# TM-21 Report

| Table 1: Report at each LM-80 Test Condition | | | | | |
|---|---|---|---|---|---|
| **Description of LED Light Source Tested (manufacturer, model, catalog number)** | LED Manufacturer: Samsung; LED Model No: LM281B | | | | |
| **Test Condition 1 - 85ºC Case Temp** | | **Test Condition 2 - 105ºC Case Temp** | | | |
| Sample size | 20 | Sample size | 20 | Sample size | - |
| Number of failures | 0 | Number of failures | 0 | Number of failures | - |
| DUT drive current used in the test (mA) | 150 | DUT drive current used in the test (mA) | 150 | DUT drive current used in the test (mA) | - |
| Test duration (hours) | 6,000 | Test duration (hours) | 6,000 | Test duration (hours) | - |
| Test duration used for projection (hour to hour) | 1,000 - 6,000 | Test duration used for projection (hour to hour) | 1,000 - 6,000 | Test duration used for projection (hour to hour) | - |
| Tested case temperature (ºC) | 85 | Tested case temperature (ºC) | 105 | Tested case temperature (ºC) | - |
| α | 4.826E-06 | α | 5.690E-06 | α | - |
| B | 1.007 | B | 1.007 | B | - |
| Reported L70(6k) (hours) | >36000 | Reported L70(6k) (hours) | >36000 | Reported L70(6k) (hours) | - |

| Table 2: Interpolation Report (projection based on *in-situ* temperature entered) | |
|---|---|
| $T_{s,1}$ (ºC) | 85.00 |
| $T_{s,1}$ (K) | 358.15 |
| $\alpha_1$ | 4.826E-06 |
| $B_1$ | 1.007 |
| $T_{s,2}$ (ºC) | - |
| $T_{s,2}$ (K) | - |
| $\alpha_2$ | - |
| $B_2$ | - |
| $E_a/k_b$ | - |
| A | - |
| $B_0$ | 1.007 |
| $T_{s,i}$ (ºC) | 85.00 |
| $T_{s,i}$ (K) | 358.15 |
| $\alpha_i$ | 4.826E-06 |
| Reported L70(6k) at 85ºC (hours) | >36000 |

| | |
|---|---|
| Report Generated By: Jeremy B | Notes: For EPSLED-MJ-15W-LED Series |
| Company: Larson Electronics LLC | |
| Date: 5/18/2021 | |

# TM-21 Inputs

| Instructions |
|---|
| Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.<br><br>First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". If the in-situ values falls between two cases temperatures, enter only those two case temperature data sets in Tested case temperature 1 and 2 in ascending temperature order.<br><br>Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2).<br><br>Enter drive current, in-situ temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".<br><br>Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report". |

## LM-80 Test Inputs

| Description of LED Light Source Tested (manufacturer, model, catalog number) |
|---|
| LED Manufacturer: Samsung; LED Model No: LM281B |

| LM-80 Testing Details | |
|---|---|
| Total number of units tested per case temperature: | 20 |
| Number of failures: | 0 |
| Number of units measured: | 20 |
| Test duration (hours): | 6000 |
| Tested drive current (mA): | 150 |
| Tested case temperature 1 ($T_c$, ºC): | 85 |
| Tested case temperature 2 ($T_c$, ºC): | 105 |
| Tested case temperature 3 ($T_c$, ºC): | |

Please enter case temperatures in ascending order

| Test Data for 85ºC Case Temperature | |
|---|---|
| Time (hours) | Lumen Maintenance (%) |
| 0 | 100.00% |
| 1000 | 100.23% |
| 2000 | 99.79% |
| 3000 | 99.30% |
| 4000 | 98.79% |
| 5000 | 98.30% |
| 6000 | 97.88% |

| Test Data for 105ºC Case Temperature | |
|---|---|
| Time (hours) | Lumen Maintenance (%) |
| 0 | 100.00% |
| 1000 | 100.10% |
| 2000 | 99.60% |
| 3000 | 99.01% |
| 4000 | 98.43% |
| 5000 | 97.84% |
| 6000 | 97.34% |

| Tested Case Temperature 3 | |
|---|---|
| Time (hours) | Lumen Maintenance (%) |

## *In-Situ* Inputs

| | |
|---|---|
| Drive current for each LED package/array/module (mA): | 150 |
| *In-situ* case temperature ($T_c$, ºC): | 85 |
| Percentage of initial lumens to project to (e.g. for $L_{70}$, enter 70): | 70 |

## Results

| | |
|---|---|
| Time (t) at which to estimate lumen maintenance (hours): | 75,000 |
| Lumen maintenance at time (t) (%): | 70.14% |
| Reported L70 (hours): | >36000 |