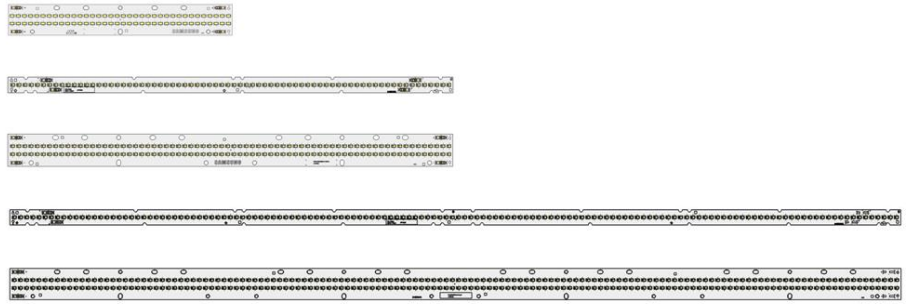


## LED Module

# F-Series Gen3



### Features & Benefits

- Efficacy improvement, 22% from Gen2 to achieve DLC premium
- High lumen density linear board well-fit into industrial applications
- 4ft length option added

### Applications

- Industrial Lighting:
  - Warehouse, Plant, Parking lot, Etc
- High ceiling Lighting
- Linear, Troffer, Etc



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## 1. Product Code Information

- LT-F284B

Nominal CCT (K)	SEC Code
3000K	SI-B8V261280WW
3500K	SI-B8U261280WW
4000K	SI-B8T261280WW
5000K	SI-B8R261280WW

- LT-F562B

Nominal CCT (K)	SEC Code
3000K	SI-B8V261560WW
3500K	SI-B8U261560WW
4000K	SI-B8T261560WW
5000K	SI-B8R261560WW

- LT-F564B

Nominal CCT (K)	SEC Code
3000K	SI-B8V521560WW
3500K	SI-B8U521560WW
4000K	SI-B8T521560WW
5000K	SI-B8R521560WW

## - LT-FB22B

Nominal CCT (K)	SEC Code
3000K	SI-B8V521B20WW
3500K	SI-B8U521B20WW
4000K	SI-B8T521B20WW
5000K	SI-B8R521B20WW

## - LT-FB24B

Nominal CCT (K)	SEC Code
3000K	SI-B8VZ91B20WW
3500K	SI-B8UZ91B20WW
4000K	SI-B8TZ91B20WW
5000K	SI-B8RZ91B20WW

## 2. Characteristics

### a) Basic Information

Item	Rating	Unit	Remark
Rated Lifetime	>50,000	hour	L70B50
Ingress Protection (IP)	no rating	-	
Ambient / Operating Temperature ( $t_{amb}$ )	-30 ~ +55	°C	
Storage Temperature	-30 ~ +80	°C	

### b) Electro-Optical Characteristics

- LT-F284B

Item	Nom. CCT (K)	Rating			Unit	Remark
		Min	Typ.	Max		
Luminous Flux ( $\Phi_v$ )	3000	3900	4335	4815	lm	$I_f = 1120\text{mA}$ $t_p = 65^\circ\text{C}$
	3500	3960	4400	4890		
	4000	4050	4500	5000		
	5000	4185	4650	5165		
Luminous Efficacy	3000	151	168	187	lm/W	
	3500	154	171	190		
	4000	157	175	194		
	5000	162	181	201		
CCT	3000	2961	3050	3145	K	Mac Adam 3 step
	3500	3340	3454	3577		
	4000	3809	3955	4110		
	5000	4798	4984	5177		
Color Rendering Index (Ra)	-	80	-	-	-	Integrating Sphere
Operating Current ( $I_f$ )	-	-	1120	1800	mA	-
Operating Voltage ( $V_f$ )	-	21.9	23.0	24.2	Vdc	$I_f = 1120\text{mA}$ $t_p = 65^\circ\text{C}$
Power Consumption	-	24.5	25.8	27.1	W	

#### Notes:

- $t_p$ : temperature at which performance is specified; measured at "Tc point".
- Samsung maintains a measurement tolerance of : Luminous flux:  $\pm 7\%$ , CRI:  $\pm 3.0$ , Voltage:  $\pm 0.3\text{ V}$ , Power Consumption:  $\pm 0.3\text{W}$
- Measurement tolerance of the color coordinates is  $\pm 0.005$

