M51910P

9-POINT/2-INPUT LED LEVEL INDICATOR

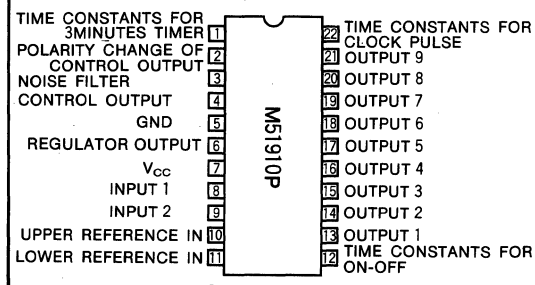
DESCRIPTION

The M51910P is a dot display type LED indicator. 2input levels can be indicated at the same time with the different modes, static mode and on-off mode. The built-in comparator compares that 2 input levels, and that output can drive the current within 50mA.

FEATURES

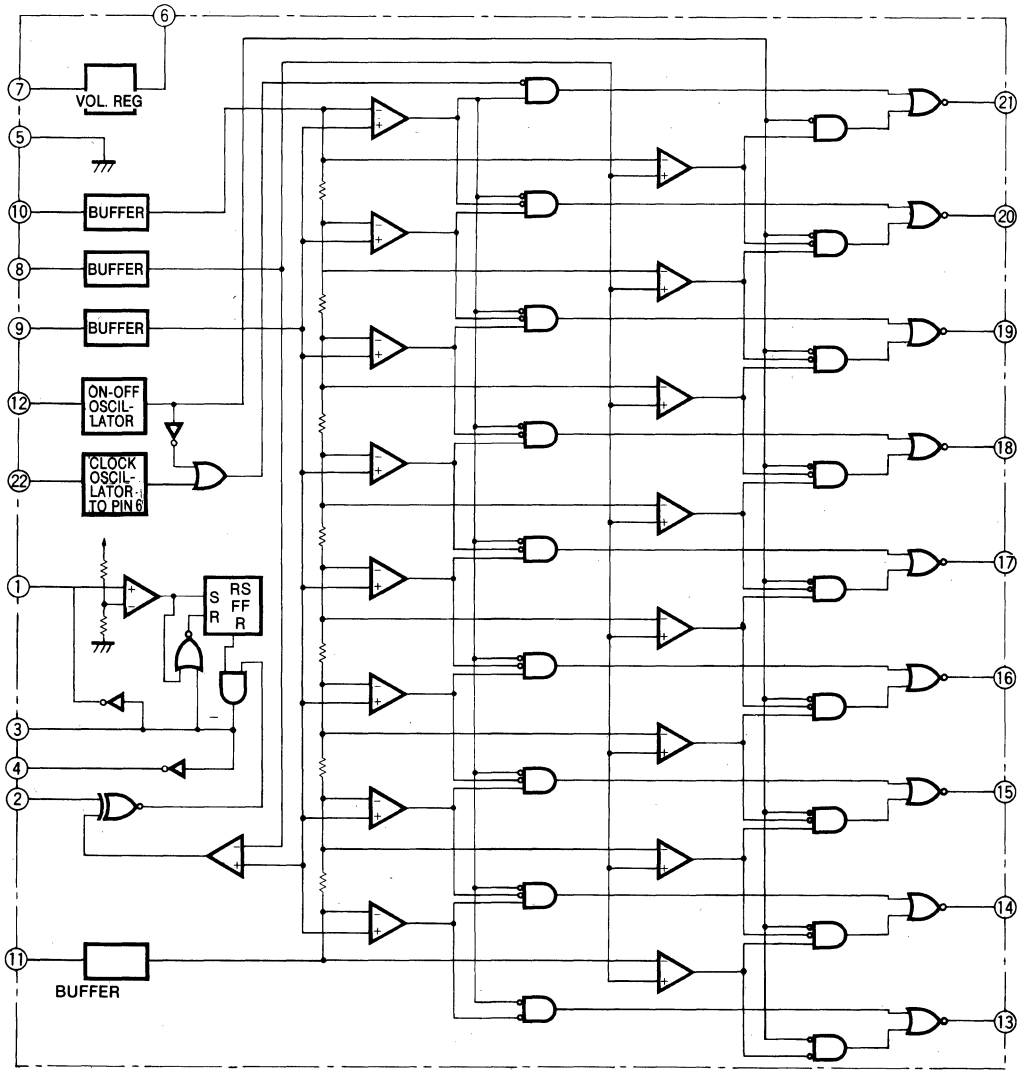
- 2 input level indicator
- Threshold voltage is selectable by the external reference voltage ····· reference voltage range 0.5~3.5V
- Built-in voltage regulator ····· V_S=4.8V, Iomax=10mA
- Built-in timer that operates even when power is off for a moment ····· Setting range is within 5 minutes.

