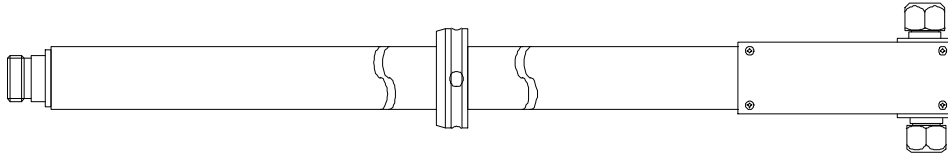


SCHWARZBECK MESS - ELEKTRONIK

An der Klinge 29 D-69250 Schönau Tel.: 06228/1001 Fax.: (49)6228/1003

VHF-UHF Breitband Balun / Halter UBAA 9114 VHF-UHF Broadband Balun / Holder UBAA 9114



Allgemeine Beschreibung:

Der 4:1 Balun UBAA 9114 kann sowohl Bikonus-Elemente (z.B. BBVU 9135 oder BBUK 9139) als auch offene Konuselemente (z.B. BAOC 9216 oder BBOC 9217) aufnehmen. Der verlustarme Übertrager bietet einen deutlich verbesserten Antennenfaktor und gute Symmetrie insbesondere bei tiefen Frequenzen, trotz kleiner Elementabmessungen. Die enorme Bandbreite und das feststehende Strahlungszentrum erlauben komfortable Messungen ohne Antennenwechsel, die bisher nur mit zwei Antennen möglich waren. Höchste Symmetrieanforderungen (bei etwas größeren Verlusten) erfüllt der Balun/Halter UBAA 9115. Die Abmessungen und die Elementaufnahmen sind bei beiden Modellen identisch, so daß eventuell schon vorhandene Elemente benutzt werden können.

Anwendung:

Der verlustarme Balun UBAA 9114 wird bevorzugt mit den relativ kompakten Bikonuselementen BBVU 9135 oder BBUK 9139 eingesetzt. Diese Bikonusantenne eignet sich insbesondere als breitbandige Messantenne zur raschen Beurteilung von Absorberräumen oder Freifeldmessgeländen. In Verbindung mit dem batteriebetriebenen Spektrumgenerator SG 9301 erhält man eine netzunabhängige Vergleichsstrahlungsquelle, die ebenfalls zur Beurteilung von Messplätzen herangezogen werden kann.

General Description:

The 4:1 Balun/Holder UBAA 9114 can accept both, biconical elements (e.g. BBVU 9135 or BBUK 9139) and open cone elements (e.g. BAOC 9216 and BBOC 9217). The low loss balun offers better antenna factors and a good symmetry, especially at lower frequencies. The wide bandwidth and the fixed center of radiation help to make convenient measurements without antenna changes. Thanks to the small size UBAA 9114 can be used as a passive field sensor. Highest degree of symmetry (with slightly increased losses) can be achieved with the balun/holder UBAA 9115. The dimensions and element fixtures of both baluns are identical in order to accept the same elements.

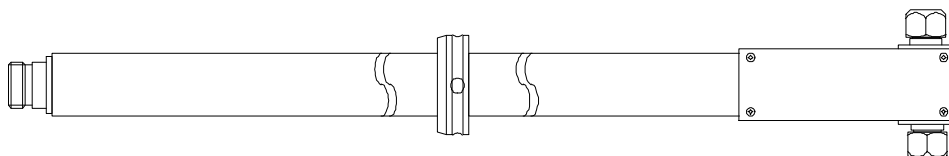
Application:

The low loss balun UBAA 9114 is most often used with the compact biconical elements BBVU 9135 or BBUK 9139. The biconical antenna is especially valuable for convenient broad band evaluations of anechoic chambers or open area test sites. In combination with the battery driven spectrum generator SG 9301 a portable reference radiator is available, which can also be used for test site assessments.

