

**SANYO**

No.4038

**LA7916****Peripheral Circuit for TV / VCR Frequency  
Synthesizer Channel Select System**

The LA7916 contains CPU/PLL-excluded peripheral circuits such as switch, +5V power supply (with  $\overline{\text{RST}}$ ), sync detector, low-pass filter for color TV/VTR frequency synthesizer channel select system use.

**Functions**

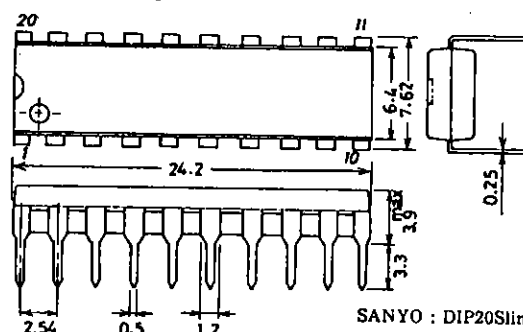
- Band switch (2-input 4-output)
- Video signal, flyback pulse, AFT output-used detection of tuning mode and horizontal sync mode
- +5V power supply, with  $\overline{\text{RST}}$  output (for CPU)
- OP amp for low-pass filter (for frequency synthesizer)

**Features**

- The band switch truth table can be changed in a short period of time at the user's option.
- The band switch is of pnp output type which need not be driven externally.
- The OP amp for low-pass filter is excellent in pulse response because of its high-impedance input pin.

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

|                                              |                                              |                             |             |                  |
|----------------------------------------------|----------------------------------------------|-----------------------------|-------------|------------------|
| Allowable Power Dissipation                  | $P_d \text{ max}$                            | $T_a \leq 65^\circ\text{C}$ | 770         | unit             |
| Operating Temperature                        | $T_{opr}$                                    |                             | -20 to +65  | $^\circ\text{C}$ |
| Storage Temperature                          | $T_{stg}$                                    |                             | -55 to +125 | $^\circ\text{C}$ |
| [Band Switch Section]                        |                                              |                             |             |                  |
| $V_{CC1}$ Maximum Supply Voltage             | $V_{13} \text{ max}$                         |                             | 15          | V                |
| Maximum Load Current                         | $I_{14}, I_{15}, I_{16}, I_{17} \text{ max}$ |                             | -50         | mA               |
| Maximum Applied Voltage                      | $V_{14}, V_{15}, V_{16}, V_{17} \text{ max}$ | Output off                  | -15         | V                |
| Maximum Applied Voltage (Input)              | $V_6 \text{ max}, V_7 \text{ max}$           | $V_{CC1} = 14\text{V}$      | 12          | V                |
| [+5V Power Supply Section]                   |                                              |                             |             |                  |
| $V_{CC2}$ Maximum Supply Voltage             | $V_{10} \text{ max}$                         |                             | 15          | V                |
| +5V Output Current                           | $I_8 \text{ max}$                            |                             | -38         | mA               |
| [Tuning Detection Section]                   |                                              |                             |             |                  |
| Maximum Input Voltage                        | $V_2 \text{ max}$                            |                             | 3.5         | V                |
| Maximum Input Voltage                        | $V_3 \text{ max}$                            |                             | $V_{CC1}$   | V                |
| Maximum Input Voltage<br>(Negative Polarity) | $-V_2 \text{ max}$                           |                             | -1.4        | V                |
| Maximum Comparator<br>Difference Voltage     | $V_{19}-V_{20}$                              |                             | 6           | V                |
| Maximum Output Current                       | $I_1 \text{ max}$                            |                             | -3          | mA               |
| [Operational Amplifier Section]              |                                              |                             |             |                  |
| Maximum Applied Voltage                      | $V_{12} \text{ max}$                         |                             | 35          | V                |
| Maximum Input Voltage                        | $V_{11} \text{ max}$                         |                             | 5.9         | V                |

**Package Dimensions**(unit : mm)  
3021B

SANYO : DIP20SLim

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**Operating Conditions at Ta = 25°C**

|                                                                                   |                                 | min | typ | max  | unit |
|-----------------------------------------------------------------------------------|---------------------------------|-----|-----|------|------|
| Supply Voltage Range                                                              | V <sub>10</sub>                 | 9.0 | 12  | 14.0 | V    |
|                                                                                   | V <sub>13</sub>                 | 9.0 | 12  | 14.0 | V    |
| Recommended Output Current<br>in Tuning Detection Section                         | I <sub>4</sub> , I <sub>5</sub> |     |     | 3    | mA   |
| Recommended Load Current<br>in OP Amp Section                                     | I <sub>12</sub>                 |     | 3   | 5    | mA   |
| Recommended Setting Range<br>of Comparator Voltage<br>in Tuning Detection Section | V <sub>19</sub>                 | 2.7 |     | 7.0  | V    |

