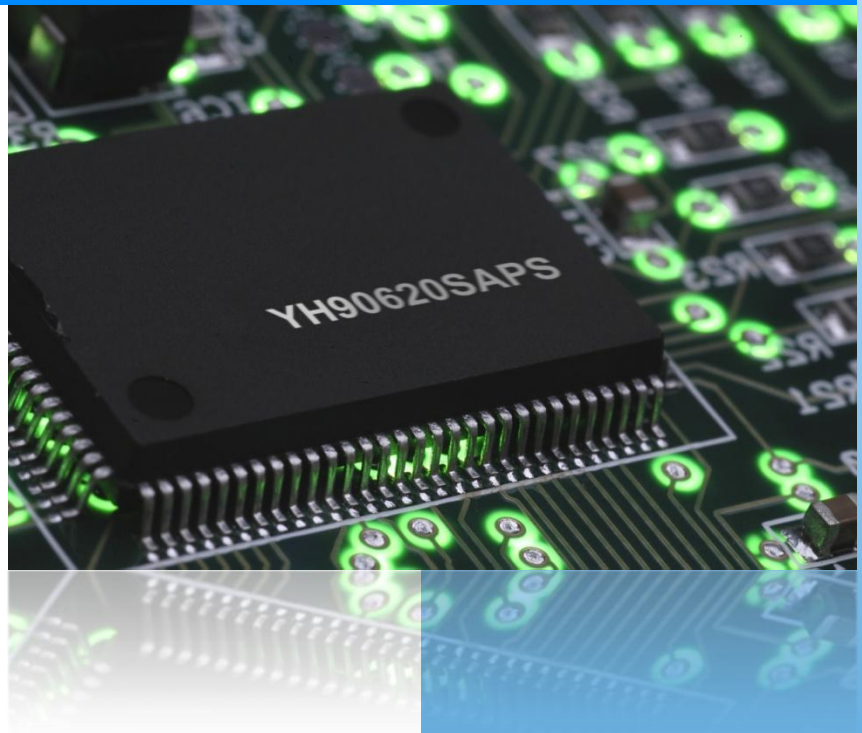




Application sample - OCR Lot Mixing



Introduction

In the semiconductor final packaging process, it is very common to check component's lot codes. Lot mixing check is necessary for the quality control of the product.

A system utilizing EasyOCR is suitable to verify that only components from a specific lot are present in the final packaging.

Three application samples are provided to illustrate this process:

- **Lot Mixing Learn**

This sample deals with the learning of characters to be used in the lot mixing checking process. The resulting font file can be saved. Running this sample requires an EasyOCR license.

- **OCR Font Explorer**

The EasyOCR character recognition operations rely on the usage of proprietary font files. A font file stores the segmentation parameters allowing to extract characters from the inspected image, as well as the set of learnt characters. Each character is stored as a small bitmap, called a pattern.

This sample shows how to browse the list of patterns stored in an EasyOCR font file. It can be used as a font file maintenance tool. Running the sample requires an EasyOCR license.

