TECHNOLOGY SUMMARY

MICRO-FABRICATED INDUCTORS FOR POWER-SUPPLY-IN-PACKAGE

Creating inductors compatible with integration into semiconductor device package technology

VALUE PROPOSITION (ELEVATOR PITCH)

Mobility, form-factor and battery life are key in consumer electronic design today. Battery life requirements have motivated a move from inefficient linear regulators to more efficient switching regulators.

However, the disadvantage of the switching regulator is that it is generally a multiple component solution, requiring external, discrete components placed alongside an active semiconductor device.

This disadvantage can be reduced if these passive components can be miniaturised and integrated into the package, or on-chip, so as to achieve a single chip switching converter or “Power supply on Chip” (PwrSoC).

The most important and challenging device to integrate is the inductor, since it is often physically large, and not usually compatible with semiconductor device package technology. This technical challenge has been addressed by the new Tyndall integrated micro-inductor technology.

THE TECHNOLOGY

This technology is the key to granular power for multi-voltage rail, multi-core, microprocessors, servers and HPC. Micro-transformer provides efficient isolated power and data transfer.

- Extremely low profile and reduced footprint
- Industry leading efficiency and integration density of voltage regulators and power supplies
- Provides efficient, high density on-chip/on-package power conversion
- Reduced cost with overall reduction in the bill of materials (BOM) and mother board space
- Fabrication compatible with high volume silicon manufacturing for integration onto Silicon (PwrSoC). Compatible with back-end packaging or in package (PwrSiP). Compatible with flip-chip bonding and hence with stacking with active converter die
- Validated design optimisation models with focus on efficiency and footprint.
- Design tool enablement with first CAD tool for power micro-inductors
- Reduces parasitic losses in power.

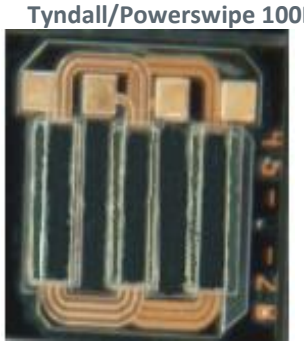
DEVELOPMENT STAGE

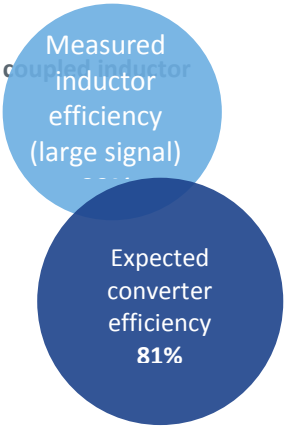
Extensive suite of functional devices and performance results are available.

APPLICATIONS

Power Management for System-on-Chip (SoC) and micro-platforms
On-chip / PCB embedded
Power Magnetics components:
- Inductors
- Coupled Inductors
Transformers

Tyndall/Powerswipe 100MHz coupled inductor





CONTACT

To arrange a meeting or teleconference with the University for preliminary discussions, please contact ANTHONY MORRISSEY (p):+353 21 2346077, (e) anthony.morrissey@ucc.ie (w) http://techtransfer.ucc.ie