AN2861K

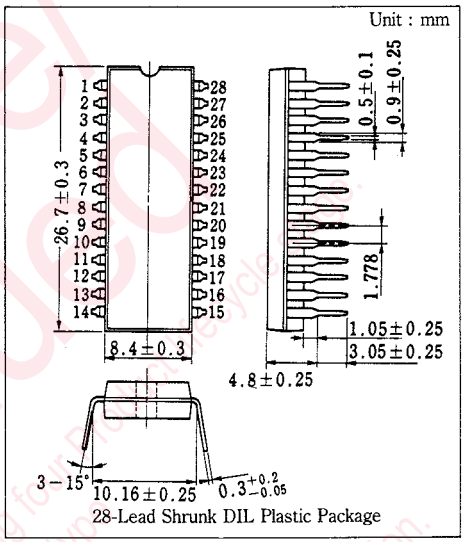
VHD Video Disc Player Turntable Speed Control and TBC Circuit

■Outline

The AN2861K is an integrated circuit designed for turntable speed control and time axis correction of VHD-system video disk player.

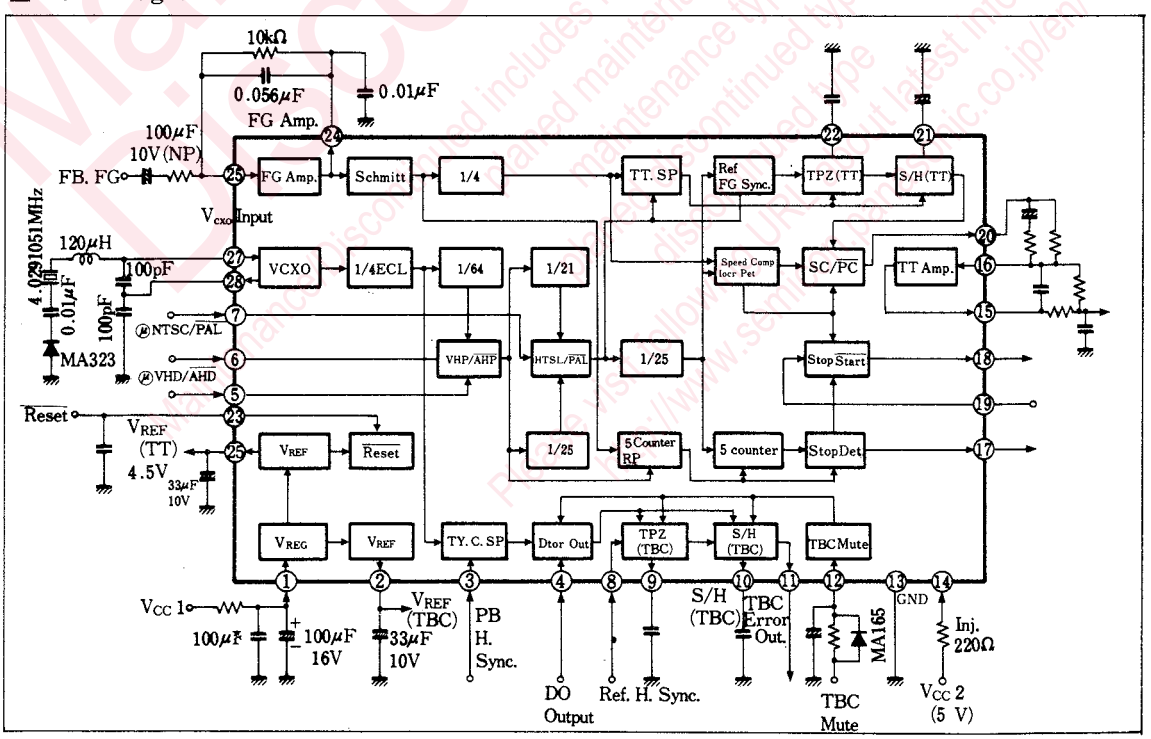
■ Features

- The functions consist of:
  - Turntable Speed control and TBC control.
  - Turntable Lock detect, Stop detect.
  - Control signal switching to NTSC or PAL.
  - Control signal switching to VHD or AHD.



