

Analysis of Television Luminance and Power Consumption

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BY

Keith Jones, Australian Digital Testing

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Executive Summary Prepared by

Christopher Stone, CLASP

Report Prepared by

Keith Jones, Australian Digital Testing



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Abbreviations

3-Bar	Test pattern cited in a number of the current television programme measuring standards such as US and Australia
50% Grey	A test pattern currently being discussed by European manufacturers
9-Point	Test pattern used in Chinese television standard
ABC	Automatic Brightness Control
ABL	Automatic Brightness Limiting
APL	Average Picture Level
ADT	Australian Digital Testing Pty Limited
CLASP	Collaborative Labelling and Appliance Standards Program
HD	High Definition
IDTV	Integrated Digital television
LCD	Liquid Crystal Display
MPEG	Motion Picture Experts Group
MPEG-2	A standard for coding of video and associated audio
MPEG-4	A collection of methods defining compression of video and audio
PDP	Plasma Display Panel
PVR	Personal Video recorder
SD	Standard Definition
STB	Set-Top Box
TV	Television

Executive Summary

The U.S. Department of Energy (DOE) and Environmental Protection Agency (EPA) are in the process of establishing test procedures for televisions. Therefore, CLASP is investigating the efficacy of the current test procedures used for television energy efficiency to identify improvements that can be made. In the short term, suggested improvements include revisions to existing test procedures; in the longer term, suggested improvements include new test methods to improve the quality of television power consumption measurements.

This study addresses four main areas of research:

- Energy use of televisions is typically evaluated based on product performance in the “home” picture mode (home mode), the default setting for consumers. Manufacturers must set the luminance of television in home mode to be at least 65% of the luminance level produced in “retail” picture mode (retail mode), the setting used in stores. Three different test patterns are currently used to verify whether home mode luminance is at least 65% of retail mode luminance. The 3-bar pattern is currently used in the US, and two other test patterns have been identified as possible alternatives. This study evaluates the pros and cons of each test pattern, including whether each test pattern allows for accurate measurement of screen luminance for all TV display technologies found in the U.S. market.
- Automatic brightness control (ABC) adjusts the brightness level of a television in response to ambient light levels in order to reduce energy use. This study investigates whether the current ENERGY STAR test method provides results that are representative of actual television energy use with ABC enabled. This study investigates whether the energy use of televisions using ABC is linearly related to ambient light levels, and whether there is an ambient light level at which the energy use of televisions increases or decreases significantly.
- It has been proposed that a power ratio evaluation could be used in place of a luminance ratio evaluation to ensure that measurements of television energy performance accurately represent performance under real world conditions.. This study investigates whether a power ratio provides sufficient information in comparison with a luminance ratio in the evaluation of television energy performance.
- There is little data available on the energy use implications of new television features. This study includes a preliminary investigation of the energy use of televisions with 3D and internet modes enabled.

This study presents the findings from the collection and analysis of empirical data from testing 40 televisions, representative of the spectrum of technologies available in the U.S. market. Of the 40 televisions tested, 17 used LCDs backlit by CCFLs, 13 used LCDs backlit by LEDs, and 10 used plasma technology. One television of the 40 had 3D capabilities, and one television was internet-enabled.

Key Conclusions and Recommendations:

1. Both the 9-point and 50% gray test patterns show significant improvements over the current 3-bar pattern for use in determining luminance ratios for all television display technologies.

In particular, these test patterns enable more consistent measurements of the luminance of plasma televisions - a significant improvement over the 3-bar test pattern, which tends to induce Automatic Brightness Limiting (ABL) of plasma televisions in retail mode. These alternative test patterns do change the home mode acceptability of some samples compared to the current 3-bar pattern.

- Test procedures should use the 9-point or 50% gray test pattern, or a combination of both, rather than the 3-bar test pattern.
 - Any proposed change to require use of the 50% gray or 9-point pattern should also include an evaluation of a combined pattern prior to implementation.
 - The 9-point pattern has an average picture level of 17%, while the 50% gray pattern and the current 3-bar pattern each have an average picture level of 50%. Likely because of this, the 9-point pattern produces a higher luminance measurement for every plasma television, indicating that it is defeating the ABL effect most significantly.
2. The average of 9 luminance ratio measurements taken with the 9-point and 50% gray patterns varies by less than 2% (in most instances, less than 0.5%) from the measured luminance ratio at a single point in the center of the screen. This small variation exists despite larger variation in absolute luminance values across the 9 points.
 - The similarity between the average and single-point luminance ratios likely occurs because any points with higher luminance in retail mode will also have higher luminance in home mode, leading to a similar ratio across the screen.
 - More testing is recommended (using the final selected test pattern) to determine if a single test point is sufficient for determining luminance ratios. If this is the case, a single-point test with the 50% gray pattern or the center of the 9-point pattern would save time and resources for testing facilities.
 3. Discussion has commenced in the IEC committee TC 100, TA14 on adding a moving image to the televisions test procedure (adapting the Broadcast test loop), to allow for more accurate testing of luminance levels for all TV display technologies.
 - This hypothesis should be tested further. It is unlikely that such an approach will be available within the time needed for the current ENERGY STAR test method revisions.
 4. Preliminary results indicate that both contact and non-contact luminance meters provide acceptable results.
 - If a 9-point test pattern is used, contact sensors should be specified because they induce less error, minimize the impact of room ambient light levels, and are easier to use.
 5. The ENERGY STAR test procedure requires ABC-enabled televisions to be tested at 0 lux and at 300 lux. Data shows that power consumption in retail mode generally aligns power consumption at 300 lux with ABC-enabled. Data also shows that power consumption in the darkest programmed mode (often used for watching movies) does not align power consumption at 10 lux with ABC-enabled. (See **Figure X1** below.) Power consumption at the darkest programmed mode (ABC disabled) is in most cases slightly higher than television power consumption at 50 lux with ABC-enabled, and significantly higher than at 10 lux.

Note: this study did not measure power consumption of ABC-enabled televisions at 0 lux, but utilized 10 lux for the low ambient light point.

- Because televisions in the darkest programmed picture mode have significantly higher power consumption than ABC-enabled televisions at ambient light levels of 10 lux, it appears that manufacturers have reduced luminance levels dramatically at very low levels of ambient light. This indicates that the 0 lux point as defined in ENERGY STAR test procedures may be exploited to skew the reported power consumption of ABC-enabled televisions.

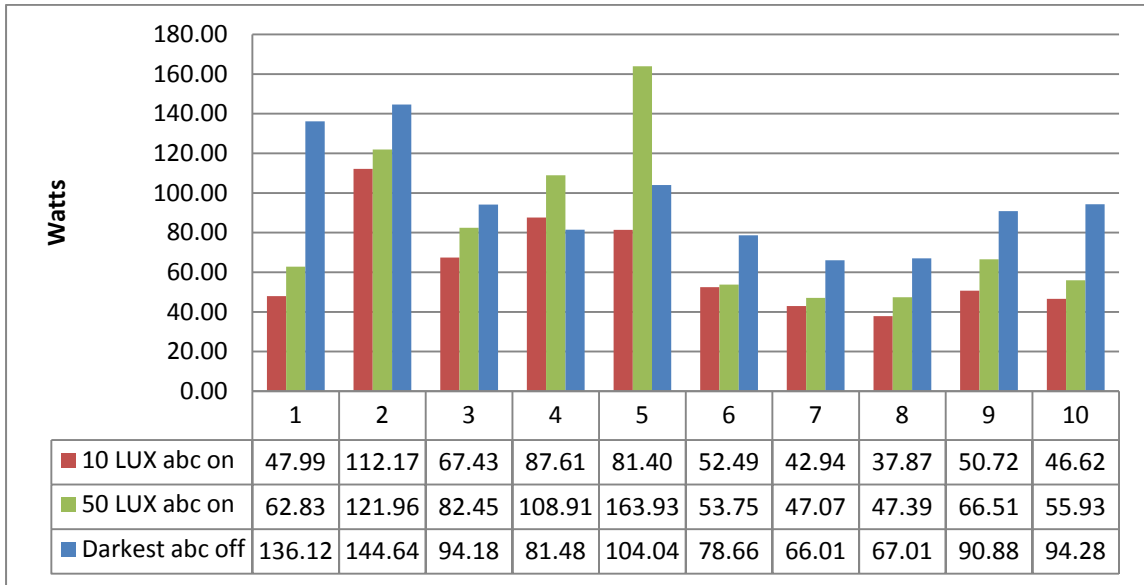


Figure X1: Darkest mode vs. ABC power consumption

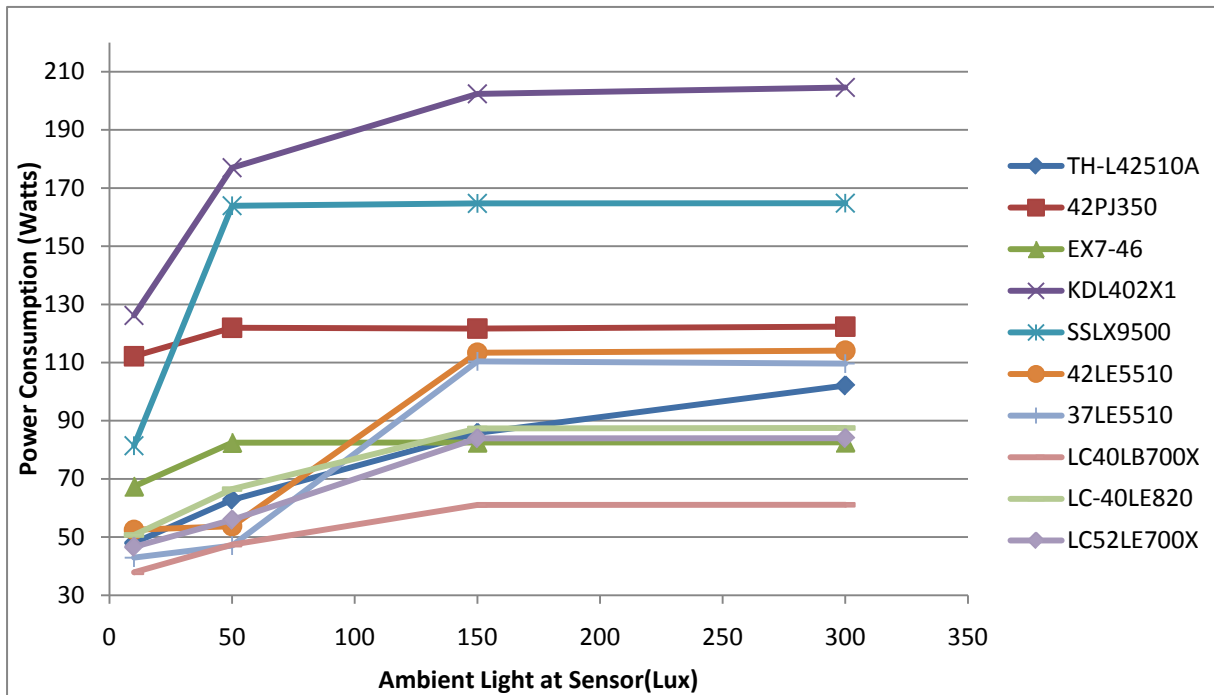


Figure X2 Power Consumption vs. Ambient Light

6. Data displayed in **Figure X2** (above) shows that power consumption of televisions increases significantly at 50 lux.
 - **As critical information to understand before undertaking the next required changes for ENERGY STAR, more research is needed to determine the average, high, and low ambient light levels in households.** The outcome of this research will enable the ABC function of televisions to be tested using more accurate testing points that fall within a reasonable range of television viewing background luminance.
 - Most likely the new testing points would include the average lowest ambient light levels, the average highest ambient light levels, and the average overall light level or any recurrent light levels (incidence peaks) in the middle.
7. It was noted in a number of cases that power consumption was actually higher with ABC enabled than in home mode (with ABC disabled) at ambient light levels above 50 lux. To adequately evaluate power consumption and avoid the possibility of televisions using more energy with ABC enabled, tests should be performed with ABC enabled regardless of the default mode of the device when shipped.
 - Based on findings in this report, there appears to be no comparable relationship between luminance ratio and the resulting power ratio. Additionally, specific television technologies respond very differently, making it an undesirable approach.
 - No recommendation can be made to replace luminance ratio with power ratio.
8. One television tested in 3D mode showed a 132% increase in power consumption.
 - Although this is a significant increase in power consumption, one television is not representative of the entire market of 3D televisions. More testing is needed to determine the effect of 3D mode on television energy use. Testing will require a dedicated 3D test clip.
9. One television tested in internet-enabled mode did not use significantly more energy than non-internet enabled televisions.
 - Only one television was tested, and it was not tested with network streamed video, but only with the internet mode enabled while watching the standard test clip. More testing is needed to determine the effect of internet-enabling and data-streaming on televisions.
 - Follow-up testing should include samples with network and other IP features enabled and operating, streaming data.

Supplemental Analysis

As televisions continue to evolve and manufacturers develop additional features and functions, a modified approach to energy efficiency evaluation will be necessary. This section provides additional analysis, using the findings of this report, to lay out the possible use of multiple power measurements for test procedures. It then uses this new proposed method to compare multiple power measurement test results with ENERGY STAR calculated results.

Multiple power measurements

From the results of this study, it seems that a significant amount of time is spent trying to verify that the home/default picture mode setting is sufficiently bright with respect to the retail picture mode setting. The present procedures to accomplish that task do not produce uniform results across display technologies. As noted above, new test patterns and more data collection will be required to improve the method although overall test time may also need to increase.

A better solution may be to allocate time collecting power data in multiple modes to determine a composite metric, focusing on power consumption since it is the key metric for evaluation of energy efficiency.

By providing a comprehensive picture of television energy use, the use of multiple power measurements may make the luminance ratio and associated test methods and patterns unnecessary. The issue of home mode versus retail mode may become a non-issue when shifting to weighted mode based measurement of power.

- One recommendation for future test procedures would be to acquire power data at multiple luminance settings – Darkest (often movie mode), Brightest (retail mode), and Home (out of the box) – and calculate a power value using an average or weighting modes by use. The same approach can be extended to include testing with ABC enabled for televisions that incorporate that feature. Those additional tests would include additional data points and be calculated on a weighted average. As described above, further study of in-home luminance levels and usage would be beneficial in ABC-enabled applications.
 - A tremendous amount of effort went into the development of the IEC 62087 10 minute clip, which appears to work well for the intended purpose. Using that clip at multiple modes would not require new procedures.
 - A 3D mode test will need to be incorporated. Establishing a proper measurement method and extending it to calculate energy consumption based on weighting will inherently solve that issue in the process. If 3D mode exists, it can be weighted into the overall metric. A 10 minute clip of 3D content would likely be adequate for this purpose.

The 40 television samples were tested in home, brightest, and darkest modes with ABC disabled. **Figure X3** below shows power consumption in the home mode compared with a weighted power consumption (50% in home mode, 30% brightest, 20% darkest).

Figure X4 shows weighted results as a percentage of home power consumption. Though many results are similar, a number of the weighted results are significantly higher, with weighted power consumption averaging 106% of home mode power consumption.

These results indicate that because power consumption is currently tested only in home mode, home mode may be specifically adjusted to achieve lower power consumption results.

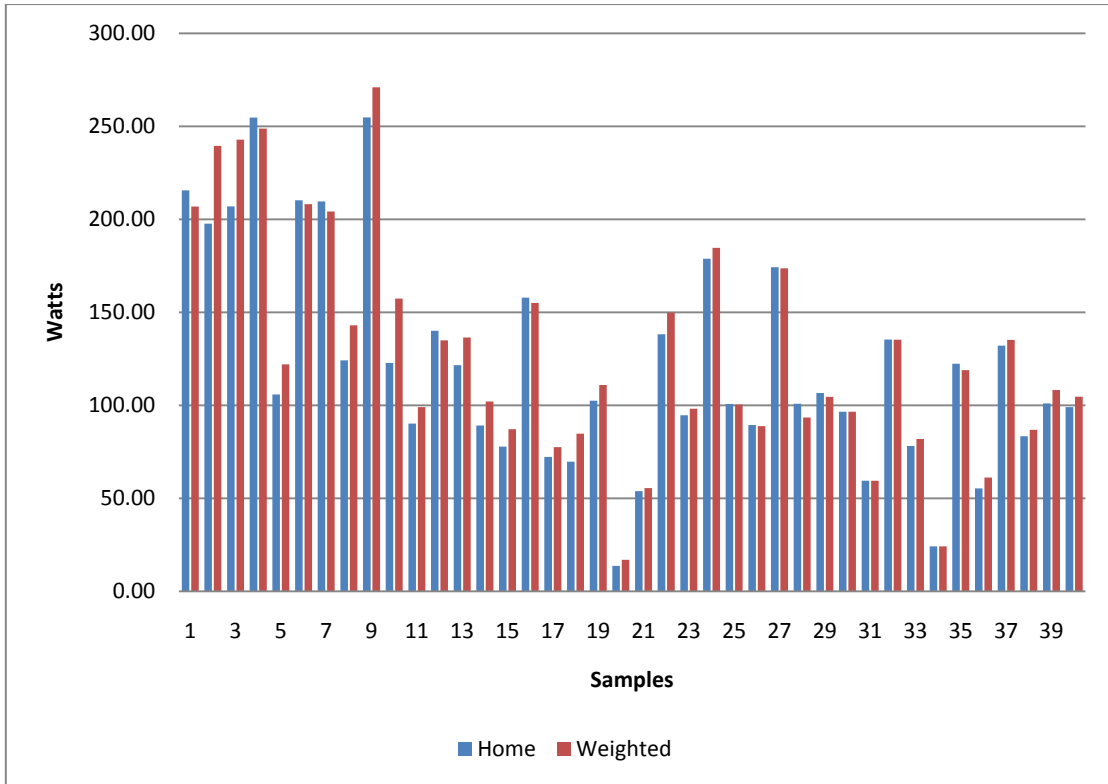


Figure X3: Power Comparison Home vs. Weighted

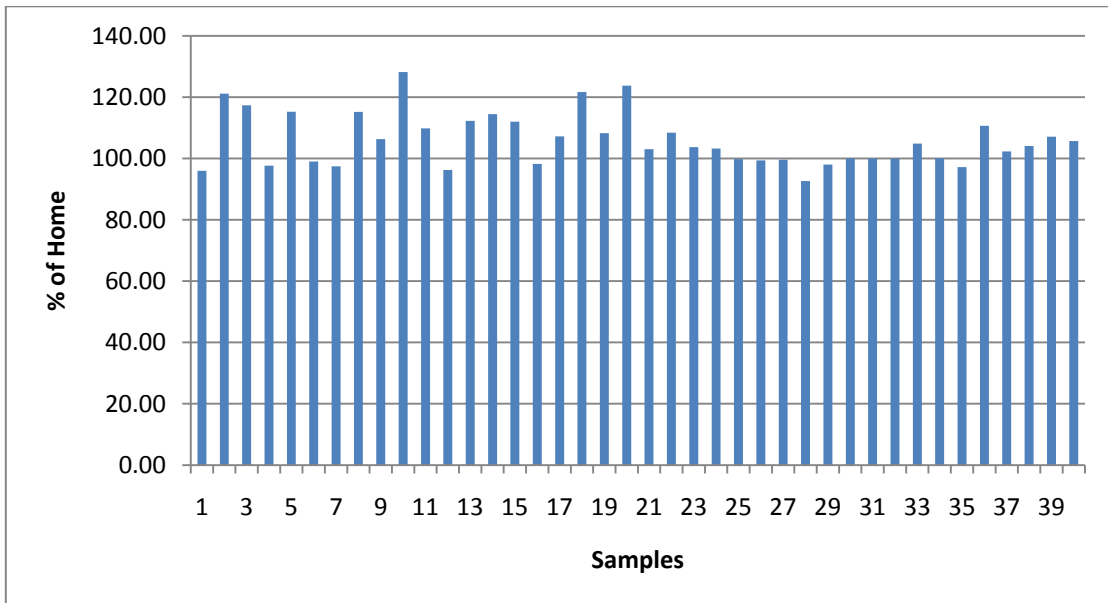


Figure X4: Weighted results % of Home

A possible way to use this multiple power mode procedure would be to break televisions into product types and components, where each component has a set number of data collection points with weighting/usage factors associated. This could be expanded to additional types or components and balanced with usage factors to get a final overall power consumption value in watts. For example:

- **Default procedure:**
 - 3 power runs at Home, Darkest, Brightest modes
- **Expanded procedure:**
 - For televisions with ABC capabilities, replace the above 3 power runs with 3-4 runs at ambient light levels found in homes (to be determined by further research as indicated above)
 - For televisions with 3D capabilities, add one additional run at highest 3D power setting available
 - For televisions with IP streaming capabilities, add one additional run with IP streaming test

This proposed procedure would incorporate and credit energy-saving design components, such as ABC, and promote proper implementation of those features. By combining various data points, this would provide an average value that represents the range of power consumption for the product. It also may result in far less ability to game the test procedure.

Figure X5 below looks at energy consumption of televisions using current test procedures, and compares this with possible procedures, as outlined above, that would use multiple power measurements. The Home bars indicate power consumption of ABC-disabled televisions in home mode. The ABC Weighted bars indicate the weighted power consumption of ABC-enabled televisions for average ambient light levels in homes, using a method similar to the current ENERGY STAR test procedure. The data used here represent an average of power consumption at ambient light levels of 10, 50, 150, and 300 lux, arbitrary points acting as placeholders for average ambient light levels in homes to be determined through further research. The Weighted bars indicate the power consumption of ABC-disabled televisions tested at home, retail, and darkest modes, similar to the default procedure proposed above.

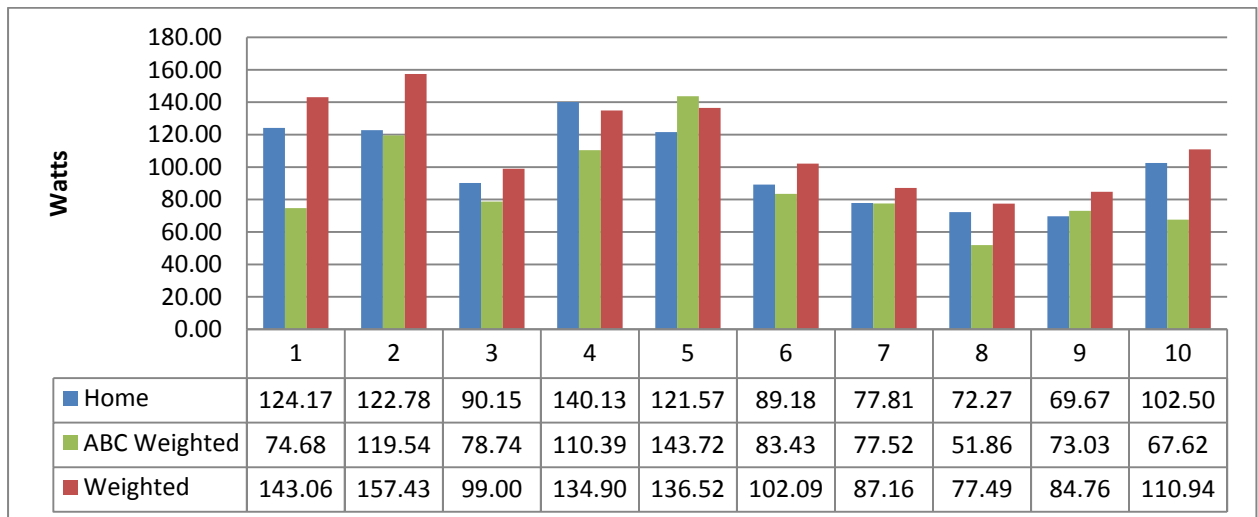


Figure X5: Energy use in various ABC-enabled and ABC-disabled modes from 10 television samples

ENERGY STAR V5.3 Comparisons

Evaluation of ABC results included a comparison with ENERGY STAR (ESTAR) calculated results. Comparison of various weighting levels and results are presented here.

Note: Values used for the ESTAR 0 LUX data point has been substituted with 10 LUX data. 0 LUX data was not obtained in the study.

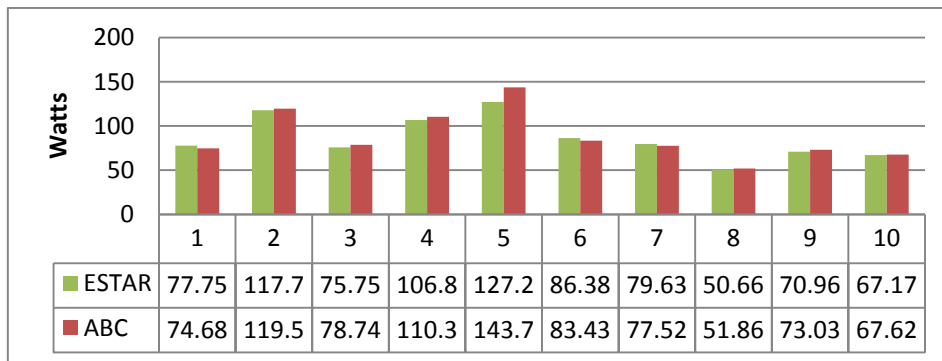


Figure X6: ESTAR vs. ABC

In **Figure X6**, ENERGY STAR V5.3 results compare closely with the ABC weighted results with one exception that was notably lower.

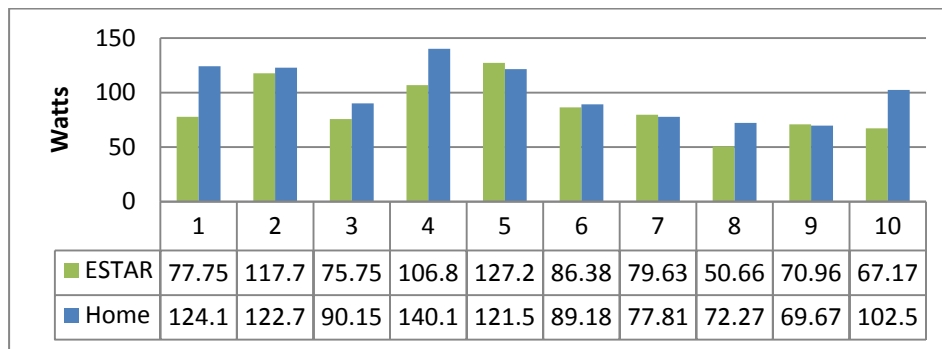


Figure X7: ESTAR vs. Home

In **Figure X7**, ESTAR results compared to Home mode appear to indicate substantial energy savings. However when fully analyzing the data, as outlined above, the ESTAR results incorporate data at 0 LUX which reduces average power consumption to an artificially low value.

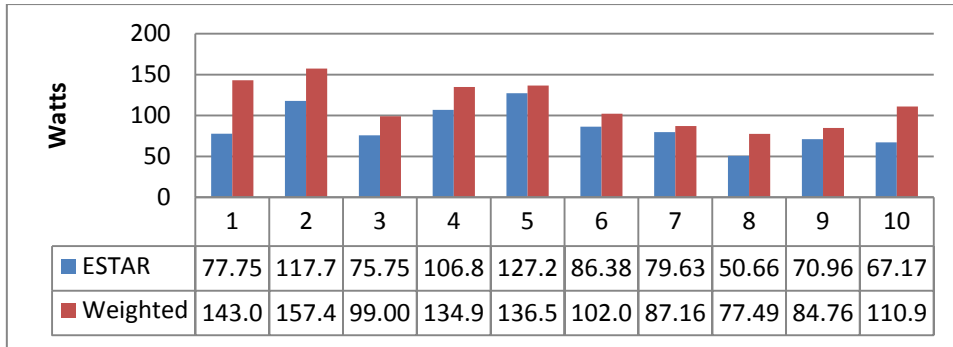


Figure X8: ESTAR vs. Weighted

In **Figure X8**, ESTAR results compared to multi-mode weighted results indicate the range of power consumption over various brightness levels including Home, Brightest, and Darkest is significantly higher than ESTAR results suggest.

1. Scope and Aims of the Research and Testing

CLASP requires ADT to provide the following material

1. Empirical data on the representative sample of television in the market on the luminance – power consumption characteristic;
2. Recommendations as to the appropriateness of luminance ratios over power ratios;
3. An analysis on the suitability of the 3-Bar, 50% and 9-Point patterns for luminance measurement;
4. Evidence as to what ratio levels should be used; and,
5. Comprehensive analysis of television luminance vs. Power consumption curves by technology type to provide data on the characteristics of Automatic Brightness Limiting (ABL) operation and Automatic Brightness Control (ABC) operation.

The nature of the work

ADT has tested:

- 13 x LED backlight televisions
- 10 x Plasma televisions
- 17 x conventional LCD televisions both fixed and modulated backlights

Table 1 lists each of the televisions by model number, brand, screen size, display technology and, for LCD televisions, the backlight technology used.

