



## Product Brief

# Up to 75 A 1200 V IGBT in TO-247PLUS 4pin

> 20 percent total switching losses  $E_{ts}$  reduction, excellent thermal performance  
> 20 percent lower  $R_{thjh}$  with new TO-247PLUS 4pin

### More than 20 percent switching loss reduction with 4pin package configuration

The TO-247PLUS 4pin Kelvin source package provides ultra-low inductance gate-emitter control loop with 4<sup>th</sup> pin is connected to the logic ground of the gate driver. The 4pin package configuration allows for reduction the both of  $E_{on}$  and  $E_{off}$  losses amounting up to 20 percent lower total switching losses  $E_{ts}$ .

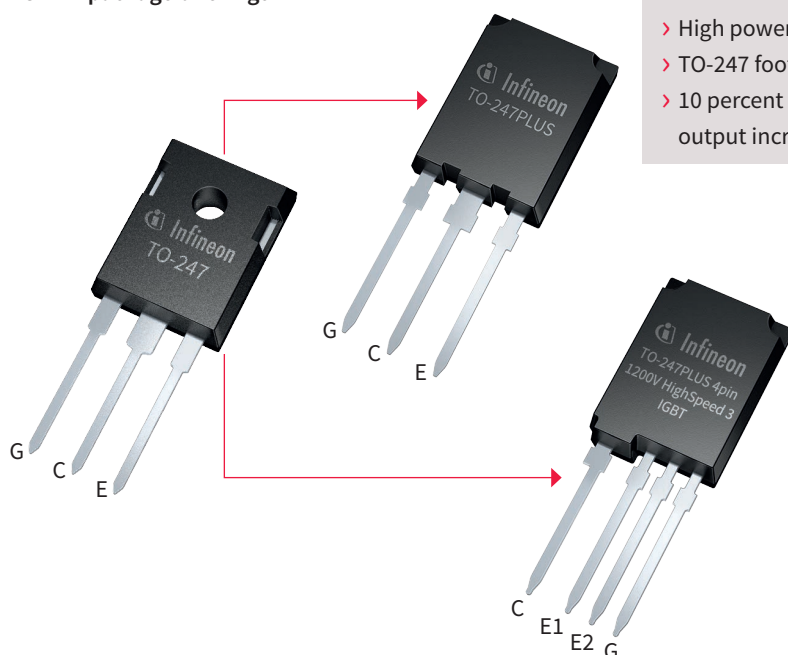
### Higher efficiency. Increased the power density. Lower cost.

With less energy lost in the system, the more can be transferred to output power and the higher the system efficiency. With more than 20 percent lower losses, the 4pin package allows to increase the output power and contributes to the improved kW/€ cost ratio.

### Higher IGBT current for less paralleling

The higher nominal current of TO-247PLUS 4pin can be used to reduce number of paralleled switches – i.e. 2 units of 25 A IGBT can be replaced with 1 unit of 50 A IGBT with additional benefit of lower switching losses and improved thermal performance due to 4pin package configuration and lower  $R_{thjh}$  of the package.

### TO-247 package offerings



- > High power density
- > TO-247 footprint
- > 10 percent power output increase

- > High power density
- > Improved efficiency
- > 20 percent power output increase

### Key features

- > More than 20 percent total switching losses  $E_{ts}$  reduction
- > 20 percent lower  $R_{thjh}$  of TO-247PLUS comparing to TO-247
- > 5.4 mm C-E creepage in TO-247PLUS 4pin
- > Up to 75 A 1200 V IGBT co-packed with 75 A diode in TO-247 footprint

