

EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 858

DATE: MAY 1, 2020

PROJECT RP0352

The following classification changes will be effected by this Notice of Changes:

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
SCHEME:		
Symbols Deleted:	H01L	33/0079
Symbols New:	H01L	33/0093
Titles Changed:	H01L	33/0095
Indents Changed:	H01L	2933/0041, 2933/005, 2933/0058, 2933/0066, 2933/0075
Notes Modified:	H01L	33/00
DEFINITIONS:		
Definitions New:	H01L	33/0004, 33/0008, 33/0012, 33/0016, 33/002, 33/0025, 33/0029, 33/0033, 33/0037, 33/0041, 33/0045, 33/005, 33/0054, 33/0058, 33/0062, 33/0066, 33/007, 33/0075, 33/0083, 33/0087, 33/0091, 33/0093, 33/0095, 33/02, 33/025, 33/04, 33/06, 33/08, 33/10, 33/105, 33/12, 33/14, 33/145, 33/16, 33/18, 33/20, 33/22, 33/24, 33/28, 33/285, 33/30, 33/305, 33/32, 33/325, 33/34, 33/343, 33/346, 33/36, 33/38, 33/382, 33/385, 33/387, 33/40, 33/405, 33/42, 33/44, 33/46, 33/465, 33/48, 33/483, 33/486, 33/50, 33/501, 33/502, 33/504, 33/505, 33/507, 33/508, 33/52, 33/54, 33/56, 33/58, 33/60, 33/62, 33/64, 33/641, 33/642, 33/644, 33/645, 33/647, 33/648
Definitions Modified:	H01L	33/00

No other subclasses/groups are impacted by this Notice of Changes.

This Notice of Changes includes the following [Check the ones included]:

1. CLASSIFICATION SCHEME CHANGES

- A. New, Modified or Deleted Group(s)
- B. New, Modified or Deleted Warning(s)
- C. New, Modified or Deleted Note(s)
- D. New, Modified or Deleted Guidance Heading(s)

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2. DEFINITIONS

- A. New or Modified Definitions (Full definition template)
 - B. Modified or Deleted Definitions (Definitions Quick Fix)
3. REVISION CONCORDANCE LIST (RCL)
 4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)
 5. CHANGES TO THE CROSS-REFERENCE LIST (CRL)

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1. CLASSIFICATION SCHEME CHANGES

A. New, Modified or Deleted Group(s)

SUBCLASS H01L - SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to[#]</u>
D	H01L33/0079	3	{wafer bonding or at least partial removal of the growth substrate}	<administrative transfer to H01L33/0093>
U	H01L33/0091	2	{for devices with an active region comprising only IV-VI compounds}	
N	H01L33/0093	2	{Wafer bonding; Removal of the growth substrate}	
M	H01L33/0095	2	{Post-treatment of devices, e.g. annealing, recrystallisation or short-circuit elimination}	
U	H01L2933/00	0	Details relating to devices covered by the group H01L33/00 but not provided for in its subgroups	
U	H01L2933/0008	1	Processes	
U	H01L2933/0033	2	relating to semiconductor body packages	
M	H01L2933/0041	3	relating to wavelength conversion elements	
M	H01L2933/005	3	relating to encapsulations	
M	H01L2933/0058	3	relating to optical field-shaping elements	
M	H01L2933/0066	3	relating to arrangements for conducting electric current to or from the semiconductor body	
M	H01L2933/0075	3	relating to heat extraction or cooling elements	

*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; T = existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:

- **No {curly brackets} are used for titles in CPC only subclasses, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} are used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- U groups: it is obligatory to display the required “anchor” symbol (U group), i.e. the entry immediately preceding a new group or an array of new groups to be created (in case new groups are not clearly subgroups of C-type groups). Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types.

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- “Transferred to” column must be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the “Transferred to” column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: “<administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD> , <administrative transfer to XX INV>, or < administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“Transferred to”) symbol, however it is required to specify “<no transfer>” in the “Transferred to” column for such cases.
- For finalisation projects, the deleted “F” symbols should have <no transfer> in the “Transferred to” column.
- For more details about the types of scheme change, see CPC Guide.

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C. New, Modified or Deleted Note(s)

SUBCLASS H01L - SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
M	H01L 33/00	<p>1. This group <u>covers</u> light emitting diodes [LEDs] or superluminescent diodes [SLDs], including LEDs or SLDs emitting infra-red [IR] light or ultra-violet [UV] light.</p> <p>2. In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.</p>	<p>1. This group covers light emitting diodes [LEDs] or superluminescent diodes [SLDs], including LEDs or SLDs emitting infra-red [IR] light or ultra-violet [UV] light.</p>

*N = new note, M = modified note, D = deleted note

NOTE: The "Location" column only requires the symbol PRIOR to the location of the note. No further directions such as "before" or "after" are required.

2. A. DEFINITIONS (new)

Insert: the following new Definitions.

H01L 33/0004

Definition statement

This place covers:

Light emissive devices characterized by their operation, e.g. field effect, low coherence emission, barrier structure or junction structure.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Light emitting devices based on quantum effects	H01L 33/04
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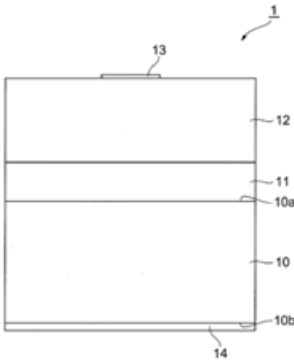
H01L 33/0008

Definition statement

This place covers:

Light emissive devices including at least one p-n junction (e.g. p-n, p-i-n, p-p-n, p-n-n) or hi-lo junction (e.g. n-/n+ or p-/p+), e.g. single p-n junctions or hi-lo homo-junctions.

Illustrative examples:



[n-type layer 10, insulating layer 11, p-type layer 12]

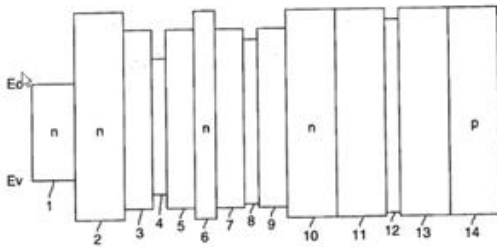


Fig. 1

TABLE I

Layer	Composition	Band gap Energy (E_g)
1	InP substrate	1.35 eV
2	n-doped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV
3	$Cd_{0.33}Mg_{0.27}Zn_{0.38}Se$	2.6 eV
4	$Cd_{0.70}Zn_{0.30}Se$	1.9 eV
5	$Cd_{0.33}Mg_{0.27}Zn_{0.38}Se$	2.6 eV
6	n-doped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV
7	$Cd_{0.33}Mg_{0.27}Zn_{0.38}Se$	2.6 eV
8	$Cd_{0.33}Zn_{0.67}Se$	2.3 eV
9	$Cd_{0.33}Mg_{0.27}Zn_{0.38}Se$	2.6 eV
10	n-doped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV
11	undoped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV
12	$Cd_{0.31}Mg_{0.27}Zn_{0.37}Se$	2.7 eV
13	undoped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV
14	p-doped $Cd_{0.24}Mg_{0.43}Zn_{0.33}Se$	2.9 eV

