Lenovo Global Labeling Guide

Volume 5 – Part Labels

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Contents

1. Purpose

This engineering specification defines the requirements for data and labels applied to parts and assemblies. It also provides guidance on supplier part packaging used for manufacturing operations. The label material, adhesive, and printing requirements are specified.

This specification is not intended to address labeling of "finished goods" (any hardware system, machine unit or device offered for sale or lease by Lenovo) or labeling of finished goods packaging. This is covered in Corporate Standards C-S 1-1121-003 and C-S 1-1121-010 and the other volumes of the Global Labeling Guides.

2. Application & Scope

This engineering specification applies to parts or subassemblies procured from a supplier or manufactured by Lenovo or its subsidiaries. It is also applicable to part packaging for packages intended for manufacturing use (vs. Service use).

This engineering specification applies only when reference is made on Lenovo drawings of parts or assemblies or in other specifications. In cases of conflict between this specification and any document referring to this specification, that document shall take precedence.

This specification does not address '2D' bar codes, which are not in general use within Lenovo. Future releases may cover this subject should interest develop.

This specification may be used for subcomponent parts, but is intended primarily for parts and assemblies procured from a supplier or manufactured by Lenovo or its subsidiaries.

Note: This specification does not address National Laboratory (e.g. UL, DIN), power rating or recycling labeling which may be required on a particular part or product.

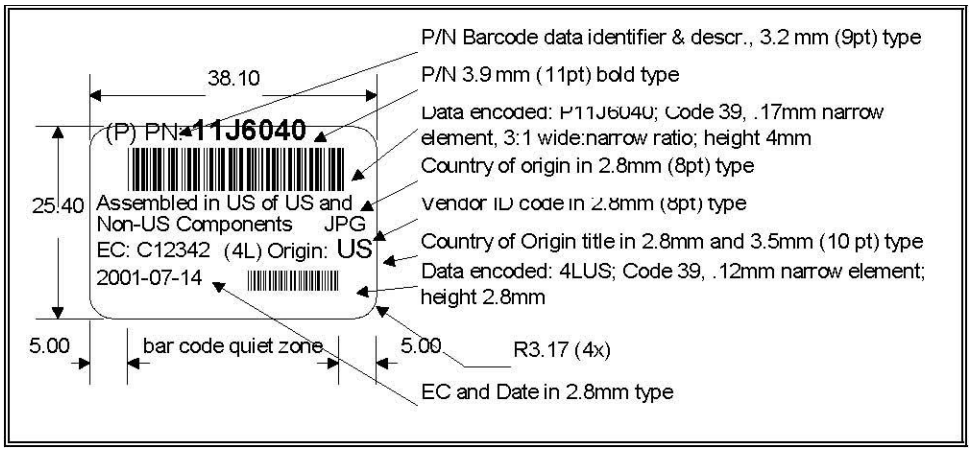
3. Format of Labels

Below are sample layouts of labels that may be used for part labeling. These labels are examples of good practice and can be used as-is. Other layouts, including splitting the information onto multiple labels, are acceptable when there are space constraints.

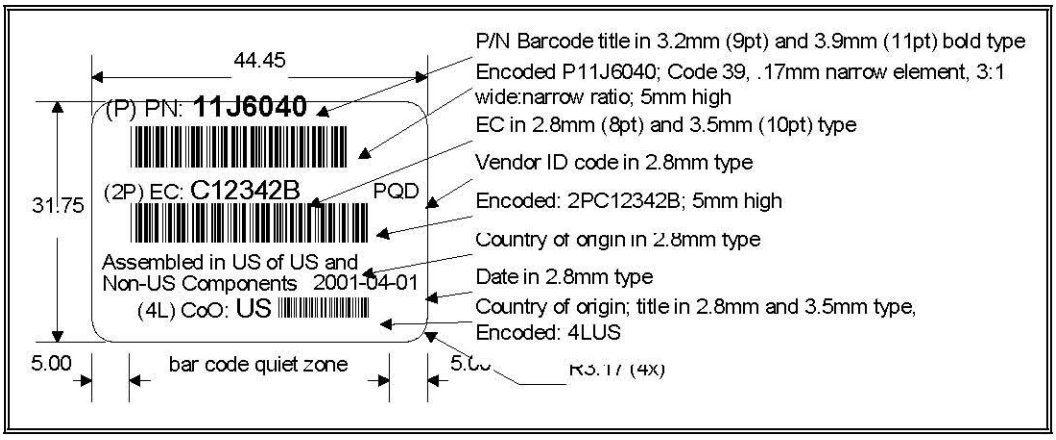
Note: References to point sizes (pt) in this specification are in PostScript standard points; there are 72 points to the inch. (The traditional size of a point is slightly smaller - 72.29 per inch.)

3.1 Non-serialized parts

Design 1: Label on 1.5 in. x 1.0 in. Stock (all dimensions in mm) This design is appropriate when a bar coded EC is not required.

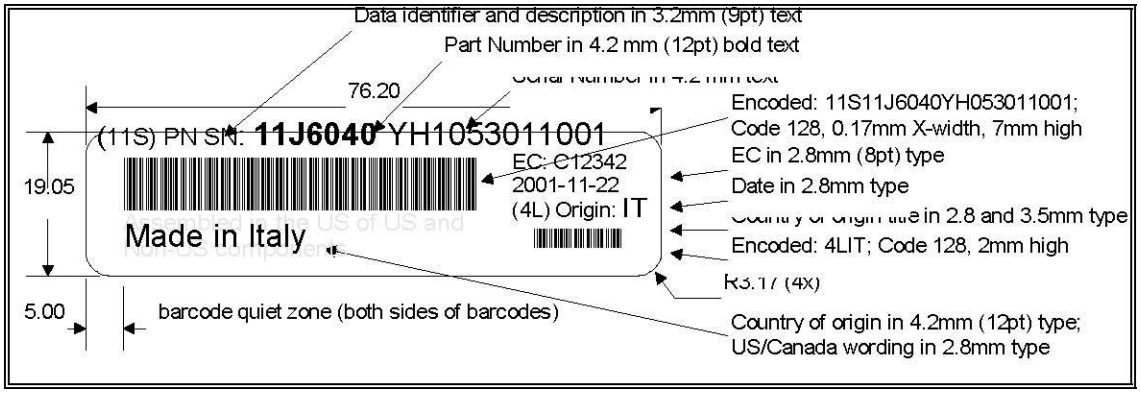


Design 4: Label on 1.75 in. x 1.25 in. stock (all dimensions in mm) This design includes a bar coded EC on slightly larger stock



