

Ultra High Power LED

# EdiPower™ Emitter

Approved By Customer	Designer	Checker	Approval

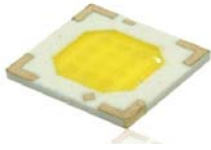
Date : 2006/6/17

Version : 1.3

Device No. : 3-RD-01-H0001  
EDISON OPTO CORPORATION  
4F, No. 800, Chung-Cheng Rd,  
Chung-Ho, Taipei 235, Taiwan  
Tel: 886-2-8227-6996  
Fax: 886-2-8227-6997  
<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

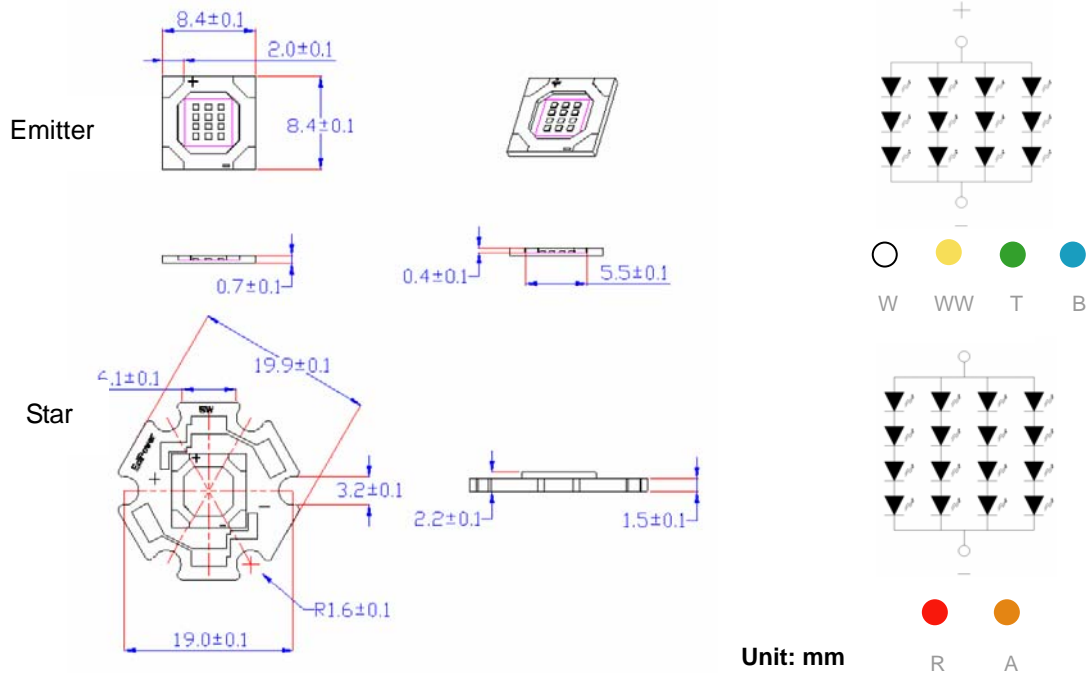
- LEDs lighting engine
- High power consumption
- Excellent thermal performance
- No UV

