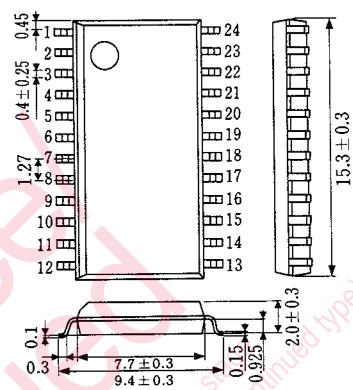
AN6631S

Direct-Drive Motor Control Circuit

■ Outline

The AN6631S is an integrated circuit designed for converting a motor FG (Frequency Generator) signal into F/V (Frequency-Voltage) at a sample hold circuit for comparison with a reference signal and control the rotation of a motor.
It also has a wide range of operating supply voltage and is suitable for control of a compact DC motor which is used for a tape recorder, etc.

Unit : mm

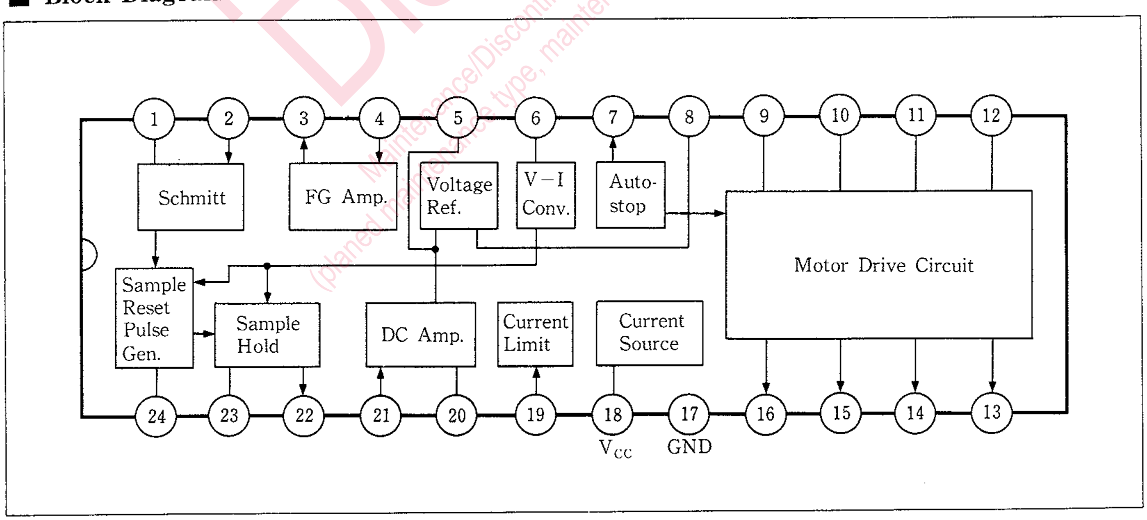


24-Lead PANAFLAT Package(SO-24D)

■ Features

- 2-phase, all-wave drive.
- Wide range of operating voltage : $V_{CC}=2\sim8V$
- Low current consumption : $I_{CC}=5mA$ typ.

■ Block Diagram



Panasonic

■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Trapezoidal Wave Output	13	Pre-driver Output I
2	Schmitt Circuit Input	14	Pre-driver Output II
3	FG Amp. Output	15	Pre-driver Output III
4	FG Amp. Input	16	Pre-driver Output IV
5	Reference Voltage	17	GND
6	FG Frequency Control	18	V_{CC}
7	Stop	19	Current Limit
8	Hall Dev. Bias	20	Invert Amp. Output
9	Hall Dev. A Input I	21	Invert Amp. Input
10	Hall Dev. A Input II	22	Sample & Hold Transf.
11	Hall Dev. B Input I	23	Sample & Hold Output
12	Hall Dev. B Input II	24	Saw Tooth Wave Output

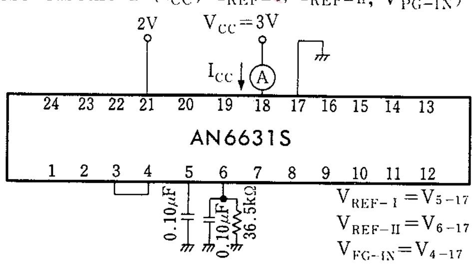
■ Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Rating	Unit
Supply Voltage	V_{CC}	8	V
Supply Current	I_{CC}	15	mA
Power Dissipation	P_D	120	mW
Operating Ambient Temperature	T_{opr}	−20～+75	℃
Storage Temperature	T_{stg}	−55～+125	℃

