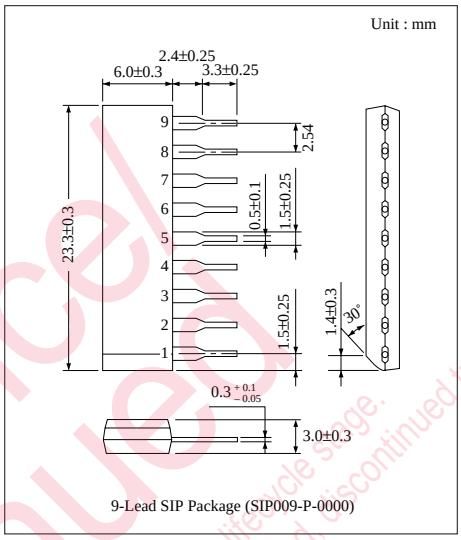
AN6262N, AN6263N

Pause Detection Circuits of Radio Cassette, Cassette Deck

■ Overview

The AN6262N and the AN6263N are the pause detection integrated circuits which select the program on the cassette tape. In the ordinal method, tape speed is different depending on the PLAY and FF/REW, and also non-signal time between the programs is different. Therefore, two time constant circuit has been applied in order to detect each time. The AN6262N and the AN6263N are proud of detecting the program by making the time corresponding to each non signal time logically in the one time constant circuit. Furthermore, signal can be detected in this time constant circuit and beginning of the program is recognized when sound signal pulse increase more than specified numbers.

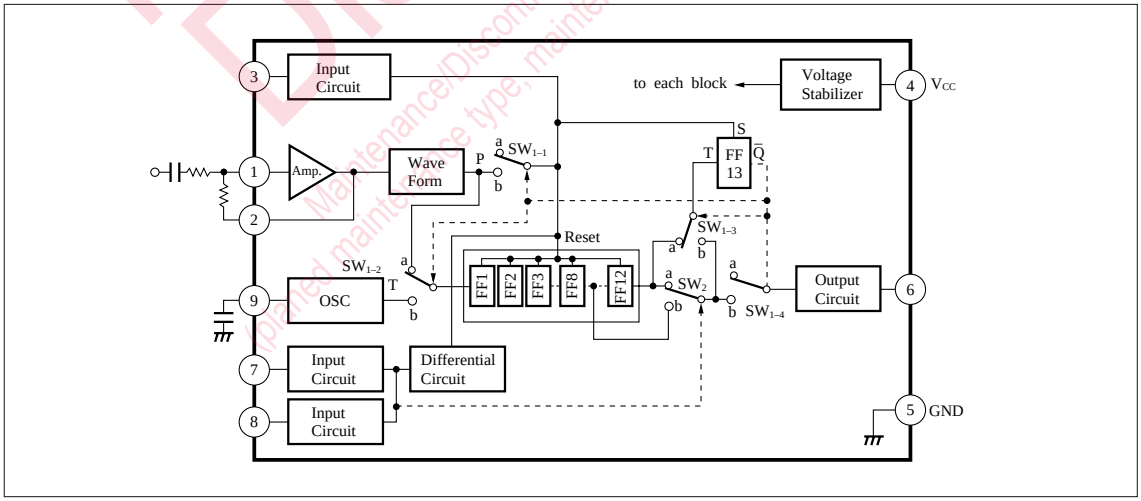


9-Lead SIP Package (SIP009-P-0000)

■ Features

- Built-in protection circuit to prevent mis-operation when power switch is turned ON.
- Time-constant circuit for detection of no-signal period in PLAY and FF/REW.
- No-signal period and output pulse width can be selected by external capacitor.
- Detection level of input signal can be selected by external resistor.
- As the ON/OFF input for mode setting and pause detection, both TTL level and power source level can be used.
- Very few external components needed.

