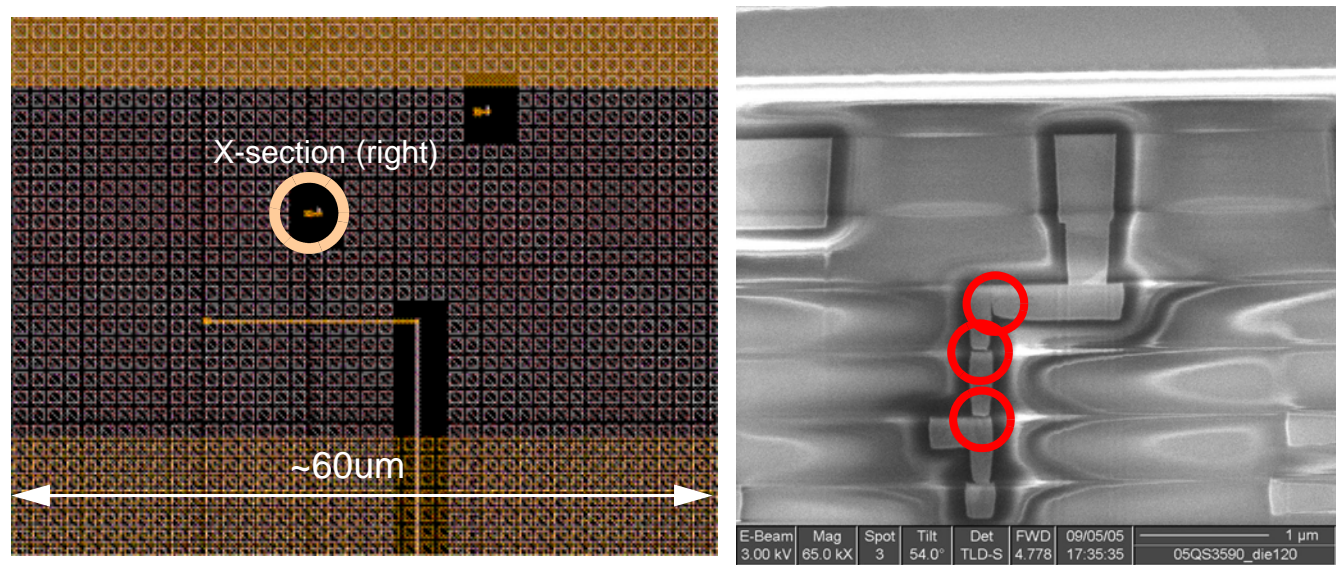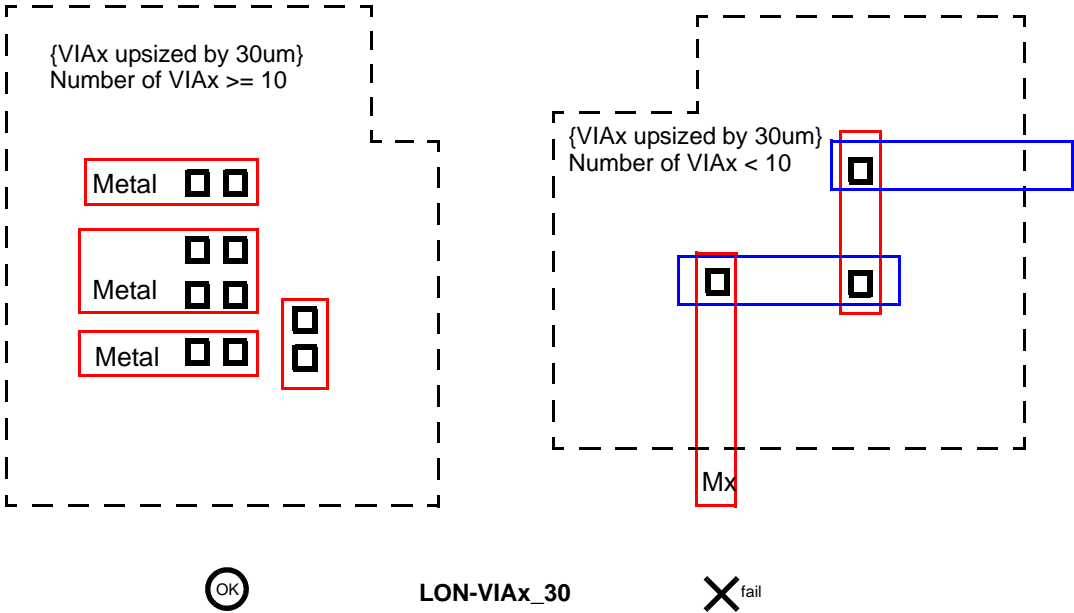## 7.4 ROBUST DESIGN RULES

