

**ONE CHIP TV MPX DEMODULATOR
(KOREA TWO CARRIER SYSTEM)**

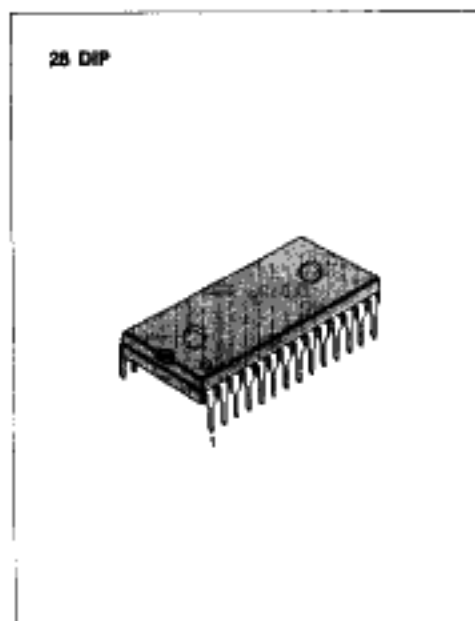
The KA22682 is a silicon monolithic integrated circuit designed for demodulating Korea two-carrier TV-MPX broadcasts. The use of PLL makes reed filters unnecessary.

FUNCTIONS

- 1st Sound IF Amp & Det.
- 2nd Sound IF Amp & Det.
- Matrix for Stereo
- Pilot Amp and Detector
- Pilot Decoder
- Mode Change Switch
- LED Drivers (Stereo, Bilingual)

FEATURES

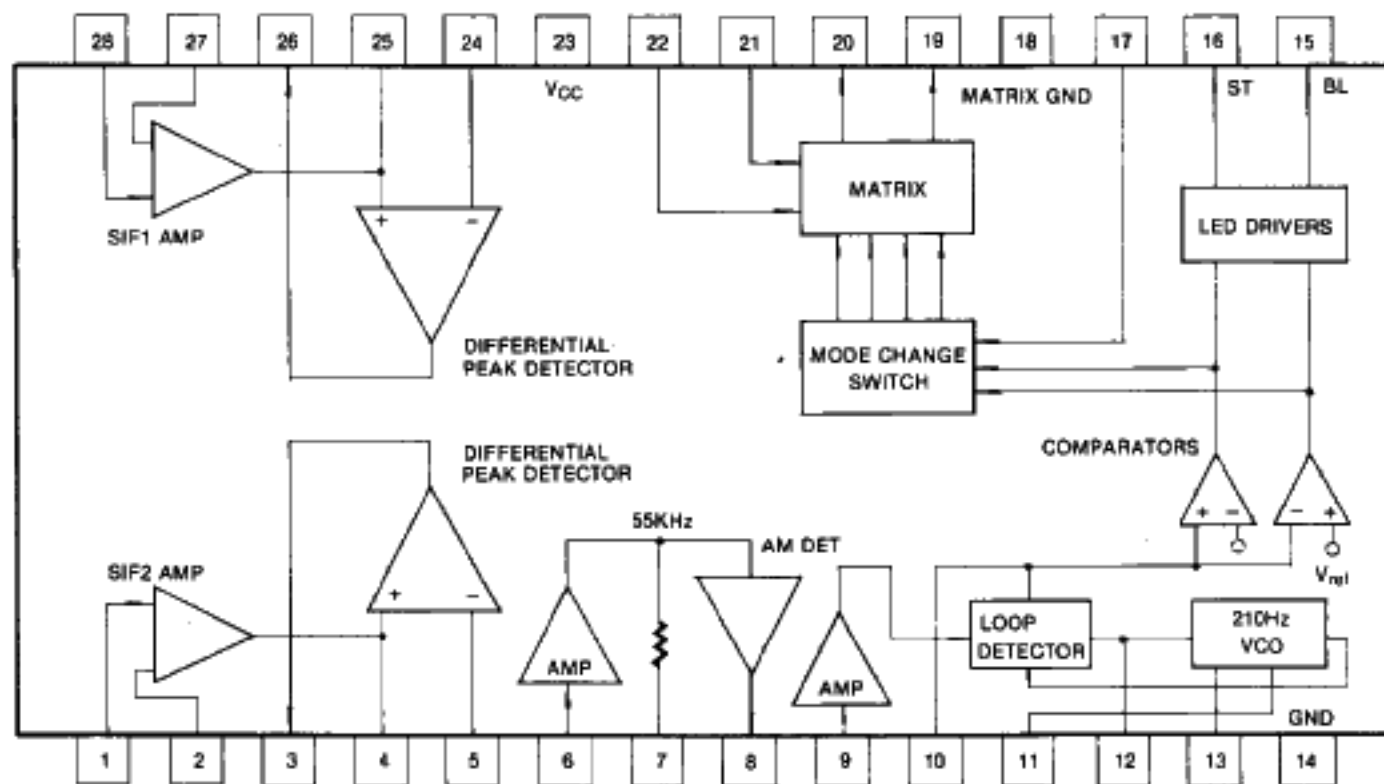
- One input mode change switch
- Auto pilot decoding by phase detector
- Minimum number of external parts required



