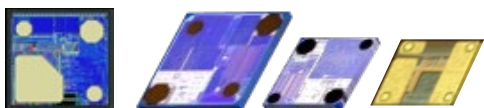


RFID...By Alien Technology^(R) IC, Inlay & Hardware Catalog

Providing EPCglobal Gen2 and ISO/IEC 18000-6c compliant UHF passive RFID transceiver chips, inlays & tags, fixed & mobile readers and a full range of related professional services.

World-class Read, Write & memory retention

- HiggsTMEC SentinelTM bit error correction
- Optimized memory system for mass markets
- *BlastWriteTM* and *QuickWriteTM* for mass-encoding
- Pre-encoded chip-level serialization



RFID ICs

High performance, ease of use, robust feature set

- Featuring on-reader data processing
- Streamlines peripheral enrollment on networks
- Alien Reader Protocol (& LLRP on ALR-F800 / F800-X)



READERS

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 AcademyTM : Standard / Custom / On-Site
- US : RFID Solutions Center – Conveyers, retail etc.
- EMEA & Worldwide
- Feasibility analysis, system design & testing
- Best Practices

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.







Services

Alien provides a full suite of professional services including the worldwide recognized Alien Academy (RFID hands-on training), custom on-site training, site surveys, feasibility analysis, installation & implementation.


- Please visit www.AlienTechnology.com/Services/Academy-Registration for all current EMEA and US Academy dates, pricing and registration.



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	Robust enterprise level applications such as warehouse, retail, trucks, supply chain management, etc. 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 Mobile Readers

	Class	Operating System	CPU/Mem	Antenna	Application
ALR-H450 	Connected Handheld	Android 4.4 (Kit Kat)	Quad-Core 1.3GHz 1GB RAM 4GB Flash	4dBic	Enables users to deploy manageable, robust, best-in-class RFID solutions for supply chain, manufacturing, and asset management applications.



Alien Mobile Readers (continued)...

	Class	Operating System	CPU/Mem	Antenna	Application
 <p>ALR-S350</p>	RFID Sled with All Day Battery Life for use with the Latest Smart Devices	None (Works with with Apple™ iOS® and Google™ Android®)	Uses the Smart Device CPU and Memory	Linear, circular or in proximity modes	Combines robust features of traditional “connected” handheld allowing user connect iOS or Android based smart device.

Alien Reader Antenna

	Frequency	Gain	IP Rating	Size	Cable/Connector
 <p>ALR-A1001 (Thin Form factor)</p>	865-867MHz 902-928MHz	8.5dBic	IP67	9.84" x 9.84" x 0.55"	Inset SMA male connector
 <p>ALR-A0501</p>	865-868MHz 902-928MHz	6dBic	IP67	5.04" x 5.04" x 0.79"	Inset SMA male connector
 <p>ALR-8697</p>	865 - 928 MHz	8.5dBic	IP67	10.16" x 10.16" x 1.42"	Inset RTNC male connector
 <p>ALR-8698</p>		Nominally 10.5dBic 11dBic FCC / 10dBic ETSI			












Higgs™ IC Family

	EPC Memory	User Memory	UTID	Sensitivity	Serialization	Applications
Higgs 3 	96-480 bits	Up to 512 bits	64 bits	Very good (-20dBm)	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	Excellent (-20.5dBm)		
Higgs-EC 	128 bits	128 bits	48 bits	Best-In-Class (-21.5dBm)		
Higgs-9  new	96-496 bits	Up to 688 bits	48 bits	Best-In-Class (-21.5dBm)		



Alien Family of EPC Gen 2 RFID Inlays

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	N/A	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	
Express (EX) 	N/A	N/A	ALN-9835	N/A	2.576" x 0.500" 70mm x 12.7mm	
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	

Product	Features	Benefits
Squiggle (SQ)	Squiggle is one of the most widely used general purpose tags.	Well proven design for a broad range of worldwide applications.
Squiglette (ST) and Squiglette-E (STE)	Family extends the Squiggle features into different form-factors.	All Alien tags are world-tags and work well in all regions. Tags denoted with an "E" on the model number (and name) are <i>specialty</i> tuned for optimal performance in Europe (but are still world tags).
Short (SH)		
Squig (SG)	One of the best performing general purpose tag family on the market.	A very robust general purpose tag (for ultimate robustness in high dielectric environments - see Aliens "G" or "BAT" tags).
Express (EX)	Designed to work well in challenging environments.	
Doc Tag (DOC)	Dielectrically matched to papers, cardboards and similar printed stock. Extremely tolerant to close placement of multiple tags.	







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.



Alien Family of EPC Gen 2 RFID Inlays

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

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.
BAT (BAT) 	N/A	ALN-9770	N/A	N/A	3.25" x 1.25" 82.5mm x 32mm	Automotive batteries, fluid filled objects, plastic containers and metal filled objects.
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.



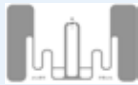





Product	Features	Benefits
G Tag (G)	Exceptional performance for high dielectric mounting.	Ideal for windscreen/safety glass, standard glass, plastics, wood or other materials normally a challenge for RF.
BAT (BAT)	Highly tuned for read rates and distances when amongst metal/water based objects contained in plastics, glass etc.	Optimized for use with thin high-dielectric materials, particularly when materials contain metallic material and/or water based fluids.
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 handhelds 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.

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Alien Family of EPC Gen 2 RFID Inlays

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-L)  	N/A	N/A	ALN-9827		Best performing all-retail Auburn™ category retail, apparel, hang-tag, label inlay for dense readability
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 applications and in handheld environments.
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 readability.

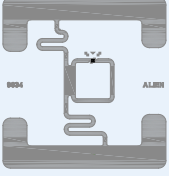



Product	Features	Benefits
Spider-360 (SP)	An orientation agnostic 30x50mm form-factor tag. Useful when end-on reads are required.	Designed for 360 degree readability for dynamically changing tag orientation. Ideal for (but not limited to) retail, apparel, airline baggage, etc.
Garment Tag (GT)	30x50mm 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-L)	30x50 form-factor with additional performance enhancement for dense packed, shelves and hanging garments	Adds Auburn I&K compliance for an ever more robust reliability for today & tomorrow's fast moving retail application environments.
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)		

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Alien Family of EPC Gen 2 RFID Inlays

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) 	ALN-9613	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.

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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, 6623579, 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
866-RFID NOW
www.alientechnology.com