

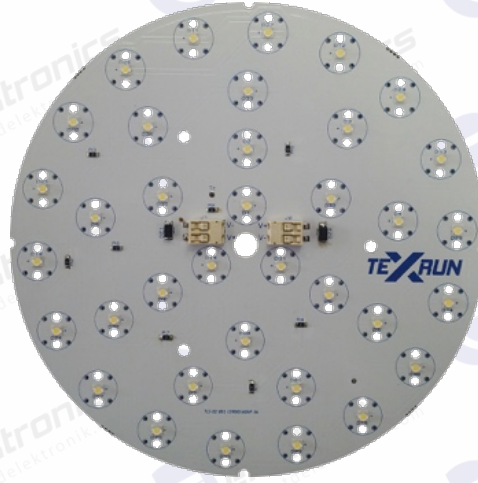


# Product Datasheet

**X-MR00160NC-219xx-36**

Revision: June 2015

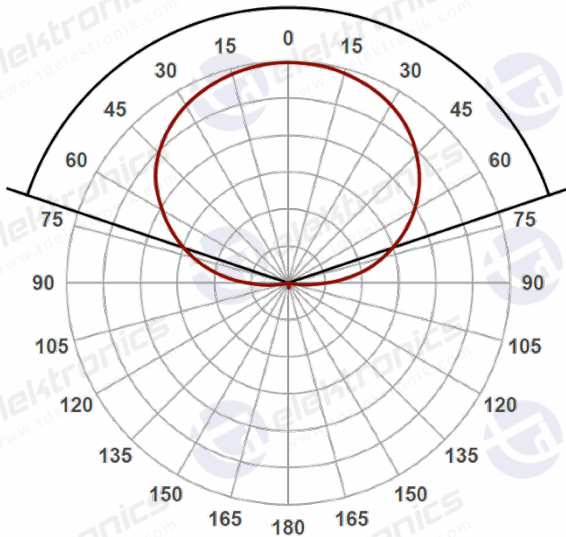
## Picture of Module



## Photometry

Beam angle

**142,8°**



## Applications



Down light



Panel light



Tube light



Decorative



Cove light



Spotlight



Street light



Outdoor



PAR lamp



High bay



Bulb

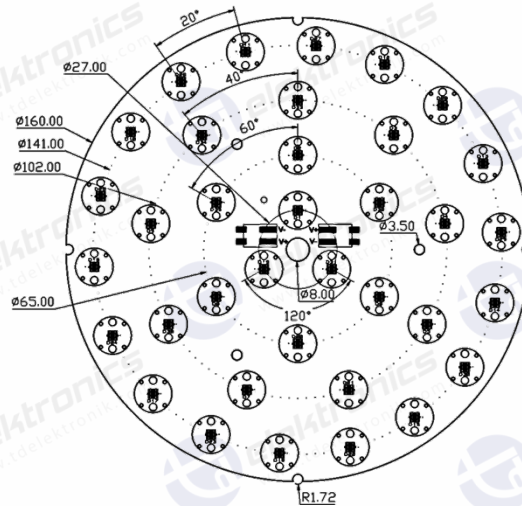
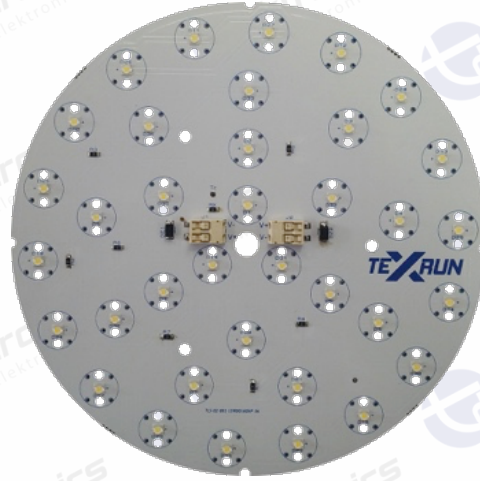


Sign board

## Product Features

- Default driving method is constant voltage input. Ask for alternatives depending on your project.
- IES and LDT files provided upon request.

