



60W Multiple-Stage Constant Current Mode LED Driver

LCM-60BLE



## Features

- Constant Current mode output with multiple levels selectable by dip switch
- Flicker free design
- Plastic housing with class II design
- Built-in active PFC function
- Functions: Casambi Bluetooth low energy protocol, push dimming, synchronization up to 10units
- 3 years warranty

## Applications

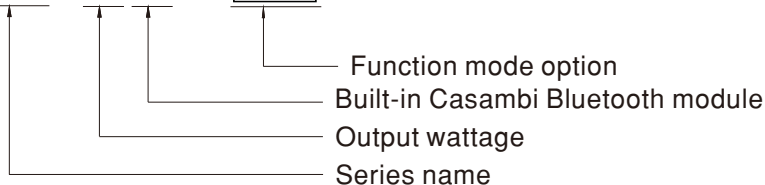
- LED indoor lighting
- LED office lighting
- LED architectural lighting
- LED panel lighting

## Description

LCM-60BLE series is a 60W AC/DC constant current mode output LED driver featuring the multiple levels selectable by dip switch and integration of Casambi Bluetooth control so that the installation is greatly simplified. LCM-60BLE operates from 180~295VAC and offers different current levels ranging between 500mA and 1400mA. Thanks to the high efficiency up to 91%, with the fanless design, the entire series is able to operate for -30°C ~+90°C case temperature under free air convection. In addition, LCM-60BLE is equipped with push dimming and synchronization so as to provide the optimal design flexibility for LED lighting system.

## Model Encoding

LCM - 60BLE - AUX



| Type  | Function                                            | Note       |
|-------|-----------------------------------------------------|------------|
| Blank | Casambi Bluetooth control protocol and push dimming | By request |
| AUX   | Same as blank type and Auxiliary DC output          | By request |



