



# Ausgangslage

- **Spezialwettbewerb 2007 *Leichter als 2 kg***
- **Gewichtsüberlegungen:**

Transceiver ATS3 inkl. Zubehör	200 g
Bisherige Antenne komplett:	900 g
Bleibt für die Endstufe inkl. Batterie: 900 g	
- **Wieviele Watt kann ich mit 900 g machen?**



# Batterie und Leistung wählen

- Batteriekapazität

Batteriespannung

Was gibt es auf dem Markt?

Preis?

Batteriegewicht

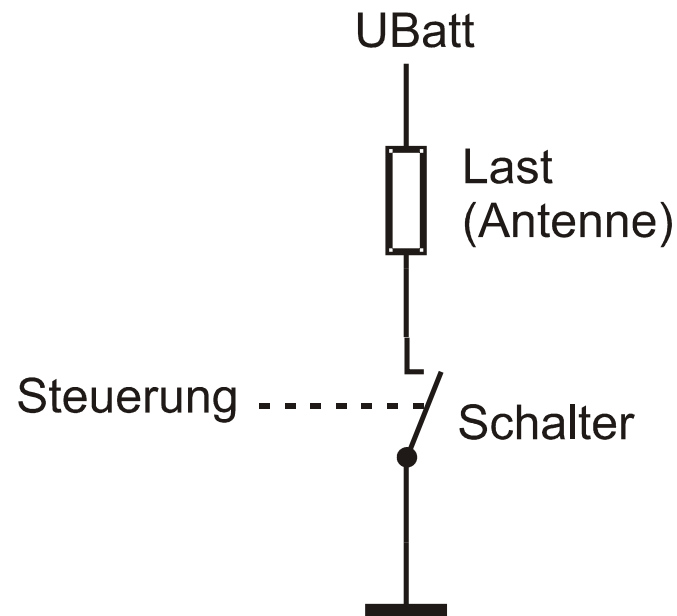


# Eigenschaften der Klasse E

- **Hoher Wirkungsgrad**
- **Wenig Bauteile – unkritische Werte**

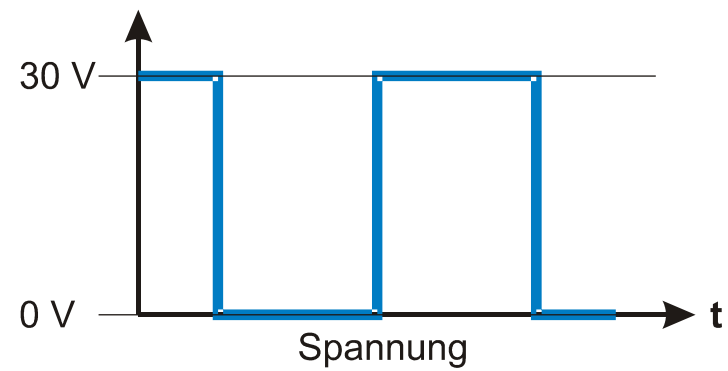
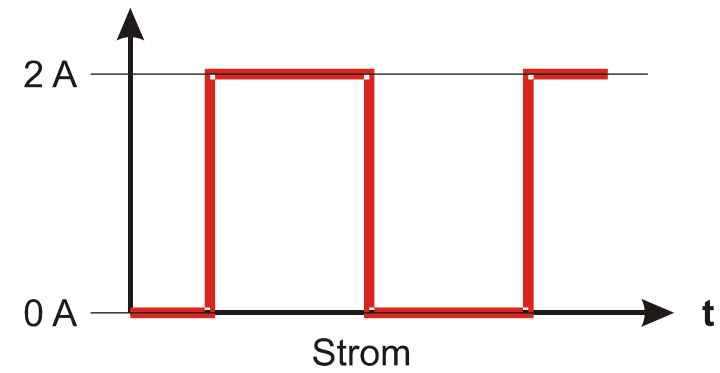
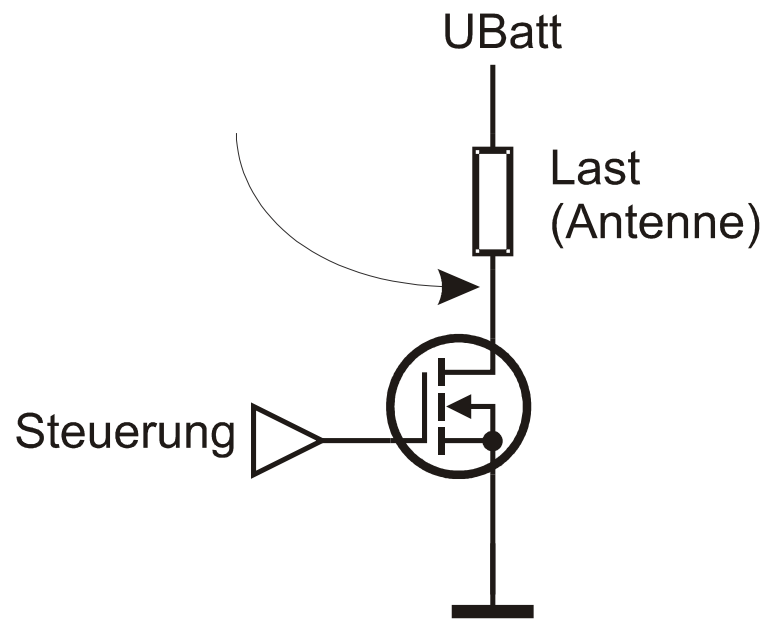


