

AN7410N

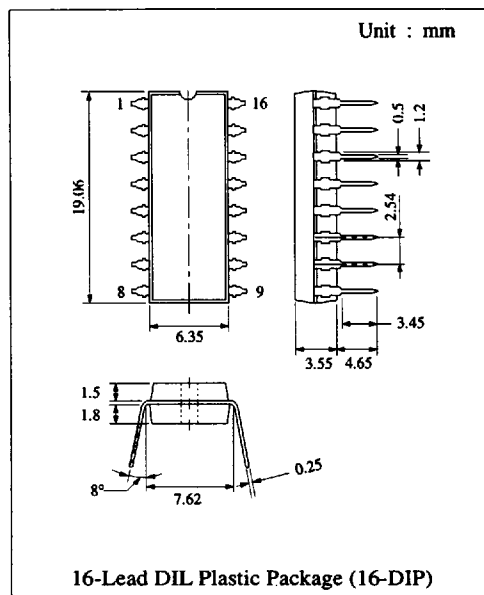
FM Stereo Multiplex Demodulator

■ Description

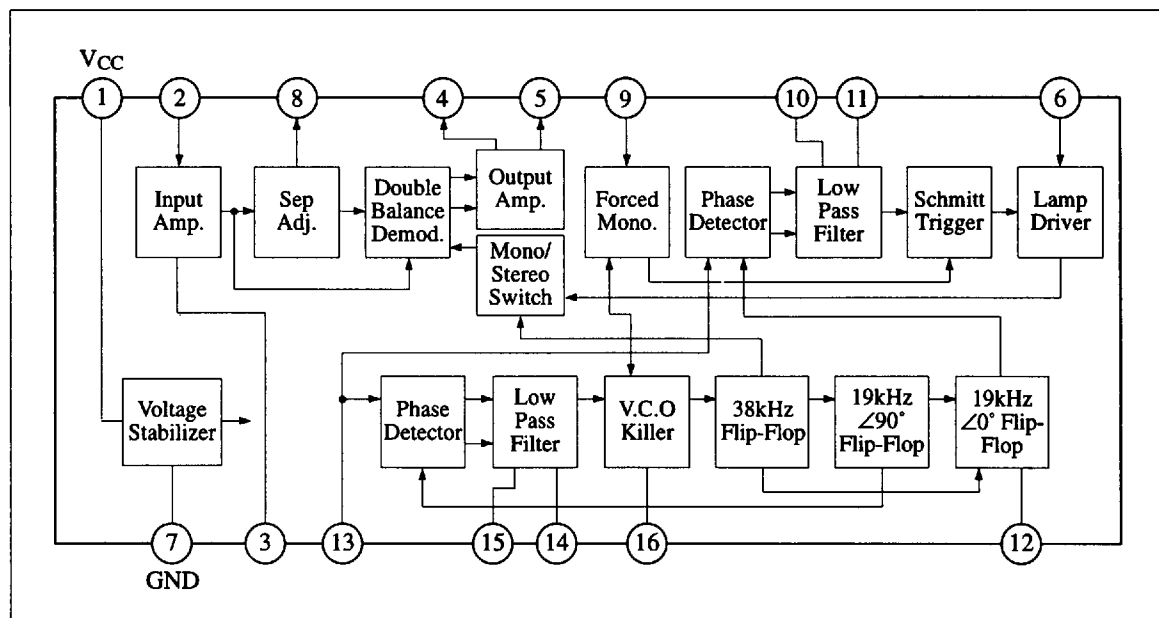
The AN7410N is a monolithic integrated circuit designed for low voltage operating FM multiplex demodulator. It has improved performance over the AN7410 at low voltage (lower distortion, LED mis-tuning protection, lower power consumption).

■ Features

- LED mis-tuning protection circuit at transient operation voltage
- High performance (small gain loss, low distortion)
- Provided with forced monaural and VCO stop circuits



