

# Company Profile

Shamrock was funded in 2006 in Taipei. We are a analog IC design house focusing on constant current or constant voltage AC-to-DC and DC-to-DC IC for LED driver, switching power supply and Fan power drive.

## Product

- AC/DC Isolated Flyback CV PWM IC
- AC/DC Non-isolated CV Buck Controller IC
- AC/DC Active Power Factor Control IC
- AC/DC CC Buck Controller/Converter IC
- DC/DC CC Buck Controller/Converter IC

## Application

- DC-DC LED lighting
- Automotive LED lighting
- Stage lighting
- EC-FAN AC/DC power
- DOE5 power adaptor
- DOE6 power adaptor

# CC Mode LED Lighting Driver IC

Product	Package	Function	Application	Stage
SMD802	SOP-8	8V~500V constant current Buck IC	DC/DC, AC/DC LED lighting, PWM dimming and Analog dimming	MP
SMD803	ESOP-8	60V/2A MOS inside CC Buck IC	DC/DC LED Lighting	MP
SMD804	ESOP-8	60V/1.5A MOS inside Dimmable CC Buck IC	DC/DC LED Lighting, PWM dimming and Analog dimming	MP
SMD805	ESOP-8	100V/1A MOS inside CC Buck IC	DC/DC LED Lighting	MP
SMD806	ESOP-8	100V/1A MOS inside CC Buck IC	DC/DC LED Lighting, PWM dimming and Analog dimming	MP
SMD302	SOT26	Constant current Buck IC	AC/DC LED Lighting	MP
SMD2810	SOT26	Linear constant current IC	Low cost AC/DC, DC/DC LED Lighting	MP
SMD2812	ESOP-8	5V~100V CCR Linear Drive IC	Dimmable DC/DC LED Lighting	MP
SMD2832	ESOP-8	5V~100V CCR Linear Drive IC	500mA DC/DC LED Lighting	MP
SMD2840	ESOP-8	2-channel or 1-channel CCR IC	500mA~1A DC/DC LED Lighting	MP

# SMPS Flyback PWM IC

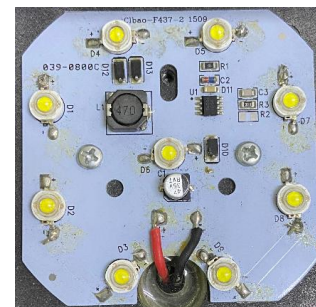
Product	Function	Application	Stage
SMD731	SMPS Flyback PWM IC	DOE 5 Power Adaptor	MP
SMD7321	SMPS Flyback PWM IC 65K/100K/133K	DOE 6 Power Adaptor	MP
SMD7325	SMPS Flyback PWM IC 65K/100K/133K	DOE 6 Power Adaptor	MP
SMD630	Active Power Factor Controller IC	Active PFC	MP
SMD601	Dual-OP and Voltage Reference	CC/CV power supply	MP

# Non-isolated AC/DC Constant Voltage Buck IC

Product	Function	Application	Stage
SMD911	Non-Isolated AC/DC CV Buck Controller IC	AUX Power, EC-FAN power	MP
SMD913	Non-Isolated AC/DC CV Buck Controller IC	AUX Power, EC-FAN power	MP
SMD914	Non-Isolated AC/DC CV Buck Converter	AUX Power, EC-FAN power	Available in 2022
SMD915	Non-Isolated AC/DC Current mode Flyback/Buck Controller IC	AUX Power, EC-FAN power	Available in 4Q/2021

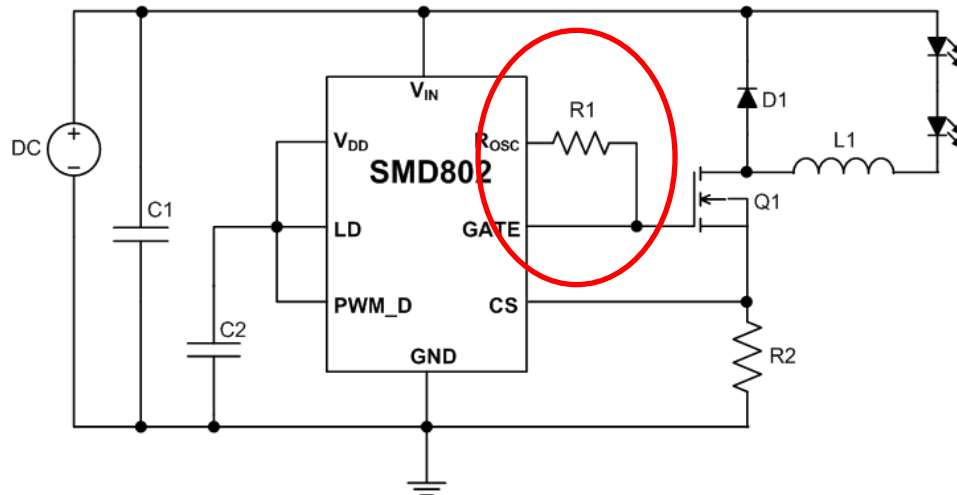
# High Power Car Exterior Lighting by - SMD802 -

