Descriptions：

RM9003BS is a high precision single channel LED linear constant flow drive control chip, integrated high voltage MOS can directly drive LED lights, which is mainly used in the drive of various light sources with high voltage input and lamps. The output resistance of the RM9003BS is set by the external Rext resistance, with a maximum filling current of 80mA, and has good constant current characteristics.

RM9003BS system has a simple structure, few peripheral components, no magnetic elements, and no EMI problems.

Features：

- The peripheral circuit is simple, with no magnetic elements
- Multi-chip parallel to do high-power application
- The chip can share the PCB board with the LED
- The LED current can be set externally
- There is no EMI problem with the chip application line
- Built-in 500V high-pressure MOS
- The chip has an over-temperature protection function
- Package：ESOP8,SOT89/3,TO252

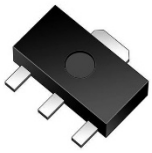
Applications：

- LED lighting

Package：

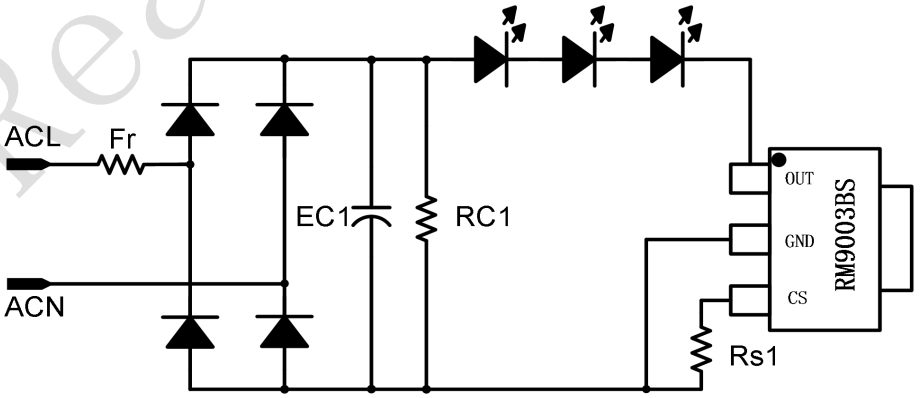
ESOP8

TO-252



SOT89/3

Typical application：



P1 RM9003BS LOW PF applications

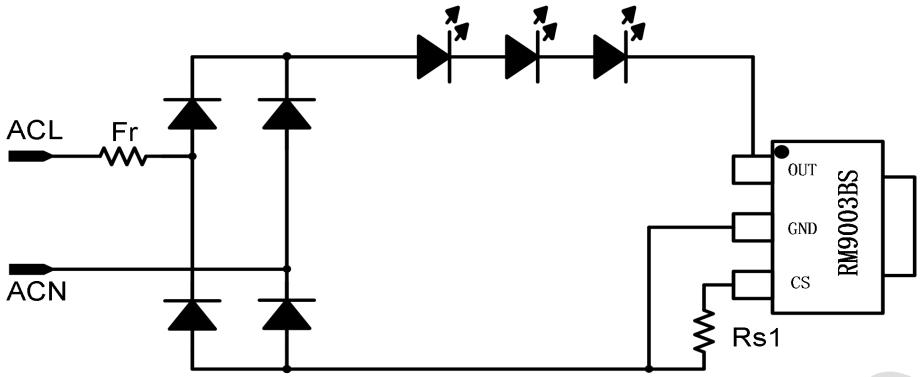


图 2　RM9003BS High PF applications

Pin Description：

Pin	Description	ESOP8	TO252	SOT89/3
OUT	Drain of built_in MOS	Pin 7	Pin 1	Pin 1
GND	Ground for internal circuitry.	Pin 1	Pin 2	Pin 2
CS	Current sense input of Sample	Pin 2	Pin 3	Pin 3
NC	No connect	Other Pin		

Ordering Information：

Order number	Case	Package number	Volume disk size
RM9003BS	ESOP8	4000 pcs/Disk	13 inch
RM9003BS	SOT89-3	4000 pcs/Disk	13 inch
RM9003BS	TO-252	2500 pcs/Disk	13 inch

Absolute Maximum Ratings：(Note 1)