Table 1: List of televisions tested

Model	Brand	Size	Type	Backlight	Resolution	Special Features
AL-32LCD	Allure	32"	LCD	LCD	1080p	
DF3220BC	Baumann Meyer	32"	LCD	LCD	1080p	
IDLCD3211HDV	Bush	32"	LCD	LCD	1080p	
CHL3243A	ChangHong	32"	LCD	LCD	1080p	
LV3243A	Daewoo	32"	LCD	LCD	720p	
LV42L1B1LF	Daewoo	42"	LCD	LCD	1080p	
DG-FHD32LCD	DGTEC	32"	LCD	LCD	720p	
GLCD3206HDV	Grundig	32"	LCD	LCD	720p	
HL140V88PZ	Hisense	42"	LCD	LCD	1080p	
HL5140T18PZL	Hisense	42"	LCD	Edge Lit LED	1080p	
HSL8129HDI	Hisense	32"	LCD	LCD	1080p	
32LG50FD	LG	32"	LCD	LCD	1080p	
32LH20D	LG	32"	LCD	LCD	720p	
32LH35FD	LG	32"	LCD	LCD	1080p	
37LE5510	LG	37"	LCD	Full LED	1080p	IP/ABC
42LE5510	LG	42"	LCD	Full LED	1080p	IP/ABC
42LG30D	LG	42"	LCD	LCD	1080p	
55LX9500	LG	55"	LCD	Full LED	1080p	IP/ABC
TFTV552LED	Palsonic	22"	LCD	Full LED	1080p	
TH-L32X10A	Panasonic	32"	LCD	LCD	720p	
TH-L37G10A	Panasonic	37"	LCD	LCD	1080p	
TH-P42S10A	Panasonic	42"	PDP	N/A	1080p	ABC
LA37B530P7F	Samsung	37"	LCD	LCD	1080p	

Model	Brand	Size	Type	Backlight	Resolution	Special Features
UA32C4000PD	Samsung	32"	LCD	Edge Lit LED	1080p	
UA55C7000WF	Samsung	55"	LCD	Full LED	1080p	IP/3D
LC-19LE520X	Sharp	19"	LCD	Full LED	1080p	
LC-40LB700X	Sharp	40"	LCD	Full LED	1080p	ABC
LC-40LE820	Sharp	40"	LCD	Edge Lit LED	1080p	ABC
LC-52LE700X	Sharp	52"	LCD	Full LED	1080p	ABC
EX7-46	Sony	46"	LCD	Edge Lit LED	1080p	ABC
KDL-40ZX1	Sony	40"	LCD	Edge Lit LED	1080p	ABC
PT4252HD	Celestial	42"	PDP	N/A	1080p	
EV42P	Electroview	42"	PDP	N/A	1080p	
42PJ350	LG	42"	PDP	N/A	1080p	ABC
50PK550	LG	50"	PDP	N/A	1080p	
CP-42PDH10S	AWA	42"	PDP	N/A	1080p	
PXT-32XD3	NEC	32"	PDP	N/A	1080p	
TH-P46S10A	Panasonic	46"	PDP	N/A	1080p	
PS-50B550T	Samsung	50"	PDP	N/A	1080p	
PTV42HDQ	Vivo	42"	PDP	N/A	1080p	

Power and luminance

Each test consisted of power consumption measurement using the IEC ten minute video clip as well as the luminance level for each of the following equipment operating conditions:

1. The recommended “Home” mode (often called normal or standard display mode).
2. The darkest mode
3. The brightest mode (often called retail or shop display mode)

The method used was the method in IEC 62087 Ed2:2008.

Illuminance conditions¹

For the Home mode a curve was generated of power consumption vs. illuminance level. Where an Average Brightness Limiting (ABL) feature exists, characterized the ABL operation. For the purpose of this testing, luminance levels of 10, 50, 150 and 300 Lux were used. The illuminance was measured at the ABL sensor. The illuminance source was an adjustable diffuse light source.

Luminance test pattern comparisons

For luminance measurement in Home mode a comparison of three test patterns has been conducted being:

1. 3-Bar, which is an established test pattern used in luminance measurement
2. 50% Average Picture Level (APL), which is currently under discussion by European manufacturers for luminance measurement
3. 9-Point, which is used by Chinese manufacturers for TV luminance measurement

This series of measurements have been conducted with a contact light meter and a non contact light meter.

Other measurements

Televisions with internet connectivity were measured with and without the internet connected. Standby power modes were also measured.

¹ Illuminance measures ambient light whereas luminance is the measure of the brightness of an object such as a television display.

2. Methodology

2.1 Test equipment used

Test equipment used ADT used the following test equipment:

- Konica Minolta CA-210 contact luminance meter (contact tests)
- Konica Minolta LS-100 luminance meter (non contact tests)
- Yokogawa WT-210 power meter.
- Greendot Electric Corporation Servo Voltage Stabiliser.

2.2 Test procedure

ADT carried out the following test procedure:

- Televisions were set up in a test laboratory with an illuminance level of greater than 300 Lux for the first round of testing and an ambient temperature of 22 degrees centigrade, which was monitored throughout the testing process.
- IEC 62087 Blu-ray disc was played out to perform the power measurement on all television models utilizing the ten minute test clip and values were recorded.
- The three values that were measured were the “Out of the Box” or “Home” mode, the darkest mode and the “Store/Shop” mode.
- Contact LUX measurements were then recorded using the 3-Bar, 50% Luminance and nine Point patterns across all three modes and the values recorded.
- Non contact measurements were then performed on each unit in the “Home” mode only, using the 3-Bar, 50% Luminance and 9-Point patterns.
- Dark room conditions were then set up and the televisions were measured in LUX conditions of 10, 50,150 and 300 respectively. The ten minute test clip was used in all these tests and the power consumption was also recorded.
- Plasma televisions had additional tests performed on the “Home” mode, each unit’s contrast ratio was measured starting from a base level of ten working up to 100 using increments of ten for each measurement.
- All units tested had the active (if applicable) and the passive standby modes power measurement recorded.
- Televisions that had the capability to disable the Automatic Brightness Control (ABC) function were tested in this condition as well as the function enabled, see results in tables provided in the report.
- Four televisions had internet capability. These units had the standby power recorded with the internet connected.

3. Detailed Results and Analysis

3.1 Automatic Brightness Limiting technology used in plasma TVs

Automatic Brightness Limiting (ABL) is a technology that protects the phosphors in a Plasma panel from damage where there is a high luminance level on the screen. ABL limits the drive to the phosphor cells in the panel once the Average Picture Level (APL) exceeds a predetermined limit. Different manufacturers use different levels for ABL as panels have differing requirements for protection to damage of the phosphors.

Figure 1 shows the characteristic ABL curves for the plasma televisions tested.

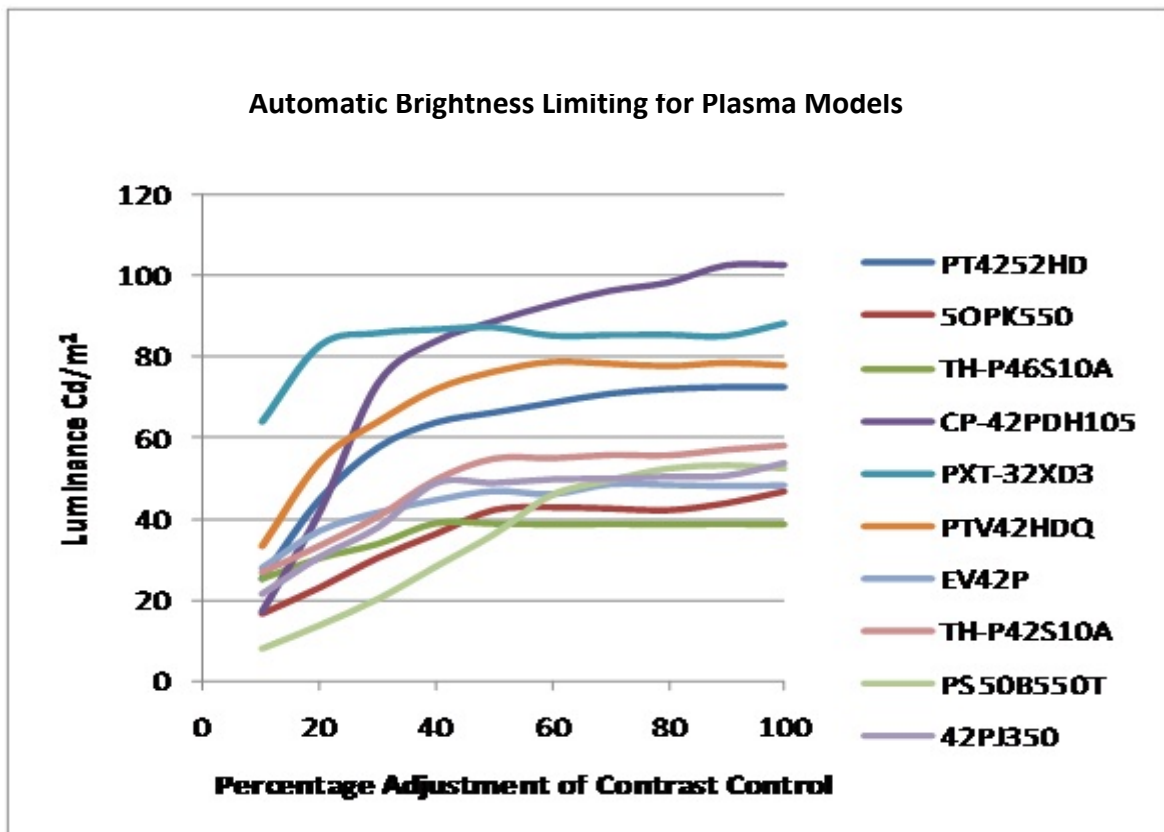


Figure 1: ABL Curves for the Plasma televisions

As can be seen from the figure 1 above, the ABL is being activated at contrast levels of between 20 – 40 %. These levels coincide with APL levels of about the same values. This means that, if a test pattern has an APL value of over these limits and depending on its video content, it may be invoking ABL. Therefore it will not be truly measuring the peak white luminance that would exist on video content where the APL is low but small areas of the screen have peak white content. Examples of this type of video content are car headlights or fireworks in night time scene.

These pictures will be significantly brighter than the measurement using a test pattern with a high APL would suggest. This would lead to a higher Home mode to brightest mode luminance ratio than in a situation where the ABL was not enabled.

3.2 Backlight dimming technology used in LCD TVs

Backlight dimming is a technology that is used with LCD televisions to improve picture quality. Televisions with this technology adjust their backlight level in response to the APL of the video being displayed.

There are three forms of backlight dimming:

1. the whole backlight is dimmed which affects the peak white that is being shown;
2. a region covering the entire width or height of the screen is dimmed leaving the rest of the screen at full backlight. This means that the peak white the dimmed area will be lower than the peak white in the non dimmed area; and
3. full dimming and is used on full LED LCD televisions where the LEDs providing the light for a small zone of LCDs are dimmed to represent the APL at that point of the screen.

Power and luminance in standard, brightest and darkest picture modes

Measurements were made of the power and luminance in Home or standard mode, and the brightest and the darkest picture modes. Ratios were then calculated from these measurements.

Home mode to brightest luminance ratio

Of particular interest was the power and luminance ratios between Home mode and the brightest mode as these are the ratios used in a number of the energy efficiency programs already in place for televisions.

The TVs were measured using the three test patterns:

1. 9-Point test pattern;
2. 3-Bar black; and
3. White pattern specified in many of the programs and a 50% grey, Black and White pattern.

9-Point test pattern

The 9-Point test pattern is shown in Figure 2 below. This pattern is used in the Chinese television standard. This test pattern has an APL of 17%. This APL is low enough so as not to significantly activate the ABL circuits of plasma televisions. It also has the advantage of a 9-Point measurement which can provide information on how the luminance varies over the area of the screen. This is discussed in more detail later in the report.

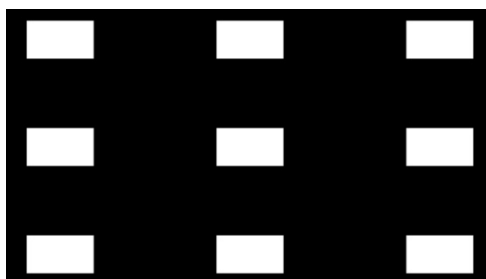


Figure 2: 9-Point Test Pattern

3-Bar Black and White (50% APL)

The 3-Bar Black and White test pattern, as shown in Figure 3 below, is cited in a number of the current television programme measuring standards such as US and Australia and is included in the IEC62087 test materials. This test pattern has an APL of 50% and does activate ABL on Plasma type televisions.



Figure 3: 3-Bar Black and White

50% Grey test pattern

This pattern has been proposed by one company in Europe. At this time ADT does not have permission to show the pattern. In brief, however, it can be described as a white window (100%) with APL in the centre of the screen occupying 20% of the screen area. A black (0% APL) border surrounds the screen also occupying 20% of the screen area. The remaining 60% of the pattern is 50% grey. The entire pattern has an APL of 50%. From the measurements presented below, it is apparent that the APL on plasma type televisions is substantially not activated with this pattern.

3.3 Luminance ratio results

Figure 4 to Figure 7 show the results for the televisions tested categorised by technology type using the 9-Point, 3-Bar and 50% grey & white test patterns.

The data has been presented in this way because it is important to investigate and understand the impact the test pattern has on the measurement. If the ABL and/or backlight dimming is being invoked by a particular test pattern, then the resulting measurements would not reflect the luminance that may be achieved by a display panel when only small areas of the screen are at a 100% white point. This means that when ABL or backlight dimming is being invoked there is a real possibility that the luminance ratio between the “normal viewing” mode and the “Brightest” picture mode may be understated.

It is fair to say that the lower the luminance ratio the greater the likelihood the effects of ABL or backlight dimming are being defeated.

Luminance ratio for plasma television

Figure 4 below illustrates that the 9-Point pattern (the blue bar) produces a lower luminance ratio in six out of ten of the plasma models.

For the four televisions where the 9-Point test pattern did not produce a lower ratio, the ratio was not very different to the other two test patterns. This would appear to be evidence that the 9-Point

pattern does indeed better defeat the operation of ABL and therefore provides a more accurate measurement and luminance ratio.

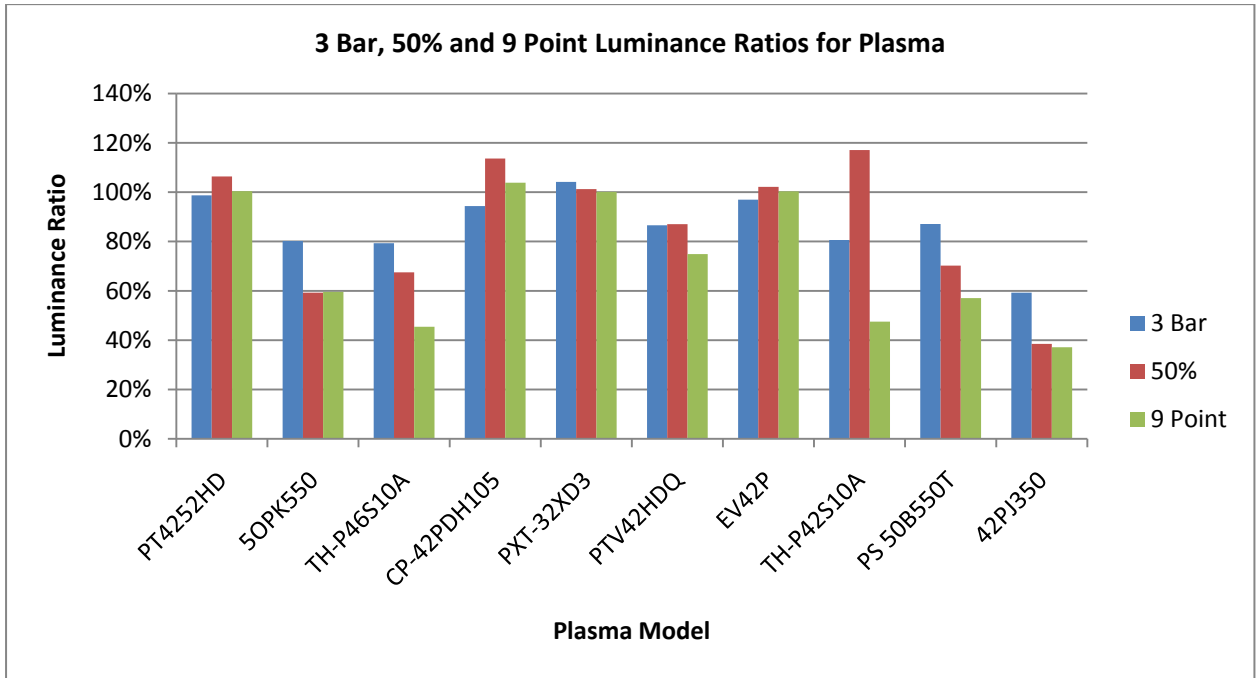


Figure 4: Luminance ratio between Home and Brightest Picture Modes for Plasma televisions

Luminance ratio of LCD TVs with CCFL backlight

Figure 5 shows the results for the LCD televisions with CCFL Backlight.

Fifteen of the 17 samples show results that are very similar for all three patterns although in a number of cases the 9-Point is marginally higher.

The result for the model LVA42L1B1LF is somewhat strange in that the 50% pattern produces a ratio of over 100%. Two other models (32LG50FD and 42LG30D) produce much higher ratios for the 9-Point test pattern. The reasons for these results are not readily apparent but they do indicate that some televisions will produce results that are counter intuitive depending on the test pattern used. It is reasonably clear that no one test pattern seems to provide a better result for LCD televisions with CCFL backlight.

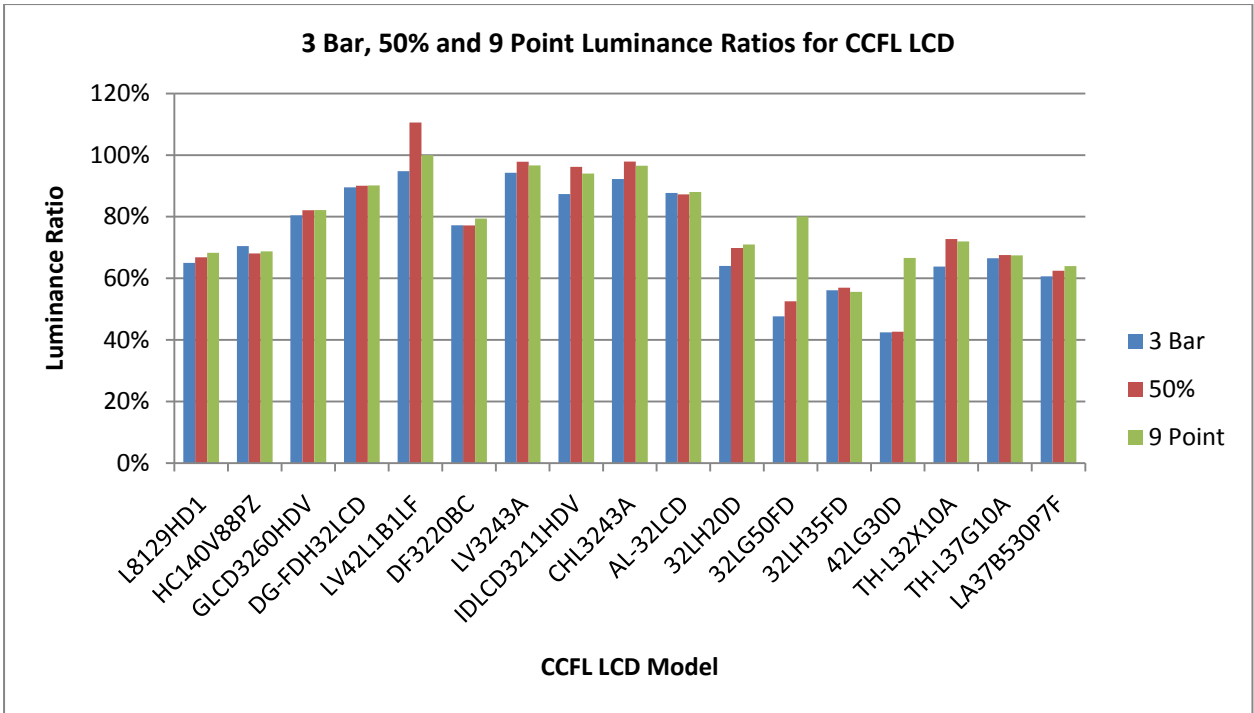


Figure 5: Luminance ratio between Home and Brightest Picture Modes for CCFL Backlight LCD televisions

Luminance Ratio of Full LED Backlight LCD televisions

Figure 6 below shows that there is little difference between the three test patterns for Full LED Backlight LCD televisions.

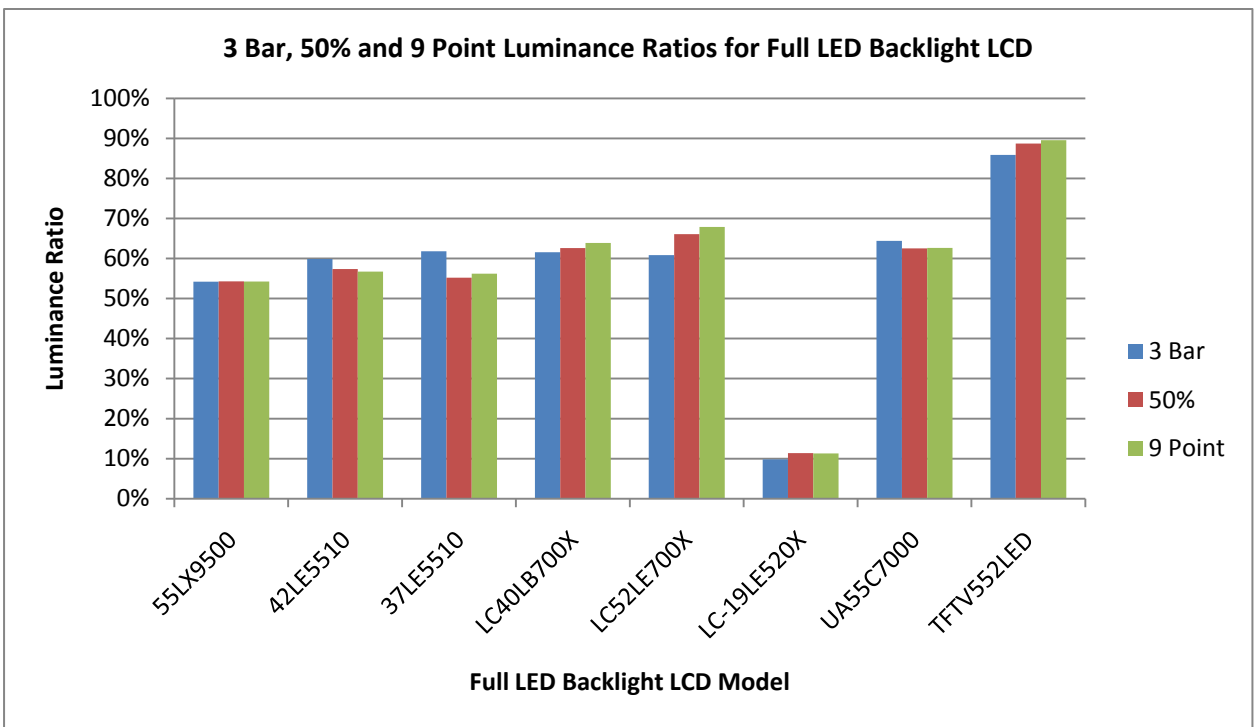


Figure 6: Luminance ratio between Home and Brightest Picture Modes for Full LED Backlight LCD TVs

Luminance Ratio of Edge Lit LED Backlight LCD televisions

Figure 7 again shows little difference between the test patterns for Edge Lit Backlight LCD TVs except for model LC-40LE820 where the 9-Point pattern has a significantly lower ratio.

However the 9-Point test pattern may have advantages over the two other types of test pattern as the 9-Point test pattern allows analysis of the effectiveness of the light guides used in edge lit television display technology.

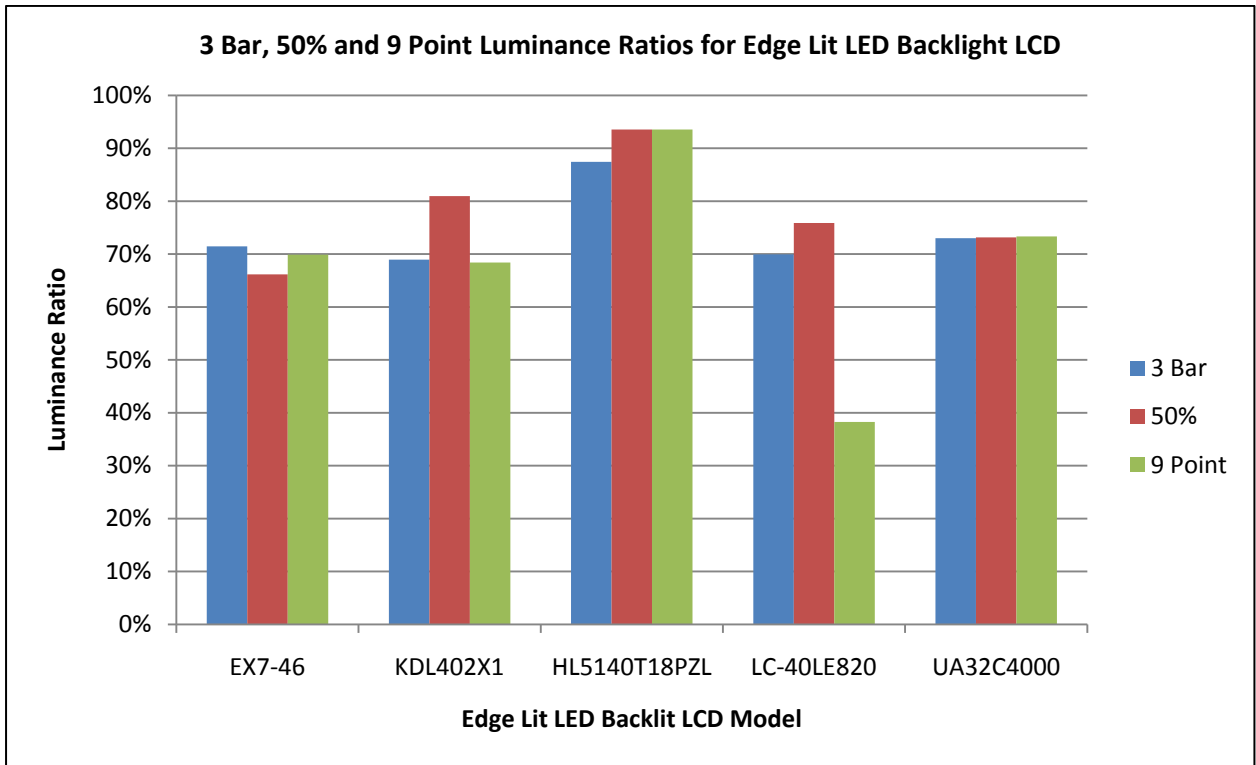


Figure 7: Luminance ratio between Home and Brightest Picture Modes for Edge Lit LED Backlight LCD televisions

3.4 Comparison of test patterns using absolute measurements

Although ratios are important in comparing the test patterns it is also useful to look at the absolute measurements.

For the purposes of the charts that are now presented the absolute values have been normalised using the 9-Point pattern as a reference. In this way assessment can be made as to how effectively the test patterns are defeating ABL and backlight dimming, which as discussed above, has the potential to misrepresent the luminance ratios.

Plasma television models

Figure 8 shows the results for Home viewing mode, which, being generally a lower luminance level, would be less likely to be invoking ABL effects. It is clear that the 3-Bar pattern measures lower than either of the 50% test pattern or the 9-Point test pattern. For most of the measurements the 9-Point test pattern is measuring a somewhat higher luminance than the other two patterns. In four of the measurements the 50% Grey test pattern and 9-Point test pattern produce similar results. In only two of the measurements the 50% Grey test pattern measures significantly higher than the 9-Point test pattern

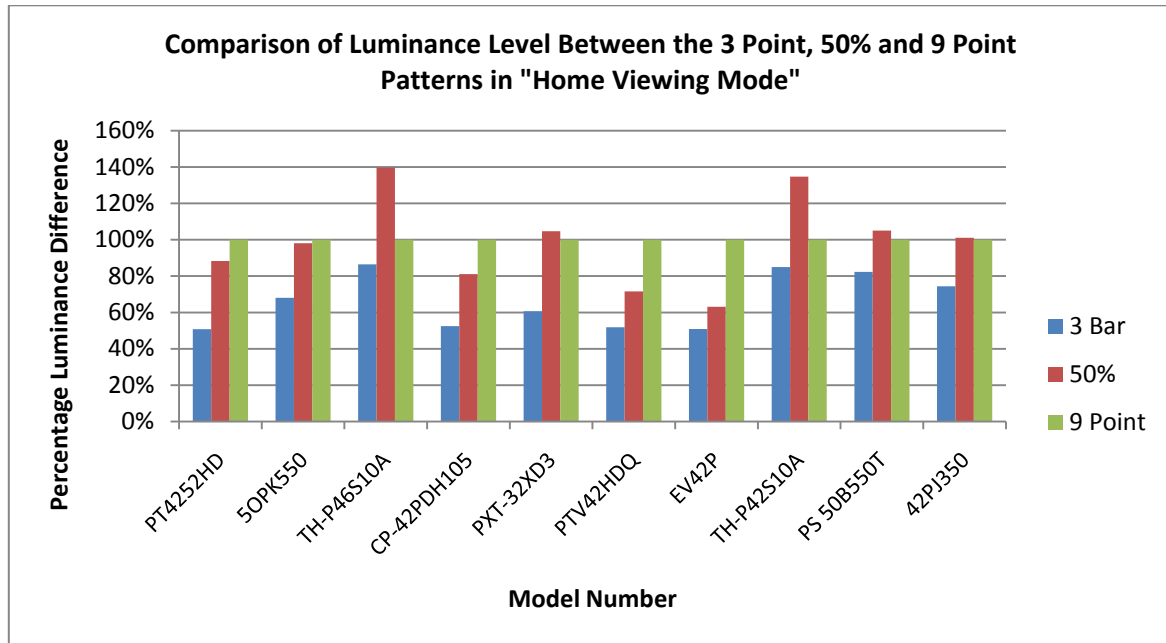


Figure 8: Comparison of the three test patterns for Plasma televisions in the "Home Viewing Mode"

Figure 9 shows the results for the brightest viewing mode. ABL is now very likely being invoked as the results would suggest. Again the 3-Bar test pattern produces a luminance measurement significantly lower than the other two test patterns. This would indicate a poor ability to defeat the ABL effect. The 9-Point test pattern produces a higher measurement for every television indicating that it is defeating the ABL effect the most significantly.

