EM MICROELECTRONIC

A COMPANY OF THE **SWATCH GROUP**

em | echo-T
Tamper-Evident RAINFC

DUAL Frequency RAINFC Transponder IC with Tamper Alarm

Features

l Tamper detection
l Dual Frequency 1-step inlay manufacturing
l Shared memory and shared unique ID
l Minimum 100k write cycles endurance
l Minimum 10 years data retention
l Extended temperature range (-40°C to +85°C)
l Sawn wafers, 6-mils thickness, gold bumps

l **NFC Interface**
· ISO/IEC 14443A-3 compliant tag
· NFC Forum™ Type 2 compliant
· Enables NDEF data structure configurations
· NDEF swap configurable for app-free tamper detection
· Tamper alarm is readable
· Communication baud rates at 106kbps
· Anti-tearing support for NFC capability container (CC) and Static/Dynamic lock bytes
· ACCESS counter increased at first reading
· Optional limit of unsuccessful LOGINs
· Optional security timeout for unsuccessful LOGINs
· Optional control of EPC privacy features
· UHF power detection
· 50pF NFC on-chip resonant capacitor

l **EPC Interface**
· ISO/IEC 18000-63 compliant
· EPC™ Gen2 V2 compliant
  · Alteration EAS compliant
  · Tag Alteration (Core) compliant
· 32-bit Access and Kill passwords
· Read sensitivity up to -18dBm with a dipole antenna
· Write sensitivity up to -13dBm with a dipole antenna
· Fast writing using the BlockWrite command
· BlockPermalock for USER memory
· NFC field detection and ACCESS counter
· Tamper alarm is readable

l **Memory**
· 32-bit Shared unique ID included in:
  · 7 bytes UID (NFC)
  · 96-bit TID (EPC)
· 2080-bit or 1984-bit User memory
  · 1920 bit contiguous user data from NFC
  · 160 or 64 bit USER contiguous data from EPC
· 128-bit or 224-bit UII/EPC encodings
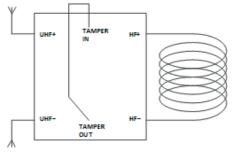· 1 step encoding possible from NFC or EPC interface.

General Description

em|echo-T is part of the latest generation of EM Microelectronic Radio-Frequency IDentification (RFID) devices, combining Near-Field Communication (NFC) and RAIN RFID functionalities on a single die. Target applications and market segments include retail, product authenticity.

em|echo-T provides multiple benefits and usages via the RAIN RFID communication interface like supply chain management, stock inventory, product returns and data privacy. In parallel it enables customer engagement through product information and loyalty programs using an NFC-enabled smartphone. An electrical continuity loop check ("tamper detection") provides a means to detect tampering with product packaging through both the RAIN RFID reader infrastructure for in-store inventory surveillance and end customer smartphones for product authenticity applications.

em|echo-T is a dual frequency device supporting ISO/IEC 14443A and NFC Forum™ Type 2 specifications on one side and RAIN RFID protocols ISO/IEC 18000-63 and EPC™ Gen-2v2, including extended privacy features, on the other. Each IC is manufactured with a 96-bit unalterable unique identifier (UID) used by both RF protocols. em|echo-T's non-volatile memory is accessible from either RF air interface and supports BlockWrite commands, enabling fast encoding, as well as the Untraceable command to hide portions of memory of the tag or label to guarantee end-user privacy.

Tamper status can be optionally stored in non-volatile memory, enabling product packaging lifecycle management. Tamper evidence read-out using a smartphone is supported using a dynamic NDEF message implementation supported by both Android™ and iOS™.

Typical Operating Application

Applications

l Product Identification with tamper evidence detection
l Customer engagement, coupons, loyalty programs
l Inventory and supply chain management
l Asset control
l Single tap quick re-ordering

RAIN RFID is a trademark of the RAIN RFID Alliance.
EPC is a trademark of EPCglobal Inc.