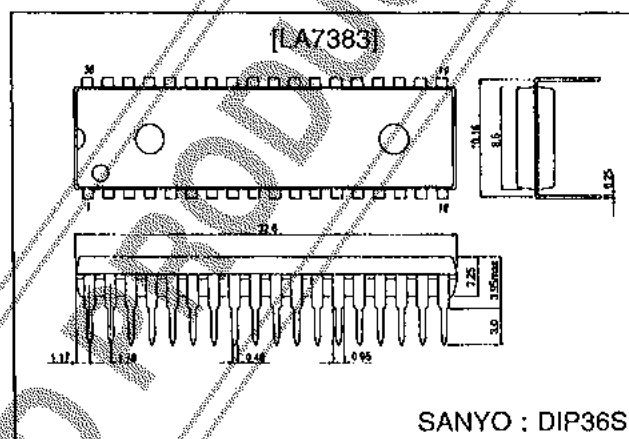


**SANYO****LA7383****NTSC Video Signal Processing LSI for VCRs****Overview**

The LA7383 combines luminance signal processing functions and color signal processing functions for NTSC VCRs on a single chip. Developed as a new-generation LSI for use in VCRs which offer increasingly higher image quality, the LA7383 offers all of the functions needed in order to realize improved picture quality in a dramatically compact 36-pin package, making this device suitable for a wide range of VCRs, from popularly priced models to high-end models.

**Package Dimensions**

unit : mm

**3170-DIP36S****Features**

- Includes all functions required for video signal processing in an NTSC VCR.
- Supports full HQ functions.
  - YNR on chip (standard).
  - CNR on chip (external components can be removed for passthrough operation).
  - Detail enhancer on chip.
  - Higher white clipping level (190%).
- In addition to the above, also provides the following functions for excellent image quality.
  - Edge compensation.
  - Double high-pass noise canceller → permits wide-band noise reduction.
  - Linear phase-type image quality adjustment → ideal image quality adjustment method, with no waveform distortion.
- By adopting the ICCD method, one comb filter (glass) has become unnecessary.
  - Has a single 1H-delay CCD and a comb Y/C separation/YNR chroma crosstalk canceller function on chip.
- Automatic adjustment filter on chip.
  - Y: LPF
  - C: 3.58 MHz BPF, 4.21 MHz BPF, LPF (REC)
- No adjustment required for white and dark clipping levels.
- Extremely few peripheral components (about 60 components, excluding peripheral components for the CCD).
- fsc output can be used as clock for OSD IC.
  - Crystal oscillator for the on-screen display circuit is not required.
- DCC circuit on chip.
  - Suppresses flicker at top of screen and reduces AM noise.
- High-speed AFC circuit.
  - Prevents color alteration and loss at top of screen when dubbing.
- Head switching noise reduction circuit on chip.
- Smallest package in the industry.
- Few components needed.

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

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Maximum Ratings at  $T_a = 25\text{ }^{\circ}\text{C}$ 

| Parameter                   | Symbol      | Conditions                            | Rating      | Unit               |
|-----------------------------|-------------|---------------------------------------|-------------|--------------------|
| Maximum supply voltage      | $V_{CCmax}$ |                                       | 7.0         | V                  |
| Allowable power dissipation | $P_{dmax}$  | $T_a \leq 65\text{ }^{\circ}\text{C}$ | 1070        | mW                 |
| Operating temperature       | $T_{opr}$   |                                       | -10 to +65  | $^{\circ}\text{C}$ |
| Storage temperature         | $T_{stg}$   |                                       | -40 to +150 | $^{\circ}\text{C}$ |

Operating Conditions at  $T_a = 25\text{ }^{\circ}\text{C}$ 

| Parameter                      | Symbol     | Conditions | Rating     | Unit |
|--------------------------------|------------|------------|------------|------|
| Recommended supply voltage     | $V_{CC}$   |            | 5.0        | V    |
| Operating supply voltage range | $V_{CCop}$ |            | 4.8 to 5.2 | V    |

Operating Characteristics at  $T_a = 25\text{ }^{\circ}\text{C}$ ,  $V_{CC} = 5\text{ V}$ 

