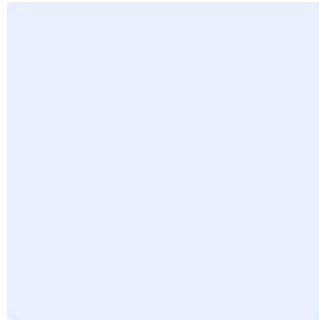




EE LAB 0014


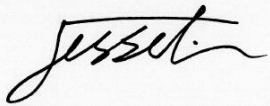


Energy Efficiency Test Report

SASO-2927-2019/AMD1:2021

Information of all related parties

| Lab information | | |
|------------------------------------|------------------|---|
| Name | | Shenzhen Southern LCS Compliance Testing Laboratory Ltd. |
| Address | Building number | 101-201, No.39 Building |
| | Street | Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District |
| | City | Shenzhen |
| | Country | China |
| Contact person | Name | Ian Luo |
| | Position | Director |
| | Telephone number | (86)0755-29871520 |
| | Email address | ian.luo@lcs-cert.com |
| Manufacture information | | |
| Name | | MIC Optoelectronic Co.,Ltd |
| Address | Building number | 2nd floor,Third Building, |
| | Street | 97# AiNan Road,LongDong,BaoLong Street |
| | City | Shenzhen, |
| | Country | China |
| Contact person | Name | Mr Lawrence |
| | Position | General Manager |
| | Telephone number | +86 13543343078 |
| | Email address | lawrence@mic-led.com |
| Factory information (Street Light) | | |
| Name | | MIC Optoelectronic Co.,Ltd |
| Address | Building number | 2nd floor,Third Building, |
| | Street | 97# AiNan Road,LongDong,BaoLong Street |
| | City | Shenzhen, |
| | Country | China |
| Contact person | Name | Mr Lawrence |
| | Position | General Manager |
| | Telephone number | +86 13543343078 |
| | Email address | lawrence@mic-led.com |
| Factory information (Control Gear) | | |
| Name | | MOSO Electronics Corp. |
| Address | Building number | MOSO Industrial Park, |
| | Street | Xili Town, Nanshan District, |
| | City | Shenzhen, |
| | Country | China |
| | Telephone number | +86 400 889 0018 |
| | Email address | info@mosopower.com |
| Factory information (Chip) | | |
| Name | | Lumileds |

| | | |
|------------------------------|------------------|---|
| Address | Building number | Rm231-233Core Building 2 |
| | Street | ,No.Science Park West Avenje HK Science Park, |
| | City | Shatin,HongKong |
| | Country | China |
| | Telephone number | +852 2812 5888 |
| | Email address | info@lumileds.com |
| Applicant information | | |
| Name | | MIC Optoelectronic Co.,Ltd |
| Address | Building number | 2nd floor,Third Building, |
| | Street | 97# AiNan Road,LongDong,BaoLong Street |
| | City | Shenzhen, |
| | Country | China |
| Contact person | Name | Mr Lawrence |
| | Position | General Manager |
| | Telephone number | +86 13543343078 |
| | Email address | lawrence@mic-led.com |
| Report information | | |
| Report Link (if needed) | | N/A |
| Report number | | LCSB08234028S001 |
| Number of pages | | 11 |
| Dates | Issue | 07/07/2025 |
| | Sample received | 09/23/2024 |
| | Sample start | 09/24/2024 |
| | Sample end | 06/19/2025 |
| Tested by (Person) | Name | Seth Cai |
| | Position | Project Engineer |
| | Telephone number | (86)0755-29871520 |
| | Email address | seth.cai@lcs-cert.com |
| | Signature |  |
| Approved by (Person) | Name | Jesse Liu |
| | Position | Manager |
| | Telephone number | (86)0755-29871520 |
| | Email address | jesse.liu@lcs-cert.com |
| | Signature |  |

