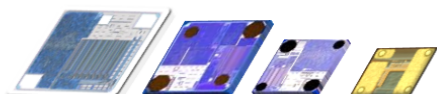# Alien Products Portfolio

RFID...By Alien Technology(R) IC, Inlay & Hardware Catalog

Over 30 years of innovation, technology and quality EPCglobal Gen2 and ISO/IEC 18000-6C compliant UHF passive RFID transceiver chips, inlays & tags, fixed & mobile readers and services.

RFID ICs

World-class Read, Write & memory retention

- Higgs™ Sentinel™ bit error correction
- Optimized memory system for mass markets
- *Blast***Write**™ and *Quick***Write**™ for mass-encoding
- Pre-encoded chip-level serialization

READERS

High performance, ease of use, robust feature set

- Fixed, Handheld, Sled options for all applications
- Featuring on-reader data processing
- Streamlines peripheral enrollment on networks
- Alien Reader Protocol (& LLRP on ALR-F800 / F800-X)

INLAYS / TAGS

Industry's best selling and trusted tag family

- Featuring the pioneering "Squiggle" tag & family
- Inlays for Retail, Transportation, Bio, Security applications and more
- Available under license as reference designs
- Custom tag design service (with NRE or volume commitment)

SERVICES

Industry's first & most respected RFID training

- RFID Academy™ : Standard / Custom / On-Site
- Best Practices
- Practical Product Technical Training
- RFID 101 to Deep Dive, Academy Covers It All

With demonstrated expertise and performance in retail/apparel, transportation, aerospace, authentication, supply chain, item level and life-science applications for almost 20 years, Alien Technology continues to create innovative products and solutions.

Alien Fixed Readers

	Class	Operating System	GPIOs	Protocol	Application
ALR-F800-X Series w/ Emissary	Combines F800 Enterprise Reader with an Edge Server and Emissary Multi-Reader Management and Workflow Management.	Linux with Emissary	4 in / 8 out (optically isolated / open collector)	ARP (Alien Reader Protocol) / LLRP	Available as -X0 (manages itself), -X (manages up to 4 additional readers) & -X2 (manages up to 8 additional readers) **Manages its own network of other readers. Visual workflow creation and multiple reader management.**
ALR-F800	**Fifth Generation** Enterprise 4-port Fixed	Linux	4 in / 8 out (optically isolated / open collector)	ARP (Alien Reader Protocol) / LLRP	Robust enterprise level applications such as warehouse, retail, trucks, supply chain management, etc. **Industry's best Power over Ethernet (PoE) transmit power and performance.**
ALR-9680	Commercial 4-Port Fixed	Linux	2 in / 2 out (TTL)	ARP (Alien Reader Protocol)	Power-over-Ethernet reader for warehouse, retail, and supply chain management.
ALR-9650	Commercial Smart-Antenna (integrated antenna)	Linux	2 in / 2 out (TTL)	ARP (Alien Reader Protocol)	Power-over-Ethernet reader with built in antenna for applications that are space sensitive.

Alien Nexus

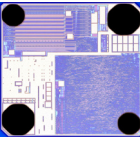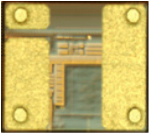|	Class	Application
ALX-2525	Multiplexor (MUX)	With plug-and-play capability with any Alien F800-series fixed reader, add up to 8 antennas per antenna port (32 antennas maximum) when connected to ALX-2530 to cover large read zones, smart shelving and any other applications requiring expanded read point accuracy, at a fraction of the cost of traditional H/W deployments
ALX-2530	Controller	Plug-and-play MUX controller for F800-series featuring flexible power options (USB, GPIO or external DC power) and ability to connect & control 2 output & 4 input GPIO peripherals along with the connected multiplexors

Alien Mobile Readers

	Class	Operating System	CPU/Mem	Antenna	Application
ALR-H460 (US Only)	Entperprise Handheld RFID reader	Android 6.0	Quad-Core 1.45GHz 2GB RAM 16GB Flash	4dBic	Enables users to deploy manageable, robust, best-in-class RFID solutions for supply chain, manufacturing, and asset management applications.

