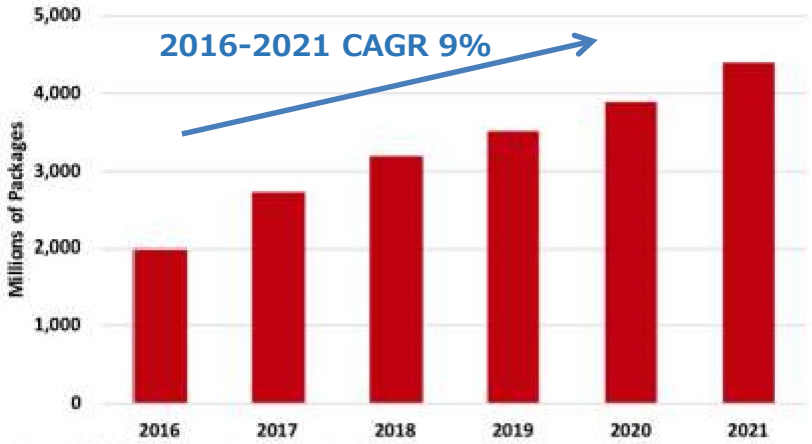
Power QFN with Cu-Clip

Power QFN with Cu-clip

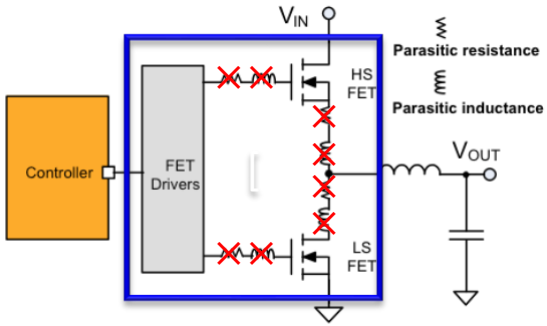
Power QFN with Copper clip market



Source : TechSearch International Inc.

Target applications : High current DCDC converter

Step down DCDC converter



Required characteristics :
Low Parasitic Inductance and Resistance

Clip process flow image

Case study: For multi chips

1. Solder screen printing

2. Die attach

3. Solder dispense

4. Clip attach ＆Reflow ＆ Flux cleaning

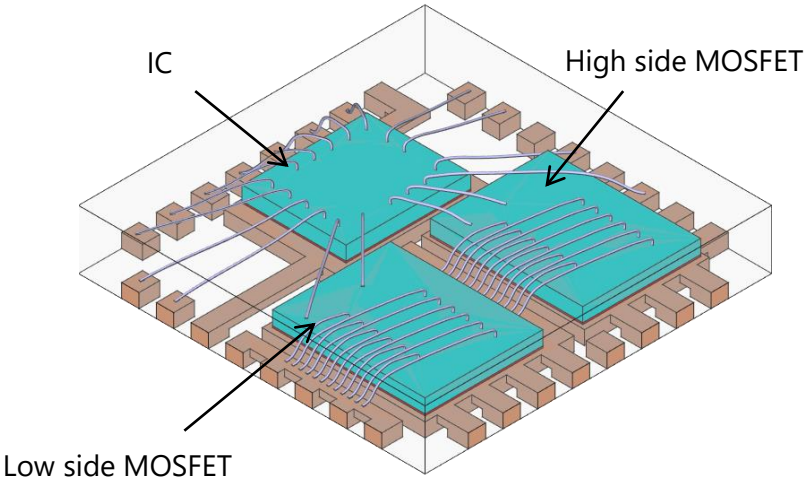
- Transfer Mold
- Post Mold Cure
- Laser Mark
- Package Sawing
- Test

