

APPLICATION BRIEF

SFT no.27

2007.4

Using the SFT9500 to check for the presence of lead in assembled PCBs

1. Introduction

In response to RoHS directives, analysis units that irradiate samples with fluorescent X-rays from below are widely used to check for environmentally hazardous substances in products. When samples are irradiated with fluorescent X-rays from below, irradiation diameter is large (5 mm Φ) and the test sample is close to the detector. As a result, this method is highly sensitive and able to detect minute amounts. However, there are times when measurement may be difficult when using such highly sensitive irradiation units. For example, when measuring a PCB that has parts on it and is near completion, it is troublesome to dismantle the PCB part by part. Even if non-destructive measurement is attempted, different part heights may negatively influence measurement accuracy.

This document introduces a simple way to use the SFT9500 for PCB mapping. The SFT9500 can monitor the contents of PCBs and display where the contents are located.

2. Testing

The following chart lists the measurement conditions when the SFT9500 mapped the PCB. (These are the conditions for each mapping point.)

Measurement time (seconds)	3
Collimator	$\phi 0.1\text{mm}$
Tube voltage (kV)	30
Tube current (μA)	1000
Filter	For Pb
Atmosphere	Air

3. Results

The results of the PCB measurement are shown below. The images show the elements that make up the PCB and where the elements are located. They allow us to clearly define the component elements of the PCB, and also can be used to monitor for harmful substances.

By looking at the element mapping data and images, we can see that lead was detected in two types of chips. Furthermore, barium was found in the ceramic section and bromine was detected in the PCB, indicating that the PCB contains halogen.

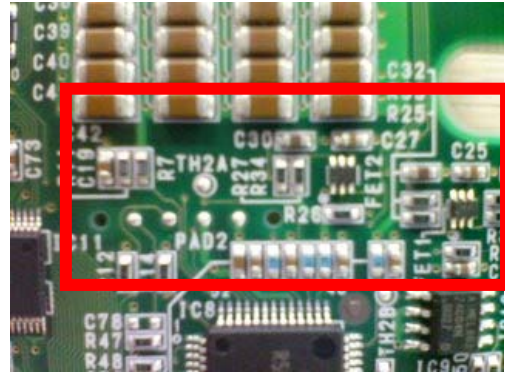
PCB mapping presents easy-to-understand information about the area measured. When lead is present, the location is obvious and the parts in question can be visually determined.

4. Conclusion

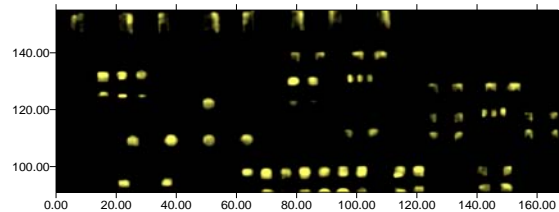
Areas on the PCB that contain lead can be easily determined because PCB mapping clearly distinguishes the measured elements. However, it is important to remember that items which are not included in the RoHS directive, such as resistors, are also measured. As a result, a PCB may be acceptable even when lead is detected.

Furthermore, the SFT9500 has a shorter measurement time and smaller X-ray irradiation diameter than fluorescent X-ray units that irradiate test samples from below. Also, the test sample and detector are further apart so the SFT9500 has difficulty making distinctions within several hundred ppm.

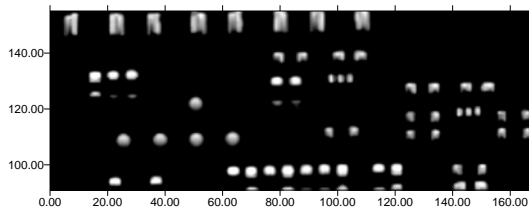
Did you accidentally use solder containing lead? Did a lot change shift your product from RoHS compliant to noncompliant? The SFT9500 is very useful for answering such questions.



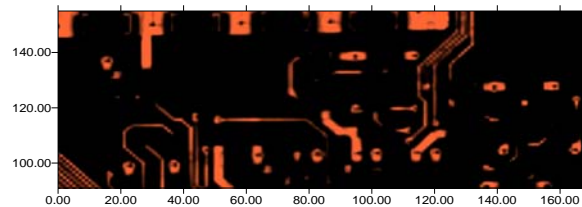
Ag



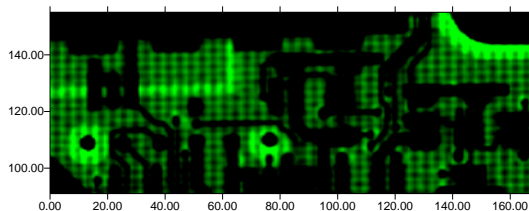
Sn



Cu



Br



Pb

