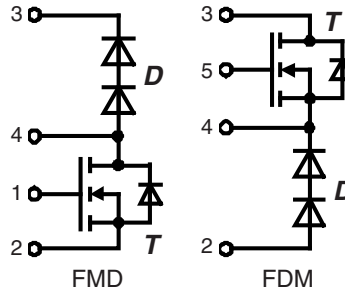


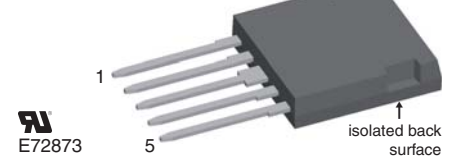
CoolMOS™¹⁾ Power MOSFET with HiPerDyn™ FRED Buck and Boost Topologies

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



$$\begin{aligned} I_{D25} &= 47 \text{ A} \\ V_{DSS} &= 600 \text{ V} \\ R_{DS(on) \text{ max}} &= 0.045 \Omega \end{aligned}$$

ISOPLUS i4™



MOSFET T				
Symbol	Conditions	Maximum Ratings		
V_{DSS}	$T_{VJ} = 25^\circ\text{C}$	600		V
V_{GS}		± 20		V
I_{D25}	$T_C = 25^\circ\text{C}$	47		A
I_{D90}	$T_C = 90^\circ\text{C}$	32		A
E_{AS}	single pulse repetitive } $I_D = 11 \text{ A}; T_C = 25^\circ\text{C}$	1950		mJ
E_{AR}		3		mJ
dV/dt	MOSFET dV/dt ruggedness $V_{DS} = 0 \dots 480 \text{ V}$	50		V/ns

Symbol	Conditions	Characteristic Values			
		(T _{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}; I_D = 44 \text{ A}$		40	45	mΩ
$V_{GS(th)}$	$V_{DS} = V_{GS}; I_D = 3 \text{ mA}$	2.5	3	3.5	V
I_{DSS}	$V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}$				
	$T_{VJ} = 25^\circ\text{C}$			10	μA
	$T_{VJ} = 125^\circ\text{C}$		50		μA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			100	nA
C_{iss}	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$ $f = 1 \text{ MHz}$		6800		pF
C_{oss}			320		pF
Q_g	$V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 44 \text{ A}$		150	190	nC
Q_{gs}			35		nC
Q_{gd}			50		nC
$t_{d(on)}$	$V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$ $I_D = 44 \text{ A}; R_G = 3.3 \Omega$		30		ns
t_r			20		ns
$t_{d(off)}$			100		ns
t_f			10		ns
E_{on}			tbd		mJ
E_{off}			tbd		mJ
$E_{rec off}$			tbd		mJ
R_{thJC}				0.45	K/W
R_{thCH}	with heat transfer paste	0.25			K/W

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

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			
		(T _{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
I _S	V _{GS} = 0 V			44	A
V _{SD}	I _F = 44 A; V _{GS} = 0 V		0.9	1.2	V
t _{rr}	I _F = 44 A; -di _F /dt = 100 A/μs; V _R = 400 V		600		ns
Q _{RM}			17		μC
I _{RM}			60		A

Diode D (data for series connection)

Symbol	Conditions	Maximum Ratings			
V _{RRM}	T _{VJ} = 25°C to 150°C			600	V
I _{F25}	T _C = 25°C			95	A
I _{F90}	T _C = 90°C			56	A
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V _F	I _F = 30 A	T _{VJ} = 25°C		2.48	V
	I _F = 60 A			3.02	V
	I _F = 30 A	T _{VJ} = 150°C		1.89	A
	I _F = 60 A			2.45	A
I _R	V _R = V _{RRM}	T _{VJ} = 25°C		1	μA
		T _{VJ} = 150°C		0.2	mA
I _{FSM}	t = 10 ms (50 Hz), sine;	T _{VJ} = 45°C		450	A
I _{RM} t _{rr}	I _F = 30 A; V _R = 100 V; -di _F /dt = 200 A/μs	T _{VJ} = 25°C		2	A
				30	ns
R _{thJC} R _{thCH}	with heat transfer paste		0.25	0.55	K/W
					K/W

Component

Symbol	Conditions	Maximum Ratings			
T _{VJ}	operating			-55...+150	°C
T _{stg}	storage			-55...+125	°C
V _{ISOL}	I _{ISOL} < 1 mA; 50/60 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