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H01L 33/0012

Definition statement

This place covers:

Light emissive devices characterized by an intrinsic region or layer between a p-doped region and an n-doped region.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Light emissive devices with quantum effect active region
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H01L 33/06

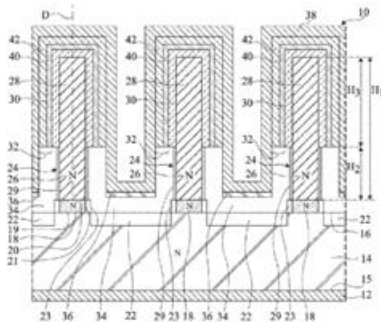
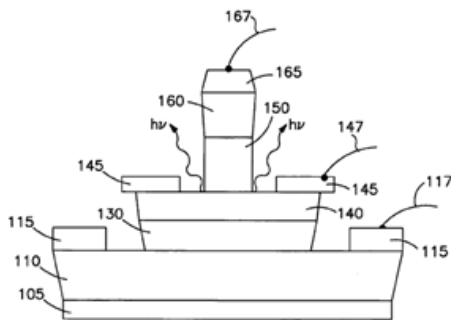
H01L 33/0016

Definition statement

This place covers:

Light emissive devices having two or more p-n junctions within a single device. Examples include: light emitting bipolar transistors, light emitting thyristors, commonly addressed multi-spectral light emissive devices, and multi-junction light emissive diodes having multiple junctions addressed by a common anode and cathode.

Illustrative examples:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Light emissive semiconductor bodies having two or more light emitting regions	H01L 33/08
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H01L 33/002

Definition statement

This place covers:

Light emissive devices characterized by a heterojunction or a homojunction having a graded energy gap.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processes relating to the semiconductor material of light emitting regions	H01L 33/0054 – H01L 33/0091
Semiconductor body details of light emissive devices	H01L 33/02

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H01L 33/0025**Definition statement***This place covers:*

Heterojunctions or graded gap homojunctions wherein all constituent semiconductor materials are Group III-V compounds.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Processes relating to light emissive devices with III-V compounds in the active region	H01L 33/0062
Group III-V compounds in the light emitting region	H01L 33/30

H01L 33/0029**Definition statement***This place covers:*

Heterojunctions or graded gap homojunctions wherein all constituent semiconductor materials are Group II-VI compounds.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Processes relating to light emissive devices with II-V compounds in the active region	H01L 33/0083
Group II-VI compounds in the light emitting region	H01L 33/28

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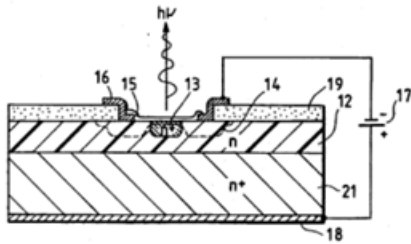
H01L 33/0033

Definition statement

This place covers:

Light emissive devices including a Schottky barrier junction formed between a Schottky metal and a semiconductor.

Illustrative example:



[Schottky electrode 15]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electrode materials of light emissive devices	H01L 33/40
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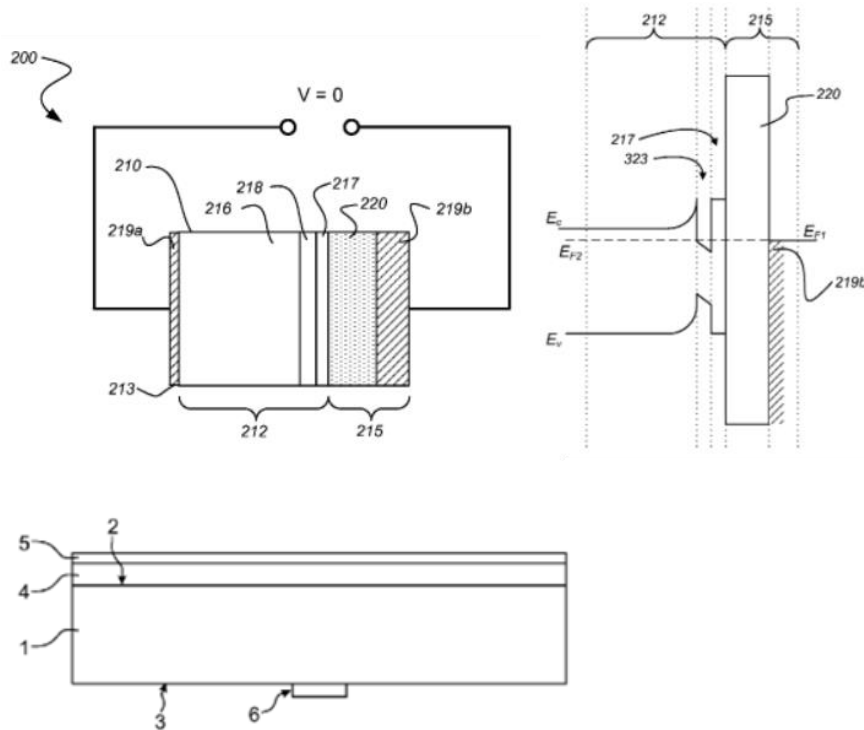
H01L 33/0037

Definition statement

This place covers:

Light emissive devices having a metal-insulator-semiconductor barrier at one of the anode or cathode.

Illustrative examples:



[substrate 1, metal oxide 4, conductive layer 5]

H01L 33/0041

Definition statement

This place covers:

Light emissive devices operated by using field-effect, wherein the conductivity of a region is altered by the application of an external electric field. Examples include light emitting MIS gated transistors or light emitting gated diodes.

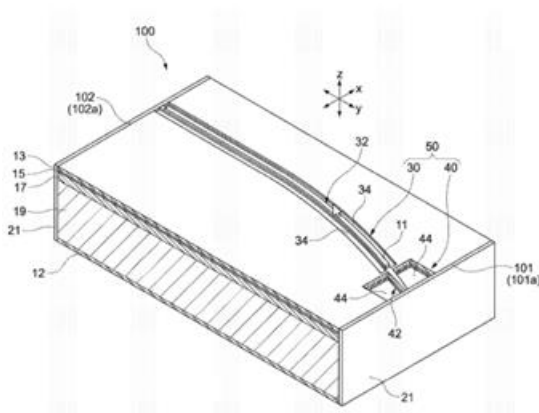
H01L 33/0045

Definition statement

This place covers:

Broadband light emitting diodes having an optical cavity that generates amplified spontaneous emission, said emission is incoherent or has low coherence. A superluminescent diode is characterized by at least one wave guiding structure that suppresses coherence emission.

Illustrative example:



[AR coatings 21, waveguide bodies 32, 42]

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Informative references

Attention is drawn to the following places, which may be of interest for search:

Shape of light emitting regions	H01L 33/24
Anti-reflective coatings	H01L 33/44

H01L 33/005

Definition statement

This place covers:

Processes specially adapted for the manufacture or treatment of light emissive devices covered by this main group.

H01L 33/0054

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group IV elements or compounds with or without impurities in the active region.

