60W Multiple-Stage Constant Power/Constant Voltage LED Driver XLC-60-MA series

User's Manual

XLC-60-MAS Series
(Independent type)

XLC-60-MA Series
(Built-in type)

for XLC-60 MAS series

DC Input: 176-280 VDC

Note.8

Features

- Constant power mode output with multiple stage selectable by DIP switch (H-type)
- Constant voltage mode output(12/24/48V)
- Plastic housing with class II and PFC design
- Flicker free, complying with CE ErP directive
- Standby power consumption <0.5W
- Meet emergency lighting (EL) application
- Minimum dimming level 0.1% (12/24/48V)
- Minimum dimming level 0.5% (H-type)
- Matter over thread, Matter 1.3 specification
- 5 years warranty

Applications

- Recessed Light
- Down Light
- Panel Light
- Commercial Lighting
- Decorative Lighting
- LED strip lighting
- Matter wireless Lighting

GTIN CODE

MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

XLC-60-MA series is a 60W with constant power and constant voltage output LED driver . It can operate from 100~305V AC and output current ranging between 900 mA to 1700 mA selectable by DIP switch. Thanks to high efficiency up to 90%, it is able to operate for -25℃ ~90℃ case temperature under free air convection. XLC-60-MA series is designed based on latest safety regulations with matter wireless dimming .It provides more flexibility for LED Lighting application.

Model Encoding

XLC - 60 - □ - MA □

- Casing type: { Blank: without strain-relief (Built-in type); S: with strain-relief (Independent type) }
- Function options: Matter wireless dimming
- Rated output voltage (12/24/48V or H-type)
- Rated wattage
- Series name

Type	Function	Note
MA	H type output current selectable by DIP switch, without strain-relief(Built-in type)	In stock
	12, 24, 48V Constant voltage output, without strain-relief(Built-in type)	
MAS	H type output current selectable by DIP switch, with strain-relief(Independent type)	In stock
	12, 24, 48V Constant voltage output, with strain-relief(Independent type)	

