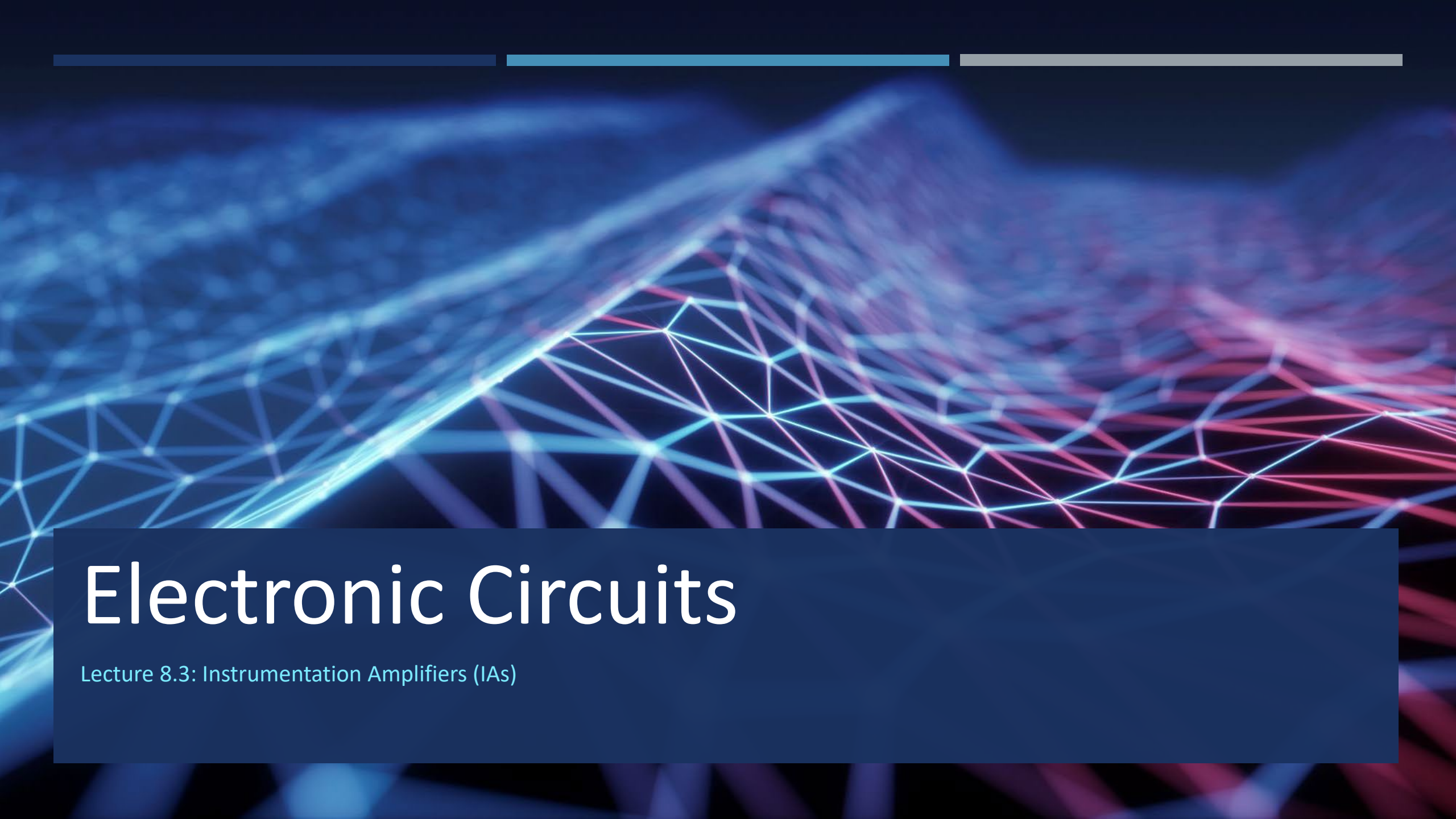
