

## ONE-CHIP TV SOUND MPX (KOREA TWO-CARRIER SYSTEM)

The KA2268N is a silicon monolithic integrated circuit designed for demodulating Korea two-carrier TV-MPX broadcasts. The use of PLL makes reed filters unnecessary.

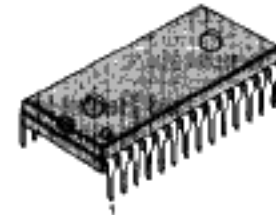
### FUNCTIONS

- 1st Sound IF
- 2nd Sound IF
- Matrix for Stereo
- Pilot Amp and Detector
- Pilot Decoder
- Mode Change Switch
- Indicators (Stereo, Bilingual)

### FEATURES

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

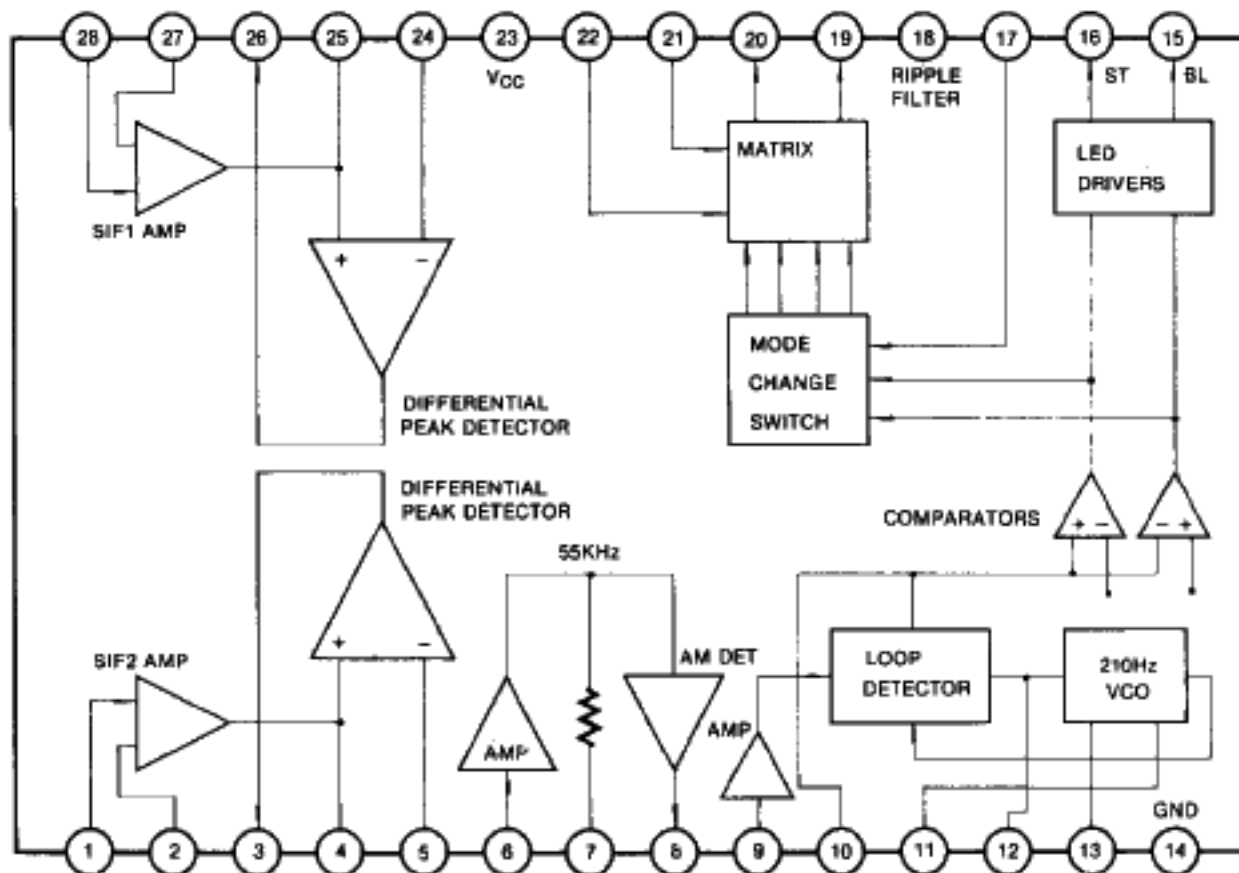
28 DIP



### ORDERING INFORMATION

| Device | Package | Operating Temperature |
|--------|---------|-----------------------|
| KA2268 | 28 DIP  | -20 ~ +70°C           |

### BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Characteristics         | Symbol              | Condition          | Value                  | Unit |
|-------------------------|---------------------|--------------------|------------------------|------|
| Maximum Supply Voltage  | V <sub>CC</sub> max | V <sub>i</sub> = 0 | 15                     | V    |
| Pin 15 Output Current   | I <sub>15</sub>     |                    | 30                     | mA   |
| Pin 16 Output Current   | I <sub>16</sub>     |                    | 30                     | mA   |
| Maximum Mode SW Voltage | V <sub>17</sub>     |                    | -0.3 ~ V <sub>CC</sub> | V    |
| Power Dissipation       | P <sub>D</sub>      |                    | 1.5                    | W    |
| Operating Temperature   | T <sub>opr</sub>    |                    | -20 ~ +70              | °C   |
| Storage Temperature     | T <sub>stg</sub>    |                    | -40 ~ +125             | °C   |

## RECOMMENDED OPERATING CONDITIONS

| Characteristics   | Symbol           | Min | Typ | Max | Unit |
|-------------------|------------------|-----|-----|-----|------|
| Operating Voltage | V <sub>opr</sub> | 9   | 12  | 15  | V    |

## ELECTRICAL CHARACTERISTICS

SIF SECTION (V<sub>CC</sub> = 12V, f<sub>m</sub> = 400Hz, V<sub>i</sub> = 100dB<sub>μ</sub>, Ta = 25°C Δf = ±30KHz, unless otherwise specified)

| Characteristics                 | Symbol            | Condition  | Min | Typ | Max | Unit             |
|---------------------------------|-------------------|--|-----|-----|-----|------------------|
| Total Circuit Current           | I <sub>CC</sub>   | V <sub>i</sub> = 0   |     | 40  | 60  | mA               |
| Input Limiting Voltage 1        | V <sub>lim1</sub> | f <sub>0</sub> = 4.5MHz, V <sub>o</sub> = -3dB               |     |     | 52  | dB <sub>μ</sub>  |
| Input Limiting Voltage 2        | V <sub>lim2</sub> | f <sub>0</sub> = 4.72MHz, V <sub>o</sub> = -3dB              |     |     | 52  | dB <sub>μ</sub>  |
| Detector Output 1               | V <sub>o1</sub>   | f <sub>0</sub> = 4.5MHz                                      | 0.7 | 0.9 | 1.3 | V <sub>rms</sub> |
| Detector Output 2               | V <sub>o2</sub>   | f <sub>0</sub> = 4.72MHz                                     | 0.7 | 0.9 | 1.3 | V <sub>rms</sub> |
| T.H.D. 1                        | THD1              | f <sub>0</sub> = 4.5MHz                                      | —   | 0.5 | 2   | %                |
| T.H.D. 2                        | THD2              | f <sub>0</sub> = 4.72MHz                                     | —   | 0.5 | 2   | %                |
| AM Rejection Ratio 1            | AMR1              | f <sub>0</sub> = 4.5MHz, AM = 30%                            | 35  | 45  | —   | dB               |
| AM Rejection Ratio 2            | AMR2              | f <sub>0</sub> = 4.72MHz, AM = 30%                           | 35  | 45  | —   | dB               |
| Input Impedance of Pin 28       | Z <sub>in28</sub> | f = 4.5MHz   |     | 40  |     | Kohm             |
| Input Impedance of Pin 1        | Z <sub>in1</sub>  | f = 4.72MHz  |     | 40  |     | Kohm             |
| Output Resistance of DET Output | Z <sub>26</sub>   |  |     | 1.2 |     | Kohm             |
| Output Resistance of DET Output | Z <sub>3</sub>    |  |     | 1.2 |     | Kohm             |
| Cross Talk (SIF1 → SIF2)        | CT1               | SIF1 f <sub>0</sub> = 4.5MHz,<br>f <sub>m</sub> = 400Hz-5KHz | 50  | 55  | —   | dB               |
|                                 |                   | SIF2 f <sub>0</sub> = 4.72MHz<br>Δf = 0                      |     |     |     |                  |