ORDERING INFORMATION

| Device | Package | Operating Temperature |
|---------|---------|-----------------------|
| KA22682 | 28 DIP | -20 ~ +70°C |

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Characteristics | Symbol | Condition | Value | Unit |
|-------------------------|---------------|-----------|--------------------|------|
| Maximum Supply Voltage | $V_{CC\ max}$ | $V_i = 0$ | 15 | V |
| Pin 15 Output Current | I_{15} | | 30 | mA |
| Pin 16 Output Current | I_{16} | | 30 | mA |
| Maximum Mode SW Voltage | V_{17} | | $-0.3 \sim V_{CC}$ | V |
| Power Dissipation | P_D | | 1.5 | W |
| Operating Temperature | T_{opr} | | $-20 \sim +70$ | °C |
| Storage Temperature | T_{stg} | | $-40 \sim +125$ | °C |

RECOMMENDED OPERATING CONDITIONS

| Characteristics | Symbol | Min | Typ | Max | Unit |
|-------------------|-----------|-----|-----|-----|------|
| Operating Voltage | V_{opr} | 9 | 12 | 15 | V |

ELECTRICAL CHARACTERISTICS

SIF SECTION ($V_{CC} = 12V$, $f_m = 400Hz$, $V_i = 100dB\mu$, $T_a = 25^\circ C$, $\Delta f = \pm 25KHz$, unless otherwise specified)

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|---------------------------------|------------|---------------------------|-----|-----|-----|-----------|
| Total Circuit Current | I_{CC} | $V_i = 0$ | | 40 | 60 | mA |
| Input Limiting Sens Voltage 1 | V_{lim1} | $f_0 = 4.5MHz$ | — | 52 | | $dB\mu$ |
| | | $V_o = -3dB$ | | | | |
| Input Limiting Sens Voltage 2 | V_{lim2} | $f_0 = 4.7MHz$ | — | 52 | | $dB\mu$ |
| | | $V_o = -3dB$ | | | | |
| Detector Output Voltage 1 | V_{o1} | $f_0 = 4.5MHz$ | 0.7 | 0.9 | 1.2 | V_{rms} |
| Detector Output Voltage 2 | V_{o2} | $f_0 = 4.7MHz$ | 0.7 | 0.9 | 1.2 | V_{rms} |
| T.H.D. 1 | THD1 | $f_0 = 4.5MHz$ | — | 0.5 | 1 | % |
| T.H.D. 2 | THD2 | $f_0 = 4.7MHz$ | — | 0.5 | 1 | % |
| AM Rejection Ratio 1 | AMR1 | $f_0 = 4.5MHz$, AM = 30% | 35 | 45 | — | dB |
| AM Rejection Ratio 2 | AMR2 | $f_0 = 4.7MHz$, AM = 30% | 35 | 45 | — | dB |
| Input Impedance of Pin 28 | Z_{in28} | $f = 4.5MHz$ | — | 40 | — | Kohm |
| Input Impedance of Pin 1 | Z_{in1} | $f = 4.7MHz$ | — | 40 | — | Kohm |
| Output Resistance of Det Output | Z_{o26} | | — | 1.2 | — | Kohm |
| Output Resistance of Det Output | Z_{o3} | | — | 1.2 | — | Kohm |

