

SM2087

Features

- No transformer and high voltage electrolysis capacitor
- Integrated high voltage startup power supply circuit
- Adjustable output current, max 60mA
- Inter-chip current deviation $< \pm 5\%$
- Efficiency: $> 90\%$
- Power factor : > 0.95
- THD $< 20\%$
- Over temperature protection
- Application system no EMI problems
- Package: ESOP8

Applications

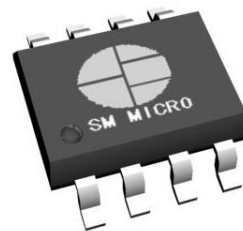
- LED constant current driver
- T5/T8 tube lamp
- LED bulb lamp
- LED ceiling lamp

General Description

SM2087 is a high power factor linear constant current LED driver which is applied to LED lighting. Through the distinctive constant current control technology, it realizes that constant current accuracy is less than $\pm 5\%$ and output current is adjustable through external resistor. High power factor and low harmonic distortion are the particular features.

The system is simple without transformer and electrolysis capacitor. Therefore, LED lighting batch job can be realized.

Pin Figure



Typical Schematic Circuit Diagram

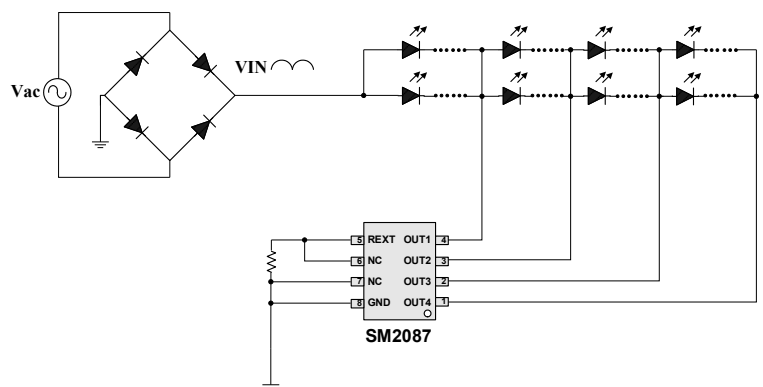
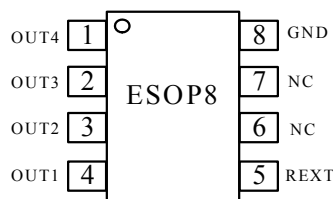


Diagram 1. SM2087 Typical Schematic Circuit Diagram

Pin Schematic Diagram



Pin Description

Pin	Pin Function
OUT1	Power input and constant current output port1
OUT2	current output port 2
OUT3	current output port 3
OUT4	current output port 4
REXT	Output current setting port
GND	GND

Limiting Values

Ambient temperature is 27°C if there is no special instruction.

Characteristic parameters	Symbol	Range
Operating temperature	TOPT	-20°C ~ +125°C
Storage temperature	TSTG	-50°C ~ +150°C
ESD voltage withstand	VESD	>2000V

Electrical Operating Parameters

Ambient temperature is 27°C if there is no special instruction.

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
OUT1 input voltage	V_{OUT1}	-----			6.5	V
Output current	I_{OUT}	-----	10		60	mA
REXT port voltage	V_{REXT}	$V_{OUT1} = V_{OUT4} = 10V$		0.9		V
OUT1/ OUT2 port withstand voltage	V_{DS_BV1}	$I_{OUT1} = I_{OUT2} = 0$	400			V
OUT3/ OUT4 port withstand voltage	V_{DS_BV2-4}	$I_{OUT3} = I_{OUT4} = 0$	250			V
IOUT accuracy	dI_{OUT}	$I_{OUT} = 10mA \sim 50mA$		±5		%
Over-temperature Protection point(1)*	TSC	-	-	110	-	°C

Note(1)*:When the junction temperature is over 110 °C, the output current of SM2082B will be reduced

Functional Description

SM2087 is constant current drive which integrates the functional module such as LED constant current control and OUT port high voltage drive. OUT1 port minimum input voltage is 6V ($I_{OUT} = 20mA$) and it can reach output current 10mA~60mA by external REXT resistor. Built-in LED constant current drive maintains LED current a high precision without impact of ambient temperature.

The chip can achieve high efficiency and high power factor by opening four switches one by one.

