AN8230K

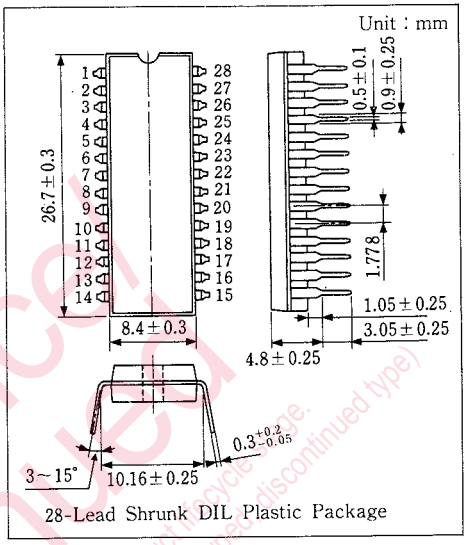
IC for FDD Motor Drive Control

■ Outline

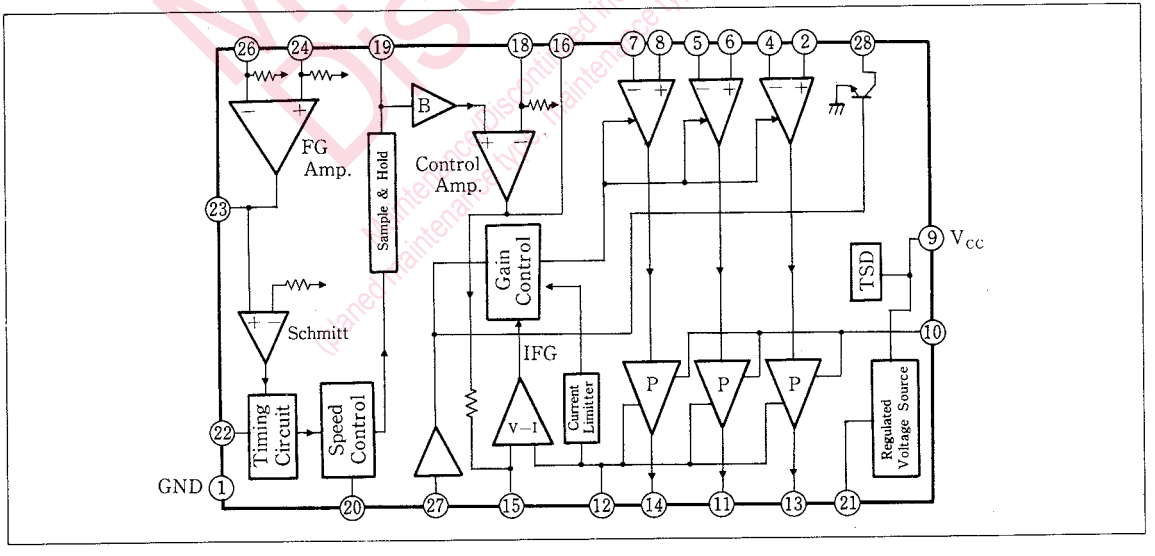
The AN8230K is an FDD motor drive control IC in which a frequency-controlled speed control circuit and a 3-phase full wave drive circuit are integrated on a single chip.

■ Features

- Total current in stop mode : less than 0.3mA
- Current-limit circuit
- Thermal shut-down circuit
- Maximum output current : 500mA



■ Block Diagram



■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	GND	15	V_I Conv. Ripple Reduction
2	Hall Amp.Input(Ha^+)	16	Cont. Amp. Output
3	NC	17	NC
4	Hall Amp.Input(Ha^+)	18	Cont. Amp. Input
5	Hall Amp.Input(Ha^-)	19	Sample & Hold
6	Hall Amp.Input(Hb^+)	20	Speed Control
7	Hall Amp.Input(Hc^-)	21	V_S
8	Hall Amp.Input(Hc^+)	22	Ref. O_{SC}.
9	V_{CC}	23	FG Amp. Output
10	V_M	24	FG Amp. Input(+)
11	Current Output	25	NC
12	GND(Power)	26	FG Amp. Input(−)
13	Current Output	27	Start/Stop
14	Current Output	28	Hall Element Bias

■ Absolute Maximum Ratings (Ta=25℃)

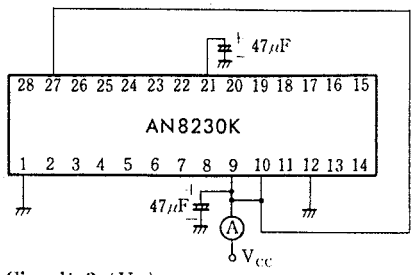
Item	Symbol	Rating	Unit
Supply Voltage	V_{CC}	18	V
Power Dissipation	P_D	1780	mW
Output Current	I_O	±500	mA
Hall Input Voltage Range	V_{HB}	2.2～8.5	V
Operating Ambient Temperature	T_{opr}	−20～+70	℃
Storage Temperature	T_{stg}	−55～+150	℃

