Z-power LED – failure mode

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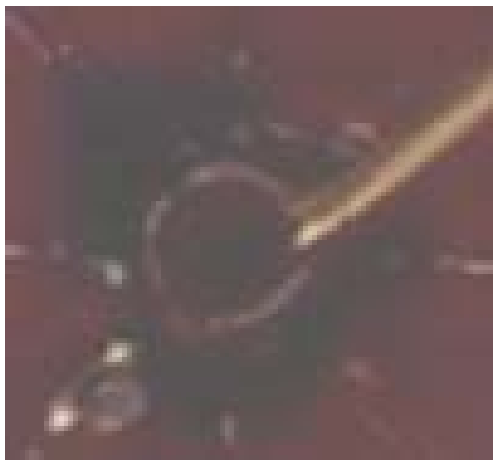
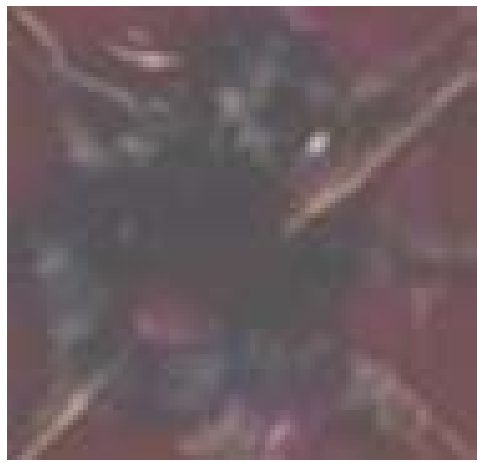
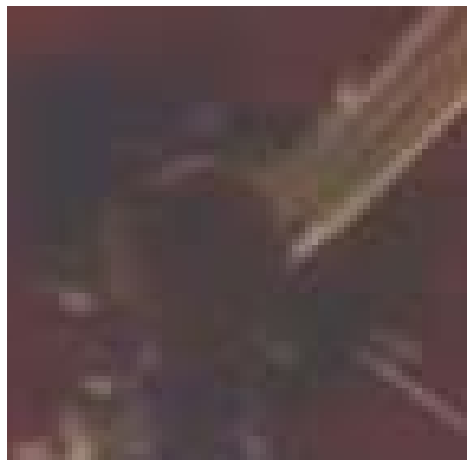
* **Problems of electrical overload**

Critical failure can be caused by supplying overload current and voltage(over 5V) or exceeding the maximum value of forward current written on our datasheet.

Critical failure types of product can be caused in different ways including failing electrical overload. The gold wire in LED products can be destroyed due to its electrical overload. If external shock damages the gold wire, it could also damage the whole product.







It is unable to find this figure through x-ray, but optical microscope, only

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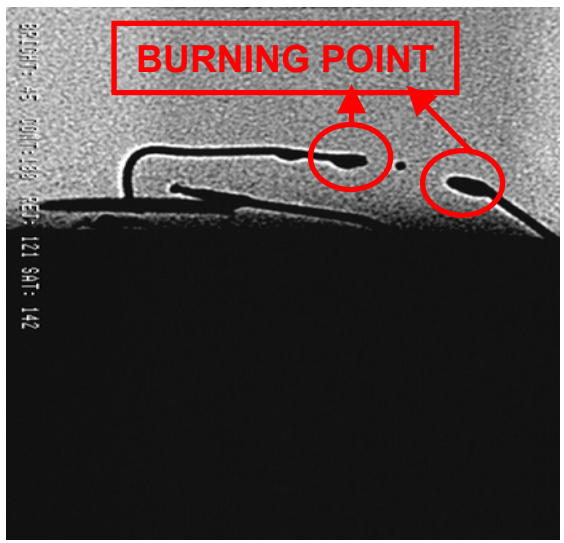
*** Problems of wire disconnection**

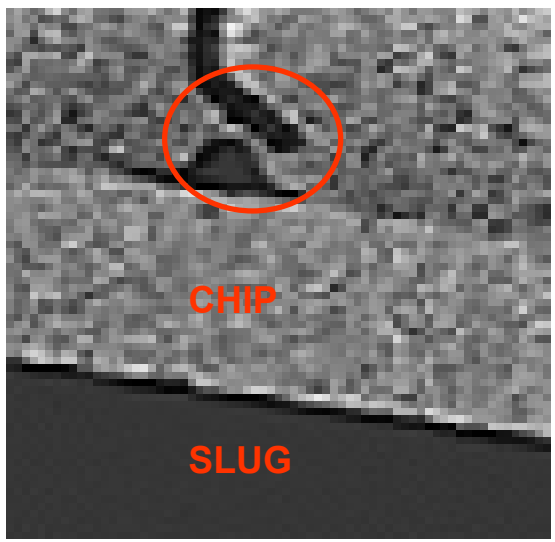
Overload current is destroyed not only the gold wire in LED products,but also the wire connection. Since current determines the amplitude and period of electrical circumstance as well as the diameter of gold wire, the gold wire can be fused and disconnected due to its high current. Finally, the long pulse transient can also cause the wire disconnection. If mechanical or physical damage is applied in silicone lens, the wire is disconnected according to the external impact.

-Wire is melted by electrical disconnection

-Mechanical disconnection shows that a clean cut edge of the wire



Electrical disconnection



Mechanical disconnection

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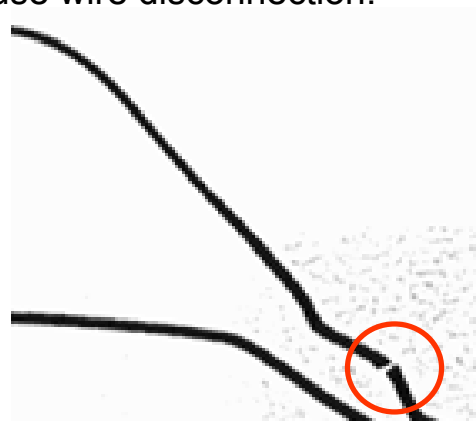
*** Problems of thermal overload**

Since there are differences in coefficient of thermal expansion in product, various types of critical product malfunction are caused when the product is exposed to high internal temperature of maximum electric shock or thermal circulation. In general, silicone is very soft and elastic and has higher resistance power than epoxy. When excessive internal temperature in silicone increases, external surrounding heat also increases. Therefore, too much forward current and thermal resistance cause extremely high external temperature and surrounding heat.

Between a layer of protect shield and chip can be separated due to the excessive heat, then it narrows the contact surface down between chip and silicone in a package. This would not cause the main critical malfunction, but luminous flux could not be continued.

In case of white, between a layer of phosphor coating and patented silicone protector or between a layer of phosphor coating and chip might be separated. Moreover, increasing external temperature of lead contraction and expansion of silicone are able to cause wire disconnection.



-Cause wire disconnection due to its increased external temperature and surrounding heat