



## Photometric Test Report

### Relevant Standards

- IES LM-79-2008
- ANSI C82.77-2002
- UL1598-2008/ UL1993-2012

### Prepared For

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### Catalog Number

**KT-RKIT23-22D-8XX-VDIM**

### Project Number

4788221033

### Report Number

4788221033\_3

### Test Date

10/27/2017-10/31/2017

### Issue Date

11/8/2017

Prepared By

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Approved By

*Duff Yang*

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The results contained in this report pertain only to the tested sample.

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## 1.0 Test Summary

DLC Technical Requirements v4.2

| Requirement Category                                 | Test Method                      | Requirements | Test value | Results (Fail/Pass) |
|--|----------------------------------|--------------|------------|---------------------|
| Minimum Light Output (lm)                            | IES LM-79-2008                   | 2000         | 2904.31    | Pass                |
| Minimum Lamp Output (lm)                             | IES LM-79-2008                   | N/A          | N/A        | N/A                 |
| Spacing Criteria (0-180°)                            | IES LM-79-2008                   | 1.0-2.0      | 1.3        | Pass                |
| Spacing Criteria (90-270°)                           | IES LM-79-2008                   | 1.0-2.0      | 1.22       | Pass                |
| Zonal Lumen Requirement (0°-60°)                     | IES LM-79-2008                   | 72%          | 76.00%     | Pass                |
| Zonal Lumen Requirement 2                            | IES LM-79-2008                   | N/A          | N/A        | N/A                 |
| Minimum Luminaire Efficacy (lm/W)                    | IES LM-79-2008                   | 121.25lm/W   | 129.86     | Pass                |
| Minimum Lamp Efficacy (lm/ft)                        | IES LM-79-2008                   | N/A          | N/A        | N/A                 |
| Allowable CCTs* (K)                                  | IES LM-79-2008                   | ≤5000        | 5006       | Pass                |
| Minimum CRI  | IES LM-79-2008<br>CIE 13.3-1995  | ≥80          | 84.14      | Pass                |
| L70 Lumen maintenance (hours)                        | IES LM-80-2015<br>IES TM-21-2011 | ≥50000       | ≥50000     | Pass                |
| L90 Lumen maintenance (hours)                        | IES LM-80-2015<br>IES TM-21-2011 | ≥36000       | ≥36000     | Pass                |
| Power Factor   | ANSI C82.77-2002                 | ≥0.9         | 0.9451     | Pass                |
| Total Harmonic Distortion (A%)                       | ANSI C82.77-2002                 | ≤20%         | 11.62%     | Pass                |
| In-Situ Temperature Measurement Test for LED (°C)    | UL1598-2008/<br>UL1993-2012      | ≤105         | 44.4       | Pass                |
| In-Situ Temperature Measurement Test for Driver (°C) | UL1598-2008/<br>UL1993-2012      | 85           | 41.9       | Pass                |
| Minimum Luminaire Warranty (years)                   | N/A                              | 5            | 5          | Pass                |

\*Defined by ANSI C78.377-2011‡

‡ANSI C78.377-2015 also referred to for Duv and (x,y) chromaticity coordinates tolerances for indoor categories.



## 2.0 Test List

| Test Item | Test                                       | Test Date  | Model Number           | Tests Conducted By |
|-----------|--|------------|------------------------|--------------------|
| 1         | Integrating Sphere Test for the Lower CCT  | 10/27/2017 | KT-RKIT23-22D-835-VDIM | Gavin Yang         |
| 2         | Integrating Sphere Test for the Higher CCT | 10/27/2017 | KT-RKIT23-22D-850-VDIM | Gavin Yang         |
| 3         | Goniophotometer Test                       | 10/27/2017 | KT-RKIT23-22D-835-VDIM | Gavin Yang         |
| 4         | THD and PF Test                            | 10/27/2017 | KT-RKIT23-22D-835-VDIM | Gavin Yang         |
| 5         | In-Situ Temperature Measurement Test       | 10/31/2017 | KT-RKIT23-22D-835-VDIM | Gavin Yang         |

