

# CoolMOS™ Power MOSFET IXKG 25N80C

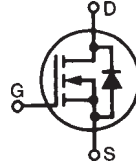
## ISO264™

### Electrically Isolated Back Surface

N-Channel Enhancement Mode

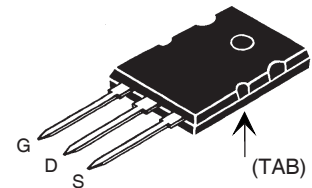
Low  $R_{DS(on)}$ , High Voltage MOSFET

$$\begin{aligned} V_{DSS} &= 800 \text{ V} \\ I_{D25} &= 25 \text{ A} \\ R_{DS(on)} &= 150 \text{ m}\Omega \end{aligned}$$



| Symbol       | Test Conditions                                                                                            | Maximum Ratings |                  |
|--------------|------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$    | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$                                                             | 800             | V                |
| $V_{GS}$     | Continuous                                                                                                 | $\pm 20$        | V                |
| $I_{D25}$    | $T_C = 25^\circ\text{C}$                                                                                   | 25              | A                |
| $I_{D90}$    | $T_C = 90^\circ\text{C}$                                                                                   | 9               | A                |
| $I_{D(RMS)}$ | Package lead current limit                                                                                 | 45              | A                |
| $E_{AS}$     | $I_o = 10\text{A}, T_C = 25^\circ\text{C}$                                                                 | 690             | mJ               |
| $E_{AR}$     | $I_o = 20\text{A}$                                                                                         | 0.5             | mJ               |
| $dv/dt$      | $V_{DS} < V_{DSS}, I_F \leq 17\text{A}, T_{vj} = 150^\circ\text{C}$<br>$dI_F/dt = 100\text{A}/\mu\text{s}$ | 6               | V/ns             |
| $P_D$        | $T_C = 25^\circ\text{C}$                                                                                   | 250             | W                |
| $T_J$        |                                                                                                            | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$     |                                                                                                            | 150             | $^\circ\text{C}$ |
| $T_{stg}$    |                                                                                                            | -55 ... +125    | $^\circ\text{C}$ |
| $T_L$        | 1.6 mm (0.062 in.) from case for 10 s                                                                      | 300             | $^\circ\text{C}$ |
| $V_{ISOL}$   | RMS leads-to-tab, 50/60 Hz, $t = 1$ minute                                                                 | 2500            | V~               |
| $M_d$        | Mounting torque                                                                                            | 0.9 / 6         | Nm/lb-in         |
| Weight       |                                                                                                            | 8               | g                |

#### ISO264™



G = Gate, D = Drain,  
S = Source

\* Patent pending

#### Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- 3<sup>RD</sup> generation CoolMOS power MOSFET
  - High blocking capability
  - Low on resistance
  - Avalanche rated for unclamped inductive switching (UIS)
- Low thermal resistance due to reduced chip thickness
- Low drain to tab capacitance(<40pF)

#### Applications

- Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supplies (UPS)
- Power Factor Correction (PFC)
- Welding
- Inductive Heating

#### Advantages

- Easy assembly
- Space savings
- High power density

| Symbol       | Test Conditions                                                                                                                     | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |            |                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|-----------------------------------|
|              |                                                                                                                                     | min.                                                                              | typ.       | max.                              |
| $R_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = I_{D90}, \text{Note 1}$<br>$V_{GS} = 10\text{V}, I_D = I_{D90}, \text{Note 1 } T_J = 125^\circ\text{C}$ |                                                                                   | 126<br>297 | 150 m $\Omega$<br>m $\Omega$      |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 2\text{mA}$                                                                                                 | 2                                                                                 |            | 4 V                               |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0\text{V}$                                                                                          |                                                                                   | 10         | 50 $\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{V}_{DC}, V_{DS} = 0$                                                                                          |                                                                                   |            | $\pm 200$ nA                      |

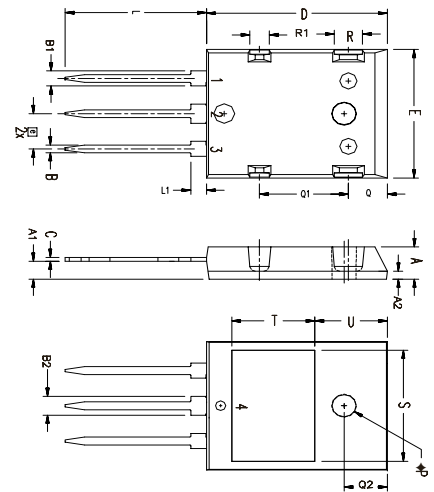
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| Symbol              | Test Conditions                                                        | Characteristic Values                               |      |         |
|---------------------|------------------------------------------------------------------------|-----------------------------------------------------|------|---------|
|                     |                                                                        | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |         |
|                     |                                                                        | min.                                                | typ. | max.    |
| Q <sub>g(on)</sub>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 640 V, I <sub>D</sub> = 17 A |                                                     | 166  | nC      |
| Q <sub>gs</sub>     |                                                                        |                                                     | 18   | nC      |
| Q <sub>gd</sub>     |                                                                        |                                                     | 84   | nC      |
| t <sub>d(on)</sub>  | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 640V                         |                                                     | 25   | ns      |
| t <sub>r</sub>      |                                                                        |                                                     | 25   | ns      |
| t <sub>d(off)</sub> | I <sub>D</sub> = 35 A, R <sub>G</sub> = 2.2 Ω                          |                                                     | 75   | ns      |
| t <sub>f</sub>      |                                                                        |                                                     | 10   | ns      |
| R <sub>thJC</sub>   |                                                                        |                                                     |      | 0.5 K/W |
| R <sub>thCH</sub>   |                                                                        |                                                     | 0.30 |         |

| Reverse Conduction |                                                          | Characteristic Values                               |      |       |
|--------------------|----------------------------------------------------------|-----------------------------------------------------|------|-------|
|                    |                                                          | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |       |
| Symbol             | Test Conditions                                          | min.                                                | typ. | max.  |
| V <sub>SD</sub>    | I <sub>F</sub> = 12.5 A, V <sub>GS</sub> = 0 V<br>Note 1 |                                                     | 1    | 1.2 V |

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

## ISO264 OUTLINE



- 1 - Gate  
2 - Drain (Collector)  
3 - Source (Emitter)  
4 - No Connection

| SYM | INCHES   |       | MILLIMETERS |       |
|-----|----------|-------|-------------|-------|
|     | MIN      | MAX   | MIN         | 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  | .087     | .102  | 2.21        | 2.59  |
| b2  | .111     | .126  | 2.82        | 3.20  |
| c   | .020     | .029  | 0.51        | 0.74  |
| D   | 1.020    | 1.040 | 25.91       | 26.42 |
| E   | .770     | .799  | 19.56       | 20.29 |
| e   | .215 BSC |       | 5.45 BSC    |       |
| L   | .780     | .820  | 19.81       | 20.83 |
| L1  | .080     | .102  | 2.03        | 2.59  |
| P   | .130     | .145  | 3.30        | 3.68  |
| Q   | .210     | .235  | 5.33        | 5.97  |
| Q1  | .490     | .513  | 12.45       | 13.03 |
| Q2  | .235     | .255  | 5.96        | 6.48  |
| R   | .150     | .180  | 3.81        | 4.57  |
| R1  | .100     | .130  | 2.54        | 3.30  |
| S   | .668     | .690  | 16.97       | 17.53 |
| T   | .460     | .480  | 11.68       | 12.19 |
| U   | .400     | .420  | 10.16       | 10.67 |

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more

4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1  
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665