

# RADIATION HARDENED B-DOT SENSOR

## MODEL RB-130

### DESCRIPTION

The RB-130 is a small, free-field, high frequency radiation hardened sensor, which was designed to measure B-Dot fields in a nuclear radiation environment. It has a high transparency (approx. 86%), continuous aluminum cylindrical loop utilizing a moebius pickoff configuration and is totally encapsulated. The loop is attached to a metal tube, which is normally 12 inches long, and provides the capability for mounting. The output cables are 50 ohm semi-rigid type and exit from the tube. The length of the output cables beyond the tube end is 18 inches, but the tube and cable lengths can be varied to meet special needs.

The output signal of the sensor is proportional to the time rate-of-change of the magnetic field. The pertinent equation for this device is:

$$V_o = A_{eq} \cdot \frac{d\vec{B}}{dt} = \text{sensor output (in volts)}$$

where

- $A_{eq}$  = sensor equivalent area ( $m^2$ )
- $B$  = magnetic flux density vector (teslas)

### ELECTRICAL SPECIFICATIONS

Equivalent Area ( $A_{eq}$ ) . . . . .	$4 \times 10^{-5} m^2$
Frequency Response (3 db Point) . . . . .	$\sim 2 GHz$
Risetime ( $t_r$ 10 - 90) . . . . .	$< .5ns$
Maximum output (peak) . . . . .	1 KV
Output connectors . . . . .	SMA (male)

### PHYSICAL SPECIFICATIONS