## Mechanical Details



## Order Code Formation

| Product Code         | CCT options | CRI options |
|----------------------|-------------|-------------|
| X-MR00160NC-219xx-36 | 2700        | 65          |
|                      | 3000        | 70          |
|                      | 4000        | 80          |
|                      | 5000        | 90          |
|                      | 6500        | M3          |

Order code consists of product code, combined with CCT and CRI values.

Example Order Code: X-MR00160NC-219xx-36 + 4000 + 90

*(Given values are just examples, you may choose whichever you want from the list.)*

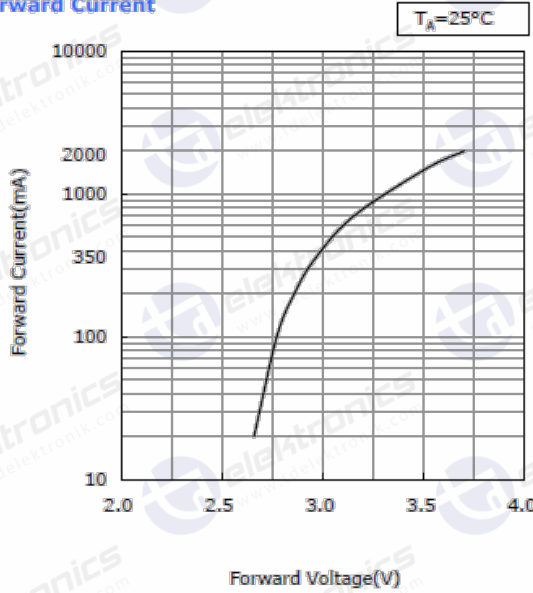
## Absolute Maximum Ratings & Specs for NCS219B\_V1

| Common Characteristics [ @ T <sub>j</sub> : 65°C & T <sub>ambient</sub> : 25°C ] |                       |       |       |                       |       |       |  |  |
|----------------------------------------------------------------------------------|-----------------------|-------|-------|-----------------------|-------|-------|--|--|
| LED Brand & Type                                                                 | NCSx219B              |       |       | Electrical Connection |       |       |  |  |
| PCB Material                                                                     | Aluminium             |       |       |                       |       |       |  |  |
| Operation Temperature (°C)                                                       | -40 ~ 100             |       |       | Parallel              | 1     |       |  |  |
| Storage Temperature (°C)                                                         | -40 ~ 100             |       |       | Series                | 36    |       |  |  |
| Thermal Conductivity (W/m-K)                                                     | 1,5                   |       |       | Total LED Quantity    | 36    |       |  |  |
| Specs for Warm White Outputs                                                     |                       |       |       |                       |       |       |  |  |
| Part Number                                                                      | X-MR00160NC-219VWW-36 |       |       | X-MR00160NC-219VW-36  |       |       |  |  |
| Correlated Color Temperature (CCT)                                               | 2700 K                |       |       | 3000 K                |       |       |  |  |
| Color Rendering Index (CRI)                                                      | 80 +                  |       |       | 80 +                  |       |       |  |  |
| Module Operating Current (mA)                                                    | 350                   | 500   | 700   | 350                   | 500   | 700   |  |  |
| Branch Operating Current (mA)                                                    | 350                   | 500   | 700   | 350                   | 500   | 700   |  |  |
| Module Operating Voltage (V)                                                     | 111.9                 | 116.1 | 121.1 | 111.9                 | 116.1 | 121.1 |  |  |
| Module Power (W)                                                                 | 39.2                  | 58.1  | 84.8  | 39.2                  | 58.1  | 84.8  |  |  |
| Module Light Output @ T <sub>j</sub> 65 (lm)                                     | 4099                  | 5506  | 7243  | 4276                  | 5743  | 7555  |  |  |
| Module Efficiency (lm/W)                                                         | 105                   | 95    | 85    | 109                   | 99    | 89    |  |  |
| Specs for Neutral White Output                                                   |                       |       |       |                       |       |       |  |  |
| Part Number                                                                      | X-MR00160NC-219NW-36  |       |       |                       |       |       |  |  |
| Correlated Color Temperature (CCT)                                               | 4000 K                |       |       |                       |       |       |  |  |
| Color Rendering Index (CRI)                                                      | 80 +                  |       |       |                       |       |       |  |  |
| Module Operating Current (mA)                                                    | 350                   |       | 500   | 700                   |       |       |  |  |
| Branch Operating Current (mA)                                                    | 350                   |       | 500   | 700                   |       |       |  |  |
| Module Operating Voltage (V)                                                     | 111.9                 |       | 116.1 | 121.1                 |       |       |  |  |
| Module Power (W)                                                                 | 39.2                  |       | 58.1  | 84.8                  |       |       |  |  |
| Module Light Output @ T <sub>j</sub> 65 (lm)                                     | 4488                  |       | 6028  | 7930                  |       |       |  |  |
| Module Efficiency (lm/W)                                                         | 115                   |       | 104   | 94                    |       |       |  |  |
| Specs for Cool White Outputs                                                     |                       |       |       |                       |       |       |  |  |
| Part Number                                                                      | X-MR00160NC-219CW-36  |       |       | X-MR00160NC-219VCW-36 |       |       |  |  |
| Correlated Color Temperature (CCT)                                               | 5000 K                |       |       | 6500 K                |       |       |  |  |
| Color Rendering Index (CRI)                                                      | 70 +                  |       |       | 70 +                  |       |       |  |  |
| Module Operating Current (mA)                                                    | 350                   | 500   | 700   | 350                   | 500   | 700   |  |  |
| Branch Operating Current (mA)                                                    | 350                   | 500   | 700   | 350                   | 500   | 700   |  |  |
| Module Operating Voltage (V)                                                     | 111.9                 | 116.1 | 121.1 | 111.9                 | 116.1 | 121.1 |  |  |
| Module Power (W)                                                                 | 39.2                  | 58.1  | 84.8  | 39.2                  | 58.1  | 84.8  |  |  |
| Module Light Output @ T <sub>j</sub> 65 (lm)                                     | 5052                  | 6783  | 8919  | 5052                  | 6783  | 8919  |  |  |
| Module Efficiency (lm/W)                                                         | 129                   | 117   | 105   | 129                   | 117   | 105   |  |  |

