



ShenZhen Xin An Biao Technology Service Co. Ltd Testing Center

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Energy Star Test Report

For

L-TECH CORPORATION

(Brand Name:N/A)

Shaogangtou District, Qiaotou Town, Dongguan City

Model name(s):

ULD4-5CT

Report Type: Testing and Report According to ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2

Type of Luminaire: Inseparable Other SSL Luminaire

Report Date: 2021-04-20

Test & Report By:

Garman Mo

Engineer: Garman Mo

Review By:

Johnson Sun

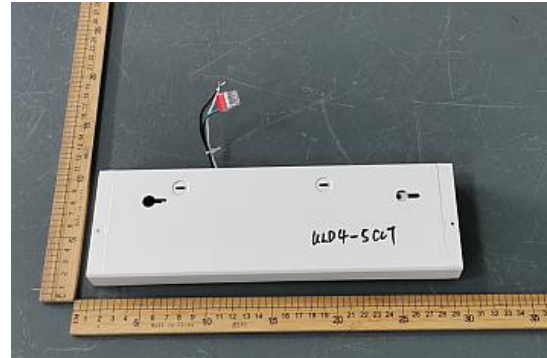
Manager: Johnson Sun

- Note: 1.The results contained in this report pertain only to the tested samples.
- 2.This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.
- 3.This report contains data that are not covered by the A2LA accreditation.

| 1.1 Product Information: | | |
|---|--|-----|
| Model Number | ULD4-5CT | |
| Remark | According to the test data, 2700K is the most consumptive mode. | |
| Representative (Tested) Model | ULD4-5CT(Mode:2700K) ULD4-5CT(Mode:3000K) ULD4-5CT(Mode:3500K) ULD4-5CT(Mode:4000K) ULD4-5CT(Mode:5000K) | |
| Model Difference | N/A | |
| SKU (if available) | N/A | |
| Type of Luminaire (for integral lamps, list base type and lamp type) | Inseparable Other SSL Luminaire | |
| LED Manufacturer | EVERLIGHT ELECTRONICS CO., LTD | |
| LED Model | 67-21S Series | |
| Dimming | 10%-100% | |
| Sample Number | JCE210313-A1 | |
| Date of Receipt | 2021-04-05 | |
| Luminaire Aperture (for Downlight retrofits) | -- | in. |
| Luminaire Length | -- | mm |
| Luminaires Width | -- | mm |
| Number of Units (modular products) | N/A | s |

| 1.2 Rated Values: | |
|---------------------------|-------------------------------|
| Rated Voltage / Frequency | 120V,50/60Hz |
| Nominal Power | 7W |
| Rated Initial Lamp Lumen | -- |
| Declared CCT | 2700K,3000K,3500K,4000K,5000K |

1.3 Product Photos



1.4 Test Specifications:

| | |
|--------------------|---|
| Test item | <ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters 8. Color Angular Uniformity 9. Dimming 10. Flicker 11. Operating Frequency 12. Starting Time 13. Transient Protection Test 14. In-Situ Temperature Measurement Test 15. Standby Power Consumption |
| Reference Standard | <ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. C82.77-10:2014 American National Standard for Lighting Equipment-Harmonic Emission Limits-Related Power Quality Requirements 4. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 5. CIE 15-2004 Technical Report Colorimetry 6. UL1993 4th Edition, Self-Ballasted Lamps and Lamp Adapters 7. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2 8. ANSI/IEEE C62.41.2:2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage(1000V and Less) AC Power Circuits 9. IEC 62301:2011 Household electrical appliances - Measurement of standby power 10. NEMA 77-2017 Standard for Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria |
| Remark | <p>Below test and data are not covered by A2LA accreditation:</p> <ul style="list-style-type: none"> - Operating Frequency - Noise |

1.5 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity 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 sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Summary of Test Result

| Criteria Item | The Type of Luminaires | Requirement (ES for Luminaires V2.2) | Measured Value | Status |
|------------------------------------|---------------------------------------|--|-------------------------------|--------|
| Input Wattage | All | \leq Rated Wattage | 5.398W | Pass |
| Luminous Efficacy | Inseparable Other SSL Luminaire | ≥ 70 lm/W | 79.22lm/W | Pass |
| Luminaire Minimum Light Output | Inseparable Other SSL Luminaire | ≥ 200 lumens | 427.64lm | Pass |
| Correlated Color Temperature (CCT) | Inseparable Other SSL Luminaire | Shall be capable of providing at least one of the following nominal correlated color temperatures (CCTs): • 2700 Kelvin • 3000 Kelvin • 3500 Kelvin • 4000 Kelvin • 5000 Kelvin | 2733K Duv=-0.0005 | Pass |
| Color Rendering Index (CRI) | Inseparable Other SSL Luminaire | $R_a \geq 80$ $R_9 > 0$ | $R_a = 93.7$ $R_9 = 62$ | Pass |
| Lumen Maintenance | Solid State Option 1: | L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for inseparable luminaires | 50,000 87.20% >54000 | Pass |
| Light Source Life | Solid State | L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for inseparable luminaires | 50,000 87.20% >54000 | Pass |
| Color Maintenance | Inseparable Other SSL Luminaire | $\Delta u'v' \leq 0.007$ | Max. 0.00687 in LM-80 report* | Pass |
| Source Start Time | Inseparable Other SSL Luminaire | < 750 ms | 68ms | Pass |

| | | | | |
|--|----------------|---|---------------------------------------|------|
| Power Factor | Solid State | Total luminaire input power ≤ 5 watts: PF ≥ 0.5 Total luminaire input power > 5 watts: PF ≥ 0.7 | 0.9264 | Pass |
| Transient Protection | Solid State | The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode. | Survival | Pass |
| Standby Power Consumption | All Luminaires | Luminaires shall not draw power in the off state. | 0 W | Pass |
| Operating Frequency | Solid State | Frequency ≥ 120 Hz | 120.005Hz | Pass |
| Maximum Measured Driver Case Temperature | Solid State | shall not exceed the driver manufacturer's maximum recommended temperature during in situ operation. ≤ 105 °C | 34.7°C | Pass |
| Maximum In-Situ Source Temperature | Solid State | Maximum permitted Ts temperature for L70 \geq 50,000 hrs ≤ 105 °C | 39.4°C | Pass |
| Dimming | Solid State | The luminaire and its components shall provide continuous dimming from 100% to 20% of total light output. Luminaire shall not emit noise above 24dBA at 1 meter or less at the minimum output. | Validated | Pass |
| CCT | Solid State | Packaging shall clearly describe the nominal color designation in units of Kelvin (e.g. 2700K, 3000K). | 2700K,3000K, 3500K,4000K, 5000K | Pass |

Note: The information or data with an “*” are provided by the manufacturer.

