

|                                                                                   |          |                      |
|-----------------------------------------------------------------------------------|----------|----------------------|
|  | No.3969B | Monolithic Linear IC |
|                                                                                   | LA7454W  |                      |
| <b>FM Audio Recording/Playback Processor<br/>for 8-mm VCRs</b>                    |          |                      |

## Overview

The LA7454W is an audio recording and playback processor for 8-mm VCRs that is compatible with both PAL and NTSC video standards, and which supports stereo, standard-play (SP) and long-play (LP) modes.

The LA7454W incorporates an FM modulator and demodulator, a bandpass filter and deviation limiter for processing the encoded signal. On-chip noise reduction, long-play emphasis and lowpass filter circuits process and recover the audio signals.

The LA7454W operates from a single 4.75 V supply and is available in 48-pin QFPs.

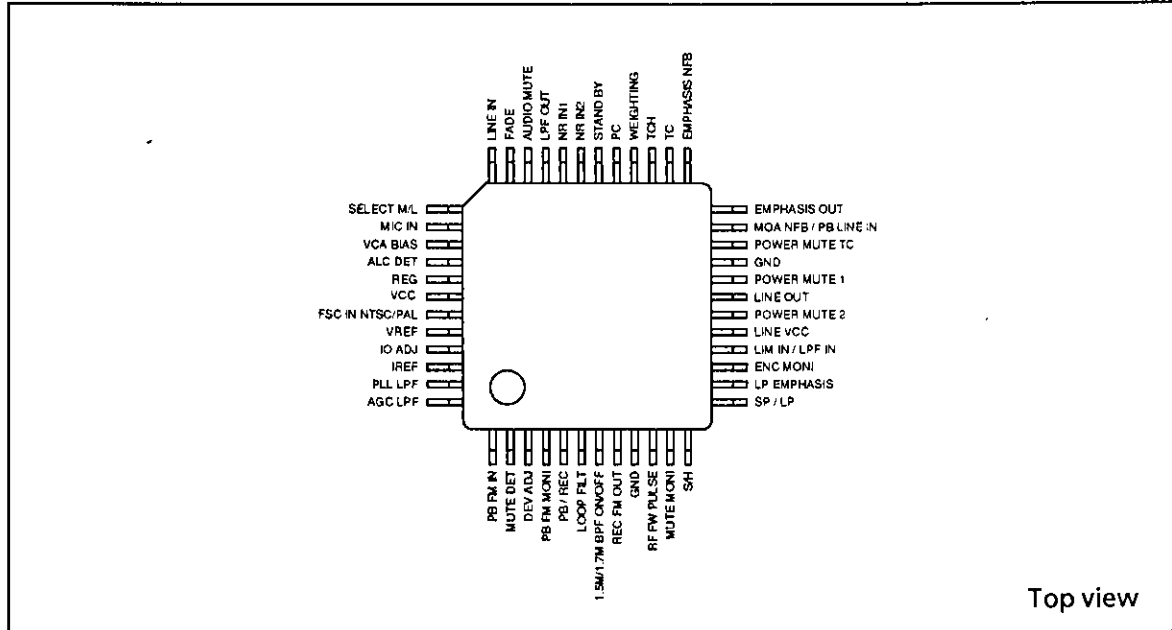
## Features

- Support for PAL and NTSC
- Stereo operation
- Supports SP and LP modes
- LP emphasis
- Noise reduction circuit
- Audio level control
- Audio fader
- 30 kHz lowpass filter
- 1.5 MHz bandpass filter
- Line amplifier for earphones
- Power mute for external amplifiers
- Low external component count
- Low power consumption
- 4.75 V supply
- 48-pin QFP



