

ECLA**EUROPEAN CLASSIFICATION****H03F**

AMPLIFIERS (measuring, testing G01R; optical parametric amplifiers G02F; circuit arrangement with secondary emission tubes [H01J43/30](#); 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 [H04B3/36](#), [H04B3/58](#); application of speech amplifiers in telephonic communication [H04M1/60](#), [H04M3/40](#))

[N: **WARNING**
[C0411]

- The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups:

| | | |
|--------------------------|------------|--------------------------|
| H03F1/44 | covered by | H03F1/42 |
| H03F1/46 | covered by | H03F1/42 |
| H03F3/18 | covered by | H03F3/00 |
| H03F3/32 | covered by | H03F3/30 |
| H03F7/06 | covered by | H03F7/00 |

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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.

H03F1/00

Details of amplifiers with only discharge tubes, only semiconductor devices or only unspecified devices as amplifying elements

- | | | |
|---------------|-----------|---|
| H03F1/02 | · | Modifications of amplifiers to raise the efficiency, e.g. gliding Class A stages, use of an auxiliary oscillation |
| H03F1/02T | · . | [N: in transistor amplifiers] |
| H03F1/02T1 | · . . | [N: with control of the supply voltage or current] |
| H03F1/02T1C | · . . . | [N: Continuous control] |
| H03F1/02T1C1 | · | [N: by using a signal derived from the input signal] |
| H03F1/02T1C1K | · | [N: using supply converters] |
| H03F1/02T1C2 | · | [N: by using a signal derived from the output signal, e.g. bootstrapping the voltage supply] |
| H03F1/02T1C2K | · | [N: using supply converters] |
| H03F1/02T1D | · . . . | [N: Stepped control] |
| H03F1/02T1D1 | · | [N: by using a signal derived from the input signal] [N0209] |
| H03F1/02T1D2 | · | [N: by using a signal derived from the output signal] [N0209] |

- H03F1/02T2 . . . [N: with control of the polarisation voltage or current, e.g. gliding Class A]
- H03F1/02T2E [N: by using a signal derived from the input signal] [N0209]
- H03F1/02T2S [N: by using a signal derived from the output signal] [N0209]
- H03F1/02T3 . . . [N: Selecting one or more amplifiers from a plurality of amplifiers]
- H03F1/02T4 . . . [N: Reducing the number of Dc-current paths]
- H03F1/02T5 . . . [N: 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] [N0101]
- H03F1/02T6 . . . [N: using vector summing of two or more constant amplitude phase-modulated signals] [N0207]
- H03F1/04 . . in discharge-tube amplifiers
- H03F1/06 . . . to raise the efficiency of amplifying modulated radio frequency waves; to raise the efficiency of amplifiers acting also as modulators [N: (modulation [H03C](#))]
- H03F1/07 Doherty-type amplifiers
- H03F1/08 . Modification of amplifiers to reduce detrimental influences of internal impedances of amplifying elements (wide-band amplifiers with inter-stage coupling networks incorporating these impedances [H03F1/42](#); eliminating transit-time effects in vacuum tubes [H01J21/34](#))
- H03F1/08B . . [N: in transistor amplifiers ([H03F1/10](#) to [H03F1/22](#) take precedence)]
- H03F1/08B1 . . . [N: with FET`s]
- H03F1/10 . . by use of amplifying elements with multiple electrode connections
- H03F1/12 . . by use of attenuating means [N: (attenuators [H03G](#))]
- H03F1/13 . . . in discharge tube amplifiers
- H03F1/14 . . by use of neutralising means
- H03F1/16 . . . in discharge tube amplifiers
- H03F1/18 . . by use of distributed coupling [N: i.e. distributed amplifiers (distributed amplifiers using coupling networks with distributed constants [H03F3/60D](#))]
- H03F1/20 . . . in discharge-tube amplifiers
- H03F1/22 . . by use of cascode coupling, i.e. earthed cathode or emitter stage followed by earthed grid or base stage respectively
- H03F1/22B . . . [N: with MOSFET`s]
- H03F1/22J . . . [N: with junction-FET`s]
- H03F1/24 . . . in discharge-tube amplifiers
- H03F1/26 . Modifications of amplifiers to reduce influence of noise generated by amplifying elements
- H03F1/28 . . in discharge-tube amplifiers [N: (constructional modifications [H01J23/11](#))]
- H03F1/30 . Modifications of amplifiers to reduce influence of variations of temperature or supply voltage [N: or other physical parameters (in differential amplifiers [H03F3/45S3](#))]
- H03F1/30B . . [N: in MOSFET amplifiers ([H03F1/30D](#), [H03F1/30E](#), [H03F1/30P1](#) take precedence)]
- H03F1/30C . . [N: in bipolar transistor amplifiers ([H03F1/30D](#), [H03F1/30E](#), [H03F1/30P](#) take precedence)]
- H03F1/30D . . [N: using a switching device ([H03F1/30E](#), [H03F3/00C](#), [H03F3/38](#) take precedence)]