## 60W Multiple-Stage Constant Current Mode LED Driver

## LCM-60BLE

## SPECIFICATION

|              |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |                |         |         |         |
|--------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|---------|---------|---------|
| MODEL        |                                         | LCM-60BLE-□                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |                |         |         |         |
| OUTPUT       | CURRENT LEVEL                           | Current level selectable via DIP switch, please refer to "DIP SWITCH TABLE" section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
|              |                                         | 500mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 600mA   | 700mA(default) | 900mA   | 1050mA  | 1400mA  |
|              | RATED POWER                             | 60.3W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                |         |         |         |
|              | DC VOLTAGE RANGE                        | 2 ~ 90V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2 ~ 90V | 2 ~ 86V        | 2 ~ 67V | 2 ~ 57V | 2 ~ 42V |
|              | OPEN CIRCUIT VOLTAGE (max.)             | 95V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                | 73V     |         |         |
|              | CURRENT RIPPLE    Note.5                | 5.0% max. @rated current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                |         |         |         |
|              | CURRENT TOLERANCE                       | ±5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
|              | AUXILIARY DC OUTPUT                     | Nominal 12V(deviation 11.4~12.6V)@50mA for AUX-Type only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                |         |         |         |
|              | SETUP TIME        Note.3                | 500ms / 230VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |                |         |         |         |
| INPUT        | VOLTAGE RANGE        Note.2             | 180 ~ 295VAC      254 ~ 417VDC<br>(Please refer to "STATIC CHARACTERISTIC" section)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
|              | FREQUENCY RANGE                         | 47 ~ 63Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |                |         |         |         |
|              | POWER FACTOR (Typ.)                     | PF ≥ 0.975/230VAC, PF ≥ 0.96/277VAC@full load<br>(Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |                |         |         |         |
|              | TOTAL HARMONIC DISTORTION               | THD< 20%(@load≥75%)<br>(Please refer to "TOTAL HARMONIC DISTORTION(THD)" section)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |                |         |         |         |
|              | EFFICIENCY (Typ.)        Note.4         | 91%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
|              | AC CURRENT (Typ.)                       | 0.32A/230VAC      0.27A/277VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |                |         |         |         |
|              | INRUSH CURRENT (Typ.)                   | COLD START 20A(twidth=270μs measured at 50% Ipeak) at 230VAC; Per NEMA 410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                |         |         |         |
|              | MAX. No. of PSUs on 16A CIRCUIT BREAKER | 25 units (circuit breaker of type B) / 32 units (circuit breaker of type C) at 230VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                |         |         |         |
|              | LEAKAGE CURRENT                         | <0.5mA / 240VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |                |         |         |         |
| PROTECTION   | SHORT CIRCUIT                           | Constant current limiting, recovers automatically after fault condition is removed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |                |         |         |         |
|              | OVER VOLTAGE                            | 105 ~ 125V<br>Shutdown o/p voltage, re-power on to recover                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                |         |         |         |
|              | OVER TEMPERATURE                        | Shutdown o/p voltage, re-power on to recover                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |                |         |         |         |
| FUNCTION     | WIRELESS PROTOCOL                       | Casambi Bluetooth low energy 2.4GHz protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |                |         |         |         |
|              | DIMMING                                 | Please refer to "DIMMING OPERATION" section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |                |         |         |         |
|              | SYNCHRONIZATION                         | Please refer to "SYNCHRONIZATION OPERATION" section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
|              | TEMP. COMPENSATION                      | By external NTC, please refer to "TEMPERATURE COMPENSATION OPERATION" section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |                |         |         |         |
| ENVIRONMENT  | WORKING TEMP.                           | Tcase=-25 ~ +90℃ (Please refer to " OUTPUT LOAD vs TEMPERATURE" section)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                |         |         |         |
|              | MAX. CASE TEMP.                         | Tcase=+90℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                |         |         |         |
|              | WORKING HUMIDITY                        | 20 ~ 90% RH non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                |         |         |         |
|              | STORAGE TEMP., HUMIDITY                 | -40 ~ +80℃, 10 ~ 95% RH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |                |         |         |         |
|              | TEMP. COEFFICIENT                       | ±0.03%/℃ (0 ~ 50℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |                |         |         |         |
|              | VIBRATION                               | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |                |         |         |         |
| SAFETY & EMC | SAFETY STANDARDS                        | UL8750, CSA C22.2 No.250.13-12, EN61347-1, EN61347-2-13, EN62384 independent approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                |         |         |         |
|              | WITHSTAND VOLTAGE                       | I/P-O/P:3.75KVAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                |         |         |         |
|              | ISOLATION RESISTANCE                    | I/P-O/P:>100M Ohms / 500VDC / 25℃ / 70% RH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                |         |         |         |
|              | EMC EMISSION    Note.7                  | Compliance to EN55015, EN61000-3-2 Class C(@load ≥ 40%) ; EN61000-3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                |         |         |         |
|              | EMC IMMUNITY                            | Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, light industry level(surge immunity Line-Line 2KV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |                |         |         |         |
| OTHERS       | MTBF                                    | 193.6K hrs min.    MIL-HDBK-217F (25℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |                |         |         |         |
|              | DIMENSION                               | 123.5*81.5*23mm (L*W*H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |                |         |         |         |
|              | PACKING                                 | 0.24Kg ; 54pcs/15Kg/1.12CUFT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |                |         |         |         |
| NOTE         |                                         | 1. All parameters NOT specially mentioned are measured at 230VAC input, rated current and 25℃ of ambient temperature.<br>2. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.<br>3. Length of set up time is measured at first cold start. Turning ON/OFF the driver may lead to increase of the set up time.<br>4. Efficiency is measured at 900mA/67V output set by DIP switch.<br>5. Current ripple is measured 60%~100% of maximum voltage under rated power delivery.<br>6. The driver is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.<br>7. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft). |         |                |         |         |         |

