M51728L

PLL SPEED CONTROL FOR DC MOTOR

DESCRIPTION

The M51728L is monolithic IC designed for the use of the speed control circuit for DC micro motor. It controls constantly the speed of the DC micro motor, using the signal of the Frequency Generator and the precision speed control can be obtained because of the P. L. L. circuit. It consists of the internal oscillator, phase comparator, input signal comparator, output buffer amplifier, and internal voltage stabilizer.

FEATURES

- High stability vs supply voltage ····· 0.01%(9~18V)
- High stability vs temperature ····· ±0.01%(−20~+75℃)
- High stability vs load ····· 0
- Wide supply voltage range ····· 9~18V(RD=910Ω)

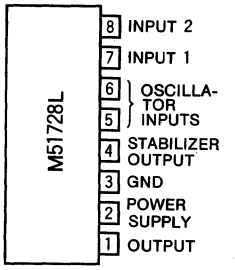
APPLICATIONS

- Motor driven equipment
- Record player
- Tape recorder
- Car stereo

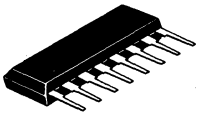
RECOMMENDED OPERATING CONDITIONS

V_S=13V (RD=910Ω)

PIN CONFIGURATION (TOP VIEW)

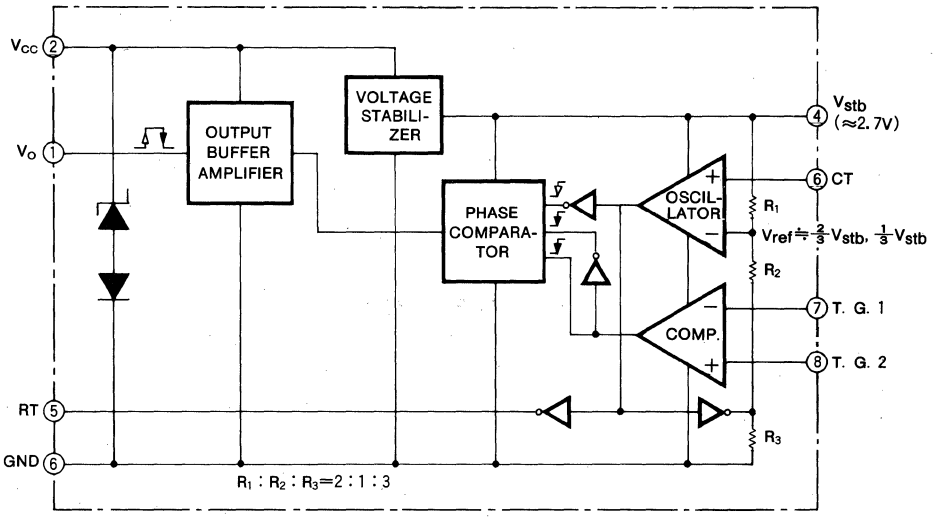


Outline 8P5



8-pin molded plastic SIL

BLOCK DIAGRAM



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

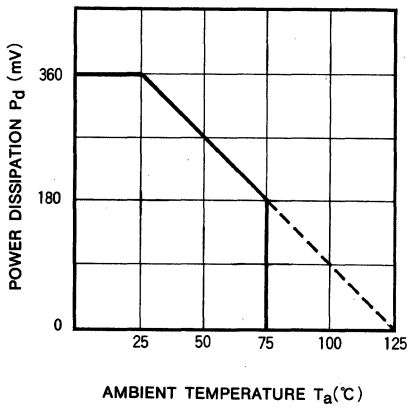
Symbol	Parameter	Conditions	Limits	Unit
I_{CC}	Supply current		20	mA
$V_{In⑦-⑧}$	Supply voltage between 7-8pin		5.7	V_{P-P}
$V_④$	4 Pin supply voltage		3.7	V
$V_⑤$	5 Pin supply voltage		7	V
$I_⑤$	5 Pin supply voltage		2	mA
$V_⑥$	6 Pin supply voltage		3.7	V
$V_⑦$	7 Pin supply voltage		3.9	V
$V_⑧$	8 Pin supply voltage		3.9	V
$V_①$	1 Pin supply voltage		7	V
I_{OH}	1 Pin supply voltage		2	mA
I_{OL}	1 Pin sink current		2	mA
P_d	Power dissipation		0.36	W
K_θ	Power derating rate (T_a>+25℃)		−3.6	mW/℃
T_{OPr}	Operating ambient temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