- H03F1/30D1 . . . [N: and using digital means]
- H03F1/30E . . [N: in case of switching on or off of a power supply]
- H03F1/30J . . [N: in junction-FET amplifiers ([H03F1/30D](#), [H03F1/30E](#), [H03F1/30P2](#) take precedence)]
- H03F1/30P . . [N: in push-pull amplifiers]
- H03F1/30P1 . . . [N: using MOSFET]
- [N: **WARNING**
Not complete, see also [H03F1/30B](#)
]
- H03F1/30P2 . . . [N: using junction-FET]
- [N: **WARNING**
Not complete, see also [H03F1/30J](#)
]
- H03F1/32 . Modifications of amplifiers to reduce non-linear distortion (by negative feedback [H03F1/34](#))
- H03F1/32B . . [N: in field-effect transistor amplifiers]
- H03F1/32D . . [N: in differential amplifiers]
- H03F1/32E . . [N: in single ended push-pull amplifiers]
- H03F1/32F . . [N: using feed-forward ([H03F1/32D](#) takes precedence)]
- H03F1/32F2 . . . [N: using a loop for error extraction and another loop for error subtraction] [N9907]
- H03F1/32F2P [N: using a pilot signal] [N9907] [C0008]
- [N: **WARNING**
Not complete, see also [H03F1/32F2](#)
]
- H03F1/32P . . [N: using predistortion circuits ([H03F1/32D](#), [H03F1/32E](#) take precedence)]
- H03F1/32P2 . . . [N: using feedback acting on predistortion circuits ([H03F1/32P8](#) takes precedence)] [N0008]
- [N: **WARNING**
Not complete, see also [H03F1/32P](#) for non patent literature
]
- H03F1/32P4 . . . [N: using multiple parallel paths between input and output ([H03F1/32P6](#), [H03F1/32P12](#), [H03F1/32P14](#) take precedence)] [N0008] [C0111]
- [N: **WARNING**
Not complete, see also [H03F1/32P](#) for non patent literature
]
- H03F1/32P6 . . . [N: based on polynomial terms] [N0008]
- H03F1/32P8 . . . [N: in audio amplifiers] [N0008]
- H03F1/32P8T [N: to emulate discharge tube amplifier characteristics] [N0008]
- H03F1/32P10 . . . [N: using the nonlinearity inherent to components, e.g. a diode] [N0111]
- H03F1/32P12 . . . [N: Acting on the phase and the amplitude of the input signal] [N0111]
- H03F1/32P12A [N: to compensate phase shift as a function of the amplitude] [N0111]
- H03F1/32P14 . . . [N: Acting on the real and imaginary components of the input signal] [N0111]

- H03F1/33
 - . . in discharge-tube amplifiers
- H03F1/34
 - . Negative-feedback-circuit arrangements with or without positive feedback ([H03F1/02](#) to [H03F1/30](#), [H03F1/38](#) to [H03F1/50](#), [H03F3/50](#) take precedence; [N: for rejection of common mode signals [H03F3/45S3](#)])
- H03F1/34B
 - . . [N: in field-effect transistor amplifiers]
- H03F1/34H
 - . . [N: using hybrid or directional couplers] [N0008]
 - [N: **WARNING**
Not complete, see also [H03F1/34](#)
]
- H03F1/34T
 - . . [N: using transformers]
- H03F1/36
 - . . in discharge-tube amplifiers
- H03F1/38
 - . Positive-feedback circuit arrangements without negative feedback
- H03F1/40
 - . . in discharge-tube amplifiers
- H03F1/42
 - . Modifications of amplifiers to extend the bandwidth
- H03F1/48
 - . . of aperiodic amplifiers
- H03F1/48B
 - . . . [N: with field-effect transistors]
- H03F1/48I
 - . . . [N: with IC amplifier blocks]
- H03F1/50
 - . . . with tubes only
- H03F1/52
 - . Circuit arrangements for protecting such amplifiers [N: (monitoring arrangements [G01R31/28](#); increasing reliability in communication systems, e.g. using redundancy [H04B1/74](#))]
- H03F1/52B
 - . . [N: for amplifiers using field-effect devices ([H03F1/52R](#) takes precedence)]
- H03F1/52R
 - . . [N: protecting by using redundant amplifiers]
 - [N: **WARNING**
Not complete, see also [H03F1/52B](#)
]
- H03F1/54
 - . . with tubes only [N: (testing of vacuum tubes [G01R31/25](#))]
- H03F1/54B
 - . . . [N: Replacing by standby devices]
- H03F1/54C
 - . . . [N: Protection of filaments]
- H03F1/54D
 - . . . [N: Delaying application of anode power supply with respect to application of filament heating power supply]
- H03F1/54F
 - . . . [N: Protection of anode or grid circuit against overload]
- H03F1/56
 - . Modifications of input or output impedances, not otherwise provided for
- H03F1/56I
 - . . [N: using inductive elements]
- H03F3/00**

