

Ultra High Power LED

# EdiPower™ Emitter

Approved By Customer	Designer	Checker	Approval

Date : 2006/3/27

Version : 1.2

Device No. : 3-RD-01-H0001  
EDISON OPTO CORPORATION

4F, No. 800, Chung-Cheng Rd,

Chung-Ho, Taipei 235, Taiwan

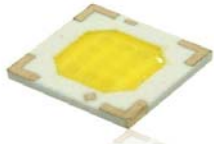
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<http://www.edison-opto.com.tw>



# EdiPower<sup>TM</sup>



EdiPower series can provide different power-operation and different colors. They serve as optical engine appropriately and applied to lighting and projector in the form of MR16 or others.

## Features

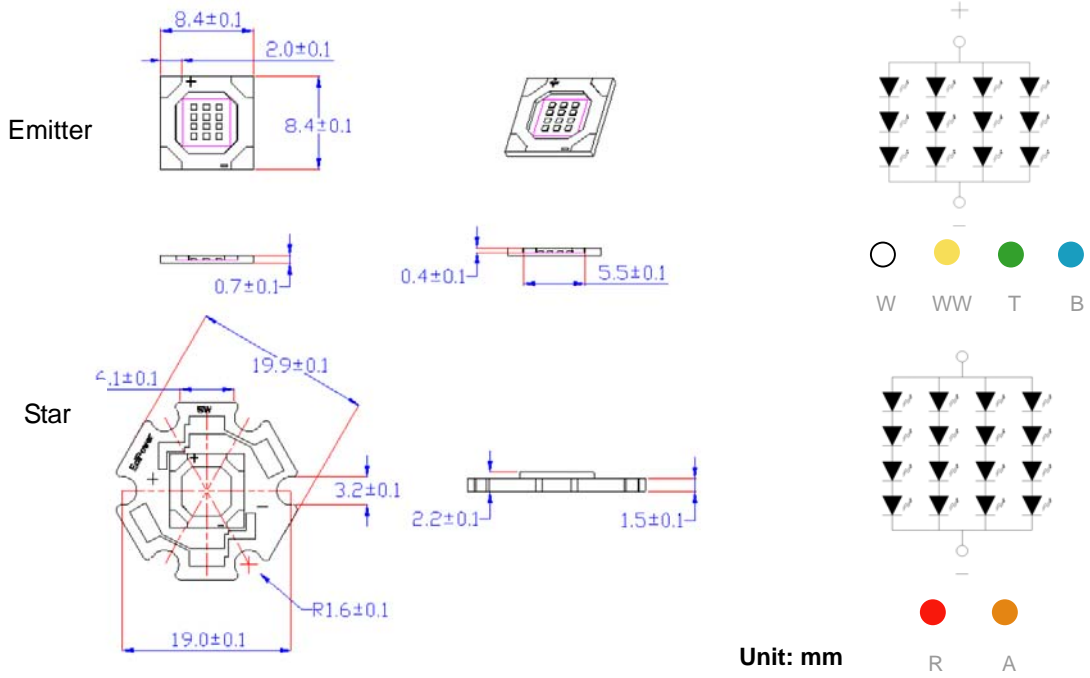
- LEDs lighting engine
- High power consumption
- Excellent thermal performance
- No UV

