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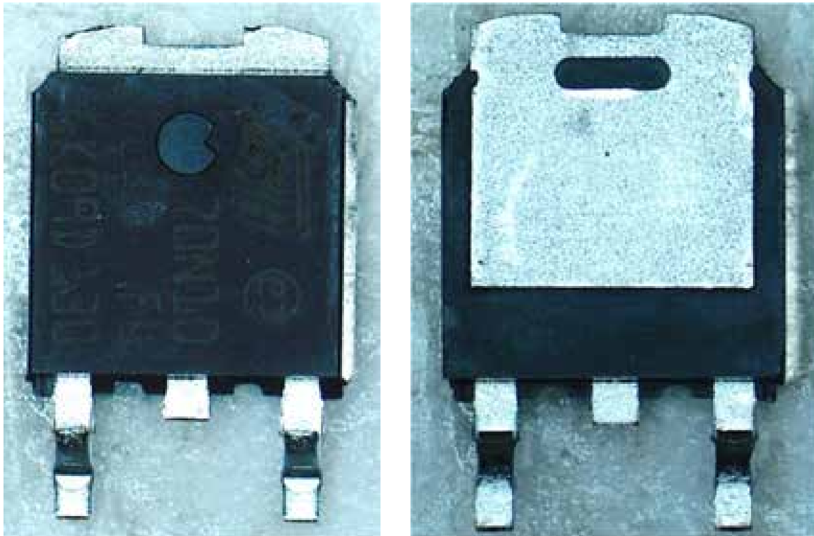
PICTURE BOOK

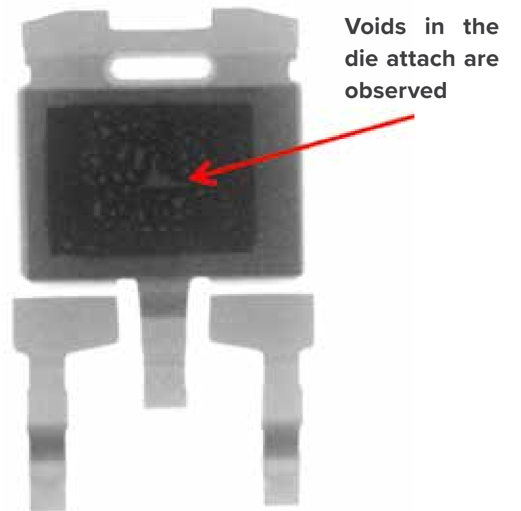
Level 1 Failure Analysis

Level 1 FAs include: non-destructive tests optical inspection, X-ray, C-SAM, and electrical characterization. This can complete an analysis or indicate the path for deeper analyses.