### **Remark** (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



### 3.0 Production Description

**Luminaire Description:** Integrated Retrofit Kits for 2x2 Luminaires

**Model Number:** KT-RKIT23-22D-835-VDIM

**Rated Voltage:** 120-277V

**Frequency:** 50/60Hz

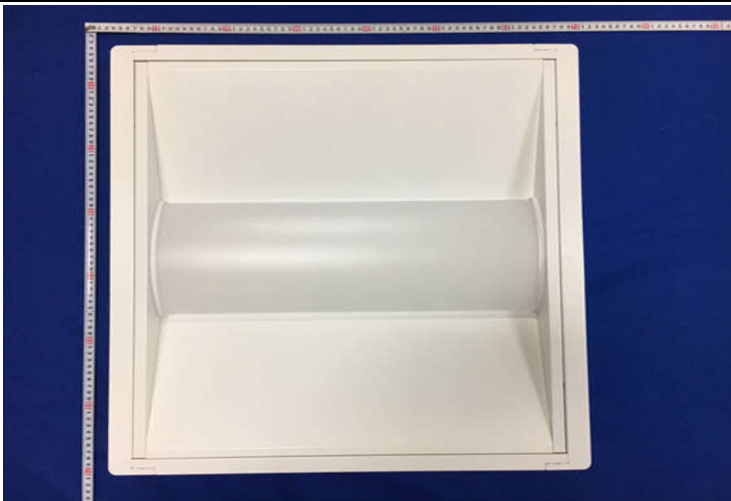
**LED Package:** STWxA2PD-xx

**Family Model and Variation:** KT-RKIT23-22D-850-VDIM

**Housing Model Number:** Lithonia 2GT8 2 17 A12 MVOLT GEB10IS

#### Photos of Luminaire Characteristics

| Model Number           | CCT   | Light Output (lm) | Power (W) | Luminous efficacy (lm/W) |
|------------------------|-------|-------------------|-----------|--------------------------|
| KT-RKIT23-22D-835-VDIM | 3500K | 2967              | 23        | 129                      |
| KT-RKIT23-22D-840-VDIM | 4000K | 3013              | 23        | 131                      |
| KT-RKIT23-22D-850-VDIM | 5000K | 3036              | 23        | 132                      |





#### 4.0 LM-79 Measurement and Test Results

|                     |                        |                           |             |
|---------------------|------------------------|---------------------------|-------------|
| Model No.           | KT-RKIT23-22D-835-VDIM | Sample ID.                | 1209820-001 |
| Opreate time (Min.) | 90                     | Stabilization time (Min.) | 45          |

#### Test Method

1.The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.  
 2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.  
 3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

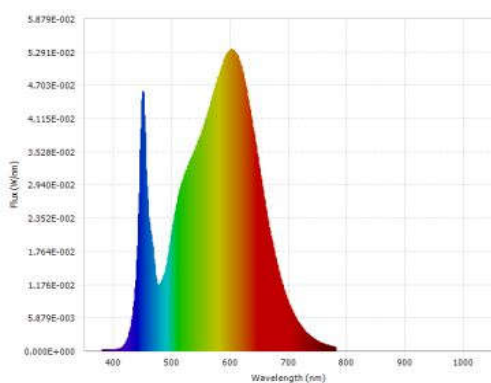
#### Integrating Sphere Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Current THD |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.1             | 120.02        | 60             | 0.1884      | 22.365    | 0.9892       | 13.20%      |

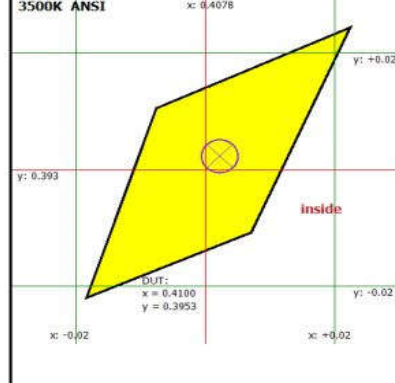
#### Test Results

| CCT (K) | CRI (Ra) | Duv   | Luminous Flux (lm) | Luminous Efficacy (lm/W) | Luminous Efficacy (lm/ft) |
|---------|----------|-------|--------------------|--------------------------|---------------------------|
| 3435    | 84.14    | 0.001 | 2904.31            | 129.86                   | N/A                       |