| Parameter                                                     | Symbol           | Conditions                                                                                                                                                                             | min  | typ  | max  | Unit          |
|---------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------|
| [REC Mode Y]                                                  |                  |                                                                                                                                                                                        |      |      |      |               |
| Current consumption REC                                       | $I_{ccR}$        | When $V_{CC} = 5\text{ V}$ (when there is no signal), measure sum of incoming currents at pins 29 and 24                                                                               | 95   | 120  | 145  | mA            |
| AGC adjustment                                                | CAGC             | $V_{IN} = 1.0\text{ Vp-p}$ video signal, use VR33 to adjust T3 output to 0.5 Vp-p                                                                                                      |      |      |      |               |
| VCA control characteristics 1                                 | VCA 1            | Measure T3 output level when S9 is set to 2                                                                                                                                            | 0.48 | 0.5  | 0.52 | Vp-p          |
| VCA control characteristics 2                                 | VCA 2            | Measure T3 output level when S9 is set to 4                                                                                                                                            | 0.48 | 0.5  | 0.52 | Vp-p          |
| AGC adjustment voltage                                        | $V_{AGC}$        | Measure T33 DC voltage in above state                                                                                                                                                  | 3.2  | 3.4  | 3.6  | V             |
| AGC detection voltage                                         | $V_{AD}$         | Measure T32 DC voltage in same manner                                                                                                                                                  | 1.2  | 1.4  | 1.6  | V             |
| EE output level                                               | $V_{EE}$         | Measure T28A output level in same manner                                                                                                                                               | 0.95 | 1.0  | 1.05 | Vp-p          |
| AGC output 1                                                  | AGC 1            | $V_{IN} = 2.0\text{ Vp-p}$ video signal<br>Measure T3 output level                                                                                                                     | 500  | 520  | 540  | mVp-p         |
| AGC output 2                                                  | AGC 2            | $V_{IN} = 0.5\text{ Vp-p}$ video signal<br>Measure T3 output level                                                                                                                     | 460  | 480  | 500  | mVp-p         |
| AGC output 3                                                  | AGC 3            | $V_{IN} = 714\text{ mVp-p LUMI}$ , 572 mVp-p SYNC,<br>measure T3 SYNC level                                                                                                            | 135  | 150  | 165  | mVp-p         |
| AGC output 4                                                  | AGC 4            | $V_{IN} = 714\text{ mVp-p LUMI}$ , 143 mVp-p SYNC,<br>measure T3 SYNC level                                                                                                            | 90   | 100  | 110  | mVp-p         |
| Sync separation output level                                  | $V_{SYR}$        | $V_{IN} = 1.0\text{ Vp-p}$ video signal,<br>T26 output pulse peak value                                                                                                                | 4.0  | 4.2  | 4.4  | Vp-p          |
| Sync separation output pulse width                            | $PW_{SYR}$       | $V_{IN} = 1.0\text{ Vp-p}$ video signal,<br>T26 output pulse width                                                                                                                     | 4.0  | 4.3  | 4.6  | $\mu\text{s}$ |
| Sync separation output leading edge delay time                | $\Delta T_{SYR}$ | $V_{IN} = 1.0\text{ Vp-p}$ video signal, measure delay time of output SYNC versus input SYNC                                                                                           | 0.8  | 1.0  | 1.2  | $\mu\text{s}$ |
| Sync separation threshold level                               | $TH_{SYR}$       | Gradually attenuate the input level, measure input level at point when output pulse width widens 1 $\mu\text{s}$ or more beyond $PW_{SYR}$                                             |      | -18  | -14  | dB            |
| Sync tip level, pedestal level, white level measurement (REC) | $L_{VDR}$        | Measure electric potential for each of the T28 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 (REC)                                | $\Delta V_{DR}$  | Measure T28 DC voltage when 5 V is applied to T27, and assign the measured value to $L_{VDR}$ and calculate the difference with $L_{SYN}$<br>$\Delta V_{DR} = L_{SYN} - L_{VDR}$       | -80  | 0    | +80  | mV            |
| Pseudo H insertion level (REC)                                | $\Delta H_{DR}$  | Measure T28 DC voltage when 2.5 V is applied to T27, and assign the measured value to $L_{HDR}$ and calculate the difference with $L_{PED}$<br>$\Delta H_{DR} = L_{PED} - L_{HDR}$     | -200 | -100 | 0    | mV            |

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| Parameter                                 | Symbol          | Conditions                                                                                                                                                                         | min  | typ  | max  | Unit  |
|-------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|-------|
| White insertion level (REC)               | $\Delta W_{HR}$ | Measure T28 DC voltage when 1.3 V is applied to T27, and assign the measured value to $L_{WHR}$ and calculate the difference with $L_{WHI}$<br>$\Delta W_{HR} = L_{WHI} - L_{WHR}$ | 40   | 140  | 240  | mV    |
| VCA detection voltage                     | VVCA            | Measure T8 DC voltage                                                                                                                                                              | 2.80 | 2.95 | 3.10 | V     |
| Comb filter adjustment                    |                 | $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off, adjust so that the 3.58 MHz component at T21 is at a minimum                                                           |      |      |      |       |
| Y-comb characteristics                    | GY-Comb         | Measure the chroma level at T2 with a spectrum analyzer, $V_{IN}$ = standard chroma noise test signal 1 Vp-p and S30 = off                                                         |      |      | -25  | dB    |
| C-comb characteristics                    | GC-Comb         | $V_{IN}$ = white 50% + CW 3.0 MHz                                                                                                                                                  |      |      | -25  | dB    |
| REC YNR operation EP/LP (1)               | VR-YNR1         | Measure the YNR addition level at T2 with $V_{IN}$ = standard color bar signal 1 Vp-p and S30 = off                                                                                | 10   | 12   | 14   | mV    |
| REC YNR operation EP/LP (2)               | VR-YNR2         | Measure the YNR addition level at edit mode T2 with $V_{IN}$ = standard color bar signal 1 Vp-p and S30 = off                                                                      | 2    | 3    | 4    | mV    |
| Pre-CCD LPF frequency characteristics (1) | GPFIL1          | Input a standard multiburst signal (1 Vp-p) and measure the 4 MHz response for 500 kHz at T11                                                                                      | -0.5 | 0    | +0.5 | dB    |
| Pre-CCD LPF frequency characteristics (2) | GPFIL2          | 10 MHz response for 500 kHz at T11 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                 | -10  | -8   | -6   | dB    |
| 3MLPF frequency characteristics (1)       | G3MLP1          | 1 MHz response for 500 kHz at T2 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                   | -0.5 | 0    | +0.5 | dB    |
| 3MLPF frequency characteristics (2)       | G3MLP2          | 2 MHz response for 500 kHz at T2 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                   | -1   | 0    | +1   | dB    |
| 3MLPF frequency characteristics (3)       | G3MLP3          | 3 MHz response for 500 kHz at T2 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                   | -10  | -8   | -6   | dB    |
| 3MLPF frequency characteristics (4)       | G3MLP4          | 3.58 MHz response for 500 kHz at T2 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                |      |      | -30  | dB    |
| 3MLPF frequency characteristics (5)       | G3MLP5          | 4.2 MHz response for 500 kHz at T2 when $V_{IN}$ = standard multiburst signal 1 Vp-p and S30 = off                                                                                 |      |      | -15  | dB    |
| FM modulator output level                 | $V_{FM}$        | 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         | $F_{MOD}$       | Ratio of 8 MHz component to 4 MHz in the above state                                                                                                                               |      | -40  | -35  | dB    |
| FM modulator modulation sensitivity       | $S_{MOD}$       | Measure amplitude of change in output frequency when 2.6 V DC or 3.1 V DC is applied to T3, $2 \times (f_{3.1} - f_{2.6})$                                                         | 1.6  | 2.0  | 2.4  | MHz/V |
| FM modulator linearity                    | $L_{MOD}$       | Measure output frequency when 2.85 V DC applied to T3, $f_{2.85}$<br>$L_{MOD} = \frac{f_{2.85} - (f_{3.1} + f_{2.6})/2}{f_{3.1} - f_{2.6}} \times 100$                             | -3   | 0    | +2   | %     |
| 1/2 $f_H$ carrier shift 1                 | CS1             | Measure amplitude of change in output frequency when SW35B is from on to off and SW35A is off                                                                                      | 6.8  | 7.8  | 9.5  | kHz   |
| 1/2 $f_H$ carrier shift 2                 | CS2             | Measure amplitude of change in output frequency when SW35A is on and SW35B is switch from on to off                                                                                | 6.8  | 7.8  | 9.5  | kHz   |
| Emphasis gain                             | GEMP            | $V_{IN}$ = 0.5 mVp-p 10 kHz sine wave<br>Measure ratio of levels of input and output amplitude at T4                                                                               | -0.5 | 0    | +0.5 | dB    |

