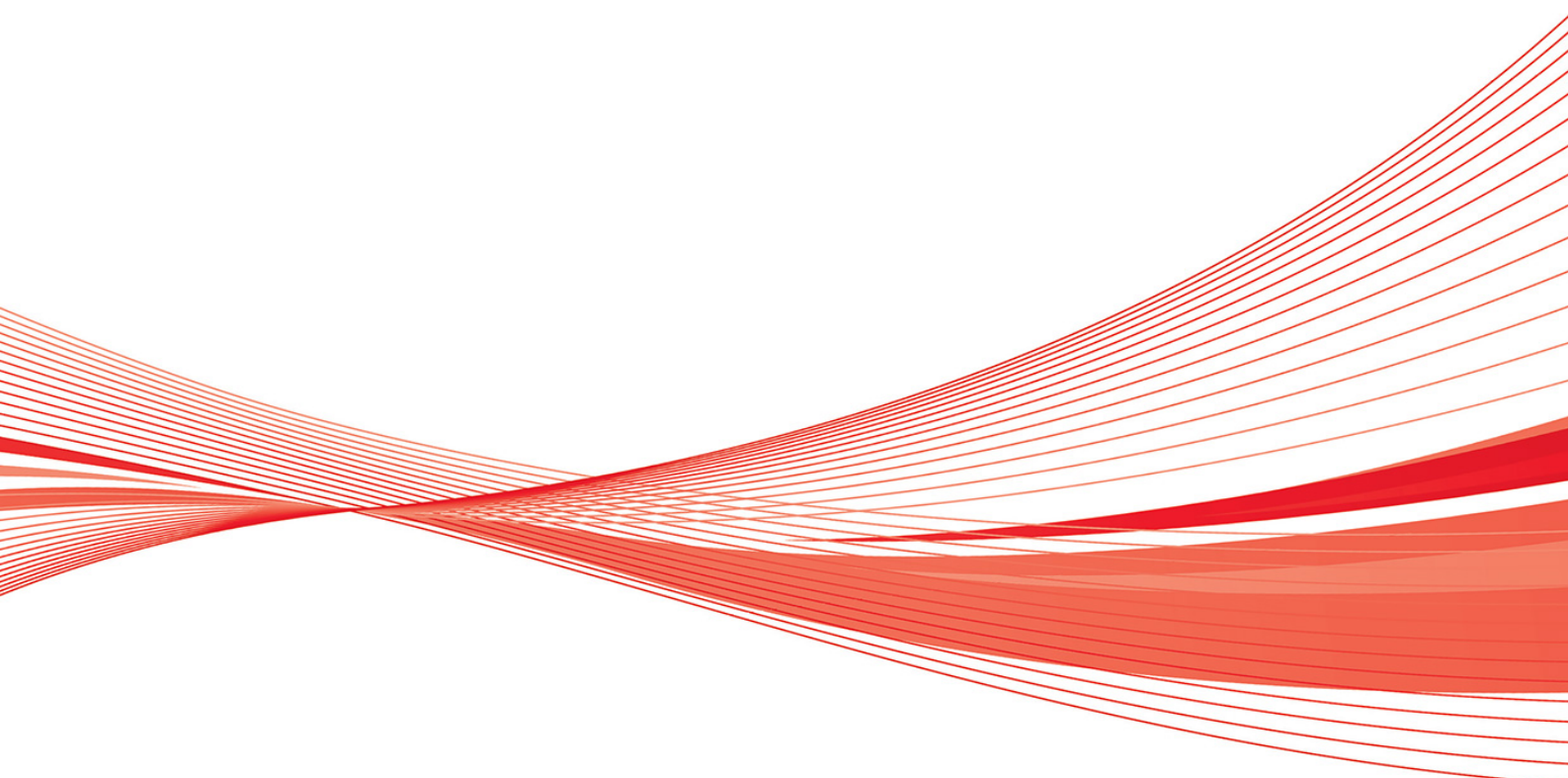




Harwin Test Report Summary

HT05501

Current Testing of Removable 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 3 amps to 13 amps depending on:

- The PCB material, PCB design, and the distance between the two Clips.
- The S0871-46R vertical clip generally performs 1 to 3 amps 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 aids heat dissipation