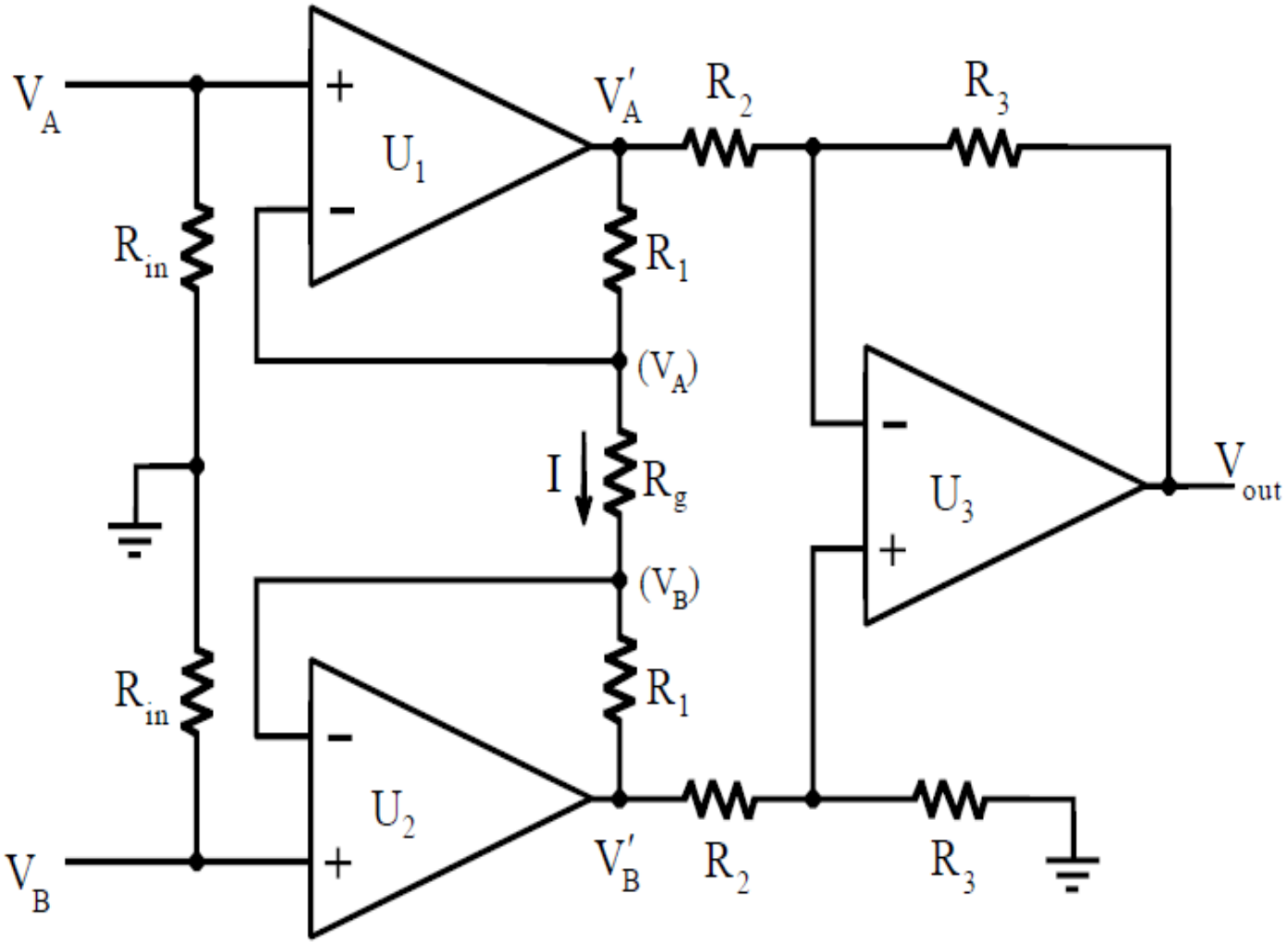