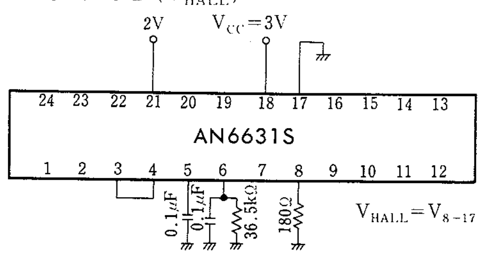
■ Electrical Characteristics (Ta=25℃)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply Current	I_{CC}	1	V_{CC}=3V	3.5	5	7	mA
Reference Voltage(1)	V_{REF-I}	1	V_{CC}=3V	1.1	1.2	1.3	V
Reference Voltage(2)	V_{REF-II}	1	V_{CC}=3V	1.1	1.2	1.3	V
Hall Element Drive Voltage	V_{HALL}	2	V_{CC}=3V	1.1	1.27	1.44	V
FG AMP Input Voltage	V_{FG-IN}	1	V_{CC}=3V	1.1	1.2	1.3	V
Output Sink Current	$I_{O(Sink)}$	4	V_{CC}=3V	7	12		mA
Output Other-Phase Leak Current	$I_{O(Leak)}$	4	V_{CC}=3V		20	100	μA
FG AMP Gain	$G_{V(FG)}$	5	V_{CC}=3V	48	52		dB
FG Frequency	$f_{(FG)}$	5	V_{CC}=3V, I_L=70mA	1100	1200	1300	Hz
FG Frequency Voltage Characteristics	$\Delta f_{V(FG)}$	5	V_{CC}=2～5V, I_L=70mA			22	Hz
FG Frequency Load Characteristics	$\Delta f_{V(FG)}$	5	V_{CC}=3V, I_L=20～120mA			22	Hz
Starting Current	I_S	5	V_{CC}=3V	240	475		mA
Low Level Trapezoidal Wave Output	V_{TRA-l}	3	V_{CC}=3V, V_2=2.2V		50	280	mV
High Level Trapezoidal Wave Output	V_{TRF-H}	3	V_{CC}=3V, V_2=2.6V	1.38	1.58	1.78	V

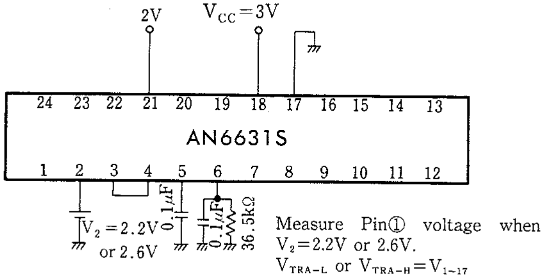
Test Circuit 1 (I_{CC}, I_{REF-I}, I_{REF-II}, V_{FG-IN})



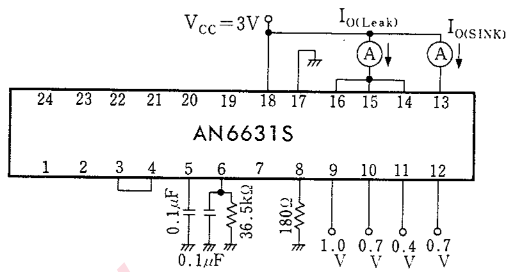
Test Circuit 2 (V_{HALL})



