DIVA Labs.

ECR (Engineering Change Request)

Proposed Change：	☑1. Design modification 設計修改 ☐2. Material change 材料變更 ☐3. Manufacturer change 製造商變更 ☐4. Factory change 工廠變更 ☐5. Process sequency change 工序變更 ☐6. Equipment / Tooling change 設備/ 模具變更 ☐7. Process / Method / Condition change 加工流程/方法/條件變更 ☐8.Add second source 新增替代料 ☐9. Others 其他：_____	**Initiator：** owen.wu 0130 0915
Reason for Change：	改善灰階DLL 16th front sensor 亮度量測計算方式降低誤差.(29.31 % --> 4.31%)	**EC No：** EC26012101
Model / Part No.：	MCD27~~012~~ 102 / 1A1A27245300800 owen	**Issue Date：** 2026/1/26 **Requester Dept.：** DV11S001
Implementation Type：	☑1. Immediately Change 立即切換 ☐2. Running Change 自然切換 ☐3. Other 其他：_____	**Customer Approval：** (confirmed by PM) ☐Needed ☑Not needed

Material Change Description（Please add pages as needed if the provided space is insufficient.）
物料變更說明（如不敷使用請逕行增頁）

No.	Subassembly		Part No.	Description	Q'ty	Location	Stock	Remark
1	2AAD674R127	B	8SWD674V11B	FW (MCD27102_240717R0V01)	1	U502		Change
		A	8SWD674V11C	FW (MCD27102_251209R0V01)	1	U502		
		B						
		A						
		B						
		A						

Comments 會簽意見

R&D		Department 會簽部門								Approval
Initiator	Initiator's Direct Supervisor	DQE	PM	Sales	PE	PMC	SCM	PD	QA	R&D Director
owen wu 0127 1400	Michael 0127 1500 / Rea Wang 0127 1415	[signature] 0127 1420	[signature] 0127 1500	[signature] 0127 1500	[signature] 0128 0910 / John 0128 0900 / Hsuan 0128 0855	Terry 0129 1200	X	Bowen 0128 1550 / 嘉彬 0128 0905 / Joanne 0128 1130	[signature] 0129	Michael 0129 1510

ECR (Engineering Change Request)

Material Change Description (Please add pagesor row as needed if the provided space is insufficient.)
物料變更說明（如不敷使用請逕行增頁或增列）

No.	Subassembly	Part No.		Description	Q'ty	Location	Stock	Remark
		B						
		A						
		B						
		A						

ECR (Engineering Change Request)

Engineering Change Assessment Item List 工程變更評估項目清單			
Document	Confirm	Authorized Dept.	Remark
1. Application for Revision of Specification or Drawing(s) for delivery 是否有修改交貨的規格或圖面	☐Yes ☑No need	RD	
2. Standards or Regulatories Impact 是否有評估適用之標準或主管機關之相關法規的申請	☐Yes ☑No need	DQE	無影响.
3. Change point of PCB mounting PCBA插件位置是否變更	☐Yes ☑No need	RD	
4. PCBA Process Changes PCBA製程是否變更	☐Yes (Continue checking below) ☑No	PE	無影响
4-1) Change of Reflow temperature 迴焊溫度是否變更	☐Yes ☐No need		
4-2) Change of bonding temperature 膠合溫度是否變更	☐Yes ☐No need		
4-3) Change of Manual Soldering temperature 人工手焊工具之溫度是否變更	☐Yes ☐No need		
4-4) Change of storage condition after protection humidity package 防潮包裝完成後的儲存條件是否變更	☐Yes ☐No need		
5. Reliability test report (Test result and data) 是否有可靠性測試報告（測試結果及數據）	☑Yes ☐No need	DQE	
6. Process FMEA（Medical only） 是否有進行製程失效模式與效應分析	☐Yes ☑No need	PE	無影响
7. Design FMEA（Medical only） 是否有進行設計失效模式與效應分析	☐Yes ☑No need	RD	
8. Risk Management（Medical only） 是否有進行風險管理評估	☐Yes ☑No need	RD	
9. Change points due to the modification 是否此修改會延伸導致其他變更點	☐Yes ☑No need	RD	

ECR (Engineering Change Request)

