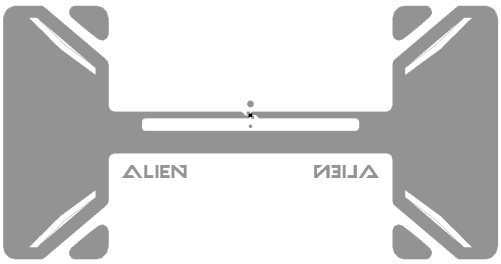
ALN-9874

"Tread" Tire and Automotive Inlay

Fast-track and stay on course with the Alien Technology® ALN-9874 "Tread" RFID inlay for automotive tire label and high-dielectric material applications requiring extra-high sensitivity



Applications

- Automotive Tire Label
- Reusable containers
- High-dielectric materials
- Metal-filled objects

FEATURE	DESCRIPTION	BENEFIT
Performance tuned for automotive rubber and high-dielectric materials	80x40 mm size, compatible with all standard far-field RFID reader antennas (fixed and handheld)	Exceptional performance for traditionally challenging RF materials
Reliable read / write performance with Sentinel™ memory	Bit error correction, improved read/write sensitivity, robust memory retention and 200,000 write cycles (2X that of competition)	Robust reliability of stored data & added protection against data loss/corruption

Features:

- Worldwide operation in all RFID UHF bands (860-960 MHz)
- Global GS1 Class 1 Gen 2 (V1.2.0) and ISO/IEC 18000-6C compliance
- Class leading read and write performance
- 512 bits of NVRAM Memory
  - Up to 128 EPC bits (96-bits nominal)
  - 128 User bits
  - 48 bit Unique TID
  - 32 bit Access and 32 bit Kill passwords
- User Memory may be Block Perma-Locked as well as read password protected in 32 bit blocks
- Low power operation for both read and write
- *Blast*Write™ and *Quick*Write™ mass-encoding
- Dynamic Authentication™ - anti-cloning/ anti-counterfeit technology
- Available in high-yield, high capacity dry/wet inlay rolls

Product Overview:

Designed for Automotive Tire, High-Dielectric, General Asset Management & Supply Chain applications, the 80x40 mm **Higgs™-EC UHF RFID IC** based **"Tread" antenna design** offers robust performance on traditionally RF challenged assets and materials.

Applications include (but not limited to):

- Automotive tire external labeling

- High-dielectric material tagging

- Metal-filled objects

- Applications requiring extra high sensitivity

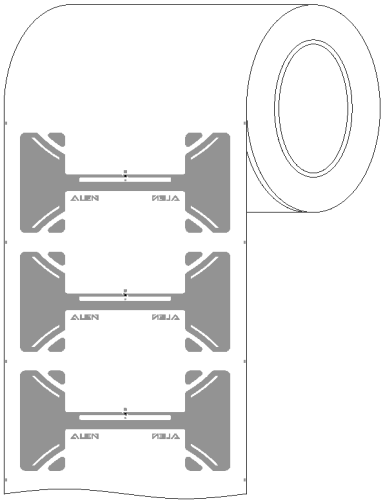
Enhanced memory footprint includes **a 48-bit Unique TID for authentication** and **serialization** applications and **password protected read and write** support to prevent unauthorized viewing and modification of the tag's data.

ALN-9874 inlays are World Tag compliant, enabling consistent operation across the diverse frequencies of the Americas, Europe, Middle East, Asia, and Africa.

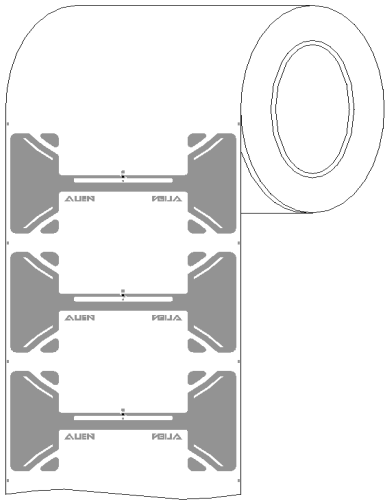
ALN-9874 “Tread” Inlay

All dimensions in millimeters unless otherwise specified

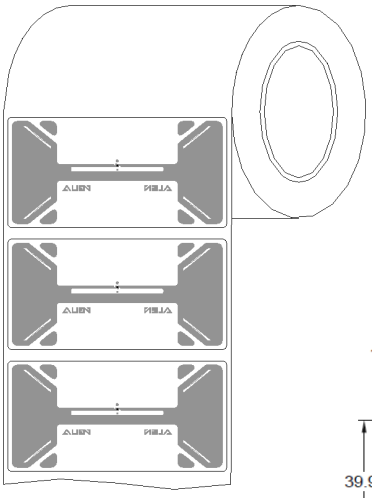
ALN-9874 Inlay Orientation



ALN-9874-R
(Dry Unslit Roll)