## - LT-F562B

Item	Nom. CCT (K)	Rating			Unit	Remark
		Min	Typ.	Max		
Luminous Flux ( $\Phi_v$ )	3000	3900	4335	4815	lm	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
	3500	3960	4400	4890		
	4000	4050	4500	5000		
	5000	4185	4650	5165		
Luminous Efficacy	3000	151	168	187	lm/W	
	3500	154	171	190		
	4000	157	175	194		
	5000	162	181	201		
CCT	3000	2961	3050	3145	K	Mac Adam 3 step
	3500	3340	3454	3577		
	4000	3809	3955	4110		
	5000	4798	4984	5177		
Color Rendering Index (Ra)	-	80	-	-	-	Integrating Sphere
Operating Current ( $I_f$ )	-	-	1120	1800	mA	-
Operating Voltage ( $V_f$ )	-	21.9	23.0	24.2	Vdc	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
Power Consumption	-	24.5	25.8	27.1	W	

**Notes:**

- 1)  $\phi_p$ : temperature at which performance is specified; measured at "Tc point".
- 2) Samsung maintains a measurement tolerance of : Luminous flux:  $\pm 7\%$ , CRI:  $\pm 3.0$ , Voltage:  $\pm 0.3\text{ V}$ , Power Consumption:  $\pm 0.3\text{W}$
- 3) Measurement tolerance of the color coordinates is  $\pm 0.005$

## - LT-F564B

Item	Nom. CCT (K)	Rating			Unit	Remark
		Min	Typ.	Max		
Luminous Flux ( $\Phi_v$ )	3000	7805	8670	9635	lm	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
	3500	7920	8800	9780		
	4000	8100	9000	10000		
	5000	8370	9300	10335		
Luminous Efficacy	3000	151	168	187	lm/W	
	3500	154	171	190		
	4000	157	175	194		
	5000	162	181	201		
CCT	3000	2961	3050	3145	K	Mac Adam 3 step
	3500	3340	3454	3577		
	4000	3809	3955	4110		
	5000	4798	4984	5177		
Color Rendering Index (Ra)	-	80	-	-	-	Integrating Sphere
Operating Current ( $I_f$ )	-	-	1120	1800	mA	-
Operating Voltage ( $V_f$ )	-	43.7	46.0	48.4	Vdc	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
Power Consumption	-	48.9	51.5	54.2	W	

**Notes:**

- 1)  $\phi_p$ : temperature at which performance is specified; measured at "Tc point".
- 2) Samsung maintains a measurement tolerance of : Luminous flux:  $\pm 7\%$ , CRI:  $\pm 3.0$ , Voltage:  $\pm 0.3\text{ V}$ , Power Consumption:  $\pm 0.3\text{W}$
- 3) Measurement tolerance of the color coordinates is  $\pm 0.005$

## - LT-FB22B

Item	Nom. CCT (K)	Rating			Unit	Remark
		Min	Typ.	Max		
Luminous Flux ( $\Phi_v$ )	3000	7805	8670	9635	lm	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
	3500	7920	8800	9780		
	4000	8100	9000	10000		
	5000	8370	9300	10335		
Luminous Efficacy	3000	151	168	187	lm/W	
	3500	154	171	190		
	4000	157	175	194		
	5000	162	181	201		
CCT	3000	2961	3050	3145	K	Mac Adam 3 step
	3500	3340	3454	3577		
	4000	3809	3955	4110		
	5000	4798	4984	5177		
Color Rendering Index (Ra)	-	80	-	-	-	Integrating Sphere
Operating Current ( $I_f$ )	-	-	1120	1800	mA	-
Operating Voltage ( $V_f$ )	-	43.7	46.0	48.4	Vdc	$I_f = 1120\text{mA}$ $\phi_p = 65^\circ\text{C}$
Power Consumption	-	48.9	51.5	54.2	W	

**Notes:**

- 1)  $\phi_p$  : temperature at which performance is specified; measured at "Tc point".
- 2) Samsung maintains a measurement tolerance of : Luminous flux:  $\pm 7\%$ , CRI:  $\pm 3.0$ , Voltage:  $\pm 0.3\text{ V}$ , Power Consumption:  $\pm 0.3\text{W}$
- 3) Measurement tolerance of the color coordinates is  $\pm 0.005$