ELECTRICAL CHARACTERISTICS (Continued)

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|--------------------------------|--------|--|-----|-----|-----|------|
| Cross Talk (SIF1→SIF2) | CT1 | SIF1 $f_0 = 4.5\text{MHz}$ $f_m = 400\text{-}5\text{K}$ | 50 | 55 | — | dB |
| | | SIF2 $f_0 = 4.7\text{MHz}$ $\Delta f = 0$ | | | | |
| Cross Talk (SIF2→SIF1) | CT2 | SIF1 $f_0 = 4.5\text{MHz}$ $\Delta f = 0$ | 50 | 55 | — | dB |
| | | SIF2 $f_0 = 4.7\text{MHz}$ $f_m = 400\text{-}5\text{K}$ | | | | |
| Frequency Response of Detector | F_1 | $f_0 = 4.5\text{MHz}$ $f_m = 40\text{Hz}\text{-}55\text{KHz}$ | -3 | 0 | 1.5 | dB |
| Frequency Response of Detector | F_2 | $f_0 = 4.7\text{MHz}$ $f_m = 40\text{Hz}\text{-}55\text{KHz}$ | -3 | 0 | 1.5 | dB |
| Detector Output Balance | C.B. | SIF1 = 4.5MHz SIF2 = 4.7MHz | -2 | 0 | 2 | dB |

PILOT AMP AND DETECTOR

($V_{CC} = 12\text{V}$, $f_c = 55.125\text{KHz}$, $f_m = 150$ or 276Hz , AM = 50%, unless otherwise specified)

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|-----------------------------|---------------|--|-----|-----|-----|------|
| Input Resistance of Pin 6 | Z_{i6} | | — | 30 | — | Kohm |
| Maximum Pilot Input Voltage | $V_{in(max)}$ | $V_o = -3\text{dB}$, 0dB : $V_i = 10\text{mV}$ | | 100 | — | mV |
| Detector Gain | A_{VD} | | 30 | 36 | | dB |
| Detector Output Voltage | V_{OD} | $V_{in} = 10\text{mV}$ | | 270 | | mV |
| Output Resistance of Pin 8 | Z_{out} | | — | 700 | — | ohm |

PILOT DECODER ($V_{CC} = 12\text{V}$, $f = 150$ or 276Hz , unless otherwise specified)

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|---------------------------|------------|-----------------------------|-----|--------------|-----|------|
| Input Sensitivity | V_{sens} | $f = 150$ or 276Hz | | 10 | 20 | mV |
| Input Resistance of Pin 9 | Z_{i9} | | — | 47 | — | Kohm |
| Capture Range | f_c | $V_i = 50\text{mV}$ | | ± 5 | | Hz |
| Lock Range | f_L | $V_i = 50\text{mV}$ | | ± 10 | | Hz |
| Stereo Range | f_{ST} | $V_i = 100\text{mV}$ | | 150 ± 10 | | Hz |
| Bilingual Range | f_{BL} | $V_i = 100\text{mV}$ | | 276 ± 10 | | Hz |

INDICATOR ($V_{CC} = 12V$, unless otherwise specified)

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|-----------------------------------|-----------|--|-----|-----|-----|------|
| Saturation Voltage of Pin 15 & 16 | V_{sat} | $I_{15}, I_{16} = 30mA$ | | 0.7 | | V |
| LED On Time | t_{ON} | $f = 150, 276Hz$ $V_i = 0mV \rightarrow 50mV$ | — | 100 | 200 | mS |
| LED Off Time | t_{OFF} | $f = 150, 276Hz$ $V_i = 50mV \rightarrow 0mV$ | — | 100 | 200 | mS |

MODE SWITCH SECTION

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|-------------------------|------------|-----------|------|-----|-----|------|
| Main/Main Resistance | R (m/m) | $SW = 2$ | 3.1 | 4.7 | 7.0 | Kohm |
| Forced Mono Voltage | V_{mono} | $SW = 1$ | | 0 | 1.0 | V |
| Main/Sub Supply Current | $I_{m/s}$ | $SW = 3$ | -0.2 | 0 | 0.2 | mA |
| Sub/Sub Supply Voltage | $V_{s/s}$ | $SW = 4$ | 11 | 12 | | V |

