AN5015K

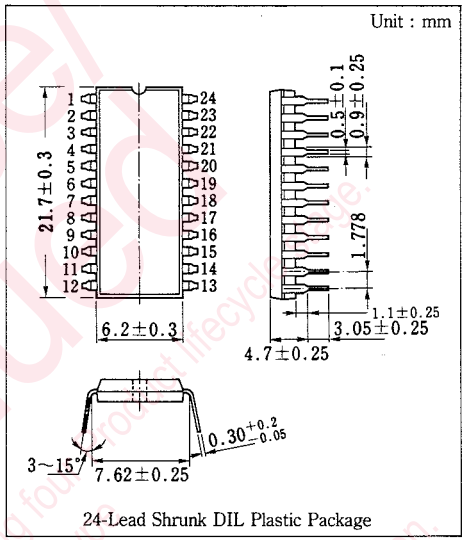
TV Electronic Channel Selection Circuit

■ Outline

The AN5015K is an integrated circuit designed for electronic tuner by the preset volume method.

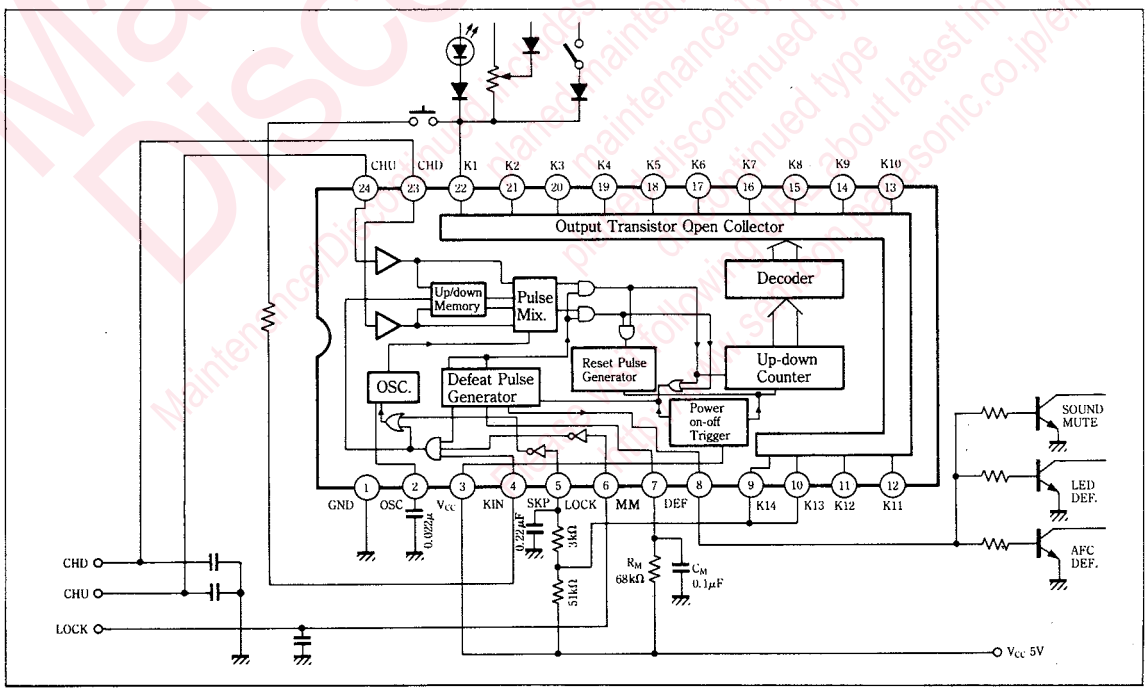
■ Features

- Can drive LED directly (Vsat=75mV typ., I_K=15mA)
- Capable of tuning 14 channels
- Channel-lock is possible
- Defeat pulse width can be adjusted by external C. R.
- Low power consumption (V_{CC}=5V, I_{CC}=15mA typ.)
- Breakdown voltage of output terminal : 50V
- Skip channel selection possible



