

# CPC COOPERATIVE PATENT CLASSIFICATION

**H03F** **AMPLIFIERS** (measuring, testing [G01R](#); optical parametric amplifiers [G02F](#); circuit arrangement with secondary emission tubes [H01J 43/30](#); masers, lasers [H01S](#); control of amplification [H03G](#); coupling arrangements independent of the nature of the amplifiers, voltage dividers [H03H](#); amplifiers capable only of dealing with pulses [H03K](#); repeater circuits in transmission lines [H04B 3/36](#), [H04B 3/58](#); application of speech amplifiers in telephonic communication [H04M 1/60](#), [H04M 3/40](#))

## NOTE

This subclass covers:

- linear amplification, there being linear relationship between the amplitudes of input and output, and the output having substantially the same waveform as the input;
- dielectric amplifiers, magnetic amplifiers, and parametric amplifiers when used as oscillators or frequency-changers;
- constructions of active elements of dielectric amplifiers and parametric amplifiers if no provision exists elsewhere.

## WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

<a href="#">H03F 1/44</a>	covered by	<a href="#">H03F 1/42</a>
<a href="#">H03F 1/46</a>	covered by	<a href="#">H03F 1/42</a>
<a href="#">H03F 3/18</a>	covered by	<a href="#">H03F 3/00</a>
<a href="#">H03F 3/32</a>	covered by	<a href="#">H03F 3/30</a>
<a href="#">H03F 7/06</a>	covered by	<a href="#">H03F 7/00</a>

<b>1/00</b>	<b>Details of amplifiers with only discharge tubes, only semiconductor devices or only unspecified devices as amplifying elements</b>	1/04	. . in discharge-tube amplifiers
1/02	. Modifications of amplifiers to raise the efficiency, e.g. gliding Class A stages, use of an auxiliary oscillation	1/06	. . . to raise the efficiency of amplifying modulated radio frequency waves; to raise the efficiency of amplifiers acting also as modulators { <a href="#">(modulation H03C)</a> }
1/0205	. . {in transistor amplifiers}	1/07	. . . . Doherty-type amplifiers
1/0211	. . . {with control of the supply voltage or current}	1/08	. Modification of amplifiers to reduce detrimental influences of internal impedances of amplifying elements ( <a href="#">wide-band amplifiers with inter-stage coupling networks incorporating these impedances H03F 1/42</a> ; eliminating transit-time effects in vacuum tubes <a href="#">H01J 21/34</a> )
1/0216	. . . . {Continuous control}	1/083	. . {in transistor amplifiers ( <a href="#">H03F 1/10</a> - <a href="#">H03F 1/22</a> take precedence)}
1/0222	. . . . . {by using a signal derived from the input signal}	1/086	. . . {with FET's}
1/0227	. . . . . {using supply converters}	1/10	. . by use of amplifying elements with multiple electrode connections
1/0233	. . . . . {by using a signal derived from the output signal, e.g. bootstrapping the voltage supply}	1/12	. . by use of attenuating means { <a href="#">(attenuators H03G)</a> }
1/0238	. . . . . {using supply converters}	1/13	. . . in discharge tube amplifiers
1/0244	. . . . {Stepped control}	1/14	. . by use of neutralising means
1/025	. . . . . {by using a signal derived from the input signal}	1/16	. . . in discharge tube amplifiers
1/0255	. . . . . {by using a signal derived from the output signal}	1/18	. . by use of distributed coupling {, i.e. distributed amplifiers ( <a href="#">distributed amplifiers using coupling networks with distributed constants H03F 3/605</a> )}
1/0261	. . . {with control of the polarisation voltage or current, e.g. gliding Class A}	1/20	. . . in discharge-tube amplifiers
1/0266	. . . . {by using a signal derived from the input signal}	1/22	. . by use of cascode coupling, i.e. earthed cathode or emitter stage followed by earthed grid or base stage respectively
1/0272	. . . . {by using a signal derived from the output signal}	1/223	. . . {with MOSFET's}
1/0277	. . . {Selecting one or more amplifiers from a plurality of amplifiers}	1/226	. . . {with junction-FET's}
1/0283	. . . {Reducing the number of Dc-current paths}	1/24	. . . in discharge-tube amplifiers
1/0288	. . . {using a main and one or several auxiliary peaking amplifiers whereby the load is connected to the main amplifier using an impedance inverter, e.g. Doherty amplifiers}	1/26	. Modifications of amplifiers to reduce influence of noise generated by amplifying elements
1/0294	. . . {using vector summing of two or more constant amplitude phase-modulated signals}	1/28	. . in discharge-tube amplifiers { <a href="#">(constructional modifications H01J 23/11)</a> }

- 1/30 . Modifications of amplifiers to reduce influence of variations of temperature or supply voltage {or other physical parameters ([in differential amplifiers H03F 3/45479](#))}
- 1/301 . . {in MOSFET amplifiers ([H03F 1/303](#), [H03F 1/305](#), [H03F 1/308](#) take precedence)}
- 1/302 . . {in bipolar transistor amplifiers ([H03F 1/303](#), [H03F 1/305](#), [H03F 1/307](#) take precedence)}
- 1/303 . . {using a switching device ([H03F 1/305](#), [H03F 3/005](#), [H03F 3/38](#) take precedence)}
- 1/304 . . . {and using digital means}
- 1/305 . . {in case of switching on or off of a power supply}
- 1/306 . . {in junction-FET amplifiers ([H03F 1/303](#), [H03F 1/305](#), [H03F 1/309](#) take precedence)}
- 1/307 . . {in push-pull amplifiers}
- 1/308 . . . {using MOSFET}
- WARNING**
- Not complete, see also [H03F 1/301](#)
- 1/309 . . . {using junction-FET}
- WARNING**
- Not complete, see also [H03F 1/306](#)
- 1/32 . Modifications of amplifiers to reduce non-linear distortion ([by negative feedback H03F 1/34](#))
- 1/3205 . . {in field-effect transistor amplifiers}
- 1/3211 . . {in differential amplifiers}
- 1/3217 . . {in single ended push-pull amplifiers}
- 1/3223 . . {using feed-forward ([H03F 1/3211](#) takes precedence)}
- 1/3229 . . . {using a loop for error extraction and another loop for error subtraction}
- 1/3235 . . . . {using a pilot signal}
- WARNING**
- Not complete, see also [H03F 1/3229](#)
- 1/3241 . . {using predistortion circuits ([H03F 1/3211](#), [H03F 1/3217](#) take precedence)}
- 1/3247 . . . {using feedback acting on predistortion circuits ([H03F 1/3264](#) takes precedence)}
- WARNING**
- Not complete, see also [H03F 1/3241](#) for non patent literature
- 1/3252 . . . {using multiple parallel paths between input and output ([H03F 1/3258](#), [H03F 1/3282](#), [H03F 1/3294](#) take precedence)}
- WARNING**
- Not complete, see also [H03F 1/3241](#) for non patent literature
- 1/3258 . . . {based on polynomial terms}
- 1/3264 . . . {in audio amplifiers}
- 1/327 . . . . {to emulate discharge tube amplifier characteristics}
- 1/3276 . . . {using the nonlinearity inherent to components, e.g. a diode}
- 1/3282 . . . {Acting on the phase and the amplitude of the input signal}
- 1/3288 . . . . {to compensate phase shift as a function of the amplitude}
- 1/3294 . . . {Acting on the real and imaginary components of the input signal}
- 1/33 . . in discharge-tube amplifiers
- 1/34 . Negative-feedback-circuit arrangements with or without positive feedback ([H03F 1/02](#) - [H03F 1/30](#), [H03F 1/38](#) - [H03F 1/50](#), [H03F 3/50](#) take precedence; {for rejection of common mode signals [H03F 3/45479](#)})
- 1/342 . . {in field-effect transistor amplifiers}
- 1/345 . . {using hybrid or directional couplers}
- WARNING**
- Not complete, see also [H03F 1/34](#)
- 1/347 . . {using transformers}
- 1/36 . . in discharge-tube amplifiers
- 1/38 . Positive-feedback circuit arrangements without negative feedback
- 1/40 . . in discharge-tube amplifiers
- 1/42 . Modifications of amplifiers to extend the bandwidth
- 1/48 . . of aperiodic amplifiers
- 1/483 . . . {with field-effect transistors}
- 1/486 . . . {with IC amplifier blocks}
- 1/50 . . . with tubes only
- 1/52 . Circuit arrangements for protecting such amplifiers {([monitoring arrangements G01R 31/28](#); [increasing reliability in communication systems, e.g. using redundancy H04B 1/74](#))}
- 1/523 . . {for amplifiers using field-effect devices ([H03F 1/526](#) takes precedence)}
- 1/526 . . {protecting by using redundant amplifiers}
- WARNING**
- Not complete, see also [H03F 1/523](#)
- 1/54 . . with tubes only {([testing of vacuum tubes G01R 31/25](#))}
- 1/542 . . . {Replacing by standby devices}
- 1/544 . . . {Protection of filaments}
- 1/546 . . . {Delaying application of anode power supply with respect to application of filament heating power supply}
- 1/548 . . . {Protection of anode or grid circuit against overload}
- 1/56 . Modifications of input or output impedances, not otherwise provided for
- 1/565 . . {using inductive elements}
- 3/00 Amplifiers with only discharge tubes or only semiconductor devices as amplifying elements**
- 3/005 . {using switched capacitors, e.g. dynamic amplifiers; using switched capacitors as resistors in differential amplifiers ([H03F 3/45](#) takes precedence)}
- NOTE**
- Groups [H03F 3/20](#) - [H03F 3/72](#) take precedence over groups [H03F 3/02](#) - [H03F 3/195](#)
- WARNING**
- Not complete, see also [H03F 1/02](#), [H03F 3/70](#), [H03F 3/72](#)
- 3/02 . with tubes only ([subsequent sub-groups take precedence](#))
- 3/04 . with semiconductor devices only ([subsequent sub-groups take precedence](#))

