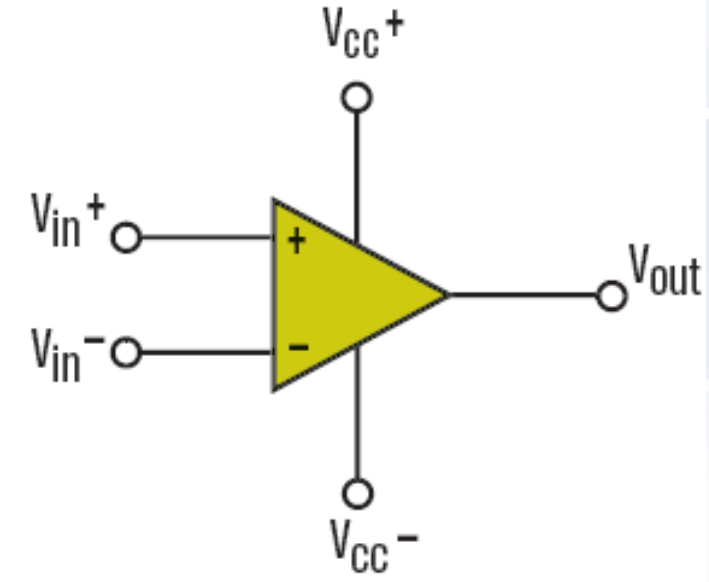
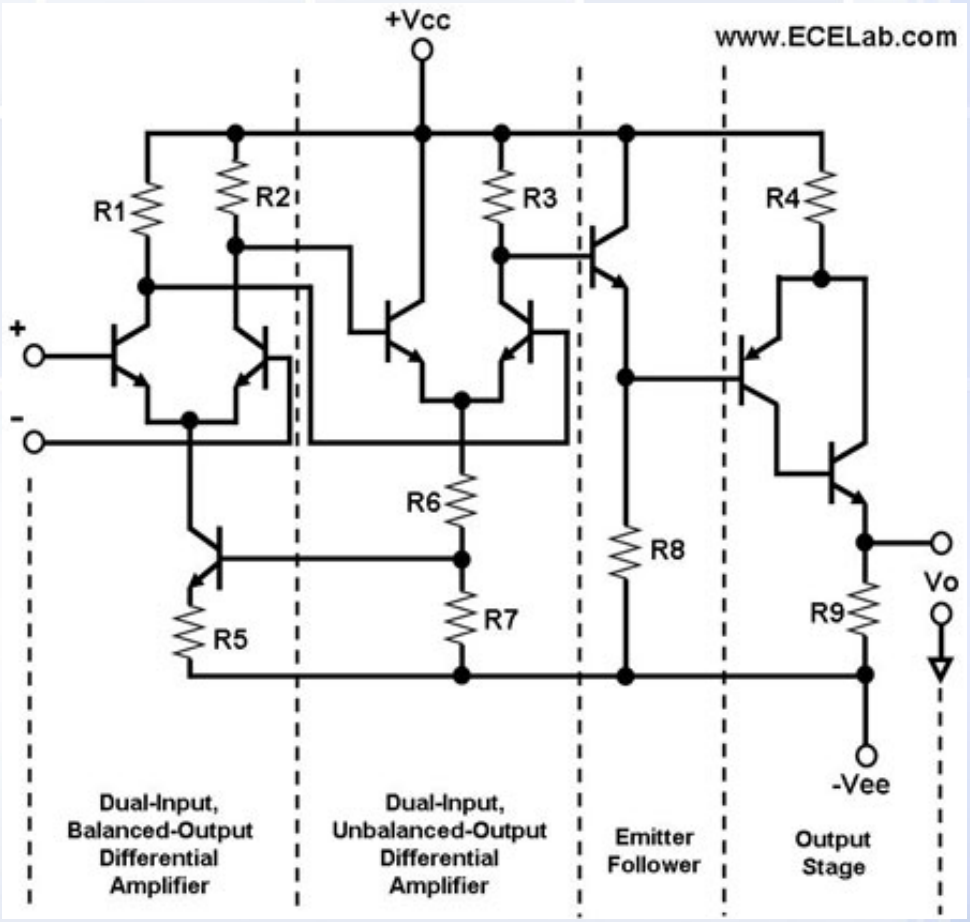
OPERASIONAL AMPLIFIER (OP-AMP)

