



Product Brief

100A and 120A Co-Pack Discrete IGBT in TO-247PLUS

Maximum flexibility in high power 600V designs

Responding to the market requirement to accommodate ever increasing amounts of silicon in smaller, space saving packages, Infineon introduces the new package TO-247PLUS.

Higher current capability, improved thermal behavior

The TO-247PLUS has the same outer dimensions as the industry standard TO-247, but due to the absence of the screw hole, allows up to 120A in 600V. Also the total backside active thermal pad area has been increased to improve heat dissipation capabilities of the package.

TO-247PLUS use in target applications

100A and 120A TRENCHSTOP™ IGBT in TO-247PLUS package may be used:

- To upgrade existing designs for higher power output – up to 20% I_{out} increase for “plug & play” 75A TO-247 replacement with 120A TO-247PLUS
- To improve the thermal conditions in the application consequently improving the system reliability and lifetime – 25% T_{case} reduction with 75A TO-247 replaced with 100A TO-247PLUS
- As lower cost alternative to IGBT modules – 50% cost reduction, much lower maintenance and component replacements cost, more design flexibility

Features

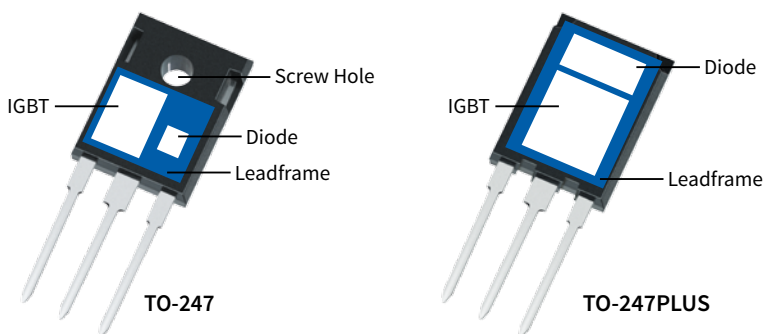
- Highest current rating co-pack 600V in 100A and 120A
- 35% bigger active thermal pad area for up to 20% lower thermal resistance $R_{th(jh)}$
- Extended creepage distance of 4.25mm – 2mm bigger than TO-247

Benefits

- Higher system power density – I_c increase keeping the same system thermal performance
- Lower thermal resistance $R_{th(jh)}$ and improved by ~15% heat dissipation capability of TO-247PLUS vs TO-247
- Higher reliability, extended lifetime of the device

Applications

- UPS
- Solar
- Welding
- Drives
- AirCon/ HVAC
- Automotive



TO-247PLUS with 100A and 120A TRENCHSTOP™ IGBT inside, is qualified according to industrial as well as automotive standards. A mounting recommendation is given within the Infineon assembly guidance*.

*TO-247PLUS - Package Performance and assembly guidelines check www.infineon.com



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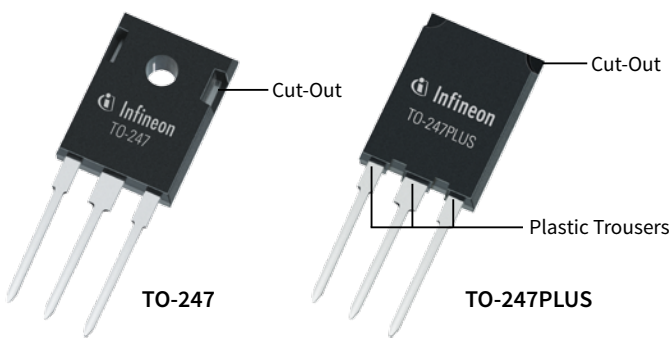
Improved thermal management and creepage distances

Better heat dissipation through lower R_{th} improves thermal management, which means less heat sink and lower cost for the cooling infrastructure.

TO-247PLUS package body has special “plastic trousers”, that allows to increase the creepage distance to 4.25mm – 2mm bigger than the standard TO-247. Special cut-outs of the mold compound at the upper corners, increase creepage path at single clip mounting.

Moreover, the TO-247PLUS plastic body has tighter tolerances to clip pressure comparing to the major competitors on the market, thus contributing for better reliability of the device use in application.

A new bond wiring concept realized in TO-247PLUS package allows increase of the DC collector current from 80A to 160A (at $T_c=25^\circ\text{C}$) contributing to the better reliability and longer lifetime of the IGBT.



TO-247PLUS IGBT Product Portfolio

Continuous Current I_c $T_c = 100^\circ\text{C}$	Application	
	Industrial	Automotive
100A	IKQ100N60T	IKQ100N60TA
120A	IKQ120N60T	IKQ120N60TA

Main benefits of TO-247PLUS - higher current capability and lower junction temperature T_j

System nominal current I_c [A]	Available solution with TO-247	Alternative solution with TO-247PLUS	Replacement ratio	Advantages of using TO-247PLUS
Power output increase or junction temperature T_j reduction				
75A → 75A (keeping I_c the same)	IKW75N60T	IKQ100N60T	1:1	Better thermal conditions, T_j and T_c reduction, for longer IGBT lifetime
75A → 100A (increasing I_c)	IKW75N60T	IKQ100N60T	1:1	Power output increase by ~25% keeping the same footprint and thermal condition
75A → 120A	IKW75N60T	IKQ120N60T	1:1	Power output increase by >40% keeping the same footprint and thermal condition Expanding the power output beyond 75kW
Improving power density – Reducing the number of discrete IGBT by using higher current devices keeping the same I_c				
75A → 75A	IKW75N60T	IKQ120N60T	3:2	Improving system power density - shrinking the PCB footprint, keeping the same I_c
Cost/performance alternative to module: Low power modules replacement with discrete IGBT				
100A → 100A/ 120A	Base plateless IGBT Module 100A/ 120A	IKQ100N60T	1:6	System cost reduction, easy maintenance and replacement, multiple sources, flexibility of design

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