24-Lead Shrunk DIL Plastic Package

■ Block Diagram



■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	GND	13	Selection Output (K10)
2	OSC	14	Selection Output (K9)
3	V_{CC}	15	Selection Output (K8)
4	K−input	16	Selection Output (K7)
5	Skip	17	Selection Output (K6)
6	Channel Lock	18	Selection Output (K5)
7	Mon−multi	19	Selection Output (K4)
8	Defeat Output	20	Selection Output (K3)
9	Selection Output (K14)	21	Selection Output (K2)
10	Selection Output (K13)	22	Selection Output (K1)
11	Selection Output (K12)	23	Channel Down
12	Selection Output (K11)	24	Channel Up

■ Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Rating	Unit
Supply Voltage	$V_{CC(V3-1)}$	6	V
Terminal Voltage	V_{2-1}	0 ～V_{CC}	V
	V_{6-1}	0 ～V_{CC}	V
	$V_{23,24-1}$	0 ～V_{CC}	V
	$V_{9\sim22-1}$	0 ～V_{CC}	V
Supply Current	I_{CC}	22	mA
	I_4	0 ～ 5	mA
	I_5	0 ～ 5	mA
	$I_{6\sim22}$	0 ～ 30	mA
	I_8	−5 ～ 0	mA
	P_D*	150	mW
Operating Ambient Temperature	T_{opr}	−20～+70	℃
Storage Temperature	T_{sig}	−55～+150	℃

*The allowable range shall be up to 525 mW instantaneously when channels are switched.

■ Electrical Characteristics (Ta=25℃)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply Current	I_{tot}*		V_{CC}=5V	11.25	15	18.25	mA
Tuning Output Saturation Voltage	$V_{OL(K)}$*		V_{CC}=4V, I_{OL}=15mA			150	mV
Tuning Output Leak Current	$I_{OH(K)}$*		V_{CC}=4V, V_{OH}=50V			5	μA
Tuning Output Breakdown Voltage	BV_O*		V_{CC}=4V, $I_{OH(K)}$=10 μA	50			V
DEF Output Voltage	$V_{OH(D)}$*		V_{CC}=5V, I_{OH}=−5mA	1	3	4	V
CHU/D High Threshold Voltage	$V_{TH(CH)}$*		V_{CC}=5V	2.6	3.3	4.0	V
CHU/D Low Threshold Voltage	$V_{TL(CH)}$*		V_{CC}=5V	1.1	1.4	1.7	V
CHU/D Input Current	$I_{IH(CH)}$*		V_{CC}=5V, $V_{23,24}$=4V	50		450	μA
CHU/D Leak Current	$I_{IL(CH)}$*		V_{CC}=5V, V_{IL}=0V	− 5			μA
KIN Input Current	$I_{IH(KI)}$*		V_{CC}=5V	200			μA
KIN Leak Current	$I_{IL(KI)}$*		V_{CC}=5V, V_{IL}=0V	− 5			μA
SKP Input Current	$I_{IH(SK)}$*		V_{CC}=5V	50			μA
SKP Leak Current	$I^{IL(SK)}$*		V_{CC}=5V, V_{IL}=0V	− 5			μA

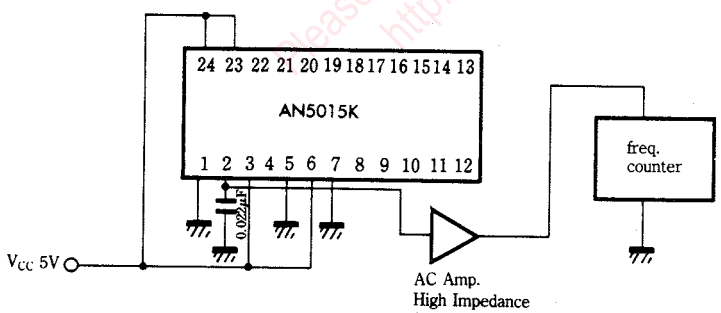
■ Electrical Characteristics (Cont'd) (Ta=25℃)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
CH Lock Input Current	$I_{IH(LO)}$*		V_{CC}=5V	50			μA
CH Lock Leak Current	$I_{IL(LO)}$*		V_{CC}=5V, V_{IL}=0V	− 5			μA
OSC.Input Current (1)	$I_{IH(OS)}$*		V_{CC}=4V, V_{IH}=3V	50	70	90	μA
OSC.Input Current (2)	$I_{IL(OS)}$*		V_{CC}=6V, V_{IL}=1V	−170	−120	− 90	μA
Clock Oscillation Frequency	f_{osc}	1	V_{CC}=5V, C=0.022μF	1.2	1.7	2.2	KHz
CH.Up/Down Pulse Width	τ_1	2	V_{CC}=5V			20	μs
Initializing Pulse Width	τ_2	2	V_{CC}=5V			100	μs
DEF Output Pulse Width	t_{DEF}	3	V_{CC}=5V, R=50kΩ, C=0.1μF	2.5	3.4	4.5	ms

