

# RFID LINECARD

## RFID

RFID (Radio Frequency Identification) has become a widely spread, mature technology for recording data based on standardised protocols working in three frequency ranges:

- Low Frequency = 120...134 kHz,
- High Frequency = 13.56 MHz,
- Ultra-High Frequency = 0.86...2.4 GHz.

Silica provides a comprehensive portfolio of RFID products like chips for tags and for readers as well as finished packaged products. If you need a custom tag for harsh environments or if you are looking for the best suitable RFID reader to integrate into your product, then Silica can help! Just email your queries to: [rfid@silica.com](mailto:rfid@silica.com)



	Readers ICs			Wafer & ICs			Transponders	
	LF	HF	UHF	LF	HF	UHF	LF	HF
Impinj			•					
NXP	•	•		•	•	•	•	
ST					•	•		
TI	•	•		•	•	•	•	•

### Product Highlight: UHF Reader from Impinj: Indy R1000

Impinj's Indy R1000 reader chip is based on an award-winning technology acquired from Intel Corporation. This highly integrated reader chip with supporting software delivers the key building blocks for a full range of UHF Gen 2 RFID readers, including everything from short-range embedded modules to long-range dock door readers.

#### Features and Benefits

- Incorporates complete UHF Gen 2 standard transmit, receive, demodulation, and baseband functions
- Integrates up to 90% of the components in a discrete reader design, providing for significantly smaller reader designs
- Very low power enables longer battery life for handheld readers, power over USB for short range readers and Power over Ethernet (PoE) for high performance, long range readers

- Reader chip and firmware support EPCglobal Gen 2 and ISO-18000-6C specifications, regional regulatory requirements and the full 840...960 MHz band
- Reader chip and software support low-level diagnostics, remote management and provisioning and easy integration
- Protocol firmware, programming tools, radio drivers and schematics all enable quick time-to-market



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## RFID for PCB Tracking Solutions

The technology for PCB (Printed Circuit Board) tracking has continually evolved from manual input to the use of linear and 2D barcodes. The next natural step of this evolution is RFID! Implementing RFID for tracking assets has proven to be difficult in the past. The main challenges consisted of the complexity and the size requirements of the antenna needed for tags in LF and HF frequencies. Silica now presents a new innovative solution

from NXP that perfectly fits the needs of PCB Tracking. The novelty of this solution is:

- Very small surface mount package compatible with standard pick and place machines
- Use of the ground plane of the PCB as antenna, reducing the space requirements for the application

## RFID Advantages over Barcode

	Linear Barcode	2D Barcode	RFID
PCB area (typical)	500 mm <sup>2</sup>	100 mm <sup>2</sup>	35 mm <sup>2</sup>
Reading errors (typical)	10...20%		0...2%
Line of sight	Required		Can read through everything except metal
Read range	35 cm	25 cm	Up to 7 m
Rewritability	No		Yes
Reader scanner placement flexibility	Medium	Low	High
Scanning speed	One code at a time		100+ tags simultaneously
Smudge effects	Can affect readability		No effect

## NXP's Solution based on UCODE G2XM

- UHF frequency range: 840...960 MHz
- High chip sensitivity enabling large read range (-15 dBm for read, -13 dBm for write)
- 512-bit non-volatile user memory, large Tag Identifier (TID): 64-bit incl. a 32-bit unique serial number, 240-bit EPC number space

- Password protection
- Small size robust SOT1122 (1.45 mm<sup>2</sup>) package with 3 pads
- Temperature range: -40...85°C
- Certified according to UHF EPCglobal Gen2 standard (v1.0.9)
- Compliant to EPCglobal Gen2 (v1.1.0)



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