## LA7454W

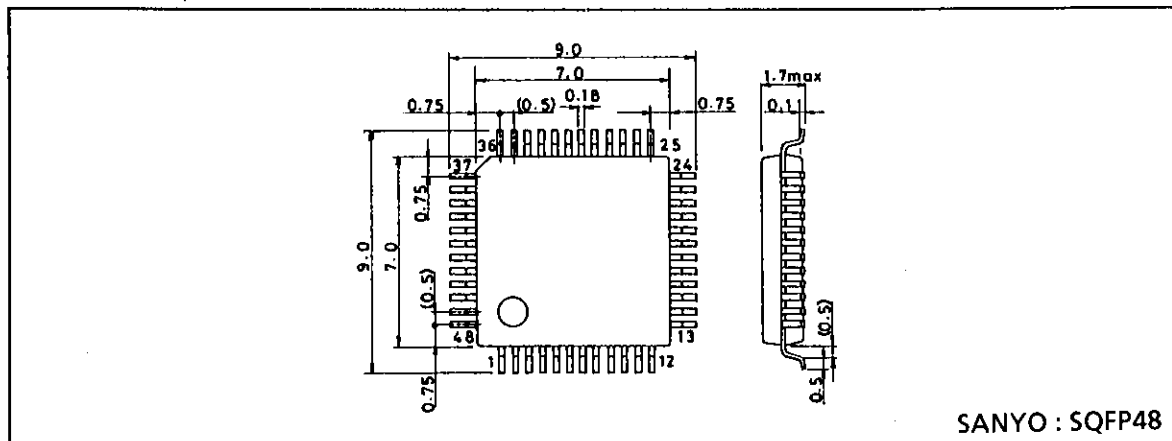
### Pin Assignment



### Package Dimensions

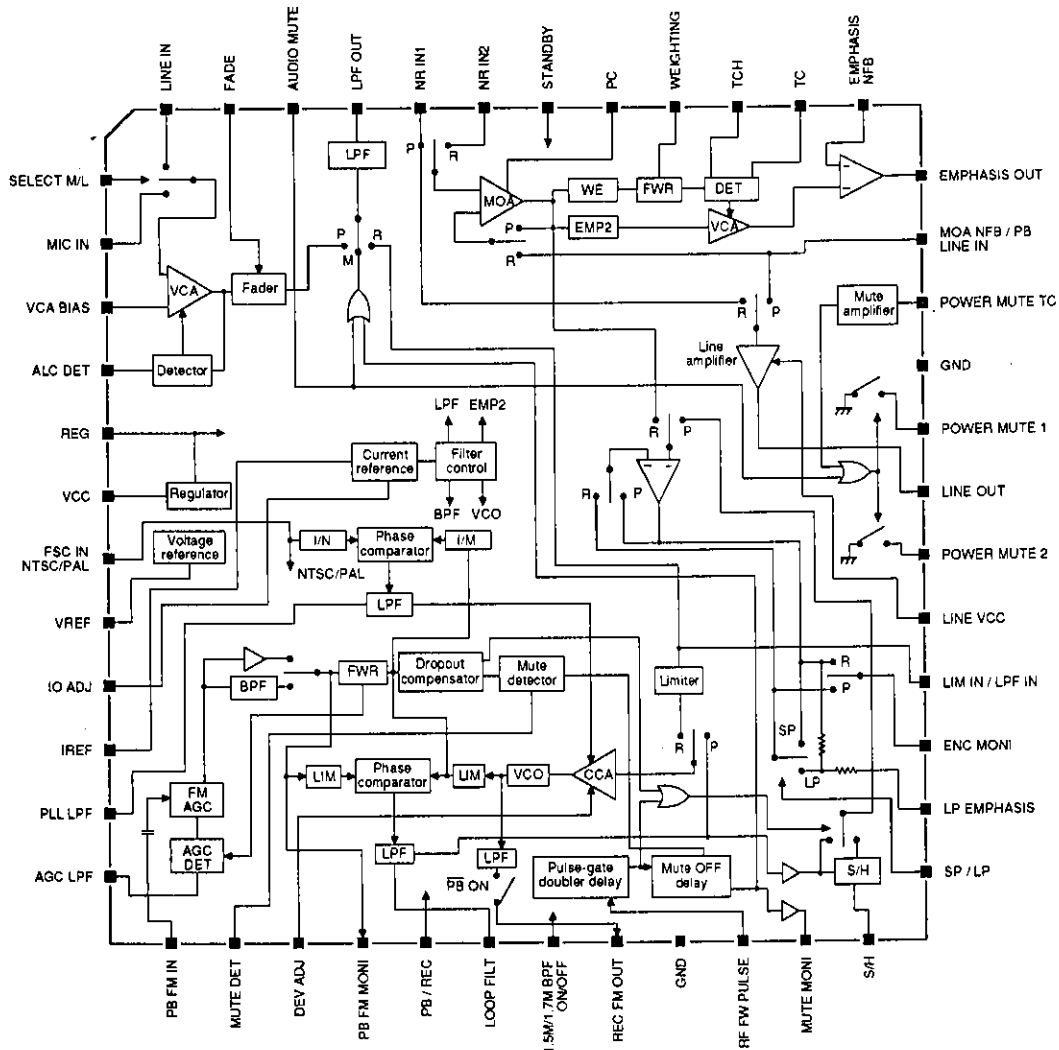
Unit: mm

### 3163A-SQFP48



# LA7454W

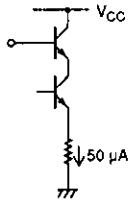
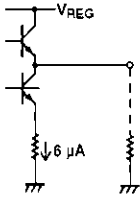
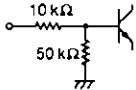
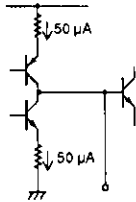
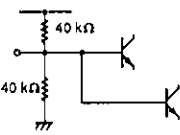
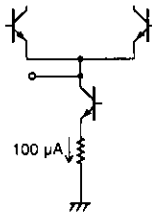
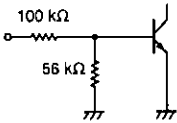
## Block Diagram



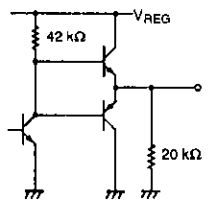
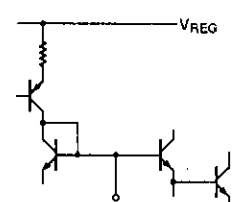
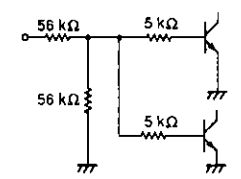
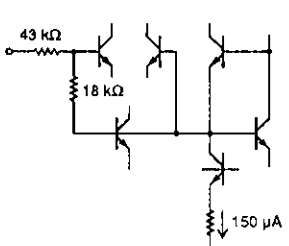
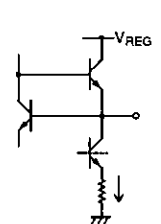
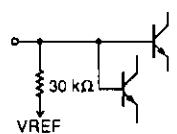
## Pin Functions

| Number | Name     | Equivalent circuit | Function                                                                     |
|--------|----------|--------------------|------------------------------------------------------------------------------|
| 1      | PB FM IN |                    | Playback FM signal input. Nominal AC input voltage is 30 mV <sub>p-p</sub> . |
| 2      | MUTE DET |                    | Mute detect output                                                           |