S0871-46R gives higher current performance

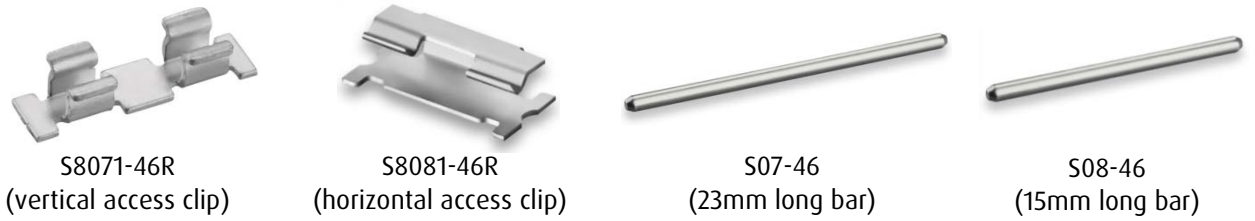


Place the clips as close as possible to each other, reducing the distance for the current to travel

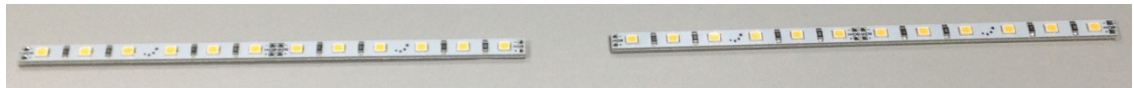
Figure 1 – Design hints to help improve high current performance

2. **Test Setup and Method**

2.1. **List of Test Samples – Harwin Clip and Bar products**



Vishay VLPC0601A2 PCB (ridged LED strip, aluminium backed)

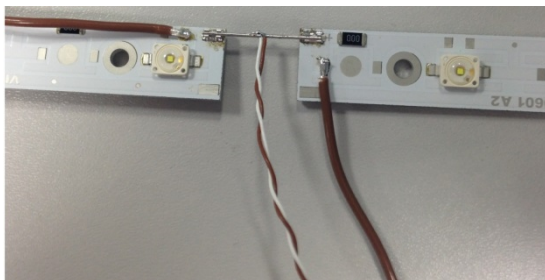


PowerLED R6-W2835-24-42-IP20 PCB (ridged LED strip, single-sided FR4 type)

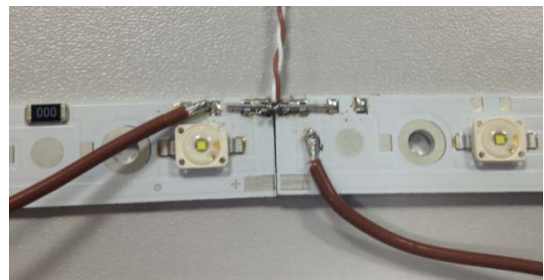
2.2. **Clip positions**

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. Examples are shown in photographs in Figure 2.

Figure 2 – Test setup of Vishay VLPC0601A2 PCB with S8071-46R clips



Clips placed at the end of the bar



Clips towards the middle of the bar

3. **Results**

The results table gives the different combinations of:

- PCB type;
- Clip type;
- Bar length (S07 = 23mm, S08 = 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 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.

	PCB type	Vishay VLPC0601A2 PCB (aluminium backed)						PowerLED R6-W2835-24-42-IP20 PCB (FR4 type)					
	Clip Model	S8071-46R			S8081-46R			S8071-46R			S8081-46R		
	Clip position	End		Middle	End		Middle	End		Middle	End		Middle
Bar model	S07	S08	S08	S07	S08	S08	S07	S08	S08	S07	S08	S08	
Current (A)	1	0.8	0	0	0	0	0	1.5	0	0	3.7	0.5	0
	2	2.9	0.6	0	1.8	0.6	1.8	5.6	2.1	1.9	11.2	4.4	1.7
	3	6	2.1	0	7.0	5.5	5.4	12.1	5.7	5.6	20.8	10.4	5
	4	9.4	4.3	0.7	14.9	12.5	9.8	20.9	10.4	10.3	33.1	18.4	9.6
	5	13.9	7.2	2.3	25.1	21.2	14.9	29.8	16.1	17		28.9	15.5
	6	19.3	10.5	4	37.0	29.8	20.9	40.4	23.3	23.5		42.3	22.2
	7	25.1	14.3	6.1		38.9	28.9		31.1	32.5			30.1
	8	31.8	18.9	9			37.2						40.0
	9	39.3	23.9	12									
	10		29.3	15.4									
	11		35.4	19.1									
	12			23.2									
	13			28.1									
	14			37.7									
Temperature rise above ambient (°C)													