Alien Reader Antenna Selection

	Frequency	Gain	IP Rating	Size	Cable/Connector
ALR-8697	865 - 928 MHz	8.5dBic	IP67	10.16″ x 10.16″ x 1.42″	Inset RTNC female connector
ALR-8698		Nominally 10.5dBic 11dBic FCC / 10dBic ETSI			

Higgs™ RFID Integrated Circuit (IC) Family (* sensitivity when measured on 2.15 dBi gain dipole antenna and 50 Ohm source impedance)

	EPC Memory	User Memory	UTID	Read Sensitivty*	Write Sensitivity*	Serialization	Applications
Higgs 3	96-480 bits	Up to 512 bits	64 bits	-18.0 dBm	-13.5 dBm	Yes - Chip & Non-chip serialization	General purpose, aerospace, apparel, Automatic Vehicle Identification (AVI), automotive, baggage, books, cases, documents, ID cards, item level tracking, labels, loyalty cards, pharmaceutical, palettes, retail, etc.
Higgs 4	128 bits	128 bits	64 bits	-19 dBm	-16 dBm		
Higgs-EC	128 bits	128 bits	48 bits	-20.0 dBm	-17 dBm		
Higgs-9	96-496 bits	Up to 688 bits	48 bits	-20.0 dBm	-18 dBm		
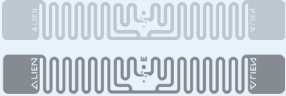
Alien Inlay Family Selection Matrix

	Squiggle Family						Specialized Retail						High-Dielectric / Automotive / Aviation			Form-factor					
	Squiggle® (SQ)	Short (SH)	Squiglette (ST)	Squig (SG)	Doc Tag (DT)	Gecko (GE)	Pearl (PE)	Glint (GL)	HScan (HS)	GT-Tag (GT)	GT-W Tag (GT-W)	Spider-360 (SP)	Aviator (AV)	Wonder-Dog (WD)	Tread (TR)	G-Tag (G)	Bio-Tag	SlimLine (SL)	2x2	Square (1x1)	SIT (SIT)
Higgs™9 Model #	ALN-9940	ALN-9962	ALN-9930	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ALN-9954	N/A	N/A	N/A	N/A	N/A
Higgs™EC Model #	ALN-9840	ALN-9862	ALN-9830	N/A	ALN-9841	ALN-9825	N/A	ALN-9815	ALN-9820	ALN-9828	ALN-9828-W	N/A	ALN-9850	N/A	ALN-9874	N/A	N/A	N/A	N/A	N/A	N/A
Higgs™4 Model #	ALN-9740	ALN-9762	ALN-9730 ALN-9730-E	ALN-9710	ALN-9741	N/A	ALN-9716	ALN-9715	ALN-9720	ALN-9728	N/A	ALN-9726	N/A	ALN-9768	N/A	N/A	ALN-9714	ALN-9745	N/A	N/A	ALN-9713
Higgs™3 Model #	ALN-9640	ALN-9662	ALN-9630	ALN-9610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ALN-9654	N/A	N/A	ALN-9634	ALN-9629	N/A

Inlays: Squiggle Family

Product	Higgs-3	Higgs-4	Higgs-EC	Higgs-9	Antenna Size[1]	Application
Squiggle™ (SQ)	ALN-9640	ALN-9740	ALN-9840	ALN-9940	3.732″ x 0.319″ 94.8mm x 8.1mm	Item/asset tracking including: pallet placards, cases, baggage, denim, poly bags, electronics, apparel tags and boxed items.
Squiglette (ST) and Squiglette-E (STE)	ALN-9630	ALN-9730 ALN-9730-E[2]	ALN-9830	ALN-9930	2.756″ x 0.374″ 70mm x 9.5mm	
Short (SH)	ALN-9662	ALN-9762	ALN-9862	ALN-9962	2.756″ x 0.669″ 70mm x 17mm	
Squig (SG)	ALN-9610	ALN-9710	N/A	N/A	1.752″ x 0.409″ 44.5mm x 10.4mm	
Doc Tag (DOC)	N/A	ALN-9741	ALN-9841	N/A	3.74″ x 0.32″ 95mm x 8.15mm	Paper/cardboard tagging, documents, file folders (e.g. medical, dental, legal etc), envelopes and booklets

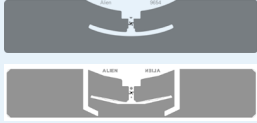| Product	Features	Benefits
Squiggle (SQ) Squiglette (ST) and Squiglette-E (STE) Short (SH) Squig (SG)	Squiggle is one of the most widely used general purpose tags. Family extends the Squiggle features into different form-factors. One of the best performing general purpose tag family on the market. Designed to work well in challenging environments.	Well proven design for a broad range of worldwide applications. **All Alien tags are world-tags and work well in all regions.** Tags denoted with an "E" on the model number (and name) are *specially* tuned for optimal performance in Europe (but are still world tags). A very robust general purpose tag (for ultimate robustness in high dielectric environments - see Aliens "G" or "BAT" tags).
Doc Tag (DOC)	Dielectrically matched to papers, cardboards and similar printed stock. Extremely tolerant to close placement of multiple tags.	Allows tags to be placed on documents or files where these documents will be tightly packed together with many tags in close proximity to each other. These tags have minimal chance of shadowing (hiding each other) from the reader.

