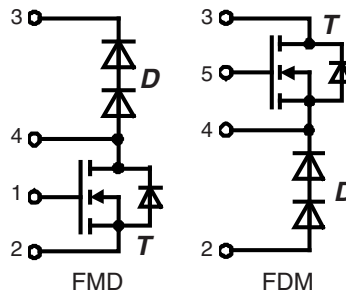


CoolMOS™¹⁾ Power MOSFET with HiPerDyn™ FRED

Buck and Boost Topologies

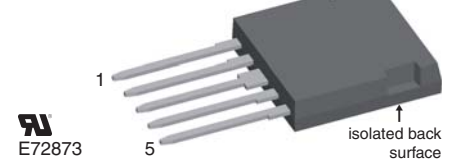
Electrically isolated back surface
2500 V electrical isolation
N-Channel Enhancement Mode
Low $R_{DS(on)}$, high V_{DSS} MOSFET
Ultra low gate charge



$$I_{D25} = 15 \text{ A}$$

$$V_{DSS} = 600 \text{ V}$$

$$R_{DS(on) \text{ max}} = 0.165 \Omega$$

ISOPLUS i4™


MOSFET T			
Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^\circ\text{C}$	600	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^\circ\text{C}$	15	A
I_{D90}	$T_C = 90^\circ\text{C}$	11	A
E_{AS} E_{AR}	single pulse repetitive } $I_D = 7.9 \text{ A}; T_C = 25^\circ\text{C}$	522 0.79	mJ mJ
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 ($< 40 \text{ pF}$)
- 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	m Ω
$V_{GS(th)}$	$V_{DS} = V_{GS}; I_D = 0.79 \text{ mA}$	2.5	3	3.5	V
I_{DSS}	$V_{DS} = 600 \text{ V}; V_{GS} = 0 \text{ V}$			1	μA μA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$			100	nA
C_{iss} C_{oss}	$V_{GS} = 0 \text{ V}; V_{DS} = 100 \text{ V}$ $f = 1 \text{ MHz}$		2000 100		pF pF
Q_g Q_{gs} Q_{gd}	$V_{GS} = 0 \text{ to } 10 \text{ V}; V_{DS} = 400 \text{ V}; I_D = 12 \text{ A}$		40 9 13	52	nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} $E_{rec off}$	$V_{GS} = 10 \text{ V}; V_{DS} = 400 \text{ V}$ $I_D = 12 \text{ A}; R_G = 3.3 \Omega$		12 5 50 5 tbd tbd tbd		ns ns ns ns mJ mJ mJ
R_{thJC} R_{thCH}	with heat transfer paste		0.35	1.1	K/W 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}	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	600	V
I_{F25}	$T_C = 25^{\circ}\text{C}$	15	A
I_{F90}	$T_C = 90^{\circ}\text{C}$	8	A

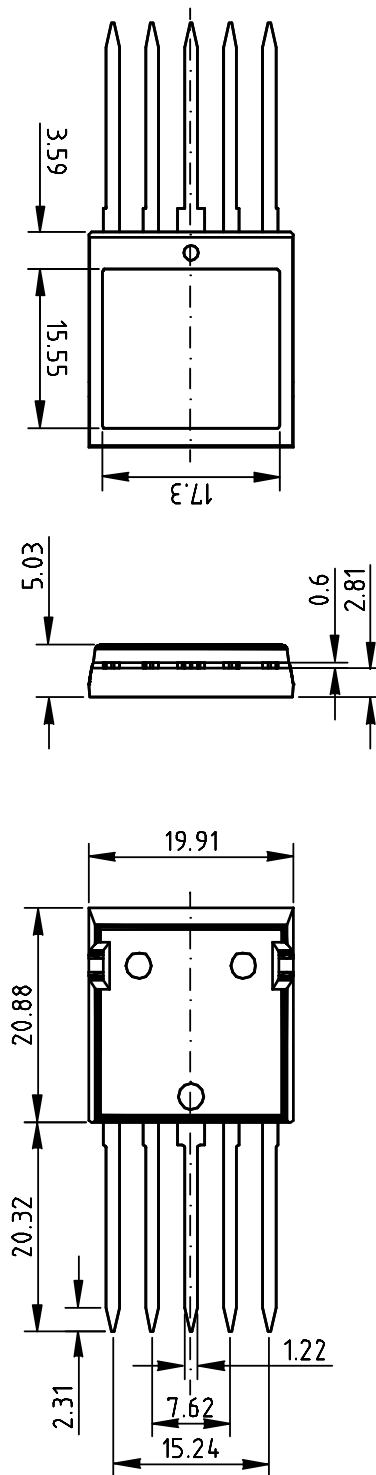
Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_F	$I_F = 15\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$		2.50	V
				3.00	V
	$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$		2.00	A
				2.55	A
I_R	$V_R = V_{RRM}$	$T_{VJ} = 25^{\circ}\text{C}$		1	μA
		$T_{VJ} = 150^{\circ}\text{C}$		0.08	mA
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





Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.