
myProject™ - P1789 PAR Detail

Submitter Email: lehman@ece.neu.edu

Type of Project: New IEEE Standard

PAR Request Date: 09-May-2008

PAR Approval Date: 26-Sep-2008

PAR Expiration Date: 31-Dec-2012

Status: PAR for a New IEEE Standard

Project Record:

1.1 Project Number: P1789

1.2 Type of Document: Recommended Practice

1.3 Life Cycle: Full Use

2.1 Title: Recommended Practices of Modulating Current in High Brightness LEDs for Mitigating Health Risks to Viewers

3.1 Working Group: LED Dimmers (PEL/SC/LED Dimmers)

Contact Information for Working Group Chair

Name: Bradley Lehman

Email: lehman@ece.neu.edu

Phone: (617)373-3052

Contact Information for Working Group Vice-Chair

None

3.2 Sponsoring Society and Committee: IEEE Power Electronics Society/Standards Committee (PEL/SC)

Contact Information for Sponsor Chair

Name: Homer Alan Mantooth

Email: mantooth@uark.edu

Phone: 4795754838

Contact Information for Standards Representative

Name: Homer Alan Mantooth

Email: mantooth@uark.edu

Phone: 4795754838

4.1 Type of Ballot: Individual

4.2 Expected Date of Submission for Initial Sponsor Ballot: 09/2009

4.3 Projected Completion Date for Submittal to RevCom: 12/2010

5.1 Approximate number of people expected to work on this project: 15

5.2 Scope: The scope of this standard is to: 1) Define the concept of modulation frequencies for LEDs and give discussion on their applications to LED lighting, 2) Describe LED lighting applications in which modulation frequencies pose possible health risks to users, 3) Discuss the concept of dimming of LEDs by modulating the frequency of driving currents/voltage 4) Present recommendations for modulation frequencies for LED lighting and dimming applications to protect against known adverse health effects.

5.3 Is the completion of this standard dependent upon the completion of another standard: No

5.4 Purpose: Presently, there are no standards or recommendations on safe modulating frequencies for High Brightness LEDs. Various driving frequencies are being suggested by vendors, some at very low frequencies and others at high frequencies. Past work

for fluorescent lighting in the late 1980 s and early 1990 s have shown that modulation at low frequencies for office and residential lighting can cause health related problems, such as headaches, eye strain and epileptic seizure. The detrimental effects depend on factors such as brightness, angle of viewing, wavelength, depth of modulation, among others. The purpose of this propose standard is to 1) describe some possible health risks, such as headaches, eye strain and epileptic seizure, associated with low frequency modulation of High Brightness LEDs in different applications and 2) provide recommended practices to aid design of LED driving systems to modulate at safe frequencies for their particular applications in order to protect against the described health risks.

5.5 Need for the Project: The importance of recommended design guidelines cannot be understated. Companies are already wondering what frequencies to modulate the LEDs are safe. They are looking for objective guidelines before the projected LED lighting revolution for general illumination begins. By recommending safe modulation frequencies for high brightness applications, this will help with the development of new LED products and improve consumer safety.

5.6 Stakeholders for the Standard: Lighting industry, LED IC driver manufacturers, LED manufacturers

Intellectual Property

6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board? Yes

If yes, state date: 05/01/2008

6.1.b. Is the Sponsor aware of any copyright permissions needed for this project? No

6.1.c. Is the Sponsor aware of possible registration activity related to this project? No

7.1 Are there other standards or projects with a similar scope? No

7.2 International Activities

a. Adoption

Is there potential for this standard (in part or in whole) to be adopted by another national, regional or international organization? Yes

Organization: IEC

Technical Committee Name: TC34

Technical Committee Number:

Contact Person Name:

Contact Person Phone:

Contact Person Email:

b. Joint Development

Is it the intent to develop this document jointly with another organization? No

c. Harmonization

Are you aware of another organization that may be interested in portions of this document in their standardization development efforts? No

8.1 Additional Explanatory Notes (Item Number and Explanation): 7.2 There are peripherally related lighting standards. In Europe, High Brightness LEDs are often held to similar optical standards as Class 1 lasers, EN60825, but this has not been the case for the US. These standards for lasers are concerned primarily with optical radiation. Besides laser standards, we will perform further standards search/surveys, but the following reports are the most relevant and are concerned with general best working practices for indoor lighting: 1. ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting Illuminating Engineering Society of North America / 20-Feb-2004 / 71 pages 2. ISO/CIE 8995-1:2002: Lighting of work places -- Part 1: Indoor 3. IEC 62471 Ed. 1.0 b:2006: Photobiological safety of lamps and lamp systems 4. IEC 60825-1: 2007 Safety of laser products - Part 1: Equipment classification and requirements. Also another standards committee that will incorporate our work will by NEMA ANSLG SSL C78-09/C82-04. Contact is Alex Boesenberg Alex.Boesenberg@nema.org
