

CoolMOS Power MOSFET in ECO-PAC 2

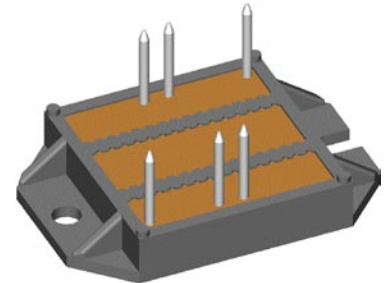
N-Channel Enhancement Mode
Low R_{DSon} , High V_{DSS} MOSFET

Package with Electrically Isolated Base

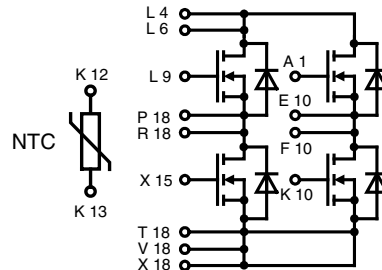
Preliminary data

$I_{D25} = 38 \text{ A}$
 $V_{DSS} = 600 \text{ V}$
 $R_{DSon} = 70 \text{ m}\Omega$

COOLMOS¹⁾
Power Semiconductors



Pin arrangement see outlines



| MOSFET | | Maximum Ratings | |
|-----------|---------------------------------------------------------------------------------------------------------------------|-----------------|------|
| Symbol | Conditions | | |
| V_{DSS} | $T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$ | 600 | V |
| V_{GS} | | ± 20 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 38 | A |
| I_{D90} | $T_C = 90^\circ\text{C}$ | 25 | A |
| dV/dt | $V_{DS} < V_{DSS}; I_F \leq 50 \text{ A}; di_F/dt \leq 200 \text{ A}/\mu\text{s}$ $T_{VJ} = 150^\circ\text{C}$ | 6 | V/ns |
| E_{AS} | $I_D = 10 \text{ A}; L = 36 \text{ mH}; T_C = 25^\circ\text{C}$ | 1.8 | J |
| E_{AR} | $I_D = 20 \text{ A}; L = 5 \text{ mH}; T_C = 25^\circ\text{C}$ | 1 | mJ |

Applications

- ECO-PAC 2 with DCB Base
 - Electrical isolation towards the heatsink
 - Low coupling capacitance to the heatsink for reduced EMI
 - High power dissipation
 - High temperature cycling capability of chip on DCB
 - solderable pins for DCB mounting
- fast CoolMOS power MOSFET
 - High blocking capability
 - Low on resistance
 - Avalanche rated for unclamped inductive switching (UIS)
 - Low thermal resistance due to reduced chip thickness
- Enhanced total power density

| Symbol | Conditions | Characteristic Values | | | |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|------|------|--------------------------------|
| | | min. | typ. | max. | |
| $(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | | | | |
| R_{DSon} | $V_{GS} = 10 \text{ V}; I_D = I_{D90}$ | | | 70 | m Ω |
| $V_{GS(th)}$ | $V_{DS} = 20 \text{ V}; I_D = 3 \text{ mA}$ | 3.5 | | 5.5 | V |
| I_{DSS} | $V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$ | | 60 | 25 | μA μA |
| I_{GSS} | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$ | | | 100 | nA |
| Q_g Q_{gs} Q_{gd} | $V_{GS} = 10 \text{ V}; V_{DS} = 350 \text{ V}; I_D = 50 \text{ A}$ | | 220 | | nC |
| | | | 55 | | nC |
| | | | 125 | | nC |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f | $V_{GS} = 10 \text{ V}; V_{DS} = 380 \text{ V}$ $I_D = 25 \text{ A}; R_G = 1.8 \Omega$ | | 30 | | ns |
| | | | 95 | | ns |
| | | | 100 | | ns |
| | | | 10 | | ns |
| R_{thJC} | per MOSFET | | | 0.45 | K/W |

Data according to IEC 60747 refer to a single diode or transistor unless otherwise stated

Applications

- Switched mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)
- Power factor correction (PFC)
- Welding
- Inductive heating

1) CoolMOS is a trademark of Infineon Technologies AG.

Source-Drain Diode

| Symbol | Conditions | Characteristic Values | | | |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------|------|------|------------------------|
| | | min. | typ. | max. | |
| ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | | | | | |
| I_S | Inverse diode forward current | | | 47 | A |
| I_{SM} | Inverse diode direct current pulsed | | | 141 | A |
| V_{SD} | Inverse diode forward voltage $V_{GS} = 0\text{ V}; I_F = I_S$ | | 1 | 1.2 | V |
| t_{rr} | $\left. \begin{array}{l} V_R = 350\text{ V} \\ I_F = I_S \\ di_F/dt = 100\text{ A}/\mu\text{s} \end{array} \right\}$ | | 580 | | ns |
| Q_{rr} | | | 23 | | μC |
| I_{RM} | | | 73 | | A |
| di_{rr}/dt | | | 900 | | $\text{A}/\mu\text{s}$ |

Temperature Sensor NTC

| Symbol | Conditions | Characteristic Values | | | |
|-------------------------|--------------------------|-----------------------|------|------|-----------------------|
| | | min. | typ. | max. | |
| R_{25} $B_{25/50}$ | $T = 25^{\circ}\text{C}$ | 4.75 | 5.0 | 5.25 | $\text{k}\Omega$ K |

Module

| Symbol | Conditions | Maximum Ratings | |
|------------|--------------------------------------------------------------|----------------------|-----------------------|
| | | | |
| T_{VJ} | | -40...+150 | $^{\circ}\text{C}$ |
| T_{stg} | | -40...+125 | $^{\circ}\text{C}$ |
| V_{ISOL} | $I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}; t = 1\text{ s}$ | 3600 | V~ |
| M_d | mounting torque (M4) | 1.5 - 2.0 14 - 18 | Nm lb.in |
| a | Max. allowable acceleration | 50 | m/s^2 |

| Symbol | Conditions | Characteristic Values | | |
|--------|------------------------------------------------|-----------------------|------|------|
| | | min. | typ. | max. |
| d_S | Creepage distance on surface (pin to heatsink) | 11.2 | | mm |
| d_A | Strike distance in air (pin to heatsink) | 11.2 | | mm |
| Weight | | | 24 | g |

Dimensions in mm (1 mm = 0.0394")

