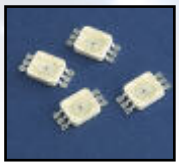
The Optoelectronic Manufacturing Corporation

High Power Thermal PCB



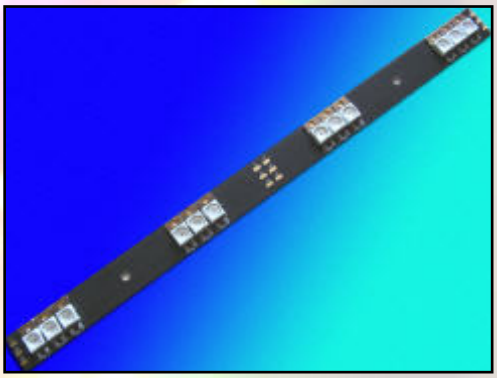
www.omc-uk.com

The Optoelectronic Manufacturing Corporation

Technical Datasheet

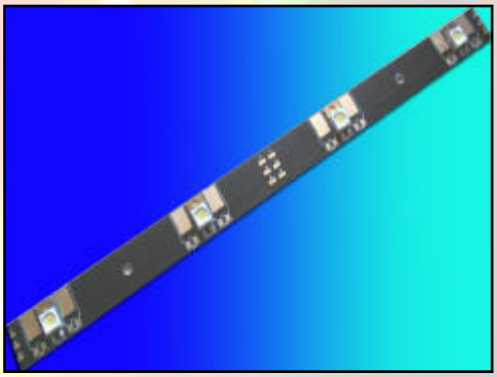
Aluminium circuit boards populated with 1W TO-220 high power LEDs, designed to facilitite the production of strip light based high power products and the integration of high power LEDs into product designs.

Key Features:



- Thermally conductive PCB
- Central link for increased LED addressability
- Screw holes for easy of heatsink mounting
- Compact and low profile
- Output characterised for lighting applications
- Available in a range of populations
- Series design allows several strips to be joined
- Compatible with TO-220 lens range
- Built-in antistatic protection
- Built-in reverse polarity protection
- RoHS Compliant

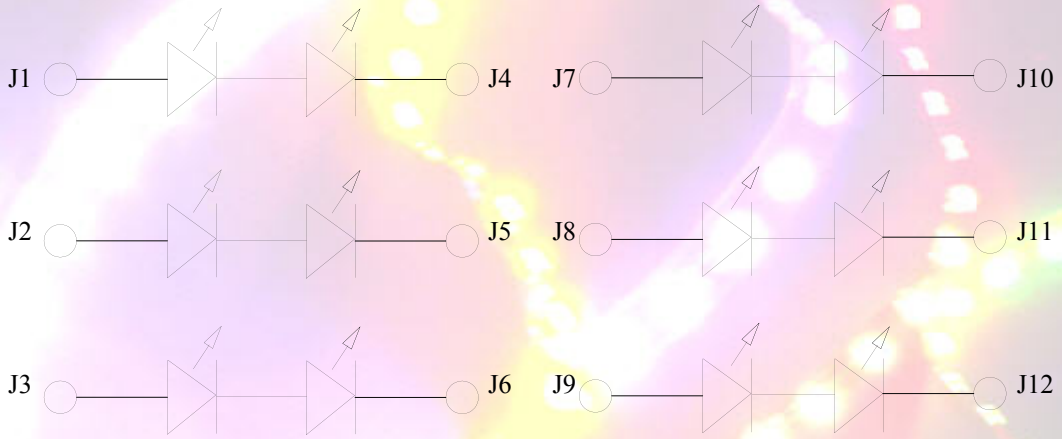
Typical Applications:



- Replacement of fluorescent light sources
- Lighting for industrial applications
- Accent lighting
- Backlighting
- Strip lights
- Illumination for equipment
- Lighting for machinery
- Solar powered lighting
- Wall washers
- Signalling
- Automotive illumination
- Low energy lighting
- Lighting for point-of-sale applications
- General LED lighting

Circuit Layout:

Circuit comprises 3 series chains in parallel, each with an open central link and consisting of 4 LED pads in series. Circuit diagram is given below.



LED pads are shown populated for ease of illustration. Actual population varies depending on part number as explained below. Some pads will therefore be unpopulated depending on number of LEDs per strip. Unpopulated pads may be populated with TO-220 high power LEDs.

Part numbering system - HSB1XY

X = 4, 8, 12 - number of LEDs per strip
Y = Colour; R = Red, G = Green, B = Blue, Y = Amber, D = Daylight White, W = Warm White
Note exception: HSB112RGB = 4 Red LEDs, 4 Green LEDs, 4 Blue LEDs per strip (3 separate chains).