- Applications : Car Head Light, Working Light, Driving Light
- SMD802 has been shipped for more than 10 Millions of pcs for high power DC-DC LED lighting applications:
  - Internal High-V (900V) regulator for any rush power-in
  - Chip-to-chip consistency
  - Stable quality for high power applications
  - High reliability in harsh environment



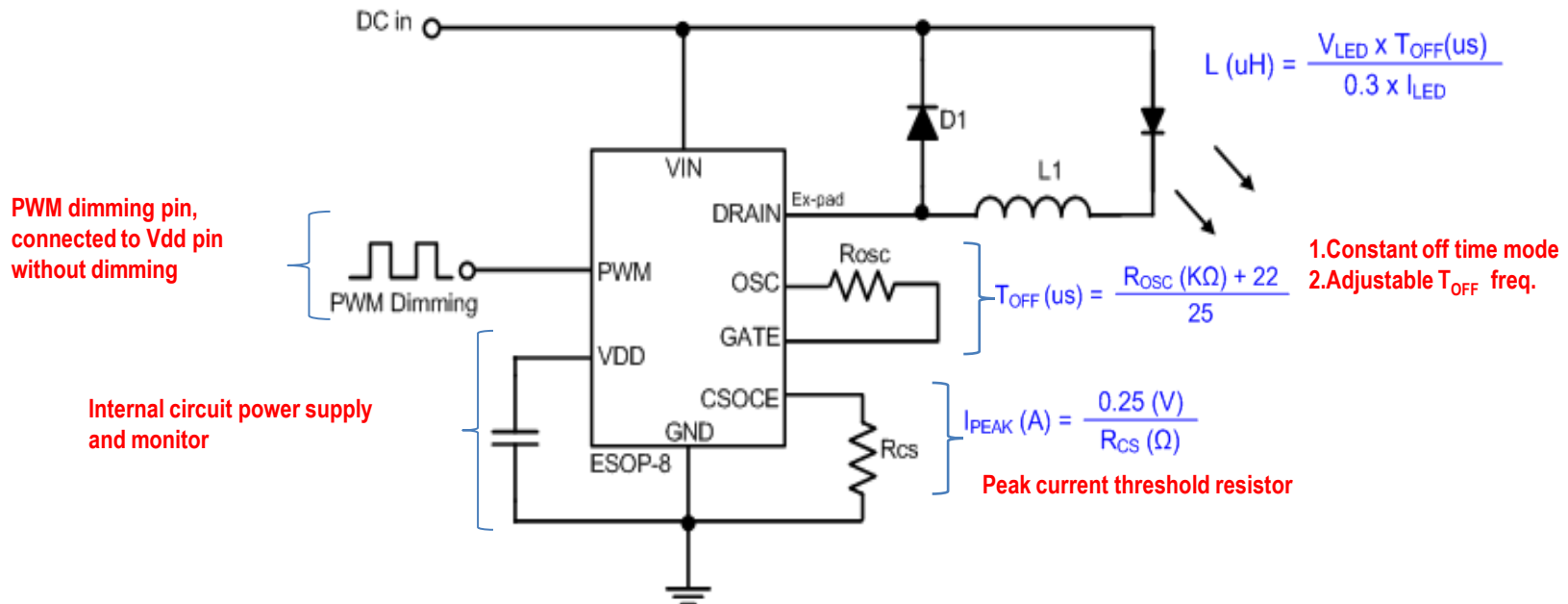
# SMD802 Constant-Off Time CC Buck Controller IC

- Operate at DC voltage 8V~500V or AC voltage 90V~264V
- Input Voltage Regulator up to 900V
- Support driving current up to several Ampere.
- Programmable oscillation frequency setting by external resistor up to 400KHz.
- Supports Fixed frequency mode (Only used for Duty Cycle < 50%) and Constant-off time frequency mode (Especially for Duty Cycle > 50%)
- Supports Analog dimming (LD) and PWM dimming (PWM\_D)
- Tolerance of CS pin voltage is  $\leq \pm 3\%$
- 1%~100% PWM dimming
- Over Temperature Protection
- SOP-8 package



