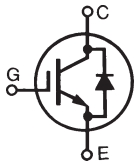
HiPerFAST™ IGBT

IXGH15N120B2D1
IXGT15N120B2D1

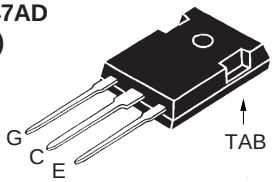
V_{CES} = 1200 V
I_{C25} = 30 A
$V_{CE(sat)}$ = 3.3 V
$t_{fi(typ)}$ = 137 ns

Optimized for 10-20 KHz hard switching and up to 100 KHz resonant switching

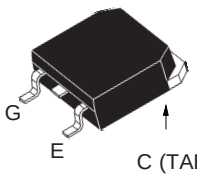


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	30	A
I_{C90}	T_C = 90°C	15	A
I_{CM}	T_C = 25°C, 1 ms	60	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 10 Ω Clamped inductive load	I_{CM} = 40 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	192	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque (TO-247)	1.13/10	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-247AD / TO-268	6 / 4	g

TO-247AD (IXGH)



TO-268 (IXGT)



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

Features

- International standard packages: JEDEC TO-247AD & TO-268
- IGBT and anti-parallel FRED in one package
- MOS Gate turn-on
  - drive simplicity
- Fast Recovery Expitaxial Diode (FRED)
  - soft recovery with low I_{RM}

Applications

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

Advantages

- Saves space (two devices in one package)
- Easy to mount with 1 screw (isolated mounting screw hole)
- Reduces assembly time and cost

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250 μA, V_{GE} = 0 V		1200			V
$V_{GE(th)}$	I_C = 250 μA, V_{CE} = V_{GE}		2.5		5.0	V
I_{CES}	V_{CE} = V_{CES}	T_J = 25°C			100	μA
	V_{GE} = 0 V	T_J = 125°C			3.5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{CE90}, V_{GE} = 15				3.3	V
		T_J = 125°C		2.7		V

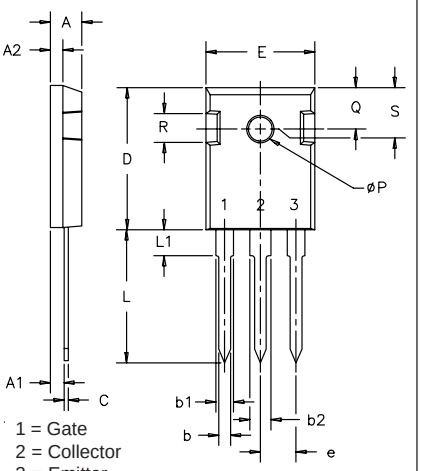
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	12	15		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1700		pF
C_{oes}			95		pF
C_{res}			38		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		86		nC
Q_{ge}			13		nC
Q_{gc}			26		nC
	Inductive load, T_J = 25°C				
$t_{d(on)}$	$I_C = I_{C90}$, V_{GE} = 15 V		25		ns
t_{ri}	V_{CE} = 960 V, $R_G = R_{off}$ = 10 Ω		15		ns
$t_{d(off)}$	Remarks: Switching times may		165	240	ns
t_{fi}	increase for V_{CE} (Clamp) > 0.8 V_{CES},		137	255	ns
E_{off}	higher T_J or increased R_G		1.4	2.3	mJ
	Inductive load, T_J = 125°C				
$t_{d(on)}$	$I_C = I_{C90}$, V_{GE} = 15 V		25		ns
t_{ri}	V_{CE} = 960 V, $R_G = R_{off}$ = 10 Ω		18		ns
E_{on}	Remarks: Switching times may		0.60		mJ
$t_{d(off)}$	increase for V_{CE} (Clamp) > 0.8 V_{CES},		260		ns
t_{fi}	higher T_J or increased R_G		305		ns
E_{off}			2.8		mJ
R_{thJC}				0.65	K/W
R_{thCK}	TO-247		0.25		K/W

Reverse Diode (FRED)

Characteristic Values
(T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	min.	typ.	max.	
I_F	T_C = 100°C			15	A
V_F	I_F = 15 A, V_{GE} = 0 V			2.8	V
	I_F = 15 A, V_{GE} = 0 V, T_J = 125°C		2.1		V
I_{RM}	I_F = 25 A; -di$_F$/dt = 100 A/µs, V_R = 100 V		6		A
t_{rr}	V_{GE} = 0 V; T_J = 100°C		165		ns
R_{thJC}				1.6	K/W

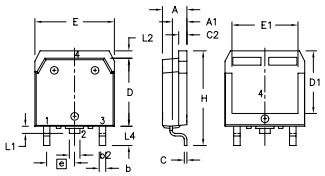
TO-247 AD Outline

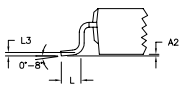


1 = Gate
2 = Collector
3 = Emitter
Tab = Collector

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.7	5.3
A_1	.087	.102	2.2	2.54
A_2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b_1	.065	.084	1.65	2.13
b_2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
øP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

TO-268 Outline





Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161