Strategic High Sensitivity HF NVIS DF Element

1 – 30 MHz

VERSION: 1.8

Product Code: DF-A0115

PRODUCT DESCRIPTION:

The DF-A0115 antenna is a single site location (SSL) HF DF array element. Polarisation is selectable between linear vertical, RHCP and LHCP though the injecting of different DC voltages onto the switch board via a dedicated control interface. On the DF-A0115-01 linear vertical, RHCP and LHCP are available as three separate, simultaneous outputs with pre-amplification.

The antenna is intended for use in constructing DF interferometer arrays consisting of a number of DF-A0115 antennas. It can be deployed as part of either a linear or circular array. The large physical size of the product provides the best possible sensitivity at HF frequencies.

The antenna includes an integrated switching system and lightning and ESD protection. There are no nonlinear active components in the chain to introduce unwanted distortion on the received signals. In LHCP and RHCP modes, the antenna element is capable of receiving waves of LHCP and RHCP polarisation respectively, incident from the upper half sphere, with a gain peak at θ = 0° (directly upwards). In VP omni mode, the antenna operates similar to a monopole antenna, able to receive waves with vertical polarisation with a gain peak on the horison (or just above it) and a null at θ = 0°.

Unlike competing products of the same kind, this antenna utilises our patented stabilised loop technology that eliminates cross polarisation disturbance of the antenna, providing enhanced reliability, accuracy and repeatability in practical use.

The antenna is designed only for fixed site installation on a plinth or other mechanical support structure. The antenna additionally requires guying for installation.
*CA Application 2,853,219;
*EP Patent 2771943;
*U.S. Patent No. 14/353,382;
*ZA Patent No. 2014/02806

APPLICATIONS:

- HF DF array element
- Linear or circular arrays
- SSL arrays
- High sensitivity HF RDF
- High accuracy HF RDF
- Fixed site permanent outdoor deployments

SPECIFICATIONS:

Product numbers:

DF-A0115	DC injection to select polarisation
DF-A0115-01	Simultaneous RHCP, LHCP and VP with pre-amplification

Electrical:

Frequency range	1 – 30 MHz	
VSWR	< 2.0:1 (typical CP modes)	
Nominal impedance	50 Ω	
RF power handling	Passive, receive only	
Polarisation	Linear, vertical, LCP or RCP	
Connector	**DF-A0115**	**DF-A0115-01**
RF	N-type (female)	3 x N-type (female)
DC	4-way circular connector	None
Power supply	DC injected to select polarisation (+5 V VP, 0 V LHCP, -5 V RHCP)	Bias-tee via OMNI connector
Switching cycles	Designed for 100 Mc	

Mechanical:

Total height	< 4510 mm
Total diameter	< 3000 mm
Dimensions packed	< 2450 x 570 x 440 mm
Ground radials	16 x 6m radials, SS 316 secured with pegs
Total mass	< 60 kg
Mounting	Mounted using plinth and ground radial plate
Colour	Primarily black, limited components can be colour selected on request.

Environmental: designed to meet the following specifications

Temperature range	Storage: -30 °C to +70 °C Operation: -30 °C to +55 °C
Wind survival	160 km/h (5 mm ice)
Weatherproofing	IP66
Shock and vibration	MIL-STD 810G 516.4: vibration category 8, shock 40 g during transport
Lightning protection	Gas discharge arrestor
Exposed materials	Painted aluminium and fibreglass

PRODUCT FEATURES:

- Passive (no distortion)
- Integrated switching system
- Lightning/ESD protected
- Compact stowed form factor
- Patented stabilised loop excludes cross polarisation inaccuracies
- Incorporated lightning protection
- Ground radials and guy ropes provided

Related Products:

- MISC-A0273 – 1m extension pole for DF-A0115
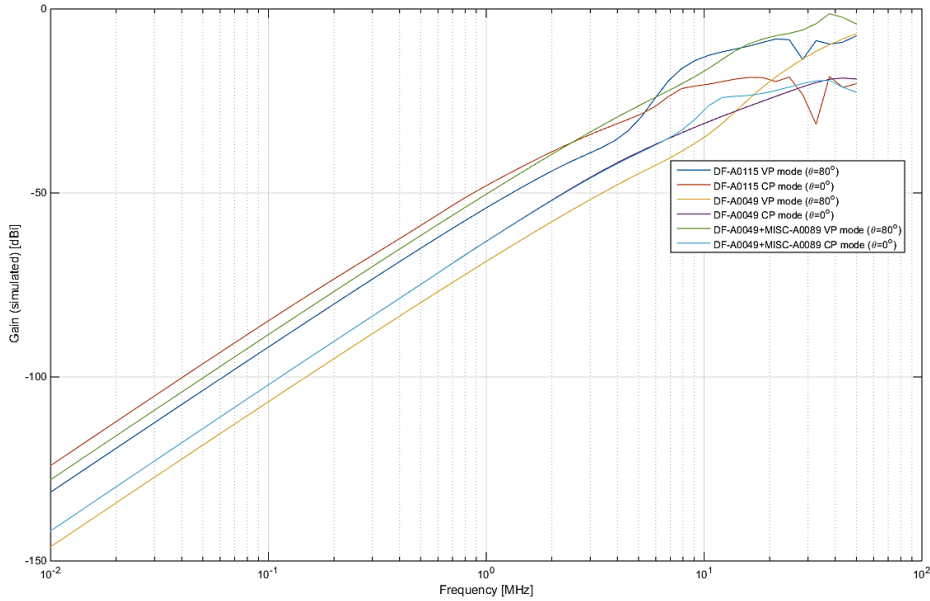- MISC-A0293 – Lightning arrestor with replaceable GDT