MEAN WELL

60W Constant Voltage LED Driver

XLC-60-MA series

SPECIFICATION

MODEL		XLC-60 -12-MA ☐	XLC-60-24-MA ☐	XLC-60-48-MA ☐
OUTPUT	DC VOLTAGE	12V	24V	48V
	DEFAULT CURRENT	5A	2.5A	1.25A
	RATED POWER Note.2	60W	60W	60W
	SETUP,RISE TIME Note.3	2500ms,180ms/230VAC ,2500ms,180ms/115VAC		
INPUT	VOLTAGE RANGE	100~305VAC 155~400VDC		
	FREQUENCY RANGE	47 ~ 63Hz		
	POWER FACTOR	PF≥0.95/115VAC, PF≥0.95/230VAC, PF≥0.9/277VAC@full load (Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section)		
	TOTAL HARMONIC DISTORTION	THD< 20%(@load ≥60%/230VAC; @load ≥75%/277VAC); THD<10%@load 100%/230VAC (Please refer to "TOTAL HARMONIC DISTORTION(THD)" section)		
	EFFICIENCY(Typ.)	86%	87%	88%
	AC CURRENT	0.75A/115VAC, 0.35A/230VAC, 0.3A/277VAC		
	INRUSH CURRENT	COLD START 15A(twidth=310μs measured at 50% Ipeak) at 230VAC; Per NEMA 410		
	MAX. NO. of PSUs on 16A CIRCUIT BREAKER	25 units (circuit breaker of type B) / 36 units (circuit breaker of type C) at 230VAC		
	LEAKAGE CURRENT	<0.75mA / 277VAC		
	STANDBY POWER CONSUMPTION Note.4	Standby power consumption<0.5W (Dimming OFF)		
PROTECTION	OVERLOAD	105~200% rated output power		
		Protection type: Hiccup mode, recovers automatically after fault condition is removed.		
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed		
	OVER VOLTAGE	14~17V	26~35V	52~63V
		Shut down output voltage, re-power on to recover		
	OVER TEMPERATURE	Shut down output voltage, recovers automatically after fault condition is removed		
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	CSA C22.2 No. 250.13-12; ENEC BS EN/EN61347-1, BS EN/EN61347-2-13(EL) appendix J suitable for emergency installations (DC input 176-280VDC); BS EN/EN62384 , GB/T 19510.1, GB/T 19510.213, EAC TP TC 004 approved; Design refer to AS/NZS 61347-1, AS/NZS 61347-2-13		
	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC		
	ISOLATION RESISTANCE	I/P-O/P: >100M Ohms / 500VDC / 25℃/ 70% RH		
	EMC EMISSION	**Parameter**	**Standard**	**Test Level/Note**
		Conducted	BS EN/EN55015(CISPR15) ,GB/T 17743	-----
		Radiated	BS EN/EN55015(CISPR15) ,GB/T 17743	-----
		Harmonic Current	BS EN/EN61000-3-2 , GB17625.1	Class C @load≥60%
		Voltage Flicker	BS EN/EN61000-3-3	-----
	EMC IMMUNITY	BS EN/EN61547		
		Parameter	**Standard**	**Test Level/Note**
		ESD	BS EN/EN61000-4-2	Level 3, 8KV air ; Level 2, 4KV contact
		Radiated	BS EN/EN61000-4-3	Level 2
		EFT/Burst	BS EN/EN61000-4-4	Level 2
		Surge	BS EN/EN61000-4-5	Level 3, 1KV/Line-Line
		Conducted	BS EN/EN61000-4-6	Level 2
		Magnetic Field	BS EN/EN61000-4-8	Level 2
		Voltage Dips and Interruptions	BS EN/EN61000-4-11	70% residual voltage for 10 period, 0% residual voltage for 0.5 periods
OTHERS	MATTER STANDARD	Matter 1.3 Specification		
	FLICKER Note.7	PstLM ≤ 1, SVM ≤ 0.4		
	MTBF	4130.5K hrs min. Telcordia SR-332 (Bellcore) 317.7Khrs min. MIL-HDBK-217F (25℃)		
	DIMENSION	176*45*32mm , 136*45*32mm (L*W*H)		
	PACKING	0.28Kg; 40pcs/12Kg/0.48CUFT(for Blank type); 0.30Kg; 40pcs/13Kg/0.63CUFT(for S-type);		

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated current and 25℃ of ambient temperature.
2. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.
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.
4. Standby power consumption is measured at 230VAC.
5. 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.
   (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
6. 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).
7. Flicker is measured at full load with the light source provided by MEAN WELL.
8. For XLC-S series: RCM is on a voluntary basis. Non IC classification Independent LED control gear is not suitable for residential installations.
   For XLC(except -S) series: RCM is on a voluntary basis and meets relevant IEC or AS/NZS standards complying with AS/NZS 4417.1.
9. This series meets the typical life expectancy of 50000 hours of operation when Tcase,particularly (tc) point(or TMP,per DLC), is about 75℃ or less.
10. For more information, please contact with MEAN WELL sales.