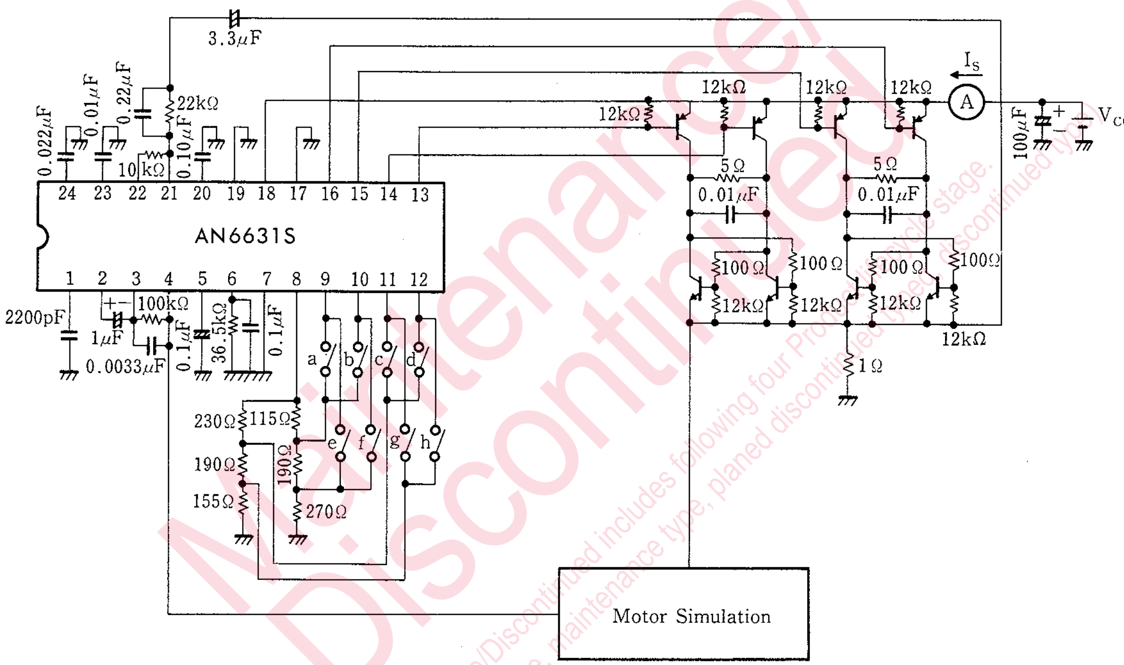
Test Circuit 3 (V_{TRA-L}, V_{TRA-H})



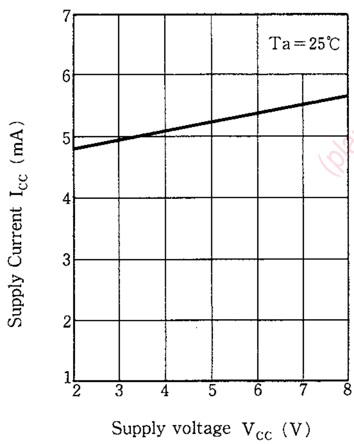
Test Circuit 4 ($I_{O(SINK)}$, $I_{O(Leak)}$)



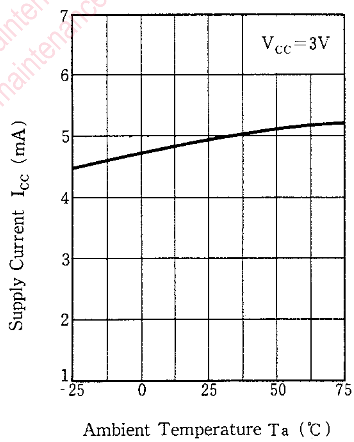
Test Circuit 5 ($G_{V(FG)}$, $f_{(FG)}$, $\Delta f_{(FG)}$)



