



IECQ CS 033000-UK0001

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IECQ COMPONENT SPECIFICATION

IEC Quality Assessment System for Electronic Components (IECQ System)

e-Labelling – Specifications for writing and reading

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

FOREWORD

The IEC Quality Assessment System for Electronic Components (IECQ) is composed of those member countries of the International Electrotechnical Commission (IEC) who wish to take part in a harmonized system for electronic components of assessment quality. IECQ is also formally known in some European member countries as IECQ-CECC.

The object of the System is to facilitate international trade via business to business supply chain management tools and the harmonization of the specifications and quality assessment procedures for electronic components, assemblies and related materials and processes, and by the grant of an international recognized Certification of Conformity and the optional use of an IECQ Mark of Conformity. The components produced or services provided under the System are therefore accepted in all member countries without further testing.

This Component Specification is based upon the requirements of IECQ 03 Series of Rules of Procedure by:

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839 N Rochester Road
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and published under the authority of:

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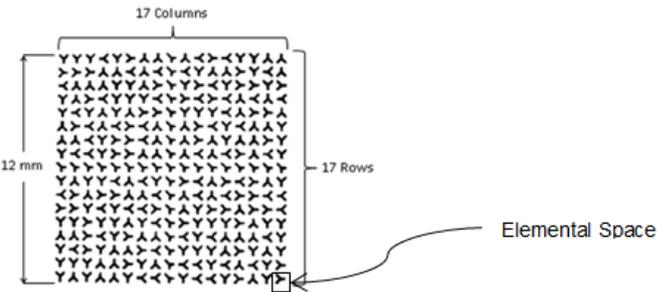
AMENDMENT RECORD

No previous editions.

REQUIREMENTS

The following data sheet satisfies the requirements of IECQ Component Specifications as detailed in IECQ 03 Series of Rules of Procedure.

It should be note that IECQ is not responsible for manufactures declaration made in data sheets which fall outside the limits of Certificates of Conformity.

 <p>Component Specification available from:</p> <p><input checked="" type="checkbox"/> Publicly available Specifications</p> <ul style="list-style-type: none"> - IECQ Certification Body under whose authority the Component Specification (CS) is published - IEC Webstore - IECQ Website <p>www.iecq.org/publications/specifications/</p> <p><input type="checkbox"/> Proprietary Specifications</p> <ul style="list-style-type: none"> - IECQ Certification Body under whose authority the Component Specification (CS) is published - Other: ... 	<p>Component Specification number:</p> <p>IECQ CS 033000-UK0001 for use within the IECQ Approved Component Scheme</p> <p>Edition: 1.1</p>
<p>Electronic Components of Assessed Quality Component Specification in according with:</p> <p>ISO/IEC 15415, <i>Information technology – Automatic identification and data capture techniques – Bar code symbol print quality test specification – Two-dimensional symbols</i></p> <p>ISO/IEC TR 29158, <i>Information technology – Automatic identification and data capture techniques – Direct Part Marking (DPM) Quality Guideline</i></p>	<p>IECQ Certification Body:</p>  <p>BSI Kitemark Court, Davy Avenue Knowlhill, Milton Keynes MK5 8PP United Kingdom</p> <p>Product description:</p> <p>E-Labeling, that may be affixed to, or laser marked into the surface of electronic devices and components.</p>
<p>Outline drawing and install information:</p> 	<p>Applicant:</p> <p>ECC Corp. 839 N Rochester Road Clawson Michigan USA</p>

Guidelines

- **Component Specification available from:** The Category of Component Specification “Public” or “Proprietary”, other sources of availability maybe be listed under “Proprietary” if applicable. In accordance with IECQ OD 302, Clause 5.6.
- **IECQ Certification Body:** The name of the IECQ Certification Body under whose authority the Component Specification is published.
- **Component Specification Number:** The unique identification number allocated by the IECQ CB in accordance with IECQ OD 302, Clause 5.3 “Numbering”, and Edition status.
- **Electronic Components of Assessed Quality Component Specification in according with:** The list of standards and or specifications that are utilized within the Component Specification where relevant, these maybe IEC or IECQ or ISO International Standard, or generic (and, if appropriate, sectional) specifications or a Technology Approval Schedule (TAS) relevant to the CS or where in the absence of an IEC, IECQ or ISO International Standard a national and or industry recognized standard/specification.
- **Product description:** A brief description of the approved components, piece parts or material.
- **Outline drawing and install information:** An outline drawing with main dimensions that are of importance for interchangeability and applicable installation information.
- **Applicant:** The creator of the Component Specification.

e-Labelling – Specifications for writing and reading

1 Introduction

The e-Labelling functionality is based on AIDC (Automatic Identification and Data Capture) Information Technology. AIDC is normally referred to as Bar Coding. The technology of Bar Coding is based on the recognition of patterns encoded, in bars and spaces or in a matrix of modules of defined dimensions. These are fixed according to rules defining the translation of characters into such patterns, known as the symbology specification. Symbology specifications may be categorized into those for linear symbols, on the one hand, and two-dimensional (2-D) symbols on the other. (ISO/IEC 15415)

An AIDC symbol must be produced in such a way as to be reliably decoded at the point of use, if it is to fulfil its basic objective as a machine-readable data carrier.

e-Labelling Information Technology is based on a unique symbology. As a single mark ('Mark'), it has application for external marking on electrical or electronic devices ('Device') or components ('Components'). It can be produced as an Affixable Printed Product (APP) that is applied to the Device or, by Direct Part Marking (DPM) typically laser etched into the outer surface of the Device or Component. In both cases the area of the alteration to the substrate/device is called the 'Mark'. The area that includes the Mark and background as a whole, when containing a pattern defined by a 2-D symbology specification, is called a 'Symbol'. Individual electronic components are considered Devices.