H01L 33/0058

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising amorphous group IV elements or compounds with or without impurities in the active region.

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H01L 33/0062

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group III-V compounds with or without impurities in the active region.

H01L 33/0066

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group III-V compounds with or without impurities in the active region and wherein the substrate is not a group III-V compound, e.g. GaN grown on a sapphire growth substrate.

H01L 33/007

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group III-V nitride compounds with or without impurities in the active region wherein the substrate is not a group III-V compound e.g. sapphire growth substrate.

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H01L 33/0075

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group III-V nitride compounds with or without impurities in the active region.

H01L 33/0083

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group II-VI compounds with or without impurities in the active region.

H01L 33/0087

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group II-VI compounds with or without impurities in the active region wherein the substrate is not a group II-VI compound, e.g. ZnO grown on sapphire growth substrate.

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H01L 33/0091

Definition statement

This place covers:

Processes specially adapted for the manufacture of light emitting devices comprising group IV-VI compounds with or without impurities in the active region.

H01L 33/0093

Definition statement

This place covers:

Wafer bonding or at least partial growth substrate removal from light emissive devices.

H01L 33/0095

Definition statement

This place covers:

Any front end of line treatments or processes up to and including singulation of a wafer in to individual light emissive devices.

H01L 33/0095 covers all manufacturing steps up to but not including singulation (e.g. annealing, encapsulating, wafer level testing and repair, etc.).

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H01L 33/02

Definition statement

This place covers:

Light emissive devices having a particular semiconductor body, and structures or layers that directly influence the light emissive region, e.g. all layers and structures in the current path or directly influencing the semiconductor body, e.g. permanent buffer or stress relaxation layers.

The "particularity" can be:

- the nature of the material (specific composition, special doping species, crystal structure or orientation)
- shape, disposition or dimensions
- inclusions, defects and dislocations

H01L 33/025

Definition statement

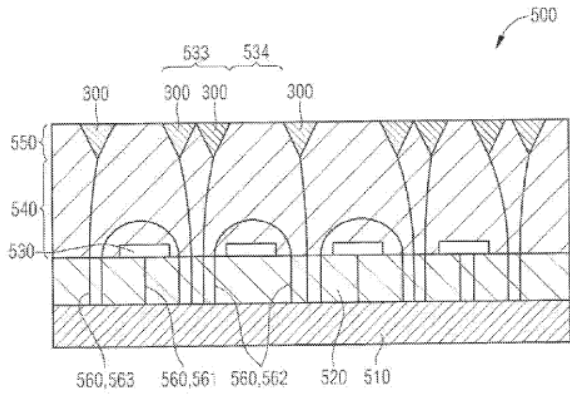
This place covers:

Details regarding the presence or distribution of imperfections, inclusions, dislocations, voids, defects, or particular doping profiles within the semiconductor body.

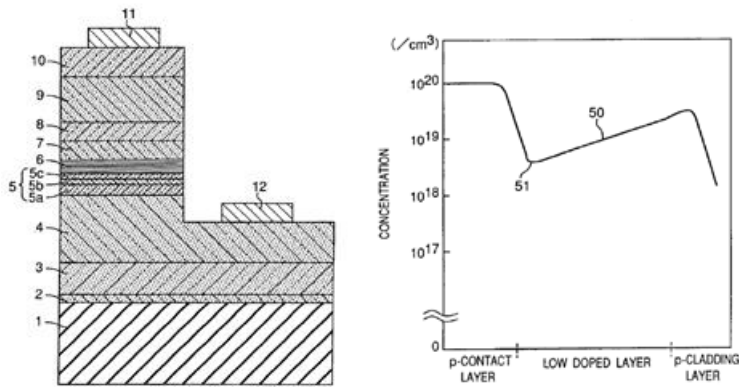
Illustrative example:

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[V-defects 300 and threading dislocations 560 in luminous active layer 550 and semiconductor layers 540, 520]



[p-cladding layer 8, low-doped p-type layer 9, p-contact layer 10 and the associated impurity concentration]

H01L 33/04

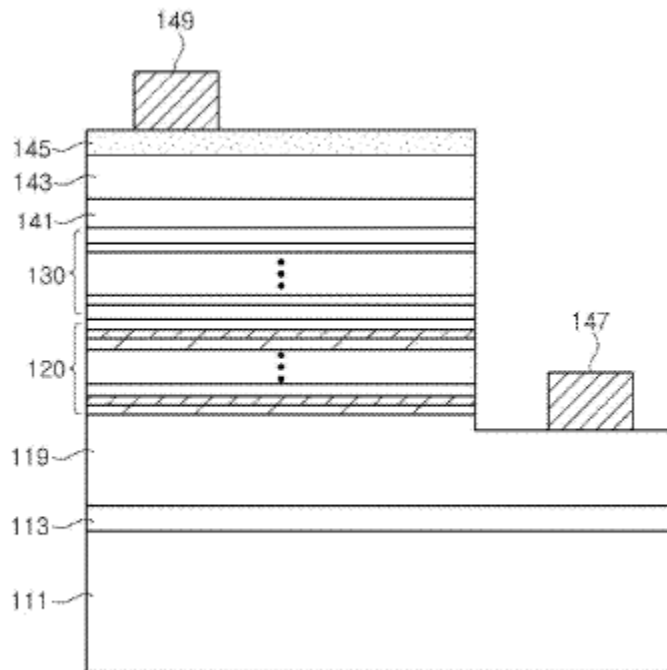
Definition statement

This place covers:

Structures creating a quantum effect within the semiconductor bodies, e.g. tunnelling barriers, quantum wells, super-lattices or similar nanostructures, which create a quantum effect.

The quantum effect structures are within the semiconductor body, but do not need to be in the light emitting region.

Illustrative example:



[superlattice 120 formed between n-type cladding layer 119 and light emitting region 130]

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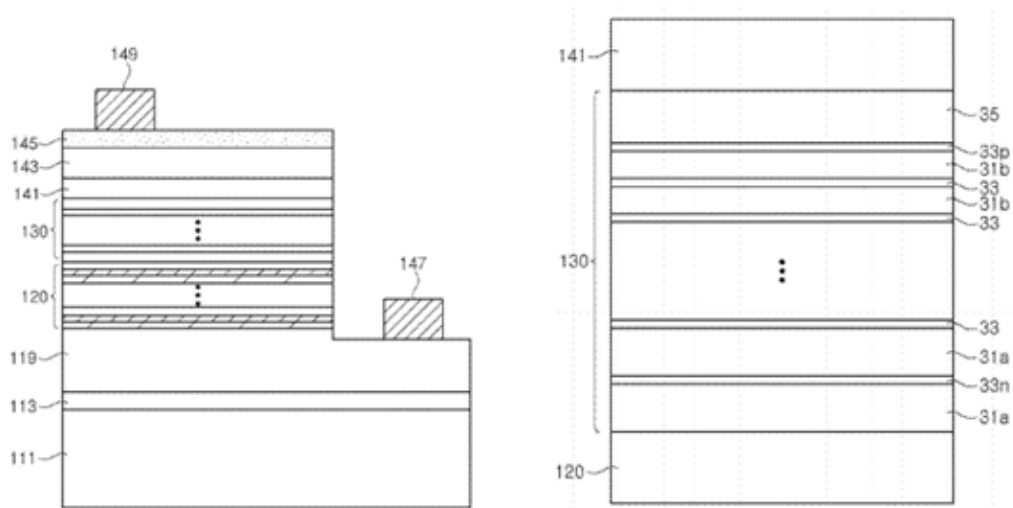
H01L 33/06

Definition statement

This place covers:

Structures creating a quantum effect within the light emitting regions.

