Fairchild Semiconductor's RoHS-Compliant Product Identification

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RoHS Compliant Product Identification

- Fairchild believes there are three key areas of concern relating to the identification RoHS compliant products:
  - Ability to differentiate RoHS compliant products when placing an order.
  - Easy identification of products as received.
  - Identification of “orphaned” products no longer associated with Fairchild’s original packing materials.
- Fairchild has taken effective steps to control all of these areas.

RoHS Compliant Product Identification – Product Ordering

There are two methods for ordering RoHS compliant products.

- For those customers who prefer to avoid the administrative issues associated with part number changes, Fairchild's entire portfolio of products can be ordered as RoHS compliant by simply using the standard part number.

- For those customers who require a unique part number, special order codes (_NL suffix added to the standard part numbers) have been established.
  - _NL products are listed in the product folder on the Fairchild Semiconductor web site.
    - Some low volume products may not have an _NL part number shown, but one can be created if customer demand exists.

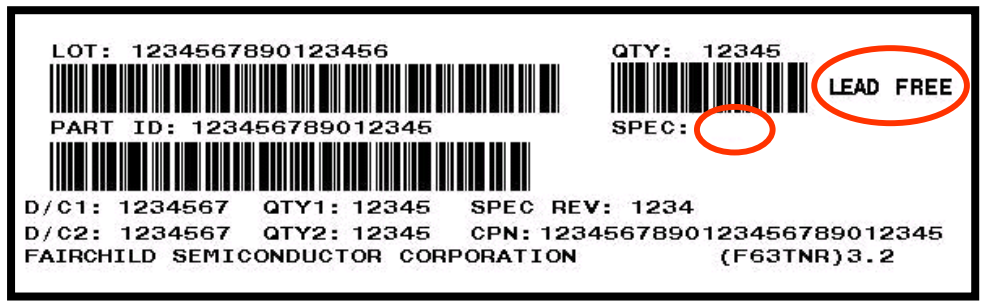
RoHS Compliant Product Identification – Product Ordering (Continued)

- Tin-lead devices, if available, can only be ordered by using a new part number (_Q suffix added to the standard part number).
  - _Q products are defined, processed and inventoried as separate Fairchild part numbers.
  - Any existing tin-lead inventory within Fairchild controlled locations has been converted to _Q products to prevent the possibility of mixing.
  - Fairchild will provide tin-lead products when manufacturing capability exists. Non-standard processes used to support these products may impact price and lead time.
  - Fairchild does not display special order products on its website. Customers requiring tin-lead products should check with their local Sales representative to determine availability.

RoHS Compliant Product Identification – Existing Product Labeling

- All Fairchild products currently have the words “LEAD FREE” printed on the labels used on inner boxes, reels, bags, etc.
- “LEAD FREE” indicates that all external package terminations are lead-free. Some packages may still contain lead internally, which is allowed for in approved exemptions to RoHS.

