

# Matching Device for AD-25/CW-3512 Broadband Antenna System Adaptive to Changing Load Impedance

Isaev V.O.

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## Abstract

The mathematical model of an adaptive matching device is presented, taking into account the deviation of the load impedance and the parameters of the matching circuit, based on this mathematical model, an adaptive matching device was synthesized for the AD-25/CW-3512 broadband antenna, which made it possible to reduce the loss of the power transmission coefficient level from the input (output) of the path to the AC and increase the potential range of the radio link from 2 to 15

**Index terms**— coordination, method, sensitivity, load, broadband, mathematical model, adaptation.

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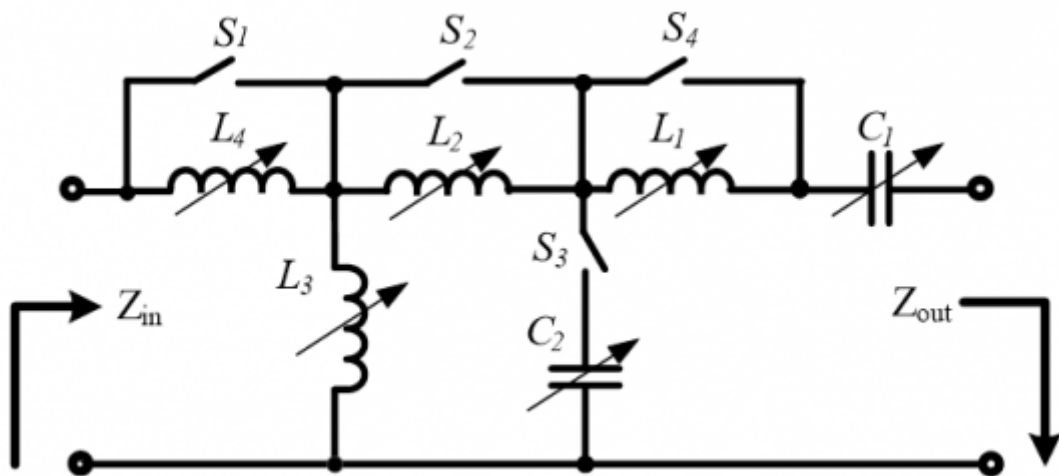
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Figure 1: ??????? 1 :F



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Figure 2: ??????? 6 :

$$Z_{\text{сн}}(s) = \frac{a_0 + a_1s + a_2s^2 + a_3s^3 + a_4s^4 + a_5s^5}{b_0 + b_1s + b_2s^2 + b_3s^3 + b_4s^4 + b_5s^5}$$

Figure 3: F

$$Z_{\text{сн}}(s)$$

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Figure 4: ??????? 7 :. ( 7 )

$$\begin{cases} a_0 = R; \\ a_1 = L_3 + L_4; \\ a_2 = C_1L_1R + C_1L_2R + C_2L_3R; \\ a_3 = C_1(L_1L_4 + L_1L_3 + L_2L_3 + L_2L_4 + L_3L_4) + C_2(L_2L_3 + L_2L_4 + L_3L_4); \\ a_4 = C_1C_2L_1R(L_3 + L_2); \\ a_5 = C_1C_2L_1(L_3L_4 + L_2L_4 + L_2L_3). \end{cases}$$

1

Figure 5: ??????? 1 :

$$\begin{cases} b_0 = 0; \\ b_1 = C_1R; \\ b_2 = C_1(L_3 + L_4); \\ b_3 = C_1C_2R(L_2 + L_3); \\ b_4 = C_1C_2(L_3L_4 + L_2L_4 + L_2L_3); \\ b_5 = 0. \end{cases}$$

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Figure 6: 1???????? 9 : 2 :

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Figure 7: F

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Figure 8:

Matching Device for AD-25/CW-3512 Broadband Antenna System Adaptive to Changing Load Impedance

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Figure 9: F

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*[Note: 3 11,3 31,4% 17,2 36,3 20.2 19% 10% 11,3 5,8% 12,2 6,3%]*

Figure 10:





107 [????????? et al. ()] , ? ? ?????????? , ? ? ?????????? , ? ? ?????? , ? ?????? ? ?????????????????  
108 ?????????????? / ? , ? ? ????????????? , ? ? ?????????? , . -? ?????? , ??????? . 1973.

