Printed board for the layout of electronic circuits

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Orcad 16.6 with PSpice

Presentation at Cadence User Conference 2016

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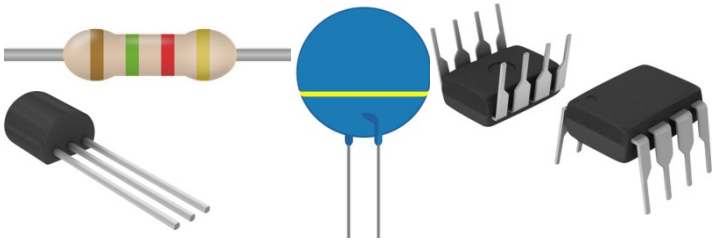
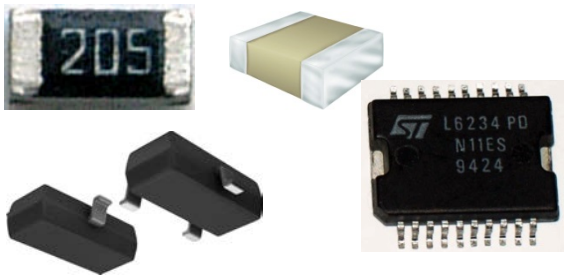
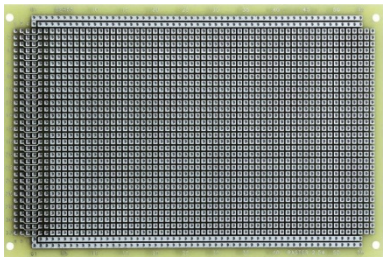
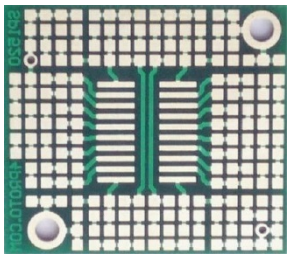
Motivation:

- Available printed boards for prototyping:
  - Wired connection components < - > SMD connection components



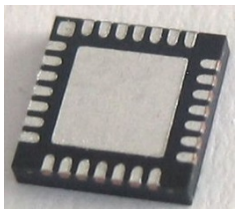






Restrictions of these solutions:

- Impossible to fulfill EMC and thermal considerations
- Impossible to use individual component footprints



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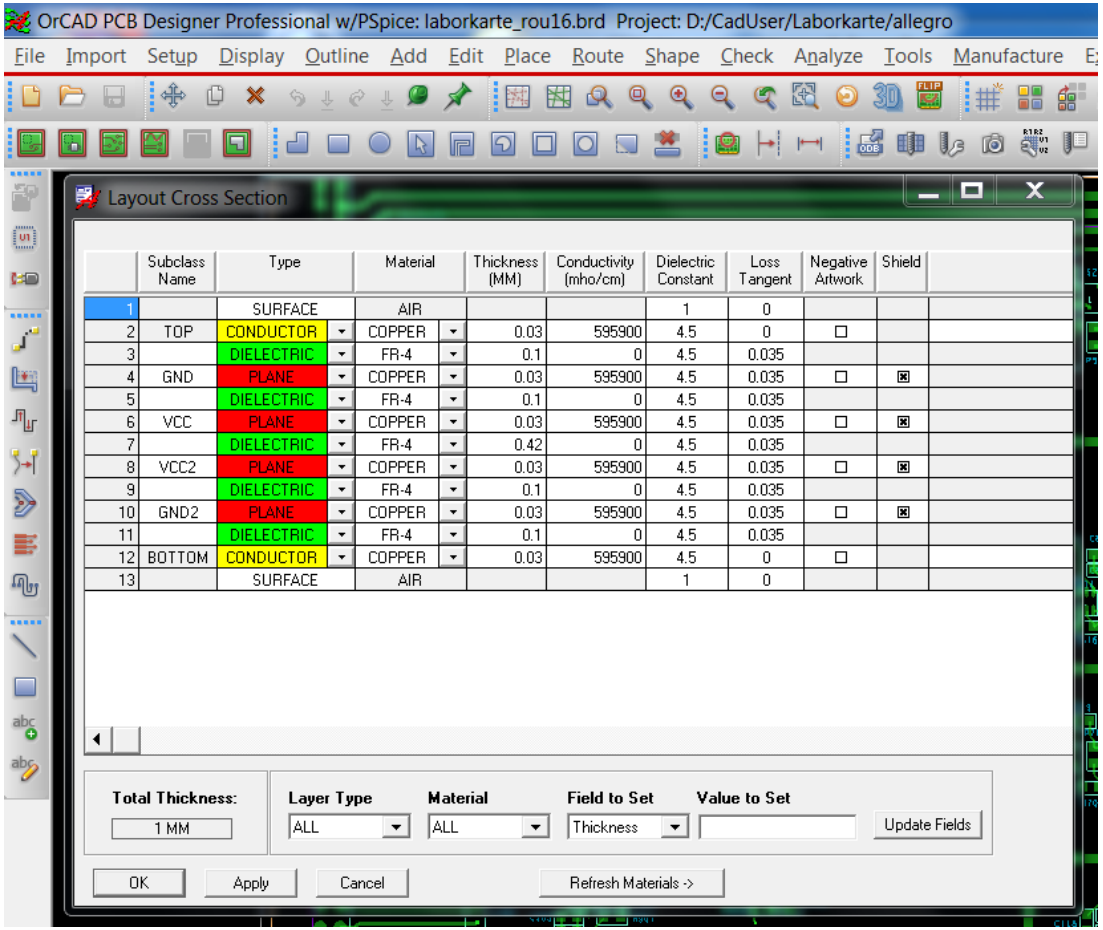
6 Layers are the minimum for fulfilling all EMC:



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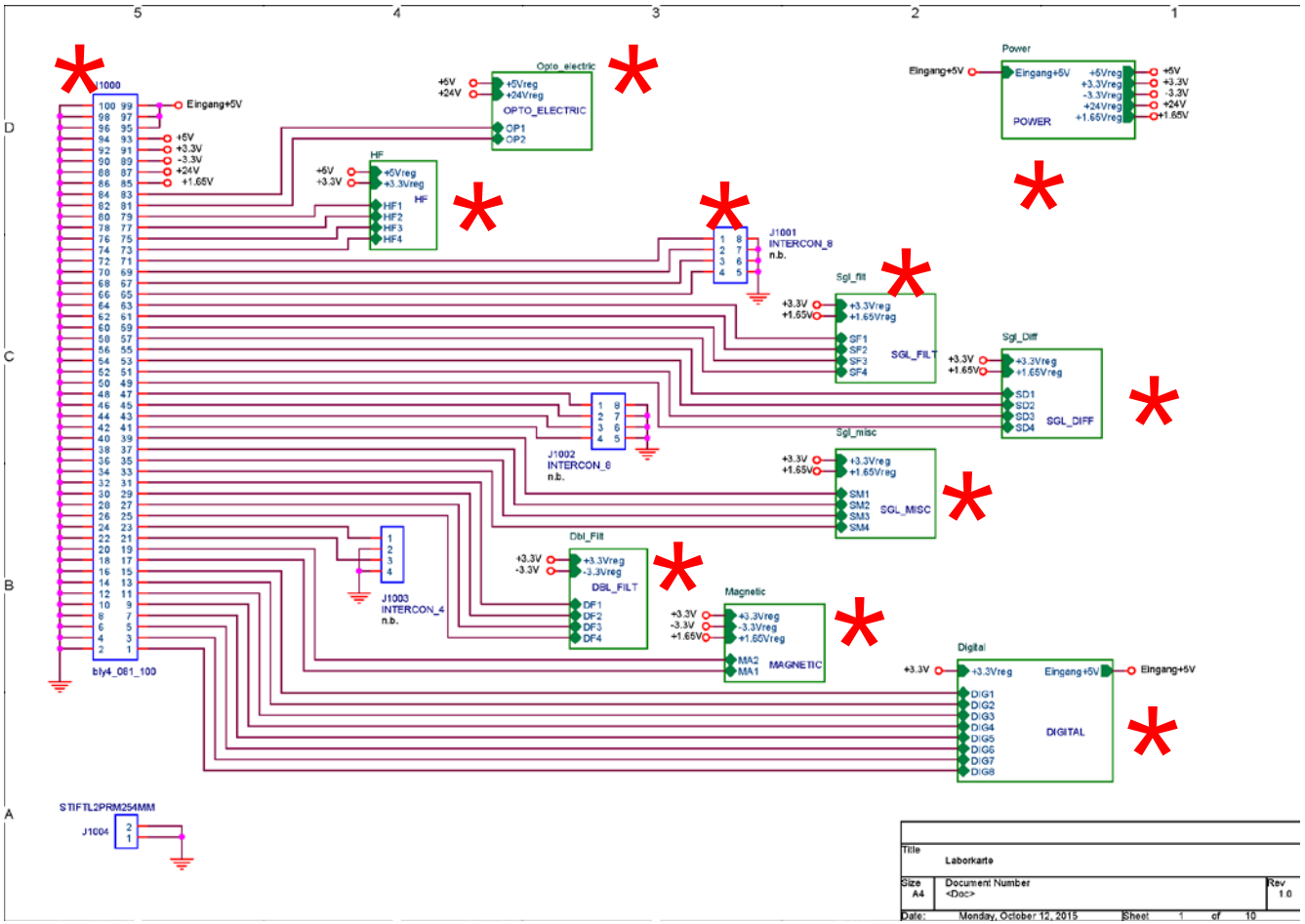
Blockdiagram:



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Top layer and ground (layer 2 and 5)

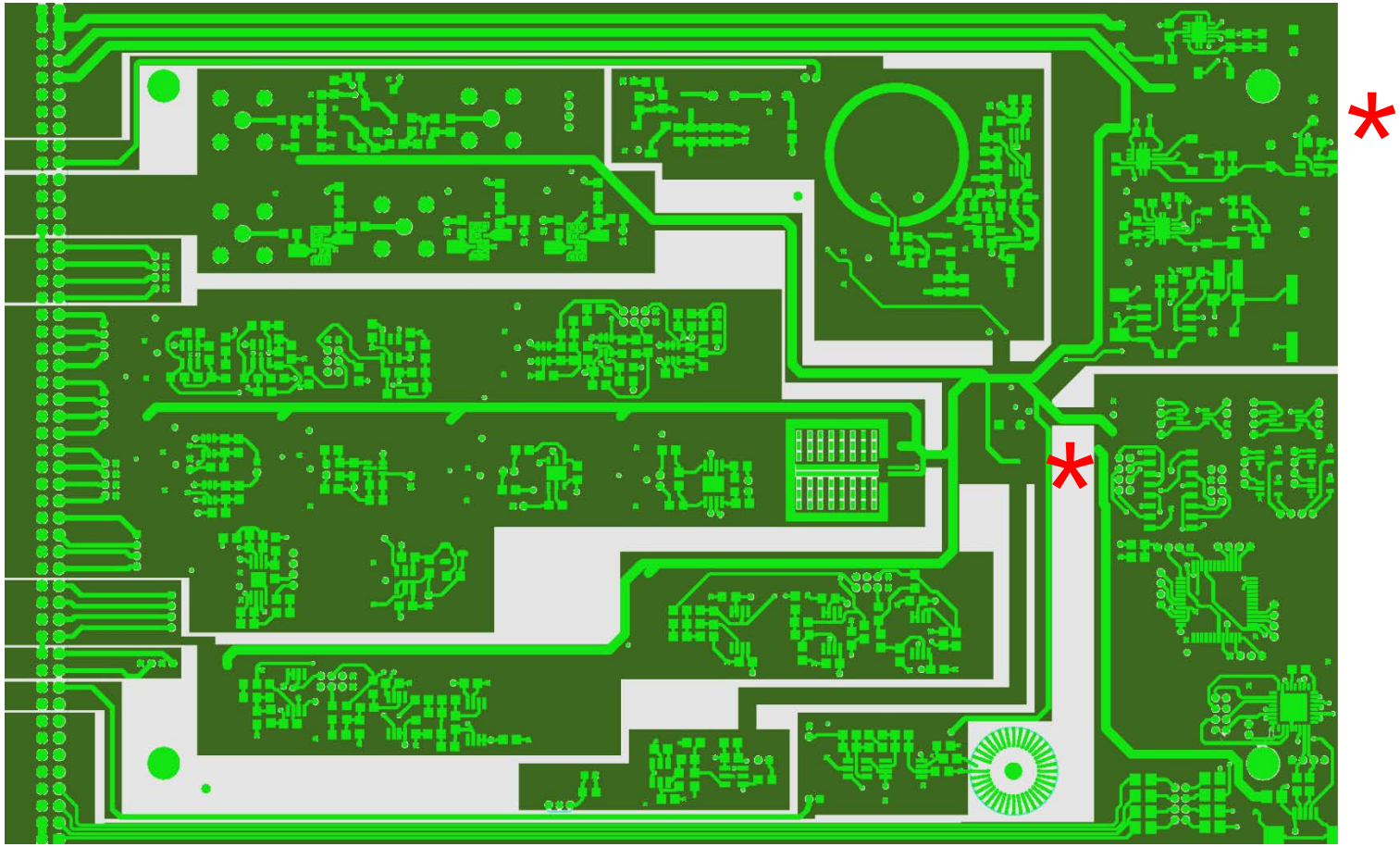