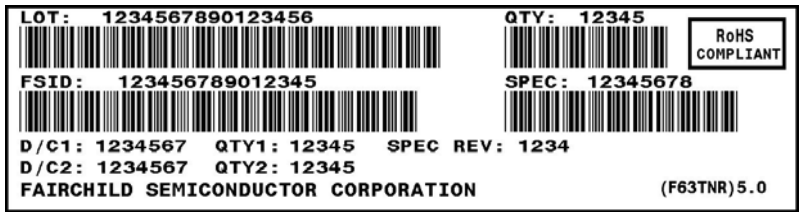
Label For Lead-Free Standard Part



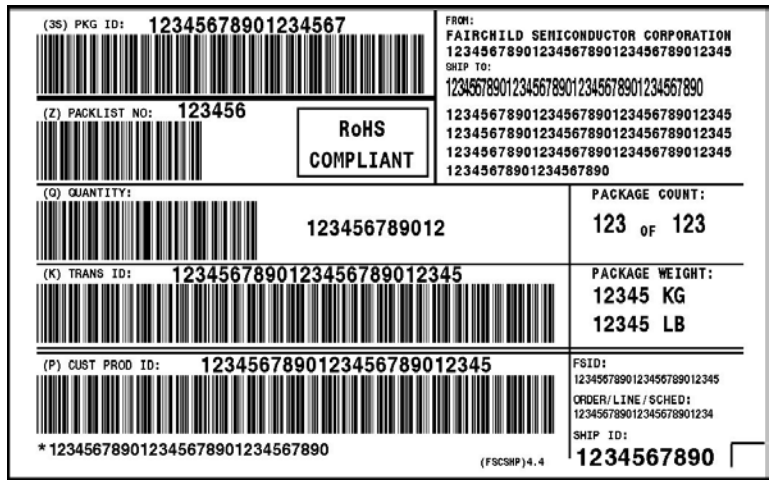
Label For Lead-Free _NL Part

RoHS Compliant Product Identification – Future Product Labeling

- Fairchild will replace “LEAD FREE” with a symbol indicating compliance to RoHS regulations (2002/95/EC).
  - This symbol will be used on all internal and external shipping labels for Fairchild’s RoHS-compliant products.
- Existing inventory will not be re-labeled as new labels are phased in. As such, label variations can be expected until existing inventories are consumed.



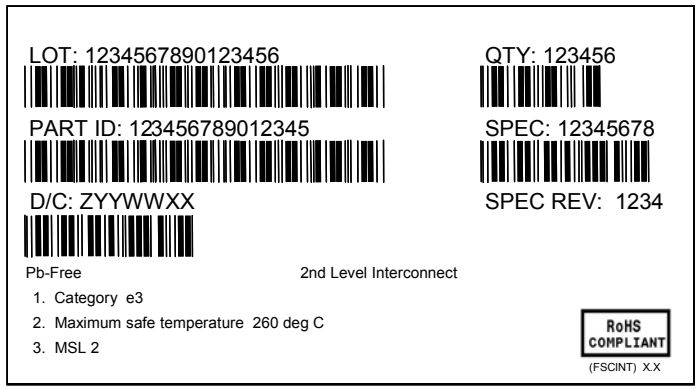
Example internal label with RoHS compliance symbol



Example external shipping label with RoHS compliance symbol

RoHS Compliant Product Identification – Future Product Labeling

- Fairchild is working to implement labeling of lead-free devices according to the requirements of JESD97.
  - Information such as moisture sensitivity level, maximum reflow temperature, plating category and lead-free category (completely lead-free or 2nd level interconnect lead-free) will be included on future labels.
  - Information may be included on existing labels or may require the use of an additional label, depending on label size.
- Existing inventory will not be re-labeled as new labels are phased in. As such, label variations can be expected until existing inventories are consumed.



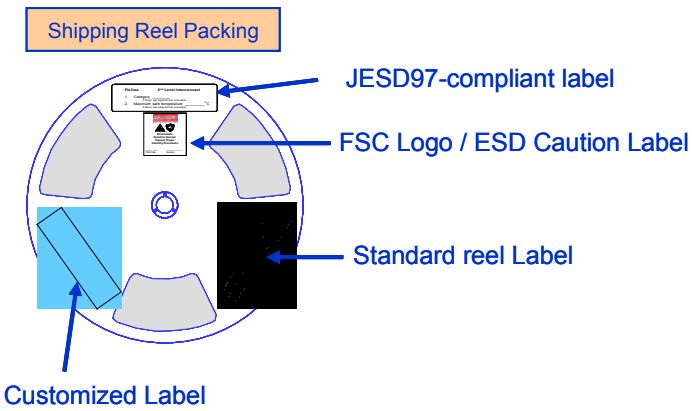
Example of JESD97-compliant box label

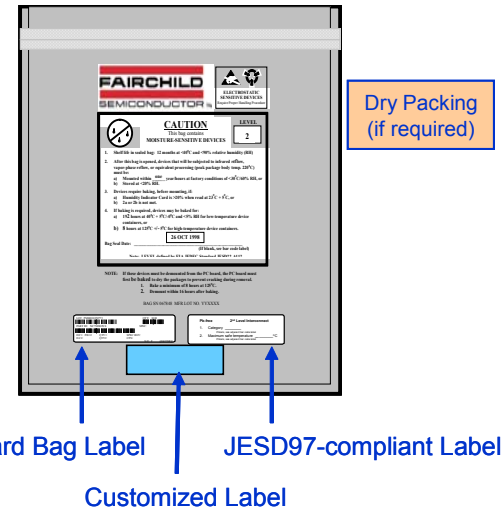
RoHS Compliant Product Identification – Future Product Labeling