ELECTRICAL CHARACTERISTICS (T_a=+25℃)

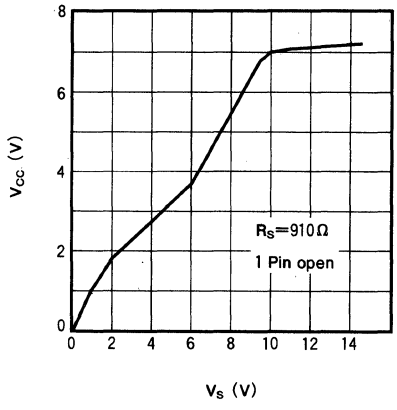
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V_{CC}	4 Pin voltage	V_S=13V, R_S=910Ω	6.2	6.9	7.6	V
I_{CC}	Circuit current		2.3	3.5	5.2	mA
V_{OH}	1 Pin output high voltage	V_S=13V, R_S=910Ω	4.3	5.5	—	V
V_{OL}	1 Pin Output low voltage	V_S=13V, R_S=910Ω	—	35	300	mV
V_{stb}	Regulate output voltage		2.4	2.7	3.0	V
$V_{⑤L}$	5 Pin low voltage		—	35	150	mV
$V_{⑥ON}$	6 Pin on voltage		1.90	2.00	2.10	V
$V_{⑥off}$	6 Pin off voltage		0.90	1.00	1.10	V
f_{OSC}	Oscillator frequency	C_T=0.0100μF, RT_1=RT_2=47kΩ	995	1025	1055	Hz
$V_⑦$	7 Pin voltage		1.0	1.3	1.5	V
$V_⑧$	8 Pin voltage		1.0	1.3	1.5	V
$I_{⑦-⑧}$	Current between ⑦-⑧pin		1.9	2.5	3.6	mA
$I_{⑥in}$	6 Pin input current		—	200	600	nA

TYPICAL CHARACTERISTICS

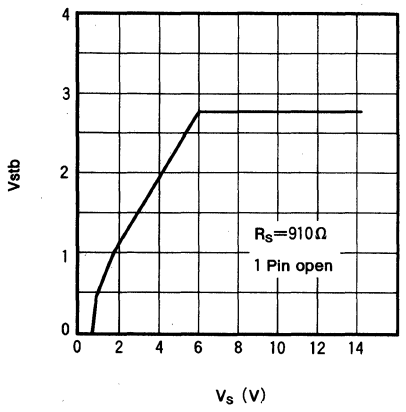
THERMAL DERATING (MAXIMUM RATING)



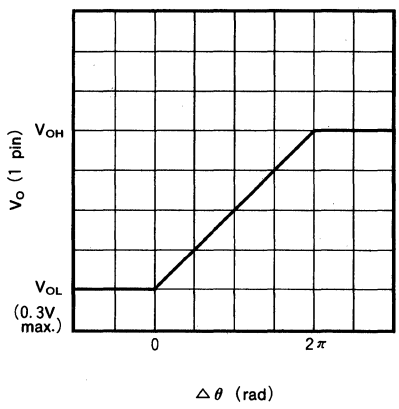
A. V_S—V_{CC}



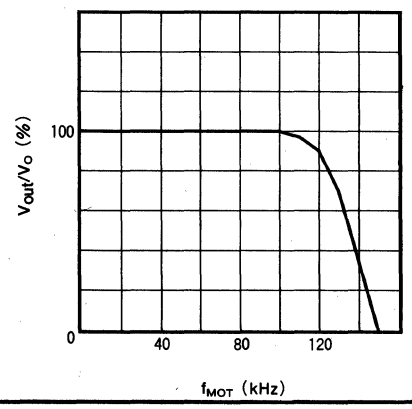
B. V_S—V_{stb}



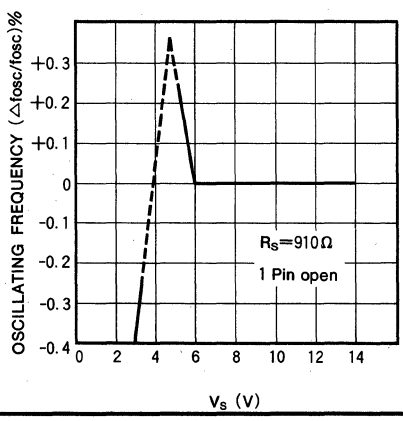
OUTPUT CHARACTERISTICS OF PHASE COMPARATOR