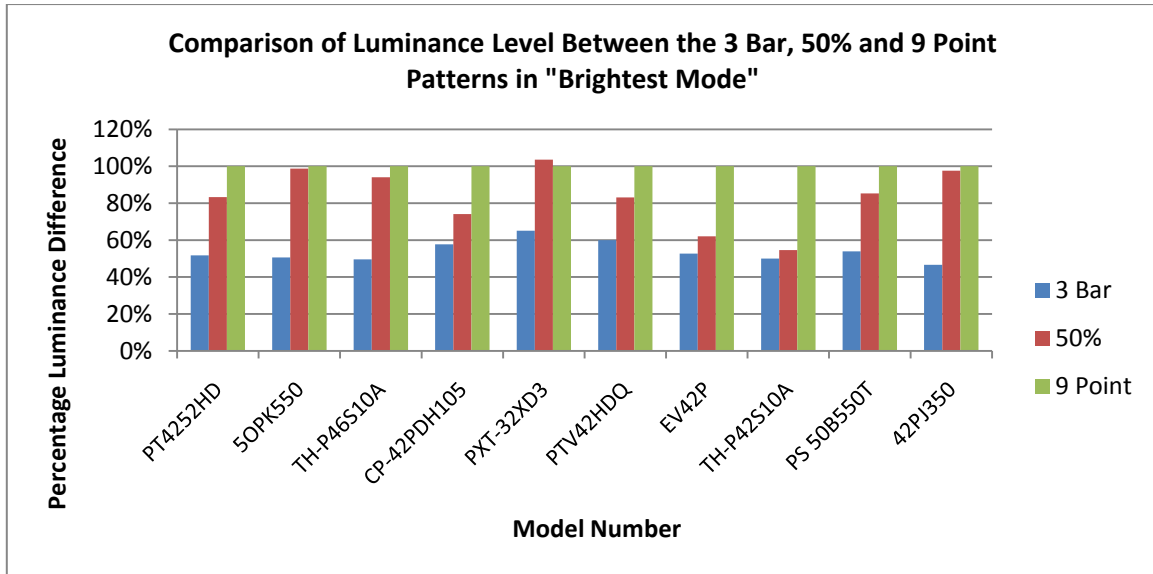


Figure 9: Comparison of the three test patterns for Plasma televisions in the brightest viewing mode

LCD models with a CCFL backlight

LCD televisions with a CCFL backlight have backlight dimming rather than ABL circuits. Figure 10 below shows the measured results for the LCD televisions with CCFL backlight in the Home viewing mode. It is clear that some backlight dimming processes are evident in some of the televisions.

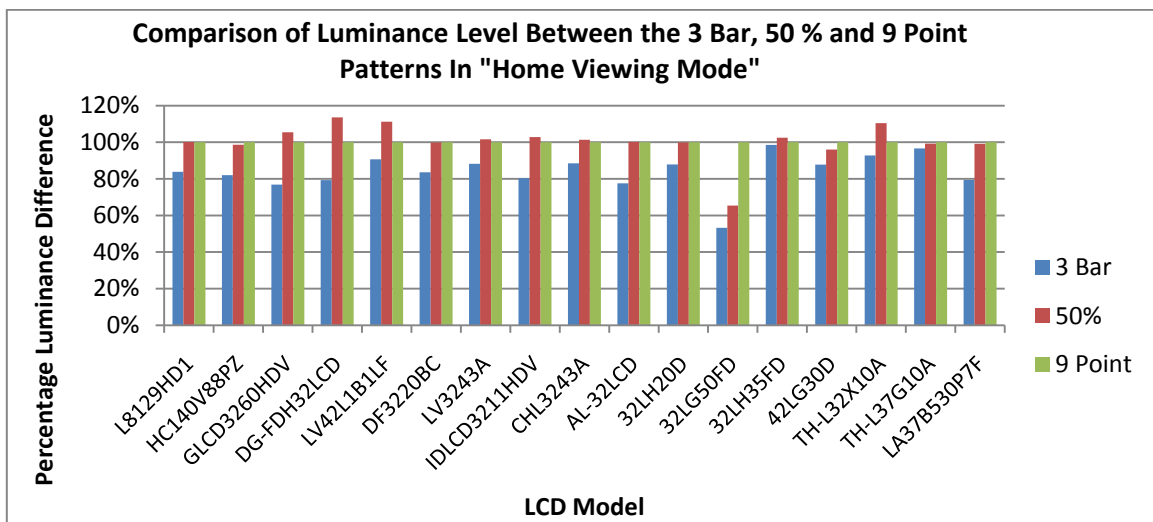


Figure 10: Comparison of the three test patterns for CCFL televisions in the Home viewing mode

If backlight dimming is not operating it would be expected that all three test patterns would produce the same luminance measurement. However this is not the case. The 3-Bar pattern seems to suffer the worse from the backlight dimming as the results for the 3-Bar test pattern are consistently low. It is most pronounced in the results for the model 32LG30D, which interestingly was also one of the models identified as producing anomalous results in the ratio analysis.

The results show that the 50% Grey test pattern and the 9-Point test pattern have similar results except for that particular model where whenever backlight dimming is operating the results of the 50% Grey test pattern are similar to results of the 3-Bar test pattern.

With Figure 11 below it is evident that the 3-Bar test pattern continues to suffer from the effects of backlight dimming. The results for the 50% Grey test pattern and the 9-Point test pattern are actually closer. The measurement anomaly for 32LG30D disappeared and had by a similar result for 42LG30D.

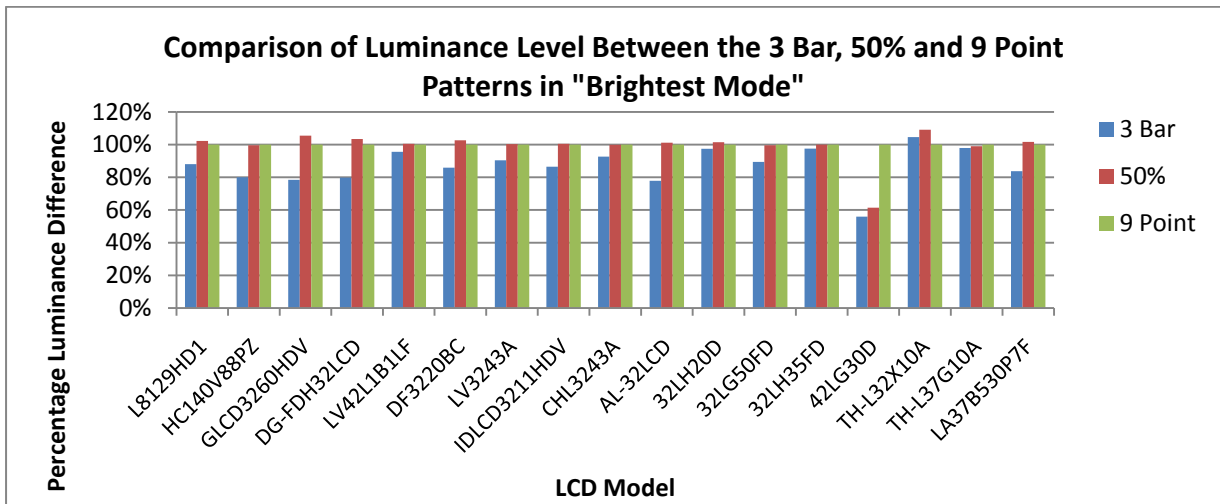


Figure 11: Comparison of the three test patterns for LCD televisions with a CCFL backlight in the brightest viewing mode”

The inability of the 3-Bar test pattern to defeat backlight dimming is not immediately obvious in the ratio study, as both home and brightest picture modes are being similarly affected.

LCD TVs with LED backlights

For LCD televisions with LED backlights there is little difference between the test patterns except for three models in the Home viewing mode. One of the television models ceases to have excessive backlight dimming effects in the brightest viewing mode. This is further evidence that no test pattern is able to provide explainable and consistent results for all technology types.

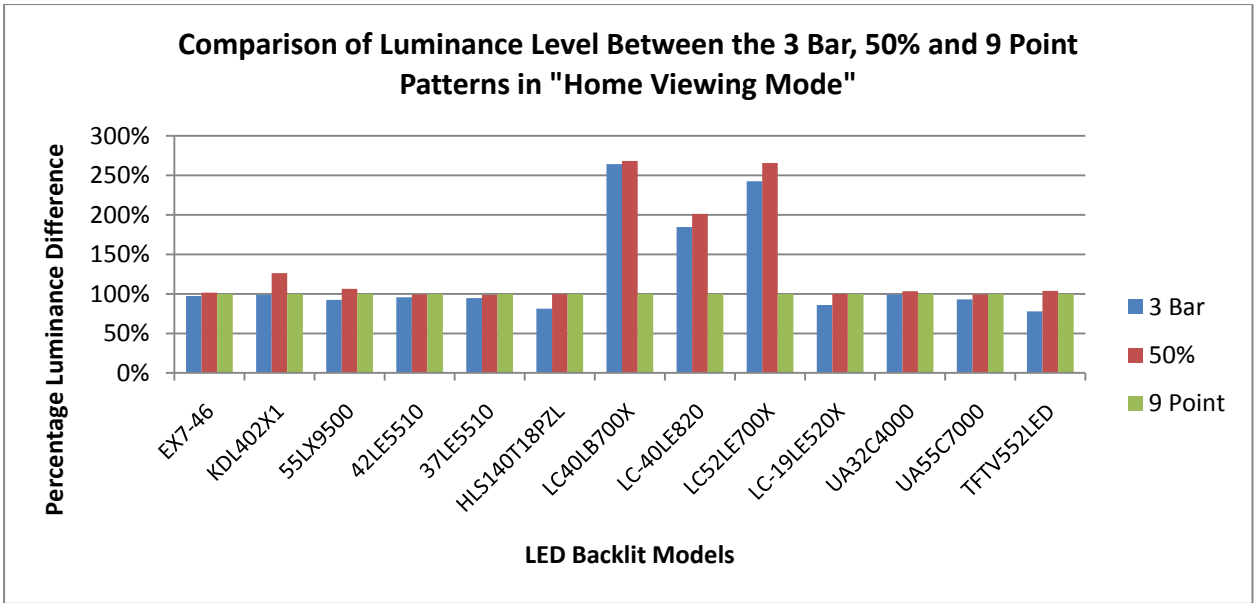


Figure 12: Comparison of the three test patterns for LED Backlight televisions in the Home viewing mode

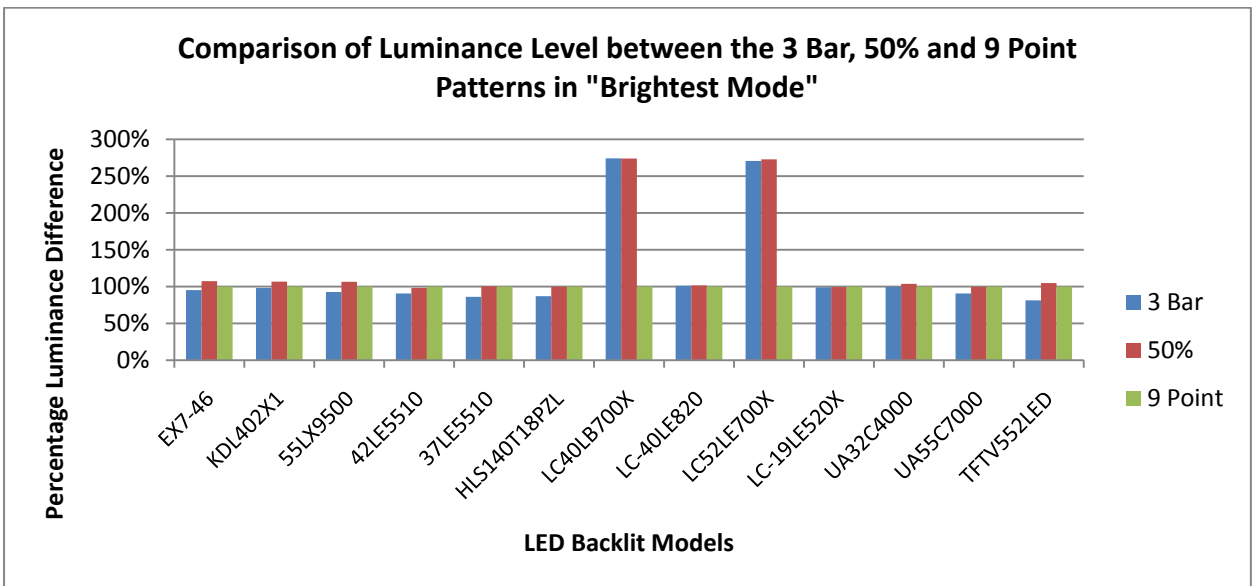


Figure 13: Comparison of the three test patterns for LED Backlight LCD televisions in the brightest viewing mode

3.5 Home mode to brightest luminance and power ratios

It has been suggested that using a luminance ratio may not be the best approach in ensuring overly dark home picture modes are not implemented. Those who have suggested this have further suggested that power consumption ratios may be a better parameter.

Figure 14 shows a comparison between the difference of luminance ratios and the power ratios. The chart shows clearly that there is little or no relationship between power and luminance ratio. Given the complex nature of ABL and backlight dimming technologies it seems unlikely that power consumption ratios would provide a more reliable measure.

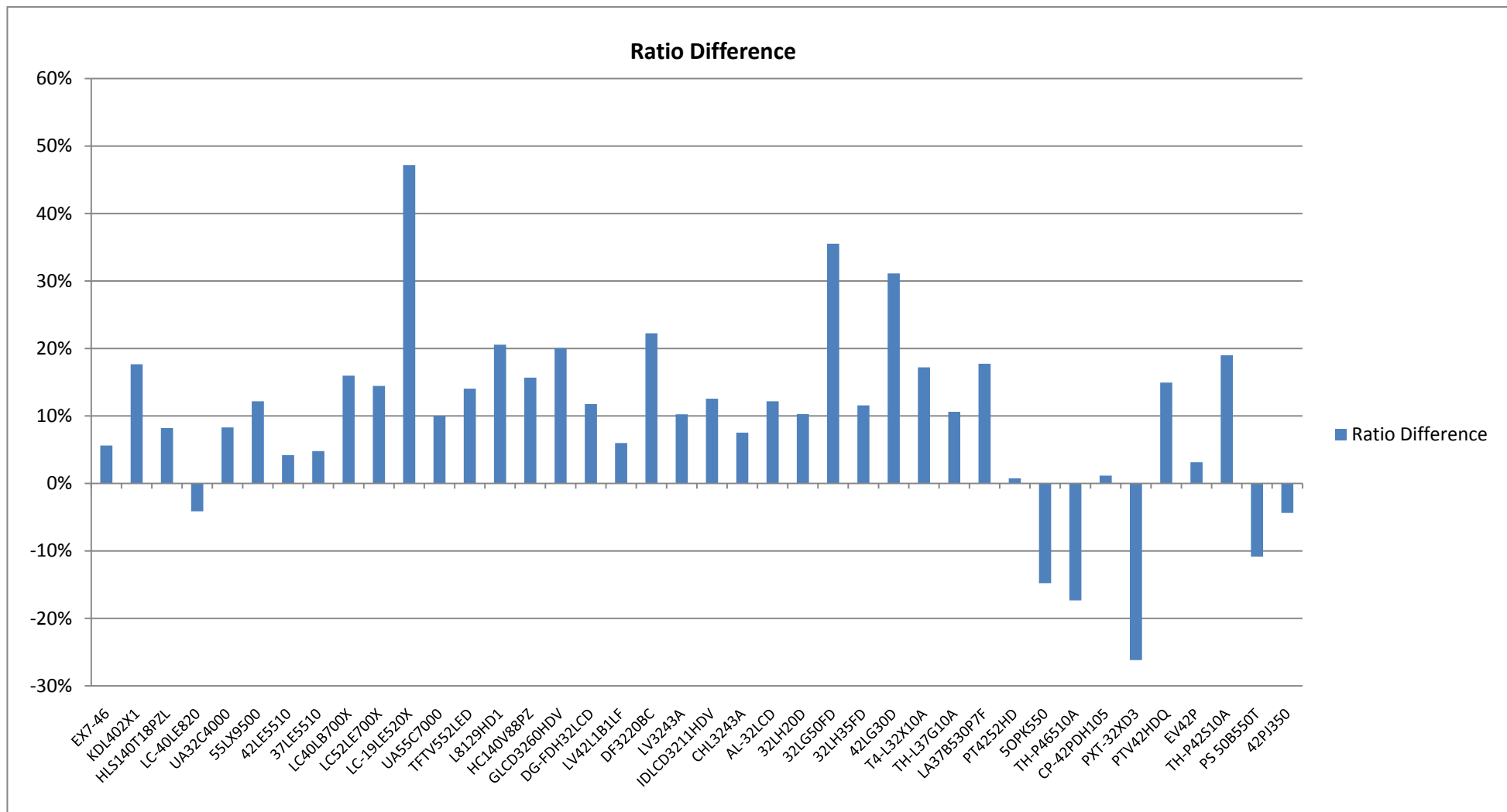


Figure 14: The difference between the luminance ratio and the power ratio

3.6 Home, Brightest and darkest power consumption

Table 2 shows the power measurements for each mode of power use. For on mode the power consumed in home, brightest and darkest is shown. The ratio between home and brightest is also shown.

Table 2: Power consumption of each model for home, brightest and darkest picture mode including Standby

Model	Type	Screen Size (Inches)	Darkest Mode Power(W)	Home Mode Power(W)	Brightest mode Power(W)	% Ratio Home/Brightest	Passive Standby (W)	Active Standby (W)	Internet Standby (W)
AL-32LCD	LCD	32"	134.89	135.33	135.46	0.13	0.34	-	
DF3220BC	LCD	32"	62.96	100.82	101.34	0.52	1.5	-	
IDLCD3211HDV	LCD	32"	96.48	96.54	96.63	0.09	1	-	
CHL3243A	LCD	32"	59.25	59.44	59.57	0.13	0.7	-	
LV3243A	LCD	32"	103.19	106.65	102.03	4.62	1.24	-	
LV42L1B1LF	LCD	42"	173.01	174.3	172.93	1.37	1.25	-	
DG-FHD32LCD	LCD	32"	88.34	89.37	88.21	1.16	0.27	-	
GLCD3206HDV	LCD	32"	100.28	100.65	100.18	0.47	1	-	
HL140V88PZ	LCD	42"	164.86	178.82	207.60	28.78	0.55	-	
HL5140T18PZL	LCD	42"	133.00	157.89	165.07	7.18	0.51	-	
HSL8129HDI	LCD	32"	88.36	94.63	110.59	15.96	1.6	-	

Model	Type	Screen Size (Inches)	Darkest Mode Power(W)	Home Mode Power(W)	Brightest mode Power(W)	% Ratio Home/Brightest	Passive Standby (W)	Active Standby (W)	Internet Standby (W)
32LG50FD	LCD	32"	67.94	122.35	147.09	24.74	0.8	-	
32LH20D	LCD	32"	56.47	78.09	105.13	27.04	2.8	-	
32LH35FD	LCD	32"	45.11	55.29	81.696	26.406	0.06	-	
37LE5510	LCD	37"	66.01	77.81	116.85	39.04	0.1	-	0.11
42LE5510	LCD	42"	78.66	89.18	139.23	50.05	0.1	-	0.11
42LG30D	LCD	42"	76.14	179.61	132.13	47.48	0.83	-	
55LX9500	LCD	55"	104.04	121.57	183.10	61.53	0.12	-	0.14
TFTV552LED	LCD	22"	24.13	24.11	24.13	0.02	0.1	-	
TH-L32X10A	LCD	32"	71.21	83.4	102.94	19.54	0.23	17.8	
TH-L37G10A	LCD	37"	91.92	101.06	131.03	29.97	0.42	17.81	
TH-P42S10A	PDP	42"	195.82	207.01	334.14	127.13	0.29	14.36	
LA37B530P7F	LCD	37"	86.35	99	126.29	27.29	0.25	-	
UA32C4000PD	LCD	32"	45.50	53.87	66.246	12.376	0.25	-	
UA55C7000WF	LCD	42"	125.17	138.19	185.73	47.54	0.1	-	0.12
LC-19LE520X	LCD	19"	14.47	13.68	24.00	10.32	0.1	-	

Model	Type	Screen Size (Inches)	Darkest Mode Power(W)	Home Mode Power(W)	Brightest mode Power(W)	% Ratio Home/Brightest	Passive Standby (W)	Active Standby (W)	Internet Standby (W)
LC-40LB700X	LCD	40"	67.01	72.27	93.19	20.92	0.3	16.5	
LC-40LE820	LCD	40"	90.88	69.67	105.84	36.17	0.22	13W	
LC-52LE700X	LCD	52"	94.28	102.50	136.11	33.61	0.45	16.5	
EX7-46	LCD	46"	94.18	90.15	116.96	26.81	0.2	14.6	
KDL-40ZX1	LCD	37"	81.48	140.13	161.78	21.65	2	36.4	
PT4252HD	PDP	42"	170.46	215.59	216.77	0.87	0.95	-	
EV42P	PDP	42"	183.08	209.62	209.41	0.21	0.71	-	
42PJ350	PDP	42"	144.64	122.78	223.72	100.94	0.12	-	
50PK550	PDP	50"	249.98	197.7	302.26	104.56	0.1	-	
CP-42PDH10S	PDP	42"	207.18	254.71	266.68	11.97	1.1	-	
PXT-32XD3	PDP	32"	141.80	105.88	135.81	119.93	0.7	-	
TH-P46S10A	PDP	42"	136.12	124.17	179.18	55.64	0.3	17.8	
PS-50B550T	PDP	50"	216.60	254.86	303.22	48.36	0.3	-	
PTV42HDQ	PDP	42"	195.05	210.28	213.55	3.27	0.6	-	

3.7 3D and video streaming

One model the Samsung UA55C7000WF had two extra features - 3D mode and internet streaming. The power consumption of these various modes were also measured and are shown in

Table 3: Power consumption of UA55C7000WF performing 2D, 3D and streaming functions

Signal Source	Average Power(W)
3D Free to Air	182.42
Energy test (HDMI)	138.19
YouTube (Internet)	134.10

Caution should be taken in the interpretation if these results as the video for each is different and therefore has a different APL which will affect the power measurement. It is safe, however, to suggest that the results are representative of the performance of this television.

It is interesting to note that the normal test using the HDMI input with the IEC broadcast video is similar to the result for the internet streaming. This is probably not surprising as an HDMI interface is likely to use about the same power as an Ethernet connection.

Of note is the increased power consumption of the 3D test which shows an increase of 132% in power use compared to the home mode power consumption.

3.8 Automatic Brightness Control technology

Automatic Brightness Control (ABC) is a technology that uses a light sensor to sense the light level in the environment that the television is being used and then adjusts the luminance of the display to provide a more appropriate viewing condition. As the illuminance level of a room decreases a television display does not need to be as bright and in fact in a darker room where the television's display is maintained at a higher luminance the television's display can be rather harsh for the viewer. The television's light sensor senses the lower level of light in the room and automatically reduces the television's luminance level. This not only produces a better viewing condition but also has the additional benefit of reducing the energy consumption of the television.

Ten of the forty televisions tested (25%) had this feature.

Figure 15 and Figure 16 show the power consumption and luminance levels against the ambient light that is detected by the light sensor. As can be seen the power consumption for a number of the televisions can be reduced by as much as 60 – 70 Watts, representing a considerable energy saving. This

saving in power is in direct association with the decreased luminance, which can be as much as 500 Cd/m² as can be seen in Figure 16.

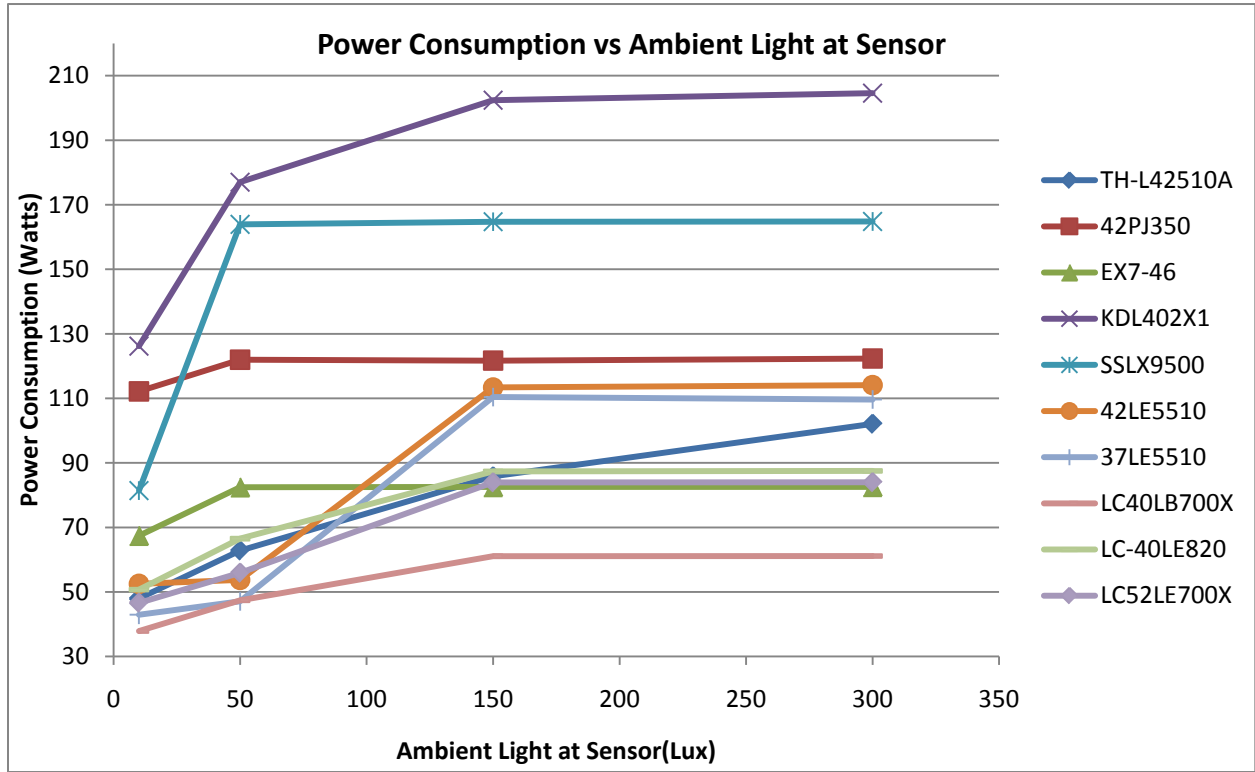


Figure 15: Power consumption vs Ambient Light

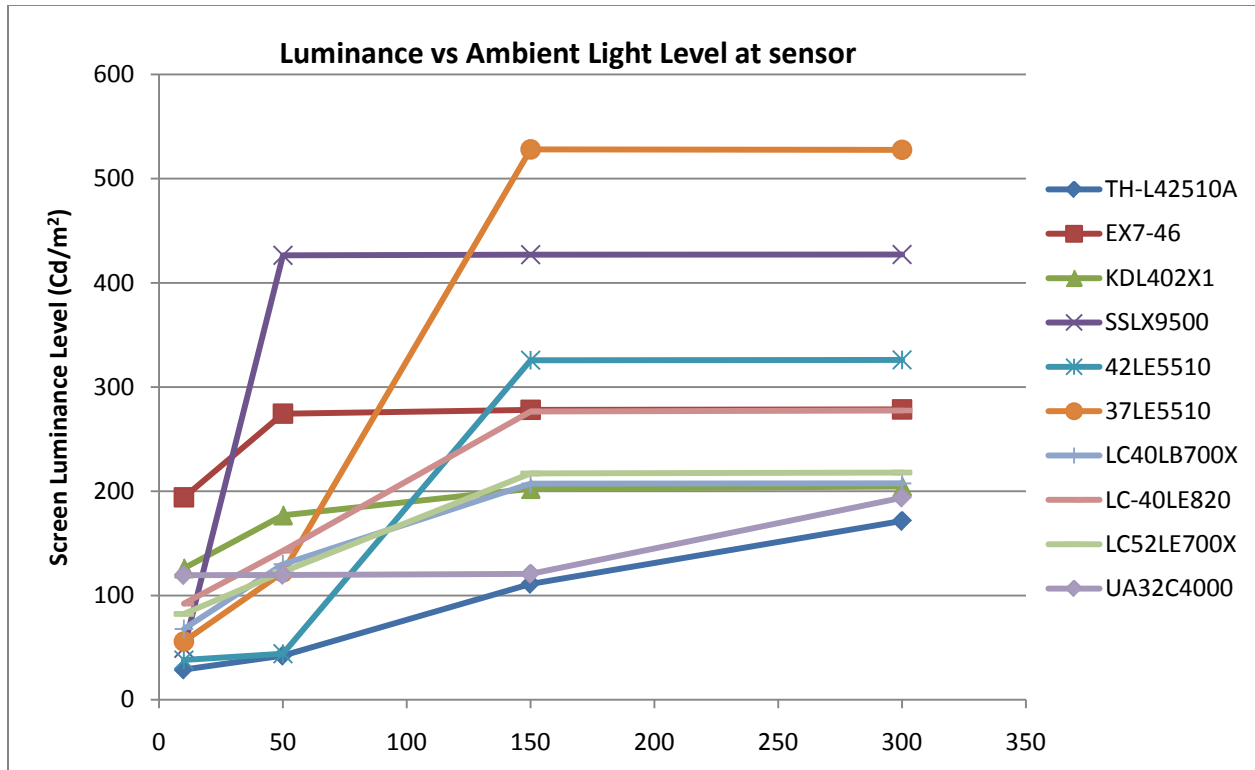


Figure 16: Television Display Luminance level vs Ambient Light

Clearly there is no consistency in how manufacturers reduce the luminance for any given ambient light level or how manufacturers implement the ABC characteristics.

Some models, such as the TH-L422510A, gradually reduce the luminance from 300 Lux. Other models, such as the SSLX9500, have no luminance reduction until the ambient light level is less than 50 Lux and then drastically reduces the luminance between 10 Lux and 50 Lux.

The television model UA32C4000 starts to reduce luminance at 300 Lux but shows no additional luminance reduction under 150 Lux.

Table 4 shows the luminance and power at a high illuminance level of 300 Lux and the resulting reduced luminance and power at a illuminance level of 10 Lux.

The resulting average reduction is shown in the last row of Table 4.

Table 4: Luminance and power reductions by model

Model	Luminance at 300 Lux	Power at 300 Lux	Luminance at 10 Lux	Power at 10 Lux	Luminance Reduction	Power Reduction
TH-P42S10A	171.5	102.1	28.89	47.99	142.61	54.11
42PJ350	78.67	122.34	78.43	112.17	0.24	10.17
EX7-46	278.6	82.56	194.2	67.43	84.4	15.13
KDL402X1	204.6	122.52	126.2	87.61	78.4	34.91
55LX9500	427.2	164.81	49.32	81.4	377.88	83.41
42LE5510	326.1	114.11	38.1	52.49	288	61.62
37LE5510	527.7	109.65	55.9	42.94	471.8	66.71
LC40LB700X	207.6	61.12	67.9	37.87	139.7	23.25
LC-40LE820	277.5	87.52	92.2	50.72	185.3	36.8
LC52LE700X	218	83.98	82.3	46.62	135.7	37.36
Average Reduction					190.402	42.347

Typically the light in a living room in a house during day time hours is between 50 – 150 Lux. At night under artificial light the ambient light is typically from 50 down to less than 10 Lux. It appears that significant energy saving can be achieved with ABC technology.