# Prinzip des Klasse-E-Verstärkers



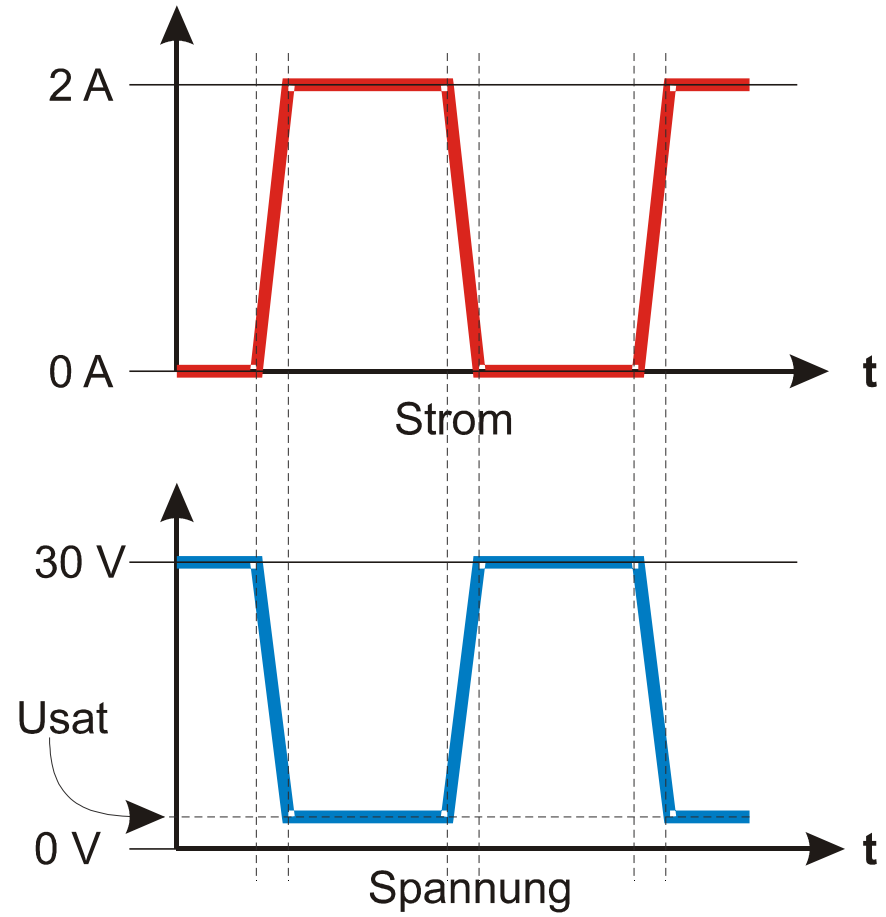
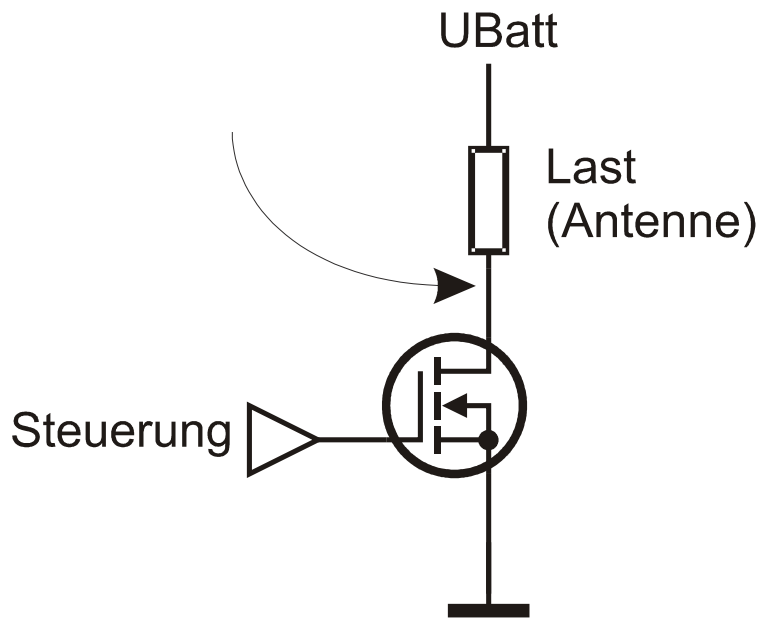


