M51901P

12-POINT/23-MODE LED DRIVER

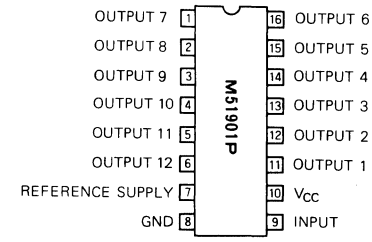
DESCRIPTION

The M51901P is a semiconductor integrated circuit consisting of a driver circuit capable of driving 12 LEDs in 23 modes.

When a DC voltage is applied to the input pin the LED driving outputs are activated either 1 or 2 at a time to provide 23 LED drive modes in accordance with the applied voltage level. In addition, a blanking function is available when the reference voltage is made a low level.

The M51901P consists of 12 differential amplifiers and the associated ladder circuit as well as a blanking circuit.

PIN CONFIGURATION (TOP VIEW)



Outline 16P4

FEATURES

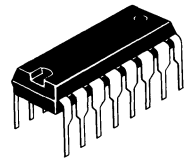
- 12 LEDs may be driven in accordance with the level of a DC voltage applied to the input, using a built-in A-D conversion capability.
- 23 operating modes are provided
- Built-in blanking function
- The reference voltage level may be freely selected

APPLICATION

23-mode drivers for 12 LEDs, simplified A-D converters

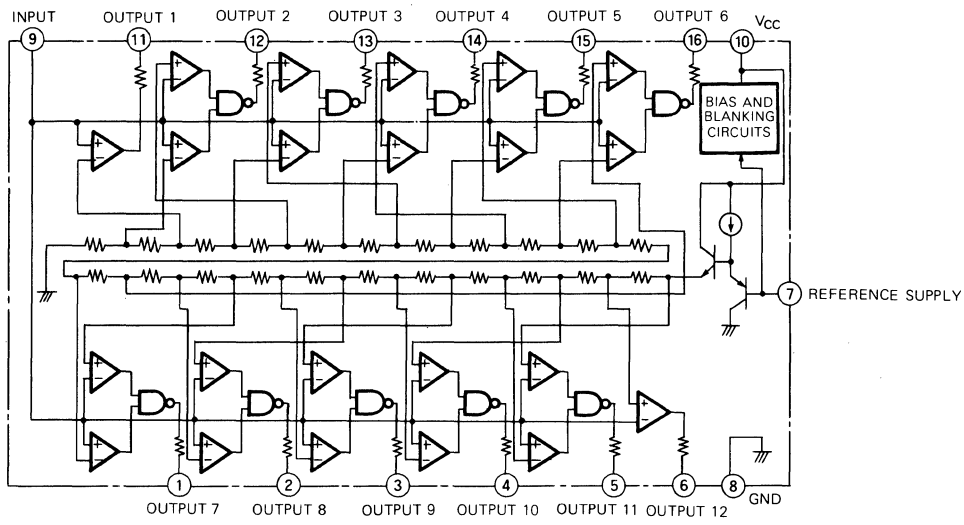
RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... 10.2~16.5V
Rated supply voltage 13.2V
Reference voltage range ..... 5.0~7.5V
Input voltage range ..... 0~9.2V



16-pin molded plastic DIL

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_a=25℃, unless otherwise noted)

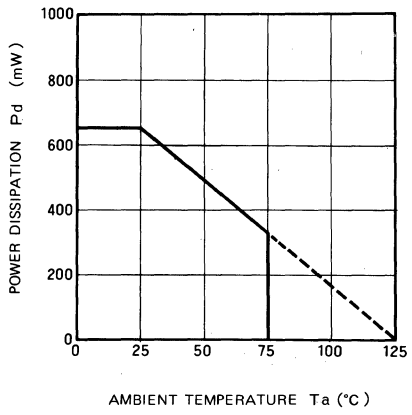
Symbol	Parameter	Conditions	Limits	Unit
Vcc	Supply voltage		18	V
Io	Output current		30	mA
Pd	Power dissipation		650	mW
K_θ	Derating	Ta≧25°C	6.5	mW/°C
Topg	Operating temperature		−20～+75	°C
Tstg	Storage temperature		−40～+125	°C

