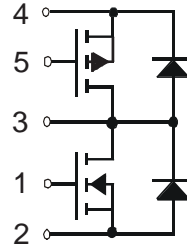


Trench™ P & N-Channel Power MOSFET

Common Drain Topology

FMP76-010T



| | P CH. | N CH. |
|---------------|--------|-------|
| V_{DSS} | - 100V | 100V |
| I_{D25} | - 54A | 62A |
| $R_{DS(on)}$ | 24mΩ | 11mΩ |
| $t_{rr(typ)}$ | 70ns | 67ns |

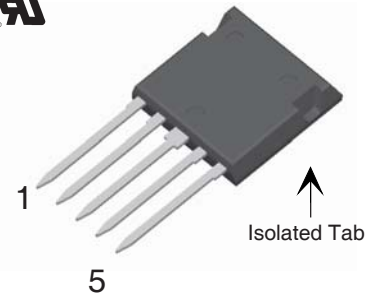
| Symbol | Test Conditions | Maximum Ratings | |
|-------------|--------------------------------------|-------------------|-------|
| T_J | | -55 ... +150 | °C |
| T_{JM} | | 150 | °C |
| T_{stg} | | -55 ... +150 | °C |
| V_{ISOLD} | 50/60Hz, RMS, t = 1min, leads-to-tab | 2500 | ~V |
| T_L | 1.6mm (0.062 in.) from case for 10s | 300 | °C |
| T_{SOLD} | Plastic body for 10s | 260 | °C |
| F_C | Mounting force | 20..120 / 4.5..27 | N/lb. |

| Symbol | Test Conditions | Characteristic Values | | |
|---------------|--|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| C_p | Coupling capacitance between shorted pins and mounting tab in the case | | 40 | pF |
| d_S, d_A | pin - pin | 1.7 | | mm |
| d_S, d_A | pin - backside metal | 5.5 | | mm |
| Weight | | | 9 | g |

P - CHANNEL

| Symbol | Test Conditions | Maximum Ratings | |
|-----------|---|-----------------|---|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | - 100 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1M\Omega$ | - 100 | V |
| V_{GSS} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | - 54 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | - 230 | A |
| I_A | $T_C = 25^\circ\text{C}$ | - 38 | A |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.0 | J |
| P_D | $T_C = 25^\circ\text{C}$ | 132 | W |

ISOPLUS i4-Pak™



Features

- Silicon chip on Direct-Copper Bond (DCB) substrate
 - UL recognized package
 - Isolated mounting surface
 - 2500V electrical isolation
- Avalanche rated
- Low Q_g
- Low Drain-to-Tab capacitance
- Low package inductance

Advantages

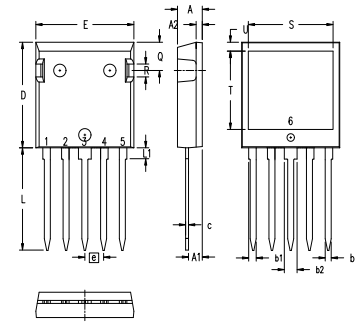
- Low gate drive requirement
- High power density
- Low drain to ground capacitance
- Fast switching

Applications

- DC and AC motor drives
- Class AB audio amplifiers
- Multi-phase DC to DC converters
- Industrial battery chargers
- Switching power supplies

| Symbol | Test Conditions ² (T _J = 25°C unless otherwise specified) | Characteristic Values | | |
|---------------------------|---|-----------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | V _{GS} = 0V, I _D = - 250 μA | - 100 | | V |
| V_{GS(th)} | V _{DS} = V _{GS} , I _D = - 250μA | - 2.0 | | V |
| I_{GSS} | V _{GS} = ±20 V, V _{DS} = 0V | | | ± 100 nA |
| I_{DSS} | V _{DS} = V _{DSS} , V _{GS} = 0V T _J = 125°C | | | -15 μA - 750 μA |
| R_{DS(on)} | V _{GS} = -10V, I _D = - 38A, Note 1 | | | 24 mΩ |
| g_{fs} | V _{DS} = -10V, I _D = - 38A, Note 1 | 35 | 58 | S |
| C_{iss} | V _{GS} = 0V, V _{DS} = - 25V, f = 1MHz | | 13.7 | nF |
| C_{oss} | | | | |
| C_{rss} | | | | |
| t_{d(on)} | Resistive Switching Times V _{GS} = -10V, V _{DS} = 0.5 • V _{DSS} , I _D = - 38A R _G = 1Ω (External) | | 25 | ns |
| t_r | | | | |
| t_{d(off)} | | | | |
| t_f | | | | |
| Q_{g(on)} | V _{GS} = -10V, V _{DS} = 0.5 • V _{DSS} , I _D = - 38A | | 197 | nC |
| Q_{gs} | | | | |
| Q_{gd} | | | | |
| R_{thJC} | | | | 0.95 °C/W |
| R_{thCS} | | 0.15 | | °C/W |

