



Evaluation Report of CPT 3.0" LCM with R61509V

Renesas SP Drivers Taiwan Inc.

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1. LCD Module

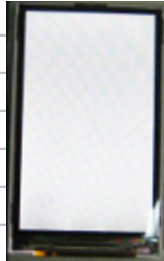

- Glass : 3.0“ Glass, wQVGA (240RGBx400), TN type
- Glass P/N : C030JB
- Common Test Condition :
 - I/F:18bit x 1 time, 262K color
 - 1 Line inversion drive
 - $VCI1=VCILVL * 1.00$
 - Frame frequency : 69.54Hz (TE output signal)
- Test Sample : 1 pc

2. Condition A

VCC=VCI=IOVCC=2.80V

VCI1 short to VCI

2.1 Voltage and Current

| | Calculation | White display | 32 gray | Black display |
|----------------------|-------------|---|--|--|
| VGH(V) | 16.80 | 15.60 | 15.00 | 14.10 |
| DDVDH(V) | 5.60 | 5.21 | 5.04 | 4.73 |
| VREG(V) | 4.50 | 4.58 | 4.58 | 4.56 |
| VGL(V) | -8.40 | -7.81 | -7.42 | -6.77 |
| Ivcc+Ivci+Iiovcc(mA) | - | 5.23 | 7.40 | 11.28 |
| Picture | - |  |  |  |

2.2 Brightness & Contrast

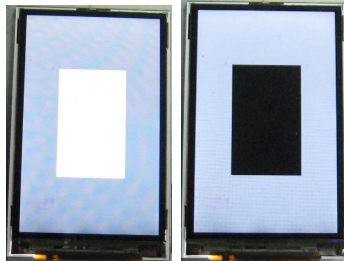
Max. brightness (white display) : 294 (cd/m²)

Min. brightness (black display) : 0.4 (cd/m²)

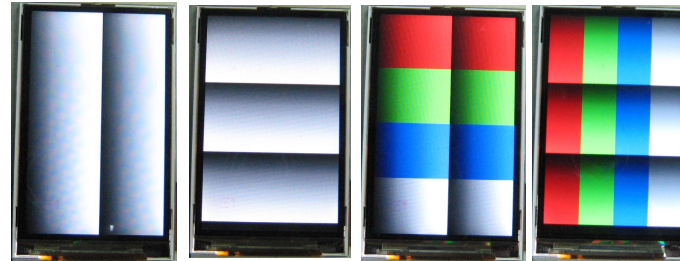
Contrast ratio : 735

2.3 Pattern Checking

Crosstalk: OK



Smooth Gradation: OK



Each Gray
Level (0~63): OK



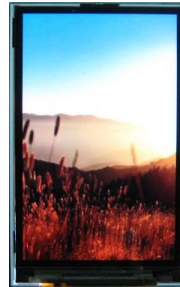
Flicker : OK



Girl : OK



Sunrise : OK



Others : OK

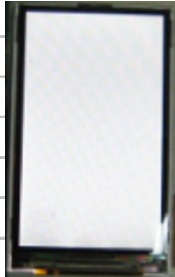




3. Condition B

VCC=VCI=IOVCC=2.80V

VCI1 **NOT** short to VCI

3.1 Voltage and Current

| | Calculation | White display | 32 gray | Black display |
|----------------------|-------------|---|--|--|
| VGH(V) | 16.80 | 14.20 | 14.50 | 13.60 |
| DDVDH(V) | 5.60 | 4.88 | 4.98 | 4.68 |
| VREG(V) | 4.50 | 4.44 | 4.51 | 4.50 |
| VGL(V) | -8.40 | 6.97 | -6.42 | -5.65 |
| Ivcc+Ivci+Iiovcc(mA) | - | 4.80 | 7.04 | 9.75 |
| Picture | - |  |  |  |

3.2 Brightness & Contrast

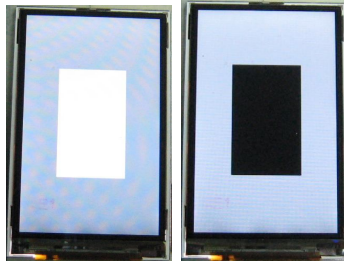
Max. brightness (white display) : 294 (cd/m²)