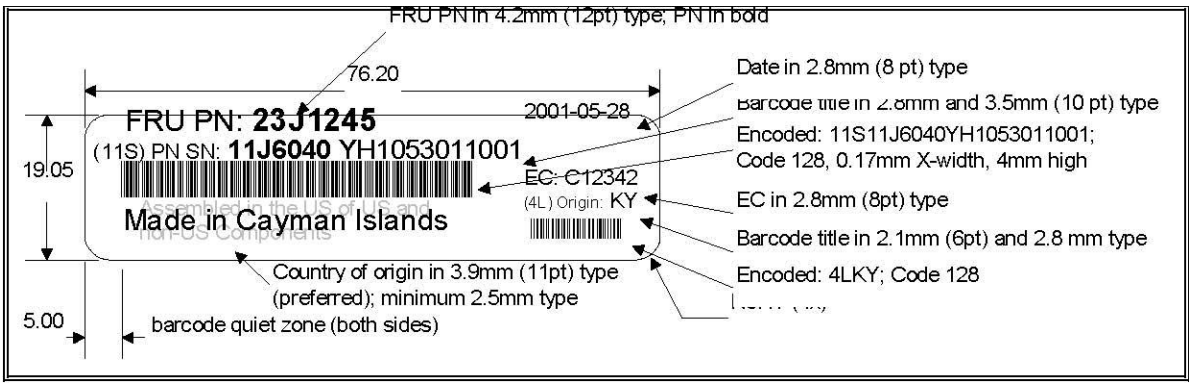
3.2 Serialized Parts

Design 2: Label on 3.0 in x 0.75 in stock
This label may be used when the manufacturing P/N and the FRU P/N are the same.



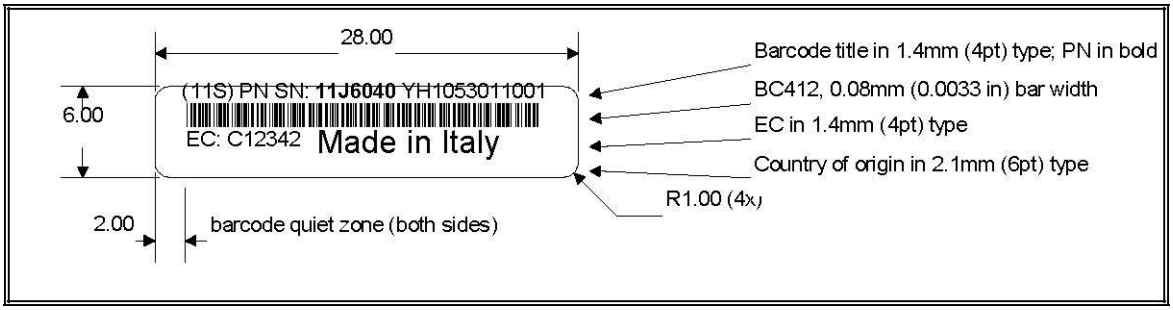
Design 3: Label on 3.0 in. x 0.75 in. stock

Label when FRU P/N is different from the manufacturing P/N on 3.0 x.0.75in. Stock. Note that the FRU P/N text is significantly larger than the bar code title containing the manufacturing P/N..



Design 5:

The smallest feasible label using BC 412 or Code 128 that includes all essential data elements (the country of origin, supplier and date of production must be derivable from the S/N using i2 Explore). Note that this label must be printed on a 300 dpi printer that is carefully aligned and well maintained using premium label stock. This label is shown twice actual size.



4.0 Content & Layout

4.1 Part Labeling Data Elements

Data Element	Text Requirement	Text Format [1]	Details in section	Bar Code Required ?	Bar Code Data Identifer (4.5.2)
Part Number (P/N)	Required	AN7	4.3.1	Yes	P or in 11S
FRU P/N	Required if different than P/N	AN7	4.3.1	No	
EC Level	Required	AN6..7	4.3.2	Optional	2P; see 4.5.2.3
Country of Origin	Required	AN12..50	4.3.3	Yes	4L; 4.5.2.4
Date of Manufacture	Required	yyyy-mm-dd	4.3.5	No	
Vendor Identification Code	Required if not in 11S bar code	AN3	4.3.6	No	
Lot Code	Optional	AN		Optional	1T; 4.5.3.2
Serial Number	Optional	AN12	4.3.4	Yes	11S; 4.5.2.7

The following data elements are mandatory on parts produced by or for Lenovo, in human-readable text.

1. Part Number (P/N) - 7 character value, e.g. 11J6040
2. EC - 6 or 7 character value, e.g. C32192 or C32192B
   (the optional letter at the right end is known as the 'suffix')
3. Country of Origin, e.g. Made in Spain.
4. Date of Manufacture, which may be encoded in a number of ways. See Date of Manufacture on page 11.
5. Vendor identification mark or code. See Vendor Identification on page 11.

When specified by Lenovo,

6. Serial Number (S/N) - a 12-character value, e.g., YH1016913012. See Serial Numbering on page 10.
7. FRU P/N, if different from the manufacturing P/N.

The following shall be bar coded:

8. P/N
9. S/N, if present, merged with the P/N in a single bar code. (see Part Number & Serial Number (11S) on page 15.)
10. Country of Origin

[1] Text formats are covered in Lenovo Global Labeling Guides Volume 1 - Overview of Global Labeling section 1.2 (see A.3 on page 23).

4.2 Part Package Labeling Data Elements

The following applies to parts packaging - bags, boxes, cartons, tubs, crates, reels, etc. - intended for the shipment and protection of the part from the point of manufacture of the part until the point of consumption of the part in a subsequent manufacturing operation.

It does not address shipping labeling or customer labeling - see Lenovo Global Labeling Guides referenced on page 23.

It does not address parts that are packed for Service stock (FRU labeling) - see Volume 6 -FRU Package Labels in Appendix A.3 on page 23. The primary differences are that Quantity and a bar coded FRU P/N are mandatory on FRU packaged parts.

4.2.1 Unit Packages

Data Element	Text Requirement	Text Format	Details in section	Bar Code Required?	Bar Code Data Identifer (4.5.2)
Part Number (P/N)	Required	AN7	4.3.1	Yes	P or in 11S
FRU P/N	Required if different than P/N	AN7	4.3.1	Yes if FRU packaged	P; see 4.5.2.1
EC Level	Required	AN6..7	4.3.2	Optional	2P; 4.5.2.3
Country of Origin	Required	AN12..50	4.3.3	Yes	4L; 4.5.2.4
Quantity	Required if FRU packaged	N1	4.3.7	No	Q; 4.5.2.5
Date of Manufacture	Required	yyyy-mm-dd	4.3.5	No	
Vendor Identification Code	Required if not in 11S bar code	AN3	4.3.6	No	
Lot Code	Optional	AN			1T; 4.5.3.2
Serial Number	Optional	AN12	4.3.4	Yes	11S; 4.5.2.7

The following data elements are mandatory on single-unit packaged parts produced by or for Lenovo.

