

## Three Channel LF Transceiver (3D AFE) TMS37122

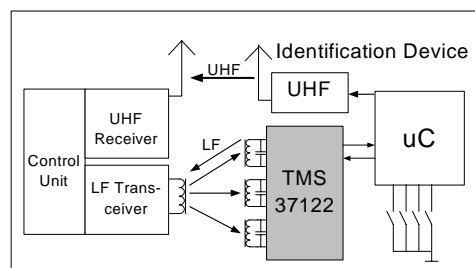


Figure 1: Passive Entry System

**First Three Channel LF Transceiver for RFID applications with programmable wake-up patterns and LF threshold detector.**

### Description

The TMS37122 is a three channel LF Transceiver, which can handle up to three antennas for LF field detection independent of orientation. It provides a maximum sensitivity of typical 5mVpp, which allows extended read ranges up to a few meters. This is by far more compared to traditional transponder systems. **Figure 1** shows the implementation in a Passive Entry system and **Figure 2** a typical application in a generic identification device. Two different read ranges can be achieved with the

programmable wake patterns and thresholds. This is used e.g. for read range restrictions on Indoor / Outdoor detection in passive entry automotive applications.

Also external devices can be woken up with the WAKE UP output. A simple serial interface enables bi-directional LF data transmission.

The IC provides a very low current consumption of typically 5µA in standby mode with all 3 antennas active. To reduce standby current consumption,

unused antennas can be switched off and the standby current goes down to typically 2µA with one antenna active. This feature extends battery lifetime and makes the device well suited for battery-powered applications. The device can also operate in battery-less backup mode, if battery power is not available. Exact resonance trimming of each antenna circuit can be achieved with the on-chip trimming capacitors.

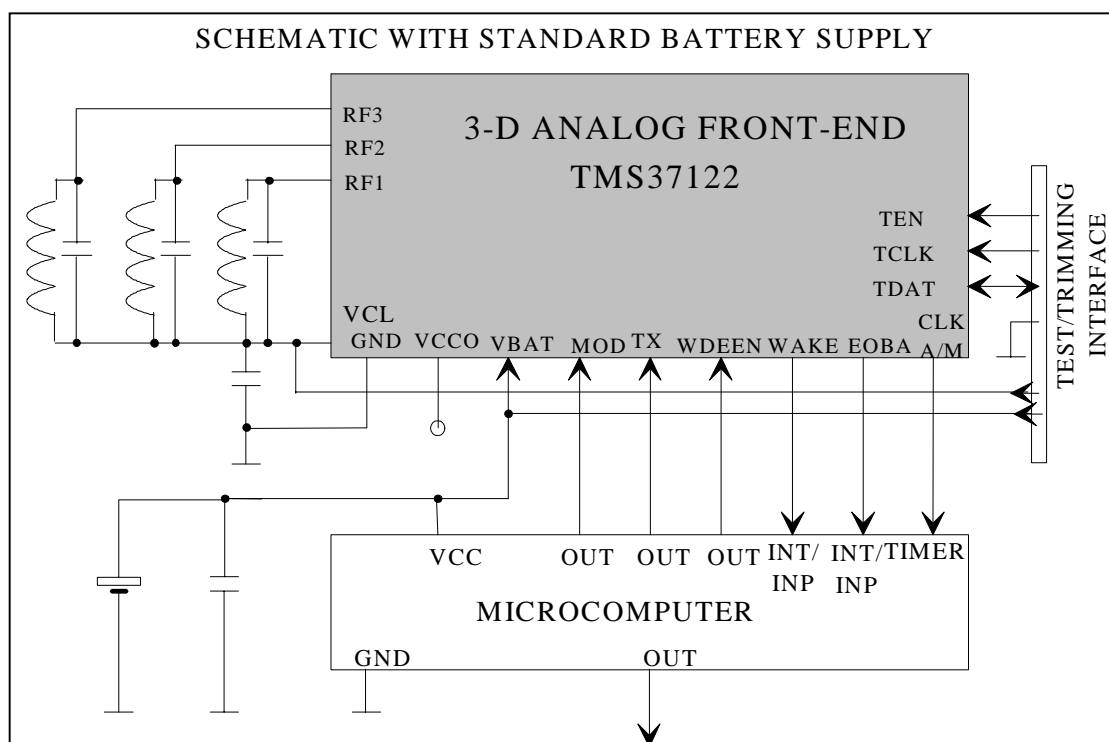


Figure 2: Typical application of TMS37122

## Features:

- Three Antenna input channels
- Orientation independent LF field detection
- High sensitivity of typical 5mV<sub>pp</sub>
- Read range up to a few meters
- Ultra low quiescent current of 100nA
- Ultra low standby current
  - typ. 5μA with three antennas active
  - typ. 2 μA with one antenna active
- Supports batteryless backup mode
- Programmable LF threshold levels
- Wake up function for external devices
- Two programmable 16 bit wake patterns
- Serial interface for data transmission
- 120kHz - 140kHz LF frequency range
- TI 134 kHz / HDX Transponder compatible modulation
- On-chip antenna trimming for all three antennas
- Up to 4kBit Data Transmission rate
- Small TSSOP16 SMD package

## Application Examples:

### Automotive:

- Passive Entry / Passive Start
- Indoor / Outdoor recognition
- Immobilizer
- Sensor monitoring

### Industry:

- Remote LF initiated measurement
- Payment systems
- Vehicle-asset tracking
- Supply chain automation
- Security / Access Systems
- Customer Relationship Management (CRM)

## Specifications:

Part Number:		RI-TMS37122-TR			
Parameter	Description	min	typ.	max	Unit
VBAT	Battery voltage	2.0	3.0	4.0	V
I <sub>quiet</sub>	Quiescent current			100	nA
I <sub>stby</sub>	Standby current three antennas active		5		μA
I <sub>stby</sub>	Standby current two antennas active		3.5		μA
I <sub>stby</sub>	Standby current one antenna active		2		μA
I <sub>act</sub>	Active current		20μA		μA
V <sub>wakeA</sub>	Maximum antenna sensitivity	2	5	10	mV <sub>pp</sub>
TaR	Operating temperature range	-40		85	C
	Trimming capacitors per channel		8		
CT	Nominal Trimming capacitor range, 256 steps	0		150	pF
FRX	Data rate			4	kBit/sec
FRES	Resonance frequency range	120	134.2	140	kHz
Packaging	Tape on Reel				

For more information, contact the sales office or distributor nearest you. This contact information can be found on our web site at: <http://www.ti-rfid.com>

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