Earlier in this study the results for luminance ratio were presented and discussion focused on the appropriateness of the test patterns for luminance measurement and whether luminance itself was the correct parameter for the ratio.

The results of this study suggest that ABC could be considered as an alternative to imposing minimum ratios. The manufacturers argue that the televisions need a high luminance for store display purposes where the illuminance level is likely to be 300 Lux or better. By the same token much lower luminance are appropriate for good picture quality in darker room where televisions are normally being viewed. Rather than relying on the setting of “Store” and “Home” modes and the use of ratios, the ABC features can detect the ambient light and automatically adjust the television display for the correct luminance for the viewing environment – be that in a shop or at home.

Given the lack of uniformity of the ABC response curves using the 10, 50, 150 and 300 Lux measuring points provides sufficient information to characterise the variation in ABC response.

3.9 Contact and non contact luminance measurement

There is little difference between the contact and non contact luminance measurements. This establishes that the simplest type of luminance measurement is with a contact meter without the need of a dark room. There is now evidence to suggest only one type of meter should be used

3.10 Uniformity of light across the screen

Figure 17 below is the 9-Point pattern and each point has been identified by a number 1-9, horizontally then vertically. The results of the measurements are shown in Appendix A.

The surprising result is the lack of uniformity of luminance over the displays for all types of technology. The implication for this is that it is important to ensure that luminance measurements are done consistently in the centre of the screen to establish a common reference point.

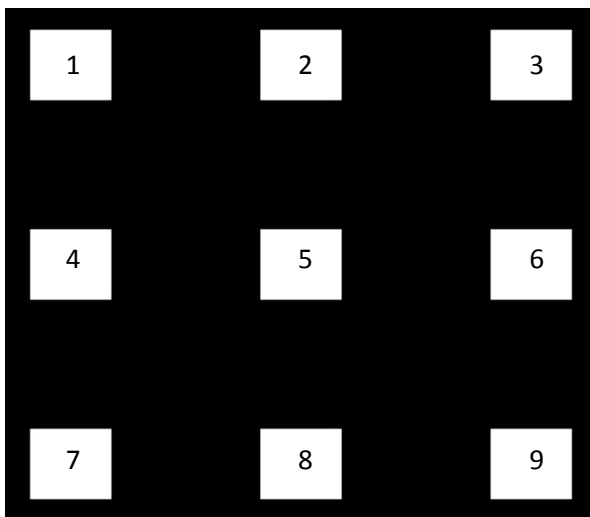


Figure 17: Identification of each of the 9 points in the 9-point pattern

3.11 Recommendations for future studies

From the testing conducted there seems to be four critical areas where additional studies may assist in resolving critical issues.

Luminance measurement

Home to brightest picture mode ratios have become an integral part of several programmes. In this report the adequacy of three test patterns were explored. The conclusion reached was that, although the 9 point pattern is the best performing pattern from the reported results, it still has issues that are significant enough to cause sufficient concerns in recommending this pattern be adopted for measurement.

The original IEC test philosophy was to create an energy consumption test that was as close to real world viewing conditions as possible. It seems reasonable to promote this same philosophy for

luminance measurement. Work on producing a moving picture test pattern needs to be completed and then it's adequacy should then be assessed against other competing patterns.

Automatic Brightness Control

This technology has significant potential for energy saving but as is demonstrated in this report the implementation is very non uniform. Further studies on this technology will assist in the forming a view about the requirement for a uniform approach. Implementing ABC on all television would also potentially illuminate the need for luminance ratios as the control could be made intelligent enough to detect display viewing conditions which are invariably over 200 lux and automatically set an appropriate lighting level for this condition. To promote such requirements will need more empirical evidence.

Internet Standby and Streaming measurements

In the sample of TVs tested in this report only four had any sought of internet capability. The conclusion of this report was that this feature had little effect on the overall energy consumption of a TV. However, this may change as more TVs emerge with this functionality. Repeating a study in this area could be very useful to further assess the impact of this technology as it becomes more main stream.

3D TVs

It seems reasonable to suggest that this technology will become main stream in 2-3 years as more 3D content is produced and offered through either broadcast or pre recorded material. Repeating tests for this feature when it has become main stream and there is significant material available will ensure a better understanding of energy consumption associated with this technology is acheived.

Appendix A: Display Uniformity of 9-Point Test Pattern²

Table 5: Display uniformity of plasma models using 9-Point test pattern

Model	Brightest Mode	Darkest Mode	Comment																																								
PT4252HD	<table border="1"> <caption>Brightest Mode Data for PT4252HD</caption> <thead> <tr><th>Screen Point</th><th>Luminance (cd/m²)</th></tr> </thead> <tbody> <tr><td>Point 1</td><td>240</td></tr> <tr><td>Point 2</td><td>245</td></tr> <tr><td>Point 3</td><td>220</td></tr> <tr><td>Point 4</td><td>250</td></tr> <tr><td>Point 5</td><td>255</td></tr> <tr><td>Point 6</td><td>225</td></tr> <tr><td>Point 7</td><td>265</td></tr> <tr><td>Point 8</td><td>260</td></tr> <tr><td>Point 9</td><td>230</td></tr> </tbody> </table>	Screen Point	Luminance (cd/m ²)	Point 1	240	Point 2	245	Point 3	220	Point 4	250	Point 5	255	Point 6	225	Point 7	265	Point 8	260	Point 9	230	<table border="1"> <caption>Darkest Mode Data for PT4252HD</caption> <thead> <tr><th>Screen Point</th><th>Luminance (cd/m²)</th></tr> </thead> <tbody> <tr><td>Point 1</td><td>158</td></tr> <tr><td>Point 2</td><td>161</td></tr> <tr><td>Point 3</td><td>151</td></tr> <tr><td>Point 4</td><td>166</td></tr> <tr><td>Point 5</td><td>167</td></tr> <tr><td>Point 6</td><td>151</td></tr> <tr><td>Point 7</td><td>175</td></tr> <tr><td>Point 8</td><td>174</td></tr> <tr><td>Point 9</td><td>158</td></tr> </tbody> </table>	Screen Point	Luminance (cd/m ²)	Point 1	158	Point 2	161	Point 3	151	Point 4	166	Point 5	167	Point 6	151	Point 7	175	Point 8	174	Point 9	158	
Screen Point	Luminance (cd/m ²)																																										
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² Y-AXIS for all charts is (cd/m²)

Model	Brightest Mode	Darkest Mode	Comment																																								
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Model	Brightest Mode	Darkest Mode	Comment																																								
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TH-P42S10A	<table border="1"> <caption>Brightest Mode Data for TH-P42S10A</caption> <thead> <tr><th>Screen Point</th><th>Value</th></tr> </thead> <tbody> <tr><td>Point 1</td><td>194</td></tr> <tr><td>Point 2</td><td>188</td></tr> <tr><td>Point 3</td><td>186</td></tr> <tr><td>Point 4</td><td>199</td></tr> <tr><td>Point 5</td><td>198</td></tr> <tr><td>Point 6</td><td>198</td></tr> <tr><td>Point 7</td><td>202</td></tr> <tr><td>Point 8</td><td>200</td></tr> <tr><td>Point 9</td><td>189</td></tr> </tbody> </table>	Screen Point	Value	Point 1	194	Point 2	188	Point 3	186	Point 4	199	Point 5	198	Point 6	198	Point 7	202	Point 8	200	Point 9	189	<table border="1"> <caption>Darkest Mode Data for TH-P42S10A</caption> <thead> <tr><th>Screen Point</th><th>Value</th></tr> </thead> <tbody> <tr><td>Point 1</td><td>76.5</td></tr> <tr><td>Point 2</td><td>74.0</td></tr> <tr><td>Point 3</td><td>73.8</td></tr> <tr><td>Point 4</td><td>78.2</td></tr> <tr><td>Point 5</td><td>78.8</td></tr> <tr><td>Point 6</td><td>75.0</td></tr> <tr><td>Point 7</td><td>80.5</td></tr> <tr><td>Point 8</td><td>78.8</td></tr> <tr><td>Point 9</td><td>76.0</td></tr> </tbody> </table>	Screen Point	Value	Point 1	76.5	Point 2	74.0	Point 3	73.8	Point 4	78.2	Point 5	78.8	Point 6	75.0	Point 7	80.5	Point 8	78.8	Point 9	76.0	
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Table 6: Display uniformity of LED edge lit backlight LCD using 9-Point test pattern

Model	Darkest Mode	Brightest Mode	Comment																																								
EX7-46	<table border="1"> <caption>EX7-46 Darkest Mode Luminance Data</caption> <thead> <tr> <th>Screen Point</th> <th>Luminance</th> </tr> </thead> <tbody> <tr><td>Point 1</td><td>425</td></tr> <tr><td>Point 2</td><td>428</td></tr> <tr><td>Point 3</td><td>432</td></tr> <tr><td>Point 4</td><td>375</td></tr> <tr><td>Point 5</td><td>450</td></tr> <tr><td>Point 6</td><td>385</td></tr> <tr><td>Point 7</td><td>435</td></tr> <tr><td>Point 8</td><td>410</td></tr> <tr><td>Point 9</td><td>432</td></tr> </tbody> </table>	Screen Point	Luminance	Point 1	425	Point 2	428	Point 3	432	Point 4	375	Point 5	450	Point 6	385	Point 7	435	Point 8	410	Point 9	432	<table border="1"> <caption>EX7-46 Brightest Mode Luminance Data</caption> <thead> <tr> <th>Screen Point</th> <th>Luminance</th> </tr> </thead> <tbody> <tr><td>Point 1</td><td>310</td></tr> <tr><td>Point 2</td><td>312</td></tr> <tr><td>Point 3</td><td>315</td></tr> <tr><td>Point 4</td><td>275</td></tr> <tr><td>Point 5</td><td>325</td></tr> <tr><td>Point 6</td><td>280</td></tr> <tr><td>Point 7</td><td>315</td></tr> <tr><td>Point 8</td><td>305</td></tr> <tr><td>Point 9</td><td>315</td></tr> </tbody> </table>	Screen Point	Luminance	Point 1	310	Point 2	312	Point 3	315	Point 4	275	Point 5	325	Point 6	280	Point 7	315	Point 8	305	Point 9	315	
Screen Point	Luminance																																										
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Model	Darkest Mode	Brightest Mode	Comment																																								
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Model	Darkest Mode	Brightest Mode	Comment																																								
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Table 7: Display uniformity for LED Full LCD TVs using 9-Point test pattern

Model	Darkest Mode	Brightest Mode	Comment																																								
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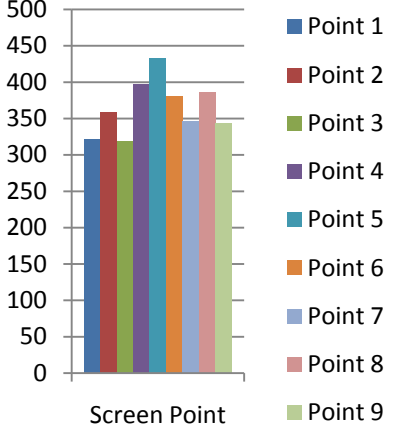
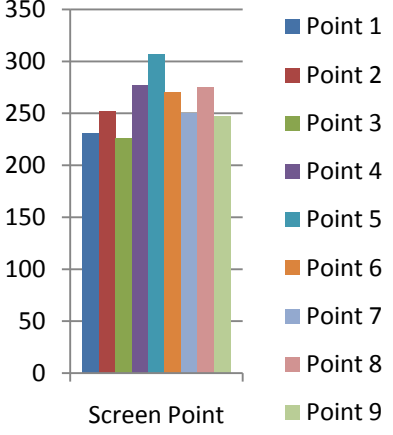
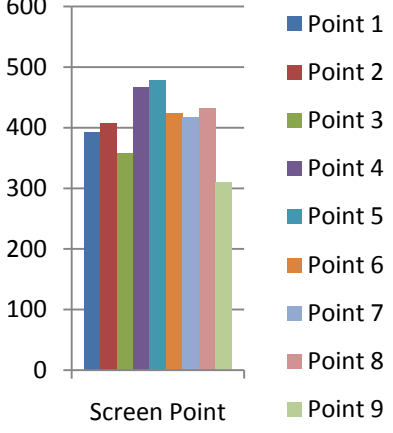
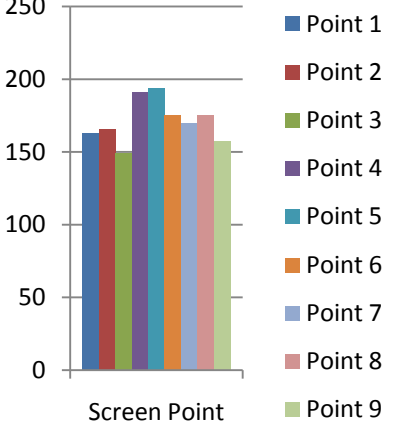
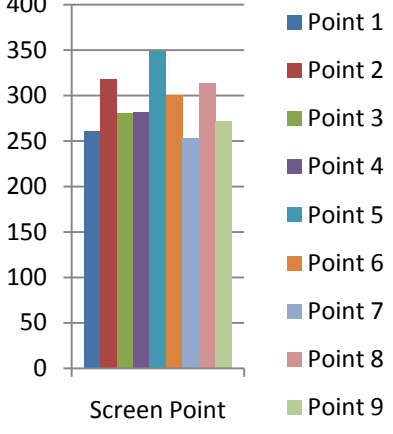
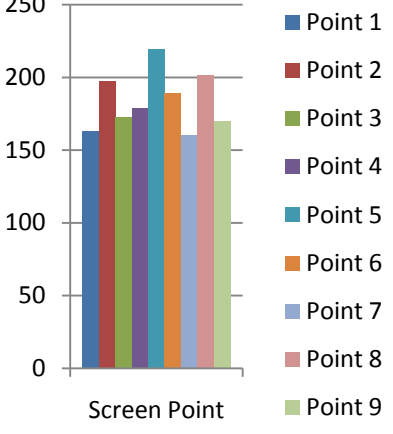
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Table 8: Display uniformity for LCD TVs with CCFL Backlight using 9-Point test pattern

Model	Darkest Mode	Brightest Mode	Comment																																								
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Model	Darkest Mode	Brightest Mode	Comment																																								
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Model	Darkest Mode	Brightest Mode	Comment																																								
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Appendix B: Detailed Test Results

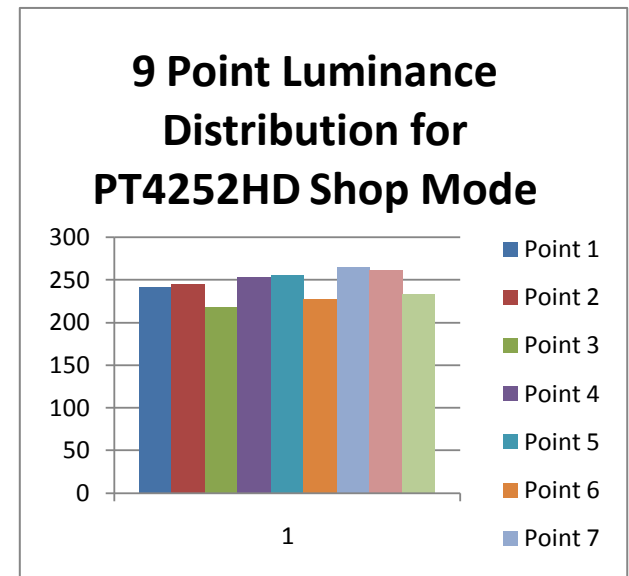
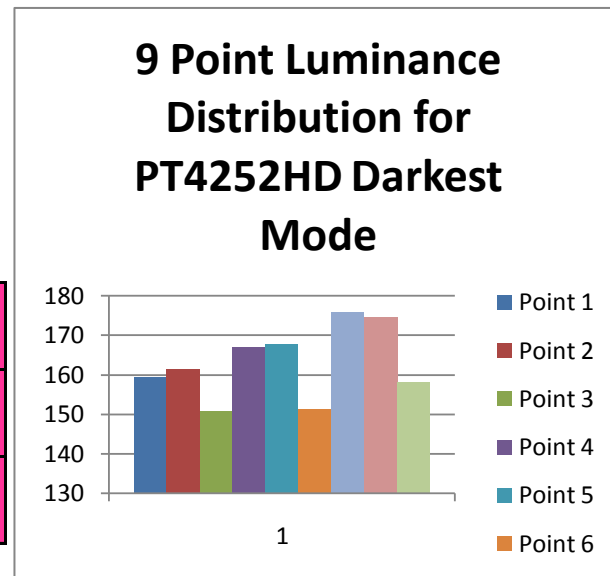
Test Result Sheet No. 1

Model Numk PT4252HD
 Brand Celestial
 Type Plasma

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	215.59 .92				On Power	216.77 .95				On Power	170.46 .89			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		130.1			3 Bar		131.8			3 Bar		113.8		
50% Pattern		225.9			50% Pattern		212.4			50% Pattern		179.4		
9 Point					9 Point					9 Point				
		246.3	250.6	233.8			241.4	244.8	218.4			159.2	161.3	150.8
		254.8	255.9	230.4			252.8	254.9	226.5			167	167.6	151.2
		267.7	265.8	240.3			265.1	261	232.4			175.9	174.6	158.2

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		131.3		
50% Pattern		228.3		
9 Point				
		241.7	251.8	235.1
		251	259.7	259.4
		257.5	265.1	236.8



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	25.04	44.76	57.47	63.62	66.08	68.47	70.72	71.87	72.35	72.36

ABC	10	50	150	300
Power	214.96	215.27	215.36	216.02
Luminan	255.6	255.6	255.7	255.6

Passive Standby
 0.95

Active Standby

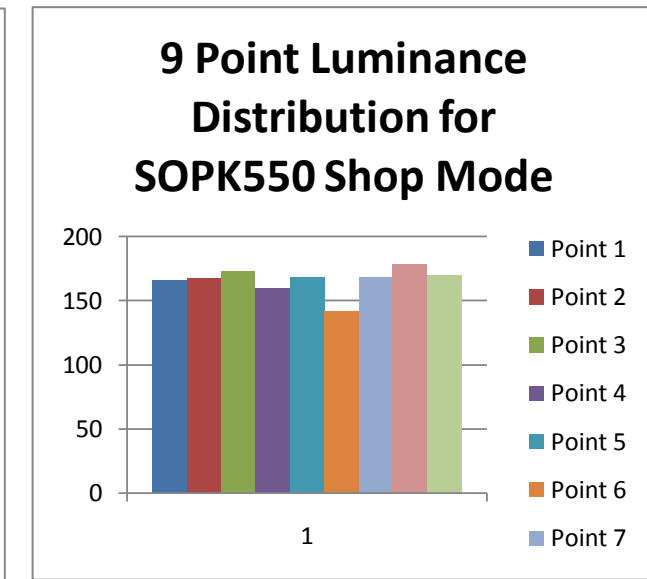
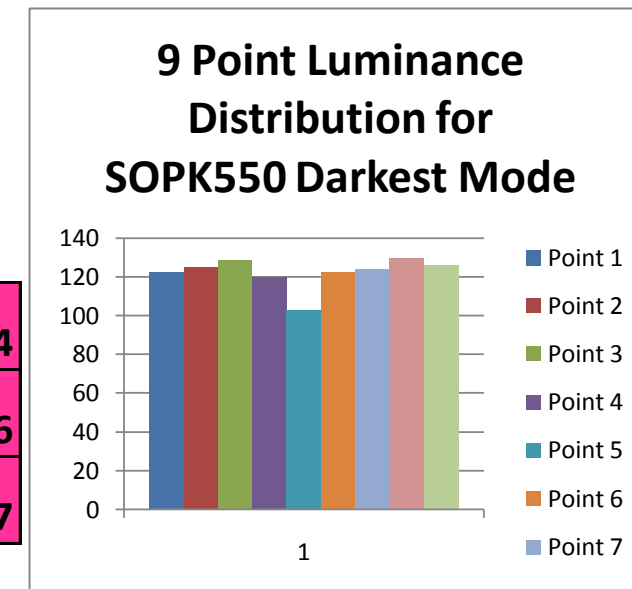
Test Result Sheet No. 2

Model Numb SOPK550
 Brand LG
 Type Plasma

Home Mode	A.P.S (Automatic Power Save)			Shop Mode	Vivid			Darkest Mod	Cinema			
On Power	197.7 .98			On Power	302.26 .95			On Power	249.98 .92			
Luminance	Contact Meter			Luminance	Contact Meter			Luminance	Contact Meter			
3 Bar		68.3		3 Bar		85.17		3 Bar		86.05		
50% Pattern		98.4		50% Pattern		166.1		50% Pattern		135.9		
9 Point				9 Point				9 Point				
		97.1	98.2	102.1		165.9	167.9	173.2		122.5	124.7	128.6
		93.7	100.3	95.9		159.3	168.3	142.1		119.8	103.1	122.2
		98.6	102.1	99.2		168.5	178.1	169.8		123.8	129.8	126.1

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		70.94		
50% Pattern		99.54		
9 Point				
		96.1	102	104.4
		93.9	103.2	100.6
		99.2	108	105.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	16.55	23.03	30.34	36.24	42.12	42.78	42.48	42.06	43.76	46.68

ABC	10	50	150	300
Power	197.13	197.2	197.22	197.21
Luminan	102.1	102	102.4	104.8

Passive Standby
 0.1

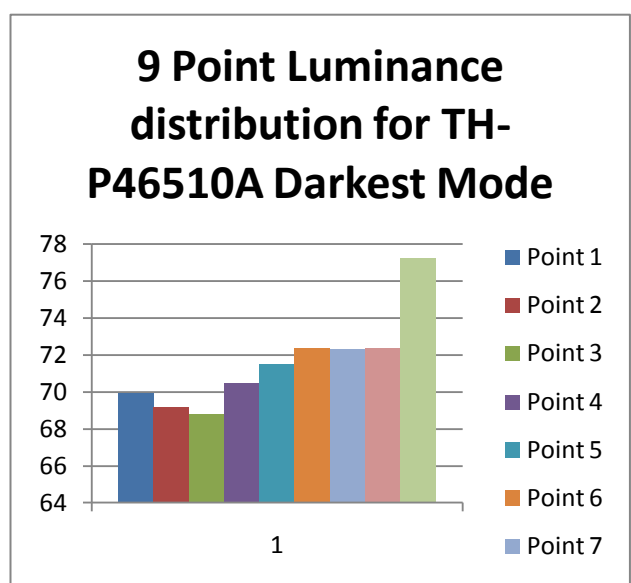
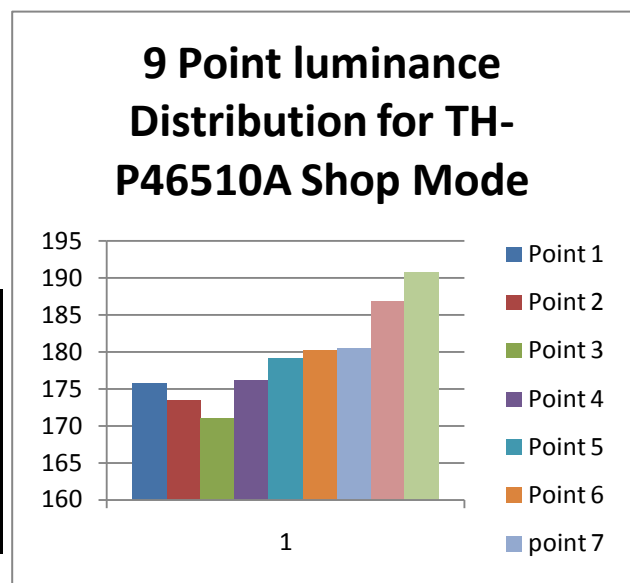
Active Standby

Test Result Sheet No. 3

Model Numb TH-P46510A
 Brand Panasonic
 Type Plasma

Home Mode	Normal				Shop Mode	Dynamic				Darkest Mod	Cinema			
On Power	207.01 .81				On Power	334.14 .85				On Power	195.82 .81			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		70.4			3 Bar		88.8			3 Bar		59.1		
50% Pattern		113.7			50% Pattern		168.5			50% Pattern		81.8		
9 Point					9 Point					9 Point				
		79.6	78.6	76.5			175.8	173.5	171			69.9	69.2	68.8
		80.3	81.4	82.5			176.1	179.2	180.3			70.5	71.5	72.4
		82.3	84.9	87.4			180.5	186.8	190.7			72.3	72.4	77.2

ABC On Standard			ABC Off Standard						
Luminance	Contact				Luminance	Non Contact Meter			
3 Bar		70.1			3 Bar		71.8		
50% Pattern		111.6			50% Pattern		113.8		
9 Point					9 Point				
		78.1	76.6	76			77.4	78.4	77.1
		78.1	79.4	80.5			78.4	82	81.7
		79.4	81.9	84.7			79.5	89.1	85.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	24.99	30.2	33.8	39	38.9	38.7	38.8	38.7	38.8	38.7

ABC	10	50	150	300
Power	200.5	200.61	200.01	200.1
Luminan	80.3	80.8	80.8	81.62

Passive Standby
 0.29

Active Standby
 14.36

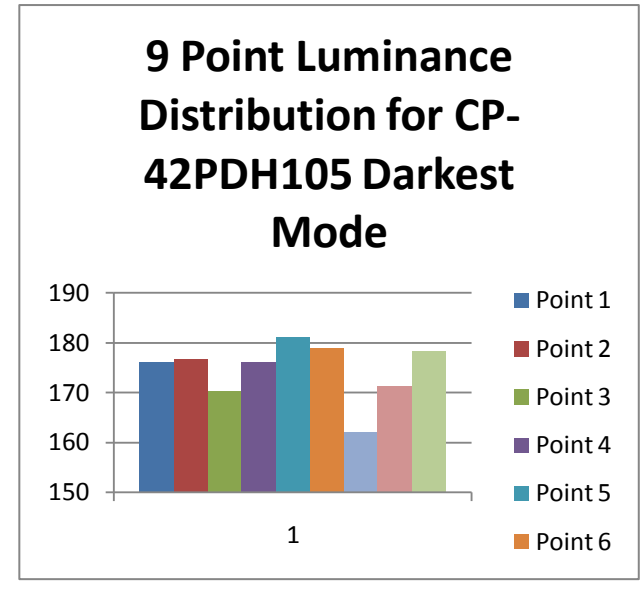
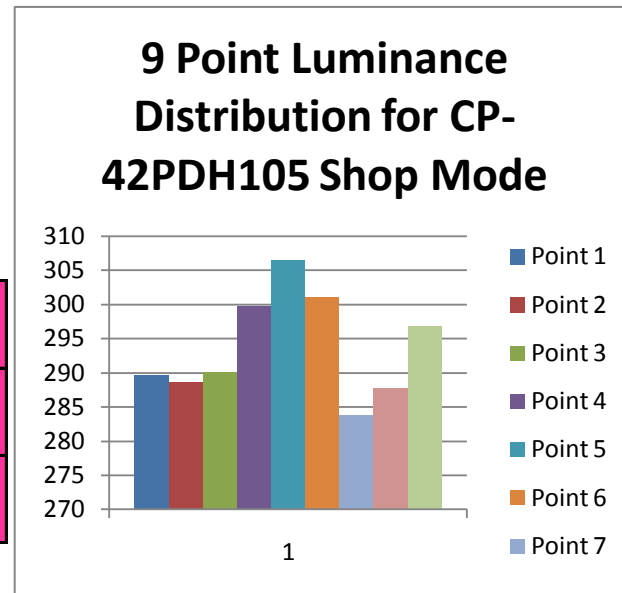
Test result Sheet No. 4

Model Numb CP-42PDH105
 Brand AWA
 Type Plasma

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	User				
On Power	254.71 .97				On Power	266.68 .98				On Power	207.18 .96				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		167.1			3 Bar		177.1			3 Bar		169.8			
50% Pattern		258.2			50% Pattern		227.2			50% Pattern		186.5			
9 Point					9 Point					9 Point					
		294.3	294.2	295.1			289.7	288.7	290.1			176.1	176.6	170.2	
		308.4	318.3	312.5			299.8	306.6	301.1			176.1	181.2	179	
		293.4	292.1	306.2			283.9	287.8	296.8			162.2	171.4	178.3	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		177.5		
50% Pattern		243.5		
9 Point				
		282.8	284.1	284.1
		290.7	304.6	292.9
		275.3	284.6	292.4



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	17.33	42.05	73.42	83.78	88.65	92.76	96.16	98.14	102.4	102.5

ABC	10	50	150	300
Power	252.95	253.61	254.43	254.69
Luminan	317.3	317.7	317.9	318.2

Passive Standby
 1.1

Active Standby

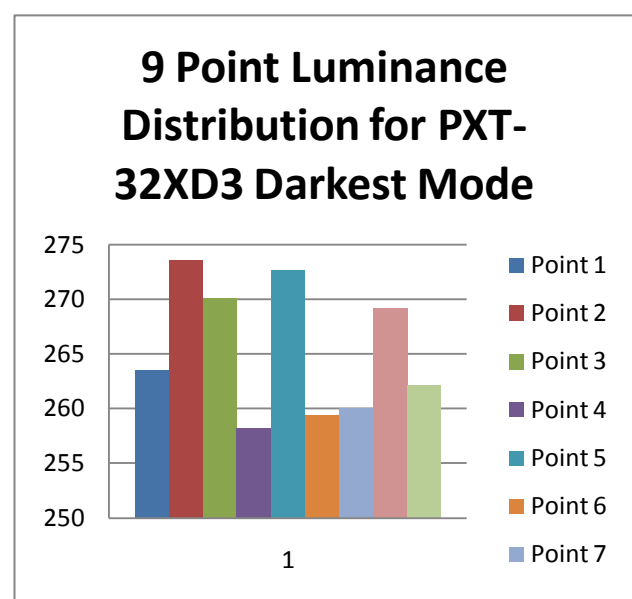
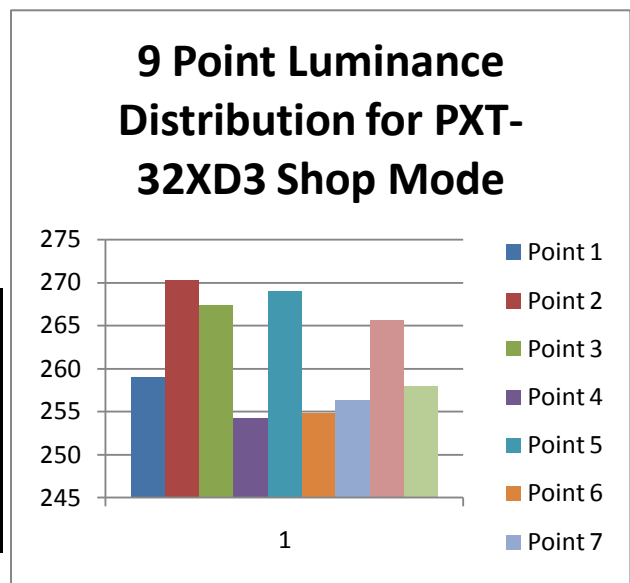
Test Result Sheet No. 5