## ELECTRICAL CHARACTERISTICS (Continued)

| Characteristics                | Symbol | Condition   | Min | Typ | Max | Unit |
|--------------------------------|--------|---|-----|-----|-----|------|
| Cross Talk (SIF1→SIF2)         | CT1    | SIF1 $f_0 = 4.5\text{MHz}$ ,<br>$f_m = 400\text{Hz-5KHz}$ | 50  | 55  | —   | dB   |
|                                |        | SIF2 $f_0 = 4.72\text{MHz}$<br>$\Delta f = 0$             |     |     |     |      |
| Cross Talk (SIF2→SIF1)         | CT2    | SIF1 $f_0 = 4.5\text{MHz}$                                | 50  | 55  | —   | dB   |
|                                |        | SIF2 $f_0 = 4.72\text{MHz}$<br>$f_m = 400\text{Hz-5KHz}$  |     |     |     |      |
| Frequency Response of Detector | $F_1$  | $f_0 = 4.5\text{MHz}$<br>$f_m = 40\text{Hz-55KHz}$        | -3  | 0   | 1.5 | dB   |
| Frequency Response of Detector | $F_2$  | $f_0 = 4.724\text{MHz}$<br>$f_m = 40\text{Hz-55KHz}$      | -3  | 0   | 1.5 | dB   |
| Detector Output Balance        | C.B.   | SIF1 = 4.5MHz<br>SIF2 = 4.724MHz                          | -2  | 0   | 2   | dB   |

## PILOT AMP AND DETECTOR

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

| Characteristics            | Symbol            | Condition  | Min | Typ | Max | Unit |
|----------------------------|-------------------|--|-----|-----|-----|------|
| Input Resistance of Pin 6  | $Z_{in6}$         |  | —   | 30  | —   | Kohm |
| Maximum Pilot Input        | $V_{in, P_{max}}$ | $V_o = -3\text{dB}$ , $0\text{dB}$ : $V_i = 10\text{mV}$ |     | 100 | —   | mV   |
| Detector Gain              | $A_{VD}$          |  | 30  | 36  |     | dB   |
| Detector Output            | $V_{OD}$          | $V_{in} = 10\text{mV}$                                   |     | 270 |     | mV   |
| Output Resistance of Pin 8 | $Z_{out8}$        |  | —   | 700 | —   | ohm  |

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

| Characteristics           | Symbol     | Condition                   | Min | Typ          | Max | Unit              |
|---------------------------|------------|-----------------------------|-----|--------------|-----|-------------------|
| Input Sensitivity         | $V_{sens}$ | $f = 150$ or $276\text{Hz}$ |     | 10           | 20  | $\text{mV}_{rms}$ |
| Input Resistance of Pin 9 | $Z_{in9}$  |                             | —   | 47           | —   | Kohm              |
| Capture Range             | $f_c$      | $V_i = 50\text{mV}$         |     | $\pm 5$      |     | Hz                |
| Lock Range                | $f_L$      | $V_i = 50\text{mV}$         |     | $\pm 10$     |     | Hz                |
| Stereo Range              | $f_{ST}$   | $V_i = 100\text{mV}$        |     | $150 \pm 10$ |     | Hz                |
| Bilingual Range           | $f_{BL}$   | $V_i = 100\text{mV}$        |     | $276 \pm 10$ |     | Hz                |

