



Pioneering RFID for more than 3 decades

Swatch Group's **EM Microelectronic** serves the RFID market since 1989 with premium ICs, standard and customized, for LF, HF, UHF and multi-frequency/multi-protocol applications



1989 EM4001 First EM LF chip



1996

ISO 11784/11785 standard for animal identification. EM4005



2000

EM4095 High Performance LF Reader AFE



2003-2008

World's first mass UHF RFID retail deployment, EM delivers 90% of worlds UHF chips



2017

New benchmark for RAIN RFID crypto transponders

em aura-C



2020

Holistic omnichannel RAINFC solution

em echo



2021

Scalable high-performance NFC web authentication

em ling

Where Augmented RFID technology leads us

& Maintenance



Manufacturing



Transportation & Logistic



IoT

Cannot really take shape because most sensor solutions are not cost-effective for widespread distribution

Many use cases cannot tolerate the presence of a battery or recycling and ubiquity constraints.





power using RFID field.
Existing know-how in RFID and sensors

Collecting
physical
parameters
through wireless
sensing



Healthcare



Agriculture



Automotive Industry

Sustainable green tag deployments with no maintenance and minimum CO₂ footprint.

em

aura-sense Passive capacitive sensor tag



RF performance

✓ Inventory: -19.5dBm*

AUGMENTED RFID

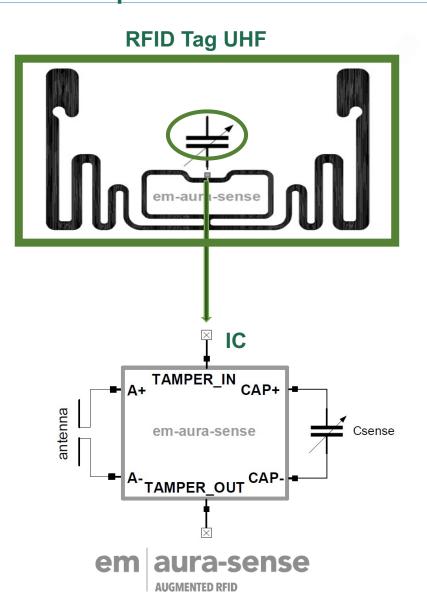
- ✓ Sensing :-18dBm*
- ✓ Data storing: -15.5dBm*

*with dipole antenna



Snapshot sensor

- ✓ No coupling between sensing element and antenna.
- ✓ Standard reader commands and tag replies.
- ✓ Retrieve sense at boot acquisition with simple read command.



1-step inlay manufacturing

✓ The capacitive sensor is external to the chip and integrated in the inlay.

Capacitive sensing

- √ 7 bits resolution
- ✓ Capacitive sensitivity: 160fF/code
- Capacitance effective range: 17pF
- ✓ Sensing error reporting







Augmented RFID for green IoT

- Maintenance-free, long life-cycle tags for sustainable deployments
- Plug-and-play deployment on RAIN RFID infrastructure
- Best-in-class passive sensor accuracy

