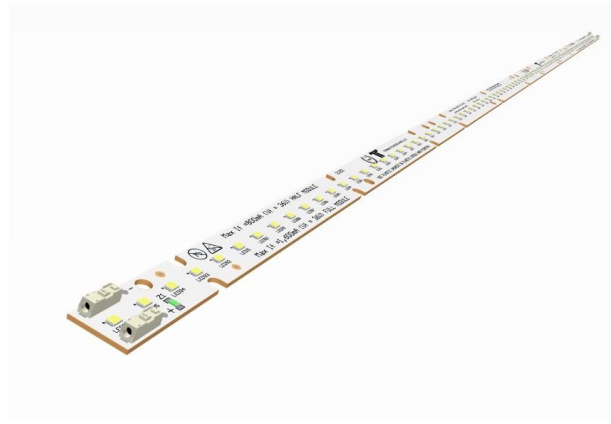




### LED Solution

### DC Board

TT21252-96L8xx-x



MacAdam  
3-Step



## Product Brief

### Applications



### Key Applications

- Linear highbay
- Troffer

### Features & Benefits

- Long Life Time
- Simple BOM
- Lead Free Product
- RoHS Compliant
- High Efficacy

### Description

High efficiency design  
 Tube lighting for fluorescent replacement products used by the LED module

Table 1. Product Selection - Flux@ 25°C

Part No.	Luminous Flux (lm)		CCT (K)	CR
	Minimum	Typical	CCT	Min.
TT21252-96L8xx-x	5980	6270	3000	80
	6150	6470	3500	
	6370	6660	4000	
	6370	6660	5000	
	6370	6660	5700	

### References

Refer to page 5 'Part Information' regarding the meaning of 'Order Code' and 'Part No.'



Table 2. Product Selection - Vf@25°C

Part No.	Vf Bin	Forward Voltage (Vdc)	Forward Current (mA)
TT21252-96L8xx-x	ALL	34.5	1050

## Performance Characteristics

Table 3. Electro Optical Characteristics,  $T_a = 25^\circ\text{C}^{(1)}$ ,  $I_f = 1050\text{mA}$ 

Parameter	Symbol	Value			Unit	Mark
		Min.	Typ.	Max.		
Luminous Flux	$\Phi_v(2)$	5980	6270	-	lm	
		6150	6470	-		
		6370	6660	-		
Correlated Color Temperature(3)	CCT	2900	3000	3200	K	
		3200	3500	3700		
		3700	4000	4200		
		4700	5000	5300		
		5300	5700	6000		
CRI	Ra	80	82	-	-	
Efficacy @150mA	$\eta$	-	186	-	lm/W	
Forward Voltage	$V_{in}$	33.0	34.5	36.0	Vdc	
Input Current	$I_f$	-	1050	-	mA	
Power Consumption	P	34.7	36.2	38.0	W	
Viewing Angle	$2\theta_{1/2}$	-	120	-	deg.	

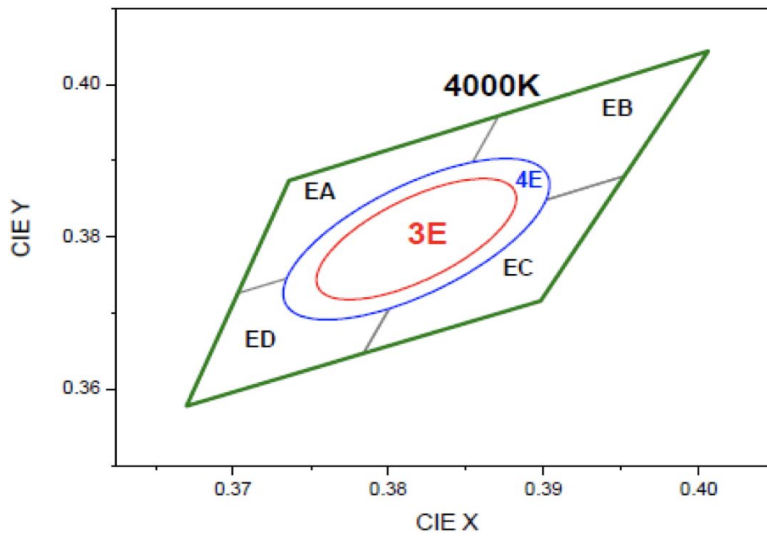
### Notes:

- (1) Test Current is 1050mA at  $T_a = 25^\circ\text{C}$ .
- (2)  $\Phi_v$  is the total luminous flux output measured with an integrated sphere.
- (3) Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

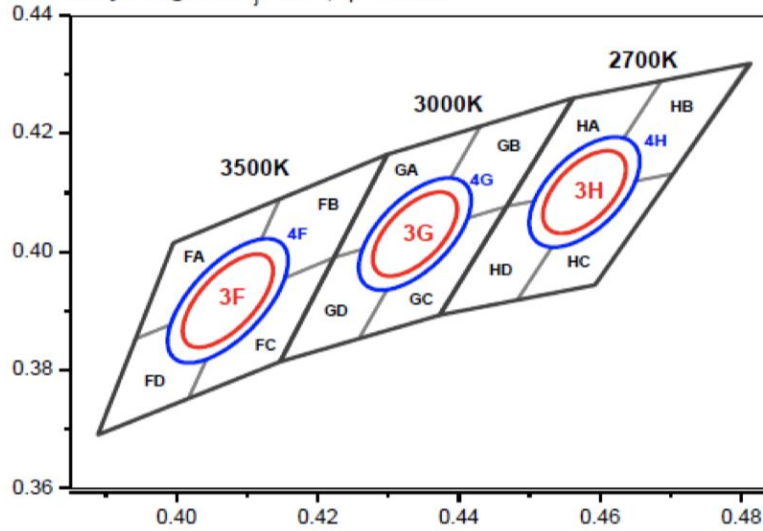


### Color Bin Structure

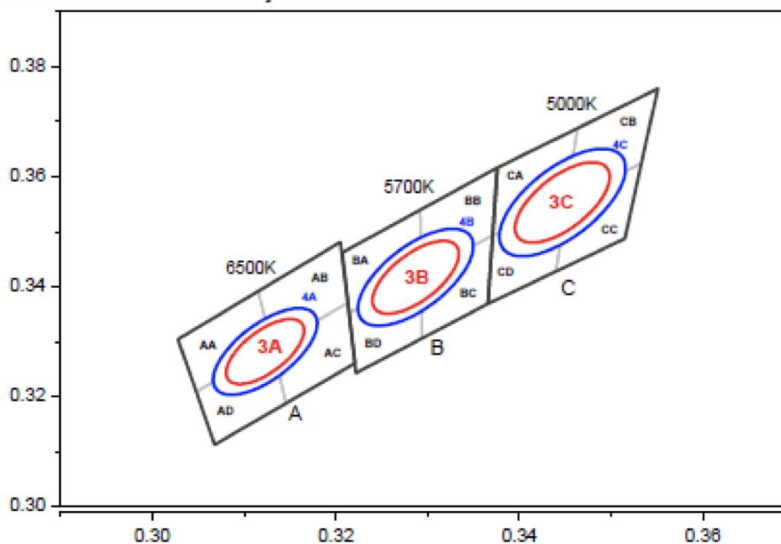
CIE Chromaticity Diagram  $T_j=25^\circ\text{C}$ ,  $I_F=65\text{mA}$