Spectral Flux Graph



Chromaticity Diagram



Spectral Result

|                         |              |                          |               |
|-------------------------|--------------|--------------------------|---------------|
| Luminous Flux $\Phi(v)$ | 2904.31 (lm) | Chrom x                  | 0.4100        |
| Chrom y                 | 0.3953       | Chrom u                  | 0.2368        |
| Chrom v                 | 0.3426       | Duv                      | 0.001         |
| Chrom u'                | 0.2368       | Chrom v'                 | 0.5139        |
| CCT                     | 3435.0 (K)   | Luminous Efficacy $\eta$ | 129.86 (lm/W) |
| Ra                      | 84.14        | R1                       | 82.6          |
| R2                      | 89.9         | R3                       | 95.9          |
| R4                      | 83.5         | R5                       | 82.5          |
| R6                      | 86.7         | R7                       | 86.4          |
| R8                      | 65.5         | R9                       | 15.8          |
| R10                     | 76.4         | R11                      | 82.9          |
| R12                     | 66.6         | R13                      | 84.2          |
| R14                     | 97.7         | R15                      | 76.3          |
| Rf                      | 83.9         | Rg                       | 96.7          |



## 4.0 LM-79 Measurement and Test Results

### 4.2 Integrating Sphere Test for the higher CCT

|                            |                        |                                  |             |
|----------------------------|------------------------|----------------------------------|-------------|
| <b>Model No.</b>           | KT-RKIT23-22D-850-VDIM | <b>Sample ID.</b>                | 1209820-003 |
| <b>Operate time (Min.)</b> | 90                     | <b>Stabilization time (Min.)</b> | 45          |

#### Test Method

1. The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.

2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.

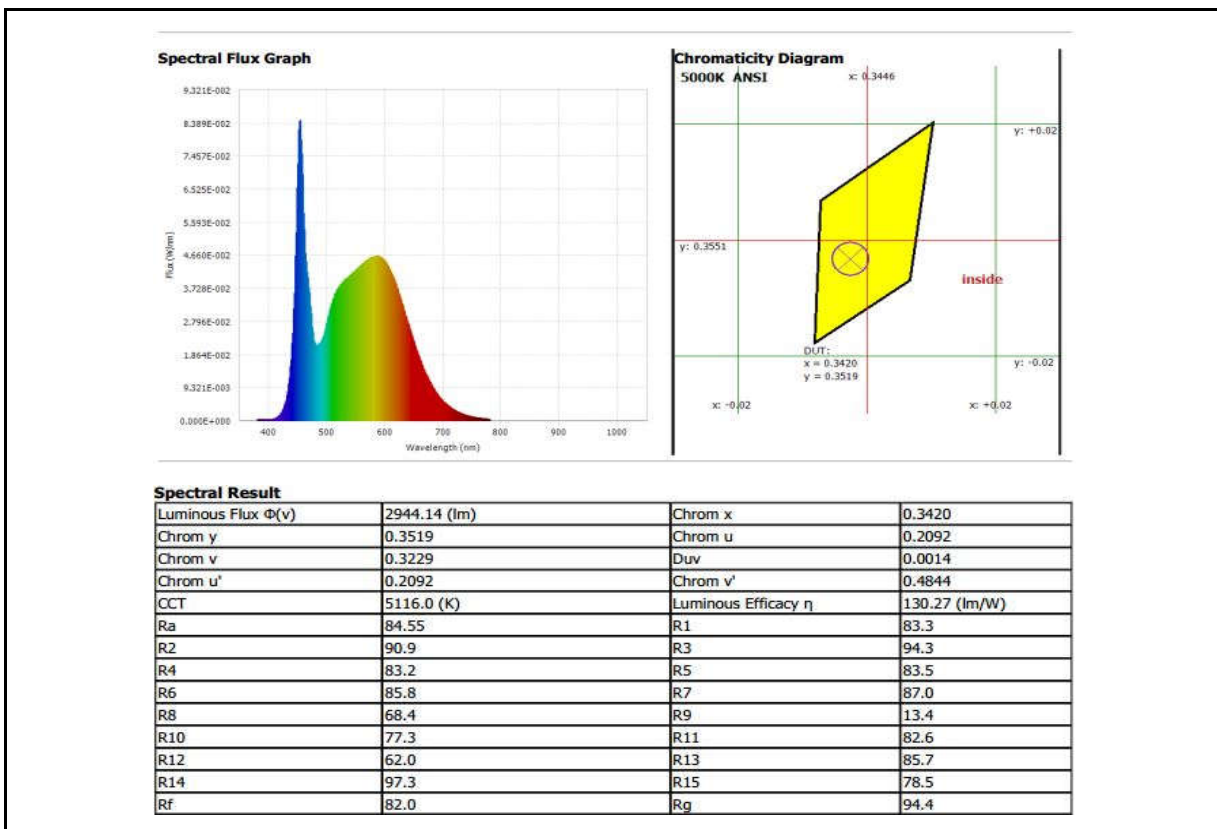
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Current THD |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.2             | 120.01        | 60             | 0.1895      | 22.501    | 0.9915       | 11.19%      |