1. P/N
2. EC
3. Country of Origin
4. Quantity (1) (required on FRU-packed parts; optional on other parts)
5. Date of Manufacture is mandatory if the part has a limited shelf life (e.g. batteries) or if space permits. It should match any date of manufacture on the part or clearly identify the difference in dating (e.g. 'Pack date yyyy-mm-dd').
6. S/N, if the part is serialized and serial tracking is required (e.g. the P/N is APC 3 or higher) by Lenovo. The P/N, Country of Origin and S/N (if present) must be bar coded.
7. Data Element Text Text Details Bar Code Bar Code Data

4.2.2 Bulk Packages and Overpacks

	Requirement	Format	In Section	Required?	Identifer (4.5.2)
Part Number (P/N)	Required	AN7	4.3.1	Yes	P or in 11S
FRU P/N	Required if different than P/N	AN7	4.3.1	packaged Yes if FRU	P; see 4.5.2.1
EC Level	Required	AN6..7	4.3.2	Optional	2P; 4.5.2.3
Country of Origin	Required	AN12..50	4.3.3	Yes	4L; 4.5.2.4
Quantity	Required	N1..5	4.3.7	No	Q; 4.5.2.5
Manufacture Date of	Required	yyyy-mm-dd	4.3.5	No	
Identification Code Vendor	Required if not in 11S bar code	AN3	4.3.6	No	
Lot Code	Optional	AN			1T; 4.5.3.2
Serial Number	Optional	AN12	4.3.4	Yes	11S; 4.5.2.7

The following data elements are required on bulk-pack packages of parts produced by or for Lenovo. These elements must also appear on overpacks of unit- or bulk- packaged parts. (See also IEC 62090, Package Labels for Electronic Components Using Bar Code and two Dimensional Symbologies).

1 P/N
2 EC
3 Country of Origin
4 Quantity in package
5 Date of Manufacture if the part has a limited shelf life The following shall be bar coded:
6 P/N
7 Quantity
8 Country of Origin
9 S/Ns if listed on the bulk pack.

This does not address parts that are packed for Service stock (FRU labeling) - see Volume 6 -FRU Package Labels in Appendix A.3 on page 23. The primary differences are that Quantity and a bar coded FRU P/N are mandatory on FRU packaged parts.

4.3 Data Element Details

4.3.1 Part Number

The Part Number (P/N) shall be represented as 7 alphanumeric characters on all labels. Leading zeros are significant and must appear. The P/N, in particular the FRU P/N, shall be at least as large as any other text on the label. It should be set in bold text if the same size as other text to highlight it.

Some parts have a FRU P/N that is different than the manufacturing P/N. When this is the case, the FRU P/N shall be clearly identified as such (e.g. preceeded by 'FRU PN:') and printed in larger/bolder type than the manufacturing P/N.

4.3.2 Engineering Change Number

The Engineering Change (EC) shall be represented as 6 or 7 characters on all labels. The 7th, rightmost character is called the 'suffix' and is only occasionally used, however label layouts should be designed to accommodate the suffix.

4.3.3 Country of Origin

All Lenovo parts may be subject to import, export, and re-import over the lifetime of the part. Lenovo requires that all items and their immediate containers (innermost packaging) be clearly marked with the full English name of the country of origin (CoO) as legibly and permanently as the nature of the article will allow. See the Information Plates and Labels Country of Origin references on page 23 for the definitive requirements on CoO marking.

Examples

Made in Mexico Assembled in the US of US and Non-US Components Recorded in New Zealand Printed in South Africa Product of Canada; Chips from Singapore

Requirements

- The CoO shall be labeled on the part unless the part is exempted from country of origin marking by the Import Compliance Office (ICO). If the part has been exempted from country of origin marking, the following note shall be stated on the engineering drawing or a referenced Engineering Specification: "This part is exempt from country of origin marking as per Corporate Standard C-S 1-1121-003."
- The text and placement of the CoO on the part shall be conspicuous (capable of being easily seen with normal handling of the article or container) and legible (can be easily read by a Customs Inspector with normal eyesight). It shall be placed near the P/N and in text at least 2 mm (6 point) high and preferably at least 4 mm (11 point) high.
- Unless the part is exempted from CoO marking, the CoO shall also be bar coded using a 4L bar code as covered in Country of Origin (4L) on page 11.
- The CoO must appear on the immediate container (innermost packaging) . In most cases, the 'immediate container' is the box in which the part is packed. The CoO wording on the immediate container must match the CoO wording on the part. The CoO should be placed near the P/N.
- The CoO should appear on the outer shipping container. The following statement is recommended: "Contains Merchandise from the Following Countries: (List of the full names of all the countries in the shipment, in English)". If there is only one Country of Origin, it may be placed in a 4L bar code as covered on page 14. See Lenovo Global Labeling Guides (Appendix A.3 Lenovo Internal Resources on page 23) for more details regarding the labeling of outer shipping containers.

4.3.4 Serial Numbering

If serialization is required, the Serial Number (S/N) shall be constructed as covered in C-S 0-2535-004 Serial Numbering of Printed Circuit Panels, Cards and Boards. This format is frequently referred to as a '11S-Y' or 'Y-alpha-1' serial number. A summary is presented here.

Typical S/N: YH101691C012

Y — First character of S/N. Indicates sub-format of S/N as shown below. Note that this character, which appears at the start of all current S/Ns, is part of the S/N and must be entered in all logistics systems as the first character of the S/N.

H1 — Identifies the location (lab) of control of the P/N and the part 'type' (new, used, internal-use-only, etc.). The letter indicates the lab, and the number indicates the type. Letter-number and number-letter pairs indicate different labs.

H1 - Location of Control: Poughkeepsie, type: New

L1 - Location of Control: Rochester, type: New

A1 - Location of Control: Austin, type: New

7S - Location of Control: Böblingen, type: Used

016 — 'Header', consisting of 3 independent subfields:
0 - EC indicator for P/N, starting at 0
1 - Supplier ID assigned for the P/N; this assignment is for this particular P/N, other P/Ns made by the same supplier may have different supplier Ids.
6 - Manufacturing revision level.

Note that parts released by Poughkeepsie (H1) and Rochester/Austin (L1 and A1) differ from other labs in their use of the manufacturing revision level field. Poughkeepsie uses this as a second character for supplier ID and Rochester uses this as the year of manufacture. In this example 16 is Microelectronics in the Mid-Hudson Valley.

91C012 — Sequence number, broken down as follows.

91C Date code. 91C is 1999/01/12 (days and months over 9 use letters). This satisfies the Date of Manufacture data element requirement. (Other date codings can be used by prior arrangement with Lenovo.)

012 Sequence of production on the date. Typically numeric, but hexadecimal and alphanumeric (less I,O,Q) can be used if production volumes may exceed 1000/day.

Lenovo shall define to the supplier the first 6 characters of the S/N to use (e.g. YH1016) for any particular P/N, EC, supplier & production run. These values will be encoded in i2 Explore by the ABCMP (Authorized Bar Code Management Person) for the purchasing site or the controlling location.

