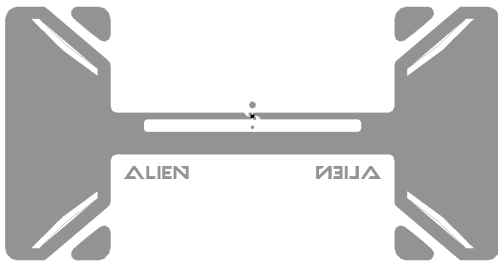




# ALN-9874

## “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



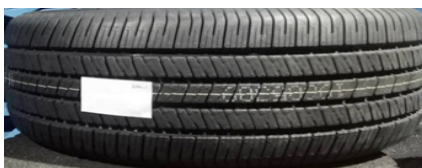
### Applications

- 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
- › *BlastWrite™* and *QuickWrite™* 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.

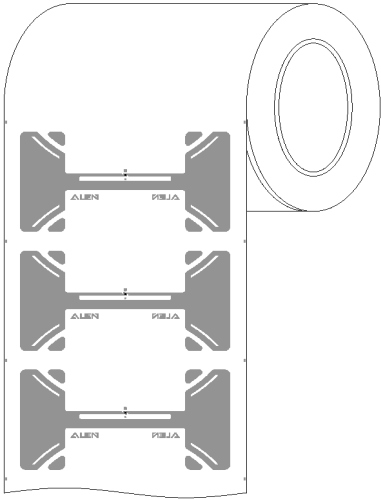
ALN-9874 inlays are World Tag compliant, enabling consistent operation across the diverse frequencies of the Americas, Europe, Middle East, Asia, and Africa.



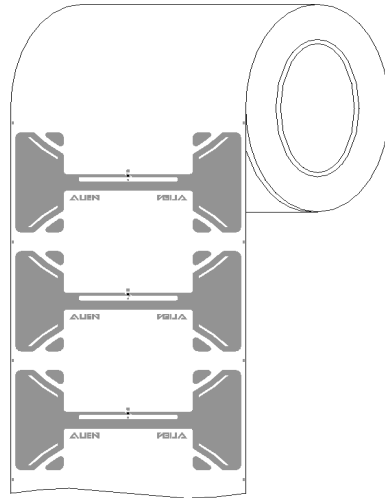
# ALN-9874 "Tread" Inlay

All dimensions in millimeters unless otherwise specified

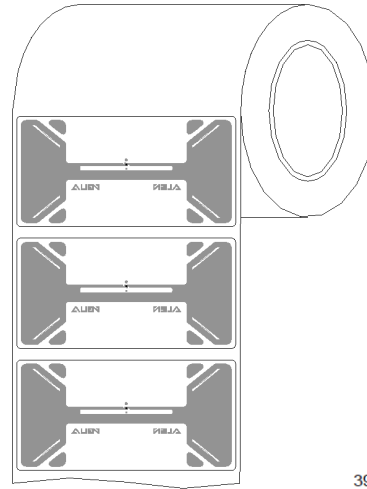
## ALN-9874 Inlay Orientation



**ALN-9874-R**  
(Dry Unslit Roll)



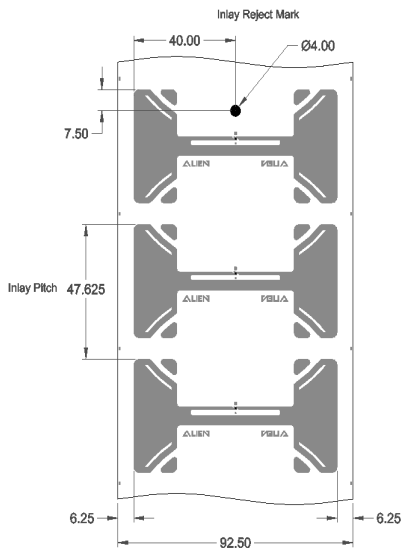
**ALN-9874-SR**  
(Dry Slit Roll)



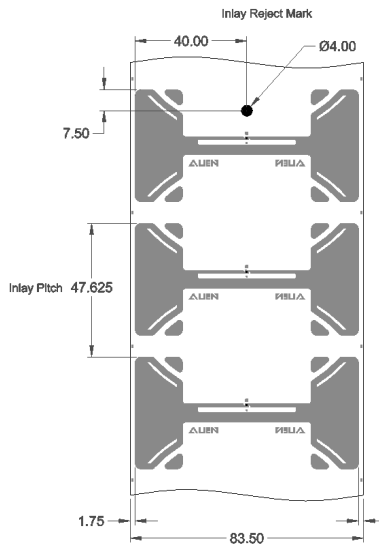
**ALN-9874-WRW**  
(White Wet Inlay)