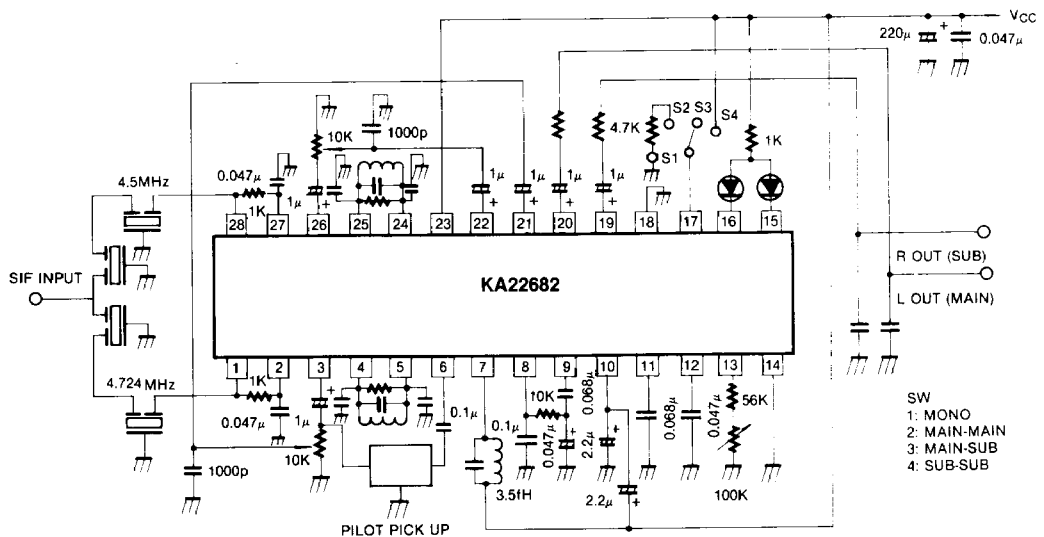
MATRIX SECTION

| Characteristics | Symbol | Condition | Min | Typ | Max | Unit |
|------------------------------------|--------------------------|--------------|-----|-----|-----|------|
| T.H.D. In Main Mode | THD_M | $V_i = 50mV$ | — | 0.3 | 1.0 | % |
| T.H.D. In Sub Mode | THD_S | $V_i = 50mV$ | — | 0.3 | 1.0 | % |
| T.H.D. In Stereo Mode | THD_{ST} | $V_i = 50mV$ | — | 0.3 | 1.0 | % |
| Cross Talk (M/M \rightarrow S/S) | $CT_{MM \rightarrow SS}$ | $V_i = 50mV$ | 50 | 55 | — | dB |
| Cross Talk (S/S \rightarrow M/M) | $CT_{SS \rightarrow MM}$ | $V_i = 50mV$ | 50 | 55 | — | dB |
| Cross Talk (M \rightarrow S) | $CT_{M \rightarrow S}$ | $V_i = 50mV$ | 50 | 55 | — | dB |
| Cross Talk (S \rightarrow M) | $CT_{S \rightarrow M}$ | $V_i = 50mV$ | 50 | 55 | — | dB |
| Separation (L \rightarrow R) | $SEP_{L \rightarrow R}$ | $V_i = 50mV$ | 40 | 50 | — | dB |
| Separation (R \rightarrow L) | $SEP_{R \rightarrow L}$ | $V_i = 50mV$ | 40 | 50 | — | dB |
| Voltage Gain of Matrix | A_V | $V_i = 50mV$ | 10 | 12 | 16 | dB |
| Output Impedance | Z_D (M) | | | 600 | | ohm |