Engineering Change Assessment Item List 工程變更評估項目清單			
Document	Confirm	Authorized Dept.	Remark
10. Initial Supply Control implements plan or result. 是否有實施供料控制評估	☑Yes ☐No need	PMC	
10-1) Confirm the work order or order number or date for the implementation start of the engineering change. 確認工程變更開始實施之工單或訂單號碼或日期。	☑Yes ☐No need		WO:1007666，日期2026/4/15
10-2) Coordinate the handling methods for related products and materials. 協調相關產品及材料處理方法。	☐Yes ☑No need		
10-3) Arrange the production schedule. 處理生產日程之安排。	☐Yes ☑No need		
10-4) Control the changed materials. 變更材料之管制。	☐Yes ☑No need		
10-5) Establish relevant execution control records for EC materials, register traceability data for each material. 建立有關工程變更物料之相關執行管控記錄、登錄各項物料追溯性資料。	☑Yes ☐No need		WO:1007666追縱.
11. Training Requirement 若此一變更影響製程或檢驗，是否需要再做人員訓練	☐Yes ☑No need	PE	無影响
12. Modification contents (For example, the following documents) 是否有評估此變更之各項相關文件（如下） ☐ MDF ☐ DMR ☑ SOP ☑ SIP ☐ QC control plan ☐ Approval Sheet ☐ Engineering Spec ☐ Others	☑Yes ☐No need	QA	

Firmware Version History Release Note

Model Nam	MCD27102
Location	3PD606F0110(RTD2795)/ U502
Part	MAIN BD (RUH2762AMII) (2AAD606R038)

Document No. / Rev.：QRC-L-016 / Rev. A

Status	Own	Frimware Vesion Description	Mark	Description of Changes
ES	Owen	MCD27102_240103R0V01		Modify base on version MCD27102_231012R0V01 1:Factory mode after do recall function close osd menu. 2:Fine tune Front sensor pattern V-position. 3:Backlight 調整值在Gamma native及 ALS off 值不同步. 4. Add DDCCI Command for front sensor tpye. 5. Modify Change OSD Menu ALS Pause 3sec.
ES	Owen	MCD27102_240506R0V01		Modify base on version MCD27102_230103R0V01 1: Factory mode recall function 執行後關閉OSD menu. 2: ALS off or Gamma off切換時backlight OSD 顯示值一致. 3: 增加front sensor 32 灰階校正(使用新版校正軟體 4: OSD menu 顯示多了 FW Version 及 Gamma選擇項目 5. Hours used / on time 最大顯示 1小時 39 分, AC / DC off on 會
MP	Owen	MCD27102_240717R0V01		Modify base on version MCD27102_230506R0V01 1.Modify USB / DDCCI interface are select from PC restar.
MP	Owen	MCD27102_251209R0V01		Modify Lamp to Luminance calculate.

owen_wu

寄件者: Dennis <Dennis_liu@diva.com.tw>
寄件日期: 2026年1月26日星期一 上午 9:20
收件者: 'Sharon_Yeh(DIVA PM)'; 'owen_wu'
主旨: RE: A question on Diva calibration Program
附件: RE: MCD27102 price update

Dear Sharon & Owen,

Olorin已同意MCD27102可以導入此最新的firmware MCD27102_251209R0V01進行生產如附

Thanks & Best Regards
Dennis Liu

DIVA Laboratories, Ltd. | Sales & Marketing Dep.
T:+886-2-2226-8631#245 | E: dennis_liu@diva.com.tw
F:+886-2-2226-2423 | W: www.diva.com.tw
M: +886-937-314-799 | Skype ID: willowdenis
A: 9F., No.351, Sec. 2, Zhongshan Road, Zhonghe District , New Taipei City 235602, Taiwan R.O.C.

From: Sharon_Yeh(DIVA PM) <sharon_yeh@diva.com.tw>
Sent: Friday, January 23, 2026 10:39 AM
To: 'Dennis' <Dennis_liu@diva.com.tw>
Cc: 'owen_wu' <owen_wu@diva.com.tw>
Subject: RE: A question on Diva calibration Program

Hi Dennis,

請在收到新訂單那封email回覆Olorin時，確認往後MCD27102出貨是否導入下這版FW
若需要，要跑EC在上線生產前導入此版本FW，謝謝

Best Regards,
Sharon Yeh #242
Product Management Dep.

From: owen_wu <owen_wu@diva.com.tw>
Sent: Friday, January 23, 2026 10:32 AM
To: 'Sharon_Yeh(DIVA PM)' <sharon_yeh@diva.com.tw>
Cc: 'Dennis' <Dennis_liu@diva.com.tw>
Subject: RE: A question on Diva calibration Program

Dear Sharon,
MCD27102 給Olorin最後一次版本FW version MCD27102_251209R0V01
TKS,

Best Regards,
Owen.Wu
DIVA Laboratories. Ltd.
鈺緯科技開發股份有限公司
www.diva.com.tw
Tel:+886-2-2226-8631#546
Fax:+886-2-2226-2423
235029 新北市中和區中山路二段351號9F
9F., No.351, Sec.2, Zhongshan Road, Zhonghe District, New Taipei City 235, Taiwan R.O.C.