- **Lot Mixing Online**

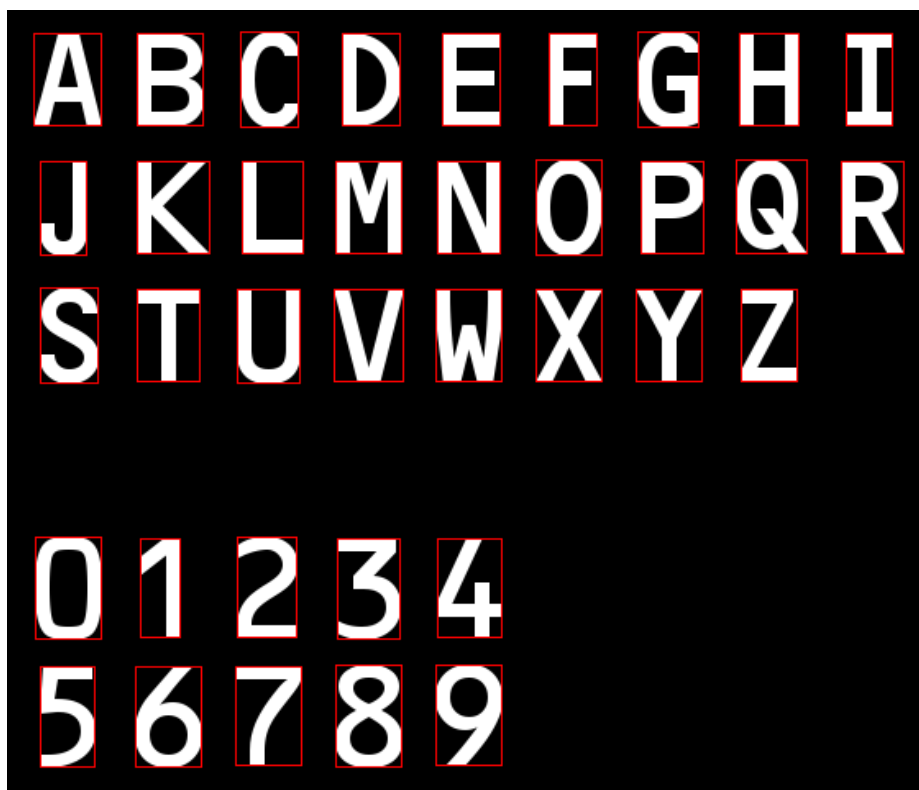
This application sample exhibits the final inspection using EasyOCR. Characters of each device are read and reported. To run this sample, the EasyOCR, EasyImage, and EasyGauge licenses are required.

Lot Mixing Learn

Initialization

An image featuring the set of characters used by the device is needed for the learning process.

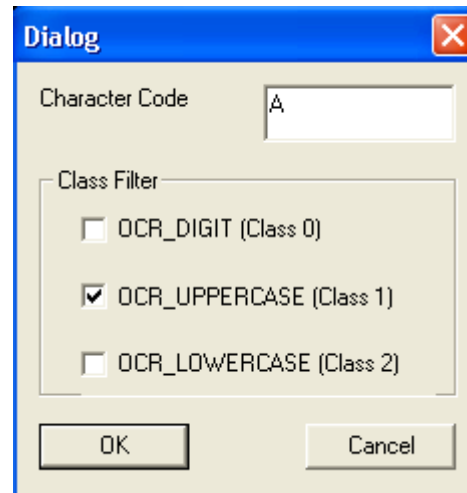
In this example we use the OCR-B.bmp image which contains all white uppercase and numeric OCR-B characters on a black background. This image is segmented to find the character blobs. A red bounding box is drawn around each character.



Learning

Once the characters have been extracted from the image, the next step is to:

- Associate each character with the relevant code.
- Set the class the character belongs to.



This step is implemented in the CharCodeDialog. It is invoked whenever a character on the image is double-clicked. It is required to specify the character code and the class it belongs to. Once this is done, EasyOCR adds the character pattern, the corresponding code and the class into its memory,

