TRAINING COURSE PROFILE

EEE components hands-on laboratory testing for aerospace qualification

Objective(s):

Electrical, Electromechanical and Electronic (EEE) components need to be intensively tested to be qualified for aerospace use and before being launched in a spacecraft. This course develops the theoretical knowledge and the practical skills necessary to carry out an important part of this intensive testing: the pre-encapsulation inspection, also known as pre-cap. This inspection is always carried out at the EEE components manufacturers' facilities right before encapsulating the EEE components that are being manufactured. The manufacturer is the customer's test laboratory and that is why inspections like these are known as Customer Source Inspections (CSI). Moreover, buy-off and incoming inspections will be also covered.

Some of this course's targets are to provide a deep understanding of the need of these inspections, of the benefits of a correct implementation and of the ability to make a critical review of third-party reports.

Description:

Pre-cap inspection aims at determining, prior to encapsulation and sealing of the components that the parts are acceptable for further processing at the manufacturer's factory. Another type of CSI is the buy-off inspection. This one is oriented to determine the acceptability of the parts, once the lot is finished and typically prior to final electrical measurements at the manufacturer's site.

An incoming inspection is performed at reception of the goods in order to determine their acceptability based on the project requirements.

The course will cover in depth each of the activities carried out during customer source inspections (CSI) and incoming inspection as follows:

- MFR Traveller Sheet Review
- SEM/Radiation/Microsection Report Review
- Design Conformity Review
- Internal Visual Inspection (High & Low Magnification)
- Package and die inspection to international standards (e.g. ESCC 20400 Internal visual inspection and MIL-STD-883 Method 2010, 2014 or 2017). Differences between the two methods will be highlighted.
- Wire Bond Strength
- Die-Shear
- Checking of some Manufacturers' Process and Build Confidence in the Supplier
- External visual inspections
- Dimensions check
- Final test witnessing

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Training Methods:

The course will be divided into theoretical and practical sessions.

The theoretical session will be oriented to provide the entire theoretical basis to be able to carry out a CSI or incoming inspection covering all the steps that the inspection entails. In particular, the acceptance criteria allowed by the ESCC and MIL methods indicated above, will be covered in depth.

In the practical session the trainee/(s) will be carrying out the tests required in CSI / Incoming Inspection at the laboratory, fully guided by ALTER TECHNOLOGY experts on different EEE component types, for instance, discrete semiconductor components, Integrated Circuits (IC) or hybrid components.

During the practical sessions ALTER TECHNOLOGY will provide the necessary materials, documentation and samples of the selected EEE component types, so that the trainees can experience “real” performance at each step of the inspections carried out.

Target Group:

All staff and contractors/engineers/scientists who wish to have a hands-on, 100% lab approach to Electrical, Electromechanical and Electronic (EEE) components.

Trainer:

ALTER TECHNOLOGY TÜV NORD qualified personnel.

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