Other sequence codings (the last 6 characters of the serial number) may be used with prior arrangement with Lenovo.

The supplier ID is used to identify the specific location of supply/manufacture; a supplier with multiple locations, particularly in multiple countries, will have multiple supplier IDs. Since the supplier ID identifies the specific location of supply (manufacture), in many cases it may be used to infer the country of origin of the part; note that a 'substantial transformation' must occur for the part's CoO to change, which may not have happened at this location of supply. However, the Country of Origin must be bar coded on the part as well when feasible and particularly if the supplier ID might not properly indicate the CoO.

If the part has Vital Product Data (VPD), the S/N in the VPD data will match the bar coded S/N unless otherwise specified by Lenovo.

4.3.5 Date of Manufacture

If the part is serialized, the Date of Manufacture should be encoded within the S/N as shown in Serial Numbering above. If the date coding specified in the Standard (91C in the example above) is not encoded in the S/N, then a separate date code on the part is required.

Non-serialized parts shall use either an ISO date format (e.g. 2001-10-03) or the 2-character month-year date of manufacture as defined in C-H 0-2027-003 Date Code for Manufactured and/or Purchased Parts and Products; Coded Representation of Calendar Dates (see references on page 22). Other date formats in this Standard, including yyww (2 digit year, 2 digit week), ymm (one digit year, 2 digit month), may be used with prior arrangement with Lenovo or as specified on the drawing or other specification.

4.3.6 Vendor Identification

The part shall be marked so that the supplier and place of manufacture can be determined. This code or mark should identify 'manufactured by', not 'manufactured for'.

Non-serialized parts should use a vendor code as covered in C-B 0-2027-000 Supplier Identification Code System (see A.2 Corporate Standards, Procedures, etc.22). This code may be omitted if the part is otherwise marked with the supplier's name (typically for an agency registration).

Serialized parts have the supplier identified as part of the Y-alpha-1 header code and do not require a separate mark.

4.3.7 Quantity

The quantity shall be shown with no leading zeros. The thousands separator shall be a blank, not a comma (US usage) or a period (European usage). Quantities equal to or greater than 10 000 shall have a thousands separator.

4.4 Text

All text should be set in a sans-serif font such as Helvetica or Arial. Use of condensed or expanded fonts should be avoided. Use of mixed case is recommended.

Text sizes in this document are specified for the 'capital letter height', that is the height of an 'A'. Typically the numbers will have a similar (if not identical) height. Note that this is **not** the traditional type size specification, which is usually the height from the top of an ascender (on a 'd') to the bottom of a descender ('p').

All text should have a capital letter height of 2.1 mm (6 point) or more, with heights of 3.5 mm (10 points) or more preferred. Critical text (e.g. the part number) should be set in larger text and/or with a bold font for added legibility.

When 'Lenovo' is to be printed, use Helvetica. Equivalent fonts can be used with prior approval.

All text should read from left to right; avoid mixing rotated text on a part or container. 'Stacked' text (one letter on top of another in a column) shall not be used.

4.5 Bar Codes

All bar codes shall meet the requirements in C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing.

Each bar coded data element shall be preceded by a FACT data identifier. A FACT data identifier is a letter preceded by zero, one, two or three digits. It describes the data encoded after the data identifier. For example, 'P', '1P', '2P', '20P' are all identifiers for parts.

Each bar coded data element shall have a 'title' over (strongly preferred) or elsewhere immediately adjacent to the bar code. The title consists of 3 elements, separated by blanks. An example:

(P) Lenovo PN: 11J6040

(P)	Data identifier enclosed in parentheses
Lenovo PN:	Description of the value, with a trailing colon
11J6040	Value in the bar code (in this case, a part number)

The data that is encoded in this bar code is P11J6040; the description, special characters and blanks are not encoded. (The start, stop and check characters are also encoded but not shown.)

Blanks may be used in the value portion of the title for readability, for example, in an 11S bar code:

(11S) PN SN: 11J6040 YH1042947123

Use of the '+' to concatenate multiple data identifiers & data as covered in CS 1-1121-015 is not supported in most Lenovo logistics systems and can only be used with prior approval except for the format covered in Vendor P/Ns and S/Ns on page 16 (this format will not be scanned by Lenovo).

The value portion of the title (11J6040 in the example above) shall be set in larger or bolder type than the data identifier and description.

The title should start over the quiet zone of the bar code, i.e. the left parenthesis should appear approximately 5 mm to the left of the first bar of the bar code. (This is done to assure that the printer is properly aligned to have sufficient left margin for the quiet zone.)

4.5.1 Symbology

Bar codes shall be encoded in Code 39 (a.k.a. Code 3 of 9), or Code 128 when roughly 15% higher density is needed. All bar codes on a given label should use the same symbology.

Each bar code shall have start and stop characters as defined by the symbology. These start and stop characters do not appear in the title and are not part of the data. Most printers designed for bar codes add the start and stop characters automatically and most scanners strip off the start and stop characters automatically; however bar code fonts for use in printing applications need to have the start and stop characters explicitly as part of the encoded data. If a scan of the bar code results in leading and trailing * (asterisks), suspect that there are two start and stop characters.

High density (small) bar codes must be carefully selected to account for the printer characteristics. For example, a Code 39 bar code at 3:1 wide:narrow ratio takes 16 dots per character. On a 300 dot-per-inch printer, this is 18.75 characters per inch; on a 203 dpi printer, this is 12.7 characters per inch. The next larger size is twice as large, when 2 dots are used for the narrow element.

Code 39 bar codes shall have a minimum wide-to-narrow ratio of 2.3:1, with 3.0:1 strongly recommended. The 'X' dimension (narrow element width) shall not be less than 0.127 mm (0.005 inch) without prior approval from Lenovo. An 'X' dimension of 0.190 mm (0.0075 inch) or larger is recommended. (Code 39 at 0.127 mm 'X' dimension & 3:1 wide-to-narrow is 5 characters per cm.) The optional Code 39 check digit shall not be encoded.

Code 128 bar codes shall have an 'X' dimension not less than 0.127 mm without prior approval from Lenovo; an 'X' dimension of 0.190 mm or larger is recommended.

The height of the bar code shall be at least 15% of the length and preferably 25% of the length. Smaller ratios are hard to scan with handheld equipment. The examples in section 3 on page 3 are generally 15% of the width.

Each bar code shall have a 'quiet zone' of white space before and after the bar code. This should be at least 5 mm (0.25 in) in width and in no case smaller than one character width. Sufficient space should appear above and below the bar code to clearly separate the bar codes from one another and to minimize mistaken scans by the user.

Also note that very high density bar codes require scanners capable of reading them, and in general wand scanners (pencil-shaped scanners that are hand-moved over the bar code) will not have acceptable performance. A brief list of printer and scanner suppliers that provide equipment in general use in Lenovo is listed at Equipment vendors on page 24.

