

**SANYO**

No. 3952B

**VHS-format VCR  
Video Signal Processor****Overview**

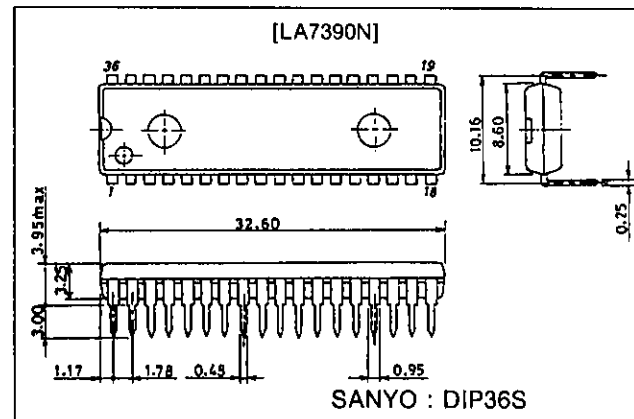
The LA7390N is a single-chip video signal processing IC that is compatible with three systems.

**Features**

- Compatible with three systems (PAL/MESECAM/4.43-NTSC).
- All filters on chip, except for PB-LPF for chroma (cutoff frequency requires no adjustment).
- No adjustment of YNR and DOC levels.
- Double high-pass noise canceller on chip.
- Linear phase-type picture control on chip.
- fsc output can be used as clock for OSD IC.
- DCC circuit on chip.
- High-speed AFC circuit on chip.
- Smallest package in the industry.
- Few components needed.

**Package Dimensions**

unit: mm

**3170-DIP36S****Specifications****Maximum Ratings at Ta = 25°C**

| Parameter                   | Symbol             | Conditions            | Ratings     | Unit |
|-----------------------------|--------------------|-----------------------|-------------|------|
| Maximum supply voltage      | V <sub>CCmax</sub> |                       | 7.0         | V    |
| Allowable power dissipation | P <sub>dmax</sub>  | T <sub>a</sub> ≤ 65°C | 1070        | mW   |
| Operating temperature       | T <sub>opr</sub>   |                       | -10 to +65  | °C   |
| Storage temperature         | T <sub>stg</sub>   |                       | -40 to +150 | °C   |

**Operating Conditions at Ta = 25°C**

| Parameter                      | Symbol            | Conditions | Ratings    | Unit |
|--------------------------------|-------------------|------------|------------|------|
| Recommended supply voltage     | V <sub>CC</sub>   |            | 5.0        | V    |
| Operating supply voltage range | V <sub>CCop</sub> |            | 4.8 to 5.2 | V    |

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Operating Characteristics at Ta = 25°C, VCC = 5.0 V

