FPC Series Lighting Application Guide

With the dynamic advancement in LED technology and its brightness efficacy exceed traditional light source, LED used in general lighting is an inevitable replacement as it brings many benefit with its advantage in reducing energy consumption.

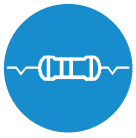
Since the beginning, Edison Opto has been devoted to promote high brightness LED used in the lighting market. As we have enable many custom pioneering design and applications. Edison Opto introduces this Step by step, easy read through guide book solely purpose to accelerate the integration of LED into various lighting products, and to help the customers in specifying the right Edison LEDs at Lighting.

EDISON
Lighting Design Manufacturing Service

Here at Edison Opto, we understand how difficult it could be when designing a lighting fixture with high power LEDs. Common questions relating to LED module design can be categorized in four application aspects as T.E.M.O.

Thermal Management

Does this heat-sink have enough surface area?



Electrical Driving Condition

How much current should my LED modules be driven?

Mechanical Refinement

How do I mount LED modules to my design?

Optical Optimization

Which secondary lens is suitable to my application?

If you have any questions similar to the above in mind, our LED Detective is here to help you overcome these restrains and to offer TEMO solutions that are optimized to your unique designs.

Heat-Sink Evaluation

Assembly Instructions

LED Drivers Suggestion

Optical Recommenedation

To serve and protect

LED Detective serves to ensure an overall sustainable LED system by offering LED design insights with services including thermal evaluation, LED drivers suggestion, assembly guidance and secondary lens correspondence. For more information on LED Detective services, please contact LED.Detective@edison-opto.com.tw

Table of Contents

Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
LED junction Temperature	T_j	125	°C
Operating Temperature	T_{opr}	-20 ~ +50	°C
Storage Temperature	T_{stg}	10 ~ +50	°C

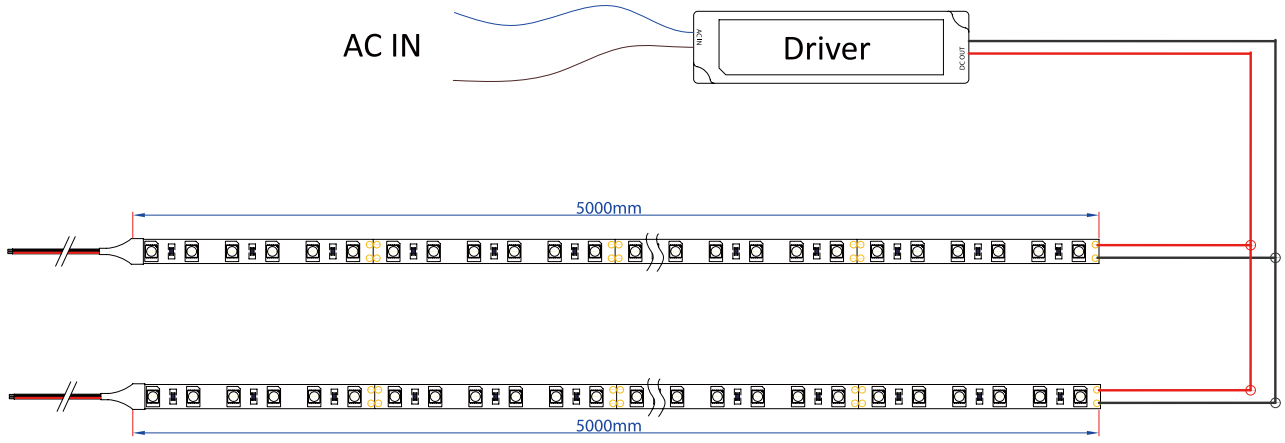
Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.
3. This product is not designed for directly outdoor using. If in case, a shelter accessory is recommended.
4. This product is not designed for directly contact with chemicals, for example pesticide and cleaner, etc.

Application note

1. For extended utilize, please join the lightbar male port to the other lightbar's female port with connector.

2. Strongly recommended one power connection one set FPC, If over two set FPC recommended connection power between two FPC (Drawing).



Drivers connection diagram

Accessory : Connector

Waterproof connector

Order Code :13CNP2000001

Assembling Methods

Step1

Make a connection between the male and female side of the wire. Please notice that the colors of the wires are different. Be sure the same color is connected at the same side.