- 3/06 . . . using hole storage effect
  - 3/08 . . . controlled by light
  - 3/082 . . . {with FET's ([H03F 3/085 takes precedence](#))}
  - 3/085 . . . {using opto-couplers between stages}
  - 3/087 . . . {with IC amplifier blocks ([H03F 3/085 takes precedence](#))}
  - 3/10 . . . with diodes {([parametric amplifiers H03F 7/00](#))}
  - 3/12 . . . with Esaki diodes
  - 3/14 . . . with amplifying devices having more than three electrodes or more than two PN junctions
  - 3/16 . . . with field-effect devices
  - 3/165 . . . {with junction-FET's}
  - 3/181 . Low frequency amplifiers, e.g. audio preamplifiers
  - 3/183 . . . with semiconductor devices only
  - 3/185 . . . with field-effect devices ([H03F 3/187 takes precedence](#))
  - 3/1855 . . . . {with junction-FET devices}
  - 3/187 . . . in integrated circuits
  - 3/189 . High frequency amplifiers, e.g. radio frequency amplifiers
  - 3/19 . . . with semiconductor devices only
  - 3/191 . . . Tuned amplifiers ([H03F 3/193](#), [H03F 3/195 take precedence](#))
  - 3/193 . . . with field-effect devices ([H03F 3/195 takes precedence](#))
  - 3/1935 . . . . {with junction-FET devices}
  - 3/195 . . . in integrated circuits
  - 3/20 . Power amplifiers, e.g. Class B amplifiers, Class C amplifiers ([H03F 3/26 - H03F 3/30 take precedence](#))
  - 3/21 . . . with semiconductor devices only {([H03F 3/245 takes precedence](#))}
  - 3/211 . . . {using a combination of several amplifiers ([H03F 3/60 takes precedence](#))}
- WARNING**
- Not complete, see also [H03F 3/21](#), [H03F 3/68](#)
- 3/213 . . . in integrated circuits
  - 3/217 . . . Class D power amplifiers; Switching amplifiers
  - 3/2171 . . . . {with field-effect devices ([H03F 3/2173 - H03F 3/2178 take precedence](#))}
  - 3/2173 . . . . {of the bridge type}
  - 3/2175 . . . . {using analogue-digital or digital-analogue conversion ([H03F 3/2173 takes precedence](#))}
  - 3/2176 . . . . {Class E amplifiers}
  - 3/2178 . . . . {using more than one switch or switching amplifier in parallel or in series ([H03F 3/2173](#), [H03F 3/2175 take precedence](#))}
  - 3/22 . . . with tubes only ([H03F 3/24 takes precedence](#))
  - 3/24 . . . of transmitter output stages
  - 3/245 . . . {with semiconductor devices only}
  - 3/26 . Push-pull amplifiers; Phase-splitters therefor ([duplicated single-ended push-pull arrangements or phase-splitters therefor H03F 3/30](#))
  - 3/265 . . . {with field-effect transistors only}
  - 3/28 . . . with tubes only
  - 3/30 . Single-ended push-pull {[SEPP]} amplifiers {([single-ended sense amplifiers G11C 7/067](#))}; Phase-splitters therefor
  - 3/3001 . . . {with field-effect transistors}
  - 3/3008 . . . {Bifet SEPP output stages}
  - 3/301 . . . . {CMOS common drain output SEPP amplifiers ([H03F 3/3008 takes precedence](#))}
  - 3/3011 . . . . {with asymmetrical driving of the end stage}
  - 3/3013 . . . . {using a common drain driving stage, i.e. follower stage}
  - 3/3015 . . . . {using a common source driving stage, i.e. inverting stage}
  - 3/3016 . . . . {with symmetrical driving of the end stage}
  - 3/3018 . . . . {using opamps as driving stages}
  - 3/302 . . . . {using two SEPP driving stages}
  - 3/3022 . . . {CMOS common source output SEPP amplifiers ([H03F 3/3008 takes precedence](#))}
  - 3/3023 . . . . {with asymmetrical driving of the end stage}
  - 3/3025 . . . . {using a common drain driving stage, i.e. follower stage}
  - 3/3027 . . . . {using a common source driving stage, i.e. inverting stage}
  - 3/3028 . . . . {with symmetrical driving of the end stage}
  - 3/303 . . . . {using opamps as driving stages}
  - 3/3032 . . . . {using two SEPP driving stages}
  - 3/3033 . . . {NMOS SEPP output stages ([H03F 3/3008 takes precedence](#))}
  - 3/3035 . . . . {using differential amplifiers as phase-splitting elements}
  - 3/3037 . . . . {with asymmetric control, i.e. one control branch containing a supplementary phase inverting stage}
  - 3/3038 . . . {PMOS SEPP output stages ([H03F 3/3008 takes precedence](#))}
  - 3/304 . . . . {using differential amplifiers as phase-splitting element}
  - 3/3042 . . . . {with asymmetric control, i.e. one control branch containing a supplementary phase inverting stage}
  - 3/3044 . . . {Junction FET SEPP output stages ([H03F 3/3008 takes precedence](#))}
  - 3/3045 . . . . {with asymmetrical driving of the end stage}
  - 3/3047 . . . . {using a common drain driving stage, i.e. follower stage}
  - 3/3049 . . . . {using a common source driving stage, i.e. inverting stage}
  - 3/305 . . . . {with symmetrical driving of the end stage}
  - 3/3052 . . . . {using opamps as driving stages}
  - 3/3054 . . . . {using two SEPP driving stages}
  - 3/3055 . . . {Parallelised mixed SEPP stages, e.g. a CMOS common drain and a CMOS common source in parallel or bipolar SEPP and FET SEPP in parallel}
  - 3/3057 . . . . {with asymmetrical driving of the end stage}
  - 3/3059 . . . . {with symmetrical driving of the end stage}
  - 3/3061 . . . {Bridge type, i.e. two complementary controlled SEPP output stages}
  - 3/3062 . . . . {with asymmetrical driving of the end stage}
  - 3/3064 . . . . {with symmetrical driving of the end stage}
  - 3/3066 . . . {the collectors of complementary power transistors being connected to the output}
  - 3/3067 . . . {with asymmetrical driving of the end stage}
  - 3/3069 . . . {the emitters of complementary power transistors being connected to the output}
  - 3/3071 . . . {with asymmetrical driving of the end stage}
  - 3/3072 . . . . {using Darlington transistors ([H03F 3/3074 takes precedence](#))}
  - 3/3074 . . . . {using parallel power transistors}

- 3/3076 . . . {with symmetrical driving of the end stage}
- 3/3077 . . . . {using Darlington transistors ([H03F 3/3079 takes precedence](#))}
- 3/3079 . . . . {using parallel power transistors}
- 3/3081 . . {Duplicated single-ended push-pull arrangements, i.e. bridge circuits ([using FET's H03F 3/3061](#))}
- 3/3083 . . {the power transistors being of the same type ([H03F 3/3001 takes precedence](#))}
- 3/3084 . . . {one of the power transistors being controlled by the output signal}
- 3/3086 . . . {two power transistors being controlled by the input signal}
- 3/3088 . . . . {with asymmetric control, i.e. one control branch containing a supplementary phase inverting transistor}
- 3/3089 . . . . {comprising field-effect transistors in the control circuit}
- 3/3091 . . . . {comprising two complementary transistors for phase-splitting}
- 3/3093 . . . . {comprising a differential amplifier as phase-splitting element}
- 3/3094 . . . . {Phase splitters therefor ([H03F 3/3088](#), [H03F 3/3091](#), [H03F 3/3093](#), [H03F 3/3096](#), [H03F 3/3098 take precedence](#))}
- 3/3096 . . . . {using a single transistor with output on emitter and collector as phase splitter}
- 3/3098 . . . . {using a transformer as phase splitter}
- 3/34 . . Dc amplifiers in which all stages are dc-coupled ([H03F 3/45 takes precedence](#))
- 3/343 . . with semiconductor devices only
- 3/3432 . . . {with bipolar transistors}
- 3/3435 . . . . {using Darlington amplifiers}
- 3/3437 . . . . . {with complementary transistors}
- 3/345 . . . with field-effect devices ([H03F 3/347 takes precedence](#))
- 3/3455 . . . . {with junction-FET's}
- 3/347 . . . in integrated circuits
- 3/36 . . with tubes only
- 3/38 . . Dc amplifiers with modulator at input and demodulator at output; Modulators or demodulators specially adapted for use in such amplifiers ([switched capacitor amplifiers H03F 3/005](#); [modulators in general H03C](#); [demodulators in general H03D](#); [amplitude modulation of pulses in general H03K 7/02](#); [amplitude demodulation of pulses in general H03K 9/02](#))
- 3/387 . . with semiconductor devices only
- 3/393 . . . with field-effect devices
- 3/40 . . with tubes only
- 3/42 . . Amplifiers with two or more amplifying elements having their dc paths in series with the load, the control electrode of each element being excited by at least part of the input signal, e.g. so-called totem-pole amplifiers
- 3/423 . . {with MOSFET's}
- 3/426 . . {with junction-FET's}
- 3/44 . . with tubes only
- 3/45 . . Differential amplifiers ([differential sense amplifiers G11C 7/062](#))
- 3/45071 . . {with semiconductor devices only}
- 3/45076 . . . {characterised by the way of implementation of the active amplifying circuit in the differential amplifier}
- 3/4508 . . . . {using bipolar transistors as the active amplifying circuit ([H03F 3/45278 takes precedence](#))}
- 3/45085 . . . . . {Long tailed pairs ([H03F 3/45112](#), [H03F 3/45139 take precedence](#))}
- 3/45089 . . . . . {Non-folded cascode stages}
- 3/45094 . . . . . {Folded cascode stages}
- 3/45098 . . . . . {PI types ([H03F 3/45125](#), [H03F 3/45152 take precedence](#))}
- 3/45103 . . . . . {Non-folded cascode stages}
- 3/45107 . . . . . {Folded cascode stages}
- 3/45112 . . . . . {Complementary long tailed pairs having parallel inputs and being supplied in parallel}
- 3/45116 . . . . . {Non-folded cascode stages}
- 3/45121 . . . . . {Folded cascode stages}
- 3/45125 . . . . . {Complementary PI types having parallel inputs and being supplied in parallel}
- 3/4513 . . . . . {Non-folded cascode stages}
- 3/45134 . . . . . {Folded cascode stages}
- 3/45139 . . . . . {Complementary long tailed pairs having parallel inputs and being supplied in series}
- 3/45143 . . . . . {Non-folded cascode stages}
- 3/45147 . . . . . {Folded cascode stages}
- 3/45152 . . . . . {Complementary PI types having parallel inputs and being supplied in series}
- 3/45156 . . . . . {Non-folded cascode stages}
- 3/45161 . . . . . {Folded cascode stages}
- 3/45165 . . . . . {Complementary cross coupled types}
- 3/4517 . . . . . {Complementary non-cross coupled types}
- 3/45174 . . . . . {Mirror types}
- 3/45179 . . . . {using MOSFET transistors as the active amplifying circuit ([H03F 3/45278 takes precedence](#))}
- 3/45183 . . . . . {Long tailed pairs ([H03F 3/4521](#), [H03F 3/45237 take precedence](#))}
- 3/45188 . . . . . {Non-folded cascode stages}
- 3/45192 . . . . . {Folded cascode stages}
- 3/45197 . . . . . {PI types ([H03F 3/45224](#), [H03F 3/45251 take precedence](#))}
- 3/45201 . . . . . {Non-folded cascode stages}
- 3/45206 . . . . . {Folded cascode stages}
- 3/4521 . . . . . {Complementary long tailed pairs having parallel inputs and being supplied in parallel}
- 3/45215 . . . . . {Non-folded cascode stages}
- 3/45219 . . . . . {Folded cascode stages}
- 3/45224 . . . . . {Complementary PI types having parallel inputs and being supplied in parallel}
- 3/45228 . . . . . {Non-folded cascode stages}
- 3/45233 . . . . . {Folded cascode stages}
- 3/45237 . . . . . {Complementary long tailed pairs having parallel inputs and being supplied in series}
- 3/45242 . . . . . {Non-folded cascode stages}
- 3/45246 . . . . . {Folded cascode stages}
- 3/45251 . . . . . {Complementary PI types having parallel inputs and being supplied in series}
- 3/45255 . . . . . {Non-folded cascode stages}
- 3/4526 . . . . . {Folded cascode stages}
- 3/45264 . . . . . {Complementary cross coupled types}
- 3/45269 . . . . . {Complementary non-cross coupled types}



