

SANYO**LA7220****Electronic Switch for VCR/Audio Use****Overview**

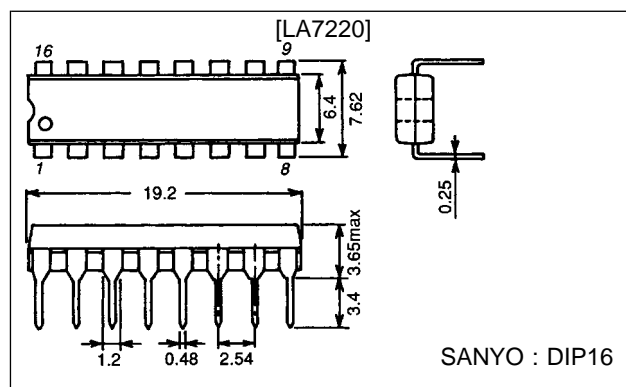
The LA7220 is a 3-channel 2-position high-performance analog switch having wide application from audio band to video band. It is also provided with 2 channels of muting function.

Features

- 3-channel 2-position switch
- Wide input dynamic range
- Low distortion
- Good frequency characteristic
- Muting available

Package Dimensions

unit : mm

3006B-DIP16**Specifications****Maximum Ratings at Ta = 25°C**

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|--------------|-----------------------------|-------------|------------------|
| Maximum supply voltage | V_{CC} max | | 15 | V |
| Allowable power dissipation | P_d max | $T_a \leq 65^\circ\text{C}$ | 500 | mW |
| Operating temperature | T_{opr} | | -20 to +70 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | | -40 to +125 | $^\circ\text{C}$ |

Operating Conditions at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------------|------------|------------|---------|------|
| Recommended supply voltage | V_{CC} | | 12 | V |
| Operating voltage range | V_{CCop} | | 9 to 13 | V |

Operating Characteristics at Ta = 25°C, V_{CC} = 12 V

| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---------------------------|------------------|------------------------------------------------------------------------------------------------------------|------|-------|---------|------|
| Current drain | I_{CC} | | | 30.0 | 39.9 | mA |
| Total harmonic distortion | THD | $R_g = 600\ \Omega$, 4.5 Vp-p, $f = 1\ \text{kHz}$, $R_L = \infty$, (Note 1) | | 0.007 | 0.1 | % |
| Noise voltage | V_{NO} | $R_g = 600\ \Omega$, $f = 20\ \text{Hz to } 20\ \text{kHz}$, $R_L = \infty$, (Note 1) | | -93 | -80 | dBs |
| Crosstalk | 1ch | CR1 Input 1: $R_g = 50\ \Omega$, 2 Vp-p, $f = 3.58\ \text{MHz}$, Input 2: $R_g = 500\ \Omega$, (Note 2) | | -50 | | dB |
| | 2ch | CR2 Input 1: $R_g = 50\ \Omega$, (Note 2) | -60 | | | dB |
| | 3ch | CR3 Input 1: $R_g = 50\ \Omega$, (Note 2) | -50 | | | dB |
| Pedestal level | ΔV_{ped} | V_{CTL} (Pins 10, 13, 15) = 0 to 12 V, (Note 1) | -100 | | 0 + 100 | mV |
| Maximum input voltage | V_{IN} max | $R_g = 600\ \Omega$, $f = 1\ \text{kHz}$, $R_L = \infty$, THD = 1%, (Note 1) | 5.0 | | | Vp-p |