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SPECIFICATION

MODEL		XLC-60-H-MA ☐
OUTPUT	OPEN CIRCUIT VOLTAGE Note.2	60V
	DEFAULT CURRENT	1400mA
	CURRENT ADJ. RANGE (BY DIP SWITCH)	0.9~1.7A
	CONSTANT CURRENT REGION	9~54V
	RATED POWER Note.4	60W
	CURRENT RIPPLE Note.5	<4%
	CURRENT TOLERANCE	±5%
	DIMMING RANGE	0~100%
	SETUP, RISE TIME Note.6	2500ms,100ms/230VAC ,2500ms,100ms/115VAC
INPUT	VOLTAGE RANGE	100~305VAC 155~400VDC
	FREQUENCY RANGE	47 ~ 63Hz
	POWER FACTOR	PF≥0.95/115VAC, PF≥0.95/230VAC,PF≥0.9/277VAC@full load (Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section)
	TOTAL HARMONIC DISTORTION	THD< 20%(@load ≥60%/230VAC; @load ≥75%/277VAC); THD<10%@load 100%/230VAC (Please refer to "TOTAL HARMONIC DISTORTION(THD)" section)
	EFFICIENCY(Typ.) Note.7	90%
	AC CURRENT	0.75A/115VAC, 0.35A/230VAC, 0.3A/277VAC
	INRUSH CURRENT	COLD START 15A(twidth=310μs measured at 50% Ipeak) at 230VAC; Per NEMA 410
	MAX. NO. of PSUs on 16A CIRCUIT BREAKER	25 units (circuit breaker of type B) / 36 units (circuit breaker of type C) at 230VAC
	LEAKAGE CURRENT	<0.75mA / 277VAC
	STANDBY POWER CONSUMPTION Note.9	Standby power consumption<0.5W (Dimming off)
PROTECTION	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed
	OVER TEMPERATURE	Stage 1: De-rating to 75% loading; Stage 2: De-rating to 50% loading. Recovers automatically after fault condition is removed.
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	CSA C22.2 No. 250.13-12; ENEC BS EN/EN61347-1, BS EN/EN61347-2-13(EL) appendix J suitable for emergency installations (DC input 176-280VDC); BS EN/EN62384 , GB/T 19510.1, GB/T 19510.213, EAC TP TC 004 approved; Design refer to AS/NZS 61347-1, AS/NZS 61347-2-13
	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC
	ISOLATION RESISTANCE	I/P-O/P: >100M Ohms / 500VDC / 25℃/ 70% RH

EMC EMISSION

Parameter	Standard	Test Level/Note
Conducted	BS EN/EN55015(CISPR15) ,GB/T 17743	-----
Radiated	BS EN/EN55015(CISPR15) ,GB/T 17743	-----
Harmonic Current	BS EN/EN61000-3-2 , GB17625.1	Class C @load≥60%
Voltage Flicker	BS EN/EN61000-3-3	-----

EMC IMMUNITY

BS EN/EN61547

Parameter	Standard	Test Level/Note
ESD	BS EN/EN61000-4-2	Level 3, 8KV air ; Level 2, 4KV contact
Radiated	BS EN/EN61000-4-3	Level 2
EFT/Burst	BS EN/EN61000-4-4	Level 2
Surge	BS EN/EN61000-4-5	Level 3, 1KV/Line-Line
Conducted	BS EN/EN61000-4-6	Level 2
Magnetic Field	BS EN/EN61000-4-8	Level 2
Voltage Dips and Interruptions	BS EN/EN61000-4-11	70% residual voltage for 10 period, 0% residual voltage for 0.5 periods

OTHERS	MATTER STANDARD	Matter 1.3 Specification
	FLICKER Note.10	PstLM ≤ 1, SVM ≤ 0.4
	MTBF	4130.5K hrs min. Telcordia SR-332 (Bellcore) 317.7Khrs min. MIL-HDBK-217F (25℃)
	DIMENSION	176*45*32mm , 136*45*32mm (L*W*H)
	PACKING	0.28Kg; 40pcs/12Kg/0.48CUFT(for Blank type); 0.30Kg; 40pcs/13Kg/0.63CUFT(for S-type);

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated current and 25℃ of ambient temperature.
2. Output hiccups under no-load condition.
3. Please refer to "DRIVER METHODS OF LED MODULE".
4. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.
5. Current ripple is measured 50%~100% of maximum voltage under rated power delivery.
6. 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.
7. Efficiency is measured at 1050mA/54V output set by DIP switch.
8. For XLC-S series: RCM is on a voluntary basis. Non IC classification Independent LED control gear is not suitable for residential installations.
   For XLC(except -S) series: RCM is on a voluntary basis and meets relevant IEC or AS/NZS standards complying with AS/NZS 4417.1.
9. Standby power consumption is measured at 230VAC.
10. Flicker is measured at full load with the light source provided by MEAN WELL.
11. 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.
    (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
12. 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).
13. This series meets the typical life expectancy of 50000 hours of operation when Tcase, particularly (tc) point (or TMP, per DLC), is about75℃ or less.
14. For more information, please contact with MEAN WELL sales.

