CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H01 ELECTRIC ELEMENTS

(NOTES omitted)

H01G CAPACITORS; CAPACITORS, RECTIFIERS, DETECTORS, SWITCHING DEVICES, LIGHT-SENSITIVE OR TEMPERATURE-SENSITIVE DEVICES OF THE ELECTROLYTIC TYPE (selection of specified materials as dielectric H01B 3/00; capacitors having potential barriers H10D 1/62, H10K 10/10)

NOTE

In this subclass, group H01G 11/00 takes precedence over groups H01G 4/00 and H01G 9/00.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

2/00 Details of capacitors not covered by a single one of groups H01G 4/00-H01G 11/00

2/02 . Mountings
2/04 . . specially adapted for mounting on a chassis
2/06 . . specially adapted for mounting on a printed-circuit support
2/065 . . . {for surface mounting, e.g. chip capacitors}
2/08 . Cooling arrangements; Heating arrangements; Ventilating arrangements
2/10 . Housing; Encapsulation
2/103 . . {Sealings, e.g. for lead-in wires; Covers}
2/106 . . {Fixing the capacitor in a housing}
2/12 . Protection against corrosion (H01G 2/10 takes precedence)
2/14 . Protection against electric or thermal overload (by cooling H01G 2/08)
2/16 . . with fusing elements
2/18 . . with breakable contacts
2/20 . Arrangements for preventing discharge from edges of electrodes
2/22 . Electrostatic or magnetic shielding
2/24 . Distinguishing marks, e.g. colour coding

4/00 Fixed capacitors; Processes of their manufacture (electrolytic capacitors H01G 9/00)

4/002 . Details
4/005 . . Electrodes
4/008 . . . Selection of materials
4/0085 . . . . {Fried electrodes}
4/01 . . . Form of self-supporting electrodes
4/012 . . . Form of non-self-supporting electrodes
4/015 . . . Special provisions for self-healing
4/018 . . Dielectrics
4/02 . . . Gas or vapour dielectrics
4/04 . . . Liquid dielectrics
4/06 . . . Solid dielectrics
4/08 . . . . Inorganic dielectrics
4/085 . . . . . {Vapour deposited}
4/10 . . . . . Metal-oxide dielectrics {(H01G 4/085 takes precedence)}
4/105 . . . . . {Glass dielectric}
4/12 . . . . . Ceramic dielectrics {(H01G 4/085 takes precedence)}
4/1209 . . . . . {characterised by the ceramic dielectric material (H01G 4/1272, H01G 4/1281 take precedence)}
4/1218 . . . . . {based on titanium oxides or titanates (H01G 4/1245 takes precedence)}
4/1227 . . . . . {based on alkaline earth titanates}
4/1236 . . . . . {based on zirconium oxides or zirconates (H01G 4/1263 takes precedence)}
4/1245 . . . . . {containing also titanates}
4/1254 . . . . . {based on niobium or tungsteen, tantalum oxides or niobates, tantalates}
4/1263 . . . . . {containing also zirconium oxides or zirconates}
4/1272 . . . . . {Semiconductive ceramic capacitors}
4/1281 . . . . . {with grain boundary layer}
4/129 . . . . . {containing a glassy phase, e.g. glass ceramic}
4/14 . . . . Organic dielectrics
4/145 . . . . . {vapour deposited}
4/16 . . . . . of fibrous material, e.g. paper
4/18 . . . . . of synthetic material, e.g. derivatives of cellulose (H01G 4/16 takes precedence)
4/183 . . . . . {Derivatives of cellulose (H01G 4/145 takes precedence)}
4/186 . . . . . {halogenated (H01G 4/145 takes precedence)}
4/20 . . . using combinations of dielectrics from more than one of groups H01G 4/02 - H01G 4/06 (H01G 4/12 takes precedence)
4/203 . . . . {Fibrous material or synthetic material}
4/206 . . . . {inorganic and synthetic material}
4/22 . . . . impregnated