ELECTRICAL CHARACTERISTICS (T_a=25℃, V_{CC}=±13.2V, V_{REF}=7.20V, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{CC}	Circuit current	V_{IN}=0V, outputs open		2	5	mA
I_I	Input current	V_{IN}=9.2V			100	μA
V_O	Output voltage (pins ①～⑫)	R_L=620 Ω	4.2	5.5	6.8	V
V_{BL}	Blanking voltage	V_{IN}=9.2V, I_O=100μA			0.8	V
$I_⑦$	Pin ⑦ output current	V_{IN}=0V			15	μA
$V_②$	Output 2 on-state central input voltage	I_O≧1mA		1.99		V
$V_③$	Output 3 on-state central input voltage	I_O≧1mA		2.51		V
$V_④$	Output 4 on-state central input voltage	I_O≧1mA		3.03		V
$V_⑤$	Output 5 on-state central input voltage	I_O≧1mA		3.55		V
$V_⑥$	Output 6 on-state central input voltage	I_O≧1mA		4.07		V
$V_⑦$	Output 7 on-state central input voltage	I_O≧1mA		4.59		V
$V_⑧$	Output 8 on-state central input voltage	I_O≧1mA		5.11		V
$V_⑨$	Output 9 on-state central input voltage	I_O≧1mA		5.63		V
$V_⑩$	Output 10 on-state central input voltage	I_O≧1mA		6.15		V
$V_⑪$	Output 11 on-state central input voltage	I_O≧1mA		6.67		V

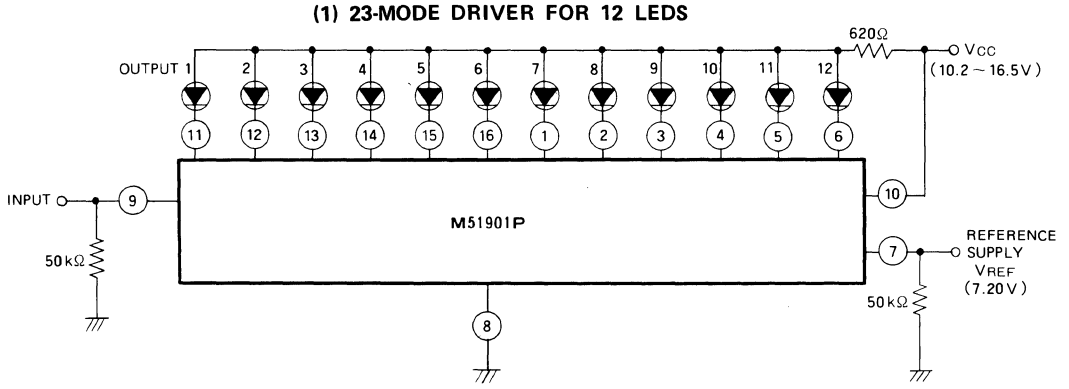
TYPICAL CHARACTERISTICS (T_a=25°C, unless otherwise noted)

THERMAL DERATING
(MAXIMUM RATING)

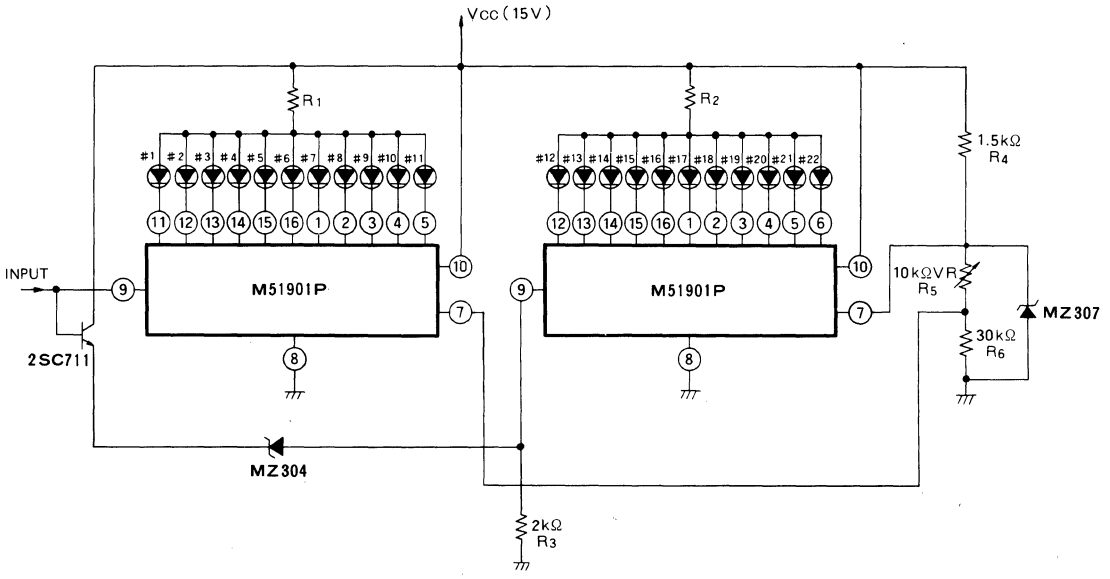


APPLICATION EXAMPLES

(1) 23-MODE DRIVER FOR 12 LEDS



(2) 22-LED DRIVER (USING CASCADE CONNECTION)



Note R_5 is chosen such that the lower drive level limit for LED #12 is just 0.24V higher than higher drive level limit for LED #10.