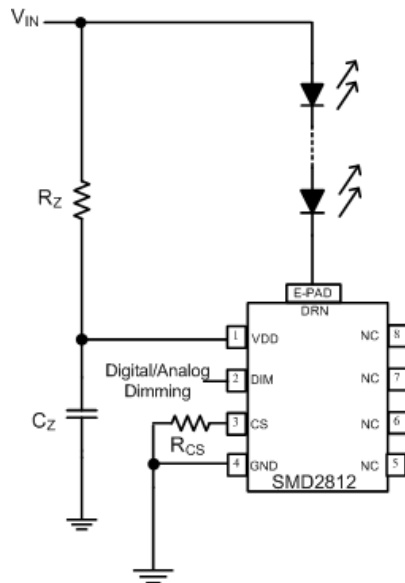
# SMD804 : DC-DC Constant-Off Time CC Buck Converter

- Common Anode Floating Buck Topology
- Peak Current Mode without loop back path
- MOSFET inside, Low  $R_{DS\_ON}=75m\Omega$
- Constant-off time frequency mode with maximal 95% Duty cycle
- Peak current mode threshold 240mV~260mV
- PWM dimming and CCR (Constant Current Reduction) dimming
- OTP= typ. 150°C
- ESOP-8
- Applications : DC-DC Lighting, Automobile Lighting, POE Lighting



# SMD2812 : Non-Switching CCR Linear LED Driver IC

- $V_{IN\_DC} = 5V \sim 100V$ ,  $V_{IN\_LED}$  ( $V_{DRN}$  of ExPAD) max. = 100V
- $I_{OUT\_max} * (V_{IN} - V_{LED}) < 1.2W$ (SMD2812), 1.6W(SMD2832), 2W(SMD2840)
- Built in 5V Zener clamp circuit for internal power supply
- Minimal operating voltage : DC 3V
- Adjustable constant current by external  $R_{CS}$
- Constant current threshold voltage  $V_{CS} \pm 3\%$
- SMD2812 supports both analog and digital dimming
- Over temperature Limit OTL @ 120°C
- Low EMI
- ESOP-8
- Applications : DC lighting, Automotive lighting, LED light belt



$I_{OUT}$  vs Maximal ( $V_{IN} - V_{LED}$ )

$I_{OUT}$	SMD2840+MOSFET
100mA	12V
200mA	6V
300mA	4V
400mA	4V
500mA	2.4V
600mA	Not recommended
700mA	Not recommended

Notes:

1. Maximal ( $V_{IN} - V_{LED}$ ) means in condition of testing demo board @ room temperature.

2. The real  $I_{OUT}$  vs ( $V_{IN} - V_{LED}$ ) is related to the heat sink design.



# EC-FAN

## -AC power driving DC Motor-



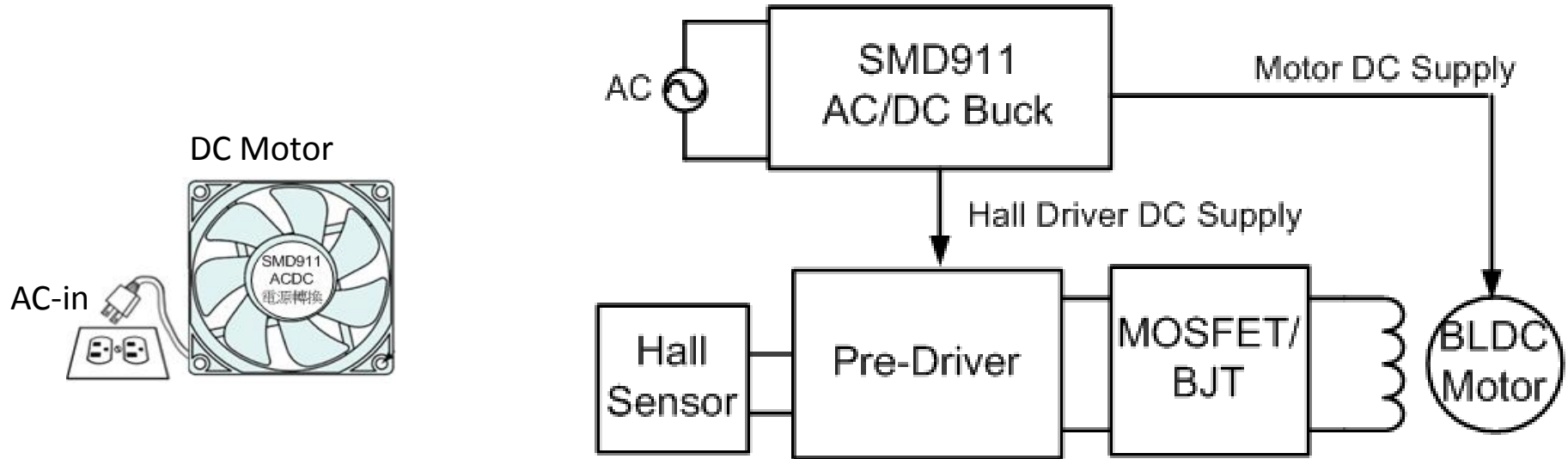
**Save Energy  
Save the Future.**

120x120x38    Ø200x77.4    Ø90.6x82

## EC Fan and Motor

For Commercial Refrigerators, Freezers, Beverage Coolers, Icemakers,  
Heat-pump Water Heaters, Heat-pump Dryers and Air-conditioning Application.

