IXGH 40N30A IXGH 40N30B
IXGH 40N30S IXGH 40N30AS IXGH 40N30BS

Symbol	Test Conditions	Characteristic Values		
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$	20	28	S
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		2500	pF
C_{oes}			210	pF
C_{res}			60	pF
Q_g	$I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		145	170 nC
Q_{ge}			23	35 nC
Q_{gc}			50	75 nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 1.0\ \Omega$ Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G		25	ns
t_{ri}			40	ns
$t_{d(off)}$		40N30	170	ns
		40N30A	100	ns
		40N30B	75	ns
t_{fi}		40N30	230	ns
	40N30A	120	ns	
	40N30B	75	ns	
E_{off}		40N30	1.6	mJ
		40N30A	0.75	mJ
		40N30B	0.3	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 1.0\ \Omega$ Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G		25	ns
t_{ri}			40	ns
E_{on}			0.3	mJ
$t_{d(off)}$		40N30	250	500 ns
		40N30A	150	300 ns
		40N30B	90	180 ns
t_{fi}	40N30	350	600 ns	
	40N30A	220	330 ns	
	40N30B	130	230 ns	
E_{off}		40N30	3.3	4.8 mJ
		40N30A	1.6	2.4 mJ
		40N30B	0.6	1.4 mJ
R_{thJC}				0.62 K/W
R_{thCK}		0.25		K/W

Min. Recommended Footprint
 (Dimensions in inches and mm)

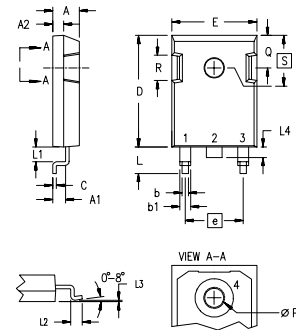


TO-247 AD Outline



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
L ₁		4.50		.177
∅P	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 - Drain (collector)
- 3 - Source (Emitter)
- 4 - Drain (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	1.19	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
L ₁	2.70	2.90	.106	.114
L ₂	2.10	2.30	.083	.091
L ₃	0.00	0.10	.000	.004
L ₄	1.90	2.10	.075	.083
∅P	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