Our laboratory has no responsibility for the decision of compliance with specification that based on the data or information with the “*”.

| | |
|--|-----------------------|
| 2.2.1 Electrical, Photometric and Chromaticity Measurements | IES LM-79 2008 |
|--|-----------------------|

| | | | |
|------------------|----------------------|----------------------------|-----------|
| Test date | 2021-04-07 | Test Ambient: | 25 ± 1° C |
| Test Orientation | As intended | Stabilization Time (min) | 60 |
| Model Number | ULD4-5CT(Mode:2700K) | Total Operating Time (min) | 75 |

Electrical Measurement:

| Sample No. | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|--------------|---------------|-----------------|-------------|-----------|--------------|
| JCE210313-A1 | 120.1 | 60 | 0.0485 | 5.398 | 0.9264 |

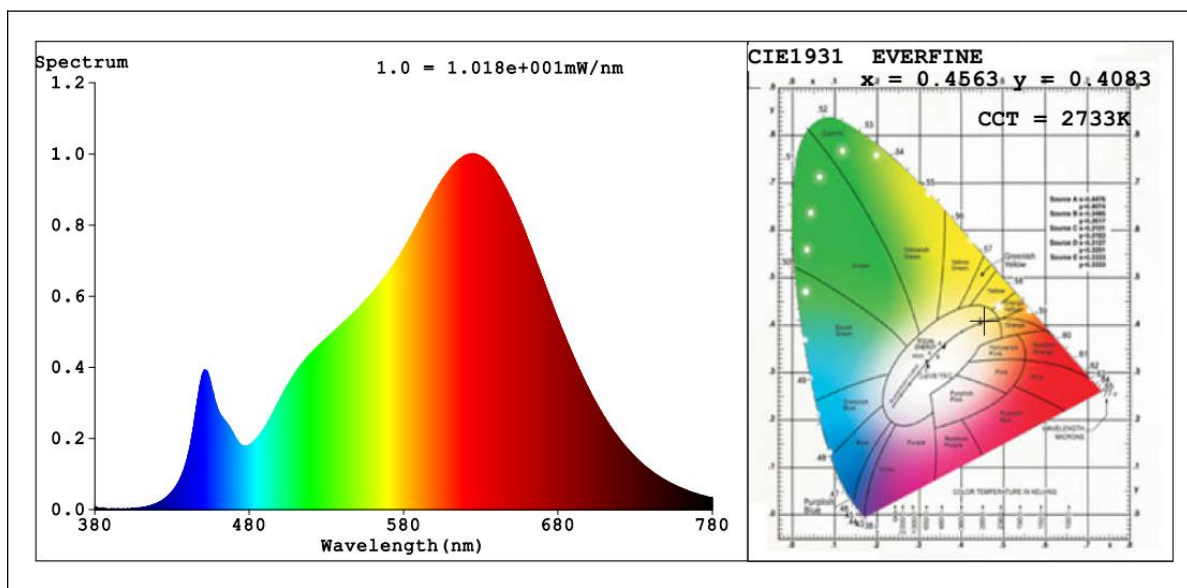
Sphere-Spectroradiometer Method(Self-absorption:1.0977):

| Parameter | Result |
|-----------------------------|---------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Color Rendering Index (CRI) | 93.7 |
| R9 | 62 |
| CCT (K) | 2733 |
| Duv | -0.0005 |

Goniophotometer Method(Test Distance:26.000m):

| Parameter | Result |
|-------------------------------|--------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Total Luminous (lm) | 427.64 |
| Luminous Efficacy (lm/W) | 79.22 |
| Beam Angle° | 97.2 |
| Center Beam Candle Power (cd) | 180 |

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.4563$ $y=0.4083$ $u'=0.2612$ $v'=0.5260$ $Du, Dv: 0.0002, -0.0005$

CCT=2733K ($Duv=-0.0005$) Dominant WL: $L_d = 584.2\text{nm}$ Purity=59.5%

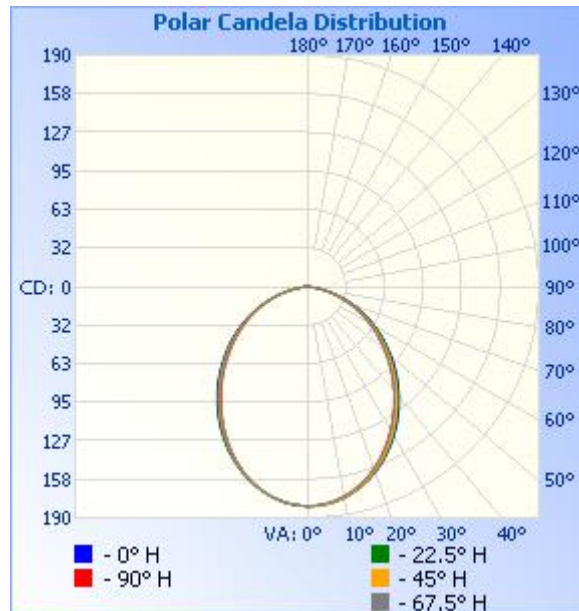
Peak WL: $L_p=625.2\text{nm}$ FWHM=148.6nm

Render Index: $R_a=93.7$ Render Index: $AvgR = 91.3$

R1 =94 R2 =97 R3 =99 R4 =94 R5 =94 R6 =97 R7 =92

R8 =83 R9 =62 R10=93 R11=96 R12=86 R13=95 R14=99 R15=90

Zonal Lumen Tabulation



| Zonal Lumen Summary | | |
|---------------------|--------|-------------|
| Zone | Lumens | % Luminaire |
| 0-30 | 133.3 | 31.2% |
| 0-40 | 211.9 | 49.6% |
| 0-60 | 353.9 | 82.8% |
| 60-90 | 73.7 | 17.2% |
| 70-100 | 27.3 | 6.4% |
| 90-120 | 0 | 0% |
| 0-90 | 427.6 | 100% |
| 90-180 | 0 | 0% |
| 0-180 | 427.6 | 100% |

| Lumens Per Zone | | | | | |
|-----------------|--------|---------|---------|--------|---------|
| Zone | Lumens | % Total | Zone | Lumens | % Total |
| 0-10 | 16.9 | 4.0% | 90-100 | 0 | 0% |
| 10-20 | 47.4 | 11.1% | 100-110 | 0 | 0% |
| 20-30 | 68.9 | 16.1% | 110-120 | 0 | 0% |
| 30-40 | 78.6 | 18.4% | 120-130 | 0 | 0% |
| 40-50 | 76.8 | 18.0% | 130-140 | 0 | 0% |
| 50-60 | 65.2 | 15.2% | 140-150 | 0 | 0% |
| 60-70 | 46.4 | 10.9% | 150-160 | 0 | 0% |
| 70-80 | 23.5 | 5.5% | 160-170 | 0 | 0% |
| 80-90 | 3.8 | 0.9% | 170-180 | 0 | 0% |