PIN CONFIGURAION (TOP VIEW)



Outline 22P4

BLOCK DIAGRAM



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

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		18	V
I_{odis}	Display output current		30*	mA
BV_{odis}	Display output voltage		18	V
$I_④$	Pin④ current	Sink current	50	mA
$BV_④$	Pin④ voltage		30	V
$I_⑥$	Pin⑥ current	Issued current	−10	mA
P_d	Power dissipation		1400	mW
K_θ	Thermal derating	T_a≧25℃	1.4	mW/℃
T_{opr}	Operating temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

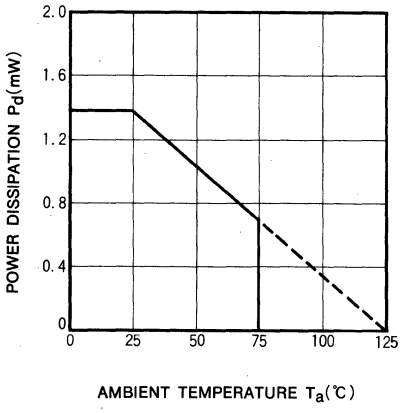
* : The average current rating is 20mA when the clock frequency is over 30Hz. (Peak current=40mA)

ELECTRICAL CHARACTERISTICS (T_a=25℃, V_{CC}=12V, unless otherwise noted)

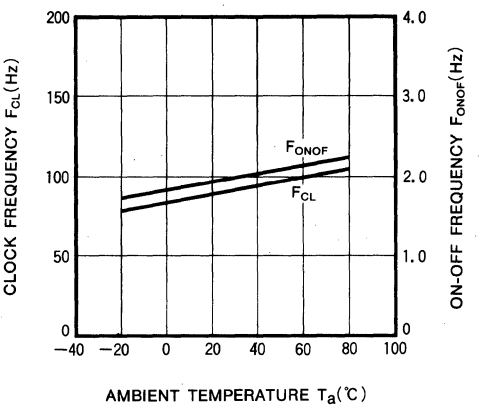
Symbol	Parameter		Test conditions	Limits			Unit
				Min	Typ	Max	
I_{CC}	Circuit current				10	20	mA
V_S	Regulated voltage		Pin⑥ voltage	4.4	4.8	5.4	V
$I_{⑧in}$	Pin⑧ input current			−10	−1.7		μA
$I_{⑨in}$	Pin⑨ input current			−10	−1.7		μA
$I_{⑩in}$	Pin⑩ input current			−10	−1.7		μA
$I_{⑪in}$	Pin⑪ input current			−15	−2.7		μA
$V_{⑧on2}$	Threshold voltage for pin⑧	Output 2	Input level when the output change from off to on according to rising input level	2.180	2.22	2.250	V
$V_{⑧on3}$		Output 3		2.265	2.30	2.335	V
$V_{⑧on4}$		Output 4		2.345	2.38	2.415	V
$V_{⑧on5}$		Output 5		2.425	2.46	2.495	V
$V_{⑧on6}$		Output 6		2.505	2.54	2.574	V
$V_{⑧on7}$		Output 7		2.585	2.62	2.655	V
$V_{⑧on8}$		Output 8		2.670	2.70	2.740	V
$V_{⑧on9}$		Output 9		2.750	2.79	2.820	V
$V_{⑨on2}$	Threshold voltage for pin⑨	Output 2		2.180	2.22	2.250	V
$V_{⑨on3}$		Output 3		2.265	2.30	2.335	V
$V_{⑨on4}$		Output 4		2.345	2.38	2.415	V
$V_{⑨on5}$		Output 5		2.425	2.46	2.495	V
$V_{⑨on6}$		Output 6		2.505	2.54	2.575	V
$V_{⑨on7}$		Output 7		2.585	2.62	2.655	V
$V_{⑨on8}$		Output 8		2.670	2.70	2.740	V
$V_{⑨on9}$		Output 9		2.750	2.79	2.820	V
$V_{⑧HY}$	Hysterisis of pin⑧ level for display		Input difference between off-on level and on-off level	3	5	7	mV
$V_{⑨HY}$	Hysterisis of pin⑨ level for display						
$\Delta V_⑧$	Threshold voltage difference for pin⑧ between neighboring outputs			70	82	95	mV
$\Delta V_⑨$	Threshold voltage difference for pin⑨ between neighboring outputs						
$\Delta V_{⑧⑨}$	Threshold voltage difference for same output between pin⑧ and pin⑨			−12	0	12	mV
F_{CL}	Frequency of clock oscillator		Half of frequency at pin㉒		90		Hz
F_{ONOF}	Frequency of on-off oscillator		Half of frequency at pin⑫		2		Hz
V_{CTH}	Built-in comparator threshold voltage		$V_⑧$=2.500V, threshold voltage for pin⑨	2.490	2.505	2.530	V
ΔV_{CT}	Built-in comparator hysterisis			5	15	25	mV
T_t	Operating time of timer				200		Sec