OUTPUT CHARACTERISTICS OF THE INPUT SIGNAL AMPLIFIER

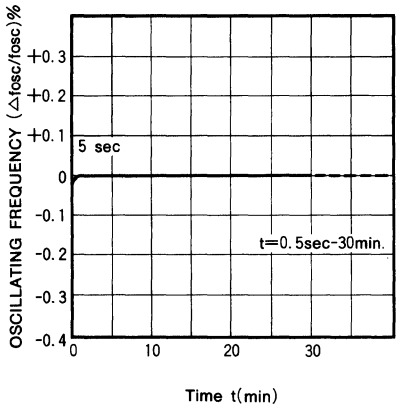


E. V_S-fosc

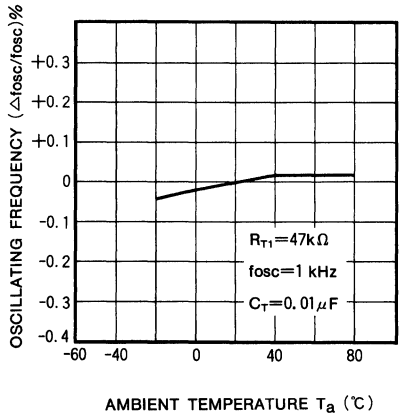


MITSUBISHI ELECTRIC

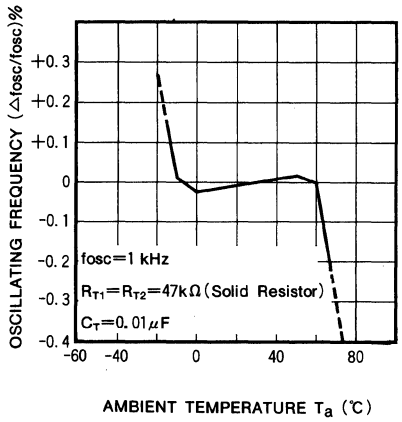
F. t-fosc



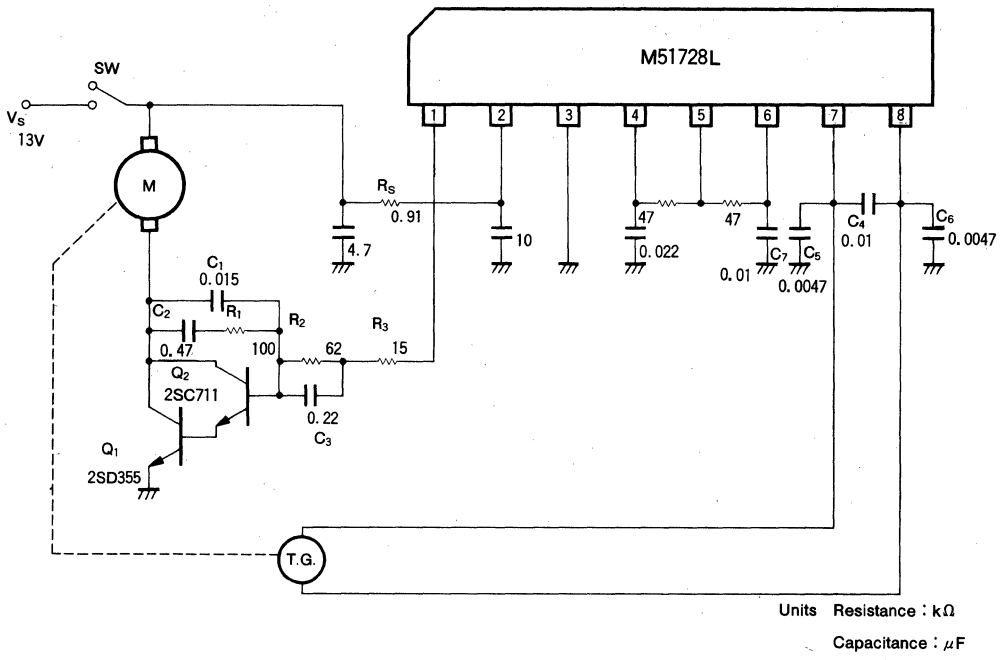
G. T_a-fosc



H. T_a-fosc over-all



APPLICATION EXAMPLE



Units Resistance : kΩ
Capacitance : μF