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| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 | 360 |
|----|-----|------|-----|------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
| 0 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| 1 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| 2 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| 3 | 180 | 180 | 180 | 180 | 180 | 180 | 179 | 180 | 179 | 179 | 180 | 179 | 179 | 180 | 180 | 180 | 180 |
| 4 | 180 | 180 | 180 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 180 | 180 | 180 |
| 5 | 179 | 179 | 179 | 179 | 179 | 178 | 178 | 179 | 178 | 179 | 178 | 179 | 179 | 179 | 179 | 179 | 179 |
| 6 | 179 | 179 | 179 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 179 | 179 | 179 |
| 7 | 178 | 178 | 178 | 177 | 177 | 177 | 177 | 177 | 177 | 177 | 177 | 177 | 177 | 178 | 178 | 178 | 178 |
| 8 | 178 | 178 | 178 | 177 | 177 | 176 | 176 | 177 | 176 | 176 | 176 | 176 | 176 | 177 | 177 | 178 | 178 |
| 9 | 177 | 177 | 177 | 176 | 176 | 175 | 175 | 176 | 175 | 175 | 175 | 175 | 176 | 176 | 176 | 177 | 177 |
| 10 | 176 | 176 | 176 | 175 | 175 | 174 | 174 | 175 | 174 | 174 | 174 | 174 | 174 | 175 | 175 | 176 | 176 |
| 11 | 175 | 175 | 175 | 174 | 174 | 173 | 173 | 174 | 173 | 173 | 173 | 173 | 173 | 174 | 174 | 175 | 175 |
| 12 | 174 | 174 | 174 | 172 | 172 | 172 | 172 | 172 | 172 | 172 | 172 | 172 | 172 | 173 | 173 | 174 | 174 |
| 13 | 173 | 173 | 172 | 171 | 171 | 170 | 170 | 171 | 171 | 171 | 171 | 170 | 171 | 171 | 172 | 173 | 173 |
| 14 | 171 | 171 | 171 | 170 | 170 | 169 | 169 | 170 | 169 | 170 | 169 | 169 | 169 | 170 | 171 | 171 | 171 |
| 15 | 170 | 170 | 170 | 168 | 168 | 167 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 169 | 170 | 170 |
| 16 | 169 | 169 | 168 | 167 | 166 | 166 | 166 | 167 | 166 | 167 | 166 | 166 | 166 | 167 | 168 | 169 | 169 |
| 17 | 167 | 167 | 167 | 165 | 165 | 164 | 164 | 165 | 165 | 165 | 165 | 164 | 164 | 165 | 166 | 167 | 167 |
| 18 | 166 | 165 | 165 | 163 | 163 | 162 | 163 | 164 | 163 | 163 | 163 | 162 | 162 | 163 | 164 | 166 | 166 |
| 19 | 164 | 164 | 163 | 161 | 161 | 160 | 161 | 162 | 162 | 162 | 161 | 161 | 161 | 162 | 163 | 164 | 164 |
| 20 | 162 | 162 | 161 | 159 | 159 | 158 | 159 | 160 | 160 | 160 | 159 | 159 | 159 | 160 | 161 | 162 | 162 |
| 21 | 161 | 160 | 159 | 158 | 157 | 156 | 157 | 158 | 158 | 158 | 157 | 157 | 157 | 158 | 159 | 160 | 161 |
| 22 | 159 | 158 | 158 | 155 | 155 | 154 | 155 | 156 | 156 | 156 | 155 | 155 | 155 | 156 | 157 | 159 | 159 |
| 23 | 157 | 157 | 155 | 153 | 153 | 152 | 153 | 154 | 154 | 154 | 153 | 152 | 152 | 153 | 155 | 157 | 157 |
| 24 | 155 | 154 | 153 | 151 | 151 | 150 | 151 | 152 | 152 | 152 | 151 | 150 | 150 | 151 | 153 | 155 | 155 |
| 25 | 153 | 152 | 151 | 149 | 148 | 148 | 148 | 150 | 150 | 150 | 149 | 148 | 148 | 149 | 151 | 153 | 153 |
| 26 | 151 | 150 | 149 | 147 | 146 | 146 | 146 | 148 | 148 | 148 | 147 | 146 | 146 | 147 | 148 | 151 | 151 |
| 27 | 149 | 148 | 147 | 144 | 144 | 143 | 144 | 146 | 146 | 146 | 144 | 143 | 143 | 144 | 146 | 148 | 149 |
| 28 | 146 | 146 | 145 | 142 | 141 | 141 | 142 | 144 | 144 | 143 | 142 | 141 | 141 | 142 | 144 | 146 | 146 |
| 29 | 144 | 143 | 142 | 140 | 139 | 138 | 139 | 141 | 142 | 141 | 140 | 138 | 138 | 140 | 141 | 144 | 144 |
| 30 | 142 | 141 | 140 | 137 | 137 | 136 | 137 | 139 | 139 | 139 | 137 | 136 | 136 | 137 | 139 | 142 | 142 |

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| 31 | 139 | 139 | 137 | 135 | 134 | 134 | 134 | 137 | 137 | 136 | 135 | 134 | 133 | 135 | 136 | 139 | 139 |
| 32 | 137 | 136 | 135 | 132 | 131 | 131 | 132 | 134 | 134 | 134 | 132 | 131 | 131 | 132 | 134 | 137 | 137 |
| 33 | 135 | 134 | 132 | 129 | 129 | 128 | 129 | 132 | 132 | 131 | 130 | 129 | 128 | 129 | 131 | 134 | 135 |
| 34 | 132 | 131 | 130 | 127 | 126 | 126 | 127 | 129 | 130 | 129 | 127 | 126 | 125 | 127 | 129 | 132 | 132 |
| 35 | 130 | 129 | 127 | 124 | 124 | 123 | 124 | 127 | 127 | 126 | 125 | 123 | 123 | 124 | 126 | 129 | 130 |
| 36 | 127 | 126 | 125 | 122 | 121 | 121 | 122 | 124 | 125 | 124 | 122 | 121 | 120 | 122 | 123 | 127 | 127 |
| 37 | 125 | 124 | 122 | 119 | 118 | 118 | 119 | 122 | 122 | 121 | 120 | 118 | 118 | 119 | 121 | 124 | 125 |
| 38 | 122 | 121 | 120 | 116 | 116 | 116 | 117 | 119 | 120 | 119 | 117 | 116 | 115 | 116 | 118 | 122 | 122 |
| 39 | 119 | 118 | 117 | 114 | 113 | 113 | 114 | 116 | 117 | 116 | 115 | 113 | 112 | 114 | 116 | 119 | 119 |
| 40 | 117 | 116 | 114 | 111 | 111 | 110 | 112 | 114 | 114 | 114 | 112 | 111 | 110 | 111 | 113 | 116 | 117 |
| 41 | 114 | 113 | 112 | 108 | 108 | 108 | 109 | 111 | 112 | 111 | 110 | 108 | 107 | 108 | 110 | 114 | 114 |
| 42 | 112 | 110 | 109 | 106 | 105 | 105 | 106 | 109 | 109 | 108 | 107 | 105 | 104 | 106 | 108 | 111 | 112 |
| 43 | 109 | 108 | 106 | 103 | 103 | 102 | 104 | 106 | 107 | 106 | 104 | 103 | 102 | 103 | 105 | 108 | 109 |
| 44 | 106 | 105 | 104 | 100 | 100 | 100 | 101 | 104 | 104 | 103 | 102 | 100 | 99 | 100 | 102 | 106 | 106 |
| 45 | 104 | 102 | 101 | 98 | 97 | 97 | 98 | 101 | 101 | 101 | 99 | 97 | 96 | 98 | 100 | 103 | 104 |
| 46 | 101 | 100 | 98 | 95 | 95 | 94 | 96 | 98 | 99 | 98 | 96 | 95 | 94 | 95 | 97 | 100 | 101 |
| 47 | 98 | 97 | 95 | 92 | 92 | 92 | 93 | 96 | 96 | 95 | 94 | 92 | 91 | 92 | 94 | 98 | 98 |
| 48 | 96 | 94 | 93 | 89 | 89 | 89 | 90 | 93 | 93 | 92 | 91 | 89 | 88 | 90 | 92 | 95 | 96 |
| 49 | 93 | 92 | 90 | 87 | 87 | 86 | 88 | 90 | 91 | 90 | 88 | 87 | 86 | 87 | 89 | 92 | 93 |
| 50 | 90 | 89 | 87 | 84 | 84 | 84 | 85 | 88 | 88 | 87 | 86 | 84 | 83 | 84 | 86 | 89 | 90 |
| 51 | 88 | 86 | 84 | 81 | 81 | 81 | 82 | 85 | 85 | 84 | 83 | 82 | 80 | 82 | 84 | 87 | 88 |
| 52 | 85 | 84 | 82 | 79 | 79 | 78 | 80 | 82 | 83 | 82 | 80 | 79 | 78 | 79 | 81 | 84 | 85 |
| 53 | 82 | 81 | 79 | 76 | 76 | 76 | 77 | 80 | 80 | 79 | 78 | 76 | 75 | 76 | 78 | 81 | 82 |
| 54 | 79 | 78 | 76 | 73 | 73 | 73 | 74 | 77 | 77 | 76 | 75 | 74 | 73 | 74 | 76 | 78 | 79 |
| 55 | 77 | 76 | 74 | 71 | 71 | 71 | 72 | 74 | 75 | 74 | 72 | 71 | 70 | 71 | 73 | 76 | 77 |
| 56 | 74 | 73 | 71 | 68 | 68 | 68 | 69 | 72 | 72 | 71 | 70 | 69 | 68 | 69 | 71 | 73 | 74 |
| 57 | 71 | 70 | 68 | 66 | 66 | 65 | 67 | 69 | 69 | 68 | 67 | 66 | 65 | 66 | 68 | 71 | 71 |
| 58 | 69 | 68 | 66 | 63 | 63 | 63 | 64 | 66 | 67 | 66 | 65 | 63 | 63 | 64 | 65 | 68 | 69 |
| 59 | 66 | 65 | 63 | 60 | 60 | 60 | 62 | 64 | 64 | 63 | 62 | 61 | 60 | 61 | 63 | 65 | 66 |
| 60 | 63 | 62 | 60 | 58 | 58 | 58 | 59 | 61 | 61 | 61 | 60 | 58 | 58 | 58 | 60 | 63 | 63 |
| 61 | 61 | 60 | 58 | 55 | 55 | 55 | 56 | 58 | 59 | 58 | 57 | 56 | 55 | 56 | 58 | 60 | 61 |
| 62 | 58 | 57 | 55 | 53 | 53 | 53 | 54 | 56 | 56 | 55 | 54 | 53 | 52 | 53 | 55 | 57 | 58 |



