



# **RF Lighting Technical Requirements and Testing Guidance**

**October 22, 2014**



# Overview

- Lighting technology is rapidly changing.
  - LED lighting will become a very large replacement technology as common general service incandescent lamps are phased out in the U.S. due to EISA 2007 implementation by the U.S. Department of Energy.
- There have been a number of interference complaints with regards to fluorescent and LED lighting that are being investigated by the FCC Enforcement Bureau.



# Overview

- FCC has requirements for RF lighting in Part 18, but there are questions as to whether these rules apply to all lighting technologies on the market.
- Also, we have received questions about the applicability of the radiated emissions limits.
- **Draft KDB Publication 640677** provides **draft guidance** on the applicable technical and testing requirements for lighting devices.
- **Soliciting public comments on the draft.**



# General Conditions of Operation

- Unintentional radiators are subject to operation on the condition that no harmful interference is caused (§§15.5 and 18.111).
- Use good engineering designs and construction techniques (§§15.15 and 18.109).
- Operation of lighting devices will be required to cease operation if harmful interference occurs (§§15.15(c) and 18.115).



# Part 15 Lighting Devices

- Lighting devices that power the bulb or tube with direct current (DC) or alternating current (AC) below 9 KHz and utilize switching power supply technology are authorized under FCC Part 15.
- An example of this type of device is an LED lighting device powered by a DC voltage from a switching power supply.





# Part 15 Lighting Devices

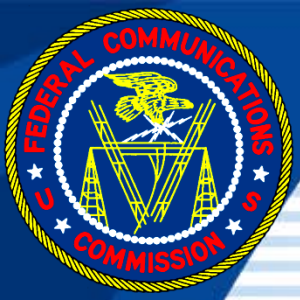
## ● Technical Requirements

### – *AC Power Line Conducted Emission Limits:*

- §15.107(a) for Class B (residential) devices or §15.107(b) for Class A (commercial) devices, as appropriate.

### – *Radiated Emission Limits:*

- §15.109(a) for Class B (residential) devices or §15.109(b) for Class A (commercial), as appropriate.
- **Proposed testing guidance – Radiated emission measurements are to be performed from 30 MHz to 1000 MHz.**



# Part 15 Lighting Devices

- **Equipment Authorization Procedure:**
  - The “Verification” equipment authorization procedure is used for both Class A and Class B devices.



# Part 18 Lighting Devices

- Lighting devices that power the bulb, tube, etc. using an RF signal that is applied to a gas inside a lamp are authorized under Part 18.
- Examples of these types of devices include ballasts for fluorescent lamps, and self-ballasted lamps powered from an RF source.

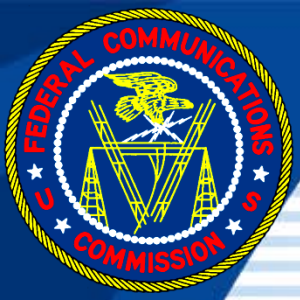




# Part 18 Lighting Devices

## ● Technical requirements

- ***AC Power Line Conducted Emission Limits:***
  - §18.307(c), for all equipment (i.e., consumer or non-consumer equipment).
- ***Radiated Emission Limits:***
  - §18.305(c).
  - **Proposed testing guidance – Radiated emission measurements are to be performed from 30 MHz to 1000 MHz.**



# Part 18 Lighting Devices

- ***Equipment Authorization Procedure:***
  - The “Verification” equipment authorization procedure is used for non-consumer equipment; and the “Declaration of Conformity” (DoC) or “Certification” equipment authorization procedure is used for consumer equipment.



# Summary

- See draft guidance provided in Draft KDB Publication 640677.
- ***Proposed Guidance*** – Lighting devices which typically use frequencies below 1.705 MHz for their operation to perform are required to have radiated emissions measurements performed from 30 MHz to 1000 MHz.
- Comments have been received and are being reviewed.