## - LT-FB24B

Item	Nom. CCT (K)	Rating			Unit	Remark
		Min	Typ.	Max		
Luminous Flux ( $\Phi_v$ )	3000	15605	17340	19265	lm	$I_f = 2240\text{mA}$ $t_p = 65^\circ\text{C}$
	3500	15840	17600	19555		
	4000	16200	18000	20000		
	5000	16740	18600	20665		
Luminous Efficacy	3000	151	168	187	lm/W	
	3500	154	171	190		
	4000	157	175	194		
	5000	162	181	201		
CCT	3000	2961	3050	3145	K	Mac Adam 3 step
	3500	3340	3454	3577		
	4000	3809	3955	4110		
	5000	4798	4984	5177		
Color Rendering Index (Ra)	-	80	-	-	-	Integrating Sphere
Operating Current ( $I_i$ )	-	-	2240	3600	mA	-
Operating Voltage ( $V_i$ )	-	43.7	46.0	48.4	Vdc	$I_f = 2240\text{mA}$ $t_p = 65^\circ\text{C}$
Power Consumption	-	97.9	103.0	108.5	W	

**Notes:**

- 1)  $t_p$  : temperature at which performance is specified; measured at "Tc point".
- 2) Samsung maintains a measurement tolerance of : Luminous flux:  $\pm 7\%$ , CRI:  $\pm 3.0$ , Voltage:  $\pm 0.3\text{ V}$ , Power Consumption:  $\pm 0.3\text{ W}$
- 3) Measurement tolerance of the color coordinates is  $\pm 0.005$

### c) Temperature Characteristics

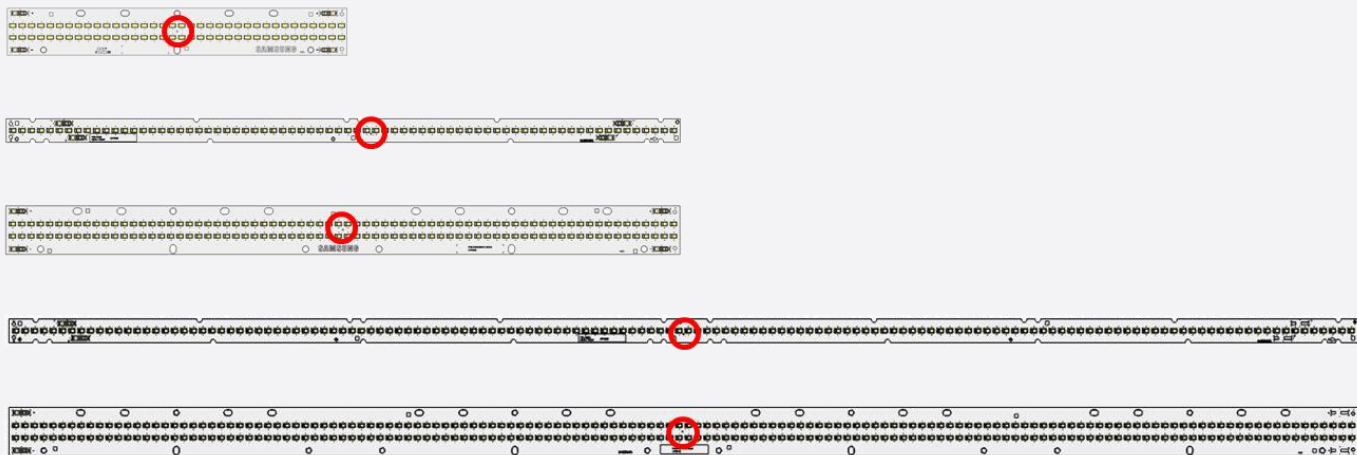
Item	Nominal( $t_b$ )*	Life**	Max( $t_c$ )***	Unit
Temperature	65	80	95	°C

**Notes:**

- \* Temperature used to specify performance of the module ( $t_b$ ).
  - \*\* Rated maximum performance temperature at which lifetime is specified.
  - \*\*\* Rated maximum temperature, highest permissible temperature to avoid safety risk ( $t_c$ ).
- All temperatures are measured at the designated “Tc point” as indicated on the module. (See page 11)