3/45273 . . . . .	{Mirror types}	3/4547 . . . . .	{Mirror types}
3/45278 . . . . .	{using BiFET transistors as the active amplifying circuit}	3/45475 . . . . .	{using IC blocks as the active amplifying circuit}
3/45282 . . . . .	{Long tailed pairs ( <a href="#">H03F 3/45309</a> , <a href="#">H03F 3/45336</a> take precedence)}	3/45479 . . . . .	{characterised by the way of common mode signal rejection}
3/45286 . . . . .	{Non-folded cascode stages}	3/45484 . . . . .	{in differential amplifiers with bipolar transistors as the active amplifying circuit ( <a href="#">H03F 3/4578</a> takes precedence)}
3/45291 . . . . .	{Folded cascode stages}	3/45488 . . . . .	{by using feedback means ( <a href="#">H03F 3/4578</a> takes precedence)}
3/45295 . . . . .	{PI types ( <a href="#">H03F 3/45322</a> , <a href="#">H03F 3/45349</a> take precedence)}	3/45493 . . . . .	{Measuring at the loading circuit of the differential amplifier}
3/453 . . . . .	{Non-folded cascode stages}	3/45497 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45304 . . . . .	{Folded cascode stages}	3/45502 . . . . .	{Controlling the common emitter circuit of the differential amplifier}
3/45309 . . . . .	{Complementary long tailed pairs having parallel inputs and being supplied in parallel}	3/45506 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45313 . . . . .	{Non-folded cascode stages}	3/45511 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45318 . . . . .	{Folded cascode stages}	3/45515 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}
3/45322 . . . . .	{Complementary PI types having parallel inputs and being supplied in parallel}	3/4552 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45327 . . . . .	{Non-folded cascode stages}	3/45524 . . . . .	{Controlling the common emitter circuit of the differential amplifier}
3/45331 . . . . .	{Folded cascode stages}	3/45529 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45336 . . . . .	{Complementary long tailed pairs having parallel inputs and being supplied in series}	3/45533 . . . . .	{Measuring at the common emitter circuit of the differential amplifier}
3/4534 . . . . .	{Non-folded cascode stages}	3/45538 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45345 . . . . .	{Folded cascode stages}	3/45542 . . . . .	{Controlling the common emitter circuit of the differential amplifier}
3/45349 . . . . .	{Complementary PI types having parallel inputs and being supplied in series}	3/45547 . . . . .	{by using feedforward means ( <a href="#">H03F 3/45596</a> takes precedence)}
3/45354 . . . . .	{Non-folded cascode stages}	3/45551 . . . . .	{Measuring at the input circuit of the differential amplifier}
3/45358 . . . . .	{Folded cascode stages}	3/45556 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45363 . . . . .	{Complementary cross coupled types}	3/4556 . . . . .	{Controlling the common emitter circuit of the differential amplifier}
3/45367 . . . . .	{Complementary non-cross coupled types}	3/45565 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45372 . . . . .	{Mirror types}	3/45569 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45376 . . . . .	{using junction FET transistors as the active amplifying circuit ( <a href="#">H03F 3/45278</a> takes precedence)}	3/45573 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}
3/45381 . . . . .	{Long tailed pairs ( <a href="#">H03F 3/45408</a> , <a href="#">H03F 3/45434</a> take precedence)}	3/45578 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45385 . . . . .	{Non-folded cascode stages}	3/45582 . . . . .	{Measuring at the common emitter circuit of the differential amplifier}
3/4539 . . . . .	{Folded cascode stages}	3/45587 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45394 . . . . .	{PI types ( <a href="#">H03F 3/45421</a> , <a href="#">H03F 3/45448</a> take precedence)}	3/45591 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45399 . . . . .	{Non-folded cascode stages}	3/45596 . . . . .	{by offset reduction}
3/45403 . . . . .	{Folded cascode stages}	3/456 . . . . .	{by using a feedback circuit}
3/45408 . . . . .	{Complementary long tailed pairs having parallel inputs and being supplied in parallel}	3/45605 . . . . .	{using switching means, e.g. sample and hold}
3/45412 . . . . .	{Non-folded cascode stages}	3/45609 . . . . .	{by using a feedforward circuit}
3/45417 . . . . .	{Folded cascode stages}	3/45614 . . . . .	{using switching means, e.g. sample and hold}
3/45421 . . . . .	{Complementary PI types having parallel inputs and being supplied in parallel}	3/45618 . . . . .	{by using balancing means}
3/45426 . . . . .	{Non-folded cascode stages}		
3/4543 . . . . .	{Folded cascode stages}		
3/45434 . . . . .	{Complementary long tailed pairs having parallel inputs and being supplied in series}		
3/45439 . . . . .	{Non-folded cascode stages}		
3/45443 . . . . .	{Folded cascode stages}		
3/45448 . . . . .	{Complementary PI types having parallel inputs and being supplied in series}		
3/45452 . . . . .	{Non-folded cascode stages}		
3/45457 . . . . .	{Folded cascode stages}		
3/45461 . . . . .	{Complementary cross coupled types}		
3/45466 . . . . .	{Complementary non-cross coupled types}		

3/45623 . . . . .	{using switching means}	3/4578 . . . . .	{in differential amplifiers with BiFET transistors as the active amplifying circuit}
3/45627 . . . . .	{by using cross switches}	3/45784 . . . . .	{by using feedback means ( <a href="#">H03F 3/45892 takes precedence</a> )}
3/45632 . . . . .	{in differential amplifiers with FET transistors as the active amplifying circuit ( <a href="#">H03F 3/4578 takes precedence</a> )}	3/45789 . . . . .	{Measuring at the loading circuit of the differential amplifier}
3/45636 . . . . .	{by using feedback means ( <a href="#">H03F 3/45744 takes precedence</a> )}	3/45793 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45641 . . . . .	{Measuring at the loading circuit of the differential amplifier}	3/45798 . . . . .	{Controlling the common source circuit of the differential amplifier}
3/45645 . . . . .	{Controlling the input circuit of the differential amplifier}	3/45802 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/4565 . . . . .	{Controlling the common source circuit of the differential amplifier}	3/45807 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45654 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}	3/45811 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}
3/45659 . . . . .	{Controlling the loading circuit of the differential amplifier}	3/45816 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45663 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}	3/4582 . . . . .	{Controlling the common source circuit of the differential amplifier}
3/45668 . . . . .	{Controlling the input circuit of the differential amplifier}	3/45825 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45672 . . . . .	{Controlling the common source circuit of the differential amplifier}	3/45829 . . . . .	{Measuring at the common source circuit of the differential amplifier}
3/45677 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}	3/45834 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45681 . . . . .	{Measuring at the common source circuit of the differential amplifier}	3/45838 . . . . .	{Controlling the common source circuit of the differential amplifier}
3/45686 . . . . .	{Controlling the input circuit of the differential amplifier}	3/45843 . . . . .	{by using feedforward means ( <a href="#">H03F 3/45892 takes precedence</a> )}
3/4569 . . . . .	{Controlling the common source circuit of the differential amplifier}	3/45847 . . . . .	{Measuring at the input circuit of the differential amplifier}
3/45695 . . . . .	{by using feedforward means ( <a href="#">H03F 3/45744 takes precedence</a> )}	3/45852 . . . . .	{Controlling the input circuit of the differential amplifier}
3/45699 . . . . .	{Measuring at the input circuit of the differential amplifier}	3/45856 . . . . .	{Controlling the common source circuit of the differential amplifier}
3/45704 . . . . .	{Controlling the input circuit of the differential amplifier}	3/4586 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/45708 . . . . .	{Controlling the common source circuit of the differential amplifier}	3/45865 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45713 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}	3/45869 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}
3/45717 . . . . .	{Controlling the loading circuit of the differential amplifier}	3/45874 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45721 . . . . .	{Measuring at the active amplifying circuit of the differential amplifier}	3/45878 . . . . .	{Measuring at the common source circuit of the differential amplifier}
3/45726 . . . . .	{Controlling the loading circuit of the differential amplifier}	3/45883 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}
3/4573 . . . . .	{Measuring at the common source circuit of the differential amplifier}	3/45887 . . . . .	{Controlling the loading circuit of the differential amplifier}
3/45735 . . . . .	{Controlling the active amplifying circuit of the differential amplifier}	3/45892 . . . . .	{by offset reduction}
3/45739 . . . . .	{Controlling the loading circuit of the differential amplifier}	3/45896 . . . . .	{by using a feedback circuit}
3/45744 . . . . .	{by offset reduction}	3/45901 . . . . .	{using switching means, e.g. sample and hold}
3/45748 . . . . .	{by using a feedback circuit}	3/45905 . . . . .	{by using a feedforward circuit}
3/45753 . . . . .	{using switching means, e.g. sample and hold}	3/4591 . . . . .	{using switching means, e.g. sample and hold}
3/45757 . . . . .	{by using a feedforward circuit}	3/45914 . . . . .	{by using balancing means}
3/45762 . . . . .	{using switching means, e.g. sample and hold}	3/45919 . . . . .	{using switching means}
3/45766 . . . . .	{by using balancing means}	3/45923 . . . . .	{by using cross switches}
3/45771 . . . . .	{using switching means}	3/45928 . . . . .	{using IC blocks as the active amplifying circuit}
3/45775 . . . . .	{by using cross switches}	3/45932 . . . . .	{by using feedback means ( <a href="#">H03F 3/45968 takes precedence</a> )}

- 3/45937 . . . . . {Measuring at the loading circuit of the differential amplifier}
- 3/45941 . . . . . {Controlling the input circuit of the differential amplifier}
- 3/45946 . . . . . {Controlling the loading circuit of the differential amplifier}
- 3/4595 . . . . . {by using feedforward means  
(H03F 3/45968 takes precedence)}
- 3/45955 . . . . . {Measuring at the input circuit of the differential amplifier}
- 3/45959 . . . . . {Controlling the input circuit of the differential amplifier}
- 3/45964 . . . . . {Controlling the loading circuit of the differential amplifier}
- 3/45968 . . . . . {by offset reduction}
- 3/45973 . . . . . {by using a feedback circuit}
- 3/45977 . . . . . {using switching means, e.g. sample and hold}
- 3/45982 . . . . . {by using a feedforward circuit}
- 3/45986 . . . . . {using switching means, e.g. sample and hold}
- 3/45991 . . . . . {by using balancing means}
- 3/45995 . . . . . {using switching means}
- 3/46 . . . . . Reflex amplifiers {[\(reflection amplifiers H03F 3/608\)](#)}
- 3/48 . . . . . with tubes only
- 3/50 . . . . . Amplifiers in which input is applied to, or output is derived from, an impedance common to input and output circuits of the amplifying element, e.g. cathode follower
- 3/505 . . . . . {with field-effect devices}
- 3/52 . . . . . with tubes only
- 3/54 . . . . . Amplifiers using transit-time effect in tubes or semiconductor devices ([parametric amplifiers H03F 7/00](#); [solid state travelling-wave devices H01L 45/02](#))
- 3/55 . . . . . with semiconductor devices only
- 3/56 . . . . . using klystrons
- 3/58 . . . . . using travelling-wave tubes
- 3/60 . . . . . Amplifiers in which coupling networks have distributed constants, e.g. with waveguide resonators ([H03F 3/54 takes precedence](#))
- 3/601 . . . . . {using FET's, e.g. GaAs FET's ([H03F 3/607](#), [H03F 3/608 take precedence](#))}
- WARNING**
- Not complete, see also [H03F 3/16](#)
- 3/602 . . . . . {Combinations of several amplifiers}
- WARNING**
- Not complete, see also [H03F 3/68](#)
- 3/604 . . . . . {using FET's}
- WARNING**
- Not complete, see also [H03F 3/16](#), [H03F 3/68](#)
- 3/605 . . . . . {Distributed amplifiers}
- WARNING**
- Not complete, see also [H03F 1/18](#)
- 3/607 . . . . . {using FET's}
- WARNING**
- Not complete, see also [H03F 1/18](#)
- 3/608 . . . . . {Reflection amplifiers, i.e. amplifiers using a one-port amplifying element and a multiport coupler  
([H03F 7/00 takes precedence](#))}
- WARNING**
- Not complete, see also [H03F 3/46](#)
- 3/62 . . . . . Two-way amplifiers
- 3/64 . . . . . with tubes only
- 3/66 . . . . . Amplifiers simultaneously generating oscillations of one frequency and amplifying signals of another frequency
- 3/68 . . . . . Combinations of amplifiers, e.g. multi-channel amplifiers for stereophonics {[\(power amplifiers using a combination of several semiconductor amplifiers H03F 3/21](#); [combinations of amplifiers using coupling networks with distributed constants H03F 3/602](#))}
- 3/70 . . . . . Charge amplifiers
- 3/72 . . . . . Gated amplifiers, i.e. amplifiers which are rendered operative or inoperative by means of a control signal
- 5/00 Amplifiers with both discharge tubes and semiconductor devices as amplifying elements**
- 7/00 Parametric amplifiers** ([{H03F 19/00 takes precedence](#)}; [devices or arrangements for the parametric generation or amplification of light, infra-red or ultra-violet waves G02F 1/39](#))
- 7/02 . . . . . using variable-inductance element; using variable-permeability element
- 7/04 . . . . . using variable-capacitance element; using variable-permittivity element
- 9/00 Magnetic amplifiers**
- 9/02 . . . . . current-controlled, i.e. the load current flowing in both directions through a main coil
- 9/04 . . . . . voltage-controlled, i.e. the load current flowing in only one direction through a main coil, e.g. Logan circuits ([H03F 9/06 takes precedence](#))
- 9/06 . . . . . Control by voltage time integral, i.e. the load current flowing in only one direction through a main coil, whereby the main coil winding also can be used as a control winding, e.g. Ramey circuits
- 11/00 Dielectric amplifiers**
- 13/00 Amplifiers using amplifying element consisting of two mechanically- or acoustically-coupled transducers, e.g. telephone-microphone amplifier**
- 15/00 Amplifiers using galvano-magnetic effects not involving mechanical movement, e.g. using Hall effect**
- 17/00 Amplifiers using electroluminescent element or photocell**
- 19/00 Amplifiers using superconductivity effects**
- 21/00 {Amplifiers not covered by groups H03F 3/00 - H03F 19/00 (dynamo-electric amplifiers H02K)}**