Power QFN with Cu-clip

Specific study case

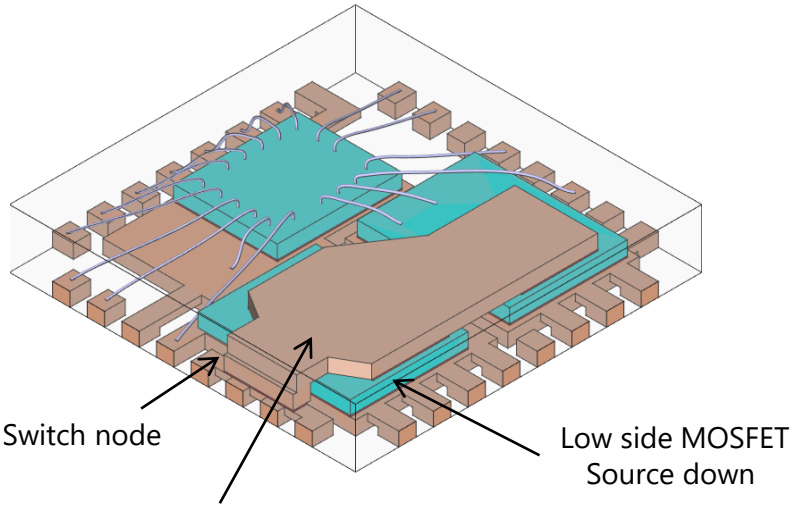
- Synchronous rectification type step-down DCDC
- Package：Power QFN
- Device：IC+MOSFET×2(Half-bridge)　3in1

Current) Wire Type



- High side MOS : Drain down
- Low side MOS : Drain down
- Wire : Pd-Cu Φ30μm
- MOSFET source 12wires
  ※Staggered wiring

Proposal) Cu-Clip Type



Half-bridge with Cu-clip

- MOSFET Wire → Cu-clip (Half bridge)
- MOSFET Low side → Source down
- Switch node is small

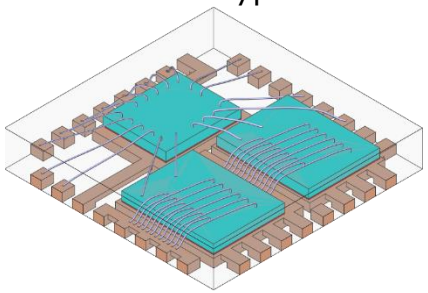
⇒ Low Inductance and Resistance

Target application
Current : 10～30A

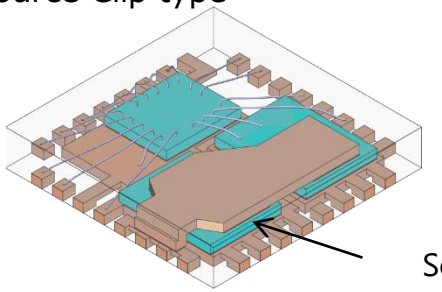
Power QFN with Cu-clip

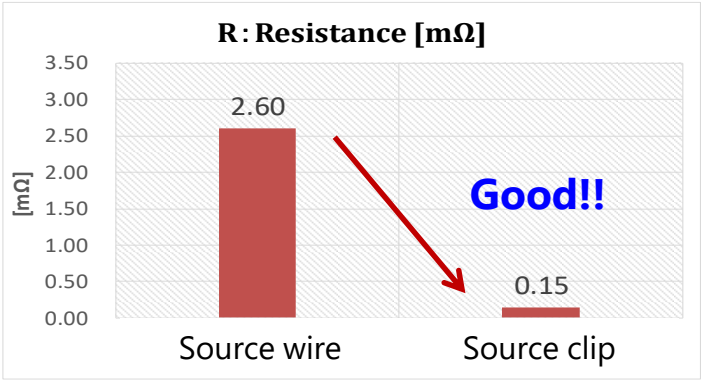
Advantage : Low Electrical Parasitic properties