Product information

| Device Info | |
|--------------|----------|
| Model number | MSL-F240 |

| | | |
|--------------------------|--|---------------------------------|
| Brand name | | MIC |
| Current Type | | AC |
| Voltage Type | | Voltage Range |
| Frequency | | 50/60Hz |
| Control Gear Info | | |
| Model number | | X6-320M062 |
| Brand name | | MOSO |
| Voltage Type | | Voltage Range |
| Frequency | | 50/60Hz |
| Test condition | Ambient temperature | 24.9 |
| | Voltage | 100V, 230V, 277V |
| | Frequency | 60Hz |
| Dimensions (mm) | Height | 231 |
| | Width | 98 |
| | Depth | 42 |
| Designation | Standard | SASO 2927-2019 |
| | product Type | Street Light |
| | Technology | LED Luminaire (Street Lighting) |
| | Directionality (LED Luminaire-Street Lighting or HID Lamps _Street Lighting) | Direct |
| | Type Of Driver (Control Gear/Ballast-Street Lighting) | Control Gear |
| | Type of Dimming System (Control Gear/Ballast-Street Lighting) | 1-10V |
| | Clear Lamp (Control Gear/Ballast-Street Lighting) | Dimmable |
| | Type of Product Name (LED Luminaire _Street Lighting or HID Lamps _Street Lighting or Control Gear/Ballast _Street Lighting) | LED Street Light |
| | Other properties of the Product (LED Luminaire _Street Lighting or HID Lamps _Street Lighting) | N/A |
| | External Control gear (LED Luminaire _Street Lighting or HID Lamps _Street Lighting) | Yes |
| | Clear Lamp (HID Lamps _Street Lighting) | Not Applicable |
| | Second envelope (HID Lamps _Street Lighting) | Not Applicable |
| | Anti-glare (HID Lamps _Street Lighting) | Not Applicable |
| Rated Values | Voltage From (Street Light) | 100V |
| | Voltage To (Street Light) | 277V |
| | Frequency (Street Light) | 50/60Hz |
| | Voltage From (Control Gear) | 100V |
| | Voltage To (Control Gear) | 277V |
| | Frequency (Control Gear) | 50/60Hz |
| | HID Type | Not Applicable |
| | Retrofit HP vapor sodium operating with HP mercury vapor lamp ballast | No |
| | Color Rendering | 70 |

| | | |
|---------------|---|---------|
| | Luminous flux | 40800lm |
| | Power | 240W |
| | LED chip Efficacy at 25°C | 200lm/w |
| | Current Value | 100mA |
| | Pcor | 235.2 |
| | Pref | 2995.13 |
| | Annual Energy Consumption (kWh) | 235kWh |
| | EEL | 0.079 |
| | Classification | A |
| | Efficacy | 170lm/w |
| | Color temperature | 6000K |
| | Power factor | 0.95 |
| | Rated Lifetime | 50000h |
| | Over Current Protection | 10KA |
| | Over Voltage Protection | 10KV |
| | Electrical Protection Class (Street Light) | I |
| | Control Unit Protection | 10KV |
| | Drivers | 1-10V |
| | 7-Pin NEMA Socket | Yes |
| | Sensor Ready Socket | No |
| | Luminaire Ingress Protection (IP) | IP66 |
| | Impact protection (IK)) | IK10 |
| | Control unit withstand a temperature °C, Min. Value | -40 |
| | Control unit withstand a temperature °C, Max. Value | 90 |
| | Corrosion Classification ratings (classification >= 5) | 5 |
| | Corrosion Classification hours (hours >= 2500) | 2500h |
| | Withstand Wind Speed | 150km/h |
| | The Surge Protection Device (SPD) work normally at a temperature of 80°C (inside the fixture) | Yes |
| | Meets 3G vibration standards according to ANSI C136.31-2010 | Yes |
| | Meets 1.5G vibration standards according to ANSI C136.31-2010 | Yes |
| | Rated Power of Control Gear | 320 |
| | Energy Efficiency of Control Gear | 90% |
| | Control gear Ingress Protection (IP) | IP66 |
| Tested Values | Voltage From | 100 |
| | Voltage To | 277 |
| | Tested Power 1 | 251.93 |
| | Tested Power 2 | 240.09 |
| | Power (Street Light HID Lamps) | N/A |
| | Tested Power (Control Gear) | 319.38 |
| | No Load Power (Control Gear) | 0 |
| | Stand by Power (Control Gear) | 0.28 |



