

FINAL

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the



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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

50 PCS samples were received on 2017-05-10. The samples were numbered from 1 to 25 and 26 to 50.

| | |
|------------------------------|---|
| Manufacturer: | Hongli Zhihui Group Co.,Ltd. Guangzhou Branch |
| Part Number: | HL-EMC-3030DW-2C-S1-HR3 |
| Part Type: | LED Package |
| Drive Level: | DC 150mA |
| Nominal CCT: | 2700K |
| Power: | 1.02W |
| Current Density per LED die: | 930.0019mA/mm ² |
| Power Density per LED die: | 3.162W/mm ² |
| CRI: | 80 |
| Die Spacing: | 0.22mm |

Sampling Method:

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.

These manufacturing lots are picked to represent a wide parametric distribution.

Note:

1. The applicant Hongli Zhihui Group Co.,Ltd. Guangzhou Branch. declare that their products with model HL-EMC-3030DW-2C-S1-HR3 are the same to the products in report#R2DG170510050-10-9000 and is authorized by original applicant to use their test data.
2. All the data in previous report (R2DG170510050-10-9000) is shared in this report.

1.2 Standards Used:

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs(This standard was not accredited by IAS)
- ENERGY STAR® Requirements for the Use of LM-80 Data(This standard was not accredited by IAS)

1.3 Testing Equipment ®

| Device | Manufacture |
|--------|-------------|
|--------|-------------|



Bay Area Compliance Laboratories Corp. (Dongguan)

No.69,Pulongcun, Puxinhu Industrial Area Tangxia ,
Dongguan, Guangdong, China.
The IAS Accreditation Number TL-460

1.8 Sample Set

Data Set 1: 85°C, 150mA

Part Number: HL-EMC-3030DW-2C-S1-HR3
Number of Units: 25
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

Data Set 2: 105°C, 150mA

Part Number: HL-EMC-3030DW-2C-S1-HR3
Number of Units: 25
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

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2 - Summary of Test Result

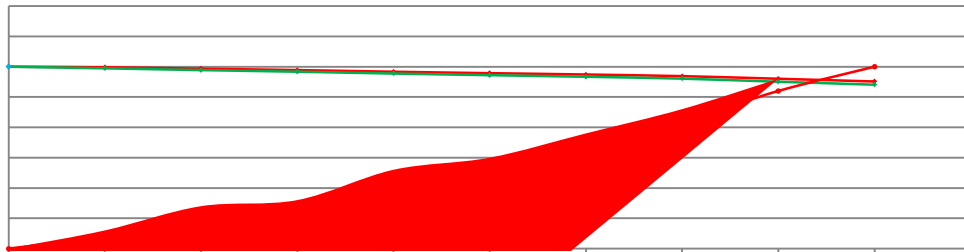
| Data Set: | Sample Size | Failures Observed: | Test Interval | Test Duration | | | Reported TM-21 L ₇₀ Lifetime | Reported TM-21 L ₉₀ Lifetime |
|-----------|-------------|--------------------|---------------|---------------|-----------|-------|---|---|
| 1 | 25 | 0 | 1000hrs | 9000hrs | 3.217E-06 | 1.005 | >54000 hours | 34000 hours |
| 2 | 25 | 0 | 1000hrs | 9000hrs | 3.718E-06 | 1.005 | >54000 hours | 30000 hours |

| | |
|---|---------|
| s | 9000hrs |
| 6 | 97.56% |
| 6 | 97.03% |

| | |
|---|---------|
| s | 9000hrs |
| 6 | 0.0030 |
| 6 | 0.0033 |

| | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2 | 0.0003 | 0.0007 | 0.0008 | 0.0013 | 0.0015 | 0.0019 | 0.0023 | 0.0028 | 0.0033 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 -



