# 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

Unit : mm

28-Lead Shrunk DIL Plastic Package

■ Block Diagram

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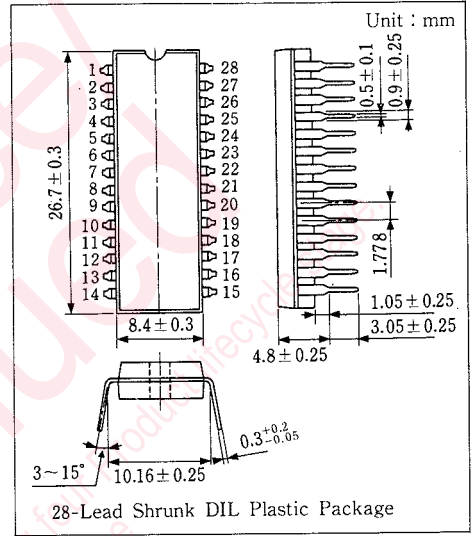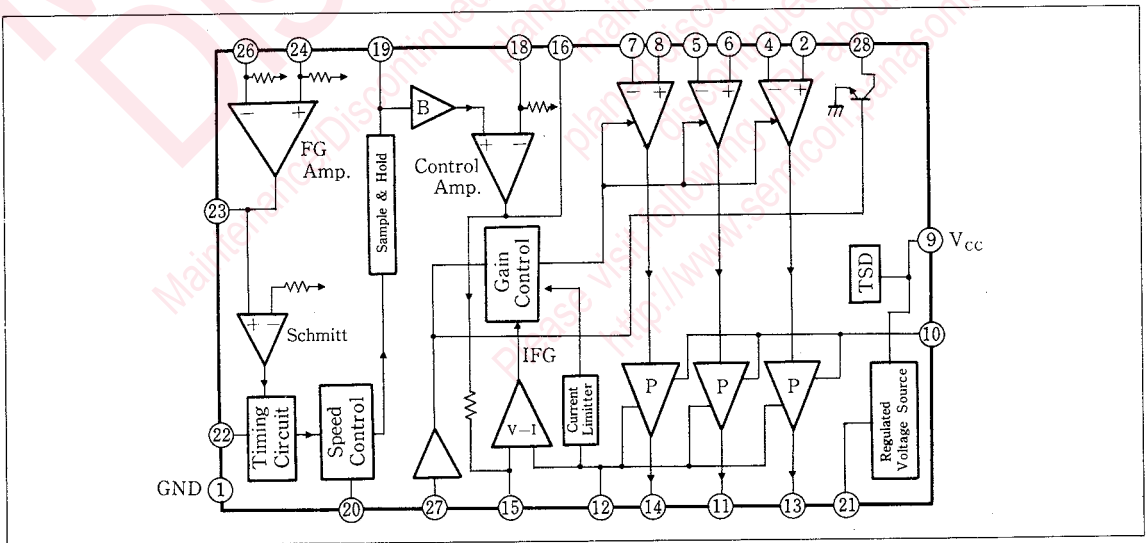
■ Pin

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	$V_{STOP}=0.8V$, $I_{FG}^+=50\mu A$			4	V
Schmitt Amp. Input Bias Voltage "L"	V_{SL}	8	$V_{STOP}=0.8V$, $I_{FG}=-50\mu A$	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
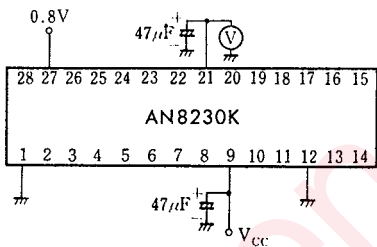Note 2) Supply power to V_{cc} and V_M simultaneously, or V_M first.
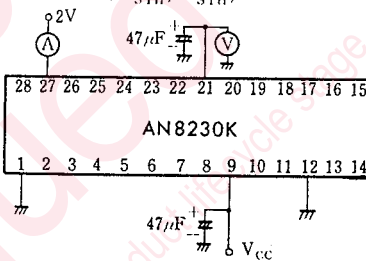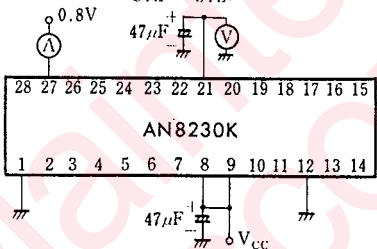
Test Circuit 1 (I_{CS})
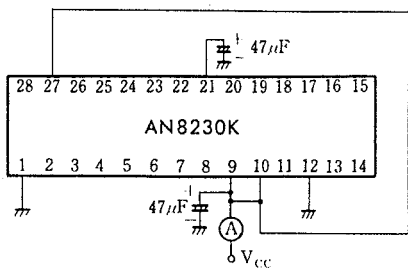
Test Circuit 2 (I_{CM})
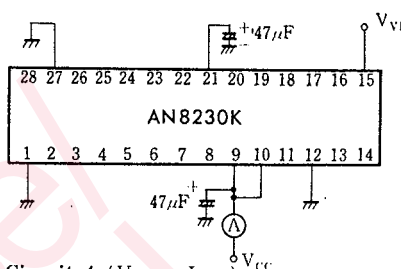
Test Circuit 3 (V_S)

Test Circuit 4 (V_{STH}, I_{STH})
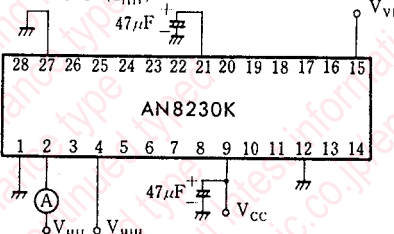
- When 2V is applied to Pin ㉗, measure Pin ㉑ voltage to check that the stabilized power circuit is turned ON.
- Measure the current value when 2V is applied to Pin ㉗.

