



**COMBI  
DUAL FREQUENCY  
NFC UHF LABEL**

**50x40 mm**

**EM4423 ECHO**

**NFC 13,56 MHz ISO14443A**

**UHF 868 MHz ISO18000-6**

<b>Product:</b>	Flexible NFC UHF LABEL 50 x 40 mm for Industrial Applications readable with UHF RFID Reader and NFC enabled smart phone, 13,56 / 865...928 MHz High/Ultra High Frequency with EM ECHO EM4423 ISO14443 / ISO18000-6 chip	
<b>Options:</b>	Customized 4 colour print (Logo, UID, Serial-No., QR-Code), programming.	
<b>Max. Read Range:</b>	ISO14443 up to 50 mm ISO18000 up to 3 m	(Depends on reader power)
<b>Frequency:</b>	13,56 / 865...928 MHz	(At room temperature 20°C)
<b>ISO Standard:</b>	ISO14443 ISO18000	NFC Forum Type 2 compliant Class 1 Gen 2 compliant
<b>Dimensions / Weight:</b>	50 x 40 mm (Antenna: 35 x 20 mm)	0,5g
<b>Material / Colour:</b>	Paper cover, AL, adhesive	White, other colour and logo QR Code number print on request
<b>Minimum Order Quantity:</b>	1000 pieces on roll	
<b>Temperature:</b>	Operating: -25°C ... + 55°C	Storage: -25°C ... + 55°C
<b>Certification / Other:</b>	CE	RoHS ✓ REACH ✓
<b>Part Description:</b>	DF-L-5040- EM4423	Other RF Chip versions are available on request

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### DESCRIPTION

em|echo corresponds to the latest generation of EM Microelectronic contactless devices, bringing innovative features to the NFC and EPC™ worlds. The chip combines two functionalities on one single die, the EPC technology used for long range application purposes and the NFC used to exchange data in a proximity range. Both protocols may share a common unique ID.

Targeted applications and market segments include retail, product authentication or smart NFC posters.

A tag or label based on the em|echo provides multiple benefits and usages via the EPC communication interface like stock inventory, product returns, and data privacy. The same tag or label also enables new marketing services like product information or loyalty programs using an NFC enabled smartphone.

The chip is a dual frequency device supporting ISO/IEC14443 Type A, NFC Forum™ Type 2 specifications, ISO/IEC18000-63 and EPC Gen2 V2. Additional features have been added to provide chip privacy. For the NFC interface, the smart counter increments its value each time the NFC message has been read by the end-user.

Each chip is manufactured with a 96-bit unalterable unique identifier (UID) to ensure full traceability. The same UID number is used by both RF protocols. During an ISO/IEC14443 anti-collision procedure, the 7 bytes which are part of the 96-bit are sent back by the transponder IC.

The em|echo offers two non-volatile memories which are accessible by both RF air interfaces. The two memories are segmented to implement multiple applications.

em|echo supports the optional *BlockWrite* command, enabling the fast encoding of a 96-bit EPC. em|echo also supports the optional *Untraceable* command to hide portions of memory of the tag or label.

### NFC INTERFACE

- | ISO/IEC 14443A -3 compliant tag
- | NFC Forum Type 2 compatible
- | Enables NDEF data structure configurations
- | 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

### EPC INTERFACE

- | ISO/IEC 18000-63 compliant
- | EPC Gen2 V2 certified
  - Alteration EAS certified
  - Tag Alteration (Core) certified
- | 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
- | Block permalock for USER memory
- | NFC field detection
- | NFC ACCESS counter

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**FEATURES**

- | Dual Frequency 1-step inlay manufacturing
- | Shared unique ID
- | Shared memory
- | Minimum 100k write cycles endurance
- | Minimum 10 years data retention
- | Extended temperature range: -40°C to +85°C
- | Sawn wafers, 6-mil thickness, gold bumps

**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.



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

**APPLICATIONS**

- | Product Identification
- | Customer engagement, coupons, loyalty programs
- | Inventory and supply chain management
- | Asset control
- | Single tap quick re-ordering

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