DIVA displays better.best Regards

DIVA displays better.

積極改善，挑戰未來

From: owen_wu [mailto:owen_wu@diva.com.tw]
Sent: Tuesday, December 9, 2025 4:38 PM
To: 'Dennis' <Dennis_liu@diva.com.tw>
Cc: 'sharon_yeh 葉文琴' <sharon_yeh@diva.com.tw>; 'Andrew Chen' <andrew_chen@diva.com.tw>
Subject: RE: A question on Diva calibration Program

Dear Dennis,
1. Update Olorin MCD27102 bin file.
   A: FW version MCD27102_251209R0V01
   B: 附件是測試report及 bin file.
2.使用 USB update bin file name 變更為MCD27102.bin.

Best Regards,
Owen.Wu
DIVA Laboratories. Ltd.
鈺緯科技開發股份有限公司
www.diva.com.tw
Tel:+886-2-2226-8631#546
Fax:+886-2-2226-2423
235029 新北市中和區中山路二段351號9F
9F., No.351, Sec.2, Zhongshan Road, Zhonghe District, New Taipei City 235, Taiwan R.O.C.

DIVA displays better.best Regards

DIVA displays better.

積極改善，挑戰未來

From: Dennis [mailto:Dennis_liu@diva.com.tw]
Sent: Monday, December 8, 2025 9:16 AM
To: 'owen_wu' <owen_wu@diva.com.tw>; sharon_yeh 葉文琴 <sharon_yeh@diva.com.tw>
Subject: FW: A question on Diva calibration Program

Dear Sharon & Owen,

Olorin來信有MCD27102的調校疑問如Excel附件, 並有下列需求, 再請協助幫忙確認後回覆, 感謝

I am doing front sensor calibration from remote so I have no access to the OSD. Could you also include monitor temperature in the report. Either at start or at the end.

Thanks & Best Regards
Dennis Liu

DIVA Laboratories, Ltd. | Sales & Marketing Dep.
T:+886-2-2226-8631#245 | E: dennis_liu@diva.com.tw
F:+886-2-2226-2423 | W: www.diva.com.tw
M: +886-937-314-799 | Skype ID: willowdenis
A: 9F., No.351, Sec. 2, Zhongshan Road, Zhonghe District , New Taipei City 235602, Taiwan R.O.C.

From: Uno Kraft <uno.kraft@olorin.se>
Sent: Monday, December 8, 2025 7:17 AM
To: Dennis <Dennis_liu@diva.com.tw>
Cc: Christoffer Andersson <christoffer.andersson@olorin.se>; uno@olorin.com
Subject: A question on Diva calibration Program

Hi Dennis

Have your technicians take a look at the question I have in the attached excel document

Uno

This email has been scanned for spam and viruses. Click here to report this email as spam.

設計變更審查會議記錄

會議名稱	ECN/ECR	日期	2026/01/26	時間	09:00-10:00	地點	802 會議室
會議種類	例會						
主席	Project Leader	與會人員	Michael, Jacky, Nick, Gary , Laslie ,Roy, Rex, Ryan, RongChi,Sharon ,Owen , killy, Ben,John, Joe				
會議記錄	PM	缺席人員	無				

主席指示事項：

No	工作項目	負責人
1.	依據 ECN 文件內容進行功能,性能及安全性評估	PL

決議事項：

No	工作項目	負責人	狀態
1.	DQE 測試完成後導入.	PL	

追蹤事項：

No	工作項目	負責人	完成日期	狀態	
1.					

會議記錄內容： *(XXX)紅色部分表示該事項負責人

機種名稱: MCD27102

設計變更原因：改善灰階 DLL 16th front sensor 亮度量測計算方式提升準確度

設計變更描述:

1. Modify front sensor lamp counter to luminance 亮度量測計算方式提升準確度(29.31 % → 4.31%).

導入時程：Normal

客戶審查：Not needed

一. 研發課評估:

單位	審查內容	附加文件
EE :	評估變更 front sensor 亮度量測計算方式與硬體設計無關,不會造成硬體安全性影響	無
FW:	經評估變更 front sensor 亮度量測計算方式,狀態不影響安全性.	無
ME:	設計變更機構並不會造成產品功能,性能及安全性影響.	無
SW:	經評估變更與軟體設計無關,不會造成軟體安全性影響	無
DQE:	測試功能修改項目產品功能,性能及安進行相關驗證.	Test report

二 結論:

DQE 完成測試報告後導入.