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

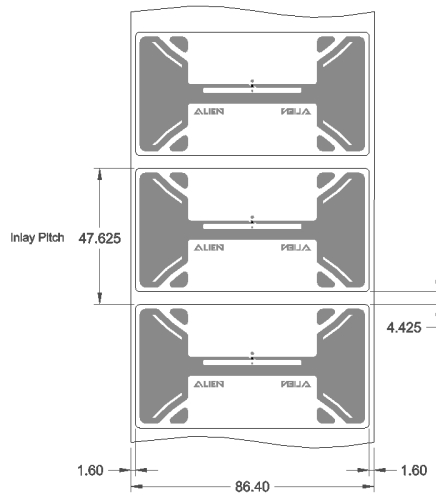
## ALN-9874 Inlay Specification



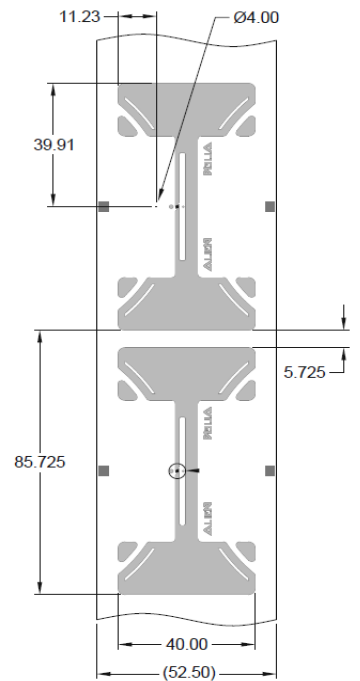
**ALN-9874-R**  
(Dry Unslit Roll)



**ALN-9874-SR**  
(Dry Slit Roll)



**ALN-9874-WRW**  
(White Wet Inlay)

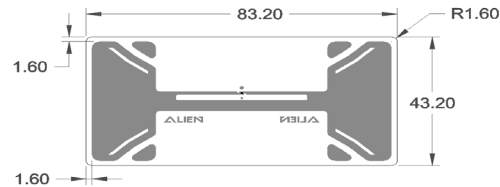
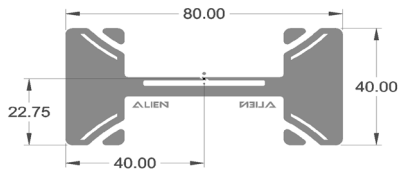


**ALN-9874-90R**  
(Dry Unslit 90 Degree Rotate)





### ALN-9874 General Dimensions



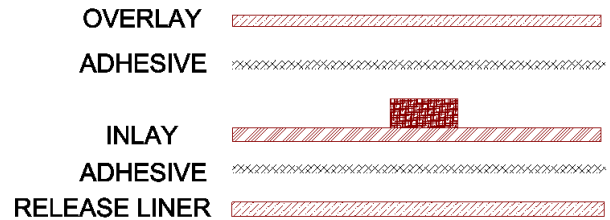
### ALN-9874 Inlay Stackup

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



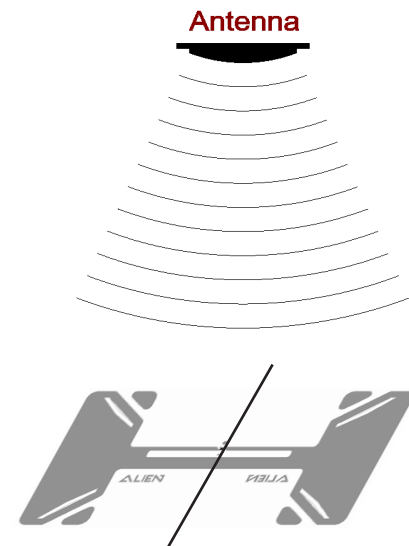
ALN-9874-R  
(Dry Unslit Inlay)



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)



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

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



# ALIEN. 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 Nominal
Inlays per Roll (-R)	6,800 Nominal
Inlays per Roll (-90R)	4,600 Nominal

### 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 <sup>2</sup>
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  
October 18 2019

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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.

This product is covered by one or more of the following U.S. patents: 7967204, 7931063, 7868766, 7737825, 7716208, 7716160, 7688206, 7659822, 7619531, 7615479, 7598867, 7580378, 7576656, 7562083, 7561221, 7559486, 7559131, 7554451, 7551141, 7542301, 7542008, 7531218, 7522055, 7500610, 7489248, 7453705, 7425467, 7417306, 7411503, 7385284, 7377445, 7364084, 7353598, 7342490, 7324061, 7321159, 7301458, 7295114, 7288432, 7265675, 7262686, 7260882, 7253735, 7244326, 7218527, 7214569, 7199527, 7193504, 7173528, 7172910, 7172789, 7141176, 7113250, 7101502, 7080444, 7070851, 7068224, 7046328, 6998644, 6988667, 6985361, 6980184, 6970219, 6952157, 6942155, 6933848, 6927085, 6816380, 6780696, 6731353, 6693384, 6683663, 6665044, 6657289, 6623599, 6606247, 6606079, 6590346, 6586338, 6566744, 6555408, 6527964, 6479395, 6468638, 6420266, 6316278, 6291896, 6281038. Other patents pending.

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Alien Technology  
845 Embedded Way  
San Jose, CA 95138-1030  
866-RFID NOW  
www.alientechnology.com