1200 V discrete IGBT in TO-247PLUS 3pin / 4pin

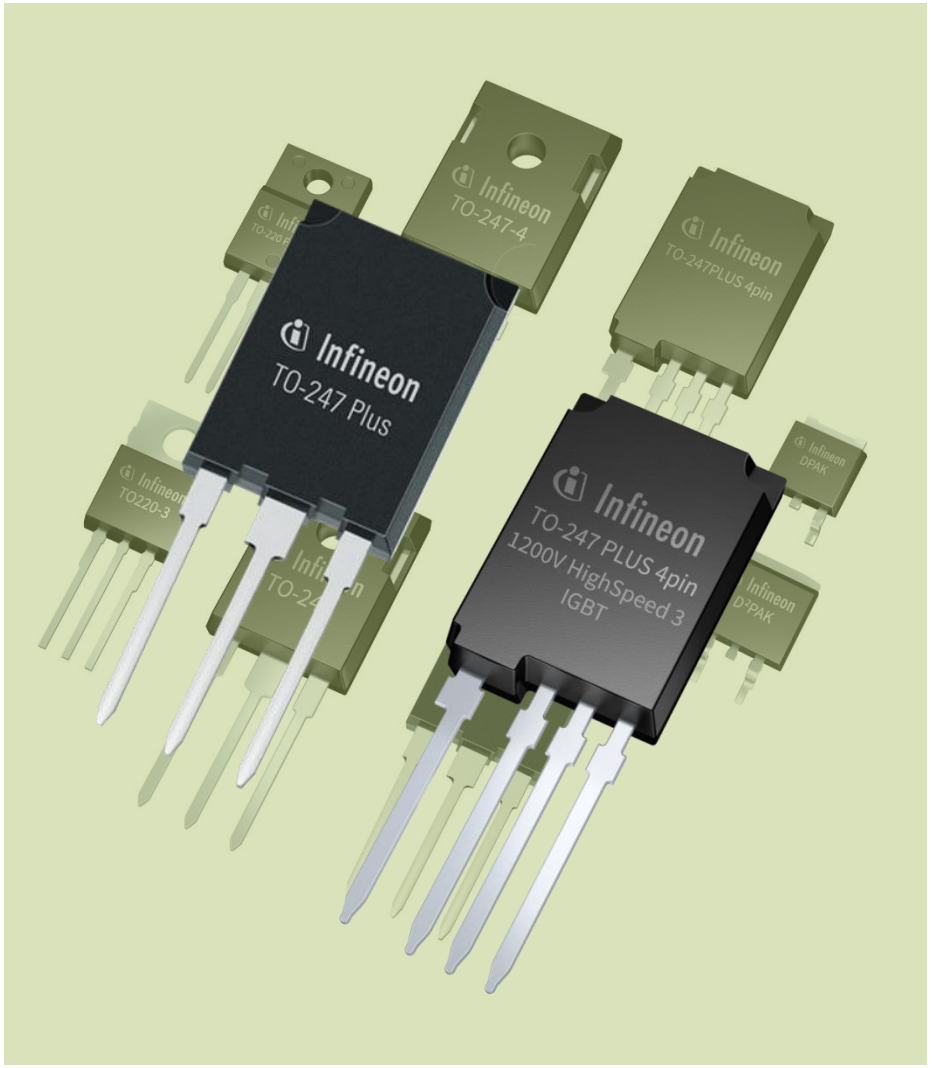
Motivation

Infineon expands IGBT offering

TO-247PLUS 3pin / 4pin package for 1200 V IGBT

Addresses needs for

- **increased power density in space-saving packages**
- **high efficiency**



TO-247PLUS 3pin / 4pin
Key features and benefits

Same footprint!

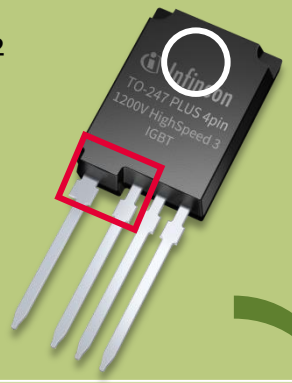
High current/low $R_{th(jc)}$ due to missing hole

Lower switching losses

No extra space on the board required

TO-247PLUS 3pin / 4pin
Key features and benefits

TO-247 3pin		TO-247PLUS 4pin
Screw mounting hole	**Mounting technique**	No screw hole (clip/pressure assembly)
~70 mm²	**Active chip area**	~120 mm²
40 A	**Current capability**	75 A
2.25 mm	**Pin creepage distance**	5.4 mm
80 A	**Bond wire limit**	160 A