## Typical Applications

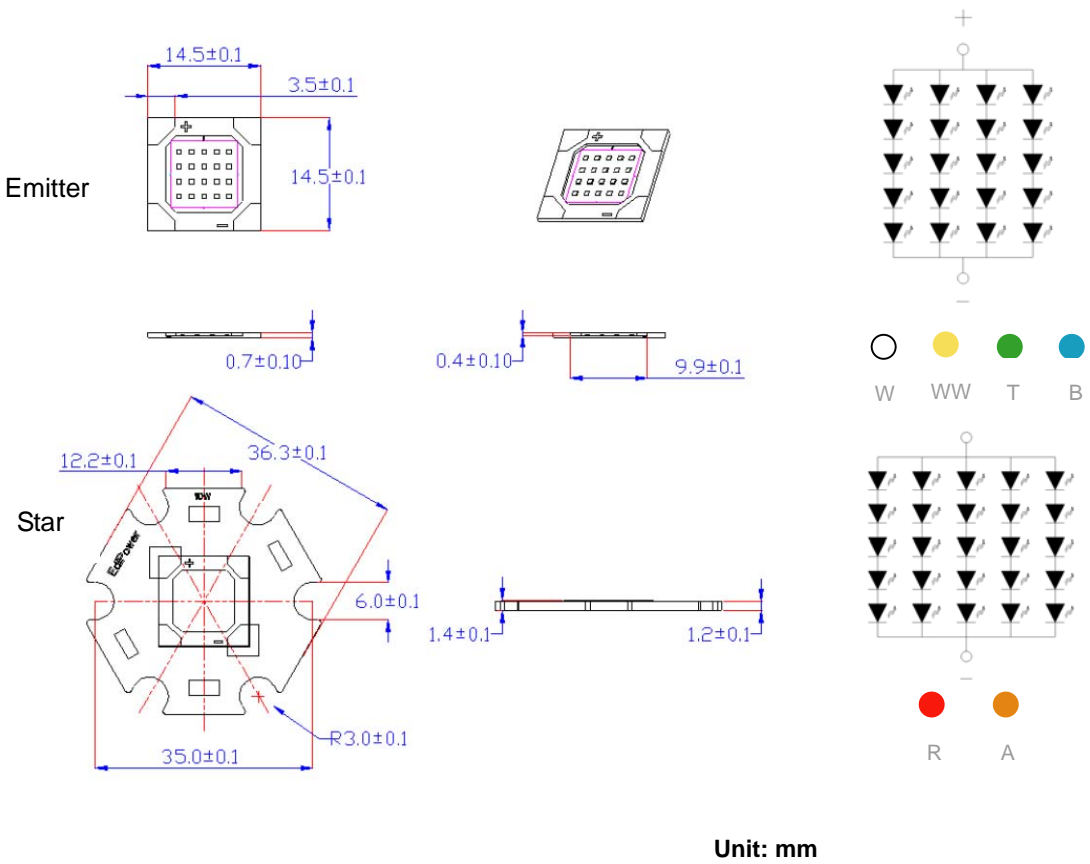
- Reading lights
- Portable flashlight
- LEDs lighting engine
- Bollards / Security / Garden lighting
- Indoor and Outdoor Commercial lighting
- LCD Backlights / Light guides
- Architectural lighting