28-Lead Shrunk DIL Plastic Package

■Block Diagram



■Absolute Maximum Ratings (Ta = 25°C)

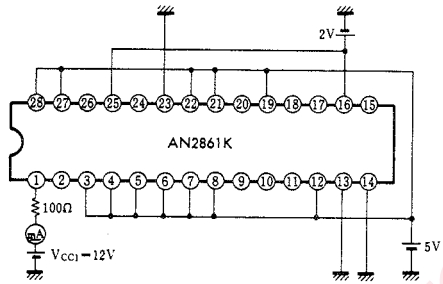
Item	Symbol	Rating	Unit
Supply voltage	V_{CC}*	14.4	V
Supply current	I_{CC}	89	mA
Power dissipation	P_D	540	mW
Operating ambient temperature	T_{opr}	−20～+70	°C
Storage temperature	T_{stg}	−55～+150	°C

* Impress the supply voltage Vcc through 100Ω.

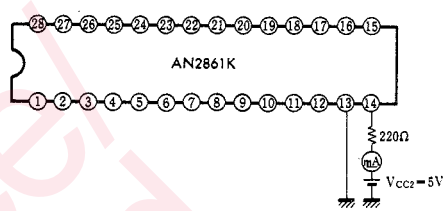
■Electrical Characteristics (Ta = 25°C)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Linear circuit current	I_1	1	V_{CC1}=12V	21	30	39	mA
Internal supply voltage	V_{1-13}	1	V_{CC1}=12V	8.1	9.0	9.9	V
TBC reference voltage	V_{2-13}	1	V_{CC1}=12V	4.05	4.50	4.95	V
TT reference voltage	V_{26-13}	1	V_{CC1}=12V	4.05	4.50	4.95	V
I^2L circuit current	I_{14}	2	V_{CC2}=5V	17	19	21	mA
TT amp. input conversion offset voltage	$V_{I25(offset)}$	3	V_{CC1}=12V			10	mV
FG amp. input conversion offset voltage	$V_{I16(offset)}$	4	V_{CC1}=12V			10	mV
TBC trapezoidal wave charging current	$I_{O(9)}$	5	Pin ⑨=4.5V	−35	−45	−55	μA
TT trapezoidal wave charging current	$I_{O(22)}$	6	Pin ㉒=4.5V	−40	−50	−60	μA
DO input voltage	$V_{I(4)}$	7	Pin ⑧=Ref. H Sync. Pin ③=PB. H Sync.	2.3	3.0	3.7	V
TBC mute OFF input voltage	$V_{OFF(12)}$	7	Pin ⑧=Ref. H Sync. Pin ③=PB. H Sync.	0.6			V
TBC mute ON input voltage	$V_{ON(12)}$	7	Pin ⑧=Ref. H Sync. Pin ③=PB. H Sync.			3.3	V
TBC mute output voltage	$V_{O(11)}$	7	Pin ⑧=Ref. H Sync. oscillation Pin ③=PB. H Sync.	4.05	4.50	4.95	V
VHD/AHD select input voltage	$V_{I(6)}$	8	Pin ㉗=VCXO oscillation Pin ⑤=AHD EXT IN	1.4	2.0	2.6	V
NTSC/PAL select input voltage	$V_{I(7)}$	8	Pin ㉗=VCXO oscillation Pin ⑤=AHD EXT IN	1.4	2.0	2.6	V
STOP/START select input voltage	$V_{I(14)}$	9	Pin ㉗=VCXO oscillation	1.4	2.0	2.6	V
Speed error output voltage(H)	$V_{OH(20)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG	6.75	7.50	8.25	V
Speed error output voltage(L)	$V_{OL(20)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG	1.2	1.5	1.8	V
Lock detection output voltage(H)	$V_{OH(18)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG	2.8			V
Lock detection output voltage(L)	$V_{OL(18)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG			0.5	V
Stop detection output voltage(H)	$V_{OH(17)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG	2.8			V
Stop detection output voltage(L)	$V_{OL(17)}$	10	Pin ㉗=VCXO oscillation Pin ㉕=PB. FG			0.5	V

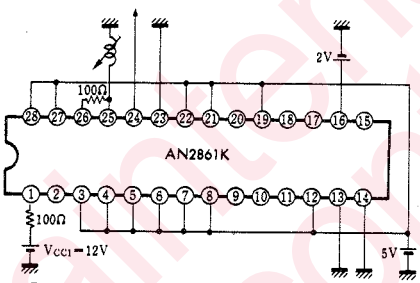
Test Circuit 1 (I_1, $V_{1\text{-}13}$, $V_{2\text{-}13}$, $V_{26\text{-}13}$)



Test Circuit 2 (I_{14})

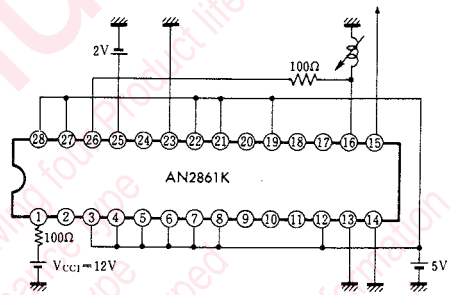


Test Circuit 3 ($V_{I25(offset)}$)



