

## **B-30/40/50/70/80 multi-gap type ground plane sensors**

Prodyn's precision, high frequency, multi-gap type ground plane magnetic field sensors are designed to produce a voltage output in response to a time variant B field when mounted to a conducting surface.

Sensors consist of a half-cylinder loop on a base plate that has a parallel-series wiring configuration that cancels the electric field induced signals and makes the output signal the result of only the magnetic field. They can be also used to measure surface current density since the magnetic field over a conductive surface is related to the surface current density.

### **SPECIFICATION**

	<b>B30A</b>	<b>B40A / B40R</b>	<b>B50A / B50R</b>	<b>B70R</b>	<b>B80R</b>
Equivalent Area (Aeq)	$1 \times 10^{-1} \text{m}^2$	$1 \times 10^{-2} \text{m}^2$	$1 \times 10^{-3} \text{m}^2$	$1 \times 10^{-4} \text{m}^2$	$1 \times 10^{-5} \text{m}^2$
Freq. Resp.(3 db pt.)	>78MHz	>230MHz	>700MHz	1.8GHz	>7.5GHz
Risetime (tr 10-90)	<4.5ns	<1.5ns	<0.5ns	<0.2ns	<0.45ns
Maximum output (peak)	$\pm 5 \text{kV}^1$	$\pm 5 \text{kV}^1$	$\pm 5 \text{kV}^1$	$\pm 1 \text{kV}$	$\pm 250 \text{V}$
Output connector(s)	50Ω GR-874	Type N female	Type N female	SMA (female)	SMA (female)

<sup>1</sup> Output can be changed to N-type/SMA etc. however max voltage will be affected

### **EQUATION**

The equation relating to surface current density is:

$$V_0 = A_{eq} \mu_0 \frac{dJ_s}{dt} \sin \theta$$

Where  $V_0$  = sensor output (volts),  $A_{eq}$  = sensor equivalent area ( $\text{m}^2$ ),  $\mu_0$  = permeability of free space ( $4\pi \times 10^{-7}$  H/m),  $J_s$  = surface current density (A/m),  $\sin \theta$  = angle between axis and  $J_s$  vector

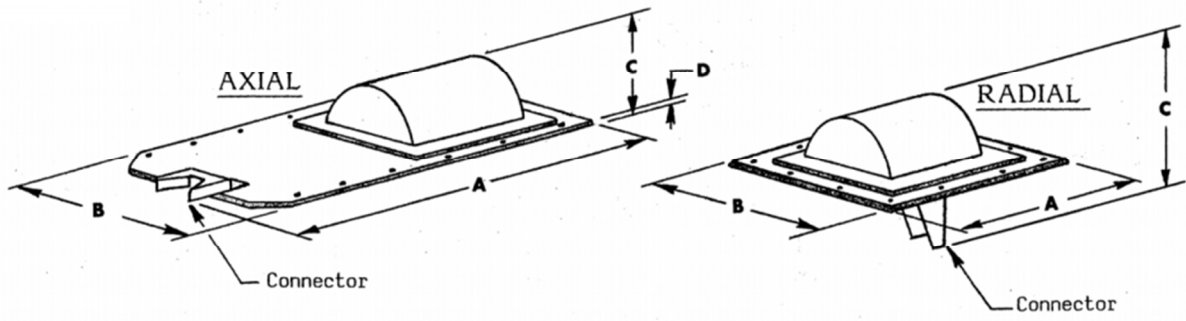
The equation relating to B-Dot measurements is:

$$V_0 = A_{eq} \frac{dB}{dt}$$

Where  $V_0$  = sensor output (volts),  $A_{eq}$  = sensor equivalent area ( $\text{m}^2$ ), B = magnetic flux density (teslas)



**DIMENSIONS**



	B30A	B40A / B40R	B50A / B50R	B70R	B80R
Mass	26Kg	4.5Kg	2.7Kg	80g	15g
A (cm) - see outline	97.54	70.10 (A) / 43.18 (R)	54.10 (A) / 28.70 (R)	5.59	2.54
B (cm) - see outline	93.98	43.18 (A) / 43.18 (R)	25.40 (A) / 25.40 (R)	5.59	2.54
C (cm) - see outline	39.21	13.03 (A) / 21.34 (R)	5.72 (A) / 15.25 (R)	4.12	1.32
D (cm) - see outline	0.48	0.32	0.32	0.24	0.13