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Input on Minimum Warranty Period and Power Factor

Additional submitted attachment is included below.

November 17, 2015

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Dear Commission Staff,

My name is Steve Bakos and I am the Vice President of Lighting Products at Exar.

I have the following comments regarding the Notice of Proposed Action from your committee dated October 15, 2015:

1) Minimum Warranty requirement should be 5 years and/or the rated life of the lamps should be heavily weighted with or limited by the manufacturers warranty period.

   The CEC clearly wants to avoid the pitfalls experienced with the CFL lamps, and rightly so. Fortunately, LED lamps squarely address all of those CFL performance issues, and then some. Probably the biggest advantage of LEDs is their enhanced lifetime as compared to CFL. This is now common knowledge and is printed conspicuously on the front all of the LED lamp packages. The problem is that this is not the whole truth. LEDs themselves do last extremely long, however, they do not drive themselves, and the drivers that are currently used can and do fail, often an order of magnitude shorter in time than the advertised life on the front of the box. In addition, as cost pressures continue to drive behavior, this premature failure phenomenon will continue to accelerate.
   The entire lamp industry is keenly aware of this fact. In addition to my firsthand knowledge working in this industry, it is proven simply by studying the warranty periods of the LED lamps. Even though manufacturers print the equivalent of 10 – 20 years of lifetime on the front of the packaging of their LED lamp in big bold print, they use very tiny print on the back of the package to reveal the warranty period of as low as only 2 – 3 years. That is a major discrepancy that leads a reasonable person to justifiable suspicion, if they are fortunate enough to notice in the store. Unfortunately for a variety of reasons, many people are finding this out the hard way a short time later, much shorter than expected in some cases.

It takes a simple online search to come up with multiple articles, blog posts, and youtube videos with titles and comments like:

- "the Big Lie about LED lighting"
- "the Great LED lightbulb ripoff"
- "the great lightbulb conspiracy"
- "… ten short months later, one of the bulbs failed…"
- "…nine out of twelve LED bulbs failed…"

and my personal favorite…

- "they all suck! All of them. Everyone I bought from any major company failed in months. Not years, months."

This is the big problem that has to be dealt with, and the consumers around the world are clearly noticing this. Unless this issue is tackled head on, in my opinion, this will become the Achilles Heel of the LED lamps that your successors will be writing their case studies around when the next lighting technology is being introduced to the market.

The cause of these failures is predominantly attributed to the electrolytic capacitors in the AC/DC driver circuits. I will spare you the technical details, but I have 25 years in the power electronics industry, and can assure you that this is the case. There are other components that can and do fail, but these capacitors are most often the culprit. As manufacturers get squeezed on cost, they use less expensive and less "rugged" capacitors, and this is a significant portion of reason that the warranty periods are shrinking and that the bulbs are failing quickly as compared to the statements on the front of the box.

Manufacturers today can easily remedy this issue. They have options to spend a few more pennies to improve the lifetime of their drivers or use **new technology drivers that are not dependent on these capacitors making the effective life of the lamp entirely depended upon the LEDs themselves**. **These are extremely low cost and high performance as well**. My company's solutions provide this and are cost competitive with current low cost bulb solutions on the market today that would meet these proposed amendments.

I realize that one of the biggest factors of adoption is cost, but certain performance standards need to be met, which is the purpose of these regulations. While light quality, quantity, and electrical criteria are important, you must not overlook the warranty period, as this is a major factor for the consumer as they are forced into paying "extra money upfront" with the promise of "savings over ten years". If ten years is a pipe dream, then consumers are being forced to spend a lot more money, not less, and they rightfully will become quite angry. It would be CFL, all over again.

2) Power Factor minimum requirement should be kept at 0.9 -

   The technology READILY exists to provide cost effective solutions with power factors of 0.9 or greater, and the cost impact of going from a traditional AC/DC driver solution with a Power Factor of 0.7 to one with 0.9 is pennies in cost. In addition the new technology referenced above is also a viable alternative. The solutions that my company offers easily achieve a Power Factor of > 0.95 at the same price points of the existing drivers.

   The goal of these standards is to save energy and reduce loads on the grid for an expanding population. Power Factor is the key to maximizing the benefit of LED lighting and should not be sacrificed when the cost penalty for implementing a Power Factor of 0.9 is negligible.

Thank you for your time and consideration,

Steve Bakos

Vice President, Lighting Products
Exar Corporation