Komponen dasar sistem analog.
Penggunaan yang luas.
Fairchild Semiconductor 1965, µA709.
Generasi kedua µA709 atau 741.
MC1741, LM741, SN72741.
Standar industri dan komersil.

Simbol & Rangkaian internal



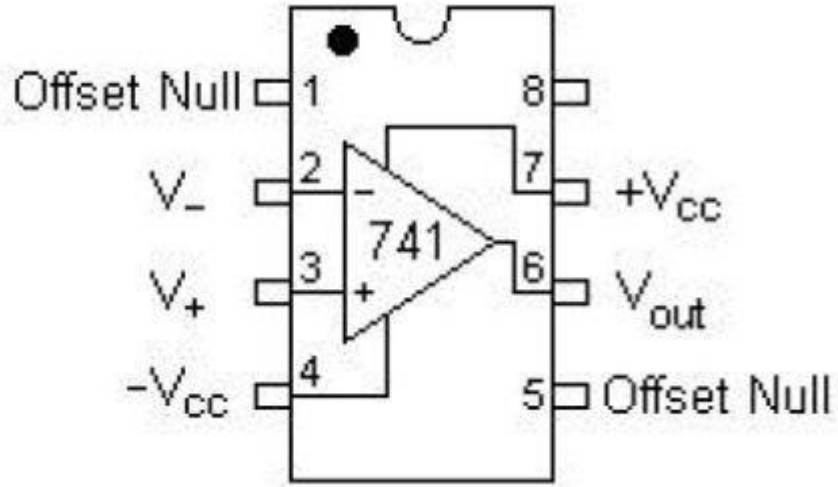
Vin+: non-inverting input
Vin-: inverting input
Vout: output
VCC+: positive power supply
VCC-: negative power supply