1. 開發單位各部門評估後,此設計變更不會對產品預期用途造成影響,

功能	設計變更內容測試項目
性能	設計變更內容 front sensor 亮度量測計算方式提升產品性能
可用性	無影響,沒有使用上的風險
安全性	組裝方式沒有改變, 沒有安全性風險,
法規	經審查法規內容

Characteristic Test

Test Engineer	Joe Lin	Date	2026/1/27	Stage	Result
				MP	PASS

Test Propose

All optical characteristic must be within engineering and product spec.

Evaluation Environment

Temperature	24±2ºC
Relative Humidity	50%±10%(RH)

Evaluation Equipment

Computer	Intel ® Core™ i5-4440 CPU @ 3.10GHz		
Graphics Card	NVIDIA Quadro K2000D- Driver 392.00		
O.S.	Windows 7 Professional 32 bit		
Test Equipment	EXTECH AC POWER SOURCE CFW-10	Display Color Analyzer : KONICA MINOLTA CA-310	N/A

Evaluation Unit Level

LCD Type	AUO G270ZAN01.5
Power Adapter	24V, 3ZAD24V3740
F/W Version	MCD27102_251209R0V01
Main Board	RTD2795
Controller Board	N/A
Speaker	10Wx2
Interface Option	HDMI X2、DP、Audio
Touch Panel Type	N/A
Serial Number	RD250410001

Test Standard

Characteristic Test Specification

Criteria

1. Brightness value must be greater than the minimum panel specification.
2. Contrast value must be greater than the min panel spec.
3. RGB value must be within≦±0.03
4. Color Temperature(x, y)≦±0.03
5. Follow Panel Spec / Engineering Spec/Product Spec.

MCD27102_251209R0V01

改善MCD27102 front sensor 暗階量測誤差值

FW version MCD27102_251209R0V01

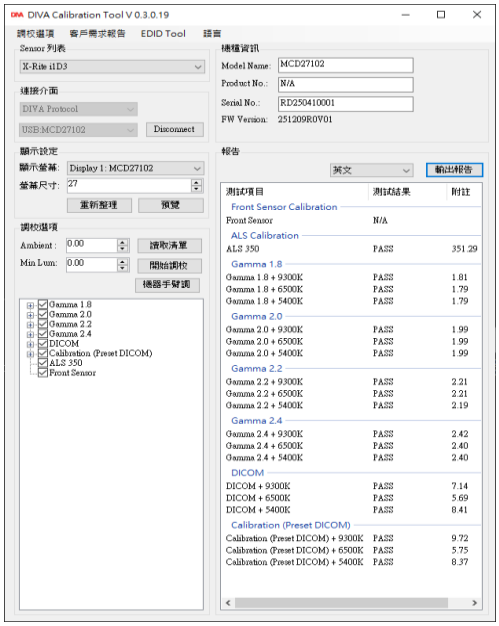
Before

DLL	Lamp	extern sensor	FS verrify	external sensor verify			
0	16	0.43	0.42	0.43	16	0.01	2.33%
8	17	0.61	0.6	0.59	17	-0.01	-1.69%
16	23	1.22	1.5	1.16	22	-0.34	-29.31%
25	35	2.53	2.25	2.36	33	0.11	4.66%
33	51	4.3	3.84	3.92	47	0.08	2.04%

After

0	16	0.43	0.43	0.43	16	0	0.00%
8	17	0.61	0.61	0.59	17	-0.02	-3.39%
16	23	1.22	1.11	1.16	22	0.05	4.31%
25	35	2.53	2.31	2.36	33	0.05	2.12%
33	51	4.3	3.85	3.92	47	0.07	1.79%

DIVA Calibration test Front Sensor Calibrated Data



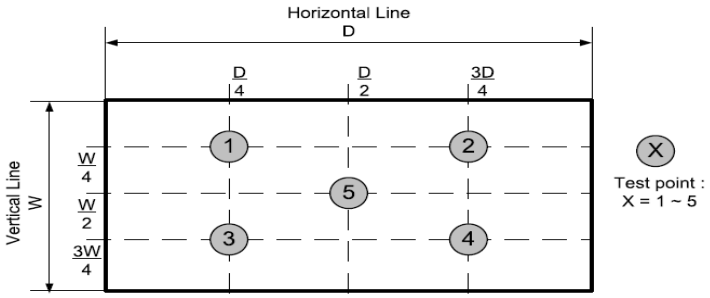
DIVA Calibration Report			
Calibrate Date:	2026/01/27 10:32:38 - 2026/01/27 11:42:19		
Measuring Device:	X-Rite i1D3 , OE-20.B-02.109928.02		
Model Name:	MCD27102	Serial Number:	RD250410001
Firmware Version:	251209R0V01?	Software Version:	0.3.0.19