Test Data

3.1 Data Set 1, 85°C, 150mA (Lumen Maintenance)

| No. | (lm) | Lumen Maintenance (%) | | | | | | | | |
|-----|--------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 0hr(Initial) | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs | 7000hrs | 8000hrs | 9000hrs |
| 1 | 139.5 | 100.07 | 99.93 | 99.64 | 99.43 | 99.28 | 99.21 | 98.92 | 98.42 | 97.85 |
| 2 | 137.8 | 99.93 | 99.78 | 99.64 | 99.56 | 99.35 | 99.13 | 98.84 | 98.40 | 97.97 |
| 3 | 138.1 | 100.07 | 99.71 | 99.42 | 99.06 | 98.84 | 98.70 | 98.48 | 98.04 | 97.61 |
| 4 | 139.2 | 99.86 | 99.71 | 99.57 | 99.35 | 98.99 | 98.92 | 98.71 | 98.28 | 97.99 |
| 5 | 137.3 | 99.85 | 99.64 | 99.42 | 99.27 | 98.98 | 98.91 | 98.54 | 98.18 | 97.67 |
| 6 | 140.8 | 100.07 | 99.93 | 99.50 | 99.15 | 99.01 | 98.86 | 98.44 | 97.94 | 97.51 |
| 7 | 142.3 | 99.86 | 99.58 | 99.44 | 99.09 | 98.95 | 98.74 | 98.38 | 98.03 | 97.33 |

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3.2 Data Set 1, 85°C, 150mA (Forward Voltage)

| No. | Forward Voltage (V) | | | | | | | | | |
|-----|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Ohr(Initial) | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs | 7000hrs | 8000hrs | 9000hrs |
| 1 | 5.980 | 5.975 | 5.979 | 5.975 | 5.978 | 5.979 | 6.004 | 5.981 | 5.995 | 5.994 |
| 2 | 5.892 | 5.883 | 5.886 | 5.883 | 5.885 | 5.888 | 5.906 | 5.888 | 5.900 | 5.917 |
| 3 | 5.898 | 5.895 | 5.895 | 5.888 | 5.894 | 5.895 | 5.912 | 5.894 | 5.904 | 5.912 |
| 4 | 5.906 | 5.888 | 5.889 | 5.889 | 5.902 | 5.894 | 5.908 | 5.893 | 5.904 | 5.916 |
| 5 | 5.895 | 5.886 | 5.889 | 5.890 | 5.894 | 5.891 | 5.907 | 5.892 | 5.899 | 5.914 |
| 6 | 6.009 | 5.998 | 6.000 | 6.001 | 6.012 | 6.006 | 6.031 | 6.003 | 6.015 | 6.024 |
| 7 | 6.008 | 6.000 | 5.997 | 6.002 | 6.006 | 6.004 | 6.033 | 6.010 | 6.014 | 6.021 |
| 8 | 5.900 | 5.893 | 5.901 | 5.894 | 5.898 | 5.902 | 5.913 | 5.900 | 5.906 | 5.933 |
| 9 | 6.032 | 6.027 | 6.026 | 6.028 | 6.031 | 6.032 | 6.056 | 6.033 | 6.041 | 6.050 |
| 10 | 5.981 | 5.974 | 5.975 | 5.977 | 5.979 | 5.985 | 6.003 | 5.981 | 5.987 | 5.997 |
| 11 | 5.983 | 5.976 | 5.980 | 5.981 | 5.984 | 5.989 | 6.005 | 5.984 | 5.991 | 6.000 |
| 12 | 5.969 | 5.963 | 5.963 | 5.963 | 5.967 | 5.970 | 5.986 | 5.967 | 5.976 | 5.982 |
| 13 | 5.895 | 5.904 | 5.889 | 5.892 | 5.903 | 5.897 | 5.907 | 5.896 | 5.899 | 5.917 |
| 14 | 5.976 | 5.972 | 5.968 | 5.973 | 5.980 | 5.979 | 5.996 | 5.972 | 5.982 | 5.996 |
| 15 | 5.889 | 5.876 | 5.880 | 5.880 | 5.887 | 5.882 | 5.902 | 5.886 | 5.889 | 5.903 |
| 16 | 5.895 | 5.885 | 5.884 | 5.887 | 5.891 | 5.887 | 5.902 | 5.890 | 5.893 | 5.907 |
| 17 | 6.012 | 6.001 | 6.003 | 6.008 | 6.009 | 6.013 | 6.032 | 6.008 | 6.014 | 6.025 |
| 18 | 5.888 | 5.873 | 5.878 | 5.882 | 5.881 | 5.883 | 5.895 | 5.881 | 5.887 | 5.903 |
| 19 | 5.886 | 5.875 | 5.881 | 5.883 | 5.890 | 5.886 | 5.896 | 5.884 | 5.889 | 5.900 |
| 20 | 5.896 | 5.884 | 5.889 | 5.894 | 5.891 | 5.894 | 5.906 | 5.894 | 5.898 | 5.910 |
| 21 | 5.880 | 5.870 | 5.875 | 5.881 | 5.879 | 5.882 | 5.894 | 5.881 | 5.886 | 5.904 |
| 22 | 5.949 | 5.927 | 5.937 | 5.938 | 5.971 | 5.939 | 5.955 | 5.937 | 5.944 | 5.962 |



