## TrenchMV ${ }^{\text {TM }}$ Power MOSFET

## N-Channel Enhancement Mode



IXTA98N075T
IXTP98N075T

| Symbol | Test Conditions | Maximum Ratings |  |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {DSs }}$ | $\mathrm{T}_{\mathrm{J}}=25^{\circ} \mathrm{C}$ to $175^{\circ} \mathrm{C}$ | 75 | V |
| $\mathrm{V}_{\text {DGR }}$ | $\mathrm{T}_{\mathrm{J}}=25^{\circ} \mathrm{C}$ to $175^{\circ} \mathrm{C} ; \mathrm{R}_{\mathrm{GS}}=1 \mathrm{M} \Omega$ | 75 | V |
| $\mathrm{V}_{\text {GSM }}$ | Transient | $\pm 20$ | V |
| $\mathrm{I}_{\mathrm{D} 25}$ | $\mathrm{T}_{\mathrm{c}}=25^{\circ} \mathrm{C}$ | 98 | A |
| $\mathrm{I}_{\text {LRMS }}$ | Package Current Limit (RMS): | 75 | A |
| $\mathrm{I}_{\mathrm{DM}}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$, pulse width limited by $\mathrm{T}_{\mathrm{JM}}$ | 280 | A |
| dv/dt | $\begin{aligned} & \mathrm{I}_{\mathrm{S}} \leq \mathrm{I}_{\mathrm{DM}}, \mathrm{di} / \mathrm{dt} \leq 100 \mathrm{~A} / \mu \mathrm{s}, \mathrm{~V}_{\mathrm{DD}} \leq \mathrm{V}_{\mathrm{DSS}} \\ & \mathrm{~T}_{\mathrm{J}} \leq 175^{\circ} \mathrm{C}, \mathrm{R}_{\mathrm{G}}=5 \Omega \end{aligned}$ | 5 | V/ns |
| $\mathrm{I}_{\text {AR }}$ | $\mathrm{T}_{\mathrm{c}}=25^{\circ} \mathrm{C}$ | 25 | A |
| $\mathrm{E}_{\text {AS }}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$ | 600 | mJ |
| $\mathrm{P}_{\mathrm{d}}$ | $\mathrm{T}_{\mathrm{C}}=25^{\circ} \mathrm{C}$ | 230 | W |
| TJ |  | $-55 \ldots+175$ | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {JM }}$ |  | 175 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {stg }}$ |  | -40 ... +175 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | 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-220) | 1.13 / 10 | $\mathrm{Nm} / \mathrm{lb}$.in. |
| Weight | TO-220 | 3.0 | g |
|  | TO-263 | 2.5 | g |


| Symbol Test Conditions <br> ( $\mathrm{T}_{\mathrm{J}}=25^{\circ} \mathrm{C}$ unless otherwise specified) |  |  | Characteristic Values |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Min. | Typ. | Max |  |
| $B V_{\text {Dss }}$ | $\mathrm{V}_{G S}=0 \mathrm{~V}, \mathrm{I}_{\mathrm{D}}$ |  | 75 |  |  | V |
| $\mathrm{V}_{\mathrm{GS}(\mathrm{th})}$ | $V_{D S}=V_{G S}, I_{D}$ |  | 2.0 |  | 4.0 | V |
| $\mathrm{I}_{\text {GSS }}$ | $\mathrm{V}_{\mathrm{GS}}= \pm 20 \mathrm{~V}$, |  |  |  | $\pm 200$ | nA |
| $\mathrm{I}_{\text {DSS }}$ | $\begin{aligned} & V_{D S}=V_{D S S} \\ & V_{G S}=0 \mathrm{~V} \end{aligned}$ | $\mathrm{T}_{\mathrm{J}}=150^{\circ} \mathrm{C}$ |  |  | 2 150 | $\mu \mathrm{A}$ $\mu \mathrm{A}$ |
| $\mathrm{R}_{\text {DS(on) }}$ | $\mathrm{V}_{\mathrm{GS}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{D}}$ | 1, 2 |  |  | 10 | $\mathrm{m} \Omega$ |



TO-263 (IXTA)


TO-220 (IXTP)