Step2

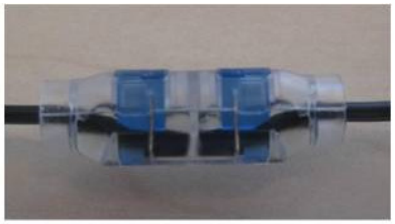
Use the recommended connector to link a light bar and a driver. Put the cables of the wire and driver into each side of the connector. Make sure the red cable of the wire is linked to the positive terminal of the driver (also in red), and vice versa.

Step3

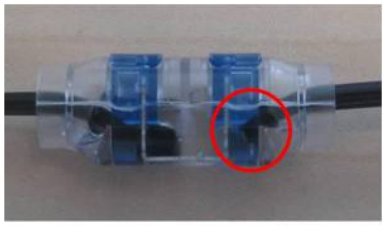
Ones the cables are inside of the connector, press down the bottom of the connector and make sure the cables are tight fixed.

Cable preparation

Before using, make sure the applicable cable is clean and free of superficial pollution like dust or other substances that can compromise the insulation level. When stripping the cable jacket make sure it is a straight clean cut and prevent at all times that the insulation of the wires within the cable are damaged or cut in. The stripped jacket end shall be cut under a maximum angle of 10°. Proper cutting tooling shall be used to avoid spacing deformation and burrs.



Wires terminated correctly



Wires terminated incorrectly

Notes:

1. The connector is used in Waterproof FPC Series.
2. The connector do not reuse.
3. To prevent the defect of water resistance, the bare wire is recommended to be cut off or be kept less than 2 millimeter.

Solderless Connector Series

33WR100000xx assembly methods (2 WIRE)

Step1

Open the connector cover

Step2

The cut FPC positive and connector positive (red line)on the same side

Step3

Confirm the connector PIN in contact with FPC PAD

Step4

Close the connector cover, and verify tightly

33WR100000xx assembly methods (4 WIRE)

Step1

Open the connector cover

Step2

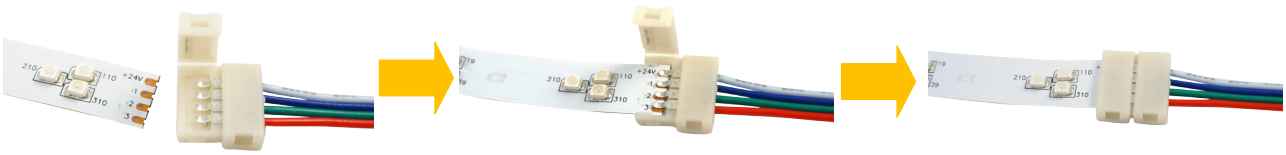
The cut FPC positive and connector positive (White line)on the same side

Step3

Confirm the connector PIN in contact with FPC PAD

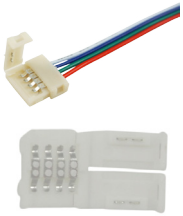
Step4

Close the connector cover, and verify tightly



Connector Order code		33WR10000001 33CNR1000001		33WR10000002 33CNR1000002
FPC Series	3014	3528	5050	5630
FPC Order Code	6LBR1CWNI0000003	6LBR1CWNI0000001	6LBR1CWNI0000002	6LBR1CWNI0000004
	6LBR1NWNI0000003	6LBR1NWNI0000001	6LBR1NWNI0000002	6LBR1NWNI0000004
	6LBR1WWNI0000003	6LBR1WWNI0000001	6LBR1WWNI0000002	6LBR1WWNI0000005
	6LBR1CWNJ0000005	6LBR1WWNI0000007	6LBR1CWNJ0000002	6LBR1CWNJ0000006
	6LBR1NWNJ0000008	6LBR1RXNI0000001	6LBR1NWNJ0000002	6LBR1NWNJ0000007
	6LBR1WWNJ0000009	6LBR1TXNI0000003	6LBR1WWNJ0000004	6LBR1WWNJ0000008
		6LBR1BXNI0000001	6LBR1PVNJ0000001	
		6LBR1YXNI0000001		
		6LBR1PXNI0000001		
		6LBR1PXNI0000002		
		6LBR1CWNJ0000004		
		6LBR1NWNJ0000005		
		6LBR1WWNJ0000006		
	-	6LBR1WWNJ0000011	-	-
		6LBR1RXNJ0000002		
		6LBR1TXNJ0000002		
		6LBR1BXNJ0000002		
		6LBR1PXNJ0000003		
		6LBR1PXNJ0000005		
		6LBR1CWNJ0000007		
		6LBR1NWNJ0000010		
		6LBR1WWNJ0000013		