CIE Chromaticity Diagram  $T_j=25^\circ\text{C}$ ,  $I_F=65\text{mA}$



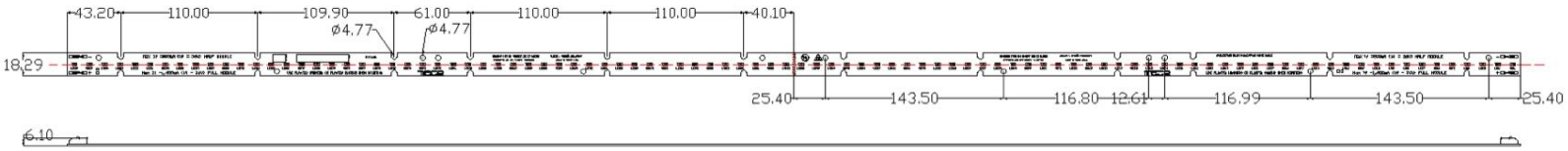
CIE Chromaticity Diagram  $T_j=25^\circ\text{C}$ ,  $I_F=65\text{mA}$





# Mechanical Dimensions

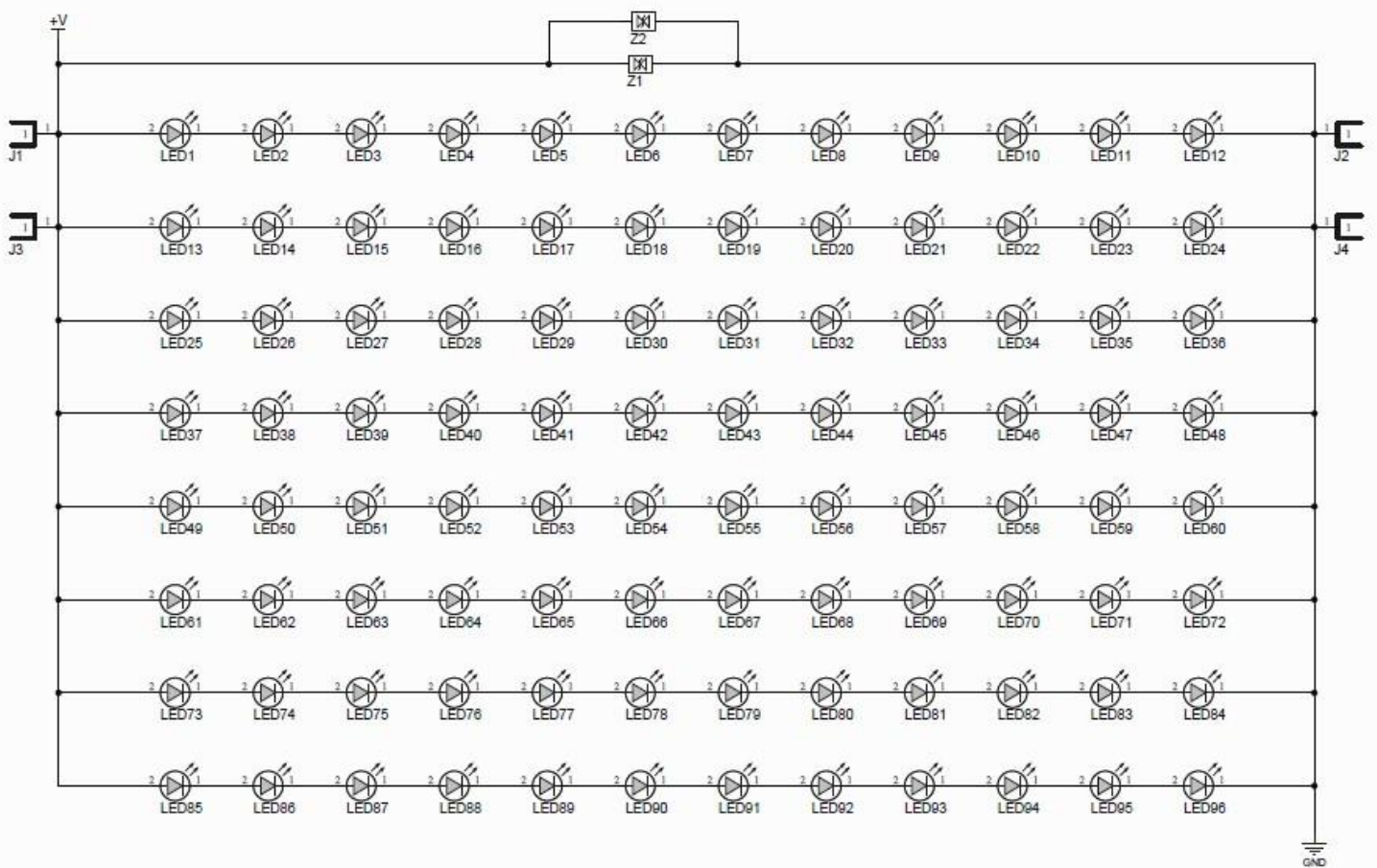
Image 1. Mechanical Dimensions



## Notes:

- (1) All dimensions are in millimeters.
- (2) Scale : None
- (3) Module thickness :  $1.6 \pm 0.10$

Image 2. Circuit Schematic





## Part Information

Table 4. Part List

No.	Part	Reference	Specification	Qty
1	LED PKG	L1~L196	STW8A2PD-E1(H)S	96
2	PCB	-	MCPCB 1layer / 18.3(W)x1168.4(L)x1.6(T)mm / Cu=1oz / OSP	1
3	Connector	CN1-CN4	2060-451/998-404	4
