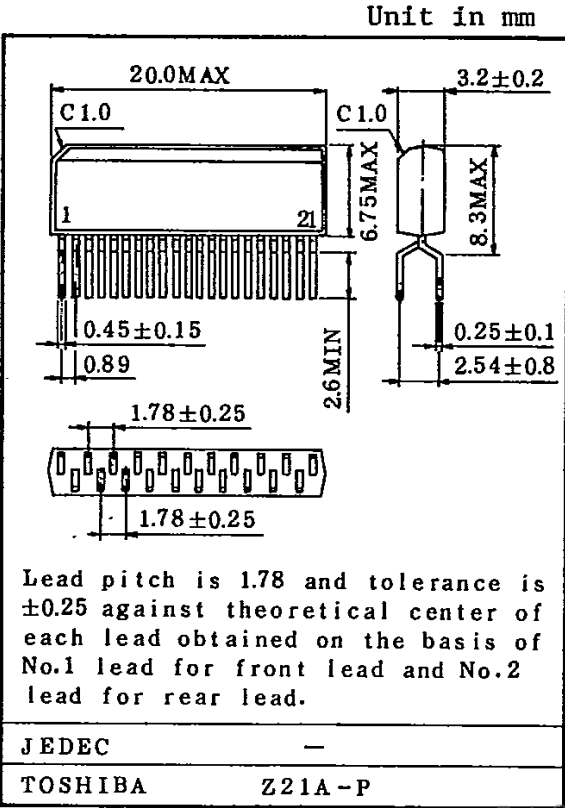


DUAL PRE AMPLIFIER SYSTEM

The TA7417AP is a dual preamplifier system IC designed for radio cassette player of the low end class to the middle class.

- . Recording Amp with ALC
- . Play Back Amp
- . Mic Amp with ALC
- . Monitor Amp
- . Built-in switch for selecting REC/PLAY
- . Built-in switch for selecting TAPE input or RADIO(AUX) input
- . Built-in Recording Bias Circuit Control terminal
- . Following 4 modes can be carried out by external two switches combination.
  - . Radio Recording
  - . Mic Recording
  - . Radio Play
  - . Tape Play Back
- . Few external parts
- . Small package (ZIP-21)
- . Operational supply voltage (recommended)  
 $V_{CC}=3.5\sim 7V$  ( $T_a=25^{\circ}C$ )



Weight : 0.94g

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

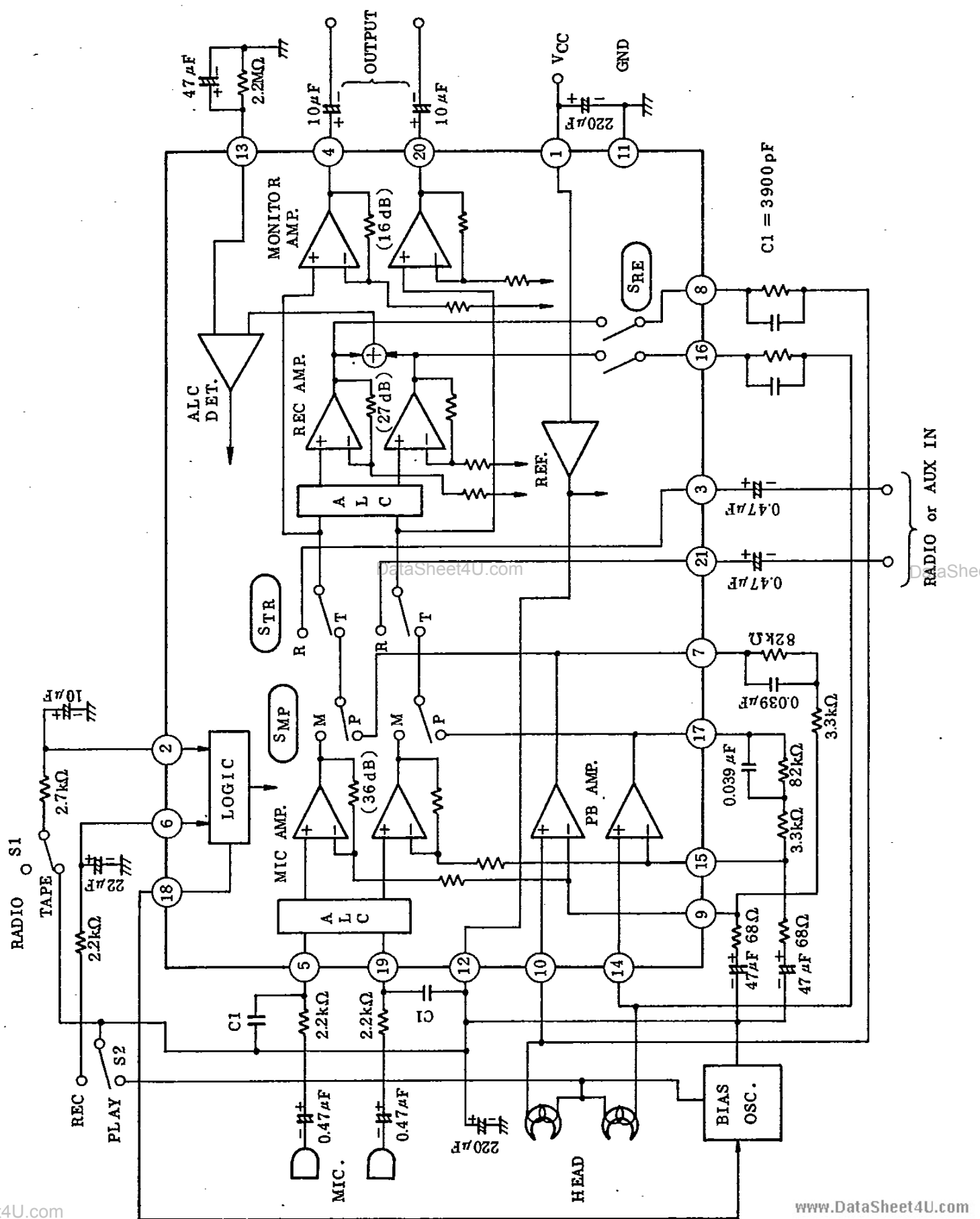
| CHARACTERISTIC           | SYMBOL    | RATING  | UNIT        |
|--------------------------|-----------|---------|-------------|
| Supply Voltage           | $V_{CC}$  | 8       | V           |
| Power Dissipation (Note) | $P_D$     | 750     | mW          |
| Operating Temperature    | $T_{opr}$ | -25~75  | $^{\circ}C$ |
| Storage Temperature      | $T_{stg}$ | -55~150 | $^{\circ}C$ |