#### Test Results

| CCT (K) | CRI (Ra) | Duv    | Luminous Flux (lm) | Luminous Efficacy (lm/W) | Luminous Efficacy (lm/ft) |
|---------|----------|--------|--------------------|--------------------------|---------------------------|
| 5006    | 85.06    | 0.0021 | 2998.34            | 133.25                   | N/A                       |





## 5.0 LM-79 Measurement and Test Results

|                            |                        |                                  |             |
|----------------------------|------------------------|----------------------------------|-------------|
| <b>Model No.</b>           | KT-RKIT23-22D-835-VDIM | <b>Sample ID.</b>                | 1209820-001 |
| <b>Operate time (Min.)</b> | 90                     | <b>Stabilization time (Min.)</b> | 45          |

### Test Method

|   |
|---|
| <p>1.The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.</p> <p>2.Photometric paramters were measured using a type C goniophotometer and software.</p> <p>3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.The reference standard lamp is rated current 3.865A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.</p> <p>4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals..Photometric distance was more than five times of the largest dimension of the test SSL product.</p> |
|---|

### Goniophotometer Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Orientation |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.1             | 119.96        | 60             | 0.18794     | 22.354    | 0.9915       | Horizontal  |

### Test Result

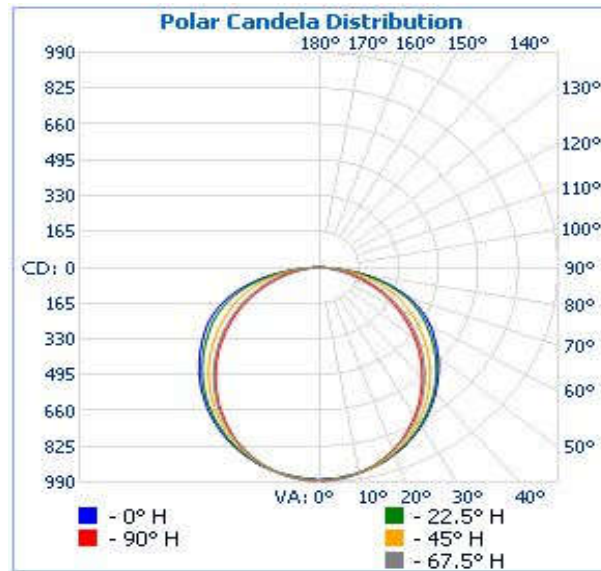
| Flux (lm)     | Zonal Lumen Requirement (0°-60°) | Field Angle (10%) |                 | Beam Angle (50%)  |                 | Luminous Efficacy (lm/W) |
|---------------|----------------------------------|-------------------|-----------------|-------------------|-----------------|--------------------------|
|               |                                  | Horizontal Spread | Vertical Spread | Horizontal Spread | Vertical Spread |                          |
| 2890.1        | 76.0%                            | 157.7             | 167.6           | 104.3             | 125.9           | 129.29                   |
| <b>SC</b>     | <b>SC</b>                        |                   |                 |                   |                 |                          |
| <b>0~180°</b> | <b>90°~270°</b>                  |                   |                 |                   |                 |                          |
| 1.3           | 1.22                             |                   |                 |                   |                 |                          |