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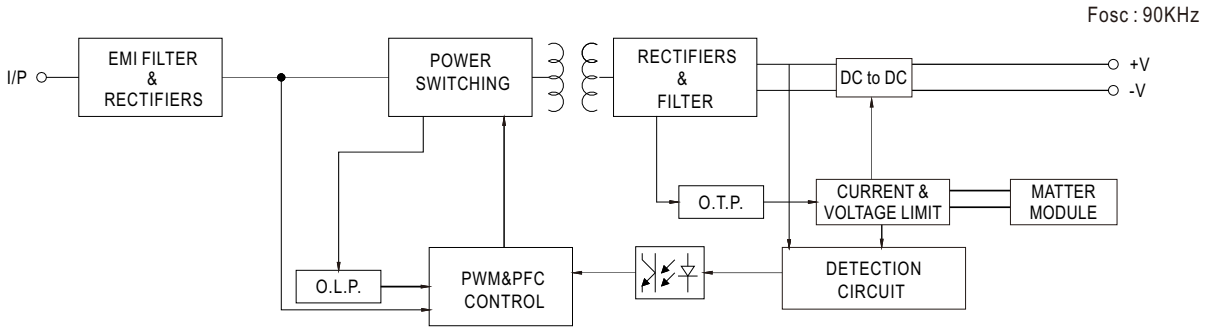
■ BLOCK DIAGRAM

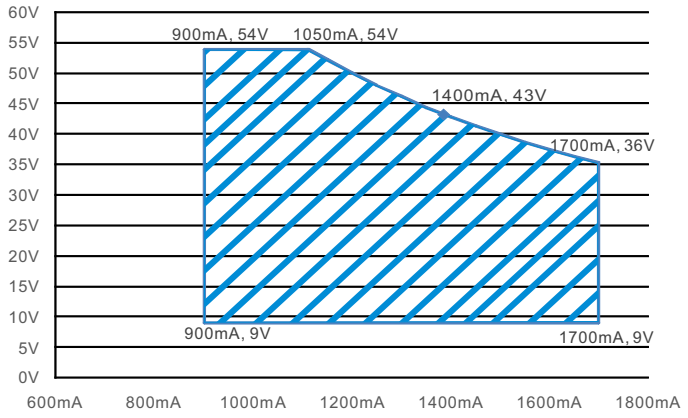


■ DRIVING METHODS OF LED MODULE

※ I-V Operating Area

◎ **XLC-60-H-MA**

For 60W application



■ CONSTANT POWER TABLE

XLC-60-H-MA is a multiple-stage constant power driver, selection of output current through DIP switch setting is exhibited below.

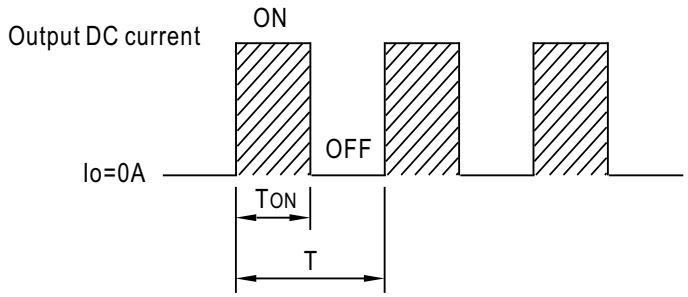
Vo	Io \ DIP S.W	1	2	3
9~54V	900mA	----	----	----
9~54V	1050mA	----	----	ON
9~50V	1200mA	----	ON	----
9~46V	1300mA	----	ON	ON
9~43V	1400mA(default)	ON	----	----
9~40V	1500mA	ON	----	ON
9~38V	1600mA	ON	ON	----
9~36V	1700mA	ON	ON	ON

Note: The operating voltage range which show on this table is recommend to use.