Illustrative example:



[light emitting region 130 being a multiple quantum well including intrinsic region 33 and surrounding n-type region 33n and p-type region 33p]

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H01L 33/08

Definition statement

This place covers:

Light emitting devices with semiconductor bodies having two or more light emitting regions, wherein light emitting regions are not individually addressable.

References

Limiting references

This place does not cover:

Monolithically integrated arrays of individually addressable light emissive devices	H01L 27/15
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H01L 33/10

Definition statement

This place covers:

Light reflecting structures that directly influence the semiconductor body.

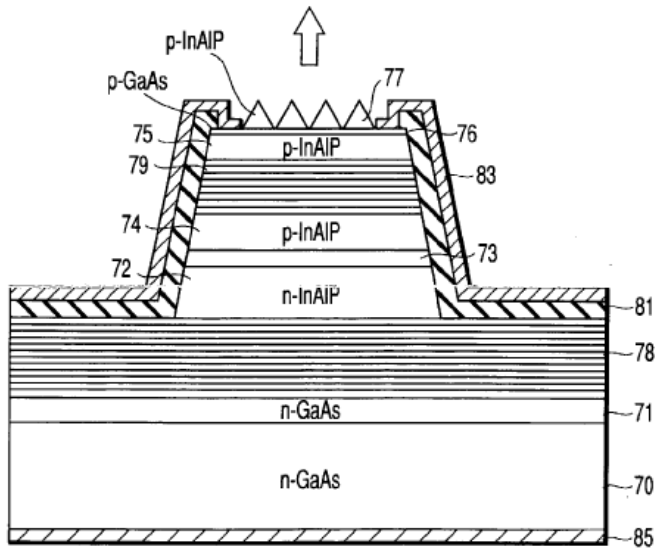
H01L 33/105

Definition statement

This place covers:

Resonant cavity structures that directly influence the semiconductor body.

Illustrative example:



[DBR 79 and DBR 78 create a resonant cavity within the semiconductor body]

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H01L 33/12

Definition statement

This place covers:

Stress relaxation structures, layers or films directly influencing the semiconductor body, e.g. lattice matching or stress relaxation between growth substrates and layers deposited thereon.

H01L 33/14

Definition statement

This place covers:

Regions, structures or layers directly influencing the semiconductor body that modify the carrier path, impede or enhance carrier mobility, e.g. carrier transport, blocking or injection layers.

H01L 33/14 is used for carrier transport layers and carrier injection layers.

H01L 33/145

Definition statement

This place covers:

Regions, structures or layers directly influencing the semiconductor body, which reduce carrier mobility or redirect current path.

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H01L 33/16

Definition statement

This place covers:

Crystal structures, porosity, polarity or crystal orientation of semiconductor bodies.

H01L 33/16 is used for particular crystal structure, orientation, porosity or polarity of semiconductor body regions outside the light emitting region.

H01L 33/18

Definition statement

This place covers:

Crystal structures, porosity, polarity or crystal orientation of light emitting regions.

H01L 33/20

Definition statement

This place covers:

Shape of semiconductor bodies, e.g. surface roughness, periodic interfaces or nanostructures.

H01L 33/20 is used for particular shape of semiconductor body regions outside of the light emitting region.

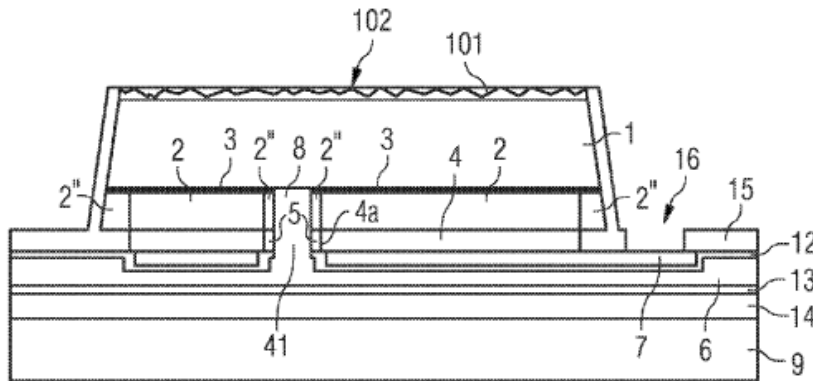
H01L 33/22

Definition statement

This place covers:

Roughened surface or roughened interface on or within the semiconductor bodies.

Illustrative example:



[n-conducting region 1 has a roughening 101 produced on its outer surface]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Scattering means formed in or on the semiconductor bodies or semiconductor body packages	H01L 2933/0091
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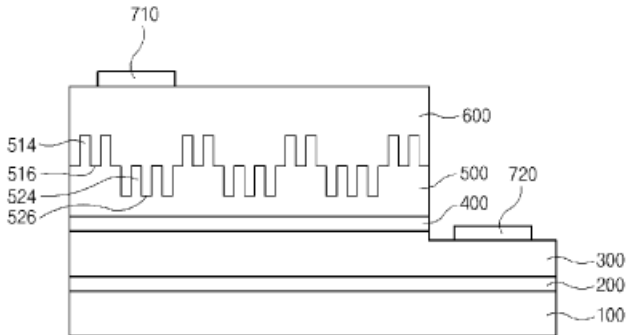
H01L 33/24

Definition statement

This place covers:

Particular shape of the light emitting region or within the light emitting region, e.g. interface or junction, wherein the shape is periodic and ordered and not a roughened surface with random order and structure.

Illustrative example:



[light emitting region comprising first semiconductor layer 300, active layer 400 and second semiconductor layer 500, having a particular shape, specifically second semiconductor layer 500]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Roughened surfaces	H01L 33/22
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Special rules of classification

Particular patterns for optical field shaping in or on the semiconductor body are additionally classified in indexing subgroup H01L 2933/0083.

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H01L 33/28

Definition statement

This place covers:

Material of the light emitting region being only group II-VI compounds with or without impurities.

H01L 33/285

Definition statement

This place covers:

Dopants specially adapted for group II-VI compound semiconductors, forming part of the light emitting region.

H01L 33/30

Definition statement

This place covers:

Material of the light emitting region being only group III-V compounds with or without impurities.

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H01L 33/305

Definition statement

This place covers:

Dopants specially adapted for group III-V compound semiconductors, forming part of the light emitting region.

H01L 33/32

Definition statement

This place covers:

Material of the light emitting region being group III-nitride compounds with or without impurities.

H01L 33/325

Definition statement

This place covers:

Dopants specially adapted for the group III-nitride compounds.