4	TVS	Z1,Z2	SMF60A	2

Figure 1. Part Information

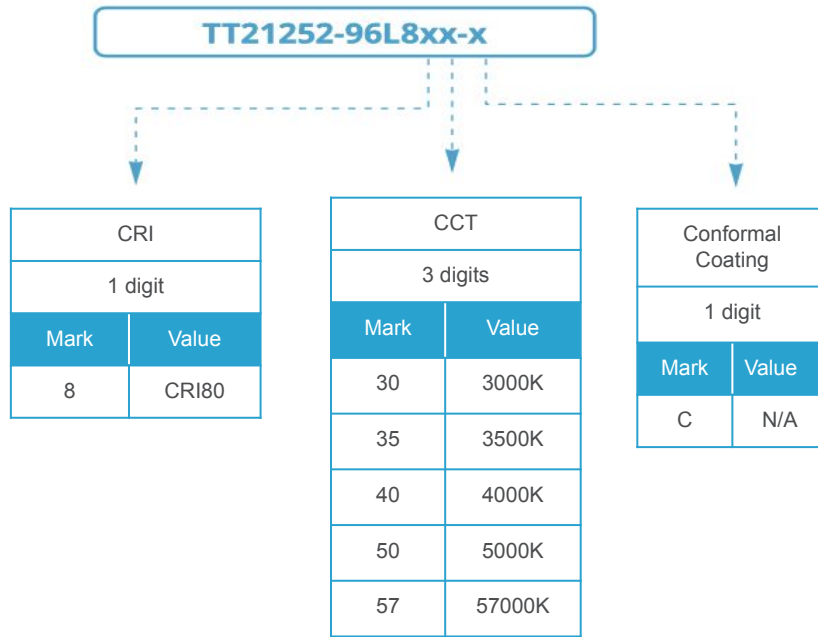


Table 5. Marking Point & Information

MF. Date (YYMMDD)	Module Rank <sup>(1)</sup>				Customer Part No.	Serial No.
	Flux Rank	CCT Rank	CRI Rank	Vf Rank		
200519	G82	O3	8	ALL	TT21252-96L8xx-x	00001



Notes :

(1) Customer part no.:

- TT21252-96L827 for CCT 2700K • TT21252-96L850 for CCT 5000K
- TT21252-96L835 for CCT 3500K • TT21252-96L865 for CCT 6500K
- TT21252-96L840 for CCT 4000K

(3) Module CCT ran

Marking Information

Notes :

- 1) Marking information should be printed in two places

Image 4. Marking point 1

Do ink printing into marking border (from LED L83 to L80)