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| 63 | 55 | 54 | 52 | 50 | 50 | 50 | 51 | 53 | 54 | 53 | 52 | 51 | 50 | 51 | 52 | 55 | 55 |
| 64 | 53 | 52 | 50 | 48 | 48 | 48 | 48 | 50 | 51 | 50 | 49 | 48 | 47 | 48 | 50 | 52 | 53 |
| 65 | 50 | 49 | 47 | 45 | 45 | 45 | 46 | 48 | 48 | 48 | 47 | 46 | 45 | 46 | 47 | 49 | 50 |
| 66 | 47 | 47 | 45 | 43 | 42 | 42 | 43 | 45 | 46 | 45 | 44 | 43 | 43 | 44 | 45 | 47 | 47 |
| 67 | 45 | 44 | 42 | 40 | 40 | 40 | 41 | 43 | 43 | 43 | 42 | 41 | 40 | 41 | 42 | 44 | 45 |
| 68 | 42 | 41 | 40 | 38 | 38 | 37 | 38 | 40 | 40 | 40 | 39 | 38 | 38 | 38 | 40 | 41 | 42 |
| 69 | 39 | 39 | 37 | 35 | 35 | 35 | 36 | 37 | 38 | 37 | 36 | 35 | 35 | 36 | 37 | 39 | 39 |
| 70 | 37 | 36 | 34 | 33 | 33 | 33 | 33 | 35 | 35 | 35 | 34 | 33 | 33 | 33 | 35 | 36 | 37 |
| 71 | 34 | 33 | 32 | 31 | 30 | 30 | 31 | 32 | 32 | 32 | 31 | 31 | 30 | 31 | 32 | 34 | 34 |
| 72 | 32 | 31 | 29 | 28 | 28 | 28 | 28 | 30 | 30 | 30 | 29 | 28 | 28 | 29 | 30 | 31 | 32 |
| 73 | 29 | 28 | 27 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 26 | 26 | 26 | 28 | 29 | 29 |
| 74 | 26 | 26 | 25 | 24 | 23 | 23 | 24 | 25 | 25 | 25 | 24 | 23 | 24 | 24 | 25 | 26 | 26 |
| 75 | 24 | 23 | 22 | 22 | 21 | 21 | 21 | 22 | 23 | 22 | 22 | 21 | 21 | 22 | 23 | 24 | 24 |
| 76 | 21 | 21 | 20 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 19 | 19 | 19 | 20 | 21 | 21 |
| 77 | 19 | 19 | 18 | 17 | 16 | 16 | 17 | 18 | 18 | 18 | 17 | 17 | 17 | 17 | 18 | 19 | 19 |
| 78 | 16 | 16 | 15 | 15 | 14 | 14 | 15 | 15 | 15 | 16 | 15 | 14 | 15 | 15 | 16 | 17 | 16 |
| 79 | 14 | 14 | 13 | 13 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 14 | 14 |
| 80 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 11 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 12 | 12 |
| 81 | 10 | 10 | 9 | 9 | 8 | 8 | 9 | 9 | 9 | 9 | 8 | 8 | 9 | 9 | 9 | 10 | 10 |
| 82 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 |
| 83 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 |
| 84 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 85 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 86 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 87 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| | | | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 107 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 109 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 122 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 123 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 124 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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Report Format Number STP-QP019-103-A/1

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| | | | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 133 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 134 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 139 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 143 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 144 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 146 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 147 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 149 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 156 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 157 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 158 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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Report Format Number STP-QP019-103-A/1

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|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 163 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 167 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 168 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 171 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 172 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 173 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 174 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 176 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 179 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|--|-----------------------|
| 2.2.2 Electrical, Photometric and Chromaticity Measurements | IES LM-79 2008 |
|--|-----------------------|

| | | | |
|------------------|----------------------|----------------------------|-----------|
| Test date | 2021-04-07 | Test Ambient: | 25 ± 1° C |
| Test Orientation | As intended | Stabilization Time (min) | 60 |
| Model Number | ULD4-5CT(Mode:3000K) | Total Operating Time (min) | 61 |

