

TrenchT4™ Power MOSFET

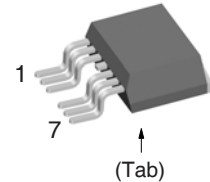
IXTA380N036T4-7

$V_{DSS} = 36V$
 $I_{D25} = 380A$
 $R_{DS(on)} \leq 1.0m\Omega$

N-Channel Enhancement Mode
Avalanche Rated



TO-263 (7-lead)



Pins: 1 - Gate
 2, 3, 5, 6, 7 - Source
 4 (Tab) - Drain

| Symbol | Test Conditions | Maximum Ratings | |
|---------------|---|-------------------|------------|
| V_{DSS} | $T_J = 25^\circ C$ to $175^\circ C$ | 36 | V |
| V_{DGR} | $T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$ | 36 | V |
| V_{GSM} | Transient | ± 15 | V |
| I_{D25} | $T_C = 25^\circ C$ | 380 | A |
| I_{LRMS} | Lead Current Limit, RMS | 160 | A |
| I_{DM} | $T_C = 25^\circ C$, Pulse Width Limited by T_{JM} | 830 | A |
| I_A | $T_C = 25^\circ C$ | 190 | A |
| E_{AS} | $T_C = 25^\circ C$ | 1.4 | J |
| P_D | $T_C = 25^\circ C$ | 480 | W |
| T_J | | -55 ... +175 | $^\circ C$ |
| T_{JM} | | 175 | $^\circ C$ |
| T_{stg} | | -55 ... +175 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062in.) from Case for 10s | 260 | $^\circ C$ |
| F_C | Mounting Force | 10.65 / 2.2..14.6 | N/lb |
| Weight | | 3.0 | g |

Features

- International Standard Package
- $175^\circ C$ Operating Temperature
- High Current Handling Capability
- Avalanche Rated
- Low $R_{DS(on)}$

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Converts & Off-Line UPS
- High Current Switching Applications
- Primary-Side Switch

| Symbol | Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|----------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0V$, $I_D = 250\mu A$ | 36 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250\mu A$ | 2.0 | | 4.0 V |
| I_{GSS} | $V_{GS} = \pm 15V$, $V_{DS} = 0V$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0V$ | | | 10 μA |
| | $T_J = 150^\circ C$ | | | 750 μA |
| $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 100A$, Note 1 | | | 1.0 m Ω |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|--|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10\text{V}$, $I_D = 60\text{A}$, Note 1 | 105 | 175 | S |
| R_{Gi} | Gate Input Resistance | | 1.0 | Ω |
| C_{iss} | } $V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$ | | 13.4 | nF |
| C_{oss} | | | 2400 | pF |
| C_{rss} | | | 1650 | pF |
| $t_{d(on)}$ | } Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 5\Omega$ (External) | | 36 | ns |
| t_r | | | 78 | ns |
| $t_{d(off)}$ | | | 125 | ns |
| t_f | | | 80 | ns |
| $Q_{g(on)}$ | } $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ | | 260 | nC |
| Q_{gs} | | | 60 | nC |
| Q_{gd} | | | 92 | nC |
| R_{thJC} | | | | 0.31 $^\circ\text{C/W}$ |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|----------|--|-----------------------|------|--------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{V}$ | | | 380 A |
| I_{SM} | Repetitive, Pulse width limited by T_{JM} | | | 1520 A |
| V_{SD} | $I_F = 100\text{A}$, $V_{GS} = 0\text{V}$, Note 1 | | | 1.4 V |
| t_{rr} | } $I_F = 150\text{A}$, $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 30\text{V}$ | | 54 | ns |
| I_{RM} | | | 2.6 | A |
| Q_{RM} | | | 70 | nC |

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

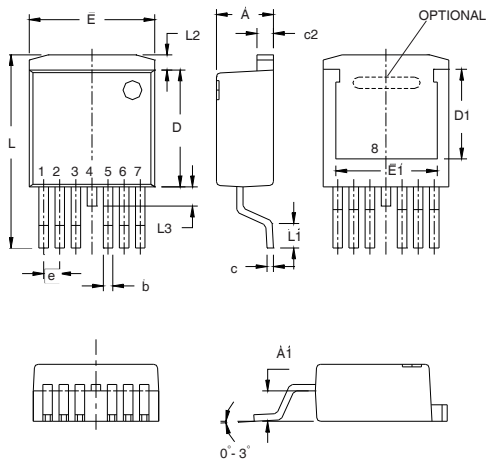
ADVANCE TECHNICAL INFORMATION

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 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 | 7,157,338B2 |
| 4,860,072 | 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 | |

TO-263 (7-lead) (IXTA..7) Outline


Pins: 1 - Gate
 2, 3, 5, 6, 7 - Source
 4 - Drain

| SYM | INCHES | | MILLIMETER | |
|-----|----------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .170 | .185 | 4.30 | 4.70 |
| A1 | .085 | .104 | 2.15 | 2.65 |
| b | .026 | .035 | 0.65 | 0.90 |
| c | .016 | .024 | 0.40 | 0.60 |
| c2 | .049 | .055 | 1.25 | 1.40 |
| D | .355 | .370 | 9.00 | 9.40 |
| D1 | .272 | .280 | 6.90 | 7.10 |
| E | .386 | .402 | 9.80 | 10.20 |
| E1 | .311 | .319 | 7.90 | 8.10 |
| e | .050 BSC | | 1.27 BSC | |
| L | .591 | .614 | 15.00 | 15.60 |
| L1 | .091 | .110 | 2.30 | 2.80 |
| L2 | .039 | .059 | 1.00 | 1.50 |
| L3 | .000 | .059 | 0.00 | 1.50 |