

The EM FIT 60/220-240/350 D CS L G3 is a 60W, constant-current and IP20 rated Linear non-isolated LED driver that operates from 220 - 240 V input with excellent power factor. Design for various lighting applications including tri-proof, linear luminaire, etc.



### Features

- Flexible with 1 driver offers 4 output currents.
- Input Surge Protection: DM 1kV, CM 2kV.
- Low THD < 10% @ full load.
- Lifetime up to 50k hrs @  $t_{c\_max}$ .
- Halogen Free.

### Application

- Suitable for Industrial Applications
- Suitable for Luminaires with Protection Class I
- Suitable for Build-in Use
- Suitable for Emergency Lighting

### Models

| Nominal current range (mA) | Default Output Current (mA) | Nominal Output Voltage Range (Vdc) | Maximum Output Power (W) | Typical Efficiency | Power Factor $\lambda$ | Product Name                    |
|----------------------------|-----------------------------|------------------------------------|--------------------------|--------------------|------------------------|---------------------------------|
| 200/250/300/350            | 200                         | 90 - 175                           | 61.25                    | 91.5%              | 0.7C – 0.95            | EM FIT 60/220-240/350 D CS L G3 |

### Input Specifications

| Parameter                                   | Min.      | Typ.  | Max.    | Notes                                      |
|---------------------------------------------|-----------|-------|---------|--------------------------------------------|
| Input Voltage AC                            | 220 Vac   | -     | 240 Vac |                                            |
| Input Voltage DC                            | 176 Vdc   | -     | 276 Vdc |                                            |
| Mains Frequency                             | 0/50/60Hz |       |         |                                            |
| Touch Current                               | -         | -     | 0.7mA   | IEC 60598-1 (mA peak)                      |
| Protective Conductor Current                | -         | -     | 3.5mA   | IEC 60598-1 (mA RMS) (only for Class I)    |
| Nominal Input Current                       | -         | 0.30A | -       | Measured at 100% load and 230 Vac input.   |
| Suitable for Fixtures with Protection Class | Class I   |       |         |                                            |
| Power Factor $\lambda$                      | 0.7C      | 0.95  |         | At 220-240Vac, 50/60Hz, Load (18 – 61.25W) |
| Total Harmonic Distortion                   | -         | -     | 30%     |                                            |
| Total Harmonic Distortion Extended Range    | -         | -     | 10%     | At 230Vac, 50/60Hz, Full load              |

## Output Specifications

| Parameter                      | Min.              | Typ.   | Max.         | Notes                                   |
|--------------------------------|-------------------|--------|--------------|-----------------------------------------|
| Nominal Output Current Range   | 200/250/300/350mA |        |              |                                         |
| Default Output Current         | -                 | 200 mA | -            |                                         |
| Nominal Output Voltage         | 90 V              | -      | 175 V        |                                         |
| Output Current Tolerance       | -5%<br>-7.5%      | -      | +5%<br>+7.5% | At 300/350mA<br>At 200/250mA            |
| Nominal Output Power Range     | 18W               | -      | 61.25W       |                                         |
| Output Current Ripple LF       | -                 | -      | 3%Iomax      | At 100% load condition, <1k Hz (pk-pk). |
| Total Output Current Ripple HF | -                 | -      | 10%Iomax     | At 100% load condition, >1k Hz (pk-pk). |
| P <sub>st</sub> LM             | -                 | -      | 1.0          | Measured at 230Vac input, 100% load     |
| SVM                            | -                 | -      | 0.4          | Measured at 230Vac input, 100% load     |
| Startup Overshoot Current      | -                 | -      | 10%Iomax     | At 100% load condition                  |
| U <sub>out</sub>               | -                 | -      | 250 V        |                                         |
| Galvanic Isolation             | Non-isolated      |        |              |                                         |
| Emergency Lighting             | Yes               |        |              | EoFi=1                                  |
| Line Regulation                | -                 | -      | ± 5%         | Measured at 100% load                   |
| Load Regulation                | -                 | -      | ± 5%         |                                         |
| Turn-on Delay Time             | -                 | -      | 0.5 s        |                                         |

