

Balun-klinikka

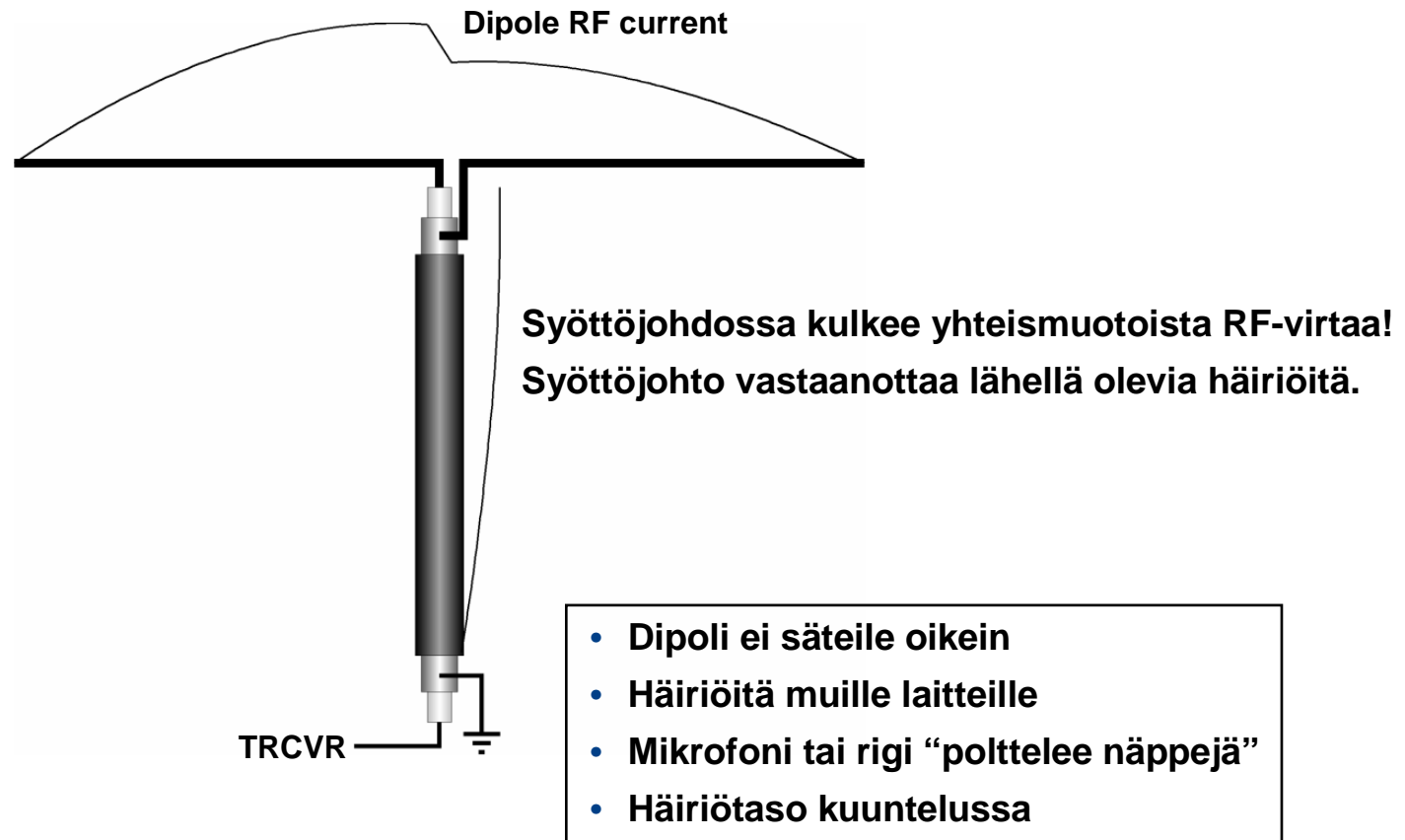


OH2AP, OH2Z, OH2AA, OH2K 2013

Matti Hohtola OH7SV

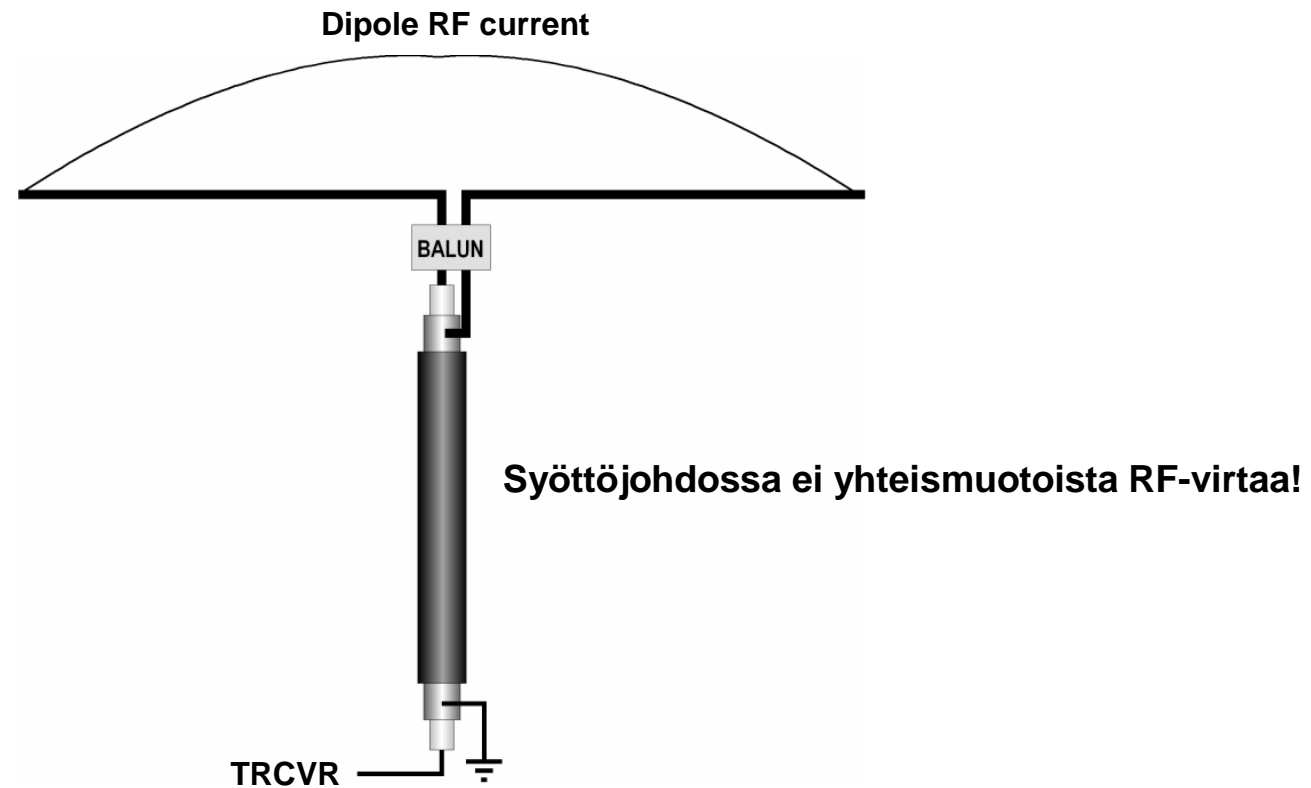
Balun-klinikka