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

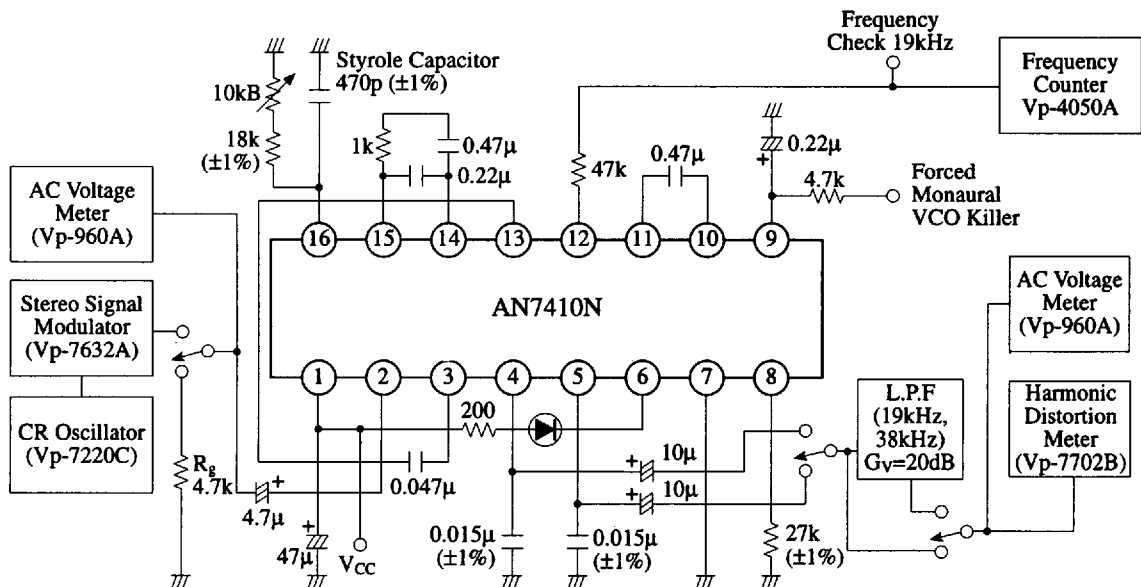
Item	Symbol	Rating	Unit
Supply Voltage	V _{CC}	12	V
Terminal Voltage	V ₆₋₇	12	V
Circuit Current	I ₆	75	mA
Power Dissipation	P _D	360	mW
Operating Ambient Temperature	Topr	-20 ~ +75	°C
Storage Temperature	Tstg	-55 ~ +125	°C

Operating Supply Voltage Range: $V_{CC} = 4.0V \sim 12.0V$

■ Electrical Characteristics (V_{CC}=6V, Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Total Current	I_{tot}	$V_{\text{in}} = 0\text{mV}$	9	13	17	mA
Separation	Sep	$V_{(\text{L+R})} = 135\text{mV}$, $f_m = 1\text{kHz}$, $V_p = 15\text{mV}$	30	45		dB
Total Harmonic Distortion (Stereo)	THD			0.1	0.3	%
Total Harmonic Distortion (Monaural)	THD	$V_{\text{in}} = 150\text{mV}$, $f_m = 1\text{kHz}$		0.1	0.3	%
Monaural Output Voltage	V_O		125	145	170	mV
Monaural Channel Balance	CB		-1	0	+1	dB
Stereo Lamp ON Level	$V_{p(\text{ON})}$	Pilot signal (19kHz)	4.5	6.0	8.5	mV

Test Circuit

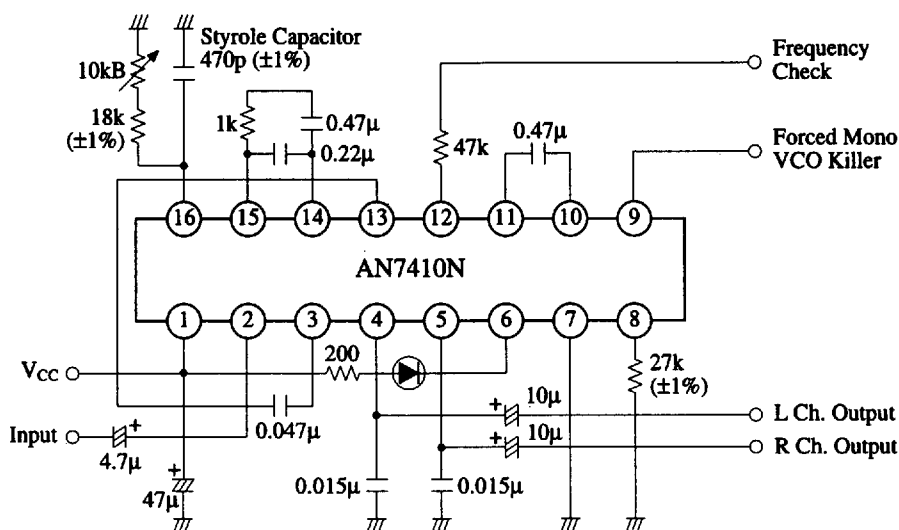


Note 1) VCO free-run frequency is adjusted to 19kHz (± 10 Hz) with frequency check terminal.