■ Electrical Characteristics (Ta=25℃)

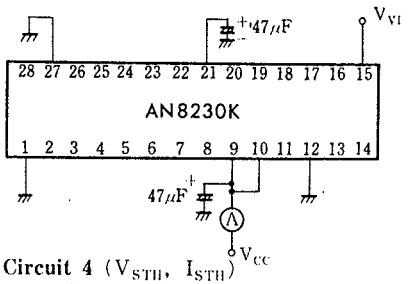
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Standby Supply Current	I_{CS}	1	V_{STOP}=12, V_M=12V			0.3	mA
No-load Supply Current	I_{CM}	2	V_M=12V, V_{VI}=1.7V			15	mA
Stabilized Supply Voltage	V_S	3	V_{STOP}=0.8V	4.0	4.5	5.2	V
Start/Stop Input Voltage "H"	V_{STH}	4	V_{CC}=9.6V	2			V
Start/Stop Input Voltage "L"	V_{STL}	5	V_{CC}=9.6V			0.8	V
Start/Stop Input Current "H"	I_{STH}	4	V_{STOP}=2V			100	nA
Start/Stop Input Current "L"	I_{STL}	5	V_{STOP}=0.8V	−150			μA
Hall Bias Current (for pins)	I_{HB}	6	V_{VI}=3.2V, V_{HIL}=2.5V, V_{HIH}=3.2V			3	μA
FG Amp. Input Bias Voltage"+"	V_{FG}^+	7	V_{VI}=1.7V, V_{STOP}=0.8V	2.0	2.25	2.6	V
FG Amp. Input Bias Voltage"−"	V_{FG}^-	7	V_{VI}=1.7V, V_{STOP}=0.8V	2.0	2.25	2.6	V
Schmitt Amp. Input Bias Voltage"H"	V_{SH}	8	V_{STOP}=0.8V, I_{FG}^+=50μA			4	V
Schmitt Amp. Input Bias Voltage"L"	V_{SL}	8	V_{STOP}=0.8V, I_{FG}=−50μA	1			V
Speed Control Input Bias Current	I_{SP}	9	V_{SP}=2.3V, V_{CC}=16V, V_{OSC}=0V, V_{STOP}=0.8V			100	nA
S/H Input Bias Current	I_{SHB}	10	V_{SH}=2.3V, V_{CC}=16V, V_{OSC}=0V, V_{STOP}=0.8V			100	nA
Output Voltage "L"	V_{OL}	11	I_{OL}=300mA, V_{VI}=3.2V, V_{CC}=V_M=9V			1	V
Current Limit Reference Voltage	V_{LM}	12	V_M=12V, V_{VI}=3.2V		0.5	0.55	V

Note 1) V_{CC}=12V, V_{STOP}=0V, V_{PG}=0V in case of no specific conditions
Note 2) Supply power to V_{CC} and V_M simultaneously, or V_M first.

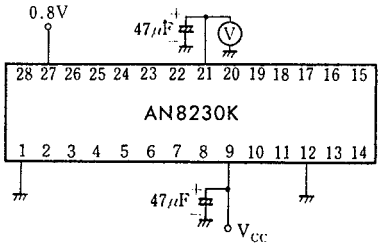
Test Circuit 1 (I_{CS})



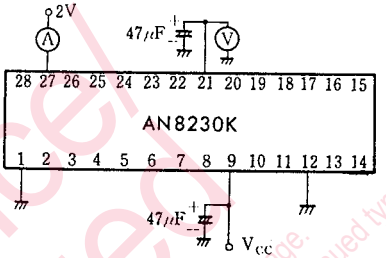
Test Circuit 2 (I_{CM})



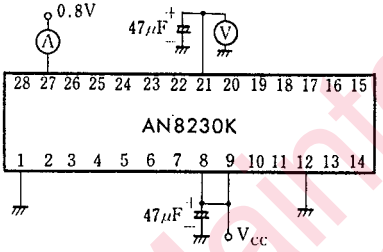
Test Circuit 3 (V_S)



Test Circuit 4 (V_{STH}, I_{STH})

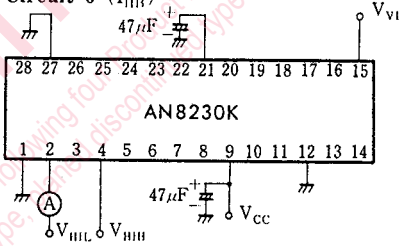


Test Circuit 5 (V_{STL}, I_{STL})



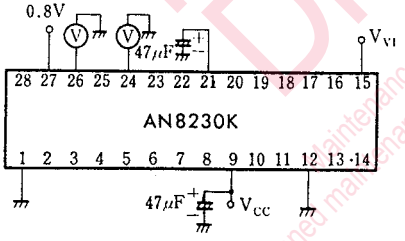
- When 0.8V is applied to Pin ㉗, measure Pin ㉑ voltage to check that the stabilized power circuit is turned ON.
- Measure the current value when 0.8V is applied to Pin ㉗.

