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IXYS Corporation
IXGA7N60BD1

For any questions, you can email us directly:
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EIS electronic components
Distributor of IXYS Corporation: Excellent Integrated System Limited
Datasheet of IXGA7N60BD1 - IGBT 600V 14A 80W TO263
Contact us: sales@integrated-circuit.com Website: www.integrated-circuit.com

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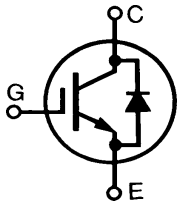
Advanced Technical Information

HiPerFAST™ IGBT with Diode

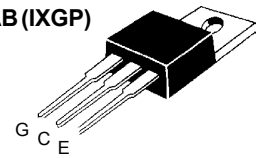
IXGA 7N60BD1
IXGP 7N60BD1

V_{CES} = 600 V
I_{C25} = 14 A
$V_{CE(sat)}$ = 2.0 V
t_{fi} = 150ns

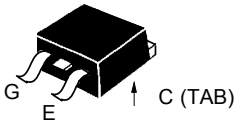


Symbol	Test Conditions		Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C		600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ		600	V
V_{GES}	Continuous		±20	V
V_{GEM}	Transient		±30	V
I_{C25}	T_C = 25°C		14	A
I_{C90}	T_C = 90°C		7	A
I_{CM}	T_C = 25°C, 1 ms		56	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 18 Ω Clamped inductive load @ 0.8 V_{CES}		I_{CM} = 14	A
P_C	T_C = 25°C		80	W
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s			300	°C
M_d	Mounting torque, (TO-220)	M3 M3.5	0.45/4 0.55/5	Nm/lb.in. Nm/lb.in.
Weight	TO-220 TO-263		4 2	g g

TO-220AB (IXGP)



TO-263 AA (IXGA)



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

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 250 µA, V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}		2.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES} V_{GE} = 0 V	T_J = 25°C T_J = 125°C			100 750	µA µA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V			1.8	2.0	V

Features

- International standard packages JEDEC TO-263 surface mountable and JEDEC TO-220 AB
- High current handling capability
- HiPerFAST™ HDMOS™ process
- MOS Gate turn-on
  - drive simplicity

Applications

- 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
- Suitable for surface mounting

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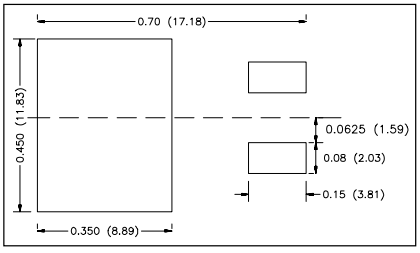
IXGA 7N60BD1
IXGP 7N60BD1

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	3	7		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		500		pF
C_{oes}			50		pF
C_{res}			17		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		25		nC
Q_{ge}			15		nC
Q_{gc}			10		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		10		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		10		ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, $R_G = R_{off}$ = 18 Ω		100	200	ns
t_{fi}	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		150	250	ns
E_{off}			0.3	0.6	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		10		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		15		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, $R_G = R_{off}$ = 18 Ω		0.15		mJ
$t_{d(off)}$	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		200		ns
t_{fi}			250		ns
E_{off}			0.6		mJ
R_{thJC}	IGBT			1.56	K/W
R_{thCK}			0.50		K/W

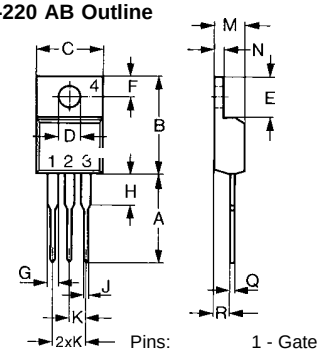
Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
V_F	I_F = 10A; T_{VJ} = 150°C			1.96	V
	T_{VJ} = 25°C			2.95	V
I_{RM}	V_R = 100 V; I_F =25A; -di_F/dt = 100 A/µs L < 0.05 µH; T_{VJ} = 100°C		2	2.5	V
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V T_J = 25°C		35		ns
R_{thJC}	Diode			1.6	K/W



Min. Recommended Footprint
(Dimensions in inches and mm)

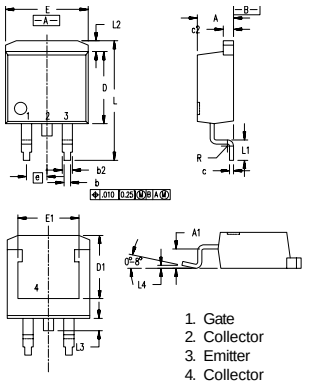
TO-220 AB Outline



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

Dim.	Millimeter Min.	Max.	Inches 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



1. Gate
2. Collector
3. Emitter
4. Collector
Botton Side

Dim.	Millimeter Min.	Max.	Inches 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

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