Note: Derated above  $T_a=25^{\circ}C$  in the proportion of 6mW/ $^{\circ}C$ .

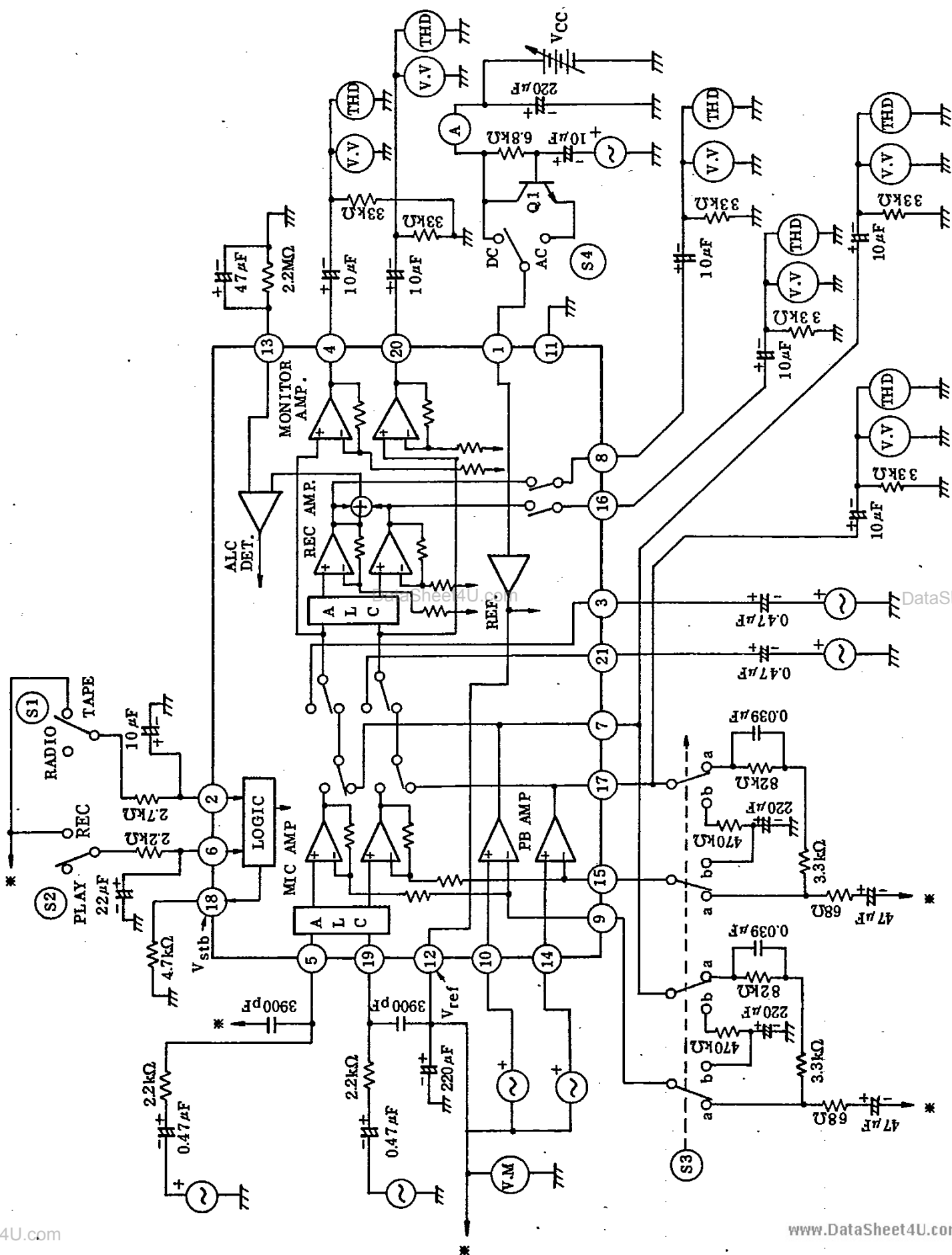
ELECTRICAL CHARACTERISTICS (Unless otherwise specified,  $T_a=25^{\circ}\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $f=1\text{kHz}$ )