## Typical Applications

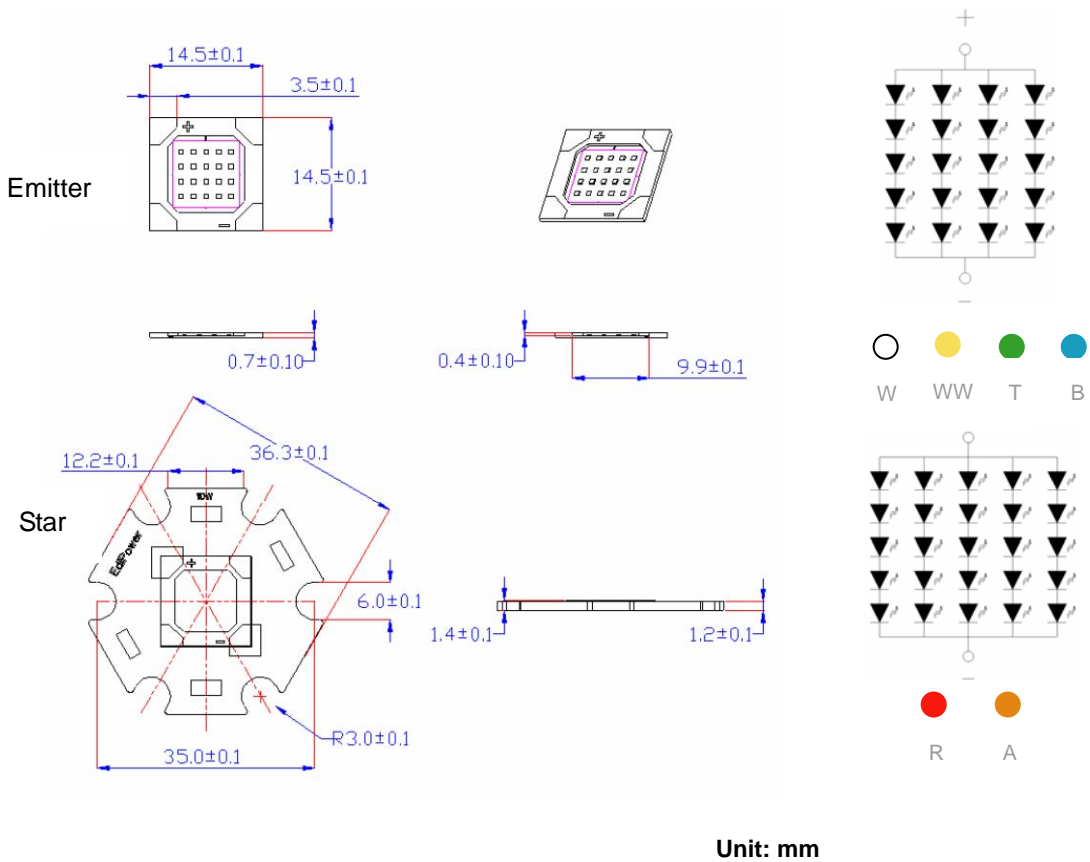
- Reading lights
- Portable flashlight
- LEDs lighting engine
- Bollards / Security / Garden lighting
- Indoor and Outdoor Commercial lighting
- LCD Backlights / Light guides
- Architectural lighting