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| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|-----------------------------|----------|--------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|-----|-----|------------------|
| 2nd harmonic voltage | | H2 | $R_g = 50\ \Omega$, 4.0 Vp-p, $f = 1\ \text{MHz}$, $R_L = \infty$, (Note 1) | -46 | -55 | | dB |
| 3rd harmonic voltage | | H3 | $R_g = 50\ \Omega$, 4.0 Vp-p, $f = 1\ \text{MHz}$, $R_L = \infty$, (Note 1) | -46 | -55 | | dB |
| Switch changeover voltage | | V_{CTLS} | (Note 1) | 2.6 | 3.1 | 4.0 | V |
| Mute threshold voltage | | V_{ML} | Low level, (Note 3) | 1.1 | 1.5 | 1.9 | V |
| | | V_{MH} | High level, (Note 3) | 6.6 | 7.3 | 8.0 | V |
| Crosstalk between channels | 1ch | | $R_g = 500\ \Omega$, $R_L = \infty$, other channel input $R_g = 50\ \Omega$, 2 Vp-p, $f = 3.58\ \text{MHz}$, (Note 4) | -50 | -68 | | dB |
| | 2ch | | | -50 | -68 | | dB |
| | 3ch | | | -50 | -68 | | dB |
| Mute compression ratio | | | $R_g = 600\ \Omega$, 2 Vp-p, $f = 1\ \text{kHz}$, $R_L = \infty$, series resistance $10\ \text{k}\Omega$, (Note 3) | | -60 | | dB |
| Control pin flow-in current | | I_{CTL} | (Note 1) | | 8 | | μA |
| Input impedance | | Z_{IN} | (Note 1) | | 10 | | $\text{k}\Omega$ |
| Output impedance | | Z_{OUT} | (Note 1) | | 29 | | Ω |
| Pin voltage | (Pin 1) | V_{pin1} | $V_{\text{pin15}} = 0\ \text{V}$ | Test point: V14 | 7.9 | | V |
| | | | $V_{\text{pin15}} = 12\ \text{V}$ | | 7.9 | | V |
| | (Pin 2) | V_{pin2} | | Test point: V2 | 7.2 | | V |
| | (Pin 5) | V_{pin5} | $V_{\text{pin13}} = 0\ \text{V}$ | Test point: V16 | 7.9 | | V |
| | | | $V_{\text{pin13}} = 12\ \text{V}$ | | 7.9 | | V |
| | (Pin 6) | V_{pin6} | | Test point: V5 | 7.2 | | V |
| | (Pin 7) | V_{pin7} | | Test point: V7 | 7.2 | | V |
| | (Pin 8) | V_{pin8} | $V_{\text{pin10}} = 0\ \text{V}$ | Test point: V18 | 7.9 | | V |
| | | | $V_{\text{pin10}} = 12\ \text{V}$ | | 7.9 | | V |
| | (Pin 9) | V_{pin9} | $V_{\text{pin10}} = 0\ \text{V}$ | Test point: V17 | 7.9 | | V |
| | | | $V_{\text{pin10}} = 12\ \text{V}$ | | 7.9 | | V |
| | (Pin 12) | V_{pin12} | $V_{\text{pin13}} = 0\ \text{V}$ | Test point: V15 | 7.9 | | V |
| | | | $V_{\text{pin13}} = 12\ \text{V}$ | | 7.9 | | V |
| | (Pin 16) | V_{pin16} | $V_{\text{pin15}} = 0\ \text{V}$ | Test point: V13 | 7.9 | | V |
| | | | $V_{\text{pin15}} = 12\ \text{V}$ | | 7.9 | | V |

Note 1. Measurements are made for each of 1ch, 2ch, 3ch using input A and input B.

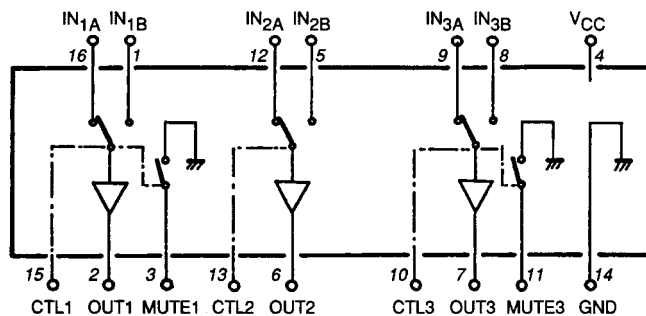
Input A: V_{CTL} (pins 10, 13, 15) is 12 V at the measurement mode.Input B: V_{CTL} is 0 V at the measurement mode.