■ Block Diagram



■ Pin Descriptions

Pin No.	Pin Name
1	Signal Input
2	Negative Feedback
3	Pause Detection ON/OFF Input
4	V_{CC}
5	GND
6	Output
7	Mode *
8	Mode *
9	Reference Oscillation

* Pin 7	Pin 8	Mode
L	L	OFF
H	L	FF/REW
L	H	PLAY
H	H	OFF

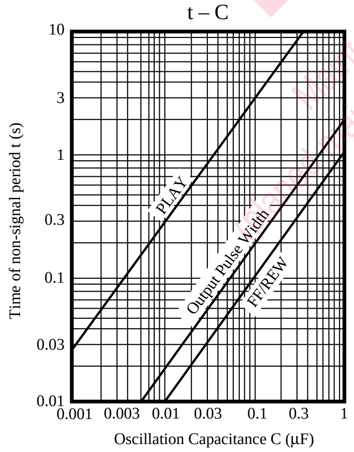
■ Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol		Rating	Unit
Supply Voltage	V_{CC}		16	V
Supply Current	I_{CC}	AN6262N	21	mA
		AN6263N	25	mA
Power Dissipation	P_D	AN6262N	336	mW
		AN6263N	475	mW
Operating Ambient Temperature	T_{opr}		–25 ~ + 75	˚C
Storage Temperature	T_{stg}		–55 ~ + 125	˚C

■ Electrical Characteristics (V_{CC}=12V, Ta=25˚C)

Parameter		Symbol	Condition		min.	typ.	max.	Unit
Supply Current (Output OFF)		$I_{4\,(OFF)}$	V_3=V_7=V_8=2V, V_9=1V	AN6262N	11.5	—	20	mA
				AN6263N	12.5	—	23	mA
Oscillation Frequency		f_{OSC}	V_1=0V, V_3=V_7=V_8=0V		0.9	1.2	1.47	kHz
Signal Detection Level		V_1	f_1=10kHz, V_3=V_7=2V, V_8=0V		1.6	—	2.6	mVrms
Pause Detection ON/OFF Level		V_{3-5}	I_3= –100µA, V_7=V_8=2V, V_9=1V		1.1	—	1.6	V
Pause Detection OFF Outcoming Current		I_3	V_3=0V, V_{CC}=18V, V_7=V_8=2V, V_9=1V		– 0.6	—	– 0.3	mA
Mode Switching Level	Pin7	V_{7-5}	V_3=V_8=2V, I_7= –100µA, V_9=1V		1.0	—	1.5	V
	Pin8	V_{8-5}	V_3=V_7=2V, I_8= –100µA, V_9=1V		1.0	—	1.5	V
Mode Switching Circuit Outgoing Current	Pin7	I_7	V_3=V_8=2V, V_{CC}=18V, V_7=0V, V_9=1V		–1.2	—	– 0.6	mA
	Pin8	I_8	V_3=V_7=2V, V_{CC}=18V, V_8=0V, V_9=1V		–1.2	—	– 0.6	mA

