



HARWIN

Test Report Summary

HT05502

Current Testing of
Removable SMT Links (Clip and Bar System)

1. Introduction

1.1. Description

This report summarises the current testing performed on the S8071-46R and S8081-46R surface mount clips, and S07-46 and S08-46 bars. These products together form the removable link system, also known as "Clip and Bar System".

The following test data has been extracted from Harwin Test Report 1459, which includes the full test setup. Contact technical@harwin.com for further information.

1.2. Scope for LED manufacturers

A major issue for manufacturers of LED lighting is the temperature rise that can be caused by current flow in the connections between the PCBs.

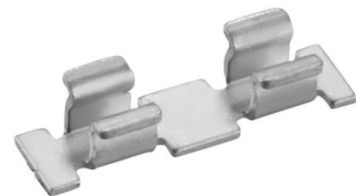
It is existing knowledge that a PCB will dissipate heat from the assembled components. Therefore, the testing for current rating has been performed with the applicable components soldered to a PCB in order to include these dissipation effects.

1.3. Conclusion

The tested products produce a temperature rise of less than 30°C from 3A to 13A, dependent on:

- The PCB material, PCB design, and the distance between the two Clips
- The S0871-46R vertical clip generally performs 1 to 3A better than the S8081-46R horizontal clip

Further heat dissipation can also be achieved by attaching the PCBs to metal fixings (which may already be designed to aid with light direction).



High quality PCB will aid heat dissipation

S0871-46R gives a higher current performance

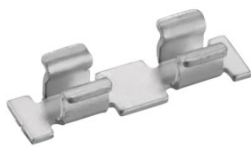


Place the clips as close as possible to each other, reducing the distance for the current to travel

Design hints to help improve high current performance

2. Test Setup and Method

2.1. List of Test Samples



S8071-46R
Vertical access clip



S8081-46R
Horizontal access clip



S07-46
23mm long bar



S08-46
15mm long bar



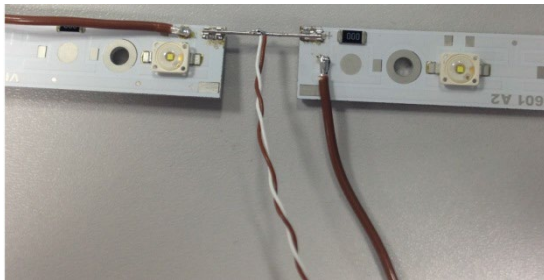
Vishay VLPC0601A2 PCB (ridged LED strip, aluminium backed)



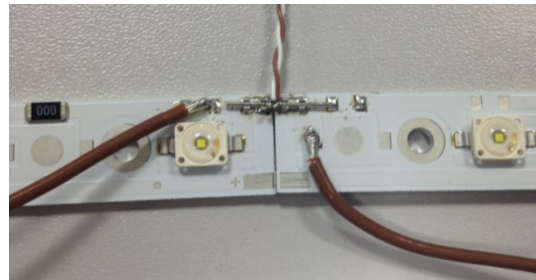
PowerLED R6-W2835-24-42-IP20 PCB (ridged LED strip, single-sided FR4 type)

2.2. Clip positions

The clips were soldered to the PCBs, and the thermocouple was soldered to the middle of the bar. The position of the bar relative to the clip was altered during the test to show the differences.



Clips placed at the end of the bar



Clips towards the middle of the bar

Test setup of Vishay VLPC0601A2 PCB with S8071-46R clips

3. Results

The results table gives the different combinations of:

- PCB type
- Clip type
- Bar length (S07-46 = 23mm, S08-46 = 15mm)
- Whether the clips were located at the end of the bar, or the middle
- Current – raised until reaching 30°C above ambient

Bar S08-46 was used for the test for the clips in the middle of the bar, on the assumption that the length of the bar would make little difference to these results.

All values in the table below are the Temperature Rise above ambient (°C).

PCB type	Vishay VLPC0601A2 (Aluminium backed)						PowerLED R6-W2835-24-42-IP20 (FR4 type)					
	S8071-46R			S8081-46R			S8071-46R			S8081-46R		
Clip	End		Middle	End		Middle	End		Middle	End		Middle
Bar	S07	S08	S08	S07	S08	S08	S07	S08	S08	S07	S08	S08
1A	0.8	0	0	0	0	0	1.5	0	0	3.7	0.5	0
2A	2.9	0.6	0	1.8	0.6	1.8	5.6	2.1	1.9	11.2	4.4	1.7
3A	6.0	2.1	0	7.0	5.5	5.4	12.1	5.7	5.6	20.8	10.4	5.0
4A	9.4	4.3	0.7	14.9	12.5	9.8	20.9	10.4	10.3	33.1	18.4	9.6
5A	13.9	7.2	2.3	25.1	21.2	14.9	29.8	16.1	17.0		28.9	15.5
6A	19.3	10.5	4.0	37.0	29.8	20.9	40.4	23.3	23.5		42.3	22.2
7A	25.1	14.3	6.1		38.9	28.9		31.1	32.5			30.1
8A	31.8	18.9	9.0			37.2						40.0
9A	39.3	23.9	12.0									
10A		29.3	15.4									
11A		35.4	19.1									
12A			23.2									
13A			28.1									
14A			37.7									