# Idealer Schalter



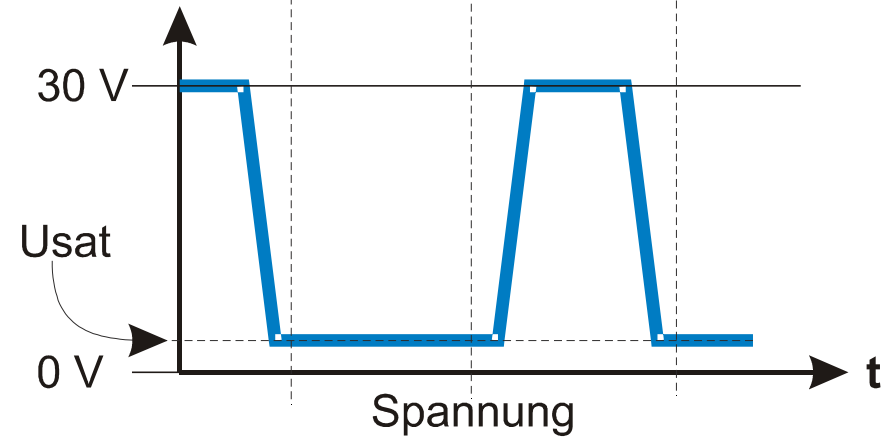
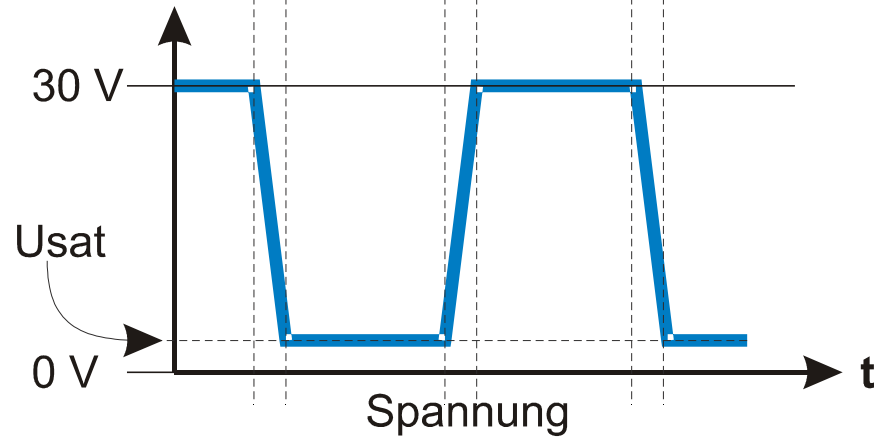
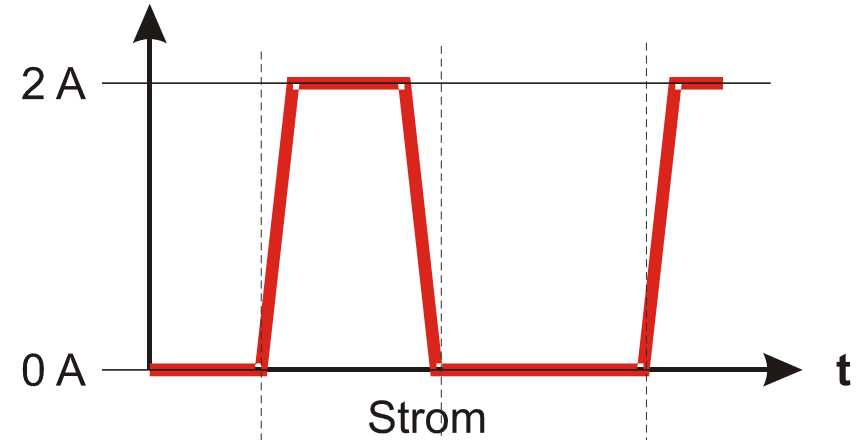
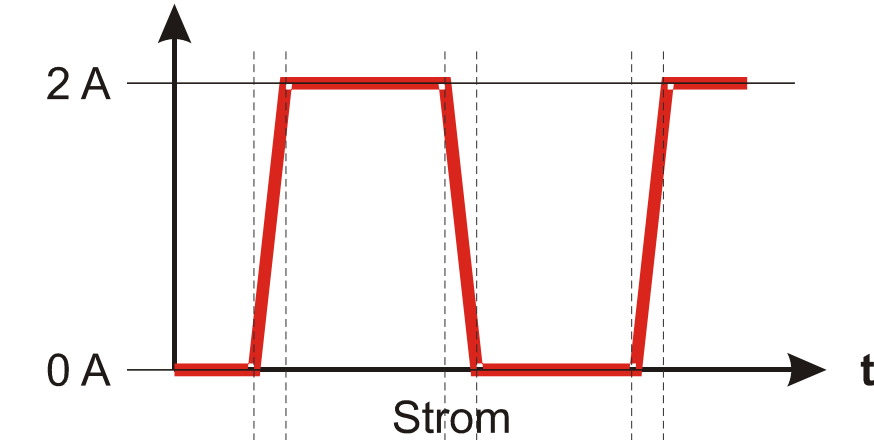


