

AN5015K

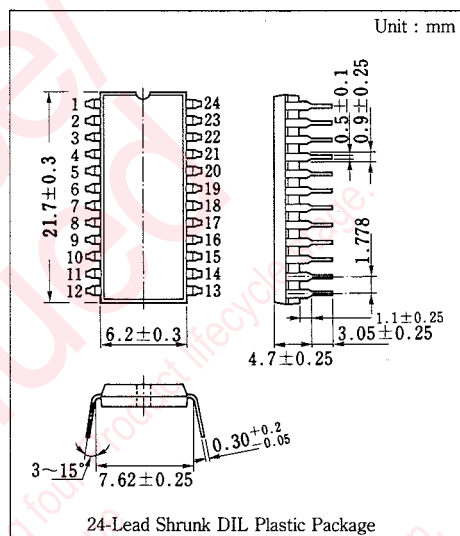
TV Electronic Channel Selection Circuit

Outline

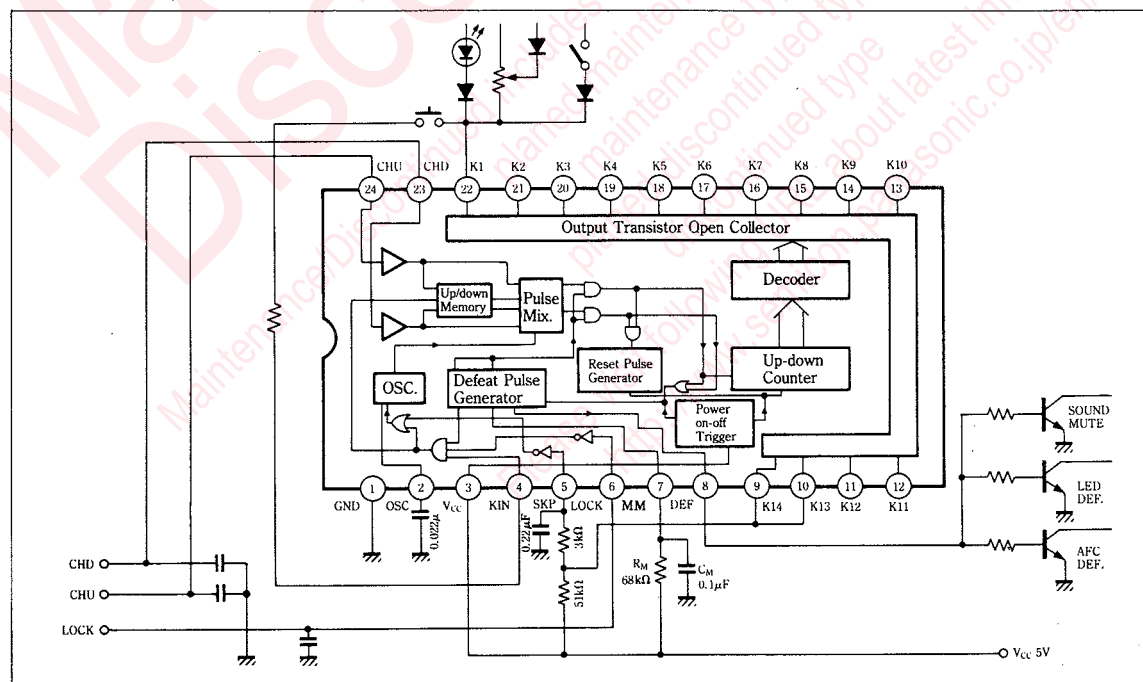
The AN5015K is an integrated circuit designed for electronic tuner by the preset volume method.

Features

- Can drive LED directly ($V_{sat}=75mV$ 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



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°C)

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 ₉₋₂₂₋₁	0 ~ V _{cc}	V
Supply Current	I _{cc}	22	mA
	I ₁	0 ~ 5	mA
	I ₅	0 ~ 5	mA
	I ₅₋₂₂	0 ~ 30	mA
	I ₅	-5 ~ 0	mA
	P _D *	150	mW
Operating Ambient Temperature	T _{opr}	-20 ~ +70	°C
Storage Temperature	T _{stg}	-55 ~ +150	°C

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

■ Electrical Characteristics (Ta=25°C)

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 _{HH(CH)} *		V _{cc} =5V, V _{23,24} =4V	50		450	μA
CHU/D Leak Current	I _{LL(CH)} *		V _{cc} =5V, V _{IL} =0V	-5			μA
KIN Input Current	I _{HK(K)} *		V _{cc} =5V	200			μA
KIN Leak Current	I _{LL(K)} *		V _{cc} =5V, V _{IL} =0V	-5			μA
SKP Input Current	I _{HS(K)} *		V _{cc} =5V	50			μA
SKP Leak Current	I _{LS(K)} *		V _{cc} =5V, V _{IL} =0V	-5			μA

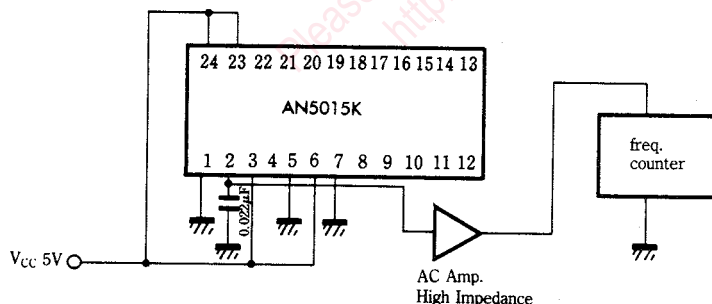
■ Electrical Characteristics (Cont'd) (Ta=25°C)

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	$V_{CC}=5V, C=0.022\mu F$	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	$V_{CC}=5V, R=50k\Omega, C=0.1\mu F$	2.5	3.4	4.5	ms

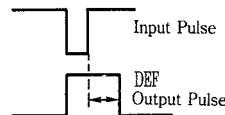
*Test Conditions

Item	Symbol	Test Pin No.	Pin No.																								Note
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Supply Voltage	I _{CC}	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 30V	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 30V	to 3	to 3	For R:1ch
Tuning Output Breakdown Voltage	BV _o	V ₂₂	0V		4V	50kΩ to 3	to 3	0V																100kΩ 30V	to 4V to 3	to 4V to 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(KD)}	I ₇	0V	1V	5V	400 mA	50kΩ to 3	0V	0.5 V																to 3	to 3	
KIN Leak Current	I _{IL(KD)}	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	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})



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



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

The diagram illustrates the internal circuitry of the Panasonic SL-N5000 portable cassette player, centered around a 20-pin integrated circuit (IC) package. The IC pins are numbered 1 through 20, with 10 pins on the bottom and 10 on the top. The top pins are labeled K1 through K10, and the bottom pins are labeled K14 through K11. The IC is connected to various external components, including a 5V power supply (V_{CC}), a 50kΩ resistor (R_M), a 68kΩ resistor (R_M), a 0.1μF capacitor (C_M), and a 0.022μF capacitor (C_M). The IC also controls three output transistors: SOUND MUTE, LED DEF., and AFC DEF. The circuit includes a Pulse Mix. block, an Up/down Counter, a Decoder, a Reset Pulse Generator, a Power on-off Trigger, a Defeat Pulse Generator, and an OSC. block. The IC is also connected to a 20-pin connector (K1-K10) and a 20-pin connector (K14-K11).

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