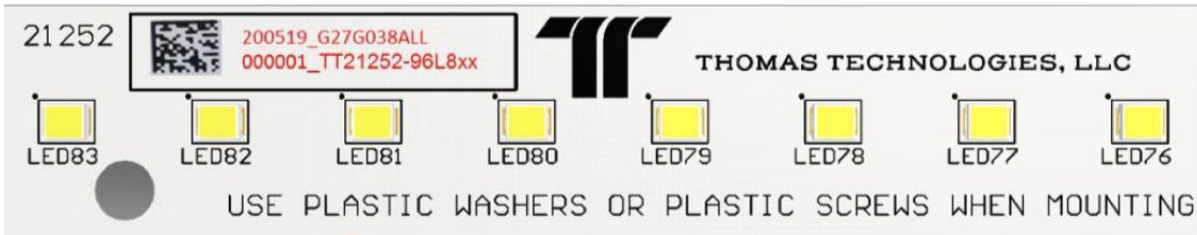
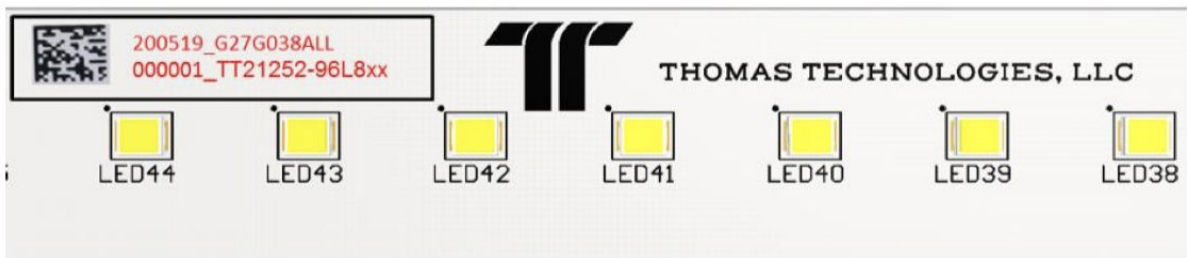


Image 5. Marking point 2:

Marking point 2: Do ink printing from L45 to L42



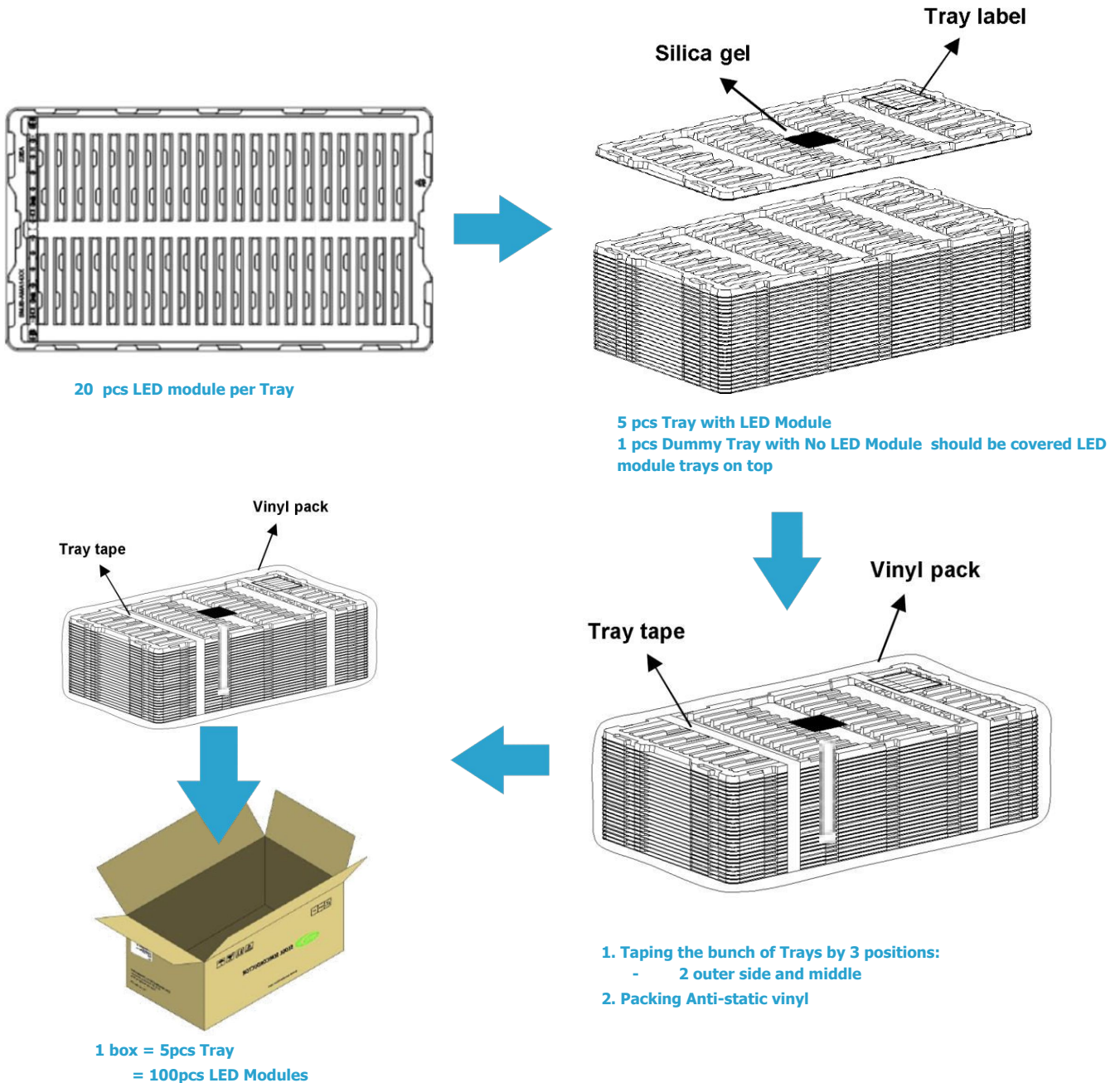




# Packing

Table 6. Packing

Tray			Box			Pallet		
Size (mm)	Module Qty (EA)	Material	Size (mm)	Tray Qty (EA)	Module Qty (EA)	Size (mm)	Box Qty (EA)	Module Qty (EA)
1210 X 335 X 26	22	Anti-static PET	1230 X 355 X 139	5(+1) Trays	110	1300x1100 x 150	21	2310





## Conditions of Acceptable Usage

This component has been judged on the basis of the required spacing distances in the Standard for LED Equipment for Use in Lighting Products, UL 8750.

- 1) The LED modules are intended for connection to a constant current, Class 2 power supply. When the arrays are connected and used with power supplies other than class 2, the need for an additional evaluation shall be considered in the end use product investigation.
- 2) The LED modules shall be installed in compliance with the mounting, spacing, casualty, and the segregation requirements applicable to the ultimate application.
- 3) The LED modules were not subjected to the Normal Temperature Test. A Temperature Test shall be conducted in the end product with considerations for the following components, their ratings, and LED-to-LED spacing:
  - Printed Wiring Board – 105°C
  - Connectors – 105°C
- 4) The LED modules are intended for use in dry and damp locations when connected to a Class 2 power supply. Use in other than dry and damp locations powered by a Class 2 power supply shall be evaluated to the end use application.
- 5) All models shall be marked with any voltage and current rating that doesn't exceed the maximum ratings in the ELECTRICAL RATINGS table of this report. All models are to be used within their marked ratings.

## Precaution for Use

- 1) Please review the module Application Note for proper protective circuitry usage.
- 2) DO NOT touch any of the circuit board, components or terminals with body or metal while circuit is active
- 3) Please do not add or change wires while module circuit is active.
- 4) Long time exposure to sunlight or UV can cause the lens to discolor.
- 5) Please do not use adhesives to attach the LED that outgas organic vapor.
- 6) Please do not use together with the materials containing Sulfur.
- 7) Please do not assemble in conditions of high moisture and/or oxidizing gas such as Cl, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, etc.
- 8) Please do not make any modification on module.
- 9) Please be cautious when soldering to board so as not to create a short between different trace patterns
- 10) LEDs are sensitive to Electrostatic Discharge (ESD) and Electrical Over Stress (EOS).

