SECTION H — ELECTRICITY

H10 SEMICONDUCTOR DEVICES; ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR

H10N ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR [2023.01]

Note(s) [2024.01]

In this subclass, the periodic system used is the I to VIII group system indicated in the Periodic Table under Note (3) of section C.

Subclass index

Thermoelectric or thermomagnetic devices [2023.01]

10/00 Thermoelectric devices comprising a junction of dissimilar materials, i.e. devices exhibiting Seebeck or Peltier effects (integrated devices or assemblies of multiple devices H10N 19/00) **[2023.01]**

Note(s) [2023.01]

This group covers thermoelectric devices comprising a junction of dissimilar materials, with or without other thermoelectric or thermomagnetic effects.

10/01 • Manufacture or treatment **[2023.01]**

10/10 • operating with only the Peltier or Seebeck effects **[2023.01]**

10/13 • • characterised by the heat-exchanging means at the junction **[2023.01]**

10/17 • • characterised by the structure or configuration of the cell or thermocouple forming the device **[2023.01]**

10/80 • Constructional details **[2023.01]**

10/81 • • Structural details of the junction **[2023.01]**

10/813 • • • the junction being separable, e.g. using a spring **[2023.01]**

10/817 • • • the junction being non- separable, e.g. being cemented, sintered or soldered **[2023.01]**

10/82 • • Interconnections **[2023.01]**

10/85 • • Thermoelectric active materials **[2023.01]**

10/851 • • • comprising inorganic compositions **[2023.01]**

10/852 • • • • comprising tellurium, selenium or sulfur **[2023.01]**

10/853 • • • • comprising arsenic, antimony or bismuth (H10N 10/852 takes precedence) **[2023.01]**

10/854 • • • • comprising only metals (H10N 10/852, H10N 10/853 take precedence) **[2023.01]**

10/855 • • • • comprising compounds containing boron, carbon, oxygen or nitrogen **[2023.01]**

10/856 • • • comprising organic compositions **[2023.01]**

10/857 • • • comprising compositions changing continuously or discontinuously inside the material **[2023.01]**

15/00 Thermoelectric devices without a junction of dissimilar materials; Thermomagnetic devices, e.g. using the Nernst-Ettingshausen effect (integrated devices or assemblies of multiple devices H10N 19/00) **[2023.01]**

15/10 • Thermoelectric devices using thermal change of the dielectric constant, e.g. working above and below the Curie point **[2023.01]**

15/20 • Thermomagnetic devices using thermal change of the magnetic permeability, e.g. working above and below the Curie point **[2023.01]**

19/00 Integrated devices, or assemblies of multiple devices, comprising at least one thermoelectric or thermomagnetic element covered by groups H10N 10/00-H10N 15/00 [2023.01]

Piezoelectric, electrostrictive or magnetostrictive devices [2023.01]

30/00 Piezoelectric or electrostrictive devices (integrated devices or assemblies of multiple devices H10N 39/00) **[2023.01]**

30/01 • Manufacture or treatment **[2023.01]**

30/02 • • Forming enclosures or casings **[2023.01]**

30/03 • • Assembling devices that include piezoelectric or electrostrictive parts **[2023.01]**

30/04 • • Treatments to modify a piezoelectric or electrostrictive property, e.g. polarisation characteristics, vibration characteristics or mode tuning **[2023.01]**

30/045 • • • by polarising **[2023.01]**

30/05 • • Manufacture of multilayered piezoelectric or electrostrictive devices, or parts thereof, e.g. by stacking piezoelectric bodies and electrodes **[2023.01]**

30/053 • • • by integrally sintering piezoelectric or electrostrictive bodies and electrodes **[2023.01]**

30/057 • • • by stacking bulk piezoelectric or electrostrictive bodies and electrodes **[2023.01]**

30/06 • • Forming electrodes or interconnections, e.g. leads or terminals **[2023.01]**

30/063 • • • Forming interconnections, e.g. connection electrodes of multilayered piezoelectric or electrostrictive parts **[2023.01]**

30/067 • • • Forming single-layered electrodes of multilayered piezoelectric or electrostrictive parts **[2023.01]**

30/07 • • Forming of piezoelectric or electrostrictive parts or bodies on an electrical element or another base **[2023.01]**

30/071 • • • Mounting of piezoelectric or electrostrictive parts together with semiconductor elements, or other circuit elements, on a common substrate **[2023.01]**

30/072 • • • by laminating or bonding of piezoelectric or electrostrictive bodies **[2023.01]**

30/073 • • • • by fusion of metals or by adhesives **[2023.01]**

30/074 • • • by depositing piezoelectric or electrostrictive layers, e.g. aerosol or screen printing **[2023.01]**

30/076 • • • • by vapour phase deposition **[2023.01]**

30/077 • • • • by liquid phase deposition **[2023.01]**

30/078 • • • • • by sol-gel deposition **[2023.01]**

30/079 • • • • using intermediate layers, e.g. for growth control **[2023.01]**

30/08 • • Shaping or machining of piezoelectric or electrostrictive bodies **[2023.01]**