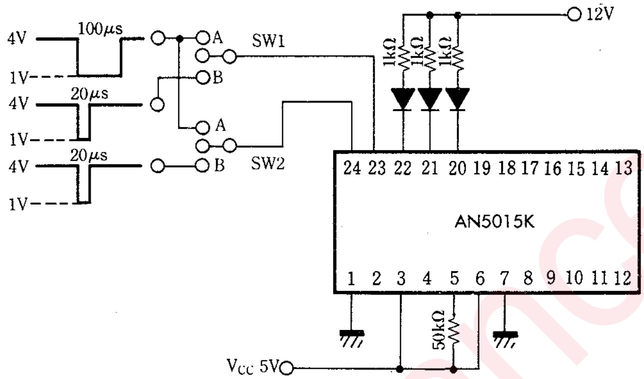
*Test Conditions

Item	Symbol	Test Pin No.	Pin No. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Note
Supply Voltage	Icc	I_3	0V		5V		50kΩ to ③	5V	0V																5V	5V	
Tuning Output Saturation Voltage	$V_{OL(R)}$	V_{22}	0V		4V		50kΩ to ③	to ③	0V															3.3kΩ 50V	to ③	to ③	For R:1ch
Tuning Output Leak Current	$I_{OH(R)}$	I_{22}	0V		4V		50kΩ to ③	to ③	0V															100kΩ 50V	to ③	to ③	For R:1ch
Tuning Output Breakdown Voltage	BVo	V_{22}	0V		4V		50kΩ to ③	to ③	0V															100kΩ 50V	to 4V ③	to 4V ③	For R:1ch
DEF Output Voltage	$V_{OH(D)}$	V_8	0V		5V		50kΩ to ③	to ③	0V																10kΩ to ③	0V	
CHU/D High Threshold Voltage	$V_{TH(CH)}$	$V_{23,24}$ *1	0V		5V		50kΩ to ③	to ③	0.5 V																to ③		
CHU/D Low Threshold Voltage	$V_{TL(CH)}$	$V_{23,24}$ *2	0V		5V		50kΩ to ③	to ③	0.5 V																to ③		
CHU/D Input Current	$I_{IH(CH)}$	$I_{23,24}$	0V		5V		50kΩ to ③																		4V	4V	
CHU/D Leak Current	$I_{IL(CH)}$	$V_{23,24}$	0V		5V		50kΩ to ③																		10kΩ 0V	10kΩ 0V	
KIN Input Current	$I_{IH(KI)}$	I_7	0V	1V	5V	400 mA	50kΩ to ③	0V	0.5 V																to ③	to ③	
KIN Leak Current	$I_{IL(KI)}$	I_4	0V	1V	5V	0V	50kΩ to ③	0V	0.5 V																to ③	to ③	
SKIP Input Current	$I_{IH(SK)}$	I_7	0V	1V	5V	0V	50 mA	to ③	0.5 V																to ③	to ③	
SKIP Leak Current	$I_{IL(SK)}$	I_5	0V	1V	5V	0V	0V	to ③	0.5 V																to ③	to ③	
CH.Lock Input Current	$I_{IH(LO)}$	I_7	0V	0V	1V	10kΩ to ③	50kΩ to ③	50 mA	0.5 V																to ③	to ③	
CH.Lock Leak Current	$I_{IL(LO)}$	I_6	0V	1V	5V	10kΩ to ③	50kΩ to ③	0V	0.5 V																to ③	to ③	
OSC.Input Current	$I_{IH(OS)}$	I_2	0V	3V	4V		0V	to ③																	to ③	to ③	
OSC.Input Current	$I_{IL(OS)}$	I_2	0V	1V	6V		0V	to ③																	to ③	to ③	

