

AN2661NK

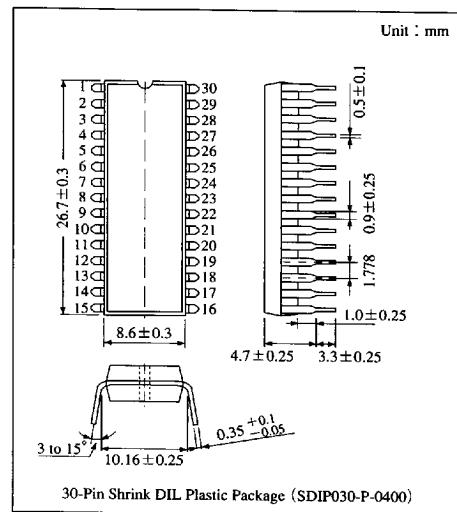
Video Signal Processing IC for Multi-laser Player

■ Overview

The AN2661NK is a video signal processing IC for multi-laser player. Its functions include FM demodulation, dropout-detection and compensation, noise canceling, and fade effect.

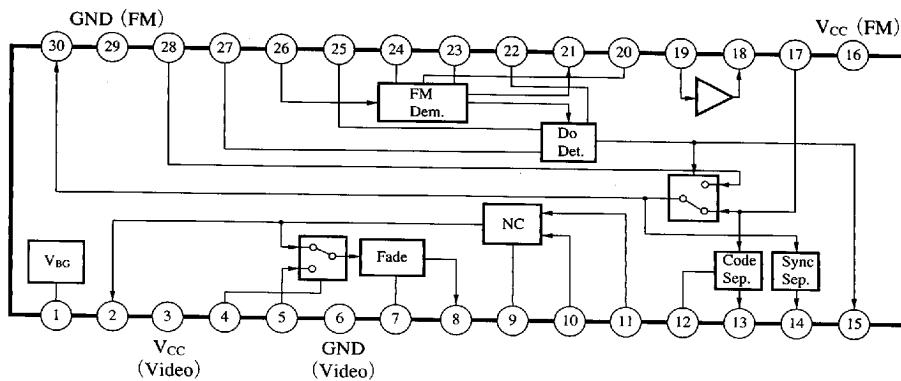
■ Features

- 5V single power supply operation
- Wide bandwidth FM-demodulation with a built-in delay circuit
- Detection of dropout, and its compensation after demodulation by identification RF signal amplitude, lower frequency and higher frequency
- Detection of code signal and synchronous signal
- Built-in noise-canceling function
- Black fading-effect are easily obtained without any gate pulses
- Able to switch external video signal
- Half-picture-function that makes surrounding frame for character.



30-Pin Shrink DIL Plastic Package (SDIP030-P-0400)

■ Block Diagram



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■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	6	V
Supply current	I _{CC}	90	mA
Power dissipation	P _D	540	mW
Operating ambient temperature	T _{opr}	-20 to +70	°C
Storage temperature	T _{stg}	-55 to +150	°C