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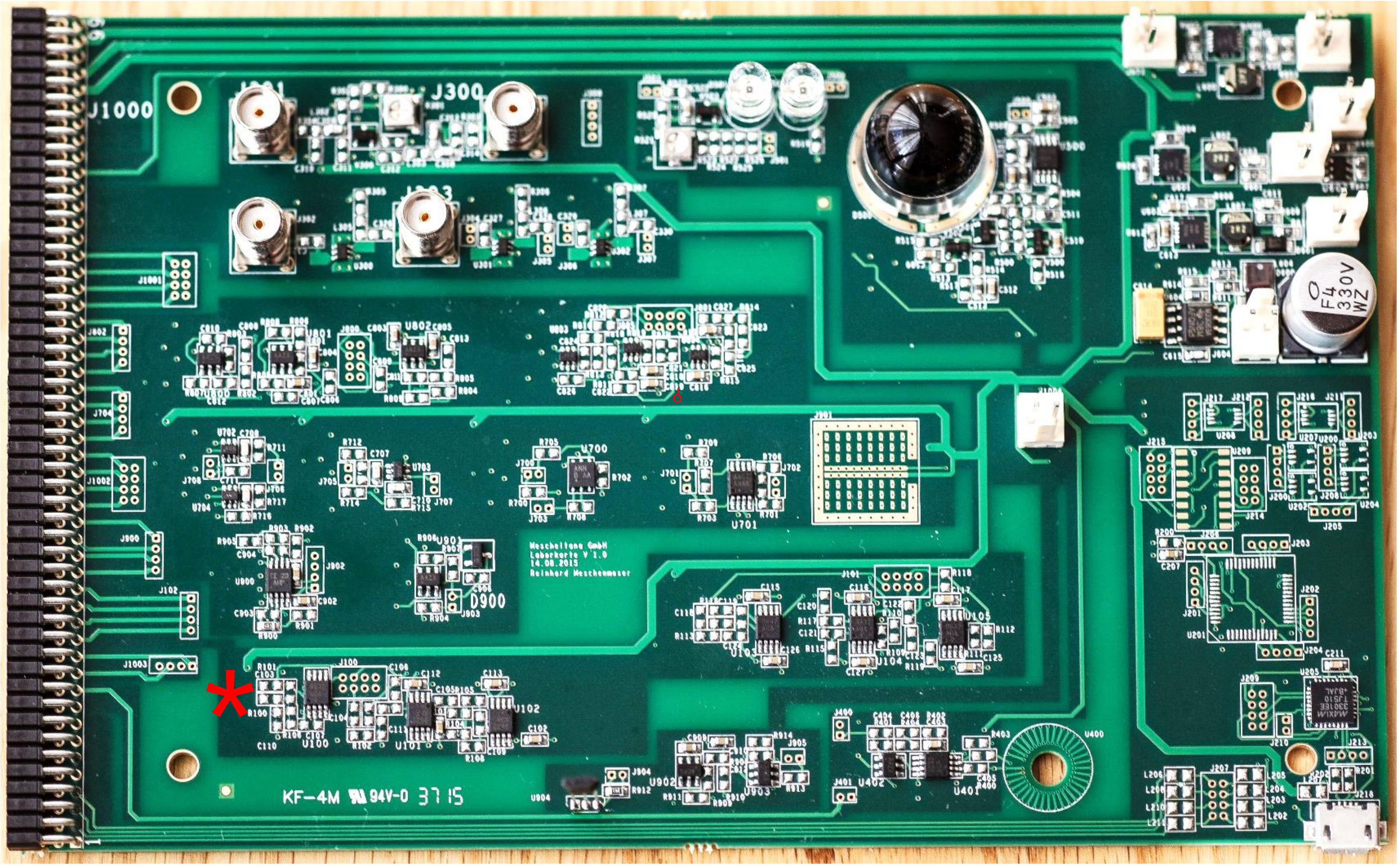