Test Circuit 1 (f_{OSC})

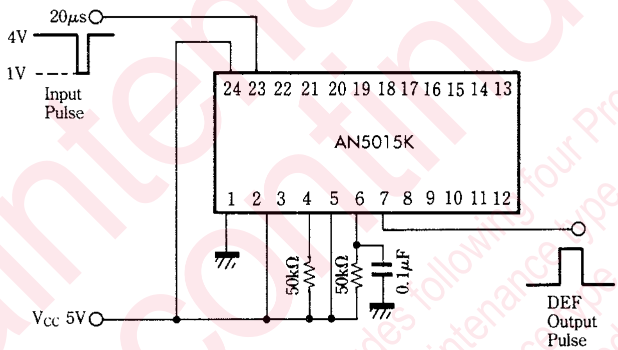


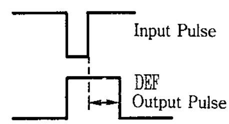
Test Circuit 2 (τ_1, τ_2)



① SW1 and SW2 at the side A are initialized in a pulse of 100 μs.
("Initial Operation" in this case denotes that 1 channel is output when CHU and CHD become Low level at the same time.)
②SW1 at the side B is in CHD operation in a pulse of 20 μs.
("CHD operation" in this case denotes that a channel is Down when CHD becomes Low level.)
③SW2 at the side B is in CHU operation in a pulse of 20 μs.
("CHU operation" in this case denotes that a channel is Up when CHU becomes Low level.)

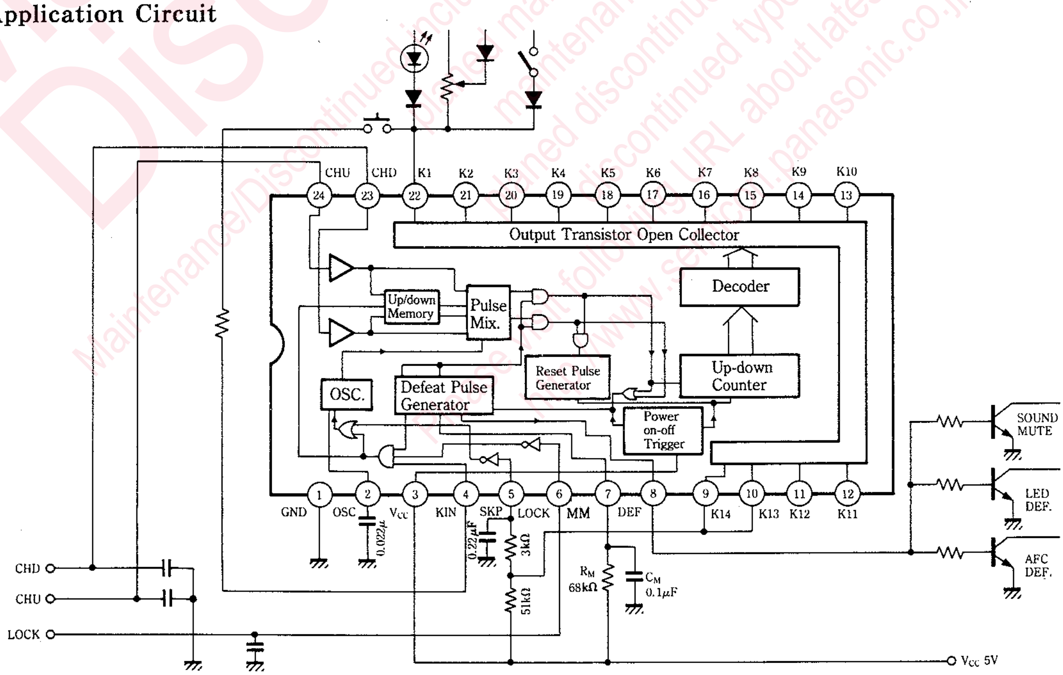
Test Circuit 3 (τ_{DEF})





Note: Measure the time from the end of input pulse to the end of DEF output pulse.

■ Application Circuit



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