

## SECTION H — ELECTRICITY

### H03 BASIC ELECTRONIC CIRCUITRY

**H03F AMPLIFIERS** (measuring, testing G01R; optical parametric amplifiers G02F; circuit arrangements with secondary emission tubes H01J 43/30; masers, lasers H01S; dynamo-electric amplifiers H02K; control of amplification H03G; coupling arrangements independent of the nature of the amplifier, 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(s)

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.

#### Subclass index

|   |                            |
|---|----------------------------|
| AMPLIFIERS USING TUBES OR SEMICONDUCTORS; DETAILS.....                              | 3/00, 5/00, 1/00           |
| PARAMETRIC AMPLIFIERS.....  | 7/00                       |
| MAGNETIC; DIELECTRIC AMPLIFIERS.....  | 9/00, 11/00                |
| AMPLIFIERS USING SPECIAL ELEMENTS   |                            |
| Mechanical or acoustic; using Hall effect; electroluminescent; superconductive..... | 13/00, 15/00, 17/00, 19/00 |
| OTHER AMPLIFIERS.....   | 99/00                      |

#### **1/00 Details of amplifiers with only discharge tubes, only semiconductor devices or only unspecified devices as amplifying elements**

- 1/02 • Modifications of amplifiers to raise the efficiency, e.g. gliding Class A stages, use of an auxiliary oscillation
- 1/04 • • in discharge-tube amplifiers
- 1/06 • • • to raise the efficiency of amplifying modulated radio frequency waves; to raise the efficiency of amplifiers acting also as modulators [2]
- 1/07 • • • • Doherty-type amplifiers [2]
- 1/08 • Modifications of amplifiers to reduce detrimental influences of internal impedances of amplifying elements (wide-band amplifiers with inter-stage coupling networks incorporating these impedances H03F 1/42; eliminating transit-time effects in vacuum tubes H01J 21/34)
- 1/10 • • by use of amplifying elements with multiple electrode connections
- 1/12 • • by use of attenuating means
- 1/13 • • • in discharge-tube amplifiers [2]
- 1/14 • • by use of neutralising means
- 1/16 • • • in discharge-tube amplifiers
- 1/18 • • by use of distributed coupling
- 1/20 • • • in discharge-tube amplifiers
- 1/22 • • by use of cascode coupling, i.e. earthed cathode or emitter stage followed by earthed grid or base stage respectively
- 1/24 • • • in discharge-tube amplifiers
- 1/26 • Modifications of amplifiers to reduce influence of noise generated by amplifying elements

- 1/28 • • in discharge-tube amplifiers
- 1/30 • Modifications of amplifiers to reduce influence of variations of temperature or supply voltage
- 1/32 • Modifications of amplifiers to reduce non-linear distortion (by negative feedback H03F 1/34)
- 1/33 • • in discharge-tube amplifiers [2]
- 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) [3]
- 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
- 1/44 • • of tuned amplifiers
- 1/46 • • • with tubes only
- 1/48 • • of aperiodic amplifiers
- 1/50 • • • with tubes only
- 1/52 • Circuit arrangements for protecting such amplifiers [3]
- 1/54 • • with tubes only [3]
- 1/56 • Modifications of input or output impedances, not otherwise provided for [3]

#### **3/00 Amplifiers with only discharge tubes or only semiconductor devices as amplifying elements**

##### Note(s)

Groups H03F 3/20-H03F 3/72 take precedence over groups H03F 3/02-H03F 3/189.

## H03F

- 3/02 • with tubes only (subsequent subgroups take precedence)
- 3/04 • with semiconductor devices only (subsequent subgroups take precedence)
- 3/06 • • using hole storage effect
- 3/08 • • controlled by light
- 3/10 • • with diodes
- 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
- 3/18 • with semiconductor devices of complementary types (subsequent subgroups take precedence)
- 3/181 • Low-frequency amplifiers, e.g. audio preamplifiers [2]
- 3/183 • • with semiconductor devices only [2]
- 3/185 • • • with field-effect devices (H03F 3/187 takes precedence) [2]
- 3/187 • • • in integrated circuits [2]
- 3/189 • High-frequency amplifiers, e.g. radio frequency amplifiers [2]
- 3/19 • • with semiconductor devices only [2]
- 3/191 • • • Tuned amplifiers (H03F 3/193, H03F 3/195 take precedence) [2]
- 3/193 • • • with field-effect devices (H03F 3/195 takes precedence) [2]
- 3/195 • • • in integrated circuits [2]
- 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 [2]
- 3/213 • • • in integrated circuits [2]
- 3/217 • • • Class D power amplifiers; Switching amplifiers [2]
- 3/22 • • with tubes only (H03F 3/24 takes precedence)
- 3/24 • • of transmitter output stages
- 3/26 • Push-pull amplifiers; Phase-splitters therefor (duplicated single-ended push-pull arrangements or phase-splitters therefor H03F 3/30)
- 3/28 • • with tubes only
- 3/30 • Single-ended push-pull amplifiers; Phase-splitters therefor
- 3/32 • • with tubes only
- 3/34 • Dc amplifiers in which all stages are dc-coupled (H03F 3/45 takes precedence) [3]
- 3/343 • • with semiconductor devices only [2]
- 3/345 • • • with field-effect devices (H03F 3/347 takes precedence) [2]
- 3/347 • • • in integrated circuits [2]
- 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 (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 [2]
- 3/393 • • • with field-effect devices [2]
- 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
- 3/44 • • with tubes only
- 3/45 • Differential amplifiers [2]
- 3/46 • Reflex amplifiers
- 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
- 3/52 • • 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 [2]
- 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)
- 3/62 • 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
- 3/70 • Charge amplifiers [2]
- 3/72 • Gated amplifiers, i.e. amplifiers which are rendered operative or inoperative by means of a control signal [2]
- 5/00 Amplifiers with both discharge tubes and semiconductor devices as amplifying elements**
- 7/00 Parametric amplifiers** (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
- 7/06 • with electron beam tube
- 9/00 Magnetic amplifiers**
- 9/02 • current-controlled, i.e. the load current flowing in both directions through a main coil [2]
- 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) [2]
- 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 [2]
- 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**
- 99/00 Subject matter not provided for in other groups of this subclass [2009.01]**