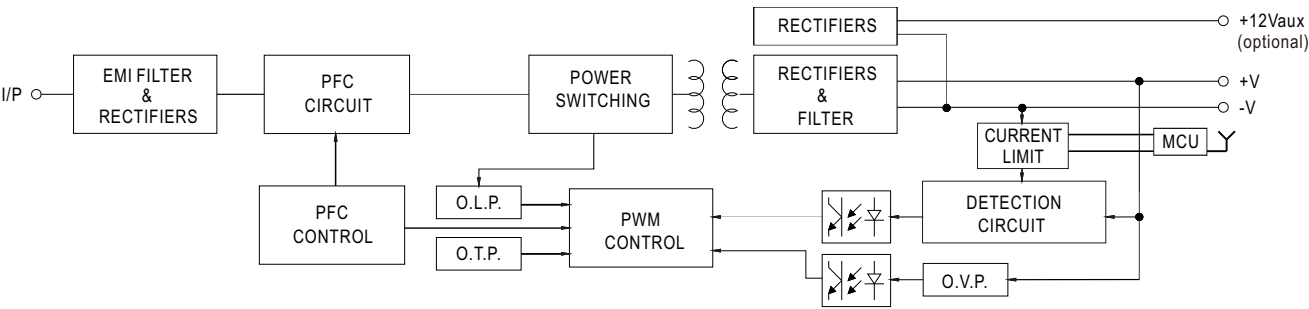


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BLOCK DIAGRAM

PFC fosc : 60KHz  
PWM fosc : 80KHz



DIP SWITCH TABLE

LCM-60BLE is a multiple-stage constant current driver, selection of output current through DIP switch is exhibited below.

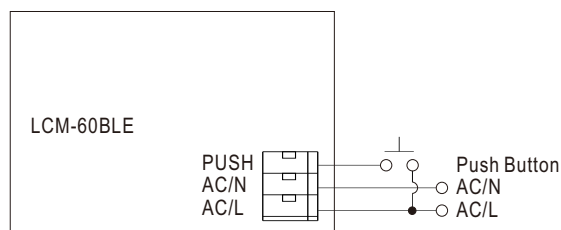
| Io \ DIP S.W.          | 1    | 2    | 3    | 4    | 5    | 6    |
|------------------------|------|------|------|------|------|------|
| 500mA                  | ---- | ---- | ---- | ---- | ---- | ---- |
| 600mA                  | ON   | ---- | ---- | ---- | ---- | ---- |
| 700mA(factory default) | ON   | ON   | ---- | ---- | ---- | ---- |
| 900mA                  | ON   | ON   | ON   | ---- | ---- | ON   |
| 1050mA                 | ON   | ON   | ON   | ON   | ---- | ON   |
| 1400mA                 | ON   | ON   | ON   | ON   | ON   | ON   |



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### ■ DIMMING OPERATION

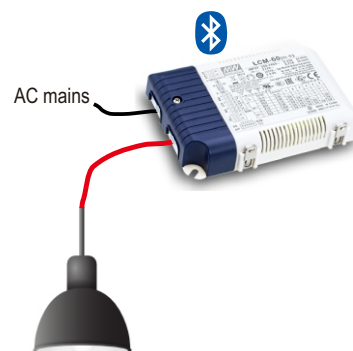
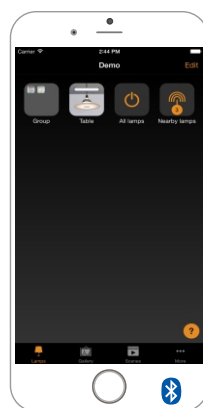
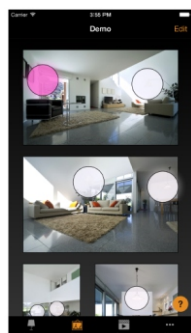


#### ※Freely assignable (push) input

- The LCM BLE series also has one freely assignable AC mains (push) input. As with a CASAMBI sensor module, control pulses can be defined here (e.g. "controls a luminaire"; "controls an element"; "controls a group"; "controls scenes"; "controls all luminaires"; "change scenes"). See the reference connection figure in the above.

#### ※Casambi Bluetooth control

- To be used through APP available on Apple Store and Play Store for iOS and Android.



### ■ APP SOFTWARE OVER TEMPERATURE PROTECTION

The real time Bluetooth IC temperature is shown in the APP. In case it reaches above 75 °C (equivalent to Tc 90°C), the driver will be turn off to provide a protection. In case the units is cooled down, it can be manually turn ON and back to normal operation again.