# ECFAN Power by SMD911

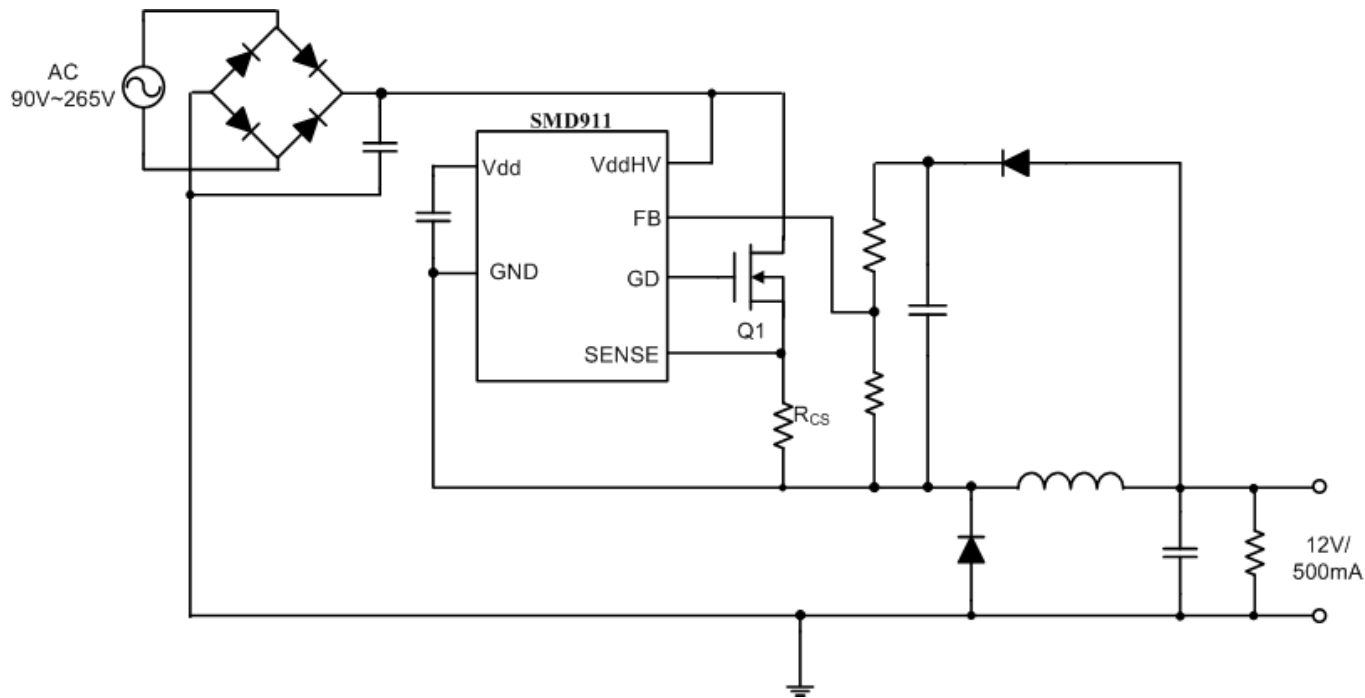


## AC Fan vs EC Fan vs DC Fan :

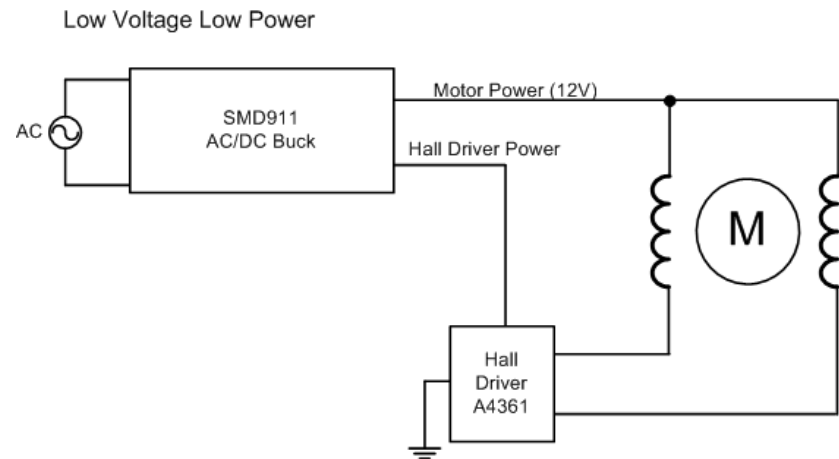
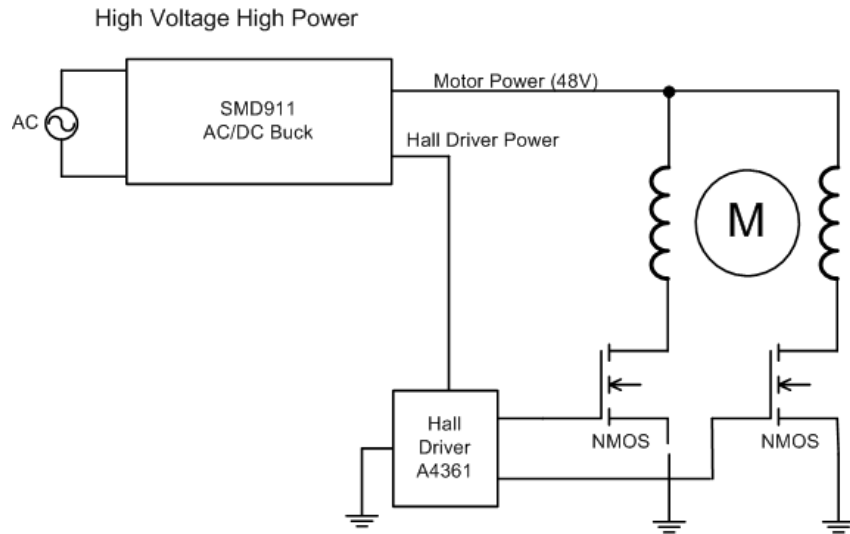
Fan Type	Motor Type	Fan Size (mm)	Input Voltage	Power (W)	Motor Speed (RPM)	Fan Air Flow (CFM)	Noise (db/A)
AC FAN	AC Motor	120x120x38	110Vac / 220Vac	23	3000	120	48
EC FAN	DC Motor	120x120x38	90Vac ~ 265Vac	7.5	3000	120	48
DC FAN	DC Motor	120x120x38	24Vdc	6	3000	120	48

# SMD911 Non-isolated AC/DC CV Buck

- Built-in 450V regulator, direct AC input 90V~265V
- External MOSFET for higher O/P current application
- Operating frequency up to 100KHz
- Closed loop output voltage feedback
- Built-in current limit adjusted by external resistor
- Built-in soft start circuit
- OTP= typ. 150°C
- SOP-8 package