## General Specifications

| Parameter                                               | Min.             | Typ.          | Max.  | Notes                                                                                                                                              |
|---------------------------------------------------------|------------------|---------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency at 230Vac Input<br>I <sub>o</sub> =350 mA    | 91%              | 91.5%         | -     | Measured at 100% load and Steady-state temperature in 25°C ambient:                                                                                |
| Device Power Loss                                       | -                | 4.6W          | -     |                                                                                                                                                    |
| Operating Case Temperature for Safety tc <sub>s</sub>   | -30°C            | -             | +85°C |                                                                                                                                                    |
| Max. Housing Temperature in Case of Fault               | -                | -             | 110°C |                                                                                                                                                    |
| Operating Case Temperature for Warranty tc <sub>w</sub> | -30°C            | -             | +85°C | Case temperature for 5 years warranty. Please see Inventronics Warranty Statement for complete details. Humidity: 5% RH to 85% RH, No condensation |
| Lifetime at tc <sub>w</sub> .                           | -                | 50,000 Hours  | -     | Measured at 230Vac input, 100% load. 10% failure rate                                                                                              |
| Lifetime at tc <sub>w</sub> – 10°C.                     | -                | 100,000 Hours | -     | Measured at 230Vac input. 10% failure rate                                                                                                         |
| Ambient Temperature <sub>ta</sub>                       | -30°C            | -             | +55°C | Measured at 230Vac input, 100% load @ tc <sub>w</sub>                                                                                              |
| Permitted Rel. Humidity During Operation                | 5%               | -             | 85%   | No condensation                                                                                                                                    |
| Temperature at Storage                                  | -40°C            | -             | +85°C | Humidity: 5% RH to 85% RH, No condensation                                                                                                         |
| Noise during start                                      | -                | -             | 40db  | ISO3743_30cm                                                                                                                                       |
| Noise during operation                                  | -                | -             | 20db  | ISO3743_30cm                                                                                                                                       |
| Mains Switching Cycles                                  | 200,000          | -             | -     |                                                                                                                                                    |
| IP Rating                                               | IP20             |               |       |                                                                                                                                                    |
| Dimensions (L × W ×H)                                   | 168 x 30 x 21 mm |               |       |                                                                                                                                                    |
| Net Weight                                              | -                | 120 g         | -     |                                                                                                                                                    |

### Inrush Current Waveform

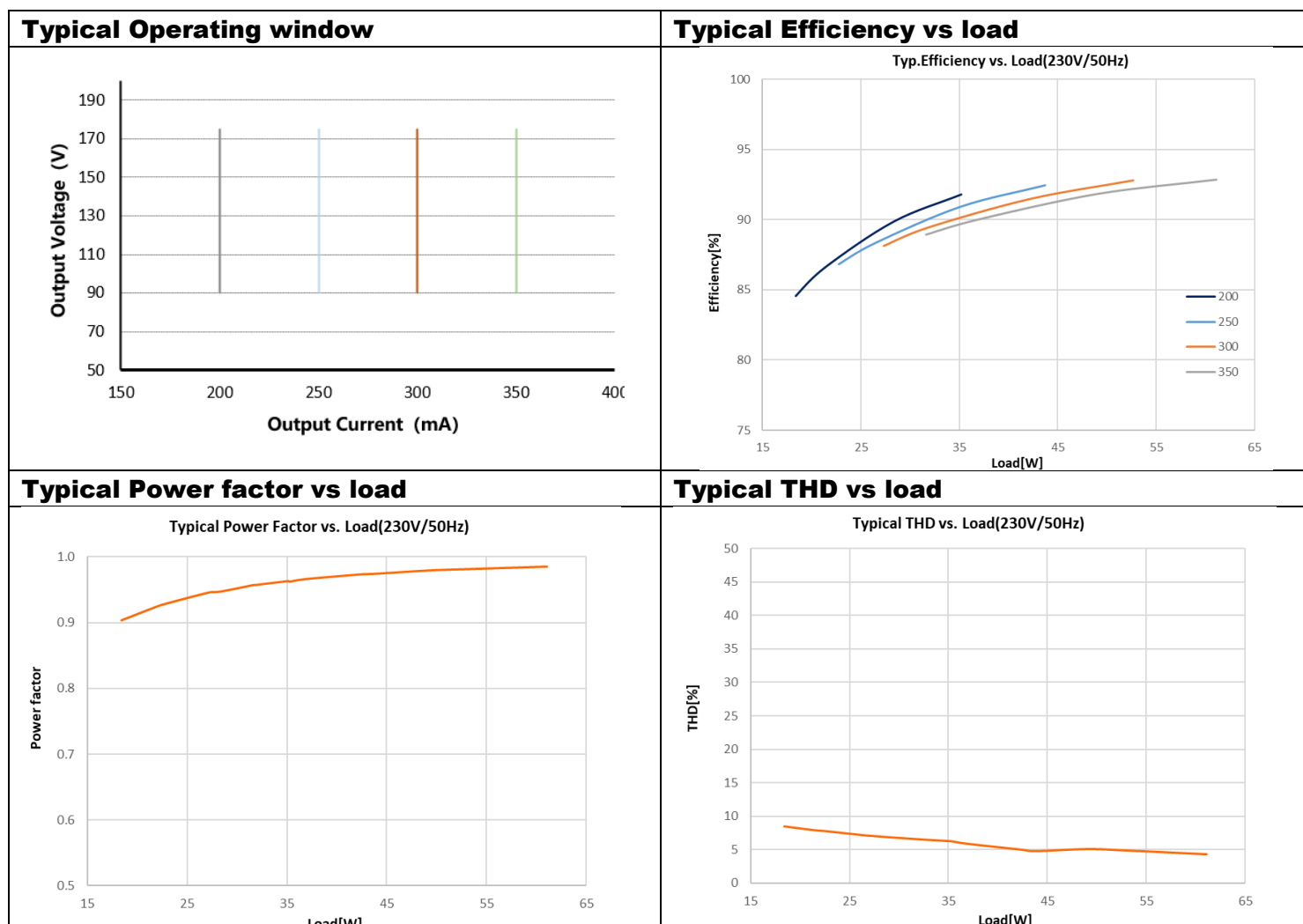
| Input AC Voltage | Inrush current<br>$I_{peak}$ | Inrush current width $t_{width}$<br>(@ 50% $I_{peak}$ ) | The Number of LED Driver can be Configured (MCB) |     |     |     |     |     |     |     |
|------------------|------------------------------|---------------------------------------------------------|--------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|
|                  |                              |                                                         | B10                                              | B16 | B20 | B32 | C10 | C16 | C20 | C25 |
| 230 Vac          | 28.0A                        | 210 us                                                  | 13                                               | 22  | 34  | 44  | 23  | 37  | 57  | 74  |

