## TrenchP™ Power MOSFET

**IXTN210P10T**

P-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier

### Symbol Test Conditions Maximum Ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{DSS}$</td>
<td>$T_J = 25^\circ C$ to $150^\circ C$</td>
<td>-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{DGR}$</td>
<td>$T_J = 25^\circ C$ to $150^\circ C$, $R_{DS} = 1, M\Omega$</td>
<td>-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{GSS}$</td>
<td>Continuous</td>
<td>±15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{GSM}$</td>
<td>Transient</td>
<td>±25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{DSS}$</td>
<td>$T_C = 25^\circ C$ (Chip Capability)</td>
<td>-210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{LRSMS}$</td>
<td>Lead Current Limit, RMS</td>
<td>-200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{DM}$</td>
<td>$T_C = 25^\circ C$, Pulse Width Limited by $T_{JM}$</td>
<td>-800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_A$</td>
<td>$T_C = 25^\circ C$</td>
<td>-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{AS}$</td>
<td>$T_C = 25^\circ C$</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$dv/dt$</td>
<td>$I_s \leq I_{DAP}, V_{DS} \leq V_{DSS}, T_J \leq 150^\circ C$</td>
<td>10</td>
<td>V/ns</td>
<td></td>
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<tr>
<td>$P_D$</td>
<td>$T_C = 25^\circ C$</td>
<td>830</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>$T_J$</td>
<td></td>
<td>-55 to +150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$T_{JM}$</td>
<td></td>
<td>150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$T_{stop}$</td>
<td></td>
<td>-55 to +150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$V_{ISOL}$</td>
<td>50/60 Hz, RMS, $t = 1$ minute</td>
<td>2500</td>
<td>V~</td>
<td></td>
</tr>
<tr>
<td>$I_{ISOL}$</td>
<td>$\leq 1, mA$, $t = 1$s</td>
<td>3000</td>
<td>V~</td>
<td></td>
</tr>
<tr>
<td>$M_d$</td>
<td>Mounting Torque for Base Plate</td>
<td>1.5/13</td>
<td>Nm/lb.in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal Connection Torque</td>
<td>1.3/11.5</td>
<td>Nm/lb.in.</td>
<td></td>
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<tr>
<td>Weight</td>
<td></td>
<td>30</td>
<td>g</td>
<td></td>
</tr>
</tbody>
</table>

### Features

- International Standard Package
- Low Intrinsic Gate Resistance
- miniBLOC with Aluminum Nitride Isolation
- Avalanche Rated
- Extended FBSOA
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$ and $Q_G$

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- High-Side Switching
- Push Pull Amplifiers
- DC Choppers
- Automatic Test Equipment
- Current Regulators
- Battery Charger Applications

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$V_{DSS} = -100\, V$

$I_{D25} = -210\, A$

$R_{DS(on)} \leq 7.5\, \text{m}\Omega$

$t_{rr} \leq 200\, \text{ns}$

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DS100408A(01/13)
Symbol | Test Conditions (T_j = 25°C, Unless Otherwise Specified) | Characteristic Values
--- | --- | ---
| | | Min. | Typ. | Max.

**gfs**

V_{DS} = -10V, I_D = -60A, Note 1

90 | 150 | S

C_{oss}

V_{GS} = 0V, V_{DS} = -25V, f = 1MHz

4070 | pF

C_{oss}

V_{GS} = 0V, V_{DS} = -25V, f = 1MHz

1100 | pF

**t_{d(on)}**

Resistive Switching Times

V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS\text{M}}, I_D = 0.5 \cdot I_{DSS\text{M}}

165 | ns

**Q_{g(on)}**

V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS\text{M}}, I_D = 0.5 \cdot I_{DSS\text{M}}

740 | nC

**Q_{gs}**

V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS\text{M}}, I_D = 0.5 \cdot I_{DSS\text{M}}

200 | nC

**Q_{gd}**

V_{GS} = -10V, V_{DS} = 0.5 \cdot V_{DSS\text{M}}, I_D = 0.5 \cdot I_{DSS\text{M}}

155 | nC

**R_{thJC}**

0.15 °C/W

**R_{thCS}**

0.05 °C/W

Source-Drain Diode

Symbol | Test Conditions (T_j = 25°C, Unless Otherwise Specified) | Characteristic Values
--- | --- | ---
| | | Min. | Typ. | Max.

**I S**

V_{GS} = 0V

-210 A

**I_{SM}**

Repetitive, Pulse Width Limited by T_{JM}

-840 A

**V_{SD}**

I_{F} = -100A, V_{GS} = 0V, Note 1

-1.4 V

**t_{F}**

I_{F} = -105A, -di/dt = -100A/\mu s

930 ns

**Q_{RM}**

V_{N} = -100V, V_{GS} = 0V

-12.4 A

**Q_{RM}**

V_{N} = -100V, V_{GS} = 0V

-12.4 A

**t_{RR}**

-209  A

Note

1. Pulse test, t \leq 300\mu s, duty cycle, d \leq 2%.

**PRELIMINARY TECHNICAL INFORMATION**

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.
Fig. 1. Output Characteristics @ $T_J = 25^\circ$C

Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ$C

Fig. 3. Output Characteristics @ $T_J = 125^\circ$C

Fig. 4. $R_{DS(on)}$ Normalized to $I_D = -105A$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = -105A$ Value vs. Drain Current

Fig. 6. Maximum Drain Current vs. Case Temperature
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.
Fig. 19. Maximum Transient Thermal Impedance

0.00001 0.0001 0.001 0.01 0.1 1 10

0.0001 0.001 0.01 0.1 1

Pulse Width - Seconds

Z(thermal) - °C/W