

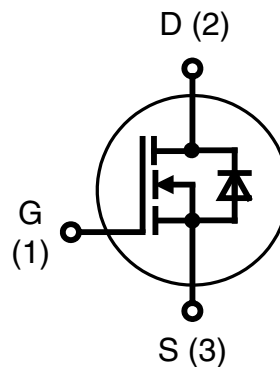
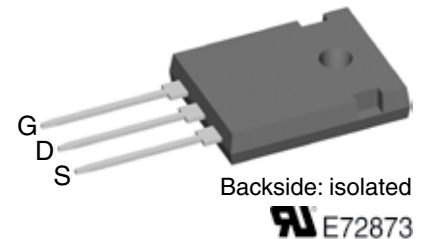
preliminary

# CoolMOS™<sup>1)</sup> CFD Power MOSFET

$I_{D25}$	=	<b>25 A</b>
$V_{DSS}$	=	<b>650 V</b>
$R_{DS(on) max}$	=	<b>80 mΩ</b>

## Single MOSFET

**Part number**  
MKH24I650HR



### Features / Advantages:

- High speed switching
- Fast body diode
- Very high commutation ruggedness
- Easy to drive
- Very low FOM  $R_{DS(on)} * Q_g$  and  $E_{OSS}$

### Applications:

- Switch mode power supplies
- Resonant switching converters
- DC/DC converters
- Solar inverters
- Lighting
- Telecom

### Package: ISO247

- Isolation Voltage: 3600V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

<sup>1)</sup> CoolMOS™ is a trademark of Infineon Technologies AG

### Terms & Conditions of usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you. Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

MOSFET				Ratings					
Symbol	Definitions	Conditions	min.	typ.	max.				
$V_{DS}$	drain source breakdown voltage				650		V		
$V_{GS}$	gate source voltage		-20		+20		V		
$V_{GSM}$	max. transient gate source voltage		-30		+30		V		
$I_{D25}$	drain current				25		A		
$I_{D80}$					22.5		A		
$I_{D100}$					19		A		
$R_{DSon}$	static drain source on resistance	$I_D = 18\text{ A}; V_{GS} = 20\text{ V}$		72 190	80		mΩ mΩ		
$V_{GS(th)}$	gate threshold voltage	$I_D = 1.76\text{ mA}; V_{DS} = 10\text{ V}$	3.5		4.5		V		
$I_{DSS}$	drain source leakage current	$V_{DS} = 650\text{ V}; V_{GS} = 0\text{ V}$		500	1		μA μA		
$I_{GSS}$	gate source leakage current	$V_{DS} = 0\text{ V}; V_{GS} = 20\text{ V}$			100		nA		
$R_G$	internal gate resistance			0.75			Ω		
$C_{iss}$	input capacitance	$V_{DS} = 100\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		5030		pF		
$C_{oss}$	output capacitance							215	pF
$C_{rss}$	reverse transfer (Miller) capacitance								pF
$Q_g$	total gate charge	$V_{DS} = 480\text{ V}; I_D = 25\text{ A}; V_{GS} = 0/10\text{ V}$	$T_{VJ} = 25^\circ\text{C}$		170		nC		
$Q_{gs}$	gate source charge							25	nC
$Q_{gd}$	gate drain (Miller) charge							120	nC
$t_{d(on)}$	turn-on delay time	Inductive switching Free wheeling diode DHG20I600HA $V_{DS} = 400\text{ V}; I_D = 25\text{ A}$ $V_{GS} = 0 / 10\text{ V}; R_G = 5\ \Omega$ (external)	$T_{VJ} = 25^\circ\text{C}$		33		ns		
$t_r$	current rise time							17	ns
$t_{d(off)}$	turn-off delay time							145	ns
$t_f$	current fall time							16	ns
$E_{on}$	turn-on energy per pulse							0.83	mJ
$E_{off}$	turn-off energy per pulse							0.13	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off							0.16	mJ
$R_{thJC}$	thermal resistance junction to case							with heatsink compound; IXYS test setup	
$R_{thJH}$	thermal resistance junction to heatsink	1.0	K/W						

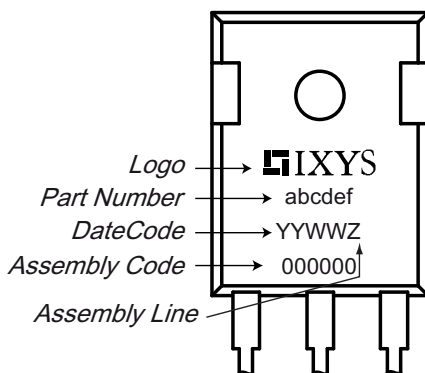
Source-Drain Diode				Ratings					
Symbol	Definitions	Conditions	min.	typ.	max.				
$I_{S25}$	source current, pulsed	$V_{GS} = 0\text{ V}$			130		A		
$I_{S100}$					70		A		
$V_{SD}$	forward voltage drop	$I_F = 26\text{ A}; V_{GS} = 0\text{ V}$		0.9			V V		
$t_{rr}$	reverse recovery time	$V_{GS} = 0\text{ V}; I_F = 26\text{ A}$ $V_R = 400\text{ V}; -di_F/dt = 100\text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$		180		ns		
$Q_{RM}$	reverse recovery charge (intrinsic diode)							1	nC
$I_{RM}$	max. reverse recovery current							10	A