### Benefits

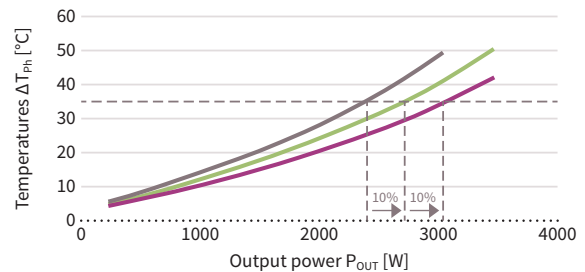
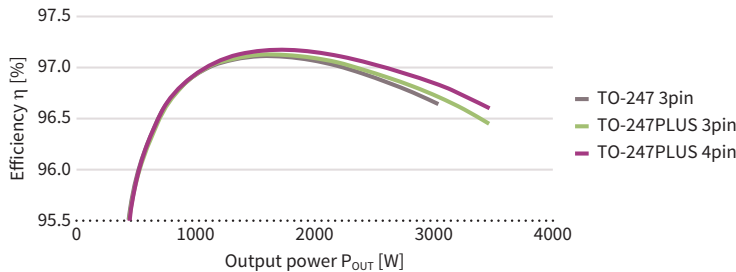
- > Highest system efficiency with lowest switching losses 1200 V IGBT
- > 15 percent better heat dissipation
- > Reduction of parallel switches – system size and complexity reduction
- > Upgrade of available designs for higher power



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## Application test HB converter with AC output



0.07 percent full load efficiency improvement TO-247-3 with TO-247PLUS 3pin  
 0.11 percent efficiency improvement when replacing TO-247PLUS 3pin with TO-247PLUS 4pin

~10 percent  $P_{OUT}$  increase by replacing TO-247 3pin with TO-247PLUS 3pin  
 ~10 percent  $P_{OUT}$  increase replacing TO-247PLUS 3pin with TO-247PLUS 4pin

Replacing TO-247 3pin with TO-247PLUS 3pin gives an efficiency improvement of 0.07 percent due to lower chip junction temperature  $T_j$ . Lower temperature of the chip is due to lower thermal resistance  $R_{thjh}$  and better heat dissipation capability of the TO-247PLUS package.

Replacing TO-247PLUS 3pin with TO-247PLUS 4pin improves the efficiency by another 0.1 percent at full load. Reason for that – lower switching losses due to 4pin Kelvin emitter package.

## Product portfolio

Product part number	Package	$V_{CE}$ [V]	$I_c$ at 100°C [A]	$V_{CE(sat)}$ at 25°C [V]	$E_{on}$ at 25°C [mJ]	$E_{off}$ at 25°C [mJ]	SCWT [μs]	$Q_G$ [nC]	$I_F$ at 100°C [A]
<b>1200 V TRENCHSTOP™ 2 IGBT + full rated current diode</b>									
IKQ40N120CT2	TO-247PLUS 3pin	1200	40	1.75	3.10	3.0	10	190	40
IKQ50N120CT2	TO-247PLUS 3pin	1200	50	1.75	3.80	3.0	10	235	50
IKQ75N120CT2	TO-247PLUS 3pin	1200	75	1.75	6.70	4.1	10	370	75
<b>1200 V HighSpeed 3 IGBT + full rated current diode</b>									
IKQ40N120CH3	TO-247PLUS 3pin	1200	40	2.00	3.30	1.3	10	190	40
IKQ50N120CH3	TO-247PLUS 3pin	1200	50	2.00	3.00	1.9	10	235	50
IKQ75N120CH3	TO-247PLUS 3pin	1200	75	2.00	6.40	2.8	10	370	75
<b>1200 V HighSpeed 3 IGBT + full rated current diode</b>									
IKY40N120CH3	TO-247PLUS 4pin	1200	40	2.00	2.18	1.3	10	190	40
IKY50N120CH3	TO-247PLUS 4pin	1200	50	2.00	2.30	1.9	10	235	50
IKY75N120CH3	TO-247PLUS 4pin	1200	75	2.00	3.40	2.9	10	370	75

Learn more on [www.infineon.com/to-247-4](http://www.infineon.com/to-247-4)

Published by  
 Infineon Technologies AG  
 81726 Munich, Germany

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