Amplifiers with only discharge tubes or only semiconductor devices as amplifying elements
- H03F3/00C
 - . [N: using switched capacitors, e.g. dynamic amplifiers; using switched capacitors as resistors in differential amplifiers ([H03F3/45](#) takes precedence)]
 - [N: **WARNING**

Not complete, see also [H03F1/02](#), [H03F3/70](#), [H03F3/72](#)
]

Note

Groups [H03F3/20](#) to [H03F3/72](#) take precedence over groups [H03F3/02](#) to [H03F3/195](#)

- [H03F3/02](#)
 - with tubes only (subsequent sub-groups take precedence)
- [H03F3/04](#)
 - with semiconductor devices only (subsequent sub-groups take precedence)
- [H03F3/06](#)
 - . using hole storage effect
- [H03F3/08](#)
 - . controlled by light
- [H03F3/08B](#)
 - . . [N: with FET`s ([H03F3/08C](#) takes precedence)]
- [H03F3/08C](#)
 - . . [N: using opto-couplers between stages]
- [H03F3/08I](#)
 - . . [N: with IC amplifier blocks ([H03F3/08C](#) takes precedence)]
- [H03F3/10](#)
 - . with diodes [N: ([parametric amplifiers H03F7/00](#))]
- [H03F3/12](#)
 - . . with Esaki diodes
- [H03F3/14](#)
 - . with amplifying devices having more than three electrodes or more than two PN junctions
- [H03F3/16](#)
 - . with field-effect devices
- [H03F3/16J](#)
 - . . [N: with junction-FET`s]
- [H03F3/181](#)
 - Low frequency amplifiers, e.g. audio preamplifiers
- [H03F3/183](#)
 - . with semiconductor devices only
- [H03F3/185](#)
 - . . with field-effect devices ([H03F3/187](#) takes precedence)
- [H03F3/185J](#)
 - . . . [N: with junction-FET devices]
- [H03F3/187](#)
 - . . in integrated circuits
- [H03F3/189](#)
 - High frequency amplifiers, e.g. radio frequency amplifiers
- [H03F3/19](#)
 - . with semiconductor devices only
- [H03F3/191](#)
 - . . Tuned amplifiers ([H03F3/193](#), [H03F3/195](#) take precedence)
- [H03F3/193](#)
 - . . with field-effect devices ([H03F3/195](#) takes precedence)
- [H03F3/193J](#)
 - . . . [N: with junction-FET devices]
- [H03F3/195](#)
 - . . in integrated circuits
- [H03F3/20](#)
 - Power amplifiers, e.g. Class B amplifiers, Class C amplifiers ([H03F3/26](#) to [H03F3/30](#) take precedence)
- [H03F3/21](#)
 - . with semiconductor devices only [N: ([H03F3/24B](#) takes precedence)]
- [H03F3/21C](#)
 - . . [N: using a combination of several amplifiers ([H03F3/60](#) takes precedence)]
- [N: **WARNING**
Not complete, see also [H03F3/21](#), [H03F3/68](#)
]
- [H03F3/213](#)
 - . . in integrated circuits
- [H03F3/217](#)
 - . . Class D power amplifiers; Switching amplifiers
- [H03F3/217B](#)
 - . . . [N: with field-effect devices ([H03F3/217C](#) to [H03F3/217P](#) take precedence)]