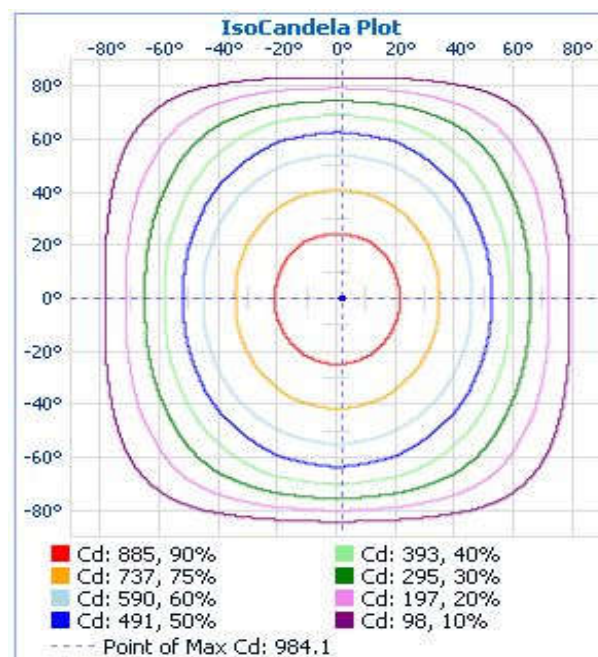


## 5.2 Goniophotometer Test (Cont'd)

### Light Distribution Curve



### IsoCandela Plot







## 5.2 Goniophotometer Test (Cont'd)

### Zonal Lumen Summary

| Zonal Lumen Summary |         |             |
|---------------------|---------|-------------|
| Zone                | Lumens  | % Luminaire |
| 0-30                | 756.0   | 26.2%       |
| 0-40                | 1,235.3 | 42.7%       |
| 0-60                | 2,196.4 | 76%         |
| 60-90               | 683.7   | 23.7%       |
| 70-100              | 308.3   | 10.7%       |
| 90-120              | 4.8     | 0.2%        |
| 0-90                | 2,880.0 | 99.7%       |
| 90-180              | 9.8     | 0.3%        |
| 0-180               | 2,889.9 | 100%        |

### Lumens Per Zone

| Lumens Per Zone |        |         |         |        |         |
|-----------------|--------|---------|---------|--------|---------|
| Zone            | Lumens | % Total | Zone    | Lumens | % Total |
| 0-5             | 23.4   | 0.8%    | 90-95   | 1.0    | 0%      |
| 5-10            | 69.3   | 2.4%    | 95-100  | 0.9    | 0%      |
| 10-15           | 112.6  | 3.9%    | 100-105 | 0.8    | 0%      |
| 15-20           | 151.9  | 5.3%    | 105-110 | 0.7    | 0%      |
| 20-25           | 185.8  | 6.4%    | 110-115 | 0.7    | 0%      |
| 25-30           | 213.1  | 7.4%    | 115-120 | 0.7    | 0%      |
| 30-35           | 233.3  | 8.1%    | 120-125 | 0.6    | 0%      |
| 35-40           | 245.9  | 8.5%    | 125-130 | 0.6    | 0%      |
| 40-45           | 250.9  | 8.7%    | 130-135 | 0.6    | 0%      |
| 45-50           | 248.4  | 8.6%    | 135-140 | 0.5    | 0%      |
| 50-55           | 238.7  | 8.3%    | 140-145 | 0.5    | 0%      |
| 55-60           | 223.0  | 7.7%    | 145-150 | 0.5    | 0%      |
| 60-65           | 202.2  | 7.0%    | 150-155 | 0.4    | 0%      |
| 65-70           | 175.1  | 6.1%    | 155-160 | 0.4    | 0%      |
| 70-75           | 141.0  | 4.9%    | 160-165 | 0.3    | 0%      |
| 75-80           | 100.2  | 3.5%    | 165-170 | 0.3    | 0%      |
| 80-85           | 54.1   | 1.9%    | 170-175 | 0.2    | 0%      |
| 85-90           | 11.1   | 0.4%    | 175-180 | 0.1    | 0%      |