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| Parameter                                   | Symbol            | Conditions                                                                                                                                                                                        | min  | typ  | max  | Unit  |
|---------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|-------|
| Detail enhancer characteristics (1)         | GENH1             | $V_{IN} = 158 \text{ mVp-p}$ 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                        | 1.6  | 1.9  | 2.6  | dB    |
| Detail enhancer characteristics (2)         | GENH2             | $V_{IN} = 50 \text{ mVp-p}$ 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                         | 3.1  | 4.1  | 5.1  | dB    |
| Detail enhancer characteristics (3)         | GENH3             | $V_{IN} = 15.8 \text{ mVp-p}$ 2 MHz sine wave<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                       | 5.3  | 6.3  | 7.3  | dB    |
| Detail enhancer characteristics (4)         | GENH4             | $V_{IN} = 15.8 \text{ mVp-p}$ 2 MHz sine wave<br>Measure output amplitude at T4 in edit mode, difference with GEMP                                                                                | 2.9  | 3.9  | 4.9  | dB    |
| Nonlinear emphasis characteristics (1)      | GNLEMP1           | $V_{IN} = 500 \text{ mVp-p}$ 2 MHz<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                                  | 0.5  | 1.4  | 2.3  | dB    |
| Nonlinear emphasis characteristics (2)      | GNLEMP2           | $V_{IN} = 158 \text{ mVp-p}$ 2 MHz<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                                  | 2.6  | 3.8  | 5.2  | dB    |
| Nonlinear emphasis characteristics (3)      | GNLEMP3           | $V_{IN} = 50 \text{ mVp-p}$ 2 MHz<br>Measure ratio of levels of T3 and T4, difference with GEMP                                                                                                   | 4.9  | 6.4  | 7.9  | dB    |
| Main linear emphasis characteristics (1)    | GME1              | $V_{IN} = 50 \text{ mVp-p}$ 500 kHz sine wave<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                       | 4.9  | 5.2  | 5.5  | dB    |
| Main linear emphasis characteristics (2)    | GME2              | $V_{IN} = 50 \text{ mVp-p}$ 2 MHz<br>Measure ratio of levels of T4 and T3, difference with GEMP                                                                                                   | 13.1 | 13.6 | 14.1 | dB    |
| Detail enhancer US mode characteristics (1) | GENHS1            | Measure the amplitude at T4 when $V_{IN} = 15.8 \text{ mVp-p}$ 2 MHz sine wave; compare level with GEMP                                                                                           | 2.9  | 3.9  | 4.9  | dB    |
| Detail enhancer US mode characteristics (2) | GENHS2            | Measure the amplitude at T4 when $V_{IN} = 15.8 \text{ mVp-p}$ 2 MHz sine wave in edit mode; compare level with GEMP                                                                              | 0.7  | 1.7  | 2.7  | dB    |
| White clipping level                        | LWC               | $V_{IN} = 500 \text{ mVp-p}$ white 100% video<br>Measure white clipping level at T4                                                                                                               | 186  | 193  | 200  | %     |
| Dark clipping level                         | LDC               | $V_{IN} = 500 \text{ mVp-p}$ white 100% video<br>Measure dark clipping level at T4                                                                                                                | -50  | -45  | -40  | %     |
| [PB Mode Y]                                 |                   |                                                                                                                                                                                                   |      |      |      |       |
| Current consumption PB                      | IccP              | Incoming currents at pins 29 and 24 when $V_{CC} = 5.0 \text{ V}$                                                                                                                                 | 125  | 155  | 185  | mA    |
| Dropout compensation period                 | T <sub>DOC</sub>  | T33A: 4 MHz, 300 mVp-p sine wave<br>T3A: 0.5 Vp-p video signal<br>T33A: time from when input went to 0 until T28A output returned                                                                 | 0.6  |      | 1.0  | ms    |
| FM demodulation voltage                     | V <sub>DEM4</sub> | $V_{IN} = 300 \text{ mVp-p}$ , $f = 4 \text{ MHz}$ , output voltage                                                                                                                               | 0.9  | 1.05 | 1.15 | V     |
| FM demodulation sensitivity                 | S <sub>DEM</sub>  | $V_{IN} = 300 \text{ mVp-p}$ , $f = 2 \text{ MHz}$ , V <sub>DEM2</sub><br>$V_{IN} = 300 \text{ mVp-p}$ , $f = 6 \text{ MHz}$ , V <sub>DEM6</sub><br>Calculate $S_{DEM} = (V_{DEM2} - V_{DEM6})/4$ | 0.11 | 0.14 | 0.17 | V/MHz |
| FM demodulation linearity                   | L <sub>DEM</sub>  | $L_{DEM} = \frac{V_{DEM4} - (V_{DEM2} + V_{DEM6})/2}{V_{DEM2} - V_{DEM6}} \times 100$                                                                                                             | -3.5 | 0    | +3.5 | %     |
| Carrier leakage                             | CL                | $V_{IN} = 300 \text{ mVp-p}$ , $f = 4 \text{ MHz}$<br>Ratio between 4 MHz component of T1 and S <sub>DEM</sub>                                                                                    |      | -40  | -35  | dB    |
| Noncorrelation detection level              | V <sub>CORR</sub> | $V_{IN} = 500 \text{ mVp-p}$ video signal (ramp waveform)                                                                                                                                         |      | 22   |      | IRE   |
| PB YNR characteristics LP/EP (1)            | GP-YNR1           | $V_{IN} = 500 \text{ mVp-p}$ noise test signal -30 dB<br>S/N difference with S6 on/off                                                                                                            | 2.5  |      |      | dB    |
| PB YNR characteristics LP/EP (2)            | GP-YNR2           | $V_{IN} = 500 \text{ mVp-p}$ noise test signal -30 dB<br>S/N difference with EDIT on/off; pin 36 low                                                                                              | 1.5  |      |      | dB    |