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| H03F3/217C | [N: of the bridge type] |
| H03F3/217D | [N: using analogue-digital or digital-analogue conversion (H03F3/217C takes precedence)] |
| H03F3/217E | [N: Class E amplifiers] |
| H03F3/217P | [N: using more than one switch or switching amplifier in parallel or in series (H03F3/217C , H03F3/217D take precedence)] |
| H03F3/22 | . . with tubes only (H03F3/24 takes precedence) |
| H03F3/24 | . . of transmitter output stages |
| H03F3/24B | . . . [N: with semiconductor devices only] |
| H03F3/26 | . Push-pull amplifiers; Phase-splitters therefor (duplicated single-ended push-pull arrangements or phase-splitters therefor H03F3/30) |
| H03F3/26B | . . [N: with field-effect transistors only] |
| H03F3/28 | . . with tubes only |
| H03F3/30 | . Single-ended push-pull [N: (SEPP)] amplifiers [N: (single-ended sense amplifiers G11C7/06S)]; Phase-splitters therefor [C0205] |
| H03F3/30B | . . [N: with field-effect transistors] |
| H03F3/30B4 | . . . [N: Bifet SEPP output stages] [N0205] |
| H03F3/30B5 | . . . [N: CMOS common drain output SEPP amplifiers (H03F3/30B4 takes precedence)] [N0205] |
| H03F3/30B5A | [N: with asymmetrical driving of the end stage] [N0205] |
| H03F3/30B5A1 | [N: using a common drain driving stage, i.e. follower stage] [N0205] |
| H03F3/30B5A2 | [N: using a common source driving stage, i.e. inverting stage] [N0205] |
| H03F3/30B5B | [N: with symmetrical driving of the end stage] [N0205] |
| H03F3/30B5B1 | [N: using opamps as driving stages] [N0205] |
| H03F3/30B5B2 | [N: using two SEPP driving stages] [N0205] |
| H03F3/30B6 | . . . [N: CMOS common source output SEPP amplifiers (H03F3/30B4 takes precedence)] [N0205] |
| H03F3/30B6A | [N: with asymmetrical driving of the end stage] [N0205] |
| H03F3/30B6A1 | [N: using a common drain driving stage, i.e. follower stage] [N0205] |
| H03F3/30B6A2 | [N: using a common source driving stage, i.e. inverting stage] [N0205] |
| H03F3/30B6B | [N: with symmetrical driving of the end stage] [N0205] |
| H03F3/30B6B1 | [N: using opamps as driving stages] [N0205] |
| H03F3/30B6B2 | [N: using two SEPP driving stages] [N0205] |
| H03F3/30B7 | . . . [N: NMOS SEPP output stages (H03F3/30B4 takes precedence)] [N0205] |
| H03F3/30B7A | [N: using differential amplifiers as phase-splitting elements] [N0205] |
| H03F3/30B7B | [N: with asymmetric control, i.e. one control branch containing a supplementary phase inverting stage] [N0205] |
| H03F3/30B8 | . . . [N: PMOS SEPP output stages (H03F3/30B4 takes precedence)] [N0205] |
| H03F3/30B8A | [N: using differential amplifiers as phase-splitting element] [N0205] |
| H03F3/30B8B | [N: with asymmetric control, i.e. one control branch containing a supplementary phase inverting stage] [N0205] |
| H03F3/30B9 | . . . [N: Junction FET SEPP output stages (H03F3/30B4 takes precedence)] [N0205] |
| H03F3/30B9A | [N: with asymmetrical driving of the end stage] [N0205] |