3.3 Data Set 1, 85°C, 150mA (Chromaticity Shift)

| No. | u' | v' | CCT(K) | Chromaticity Shift (u'v') | | | | | | | | |
|------|--------|--------|--------|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | 0hr(Initial) | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs | 7000hrs | 8000hrs |
| 1 | 0.2631 | 0.5279 | 2686 | 0.0003 | 0.0004 | 0.0007 | 0.0011 | 0.0015 | 0.0018 | 0.0021 | 0.0025 | 0.0028 |
| 2 | 0.2618 | 0.5242 | 2727 | 0.0002 | 0.0005 | 0.0007 | 0.0010 | 0.0014 | 0.0020 | 0.0022 | 0.0025 | 0.0030 |
| 3 | 0.2612 | 0.5237 | 2742 | 0.0001 | 0.0004 | 0.0005 | 0.0009 | 0.0011 | 0.0018 | 0.0021 | 0.0025 | 0.0029 |
| 4 | 0.2604 | 0.5239 | 2758 | 0.0002 | 0.0006 | 0.0007 | 0.0012 | 0.0013 | 0.0018 | 0.0023 | 0.0027 | 0.0031 |
| 5 | 0.2620 | 0.5251 | 2720 | 0.0002 | 0.0004 | 0.0007 | 0.0009 | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0029 |
| 6 | 0.2621 | 0.5241 | 2723 | 0.0002 | 0.0006 | 0.0007 | 0.0011 | 0.0015 | 0.0019 | 0.0022 | 0.0026 | 0.0031 |
| 7 | 0.2606 | 0.5251 | 2749 | 0.0002 | 0.0004 | 0.0005 | 0.0010 | 0.0013 | 0.0017 | 0.0021 | 0.0027 | 0.0031 |
| 8 | 0.2609 | 0.5247 | 2744 | 0.0002 | 0.0005 | 0.0006 | 0.0009 | 0.0012 | 0.0017 | 0.0019 | 0.0024 | 0.0030 |
| 9 | 0.2629 | 0.5243 | 2704 | 0.0002 | 0.0006 | 0.0007 | 0.0010 | 0.0015 | 0.0018 | 0.0022 | 0.0027 | 0.0031 |
| 10 | 0.2609 | 0.5242 | 2747 | 0.0002 | 0.0005 | 0.0006 | 0.0010 | 0.0014 | 0.0018 | 0.0022 | 0.0026 | 0.0030 |
| 11 | 0.2617 | 0.5246 | 2729 | 0.0002 | 0.0006 | 0.0006 | 0.0011 | 0.0013 | 0.0018 | 0.0022 | 0.0026 | 0.0030 |
| 12 | 0.2616 | 0.5236 | 2735 | 0.0001 | 0.0004 | 0.0004 | 0.0008 | 0.0013 | 0.0016 | 0.0021 | 0.0025 | 0.0029 |