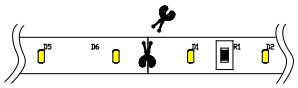
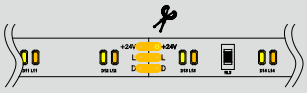
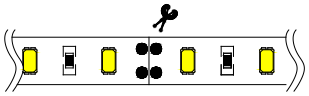
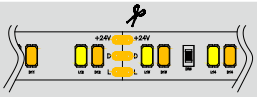
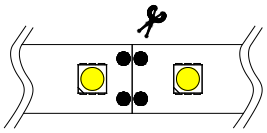
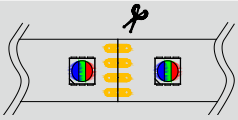
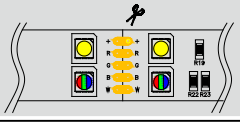
4 WIRE connector for FPC List

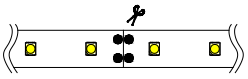
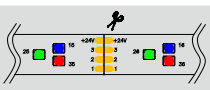
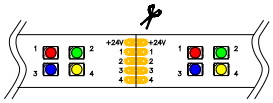
Connector Order Code		33WR10000004 33CNR1000004		33WR10000003 33CNR1000003
FPC Series	3528		5050	
FPC Order Code	6LBR1M1NJ0000002		6LBR1M1NJ0000001	

Notes:

1. This Connector is already for 8 / 10/12mm FPC, can choose 2 wire and 4 wire two type.
2. Please follow the above form when use the connector. The rest is not suitable

Cut Line & Current Loss calculate

Series	Order code	CUT Point	Reduced length	Current loss/length
3014 Series	6LBR1CWNJ0000005		100mm	30mA
	6LBR1NWNJ0000008			
	6LBR1WWNJ0000009			
	6LBR1CWNI0000003		50mm	30mA
	6LBR1NWNI0000003			
	6LBR1WWNI0000003			
	6LBR1M6NJ0000001		100mm	60mA
5630 Series	6LBR1CWNJ0000006		100mm	60mA
	6LBR1NWNJ0000007			
	6LBR1WWNJ0000008			
	6LBR1CWNI0000004		50mm	60mA
	6LBR1NWNI0000004			
	6LBR1WWNI0000005			
	6LBR1M6NJ0000004		100mm	120mA
5050 Series	6LBR1CWNJ0000002		100mm	60mA
	6LBR1NWNJ0000002			
	6LBR1WWNJ0000004			
	6LBR1PVNJ0000001			
	6LBR1CWNI0000002		50mm	60mA
	6LBR1NWNI0000002			
	6LBR1WWNI0000002			
	6LBR1M1NI0000001		50mm	60mA
	6LBR1M1NJ0000001		100mm	60mA
	6LBR1M2NJ0000003		166.67mm	120mA
	6LBR1M7NJ0000002			
	6LBR1M2NJ0000001		125mm	120mA
	6LBR1M7NJ0000003			

Series	Order code	CUT Point	Reduced length	Current loss/length
3528 Series	6LBR1CWNJ0000004		100mm	20mA
	6LBR1NWNJ0000005			
	6LBR1WWNJ0000006			
	6LBR1WWNJ0000011			
	6LBR1RXNJ0000002			
	6LBR1TXNJ0000002			
	6LBR1BXNJ0000002			
	6LBR1PXNJ0000003			
	6LBR1PXNJ0000005			
	6LBR1CWNJ0000007			
	6LBR1NWNJ0000010			
	6LBR1WWNJ0000013			
	6LBR1CWNI0000001			
	6LBR1NWNI0000001			
	6LBR1WWNI0000001			
	6LBR1WWNI0000007			
	6LBR1RXNI0000001			
	6LBR1TXNI0000003			
	6LBR1BXNI0000001			
	6LBR1YXNI0000001			
	6LBR1PXNI0000001			
	6LBR1PXNI0000002			
	6LBR1CWNJ0000001		50mm	20mA
	6LBR1NWNJ0000001			
	6LBR1WWNJ0000001			
	6LBR1RXNJ0000001			
	6LBR1TXNJ0000001			
	6LBR1BXNJ0000001			
	6LBR1YXNJ0000001			
	6LBR1PXNJ0000002			
	6LBR1PXNJ0000004			
	6LBR1WWNJ0000012			
	6LBR1M1NJ0000002		166.67mm	60mA
	6LBR1M2NJ0000002		166.67mm	80mA

