SNAP-IN TYPE LED MODULE

APPLICATIONS MANUAL

WARNING

- **The Snap-in LED emits an intense beam. Never gaze directly at the LED.**
- **Never use a module that has in anyway been damaged or disassembled.**
- **When the LED is illuminated, it will become hot. Please pay attention to avoid burning or injury when handling the LED.**
- **Never solder the module terminals.**

INTRODUCTION

This manual is for lighting equipment designers.
This manual explains the design guidelines for this detachable Snap-in Series of lighting equipment.
Refer to this manual to maximize the Snap-in modules' performance and create special, unique and superior lighting.
This manual consists of three sections: Optical, Structural and circuit designing.
Useful and simple examples and recommended designs are included in this manual.
Also, safety and performance instructions are included.
Before starting to design with the Snap-in Series, be sure to read this manual thoroughly and completely understand the contents in order to make the most of your design endeavors.
For the performance and characteristics of the Snap-in Series, refer to its specifications (separately available).

SPECIAL FEATURES

STANLEY's detachable LED lighting modules (SNAP-IN Series) have the following advanced features:

- The Snap-in Series has a detachable structure. It can be installed/removed in a simple action. There is no need for soldering to install the module.
- The electrical and heat discharging units are completely separated.
- High luminosity (1W) and high efficiency LEDs are used in our modules.
- The Snap-in Series' LEDs offer long life, high reliability and good spatial distribution.
- A wide color variation can be selected (White, warm white, blue, red and green).
- The white and warm white color types have high color rendering properties: Ra: 90 (Typ. value)
- 30 or 60 degree high performance lens installed types are available.
- The side slot opening structure increases the design applications of this lighting.
- If the BJB special socket is installed, it will be easy to install/remove the LED module.

NOTE: To install the module, insert the module into the heat sink (the plate must be prepared by the customer) and turn it clockwise while pressing it.

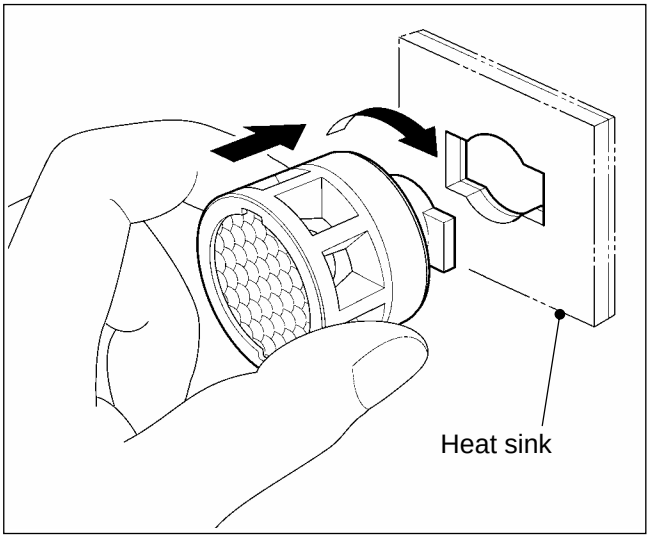


TABLE OF CONTENTS

1. CHARACTERISTICS AND VARIATIONS ····· 1
2. SNAP-IN SERIES HEAT DISCHARGING CONSTRUCTION ····· 1
3. OPTICAL DESIGN ····· 2
4. HEAT SINK AND INSTALLATION DESIGNS ····· 3
5. TEMPERATURE MEASUREMENT ····· 4
6. POWER SUPPLY AND CIRCUIT DESIGN ····· 4
7. APPLICATIONS ····· 5～7