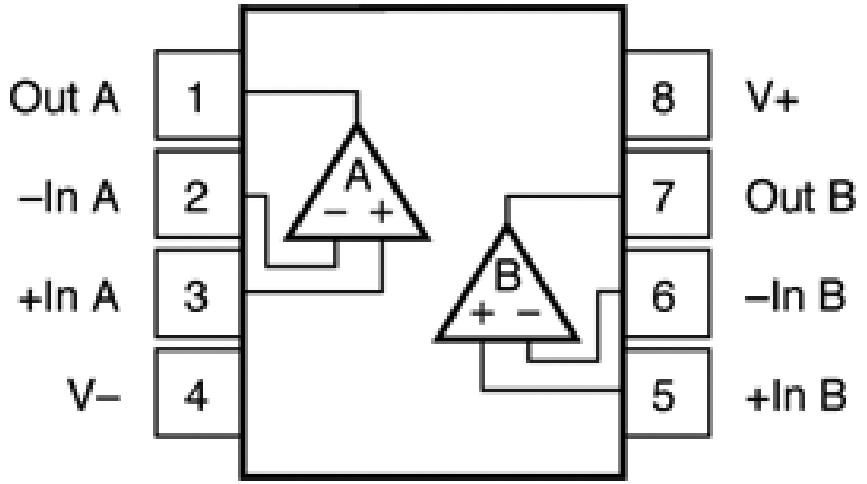


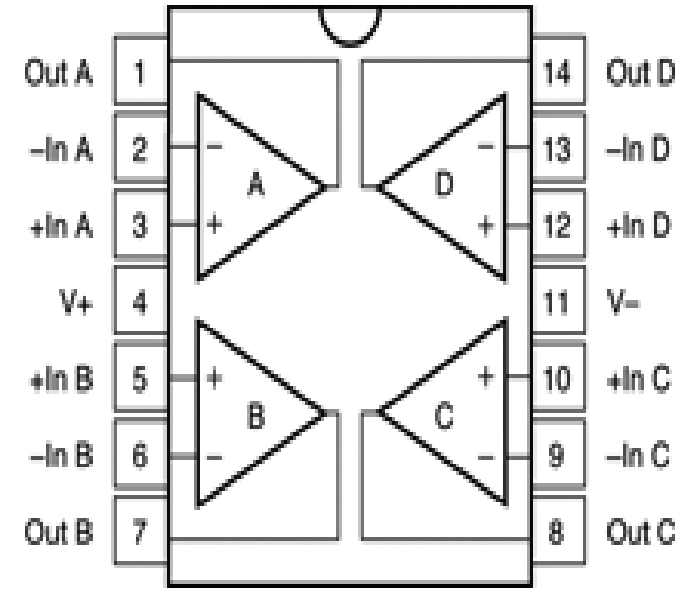
Karakteristik

Parameter	Ideal	LM741	LF347	LM318
Open-loop Gain (A_{OL})	∞	$2 . 10^5$	10^5	$2 . 10^5$
Input Resistance (R_{in})	∞ Ω	2 M Ω	10^{12} Ω	3 M Ω
Output Resistance (R_o)	0 Ω	75 Ω	75 Ω	75 Ω
Gain Bandwidth Product	∞ Hz	1 MHz	4 MHz	15 MHz
CMRR	∞	90 dB	100 dB	100 dB

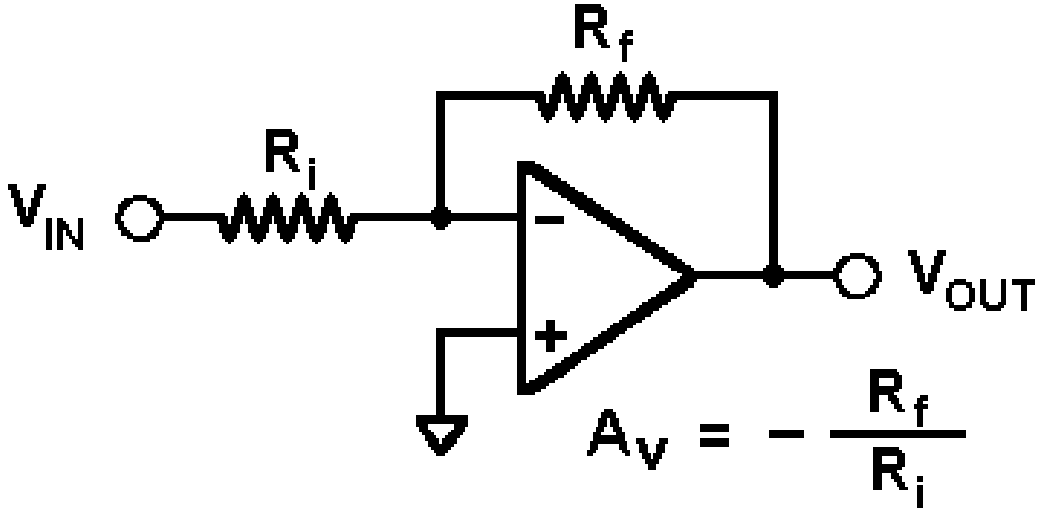
Konstruksi


Offset Null
1
8
V_
2
7
+Vcc
741
V+
3
6
Vout
-Vcc
4
5
Offset Null


Out A
1
8
V+
–In A
2
A
7
Out B
+In A
3
B
6
–In B
V–
4
5
+In B


Out A
1
14
Out D
–In A
2
A
D
13
–In D
+In A
3
12
+In D
V+
4
11
V–
+In B
5
B
C
10
+In C
–In B
6
9
–In C
Out B
7
8
Out C