■ PWM OUTPUT DIMMING PRINCIPLE

※ **For 12V/24V/48V PWM style output dimming**

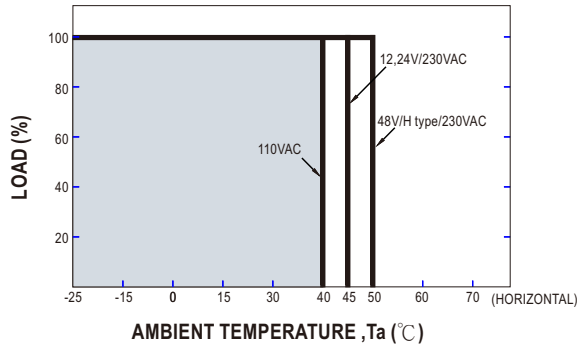
- Dimming is achieved by varying the duty cycle of the output current.

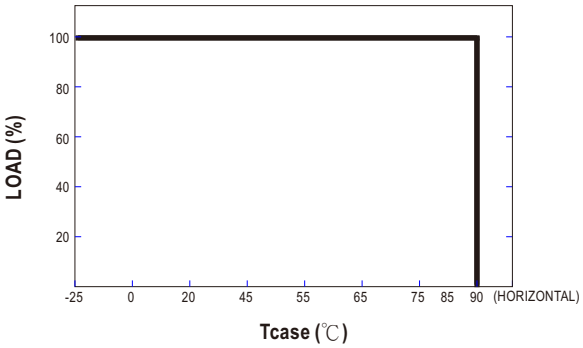


$$\text{Duty cycle}(\%) = \frac{T_{ON}}{T} \times 100\%$$

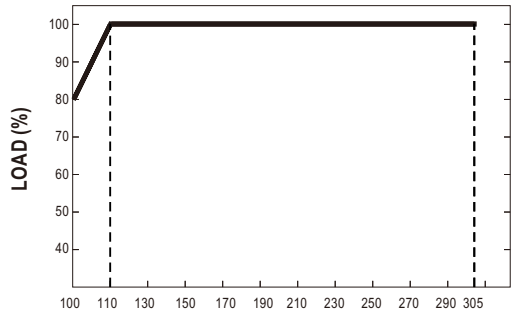
Output PWM frequency : 3.2kHz(Typ.)

■ OUTPUT LOAD vs TEMPERATURE



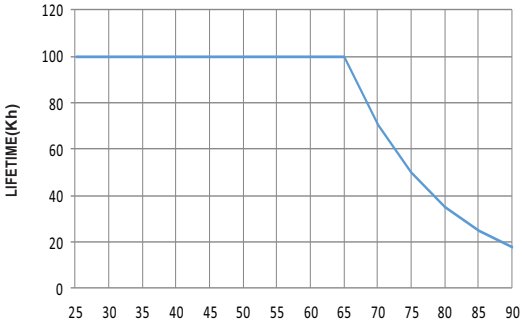


■ STATIC CHARACTERISTIC



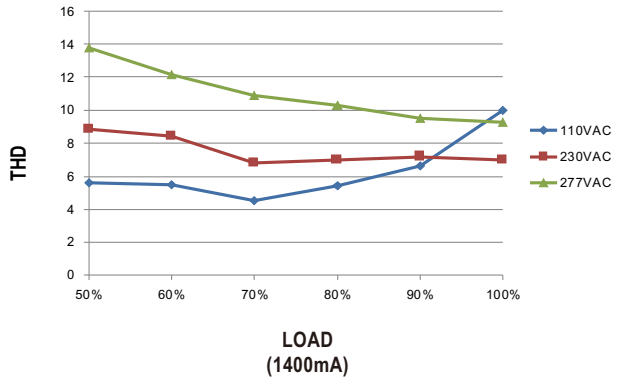
※ De-rating is needed under low input voltage.