**Note:**

For MOSFET paralleling the use of ferrite beads on the gate or separate totem poles is generally recommended

**Package ISO247**

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per terminal			50	A
$T_{stg}$	storage temperature		-55		150	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{vJ}$	virtual junction temperature		-55		150	°C
<b>Weight</b>					6	g
$M_D$	mounting torque		0.8		1.2	Nm
$F_C$	mounting force with clip		20		120	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to backside	2.7			mm
$d_{Spb/Apb}$		terminal to terminal	4.1			mm
$V_{ISOL}$	isolation voltage	t = 1 second t = 1 minute	3600 3000	50 / 60 Hz, RMS; $I_{ISOL} \leq 1$ mA		V V
$C_p$	coupling capacity	between shorted pins and back side metallization			16	pF

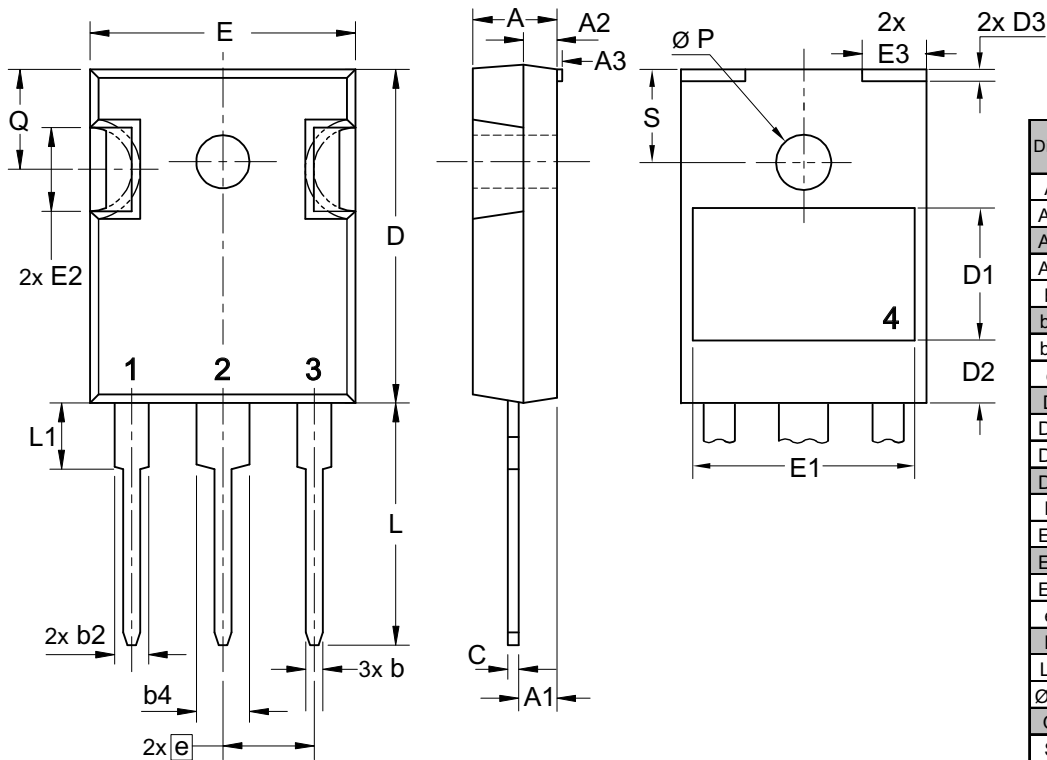
**Product Marking**

**Part number**

M = Mosfet  
 K = CoolMOS<sup>1)</sup>  
 H = CFD die type  
 24 = Current Rating [A]  
 I = Single Mosfet  
 650 = Reverse Voltage [V]  
 HR = ISO247 (3)

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Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MKH24I650HR	MKH24I650HR	Tube	30	516493

Outlines ISO247



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
A3	typ. 0.05		typ. 0.002	
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.844
D1	typ. 8.90		typ. 0.350	
D2	typ. 2.90		typ. 0.114	
D3	typ. 1.00		typ. 0.039	
E	15.49	16.24	0.610	0.639
E1	typ. 13.45		typ. 0.530	
E2	4.31	5.48	0.170	0.216
E3	typ. 4.00		typ. 0.157	
e	5.46 BSC		0.215 BSC	
L	19.80	20.30	0.780	0.799
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