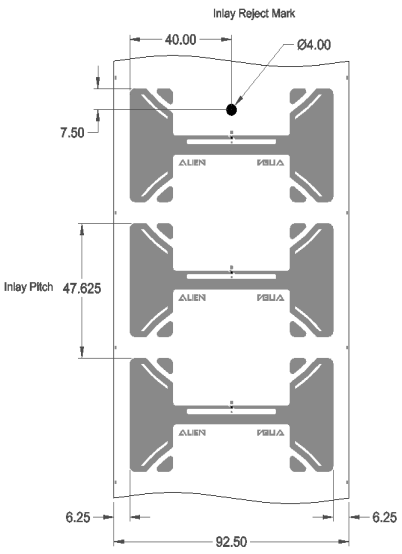
ALN-9874-SR
(Dry Slit Roll)



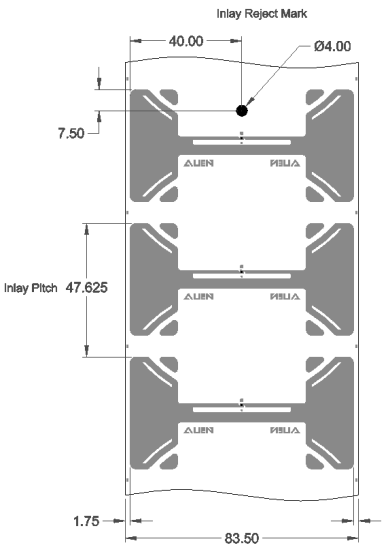
ALN-9874-WRW
(White Wet Inlay)

Standard Alien Inlay rolls unwind with metal antenna side facing outward, with respect to the core.

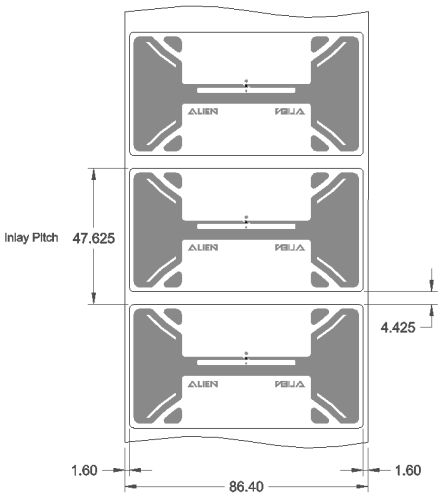
ALN-9874 Inlay Specification



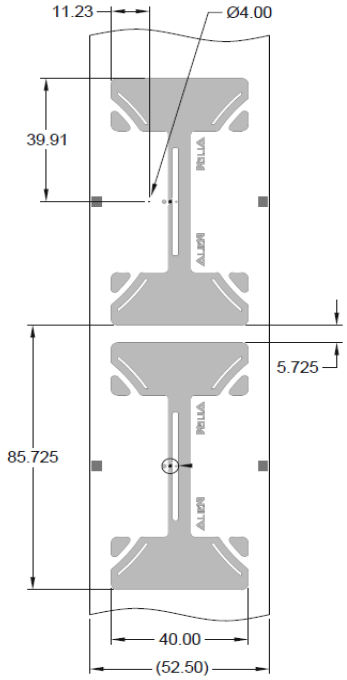
ALN-9874-R
(Dry Unslit Roll)



ALN-9874-SR
(Dry Slit Roll)

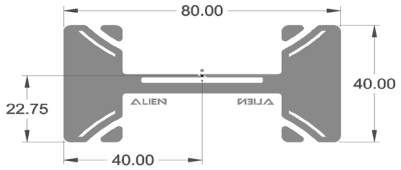


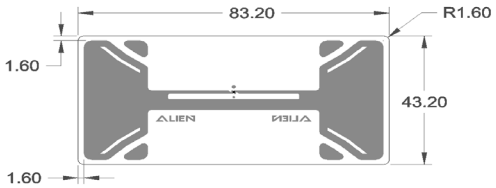
ALN-9874-WRW
(White Wet Inlay)



ALN-9874-90R
(Dry Unslit 90 Degree Rotate)

ALN-9874 General Dimensions



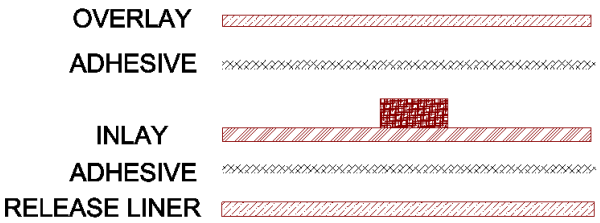


ALN-9874 Inlay Stackup

DRY INLAY THICKNESS ±10%	
Over Antenna	**0.06mm**
Over Chip	**0.24mm**

WHITE WET INLAY THICKNESS ±10%	
Over Antenna	**0.16mm**
Over Chip	**0.32mm**

ALN-9874-R
(Dry Unslit Inlay)