### d) Thermal Measurement

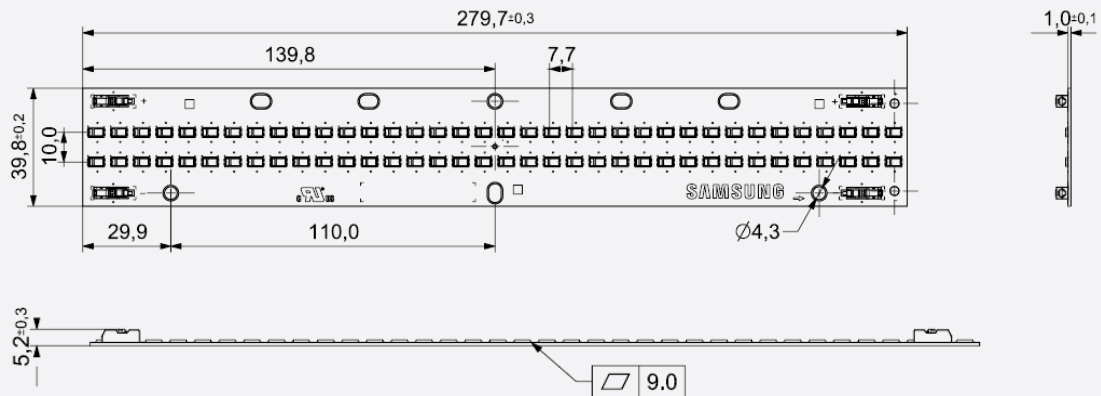
Performance temperatures are measured on “Tc point” as indicated on the module.



### 3. Structure and Assembly

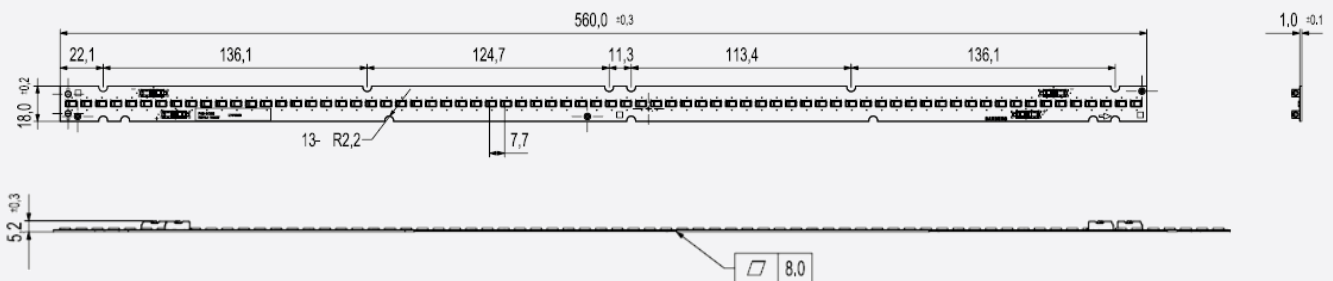
#### a) Appearance & Dimension

- LT-F284B



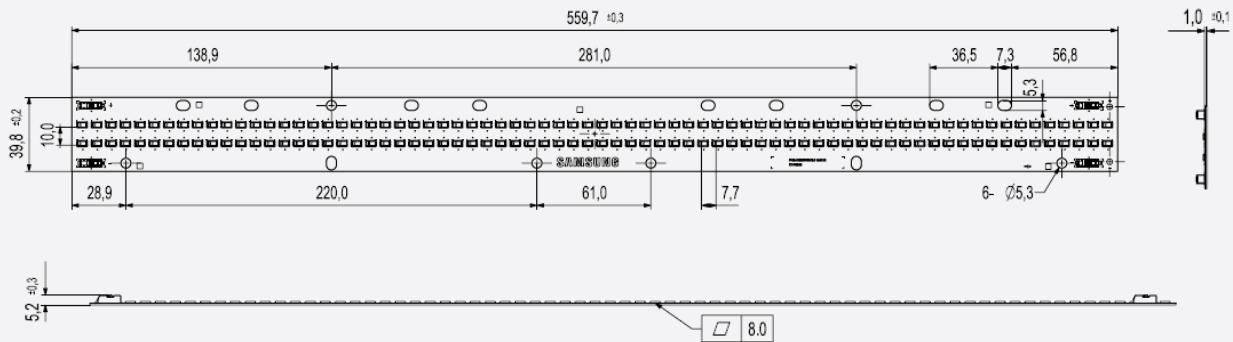
Dimension	Specification	Tolerance	Unit
Module Length	279.7	±0.3	mm
Module Width	39.8	±0.2	mm
Module Height	5.2	±0.3	mm
PCB Thickness	1.0	±0.1	mm
Module Weight	29.5	±1.48	g