Test Circuit 6 (I_{HB})

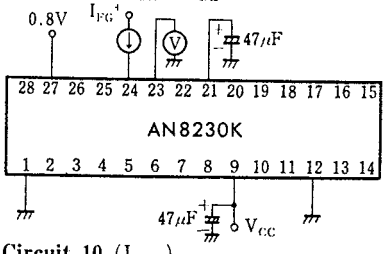


- Apply V_{HIL} to the measuring pin to measure I_{HB}. Similar procedure is made for Pins ④ to ⑧.

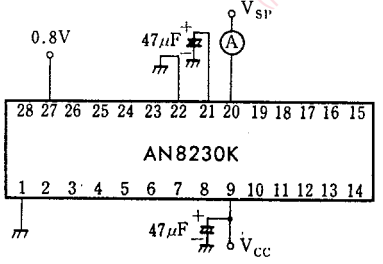
Test Circuit 7 (V_{FG}^+, V_{FG}^-)



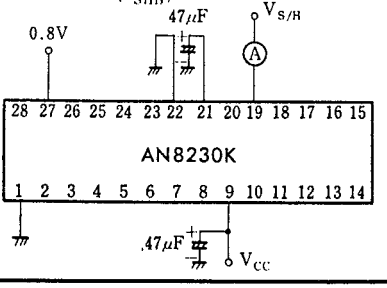
Test Circuit 8 (V_{SH}, V_{SL})



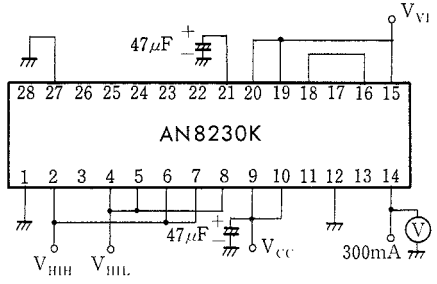
Test Circuit 9 (I_{SP})



Test Circuit 10 (I_{SHB})

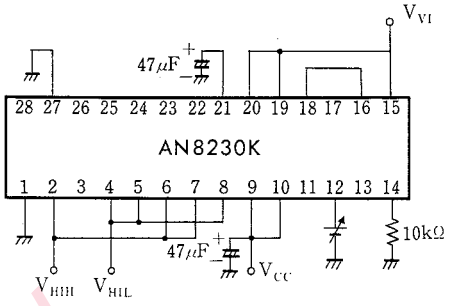


Test Circuit 11 (V_{OL})



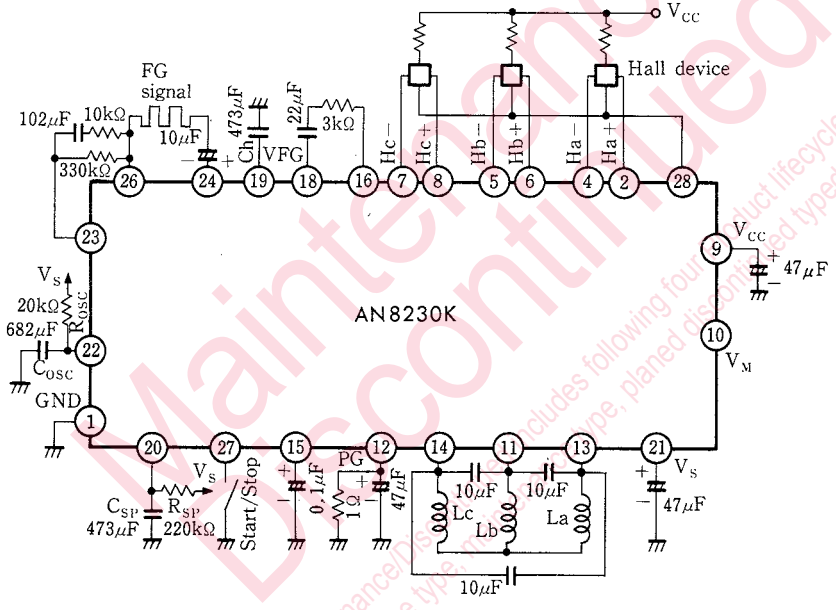
● Measure Pin ⑭ voltage when 300mA is applied to it.

Test Circuit 12 (V_{LM})



● Change the voltage to be applied to Pin ⑫ and measure the voltage when Pin ⑭ becomes from "H" to "L".

■ Application Circuit



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