

Specification

Customer: _____

Customer Code: _____

Product Name: Emergency LED Driver

Model No.: LF- GSP055YC1350U

Product Material No.: 1.1.0900550001

Specifications: AC100-277V DC27-40V 600-1350mA

Version: V1.1

Manufacturer: Lifud Technology Co., Ltd.

Customer Approval

Checked by	Reviewed by	Approved by

Lifud Approval

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1. Description

1.1 Application: Emergency LED lighting such as LED tube, panel light, tri-proof light, etc.

1.2 This is a emergency LED driver equipped with high quality CC LED driver chips and high speed MCU. When there's power failure, the driver will switch to emergency mode smoothly.

1.3 This product was specifically designed for LED emergency lighting. It integrates the management of intelligent charging and discharging with intelligent constant current LED driver. This product is more reliable compared with the traditional design which combines charging-and-discharging controller with intelligent LED driver.

1.4 The whole system use the software algorithm designed by Lifud R&D team, combining with efficient constant current chips. It can achieve 3-wire emergency lighting. (In this 3-wire solution, the switch connected in series can turn on/off the light normally).

1.5 The product has over-charging protection, over-discharging protection, short-circuit protection for output, open-circuit protection for output and reverse connection protection for the battery.

1.6 Five years warranty will be offered for the driver under these condition: AC:220V, DC:27-40V, 600-1350mA and $T_c < 60^\circ\text{C}$.

1.7 The appropriate ambient temperature for this product is within $0-50^\circ\text{C}$. In emergency mode, the output voltage range is 27-40V and the output current range is 200-350mA. The battery pack can discharge for at least 2 hours.

2. Product Picture



The picture is for reference only.

Safety tips instructions:

- ① It is recommended that the customer install protection devices for over-under-voltage protection and surge protection in the power supply circuit of the light fixture, for safety concern.
- ② The PC cover, housing, end caps and other parts of the LED driver inside the LED light fixture must conform to UL94 V-0 flammability standard or above.

3. Input Characteristic

Name	Min	Rated	Max	Units	Remark
Input Voltage	90	110/277	305	Vac	For UL
	90	110/220	264	Vac	For CE
Input Frequency	47	50/60	63	HZ	
Input Current	--	--	0.9	A	90Vac Full load
Inrush Current (cold start)	--	--	60/400	A/uS	220Vac Full load
			60/300	A/uS	277Vac Full load

4. Load Characteristic

Name	Min	Max	Unit	Remark
Start-up Delay Time	--	<0.5	S	110Vac Full Load
	--	<0.5	S	220Vac Full Load
Input Line Regulation	--	≤5	%	40Vdc Full Load
	--	≤5	%	30Vdc Light Load
Output Line Regulation	--	≤5	%	110Vac Input
	--	≤5	%	220Vac Input
No-load Power Consumption	--	3	W	110Vac Input
	--	4	W	220Vac Input
Temperature Drift	--	≤10	%	110Vac Full Load
	--	≤10	%	220Vac Full Load

5. Electrical Performance

5.1 Parameter Table

Output Voltage Range	Output Current Range	Output Power	Input Voltage	Power Factor	Efficiency	Harmonic Current	Output Ripple Voltage	Current Tolerance
(Unit: Vdc)	(Unit: mA)	(Unit: W)	(Unit: Vac)	(Unit: %)	(Unit: %)	(Unit: %)	(Unit: Vdc)	
27-40	600-1350	54	110	≥0.97	≥80	≤20	≤4	±5%
			220	≥0.93	≥81	≤20	≤4	±5%
			277	≥0.90	≥80	≤20	≤4	±5%

Remark:

1. The parameters above are test results under full load and with Battery.
2. The parameters above includes all variants based on standard model. If special parameters are required, Lifud R&D will do evaluation before deciding modification.
3. The data above are test results under ambient temperature of 25°C and humidity of 50% .