NOTE: 1.This software temperature protection is an extra independent function from driver its own hardware over temperature protection(when it is enabled, it needs re-AC power on to recover) and temperature compensation operation function described in the following section.

2.In general the software temperature protection is triggered before the hardware one when in over temperature.

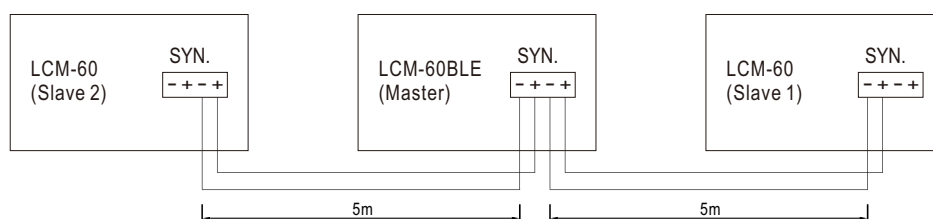


## 60W Multiple-Stage Constant Current Mode LED Driver

## LCM-60BLE

### ■ SYNCHRONIZATION OPERATION

- Synchronization up to 10 drivers (1 master + 9 slaves)
- Dimming operating range : 10%~100%
- Sync cable length : < 5m
- Sync cable type : Flat cable
- Sync cable cross section area : 22 – 24 AWG (0.2~0.3mm<sup>2</sup>)

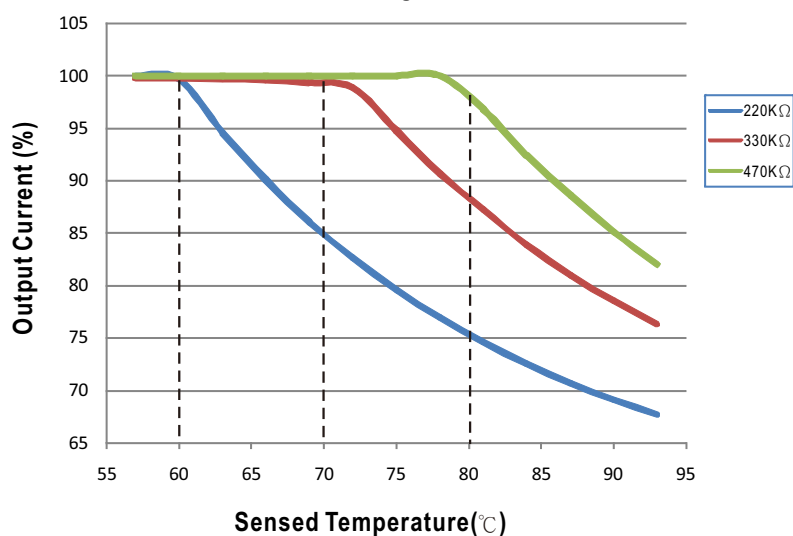


NOTE: 1. Please make sure all units are set to 100% dimming setting (factory default) before synchronizing.  
2. Min. Dimming operating range depends on dimmer setting.

### ■ TEMPERATURE COMPENSATION OPERATION

LCM-60BLE have the built-in temperature compensation function ; by connecting a temperature sensor (NTC resistor) between the +NTC / -NTC terminal of LCM-60BLE and the detecting point on the lighting system or the surrounding environment, output current of LCM-60BLE could be correspondingly changed, based on the sensed temperature, to ensure the long life of LED.

**NTC derating curve**



◎ LCM-60BLE can still be operated normally when the NTC resistor is not connected and the value of output current will be the current level selected through the DIP switch.

◎ NTC reference:

| NTC resistance | Output Current                                                                                                                                                  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 220K           | < 60°C, 100% of the rated current (corresponds to the setting current level)<br>> 60°C, output current begins to reduce, please refer to the curve for details. |
| 330K           | < 70°C, 100% of the rated current (corresponds to the setting current level)<br>> 70°C, output current begins to reduce, please refer to the curve for details. |
| 470K           | < 80°C, 100% of the rated current (corresponds to the setting current level)<br>> 80°C, output current begins to reduce, please refer to the curve for details. |

Notes: 1. MEAN WELL does not offer the NTC resistor and all the data above are measured by using THINKING TTC03 series.