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Technische Daten:

Frequenzbereich, einsetzbar: 25 - 1200 MHz
 Kernbereich: 30 - 1000 MHz
 Rückflußdämpfung ab 250MHz: typ. 4 dB
 desgl.mit 3dB-Dämpfungsglied: typ. 10 dB \approx SWR 2
 Antennenwandlungsmaß: 18 - 38 dB/m
 (abhängig vom Elementtyp)
 Länge Halterung: LH=540 mm

Breite: je nach Elementtyp
 (siehe Tabelle Zubehör)
 Antennenschaft (Halterungsrohr) \varnothing 22 mm
 Gewicht der gesamten Antenne: 0.83 kg
 HF-Leistung: 5 W
 Koaxialanschluß: N-Buchse / N - female

Empfohlenes Zubehör:

BBVU 9135 Bikonus-Elemente LE=444 mm, D=185 mm
BBUK 9139 Bikonus-Elemente LE=330 mm, D=130 mm
BAOC 9216 Offenkonus-Elemente LE=276 mm, D=155 mm
BBOC 9217 Offenkonus-Elemente LE=390 mm, D=230 mm

Specifications:

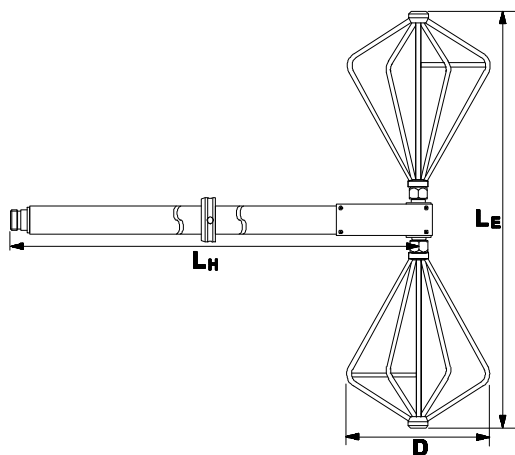
Frequency Range (useable): 25 - 1200 MHz
 Main Frequency Range: 30 - 1000 MHz
 Return loss $f > 250$ MHz: typ. 4 dB
 Ret. loss $f > 250$ MHz, 3 dB pad: typ. 10 dB \approx SWR 2
 Antenna Factor: 18 - 38 dB/m
 (depending on elem. type in use)
 Length holder: LH=540 mm

Width depends on elements used
 (see table accessories below)
 Antenna shaft (Tube): \varnothing 22 mm
 Total weight: 0.83 kg
 Power (EMC TX): 5 W
 Coaxial Connector: N-Buchse / N - female

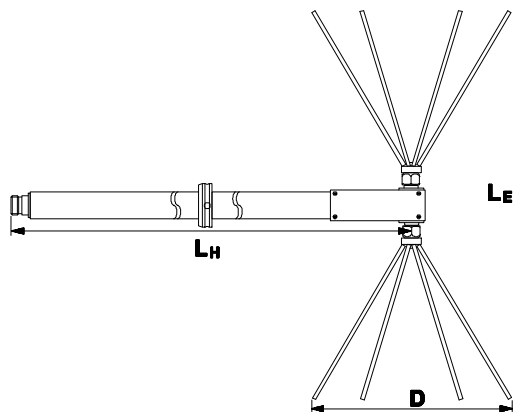
Recommended Accessories:

BBVU 9135 Biconical Elements
BBUK 9139 Biconical Elements
BAOC 9216 Open-Cone Elements
BBOC 9217 Open-Cone Elements

Bikonus-Elemente Biconical Elements



Offenkonus-Elemente Open Cone Elements



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VHF-UHF Breitband Balun / Halter UBAA 9114 **VHF-UHF Broadband Balun / Holder UBAA 9114**

Application as an E Field Sensor

For the measurement of E field-strength in the volt-per-meter region diode or FET sensors with short dipoles are frequently used. They offer wide bandwidths and reasonable flatness, but the accuracy for a defined frequency is limited. A calibration is usually performed in TEM cells. Their vertical width should be 5 times the length of the test dipole to obtain sufficient accuracy. In case of a Crawford triplate cell the total height would be ten times the dipole length. Such large TEM cells suffer from a frequency limit in the vhf range. For EMC applications a calibration up to 1 GHz should be possible.

The passive biconical Test Antenna UBAA 9114 has primarily been designed for field-strength measurements in the range 30 MHz to 1 GHz. Such passive antennas with identical gain data can be accurately calibrated under free-space conditions with the "Two-Antenna-Method" that does not require a gain standard. The measurement uncertainty can be reduced to less than 1 dB under near-perfect free-space conditions using a method developed here with simultaneous height-variation and averaging the results.

The aim of designing E field sensors might be a very short dipole length to measure the fieldstrength on a defined "spot". In case of immunity testing of practical equipment, e.g. of 19" boxes, the surface or volume of the EuT must be tested. In case of varying field-strengths a final definition must be established. An alternative method could be the use of an E-field sensor of a comparable size compared to the EuT. With a total length of the biconical antenna of 325 mm this condition is met for a number of applications.