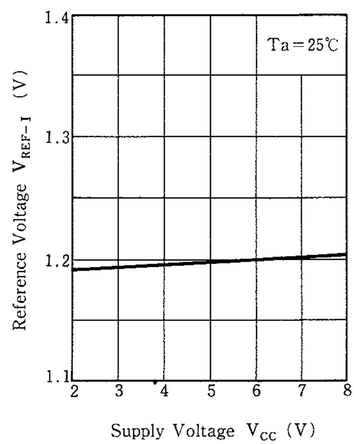
I_{CC}—V_{CC}



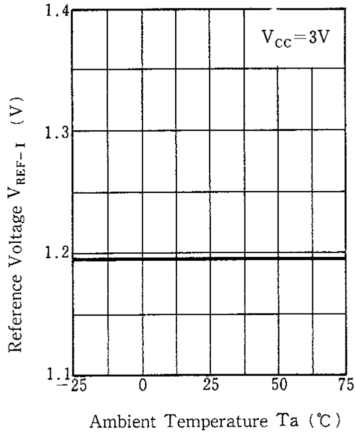
I_{CC}—Ta



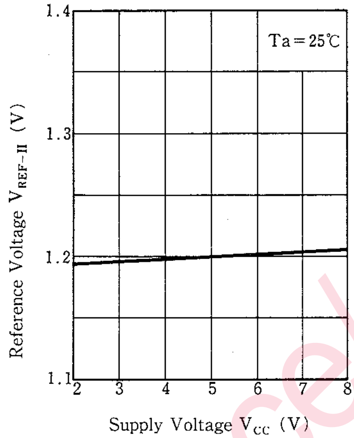
V_{REF-I}—V_{CC}



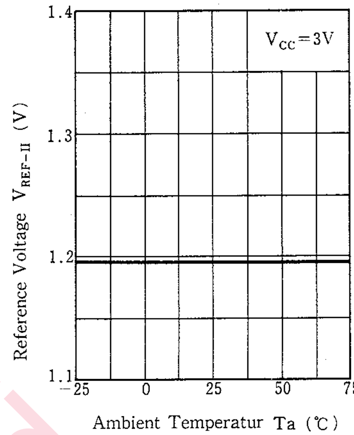
V_{REF-I}—Ta



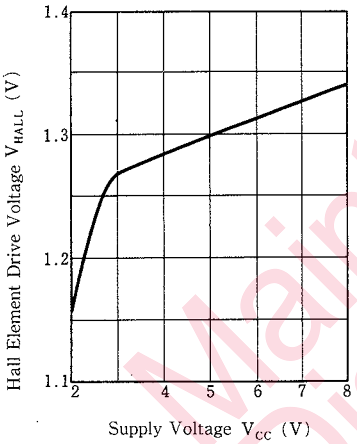
V_{REF-II}—V_{CC}



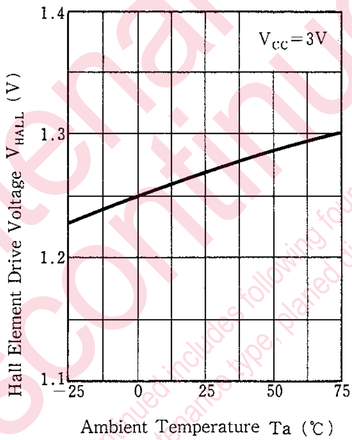
V_{REF-II}—Ta



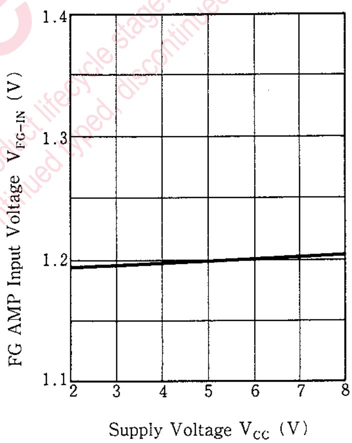
V_{HALL}—V_{CC}



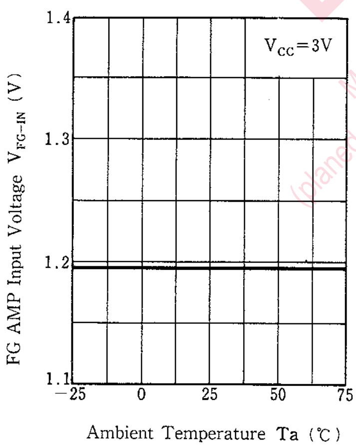
V_{HALL}—Ta