4/221 . . . . . {characterised by the composition of the impregnant}
4/222 . . . . . {halogenated}
4/224 . . Housing; Encapsulation
4/228 . . Terminals
4/232 . . . electrically connecting two or more layers of a stacked or rolled capacitor
4/2325 . . . . {characterised by the material of the terminals}
4/236 . . . leading through the housing, i.e. lead-through
4/242 . . . the capacitive element surrounding the terminal
4/245 . . . . Tabs between the layers of a rolled electrode
4/248 . . . the terminals embracing or surrounding the capacitive element, e.g. caps (H01G 4/252 takes precedence)
4/252 . . . the terminals being coated on the capacitive element (H01G 4/232 takes precedence)
4/255 . . Means for correcting the capacitance value
4/258 . . Temperature compensation means
4/26 . Folded capacitors
4/28 . Tubular capacitors
4/30 . Stacked capacitors (H01G 4/33 takes precedence)
4/302 . . {obtained by injection of metal in cavities formed in a ceramic body}
4/304 . . {obtained from a another capacitor}
4/306 . . {made by thin film techniques}
4/308 . . {made by transfer techniques}
4/32 . Wound capacitors
4/33 . Thin- or thick-film capacitors {(thin- or thick-film circuits; capacitors without a potential-jump or surface barrier specially adapted for integrated circuits, details thereof, multistep manufacturing processes therefor)}
4/35 . Feed-through capacitors or anti-noise capacitors
4/38 . Multiple capacitors, i.e. structural combinations of fixed capacitors
4/385 . . {Single unit multiple capacitors, e.g. dual capacitor in one coil}
4/40 . Structural combinations of fixed capacitors with other electric elements, the structure mainly consisting of a capacitor, e.g. RC combinations

5/00 Capacitors in which the capacitance is varied by mechanical means, e.g. by turning a shaft; Processes of their manufacture

5/01 . Details
5/011 . . Electrodes
5/012 . . . at least one of the electrodes being a displaceable liquid or powder
5/013 . . Dielectrics
5/0132 . . . {Liquid dielectrics}
5/0134 . . . {Solid dielectrics}
5/0136 . . . . {with movable electrodes}
5/0138 . . . . {with movable dielectrics}
5/014 . . Housing; Encapsulation
5/015 . . Current collectors
5/017 . . Temperature compensation
5/019 . . Means for correcting the capacitance characteristics
2005/02 . {having air, gas, or vacuum as the dielectric}
5/04 . using variation of effective area of electrode
5/06 . . due to rotation of flat or substantially flat electrodes
5/08 . . . becoming active in succession
5/10 . . due to rotation of helical electrodes
5/12 . . due to rotation of part-cylindrical, conical, or spherical electrodes
5/14 . . due to longitudinal movement of electrodes
5/145 . . . {with profiled electrodes}
5/16 . using variation of distance between electrodes
5/18 . . due to change in inclination, e.g. by flexing, by spiral wrapping
5/38 . Multiple capacitors, e.g. ganged
5/40 . Structural combinations of variable capacitors with other electric elements not covered by this subclass, the structure mainly consisting of a capacitor, e.g. RC combinations

7/00 Capacitors in which the capacitance is varied by non-mechanical means; Processes of their manufacture

7/02 . Electrets, i.e. having a permanently-polarised dielectric
7/021 . . {having an organic dielectric}
7/023 . . . {of macromolecular compounds}
7/025 . . {having an inorganic dielectric}
7/026 . . . {with ceramic dielectric}
7/028 . . {having a heterogeneous dielectric}
7/04 . having a dielectric selected for the variation of its permittivity with applied temperature
7/06 . having a dielectric selected for the variation of its permittivity with applied voltage, i.e. ferroelectric capacitors (electrets H01G 7/02)

9/00 Electrolytic capacitors, rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices; Processes of their manufacture

