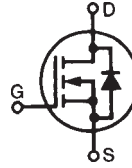


# TrenchMV™ Power MOSFET

**IXTA98N075T**  
**IXTP98N075T**

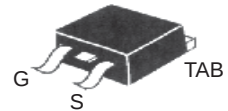
$$\begin{aligned} V_{DSS} &= 75 \text{ V} \\ I_{D25} &= 98 \text{ A} \\ R_{DS(on)} &\leq 10 \text{ m}\Omega \end{aligned}$$

N-Channel Enhancement Mode

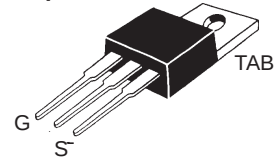


| Symbol     | Test Conditions                                                                                                                       | Maximum Ratings |                  |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$                                                                                       | 75              | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$                                                        | 75              | V                |
| $V_{GSM}$  | Transient                                                                                                                             | $\pm 20$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                                                                              | 98              | A                |
| $I_{LRMS}$ | Package Current Limit (RMS):                                                                                                          | 75              | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                            | 280             | A                |
| $dv/dt$    | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 175^\circ\text{C}$ , $R_G = 5 \Omega$ | 5               | V/ns             |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                              | 25              | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                                                                                              | 600             | mJ               |
| $P_d$      | $T_C = 25^\circ\text{C}$                                                                                                              | 230             | W                |
| $T_J$      |                                                                                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$   |                                                                                                                                       | 175             | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                                                                                       | -40 ... +175    | $^\circ\text{C}$ |
| $T_L$      | 1.6 mm (0.062 in.) from case for 10 s                                                                                                 | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$ | Plastic body for 10 seconds                                                                                                           | 260             | $^\circ\text{C}$ |
| $M_d$      | Mounting torque (TO-220)                                                                                                              | 1.13 / 10       | Nm/lb.in.        |
| Weight     | TO-220                                                                                                                                | 3.0             | g                |
|            | TO-263                                                                                                                                | 2.5             | g                |

TO-263 (IXTA)



TO-220 (IXTP)



G = Gate      D = Drain  
S = Source      TAB = Drain

## Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect
- 175  $^\circ\text{C}$  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<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values |      |                      |
|--------------|---------------------------------------------------------------------------|-----------------------|------|----------------------|
|              |                                                                           | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$                          | 75                    |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 100 \mu\text{A}$                               | 2.0                   |      | 4.0 V                |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$                      |                       |      | $\pm 200 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$                                                        |                       |      | 2 $\mu\text{A}$      |
|              | $V_{GS} = 0 \text{ V}$ $T_J = 150^\circ\text{C}$                          |                       |      | 150 $\mu\text{A}$    |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 25 \text{ A}$ , Notes 1, 2               |                       |      | 10 $\text{m}\Omega$  |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values |      |                        |
|--------------|---------------------------------------------------------------------------|-----------------------|------|------------------------|
|              |                                                                           | Min.                  | Typ. | Max.                   |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}, \text{Note 1}$                  | 38                    | 64   | S                      |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$             |                       | 3100 | pF                     |
| $C_{oss}$    |                                                                           |                       | 520  | pF                     |
| $C_{rss}$    |                                                                           |                       | 125  | pF                     |
| $t_{d(on)}$  | Resistive Switching Times                                                 |                       | 20   | ns                     |
| $t_r$        | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 25\text{ A}$           |                       | 42   | ns                     |
| $t_{d(off)}$ | $R_G = 5\ \Omega$ (External)                                              |                       | 42   | ns                     |
| $t_f$        |                                                                           |                       | 27   | ns                     |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 25\text{ A}$           |                       | 68   | nC                     |
| $Q_{gs}$     |                                                                           |                       | 18   | nC                     |
| $Q_{gd}$     |                                                                           |                       | 15   | nC                     |
| $R_{thJC}$   |                                                                           |                       | 0.50 | $0.65^\circ\text{C/W}$ |
| $R_{thCS}$   |                                                                           |                       |      | $^\circ\text{C/W}$     |