INDICATOR ( $V_{CC} = 12V$ )

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

## MODE CHANGE SWITCH CIRCUIT

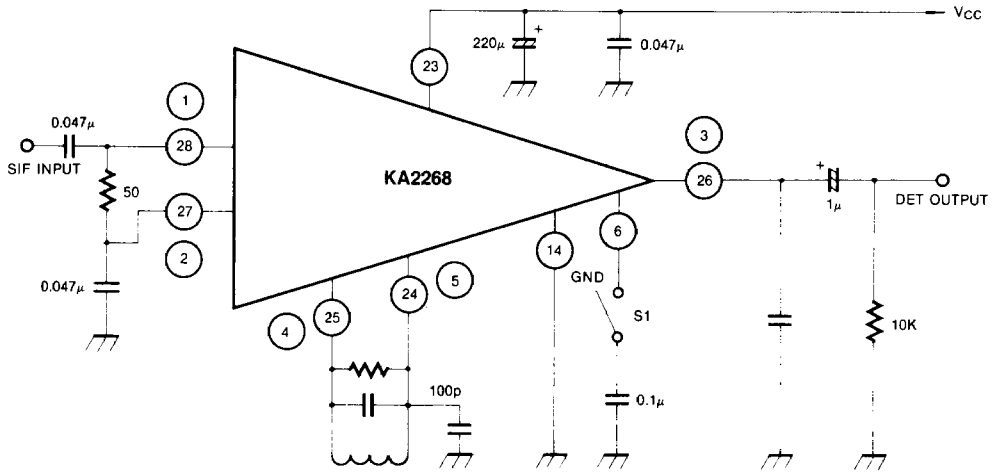
| Characteristics         | Symbol     | Condition | Min  | Typ | Max | Unit |
|-------------------------|------------|-----------|------|-----|-----|------|
| Main/Main Resistance    | R (m/m)    | SW = 2    | 3.1  | 4.7 | 7.0 | Kohm |
| Forced Mono Voltage     | $V_{mono}$ | SW = 1    |      | 0   | 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 CIRCUIT

| Characteristics        | Symbol              | Condition    | Min | Typ | Max | Unit |
|------------------------|---------------------|--------------|-----|-----|-----|------|
| T.H.D. In Main Mode    | THD <sub>M</sub>    | $V_i = 50mV$ | —   | 0.3 | 1.0 | %    |
| T.H.D. In Sub Mode     | THD <sub>S</sub>    | $V_i = 50mV$ | —   | 0.3 | 1.0 | %    |
| T.H.D. In Stereo Mode  | THD <sub>ST</sub>   | $V_i = 50mV$ | —   | 0.3 | 1.0 | %    |
| Cross Talk (M/M → S/S) | CT <sub>MM→SS</sub> | $V_i = 50mV$ | 50  | 55  | —   | dB   |
| Cross Talk (S/S → M/M) | CT <sub>SS→MM</sub> | $V_i = 50mV$ | 50  | 55  | —   | dB   |
| Cross Talk (M → S)     | CT <sub>M→S</sub>   | $V_i = 50mV$ | 50  | 55  | —   | dB   |
| Cross Talk (S → M)     | CT <sub>S→M</sub>   | $V_i = 50mV$ | 50  | 55  | —   | dB   |
| Separation (L → R)     | SEP <sub>L→R</sub>  | $V_i = 50mV$ | 30  | 35  | —   | dB   |
| Separation (R → L)     | SEP <sub>R→L</sub>  | $V_i = 50mV$ | 30  | 35  | —   | dB   |
| Voltage Gain of Matrix | $A_V$               | $V_i = 50mV$ | 8   | 10  | 12  | dB   |