| | |
|---|---------|
| Luminous Flux 1 | 43503.4 |
| Luminous Flux 2 | 42023.0 |
| Luminous Flux (Street Light HID Lamps) | N/A |
| Pcor 1 | 246.89 |
| Pcor 2 | 235.29 |
| Pref 1 | 3193.58 |
| Pref 2 | 3084.91 |
| EEI 1 | 0.077 |
| EEI 2 | 0.076 |
| EEI (Street Light HID Lamps) | N/A |
| Efficacy 1 | 172.68 |
| Efficacy 2 | 175.03 |
| Class 1 | A |
| Class 2 | A |
| Efficiency Class (Street Light HID Lamps) | N/A |
| Power Factor | 0.960 |
| No. of Switches | 15000 |
| Starting time | 0.409 |
| Color Rendering | 71.6 |
| Color Temperature (LED Luminaire-Street Lighting or HID Lamps _Street Lighting) | 6302 |
| Color constent with 6 steps MAC Adam ellipse | Yes |
| Premature Failure rate at 1 0 0 0 hr | 0 |
| Driver Power Factor | 0.983 |
| Total Harmonic Distortion | 11% |
| Lumen Maintenance for chip at 6000h | N/A |
| Lamp Survival Factor for chip at 6000h | N/A |
| Lumen Maintenance for luminaire at 2000/6000h | 93.28% |
| Lamp Survival Factor for luminaire at 2000/6000h | 100% |



Standard references

| Standard reference | Description | Check |
|--------------------|---|-------------------------------------|
| SASO 2902 | Energy efficiency, functionality and labelling requirements for lighting products (part 2) | <input checked="" type="checkbox"/> |
| CIE 115-2010 | Lighting of roads for motor and pedestrain traffic | <input checked="" type="checkbox"/> |
| CIE 88-2004 | Guied for the lighting of road tunnels and underpasses | <input checked="" type="checkbox"/> |
| IEC 60598-1/2017 | Luminaires - Part 1: General requirements and tests | <input checked="" type="checkbox"/> |
| IEC 61547:2009 | Equipment for general lighting purposes - EMC immunity requirements | <input checked="" type="checkbox"/> |
| IEC 61643-11:2011 | Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods | <input checked="" type="checkbox"/> |
| IES LM-79-08 | Electrical and photometric measurements of Solid State lighting products | <input checked="" type="checkbox"/> |
| IES LM-80-08 | Measuring lumen maintenance of LED Light sources | <input checked="" type="checkbox"/> |
| IES LM-82-12 | Method for characterisation of LED light Engines and Integrated LED lamps for Electrical properties as a function of the temperature | <input checked="" type="checkbox"/> |
| IES LM-84-14 | Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires | <input checked="" type="checkbox"/> |
| ISTMT | In-SITU Temperature Measurement Testin | <input checked="" type="checkbox"/> |
| IES TM21-11 | Projecting long term lumen maintenance of LED light sources | <input checked="" type="checkbox"/> |
| IES TM28-14 | Projecting long-term luminous flux maintenance of LED lamps and luminaires | <input checked="" type="checkbox"/> |
| IEC 60529:2013 | Degrees of protection provided by enclosures (IP Code) | <input checked="" type="checkbox"/> |
| ISO 9227:2017 | Corrosion tests in artificial atmospheres — Salt spray tests | <input checked="" type="checkbox"/> |