### Source-Drain Diode

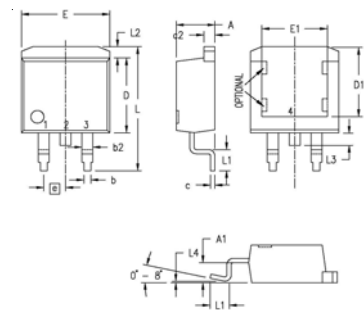
| Symbol   | Test Conditions                                                                                    | Characteristic Values | Min. | Typ. | Max.  |
|----------|----------------------------------------------------------------------------------------------------|-----------------------|------|------|-------|
| $I_S$    | $V_{GS} = 0\text{ V}$                                                                              |                       |      |      | 98 A  |
| $I_{SM}$ | Repetitive                                                                                         |                       |      |      | 280 A |
| $V_{SD}$ | $I_F = I_S, V_{GS} = 0\text{ V}, \text{Note 1}$                                                    |                       |      |      | 1.5 V |
| $t_{rr}$ | $I_F = 49\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$<br>$V_R = 40\text{ V}, V_{GS} = 0\text{ V}$ |                       | 50   |      | ns    |

- Note 1. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle,  $d \leq 2\%$ ;  
 2. On through-hole packages,  $R_{DS(on)}$  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.

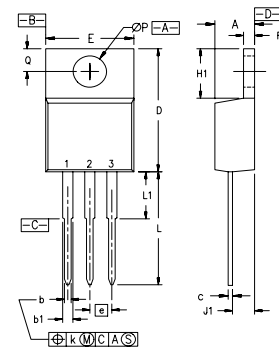
### TO-263 (IXTA) Outline



Pins: 1 - Gate 2 - Drain  
3 - Source 4, TAB - Drain

| Dim. | Millimeter |       | Inches |      |
|------|------------|-------|--------|------|
|      | Min.       | Max.  | Min.   | Max. |
| A    | 4.06       | 4.83  | .160   | .190 |
| A1   | 2.03       | 2.79  | .080   | .110 |
| b    | 0.51       | 0.99  | .020   | .039 |
| b2   | 1.14       | 1.40  | .045   | .055 |
| c    | 0.46       | 0.74  | .018   | .029 |
| c2   | 1.14       | 1.40  | .045   | .055 |
| D    | 8.64       | 9.65  | .340   | .380 |
| D1   | 7.11       | 8.13  | .280   | .320 |
| E    | 9.65       | 10.29 | .380   | .405 |
| E1   | 6.86       | 8.13  | .270   | .320 |
| e    | 2.54       | BSC   | .100   | BSC  |
| L    | 14.61      | 15.88 | .575   | .625 |
| L1   | 2.29       | 2.79  | .090   | .110 |
| L2   | 1.02       | 1.40  | .040   | .055 |
| L3   | 1.27       | 1.78  | .050   | .070 |
| L4   | 0          | 0.38  | 0      | .015 |
| R    | 0.46       | 0.74  | .018   | .029 |

### TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - Drain  
3 - Source 4, TAB - Drain

| SYM | INCHES |      | MILLIMETERS |       |
|-----|--------|------|-------------|-------|
|     | MIN    | MAX  | MIN         | MAX   |
| A   | .170   | .190 | 4.32        | 4.83  |
| b   | .025   | .040 | 0.64        | 1.02  |
| b1  | .045   | .065 | 1.15        | 1.65  |
| c   | .014   | .022 | 0.35        | 0.56  |
| D   | .580   | .630 | 14.73       | 16.00 |
| E   | .390   | .420 | 9.91        | 10.66 |
| e   | .100   | BSC  | 2.54        | BSC   |
| F   | .045   | .055 | 1.14        | 1.40  |
| H1  | .230   | .270 | 5.85        | 6.85  |
| J1  | .090   | .110 | 2.29        | 2.79  |
| k   | 0      | .015 | 0           | 0.38  |
| L   | .500   | .550 | 12.70       | 13.97 |
| L1  | .110   | .230 | 2.79        | 5.84  |
| ØP  | .139   | .161 | 3.53        | 4.08  |
| Q   | .100   | .125 | 2.54        | 3.18  |

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

|           |           |           |           |              |              |              |              |              |              |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|
| 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 | 7,157,338 B2 |
| 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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