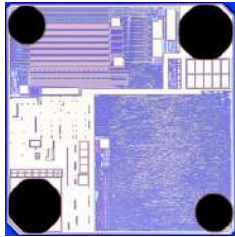




Higgs-4 is a highly integrated single chip EPC global Class 1 Gen 2 UHF RFID Tag IC that further enhances Higgs-family performance while being optimized for the highest volume applications to aid the mass-market adoption of RFID technology.



### Applications

- Retail Item Level Tagging
- Supply Chain Management
- Vehicle Tracking
- Product Authentication
- Asset Inventory and Tracking
- Baggage Handling and Tracking

FEATURE	DESCRIPTION	BENEFIT
Further Increases Alien's Industry Leading Read Sensitivity	Industry leading tag performance especially in challenging RF environments.	Saves money: Reduces the number of read points and/or minimizes tag size.
Read Sensitivity	Up to -19 dBm*	Increased write performance, writing multiple words in a single command and writing to multiple-tags simultaneously, massively decreases the cost and time associated with programming millions of tags. Proven at 3,600 tags/minute (measured performance).
Write Sensitivity	Up to -16 dBm*	
<i>QuickWrite</i> ™	The ability to write a complete bank of memory with one command.	
<i>BlastWrite</i> ™	An IC mass-encoding capability. Takes a single write-cycle to encode multiple tags.	

\*on a 2.15 dBi gain dipole antenna

### Features:

- › Designed to meet EPCglobal Gen2 (V 1.2.0) and ISO/IEC 18000-6C
- › Worldwide operation in the RFID UHF bands (840-960 MHz)
- › 448-Bits of NVM/RAM Memory
  - Up to 128-EPC Bits (nominally 96 bits)
  - 128 User Bits
  - 64 Bit Unique TID
  - 32 Bit Access and 32 bit Kill Passwords
- › Pre-Programmed with a unique, unalterable 64-bit serial number
- › User Memory can be Block Perma-Locked as well as read password protected in 32 Bit Blocks
- › Low power operation for both read and program
- › QuickWrite™ / BlastWrite™- High speed chip & mass programming
- › Dynamic Authentication™ - anti-cloning/anti-counterfeit technology
- › Exceptional operating range, up to 11m with appropriate antenna.

### Product Overview:

Higgs-4 operates at extremely low power levels yet still provides sufficient backscatter signal to read tags at extended range. It can also be programmed at low RF power and at high speed using Alien's *QuickWrite*™ single instruction bank-write capability. *BlastWrite*™ can also be used to program multiple tags simultaneously for mass-encoding in high-volume retail applications. Higgs-4 also fully supports the latest industry standard serialization schemes.

Higgs-4 offers a mass-market optimized but flexible memory architecture that provides for the optimum allocation of EPC and User memory for different use cases such as legacy part numbering systems and service history. User memory can also be read and or write locked on 32-bit boundaries, supporting a variety of public/private usage models.

Higgs-4 contains a number of unique advanced features. Dynamic Authentication™ provides a unique non-reproducible fingerprint that can be used for anti-cloning and anti-counterfeiting.

The IC also features factory programmed 64-bit serial number that cannot be altered. In conjunction with the EPC code, this provides a unique identification for the tagged item.

**Operating Conditions & Electrical Characteristics**

Symbol	Parameter	Conditions / Capability	Min	Typ	Max	Units
<b>Operating Conditions</b>						
$T_A$	Operating Temperature		-50		+85	°C
$f_{in}$	Operating Frequency		840		960	MHz
<b>Electrical Characteristics</b>						
$S_R$	Sensitivity during Read	Bare die measurement, 50 Ohm impedance, Calibrated Voyantic™ measurement system		-16.8		dBm
$S_W$	Sensitivity during Write			-13.8		dBm
$I_S$	Interference Signal Suppression			-4		dB
$R_p$	Equivalent input parallel resistance	At -20.5 dBm input power		1800		Ohms
$C_p$	Equivalent input parallel Capacitance	At -20.5 dBm input power		0.95		pF
$D_{ret}$	Data Retention			50		Years
$P_{cycl}$	Programming Cycles at 25°C			100,000		Cycles

**Memory Map**

Bank	Address	Description	Memory	Bits
User	00h – 7Fh	User	NVM	128
TID	60h – BFh	Device Configuration	ROM-NVM	96
	20h – 5Fh	Unique Tag ID Unalterable	NVM	64
	00h – 1Fh	TID EPC/TMD/TMDID/TMN	ROM	32
EPC	20h – 9Fh	EPC #	NVM	128
	10h – 1Fh	EPC-PC	NVM	16
	00h – 0Fh	EPC-CRC	RAM	16
Reserved	20h – 3Fh	RES-Access Pwd, EPC optional	NVM	32
	00h – 1Fh	RES-Kill Pwd	NVM	32