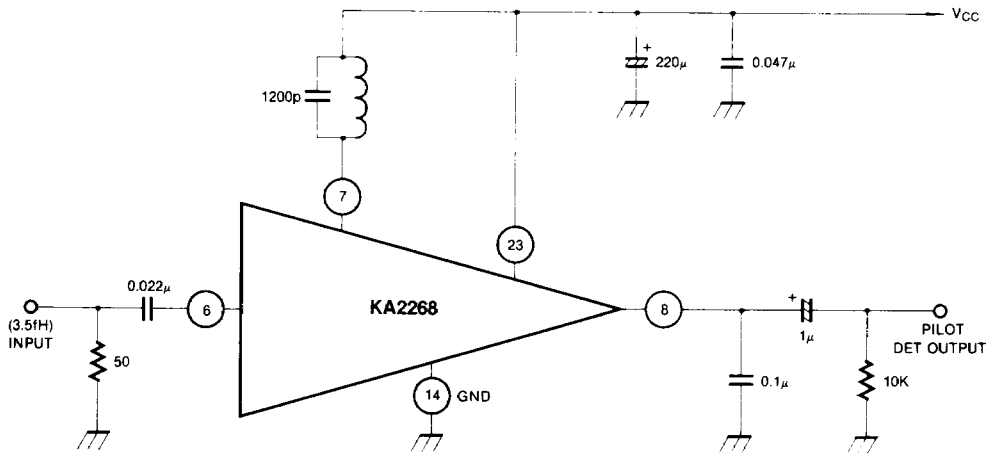


TEST CIRCUIT 1 SIF SECTION

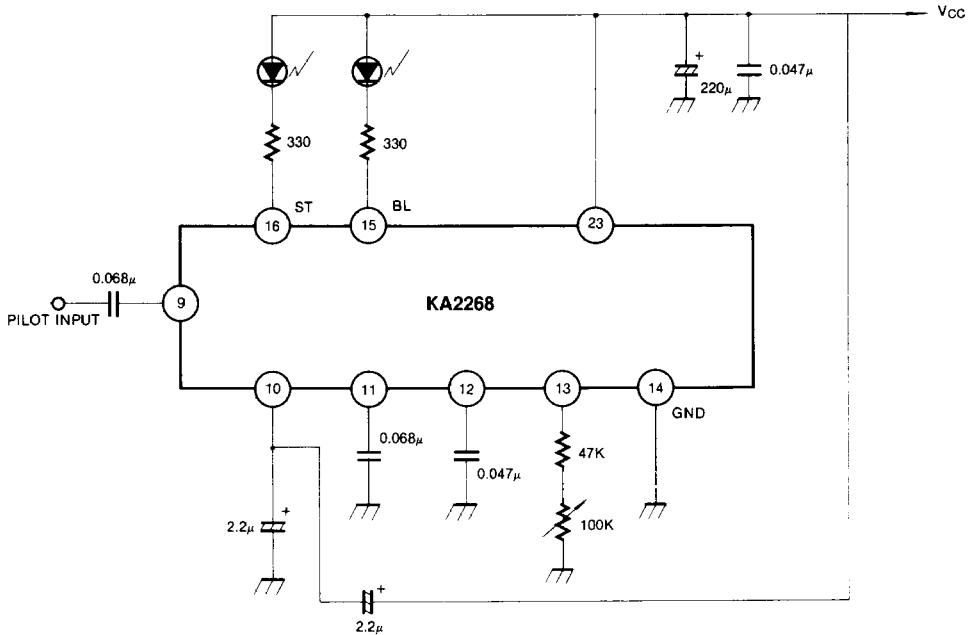


S1: PILOT INPUT NOISE BYPASS

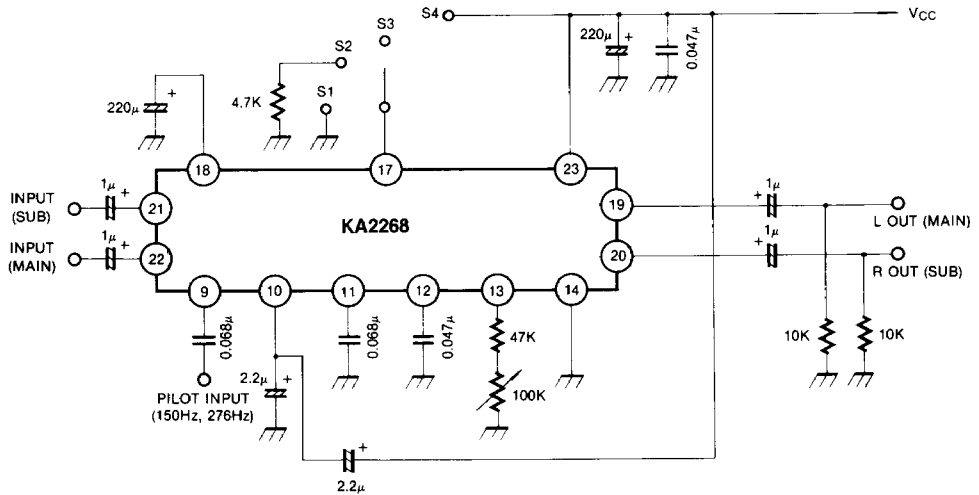
TEST CIRCUIT 2 PILOT AMP/DET SECTION