4.5.2 Bar Code Data Elements

This section describes the detailed data content of each bar code of interest and the title to be used.

4.5.2.1 Part Number (P)

This format is to be used for a P/N bar code unless otherwise directed.

Leading zeros on the 7-character P/N are significant and must be coded.

Identifier: P

Value after identifier: 7 character Lenovo P/N

Title: (P) Lenovo PN: ppppppp, (P) FRU: ppppppp or (P) FRU PN: ppppppp (depends on usage; use Lenovo P/N: under normal circumstances)

example: (P) Lenovo PN: 08J6040

Example of encoded data: P08J6040

Note: The sample bar codes in this section are set at an approximate narrow element dimension of 0.17 mm (0.0067 in.) and are roughly 8.8 characters per inch in Code 39 at a wide:narrow ratio of 3:1

Example bar code:

Note that the P/N is set in a larger & bolder font that the data identifier and description. Also note that the data identifier is placed to the left of the bar code.

4.5.2.2 Part Number (1P)

This format is an alternative to P when P is used for a customer of Lenovo's. Generally, this data identifier does NOT appear on parts.

Leading zeros on the 7-character P/N are significant and must be coded.

Identifier: 1P

Value after identifier: 7 character Lenovo P/N

Title: (1P) Lenovo PN: ppppppp, (1P) FRU: ppppppp or (1P) FRU PN: ppppppp (depends on usage; use Lenovo P/N: under normal circumstances)

example: (1P) Lenovo PN: 11J6040

Example of encoded data: 1P11J6040

Example bar code:

4.5.2.3 Engineering Change (2P)

Identifier: 2P

Value after identifier: 6 or 7 character Lenovo EC

Title: (2P) EC: eeeeeex

Example of encoded data: 2PC12013 (no suffix, usual case) or 2PC12013B (with suffix)

Note: If no suffix is present, no blank is to be coded.

Example bar code:

4.5.2.4 Country of Origin (4L)

This bar code is used for CoO marking, but cannot be used for full compliance with CoO requirements for parts and their immediate containers (innermost packaging); see Country of Origin on page 9.

Identifier: 4L

Value after identifier: 2 character ISO-3166 country code

Title: (4L) ORIGIN: xx

Example of encoded data: 4LCN (CN is The People's Republic of China)

Example bar code:

4.5.2.5 Quantity (Q)

Identifier: Q

Value after identifier: decimal quantity, no leading zeros

Title: (Q) QUANTITY: xxxx

Example of encoded data: Q102

Example bar code:

4.5.2.6 Date Bar Codes

Lenovo does not require date bar codes on parts or packages under most circumstances. Consult C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing for the 'xxD' FACT identifiers that may be used for dates.

4.5.2.7 Part Number & Serial Number (11S)

The required bar code for S/Ns also includes the P/N. This bar code may be used to encode both the P/N and the S/N in a single bar code when the part is serialized. Lenovo's serial tracking systems are optimized for use of this bar code and separate P/N and S/N bar codes are strongly discouraged.

This bar code is not generally used to identify "finished goods", which are not covered by this specification.

Leading zeros on the 7-character P/N are significant and must be coded.

Identifier: 11S

Value after identifier: pppppppsssssssssss (7 character P/N, 12 character S/N)

Title: (11S) Lenovo PN SN: ppppppp sssssssssss (place one or more spaces between the P/N and S/N) (Do not imbed blanks in the serial number for readability)

The P/N should be set in slightly larger or bolder type than the S/N to call attention to the P/N, particularly if the 11S title is the only indicator of the P/N on the part.

The long length of this bar code (22 characters) means special care should be to assure that the height is at least 15% of the length.

Alternate title: (11S) Lenovo PN: ppppppp SN: sssssssssss

Example of encoded data: 11S08L1020YL1009234123 (total of 22 characters)

Example bar code:

4.5.3 Optional Bar Codes

4.5.3.1 Vendor P/Ns and S/Ns

When a Vendor wishes to code their P/N and/or S/N in a bar code on a part, they should use 34P for the vendor P/N and an S bar code for the vendor S/N, concatenated together with a '+' if both appear on the part. Use of the '11S' bar code is not to be used for non-Lenovo P/Ns and S/Ns. An example is below. The encoded data is 34PSQD-04385-01+SQ02X003.

4.5.3.2 Lot Code

A Lot Code bar code should be used for non-serialized parts when the lot code needs to be tracked in manufacturing or other processes. '1T' is the usual data identifier for this purpose; other 'Traceability Number' data identifiers can be found in C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing.

Before specifying this bar code, assure that all affected logistics systems can accept this bar code and that the length of encoded data does not exceed the systems' capabilities.

Identifier: 1T

Value after identifier: lot code as specified by the supplier

Title: (1T) Lot: 125NKNO2X

Example of encoded data: 1T 125NKNO2X

Example bar code:

Example bar code:

4.5.2.5 Quantity (Q)

Identifier: Q

Value after identifier: decimal quantity, no leading zeros

Title: (Q) QUANTITY: xxxx

Example of encoded data: Q102

Example bar code:

4.5.2.6 Date Bar Codes

Lenovo does not require date bar codes on parts or packages under most circumstances. Consult C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing for the 'xxD' FACT identifiers that may be used for dates.

4.5.2.7 Part Number & Serial Number (11S)

The required bar code for S/Ns also includes the P/N. This bar code may be used to encode both theP/N and the S/N in a single bar code when the part is serialized. Lenovo's serial tracking systems are optimized for use of this bar code and separate P/N and S/N bar codes are strongly discouraged.

This bar code is not generally used to identify "finished goods", which are not covered by this specification. Leading zeros on the 7-character P/N are significant and must be coded.

Identifier: 11S

Value after identifier: pppppppsssssssssss (7 character P/N, 12 character S/N)

Title: (11S) Lenovo PN SN: ppppppp sssssssssss (place one or more spaces between the P/N andS/N) (Do not imbed blanks in the serial number for readability)

The P/N should be set in slightly larger or bolder type than the S/N to call attention to the P/N, particularly if the 11S title is the only indicator of the P/N on the part.

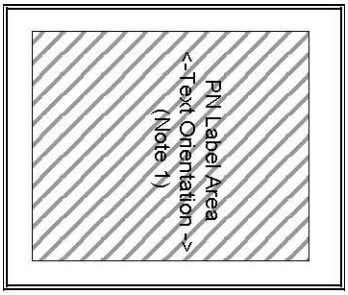
The long length of this bar code (22 characters) means special care should be to assure that the height is at least 15% of the length.

Alternate title: (11S) Lenovo PN: ppppppp SN: sssssssssss

Example of encoded data: 11S08L1020YL1009234123 (total of 22 characters)

P/N-only, placement and orientation specified

Label part per Lenovo Specification 41U3001, serialization is not required. Place the label in the indicated area. Text shall be oriented as shown.