ISOPLUS i4-Pak™ Outline



NOTE: Bottom heatsink meets 3000 Volts AC 1 sec isolation to the other pins.

| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .102 | .118 | 2.59 | 3.00 |
| A2 | .046 | .085 | 1.17 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .058 | .068 | 1.47 | 1.73 |
| b2 | .100 | .110 | 2.54 | 2.79 |
| C | .020 | .029 | 0.51 | 0.74 |
| D | .819 | .840 | 20.80 | 21.34 |
| E | .770 | .799 | 19.56 | 20.29 |
| e | .150 BSC | | 3.81 BSC | |
| L | .780 | .840 | 19.81 | 21.34 |
| L1 | .083 | .102 | 2.11 | 2.59 |
| Q | .210 | .244 | 5.33 | 6.20 |
| R | .100 | .180 | 2.54 | 4.57 |
| S | .660 | .690 | 16.76 | 17.53 |
| T | .590 | .620 | 14.99 | 15.75 |
| U | .065 | .080 | 1.65 | 2.03 |

Ref: IXYS CO 0077 R0

Drain-Source Diode

| Symbol | Test Conditions ² | Characteristic Values (T _J = 25°C unless otherwise specified) | | |
|-----------------------|---|---|------|---------|
| | | Min. | Typ. | Max. |
| I_s | V _{GS} = 0V | | | - 54 A |
| I_{SM} | Repetitive, pulse width limited by T _{JM} | | | - 304 A |
| V_{SD} | I _F = - 38A, V _{GS} = 0V, Note 1 | | | - 1.3 V |
| t_{rr} | I _F = - 38A, di/dt = 100A/μs V _R = - 50V, V _{GS} = 0V | | 70 | ns |
| Q_{RM} | | | | |
| I_{RM} | | | | |
| | | | - 6 | A |

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 |
| | 4,850,072 | 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 | |

N - CHANNEL

| Symbol | Test Conditions | Maximum Ratings | |
|-----------|--|-----------------|----|
| V_{DSS} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 100 | V |
| V_{DGR} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}, R_{GS} = 1\text{M}\Omega$ | 100 | V |
| V_{GSM} | Transient | ± 20 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 62 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 300 | A |
| I_A | $T_C = 25^\circ\text{C}$ | 65 | A |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 500 | mJ |
| P_D | $T_C = 25^\circ\text{C}$ | 89 | W |

| Symbol | Test Conditions ² ($T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|--------------------------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0\text{V}, I_D = 250 \mu\text{A}$ | 100 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$ | 2.5 | | 4.5 V |
| I_{GSS} | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0\text{V}$ $T_J = 150^\circ\text{C}$ | | | 5 μA 250 μA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = 25\text{A}$, (Note 1) | | | 11 m Ω |
| g_{fs} | $V_{DS} = 10\text{V}, I_D = 60\text{A}$, (Note 1) | 55 | 93 | S |
| C_{iss} | } $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 5080 | pF |
| C_{oss} | | | 635 | pF |
| C_{rss} | | | 95 | pF |
| $t_{d(on)}$ | } Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$ $R_G = 5\Omega$ (External) | | 30 | ns |
| t_r | | | 47 | ns |
| $t_{d(off)}$ | | | 44 | ns |
| t_f | | | 28 | ns |
| $Q_{g(on)}$ | } $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25\text{A}$ | | 104 | nC |
| Q_{gs} | | | 30 | nC |
| Q_{gd} | | | 29 | nC |
| R_{thJC} | | | | 1.4 $^\circ\text{C/W}$ |
| R_{thCS} | | 0.15 | | $^\circ\text{C/W}$ |

Source-Drain Diode
Characteristic Values
 $T_j = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Test Conditions ³ | Characteristic Values | | |
|----------------------------------|--|-----------------------|------|-------|
| | | Min. | Typ. | Max. |
| I_s | $V_{GS} = 0V$ | | | 62 A |
| I_{SM} | Repetitive, pulse width limited by T_{JM} | | | 350 A |
| V_{SD} | $I_F = 25A, V_{GS} = 0V, \text{Note 1}$ | | | 1.0 V |
| t_{rr} Q_{RM} I_{RM} | $I_F = 25A, -di/dt = 100A/\mu s$ $V_R = 50V, V_{GS} = 0V$ | | 67 | ns |
| | | | 160 | nC |
| | | | 4.7 | A |

Note 1: Pulse test, $t \leq 300\mu s$, 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 objective result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.