# Realer Schalter





# Das ist Klasse E!

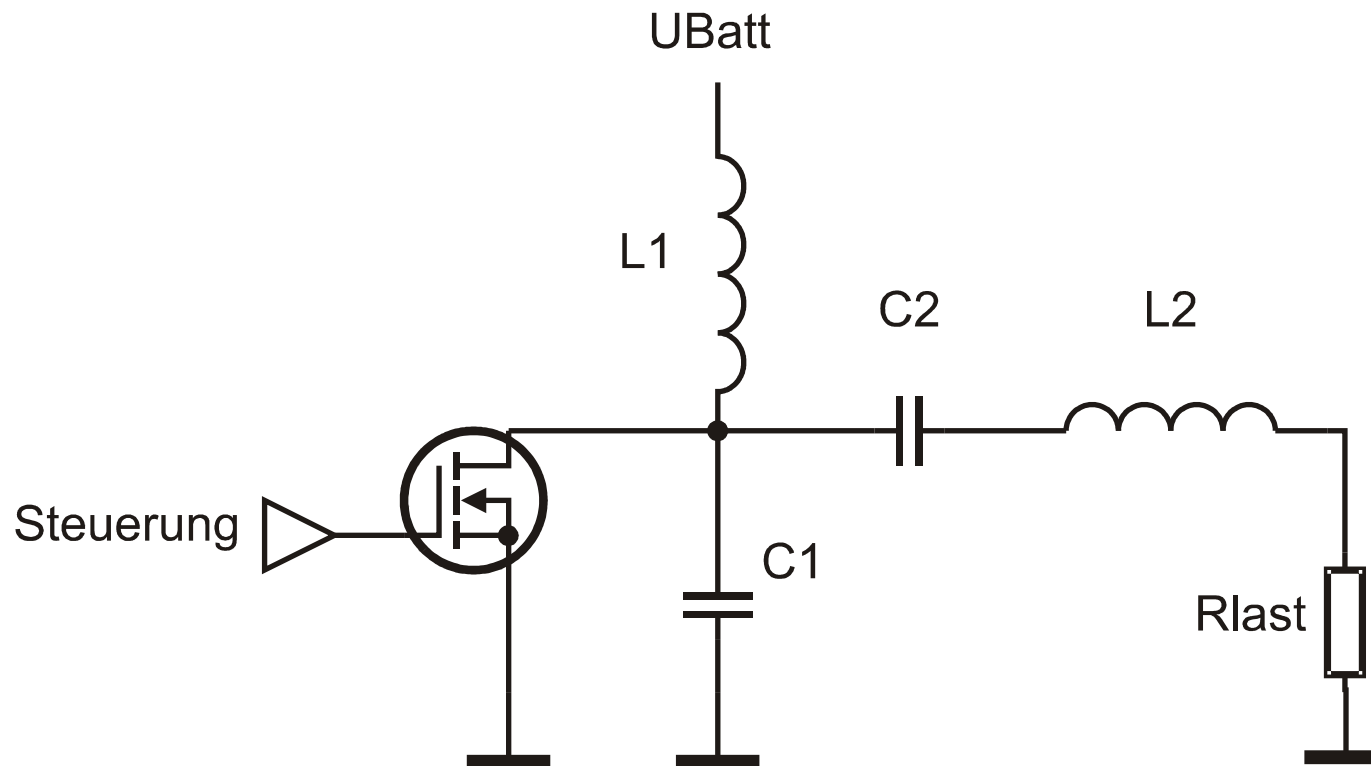


**Viel Verluste**

**Wenig