Research Proposal on Technical Standards System for SSL

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China SSL Alliance Standardization Committee
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Background

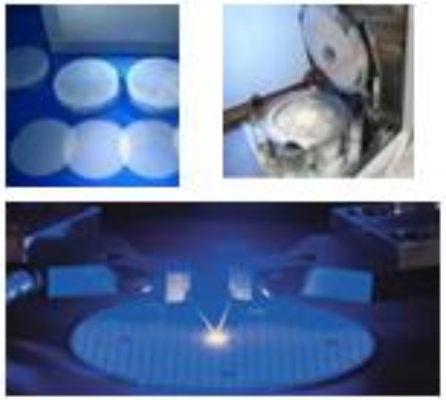
- SSL has established its dominant position in the lighting industry transformation due to the advantages of energy saving, environmental protection, rich colors, strong controllability, etc.
- The Chinese government pays high attention to the technology innovation and industry development of semiconductor lighting.
- With the development of lighting technology and the improvement of people's living quality, the lighting effect is no longer the only focal point by people. Developing new lighting products, improving the light quality, and building a healthy, comfortable, and intelligent light environment, etc.

Standardization Organization

- **CIE** - The International Commission on Illumination
- **IEC/TC34** - International Electrotechnical Commission/lamps and related equipment
- **ISO/TC 274** - International Organization for Standardization/light and lighting
- **ISA Technical Committee on Standardization (TCS)**
- **SAC (China)** Standardization Administration of China
- **China SSL Alliance Standardization Committee (CSAS)**
- **IES, Energy Star, etc.**