| CHARACTERISTIC    |                           | SYMBOL | TEST CONDITION            | MIN. | TYP. | MAX. | UNIT             |
|-------------------|---------------------------|--------|---------------------------|------|------|------|------------------|
| Quiescent Current |                           | ICC1   | S1=RADIO, S2=PLAY         | -    | 11   | 16   | mA               |
|                   |                           | ICC2   | S1=RADIO, S2=REC          | -    | 14   | 19   |                  |
|                   |                           | ICC3   | S1=TAPE, S2=PLAY          | -    | 11   | 16   |                  |
|                   |                           | ICC4   | S1=TAPE, S2=REC           | -    | 10   | 15   |                  |
| Reference Voltage |                           | Vref   |                           | 1.8  | 2.0  | 2.3  | V                |
| MONITOR AMP       | Voltage Gain              | Gv1    | Vin=-50dBV                | 14   | 16   | 18   | dB               |
|                   | Maximum Output Voltage    | Vomax1 | THD=1%                    | -    | 1.3  | -    | Vrms             |
|                   | Output Noise Voltage      | Vno1   | BW=5~30kHz                | -    | 15   | -    | $\mu\text{Vrms}$ |
|                   | Total Harmonic Distortion | THD1   | Vout=-10dBV, BW=400~30kHz | -    | 0.06 | -    | %                |
|                   | Cross Talk                | CT1    | Vout=0dBV, BW=400~30kHz   | -    | -66  | -    | dB               |
|                   | Ripple Rejection Ratio    | RR1    | Vripple=-20dBV, f=100Hz   | -    | -50  | -    | dB               |
| PLAY BACK AMP     | Voltage Gain              | Gv2    | Vin=-50dBV                | 35   | 38   | 41   | dB               |
|                   | Open Loop Voltage Gain    | Gvo2   | Vin=-90dBV                | -    | 78   | -    | dB               |
|                   | Maximum Output Voltage    | Vomax2 | THD=1%                    | -    | 1.3  | -    | Vrms             |
|                   | Output Noise Voltage      | Vno2   | BW=5~30kHz                | -    | 80   | 160  | $\mu\text{Vrms}$ |
|                   | Total Harmonic Distortion | THD2   | Vout=-10dBV, BW=400~30kHz | -    | 0.02 | -    | %                |
|                   | Cross Talk                | CT2    | Vout=0dBV, BW=400~30kHz   | -    | -77  | -    | dB               |
|                   | Ripple Rejection Ratio    | RR2    | Vripple=-20dBV, f=100Hz   | -    | -42  | -    | dB               |
| REC AMP           | Voltage Gain              | Gv3    | Vin=-50dBV                | 24   | 27   | 30   | dB               |
|                   | Output Noise Voltage      | Vno3   | BW=5~30kHz                | -    | 160  | -    | $\mu\text{Vrms}$ |
|                   | Total Harmonic Distortion | THD3   | Vout=-10dBV, BW=400~30kHz | -    | 0.04 | -    | %                |
|                   | Cross Talk                | CT3    | Vout=-10dBV, BW=400~30kHz | -    | -71  | -    | dB               |
|                   | Ripple Rejection          | RR3    | Vripple=-20dBV, f=100Hz   | -    | -42  | -    | dB               |
|                   | ALC1                      | ALC31  | Vin=-25dBV, Dual OP.      | -6   | -2   | 2    | dBV              |
|                   | ALC2                      | ALC32  | Vin=-15dBV, Dual OP.      | -    | -1   | -    | dBV              |
|                   | ALC3                      | ALC33  | Vin=-5dBV, Dual OP.       | -    | -1   | -    | dBV              |
| MIC AMP+REC AMP   | Voltage Gain              | Gv4    | Vin=-80dBV                | -    | 63   | -    | dB               |
|                   | Output Noise Voltage      | Vno4   | BW=5~30kHz                | -    | 3.5  | 5.6  | mVrms            |
|                   | Total Harmonic Distortion | THD4   | Vout=-10dBV, BW=400~30kHz | -    | 0.7  | -    | %                |
|                   | Cross Talk                | CT4    | Vout=-10dBV, BW=400~30kHz | -    | -43  | -    | dB               |
|                   | Ripple Rejection Ratio    | RR4    | Vripple=-20dBV, f=100Hz   | -    | -28  | -    | dB               |
|                   | ALC1                      | ALC41  | Vin=-60dBV, Dual OP.      | -6   | -2   | 2    | dBV              |
|                   | ALC2                      | ALC42  | Vin=-40dBV, Dual OP.      | -    | -1   | -    | dBV              |
|                   | ALC3                      | ALC43  | Vin=-15dBV, Dual OP.      | -4   | -1   | 2    | dBV              |

## BLOCK DIAGRAM



## TEST CIRCUIT

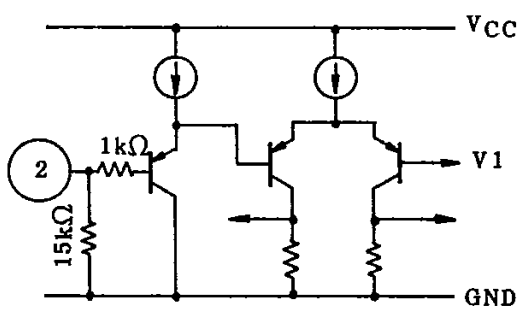
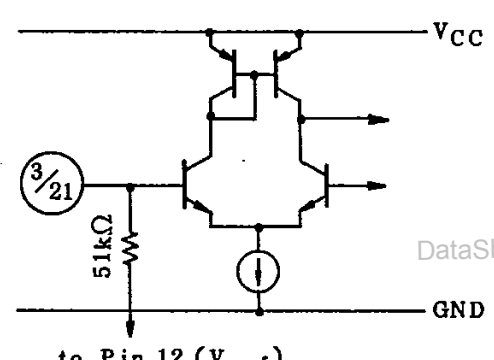
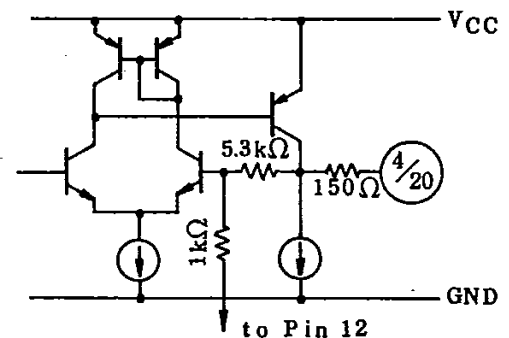
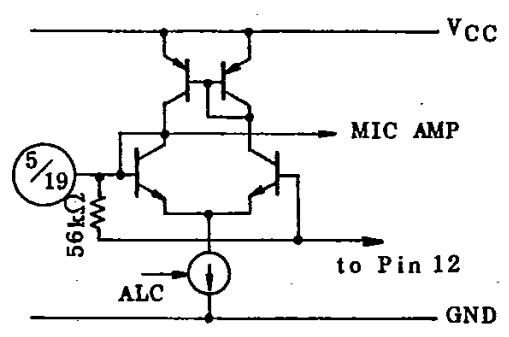


