

# CEA Standard

Consumer Camcorder or Video  
Camera Low Light Performance

CEA-639 R-2009

December 2009



**CEA**<sup>®</sup>  
Consumer Electronics Association

[www.CE.org](http://www.CE.org)

## NOTICE

Consumer Electronics Association (CEA<sup>®</sup>) Standards, Bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Bulletins and other technical publications shall not in any respect preclude any member or nonmember of CEA from manufacturing or selling products not conforming to such Standards, Bulletins or other technical publications, nor shall the existence of such Standards, Bulletins and other technical publications preclude their voluntary use by those other than CEA members, whether the standard is to be used either domestically or internationally.

Standards, Bulletins and other technical publications are adopted by CEA in accordance with the American National Standards Institute (ANSI) patent policy. By such action, CEA does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard, Bulletin or other technical publication.

This CEA Standard is considered to have International Standardization implication, but the International Electrotechnical Commission activity has not progressed to the point where a valid comparison between the CEA Standard and the IEC document can be made.

This Standard does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

(Formulated under the cognizance of the CEA's **R4 Video Systems Committee**.)

Published by

©CONSUMER ELECTRONICS ASSOCIATION 2009  
Technology & Standards Department  
1919 S. Eads Street  
Arlington, Virginia 22202

**PRICE: Please call IHS  
USA and Canada (1-800-854-7179)  
International (303-397-7956)**

**<http://global.ihs.com>**

All rights reserved

Printed in U.S.A.

PLEASE!

DON'T VIOLATE  
THE  
LAW!

This document is copyrighted by the Consumer Electronics Association (CEA<sup>®</sup>)  
and may not be reproduced without permission.

Organizations may obtain permission to reproduce a limited number of copies by  
entering into a license agreement. For information contact:

IHS  
15 Inverness Way East  
Englewood, Colorado 80112-5704  
or call U.S.A. and Canada 1-800-854-7179, International (303) 397-7956  
See <http://global.ihs.com> or email [global@ihs.com](mailto:global@ihs.com)

## Contents

<b>Introduction.....</b>	<b>1</b>
Purpose.....	1
Applicability .....	1
Parameters to Be Measured .....	1
<b>Test Equipment and Test Setup .....</b>	<b>2</b>
Test Equipment .....	2
Test Chart Illumination and Test Set Up Notes .....	2
Preliminary Settings.....	3
Test Methods.....	4
1) Luminance Level .....	4
2) Black Level .....	4
3) Luminance Signal to Noise.....	4
4) Chroma level.....	5
5) Resolution .....	5
Measurement Summary .....	6
<b>Appendix 1.....</b>	<b>7</b>
<b>Appendix 2.....</b>	<b>8</b>
<b>Appendix 3.....</b>	<b>10</b>
<b>Appendix 4.....</b>	<b>11</b>

## Introduction

### Purpose

The purpose of this document is to specify the recommended method and test conditions to determine the low light sensitivity of consumer camcorders<sup>1</sup> operating on the North American 525 line, 60 Hz NTSC color video standard.

Utilizing standard engineering video test equipment, test charts and simple adjustable lighting, the low light sensitivity of consumer-grade camcorders will be determined. The low light sensitivity of the unit under test will be expressed in lux.

### Applicability

This specification applies to camcorders designed with gamma correction for both luminance and chroma channels. The camcorder shall be capable of operation under a wide range of light color balance conditions including incandescent, fluorescent and outdoor lighting.

Reference to this standard in manufacturer's published specifications or advertisements of low light sensitivity will imply that all production units of that model meet or exceed the published values.

In addition, the low light performance will be determined on the video camera section only. This specification will not be used to determine low light performance from a playback tape. For camcorders that do not provide a baseband video output from the camera video section, the manufacturer will be required to provide an adapter circuit with a 75  $\Omega$  baseband video output.

### Parameters to Be Measured

This standard will measure five parameters to collectively assess low light sensitivity:

- 1) Luminance level
- 2) Black level (to qualify the camera for further testing)
- 3) Luminance signal to noise
- 4) Chroma level
- 5) Resolution

Each parameter has been assigned a minimum acceptable level. The low light lux rating for the camcorder under test will be the minimum light level in lux required to achieve the minimum acceptable levels of performance. If the minimum acceptable level is not achieved in any one or more parameters, then the illumination level should be increased until the minimum acceptable performance level is met for all parameters (with the exception of black level). This illumination level will represent the low light performance for that camcorder.

---

<sup>1</sup> For the purpose of this document, the terms "camcorder", "video camera", and "camera" will be used interchangeably.