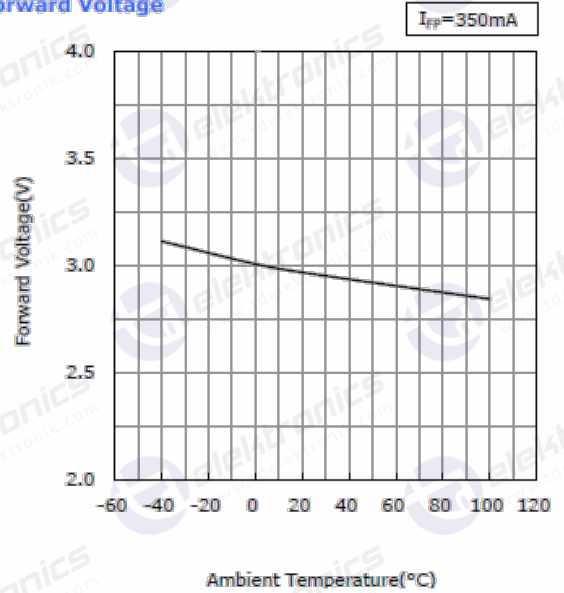
## Absolute Maximum Ratings & Specs for NVS219B\_V1

## Thermal & Luminous Flux - NCS219B\_V1

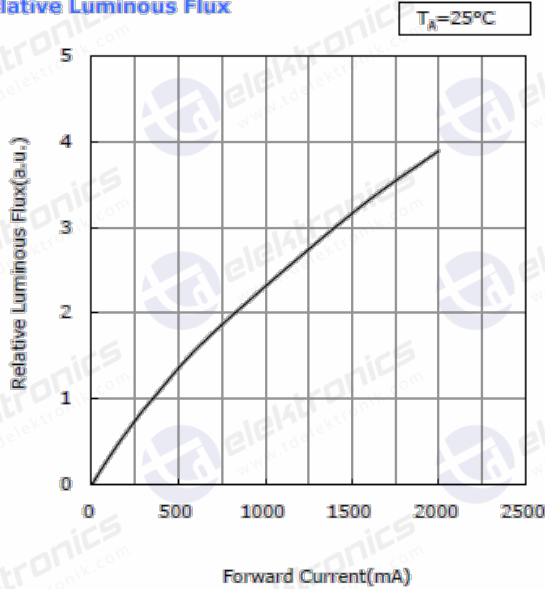
**Forward Voltage vs  
Forward Current**