## TEST METHOD (cf TEST CIRCUIT)

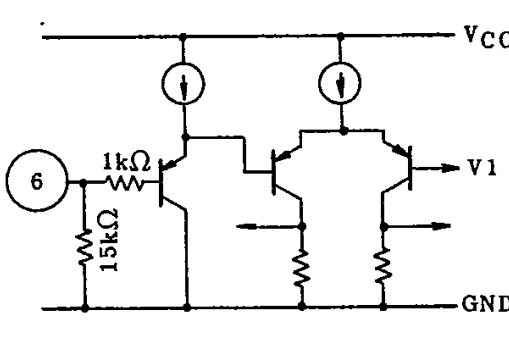
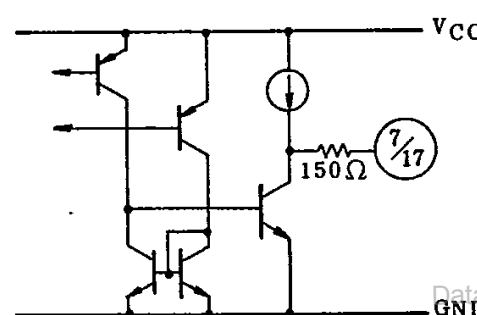
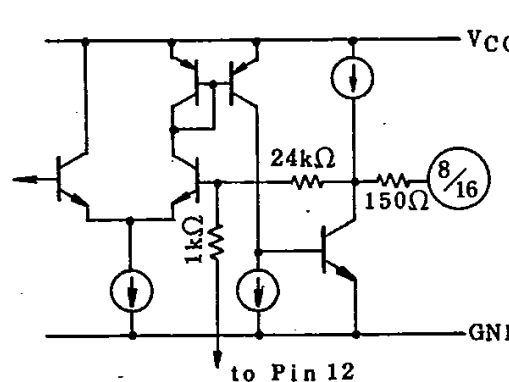
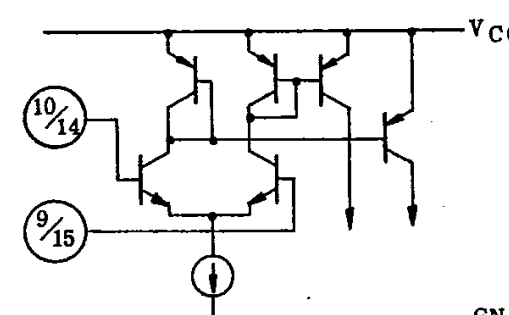
| SYMBOL  | S1    | S2   | S3 | S4 |
|---------|-------|------|----|----|
| ICC1    | RADIO | PLAY | a  | DC |
| ICC2    | RADIO | REC  | ↓  | ↓  |
| ICC3    | TAPE  | PLAY | ↓  | ↓  |
| ICC4    | TAPE  | REC  | ↓  | ↓  |
| Vref    | -     | -    | ↓  | ↓  |
| Gv1     | RADIO | REC  | a  | DC |
| Vo max1 | ↓     | ↓    | ↓  | ↓  |
| Vno1    | ↓     | ↓    | ↓  | ↓  |
| THD1    | ↓     | ↓    | ↓  | ↓  |
| CT1     | ↓     | ↓    | ↓  | ↓  |
| RR1     | RADIO | REC  | a  | AC |
| Gvo2    | TAPE  | PLAY | b  | DC |
| Gv2     | TAPE  | PLAY | a  | DC |
| Vo max2 | ↓     | ↓    | ↓  | ↓  |
| Vno2    | ↓     | ↓    | ↓  | ↓  |
| THD2    | ↓     | ↓    | ↓  | ↓  |
| CT2     | ↓     | ↓    | ↓  | ↓  |
| RR2     | TAPE  | PLAY | a  | AC |

| SYMBOL | S1    | S2  | S3 | S4 |
|--------|-------|-----|----|----|
| Gv3    | RADIO | REC | a  | DC |
| Vno3   | ↓     | ↓   | ↓  | ↓  |
| THD3   | ↓     | ↓   | ↓  | ↓  |
| CT3    | ↓     | ↓   | ↓  | ↓  |
| RR3    | RADIO | REC | a  | AC |
| ALC31  | RADIO | REC | a  | DC |
| ALC32  | ↓     | ↓   | ↓  | ↓  |
| ALC33  | ↓     | ↓   | ↓  | ↓  |
| Gv4    | TAPE  | REC | a  | DC |
| Vno4   | ↓     | ↓   | ↓  | ↓  |
| THD4   | ↓     | ↓   | ↓  | ↓  |
| CT4    | ↓     | ↓   | ↓  | ↓  |
| RR4    | TAPE  | REC | a  | AC |
| ALC41  | TAPE  | REC | a  | DC |
| ALC42  | ↓     | ↓   | ↓  | ↓  |
| ALC43  | ↓     | ↓   | ↓  | ↓  |