PACKAGE OPTICAL INSPECTION



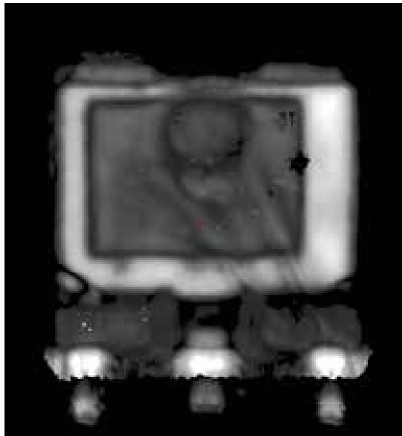
X-RAY INSPECTION



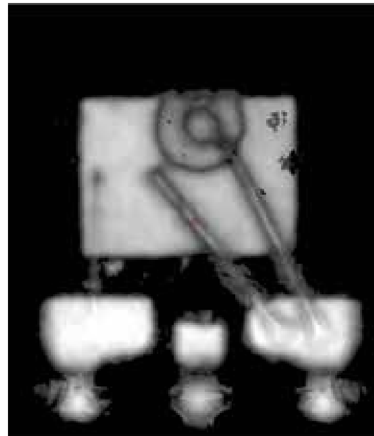
Voids in the die attach are observed

C-SAM INSPECTION

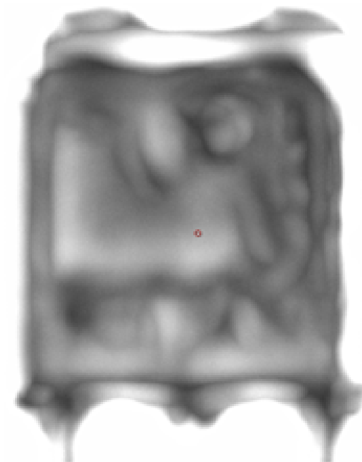
PADDLE



DIE SURFACE



THRU SCAN



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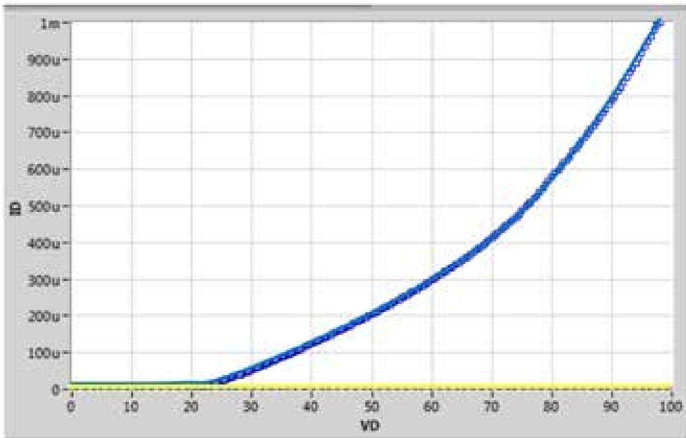
Level 1 Failure Analysis