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|--------------|-----------|--|
| H03F3/30B9A1 | | [N: using a common drain driving stage, i.e. follower stage] [N0205] |
| H03F3/30B9A2 | | [N: using a common source driving stage, i.e. inverting stage] [N0205] |
| H03F3/30B9B | | [N: with symmetrical driving of the end stage] [N0205] |
| H03F3/30B9B1 | | [N: using opamps as driving stages] [N0205] |
| H03F3/30B9B2 | | [N: using two SEPP driving stages] [N0205] |
| H03F3/30B10 | | [N: Paralleled mixed SEPP stages, e.g. a CMOS common drain and a CMOS common source in parallel or bipolar SEPP and FET SEPP in parallel] [N0205] |
| H03F3/30B10A | | [N: with asymmetrical driving of the end stage] [N0205] |
| H03F3/30B10B | | [N: with symmetrical driving of the end stage] [N0205] |
| H03F3/30B11 | | [N: Bridge type, i.e. two complementary controlled SEPP output stages] [N0205] |
| H03F3/30B11A | | [N: with asymmetrical driving of the end stage] [N0205] |
| H03F3/30B11B | | [N: with symmetrical driving of the end stage] [N0205] |
| H03F3/30C | | [N: the collectors of complementary power transistors being connected to the output] |
| H03F3/30C1 | | [N: with asymmetrical driving of the end stage] |
| H03F3/30E | | [N: the emitters of complementary power transistors being connected to the output] |
| H03F3/30E1 | | [N: with asymmetrical driving of the end stage] |
| H03F3/30E1D | | [N: using Darlington transistors (H03F3/30E1P takes precedence)] |
| H03F3/30E1P | | [N: using parallel power transistors] |
| H03F3/30E2 | | [N: with symmetrical driving of the end stage] |
| H03F3/30E2D | | [N: using Darlington transistors (H03F3/30E2P takes precedence)] |
| H03F3/30E2P | | [N: using parallel power transistors] |
| H03F3/30P | | [N: Duplicated single-ended push-pull arrangements, i.e. bridge circuits (using FET's H03F3/30B3)] |
| H03F3/30S | | [N: the power transistors being of the same type (H03F3/30B takes precedence)] |
| H03F3/30S1 | | [N: one of the power transistors being controlled by the output signal] |
| H03F3/30S2 | | [N: two power transistors being controlled by the input signal] |
| H03F3/30S2A | | [N: with asymmetric control, i.e. one control branch containing a supplementary phase inverting transistor] |
| H03F3/30S2B | | [N: comprising field-effect transistors in the control circuit] |
| H03F3/30S2C | | [N: comprising two complementary transistors for phase-splitting] |
| H03F3/30S2D | | [N: comprising a differential amplifier as phase-splitting element] |
| H03F3/30S2P | | [N: Phase splitters therefor (H03F3/30S2A , H03F3/30S2C , H03F3/30S2D , H03F3/30S2S , H03F3/30S2T take precedence)] |
| H03F3/30S2S | | [N: using a single transistor with output on emitter and collector as phase splitter] |
| H03F3/30S2T | | [N: using a transformer as phase splitter] |
| H03F3/34 | | Dc amplifiers in which all stages are dc-coupled (H03F3/45 takes precedence) |
| H03F3/343 | | with semiconductor devices only |
| H03F3/343D | | [N: with bipolar transistors] |
| H03F3/343D1 | | [N: using Darlington amplifiers] |
| H03F3/343D1B | | [N: with complementary transistors] |
| H03F3/345 | | with field-effect devices (H03F3/347 takes precedence) |

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| H03F3/345J | [N: with junction-FET`s] |
| H03F3/347 | . . . in integrated circuits |
| H03F3/36 | . . with tubes only |
| H03F3/38 | . Dc amplifiers with modulator at input and demodulator at output; Modulators or demodulators specially adapted for use in such amplifiers ([N: switched capacitor amplifiers H03F3/00C]; modulators in general H03C ; demodulators in general H03D ; amplitude modulation of pulses in general H03K7/02 ; amplitude demodulation of pulses in general H03K9/02) |
| H03F3/387 | . . with semiconductor devices only |
| H03F3/393 | . . . with field-effect devices |
| H03F3/40 | . . with tubes only |
| H03F3/42 | . 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 |
| H03F3/42B | . . [N: with MOSFET`s] |
| H03F3/42J | . . [N: with junction-FET`s] |
| H03F3/44 | . . with tubes only |
| H03F3/45 | . Differential amplifiers (differential sense amplifiers G11C7/06C) [C9804] |
| H03F3/45S | . . [N: with semiconductor devices only] [N0205] |
| H03F3/45S1 | . . . [N: characterised by the way of implementation of the active amplifying circuit in the differential amplifier] [N0205] |
| H03F3/45S1A | [N: using bipolar transistors as the active amplifying circuit (H03F3/45S1C takes precedence)] [N0205] |
| H03F3/45S1A1 | [N: Long tailed pairs (H03F3/45S1A3 , H03F3/45S1A5 take precedence)] [N0205] |
| H03F3/45S1A1A | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A1B | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A2 | [N: PI types (H03F3/45S1A4 , H03F3/45S1A6 take precedence)] [N0205] |
| H03F3/45S1A2A | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A2B | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A3 | [N: Complementary long tailed pairs having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1A3A | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A3B | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A4 | [N: Complementary PI types having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1A4A | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A4B | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A5 | [N: Complementary long tailed pairs having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1A5A | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A5B | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A6 | [N: Complementary PI types having parallel inputs and being supplied in series] [N0205] |