**2200/00 Indexing scheme relating to amplifiers**

- 2200/03 . the amplifier being designed for audio applications
- 2200/06 . A balun, i.e. balanced to or from unbalanced converter, being present at the input of an amplifier
- 2200/09 . A balun, i.e. balanced to or from unbalanced converter, being present at the output of an amplifier
- 2200/102 . A non-specified detector of a signal envelope being used in an amplifying circuit
- 2200/105 . A non-specified detector of the power of a signal being used in an amplifying circuit
- 2200/108 . A coil being added in the drain circuit of a FET amplifier stage, e.g. for noise reducing purposes
- 2200/111 . the amplifier being a dual or triple band amplifier, e.g. 900 and 1800 MHz, e.g. switched or not switched, simultaneously or not
- 2200/114 . the amplifier comprising means for electro-magnetic interference [EMI] protection
- 2200/117 . A coil being coupled in a feedback path of an amplifier stage
- 2200/12 . A bias circuit for some stages being shown using transmission lines
- 2200/121 . A transistor in common gate configuration being used in a feedback circuit of an amplifier stage
- 2200/123 . A difference signal between an output and an input signal of an amplifier being coupled back at the input of the amplifier
- 2200/126 . A diode being coupled in a feedback path of an amplifier stage, e.g. active or passive diode
- 2200/129 . there being a feedback over the complete amplifier
- 2200/132 . Hybrid coupler placed in a feedback circuit of an amplifier
- 2200/135 . there being a feedback over one or more internal stages in the global amplifier
- 2200/138 . the feedback circuit comprising a parallel resonance circuit
- 2200/141 . the feedback circuit of the amplifier stage comprising a resistor and a capacitor in series, at least one of them being an active one
- 2200/144 . the feedback circuit of the amplifier stage comprising a passive resistor and passive capacitor
- 2200/147 . the feedback circuit comprising a series resonance circuit
- 2200/15 . the supply or bias voltage or current at the drain side of a FET being continuously controlled by a controlling signal
- 2200/151 . A source follower being used in a feedback circuit of an amplifier stage
- 2200/153 . Feedback used to stabilise the amplifier
- 2200/156 . One or more switches are realised in the feedback circuit of the amplifier stage
- 2200/159 . the feedback circuit being closed during a switching time
- 2200/162 . FETs are biased in the weak inversion region
- 2200/165 . A filter circuit coupled to the input of an amplifier
- 2200/168 . Two amplifying stages are coupled by means of a filter circuit
- 2200/171 . A filter circuit coupled to the output of an amplifier
- 2200/174 . Floating gate implemented in MOS technology
- 2200/177 . Folded cascode realised by a folding coil
- 2200/18 . the bias of the gate of a FET being controlled by a control signal
- 2200/181 . A coil being added in the gate circuit of a FET amplifier stage, e.g. for noise reducing purposes
- 2200/183 . the amplifier comprising a gated diode
- 2200/186 . the ground, reference potential being controlled
- 2200/189 . the ground, reference or shield potential difference between different chips being controlled
- 2200/192 . A hybrid coupler being used at the input of an amplifier circuit
- 2200/195 . A hybrid coupler being used as power measuring circuit at the input of an amplifier circuit
- 2200/198 . A hybrid coupler being used as coupling circuit between stages of an amplifier circuit
- 2200/201 . A hybrid coupler being used as power measuring inter-stage circuit between two stages of an amplifier circuit
- 2200/204 . A hybrid coupler being used at the output of an amplifier circuit
- 2200/207 . A hybrid coupler being used as power measuring circuit at the output of an amplifier circuit
- 2200/21 . Bias resistors are added at the input of an amplifier
- 2200/211 . the input of an amplifier can be attenuated by a continuously controlled transistor attenuator
- 2200/213 . A variable capacitor being added in the input circuit, e.g. base, gate, of an amplifier stage
- 2200/216 . A coil being added in the input circuit, e.g. base, gate, of an amplifier stage
- 2200/219 . Follower transistors are added at the input of the amplifier, e.g. source or emitter followers
- 2200/222 . A circuit being added at the input of an amplifier to adapt the input impedance of the amplifier
- 2200/225 . the input circuit of an amplifying stage comprising an LC-network
- 2200/228 . A measuring circuit being coupled to the input of an amplifier
- 2200/231 . the input of an amplifier can be switched on or off by a switch to amplify or not an input signal
- 2200/234 . the input amplifying stage being one or more operational amplifiers
- 2200/237 . A parallel resonance being added in series in the input circuit, e.g. base, gate, of an amplifier stage
- 2200/24 . the supply or bias voltage or current at the source side of a FET being continuously controlled by a controlling signal
- 2200/241 . A parallel resonance being added in shunt in the input circuit, e.g. base, gate, of an amplifier stage
- 2200/243 . A series resonance being added in series in the input circuit, e.g. base, gate, of an amplifier stage
- 2200/246 . A series resonance being added in shunt in the input circuit, e.g. base, gate, of an amplifier stage, e.g. as a trap
- 2200/249 . A switch coupled in the input circuit of an amplifier being controlled by a circuit, e.g. feedback circuitry being controlling the switch
- 2200/252 . Multiple switches coupled in the input circuit of an amplifier are controlled by a circuit, e.g. feedback circuitry being controlling the switch
- 2200/255 . Amplifier input adaptation especially for transmission line coupling purposes, e.g. impedance adaptation
- 2200/258 . the input of the amplifier has voltage limiting means
- 2200/261 . Amplifier which being suitable for instrumentation applications
- 2200/264 . An operational amplifier based integrator or transistor based integrator being used in an amplifying circuit
- 2200/267 . A capacitor based passive circuit, e.g. filter, being used in an amplifying circuit



- 2200/27 . A biasing circuit node being switched in an amplifier circuit
- 2200/271 . the DC-isolation amplifier, e.g. chopper amplifier, modulation/demodulation amplifier, uses capacitive isolation means, e.g. capacitors
- 2200/273 . the DC-isolation amplifier, e.g. chopper amplifier, modulation/demodulation amplifier, uses inductive isolation means, e.g. transformers
- 2200/276 . the DC-isolation amplifier, e.g. chopper amplifier, modulation/demodulation amplifier, uses optical isolation means, e.g. optical couplers
- 2200/279 . the level shifting stage between two amplifying stages being realised by an explicit differential amplifier
- 2200/282 . the level shifting stage between two amplifying stages being realised by a diode
- 2200/285 . the level shifting stage between two amplifying stages being realised by an emitter follower
- 2200/288 . the level shifting stage between two amplifying stages being realised by a resistor or potentiometer
- 2200/291 . the level shifting stage between two amplifying stages being realised by a source follower
- 2200/294 . the amplifier being a low noise amplifier [LNA]
- 2200/297 . the loading circuit of an amplifying stage comprising a capacitor
- 2200/301 . the loading circuit of an amplifying stage comprising a coil
- 2200/303 . the loading circuit of an amplifying stage comprising a diode or diode coupled transistor
- 2200/306 . the loading circuit of an amplifying stage being a parallel resonance circuit
- 2200/309 . the loading circuit of an amplifying stage being a series resonance circuit
- 2200/31 . the switching power stage comprising circuitry for emulating the behaviour of a bootstrap diode
- 2200/312 . the loading circuit of an amplifying stage comprising one or more switches
- 2200/315 . the loading circuit of an amplifying stage comprising a transmission line
- 2200/318 . A matching circuit being used as coupling element between two amplifying stages
- 2200/321 . Use of a microprocessor in an amplifier circuit or its control circuit
- 2200/324 . An amplitude modulator or demodulator being used in the amplifier circuit
- 2200/327 . Amplitude shift keying modulation being used in an amplifying circuit
- 2200/33 . Bridge form coupled amplifiers; H-form coupled amplifiers
- 2200/331 . Sigma delta modulation being used in an amplifying circuit
- 2200/333 . A frequency modulator or demodulator being used in the amplifier circuit
- 2200/336 . A I/Q, i.e. phase quadrature, modulator or demodulator being used in an amplifying circuit
- 2200/339 . Pulse amplitude modulation being used in an amplifying circuit
- 2200/342 . Pulse code modulation being used in an amplifying circuit
- 2200/345 . Pulse density modulation being used in an amplifying circuit
- 2200/348 . Pulse frequency modulation being used in an amplifying circuit
- 2200/351 . Pulse width modulation being used in an amplifying circuit
- 2200/354 . the amplifier comprising MOS which are biased in the moderate inversion region
- 2200/357 . the amplifier comprising MOS which are biased in the weak inversion region
- 2200/36 . the amplifier comprising means for increasing the bandwidth
- 2200/361 . Transistor with multiple collectors
- 2200/363 . Transistor with multiple emitters
- 2200/366 . Multiple MOSFETs are coupled in parallel
- 2200/369 . A negative impedance circuit being added to an amplifier circuit
- 2200/372 . Noise reduction and elimination in amplifier
- 2200/375 . Circuitry to compensate the offset being present in an amplifier
- 2200/378 . A variable capacitor being added in the output circuit, e.g. collector, drain, of an amplifier stage
- 2200/381 . An active variable resistor, e.g. controlled transistor, being coupled in the output circuit of an amplifier to control the output
- 2200/384 . Amplifier without output filter, i.e. directly connected to the load
- 2200/387 . A circuit being added at the output of an amplifier to adapt the output impedance of the amplifier
- 2200/39 . Different band amplifiers are coupled in parallel to broadband the whole amplifying circuit
- 2200/391 . the output circuit of an amplifying stage comprising an LC-network
- 2200/393 . A measuring circuit being coupled to the output of an amplifier
- 2200/396 . the output of an amplifier can be switched on or off by a switch to couple the output signal to a load
- 2200/399 . A parallel resonance being added in shunt in the output circuit, e.g. base, gate, of an amplifier stage
- 2200/402 . A series resonance being added in shunt in the output circuit, e.g. base, gate, of an amplifier stage
- 2200/405 . the output amplifying stage of an amplifier comprising more than three power stages
- 2200/408 . the output amplifying stage of an amplifier comprising three power stages
- 2200/411 . the output amplifying stage of an amplifier comprising two power stages
- 2200/414 . A switch being coupled in the output circuit of an amplifier to switch the output on/off
- 2200/417 . A switch coupled in the output circuit of an amplifier being controlled by a circuit
- 2200/42 . the input to the amplifier being made by capacitive coupling means
- 2200/421 . Multiple switches coupled in the output circuit of an amplifier are controlled by a circuit
- 2200/423 . Amplifier output adaptation especially for transmission line coupling purposes, e.g. impedance adaptation
- 2200/426 . the amplifier comprising circuitry for protection against overload
- 2200/429 . Two or more amplifiers or one amplifier with filters for different frequency bands are coupled in parallel at the input or output
- 2200/432 . Two or more amplifiers of different type are coupled in parallel at the input or output, e.g. a class D and a linear amplifier, a class B and a class A amplifier