Accessory : Driver

CLG Series

SPV Series

Series	Order code	CLG-60-12 (DC 12V,5A,IP67)	CLG-150-12 (DC 12V,11A,IP67)	SPV-150-12 (DC 12V, 12.5A)
		FPC Quantity	FPC Quantity	FPC Quantity
3014	6LBR1CWNI0000003	1	3	4
	6LBR1NWNI0000003			
	6LBR1WWNI0000003			
3528	6LBR1CWNI0000001	2	5	6
	6LBR1NWNI0000001			
	6LBR1WWNI0000001			
	6LBR1WWNI0000007			
	6LBR1RXNI0000001			
	6LBR1TXNI0000003			
	6LBR1BXNI0000001			
	6LBR1YXNI0000001			
	6LBR1PXNI0000001			
	6LBR1PXNI0000002			
5050	6LBR1CWNI0000002	-	1	2
	6LBR1NWNI0000002			
	6LBR1WWNI0000002			
	6LBR1M1NI0000001			
5630	6LBR1CWNI0000004			
	6LBR1NWNI0000004			
	6LBR1WWNI0000005			

Series	Order code	CLG-60-24 13EEE60D0001 (DC 24V,2.5A,IP67)	CLG-100-24 (DC 24V,4A,IP67)	CLG-150-24 (DC 24V,6.3A,IP67)	SPV-150-24 (DC 24V, 6.25A)
		FPC Quantity	FPC Quantity	FPC Quantity	FPC Quantity
3014	6LBR1CWNJ0000005	1	2	4	4
	6LBR1NWNJ0000008				
	6LBR1WWNJ0000009				
	6LBR1M6NJ0000001	-	1	2	2
3528	6LBR1CWNJ0000004	2	4	6	6
	6LBR1NWNJ0000005				
	6LBR1WWNJ0000006				
	6LBR1WWNJ0000011				
	6LBR1RXNJ0000002				
	6LBR1TXNJ0000002				
	6LBR1BXNJ0000002				
	6LBR1PXNJ0000003				
	6LBR1PXNJ0000005				
	6LBR1CWNJ0000007				
	6LBR1NWNJ0000010				
	6LBR1WWNJ0000013				
	6LBR1M1NJ0000002	1	2	3	3
	6LBR1CWNJ0000001				
	6LBR1NWNJ0000001				
	6LBR1WWNJ0000001				
	6LBR1WWNJ0000012				
	6LBR1RXNJ0000001				
	6LBR1TXNJ0000003				
	6LBR1BXNJ0000001				
	6LBR1YXNJ0000001				
	6LBR1PXNJ0000002				
	6LBR1PXNJ0000004				
	6LBR1M2NJ0000002	1	1	2	2
	6LBR1M7NJ0000001				

Notes:

1. Please select the driver with an appropriate total output power which is corresponded to the connected lightbar. Total connected current is recommended less than 6 Ampere.
2. SPV Series connection as following table.

Series	Order code	CLG-60-24 13EEE60D0001 (DC 24V,2.5A,IP67)	CLG-100-24 (DC 24V,4A,IP67)	CLG-150-24 (DC 24V,6.3A,IP67)	SPV-150-24 (DC 24V, 6.25A)
		FPC Quantity	FPC Quantity	FPC Quantity	FPC Quantity
5050	6LBR1CWNJ0000002	-	1	2	2
	6LBR1NWNJ0000002				
	6LBR1WWNJ0000004				
	6LBR1PVNJ0000001				
	6LBR1M1NJ0000001				
	6LBR1M2NJ0000003	-	1	1	1
	6LBR1M7NJ0000002				
	6LBR1M2NJ0000001	-	-	1	1
	6LBR1M7NJ0000003				
5630	6LBR1CWNJ0000006	-	1	2	2
	6LBR1NWNJ0000007				
	6LBR1WWNJ0000008				
	6LBR1M6NJ0000004	-	-	1	1

Notes:
1. Please select the driver with an appropriate total output power which is corresponded to the connected lightbar. Total connected current is recommended less than 6 Ampere.
2. SPV Series connection as following table.