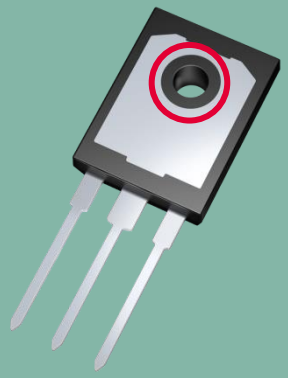


- ✓ Uniform pressure distribution/reliable mechanical stability
- ✓ 70% larger chip
- ✓ Twice the current of TO-247
- ✓ Increased product reliability and lifetime

TO-247PLUS 3pin / 4pin
Key features and benefits

TO-247 3pin

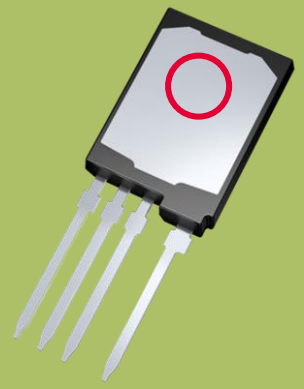
140 mm²



Active thermal pad area

TO-247PLUS 4pin

190 mm²



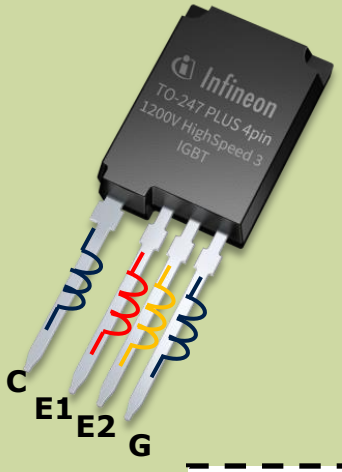
- ✓ Lower thermal resistance (up to 20% less $R_{th(jh)}$)
- ✓ Improved heat dissipation (15%)
- ✓ 0.05% – 0.1% higher efficiency (based on internal application test)

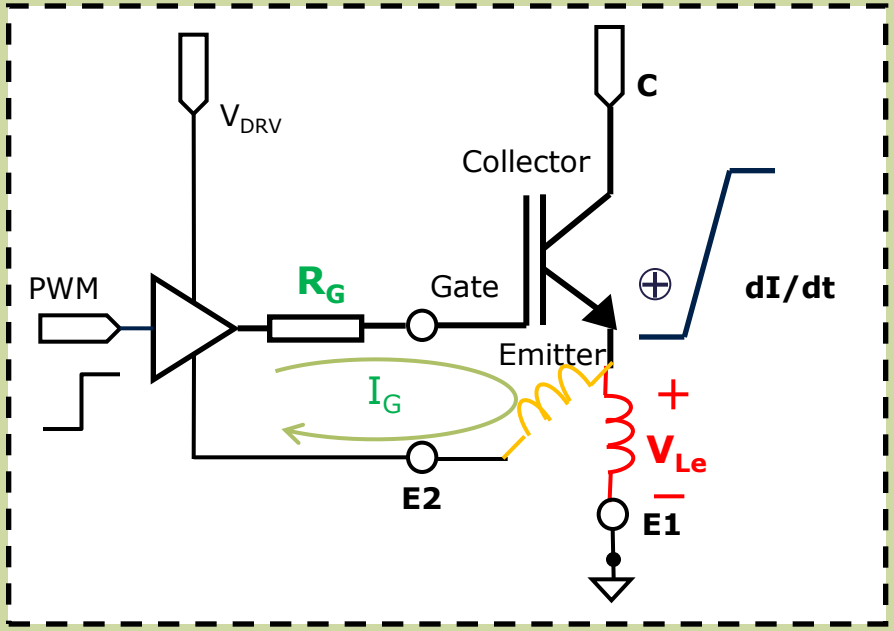
TO-247PLUS 3pin / 4pin
Key features and benefits

