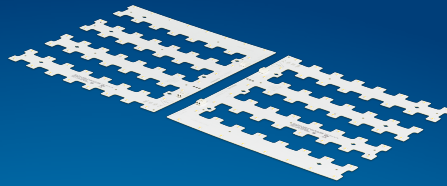


# PHILIPS

## Fortimo

### LED

Fortimo LED Square-S  
SMF 9xx HV/LV4



## Datasheet

### Fortimo LED Square systems

Fortimo LED Square systems consist of white light LED modules with square outer dimensions delivering high energy efficiency and high quality of light. Fortimo LED Square systems are ideal for office applications where the luminaires require a very homogeneous exit surface window. Typical applications are recessed, surface mounted and suspended office luminaires.

#### Key features and benefits

- LED module efficiency of 200 lm/W (nominal at 4000K, CRI80, S) or 188 lm/W in CRI90 (nominal at 4000K, CRI90, S)
- Long life-time: >70,000 hours
- High color rendering: choice between CRI >80 or CRI >90
- CRI90 products are based on our CRI90 High Efficiency technology
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000K, 3500K, 4000K and 6500K)
- Two sizes: Square (1250lm) and Double-Square (2500lm)
- FlexTune tunable white modules available in both lumen packages
- FlexTune tunable white modules can be tuned from 2700K to 6500K in CRI90
- FlexTune tunable white modules work perfectly together with the Xitanium FlexTune non-isolated drivers
- Tunable lumen output, efficacy and lifetime
- Push-in connectors enabling automated wiring
- Five year system warranty when paired with Xitanium drivers

November 2024



## Ordering data

| Commercial product name             | 12NC           | EPREL registration # | Box quantity |
|-------------------------------------|----------------|----------------------|--------------|
| Fortimo LED Square-S SMF 930 HV/LV4 | 9290 039 93306 | 10012795             | 20           |
| Fortimo LED Square-S SMF 940 HV/LV4 | 9290 039 93406 | 10012809             | 20           |
| Fortimo LED Square-S SMF 965 HV/LV4 | 9290 039 93506 | 10012803             | 20           |

## Drive currents

| Parameter                           | Nominal* | Life** | Max*** | Unit |
|-------------------------------------|----------|--------|--------|------|
| Fortimo LED Square-S SMF 9xx HV/LV4 | 155      | 960    | 960    | mA   |

## Module temperatures

| Parameter                                                 | Nominal* | Life** | Max*** | Unit |
|-----------------------------------------------------------|----------|--------|--------|------|
| T <sub>c</sub> (case temperature at T <sub>c</sub> point) | 45       | 75     | 85     | °C   |

\* Nominal value at which typical performance is specified

\*\* Value at which life time is specified

\*\*\* Maximum value for safe operation, do not operate above this value

## Optical characteristics - table per color (CCT)

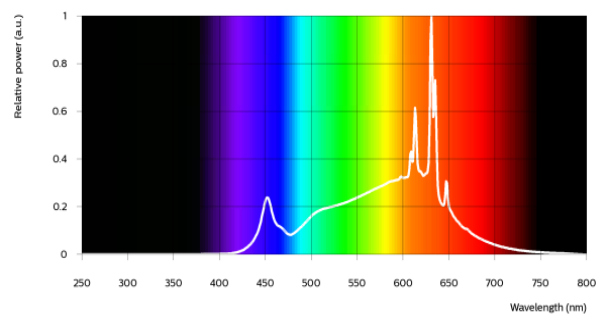
### Fortimo LED Square-S SMF 930 HV/LV4

| Parameter                          | Min  | Typ            | Max           | Unit |
|------------------------------------|------|----------------|---------------|------|
| Luminous flux                      | 1120 | 1138           | 1260          | lm   |
| Efficacy                           | 166  | 172            | 202           | lm/W |
| Correlated color temperature (CCT) |      | 3000           |               | K    |
| Color coordinates (CIEx, CIEy)     |      | (0.436, 0.399) |               | -    |
| Color consistency                  |      |                | 3             | SDCM |
| CRI                                | 90   |                |               |      |
| R9                                 | 50   |                |               |      |
| Radiation angle                    |      | 120            |               | deg  |
| Photobiological safety             |      |                | RG1 unlimited |      |



Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$ .