ELECTRICAL CHARACTERIZATION

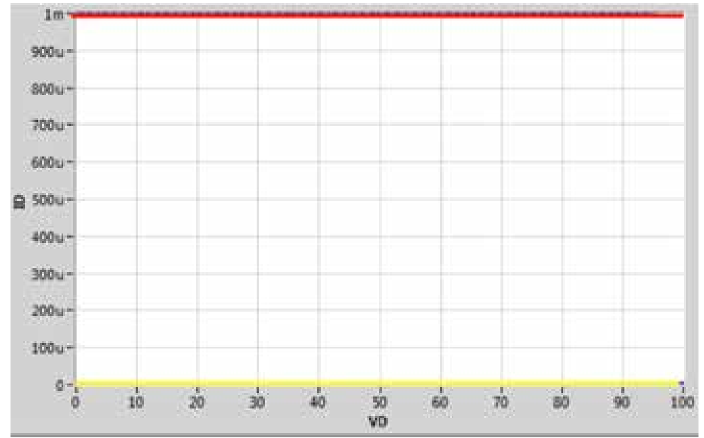
Drain I-V curve: Good vs. Leaky device



Blue =leaky device

Yellow=good device

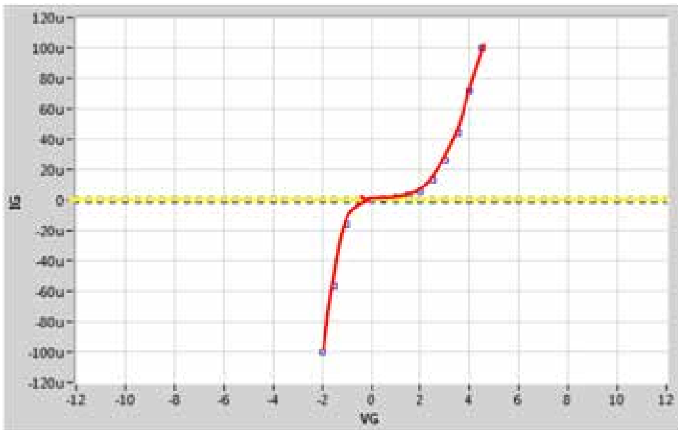
Drain I-V curve: Good vs. Short device



Red =short device

Yellow=good device

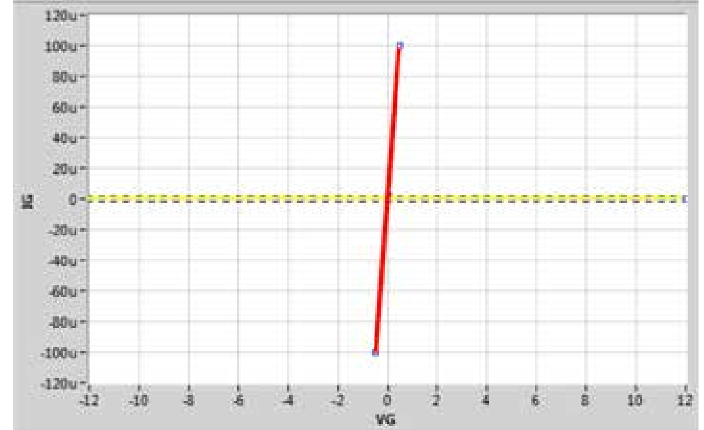
Gate I-V curve: Good vs. Leaky device



Red =leaky device

Yellow=good device

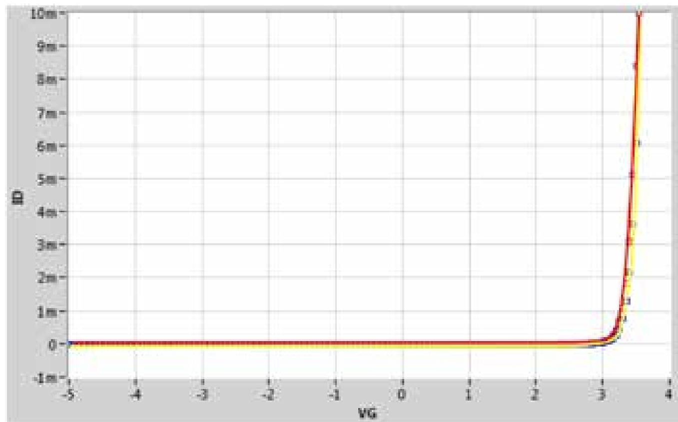
Gate I-V curve: Good vs. Short device



Red =short device

Yellow=good device

Vth I-V curve: Good vs. Leaky device



Red = device suffering from negative Vth shift due to leaky Drain current in transistor

Yellow=good device

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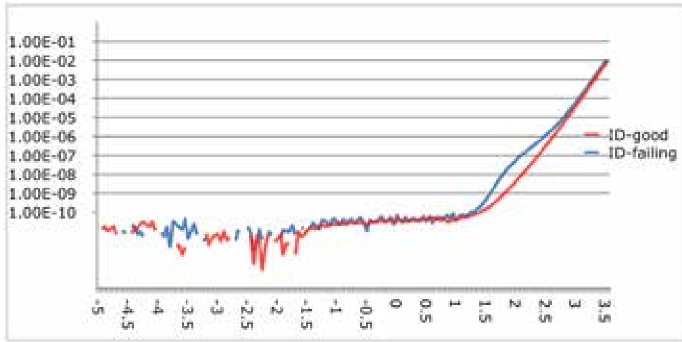
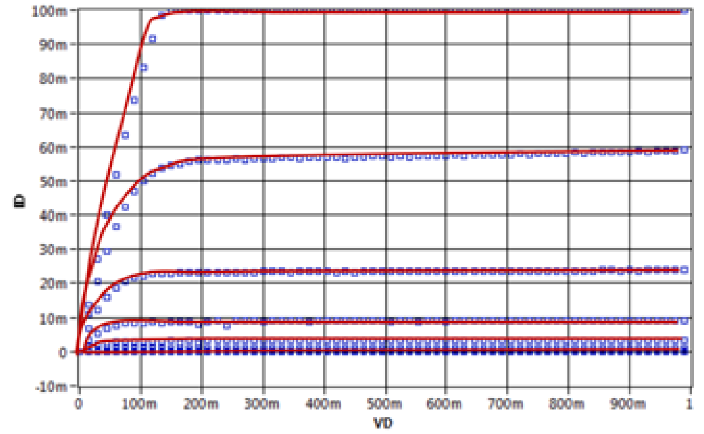
Level 1 Failure Analysis

Vth I-V curve: Good vs. Leaky device (log scale)