7.4.1 LONELY VIA RULE

VIAs located in a very isolated environment can show a systematic VIA opening failure.

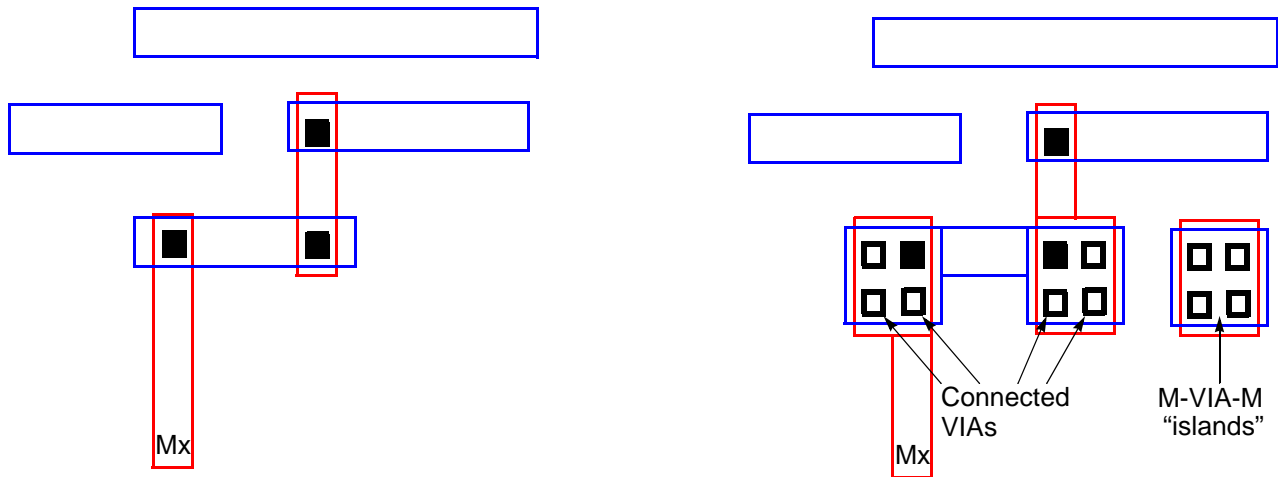Critical VIAs can be located with the following rule:

Lonely VIAx (only applies for VIAx)		
LON-VIAx_30	Minimum number of VIAx inside {VIAx upsized by 30um}	10

{VIAx upsized by 30um}
Number of VIAx >= 10

Metal

{VIAx upsized by 30um}
Number of VIAx < 10

Metal

Metal

Mx

(OK)   **LON-VIAx_30**   ✗ fail

Approved for Product Design

Regions with critical VIAs can be corrected by:

- increasing the number of connected VIAs in the near vicinity of the lonely VIAs. This might require enlarging the metal lines below and/or above.
- placing "islands" of metal-VIA-metal, in case connected VIAs cannot be placed due to space limitations as for instance in case of neighbouring metal lines.

Mx

Mx

Connected
VIAs

M-VIA-M
"islands"

Approved for Product Design