Standard System

- Lighting industry chain



Substrate epitaxial layers

Device module

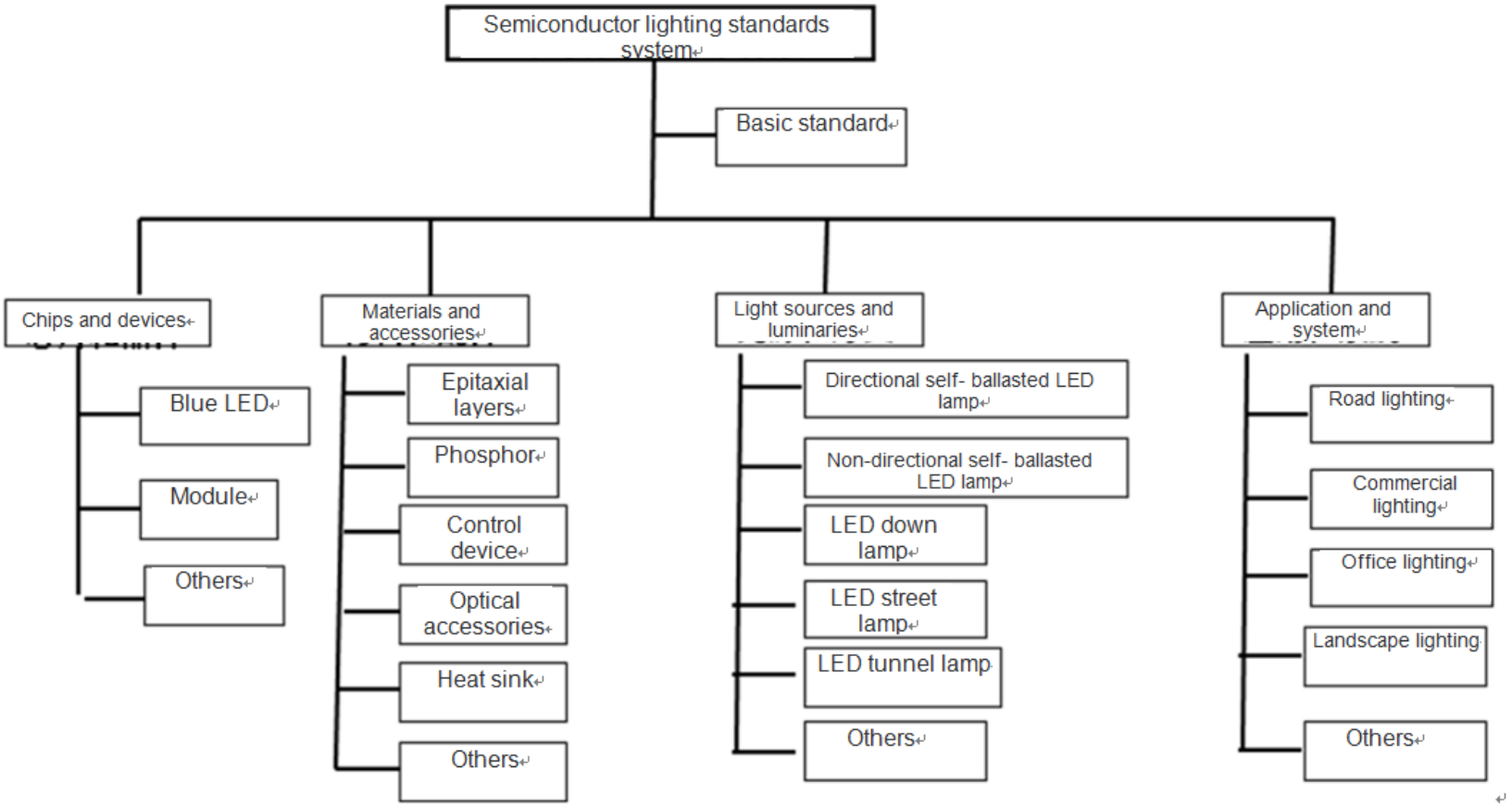
Material accessories

Light source lamps

Application system

Standard System

- SSL Standards System



Basic Standards

- The basic standards refer to terms and definitions, classification, etc

No.	Standard Organization	Standard No.	Standard Name
1	IEC/TC34	IEC 62504:2014	General lighting—**Light emitting diode (LED) products** and related equipment—Terms and definitions
2		IEC 62707-1:2013	**LED—Binning**—Part 1: General requirements and white colour grid
3		IEC/TS 62972 Ed. 1	General lighting - **Organic light emitting diode (OLED) products** and related equipment - Terms and definitions
4	Chinese National Standard	GB/T 24826-2016（IDT IEC 62504:2014）	General lighting—**Light emitting diode (LED) products** and related equipment—Terms and definitions
5		GB/T 32655-2016	**LED lighting for plant growth**—Terms and definitions
6		GB/T 32482.1-2016（IDT IEC 62707-1:2013）	**LED—Binning**—Part 1: General requirements and white colour grid
7	CSA standard	T/CSA 014-2012	**Organic light emitting diode (OLED)** lighting — terminology and letter symbols

Components and modules

- The chips and devices can be classified into blue LED, red LED, green LED, and yellow LED according to colours, and upright LED, inverted LED, vertical structure membrane LED, etc. according to the structure.

No.	Standard Organization	Standard No.	Standard Name
1	IEC/TC34	IEC62031:2008	**LED modules** for general lighting - Safety specifications
2		IEC 62717:2014	**LED modules** for general lighting - Performance requirements
3		IEC 63013 Ed.1.0	**LED package** - Long-term luminous flux maintenance projection
4		IEC/TS 62861 Ed.1.0	Guide to principle component reliability testing for **LED light sources and LED luminaires**
5	IEC/SC 47E	IEC 60747-5-6:2016	Semiconductor devices - Part 5-6: Optoelectronic devices - **Light emitting diodes**
6	Chinese National Standard	GB 24819-2009（IDT IEC 62031:2008）	**LED modules** for general lighting - Safety specifications
7		GB/T 24824-2009（NEQ CIE 127:2007）	Measurement methods of **LED modules** for general lighting
8		GB/T 24823-2009	**LED-modules** for general lighting - Performance requirements
9		GB/T 32872-2016	Screening specifications for **illumination LEDs** in space sciences

Materials and accessories

- For materials and accessories, the materials include epitaxial layers, phosphor, silica gel, PPA materials, etc. The accessories include bracket, mould strip, PCB panel, lens, reflector cover, heat sink, control devices, connectors, etc

No.	Standard Organization	Standard No.	Standard Name
1	IEC/TC34	IEC 60838-2-2:2006	Miscellaneous lampholders - Part 2-2: Particular requirements - **Connectors** for LED-modules
2		IEC 61347-2-13:2014	Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. **supplied electronic control gear** for LED modules
3		IEC 62384:2006	DC or AC **supplied electronic control gear** for LED modules - Performance requirements
4		IEC 62386-207:2009	Digital addressable lighting interface - Part 207: Particular requirements for **control gear - LED modules** (device type 6)
5		IEC 62442-3:2014	Energy performance of **lamp control gear** - Part 3: Control gear for halogen lamps and LED modules - Method of measurement to determine the efficiency of the control gear
6		IEC 60838-2-3 Ed1.0	Miscellaneous lampholders - Part 2-3: Particular requirements - Lampholders for **double-capped linear LED-lamps**
7	IEC/TC91 Electronics assembly technology	IEC 61189-3-913:2016	Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 3-913: Test method for thermal conductivity of **electronic circuit boards** for high-brightness LEDs
8		IEC TR 61189-3-914:2017	Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 3-914: Test method for thermal conductivity of **printed circuit boards** for high-brightness LEDs - Guidelines
9		IEC 62326-20:2016	Printed boards - Part 20: **Printed circuit boards** for high-brightness LEDs