| Operation point | 930          | lm   | lm/W |
|-----------------|--------------|------|------|
| 80% I-nom 124mA | Tc 25 °C     | 873  | 165  |
|                 | Tc-nom 45 °C | 853  | 164  |
|                 | Tc-max 85 °C | 802  | 157  |
| I-nom 155mA     | Tc 25 °C     | 1137 | 172  |
|                 | Tc-nom 45 °C | 1138 | 172  |
|                 | Tc-max 85 °C | 1045 | 161  |
| I-max 960mA     | Tc 25 °C     | 5030 | 107  |
|                 | Tc-nom 45 °C | 4909 | 106  |
|                 | Tc-max 85 °C | 4604 | 100  |



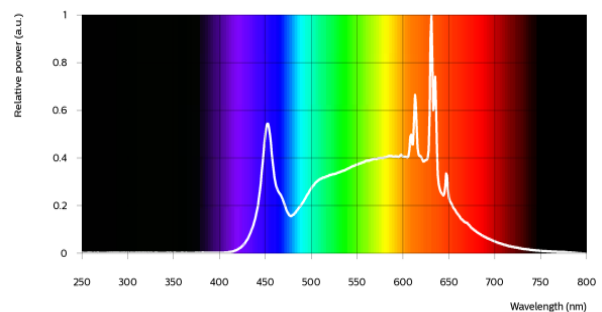
### Fortimo LED Square-S SMF 940 HV/LV4

| Parameter                          | Min  | Typ            | Max           | Unit |
|------------------------------------|------|----------------|---------------|------|
| Luminous flux                      | 1210 | 1250           | 1370          | lm   |
| Efficacy                           | 179  | 188            | 218           | lm/W |
| Correlated color temperature (CCT) |      | 4000           |               | K    |
| Color coordinates (CIEx, CIEy)     |      | (0.384, 0.378) |               | -    |
| Color consistency                  |      |                | 3             | SDCM |
| CRI                                | 90   |                |               |      |
| R9                                 | 50   |                |               |      |
| Radiation angle                    |      | 120            |               | deg  |
| Photobiological safety             |      |                | RG1 unlimited |      |



Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$ .

| Operation point | 940          | lm   | lm/W |
|-----------------|--------------|------|------|
| 80% I-nom 124mA | Tc 25 °C     | 1005 | 190  |
|                 | Tc-nom 45 °C | 981  | 189  |
|                 | Tc-max 85 °C | 919  | 180  |
| I-nom 155mA     | Tc 25 °C     | 1249 | 189  |
|                 | Tc-nom 45 °C | 1250 | 188  |
|                 | Tc-max 85 °C | 1142 | 176  |
| I-max 960mA     | Tc 25 °C     | 6867 | 151  |
|                 | Tc-nom 45 °C | 6694 | 148  |
|                 | Tc-max 85 °C | 6257 | 141  |

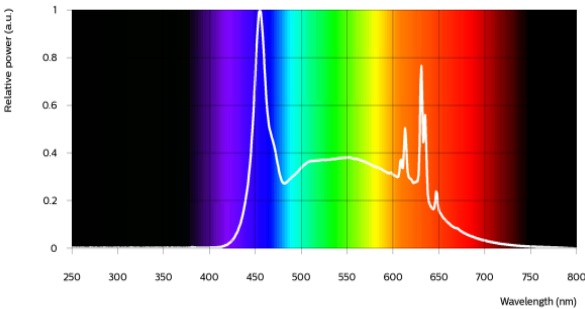


| Parameter                          | Min  | Typ            | Max           | Unit |
|------------------------------------|------|----------------|---------------|------|
| Luminous flux                      | 1180 | 1223           | 1330          | lm   |
| Efficacy                           | 174  | 184            | 212           | lm/W |
| Correlated color temperature (CCT) |      | 6500           |               | K    |
| Color coordinates (CIEx, CIEy)     |      | (0.314, 0.326) |               | -    |
| Color consistency                  |      |                | 3             | SDCM |
| CRI                                | 90   |                |               |      |
| R9                                 | 50   |                |               |      |
| Radiation angle                    |      | 120            |               | deg  |
| Photobiological safety             |      |                | RG1 unlimited |      |



Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 965          | lm   | lm/W |
|-----------------|--------------|------|------|
| 80% I-nom 124mA | Tc 25 °C     | 982  | 185  |
|                 | Tc-nom 45 °C | 955  | 184  |
|                 | Tc-max 85 °C | 893  | 172  |
| I-nom 155mA     | Tc 25 °C     | 1222 | 185  |
|                 | Tc-nom 45 °C | 1223 | 184  |
|                 | Tc-max 85 °C | 1111 | 171  |
| I-max 960mA     | Tc 25 °C     | 6801 | 150  |
|                 | Tc-nom 45 °C | 6610 | 147  |
|                 | Tc-max 85 °C | 6166 | 139  |