Note 2) Outer component should be in less than ($\pm 5\%$) unless otherwise specified.

L.P.F. (3L-13) is a filter amplifier with gain 20dB manufactured by Koringiken.

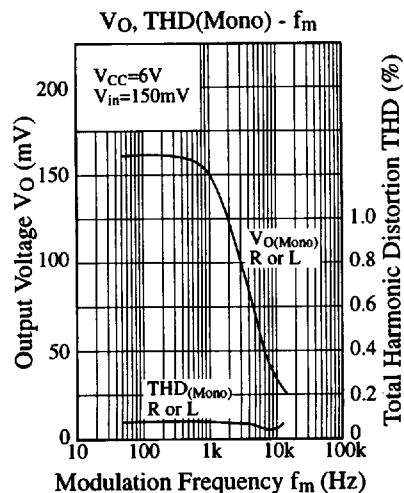
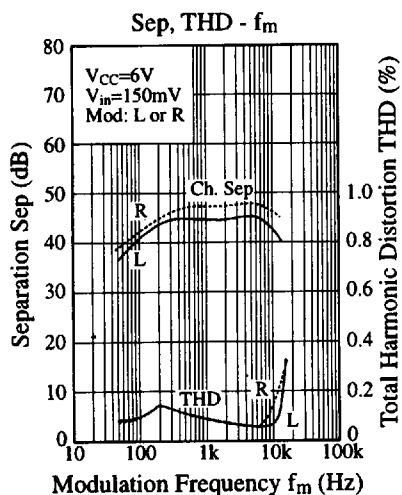
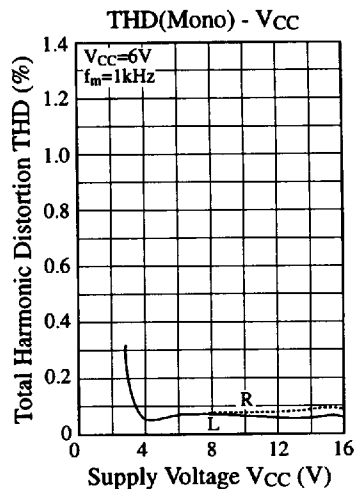
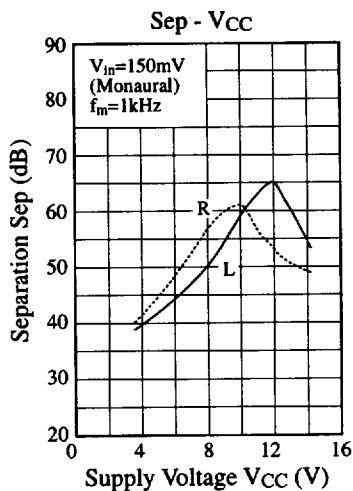
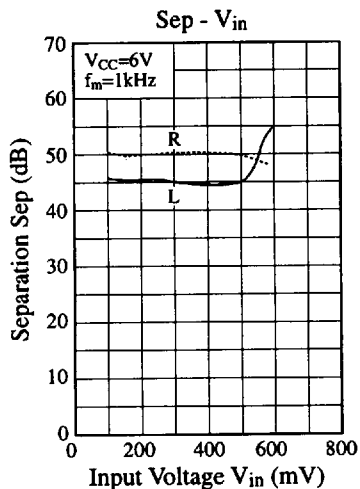
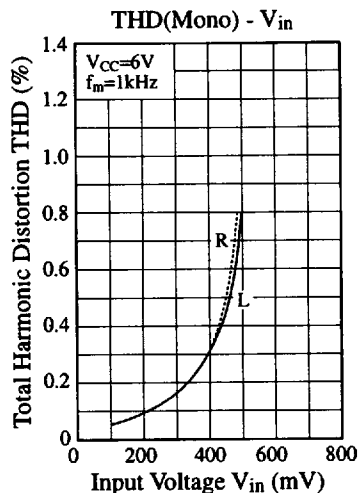
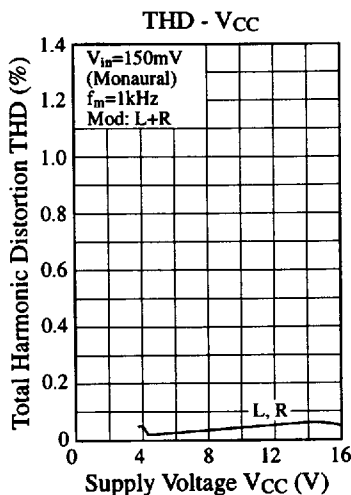
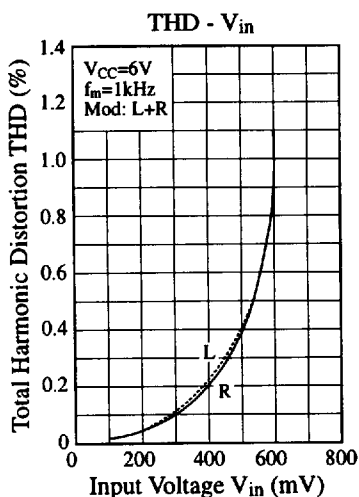
■ Application Circuit



