

NEDA Supplier Guideline
For 1-Dimensional Bar code & 2-Dimensional Matrix Code
Product Package & Shipment Labeling

Purpose – To provide information that will help the Electronics Distribution Industry to know & choose appropriate symbology(s), materials, & equipment for their current & future application needs. This document is consistent with current industry standards (see EIA/CEA & ISO/IEC reference documents), and will make recommendations for symbology(s) and standardized set of data & data identifiers for each level of labeling applications used in the electronic manufacturing component supply chain (non-retail).

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I. Defined Terms Related To This Document

- A. 1-Dimensional (1D) Barcode – A bar code symbology in which the symbol is formed of a single row of symbol characters (made up of narrow & wide bars and spaces).
- B. 2-Dimensional (2D) Matrix Code – Optically readable symbols that must be examined both vertically and horizontally to read the entire message. Two-dimensional symbols may be one of two types: matrix symbols and multi-row barcode symbols. Two dimensional symbols have error detection and may include error correction features.
- C. Component – Electronic or electrical parts (e.g., bare printed circuit boards, integrated circuits, capacitors, diodes, electronic modules, switches, heat sinks, resistors, electronic/electrical connector, etc.) of a first level assembly. A single part, item, or material purchased, manufactured, and/or distributed
- D. Data Identifier (DI) - A specified character, or string of characters, that defines the intended use of the data element that follows.
- E. Packing Slip – Also known as a pick/pack list or delivery note, this document contains the order specific information for the total ship quantity of 1 or more part numbers of a Purchase Order.

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- F. Product Package - A commercial unit of components defined by the supplier including, if applicable, their means for protection, structured alignment, and for transporting, storage, and/or assembly. Typical examples of a product package for leaded components (such as Integrated Circuits) are:
- the single reel on which components are taped
 - the single ammo box containing taped components
 - the single (inner) transportable bag or box containing a reel, tube(s), stick(s), tray(s), or bulk packed components
 - the single (intermediate) transportable bag or box containing multiple inner reels, bags, or boxes
- G. Shipping Container – The outer non-breakable container handled by a freight carrier in the transportation of an order from a shipper (supplier) to a receiver (customer or forwarder).
- H. Unit Pack – The first tie, wrap, or container of a single part number (ie; tape, tube, tray, bag) — A unit pack may be an item packaged singly or a standardized quantity of items.

II. Reference Documents

NEDA Supplier Guideline, Packing and Handling (Being Edited by Ty Golden's workgroup)

EIA-706, Component Marking Standard

EIA/JEP 130, Guidelines for Packing and Labeling of Integrated Circuits in Unit Container Packing (Tubes, Trays, and Tape and Reel)

CEA-624-A, Linear Bar Code and Two-Dimensional Symbols for the Labeling of Product Packages

CEA-556-C, Outer Shipping Container Label Standard

ISO/IEC 15415, Bar Code Print Quality Test Specification - Two Dimensional Symbols

ISO/IEC 15416, Bar Code Print Quality Test Specification - Linear symbols

ISO/IEC 15417, Bar Code Symbology - Specification Code 128

ISO/IEC 16388, Bar Code Symbology - Specification Code 39

ISO/IEC 15438, Bar Code Symbology Specification - PDF417

ISO/IEC 16022, Bar Code Symbology Specification - Data Matrix

ISO/IEC 15418, EAN/UCC Application Identifiers and ASC MH10 Data identifiers

ISO/IEC 3166-1, Codes for the representation of names of countries

III. Symbologies

A. 1D Linear Barcodes -

1. Code 39

- a. Most commonly used barcode readable by all barcode scanners, approved for use in all major Industry Standards(ISO, ANSI, EIA/CEA, etc)

2. Code 128

- a. Approved for use in all major Industry Standards.
- b. Recommended for Disty Specifications using 1D Barcode
- c. Advantage over Code 39 is space efficiency (data compression produces shorter barcode & faster scan rate when compared to Code 39, for most applications).
- d. Industry trend toward replacing Code 39 with Code 128

B. 2D Matrix Codes (see “Informative” in Section IV.)

1. Data Matrix ECC-200

- a. Recommended for Disty Specifications using 2D Data Matrix on inner/intermediate product packages (bags, boxes, reels). Also recommended for any required 2D Contents List outer containers as supplement to “Mixed Load” label.
- b. Data Matrix ECC 200 uses the automatic error correction to insure reliable performance of slightly damaged labels.

c.