Below is a list of suggestions that Seoul Semiconductor purposes to minimize these effects.

A. ESD (Electro Static Discharge) Electrostatic discharge (ESD) is defined as the release of static electricity when two objects come into contact. While most ESD events are considered harmless, it can be an expensive problem in many industrial environments during production and storage. The damage from ESD to LEDs may cause the product to demonstrate unusual characteristics such as:

- Increase in reverse leakage current lowered turn-on voltage
- Abnormal emissions from the LED at low current

The following recommendations are suggested to help minimize the potential for an ESD event: One or more recommended work area suggestions:

- Ionizing fan setup
- ESD table/shelf mat made of conductive materials
- ESD safe storage containers





## Precaution for Use

One or more personnel suggestion options:

- Antistatic wrist-strap
- Antistatic material shoes
- Antistatic clothes Environmental controls
- Humidity control (ESD gets worse in a dry environment)

B. EOS (Electrical Over Stress) Electrical Over-Stress (EOS) is defined as damage that may occur when an electronic device is subjected to a current or voltage that is beyond the maximum specification limits of the device. The effects from an EOS event can be noticed through product performance like:

Changes to the performance of the LED package (If the damage is around the bond pad area and since the package is completely encapsulated the package may turn on but flicker show severe performance degradation.)

Changes to the light output of the luminaire from component failure Components on the board not operating at determined drive power Failure of performance from entire fixture due to changes in circuit voltage and current across total circuit causing trickle down failures It is impossible to predict the failure mode of every LED exposed to electrical overstress as the failure modes have been investigated to vary, but there are some common signs that will indicate an EOS event has occurred.

- Damaged may be noticed to the bond wires (appearing similar to a blown fuse).
- Damage to the bond pads located on the emission surface of the LED package (shadowing can be noticed around the bond pads while viewing through a microscope).
- Anomalies noticed in the encapsulation and phosphor around the bond wires.
- This damage usually appears due to the thermal stress produced during the EOS event.

C. To help minimize the damage from an EOS event Seoul Semiconductor recommends utilizing

- A surge protection circuit
- An appropriately rated over voltage protection device
- A current limiting device

## Handling of Silicone Resin for LEDs

- 1) LED is encapsulated with silicone resin for high optical efficiency.
- 2) Please do not touch the silicone resin area with sharp objects such as pincette(tweezers).
- 3) Finger prints on silicone resin area may affect the performance.
- 4) Please store LEDs in covered containers to prevent dust accumulation as this may affect performance.
- 5) Excessive force more than 3000gf to the silicone lens can result in fatal or permanent damage with LEDs.
- 6) Please do not cover the silicone resin area with any other resins such as epoxy, urethane, etc.



## Storage Before Use

- 1) Do not impact or place pressure on this product because even a small amount of pressure can damage the product. The product should also not be placed in high temperatures, high humidity or direct sunlight since the device is sensitive to these conditions.
- 1) When storing devices for a long period of time before usage, please following these guidelines.
  - The device should be stored in the anti-static foam trays and fingers they were shipped in.
  - If the anti-static bag has been opened, re-seal preventing air and moisture from being present in the bag.

## Guidelines for properly working with Module

- 1) Discharge the lighting system a minimum of 2-3 times prior to working with the module.
- 2) Use only properly rated test equipment and tools for the rated voltage and current of the product being tested.
- 3) It is strongly suggested to wear rubber insulated gloves and rubber bottom shoes.
- 4) Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.
- 5) Perform several tests with power off and the lighting system unplugged.
- 6) Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.
- 7) Internal component failure can cause excessive voltages.
- 8) Stored or residual electricity in long wire could be hazardous.
- 9) Make sure proper discharge prior to starting work.

## Legal Disclaimer

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## Revision History

**Table 6. Revision History**

Revision	Date	Remarks
A	2022.03.24	Data sheet for TT21252-96L8xx-x