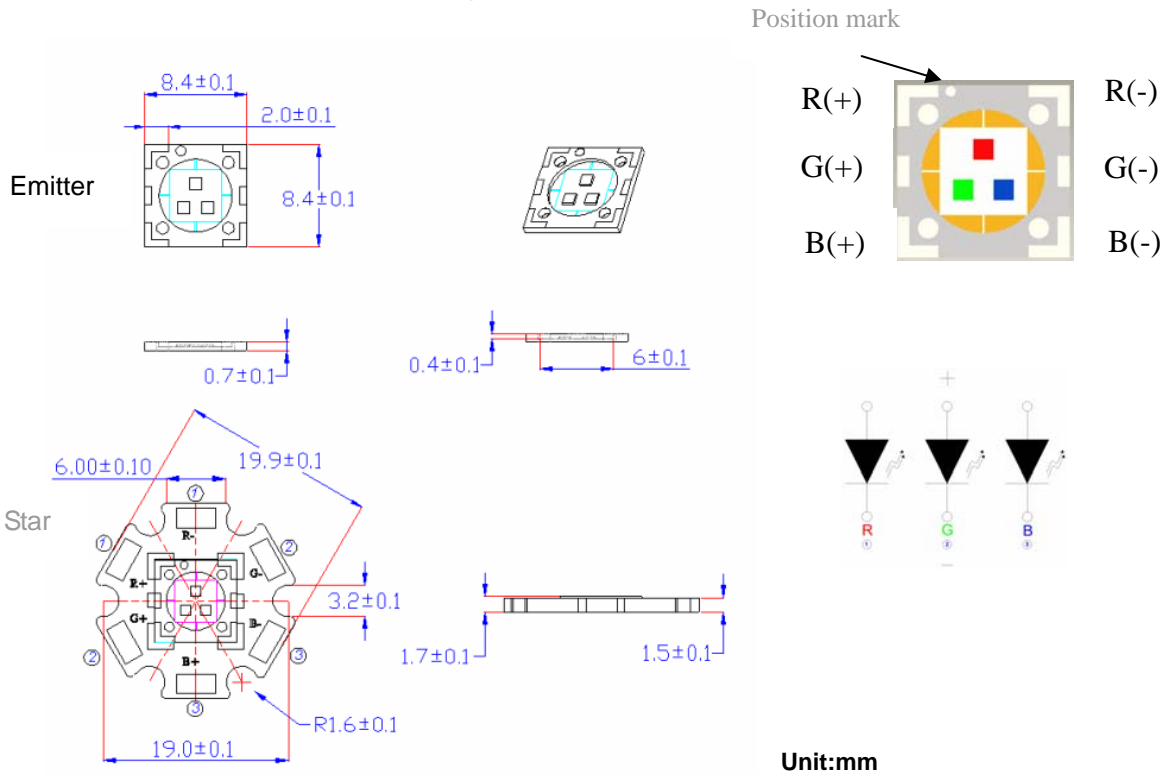
**Package Outlines: 5W**



**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; ( $t_p \leq 100\mu s$ , 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>
	<b>EPBR-4E00</b>	Red	<b>10.5</b>	<b>1.90</b>	<b>500</b>	<b>0.5</b>
	<b>EPBT-4E00</b>	True Green	<b>18.5</b>	<b>1.12</b>	<b>500</b>	<b>0.5</b>
	<b>EPBB-4E00</b>	Blue	<b>18.5</b>	<b>1.12</b>	<b>240</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

Power Consumption	Part Name	Color	Min. Voltage (V)	Typ. Voltage (V)	Max. Voltage (V)
20W	EPBW-2E00	White	16.6	17.2	18.3
	EPBX-2E00	Warm White	16.6	17.2	18.3
	EPBR-2E00	Red	11.0	12.1	13.0
	EPBT-2E00	True Green	16.6	17.2	18.3
	EPBB-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

Power Consumption	Part Name	Color	Bin Group		Bin Group	
20W	EPBW-2E00	White	VW01	16.6~17.1	VW02	17.2~18.3
	EPBX-2E00	Warm White	VX01	16.6~17.1	VX02	17.2~18.3
	EPBR-2E00	Red	VR01	11.0~12.0	VR02	12.1~13.0
	EPBT-2E00	True Green	VT01	16.6~17.1	VT02	17.2~18.3
	EPBB-2E00	Blue	VB01	16.6~17.1	VB02	17.2~18.3

### CCT ranks

CCT Group	CCT (°K)
<b>Warm White</b>	<b>2700 ~ 3300</b>
X1	2700 ~ 2900
X2	2900 ~ 3100
X3	3100 ~ 3300
<b>White</b>	<b>5200 ~ 7200</b>
W1	5200 ~ 5600
W2	5600 ~ 6000
W3	6000 ~ 6400
W4	6400 ~ 6800
W5	6800 ~ 7200

### 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-2E00	White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPBX-2E00	Warm White	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPBR-2E00	Red	<b>5 series 5 parallel</b>	<b>Only emitter</b>
	EPBT-2E00	True Green	<b>5 series 4 parallel</b>	<b>Only emitter</b>
	EPBB-2E00	Blue	<b>5 series 4 parallel</b>	<b>Only emitter</b>