■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range	V _{CC}	4.5V to 5.5V

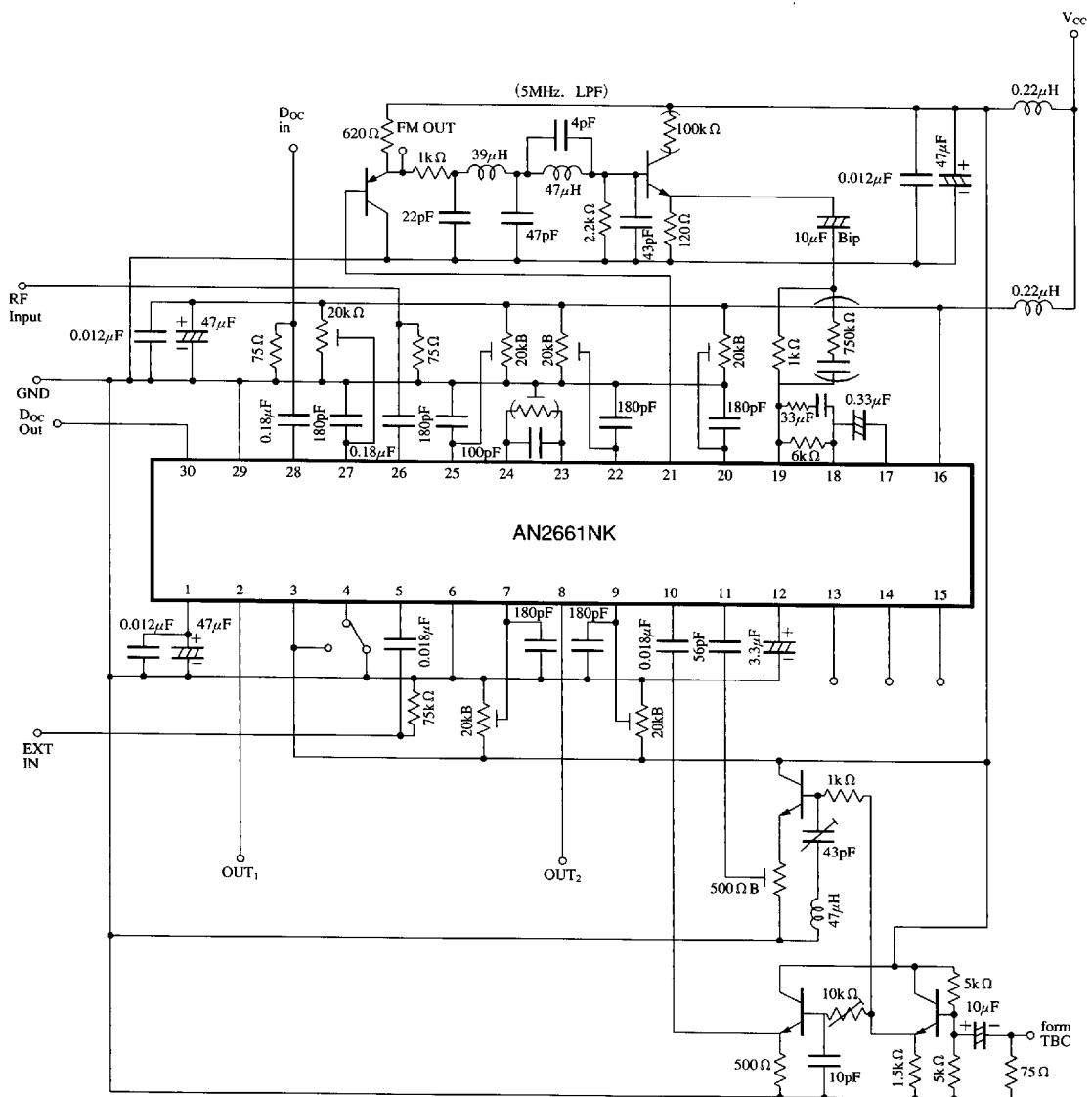
■ Electrical Characteristics (V_{CC}=5V, Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Total current	I _{I6}	Pin⑩+Pin⑯	40	60	80	mA
FM demodulation output voltage	V _{f10}	Voltage after LPF when the input is 10MHz, 50mVrms	1.2	1.37	1.55	V
FM demodulation sensitivity	α	An average per 1MHz of the output difference between 10MHz and 6MHz input	-130	-113	-96	mV/MHz
Sensitivity adjustment	ΔV_{f6}	Difference of outputs at the control terminals 1.5V and 4V	170	220	270	mV
NORMAL detection	V _H	NORMAL detection when control terminal is opened.	4.6	4.78	5.1	V
Amplitude detection	V _{AL}	Abnormal detection of amplitude when detection control is 2V	-0.1	0.07	0.4	V
Low frequency detection	V _{LL}	Abnormal detection of low frequency when detection control is 2V	-0.1	0.07	0.4	V
High frequency detection	V _{HL}	Abnormal detection of high frequency when detection control is 2V	-0.1	0.07	0.4	V
Detecting off 1	V _{HH}	Release of detection at the abnormal input of high frequency	4.6	4.78	5.1	V
Detecting off 2	V _{1H}	Release of detection at the abnormal input of low frequency	4.6	4.78	5.1	V
De-emphasis gain	G _{DE}	OP Amp gain of external 1kΩ and 10kΩ at the input 1MHz, 35mVrms	17	19.5	22	dB
NORMAL gain	G _{P1}	Gain at the time of : input 1V _{PP} video signal and normal DO detection	-1.5	0.2	1.5	dB
Dropout gain	G _{D2}	Gain at the time of : normal DO detection and input 0.5V _{PP} video signal	5	6.6	8	dB
Sync. separation H	V _{SYH}	Sync separation at : DO detection= abnormal input 0.5V _{PP} video signal	4.05	4.38	4.75	V
Sync. separation L	V _{SYL}	Sync separation at : DO detection= abnormal input 0.5V _{PP} video signal	0.1	0.54	1	V
Code separation H	V _{CDH}	Input 1V _{PP} video signal code separation	4.75	4.94	5.1	V
Code separation L	V _{CDL}	Input 1V _{PP} video signal code separation	-0.1	0.1	0.4	V
Noise cancellation gain	G _{NC1}	Gain at the time of noise cancellation off (control voltage V _{CC})	4	5.7	7	dB
Noise cancellation amount	ΔG_{NC}	Gain difference between above and max. noise cancel (control voltage GND)	0.2	1.5	2.8	dB
Main gain	G _{V1}	Input video signal 0.5V _{PP}	5.5	7.25	9	dB
Fade main gain	G _{V2}	Input video signal 0.5V _{PP}	5.5	7.35	9	dB
Fade sub-gain	G _{V3}	Input video signal 1V _{PP}	-0.5	0.9	2.5	dB
Fade sync	v _{V4}	Input video signal 1V _{PP} , control GND	260	298	340	mV _{PP}
Fade offset	v _{V5}	Input video signal 1V _{PP} , control GND	15	70	115	mV _{PP}
Half picture gain	G _{V6}	Gain at control V _{CC}	-6.5	-5.2	-3.5	dB

