

## ELECTRIC FIELD SENSORS (D)

### GROUND PLANE

PRODYN's precision high frequency ground plane electric field sensors are designed to measure time rate-of-change of electric displacement over a wide frequency spectrum. They can also be used to measure the time rate-of-change of surface current density. Surface or thru-the-ground plane output configurations are available to allow testing flexibility.

Testing has shown the asymptotic sensing element design to have less capacitance and higher upper frequency characteristics compared to older HSD (Hemi-Spherical D-Dot) design.

The equation pertinent to these devices is:

$$V_o = R A_{eq} \frac{dD}{dt} \quad \text{or} \quad V_o = R A_{eq} \frac{dq_s}{dt}$$

Where:  $V_o$  = sensor output (Volts)

$R$  = sensor characteristic load impedance (50 ohms)

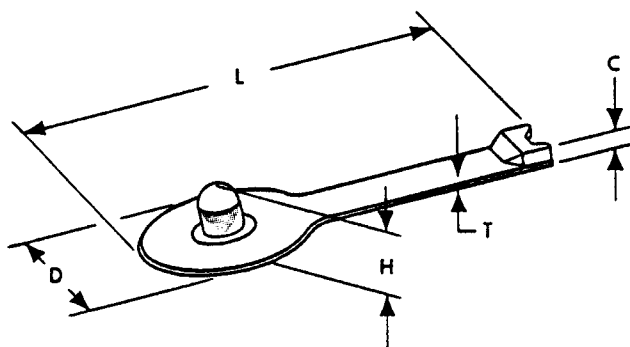
$A_{eq}$  = sensor equivalent area ( $m^2$ )

$D$  = Magnitude of electric displacement vector ( $D = \epsilon_o \vec{E}$  in  $Coul/m^2$ )

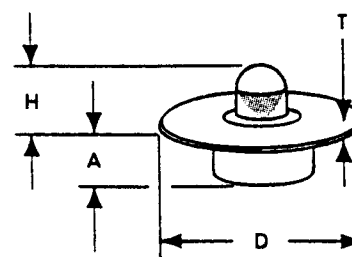
$q_s$  = surface current density ( $Coul/m^2$ )

#### M O D E L

Electrical Spec	AD-S10(R)	AD-10(A)	AD-S110(R)	AD110(A)	ADS30(R)	AD-30(A)	ADS60(R)	AD-60(A)
Equiv. Area ( $A_{eq}$ )	$1 \times 10^{-4} m^2$	$1 \times 10^{-4} m^2$	$1 \times 10^{-3} m^2$	$1 \times 10^{-3} m^2$	$1 \times 10^{-2} m^2$	$1 \times 10^{-2} m^2$	$1 \times 10^{-1} m^2$	$1 \times 10^{-1} m^2$
Freq. Response (3 db point)	>10GH <sub>Z</sub>	>10GH <sub>Z</sub>	>3.5GH <sub>Z</sub>	>3.5GH <sub>Z</sub>	>1GH <sub>Z</sub>	>1GH <sub>Z</sub>	>400MH <sub>Z</sub>	>400MH <sub>Z</sub>
Risetime (tr 10-90)	<.03ns	<.03ns	<.10ns	<.10ns	<.35ns	<.35ns	<1.0ns	<1.0ns
Maximum Output (Peak)	±150V	±150V	±1KV	±1KV	±4KV	±4KV	±5KV	±5KV
Output Connector (Female)	SSMA	SSMA	SMA	SMA	SMA	SMA	Type N	Type N
Physical Spec								
Mass	16g	13g	70g	60g	546g	324g	1.5kg	1.3kg
(in.) H	.22	.22	.68	.68	1.98	1.98	6.12	6.12
D	1.00	1.00	3.00	3.00	5.50	5.50	11.12	11.12
L	3.00	-	8.00	-	12.0	-	22.0	-
T	.04	.04	.09	.09	.09	.10	.12	.12
A	-	.59	-	.75	-	.72	-	2.25
C	.48	-	.90	-	.90	-	1.62	-



**RADIAL (R)**



**AXIAL (A)**