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| H03F3/45S1A6A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1A6B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1A7 | | [N: Complementary cross coupled types] [N0205] |
| H03F3/45S1A8 | | [N: Complementary non-cross coupled types] [N0205] |
| H03F3/45S1A9 | | [N: Mirror types] [N0205] |
| H03F3/45S1B | | [N: using MOSFET transistors as the active amplifying circuit (H03F3/45S1C takes precedence)] [N0205] |
| H03F3/45S1B1 | | [N: Long tailed pairs (H03F3/45S1B3 , H03F3/45S1B5 take precedence)] [N0205] |
| H03F3/45S1B1A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B1B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B2 | | [N: PI types (H03F3/45S1B4 , H03F3/45S1B6 take precedence)] [N0205] |
| H03F3/45S1B2A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B2B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B3 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1B3A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B3B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B4 | | [N: Complementary PI types having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1B4A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B4B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B5 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1B5A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B5B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B6 | | [N: Complementary PI types having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1B6A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1B6B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1B7 | | [N: Complementary cross coupled types] [N0205] |
| H03F3/45S1B8 | | [N: Complementary non-cross coupled types] [N0205] |
| H03F3/45S1B9 | | [N: Mirror types] [N0205] |
| H03F3/45S1C | | [N: using BiFET transistors as the active amplifying circuit] [N0205] |
| H03F3/45S1C1 | | [N: Long tailed pairs (H03F3/45S1C3 , H03F3/45S1C5 take precedence)] [N0205] |
| H03F3/45S1C1A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1C1B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C2 | | [N: PI types (H03F3/45S1C4 , H03F3/45S1C6 take precedence)] [N0205] |
| H03F3/45S1C2A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1C2B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C3 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1C3A | | [N: Non-folded cascode stages] [N0205] |

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| H03F3/45S1C3B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C4 | | [N: Complementary PI types having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1C4A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1C4B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C5 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1C5A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1C5B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C6 | | [N: Complementary PI types having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1C6A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1C6B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1C7 | | [N: Complementary cross coupled types] [N0205] |
| H03F3/45S1C8 | | [N: Complementary non-cross coupled types] [N0205] |
| H03F3/45S1C9 | | [N: Mirror types] [N0205] |
| H03F3/45S1J | | [N: using junction FET transistors as the active amplifying circuit (H03F3/45S1C takes precedence)] [N0205] |
| H03F3/45S1J1 | | [N: Long tailed pairs (H03F3/45S1J3 , H03F3/45S1J5 take precedence)] [N0205] |
| H03F3/45S1J1A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J1B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J2 | | [N: PI types (H03F3/45S1J4 , H03F3/45S1J6 take precedence)] [N0205] |
| H03F3/45S1J2A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J2B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J3 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1J3A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J3B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J4 | | [N: Complementary PI types having parallel inputs and being supplied in parallel] [N0205] |
| H03F3/45S1J4A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J4B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J5 | | [N: Complementary long tailed pairs having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1J5A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J5B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J6 | | [N: Complementary PI types having parallel inputs and being supplied in series] [N0205] |
| H03F3/45S1J6A | | [N: Non-folded cascode stages] [N0205] |
| H03F3/45S1J6B | | [N: Folded cascode stages] [N0205] |
| H03F3/45S1J7 | | [N: Complementary cross coupled types] [N0205] |
| H03F3/45S1J8 | | [N: Complementary non-cross coupled types] [N0205] |
| H03F3/45S1J9 | | [N: Mirror types] [N0205] |
| H03F3/45S1K | | [N: using IC blocks as the active amplifying circuit] [N0205] |

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| H03F3/45S3 | . . . | [N: characterised by the way of common mode signal rejection] [N0205] |
| H03F3/45S3A | | [N: in differential amplifiers with bipolar transistors as the active amplifying circuit (H03F3/45S3C takes precedence)] [N0205] |
| H03F3/45S3A1 | | [N: by using feedback means (H03F3/45S3C takes precedence)] [N0205] |
| H03F3/45S3A1A | | [N: Measuring at the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1A1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1A2 | | {7 dots} [N: Controlling the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1A3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1A4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1B | | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1B1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1B2 | | {7 dots} [N: Controlling the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1B3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1C | | [N: Measuring at the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1C1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3A1C2 | | {7 dots} [N: Controlling the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2 | | [N: by using feedforward means (H03F3/45S3A3 takes precedence)] [N0205] |
| H03F3/45S3A2A | | [N: Measuring at the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2A1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2A2 | | {7 dots} [N: Controlling the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2A3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2A4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2B | | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2B4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2C | | [N: Measuring at the common emitter circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2C3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3A2C4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3A3 | | [N: by offset reduction] [N0205] |

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| H03F3/45S3A3A | | [N: by using a feedback circuit] [N0205] |
| H03F3/45S3A3A1 | | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3A3B | | [N: by using a feedforward circuit] [N0205] |
| H03F3/45S3A3B1 | | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3A3C | | [N: by using balancing means] [N0205] |
| H03F3/45S3A3C1 | | {7 dots} [N: using switching means] [N0205] |
| H03F3/45S3A3D | | [N: by using cross switches] [N0205] |
| H03F3/45S3B | | [N: in differential amplifiers with FET transistors as the active amplifying circuit (H03F3/45S3C takes precedence)] [N0205] |
| H03F3/45S3B1 | | [N: by using feedback means (H03F3/45S3B3 takes precedence)] [N0205] |
| H03F3/45S3B1A | | [N: Measuring at the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1A1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1A2 | | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1A3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1A4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1B | | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1B1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1B2 | | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1B3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1C | | [N: Measuring at the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1C1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3B1C2 | | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2 | | [N: by using feedforward means (H03F3/45S3B3 takes precedence)] [N0205] |
| H03F3/45S3B2A | | [N: Measuring at the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2A1 | | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2A2 | | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2A3 | | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2A4 | | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2B | | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2B4 | | {7 dots} [N: Controlling the loading circuit of the differential |