SPV Series			
NO.	Function	NO.	Function
1	AC/L	5	PV
2	AC/N	6~7	DC Output V+
3	FG	8~9	DC Output V-
4	RC	-	-

Dimmer recommend using FPC quantity

Item	Order code	Spec
	33LBR1010001 (Controller) 33LBR1020001 (Remote) 33LBR1030001 (Controller + Remote)	1. RF 2.4G Hz 2. Dimmer 2.1. Brightness Adjusting(100%~1%, 20 grades of Brightness to adjust) 2.2. Color temperature Adjusting(11 grades to adjust) 3. Effective receiving distance nearly 30m 4 12 automatical change modes to choose 5. Input/Output Voltage: DC 12V~24V 6. Current per channel: 6A; Total Output Current: 12A 7. Output Power:12V<72W, 24V<144W
	33LBR1010002 (Controller) 33LBR1020002 (Remote) 33LBR1030002 (Controller + Remote)	1. RF 2.4G Hz 2. Dimmer 3. Effective receiving distance nearly 30m 4. 20 automatical change modes to choose 5. Input/Output Voltage:DC 12V~24V 6. Current per channel: 6A; Total Output Current:18A 7. Output Power:12V<216W, 24V<432W
	33LBR1010003 (Controller) 33LBR1020003 (Remote) 33LBR1030003 (Controller + Remote)	1. RF 2.4G Hz 2. Dimmer 3. Effective receiving distance nearly 30m 4. 12 automatical change modes to choose 5. Input/Output Voltage:DC 12V~24V 6. Current per channel: 6A; Total Output Current: 24A 7. Output Power:12V<216W, 24V<432W

Note:
One controller can support four remote.

With Dimmer Connector

Assembly methods

Step1

The FPC wire was connected to the controller output, and with the controller labeled consistent

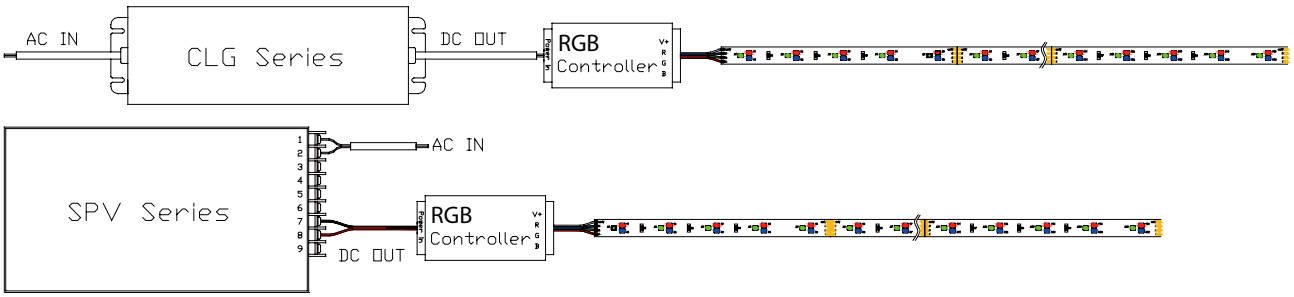
Step2

The power supply output was connected to the controller input, Positive to the positive, Negative to the negative

