

M51961L

FLASHER CONTROL CIRCUIT

DESCRIPTION

The M51961L is a semiconductor integrated circuit for flasher, and especially is suited for the automobile flasher. It is designed so that its flashing frequency is set to 85cpm in case of turn signal or hazard, then it is 192cpm in case of break.

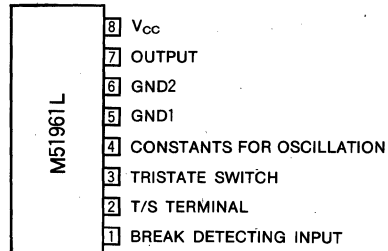
The break detecting is made use of the break detecting resistance connecting between the power supply and the lamp.

The threshold voltage for break is about 90mV when supply voltage is 12.8V, and it is designed so as to compensate for the characteristics of the lamp of supply voltage and temperature.

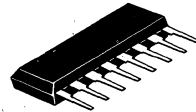
FEATURES

- The lamp is on immediately after turn signal switch is turned on. 25ms (max.)
- Threshold voltage for break detecting compensates for the characteristics of the lamp.
- Deviation of flashing frequency according to supply voltage and temperature is small. 1 % (typ.)
($V_{CC}=7\sim 17V$ and $T_a=-20\sim +60^{\circ}C$)
- Flashing frequency is not influenced by the ripple of power supply because of the built-in stabilized power supply.
- The built in zenor diode at the output terminal for absorbing reverse E.M.F. of the relay.

PIN CONFIGURATION (TOP VIEW)



Outline 8P5



8-pin molded plastic SIL

APPLICATION

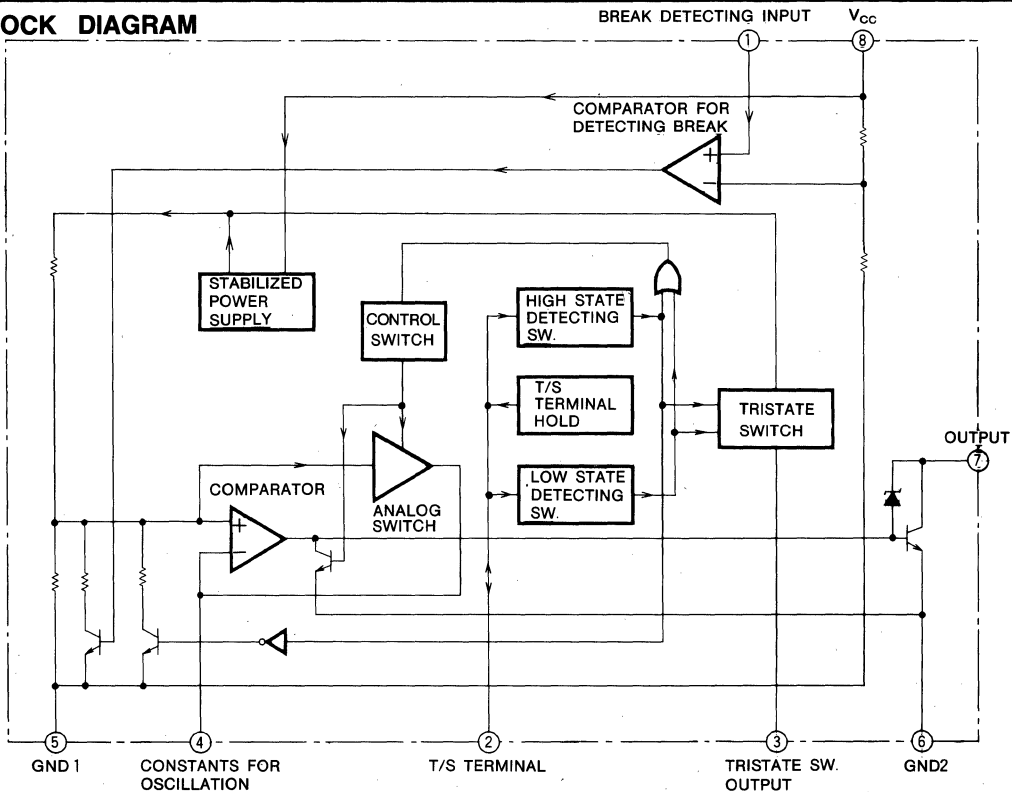
Automobile flasher, break detecting of lamp.

