

MAVZU: Elektron sxemalar uchun operatsion kuchaytirgichlarni hisoblash va loyihalash

Operatsion kuchaytirgich (OK) deb, analog signallar ustidan turli amallarni bajarishga mo'ljallangan, differensial kuchaytirish prinsipiga asoslangan, kuchlanish bo'yicha katta kuchaytirish koeffitsientiga ega bo'lgan integral o'zgarmas tok kuchaytirgichiga aytiladi.

- Bu matematik amallar quyidagilardan iborat
- qo'shish
- ayirish
- ko'paytirish
- bo'lish
- integrallash
- differensiallash

Hozirgi kunda OKlar analog va raqamli qurilmalarda



kuchaytirish



cheklash



ko'paytirish



chastotani filtrlash

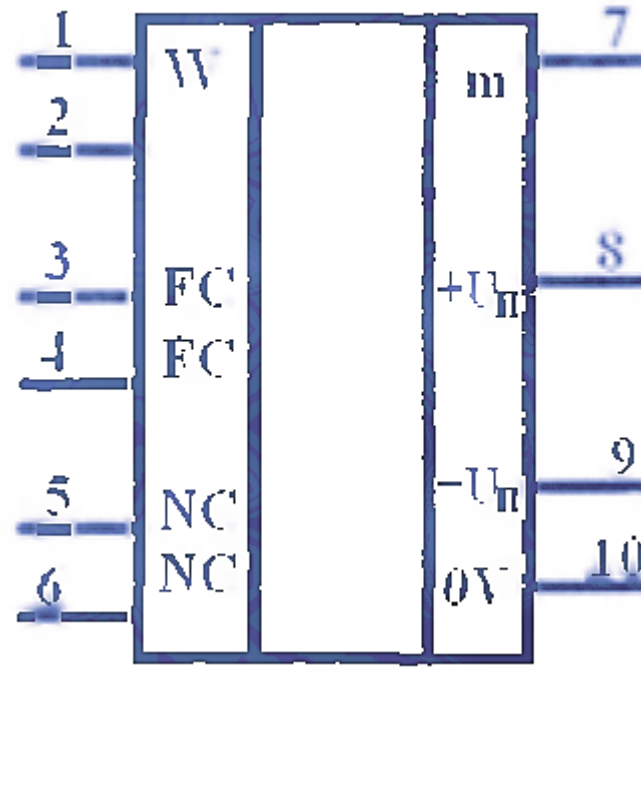
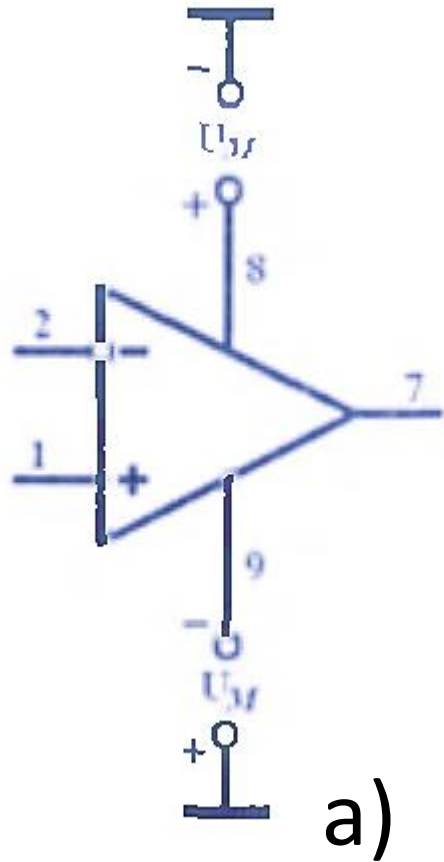


generatsiyalash



signallarni barqarorlashda qo'llanilib kelmoqda

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Operatsion kuchaytirgichning a) elektr sxemalarda keltiriladigan shartli belgisi
 b) standart grafik belgilanishi