Dipoli syötettynä suoraan koaksiaalikaapelilla



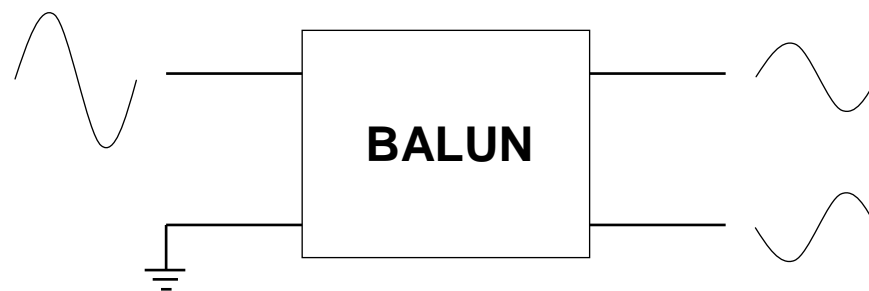
Balun-klinikka

Baluuni dipolin syöttöpisteessä



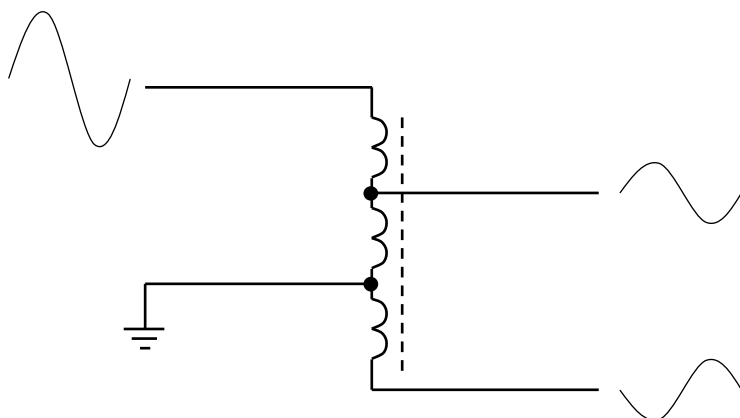