Electronic Circuits

Lecture 8.3: Instrumentation Amplifiers (IAs)

Instrumentation Amplifier with 3 OPAMPs



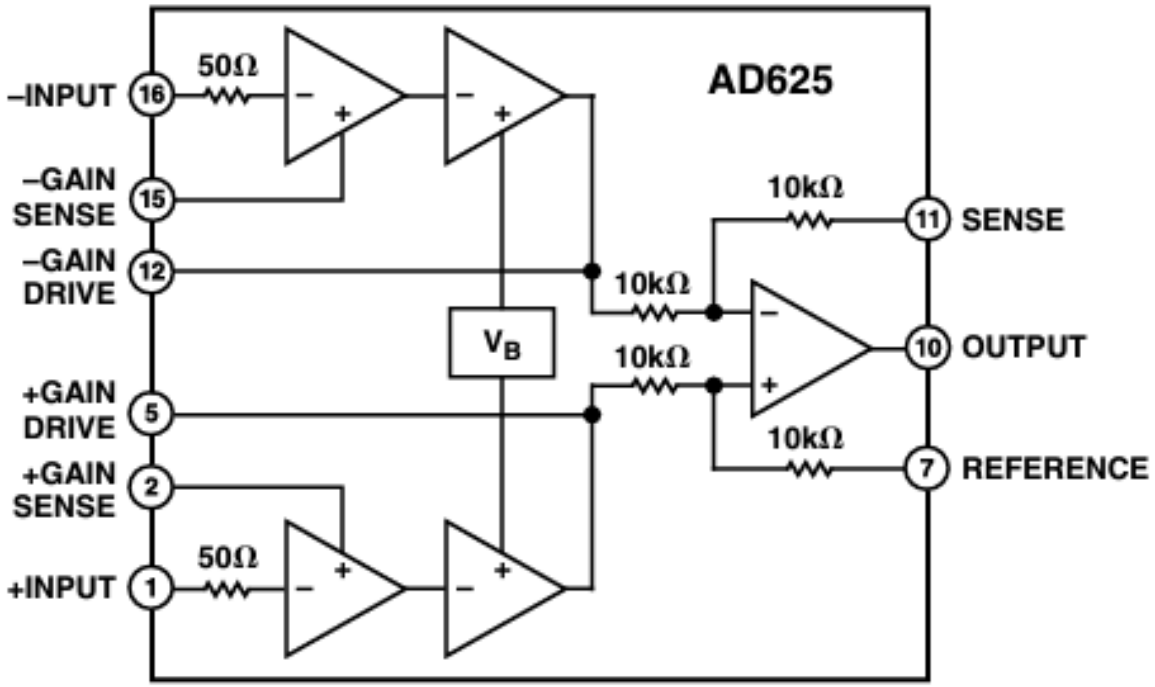
$$V_{out} = \frac{R_3}{R_2}\left(V'_B - V'_A\right)$$

$$I = \frac{V'_A - V'_B}{2R_1 + R_g} = \frac{V_A - V_B}{R_g}$$

$$V'_A - V'_B = \frac{2R_1 - R_g}{R_g}\left(V_A - V_B\right)$$

$$V_{out} = \frac{R_3}{R_2}\left(1 + \frac{2R_1}{R_g}\right)\left(V_B - V_A\right)$$

AD625



FEATURES

User Programmed Gains of 1 to 10,000
Low Gain Error: 0.02% Max
Low Gain TC: 5 ppm/°C Max
Low Nonlinearity: 0.001% Max
Low Offset Voltage: 25 μV
Low Noise 4 nV/√Hz (at 1 kHz) RTI
Gain Bandwidth Product: 25 MHz
16-Lead Ceramic or Plastic DIP Package,
20-Terminal LCC Package
Standard Military Drawing Available
MIL-Standard Parts Available
Low Cost

