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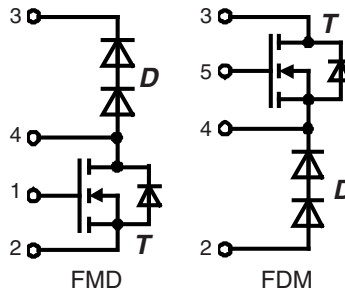
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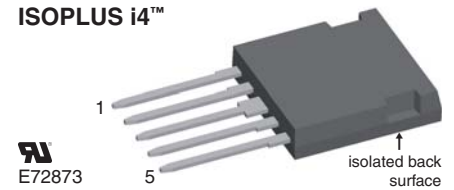
IXYS Advanced Technical Information **FMD 15-06KC5**
FDM 15-06KC5

CoolMOS™ 1) Power MOSFET
with HiPerDyn™ FRED
Buck and Boost Topologies

Electrically isolated back surface
 2500 V electrical isolation
 N-Channel Enhancement Mode
 Low $R_{DS(on)}$, high V_{DSS} MOSFET
 Ultra low gate charge



$I_{D25} = 15 \text{ A}$
 $V_{DSS} = 600 \text{ V}$
 $R_{DS(on) \text{ max}} = 0.165 \Omega$



MOSFET T		Maximum Ratings	
Symbol	Conditions		
V_{DSS}	$T_{VJ} = 25^\circ\text{C}$	600	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^\circ\text{C}$	15	A
I_{D90}	$T_C = 90^\circ\text{C}$	11	A
E_{AS}	single pulse	522	mJ
E_{AR}	repetitive		
		$I_D = 7.9 \text{ A}; T_C = 25^\circ\text{C}$	
dV/dt	MOSFET dV/dt ruggedness $V_{DS} = 0 \dots 480 \text{ V}$	50	V/ns

Features

- Silicon chip on Direct-Copper-Bond substrate
 - high power dissipation
 - isolated mounting surface
 - 2500 V electrical isolation
 - low drain to tab capacitance (< 40 pF)
- Fast CoolMOS™ 1) power MOSFET 4th generation
 - high blocking capability
 - lowest resistance
 - avalanche rated for unclamped inductive switching (UIS)
 - low thermal resistance due to reduced chip thickness
- Enhanced total power density
- HiPerDyn™ FRED
 - consisting of series connected diodes
 - enhanced dynamic behaviour for high frequency operation

Symbol	Conditions	Characteristic Values		
		$(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$		
		min.	typ.	max.
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}; I_D = 12 \text{ A}$		150	165
$V_{GS(th)}$	$V_{DS} = V_{GS}; I_D = 0.79 \text{ mA}$	2.5	3	3.5
I_{DSS}	$V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$			1
				$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			100
C_{iss}	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$ $f = 1 \text{ MHz}$		2000	
C_{oss}			100	
Q_g	$V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 12 \text{ A}$		40	52
Q_{gs}			9	
Q_{gd}			13	
$t_{d(on)}$	$V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$ $I_D = 12 \text{ A}; R_G = 3.3 \Omega$		12	
t_r			5	
$t_{d(off)}$			50	
t_f			5	
E_{on}			tbd	
E_{off}			tbd	
$E_{rec off}$			tbd	
R_{thJC}	with heat transfer paste		1.1	K/W
R_{thCH}		0.35		K/W

Applications

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

Advantages

- Easy assembly: no screws or isolation foils required
- Space savings
- High power density
- High reliability

1) CoolMOS™ is a trademark of Infineon Technologies AG.

MOSFET T Source-Drain Diode

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)				
I_S	$V_{GS} = 0\text{ V}$		12	A
V_{SD}	$I_F = 12\text{ A}; V_{GS} = 0\text{ V}$	0.9	1.2	V
t_{rr}	$I_F = 12\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_R = 400\text{ V}$		390	ns
Q_{RM}			7.5	μC
I_{RM}			38	A

Diode D (data for series connection)

Symbol	Conditions	Maximum Ratings	
V_{RRM}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	600	V
I_{F25}	$T_C = 25^{\circ}\text{C}$	15	A
I_{F90}	$T_C = 90^{\circ}\text{C}$	8	A

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_F	$I_F = 15\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$		2.50	V
			$I_F = 30\text{ A}$		3.00
	$I_F = 15\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			2.00
			$I_F = 30\text{ A}$		2.55
I_R	$V_R = V_{RRM}$	$T_{VJ} = 25^{\circ}\text{C}$		1	μA
		$T_{VJ} = 150^{\circ}\text{C}$	0.08	mA	
I_{FSM}	$t = 10\text{ ms}$ (50 Hz), sine;	$T_{VJ} = 45^{\circ}\text{C}$	150	A	
I_{RM}	$I_F = 20\text{ A}; V_R = 100\text{ V}; -di_F/dt = 200\text{ A}/\mu\text{s}$	$T_{VJ} = 25^{\circ}\text{C}$	3	A	
t_{rr}			35	ns	
R_{thJC}	with heat transfer paste		2.4	K/W	
R_{thJH}		0.8	K/W		

Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-55...+150	$^{\circ}\text{C}$
T_{stg}	storage	-55...+125	$^{\circ}\text{C}$
V_{ISOL}	$I_{ISOL} < 1\text{ mA}; 50/60\text{ Hz}$	2500	V~
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	pin - pin	1.7		mm
d_S, d_A	pin - backside metal	5.5		mm
Weight			9	g

ISOPLUS i4™ Outline