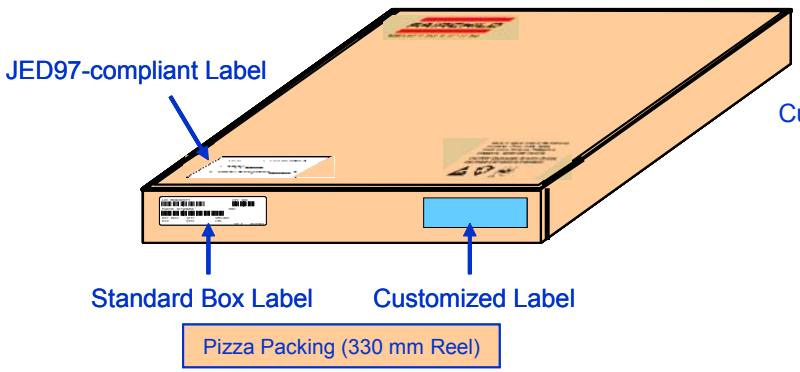
- The lead-free category is a 2-character code identifying the type of finish used on package terminations.
  - Codes currently defined by JEDEC use the format “eX” where X is a number between 1 and 7.
  - Fairchild has included an additional code series, “GX”, as suggested by others in the industry, to indicate green components (those products that are RoHS compliant AND do not use halides or antimony compounds as flame retardants).
- Fairchild currently uses matte tin (Sn), nickel-palladium-gold (NiPdAu), nickel-gold (NiAu) or tin-silver-copper (SnAgCu) as the plating for all of its products. Possible lead-free category codes include:

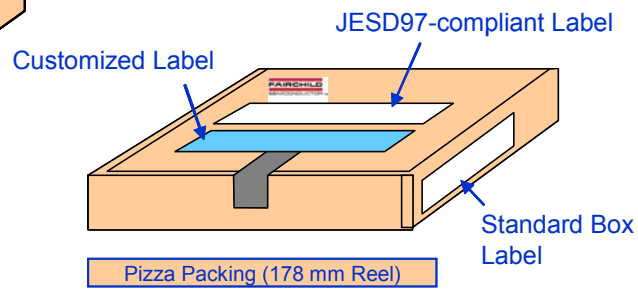
PLATING TYPE	COMPONENT CATEGORY	LEAD-FREE CODE
SnAgCu	2nd Level Interconnect	**e1**
SnAgCu	Completely Lead-free	**e1**
SnAgCu	Green component	**G1**
Sn	2nd Level Interconnect	**e3**
Sn	Completely Lead-free	**e3**
Sn	Green component	**G3**
NiPdAu, NiAu	2nd Level Interconnect	**e4**
NiPdAu, NiAu	Completely Lead-free	**e4**
NiPdAu, NiAu	Green component	**G4**

RoHS Compliant Product Identification – Future Product Labeling



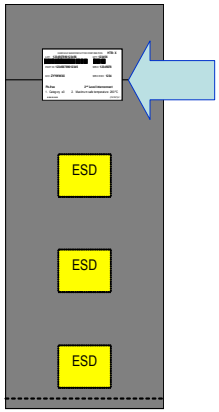






Example of label placement with additional JESD97-compliant label

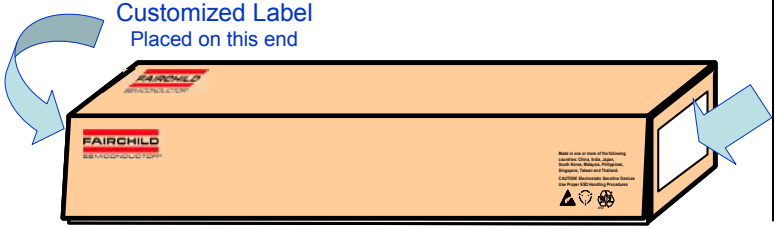
RoHS Compliant Product Identification – Future Product Labeling



FAIRCHILD SEMICONDUCTOR CORPORATION
HTB: X
LOT: 1234567890123456
QTY: 123456
PART ID: 123456789012345
SPEC: 12345678
D/C: ZYYWWXX
SPEC REV: 1234
Pb-free
2nd Level Interconnect
1. Category e3
2. Maximum safe temperature 260 deg C
3. MSL 2
RoHS COMPLIANT
FSCBAGLF

Bag Label
(for products shipped in tubes)

Customized Label
Placed on this end



FAIRCHILD SEMICONDUCTOR CORPORATION
HTB: X
LOT: 1234567890123456
QTY: 123456
PART ID: 123456789012345
SPEC: 12345678
D/C: ZYYWWXX
SPEC REV: 1234
Pb-Free
2nd Level Interconnect
1. Category e3
2. Maximum safe temperature 260 deg C
3. MSL 2
RoHS COMPLIANT
(FSCINT) X.X

Box Label

Example of label placement with expanded JESD97-compliant label

RoHS Compliant Product Identification – Device Marking

- Fairchild reviewed various marking schemes for identification of RoHS compliant products, with the goal of providing an easily visible distinction for customers.
  - JESD97 does not adequately address identification of individual products when package space is insufficient, which is the case for most of Fairchild's products.
- Fairchild's solution is to change some of the date code characters on RoHS compliant products.
  - This provides an easy and effective means of identifying RoHS compliant products.
  - There is a very small number of packages, such as DO-35 or LL-34, that do not have space for date code marking. There is no RoHS compliant marking scheme for products assembled in such packages.

RoHS Compliant Product Identification – Product Marking (Numeric Date Code)

Products with a 4-character date code format

Non Lead-Free Marking	Lead-Free Marking
P0506AB Device name Device name	P F06AB Device name Device name

Products with a 2-character date code format

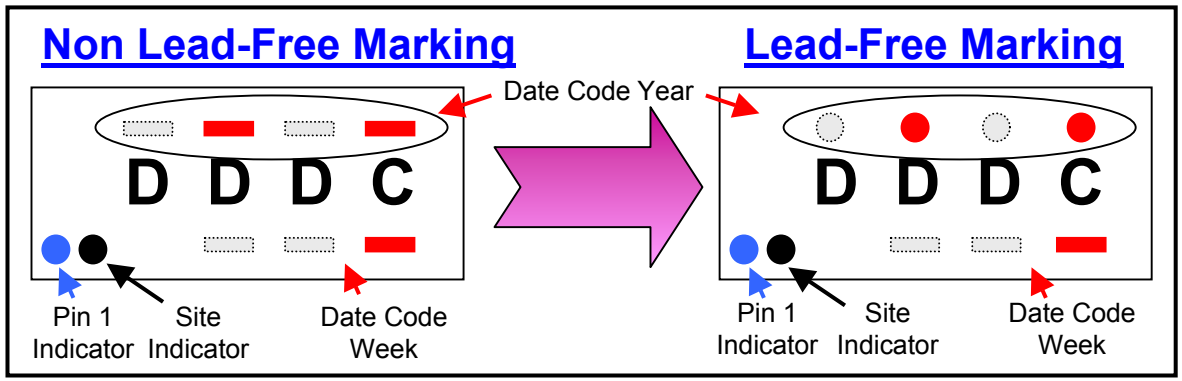
Non Lead-Free Marking	Lead-Free Marking
P52AB Device name Device name	PF2AB Device name Device name

YEAR	CHARACTER
2000	A
2001	B
2002	C
2003	D
2004	E
2005	F
2006	G
2007	H
2008	J
2009	K
2010	A

Number Representing The Year Are Changed To A Letter

RoHS Compliant Product Identification – Product Marking (Binary Date Code)

Dashes On The **Top** Line Are Changed To Dots



Date Code Year Encoding

Year	Top Line Code
2000	○ ○ ○ ○
2001	○ ○ ○ ●
2002	○ ○ ● ○
2003	○ ○ ● ●
2004	○ ● ○ ○
2005	○ ● ○ ●
2006	○ ● ● ○
2007	○ ● ● ●
2008	● ○ ○ ○
2009	● ○ ○ ●
2010	○ ○ ○ ○

Date Code Week Encoding

Bottom Line Code	Week
▭ ▭ ▭	N/A
▭ ▭ ▬	08 - 15
▭ ▬ ▭	16 - 23
▭ ▬ ▬	24 - 31
▬ ▭ ▭	32 - 39
▬ ▭ ▬	40 - 47
▬ ▬ ▭	48 - 51
▬ ▬ ▬	52 - 07

Manufacturing Site Encoding

●	Fairchild, Cebu
● ●	Fairchild, Penang
▮ ●	Philippine Subcontractor
▮ ● ●	Thailand Subcontractor
▮ ● ▬	Malaysia Subcontractor
● ● ●	Korea Subcontractor

This information is provided as an example only. Although the dot vs. dash distinction remains constant, the actual encoding scheme may vary depending on the package.

RoHS Compliant Product Identification – Summary

- Fairchild has implemented several controls for identification RoHS compliant products.
  - Customers have a choice of using either the standard Fairchild part number or a unique part number when ordering RoHS compliant products.
  - Special order codes must be used for tin-lead products.
  - Labels will identify products inside as RoHS compliant.
  - Product marking will differentiate components at the device level.
- These actions will provide an easy transition for customers and provide assurance that they can order and receive RoHS compliant products without concern.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