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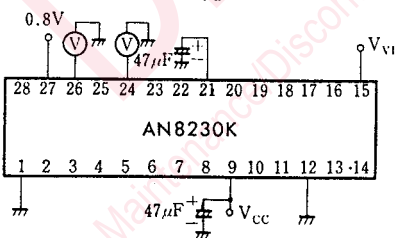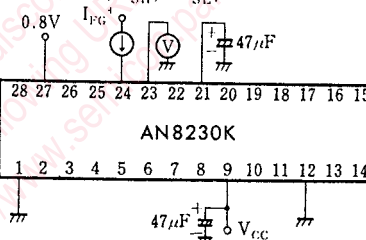

- When 0.8V is applied to Pin ㉗, measure Pin ㉑ voltage to check that the stabilized power circuit is turned ON.
- Measure the current value when 0.8V is applied to Pin ㉗.

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})

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Test Circuit 11 （V_{OL}）

47μF

28 27 26 25 24 23 22 21 20 19 18 17 16 15

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1 2 3 4 5 6 7 8 9 10 11 12 13 14

V_{VI}

47μF V_{CC}

V_{HIH} V_{HIL}
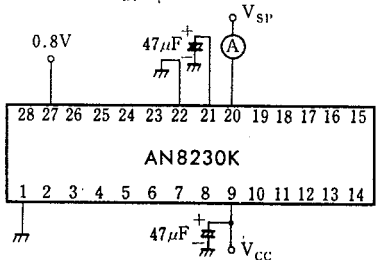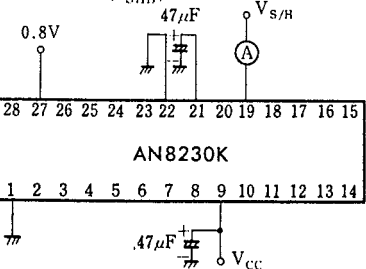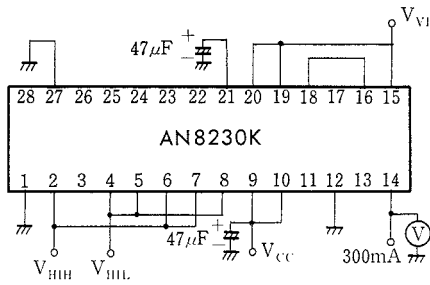
300mA

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

Test Circuit 12 （V_{LM}）

47μF

28 27 26 25 24 23 22 21 20 19 18 17 16 15

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1 2 3 4 5 6 7 8 9 10 11 12 13 14

V_{VI}

47μF V_{CC}

V_{HIH} V_{HIL}

10kΩ
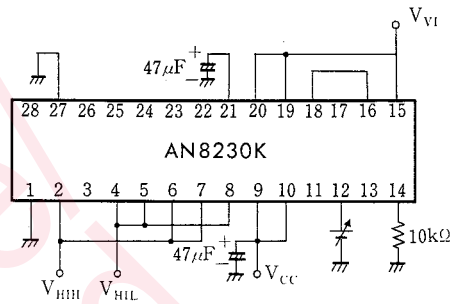
- Change the voltage to be applied to Pin ⑫ and measure the voltage when Pin ⑭ becomes from "H" to "L".

■ Application Circuit
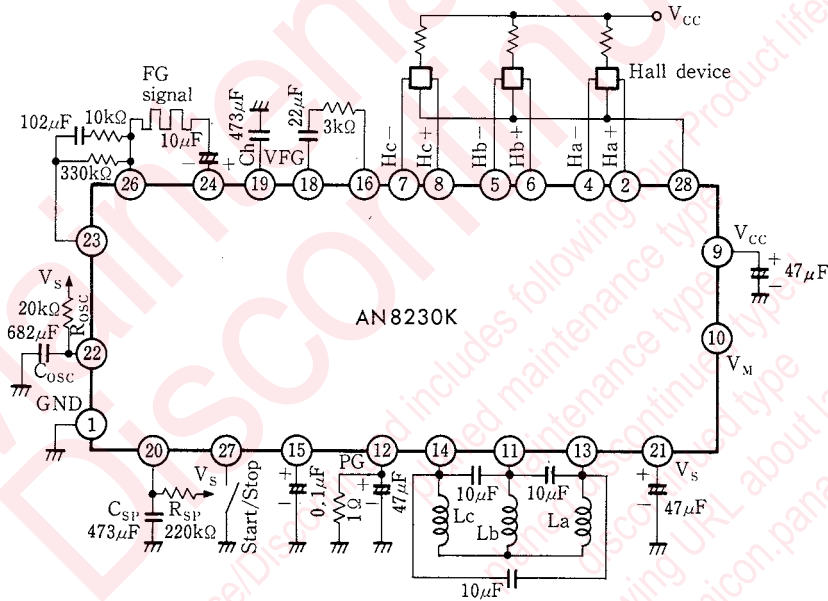
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