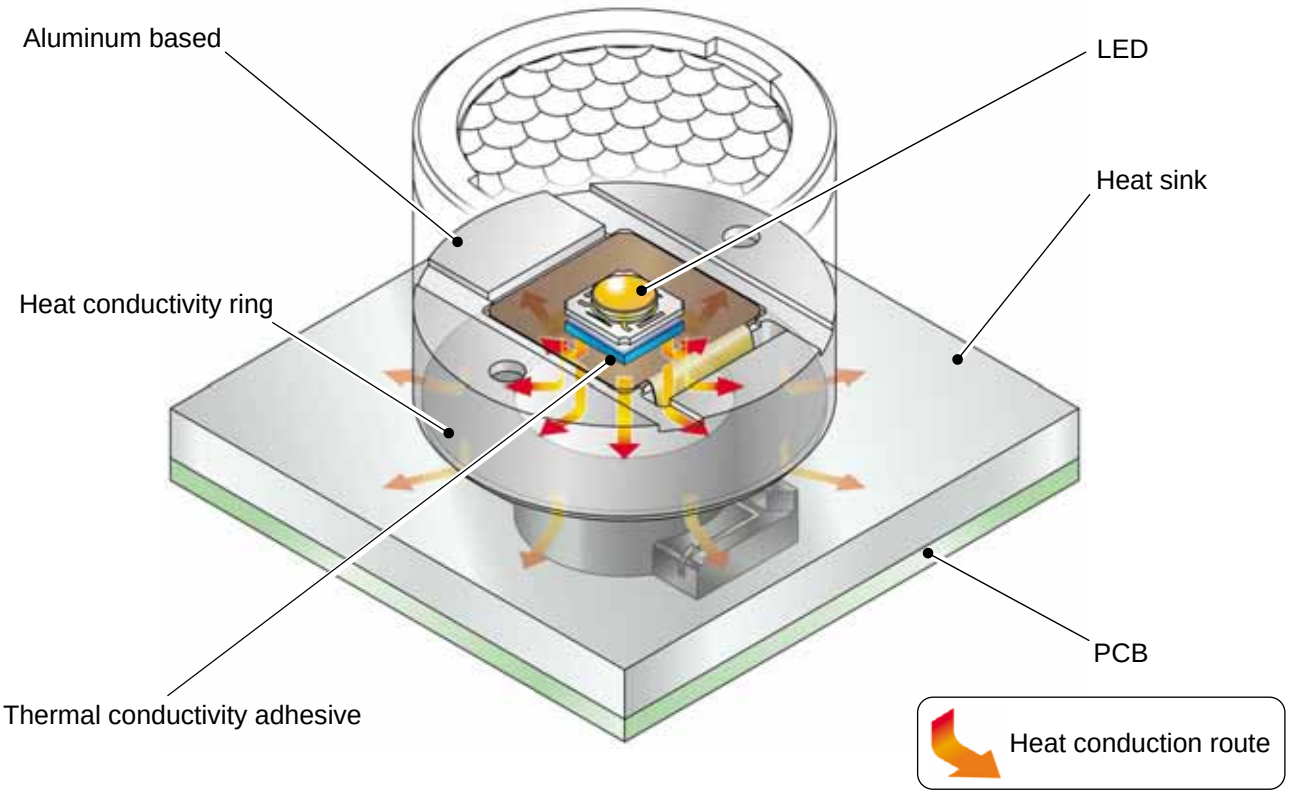
1. CHARACTERISTICS AND VARIATIONS

	Illuminating condition: Forward currentIf [mA]	Forward voltage Vf TYP [VDC]	Lumen TYP [lm]	Illumination TYP. [lx]		Luminous intensity TYP [cd]	
				30° lens	60° lens	30° lens	60° lens
White (5500K)	300	3.3	21	63	10	63	10
Warm white(3000K)	300	3.3	19	57	9	57	9
Red	300	2.4	–	–	–	30	8
Green	300	3.3	–	–	–	50	13
Blue	300	3.3	–	–	–	10	3

NOTE: The illumination data on the chart is measured at 1 m from the light source.

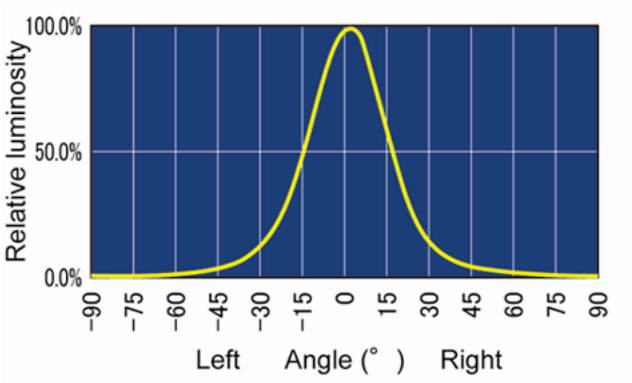
2. SNAP-IN SERIES HEAT DISCHARGING CONSTRUCTION