TYPICAL CHARACTERISTICS

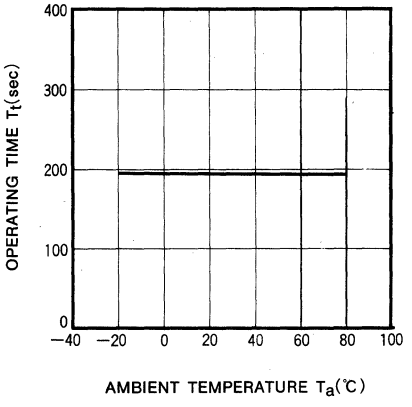
THERMAL DERATING (MAXIMUM RATING)



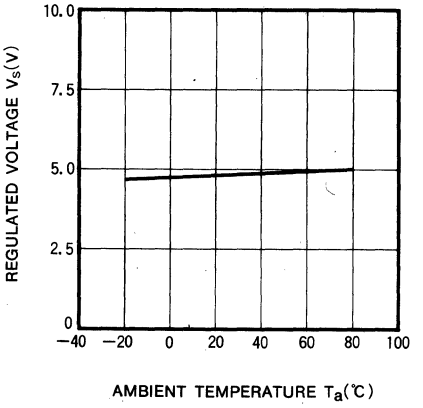
ON-OFF, CLOCK FREQUENCY VS AMBIENT TEMPERATURE



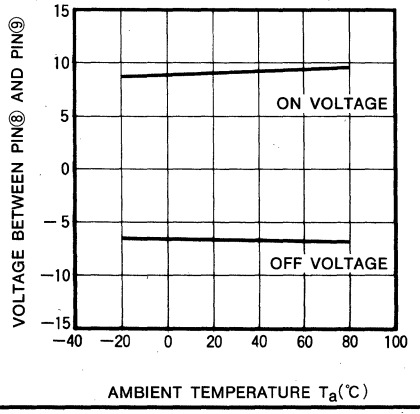
OPERATING TIME OF TIMER VS AMBIENT TEMPERATURE



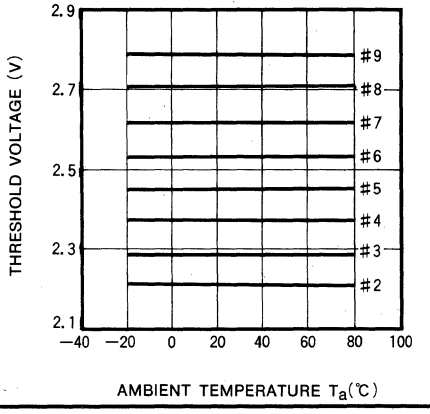
REGULATED VOLTAGE VS AMBIENT TEMPERATURE



BUILT-IN COMPARATOR ON, OFF VOLTAGE VS AMBIENT TEMPERATURE



THRESHOLD VOLTAGE FOR DISPLAY VS AMBIENT TEMPERATURE



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TEST CIRCUIT AND TYPICAL APPLICATION