## 5.2 Goniophotometer Test (Cont'd)

### Intensity Data(cd)

|     | 0   | 22.5 | 45  | 67.5 | 90  | 113 | 135 | 158 | 180 | 203 | 225 | 247.5 | 270 | 293 | 315 | 338 | 360 |
|-----|-----|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|
| 0   | 980 | 980  | 980 | 980  | 980 | 980 | 980 | 980 | 980 | 980 | 980 | 980   | 980 | 980 | 980 | 980 | 980 |
| 1   | 976 | 978  | 981 | 982  | 984 | 982 | 981 | 977 | 976 | 977 | 981 | 982   | 984 | 982 | 981 | 978 | 976 |
| 2   | 974 | 978  | 980 | 982  | 983 | 981 | 979 | 977 | 975 | 977 | 979 | 981   | 983 | 982 | 980 | 978 | 974 |
| 3   | 975 | 976  | 980 | 981  | 983 | 981 | 979 | 975 | 974 | 975 | 979 | 981   | 983 | 981 | 980 | 976 | 975 |
| 4   | 974 | 975  | 977 | 978  | 980 | 979 | 976 | 974 | 972 | 974 | 976 | 979   | 980 | 978 | 977 | 975 | 974 |
| 5   | 973 | 973  | 976 | 977  | 978 | 976 | 975 | 972 | 972 | 972 | 975 | 976   | 978 | 977 | 976 | 973 | 973 |
| 6   | 969 | 972  | 975 | 976  | 976 | 974 | 973 | 971 | 969 | 971 | 973 | 974   | 976 | 976 | 975 | 972 | 969 |
| 7   | 967 | 970  | 972 | 972  | 972 | 971 | 970 | 968 | 967 | 968 | 970 | 971   | 972 | 972 | 972 | 970 | 967 |
| 8   | 966 | 968  | 969 | 968  | 970 | 968 | 967 | 966 | 965 | 966 | 967 | 968   | 970 | 968 | 969 | 968 | 966 |
| 9   | 964 | 965  | 966 | 965  | 965 | 964 | 964 | 963 | 962 | 963 | 964 | 964   | 965 | 965 | 966 | 965 | 964 |
| 10  | 960 | 962  | 962 | 961  | 962 | 960 | 959 | 960 | 961 | 960 | 959 | 960   | 962 | 961 | 962 | 962 | 960 |
| 11  | 957 | 958  | 959 | 956  | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956   | 956 | 956 | 959 | 958 | 957 |
| 12  | 954 | 955  | 954 | 952  | 951 | 951 | 952 | 952 | 953 | 952 | 952 | 951   | 951 | 952 | 954 | 955 | 954 |
| 13  | 950 | 951  | 949 | 947  | 946 | 945 | 947 | 948 | 948 | 948 | 947 | 945   | 946 | 947 | 949 | 951 | 950 |
| 14  | 946 | 947  | 945 | 942  | 940 | 940 | 941 | 944 | 946 | 944 | 941 | 940   | 940 | 942 | 945 | 947 | 946 |
| 15  | 941 | 942  | 939 | 935  | 934 | 934 | 937 | 939 | 941 | 939 | 937 | 934   | 934 | 935 | 939 | 942 | 941 |
| 16  | 938 | 939  | 934 | 928  | 926 | 926 | 931 | 934 | 937 | 934 | 931 | 926   | 926 | 928 | 934 | 939 | 938 |
| 17  | 933 | 932  | 928 | 922  | 919 | 920 | 924 | 929 | 931 | 929 | 924 | 920   | 919 | 922 | 928 | 932 | 933 |
| 18  | 928 | 926  | 922 | 914  | 911 | 913 | 918 | 924 | 926 | 924 | 918 | 913   | 911 | 914 | 922 | 926 | 928 |
| 19  | 922 | 921  | 916 | 906  | 904 | 905 | 910 | 917 | 921 | 917 | 910 | 905   | 904 | 906 | 916 | 921 | 922 |
| 20  | 916 | 915  | 907 | 898  | 895 | 897 | 904 | 911 | 915 | 911 | 904 | 897   | 895 | 898 | 907 | 915 | 916 |
| 25  | 883 | 881  | 869 | 854  | 848 | 851 | 863 | 877 | 883 | 877 | 863 | 851   | 848 | 854 | 869 | 881 | 883 |
| 30  | 846 | 839  | 821 | 802  | 792 | 799 | 816 | 835 | 843 | 835 | 816 | 799   | 792 | 802 | 821 | 839 | 846 |
| 35  | 801 | 793  | 768 | 744  | 732 | 740 | 764 | 788 | 799 | 788 | 764 | 740   | 732 | 744 | 768 | 793 | 801 |
| 40  | 752 | 742  | 712 | 680  | 666 | 676 | 705 | 737 | 751 | 737 | 705 | 676   | 666 | 680 | 712 | 742 | 752 |
