

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-S40	B-S50	B-S70	B-S80
Equivalent Area (Aeq)	1 x 10 ⁻² m ²	1 x 10 ⁻³ m ²	1 x 10 ⁻⁴ m ²	1 x 10 ⁻⁵ m ²
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:

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

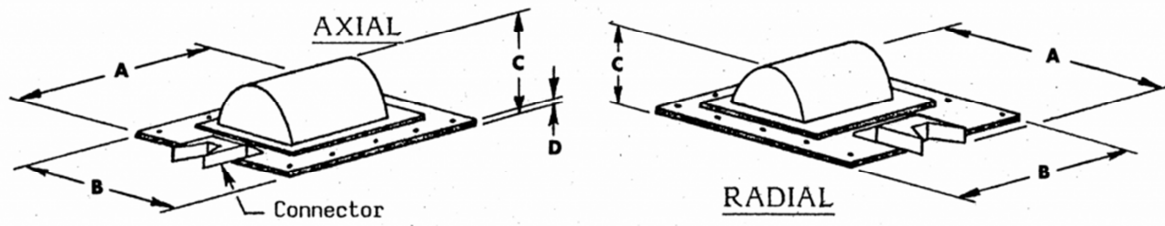
Where V_o = sensor output (volts), A_{eq} = sensor equivalent area (m²), μ_0 = permeability of free space (4 π x10⁻⁷ H/m), J_s = surface current density (A/m), $\sin \theta$ = angle between axis and J_s vector

The equation relating to B-Dot measurements is:

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

Where V_o = sensor output (volts), A_{eq} = sensor equivalent area (m²), 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