- LT-F562B



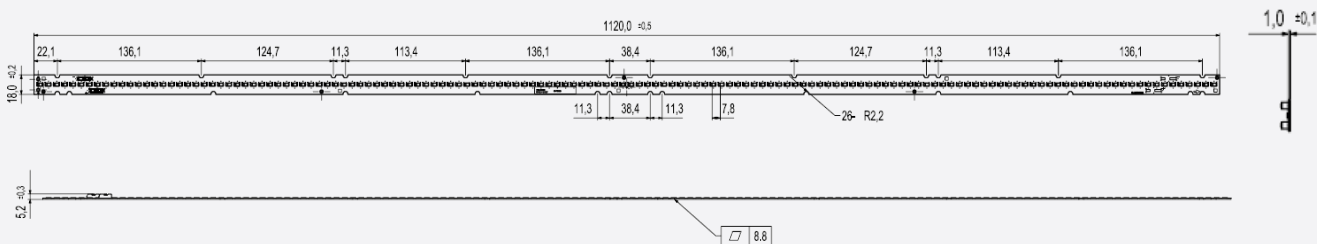
Dimension	Specification	Tolerance	Unit
Module Length	560.0	±0.3	mm
Module Width	18.0	±0.2	mm
Module Height	5.2	±0.3	mm
PCB Thickness	1.0	±0.1	mm
Module Weight	26.8	±1.34	g

- LT-F564B



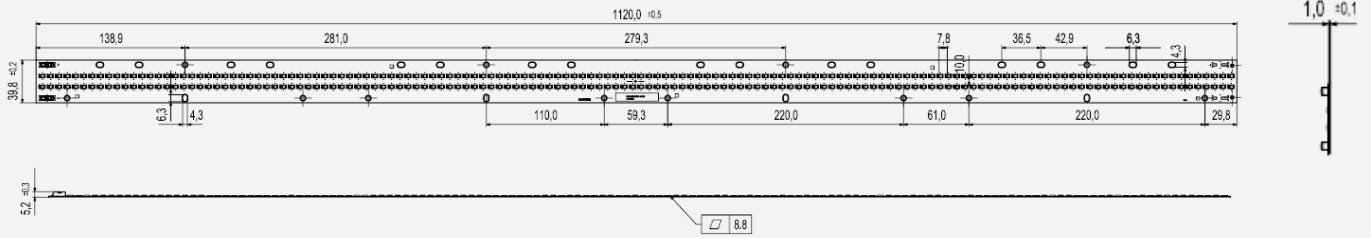
Dimension	Specification	Tolerance	Unit
Module Length	559.7	±0.3	mm
Module Width	39.8	±0.2	mm
Module Height	5.2	±0.3	mm
PCB Thickness	1.0	±0.1	mm
Module Weight	58.7	±2.94	g

- LT-FB22B



Dimension	Specification	Tolerance	Unit
Module Length	1120.0	±0.5	mm
Module Width	18.0	±0.2	mm
Module Height	5.2	±0.3	mm
PCB Thickness	1.0	±0.1	mm
Module Weight	54.0	±2.7	g

## - LT-FB24B



Dimension	Specification	Tolerance	Unit
Module Length	1120.0	±0.5	mm
Module Width	39.8	±0.2	mm
Module Height	5.2	±0.3	mm
PCB Thickness	1.0	±0.1	mm
Module Weight	118.0	±5.9	g

## b) Structure

Item	Specification
LED	LM561C Middle Power LED
PCB	Material : copper, solder mask, epoxy
Connector	Reworkable poke-in connector type
Wire	24~18 AWG ; terminal strip length of 7.5~8.5 mm (Appendix 1)

