General FDCFOA Sallen-Key Filter Analysis – A Symmetrical Case

Model of FDCFA with resistor in gate and resistor in gate has a common form

They are:

1. 13\_SimpModelControlledSources/Models\_CFMB\_OUT  
   13\_SimpModelControlledSources/Models\_NO\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_NO\_CFMB\_OUT
2. 13\_SimpModelControlledSources/Models\_TE\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_TE\_CFMB\_OUT
3. 13\_SimpModelControlledSources/Models\_TE\_NO\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_TE\_NO\_CFMB\_OUT
4. 15.SimpModelControlledSourcesImprovedkR/Models\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_CFMB\_OUT
5. 15.SimpModelControlledSourcesImprovedkR/Models\_NO\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_NO\_CFMB\_OUT
6. 15.SimpModelControlledSourcesImprovedkR/Models\_TE\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_TE\_CFMB\_OUT
7. 15.SimpModelControlledSourcesImprovedkR/Models\_TE\_NO\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_TE\_NO\_CFMB\_OUT

Instead of determining the final transfer function, which can be difficult for the further post-processing, we can disperse each HOSC to 3 adding additional deletions.

In such a case we should determine:

Developed values are:

We can easily see that

because

The above form is much clearer than when we insert the FDCFOA at once.

The surrounding circuit around the active device causes that . Thus:

1. 13\_SimpModelControlledSources/Models\_CFMB\_OUT  
   13\_SimpModelControlledSources/Models\_NO\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_NO\_CFMB\_OUT
2. 13\_SimpModelControlledSources/Models\_TE\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_TE\_CFMB\_OUT
3. 13\_SimpModelControlledSources/Models\_TE\_NO\_CFMB\_OUT  
   14\_SimpModelControlledSourcesAsym/Models\_TE\_NO\_CFMB\_OUT
4. 15.SimpModelControlledSourcesImprovedkR/Models\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_CFMB\_OUT
5. 15.SimpModelControlledSourcesImprovedkR/Models\_NO\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_NO\_CFMB\_OUT
6. 15.SimpModelControlledSourcesImprovedkR/Models\_TE\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_TE\_CFMB\_OUT
7. 15.SimpModelControlledSourcesImprovedkR/Models\_TE\_NO\_CFMB\_OUT  
   16.SimpModelControlledSourcesImprovedkRAsym/Models\_TE\_NO\_CFMB\_OUT

Then,