

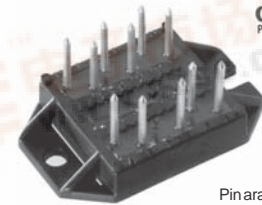
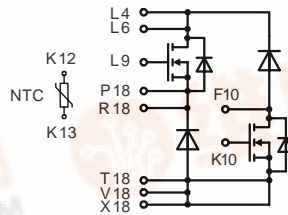
# CoolMOS Power MOSFET

## in ECO-PAC 2

N-Channel Enhancement Mode  
Low  $R_{DSon}$ , High  $V_{DSS}$  MOSFET  
Package with Electrically Isolated Base

Preliminary data sheet

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



**COOLMOS**<sup>1)</sup>  
Power Semiconductors

Pin arrangement see outlines

MOSFET		
Symbol	Conditions	Maximum Ratings
$V_{DSS}$	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	600 V
$V_{GS}$		$\pm 20$ 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
$E_{AR}$	$I_D = 20 \text{ A}; L = 5 \mu\text{H}; T_C = 25^\circ\text{C}$	1 mJ

### Features

- 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 - 2<sup>nd</sup> generation
  - 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 ( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$R_{DSon}$	$V_{GS} = 10 \text{ V}; I_D = I_{D90}$			70 m $\Omega$
$V_{GSth}$	$V_{DS} = 20 \text{ V}; I_D = 3 \text{ mA};$	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 $\mu\text{A}$ $\mu\text{A}$
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			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
$V_F$	(reverse conduction) $I_F = 20 \text{ A}; V_{GS} = 0 \text{ V}$		0.9	1.1 V
$R_{thJC}$	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

<sup>1)</sup> CoolMOS is a trademark of Infineon Technologies AG.



**Reverse diodes (FRED)**

Symbol	Conditions	Maximum Ratings	
$I_{F25}$	$T_C = 25^\circ\text{C}$	18.5	A
$I_{F80}$	$T_C = 80^\circ\text{C}$	12.0	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 15\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.58	2.64	V
$I_{RM}$ $t_{rr}$	$I_F = 10\text{ A}; di_F/dt = 400\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 300\text{ V}; V_{GE} = 0\text{ V}$	70	7	ns
$R_{thJC}$ $R_{thJH}$	with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )	7	3.5	K/W K/W

**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 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	Nm lb.in.
$a$	Max. allowable acceleration	50	$\text{m/s}^2$

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
<b>Weight</b>		24		g

**Dimensions in mm (1 mm = 0.0394")**