The chip output current is adjustable by REXT resistor $I_{OUT}=V_{REXT}/R$. Output current generated by four switches opening one by one is shown below:

$$I_{OUT1}=0.55V/R \quad I_{OUT2}=0.70V/R \quad I_{OUT3}=0.85V/R \quad I_{OUT4}=0.90V/R$$

Typical Application Circuit

◆ SM2087 Typical Application Circuit

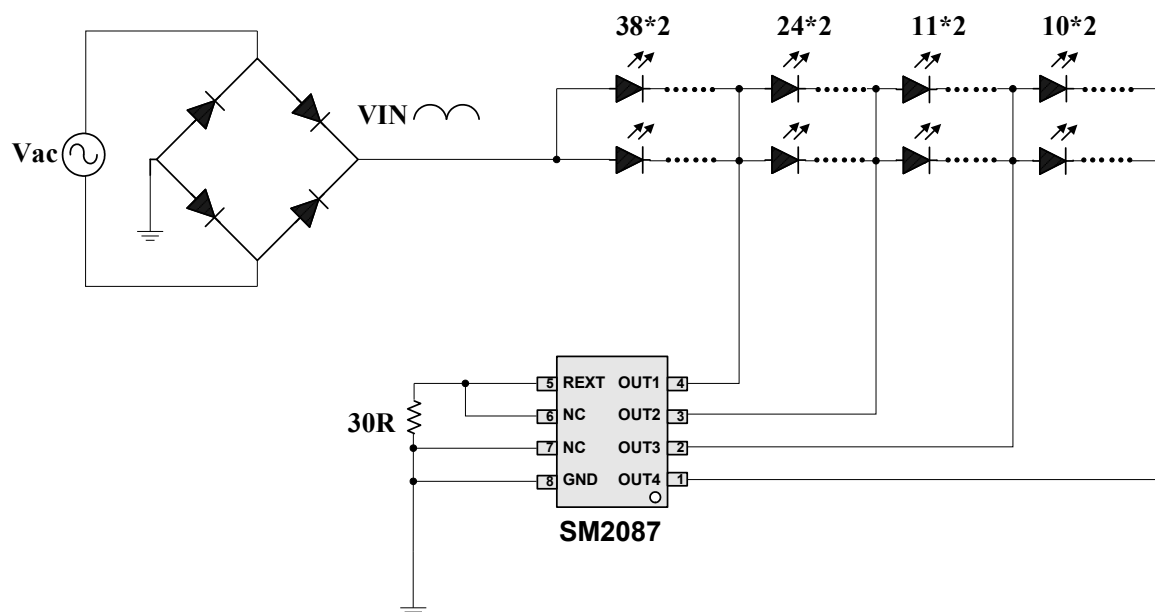


Diagram 2. SM2087 Typical Application Circuit

◆ SM2087 Parallel Application Circuit

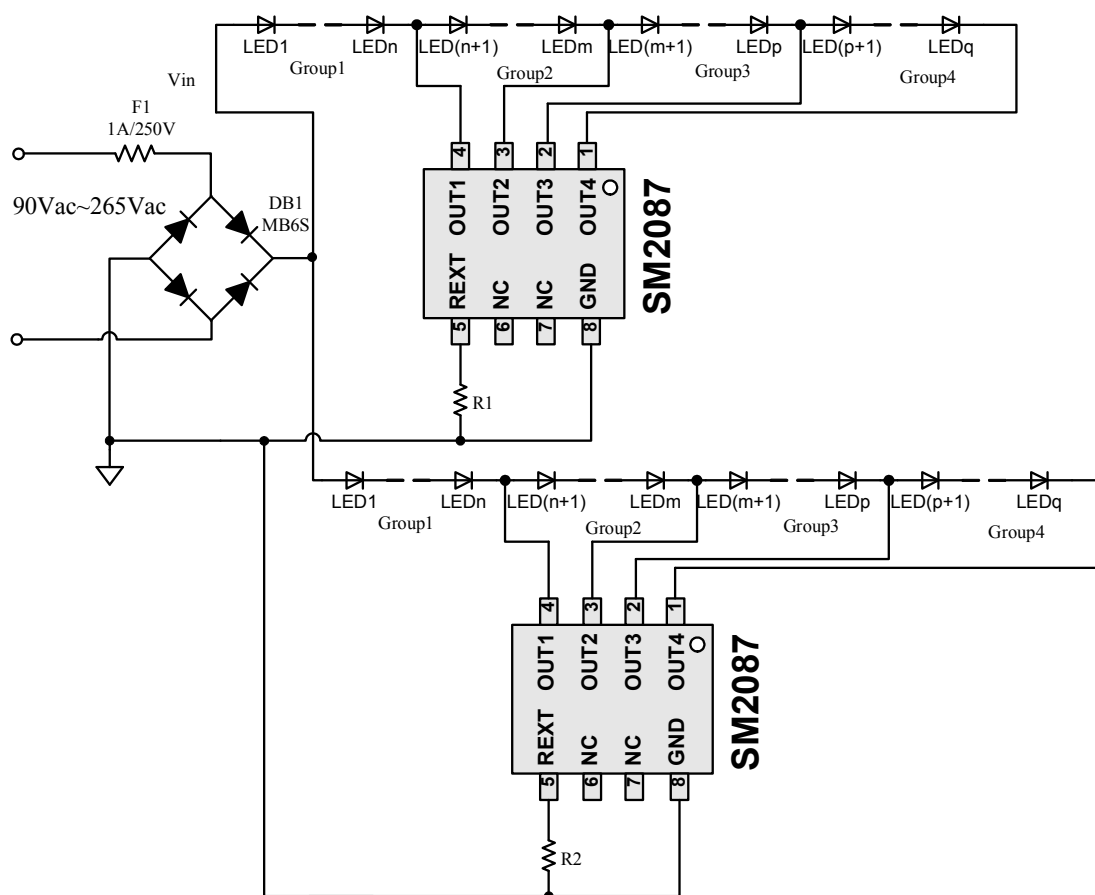
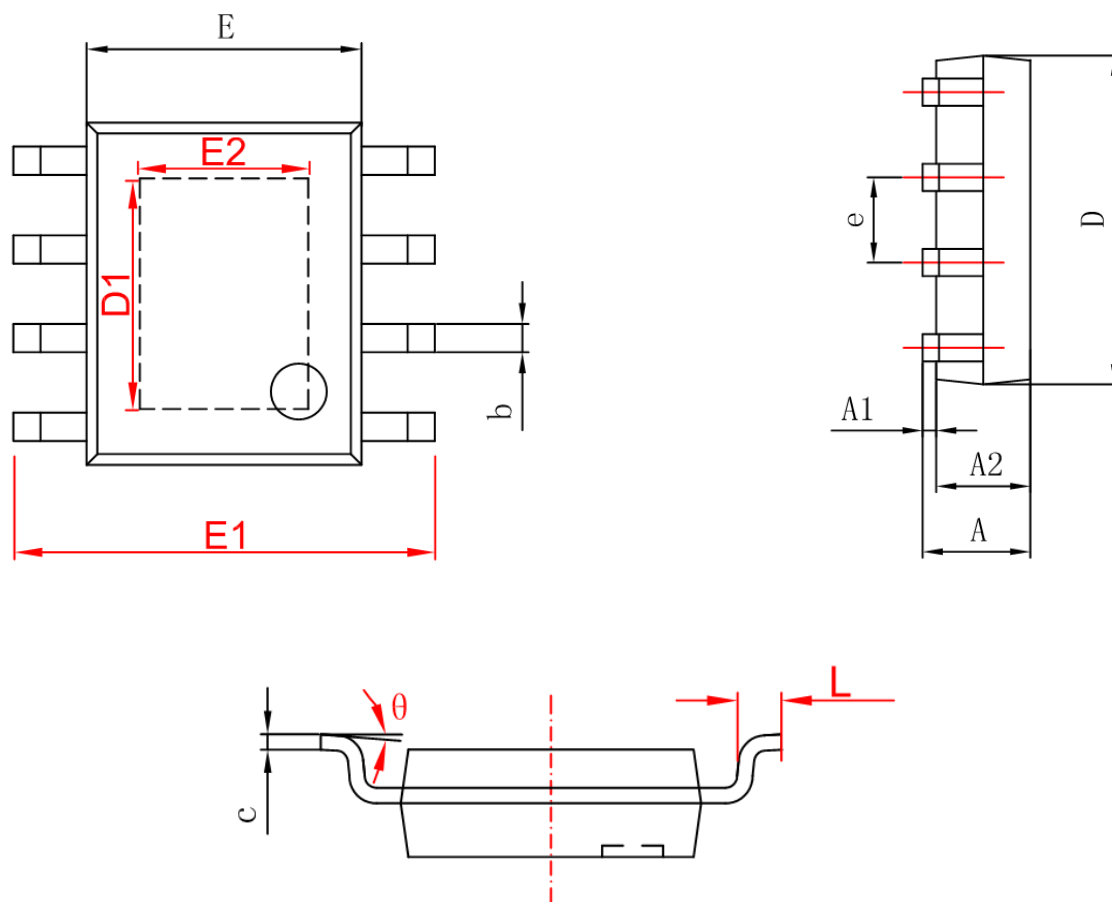


Diagram 3. SM2087 Parallel Application Circuit

Package

ESOP8



	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°