Min. brightness (black display) : 0.46 (cd/m²)

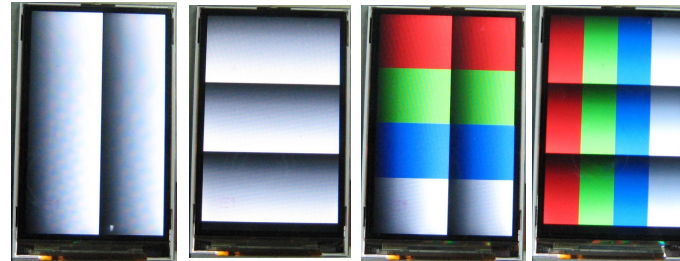
Contrast ratio : 639

3.3 Pattern Checking

Crosstalk: OK



Smooth Gradation: OK



Each Gray
Level (0~63): OK



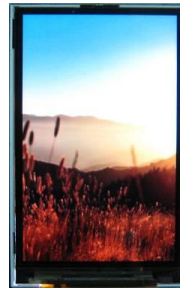
Flicker : OK



Girl : OK



Sunrise : OK



Others : OK





4. Condition C

VCC=VCI=IOVCC = **3.30V**

VCI1 short to VCI

4.1 Voltage and Current

| | Calculation | White display | 32 gray | Black display |
|----------------------|-------------|---|--|--|
| VGH(V) | 19.80 | 18.30 | 17.80 | 17.10 |
| DDVDH(V) | 6.60 | 6.12 | 6.00 | 5.76 |
| VREG(V) | 4.50 | 4.40 | 4.41 | 4.38 |
| VGL(V) | -9.90 | -9.09 | -8.74 | -8.27 |
| Ivcc+Ivci+Iiovcc(mA) | - | 6.05 | 8.32 | 11.68 |
| Picture | - |  |  |  |

4.2 Brightness & Contrast

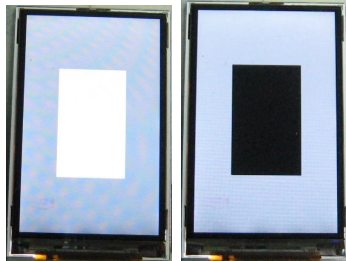
Max. brightness (white display) : 294 (cd/m²)

Min. brightness (black display) : 0.39 (cd/m²)