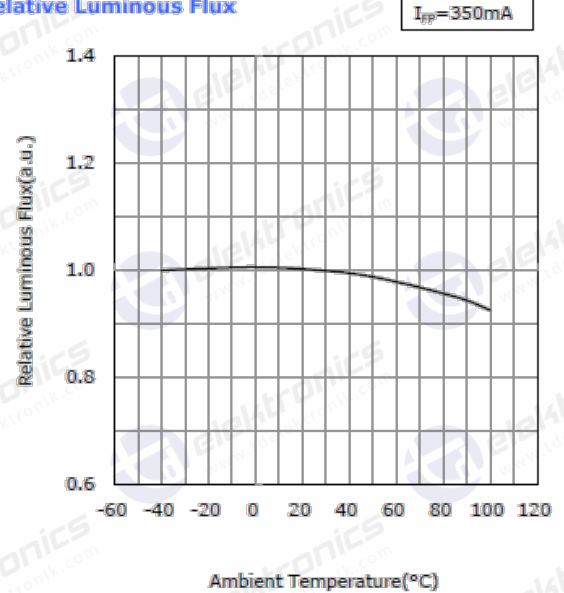
**Ambient Temperature vs  
Forward Voltage**



**Forward Current vs  
Relative Luminous Flux**



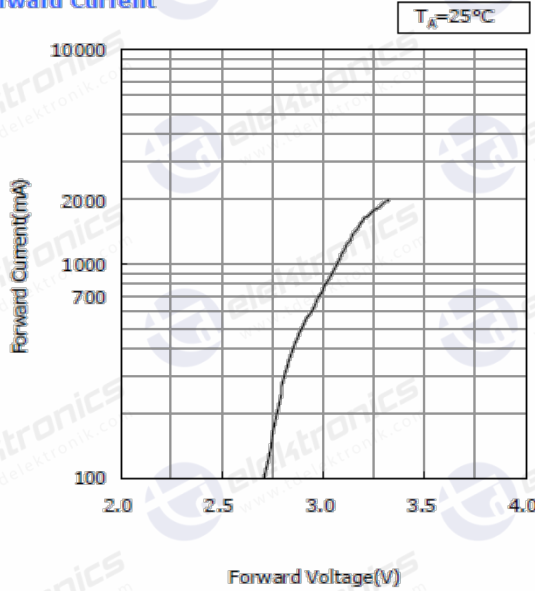
**Ambient Temperature vs  
Relative Luminous Flux**



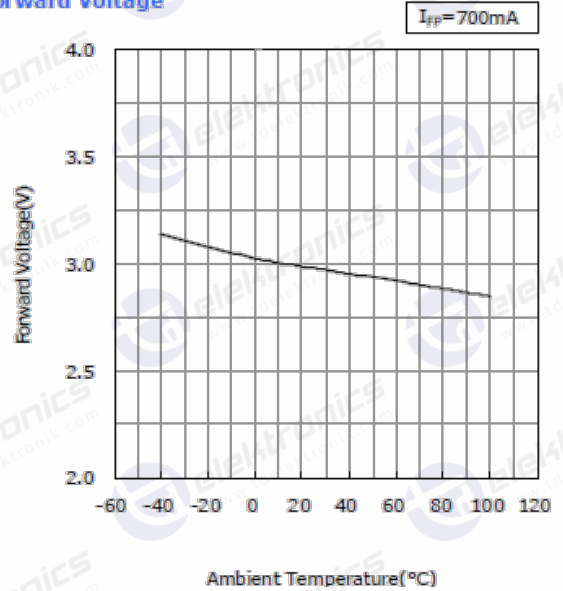
- All these data are related to Nichia LED's used in our LED Light Engines.
- Please find Parallel Connection information of the Module and define your Driving Current. Then, divide your driving current with the number of parallel Connection to find LED itself driving current to check from the graph. Additionally, you can find out total Voltage Output of the Module by multiplying the Calculated single LED Vf and Series Connection. For Example; Parallel Connection: 4, Driving Current: 350mA Then:  $350/4 = 87,5\text{mA}$  Then check the Data from the graph to find Vf and Relative Luminous Flux by using this method.