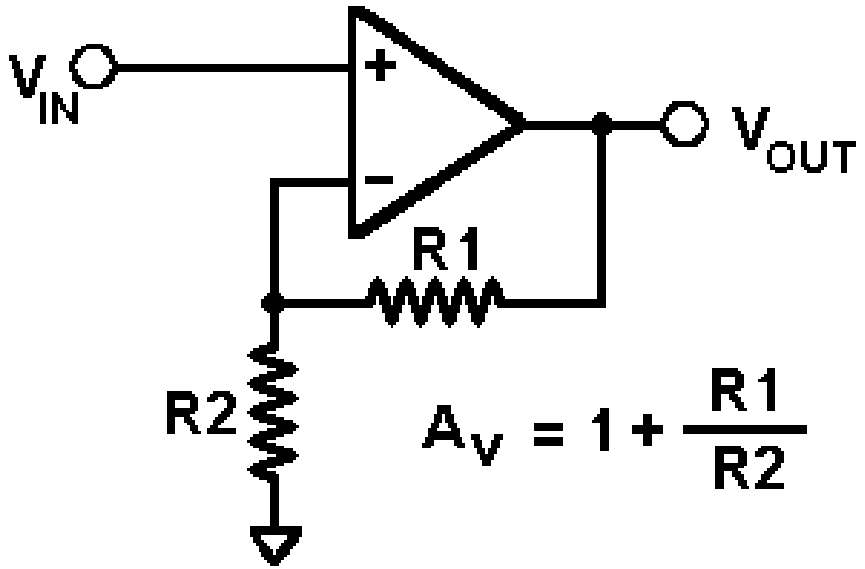
Inverting Amplifier



Resistansi input = R_S

Resistansi output ≈ 0

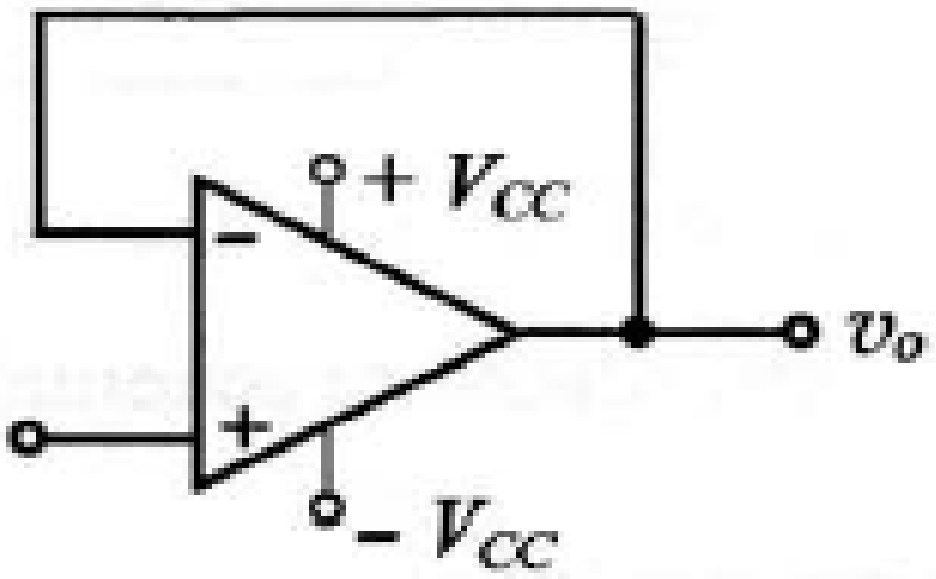
Non Inverting Amplifier