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| Parameter                                                    | Symbol          | Conditions                                                                                                                                                                                                                       | min   | typ  | max  | Unit  |
|--------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|-------|
| Playback through gain                                        | $G_{PB}$        | Apply $V_{IN} = 0.5$ Vp-p video signal to pin 3, and determine ratio between pin 28 output level and input level                                                                                                                 | 4.5   | 6.0  | 7.5  | dB    |
| Dropout detection (feedback) level                           | $L_{DOC}$       | T33A: 4 MHz, 300 mVp-p sine wave<br>T3A: 0.5 Vp-p video signal<br>Measure input signal level when T33A signal drops momentarily and T28A output goes to 0                                                                        | 30    | 40   | 50   | mVp-p |
| Nonlinear de-emphasis characteristics (1)                    | $GNLDEEM1$      | $N_{IN}$ = white 50% video + sine wave<br>$f = 2$ MHz, 158 mVp-p<br>Measure I/O response, and assign output level described above as 0 dB                                                                                        | -6.0  | -5.0 | -4.0 | dB    |
| Nonlinear de-emphasis characteristics (2)                    | $GNLDEEM2$      | $f = 2$ MHz, 50 mVp-p                                                                                                                                                                                                            | -9.0  | -8.0 | -7.0 | dB    |
| Double noise canceller characteristics (1)                   | $G_{WNC1}$      | $f = 2$ MHz, 158 mVp-p                                                                                                                                                                                                           | -2.3  | -1.8 | -1.3 | dB    |
| Double noise canceller characteristics (2)                   | $G_{WNC2}$      | $f = 2$ MHz, 50 mVp-p                                                                                                                                                                                                            | -6.0  | -5.0 | -4.0 | dB    |
| Double noise canceller characteristics (3)                   | $G_{WNC3}$      | $f = 2$ MHz, 15.8 mVp-p                                                                                                                                                                                                          | -10.5 | -9.0 | -7.5 | dB    |
| Double noise canceller characteristics (4)                   | $G_{WNC4}$      | $f = 3.58$ MHz, 158 mVp-p                                                                                                                                                                                                        | -2.0  | -1.5 | -1.0 | dB    |
| Double noise canceller characteristics (5)                   | $G_{WNC5}$      | $f = 3.58$ MHz, 50 mVp-p                                                                                                                                                                                                         | -5.1  | -4.1 | -3.1 | dB    |
| Double noise canceller characteristics (6)                   | $G_{WNC6}$      | $f = 3.58$ MHz, 15.8 mVp-p                                                                                                                                                                                                       | -10.5 | -8.5 | -7.0 | dB    |
| PIC-CTL hard response characteristics (1)                    | $G_{PH1}$       | $f = 1$ MHz, 158 mVp-p                                                                                                                                                                                                           | 3.5   | 4.5  | 5.5  | dB    |
| PIC-CTL hard response characteristics (2)                    | $G_{PH2}$       | $f = 2$ MHz, 158 mVp-p                                                                                                                                                                                                           | 7     | 8    | 9    | dB    |
| PIC-CTL soft response characteristics (1)                    | $G_{PS1}$       | $f = 1$ MHz, 158 mVp-p                                                                                                                                                                                                           | -5.5  | -4.5 | -3.5 | dB    |
| PIC-CTL soft response characteristics (2)                    | $G_{PS2}$       | $f = 2$ MHz, 158 mVp-p                                                                                                                                                                                                           | -9    | -8   | -7   | dB    |
| PIC-CTL center response characteristics                      | $G_{PC}$        | $f = 2$ MHz, 158 mVp-p                                                                                                                                                                                                           | 1.0   | 1.5  | 2.0  | dB    |
| DOC loop gain Y                                              | $G_{DOC}$       | T33A: 4 MHz, 300 mVp-p sine wave<br>T3A: 0.5 Vp-p video signal<br>I/O response 5H after instant when input at T33A went to 0                                                                                                     | -1.0  | 0    | +1.0 | dB    |
| Sync tip level, pedestal level, white level measurement (PB) | $L_{VDR}$       | With $V_{IN}$ = white 100% 0.5 Vp-p<br>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)                                | $\Delta V_{DP}$ | Measure pin 28 DC voltage when 5 V is applied to pin 26, and assign the measured value to $L_{VDP}$ , and calculate the difference with $L_{SYN}$<br>$\Delta V_{DP} = L_{SYN} - L_{VDP}$                                         | -80   | 0    | +80  | mV    |
| Pseudo H insertion level (PB)                                | $\Delta H_{DP}$ | Measure pin 28 DC voltage when 2.5 V is applied to pin 26, and assign the measured value to $L_{HDP}$ , and calculate the difference with $L_{PED}$<br>$\Delta H_{DP} = L_{PED} - L_{HDP}$                                       | -200  | -100 | 0    | mV    |
| White insertion level (PB)                                   | $\Delta W_{HP}$ | Measure pin 28 DC voltage when 1.3 V is applied to pin 26, and assign the measured value to $L_{WHP}$ , and calculate the difference with $L_{WHI}$<br>$\Delta W_{HP} = L_{WHI} - L_{WHP}$                                       | 40    | 140  | 240  | mV    |
| Sync separation output level                                 | $V_{SYP}$       | $V_{IN} = 0.5$ Vp-p video signal<br>Pin 26 output pulse peak value                                                                                                                                                               | 4.0   | 4.2  | 4.4  | Vp-p  |