| Parameter  | Symbol             | Input | Output | Conditions  | min  | typ  | max  | Unit  |
|--|--------------------|-------|--------|---|------|------|------|-------|
| [REC Mode Y]   |                    |       |        |   |      |      |      |       |
| Current drain REC  | I <sub>CCR</sub>   |       |        | When V <sub>CC</sub> = 5 V (when there is no signal), measure sum of incoming current at pins 24 and 29   | 95   | 120  | 145  | mA    |
| AGC adjustment   | CAGC               | T31A  |        | V <sub>IN</sub> = 1.0 p-p video signal, use VR33 to adjust T3 output to 0.5 Vp-p  |      |      |      |       |
| VCA control characteristics                                    | VCA                | T31A  | T3     | Measure T3 output level when S9 is set to 2   | 0.48 | 0.5  | 0.52 | Vp-p  |
| AGC adjustment voltage   | V <sub>AGC</sub>   | T31A  | T33    | Measure T33 DC voltage in above state   | 3.2  | 3.4  | 3.6  | V     |
| AGC detection voltage  | V <sub>AD</sub>    | T31A  | T32    | Measure T32 DC voltage in same manner   | 1.2  | 1.4  | 1.6  | V     |
| EE output level  | V <sub>EE</sub>    | T31A  | T28A   | Measure T28A output level in same manner  | 0.92 | 0.97 | 1.02 | Vp-p  |
| AGC Output 1   | AGC 1              | T31A  | T3     | V <sub>IN</sub> = 2.0 Vp-p video signal<br>Measure T3 output level  | 500  | 540  | 560  | mVp-p |
| AGC Output 2   | AGC 2              | T31A  | T3     | V <sub>IN</sub> = 0.5 Vp-p video signal<br>Measure T3 output level  | 470  | 490  | 500  | mVp-p |
| AGC Output 3   | AGC 3              | T31A  | T3     | V <sub>IN</sub> = 700 mVp-p LUMI, 600 mVp-p SYNC,<br>measure T3 SYNC level  | 135  | 150  | 165  | mVp-p |
| AGC Output 4   | AGC 4              | T31A  | T3     | V <sub>IN</sub> = 700 mVp-p LUMI, 150 mVp-p SYNC,<br>measure T3 SYNC level  | 70   | 85   | 100  | mVp-p |
| Sync separation output level                                   | V <sub>SYR</sub>   | T31A  | T26    | V <sub>IN</sub> = 1.0 Vp-p video signal,<br>measure T26 output pulse wave high value  | 4.0  | 4.2  | 4.4  | Vp-p  |
| Sync separation output pulse width                             | PW <sub>SYR</sub>  | T31A  | T26    | V <sub>IN</sub> = 1.0 Vp-p video signal,<br>measure T26 output pulse width  | 4.4  | 4.7  | 5.0  | μs    |
| Sync separation output leading edge delay time                 | Δ T <sub>SYR</sub> | T31A  | T26    | V <sub>IN</sub> = 1.0 Vp-p video signal, measure delay time of output SYNC versus input SYNC  | 0.6  | 0.8  | 1.0  | μs    |
| Sync separation threshold level                                | TH <sub>SYR</sub>  | T31A  | T26    | Gradually attenuate the input level, measure input level at point when output pulse width widens 1 μs or more beyond PWSYR  |      | -18  | -14  | dB    |
| Sync chip level, pedestal level, white level measurement (REC) | L <sub>VOR</sub>   | T31A  | T28    | Measure electric potential for each of the T28 video output sync tip, pedestal, and white peak, and assign the measured values to L <sub>SYN</sub> , L <sub>PEP</sub> , and L <sub>WHI</sub> , respectively |      |      |      |       |
| Pseudo V insertion level (REC)                                 | Δ VDR              | T31A  | T28    | Measure T28 DC voltage when 5 V is applied to T27, and assign the measured value to L <sub>VDR</sub> and calculate the difference with L <sub>SYN</sub><br>ΔVDR = L <sub>SYN</sub> - L <sub>VDR</sub>       | -80  | 0    | +80  | mV    |
| Pseudo H insertion level (REC)                                 | Δ HDR              | T31A  | T28    | Measure T28 DC voltage when 2.7 V is applied to T27, and assign the measured value to L <sub>HDR</sub> and calculate the difference with L <sub>PEP</sub><br>ΔHDR = L <sub>PEP</sub> - L <sub>HDR</sub>     | -200 | -100 | 0    | mV    |
| White insertion level (REC)                                    | Δ WHR              | T31A  | T28    | Measure T28 DC voltage when 1.3 V is applied to T27, and assign the measured value to L <sub>WHR</sub> and calculate the difference with L <sub>WHI</sub><br>ΔWHR = L <sub>WHI</sub> - L <sub>WHR</sub>     | 150  | 250  | 350  | mV    |
| VCA detection voltage  | VVCA               | T31A  | T8     | Measure T8 DC voltage   | 3.1  | 3.4  | 3.7  | V     |
| REC YNR operation EP/LP  | YR-YNR             | T31A  | T2     | V <sub>IN</sub> = white 50% + CW (15.81 mVp-p)<br>calculate ratio between 32f <sub>H</sub> component and 32.5f <sub>H</sub> component   | 3.5  | 4.5  | 5.5  | dB    |
| Y-LPF frequency characteristics                                | YLPF1              | T31A  | T2     | V <sub>IN</sub> = standard multiburst signal 1 Vp-p, measure 2 MHz response to 500 kHz at T2  | 0.2  | 0.7  | 1.2  | dB    |
|  | YLPF2              | T31A  | T2     | V <sub>IN</sub> = standard multiburst signal 1 Vp-p, measure 4.8 MHz response to 500 kHz at T2  | -4.5 | -3.5 | -2.5 | dB    |
| FM modulator output level                                      | V <sub>FM</sub>    |       | T34    | No Input, use VR36 to adjust output frequency to 4 MHz, measure output level  | 0.8  | 1.0  | 1.2  | Vp-p  |
| FM modulator secondary distortion                              | H <sub>MOD</sub>   |       | T34    | Calculate ratio of 8 MHz component to 4 MHz in the above state  |      | -40  | -35  | dB    |
| FM modulator modulation sensitivity                            | S <sub>MOD</sub>   | T3    | T34    | Measure amplitude of change in output frequency when 2.6 V DC or 3.1 V DC is applied to T3, 2 x (f3.1 - f2.6)   | 1.6  | 2.0  | 2.4  | MHz/V |

