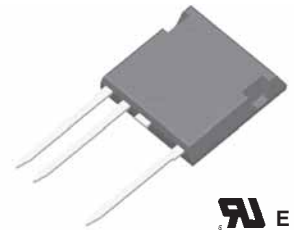


CoolMOS Power MOSFET with Series Schottky Diode and Ultra Fast Antiparallel Diode in High Voltage ISOPLUS i4-PAC™

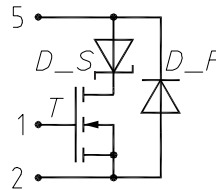
$I_{D25} = 38 \text{ A}$
 $V_{DSS} = 600 \text{ V}$
 $R_{DSon} = 60 \text{ m}\Omega$
 $t_{rr} = 70 \text{ ns}$

COOLMOS
Power Semiconductors



E 72873

Preliminary data



MOSFET T		
Symbol	Conditions	Maximum Ratings
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

Features

- fast CoolMOS power MOSFET- 3rd generation
 - High blocking voltage
 - Low on resistance
 - Low thermal resistance due to reduced chip thickness
- Series Schottky diode prevents current flow through MOSFET's body diode
 - very low forward voltage
 - fast switching
- Ultra fast HiPerFRED™ anti parallel diode
 - low operating forward voltage
 - fast and soft reverse recovery - low switching losses
- ISOPLUS i4-PAC™ high voltage package
 - isolated back surface
 - low coupling capacity between pins and heatsink
 - enlarged creepage towards heatsink
 - enlarged creepage between high voltage pins
 - application friendly pinout
 - high reliability
 - industry standard outline
 - UL registered E 72873

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
R_{DSon}	$V_{GS} = 10 \text{ V}; I_D = I_{D90}$		60	70 m Ω
V_{GSth}	$V_{DS} = 20 \text{ V}; I_D = 3 \text{ mA};$	2.1		3.9 V
I_{DSS}	$V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		0.5	0.3 mA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			100 nA
Q_g Q_{gs} Q_{gd}	} $V_{GS} = 10 \text{ V}; V_{DS} = 350 \text{ V}; I_D = 50 \text{ A}$		250	nC
			25	nC
			120	nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	} $V_{GS} = 10 \text{ V}; V_{DS} = 380 \text{ V};$ $I_D = 50 \text{ A}; R_G = 1.8 \Omega$		20	ns
			30	ns
			110	ns
			10	ns
R_{thJC} R_{thJH}	with heat transfer paste		0.9	0.45 K/W K/W

Applications

Converters with

- circuit operation leading to current flow through switches in reverse direction - e. g.
 - phaseleg with inductive load
 - resonant circuits
- high switching frequency

Examples

- switched mode power supplies (SMPS)
- uninterruptable power supplies (UPS)
- DC-DC converters
- welding converters
- converters for inductive heating
- drive converters

Series Schottky Diode D_S

Symbol	Conditions	Maximum Ratings	
I _{F25}	T _C = 25°C	60	A
I _{F90}	T _C = 90°C	40	A

Symbol	Conditions	Characteristic Values (T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _F	I _F = 20 A; T _{VJ} = 25°C T _{VJ} = 125°C	0.7	0.9	V
R _{thJC} R _{thJH}	with heat transfer paste	2.9	2	K/W K/W

Anti Parallel Diode D_F

Symbol	Conditions	Maximum Ratings	
I _{F25}	T _C = 25°C	32	A
I _{F90}	T _C = 90°C	16	A

Symbol	Conditions	Characteristic Values (T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _F	I _F = 20 A; T _{VJ} = 25°C T _{VJ} = 125°C	2.1 1.4	2.5	V V
I _{RM} t _{rr}	I _F = 30 A; di _F /dt = -500 A/μs; T _{VJ} = 125°C V _R = 600 V; V _{GE} = 0 V	15 70	A ns	
R _{thJC} R _{thJH}	with heat transfer paste	2.6	1.3	K/W K/W

Component

Symbol	Conditions	Maximum Ratings	
V _{ISOL}	I _{ISOL} ≤ 1 mA; 50/60 Hz	2500	V~
T _{VJ}		-40...+150	°C
T _{stg}		-40...+125	°C
F _C	mounting force with clip	20 ... 120	N

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
C _p	coupling capacity between shorted pins and mounting tab in the case		40	pF
d _S , d _A	D pin - S pin	7		mm
d _S , d _A	pin - backside metal	5.5		mm
Weight			9	g

Dimensions in mm (1 mm = 0.0394")