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H01L 33/34

Definition statement

This place covers:

Material of the light emitting region being only group IV materials with or without impurities.

H01L 33/343

Definition statement

This place covers:

Dopants specially adapted for the group IV materials.

H01L 33/346

Definition statement

This place covers:

Material of the light emitting region containing porous silicon.

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H01L 33/36

Definition statement

This place covers:

Electrodes for inorganic light emissive devices; methods of their manufacturing.

Special rules of classification

Processes related to the making of electrodes are classified as additional information in H01L 2933/0016.

H01L 33/38

Definition statement

This place covers:

Electrodes with a particular shape or disposition.

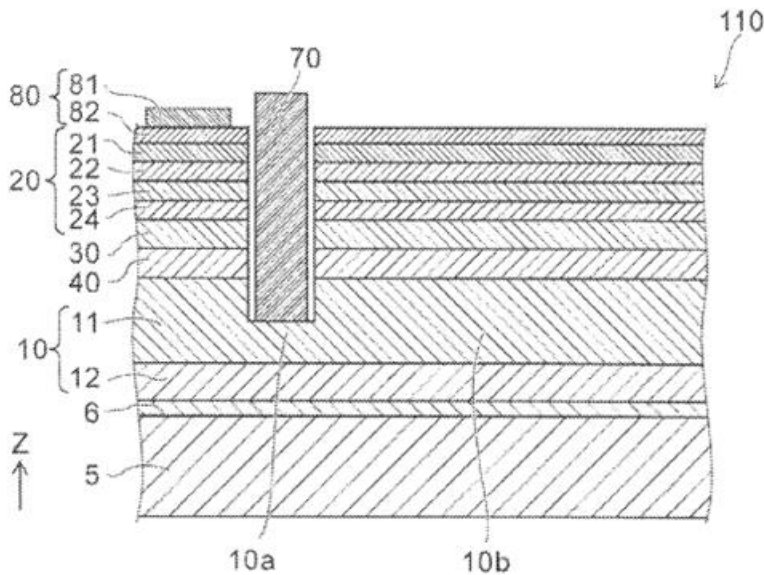
H01L 33/382

Definition statement

This place covers:

The electrodes of a light emitting device extending from at least a surface of the semiconductor body at least to an internal region of the semiconductor body and being surrounded by the semiconductor body.

Illustrative example:



[electrode 70 extends into the semiconductor body]

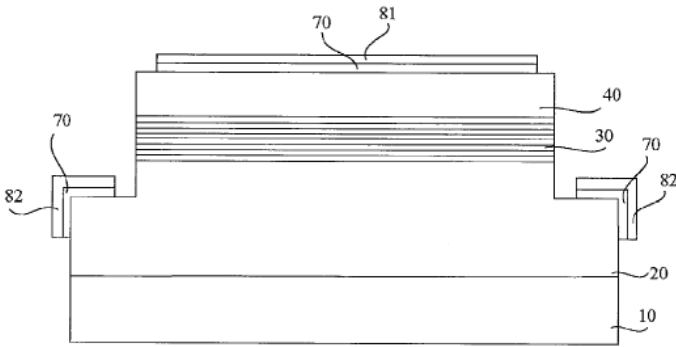
H01L 33/385

Definition statement

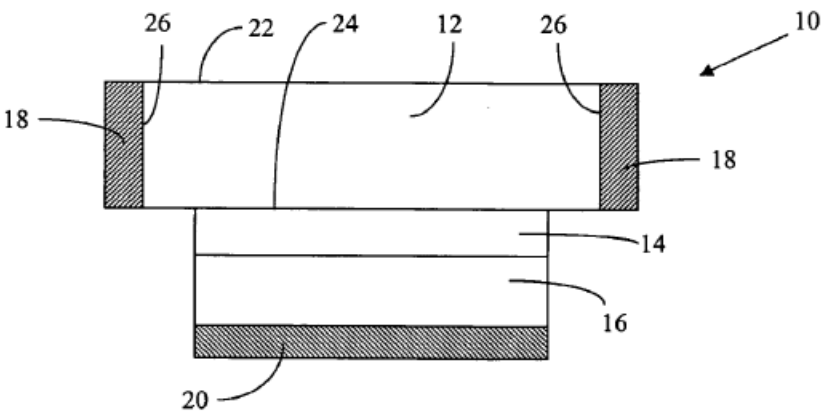
This place covers:

Light emitting devices where at least one of the anode and cathode is formed along a side surface of the semiconductor body.

Illustrative examples:



[electrode including a reflective layer 70 and an additional conductive layer 82 extends to cover a side surface of the semiconductor body]



[electrode 18 formed on the side of semiconductor layer 12]

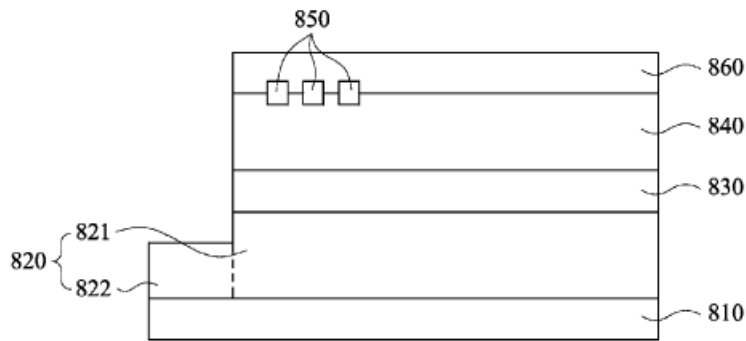
H01L 33/387

Definition statement

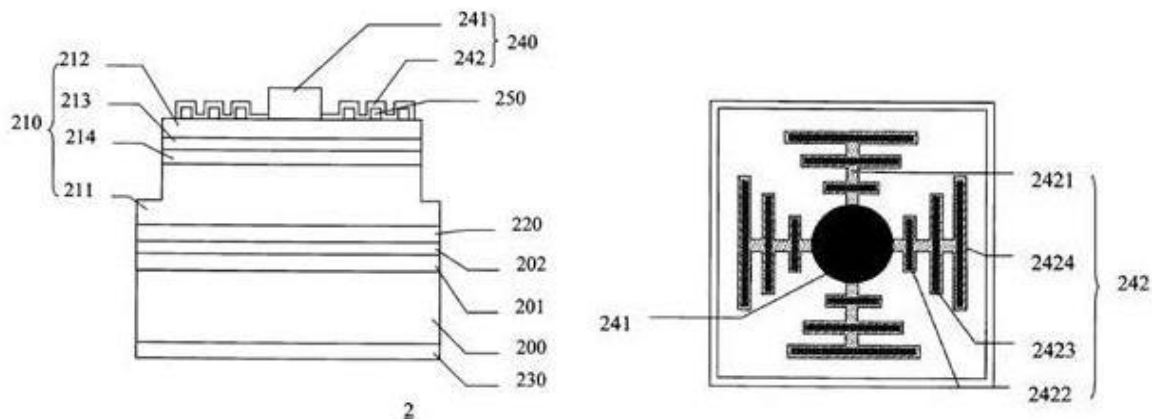
This place covers:

Electrode structures having at least two segments connected together by another separate electrode.