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| Parameter                            | Symbol            | Input   | Output | Conditions  | min  | typ  | max  | Unit  |
|--------------------------------------|-------------------|---|--------|---|------|------|------|-------|
| FM modulator linearity               | L <sub>MOD</sub>  | T3  | T34    | Measure output frequency when 2.85 V DC applied to T3,<br>$L_{MOD} = \frac{f_{2.85} - (f_{3.1} + f_{2.6}) / 2}{S_{MOD}} \times 100$   | -2   | 0    | +2   | %     |
| 1/2 f <sub>H</sub> carrier shift     | CS1               |   | T34    | Measure amplitude of change in output frequency when SW35B is off and SW35A is switched from on to off  | 6.8  | 7.8  | 9.5  | kHz   |
|                                      | CS2               |   | T34    | Measure amplitude of change in output frequency when SW35B is on and SW35A is switched from on to off   | 6.8  | 7.8  | 9.5  | kHz   |
| Emphasis gain                        | G <sub>EMPH</sub> | T3A   | T4     | V <sub>IN</sub> = 0.5 Vp-p 10 kHz sine wave<br>Measure ratio of levels of input and output amplitude at T4  | -0.5 | 0    | +0.5 | dB    |
| Detail enhancer characteristics      | GENH1             | T3A   | T4     | V <sub>IN</sub> = 158 mVp-p 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>  | 0.9  | 1.4  | 1.9  | dB    |
|                                      | GENH2             | T3A   | T4     | V <sub>IN</sub> = 50 mVp-p 2 MHz, sine wave<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>  | 2.2  | 3.2  | 4.2  | dB    |
|                                      | GENH3             | T3A   | T4     | V <sub>IN</sub> = 15.8 mVp-p 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>   | 4.0  | 5.0  | 6.0  | dB    |
|                                      | GENH4             | T3A   | T4     | V <sub>IN</sub> = 15.8 mVp-p 2 MHz sine wave<br>Measure output amplitude at T4 in edit mode, calculate difference with G <sub>EMPH</sub>  | 1.8  | 2.8  | 3.8  | dB    |
| Non linear emphasis characteristics  | GNLEMP1           | T3A   | T4     | V <sub>IN</sub> = 500 mVp-p 2 MHz<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>  | 0.5  | 1.4  | 2.3  | dB    |
|                                      | GNLEMP2           | T3A   | T4     | V <sub>IN</sub> = 158 mVp-p 2 MHz<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>  | 2.6  | 3.8  | 5.2  | dB    |
|                                      | GNLEMP3           | T3A   | T4     | V <sub>IN</sub> = 50 mVp-p 2 MHz<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>   | 4.9  | 6.4  | 7.9  | dB    |
| Main linear emphasis characteristics | G <sub>ME1</sub>  | T3A   | T4     | V <sub>IN</sub> = 50 mVp-p 200 kHz sine wave<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>   | 4.9  | 5.2  | 5.5  | dB    |
|                                      | G <sub>ME2</sub>  | T3A   | T4     | V <sub>IN</sub> = 50 mVp-p 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, calculate difference with G <sub>EMPH</sub>   | 13.1 | 13.6 | 14.1 | dB    |
| White clipping level                 | L <sub>WC</sub>   | T3A   | T4     | V <sub>IN</sub> = 500 mVp-p white 100% video signal<br>Measure white clipping level at T4   | 186  | 193  | 200  | %     |
| Dark clipping level                  | L <sub>DC</sub>   | T3A   | T4     | V <sub>IN</sub> = 500 mVp-p white 100% video signal<br>Measure dark clipping level at T4  | -60  | -55  | -50  | %     |
| <b>[PB Mode Y]</b>                   |                   |   |        |   |      |      |      |       |
| Current drain PB                     | I <sub>ccP</sub>  |   |        | Incoming current at pins 24 and 29 when V <sub>CC</sub> = 5.0 V   | 125  | 155  | 185  | mA    |
| Dropout compensation period          | T <sub>DOC</sub>  | T33A<br>T3A   | T28A   | T33A: 4 MHz, 300 mVp-p sine wave<br>T3A: 0.5 Vp-p video signal<br>T28A: time from when input went to 0 until T28A output returned, SW9 → 1  | 0.35 | 0.5  | 0.65 | ms    |
| DOC loop gain                        | G <sub>DOC</sub>  | T33A<br>T3A   | T11    | T33A: 4 MHz, 300 mVp-p sine wave<br>T3A: 0.5 Vp-p video signal<br>T33A: Input/output response when 5H have elapsed after input went to 0, SW9 → 3   | -1.0 | 0    | +1.0 | dB    |
| FM demodulation voltage              | V <sub>DEM4</sub> | T33A  | T2     | V <sub>IN</sub> = 300 mVp-p, f = 4 MHz, Output DC Voltage   | 1.5  | 2.0  | 2.5  | V     |
| FM demodulation sensitivity          | S <sub>DEM</sub>  | T33A  | T2     | V <sub>IN</sub> = 300 mVp-p, f = 2 MHz, V <sub>DEM2</sub><br>V <sub>IN</sub> = 300 mVp-p, f = 6 MHz, V <sub>DEM6</sub><br>Calculate S <sub>DEM</sub> = (V <sub>DEM6</sub> - V <sub>DEM2</sub> )/4 | 0.36 | 0.45 | 0.54 | V/MHz |
| FM demodulation linearity            | L <sub>DEM</sub>  | $L_{DEM} = \frac{V_{DEM4} - (V_{DEM6} + V_{DEM2})/2}{V_{DEM6} - V_{DEM2}} \times 100$ |        | -3.5  | 0    | +3.5 | %    |       |