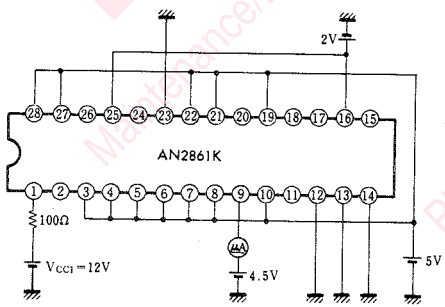
The Pin㉔ output voltage is switched when the Pin㉕ input current is changed. Measure an absolute voltage value between the Pins㉔ and ㉖ when the Pin ㉔ output voltage becomes equal to the Pin ㉖ output voltage.

Test Circuit 4 ($V_{I16(offset)}$)

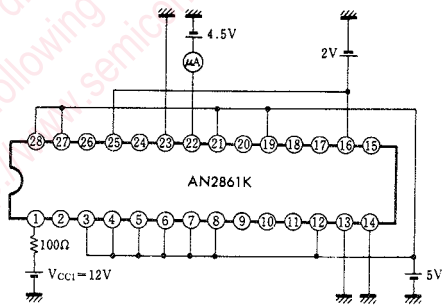


The Pin ⑮ output voltage is switched when the Pin ⑯ input current is changed. Measure an absolute voltage value between the Pins⑮ and ㉖ when the Pin⑮ output voltage become equal to the Pin㉖ output voltage.

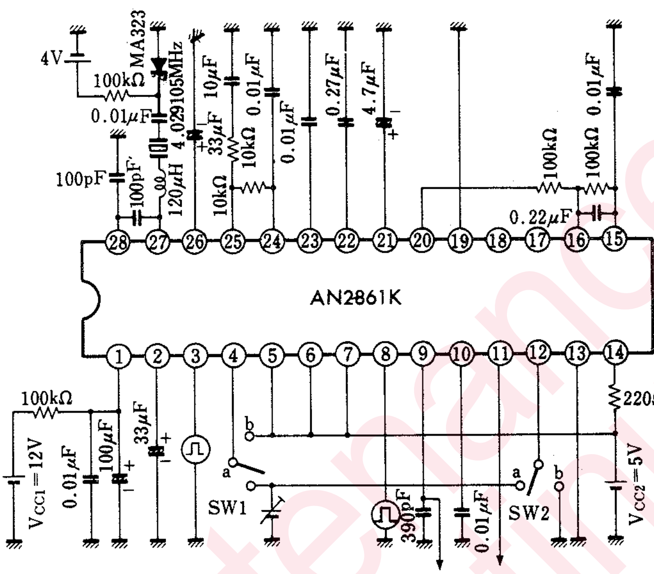
Test Circuit 5 ($I_{O(9)}$)

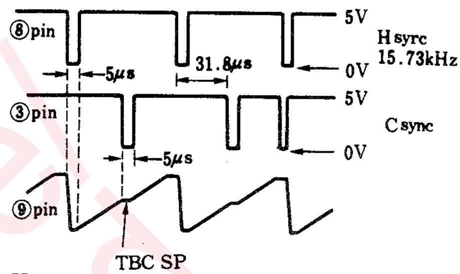


Test Circuit 6 ($I_{O(22)}$)



Test Circuit 7 ($V_{I(4)}$, $V_{OFF(12)}$, $V_{ON(12)}$, $V_{O(11)}$)



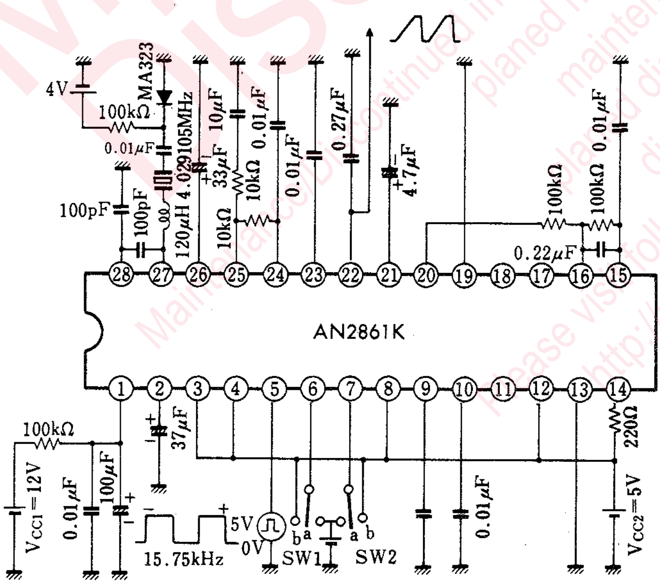


$V_{I(4)}$:
1. Set the SW1 to "a" and SW2 to "b".
2. When a Pin ④ input voltage is changed, TBC. SP of the Pin⑨ output signal is lost. Measure the then Pin④ input voltage and assumes it as $V_{I(4)}$.