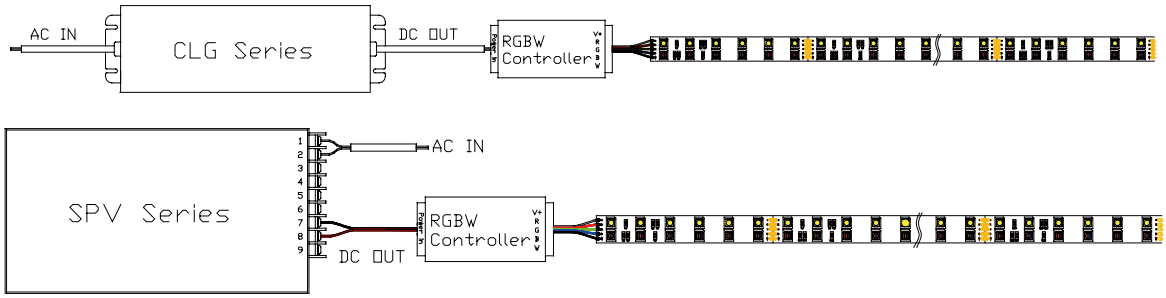
Step3

Confirm wiring is correct, you can connect the AC power to the power supply

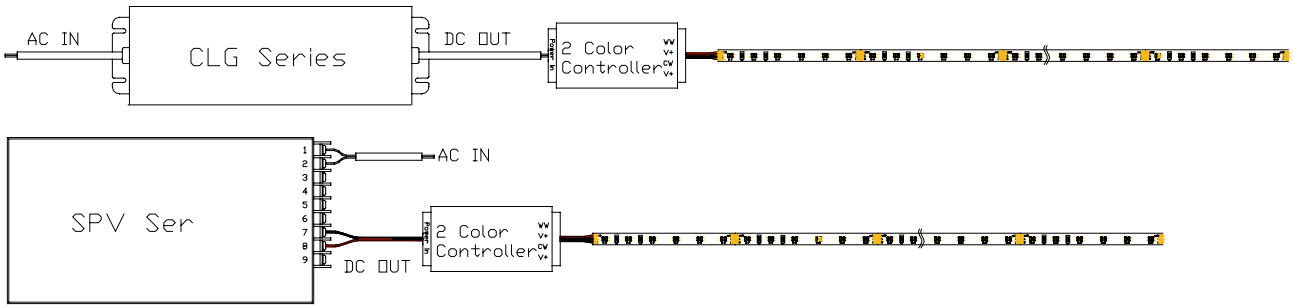
RGB Connection



RGBW Connection



2 Color Connection

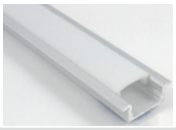
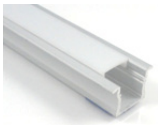


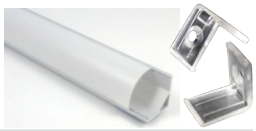
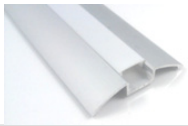
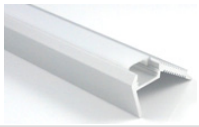
Accessory : Dimmer

Controller	Dimmer Order Code	FPC Order code	Driver	FPC Quantity
	33LBR1030001 (Controller + Remote)	6LBR1M6NJ0000001	CLG-100-24	1
			CLG-150-24	2
			SPV-150-24	2
		6LBR1M6NJ0000004	CLG-150-24	1
			SPV-150-24	1
	33LBR1030002 (Controller + Remote)	6LBR1M1NI0000001	CLG-150-12	1
			SPV-150-12	2
		6LBR1M1NJ0000001	CLG-100-24	1
			CLG-150-24	2
			SPV-150-24	2
		6LBR1M1NJ0000002	CLG-60-24	1
			CLG-100-24	2
			CLG-150-12	3
			SPV-150-24	3
	33LBR1030003 (Controller + Remote)	6LBR1M2NJ0000001	CLG-150-24	1
			SPV-150-24	1
		6LBR1M2NJ0000002	CLG-60-24	1
			CLG-100-24	1
			CLG-150-24	2
			SPV-150-24	2
		6LBR1M2NJ0000003	CLG-100-24	1
			CLG-150-24	1
			SPV-150-24	1

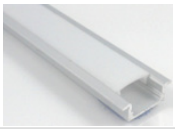
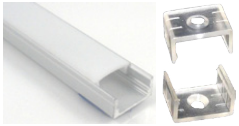
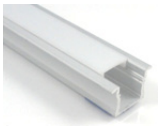
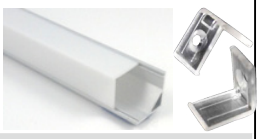
Accessory : Aluminum extrusion

3014 Series

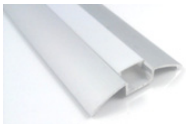
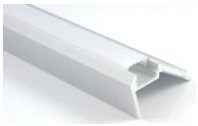
Order Code	33LBR1040001 	33LBR1040002 	33LBR1040003 	33LBR1040004 
6LBR1CWNI0000003	V	V	V	V
6LBR1NWNI0000003	V	V	V	V
6LBR1WWNI0000003	V	V	V	V
6LBR1CWNJ0000005	V	V	V	V
6LBR1NWNJ0000008	V	V	V	V
6LBR1WWNJ0000009	V	V	V	V
6LBR1M6NJ0000001	V	V	V	V