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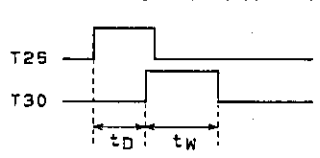
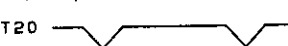
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| Parameter  | Symbol                  | Input | Output | Conditions   | min   | typ   | max   | Unit          |
|--|-------------------------|-------|--------|--|-------|-------|-------|---------------|
| Carrier leak   | CL                      | T33A  | T2     | $V_{IN} = 300 \text{ mVp-p}$ , $f = 4 \text{ MHz}$<br>Ratio between 4 MHz component of T2 and $S_{DEM}$  |       | -40   | -35   | dB            |
| PB YNR characteristics LP/EP                                 | GP-YNR                  | T3A   | T24A   | $V_{IN} = \text{white } 50\% + \text{CW } (15.8 \text{ mVp-p})$<br>Ratio between $32f_H$ component and $32.5f_H$ component   | -11   | -9    | -7    | dB            |
| PB LNC characteristics SP                                    | GP-LNC                  | T3A   | T24A   | $V_{IN} = \text{white } 50\% + \text{CW } (15.8 \text{ mVp-p})$<br>Ratio between $32f_H$ component and $32.5f_H$ component   | -12   | -10   | -8    | dB            |
| Playback through gain  | $G_{PB}$                | T3A   | T28A   | Apply $V_{IN} = 0.5 \text{ Vp-p}$ video signal to pin 3, and determine ratio between T28A output level and input level   | 4.0   | 5.5   | 7.0   | dB            |
| Nonlinear de-emphasis characteristics                        | $G_{NL-DEEM1}$          | T3A   | T28A   | $V_{IN} = \text{white } 50\% + \text{CW}$<br>$f = 1 \text{ MHz}$ , measure input/output response, difference with $158 \text{ mVp-p}$ , $G_{PB}$   | -2.8  | -1.8  | -0.8  | dB            |
|  | $G_{NL-DEEM2}$          | T3A   | T28A   | $f = 1 \text{ MHz}$ , $50 \text{ mVp-p}$   | -5.0  | -4.0  | -3.0  | dB            |
| Noise canceller characteristics                              | $G_{WNC1}$              | T3A   | T28A   | $f = 1.5 \text{ MHz}$ , $158 \text{ mVp-p}$  | -1.3  | -0.8  | -0.3  | dB            |
|  | $G_{WNC2}$              | T3A   | T28A   | $f = 1.5 \text{ MHz}$ , $50 \text{ mVp-p}$   | -5.0  | -4.0  | -3.0  | dB            |
|  | $G_{WNC3}$              | T3A   | T28A   | $f = 1.5 \text{ MHz}$ , $15.8 \text{ mVp-p}$   | -14.0 | -12.0 | -10.0 | dB            |
| PIC-CTL center response characteristics                      | $G_{PC}$                | T3A   | T28A   | $f = 2 \text{ MHz}$ , $158 \text{ mVp-p}$  | 1.2   | 1.7   | 2.2   | dB            |
| PIC-CTL hard response characteristics                        | $G_{PH}$                | T3A   | T28A   | $f = 2 \text{ MHz}$ , $158 \text{ mVp-p}$  | 7.0   | 8.0   | 10.0  | dB            |
| PIC-CTL soft response characteristics                        | $G_{PS}$                | T3A   | T28A   | $f = 2 \text{ MHz}$ , $158 \text{ mVp-p}$  | -10.0 | -8.0  | -7.0  | dB            |
| Sync tip level, pedestal level, white level measurement (PB) | $L_{VOR}$               | T3A   | T28A   | With $V_{IN} = \text{white } 100\%$ and T28A at $1.0 \text{ Vp-p}$ , measure electric potential for each of the pin 28 video output sync tip, pedestal, and white peak, and assign the measured values to $L_{SYN}$ , $L_{PED}$ , and $L_{WHI}$ , respectively |       |       |       |               |
| Pseudo V insertion level (PB)                                | $\Delta \text{VDP}$     | T3A   | T28    | Measure pin 28 DC voltage when 5 V is applied to pin 27, and assign the measured value to $L_{VDP}$ , and calculate the difference with $L_{SYN}$<br>$\Delta \text{VDP} = L_{SYN} - L_{VDP}$   | -80   | 0     | +80   | mV            |
| Pseudo H insertion level (PB)                                | $\Delta \text{HDP}$     | T3A   | T28    | Measure pin 28 DC voltage when 2.7 V is applied to pin 27, and assign the measured value to $L_{HDP}$ , and calculate the difference with $L_{PED}$<br>$\Delta \text{HDP} = L_{PED} - L_{HDP}$   | -300  | -200  | -100  | mV            |
| White insertion level (PB)                                   | $L_{WHP}$               | T3A   | T28    | Measure pin 28 DC voltage when 1.3 V is applied to pin 27, and assign the measured value to $L_{WHP}$ , and calculate the difference with $L_{WHI}$<br>$\Delta \text{WHP} = L_{WHI} - L_{WHP}$   | 20    | 120   | 220   | mV            |
| Sync separation output level                                 | $V_{SYP}$               | T3A   | T26    | $V_{IN} = 0.5 \text{ Vp-p}$ video signal, pin 26 output pulse wave high value  | 4.0   | 4.2   | 4.4   | Vp-p          |
| Sync separation output pulse width                           | $PW_{SYP}$              | T3A   | T26    | $V_{IN} = 0.5 \text{ Vp-p}$ video signal, pin 26 output pulse width  | 4.4   | 4.7   | 5.0   | $\mu\text{s}$ |
| Sync separation output leading edge delay time               | $\Delta \text{T}_{SYP}$ | T3A   | T26    | $V_{IN} = 0.5 \text{ Vp-p}$ video signal, measure delay time of output SYNC versus input SYNC  | 0.9   | 1.1   | 1.3   | $\mu\text{s}$ |
| 4.2 V regulator operation check                              | $V_{REG}$               |       | T25    | Measure DC level of T25 in REC mode  | 3.95  | 4.15  | 4.35  | VDC           |
| <b>[REC Mode Chroma]</b>                                     |                         |       |        |  |       |       |       |               |
| REC Chroma low-band conversion output level                  | $V_{OR-14}$             | T31A  | T14A   | $V_{IN} = \text{standard color bar signal } (1 \text{ Vp-p})$<br>Measure burst level at T14A   | 120   | 160   | 200   | mVp-p         |
| VXO oscillation level  | $V_{VXO-R}$             | T31A  | T18    | $V_{IN} = \text{standard color bar signal } (1 \text{ Vp-p})$ , measure T18 output amplitude (with a FET probe)  | 450   | 560   | 670   | mVp-p         |