## c) Schematic Circuit

- LT-F284B : 8S x 9P
- LT-F562B : 8S x 9P
- LT-F564B : 16S x 9P
- LT-FB22B : 16S x 9P
- LT-FB24B : 16S x 18P

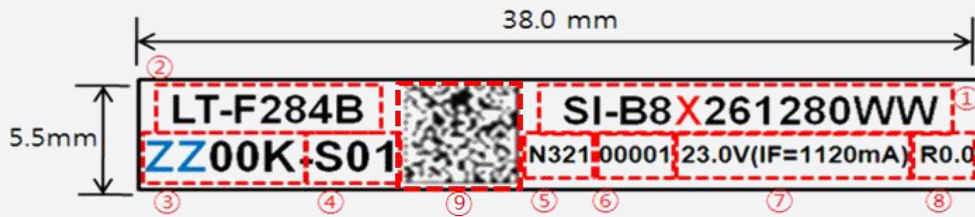
## 4. Certification and Declaration

Item	Compliant to	Remark
Test & Certification	UL / cUL	T.B.D
	Photo biological Safety (LM561C LED)	IEC / EN 62471
Declaration	RoHS	Hazardous Substance & Material
	REACH	Hazardous Substance & Material

## 5. Label Structure

### a) Module Label

Ex) LT-F284B



Number	Item	Remark
①	Model Code	Refer to page 3 X = V, U, T, R
②	Product name	
③	Color temperature	ZZ = 30, 35, 40, 50
④	LED Maker	-S (Samsung)
⑤	SMT date	N321 (2013-March -21th)
⑥	Serial No.	00001~99999; Setting "00001" every working day
⑦	Operating Current & Voltage Typ.	
⑧	Product Revision	
⑨	QR Code	SI-B8X261280WW_ N321100001ZZ00K-S01



## b) TRAY &amp; MBB bag LABEL

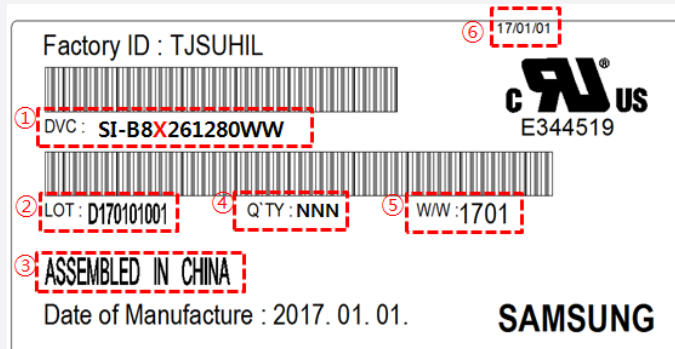
Ex) LT-F284B



Number	Item	Remark
①	Model Code	Refer to page 3
②	LOT ID	
③	Quantity	Refer to page 17
④	Date of production	
⑤	Date of Issue	

## C) Box Label

Ex) LT-F284B



Number	Item	Remark
①	Model Code	Refer to page 3
②	LOT ID	
③	Place of origin	
④	Quantity	Refer to page 17
⑤	Describe production week	
⑥	Date of Issue	



## 6. Packing Structure

Product	Packing	Quantity (modules)	Dimension (mm)		
			Length	Width	Height
LT-F284B	Tray	32 ea	380	355	46.5
	Outer Box	160 ea	385	360	225
	Pallet	3840 ea	1200	800	130
LT-F562B	Tray	40 ea	600	444	25
	Outer Box	280 ea	605	449	165
	Pallet	5600 ea	1100	1100	130
LT-F564B	Tray	30 ea	580	380	50.7
	Outer Box	150 ea	585	385	225
	Pallet	2400 ea	1200	800	130
LT-FB22B	Tray	20 ea	1180	310	16.8
	Outer Box	200 ea	1185	315	160
	Pallet	2400 ea	1200	1000	130
LT-FB24B	Tray	12 ea	1180	310	16.8
	Outer Box	96 ea	1185	315	135
	Pallet	1440 ea	1200	1000	130

## 7. Precautions in Handling & Use

A. The LED Lighting Modules for white light are devices which are materialized by combining white LEDs.

The color of white light can differ a little unusually to diffuser plate(sign-board panel).

Also when the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.

### B. Handling

To prevent the LED Lighting Modules from making any defectives, please handle the LED Lighting Modules with care as follows.

- (1) Don't drop the unit and don't give the unit any shocks.
- (2) Don't bend the PCB and don't touch the LED Resin.
- (3) Don't storage the Module in a dusty place or room.
- (4) Don't take the product apart.
- (5) Don't touch the LED and also PCB and other circuit parts of Module with your naked fingers or sharpness things.
- (6) Take care so that do not pull wire with hand in case of carries or moves LED Lighting Modules.