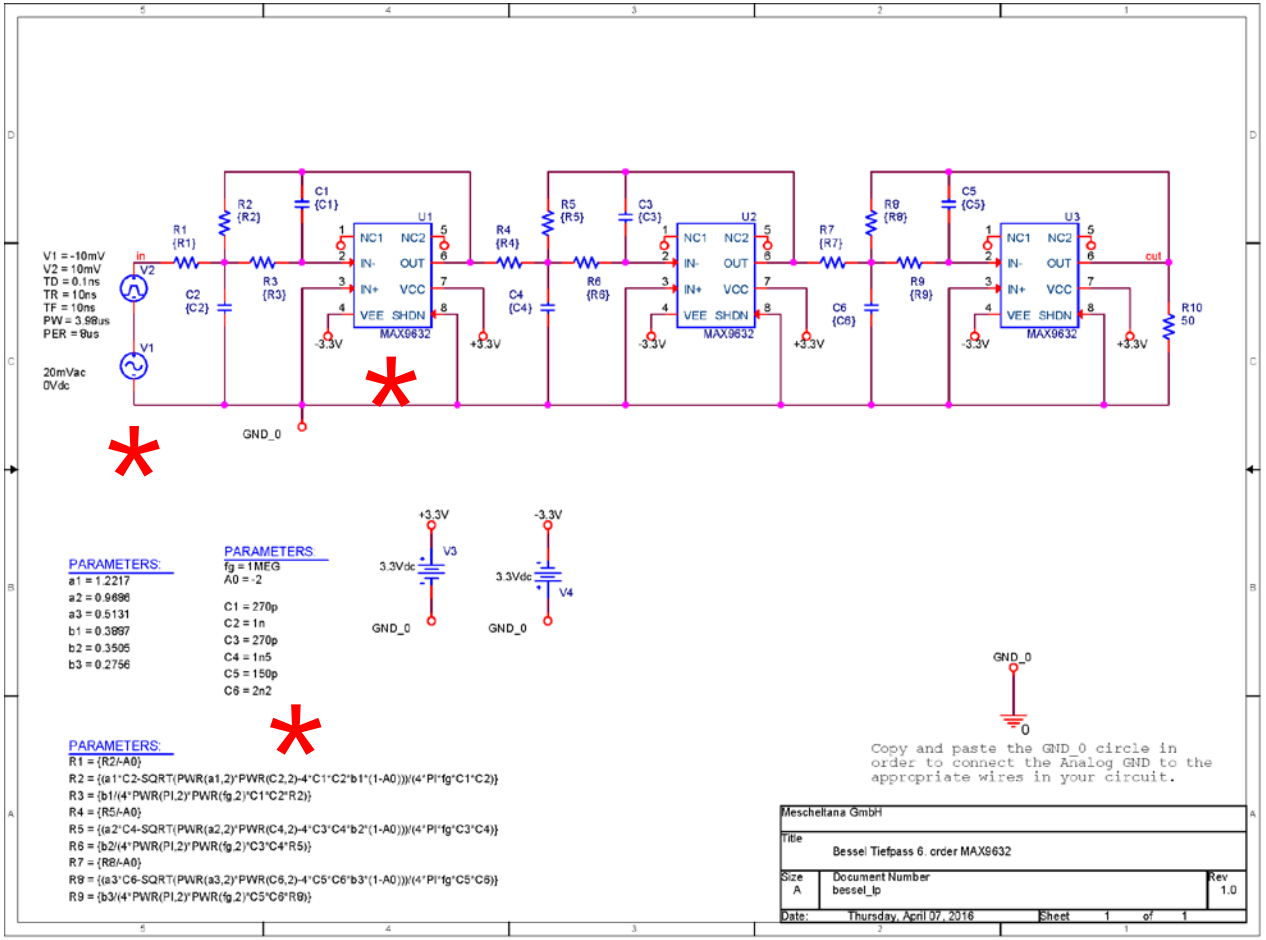
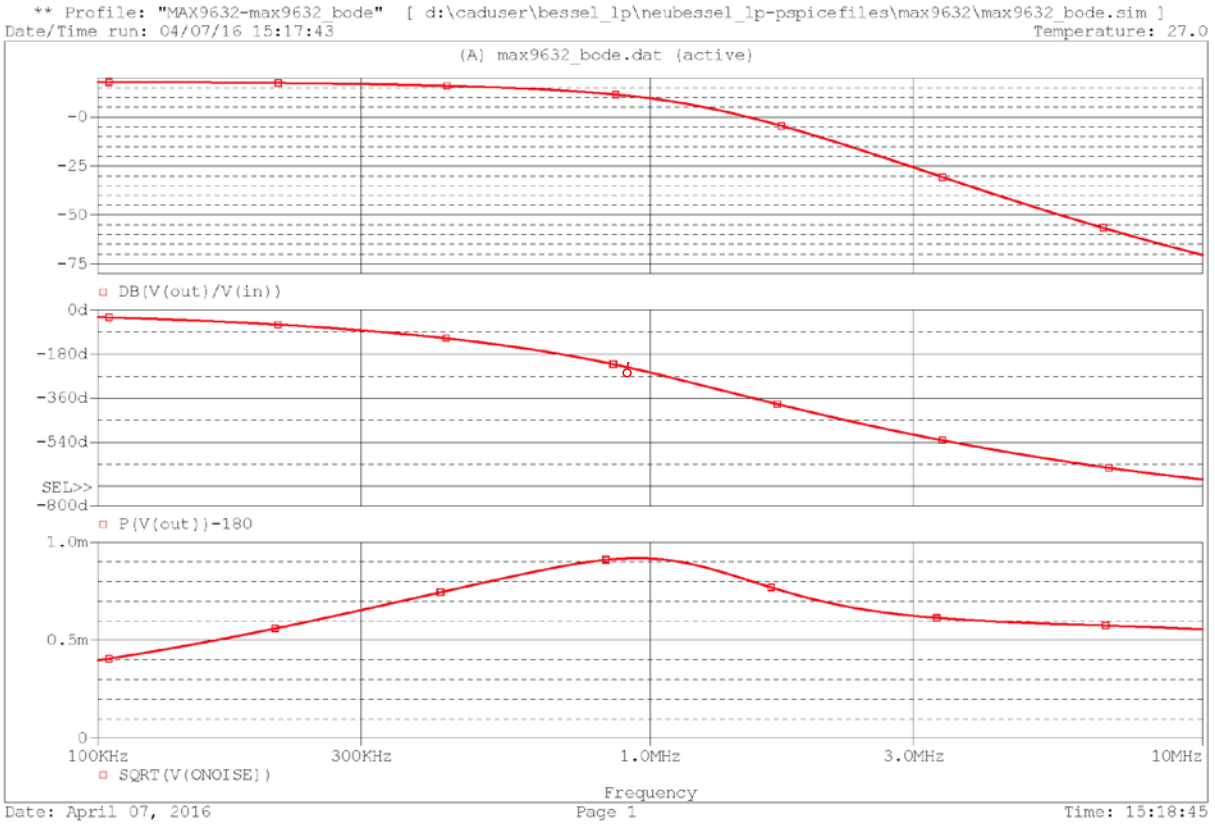
Photo of the partly mounted board:



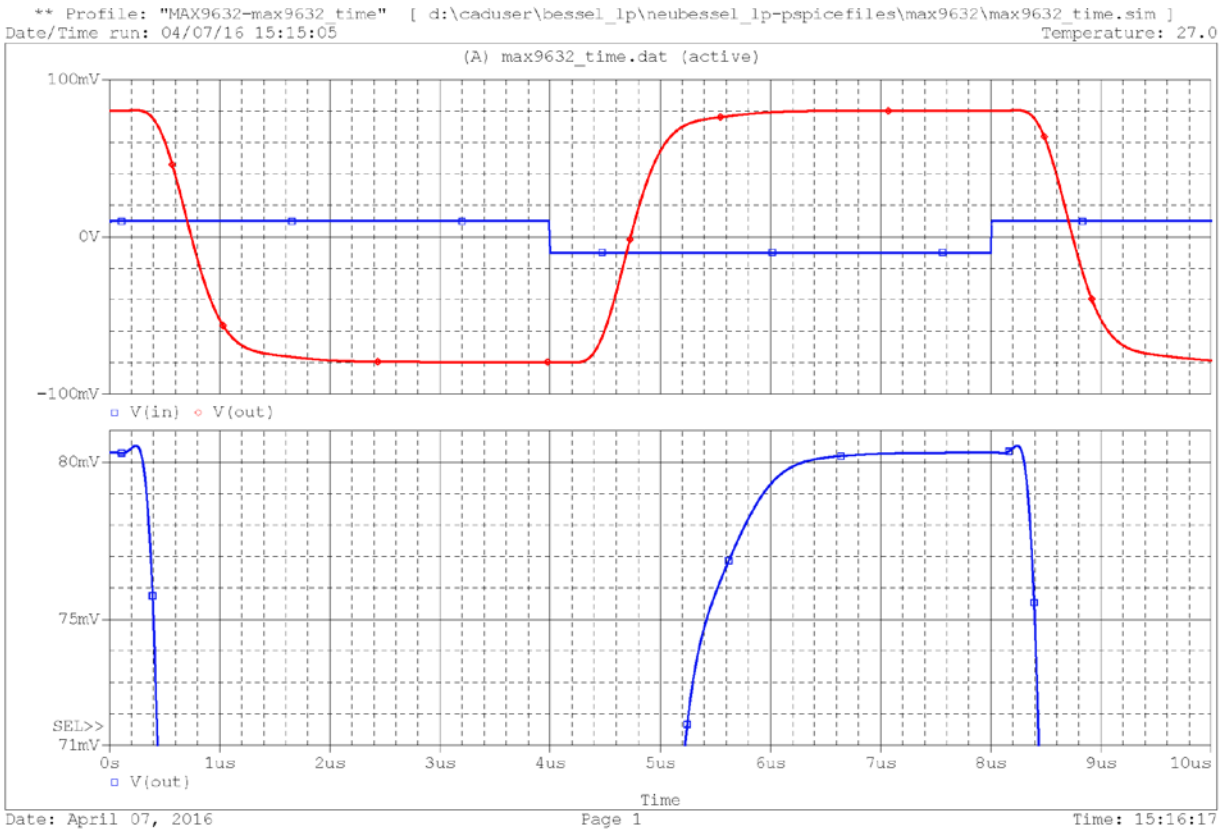
Circuit of the PSpice simulation:



Frequency simulation:



Time simulation:



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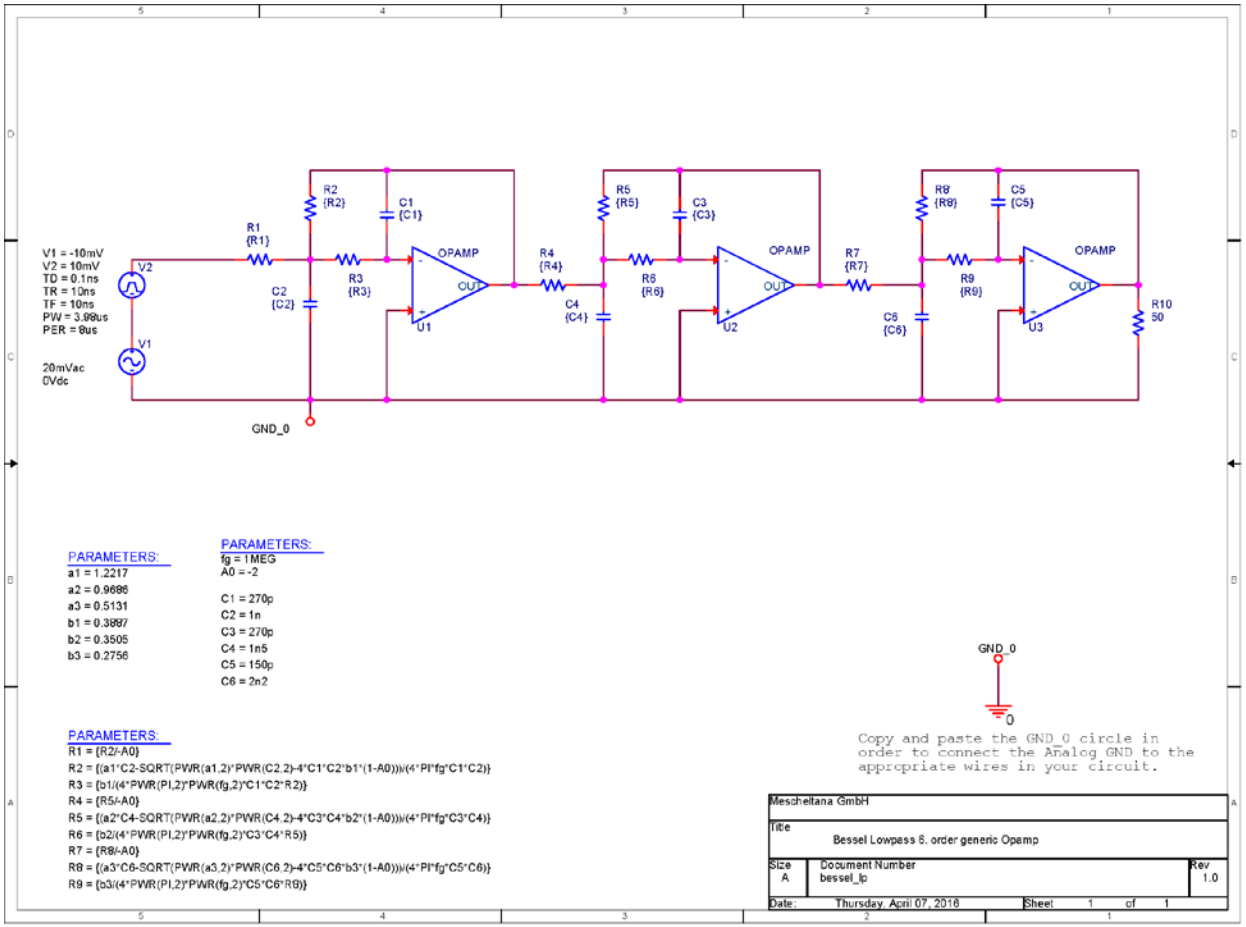
Finally:

- My offer to customers:
  - Sale of the unmounted board
  - Sale a partly mounted version of the board
    - Individual configuration to customer requirements
  - Use of parts and concepts as a base for individual developments
- Evaluation the whole schematics:
  http://www.mescheltana.de/LABORKARTE3_link.pdf
- Reference:
  - [1] Tietze, U., Schenk, C., & Gamm, E. (2009). Halbleiter-Schaltungstechnik. Erlangen und München: Springer.