2. PDF417

- a. Recommended for Disty Specifications using 2D Data Matrix on outer shipping container & Master/Packlist labels.
- b. Error Correction level of 3 is recommended to insure reliable performance of slightly damaged labels.

3. MaxiCode

- a. Recommended only when required by Freight Carrier for Freight Tracking of shipping cartons.

IV. Materials & Equipment

A. Labels & Ribbon

B. Printers

C. Scanners/Print Quality Verifiers

Informative - Selection and Use of 2D Symbols & Equipment

2D Symbol Selections - PDF 417 and Data Matrix ECC 200 are approved to be used for product package labels. Before choosing a 2D symbology or equipment for your application(s), consideration needs to be made concerning all supply chain materials passing thru your application(s) for scan automation and for label space efficiency. The following table illustrates the major differences to be considered when making these decisions.

Symbology	Linear Imager	Area Imager	Linear Laser	Raster Laser	Label Space Efficiency (for same "X" dimension)
PDF417	May be compatible (check with manufacturer)	Compatible	May be compatible (check with manufacturer)	Compatible	More efficient than linear barcode
Data Matrix ECC 200	Not Compatible	Compatible	Not Compatible	Not Compatible	More efficient than linear barcode and PDF417
1D Code 39/ Code 128	Compatible	Compatible	Compatible	Compatible	Code 128 is more efficient than Code 39
2D Maxicode	May be compatible (check with manufacturer)	Compatible	May be compatible (check with manufacturer)	Not Compatible	Efficient but dedicated use for "Freight Tracking" only.

When evaluating printers and scanners, other special considerations should include:

- Printer capabilities (2D capabilities, DPI, Print Quality, Size/Footprint, etc.)
- Print Quality Verifier types and capabilities (handheld, fixed, in-line, etc.)
- Scanner types & capabilities (hand-held, fixed, field of view, depth of field, lighting, etc.)

V. Marking/Labeling Applications & Interface

A. Component Marking

1. At the time of this publication 2D part marking on individual components is limited to special and custom parts (not required for distribution).
2. Data Matrix ECC 200 is the industry standard symbology for 2D part marking
3. Typical 2D data for individual component tracking include a) Part Number, b) Supplier Code, c) Mfg Lot Trace Code, and d) Environmental category (Pb-Free/ROHS/Lead Finish type code).
4. See example of 2D direct part marking in examples section

- B. Product Package Label
- C. Shipping & Receiving
 - 1. Shipping Carton (Load)
 - 2. Mixed Load
 - 3. Master (Packlist/Delivery with Single Part#)
 - 4. Content Summary Label (for Mixed Load Container)
- D. Unit Pack Label (See Product Package Label)

PLAET

VI. Examples

A. Component Marking (not required for distribution at the time of this publication)



(P)1234567890^G_s(V)12345^G_s(1T)1234567

Note: Parenthèses () are to illustrate inclosed DIs (Data Identifiers) and are not not actual encoded data.

Note: For component marking where only Data Matrix ECC 200 is used for 2D marking, it is not necessary to encode the full syntax structure of Header & Trailer information if agreeable to trading partners.