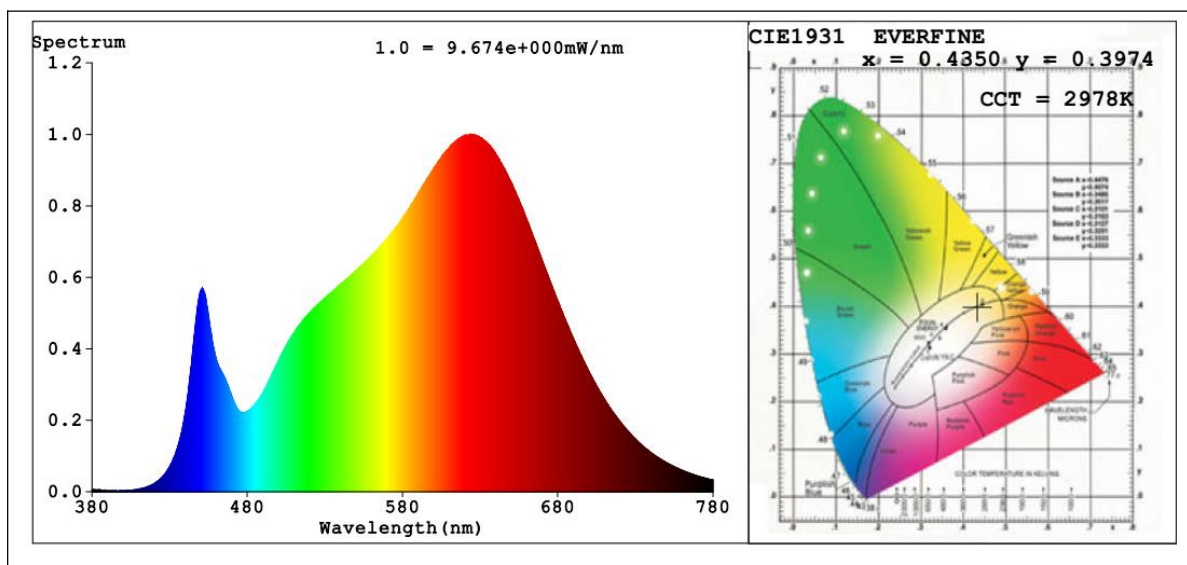
Electrical Measurement:

| Sample No. | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|--------------|---------------|-----------------|-------------|-----------|--------------|
| JCE210313-A1 | 120.0 | 60 | 0.0483 | 5.400 | 0.9325 |

Sphere-Spectroradiometer Method(Self-absorption:1.0977):

| Parameter | Result |
|-----------------------------|---------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Color Rendering Index (CRI) | 94.6 |
| R9 | 69 |
| CCT (K) | 2978 |
| Duv | -0.0024 |
| Total Luminous (lm) | 432.4 |
| Luminous Efficacy (lm/W) | 80.07 |

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.4350$ $y=0.3974$ $u'=0.2522$ $v'=0.5184$ $Du, Dv: 0.0009, -0.0023$

$\text{CCT}=2978\text{K}$ ($Duv=-0.0024$) Dominant WL: $\lambda_d = 583.8\text{nm}$ Purity=49.8%

Peak WL: $\lambda_p = 623.7\text{nm}$ FWHM=163.1nm

Render Index: $R_a = 94.6$ Render Index: AvgR = 92.4

R1 = 96 R2 = 98 R3 = 98 R4 = 95 R5 = 95 R6 = 96 R7 = 93

R8 = 86 R9 = 69 R10 = 94 R11 = 96 R12 = 85 R13 = 96 R14 = 98 R15 = 92

| | |
|--|-----------------------|
| 2.2.3 Electrical, Photometric and Chromaticity Measurements | IES LM-79 2008 |
|--|-----------------------|

| | | | |
|------------------|----------------------|----------------------------|-----------|
| Test date | 2021-04-07 | Test Ambient: | 25 ± 1° C |
| Test Orientation | As intended | Stabilization Time (min) | 60 |
| Model Number | ULD4-5CT(Mode:3500K) | Total Operating Time (min) | 61 |

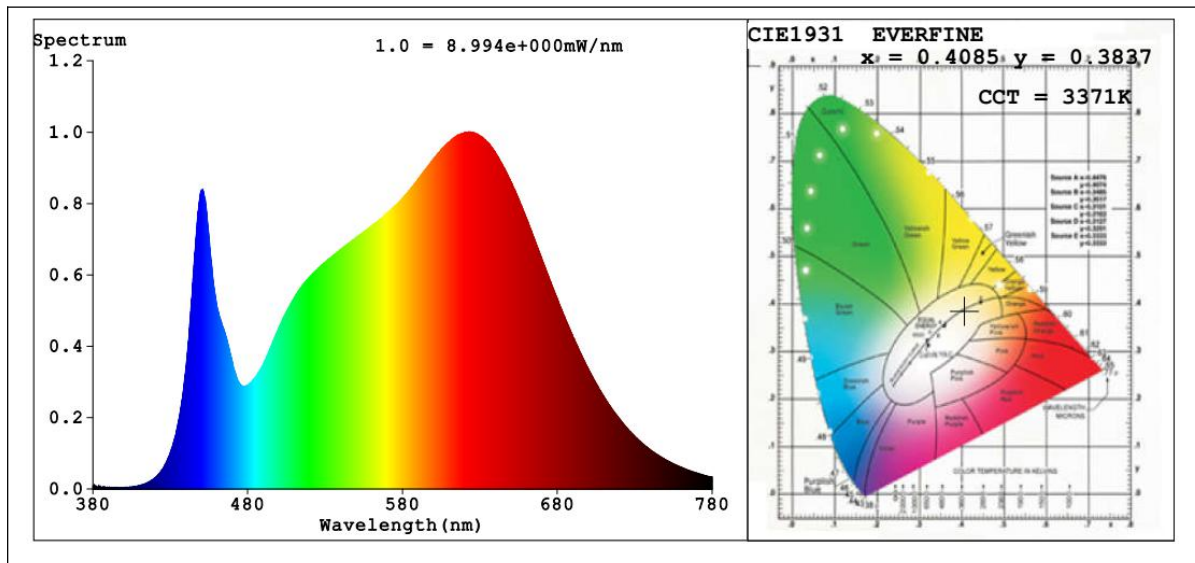
Electrical Measurement:

| Sample No. | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|--------------|---------------|-----------------|-------------|-----------|--------------|
| JCE210313-A1 | 120.0 | 60 | 0.0483 | 5.412 | 0.9331 |

Sphere-Spectroradiometer Method(Self-absorption:1.0977):

| Parameter | Result |
|-----------------------------|---------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Color Rendering Index (CRI) | 95.4 |
| R9 | 76 |
| CCT (K) | 3371 |
| Duv | -0.0038 |
| Total Luminous (lm) | 439.6 |
| Luminous Efficacy (lm/W) | 81.23 |

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.4085$ $y=0.3837$ / $u'=0.2407$ $v'=0.5088$ $Du, Dv: 0.0017, -0.0034$

$\text{CCT}=3371\text{K}$ ($Duv=-0.0038$) Dominant WL: $\text{Ld} = 583.0\text{nm}$ Purity=37.8%

Peak WL: $\text{Lp}=622.9\text{nm}$ FWHM=177.6nm

Render Index: $\text{Ra}=95.4$ Render Index: $\text{AvgR} = 93.3$

R1 =97 R2 =98 R3 =97 R4 =96 R5 =96 R6 =95 R7 =94

R8 =89 R9 =76 R10=94 R11=96 R12=82 R13=98 R14=98 R15=95

| | |
|--|-----------------------|
| 2.2.4 Electrical, Photometric and Chromaticity Measurements | IES LM-79 2008 |
|--|-----------------------|

| | | | |
|------------------|----------------------|----------------------------|-----------|
| Test date | 2021-04-07 | Test Ambient: | 25 ± 1° C |
| Test Orientation | As intended | Stabilization Time (min) | 60 |
| Model Number | ULD4-5CT(Mode:4000K) | Total Operating Time (min) | 61 |