[1] Sizes are approximate. **Dimensions are inlay ANTENNA sizes**. Tags and labels will be larger. Please refer to specific product details available on Alien's website for exact measurements - www.alientechnology.com

[2] All Alien tags are world-tags and work well in all regions. However, tags denoted "E" are specially tuned for optimal performance in Europe.

Inlays: High Dielectric Family / Automotive (Tires, Windshields) / Aviation

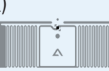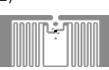| Product	Higgs-3	Higgs-4	Higgs-EC	Higgs-9	Antenna Size[1]	Application
G Tag (G) H3 (top) & H9 (bottom)	ALN-9654	N/A	N/A	ALN-9954	3.66" x 0.748" 93mm x 19mm	High density plastic totes, windshields, batteries etc.
Aviator (AV)	N/A	N/A	ALN-9850	N/A	2.99" x 1.49" 76mm x 38mm	Auburn Category U certified for Aviation baggage labels, Aviation assets and general inventory & logistics
Tread (TR)	N/A	N/A	ALN-9874	N/A	3.15" x 1.57" 80mm x 40mm	Optimized for retail automotive tire labels, general automotive assets, materials normally a challenge for RF
Wonder Dog™ (WD)	N/A	ALN-9768	N/A	N/A	3.30" x 0.91" 86mm x 23mm	General purpose, automotive metalized windshields/ head lamp and consumer electronic devices.
Bio Tag (BIO)	N/A	ALN-9714	N/A	N/A	0.67" x 0.59" 17mm x 15mm	Pharmaceuticals, healthcare, vials/ ampoules, small glass objects and small liquid filled objects.

Product	Features	Benefits
G Tag (G)	Exceptional performance for high dielectric mounting.	Ideal for windscreen/safety glass, standard glass, plastics, wood or other materials normally a challenge for RF.
Aviator (AV)	Designed for Aviation baggage labels, assets, and general inventory	Certified by Auburn University for Category U, Aviator is ideal for baggage label use for bag tracking and also for other Aviation focused asset & logistics applications.
Tread (TR)	Optimized for automotive tire retail labeling and other difficult to read material normally challenging for RF.	Robust reliability when reading multiple and densely stacked automotive tires and similar dielectric material assets.
Wonder Dog™ (WD)	Both a good general purpose tag but also excellent near metal or fluids. Excellent with lower power readers (e.g. handheld).	Excellent general purpose high-performance tag ideal for challenging dielectric materials while still providing excellent performance with handheld and lower power readers.
Bio Tag (BIO)	Small form factor, non-near field read tag and tuned for placement on glass containing water or oil based fluids.	Offers read/write distances compatible with usage in pharmaceutical production facilities and handheld reader usage for logistics and supply chain. Designed to provide 30 cm / 12" or greater read distance even when applied to vials containing water based fluids.

[1] Sizes are approximate. **Dimensions are inlay ANTENNA sizes**. Tags and labels will be larger. Please refer to specific product details available on Alien's website for exact measurements - www.alientechnology.com

Inlays: Specialized Retail

Product	Higgs-3	Higgs-4	Higgs-EC	Antenna Size[1]	Application
Spider-360 (SP)	N/A	ALN-9726	N/A	1.97″ x 1.18″ 50mm x 30mm **aka "30 x 50"**	Retail, apparel, hang-tags, joker tags, airline baggage, labels and document tracking.
Garment Tag (GT)	N/A	ALN-9728	ALN-9828		Retail, apparel, hang-tags, joker tags, labels and document tracking.
Garment Tag (GT-W)	N/A	N/A	ALN-9828-W		Auburn W1, W2, W3, W5, A, B, C, D, G, M, N Q Retail certified for all 30x50 applications
HiScan™ (HS)	N/A	ALN-9720	N/A	1.57″ x 0.61″ 40mm x 15.5mm	Specialized tag designed for the most challenging retail and apparel
Glint™ (GL)	N/A	ALN-9715	N/A	1.06″ x 0.38″ 27mm x 9.7mm	Jewelry, cosmetics and other smaller form factor items.
Pearl™ (PE)	N/A	ALN-9716	N/A	0.87″ x 0.49″ 22mm x 12.5mm	
Gecko™ (GE)	N/A	N/A	ALN-9825	1.14″x 0.59″ 29mm x 15mm	Retail, apparel, compact form factor assets, dense readabiltiy.