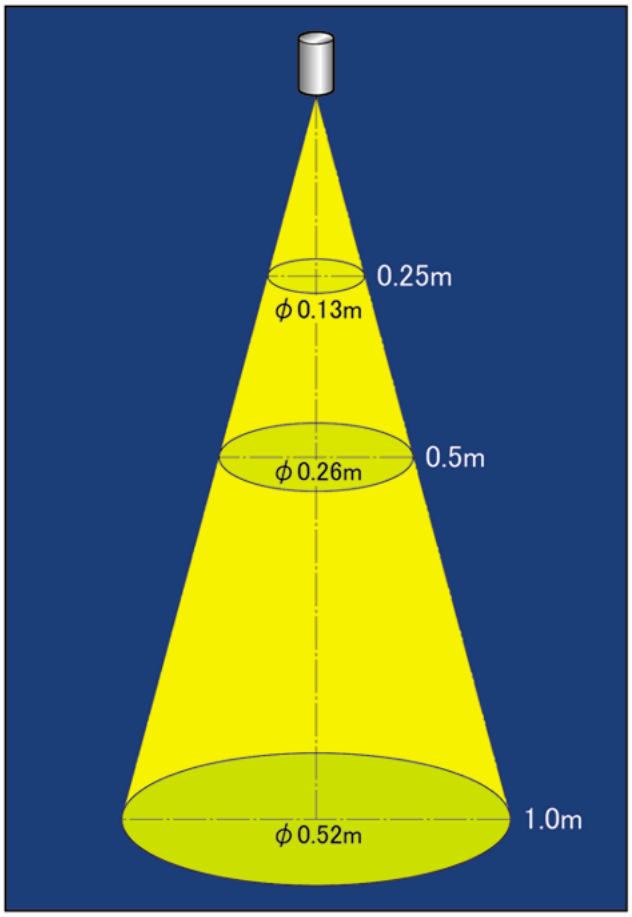
Be sure to employ a heat sink (aluminum plate, etc., prepared by the customer) in accordance with the instructions explained in this manual.
Install the module onto a high thermal conductivity base such as aluminum plate.
The thickness of the heat sink with PCB should be 5 mm ±0.1 mm.



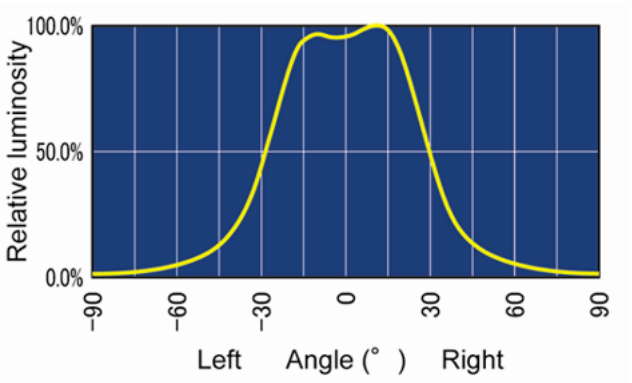
3. OPTICAL DESIGN

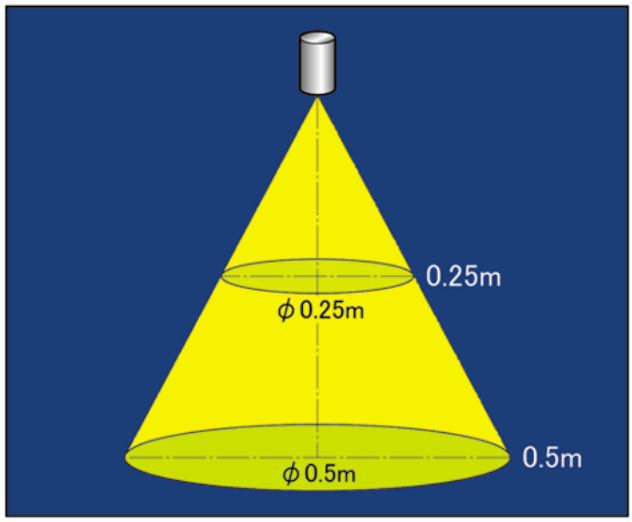
1) Optical spatial distribution characteristics (30° lens)





2) Optical spatial distribution characteristics (60° lens)

