Reference

Application Note for Thermal Management

Tj Dependence on Heat Release for NCSU03xA, an ultraviolet emission LED

[Introduction]

LEDs require higher current for greater light output. However, the higher current is applied to LEDs, the more heat is generated from a LED junction, which leads to light output deterioration. Therefore, thermal management is critical for an effective use of NCSU03xA.

This application note provides examples of heat-releasing (Case 1, 2) for the better use of NCSU033A.

[Tj Calculation Method]

The equation used for calculating Tj is:

Tj = Ts + Rj-s × P

Where

Tj: Temperature of LED junction (°C)

Ts: Temperature of soldering point (°C) *

Rj-s: Thermal resistance from LED junction to Ts measurement point (°C / W) **

P: Input power (W)

*Ts measuring point: the red circled point in Fig.1

**Rj-s for NCSU03xA: 7°C /W

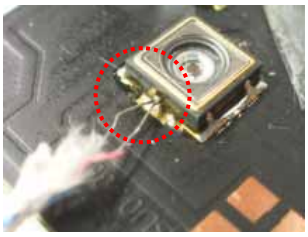

Fig. 1 Using higher heat-conductive grease or adhesive when Tj measured with thermocouples

[Tj Measurement Results]

Case 1. Aluminum board

I_F(A)	T_S (°C)	V_F(V)	T_j (°C)
0.5	75	3.57	88
0.7	95	3.63	113
1.0	122	3.71	148

Case 2. Aluminum board + Heat sink

I_F(A)	T_S (°C)	V_F(V)	T_j (°C)
0.5	54	3.62	67
0.7	66	3.70	84
1.0	82	3.80	109

Fig. 1 Aluminum board

Fig. 2 Aluminum board + Heat

[Heat Release Equipment]

Heat Release Board

Main Material: Aluminum

Outer Dimension: 30mm×30mm×1.6mm

Heat Sink

Product #: 30SQ30H20

Manufacturer: LSI COOLER Co., Ltd.

Manufacturer URL: http://www.lsi-cooler.co.jp/index.html

Note: Absolute Maximum Rating

Absolute Maximum Rating: I_F= 0.7A, Tj=130°C

The operating conditions exceeding the above absolute maximum ratings are not covered by the warranty.