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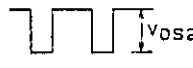
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| Parameter                             | Symbol               | Input | Output      | Conditions   | min  | typ  | max  | Unit  |
|---------------------------------------|----------------------|-------|-------------|--|------|------|------|-------|
| REC ACC characteristics               | ACC <sub>R1</sub>    | T31A  | T14A        | V <sub>IN</sub> = standard color bar signal (1 Vp-p), input +6 dB chroma signal level, measure T14A burst level, and calculate ratio with VOR-14   |      | +0.2 | +0.5 | dB    |
|                                       | ACC <sub>R2</sub>    | T31A  | T14A        | V <sub>IN</sub> = standard color bar signal (1 Vp-p), input -6 dB chroma signal level, measure T14A burst level, and calculate ratio with VOR-14   | -0.5 | -0.1 |      | dB    |
| REC ACC killer input level            | VACC <sub>K-ON</sub> | T31A  | T14A        | V <sub>IN</sub> = standard color bar signal (1 Vp-p), lower the chroma signal, and measure the input burst level at the point where output at T14A stops, and calculate the ratio with the standard input level.   |      | -26  |      | dB    |
| REC ACC killer output level           | VO <sub>ACK</sub>    | T31A  | T14A        | Use a spectrum analyzer to measure the output level at T14A in the killer state described previously; ratio with V <sub>OR-14</sub>  |      | -60  | -50  | dB    |
| Input level for REC ACC killer return | V <sub>ACK-OFF</sub> | T31A  | T14A        | Starting from the killer state described previously, gradually raise the input chroma level and measure the input burst level when output is generated at T14A and calculate the ratio with the standard input level   |      | -20  |      | dB    |
| VXO measurement sensitivity           | S <sub>VXO</sub>     | T31A  | T16<br>T18A | Measure the pin 16 DC voltage when a standard color bar signal is input (1 Vp-p)...V <sub>0</sub> Measure the frequency at T18A when V <sub>0</sub> is applied to pin 16 from the external power supply...f <sub>1</sub> Measure the frequency at T18A when V <sub>0</sub> + 10 mV is applied to pin 16...f <sub>2</sub><br>$S_{VXO} = \frac{f_2 - f_1}{10} \text{ Hz/mV}$   | 3.8  | 5.7  | 7.6  | Hz/mV |
| REC APC pull-in range                 | Δf <sub>APC1</sub>   | T31A  | T14A        | Input a 50% white signal overlapped with a 4.4336 MHz, 300 mVp-p continuous wave. After confirming that there is output at T14A, increase the frequency of the CW until the output at T14A stops, and then gradually reduce the frequency until output appears again at T14A; that CW frequency is f <sub>1</sub> .<br>Δf <sub>APC1</sub> = f <sub>1</sub> - 4433619 (Hz)  | 350  | 440  |      | Hz    |
|                                       | Δf <sub>APC2</sub>   | T31A  | T14A        | In the same manner, reduce the frequency of the CW until the output at T15A stops, then gradually increase the frequency until output appears again at T15A; that frequency is f <sub>2</sub> .<br>Δf <sub>APC2</sub> = f <sub>2</sub> - 4433619 (Hz)  |      | -900 | -350 | Hz    |
| BGP delay time                        | t <sub>D</sub>       | T31A  | T26<br>T30  | Measure waveforms at T26 and T30 when a standard color bar signal (1 Vp-p) is input.   |      | 4.3  |      | μs    |
| BGP pulse width                       | t <sub>W</sub>       | T31A  | T26<br>T30  |    |      | 4.8  |      | μs    |
| REC AFC pull-in range                 | Δf <sub>AFC1</sub>   | T31A  | T20         | Input a string of pulses (negative polarity) at 300 mV, 15.6 kHz with a width of 5 μs. After increasing the frequency of the pulse string until the waveform at pin 20 is disrupted, then reduce the frequency until the waveform at pin 20 is normal again; that pulse string frequency is f <sub>1</sub> .<br><br>Δf <sub>AFC1</sub> = f <sub>1</sub> - 15.625 (kHz) | 1.0  | 7.0  |      | kHz   |