Notes: The maximum number of units per circuit breaker is indicative value.

### Certificates & standards

| Safety Category | Standard                                                                                      |
|-----------------|-----------------------------------------------------------------------------------------------|
| ENEC            | EN IEC 61347-1, EN IEC 61347-2-13, EN IEC 62384                                               |
| CE              | EN IEC 61347-1, EN IEC 61347-2-13, EN IEC 55015, EN IEC 61547, EN IEC 61000-3-2, EN 61000-3-3 |
| CB              | IEC 61347-1, IEC 61347-2-13                                                                   |
| CCC             | GB/T 19510.1, GB/T 19510.213, GB/T 17743, GB/T 17625.1                                        |
| RCM             | AS/NZS 61347-1, AS 61347-2-13                                                                 |

Note: This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.



| Rated output power and current sets |      |      |      |      |
|-------------------------------------|------|------|------|------|
| I <sub>out</sub> [mA]               | 200  | 250  | 300  | 350  |
| U <sub>min</sub> [V]                | 90   | 90   | 90   | 90   |
| U <sub>max</sub> [V]                | 175  | 175  | 175  | 175  |
| P <sub>min</sub> [W]                | 18.0 | 22.5 | 27.0 | 31.5 |
| P <sub>max</sub> [W]                | 35.0 | 43.7 | 52.5 | 61.2 |
| ta <sub>max</sub> [°C]              | 55   | 55   | 55   | 55   |
| tc <sub>max</sub> [°C]              | 85   | 85   | 85   | 85   |
| Line Current, nominal@230V_ [A]     | 0.18 | 0.22 | 0.26 | 0.30 |
| Max Power Loss@230V_ [W]            | 3.4  | 3.8  | 3.9  | 4.6  |
| Input Power @230V_ [W]              | 38.4 | 47.5 | 56.4 | 65.8 |

| DIP1                           | DIP2 | Current (mA) |
|--------------------------------|------|--------------|
| OFF                            | OFF  | 200          |
| ON                             | OFF  | 250          |
| OFF                            | ON   | 300          |
| ON                             | ON   | 350          |
| Current selected by Dip switch |      |              |

## Protection Functions

### Over Voltage Protection (OVP)

Limits output voltage at no load and in case the normal voltage limit fails.