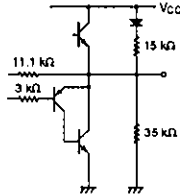
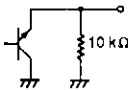
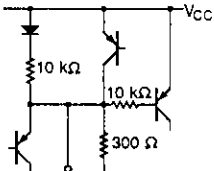
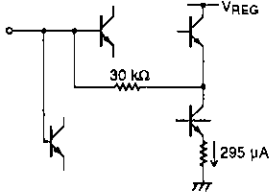
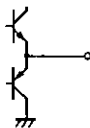
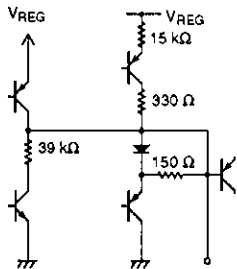
# LA7454W

| Number | Name                   | Equivalent circuit                                                                  | Function                                                                                                                                                                                                            |
|--------|------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3      | - DEV ADJ              |    | VCO deviation adjust input                                                                                                                                                                                          |
| 4      | PB FM MONI             |    | Playback FM signal monitor output. Nominal DC bias voltage is 2.1 V. Nominal AC output voltage is 280 mV <sub>p-p</sub> .                                                                                           |
| 5      | PB/REC                 |   | Playback/recording select input.                                                                                                                                                                                    |
| 6      | LOOP FILT              |  | PLL loop filter input. Nominal DC bias voltage is 2.1 V. Nominal AC level is -15 dBs.                                                                                                                               |
| 7      | 1.5 M/1.7 M BPF ON/OFF |  | PLL center frequency and bandpass filter mode selection                                                                                                                                                             |
| 8      | REC FM OUT             |  | Recording FM signal output. Nominal DC bias voltage is 2.1 V. Nominal AC output voltage is 340 mV <sub>p-p</sub> . In playback mode, the nominal DC bias voltage is 1.4 V and the nominal AC output voltage is 0 V. |
| 9      | GND                    |                                                                                     | Ground                                                                                                                                                                                                              |
| 10     | RF SW PULSE            |  | RF switch pulse input                                                                                                                                                                                               |

# LA7454W

| Number | Name          | Equivalent circuit                                                                  | Function                                                                                                          |
|--------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 11     | MUTE MONI     |    | MUTE monitor output                                                                                               |
| 12     | S/H           |    | Sample-and-hold input. Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs.                      |
| 13     | SP/LP         |   | Standard-play/long-play select input                                                                              |
| 14     | LP EMPHASIS   |  | Long-play emphasis capacitor connection. Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs.    |
| 15     | ENC MONI      |  | Recording/playback encoding monitor output. Nominal DC bias voltage is 2.1 V. Nominal AC output level is -15 dBs. |
| 16     | LIM IN/LPF IN |  | Limiter and lowpass filter input. Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs.           |
| 17     | LINE VCC      |                                                                                     | Line amplifier supply                                                                                             |
| 18     | POWER MUTE 2  |  | Mute output 2                                                                                                     |

# LA7454W

| Number | Name               | Equivalent circuit                                                                  | Function                                                                                                                       |
|--------|--------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 19     | LINE OUT           |    | Line amplifier output. Nominal DC bias voltage is 2.1 V. Nominal AC output level is -7 dBs.                                    |
| 20     | POWER MUTE 1       |    | Mute output 1                                                                                                                  |
| 21     | GND                |                                                                                     | Ground                                                                                                                         |
| 22     | POWER MUTE TC      |   | Mute time adjust input                                                                                                         |
| 23     | MOA NFB/PB LINE IN |  | Input to LINE amplifier and MOA negative feedback input. Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs. |
| 24     | EMPHASIS OUT       |  | Emphasis feedback network connection. Nominal DC bias voltage is 2.1 V. Nominal AC output level is -15 dBs.                    |
| 25     | EMPHASIS NFB       |  | Negative feedback input of emphasis amplifier. Nominal DC input voltage is 2.1 V. Nominal AC input level is -27.6 dBs.         |
| 26     | TC                 |  | Time constant capacitor connection. Nominal DC bias voltage is 2.0 V.                                                          |

# LA7454W

| Number | Name      | Equivalent circuit | Function                                                                                                       |
|--------|-----------|--------------------|----------------------------------------------------------------------------------------------------------------|
| 27     | TCH       |                    | Time constant hold capacitor connection.<br>Nominal DC bias voltage is 2.6 V.                                  |
| 28     | WEIGHTING |                    | Weighting capacitor connection.<br>Nominal DC bias voltage is 2.1 V.                                           |
| 29     | PC        |                    | Phase compensation capacitor connection.<br>Nominal DC bias voltage is 2.8 V.                                  |
| 30     | STANDBY   |                    | Standby mode input                                                                                             |
| 31     | NR IN2    |                    | Noise reduction network connection 2.<br>Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs. |
| 32     | NR IN1    |                    | Noise reduction network connection 1.<br>Nominal DC input voltage is 2.1 V. Nominal AC input level is -15 dBs. |
| 33     | LPF OUT   |                    | Lowpass filter output. Nominal DC bias voltage is 2.1 V. Nominal AC output level is -15 dBs.                   |

# LA7454W

| Number | Name       | Equivalent circuit | Function                                                |
|--------|------------|--------------------|---------------------------------------------------------|
| 34     | AUDIO MUTE |                    | Audio mute input                                        |
| 35     | FADE       |                    | FADE control input                                      |
| 36     | LINE IN    |                    | LINE signal input. Nominal AC input level is -21.0 dBs. |
| 37     | SELECT M/L |                    | Source select input                                     |
| 38     | MIC IN     |                    | MIC signal input. Nominal AC input level is -38.0 dBs.  |
| 39     | VCA BIAS   |                    | VCA bias input. Nominal DC input voltage is 2.1 V.      |
| 40     | ALC DET    |                    | Audio level control input                               |

## LA7454W

| Number | Name            | Equivalent circuit | Function                                                                                 |
|--------|-----------------|--------------------|------------------------------------------------------------------------------------------|
| 41     | REG             |                    | Internal voltage regulator output. Nominal DC bias voltage is 4.2 V.                     |
| 42     | VCC             |                    | 4.75 V supply                                                                            |
| 43     | FSC IN NTSC/PAL |                    | NTSC/PAL mode select and FSC input                                                       |
| 44     | VREF            |                    | Voltage reference output. Nominal DC bias voltage is 2.1 V.                              |
| 45     | IO ADJ          |                    | Current reference adjust input                                                           |
| 46     | IREF            |                    | Current reference output. Nominal DC bias voltage is 2.2 V with 3.3 V applied to IO ADJ. |
| 47     | PLL LPF         |                    | PLL loop filter input. Nominal DC input voltage is 2.1 V.                                |

