Prior to this work, catastrophic shorting was a major reliability challenge for OLED manufacturers.

- **Origin unknown**
- **Unpredictable**
- **Lack of mitigation strategy**

> Understanding the nature of shorts is critical

## Two general classes of defects

1. **Bright spots**: Local EL at subthreshold panel voltages.
2. **Hot spots**: Observed under temperature-selective EL imaging.

**Hot spots & bright spots do not generally coincide**

### Short origin from hot spots

- **Hot spot evolving with reverse bias duration**
- **Dark spot forming after accelerated fade testing on hot spot**

### Possible strategies
- Avoid shadowing
- Ultrathin dielectric layer
- Fuse-like layer

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**Conclusions**

- Two different classes of defects identified: ‘Bright’ spots and ‘Hot’ spots.
- Bright spots are associated with ITO particles and are not precursors of catastrophic shorts.
- Hot spots are associated with particulates in the organic layer stack and are precursors of catastrophic shorts.
- A model has been proposed for the growth of hot spots into catastrophic shorts.
- Proprietary new device architecture has been demonstrated to arrest growing shorts and eliminate catastrophic failure in production.