Saving

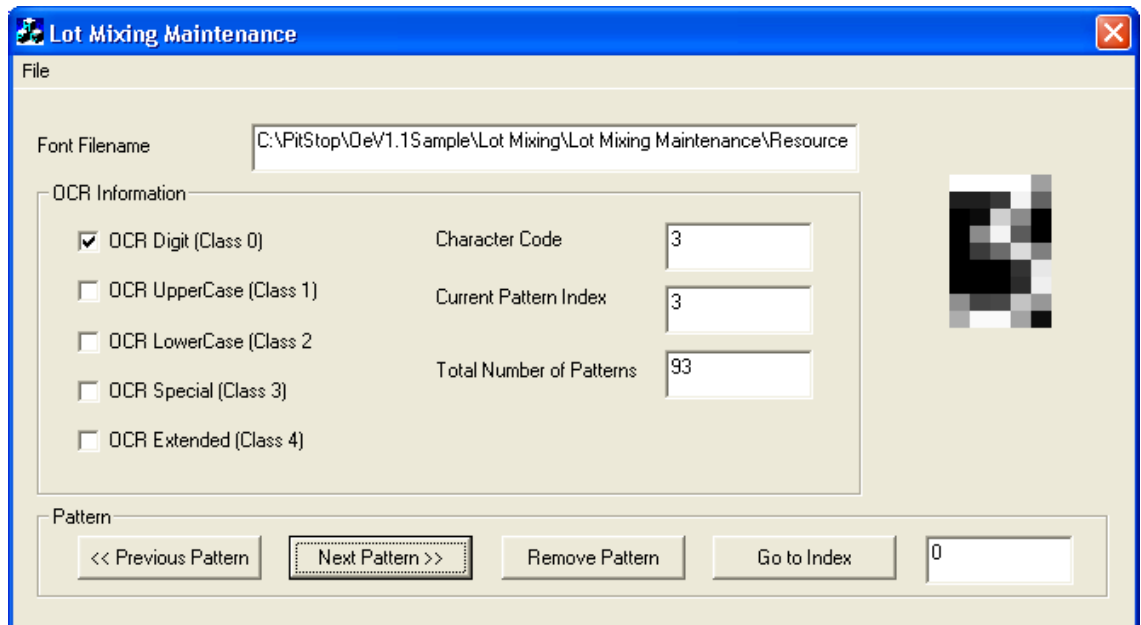
The final step is simply saving the learnt characters into an EasyOCR font file so that it can be used later. This is done via the File->Save Font File menu item.



OCR Font Explorer

Navigation

This sample shows how to load an EasyOCR font file, navigate through the stored patterns, retrieve the associated character code and class, and remove a given pattern. Each pattern in the font file is identified by its index.



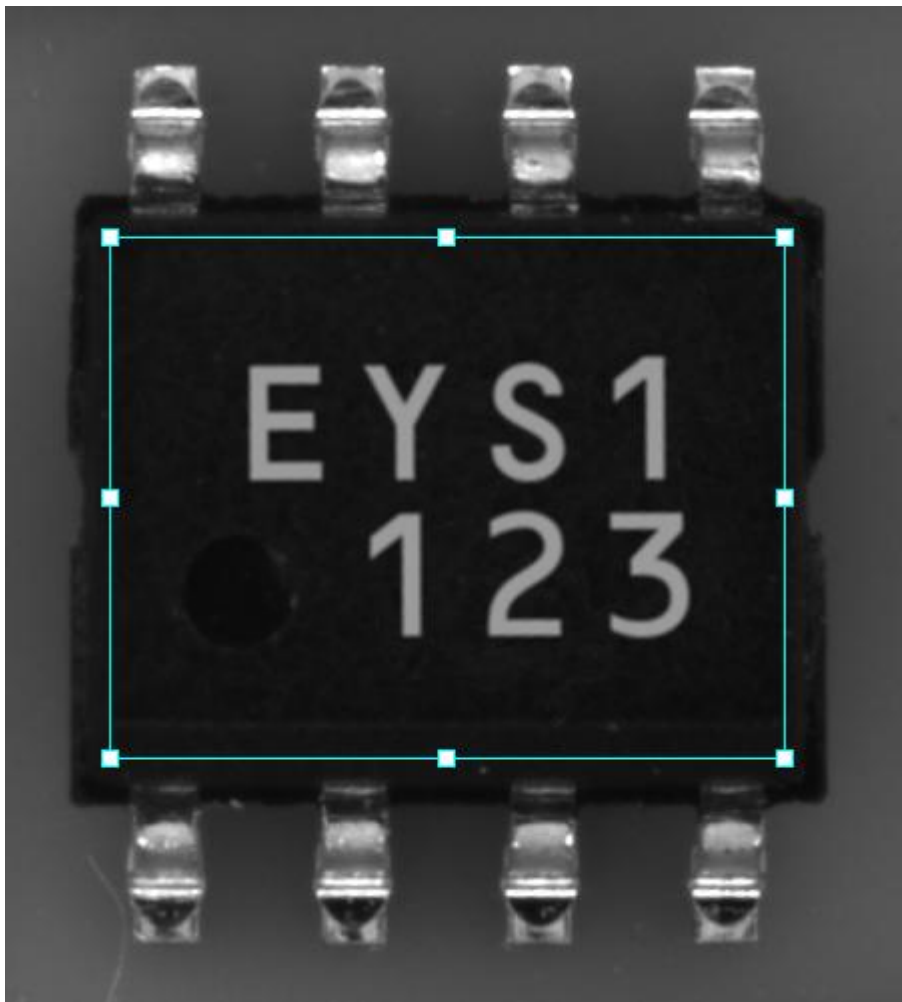
To start using this sample, load a font file via the [Load Font File] item of the [File] menu. If necessary, the font file can be saved via the [Save Font File] item of the [File] menu.