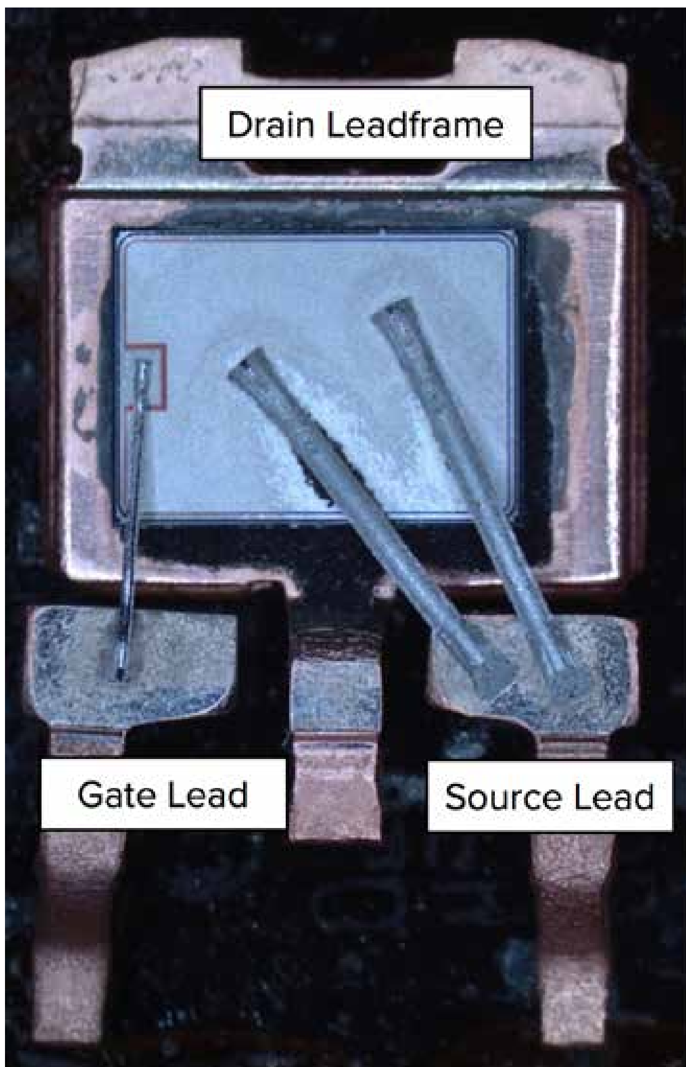


Transistor Characteristic Curves

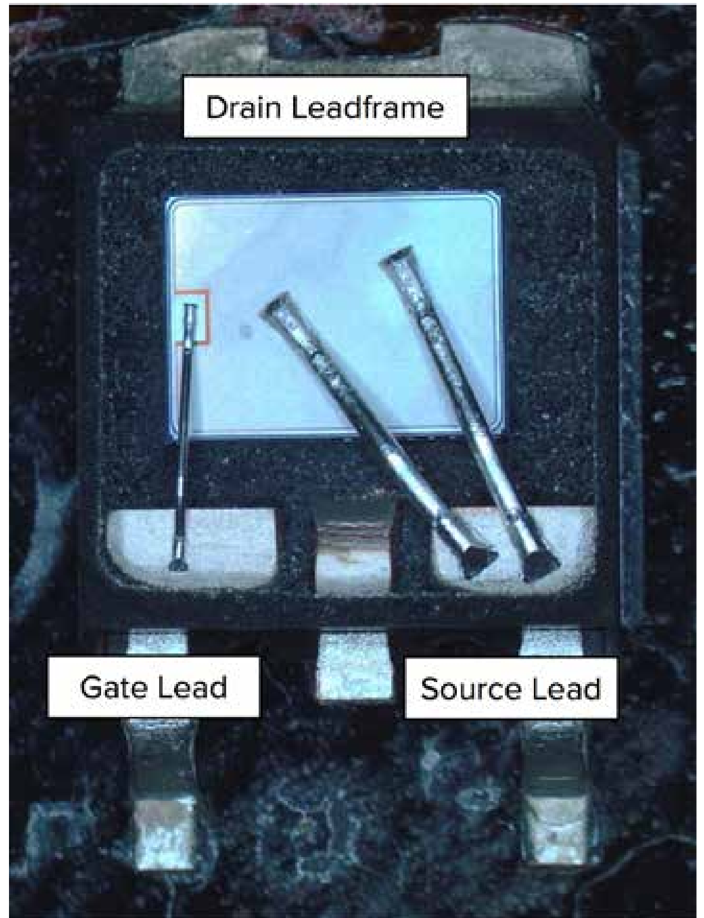


DECAPSULATION

Full boil out to remove all the encapsulation material



Using drop method to preserve encapsulation material and protect leads



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