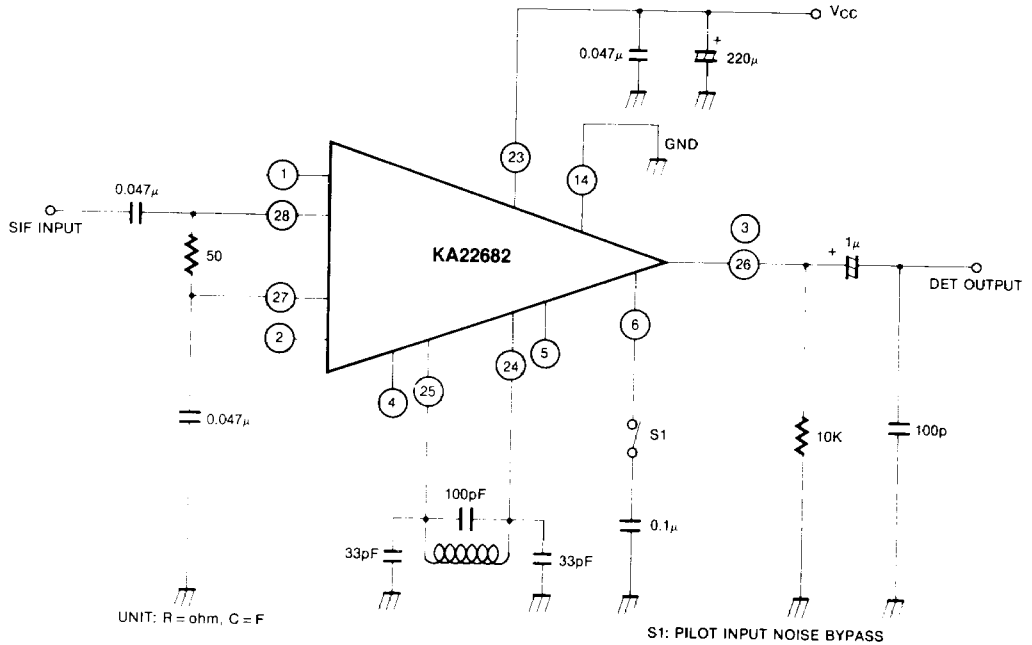
PIN CONFIGURATION

| Pin No | Description | Pin No | Description |
|--------|------------------|--------|-----------------------|
| 1 | SIF2 Input | 15 | Indicator (Bilingual) |
| 2 | SIF2 Bias | 16 | Indicator (Stereo) |
| 3 | SIF2 Det Output | 17 | Mode Change Switch |
| 4 | SIF2 Coil | 18 | Matrix GND |
| 5 | SIF2 Coil | 19 | R (Sub) Output |
| 6 | Pilot Input | 20 | L (Main) Output |
| 7 | 3.5H Coil | 21 | Sub Input |
| 8 | Pilot Det Output | 22 | Main Input |
| 9 | PLL Input | 23 | V _{CC} |
| 10 | Phase Det Filter | 24 | SIF1 Det Coil |
| 11 | Loop Filter | 25 | SIF1 Coil |
| 12 | C-Time | 26 | SIF1 Det Output |
| 13 | R-Time | 27 | SIF1 Bias |
| 14 | GND | 28 | SIF1 Input |