Symbol	Parameter	Rating		Unit
OUT	Chip 500V high-voltage interface	-0.3 ~ 500		V
CS	Current sampling of the input voltage	-0.3 ~ 7		V
$I_{OUT@max}$	Drain max current	80		mA
$R\theta_{JA}$	environmental heat resistance	ESOP8	65	℃/W
		TO252	55	
		SOT89/3	125	
T_J	Operating Junction Temp	- 40 ~ 150		℃
T_{STG}	Storage temperature range	- 55 ~ 150		℃

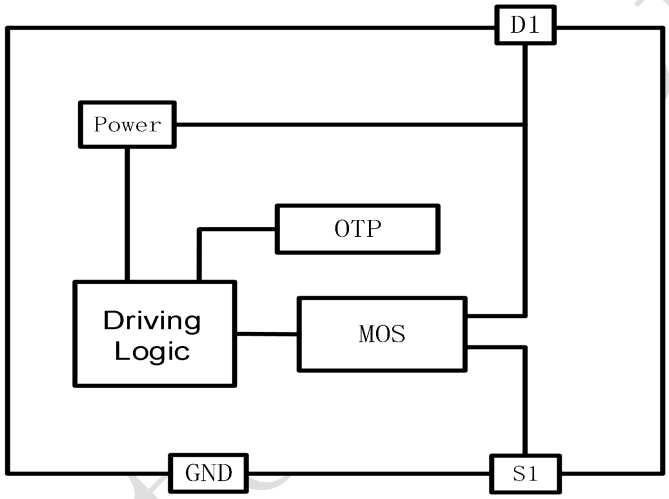
Note1：Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maxim rating conditions for extended periods may affect device reliability。

Electrical Operating Parameters：

(Ambient temperature is 25°C if there is no special instruction)

Symbol	Descriptions	Conditions	Min	Typical	Max	Unit
Static operating current of the chip						
I_Q	Static current	OUT=30V	----	80	----	uA
Chip voltage benchmark						
V_{REF1}	Chip voltage benchmark	OUT=30V，RS1=100Ω	0.585	0.6	0.615	V
Over temperature point						
OTP			----	150	----	℃

Block Diagram：



P3 RM9003BS Block Diagram

Application information：

RM9003BS is a high precision single channel LED linear constant flow drive control chip, integrated high voltage MOS can directly drive LED lights, which is mainly used in the drive of various light sources with high voltage input and lamps. The output resistance of the RM9003BS is set by the external Rext resistance, with a maximum filling current of 80mA, and has good constant current characteristics.

RM9003BS system has a simple structure, few peripheral components, no magnetic elements, and no EMI problems.

1. Power

After the RM9003BS is powered on the system, the OUT supplies the chip through the internal high-voltage JEFT, and the chip starts working when the OUT port voltage exceeds 6V.

2. Constant current control function

RM9003BS Constant current control function：

The chip has a built-in flow limiting module, the reference voltage of which is 0.6V

The OUT output current calculation formula for the LED drive port of the RM9003BS：

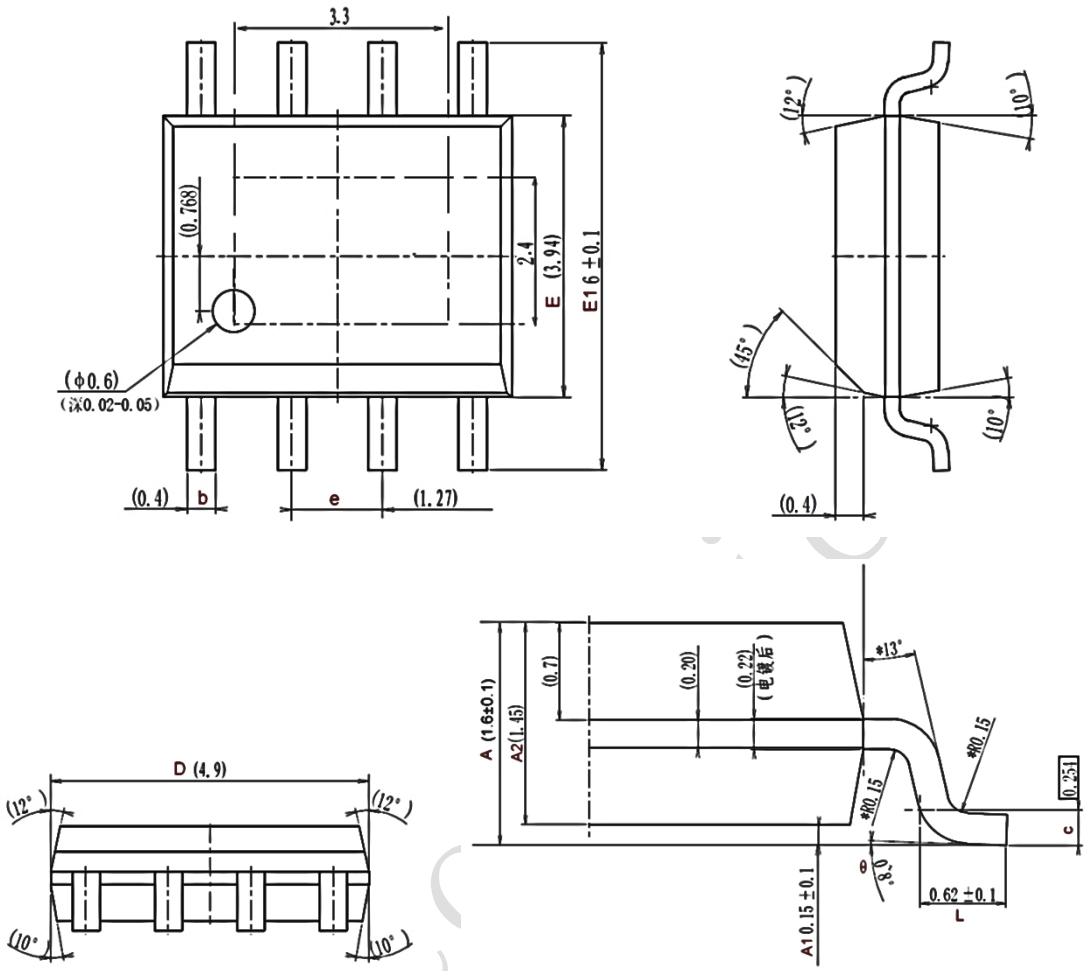
$$I_{OUT} = \frac{V_{OUT}}{R_{S1}} = \frac{0.6V}{R_{S1}} \text{（A）}$$

3. OTP

RM9003BS has the over-temperature protection function, when the drive chip overheating will trigger the chip protection, thus reducing the output current, in order to avoid the current drop phenomenon caused by the high temperature of the chip, it should ensure that the chip works in a reasonable temperature range, while effectively increase the heat dissipation measures.Improve the system reliability.

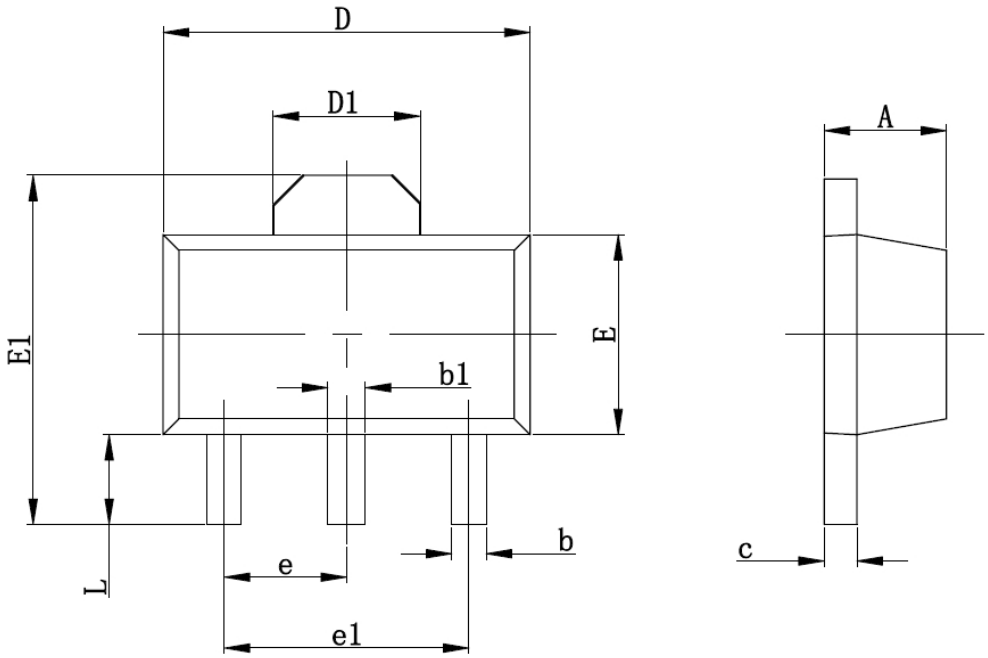
The overtemperature protection point set inside the RM9003BS is 150℃.

RM9003BS（ESOP8）package information



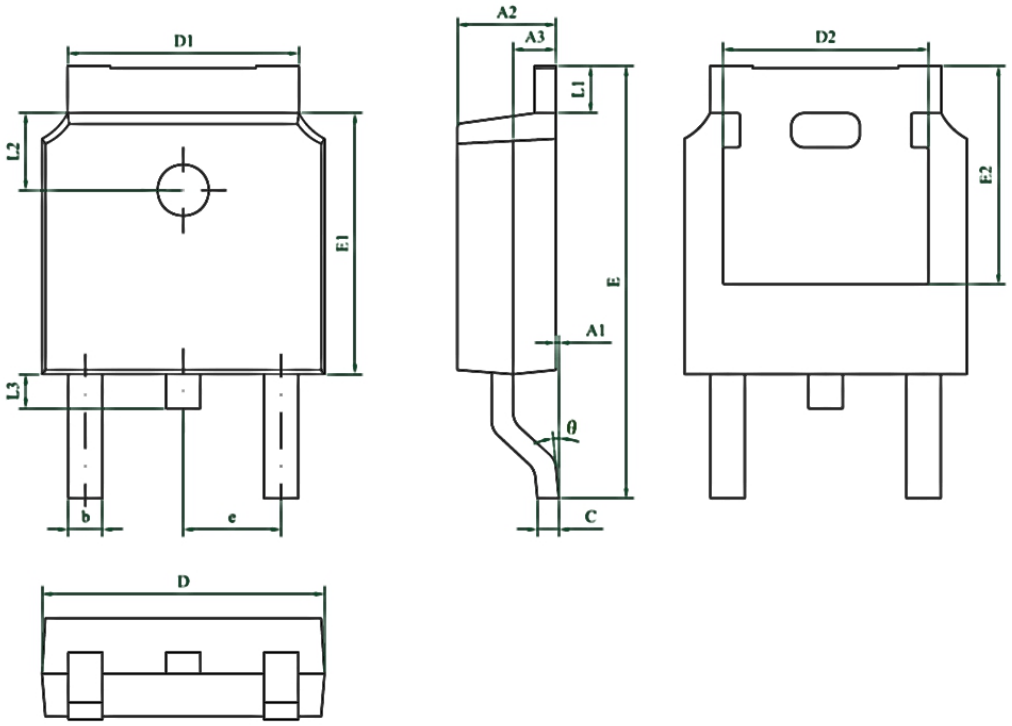
symbol	mm		
	min	typ	max
A	1.500	1.600	1.700
A1	0.050	0.165	0.250
A2	1.350	1.450	1.550
b	0.300	0.400	0.500
c	0.220	0.254	0.280
D	4.800	4.900	5.000
E	3.840	3.940	4.040
E1	5.900	6.000	6.100
e		1.27(BSC)	
L	0.520	0.620	0.720
θ°	0°		8°

RM9003BS（SOT89-3）package information



Symbol	mm	
	min	max
A	1.400	1.600
b	0.350	0.520
b1	0.400	0.580
c	0.350	0.440
D	4.400	4.600
D1	1.550REF	
E	2.350	2.550
E1	3.940	4.250
e	1.500TYP	
e1	3.000TYP	
L	0.900	1.100

RM9003BS（TO252）package information



symbol	min		
	min	typ	max
A1	0	----	0.10
A2	2.20	2.30	2.40
A3	0.90	1.00	1.10
b	0.75	----	0.85
c	0.50	----	0.60
D	6.50	6.60	6.70
D1	5.30	5.40	5.50
D2	4.70	4.80	4.90
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.20	5.30	5.40
e	2.20	2.286	2.40
L1	0.90	----	1.25
L2	1.70	1.80	1.90
L3	0.60	0.80	1.00
θ°	0°	----	8°