**Operating Characteristics at Ta = 25°C**

|                                 |                                     |                         | min   | typ  | max   | unit |
|---------------------------------|-------------------------------------|-------------------------|-------|------|-------|------|
| [Band Switch Section]           |                                     |                         |       |      |       |      |
| Quiescent Current Dissipation   | I <sub>CC1</sub>                    |                         |       | 16.0 |       | mA   |
| Output Saturation Voltage       | F1 to 4 sat                         | I <sub>o</sub> = -40mA  | 0     |      | 0.7   | V    |
| Input 'H'-Level Voltage         | V <sub>6TH</sub> , V <sub>7TH</sub> |                         | 2.2   |      |       | V    |
| Input 'L'-Level Voltage         | V <sub>6TL</sub> , V <sub>7TL</sub> |                         | 0     |      | 0.8   | V    |
| Output Leakage Current          | I <sub>FL</sub>                     | -15V                    |       |      | -50   | μA   |
| [+5V Power Supply Section]      |                                     |                         |       |      |       |      |
| Quiescent Current Dissipation   | I <sub>CC2</sub>                    |                         |       | 3.6  |       | mA   |
| +5V Output Voltage              | V <sub>8</sub>                      | I <sub>g</sub> = -30mA  | 4.5   |      | 5.5   | V    |
| RST Output Voltage              | V <sub>9</sub> sat                  | I <sub>g</sub> = -100μA | 4.5   |      | 5.5   | V    |
| [Tuning Detection Section]      |                                     |                         |       |      |       |      |
| Input Threshold Voltage         | V <sub>2TH</sub>                    |                         | 0.4   | 0.72 | 1.5   | V    |
| Comparator Voltage              | V <sub>C19</sub>                    |                         | 3.7   | 4.0  | 4.3   | V    |
| Window Comparator 'H' Voltage   | V <sub>CH</sub>                     |                         | 5.7   | 6.0  | 6.3   | V    |
| Window Comparator 'L' Voltage   | V <sub>CL</sub>                     |                         | 2.7   | 3.0  | 3.3   | V    |
| Output Saturation Voltage       | V <sub>4</sub> sat                  | I <sub>sink</sub> = 2mA | 0     | 0.33 | 0.7   | V    |
|                                 | V <sub>5</sub> sat                  | I <sub>sink</sub> = 2mA | 0     | 0.33 | 0.7   | V    |
| Low-Pass Filter Output Current  | I <sub>OL</sub>                     |                         | -1.80 |      | -0.90 | mA   |
| Sync Separation Start Current   | I <sub>1TH</sub>                    |                         | -150  |      |       | μA   |
| [Operational Amplifier Section] |                                     |                         |       |      |       |      |
| Output Saturation Voltage       | V <sub>12</sub> sat                 |                         | 0     |      | 0.3   | V    |
| Input Threshold Voltage         | V <sub>11TH</sub>                   |                         | 2.0   |      | 2.4   | V    |
| Input Current                   | I <sub>11</sub>                     |                         |       |      | 20    | nA   |

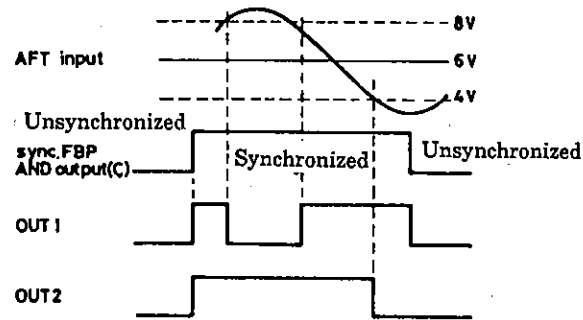
**Band Switch Truth Table**

| Input        |              | Output         |                |                |                |
|--------------|--------------|----------------|----------------|----------------|----------------|
| A<br>(Pin 7) | B<br>(Pin 6) | F1<br>(Pin 14) | F2<br>(Pin 15) | F3<br>(Pin 16) | F4<br>(Pin 17) |
| L            | L            | H              | Z              | Z              | Z              |
| H            | L            | Z              | H              | Z              | Z              |
| L            | H            | Z              | Z              | H              | Z              |
| H            | H            | Z              | Z              | Z              | H              |