- 2200/435 . A peak detection being used in a signal measuring circuit in a controlling circuit of an amplifier
- 2200/438 . Separate feedback of amplitude and phase signals being present
- 2200/441 . Protection of an amplifier being implemented by clamping means
- 2200/444 . Diode used as protection means in an amplifier, e.g. as a limiter or as a switch
- 2200/447 . the amplifier being protected to temperature influence
- 2200/45 . the load of the amplifier being a capacitive element, e.g. CRT
- 2200/451 . the amplifier being a radio frequency amplifier
- 2200/453 . Controlling being realised by adding a replica circuit or by using one among multiple identical circuits as a replica circuit
- 2200/456 . A scaled replica of a transistor being present in an amplifier
- 2200/459 . Ripple reduction circuitry being used in an amplifying circuit
- 2200/462 . the current being sensed
- 2200/465 . Power sensing
- 2200/468 . the temperature being sensed
- 2200/471 . the voltage being sensed
- 2200/474 . A current mirror being used as sensor
- 2200/477 . Paralleled transistors are used as sensors
- 2200/48 . the output of the amplifier being coupled out by a capacitor
- 2200/481 . A resistor being used as sensor
- 2200/483 . A shunting switch being paralleled to the sensor
- 2200/486 . the current in the load of an amplifying stage being sensed by a torus
- 2200/489 . A coil being added in the source circuit of a common source stage, e.g. as degeneration means
- 2200/492 . A coil being added in the source circuit of a transistor amplifier stage as degenerating element
- 2200/495 . A parallel resonance circuit being added in the source circuit of a FET amplifier
- 2200/498 . A resistor being added in the source circuit of a transistor amplifier stage as degenerating element
- 2200/501 . A series resonance circuit being added in the source circuit of a FET amplifier
- 2200/504 . the supply voltage or current being continuously controlled by a controlling signal, e.g. the controlling signal of a transistor implemented as variable resistor in a supply path for, an IC-block showed amplifier
- 2200/507 . A switch being used for switching on or off a supply or supplying circuit in an IC-block amplifier circuit
- 2200/51 . Capacitor in positive feedback circuit of an amplifier circuit to bootstrap a resistor
- 2200/511 . Many discrete supply voltages or currents or voltage levels can be chosen by a control signal in an IC-block amplifier circuit
- 2200/513 . the amplifier being made for low supply voltages
- 2200/516 . Some amplifier stages of an amplifier use supply voltages of different value
- 2200/519 . the bias or supply voltage or current of the drain side of a FET amplifier being controlled to be on or off by a switch
- 2200/522 . the bias or supply voltage or current of the gate side of a FET amplifier being controlled to be on or off by a switch
- 2200/525 . the bias or supply voltage or current of the source side of a FET amplifier being controlled to be on or off by a switch
- 2200/528 . the temperature dependence being controlled by referencing to the band gap
- 2200/531 . the temperature difference between different chips being controlled
- 2200/534 . Transformer coupled at the input of an amplifier
- 2200/537 . A transformer being used as coupling element between two amplifying stages
- 2200/54 . Two or more capacitor coupled amplifier stages in cascade
- 2200/541 . Transformer coupled at the output of an amplifier
- 2200/543 . A transmission line being used as coupling element between two amplifying stages
- 2200/546 . A tunable capacitance being present in an amplifier circuit
- 2200/549 . the amplifier comprising means to emulate the vacuum tube behaviour
- 2200/552 . the amplifier being made for video applications
- 2200/555 . A voltage generating circuit being realised for biasing different circuit elements
- 2200/57 . Separate feedback of real and complex signals being present
- 2200/61 . the cascode amplifier has more than one common gate stage
- 2200/63 . the amplifier being suitable for CATV applications
- 2200/66 . Clipping circuitry being present in an amplifier, i.e. the shape of the signal being modified
- 2200/69 . the amplifier stage being a common drain coupled MOSFET, i.e. source follower
- 2200/72 . the amplifier stage being a common gate configuration MOSFET
- 2200/75 . the amplifier stage being a common source configuration MOSFET
- 2200/78 . A comparator being used in a controlling circuit of an amplifier
- 2200/81 . Inputs or outputs are crossed during a first switching time, not crossed during a second switching time
- 2200/84 . A cross coupling circuit being realized by current mirrors
- 2200/87 . the cross coupling circuit being realised only by MOSFETs
- 2200/91 . the amplifier has a current mode topology
- 2200/93 . Two or more transistors are coupled in a Darlington composite transistor configuration, all transistors being of the same type
- 2200/96 . Two or more complementary transistors are coupled in a Darlington composite transistor configuration
- 2200/99 . A diode as rectifier being used as a detecting circuit in an amplifying circuit
- 2201/00 Indexing scheme relating to details of amplifiers with only discharge tubes, only semiconductor devices or only unspecified devices as amplifying elements covered by [H03F 1/00](#)**
- 2201/32 . Indexing scheme relating to modifications of amplifiers to reduce non-linear distortion
- 2201/3203 . . the amplifier comprising means for back off control in order to reduce distortion
- 2201/3206 . . Multiple channels are combined and amplified by only one amplifier
- 2201/3209 . . the amplifier comprising means for compensating memory effects

- 2201/3212 . . Using a control circuit to adjust amplitude and phase of a signal in a signal path
- 2201/3215 . . To increase the output power or efficiency
- 2201/3218 . . the main amplifier or error amplifier being a feedforward amplifier
- 2201/3221 . . Predistortion by overamplifying in a feedforward stage the distortion signal to have a combined main signal and "negative" distortion to form the predistorted signal for a further stage. so that after amplification in the further stage only the amplified main signal remains
- 2201/3224 . . Predistortion being done for compensating memory effects
- 2201/3227 . . Adaptive predistortion based on amplitude, envelope or power level feedback from the output of the main amplifier
- 2201/3231 . . Adaptive predistortion using phase feedback from the output of the main amplifier
- 2201/3233 . . Adaptive predistortion using lookup table, e.g. memory, RAM, ROM, LUT, to generate the predistortion
- 2201/3236 . . A generated signal, e.g. a pulse or an inverted synchronous signal, being added to avoid certain conditions, e.g. clipping
- 2203/00 Indexing scheme relating to amplifiers with only discharge tubes or only semiconductor devices as amplifying elements covered by H03F 3/00**
- 2203/20 . Indexing scheme relating to power amplifiers, e.g. Class B amplifiers, Class C amplifiers
- 2203/21 . . with semiconductor devices only
- 2203/211 . . . using a combination of several amplifiers
- 2203/21103 . . . . An impedance adaptation circuit being added at the input of a power amplifier stage
- 2203/21106 . . . . An input signal being distributed in parallel over the inputs of a plurality of power amplifiers
- 2203/21109 . . . . An input signal being distributed by switching to a plurality of paralleled power amplifiers
- 2203/21112 . . . . An filter circuit being added at the input of a power amplifier stage
- 2203/21115 . . . . An input signal dependant signal being measured by current measuring at the input of a power amplifier
- 2203/21118 . . . . An input signal dependant signal being measured by power measuring at the input of a power amplifier
- 2203/21121 . . . . An input signal dependant signal being measured by voltage measuring at the input of a power amplifier
- 2203/21124 . . . . A parallel resonance circuit being coupled at the input of a power amplifier
- 2203/21127 . . . . the input bias current of a power amplifier being controlled, e.g. by an active current source or a current mirror
- 2203/21131 . . . . the input bias voltage of a power amplifier being controlled, e.g. by a potentiometer or an emitter follower
- 2203/21133 . . . . A series resonance circuit being coupled at the input of a power amplifier
- 2203/21136 . . . . An input signal of a power amplifier being on/off switched
- 2203/21139 . . . . An impedance adaptation circuit being added at the output of a power amplifier stage
- 2203/21142 . . . . Output signals of a plurality of power amplifiers are parallel combined to a common output
- 2203/21145 . . . . Output signals are combined by switching a plurality of paralleled power amplifiers to a common output
- 2203/21148 . . . . An output signal of a power amplifier being controlled by controlling current signal, e.g. by controlled current mirror
- 2203/21151 . . . . An output signal of a power amplifier being controlled by controlling power signal, e.g. by an inductive coupler
- 2203/21154 . . . . An output signal of a power amplifier being controlled by controlling voltage signal
- 2203/21157 . . . . A filter circuit being added at the output of a power amplifier stage
- 2203/21161 . . . . An output signal dependant signal being measured by current measuring at the output of a power amplifier
- 2203/21163 . . . . An output signal dependant signal being measured by power measuring, e.g. by an inductive coupler, at the output of a power amplifier
- 2203/21166 . . . . An output signal dependant signal being measured by voltage measuring at the output of a power amplifier
- 2203/21169 . . . . A parallel resonance circuit being coupled at the output of a power amplifier
- 2203/21172 . . . . A series resonance circuit being coupled at the output of a power amplifier
- 2203/21175 . . . . An output signal of a power amplifier being on/off switched
- 2203/21178 . . . . Power transistors are made by coupling a plurality of single transistors in parallel
- 2203/21181 . . . . the supply current of a power amplifier being continuously controlled, e.g. by controlling current sources or resistors
- 2203/21184 . . . . the supply current of a power amplifier being continuously measured, e.g. by a resistor, a current mirror, to produce a controlling signal
- 2203/21187 . . . . the supply current of a power amplifier being measured discontinuously in time, e.g. by sampling, to produce a controlling signal
- 2203/21191 . . . . the supply current of a power amplifier being switchable controlled, e.g. by choosing different current sources or resistors
- 2203/21193 . . . . the supply voltage of a power amplifier being continuously controlled, e.g. by an active potentiometer
- 2203/21196 . . . . the supply voltage of a power amplifier being switchable controlled
- 2203/30 . Indexing scheme relating to single-ended push-pull [SEPP]; Phase-splitters therefor
- 2203/30003 . . the SEPP amplifier stage comprising calibration possibility
- 2203/30006 . . the push and the pull stages of the SEPP amplifier are both current mirrors
- 2203/30009 . . the push and pull stages of the SEPP amplifier are both cascode current mirrors
- 2203/30012 . . the two SEPP amplifying transistors are Darlington composite transistors
- 2203/30015 . . An input signal dependent control signal controls the bias of an output stage in the SEPP

- 2203/30018 . . A series coupled active resistor and capacitor are coupled in a feedback circuit of a SEPP amplifier
- 2203/30021 . . A capacitor being coupled in a feedback circuit of a SEPP amplifier
- 2203/30024 . . the SEPP bias current being controlled by a control signal from a feedback circuit
- 2203/30027 . . the SEPP bias voltage being controlled by a control signal from a feedback circuit
- 2203/30031 . . A resistor being coupled as feedback circuit in the SEPP amplifier
- 2203/30033 . . A series coupled resistor and capacitor are coupled in a feedback circuit of a SEPP amplifier
- 2203/30036 . . A feedback circuit to stabilise the SEPP being used
- 2203/30039 . . the SEPP bias current being controlled by a control signal from a feedforward circuit
- 2203/30042 . . the SEPP bias voltage being controlled by a control signal from a feedforward circuit
- 2203/30045 . . the SEPP power transistors comprising measuring push or pull transistors to produce a controlling signal
- 2203/30048 . . the SEPP amplifier has multiple SEPP outputs from paralleled output stages coupled in one or more outputs
- 2203/30051 . . the SEPP amplifying transistors are composed of multiple coupled transistors
- 2203/30054 . . the SEPP power transistors are realised as paralleled cascode coupled transistors, i.e. the push or the pull transistors
- 2203/30057 . . the SEPP power transistors are realised as paralleled FETs, i.e. the push or the pull transistor
- 2203/30061 . . One or more current mirrors are used as bias circuit or stages for the push or pull stages
- 2203/30063 . . A differential amplifier being used in the bias circuit or in the control circuit of the SEPP-amplifier
- 2203/30066 . . A optical element being used in the bias circuit of the SEPP-amplifier
- 2203/30069 . . A SEPP amplifier with a reactive element in the bias circuit
- 2203/30072 . . the SEPP has a power supply switchable by a controlling signal derived from the input signal
- 2203/30075 . . the SEPP has a power supply switchable by a controlling signal derived from the output signal
- 2203/30078 . . A resistor being added in the pull stage of the SEPP amplifier
- 2203/30081 . . the pull transistor circuit comprising one or more capacitors
- 2203/30084 . . the pull circuit of the SEPP amplifier being a cascode circuit
- 2203/30087 . . Only the bias of the pull transistor of the SEPP being dynamically controlled by the input signal
- 2203/30091 . . the pull side of the SEPP amplifier has an extra drive follower stage to control this pull side
- 2203/30093 . . the pull side of the SEPP amplifier has an extra drive inverter stage to control this pull side
- 2203/30096 . . An op amp being used as extra drive amp for the pull side of the SEPP
- 2203/30099 . . the pull transistor being gated by a switching element
- 2203/30102 . . the pull transistor has a measuring transistor for controlling purposes
- 2203/30105 . . the pull transistor of the asymmetrically driven SEPP amplifier being a driven current mirror
- 2203/30108 . . the pull transistor of the SEPP amplifier being a cascode current mirror
- 2203/30111 . . A resistor being added in the push stage of the SEPP amplifier
- 2203/30114 . . the push transistor circuit comprising one or more capacitors
- 2203/30117 . . the push circuit of the SEPP amplifier being a cascode circuit
- 2203/30121 . . Only the bias of the push transistor of the SEPP being dynamically controlled by the input signal
- 2203/30123 . . the push side of the SEPP amplifier has an extra drive follower stage to control this push side
- 2203/30126 . . the push side of the SEPP amplifier has an extra drive inverter stage to control this push side
- 2203/30129 . . An op amp being used as extra drive amp for the push side of the SEPP
- 2203/30132 . . the push transistor being gated by a switching element
- 2203/30135 . . the push transistor has a measuring transistor for controlling purposes
- 2203/30138 . . the push transistor of the asymmetrically driven SEPP amplifier being a driven current mirror
- 2203/30141 . . the push transistor of the SEPP amplifier being a cascode current mirror
- 2203/30144 . . the SEPP comprising a reactive element in the amplifying circuits
- 2203/30147 . . the current sink of the push driven, i.e. source driven SEPP amplifier being a current mirror
- 2203/30151 . . the current sink of the push driven, i.e. source driven SEPP amplifier being a cascode current mirror
- 2203/30153 . . the current source of the pull driven, i.e. sink driven SEPP amplifier being a current mirror
- 2203/30156 . . the current source of the pull driven, i.e. sink driven SEPP amplifier being a cascode current mirror
- 2203/45 . . Indexing scheme relating to differential amplifiers
- 2203/45002 . . the addition of two signals being made by addition of two currents by coupling the outputs of two current mirrors in parallel
- 2203/45004 . . the addition of two signals being made by addition of two currents by coupling two current sources in parallel
- 2203/45006 . . the addition of two signals being made by two emitter or source coupled followers
- 2203/45008 . . the addition of two signals being made by a resistor addition circuit for producing the common mode signal
- 2203/45011 . . the addition of two signals being made in a source degeneration circuit of a current mirror for producing the common mode signal
- 2203/45012 . . the addition of two signals being made in a switched capacitor circuit for producing the common mode signal
- 2203/45014 . . the addition of two signals being made in the tail circuit of a differential amplifier for producing the common mode signal
- 2203/45016 . . the addition of two signals being made by paralleling two triode biased transistors for producing the common mode signal
- 2203/45018 . . the differential amplifier amplifying transistors have added cross couplings
- 2203/45021 . . One or more added diodes to the amplifying transistors in the differential amplifier