### C. Cleaning

The LED Lighting Modules should not be used in any type of fluid such as water, oil, organic solvent, etc.

It is recommended that IPA (Isopropyl Alcohol) be used as a solvent for cleaning the LED Lighting Modules.

When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations. Do not clean the LED Lighting Modules by the ultrasonic.

Before cleaning, a pre-test should be done to confirm whether any damage to the LED Lighting Modules will occur.

### D. Static Electricity

Static electricity or surge voltage damages the LED Lighting Modules. Please keep the working process anti-static electricity condition to prevent the Lighting from destroying, as following.

- (1) Anyone who handles the unit should be well grounded.(earth ring or anti-static glove)
- (2) Anyone who handles the unit should wear anti-electrostatic working clothes.
- (3) All kinds of device and instruments, such as working table, measuring instruments and assembly jigs in your production lines should be well grounded.

### E. Storage

The LED Lighting Modules must be stored to insert a package of a moisture absorbent material(silica gel) in a box.

### F. Others

If over voltage which exceeds the absolute maximum rating is applied to LED Lighting Modules.

It will cause damage Circuits(that LED is included) and result in destruction.

Do not directly look into lighted LED with naked eyes.

Please use this product within 5 months, which is kept in its original packaging unopened when Stocked

# Appendix

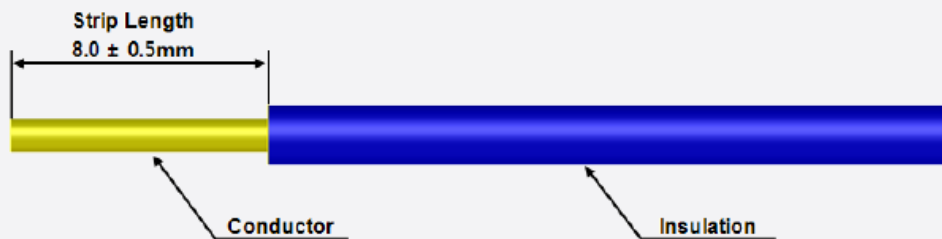
## 1. Applicable Solid Wires

a) Applicable solid wires only

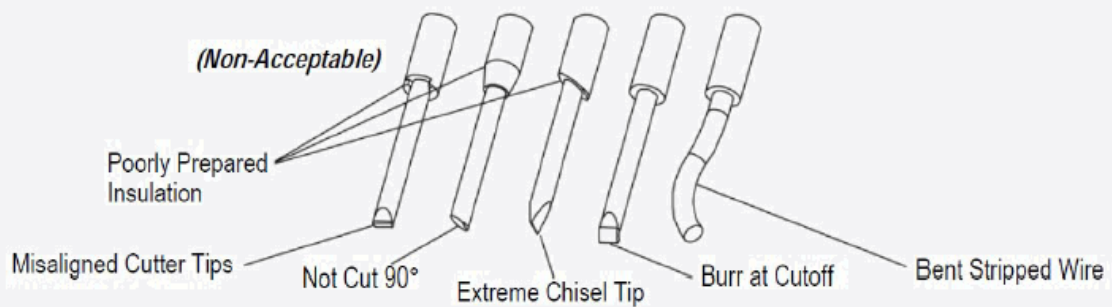
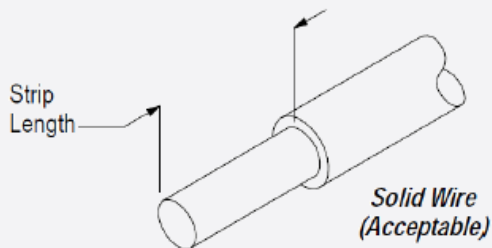
Wire Range AWG NO.	Number of Conductors / Diameter of a conductors (NO. / mm)	Insulation Diameter (mm)	Conductor Type
24	1 / 0.51	1.35	Solid
22	1 / 0.64	1.48	
20	1 / 0.81	1.65	
18	1 / 1.02	1.86	

※ outside insulation diameter  $\Phi$ 2.1mm Max.

b) Wire strip length



[ Conductor : Bear Copper ]



# Legal and additional information.

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