G = Gate
$S$ = Source
D = Drain $\mathrm{TAB}=$ Drain

## Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- easy to drive and to protect
- $175^{\circ} \mathrm{C}$ Operating Temperature


## Advantages

- Easy to mount
- Space savings
- High power density


## Applications

- Automotive
- Motor Drives
- 42V Power Bus
- ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications

| Symbol Test Conditions$\left(T_{j}=25^{\circ} \mathrm{C}\right.$ unless otherwise specified) |  | Characteristic Values |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Min. | Typ. | Max. |
| $\mathrm{g}_{\text {fs }}$ | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V} ; \mathrm{I}_{\mathrm{D}}=0.5 \mathrm{I}_{\mathrm{D} 25}$, Note 1 | 38 | 64 | S |
| $\mathrm{C}_{\text {iss }}$ |  |  | 3100 | pF |
| $\mathrm{C}_{\text {oss }}$ | $\mathrm{V}_{G S}=0 \mathrm{~V}, \mathrm{~V}_{\text {DS }}=25 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | 520 | pF |
| $\mathrm{C}_{\text {rss }}$ |  |  | 125 | pF |
| $\mathrm{t}_{\mathrm{d}(\mathrm{on})}$ | Resistive Switching Times |  | 20 | ns |
| $t_{r}$ | $\mathrm{V}_{G S}=10 \mathrm{~V}, \mathrm{~V}_{\text {DS }}=0.5 \mathrm{~V}_{\text {DSS }}, \mathrm{I}_{\mathrm{D}}=25 \mathrm{~A}$ |  | 42 | ns |
| $\mathrm{t}_{\mathrm{d} \text { (off) }}$ | $\mathrm{R}_{\mathrm{G}}=5 \Omega$ (External) |  | 42 | ns |
| $\mathrm{t}_{\mathrm{f}}$ |  |  | 27 | ns |
| $Q_{\text {g(on) }}$ |  |  | 68 | nC |
| $\mathrm{Q}_{\mathrm{gs}}$ | $\mathrm{V}_{\mathrm{GS}}=10 \mathrm{~V}, \mathrm{~V}_{\mathrm{DS}}=0.5 \mathrm{~V}_{\mathrm{DSS}}, \mathrm{I}_{\mathrm{D}}=25 \mathrm{~A}$ |  | 18 | $n \mathrm{C}$ |
| $\mathrm{Q}_{\mathrm{gd}}$ |  |  | 15 | nC |
| $\mathrm{R}_{\text {thJc }}$ |  |  |  | $0.65{ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| $\mathbf{R}_{\text {thcs }}$ |  |  | 0.50 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |

## Source-Drain Diode

## Symbol Test ConditionsCharacteristic Values

| ( $\mathrm{T}_{\mathrm{J}}=25^{\circ} \mathrm{C}$ unless otherwise specified) |  | Min. | Typ. | Max. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{I}_{\mathrm{s}}$ | $\mathrm{V}_{\mathrm{GS}}=0 \mathrm{~V}$ |  |  | 98 | A |
| $\mathrm{I}_{\text {SM }}$ | Repetitive |  |  | 280 | A |
| $\mathrm{V}_{\text {sD }}$ | $I_{F}=I_{S}, V_{G S}=0 \mathrm{~V}$, Note 1 |  |  | 1.5 | V |
| $\mathrm{t}_{\mathrm{rr}}$ | $\begin{aligned} & \mathrm{I}_{\mathrm{F}}=49 \mathrm{~A},-\mathrm{di} / \mathrm{dt}=100 \mathrm{~A} / \mu \mathrm{s} \\ & \mathrm{~V}_{\mathrm{R}}=40 \mathrm{~V}, \mathrm{~V}_{\mathrm{GS}}=0 \mathrm{~V} \end{aligned}$ |  | 50 |  | ns |

Note 1. Pulse test, $\mathrm{t} \leq 300 \mu \mathrm{~s}$, duty cycle, $\mathrm{d} \leq 2 \%$;
2. On through-hole packages, $\mathrm{R}_{\mathrm{DS}(\text { (n) }}$ Kelvin test contact location is 5 mm or less from the package body.

## 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.


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