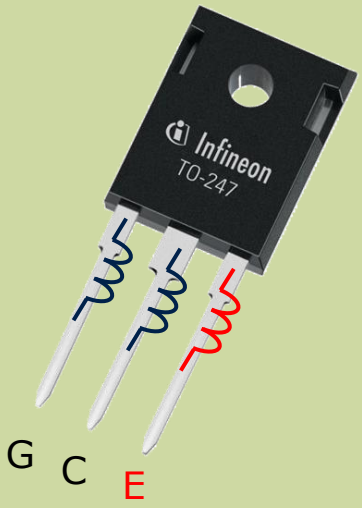
TO-247 PLUS 3pin		TO-247PLUS 4pin
No screw hole	**Mounting technique**	No screw hole (clip/pressure mounting)
~120 mm²	**Active chip area**	~120 mm²
75 A	**Current capability**	75 A
4.25 mm	**Pin creepage distance**	5.4 mm
160 A	**Bond wire limit**	160 A

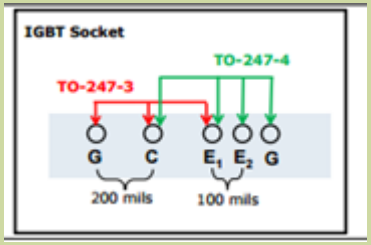
- ✓ Faster turn-on/off
- ✓ 20% total switching losses reduction (4th pin)
- ✓ Increased creepage distance