Contrast ratio : 753

4.3 Pattern Checking

Crosstalk: OK



Smooth Gradation: OK



Each Gray
Level (0~63): OK



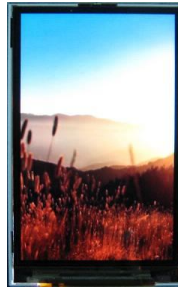
Flicker : OK



Girl : OK



Sunrise : OK

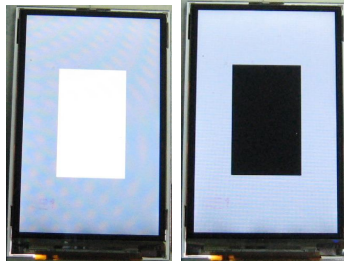


Others : OK

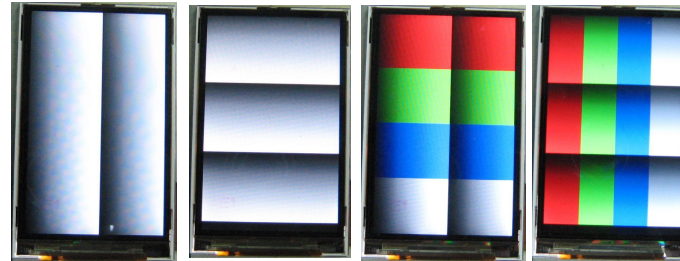


5.3 Pattern Checking

Crosstalk: OK



Smooth Gradation: OK



Each Gray
Level (0~63): OK



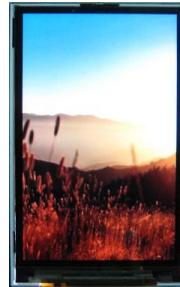
Flicker : OK



Girl : OK



Sunrise : OK



Others : OK

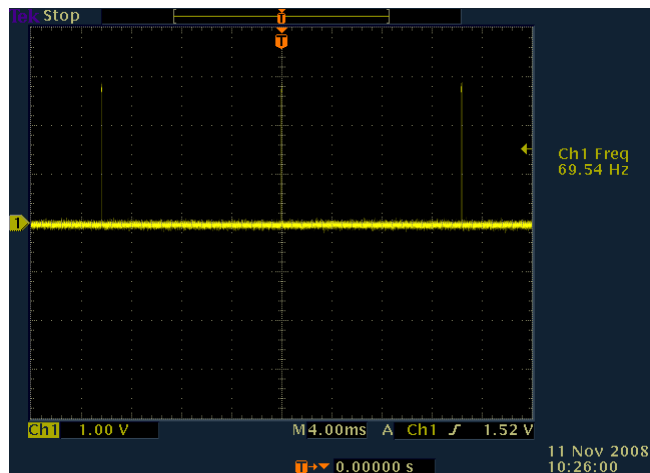


6. NVM Write & Load Function Checking

NVM write function result : OK

NVM data load to R280h result : OK

7. Frame rate measurement



FMARK : 69.54 Hz

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Appendix B : Initial Setting

| | | |
|--------------------------------|--|---|
| {setc, R00h, 0x00000} | {setc, R10h, 0x00016} //69.5Hz | {setc, R210h, 0x00000} |
| {setc, R00h, 0x00000} | {setc, R11h, 0x00101} // | {setc, R211h, 0x000EF} |
| {setc, R00h, 0x00000} | {setc, R12h, 0x00000} // | {setc, R212h, 0x00000} |
| {setc, R00h, 0x00000} | {setc, R13h, 0x00001} // | {setc, R213h, 0x0018F} //432=1AF, 400=18F |
| {time, 0010 ,ms} | | {setc, R500h, 0x00000} |
| {setc, R400h, 0x06200} | {setc, R100h, 0x00330} //BT,AP | {setc, R501h, 0x00000} |
| {setc, R08h, 0x00808} | {setc, R101h, 0x00237} //DC0,DC1,VC | {setc, R502h, 0x0005F} |
| | {setc, R103h, 0x00F00} //VDV | {setc, R401h, 0x00001} |
| {setc, R300h, 0x00C00} //gamma | {setc, R280h, 0x06100} //VCM | {setc, R404h, 0x00000} |
| {setc, R301h, 0x05A0B} | {setc, R102h, 0x0C1B0} //VRH,VCMR,PSON,PON | {time, 0100 ,ms} |
| {setc, R302h, 0x00906} | {time, 0100 ,ms} | |
| {setc, R303h, 0x01017} | | {setc, R07h, 0x00100} //BASEE |
| {setc, R304h, 0x02300} | {setc, R01h, 0x00100} | {time, 0100 ,ms} |
| {setc, R305h, 0x01700} | {setc, R02h, 0x00100} | {setc, R200h, 0x00000} |
| {setc, R306h, 0x06309} | {setc, R03h, 0x01030} | {setc, R201h, 0x00000} |
| {setc, R307h, 0x00C09} | {setc, R09h, 0x00001} | |
| {setc, R308h, 0x0100C} | {setc, R0Ch, 0x00000} | |
| {setc, R309h, 0x02232} | {setc, R90h, 0x08000} | |
| | {setc, R0Fh, 0x00000} | |