Product	Features	Benefits
Spider-360 (SP)	An orientation agnostic 30x50mm form-factor tag. Useful when end-on reads are required.	Designed for 360 degree readability for dynamically changing tag orientation. Ideal for (but not limited to) retail, apparel, airline baggage, etc.
Garment Tag (GT)	30x50mm form-factor and tuned for use in retail with packed shelves or hanging garments.	High performance readability (distance / rates) for real-world retail application environments. Optimized for stacked and hanging goods.
Garment Tag (GT-W)	30x50 form-factor tuned for emerging high-volume Retail Auburn certified categories	Adds Auburn W1, W2, W3, W5, A, B, C, D, G, M, N, Q compliance categories
HiScan™ (HS)	Tuned for high-performance reading in lower-power reading environments.	Robust readability in real-world retail application environments including (but not limited to): rapid handheld movement, tags closely spaced together, low transmit power readers etc.
Glint™ (GL)	Very small non-near-field tag designed for close placement to metals or metallic surfaces.	Compact tag design for jewelry and other smaller format assets. Utilizes close proximity of metallic objects to increase read range. Offers read/write distances in feet/meters versus inches/centimeters.
Pearl™ (PE)		
Gecko™ (GE)		For smaller format assets requiring readability in dense tagged asset populations.

[1] Sizes are approximate. **Dimensions are inlay ANTENNA sizes**. Tags and labels will be larger. Please refer to specific product details available on Alien's website for exact measurements - www.alientechnology.com

Inlays: Form-factor/Orientation Family

Product	Higgs-3	Higgs-4	Higgs-EC	Higgs-9	Antenna Size[1]	Application
2x2	ALN-9634	N/A	N/A	N/A	1.73″ x 1.81″ 44mm x 46mm	Large items, baggage tagging, apparel and pharmaceutical bottles.
Square (1x1)	ALN-9629	N/A	N/A	N/A	0.89″ x 0.89″ 22.5mm x 22.5mm	Item level tagging, apparel, pharmaceutical bottles and other high value consumables.
SIT (SIT)	N/A	ALN-9713	N/A	N/A	0.472″ x 0.354″ 12mm x 9mm	Jewelry, pharma, bottles, liquids, foods, DVD's, access control, loyalty cards, and other anti-counterfeiting
Slimline™ (SL)	N/A	ALN-9745	N/A	N/A	3.701″ x 0.228″** 94mm x 5.8mm** **3.701″ x 0.12″ / 94mm x 3.05mm without inlay chip targets (not electrically significant - used for chip mounting only).	Book spines, door edges, cigarette boxes, small package labels, narrow form factor assets.

Product	Features	Benefits
2x2	Highest performance in a 2″ form factor.	A square form-factor for tracking of larger items. Multiple-frequency sensitivity optimized for high performance in all world regions.
Square (1x1)	High performance when a longer tag form factor is inappropriate.	The Square provides performance close to the 2x2 in a smaller form-factor.
SIT (SIT)	Ultra Compact. Near field access only. Can be used adjacent to metallic objects.	Fits very small objects normally challenging for RFID. Close proximity read zone for added security. Extended read range enabled through appropriate placement to conductive surfaces.
Slimline™ (SL)	Ultra slim form-factor at 5.8mm or 3.05mm thin (3.05mm without inlay targets).	Extreme narrow form-factor enabling use where RFID is normally not possible. Comparable Squiggle/Squigglette level performance in an ultra narrow form-factor.

[1] Sizes are approximate. **Dimensions are inlay ANTENNA sizes.** Tags and labels will be larger. Please refer to specific product details available on Alien's website for exact measurements - www.alientechnology.com

29-June-2020

UMD Value Add:

Design & Manufacture
- IoT devices and interfaces
- Cables
- Modify products
- Mechanical design and assembly

Source
- Data capture and ICT products and from our agencies
- Systems Integration

Professional Services
- Engineering
- Software
- Deployment
- Support

Full Stack Solution Provider
- Data Carriers (barcode, RFID, sensors)
- Edge devices and gateways
- Own and manage PCI-DSS compliant Data Center
- Middleware and Cloud Application Broker
- Software: cloud, mobile and embedded applications
- Design, deploy and managed services

UMD RFID Services:

RFID Site Surveys

RFID Tag Selection, Printing, Programming and Testing

Design and Construction of RFID Systems and Portals

Cloud and Edge Software

Proof of Value Trials

RFID Mobile Devices. Mobile Device Management

UMD RFID Benefits For Real-Time Tracking And Productivity:

- Seamless end to end data acquisition
- Streamline inventory management
- Centralised cloud services. Distributed stock inventory and audit functionality
- Ability to track, trace and locate product
- Continuous visibility via frequent RFID stocktakes
- Stocktake accuracy and reduced human error

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