2. Measurements are made using input A and B.

3. Measurements are made for 1ch, 3ch.

4. Measurements are made for each of 1ch, 2ch, 3ch using input A and B on other channels.

Equivalent Circuit Block Diagram



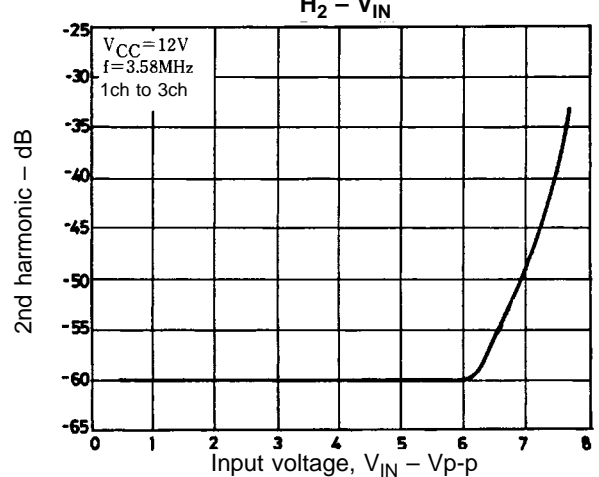
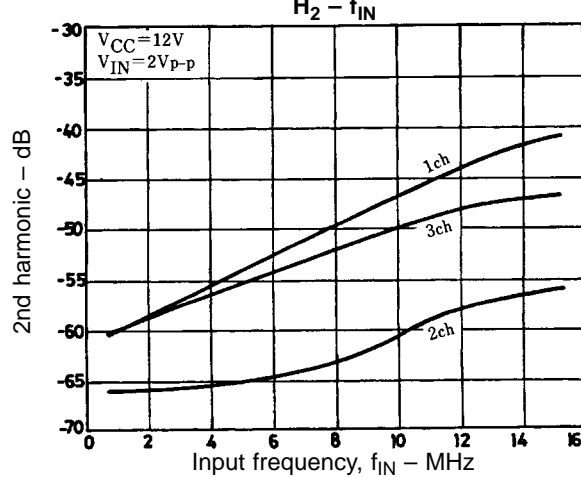
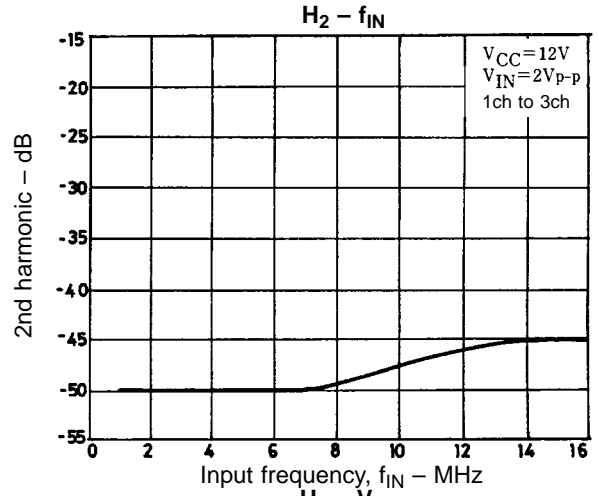
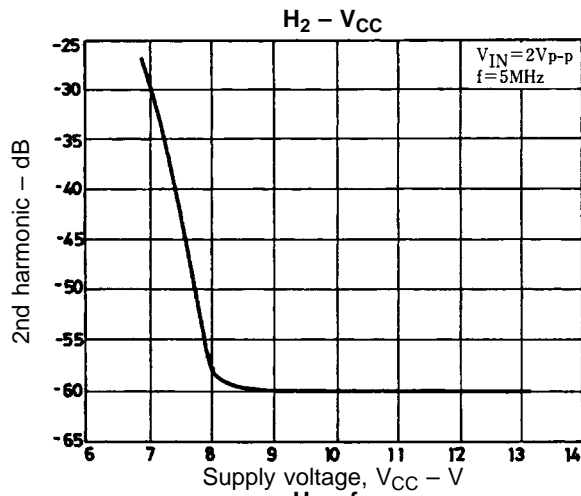
LA7220