## Electrical characteristics

### Fortimo LED Square-S SMF 930 HV/LV4

| Parameter                             | Min  | Typ  | Max  | Unit          |
|---------------------------------------|------|------|------|---------------|
| Forward voltage                       | 40.3 | 42.7 | 43.5 | V             |
| Power consumption                     | 6.3  | 6.6  | 6.7  | W = kWh/1000h |
| Number of modules in series per chain |      |      | 7    |               |
| Number of modules in parallel         |      |      | 4    |               |

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%

### Fortimo LED Square-S SMF 940 HV/LV4

| Parameter                             | Min  | Typ  | Max  | Unit          |
|---------------------------------------|------|------|------|---------------|
| Forward voltage                       | 40.5 | 42.8 | 43.6 | V             |
| Power consumption                     | 6.3  | 6.6  | 6.8  | W = kWh/1000h |
| Number of modules in series per chain |      |      | 7    |               |
| Number of modules in parallel         |      |      | 4    |               |

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%

### Fortimo LED Square-S SMF 965 HV/LV4

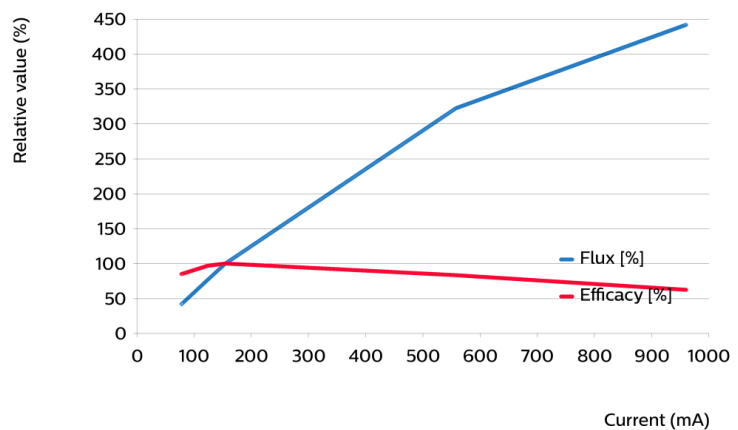
| Parameter                             | Min  | Typ  | Max  | Unit          |
|---------------------------------------|------|------|------|---------------|
| Forward voltage                       | 40.5 | 42.9 | 43.7 | V             |
| Power consumption                     | 6.3  | 6.6  | 6.8  | W = kWh/1000h |
| Number of modules in series per chain |      |      | 7    |               |
| Number of modules in parallel         |      |      | 4    |               |

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%

## Tuning information

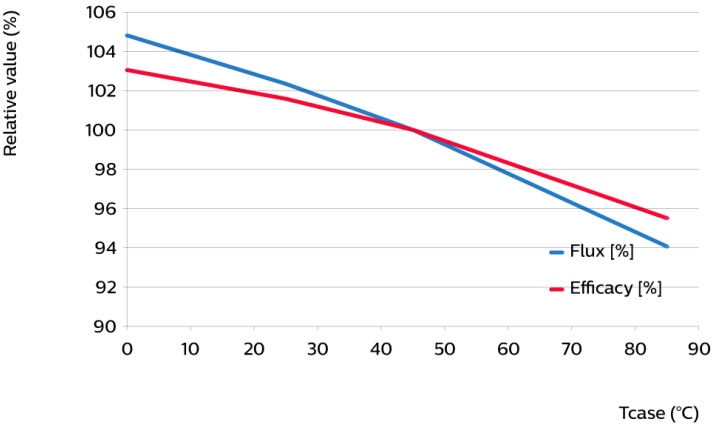
Flux and efficacy versus current (at Tc nominal)

| I [mA] | Flux [%] | Efficacy [%] |
|--------|----------|--------------|
| 960    | 442      | 62           |
| 558    | 322      | 83           |
| 155    | 100      | 100          |
| 124    | 77       | 97           |
| 78     | 42       | 85           |



Flux and efficacy versus temperature at Tc (at I nominal)

| Tc [°C] | Flux [%] | Efficacy [%] |
|---------|----------|--------------|
| 85      | 94       | 96           |
| 45      | 100      | 100          |
| 25      | 102      | 102          |
| 0       | 105      | 103          |