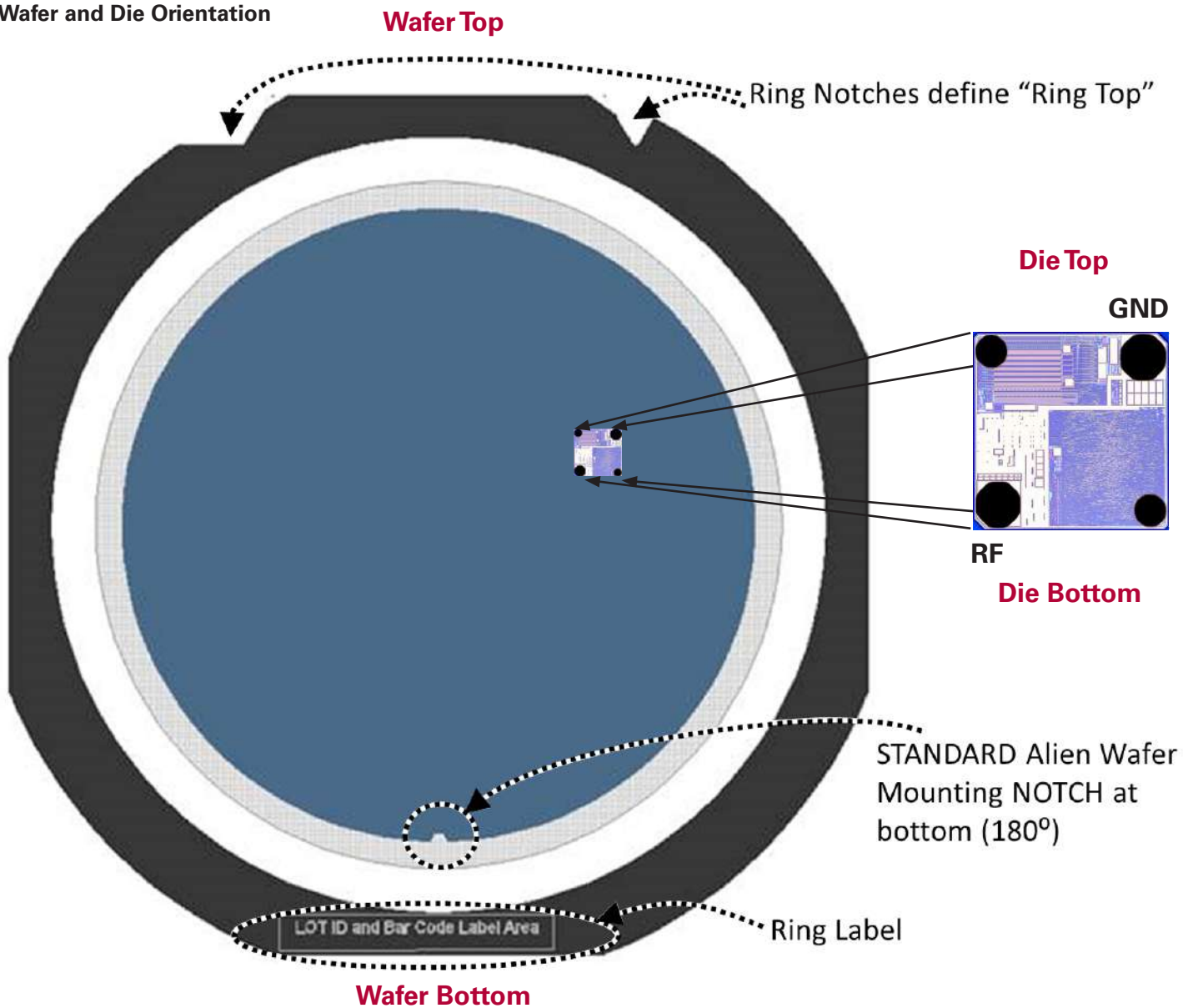
**Ordering Information**

Part	Model Number	Description
Higgs™ 4 IC	ALC-370-IC	Bumped, Tested, Ground & Sawn IC's. Provided on 8 Inch Wafer, UV Tape Mounted (SEMI/JIS Standard Metal Film Frame)
	ALC-370-SOT	SMD Package: SOT-323





Wafer and Die Orientation



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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, 7671720, 7659822, 7619531, 7615479, 7598867, 7580378, 7576656, 7562083, 7561221, 7559486, 7559131, 7554451, 7551141, 7542301, 7522055, 7500610, 7489248, 7453705, 7452748, 7425467, 7417306, 7411503, 7385284, 7377445, 7364084, 7353598, 7342490, 7324061, 7321159, 7301458, 7295114, 7288432, 7265675, 7262686, 7193504, 7173528, 7172910, 7172789, 7141176, 7113250, 7101502, 7080444, 7070851, 7068224, 7046328, 6998644, 6988667, 6985361, 6980184, 6970219, 6952157, 6942155, 6933848. Other patents pending.

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