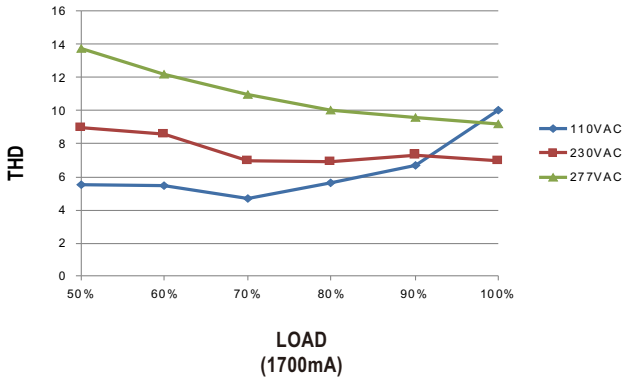
■ LIFE TIME



■ TOTAL HARMONIC DISTORTION (THD)

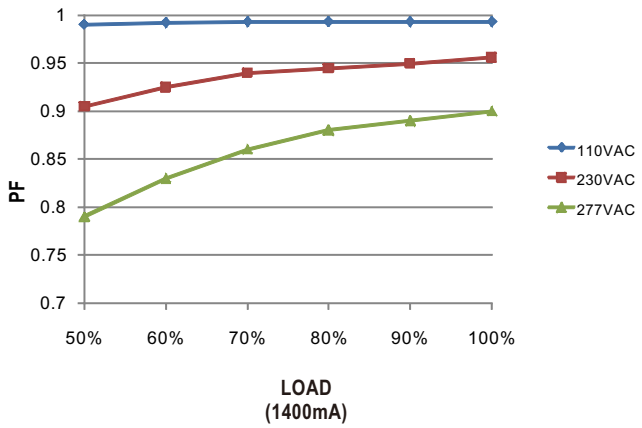
※ XLC-60-H-MA Modle, Tcase at 75℃

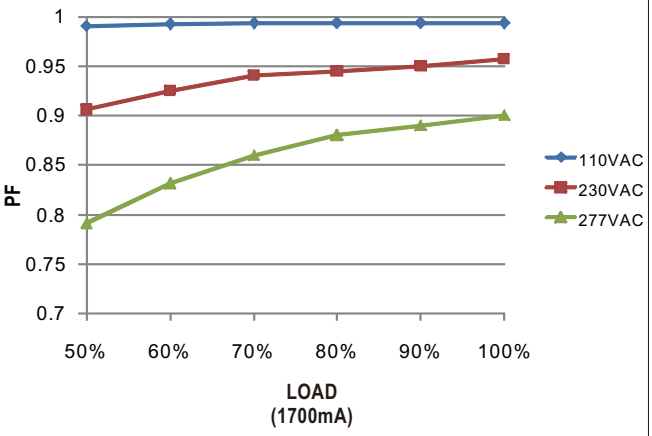




■ POWER FACTOR (PF) CHARACTERISTIC

※ XLC-60-H-MA Modle, Tcase at 75℃

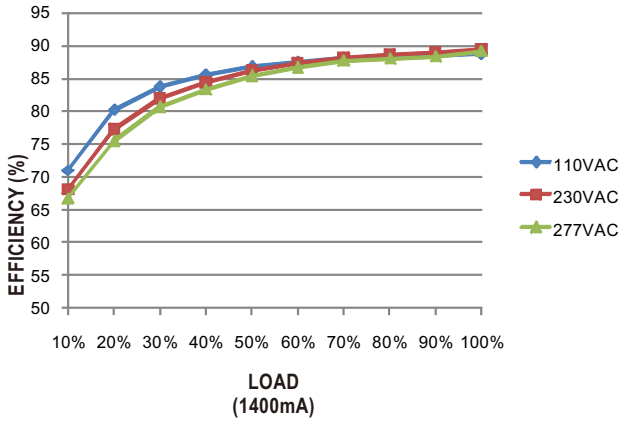


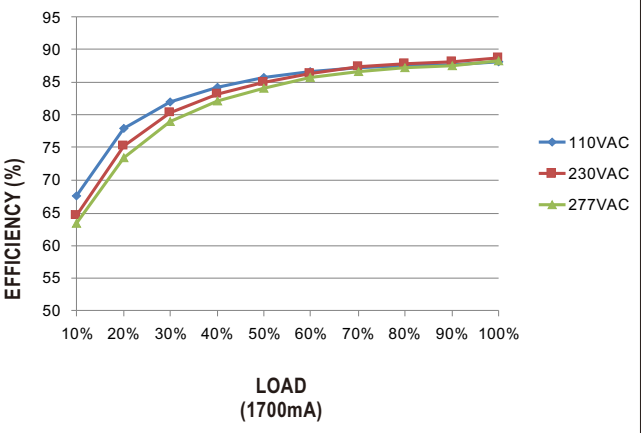


■ EFFICIENCY vs LOAD

XLC-60-H-MA series possess superior working efficiency that up to 90% can be reached in field applications.

