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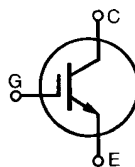
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)



# HiPerFAST™ IGBT Lightspeed™ Series

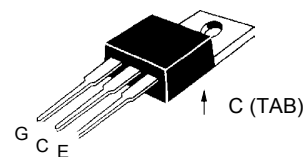
**IXGA 24N60C**  
**IXGP 24N60C**

**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**

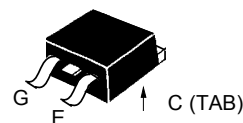


Symbol	Test Conditions	Maximum Ratings	
V <sub>CES</sub>	T <sub>J</sub> = 25°C to 150°C	600	V
V <sub>CGR</sub>	T <sub>J</sub> = 25°C to 150°C; R <sub>GE</sub> = 1 MΩ	600	V
V <sub>GES</sub>	Continuous	±20	V
V <sub>GEM</sub>	Transient	±30	V
I <sub>C25</sub>	T <sub>C</sub> = 25°C	48	A
I <sub>C110</sub>	T <sub>C</sub> = 110°C	24	A
I <sub>CM</sub>	T <sub>C</sub> = 25°C, 1 ms	96	A
<b>SSOA</b> <b>(RBSOA)</b>	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.	
<b>Weight</b>		TO-263	2 g
		TO-220	4 g

### TO-220 AB (IXGP)



### TO-263 AA (IXGA)



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

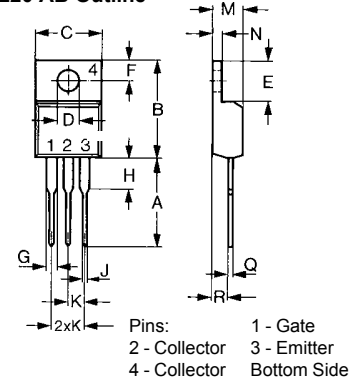
### Advantages

- 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		5 V
I <sub>CES</sub>	V <sub>CE</sub> = 0.8 • V <sub>CES</sub> V <sub>GE</sub> = 0 V		T <sub>J</sub> = 25°C T <sub>J</sub> = 150°C	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

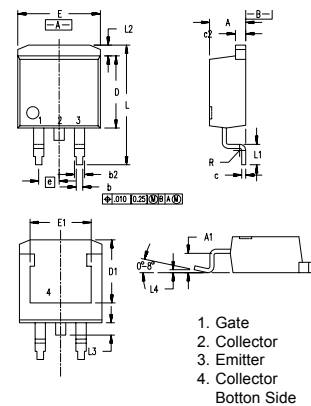
Symbol	Test Conditions	Characteristic Values			
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
$g_{fs}$	$I_C = I_{C110}, V_{CE} = 10\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$	9	17	S	
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		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 $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , 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 $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , 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	
$R_{thCK}$		0.25		K/W	

TO-220 AB Outline



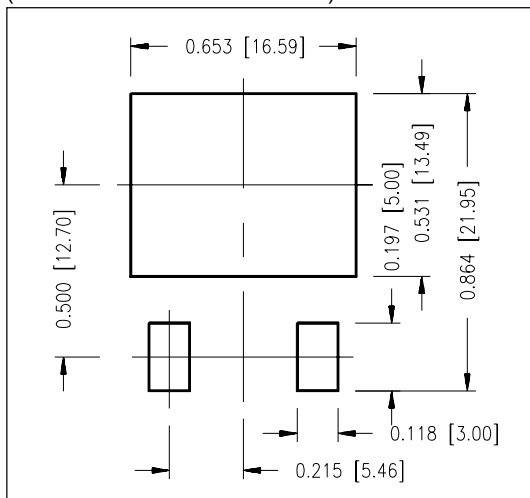
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.35	0.56	0.014	0.022
R	2.29	2.79	0.090	0.110

TO-263 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

**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	6,306,728B1
	4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	