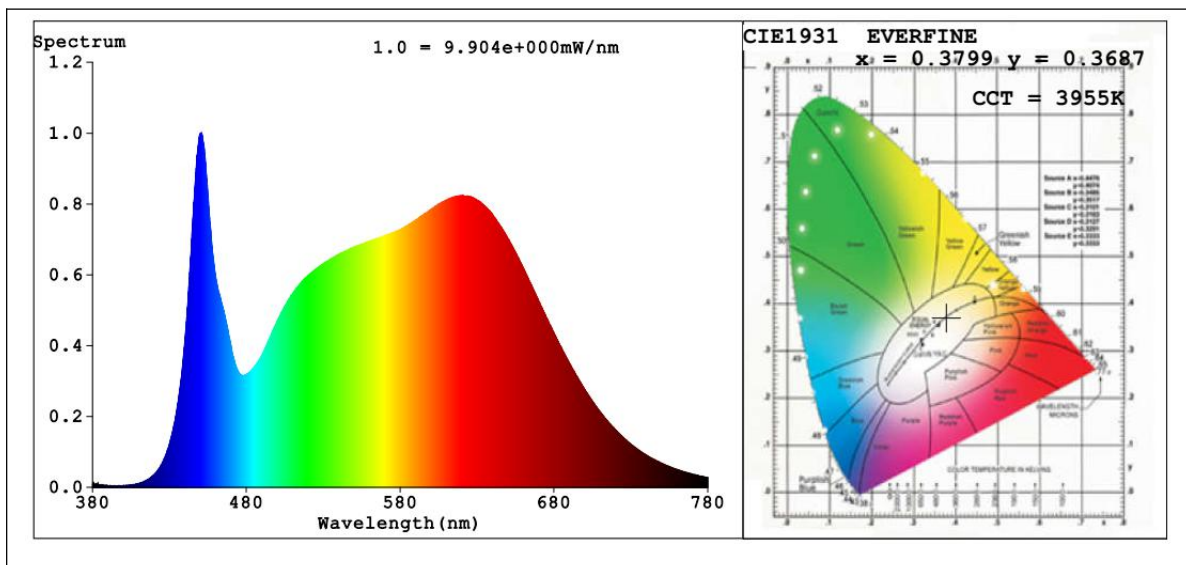
Electrical Measurement:

| Sample No. | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|--------------|---------------|-----------------|-------------|-----------|--------------|
| JCE210313-A1 | 120.0 | 60 | 0.0484 | 5.426 | 0.9335 |

Sphere-Spectroradiometer Method(Self-absorption:1.0977):

| Parameter | Result |
|-----------------------------|---------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Color Rendering Index (CRI) | 95.4 |
| R9 | 80 |
| CCT (K) | 3955 |
| Duv | -0.0036 |
| Total Luminous (lm) | 446.2 |
| Luminous Efficacy (lm/W) | 82.23 |

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.3799, y=0.3687, u'=0.2280, v'=0.4979, Du, Dv: 0.0020, -0.0030$

$\text{CCT}=3955\text{K} (\text{Duv}=-0.0036)$ Dominant WL: $\text{Ld} = 581.5\text{nm}$ Purity=24.6%

Peak WL: $\text{Lp}=450.6\text{nm}$ FWHM=23.6nm

Render Index: $\text{Ra}=95.4$ Render Index: $\text{AvgR} = 93.3$

R1 =97 R2 =97 R3 =95 R4 =96 R5 =96 R6 =94 R7 =96

R8 =92 R9 =80 R10=92 R11=95 R12=77 R13=97 R14=97 R15=96

| | |
|--|-----------------------|
| 2.2.5 Electrical, Photometric and Chromaticity Measurements | IES LM-79 2008 |
|--|-----------------------|

| | | | |
|------------------|----------------------|----------------------------|-----------|
| Test date | 2021-04-07 | Test Ambient: | 25 ± 1° C |
| Test Orientation | As intended | Stabilization Time (min) | 60 |
| Model Number | ULD4-5CT(Mode:5000K) | Total Operating Time (min) | 61 |

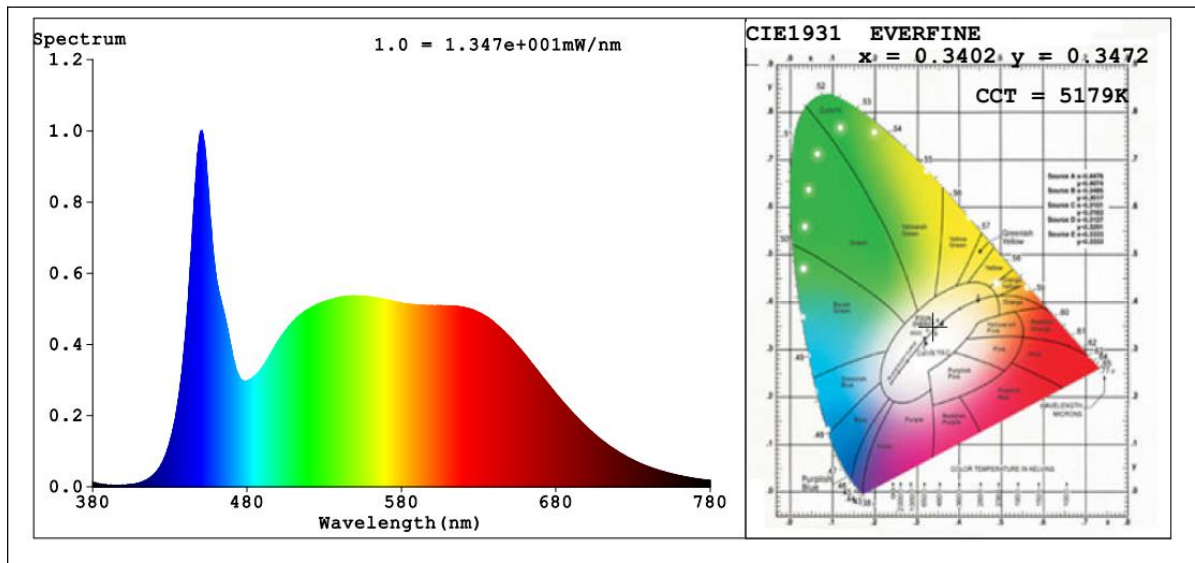
Electrical Measurement:

| Sample No. | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|--------------|---------------|-----------------|-------------|-----------|--------------|
| JCE210313-A1 | 120.0 | 60 | 0.0485 | 5.439 | 0.9339 |

Sphere-Spectroradiometer Method(Self-absorption:1.0977):

| Parameter | Result |
|-----------------------------|---------|
| Test Voltage (V) | 120.0 |
| Frequency (Hz) | 60 |
| Color Rendering Index (CRI) | 93.5 |
| R9 | 75 |
| CCT (K) | 5179 |
| Duv | -0.0002 |
| Total Luminous (lm) | 451.6 |
| Luminous Efficacy (lm/W) | 83.03 |

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.3402$ $y=0.3472$ $u'=0.2098$ $v'=0.4818$ $Du, Dv: 0.0002, -0.0002$