- 2203/45022 . . One or more added resistors to the amplifying transistors in the differential amplifier
- 2203/45024 . . the differential amplifier amplifying transistors are cascode coupled transistors
- 2203/45026 . . One or more current sources are added to the amplifying transistors in the differential amplifier
- 2203/45028 . . the differential amplifier amplifying transistors are folded cascode coupled transistors
- 2203/45031 . . the differential amplifier amplifying transistors are compositions of multiple transistors
- 2203/45032 . . the differential amplifier amplifying transistors are multiple paralleled transistors
- 2203/45034 . . One or more added reactive elements, capacitive or inductive elements, to the amplifying transistors in the differential amplifier
- 2203/45036 . . the differential amplifier amplifying transistors are single transistors
- 2203/45038 . . One or more current sources are added or changed as balancing means to reduce the offset of the dif amp
- 2203/45041 . . Fuses are blown to balance the dif amp to reduce the offset of the dif amp
- 2203/45042 . . One or more resistors are added or changed as balancing to reduce the offset of the dif amp
- 2203/45044 . . One or more switches are opened or closed to balance the dif amp to reduce the offset of the dif amp
- 2203/45046 . . the base current of the amplifying transistors of a dif amp being compensated for providing a greater input impedance of the amplifier
- 2203/45048 . . Calibrating and standardising a dif amp
- 2203/45051 . . Two or more differential amplifiers cascade coupled
- 2203/45052 . . the cascode stage of the cascode differential amplifier being controlled by a controlling signal, which controlling signal can also be the input signal
- 2203/45054 . . the cascode stage of the cascode dif amp being a current mirror
- 2203/45056 . . One or both transistors of the cascode stage of a differential amplifier being composed of more than one transistor
- 2203/45058 . . the cascode stage of the differential amplifier comprising a reactive element
- 2203/45061 . . the common mode reference signal being taken or deducted from the one or more inputs of the differential amplifier
- 2203/45062 . . the common mode signal, e.g. voltage or current being added to the cascode stage of the cascode or folded cascode differential amplifier
- 2203/45064 . . the resulting deducted common mode signal being added to the folding circuit of the folded differential amplifier
- 2203/45066 . . the resulting deducted common mode signal being added at the one or more inputs of the differential amplifier
- 2203/45068 . . the resulting deducted common mode signal being added at the one or more outputs of the differential amplifier
- 2203/45071 . . the resulting deducted common mode signal being added at the substrate or body regions of the components of the differential amplifier
- 2203/45072 . . the common mode voltage or current signal being added to the tail circuit of the differential amplifier
- 2203/45074 . . A comparator circuit compares the common mode signal to a reference before controlling the differential amplifier or related stages
- 2203/45076 . . the resulting deducted common mode signal being added to or controls the differential amplifier, and being a current signal
- 2203/45078 . . the common mode signal being taken or deducted from the one or more inputs of the differential amplifier
- 2203/45081 . . the common mode signal being level shifted before using it for controlling or adding
- 2203/45082 . . the common mode signal being taken or deducted from the one or more outputs of the differential amplifier
- 2203/45084 . . the common mode signal circuit comprising one or more inductive or capacitive elements, e.g. filter circuitry
- 2203/45086 . . the common mode signal being taken or deducted from the tail circuit of the differential amplifier
- 2203/45088 . . the resulting deducted common mode signal being added to or controls the differential amplifier, and being a voltage signal
- 2203/45091 . . Two complementary type differential amplifiers are paralleled, e.g. one of the p-type and one of the n-type
- 2203/45092 . . Two current sources bias one set of two common base transistors cascaded with two other common base transistors, the common base transistors being driven complementary
- 2203/45094 . . the dif amp being realized by coupling the emitters respectively sources of two common collector respectively drain transistors of a first type to the emitters respectively sources of two common base respectively gate transistors of a second complementary type
- 2203/45096 . . the difference of two signals being made by, e.g. combining two or more current mirrors, e.g. differential current mirror
- 2203/45098 . . Two current mirrors coupled in a subtracting configuration
- 2203/45101 . . Control of the DC level being present
- 2203/45102 . . A diode being used as clamping element at the input of the dif amp
- 2203/45104 . . A diode being used as clamping element at the loading circuit of the dif amp
- 2203/45106 . . A diode being used as clamping element at the output of the dif amp
- 2203/45108 . . A diode being used as level shifter between stages or in a follower in relation with a dif amp
- 2203/45111 . . Two dif amps of the same type are used one dif amp for each input signal
- 2203/45112 . . the biasing of the differential amplifier being controlled from the input or the output signal
- 2203/45114 . . the differential amplifier contains another differential amplifier in its feedback circuit
- 2203/45116 . . Feedback coupled to the input of the differential amplifier
- 2203/45118 . . At least one reactive element being added to at least one feedback circuit of a dif amp
- 2203/45121 . . A floating gate element being part of a dif amp
- 2203/45122 . . the folded cascode stage of the folded cascode differential amplifier being controlled by a controlling signal
- 2203/45124 . . the folded cascode stage of the folded cascode dif amp being a current mirror

- 2203/45126 . . One or both transistors of the folded cascode stage of a folded cascode dif amp are composed of more than one transistor
- 2203/45128 . . the folded cascode stage of the folded cascode dif amp contains a reactive element
- 2203/45131 . . A follower being added between the dif amp and other explicit stages in the amplifying circuit
- 2203/45132 . . A source follower using multiple single follower stages cascaded in a composed follower being added to the dif amp
- 2203/45134 . . the whole differential amplifier together with other coupled stages being fully differential realised
- 2203/45136 . . One differential amplifier in IC-block form being shown
- 2203/45138 . . Two or more differential amplifiers in IC-block form are combined, e.g. measuring amplifiers
- 2203/45141 . . A cross coupled pair of transistors being added in the input circuit of a differential amplifier
- 2203/45142 . . At least one diode being added at the input of a dif amp
- 2203/45144 . . At least one follower being added at the input of a dif amp
- 2203/45146 . . At least one op amp being added at the input of a dif amp
- 2203/45148 . . At least one reactive element being added at the input of a dif amp
- 2203/45151 . . At least one resistor being added at the input of a dif amp
- 2203/45152 . . Balancing means being added at the input of a dif amp to reduce the offset of the dif amp
- 2203/45154 . . the bias at the input of the amplifying transistors being controlled
- 2203/45156 . . At least one capacitor being added at the input of a dif amp
- 2203/45158 . . One or more diodes coupled at the inputs of a dif amp as clamping elements
- 2203/45161 . . One or more diodes coupled at the inputs of a dif amp as level shifting circuit elements
- 2203/45162 . . A parallel resonance circuit being added in the one or more input circuits of the dif amp
- 2203/45164 . . A series resonance circuit being added in the one or more input circuits of the dif amp
- 2203/45166 . . Only one input of the dif amp being used for an input signal
- 2203/45168 . . A dif amp being used as input stage to one or more other non-differential stages
- 2203/45171 . . the input signal being switched to the one or more input terminals of the differential amplifier
- 2203/45172 . . A transformer being added at the input of the dif amp
- 2203/45174 . . the application of the differential amplifier being in an integrator circuit
- 2203/45176 . . A cross coupling circuit, e.g. consisting of two cross coupled transistors, being added in the load circuit of the amplifying transistors of a differential amplifier
- 2203/45178 . . the differential amplifier contains one or more extra resistors in the active load circuit
- 2203/45181 . . Compensation of unbalanced loading in dif amps, e.g. unbalancing by connecting unequal circuits on both load circuits of the dif amp
- 2203/45182 . . the differential amplifier contains one or more cascode current mirrors in the load
- 2203/45184 . . the differential amplifier has one or more cascode current sources in the load
- 2203/45186 . . the differential amplifier contains clamping components in the load circuit
- 2203/45188 . . the differential amplifier contains one or more current sources in the load
- 2203/45191 . . One or more diodes not belonging to a current mirror as loads of a dif amp
- 2203/45192 . . the differential amplifier contains current mirrors comprising diodes which act as a load for the differential amplifier
- 2203/45194 . . At least one active load circuit of the two load circuits in a differential amplifier being realised with a combination of more than one transistor
- 2203/45196 . . A differential amplifier with one or more parallel coupled LC-circuits as load
- 2203/45198 . . A parallel resonance circuit being added in the one or more load circuits of the dif amp
- 2203/45201 . . the differential amplifier contains one or more reactive elements, i.e. capacitive or inductive elements, in the load
- 2203/45202 . . the differential amplifier contains only resistors in the load
- 2203/45204 . . A series resonance circuit being added in the one or more load circuits of the dif amp
- 2203/45206 . . One or two switches are coupled in the loading circuit of the dif amp
- 2203/45208 . . the dif amp being of the long tail pair type, one current source being coupled to the common emitter of the amplifying transistors
- 2203/45211 . . the amplifying transistors have multiple collectors with a cross coupling
- 2203/45212 . . the differential amplifier being designed to have a reduced offset
- 2203/45214 . . Offset in a differential amplifier being reduced by control of the substrate voltage, the voltage being either fixed or variable
- 2203/45216 . . A cross coupling circuit being added at the output terminals of the amplifying transistors of a differential amplifier
- 2203/45218 . . Diode clamping means are present at the output of a differential amplifier
- 2203/45221 . . the output signal being taken from the two complementary outputs of the differential amplifier
- 2203/45222 . . the differential amplifier output being directly controlled by a feedback or feedforward circuit coupled at the output of the dif amp
- 2203/45224 . . One output of the differential amplifier being taken into consideration
- 2203/45226 . . the output signal being switched taken from the one or more output terminals of the differential amplifier
- 2203/45228 . . A transformer being added at the output or the load circuit of the dif amp
- 2203/45231 . . Two dif amps of the cascode type are paralleled at their input gates or bases
- 2203/45232 . . Two dif amps of the folded cascode type are paralleled at their input gates or bases
- 2203/45234 . . Two dif amps, one of them being of the cascade type and the other one of the folded cascode type, are paralleled at their input gates or bases