Balun-klinikka

Mikä on baluuni?



Balun-klinikka

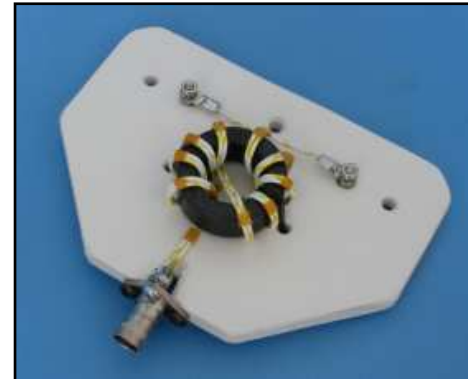
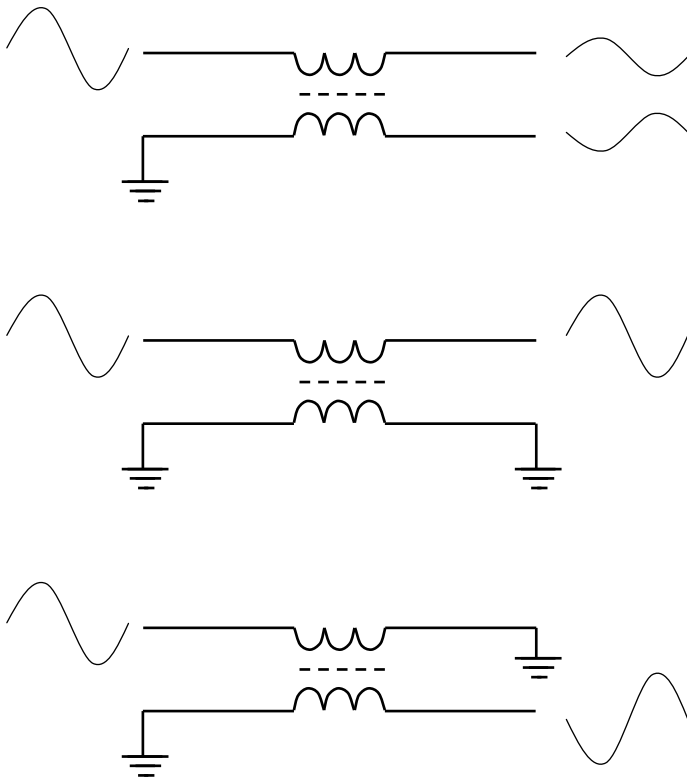
Jännitebaluuni