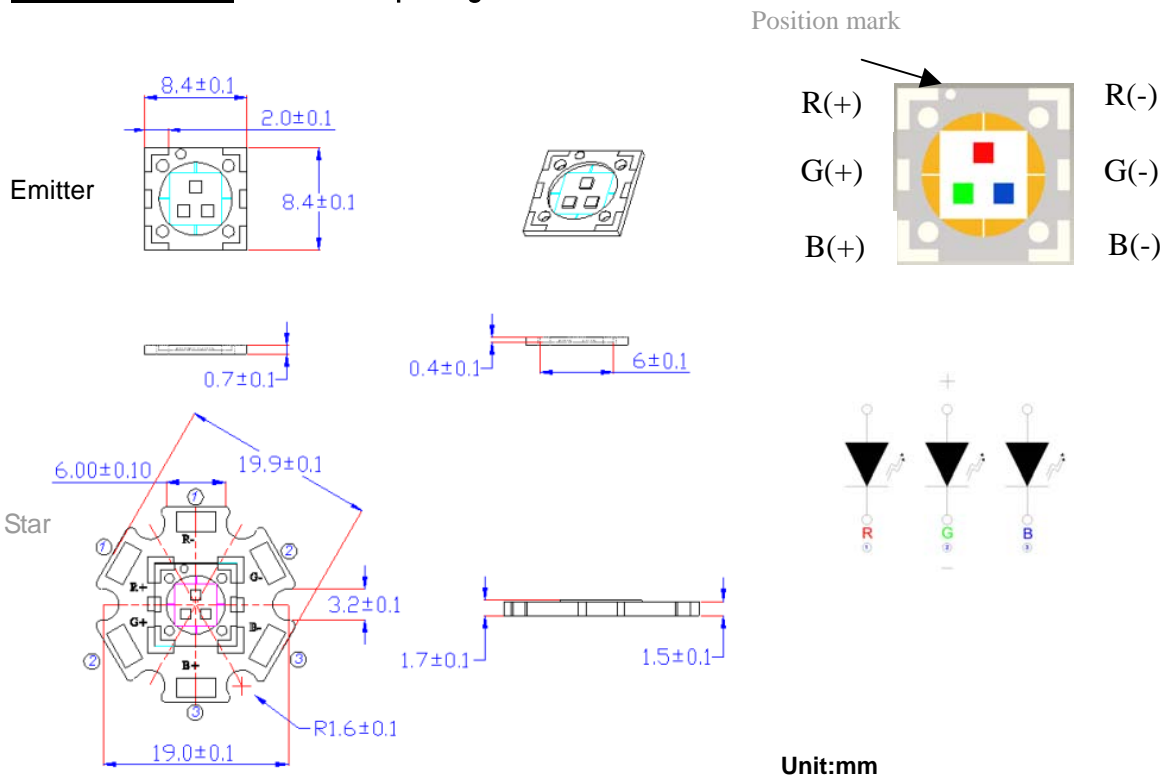
**Package Outlines: 5W**



**Package Outlines: 10W, 20W**



## Package Outlines: RGB in one package



## Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
DC Forward Current	$I_F$	500 (5W)	mA
		645 (10W)	
		1120 (20W)	
Peak pulse current;(tp $\leq$ 100 $\mu$ s, Duty cycle=0.005)	$I_{pulse}$	1000 (5W)	mA
		1290 (10W)	
		2240 (20W)	
LED junction Temperature	$T_j$	125	$^{\circ}$ C
Operating Temperature	$T_{opr}$	-30 ~ +110	$^{\circ}$ C
Storage Temperature	$T_{stg}$	-40 ~ +120	$^{\circ}$ C
Manual Soldering Time at 260 $^{\circ}$ C (Max.)	$T_{sol}$	5	seconds
LED Substrate Temperature	$T_s$	<100	$^{\circ}$ C

## Luminous Flux and Electrical Characteristics

Power Consumption	Part Name	Color	Typ. Voltage (V)	Test Current (A)	Luminous Flux (lm)	Thermal Resistance To Board (°C/W)
<b>5W</b>	<b>EP5W-2E00</b>	White	<b>10.4</b>	<b>0.50</b>	<b>200</b>	<b>2</b>
	<b>EP5X-2E00</b>	Warm White	<b>10.4</b>	<b>0.50</b>	<b>130</b>	<b>2</b>
	<b>EP5R-2E00</b>	Red	<b>8.4</b>	<b>0.60</b>	<b>130</b>	<b>2</b>
	<b>EP5A-2E00</b>	Amber	<b>8.4</b>	<b>0.60</b>	<b>130</b>	<b>2</b>
	<b>EP5T-2E00</b>	True Green	<b>10.4</b>	<b>0.50</b>	<b>130</b>	<b>2</b>
	<b>EP5B-2E00</b>	Blue	<b>10.4</b>	<b>0.50</b>	<b>60</b>	<b>2</b>
Power Consumption	Part Name	Color	Typ. Voltage (V)	Test Current (A)	Luminous Flux (lm)	Thermal Resistance To Board (°C/W)
<b>10W</b>	<b>EPAW-2E00</b>	White	<b>17.5</b>	<b>0.645</b>	<b>400</b>	<b>0.8</b>
	<b>EPAX-2E00</b>	Warm White	<b>17.5</b>	<b>0.645</b>	<b>250</b>	<b>0.8</b>
	<b>EPAR-2E00</b>	Red	<b>10.5</b>	<b>0.960</b>	<b>250</b>	<b>0.8</b>
	<b>EPAA-2E00</b>	Amber	<b>10.5</b>	<b>0.960</b>	<b>250</b>	<b>0.8</b>
	<b>EPAT-2E00</b>	True Green	<b>17.5</b>	<b>0.645</b>	<b>250</b>	<b>0.8</b>
	<b>EPAB-2E00</b>	Blue	<b>17.5</b>	<b>0.645</b>	<b>120</b>	<b>0.8</b>
Power Consumption	Part Name	Color	Typ. Voltage (V)	Test Current (A)	Luminous Flux (lm)	Thermal Resistance To Board (°C/W)
<b>20W</b>	<b>EPBW-4E00</b>	White	<b>18.5</b>	<b>1.12</b>	<b>700</b>	<b>0.5</b>
	<b>EPBX-4E00</b>	Warm White	<b>18.5</b>	<b>1.12</b>	<b>450</b>	<b>0.5</b>

