RADIATION ENGINEERING TRAINING

TRAD
Tests & radiations
a HEICO company

Atmospheric radiation environment and its effect on electronic components

Applications evolving in a neutron-rich environment may face reliability issues related to radiation effects. This topic is becoming critical for a large number of fields (such as avionics, automotive, and nuclear research and industry) and requires specific measures for component characterization and related calculations.

The purpose of this training is to provide engineers with tools and methods to better understand and quantify the neutron-rich radiation environments and their effect on electronic components. The characterization of device sensitivity operating in a neutron environment will be addressed and the standards related to radiation governing this activity will also be covered.

TRAINING CONTENT

1 Day*

1. **Introduction to Neutron environments**
2. **Basic Neutron-matter interaction mechanisms**
3. **Single Event Effects types and definitions**
4. **Specifics of Neutron testing**
5. **Standards applied to Neutron characterization and analysis**

- **Note**: If combined with the 'Characterisation of radiation effects on electronic components' session the duration can be adapted.

**Typical duration*

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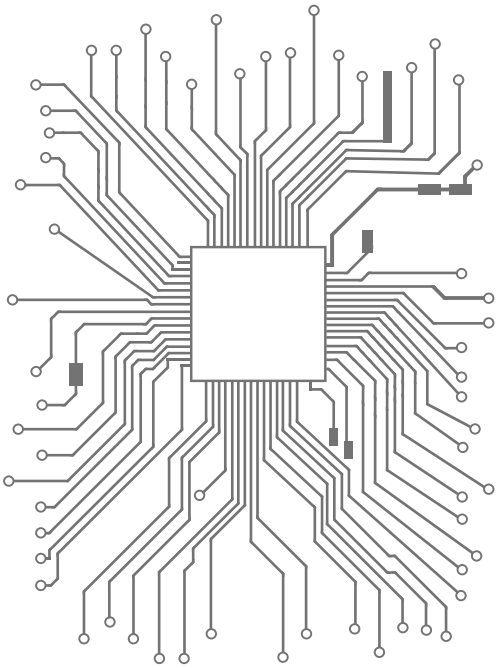
X-Ray inspections and dosimetry



X-ray inspections are part of the usual process for PCB assembly in the industry (verification of soldering; identification of defects, ...etc.). However, X-rays may generate some cumulated dose on electronic components which can have a impact on their functionality and lifetime.

The purpose of this training is to provide a general background on X-rays and their impact on electronic components, as well as discussing good practices to minimize the impact of dose when performing the inspections. General notions about dosimetry will also be presented.

TRAINING CONTENT

1 Day*

1. **X-rays origin and interaction with matter**
2. **Total ionizing dose effects on electronics devices**
3. **Notions on dosimetry, dose measurement and units**
4. **How to minimize the dose on X-ray machine**
5. **Examples of spectrum simulations with typical filters (using RayXpert® Software)**

- **Note**: If combined with the 'Characterisation of radiation effects on electronic components' session the duration can be adapted.

**Typical duration*

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