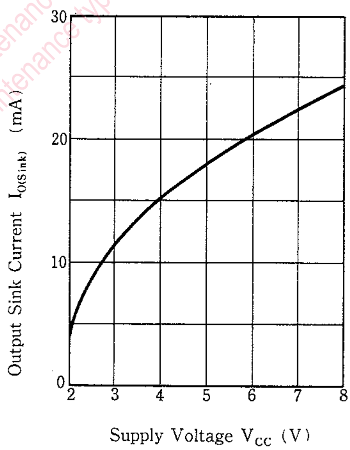
V_{FG-IN}—V_{CC}



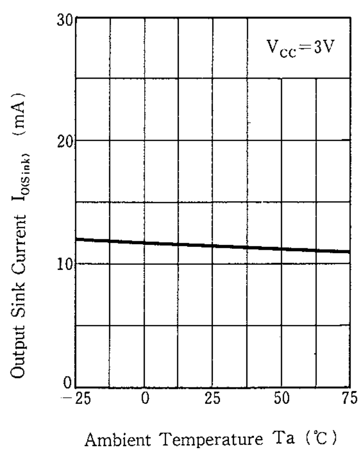
V_{FG-IN}—Ta



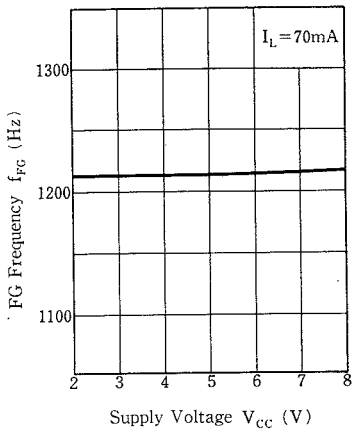
$I_{O(Sink)}$—V_{CC}



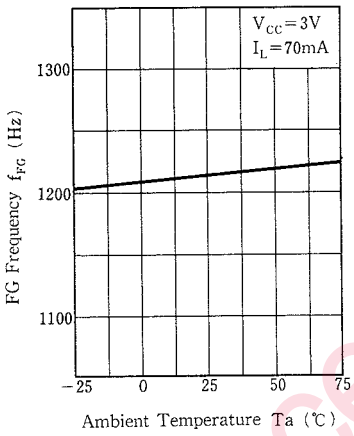
$I_{O(Sink)}$—Ta



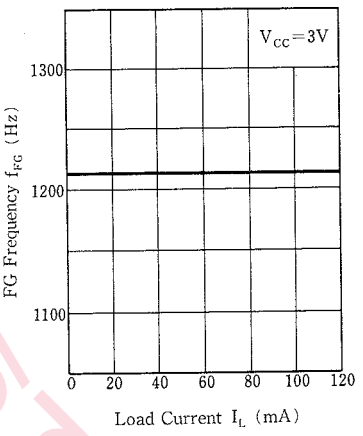
f_{FG}—V_{CC}



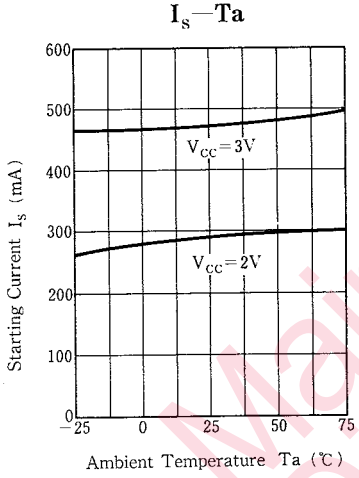
f_{FG}—Ta



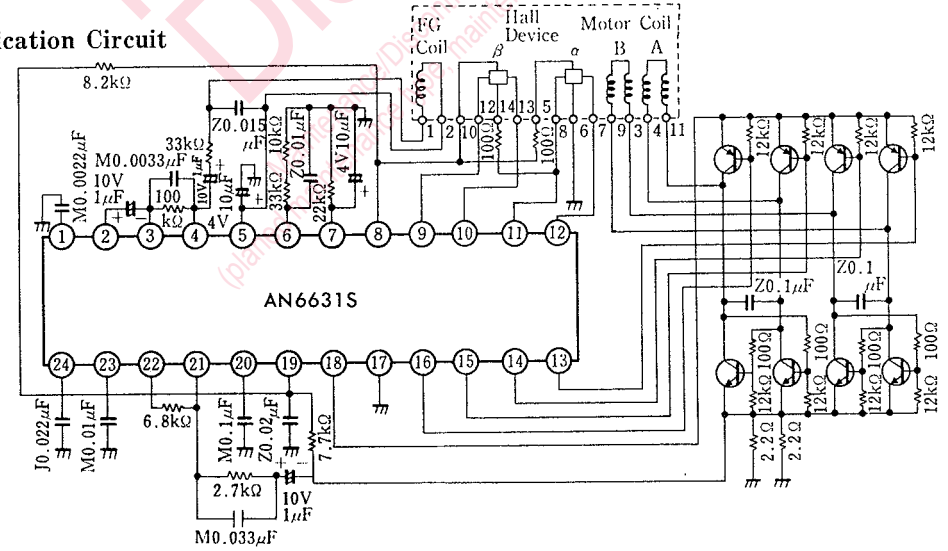
f_{FG}—I_L



I_S—Ta



■ Application Circuit



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