Model Numb PXT-32XD3
 Brand NEC
 Type Plasma

Home Mode	Vivid				Shop Mode	Cinema				Darkest Mod	User				
On Power	105.88 .85				On Power	135.81 .84				On Power	141.80 .85				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		163.5			3 Bar		157			3 Bar		157.2			
50% Pattern		282.1			50% Pattern		278.6			50% Pattern		283.1			
9 Point					9 Point					9 Point					
		265.3	271.5	268.4			259	270.2	267.4			263.5	273.6	270.1	
		258.4	269.4	261.3			254.2	269	254.8			258.2	272.6	259.4	
		257.9	267.3	260.8			256.3	265.6	258			260	269.2	262.1	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		160.8		
50% Pattern		286.2		
9 Point				
		258.6	273.6	266.7
		261.6	275	262.6
		266.1	276.1	272.6



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	63.77	82.7	85.72	86.61	87.15	85.06	85.26	85.32	84.98	88.09

ABC	10	50	150	300
Power	149.6	149.93	150.78	151.01
Luminan	268.3	268.8	269.6	269.9

Passive Standby
 0.7

Active Standby

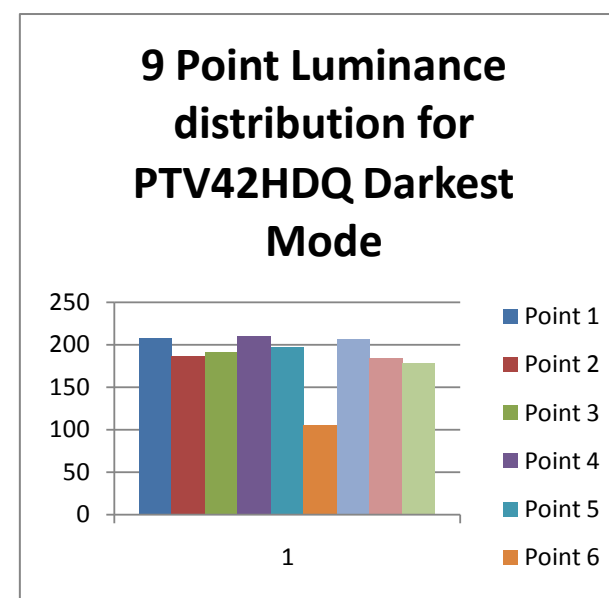
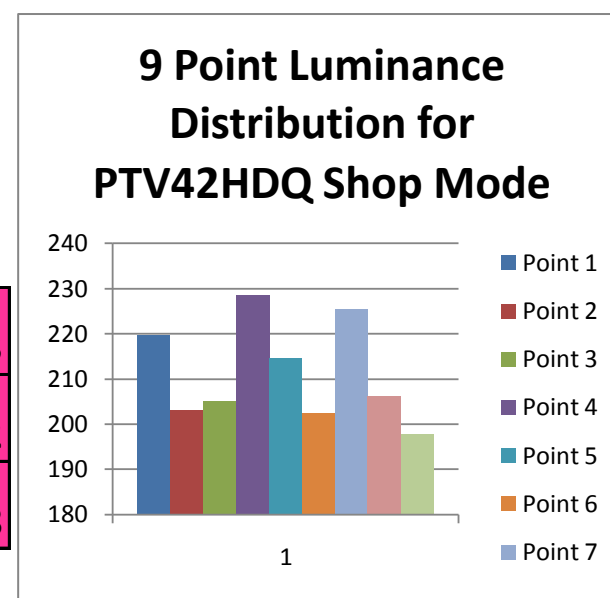
Test Result sheet No. 6

Model Num: PTV42HDQ
 Brand: Vivo
 Type: Plasma

Home Mode Vivid					Shop Mode Cinema					Darkest Mod User				
On Power	210.28 .89				On Power	213.55 .87				On Power	195.05 .84			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		148.6			3 Bar		128.7			3 Bar		133.4		
50% Pattern		205.1			50% Pattern		178.5			50% Pattern		226.9		
9 Point					9 Point					9 Point				
		283.2	257.1	261			219.7	203.2	205.1			208.4	186.6	190.4
		287.2	286.6	256.3			228.6	214.7	202.5			210.6	196.3	105.1
		280.5	251	243			225.5	206.2	197.7			205.6	184.2	178.1

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		149		
50% Pattern		205.5		
9 Point				
		274.1	254.7	258.3
		282.2	269	251.2
		276.3	263.1	243.8



Contrast Cor	10	20	30	40	50	60	70	80	90	100
Plasma Only	33.26	54.25	64.13	72.2	76.53	78.94	78.49	77.91	78.72	78.09

ABC	10	50	150	300
Power	209.41	209.79	210.31	210.36
Luminan	266.4	266.9	267.3	267.9

Passive Standby
 0.6

Active Standby

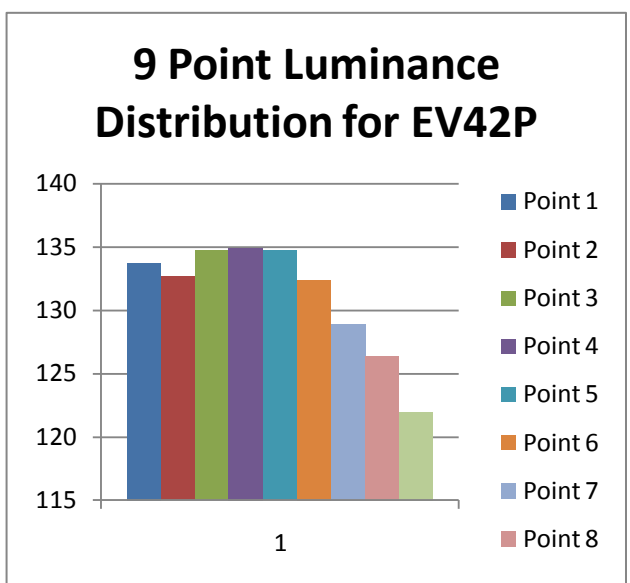
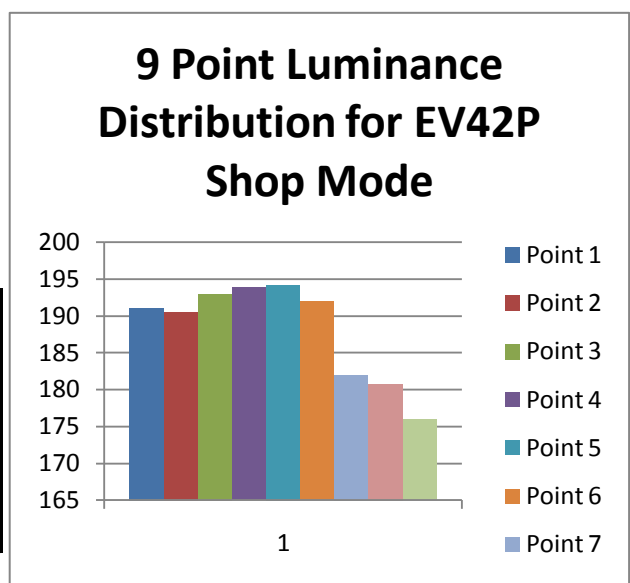
Test Result Sheet No. 7

Model Numb EV42P
 Brand Electroview
 Type Plasma

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild				
On Power	209.62 .90				On Power	209.41 .90				On Power	183.08 .87				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		99.2			3 Bar		102.3			3 Bar		85.7			
50% Pattern		123.1			50% Pattern		120.5			50% Pattern		120.5			
9 Point					9 Point					9 Point					
		196.2	194.1	196.6			191.1	190.5	193			133.7	132.7	134.7	
		196.8	194.89	193.8			193.8	194.2	192			134.9	134.7	132.4	
		187.4	181.7	178.1			182	180.7	176			128.9	126.4	122	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		99.5		
50% Pattern		123.8		
9 Point				
		185.5	192.76	191.5
		191.6	193.1	187.6
		172.2	174.7	168



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	27.99	37.26	41.77	44.88	47.12	46.31	48.79	48.63	48.37	48.52

ABC	10	50	150	300
Power	208.57	208.96	209.51	209.91
Luminan	193.6	194.1	194.6	195.2

Passive Standby
 0.71

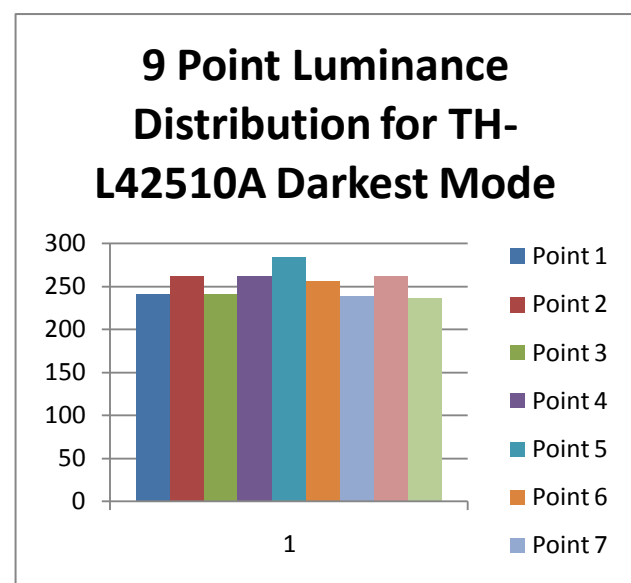
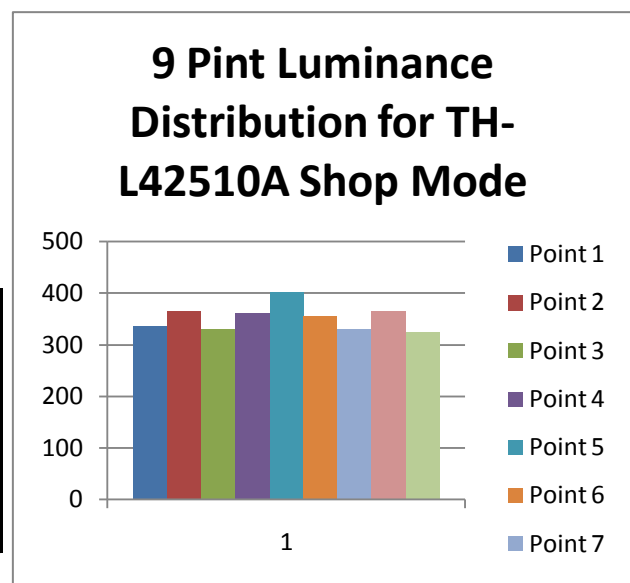
Active Standby

Test Result Sheet No. 8

Model Numb TH-L42510A
 Brand Panasonic
 Type Plasma

Home Mode	Normal				Shop Mode	Dynamic				Darkest Mod	Game				
On Power	124.17 8.7				On Power	179.18				On Power	136.12 .86				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		228.7			3 Bar		453.6			3 Bar		227.2			
50% Pattern		295.6			50% Pattern		512.6			50% Pattern		311.1			
9 Point					9 Point					9 Point					
		215.6	234.3	210.2			335.1	364.5	330.3			241.5	262.7	241.6	
		231.4	248.2	224.3			362.2	400.6	356.3			262.4	284.4	256.8	
		195.7	217.2	194.7			330.9	365.5	324.1			238.4	261.4	236.7	

ABC On Standard					ABC Off Standard				
Luminance	Contact				Luminance	Non Contact Meter			
3 Bar		98.1			3 Bar		110.2		
50% Pattern		124.4			50% Pattern		133.5		
9 Point					9 Point				
		103.9	108.9	99.1			99.6	118.7	102.6
		111.3	104.5	98.1			102.1	116.4	101.9
		95.2	87.9	83.9			83.4	91.2	83.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	24.5	28.6	35.2	42.9	50.6	59.5	70.8	81.9	96.2	108.7

ABC	10	50	150	300
Power	47.99	62.83	85.81	102.1
Luminan	28.89	42.23	111.1	171.5

Passive Standby
 0.3

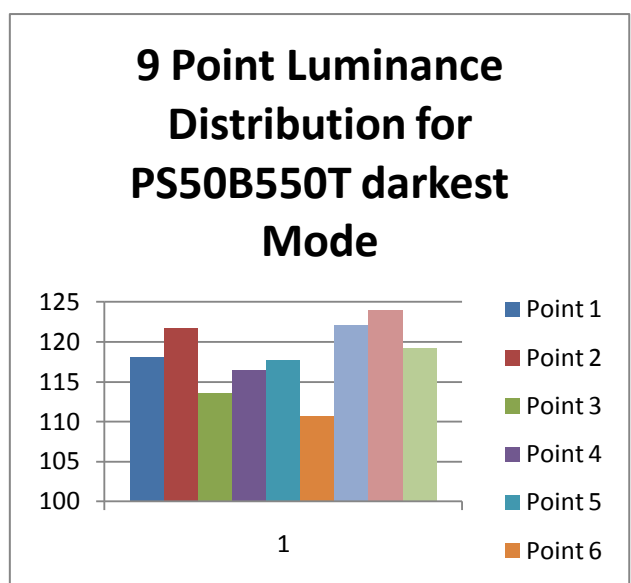
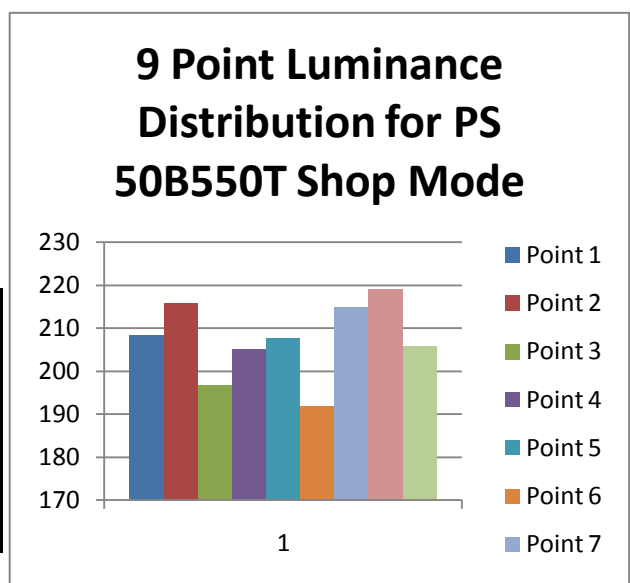
Active Standby
 17.8

Test Result Sheet No. 9

Model Numb PS 50B550T
 Brand Samsung
 Type Plasma

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Eco					
On Power	254.86	.93			On Power	334.14	.85			On Power	216.60	.93				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter					
3 Bar		97.5			3 Bar		111.9			3 Bar		97.4				
50% Pattern		124.4			50% Pattern		177.1			50% Pattern		124.4				
9 Point					9 Point					9 Point						
			119.4	123	114.8			208.3	215.8	196.7			118.1	121.7	113.6	
			117.7	118.4	111.9			205.1	207.6	191.9			116.5	117.8	110.8	
			123.3	124.7	120.3			214.9	219.2	205.7			122.2	124	119.2	

ABC On Standard					ABC Off Standard					
Luminance	Contact				Luminance	Non Contact Meter				
3 Bar		93.2			3 Bar		95.62			
50% Pattern		103.7			50% Pattern		105.3			
9 Point					9 Point					
			98.28	100.9	94.54			96.13	101.4	93.36
			96.89	98.1	92.9			95.75	100.2	93.62
			101.7	103.2	99.76			100.4	105.8	101.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	7.91	13.72	20.2	28.26	36.23	45.94	49.55	52.47	53.27	52.51

ABC	10	50	150	300
Power	209.12	208.12	207.94	207.94
Luminan	99.6	99.7	99.8	99.7

Passive Standby
 0.3

Active Standby

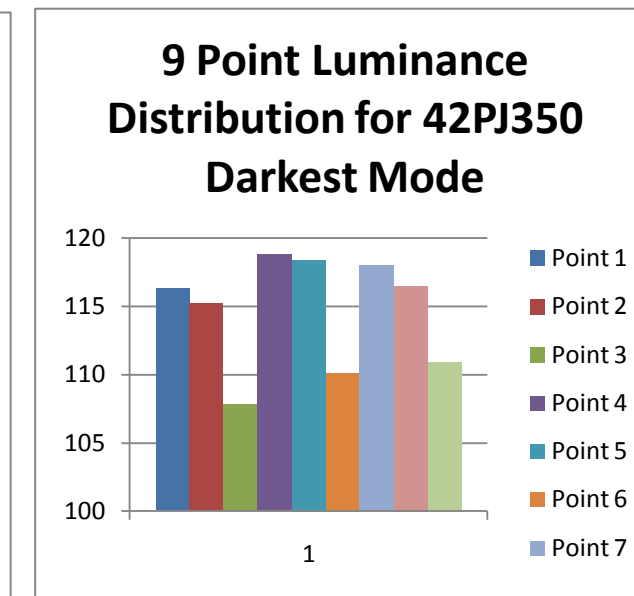
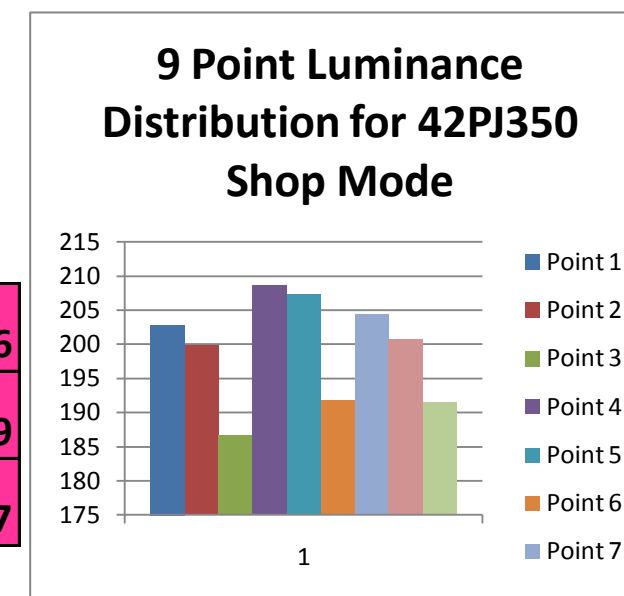
Test Result Sheet No. 10

Model Numb 42PJ350
 Brand LG
 Type Plasma

Home Mode	APS				Shop Mode	Vivid				Darkest Mod	Cinema			
On Power	122.78 .95				On Power	223.72 .98				On Power	144.64 .96			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		57.3			3 Bar		96.7			3 Bar		95.9		
50% Pattern		77.8			50% Pattern		202.3			50% Pattern		115		
9 Point					9 Point					9 Point				
		77	76	71.2			202.8	199.8	186.7			116.3	115.2	107.8
		77.9	77	72.1			208.6	207.3	191.8			118.8	118.4	110.1
		78.3	76.8	73.7			204.4	200.7	191.5			118	116.5	110.9

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		57.38		
50% Pattern		78.9		
9 Point				
		77.6	78.9	74.6
		78.5	79	74.9
		77.6	79.4	73.87



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only	21.66	30.85	38.08	48.97	49.01	49.89	50.08	50.55	50.79	53.89

ABC	10	50	150	300
Power	112.17	121.96	121.7	122.34
Luminan	78.43	78.61	78.84	78.67

Passive Standby
 0.12

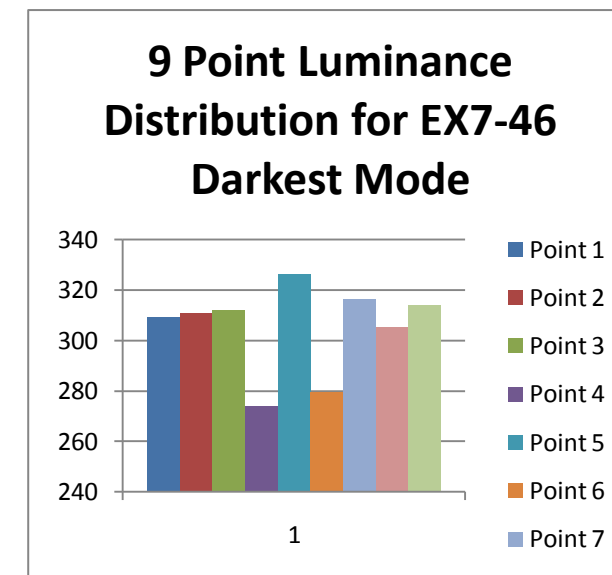
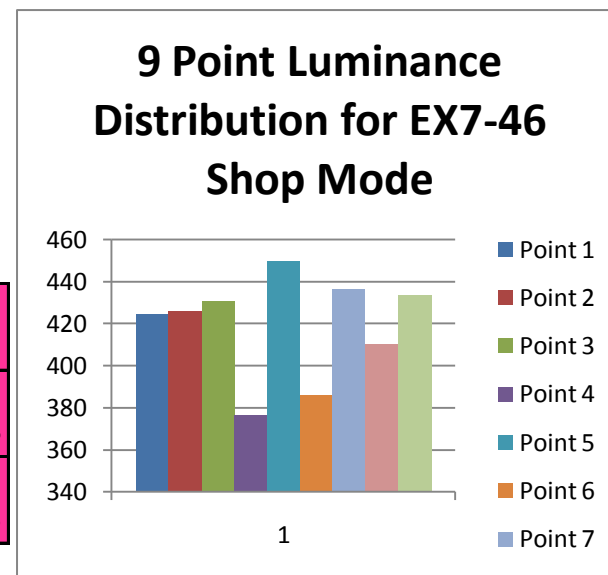
Active Standby

Test Result sheet No. 11

Model Numt EX7-46
 Brand Sony
 Type EDGE LIT LED

Home Mode	Standard							Shop Mode	Vivid							Darkest Mode	Custom			
On Power	90.15 .85							On Power	116.96 .88							On Power	94.18 .86			
Luminance	Contact Meter							Luminance	Contact Meter							Luminance	Contact Meter			
3 Bar		305.6						3 Bar		427.6						3 Bar		293.5		
50% Pattern		319.1						50% Pattern		482.3						50% Pattern		325.8		
9 Point								9 Point								9 Point				
		293.6	296.5	298.9				424.1	425.7	430.6					308.9	310.6	312			
		262.6	314.1	268.5				376.5	449.4	385.8					274	326.2	279.6			
		299.2	292.7	300.7				436.3	409.8	433.3					316.4	305.2	313.7			

ABC On Standard				ABC Off standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		261.2		3 Bar		266.6			
50% Pattern		269.8		50% Pattern		276.9			
9 Point				9 Point					
		249.2	262.3	259.1			255.6	258.5	240.9
		228.4	273.1	230.4			218	268.2	217.4
		261.5	251.5	258.1			246.7	249.5	243.8



Contrast Cor	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	67.43	82.45	82.53	82.56
Luminan	194.2	274.5	278.2	278.6

Passive Standby

0.2

Active Standby

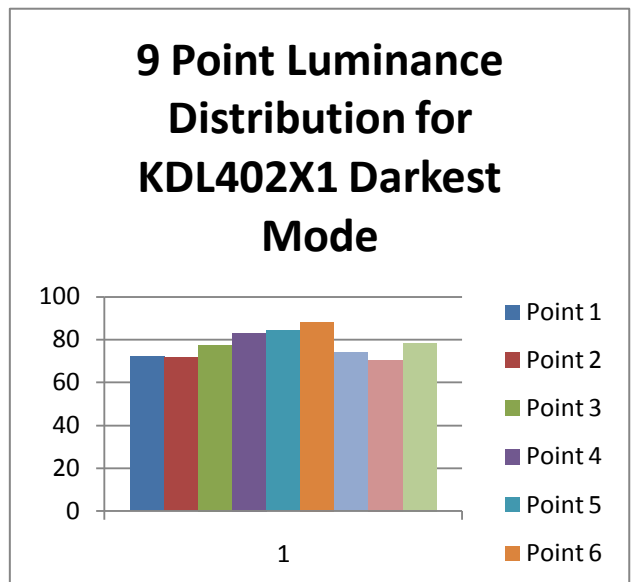
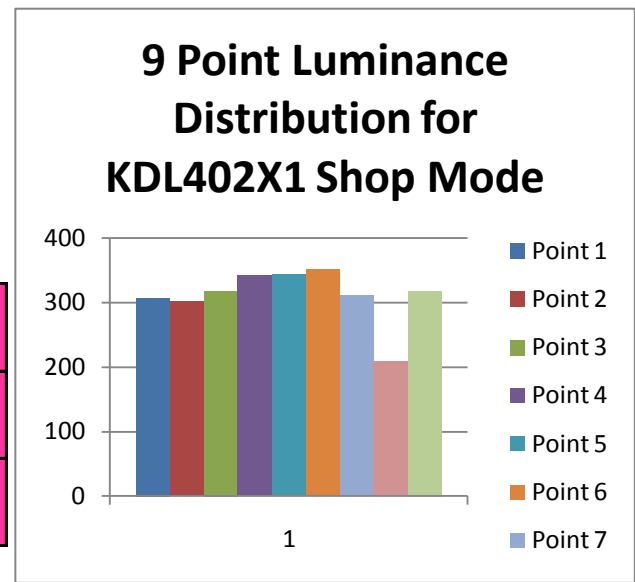
14.6

Test result Sheet No. 12

Model Numb KDL-402X1
 Brand Sony
 Type EDGE LIT LED

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Cinema				
On Power	140.13 .90				On Power	161.78 .91				On Power	81.48 .86				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		231.9			3 Bar		336.3			3 Bar		96.7			
50% Pattern		296.5			50% Pattern		366.2			50% Pattern		132.9			
9 Point					9 Point					9 Point					
		206.7	202.6	217.3			307.3	301.6	318.1			72.2	71.5	77.5	
		233.4	234.6	246.2			342.3	342.9	351.2			83.1	84.1	88.4	
		209.5	197.4	219.2			311.4	209.1	318.4			74.1	70.4	78.5	

ABC On Standard				ABC Off Standard				
Luminance	Contact			Luminance	Non Contact Meter			
3 Bar		200.1		3 Bar		202.5		
50% Pattern		261.6		50% Pattern		262		
9 Point				9 Point				
		176.5	174.2	188.1		178.6	176.1	189.4
		202.2	202.4	210.4		202.1	202.8	210.5
		178.6	170.2	188.8		174.3	173.9	174.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	87.61	108.91	122.52	122.52
Luminan	126.2	177	202.4	204.6

Passive Standby

2

Active Standby

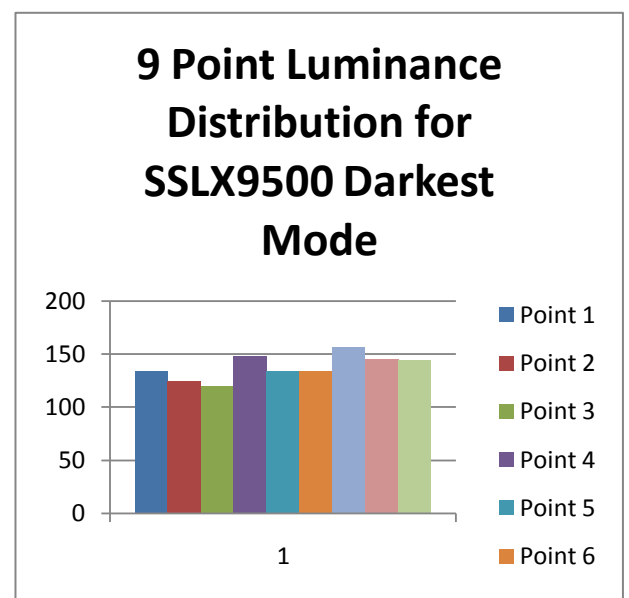
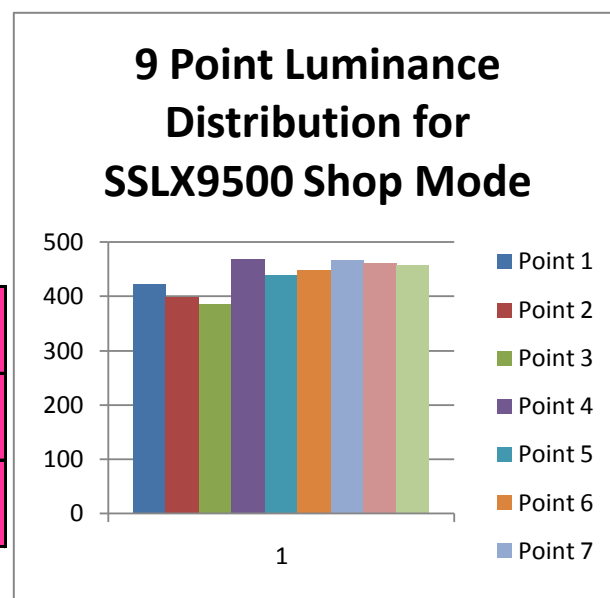
36.4

Test Result Sheet No. 13

Model Numk SSLX9500
 Brand LG
 Type FULL LED

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Cinema				
On Power	121.57 .92				On Power	183.10 .95				On Power	104.04 .89				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		220.1			3 Bar		405.9			3 Bar		177.2			
50% Pattern		253.6			50% Pattern		467.2			50% Pattern		144.3			
9 Point					9 Point					9 Point					
		232.2	218.2	206.1			421.2	398.4	385.3			134.2	124.3	119.5	
		253.3	238.1	240.9			469.2	438.9	448.5			147.1	133.3	134	
		257.3	258.1	250.7			466.2	461.6	457.1			156.4	145.1	144.5	

ABC On standard				ABC Off Standard				
Luminance	Contact			Luminance	Non Contact Meter			
3 Bar		401.3		3 Bar		395.8		
50% Pattern		460.1		50% Pattern		456.3		
9 Point				9 Point				
		408.5	386.3	377.1		334.7	369.9	314.1
		451.6	429.7	430.2		390.4	414.2	381.2
		465.4	451.2	448.5		371.7	420.8	373.1