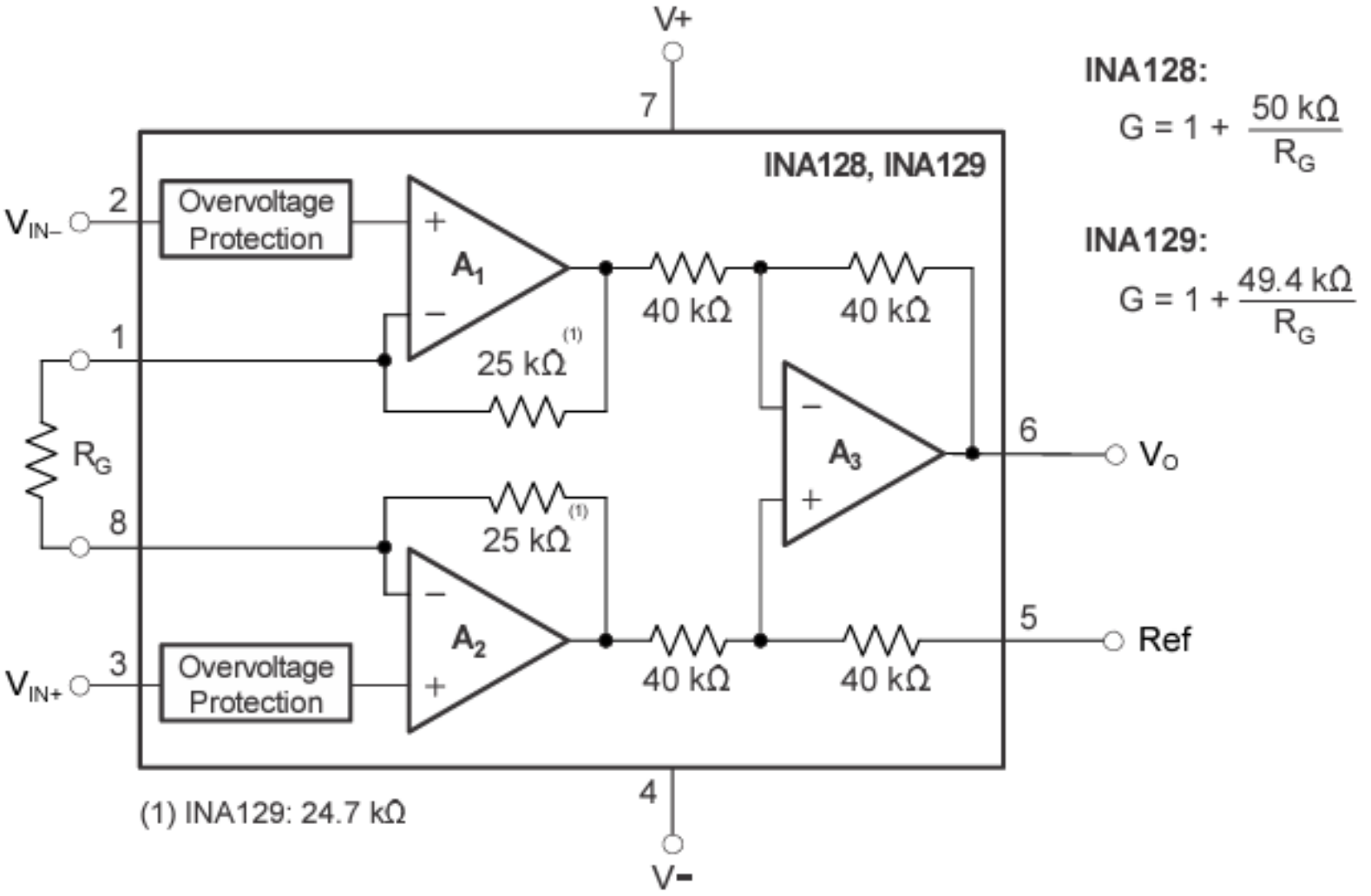
Av = 2*Rf/Rg + 1

Where Rf are connected between Gain Sense and Gain Drive inputs

And Rg is connected between Gain Driver inputs

* Sense and Output are short-circuit
* Reference is connected to GND

INA12x


V+
7
INA128, INA129
V_{IN-}
2
Overvoltage Protection
A_1
40 kΩ
40 kΩ
1
25 kΩ (1)
R_G
8
25 kΩ (1)
A_3
6
V_O
A_2
5
Ref
V_{IN+}
3
Overvoltage Protection
40 kΩ
40 kΩ
4
V−
(1) INA129: 24.7 kΩ
INA128:
$G = 1 + \frac{50\ k\Omega}{R_G}$
INA129:
$G = 1 + \frac{49.4\ k\Omega}{R_G}$

Thanks for listening ☺

YALÇIN İŞLER

Assoc. Prof.