

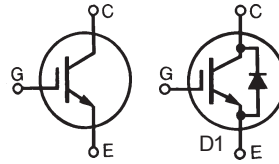
**HiPerFAST™ IGBT**  
**C2-Class High Speed**  
**IGBT in ISOPLUS220™ Case**  
**Electrically Isolated Back Surface**

**IXGC 16N60C2**  
**IXGC 16N60C2D1**

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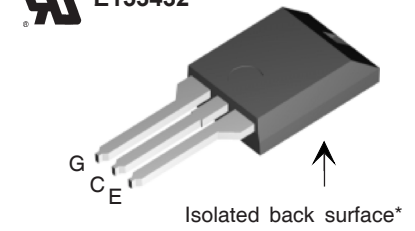
**V<sub>CES</sub> = 600 V**  
**I<sub>C25</sub> = 20 A**  
**V<sub>CE(sat)</sub> = 3.0 V**  
**t<sub>fi(typ)</sub> = 35 ns**

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	20	A
I <sub>C110</sub>	T <sub>C</sub> = 110°C	8	A
I <sub>D110</sub>	T <sub>C</sub> = 110°C (IXGC16N60C2D1 diode)	10	A
I <sub>CM</sub>	T <sub>C</sub> = 25°C, 1 ms	100	A
<b>SSOA (RBSOA)</b>	V <sub>GE</sub> = 15 V, T <sub>J</sub> = 125°C, R <sub>G</sub> = 22 Ω Clamped inductive load	I <sub>CM</sub> = 32 @0.8 V <sub>CES</sub>	A
P <sub>C</sub>	T <sub>C</sub> = 25°C	63	W
T <sub>J</sub>		-55 ... +150	°C
T <sub>JM</sub>		150	°C
T <sub>stg</sub>		-55 ... +150	°C
F <sub>C</sub>	Mounting Force	11..65/2.5..15	N/lb.
V <sub>ISOL</sub>	Isolation Voltage; 50/60Hz; t = 1minute; RMS	2500	V
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	°C
<b>Weight</b>		2	g

**ISOPLUS 220™ (IXGC)**  
**E153432**



G = Gate      C = Collector  
E = Emitter

**Features**

- DCB Isolated mounting tab
- UL recognized (E153432)
- Meets TO-273 package Outline
- High current handling capability
- MOS Gate turn-on  
- drive simplicity
- Epoxy meets UL94V-0 flammability classification

**Applications**

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

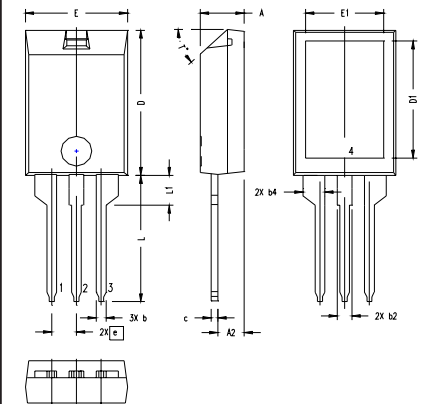
**Advantages**

- Easy assembly
- 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.
V <sub>GE(th)</sub>	I <sub>C</sub> = 250 μA, V <sub>CE</sub> = V <sub>GE</sub>	2.5		5.0 V
I <sub>CES</sub>	V <sub>CE</sub> = V <sub>CES</sub> V <sub>GE</sub> = 0 V			25 μA 50 μA
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> = 12 A, V <sub>GE</sub> = 15 V Note 2		2.7 2.1	3.0 V V
				T <sub>J</sub> = 125°C

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
$C_{oes}$			55	pF
	16N60C2		65	pF
	16N60C2D1			
$C_{res}$			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
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>		25	ns
$t_{ri}$	$I_C = 12\text{A}; V_{GE} = 15\text{V}$		15	ns
$t_{d(off)}$	$V_{CE} = 400\text{V}; R_G = R_{off} = 22\ \Omega$		60	120 ns
$t_{fi}$	Note 1.		35	100 ns
$E_{off}$			60	100 $\mu\text{J}$
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>		25	ns
$t_{ri}$	$I_C = 12\text{A}; V_{GE} = 15\text{V}$		18	ns
$E_{on}$	$V_{CE} = 400\text{V}; R_G = R_{off} = 22\ \Omega$	16N60C2D1	0.38	mJ
$t_{d(off)}$	Note 1		115	ns
$t_{fi}$			70	ns
$E_{off}$			150	$\mu\text{J}$
$R_{thJC}$				2.0 K/W
$R_{thCK}$			0.25	K/W

**ISOPLUS220 Outline**



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T*			42.5*	47.5*

NOTE:  
1. Bottom heatsink (Pin 4) is electrically isolated from Pin 1, 2, or 3.  
2. This drawing will meet dimensional requirement of JEDEC SS Product Outline TO-273 except D and D1 dimension.

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 V
$I_{RM}$	$I_F = 12\text{A}; -di_F/dt = 100\text{A}/\mu\text{s}, V_R = 100\text{V}$		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:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	