Operatsion kuchaytirgich asosiy parametrlari va xarakteristikallari

Kuchaytirishning kompleks koeffitsienti

$$k(j\omega) = U_2 / U_1$$

zanjirning chastota xarakteristikasi

$$K(\omega) = U_2 / U_1$$

faza xarakteristikasi

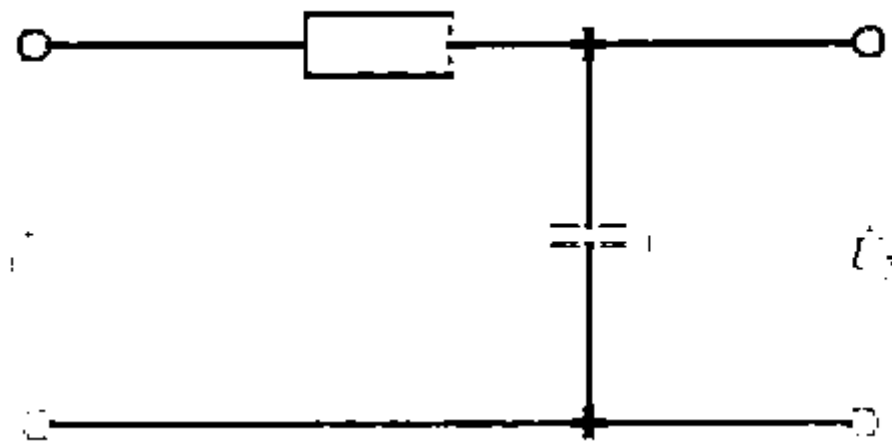
$$\varphi(\omega) = \theta - \varphi_1$$

Operatsion kuchaytirgich asosiy parametrlari va xarakteristikallari

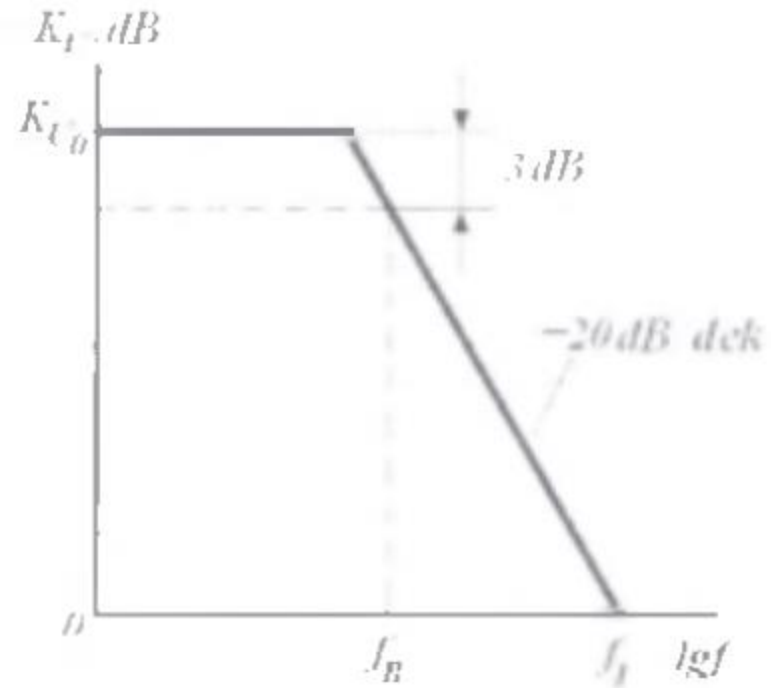
K_c — ning detsibellarda ifodalangan logarifmik birligi

$$D(\text{dB}) = 20 \lg \left(\frac{U_{\text{ch}}}{U_{\text{v}}} \right)$$

Chastotaxususiyatlarini tahlil qilishda O'Kning barcha kuchaytirish kaskadlari uning ekvivalent RC — zanjiri bilan almash tiriladi



O'Kning ekvivalent sxemasi.



Bitta kuchaytirish kaskadiga ega bo'lgan OKLAC hX si.