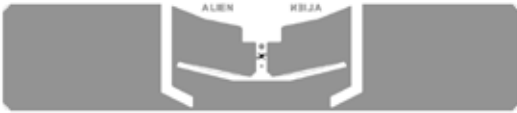




ALN-9954

“G” HIGH-DIELECTRIC INLAY

Accelerate with the next generation ultra-high-performance ALN-9954 “G” inlay by Alien Technology®. Fine tuned for windshields and high-dielectric materials, enabling class leading performance & reliability.



Applications

- Windshield glass
- Plastic pallets, totes, containers
- Asset management
- High-dielectric materials

FEATURE	DESCRIPTION	BENEFIT
Performance tuned for automotive windshields and high-dielectric materials	Compatibility 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
- › 1024 bits of NVRAM Memory
 - Up to 496 EPC bits (96-bits nominal)
 - Up to 688 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 increasingly complex Automotive windshield glass, traditionally difficult-to-tag RF materials and general purpose asset management, the 93x19 mm **Higgs™ -9 UHF RFID IC** based “G” **antenna design** offers class leading performance and reliability.

Applications include (but not limited to):

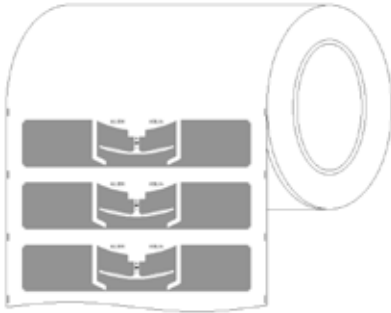
- Automotive tolling, access control
- High-dielectric material tagging
- Metal-filled objects
- Applications requiring extra high sensitivity

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.

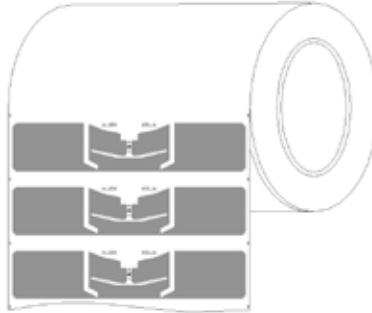
ALN-9954 inlays are World Tag compliant, enabling consistent operation across the diverse frequencies of the Americas, Europe, Middle East, Asia, and Africa.



