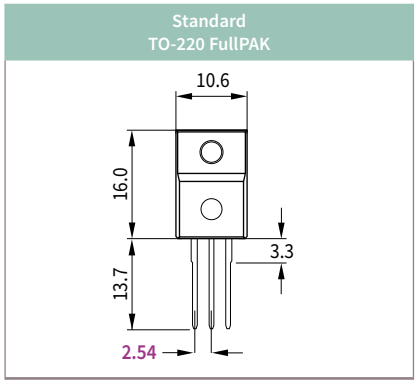
Product brief

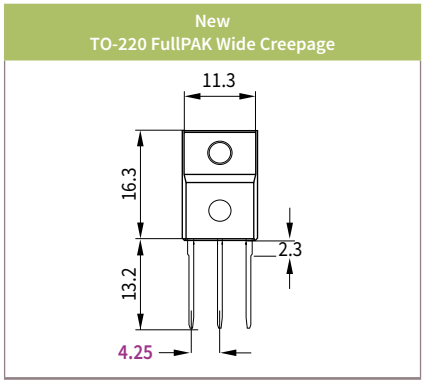
CoolMOS™ P7 and CE SJ MOSFET in TO-220 FullPAK Wide Creepage package

Improved creepage distance for open frame power supplies

Package outer dimensions

The TO-220 FullPAK Wide Creepage package offers an extended creepage by increasing the distance between pins to 4.25 mm versus the usual 2.54 mm of the widely used TO-220 FullPAK package. This package targets open frame power supplies such as TV sets and PC power where dust can enter the case through air vents. Dust particles can reduce the effective creepage between pins over time which may lead to high voltage arcing.





Regulatory requirements

The required creepage distance between pins is specified in the norm EN 60664-1. This norm requires at least 3.6 mm for open frame electrical power supplies such as LED TV, PC power or industrial power supplies, while 2.5 mm creepage is sufficient for closed frame power supplies (see figure).

Pollution degree	1	2			3		
Place where the device is used	Clean room environments	Equipment being evaluated to 60950 laboratories			Electrical equipment in industrial and farming areas		
Voltage r.m.s. [V]	250						
Material group	All materials groups	I	II	III	I	II	III
Minimum creepage distance [mm]	0.56	1.25	1.80	2.50	3.20	3.60	4.00

The EN 60664-1 standard specifies that under normal conditions 2.5 mm creepage is sufficient

Extra protection measures are needed beyond TO-220 FullPAK

TO-220 FullPAK standard creepage is okay

TO-220 FullPAK Wide Creepage version is needed

Key features

- Increased distance of 4.25 mm between pins to meet wide creepage requirements
- Package height and width identical with standard TO-220 FullPAK package

Key benefits

- Wider creepage between pins to avoid arcing even in polluted environment
- Compatible with EN 60664-1 standard group III
- Cost savings in creepage protection by removing additional efforts spent in alternative solutions today
- Fully automated PCB assembly
- FullPAK benefit of isolation

www.infineon.com/TO220-FP-widecreepage

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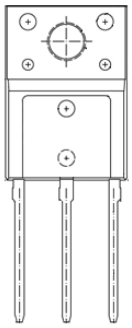
Customer benefit versus alternative solutions

The TO-220 FullPAK Wide Creepage package meets the requirements of open frame power supplies without additional measures. Thus, it reduces system cost by offering an alternative to frequently used approaches to increase creepage distance: silicon potting, the usage of sleeves, pre-bending of leads and other workarounds come at an extra cost of an estimated 2-5 USD cents. This cost and the additional process steps can be removed with the wide creepage package.

Existing ways of improving creepage		
Silicon potting		$ 0.02
Plastic sleeves on terminals		$ 0.02
Pre-bending terminals		$ 0.05
Plastic covers on terminals		$ 0.05

TO-220 FullPAK Wide Creepage package



- Wide **creepage between pins** to avoid arcing even in polluted environment
- **Cost savings** in creepage protection by removing additional process steps
- Fully **automated PCB assembly** eliminating process variation
- **FullPAK benefit** of isolation

Product portfolio

$R_{DS(on)}$ [mΩ]	600 V CoolMOS™ CE in TO-220 FullPAK Wide Creepage	600 V CoolMOS™ P7 in TO-220 FullPAK Wide Creepage
600	IPAW60R600CE	IPAW60R600P7S
380	IPAW60R380CE	
360		IPAW60R360P7S
280	IPAW60R280CE	IPAW60R280P7S
190	IPAW60R190CE	
180		IPAW60R180P7S

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