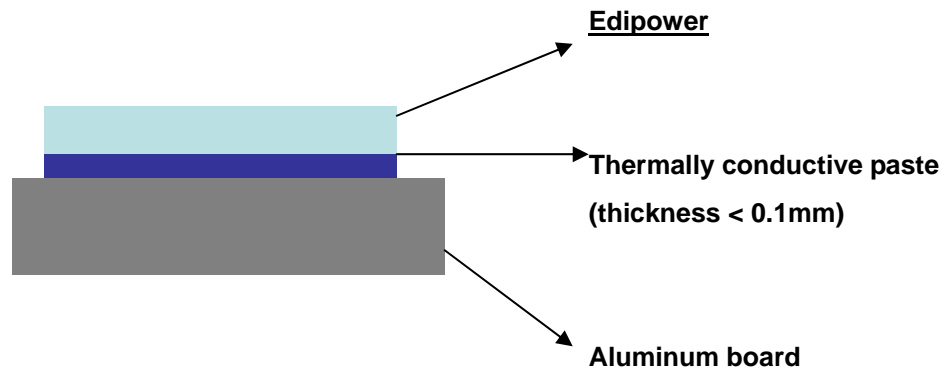
Power Consumption	Part Name	Color	Chip Connection	Note
5W	EP5W-2S00	White	<b>3 series 4 parallel</b>	<b>With star AI board</b>
	EP5X-2S00	Warm White	<b>3 series 4 parallel</b>	<b>With star AI board</b>
	EP5R-2S00	Red	<b>4 series 4 parallel</b>	<b>With star AI board</b>
	EP5A-2S00	Amber	<b>4 series 4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

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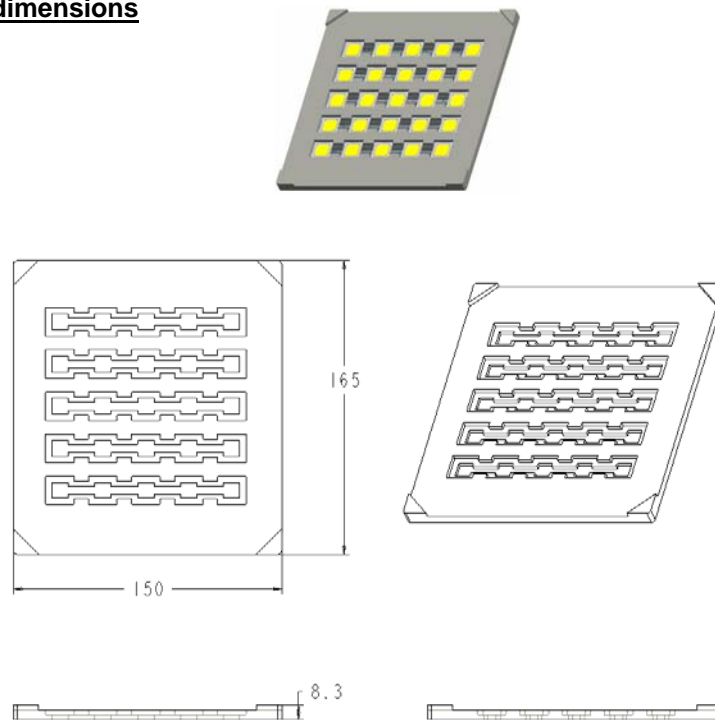
## Thermal Management



Thermally conductive paste:  $K > 2\text{W/m}\cdot\text{C}$

Aluminum board thickness: 1.5mm

## Package dimensions



Unit : mm

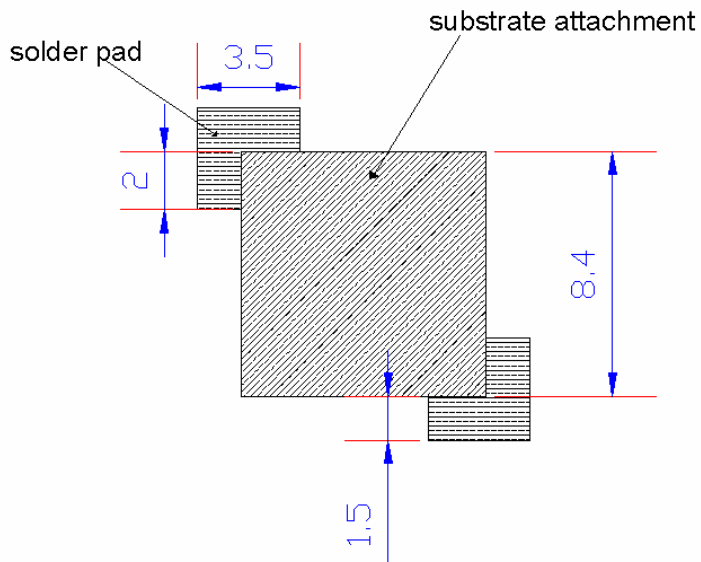
**Note:** Package storage condition will be limited in temperature 20~30°C, RH 40~50%