※ XLC-60-H-MA Modle, Tcase at 75℃

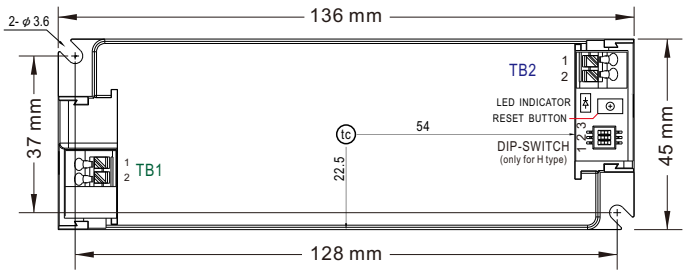




■ MECHANICAL SPECIFICATION

※ XLC-60-MA series Built-in Type

Case No.XLC-60
Unit:mm Tolerance:±1



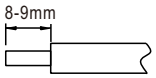
※Terminal Pin No. Assignment(TB1)

Pin No.	Assignment
1	AC/N
2	AC/L

※Terminal Pin No. Assignment(TB2)

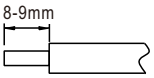
Pin No.	Assignment
1	+V
2	-V

TB1 wiring:



☐ **0.5-1.50mm²**

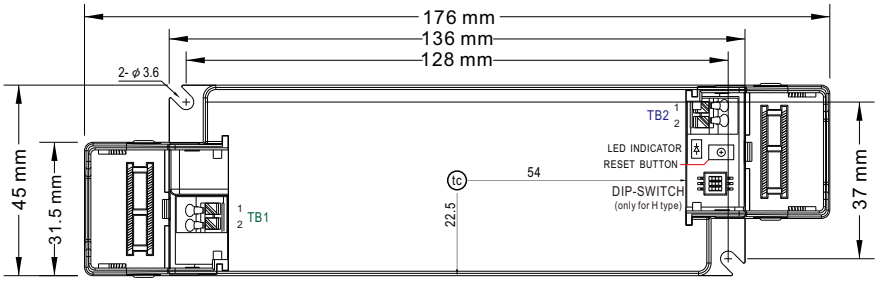
TB2 wiring:



☐ **0.5-1.50mm²**

※ XLC-60-MAS series Independent Type

Case No.XLC-60-S
Unit:mm Tolerance:±1



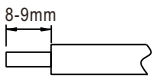
※Terminal Pin No. Assignment(TB1)

Pin No.	Assignment
1	AC/N
2	AC/L

※Terminal Pin No. Assignment(TB2)

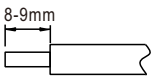
Pin No.	Assignment
1	+V
2	-V

TB1 wiring:



☐ **0.75-1.5mm²**

TB2 wiring:



☐ **0.5-1.5mm²**

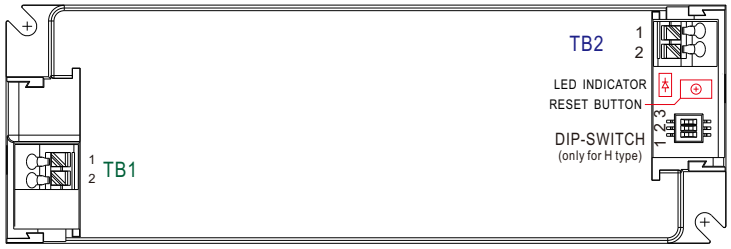
※LED indicator

Flash slowly	Factory Reset running.
Flash quickly	Factory Reset running.
Constantly ON	Matter wireless connected
Constantly OFF	Matter wireless disconnected and Bluetooth Broadcast OFF

