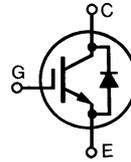


Low $V_{CE(sat)}$ IGBT with Diode
High Speed IGBT with Diode

IXGH/IXGT 15N120BD1
IXGH/IXGT 15N120CD1

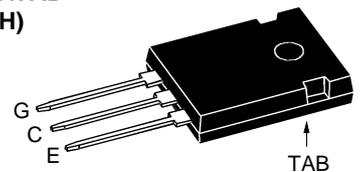
V_{DSS}	I_{C25}	$V_{CE(sat)}$
1200 V	30 A	3.2 V
1200 V	30 A	3.8 V

Preliminary data

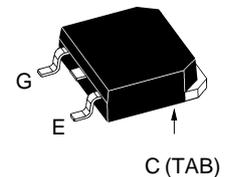


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1\text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	30	A
I_{C90}	$T_C = 90^\circ\text{C}$	15	A
I_{CM}	$T_C = 25^\circ\text{C}, 1\text{ ms}$	60	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}, T_J = 125^\circ\text{C}, R_G = 10\ \Omega$ Clamped inductive load	$I_{CM} = 40$ @ $0.8 V_{CES}$	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	$^\circ\text{C}$
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 Exipitaxial 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

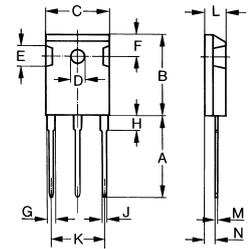
- Saves space (two devices in one package)
- Easy to mount with 1 screw (isolated mounting screw hole)
- Reduces assembly time and cost

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 1\text{ A}, V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 250\ \mu\text{A}, V_{CE} = V_{GE}$	2.5		5.0 V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0\text{ V}$		2	500 μA mA
I_{GES}	$V_{CE} = 0\text{ V}, V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15\text{ V}$ Note 2	15N120BD1 15N120CD1		3.2 V 3.8 V

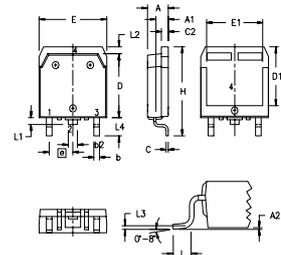
Symbol	Test Conditions	Characteristic Values			
		(T _J = 25°C, unless otherwise specified)			
		min.	typ.	max.	
g_{fs}	I _C = I _{C90} ; V _{CE} = 10 V, Note 2.	12	15	S	
C_{ies}			1700	pF	
C_{oes}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		155	pF	
C_{res}			38	pF	
Q_g			69	nC	
Q_{ge}	I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		13	nC	
Q_{gc}			26	nC	
t_{d(on)}	Inductive load, T_J = 25°C		25	ns	
t_{ri}			15	ns	
t_{d(off)}		I _C = I _{C90} ; V _{GE} = 15 V		150	280 ns
t_{fi}		V _{CE} = 0.8 V _{CES} ; R _G = R _{off} = 10 Ω	15N120BD1	160	320 ns
	Note 1.	15N120CD1	115	190 ns	
		15N120BD1	1.75	3.0 mJ	
E_{off}		15N120CD1	1.05	1.6 mJ	
t_{d(on)}	Inductive load, T_J = 125°C		25	ns	
t_{ri}			18	ns	
E_{on}		I _C = I _{C90} ; V _{GE} = 15 V		1.5	mJ
t_{d(off)}		V _{CE} = 0.8 V _{CES} ; R _G = R _{off} = 10 Ω	15N120BD1	360	ns
t_{fi}	Note 1	15N120CD1	250	mJ	
		15N120BD1	3.5	mJ	
E_{off}		15N120CD1	2.1	mJ	
R_{thJC}				0.83 K/W	
R_{thCK}	TO-247		0.25	K/W	

Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
V_F	I _F = 20 A, V _{GE} = 0 V	2.6	2.8	V
	I _F = 20 A, V _{GE} = 0 V, T _J = 125°C	2.1		V
I_F	T _C = 25°C		33	V
	T _C = 90°C		20	V
I_{RM}	I _F = 20 A; -di _F /dt = 400 A/μs, V _R = 600 V		15	A
t_{rr}	V _{GE} = 0 V; T _J = 125°C		200	ns
t_{rr}	I _F = 1 A; -di _F /dt = 100 A/μs; V _R = 30 V, V _{GE} = 0 V		40	ns
R_{thJC}				1.6 K/W

- Notes:
- Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G.
 - Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %

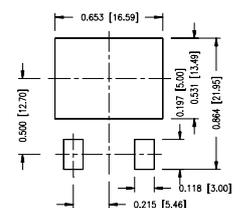
TO-247 AD (IXGH) Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

TO-268AA (D³ PAK)


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

Min. Recommended Footprint



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