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| | | | | | | plifier] [N0205] |
| H03F3/45S3B2C | . | . | . | . | . | [N: Measuring at the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2C3 | . | . | . | . | . | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3B2C4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3B3 | . | . | . | . | . | [N: by offset reduction] [N0205] |
| H03F3/45S3B3A | . | . | . | . | . | [N: by using a feedback circuit] [N0205] |
| H03F3/45S3B3A1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3B3B | . | . | . | . | . | [N: by using a feedforward circuit] [N0205] |
| H03F3/45S3B3B1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3B3C | . | . | . | . | . | [N: by using balancing means] [N0205] |
| H03F3/45S3B3C1 | . | . | . | . | . | {7 dots} [N: using switching means] [N0205] |
| H03F3/45S3B3D | . | . | . | . | . | [N: by using cross switches] [N0205] |
| H03F3/45S3C | . | . | . | . | . | [N: in differential amplifiers with BiFET transistors as the active amplifying circuit] [N0205] |
| H03F3/45S3C1 | . | . | . | . | . | [N: by using feedback means (H03F3/45S3C3 takes precedence)] [N0205] |
| H03F3/45S3C1A | . | . | . | . | . | [N: Measuring at the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1A1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1A2 | . | . | . | . | . | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1A3 | . | . | . | . | . | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1A4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1B | . | . | . | . | . | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1B1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1B2 | . | . | . | . | . | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1B3 | . | . | . | . | . | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1C | . | . | . | . | . | [N: Measuring at the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1C1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3C1C2 | . | . | . | . | . | {7 dots} [N: Controlling the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2 | . | . | . | . | . | [N: by using feedforward means (H03F3/45S3C3 takes precedence)] [N0205] |
| H03F3/45S3C2A | . | . | . | . | . | [N: Measuring at the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2A1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2A2 | . | . | . | . | . | {7 dots} [N: Controlling the common source circuit of the differential |

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| | | | | | | amplifier] [N0205] |
| H03F3/45S3C2A3 | . | . | . | . | . | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2A4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2B | . | . | . | . | . | [N: Measuring at the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2B4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2C | . | . | . | . | . | [N: Measuring at the common source circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2C3 | . | . | . | . | . | {7 dots} [N: Controlling the active amplifying circuit of the differential amplifier] [N0205] |
| H03F3/45S3C2C4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3C3 | . | . | . | . | . | [N: by offset reduction] [N0205] |
| H03F3/45S3C3A | . | . | . | . | . | [N: by using a feedback circuit] [N0205] |
| H03F3/45S3C3A1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3C3B | . | . | . | . | . | [N: by using a feedforward circuit] [N0205] |
| H03F3/45S3C3B1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3C3C | . | . | . | . | . | [N: by using balancing means] [N0205] |
| H03F3/45S3C3C1 | . | . | . | . | . | {7 dots} [N: using switching means] [N0205] |
| H03F3/45S3C3D | . | . | . | . | . | [N: by using cross switches] [N0205] |
| H03F3/45S3K | . | . | . | . | . | [N: using IC blocks as the active amplifying circuit] [N0205] |
| H03F3/45S3K1 | . | . | . | . | . | [N: by using feedback means (H03F3/45S3K3 takes precedence)] [N0205] |
| H03F3/45S3K1A | . | . | . | . | . | [N: Measuring at the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3K1A1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3K1A4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3K2 | . | . | . | . | . | [N: by using feedforward means (H03F3/45S3K3 takes precedence)] [N0205] |
| H03F3/45S3K2A | . | . | . | . | . | [N: Measuring at the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3K2A1 | . | . | . | . | . | {7 dots} [N: Controlling the input circuit of the differential amplifier] [N0205] |
| H03F3/45S3K2A4 | . | . | . | . | . | {7 dots} [N: Controlling the loading circuit of the differential amplifier] [N0205] |
| H03F3/45S3K3 | . | . | . | . | . | [N: by offset reduction] [N0205] |
| H03F3/45S3K3A | . | . | . | . | . | [N: by using a feedback circuit] [N0205] |
| H03F3/45S3K3A1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3K3B | . | . | . | . | . | [N: by using a feedforward circuit] [N0205] |
| H03F3/45S3K3B1 | . | . | . | . | . | {7 dots} [N: using switching means, e.g. sample and hold] [N0205] |
| H03F3/45S3K3C | . | . | . | . | . | [N: by using balancing means] [N0205] |
| H03F3/45S3K3C1 | . | . | . | . | . | {7 dots} [N: using switching means] [N0205] |
| H03F3/46 | . | | | | | Reflex amplifiers [N: (reflection amplifiers H03F3/60R)] |