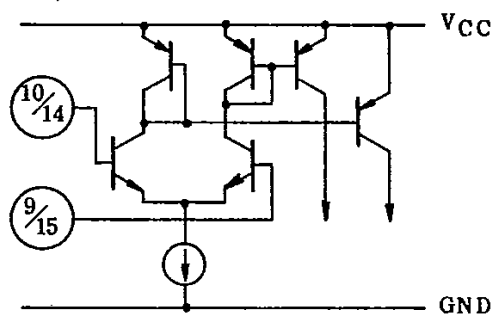
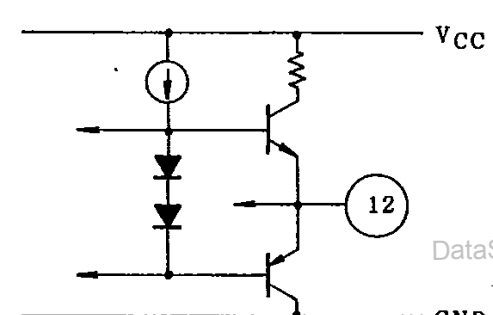
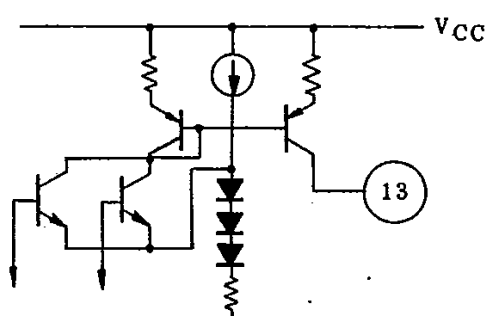
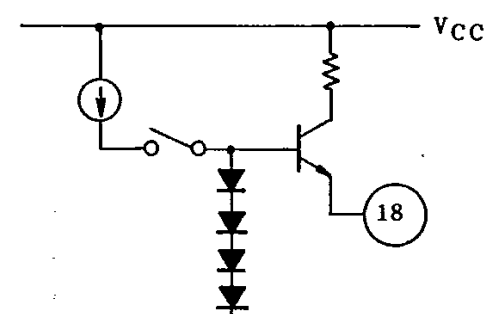
## DESCRIPTION OF EACH TERMINAL

| TERMINAL No. | TERMINAL NAME  | FUNCTION                                                                                                                   | EQUIVALENT CIRCUIT                                                                    |
|--------------|----------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1            | VCC            | VCC                                                                                                                        | —                                                                                     |
| 2            | TAPE/RADIO SW  | Change over switch for tape mode and radio mode.<br>Tape mode: Tape play<br>MIC REC<br>Radio mode: Radio play<br>Radio REC |    |
| 3/21         | RADIO (AUX) IN | Radio or Aux. input                                                                                                        |   |
| 4/20         | MONITOR OUT    | Monitor Amp output                                                                                                         |  |
| 5/19         | MIC IN         | MIC Amp input                                                                                                              |  |

## DESCRIPTION OF EACH TERMINAL

| TERMINAL No. | TERMINAL NAME | FUNCTION                                                                                                               | EQUIVALENT CIRCUIT                                                                    |
|--------------|---------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 6            | REC/PLAY SW   | Change over switch for REC mode and play mode<br>REC mode : MIC REC<br>Radio REC<br>Play mode: Tape play<br>Radio play |    |
| 7/17         | TAPE OUT      | Tape play back Amp (PB AMP) output                                                                                     |   |
| 8/16         | REC OUT       | Recording Amp output                                                                                                   |  |
| 9/15         | PB NF         | Tape play back Amp (PB AMP) NF                                                                                         |  |

## DESCRIPTION OF EACH TERMINAL

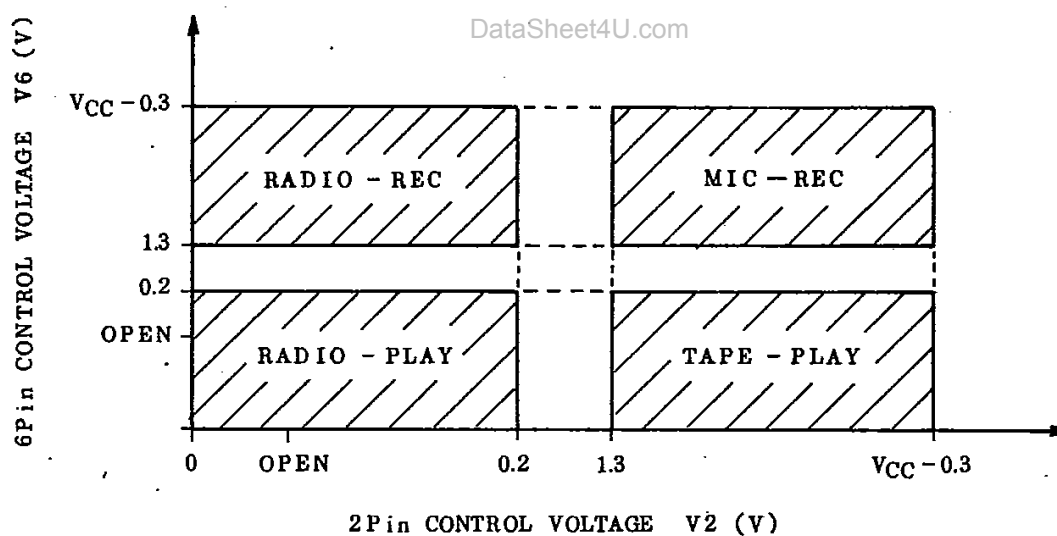
| TERMINAL No. | TERMINAL NAME    | FUNCTION                                                   | EQUIVALENT CIRCUIT                                                                    |
|--------------|------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 10/14        | TAPE IN          | Tape play back<br>Amp (PB AMP) input                       |    |
| 11           | GND              | GND                                                        | —                                                                                     |
| 12           | REFERENCE        | Reference voltage<br>terminal                              |   |
| 13           | AGC<br>T.C       | Automatic level<br>control (ALC) time<br>constant terminal |  |
| 18           | V <sub>stb</sub> | Recording bias<br>circuit control signal<br>output         |  |