**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.

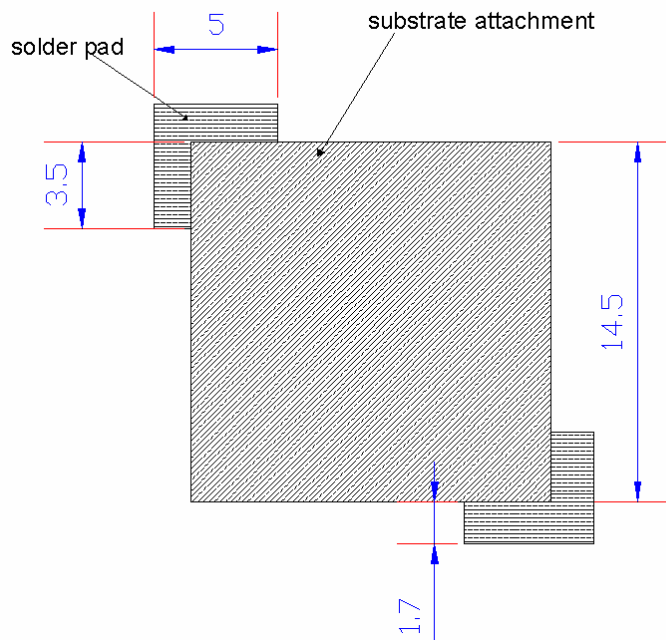
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**AIPCB Design:**

**5W**



**10W, 20W**



**Unit : mm**

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**Thermal Grease Application:**

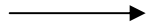
**Company:** YONYU APPLIED TECHNOLOGY MATERIAL (<http://www.yatm.com.tw>)

**Grease Name:** TG-6800-1 (K=2.6 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.

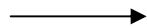
**Company:** TOPCO SCIENTIFIC (<http://www.topco.com.tw>)

**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

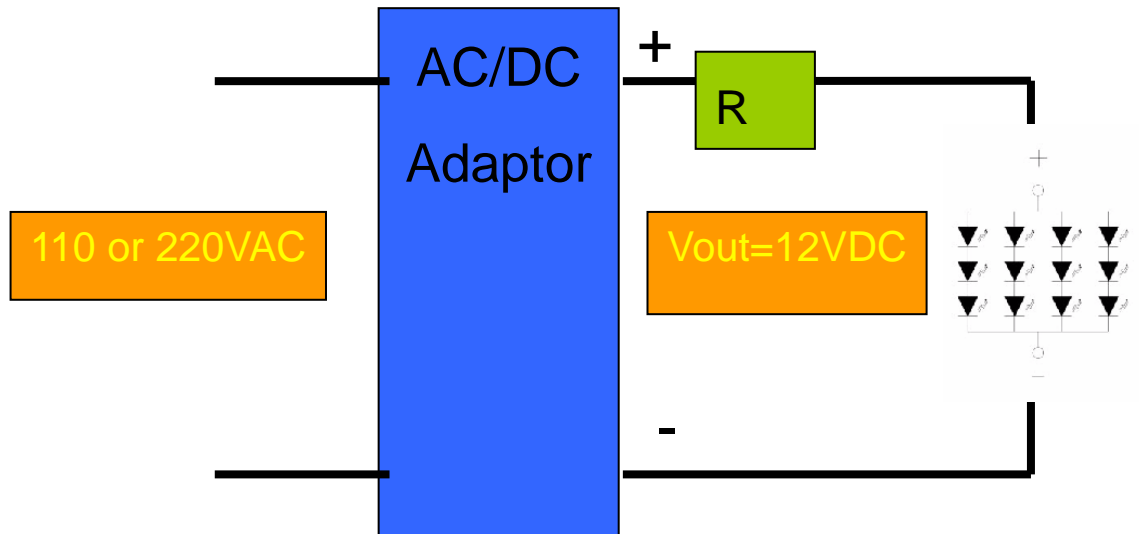
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**Emitter Assembly Note:**