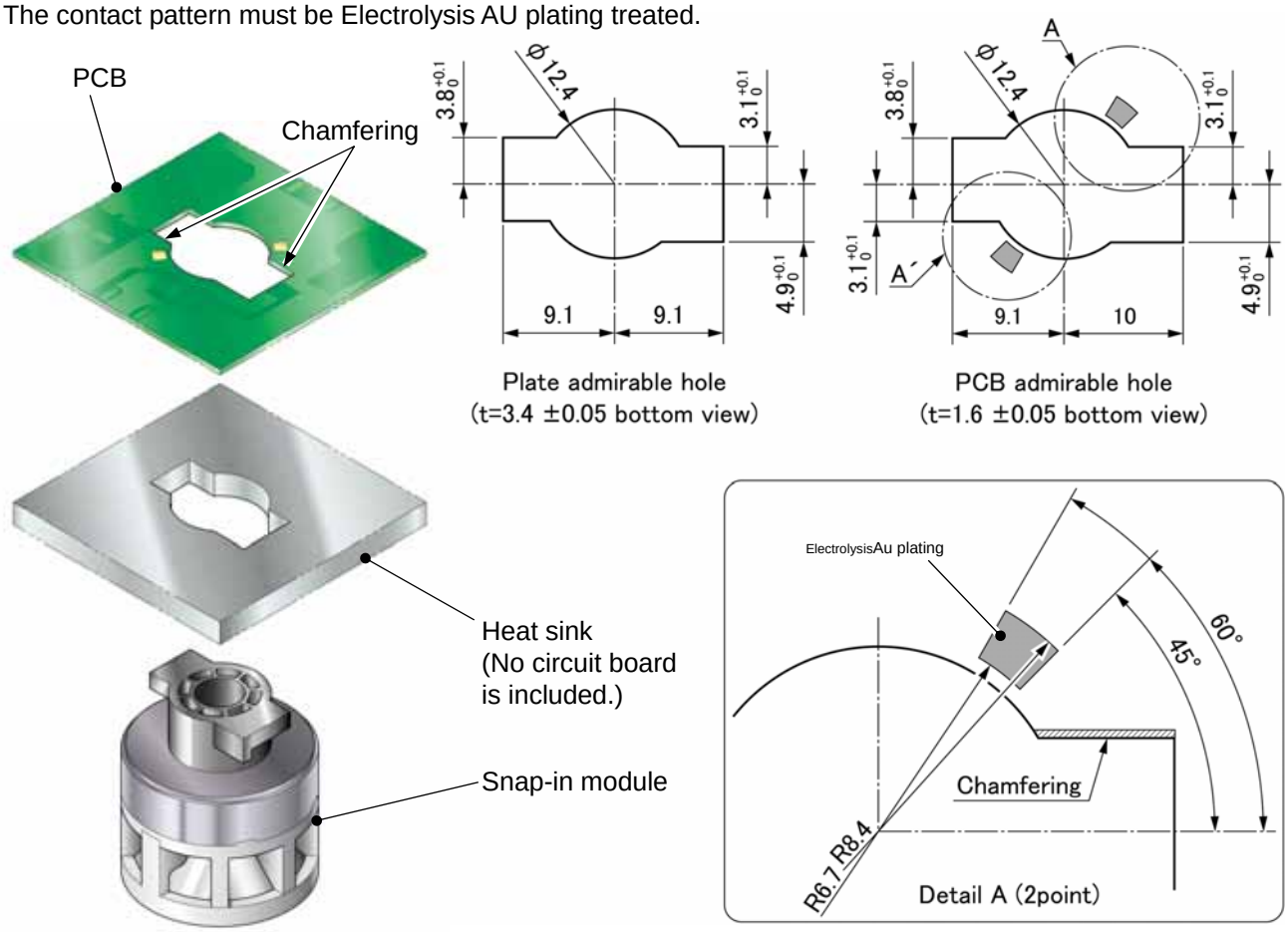




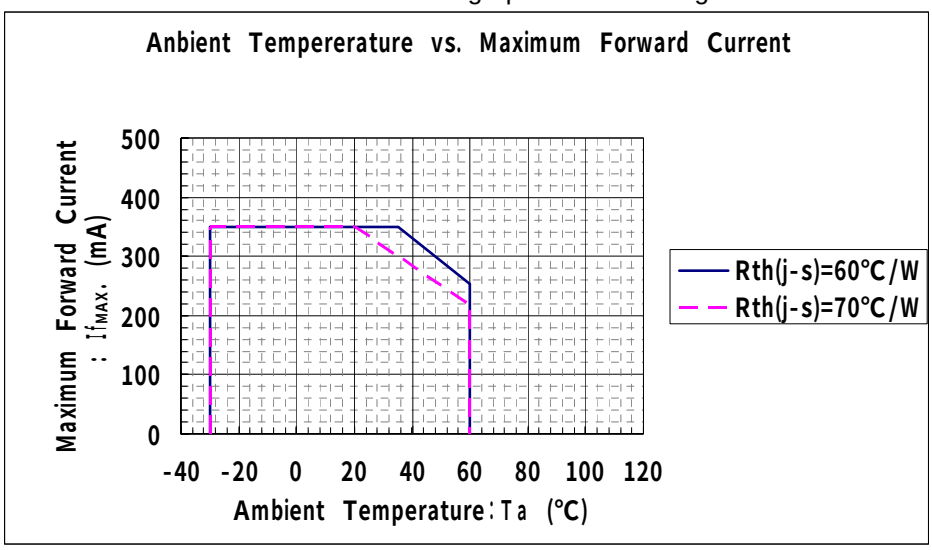
4. HEAT SINK AND INSTALLATION DESIGNS

To install the Snap-in module, a base plate (thickness: 5±0.1 mm) is necessary.
The special socket (separately purchasable, made by the socket manufacturer) can be used.
If the special socket is not to be used the customer must prepare an aluminum heat sink base (or a heat sink with PCB laminated plate). Refer to the following diagrams.

Total thickness of the radiating base with PCB: 5±0.1 mm
The recommended contact design for the PCB is shown below.
The contact pattern must be Electrolysis AU plating treated.

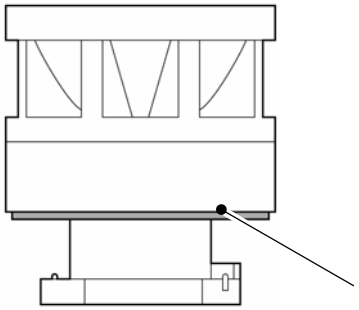


The Heat sink size should be determined considering the derating chart BELOW (current-temperature characteristics).
Example: If the aluminum heat sink thickness is 3.4 mm and its area is 36×36 mm, its thermal resistance will be 45℃/W. Refer to the 45℃/W graph in the derating chart to decide the maximum forward current.



5. TEMPERATURE MEASUREMENT