Materials and accessories

10	Chinese National Standard	GB 19510.14-2009（IDT IEC 61347-2-13:2006）	Lamp controlgear - Part 14: Particular requirements for d.c. or a.c. **supplied electronic controlgear** for LED modules
11		GB/T 24825-2009（MOD IEC 62384:2006）	DC or AC **supplied electronic control gear** for LED modules - Performance requirements
12		GB 19651.3-2008（IDT IEC 60838-2-2:2006）	Miscellaneous lampholders - Part 2-2: Particular requirements - **Connectors** for LED-modules
13		GB/T 30104.207-2013 (IEC 62386-207,2009,IDT)	Digital addressable lighting interface- Part 207: Particular requirements of **control gear** for LED modules (equipment type 6)
14		GB/T 9364.11-2016	Miniature fuses—Part 11: **Fuse-links** for LED lamps
15		GB/T 32483.3-2016（IDT IEC 62442-3:2014）	Energy performance of **lamp control gear**—Part 3: Controlgear for halogen lamps and LED modules—Method of measurement to determine the efficiency of the controlgear
16		GB/T 23595.2-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 2: Determination of relative brightness
17		GB/T 30655-2014	Test methods for internal quantum efficiency of **nitride LED epitaxial layers**
18		GB/T 30856-2014	**GaAs substrates** for LED epitaxial chips
19		GB/T 30855-2014	**GaP substrates** for LED epitaxial chips
20		GB/T 30854-2014	**Gallium nitride based epitaxial layer** for LED lighting
21		GB/T 30454-2013	Test methods **of silicate phosphors** activated by rare earths for LED

Materials and accessories

22	Chinese National Standard	GB/T 30076-2013	**Silicate phosphors** activated by rare earths for LED
23		GB/T 30075-2013	Rare earth activated **nitride red phosphors** for LEDs
24		GB/T 23595.7-2010	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 7: Determination of temperature quenching
25		GB/T 24982-2010	**Rare earth yellow phosphor** for white LED lamps
26		GB/T 23595.3-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 3: Determination of chromaticity coordinates
27		GB/T 23595.1-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 1: Determination of spectrum property
28		GB/T 23595.5-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 5: Determination of pH value
29		GB/T 23595.4-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 4: Determination of thermostability
30		GB/T 23595.6-2009	Test methods of **rare earth yellow phosphor** for white LED lamps - Part 6: Determination of conductivity
31	CSA standard	T/CSA 008-2011	General specification for **drive power supply** of LED for lighting service
32		T/CSA 017-2013	Interface requirements for external type constant **current control device** of indoor LED lighting service
33		T/CSA 036-2017	Requirements for **control device and control terminal interface** of outdoor LED lighting service

Light sources and luminaries

- For light sources and luminaries, the Light sources include directional self-ballasted LED lamps (LED spot lamp), non directional self-ballasted LED lamps (LED bulb light, LED tubular lamp), etc. The luminaries include LED down lamp, LED street lamp, LED tunnel lamp, LED panel lamp, etc.

No.	Standard Organization	Standard No.	Standard Name
1	IEC/TC34	IEC 62560:2011	**Self-ballasted LED-lamps** for general lighting services by voltages > 50 V - Safety specifications
2		IEC 62612:2013	**Self-ballasted LED lamps** for general lighting services with supply voltages > 50 V - Performance requirements
3		IEC 62776:2014	**Double-capped LED lamps** designed to retrofit linear fluorescent lamps - Safety specifications
4		IEC TR 62778:2014	Application of IEC 62471 for the assessment of blue light hazard to **light sources and luminaires**
5		IEC 62722-2-1:2014	Luminaire performance - Part 2-1: Particular requirements for **LED luminaires**
6		IEC 62838:2015	**LEDs lamps** for general lighting services with supply voltages not exceeding 50 V a.c. r.m.s. or 120 V ripple free d.c. - Safety specifications
7		IEC 62931 Ed.1.0	**GX16t-5 capped tubular LED lamp** - Safety specifications
8		IEC TR 63037	**Dimming** requirement
9		IEC 62868:2014	**Organic light emitting diode (OLED) panels** for general lighting - Safety requirements
10		IEC 62922 Ed.1.0	**Organic light emitting diode (OLED) panels** for general lighting - Performance requirements

