IXYS

Preliminary Technical Information

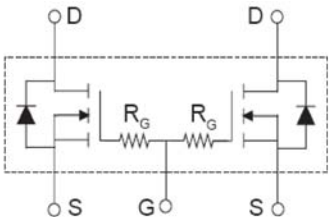
# Trench™ Power MOSFET Common-Gate Pair

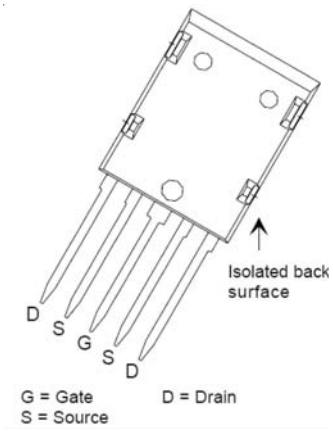
# IXTL2x180N10T

$V_{DSS}$ = 100V
$I_{D25}$ = 2x100A
$R_{DS(on)}$ ≤ 9mΩ

(Electrically Isolated Back Surface)

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier




| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 175°C | 100 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 175°C, $R_{GS}$ = 1MΩ | 100 | V |
| $V_{GSS}$ | Continuous | ± 20 | V |
| $V_{GSM}$ | Transient | ± 30 | V |
| $I_{D25}$ | $T_C$ = 25°C | 100 | A |
| $I_{L(RMS)}$ | External Lead Current Limit | 75 | A |
| $I_{DM}$ | $T_C$ = 25°C, Pulse Width Limited by $T_{JM}$ | 450 | A |
| $I_A$ | $T_C$ = 25°C | 25 | A |
| $E_{AS}$ | $T_C$ = 25°C | 750 | mJ |
| $P_D$ | $T_C$ = 25°C | 150 | W |
| dv/dt | $I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$ | 3 | V/ns |
| $T_J$ | | -55 ... +175 | °C |
| $T_{JM}$ | | 175 | °C |
| $T_{stg}$ | | -55 ... +175 | °C |
| $T_L$ | 1.6mm (0.062 in.) from Case for 10s | 300 | °C |
| $T_{SOLD}$ | Plastic Body for 10s | 260 | °C |
| $F_C$ | Mounting Force | 20..120 /9..27 | N/lb. |
| Weight | | 8 | g |

| Symbol | Test Conditions ($T_J$ = 25°C Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 100 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 250μA | 2.5 | | 4.5 | V |
| $I_{GSS}$ | $V_{GS}$ = ± 20V, $V_{DS}$ = 0V | | | ± 200 | nA |
| $I_{DSS}$ | $V_{DS} = V_{DSS}$, $V_{GS}$ = 0V | | | 5 | μA |
| | $T_J$ = 150°C | | | 250 | μA |
| $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 50A, Note 1 | | | 9 | mΩ |

## Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- 175°C Operating Temperature
- Avalanche Rated
- High Current Handling Capability
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$ and $Q_G$

## Advantages

- High Power Density
- Easy to Mount
- Space Savings

## Applications

- Automotive
  - Motor Drives
  - DC/DC Conversion
  - 42V Power Bus
  - ABS Systems
- DC/DC Converters and Off-Line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications
- Distributed Power Architechtures and VRMs
- Electronic Valve Train Systems
- High Voltage Synchronous Recifier

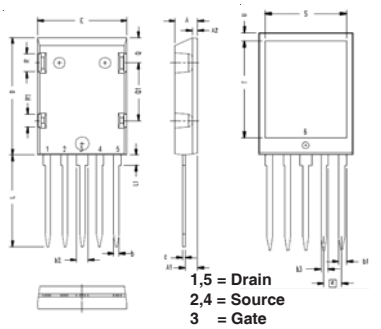
| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 10V, $I_D$ = 60A, Note 1 | 70 | 110 | | S |
| $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 6900 | | pF |
| $C_{oss}$ | | | 923 | | pF |
| $C_{rss}$ | | | 162 | | pF |
| $R_{Gi}$ | Gate Input Resistance | | 3.0 | | Ω |
| $t_{d(on)}$ | **Resistive Switching Times** | | 33 | | ns |
| $t_r$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 25A | | 54 | | ns |
| $t_{d(off)}$ | $R_G$ = 3.3Ω (External) | | 42 | | ns |
| $t_f$ | | | 31 | | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 25A | | 151 | | nC |
| $Q_{gs}$ | | | 39 | | nC |
| $Q_{gd}$ | | | 45 | | nC |
| $R_{thJC}$ | | | | 1.0 | °C/W |
| $R_{thCS}$ | | | 0.15 | | °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 | | | 180 | A |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$ | | | 450 | A |
| $V_{SD}$ | $I_F$ = 50A, $V_{GS}$ = 0V, Note 1 | | | 1.0 | V |
| $t_{rr}$ | $I_F$ = 25A, $V_{GS}$ = 0V<br>-di/dt = 100A/µs, $V_R$ = 50V | | 60 | | ns |

Note 1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

**ISOPLUS I5-Pak™ (IXTL) Outline**



1,5 = Drain
2,4 = Source
3 = Gate
6 = Isolated

| SYM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .102 | .118 | 2.59 | 3.00 |
| A2 | .046 | .055 | 1.17 | 1.40 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .063 | .072 | 1.60 | 1.83 |
| b2 | .100 | .110 | 2.54 | 2.79 |
| b3 | .058 | .068 | 1.47 | 1.73 |
| c | .020 | .029 | 0.51 | 0.74 |
| D | 1.020 | 1.040 | 25.91 | 26.42 |
| E | .770 | .799 | 19.56 | 20.29 |
| e | .150 BSC | | 3.81 BSC | |
| L | .780 | .820 | 19.81 | 20.83 |
| L1 | .080 | .102 | 2.03 | 2.59 |
| Q | .210 | .235 | 5.33 | 5.97 |
| Q1 | .490 | .513 | 12.45 | 13.03 |
| R | .150 | .180 | 3.81 | 4.57 |
| R1 | .100 | .130 | 2.54 | 3.30 |
| S | .668 | .690 | 16.97 | 17.53 |
| T | .801 | .821 | 20.34 | 20.85 |
| U | .085 | .080 | 1.85 | 2.03 |

**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.