9/0003 . {Protection against electric or thermal overload; cooling arrangements; means for avoiding the formation of cathode films (H01G 9/12 takes precedence)}
9/0029 . {Processes of manufacture}
9/0032 . . {formation of the dielectric layer}
9/0036 . . {Formation of the solid electrolyte layer}
9/004 . Details
9/008 . . Terminals
9/012 . . . specially adapted for solid capacitors
9/02 . . Diaphragms; Separators
9/022 . . Electrolytes; Absorbents
9/025 . . . Solid electrolytes (H01G 11/54 takes precedence)
9/028 . . . . Organic semiconducting electrolytes, e.g. TCNQ
9/032 . . . . Inorganic semiconducting electrolytes, e.g. MnO_2
9/035 . . . Liquid electrolytes, e.g. impregnating materials (H01G 11/54 takes precedence)
9/04 . . Electrodes {or formation of dielectric layers thereon}
9/042 . . . characterised by the material (H01G 11/22 takes precedence)
9/0425 . . . . {specially adapted for cathode}
9/045 . . . . based on aluminium
9/048 . . . characterised by their structure (H01G 11/22 takes precedence)

2009/05 . . . . {consisting of tantalum, niobium, or sintered material; Combinations of such electrodes with solid semiconductive electrolytes, e.g. manganese dioxide}
9/052 . . . . Sintered electrodes
9/0525 . . . . . {Powder therefor}
9/055 . . . . Etched foil electrodes
9/06 . . . Mounting in containers
9/07 . . Dielectric layers
9/08 . . Housing; Encapsulation
9/10 . . . Sealing, e.g. of lead-in wires
9/12 . . . Vents or other means allowing expansion
9/14 . . Structural combinations {or circuits} for modifying, or compensating for, electric characteristics of electrolytic capacitors
9/145 . Liquid electrolytic capacitors (H01G 11/00 takes precedence)
9/15 . Solid electrolytic capacitors (H01G 11/00 takes precedence)
9/151 . . {with wound foil electrodes}
9/153 . . {Skin fibre}
9/16 . specially for use as rectifiers or detectors (H01G 9/22 takes precedence)
9/18 . Self-interrupters
9/20 . Light-sensitive devices
9/2004 . . {characterised by the electrolyte, e.g. comprising an organic electrolyte}
9/2009 . . . {Solid electrolytes}
9/2013 . . . {the electrolyte comprising ionic liquids, e.g. alkyl imidazolium iodide}
9/2018 . . . {characterised by the ionic charge transport species, e.g. redox shuttles}
9/2022 . . {characterized by he counter electrode}
9/2027 . . {comprising an oxide semiconductor electrode}
9/2031 . . . {comprising titanium oxide, e.g. TiO_2 (H01G 9/2036 takes precedence)}
9/2036 . . . {comprising mixed oxides, e.g. ZnO covered TiO_2 particles}
9/204 . . . {comprising zinc oxides, e.g. ZnO (H01G 9/2036 takes precedence)}
9/2045 . . {comprising a semiconductor electrode comprising elements of the fourth group of the Periodic Table with or without impurities, e.g. doping materials}
9/205 . . {comprising a semiconductor electrode comprising AIII-BV compounds with or without impurities, e.g. doping materials}
9/2054 . . {comprising a semiconductor electrode comprising AII-BVI compounds, e.g. CdTe, CdSe, ZnTe, ZnSe, with or without impurities, e.g. doping materials (H01G 9/2027 takes precedence)}
9/2059 . . {comprising an organic dye as the active light absorbing material, e.g. adsorbed on an electrode or dissolved in solution}
9/2063 . . . {comprising a mixture of two or more dyes}
9/2068 . . {Panels or arrays of photoelectrochemical cells, e.g. photovoltaic modules based on photoelectrochemical cells}
9/2072 . . . {comprising two or more photoelectrodes sensible to different parts of the solar spectrum, e.g. tandem cells}
9/2077 . . . {Sealing arrangements, e.g. to prevent the leakage of the electrolyte}
9/2081 . . . {Serial interconnection of cells}
9/2086 . . . {Photoelectrochemical cells in the form of a fiber}
9/209 . . {Light trapping arrangements}
9/2095 . . {comprising a flexible sustrate}
9/21 . Temperature-sensitive devices
9/22 . Devices using combined reduction and oxidation, e.g. redox arrangement or solion
9/26 . Structural combinations of electrolytic capacitors, rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices with each other
9/28 . Structural combinations of electrolytic capacitors, rectifiers, detectors, switching devices with other electric components not covered by this subclass

11/00 Hybrid capacitors, i.e. capacitors having different positive and negative electrodes; Electric double-layer [EDL] capacitors; Processes for the manufacture thereof or of parts thereof