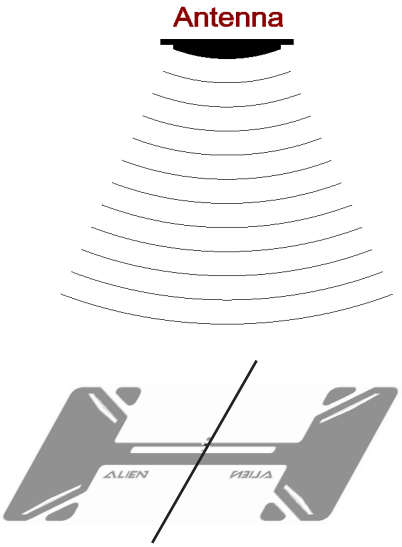
ALN-9874-WRW
(White Wet Inlay)

ALN-9874 Inlay Angular Sensitivity & Performance

Read Range		AVG.
Alien 80x40 Tire Tag	FCC	22 ft. (7 m)
	ETSI	14 ft (4 m)
Competitor 92x44 Tire Tag	FCC	9 ft (3 m)
	ETSI	6 ft. (2m)

Comparative performance on-tire compared to (larger) competitive inlay (FCC operational range 902-928 MHz, ETSI operational range 865-867 MHz).

*Figures provided for comparative reference, actual results may vary



Angular Sensitivity
Inlay is rotated in the x, y, plane about the z axis

ALN-9874 "Tread" Inlay

ALN-9874 Specifications

Dry Inlay	
Antenna Width	3.149" [80mm]
Antenna Length	1.574" [40mm]
Web Width (-R)	3.642" [92.50mm]
Web Width (-SR)	3.287" [83.50mm]
Web Width (-90R)	2.067" [52.50mm]
Web Pitch	1.875" [47.625mm]
Web Pitch (-90R)	3.375" [85.725mm
Core Width (-R)	3.642" [92.50mm]
Core Width (-SR)	3.287" [83.50mm]
Core Width (-90R)	2.067" [52.50mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll (-SR)	10,000 +/- 500
Inlays per Roll (-R)	6,800 +/- 500
Inlays per Roll (-90R)	4,600 +/- 500

Wet Inlay	
Inlay Width	3.276" [83.20mm]
Inlay Length	1.700" [43.20mm]
Web Width	3.401" [86.40mm]
Web Pitch	1.875" [47.625mm]
Core Width	3.401" [86.40mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	6,800 Nominal
Maximum Roll OD	< 16" [406.4mm]
Roll Labeling Data	Roll #, Quantity
White	TT Printable White Film Only
Overlay Adhesive	General Purpose Permanent
Inlay Adhesive	General Purpose Permanent
Adhesive Application Temperature	> +25°F [-4°C]
Adhesive Service Temperature	-40°F to +200°F [-40°C to +93.3°C]
Release Liner	40# SCK

Environmental	
Shelf Life	Dry Inlays: 5 years at +77°F [+25°C] @ 40% RH Wet Inlays: 2 years at +77°F [+25°C] @ 40% RH
Recommended Storage	+77°F [+25°C] @ 40% RH
Storage Limits	-13°F to 122°F [-25°C to +50°C] 20% to 90% RH Non-condensing
Operating Limits	-40°F to +158°F [-40°C to +70°C] 20% to 90% RH Non-condensing
Bend Diameter	> 1.97" [50mm]
Pressure	< 5N/mm^2
Drop Resistance	Per ASTM D5276
Write Cycles	200,000 @ 25°C
RoHs	2002/95/EC (RoHS 1), 2011/65/EU (RoHS 2), 2015/863 (RoHS 10)
REACH	EU 143/2011, EU 125/2012, Annex XIV of EC no. 1907/2006
ESD Limit– HBM / CDM	5.0kV / 1.5kV

RFID	
Protocols Supported	ISO/IEC 18000-6C GS1 Class 1 Gen 2
Integrated Circuit	Alien Higgs™-EC
Operating Frequency	840–960 MHz
EPC Size	128 Bits
User Memory	128 Bits
TID	32 Bits
Unique TID	48 Bits
Access Password	32 Bits
Kill Password	32 Bits

* Shipped with 6" to 3" plastic core adapter

January 22, 2020

HANDLING PRECAUTIONS Observe standard handling practices to minimize ESD.

DISCLAIMER Application recommendations are guidelines only - actual results may vary and should be confirmed. This is a general purpose product not designed or intended for any specific application.

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