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| Parameter                                      | Symbol                | Conditions                                                                                                                                                                                                                                                                                                                                                                          | min  | typ  | max  | Unit  |
|------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|-------|
| Sync separation output pulse width             | PW <sub>SYP</sub>     | V <sub>IN</sub> = 0.5 Vp-p video signal<br>Pin 26 output pulse width                                                                                                                                                                                                                                                                                                                | 4.0  | 4.3  | 4.6  | μs    |
| Sync separation output leading edge delay time | ΔT <sub>SYP</sub>     | V <sub>IN</sub> = 0.5 Vp-p video signal, measure delay time of output SYNC versus input SYNC                                                                                                                                                                                                                                                                                        | 1.4  | 1.6  | 1.8  | μs    |
| [REC Mode Chroma]                              |                       |                                                                                                                                                                                                                                                                                                                                                                                     |      |      |      |       |
| REC chroma Y/C separation output level         | V <sub>OR-21</sub>    | V <sub>IN</sub> = standard color bar signal (1 Vp-p)<br>Measure burst level at T21                                                                                                                                                                                                                                                                                                  | 170  | 220  | 270  | mVp-p |
| REC chroma low-band conversion output level    | V <sub>OR-14</sub>    | V <sub>IN</sub> = standard color bar signal (1 Vp-p)<br>Measure burst level at T14A                                                                                                                                                                                                                                                                                                 | 230  | 330  | 430  | mVp-p |
| Burst emphasis amount                          | G <sub>BE</sub>       | V <sub>IN</sub> = standard color bar signal (1 Vp-p)<br>Ratio of burst level at T14A when S35A is off (SP/EP) and on (LP)                                                                                                                                                                                                                                                           | 5.5  | 6.0  | 6.5  | dB    |
| VXO oscillation level                          | V <sub>VXO-R</sub>    | V <sub>IN</sub> = standard color bar signal (1 Vp-p),<br>measure T18 output amplitude (with an FET probe)                                                                                                                                                                                                                                                                           | 360  | 450  | 540  | mVp-p |
| REC ACC characteristics 1                      | ACC <sub>R1</sub>     | V <sub>IN</sub> = standard color bar signal (1 Vp-p),<br>input +6 dB chroma signal level only, measure T14A burst level, and calculate ratio with V <sub>OR-14</sub>                                                                                                                                                                                                                |      | +0.2 | +0.5 | dB    |
| REC ACC characteristics 2                      | ACC <sub>R2</sub>     | V <sub>IN</sub> = standard color bar signal (1 Vp-p),<br>input -6 dB chroma signal level only, measure T14A burst level, and calculate ratio with V <sub>OR-14</sub>                                                                                                                                                                                                                | -0.5 | -0.1 |      | dB    |
| REC ACC killer input level                     | V <sub>ACCK-ON</sub>  | V <sub>IN</sub> = standard color bar signal (1 Vp-p),<br>lower the chroma signal, and measure the input burst level at the point where output at T14A ceases, and calculate the ratio with the standard input level                                                                                                                                                                 | -30  | -27  | -24  | dB    |
| REC ACC killer output level                    | V <sub>OACCK</sub>    | 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>ACCK-OFF</sub> | 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                                                                                                                                                                | -24  | -21  | -18  | dB    |
| VXO control sensitivity                        | S <sub>VXO</sub>      | Measure the pin 16 DC voltage when a standard color bar signal (1 Vp-p) is input ... V <sub>O</sub><br>Measure the frequency at T18A when V <sub>O</sub> is applied to pin 16 from the external power supply...f <sub>1</sub><br>Measure the frequency at T18A when V <sub>O</sub> + 10 mV is applied to pin 16 ...f <sub>2</sub><br>$S_{VXO} = \frac{f_2 - f_1}{10} \text{ Hz/mV}$ | 3.3  | 4.9  | 7.5  | Hz/mV |
| REC APC pull-in range 1                        | Δf <sub>APC1</sub>    | Input a 50% white signal overlapping with a 3.5795 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> - 3579545 (Hz)          | 350  | 440  |      | Hz    |
| REC APC pull-in range 2                        | Δf <sub>APC2</sub>    | In the same manner, reduce the frequency of the CW until the output at T14A stops, and then gradually increase the frequency until output appears again at T14A; that CW frequency is f <sub>2</sub> .<br>Δf <sub>APC2</sub> = f <sub>2</sub> - 3579545 (Hz)                                                                                                                        |      | -900 | -350 | Hz    |
| BGP delay time for APC ACC                     | t <sub>D(N)</sub>     | Input a standard color bar signal overlapping with a 3.98 MHz, 300 mVp-p continuous wave, and measure waveforms at T26 and T16.                                                                                                                                                                                                                                                     |      | 4.8  |      | μs    |