Summary		
Calibration Item	Verification	Result:
Front Sensor	-	PASS
ALS 350	351.2921143	PASS
Gamma 1.8 + 9300K	1.812642089	PASS
Gamma 1.8 + 6500K	1.786290604	PASS
Gamma 1.8 + 5400K	1.787030448	PASS
Gamma 2.0 + 9300K	1.990499442	PASS
Gamma 2.0 + 6500K	1.98914097	PASS
Gamma 2.0 + 5400K	1.988211144	PASS
Gamma 2.2 + 9300K	2.21286036	PASS
Gamma 2.2 + 6500K	2.206618802	PASS
Gamma 2.2 + 5400K	2.1909758	PASS
Gamma 2.4 + 9300K	2.417561713	PASS
Gamma 2.4 + 6500K	2.396140464	PASS
Gamma 2.4 + 5400K	2.395000813	PASS
DICOM + 9300K	7.143775833	PASS
DICOM + 6500K	5.694179437	PASS
DICOM + 5400K	8.412248024	PASS
Calibration (Preset DICOM) + 9300K	9.724238671	PASS
Calibration (Preset DICOM) + 6500K	5.746454475	PASS
Calibration (Preset DICOM) + 5400K	8.373654471	PASS

Front Sensor Calibrated Data

Verify Values			Criterion	
FS verify	external sensor verify	Lamp verify	Difference	Percentage
0.42	0.42	13	0	-0.97%
0.6	0.59	14	0.01	0.97%
1.23	1.19	18	0.04	3.26%
2.54	2.44	26	0.1	4.09%
4.17	4.07	37	0.1	2.48%
6.23	6.2	51	0.03	0.53%
8.91	8.83	68	0.08	0.95%
12.64	12.5	92	0.14	1.16%
16.69	16.36	118	0.33	2.02%
21.29	20.89	149	0.4	1.89%
26.67	26.07	183	0.6	2.28%
32.68	31.95	223	0.73	2.29%
40.56	39.65	274	0.91	2.30%
48.43	47.34	327	1.09	2.31%
57	55.75	384	1.25	2.24%
67.1	65.46	450	1.64	2.51%
79.05	77.17	530	1.88	2.44%
90.81	88.73	607	2.08	2.35%
104.12	101.35	694	2.77	2.73%
117.61	114.78	785	2.83	2.47%
134.08	131.02	898	3.06	2.34%
149.37	146.51	1001	2.86	1.95%
166.93	163.09	1115	3.84	2.35%
184.7	180.16	1232	4.54	2.52%
203.66	198.99	1359	4.67	2.35%
226.12	220.99	1504	5.13	2.32%
247.12	241.81	1648	5.31	2.20%
269.4	263.7	1791	5.7	2.16%
292.01	285.91	1944	6.1	2.13%
318.75	312.47	2119	6.28	2.01%
343.58	336.64	2284	6.94	2.06%
368.06	362.19	2449	5.87	1.62%

Optical Characteristic Test



Test Procedure	Result	Note
1. Burn in more than 30 min.	Pass	
2. Confirm adjust OSD settings :Brightness→100 , Contrast→90, Color Temperature→User ,Gamma→Neutral	Pass	
3. Open white pattern,use the X-RiteiOne or Color Analyzer CA-310 to measure the screen five points.	Pass	
4. Record the x, y, and Y values of five points.	Pass	
5. Check that the characteristic meet the specifications.	Pass	

Test Condition

Measure Sensor	i-One	**Measure Tool**	DisplayMate for Windows(DMW)	**Resolution**	1920x1080 60Hz/DVI
Brightness	100	**Gamma**	N/A	**Color Temperature**	User
Measure Pattern	White Pattern/Black Pattern			**Contrast**	90

Test Spec

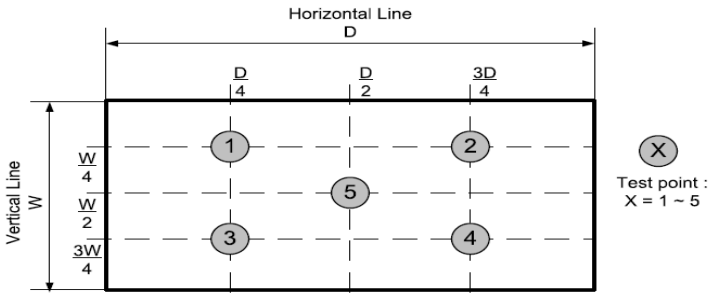
White Luminance (Center of screen)	400cd/m² (Min),500cd/m² (Typ)
Contrast Ratio (Center of screen)	700 (Min),1000 (Typ)