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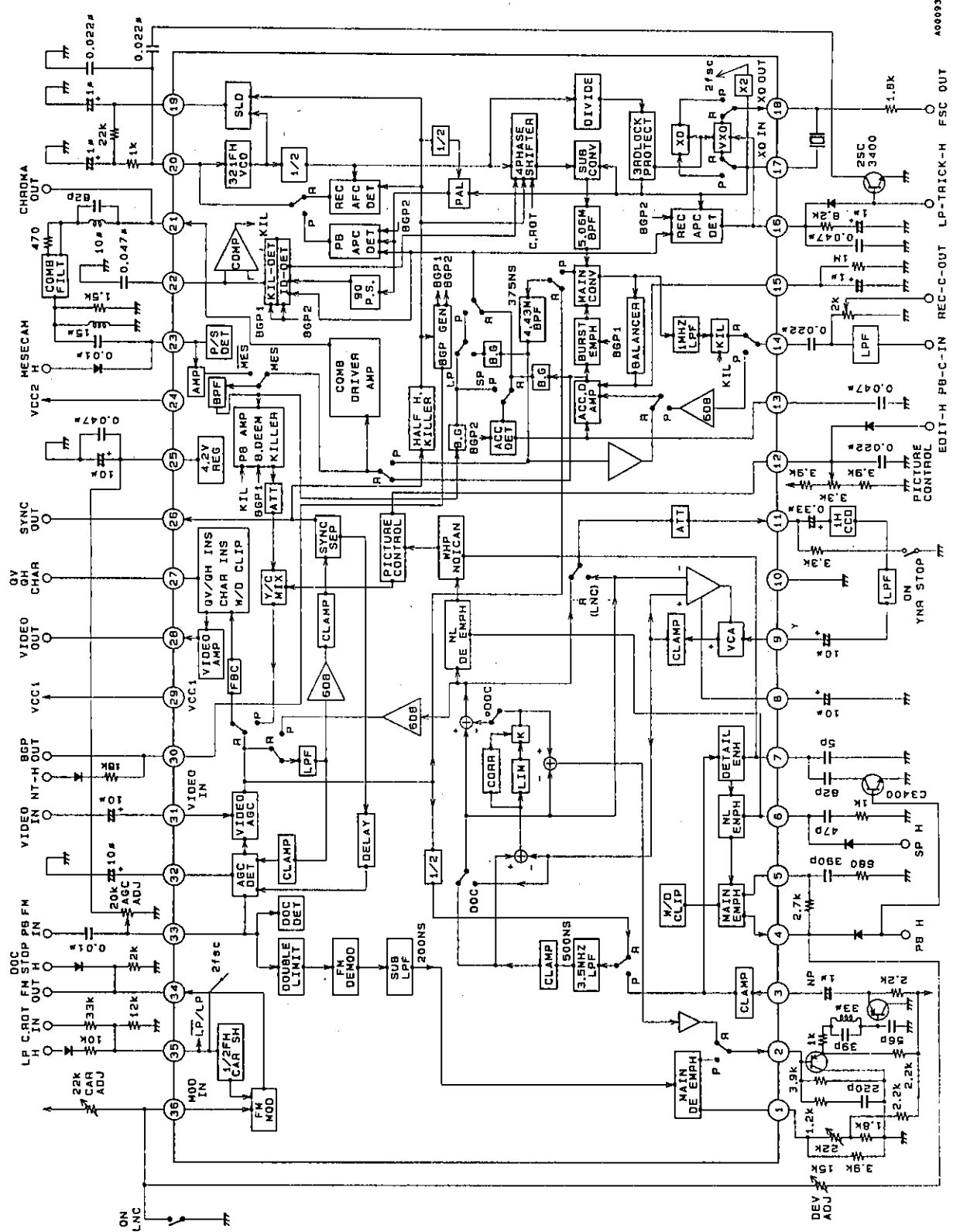
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| Parameter                             | Symbol            | Input               | Output | Conditions   | Min  | Typ  | Max  | Unit          |
|---------------------------------------|-------------------|---------------------|--------|--|------|------|------|---------------|
| REC AFC pull-in range                 | $\Delta f_{AFC2}$ | T31A                | T20    | In the same manner, after reducing the frequency of the pulse string until the waveform at pin 20 is disrupted, then increase the frequency until the waveform at pin 20 is normal again; that pulse string frequency is $f_2$ .<br>$\Delta f_{AFC2} = f_2 - 15.625$ (kHz)                     |      | -3.7 | -1.0 | kHz           |
| <b>[PB Mode Chroma]</b>               |                   |                     |        |  |      |      |      |               |
| PB chroma video output level          | $V_{op-28}$       | T33A<br>T14A<br>T3A | T28A   | In PB, SP modes, input a 4 MHz: 300 mVp-p continuous wave at T33A, and from T14A input a chroma signal (SP mode, burst 50 mVp-p) that underwent low-band conversion from a chroma noise test signal. Input a 50% white signal from T4A and measure the T28A burst level.                       | 240  | 300  | 360  | mVp-p         |
| PB ACC characteristics                | $ACC_{p1}$        | T33A<br>T14A<br>T3A | T28A   | Input the input chroma level at +6 dB under the same conditions as for $V_{op-28}$ and measure the T28A burst level, and calculate the ratio with $V_{op-28}$ .  |      | 0.5  | 0.8  | dB            |
|                                       | $ACC_{p2}$        | T33A<br>T14A<br>T3A | T28A   | Input the input chroma level at -6 dB under the same conditions as for $V_{op-28}$ and measure the T28A burst level, and calculate the ratio with $V_{op-28}$ .  | -0.5 | -0.2 |      | dB            |