| Item | | Symbol | SW, VR mode | | | | | | | | | | | | Test point |
|----------------------------|------|---------------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------------|
| | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | VR1 | VR2 | VR3 | |
| Maximum input voltage | 1chA | V _{IN max} | b | c | c | c | c | c | a | a | a | a | b | b | V19 |
| | 1chB | V _{IN max} | c | b | c | c | c | c | a | a | a | b | b | b | V1 |
| | 2chA | V _{IN max} | c | c | b | c | c | c | a | a | a | b | a | b | V19 |
| | 2chB | V _{IN max} | c | c | c | b | c | c | a | a | a | b | b | b | V1 |
| | 3chA | V _{IN max} | c | c | c | c | b | c | a | a | a | b | b | a | V19 |
| | 3chB | V _{IN max} | c | c | c | c | c | b | a | a | a | b | b | b | V1 |
| 2nd harmonic voltage | 1chA | H2-1 | a | c | c | c | c | c | a | a | b | a | b | b | V3 |
| | 1chB | H2-1 | c | a | c | c | c | c | a | a | b | b | b | b | V3 |
| | 2chA | H2-2 | c | c | a | c | c | c | a | a | b | b | a | b | V6 |
| | 2chB | H2-2 | c | c | c | a | c | c | a | a | b | b | b | b | V6 |
| | 3chA | H2-3 | c | c | c | c | a | c | a | a | b | b | b | a | V8 |
| | 3chB | H2-3 | c | c | c | c | c | a | a | a | b | b | b | b | V8 |
| 3rd harmonic voltage | 1chA | H3-1 | a | c | c | c | c | c | a | a | b | a | b | b | V3 |
| | 1chB | H3-1 | c | a | c | c | c | c | a | a | b | b | b | b | V3 |
| | 2chA | H3-2 | c | c | a | c | c | c | a | a | b | b | a | b | V6 |
| | 2chB | H3-2 | c | c | c | a | c | c | a | a | b | b | b | b | V6 |
| | 3chA | H3-3 | c | c | c | c | a | c | a | a | b | b | b | a | V8 |
| | 3chB | H3-3 | c | c | c | c | c | a | a | a | b | b | b | b | V8 |
| Switch changeover voltage | 1ch | V _{CTLS} | a | a | c | c | c | c | a | a | a | Var* | b | b | V10 |
| | 2ch | V _{CTLS} | c | c | a | a | c | c | a | a | a | b | Var* | b | V11 |
| | 3ch | V _{CTLS} | c | c | c | c | a | a | a | a | a | b | b | Var* | V12 |
| Mute threshold | 1ch | V _{ML} | b | b | c | c | c | c | b | a | a | Var* | b | b | V10 |
| | 1ch | V _{MH} | b | b | c | c | c | c | b | a | a | Var* | b | b | V10 |
| | 3ch | V _{ML} | c | c | c | c | b | b | a | b | a | b | b | Var* | V12 |
| | 3ch | V _{MH} | c | c | c | c | b | b | a | b | a | b | b | Var* | V12 |
| Crosstalk between channels | 1ch | | c | c | c | c | a | c | a | a | a | a | a | a | V3 |
| | 1ch | | c | c | c | c | c | a | a | a | a | a | a | b | V3 |
| | 1ch | | c | c | c | c | a | c | a | a | a | a | b | a | V3 |
| | 1ch | | c | c | c | c | c | a | a | a | a | a | b | b | V3 |
| | 1ch | | c | c | a | c | c | c | a | a | a | b | a | a | V3 |
| | 1ch | | c | c | a | c | c | c | a | a | a | b | a | b | V3 |
| | 1ch | | c | c | c | a | c | c | a | a | a | b | b | a | V3 |
| | 1ch | | c | c | c | a | c | c | a | a | a | b | b | b | V3 |
| | 2ch | | c | c | c | c | a | c | a | a | a | a | a | a | V6 |
| | 2ch | | c | c | c | c | c | a | a | a | a | a | a | b | V6 |
| | 2ch | | c | c | c | c | a | c | a | a | a | b | a | a | V6 |
| | 2ch | | c | c | c | c | c | a | a | a | a | b | a | b | V6 |
| | 2ch | | a | c | c | c | c | c | a | a | a | a | b | a | V6 |
| | 2ch | | a | c | c | c | c | c | a | a | a | a | b | b | V6 |
| | 2ch | | c | a | c | c | c | c | a | a | a | b | b | a | V6 |
| | 2ch | | c | a | c | c | c | c | a | a | a | b | b | b | V6 |
| | 3ch | | c | c | a | c | c | c | a | a | a | a | a | a | V8 |
| | 3ch | | c | c | c | a | c | c | a | a | a | a | b | a | V8 |
| | 3ch | | c | c | a | c | c | c | a | a | a | b | a | a | V8 |
| | 3ch | | c | c | c | a | c | c | a | a | a | b | b | a | V8 |
| | 3ch | | a | c | c | c | c | c | a | a | a | a | a | b | V8 |
| | 3ch | | a | c | c | c | c | c | a | a | a | a | b | b | V8 |
| | 3ch | | c | a | c | c | c | c | a | a | a | b | a | b | V8 |
| | 3ch | | c | a | c | c | c | c | a | a | a | b | b | b | V8 |
| Mute compression ratio | 1ch | | b | b | c | c | c | c | b | a | a | Var* | b | b | V4 |
| | 3ch | | c | c | c | c | b | b | a | b | a | b | b | Var* | V9 |