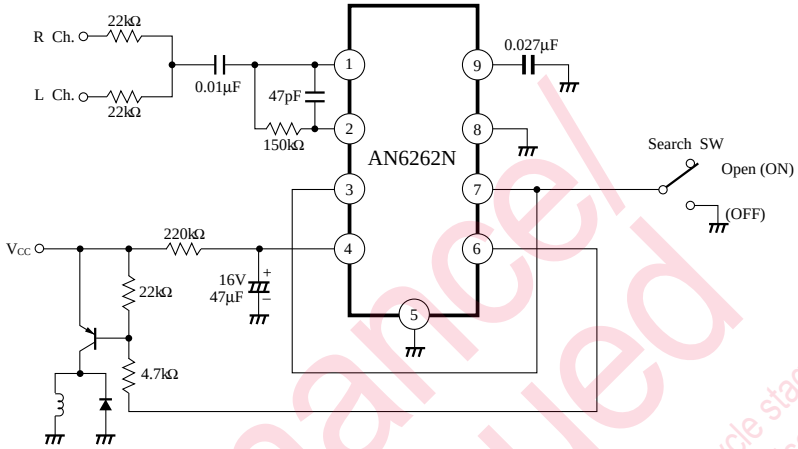
t – C



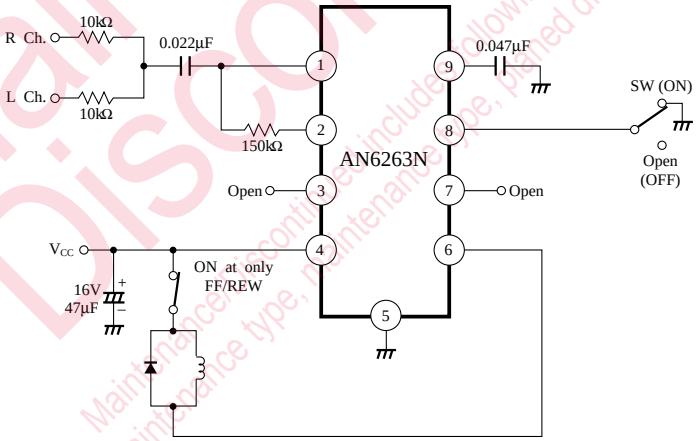
■ Application Circuits

Program detecting circuit only at FF/REW mode.

(1) When the plunger is ON between the program

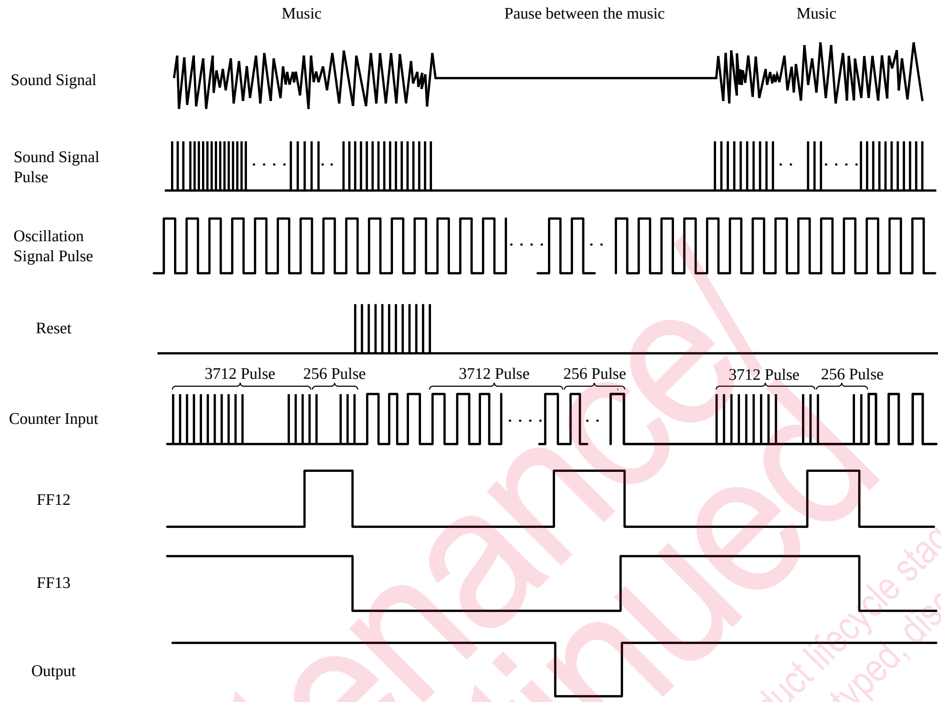


(2) When the plunger is OFF between the program



■ Operational Description

(1) Between the program timing chart (PLAY Mode)



(Output polarity is inverted in case of AN6263N)

(2) Explanation of PLAY mode (Referred to block diagram)

1) When supply voltage is turned ON and Pin3 is set to "H" (between the program detection ON), FF1-FF12 are reset and FF13 is set, Switch SW_1 is all connected to a.

2) Mode is set (Pin7 "L", Pin8 "H").

3) SW_2 is connected to a.

4) Sound signal input to Pin1 becomes pulse after wave shaped.

5) This sound pulse signal is input to the counter via SW_{1-2}.

6) Sound pulse signal is input to the counter by 3712 pulses, FF12 is inverted to "H" (L→H). But no output is obtained as the SW_{1-4} is connected to a.

7) Furthermore sound pulse signal is input by 256, FF12 in inverted to "L" (→L).

When sound pulse signal is input by 3712+256 pulses, program is recognized.

