FEATURES
- Low Power 17mW
- Repetition Rate > 4 MHz
- Tunnel Diode, Snap Action Switching
- Radiation Hard (10^6 Rads Si)
- High Reliability Screening

APPLICATIONS
- Space Instrumentation
- Portable Instrumentation
- Nuclear Instrumentation

The A150 is a high performance hybrid pulse amplitude discriminator developed for use in precision pulse spectroscopy. Its low power dissipation (17mW), high speed (> 4 MHz), and radiation hardness (10^6 Rads), make it ideal for space flight use. The A150 is packaged in a standard 14-pin hybrid DIP.

### A150 CONNECTION DIAGRAM

```
  NC  NC  +6V
  14  13  12

+47F

10  Vee

0 - 1 MEG

PULSE WIDTH ADJUST

7

3  5  6
BIAS ADJUST

-6V  GND

+47F

4

2

INPUT

1

COMPARATOR

ONE SHOT

9  8

OUTPUT

11 + Vs Direct

12 Vee bias for output CMOS one-shot

13 N.C.

14 N.C.

PIN  FUNCTION
1  Non-Inverting Input
2  Inverting Input
3  Bias Adjust (Resistance to Pin 4 reduces operating current)
4  – Vs Direct
5  – Vs through 50 ohms
6  Case and Ground
7  Pulse Width Adjust (must be connected to pin 12 either directly for minimum pulse width, or through a resistor).

PIN  FUNCTION
8  Output (positive)
9  Output (negative)
10  + Vs through 50 ohms
11  + Vs Direct
12  Vee bias for output CMOS one-shot
13  N.C.
14  N.C.
```
## Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage VS</td>
<td>Vsupply</td>
<td>±8V</td>
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<td></td>
<td></td>
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<tr>
<td>CMOS Supply VDD</td>
<td>VDD</td>
<td>+18V</td>
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<tr>
<td>Input Voltage</td>
<td>Vsupply</td>
<td></td>
<td>± VS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td></td>
<td>-55°C to +110°C</td>
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<tr>
<td>Storage Temperature</td>
<td></td>
<td>-65°C to +110°C</td>
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<tr>
<td>Lead Temperature Range (Soldering, 10 sec.)</td>
<td></td>
<td>300°C</td>
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</table>

## Electrical Characteristics $V_S = \pm 6V, V_{DD} = +10V, T_A = +25°C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
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<tr>
<td>Output Pulse Width — Positive</td>
<td>TWP</td>
<td>160</td>
<td>195</td>
<td>210</td>
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<td>Output Pulse Width — Negative</td>
<td>TWN</td>
<td>150</td>
<td>185</td>
<td>200</td>
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<td>Output Pulse Delay — Positive</td>
<td>TDP</td>
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<td>120</td>
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<td>Output Pulse Delay — Negative</td>
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<td>60</td>
<td>80</td>
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<td>Input Threshold Offset</td>
<td>VOS</td>
<td>±1</td>
<td>±5</td>
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<td>mV</td>
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<td>Supply Voltage</td>
<td>Vsupply</td>
<td>±4.5</td>
<td>±6</td>
<td>±8</td>
<td>V</td>
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<tr>
<td>Supply Current</td>
<td>IS</td>
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<td>±1.5</td>
<td>±1.7</td>
<td>mA</td>
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<tr>
<td>CMOS Supply</td>
<td>VDD</td>
<td>+4</td>
<td>+10</td>
<td>+18</td>
<td>V</td>
</tr>
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<td>Power Consumption</td>
<td>PD</td>
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<td></td>
<td>mW</td>
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<td>Input Offset Drift</td>
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<td>±10</td>
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<td>μV/°C</td>
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<td>Minimum Pulse Detected</td>
<td>VTmin</td>
<td>15</td>
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<td></td>
<td>mV</td>
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</tbody>
</table>

## A-150 OUTPUT WAVEFORMS

- Upper: Input Pulse at 5 MHz
- Middle: Pin 9 Output at VDD = +10V
- Lower: Pin 8 Output at VDD = +10V

- Upper: Input Pulse
- Middle: Outputs at VDD = +10V
- Lower: Outputs at VDD = +5V
A150 PULSE WIDTH vs RESISTANCE
(between Pin 7 & 12)
Vs = +6V, -6V; VDD = +10V

A150 POWER DISSIPATION vs RESISTANCE
(between Pin 3 & 4)
Vs = +6V, -6V; VDD = +10V

APPLICATION NOTES

LOW LEVEL DISCRIMINATOR
WITH VOLTAGE CONTROLLED THRESHOLD

AMPTEK INC.  6 DE ANGELO DRIVE, BEDFORD, MA 01730 U.S.A.  TEL: (617) 275-2242 FAX: (617) 275-3470
A TWO DETECTOR TELESCOPE SYSTEM

A COMPLETE STATE-OF-THE-ART PULSE PROCESSING SYSTEM

14 PIN DUAL IN-LINE HYBRID PACKAGE

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