Illustrative examples:



[a plurality of electrode regions 850 are in direct contact with the semiconductor body including p-type region 840 and are electrically interconnected by conductive layer 860]



[plurality of electrodes 250 commonly connected to electrode 241 through conductive layer 242]

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H01L 33/40

Definition statement

This place covers:

Materials of electrodes of light emissive devices.

H01L 33/405

Definition statement

This place covers:

Reflective electrodes for light emissive devices.

H01L 33/42

Definition statement

This place covers:

Transparent electrodes for light emissive devices.

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H01L 33/44

Definition statement

This place covers:

Coatings that are not reflective, e.g. passivating coating.

Special rules of classification

Processes related to the making of coatings are classified as additional information in H01L 2933/0025.

H01L 33/46

Definition statement

This place covers:

Coatings that are reflective, e.g. dielectric Bragg reflectors, metallic coatings.

H01L 33/465

Definition statement

This place covers:

Reflective structures consisting of two or more mirrors with varying reflectivity that improve (narrow) the linewidth and spectral purity of the emission having incoherence or low coherence, without promoting or generating stimulated lasing emission.

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H01L 33/48

Definition statement

This place covers:

“First-level” packaging elements such as a containers, encapsulation, wavelength conversion elements, optical field shaping elements, electrical arrangements, or heat extraction or cooling elements, which are structurally associated with the semiconductor bodies, electrodes, or coatings of the light emitting devices.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Details of a semiconductor or other solid state device in general	H01L 23/00
Details of an organic light emitting device	H01L 51/52

Special rules of classification

Processes related to the semiconductor body packages are classified as additional information in H01L 2933/0033, H01L 2933/0041, H01L 2933/005, H01L 2933/0058, H01L 2933/0066, and H01L 2933/0075.

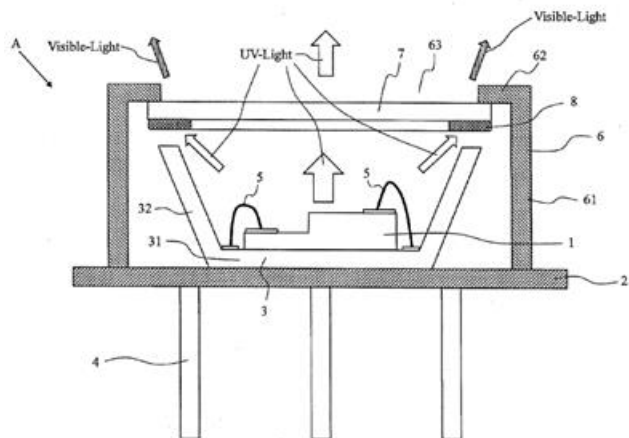
H01L 33/483

Definition statement

This place covers:

Enclosures forming part of the packaged devices, which essentially have a rigid construction, into which the body of the light emitting device is placed. It is often used as a physical protection structure. The enclosures may include a structure with a recess for receiving the light emitting device, a lid or a cover. The recesses may contain a filling, encapsulant or wavelength conversion material.

Illustrative example:



[Can-type package for light emitting device 1 comprises base 2, cup 3, pins 4, and cap 5. Pins 4 are adapted to be inserted into holes in a substrate]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

“Second level” base or cap for electric lamps, the electric lamp using a semiconductor device as a light generating element	F21K 9/235
“Second level” housing for electric lamps, the electric lamp using a semiconductor device as a light generating element	F21K 9/237

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Containers for a semiconductor or other solid state devices in general	H01L 23/02
Assembly of semiconductor or solid state devices not having separate containers	H01L 25/075
Assembly of semiconductor or solid state devices with separate containers	H01L 25/13
Containers for organic light emitting devices	H01L 51/5237
Sealing arrangements for organic light emitting devices	H01L 51/524
Housings for semiconductor laser	H01S 5/022
Semiconductor laser with a Can-type housing	H01S 5/02212

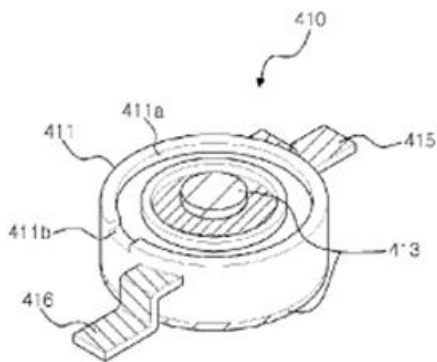
H01L 33/486

Definition statement

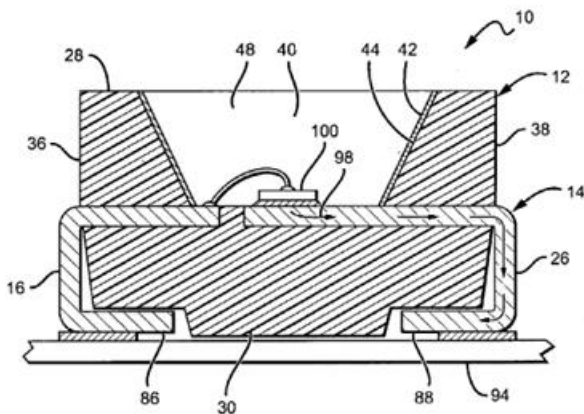
This place covers:

Containers that are specially adapted for being mounted, e.g. soldered, onto the surface of another element, e.g. circuit boards.

Illustrative examples:



[container comprises package body 411 and leads 415 and 416 which are bent to allow for surface mounting of the package]



[container comprises casing 12 and leads 16 and 26 which are adapted for surface mounting to substrate 94 by soldering]

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H01L 33/50**Definition statement**

This place covers:

Luminescent elements formed in or on light emitting device packages, meant for converting an emitted wavelength into a different wavelength. The elements often comprise wavelength conversion materials, e.g. phosphorescent or fluorescent materials, and a matrix material, e.g. a binder material.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Coatings	H01L 33/44
Encapsulations	H01L 33/52
Encapsulations or coatings for organic light emitting devices	H01L 51/5237

Special rules of classification

Processes related to the making of wavelength conversion elements are classified as additional information in H01L 2933/0041.

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H01L 33/501

Definition statement

This place covers:

Wavelength conversion elements characterized by a specific material, a specific material composition, or specific function of the material, including constituents of the wavelength conversion element which are not wavelength conversion materials, e.g. binder.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Polymer compositions in general	C08L
Use of a particular material as a binder	C09K 11/02

H01L 33/502

Definition statement

This place covers:

Wavelength conversion elements characterized by a specific wavelength conversion material, e.g. a specific phosphor or fluorescent material, or a specific function of a wavelength conversion material.

H01L 33/504

Definition statement

This place covers:

Wavelength conversion elements characterized by two or more wavelength conversion materials, e.g. two or more specific phosphor or fluorescent materials. The wavelength conversion materials may be in the same layer or in distinct layers.