8) When FF12 is inverted from "H" to "L", FF13 is inverted. When FF13 is inverted, SW_1 is all connected to b.

9) Sound pulse signal, oscillation from oscillator and output of FF12 are connected to reset pin of the counter, input of the counter and output circuit, respectively.

10) Counter will count oscillation pulse signal and is reset by the "H" of sound pulse signal (Program is there).

11) When sound pulse signal is stayed at "L" (program ends), reset is released. Counter begins to count oscillation pulse signal and FF12 is inverted to "H" by 3712 pulses.

Between the program is detected by counting oscillation pulse signal by 3712 pulses.

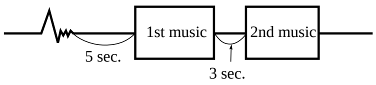
When static capacitance of the external capacitor at Pin9 is set to 0.1µF, between the program is detected when no signal time is more than 3 seconds.

12) Oscillation pulse signal is input furthermore by 256 pulses, FF12 is inverted ("H" → "L"), FF13 is also inverted and SW_1 is all connected to a.

13) Returns to 5) mode. Input pulse signal is counted by more than 3712 + 256 pulses, program is recognized.

After that, no signal time (more than 3 seconds) comes, between the program is recognized and output pulse is generated.

If no signal time is less than 3 seconds, it is recognized not between the program, but program.



Even if noise is contained before more than 3 seconds of 1st music, between 1st music and 2nd music is detected.

When count of input pulse signal is by less than 3712, it is recognized as no signal time. So noise is not recognized as program. Detection of between noise and 1st music is never done.

(3) FF/REW

Mode is set (Pin7 "H", Pin8 "L"). Switch S_2 is connected to b.

No signal detection time (0.1 seconds) is only different, count number and pulse width of the sound pulse signal, which acknowledges program, are the same, and operation is same, too.

(4) Neither PLAY nor FF/REW

When Pin7, 8 are "H", "H" and "L" and "L", between the program detection is not performed even if between the program mode is ON.

(5) Switching case of PLAY → FF/REW

Always reset and initialized.

(6) Current driving capacitance of the output is minimum 100mA. When relay is driven directly, equivalent load resistance is most suitable at 200Ω. (AN6263N).

■ How to determine oscillation capacitance

No signal detection time of PLAY, FF/REW and time of output pulse width is determined by the relation between oscillation cycle determined by the oscillation capacitance and construction stage number of the flip-flop. When oscillation period is t_{osc},

Detection time of the PLAY mode : $t_{play}=3712t_{osc}$

Detection time of the FF/REW mode : $t_{FF/REW}=128t_{osc}$

Output pulse width : $t_{out}=256t_{osc}$

Relation between oscillation cycle and oscillation capacitance is

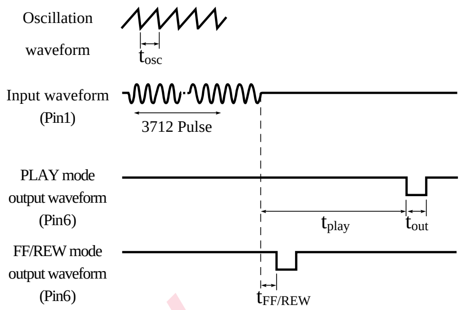
$t_{osc}=8.64C$ (ms) C : µF,

thus t_{play}, $t_{FF/REW}$, t_{out} becomes

$t_{play}=32.07C$ (s)

$t_{FF/REW}=1105.9C$ (ms)

$t_{out}=2211.8C$ (ms) C : µF.

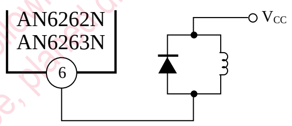


(Output polarity is inverted in case of AN6263N)

■ Precautions on Use

Following items should be taken care in order to protect destruction and keep reliability.

1. Please use it in the absolute maximum ratings. Take care in case surge voltage shall be applied.
2. Pins except Pin5 should be used in the range of positive voltage against Pin5.
3. Oscillation capacity should be used with superior thermal characteristics.
4. When plunger and relay are connected to the output circuit, diode should be connected to the both side of coil in order to protect the IC against counter electromotive force.



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