Measurement Record

Condition	Position	Measure value			Result	Note
		x	y	Y		
White Pattern BrightnessI =100 Contrast= 90 Color Mode= User	Up-Left Corner	0.3145	0.3344	408.28	Pass	Unit: cd/m²
	Up-Right Corner	0.3146	0.332	408.02	Pass	Unit: cd/m²
	Center	0.3110	0.3266	407.99	Pass	Unit: cd/m²
	Down-Left Corner	0.3097	0.3275	385.18	Pass	Unit: cd/m²
	Down-Right Corner	0.3076	0.3243	386.82	Pass	Unit: cd/m²
Black Pattern	Center	0.2655	0.2506	0.49	Pass	Unit: cd/m²

Measurement Conclusion	Measure value	Result	Note
Contrast Ratio	839.0	Pass	
White Luminance (Center Position)	407.99	Pass	Unit: cd/m²

Color Chromaticity Test



Test Procedure	Result	Note
1. Burn in more than 30 minutes.	Pass	
2. Confirm adjust OSD settings : Brightness→90 , Contrast→90, Color Temperature→User ,Gamma→Neutral	Pass	
3. Execute Red/Green/Blue/White pattern,and use the X-RiteiOne or CA-310 to measure the screen five points.	Pass	
4. Record the x, y, and Y values of five points.	Pass	
5. Check that the x and y values match the panel spec range.	Pass	

Test Condition

Measure Sensor	CA-310	Measure Tool	DisplayMate for Windows(DMW)	Resolution	1280x1024 60Hz/DVI
Color Temperature	User	Brightness	90	Gamma	Neutral
Measure Pattern	Red/Green/Blue/White screen				

Test Spec

Color/Chromaticity Coordinates	x , y	Spec (-0.03)	x	Spec (+0.03)	Spec (-0.03)	y	Spec (+0.03)
Red x , Red y	Rx , Ry	0.644	0.674	0.704	0.281	0.311	0.341
Green x , Green y	Gx , Gy	0.237	0.267	0.297	0.635	0.665	0.695
Blue x , Blue y	Bx ,By	0.123	0.153	0.183	0.02	0.05	0.08
White x , White y	Wx , Wy	0.283	0.313	0.343	0.299	0.329	0.359

Measurement Record

Condition	Position		Measure Data			Result	Note
			x	y	Y		
Red x:0.674±0.03 Red y:0.311±0.03	Red	Up-Left Corner	0.6723	0.3163	87.42	Pass	
		Up-Right Corner	0.6728	0.3163	91.07	Pass	
		Center	0.6720	0.3162	90.37	Pass	
		Down-Left Corner	0.6711	0.3162	83.89	Pass	
		Down-Right Corner	0.6716	0.3162	84.98	Pass	
Condition	**Position**		**Measure Data**			**Result**	**Note**
			x	**y**	**Y**		
Green x:0.267±0.03 Green y:0.665±0.03	Green	Up-Left Corner	0.2658	0.6470	293.30	Pass	
		Up-Right Corner	0.2654	0.6448	296.54	Pass	
		Center	0.2649	0.6453	295.10	Pass	
		Down-Left Corner	0.2660	0.6452	278.54	Pass	
		Down-Right Corner	0.2633	0.6450	280.37	Pass	
Condition	**Position**		**Measure Data**			**Result**	**Note**
			x	**y**	**Y**		
Blue x:0.153±0.03 Blue y:0.05±0.03	Blue	Up-Left Corner	0.1483	0.0477	22.52	Pass	
		Up-Right Corner	0.1479	0.0478	23.17	Pass	
		Center	0.1481	0.0471	23.89	Pass	
		Down-Left Corner	0.1485	0.0470	22.59	Pass	
		Down-Right Corner	0.1482	0.0471	23.24	Pass	
Condition	**Position**		**Measure Data**			**Result**	**Note**
			x	**y**	**Y**		
White x:0.313±0.03 White y:0.329±0.03	White	Up-Left Corner	0.3145	0.3344	408.28	Pass	
		Up-Right Corner	0.3146	0.3320	408.02	Pass	
		Center	0.3110	0.3266	407.99	Pass	
		Down-Left Corner	0.3097	0.3275	385.18	Pass	
		Down-Right Corner	0.3076	0.3243	386.82	Pass	

