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SMB1W-700-04

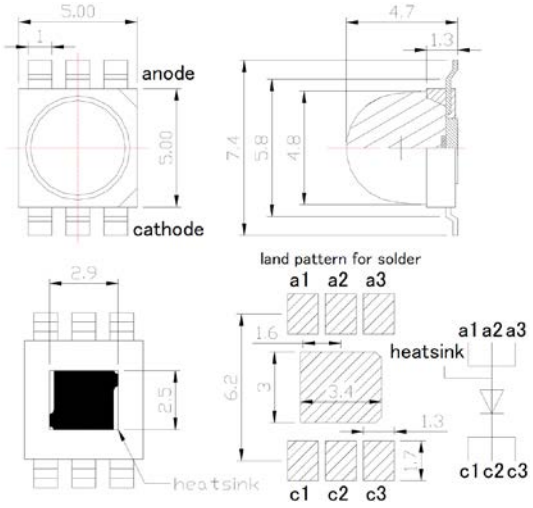
TECHNICAL DATA

High Power LED, SMD — AlGaAs

SMB1W-700-04 is a AlGaAs high power LED, mounted on a cooper heat sink with a 5x5 mm SMD package and molded with epoxy resin. On forward bias, it emits a radiation of typical 120 mW at a peak wavelength of 700 nm.

Specifications

- Structure: AlGaAs, 1W high power chip
- Peak Wavelength: 700 nm
- Optical Output Power: 120 mW
- Package: SMD, PPA resin
  Lead frame die: silver plated on copper
- Lens: epoxy resin



Absolute Maximum Ratings (T_A=25°C)

Item	Symbol	Value	Unit
Power Dissipation	P_D	1500	mW
Forward Current	I_F	500	mA
Pulse Forward Current *[1]	I_{FP}	2000	mA
Reverse Voltage	V_R	5	V
Thermal Resistance	R_{th}	10	K/W
Junction Temperature	T_J	120	°C
Operating Temperature	T_{opr}	-40 … +100	°C
Storage Temperature	T_{stg}	-40 … +100	°C
Soldering Temperature *[2]	T_{sol}	255	°C

*[1] duty = 1%, pulse width = 10 µs
*[2] must be completed within 3 seconds at 260°C

Electro-Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F = 500 mA	-	2.1	2.7	V
Pulsed Forward Voltage	V_{FP}	I_{FP} = 2 A	-	3.5	-	V
Total Radiated Power	P_O	I_F = 500 mA	60	120	-	mW
		I_{FP} = 2 A	-	480	-	
Radiant Intensity	I_E	I_F = 500 mA	-	130	-	mW/sr
		I_{FP} = 2 A	-	530	-	
Peak Wavelength	λ_P	I_F = 500 mA	690	700	710	nm
Half Width	$\Delta\lambda$	I_F = 500 mA	-	21	-	nm
Viewing Half Angle	$\Theta_{1/2}$	I_F = 500 mA	-	±24	-	deg.
Rise Time	t_r	I_F = 500 mA	-	50	-	ns
Fall Time	t_f	I_F = 500 mA	-	40	-	ns

Radiated Power is measured by S3584-08
Radiant Intensity is measured by Tektronix J-6512

Note: The above specifications are for reference purpose only and subjected to change without prior notice.

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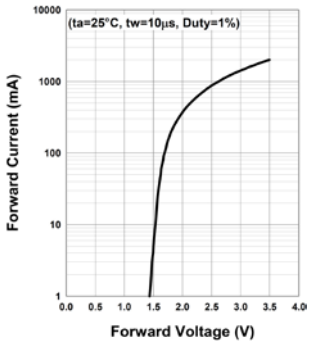
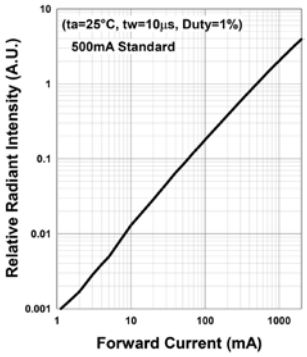
Typical Performance Curves

