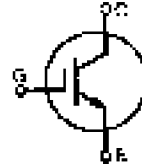


# HiPerFAST™ IGBT Lightspeed™ Series

**IXGH 24N60C**  
**IXGT 24N60C**

**V<sub>CES</sub> = 600 V**  
**I<sub>C25</sub> = 48 A**  
**V<sub>CE(sat)typ</sub> = 2.1 V**  
**t<sub>fi typ</sub> = 60 ns**

Preliminary data sheet

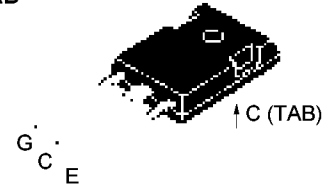


Symbol	Test Conditions	Maximum Ratings	
V <sub>CES</sub>	T <sub>J</sub> = 25°C to 150°C	600	V
V <sub>CGR</sub>	T <sub>J</sub> = 25°C to 150°C; R <sub>GE</sub> = 1 MΩ	600	V
V <sub>GES</sub>	Continuous	±20	V
V <sub>GEM</sub>	Transient	±30	V
I <sub>C25</sub>	T <sub>C</sub> = 25°C	48	A
I <sub>C110</sub>	T <sub>C</sub> = 110°C	24	A
I <sub>CM</sub>	T <sub>C</sub> = 25°C, 1 ms	96	A
SSOA (RBSOA)	V <sub>GE</sub> = 15 V, T <sub>VJ</sub> = 125°C, R <sub>G</sub> = 22 Ω Clamped inductive load, L = 100 μH	I <sub>CM</sub> = 48 @ 0.8 V <sub>CES</sub>	A
P <sub>C</sub>	T <sub>C</sub> = 25°C	150	W
T <sub>J</sub>		-55 ... +150	°C
T <sub>JM</sub>		150	°C
T <sub>stg</sub>		-55 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M <sub>d</sub>	Mounting torque (M3)	1.13/10 Nm/lb.in.	
Weight		TO-247	6 g
		TO-268	4 g

**TO-268  
(IXGT)**



**TO-247 AD  
(IXGH)**



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

## Features

- International standard packages JEDEC TO-247 and surface mountable TO-268
- High frequency IGBT
- High current handling capability
- Latest generation HDMOS™ process
- MOS Gate turn-on - drive simplicity

## Applications

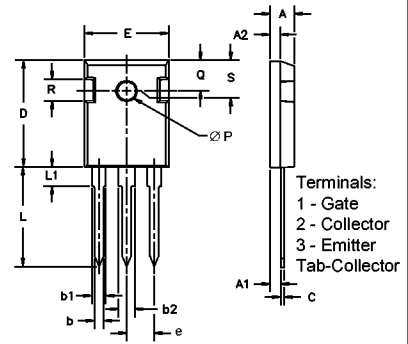
- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

## Advantages

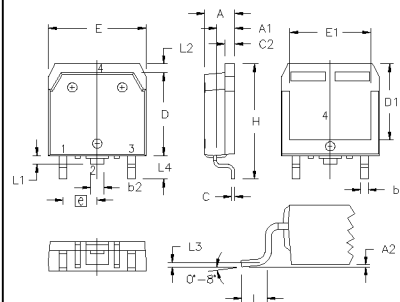
- High power density
- Very fast switching speeds for high frequency applications

Symbol	Test Conditions	Characteristic Values (T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
BV <sub>CES</sub>	I <sub>C</sub> = 250 μA, V <sub>GE</sub> = 0 V	600		V
V <sub>GE(th)</sub>	I <sub>C</sub> = 250 μA, V <sub>CE</sub> = V <sub>GE</sub>	2.5		V
I <sub>CES</sub>	V <sub>CE</sub> = 0.8 • V <sub>CES</sub> V <sub>GE</sub> = 0 V			200 μA 1 mA
I <sub>GES</sub>	V <sub>CE</sub> = 0 V, V <sub>GE</sub> = ±20 V			±100 nA
V <sub>CE(sat)</sub>	I <sub>C</sub> = I <sub>C110</sub> , V <sub>GE</sub> = 15 V	2.1	2.5	V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$g_{fs}$	$I_C = I_{C110}$ ; $V_{CE} = 10\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$	9	17	S	
$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		1500	pF	
$C_{oes}$			120	pF	
$C_{res}$			40	pF	
$Q_g$	$I_C = I_{C110}$ ; $V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5 V_{CES}$		55	nC	
$Q_{ge}$			13	nC	
$Q_{gc}$			17	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_{C110}$ ; $V_{GE} = 15\text{ V}$ , $L = 100\ \mu\text{H}$ , $V_{CE} = 0.8 V_{CES}$ ; $R_G = R_{off} = 10\ \Omega$ Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$		15	ns	
$t_{ri}$			25	ns	
$t_{d(off)}$			75	140	ns
$t_{fi}$			60	110	ns
$E_{off}$			0.24	0.36	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_{C110}$ ; $V_{GE} = 15\text{ V}$ , $L = 100\ \mu\text{H}$ , $V_{CE} = 0.8 V_{CES}$ ; $R_G = R_{off} = 10\ \Omega$ Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$		15	ns	
$t_{ri}$			25	ns	
$E_{on}$			0.15		mJ
$t_{d(off)}$			130		ns
$t_{fi}$			110		ns
$E_{off}$		0.6		mJ	
$R_{thJC}$				0.83 K/W	
$R_{thCK}$	(TO-247)	0.25		K/W	

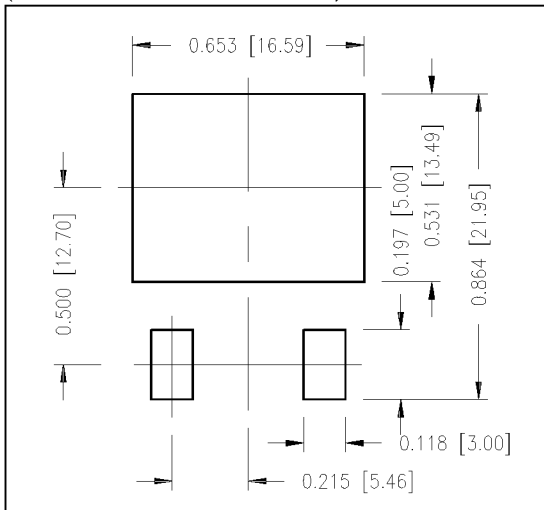
**TO-247 AD Outline**


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A <sub>1</sub>	2.2	2.54	.087	.102
A <sub>2</sub>	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b <sub>1</sub>	1.65	2.13	.065	.084
b <sub>2</sub>	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
∅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-268 Outline**


Terminals: 1 - Gate  
3 - Emitter  
2 - Collector  
Tab - Collector

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215	BSC	5.45	BSC
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010	BSC	0.25	BSC
L4	.150	.161	3.80	4.10

**Min. Recommended Footprint**  
 (Dimensions in inches and mm)


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