NOTE

Group H01G 11/02 takes precedence over groups H01G 11/04 - H01G 11/14

11/02 . using combined reduction-oxidation reactions, e.g. redox arrangement or solion
11/04 . Hybrid capacitors
11/06 . . with one of the electrodes allowing ions to be reversibly doped thereinto, e.g. lithium ion capacitors [LIC]
11/08 . Structural combinations, e.g. assembly or connection, of hybrid or EDL capacitors with other electric components, at least one hybrid or EDL capacitor being the main component
11/10 . Multiple hybrid or EDL capacitors, e.g. arrays or modules (housings, cases, encapsulations or mountings thereof H01G 11/78)
11/12 . . Stacked hybrid or EDL capacitors
11/14 . Arrangements or processes for adjusting or protecting hybrid or EDL capacitors (emergency protective circuit arrangements specially adapted for capacitors, and effecting automatic switching in the event of an undesired change from normal working conditions H02H 7/16; emergency protective circuit arrangements for limiting excess current or voltages without disconnection H02H 9/00)
11/16 . . against electric overloads, e.g. including fuses
11/18 . . against thermal overloads, e.g. heating, cooling or ventilating
11/20 . . Reformation or processes for removal of impurities, e.g. scavenging
11/22 . Electrodes
11/24 . . characterised by structural features of the materials making up or comprised in the electrodes, e.g. form, surface area or porosity; characterised by the structural features of powders or particles used therefor
11/26 . . characterised by their structure, e.g. multi-layered, porosity or surface features
11/28 . . . arranged or disposed on a current collector; Layers or phases between electrodes and current collectors, e.g. adhesives
11/30 . . characterised by their material
11/32 . . . Carbon-based

11/34 . . . . characterised by carbonisation or activation of carbon
11/36 . . . . Nanostructures, e.g. nanofibres, nanotubes or fullerenes
11/38 . . . . Carbon pastes or blends; Binders or additives therein
11/40 . . . . Fibres
11/42 . . . . Powders or particles, e.g. composition thereof
11/44 . . . . Raw materials therefor, e.g. resins or coal
11/46 . . . Metal oxides
11/48 . . . Conductive polymers
11/50 . . . specially adapted for lithium-ion capacitors, e.g. for lithium-doping or for intercalation
11/52 . Separators
11/54 . Electrolytes
11/56 . . Solid electrolytes, e.g. gels; Additives therein
11/58 . . Liquid electrolytes
11/60 . . . characterised by the solvent
11/62 . . . characterised by the solute, e.g. salts, anions or cations therein
11/64 . . . characterised by additives
11/66 . Current collectors
11/68 . . characterised by their material
11/70 . . characterised by their structure
11/72 . . specially adapted for integration in multiple or stacked hybrid or EDL capacitors
11/74 . Terminals, e.g. extensions of current collectors
11/76 . . specially adapted for integration in multiple or stacked hybrid or EDL capacitors
11/78 . Cases; Housings; Encapsulations; Mountings
11/80 . . Gaskets; Sealings
11/82 . . Fixing or assembling a capacitive element in a housing, e.g. mounting electrodes, current collectors or terminals in containers or encapsulations
11/84 . Processes for the manufacture of hybrid or EDL capacitors, or components thereof
11/86 . . specially adapted for electrodes (carbonisation or activation of carbon for the manufacture of electrodes H01G 11/34)

13/00 Apparatus specially adapted for manufacturing capacitors; Processes specially adapted for manufacturing capacitors not provided for in groups H01G 4/00 - H01G 11/00

13/003 . {Apparatus or processes for encapsulating capacitors}
13/006 . {Apparatus or processes for applying terminals}
13/02 . Machines for winding capacitors
13/04 . Drying; Impregnating
13/06 . with provision for removing metal surfaces

15/00 Structural combinations of capacitors or other devices covered by at least two different main groups of this subclass with each other (involving at least one hybrid or electric double-layer [EDL] capacitor as the main component H01G 11/08)

17/00 Structural combinations of capacitors or other devices covered by at least two different main groups of this subclass with other electric elements, not covered by this subclass, e.g. RC combinations