Serialized, specifying a specific format from this spec

Label part per Lenovo Specification 41U3001 using Example Layout Design 2, serialization is required.

P/N-only, using a pre-designed label stock

Label part using P/N xxxxxxx. Contents of label per Lenovo Specification 41U3001, serialization is not required.

— or —

Label part per Lenovo Specification 41U3001, serialization is not required.

Label shall be 35mm x 15mm using Zebra Trans Matte 2000 label stock or approved equivalent.

5 Label Material

See B.2 Label Material on page 25 for more guidance.

5.1 Label Stock

Unless otherwise specified:

- The label material shall be white litho paper. Label stock should be 89 g/m ²(equivalent to a basis weight of24# bond or 60# offset paper and approximately 0.086 mm thick).

- Labels shall have rounded corners. A radius of 3.17 mm (1/8 in) is recommended.

5.2 Adhesive & Backing

Adhesive is to be applied to the back side of the label. A dry releasable liner is to be used over the adhesive for protection before applying the label to the part.

Adhesive should be acrylic 0.02 mm (0.0008 in) to 0.05 mm (0.002 in) thickness. See Adhesives in this document for more guidance.

5.3 Colors

Label and ink colors must be chosen for high contrast. Label material should be either white, light gray or cream, with white preferred. Ink should be black. Note that most bar code scanners work with red or infrared scan beams, so it is important to optimize contrast in this range of the spectrum.

5.4 Reflectivity & Contrast

The label media shall meet reflectivity requirements in all spectral bands between 633 and 900 nanometers.

The reflectivity of the media shall exceed 60% referenced to a magnesium oxide or barium sulfate standard.

The reflectivity of the ink is required to be no more than 25% of the media reflectivity to meet minimum print contrast signal (PCS) requirements. The minimum allowable PCS is 75%.

6 Printing

Unless otherwise specified:

1. Each label shall be printed using a process and ink that is permanent and waterproof. Printing should be with a thermal transfer printing using a printer designed for printing bar codes particularly when S/N bar codes are required.
2. All bar codes shall be grade ‘C’ or higher after application to the part or package, as covered in ANSI X3.182, Guidelines for Bar Code Print Quality.
3. The black-to-white contrast ratio is covered at Reflectivity & Contrast on page 19.
4. Printed characters and bar codes shall not degrade over the life of the part. or package.
5. Label should not contain any voids, ink specks, or ink fill-in or other defects which impair reading by people or bar code scanners.

7 Label Application

7.1 Part Labeling

Labels shall be applied to the part in the areas indicated on prints, reference drawings, etc. in the orientation indicated.

The surface should be smooth and dry and free of dust, grease, oil and other contaminants before label application.

If no guidance is given, align the long axis of the label parallel or perpendicular to the long axis of the part, with the printing right-side-up when the part is installed and/or normally stored. The label should not cover any holes, slots, etc. and be placed on a flat, smooth surface.

Do not place labels on surfaces required for heat transfer without prior approval from Lenovo. Do not place labels on surfaces that mate with other parts or may cause an interference fit. Do not place labels on electrical contacts or bearing surfaces.

Labels should not be applied to surfaces that will experience abrasion in normal handling and use. If this cannot be avoided, bar codes shall be oriented so that any scratches will be along the length of the bar code
(i.e. perpendicular to the bars). Protective films (e.g. Mylar) over the label may be used when abrasion is a concern. Bar code scanning through the film should be tested prior to implementation.

Labels may be affixed longitudinally to a cable surface or applied to connector shrouds. In any case, the label design should assure that any bar codes are relatively flat along their length and can be scanned.

Labels that are applied directly to the surface of the cable should have the bar code running along the axis of the cable.

In general, labels do not need to be applied to a surface that is visible when the part is installed. Part labels, as covered in this Specification, should not be visible to the end user (customer) when the part is in its normal operating position and covers are closed. If the part is normally consumed into a subassembly, the part's labels should not be visible when the subassembly is assembled; only the label(s) identifying the subassembly should be visible. However, consideration should be given to downstream manufacturing and logistics requirements when selecting placement of labels; for example, it is frequently desirable for 11S P/N-S/N bar codes on APC 4 parts to be visible when the part is installed and the covers are open.

Labels on parts shall be applied neatly with no wrinkles, creases, turned-under corners, obvious stretch or skew or loose edges. Labels shall be applied consistently from part to part and from lot to lot. Lenovo will coordinate consistent labeling practices between suppliers and plants when necessary.

Excess labels (overruns, test printing, removed from parts, etc.) containing Lenovo logos or S/Ns shall be destroyed or otherwise controlled so that they cannot be reused by others.

7.2 Package Labeling

Labels used for part labeling, if not too small, may also be used for package (container) labeling. The larger labels in 3 Format of Labels on page 3 are acceptable for packages up to roughly 60 cm on a side; larger packages should have larger labels.

FRU-packaged parts have specific label requirements. See **Volume 6 -FRU Package Labels** in Appendix A.3 Lenovo Internal Resources for detailed requirements.

Labels on unit packed serialized parts should be applied such that the serial number bar code is cut or destroyed when the package is opened if the label contains the S/N of the part within.

When feasible, package labels should be applied so that they are easily visible when the next-level package is opened or the package is on the shelf. In most cases, the label will be on the top or a vertical side.

Parts in ESD bags which require tracking by S/N in manufacturing operations (e.g. APC 4 parts) should have the P/N and S/N bar coded (an 11S bar code) on a label used to close/seal the bag; it is not practical to read bar codes through ESD bags. As covered above, this label should be broken when the bag is opened so that an operator can trust the bag label to represent the contents of the bag. (This requirement may be waived for particular intraprocess operations by Lenovo.)

Parts packed in ESD bags and then sealed in unit-pack boxes (e.g. FRUs) do not require this bar code on the ESD bag as the box is sealed and there is a P/N-S/N bar code on the outside of the box.

When parts requiring tracking by S/N in manufacturing operations (e.g. APC parts) in unit-pack boxes have P/N-S/N (e.g. 11S) bar codes applied to the box, the bar code containing the S/N should be cut or otherwise rendered unreadable when the box is opened. This requirement also applies to FRU labeling.

The surface of the package where the label is applied should be smooth and free of dust, grease, oils, and other contaminants. Application of labels onto textured plastic will require testing for long-term adhesion. Bar coded labels shall not be used over lapped seams (other than plastic bags), but may be used on butt seams.

Labels shall be aligned with the edges of the package. Labels on packages shall be applied neatly with no wrinkles, creases, turned-under corners, obvious stretch or skew or loose edges. Labels shall be applied consistently from package to package and from lot to lot. Lenovo will coordinate consistent labeling practices between suppliers and plants when necessary. Excess labels (overruns, test printing, etc.) containing Lenovo logos or S/Ns shall be destroyed or otherwise controlled so that they cannot be reused by others.