Resistansi input ≈ ∞

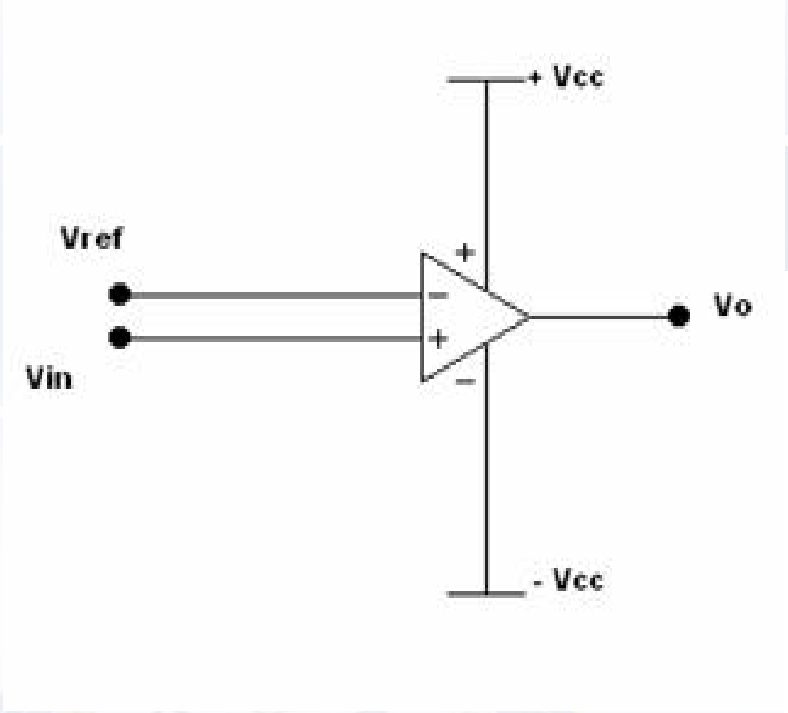
Resistansi output ≈ 0

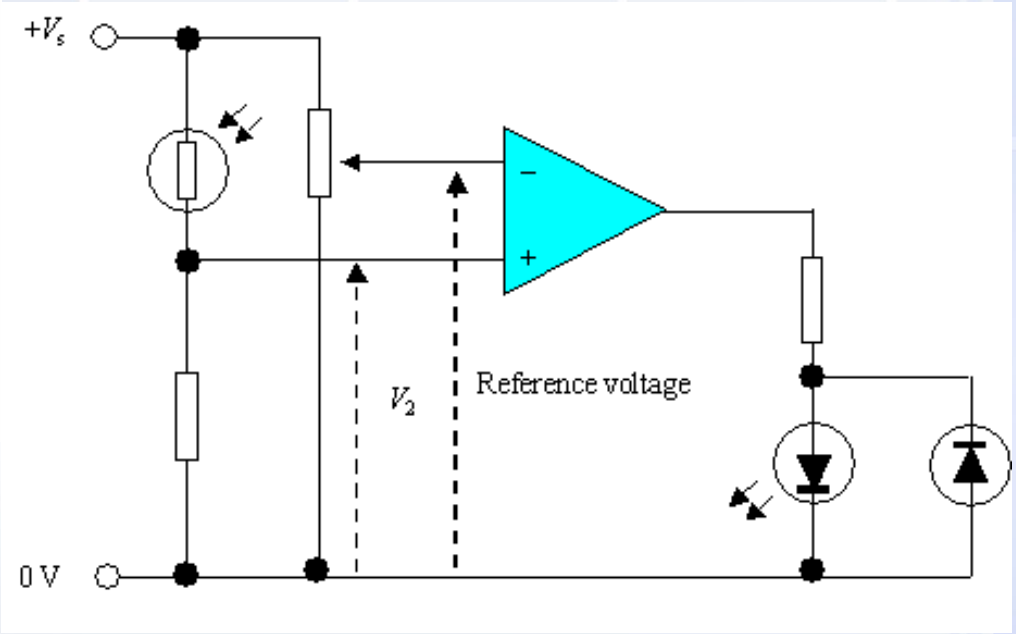
Penguatan = 1



Av = Vo/Vi = + 1

Komparator





end