RECOMMENDED OPERATING CONDITIONS

Supply voltage range 9 ~ 16V

Rated supply voltage 12.8V

BLOCK DIAGRAM



FLASHER CONTROL CIRCUIT

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Limits	Unit
V_{CC1}	Supply voltage		18	V
V_{CC2}	Peak supply voltage	$t \leq 1 \text{ min}$	24.5	V
BV_O	Output breakdown voltage		24.5	V
I_O	Output current		150	mA
$V_{\textcircled{2}}$	Voltage at ②pin		$V_{CC} - 36 \text{ V} \sim V_{CC}$	V
$V_{\textcircled{1}}$	Voltage at ①pin		$0 \sim V_{CC}$	V
P_d	Power dissipation		900	mW
K_θ	Derating	$T_a \geq 25^\circ\text{C}$	7.2	mW/°C
T_{opr}	Operating temperature		$-40 \sim +85$	°C
T_{stg}	Storage temperature		$-50 \sim +125$	°C

ELECTRICAL CHARACTERISTICS ($R_1=55\text{k}\Omega$, $C_1=10\mu\text{F}$, $T_a=25^\circ\text{C}$, $V_{CC}=12.8\text{V}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage range		7	12.8	17	V
T_s	Time from T/S on to lamp on			5	25	mS
N_1	Flashing frequency 1	In case of T/S or hazard	81	85	89	cpm
N_2	Flashing frequency 2	In case of break	178	192	207	cpm
D_1	Duty of lamp on 1	In case of T/S or hazard	41	45	49	%
D_2	Duty of lamp on 2	In case of break	33	37	41	%
$V_{\textcircled{1}TH}$	Threshold voltage for break detecting		84	91.3	98.5	mV
I_{CC1}	Circuit current 1	In case of output off		3.4	5.3	mA
I_{CC2}	Circuit current 2	In case of output on		8.9	15	mA
$V_{\textcircled{2}}$	②pin voltage	②pin open	6.0	7.4	9.0	V
$V_{\textcircled{2}THH}$	High threshold voltage of ②pin		$V_{\textcircled{2}}+1$	9.2^{*1}	11.3^{*1}	V
$V_{\textcircled{2}THL}$	Low threshold voltage of ②pin		3.5^{*2}	5.6^{*2}	$V_{\textcircled{2}}-1$	V
$I_{\textcircled{2}IN1}$	Input current to ②pin	Voltage at ②pin is V_{CC} .	0.6	0.96	1.6	mA
$I_{\textcircled{2}IN2}$	Input current from ②pin	Voltage at ② pin is GND.	-2.2	-1.36	-0.9	mA
$I_{\textcircled{1}IN}$	Input current to ①pin	Voltage at ①pin is V_{CC} .		1.6	20	μA
V_{OS}	Output saturation voltage	$R_L=120\Omega$		180	500	mV
I_{OL}	Output leak current				100	nA
V_{OZ}	Zenor voltage at output		26	30	36	V

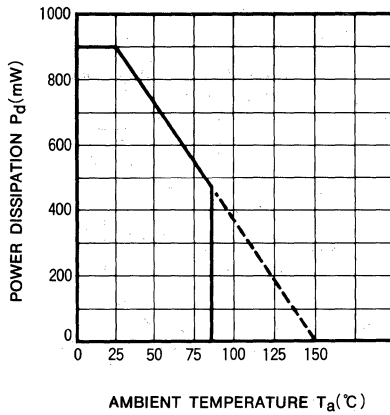
*1 Higher than $V_{\textcircled{2}}+1\text{V}$