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	81.4	163.93	164.74	164.81
Luminan	49.32	426.4	427.1	427.2

Passive Standby
 0.12

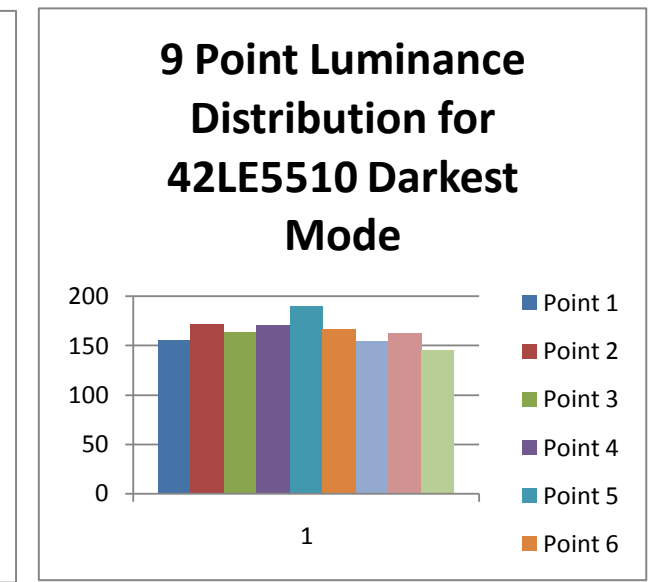
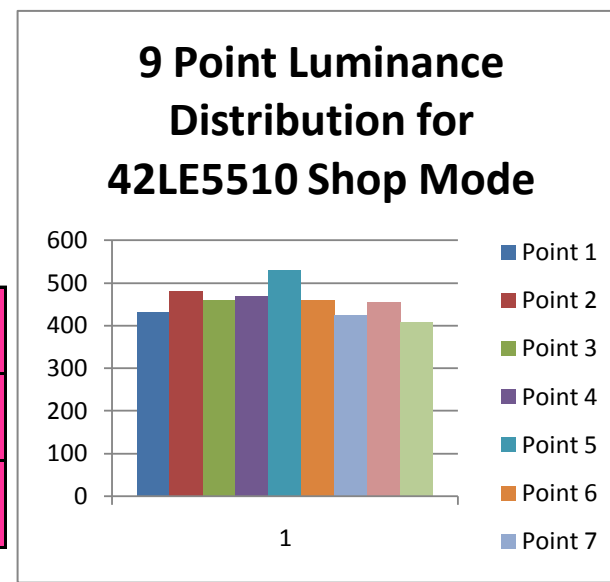
Active Standby

Test Result Sheet No. 14

Model Num: 42 LE 5510
 Brand: LG
 Type: FULL LED

Home Mode Standard					Shop Mode Vivid					Darkest Mode Cinema				
On Power	89.18 .96				On Power	139.23 .98				On Power				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		287.8			3 Bar		480.7			3 Bar		167.7		
50% Pattern		298.8			50% Pattern		520.8			50% Pattern		189.5		
9 Point					9 Point					9 Point				
		244.1	271.7	259.6			430.6	480.4	457.5			155.9	172.1	164
		266.8	300.7	265.4			467.8	530.2	459.8			170.6	189.7	166.6
		241.7	257.6	231.8			424.4	454.3	407.1			155.3	162.5	145.7

ABC On Standard			ABC Off Standard						
Luminance	Contact				Luminance	Non Contact Meter			
3 Bar		468.8			3 Bar		464.6		
50% Pattern		513.3			50% Pattern		519.9		
9 Point					9 Point				
		365.4	388.7	376.7			358.5	393	366.8
		328.1	382.7	309.8			323.7	383	304.4
		339.7	340.7	316.2			316.2	331.6	313.6



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	52.49	53.75	113.37	114.11
Luminan	38.1	44.1	325.8	326.1

Passive Standby
 0.1

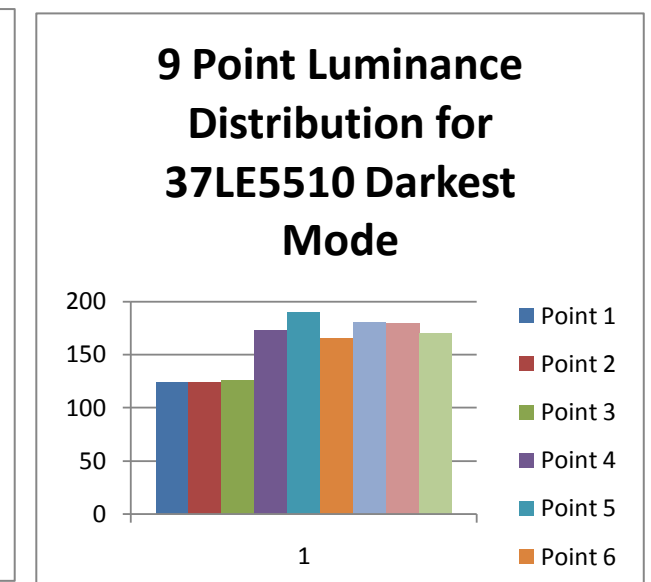
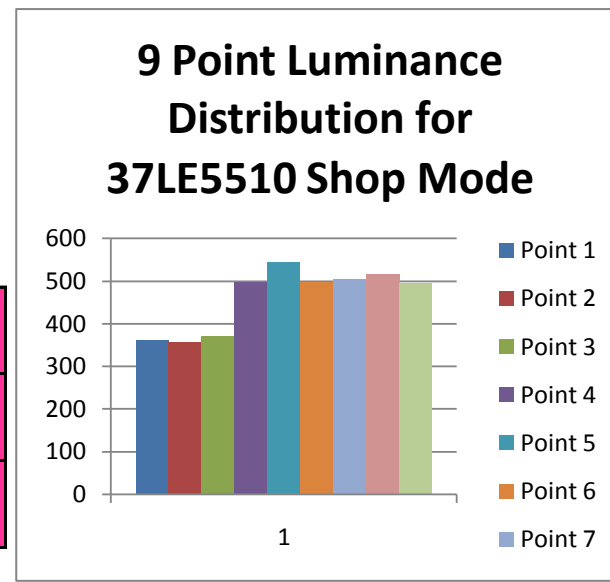
Active Standby
 []

Test Result Sheet No. 15

Model Num: 37LE5510
 Brand: LG
 Type: FULL LED

Home Mode Standard					Shop Mode Vivid					Darkest Mode Cinema				
On Power	77.81 .89				On Power	116.85 .92				On Power	66.01 .85			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		290.1			3 Bar		469.4			3 Bar		161.5		
50% Pattern		302.4			50% Pattern		547.6			50% Pattern		188.9		
9 Point					9 Point					9 Point				
		203.1	201.9	205.1			360.1	357.5	369.7			123.3	124.1	125.9
		278.2	306.5	270.2			496.2	545.2	495.3			173.1	189.6	165.4
		281.2	289.3	277.8			503.6	515.8	494.2			180.3	179.4	170.5

ABC On Standard				ABC Off Standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		495.7				3 Bar	511.3		
50% Pattern		544.2				50% Pattern	544.7		
9 Point				9 Point					
		358.2	357.1	363.5			359	375.4	363.6
		488.2	526.2	475.3			460.1	541.2	472.9
		496.4	495.1	491.3			450.8	507.9	478.5



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	42.94	47.07	110.4	109.65
Luminan	55.9	122.3	528.1	527.7

Passive Standby
 0.1

Active Standby
 []

Test Result Sheet No. 16

Model Numk HL5140T18PZL

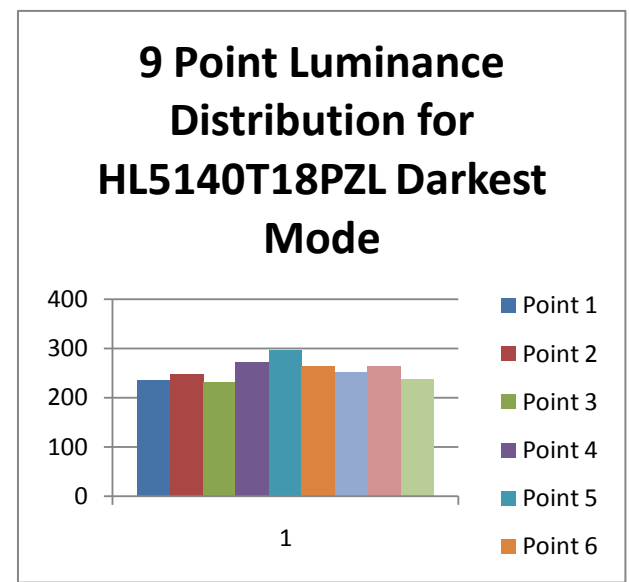
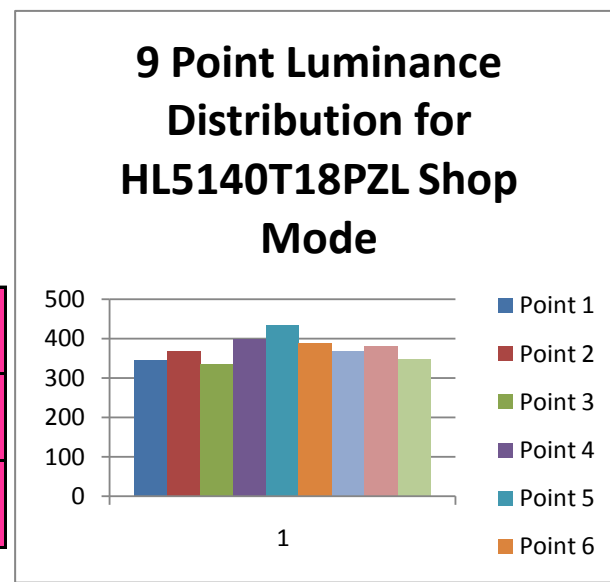
Brand Hisense

Type EDGE LIT LED

Home Mode	Standard				Bright				Darkest Mod	Soft				
On Power	157.89				165.07				133.00	.95				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar					3 Bar					3 Bar				
50% Pattern					50% Pattern					50% Pattern				
9 Point					9 Point					9 Point				
		324.7	342.6	314.9		344.1	365.3	333.2		234.2	247	230.9		
		374.5	405.6	362.4		397.7	433.5	385.8		271.9	295.2	263.9		
		343.9	361.9	320.6		366.3	380.5	344.8		249.8	262.9	236.1		

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar				
50% Pattern				
9 Point				
		310	340.5	292.8
		371.7	408.8	354.7
		319.3	348.8	294.8



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	157.86	157.87	157.86	157.83
Luminan	0.96	0.96	0.96	0.96

Passive Standby
0.51

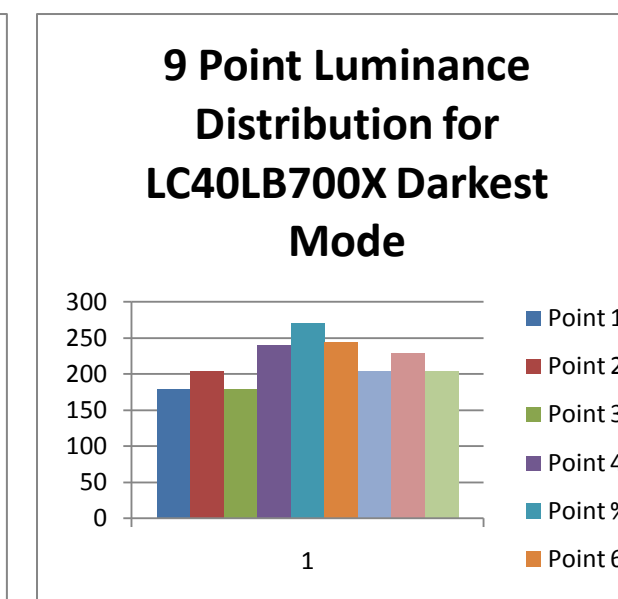
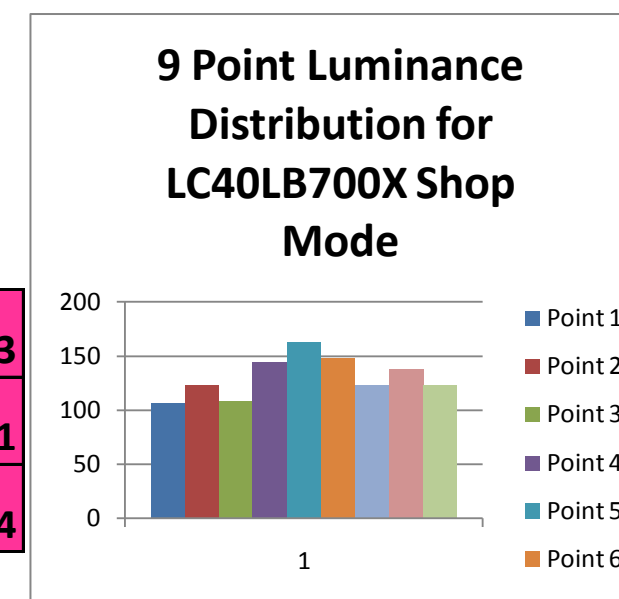
Active Standby

Test Result Sheet No. 17

Model Numb LC40LB700X
 Brand Sharp
 Type FULL LED

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Game						
On Power	72.27 .87				On Power	93.19 .89				On Power	67.01 .86						
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter						
3 Bar		274.8					3 Bar	446.3				3 Bar	245.9				
50% Pattern		279.1					50% Pattern	445.9				50% Pattern	270.9				
9 Point					9 Point					9 Point							
		68.2	79.1	68.7			106.6	122.8	108.5			179.7	204.2	178.9			
		92.1	104	95.8			145.1	162.8	147.6			241.1	271	245.4			
		78.5	88.5	79.4			123.5	138.5	123			204.1	229.8	204.6			

ABC On Standard				ABC Off Standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		204.3				3 Bar	208.9		
50% Pattern		208				50% Pattern	211.1		
9 Point				9 Point					
		136.1	155.9	136.5			135.8	157.6	137.3
		183.3	205.4	185.2			180.5	207.6	186.1
		155.8	176.2	154.1			141.9	173.3	155.4



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	37.87	47.39	61.07	61.12
Luminan	67.9	130	207.4	207.6

Passive Standby
 0.3

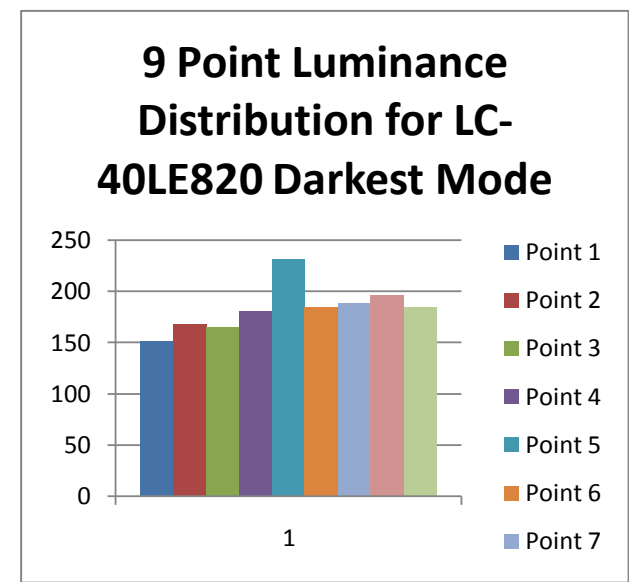
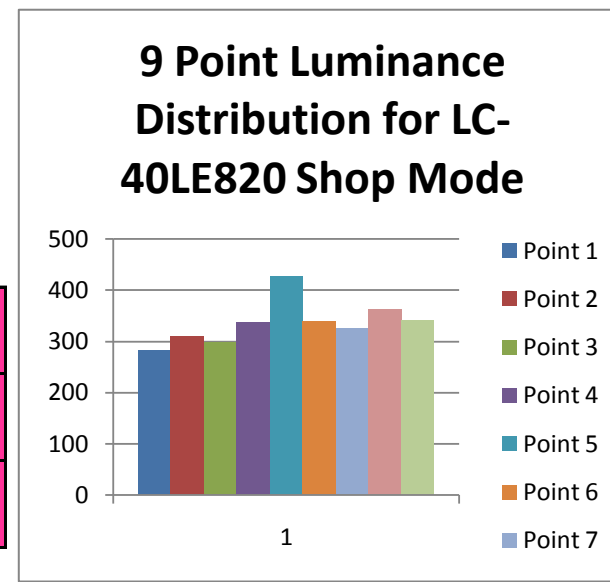
Active Standby
 16.5

Test Result Sheet No. 18

Model Numk LC-40LE820
 Brand Sharp
 Type EDGE LIT LED

Home Mode Standard					Shop Mode Dynamic (Fixed)					Darkest Mod Movie				
On Power	69.67 .82				On Power	105.84 .82				On Power	90.88 .89			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		301.9			3 Bar		431.5			3 Bar		289.7		
50% Pattern		329.1			50% Pattern		433.7			50% Pattern		323.5		
9 Point					9 Point					9 Point				
		108.2	119.3	115.1			283.8	310.5	299.3			151.3	167.9	165.2
		128.8	163.5	129.5			338.1	427.1	339.8			180.7	232.1	185
		135.5	138.7	130.8			325.4	363.6	341.6			188.2	196.1	184.6

ABC On Standard			ABC Off Standard									
Luminance	Contact				Luminance	Non Contact Meter						
3 Bar		389.7			3 Bar		394.7					
50% Pattern		429.4			50% Pattern		440.1					
9 Point					9 Point							
		181.5	199.7	194.6			207.5	222.3	218.2			
		215.6	272.9	216.1			196.1	253.4	203.3			
		227.5	232	218.6			203.2	225	207.3			



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	50.72	66.51	87.35	87.52
Luminan	92.2	142.9	276.6	277.5

Passive Standby
 0.22

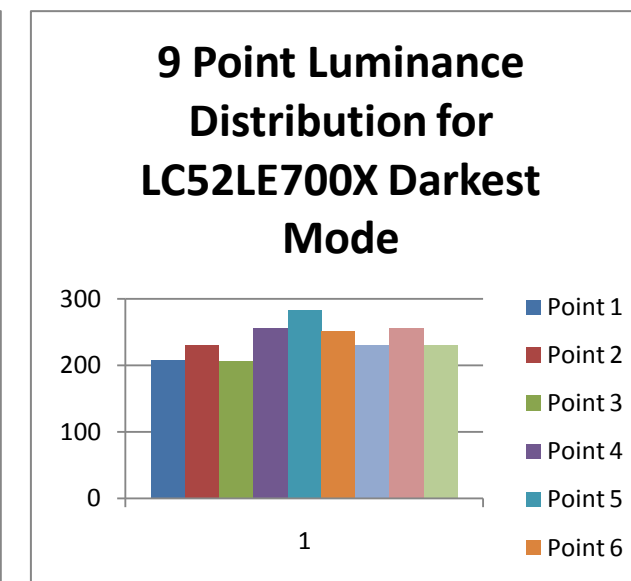
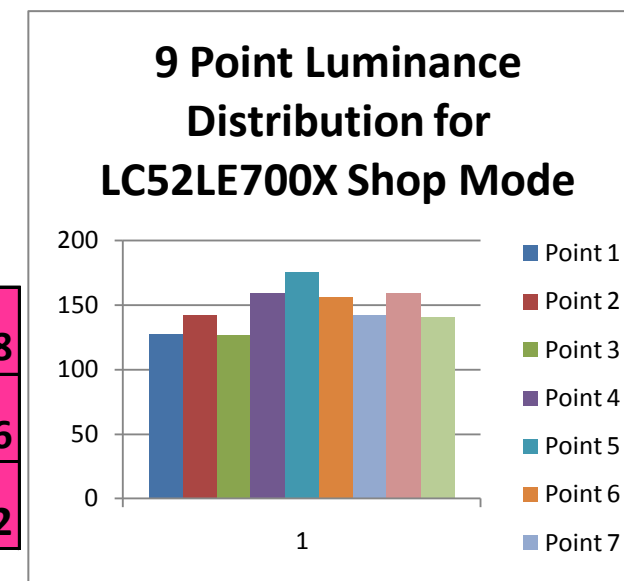
Active Standby
 13W

Test Result Sheet No. 19

Model Numb LC52LE700X
 Brand Sharp
 Type FULL LED

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Game			
On Power	102.50 .89				On Power	136.11 .89				On Power	94.28 .89			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		288.9			3 Bar		474.7			3 Bar		259.1		
50% Pattern		316.3			50% Pattern		478.6			50% Pattern		284.5		
9 Point					9 Point					9 Point				
		85.8	95.4	86.1			127.1	142.4	126.9			207.1	230.1	206.2
		107.2	119.1	104.9			159.5	175.4	155.8			256.8	283.5	251.7
		95.1	107	95.9			142.2	158.7	140.9			230.4	255.5	231.3

ABC On Standard				ABC Off Standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		216.7				3 Bar	226.1		
50% Pattern		238.4				50% Pattern	240.9		
9 Point				9 Point					
		169.2	188.6	169.5			164	188.7	157.8
		211.3	232.6	205.4			209	236.8	195.6
		188.7	208.9	187.4			174.3	202.3	166.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	46.62	55.93	83.94	83.98
Luminan	82.3	122.7	217.1	218

Passive Standby
 0.45

Active Standby
 16.5

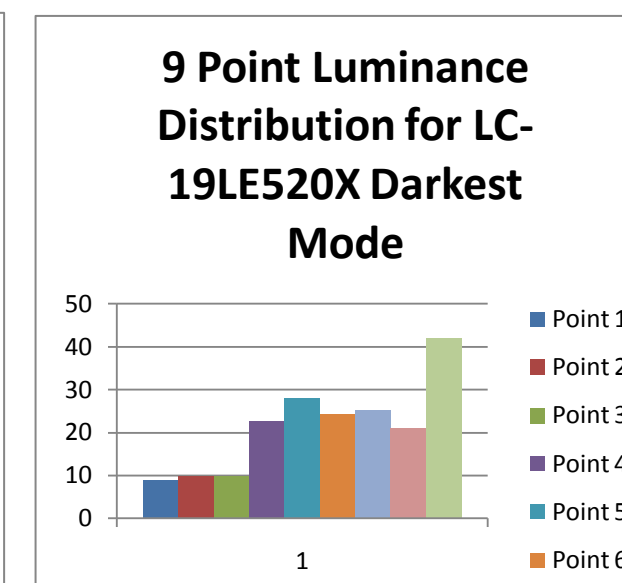
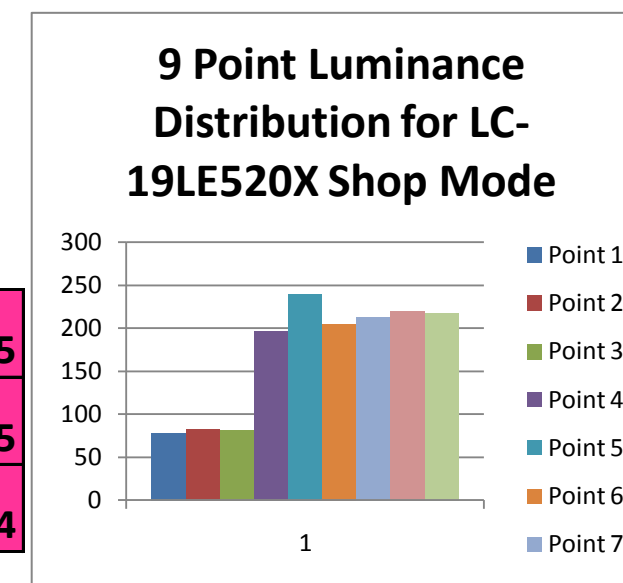
Test Result Sheet No. 20

Model Numb LC52LE700X
 Brand Sharp
 Type FULL LED

Home Mode	Standard				Shop Mode	Dynamic (Fixed)				Darkest Mod	Movie			
On Power	13.68 .45				On Power	24.00 .51				On Power	0.51			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		23.3			3 Bar		237.5			3 Bar		25.5		
50% Pattern		27.1			50% Pattern		238.4			50% Pattern		28.1		
9 Point					9 Point					9 Point				
		8.95	9.3	9.45			78.3	83.2	81.5			9.1	9.8	9.8
		22.5	27.1	23.3			197.2	240.1	205.2			22.8	28.1	24.3
		24.9	26.33	26.44			213.1	220.2	218.1			25.3	21	42.1

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		25.22		
50% Pattern		27.45		
9 Point				
		11.28	11.79	11.45
		23.2	28.02	24.75
		25.78	26.33	26.44



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	27.15	27.3	26.9	29
Luminan	12.54	12.55	15.11	18.69

Passive Standby
 0.1

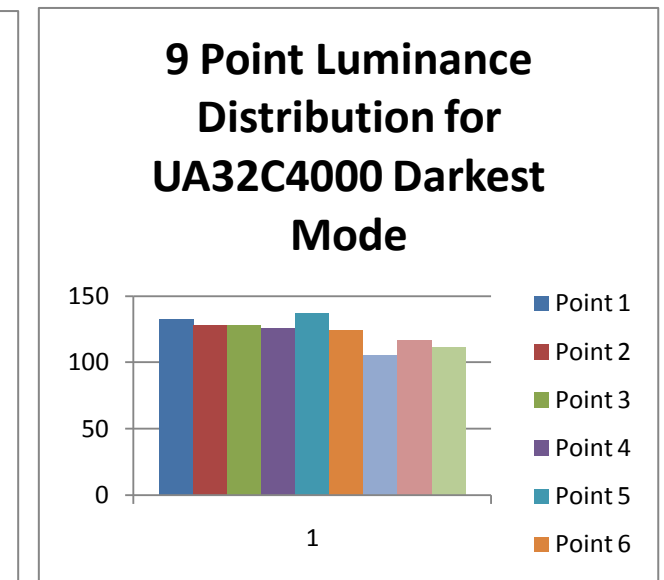
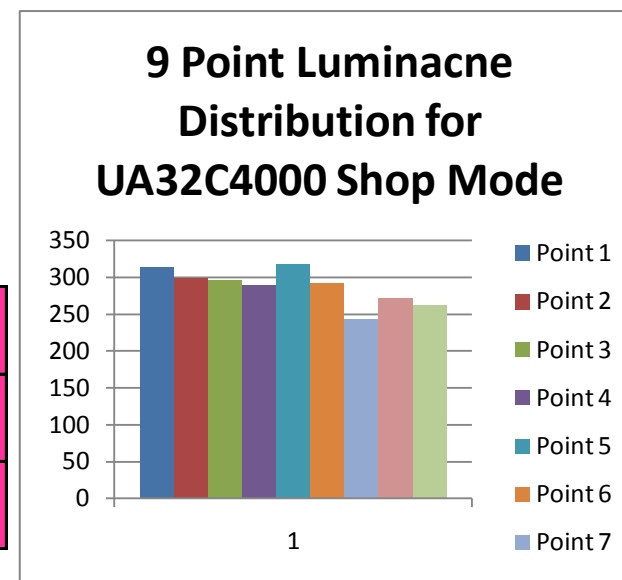
Active Standby

Test Result sheet No. 21

Model Numb UA32C4000
 Brand Samsung
 Type EDGE LIT LED

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Movie			
On Power	53.87 .58				On Power	66.246				On Power	45.50 .57			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		231.4			3 Bar		316.9			3 Bar		121.3		
50% Pattern		241.5			50% Pattern		330.1			50% Pattern		142.5		
9 Point					9 Point					9 Point				
		2298.4	219.3	219.6			313.5	299.6	297			133.1	128.5	127.8
		214.1	233.4	215.6			289.7	318.3	292.9			125.8	137.1	124.4
		180.3	200.7	192.3			243.4	271.6	261.7			105.8	116.9	111.3

ABC On Standard				ABC Off Standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		190.2				3 Bar	187.4		
50% Pattern		202.1				50% Pattern	201		
9 Point				9 Point					
		118.6	110.3	113.6			117.6	109.2	115.7
		109.1	119.2	111.1			104.7	117.5	107.2
		92.1	102.3	99.2			85.8	96.2	91.6



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	45.45	45.59	46.27	46.32
Luminan	119.5	119.7	120.8	193.9

Passive Standby
 0.25

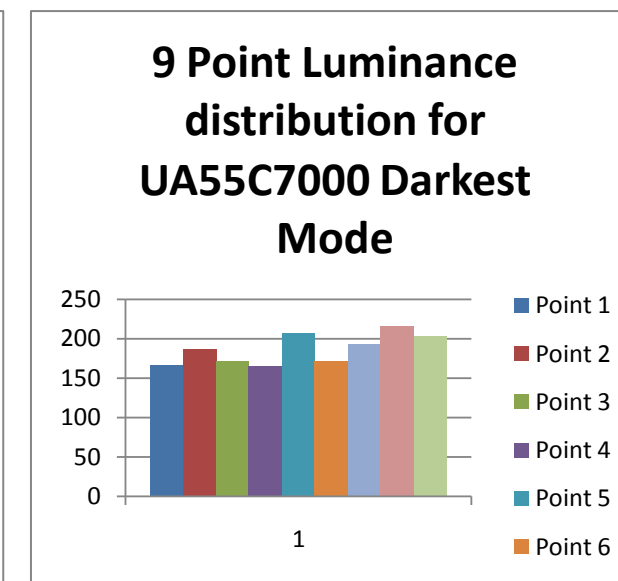
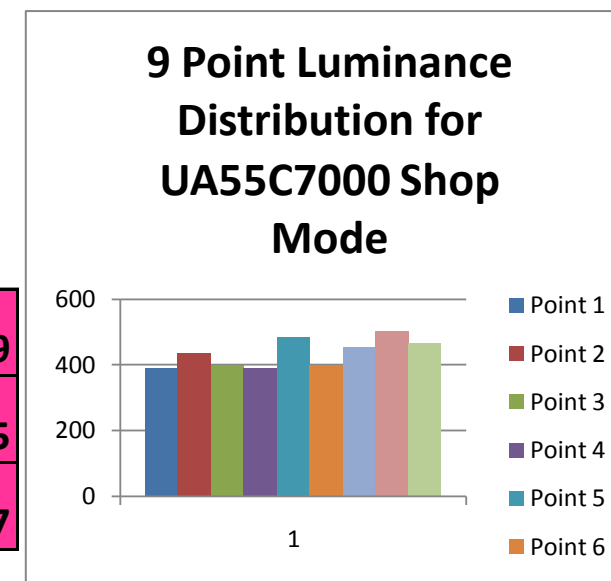
Active Standby
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Test Result Sheet No. 22