## OPERATION MODE BY EXTERNAL SWITCHES (S1,S2) COMBINATION

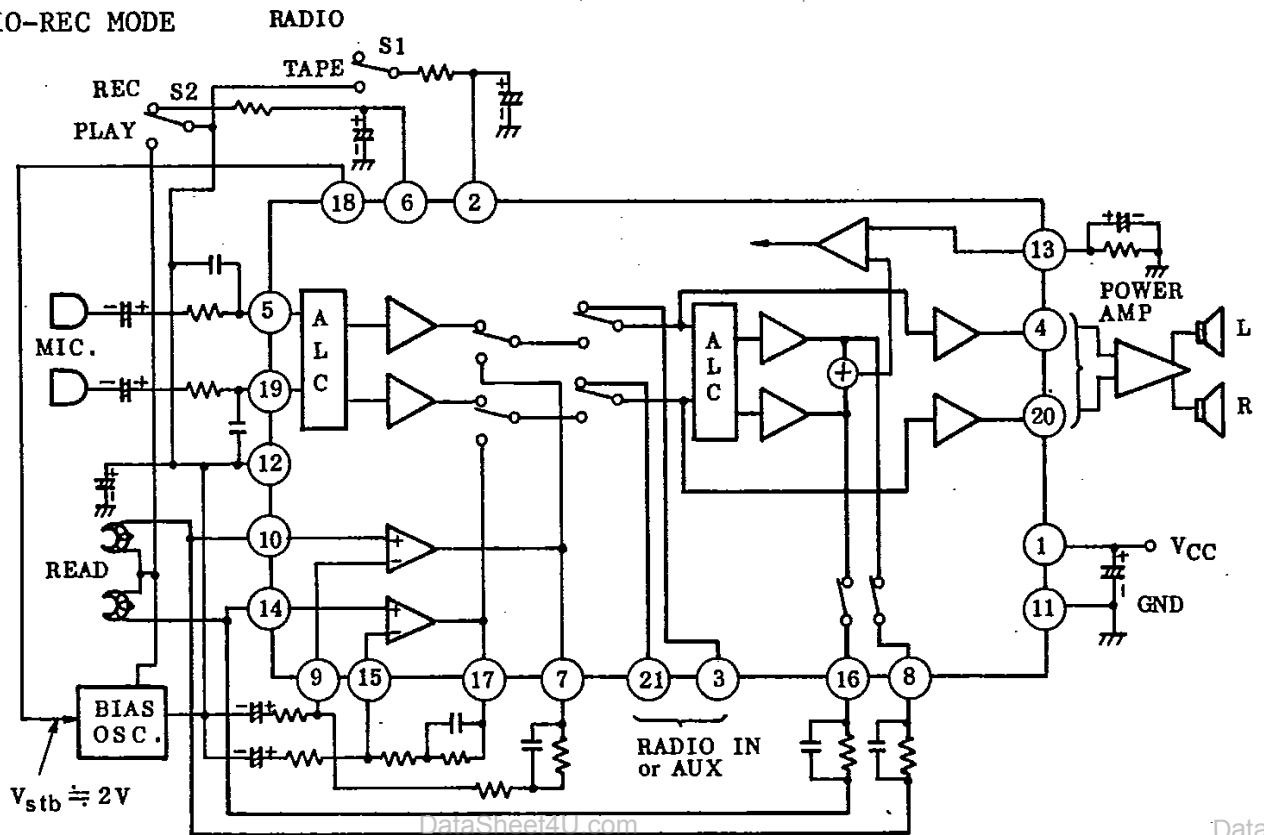
| CIRCUIT<br>BLOCK | S2<br>S1 | S2 = REC        |               | S2 = PLAY  |                |
|------------------|----------|-----------------|---------------|------------|----------------|
|                  |          | S1=RADIO        | S1=TAPE       | S1=RADIO   | S1=TAPE        |
| MIC AMP          |          | ON              | ON            | OFF        | OFF            |
| PB AMP           |          | OFF             | OFF           | ON         | ON             |
| REC AMP          |          | ON              | ON            | OFF        | OFF            |
| MONITOR AMP      |          | ON              | OFF           | ON         | ON             |
| SMP              |          | M               | M             | P          | P              |
| STR              |          | R               | T             | R          | T              |
| SRE              |          | ON              | ON            | OFF        | OFF            |
| OPERATION MODE   |          | RADIO RECORDING | MIC RECORDING | RADIO PLAY | TAPE PLAY BACK |