## LA7454W

| Number | Name    | Equivalent circuit | Function                                                      |
|--------|---------|--------------------|---------------------------------------------------------------|
| 48     | AGC LPF |                    | AGC response adjust input. Nominal DC input voltage is 2.1 V. |

## Specifications

### Absolute Maximum Ratings

| Parameter                   | Symbol    | Ratings     | Unit |
|-----------------------------|-----------|-------------|------|
| Supply voltage              | $V_{CC}$  | 7           | V    |
| Power dissipation           | $P_D$     | 300         | mW   |
| Operating temperature range | $T_{opr}$ | -20 to +75  | °C   |
| Storage temperature range   | $T_{stg}$ | -40 to +150 | °C   |

### Recommended Operating Conditions

$T_a = 25\text{ }^{\circ}\text{C}$

| Parameter            | Symbol   | Ratings    | Unit |
|----------------------|----------|------------|------|
| Supply voltage       | $V_{CC}$ | 4.75       | V    |
| Supply voltage range | $V_{CC}$ | 4.5 to 5.5 | V    |

### Electrical Characteristics

$V_{CC} = 4.75\text{ V}$ ,  $T_a = 25\text{ }^{\circ}\text{C}$

| No. | Parameter                     | Symbol     | Conditions              | Ratings |      |      | Unit |
|-----|-------------------------------|------------|-------------------------|---------|------|------|------|
|     |                               |            |                         | min     | typ  | max  |      |
| 1   | Standby-mode supply current   | $I_{CCST}$ |                         | 19.2    | 24.0 | 28.8 | mA   |
| 2   | Recording-mode supply current | $I_{CCR}$  |                         | 21.6    | 27.0 | 32.4 | mA   |
| 3   | Playback-mode supply current  | $I_{CCP}$  | Bandpass filter is ON.  | 24.8    | 31.0 | 37.2 | mA   |
| 4   |                               |            | Bandpass filter is OFF. | 21.6    | 27.0 | 32.4 |      |
| 5   | REG output voltage            | $V_{REG}$  |                         | 4.05    | 4.20 | 4.35 | V    |
| 6   | Reference voltage             | $V_{REF}$  |                         | 2.02    | 2.10 | 2.18 | V    |

## LA7454W

### Recording-mode characteristics

#### Audio level control and lowpass filter circuits

| No. | Parameter              | Symbol          | Conditions                                                      | Ratings |      |      | Unit |
|-----|------------------------|-----------------|-----------------------------------------------------------------|---------|------|------|------|
|     |                        |                 |                                                                 | min     | typ  | max  |      |
| 7   | Input switch crosstalk | CT              | f = 10 kHz, mode 1,<br>-5 dBs input level                       | —       | -78  | -70  | dB   |
| 8   |                        |                 | f = 10 kHz, mode 2,<br>-5 dBs input level                       | —       | -78  | -70  |      |
| 9   | ALC output level       | V <sub>oa</sub> | f = 400 Hz,<br>-38 dBs MIC input level                          | -16     | -15  | -14  | dBs  |
| 10  |                        |                 | f = 400 Hz,<br>-25 dBs MIC input level                          | -10.5   | -9.0 | -7.5 |      |
| 11  |                        |                 | f = 400 Hz,<br>-21 dBs LINE input level                         | -16     | -15  | -14  |      |
| 12  | ALC response           | ALC             | f = 400 Hz,<br>-28 dBs to -2 dBs<br>input level change          | —       | 0    | 3    | dB   |
| 13  | FADE attenuation       | $\alpha_{FADE}$ | f = 400 Hz,<br>-38 dBs input level,<br>V <sub>IN4</sub> = 4.5 V | 80      | 85   | —    | dBs  |

#### Noise reduction circuit

| No. | Parameter                 | Symbol           | Conditions                                   | Ratings |       |       | Unit |
|-----|---------------------------|------------------|----------------------------------------------|---------|-------|-------|------|
|     |                           |                  |                                              | min     | typ   | max   |      |
| 14  | Output level              | V <sub>oe</sub>  | f = 400 Hz,<br>-15 dBs input level           | -16     | -15   | -14   | dBs  |
| 15  |                           |                  | f = 400 Hz,<br>-35 dBs input level           | -26.5   | -25.0 | -23.5 |      |
| 16  |                           |                  | f = 400 Hz,<br>-55 dBs input level           | -37     | -35   | -33   |      |
| 17  |                           |                  | f = 7 kHz,<br>-15 dBs input level            | -12.4   | -10.9 | -9.4  |      |
| 18  |                           |                  | f = 7 kHz,<br>-35 dBs input level            | -22.4   | -20.9 | -19.4 |      |
| 19  |                           |                  | f = 7 kHz,<br>-55 dBs input level            | -32.9   | -30.9 | -28.9 |      |
| 20  | Total harmonic distortion | THD <sub>E</sub> | f = 400 Hz,<br>-15 dBs input level           | —       | 0.2   | 0.5   | %    |
| 21  | Output noise level        | V <sub>noe</sub> | R <sub>G</sub> = 1 k $\Omega$ , IHF-A filter | —       | -57   | -51   | dBs  |