$V_{OFF(12)}$:
1. Set the SW1 to "b" and the SW2 to "a".
2. When the Pin⑫ input voltage is changed, the Pin⑨ output amplitude starts reducing . Measure the then Pin⑫ input voltage and assume it as $V_{OFF(12)}$

$V_{ON(12)}$:
1. Set the SW1 to "b" and SW2 to "a".
2. When the Pin⑫ input voltage is changed, the Pin⑨ output amplitude comes to 0. Me Measure the then Pin⑫ input voltage and assume it as $V_{ON(12)}$:
3. Measure the Pin⑪ output voltage and assume it as $V_{O(11)}$.

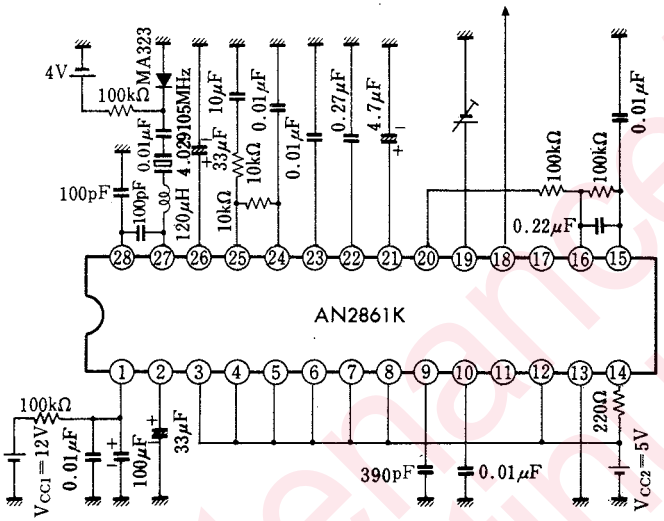
Test Circuit 8 ($V_{I(6)}$, $V_{I(7)}$)



$V_{I(6)}$:
1. Set the SW1 to "a" and the SW2 to "b".
2. When the Pin⑥ input voltage is changed,the frequency for the Pin㉒ output signal is switched. Measure the then Pin⑥ input voltage and assume it as $V_{I(6)}$.

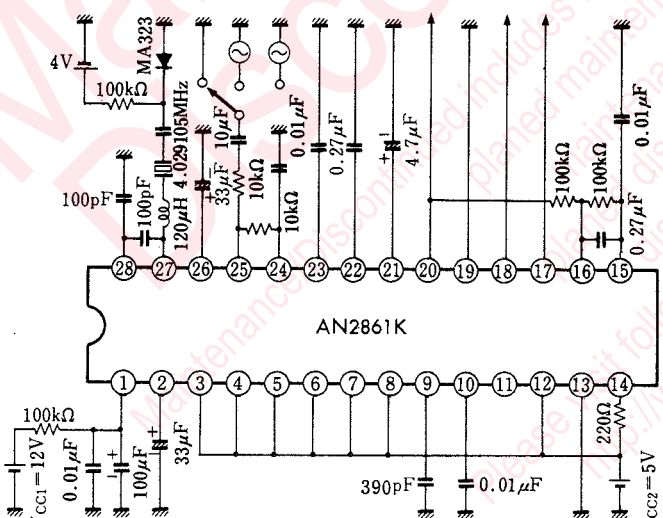
$V_{I(7)}$:
1. Set the SW1 to "b" and the SW2 to "a".
2. When the Pin⑦ input voltage is changed, the frequency for the Pin㉒ output signal is switched. Measure the then Pin⑦ input voltage and assume it as $V_{I(7)}$.

Test Circuit 9 ($V_{I(14)}$)



$V_{I(19)}$:
When the Pin⑲ input voltage is changed. the Pin⑱ output voltage is switched. Measure the then Pin⑲ input voltage and assume it as $V_{I(19)}$.

