Ordering number:ENN4038

Monolithic Linear IC

LA7916

Peripheral Circuit for TV/VCR Frequency Synthesizer Channel Select System

Overview

The LA7916 contains CPU/PLL-excluded peripheral circuits such as switch, +5V power supply (with $\overline{RST}$), sync detector, low-pass filter for color TV/VCR 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 $\overline{RST}$ ouput (for CPU).
- Operational amplifier for low-pass filter (for frequency synthesizer).

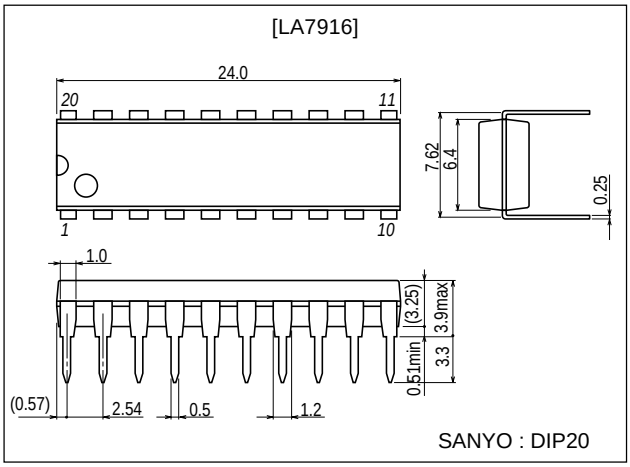
Features

- 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 operational amplifier for low-pass filter is excellent in pulse response because of its high-impedance input pin.

Package Dimensions

unit:mm

3021C-DIP20



Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Allowable power dissipation	Pd max	Ta≤65˚C	770	mW
Operating temperature	Topr		–20 to +65	˚C
Storage temperature	Tstg		–55 to +125	˚C
[Band switch section]				
V_{CC1} maximum supply voltage	V_{13} max		15	V
Maximum load current	I_{14}, I_{15} max, I_{16}, I_{17} max		–50	mA
Maximum applied voltage	V_{14}, V_{15} max, V_{16}, V_{17} max	Output off	–15	V
Maximum applied voltage (input)	V_6 max, V_7 max	V_{CC1}=14V	12	V
[+5V power supply section]				
V_{CC2} maximum supply voltage	V_{10} max		15	V
+5V output current	I_8 max		–38	mA

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Parameter	Symbol	Conditions	Ratings	Unit
[Tuning detection section]				
Maximum input voltage	V_2 max		3.5	V
Maximum input voltage	V_3 max		V_{CC1}	V
Maximum input voltage (negative polarity)	$-V_2$ max		–1.4	V
Maximum comparator difference voltage	V_{19}-V_{20}		6	V
Maximum output current	I_1 max		–3	mA
[Operational amplifier section]				
Maximum applied voltage	V_{12} max		35	V
Maximum input voltage	V_{11} max		5.9	V

Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply voltage range	V_{10}		9.0	12	14.0	V
	V_{13}		9.0	12	14.0	V
Recommended output current in tuning detection section	I_4, I_5				3	mA
Recommended load current in operational amplifier section	I_{12}			3	5	mA
Recommended setting range of comparator voltage in tuning detection section	V_{19}		2.7		7.0	V

Operating Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[Band switch section]						
Quiescent current drain	I_{CC1}			16.0		mA
Output saturation voltage	F1 to 4 sat	Io=–40mA	0		0.7	V
Input high-level voltage	V_{6TH}, V_{7TH}		2.2			V
Input low-level voltage	V_{6TL}, V_{7TL}		0		0.8	V
Output leakage current	I_{FL}	–15V			–50	µA
[+5V power supply section]						
Quiescent current drain	I_{CC2}			3.6		mA
+5V output voltage	V_8	I_8=–30mA	4.5		5.5	V
RST output voltage	V_9 sat	I_9=–100µA	4.5		5.5	V
[Tunig detection section]						
Input threshold voltage	V_{2TH}		0.4	0.72	1.5	V
Comparator voltage	V_{C19}		3.7	4.0	4.3	V
Window comparator high voltage	V_{CH}		5.7	6.0	6.3	V
Window comparator low voltage	V_{CL}		2.7	3.0	3.3	V
Output saturation voltage	V_4 sat	Isink=2mA	0	0.33	0.7	V
	V_5 sat	Isink=2mA	0	0.33	0.7	V
Low-pass filter output current	I_{OL}		–1.80		–0.90	mA
Sync separation start current	I_{1TH}		–150			µA
[Operational amplifier section]						
Output saturation voltage	V_{12} sat		0		0.3	V
Input threshold voltage	V_{11TH}		2.0		2.4	V
Input current	I_{11}				20	nA