2. If other brands of NTC resistor is applied, please check the temperature curve first.

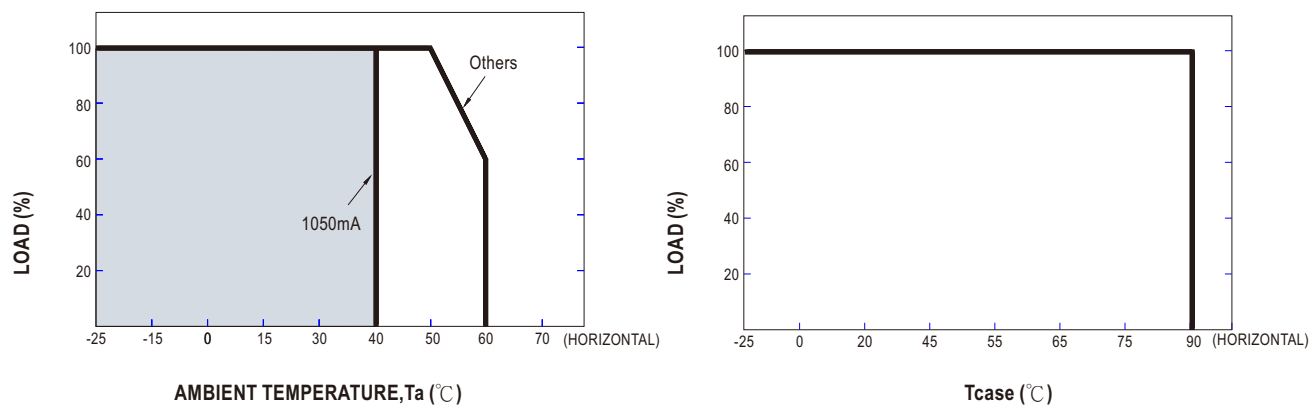
◎ Dimming and synchronization function of the driver will be invalid when the "temperature compensation" function is in use.



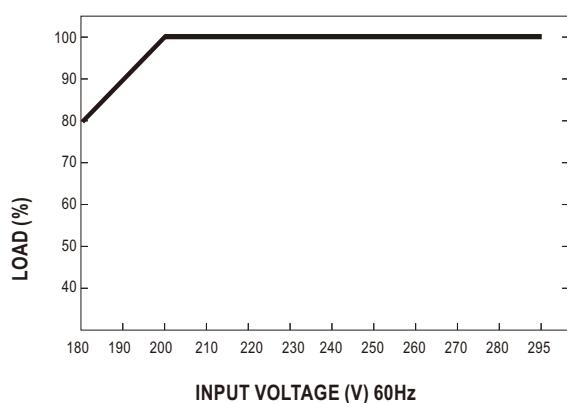
# 60W Multiple-Stage Constant Current Mode LED Driver

# LCM-60BLE

## ■ OUTPUT LOAD vs TEMPERATURE



## ■ STATIC CHARACTERISTIC



※ De-rating is needed under low input voltage.

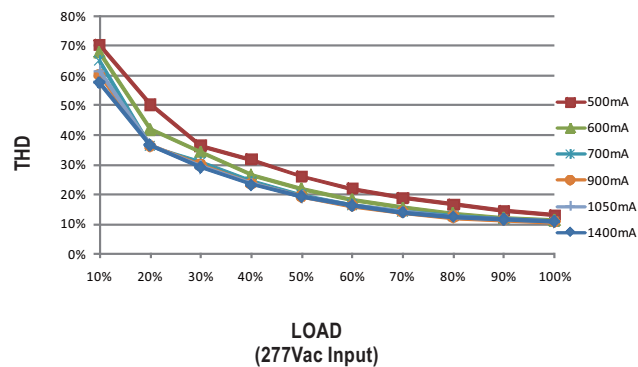
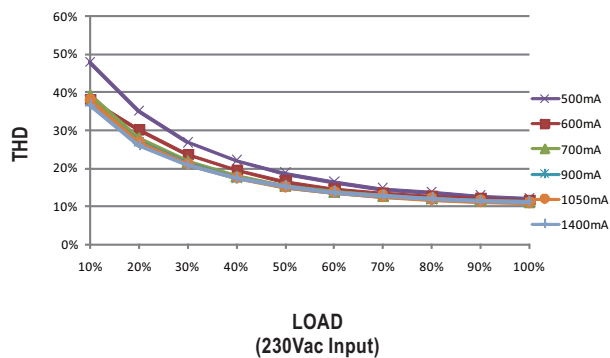


