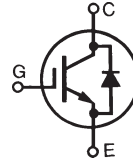


# HiPerFAST™ IGBT C2-Class High Speed IGBT

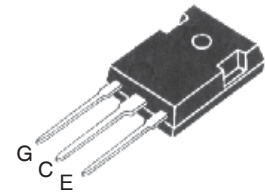
## IXGH 16N60C2D1

$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 40 \text{ A} \\ V_{CE(sat)} &= 3.0 \text{ V} \\ t_{fi(typ)} &= 35 \text{ ns} \end{aligned}$$



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
$V_{CGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	600	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	40	A
$I_{C110}$	$T_C = 110^\circ\text{C}$	16	A
$I_{F110}$	$T_C = 110^\circ\text{C}$ (Diode)	11	A
$I_{CM}$	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	100	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load	$I_{CM} = 32$ @ $0.8 V_{CES}$	A
$P_C$	$T_C = 25^\circ\text{C}$	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.	
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
	Maximum tab temperature soldering SMD devices for 10s	260	$^\circ\text{C}$
<b>Weight</b>		6	g

TO-247 (IXGH)



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

### Features

- Very high frequency IGBT
- High current handling capability
- 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

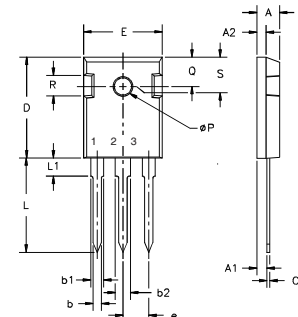
### Advantages

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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	2.5		5.0 V
$I_{CES}$	$V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			50 $\mu\text{A}$ 1 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = 12 \text{ A}, V_{GE} = 15 \text{ V}$ Note 2 $T_J = 125^\circ\text{C}$		2.1	3.0 V V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$I_C = 12\text{A}$ ; $V_{CE} = 10\text{V}$ , Note 2.	8	12	S
$C_{ies}$	$V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$		720	pF
$C_{ies}$			65	pF
$C_{res}$			19	pF
$Q_g$	$I_C = 20\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 0.5 V_{CES}$		32	nC
$Q_{ge}$			6	nC
$Q_{gc}$			10	nC
$t_{d(on)}$			25	ns
$t_{ri}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>		15	ns
$t_{d(off)}$	$I_C = 12\text{A}$ ; $V_{GE} = 15\text{V}$		60	120 ns
$t_{fi}$	$V_{CE} = 400\text{V}$ ; $R_G = R_{off} = 22\ \Omega$ Note 1.		35	ns
$E_{off}$			60	100 $\mu\text{J}$
$t_{d(on)}$			25	ns
$t_{ri}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>		18	ns
$E_{on}$	$I_C = 12\text{A}$ ; $V_{GE} = 15\text{V}$		700	$\mu\text{J}$
$t_{d(off)}$	$V_{CE} = 400\text{V}$ ; $R_G = R_{off} = 22\ \Omega$		120	ns
$t_{fi}$	Note 1		70	ns
$E_{off}$			150	$\mu\text{J}$
$R_{thJC}$ $R_{thCK}$			0.25	0.83 K/W K/W

## TO-247 Outline



Terminals: 1 - Gate      2 - Drain  
3 - Source              Tab - Drain

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
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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_F$	$I_F = 10\text{A}$ , $V_{GE} = 0\text{V}$ $T_J = 125^\circ\text{C}$			2.66 V 1.66
$I_{RM}$	$I_F = 12\text{A}$ ; $-di_F/dt = 100\text{A}/\mu\text{s}$ , $V_R = 100\text{V}$		2.5	A
$t_{rr}$	$V_{GE} = 0\text{V}$ ; $T_J = 125^\circ\text{C}$		110	ns
$t_{rr}$	$I_F = 1\text{A}$ ; $-di_F/dt = 100\text{A}/\mu\text{s}$ ; $V_R = 30\text{V}$ , $V_{GE} = 0\text{V}$		30	ns
$R_{thJC}$				2.5 K/W

- Notes: 1. Switching times may increase for  $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , higher  $T_J$ , or increased  $R_G$ .  
2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$

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:

4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1	6,259,123B1	6,306,728B1	6,683,344