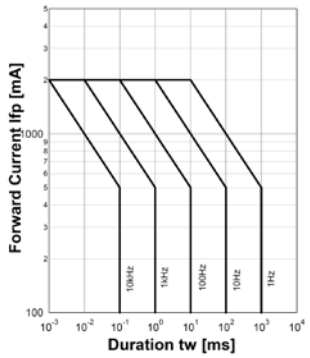
Forward Current – Forward Voltage



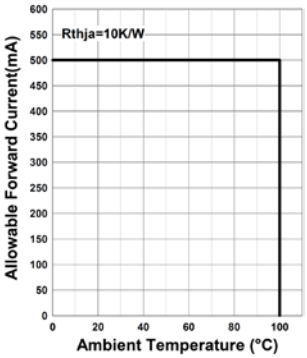
Radiant Intensity – Forward Current



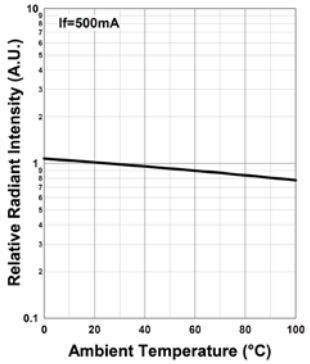
Forward Current – Pulse Duration



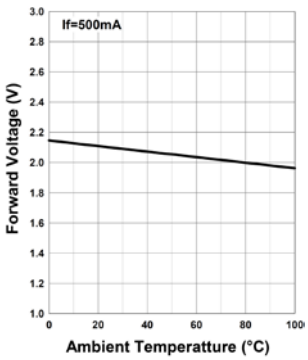
Forward Current – Ambient Temperature



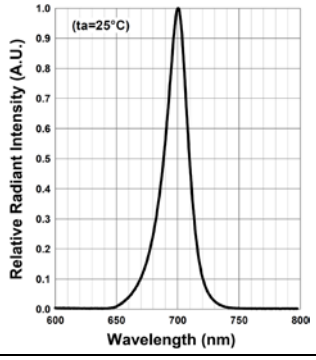
Relative Radiant Intensity – Ambient Temperature



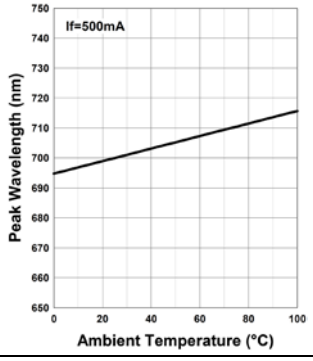
Allowed Forward Voltage – Ambient Temperature



Relative Spectral Emission



Peak Wavelength – Ambient Temperature



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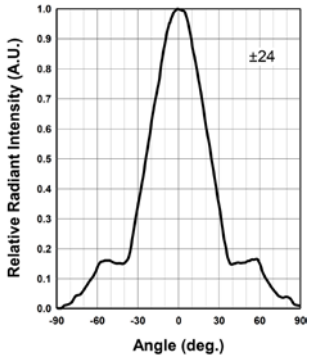
Radiation Pattern

SMB1W-700-04



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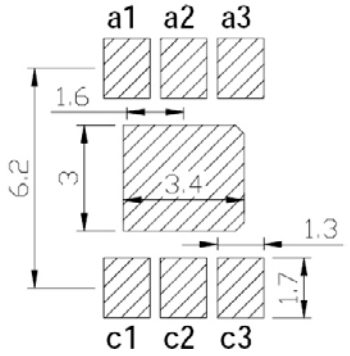
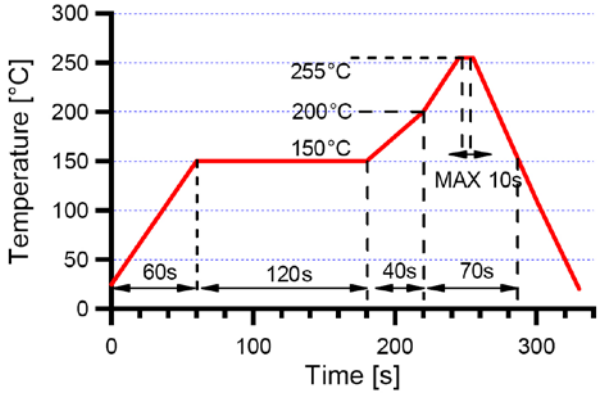
Precaution for Use

1. Cautions

- This high power LED must be cooled!
- DO NOT look directly into the emitting area of the LED during operation!
- **WARNING: LED is emitting invisible light!**

2. Soldering Conditions

- DO NOT apply any stress to the lead particularly when heat.
- After soldering the LEDs should be protected from mechanical shock or vibration until the LEDs return to room temperature.
- When it is necessary to clamp the LEDs to prevent soldering failure, it is important to minimize the mechanical stress on the LEDs.

Recommended Land Layout	Soldering Conditions
	

3. Static Electricity

- The LEDs are very sensitive to Static Electricity and surge voltage. So it is recommended that a wrist band and/or an anti-electrostatic glove be used when handling the LEDs.
- All devices, equipment and machinery must be grounded properly. It is recommended that precautions should be taken against surge voltage to the equipment that mounts the LEDs.

4. Heat Generation

- Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in the specification.
- The operating current should be decided after considering the ambient maximum temperature of LEDs.

5. Storage

- The LEDs should be stored at 30°C or less and 60%RH or less after being shipped and the storage life limits are 3 months. If the LEDs are stored for 3 months or more, they can be stored for a year in a sealed container with nitrogen atmosphere and moisture absorbent material at less than 30%RH.
- Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.