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## LCM-60BLE

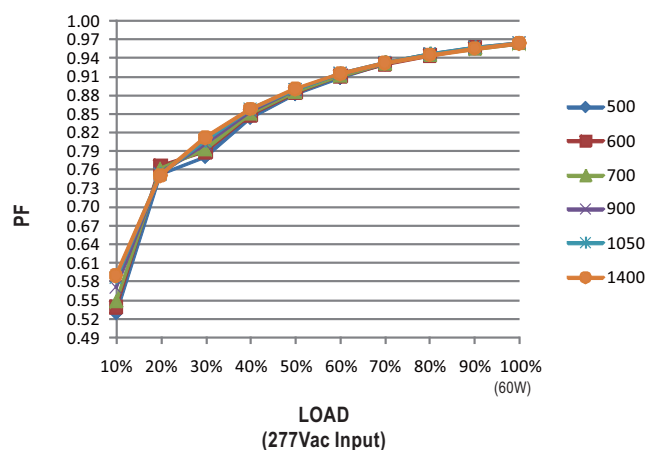
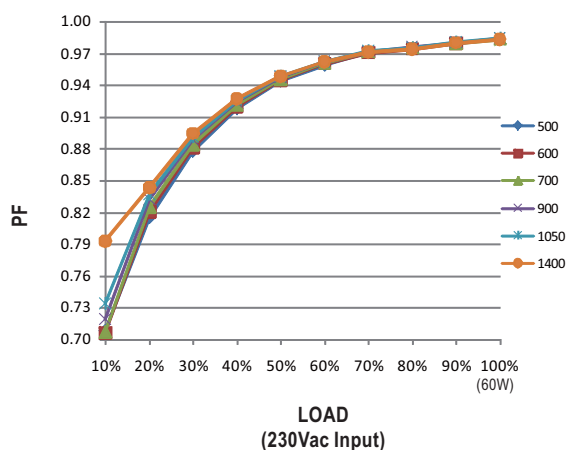
## ■ TOTAL HARMONIC DISTORTION (THD)

※ Tcase at 80°C



## ■ POWER FACTOR (PF) CHARACTERISTIC

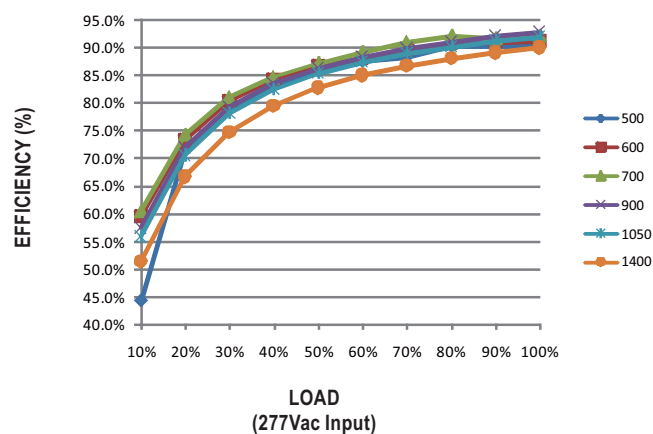
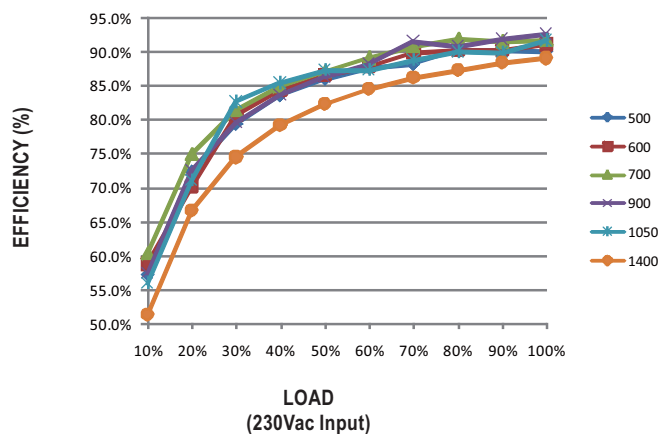
※ Tcase at 80°C