B. Product Package

Where customer Part Number is Entered in both Human Readable And Bar Code 128



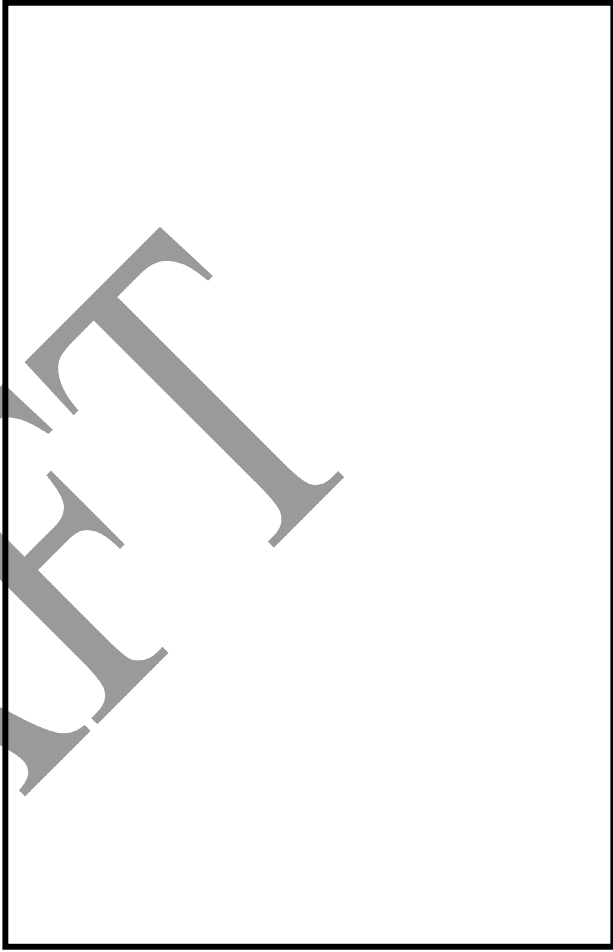
NOTE: Dan will supply new sample including PO#, Label count x of y, & (4L)COO:

C. Shipping & Receiving

1. Shipping Carton/Single Item (Load)

FROM: Texas Instruments Singapore Pte. Ltd. c/o Exel Singapore Pte Ltd No. 81, ALPS Avenue Singapore SGP 496803 SG		TO: AVNET ASIA PTE LTD ACCORD FAMOUS DISTRI CENTRE NO. 1 CHANGI SOUTH LANE 1 #02-00 SINGAPORE 486070 SG	
EXEL W/B#: E25 			
(3S) PKG. ID: 0033317+6748492 			
(K) TRANS ID: 6200104516 			
(P) CUST. PROD. ID:			
(Q) QUANTITY:  20000			
(1P) SUP. PROD. ID.: LM393DR 			
(Z) OPTIONAL:			
DESC.: DUAL CHANNEL COMPARATORS			REL-B 
PACKAGE COUNT	PACKAGE WT.	SWB: 0003825418	
2 OF 17	16.86 LBS 7.65 KGS	BX#:6748492	

2. Shipping Carton/Multiple Item (Mixed-Load)



3. Content Label (for Mixed-Load Shipping Carton)

Note: Data Format example/concatenation of 2D codes:

HEADER?>PO,Supplier Part#,Qty,#Records^G_s PO,Supplier Part#,Qty,#Records^G_s PO,Supplier
Part#,Qty,#Records^G_s PO,Supplier Part#,Qty,#Records^G_s PO,Supplier Part#,Qty,#Records^G_s PO,Supplier
Part#,Qty,#Records^G_s
Etc. TRAILER

(Z) Content List For PkgId 0033317+6748492

2D

2D

4. Master (Pasted to backside of Packlist/Delivery Note)

FROM: TEXAS INSTRUMENTS INCORPORATED AMERICA REGIONAL PDC 13601 INDEPENDENCE PARKWAY FORT WORTH TX 76178 US		TO: AVNET ASIA PTE LTD ACCORD FAMOUS DISTRI CENTRE NO.1 CHANGI SOUTH LANE 1 486070 SG	
EXEL W/B#: E25		(4S) PKG. ID: 0033317+700393150 REL-A	
			
(K) TRANS ID: 6200104516			
			
(P) CUST. PROD. ID:			
(Q) QTY: 20000		D-NOTE LABEL	
			
(1P) SUP. PROD. ID: LM393DR			
			
(4L) COO: MY		SHIP DATE: 10/19/2004	
			
PROD. DESC.: DUAL CHANNEL COMPARATORS			
PACKAGE COUNT 1		PACKAGE WT. 3.00 LBS 1.36 KGS	
		SWB: 003381904	

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