UCODE HSL

Ultra high frequency Smart Label IC

The UCODE 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, where operating distances of several meters are required.

Semiconductors

Applications
- Supply Chain Management
- Asset Management
- Container Identification
- Palet & Case Tracking

Features
- Long range solutions (up to 7m in the US, up to 4m in Europe)
- 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
- Tags / labels and readers are 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
- Reader portfolio covers all regional demands
- COMPLETE chip / tag product ROADMAP including OTP (single write / license plate functionality), read/write memory / Security, sensors / Battery powered passive, active
- In accordance with various technology and application standards

General Description

UCODE HSL is the first member of a product family of smart label ICs running at the UHF and 2.45 GHz frequency. The UCODE system offers the possibility of operating multiple labels simultaneously in the field of the reader antenna (anticollision, collision arbitration). The UCODE 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 UCODE HSL based tag, and further modulates the electromagnetic field provided by the interrogator for data transmission from the UCODE HSL based tag to the interrogator.

Whenever connected to a dedicated antenna for the targeted frequency range, the UCODE 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.

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Standards Compliance

The UCODE 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 UCODE 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 UCODE HSL based tags and labels in released frequency bands

Frequency Range	Region	Available Power	Calculated Read Distance Single Antenna[8]	Read Distance Fate At Tough Environment[8]
869.4 – 869.65 MHz (UHF)	Europe[1]	0.5 W ERP	4.0 m	2.0 m
865.5 – 867.6 MHz (UHF)	Europe[2]	2 W ERP	8.0 m	4.0 m
902 – 928 MHz (UHF)	America[3]	4 W EIRP	8.4 m	4.0 m
860 – 930 MHz (UHF)	Others[4]		0 - 3.5 m	0 to 4.0 m
2.400 GHz – 2.4835 GHz	Europe[5]	0.5 W EIRP indoor and outdoor	0.6 m	0.5 m
2.400 GHz – 2.4835 GHz	Europe[5]	4 W EIRP indoor only	1.8 m	1.5 m
2.400 GHz – 2.4835 GHz	America[6]	4 W EIRP	1.8 m	1.5 m
2.400 GHz – 2.4835 GHz	Others[7]			0 to 2 m

Notes:
The maximum write distance is around 70% of the read distance.

[1] Current CEPT/ETSI regulations: CEPT REC 70-03 Annex 1, ETSI EN 330 220-1
[2] Proposal for future CEPT/ETSI regulations
[3] FCC regulations, Part 15 Section 247
[4] In many other countries regulations either similar to FCC or CEPT/ETSI may apply
[5] Current CEPT/ETSI regulations: CEPT REC 70-03 Annex 11, ETSI EN 330 440-1
[6] FCC regulations Part 15 Section 247
[7] In many other countries regulations either similar to FCC or CEPT/ETSI apply
[8] These distances are typical values for general tags and labels. A special tag antenna design could achieve higher values

Ordering Information

Order No.	Delivery Type Description
SL3ICS30 01FW/V4	Bumped, sawn wafer on ffc, 150 μm, inked and mapped
SL3S30 01FT	TSSOP8

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