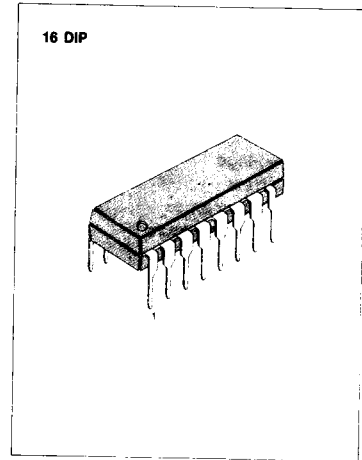


FM STEREO MULTIPLEX DECODER

The KA2261 is a monolithic integrated circuit consisting of a phase locked loop FM stereo demodulator. It was designed for use in car stereos, cassette recorders and other equipment.

FEATURES

- A PLL is used for high multiplexing performance.
- Wide operating supply voltage range: $V_{CC} = 3V - 14V$
- Low quiescent circuit current ($I_{CCQ} = 8.5mA$, Typ).
- High SCA rejection ratio.
- High channel separation (45dB, Typ) and can be controlled by an external resistor.
- Built-in VCO disable and monaural muting circuits.
- Built-in stereo indicator lamp drive circuit.



ORDERING INFORMATION

| Device | Package | Operating Temperature |
|--------|---------|-----------------------|
| KA2261 | 16 DIP | -20°C ~ +70°C |

BLOCK DIAGRAM

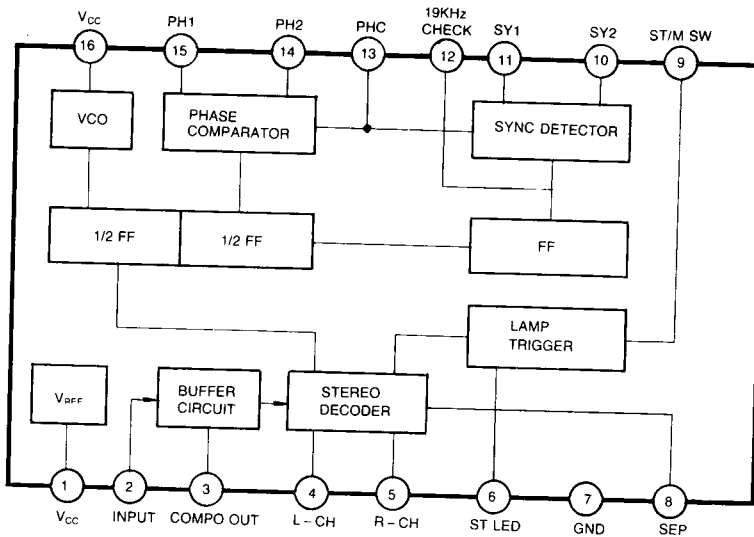


Fig. 1.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Value | Unit |
|-----------------------|------------|------------|------------------|
| Supply Voltage | V_{CC} | 16 | V |
| Lamp Current | I_{LAMP} | 40 | mA |
| Power Dissipation | P_D | 400 | mW |
| Operating Temperature | T_{OPR} | -20 ~ +70 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -40 ~ +125 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS

($T_a = 25^\circ\text{C}$, $V_{CC} = 6\text{V}$, $f = 1\text{KHz}$, $R_L = 3.3\text{K}\Omega$, unless otherwise specified)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------|--------------|---|-----|---------|-----|------------------|
| Quiescent Circuit Current | I_{CCO} | $V_i = 0$ | | 8.5 | 12 | mA |
| Channel Separation | CS | $V_i = 100\text{mV}$, $L + R = 90\%$ $P = 10\%$, $f = 1\text{KHz}$ | 35 | 45 | | dB |
| Total Harmonic Distortion | Mono | THD 1 $V_i = 100\text{mV}$ | | 0.2 | | % |
| | Stereo | THD 2 $L + R = 90\text{mV}$, $P = 10\text{mV}$ | | 0.7 | | % |
| Output Voltage | V_o | $V_i = 100\text{mV}$, $f = 1\text{KHz}$ | 66 | 85 | 115 | mV |
| Channel Balance | CB | $V_i = 100\text{mV}$, $f = 1\text{KHz}$ | | 0.5 | 1.5 | dB |
| Lamp on Level | $V_{L(ON)}$ | $L + R = 90\%$, $P = 10\%$ | | 65 | | mV |
| Lamp Hysteresis | HY | | | 3.5 | 6.0 | dB |
| Maximum Input Level | $V_{I(MAX)}$ | THD=2% | | 450 | | mV |
| SCA Rejection Ratio | SCA_{REJ} | $L + R = 90\%$, $P = 10\%$ | | 70 | | dB |
| Signal to Noise Ratio | S/N | $V_i = 100\text{mV}$, $f = 1\text{KHz}$ | | 75 | | dB |
| Carrier Leakage | V_{LKG} | $V_i = 100\text{mV}$, $L + R = 90\%$ $P = 10\%$ | | 32 | | dB |
| Capture Range | CR | $V_i = 100\text{mV}$, $L + R = 90\%$ $P = 10\%$ | | ± 3 | | % |
| Input Impedance | Z_i | | 15 | 20 | | $\text{K}\Omega$ |