## LA7454W

### Line amplifier

| No. | Parameter                 | Symbol            | Conditions                                              | Ratings |       |       | Unit |
|-----|---------------------------|-------------------|---------------------------------------------------------|---------|-------|-------|------|
|     |                           |                   |                                                         | min     | typ   | max   |      |
| 22  | Line output level         | $V_o$             | $f = 400 \text{ Hz}$ ,<br>-38 dBs input level           | -8.5    | -7.0  | -5.5  | dBs  |
| 23  | Line output noise level   | $V_{no}$          | $R_g = 1 \text{ k}\Omega$ , IHF-A filter,<br>LINE input | -       | -79   | -74   | dBs  |
| 24  |                           |                   | $R_g = 1 \text{ k}\Omega$ , IHF-A filter,<br>MIC input  | -       | -76   | -71   |      |
| 25  | Line output distortion    | $THD_L$           | $f = 400 \text{ Hz}$ ,<br>-38 dBs input level           | -       | 0.1   | 0.4   | %    |
| 26  | Earphone output level     | $V_{oep}$         | $f = 400 \text{ Hz}$ ,<br>-38 dBs input level           | -27.5   | -26.0 | -24.5 | dBs  |
| 27  | Maximum line output level | $V_o \text{ max}$ | $f = 400 \text{ Hz}$ , $THD = 1\%$                      | 0.5     | 2.5   | -     | dBs  |

### FM modulator

| No. | Parameter                  | Symbol     | Conditions                                                    | Ratings |        |        | Unit              |
|-----|----------------------------|------------|---------------------------------------------------------------|---------|--------|--------|-------------------|
|     |                            |            |                                                               | min     | typ    | max    |                   |
| 28  | Oscillator frequency       | $f_o$      | NTSC mode,<br>1.5 MHz selected,<br>$f = 3.579545 \text{ MHz}$ | 1.4995  | 1.5000 | 1.5005 | MHz               |
| 29  |                            |            | NTSC mode,<br>1.7 MHz selected,<br>$f = 3.579545 \text{ MHz}$ | 1.6995  | 1.7000 | 1.7005 |                   |
| 30  |                            |            | PAL mode,<br>1.5 MHz selected,<br>$f = 4.433619 \text{ MHz}$  | 1.4995  | 1.5000 | 1.5005 |                   |
| 31  |                            |            | PAL mode,<br>1.7 MHz selected,<br>$f = 4.433619 \text{ MHz}$  | 1.6995  | 1.7000 | 1.7005 |                   |
| 32  | Output voltage             | $V_{or}$   | $f = 3.579545 \text{ MHz}$                                    | 300     | 340    | 380    | mV <sub>p-p</sub> |
| 33  | Second-harmonic distortion | $HD_{2nd}$ | $f = 3.579545 \text{ MHz}$                                    | -       | -46    | -40    | dB                |
| 34  | Third-harmonic distortion  | $HD_{3rd}$ | $f = 3.579545 \text{ MHz}$                                    | -       | -31    | -25    | dB                |

### Playback-mode characteristics

#### FM demodulator

| No. | Parameter         | Symbol    | Conditions                                                                                        | Ratings |       |       | Unit |
|-----|-------------------|-----------|---------------------------------------------------------------------------------------------------|---------|-------|-------|------|
|     |                   |           |                                                                                                   | min     | typ   | max   |      |
| 35  | Output level      | $V_{dem}$ | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>60 kHz FM deviation,<br>$f_m = 1 \text{ kHz}$ | -16.0   | -15.0 | -14.0 | dBs  |
| 36  | Output distortion | $THD_d$   | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>60 kHz FM deviation,<br>$f_m = 1 \text{ kHz}$ | -       | 0.26  | 0.4   | %    |

## LA7454W

| No. | Parameter          | Symbol     | Conditions                                                                                   | Ratings |     |     | Unit |
|-----|--------------------|------------|----------------------------------------------------------------------------------------------|---------|-----|-----|------|
|     |                    |            |                                                                                              | min     | typ | max |      |
| 37  | Output noise level | $V_{nod}$  | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>IHF-A filter                             | –       | –71 | –64 | dBs  |
| 38  | AM rejection       | $AM_{rej}$ | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>30% modulation,<br>$f_m = 1 \text{ kHz}$ | –       | –71 | –64 | dBs  |

### Lowpass filter

| No. | Parameter                   | Symbol     | Conditions                                                                                                                       | Ratings |       |       | Unit |
|-----|-----------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------|------|
|     |                             |            |                                                                                                                                  | min     | typ   | max   |      |
| 39  | Lowpass filter output level | $V_{OLPF}$ | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>60 kHz FM deviation,<br>$f_m = 10 \text{ kHz}$                               | –16.0   | –15.0 | –14.0 | dBs  |
| 40  |                             |            | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>60 kHz FM deviation,<br>$f_m = 30 \text{ kHz}$                               | –17.5   | –16.5 | –15.5 |      |
| 41  |                             |            | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub> ,<br>60 kHz FM deviation,<br>$f_m = 7 \text{ kHz}$ , long play<br>emphasis is ON. | –19.5   | –17.5 | –15.5 |      |

### FM automatic gain control circuit

| No. | Parameter          | Symbol     | Conditions                                         | Ratings |     |     | Unit              |
|-----|--------------------|------------|----------------------------------------------------|---------|-----|-----|-------------------|
|     |                    |            |                                                    | min     | typ | max |                   |
| 42  | AGC output voltage | $V_{OAGC}$ | $f_c = 1.5 \text{ MHz}$ , 30 mV <sub>p-p</sub>     | 220     | 280 | 340 | mV <sub>p-p</sub> |
| 43  |                    |            | $f_c = 1.5 \text{ MHz}$ , 7 mV <sub>p-p</sub>      | 130     | 170 | 210 |                   |
| 44  |                    |            | $f_c = 1.5 \text{ MHz}$ , 12 mV <sub>p-p</sub>     | 220     | 280 | 340 |                   |
| 45  |                    |            | $f_c = 1.5 \text{ MHz}$ ,<br>100 mV <sub>p-p</sub> | 220     | 280 | 340 |                   |