- 2203/45236 . . Two dif amps realised in MOS or JFET technology, one of them being of the p-channel type and the other one of the n-channel type, are coupled in parallel with their gates
- 2203/45238 . . Two dif amps realised in FET technology, the dif amps being either both of the NMOS type or both of the PMOS type, are coupled in parallel with their gates and their drains
- 2203/45241 . . Two dif amps realised in MOS or JFET technology, the dif amps being either both of the p-channel type or both of the n-channel type, are coupled in parallel with their gates
- 2203/45242 . . Two dif amps are paralleled at their inputs, the dif amps being of different types, e.g. one long tail type and one complementary or pi type
- 2203/45244 . . the differential amplifier contains one or more explicit bias circuits, e.g. to bias the tail current sources, to bias the load transistors
- 2203/45246 . . the dif amp being biased in the subthreshold region
- 2203/45248 . . the dif amp being designed for improving the slew rate
- 2203/45251 . . the dif amp has a cross coupling circuit in the source circuit of the amplifying transistors
- 2203/45252 . . Diodes are added in the source circuit of the amplifying FETs of the dif amp
- 2203/45254 . . A parallel resonance circuit being added in the one or more source circuits of the amplifying FETs of the dif amp
- 2203/45256 . . One or more reactive elements are added in the source circuit of the amplifying FETs of the dif amp
- 2203/45258 . . Resistors are added in the source circuit of the amplifying FETs of the dif amp
- 2203/45261 . . A series resonance circuit being added in the one or more source circuits of the amplifying FETs of the dif amp
- 2203/45262 . . the two amplifying FETs, amplifying two complementary input signals, are not source coupled, i.e. no tail being present
- 2203/45264 . . the dif amp comprising frequency or phase stabilisation means
- 2203/45266 . . the stage cascaded to the dif amp being an asymmetrical follower stage
- 2203/45268 . . A common gate stage being coupled at the one or more outputs of the dif amp
- 2203/45271 . . the output current being reduced by a transistor which being controlled by the input signal to sink current
- 2203/45272 . . the output current being increased by a transistor which being controlled by the input signal to source current
- 2203/45274 . . Level shifting stages are added to the differential amplifier at a position other than the one or more inputs of the dif amp
- 2203/45276 . . An op amp as stage being coupled to the output of a dif amp
- 2203/45278 . . Two SEPP stages are added to the differential amplifier, the outputs of the two SEPP stages being the two outputs of the whole amplifier
- 2203/45281 . . One SEPP output stage being added to the differential amplifier
- 2203/45282 . . the differential amplifier being coupled to a symmetrical follower output stage
- 2203/45284 . . Sensing the temperature dependence by a temperature dependant sensor, e.g. a resistor, a diode
- 2203/45286 . . the temperature dependence of a differential amplifier being controlled
- 2203/45288 . . Differential amplifier with circuit arrangements to enhance the transconductance
- 2203/45291 . . the active amplifying circuit [AAC] comprising balancing means
- 2203/45292 . . the AAC comprising biasing means controlled by the signal
- 2203/45294 . . the AAC comprising biasing means to stabilise itself
- 2203/45296 . . the AAC comprising one or more discrete capacitive elements, e.g. a transistor coupled as capacitor
- 2203/45298 . . the AAC comprising one or more combinations of discrete capacitor and resistor elements, e.g. active elements using a transistor as a capacitor or as a resistor
- 2203/45301 . . there are multiple cascaded folded or not folded common gate stages of a cascode dif amp
- 2203/45302 . . the common gate stage of a cascode dif amp being controlled
- 2203/45304 . . the common gate stage of a BIFET cascode dif amp being implemented fully by FETs
- 2203/45306 . . the common gate stage implemented as dif amp eventually for cascode dif amp
- 2203/45308 . . the common gate stage of a cascode dif amp being implemented as one mirror circuit
- 2203/45311 . . the common gate stage of a cascode dif amp being implemented by multiple transistors
- 2203/45312 . . there being only one common gate stage of a cascode dif amp
- 2203/45314 . . the AAC comprising clamping means, e.g. diodes
- 2203/45316 . . the AAC comprising one or more discrete inductive elements or coils
- 2203/45318 . . the AAC comprising a cross coupling circuit, e.g. two extra transistors cross coupled
- 2203/45321 . . the common source stage of a BIFET cascode dif amp being implemented fully by FETs
- 2203/45322 . . One or more current sources are added to the AAC
- 2203/45324 . . the AAC comprising a Darlington transistor circuit
- 2203/45326 . . the AAC comprising one or more extra diodes, e.g. as level shifter, as diode coupled transistors
- 2203/45328 . . the AAC comprising one diode coupled AAC-transistor in a follower combination with the other AAC circuit part
- 2203/45331 . . the AAC comprising one or more diodes coupled as a shunt between the AAC-transistors in the AAC
- 2203/45332 . . the AAC comprising one or more capacitors as feedback circuit elements
- 2203/45334 . . the AAC comprising one or more dif amps as feedback circuit elements
- 2203/45336 . . the AAC comprising one or more resistors as feedback circuit elements
- 2203/45338 . . the AAC comprising one or more series circuits of a resistor and a capacitor as feedback circuit elements
- 2203/45341 . . the AAC comprising controlled floating gates

- 2203/45342 . . the AAC comprising control means on a back gate of the AAC
- 2203/45344 . . At least one of the AAC sub-circuits being a current mirror
- 2203/45346 . . the AAC comprising one or more FETs with multiple drains
- 2203/45348 . . the AAC comprising one or more FETs with multiple gates
- 2203/45351 . . the AAC comprising one or more FETs with multiple sources
- 2203/45352 . . the AAC comprising a combination of a plurality of transistors, e.g. Darlington coupled transistors
- 2203/45354 . . the AAC comprising offset means
- 2203/45356 . . the AAC comprising one or more op-amps, e.g. IC-blocks
- 2203/45358 . . the AAC comprising multiple transistors parallel coupled at their sources and drains only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45361 . . the AAC comprising multiple transistors parallel coupled at their drains only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45362 . . the AAC comprising multiple transistors parallel coupled at their gates and drains only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45364 . . the AAC comprising multiple transistors parallel coupled at their gates and sources only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45366 . . the AAC comprising multiple transistors parallel coupled at their gates only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45368 . . the AAC comprising multiple transistors parallel coupled at their sources only, e.g. in a cascode dif amp, only those forming the composite common source transistor
- 2203/45371 . . the AAC comprising parallel coupled multiple transistors at their source and gate and drain or at their base and emitter and collector, e.g. in a cascode dif amp, only those forming the composite common source transistor or the composite common emitter transistor respectively
- 2203/45372 . . the AAC comprising one or more potentiometers
- 2203/45374 . . the AAC comprising one or more discrete resistors
- 2203/45376 . . the AAC comprising one or more discrete resistors as shunts between collectors or drains
- 2203/45378 . . the AAC comprising saturation or cutoff avoiding means, e.g. as a feedback circuit
- 2203/45381 . . the AAC comprising multiple transistors coupled in shunt
- 2203/45382 . . the AAC comprising common gate stages in the source circuit of the AAC before the common source coupling
- 2203/45384 . . the AAC comprising common gate stages in the source circuit of the AAC before the common source coupling in which the common gate stage being controlled
- 2203/45386 . . the AAC comprising one or more coils in the source circuit
- 2203/45388 . . the AAC comprising diodes in the source circuit of the AAC before the common source coupling
- 2203/45391 . . the AAC comprising potentiometers in the source circuit of the AAC before the common source coupling
- 2203/45392 . . the AAC comprising resistors in the source circuit of the AAC before the common source coupling
- 2203/45394 . . the AAC of the dif amp comprising FETs whose sources are not coupled, i.e. the AAC being a pseudo-differential amplifier
- 2203/45396 . . the AAC comprising one or more switches
- 2203/45398 . . the AAC comprising a voltage generating circuit as bias circuit for the AAC
- 2203/45401 . . the common mode controlling loop [CMCL] comprising a transistor resistor addition circuit
- 2203/45402 . . the CMCL comprising a buffered addition circuit, i.e. the signals are buffered before addition, e.g. by a follower
- 2203/45404 . . the CMCL comprising capacitors containing, not in parallel with the resistors, an addition circuit
- 2203/45406 . . the CMCL comprising a common source node of a long tail FET pair as an addition circuit
- 2203/45408 . . the CMCL comprising a short circuited differential output of a dif amp as an addition circuit
- 2203/45411 . . the CMCL comprising a diode addition circuit, e.g. using diode connected transistors
- 2203/45412 . . the CMCL comprising a folding circuit as addition circuit
- 2203/45414 . . the CMCL comprising a current mirror addition circuit
- 2203/45416 . . the CMCL comprising no addition of the dif signals to produce a common mode signal
- 2203/45418 . . the CMCL comprising a resistor addition circuit
- 2203/45421 . . the CMCL comprising a switched capacitor addition circuit
- 2203/45422 . . the CMCL comprising one or more capacitors not as integrating capacitor, e.g. for stability purposes
- 2203/45424 . . the CMCL comprising a comparator circuit
- 2203/45426 . . the CMCL comprising a comparator circuit with extra buffering means before comparison of the common mode signal, e.g. by a follower
- 2203/45428 . . the CMCL comprising a comparator circuit using a four inputs dif amp
- 2203/45431 . . the CMCL output control signal being a current signal
- 2203/45432 . . the CMCL output control signal being a current signal and being buffered before used to control
- 2203/45434 . . the CMCL output control signal being a voltage signal
- 2203/45436 . . the CMCL output control signal being a voltage signal and being buffered before used to control
- 2203/45438 . . the CMCL uses digital signals
- 2203/45441 . . the CMCL comprising an integrating circuit
- 2203/45442 . . the CMCL comprising multiple loops for the same stage or for different stages in the amplifier
- 2203/45444 . . the CMCL comprising a sample and hold circuit
- 2203/45446 . . there are two or more CMCLs
- 2203/45448 . . the common source circuit [CSC] comprising an addition circuit made by mirrors
- 2203/45451 . . the CSC comprising an addition circuit made by added current sources
- 2203/45452 . . the CSC comprising balancing means
- 2203/45454 . . the CSC comprising biasing means controlled by the input signal