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**

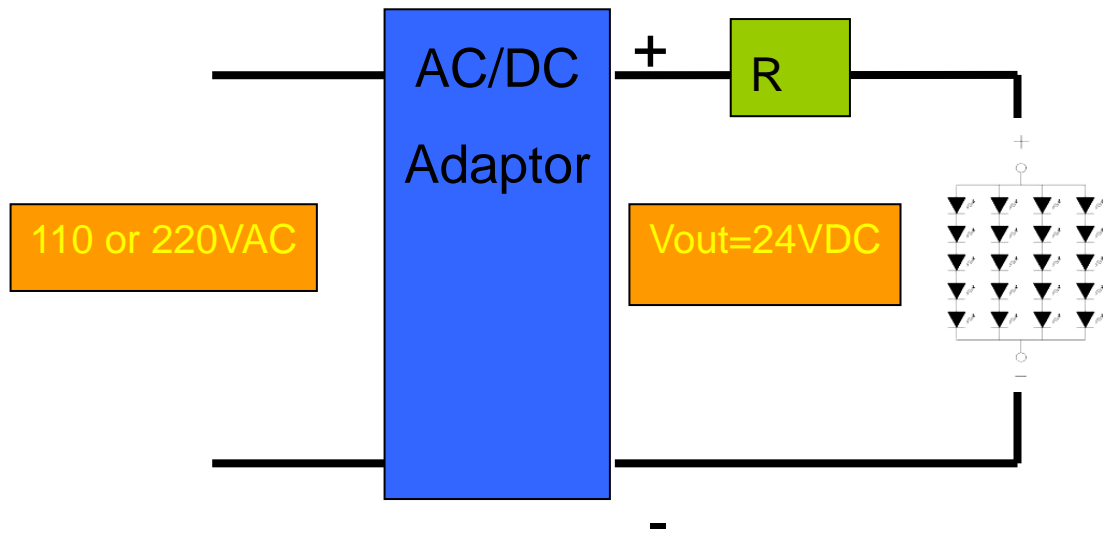
5W EdiPower



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

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

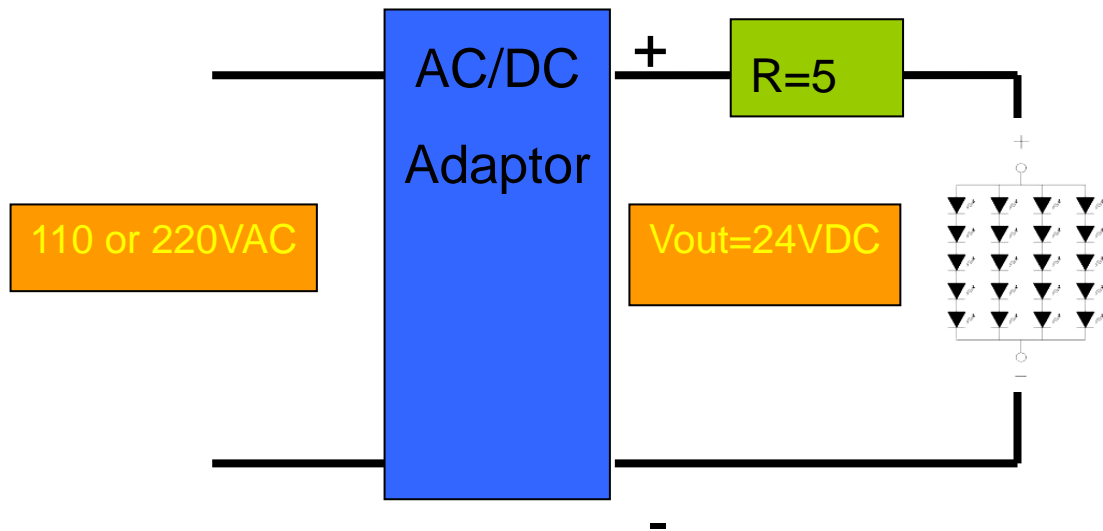
10W



$R=10\Omega$  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>
<b>1.3</b>	<b>2006/06/17</b>	<b>Add white and warm white CCT group</b>	<b>P. 7</b>