109 [D"????? et al. ()] , ? ? D"????? , ? ?????????????????? ??????? / ? , ? ? D"????? , ? ? ?????? , ?????????  
110 . 1990. (? ??.. 496 ?)

111 [????????? et al. ()] , D" ? ?????????? , / D" ? ?????????????????? , -? ?????????? . ????. ?? 1990. (335 ?)

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114 ??????????????10.04.2021 ????????????? ?????????? ?????????? ?????????? / ? . ? . ??????. -? . :  
115 ??????, 1969.

116 [D"????? (ed.) ()] ??????? ????????? ?????????????? ??????? ??? ?????????????????????? ?????????????????????? ?????????????  
117 c ?????????????????? ?????????????? ??????????? , ? ? D"????????? . / ?.?. D"????????? , ?.?. , ?????????? , ?.?. ?????? , ?.?.  
118 D"????????? // D"????????? ?D"????? (ed.) 2021. 19 p. .

119 [D"????? et al. ()] ??????? ?????????????????????? ? ?????????? ?????????????????? ??????. ?.???. ??????, ? D"????? , ?  
120 ??? : ? , ?????????? . 1973.

121 [????????? and ?????????? ()] ? ? ?????????? , ? ?????????? . ?????????????????? ??? ?????????????? ? ?????? *CST*  
122 *Microwave Studio* .-?. ?????????????? ???, 2011. 155.

123 [D"????? et al. ()] '????????? // ??????????. ????. ????. ?? ?????-?????. ??????????, ?????????? ?????????? ?  
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126 ?????????? ?????????? / ? , ? ? D"????????? , ? ? ?????????? , ? ? ?????? . ?????. ????. 2017. 2019. p. .

127 [D"????? (ed.)] ?????????? ?????????? ?????????????????? ?????????????? ??? ?????????????????????? ?????????????????????? ?????????????  
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129 D"????????? . / ? . ? . D"????????? , ? . ? . ?????????? // D"?????. ?D"?????. -2021. -? 19 (ed.) p. .

130 [????????? (ed.)] ?????????? «?????????????????» ?????????????????????? ??????? ?? ?????????????????????? ?????????????? ?????  
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133 [????????? et al. ()] ?????????????? ??????? ?????????????????? ?????????????? ?????????????????????? ?????????????? // ?????????????? ?  
134 ?????????????????????? ?????????????? ?????????????????????? ?????????????? ??????????????, ? ? ?????????? , ? D" ?????????? , ? ?  
135 ?????????? . 1999. ??????. p. .

136 [????????????? ?? ??????? ?????????????????? ? ?????????????????? ?????????????? / B.C. ?????????? ? ?? ()] ?????????????? ??  
137 ?????????? ?????????????????? ? ?????????????????????? ?????????????? / B.C. ?????????? ? ??, 1985. ??????. 640.

138 [????????? (ed.)] ?????????????????? ?????????????????? ?????????? ?????????? ?????????????????? ?? ?????????? ?????????????  
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140 ?????? // «?????????» ?????? .-2019. -?2 (ed.) 63 p. .

141 [D"????? et al. ()] '????????????? ?????????? ?????????? ?????????????????? ?????????????? ?????????????? ?????????? ?? ??????  
142 ?????????????? ?????????????????????? ? ? D"????????? , ? ? ?????????? , ? ? ?????? . ??????. ?D"????? ?  
143 ??2020. 2020 p. .

144 [D"????? (ed.) ()] ?????????????????? ??????? ? ?????????? ??????????????, ? ? D"????? . ? . ? . D"?????, ? . ? . ??????????, ? . ? .  
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