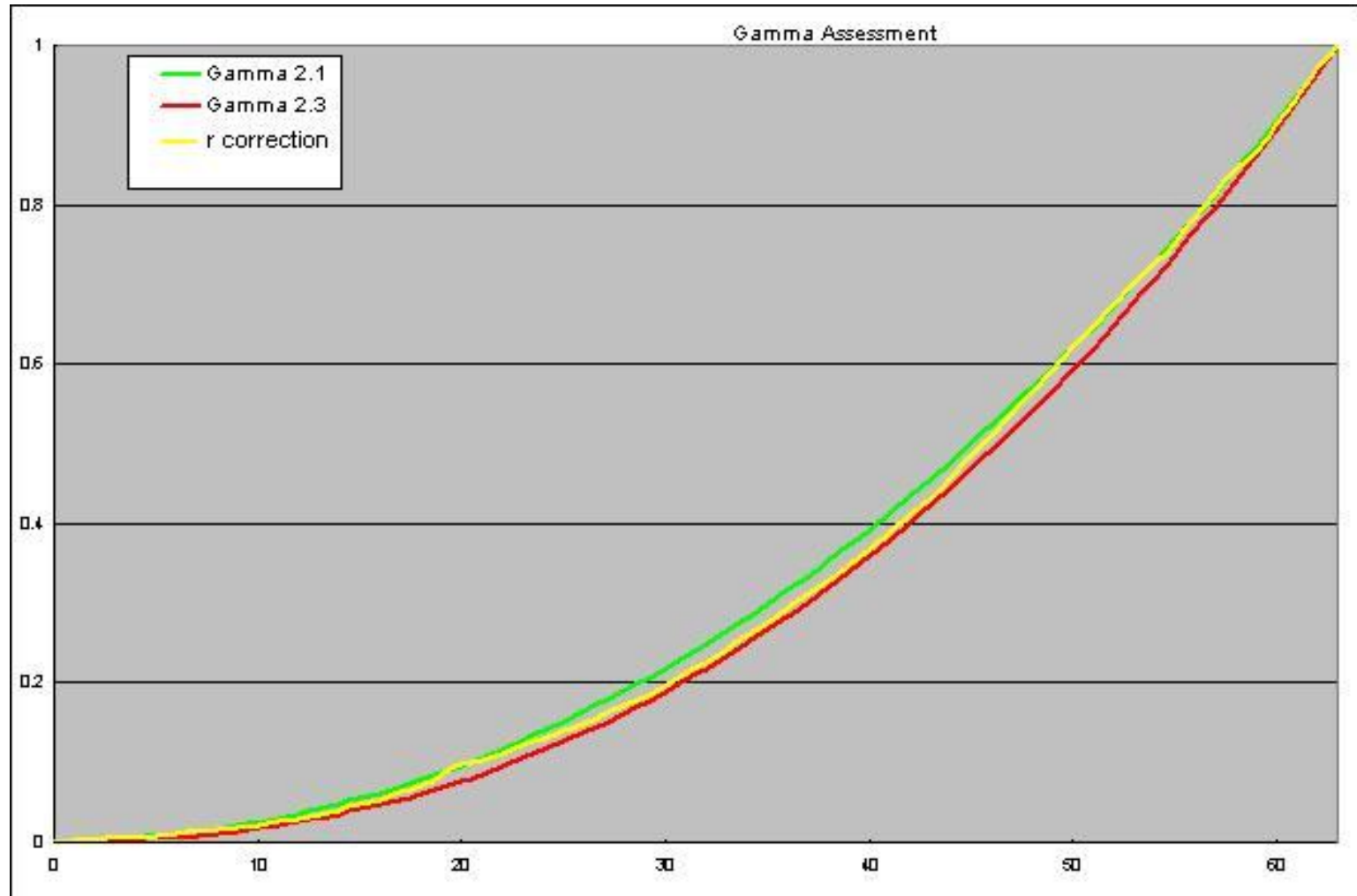
Appendix C : NVM Write Sequence

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```
{setc, R00h, 0x00000} //transfer sync.  
{setc, R00h, 0x00000}  
{setc, R00h, 0x00000}  
{setc, R00h, 0x00000}  
{setc, R6F1h, 0x061FF} //put data  
{setc, R6F0h, 0x00010} //write setting  
{setc, R6F0h, 0x00090} //write start  
{time, 0150 ,ms}  
{setc, R6F0h, 0x00000} //write end
```

Appendix D : Gamma Correction

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