Color Temperature Test

Test Procedure	Result	Note
1. Burn in more than 30 minutes.	Pass	
2. Confirm adjust OSD settings : Brightness→90 , Contrast→90, Gamma→2.2 , Color Temperature→All	Pass	
3. Confirm open white pattern and use the X-RiteiOne or Color Analyzer CA-310 to measure the center position.	Pass	
4. Record x, y and Y values for different color temperatures.	Pass	
5. Check that the x and y values match the spec range.	Pass	

Test Condition

Measure Sensor	i-one	Measure Tool	DisplayMate for Windows(DMW)	Resolution	1280x1024 60Hz/DVI
Gamma	2.2	Brightness	90	Color Temperature	Cool/Neutral/Warm/User

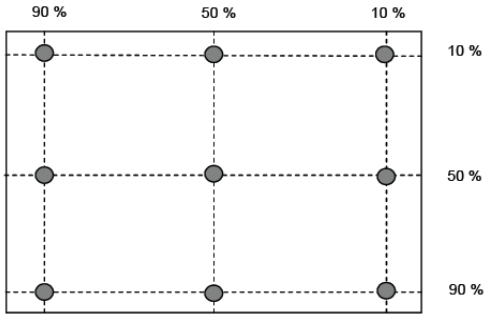
Test Spec

Color Temperature	x , y	Spec (-0.03)	x	Spec (+0.03)	Spec (-0.03)	y	Spec (+0.03)
Cool	x , y	0.264	0.294	0.324	0.279	0.309	0.339
Neutral	x , y	0.283	0.313	0.343	0.299	0.329	0.359
Warm	x , y	0.304	0.334	0.364	0.313	0.343	0.373
User	x , y	0.283	0.313	0.343	0.299	0.329	0.359

Measurement Record

Color Temperature	Position	Measure Data			Result	Note
		x	y	Y		
Cool	Center Position	0.2987	0.3108	178.5714	Pass	
Neutral	Center Position	0.3129	0.3374	219.8022	Pass	
Warm	Center Position	0.3325	0.349	186.3784	Pass	
User	Center Position	0.3135	0.3438	238.7759	Pass	

Luminance Uniformity Test



Test Procedure	Result	Note
1. Burn in more than 30 min.	Pass	
2. Confirm adjust OSD settings : Brightness→90 , Contrast→90, Gamma→Neutral , Color Temperature→User	Pass	
3. Confirm open X-RiteiOne measure Tool Uniformity Din 6868-157 Function to measure 9 points.	Pass	
4. Check that the uniformity matches the spec range.	Pass	

Test Condition

Measure Sensor	CA-310	Measure Tool	DisplayMate for Windows(DMW)	Resolution	1280x1024 60Hz/DVI
Brightness	90	Contrast	90	Color Temperature	User
GAMMA	Neutral	Measure Pattern	Full White Pattern		

Test Spec

Luminance Uniformity (9 points)	75%(Min),80%(typ)

Measurement Record

Condition	Position	Measure Data			Result	Note
		x	y	Y		
White Pattern (9 points)	Upper Left Corner	0.3150	0.3260	362.91	Pass	Unit: cd/m²
	Upper Middle Corner	0.3125	0.3253	386.32	Pass	Unit: cd/m²
	Upper Right Corner	0.3135	0.3288	373.94	Pass	Unit: cd/m²
	Center Left Corner	0.312	0.3219	350.26	Pass	Unit: cd/m²
	Center	0.3105	0.3221	373.82	Pass	Unit: cd/m²
	Center Right Corner	0.3114	0.3243	371.02	Pass	Unit: cd/m²
	Bottom Left Corner	0.3104	0.3197	356.22	Pass	Unit: cd/m²
	Bottom Middle Corner	0.3086	0.3194	367.49	Pass	Unit: cd/m²
	Bottom Right Corner	0.3082	0.3203	377.70	Pass	Unit: cd/m²

Measurement Conclusion	Luminance Uniformity (9 points) Calculation	Result	Note
White Variation (9 points)	90.67%	Pass	(Minimum Brightness of 9 points)/ (Maximum Brightness of 9 points) x100%

Gamma Test

Test Procedure	Result	Note
1. Burn in more than 1 hours or more.	Pass	
2. Confirm adjust OSD settings (Gamma Neutral/2.2).	Pass	
3. Confirm open DIVA Measure Tool and use x-ritel1 to measure Gamma curve 16bits.	Pass	
4. Record the Y value of Gamma 2.2 16bits.	Pass	
5. Check that the Gamma matches the spec range.	Pass	

