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이온빔 집속장치에 의한 회로단선 추적기술

(Using Focused Ion Beams for Testing Microstructure Isolation and Continuity)

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As the sizes of devices continue to shrink, new methods are needed in the semiconductor industry to check isolation and continuity on a submicron scale. We show the charge induced detection method with focused ion beam (FIB) which allows us to easily detect failure site of contacts. An application to locate the failure site of via contact after electromigration test using double - level metal pattern is demonstrated.

First, a passivation layer of failed samples is etched and removed with CF_4/O_2 plasma etcher. Next, either side of the metal pads is irradiated with Ga^+ ions. If the metal pattern is isolated, a clear contrast of secondary ion microscopy image can be seen at failure site since the isolated part is not positively charged (Fig.1). The failure sites are confirmed using the FIB - assisted cross-section milling of the turning point of contrast.

Fig.1. SIM image showing turning point of contrast