### Bandpass filter

| No. | Parameter                | Symbol     | Conditions                                                           | Ratings |       |       | Unit |
|-----|--------------------------|------------|----------------------------------------------------------------------|---------|-------|-------|------|
|     |                          |            |                                                                      | min     | typ   | max   |      |
| 46  | Bandpass filter response | $BPF_r$    | $f_c = 1.5 \text{ MHz} \pm 100 \text{ kHz}$ ,<br>7 mV <sub>p-p</sub> | –6      | –5    | –3    | dB   |
| 47  |                          |            | $f_c = 1.5 \text{ MHz} \pm 200 \text{ kHz}$ ,<br>7 mV <sub>p-p</sub> | –       | –15.5 | –14.5 |      |
| 48  |                          |            | $f_c = 1.2 \text{ MHz}$ , 7 mV <sub>p-p</sub>                        | –       | –38   | –31   |      |
| 49  |                          |            | $f_c = 1.8 \text{ MHz}$ , 7 mV <sub>p-p</sub>                        | –       | –35   | –30   |      |
| 50  | Voltage gain             | $VG_{BPF}$ | Bandpass filter is OFF.                                              | 26      | 28    | 30    | dB   |

## LA7454W

### Dropout mute circuit

| No. | Parameter                     | Symbol            | Conditions                                                           | Ratings |      |      | Unit |
|-----|-------------------------------|-------------------|----------------------------------------------------------------------|---------|------|------|------|
|     |                               |                   |                                                                      | min     | typ  | max  |      |
| 51  | Dropout detection threshold   | DO <sub>ON</sub>  |                                                                      | -10.0   | -7.5 | -5.0 | dB   |
| 52  | Dropout hysteresis            | DO <sub>OFF</sub> |                                                                      | 1.0     | 3.5  | 6.0  | dB   |
| 53  | Mute ON time                  | t <sub>MON</sub>  | See measurement waveforms.                                           | 140     | 220  | 300  | μs   |
| 54  | Mute hold time                | t <sub>MH</sub>   | See measurement waveforms.                                           | 130     | 150  | 170  | ms   |
| 55  | Pulse-gate doubler pulsewidth | t <sub>PGW</sub>  | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.5 MHz BPF is ON.  | 5.0     | 7.0  | 9.0  | μs   |
| 56  |                               |                   | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.5 MHz BPF is OFF. | 5.5     | 7.5  | 9.5  |      |
| 57  |                               |                   | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.7 MHz selected    | 6.7     | 8.7  | 10.7 |      |
| 58  | Pulse-gate doubler delay time | t <sub>PGT</sub>  | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.5 MHz BPF is ON.  | 1.0     | 2.0  | 3.0  | μs   |
| 59  |                               |                   | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.5 MHz BPF is OFF. | 1.0     | 2.0  | 3.0  |      |
| 60  |                               |                   | f <sub>c</sub> = 1.5 MHz, 30 mV <sub>p-p</sub> , 1.7 MHz selected    | 1.0     | 2.0  | 3.0  |      |

### External adjustment

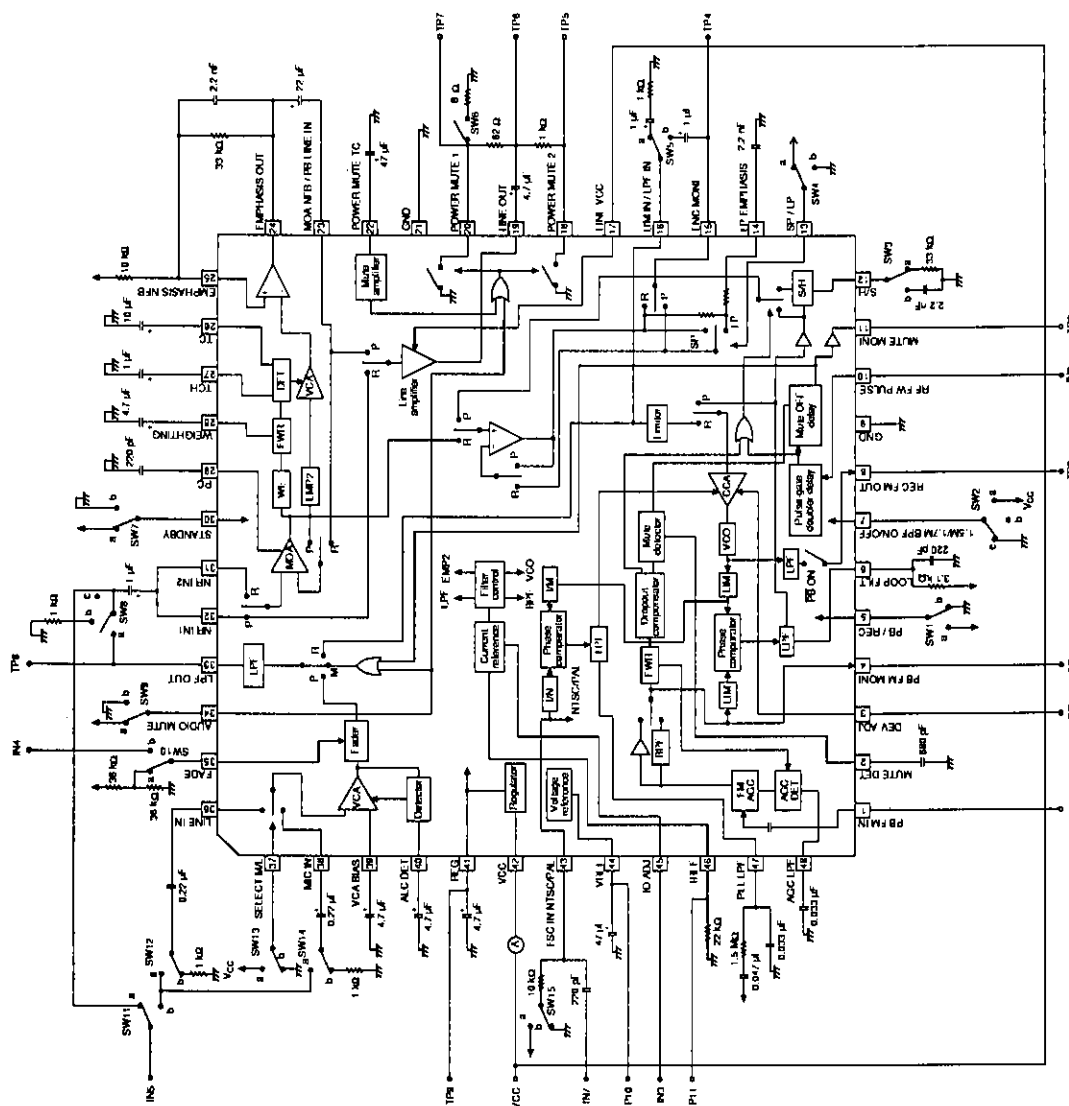
| No. | Parameter                          | Symbol | Conditions                                                          | Ratings |     |                  | Unit |
|-----|------------------------------------|--------|---------------------------------------------------------------------|---------|-----|------------------|------|
|     |                                    |        |                                                                     | min     | typ | max              |      |
| 61  | Reference current adjustment range | IO     | V <sub>TP11</sub> = 2.2 V                                           | 1.85    | 3.3 | V <sub>REG</sub> | V    |
| 62  | VCO deviation adjustment range     | DEV    | f = 400 Hz, -15 dBs signal level, signal on TP2 is 1.5 MHz ±60 kHz. | 1.85    | 3.3 | V <sub>REG</sub> | V    |
| 63  | FADE adjustment range              | FADE   | f = 400 Hz, -38 dBs signal level, signal on TP8 is -80 dBs.         | 1.85    | 3.3 | V <sub>REG</sub> | V    |