Test Condition

Sensor	x-ritel1	Test Tool	DIVA Measure Tool v2.0.4.0	Input Timing	1920x1080 60Hz/DP
Brightness	50	Contrast	90	Color Temperature	Cool/Neutral/Warm/User
Gamma	1.8、2.0、2.2、2.4	Measure Pattern	DIVA Measure Tool -> Gamma Measurement Pattern		

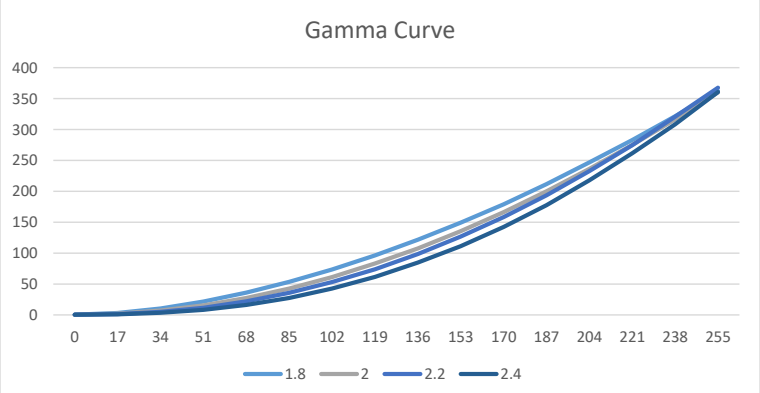
Test Spec

Item	Spec(-0.1)	Gamma	Spec(+0.1)
Gamma 1.8	1.7	1.8	1.9
Gamma 2.0	1.9	2.0	2.1
Gamma 2.2	2.1	2.2	2.3
Gamma 2.4	2.3	2.4	2.5

Gamma Data

Level	1.8	2	2.2	2.4
0	0.40	0.40	0.47	0.41
17	3.28	2.05	1.44	0.95
34	10.51	7.03	5.02	3.39
51	21.63	15.38	11.63	8.21
68	36.03	27.34	21.85	16.11
85	53.50	42.80	35.64	27.56
102	73.39	61.30	53.08	42.73
119	96.35	83.23	73.96	61.58
136	121.52	107.56	98.49	84.65
153	149.34	135.34	126.72	111.07
170	179.08	166.27	158.23	142.22
187	211.53	199.87	193.35	177.55
204	246.55	236.20	232.44	217.61
221	283.11	275.01	274.56	261.61
238	321.27	316.25	320.50	308.48
255	362.17	360.08	367.63	360.59
Measure Gamma	1.77	1.97	2.17	2.38
Result	Pass	Pass	Pass	Pass

Gamma Curve



DICOM Test

Test procedure	Result	Note
1. Burn in more than 30 min.	Pass	
2. Adjust OSD settings (DICOM).	Pass	
3. Open I1 Measure Tool DICOM to measure.	Pass	
4. Record the DICOM value and put it into the standard TUV analysis.	Pass	
5. Check that the DICOM matches the Spec range.	Pass	

Test Condition

Sensor	X-ritei1	Test Tool	DIVA Measure Tool	Input Timing	1920x1080 60Hz/DP
Color Temperature	DICOM	Brightness	Not Available	Contrast	Not Available
Measure Pattern	Full white				

Test Spec

DICOM	GSDF Deviations < ±10%

Gamma Data

Item	Level	L (cd/m²)	dL/L	Std(dL/L)	diff[%]	JND	Note
DICOM	0	0.429	0.02630	0.02553	3.02679	60.11008	
	15	1.216	0.01973	0.01911	3.24032	96.49503	
	30	2.5777	0.01556	0.01547	0.55194	132.87999	
	45	4.6125	0.01330	0.01316	1.06775	169.26494	
	60	7.5583	0.01156	0.01159	-0.29411	205.64989	
	75	11.5837	0.01069	0.01047	2.06593	242.03484	
	90	17.174	0.00973	0.00963	0.95300	278.41980	
	105	24.558	0.00922	0.00900	2.51793	314.80475	
	120	34.4609	0.00846	0.00850	-0.42710	351.18970	
	135	47.0037	0.00805	0.00811	-0.74122	387.57465	
	150	63.1221	0.00761	0.00779	-2.23351	423.95961	
	165	83.4237	0.00728	0.00753	-3.41219	460.34456	
	180	108.8754	0.00711	0.00732	-2.84665	496.72951	
	195	141.2476	0.00681	0.00715	-4.69870	533.11446	
	210	181.2262	0.00667	0.00701	-4.82177	569.49941	
	225	231.2898	0.00642	0.00689	-6.78248	605.88437	
	240	292.5126	0.00628	0.00680	-7.64628	642.26932	
	255	367.9235					
	Result	Pass					

Gamma Curve (DICOM)