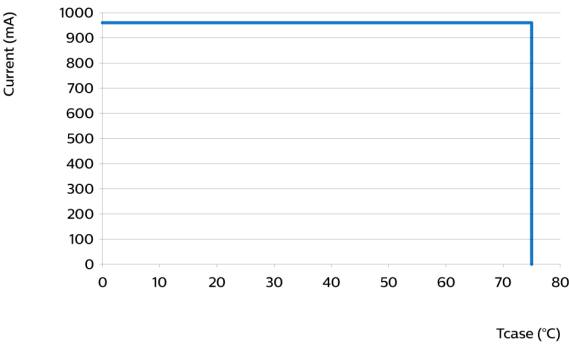
Lumen maintenance

| Operation point | Lumen maintenance<br>x 1000 hours | L70  |      |      | L80  |      |      | L90 |     |     |
|-----------------|-----------------------------------|------|------|------|------|------|------|-----|-----|-----|
|                 |                                   | B50  | B20  | B10  | B50  | B20  | B10  | B50 | B20 | B10 |
| 80% Inom=124mA  | Tc=25°C                           | >100 | >100 | >100 | >100 | >100 | >100 | 67  | 66  | 65  |
|                 | Tc_nom=45°C                       | >100 | >100 | >100 | >100 | >100 | >100 | 53  | 52  | 52  |
|                 | Tc_life=75°C                      | >100 | >100 | >100 | 83   | 81   | 80   | 39  | 38  | 38  |
| Inom=155mA      | Tc=25°C                           | >100 | >100 | >100 | >100 | >100 | >100 | 67  | 66  | 65  |
|                 | Tc_nom=45°C                       | >100 | >100 | >100 | >100 | >100 | >100 | 53  | 52  | 52  |
|                 | Tc_life=75°C                      | >100 | >100 | >100 | 83   | 81   | 80   | 39  | 38  | 38  |
| Ilife=600mA     | Tc=25°C                           | >100 | >100 | >100 | >100 | >100 | >100 | 56  | 55  | 54  |
|                 | Tc_nom=45°C                       | >100 | >100 | >100 | 94   | 92   | 91   | 44  | 43  | 43  |
|                 | Tc_life=75°C                      | >100 | >100 | >100 | 69   | 67   | 66   | 32  | 32  | 31  |

Lifetime

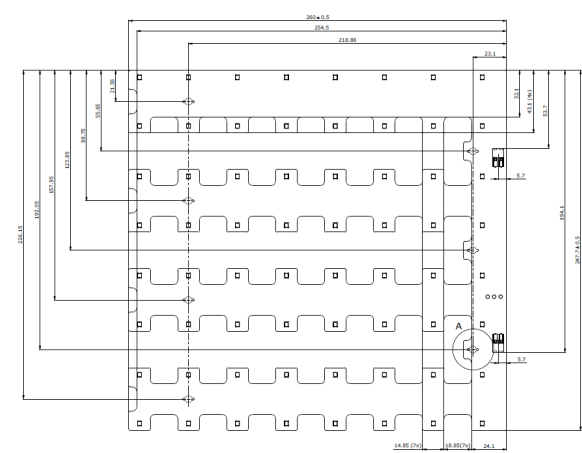
| Parameter      | Value  | Unit  |
|----------------|--------|-------|
| M70F50 nominal | 100000 | hours |
| M70F50 life    | 100000 | hours |

Performance Window



Mechanical characteristics

| Parameter    | Min   | Typ   | Max   | Unit |
|--------------|-------|-------|-------|------|
| Length       | 259.5 | 260   | 260.5 | mm   |
| Width        | 247.2 | 247.7 | 248.2 | mm   |
| Height total |       | 5.5   |       | mm   |
| Height PCB   |       | 1.7   |       | mm   |
| Product mass |       | 106   |       | gram |



Absolute ratings

| Parameter                              | Min | Max | Unit            |
|----------------------------------------|-----|-----|-----------------|
| Current through the LED module (I-max) |     | 960 | mA              |
| Case temperature (Tc-max)              |     | 85  | °C              |
| ESD (direct contact)                   | 8   |     | kV              |
| Working voltage                        |     | 350 | V <sub>dc</sub> |

Application information

Certificates and Standards

CE  
cULus  
ENEC  
ENEC+

Application

|         |     |
|---------|-----|
| Dimming | Yes |
|---------|-----|



© 2024 Signify Holding, IBRS 10461, 5600VB, NL. All rights reserved. The information provided herein is subject to change, without notice. Signify does not give any representation or warranty as to the accuracy or completeness of the information included herein and shall not be liable for any action in reliance thereon. The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract, unless otherwise agreed by Signify.

[www.philips.com/oem](http://www.philips.com/oem)

Philips and the Philips Shield Emblem are registered trademarks of Koninklijke Philips N.V. All other trademarks are owned by Signify Holding or their respective owners.  
UK importer address: Signify Commercial UK Limited, 3 Guildford Business Park, GU2 8XG

27/11/2024