| 13 | 0.2625 | 0.5253 | 2708 | 0.0001 | 0.0006 | 0.0007 | 0.0012 | 0.0014 | 0.0020 | 0.0024 | 0.0029 | 0.0033 |
| 14 | 0.2624 | 0.5243 | 2715 | 0.0002 | 0.0005 | 0.0008 | 0.0011 | 0.0013 | 0.0017 | 0.0021 | 0.0026 | 0.0030 |
| 15 | 0.2626 | 0.5244 | 2710 | 0.0002 | 0.0004 | 0.0006 | 0.0010 | 0.0012 | 0.0017 | 0.0021 | 0.0025 | 0.0030 |
| 16 | 0.2619 | 0.5246 | 2723 | 0.0001 | 0.0005 | 0.0006 | 0.0009 | 0.0014 | 0.0017 | 0.0021 | 0.0026 | 0.0028 |
| 17 | 0.2623 | 0.5251 | 2714 | 0.0001 | 0.0004 | 0.0005 | 0.0009 | 0.0009 | 0.0017 | 0.0019 | 0.0025 | 0.0027 |
| 18 | 0.2614 | 0.5246 | 2734 | 0.0003 | 0.0006 | 0.0007 | 0.0013 | 0.0016 | 0.0021 | 0.0025 | 0.0029 | 0.0034 |
| 19 | 0.2615 | 0.5243 | 2734 | 0.0002 | 0.0006 | 0.0009 | 0.0013 | 0.0015 | 0.0020 | 0.0024 | 0.0029 | 0.0032 |
| 20 | 0.2625 | 0.5250 | 2710 | 0.0002 | 0.0006 | 0.0009 | 0.0012 | 0.0014 | 0.0018 | 0.0021 | 0.0026 | 0.0031 |
| 21 | 0.2619 | 0.5251 | 2723 | 0.0002 | 0.0005 | 0.0005 | 0.0008 | 0.0009 | 0.0015 | 0.0019 | 0.0024 | 0.0026 |
| 22 | 0.2612 | 0.5219 | 2751 | 0.0002 | 0.0005 | 0.0005 | 0.0008 | 0.0013 | 0.0017 | 0.0021 | 0.0026 | 0.0028 |
| 23 | 0.2616 | 0.5245 | 2732 | 0.0001 | 0.0004 | 0.0007 | 0.0008 | 0.0011 | 0.0019 | 0.0021 | 0.0025 | 0.0027 |
| 24 | 0.2602 | 0.5248 | 2759 | 0.0002 | 0.0004 | 0.0007 | 0.0009 | 0.0013 | 0.0015 | 0.0019 | 0.0024 | 0.0027 |
| 25 | 0.2607 | 0.5247 | 2748 | 0.0000 | 0.0003 | 0.0006 | 0.0008 | 0.0010 | 0.0014 | 0.0019 | 0.0024 | 0.0027 |
| Avg. | 0.2617 | 0.5246 | 2729 | 0.0002 | 0.0005 | 0.0006 | 0.0010 | 0.0013 | 0.0018 | | | |



Bay Area Compliance Laboratories Corp. (Dongguan)

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The IAS Accreditation Number TL-460