| 45  | 699 | 687  | 649 | 612  | 596 | 608 | 642 | 682 | 700 | 682 | 642 | 608   | 596 | 612 | 649 | 687 | 699 |
| 50  | 644 | 629  | 585 | 541  | 524 | 538 | 577 | 625 | 643 | 625 | 577 | 538   | 524 | 541 | 585 | 629 | 644 |
| 55  | 586 | 568  | 516 | 468  | 448 | 464 | 512 | 563 | 589 | 563 | 512 | 464   | 448 | 468 | 516 | 568 | 586 |
| 60  | 531 | 510  | 450 | 395  | 373 | 391 | 444 | 506 | 533 | 506 | 444 | 391   | 373 | 395 | 450 | 510 | 531 |
| 65  | 464 | 445  | 383 | 322  | 297 | 318 | 379 | 443 | 470 | 443 | 379 | 318   | 297 | 322 | 383 | 445 | 464 |
| 70  | 388 | 371  | 314 | 250  | 222 | 247 | 310 | 368 | 394 | 368 | 310 | 247   | 222 | 250 | 314 | 371 | 388 |
| 75  | 294 | 283  | 237 | 179  | 150 | 176 | 234 | 280 | 301 | 280 | 234 | 176   | 150 | 179 | 237 | 283 | 294 |
| 80  | 189 | 184  | 152 | 110  | 84  | 108 | 148 | 177 | 192 | 177 | 148 | 108   | 84  | 110 | 152 | 184 | 189 |
| 85  | 67  | 71   | 62  | 44   | 31  | 42  | 57  | 64  | 71  | 64  | 57  | 42    | 31  | 44  | 62  | 71  | 67  |
| 90  | 3   | 4    | 3   | 2    | 1   | 2   | 2   | 2   | 2   | 2   | 2   | 2     | 1   | 2   | 3   | 4   | 3   |
| 95  | 2   | 3    | 2   | 2    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 2   | 2   | 3   | 2   |
| 100 | 2   | 3    | 2   | 2    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 2   | 2   | 3   | 2   |
| 105 | 1   | 3    | 2   | 2    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 2   | 2   | 3   | 1   |
| 110 | 2   | 3    | 2   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 2   | 3   | 2   |
| 115 | 2   | 3    | 3   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 3   | 3   | 2   |
| 120 | 2   | 3    | 2   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 2   | 3   | 2   |
| 125 | 2   | 3    | 2   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 2   | 3   | 2   |
| 130 | 2   | 3    | 2   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 2   | 3   | 2   |
| 135 | 2   | 2    | 2   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 1   | 2   | 2   | 2   |
| 140 | 2   | 2    | 2   | 2    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1   | 2   | 2   | 2   | 2   |
| 145 | 2   | 2    | 2   | 2    | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 2   | 2   | 2   | 2   | 2   |
| 150 | 2   | 2    | 2   | 2    | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2     | 2   | 2   | 2   | 2   | 2   |
| 155 | 2   | 2    | 2   | 2    | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2     | 2   | 2   | 2   | 2   | 2   |
| 160 | 2   | 2    | 2   | 2    | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2     | 2   | 2   | 2   | 2   | 2   |
| 165 | 2   | 2    | 2   | 2    | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2     | 2   | 2   | 2   | 2   | 2   |
| 170 | 2   | 2    | 2   | 2    | 2   | 3   | 2   | 2   | 2   | 2   | 2   | 3     | 2   | 2   | 2   | 2   | 2   |
| 175 | 3   | 3    | 3   | 3    | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3     | 3   | 3   | 3   | 3   | 3   |
| 180 | 3   | 3    | 3   | 3    | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3     | 3   | 3   | 3   | 3   | 3   |



