三合微科股份有限公司
SAMHOP Microelectronics Corp.

4-Channel Constant Current LED Driver SM6704

GENERAL DESCRIPTION

The SM6704 is a 4-channel constant current LED Driver that has a wide range of output current from 10mA up to 180mA per channel and through an external resistor (Rext) to set the Maximum sink current which gives users flexibility in controlling the light intensity of LEDs. In addition, users can precisely adjust LED brightness from 0% to 100% via OE control pin using popular Pulse Width Modulation (PWM) signal. Low output voltage drop operation of 0.6V at 180mA allows for more power efficient designs across wider supply voltage range, The 4 LED pins are compatible with high voltage up to 50V supporting applications with long strings of LEDs. Additionally, to ensure the system reliability, the SM6704 is contained with LED string short circuit detection and thermal shutdown function to protect IC from over temperature 150℃. Also, the thermal pad enhances the power dissipation. As a result, a large amount of current can be handled safely in one package.

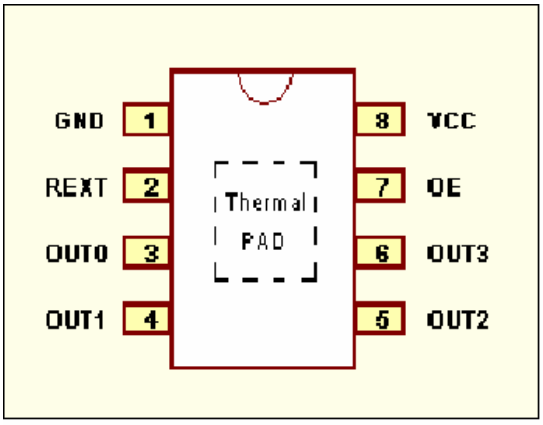
FEATURES

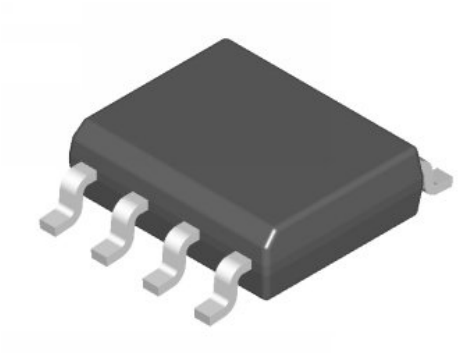
- 4-channel constant sink current
- Constant output current invariant to load voltage change
- Maximum output current per channel up to 180mA
- Output current adjusted through an external resistor
- Excellent output current accuracy
  - Between channels - ±3% , and
  - Between ICs - ±6% (Max.)
- Protections
  - Over-temperature (150℃ shutdown IC)
  - String short circuit detection (only shutdown short channel when over 5V dropout)
- Low dropout current source (0.6V at 180mA)
- LED output voltage up to 50V
- 4.5V to 5.5V logic supply range
- Package SOP-8 with thermal pad

APPLICATIONS

- High-flux LED lighting, architectural lighting
- LCD backlight, LED signs and displays
- Automotive interior lighting