### Chip Characteristics for single color

Color	Dominant Wavelength ( $\lambda_d$ )nm	Forward Voltage (V)
Red	620~630	1.90~2.35
Amber	585~595	1.90~2.35
True Green	520~530	3.20~3.65
Blue	465~475	3.20~3.65

### Chip Characteristics for RGB in one(EP3M-4XXX , 40 mil chip size)

Color	Dominant Wavelength ( $\lambda_d$ )nm	Forward Voltage (V)	Test current (A)	Luminous Flux (lm)
Red	625~630	1.9~2.2	0.35	30
True Green	520~525	3.2~3.5	0.35	35
Blue	455~460	3.4~3.7	0.35	12

### Electrical Characteristics

Power Consumption	Part Name	Color	Min. Voltage (V)	Typ. Voltage (V)	Max. Voltage (V)
5W	EP5W-2E00	White	9.3	10.2	11.4
	EP5X-2E00	Warm White	9.3	10.2	11.4
	EP5R-2E00	Red	8.0	9.2	10.8
	EP5A-2E00	Amber	8.0	9.2	10.8
	EP5T-2E00	True Green	9.3	10.2	11.4
	EP5B-2E00	Blue	9.3	10.2	11.4

Power Consumption	Part Name	Color	Min. Voltage (V)	Typ. Voltage (V)	Max. Voltage (V)
10W	EPAW-2E00	White	16.6	17.2	18.3
	EPAX-2E00	Warm White	16.6	17.2	18.3
	EPAR-2E00	Red	11.0	12.1	13.0
	EPAA-2E00	Amber	11.0	12.1	13.0
	EPAT-2E00	True Green	16.6	17.2	18.3
	EPAB-2E00	Blue	16.6	17.2	18.3

### Voltage bin

Power Consumption	Part Name	Color	Bin Group	Bin Group
5W	EP5W-2E00	White	VW01 9.3~10.1	VW02 10.2~10.8
	EP5X-2E00	Warm White	VX01 9.3~10.1	VX02 10.2~10.8
	EP5R-2E00	Red	VR01 8.0~9.1	VR02 9.2~10.8
	EP5A-2E00	Amber	VA01 8.0~9.1	VA02 9.2~10.8
	EP5T-2E00	True Green	VT01 9.3~10.1	VT02 10.2~10.8
	EP5B-2E00	Blue	VB01 9.3~10.1	VB02 10.2~10.8
Power Consumption	Part Name	Color	Bin Group	Bin Group
10W	EPAW-2E00	White	VW01 16.6~17.1	VW02 17.2~18.3
	EPAX-2E00	Warm White	VX01 16.6~17.1	VX02 17.2~18.3
	EPAR-2E00	Red	VR01 11.0~12.0	VR02 12.1~13.0
	EPAA-2E00	Amber	VA01 11.0~12.0	VA02 12.1~13.0
	EPAT-2E00	True Green	VT01 16.6~17.1	VT02 17.2~18.3
	EPAB-2E00	Blue	VB01 16.6~17.1	VB02 17.2~18.3

### Part No.Spec.

Power Consumption	Part Name	Color	Chip Connection	Note
5W	EP5W-2E00	White	<b>3 series 4 parallel</b>	<b>Only emitter</b>
	EP5X-2E00	Warm White	<b>3 series 4 parallel</b>	<b>Only emitter</b>
	EP5R-2E00	Red	<b>4 series 4 parallel</b>	<b>Only emitter</b>
	EP5A-2E00	Amber	<b>4 series 4 parallel</b>	<b>Only emitter</b>
	EP5T-2E00	True Green	<b>3 series 4 parallel</b>	<b>Only emitter</b>
	EP5B-2E00	Blue	<b>3 series 4 parallel</b>	<b>Only emitter</b>
Power Consumption	Part Name	Color	Chip Connection	Note
10W	EPAW-2E00	White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPAX-2E00	Warm White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPAR-2E00	Red	<b>5 series 5 parallel</b>	<b>Only emitter</b>
	EPAA-2E00	Amber	<b>5 series 5 parallel</b>	<b>Only emitter</b>
	EPAT-2E00	True Green	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPAB-2E00	Blue	<b>5 series 4 parallel</b>	<b>Only emitter</b>