1 – 30 MHz

Product Code: DF-A0115   **VERSION: 1.8**

Simulated Gain:

Legend:
- DF-A0115 VP mode ($\theta=80^\circ$)
- DF-A0115 CP mode ($\theta=0^\circ$)
- DF-A0049 VP mode ($\theta=80^\circ$)
- DF-A0049 CP mode ($\theta=0^\circ$)
- DF-A0049+MISC-A0089 VP mode ($\theta=80^\circ$)
- DF-A0049+MISC-A0089 CP mode ($\theta=0^\circ$)

Outline dimension drawings (excl. ground radials):
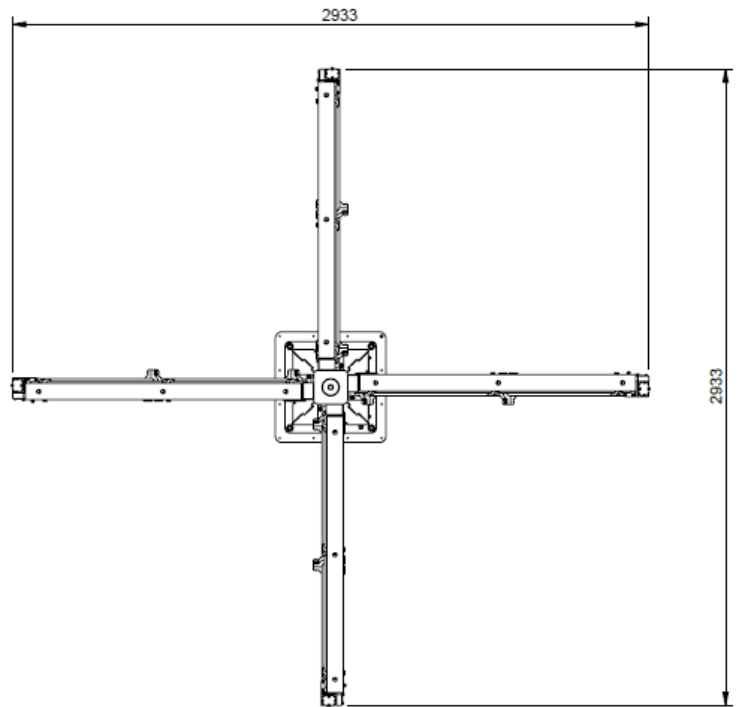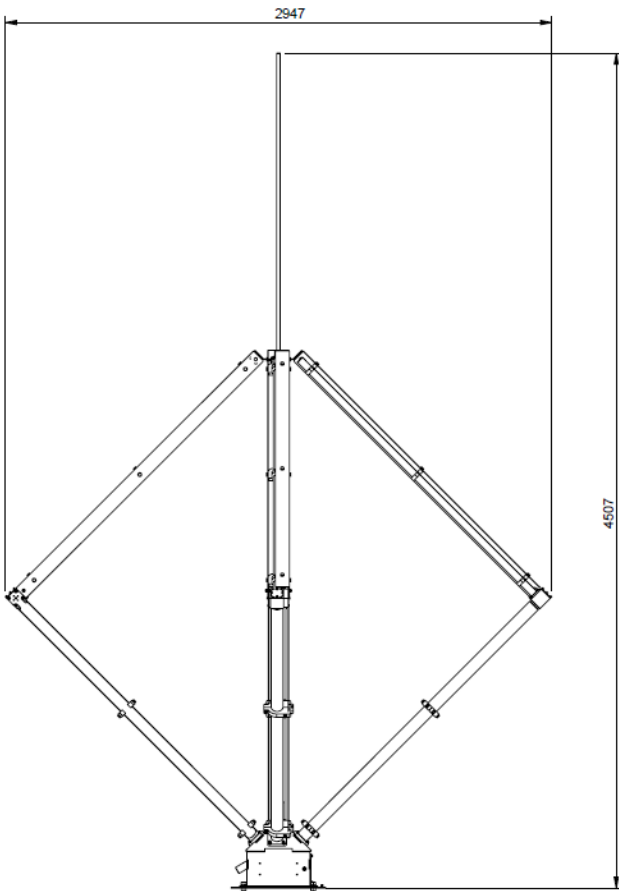
Strategic High Sensitivty HF NVIS DF Element

1 – 30 MHz

Product Code: DF-A0115

VERSION: 1.8

Elevation patterns for various ground types:

CP Gain Patterns at 5 MHz and at Phi = 0 deg

CP Gain Patterns at 5 MHz and at Phi = 0 deg

CP Gain Patterns at 15 MHz and at Phi = 0 deg

CP Gain Patterns at 15 MHz and at Phi = 0 deg

CP Gain Patterns at 30 MHz and at Phi = 0 deg

CP Gain Patterns at 30 MHz and at Phi = 0 deg

Updated 2023-11-29

www.antennas.alaris.tech