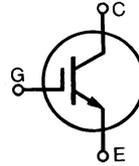


# Low $V_{CE(sat)}$ IGBT High Speed IGBT

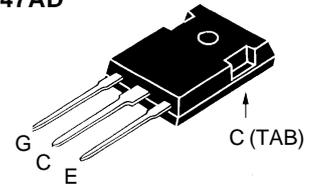
**IXGH 12N100**  
**IXGH 12N100A**

$V_{CES}$	$I_{C25}$	$V_{CE(sat)}$
1000 V	24 A	3.5 V
1000 V	24 A	4.0 V



Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1000	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GE} = 1\text{ M}\Omega$	1000	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	24	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	12	A
$I_{CM}$	$T_C = 25^\circ\text{C}$ , 1 ms	48	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15\text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 150\ \Omega$ Clamped inductive load, $L = 300\ \mu\text{H}$	$I_{CM} = 24$ @ $0.8 V_{CES}$	A
$P_C$	$T_C = 25^\circ\text{C}$	100	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 (M3)	1.13/10	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-247AD



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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 3\text{ mA}$ , $V_{GE} = 0\text{ V}$ $BV_{CES}$ temperature coefficient	1000	0.072	V %/K
$V_{GE(th)}$	$I_C = 500\ \mu\text{A}$ , $V_{GE} = V_{GE}$ $V_{GE(th)}$ temperature coefficient	2.5	-0.192	V %/K
$I_{CES}$	$V_{CE} = 0.8 V_{CES}$ , $T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}$ , $T_J = 125^\circ\text{C}$			250 $\mu\text{A}$ 1 mA
$I_{GES}$	$V_{CE} = 0\text{ V}$ , $V_{GE} = \pm 20\text{ V}$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$	12N100 12N100A		3.5 V 4.0 V

### Features

- International standard package JEDEC TO-247 AD
- 2nd generation HDMOS™ process
- Low  $V_{CE(sat)}$ 
  - for low on-state conduction losses
- High current handling capability
- MOS Gate turn-on
  - drive simplicity
- Voltage rating guaranteed at high temperature ( $125^\circ\text{C}$ )

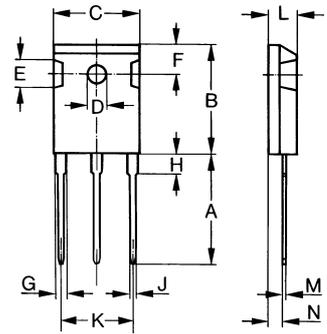
### Applications

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

### Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = I_{C90}$ ; $V_{CE} = 10\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$	6	10	S
$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		750	pF
$C_{oes}$			80	pF
$C_{res}$			30	pF
$Q_g$	$I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5 V_{CES}$		65	90 nC
$Q_{ge}$			8	nC
$Q_{gc}$			24	45 nC
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ , $L = 300\ \mu\text{H}$ , $V_{CE} = 0.8 V_{CES}$ , $R_G = R_{off} = 120\ \Omega$ Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 V_{CES}$ , higher $T_J$ or increased $R_G$		100	ns
$t_{ri}$			200	ns
$t_{d(off)}$			850	1000 ns
$t_{fi}$		12N100	800	1000 ns
		12N100A	500	700 ns
$E_{off}$		12N100	2.5	mJ
		12N100A	1.5	3.0 mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_{C90}$ , $V_{GE} = 15\text{ V}$ , $L = 300\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}$ , $R_G = R_{off} = 120\ \Omega$ Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 V_{CES}$ , higher $T_J$ or increased $R_G$		100	ns
$t_{ri}$			200	ns
$E_{on}$			1.1	mJ
$t_{d(off)}$			900	ns
$t_{fi}$		12N100	1250	ns
		12N100A	950	ns
$E_{off}$		12N100	3.5	mJ
		12N100A	2.2	mJ
$R_{thJC}$			1.25	K/W
$R_{thCK}$		0.25		K/W

**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

IXGH12N100/A characteristic curves may be found in the IXGH12N100U/AU1 data sheet.