TO-247PLUS 3pin / 4pin
Key features and benefits

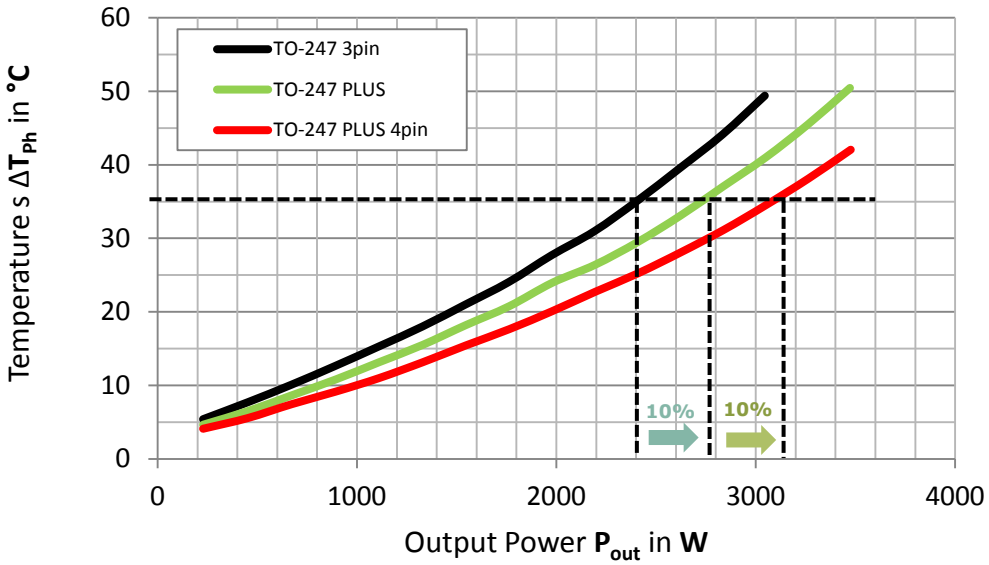








Application tests
Half-bridge converter with AC output



~10% Pout increase by replacing TO-247 3pin with TO-247**PLUS** 3pin

~10% Pout increase replacing TO-247PLUS 3pin with TO-247PLUS **4pin**

~20% Pout increase replacing TO-247 3pin with TO-247PLUS **4pin**

Tested devices

IKW40N120CH3

- 40 A 1200 V IGBT
- 40 A diode
- TO-247 3pin
- Rg = 5 Ω

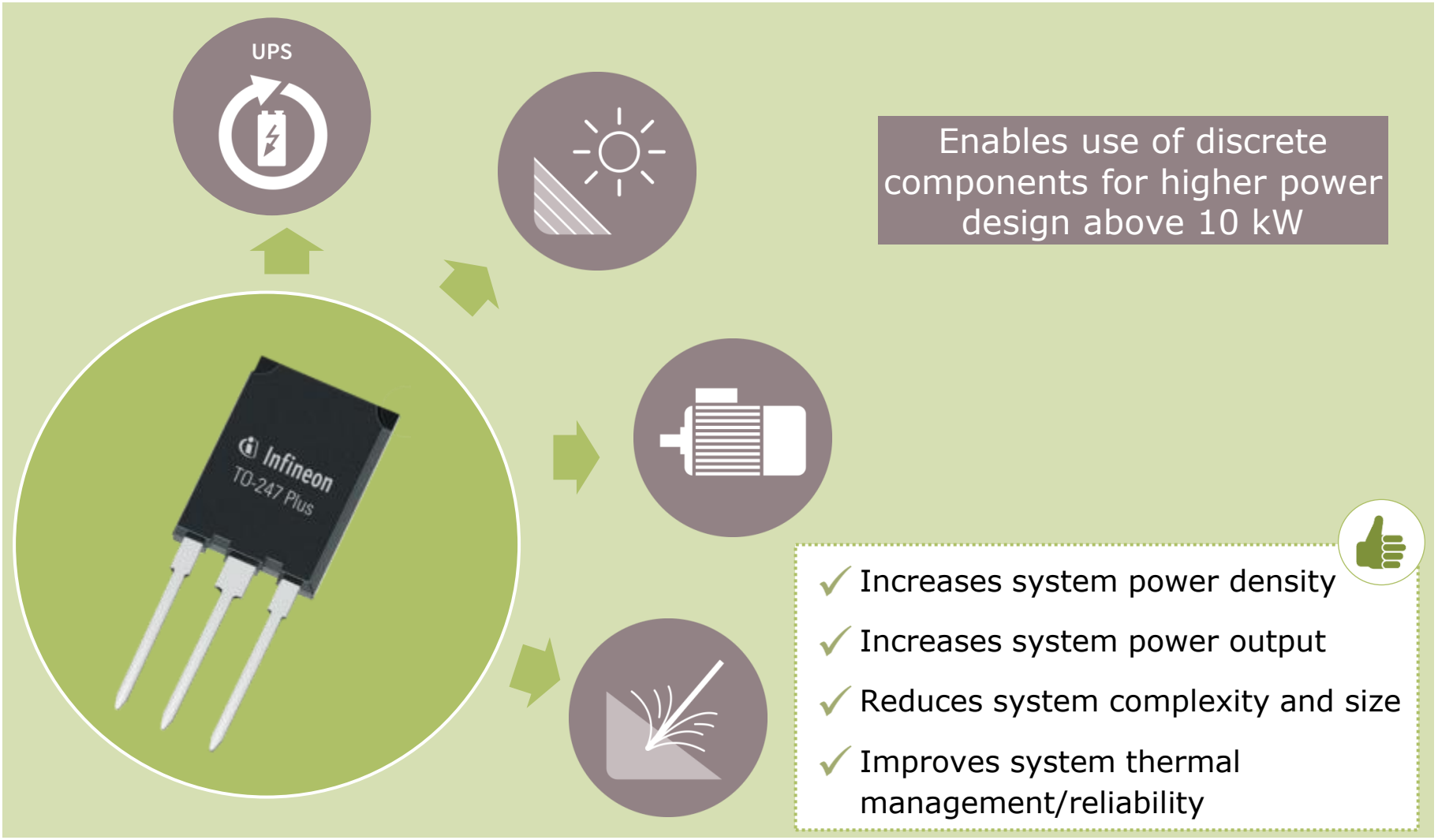
IKQ40N120CH3

- 40 A 1200 V IGBT
- 40 A diode
- TO-247PLUS 3pin
- Rg = 5 Ω

IKY40N120CH3

- 40 A 1200 V IGBT
- 40 A diode
- TO-247PLUS 4pin
- Rg = 5 Ω

TO-247PLUS 3pin target applications



TO-247PLUS 4pin target applications

- ✓ Low control inductance loop
- ✓ Reduced total switching losses (>20%)
- ✓ Increased system power density
- ✓ Improved system thermal performance

Product Portfolio

› Portfolio

1200V Technology ->		T2 TRENCHSTOP™	T2 TRENCHSTOP™	H3 Highspeed3	H3 Highspeed3	H3 Highspeed3
Package ->		TO-247-3	TO-247PLUS 3pin	TO-247-3	TO-247PLUS 3pin	TO-247PLUS 4pin
						
IGBT + diode	15A	IKW15N120T2		IKW15N120H3		
	20A	IKW25N120T2		IKW25N120H3		
	40A	IKW40N120T2	IKQ40N120CT2	IKW40N120H3	IKQ40N120CH3	IKY40N120CH3
	50A		IKQ50N120CT2		IKQ50N120CH3	IKY50N120CH3
	75A		IKQ75N120CT2		IKQ75N120CH3	IKY75N120CH3

› More information

www.infineon.com/to-247-4

www.infineon.com/to-247plus

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