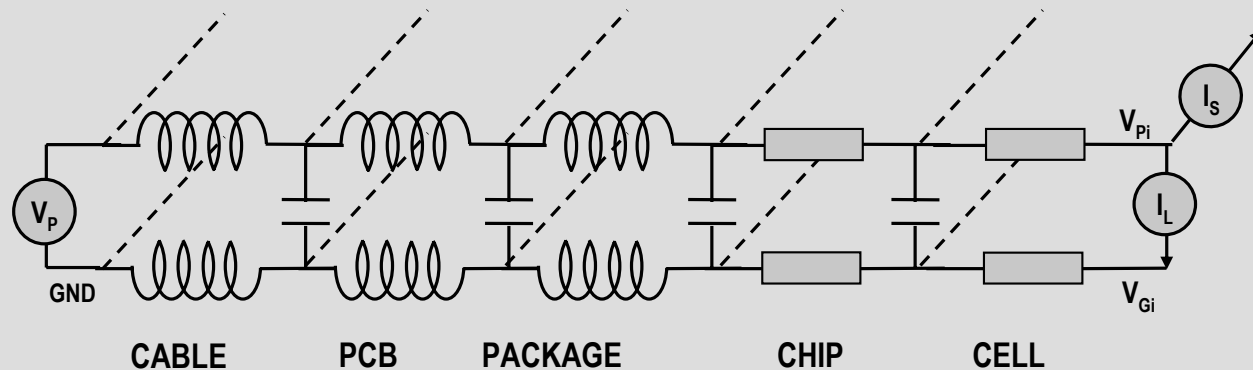


Chapter 4_3
Power Distribution

Digital Systems

GENERAL SUPPLY NETWORK

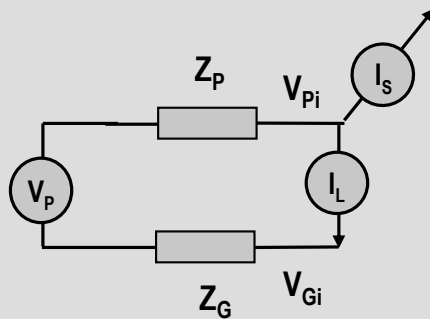


I_L : LOCAL CURRENTS CLOSING THROUGH THE SAME BRANCH

I_S : SIGNAL CURRENTS CLOSING THROUGH A DIFFERENT BRANCH

Digital Systems

LOCAL RETURNS



$$\text{If } I_S = 0$$

$$V_{Pi} = V_P - I_L \cdot Z_P$$

$$V_{Gi} = V_G + I_L \cdot Z_G$$

$$V_{Pi} - V_{Gi} = V_P - V_G - I_L (Z_P + Z_G)$$

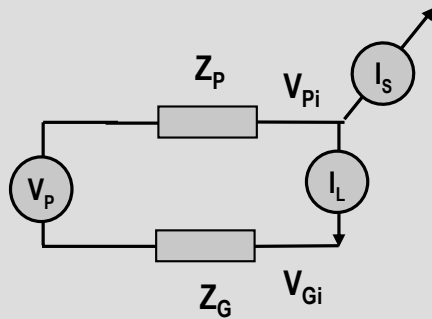
$$V_{Pi} + V_{Gi} = V_P + V_G - I_L (Z_P - Z_G)$$

$$\text{If } Z_P = Z_G$$

$$V_{Pi} + V_{Gi} = V_P + V_G$$

COMMON MODE VOLTAGE (REFERENCE) DOESN'T CHANGE

SIGNAL RETURNS



si $I_s \neq 0$

$$V_{Pi} = V_P - (I_L + I_s) \cdot Z_P$$

$$V_{Gi} = V_G + I_L \cdot Z_G$$

$$V_{Pi} - V_{Gi} = V_P - V_G - I_L (Z_P + Z_G) - I_s \cdot Z_P$$

$$V_{Pi} + V_{Gi} = V_P + V_G - I_L (Z_P - Z_G) - I_s \cdot Z_P$$

si $Z_P = Z_G$

$$V_{Pi} + V_{Gi} = V_P + V_G - I_s \cdot Z_P$$

COMMON MODE VOLTAGE (REFERENCE) CHANGES