Advance Technical Information

High Voltage IGBT

IXGH24N170
IXGT24N170


| Symbol | Test Conditions | Maximum Ratings |  |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {ces }}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$ to $150^{\circ} \mathrm{C}$ | 1700 | V |
| $\mathrm{V}_{\text {cGR }}$ | $\mathrm{T}_{\mathrm{J}}=25^{\circ} \mathrm{C}$ to $150^{\circ} \mathrm{C}, \mathrm{R}_{\text {GE }}=1 \mathrm{M} \Omega$ | 1700 | V |
| $\mathrm{V}_{\text {GES }}$ | Continuous | $\pm 20$ | V |
| $\mathrm{V}_{\text {GEM }}$ | Transient | $\pm 30$ | V |
| $\mathrm{I}_{\mathrm{C} 25}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$ | 50 | A |
| $\mathrm{I}_{\text {c90 }}$ | $\mathrm{T}_{\mathrm{C}}=90^{\circ} \mathrm{C}$ | 24 | A |
| $\mathrm{I}_{\text {cm }}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}, 1 \mathrm{~ms}$ | 150 | A |
| SSOA | $V_{G E}=15 \mathrm{~V}, \mathrm{~T}_{\mathrm{VJ}}=125^{\circ} \mathrm{C}, \mathrm{R}_{\mathrm{G}}=5 \Omega$ | $\mathrm{I}_{\text {CM }}=50$ | A |
| (RBSOA) | Clamped inductive load | @ $0.8 \cdot \mathrm{~V}_{\text {CES }}$ |  |
| $t_{\text {sc }}$ | $\mathrm{V}_{G E}=15 \mathrm{~V}, \mathrm{~T}_{\mathrm{VJ}}=125^{\circ} \mathrm{C}, \mathrm{V}_{\mathrm{CE}}=1000 \mathrm{~V}$ | 10 | $\mu \mathrm{s}$ |
| (SCSOA) | $\mathrm{R}_{\mathrm{G}}=5 \Omega$, non repetitive |  |  |
| $\mathrm{P}_{\mathrm{c}}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$ | 250 | W |
| TJ |  | $-55 \ldots+150$ | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {JM }}$ |  | 150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {stg }}$ |  | -55 ... +150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | 1.6 mm (0.062 in.) from case for 10 s | 300 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {SoLD }}$ | Plastic body for 10 seconds | 260 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{M}_{\mathrm{d}}$ | Mounting torque (TO-247) | 1.13/10 | Nm/lb.in. |
| Weight | TO-247 | 6 | g |
|  | TO-268 | 4 | g |

## Symbol Test Conditions




TO-247 (IXGH)


TO-268 (IXGT)

$G=$ Gate $\quad C \quad$ Collector
$\mathrm{E}=$ Emitter $\mathrm{TAB}=$ Collector

## Features

- International standard packages JEDEC TO-268 and JEDEC TO-247 AD
- High current handling capability
- MOS Gate turn-on
- drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94V-0 flammability classification

Applications

- Capacitor discharge \& pulser circuits
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies


## Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

| Symbol Test Conditions$\left(T_{j}=25^{\circ} \mathrm{C}\right.$ unless otherwise specified) |  | Characteristic Values |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Min. | Typ. | Max. |  |
| $\mathrm{g}_{\mathrm{fs}}$ | $\mathrm{I}_{\mathrm{C}}=\mathrm{I}_{\mathrm{C90}}, \mathrm{~V}_{\mathrm{CE}}=10 \mathrm{~V}$, Note 1 | 18 | 25 |  | S |
| $\mathrm{I}_{\mathrm{c}(\mathrm{ON})}$ | $V_{C E}=10 \mathrm{~V}, \mathrm{~V}_{\mathrm{GE}}=10 \mathrm{~V}$ |  | 100 |  | A |
| $\begin{aligned} & \mathrm{C}_{\text {ies }} \\ & \mathrm{C}_{\text {oes }} \\ & \mathrm{C}_{\text {res }} \end{aligned}$ | $\} V_{C E}=25 \mathrm{~V}, \mathrm{~V}_{\mathrm{GE}}=0 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | $\begin{array}{r} 2400 \\ 120 \\ 33 \end{array}$ |  | pF pF pF |
| $\begin{aligned} & \mathbf{Q}_{\mathrm{g}} \\ & \mathbf{Q}_{\mathrm{ge}} \\ & \mathbf{Q}_{\mathrm{gc}} \end{aligned}$ | $\} I_{C}=I_{C 90}, V_{G E}=15 \mathrm{~V}, \mathrm{~V}_{\mathrm{CE}}=0.5 \cdot \mathrm{~V}_{\mathrm{CES}}$ |  | $\begin{array}{r} 106 \\ 18 \\ 32 \end{array}$ |  | nC nC nC |
| $\begin{aligned} & t_{d(o n)} \\ & t_{\mathrm{ri}} \\ & t_{\mathrm{d}(\text { (ff) }} \\ & t_{\text {fi }} \\ & E_{\text {off }} \\ & \hline \end{aligned}$ | Inductive load, $\mathrm{T}_{\mathrm{J}}=\mathbf{2 5}{ }^{\circ} \mathrm{C}$ $\begin{aligned} & \mathrm{I}_{\mathrm{C}}=\mathrm{I}_{\mathrm{C} 25}, \mathrm{~V}_{\mathrm{GE}}=15 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CE}}=0.8 \cdot \mathrm{~V}_{\mathrm{CES}}, \mathrm{R}_{\mathrm{G}}=\mathrm{R}_{\mathrm{off}}=5 \Omega \end{aligned}$ <br> Remarks: Switching times may increase for $\mathrm{V}_{\text {CE }}($ Clamp $)>0.8 \cdot \mathrm{~V}_{\text {CES }}$, higher $T_{J}$ or increased $R_{G}$ |  | $\begin{array}{r} 42 \\ 39 \\ 200 \\ 250 \\ 8 \end{array}$ | $\begin{array}{r} 400 \\ 500 \\ 12 \end{array}$ |  |
| $\begin{aligned} & t_{d(o n)} \\ & t_{\mathrm{ri}} \\ & E_{\mathrm{on}} \\ & t_{\mathrm{d}(\mathrm{fff})} \\ & t_{\mathrm{fi}} \\ & E_{\mathrm{off}} \end{aligned}$ | Inductive load, $\mathrm{T}_{\mathrm{J}}=125^{\circ} \mathrm{C}$ $\begin{aligned} & I_{C}=I_{C 25}, V_{G E}=15 \mathrm{~V} \\ & V_{C E}=0.8 \cdot V_{C E S}, R_{G}=R_{o f f}=5 \Omega \end{aligned}$ <br> Remarks: Switching times may increase for $\mathrm{V}_{\text {CE }}$ (Clamp) $>0.8 \cdot \mathrm{~V}_{\text {CES }}$, higher $T_{J}$ or increased $R_{G}$ |  | $\begin{array}{r} 50 \\ 55 \\ 2.0 \\ 200 \\ 360 \\ 12 \end{array}$ |  | ns ns mJ ns ns mJ |
| $\begin{aligned} & \hline \mathbf{R}_{\mathrm{th} \mathrm{sc}} \\ & \mathbf{R}_{\mathrm{thcs}} \\ & \hline \end{aligned}$ | (TO-247) |  | 0.25 | 0.50 | $\begin{aligned} & { }^{\circ} \mathrm{C} / \mathrm{W} \\ & { }^{\circ} \mathrm{C} / \mathrm{W} \end{aligned}$ |

Note 1: Pulse test, $\mathrm{t} \leq 300 \mu \mathrm{~s}$, duty cycle, $\mathrm{d} \leq 2 \%$.

Min Recommended Footprint


## ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

## IXYS reserves the right to change limits, test conditions, and dimensions.

| IXYS MOSFETs and IGBTs are covered | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338B2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| by one or more of the following U.S. patents: | 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 |  |
|  | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 | 7,071,537 |  |

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