| PB killer input level                 | $V_{ACK-P}$       | T33A<br>T14A<br>T3A | T28A   | Lower the input chroma level under the same conditions as for $V_{op-28}$ and measure the input burst level at the point where T28A chroma output ceases. (Calculate ratio with standard input of 50 mVp-p.)   | -40  | -32  | -25  | dB            |
| PB killer chroma output level         | $V_{OACK-P}$      | T33A<br>T14A<br>T3A | T28A   | Use a spectrum analyzer to measure the T28A chroma output level in the killer state described previously. Calculate ratio with $V_{op-28}$ .   |      | -44  | -40  | dB            |
| PB main converter carrier leak        | $C_{LP}$          | T33A<br>T14A<br>T3A | T28A   | Monitor T28A with a spectrum analyzer under the same conditions as for $V_{op-28}$ and calculate the ratio between the 4.43 MHz component and the 5.06 MHz carrier leak component.   |      | -40  | -33  | dB            |
| PB XO output level                    | $V_{XO-P}$        |                     | T18    | Measure the PB mode T18 output level with an FET probe.  | 480  | 610  | 750  | mVp-p         |
| PB XO oscillation frequency variation | $\Delta f_{XO}$   |                     | T18A   | Measure the frequency at T18A during PB mode...f<br>$\Delta f_{XO} = f - 4433619$ (Hz)   | -9   | 0    | +9   | Hz            |
| SLD detection current                 | $I_{SLD1}$        | T33A<br>T3A         | T19A   | In PB mode, with S20:3 and S19:off, input a 4 MHz 300 mVp-p continuous wave from T33A, input a 50% white signal from T4A, and measure the wave peak at T19A.<br><br>$I_{SLD1} = V_{OS1}/1 \text{ k}\Omega$ |      | 135  |      | $\mu\text{A}$ |
|                                       | $I_{SLD2}$        | T33A<br>T3A         | T19A   | Same as above (however, S20 = 1)<br><br>$I_{SLD2} = V_{OS2}/1 \text{ k}\Omega$   |      | 135  |      | $\mu\text{A}$ |
| 2fsc output level                     | $V_{2fsc}$        |                     | T35A   | In PB mode, measure the T35A output level with an FET probe.   | 490  | 690  | 890  | mVp-p         |