Jännitebaluuni yrittää “pakottaa” ulostulojännitteet yhtäsuuriksi

Balun-klinikka

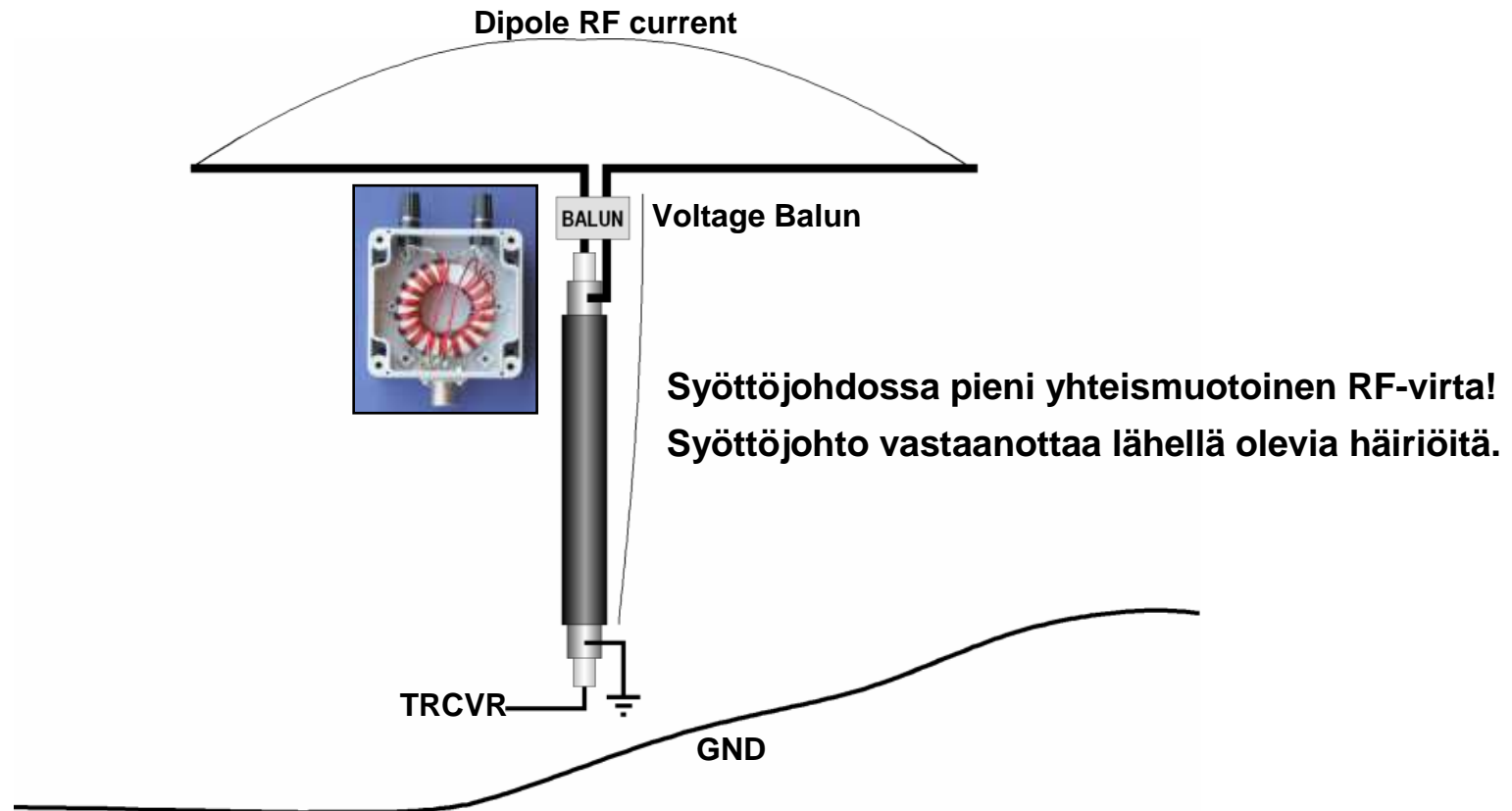
Virtabaluuni = Comon Mode Balun = Common Mode Choke



