

# SECAM discriminator IC

## BA7007

The BA7007 is a SECAM discriminator suitable for use in video cassette recorders. The BA7007 includes a pre-limiter circuit, detector, slicer-tuning amplifier and comparator. By adding a ceramic filter, and LC circuit for the  $f_H/2$  oscillation frequency, and a few resistors and capacitors it is possible to construct an extremely sensitive SECAM discriminator using a simple circuit with low space requirements that will lead to lower costs, and better performance and reliability.

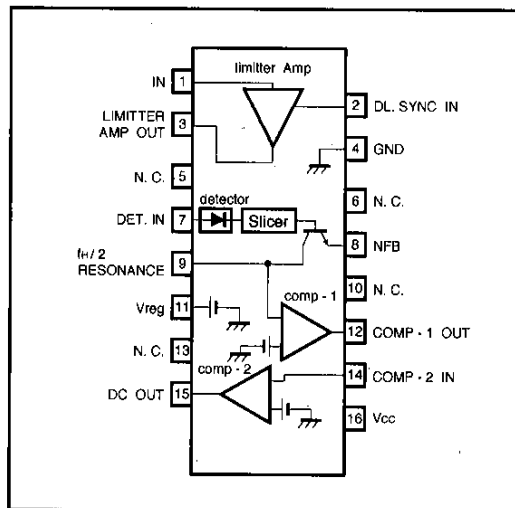
### ●Applications

SECAM discriminator for VCRs.

### ●Features

- 1)Extremely stable SECAM discrimination even with power supply and burst-signal input level fluctuations.
- 2)Digital conversion-type integration is used to ensure a large noise margin, and give high sensitivity.
- 3)Low variation in discriminator sensitivity means that adjustment is not necessary.
- 4)Few external components required.
- 5)Large current output capacity.

### ●Block diagram



● Absolute maximum ratings (Ta=25°C)

| Parameter             | Symbol           | Limits  | Unit |
|-----------------------|------------------|---------|------|
| Power supply voltage  | V <sub>CC</sub>  | 15      | V    |
| Power dissipation     | P <sub>d</sub>   | 400 *   | mW   |
| Operating temperature | T <sub>opr</sub> | -25~75  | °C   |
| Storage temperature   | T <sub>stg</sub> | -55~125 | °C   |

\* Reduced by 4mW for each increase in Ta of 1°C over 25°C.

● Electrical characteristics (Unless otherwise specified Ta=25°C and V<sub>CC</sub>=9V)

| Parameter                       | Symbol             | Min. | Typ. | Max. | Unit             | Conditions  | Measurement Circuit |
|---------------------------------|--------------------|------|------|------|------------------|---|---------------------|
| Quiescent current               | I <sub>Q</sub>     | —    | 10   | 15   | mA               | Limiter amplifier off, no output                                      | Fig.1               |
| Limiter amplifier gain          | G <sub>V1-4</sub>  | 11   | 15   | 19   | dB               | V <sub>IN</sub> =0.1V <sub>P-P</sub> ; f=10kHz, R <sub>L</sub> =100kΩ | Fig.1               |
| Limiter amplifier maximum gain  | V <sub>O4</sub>    | 0.9  | 1.25 | 1.6  | V <sub>P-P</sub> | V <sub>IN</sub> =0.1V <sub>P-P</sub> ; f=10kHz, R <sub>L</sub> =100kΩ | Fig.1               |
| Extracted pulse threshold       | V <sub>TH</sub>    | —    | 0.6  | —    | V                | Pin 2 voltage   | Fig.1               |
| Tuning amplifier output voltage | V <sub>O10</sub>   | 0.2  | 1.35 | 2.5  | V <sub>P-P</sub> | V=0.2V <sub>P-P</sub> ; f=10kHz                                       | Fig.1               |
| Tuning amplifier supply voltage | V <sub>I0</sub>    | —    | 4.3  | —    | V                | R <sub>L</sub> =10kΩ  | Fig.1               |
| DC output voltage               | V <sub>I5ON</sub>  | 6.5  | 8.2  | —    | V                | R <sub>L</sub> =510Ω  | Fig.1               |
| DC output leakage voltage       | V <sub>I5OFF</sub> | —    | 0.0  | 0.5  | V                | R <sub>L</sub> =100kΩ   | Fig.1               |