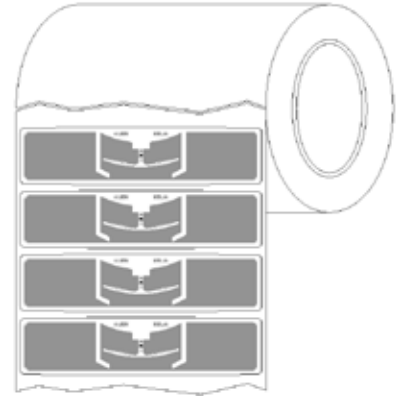
ALN-9954 Inlay Orientation



**ALN-9954-R
(Dry Unslit Roll)**



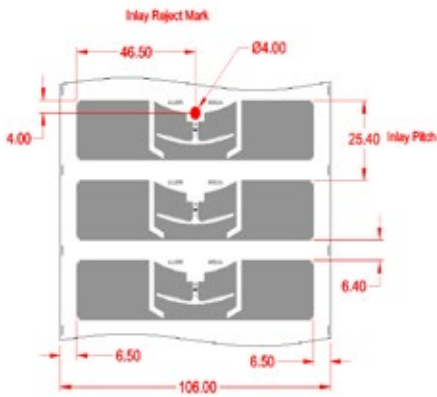
**ALN-9954-SR
(Dry Slit Roll)**



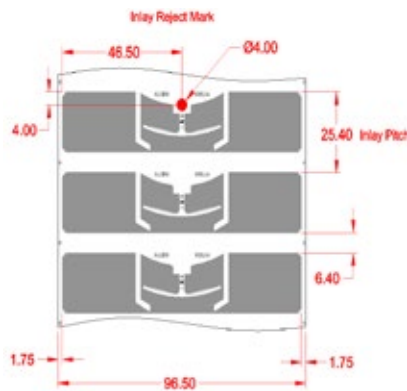
**ALN-9954-WRW
(White Wet Roll)**

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

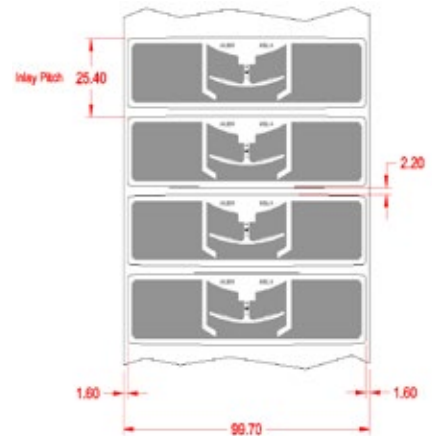
ALN-9954 Inlay Specification



**ALN-9954-R
(Dry Unslit Roll)**



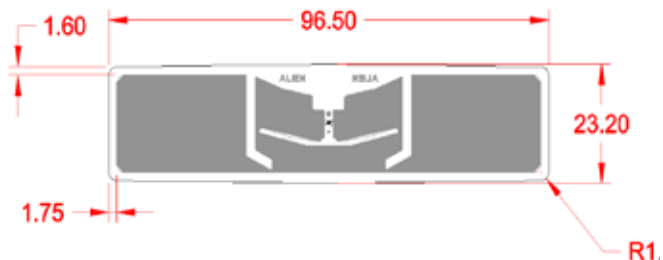
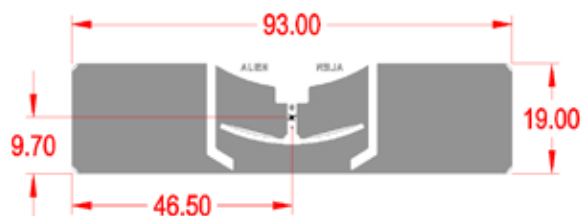
**ALN-9954-SR
(Dry Slit Roll)**



**ALN-9954-WRW
(White Wet Roll)**



ALN-9954 Inlay General Dimensions

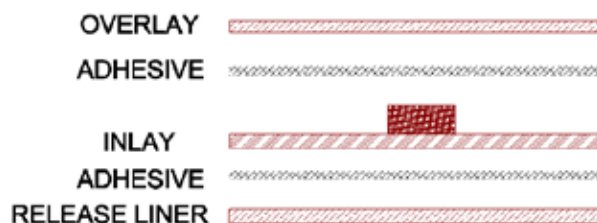


ALN-9954 Inlay Stackup

DRY INLAY THICKNESS $\pm 10\%$	
Over Antenna	0.06mm
Over Chip	0.24mm

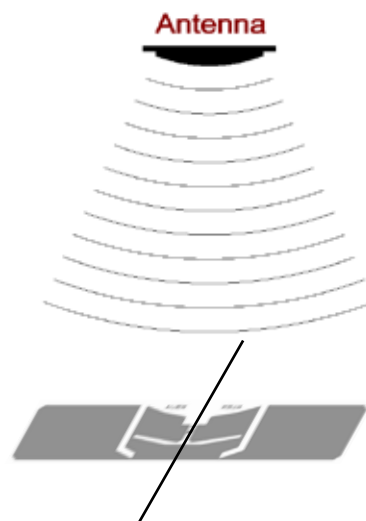
WHITE WET INLAY THICKNESS $\pm 10\%$	
Over Antenna	0.16mm
Over Chip	0.32mm

INLAY



ALN-9954 Comparable Inlay Sensitivity

Read Range (On Windshield)	Average Measured Sensitivity (dBm)
ALN-9954	-20
ALN-9654	-16
Competitive Inlay	-15



On-windshield test sensitivity shows 9954 is a full 4 dBm BETTER than 9654 and around 5 dBm BETTER than comparable competitive windshield inlay.

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

*Figures provided for comparative reference, actual results may vary



ALN-9954 Specifications

Dry Inlay

Antenna Width	3.66" [93.0mm]
Antenna Length	0.748" [19.0mm]
Web Width (-R)	4.173" [106.0mm]
Web Width (-SR)	3.799" [96.5mm]
Web Pitch	1.0" [25.4mm]
Core Width (-R)	3.799" [96.5mm]
Core Width (-SR)	4.173" [106.0mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	12,500 Nominal
Maximum Roll OD	< 12" [304.8mm]
Roll Labeling Data	Roll #, Quantity

Wet Inlay

Inlay Width	3.799" [96.5mm]
Inlay Length	0.913" [23.2mm]
Web Width	3.925" [99.7mm]
Web Pitch	1.0" [25.4mm]
Core Width	3.874" [98.4mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	12,500 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, 2005/618/EC, 2011/65/EU Compliant
REACH	1907/2006/EC Compliant
ESD Limit- HBM / CDM	5.0kV / 1.5kV

RFID

Protocols Supported	ISO/IEC 18000-6C EPCglobal Class 1 Gen 2
Integrated Circuit	Alien Higgs-9
Operating Frequency	840-960 MHz
EPC Size	96 - 496 Bits
User Memory	Up to 688 Bits
TID	32 Bits
Unique TID	48 Bits
Access Password	32 Bits
Kill Password	32 Bits

* Shipped with 6" to 3" plastic core adapter

March 27, 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, 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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