## 6.0 THD and PF Test

|                  |                        |                   |             |
|------------------|------------------------|-------------------|-------------|
| <b>Model No.</b> | KT-RKIT23-22D-835-VDIM | <b>Sample ID.</b> | 1209820-001 |
|------------------|------------------------|-------------------|-------------|

### Test Method

1. The samples were tested according to the ANSI C82.77-2002 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.
2. The ambient temperature condition was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

### Test Results

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Current THD |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.2             | 276.9         | 60             | 0.0849      | 22.21     | 0.9451       | 11.62%      |



## 7.0 In-Situ Temperature Measurement Test

|                  |                        |                   |             |
|------------------|------------------------|-------------------|-------------|
| <b>Model No.</b> | KT-RKIT23-22D-835-VDIM | <b>Sample ID.</b> | 1209820-001 |
|------------------|------------------------|-------------------|-------------|

### Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL1598-2008, Section 14 or UL1993-2012, Section 8.5 in fixture Lithonia 2GT8 2 17 A12 MVOLT GEB10IS.

2. The testing was conducted in a room with ambient temperature of 25°C ± 5°C. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. The temperature was recorded after the lamp was operated by 3.5 hours in stability or by 7.5 hours.

### In-Situ Temperature Measurement Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Orientation |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.5             | 120.02        | 60             | 0.1884      | 22.37     | 0.9892       | Horizontal  |

### Test Results(LED)

| Thermocouple Location | Manufacturer Declared Current (mA) | Temperature for Lighting source (°C) |                                | LED Model Number | LM-80 Limit Current (mA) | LM-80 Limit Temp. (°C) |
|-----------------------|------------------------------------|--------------------------------------|--------------------------------|------------------|--------------------------|------------------------|
|                       |                                    | Test result column 1                 | Test result (Correct to 25 °C) |                  |                          |                        |
| TMP of LEDs           | 65                                 | 44.9                                 | 44.4                           | STWxA2PD-xx      | 300                      | 85                     |
| Ambient temperature   | N/A                                | 25.5                                 | 25.0                           |                  |                          |                        |

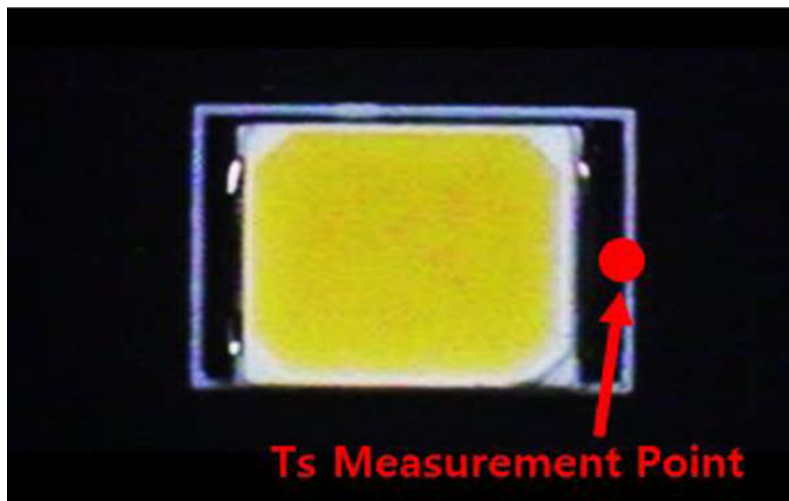
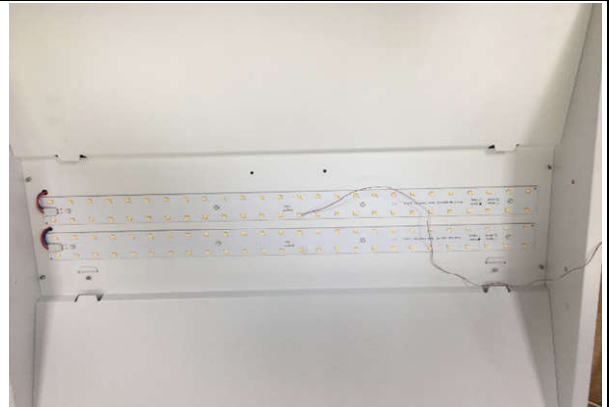
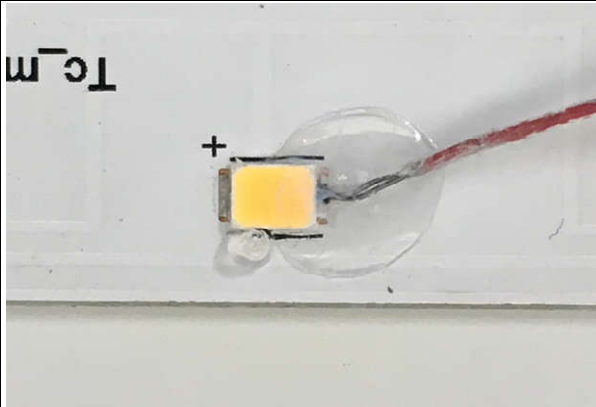
### Test Results(Driver)

| Thermocouple Location | Temperature for Driver (°C) |                                | Driver Model Number     | Driver Limit Temp. (°C) |
|-----------------------|-----------------------------|--------------------------------|-------------------------|-------------------------|
|                       | Test result column 1        | Test result (Correct to 25 °C) |                         |                         |
| TMP of Driver         | 42.4                        | 41.9                           | KTLD-25-UV-540-VDIM-LA2 | 85                      |
| Ambient temperature   | 25.5                        | 25.0                           |                         |                         |



## 7.0 In-Situ Temperature Measurement Test (Cont'd)

### Test Photos for Tc Point of LED Packages





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