Power Consumption	Part Name	Color	Chip Connection	Note
20W	EPBW-4E00	White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPBX-4E00	Warm White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPAR-4E00	Red	<b>Under Development</b>	
	EPAA-4E00	Amber		
	EPAT-4E00	True Green		
	EPAB-4E00	Blue		

Power Consumption	Part Name	Color	Chip Connection	Note
5W	EP5W-2S00	White	<b>3 series 4 parallel</b>	<b>With star AI board</b>
	EP5X-2S00	Warm White	<b>3 series 4 parallel</b>	<b>With star AI board</b>
	EP5R-2S00	Red	<b>4 series 4 parallel</b>	<b>With star AI board</b>
	EP5A-2S00	Amber	<b>4 series 4 parallel</b>	<b>With star AI board</b>
	EP5T-2S00	True Green	<b>3 series 4 parallel</b>	<b>With star AI board</b>
	EP5B-2S00	Blue	<b>3 series 4 parallel</b>	<b>With star AI board</b>

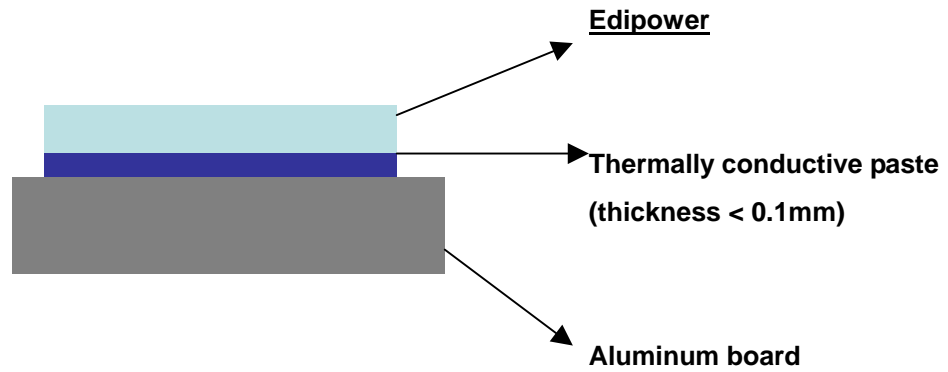
Power Consumption	Part Name	Color	Chip Connection	Note
10W	EPAW-2S00	White	<b>5 series 4 parallel</b>	<b>With star AI board</b>
	EPAX-2S00	Warm White	<b>5 series 4 parallel</b>	<b>With star AI board</b>
	EPAR-2S00	Red	<b>5 series 5 parallel</b>	<b>With star AI board</b>
	EPAA-2S00	Amber	<b>5 series 5 parallel</b>	<b>With star AI board</b>
	EPAT-2S00	True Green	<b>5 series 4 parallel</b>	<b>With star AI board</b>
	EPAB-2S00	Blue	<b>5 series 4 parallel</b>	<b>With star AI board</b>

Power Consumption	Part Name	Color	Chip Connection	Note
20W	EPBW-4S00	White	<b>5 series 4 parallel</b>	<b>With star AI board</b>
	EPBX-4S00	Warm White	<b>5 series 4 parallel</b>	<b>With star AI board</b>
	EPAR-4S00	Red	<b>Under Development</b>	
	EPAA-4S00	Amber		
	EPAT-4S00	True Green		
	EPAB-4S00	Blue		