Lot Mixing Online

Initialization

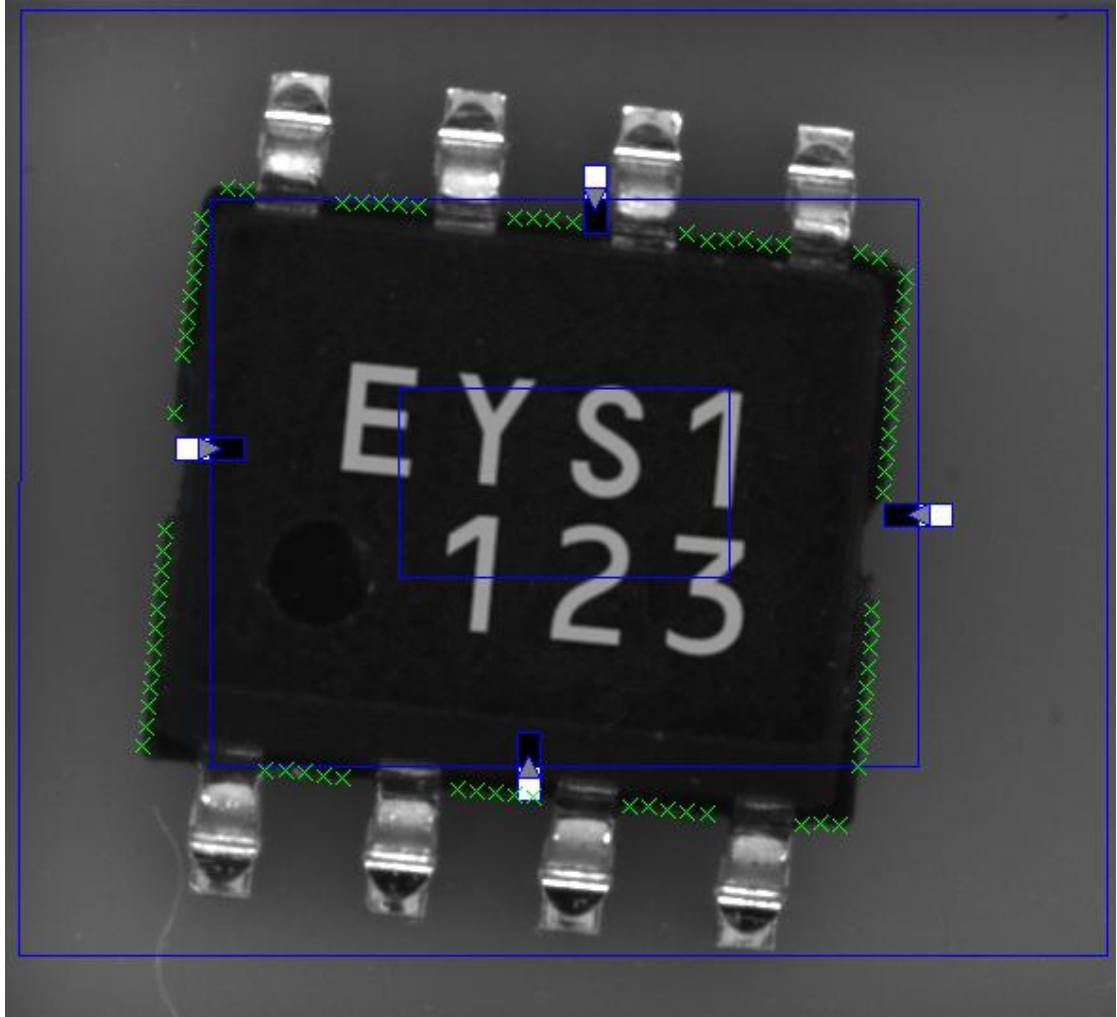
The required font file for characters recognition is first loaded prior to inspection. In this example we will use the OCR-B.ocr file created by the Lot Mixing Learn sample.