**Operation of Tuning Detection Section**

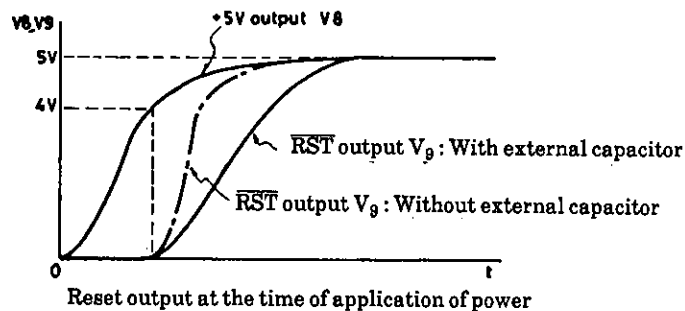
| Tuning Mode    | LPF Output | AFT   | OUT 1 | OUT 2 |
|----------------|------------|-------|-------|-------|
| Unsynchronized | L          | AFT-L | L     | L     |
|                |            | AFT-C | L     | L     |
|                |            | AFT-H | L     | L     |
| Synchronized   | H          | AFT-L | H     | L     |
|                |            | AFT-C | H     | H     |
|                |            | AFT-H | L     | H     |

AFT-L: V<sub>AFT</sub> < V<sub>CL</sub>AFT-C: V<sub>CL</sub> < V<sub>AFT</sub> < V<sub>CH</sub>AFT-H: V<sub>AFT</sub> > V<sub>CH</sub>

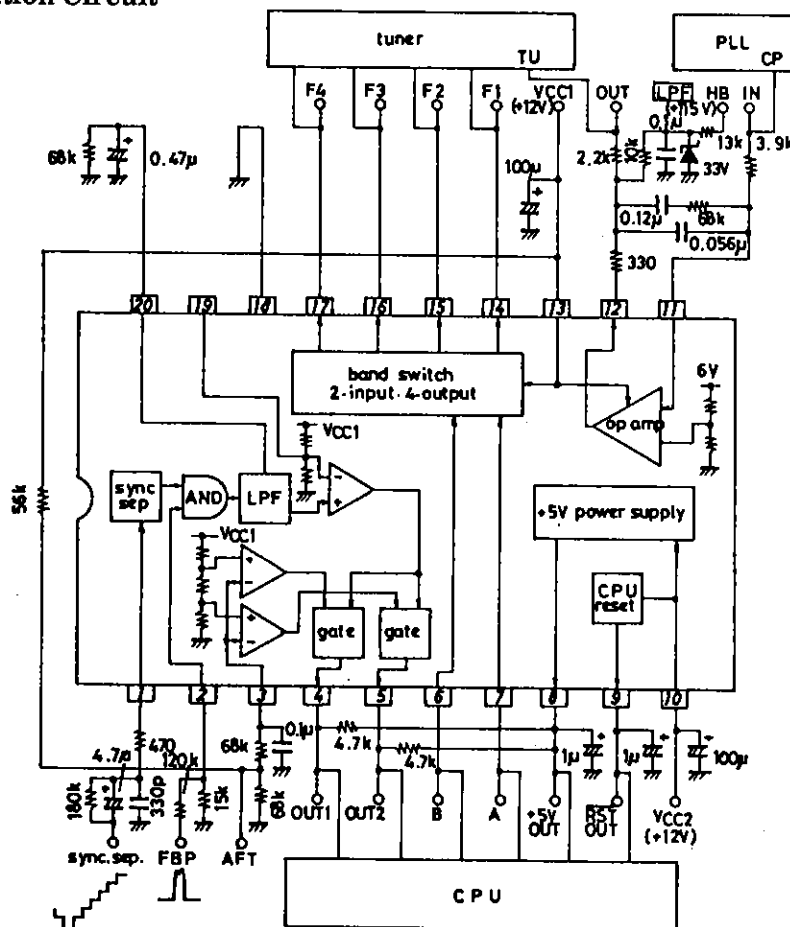


### +5V Power Supply, $\overline{\text{RST}}$ Output

When +5V output  $V_8$  becomes approximately 4V at the time of application of power, the reset signal is delivered at pin 9. The reset signal can be delayed by a capacitor (recommended value :  $1\mu\text{F}$ ) externally connected to  $\overline{\text{RST}}$  output  $V_9$ .



### Sample Application Circuit



VTR application: In VTR applications without flyback pulse, connected pin 2 to  $V_{CC}$  through a resistor

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

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