1) Read the sample temperature when it reaches stability after allowing the thermocouple to contact the sample.
2) The prescribed temperature measuring point is the gap between the aluminum base and the heat conductivity ring. Insert the thermocouple there and measure the temperature. (Refer to the figure below.)



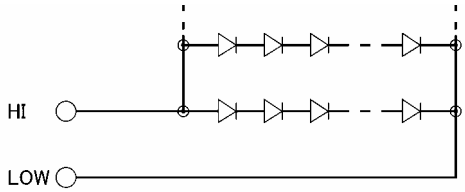
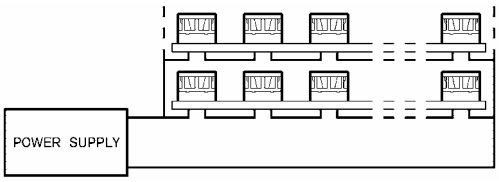
⚠ CAUTIONS

1. The maximum rating of the forward current will vary depending on the operating environment. Set the maximum forward current so that the measured LED module's temperature at its specified temperature measuring point does not exceed 70℃ even if the ambient temperature reaches the highest operating temperature.
2. The heat conductivity ring is an important part which transfers heat from the module to the heat sink. Pay attention not to deform or damage it.

6. POWER SUPPLY AND CIRCUIT DESIGN

6-1) Constant current circuit

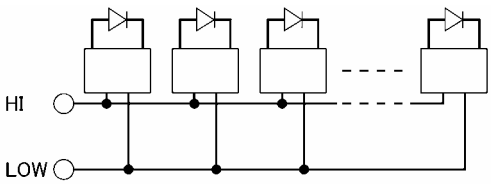
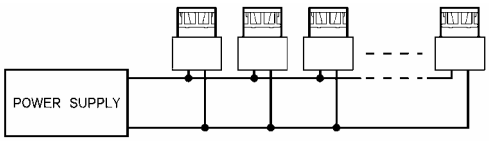
The constant current power supply can supply 300mA at the specified forward voltage.