## ■ EFFICIENCY vs LOAD

LCM-60BLE series possess superior working efficiency that up to 91% can be reached in field applications.

※ Tcase at 80°C



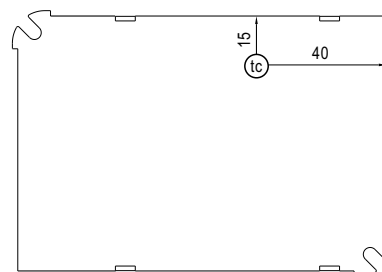
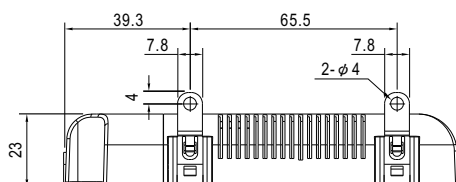
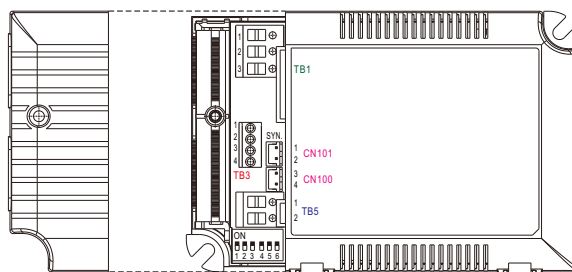
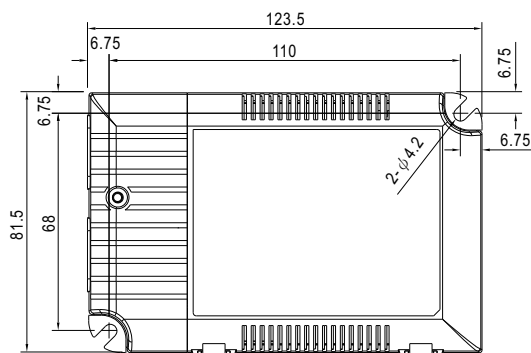


# 60W Multiple-Stage Constant Current Mode LED Driver

# LCM-60BLE

## MECHANICAL SPECIFICATION

Case No.LCM-60A Unit:mm



Bottom View

• (tc) : Max. Case Temperature

### ※ Terminal Pin No. Assignment(TB1)

| Pin No. | Assignment |
|---------|------------|
| 1       | AC/L       |
| 2       | AC/N       |
| 3       | PUSH       |

### ※ Terminal Pin No. Assignment(TB3)

| Pin No. | Assignment     | Pin No. | Assignment |
|---------|----------------|---------|------------|
| 1       | +FAN(optional) | 3       | +NTC       |
| 2       | -FAN(optional) | 4       | -NTC       |

◎ Pin1(+FAN) / Pin2(-FAN) is the Auxiliary DC output for the optional model; it can be used to drive fan.

### ※ Terminal Pin No. Assignment(TB5)

| Pin No. | Assignment |
|---------|------------|
| 1       | +V         |
| 2       | -V         |

### ※ SYN. Connector(CN101/CN100):JST B2B-XH or equivalent

| Pin No. | Assignment | Mating Housing        | Terminal                        |
|---------|------------|-----------------------|---------------------------------|
| 1,3     | +          | JST XHP or equivalent | JST SXH-001T-P0.6 or equivalent |
| 2,4     | -          |                       |                                 |

## Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>