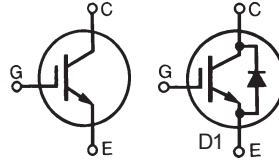


**HiPerFAST™ IGBT
C2-Class High Speed
IGBT**

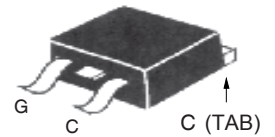
**IXGA 16N60C2
IXGP 16N60C2
IXGA 16N60C2D1
IXGP 16N60C2D1**

**V_{CES} = 600 V
I_{C25} = 40 A
V_{CE(sat)} = 3.0 V
t_{fi(typ)} = 35 ns**

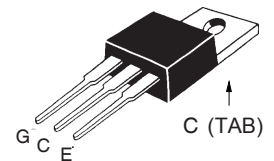


Symbol	Test Conditions	Maximum Ratings	
V _{CES}	T _J = 25°C to 150°C	600	V
V _{CGR}	T _J = 25°C to 150°C; R _{GE} = 1 MΩ	600	V
V _{GES}	Continuous	±20	V
V _{GEM}	Transient	±30	V
I _{C25}	T _C = 25°C	40	A
I _{C110}	T _C = 110°C	16	A
I _{D110}	T _C = 110°C (IXG_16N60C2D1 diode)	11	A
I _{CM}	T _C = 25°C, 1 ms	100	A
SSOA (RBSOA)	V _{GE} = 15 V, T _J = 125°C, R _G = 22 Ω Clamped inductive load	I _{CM} = 32 @0.8 V _{CES}	A
P _C	T _C = 25°C	150	W
T _J		-55 ... +150	°C
T _{JM}		150	°C
T _{stg}		-55 ... +150	°C
M_d	Mounting torque (M3.5 screw)	0.55/5 Nm/lb.in.	
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	°C
	Maximum tab temperature soldering SMD devices for 10s	260	°C
Weight	TO-220	4	g
	TO-263	2	g

TO-263 (IXGA)



TO-220 (IXGP)



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

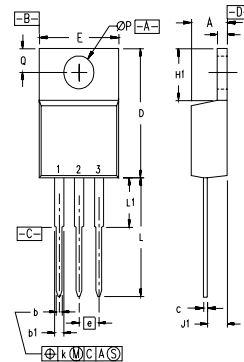
Advantages

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

Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _{GE(th)}	I _C = 250 μA, V _{CE} = V _{GE}	2.5		5.0 V
I _{CES}	V _{CE} = V _{CES}			25 μA
	V _{GE} = 0 V			50 μA
I _{GES}	V _{CE} = 0 V, V _{GE} = ±20 V			±100 nA
V _{CE(sat)}	I _C = 12 A, V _{GE} = 15 V			3.0 V
	Note 2 T _J = 125°C		2.1	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_{oes}		16N60C2	55	pF
		16N60C2D1	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
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$		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
t_{fi}	Note 1.		35	ns
E_{off}			60	100
				μJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$		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		120	ns
t_{fi}			70	ns
E_{off}			150	μJ
R_{thJC}				0.83
R_{thCK}	(IXGP)		0.5	K/W K/W

TO-220 Outline



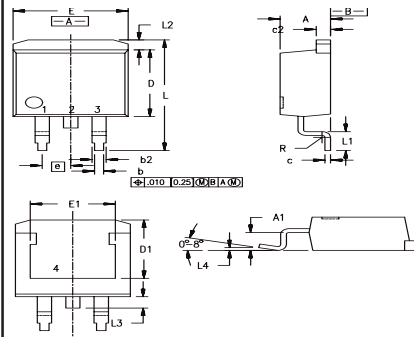
Pins: 1 - Gate 2 - Collector
3 - Emitter 4 - Collector

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

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 $d \leq 2\%$

TO-263 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

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 6,259,123B1 6,306,728B1
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