

0.18μm process: MIM capacitor cross-section

7. Metal Insulator Metal capacitor (MIM process flow option 58.71K)

High capacitance and high linearity capacitors are available with the process flow option 58.71K. This capacitor is made by using the last metal before top metal as bottom plate, nitride insulator and thin additional metal as top plate.

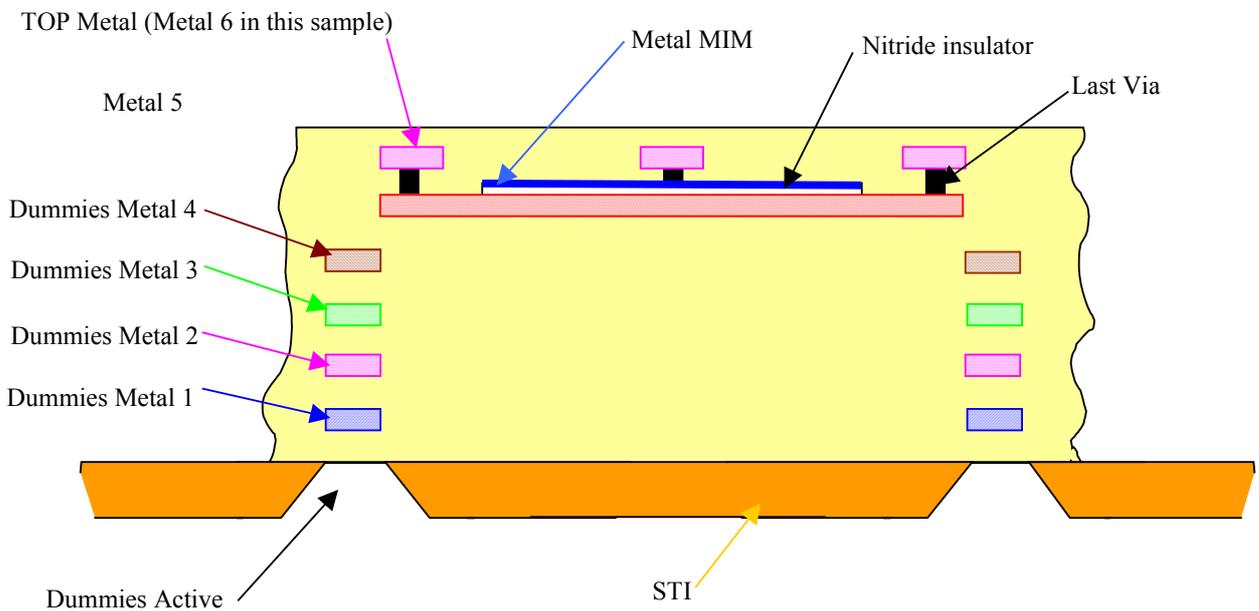
The last via is used for biasing bottom and top plate.

At least one additional mask is necessary for this process option.

Bottom plate and via for the different TOP metal

Top Metal	Metal 4	Metal 5	Metal 6
Bottom plate	Metal 3	Metal 4	Metal 5
MIM via	Via 3	Via 4	Via 5

Cross section (sample with top metal 6):

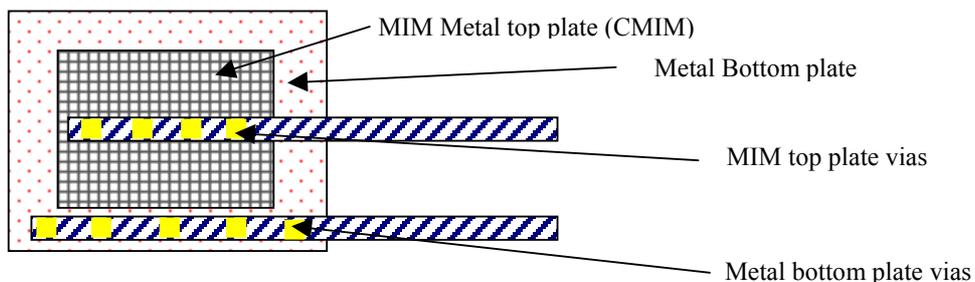


7.1: Layout of MIM capacitor:

Because the MIM top plate is etched before the metal bottom plate, the MIM top plate should be always designed over the metal bottom plate. That means that MIM top plate vias are over the active area of the capacitor.

All rules regarding this layout can be found in the 58.71K design rule manual.

Top view:



$$\text{MIM capacitance} = (1 \pm 0.15) \text{ fF}/(\mu\text{m})^2 ; \text{ mismatch} = \sigma * 1.6\% / \sqrt{W * L}$$