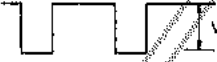
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| Parameter                      | Symbol              | Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                    | min   | typ  | max   | Unit    |
|--------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|-------|---------|
| BGP pulse width for APC ACC    | $t_w(N)$            | <p style="text-align: right;">A00340</p>                                                                                                                                                                                                                                                                                                                                                                                                      |       | 2.5  |       | $\mu s$ |
| REC AFC pull-in range 1        | $\Delta f_{AFC1}$   | <p>Input a string of pulses (negative polarity) at 286 mV, 15.7 kHz with a width of 5 <math>\mu s</math>. 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 <math>f_1</math></p> <p style="text-align: right;">A00341</p> <p><math>\Delta f_{AFC1} = f_1 - 15.734 \text{ (kHz)}</math></p> | +1.0  | +7.0 |       | kHz     |
| REC AFC pull-in range 2        | $\Delta f_{AFC2}$   | <p>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 <math>f_2</math></p> <p><math>\Delta f_{AFC2} = f_2 - 15.734 \text{ (kHz)}</math></p>                                                                                                                             |       | -6.3 | -1.0  | kHz     |
| [PB Mode Chroma]               |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |      |       |         |
| PB chroma video output level   | V <sub>op-28</sub>  | In PB, SP mode, input a continuous wave from T14A 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 T3A and measure the T28A burst level                                                                                                                                                                                                            | 210   | 260  | 310   | mVp-p   |
| PB chroma pin 21 output level  | V <sub>op-21</sub>  | Measure the T21 burst level under the same conditions as for V <sub>op-28</sub>                                                                                                                                                                                                                                                                                                                                                               | 170   | 200  | 230   | mVp-p   |
| PB ACC characteristics 1       | ACC <sub>P1</sub>   | Input the input chroma level at +6 dB under the same conditions as for V <sub>op-28</sub> and measure the T21 burst level, and calculate the ratio with V <sub>op-21</sub>                                                                                                                                                                                                                                                                    |       | +0.5 | +0.8  | dB      |
| PB ACC characteristics 2       | ACC <sub>P2</sub>   | Input the input chroma level at -6 dB under the same conditions as for V <sub>op-28</sub> and measure the T21 burst level, and calculate the ratio with V <sub>op-21</sub>                                                                                                                                                                                                                                                                    | -0.5  | -0.2 |       | dB      |
| PB killer input level          | V <sub>ACK-P</sub>  | Lower the input chroma level under the same conditions as for V <sub>op-28</sub> and measure the input burst level at the point where T21 chroma output ceases. (Calculate ratio with standard input of 50 mVp-p)                                                                                                                                                                                                                             | -55   |      | -40   | dB      |
| PB killer chroma output level  | V <sub>OACK-P</sub> | Use a spectrum analyzer to measure the T28 chroma output level in the killer state described previously. Calculate ratio with V <sub>op-28</sub> .                                                                                                                                                                                                                                                                                            |       | -44  | -40   | dB      |
| PB main converter carrier leak | C <sub>LP</sub>     | Monitor T28A with a spectrum analyzer under the same conditions as for V <sub>op-28</sub> and calculate the ratio between the 3.58 MHz component and the 4.21 MHz carrier leak component.                                                                                                                                                                                                                                                     |       | -40  | -33   | dB      |
| Burst de-emphasis amount       | G <sub>BD</sub>     | From T14A, input a 629 kHz 50 mVp-p continuous wave; from T3A, input a 50% white signal, and calculate the ratio between the output level during the T21 burst interval and the output level during other intervals                                                                                                                                                                                                                           | -4.35 | -4.6 | -4.85 | dB      |
| PB XO output level             | V <sub>XO-P</sub>   | In PB mode, measure the T18 output level with an FET probe                                                                                                                                                                                                                                                                                                                                                                                    | 480   | 610  | 750   | mVp-p   |

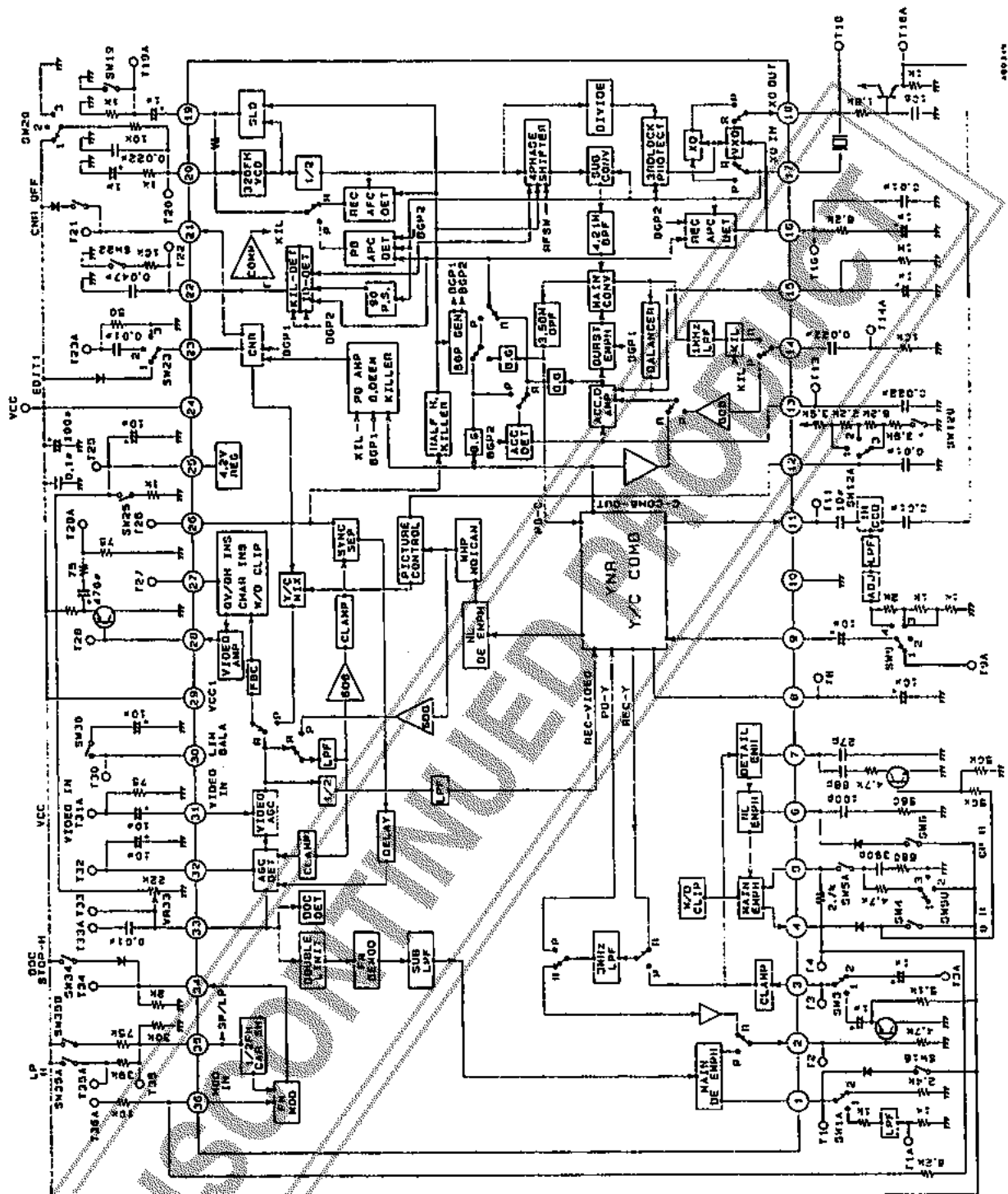
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| Parameter                                  | Symbol          | Conditions                                                                                                                                                                                                                                                                                | min | typ  | max  | Unit            |
|--------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|-----------------|
| PB XO oscillation frequency variation      | $\Delta f_{XO}$ | In PB mode, measure the frequency at T18...f<br>$\Delta f_{XO} = f - 3579545$ (Hz)                                                                                                                                                                                                        | -7  | 0    | +7   | Hz              |
| SLD detection current 1                    | $I_{SLD1}$      | 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 T3A, and measure the wave peak at T19A<br><br>$I_{SLD1} = VOS1/1 \text{ k}\Omega$ | 110 | 160  | 210  | $\mu\text{A}$   |
| SLD detection current 2                    | $I_{SLD2}$      | 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 T3A, and measure the wave peak at T19A<br><br>$I_{SLD2} = VOS2/1 \text{ k}\Omega$ | 110 | 160  | 210  | $\mu\text{A}$   |
| CNR characteristics                        | CNR             | SW21 → 2: from T14A<br>SW23 → 3: input chroma signal that is a chroma noise test signal that underwent low-band conversion (SP mode, burst 50 mVp-p)<br>PB mode: input a 50% white signal from T3A and measure the chroma level at T28                                                    | 230 | 290  | 350  | mVp-p           |
| US switch operation check                  | US              | SW21 → 2: from T14A<br>SW23 → 4: input chroma signal that is a chroma noise test signal that underwent low-band conversion (SP mode, burst 50 mVp-p)<br>PB mode: input a 50% white signal from T3A and measure the chroma level at T28                                                    | 450 | 560  | 670  | mVp-p           |
| EDIT1                                      | EDIT            | SW21 → 2: from T14A<br>SW23 → 1: input chroma signal that is a chroma noise test signal that underwent low-band conversion (SP mode, burst 50 mVp-p)<br>PB mode: input a 50% white signal from T3A and measure the chroma level at T28                                                    | 450 | 560  | 670  | mVp-p           |
| CNR-OFF                                    | CNR(OFF)        | SW21 → 1: from T14A<br>SW23 → 3: input chroma signal that is a chroma noise test signal that underwent low-band conversion (SP mode, burst 50 mVp-p)<br>PB mode: input a 50% white signal from T3A and measure the chroma level at T28                                                    | 450 | 560  | 670  | mVp-p           |
| CNR amp gain                               | $G_{CNR}$       | $V_{IN} \approx 100 \text{ mVp-p } 3.58 \text{ MHz CW}$                                                                                                                                                                                                                                   | 9.5 | 10.5 | 11.5 | dB              |
| 4.2 V regulator operation confirmation (1) | V42(R)          | SW25 → 1 measure T25 DC level REC mode                                                                                                                                                                                                                                                    |     | 4.2  |      | V <sub>DC</sub> |
| 4.2 V regulator operation confirmation (2) | V42(P1)         | SW25 → 1 measure T25 DC level PB mode                                                                                                                                                                                                                                                     |     | 4.2  |      | V <sub>DC</sub> |
| 4.2 V regulator operation confirmation (3) | V42(P2)         | SW25 → 2 measure T25 DC level PB mode                                                                                                                                                                                                                                                     |     | 4.2  |      | V <sub>DC</sub> |

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## Test Circuit Diagram



Unit (resistance:Ω, capacitance: F)

LA7383 Mode Table

| Mode | Edit               | Y/C<br>separation<br>by comb filter<br>Y (REC) | Y/C<br>separation<br>by comb filter<br>C (REC) | 1/2 f <sub>H</sub><br>shift<br>(REC) | Burst<br>emphasis<br>(REC) | NL<br>emphasis<br>(REC) | YNR<br>(REC)      | YNR<br>(PB)      | High-pass,<br>NC double<br>type<br>(PB) | CNR<br>(PB) | PIC CTL<br>(PB) | Detail enhancer<br>(REC) | APC.<br>DET.<br>(PB) | Crosstalk<br>correlation<br>switching<br>(PB) |
|------|--------------------|------------------------------------------------|------------------------------------------------|--------------------------------------|----------------------------|-------------------------|-------------------|------------------|-----------------------------------------|-------------|-----------------|--------------------------|----------------------|-----------------------------------------------|
| SP   | Off<br>(normal)    | o                                              | X                                              | X                                    | o                          | X                       | K0.5<br>LIM 3IRE  | K0.2<br>LIM 5IRE | o                                       | o           | o(variable)     | Strong<br>(US)<br>Medium | Before comb          | o                                             |
|      | On (1)<br>pin 23 H | o                                              | X                                              | X                                    | o                          | X                       | X                 | X                | o                                       | X(off)      | o               | Medium                   | Before               | o                                             |
|      | On (2)<br>pin 12 H | o                                              | X                                              | X                                    | o                          | X                       | X                 | X                | o                                       | o           | Mid-point       | Medium                   | Before               | o                                             |
| LP   | Off<br>(normal)    | o                                              | o                                              | o                                    | X                          | o                       | K0.65<br>LIM 5IRE | K0.5<br>LIM 1IRE | o                                       | o           | o               | Strong                   | After comb           | X                                             |
|      | On (1)<br>pin 23 H | o                                              | X                                              | o                                    | X                          | o                       | K0.25<br>LIM 3    | K0.2<br>LIM 5    | o                                       | X           | o               | Medium                   | After                | X                                             |
|      | On (2)<br>pin 12 H | o                                              | X                                              | o                                    | X                          | o                       | K0.25<br>LIM 3    | K0.2<br>LIM 5    | o                                       | o           | Mid-point       | Medium                   | After                | X                                             |
| EP   | Off<br>(normal)    | o                                              | o                                              | o                                    | o                          | o                       | K0.65<br>LIM 5IRE | K0.5<br>LIM 5    | o                                       | o           | o               | Strong                   | After comb           | X                                             |
|      | On (1)<br>pin 23 H | o                                              | X                                              | o                                    | o                          | o                       | K0.25<br>LIM 3    | K0.2<br>LIM 5    | o                                       | X           | o               | Medium                   | After                | X                                             |
|      | On (2)<br>pin 12 H | o                                              | X                                              | o                                    | o                          | o                       | K0.25<br>LIM 3    | K0.2<br>LIM 5    | o                                       | o           | Mid-point       | Medium                   | After                | X                                             |

## Control Pin Function Chart

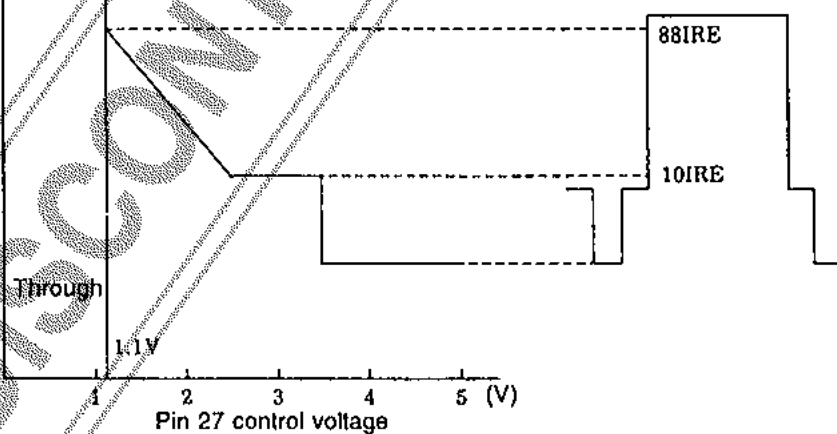
| Pin No.                                | L                                                                                                                                                                                                                                                                                                | 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<br>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>EDIT2 on                               |
| 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>EDIT1<br>US                  | Under 1.5V<br><br>US specifications                                                                                                                                                                                                                                                              | Open                                                   | Over 2.5 V<br>EDIT1 on                               |
| Pin 27<br>QV, QH, CHAR                 |                                                                                                                                                                                                                                                                                                  | Refer to pin 27,<br>QV, QH, CHAR,<br>insertion diagram |                                                      |
| 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 | <div><div>SW30</div><div><div>0.45V</div><div>0.75V</div><div>1.55V</div><div>1.85V</div><div>2.15V</div><div>2.45V</div></div><div><div>L</div><div></div><div>H</div><div></div><div>L</div><div>H</div></div><div><div>Tape speed</div><div>SP or EP mode</div><div>LP mode</div></div></div> |                                                        |                                                      |
| Pin 21<br>CNR off                      |                                                                                                                                                                                                                                                                                                  |                                                        | Over 3.0 V<br>CNR off                                |

LA7383

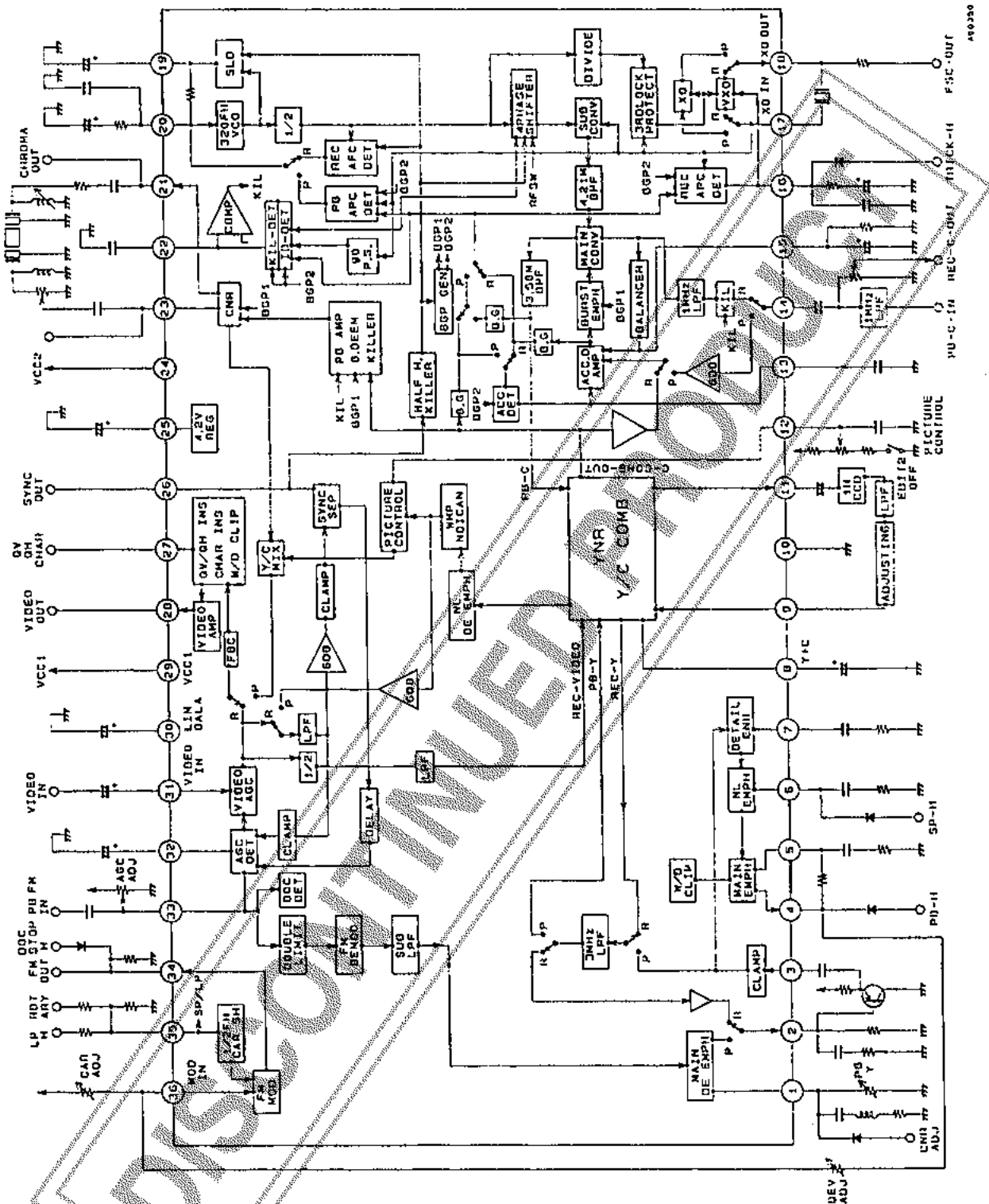
Pin 27

QV, QH, CHAR, insertion

Pin 28 output



## Application Circuit Examples

Unit (resistance:  $\Omega$ , capacitance: F)

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