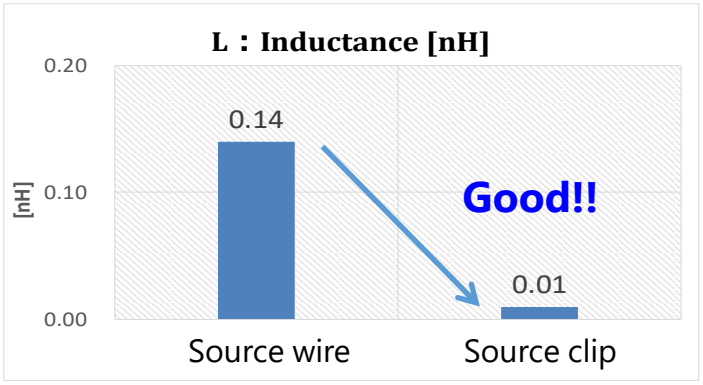
Source Wire type



Source Clip type



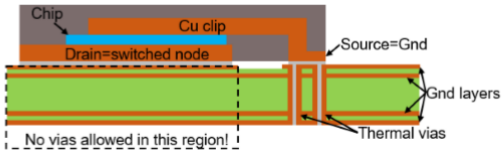




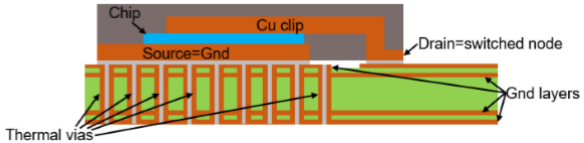
Source down advantage

Mount the source electrode that becomes the GND potential directly on a large-area substrate.
Low characteristic loss : heat dissipation and resistance

Existing) Drain down



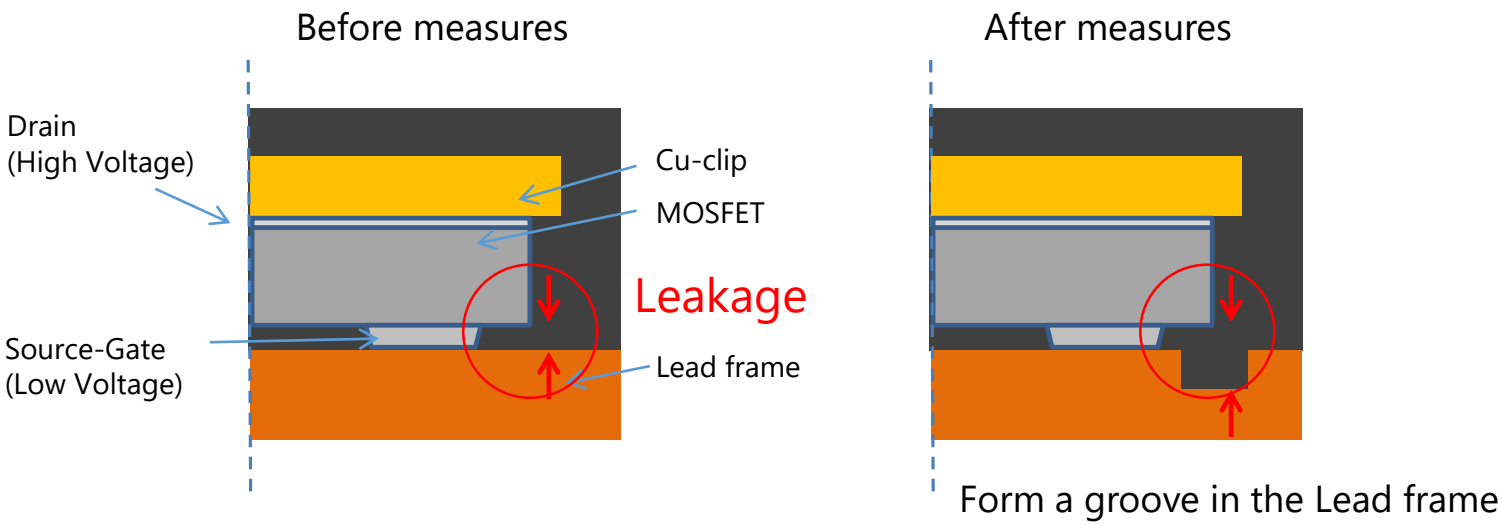
New) Source down



Source : Infineon

Power QFN with Cu-clip

Source down structure for High Voltage (VDS=100V≦)



Problem:
・Leakage becomes a problem only with the height of the joint bump.

Take measures
・Element side(High Voltage) and connection lead(Low Voltage)Secure a certain distance or more.

ATTENTION

This material contains confidential information and it is hereby notified that any disclosure, copying, distribution, or the taking of any action in reliance on the contents of this material is strictly prohibited without a prior written consent of AOI Electronics. Thank you very much for your understanding in advance.