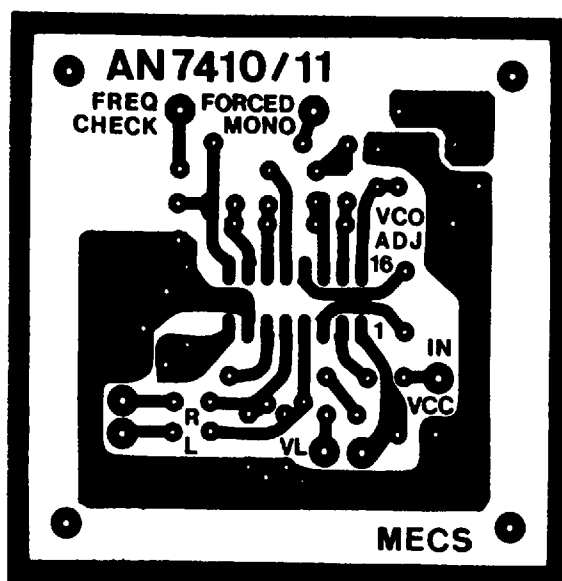
■ Pin

Pin No	Pin Name	Notes
1	V _{CC}	Maximum V _{CC} 12V
2	Stereo Signal Input	Coupling capacitor 4.7μF (to front stage FM detector)
3	Input Buffer Amplifier Output	Coupling capacitor 0.047μF (between pin 3 and 13)
4	Left Channel Signal Output (Built-in Output Load Resistor 4.7kΩ)	Coupling capacitor 10μF (to next stage low frequency amplifier) De-emphasis capacitor 0.015μF (between pin 4 and GND)
5	Right Channel Signal Output (Built-in Output Load Resistor 4.7kΩ)	Coupling capacitor 10μF (to next stage low frequency amplifier) De-emphasis capacitor 0.015μF (between pin 5 and GND)
6	Drive Terminal for Stereo Display Lamp	Lamp or LED (maximum supply voltage 12V) (maximum drive current 75mA)
7	GND	
8	Channel Separation Adjustment	Fixer resistor 27kΩ (±1%) (between pin 8 and GND) Best separation value is obtained by using VR 50kΩ(B)
9	Emphasis Monaural VCO Emphasis Stop	Emphasis monaural operates at DC 0.9V (between pin 9 and GND) VCO stops oscillation at more than 1.5V
10	Stereo Switch Circuit Low Pass Filter	Low pass filter condenser 0.47μF (between pin 10 and 11) (Capacitor with low leakage should be used)
11	Stereo Switch Circuit Low Pass Filter	Refer to pin 10
12	19kHz Frequency Check	Resistor 47kΩ (Protection resistor) (between pin 12 and frequency counter)
13	PLL Circuit Input	Refer to pin 3
14	PLL Circuit Low Pass Filter	Filter element 0.22μF // 0.47μF + 1kΩ (between pin 14 and 15) Capacitor with low leakage current should be used.
15	PLL Circuit, Low Pass Filter	Refer to pin 14
16	VCO Frequency Adjustment	Capacitor 470pF (±1%) // (between pin 16 and GND) Carbon resistor 18kΩ (±1%) + VR10kΩ(B)

■ Characteristics Curve



■ Printed Circuit Board Layout (Scale: 1:1)



Terminal 8:

Resistor $27k\Omega$ for separation adjustment, and re-set by the FM IF Detector circuit characteristics in case of set application.

Terminal 9:

R_9 is current limit resistor. C_9 determines ON/OFF time of VCO forced stop.

Terminal 10-11, 14-15:

Low leakage current should be applied for low pass filter capacitor.

Terminal 16:

$C(470pF \pm 1\%)$ styrole capacitor or equivalent. Precise and high antihumidity should be used for $R(18k\Omega \pm 1\%)$, carbon resistor, VR $10k\Omega B$. (Example $10k\Omega(B)$ EVT-S3AA00B14 Matsushita Electronic Parts)