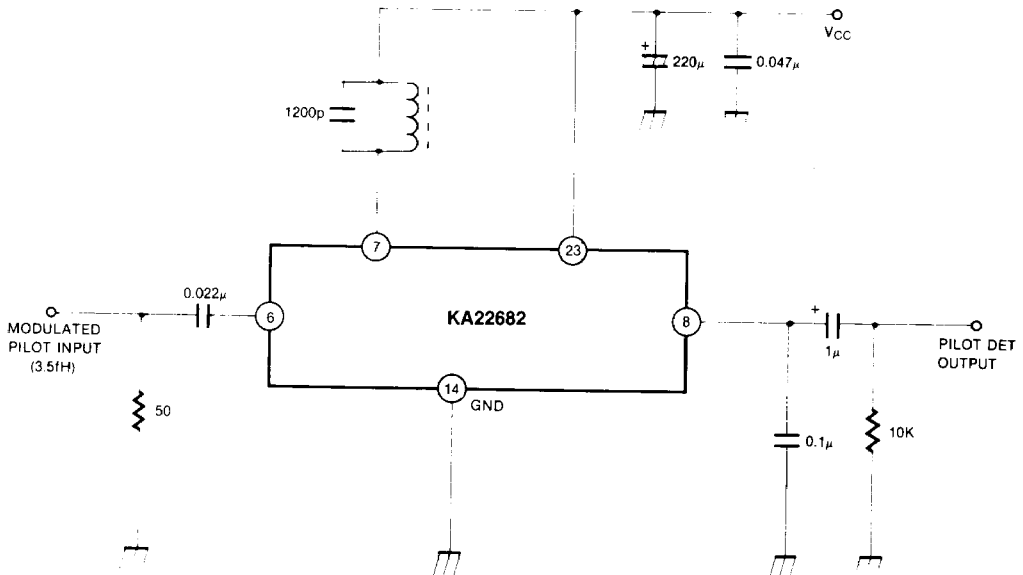
TYPICAL APPLICATION CIRCUIT



TEST CIRCUIT 1 SIF SECTION

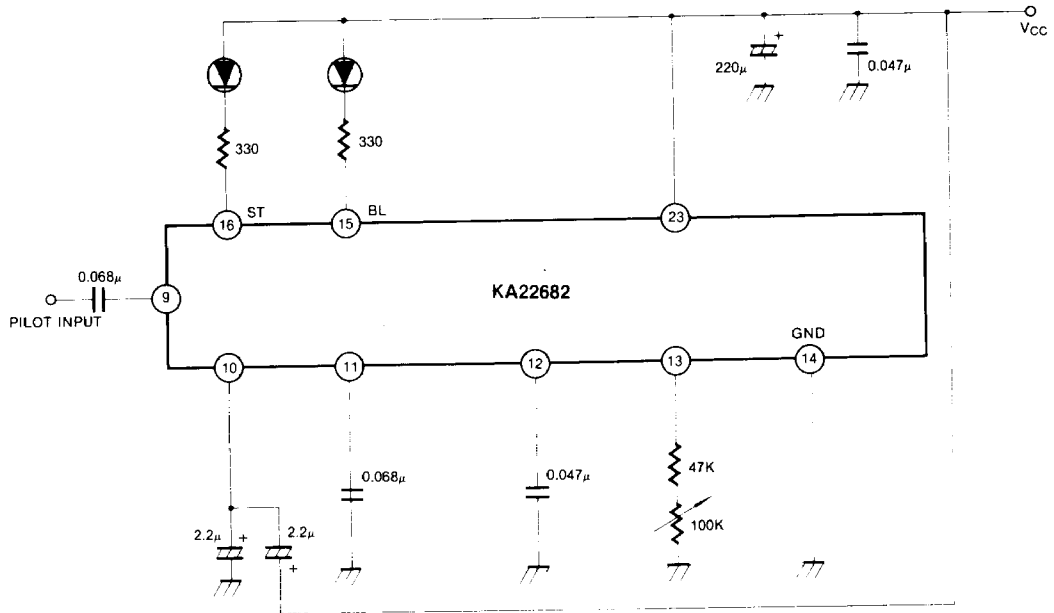


TEST CIRCUIT 2 PILOT AMP/DET SECTION



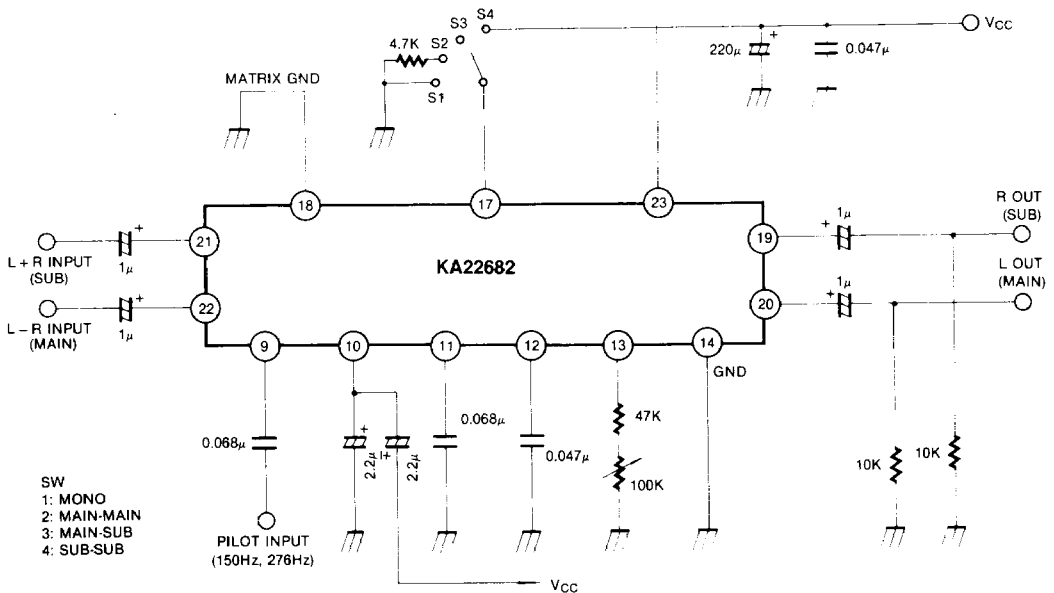
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TEST CIRCUIT 3 PILOT PLL/INDICATOR SECTION



