

MAGNETIC FIELD SENSOR (B)  
(Ground Plane)

MODEL B-80

Description

The PROLYN Model B-80 Sensor is a B-Dot loop equivalent to the AFWL MODEL MGL-8. This sensor is the smallest of the B-Dot series of sensors developed by the Air Force Weapons Laboratory. Although this sensor was designed for use in a laboratory environment, it has been upgraded to include a weather cover for some protection. The sensor can be used as a B-Dot sensor, or it can be used to measure the time rate-of-change of surface current density since the magnetic field over a conductive sheet is related to surface current density. The sensor consists of a half-cylinder loop on a base plate that when mounted to a conducting surface produces a voltage output in response to a time variant B field. The B-80 is basically identical to the Model B-S80. The B-80 version has the connector located below the ground plane while the B-S80 has the connector located on top of the ground plate.

This sensor has a parallel-series wiring configuration that cancels the electric field induced signals and makes the sensor's output signal the result of only the magnetic field. The equation pertinent to this device is:

$$V_o = \vec{A}_{eq} \cdot \frac{d\vec{b}}{dt} = \text{sensor output (in volts)}$$

where

$\vec{A}_{eq}$  = sensor equivalent area (m<sup>2</sup>)

$\vec{B}$  = magnetic flux density vector (teslas)

This sensor is a passive device; therefore, an external power source is not required. The sensor output is a radial configuration, Model B-80(R).

ELECTRICAL SPECIFICATIONS

Equivalent Area ( $A_{eq}$ ) . . . . .	$1 \times 10^{-5} \text{ m}^2$
Frequency Response (3 db point) . . . . .	$\geq 7.5 \text{ GHz}$
Risetime ( $t_r$ 10-90) . . . . .	$\leq 0.045 \text{ ns}$
Maximum Output (peak) . . . . .	$\pm 100\text{v}$
Output Connector . . . . .	Female SSMA

PHYSICAL SPECIFICATIONS

Mass: 15 grams

