

TrenchMV™

Power MOSFET

(Electrically Isolated Back Surface)

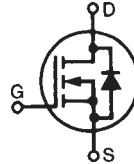
IXTF280N055T

$$V_{DSS} = 55 \text{ V}$$

$$I_{D25} = 160 \text{ A}$$

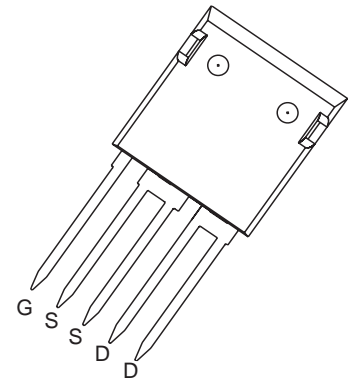
$$R_{DS(on)} \leq 4.0 \text{ m}\Omega$$

N-Channel Enhancement Mode
Avalanche Rated



| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|-----------------|------------------|
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 175°C | 55 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 175°C ; $R_{GS} = 1 \text{ M}\Omega$ | 55 | V |
| V_{GSM} | Transient | ± 20 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 160 | A |
| I_L | Package Current Limit, RMS (75 A per lead) | 150 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 600 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 40 | A |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.5 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A/ms}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 175^\circ\text{C}$, $R_G = 3.3 \Omega$ | 3 | V/ns |
| P_D | $T_C = 25^\circ\text{C}$ | 200 | W |
| T_J | | -55 ... +175 | $^\circ\text{C}$ |
| T_{JM} | | 175 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +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 | $^\circ\text{C}$ |
| V_{ISOL} | 50/60 Hz, $t = 1$ minute, $I_{ISOL} < 1 \text{ mA}$, RMS 2500 | V | |
| F_C | Mounting force | 20..120/4.5..25 | N/lb. |
| Weight | | 6 | g |

ISOPLUS i4-Pak™ (5-lead) (IXTF)



G = Gate
S = Source
D = Drain

Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect
- 175 °C Operating Temperature

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- Automotive
 - Motor Drives
 - High Side Switch
 - 12V Battery
 - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary- Side Switch
- High Current Switching Applications

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|--------------------------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$ | 55 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$ | 2.0 | | 4.0 V |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$ | | | $\pm 200 \text{ nA}$ |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 150^\circ\text{C}$ | | | 5 μA 250 μA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 50 \text{ A}$, Notes 1, 2 | | | 4.0 m Ω |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified) | | |
|--------------|---|---|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 10\text{ V}; I_D = 60\text{ A}$, Note 1 | 70 | 110 | S |
| C_{iss} | | | 9800 | pF |
| C_{OSS} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 1450 | pF |
| C_{rss} | | | 320 | pF |
| $t_{d(on)}$ | | | 32 | ns |
| t_r | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 50\text{ A}$ | | 55 | ns |
| $t_{d(off)}$ | $R_G = 3.3\ \Omega$ (External) | | 49 | ns |
| t_f | | | 37 | ns |
| $Q_{g(on)}$ | | | 200 | nC |
| Q_{gs} | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 25\text{ A}$ | | 50 | nC |
| Q_{gd} | | | 50 | nC |
| R_{thJC} | | | | 0.75 $^\circ\text{C/W}$ |
| R_{thCH} | | 0.15 | | $^\circ\text{C/W}$ |

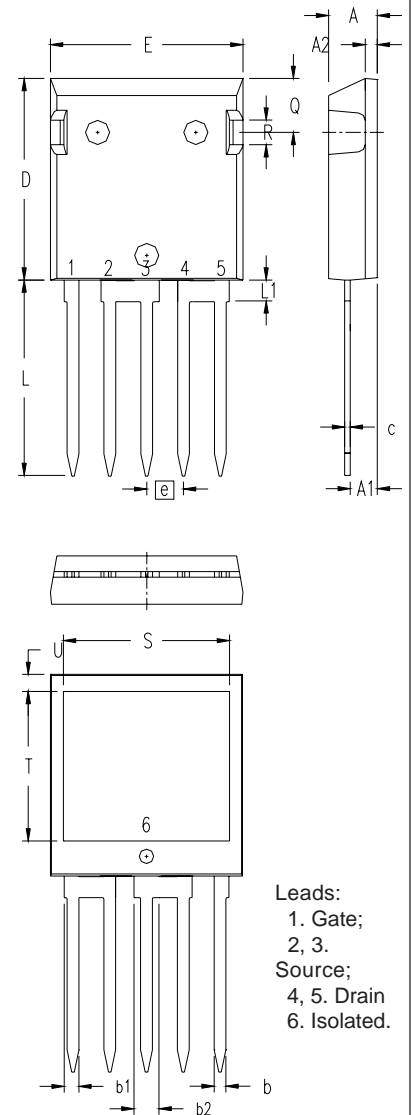
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified) | | |
|----------|--|---|------|-------|
| | | Min. | Typ. | Max. |
| I_s | $V_{GS} = 0\text{ V}$ | | | 150 A |
| I_{SM} | Pulse width limited by T_{JM} | | | 600 A |
| V_{SD} | $I_F = 50\text{ A}, V_{GS} = 0\text{ V}$, Note 1 | | | 1.0 V |
| t_{rr} | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 25\text{ V}, V_{GS} = 0\text{ V}$ | | 40 | ns |

- Notes: 1. Pulse test: $t \leq 300\ \mu\text{s}$, duty cycled $\leq 2\%$;
2. Drain and Source Kelvin contacts must be located less than 5 mm from the plastic body.

ADVANCETECHNICALINFORMATION

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.

ISOPLUS i4-Pak™ (5-Lead) (IXTF) Outline



| 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 |

All leads and tab are tin plated.

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| | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|
| 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 |
| | 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 |