Note) A trap is required in the chroma playback system (between pins 21 and 23) in order to suppress unnecessary components (5.69 MHz) in converter output.

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Equivalent Circuit Block Diagram and Sample Application Circuit

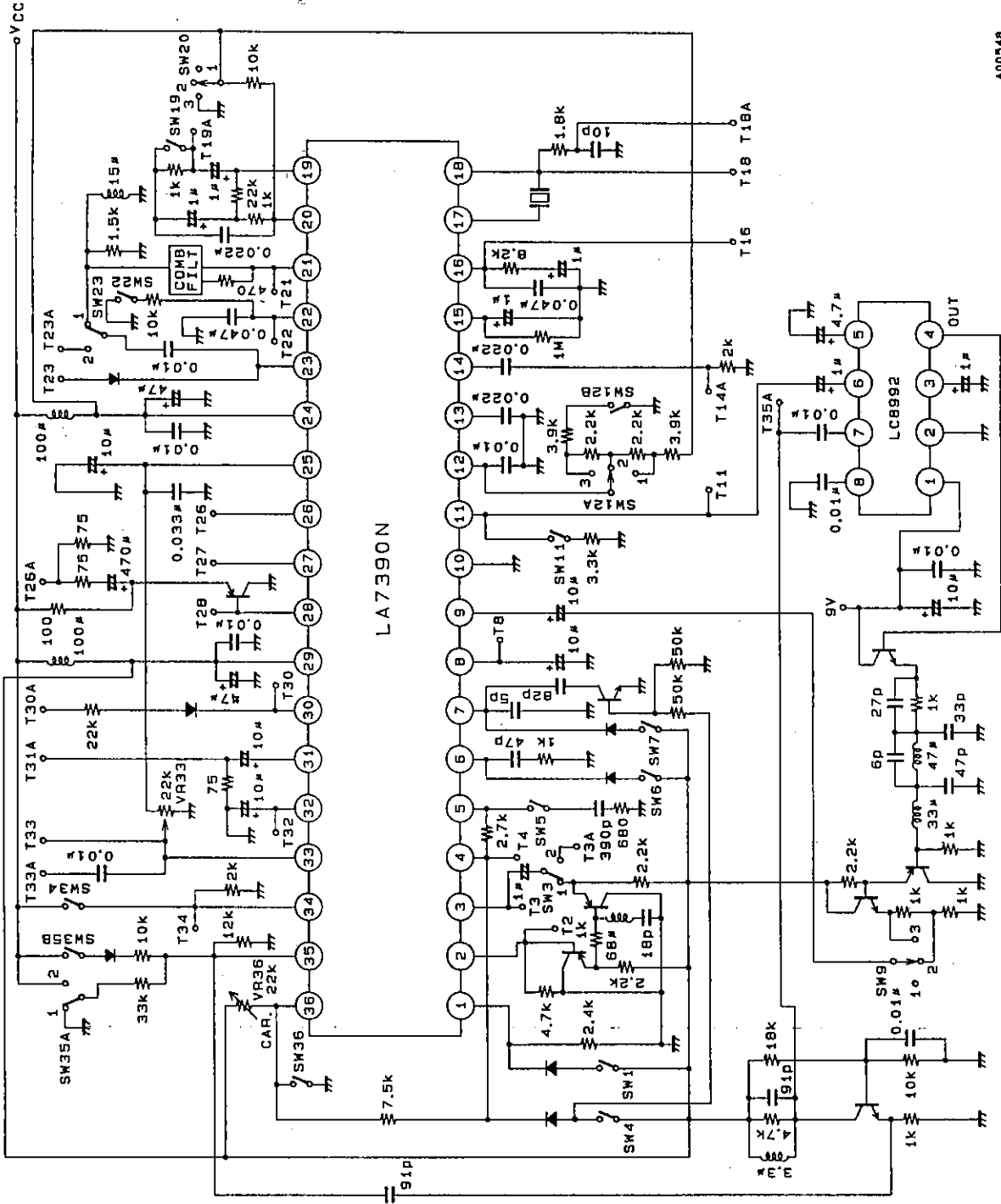


A00093

Unit (resistance: Ω, capacitance: F)

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Test Circuit Diagram



400548

Unit (resistance: Ω, capacitance: F)

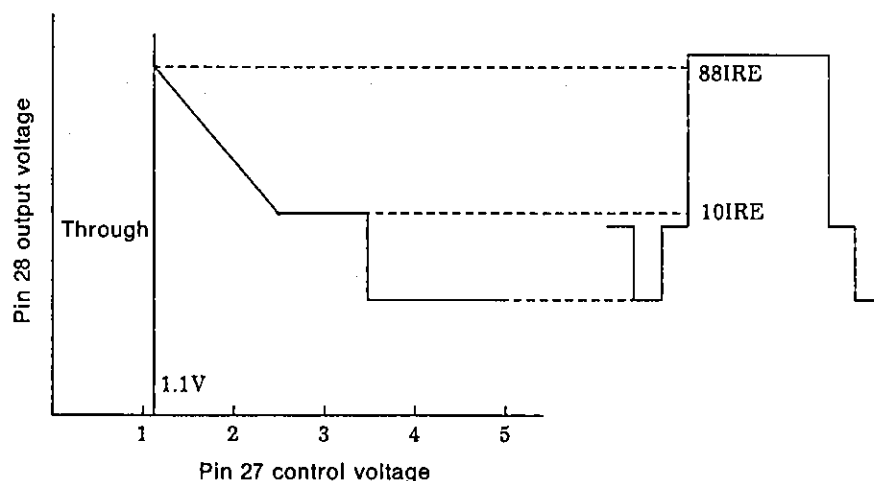


# LA7390N

## Control Pin Function Chart

| Pin No.                                | L                               | M  | H  |
|--|---------------------------------|--|--|
| Pin 4<br>R/P switching                 | Open<br>REC mode                |  | Over 3.8 V<br>PB mode                                |
| Pin 6<br>SP/EP switching               | Open<br>EP mode                 |  | Over 3.9 V<br>SP mode                                |
| Pin 12<br>EDIT2 PIC-CTL                | 2 V to 2.5 V<br>PIC-CTL<br>SOFT | 2.5 V to 3 V<br>PIC-CTL<br>HARD                        | Over 3.6 V<br>EDIT ON                                |
| Pin 13<br>SECAM CTL                    |                                 |  | Over 4.0 V<br>SECAM mode                             |
| Pin 16<br>Special playback switching   |                                 | Open<br>Before comb in SP                              | Over 3.5 V<br>(over 200 $\mu$ A)<br>After comb in SP |
| Pin 23<br>MESECAM CTL                  |                                 | Open   | Over 3.0 V<br>MESECAM mode                           |
| Pin 27<br>QV, QH, CHAR                 |                                 | Refer to pin 27,<br>QV, QH, CHAR,<br>insertion diagram |  |
| Pin 30<br>NTSC CTL                     |                                 |  | NTSC mode when<br>current flow is over 150 $\mu$ A   |
| Pin 34<br>DOC STOP control             | Open<br>Normal mode             |  | Over 3.9 V<br>DOC STOP                               |
| Pin 35<br>ROTARY pulse<br>LP switching |                                 |  |  |
| Pin 36<br>YNR/LNC switching            | Line NC when under 1 V<br>In PB | Open<br>SP: LNC, LP/EP: YNR                            |  |

Pin 27  
QV, QH, CHAR, insertion



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