

NTE7004 Integrated Circuit Electronic Channel Select System Control

Description:

The NTE7004 contains CPU/PLL-excluded peripheral circuits such as band 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} 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.

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

| | |
|--|-------------------------------------|
| Allowable Power Dissipation ($T_A \leq +65^\circ\text{C}$), P_{dmax} | 770mW |
| Operating Temperature Range, T_{opr} | -20° to $+65^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -55° to $+125^\circ\text{C}$ |

Band Switch Section

| | |
|---|-------|
| V_{CC1} Maximum Supply Voltage, V_{13max} | 15V |
| Maximum Load Current, $I_{14}, I_{15}, I_{16}, I_{17max}$ | -50mA |
| Maximum Applied Voltage (Output OFF), $V_{14}, V_{15}, V_{16}, V_{17max}$ | -15V |
| Maximum Applied Voltage (Input, $V_{CC} = 14V$), V_{6max}, V_{7ma} | 12V |

+5V Power Supply Section

| | |
|---|-------|
| V_{CC2} Maximum Supply Voltage, V_{10max} | 15V |
| +5V Output Current, I_{8max} | -38mA |

Absolute Maximum Ratings (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Tuning Detector Section

| | |
|---|--------------------|
| Maximum Input Voltage, $V_{2\text{max}}$ | 3.5V |
| Maximum Input Voltage, $V_{3\text{max}}$ | V_{CC1} V |
| Maximum Input Voltage (Negative Polarity), $-V_{2\text{max}}$ | -1.4V |
| Maximum Comparator Difference Voltage, $V_{19} - V_{20}$ | 6V |
| Maximum Output Current, $I_{1\text{max}}$ | -3mA |

Low-Pass Filter Section

| | |
|---|------|
| Maximum Applied Voltage, $V_{12\text{max}}$ | 35V |
| Maximum Input Voltage, $V_{11\text{max}}$ | 5.9V |

Recommended Operating Conditions: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit |
|--|------------|-----|------|------|------|
| Supply Voltage Range (V_{CC1}) | V_{10} | 9.0 | 12.0 | 14.0 | V |
| | V_{13} | 9.0 | 12.0 | 14.0 | |
| Output Current (Tuning Detection Section) | I_4, I_5 | - | - | 3 | mA |
| Load Current (LPF Section) | I_{12} | - | 3 | 5 | mA |
| Comparator Voltage Setting Range (Tuning Detector Section) | V_{19} | 2.7 | - | 7.0 | V |

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $V_{\text{CC1}} = 12\text{V}$, $V_{\text{CC2}} = 12\text{V}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|-----------------------------------|--------------------------------|------|------|------|---------------|
| Band Switch Section | | | | | | |
| Quiescent Current Dissipation | I_{CC1} | | - | 16.0 | - | mA |
| Output Saturation Voltage | $F_{1 \text{ to } 4 \text{ sat}}$ | $I_O = -40\text{mA}$ | 0 | - | 0.7 | V |
| Input "H" Level Voltage | $V_{6\text{TH}}, V_{7\text{TH}}$ | | 2.2 | - | - | V |
| Input "L" Level Voltage | $V_{6\text{TL}}, V_{7\text{TL}}$ | | 0 | - | 0.8 | V |
| Output Leakage Current | I_{FL} | -15V | - | - | -50 | μA |
| +5V Power Supply Section | | | | | | |
| Quiescent Current Dissipation | I_{CC2} | | - | 3.6 | - | mA |
| +5V Output Voltage | V_8 | $I_8 = -30\text{mA}$ | 4.5 | - | 5.5 | V |
| RST Output Voltage | $V_{9\text{sat}}$ | $I_9 = -100\mu\text{A}$ | 4.5 | - | 5.5 | V |
| Tuning Detection Section | | | | | | |
| Input Threshold Voltage | $V_{2\text{TH}}$ | | 0.4 | 0.72 | 1.5 | V |
| Comparator Voltage | V_{C19} | | 3.7 | 4.0 | 4.3 | V |
| Window Comparator "H" Voltage | V_{CH} | | 5.7 | 6.0 | 6.3 | V |
| Window Comparator "L" Voltage | V_{CL} | | 2.7 | 3.0 | 3.3 | V |
| Output Saturation Voltage | $V_{4\text{sat}}$ | $I_{\text{sink}} = 2\text{mA}$ | 0 | 0.33 | 0.7 | V |
| | $V_{5\text{sat}}$ | $I_{\text{sink}} = 2\text{mA}$ | 0 | 0.33 | 0.7 | |
| Low-Pass Filter Output Current | I_{OL} | | -1.8 | - | -0.9 | mA |
| LPF Section | | | | | | |
| Output Saturation Voltage | $V_{12\text{sat}}$ | | 0 | - | 0.3 | V |
| Input Threshold Voltage | $V_{11\text{TH}}$ | | 2.0 | - | 2.4 | V |
| Input Current | I_{11} | | - | - | 20 | nA |

Band Switch Truth Table

| Input | | Output | | | |
|-------------|-------------|---------------------------|---------------------------|---------------------------|---------------------------|
| A (Pin7) | B (Pin6) | F ₁ (Pin14) | F ₂ (Pin15) | F ₃ (Pin16) | F ₄ (Pin17) |
| L | L | H | Z | Z | Z |
| H | L | Z | H | Z | Z |
| L | H | Z | Z | H | Z |
| H | H | Z | Z | Z | H |

Z: High Impedance

Operation of Tuning Detection Section

| Tuning Mode | LPF Output | AFT | OUT1 | OUT2 |
|----------------|------------|-------|------|------|
| 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: $V_{AFT} < V_{CL}$

AFT-C: $V_{CL} < V_{AFT} < V_{CH}$

AFT-H: $V_{AFT} > V_{CH}$

Pin Connection Diagram