Light sources and luminaries

11	ISA		Accelerating depreciation test method for **LED lighting products**
12			**Interface requirements** for application of LED lighting：Street/tunnel light consisting of LED module with heatsink and separated control gear
13			**LED road lighting products** in cold region - Performance requirements
14			**LED products** - Test of visual healthy and comfort Part1：General introduction
15	Chinese National Standard	GB 7000.1-2015	**Lamps** - Part 1: General requirements and tests
16		GB/T 24908-2014（NEQ IEC 62612:2009）	**Non-directional Self-ballasted LED-lamps** for general lighting services—Performance requirements
17		GB 30255-2013	Minimum allowable values of energy efficiency and energy efficiency grades of **non-directional self-ballasted LED-lamps** for general lighting services
18		GB 25991-2010	**Automotive headlamps** with LED light sources and/or LED modules
19		GB/T 31112-2014	Classification of **Non-directional Self-ballasted LED-lamps** for general lighting services
		GB/T 31111-2014	Classification of **self-ballasted LED reflector lamps**
20		GB/T 29296-2012	**Self-ballasted LED reflector lamps** - Performance requirements
21			

Light sources and luminaries

22	Chinese National Standard	GB/T 29295-2012	Test methods of performance of **self-ballasted LED reflector lamps**
23		GB/T 24909-2010	**LED lamps** for decorative lighting
24		GB/T 32486-2016	General specification for **LED luminaries** of stage
25		GB/T 32481-2016	Performance requirements of **LED luminaires** for tunnel lighting
26		GB/T 31897.201-2016（IDT IEC 62722-2-1:2014）	Luminaire performance—Part 2-1: Particular requirements for **LED luminaires**
		GB/T 30413-2013	Performance requirements for **recessed LED luminaires**
27		GB/T 29294-2012	Performance requirements for **LED downlights**
28		GB/T 29293-2012	Measurement methods of the performance for **LED downlights**
29			
30		GB 24906-2010	**Self-ballasted LED-Lamps** for general lighting services >50V safety specifications
31		GB/T 24907-2010	**LED lamps** for road lighting performance specifications
32		GB/T 33720-2017	Accelerated test method of luminous flux depreciation for **LED lighting products**
33	CSA Standard	T/CSA 005-2013	Performance requirements for **cold LED road lighting product**
34		T/CSA 008-2011	General specification for **drive power supply** of LED for lighting service
35		T/CSA 017-2013	Interface requirements for external type constant **current control device** of indoor LED lighting service
36		T/CSA 020-2013	Accelerating depreciation test method for **LED lighting products**
		T/CSA 036-2017	Requirements for control device and **control terminal interface** of outdoor LED lighting service
37			

Application and system

- The applications and systems include road lighting, tunnel lighting, office lighting, commercial lighting, industrial lighting, etc.

No.	Standard Organization	Standard No.	Standard Name
1	ISO/TC274	ISO/CD 20086	Energy Performance of **Lighting in Buildings**
2		ISO/PWI 21274	Light and Lighting - **Adaptive Lighting Systems** - Commissioning Process
3		ISO/PWI TR 21783	**Biologically effective illumination** — Design guidelines
4		ISO/NP TS 22012	Light and lighting -- **Maintenance factor determination** -- Way of working
8	Chinese National Standard	GB/T 31831-2015	Technical requirements for application of **LED indoor lighting**
9		GB/T 31832-2015	Technical requirement for application of **LED road lighting**
10		GB50034	Standard for **lighting design of building**
11	CSA standard	T/CSA 018-2013	Communication protocol for interface application layer of **LED Public lighting intelligent system**
12		T/CSA 040-2017	Specification for **household intelligent lighting** communication module interface
13		T/CSA 041-2017	Specification for **household intelligent lighting** function attribute

Proposed Output and Timeline

- One ISA Recommendation/Statement/White Paper on Technical Standards System for SSL
- The first draft should be submitted before TCS 12 in Beijing.

Subcommittee or Working Group

- CSAS
- CNIS
- State Key Lab of SSL (China)
- Philips
- Osram

Thank you!

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