Destructive Physical Analysis (DPA)

DPA of electronic components is a serious of physical test and slice analysis for checkout of rejection defects of a small amount samples drawed randomly from electronic component products and judging if eligible. DPA can be applied to structure analysis and defect analysis of electronic products, comparision for choosing better products and identify true products.

### Application
- Checkout for surface and internal defects of electronic components
- Mechanism analysis for malfunctions happened in the process of design, manufacture, test, experiment and application by means of serious of analysis techniques.

### Applicable product
- Components (Chip inductor, resistor, LTCC component, chip capacitor, relay, switch and connector so on)
- Discrete devices (diode, audion and MOSFET so on)
- Microwave device

### Standard
- GJB 548B-2005 Test methods and procedures for microelectronic
- GJB 4027A-2006 Destructive physical analysis methods for military electronic components
- GB/T 17359-1998 General specification of X-ray EDS quantitative analysis for EPMA and SEM
- IPC-TM-650 2.1.1 Microsectioning methods manual
- EIA-ECA-469-D STANDARD TEST METHOD FOR DESTRUCTIVE PHYSICAL ANALYSIS (DPA) OF CERAMIC MONOLITHIC

### Analysis significance
- Complete machine enterprises acquire evidences for claim for compensation, supplier management, improvement of circuit design and test techniques.
- Components and parts factories acquire evidences for improvement of design and techniques for targeted products by understanding the design, structure and techniques of the components.
- Customs and components import and export institution understand exactly the structure of components and classify products correctly.
Instrument: Optical microscope, X-ray CT, Tegramin Section System, SEM/EDS

DPA: Decapsulation → Sample drawing → Appearance inspection
X-ray fluoroscopic examination → Sample preparation and microscopic examination → Grinding and polishing → SEM/EDS analysis

Analysis item:

- Appearance inspection
- Internal structure analysis (SEM)
- Internal defect examination (SEM)
- Internal structure analysis for defect location of the electronic component (CT)
Dimension measurement (SEM)

Element analysis

Spot-scan

Linear-scan

Area-scan

Element map