## CONTROL SWITCH TERMINAL (2,6pin) THRESHOLD VOLTAGE

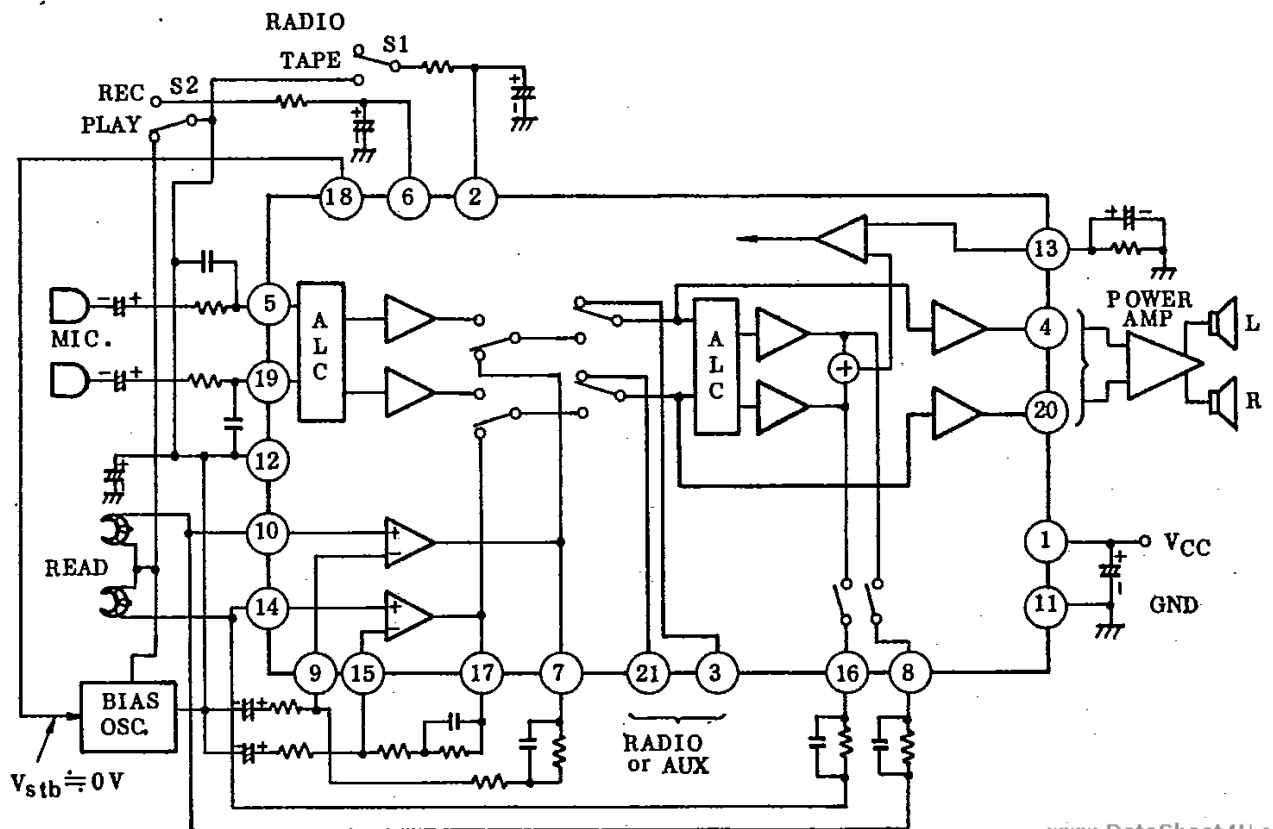


## OPERATION IN EACH MODE

## (1) RADIO-REC MODE

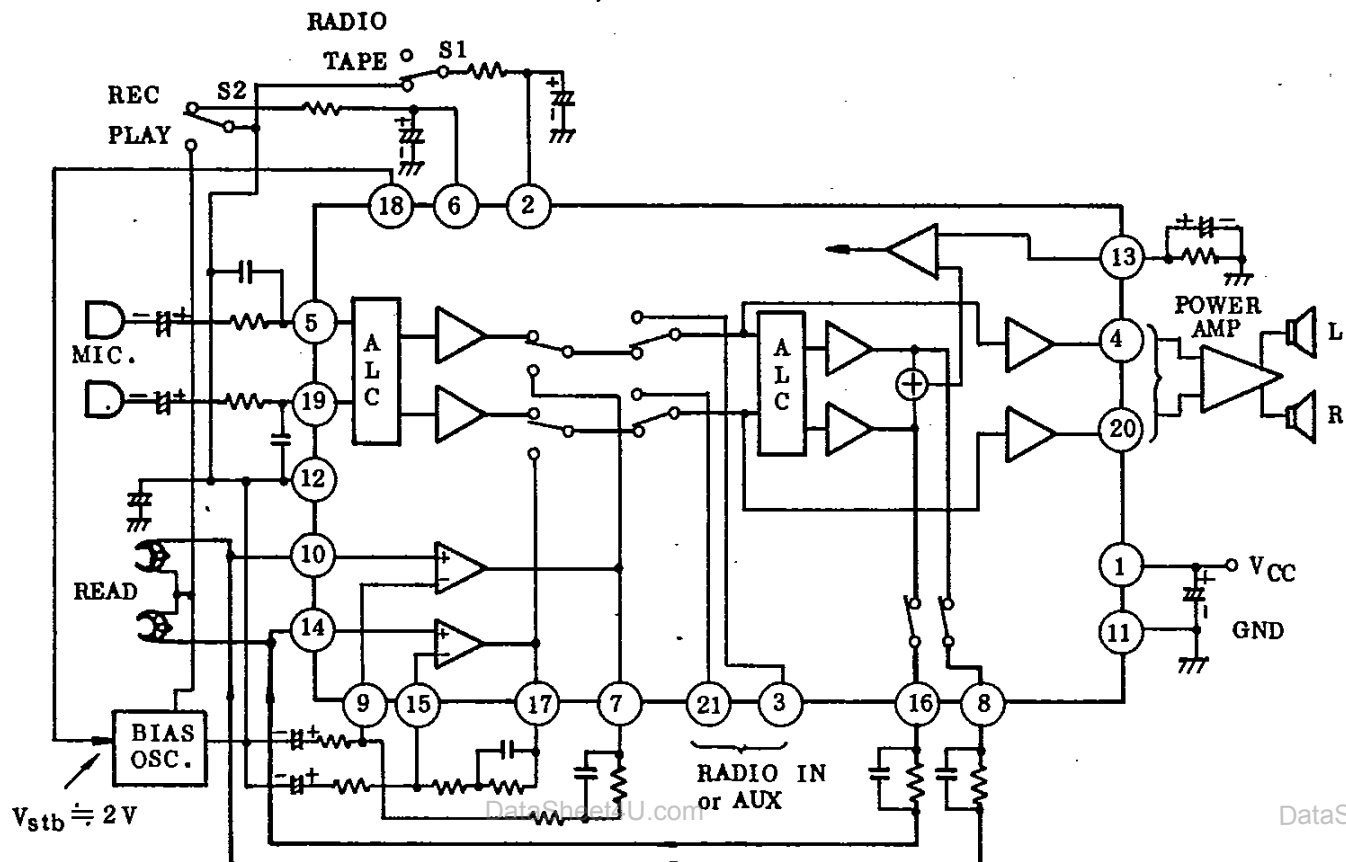


## (2) RADIO-PLAY MODE

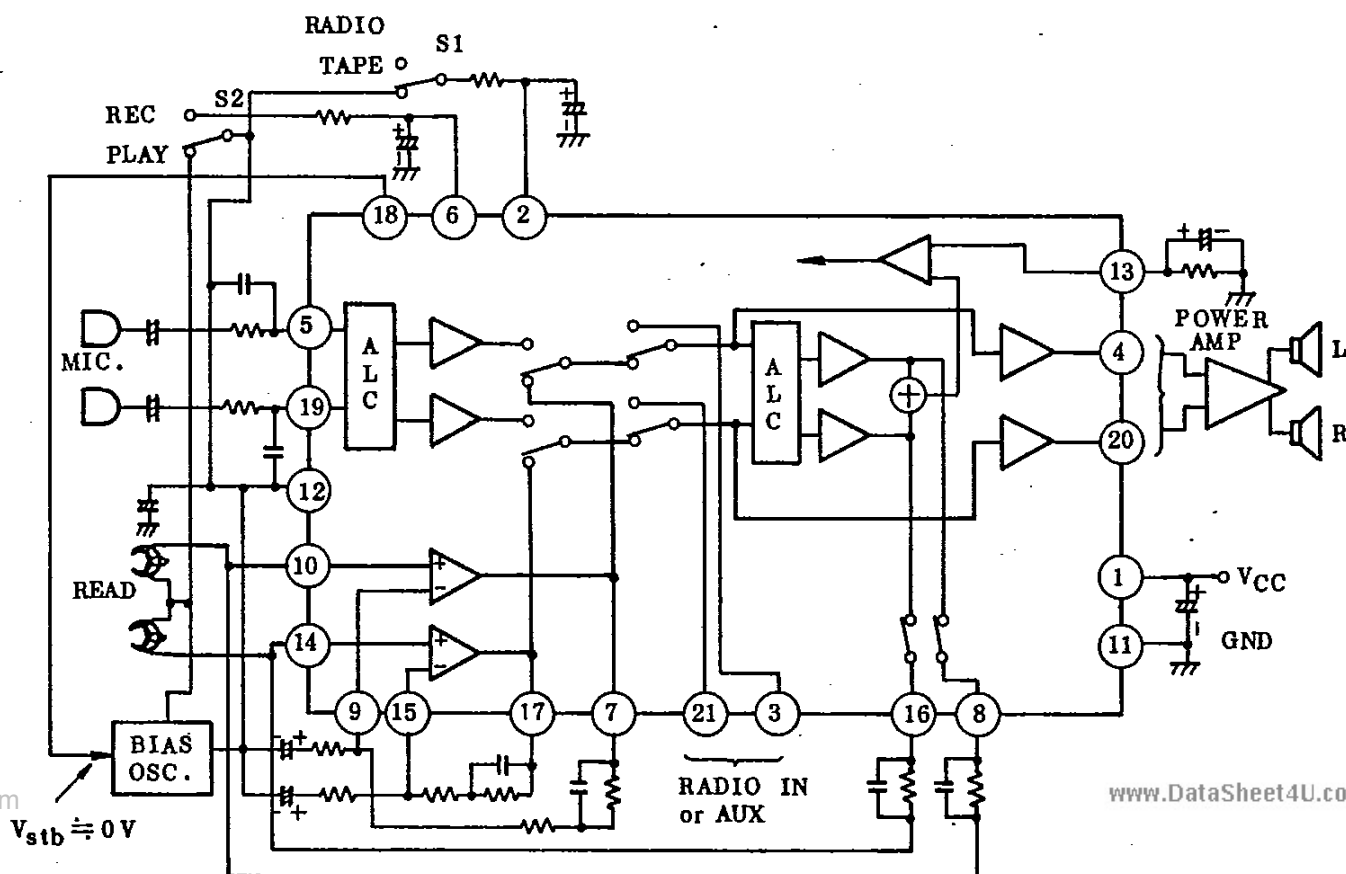


# TA7417AP

## (3) MIC-REC MODE



## (4) TAPE-PLAY MODE



DESCRIPTION OF BIAS OSC. CONTROL TERMINAL ( 18 pin ).