5.2 Battery Specification

Adapted for rechargeable Lithium Ion Battery

Nominal Voltage:14.8V±0.5V

Charging Mode : constant current / constant voltage; Charging Current: 220mA±30mA

Exhausted Voltage: 12V

Limit Charging Voltage : 16.8V

Charging Time=1.1*C/ 0.220;

Discharging Time=C/ [(Vo *Io)/(12*0.9)] *α;

(C: Capacity Ah; Vo: Emergency Lighting Voltage; Io: Emergency Lighting Current; α: correction factor. When battery voltage <14.5V, α=0.9; when battery voltage >14.5V, α=1; Calculating unit: hour)

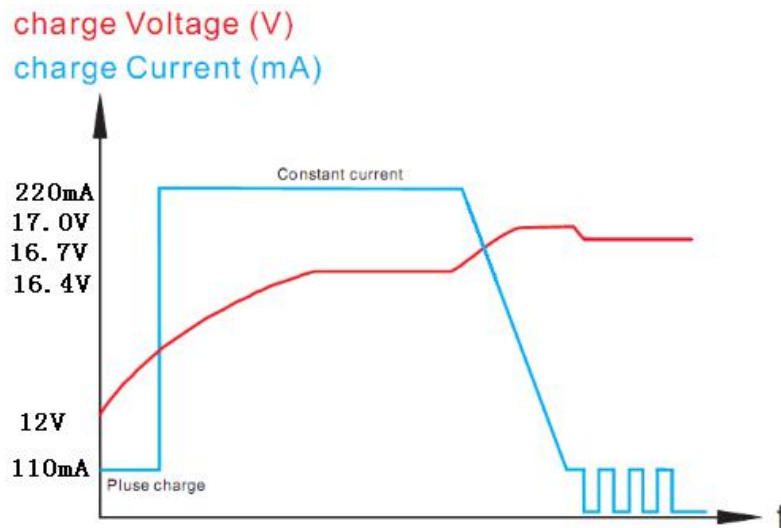
The recommended battery capacity is 2.6Ah.

5.3 Intelligent Charging and Discharging

5.3.1 Charging Method

- 1) $12V \pm 0.5V < \text{Battery voltage} < 16.4V \pm 0.5V$; Charging Current : constant current of $220mA \pm 30 \text{ mA}$;
- 2) $16.4V \pm 0.5V < \text{Battery voltage} < 16.7V \pm 0.5V$; Charging Current : constant current of $110mA \pm 20 \text{ mA}$;
- 3) $16.7V \pm 0.5V < \text{Battery voltage} < 17V \pm 0.5V$; Batch charging: Charge 10 seconds and then keep discharging mode for 2 minutes; Charging Current: constant current of $110mA \pm 20 \text{ mA}$;
- 4) $17V \pm 0.5V < \text{Battery voltage}$; battery charging shuts down.

Charging Curve



5.3.2 Discharging Management

Battery voltage $< 12V \pm 0.5V$, battery discharging shuts down;

5.4 Description of LED Indicator Light

5.4.1 AC powered status

- a. The normal status of the battery is when the battery voltage is within $13.5-17.5V (\pm 0.3V)$: LED indicator keeps on. (When the battery is charging or fully charged, the LED indicator keeps on.)
- b. The abnormal status of the battery is when there's no battery or when the battery voltage is too low or too high:

LED indicator flashes with a 0.5 sec interval (0.5 sec on, 0.5 sec off).

5.4.2 Battery powered status

- a. Battery voltage $16.7V \pm 0.5V$ --- $17V \pm 0.5V$: LED indicator flashes with a 3 sec interval. (3 sec on, 3 sec off)
- b. Battery voltage $16.4V \pm 0.5V$ --- $16.7V \pm 0.5V$: LED indicator flashes with a 2 sec interval. (2 sec on, 2 sec off)
- c. Battery voltage $12V \pm 0.5V$ --- $16.4V \pm 0.5V$: LED indicator flashes with a 1 sec interval. (1 sec on, 1 sec off)

