THERMAL MANAGE-MENT GUIDELINES

FOR LUGA SHOP 2013 MODULES

AVC®

GUIDELINES FOR A PASSIVE AND AN ACTIVE HEAT SINK SOLUTION

For Use with VS LED Modules

Given the power density of modern high-performance LEDs, a highly effective thermal management system is essential to ensure trouble-free operation of LED modules over long periods of time. In this regard, finding a suitable cooling solution poses one of the greatest challenges. As it forms a fundamental component of a luminaire, a suitable heat sink must be chosen early on in the process of developing and designing a luminaire under consideration of both thermal criteria and mechanical properties.

These guidelines are designed to simplify the process of selecting a suitable thermal management solution for VS LED modules and primarily constitute an overview of appropriate solutions that are available on the market.

Please note that the temperature ranges shown merely reflect theoretically calculated temperatures that should be generated at the tp point of the module given free convection and the requisite operating current. These calculated values closely approximate to measured data.

The calculations are based on the following assumptions:

- Ambient temperature: 35°C
- Power dissipation ratio: 80% ($P_{thermal}$ / $P_{electrical}$)
- Thermal resistance of used thermal interface material: 0.04 K/W

To determine the exact temperatures that are generated when LED modules are operated in a luminaire under real-life operating conditions, users will have to have appropriate thermal measurements carried out. Function tests should therefore always be carried out on the fully assembled final product and under the most unfavourable operating conditions (blocked convection, maximum ambient temperature, etc.).

Further detailed information on effective thermal management systems can be found on our website at www.vossloh-schwabe.com/en/home/products/notes-on-led-technology.html.

$t_p \leq 65$ °C | 65 °C < $t_p \leq 67$ °C | 67 °C < $t_p \leq 85$ °C | $t_p > 85$ °C

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VS Modules	WU-M-461*				WU-M-462*				WU-M-464*			
Luminous flux	2000 lm / 2700 lm				3000 lm / 4000 lm				5000 lm			
Current (mA)	350	500	700	1050	350	500	700	1050	350	500	700	1050
Voltage $U_{typ.}$ (V)	24.9	25.7	26.8	27.5	35.9	37.1	38.5	40	47	48.5	49.9	51.8
Power (W)	8.7	12.9	18.8	28.9	12.6	18.6	27	42	16.5	24.3	34.9	54.4

Heat sink type	Weight	Dimensions Ø / Height (mm)	Cooling	t_p (Performance Temperature) in °C at t_a (Ambient Temperature) = 35 °C
ST02G	987	165 / 55	passive	
ST02H	430	122 / 45	passive	
ST02F	1007	165 / 60	passive	
ST053	1040	170 / 40	passive	
ST04N	1060	125 / 70	passive	
ST034	589	125 / 45	passive	
Z6ET042	320	125 / 35	active	
Z5LT02W	128	65 / 40	active	
Z6ET03K	150	70 / 20	active	
Z5LT07P	126	65 / 40	active	
Z7LT04X	350	75 / 65	active	
Z5LT03F	80	65 / 10	active	
ST02T	290	125 / 30	passive	
ST07A	80	100 / 10	passive	
ST07B	240	100 / 30	passive	
ST07E	290	135 / 25	passive	
ST078	450	135 /40	passive	
ST079	900	135 / 80	passive	

* Suitable fixing holes have to be requested separately from the manufacturer.