

Life Prediction of 19-137 Series

Issue Date : 1-Jul-2020

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Revised Record		
REV.	DESCRIPTION	RELEASE DATE
1.0	Preliminary edition	2020/7/1

1. LED life prediction model

Exponential Decay Model

When the LED operated at t time, the luminous intensity of LED was represent as I_t :

$$I_t = I_0 \exp^{(-\alpha t)}$$

where

I_t : Luminous Intensity of LEDs after t Hrs Operation

I_0 : Initial Luminous Intensity of LEDs

α : Coefficient

※ Calculation of α

Since LEDs were operated with constant forward current at t time, luminous intensity, mcd or cd, or luminous flux, lm, of LEDs were measured and recorded. The trend diagram which showed brightness change with increasing time, normally at 168, 500, 1000 hrs, was observed. According to the trend of brightness variation, α can be calculated by regression analysis method.

2. 19-137 burn-in test for life prediction

Test Condition

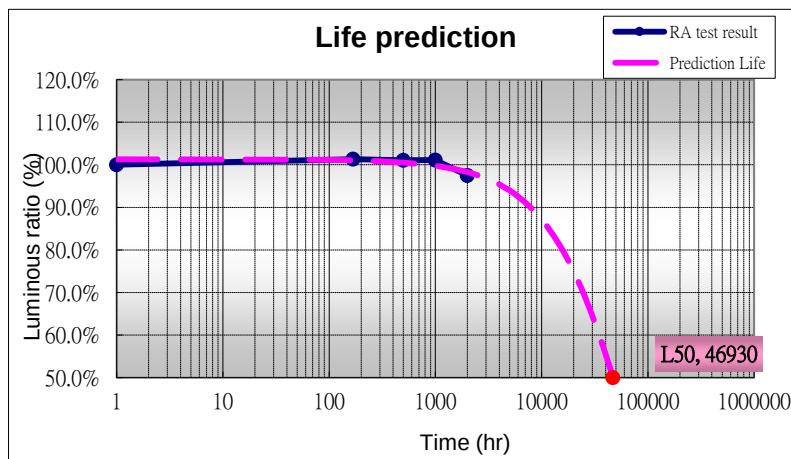
Item	Condition
Forward current	5mA/chip
Ambient Temperature	25°C
Humidity	60% RH

※ Sample Size for Each Test Item : 22pcs

Test Result

Test Time (hr)	I_V decay rate (%)
1	0.00%
168	1.32%
500	1.04%
1000	1.13%
* 2000	-2.50%

*Value is only for reference



3. Summary

Based on exponential decay model, 19-137 lifetime can reach L50@ 46930 hr under test condition of 5mA, 25°C and 60%RH.