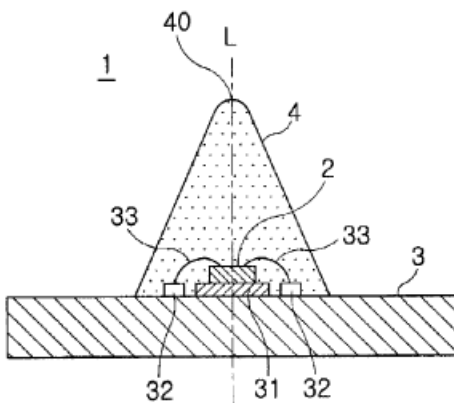
H01L 33/505

Definition statement

This place covers:

Wavelength conversion elements characterized by their shape.

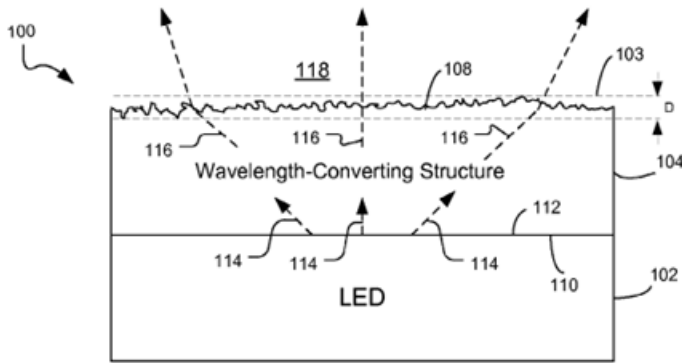
Illustrative examples:



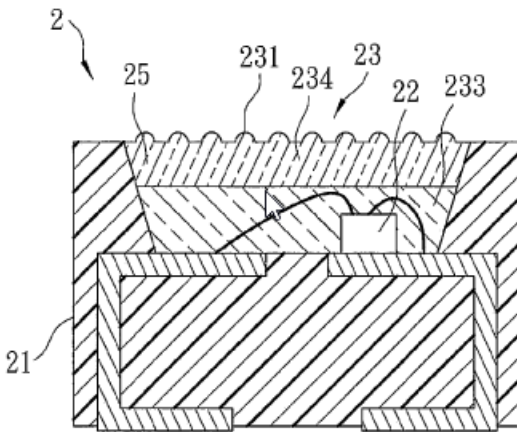
[wavelength conversion element 4 for light emitting device 2 is characterized by a vertically long triangular shape]

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[wavelength conversion element 104 for light emitting device 102 is characterized by the non-uniform shape of the top surface 108]



[wavelength conversion element 234 for light emitting element 22 is characterized by the patterned microstructures shape 231]

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Encapsulation having a particular shape	H01L 33/54
Field shaping elements, which are not wavelength conversion elements	H01L 33/58

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H01L 33/507

Definition statement

This place covers:

Wavelength conversion elements, which are not in intimate contact with, e.g. spaced away from, the light emitting devices, e.g. remote phosphor configuration.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

"Second level" wavelength conversion means for electric lamps, the electric lamp using a semiconductor device as a light generating element	F21K 9/64
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H01L 33/508

Definition statement

This place covers:

Wavelength conversion elements not having a uniform concentration. Examples include wavelength conversion elements, in which the wavelength conversion material, e.g. phosphorescent or fluorescent material, has a concentration gradient within the binder material (i.e. matrix material).

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H01L 33/52**Definition statement**

This place covers:

A sealing material in direct contact with and formed on the light emitting devices. An encapsulation may contain one or more layers and is primarily used as physical protection for the light emissive device.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Shaping of a plastic by casting	B29C 39/00
Process for the manufacture of an encapsulation of solid state devices in general	H01L 21/56
Encapsulation of solid state devices in general	H01L 23/28
Process relating to encapsulation	H01L 2933/005
Encapsulation for organic light emitting devices	H01L 51/5237

Special rules of classification

Processes related to encapsulations are classified as additional information in H01L2933/005.

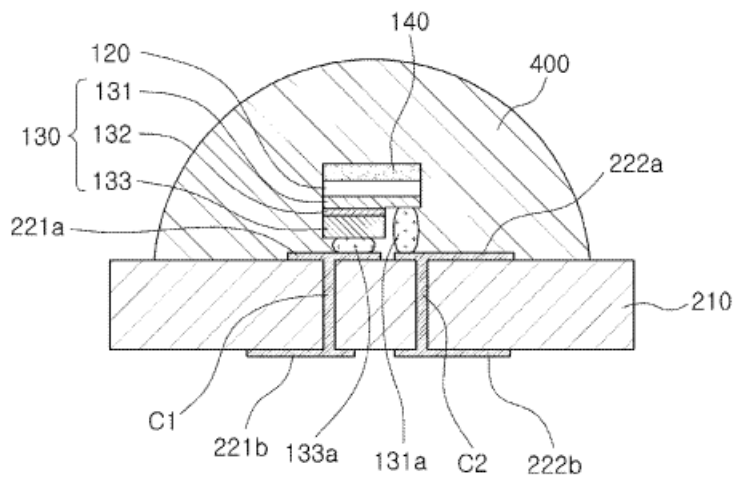
H01L 33/54

Definition statement

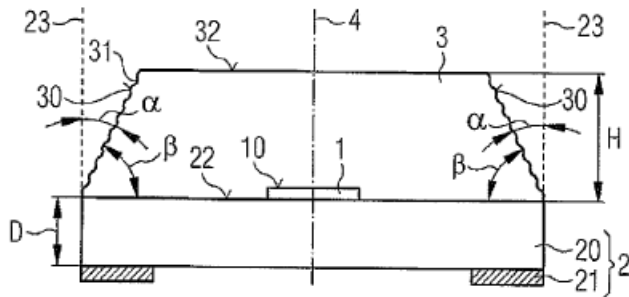
This place covers:

Encapsulation characterized by their shape.

Illustrative examples:



[encapsulation 400 is characterized by a lens shape]



[encapsulation 3 is characterized by the shape of the textured and tapered sidewalls]

References

Informative references

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Attention is drawn to the following places, which may be of interest for search:

Wavelength conversion elements characterized by their shape	H01L 33/505
Element that provides field shaping element (e.g. due to its shape) that is not an encapsulation	H01L 33/58

H01L 33/56

Definition statement

This place covers:

An encapsulation characterized by its material.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Polymer compositions in general	C08L
Use of a particular material as a binder for fluorescent particles	C09K 11/02

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H01L 33/58**Definition statement***This place covers:*

Elements formed in or on light emitting device packages that are specially adapted for altering the path of the light emitted from the light emitting device.

Examples include lenses, refractors, diffraction gratings, matrix including scattering particles, diffuser, prism, or shader.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

"Second level" optical arrangements for electric lamps, the electric lamp using a semiconductor device as a light generating element	F21K 9/60
Refractors for light sources of lens shape	F21V 5/04
Optical elements in general, e.g. lenses	G02B
Arrangements for extracting light from organic light emitting devices	H01L 51/5262
Arrangements for contrast improvement of organic light emitting devices	H01L 51/5281
Scattering means in or on the semiconductor bodies or the semiconductor body packages	H01L 2933/0091

Special rules of classification

The optical field shaping element must be a "first level" optical element. "Second level" optical elements are classified in F21K9/00 or G02B.