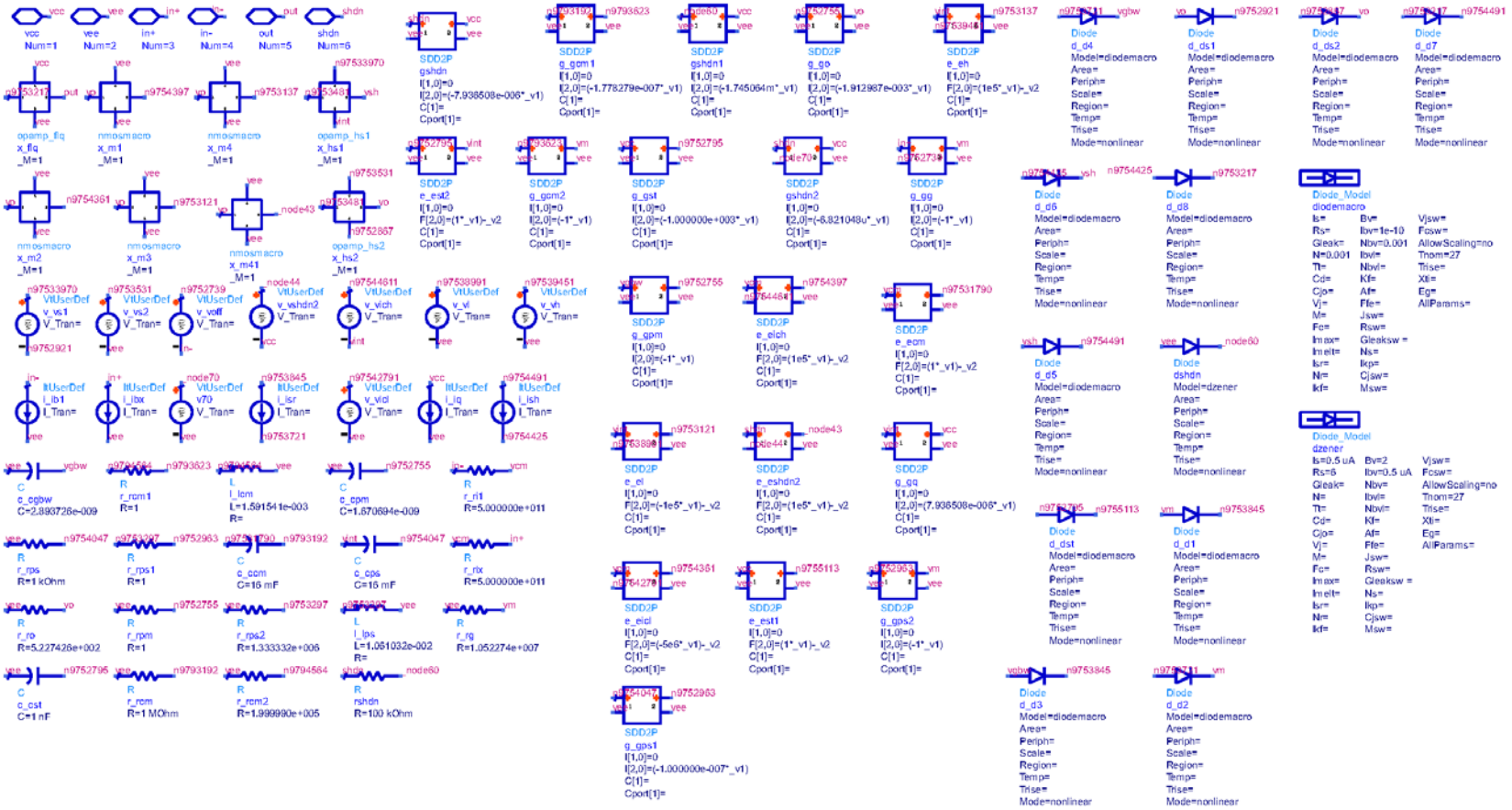
Questions ?

➔Backup

Simulation with generic operational amplifier:



Spice model of the max9632:



Excel calculation of the components:

Bessel Filter 6th Order from Tietze-Schenk:

a1=	1,2217				
a2=	0,9686				
a3=	0,5131				
b1=	0,3887				
b2=	0,3505				
b3=	0,2756				
fg=	1,00E+06	wg=	1,26E+07		
A0=	-2				
C1=	2,70E-10			zC1=	294,73
C2=	1,00E-09	C2ref=	8,44E-10	zC2=	79,58
C3=	2,70E-10			zC3=	294,73
C4=	1,50E-09	C4ref=	1,21E-09	zC4=	53,05
C5=	1,00E-10			zC5=	795,77
C6=	1,50E-09	C6ref=	1,26E-09	zC6=	53,05
R1=	108,88				
R2=	217,76				
R3=	56,45				
R4=	112,89				
R5=	121,85				
R6=	243,70				