The OCR operation will only be performed on the device body area. This is achieved by means of an ROI.

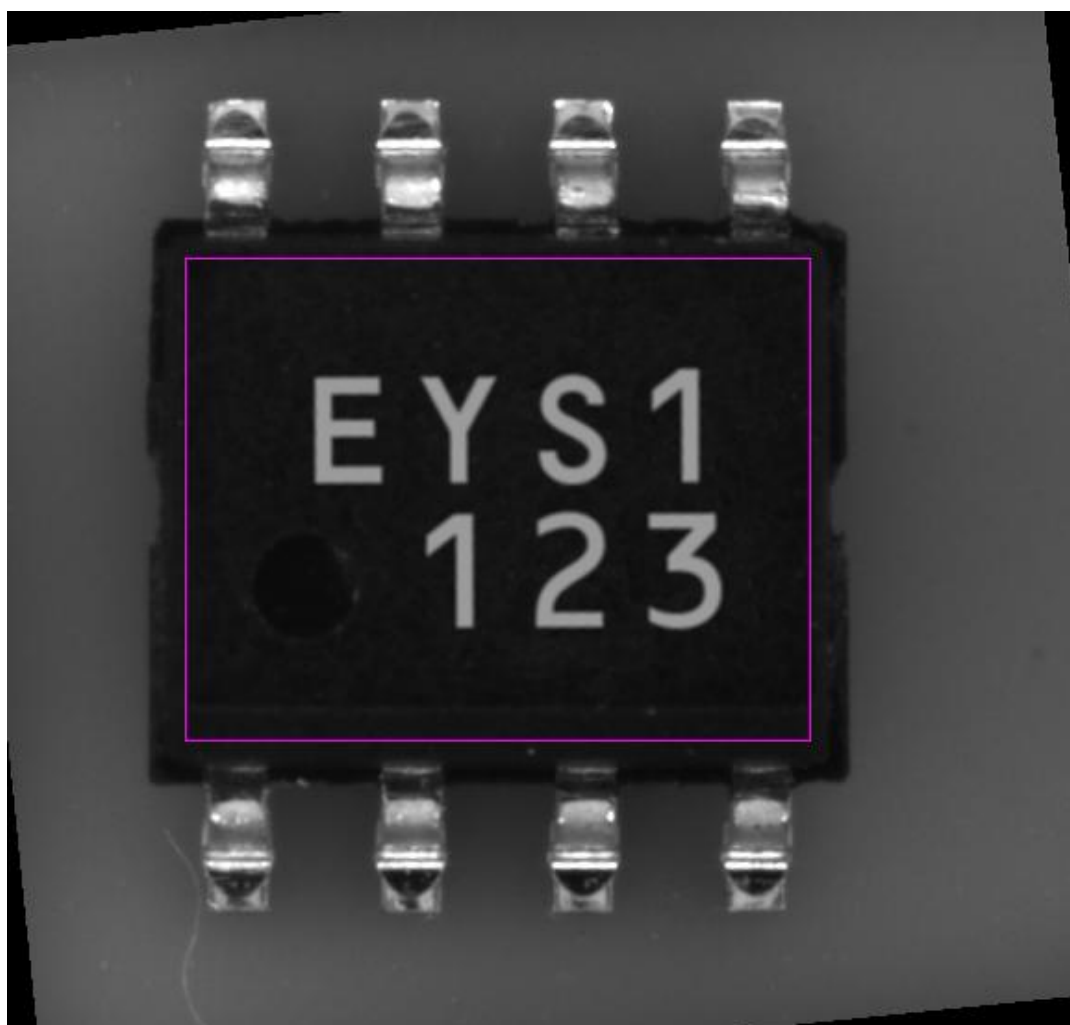


Inspection

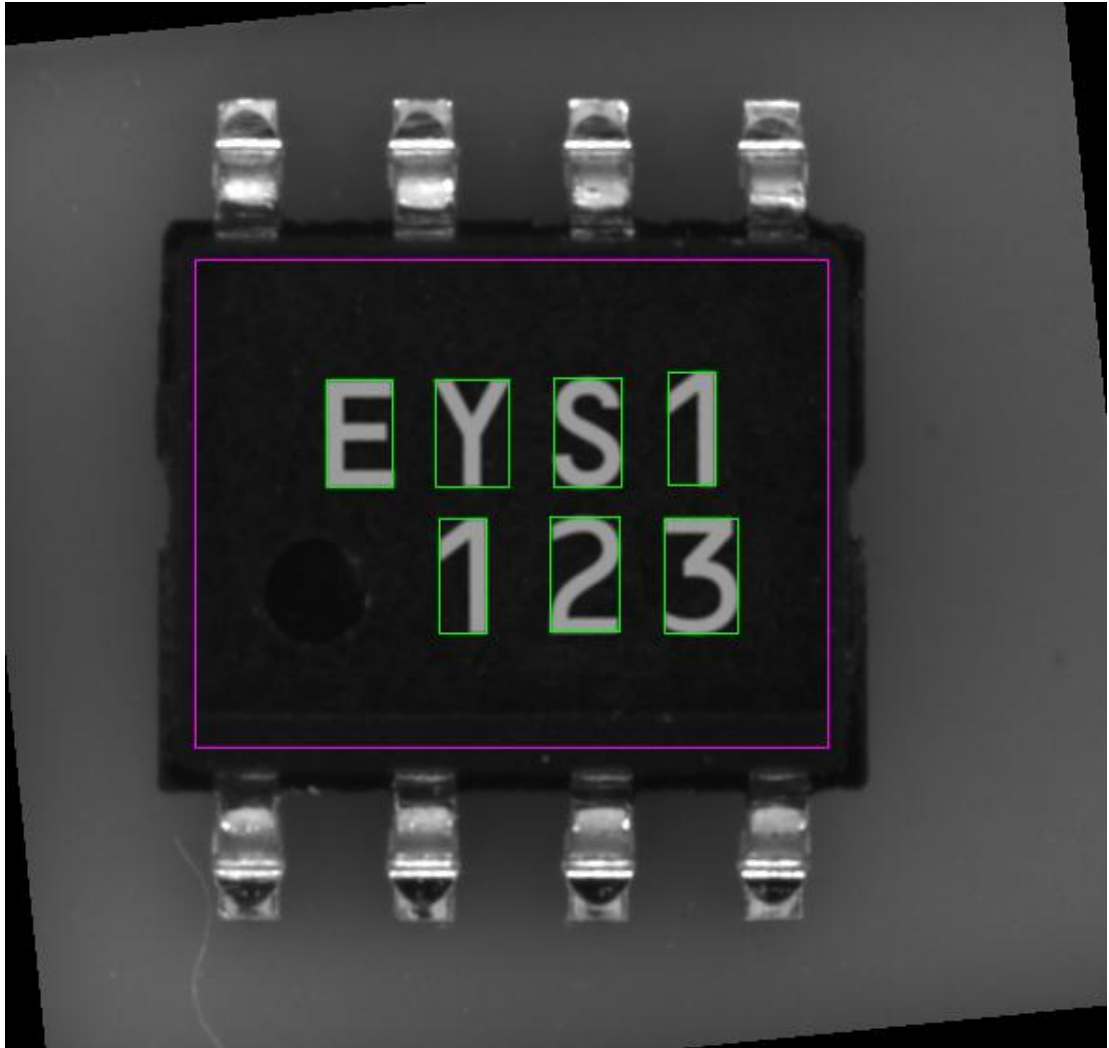
As the position of the device varies from one image to another, the first inspection step consists in using an ERectangleGauge tool to retrieve the position and the rotation angle of the device body.



The image is then registered so that the device body is centered on the image and its rotation angle is zero. This is done on temporary image storage. An ROI is placed on the device body area.



The last step invokes the EasyOCR recognition function within the ROI area.



The recognized string is displayed together with the original source image.

