**DRC errors encountered during Digital IC Design**

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**Abstract**

This document presents information about the errors or DRC fails encountered during a Digital IC Layout design and can serve as a troubleshooting guide for most common DRC errors.

**Data and Results**

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| --- | --- | --- | --- | --- |
| No. | Error Name & Code | Figure | Details | Solution |
| 1 | 4.6 Not Existing: Not selected active |  | This error arises if active area is placed without a substrate | This error can be removed by placing the active area in required P or N well. |
| 2 | 5.1a Poly Contact Exact Size |  | This error arises if poly contact size isn’t exactly equal to minimum according to DRC rules | This error can be removed by keeping size of contact exact as mentioned in the error |
| 3 | 7.3 Metal1 Overlap of Poly Contact |  | This error arises if poly contact isn’t placed at a safe distance from Metal1 or Metal1 isn’t placed at all | This error can be removed by keeping poly contact at the distance mentioned in DRC rules from Metal1 |
| 4 | 8.3 Metal1 Overlap of Via1 |  | This error arises if Via1 contact isn’t placed at a safe distance from Metal1 or if it isn’t placed at all | This error can be removed by keeping Via1 contact at the distance mentioned in DRC rules from Metal1 |
| 5 | 9.3 Metal2 Overlap of Via1 |  | This error arises if Via1 contact isn’t placed at a safe distance from Metal1 or if it isn’t placed at all | This error can be removed by keeping Via1 contact at the distance mentioned in DRC rules from Metal1 |
| 6 | 6.2a Active Overlap of Active Contact |  | This error arises if Active contact isn’t placed at safe distance from other components | The error gets removed if active contact is placed according to the distance mentioned by DRC rules |
| 7 | 6.4a Active Contact to Gate Spacing |  | This error arises if Active contact isn’t placed at safe distance from Gate | The error gets removed if active contact is placed according to the distance from Gate mentioned by DRC rules |
| 8 | 4.3c Not Exist: Active Contact not on act |  | This error arises if active contact is placed without active area | This error can be removed by placing the active area around active contact. |
| 9 | 5.2A/5.6B Poly Overlap of Poly Contact |  | This error arises if poly contact isn’t placed at safe distance from other components | The error gets removed if poly contact is placed according to the distance mentioned by DRC rules |
| 10 | 5.2b Not Exists: Poly contact not on poly |  | This error arises if poly contact is placed without poly | This error can be removed by placing the poly around poly contact. |
| 11 | 7.4 Metal1 Overlap of Active Contact |  | This error arises if active contact isn’t placed at a safe distance from Metal1 | This error can be removed by keeping active contact at the distance mentioned in DRC rules from Metal1 |
| 12 | 7.5 Metal1 Density |  | This error arises if extra Metal1 isn’t inserted to strengthen the IC | It can be removed by adding extra Metal1 in the design |
| 13 | 3.6 Poly Density |  | This error arises if Poly length is lesser as compared to density of other components | It can be removed by keeping poly density similar to that of other components |
| 14 | 5.3A Poly contact to poly contact spacing |  | This error arises if poly contacts are placed very closely | It can be removed by following DRC rules for safe distance |
| 15 | 6.1a Active contact exact size |  | This error arises if active contact size isn’t exactly equal to minimum according to DRC rules | This error can be removed by keeping size of contact exact as mentioned in the error |
| 16 | 3.2 Poly to poly spacing |  | This error arises if polys are placed very closely | It can be removed by following DRC rules for safe distance |
| 17 | 3.2a Poly to poly spacing over active |  | This error arises if polys are placed very closely on active Area | It can be removed by following DRC rules for safe distance |
| 18 | 9.1 Metal2 Minimum Width |  | This error arises Metal2 length is lesser than minimum threshold | It can be removed by keeping Metal2 width above 0.36 microns as directed by DRC Rules |
| 19 | 9.5 Metal 2 Density |  | This error arises Metal2 density is lesser as compared to that of other components | It can be removed by keeping Metal2 density similar to that of other components |
| 20 | 7.1 Metal1 Minimum Width |  | This error arises Metal1 length is lesser than minimum threshold | It can be removed by keeping Metal2 width above 0.36 microns as directed by DRC Rules |
| 21 | 4.5 Not Existing: P-select overlap of N-Select |  | This error arises if the contact of transistor with substrate isn’t possible | It can be corrected by making sure that transistor gets connected with the substrate |
| 22 | 3.3 Gate Extension Out of Active |  | If the poly gets placed horizontally, the transistor extends out of Active and this error arises | It can be corrected by vertically aligning any horizontally placed polys |
| 23 | 3.4a/4.1a  Source/Drain width |  | If the poly gets placed horizontally, the transistor’s drain and source get affected | It can be corrected by vertically aligning any horizontally placed polys |
| 24 | 8.1 Via1 Exact size |  | This error arises if Via1 size is not exactly equal to the DRC defined size | This error can be removed by keeping size of contact exact as mentioned in the DRC rules |
| 25 | 4.4 Select Minimum width |  | This error arises if P-Select or N-Select size is lesser than the DRC defined size | It can be removed by keeping Select width above 0.48 microns as directed by DRC Rules |

**Conclusion**

From this document and the information presented in it, it can be concluded that most DRC errors encountered during a Digital IC Layout design can be corrected by performing the action suggested by the error navigator.It is important to note that DRC checking the layout after each step will be more helpful in creating an error-free Digital IC Layout.