Periodic patterns for optical-field shaping in or on the semiconductor body or semiconductor body package, e.g. photonic bandgap structures are classified as additional information in H01L 2933/0083.

Processes related to the manufacturing of optical field-shaping elements are classified as additional information in H01L 2933/0058.

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H01L 33/60**Definition statement***This place covers:*

An optical field shaping element which is reflective.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Reflective means for extracting light for organic light emitting devices	H01L 51/5271
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H01L 33/62**Definition statement***This place covers:*

Electrical arrangements of "first-level" package elements, conducting electric current to or from an electrode of the light emitting device.

Examples include lead frames, insulating substrates with metallization layers thereon, solder balls, or a wire bond.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Arrangements for conducting electrical current to or from semiconductor or solid state devices in general	H01L 23/48 , H01L 23/52
Lead-frames for semiconductor or other solid state devices in general	H01L 23/495
Arrangements for connecting or disconnecting semiconductor or solid states device in general	H01L 24/00

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Special rules of classification

Processes related to the manufacturing of arrangements for conducting electric current to or from the semiconductor body are classified as additional information in H01L 2933/0066.

H01L 33/64

Definition statement

This place covers:

Elements or arrangement of elements in or on packages, the elements being specially adapted for heating or cooling of the light emitting device.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for cooling or heating of semiconductor devices in general	H01L 23/34
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Special rules of classification

Processes relating to the manufacturing of heat extraction or cooling elements are classified as additional information in H01L2933/0075.

H01L 33/641

Definition statement

This place covers:

Heat extraction or cooling elements, characterized by their specific material.

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H01L 33/642

Definition statement

This place covers:

Heat extraction or cooling elements, characterized by their shape.

H01L 33/644

Definition statement

This place covers:

Heat extraction or cooling elements, which are in direct physical contact, or integrated with, at least a part of the devices other than the semiconductor body, e.g. electrodes, package structures or coatings.

H01L 33/645

Definition statement

This place covers:

Thermoelectric heat extraction or cooling elements in or on a package.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cooling arrangements using the Peltier effect for semiconductor or solid state devices in general	H01L 23/38
Integrated devices including thermoelectric devices formed in or on a common substrate	H01L 27/16
Thermoelectric devices	H01L 35/00 , H01L 37/00

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H01L 33/647**Definition statement***This place covers:*

Heat extraction or cooling elements, which also conduct electric current to or from an electrode of the light emitting devices.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Arrangements for conducting electrical current for semiconductor or solid state devices in general	H01L 23/48 , H01L 23/52
Lead-frames for semiconductor or other solid state devices in general	H01L 23/495
Arrangements for connecting or disconnecting semiconductor or solid state devices in general	H01L 24/00

H01L 33/648**Definition statement***This place covers:*

Heat extraction or cooling elements, which facilitate heat transfer by a fluid, i.e. gas or liquid.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating or cooling elements comprising a fluid for semiconductor or solid state devices in general	H01L 23/46
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2. A. DEFINITIONS (modified)**H01L 33/00****References****Limiting references***This place does not cover:*Delete: the following two references from the Limiting references table.

Hybrid assemblies of a plurality of individual LED devices	H01L 25/075
Hybrid assemblies of LED devices with other semiconductor devices	H01L 25/167

Insert: the following new reference in the Limiting references table.

Semiconductor lasers	H01S 5/00
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Informative references*Attention is drawn to the following places, which may be of interest for search:*Delete: the following reference from the Informative references table.

Semiconductor lasers	H01S 5/00
----------------------	---------------------------

Insert: the following two new references in the Informative references table.

Hybrid assemblies of a plurality of individual LED devices	H01L 25/075
Hybrid assemblies of LED devices with other semiconductor devices	H01L 25/167

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Delete: the symbol G02F1/13357 and replace with the symbol G02F 1/133603, as shown below.

Liquid crystal display backlights using LEDs	G02F 1/133603
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Special rules of classification

Delete: the first paragraph in the Special rules section:

In this group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

Delete: the following text from the second paragraph that begins with “When classifying”:

or one of its subgroups

Insert: the following paragraph as the last paragraph in the Special rules section:

Apparatus specially adapted for the manufacture of LEDs or parts thereof is classified together with the corresponding processes in groups H01L33/005 and H01L2933/00.

Insert: the following new Glossary of terms section.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

active region	Includes the active junction and immediately adjacent P and N layers, e.g. light emitting layer, confining layer, cladding layer, spacer layer, etc.
light emitting region	Synonymous with “active region”
heterojunction	Interface between dissimilar semiconductor crystal having different band gaps.
graded	The gradual change of the composition or doping level.

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superlattice	A periodic arrangements of layers of different material or doping types. E.g. InGaN/GaN/InGaN/GaN superlattice, p/n/p/n superlattice, MQW, etc.
coating	One or more layers, which are formed essentially conformally on at least a portion of a device, and which are directly associated with the semiconductor or solid state body. Coatings typically have passivation or optical characteristics and function more than merely a physical barrier.
encapsulation	One or more layers, typically comprising epoxy material, which at least partially enclose a device. An encapsulation is often used to hermetically seal the device.
container	A solid construction in which a device is placed, or which is formed around the device, and which forms a part of a packaged device. A container requires a partial or total enclosure, but does not require a bottom. A container may also contain a filling within the container.
Intrinsic region or layer	Semiconductor region or layer that is undoped or not intentionally doped such that the electron and hole densities are approximately equal.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

Insert: the following two new rows in the Synonyms and Keywords table.

MQW	Multiple Quantum Well
SQW	Single Quantum Well

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3. REVISION CONCORDANCE LIST (RCL)

<u>Type*</u>	<u>From CPC Symbol (existing)</u>	<u>To CPC Symbol(s)</u>
D	H01L 33/0079	<administrative transfer to H01L 33/0093>

* C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed.

NOTES:

- Only C, D, F, and Q type entries are included in the table above.
- When multiple symbols are included in the “To” column, do not use ranges of symbols.
- For administrative transfer of documents, the following text should be used: “< administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD>, <administrative transfer to XX INV>, or < administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“To”) symbol, however it is required to specify “<no transfer>” in the “To” column for such cases.
- RCL is not needed for finalisation projects.

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4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H01L 33/0079		DELETE
H01L 33/0093	H01L 33/00	NEW

*Action column:

- For an (N) or (Q) entry, provide an IPC symbol and complete the Action column with “NEW.”
- For an existing CPC main trunk entry or indexing entry where the existing IPC symbol needs to be changed, provide an updated IPC symbol and complete the Action column with “UPDATED.”
- For a (D) CPC entry or indexing entry complete the Action column with “DELETE.” IPC symbol does not need to be included in the IPC column.
- For an (N) 2000 series CPC entry which is positioned within the main trunk scheme (breakdown code) provide an IPC symbol and complete the action column with “NEW”.
- For an (N) 2000 series CPC entry positioned at the end of the CPC scheme (orthogonal code), with no IPC equivalent, complete the IPC column with “CPCONLY” and complete the action column with “NEW”.

NOTES:

- F symbols are not included in the CICL table above.
- T and M symbols are not included in the CICL table above unless a change to the existing IPC is desired.