## Thermal & Luminous Flux - NVS219B\_V1

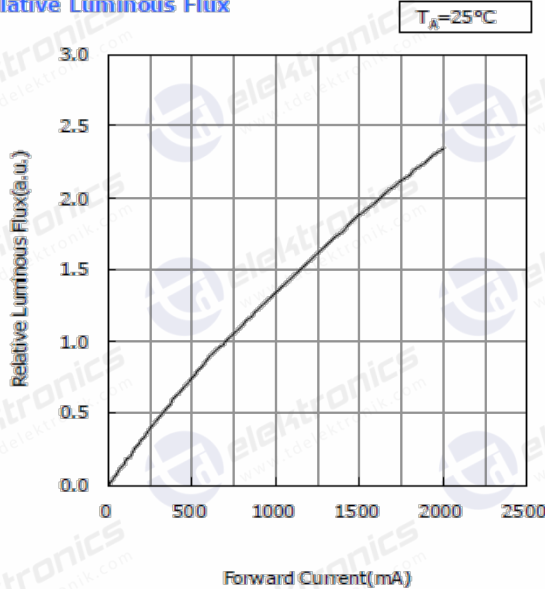
**Forward Voltage vs  
Forward Current**



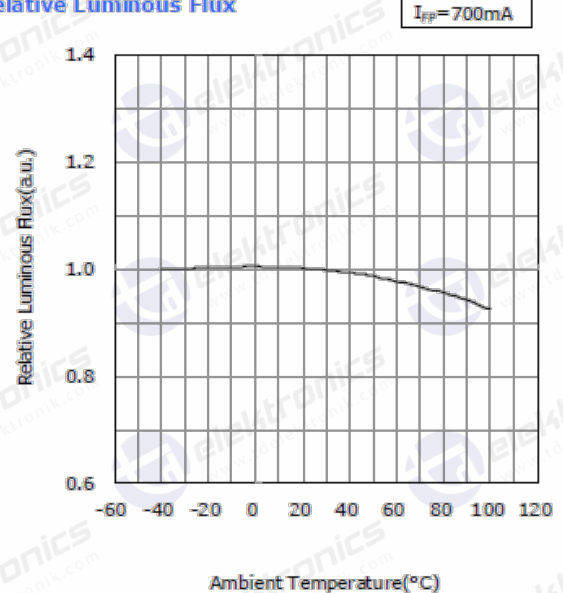
**Ambient Temperature vs  
Forward Voltage**