Model Num: UA55C7000
 Brand: Samsung
 Type: FULL LED

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Movie			
On Power	138.19 .96				On Power	185.73 .98				On Power	125.17 .98			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		282.2			3 Bar		438.2			3 Bar		173.9		
50% Pattern		301.2			50% Pattern		481.6			50% Pattern		206.3		
9 Point					9 Point					9 Point				
		243.1	271.6	249.8			389.4	434.9	399.4			165.7	186.2	171.2
		244.5	302.9	251.5			388.7	483.6	400			163.9	206.9	170.7
		283.7	313.1	293.1			452.1	500.3	464.2			192.6	215.1	202.4

ABC On Standard				ABC Off Standard					
Luminance	Contact			Luminance	Non Contact Meter				
3 Bar		258.8				3 Bar	267.6		
50% Pattern		272.6				50% Pattern	275.9		
9 Point				9 Point					
		112	124.8	116.5			105.3	125.1	110.9
		112	139.1	115.7			107	140.3	110.5
		130.2	114.6	134.6			120.8	141.1	124.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	115.06	115.09	115.12	115.14
Luminan	139.3	139.3	139.4	139.4

Passive Standby

0.1

Active Standby

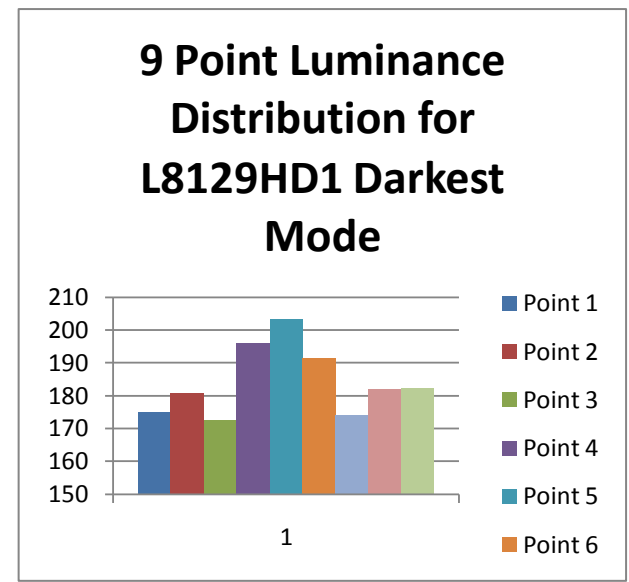
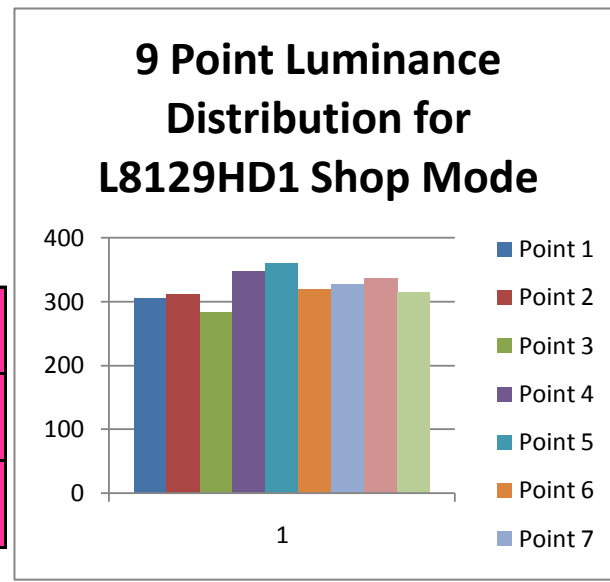
Test Result Sheet No. 23

Model Numk L8129HD1
 Brand Hisense
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild				
On Power	94.63				On Power	110.59				On Power	88.36				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		206.3			3 Bar		317.4			3 Bar		168.5			
50% Pattern		246.3			50% Pattern		368.7			50% Pattern		203.1			
9 Point					9 Point					9 Point					
		205.5	214.1	201.4			305	312.4	282.7			174.7	180.8	172.5	
		236.7	246.1	228.1			347.3	360.5	320.2			195.8	203.1	191.4	
		218.5	229.4	224.5			327.1	335.8	314.2			173.9	181.9	182.3	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		209.6		
50% Pattern		249.5		
9 Point				
		206.1	213.2	196.6
		233.8	247.3	224.6
		209.4	225.6	216



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	93.33	93.36	94.68	94.95
Luminan	249.7	250.3	255.9	256.5

Passive Standby
 1.6

Active Standby

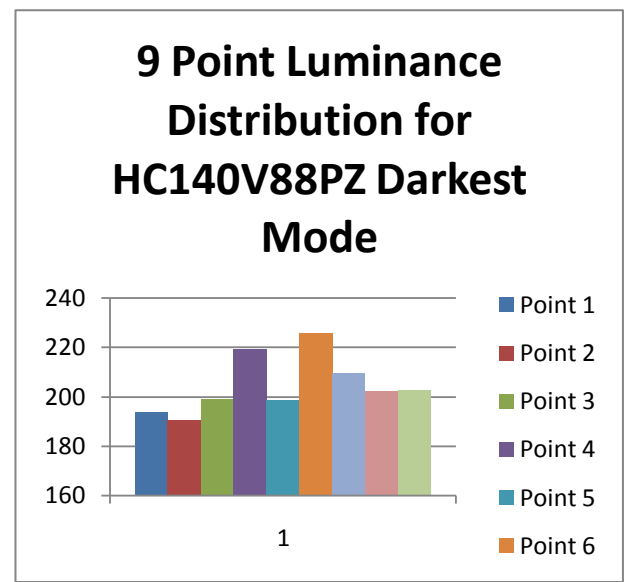
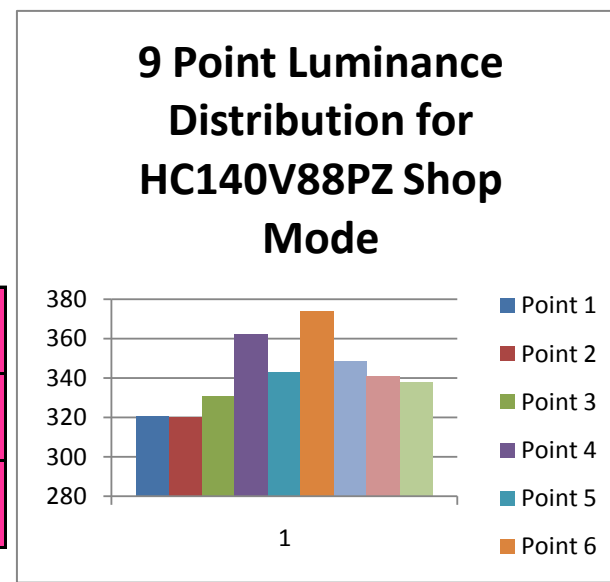
Test Result Sheet No. 24

Model Numk HC140V88PZ
 Brand Hisense
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	178.82 .97				On Power	207.60 .98				On Power	164.86 .97			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		193.1			3 Bar		274.1			3 Bar		160.4		
50% Pattern		232.2			50% Pattern		341.2			50% Pattern		200		
9 Point					9 Point					9 Point				
		227.7	223.6	235			320.5	319.6	330.2			193.7	190.5	198.9
		258.1	235.5	266.3			362.3	342.6	373.7			219.3	198.6	226
		248	239.9	239.6			348.6	340.6	337.8			209.6	202.3	202.4

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		202		
50% Pattern		243		
9 Point				
		219	230.6	227.5
		250	243.5	259.4
		228.2	227	221.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	176.13	176.26	176.36	176.28
Luminan	238.4	239.6	239.5	240

Passive Standby
 0.55

Active Standby

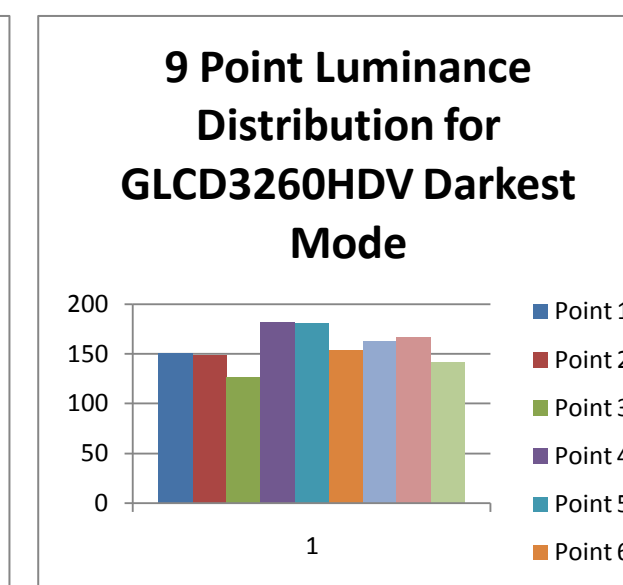
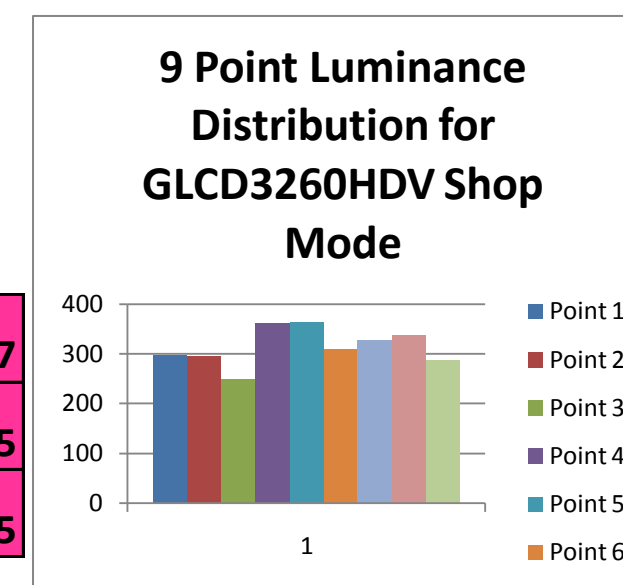
Test Result Sheet No. 25

Model Numb GLCD3260HDV
 Brand Gvendig
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	100.65 .89				On Power	100.18 .89				On Power	100.28 .89			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		229.3			3 Bar		285.1			3 Bar		137.6		
50% Pattern		314.5			50% Pattern		383.1			50% Pattern		192.6		
9 Point					9 Point					9 Point				
		243.3	245.1	206.2			297.6	296.1	250.1			150.7	149.1	126.4
		297.8	298.3	252.7			360.5	363.2	309.1			181.6	180.3	153.2
		270.1	278.8	237.9			328.6	338	287.4			163	167.5	141.7

No ABC

ABC Off standard				
Luminance	Non Contact Meter			
3 Bar		234.2		
50% Pattern		320.6		
9 Point				
		237.9	249.2	197
		292.7	303.1	248.5
		250.9	274.6	213.5



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	99.79	100.08	100.04	99.91
Luminan	300.6	300.5	299.1	298.8

Passive Standby

Active Standby

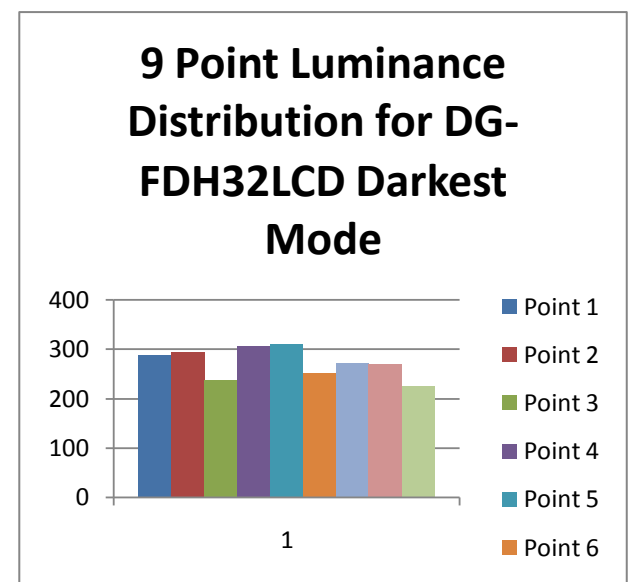
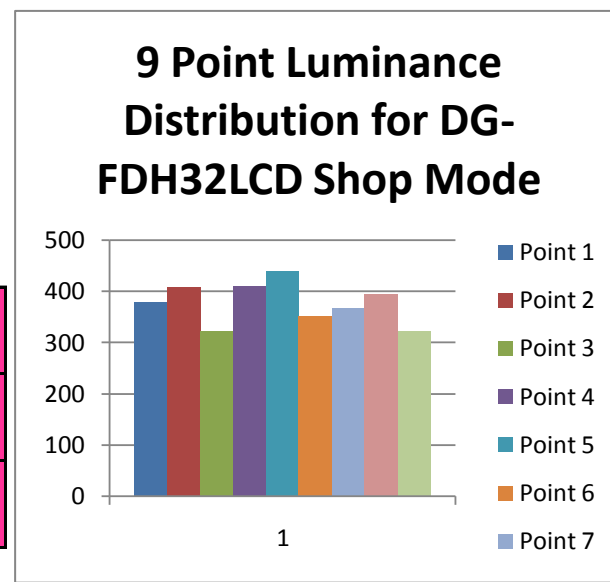
Test Result Sheet No. 26

Model Numk DG-FDH32LCD
 Brand DGTEC
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild				
On Power	89.37 .91				On Power	88.21 .91				On Power	88.34				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		313.4			3 Bar		350			3 Bar		239.7			
50% Pattern		408.1			50% Pattern		453.3			50% Pattern		322.4			
9 Point					9 Point					9 Point					
		347.7	372.8	296			378.4	407.6	321.8			287.3	295	235.7	
		379.2	395.3	318.9			409.9	438.5	350.6			306.4	310.6	251.1	
		335.1	350.5	288.4			366.6	394.2	321.7			270.8	269.5	224.7	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		313.7		
50% Pattern		405.3		
9 Point				
		346.4	374.8	296.1
		362.6	391.6	310.9
		299	381.3	277.9



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	88.07	88.1	88.1	88.04
Luminan	394.8	395.8	394.4	394.6

Passive Standby
 0.27

Active Standby

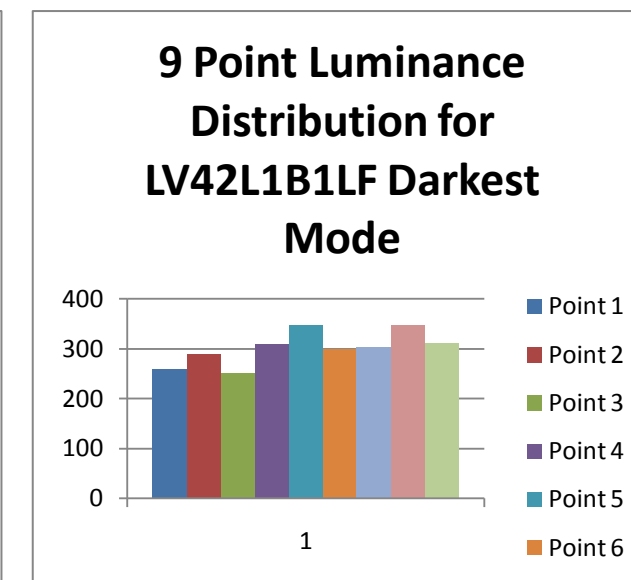
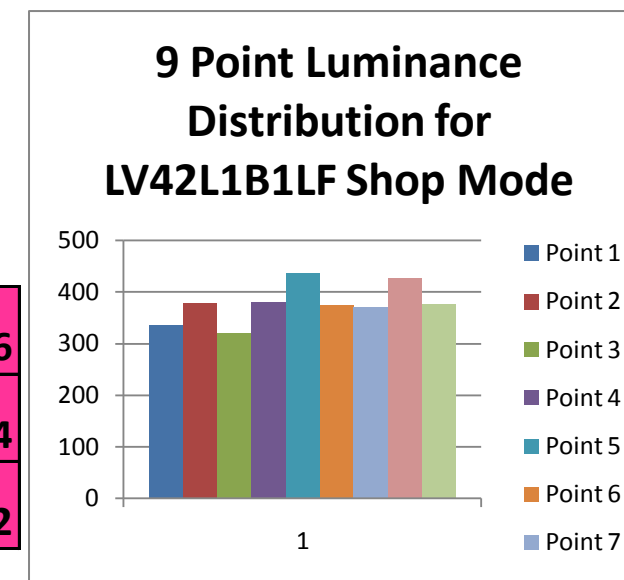
Test Result Sheet No. 27

Model Numb LV42L1B1LF
 Brand Daewoo
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	174.3 .98				On Power	172.93 .98				On Power	173.01 .98			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		396.2			3 Bar		417.9			3 Bar		301.1		
50% Pattern		486.1			50% Pattern		439.6			50% Pattern		354.6		
9 Point					9 Point					9 Point				
		336.6	375.6	321.1			335.3	379.1	321.1			259.4	288.8	251.1
		383.8	437.2	375.5			380.3	437.3	375.5			309.7	347.4	299.5
		376.6	427.5	376.1			370.4	427.3	376.3			302.9	347.1	312.3

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		400		
50% Pattern		440.4		
9 Point				
		287.9	365.5	303.6
		333.8	435.6	366.4
		311.5	410.9	356.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	172.78	173.29	173.39	173.17
Luminan	434.1	435.6	435	433.4

Passive Standby
 1.25

Active Standby

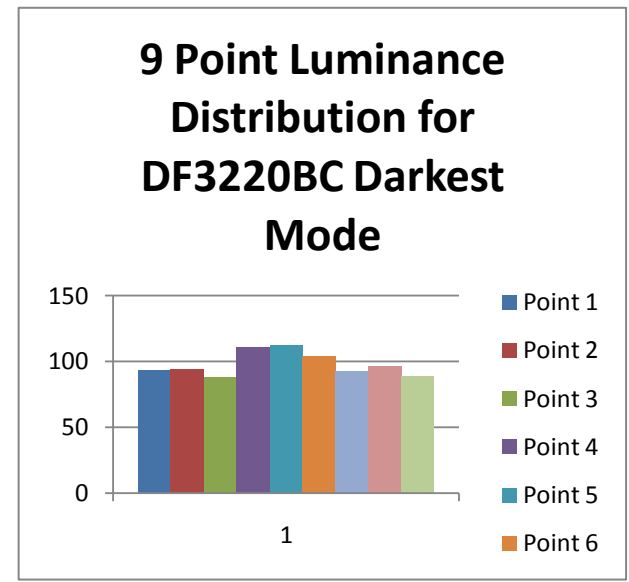
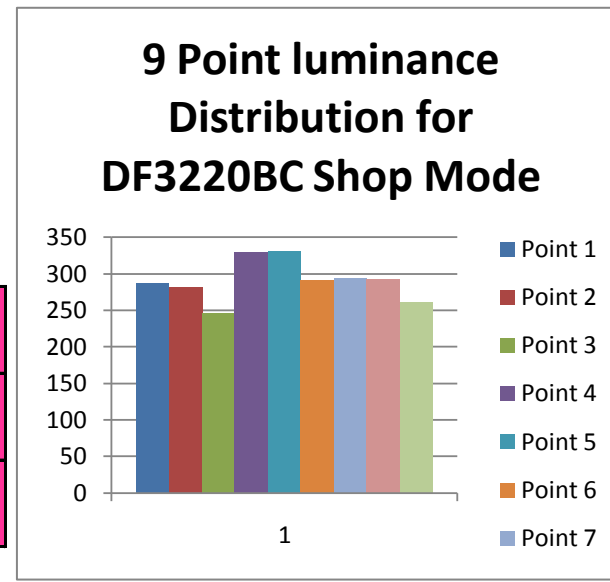
Test Result Sheet No. 28

Model Numk LV42L1B1LF
 Brand Baumann Meyer
 Type

Home Mode	Standard				Shop Mode	Custom				Darkest Mod	Night			
On Power	100.82 .95				On Power	101.34 .95				On Power	62.96 .90			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		219.8			3 Bar		284.6			3 Bar		93.3		
50% Pattern		262.5			50% Pattern		340.2			50% Pattern		111.3		
9 Point					9 Point					9 Point				
		222.2	218.1	191.8			286.8	281.2	246.1			93.3	93.7	88.3
		265.6	263	231.1			328.4	331.3	290.7			110.9	112.1	104
		241.3	236.2	212.6			293.4	292.3	261.7			92.6	95.9	88.9

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		220.2		
50% Pattern		263		
9 Point				
		220.9	222.3	189.1
		260.3	264.9	226.7
		227.8	237.7	200.4



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	99.36	99.33	99.31	99.21
Luminan	263.1	263.8	263.2	262.1

Passive Standby
 1.5

Active Standby

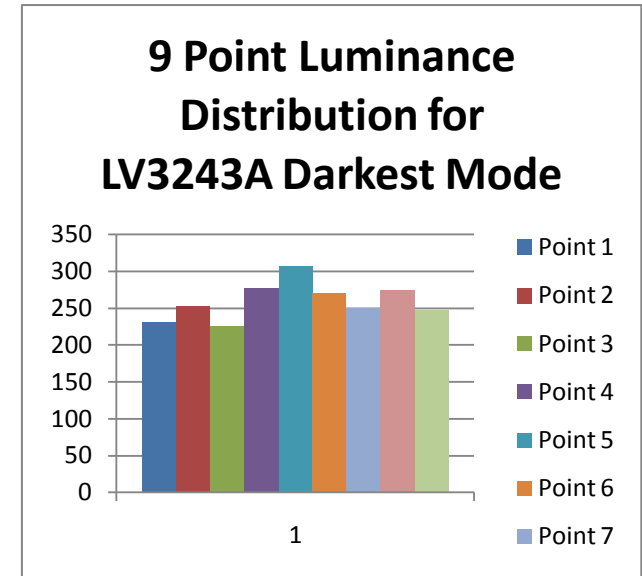
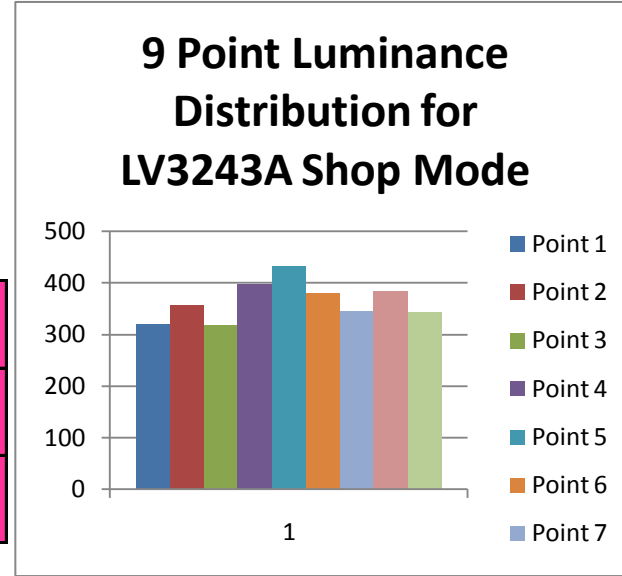
Test Result Sheet No. 29

Model Numb LV3243A
 Brand Daewoo
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	106.65 .94				On Power	102.03 .93				On Power	103.19 .93			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		369.1			3 Bar		391.5			3 Bar		252.5		
50% Pattern		425.2			50% Pattern		434.5			50% Pattern		313.1		
9 Point					9 Point					9 Point				
		314.6	345.1	308			321.3	357.9	318.1			230.7	252.2	225.8
		383.2	418.6	370.1			397.5	433.1	379.9			277.4	307.1	270.1
		336.7	372	334.8			346.3	385.5	343.7			249.9	274.8	247.2

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		368.2		
50% Pattern		422.5		
9 Point				
		303.1	351.7	305.9
		350.7	415.3	356.2
		290.7	378.3	307.9



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	101.16	101.15	101.08	100.95
Luminan	418.1	419.2	417.2	415.2

Passive Standby
 1.24

Active Standby

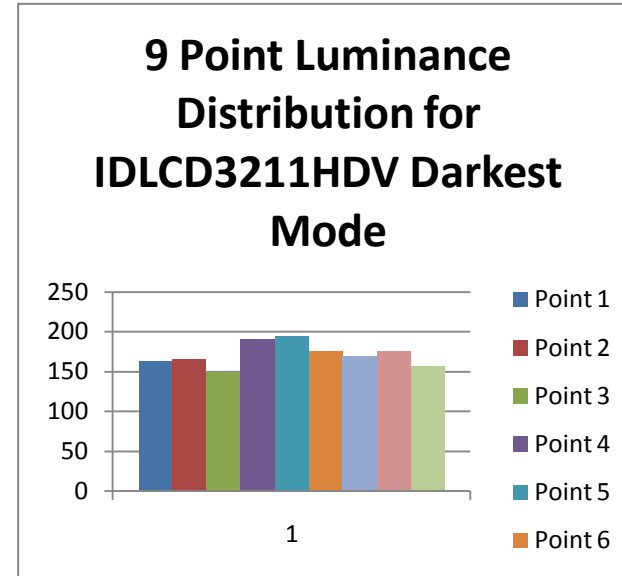
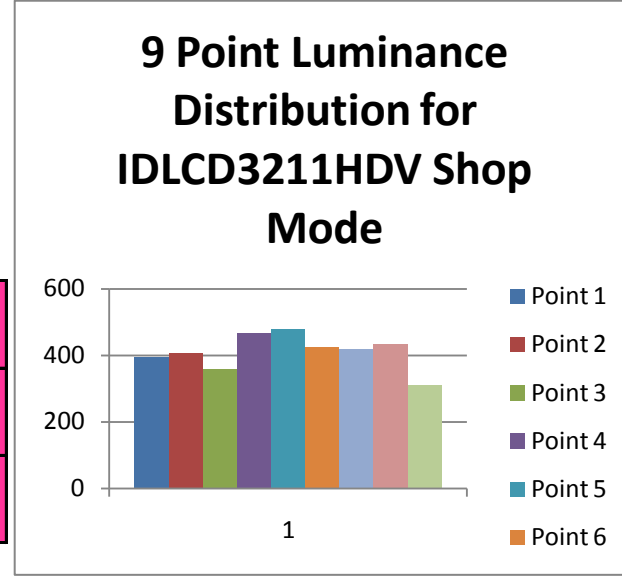
Test Result Sheet No. 30

Model Numb IDLCD3211HDV
 Brand Bush
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild				
On Power	96.54 .86				On Power	96.63 .86				On Power	96.48 .86				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		360.5			3 Bar		412.7			3 Bar		145.9			
50% Pattern		461.3			50% Pattern		479.6			50% Pattern		202.3			
9 Point					9 Point					9 Point					
		369.8	382.4	337.8			392.3	406.7	358.1			162.8	165.4	149.1	
		437.2	448.8	401.7			466.2	477.4	424.1			191	193.8	175.1	
		391.2	410.4	367.5			417.6	432.1	309.2			169.5	175.2	157.5	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		356.4		
50% Pattern		455.4		
9 Point				
		351.2	382.2	330.2
		410.5	446.8	385.3
		348.7	382	338



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	96.79	97.11	97.03	96.82
Luminan	446.6	448.2	446.5	444.7

Passive Standby
 1

Active Standby

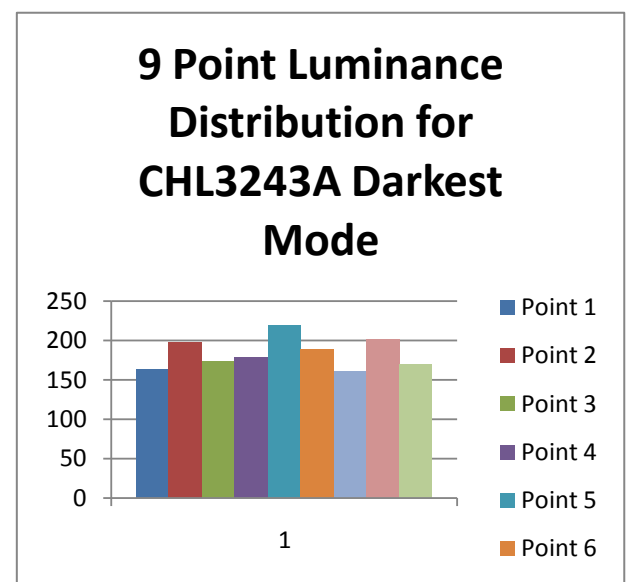
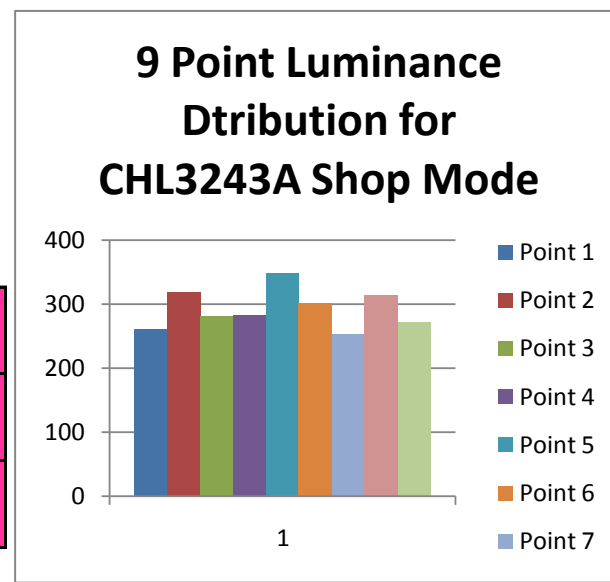
Test Result Sheet No. 31

Model Numk CHL3243A
 Brand Changhong
 Type LCD

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Soft				
On Power	59.44 .89				On Power	59.57 .89				On Power	59.25 .89				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		297.8			3 Bar		322.8			3 Bar		184.8			
50% Pattern		340.9			50% Pattern		348.2			50% Pattern		225.1			
9 Point					9 Point					9 Point					
		253.3	306.5	268.9			261.2	317.8	280.7			163.1	197.2	172.9	
		274.2	336.5	293.7			282.1	348.5	300.5			178.6	219.8	188.8	
		245.6	302.1	261.8			253.4	313.2	271.5			160.3	201.7	169.6	

No ABC

ABC Off standard				
Luminance	Non Contact Meter			
3 Bar		303.2		
50% Pattern		347.6		
9 Point				
		243.3	313.6	258.8
		265.8	340.4	289.2
		236.4	320.6	263.9



