Vodič

r1=8.55mm

Ro=0.1939 Ω/km

Aal=148.864 mm^2

Zaštitno uže

Azaš=65.809 mm^2

rg=5.25mm

broj žica=19

R1=R0+=0.19323 Ω/km

R1f=R1/2=0.097162 Ω/km

Rg=2.1578 Ω/km

hA=xA-(0.7\*f+n\*dčlanka+0.3)=19.46m

hB=xB-(0.7\*f+n\*dčlanka+0.3)=23.36m

hC=xC-(0.7\*f+n\*dčlanka+0.3)=27.36m

hP=xP-(0.7\*f+0.3)=28.1m

|  |  |  |
| --- | --- | --- |
|  | X(m) | Y(m) |
| A | 6 | 19.36 |
| B | -6 | 23.36 |
| C | 4 | 27.36 |
| P | 0 | 38.1 |

Dg=0.758\*5.25=3.9794mm

r1=8.55mm

r2=2.1+2.1/2=3.15mm

r2/r1=0.36842

k=0.822

ds=k\*r1=7.0281mm

Ds==54.22mm

Izračun međusobnih udaljenosti

d12=sqrt((x2-x1)^2+(y2-y1)^2)

d13=sqrt((x3-x1)^2+(y3-y1)^2)

d14=sqrt((x1-x4)^2+(y1-y4)^2)

d23=sqrt((x2-x3)^2+(y2-y3)^2)

d24=sqrt((x2-x4)^2+(y2-y4)^2)

d34=sqrt((x3-x4)^2+(y3-y4)^2)

d11'=2\*y1

d22'=2\*y2

d33'=2\*y3

d44'=2\*y4

d12'=sqrt((x2-x1)^2+(y2+y1)^2)

d13'=sqrt((x3-x1)^2+(y3+y1)^2)

d14'=sqrt((x1-x4)^2+(y1+y4)^2)

d23'=sqrt((x2-x3)^2+(y2+y3)^2)

d24'=sqrt((x2-x4)^2+(y2+y4)^2)

d34'=sqrt((x3-x4)^2+(y3+y4)^2)

d12 =12.6491m

d13 =8.2462m

d14 =19.6771m

d23 =10.7703m

d24 =15.9144m

d34 =11.4607m

d11' =38.7200m

d22' =46.7200m

d33' =54.7200m

d44' =76.2000m

d12' =44.3734m

d13' =46.7628m

d14' =57.7724m

d23' =51.6964m

d24' =61.7522m

d34' =65.5821m

Matrica uzdužnih impedancija:

Ziir=R1f+0.05+j\*0.0628\*ln

Ziiz=R1f+0.05+j\*0.0628\*ln

Zij=0.05+j\*0.0628\*ln

[Zvod ]=

0.1472 + 0.6628i 0.0500 + 0.3205i 0.0500 + 0.3474i 0.0500 + 0.2927i

0.0500 + 0.3205i 0.1472 + 0.6628i 0.0500 + 0.3306i 0.0500 + 0.3061i Ω/km

0.0500 + 0.3474i 0.0500 + 0.3306i 0.1472 + 0.6628i 0.0500 + 0.3267i

0.0500 + 0.2927i 0.0500 + 0.3061i 0.0500 + 0.3267i 2.2078 + 0.8269i

Pivotiranjem ju svedemo na 3x3 formulama:

z11'=z11-(z14)^2/z44

z22'=z22-(z24)^2/z44

z33'=z33-(z34)^2/z44

z12'=z12-z14\*z24/z44

z13'=z13-z14\*z34/z44

z23'=z23-z24\*z34/z44

[Zabc]=

0.1759 + 0.6388i 0.0801 + 0.2956i 0.0824 + 0.3212i

0.0801 + 0.2956i 0.1788 + 0.6370i 0.0840 + 0.3035i Ω/km

0.0824 + 0.3212i 0.0840 + 0.3035i 0.1837 + 0.6343i

Za preplitanje vrijedi

[Ze] =

0.1795 + 0.6367i 0.0822 + 0.3068i 0.0822 + 0.3068i

0.0822 + 0.3068i 0.1795 + 0.6367i 0.0822 + 0.3068i Ω/km

0.0822 + 0.3068i 0.0822 + 0.3068i 0.1795 + 0.6367i

[Z012] =

0.3438 + 1.2503i 0 0

0 0.0973 + 0.3299i 0 Ω/km

0 0 0.0973 + 0.3299i

Iz matrice Z012:

Zo=0.3438+1.2503j

Z1=0.0973+0.3299j

R0=**0.34378 Ω/km**

R1=**0.097 Ω/km**

X0=**1.2501 Ω/km**

X1=**0.3299 Ω/km**

L0=X0/ω=0.003981 H/km=**3.981 mH/km**

L1=X1/ω=0.0010506 H/km=**1.05 mH/km**

Matrica potencijalnih koeficijenata:

p11=18\*10^6\*ln(Ds/d11')

p22=18\*10^6\* ln (Ds/d22')

p33=18\*10^6\* ln (Ds/d33')

p44=18\*10^6\* ln (Dg/d44')

p12=18\*10^6\* ln (d12/d12')

p13=18\*10^6\* ln (d13/d13')

p14=18\*10^6\* ln (d14/d14')

p23=18\*10^6\* ln (d23/d23')

p24=18\*10^6\* ln (d24/d24')

p34=18\*10^6\* ln (d34/d34')

[P] =

1.1648 0.2259 0.3124 0.1939

0.2259 1.1986 0.2823 0.2441 \*10^8 km/F

0.3124 0.2823 1.2270 0.3140

0.1939 0.2441 0.3140 1.7249

Pivotiranje:

p11'=p11-(p14)^2/p44

p22'=p22-(p24)^2/p44

p33'=p33-(p34)^2/p44

p12'=p12-p14\*p24/p44

p13'=p13-p14\*p34/p44

p23'=p23-p24\*p34/p44

[Pabc]=

1.1430 0.1985 0.2771

0.1985 1.1641 0.2379 \*10^8 km/F

0.2771 0.2379 1.1699

[Babc]=314\*[Pabc]^-1

[Babc] =

0.2964 -0.0378 -0.0625

-0.0378 0.2863 -0.0493 \*10^-5 S/km

-0.0625 -0.0493 0.2932

[B012]= 0.1923 0 0

0 0.3418 0 \*10^-5 S/km

0 0 0.3418

Iz matrice B dobivamo:

B0=**1.923\*10^-6 S/km**

B1=**3.4183\*10^-6 S/km**

C0=B0/ω=**0.00603 μF/km**

C1=B1/ω=**0.010886 μF/km**

Umax=**110kV**

Imax==**731.65A**

S=\*Un\*Imax=**139.398 MVA**

Emax==**8.0921 kV/cm**

Ukr==**315.5kV**

**R0=0.34378 Ω/km**

**R1=0.097 Ω/km**

**X0=1.2501 Ω/km**

**X1=0.3299 Ω/km**

**L0=0.003981 H/km=3.981 mH/km**

**L1=0.0010506 H/km=1.05 mH/km**

**B0=1.923\*10^-6 S/km**

**B1=3.4183\*10^-6 S/km**

**C0=B0/ω=0.00603 μF/km**

**C1=B1/ω=0.010886 μF/km**

**Umax=110kV**

**Imax=731.65A**

**S=\*Un\*Imax=139.398 MVA**

**Emax=8.0921 kV/cm**

**Ukr=315.5kV**