8. Appendices

A. References

A1 - Corporate Standards, Procedures, Etc.

*** * Insert List of Corporate Standards and where they can be found . . . Chris Sattora * ***

A2 – Lenovo Internal Resources Shipping Procedures

Shipping Procedure Instructions (SPIs)

Kirstin Neira

Country of Origin

Kirstin Neira

Asset Protection

Kirstin Neira

Lenovo Global Labeling Guides

See PNs 41U2997 – 41U3004, available on ***Kirstin Neira Insert Website***

VOLUME	PN	DESCRIPTION
Volume 1	41U2997	Overview of Global Labeling
Volume 2	41U2998	The Product Package Label
Volume 3	41U2999	Shipping Labels
Volume 4	41U3000	The Packing List
Volume 5	41U3001	Part Labels (this document)
Volume 6	41U3002	FRU Package Labels
Volume 7	41U3003	Case Content Labels
Volume 8	41U3004	Special Labels and Symbols

Use of Lenovo Logo

Kirstin Neira

A.3 External & Internet Resources

Standards

ANSI X3.182, Guidelines for Bar Code Print Quality

ISO 3166, Country Codes, http://www.din.de/gremien/nas/nabd/iso3166ma/index.html; see also http://www.niso.org/3166.html

IEC 62090, Package Labels for Electronic Components Using Bar Code and two Dimensional Symbologies; this is currently in committee draft for voting form (12/00 draft).

Equipment vendors

Note: Other vendors may supply equipment that emulates products from these suppliers,particularly Zebra and Symbol.

BC412 support is available from these suppliers as a relatively inexpensive extra-cost option on certain products.

Zebra, manufacturers of printers, labels and ribbons - http://www.zebra.com/

Datamax, printers - http://www.datamaxcorp.com/

Welch-Allyn, scanners - http://www.handheld.com

Symbol, scanners - http://www.symbol.com

3M, labels - http://www.mmm.com/market/industrial/labeldiecut/index.html

B. Printing Guidelines

B.1 Printing directly on the part or package

For bar codes, this should generally be avoided, largely because most direct-printing processes do not have sufficiently high spatial resolution & stability for repeatable quality.

Pad stamping, embossing and ink-jet printing can all be used for direct part marking of textual data; inks shall be waterproof after drying.

B.2 Label Material

The material chosen should have the following characteristics:

1. Metal labels and labels that are extremely shiny should be avoided. The inked portions of the label tend to reflect light, resulting in reduced contrast while reading.

2. Label material should have minimal stretch, shrink or skew during printing and application. Paper less than 75 g/m ²(20# bond) is not recommended.

3. Unless required for tamper-evident purposes, the label should resist tearing. See Engineering Specification 0877653Pressure Sensitive Labels and IEC 62090, Package Labels for Electronic Components Using Bar Code and two Dimensional Symbologies for test methods.

4. Last for the life of the part or package; parts generally have a minimum of 10 year useful life.

5. Withstand all subsequent processing operations after application. In particular for card assemblies, the label material should withstand soldering operations (wave, reflow, rework, etc.) - there are specialized label materials that will work in these operations. Some component labels will require labels capable of withstanding 80 ~100 ℃ during operation; label, adhesive and printing will need to be selected to assure permanence in this environment.

6. Minimal ‘wicking’ of ink. If the ink spreads out during or after printing, the edges of the characters and bar code bars will be hard to detect. (This is generally not a problem on materials designed for thermal transfer bar code printing. Ink jet and laser printing may have this problem.)

7. Resist discoloration during the life of the product. Note that some labels may be exposed to 50 ~80 ℃during normal operation. Packages are likely to be stored in environments as hot as 40 ℃.Consequently, direct thermal printing may not be suitable.

8. Some applications may require fire-retardant materials or other special material characteristics. This Specification does not address these requirements.

9. When possible, the label material should be compatible with the recycling characteristics of the part or package.

B.2.1 Label Materials in Common Use

Paper

Paper is the most frequently used label material and is the lowest cost alternative. For high density printing (X dimension at or below 0.0075 inch), premium papers with special coatings and/or surface treatments will be required.

Polyester, Polyolefin, Polypropylene and Polyethylene

These represent some of the plastics that are available. Some forms of polyester label stock are UL/CSA approved.

Polyimide

Polyimide Polyimide (Kapton) labels can withstand wave soldering and similar high-temperature operations. Labels as covered in this specification should use polyimide coated for a white background (vs. the yellow uncoated color of polyimide).

B.2.2 Specification for Labels prepared for Zebra printers

Sample requirement for roll-stock labels:

1. Labels are to be supplied on rolls with an 8 inch maximum Outer Diameter. The core shall be 3 inch Inner Diameter.
2. Labels are to be positioned 2 mm from the left edge of the back liner and have a minimum 3 mm (1/8 inch) space between labels.
3. The back liner shall be sufficiently transparent that a Zebra printer can automatically detect the size of the label.
4. The Lenovo P/N, EC number and date of manufacture of the label stock shall be marked in on the inside surface of the core.
5. Two (2) label rolls and one (1) ribbon roll, sufficient for the labels, shall be packed per plastic bag. The bag shall include desiccant.

B.2.3 Adhesives

The adhesive chosen should have the following characteristics:

1. Last for the life of the part or package.
2. In packaging applications, have a peel strength exceeding the tear strength of the package outer layer. In other words, the label is permanent.
3. Be resistant to moisture. Note that this rules out most water-activated adhesives.
4. Withstand the operating and storage environment without running, cracking, peeling, drying out, etc.for the life of the product/package.
5. Not adversely affect the label stock or the part/package for the life of the item. This is sometimes a problem when applying labels to items with high plastic content, such as notebooks, wiring and cabling.
6. Withstand all subsequent processing operations after application. This includes withstanding solder operations and not contaminating the tooling if the label will be used in this environment.
7. Have a shelf life of at least 1 year. Labels with a shelf life of less than 5 years shall have a clearly marked expiration date and/or manufacturing date on the package or spool core.
8. Not require cleaning of the part or package before application. At a minimum, normal finger oils can be expected to be present at the time of application.
9. Have minimal volatile organic compound (VOC) emissions during storage, printing, application and use.

B.2.4 Tamper Evident Features

In many applications, it is desirable to have labels that are difficult if not impossible to remove and reuse. Items to consider are:

1. "Kiss cut" edge or middle cuts that cause the label to break up in multiple pieces when you attempt to remove the label. Bar codes should not be printed over kiss cuts as they tend to allow the label to distort during application or look like bars to the scanner.
2. Special adhesives. Many common adhesives are dissolved by common solvents or become frangible at low (e.g. liquid nitrogen) temperatures.
3. Plastic labels that show stress marks when bent or stretched or have low tensile strength, thus resisting peeling.
4. Hologram or 'VIN' overlabels (available from American Holographic, 3M and others). These have many security features and bar codes can be read through them.