3.4 Data Set 2, 105°C, 150mA (Lumen Maintenance) 9 8 7 6 5 4

| No. | (lm) | Lumen Maintenance (%) | | | | | | | | |
|-----|--------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Ohr(Initial) | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs | 7000hrs | 8000hrs | 9000hrs |
| 26 | 138.2 | 99.71 | 99.57 | 99.42 | 99.13 | 98.91 | 98.77 | 98.41 | 97.90 | 97.61 |
| 27 | 125.1 | 99.76 | 99.44 | 98.96 | 98.56 | 98.08 | 97.60 | 97.20 | 96.72 | 96.08 |
| 28 | 137.2 | 99.78 | 99.64 | 99.56 | 99.27 | 98.83 | 98.47 | 98.32 | 97.81 | 97.52 |
| 29 | 133.3 | 99.70 | 99.47 | 99.32 | 99.25 | 98.87 | 98.65 | 98.20 | 97.75 | 97.52 |
| 30 | 139.0 | 99.64 | 99.42 | 99.21 | 98.99 | 98.78 | 98.63 | 98.35 | 97.91 | 97.41 |
| 31 | 136.3 | 99.71 | | 99.19 | 98.90 | 98.61 | 98.39 | 98.17 | 97.58 | 97.14 |
| 32 | 137.3 | 99.64 | | 99.20 | 98.98 | 98.69 | 98.54 | 98.32 | 97.67 | 97.16 |
| 33 | 138.3 | 99.78 | | 99.13 | 98.84 | 98.77 | 98.41 | 98.12 | 97.61 | 97.25 |
| 34 | 137.2 | 99.64 | | 98.83 | 98.47 | 98.32 | 98.10 | 97.59 | 97.08 | 96.50 |
| 35 | 140.3 | 99.71 | 99.43 | | | | | | | |

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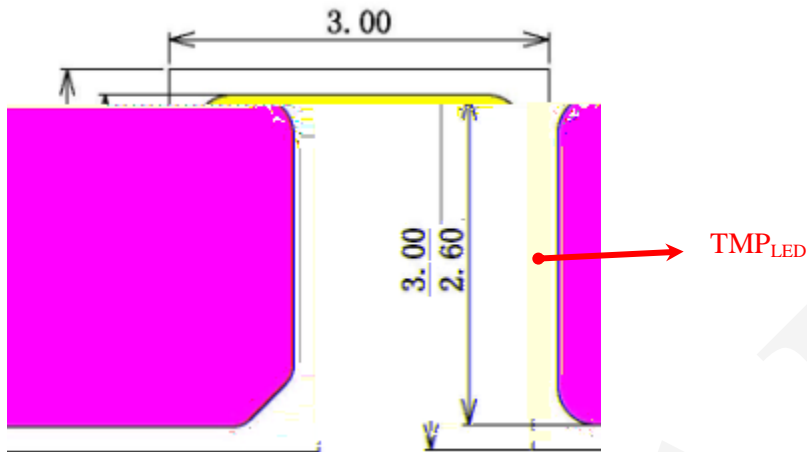
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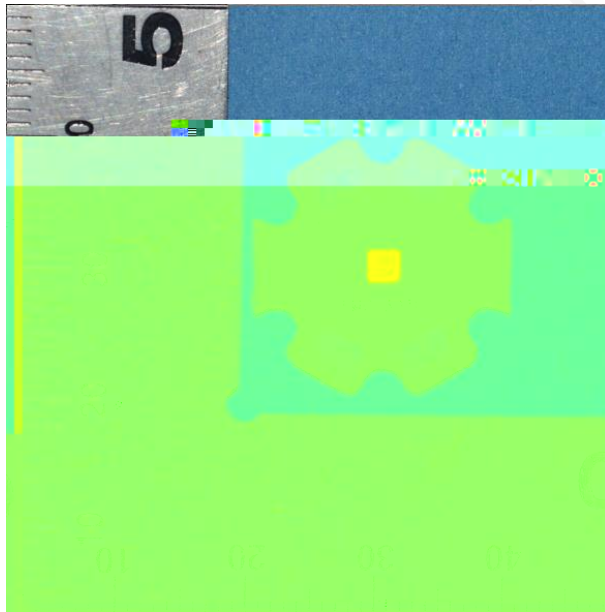
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



*****END OF REPORT*****