One of these applications is the field-strength measurement at a separation of 3m in front of the tip of a logarithmic-periodic antenna for immunity testing such as IEC 801-3, IEC 1000-4-3, ENV 50140, VDE 0847, part 3, also EN 50147.

The calibration of the model UBA 9114 has been extended down to the low limit of the vhf band (25 MHz). The antenna factor with a minimum around 200 to 400 MHz rises again with lower frequencies. As the application is with high field strengths and sensitive test receivers are available for EMI testing, low f.s. levels down to 1 mV/m at 25 MHz can be measured.

In these applications a perfect shielding should be provided for coaxial cables and the test receiver because any signal interception would add to the (relatively low) voltage from the test antenna.

As the VSWR of the antenna will be high at such low frequencies (far off resonance), the test receiver input impedance should be 50 W resistive. This situation may be improved with vhf fixed attenuators of 6 dB or 10 dB between antenna output and coaxial cable.

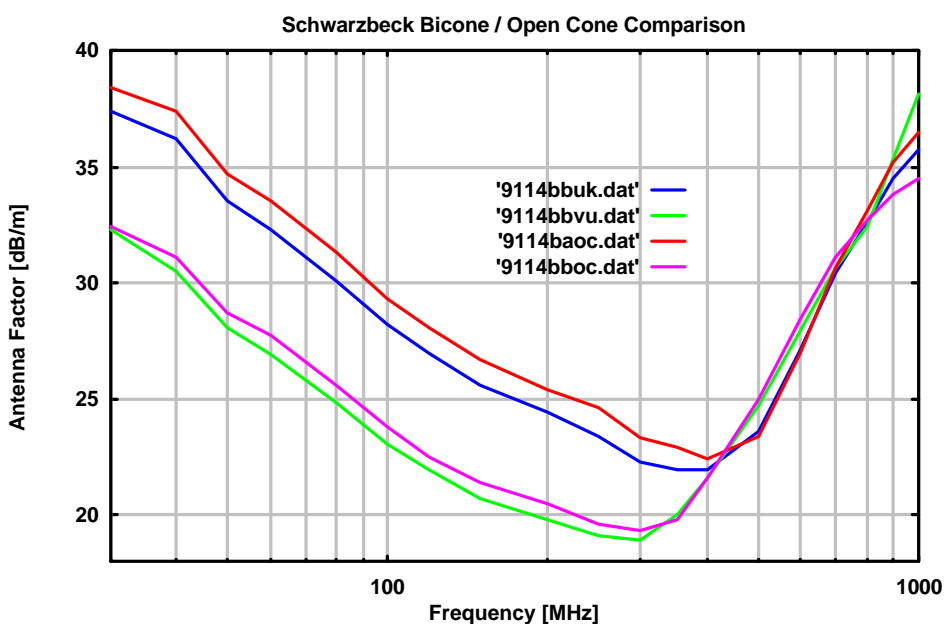
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VHF-UHF Bikonus Breitband Antenne UBAA 9114 VHF-UHF Biconical Broadband Antenna UBAA 9114