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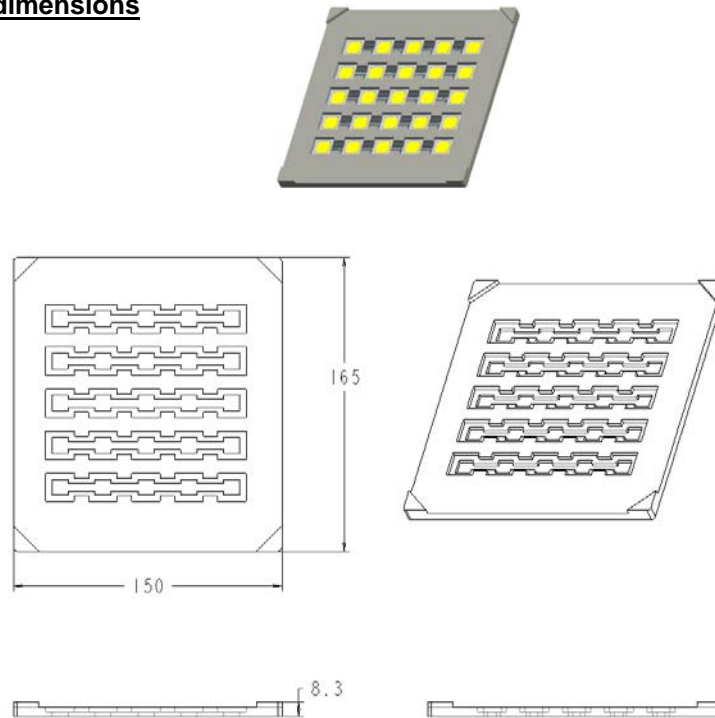
## Thermal Management



Thermally conductive paste:  $K > 2W/m^{\circ}C$

Aluminum board thickness: 1.5mm

## Package dimensions



Unit : mm

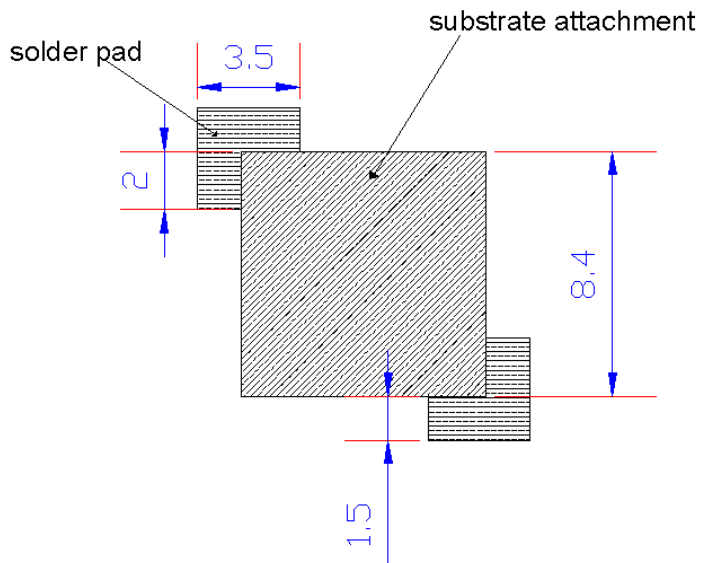
**Note:** Package storage condition will be limited in temperature 20~30°C, RH 40~50%

**Manual Soldering:** It is strongly recommended that solder tip temperature is limited under 350°C  
5 seconds. Damage to the silicone layer can cause emitter failure.

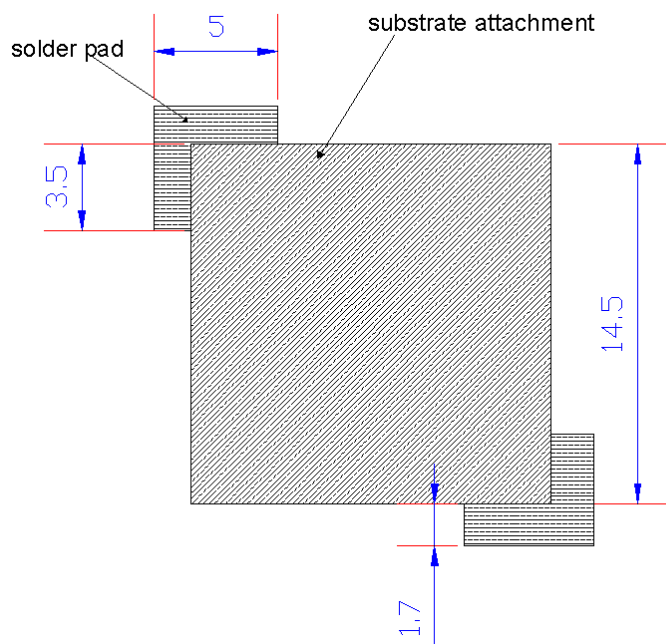
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**AIPCB Design:**

