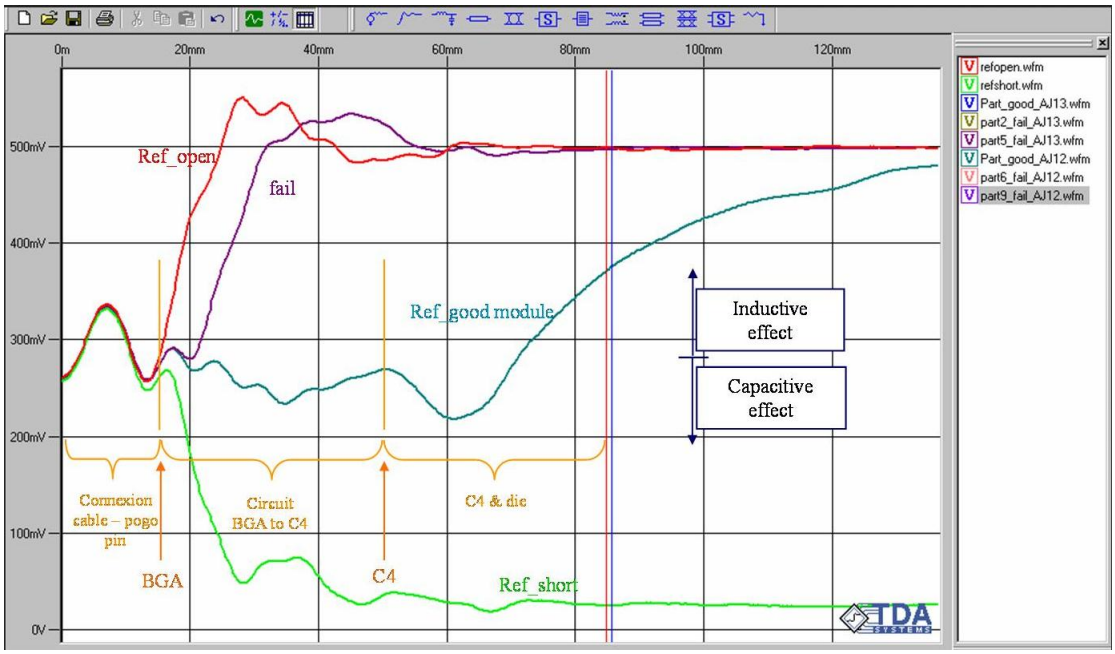
Analytical Services

Time Domain Reflectometry (TDR) is a non-destructive fault isolation technique used in the microelectronics industry for several years. This technique allows the localization of electrical failures, prior to destructive investigation, permitting to reduce the investigation cycle time and to mitigate the risk to oversight the defect.

This technique does not require sample preparation, it can be used on diverse packages (ex. Flip Chip and Wirebond packages) and for any electrical continuity problems (open, short, or resistance signature).

This technique sends a high frequency electrical pulse into the defective circuit and records impedance (Z) variations within the integrated circuit as a function of time. Using a good module as reference, the impedance profile of bad and good modules can be compared to facilitate the defect localization.



Typical impedance profile for a laminate defect

The TDR tool available at C2MI can reach a spatial resolution of approximately 750µm, using a 50GHz plug-in module, and a rise time of 12ps in a microelectronic circuit with an effective dielectric constant of 3.5. Thus, a defective signature can be related to the substrate or die in a few minutes, without destroy the IC module.