Typical electro-optical characteristics **per LED** at forward current = 350mA and Ta=25°C

Part no.	Colour & dominant λ / colour temp	Luminous Flux (typ.) lumens	Luminous Flux (max.) lumens	Forward Voltage (V)
T21D1	Daylight White 6500K	40	52	3.5
T21W1	Warm White 3000K	35	41	3.5
T21R1	Red 625nm	23	30	2.2
T21G1	Green 525nm	30	40	3.8
T21B1	Blue 465nm	10	14	3.5
T21Y1	Amber 590nm	23	30	2.2

Colours are for ease of reference only and do not indicate exact shade of LED output.

Thermal Characteristics per LED at If = 350mA, Ta=25°C

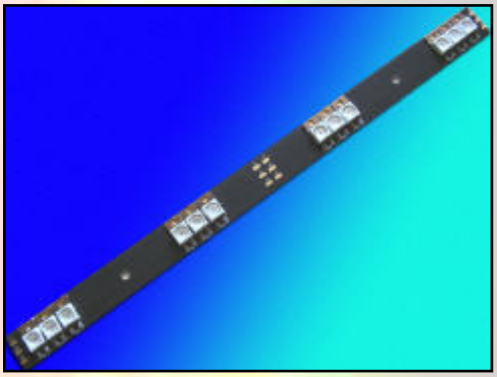
Quantity	Rating
Thermal Resistance (Semiconductor Junction to Board)	15 K/W
Forward Voltage Temperature Coeff.	-2 mV/K
Reverse Current (at reverse voltage of 5V)	5×10^{-5} A

Absolute Maximum Ratings per LED at Ta=25°C

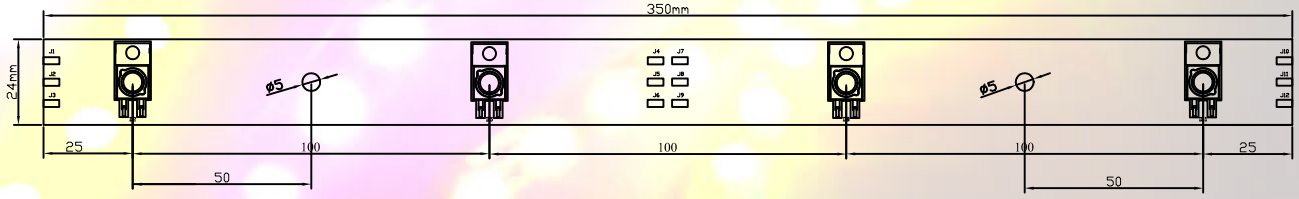
Quantity	Rating
Reverse Voltage	5V
Semiconductor Junction Temperature	120°C
Operating Temperature Range	-35°C to +75°C
Temperature Range in Storage	-35°C to +100°C
Lead soldering temperature (at 2mm from LED body for max 5 sec)	260°C
Forward DC Current	350mA
Power dissipation	1.4W

Mechanical information

- Strip length 350mm
- Strip width 24mm
- 4, 8 or 12 LEDs per 350mm strip
- Central link allows each half to be addressed separately
- For designs with 8 or 12 LEDs, LEDs are situated in groups of 2 or 3 respectively (see image).



Drawing 4 LED population shown) - refer to pad labels on circuit diagram on previous page



1.All dimensions are in millimeters.
2.Tolerance is ±2mm unless otherwise noted.

Application notes

- Junction temperature should be kept below maximum by managing power dissipation.
- Current spikes should be avoided, especially during power up. It is best practice to initially connect LED to unactivated supply, then gradually ramp up supply to desired level.
- Proper management of the thermal path from the junction should be observed. Relevant thermal resistances should be used to calculate temperature increase from ambient to junction by multiplying by power dissipation, to determine maximum ambient temperature of application.
- Proper thermal conduction layers should be introduced at all interfaces to prevent insulating air gaps in the thermal path from junction to ambient.
- If the LED packages have lenses fitted, do not use reflow soldering as the lenses should not be taken above 110°C.
- As with all semiconductor devices, it is good practice to avoid electrostatic discharge.
- High power LEDs are best driven using constant-current power supplies.
- These strips are best driven using a 350mA constant current driver.
- Do not connect to a constant voltage source without suitable current limiting measures.
- Although the circuit boards are thermally conductive, they should in turn be fitted into a secondary heatsink designed to dissipate the generated power.

The Optoelectronic Manufacturing Corporation (UK) Ltd.
Cardrew Industrial Estate,
Redruth,
Cornwall
TR15 1SS

Tel: 01209 215424
Fax: 01209 215197
General e-mail: omc-sales@omc-uk.com
www.omc-uk.com