Comon Mode balun ei “pakota” kummankaan pään jännitetasoja

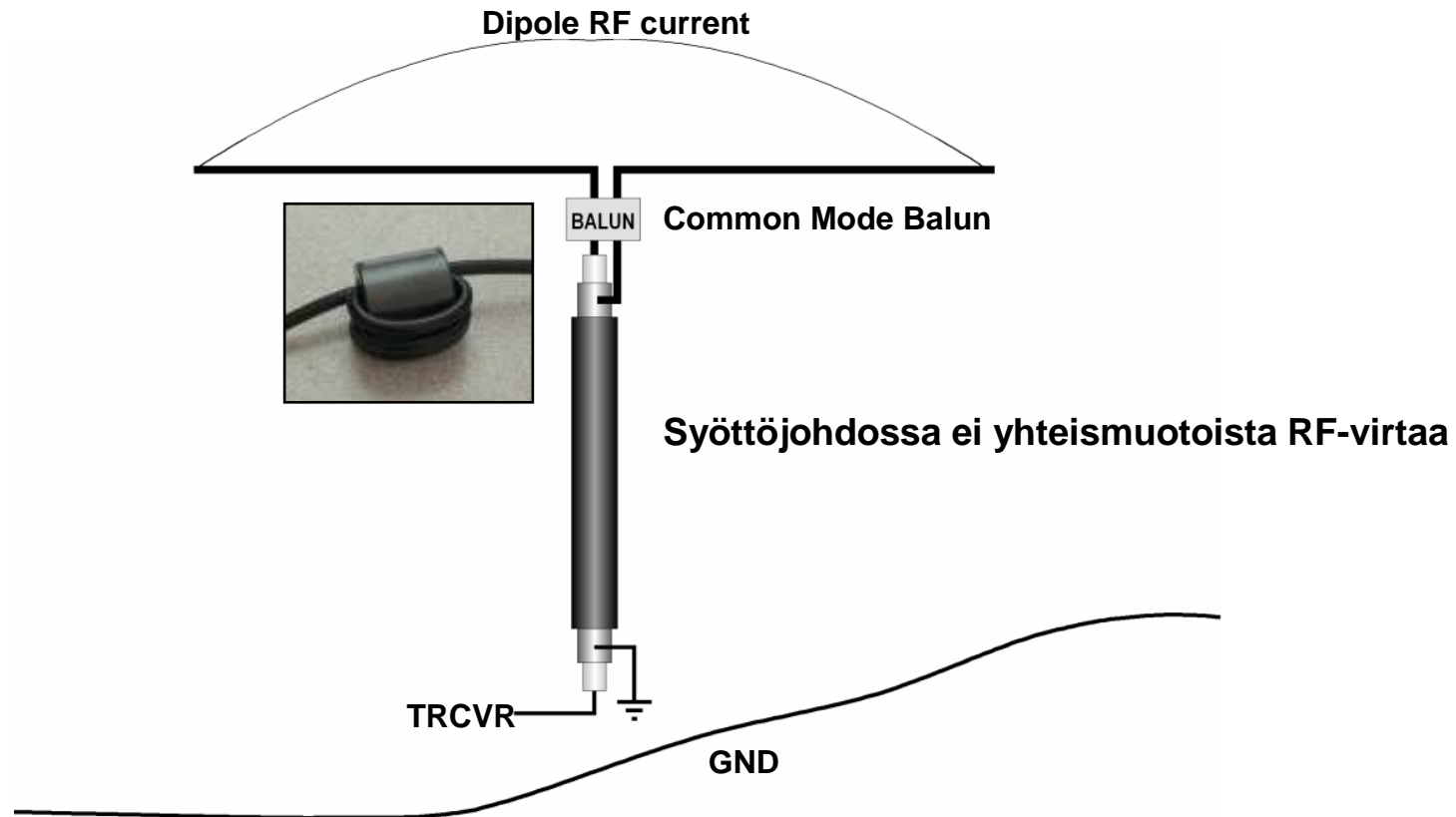
Balun-klinikka

Jännite-baluuni dipolin syöttöpisteessä



Balun-klinikka

Common Mode baluuni dipolin syöttöpisteessä



Balun-klinikka

Common Mode baluunin rakenne



Balun-klinikka

Common Mode baluunin rakenne



Balun-klinikka

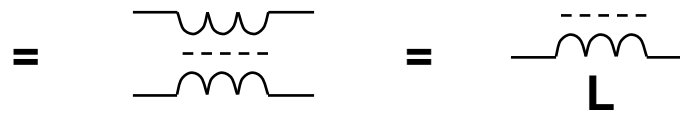
Common Mode baluunin rakenne



Balun-klinikka

Common Mode baluunin mitoitus

Reaktanssi XL vähintään 1000 ohmia.



$$XL = 2 * \pi * f * L$$

↑ ↑
Taajuus induktanssi

$$XL = 2 * \pi * f * N^2 * AL$$

↑ ↑ ↑
Taajuus Kierrokset AL-arvo

Balun-klinikka

Common Mode baluunin mitoitus



Esimerkki 1. (3.5 MHz)

$$XL = 2 * \pi * f * N^2 * AL$$

Materiaali Wurth 74270115

N = 7 kierrosta

AL = 750nH

$$XL = 2 * \pi * 3.5\text{MHz} * 7^2 * 750\text{nH} = 808 \text{ ohms}$$

Balun-klinikka

Common Mode baluunin mitoitus



Esimerkki 2. (3.5 MHz)