PIN ASSIGNMENTS

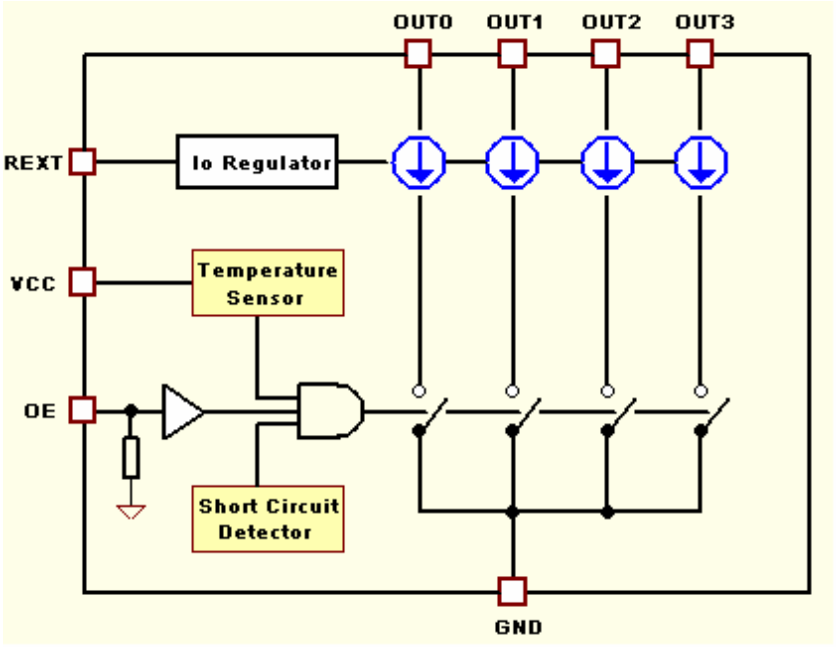




PIN DESCRIPTIONS

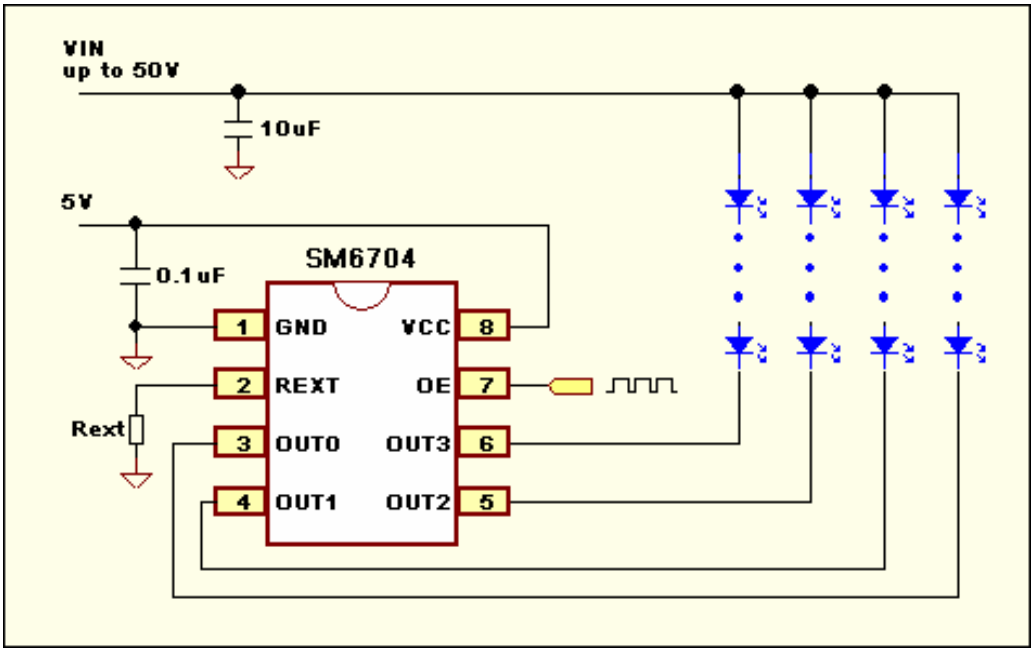
Pin No.	Name	I/O	Description
1	GND	O	Ground terminal for control logic and current sink
2	REXT	I	Reference current terminal used to connect an external resistor (Rext) for setting up output current for all output channels
3, 4, 5, 6	OUT0 ～ OUT3	O	Constant current output terminals
7	OE	I	Output enable pin When OE is applied logic High, the output pins are enabled. When OE is applied Logic Low, all output pins are turned off (blanked).
8	VCC	I	5V supply voltage terminal

FUNCTIONAL BLOCK DIAGRAM



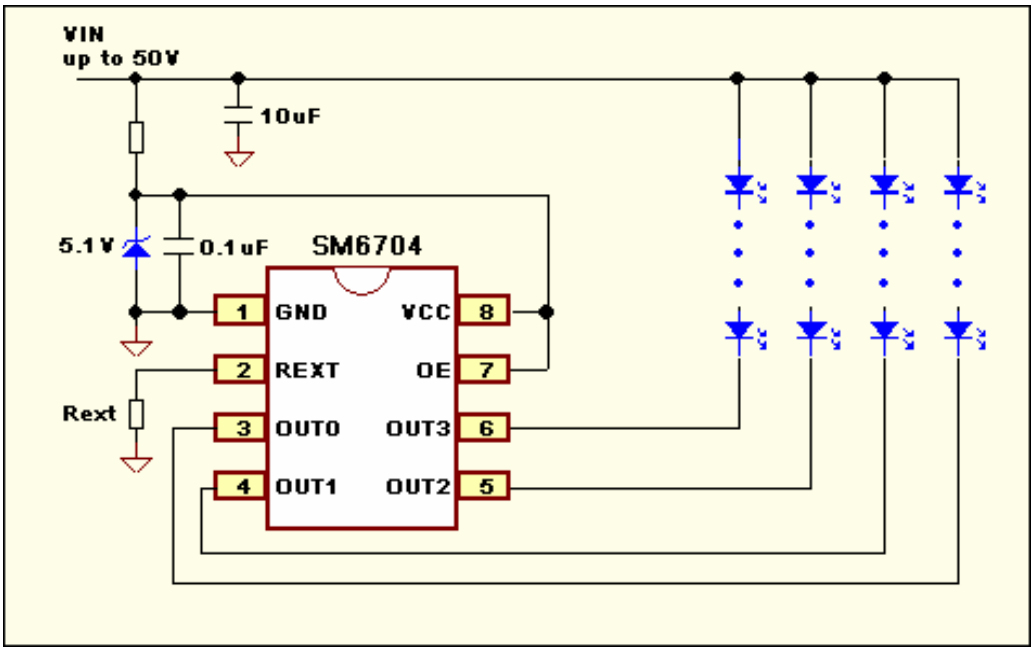
TYPICAL APPLICATION CIRCUITS

(a) SM6704 application circuit, using PWM signal to control LEDs brightness, where VIN and VCC use voltage Sources, separately



** VIN = VF * N + VSOURCE-DROPOUT, VF is LED's forward voltage; N is LED count

(b) SM6704 application circuit, where VIN and VCC share a single voltage source

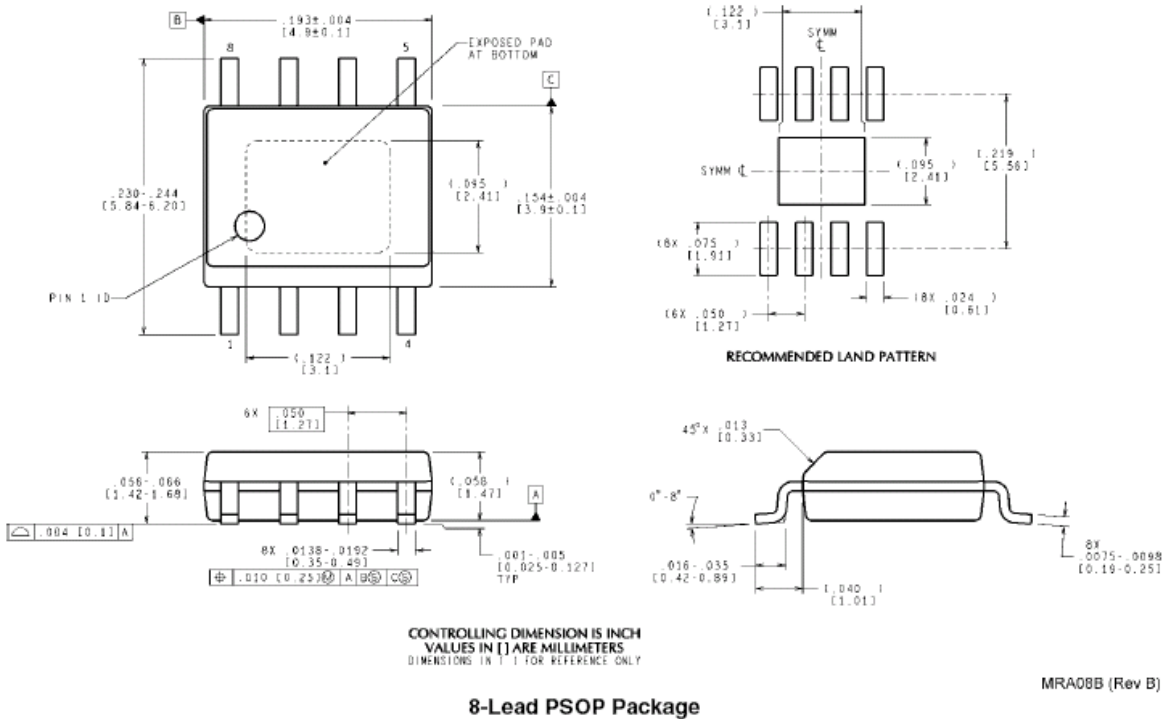


MAXIMUM RATINGS

Characteristic		Symbol	Rating	Units
Supply Voltage		VCC	0～6.0V	V
Input Voltage		VIN	-0.4V～VCC～+0.4V	V
Output Current		ILED	240 (Note1)	m A
Output Voltage		VOUT	-0.5V～+50V	V
GND Terminal Current		IGND	1000	m A
Power Dissipation	SOP-8	PD	0.8	W
Thermal Resistance (4 - Layer PCB based on JEDEC standard)	SOP-8	RΘJA	35	℃ / W
Operating Junction Temperature		Tj,max	125	℃
Operating Temperature		Top	-40 to 85	℃
Storage Temperature		Tstg	-55 to 150	℃

Note1: Users must notice that the power dissipation (almost equaling to IOUT * VSOURCE-DROPOUT) should be within the safe operation area.

Physical Dimensions inches (millimeters) unless otherwise noted



8-Lead PSOP Package