CCT=5179K ($Duv=-0.0002$) Dominant WL: $Ld = 569.9nm$ Purity=6.3%

Peak WL: $Lp=450.9nm$ FWHM=23.1nm

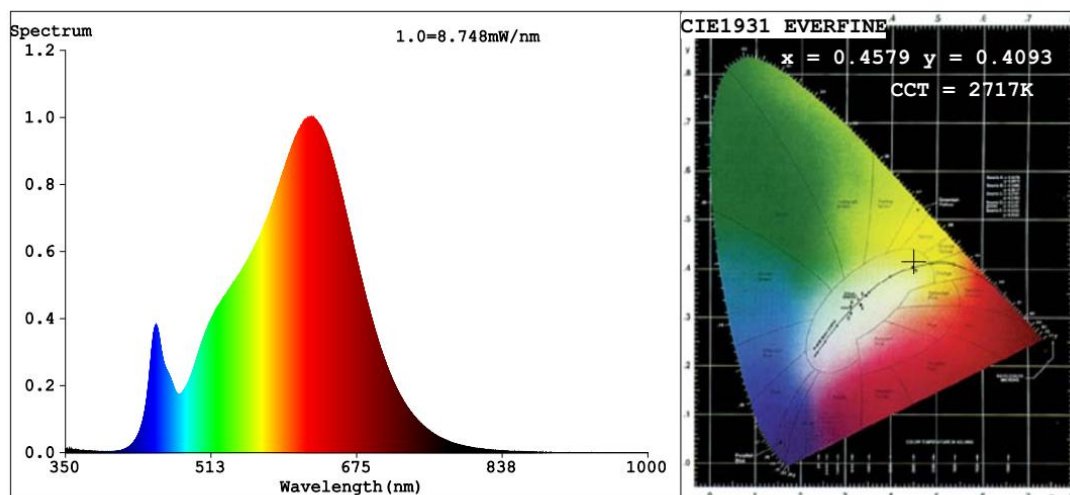
Render Index: $Ra=93.5$ Render Index: $AvgR = 90.8$

R1 =94 R2 =95 R3 =93 R4 =94 R5 =94 R6 =91 R7 =95

R8 =91 R9 =75 R10=87 R11=94 R12=73 R13=95 R14=96 R15=94

| | |
|---|---|
| 2.3 Electrical and Photometric Measurements, with dimming | IES LM-79 2008 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2 |
| Noted: The noise test and data are not covered by A2LA accreditation | |

| | | | | |
|-------------------|---------------|---------------------|-------------------|---------------|
| Test date | 2021-04-07 | | Test Ambient: | 25±1° C |
| Dimmer Technology | | | Forward phase-cut | |
| Sample No. | | | Maximum Level | Minimum Level |
| JCE210313-A1 | Input: | Light outout(Lumen) | 400.0 | 25.56 |
| | 120.0V / 60Hz | Percentage | 93.54% | 6.39% |



Color Parameters:

Chromaticity Coordinate: $x=0.4579$ $y=0.4093$ $u'=0.2618$ $v'=0.5266$
CCT=2717K (Duv=-0.0003) Dominant WL:Ld =584.2nm WL:Lc = --nm Purity=60.3%
Ratio:R=26.4% G=71.2% B=2.4% Peak WL:Lp=623.0nm FWHM=145.7nm
Render Index:Ra=93.4 AvgR=90.8 TM30:Rf=92 Rg=100

R1 =94 R2 =97 R3 =99 R4 =94 R5 =94 R6 =97 R7 =92
R8 =82 R9 =60 R10=92 R11=95 R12=86 R13=95 R14=99 R15=89

The luminaires [can] ~~lean-not~~ provide less than 20% of total light output with continuous dimmer.

| Dimmer | Peak Noise Reading (dBA) | Test Condition | Distance between the microphone and the UUT |
|------------------|--------------------------|--|---|
| LUTRON MACL-153M | 14.4 | Dimmer adjusted to lowest light output | < 1 m |



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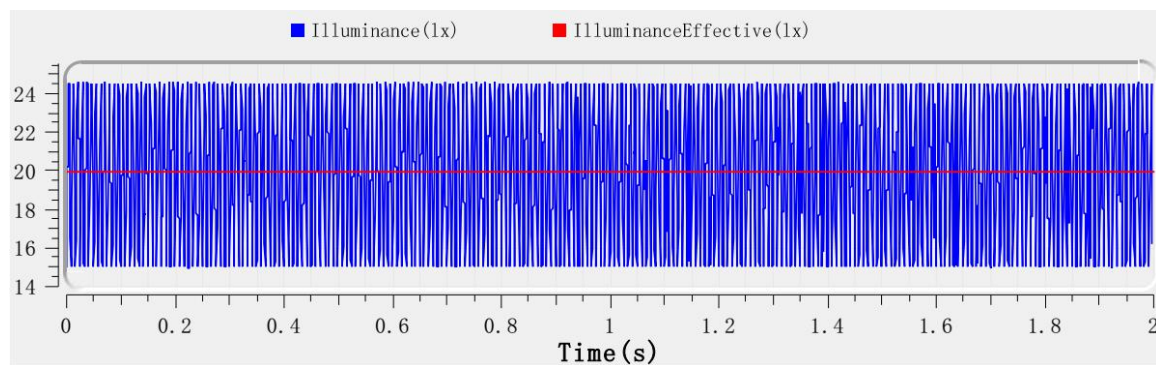
| | |
|--------------------|---|
| 2.4 Flicker | NEMA 77-2017 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2 |
|--------------------|---|

| | |
|---------------------------|-------------------|
| Dimming Technology | Forward phase-cut |
| Dimmer | LUTRON MACL-153M |

| Item | Short Term Flicker Indicator (Pst) | Stroboscopic Visibility Measure (SVM) |
|--------------------------------|------------------------------------|---------------------------------------|
| Maximum conduction | 0.135 | 0.964 |
| Intermediate conduction | 0.552 | 1.312 |
| Minimum conduction | 1.145 | 0.623 |

| | |
|--|--|
| 2.5 Operating Frequency | ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2 |
| Noted: This test and data are not covered by A2LA accreditation | |