With traditional 2-D symbologies, the Mark is always smaller than the Symbol. This is because of the requirement for a so-called 'quiet zone' surrounding the Mark. The technology used for e-Labelling has no such limitation, and the Mark is normally the same size as the Symbol. This feature is critical for devices where free space is restricted. For e-Labelling therefore, the terms Symbol and Mark are interchangeable and synonymous. For clarity in this specification it is called Mark.

Direct Part Marking (DPM) is a technology whereby, generally an item is physically altered to produce two different surface conditions. This alteration can be accomplished by various means including, but not limited to, laser etching. Low cost, low power fiber lasers are normally used. The Mark is typically 50 -100 Microns deep and does not damage the device. For e-Labelling DPM applications, this specification is based on ISO/IEC TR 29158.

For both e-Labelling formats: APP and DPM, the encoded Mark requires light to read and decode. The data elements within the Mark are identified using a technology known as OCR (Optical Character Recognition). When light illuminates the Mark, it reflects differently depending on whether it impinges on the background of the substrate or on the physical alteration. For APP e-Labelling, when scanning to decode, light is reflected off a smooth surface that has been colored to produce two different diffuse reflected states. The DPM environment generally does not fit this model because the two different reflected states depend on at least one of the states having material oriented to the lighting such that the angle of incidence is equal to the angle of reflection. However the e-Labelling DPM technology has overcome this limitation.

There are many methods of assessing 2-D symbology quality at different stages of Symbol production. The methodologies described in this document are not intended as a replacement for any current process control methods. They provide Mark producers and their trading partners with universally standardized means for communicating about the quality of the E- Labelling formats. The procedures described in this International Specification must necessarily be augmented by the reference decode algorithm and other measurement details within the e- Labelling Mark specification, and they may also be altered or overridden as appropriate by governing symbology or application specifications.

2 Scope

This is an engineering document intended for application specifications developers.

It describes modifications which are to be considered in conjunction with the Mark quality methodology defined in ISO/IEC 15415 and ISO/IEC TR 29158 and a symbology specification. It defines alternative illumination conditions, some new terms and parameters, modifications to the measurement and grading of certain parameters, and the reporting of the grading results.

It was developed to assess the Mark quality of both Affixed Printed Product (APP) and Direct Part Marking (DPM) of e-Labeling products, where the Mark is either printed on an affixable material substrate to be applied directly to the surface of the Device or, where the Mark is laser etched directly into the outer surface of the Device or Component. In both cases the reading equipment can be a Smartphone or a webcam attached to a PC. For accurately measuring and grading the quality of the Mark, a microscope camera is required, with minimum requirement of 1.2 mega pixels, 200 x magnification and 6 co-axial LED lights.

This method is appropriate and can be equally applied to Marks produced to APP and DPM methods. Marks are being scanned in the same scanning environment.

2.1 Application

This specification defines the requirements to establish and control the production of IECQ Approved Component – e-Labeling that may be affixed to, or etched into, the surface of electronic Devices, or Components.

In these instances, the e-Labeling specification only applies after data records (“Data Records”) specific to the Device have been digitally linked to that Device or Component. The e-Labeling Data Record may include among others: specifications, images, text, drawings, photographs or videos.

In the event an APP e-Labeling is produced away from the Device or Component’s manufacturing location, the requirements for verifying both the print/mark and read quality of the label is defined in ISO/IEC 15415, ISO/IEC 19762-01, ISO/IEC 19762-02 and ISO/IEC TR 29158.

In the event that an APP e-Labeling is produced, this specification defines the requirements for implementing processes to first print or mark the e-Labeling then test, analyze or otherwise ascertain the ability of the e-Labeling to be correctly read and then to successfully test, analyze and link to the associate Data Records and finally make these Data Records available in an efficient manner to the customer or agency.

In the event a DPM e-Labeling is produced, this specification defines the requirements for first applying the Mark to the Device or Component in such a manner that shall not affect in way the functionality or performance of the Device or Component. The DPM e-Labeling must be correctly read and successfully linked to the associated Data Records which shall be made available in an efficient manner to the customer or agency. After an e-Labeling DPM is applied to a Device or Component it must always be validated by decoding before the next item is marked.

Data Records linked to the e-Labeling, provide compliance with the regulatory information that is otherwise impractical to reside on the external surface of the Device because the available space is too small or overcrowded.

3 Normative references

The following publications contain provisions, which, through reference in this text, constitute provisions of this specification. At the time of publication, the editions indicated were valid.

ISO/IEC TR 29158, *Information technology – Automatic identification and data capture techniques – Direct Part Mark (DPM) Quality Guideline*

ISO/IEC 15415, *Information technology – Automatic identification and data capture techniques – Bar code symbol print quality test specification – Two-dimensional symbols*

ISO/IEC 19762-1, *Information technology – Automatic identification and data capture (AIDC) techniques – Harmonized vocabulary – Part 1: General terms relating to AIDC*

ISO/IEC 19762-2, *Information technology – Automatic identification and data capture (AIDC) techniques – Harmonized vocabulary – Part 2: Optically readable media (ORM)*

In the event of conflict between the provisions of this document and any other directly or indirectly referenced provisions, the provisions of this document shall take precedence.