Verluste**



# Grundschialtung Klasse E

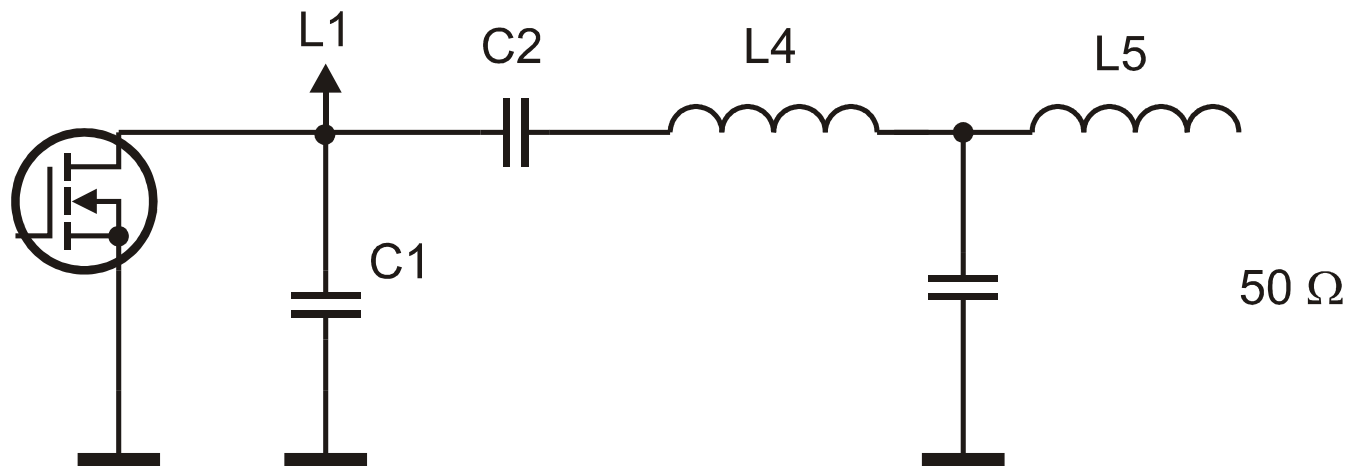
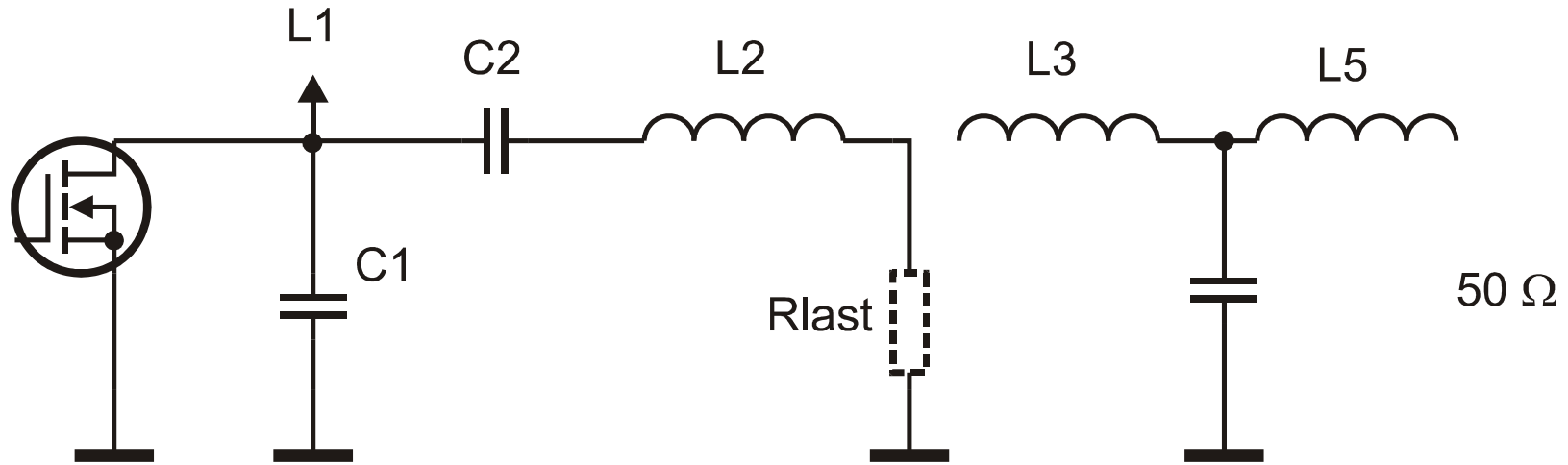