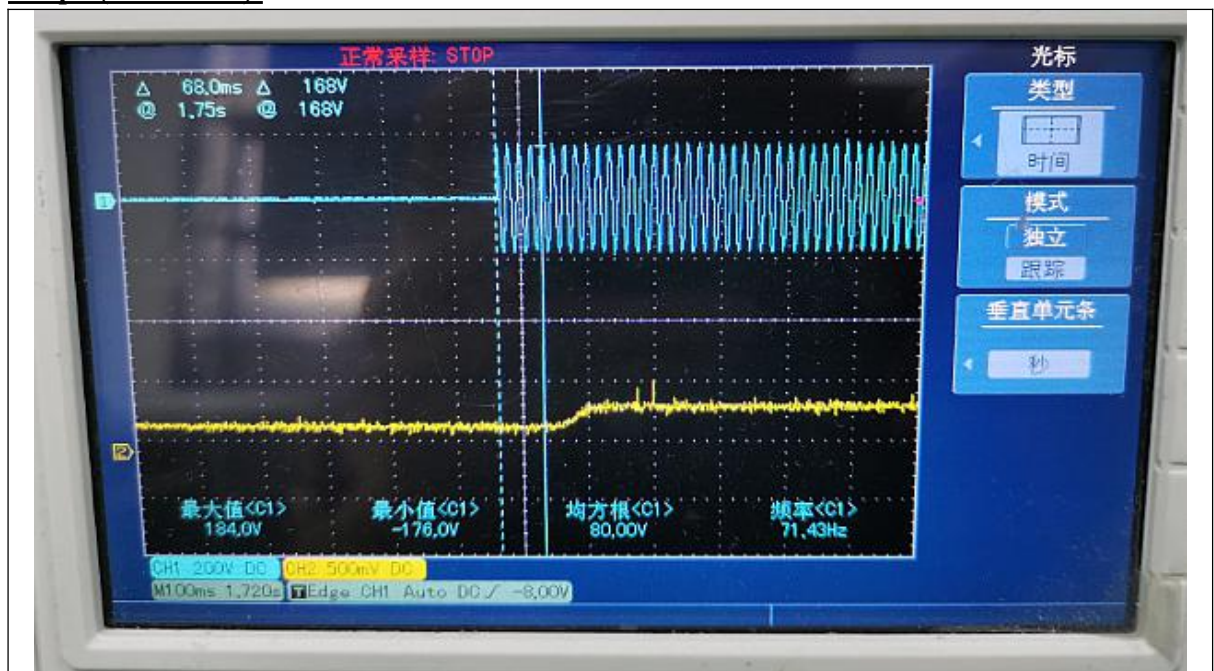
| | | | |
|-------------------|---------------------------------|----------------------|----------------|
| Test date | 2021-04-07 | Test Ambient: | 25±1° C |
| Sample No. | Operating Frequency (Hz) | | |
| JCE210313-A1 | 120.005 | | |



| | |
|-------------------|---|
| 2.6 Starting Time | ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2 |
|-------------------|---|

| | | | |
|--------------|-----------------|---------------|---------|
| Test date | 2021-04-07 | Test Ambient: | 25±1° C |
| Sample No. | Start Time (ms) | | |
| JCE210313-A1 | 68.0 | | |

Graph (Start Time):





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| | |
|--------------------------------------|--|
| 2.7 Transient Protection Test | ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.2 |
|--------------------------------------|--|

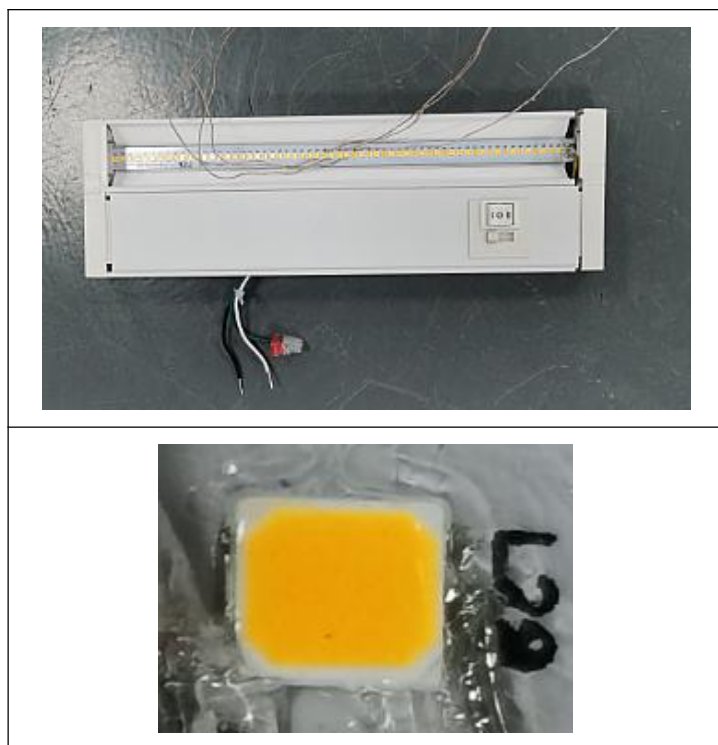
Test voltage: 120V,60Hz

| | | | |
|-------------------|------------|--|---------|
| Test date | 2021-04-07 | Test Ambient | 25±1° C |
| Sample No. | | Transient Protection Test - Seven Strikes | |
| JCE210313-A1 | | Survival | |

| | |
|---|--|
| 2.8 In-Situ Temperature Measurement Test (ISTMT) | UL1598-2008, 3rd Edition |
|---|--|

| | | | |
|----------------------|-------------------|--|---|
| Test date | 2021-04-07 | Test Ambient | 25±5° C |
| Input Vol./Frequency | 120.0V / 60Hz | Output Current of Single LED(mA) | 54.87 |
| Sample No. | LED Package Model | Maximum Measured LED Ts Point Temperature (°C) | Maximum permitted Ts temperature for L70≥ 50,000 hrs (°C) |
| JCE210313-A1 | 67-21S Series | 39.4 | 105 |

In-Situ Picture - Ts:



| | |
|--|--|
| 2.9 Maximum Measured Ballast or Driver Case Temperature | UL1598-2008, 3rd Edition |
|--|--|

| | | | |
|--------------|---|--|---------|
| Test date | 2021-04-07 | Test Ambient | 25±5° C |
| Sample No. | Maximum Measured Driver Case Temperature (°C) | Maximum Driver Case Temperature Limited (°C) | |
| JCE210313-A1 | 34.7 | 105 | |

In-Situ Picture - Ts:





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| | |
|--|--|
| 2.10 Standby Power Consumption: | ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2 |
|--|--|

| | | | |
|---------------------|----------------------|---------------------------------|---------|
| Test date | 2021-04-07 | Test Ambient: | 25±1° C |
| Model Number | ULD4-5CT(Mode:2700K) | Stabilization Time (min) | 60 |

Electrical Measurement – when the luminaires turned off:

| Sample No. | Standby Power Consumption(W): |
|-------------------|--------------------------------------|
| JCE210313-A1 | 0 |

3. Test Equipment

| Equipment ID | Equipment Name | Last Calibration Date | Next Calibration Date |
|---|------------------------------------|------------------------------------|-----------------------|
| ST-R-S-451 | 2 meter Integrating Sphere | Verified by D204 standard lamp | |
| ST-R-S-455 | Spectral analysis system HAAS-1200 | Verified by D204 standard lamp | |
| ST-R-S-452 | Standard Lamp D204 | 2021-04-15 | 2022-04-14 |
| ST-R-S-453 | Power Meter for Integrating Sphere | 2021-04-07 | 2022-04-06 |
| ST-R-S-407 | Goniophotometer system | Verified by S1530039 standard lamp | |
| ST-R-S-410 | Standard Lamp S1530039 | 2021-04-15 | 2022-04-14 |
| ST-R-S-408 | Power Meter for Goniophotometer | 2021-04-07 | 2022-04-06 |
| ST-R-S-027 | Digital Luxmeter | 2021-04-08 | 2022-04-07 |
| ST-R-S-016 | Oscillograph | 2021-04-07 | 2022-04-06 |
| ST-R-S-017 | Probe | 2021-04-08 | 2022-04-07 |
| ST-R-361 | ZLB61012X | 2020-08-19 | 2021-08-20 |
| ST-R-414 | LFA-3000 | 2020-12-18 | 2021-12-17 |
| Uncertainty: Photometric Measurement (Sphere):2.72%, k=2 Chromaticity Measurement(Sphere):43.60K, k=2 Photometric Measurement(Goniophotometer): 3.44%, k=2 | | | |

******* END OF DATASHEET PACKAGE *******