



# Application Note 002

## Void Gate Imaging

### Introduction

One important reliability issue of plastic packages is voids in mold compound. Voids in mold compound are introduced during molding and provide ideal sites for delamination propagation.

To detect voids in mold compound, a single data gate can be placed within the mold compound to record strong reflections caused by voids, which results in bright spots over dark background images. However, such images may not be so useful due to the lack of meaningful background. Instead, a void gate can be used to detect voids in the mold compound and overlap the findings with meaningful background.

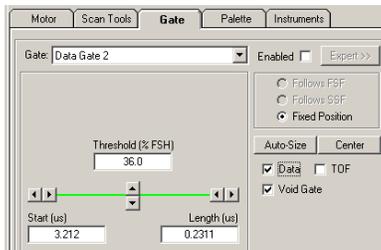
### Procedure

To use void gate imaging, two data gates are required. As shown in **Figure 1**, Data Gate 1 (the red gate) is used to generate a background image, which covers the interface of interest, generally the die top. Data Gate 2 (the green gate) is placed to cover the mold compound.



**Figure 1: Gate placement**

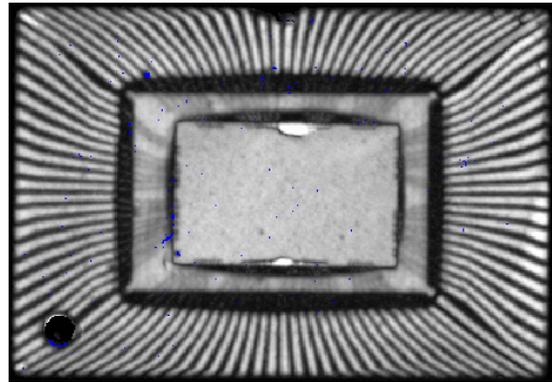
Check the “Void Gate” option for Data Gate 2 as shown in **Figure 2**. The “threshold” is used to differentiate reflections of voids from background noise. As shown in **Figure 4**, the threshold of the green gate is set at 36% FSH in this case, which is well beyond the noise level and still be able to detect the reflection of voids.



**Figure 2: Void gate set up**

### Results

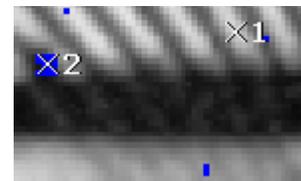
A typical image generated by the void gate is shown in **Figure 3**. The blue spots indicate suspect voids in mold compound. By overlapping with the background image, the location of voids can be easily determined.



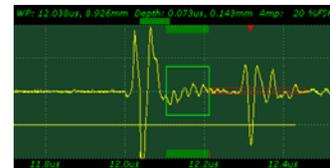
**Figure 3: Blue spots indicate suspect**

### Verification

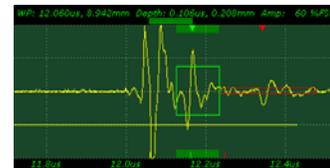
-- As illustrated in **Figure 4**, blue spot 2 is due to the strong reflection of voids in the mold compound.



**A-Scan1**



**A-Scan2**



**Figure 4: Strong reflections due to voids in mold compound.**