Order Code	33LBR1040005 	33LBR1040006 	33LBR1040007 	33LBR1040008 
6LBR1CWNI0000003	V	V	V	V
6LBR1NWNI0000003	V	V	V	V
6LBR1WWNI0000003	V	V	V	V
6LBR1CWNJ0000005	V	V	V	V
6LBR1NWNJ0000008	V	V	V	V
6LBR1WWNJ0000009	V	V	V	V
6LBR1M6NJ0000001	V	V	V	V

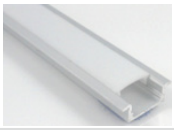
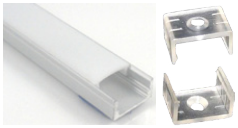
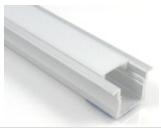
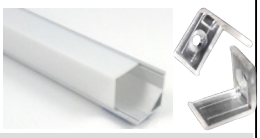
3528 Series

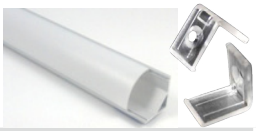
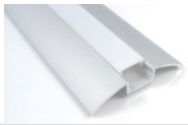
Order Code	33LBR1040001 	33LBR1040002 	33LBR1040003 	33LBR1040004 
6LBR1CWNI0000001	V	V	V	V
6LBR1NWNI0000001	V	V	V	V
6LBR1WWNI0000001	V	V	V	V
6LBR1WWNI0000007	V	V	V	V
6LBR1RXNI0000001	V	V	V	V
6LBR1TXNI0000003	V	V	V	V
6LBR1BXNI0000001	V	V	V	V
6LBR1YXNI0000001	V	V	V	V
6LBR1PXNI0000001	V	V	V	V
6LBR1PXNI0000002	V	V	V	V
6LBR1CWNJ0000004	V	V	V	V
6LBR1NWNJ0000005	V	V	V	V
6LBR1WWNJ0000006	V	V	V	V
6LBR1WWNJ0000011	V	V	V	V
6LBR1CWNJ0000007	V	V	V	V
6LBR1NWNJ0000010	V	V	V	V
6LBR1WWNJ0000013	V	V	V	V
6LBR1RXNJ0000002	V	V	V	V
6LBR1TXNJ0000002	V	V	V	V
6LBR1BXNJ0000002	V	V	V	V
6LBR1PXNJ0000003	V	V	V	V
6LBR1PXNJ0000005	V	V	V	V
6LBR1CWNJ0000001	V	V	V	V
6LBR1NWNJ0000001	V	V	V	V
6LBR1WWNJ0000001	V	V	V	V
6LBR1RXNJ0000001	V	V	V	V
6LBR1TXNJ0000001	V	V	V	V
6LBR1BXNJ0000001	V	V	V	V
6LBR1YXNJ0000001	V	V	V	V
6LBR1PXNJ0000002	V	V	V	V
6LBR1PXNJ0000004	V	V	V	V
6LBR1WWNJ0000012	V	V	V	V
6LBR1M1NJ0000002	V	V	V	X
6LBR1M2NJ0000002	V	V	V	X
6LBR1M7NJ0000001	V	V	V	X

