

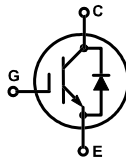
# High Voltage IGBT with Diode

**IXDH 30N120AU1**  
**IXDT 30N120AU1**

$V_{CES} = 1200\text{ V}$   
 $I_{C25} = 50\text{ A}$   
 $V_{CE(sat) typ} = 2.5\text{ V}$

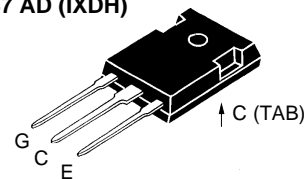
Short Circuit SOA Capability

Preliminary Data

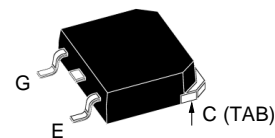


Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1200	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GE} = 1\text{ M}\Omega$	1200	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	50	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	31	A
$I_{CM}$	$T_C = 25^\circ\text{C}$ , 1 ms	100	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15\text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 47\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$	$I_{CM} = 50$ @ $V_{CES}$	A
<b><math>t_{SC}</math> (SCSOA)</b>	$V_{GE} = 15\text{ V}$ , $V_{CE} = V_{CES}$ , $T_J = 125^\circ\text{C}$ $R_G = 47\ \Omega$ , non repetitive	10	$\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$ IGBT	300	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	1.1/10	Nm/lb.in.
<b>Weight</b>		6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

TO-247 AD (IXDH)



TO-268 AA (IXDT)



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

## Features

- Square RBSOA
- International standard package
- Low  $V_{CE(sat)}$ 
  - for minimum on-state conduction losses
- Low package inductance
- Fast Recovery Epitaxial Diode
  - short  $t_{rr}$  and  $I_{RM}$

## Applications

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

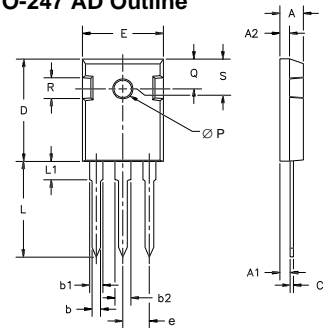
## Advantages

- Space savings
- High power density
- Surface mountable, high power packager

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$BV_{CES}$	$I_C = 5\text{ mA}$ , $V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 1\text{ mA}$ , $V_{CE} = V_{GE}$	4	5.5	6.5 V
$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0\text{ V}$ $T_J = 25^\circ\text{C}$ $V_{CE} = 0.8 \cdot V_{CES}$ , $V_{GE} = 0\text{ V}$ $T_J = 125^\circ\text{C}$		0.9 2	1.1 mA mA
$I_{GES}$	$V_{CE} = 0\text{ V}$ , $V_{GE} = \pm 20\text{ V}$			$\pm 500$ nA
$V_{CE(sat)}$	$I_C = 25\text{ A}$ , $V_{GE} = 15\text{ V}$		2,5	3 V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		1650	pF	
$C_{oes}$			250	pF	
$C_{res}$			110	pF	
$Q_g$	$I_C = 25\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		TBD	nC	
$Q_{ge}$			TBD	nC	
$Q_{gc}$			TBD	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 25\text{ A}, V_{GE} = 15\text{ V},$ $V_{CE} = 0.5 V_{CES}, R_{on/off} = 47\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.5 \cdot V_{CES}$ , higher $T_J$ or increased $R_C$		75	150	ns
$t_{ri}$			65	130	ns
$t_{d(off)}$			400	600	ns
$t_{fi}$			50	100	ns
$E_{on}$			3.7		mJ
$E_{off}$			2.4		mJ
$R_{thJC}$				0.42	K/W
$R_{thCK}$		0.25			K/W

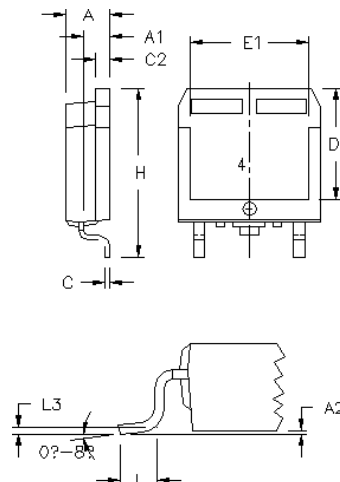
### TO-247 AD Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A <sub>1</sub>	2.2	2.54	.087	.102
A <sub>2</sub>	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b <sub>1</sub>	1.65	2.13	.065	.084
b <sub>2</sub>	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L <sub>1</sub>		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S			242 BSC	

### Reverse Diode (FRED)

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$V_F$	$I_F = 25\text{ A}, V_{GE} = 0\text{ V},$ Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$		2.1	2.6	V
$I_{RM}$	$I_F = 25\text{ A}, V_{GE} = 0\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $T_J = 100^\circ\text{C}$		12	15	A
$t_{rr}$	$I_F = 25\text{ A}, V_{GE} = 0\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$ $V_R = 600\text{ V}$ $T_J = 100^\circ\text{C}$		200		ns
	$I_F = 1\text{ A}; -di/dt = 200\text{ A}/\mu\text{s}; V_R = 30\text{ V}$ $T_J = 25^\circ\text{C}$		40	60	ns
$R_{thJC}$				1	K/W



### TO-268 AA Outline

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.9	5.1	.193	.201
A <sub>1</sub>	2.7	2.9	.106	.114
A <sub>2</sub>	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b <sub>2</sub>	1.9	2.1	.075	.083
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E <sub>1</sub>	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
L <sub>1</sub>	1.20	1.40	.047	.055
L <sub>2</sub>	1.00	1.15	.039	.045
L <sub>3</sub>	0.25 BSC		.010 BSC	
L <sub>4</sub>	3.80	4.10	.150	.161

