photomultiplier amplifier-discriminator
AD7 data sheet

ET Enterprises electron tubes

1 description

The AD7 amplifier-discriminator is a printed circuit mounting module intended for use in fast photon counting or pulse counting systems. A TTL output pulse is produced for each input pulse from the photomultiplier tube that exceeds the adjustable threshold level.

The AD7 is housed in a tin plated steel enclosure providing excellent electrical shielding. Power and signal connections are via six insulated feed-through pins, facilitating direct mounting onto a printed circuit board.

Examples of the ET Enterprises range of Amplifier Discriminators

2 applications

- can be used for fast photon counting or pulse counting systems
- ideal for use in battery powered, portable instruments

3 features

- wide dynamic range
- adjustable threshold
- low power consumption
- fully screened enclosure
- direct mounting to pcb
- the threshold level is factory set to -2 mV but can be adjusted between -2 mV and -5 mV by use of a multiturn potentiometer accessible through the top of the unit

4 characteristics

input impedance	50 Ω
input threshold	-2 mV to -5 mV
input protection	limiting diodes
output pulse	TTL high level
output pulse amplitude (unterminated)	5 V
output pulse rise time	2 ns
output pulse fall time	2 ns
output impedance	50 Ω
pulse pair resolution	24 ns
power input at $10^6 s^{-1}$ count rate	+5 V, 10 mA
supply voltage	+4.75 V to +5.25 V
temperature:	
operating	+5 °C to +55 °C

5 dynamic range

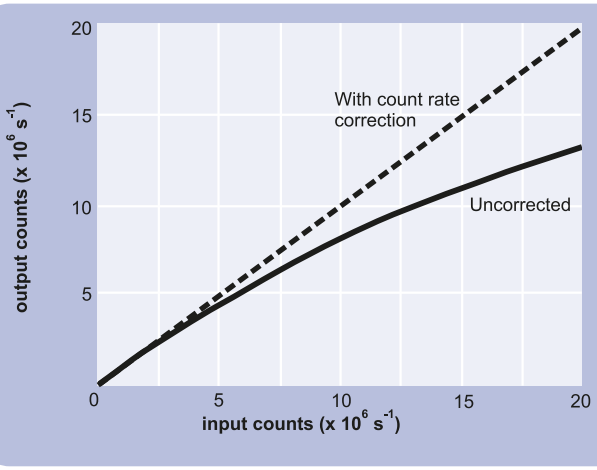
Maximum dynamic range can be realised by applying count rate correction to compensate for departure from linearity at high count rates due to pulse pile up:

$$\text{True count rate } N = \frac{n}{1 - nT}$$

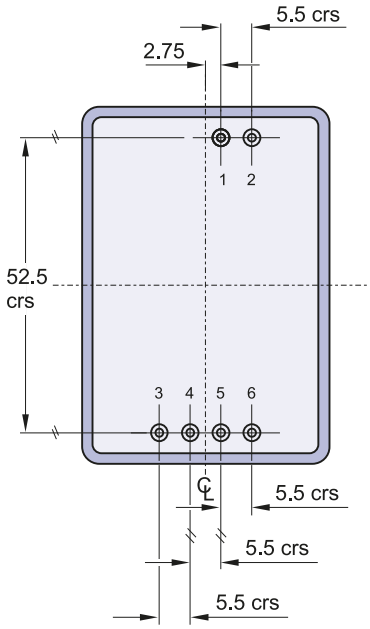
where n is the measured count rate (s^{-1}) and T is the count rate correction factor, in this case 2.4×10^{-8}s.

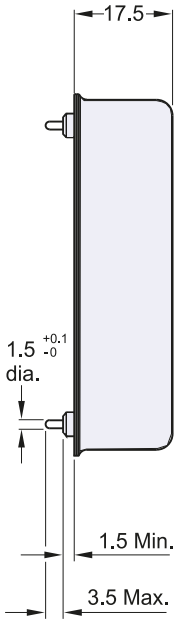
Using count rate correction, deviation from count rate linearity is typically within ±5% at $2 \times 10^7 s^{-1}$. Above this rate, the correction becomes less reliable.

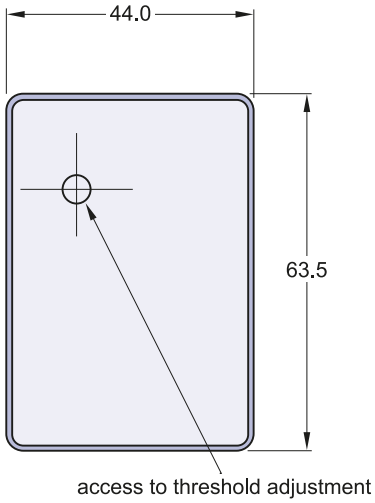
The AD7 has high input sensitivity requiring careful attention to pcb layout and system cabling.



6 outline drawings (mm)







7 connections

1	signal input
2	signal input ground
3	+5 V
4	0 V
5	signal output
6	signal output ground

The enclosure is internally connected to 0 V.

8 ordering information

The AD7 is also available with a prescaler which can be factory set to divide the output count rate by any integer from 2 to 16. This facility is intended for applications where the count rate performance of associated electronics may be too slow to enable the full dynamic range of the AD7 to be realised.

9 warning

Do not operate beyond the maximum ratings, or reverse the input voltage; this may result in loss of performance or permanent damage.

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