- 2203/45456 . . the CSC comprising bias stabilisation means, e.g. DC-level stability, positive or negative temperature coefficient dependent control
- 2203/45458 . . the CSC comprising one or more capacitors
- 2203/45461 . . the CSC comprising one or more switched capacitors
- 2203/45462 . . the CSC comprising a cascode circuit
- 2203/45464 . . the CSC comprising one or more coils
- 2203/45466 . . the CSC being controlled, e.g. by a signal derived from a non specified place in the dif amp circuit
- 2203/45468 . . the CSC comprising a cross coupling circuit, e.g. comprising two cross-coupled transistors
- 2203/45471 . . the CSC comprising one or more extra current sources
- 2203/45472 . . the CSC comprising one or more diodes
- 2203/45474 . . the CSC comprising controlled one or more floating gates
- 2203/45476 . . the CSC comprising a mirror circuit
- 2203/45478 . . the CSC comprising a cascode mirror circuit
- 2203/45481 . . the CSC comprising only a direct connection to the supply voltage, no other components being present
- 2203/45482 . . the CSC comprising offset means
- 2203/45484 . . the CSC comprising one or more op-amps
- 2203/45486 . . the CSC comprising two or more paralleled transistors as current source
- 2203/45488 . . the CSC being a pi circuit and a capacitor being used at the place of the resistor
- 2203/45491 . . the CSC being a pi circuit and the resistor being implemented by one or more transistors
- 2203/45492 . . the CSC being a pi circuit and the resistor being implemented by one or more controlled transistors
- 2203/45494 . . the CSC comprising one or more potentiometers
- 2203/45496 . . the CSC comprising one or more extra resistors
- 2203/45498 . . the CSC comprising only resistors
- 2203/45501 . . the CSC comprising a L-C parallel resonance circuit
- 2203/45502 . . the CSC comprising a L-C series resonance circuit
- 2203/45504 . . the CSC comprising more than one switch
- 2203/45506 . . the CSC comprising only one switch
- 2203/45508 . . the CSC comprising a voltage generating circuit as bias circuit for the CSC
- 2203/45511 . . the feedback circuit [FBC] comprising one or more transistor stages, e.g. cascaded stages of the dif amp, and being coupled between the loading circuit [LC] and the input circuit [IC]
- 2203/45512 . . the FBC comprising one or more capacitors, not being switched capacitors, and being coupled between the LC and the IC
- 2203/45514 . . the FBC comprising one or more switched capacitors, and being coupled between the LC and the IC
- 2203/45516 . . the FBC comprising a coil and being coupled between the LC and the IC
- 2203/45518 . . the FBC comprising one or more diodes and being coupled between the LC and the IC
- 2203/45521 . . the FBC comprising op amp stages, e.g. cascaded stages of the dif amp and being coupled between the LC and the IC
- 2203/45522 . . the FBC comprising one or more potentiometers
- 2203/45524 . . the FBC comprising one or more active resistors and being coupled between the LC and the IC
- 2203/45526 . . the FBC comprising a resistor-capacitor combination and being coupled between the LC and the IC
- 2203/45528 . . the FBC comprising one or more passive resistors and being coupled between the LC and the IC
- 2203/45531 . . the FBC comprising a parallel resonance circuit and being coupled between the LC and the IC
- 2203/45532 . . the FBC comprising a series resonance circuit and being coupled between the LC and the IC
- 2203/45534 . . the FBC comprising multiple switches and being coupled between the LC and the IC
- 2203/45536 . . the FBC comprising a switch and being coupled between the LC and the IC
- 2203/45538 . . the IC comprising balancing means, e.g. trimming means
- 2203/45541 . . the IC comprising dynamic biasing means, i.e. controlled by the input signal
- 2203/45542 . . the IC comprising bias stabilisation means, e.g. DC level stabilisation, and temperature coefficient dependent control, e.g. by DC level shifting
- 2203/45544 . . the IC comprising one or more capacitors, e.g. coupling capacitors
- 2203/45546 . . the IC comprising one or more capacitors feedback coupled to the IC
- 2203/45548 . . the IC comprising one or more capacitors as shunts to earth or as short circuit between inputs
- 2203/45551 . . the IC comprising one or more switched capacitors
- 2203/45552 . . the IC comprising clamping means, e.g. diodes
- 2203/45554 . . the IC comprising one or more coils
- 2203/45556 . . the IC comprising a common gate stage as input stage to the dif amp
- 2203/45558 . . the IC being coupled at the sources of the source coupled pair
- 2203/45561 . . the IC being controlled, e.g. by a signal derived from a non specified place in the dif amp circuit
- 2203/45562 . . the IC comprising a cross coupling circuit, e.g. comprising two cross-coupled transistors
- 2203/45564 . . the IC comprising one or more extra current sources
- 2203/45566 . . the IC comprising one or more dif stages in cascade with the dif amp
- 2203/45568 . . the IC comprising one or more diodes as shunt to the input leads
- 2203/45571 . . the IC comprising two diodes, e.g. Gilbert circuit
- 2203/45572 . . the IC comprising one or more Zener diodes to the input leads
- 2203/45574 . . the IC comprising four or more input leads connected to four or more AAC-transistors
- 2203/45576 . . the IC comprising input impedance adapting or controlling means
- 2203/45578 . . the IC comprising one or more diodes as level shifters
- 2203/45581 . . the IC comprising one or more resistors as level shifters
- 2203/45582 . . the IC comprising one or more voltage sources as level shifters
- 2203/45584 . . the IC comprising extra differentially coupled transistors for controlling purposes only
- 2203/45586 . . the IC comprising offset generating means
- 2203/45588 . . the IC comprising offset compensating means
- 2203/45591 . . the IC comprising one or more potentiometers

- 2203/45592 . . the IC comprising one or more buffer stages other than emitter or source followers between the input signal leads and input leads of the dif amp, e.g. inverter stages
- 2203/45594 . . the IC comprising one or more resistors, which are not biasing resistor
- 2203/45596 . . the IC comprising one or more biasing resistors
- 2203/45598 . . the IC comprising an input shunting circuit comprising a resistor and a capacitor in series
- 2203/45601 . . the IC comprising one or more passive resistors by feedback
- 2203/45602 . . the IC comprising one or more active resistors by feedback
- 2203/45604 . . the IC comprising a input shunting resistor
- 2203/45606 . . the IC comprising one or more parallel resonance circuits
- 2203/45608 . . the IC comprising one or more series resonance circuits
- 2203/45611 . . the IC comprising only one input signal connection lead for one phase of the signal
- 2203/45612 . . the IC comprising one or more input source followers as input stages in the IC
- 2203/45614 . . the IC comprising two cross coupled switches
- 2203/45616 . . the IC comprising more than one switch, which are not cross coupled
- 2203/45618 . . the IC comprising only one switch
- 2203/45621 . . the IC comprising a transformer for phase splitting the input signal
- 2203/45622 . . the IC comprising an voltage generating circuit
- 2203/45624 . . the LC comprising balancing means, e.g. trimming means
- 2203/45626 . . the LC comprising biasing means controlled by the input signal
- 2203/45628 . . the LC comprising bias stabilisation means, e.g. DC level stabilisation means, and temperature coefficient dependent control, e.g. DC level shifting means
- 2203/45631 . . the LC comprising one or more capacitors, e.g. coupling capacitors
- 2203/45632 . . the LC comprising one or more capacitors coupled to the LC by feedback
- 2203/45634 . . the LC comprising one or more switched capacitors
- 2203/45636 . . the LC comprising clamping means, e.g. diodes
- 2203/45638 . . the LC comprising one or more coils
- 2203/45641 . . the LC being controlled, e.g. by a signal derived from a non specified place in the dif amp circuit
- 2203/45642 . . the LC, and possibly also cascaded stages following it, being (are) controlled by the common mode signal derived to control a dif amp
- 2203/45644 . . the LC comprising a cross coupling circuit, e.g. comprising two cross-coupled transistors
- 2203/45646 . . the LC comprising an extra current source
- 2203/45648 . . the LC comprising two current sources, which are not cascode current sources
- 2203/45651 . . the LC comprising two cascode current sources
- 2203/45652 . . the LC comprising one or more further dif amp stages, either identical to the dif amp or not, in cascade
- 2203/45654 . . the LC comprising one or more extra diodes not belonging to mirrors
- 2203/45656 . . the LC comprising one diode of a current mirror, i.e. forming an asymmetrical load
- 2203/45658 . . the LC comprising two diodes of current mirrors
- 2203/45661 . . the LC comprising one or more controlled floating gates
- 2203/45662 . . the LC comprising inductive coupled loading elements
- 2203/45664 . . the LC comprising one or more cascaded inverter stages as output stage at one output of the dif amp circuit
- 2203/45666 . . the LC comprising two anti-phase controlled inverter circuits as output stages, e.g. fully differential
- 2203/45668 . . the LC comprising a level shifter circuit, which does not comprise diodes
- 2203/45671 . . the LC comprising one or more diodes as level shifter
- 2203/45672 . . the LC comprising one or more resistors as level shifter
- 2203/45674 . . the LC comprising one current mirror
- 2203/45676 . . the LC comprising one cascode current mirror
- 2203/45678 . . the LC comprising offset generating means
- 2203/45681 . . the LC comprising offset compensating means
- 2203/45682 . . the LC comprising one or more op-amps
- 2203/45684 . . the LC comprising one or more buffers or driving stages not being of the emitter respectively source follower type, between the output of the dif amp and the output stage
- 2203/45686 . . the LC comprising one or more potentiometers, which are not shunting potentiometers
- 2203/45688 . . the LC comprising one or more shunting potentiometers
- 2203/45691 . . the LC comprising one or more transistors as active loading resistors
- 2203/45692 . . the LC comprising one or more resistors in series with a capacitor coupled to the LC by feedback
- 2203/45694 . . the LC comprising more than one shunting resistor
- 2203/45696 . . the LC comprising more than two resistors
- 2203/45698 . . the LC comprising one or more resistors coupled to the LC by feedback (active or passive)
- 2203/45701 . . the LC comprising one resistor
- 2203/45702 . . the LC comprising two resistors
- 2203/45704 . . the LC comprising one or more parallel resonance circuits
- 2203/45706 . . the LC comprising one or more series resonance circuits
- 2203/45708 . . the LC comprising one SEPP circuit as output stage
- 2203/45711 . . the LC comprising two anti-phase controlled SEPP circuits as output stages, e.g. fully differential
- 2203/45712 . . the LC comprising a capacitor as shunt
- 2203/45714 . . the LC comprising a coil as shunt
- 2203/45716 . . the LC comprising a RC-series circuit as shunt, e.g. for stabilisation
- 2203/45718 . . the LC comprising a resistor as shunt
- 2203/45721 . . the LC comprising only an output circuit for one phase of the signal
- 2203/45722 . . the LC comprising one or more source followers, as post buffer or driver stages, in cascade in the LC
- 2203/45724 . . the LC comprising two cross coupled switches
- 2203/45726 . . the LC comprising more than one switch, which are not cross coupled
- 2203/45728 . . the LC comprising one switch
- 2203/45731 . . the LC comprising a transformer

- 2203/45732 . . the LC comprising a voltage generating circuit
- 2203/50 . . Indexing scheme relating to amplifiers in which input being applied to, or output being derived from, an impedance common to input and output circuits of the amplifying element, e.g. cathode follower
- 2203/5003 . . the sources of two source followers are differentially coupled
- 2203/5006 . . the input signal being capacitively coupled to the gate of the source follower
- 2203/5009 . . the output signal being capacitively coupled to the source of the source follower
- 2203/5012 . . the source follower has a controlled source circuit, the controlling signal being derived from the drain circuit of the follower
- 2203/5015 . . the source follower has a controlled source circuit, the controlling signal being derived from the gate circuit of the follower
- 2203/5018 . . the source follower has a controlled source circuit, the controlling signal being derived from the source circuit of the follower
- 2203/5021 . . the source follower has a controlled source circuit
- 2203/5024 . . the source follower has a controlled source circuit, the source circuit being controlled via a capacitor, i.e. AC-controlled
- 2203/5027 . . the source follower has a current mirror output circuit in its source circuit
- 2203/5031 . . the source circuit of the follower being a current source
- 2203/5033 . . Two source followers are controlled at their inputs by a differential signal
- 2203/5036 . . the source follower has a resistor in its source circuit
- 2203/5039 . . the source circuit of the follower has one or more capacitors between source and supply
- 2203/5042 . . the source circuit of the follower has one or more coils between source and supply
- 2203/5045 . . the source follower has a level shifter between source and output, e.g. a diode-connected transistor
- 2203/72 . . Indexing scheme relating to gated amplifiers, i.e. amplifiers which are rendered operative or inoperative by means of a control signal
- 2203/7203 . . the gated amplifier being switched on or off by a switch in the bias circuit of the amplifier controlling a bias current in the amplifier
- 2203/7206 . . the gated amplifier being switched on or off by a switch in the bias circuit of the amplifier controlling a bias voltage in the amplifier
- 2203/7209 . . the gated amplifier being switched from a first band to a second band
- 2203/7212 . . the gated amplifier being switched on or off by switching off or on a feedback control loop of the amplifier
- 2203/7215 . . the gated amplifier being switched on or off by a switch at the input of the amplifier
- 2203/7218 . . the gated amplifier being switched on or off by clamping by a switch at the input of the amplifier
- 2203/7221 . . the gated amplifier being switched on or off by a switch at the output of the amplifier
- 2203/7224 . . the gated amplifier being switched on or off by clamping by a switch at the output of the amplifier
- 2203/7227 . . the gated amplifier being switched on or off by a switch in the supply circuit of the amplifier
- 2203/7231 . . the gated amplifier being switched on or off by putting into cascade or not, by choosing between amplifiers by one or more switch(es)
- 2203/7233 . . the gated amplifier, switched on or off by putting into parallel or not, by choosing between amplifiers by one or more switch(es), being impedance adapted by switching an adapted passive network
- 2203/7236 . . the gated amplifier being switched on or off by putting into parallel or not, by choosing between amplifiers by (a ) switch(es)
- 2203/7239 . . the gated amplifier being switched on or off by putting into parallel or not, by choosing between amplifiers and shunting lines by one or more switch(es)