### Power mute circuit

| No. | Parameter                  | Symbol           | Conditions | Ratings |     |     | Unit |
|-----|----------------------------|------------------|------------|---------|-----|-----|------|
|     |                            |                  |            | min     | typ | max |      |
| 64  | Power mute 1 ON-resistance | R <sub>PM1</sub> |            | —       | 20  | 30  | Ω    |
| 65  | Power mute 2 ON-resistance | R <sub>PM2</sub> |            | —       | 20  | 30  | Ω    |

# LA7454W

## Test Circuit



### Note

When monitoring the signal on pin 4, connect a 10 kΩ resistor from this pin to ground.

# LA7454W

## Test Conditions

| No. | Switch position |     |     |     |     |     |     |     |     |      |      |      |      |      |      | Input point | Measurement point |
|-----|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------------|-------------------|
|     | SW1             | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 | SW11 | SW12 | SW13 | SW14 | SW15 |             |                   |
| 1   | b               | a   | b   | a   | b   | OFF | b   | a   | b   | b    | b    | b    | a    | b    | a    |             |                   |
| 2   | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    |             |                   |
| 3   | a               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    |             |                   |
| 4   | a               | b   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    |             |                   |
| 5   | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    |             | TP9               |
| 6   | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    |             | TP10              |
| 7   | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | a    | a    | b    | a    | IN5         | TP8               |
| 8   | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | b    | a    | a    | IN5         | TP8               |
| 9   | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP8               |
| 10  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | a    | b    | b    | a    | IN5         | TP8               |
| 11  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP8               |
| 12  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP8               |
| 13  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | a    | b    | b    | a    | a    | a    | IN5         | TP8               |
| 14  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 15  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 16  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 17  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 18  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 19  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 20  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP4               |
| 21  | b               | a   | b   | a   | b   | OFF | a   | b   | b   | b    | b    | b    | a    | a    | a    |             | TP4               |
| 22  | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP6               |
| 23  | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | b    | a    | a    | IN5         | TP6               |
| 24  | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | b    | a    | IN5         | TP6               |
| 25  | b               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP6               |
| 26  | b               | a   | b   | a   | b   | ON  | a   | a   | b   | b    | b    | b    | a    | a    | a    | IN5         | TP7               |
| 27  | b               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | TP6               |
| 28  | b               | a   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    |             | TP2               |
| 29  | b               | c   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    |             | TP2               |
| 30  | b               | a   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | b    |             | TP2               |
| 31  | b               | c   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | b    |             | TP2               |
| 32  | b               | a/c | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    |             | TP2               |
| 33  | b               | a   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    |             | TP2               |
| 34  | b               | a   | b   | a   | a   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    |             | TP2               |
| 35  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP8               |
| 36  | a               | a   | b   | a   | b   | OFF | a   | a   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP6               |

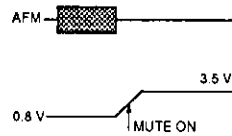
# LA7454W

| No. | Switch position |     |     |     |     |     |     |     |     |      |      |      |      |      |      | Input point | Measurement point |
|-----|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------------|-------------------|
|     | SW1             | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 | SW11 | SW12 | SW13 | SW14 | SW15 |             |                   |
| 37  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    |             | TP8               |
| 38  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP8               |
| 39  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP8               |
| 40  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP8               |
| 41  | a               | a   | b   | b   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP8               |
| 42  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 43  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 44  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 45  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 46  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 47  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 48  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 49  | a               | a   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 50  | a               | b   | b   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP1               |
| 51  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | IN1               |
| 52  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | IN1               |
| 53  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | IN1               |
| 54  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | IN1               |
| 55  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 56  | a               | b   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 57  | a               | c   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 58  | a               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 59  | a               | b   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 60  | a               | c   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    | IN1         | TP4               |
| 61  | b               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | b    | b    | a    | a    | a    |             | IN6               |
| 62  | b               | a   | a   | a   | b   | OFF | a   | c   | b   | b    | a    | b    | a    | a    | a    | IN5         | IN2               |
| 63  | b               | a   | a   | a   | b   | OFF | a   | c   | b   | a    | b    | b    | a    | a    | a    | IN5         | IN4               |
| 64  | b               | a   | a   | a   | b   | OFF | a   | c   | a   | b    | a    | b    | a    | a    | a    | IN5         | TP5               |
| 65  | b               | a   | a   | a   | b   | OFF | a   | c   | a   | b    | a    | b    | a    | a    | a    | IN5         | TP7               |

