

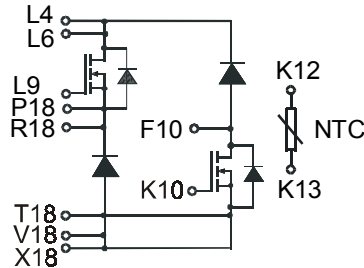
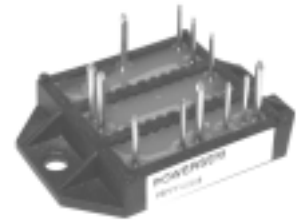
CoolMOS Power MOSFET in ECO-PAC 2

PSHM 40D/06

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

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

COOLMOS¹⁾
Power Semiconductors



Preliminary Data Sheet

MOSFET

Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^\circ\text{C}$ to 150°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}	$I_D = 20 \text{ A}$; $L = 5 \mu\text{H}$; $T_C = 25^\circ\text{C}$	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
- fastCoolMOS power MOSFET-2nd 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
- UL registered, E148688

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 Ω
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 μA μA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$; $V_{DS} = 0 \text{ V}$			100 nA
Q_g	$V_{GS} = 10 \text{ V}$; $V_{DS} = 350 \text{ V}$; $I_D = 50 \text{ A}$		220	nC
Q_{gs}			55	nC
Q_{gd}			125	nC
$t_{d(on)}$	$V_{GS} = 10 \text{ V}$; $V_{DS} = 380 \text{ V}$; $I_D = 25 \text{ A}$; $R_G = 1.8 \Omega$		30	ns
t_r			95	ns
$t_{d(off)}$			100	ns
t_f			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

Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- High power density
- Small and light weight

Caution: These Devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

¹⁾ 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	A ns
R_{thJC} R_{thJH}		with heatsink compound (0.42 K/m.K; 50 μm)		3.5 K/W

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k Ω
$B_{25/50}$			3375	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 14 - 18 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")