5.5 DIP Switch States Description

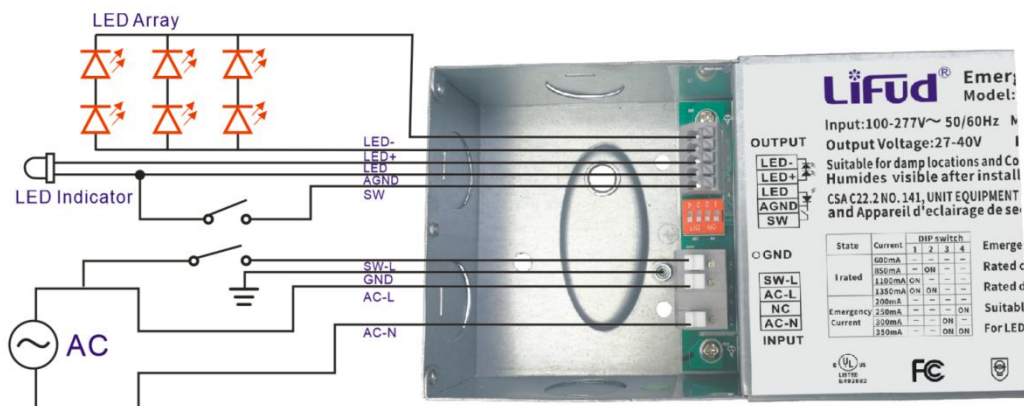
DIP switch nature	Output current adjustment switch			Emergency current adjustment switch		
DIP switch state	Switch state		Output current	Switch state		Emergency current
	DIP1	DIP2		DIP3	DIP4	
	0	0	600mA	0	0	200mA
	0	1	850mA	0	1	250mA
	1	0	1100mA	1	0	300mA
1	1	1350mA	1	1	350mA	

Four DIP switches stand for 16 states. Customers can set the output current and emergency current.

Output current range: 600mA to 1350mA($\pm 5\%$); emergency current range: 200mA to 350mA($\pm 40mA$).

5.6 Wiring Diagram & Function Description

5.6.1 Wiring of Three-Wire Input and Output



1) Wiring instruction:

- SW-L: Connect SW-L to the control switch. The other end of the control switch connects to AC-L so that this light fixture can share the same switch with other light fixtures.
- AC-L: AC live wire input.
- AC-N: AC neutral wire input.
- GND: AC ground wire input.
- Install the auto-reset button and the indicator light to the panel. (This part can be skipped if the panel is not wanted.)
- SW: connect to the white wire of the auto-reset button
- AGND:output ground wire; Connect AGND to the black wires of the auto-reset button and indicator light.
- LED: connect to the red wire of the indicator. It applies to the indicator light of $V_F \leq 3.3V$.
- LED+/LED-: the positive and negative poles of the LED light fixture.

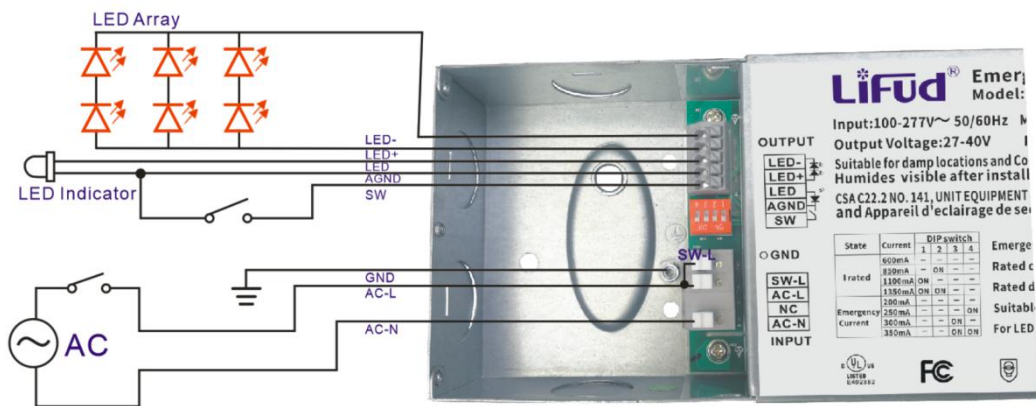
2) Control Instruction:

A) SW-L control switch: It turns on / off the light. (The light is on when control switch is on. The light is off when control switch is off).