30/081 • • • by coating or depositing using masks, e.g. lift-off **[2023.01]**

30/082 • • • by etching, e.g. lithography **[2023.01]**

30/084 • • • by moulding or extrusion **[2023.01]**

30/085 • • • by machining **[2023.01]**

30/086 • • • • by polishing or grinding **[2023.01]**

30/088 • • • • by cutting or dicing **[2023.01]**

30/089 • • • • by punching **[2023.01]**

30/09 • • Forming piezoelectric or electrostrictive materials **[2023.01]**

30/092 • • • Forming composite materials **[2023.01]**

30/093 • • • Forming inorganic materials **[2023.01]**

30/095 • • • • by melting **[2023.01]**

30/097 • • • • by sintering **[2023.01]**

30/098 • • • Forming organic materials **[2023.01]**

30/20 • with electrical input and mechanical output, e.g. functioning as actuators or vibrators **[2023.01]**

30/30 • with mechanical input and electrical output, e.g. functioning as generators or sensors **[2023.01]**

30/40 • with electrical input and electrical output, e.g. functioning as transformers **[2023.01]**

30/50 • having a stacked or multilayer structure **[2023.01]**

30/60 • having a coaxial cable structure **[2023.01]**

30/80 • Constructional details **[2023.01]**

30/85 • • Piezoelectric or electrostrictive active materials **[2023.01]**

30/853 • • • Ceramic compositions **[2023.01]**

30/857 • • • Macromolecular compositions **[2023.01]**

30/87 • • Electrodes or interconnections, e.g. leads or terminals **[2023.01]**

30/88 • • Mounts; Supports; Enclosures; Casings **[2023.01]**

35/00 Magnetostrictive devices (integrated devices or assemblies of multiple devices H10N 39/00) **[2023.01]**

35/01 • Manufacture or treatment **[2023.01]**

35/80 • Constructional details **[2023.01]**

35/85 • • Magnetostrictive active materials **[2023.01]**

39/00 Integrated devices, or assemblies of multiple devices, comprising at least one piezoelectric, electrostrictive or magnetostrictive element covered by groups H10N 30/00-H10N 35/00 [2023.01]

Galvanomagnetic or similar magnetic-effect devices [2023.01]

50/00 Galvanomagnetic devices (Hall-effect devices H10N 52/00; integrated devices or assemblies of multiple devices H10N 59/00) **[2023.01]**

50/01 • Manufacture or treatment **[2023.01]**

50/10 • Magnetoresistive devices **[2023.01]**

50/20 • Spin-polarised current-controlled devices (magnetoresistive devices H10N 50/10) **[2023.01]**

50/80 • Constructional details **[2023.01]**

50/85 • • Materials of the active region **[2023.01]**

52/00 Hall-effect devices (integrated devices or assemblies of multiple devices H10N 59/00) **[2023.01]**

52/01 • Manufacture or treatment **[2023.01]**

52/80 • Constructional details **[2023.01]**

52/85 • • Materials of the active region **[2023.01]**

59/00 **Integrated devices, or assemblies of multiple devices, comprising at least one galvanomagnetic or Hall-effect element covered by groups H10N 50/00-H10N 52/00** (MRAM devices H10B 61/00) **[2023.01]**

Superconducting devices [2023.01]

60/00 **Superconducting devices** (integrated devices or assemblies of multiple devices H10N 69/00) **[2023.01]**

60/01 • Manufacture or treatment **[2023.01]**

60/10 • Junction-based devices **[2023.01]**

60/12 • • Josephson-effect devices **[2023.01]**

60/20 • Permanent superconducting devices **[2023.01]**

60/30 • Devices switchable between superconducting and normal states **[2023.01]**

60/35 • • Cryotrons **[2023.01]**

60/355 • • • Power cryotrons **[2023.01]**

60/80 • Constructional details **[2023.01]**

60/81 • • Containers; Mountings **[2023.01]**

60/82 • • Current path **[2023.01]**

60/83 • • Element shape **[2023.01]**

60/84 • • Switching means for devices switchable between superconducting and normal states **[2023.01]**

60/85 • • Superconducting active materials **[2023.01]**

69/00 **Integrated devices, or assemblies of multiple devices, comprising at least one superconducting element covered by group H10N 60/00 [2023.01]**

Other electric solid-state devices [2023.01]

70/00 **Solid-state devices having no potential barriers, and specially adapted for rectifying, amplifying, oscillating or switching** (integrated devices or assemblies of multiple devices H10N 79/00) **[2023.01]**

70/10 • Solid-state travelling-wave devices **[2023.01]**

70/20 • Multistable switching devices, e.g. memristors **[2023.01]**

79/00 **Integrated devices, or assemblies of multiple devices, comprising at least one solid-state element covered by group H10N 70/00** (ReRAM devices H10B 63/00; PCRAM devices H10B 63/10) **[2023.01]**

80/00 **Bulk negative-resistance effect devices** (integrated devices or assemblies of multiple devices H10N 89/00) **[2023.01]**

80/10 • Gunn-effect devices **[2023.01]**

89/00 **Integrated devices, or assemblies of multiple devices, comprising at least one bulk negative resistance effect element covered by group H10N 80/00 [2023.01]**

97/00 **Electric solid-state thin-film or thick-film devices, not otherwise provided for [2023.01]**

99/00 **Subject matter not provided for in other groups of this subclass [2023.01]**