**5W**



**10W, 20W**



**Unit : mm**

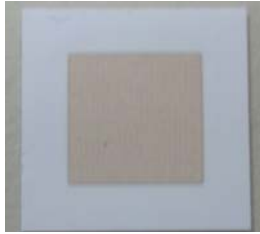
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**Thermal Grease Application:**

**Company:** YONYU APPLIED TECHNOLOGY MATERIAL (<http://www.yatm.com.tw>)

**Grease Name:** TG-6800 (K=2.8 W/mK)

**Step1:** Spread grease on the rear surface of emitter



Rear surface



Grease of rear surface

**Step2:** Fix emitter on heat sink or Al board.

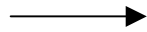
**Company:** TOPCO SCIENTIFIC (<http://www.topco.com.tw>)

**Grease Name:** KJR-9086-1 (K=2.3 W/mK)

**Step1:** Spread grease on the rear surface of emitter



Rear surface



Grease of rear surface

**Step2:** Fix emitter on heat sink or Al board.

**Step3:** Put emitter and heat sink or Al board in oven 150°C 20 minutes

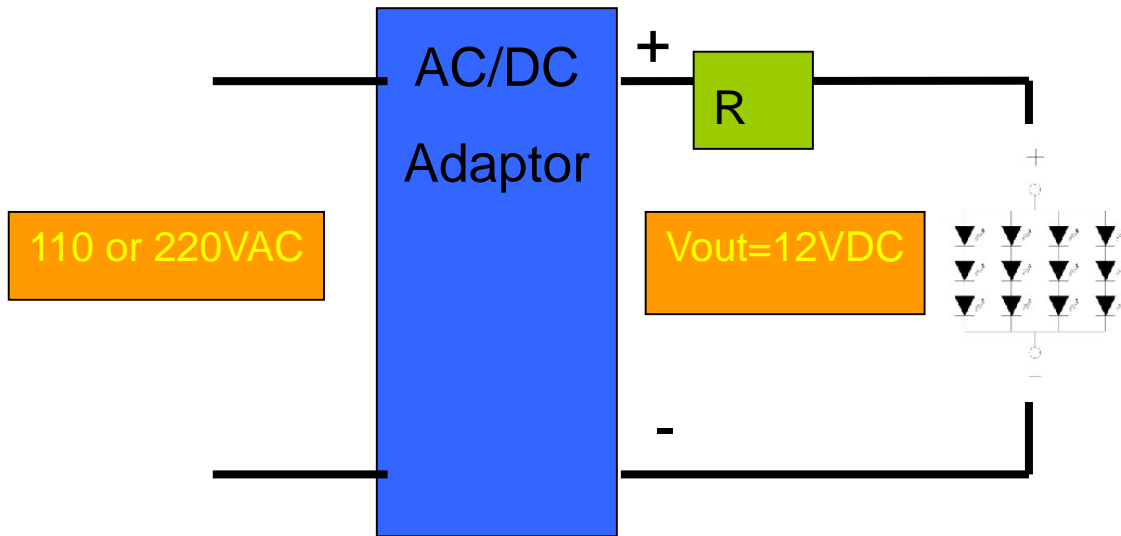
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**Emitter Assembly Note:**

1. Please do not use tweezers to touch the surface of silicone (emitting area).
2. Please do not press or touch the surface of silicone (emitting area).
3. Please wear anti-static wrist or glove to prevent ESD damage when assembling.
4. Please do not let EdiPower emitter fall down or press the surface of ceramic