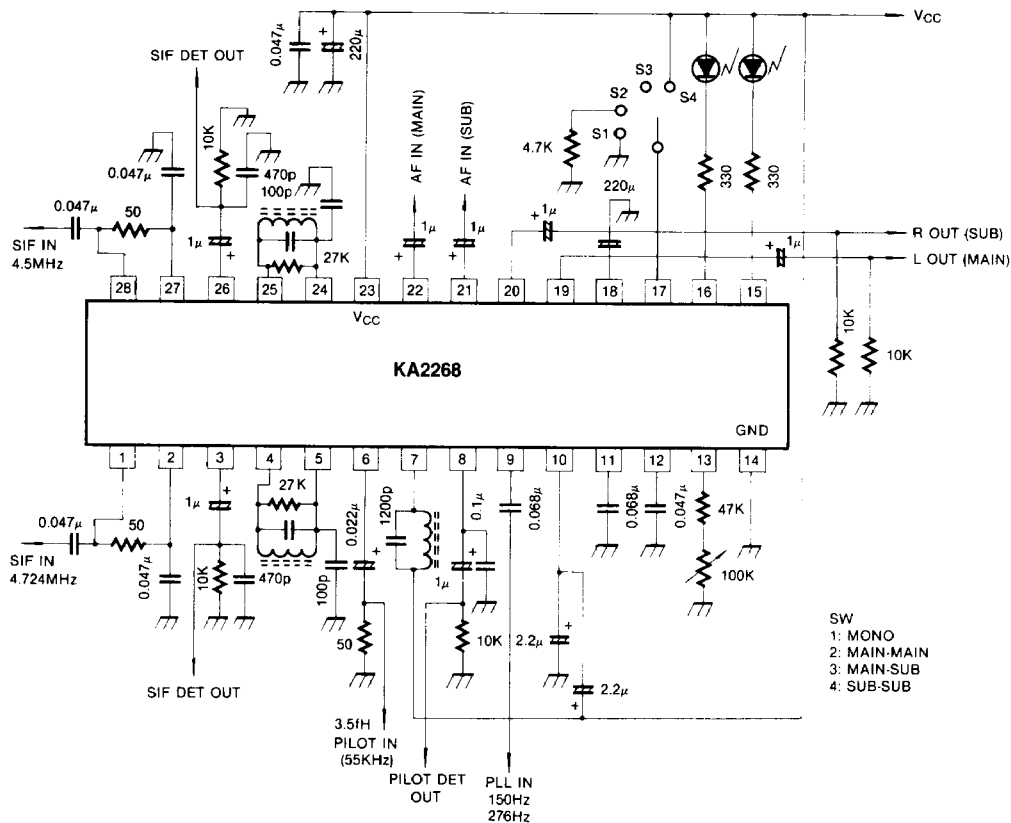
TEST CIRCUIT 3 PILOT PLL/INDICATOR SECTION



TEST CIRCUIT 4 MATRIX MODE SECTION



TEST CIRCUIT 5



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