B) SW control switch: it is suggested to connect the external auto-reset button. Press the button, then it turns to emergency status. Release the button, then it returns to normal status. (The light is on when control switch is on. The light is off when control switch is off).

C) SW control switch: press the button for 0.5 second → release it for 0.5 second → press again for 0.5 second → release again for 0.5 second → press the 3rd time for 0.5 second → release. If the LED light turns off, it's normal phenomenon. This is how to turn off the light of the two-wire wiring. If the wiring is of 3 wires, just skip this function.

5.6.2 Wiring of Three-Wire Input and Output



1) Wiring Instruction:

- SW-L: Connect SW-L to the control switch. The other end of the control switch connects to AC-L. The light fixtures cannot share one switch. During normal application, this switch is always in ON status.
- AC-L: Connect AC-L to SW-L.
- AC-N: AC neutral wire input.
- GND: AC ground wire input.
- Install the auto-reset button and the indicator light to the panel. (This part can be skipped if the panel is not wanted.)
- SW: connect to the white wire of the auto-reset button
- AGND: output ground wire; Connect AGND to the black wires of the auto-reset button and indicator light.
- LED: connect to the red wire of the indicator. It applies to the indicator light of $V_F \leq 3.3V$.
- LED+/LED-: the positive and negative poles of the LED light fixture.

2) Control Instruction:

A) SW-L control switch: When this control switch is on, the LED light is on. When it is off, the light turns to emergency status. Turn the switch on and off for more than twice within 5 seconds and the switch ends up in the ON status, the LED light turns off. (Within 5 seconds: off→on→off→on. Suggested frequency: 1Hz. If you turns on and off too quickly, the system will fail to detect these on / off actions.)

B) SW control switch: It is suggested to connect the external auto-reset button. Press the button, then it turns to emergency status. Release the button. The button will reset. Then the LED light turns on.

C) SW control switch: press the button for 0.5 second → release it for 0.5 second → press again for 0.5 second → release again for 0.5 second → press the 3rd time for 0.5 second → release. The LED light turns off.

5.6.3 Battery Wiring:

1) BAT+/BAT-: positive and negative poles of the battery

2) The built-in battery pack uses the standard lithium battery 18650 (rated 3.7V, 2600mA) in 4 series whose rated voltage is 14.8V. The batteries among the goods we ship are in disconnected status. Put the male plug into the female plug and then the battery will work. The socket has anti-reverse connection design.

6. Protection Requirement

Protection Item	Functional Index	Remark
open-circuit protection	Output voltage $\leq 55Vdc$	latch mode or constant voltage mode
short-circuit protection	When the output is of short-circuit, the input power $\leq 5W$.	tested without battery

7. Environment Requirement

Name	Min	Rated	Max	Unit	Remark
Operating Temperature	0	25	50	°C	
Operating Humidity	10	--	90	%RH	No condensation
Storage Humidity	5	--	90	%RH	No condensation
Storage Temperature	-40	--	80	°C	
atmospheric pressure	86	--	106	KPa	

8. Reliability Requirement

MTBF Life Time Calculation: at least 50,000 hours under the conditions of rated input, full load and ambient temperature of 25°C.

9. Certification Standard

9.1 Safety Compliance

Dielectric Strength (Hi-pot)	Primary to Secondary: 3750Vac 10mA Max./60 Seconds
	Primary to Earth: 1500Vac 10mA Max./60 Seconds
	Secondary to Earth: 500Vac 10mA Max./60 Seconds
Grounded Resistance	<0.1Ω, 25A, 1 Minute
Leakage Current	0.75mA Max.at Input 277ac/50Hz.
Insulation Resistance	The insulation test is conducted by adding a 500Vdc between primary and secondary side. Minimum insulation resistance: 100MΩ.