**Forward Current vs  
Relative Luminous Flux**

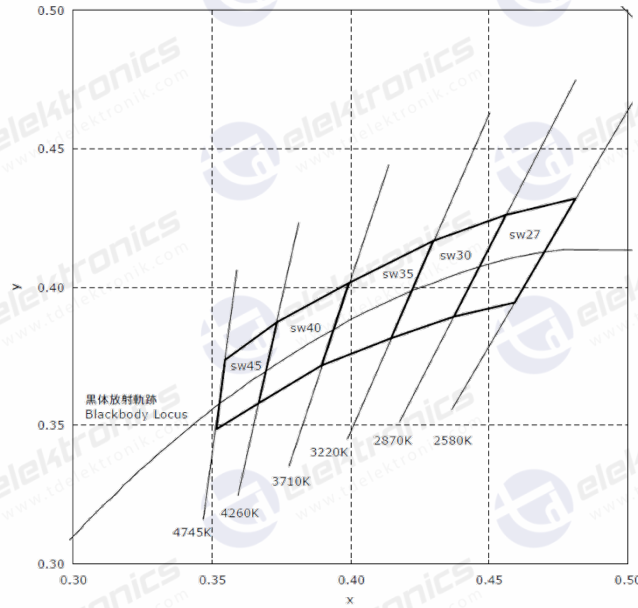


**Ambient Temperature vs  
Relative Luminous Flux**

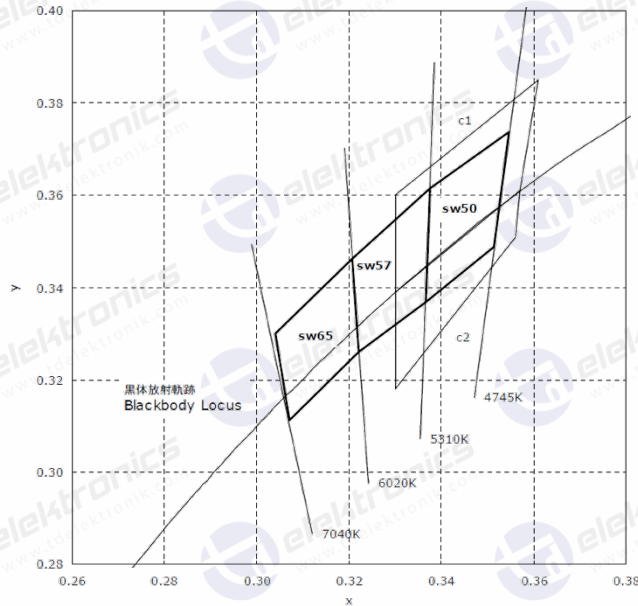


- All these data are related to Nichia LED's used in our LED Light Engines.
- Please find Parallel Connection information of the Module and define your Driving Current. Then, divide your driving current with the number of parallel Connection to find LED itself driving current to check from the graph. Additionally, you can find out total Voltage Output of the Module by multiplying the Calculated single LED Vf and Series Connection. For Example; Parallel Connection: 4, Driving Current: 350mA Then:  $350/4 = 87,5\text{mA}$  Then check the Data from the graph to find Vf and Relative Luminous Flux by using this method.

## Chromacity Diagram – NxSL219B\_V1



## Chromacity Diagram - NxSW157B



- All Modules are generally put in 3 Step MC Adam Ellipse.

## Lifetime Projection & Worst Condition Performance – NCS219B\_V1

### Description of Test Samples:

Classification: LED Package  
Model Name: Warm White LED  
Model Number: NCSL219B (Nominal CCT: 2700 K)

### Test Summary:

| Data Set | Case Temperature [T <sub>s</sub> ] | Ambient Temperature [T <sub>A</sub> ] | Drive Current [I <sub>F</sub> ] | Lumen Maintenance at 10,000 hours | Chromaticity Shift (Δu'v') at 10,000 hours | TM-21 Projection L <sub>70</sub> (10K) |
|----------|------------------------------------|---------------------------------------|---------------------------------|-----------------------------------|--------------------------------------------|----------------------------------------|
| 1        | 55 °C                              | > 50 °C                               | 700 mA                          | 97.6 %                            | 0.0025                                     | > 60200 hours                          |
| 2        | 55 °C                              | > 50 °C                               | 1000 mA                         | 96.0 %                            | 0.0029                                     | > 60200 hours                          |
| 3        | 85 °C                              | > 80 °C                               | 700 mA                          | 96.0 %                            | 0.0029                                     | > 60200 hours                          |
| 4        | 85 °C                              | > 80 °C                               | 1000 mA                         | 92.7 %                            | 0.0049                                     | > 60200 hours                          |
| 5        | 105 °C                             | > 100 °C                              | 550 mA                          | 95.1 %                            | 0.0032                                     | > 60200 hours                          |
| 6        | 105 °C                             | > 100 °C                              | 700 mA                          | 93.8 %                            | 0.0044                                     | > 60200 hours                          |
| 7        | 105 °C                             | > 100 °C                              | 1000 mA                         | 89.3 %                            | 0.0080                                     | 45700 hours                            |

### Data Set 7 : 105 °C, 1000 mA

|                                              |          |
|----------------------------------------------|----------|
| Actual Case Temperature [T <sub>s</sub> ]    | 110.5 °C |
| Actual Ambient Temperature [T <sub>A</sub> ] | 108.4 °C |
| Drive Current [I <sub>F</sub> ]              | 1000 mA  |
| Measurement Current                          | 1000 mA  |