TEST CIRCUIT

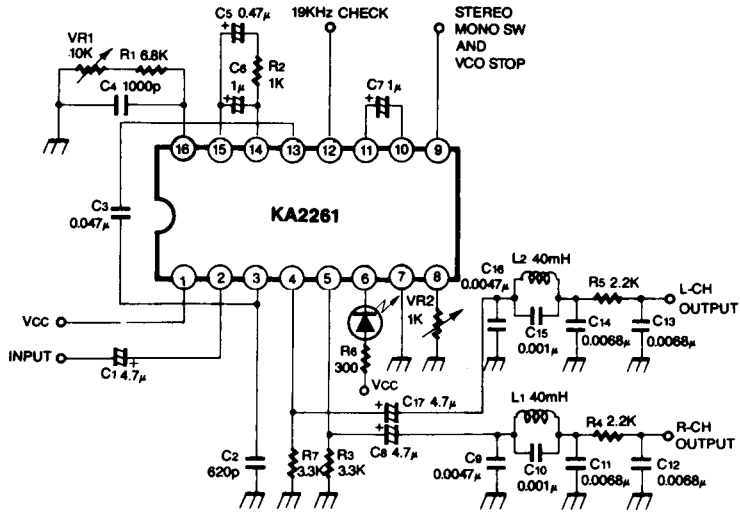
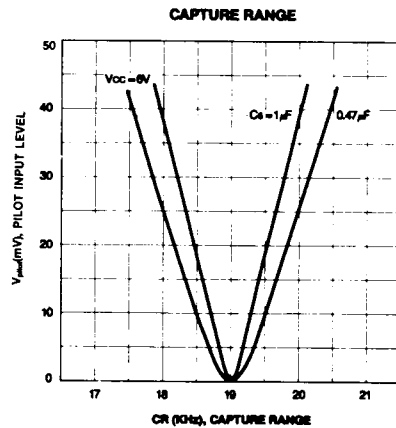
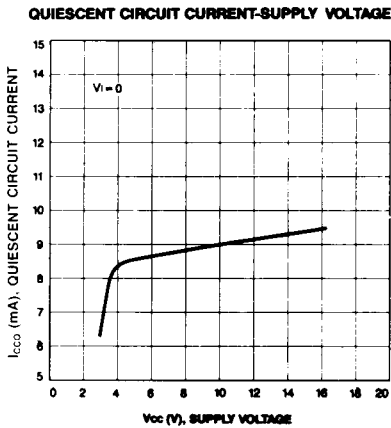
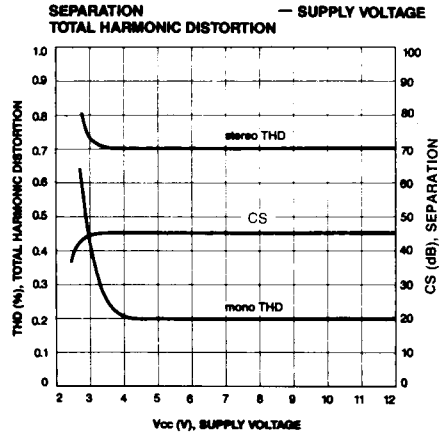
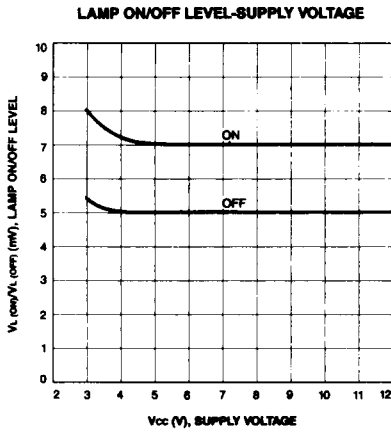
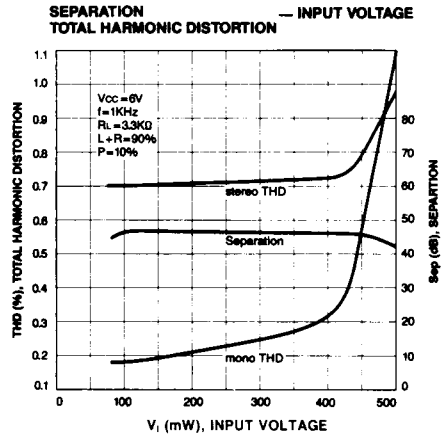
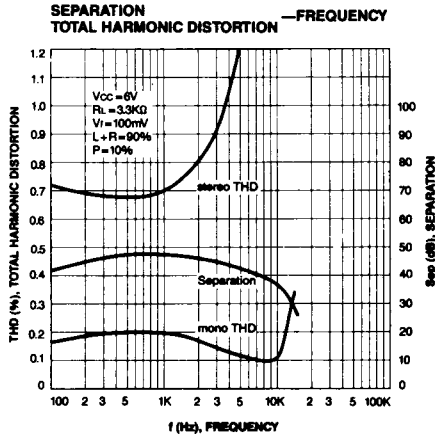