Safety Compliance	Country	Standard	Status
UL	North America	UL8750; UL1310/UL1012; CAN/CSA-C22.2 No.223-M91	Meet the standards

CE	Europe	EN61347-1:2008 +A1:2011+A2:2013; EN61347-2-13:2006	Meet the standards
IEC	All IEC Countries	IEC61347-1:2007 +A1:2010+A2:2012; IEC61347-2-13:2006	Meet the standards
GB	China	GB19510.1-2009; GB19510.14-2009	Meet the standards

9.2 EMI / EMS Standard

9.2.1 EMI Standard

<p>CI SPR15/A2:2008</p> <p>IEC61547:2009: Equipment for general lighting purposes -- EMC requirements;</p> <p>EN55015:2013 : Limits and measurement methods of radio disturbance characteristic of electrical lighting and similar equipment;</p> <p>GB17743:2007 : Limits and measurement methods of radio disturbance characteristic of electrical lighting and similar equipment;</p> <p>EN61547:2009: general lighting device -- EMC mandatory requirement;</p>

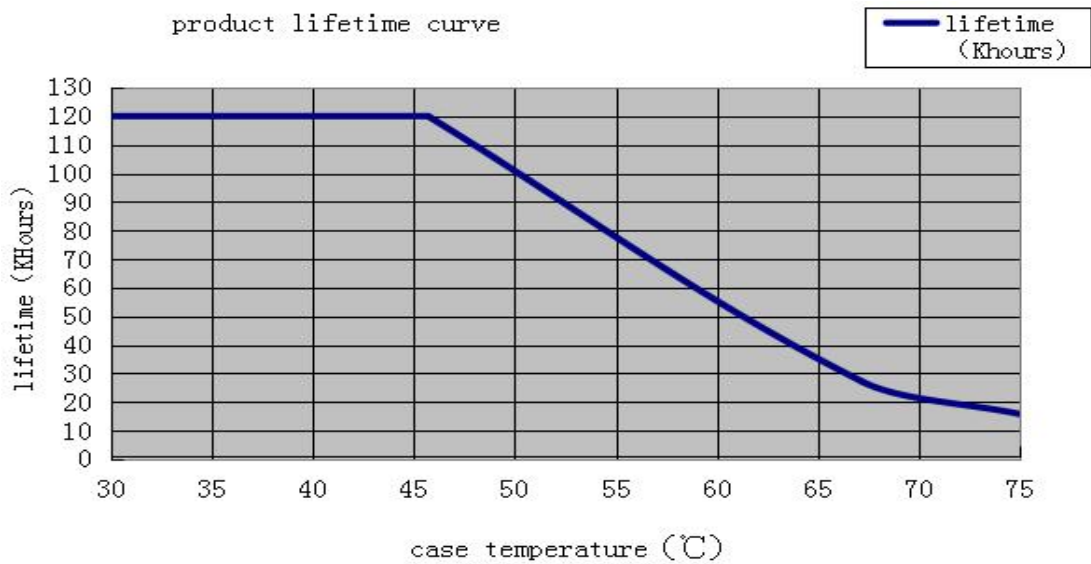
9.2.2 EMS Standard

<p>GB17743</p> <p>GB17625.1-2012</p>	Electromagnetic Compatibility-Limits- Limits for Harmonic Current Emissions.
<p>IEC61000-3-2:2009</p> <p>EN61000-3-2:2009</p>	Harmonic Current Emissions, Class C.
<p>IEC61000-3-3:2008</p> <p>EN61000-3-3:2008</p>	Voltage Fluctuations & Flicker Range.
<p>IEC 61000-4-2</p> <p>EN 61000-4-2</p>	Electrostatic Discharge (ESD): 8KV Air Discharge, 4KV Contact Discharge
<p>IEC 61000-4-3</p> <p>EN 61000-4-3</p>	Radiation, radio frequency electromagnetic field anti-interference test
<p>IEC 61000-4-5</p> <p>EN 61000-4-5</p>	Radiation, radio frequency electromagnetic field anti-interference test

EN 61000-4-8	Power Frequency Magnetic Field Test
IEC 61000-4-11 EN 61000-4-11	Voltage Dips

10. Product Lifetime Curve

The curve below illustrates the driver's lifetime data when the LED driver's Max. case temperature reaches 40°C, 50°C, 60°C, 70°C and 75°C.



11. Dimension

Net Weight: 890±10g/pcs