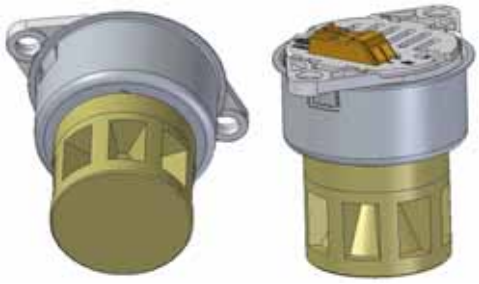
Snap-in (constant current drive)	DC power supply
Basic connection	Series connection, parallel connection
Circuit diagram (Block chart)	
Example of multiple connections	

6-2) BJB Special socket

The constant current circuit is fed from a DC12V power supply.

The DC power supply (5-12V) can supply constant current of 300mA.

Snap-in (constant current drive)	BJB Special socket
Basic connection	Parallel connection
Circuit diagram (Block chart)	
Example of multiple connections	

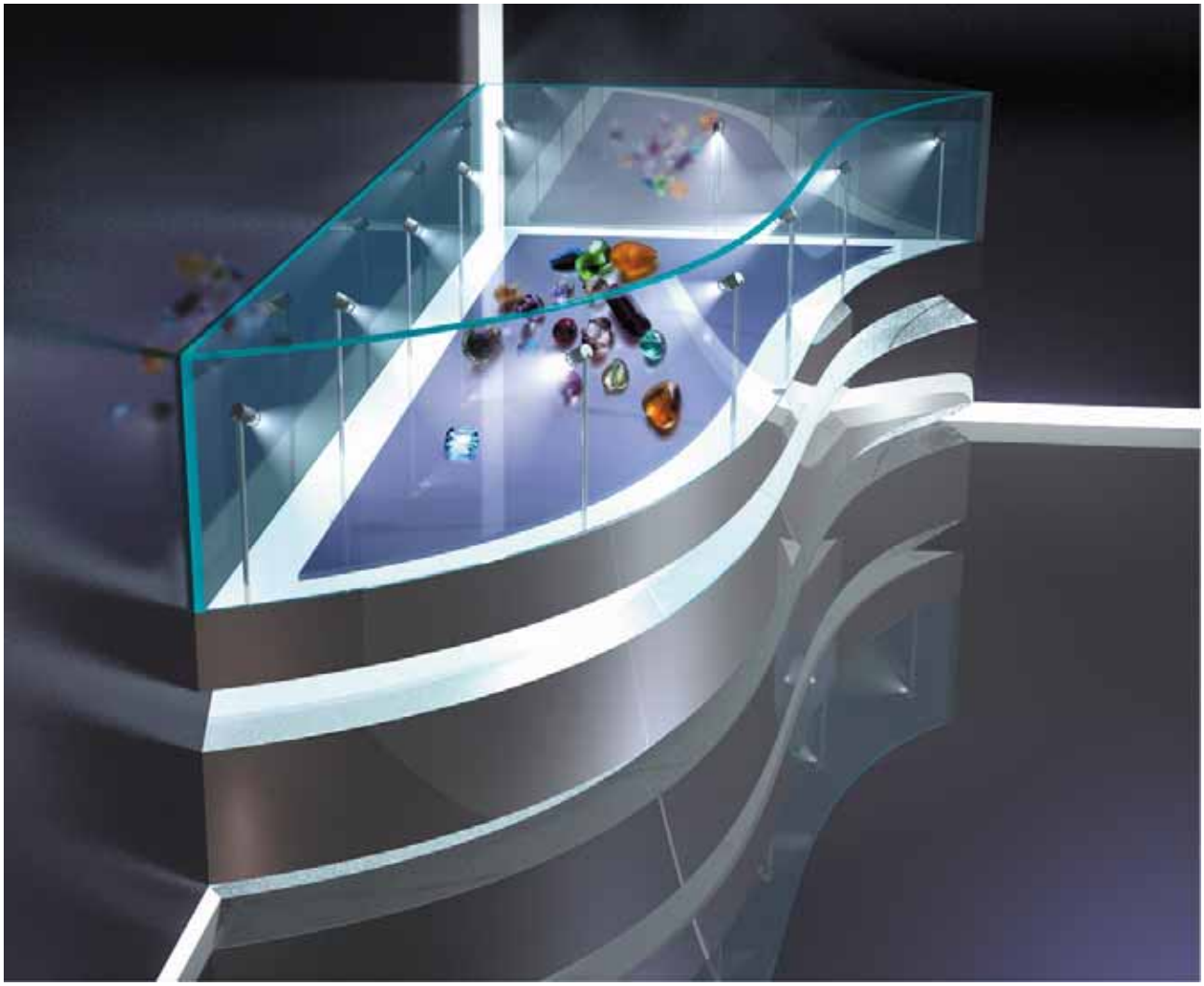


BJB is a German electronics manufacturer which produces and sells the special snap-in sockets.

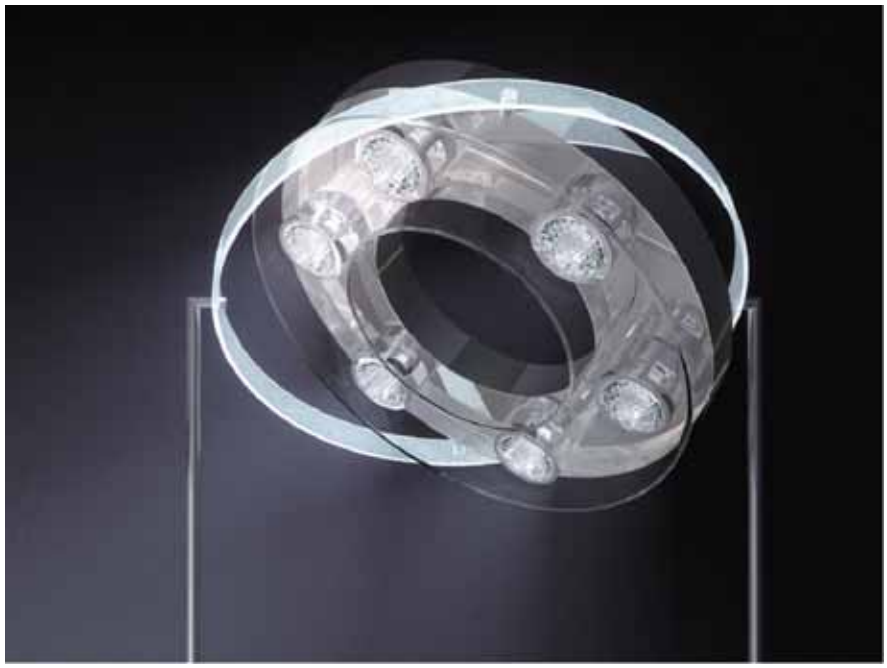
7. APPLICATIONS

The Snap-in Series will simplify optical and installation design procedure. Furthermore, it's wide product variation will encourage the designer to conceive rich and varied designs. Through the application of the designer's own concepts, the Snap-in Series applications can expand without limit. Some example designs are shown below.