| | | |
|-------------------|---|-------------------------------------|
| ISO 4628-2:2016 | Paints and varnishes -- Evaluation of degradation of coatings - - Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 2: Assessment of degree of blistering | <input type="checkbox"/> |
| ISO 4628-4:2016 | Paints and varnishes -- Evaluation of degradation of coatings - - Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 4: Assessment of degree of cracking | <input type="checkbox"/> |
| ANSI C136.31-2001 | Roadway and area Lighting Equipment - Luminaire Vibration | <input checked="" type="checkbox"/> |
| ANSI C136.3-2001 | Roadway and area lighting equipment - luminaire attachments | <input checked="" type="checkbox"/> |
| ANSI C78.377-2011 | Specifications for the Chromaticity of Solid State Lighting Products | <input checked="" type="checkbox"/> |
| IEC 62384:2006 | DC or AC supplied electronic control gear for LED modules - Performance requirements | <input checked="" type="checkbox"/> |

Testing equipment

| Equipment | Brand | Model | Purpose |
|---|----------|----------|-----------------------------------|
| Full-field Speed Goniophotometer | EVERFINE | GO-R5000 | Light color parameter measurement |
| Digital Power Meter | EVERFINE | PF2010 | electrical parameters measurement |
| AC Testing Power Source | EVERFINE | DPS1060 | electrical parameters measurement |
| Total Spectral Radiant Flux Standard Lamp | EVERFINE | D908S | Light color parameter measurement |
| 2m Integrating Sphere System | EVERFINE | HAAS2000 | Light color parameter measurement |
| Digital Power Meter | EVERFINE | PF9810 | electrical parameters measurement |
| AC Testing Power Source | EVERFINE | DPS1005 | electrical parameters measurement |
| Standard Lamp | OSRAM | DC24/50W | Light color parameter measurement |
| DC Testing Power Source | EVERFINE | WY605 | electrical parameters measurement |

Results

| Sample No. | Power (W) | Starting Time (sec.) | Warm-up Time to 60% Φ (sec.) | Warm-up Time to 95% Φ (sec.) | Power Factor | CCT | SDCM | Ra |
|------------|-----------|----------------------|-----------------------------------|-----------------------------------|--------------|-----|------|----|
|------------|-----------|----------------------|-----------------------------------|-----------------------------------|--------------|-----|------|----|

| | | | | | | | | |
|---------|--------|-------|-----|-----|-------|------|-----|------|
| 1 | 240.80 | 0.421 | N/A | N/A | 0.961 | 6318 | 4.3 | 72.2 |
| 2 | 239.75 | 0.419 | N/A | N/A | 0.958 | 6297 | 4.0 | 72.5 |
| 3 | 241.12 | 0.398 | N/A | N/A | 0.963 | 6302 | 3.9 | 72.1 |
| 4 | 240.05 | 0.406 | N/A | N/A | 0.960 | 6337 | 3.7 | 72.6 |
| 5 | 239.62 | 0.412 | N/A | N/A | 0.958 | 6271 | 4.3 | 72.3 |
| 6 | 239.99 | 0.424 | N/A | N/A | 0.959 | 6288 | 3.9 | 72.0 |
| 7 | 240.47 | 0.411 | N/A | N/A | 0.960 | 6305 | 4.0 | 72.4 |
| 8 | 241.33 | 0.403 | N/A | N/A | 0.964 | 6326 | 4.2 | 72.5 |
| 9 | 240.19 | 0.400 | N/A | N/A | 0.959 | 6279 | 4.5 | 72.6 |
| 10 | 240.82 | 0.395 | N/A | N/A | 0.961 | 6292 | 4.2 | 72.3 |
| 11 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 13 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 14 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 19 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 20 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Average | 240.41 | 0.409 | N/A | N/A | 0.960 | 6302 | 4.1 | 72.4 |