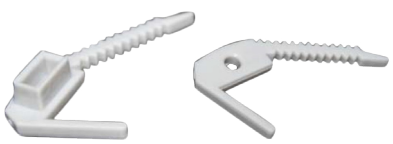
3528 Series

Order Code	33LBR1040005 	33LBR1040006 	33LBR1040007 	33LBR1040008 
6LBR1CWNI0000001	V	V	V	V
6LBR1NWNI0000001	V	V	V	V
6LBR1WWNI0000001	V	V	V	V
6LBR1WWNI0000007	V	V	V	V
6LBR1RXNI0000001	V	V	V	V
6LBR1TXNI0000003	V	V	V	V
6LBR1BXNI0000001	V	V	V	V
6LBR1YXNI0000001	V	V	V	V
6LBR1PXNI0000001	V	V	V	V
6LBR1PXNI0000002	V	V	V	V
6LBR1CWNJ0000004	V	V	V	V
6LBR1NWNJ0000005	V	V	V	V
6LBR1WWNJ0000006	V	V	V	V
6LBR1WWNJ0000011	V	V	V	V
6LBR1CWNJ0000007	V	V	V	V
6LBR1NWNJ0000010	V	V	V	V
6LBR1WWNJ0000013	V	V	V	V
6LBR1RXNJ0000002	V	V	V	V
6LBR1TXNJ0000002	V	V	V	V
6LBR1BXNJ0000002	V	V	V	V
6LBR1PXNJ0000003	V	V	V	V
6LBR1PXNJ0000005	V	V	V	V
6LBR1CWNJ0000001	V	V	V	V
6LBR1NWNJ0000001	V	V	V	V
6LBR1WWNJ0000001	V	V	V	V
6LBR1RXNJ0000001	V	V	V	V
6LBR1TXNJ0000001	V	V	V	V
6LBR1BXNJ0000001	V	V	V	V
6LBR1YXNJ0000001	V	V	V	V
6LBR1PXNJ0000002	V	V	V	V
6LBR1PXNJ0000004	V	V	V	V
6LBR1WWNJ0000012	V	V	V	V
6LBR1M1NJ0000002	X	V	V	V
6LBR1M2NJ0000002	X	V	V	V
6LBR1M7NJ0000001	X	V	V	V

5630 Series

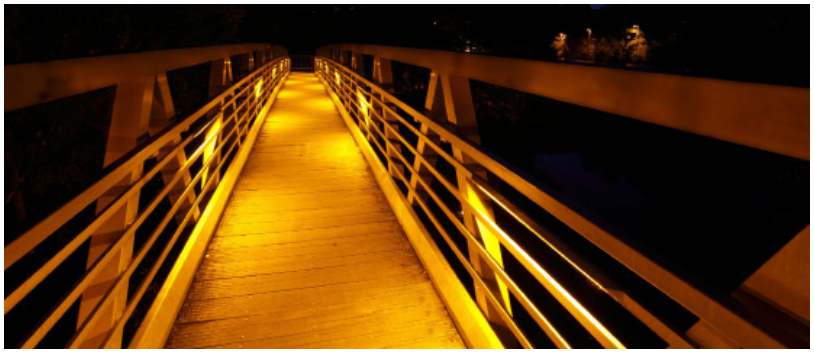
Order Code	33LBR1040001 	33LBR1040002 	33LBR1040003 	33LBR1040004 
6LBR1CWNI0000004	V	V	V	V
6LBR1NWNI0000004	V	V	V	V
6LBR1WWNI0000005	V	V	V	V
6LBR1CWNJ0000006	V	V	V	V
6LBR1NWNJ0000007	V	V	V	V
6LBR1WWNJ0000008	V	V	V	V
6LBR1M6NJ0000004	V	V	V	X

Order Code	33LBR1040005 	33LBR1040006 	33LBR1040007 	33LBR1040008 
6LBR1CWNI0000004	V	V	V	V
6LBR1NWNI0000004	V	V	V	V
6LBR1WWNI0000005	V	V	V	V
6LBR1CWNJ0000006	V	V	V	V
6LBR1NWNJ0000007	V	V	V	V
6LBR1WWNJ0000008	V	V	V	V
6LBR1M6NJ0000004	V	V	V	X

13MAFT000002 (with hole)	
13MAFT000003	
13MAFT000004 (with hole)	
13MAFT000005	
13MAFT000006 (with hole)	
13MAFT000007	
13MAFT000008 (with hole)	
13MAFT000009	
13MAFT000010 (with hole)	
13MAFT000011	
13MAFT000012 (with hole)	
13MAFT000013	
13MAFT000014 (with hole)	
13MAFT000015	
13MAFT000016 (with hole)	
13MAFT000017	

13MAFT000018	
13MAFT000019	

Application



Revision History

Versions	Description	Release Date
1	Establish order code information	2013/08/08
2	1. Revise pictures of Solderless connector series 2. Add order code of Controller + Remote 3. Revise Connector Order Code	2013/12/13
3	1. Update Driver connection diagram 2. Add Order code 3. Add Accessory:Aluminum extrusion	2014/04/01

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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