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	59.13	59.18	59.16	59.12
Luminan	332.3	334.8	333.6	335.1

Passive Standby
 0.7

Active Standby

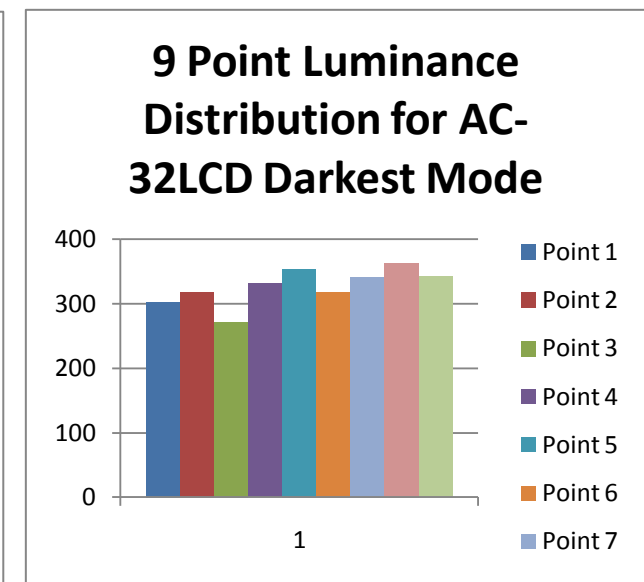
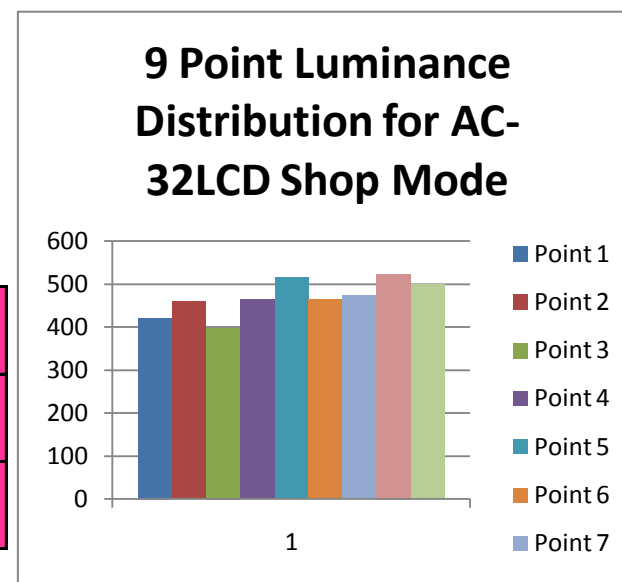
Test Result Sheet No. 32

Model Numb AC-32LCD
 Brand Allure
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild						
On Power	135.33 .94				On Power	135.46 .94				On Power	134.89 .94						
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter						
3 Bar		352.1					3 Bar	401.3				3 Bar	275.3				
50% Pattern		454.6					50% Pattern	521.2				50% Pattern	358.1				
9 Point					9 Point					9 Point							
		374.5	402.7	349.9			421.9	460.1	398.2			302.7	318.3	272.6			
		411.5	453.8	407.2			463.3	515.4	463.1			331.6	354.3	318.4			
		421.9	463.6	439.4			474.4	523.5	498.2			340.8	362.3	342.1			

No ABC

ABC Off standard				
Luminance	Non Contact Meter			
3 Bar		351.5		
50% Pattern		453.6		
9 Point				
		375.4	409.3	325.2
		410.3	455.3	408
		411.5	467.4	429.4



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	133.67	133.98	134.12	134.1
Luminan	456.4	456.5	456.5	455.6

Passive Standby
 0.34

Active Standby

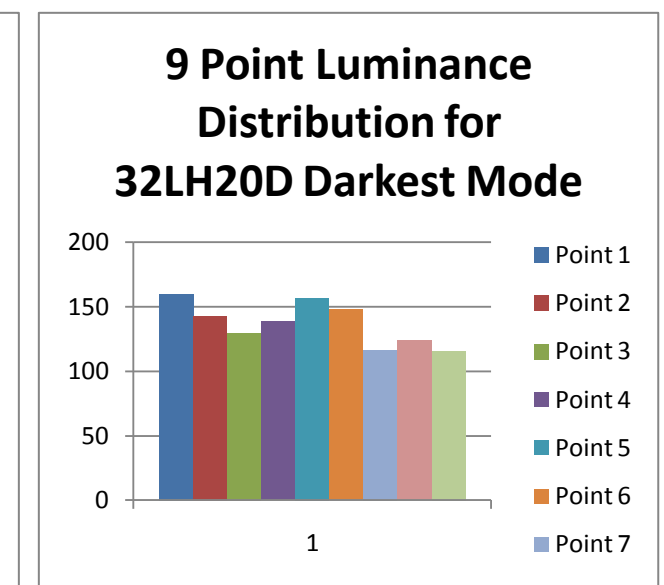
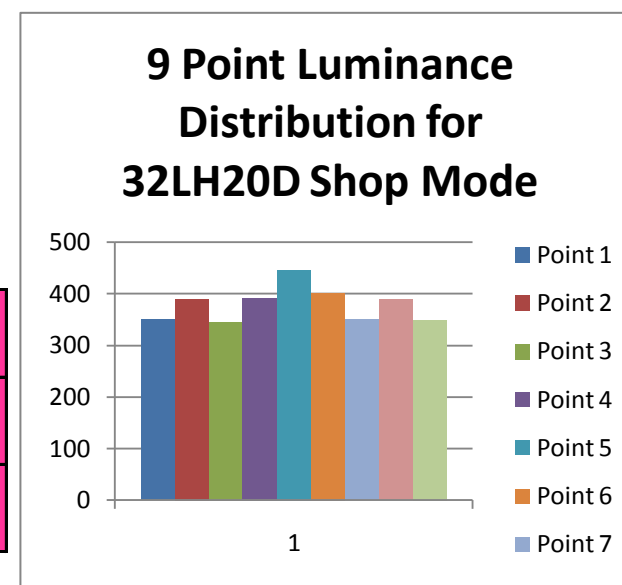
Test Result Sheet No. 33

Model Numb 32LH20D
 Brand LG
 Type

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Cinema				
On Power	78.09				On Power	105.13				On Power	56.47				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		278.1			3 Bar		434.6			3 Bar		138.7			
50% Pattern		316.2			50% Pattern		452.7			50% Pattern		160.1			
9 Point					9 Point					9 Point					
		249.4	282.5	252			349.6	390.7	344.9			159.9	142.7	129.6	
		278.3	316.6	290.6			391.4	446	401.7			138.7	156.4	147.7	
		242.8	267.5	239.1			349.9	389.5	349.1			116.8	124	115.7	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		279.7		
50% Pattern		314.7		
9 Point				
		246.3	284.4	247.2
		270.2	320.5	288.2
		223.4	263.8	224.1



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	77.87	78.02	78.03	77.97
Luminan	318.5	317.3	317.5	317.4

Passive Standby
 2.8

Active Standby

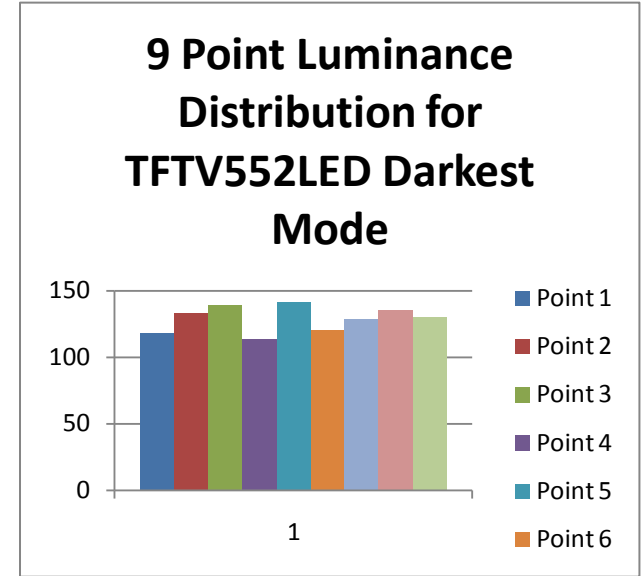
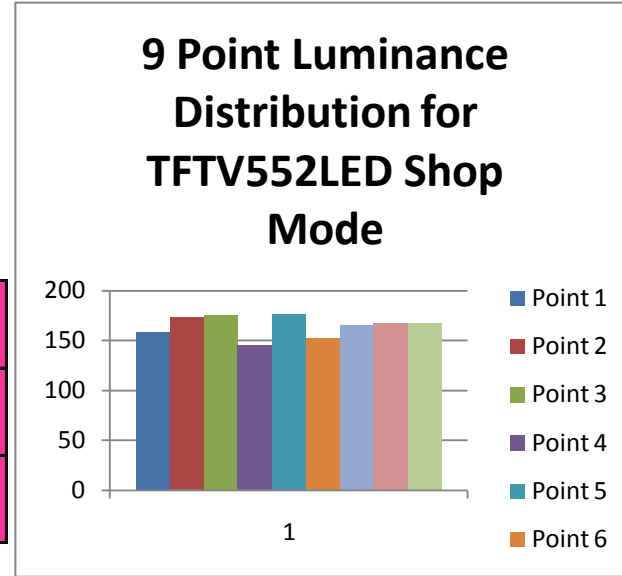
Test Result Sheet No. 34

Model Numb TFTV552LED
 Brand Palsonic
 Type FULL LED

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Mild			
On Power	24.11				On Power	24.13				On Power	24.13			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		122.8			3 Bar		143			3 Bar		110.1		
50% Pattern		163.5			50% Pattern		184.3			50% Pattern		144.6		
9 Point					9 Point					9 Point				
		137.5	156.1	158.4			158.4	173.2	175.2			117.3	132.7	139.1
		127.1	157.7	135.5			145.6	176.1	151.6			113.2	141.3	120.1
		149.2	150.5	150.2			165.3	167.4	167.1			128.5	135.3	130

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		165.1		
50% Pattern		197.7		
9 Point				
		164.1	184.5	178.5
		160.2	194	149.8
		179.2	185.1	159.5



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	24.11	24.11	24.11	24.12
Luminan	176.1	176.6	176.6	176.7

Passive Standby
 0.1

Active Standby

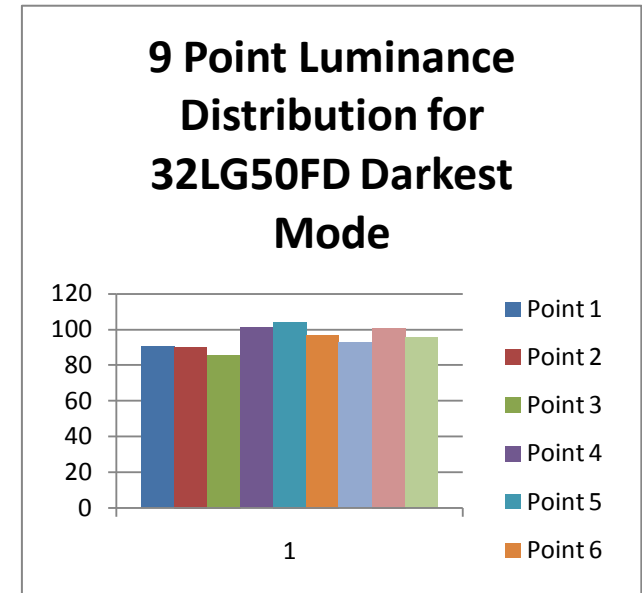
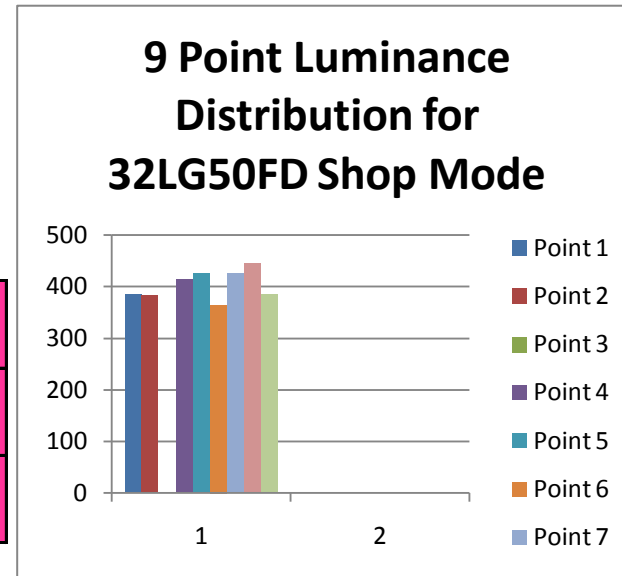
Test Result Sheet No. 35

Model Numb 32LG50FD
 Brand LG
 Type

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Cinema				
On Power	122.35				On Power	147.09				On Power	67.94				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		181.3			3 Bar		380.4			3 Bar		85.6			
50% Pattern		222.6			50% Pattern		423.8			50% Pattern		105.1			
9 Point					9 Point					9 Point					
		317.5	318.6	279.6			385.1	382.6	334.1			90.4	90.1	85.6	
		336.3	340.6	302.3			414.7	425.3	365			101.2	104.1	96.7	
		321	338.6	304.9			425.1	445	385.6			92.7	100.6	95.5	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		384.4		
50% Pattern		438.6		
9 Point				
		395.7	415.9	352.3
		424.9	443.6	374
		399.7	450.2	369.5



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	146.49	146.46	146.37	145.83
Luminan	424.2	422.7	422.4	424.9

Passive Standby
 0.8

Active Standby

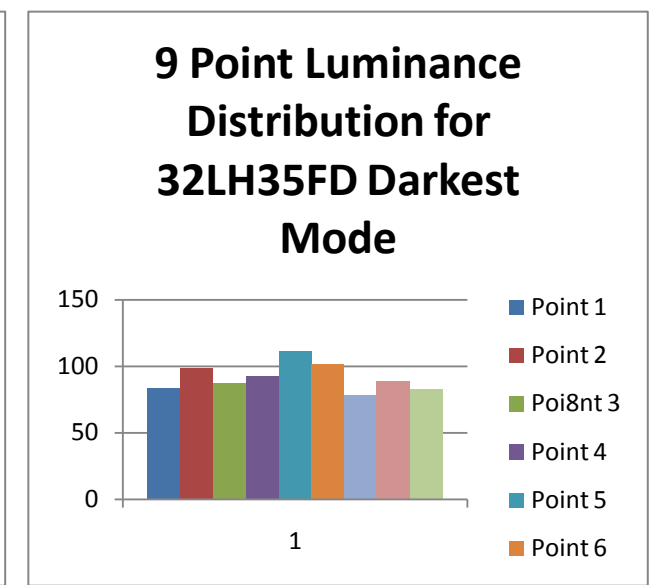
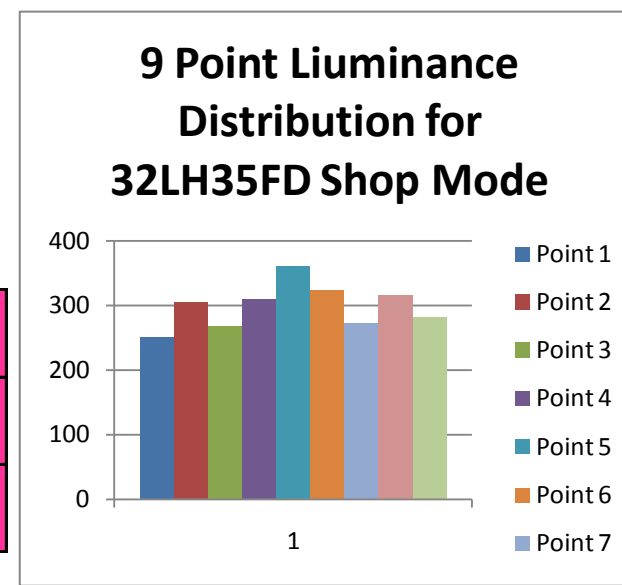
Test Result Sheet No. 36

Model Numb 32LH35FD
 Brand LG
 Type

Home Mode	Standard				Shop Mode	Vivid				Darkest Mod	Cinema				
On Power	55.29				On Power	81.696				On Power	45.11				
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter				
3 Bar		197.3			3 Bar		351.6			3 Bar		103.7			
50% Pattern		205.3			50% Pattern		360.5			50% Pattern		127.6			
9 Point					9 Point					9 Point					
		148.3	172.3	151.6			250.5	305.3	268			83.3	98.4	86.6	
		171.1	200.3	179.8			310.3	360.4	322.6			92.5	111.1	101.5	
		142.2	163.1	149			272.3	315.8	282.1			77.7	88.9	82.4	

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		192.5		
50% Pattern		197.1		
9 Point				
		148	173.4	153.5
		158.2	197.6	180.8
		130	204.7	140.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	55.42	55.38	55.37	55.38
Luminan	189.7	189.1	189.7	189.2

Passive Standby
 0.06

Active Standby

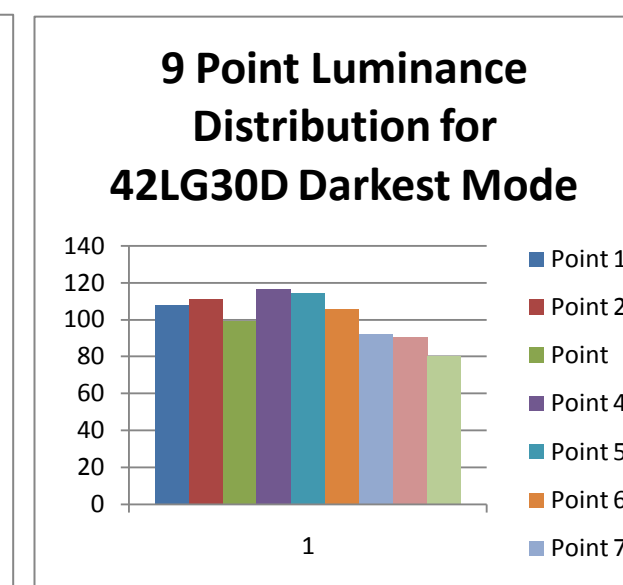
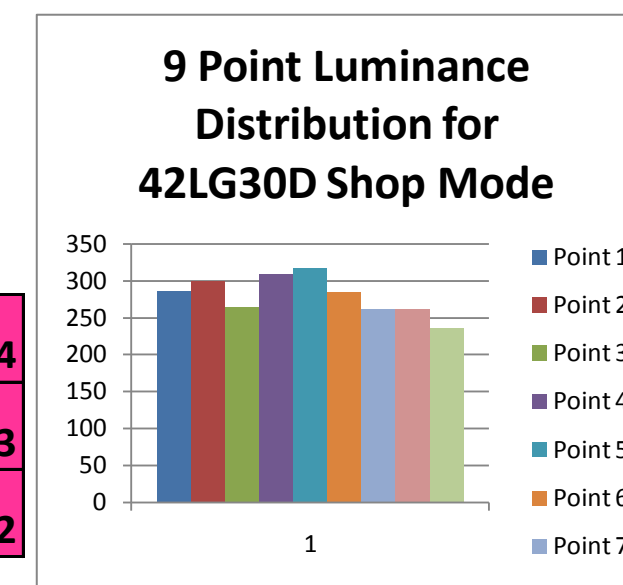
Test Result Sheet No. 37

Model Numb 42LG30D
 Brand LG
 Type

Home Mode	Vivid				Shop Mode	Standard				Darkest Mod	Cinema			
On Power	179.61				On Power	132.13				On Power	76.14			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		418.6			3 Bar		177.7			3 Bar		97.2		
50% Pattern		457.9			50% Pattern		195.3			50% Pattern		107.5		
9 Point					9 Point					9 Point				
		404.1	449.4	377.9			286.1	299.9	263.9			107.4	110.9	99
		440.1	477.1	410.8			308.5	317.8	285.4			116.3	114.4	105.7
		384.9	412.2	355.8			262.1	261.9	236.5			92.3	90.1	80.1

No ABC

ABC Off standard				
Luminance	Non Contact Meter			
3 Bar		408.6		
50% Pattern		453.3		
9 Point				
		368.7	440.7	361.4
		413.5	477.6	402.3
		345.8	399.7	345.2



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	180.88	178.92	177.94	177.52
Luminan	461.2	455.1	455.3	456.2

Passive Standby
 0.83

Active Standby

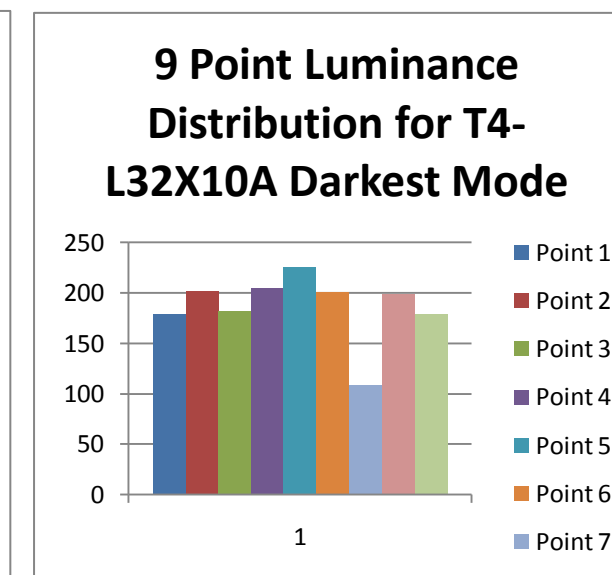
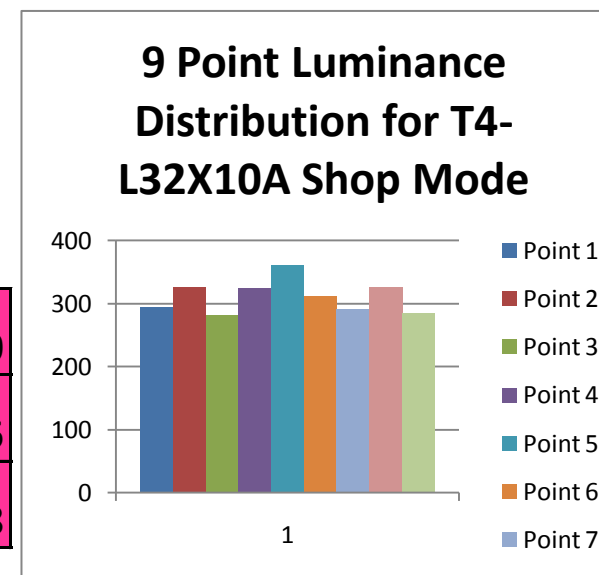
Test Result Sheet No. 38

Model Num: T4-L32X10A
 Brand: Panasonic
 Type:

Home Mode	Normal				Shop Mode	Dynamic				Darkest Mode	Cinema			
On Power	83.4				On Power	102.94				On Power	71.21			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		241			3 Bar		377.6			3 Bar		187.9		
50% Pattern		286.6			50% Pattern		394.1			50% Pattern		218.4		
9 Point					9 Point					9 Point				
		200.8	229.4	204.9			293.5	325.6	281.7			178.8	201.5	180.9
		234	259.9	232.4			323	361.1	311.7			204.5	225.3	200.4
		207.8	232.4	210.7			290.6	325.7	284.8			108.3	198.3	178.6

No ABC

ABC Off standard				
Luminance	Non Contact Meter			
3 Bar		249.7		
50% Pattern		295.6		
9 Point				
		195.9	235.1	200
		229.7	263.6	229.6
		193.1	223.4	199.8



Contrast Cor	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	82.72	82.92	82.95	82.87
Luminan	261.8	261.8	261.8	262

Passive Standby

0.23

Active Standby

17.8

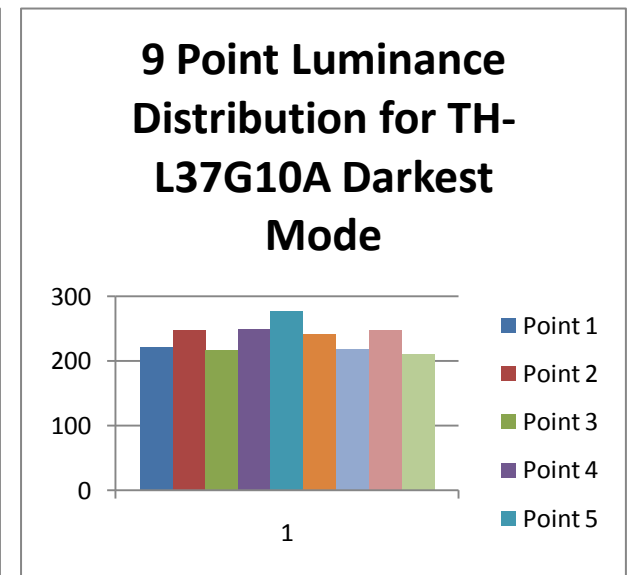
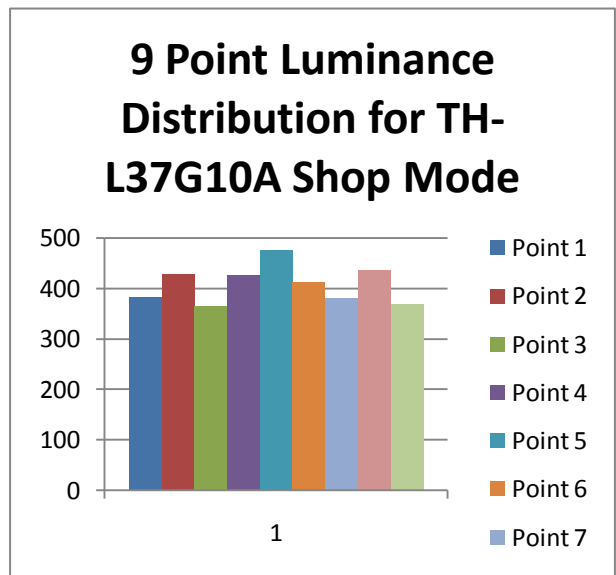
Test Result Sheet No. 39

Model Num: TH-L37G10A
 Brand: Panasonic
 Type:

Home Mode	Normal				Shop Mode	Dynamic				Darkest Mode	Cinema			
On Power	101.06				On Power	131.03				On Power	91.92			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		310.1			3 Bar		466.2			3 Bar		249.1		
50% Pattern		318.6			50% Pattern		471.5			50% Pattern		271.6		
9 Point					9 Point					9 Point				
		254.5	285.4	248.6			382.1	428.5	366.1			221.4	248.1	216.7
		286.7	321.1	277.8			427.2	476.1	411.6			250.1	278.2	241.5
		250.7	288.1	244.5			381.9	436.1	370.2			218.3	248.7	210.6

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		313.8		
50% Pattern		325.5		
9 Point				
		248.6	288.4	255
		283.7	324.7	275.7
		249.7	301.5	239.5



Contrast Cor	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	99.37	99.87	99.99	100.02
Luminan	320.4	321	320.5	320.7

Passive Standby
0.42

Active Standby
17.81

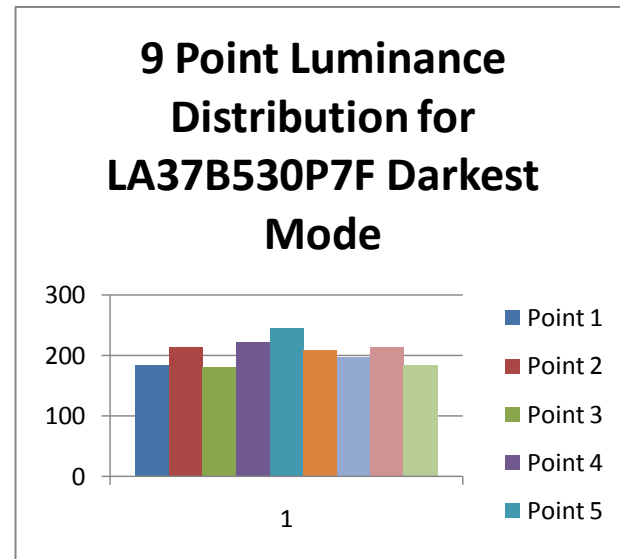
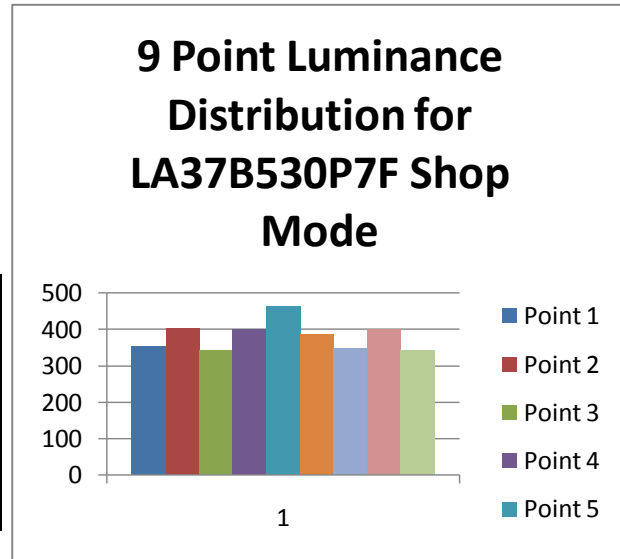
Test Result Sheet No. 40

Model Num: LA37B530P7F
 Brand Samsung
 Type

Home Mode	Standard				Shop Mode	Dynamic				Darkest Mod	Movie			
On Power	99				On Power	126.29				On Power	86.35			
Luminance	Contact Meter				Luminance	Contact Meter				Luminance	Contact Meter			
3 Bar		234.8			3 Bar		387.1			3 Bar		202.1		
50% Pattern		293.3			50% Pattern		469.8			50% Pattern		244.4		
9 Point					9 Point					9 Point				
		216.2	251.5	212.9			352.2	403.1	342.8			185.3	212.8	181.7
		261.4	295.7	249.1			399.1	462.2	386.3			222.3	245.2	210.1
		234.3	258.1	221.4			348.4	398.3	341.9			197.2	213.2	183.4

No ABC

ABC Off Standard				
Luminance	Non Contact Meter			
3 Bar		245.7		
50% Pattern		298.7		
9 Point				
		195.9	249.4	209.9
		236.8	297.5	236.5
		195.6	235.5	194.7



Contrast Con	10	20	30	40	50	60	70	80	90	100
Plasma Only										

ABC	10	50	150	300
Power	97.84	298	296.7	296.6
Luminan	297.5	298	296.7	296.6

Passive Standby
 0.25

Active Standby