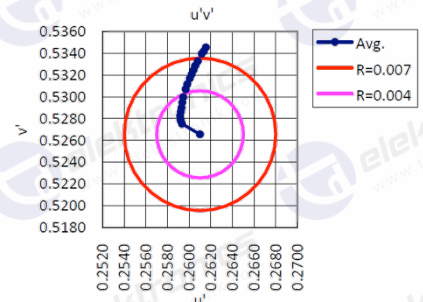
|                                  |            |       |         |
|----------------------------------|------------|-------|---------|
| Test duration used               | 4510 h     | to    | 10035 h |
| B                                | 0.9581     |       |         |
| α                                | 6.8722E-06 |       |         |
| R <sup>2</sup>                   | 0.9978     |       |         |
| Calculated L <sub>70</sub> (10K) | 45700      | hours |         |
| Reported L <sub>70</sub> (10K)   | 45700      | hours |         |

Curve-fit equation:

$$\Phi(t) = B \exp(-\alpha t)$$

Lumen maintenance life equation:

$$L_{70} = \ln(B/0.7)/\alpha$$



**IMPORTANT NOTE:** All data are provided from Nichia Corporation's LM-80 Test Report. This information shall not mean any warranty neither for Nichia nor for TD Electronics. This data is just for reference about lifetime projection of the LEDs used in TLS Light Engine.

## Lifetime Projection & Worst Condition Performance – NVS219B\_V1

### Description of Test Samples:

|                 |                               |
|-----------------|-------------------------------|
| Classification: | LED Package                   |
| Model Name:     | Warm White LED                |
| Model Number:   | NVSL219B (Nominal CCT: 2700K) |

### Test Summary:

| Data Set | Case Temperature [T <sub>S</sub> ] | Ambient Temperature [T <sub>A</sub> ] | Drive Current [I <sub>F</sub> ] | Lumen Maintenance at 10,000 hours | Chromaticity Shift (Δu'v') | TM-21 Projection L <sub>70</sub> (10K) |
|----------|------------------------------------|---------------------------------------|---------------------------------|-----------------------------------|----------------------------|----------------------------------------|
| 1        | 55°C                               | > 50°C                                | 700 mA                          | 99.3%                             | 0.0022                     | > 60100 hours                          |
| 2        | 55°C                               | > 50°C                                | 1200 mA                         | 97.9%                             | 0.0025                     | > 60100 hours                          |
| 3        | 85°C                               | > 80°C                                | 700 mA                          | 97.5%                             | 0.0025                     | > 60000 hours                          |
| 4        | 85°C                               | > 80°C                                | 1200 mA                         | 94.8%                             | 0.0031                     | > 60000 hours                          |
| 5        | 105°C                              | > 100°C                               | 700 mA                          | 95.5%                             | 0.0027                     | > 60100 hours                          |
| 6        | 105°C                              | > 100°C                               | 1000 mA                         | 93.7%                             | 0.0035                     | > 60100 hours                          |

### Data Set 6 : 105°C, 1000 mA

|                                              |          |
|----------------------------------------------|----------|
| Actual Case Temperature [T <sub>S</sub> ]    | 110.1 °C |
| Actual Ambient Temperature [T <sub>A</sub> ] | 108.0 °C |
| Drive Current [I <sub>F</sub> ]              | 1000 mA  |
| Measurement Current                          | 1000 mA  |

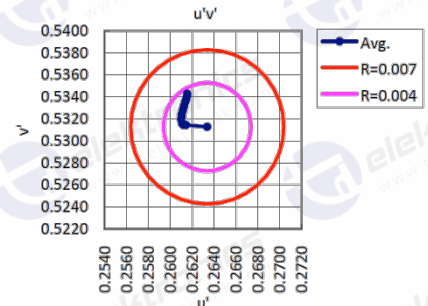
| Test duration used               | 4512 h     | to    | 10011 h |
|----------------------------------|------------|-------|---------|
| B                                | 0.9585     |       |         |
| α                                | 2.2880E-06 |       |         |
| R <sup>2</sup>                   | 0.9742     |       |         |
| Calculated L <sub>70</sub> (10K) | 137000     | hours |         |
| Reported L <sub>70</sub> (10K)   | > 60100    | hours |         |

Curve-fit equation:

$$\Phi(t) = B \exp(-\alpha t)$$

Lumen maintenance life equation:

$$L_{70} = \ln(B/0.7)/\alpha$$



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