The equivalent circuit of 18 pin is shown in Fig. 1.

When this IC is in the REC MODE (RADIO REC or MIC REC), the switch  $S_a$  is in the "ON" state and the DC voltage 2.05V(Typ.) appears in this terminal.

The output current value of this terminal should be under  $300\mu\text{A}$ .

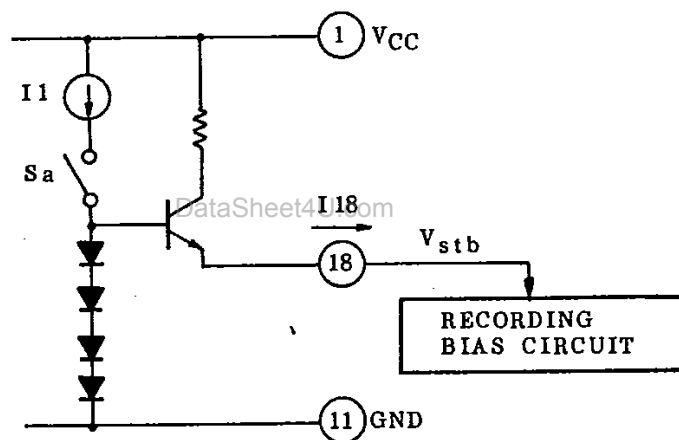


Fig. 1