**Nicht resonant!**





# Transformation auf 50 Ohm

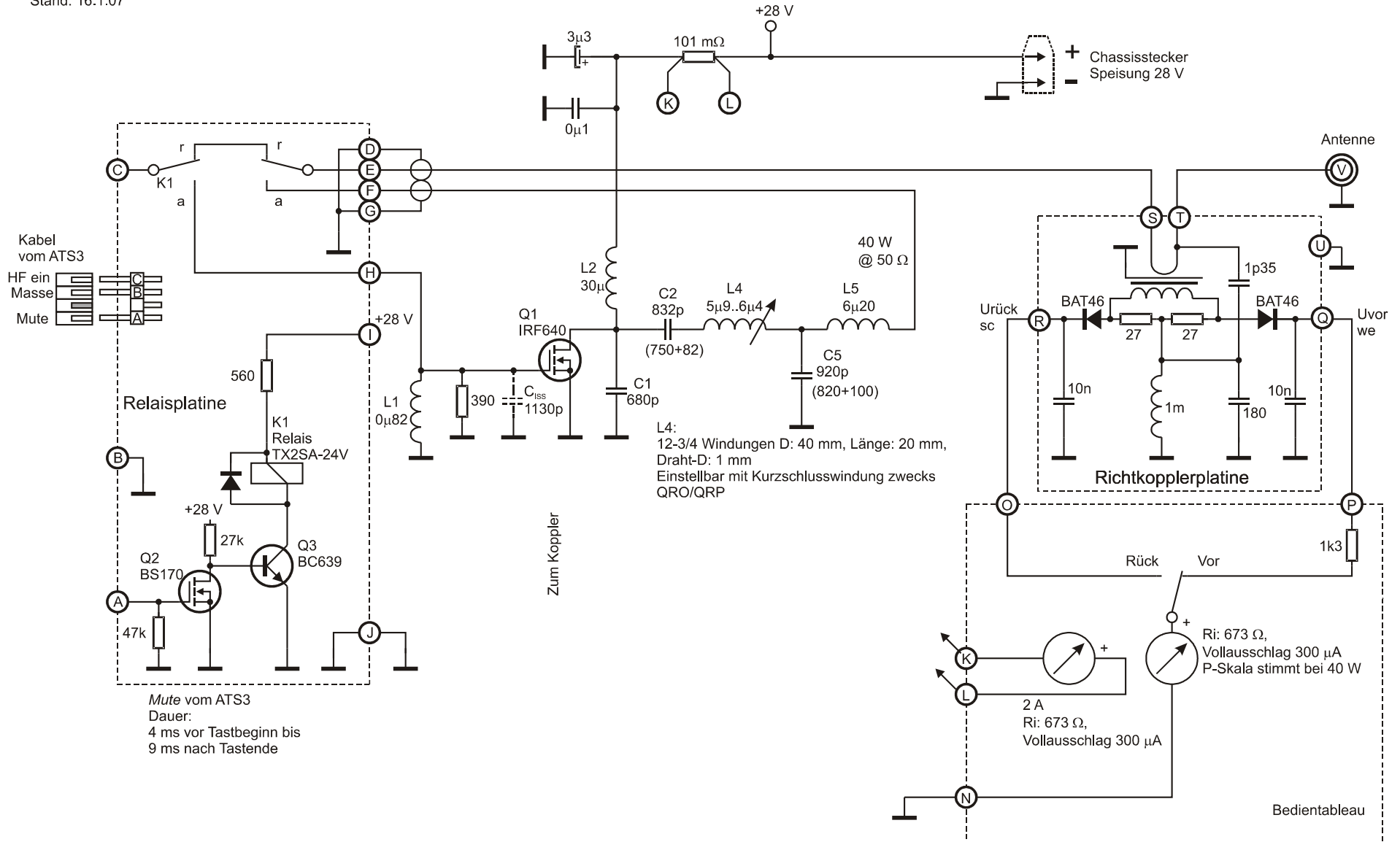


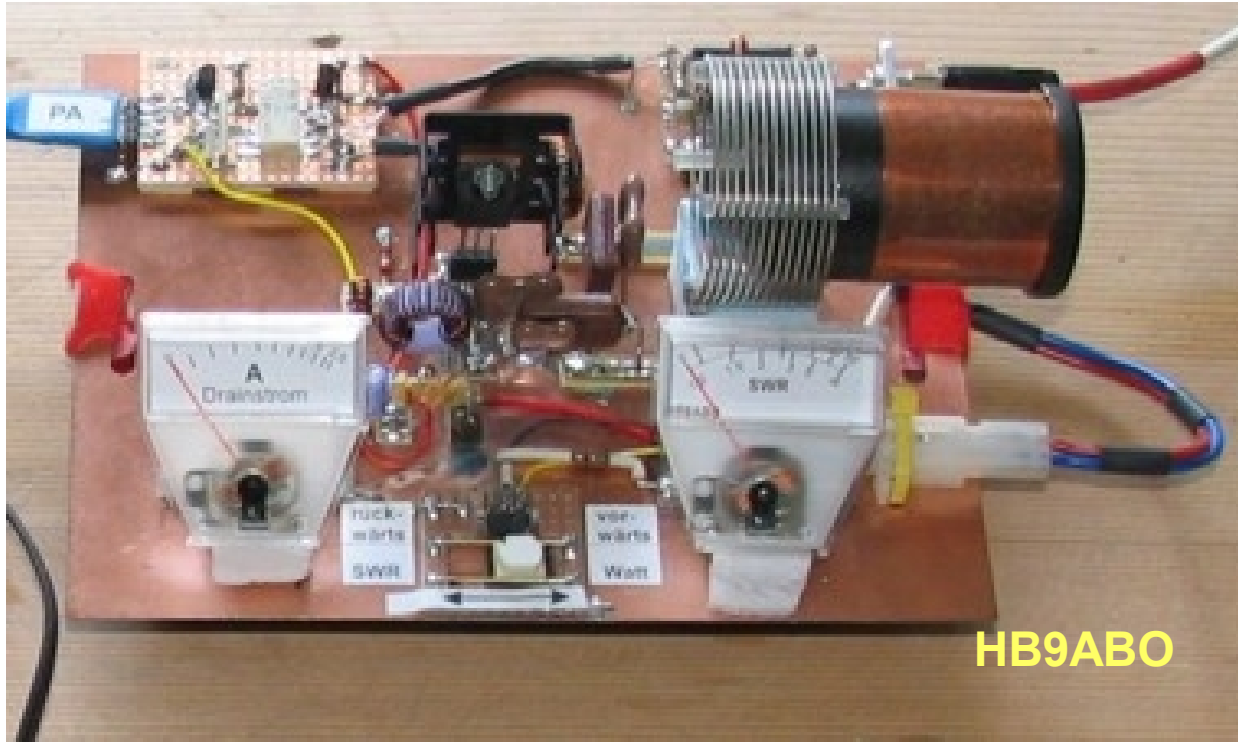


## Ausgeführte Schaltung

### Klasse-E-Endstufe PA4 HB9ABO

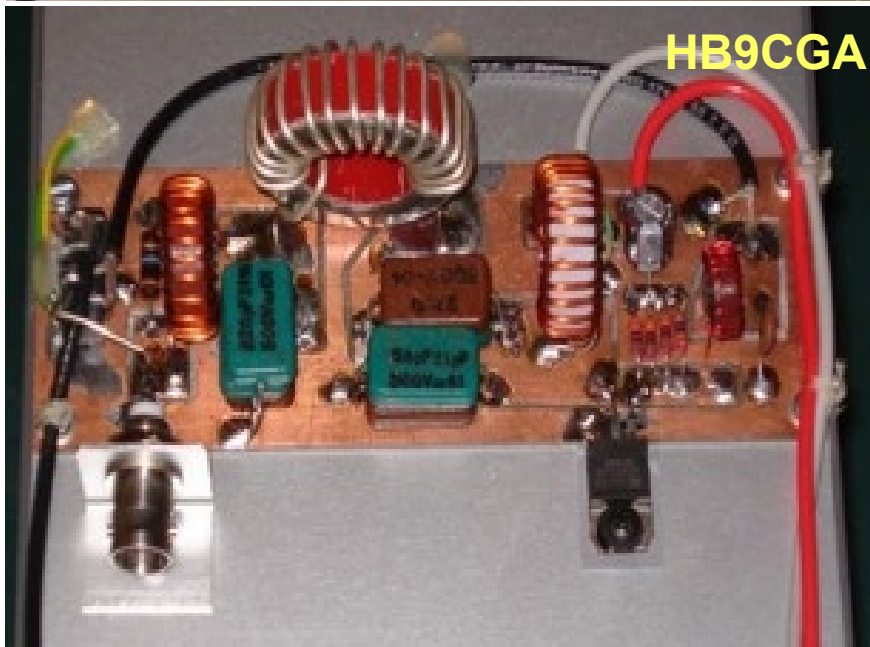
Stand: 16.1.07



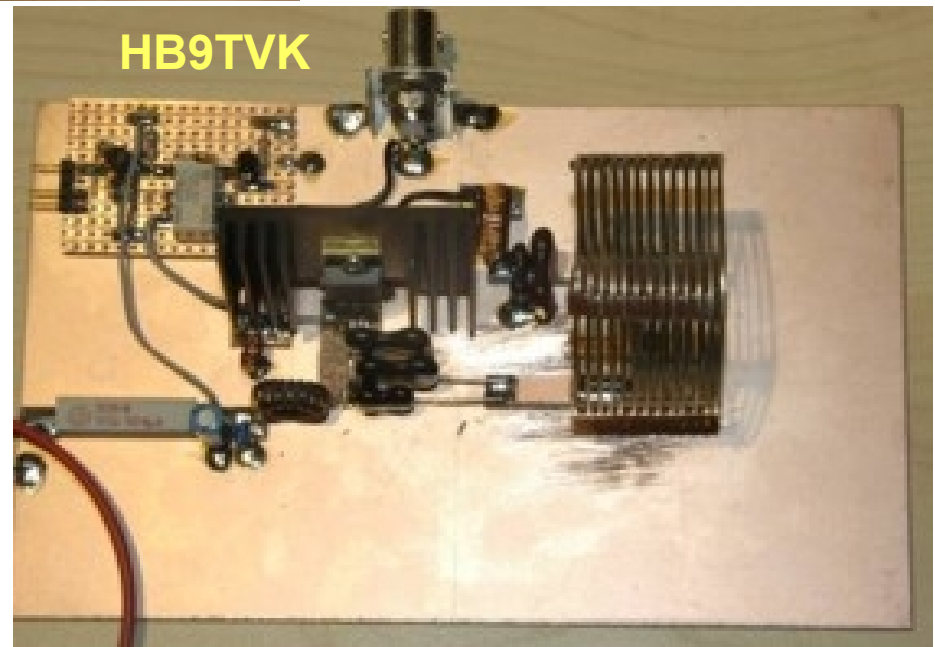


HB9ABO

**Drei Klasse-E-  
Endverstärker  