| Item | | Symbol | SW,VR mode | | | | | | | | | | | | Test point |
|-----------------------------|----------|--------------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------|
| | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | VR1 | VR2 | VR3 | |
| Control pin flow-in current | 1ch | I _{CTL1} | c | c | c | c | c | c | a | a | a | a | b | b | A2 |
| | 2ch | I _{CTL2} | c | c | c | c | c | c | a | a | a | b | a | b | A3 |
| | 3ch | I _{CTL3} | c | c | c | c | c | c | a | a | a | b | b | a | A4 |
| Pin voltage | (Pin 1) | V _{pin1} | c | c | c | c | c | c | a | a | a | b | b | b | V14 |
| | (Pin 1) | V _{pin1} | c | c | c | c | c | c | a | a | a | a | b | b | V14 |
| | (Pin 2) | V _{pin2} | c | c | c | c | c | c | a | a | a | b | b | b | V2 |
| | (Pin 5) | V _{pin5} | c | c | c | c | c | c | a | a | a | b | b | b | V16 |
| | (Pin 5) | V _{pin5} | c | c | c | c | c | c | a | a | a | b | a | b | V16 |
| | (Pin 6) | V _{pin6} | c | c | c | c | c | c | a | a | a | b | b | b | V5 |
| | (Pin 7) | V _{pin7} | c | c | c | c | c | c | a | a | a | b | b | b | V7 |
| | (Pin 8) | V _{pin8} | c | c | c | c | c | c | a | a | a | b | b | b | V18 |
| | (Pin 8) | V _{pin8} | c | c | c | c | c | c | a | a | a | b | b | a | V18 |
| | (Pin 9) | V _{pin9} | c | c | c | c | c | c | a | a | a | b | b | b | V17 |
| | (Pin 9) | V _{pin9} | c | c | c | c | c | c | a | a | a | b | b | a | V17 |
| | (Pin 12) | V _{pin12} | c | c | c | c | c | c | a | a | a | b | b | b | V15 |
| | (Pin 12) | V _{pin12} | c | c | c | c | c | c | a | a | a | b | a | b | V15 |
| | (Pin 16) | V _{pin16} | c | c | c | c | c | c | a | a | a | b | b | b | V13 |
| | (Pin 16) | V _{pin16} | c | c | c | c | c | c | a | a | a | a | b | b | V13 |

(Note) Var*: While monitoring pins 2, 6, 7, adjust so that the minimum output is obtained.

Mute Threshold: While monitoring pins 3, 11, measure the minimum and maximum values of V10, V12 when the minimum output is obtained.



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