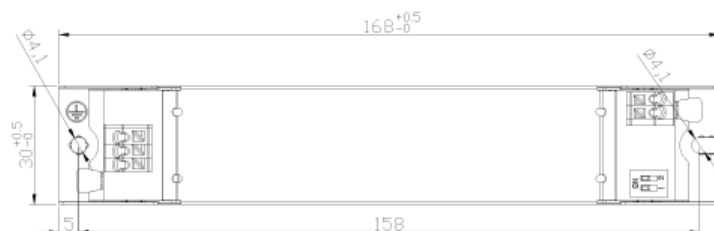
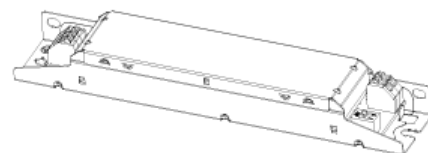
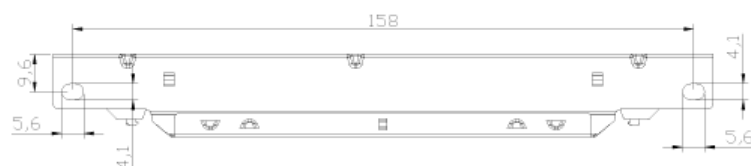
### Short Circuit Protection (SCP)

Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed

### No Load Protection (NLP)

The driver automatically adjusts the output voltage to the maximum output voltage if no load is connected and switches off its output after some seconds. Hot-plug of the load or external switching on the secondary side is not allowed.

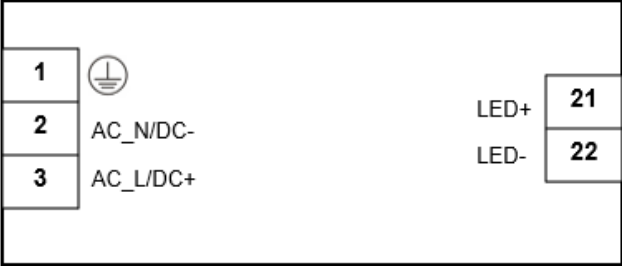
## Mechanical Outline



Connection Diagram

| Parameter  |                    | Min.                                           | Typ. | Max.                | Notes                                        |
|------------|--------------------|------------------------------------------------|------|---------------------|----------------------------------------------|
| L, N, GND  | Wire Cross-section | s:0.5 mm <sup>2</sup><br>f:0.7 mm <sup>2</sup> | -    | 1.5 mm <sup>2</sup> | Push-in at 45°angle, solid and stranded wire |
|            | Strip Length       | 7 mm                                           | -    | 8 mm                |                                              |
| LED+, LED- | Wire Cross-section | s:0.5 mm <sup>2</sup><br>f:0.7 mm <sup>2</sup> | -    | 1.5 mm <sup>2</sup> | Push-in at 45°angle, solid and stranded wire |
|            | Strip Length       | 7 mm                                           | -    | 8 mm                |                                              |

Hot plug-in or secondary switching of LEDs is not permitted and may cause a very high current to the LEDs. Indication that the lamp controlgear relies upon the luminaire enclosure for protection against accidental contact with live part



Environmental Compliance

RoHS

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

Eco-design regulation information

Intended for use with LED modules.

The forward voltage of the LED light source shall be within the defined operating window of the control gear in all operating conditions including dimming if applicable.

Separate control gear and light sources must be disposed of at certified disposal companies in accordance with Directive 2012/19/EU (WEEE) in the EU and with Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 in the UK. For this purpose, collection points for recycling centers and take-back systems (CRSO) are available from retailers or private disposal companies, which accept separate control gear and light sources free of charge. In this way, raw materials are conserved and materials are recycled.

Thermally protected controlgear are classified according to the type of thermal protection means as follow:

e)protective method of another type (providing equivalent thermal protection)

The controlgear is provided with internal protection that supports selectivity in the case of installation with fuse gG 16 A.

Product Order Overview

Order Code & Packaging

| Order Code (EAN) | Product Version Name            | Certification Markings on Product | Packaging Unit (Pieces/Box) | Packing Dimensions (L × W × H)(mm) | Gross Weight (Kg) |
|------------------|---------------------------------|-----------------------------------|-----------------------------|------------------------------------|-------------------|
| 6937186176462    | EM FIT 60/220-240/350 D CS L G3 | CE, ENEC, RCM, CCC, EL            | 50                          | 320*183*153                        | 6.45              |