Vorläufiges Datenblatt / Preliminary Data

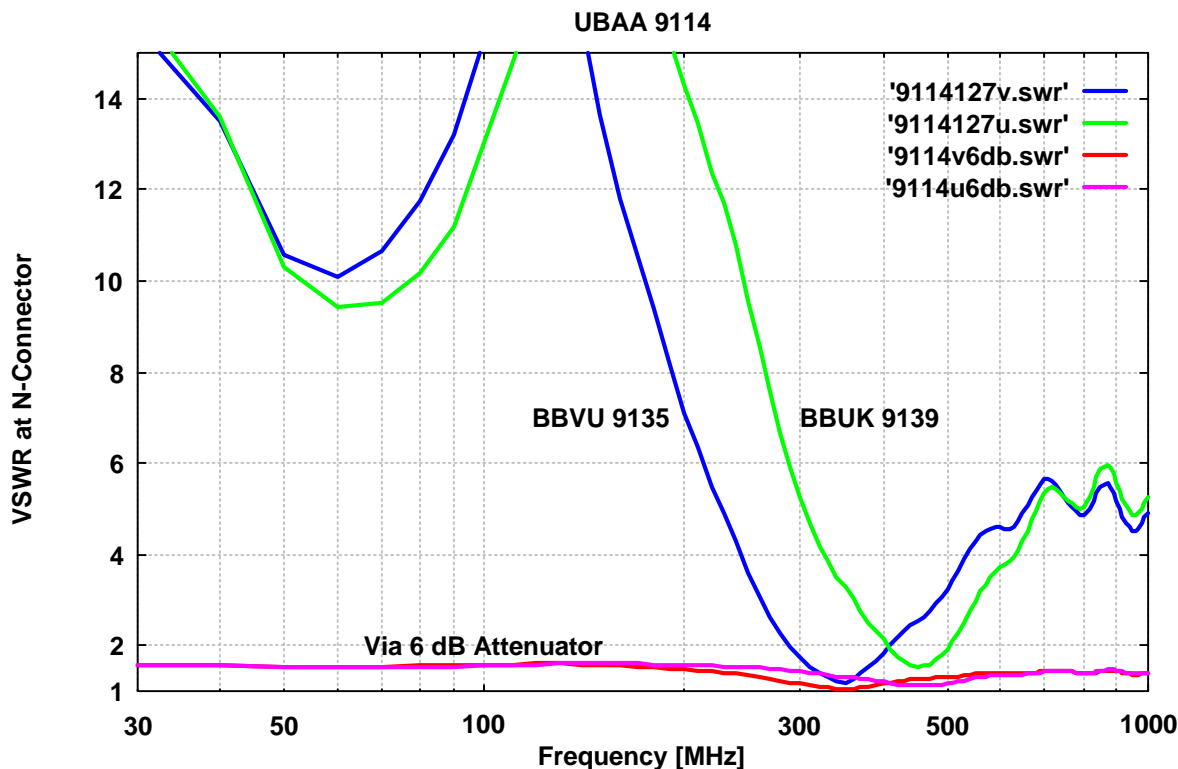
UBAA 9114				
	Bicones		Open Cone	
ELEMENT	BBUK	BBVU	BAOC	BBOC
diamet.Φ	0.13 m	0.185 m	0.15 m	0.23 m
Element length total	0.32 m	0.44 m	0.28 m	0.39 m
Frequency	AF dB/m	AF dB/m	AF dB/m	AF dB/m
30 MHz	37.4	32.3	38.4	32.4
40 MHz	36.2	30.5	37.4	31.1
50 MHz	33.5	28.1	34.7	28.7
60 MHz	32.3	26.9	33.5	27.7
80 MHz	30.1	24.8	31.3	25.6
100 MHz	28.2	23.0	29.3	23.8
120 MHz	27.0	21.9	28.1	22.5
150 MHz	25.6	20.7	26.7	21.4
200 MHz	24.4	19.8	25.4	20.5
250 MHz	23.4	19.1	24.6	19.6
300 MHz	22.3	18.9	23.3	19.3
350 MHz	21.9	20.0	22.9	19.8
400 MHz	21.9	21.6	22.4	21.6
500 MHz	23.6	24.7	23.4	25.0
600 MHz	27.1	27.9	27.0	28.4
700 MHz	30.4	30.6	30.6	31.1
800 MHz	32.6	32.4	33.1	32.7
900 MHz	34.5	35.3	35.2	33.8
1000 MHz	35.7	38.1	36.5	34.5
Frequency	AF dB/m	AF dB/m	AF dB/m	AF dB/m
A	B	C	D	E



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Individuelle VSWR-Messung Individual VSWR Plot



Zwischenschalten eines Dämpfungsgliedes ist zweckmäßig, wenn das angeschlossene Gerät ein hohes Eigen-SWR (z.B. in der 0 dB-Stellung des Eingangsteilers) aufweist. Dann ist diese Dämpfung zum Antennenwandlungsmaß zu addieren bzw. vom Gewinn abzuziehen. Bei Verwendung eines 6 dB-Dämpfungsgliedes kann über den gesamten Frequenzbereich gute Anpassung mit $SWR < 2$ erreicht werden.

Das VSWR wird von Reflexionen in der Umgebung der Antenne beeinflusst.

Insertion of an attenuator is advisable if the equipment presents a high internal SWR (e.g. in the 0 dB position of an internal step attenuator). In this case the attenuation must be added to the antenna factor (dB/m) or subtracted from the gain (dBi, dBd). Using a 6 dB fixed attenuator a good impedance matching with $SWR < 2$ can be achieved over the complete frequency range.

The VSWR depends on environmental reflections.

Seriennummer:	UBAA 9114-127	Serial Number:
Ergebnis:	o.k.	Test result:
Bearbeiter:	Dipl.-Ing. D. Schwarzbeck	Operator:
Datum:		Date: