NTE1738
Integrated Circuit
TV Remote Control Receiver

Description:
The NTE1738 is a 29–function remote–control receiver circuit manufactured by aluminum–gate CMOS technology for use in television receivers, audio equipment, and the like using infrared for transmission. It enables direct control of 12 functions at the receiver.

Features:
● Single Power Supply
● Wide Supply Voltage Range: 8V to 14V
● Low Power Dissipation
● On–Chip Oscillator
● Low–Cost LC or Ceramic Oscillator used in Determining Reference Frequency (480kHz or 455kHz)
● Information is Transmitted by Pulse Code Modulation
● Good Noise Immunity—Instructions are not Executed unless the Same Code is Received Three or more Times in Succession
● Single Transmission Frequency (40kHz or 38kHz) for Carrier Wave
● 16 TV Channels Selected Directly
● Three Analog Functions — Volume, Brightness and Color Saturation — are Independently Controlled to 64 Stages by Three 6–Bit D/A Converters.
● 12 Instructions are Controlled at the NTE1738 Receiver, as well.
● Has Large Tolerance in Operating Frequency between the Transmitter and the Receiver

Application:
● Remote–Control Receiver for TV or other Applications

Function:
The NTE1738 is designed to decode and execute instructions after three successive receptions of the identical instruction code, providing a good noise immunity. Instructions comprise direct selection of 16 channels, channel position high and low, color saturation high and low, normalization of volume, brightness and color saturation, sound mute on and off, TV main power on and off, and output CALL on and off.

In addition, 12 functional instructions can be entered from the receiver.

Absolute Maximum Ratings:
Supply Voltage (With respect to \(V_{SS}\)), \(V_{DD}\) .......................... \(-0.3\)V to 15V
Input Voltage, \(V_I\) .................................................. \(V_{SS} \leq V_I \leq V_{DD}\)
Output Voltage, \(V_O\) .................................................. \(V_{SS} \leq V_O \leq V_{DD}\)
Maximum Power Dissipation (\(T_A = +25\)°C), \(P_D\) ............................................. 300mW
Operating Free–Air Temperature Range, \(T_{opr}\) ................................. \(-30\)° to +70°C
Storage Temperature Range, \(T_{stg}\) .................................................. \(-40\)° to +126°C
### Recommended Operating Conditions:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>$V_{DD}$</td>
<td></td>
<td>8</td>
<td>12</td>
<td>14</td>
<td>V</td>
</tr>
<tr>
<td>Oscillation Frequency</td>
<td>$f_{OSC}$</td>
<td></td>
<td>–</td>
<td>455</td>
<td>–</td>
<td>kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>–</td>
<td>480</td>
<td>–</td>
<td>kHz</td>
</tr>
<tr>
<td>Input Voltage, SI</td>
<td>$V_I$</td>
<td></td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>V_{P-P}</td>
</tr>
</tbody>
</table>

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

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<tr>
<th>Parameter</th>
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<tr>
<td>Supply Voltage</td>
<td>$V_{DD}$</td>
<td>$T_A = -30^\circ$ to $+70^\circ C$, $f_{OSC} = 455kHz$</td>
<td>8</td>
<td>12</td>
<td>14</td>
<td>V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>$I_{DD}$</td>
<td>$f_{OSC} = 455kHz$</td>
<td>–</td>
<td>2</td>
<td>5</td>
<td>mA</td>
</tr>
<tr>
<td>Pull–Up Resistance</td>
<td>$R_I$</td>
<td></td>
<td>–</td>
<td>20</td>
<td>–</td>
<td>kΩ</td>
</tr>
<tr>
<td>Low Level Output Currents</td>
<td>$I_{OL}$</td>
<td>$V_O = 12V$</td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
<tr>
<td>High Level Output Currents</td>
<td>$I_{OH}$</td>
<td>$V_O = 0V$</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
<tr>
<td>Low Level Output Currents</td>
<td>$I_{OL}$</td>
<td>$V_O = 12V$</td>
<td>7</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
<tr>
<td>High Level Output Currents</td>
<td>$I_{OH}$</td>
<td>$V_O = 0V$</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
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<td>Low Level Output Currents</td>
<td>$I_{OL}$</td>
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<td>5</td>
<td>–</td>
<td>–</td>
<td>mA</td>
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<td>High Level Output Currents</td>
<td>$I_{OH}$</td>
<td>$V_O = 0V$</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
<tr>
<td>Low Level Output Currents</td>
<td>$I_{OL}$</td>
<td>$V_O = 12V$</td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>mA</td>
</tr>
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</table>
Pin Connection Diagram

Power ON Input (0V) VSS
Transmission Signal Input
Automatic Clear Input
Key Input I1
Key Input I2
Key Input I3
Scanner Output $\phi_A$
Scanner Output $\phi_B$
Scanner Output $\phi_C$
Scanner Output $\phi_D$
OSC Input
OSC Output
VDD

28 Reception Indication Output
27 CH RESET
26 CH UP
25 CH RUN
24 Channel Control Output P0
23 Channel Control Output P1
22 Channel Control Output P2
21 Channel Control Output P3
20 Power ON/OFF Control Output
19 Call Control Output
18 Sound Mute Indication Output
17 D/A Output VO
16 D/A Output BR
15 D/A Output CS

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Dimensions:
- 1.469 (37.32) Max
- 1.300 (33.02) Min
- .100 (2.54)
- .250 (6.35)
- .122 (3.1)
- .540 (13.7)
- .600 (15.24)