B.3 Printing Processes

A number of processes can be used for printing and labeling parts and packages. Unfortunately, most of these do not have sufficiently high quality for bar codes.

Thermal Transfer

This is the recommended process for labels especially when used with printers designed for printing bar codes. Characteristics:

1. Label and ribbon materials readily available
2. Custom label sizes, shapes, etc. readily available
3. Can generate custom graphics, logos, etc.
4. Can be used in 'print on demand' applications where data on the label is different for each label.
5. Programming language supports printing bar codes relatively easily
6. Long shelf life

Thermal

Thermal printing (also known as Direct Thermal) uses specially coated paper that turns black when exposed to heat. The printers used are generally identical to the ones used for thermal transfer, above.

The main limitation with thermal printing is that the label media tends to darken with age and exposure to heat, humidity and light, making it unsuitable for labels requiring long shelf- and operating-life. Labels can darken significantly within weeks.

Thermal printing must not be used for part labels because of the 10+-year operating life requirement.

In applications known to limit the label's lifetime and usage to acceptable levels, thermal printing is somewhat less expensive than thermal transfer.

Xerographic

The xerographic process is used by all laser printers. It is an effective and acceptable way to print bar codes onto paper. Use of label stock in laser printers is not cost-effective for large production runs or serialized labels unless a custom form that includes the label as part of other printed material (e.g. a page that has both the shipping label and the packing list together) is procured.

Dot Matrix

Dot matrix printers are not recommended for bar code applications. In general, the bar codes produced are of substandard quality and users tend not to replace the ribbons when required.

Ink Jet on Label

Modern ink jet printers will have similar quality characteristics as xerographic printers. However, most ink jet ink is water soluble, making it less than ideal for most label applications covered here. Note that paper designed not to 'wick' the ink will be required.

Direct Ink Jet

It is possible to procure equipment that will ink-jet bar codes and text directly on the product or package. Careful evaluation of the quality and permanence of the printing in the intended application should be done prior to procurement and implementation.

Embossing & Heat-stamping
It is conceivable that a BC412 bar code could be embossed; other symbologies depend on width of the bar too much to consider embossing without a significant development investment. Pad-Stamping Fixed bar codes can probably be pad-stamped, however the quality is likely to be marginal. Pad stamping may be acceptable for PN-only barcoding at relatively large sizes. Laser-Etching BC412 was developed with laser etching in mind. However, unless the etching equipment is already at hand, the investment is probably not affordable. Note that for high-security applications, this may be the only alternative.

Offset, Lithography, etc.

Any of the traditional printing processes can produce high-quality bar codes on paper or label stock. These processes are most suitable for when the printing is identical on all items (e.g. no serial numbers). Care must be taken to assure that the masters are of high quality (Grade 'A' recommended) and accurate during prepress.

B.4 Bar Code Quality

Experience has shown that most bar code quality problems can be avoided by printing the bar codes on appropriate equipment and properly maintaining the equipment. If a bar code cannot be read immediately after printing, you should suspect a quality problem and reject the bar code on the spot.

Higher-density (smaller) bar codes take more care and are more likely to be substandard than less-dense bar codes. See Bar Code Widths on page 17 for recommendations on matching bar code density to printer capabilities.

ANSI X3.182, *Guidelines for Bar Code Print Quality* defines a range of print qualities. Grade 'C' or better is recommended for parts and packages to allow for first-time scanning and accommodate some degradation in quality over time. Bar code verifiers can be purchased for the common encodings if quality is of utmost importance.

C. Serial Number Formats for Use

Parts

Lenovo International's Computer Division uses a Zxxhhhssssss format for its serial numbers. This format is to be used only when specified by Lenovo. Use is restricted to parts that explicitly call for it. This format is generally considered obsolete; units other than PSG should use the Y-format S/N covered in section 4.3.4 Serial Numbering on page 10.

This 12-character S/N is used within an 11S P/N-S/N bar code as covered in **Part Number & Serial Number (11S)** earlier in this document. This format is formally documented as the "11S-Z" format in C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing.

Typical S/N: ZJ16A702D512

Z	First character of S/N. Indicates sub-format of S/N as shown below. Note that this character, which appears at the start of all current S/Ns, is part of the S/N and must be entered in all logistics systems as the first character of the S/N.
J1	Identifies the plant (location) of control of the S/N header and the part 'type' (new, used, internal-use-only, etc.). The letter indicates the location, and the number indicates the type. Letter-number and number-letter pairs indicate different labs. For example: J1 - Location (Plant) of Control: Raleigh, type: New L1 - Location of Control: Rochester, type: New A1 - Location of Control: Austin, type: New 7J - Location of Control: Greenock, type: Used Other 2-digit numeric or 2-character alphabetic codes are assigned to OEM subcontractors.
6A7	'Header', assigned sequentially to parts by the plant of control, covering all P/Ns, ECs and suppliers. The header is a unique identifier for the part.
02D512	Sequence number, broken down as follows.
02D	Date code. 02D is 2000/02/13 (days and months over 9 use letters). This satisfies the Date of Manufacture data element requirement. (Other date codings can be used by prior arrangement with Lenovo.)
512	Sequence of production on the date. Typically numeric, but hexadecimal and alphanumeric (less I,O,Q) can be used if production volumes may exceed 1000/day. Note: Certain values of position 10 of the S/N (the leftmost character of the sequence of production, '5' in this example) are reserved, including '3', 'C', 'F', 'L', 'R' and 'S'. See C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing for details.

Lenovo shall define to the supplier the first 6 characters of the S/N to use (e.g. ZP16A7) for any particular P/N, EC & supplier. These values will be assigned and recorded by the plant of control.

Other sequence codings (the last 6 characters of the serial number) may be used with prior arrangement with Lenovo. If the sequence coding does not include a date of manufacture, other date marking on the part will be required.

Finished Goods

For the purposes of this section 'finished goods' are Machines, Options and Features. Machines are items with a machine type, model and machine serial number. Options and Features are items with a part number and optionally a part serial number that are packaged and intended to be sold in retail trade to upgrade a Machine.

Machines may be coded with a 1S bar code as covered in C-S 1-1121-015 Automatic Identification (AI) for Packaging Distribution and Manufacturing. Note that this is an obsolete usage of the 1S bar code and usage is restricted to machines that explicitly call for it.

Options and Features should be coded with a 30P bar code plus S as shown in the examples below.

Options and Features not requiring serialization:

Options and Features requiring serialization:

Note that the characters E, I, J, O, Q, S, U cannot be used in a machine S/N (both the plant of manufacture and serial number fields) as documented in C-S 1-1121-010 Serial Numbering of Lenovo Products (see references on page 22).

D. Revision History

Date	EC Level	Changes
2006-02-28	J83788A	Created new guide for Lenovo.

*** * * End of Document * * ***