am NMD 2007**



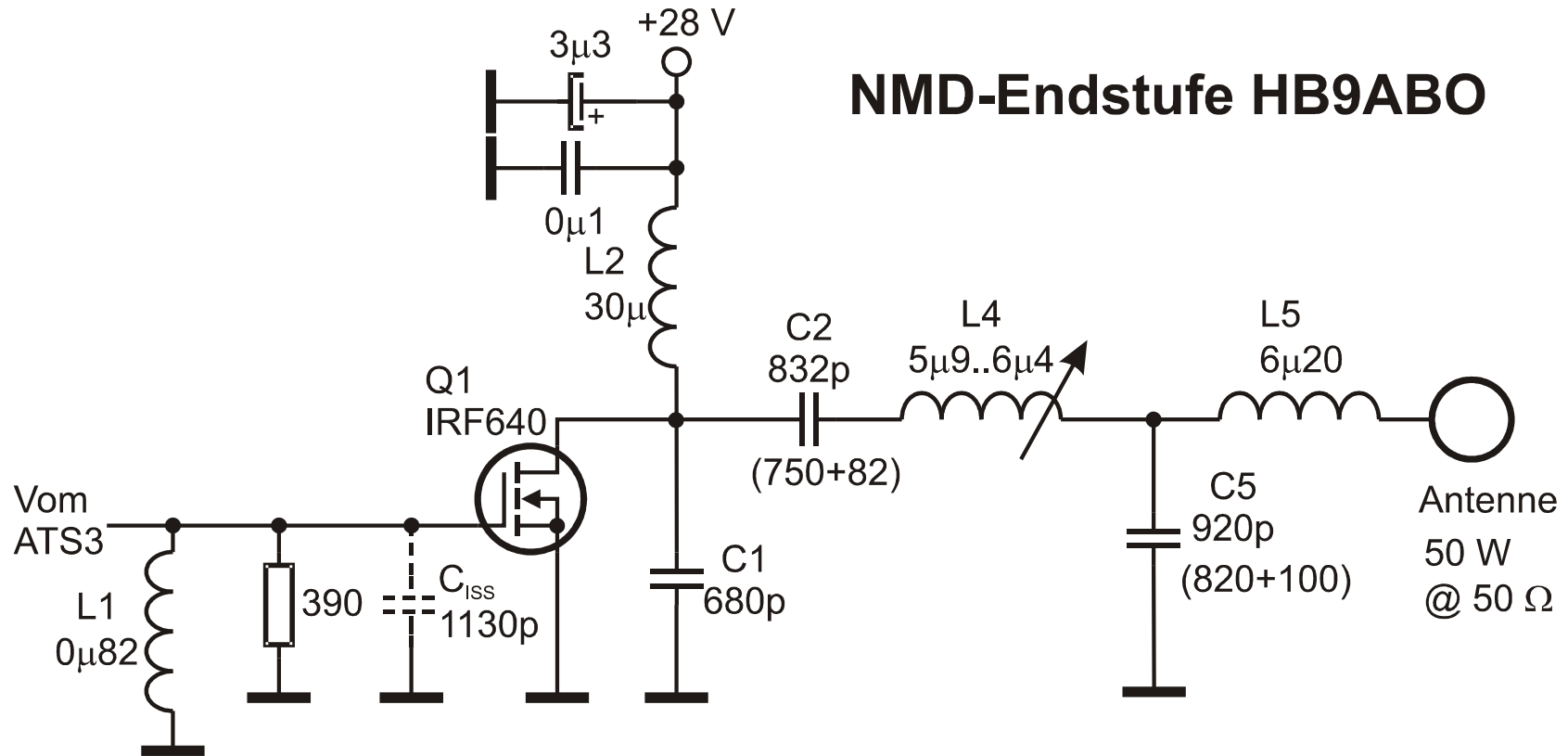
HB9CGA



HB9TVK



## NMD-Endstufe HB9ABO



- Wirkungsgrad: 91 %
- Ausgangsleistung: 50 W
- Gewicht: 117 g

*Nicht  
resonant!*



# Literatur

- Sokal N.O., Sokal A. D., "Class E – a New Class of High Efficiency Tuned Single Ended Switching Power Amplifiers" IEEE Journal of Solid-State Circuits, Vol. SC-10, No. 3, June 1975
- Sokal N.O., Sokal A. D., "Class E Switching-Mode RF Power Amplifiers" 1979 IEEE ELECTRO Conference, New York, 25 April 1979, Session 23.
- M. Kessous, J.F. Zürcher , "Amplificateur VHF en classe E utilisant un transistor à effet de champ VMOS", Bulletin AGEN, No. 30, pp. 45-49, October 1980.