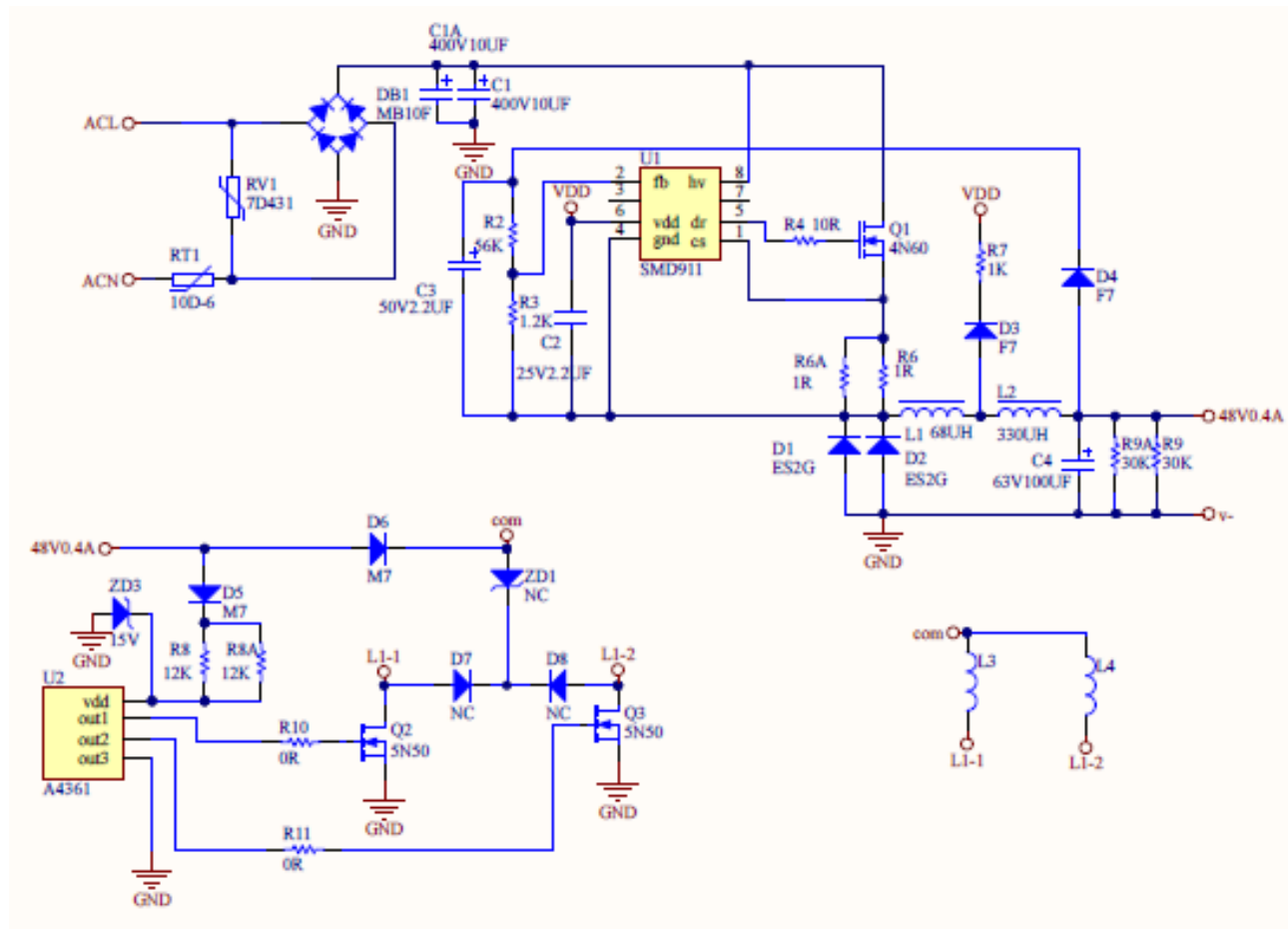


# Two-Phase ECFAN Solution

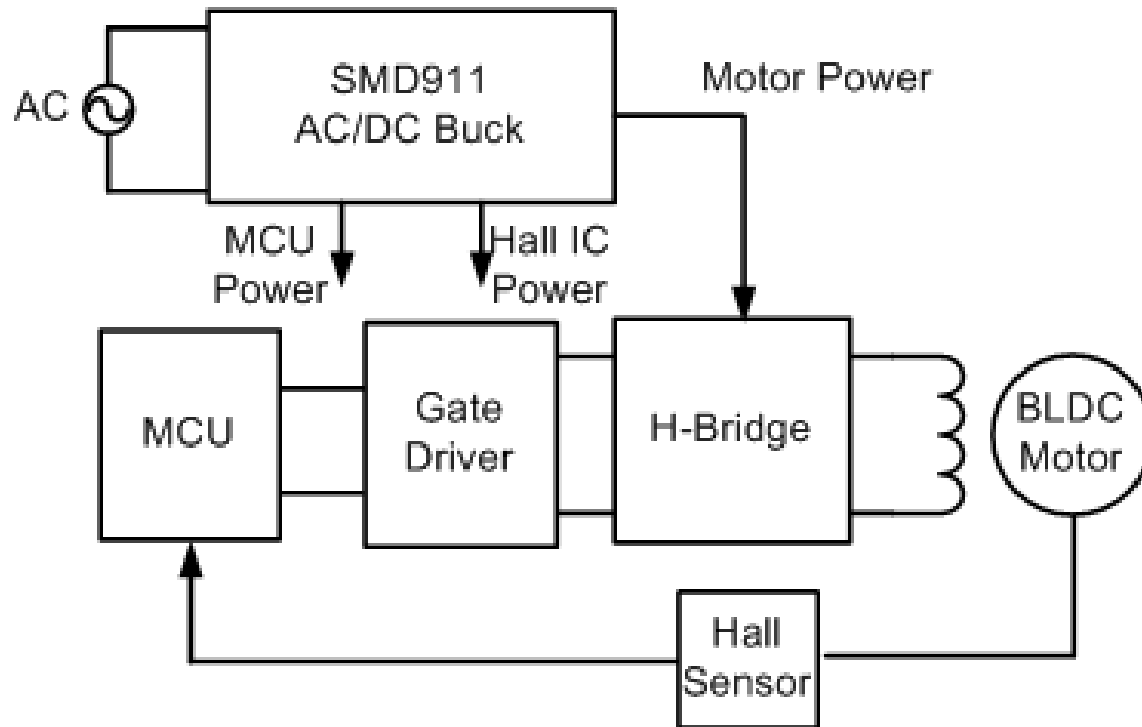


- AC/DC Power IC: Shamrock SMD911
- Hall Driver IC: MAT A4361
- 支援電動機 12V~48V
- 最大輸入功率 35W