**Simple Test Method**

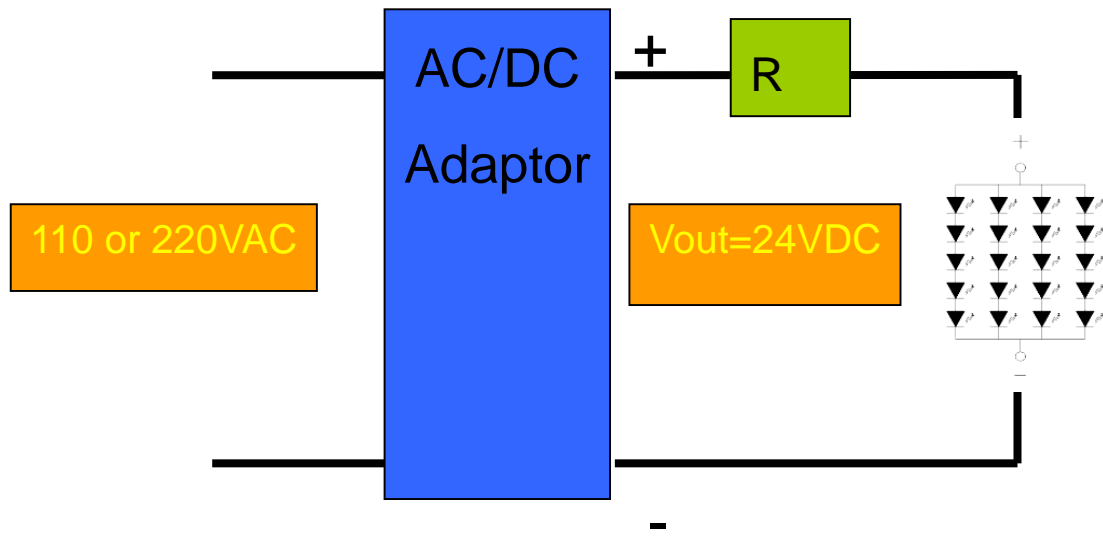
5W EdiPower



**R=4 $\Omega$**  for white, warm white, Green and Blue

**R=6 $\Omega$**  for red and Amber

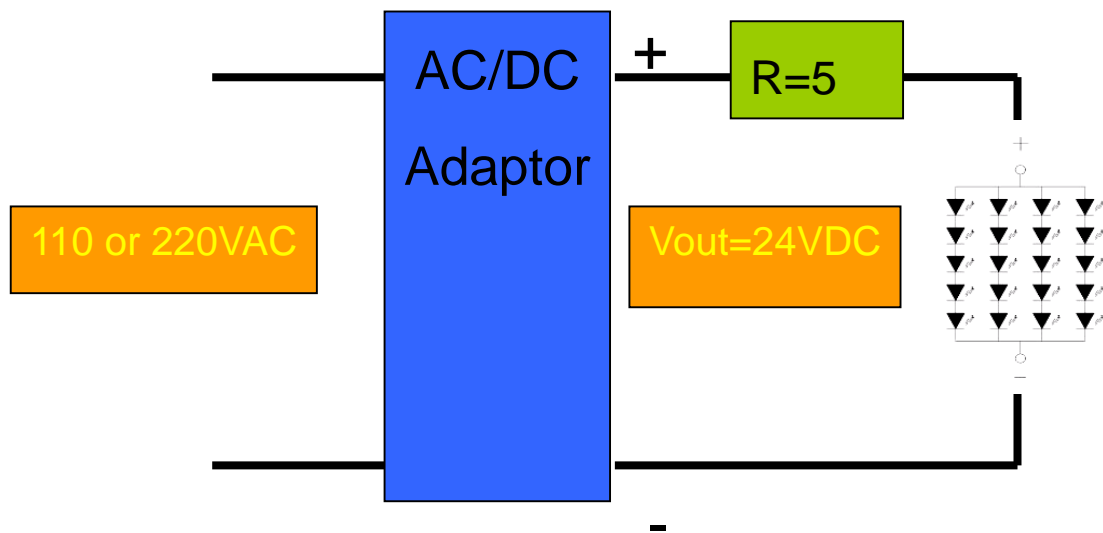
10W



$R=10\Omega$  for White, Warm White, Green, Blue

$R=2\Omega$  for Red and Amber

20W



$R=5\Omega$  for White and Warm

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**Revised History**

<b>Rev.</b>	<b>Issue Date</b>	<b>Revised Item</b>	<b>Note</b>
<b>1.1</b>	<b>2006/02/06</b>	<b>Form changed</b>	
<b>1.2</b>	<b>2006/03/27</b>	<b>1. Add thermal resistance 2. Add thermal grease application 3. Add simple test method</b>	<b>P. 4 P. 10 P. 11</b>