Test Circuit 10 ($V_{OH(20)}$, $V_{OL(20)}$, $V_{OH(18)}$, $V_{OL(18)}$, $V_{OH(17)}$, $V_{OL(17)}$)



V_{OL} $V_{OH(20)}$, $V_{OH(18)}$, $V_{OL(17)}$.
1. Set the SW1 to "a".
2. Measure the Pin⑳ output voltage and assume it as $V_{OH(20)}$.
3. Measure the Pin ⑱ output voltage and assume it as $V_{OH(18)}$
4. Measure the Pin ⑰ output voltage and assume it as $V_{OL(17)}$.

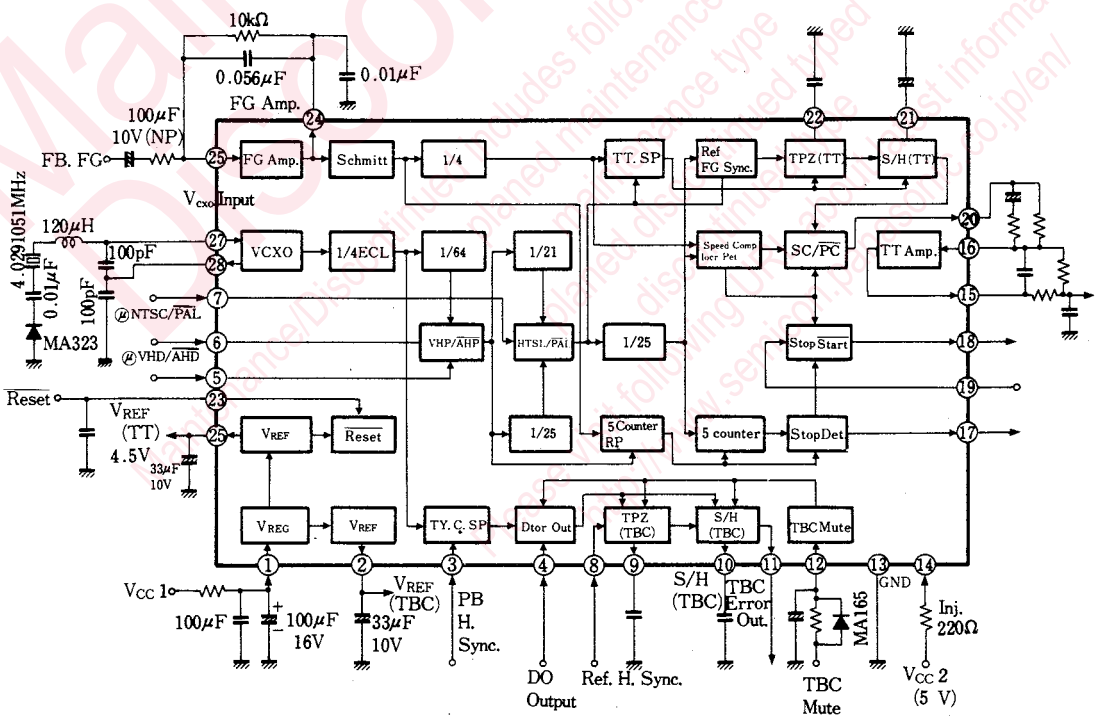
$V_{OL(18)}$, $V_{OH(17)}$:
1. Set the SW1 to "b".
2. The Pin㉕ input signal is phase-synchronized with the Pin㉘ oscillation output divided by 33,600.
3. Measure the Pin⑱ output voltage and assume it as Q $V_{OH(18)}$.
4. Measure the Pin⑰ output voltage and assume it as $V_{OH(17)}$.

$V_{OL(20)}$, $V_{OH(18)}$:
1. Set the SW1 to "c".
2. Measure the Pin⑳ output voltage and assume it as $V_{OL(20)}$.
3. Measure the Pin⑱ output voltage and assume it as $V_{OL(18)}$.

■Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	V_{CC1}	15	TT Amp Output
2	TBC Reference Voltage	16	TT Amp Input
3	PB H Sync.	17	Stop Signal Det.
4	DO Control Signal Input	18	Stop lock Det. Output
5	AHD EXT. Input	19	Stop Start Signal Switch
6	VHD·AHD Switch	20	TT Phase Speed Error Output
7	NTSC·PAL Switch	21	TT S & H
8	Ref. H Sync.	22	TT Trapezoid Signal
9	TBC Trapezoid Signal	23	RESET
10	TBC S & H	24	FG Amp. Output
11	TBC Phase Error Output	25	FG Amp. Input
12	TBC Mute Control Signal Input	26	TT Reference Voltage
13	GND	27	VCXO Input
14	IIL Injector	28	VCXO Output

■Application Circuit.



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