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■ Application Circuit

ICs for
Laser
Disk

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■ Supplementary Explanation

• Block Functions

(1) FM demodulator

This demodulates the RF signal that is FM-modulated.

For outputs, LPF that can pass video signals is required. Demodulation sensitivity can be adjusted by Pin²⁰.

(2) Dropout detection

This detects defective RF signals.

The ways of detection are : a. amplitude detection, b. low frequency detection, c. high frequency detection

a : Amplitude detection

When the amplitude of RF signals goes smaller than a certain level, it will be detected as a dropout. The detection level can be adjusted by Pin²². The detection can be released by setting Pin²² to V_{CC}.

b : Low frequency detection

When the RF signal frequency goes lower than a certain level, it will be detected as a dropout. The detection level can be adjusted by Pin²². Detection can be released by setting Pin²² to V_{CC}.

c : High frequency detection

When RF signal frequency goes higher than a certain level, it will be detected as a dropout. Detection level can be adjusted by Pin²². Detection can be released by setting Pin²² to V_{CC}.

The result of each detection is outputted as Low on dropout at Pin¹³ and also controls switch for dropout compensation.

(3) De-emphasis

Pin¹⁹ - input, Pin¹⁸ output and + input form an internally-setting OP amp. Its gain and frequency characteristics can be set by resistors installed externally.

(4) Dropout compensation

Changeover of inputs between Pin¹⁷ and Pin²² is done in response to Pin¹⁵ outputs. Pin¹⁷ signals are normally outputted and Pin²² signals are outputted on dropout. Both Pin¹⁷ and Pin²² are equipped with DC regenerators. Pin²² has gains about twice as much as that of Pin¹⁷. Outputs are Pin²⁰.

(5) Code separation

Codes of Pin¹⁷ input signals are detected by about 50IRE level and outputted at Pin¹³.

(6) Sync separation

Sync signals after dropout compensation are detected by about -26IRE level and output at Pin¹⁴.

(7) Noise cancellation

High frequency noise is removed by adding a high-frequency signal in reverse phase at Pin¹¹ to input signals at Pin¹⁰. The amplitude limit of high-frequency signals can be adjusted by Pin⁹ and outputted to Pin². It is also inputted to the switch that performs a changeover to external videos. Pin¹⁰ has gains about twice as much.

(8) Changeover for external videos

In case of Pin⁴ Low (or open), the signal that have passed through noise canceling are outputted to fade. When Pin⁴ is High, the input signals of Pin⁵ are outputted.

(9) Fading effects and half picture

The gains of video signals are controlled in response to voltage levels of Pin⁷. However, sync signals and burst remain uncontrolled. When setting Pin⁷ to V_{CC}, the gain becomes 1/2 all the way through. Those controlled signals are outputted to Pin⁸.

(10) Reference voltage generation

About 2.4V is generated by using the band gap.

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