| Sample No. | Lumen Maintenance & Lamp survival factor | | | | | Number of switching cycles | Peak Intensity (cd) | Beam angle (°) |
|------------|--|-------|--------|------------------|------------------|----------------------------|---------------------|----------------|
| | Initial | 2000h | 6000h | LSF at 2000h (%) | LSF at 6000h (%) | | | |
| 1 | 43076.5 | N/A | 93.51% | N/A | 100% | 15000 | 12677 | 116.3 |
| 2 | 42068.9 | N/A | 92.78% | N/A | 100% | 15000 | 12613 | 115.8 |
| 3 | 42521.5 | N/A | 94.12% | N/A | 100% | 15000 | 12754 | 116.1 |
| 4 | 41401.4 | N/A | 92.60% | N/A | 100% | 15000 | 12656 | 116.2 |
| 5 | 42520.6 | N/A | 92.70% | N/A | 100% | 15000 | 12571 | 115.4 |
| 6 | 41148.7 | N/A | 93.69% | N/A | 100% | 15000 | 12628 | 115.7 |
| 7 | 42399.7 | N/A | 93.17% | N/A | 100% | 15000 | 12660 | 116.0 |
| 8 | 42334.1 | N/A | 92.90% | N/A | 100% | 15000 | 12801 | 115.3 |

| | | | | | | | | |
|---------|---------|-----|--------|-----|------|-------|-------|-------|
| 9 | 41026.9 | N/A | 93.33% | N/A | 100% | 15000 | 12647 | 115.9 |
| 10 | 41558.3 | N/A | 94.02% | N/A | 100% | 15000 | 12710 | 116.6 |
| 11 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 13 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 14 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 19 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 20 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Average | 42005.7 | N/A | 93.28% | N/A | 100% | 15000 | 12672 | 115.9 |

| Sample No. | LED Chip | | | Luminaire | | | |
|------------|---|-------|--------------------------|-------------------------------|---------|-------------------------------|---------|
| | Chip forward voltage: 24V Chip forward current: 60mA | | luminous efficacy (lm/w) | Voltage: 100 Frequency: 60 | | Voltage: 277 Frequency: 60 | |
| | Power | Lumen | | Power | Lumen | Power | Lumen |
| 1 | 1.35 | 259.1 | 192.52 | 253.80 | 43714.1 | 240.00 | 42956.7 |
| 2 | 1.34 | 264.6 | 196.96 | 251.74 | 43012.3 | 239.59 | 42040.9 |
| 3 | 1.34 | 258.8 | 192.82 | 253.29 | 44432.1 | 241.16 | 41725.5 |
| 4 | 1.35 | 256.4 | 190.35 | 250.77 | 43004.5 | 240.59 | 42757.7 |
| 5 | 1.35 | 262.0 | 194.77 | 250.16 | 43347.7 | 238.75 | 41277.5 |
| 6 | 1.34 | 261.3 | 194.51 | 254.12 | 43932.3 | 239.24 | 41814.4 |
| 7 | 1.34 | 267.3 | 199.60 | 252.86 | 43034.2 | 240.58 | 41848.9 |
| 8 | 1.35 | 265.4 | 196.68 | 250.74 | 43701.5 | 240.33 | 42838.8 |
| 9 | 1.34 | 260.4 | 194.01 | 249.86 | 43288.2 | 241.02 | 41927.8 |
| 10 | 1.35 | 265.0 | 196.56 | 251.98 | 43567.3 | 239.62 | 41042.1 |
| 11 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 13 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 14 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 19 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 20 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Average | 1.34 | 262.0 | 194.88 | 251.93 | 43503.4 | 240.09 | 42023.0 |

Notes

- The samples satisfy the applicable requirements of SASO 2927 standard.
- These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.
- The test results presented in this report relate only to the object tested.
- This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory
- This report is a full test report. In this report, the test samples are provided by client and do the test at laboratory, the test results only apply to the samples and test data as received in this report.
- Standard references are updated to the latest version.
- Modifications to the format and font of this test report form are prohibited.
- Other Notes

End of Report