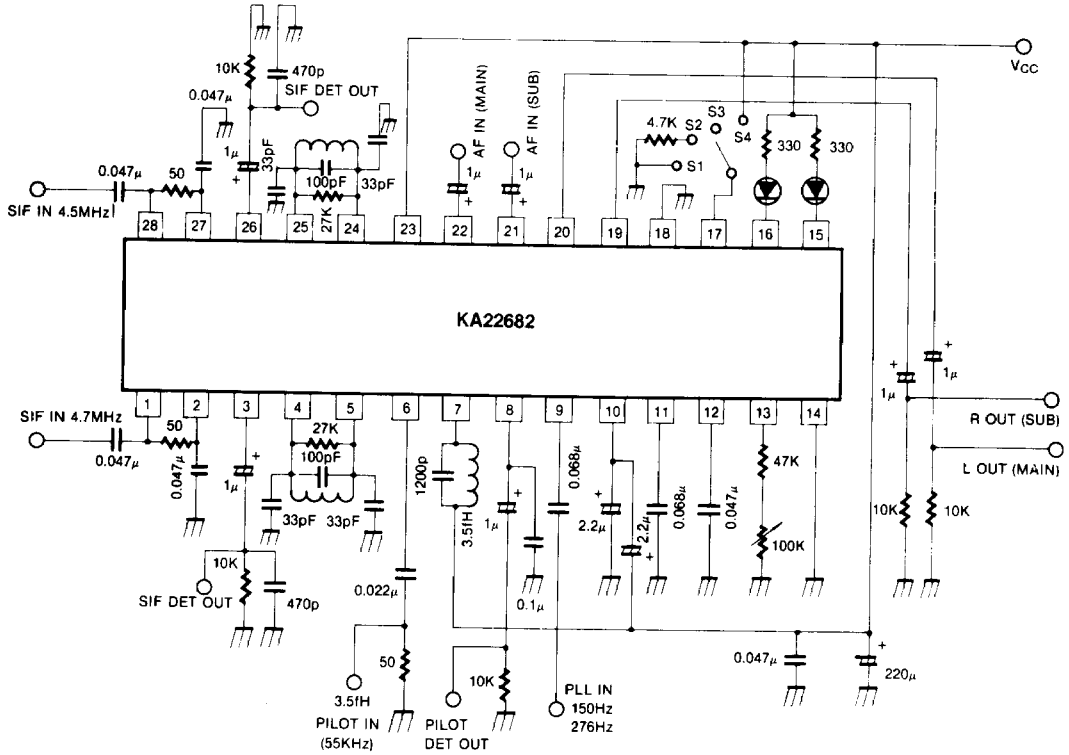
PIN 12 IS VCO FREQUENCY CHECK POINT FOR ADJUSTING 210Hz

TEST CIRCUIT 4 MATRIX MODE SECTION



- SW
 1: MONO
 2: MAIN-MAIN
 3: MAIN-SUB
 4: SUB-SUB

TEST CIRCUIT 5



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