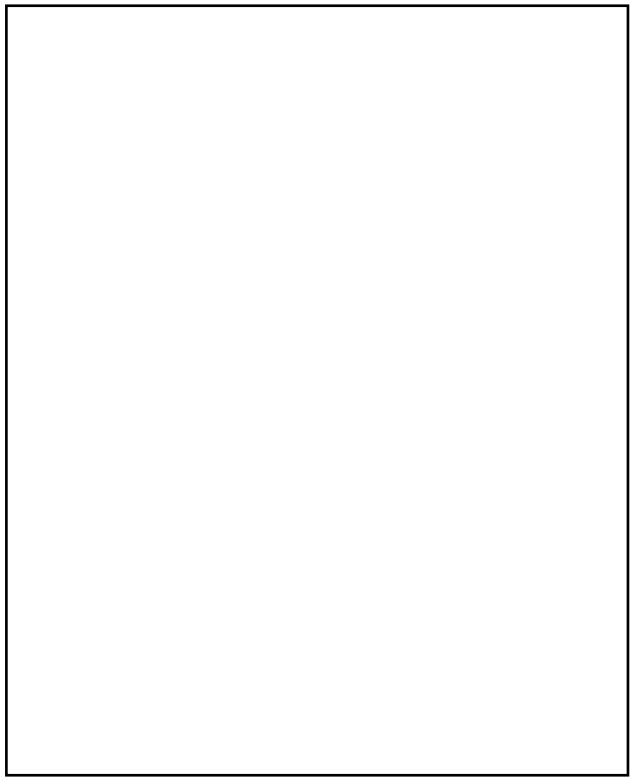
Advance Data Sheet
July 1996
For Evaluation Purposes Only

microelectronics group

Lucent Technologies
Bell Labs Innovations

High-Speed X170A Long-Wavelength PIN Photodetector



The High-Speed X170A PIN Photodetector features a bottom-illuminated, lensed receiver chip mounted in a hermetic package.

Features

- Wavelength: 1.1 µm—1.6 µm
- High-performance
  - — Very high bandwidth
  - — High responsivity
  - — High input saturation level
- Planar structure for high reliability
- Wide operating temperature range: –40 °C to +85 °C
- Bandwidth >12 GHz
- Package contains a 200 pF bypass capacitor
- Hermetic

Applications

- Telecommunications
  - — Broadband
- Military
  - — Microwave systems
  - — Remote antennae
  - — Tactical communications

Description

This product specification is intended as an aid in the process of defining a new product. The product described is available only as a model and should be used only for evaluation. This spec sheet serves only as a basis for discussion which may or may not lead to the generation of a final specification for development. The information contained herein must not be construed as a commitment to develop, manufacture, or deliver the device described by this document. If, in fact, such a device is developed, it is likely the specifications will differ, as may features and functionality. The reader is cautioned to use this document for discussion purposes only.

The high-speed 170A photodetector is a 2-mil diameter, bottom-illuminated, lensed receiver chip mounted in a hermetic package. The lens magnifies the junction, producing an apparent junction diameter of typically 70 μm. The chip is mounted over a hole in the bottom of the package.

Electro-Optical Characteristics

Table 1. Electrical and Optical Characteristics

All measurements made at 23 °C unless otherwise noted. All optical measurements made using 1.3 μm light unless otherwise noted.

Parameter	Conditions	Min	Max	Unit
Responsivity	V_R = 5 V	0.85	—	A/W
Dark Current	V_R = 5 V	—	5.0	nA
Capacitance	V = 5 V	—	0.2	pF
Bandwidth	V = 5 V	12.0	—	GHz

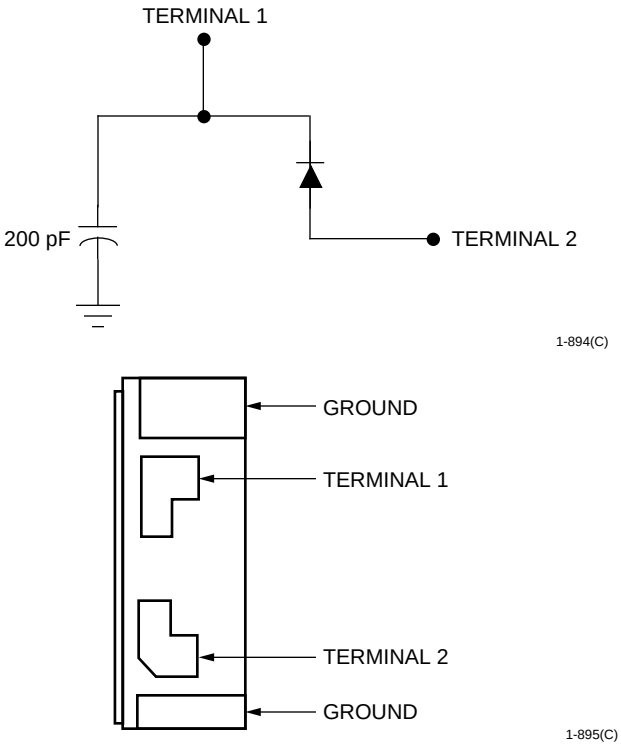


Figure 1. X170A PIN Photodetector Schematic

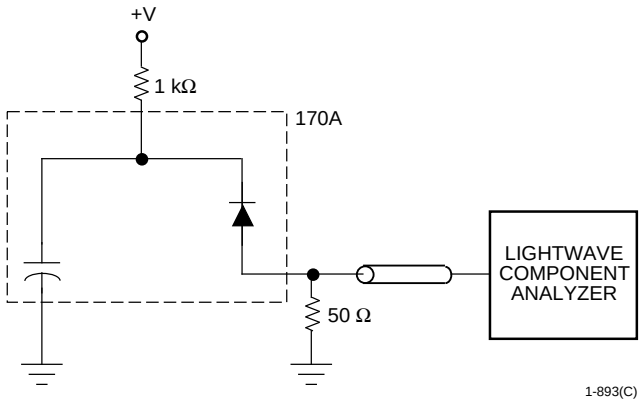


Figure 2. X170A PIN Photodetector High-Speed Measurement Circuit

Electro-Optical Characteristics (continued)

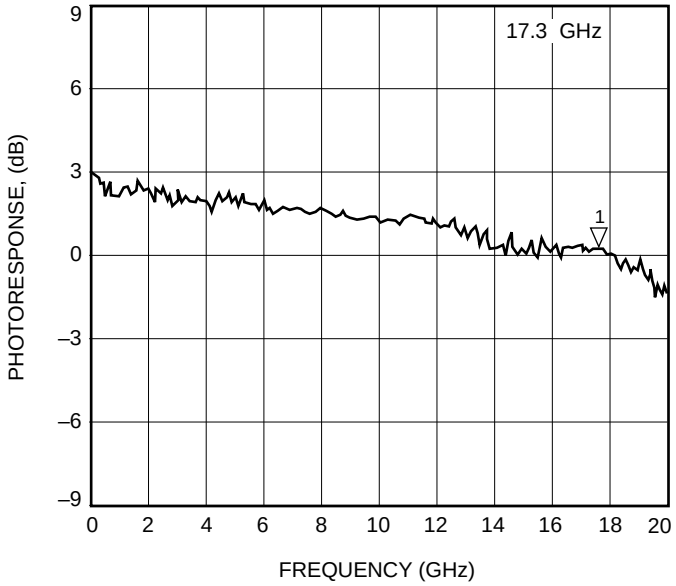


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Figure 3. Typical X170A PIN Photodetector Frequency Response Measured into a 25 Ω Load