7-1. Showcase illumination

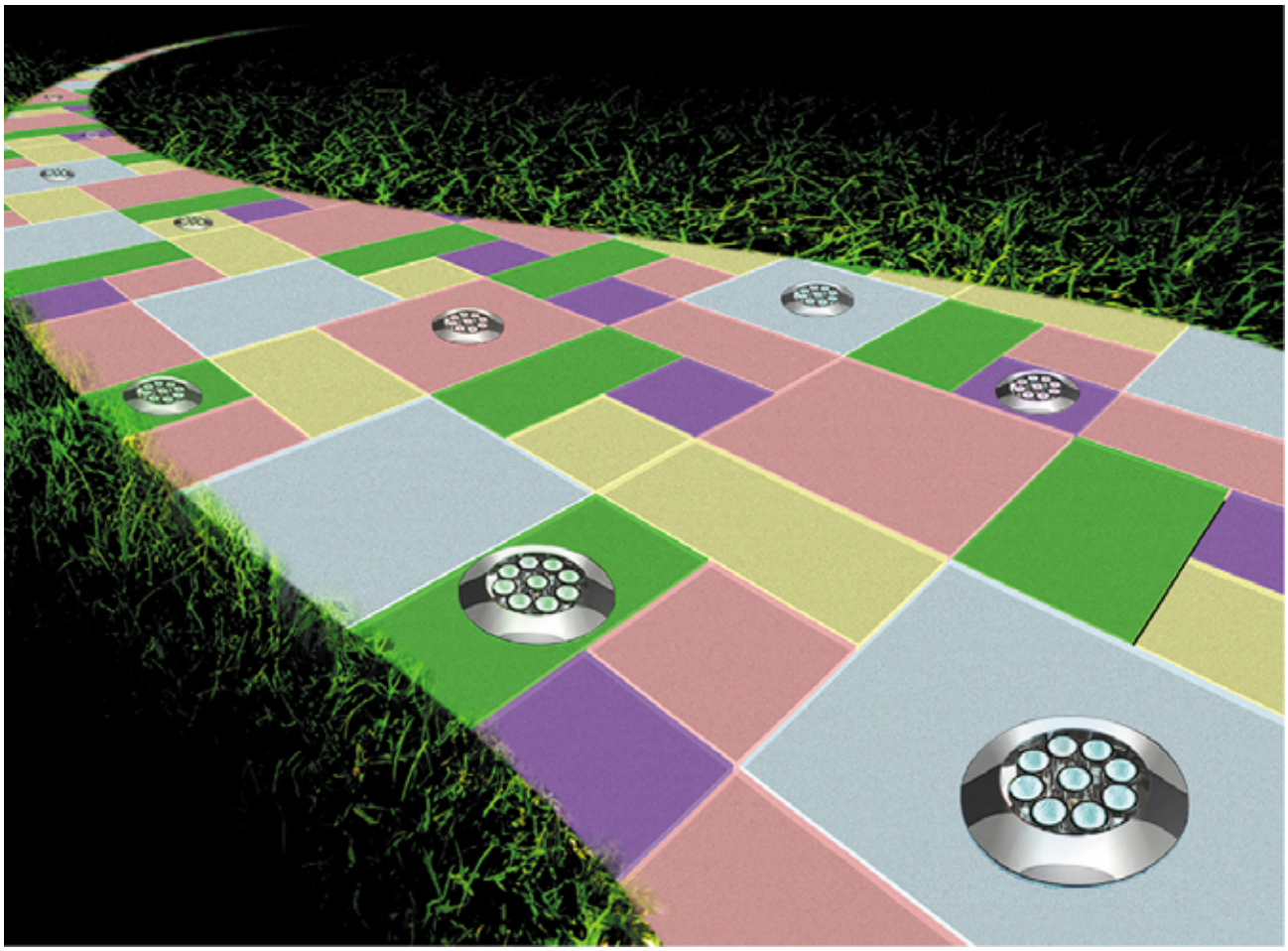


7-2. Spotlight illumination



7-3. Mini chandelier

7-4. Color stage illumination



⚠ CAUTIONS

- **When installing the Snap-in module, insert and turn it clockwise with sufficient pressure against the heat sink.**
  Insufficient pressure may result in damage to the connectors and terminals.
- **The module tightening torque, for installing the heat sink, should not exceed than 29.4 N.m.**
- **Before handling the module, the operator must fit the earth band to release electrostatic energy.**
- **Pay attention not to apply excessive force or impact to the module.**
- **Do not expose the module to naked flame.**
- **Do not damage the module with any sharp edged tool or equivalent.**
- **When multiple modules are installed, employ a cooling fan or heat exchanger to fully discharge the heat.**
  After all modules reach stable temperature, check that the measured LED module's temperature at its specified temperature measuring point does not exceed 70℃ even if the ambient temperature reaches the highest operating temperature.
  The module installation must be devised in order to maintain a module temperature below 70℃.
- **Before a module is installed or removed, be sure to turn off the power supply.**
- **Never expose the module to or store the module in an organic solvent or corrosive gas (e.g. chlorine, sulfide gas) environment.**
- **If the module is to be operated in an outdoor environment or exposed to moisture, condensation or high humidity, the installed module must be protected with some waterproof structure.**
- **The heat sink's PCB side must be protected with a cover or equivalent.**