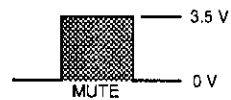
## LA7454W

### Test Waveforms

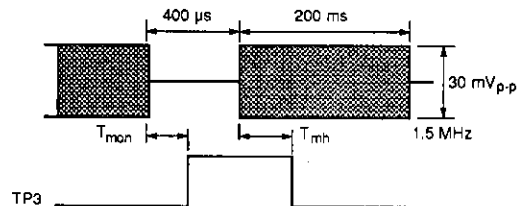
#### MUTE DET output



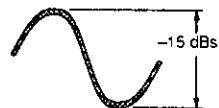
#### MUTE MONI output level



#### MUTE MONI timing



#### LOOP FILT Input waveform

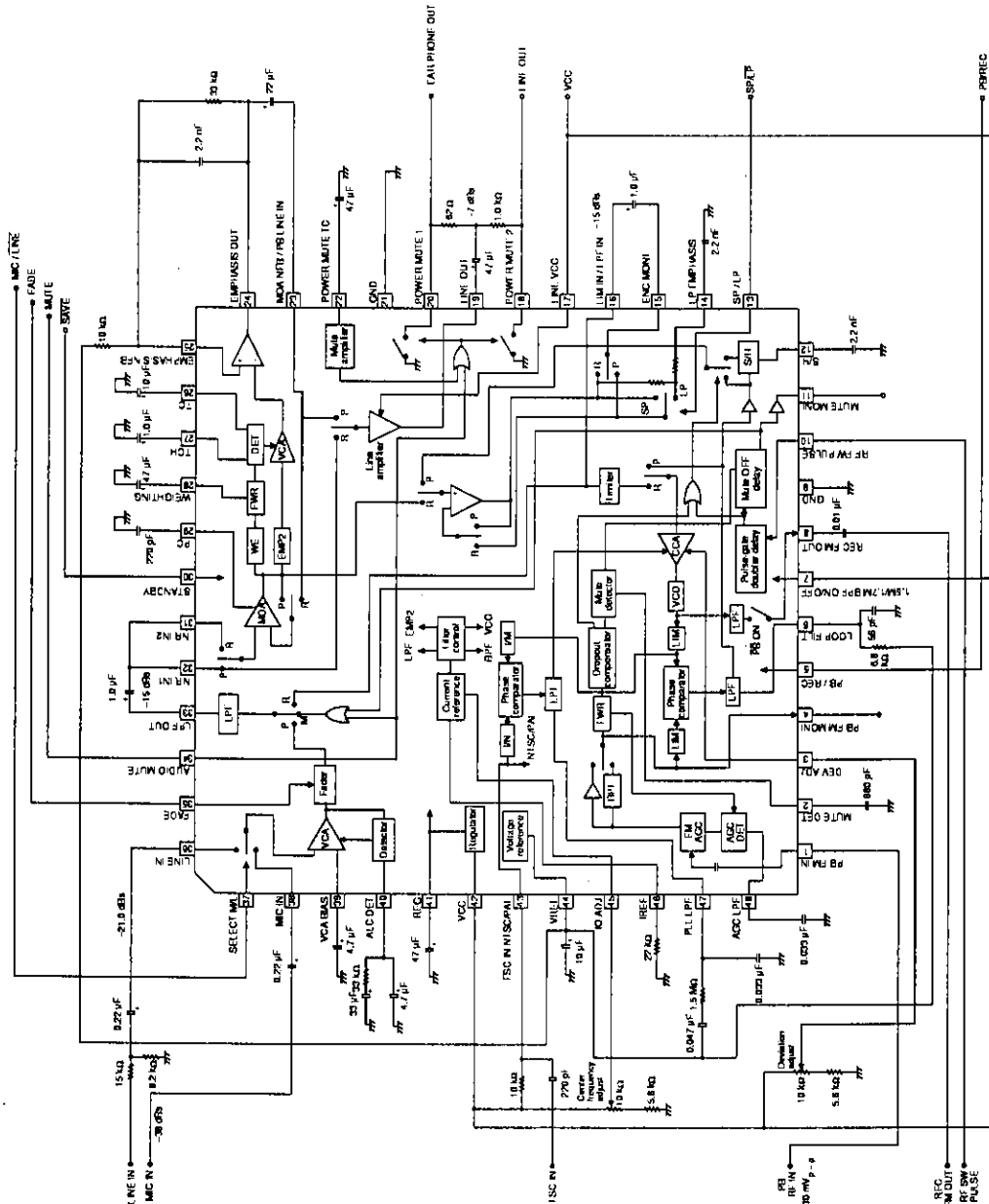


### Mode Selection

| Input                  | Mode selected if HIGH                         | Mode selected if floating                      | Mode selected if LOW                           |
|------------------------|-----------------------------------------------|------------------------------------------------|------------------------------------------------|
| PB/REC                 | Playback                                      | Recording                                      |                                                |
| SELECT M/L             | MIC input                                     | LINE input                                     |                                                |
| AUDIO MUTE             | Mute ON                                       |                                                | Mute OFF                                       |
| SP/LP                  | Standard play                                 | Long play                                      |                                                |
| FSC IN NTSC/PAL        | NTSC                                          | PAL                                            |                                                |
| 1.5 M/1.7 M BPF ON/OFF | Bandpass filter ON, VCO frequency is 1.5 MHz. | Bandpass filter OFF, VCO frequency is 1.5 MHz. | Bandpass filter OFF, VCO frequency is 1.7 MHz. |
| STANDBY                | Standby OFF                                   | Standby ON                                     |                                                |

# LA7454W

## Typical Application



### Note

Short circuit the 10 kΩ resistor on pin 43 for PAL mode.

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