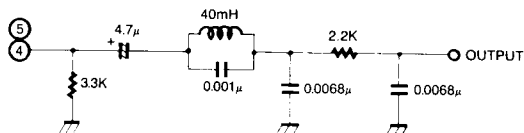
Fig. 2



APPLICATION INFORMATION

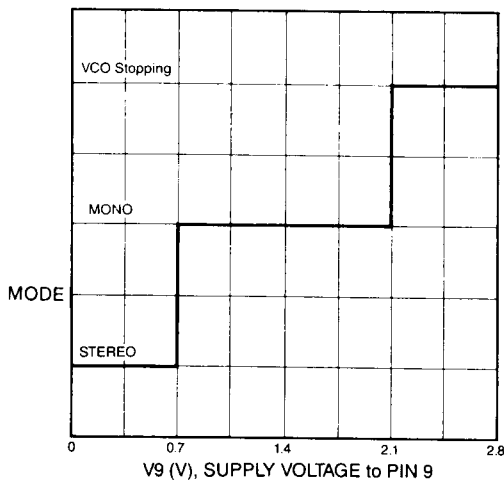
External Components (Refer to Test Circuit)

- Input coupling capacitor (Pin 2)
The recommended value is $4.7\mu\text{F}$. If smaller values than $4.7\mu\text{F}$ are used, low frequency separation will worsen, and if larger values are used, the DC operating point will require time for stabilization.
- Demodulator output (Pin 4, 5)
These components provide R and L channel output load circuits. The recommended circuits are follows:



- Separation control (Pin 8)
This component is a variable resistor used to adjust the out signal separation.
- Low pass filter (Pins 10, 11)
This capacitor is used to filter the 19KHz signal detected by the phase comparator. The recommended value is $1\mu\text{F}$. If made too small, the lamp may light imprevoly when a large mono input signal or external noise is received, too large a capacitance value will take more time to switch between mono and stereo modes.
- Preamplifier output capacitor (Pins 3, 13)
This capacitor coupled preamplified with phase comparator. The recommended value is $0.047\mu\text{F}$.
- Phase compensation capacitor (Pin 3, GND)
This capacitor is prepared in order to compensate the phase advanced.
- Loop filter (Pins 14, 15)
This is the low pass filter for the PLL, which is determined the capture range. The recommended value as follows:
 $V_i \leq 250\text{mV}$ $C_{14-15} = 0.47\mu\text{F}$
 $V_i \geq 250\text{mV}$ $C_{14-15} = 1\mu\text{F}$
- Control of Pin 9
Function of Pin 9 is a change-over of stereo/mono and VCO stopping.

SCHEMATIC DIAGRAM of PIN 9 CONTROL



- VCO network (Pin 16)
Since the VCO has a negative temperature coefficient, the RC network compensates by using a polyester film capacitor and a resistor.