■ FACTORY RESET

※ By RESET BUTTON

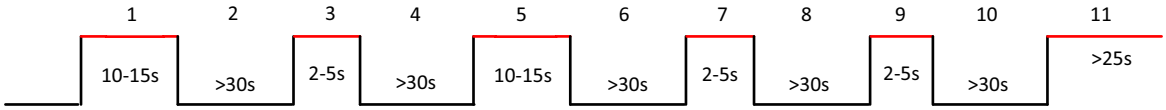
Press and hold the reset button for 10 seconds. When the LED indicator flashes quickly, release the button. The factory reset will then be completed.



※ By AC ON/OFF

To perform factory reset through AC ON/OFF, the following process must be strictly followed. If the AC ON/OFF process is correct, the output light will flash for 15 seconds. When the flashing stop, it means the factory reset is completed. This operation is consistent with thefactory reset effect performed by long-pressing the reset button.

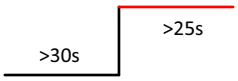
AC ON/OFF process to executes factory reset:



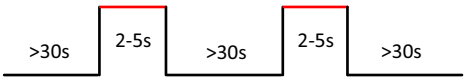
Phase	Duration	AC status
1	10-15s	ON
2	>30s	OFF
3	2-5s	ON
4	>30s	OFF
5	10-15s	ON
6	>30s	OFF
7	2-5s	ON
8	>30s	OFF
9	2-5s	ON
10	>30s	OFF
11	>25s	ON(should wait until output light stop flashing)

If there is a malfunction in the 'AC ON/OFF process', the process can be reset by the following method, starting from stage 1 again.

Method 1: AC ON time exceeds 25 seconds



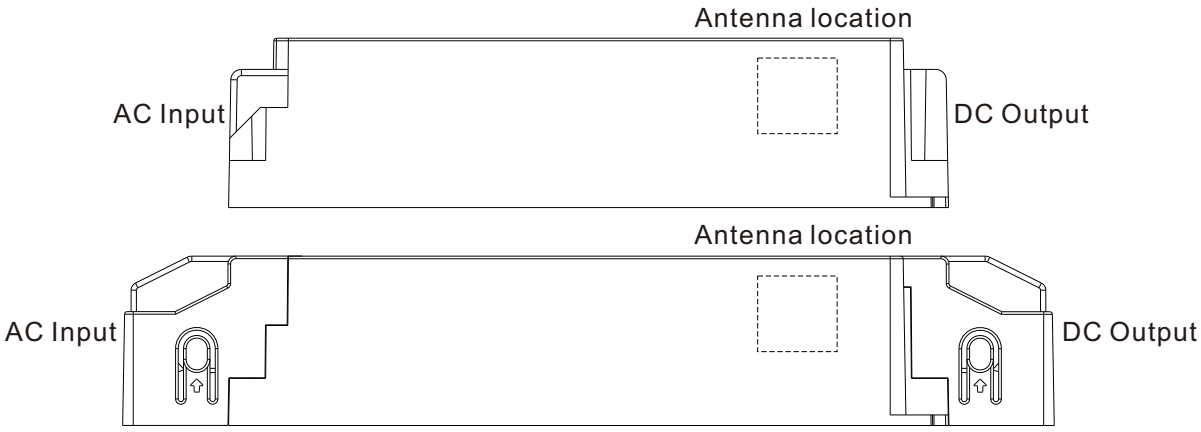
Method 2: AC ON times for 2-5s and twice



■ PLACEMENT

Matter device has an integrated antenna for easy integration. In order to maximize the range in every direction, some design guidelines should be taken into consideration when mounting the device.

The antenna positions of the device are shown in the figure below:



- Keep the device as far away as possible from vertical metal structures.
- When the device is mounted on a metal plate, the antenna should not be obscured, and there needs to be a cutout under the antenna to ensure that the RF signal can be transmitted.
- The device's communication range may be influenced by environmental factors and installation positioning, necessitating on-site adjustments and testing.

■ Installation Manual

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