*2 Lower than $V_{\textcircled{2}}-1\text{V}$

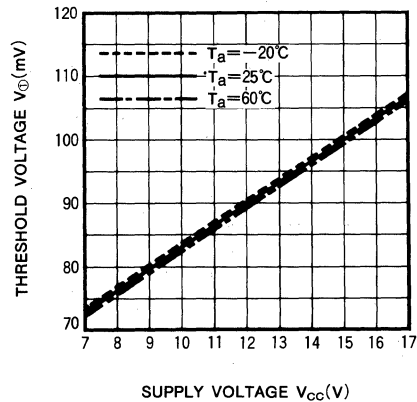
FLASHER CONTROL CIRCUIT

TYPICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$, $V_{cc}=12.8\text{V}$, unless otherwise noted)

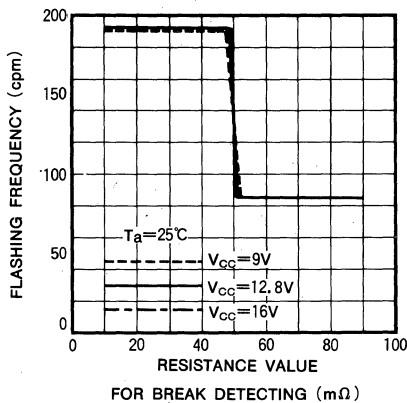
THERMAL DERATING
(MAXIMUM RATING)



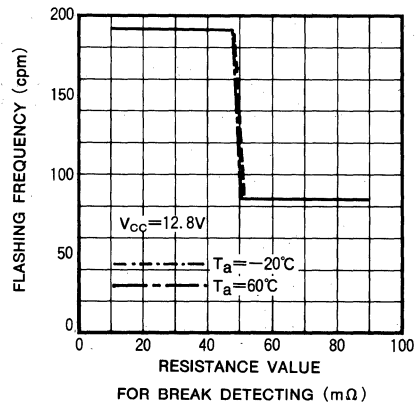
THRESHOLD VOLTAGE CHARACTERISTICS
FOR BREAK DETECTING



FLASHING FREQUENCY
CHARACTERISTICS ①



FLASHING FREQUENCY
CHARACTERISTICS ②



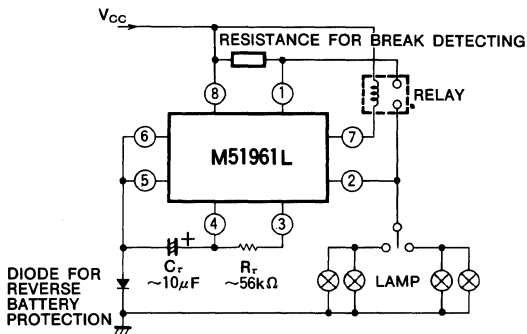
Note : 1. Flashing frequency characteristics was measured by changing the resistance value for break detecting instead of the lamp resistance used lamp; one 23W lamp

Note : 2. In the flashing frequency characteristics ② we didn't take the change of R_i , C_i by temperature into consideration.

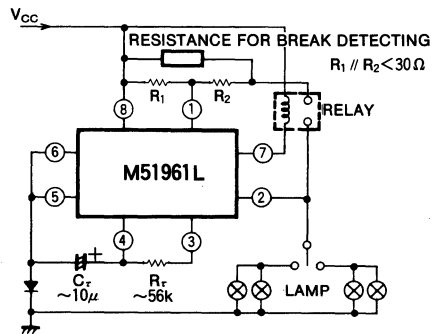
FLASHER CONTROL CIRCUIT

APPLICATION EXAMPLES

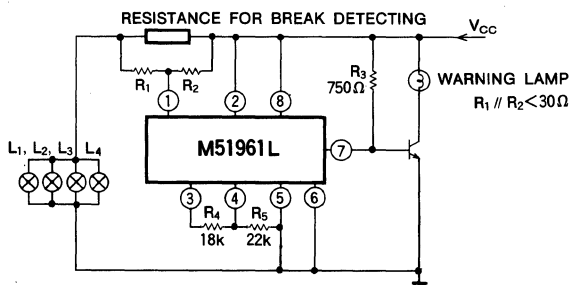
(1) Typical example



(2) Example in case of adjusting the threshold voltage for break detecting



(3) Example for break warning



The warning lamp is on when one or more lamps of the four break.