- H03F3/48
 - . . with tubes only
- H03F3/50
 - . 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
- H03F3/50B
 - . . [N: with field-effect devices]
- H03F3/52
 - . . with tubes only
- H03F3/54
 - . Amplifiers using transit-time effect in tubes or semiconductor devices ([parametric amplifiers H03F7/00](#); [solid state travelling-wave devices H01L45/02](#))
- H03F3/55
 - . . with semiconductor devices only
- H03F3/56
 - . . using klystrons
- H03F3/58
 - . . using travelling-wave tubes
- H03F3/60
 - . Amplifiers in which coupling networks have distributed constants, e.g. with waveguide resonators ([H03F3/54 takes precedence](#))
- H03F3/60B
 - . . [N: using FET`s, e.g. GaAs FET`s ([H03F3/60D1](#), [H03F3/60R take precedence](#))]
 - [N: **WARNING**
Not complete, see also [H03F3/16](#)
]
- H03F3/60C
 - . . [N: Combinations of several amplifiers]
 - [**WARNING**
Not complete, see also [H03F3/68](#)]
- H03F3/60C1
 - . . . [N: using FET`s]
 - [N: **WARNING**
Not complete, see also [H03F3/16](#), [H03F3/68](#)
]
- H03F3/60D
 - . . [N: Distributed amplifiers]
 - [N: **WARNING**
Not complete, see also [H03F1/18](#)
]
- H03F3/60D1
 - . . . [N: using FET`s]
 - [N: **WARNING**
Not complete, see also [H03F1/18](#)
]
- H03F3/60R
 - . . [N: Reflection amplifiers, i.e. amplifiers using a one-port amplifying element and a multiport coupler ([H03F7/00 takes precedence](#))]
 - [N: **WARNING**
Not complete, see also [H03F3/46](#)
]
- H03F3/62
 - . Two-way amplifiers
- H03F3/64
 - . . with tubes only
- H03F3/66
 - . Amplifiers simultaneously generating oscillations of one frequency and amplifying signals of another frequency
- H03F3/68
 - . Combinations of amplifiers, e.g. multi-channel amplifiers for stereophonics [N: (power

amplifiers using a combination of several semiconductor amplifiers [H03F3/21C](#); combinations of amplifiers using coupling networks with distributed constants [H03F3/60C](#)]

- [H03F3/70](#) . Charge amplifiers
- [H03F3/72](#) . Gated amplifiers, i.e. amplifiers which are rendered operative or inoperative by means of a control signal
- [H03F5/00](#) Amplifiers with both discharge tubes and semiconductor devices as amplifying elements**
- [H03F7/00](#) Parametric amplifiers** ([N: [H03F19/00](#) takes precedence]; devices or arrangements for the parametric generation or amplification of light, infra-red or ultra-violet waves [G02F1/39](#))
- [H03F7/02](#) . using variable-inductance element; using variable-permeability element
- [H03F7/04](#) . using variable-capacitance element; using variable-permittivity element
- [H03F9/00](#) Magnetic amplifiers**
- [H03F9/02](#) . current-controlled, i.e. the load current flowing in both directions through a main coil
- [H03F9/04](#) . voltage-controlled, i.e. the load current flowing in only one direction through a main coil, e.g. Logan circuits ([H03F9/06](#) takes precedence)
- [H03F9/06](#) . 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
- [H03F11/00](#) Dielectric amplifiers**
- [H03F13/00](#) Amplifiers using amplifying element consisting of two mechanically- or acoustically-coupled transducers, e.g. telephone-microphone amplifier**
- [H03F15/00](#) Amplifiers using galvano-magnetic effects not involving mechanical movement, e.g. using Hall effect**
- [H03F17/00](#) Amplifiers using electroluminescent element or photocell**
- [H03F19/00](#) Amplifiers using superconductivity effects**
- [H03F21/00](#) [N: Amplifiers not covered by groups [H03F3/00](#) to [H03F19/00](#) (dynamo-electric amplifiers [H02K](#))]