

# Coil on Module

## The innovative dual-interface chip packaging technology for secured smart card solutions

The innovative Coil on Module (CoM) packaging technology from Infineon is widely used for security applications like payment and identity (ID) and uses a radio frequency link instead of the mechanical/electrical connection typically used between the card antenna and the module. This improves the robustness and long-term reliability of dual interface (DIF) payment cards as well as ID documents and simplifies card design, manufacturing, and logistics. The card design process is more efficient and up to five times faster than with conventional direct connect packaging technologies.

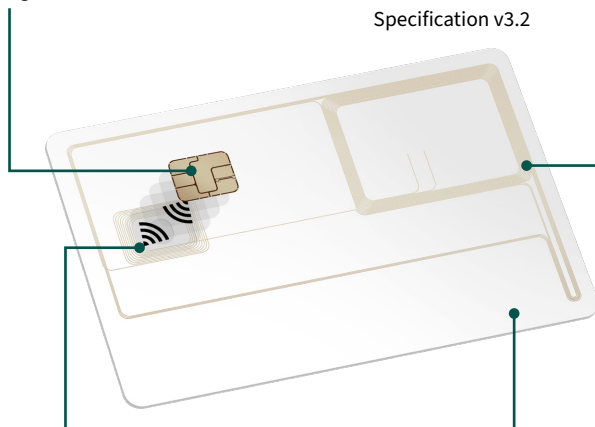
Based on our extensive semiconductor and module expertise as well as our profound understanding of card manufacturers' systems and requirements, CoM underlines our technology leadership in this field.

### CoM design featuring inductive coupling

Inductive coupling technology for DIF applications employs two antennas, one on the module and one on the card inlay. These antennas connect electromagnetically, functioning in a similar way to the air interface of contactless cards.

Module with antenna including the microcontroller chip and the contact pads according to ISO 7816

Card inlay with antenna tuned to meet the contactless card requirements according to ISO 14443 and EMVCo Contactless Interface Specification v3.2



Radio communication between card antenna and chip module antenna

Card body (typically PC or PVC) consisting of decorative and protective layers

### Coil design guide

We offer a coil design guide defining parameters for optimized card antenna layout. We have also evaluated, qualified and pre-certified different antenna technologies (AL\* etched, copper wire, etc ...) so that card manufacturers can easily switch to dual-interface card production using antennas compatible with our CoM. The migration to new technologies requires no additional effort, as the antenna design can be reused.

### CoM highlights

- No physical connection between card antenna and module (inductive coupling)
- Re-use of existing card lamination process
- Approx. 40% thinner than other conventional modules
- Universal card antenna
- Flexible module design

### Production benefits

- Stock management made easy
- High yield and robustness
- Reduced design and test costs
- Minimum investment and maximum flexibility in card design
- Improved ESD\* robustness at production and in the field
- Widely used in standard card materials like PVC\*, PETG\* and PC\* and in recycled materials as recycled PVC\*

\*Acronyms:  
 ESD: Electrostatic Discharge  
 PVC: Polyvinyl chloride  
 PC: polycarbonate  
 PETG: polyethylene terephthalate glycol-modified

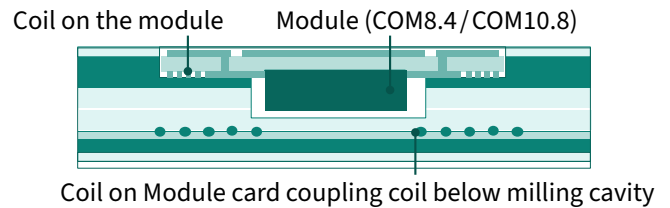


## PRODUCT BRIEF

### Top benefits of our unique CoM design

- Easy card antenna design:
  - Available guides including evaluated, qualified, and pre-certified different antenna formats
  - Flexibility to freely combine chips, modules, and card antennas, reuse of card antenna layout
- Reduced complexity and smaller inventory, faster development cycles and faster time-to-market
- The CoM package is based on the flip chip on substrate (FCOS\*) technology proven through billions of delivered modules
- Improved ESD behavior at production and in the field
- Highest reliability levels thanks to integrated antenna and inductive coupling for improved mechanical robustness
- Antenna centered in card stack to avoid warpage during card production
- Environment friendly:
  - Up to 50 % less weight than direct-connect solutions
  - CoM can be used in combination with recycled card materials
  - Less card body waste during milling
  - No electrical interconnection between module and card antenna necessary

### CoM design – front and rear



Product features	S-COM8.4	S-COM10.8
Punching size	11.0* × 8.32*	13.0* × 11.8*
Package thickness	0.3*	0.4*
Pitch	9.5*	14.3*
		*approx. mm sizes
Module technology	Flip chip on substrate (FCOS) with inductive coupling for dual interface application	
Module to antenna connection	Inductive coupling without galvanic connection from module to antenna in card	
Application	Payment cards/ID cards	
Manufacturing requirements	Standard contact-based (CB) card manufacturing equipment can be used without additional investments in new equipment	
Package qualification	Results available in package qualification report	
Qualified chip types	65 nm, 40 nm and 28 nm chips	

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