● Measurement circuit

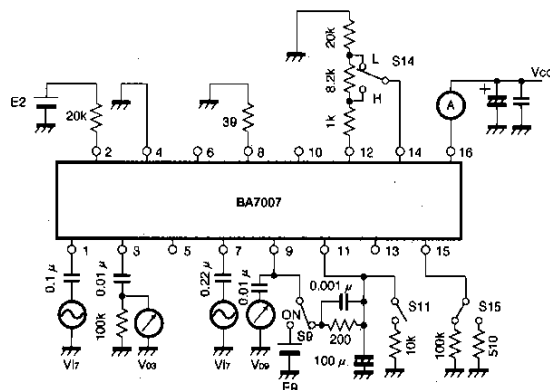


Fig.1

|                                     | E2   | E9   | S9  | S11   | S14 | S15  |
|-------------------------------------|------|------|-----|-------|-----|------|
| I <sub>CC</sub>                     | 0    | 0    | OFF | OPEN  | L   | 100k |
| G <sub>V2-3</sub> , V <sub>O3</sub> | 2.5V | 0    | OFF | OPEN  | L   | 100k |
| V <sub>O8</sub>                     | 0    | 0    | OFF | OPEN  | L   | 100k |
| V <sub>I11</sub>                    | 0    | 0    | OFF | CLOSE | L   | 100k |
| V <sub>I5 ON</sub>                  | 0    | 6.5V | ON  | OPEN  | H   | 510  |
| V <sub>I5 OFF</sub>                 | 0    | 6.5V | ON  | OPEN  | L   | 100k |

## ●Application example

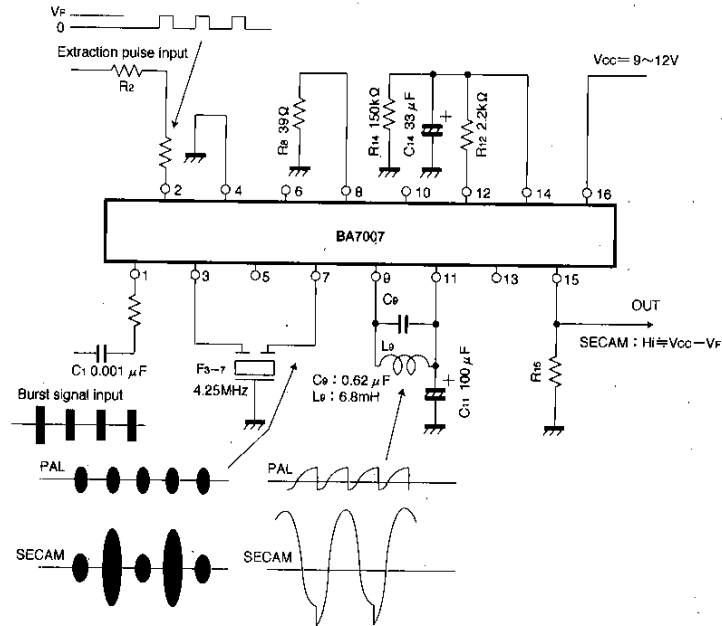
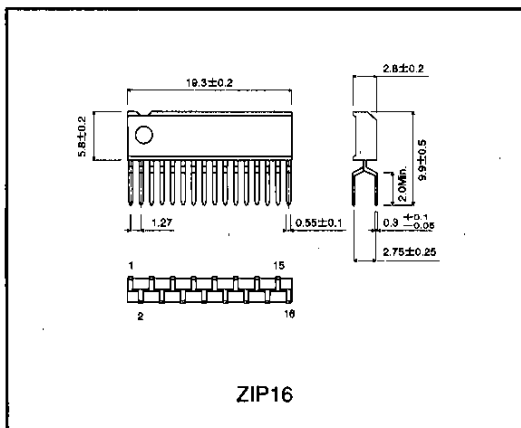


Fig.2

|   |   |
|---|---|
| C <sub>1</sub>  | Limiting amplifier input coupling capacitor   |
| R <sub>2</sub>  | Extraction pulse current limiting resistor  |
| F <sub>3-7</sub>                                      | 4.25MHz band-pass filter (impedance: 1kΩ) (It is also possible to use a 4.4MHz filter, but there will be a slight drop in discrimination sensitivity). Input/output impedance: 1kΩ                                  |
| R <sub>8</sub>  | Resistor for adjusting the tuning amplifier output level  |
| C <sub>9</sub><br>L <sub>9</sub>                      | For f <sub>H/2</sub> resonator circuit  |
| C <sub>11</sub>                                       | Ripple filter (for LC resonator circuit)  |
| C <sub>12</sub><br>C <sub>14</sub><br>R <sub>14</sub> | Components that determine the discrimination time (charge/discharge time constant)<br>Charging time constant = R <sub>12</sub> and C <sub>14</sub><br>Discharge time constant = R <sub>14</sub> and C <sub>14</sub> |
| R <sub>15</sub>                                       | Resistor for absorption of output leakage   |

●External dimensions (Units: mm)



PAL/SECAM detector

VCR components