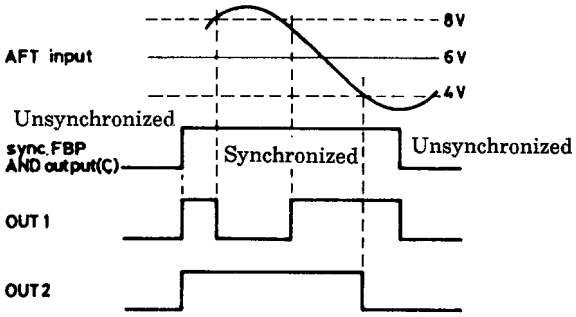
Band Switch Truth Table

Input		Output			
A (Pin 7)	B (Pin 6)	F1 (Pin 14)	F2 (Pin 15)	F3 (Pin 16)	F4 (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

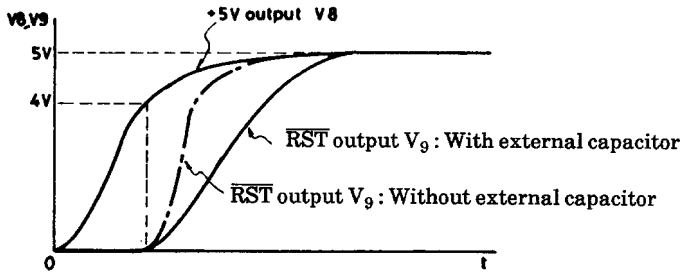
Tuning Mode	LPF Output	AFT	OUT1	OUT2
Unsynchronized	L	AFT-L AFT-C AFT-H	L L L	L L L
Synchronized	H	AFT-L AFT-C AFT-H	H H L	L H H

AFT-L : $V_{AFT}<V_{CL}$
AFT-C : $V_{CL}<V_{AFT}<V_{CH}$
AFT-H : $V_{AFT}>V_{CH}$



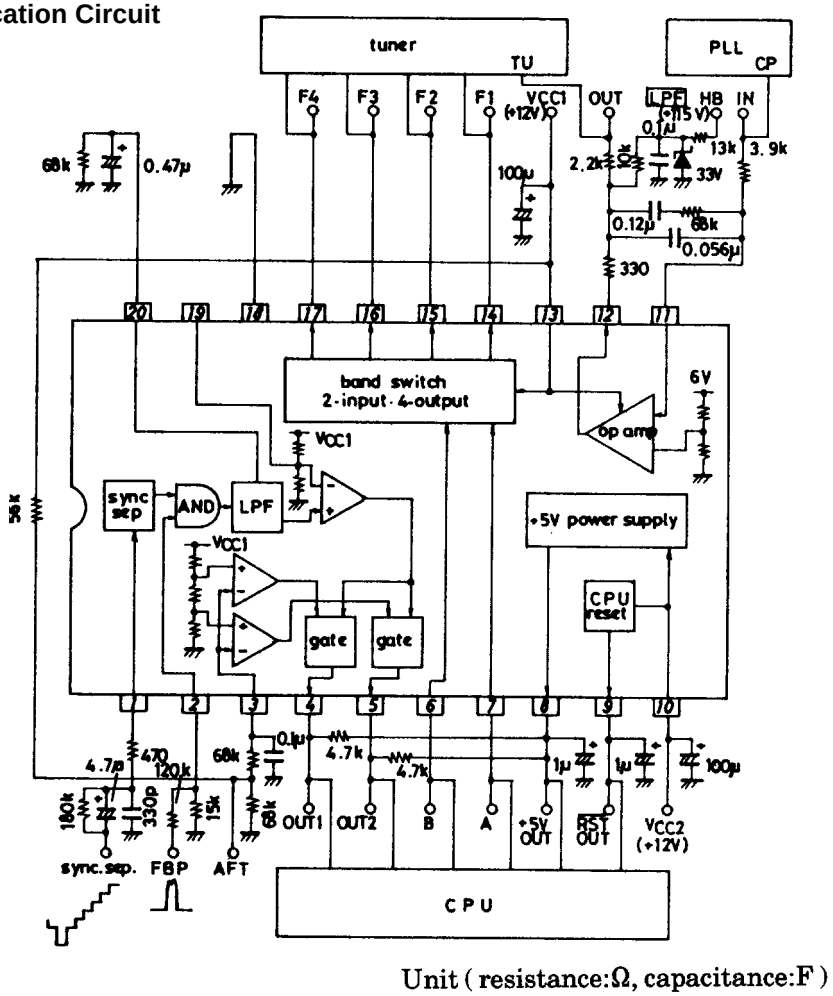
+5V Power Supply, $\overline{RST}$ Output

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 : 1μF) externally connected to $\overline{RST}$ output V_9.



Reset output at the time of application of power

Sample Application Circuit



Unit (resistance:Ω, capacitance:F)

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