SURFACE CURRENT (J) & MAGNETIC FIELD (B)
MULTI-GAP TYPE GROUND PLANE SENSORS
MODELS B-S40, B-S50, B-S70, B-S80

Description

PRODYN's precision high frequency multi-gap ground plane type sensors are designed to measure the time rate-of-change of surface current density or as a B-Dot sensor. 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. These sensors have 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 relating to surface current density is:

$$V_o = Aeq\ \mu_o \frac{djs}{dt} \sin\theta = \text{sensor output (in volts)}$$

Where
- Aeq = sensor equivalent area (m^2)
- μ_o = permeability of free space ($4\pi \times 10^{-7}$ H/m)
- J_s = surface current density (Amps/m)
- $\sin\theta$ = angle between sensor axis an J_s vector

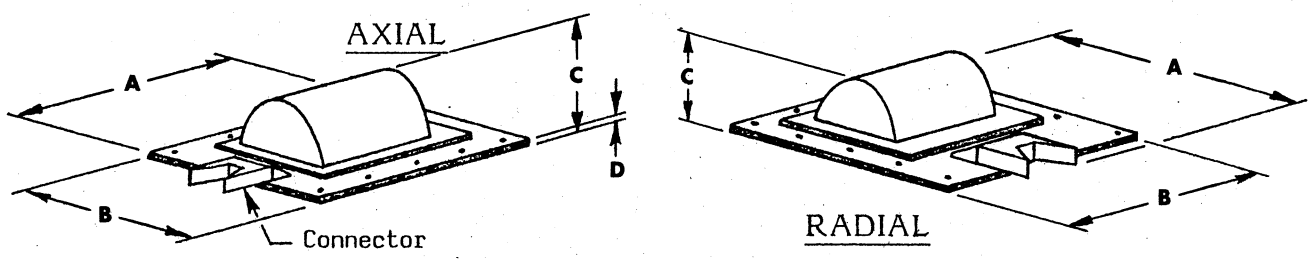
The equation relating to B-Dot measurements is:

$$V_o = Aeq \bullet \frac{db}{dt} = \text{sensor output (in volts)}$$

Where
- Aeq = sensor equivalent area (m^2)
- B = magnetic flux density vector (Teslas)

Specifications

Electrical	**B-S40 (***)**	**B-S50 (***)**	**B-S70 (***)**	**B-S80 (***)**
Equiv. Area (Aeq)	1×10^{-2} m^2	1×10^{-3} m^2	1×10^{-4} m^2	1×10^{-5} m^2
Freq Resp (3dB Point)	>230 MH_z	>700 MH_z	>1.8 GH_z	> 7.5 GH_z
Risetime (tr10-90)	<1.5 ns	<0.5 ns	<0.2 ns	<.045 ns
Max Output (peak)	± 5 kV	± 5 kV	±1 kV	± 250 v
Output Connector	Type N female	Type N Female	SMA Female	SMA Female
Physical				
Mass	4.5 kg	2.7 kg	80 g	15 g
B (cm)	36.20 (Axial) 36.20 (Radial)	25.41 (Axial) 22.20 (Radial)	5.59	2.54
A (cm)	41.91 (Axial) 41.28 (Radial)	25.41 (Axial) 22.20 (Radial)	10.16	10.16
C (cm)	13.03	5.72	2.14	0.68
D (cm)	0.32	0.32	0.24	0.13



Note: Typical configuration. Please see outline drawings for more detail.

* Can be changed to a Type N, SMA, etc. (Max output voltage will be affected)
** Available in axial output only.
*** Customer to specify axial (A) or radial (R) version