$$XL = 2 * \pi * f * N^2 * AL$$

Materiaali Amidon FT - 140 - 43

N = 9 kierrosta

AL = 952nH

$XL = 2 * \pi * 3.5\text{MHz} * 9^2 * 952\text{nH} = 1696 \text{ ohms}$

Balun-klinikka

Amidon ferriitti-toroidien mekaaniset mitat

Physical Dimensions - Ferrite Toroids						
core size ∖	OD inches	ID inches	Hgt inches	Mean length cm	Cross Sect cm ²	Volume cm ³
FT-23	.230	.120	.060	1.34	.021	.028
FT-37	.375	.187	.125	2.15	.076	.163
FT-50	.500	.281	.188	3.02	.133	.402
FT-50 -A	.500	.312	.250	3.18	.152	.483
FT-50 -B	.500	.312	.500	3.18	.303	.963
FT-82	.825	.520	.250	5.26	.246	1.294
FT-87 -A	.870	.540	.500	5.42	.315	1.710
FT-114	1.142	.750	.295	7.42	.375	2.783
FT-114-A	1.142	.750	.545	7.42	.690	5.120
FT-140	1.400	.900	.500	9.02	.806	7.270
FT-150	1.500	.750	.250	8.30	.591	4.905
FT-150-A	1.500	.750	.500	8.30	1.110	9.213
FT-193-A	1.932	1.250	.750	12.31	1.460	18.000
FT-240	2.400	1.400	.500	14.40	1.570	22.608

Balun-klinikka

Amidon ferriitti-toroidien AL-arvot

= nH / 1 turn

A_L Values (mH / 1000 turns) - Ferrite Toroids
 To complete the part number add the Mix number to the Core size number
 The 63 & 72 materials are being superseded by the 67 & 77 materials respectively.

Material > core size	43 u=850	61 u=125	63 u=250	67 u=40	68 u=20	72 u=2M	75 u=5M	77 u=2M	F u=3M	J u=5M
FT-23	188	24.8	7.9	7.8	4.0	396	990	356	NA	NA
FT-37	420	55.3	17.7	17.7	8.8	884	2210	796	NA	NA
FT-50	523	68.0	22.0	22.0	11.0	1100	2750	990	NA	NA
FT-50 -A	570	75.0	24.0	24.0	12.0	1200	2990	1080	NA	NA
FT-50 -B	1140	150.0	48.0	48.0	12.0	2400	NA	2160	NA	NA
FT-82	557	73.3	22.4	22.4	11.7	1170	3020	1060	NA	3020
FT-87 -A	NA	NA	NA	NA	NA	NA	NA	NA	3700	6040
FT-114	603	79.3	25.4	25.4	12.7	1270	3170	1140	1902	3170
FT-114-A	NA	146.0	NA	NA	NA	2340	NA	NA	NA	NA
FT-140	952	140.0	45.0	45.0	NA	2250	6736	2340	NA	6736
FT-150	NA	NA	NA	NA	NA	NA	NA	NA	2640	4400
FT-150-A	NA	N	NA	NA	NA	NA	NA	NA	5020	8370
FT-193-A	NA	NA	NA	NA	NA	NA	NA	NA	4460	7435
FT-240	1240	173.0	53.0	53.0	NA	3130	6845	3130	NA	6845

Balun-klinikka

Amidon ferriitti-toroidien muut ominaisuudet

Magnetic Properties - Ferrite Materials										
Material >	43	61	63	67	68	72	75	77	F	J
Initial Perm.	850	125	40	40	20	2000	5000	2000	3000	5000
Max Perm.	3000	450	125	125	40	3500	8000	6000	4300	9500
Max Flux den. 14 oer, gauss	2750	2350	1850	3000	2000	3500	3900	4600	4700	4300
Residual flux density, gauss	1200	1200	750	1000	1000	1500	1250	1150	900	500
Vol. Resist. ohms/cm	1×10^5	1×10^8	1×10^8	1×10^7	1×10^7	1×10^2	5×10^2	1×10^2	1×10^2	1×10^2
Temp. Co-eff. 20-70 deg. C	1%	.15%	.10%	.13%	.06%	.60%	.90%	.60%	.25%	.4%
Curie Temp. C	130	350	450	500	450	150	160	200	250	140
Resonant Cir. Freq. MHz	.01 to 1 MHz	.2 to 10 MHz	15 to 25 MHz	10 to 80 MHz	80 to 180 MHz	.001- 1 MHz	.001- 1 MHz	.001- 1 MHz	.001- 1 MHz	.001- 1 MHz
Wideband Freq. MHz. *	1 to 50 MHz	10 to 200	25 to 200	50 to 500	200- 1000	.5 to 30 MHz	.2 to 15 MHz	.5 to 30 MHz	.5 to 30 MHz	1 to 15 MHz
Attenuation RF Noise, MHz	20- 600	200- 1000	500- 2000	350- 1500	1000- 5000	1 - 50	.5- 20	1 - 50	1 - 50	.5 - 20