

The I•CODE HSL (High frequency Smart Label) IC is a dedicated chip for passive, intelligent tags and labels. It is especially suited for supply chain management and logistics applications in the US, where operating distances of several meters can be realized.

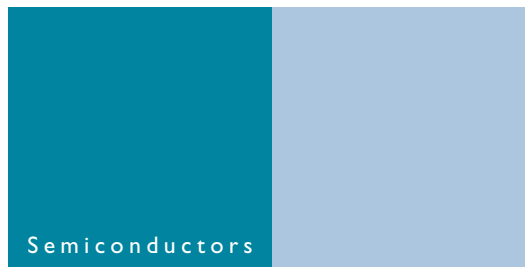


## Features

- Long range solutions (up to 7m in the US)
- Suitable for UHF and 2.45 GHz RFID, allowing one tag to be used world-wide (except UHF in Japan)
- Fast data rate
  - forward link: 10 - 40 kbits/s
  - return link: 40 - 160 kbits/s
- 10% and 100% modulation for best fit into regulation requirements
- Can be used to build Intellitag™ products
- 2048 bit R/W Memory
  - 64 bits UID
  - 216 bytes with user-definable access conditions

## Advantages

- New and most innovative UHF / GHz technology
- Tags / labels and readers will be available from various suppliers
- Backwards compatible to ANSI256 / Intellitag™
- First UHF products fitting to European regulations
- Highly advanced anti-collision and highest speed
- Broadest industry backup - EAN•UCC GTAG™ refers to ISO 18000-6
- Open product platform targeted to be compliant with ISO 18000-4 and ISO 18000-6



Semiconductors

- Reader portfolio covers all regional demands
- COMPLETE chip / tag product ROADMAP including OTP (single write / licence plate functionality), read/write memory / Security, sensors / Battery powered passive, active
- In accordance with various technology and application standards
- Broad availability of compatible components through ISO requirement for open licence policy and clear patent statements

## General Description

I•CODE HSL is the first member of a product family of smart label ICs targeted to be compliant with the future ISO standards 18000-4 and 18000-6 for item management.

The I•CODE system offers the possibility of operating multiple labels simultaneously in the field of the reader antenna (anticollision, collision arbitration).

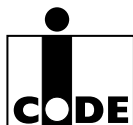
The I•CODE HSL family of ICs is especially designed for long-range applications.

The tag requires no external power supply. Its contactless interface generates the power supply via the antenna circuit by propagative energy transmission from the interrogator (read/write device), while the system clock is generated by an on-board oscillator. The contactless interface demodulates data transmitted from the interrogator to the I•CODE HSL based tag, and further modulates the electromagnetic field provided by the interrogator for data transmission from the I•CODE HSL based tag to the interrogator.

Whenever connected to a dedicated antenna for the targeted frequency range, the I•CODE HSL can be operated without the line of sight and without the need of a battery on the tag. When the smart label or tag is within the operating range of the interrogator (read/write device), the high-speed radio frequency communication interface allows data transmission in both directions.

## Applications

- Supply Chain Management
- Asset Management
- Container Identification
- Pallet Tracking

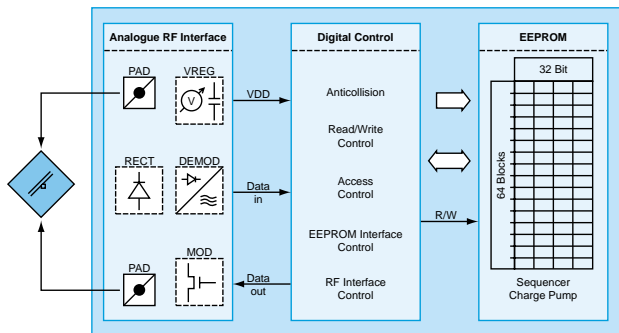


# •CODE HSL

## High frequency Smart Label IC



[www.semiconductors.philips.com](http://www.semiconductors.philips.com)



### Standards Compliance

The •CODE HSL is targeted to be compliant with the following Air Interface standards:

- ISO 18000-4 Mode 1 (2.45 GHz)
- ISO 18000-6 Type B (UHF)
- ANSI NCITS 256:1999 (R2001) Part 3 - 2.45 GHz
- ANSI NCITS 256:1999 (R2001) Part 4 - UHF

The •CODE HSL is targeted to be compliant with the following Application Standards:

- ISO 18185 - Electronic Seal Tags (ISO TC 104)
- EAN•UCC GTAG™
- MH10.8.4 - Reusable Containers
- AIAG B-11 - Automotive Tire and Wheel Identification

### Operating distances for •CODE HSL based tags and labels in released frequency bands

| Frequency Range          | Region                | Available Power          | Read Distance Single Antenna <sup>8)</sup> | Read Distance Gate <sup>9)</sup> |
|--------------------------|-----------------------|--------------------------|--|----------------------------------|
| 869.4 - 869.65 MHz (UHF) | Europe <sup>1)</sup>  | 0.5 W ERP                | 1.6 m                                      | 3.2 m                            |
| 865.5 - 867.6 MHz (UHF)  | Europe <sup>2)</sup>  | 2.0 W ERP                | 3.2 m                                      | 6.4 m                            |
| 902.0 - 928.0 MHz (UHF)  | America <sup>3)</sup> | 4.0 W EIRP               | 3.5 m                                      | 7.0 m                            |
| 860.0 - 930.0 MHz (UHF)  | Others <sup>4)</sup>  |                          | 0 - 3.5 m                                  | 0 - 7.0 m                        |
| 2.400 GHz - 2.4835 GHz   | Europe <sup>5)</sup>  | 0.5 W EIRP               | 0.35 m                                     | 0.7 m                            |
| 2.400 GHz - 2.4835 GHz   | Europe <sup>5)</sup>  | 4.0 W EIRP <sup>9)</sup> | 1.0 m                                      | 2.0 m                            |
| 2.400 GHz - 2.4835 GHz   | America <sup>6)</sup> | 4.0 W EIRP               | 1.0 m                                      | 2.0 m                            |
| 2.400 GHz - 2.4835 GHz   | Others <sup>7)</sup>  |                          | 0 - 1.0 m                                  | 0 - 2.0 m                        |

Notes:

- <sup>1)</sup> Current CEPT/ETSI regulations: CEPT REC 70-03 Annex 1, ETSI EN 330 220-1
- <sup>2)</sup> Proposal for future CEPT/ETSI regulations
- <sup>3)</sup> FCC regulations, Part 15 Section 247
- <sup>4)</sup> In many other countries regulations either similar to FCC or CEPT/ETSI apply. However, Japan does not allow RFID to be used in an UHF band around 860 MHz to 930 MHz.
- <sup>5)</sup> Current CEPT/ETSI regulations: CEPT REC 70-03 Annex 11, ETSI EN 330 440-1
- <sup>6)</sup> FCC regulations Part 15 Section 247
- <sup>7)</sup> In many other countries regulations either similar to FCC or CEPT/ETSI apply.
- <sup>8)</sup> These distances are typical values for general tags and labels. A special tag antenna design could achieve higher values.
- <sup>9)</sup> Indoors only

### Ordering Information

| Order No.        | Delivery Type Description                           |
|------------------|---|
| SL31CS30 01FW/V4 | Bumped, sawn wafer on ffc, 150 µm, inked and mapped |
| SL3S30 01FT      | TSSOP8  |

### Philips Semiconductors

Philips Semiconductors is a worldwide company with over 100 sales offices in more than 50 countries. For a complete up-to-date list of our sales offices please e-mail [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com). A complete list will be sent to you automatically. You can also visit our website <http://www.semiconductors.philips.com/sales>.

© Koninklijke Philips Electronics N.V. 2002

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.



Date of release: September 2002  
Document order number: 9397 750 10315

Published in The Netherlands