# 22W Two-Phase ECFAN Design

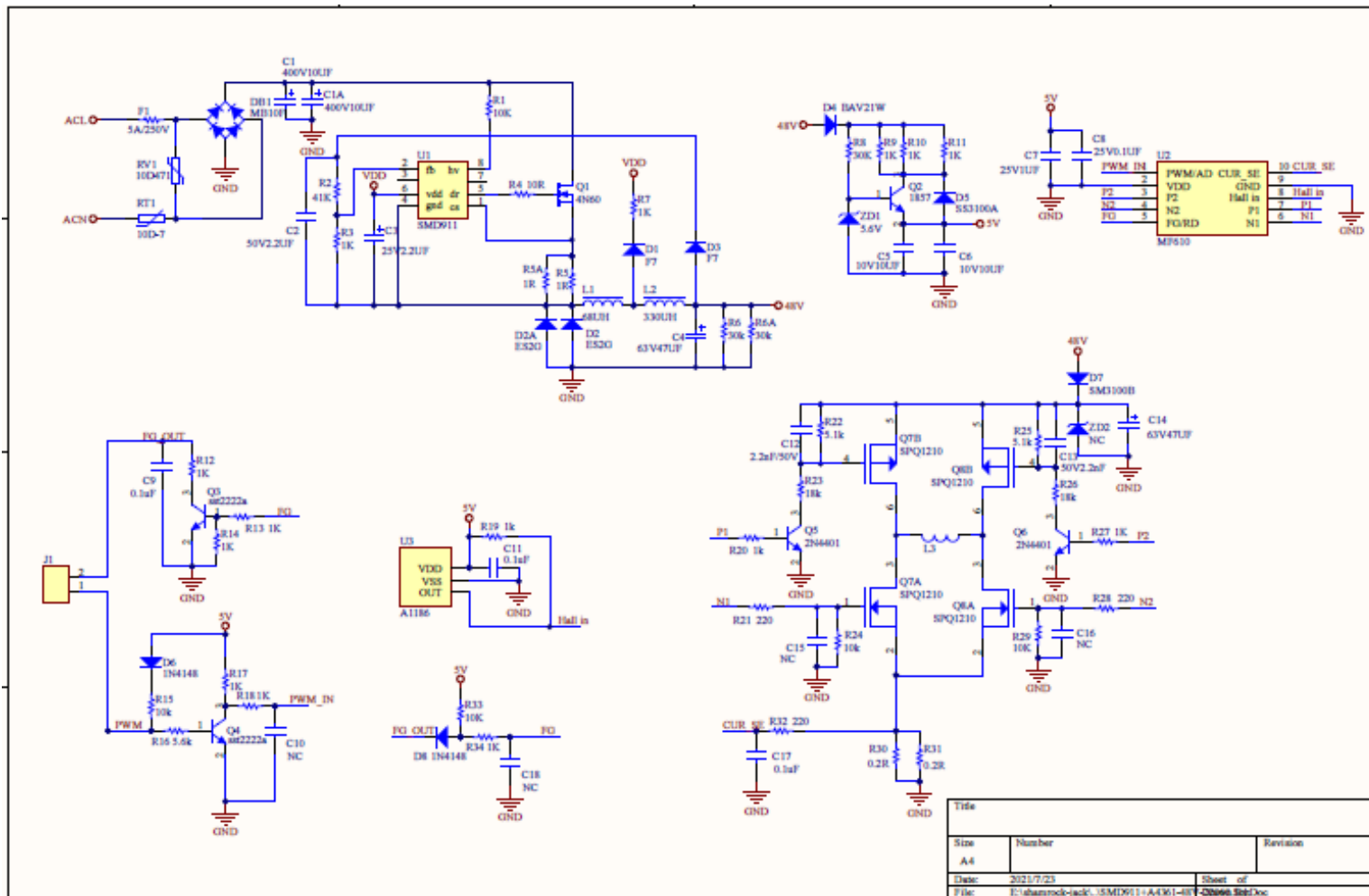


# ECFAN by One-Phase BLDC Motor

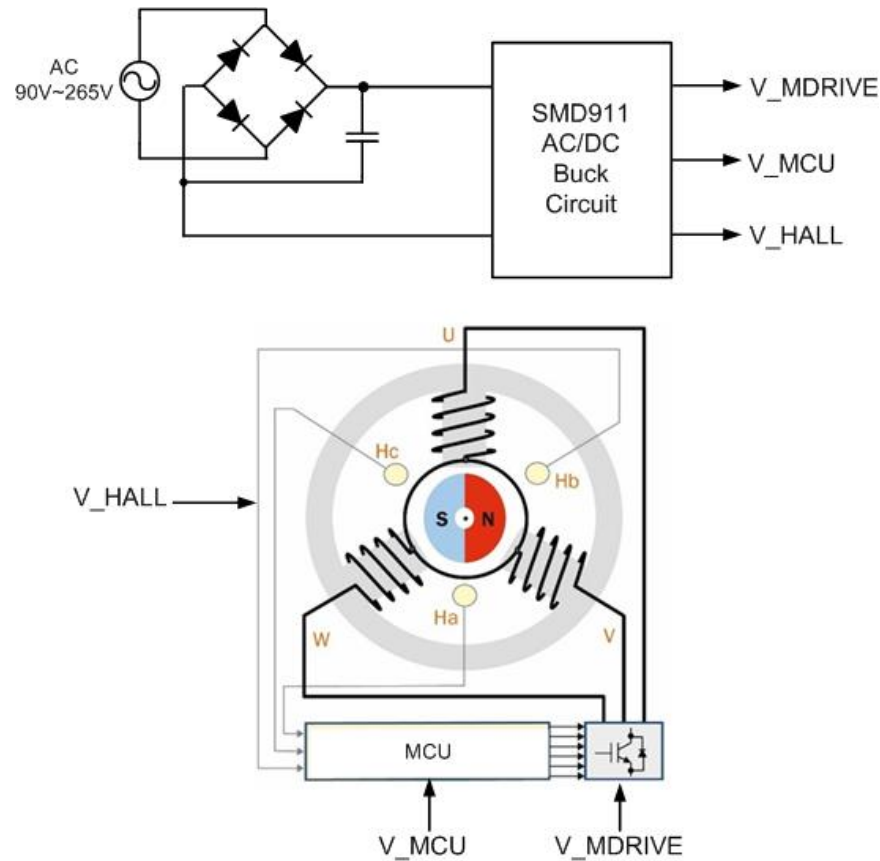


- AC/DC Power IC: Shamrock SMD911
- Hall Driver IC: MAT A1186
- MCU: PADAUK MF610
- 支援電動機 12V~48V

# ECFAN by One-Phase BLDC Motor Design



# ECFAN by Three-Phase BLDC Motor



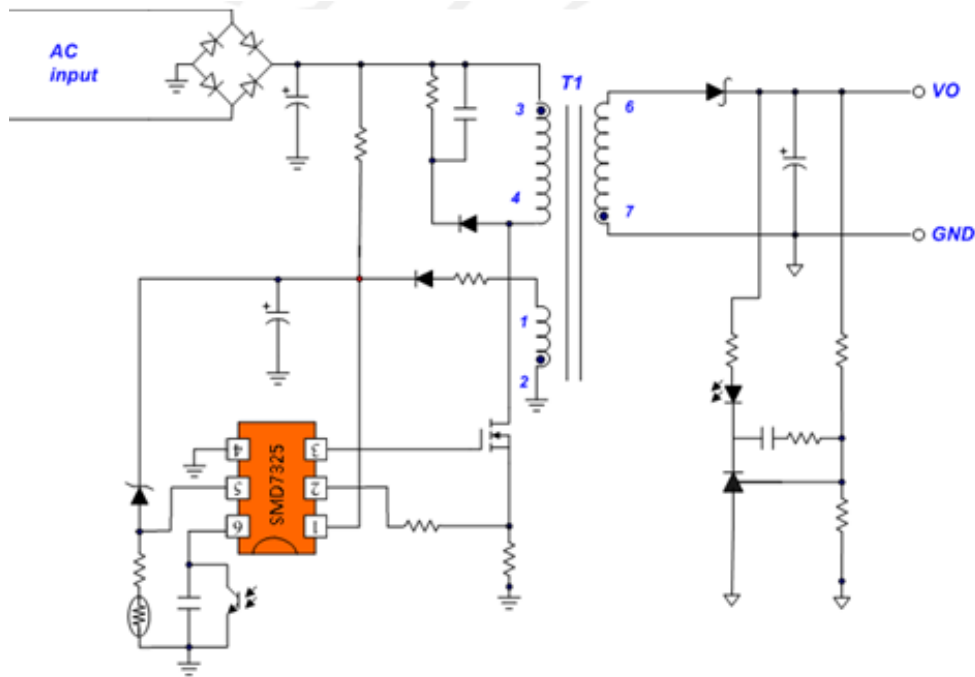
- AC/DC Power IC: Shamrock SMD911
- Hall Driver IC: MAT A1186 x 3
- MCU: PADAUK MF616



# SMD7321/SMD7325 SMPS PWM IC

- Meet DOE-6 and CoC V5 Tier2 specification
- Provide 12W~60W reference design and demo board
- Protection : OVP, OCP, OTP, OLP
- IC passed reliability and ESD test
- Demo Board meet EMI Conduction and Radiation test
- Senior FAE support
- Competitive price

# SMD7321 SMD7325 Flyback PWM IC



BOTTOM



- Flyback structure for 10W~60W power adaptor
- Efficiency and stand-by power consumption meet DOE6
- PWM output with flicker reducing EMI
- Burst mode frequency < 22KHz, no audible noise
- Support OCP, OVP, OTP and OLP
- External OTP/OVP detect pin
- SOT23-6 package

# Thank You !

# 謝謝您！

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