

## ***B-S40/50/70/80 surface current and magnetic field multi-gap type ground plane sensors***

These precision high frequency multi-gap type ground plane 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. The sensors have a parallel-series wiring configuration that cancels the electric field induced signals and makes the sensors output signal the result of only the magnetic field.

### **SPECIFICATION**

	<b>B-S40</b>	<b>B-S50</b>	<b>B-S70</b>	<b>B-S80</b>
Equivalent Area (Aeq)	1 x 10 <sup>-2</sup> m <sup>2</sup>	1 x 10 <sup>-3</sup> m <sup>2</sup>	1 x 10 <sup>-4</sup> m <sup>2</sup>	1 x 10 <sup>-5</sup> m <sup>2</sup>
Freq. Resp.(3 db pt.)	>230MHz	>700MHz	>1.8GHz	>7.5GHz
Risetime (tr 10-90)	<1.5ns	<0.5ns	<0.2ns	<0.45ns
Maximum output (peak)	± 5kV	± 5kV	± 1kV	± 250V
Output connector(s)	Type N female	Type N female	SMA (female)	SMA (female)

### **EQUATION**

The equation relating to surface current density is:

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

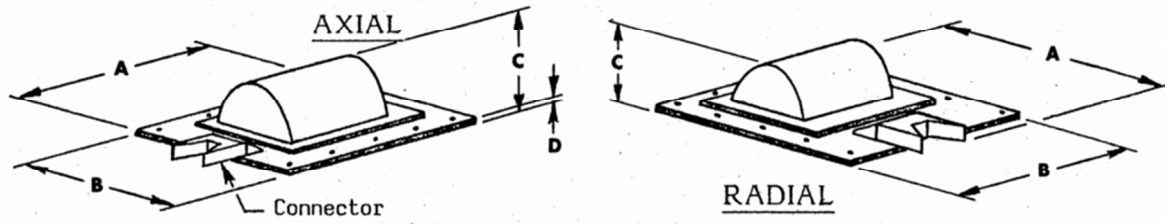
Where  $V_o$  = sensor output (volts),  $A_{eq}$  = sensor equivalent area (m<sup>2</sup>),  $\mu_0$  = permeability of free space (4 $\pi$  x10<sup>-7</sup> H/m),  $J_s$  = surface current density (A/m),  $\sin \theta$  = angle between axis and  $J_s$  vector

The equation relating to B-Dot measurements is:

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

Where  $V_o$  = sensor output (volts),  $A_{eq}$  = sensor equivalent area (m<sup>2</sup>),  $B$  = magnetic flux density (teslas)

**DIMENSIONS**



	B-S40A / B-S40R	B-S50A / B-S50R	B-S70A / B-S70R	B-S80A / B-S80R
Mass	4.5Kg	2.7Kg	80g	15g
A (cm) - see outline	41.91 (A) / 36.20 (R)	25.41 (A) / 22.20 (R)	10.16	10.16
B (cm) - see outline	36.20 (A) / 36.20 (R)	25.41 (A) / 22.20 (R)	5.59	2.54
C (cm) - see outline	13.03	5.27	2.14	0.68
D (cm) - see outline	0.32	0.32	0.24	0.13